

CONFIDENTIAL

**BGA
DAISY CHAIN
DRAWINGS**

TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	QUICK VIEW	PAGES
CSP20T1.0-ISO								24-25
20	1.0mm	5mm SQ	5 x 5	full	full	BT		
LBGA25T.8-DC059								26-27
25	0.8mm	5mm SQ	5 x 5	full	full	FR4		
CSP28T.8-DC068								28-29
28	0.8mm	5mm SQ	6 x 6	full	full	BT		
CSP36T.8-DC068								30-31
36	0.8mm	6mm SQ	6 x 6	full	full	BT		
LBGA36T.8-DC069								32-33
36	0.8mm	5mm SQ	6 x 6	full	full	FR4		
CSP40T.5-DC082								34-35
40	0.5mm	5mm SQ	8 x 8	2	none	BT		
CSP44T.65-DIE								36-37
44	0.65mm	5.5 x 11mm	7 x 8	full	full			
CSP46T.75-DC24								38-39
46	0.75mm	5.76 x 7.87mm	6 x 8	full	full	Polyimide		
CSP48T1.0-ISO								40-41
48	1.0mm	8mm SQ	8 x 8	2	none	BT		
CSP48T1.0-DC081								42-43
48	1.0mm	8mm SQ	8 x 8	2	none	BT		
CSP49T.8-DC077								44-45
49	0.8mm	7mm SQ	7 x 7	full	full	BT		
LBGA49T.8-DC078								46-47
49	0.8mm	7mm SQ	7 x 7	full	full	FR4		
CSP56T.5-DC102								48-49
56	0.5mm	6mm SQ	10 x 10	2	none	BT		
CSP56T.8-DC100								50-51
56	0.8mm	9mm	10 x 10	2	none	BT		

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	QUICK VIEW	PAGES
CSP65T.8-DC083								52-53
64	0.8mm	8mm SQ	8 x 8	full	full	BT		
BGA64T1.0-ISO								54-55
64	1.0mm	9mm SQ	8 x 8	full	full	BT		
BGA64T1.0-DC3								56-57
64	1.0mm	9mm SQ	8 x 8	full	full	BT		
LBGA64T1.0-DC089								58-59
64	1.0mm	9mm SQ	8 x 8	full	full	FR4		
CSP72T.8-DC110								60-61
72	0.8mm	9mm SQ	11 x 11	2	none	BT		
CSP80T1.0-DC103								62-63
80	1.0mm	10mm SQ	10 x 10	3	none	BT		
CSP81T.8-DC097								64-65
81	0.8mm	9mm SQ	9 x 9	full	full	BT		
CSP81T1.0-DC098								66-67
81	1.0mm	10mm SQ	9 x 9	full	full	BT		
LBGA81T.8-DC099								68-69
81	0.8mm	9mm SQ	9 x 9	full	full	FR4		
LBGA81T1.0-DC099								70-71
81	1.0mm	10mm SQ	9 x 9	full	full	FR4		
CSP84T.5-DC120								72-73
84	0.5mm	7mm SQ	12 x 12	3	none	BT		
CSP96T1.0-DC122								74-75
96	1.0mm	12mm SQ	12 x 12	3	none	BT		
CSP100T.8-DC108								76-77
100	0.8mm	10mm SQ	10 x 10	full	full	BT		

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	QUICK VIEW	PAGES
LBGA100T.8-DC109								78-79
100	0.8mm	9mm SQ	10 x 10	full	full	FR4		
CSP100T1.0-DC107								80-81
100	1.0mm	11mm SQ	10 x 10	full	full	BT		
LBGA100T1.0-DC109								82-83
100	1.0mm	10mm SQ	10 x 10	full	full	FR4		
CSP108T.5-ISO								84-85
108	0.5mm	8mm SQ	14 x 14	3	none	BT		
CSP108T.8-DC121								86-87
108	0.8mm	10mm SQ	12 x 12	3	none	BT		
BGA119T1.27-DIE								88-89
119	1.27mm	14 x 22mm	17 x 7	full	full	BT		
BGA119T1.27-DC50								90-91
119	1.27mm	14 x 22mm	17 x 7	full	full	BT		
LBGA119T1.27-DC717								92-93
119	1.27mm	14 x 22mm	17 x 17	full	full	FR4		
CSP120T.8-DC914								94-95
120	0.8mm	9 x 13mm	9 x 14	full	full	BT		
CSP120T1.0-DC131								96-97
120	1.0mm	13mm SQ	13 x 13	3	none	BT		
LBGA121T.8-DC119								98-99
121	0.8mm	9mm SQ	11 x 11	full	full	FR4		
LBGA121T1.0-DC119								100-101
121	1.0mm	11mm SQ	11 x 11	full	full	FR4		
BGA121T1.27-ISO								102-103
121	1.27mm	15mm SQ	11 x 11	full	full	BT		
CBGA121T1.27-DC5								104-105
121	1.27mm	15mm SQ	11 x 11	full	full	ceramic		

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	QUICK VIEW	PAGES
CBGA121T1.27L-DC5								106-107
121	1.27mm	15mm SQ	11 x 11	full	full	ceramic		
LBGA121T1.27-DC119								108-109
121	1.27mm	15mm SQ	11 x 11	full	full	FR4		
BGA121T1.5-DC5								110-111
121	1.5mm	19mm SQ	11 x 11	full	full	BT		
LBGA121T1.5-DC5								112-113
121	1.5mm	19mm SQ	11 x 11	full	full	FR4		
CSP128T.8-DC124								114-115
128	0.8mm	11mm SQ	12 x 12	4	none	BT		
LBGA144T.8-DC129								116-117
144	0.8mm	11mm SQ	12 x 12	full	full	FR4		
CSP144T1.0-DC127								118-119
144	1.0mm	13mm SQ	12 x 12	full	full	BT		
BGA144T1.0-ISO								120-121
144	1.0mm	13mm SQ	12 x 12	full	full	BT		
BGA144T1.0-DC128								122-123
144	1.0mm	13mm SQ	12 x 12	full	full	BT		
LBGA144T1.0-DC129								124-125
144	1.0mm	13mm SQ	12 x 12	full	full	FR4		
BGA156T1.0-ISO								128-129
156	1.0mm	15mm SQ	14 x 14	4	none	BT		
BGA156T1.0-DC144								130-131
156	1.0mm	15mm SQ	14 x 14	4	none	BT		
BGA160T1.0-ISO								132-133
160	1.0mm	15mm SQ	14 x 14	4	2 x 2	BT		
BGA160T1.0-DC145								134-135
160	1.0mm	15mm SQ	14 x 14	4	2 x 2	BT		

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	QUICK VIEW	PAGES
LBGA160T1.0-DC140								136-137
160	1.0mm	15mm SQ	14 x 14	4	none	BT		
LBGA164T1.0-DC142								138-139
164	1.0mm	15mm SQ	14 x 14	4	2 x 2	FR4		
SBGA168T1.27-DC17#?								140-141
168	1.27mm	23mm SQ	17 x 17	3	none	BT		
LBGA169T.8-DC139								142-143
169	0.8mm	11mm SQ	13 x 13	full	full	FR4		
LBGA169T1.0-DC139								144-145
169	1.0mm	13mm SQ	13 x 13	full	full	FR4		
LBGA169T1.27-DC139								146-147
169	1.27mm	17mm SQ	13 x 13	full	full	FR4		
BGA169T1.5-ISO								148-149
169	1.5mm	23mm SQ	13 x 13	full	full	BT		
BGA169T1.5-DC10								150-151
169	1.5mm	23mm SQ	13 x 13	full	full	BT		
BGA169T1.5-DC138								152-153
169	1.5mm	23mm SQ	13 x 13	full	full	BT		
LBGA169T1.5-DC10								154-155
169	1.5mm	23mm SQ	13 x 13	full	full	FR4		
CSP188T.5-DC-12								156-157
188	0.5mm	13.1mm SQ	22 x 22	2+	none	tape		
BGA192T1.0-ISO								158-159
192	1.0mm	17mm SQ	16 x 16	4	none	BT		
LBGA192T1.0-DC160								160-161
192	1.0mm	17mm SQ	16 x 16	4	none	FR4		
BGA196T1.0-ISO-14x14								162-163
196	1.0mm	15mm SQ	14 x 14	full	full	BT		

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	QUICK VIEW	PAGES
BGA196T1.0-DC148								164-165
196	1.0mm	15mm SQ	14 x 14	full	full	BT		
BGA196T1.0-ISO-16x16								166-167
196	1.0mm	17mm SQ	16 x 16	4	2 x 2	BT		
LBGA196T1.0-DC149								168-169
196	1.0mm	15mm SQ	14 x 14	full	full	FR4		
LBGA196T1.0-DC162								170-171
196	1.0mm	17mm SQ	16 x 16	full	2 x 2	FR4		
CBGA196T1.27-DC11								172-173
196	1.27mm	18.5mm SQ	14 x 14	full	full	ceramic		
CBGA196T1.27L-DC11								174-175
196	1.27mm	18.5mm SQ	14 x 14	full	full	ceramic		
LBGA196T1.27-DC149								176-177
196	1.27mm	19mm SQ	14 x 14	full	full	FR4		
BGA208T1.0-ISO								178-179
208	1.0mm	17mm SQ	16 x 16	4	4 x 4	BT		
LBGA208T1.0-DC164								180-181
208	1.0mm	17mm SQ	16 x 16	full	full	FR4		
BGA208T1.27-ISO								182-183
208	1.27mm	23mm SQ	17 x 17	4	none	BT		
BGA208T1.27-DC172								184-185
208	1.27mm	23mm SQ	17 x 17	4	none	BT		
BGA208T1.27-DC170								186-187
208	1.27mm	23mm SQ	17 x 17	4	none	BT		
LBGA208T1.27-DC170								188-189
208	1.27mm	23mm SQ	17 x 17	full	full	FR4		
BGA217T1.27-ISO								190-191
217	1.27mm	23mm SQ	17 x 17	4	3 x 3	BT		

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	QUICK VIEW	PAGES
BGA217T1.27-DC171								
217	1.27mm	23mm SQ	17 x 17	4	3 x 3	BT		192-193
BGA217T1.27-DC174								
217	1.27mm	23mm SQ	17 x 17	4	3 x 3	BT		194-195
LBGA217T1.27-DC173								
217	1.27mm	23mm SQ	17 x 17	4	3 x 3	FR4		196-197
CBGA225T1.27-DC159								
225	1.27mm	21mm SQ	15 x 15mm	full	full	ceramic		198-199
CBGA225T1.27L-DC159								
225	1.27mm	21mm SQ	15 x 15mm	full	full	ceramic		200-201
LBGA225T1.27-DC159								
225	1.27mm	21mm SQ	15 x 15	full	full	FR4		202-203
BGA225T1.5-ISO								
225	1.5mm	27mm SQ	15 x 15	full	full	BT-205		204-205
BGA225T1.5-DC15								
225	1.5mm	27mm SQ	15 x 15	full	full	BT		206-207
BGA225T1.5-DC158								
225	1.5mm	27mm SQ	15 x 15	full	full	BT		208-209
BGA240T1.27-ISO								
240	1.27mm	23mm SQ	17 x 17mm	5	none	BT		210-211
LBGA240T1.27-DC175								
240	1.27mm	23mm SQ	17 x 17	5	none	FR4		212-213
BGA240T1.27-DC55								
240	1.27mm	27mm SQ	19 x 19	4	none	BT		214-215
CBGA240T1.27-ISO								
240	1.27mm	32.5mm SQ	24 x 24	3	none	ceramic		216-217
CBGA240T1.27L-ISO								
240	1.27mm	32.5mm SQ	24 x 24	3	none	ceramic		218-219

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	QUICK VIEW	PAGES
BGA249T1.27-ISO								
249	1.27mm	23mm SQ	17 x 17	5	3 x 3	BT		220-221
LBGA249T1.27-DC176								
249	1.27mm	23mm SQ	17 x 17	5	3 x 3	FR4		222-223
BGA256T1.0-ISO								
256	1.0mm	17mm SQ	16 x 16	full	full	BT		224-225
BGA256T1.0-DC168								
256	1.0mm	17mm SQ	16 x 16	full	full	BT		226-227
LBGA256T1.0-DC169								
256	1.0mm	17mm SQ	16 x 16	full	full	FR4		228-229
BGA256T1.27-ISO								
256	1.27mm	27mm SQ	20 x 20	4	none	BT		230-231
BGA256T1.27-DC62								
256	1.27mm	27mm SQ	20 x 20	4	full	BT		232-233
BGA256T1.27-DC200								
256	1.27mm	27mm SQ	20 x 20	4	none	BT		234-235
CBGA256T1.27-DC61								
256	1.27mm	21mm SQ	16 x 16	full	full	ceramic		236-237
CBGA256T1.27L-DC61								
256	1.27mm	21mm SQ	16 x 16	full	full	ceramic		238-239
LBGA256T.27-DC200								
256	1.27mm	27mm SQ	20 x 20	4	none	FR4		240-241
SBGA256T1.27-DC201								
256	1.27mm	27mm SQ	20 x 20	4	none	BT		242-243
BGA272T1.27-ISO								
272	1.27mm	27mm SQ	20 x 20	4	4 x 4	BT		244-245
BGA272T1.27-DC202								
272	1.27mm	27mm SQ	20 x 20	4	4 x 4	BT		246-247

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	QUICK VIEW	PAGES
LBGA272T1.27-DC203								248-249
272	1.27mm	27mm SQ	20 x 20	4	4 x 4	FR4		
BGA288T1.0-ISO								250-253
288	1.0mm	23mm SQ	22 x 22	4	none	BT		
BGA288T1.0-DC221								252-253
288	1.0mm	23mm SQ	22 x 22	4	none	BT		
LBGA288T1.0-DC220								254-255
288	1.0mm	23mm SQ	22 x 22	4	none	FR4		
LBGA289T1.27-DC179								256-257
289	1.27mm	23mm SQ	17 x 17	full	full	FR4		
BGA292T1.27-ISO								258-259
292	1.27mm	27mm SQ	20 x 20	4	6 x 6	BT		
LBGA292T1.27-DC204								260-261
292	1.27mm	27mm SQ	20 x 20	4	6 x 6	FR4		
BGA300T1.27-ISO								262-263
300	1.27mm	27mm SQ	20 x 20	5	none	BT		
LBGA300T1.27-DC205								264-265
300	1.27mm	27mm SQ	20 x 20	5	none	FR4		
BGA304T1.27-DC231								266-267
304	1.27mm	31mm SQ	23 x 23	4	none	BT		
CBGA304T1.27-DC63								268-269
304	1.27mm	21 x 25mm	16 x 19	full	full	ceramic		
CBGA304T1.27L-DC63								270-271
304	1.27mm	21 x 25mm	16 x 19	full	full	ceramic		
LBGA304T1.27-DC233								272-273
304	1.27mm	31mm SQ	23 x 23	4	none	FR4		
LBGA304T1.27-DC619								274-275
304	1.27mm	21 x 25mm	16 x 19	full	full	FR4		

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	QUICK VIEW	PAGES
SBGA304T1.27-ISO								276-277
304	1.27mm	31mm SQ	23 x 23	4	none	BT		
BGA313T1.27-ISO								278-279
313	1.27/2.54mm	35mm	25 x 25	staggered	staggered	BT		
BGA313T1.27-DC65								280-281
313	1.27/2.54mm	35mm SQ	25 x 25	25	staggered	BT		
BGA316T1.27-ISO								282-283
316	1.27mm	27mm SQ	20 x 20	5	4 x 4	BT		
LBGA316T1.27-DC206								284-285
316	1.27mm	27mm SQ	20 x 20	5	4 x 4	FR4		
BGA320T1.0-DC66								286-287
320	1.0mm	21mm SQ	20 x 20	5	4 x 6	BT		
BGA324T1.0-DC224								288-289
324	1.0mm	23mm SQ	22 x 22	4	6 x 6	BT		
BGA324T1.27-ISO								290-291
324	1.27mm	27mm SQ	20 x 20	5	4 x 4	BT		
BGA324T1.27-DC207								292-293
324	1.27mm	27mm SQ	20 x 20	5	4 x 4	BT		
LBGA324T1.27-DC207								294-295
324	1.27mm	27mm SQ	20 x 20	5	4 x 4	FR4		
BGA324T1.5-DC67								296-297
324	1.5mm	31mm SQ	18 x 18	full	full	BT		
BGA328T1.27-DIE								298-299
328	1.27mm	27mm SQ	20 x 20	5	4 x 4	BT		
BGA329T1.27-ISO								300-301
329	1.27mm	31mm SQ	23 x 23	4	5 x 5	BT		
BGA329T1.27-DC232								302-303
329	1.27mm	31mm SQ	23 x 23	4	5 x 5	BT		

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	QUICK VIEW	PAGES
BGA336T1.27-ISO								304-305
336	1.27mm	27mm SQ	20 x 20	5	6 x 6	BT		
LBGA336T1.27-DC208								306-307
336	1.27mm	27mm SQ	20 x 20	5	6 x 6	FR4		
BGA352T1.27-ISO								308-309
352	1.27mm	35mm SQ	26 x 26	4	none	BT		
BGA352T1.27-DC70								310-311
352	1.27mm	35mm SQ	26 x 26	4	none	BT		
BGA352T1.27-DC70A								312-313
352	1.27mm	35mm SQ	26 x 26	4	none	BT		
SBGA352T1.27-DC70								314-315
352	1.27mm	35mm SQ	26 x 26	4	none	BT		
TBGA352T1.27-ISO								316-317
352	1.27mm	35mm SQ	26 x 26	4	none	tape		
LBGA352T1.27-DC70								318-319
352	1.27mm	35mm SQ	26 x 26	4	none	FR4		
BGA357T1.27-DC73								320-321
357	1.27mm	25mm SQ	19 x 19	full	full	BT		
LBGA357T1.27-DC73								322-323
357	1.27mm	25mm SQ	19 x 19	full	full	FR4		
BGA360T1.27-ISO								324-325
360	1.27mm	31mm SQ	23 x 23	5	none	BT		
CBGA361T1.27-DC71								326-327
361	1.27mm	25mm SQ	19 x 19	full	full	ceramic		
CBGA361T1.27L-DC71								328-329
361	1.27mm	25mm SQ	19 x 19	full	full	ceramic		
BGA385T1.27-ISO								330-331
385	1.27mm	31mm SQ	23 x 23	5	5 x 5	BT		

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	QUICK VIEW	PAGES
BGA388T1.27-ISO								332-333
388	1.27mm	35mm SQ	26 x 26	4	6 x 6	BT		
BGA388T1.27-DC72								334-335
388	1.27mm	35mm SQ	26 x 26	4	6 x 6	BT		
BGA388T1.27-DC72A								336-337
338	1.27mm	35mm SQ	26 x 26	4	6 x 6	BT		
LBGA388T1.27-DC72								338-339
388	1.27mm	35mm SQ	26 x 26	4	6 x 6	FR4		
CBGA388T1.27-DC72								340-341
388	1.27mm	35mm SQ	26 x 26	4	6 x 6	ceramic		
CBGA388T1.27L-DC72								342-343
388	1.27mm	35mm SQ	26 x 26	4	6 x 6	ceramic		
BGA396T1.27-ISO								344-345
396	1.27mm	27mm SQ	27 x 27	full	full	BT		
CBGA400T1.27-DC21								346-347
400	1.27mm	27mm SQ	20 x 20	full	full	ceramic		
CBGA400T1.27L-DC21								348-349
400	1.27mm	27mm SQ	20 x 20	full	full	ceramic		
LBGA400T1.27-DC21								350-351
400	1.27mm	27mm SQ	20 x 20	full	full	ceramic		
LBGA400T1.27-DC209								352-353
400	1.27mm	27mm SQ	20 x 20	full	full	FR4		
BGA400T1.5-DC20								354-355
396/400	1.5mm	35mm SQ	20 x 20	full	full	BT		
LBGA400T1.5-DC20								356-357
400	1.5mm	35mm SQ	20 x 20	full	full	FR4		
BGA420T1.27-ISO								358-359
420	1.27mm	35mm SQ	26 x 26	5	none	BT		

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	QUICK VIEW	PAGES
BGA420T1.27-DC85								360-361
420	1.27mm	35mm SQ	26 x 26	5	none	BT		
TBGA420T1.27-ISO								362-363
420	1.27mm	35mm SQ	26 x 26	5	none	tape		
LBGA420T1.27-DC85								364-365
420	1.27mm	35mm SQ	26 x 26	5	none	FR4		
SBGA432T1.27-DC314								366-367
432	1.27mm	40mm SQ	31 x 31	4	none	BT		
TBGA432T1.27-DC79								368-369
432	1.27mm	31mm SQ	24 x 24	6	none	tape		
BGA456T1.27-ISO								370-371
456	1.27mm	35mm SQ	26 x 26	5	6 x 6	BT		
BGA480T1.27-ISO								372-373
480	1.27mm	35mm SQ	26 x 26	6	none	BT		
BGA480T1.27-DC90								374-375
480	1.27mm	35mm SQ	26 x 26	6	none	BT		
LBGA480T1.27-DC90								376-377
480	1.27mm	35mm SQ	26 x 26	6	none	FR4		
BGA540T1.27-DC80								378-379
540	1.27mm	42.5mm SQ	32 x 32	5	none	BT		
LBGA540T1.27-DC80								380-381
540	1.27mm	42.5mm SQ	32 x 32	5	none	FR4		
LBGA540T1.27-DC325								382-383
540	1.27mm	42.5mm SQ	32 x 32	5	none	FR4		
SBGA560T1.27-DC87								384-385
560	1.27mm	42.5mm SQ	33 x 33	5	none	BT		
LBGA560T1.27-DC335								386-387
560	1.27mm	42.5mm SQ	33 x 33	5	none	FR4		

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	QUICK VIEW	PAGES
LBGA576T1.0-DC249								388-389
576	1.0mm	25mm SQ	24 x 24	full	full	FR4		
CBGA576T1.27-DC249								390-391
576	1.27mm	32.5mm SQ	24 x 24	full	full	ceramic		
CBGA625T1.27-ISO								392-393
625	1.27mm	32.5mm SQ	25 x 25	full	full	ceramic		
CBGA625T1.27L-ISO								394-395
625	1.27mm	32.5mm SQ	25 x 25	full	full	ceramic		
CBGA625T1.27-DC81								396-397
625	1.27mm	32.5mm SQ	25 x 25mm	full	full	ceramic		
CBGA625T1.27L-DC81								398-399
625	1.27mm	32.5mm SQ	25 x 25mm	full	full	ceramic		
CGA625T1.27-DC259								400-401
625	1.27mm	32.5mm SQ	25 x 25mm	full	full	ceramic		
CGA625T1.27-DC259A								402-403
625	1.27mm	32.5mm SQ	25 x 25mm	full	full	ceramic		
LBGA676T1.0-DC269								404-405
676	1.0mm	27mm SQ	26 x 26mm	full	full	FR4		
CBGA676T1.27-DC269								406-407
676	1.27mm	35mm SQ	26 x 26mm	full	full	ceramic		
CBGA729T1.27-DC279								408-409
729	1.27mm	35mm SQ	27 x 27mm	full	full	ceramic		
TBGA736T1.27-DC86								410-411
736	1.27mm	40mm SQ	31 x 31mm	8	none	tape		
LBGA784T1.0-DC289								412-413
784	1.0mm	29mm SQ	28 x 28mm	full	full	FR4		
CBGA784T1.27-DC289								414-415
784	1.27mm	37.5mm SQ	28 x 28mm	full	full	ceramic		

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	QUICK VIEW	PAGES
CBGA841T1.27-DC299								416-417
841	1.27mm	40mm SQ	29 x 29mm	full	full	ceramic		
LBGA900T1.0-DC309								418-419
900	1.0mm	31mm SQ	30 x 30	full	full	FR4		
CBGA900T1.27-DC309								420-421
900	1.27mm	40mm SQ	30 x 30	full	full	ceramic		
CBGA961T1.27-DC319								422-423
961	1.27mm	42.5mm SQ	31 x 31	full	full	ceramic		
LBGA1024T1.0-DC329								424-425
1024	1.0mm	32.5mm SQ	32 x 32	full	full	FR4		
CBGA1024T1.27-DC329								426-427
1024	1.27mm	42.5mm SQ	32 x 32	full	full	ceramic		
CGA1089T1.27-DC339								430-431
1089	1.27mm	42.5mm SQ	33 x 33	full	full	ceramic		
CGA1089T1.27-DC339A								432-433
1089	1.27mm	42.5mm SQ	33 x 33	full	full	ceramic		
LBGA1156T1.0-DC349								434-435
1156	1.0mm	35mm SQ	34 x 34	full	full	FR4		
CBGA1156T1.27-DC349								436-437
1156	1.27mm	45mm SQ	34 x 34	full	full	ceramic		
CBGA1225T1.27-DC359								438-439
1125	1.27mm	47.5mm SQ	35 x 35	full	full	ceramic		
LBGA1296T1.0-DC369								440-441
1296	1.0mm	37.5mm SQ	36 x 36	full	full	FR4		
CBGA1296T1.27-DC369								442-443
1296	1.27mm	47.5mm	36 x 36	full	full	ceramic		
CBGA1369T1.27-DC379								444-445
1369	1.27mm	50mm SQ	37 x 37	full	full	ceramic		

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	QUICK VIEW	PAGES

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	QUICK VIEW	PAGES

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	QUICK VIEW	PAGES

BALL VIEW

	5	4	3	2	1
A		●	●	●	
B	●	●	●	●	●
C	●	●		●	●
D	●	●	●	●	●
E		●	●	●	

BOTTOM SIDE (TOP X-RAY VIEW)

	1	2	3	4	5
A		●	●	●	
B	●	●	●	●	●
C	●	●		●	●
D	●	●	●	●	●
E		●	●	●	

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

CSP20T1.0-ISO

TopLine™

BALLS
20

PITCH
1.0mm

SIZE
5mm SQ

MATRIX
5 x 5

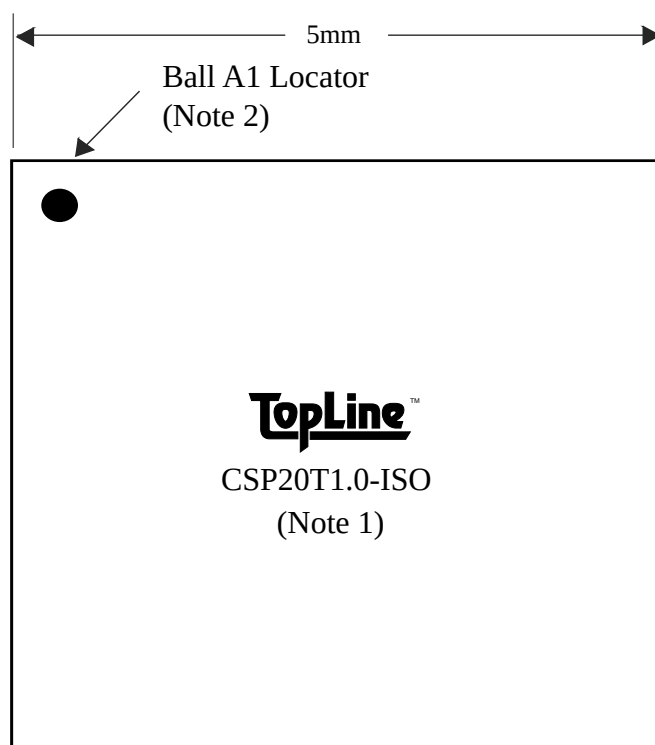
ROWS
full

CENTER
full

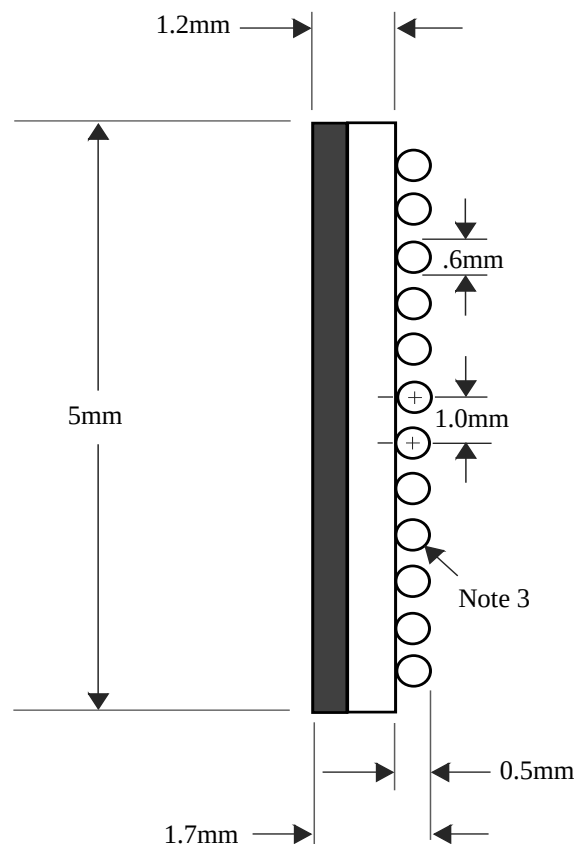
MAT'L
BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT Laminate	Tray BGATRAY5mm Tray Quantity Tray Suppliers (ref):		

BALLS

25

PITCH

0.8mm

SIZE

5mm SQ

MATRIX

5 x 5

ROWS

full

CENTER

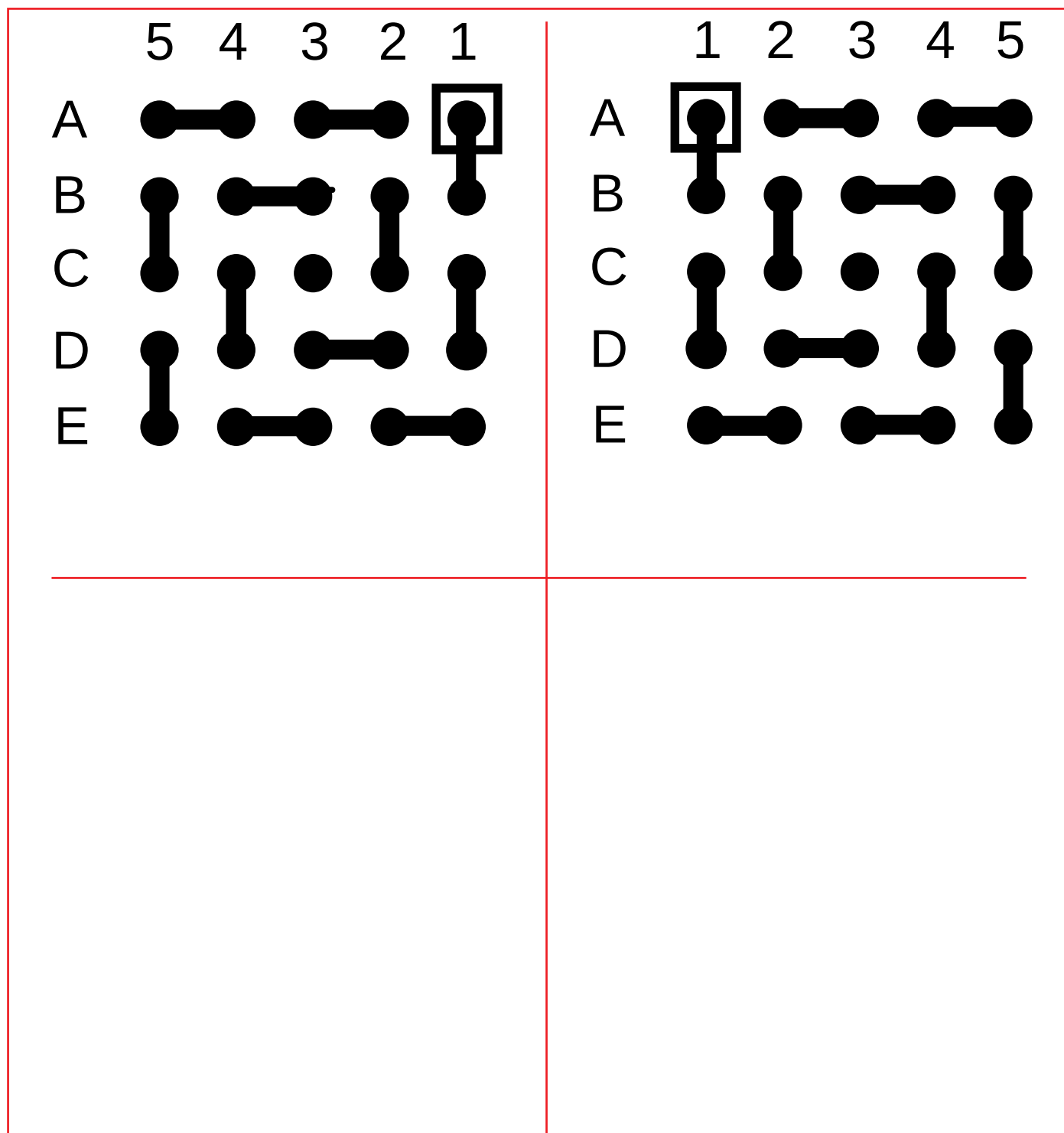
full

MAT'L

FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

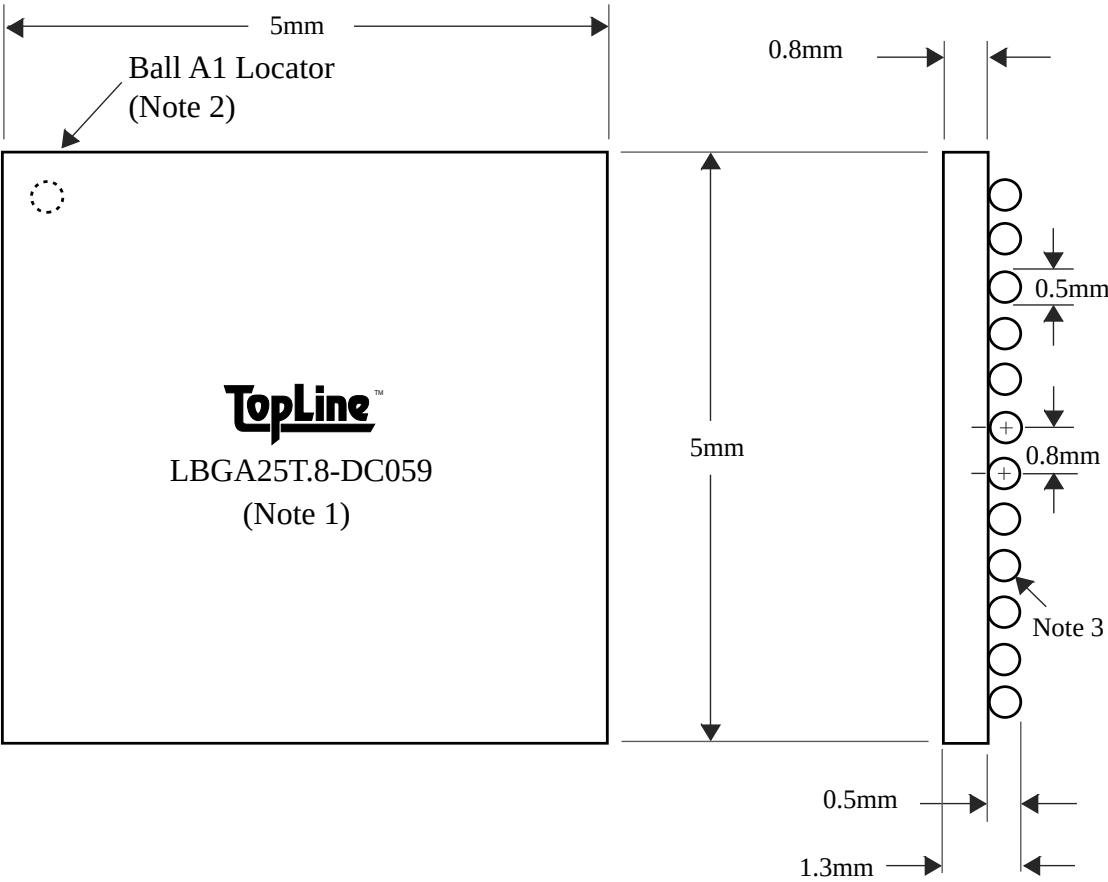
LBGA25T.8-DC059



BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830
25	0.8mm	5mm SQ	5 x 5	full	full	FR4	FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY5mm Tray Quantity Tray Suppliers (ref): FLOUROWARE		

BALLS

28

PITCH

0.8mm

SIZE

5mm SQ

MATRIX

6 x 6

ROWS

full

CENTER

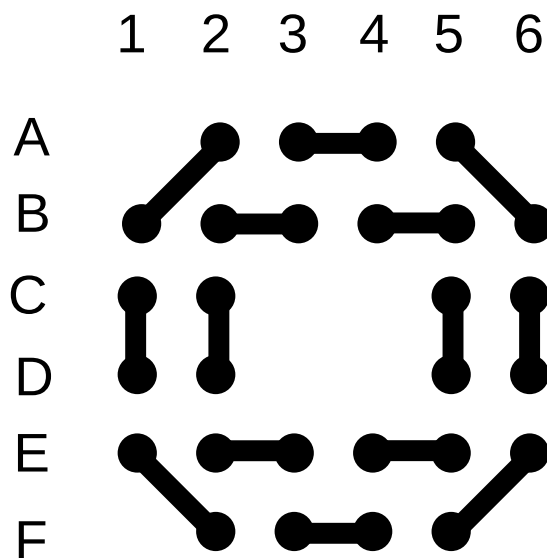
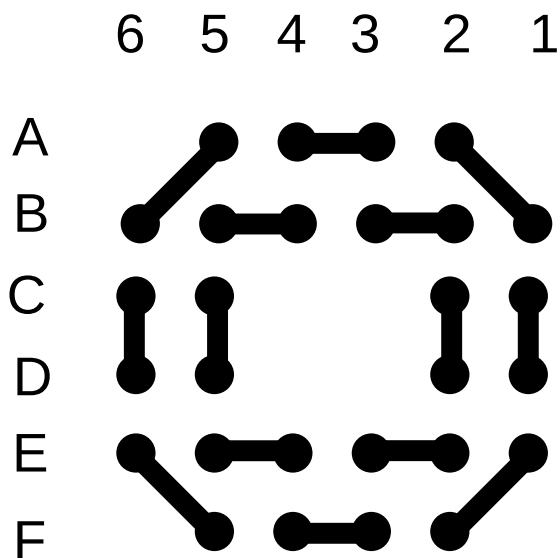
full

MAT'L

BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

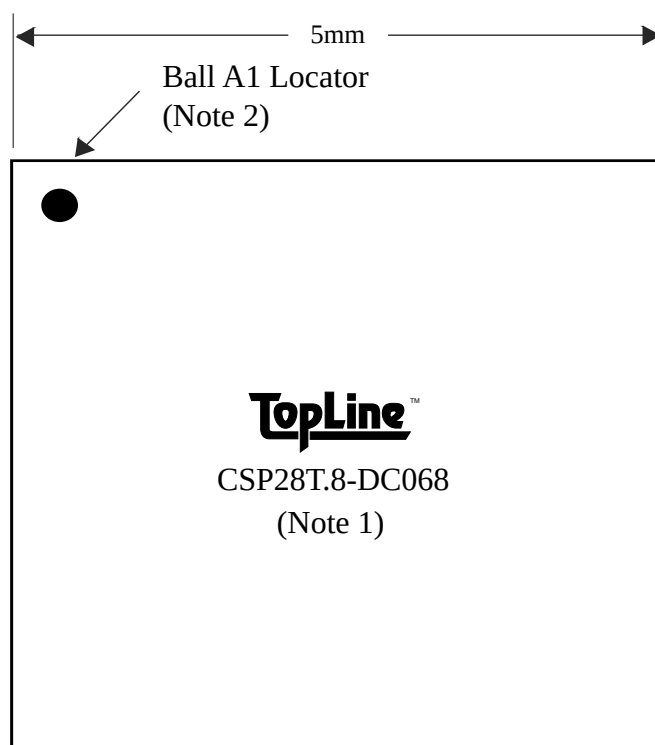
CSP28T.8-DC068

TopLine™

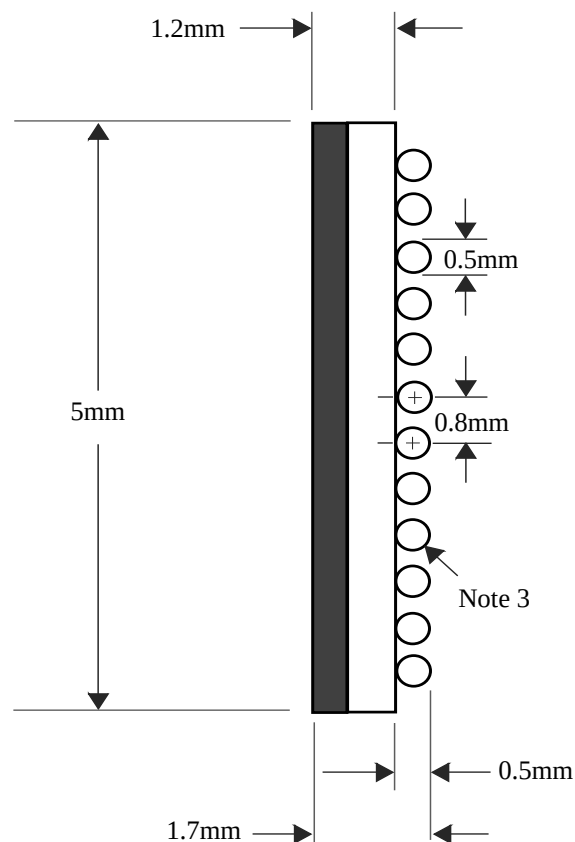
<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
28	0.8mm	5mm SQ	6 x 6	full	full	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT Laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY5mm Tray Quantity Tray Suppliers (ref): FLOUROWARE		



TEL 1-714-898-3830

FAX 1-714-891-0321

CSP36T.8-DC068

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
36	0.8mm	6mm SQ	6 x 6	full	full	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

Daisy Chain to be completed

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

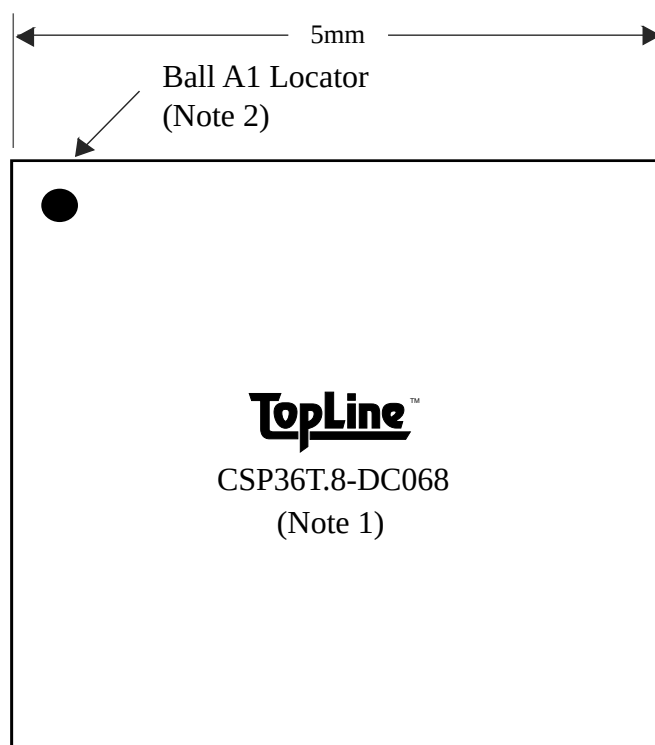
CSP36T.8-DC068

TopLine™

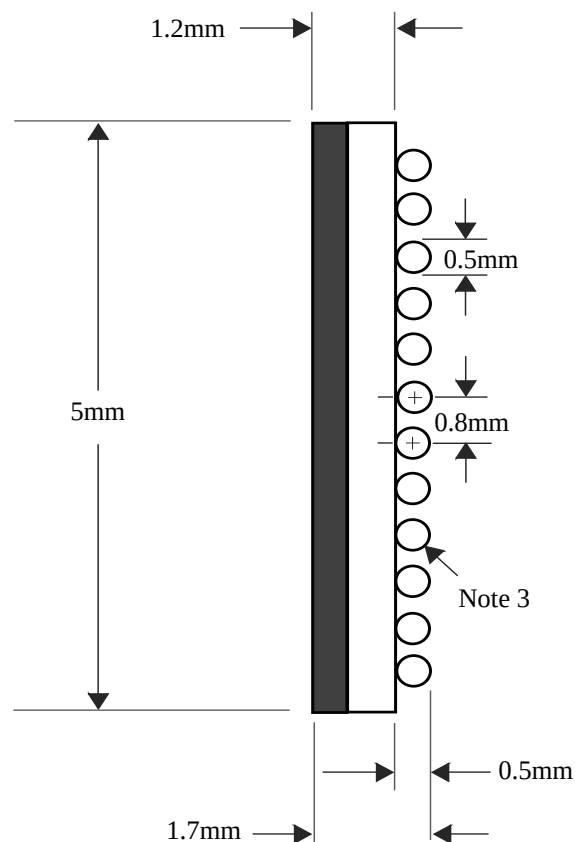
<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
36	0.8mm	6mm SQ	6 x 6	full	full	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT Laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY5mm Tray Quantity Tray Suppliers (ref): FLOUROWARE		

BALLS

36

PITCH

0.8mm

SIZE

5mm SQ

MATRIX

6 x 6

ROWS

full

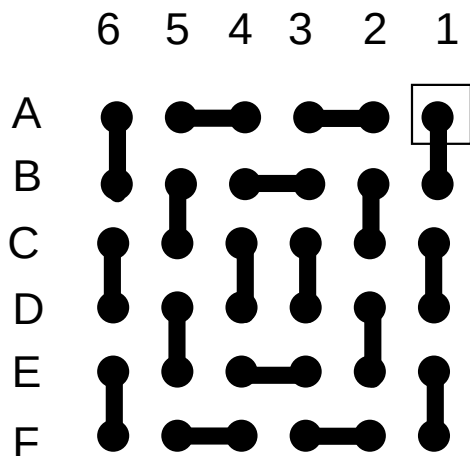
CENTER

full

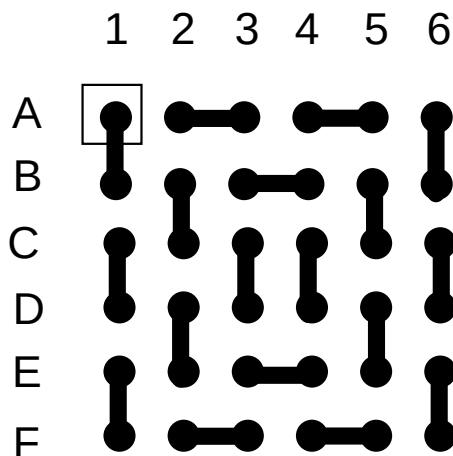
MAT'L

FR4

BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA36T.8-DC069

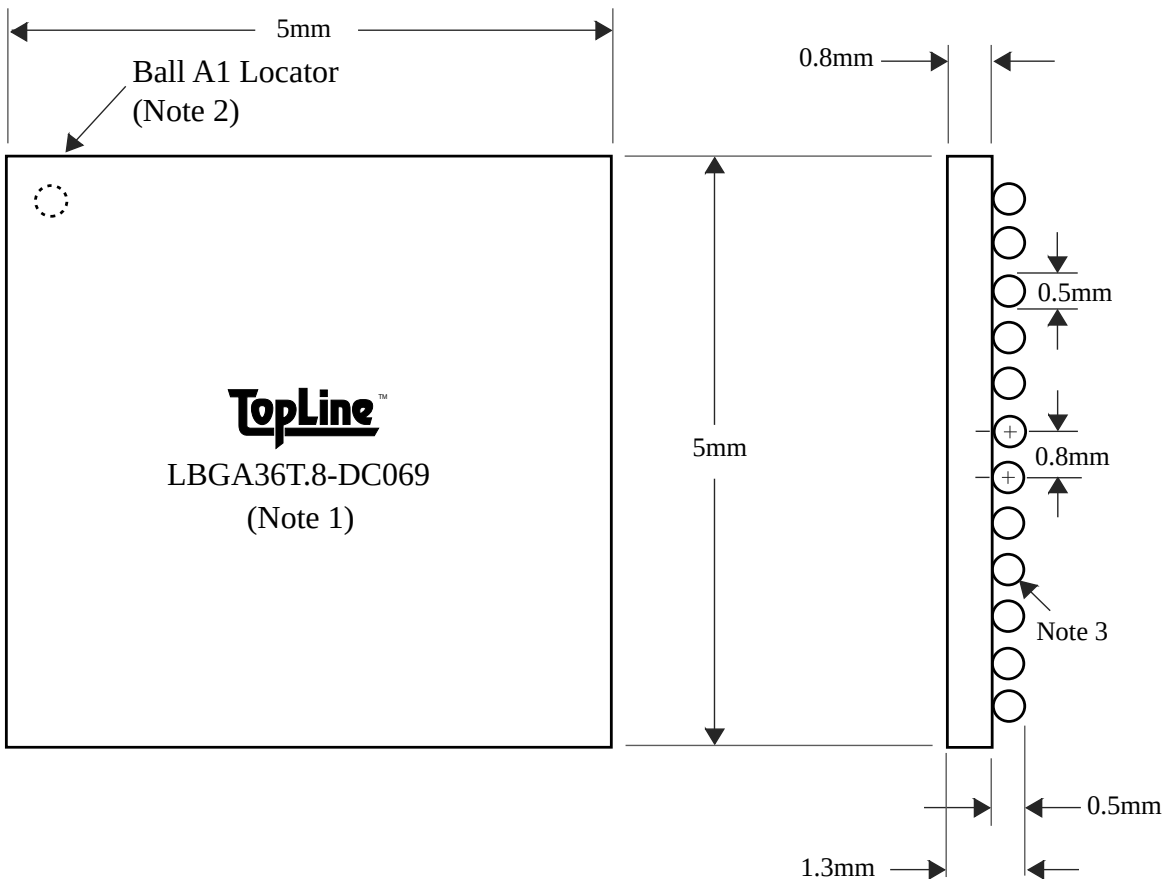
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
36	0.8mm	5mm SQ	6 x 6	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY5mm Tray Quantity Tray Suppliers (ref): FLOUROWARE		



TEL 1-714-898-3830

FAX 1-714-891-0321

CSP40T.5-DC082

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
40	0.5mm	5mm SQ	8 x 8	2	none	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

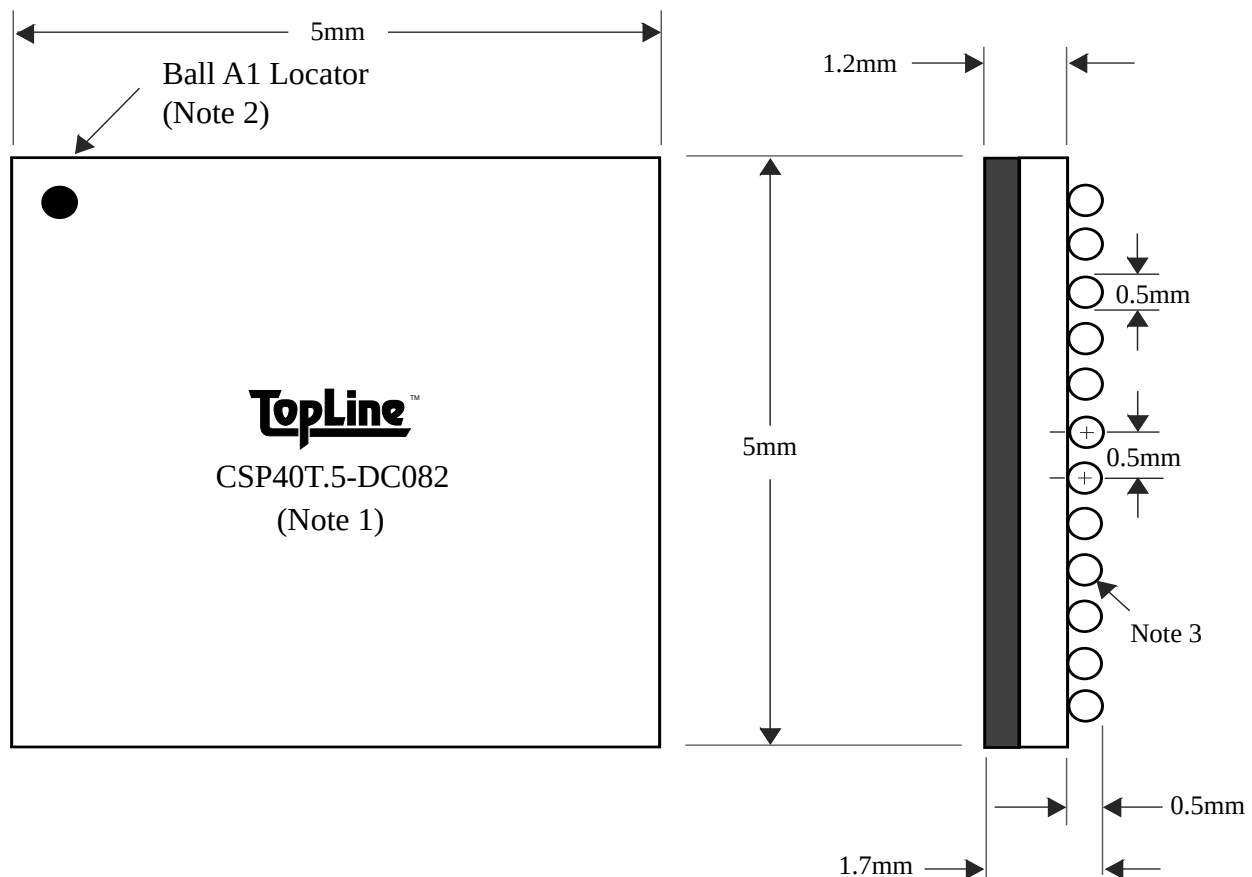
TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

TopLine™

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
40	0.5mm	5mm SQ	8 x 8	2	none	BT

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT Laminate	PACKAGING TRAYS (SEE NOTE 4) Tray BGATRAY5mm Tray Quantity Tray Suppliers (ref): FLOUROWARE		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
44	0.65mm	5.5 x 11mm	7 x 8	full	full	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

	7	6	5	4	3	2	1		1	2	3	4	5	6	7
A		●	●	●	●	●	●	A	●	●	●	●	●	●	
B		●	●	●	●	●	●	B	●	●	●	●	●	●	
C	●	●	●	●	●	●	●	C	●	●	●	●	●	●	●
D	●	●	●	●	●	●	●	D	●	●	●	●	●	●	●
E	●	●	●	●	●	●	●	E	●	●	●	●	●	●	●
F		●	●	●	●	●	●	F	●	●	●	●	●	●	
G		●	●	●	●	●	●	G	●	●	●	●	●	●	
H		●	●	●	●	●	●	H	●	●	●	●	●	●	

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

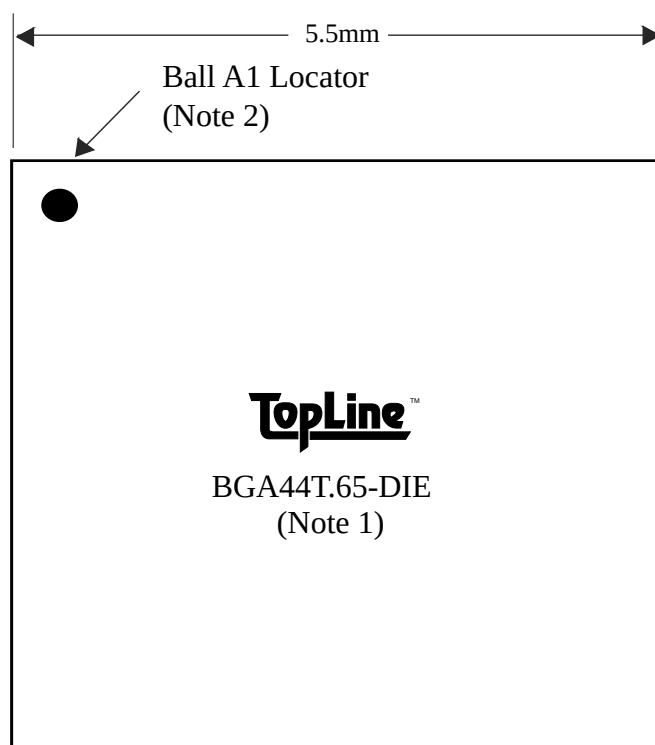
CSP44T.65-DIE

TopLine™

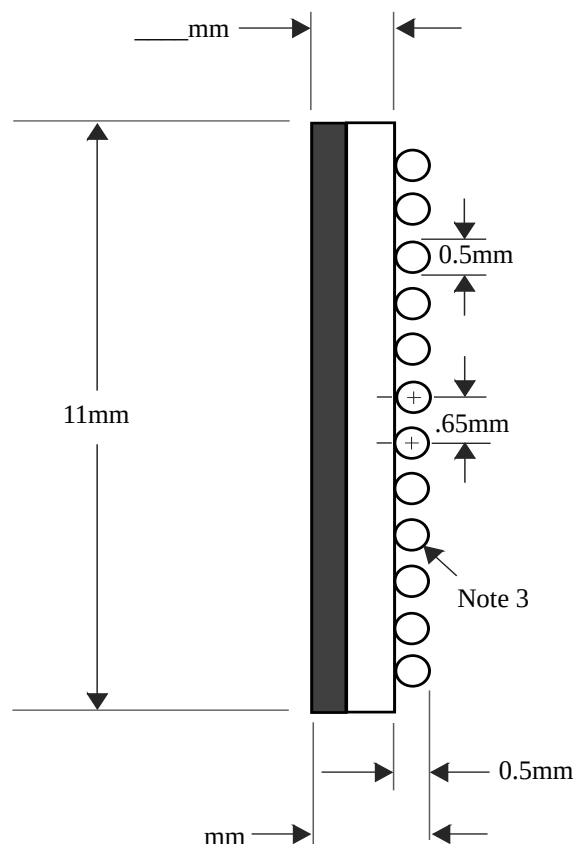
<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
44	0.65mm	5.5 x 11mm	7 x 8	full	full	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT Laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY5.5x11		
		Tray Quantity		
		Tray Suppliers (ref):		
		FLOUROWARE		

BALLS
46

PITCH
0.75mm

SIZE
5.76 x 7.87mm

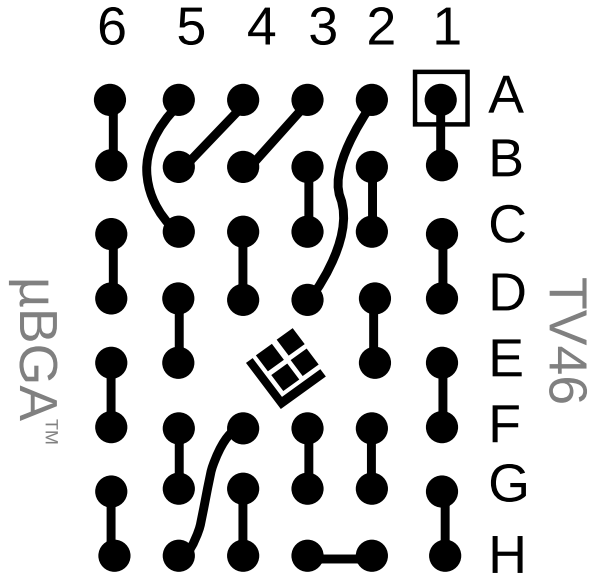
MATRIX
6 x 8

ROWS
full

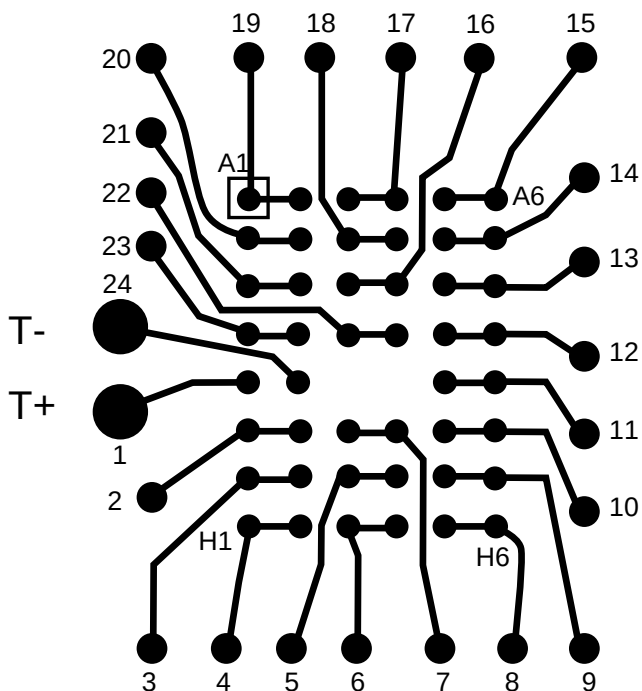
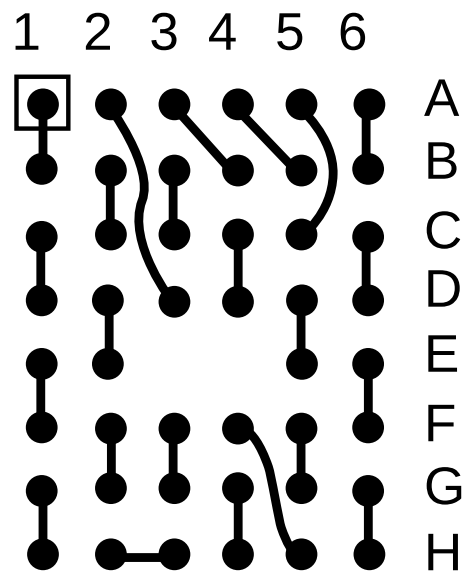
CENTER
full

MAT'L
Polyimide

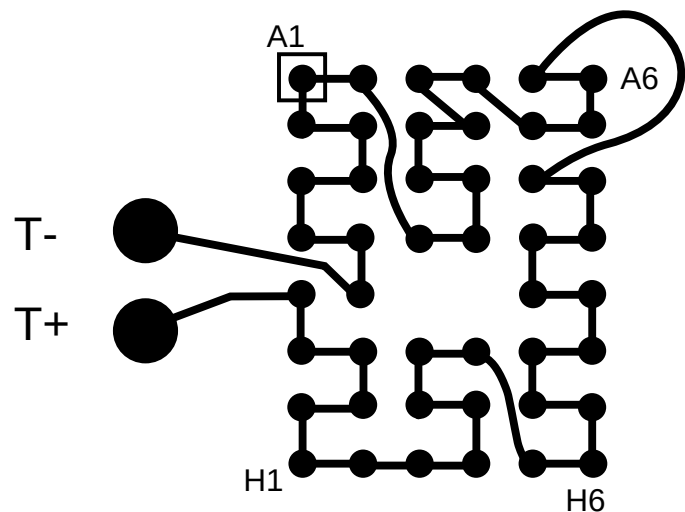
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

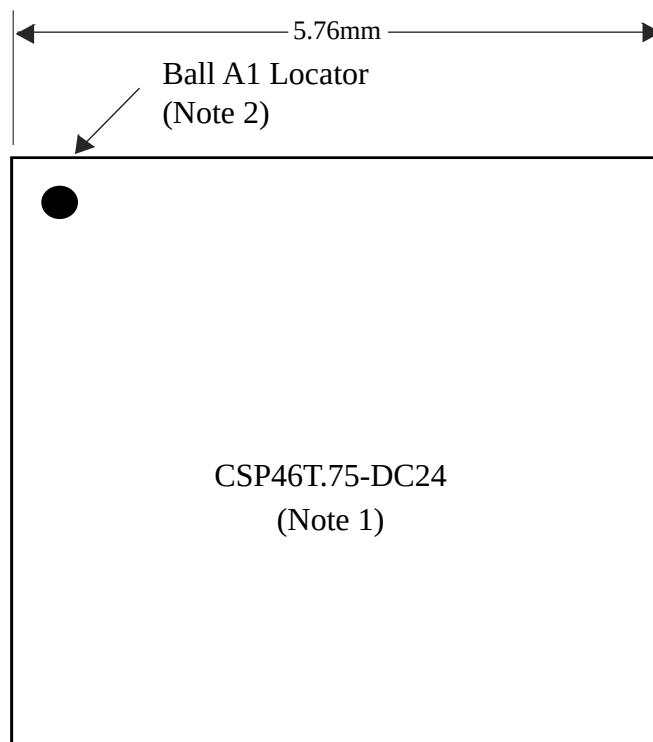
CSP46T.75-DC24

TopLine™

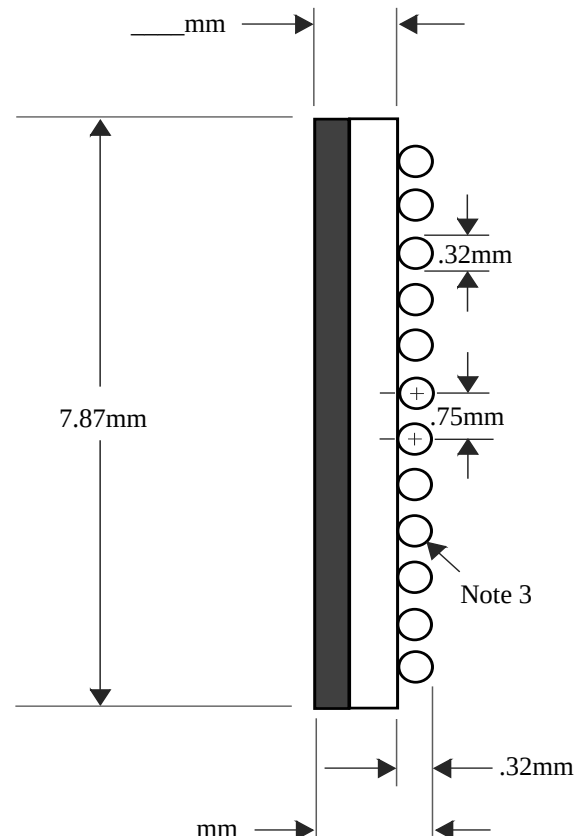
BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
46	0.75mm	5.76 x 7.87mm	6 x 8	full	full	Polyimide

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



SIDE VIEW

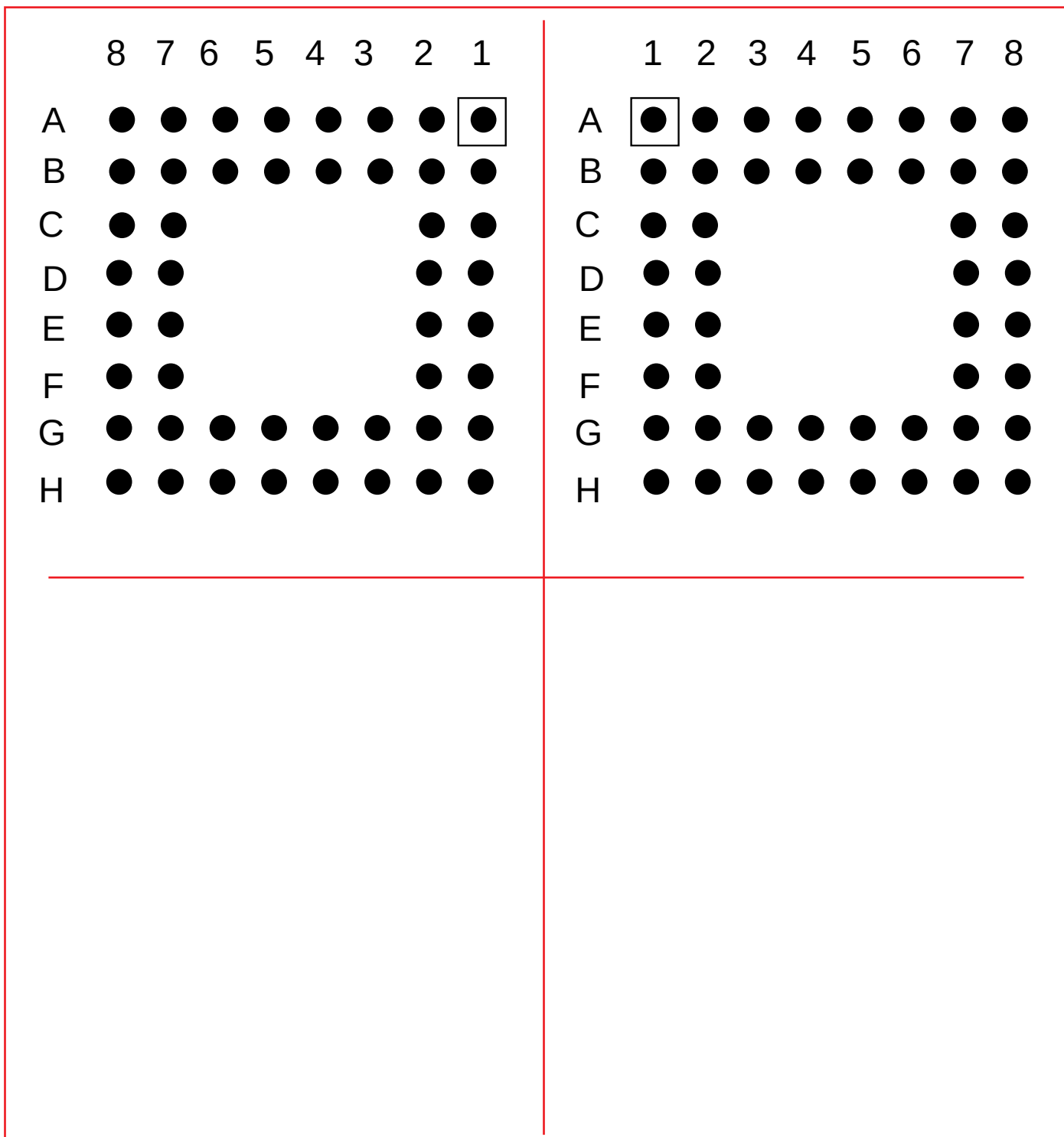


NOTES		REVISIONS		
Note 1	Logo and part number centered	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: Polyimide Tape			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY-TV46		
		Tray Quantity 64 or 99		
		Tray Suppliers (ref):		
		FLOUROWARE		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
48	1.0mm	8mm SQ	8 x 8	2	none	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

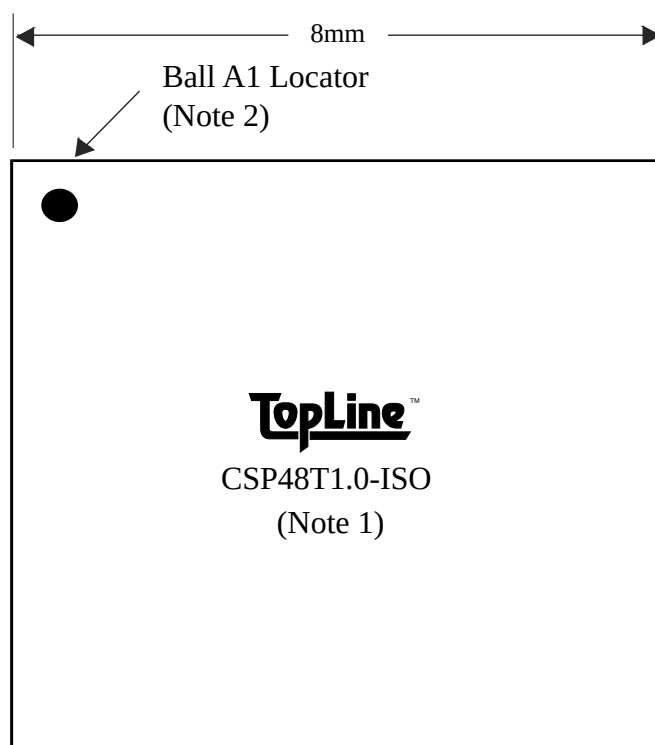
CSP48T1.0-ISO

TopLine™

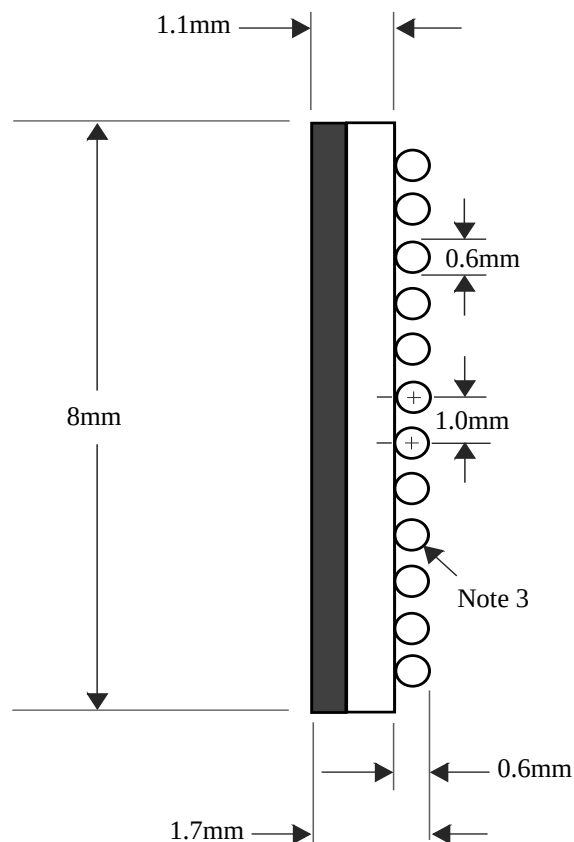
<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
48	1.0mm	8mm SQ	8 x 8	2	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



SIDE VIEW

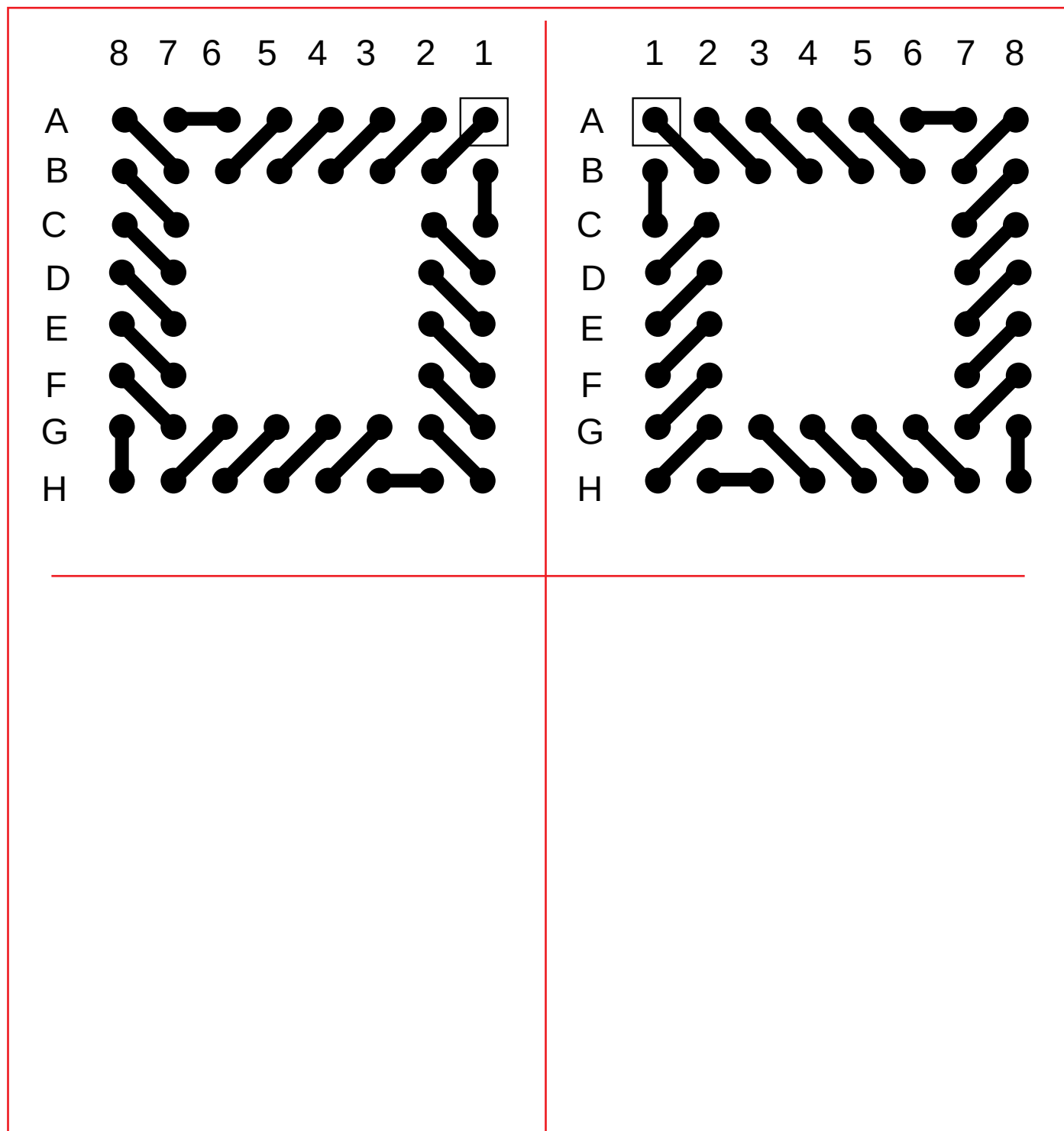


NOTES		REVISIONS		
Note 1	Logo and part number centered	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT Laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY8mm Tray Quantity Tray Suppliers (ref): FLOUROWARE		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
48	1.0mm	8mm SQ	8 x 8	2	none	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

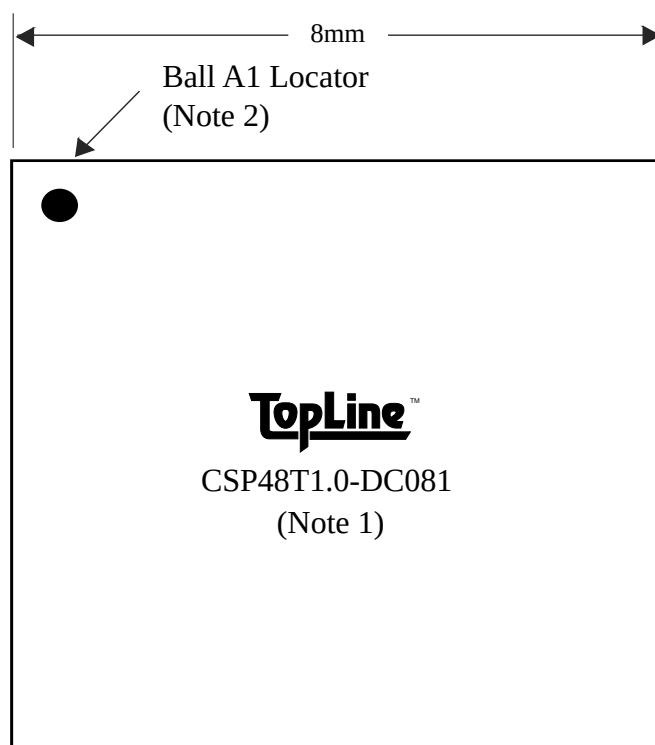
CSP48T1.0-DC081

TopLine™

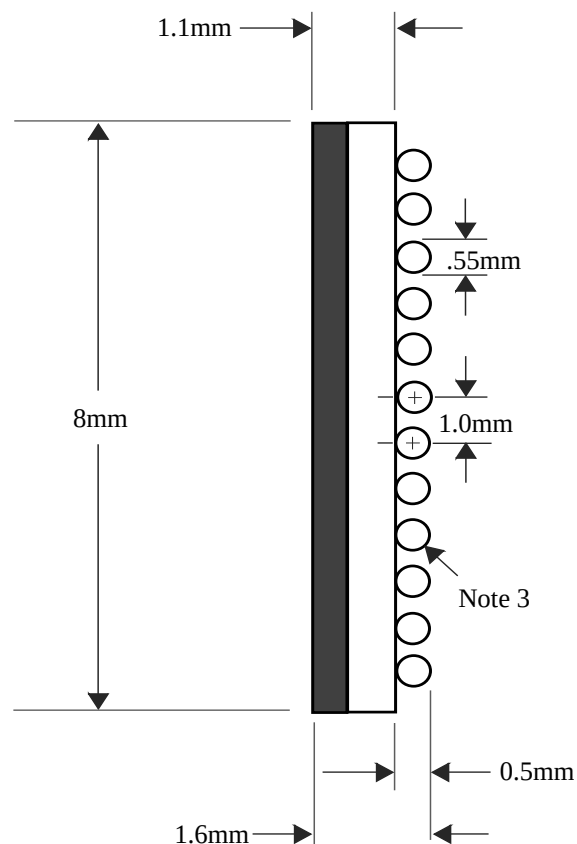
<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
48	1.0mm	8mm SQ	8 x 8	2	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 63/37 SnPb 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT Laminate BT	Tray BGATRAY8mm Tray Quantity Tray Suppliers (ref): FLOUROWARE		



TEL 1-714-898-3830
FAX 1-714-891-0321

CSP49T.8-DC077

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
49	0.8mm	7mm SQ	7 x 7	full	full	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

Daisy Chain to be completed

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

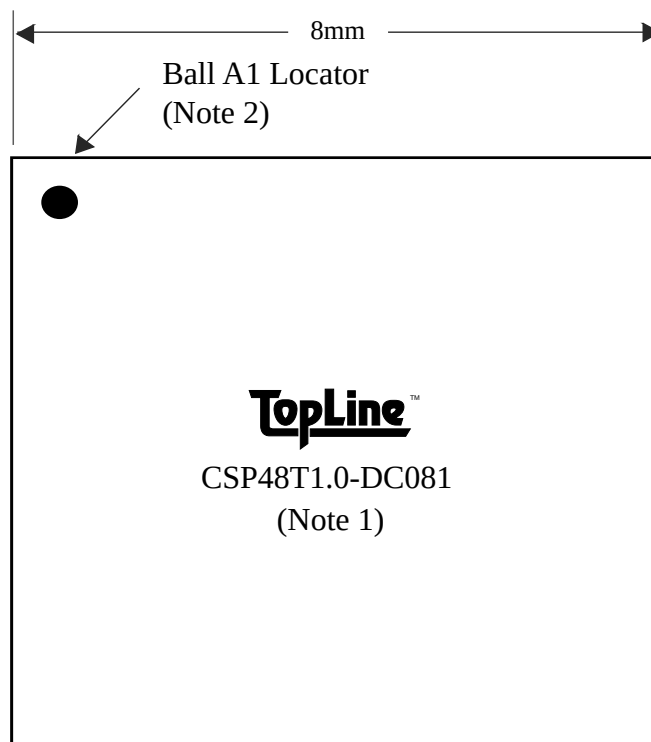
CSP49T.8-DC077

TopLine™

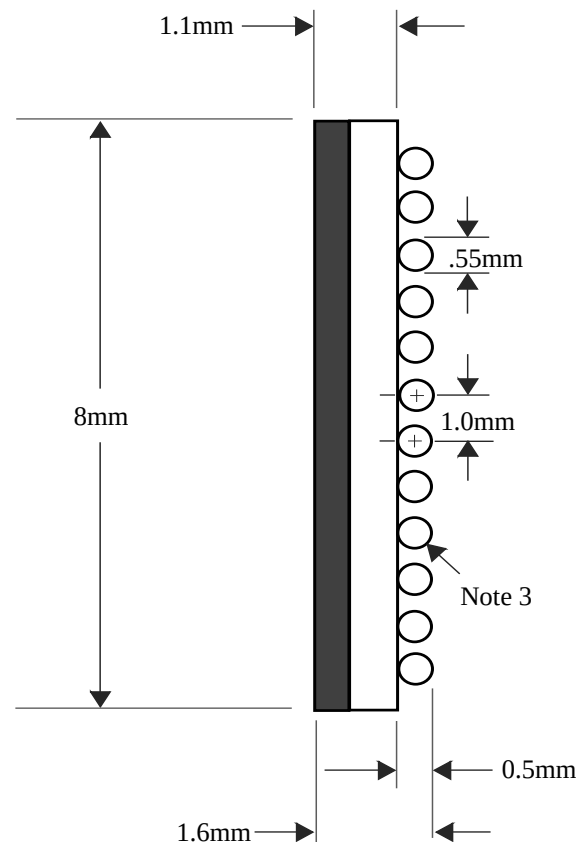
<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
49	0.8mm	7mm SQ	7 x 7	full	full	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



SIDE VIEW

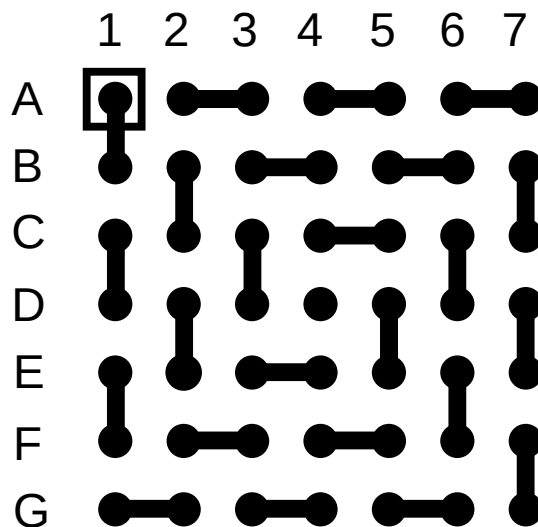
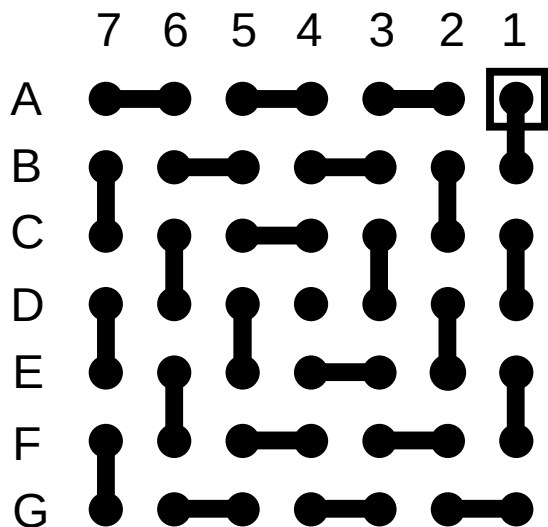


NOTES		REVISIONS		
Note 1	Logo and part number centered	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 63/37 SnPb 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT Laminate BT	Tray BGATRAY8mm Tray Quantity Tray Suppliers (ref): FLOUROWARE		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
49	0.8mm	7mm SQ	7 x 7	full	full	FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA49T.8-DC078

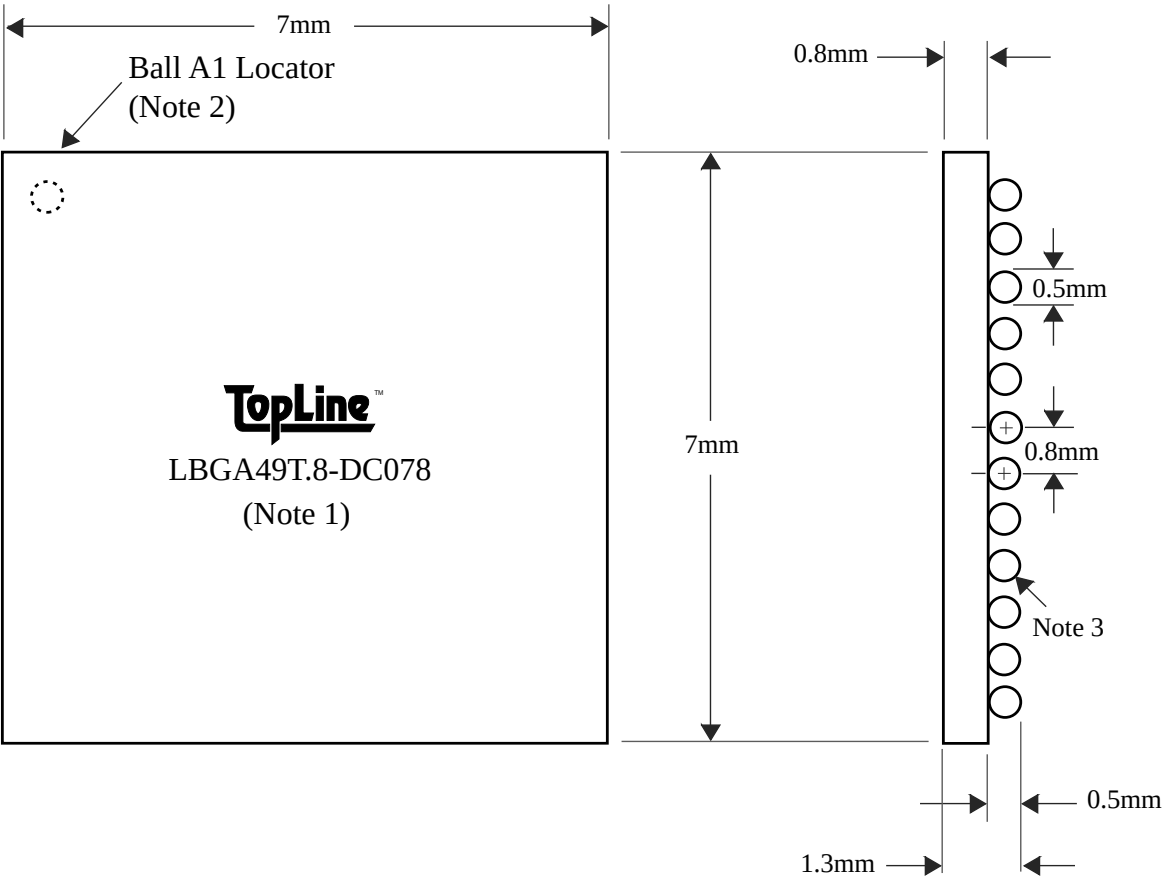


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
49	0.8mm	7mm SQ	7 x 7	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY7mm-13x32 Tray Quantity 416 Tray Suppliers (ref): FLOUROWARE		



TEL 1-714-898-3830
FAX 1-714-891-0321

CSP56T.5-DC102

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
56	0.5mm	6mm SQ	10 x 10	2	none	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

Daisy Chain to be completed

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

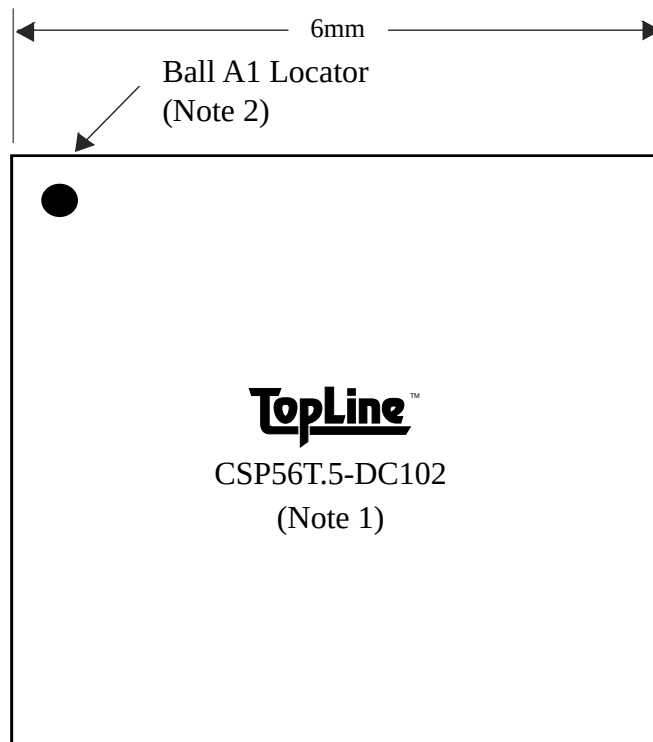
CSP56T.5-DC102

TopLine™

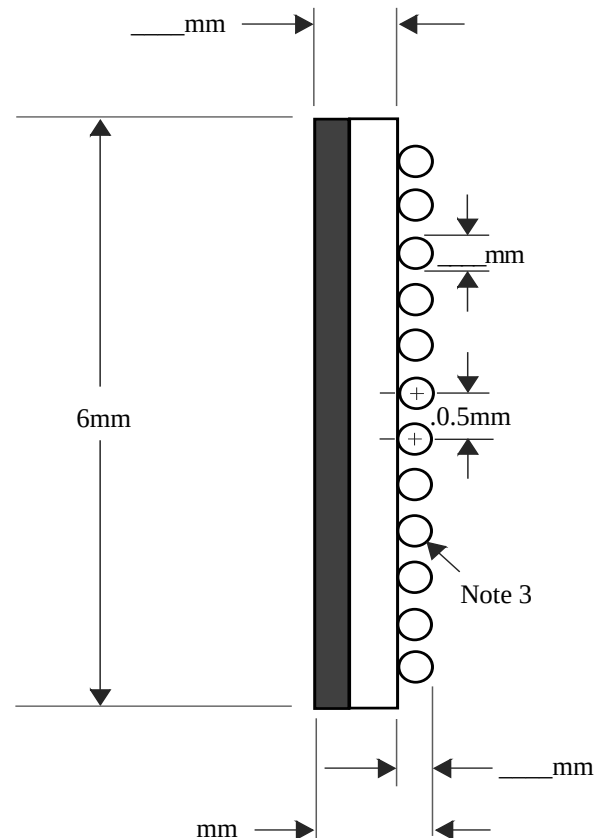
BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
56	0.5mm	6mm SQ	10 x 10	2	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



SIDE VIEW

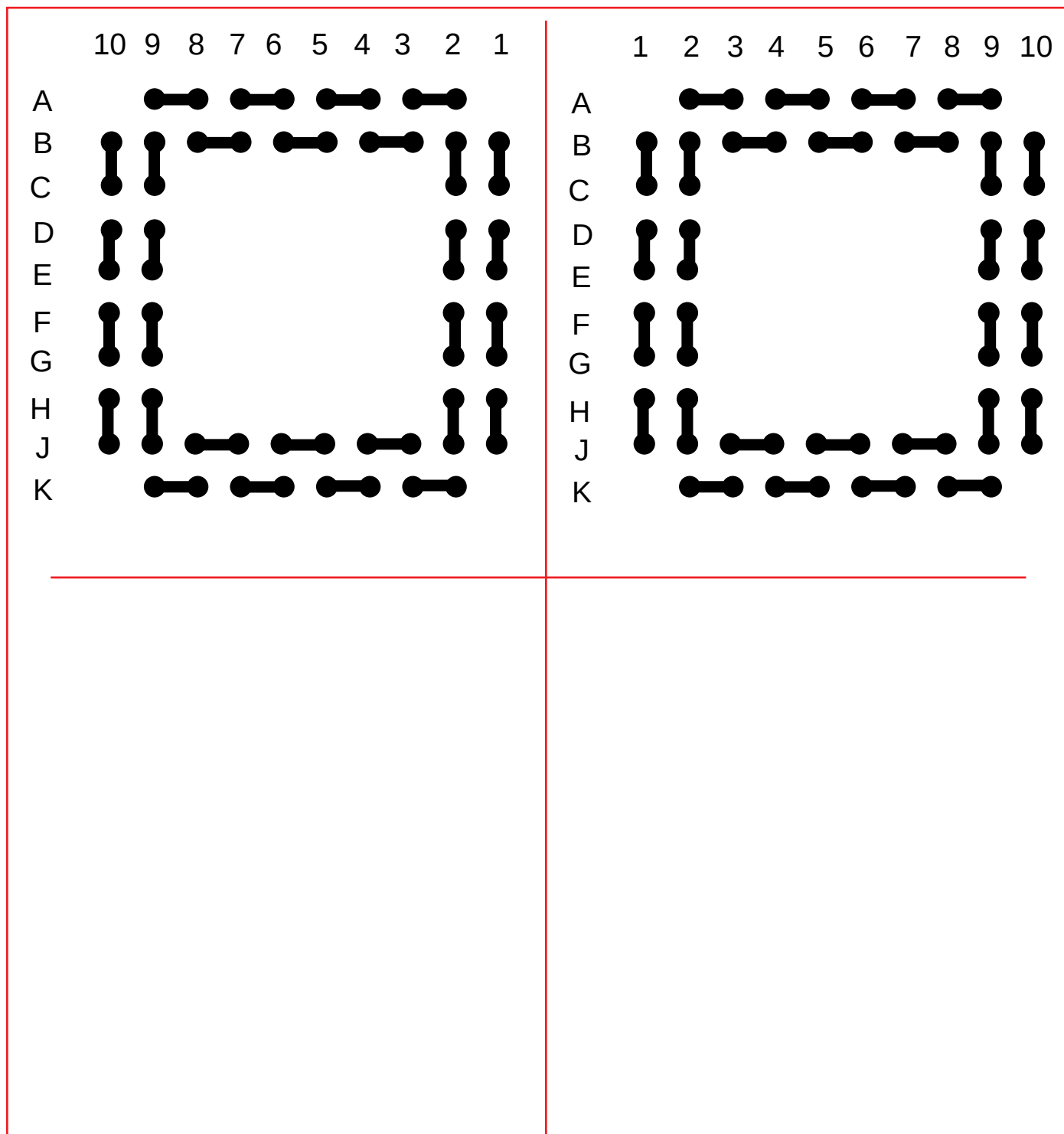


NOTES		REVISIONS		
Note 1	Logo and part number centered	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: Polyimide Tape			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY-TV46 Tray Quantity 64 or 99 Tray Suppliers (ref): FLOUROWARE		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
56	0.8mm	9mm	10 x 10	2	none	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

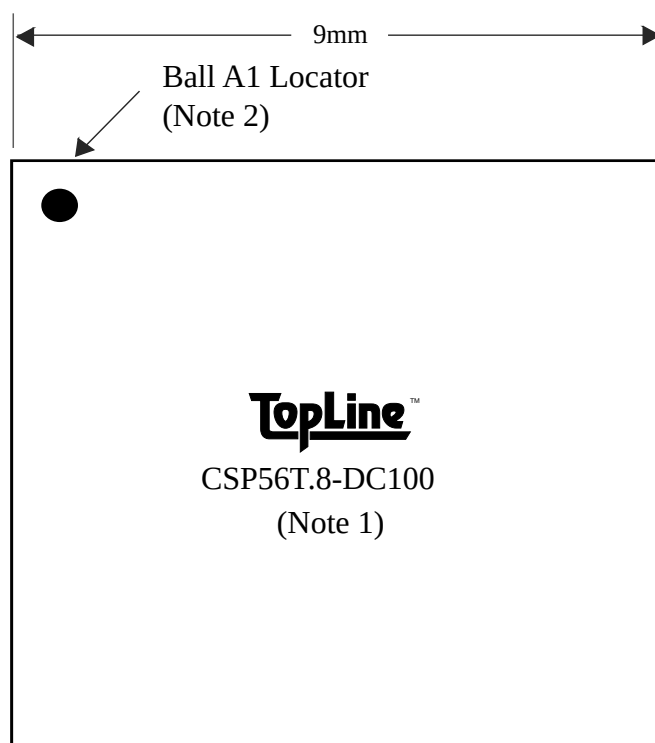
CSP56T.8-DC100

TopLine™

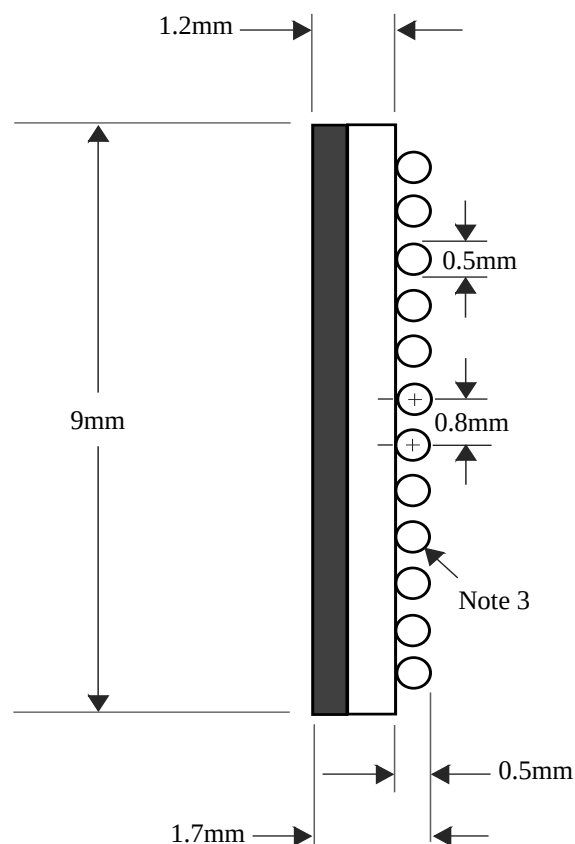
BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
56	0.8mm	9mm	10 x 10	2	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT Laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY9mm-10x26		
		Tray Quantity 260		
		Tray Suppliers (ref):		
		FLOUROWARE		



TEL 1-714-898-3830
FAX 1-714-891-0321

CSP65T.8-DC083

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
64	0.8mm	8mm SQ	8 x 8	full	full	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

Daisy Chain to be completed

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

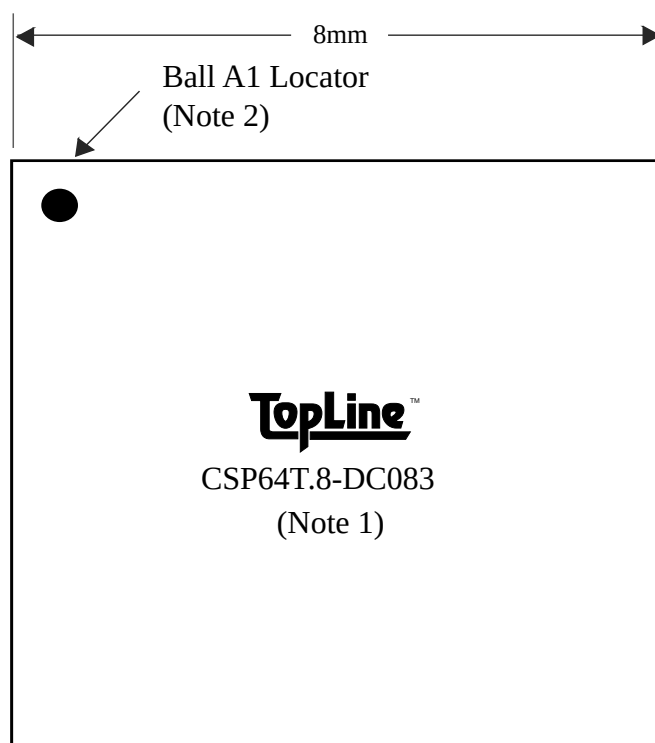
CSP65T.8-DC083

TopLine™

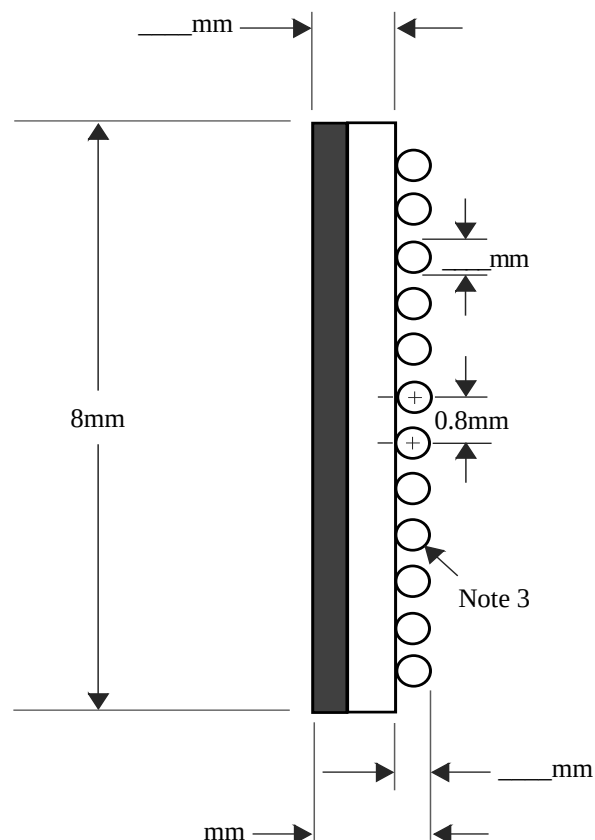
TEL 1-714-898-3830
FAX 1-714-891-0321

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
64	0.8mm	8mm SQ	8 x 8	full	full	BT

TOP VIEW



SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT Laminate	PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY9mm-10x26 Tray Quantity 260 Tray Suppliers (ref): FLOUROWARE		



TEL 1-714-898-3830
FAX 1-714-891-0321

BGA64T1.0-ISO

BALLS

64

PITCH

1.0mm

SIZE

9mm SQ

MATRIX

8 x 8

ROWS

full

CENTER

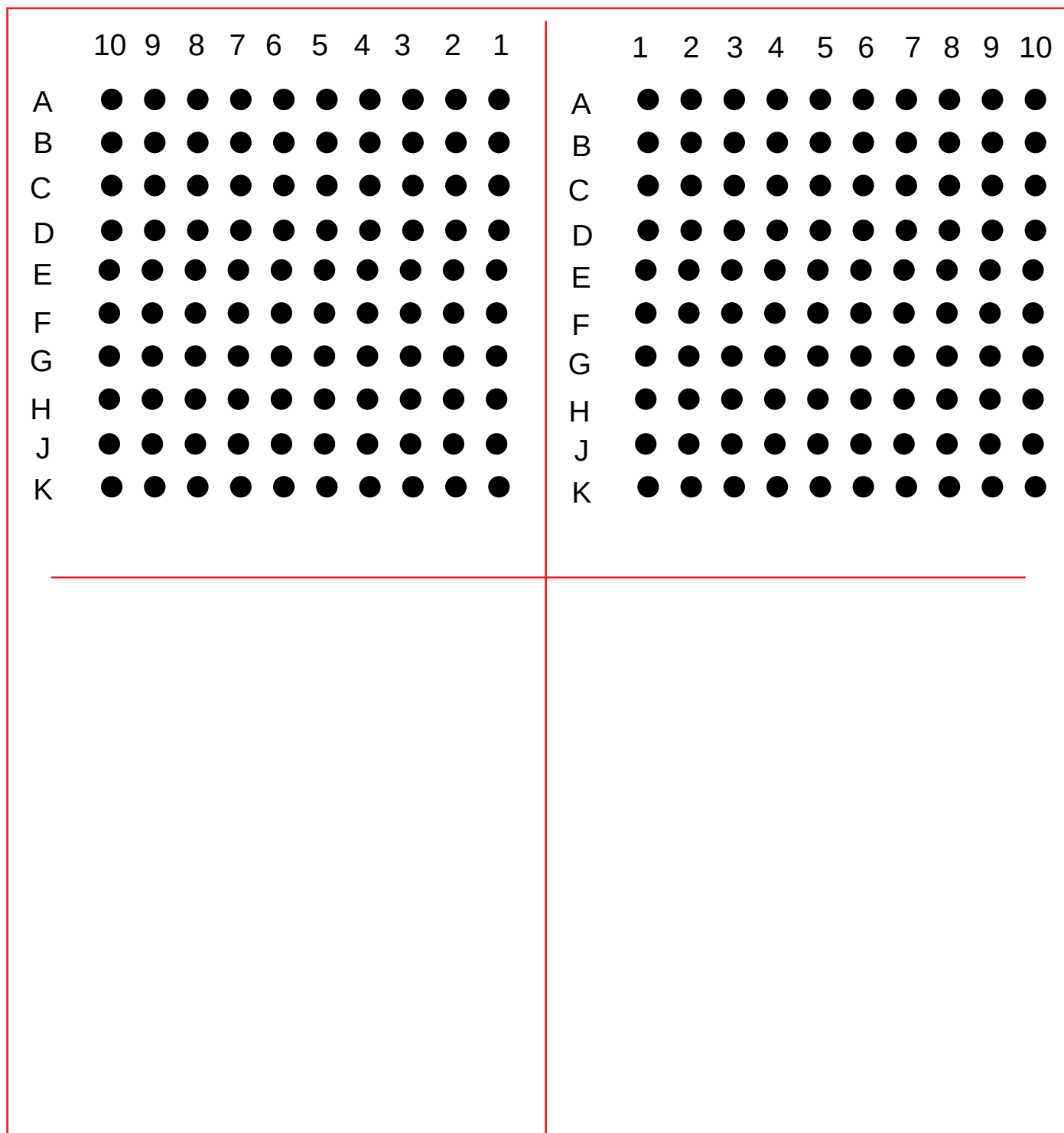
full

MAT'L

BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

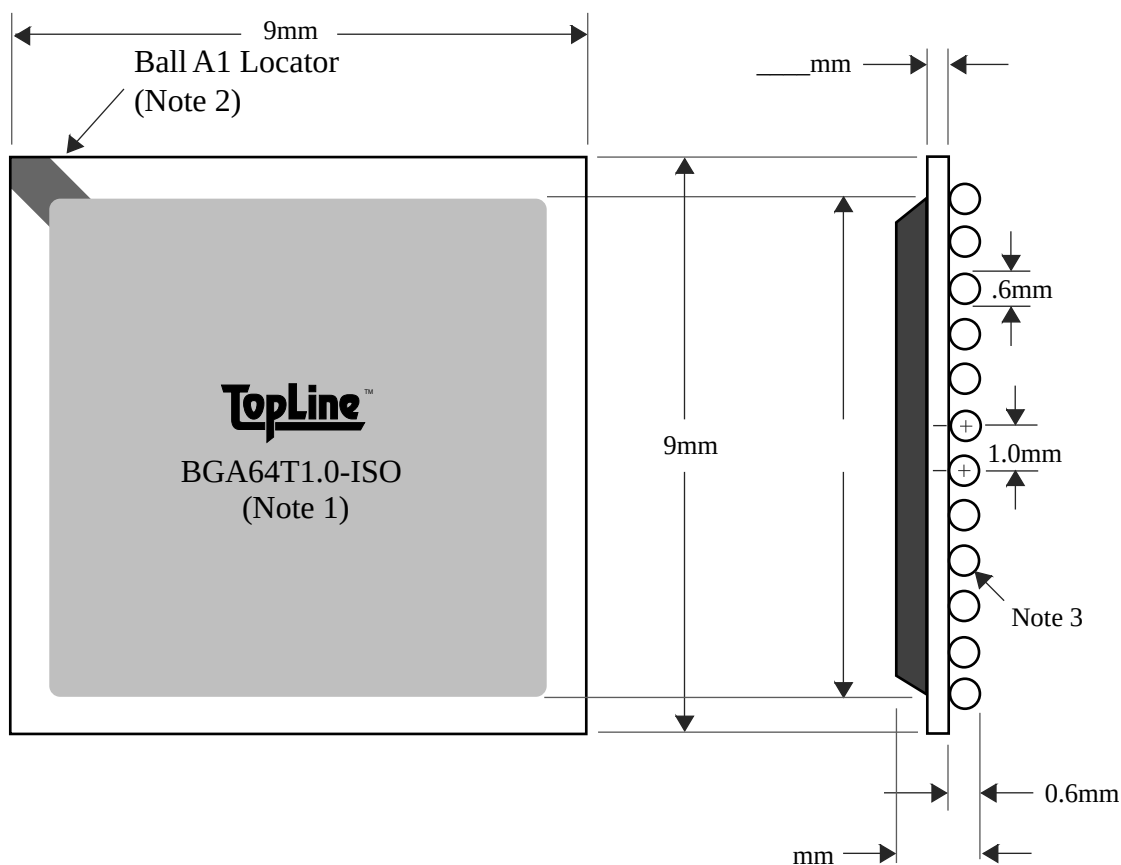
BGA64T1.0-ISO

TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830 FAX 1-714-891-0321
64	1.0mm	9mm SQ	8 x 8	full	full	BT	

TOP VIEW

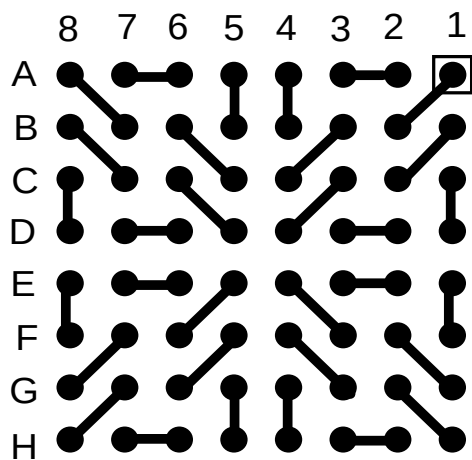
SIDE VIEW



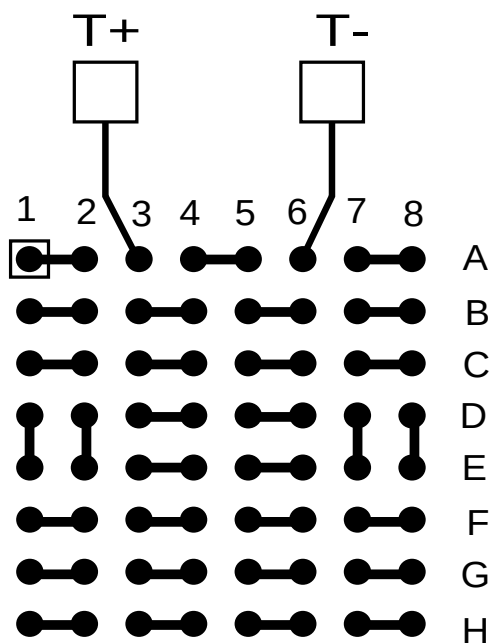
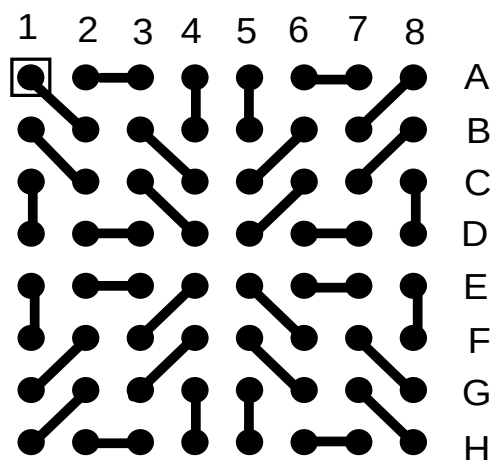
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY9mm-10x26 Tray Quantity 260 Tray Suppliers (ref):		

BGA64T1.0-DC3

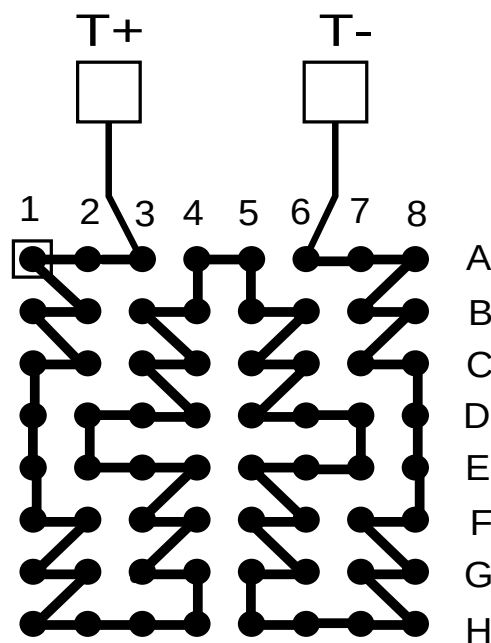
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

BGA64T1.0-DC3

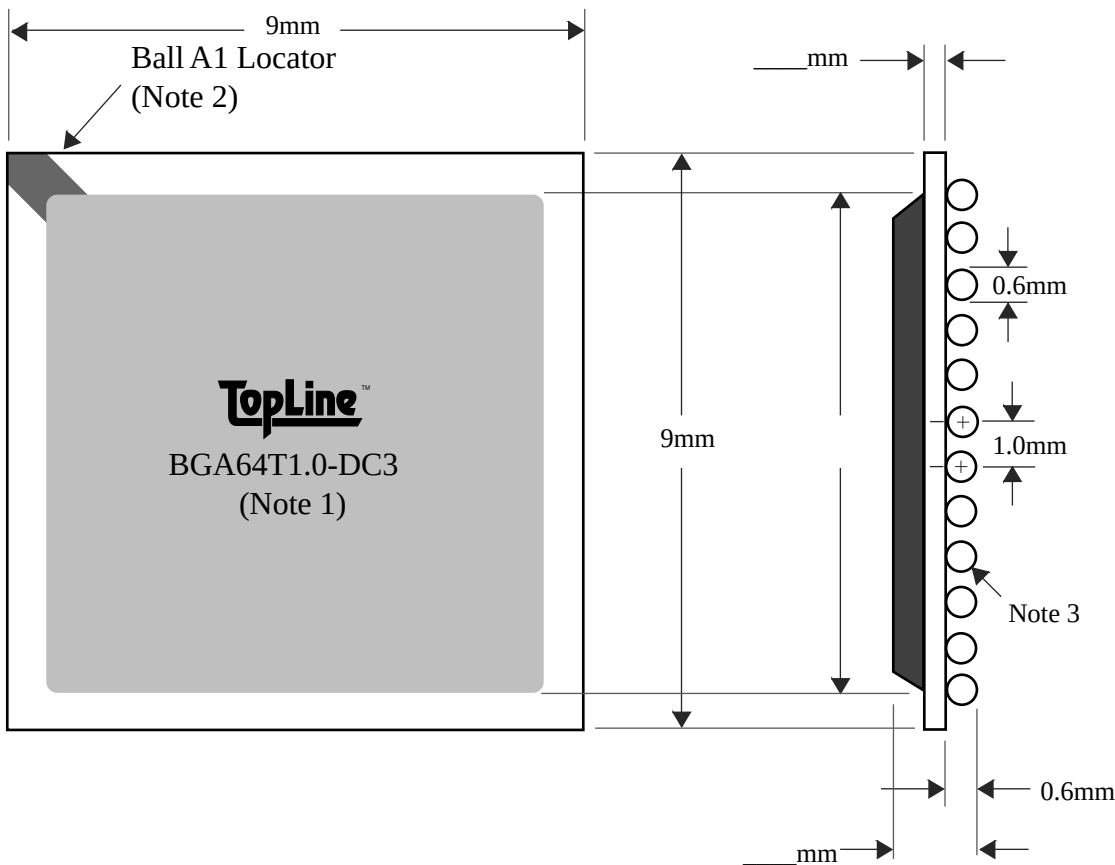
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
64	1.0mm	9mm SQ	8 x 8	full	full	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

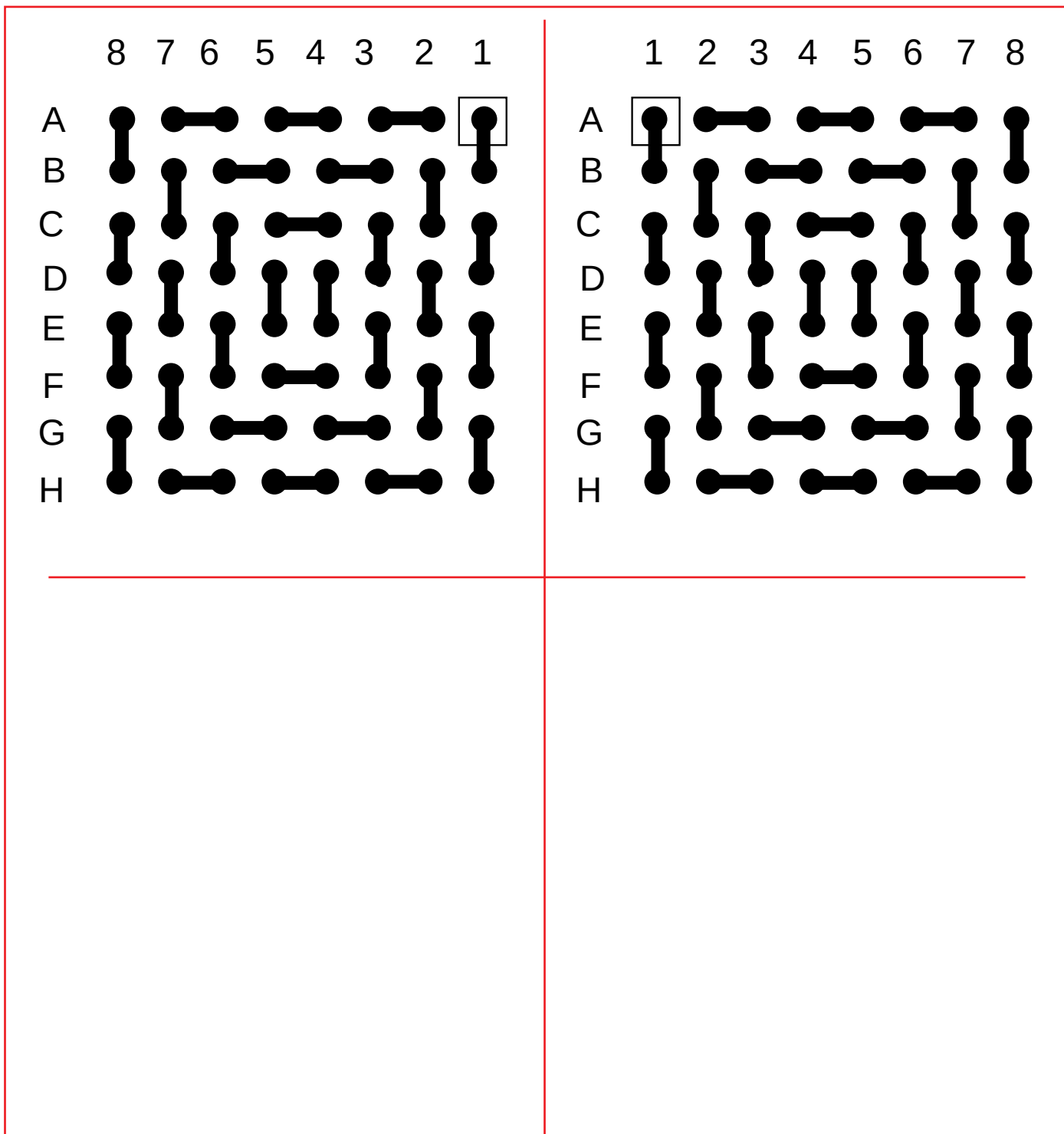


NOTES		REVISIONS	
Note 1	Logo and part number centered White ink or laser marked	Rev	Date Changes
Note 2	Ball A1 locator mark positioned in corner	subject to discontinuation	
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)	
Note 4	Substrate Material: BT laminate	Tray BGATRAY9mm-10x26 Tray Quantity 260 Tray Suppliers (ref):	

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
64	1.0mm	9mm SQ	8 x 8	full	full	FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA64T1.0-DC089

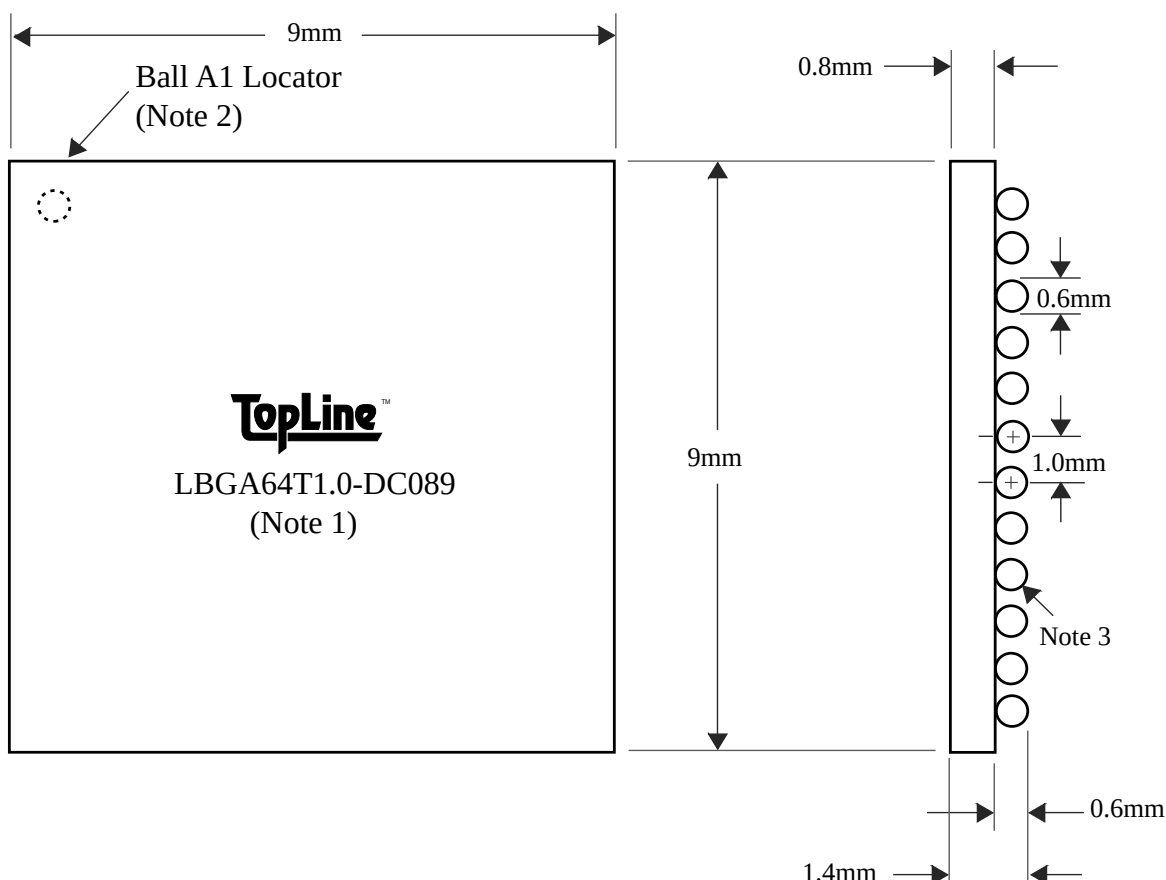
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
64	1.0mm	9mm SQ	8 x 8	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

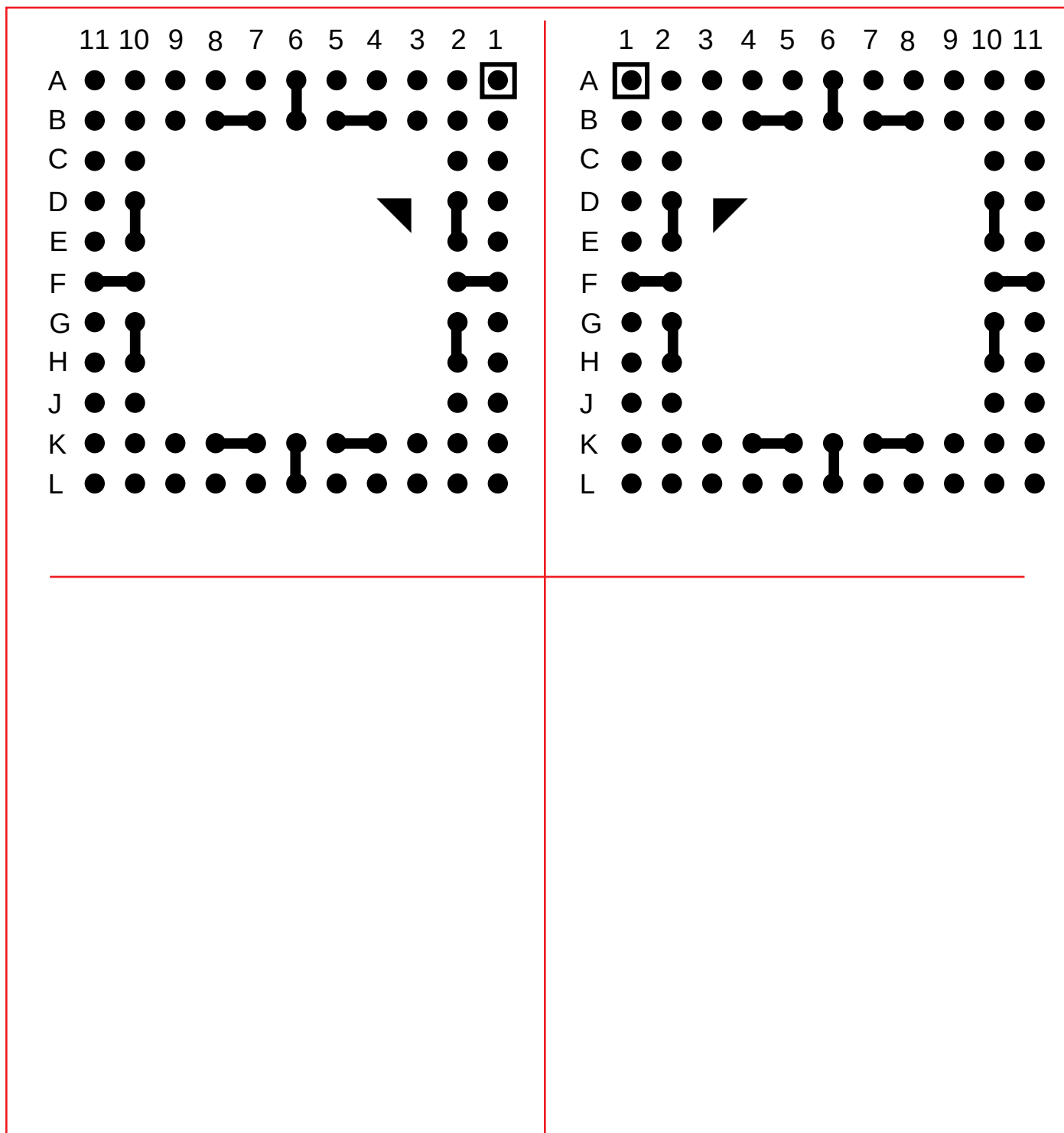


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY9mm-10x26 Tray Quantity 260 Tray Suppliers (ref):		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
72	0.8mm	9mm SQ	11 x 11	2	none	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

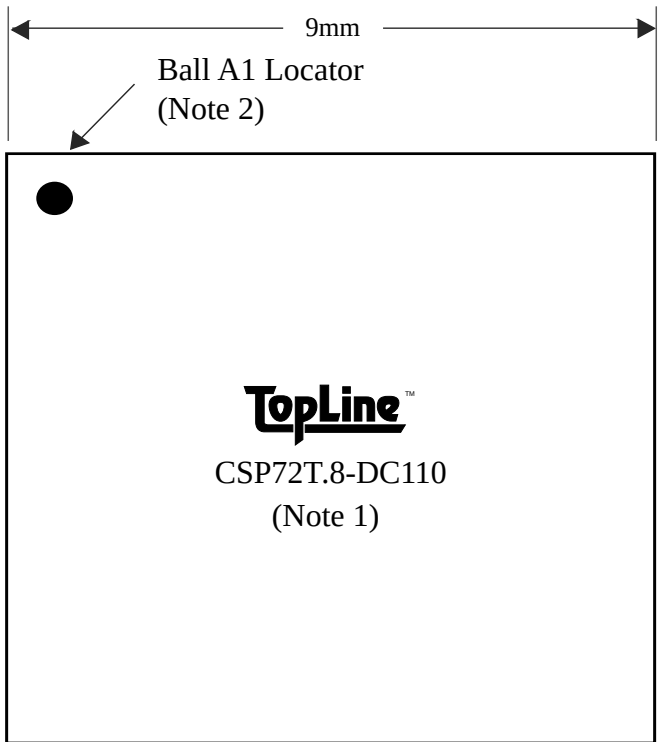
CSP72T.8-DC110

TopLine™

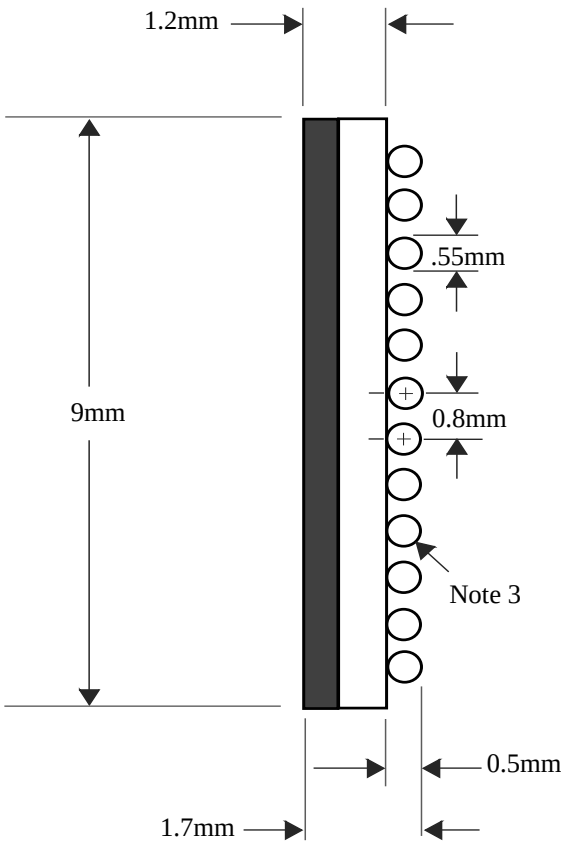
BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
72	0.8mm	9mm SQ	11 x 11	2	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



SIDE VIEW

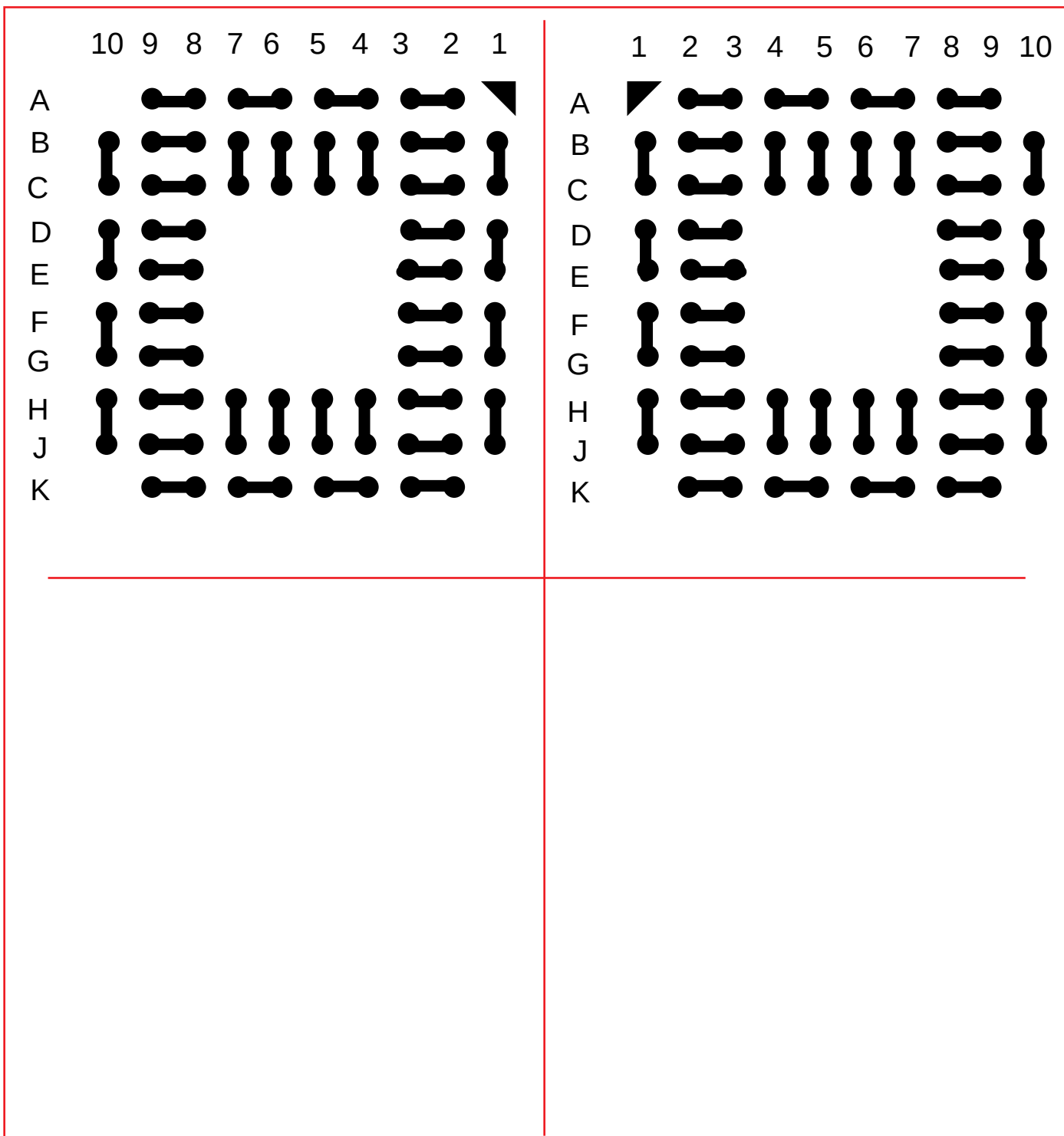


NOTES		REVISIONS		
Note 1	Logo and part number centered	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT Laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY9mm-10x26		
		Tray Quantity 260		
		Tray Suppliers (ref):		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
80	1.0mm	10mm SQ	10 x 10	3	none	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

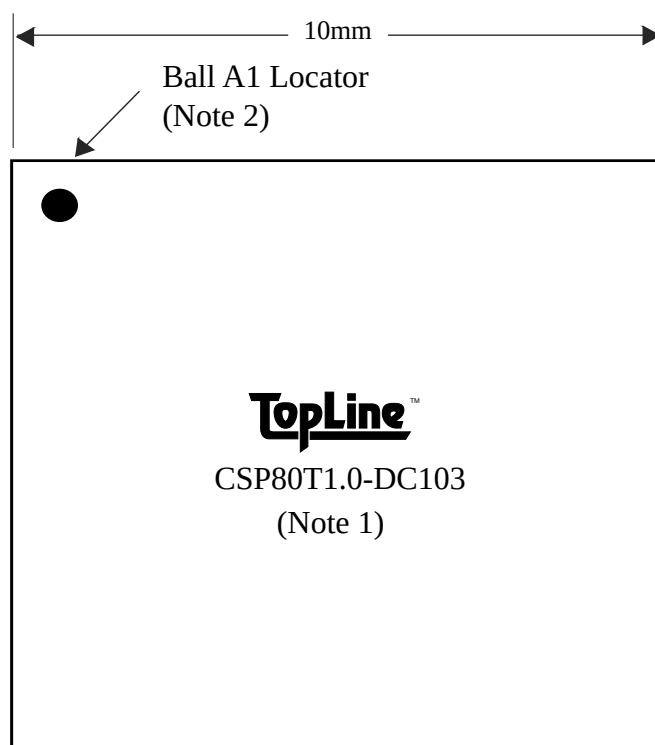
CSP80T1.0-DC103

TopLine™

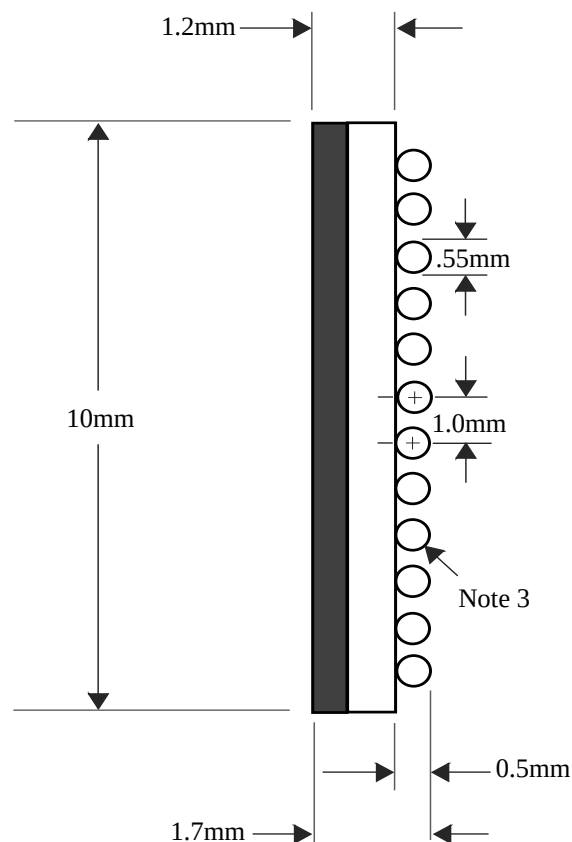
BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
80	1.0mm	10mm SQ	10 x 10	3	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT Laminate	Tray BGATRAY10mm-		
		Tray Quantity _____		
		Tray Suppliers (ref):		



TEL 1-714-898-3830
FAX 1-714-891-0321

CSP81T.8-DC097

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
81	0.8mm	9mm SQ	9 x 9	full	full	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

Daisy Chain to be completed

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

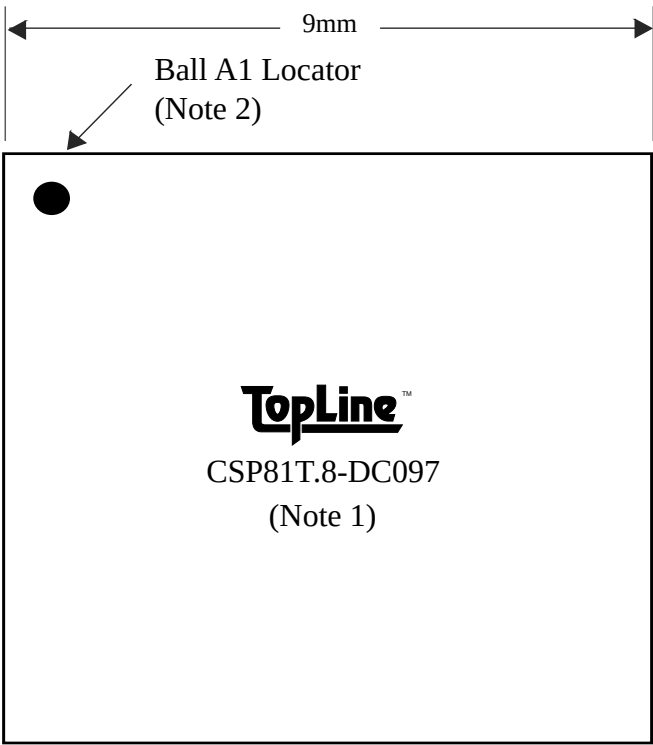
CSP81T.8-DC097



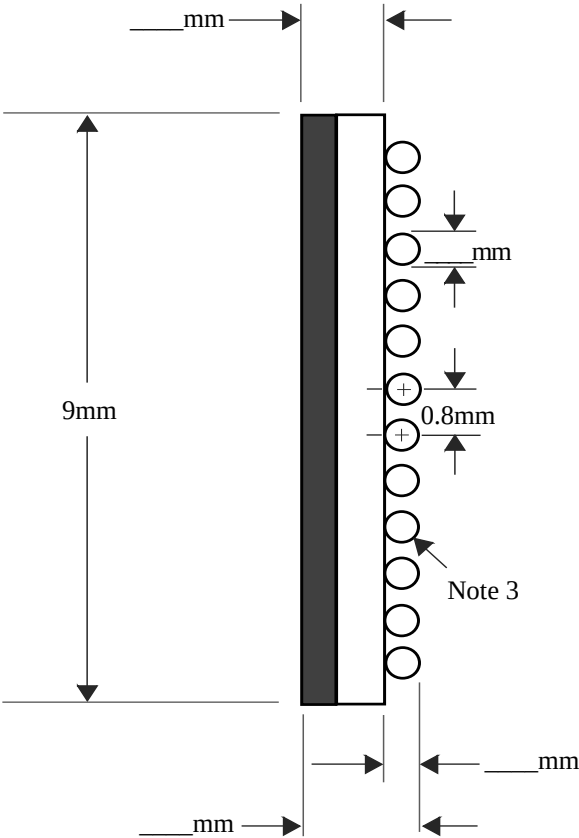
BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
81	0.8mm	9mm SQ	9 x 9	full	full	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT Laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY9mm-		
		Tray Quantity		
		Tray Suppliers (ref):		



TEL 1-714-898-3830
FAX 1-714-891-0321

CSP81T1.0-DC098

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
81	1.0mm	10mm SQ	9 x 9	full	full	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

Daisy Chain to be completed

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

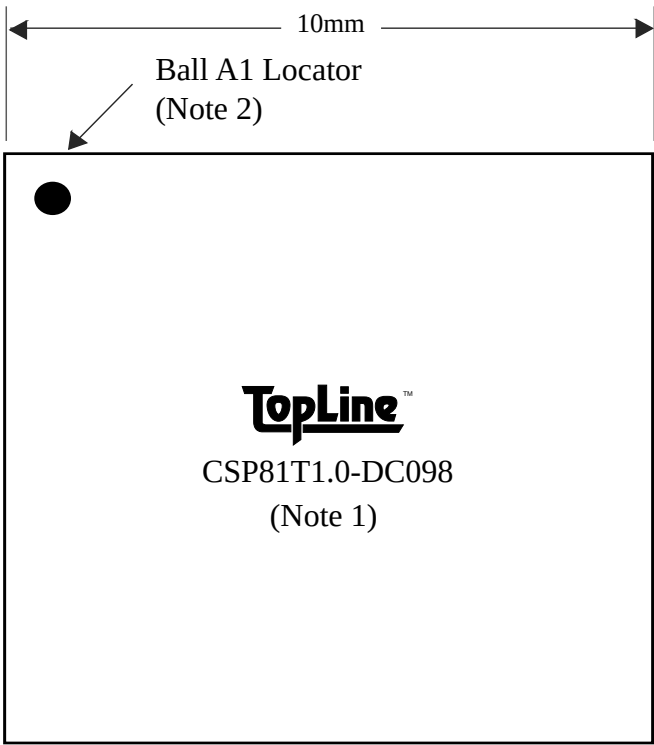
CSP81T1.0-DC098



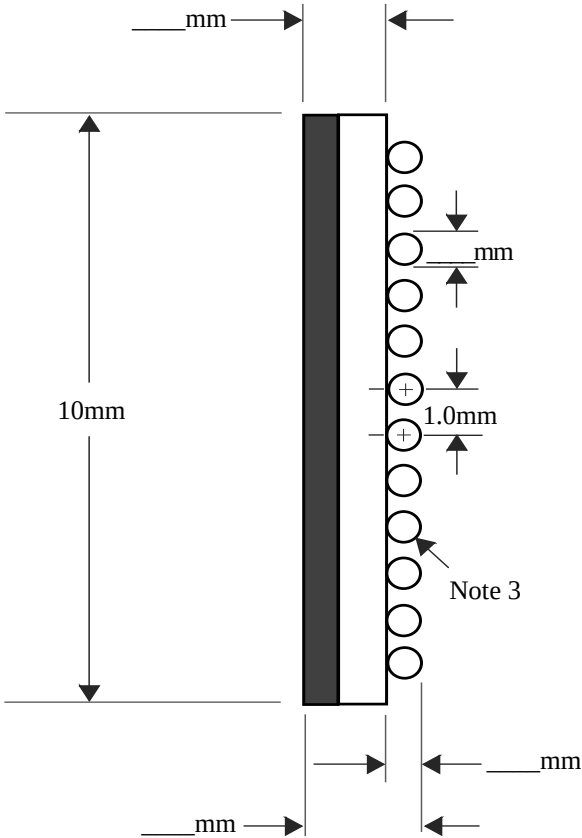
BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
81	1.0mm	10mm SQ	9 x 9	full	full	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



SIDE VIEW

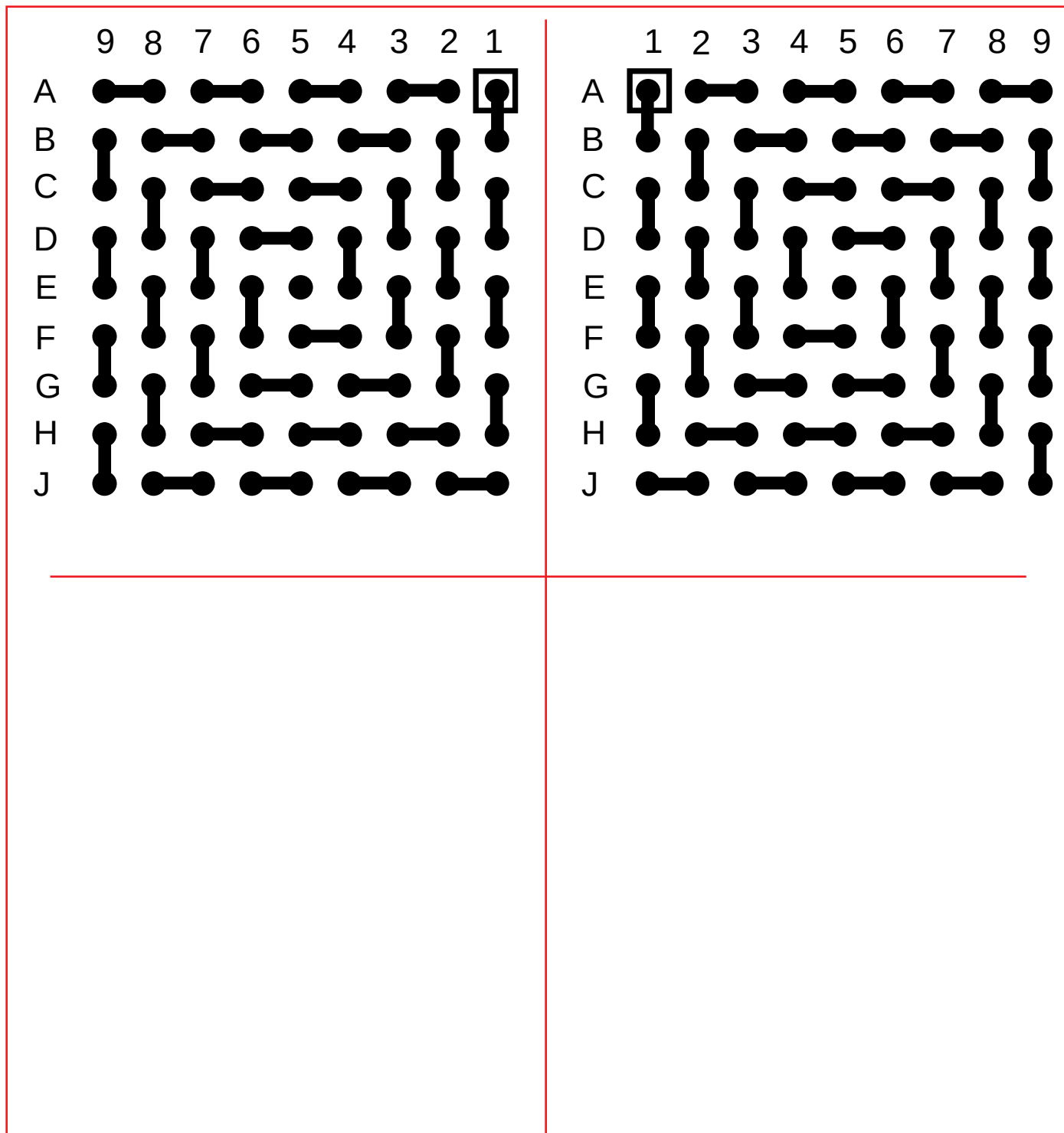


NOTES		REVISIONS		
Note 1	Logo and part number centered	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT Laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY10mm-		
		Tray Quantity _____		
		Tray Suppliers (ref):		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
81	0.8mm	9mm SQ	9 x 9	full	full	FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA81T.8-DC099

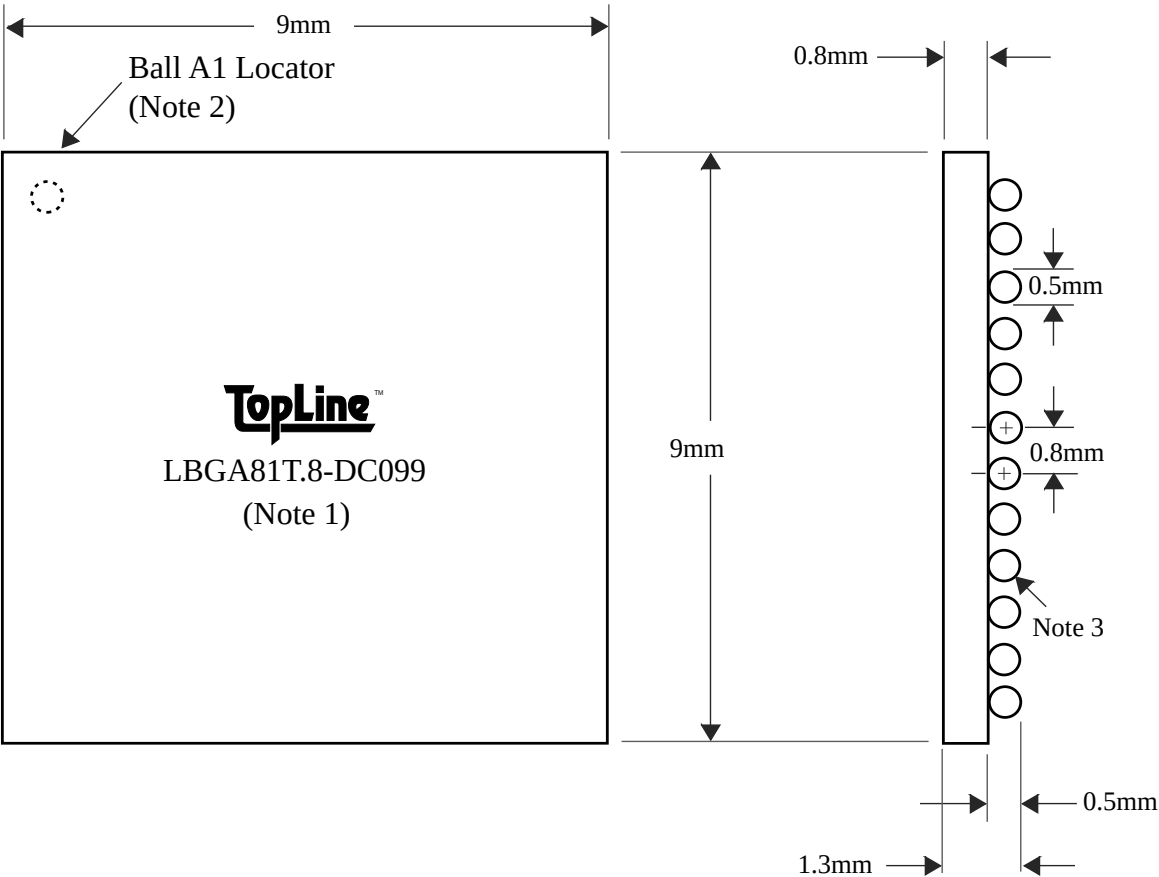
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
81	0.8mm	9mm SQ	9 x 9	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

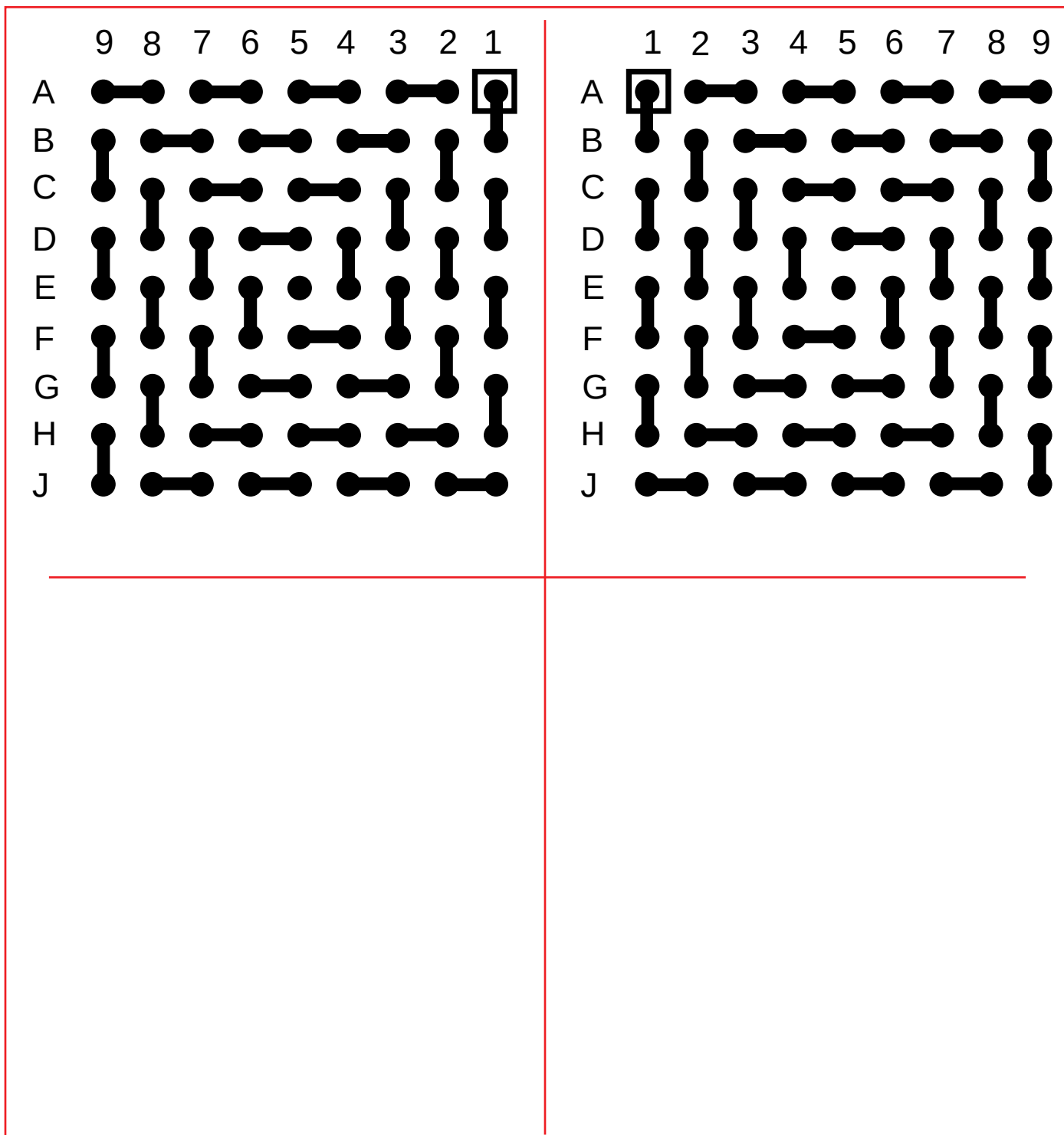


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY9mm-10x26 Tray Quantity 260 Tray Suppliers (ref):		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
81	1.0mm	10mm SQ	9 x 9	full	full	FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA81T1.0-DC099

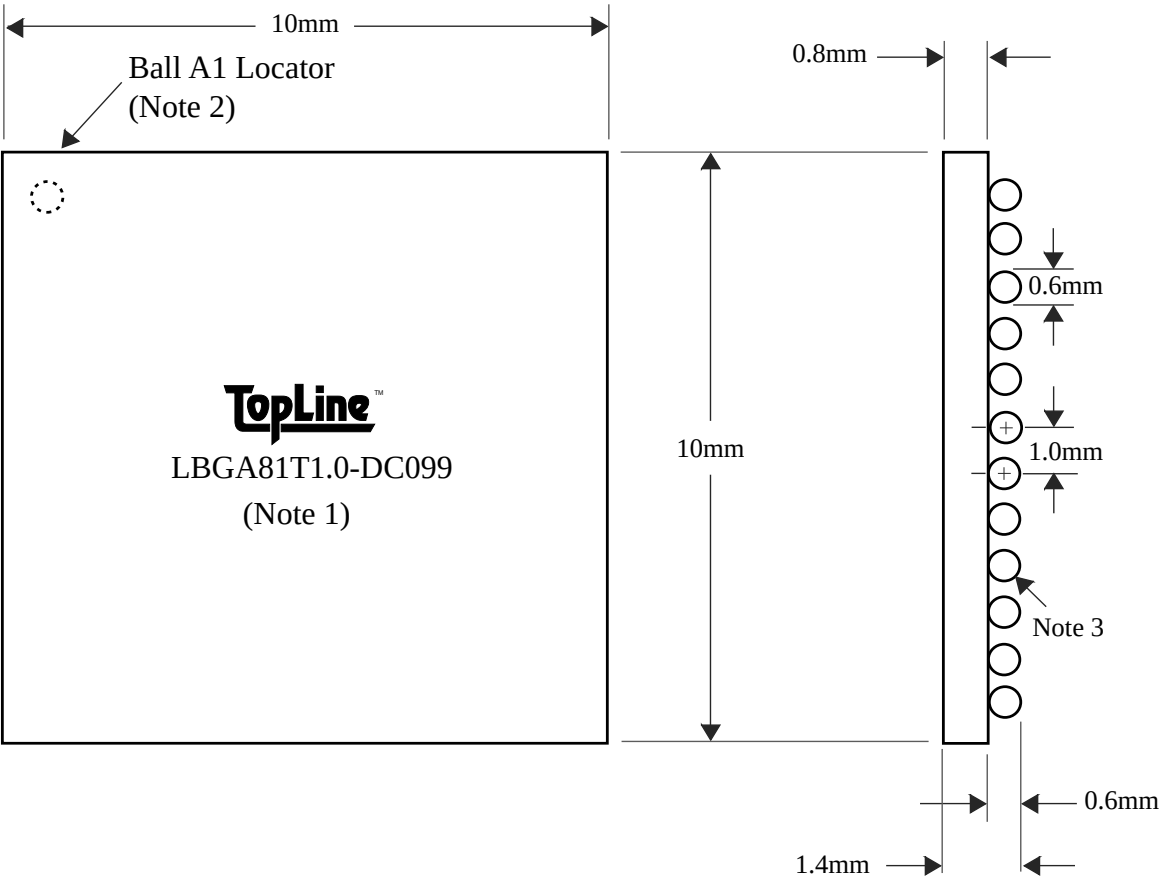
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
81	1.0mm	10mm SQ	9 x 9	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY10mm Tray Quantity _____ Tray Suppliers (ref):		



TEL 1-714-898-3830

FAX 1-714-891-0321

CSP84T.5-DC120

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
84	0.5mm	7mm SQ	12 x 12	3	none	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

Daisy Chain to be completed

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

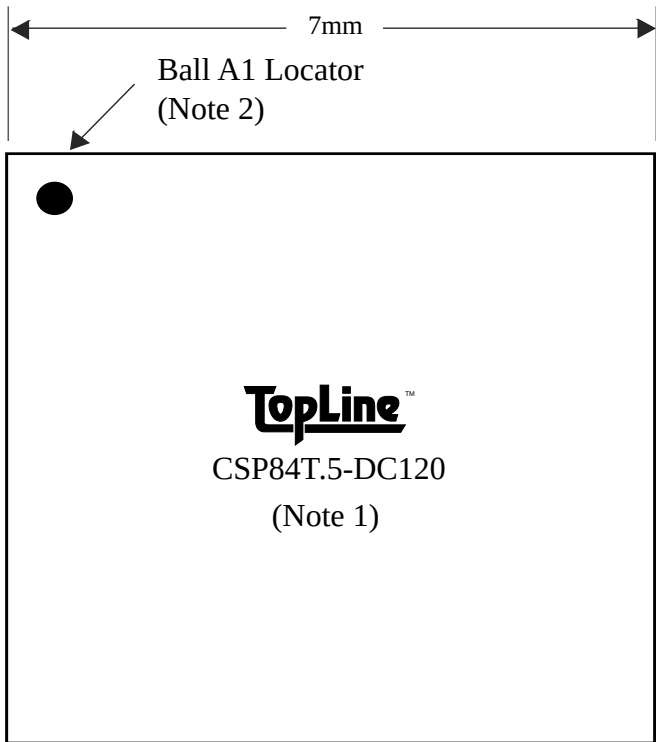
CSP84T.5-DC120

TopLine™

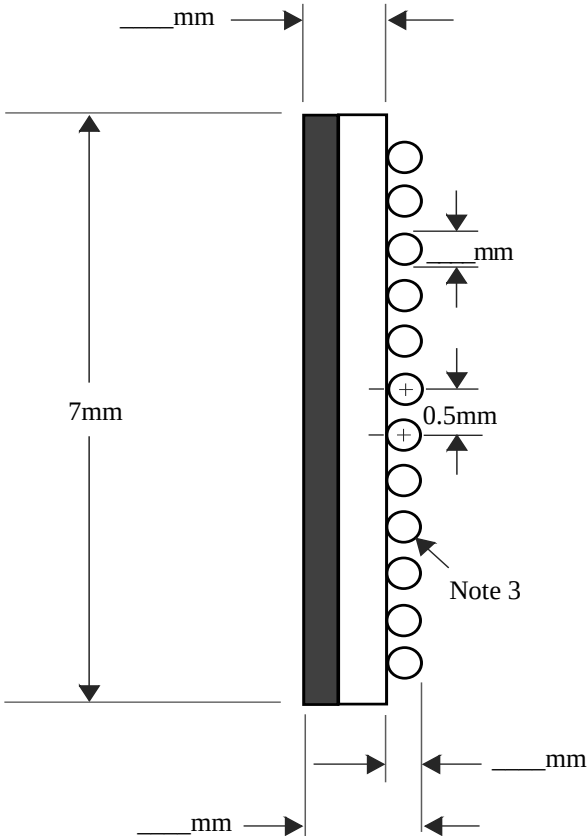
BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
84	0.5mm	7mm SQ	12 x 12	3	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



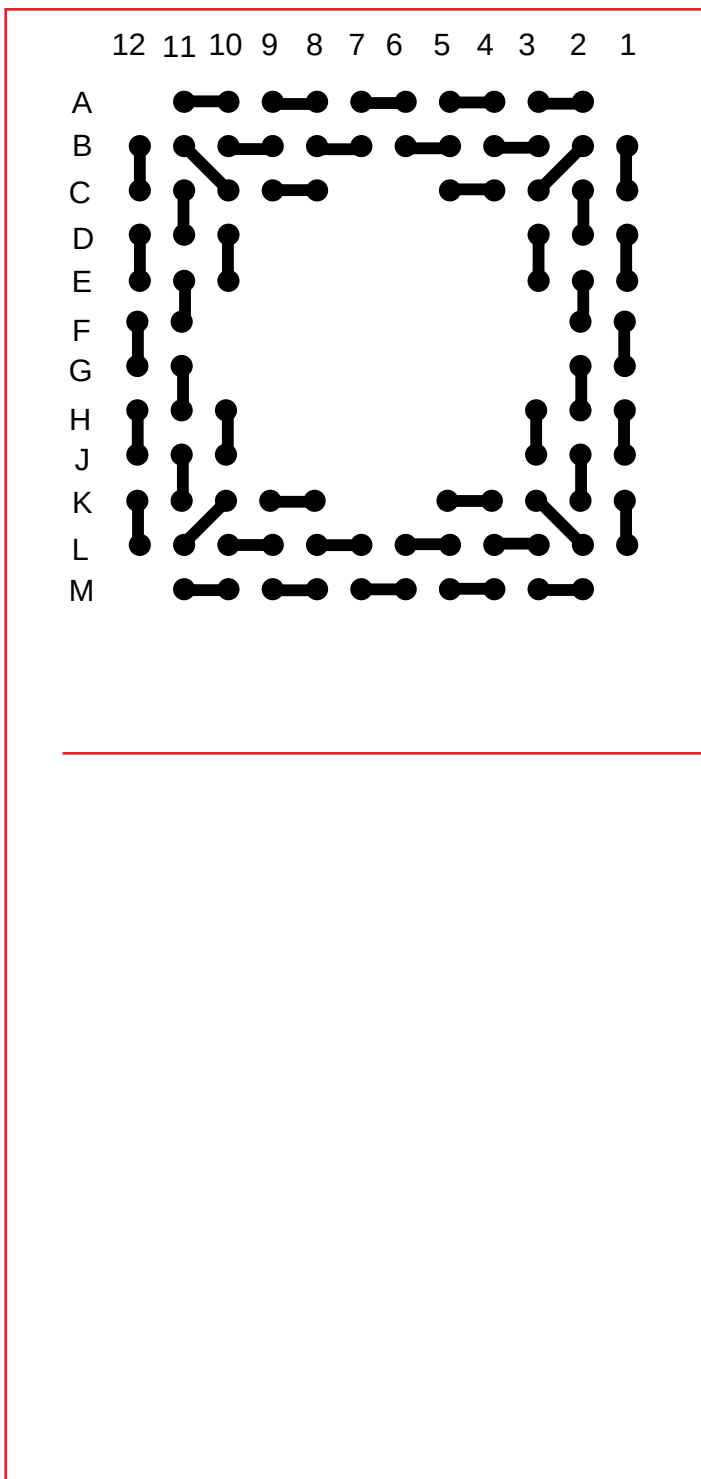
SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT Laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY _____		
		Tray Quantity _____		
		Tray Suppliers (ref):		

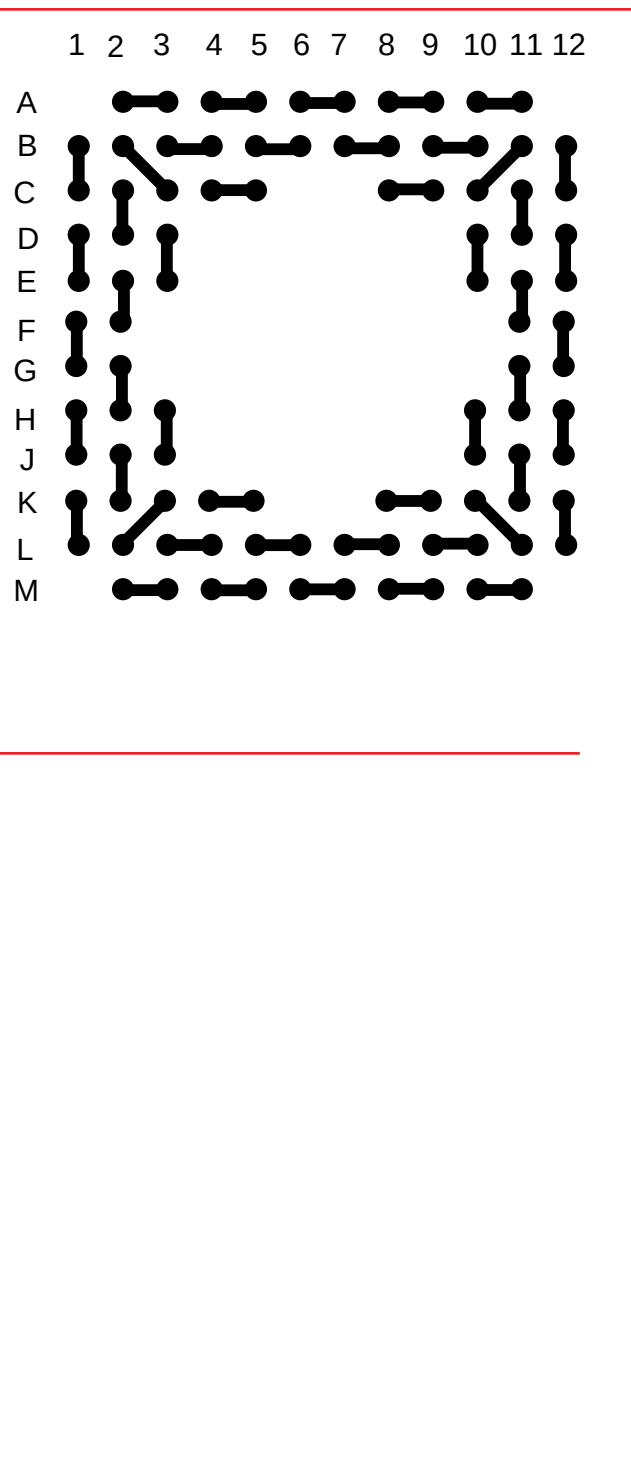
	<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
	96	1.0mm	12mm SQ	12 x 12	3	none	BT

BALL VIEW



TEST VEHICLE BOARD

BOTTOM SIDE (TOP X-RAY VIEW)



AFTER MOUNTING TO TEST BOARD

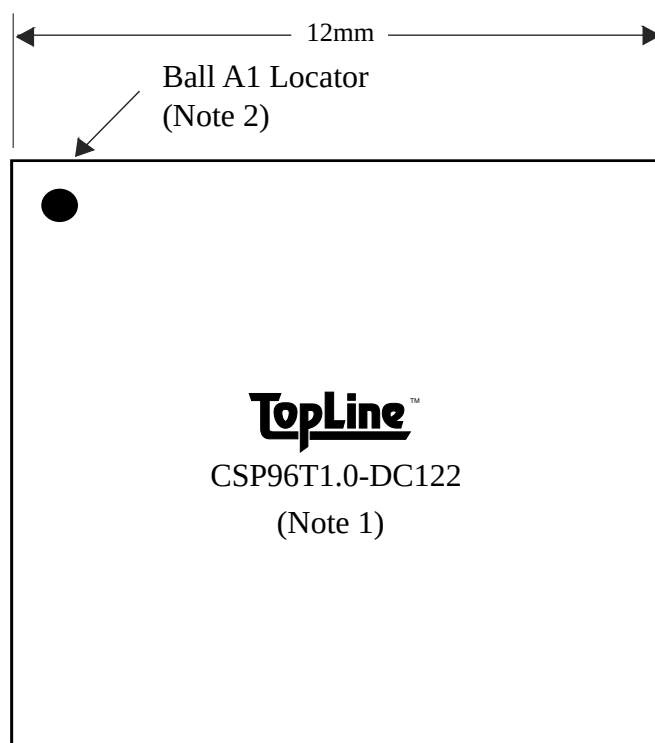
CSP96T1.0-DC122

TopLine™

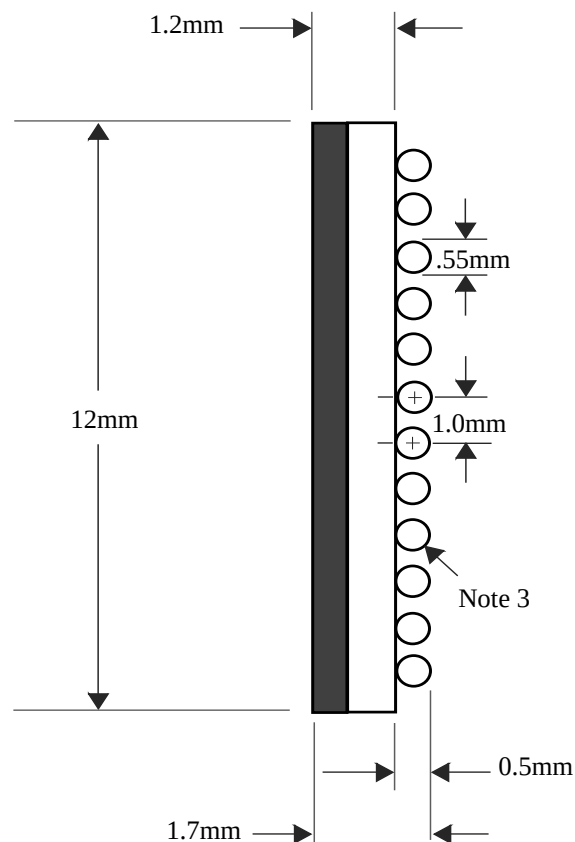
<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
96	1.0mm	12mm SQ	12 x 12	3	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT Laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY12mm-8x12		
		Tray Quantity 96		
		Tray Suppliers (ref):		



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FAX 1-714-891-0321

CSP100T.8-DC108

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
100	0.8mm	10mm SQ	10 x 10	full	full	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

Daisy Chain to be completed

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

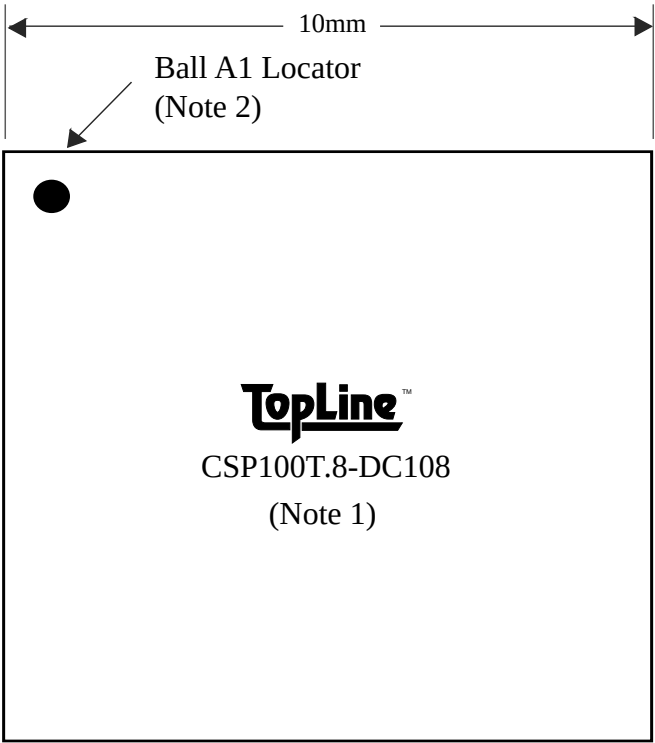
CSP100T.8-DC108



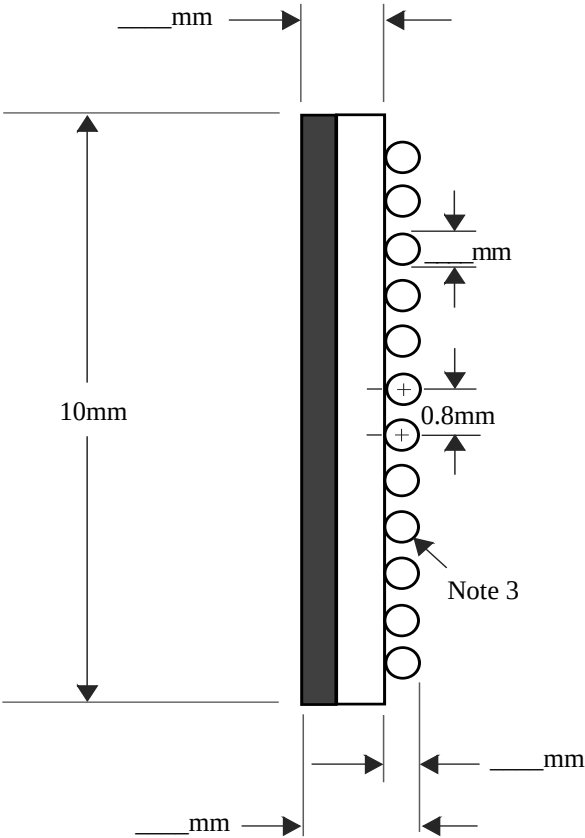
BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
100	0.8mm	10mm SQ	10 x 10	full	full	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



SIDE VIEW

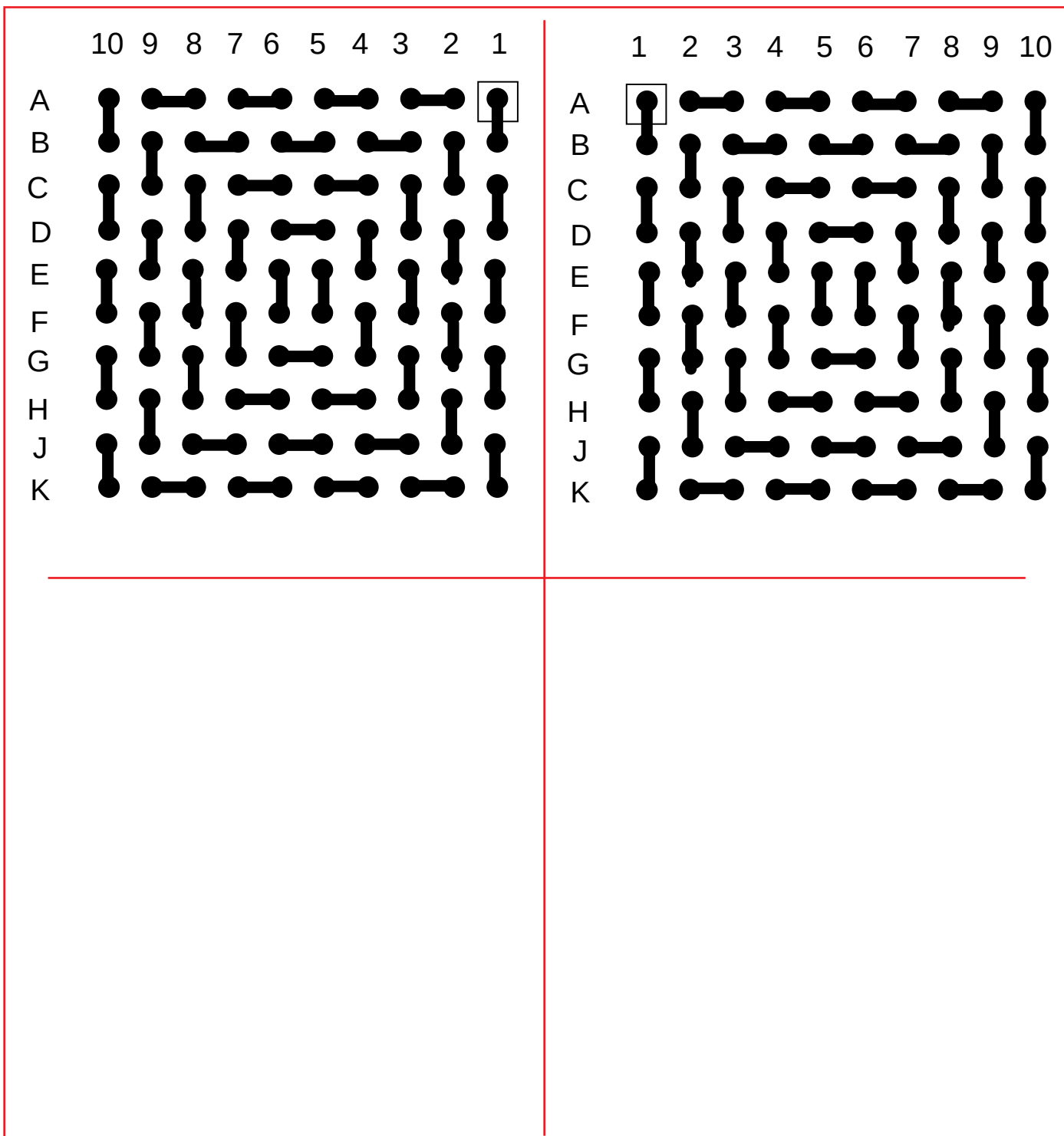


NOTES		REVISIONS		
Note 1	Logo and part number centered	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT Laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY _____		
		Tray Quantity _____		
		Tray Suppliers (ref):		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
100	0.8mm	9mm SQ	10 x 10	full	full	FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA100T.8-DC109

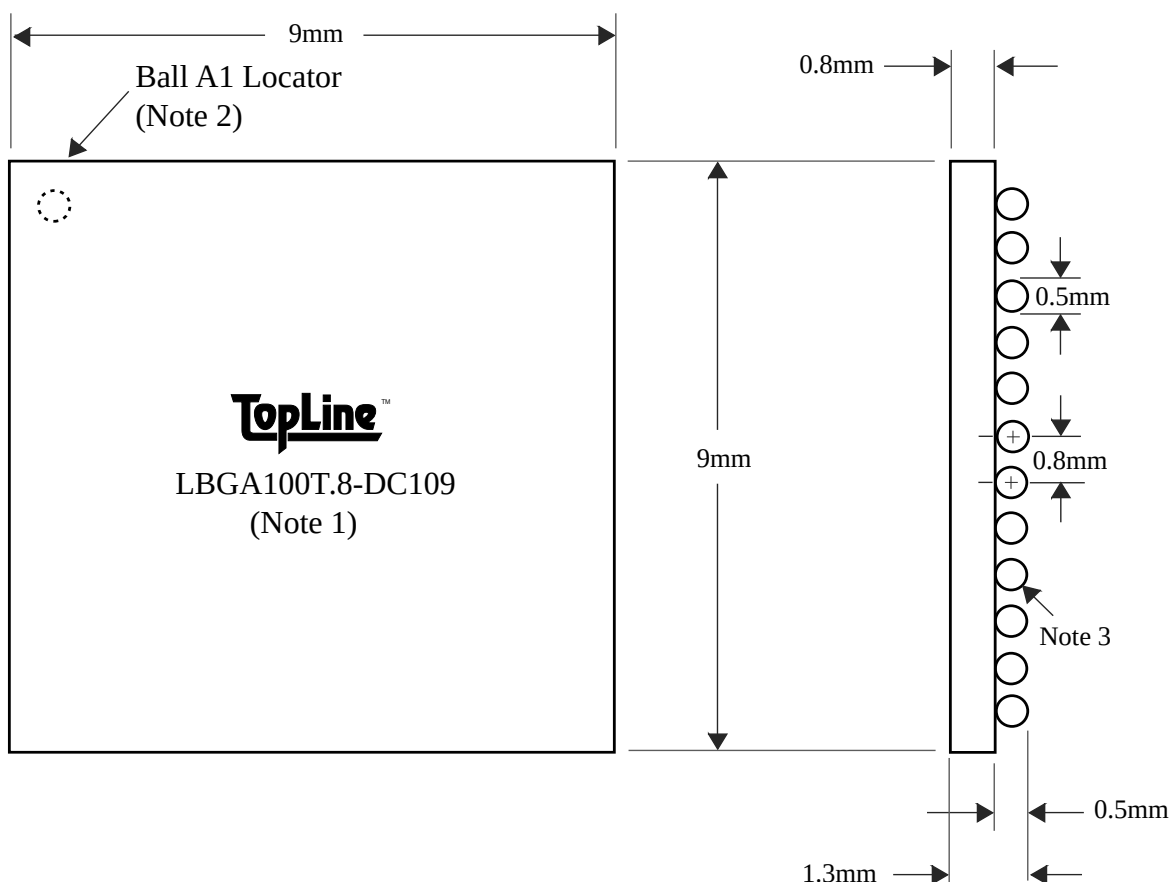
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
100	0.8mm	9mm SQ	10 x 10	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY9mm-10x26 Tray Quantity 260 Tray Suppliers (ref):		



TEL 1-714-898-3830
FAX 1-714-891-0321

CSP100T1.0-DC107

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
100	1.0mm	11mm SQ	10 x 10	full	full	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

Daisy Chain to be completed

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

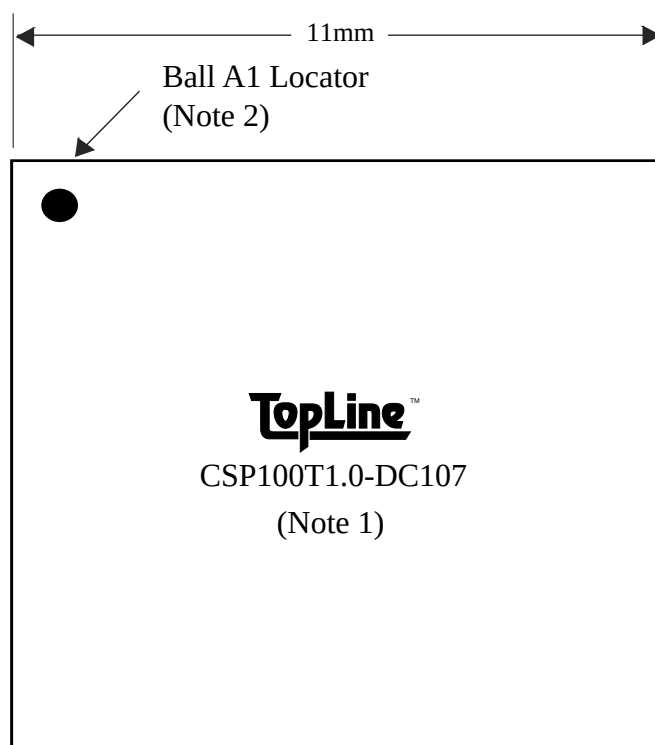
CSP100T1.0-DC107

TopLine™

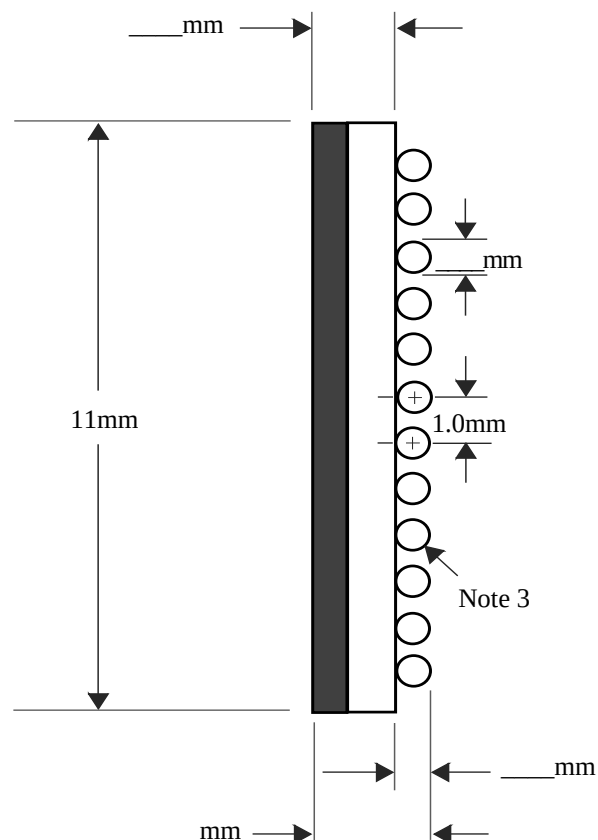
<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
100	1.0mm	11mm SQ	10 x 10	full	full	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



SIDE VIEW

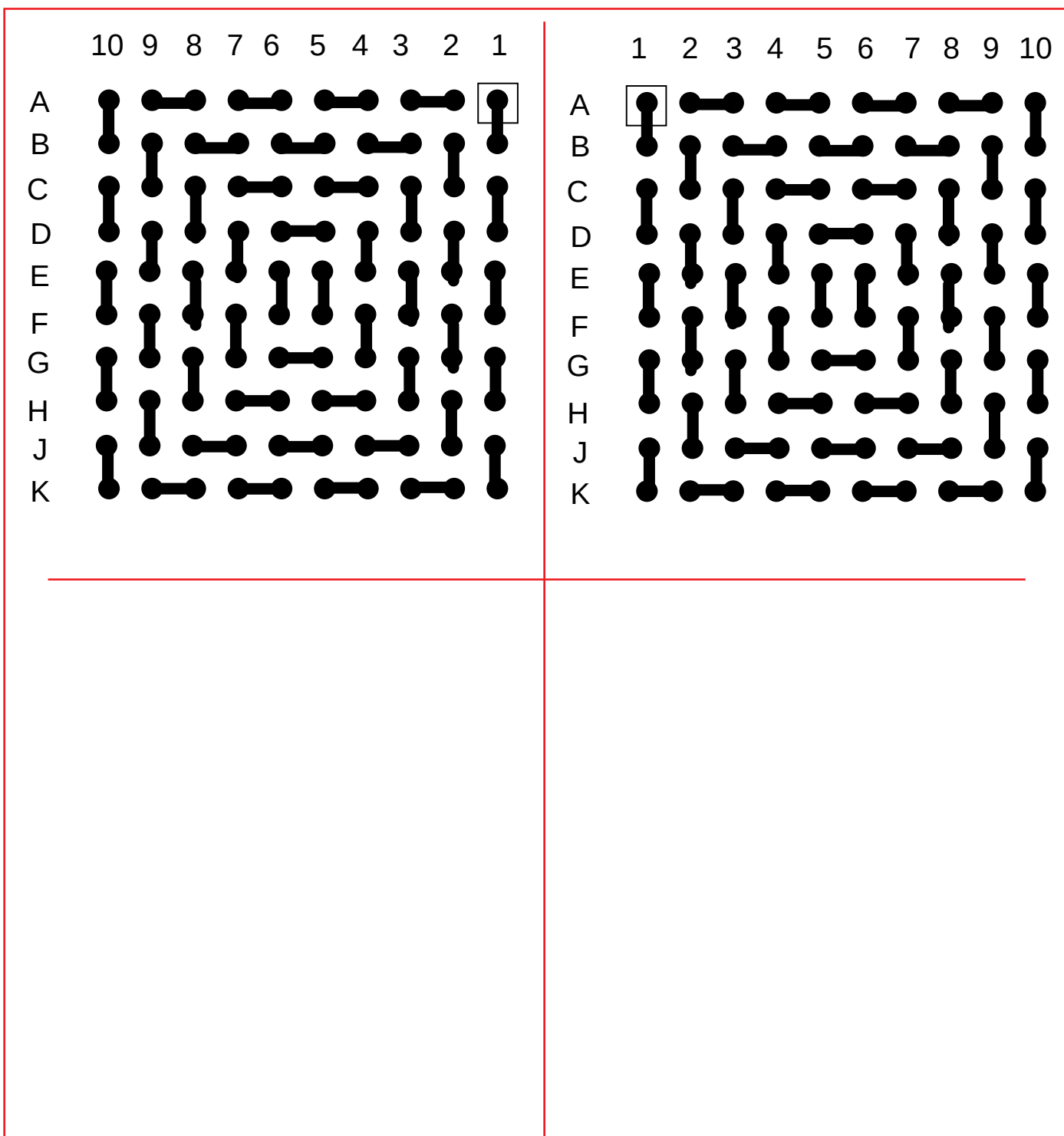


NOTES		REVISIONS		
Note 1	Logo and part number centered	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT Laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY _____		
		Tray Quantity _____		
		Tray Suppliers (ref):		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
100	1.0mm	10mm SQ	10 x 10	full	full	FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA100T1.0-DC109

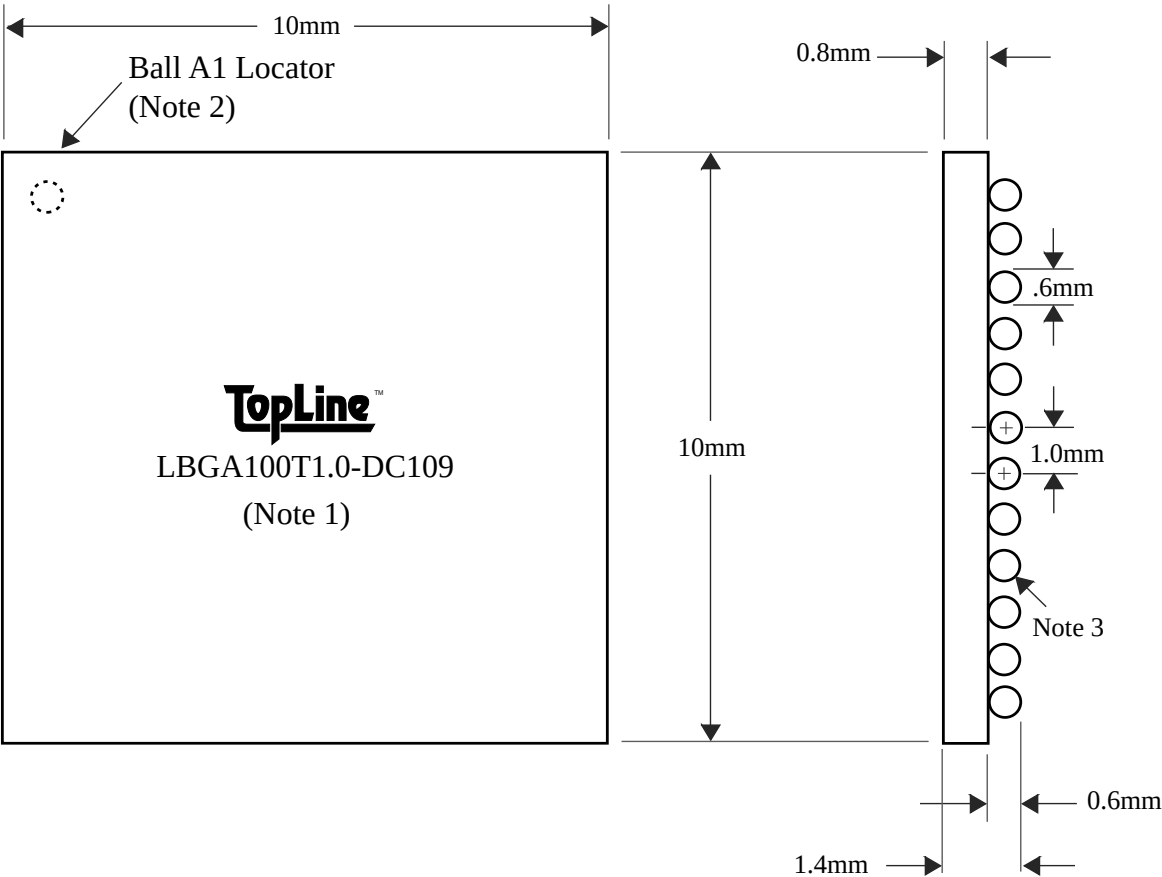
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
100	1.0mm	10mm SQ	10 x 10	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY10mm Tray Quantity _____ Tray Suppliers (ref):		



TEL 1-714-898-3830

FAX 1-714-891-0321

CSP108T.5-ISO

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
108	0.5mm	8mm SQ	14 x 14	3	none	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

Daisy Chain to be completed

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

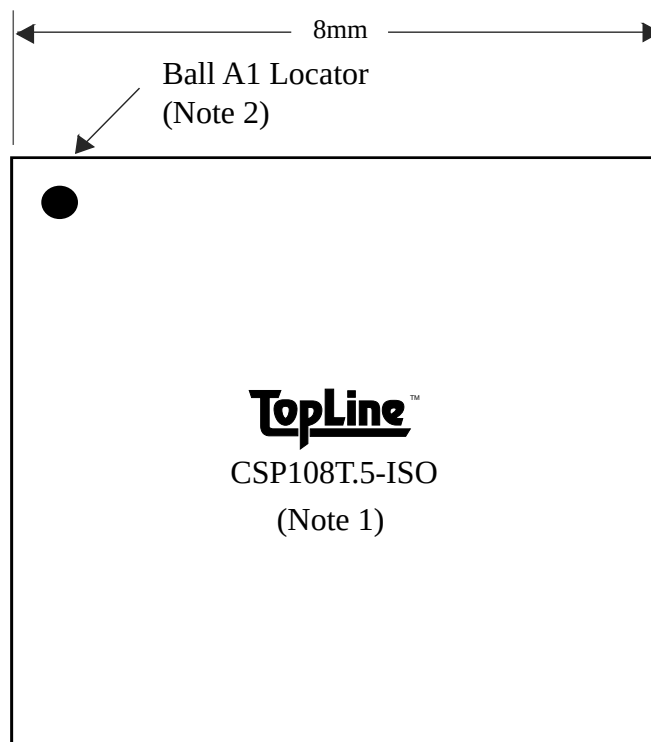
CSP108T.5-ISO

TopLine™

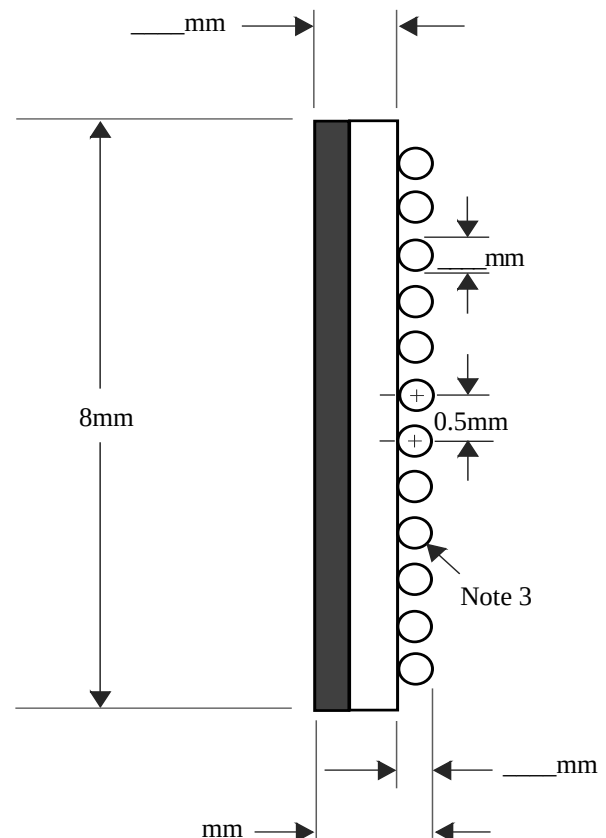
BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
108	0.5mm	8mm SQ	14 x 14	3	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



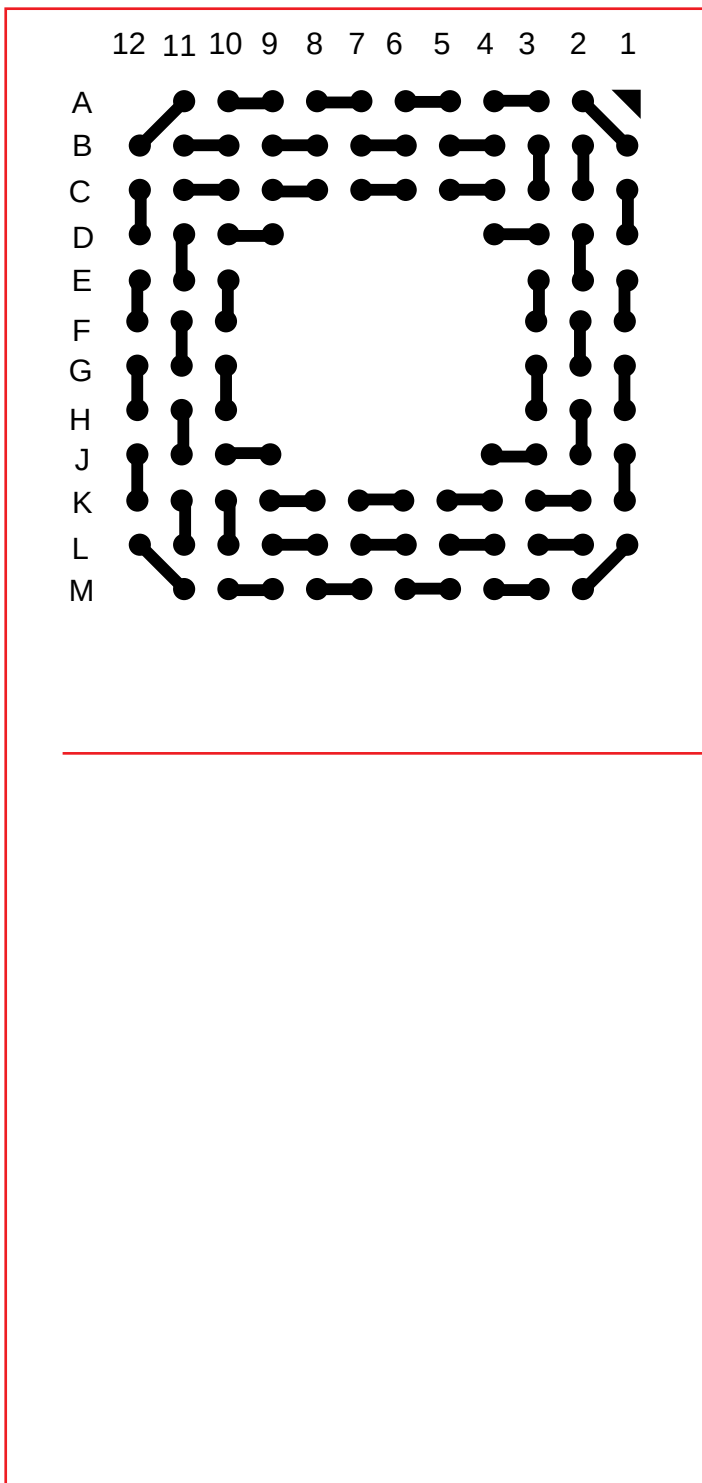
SIDE VIEW



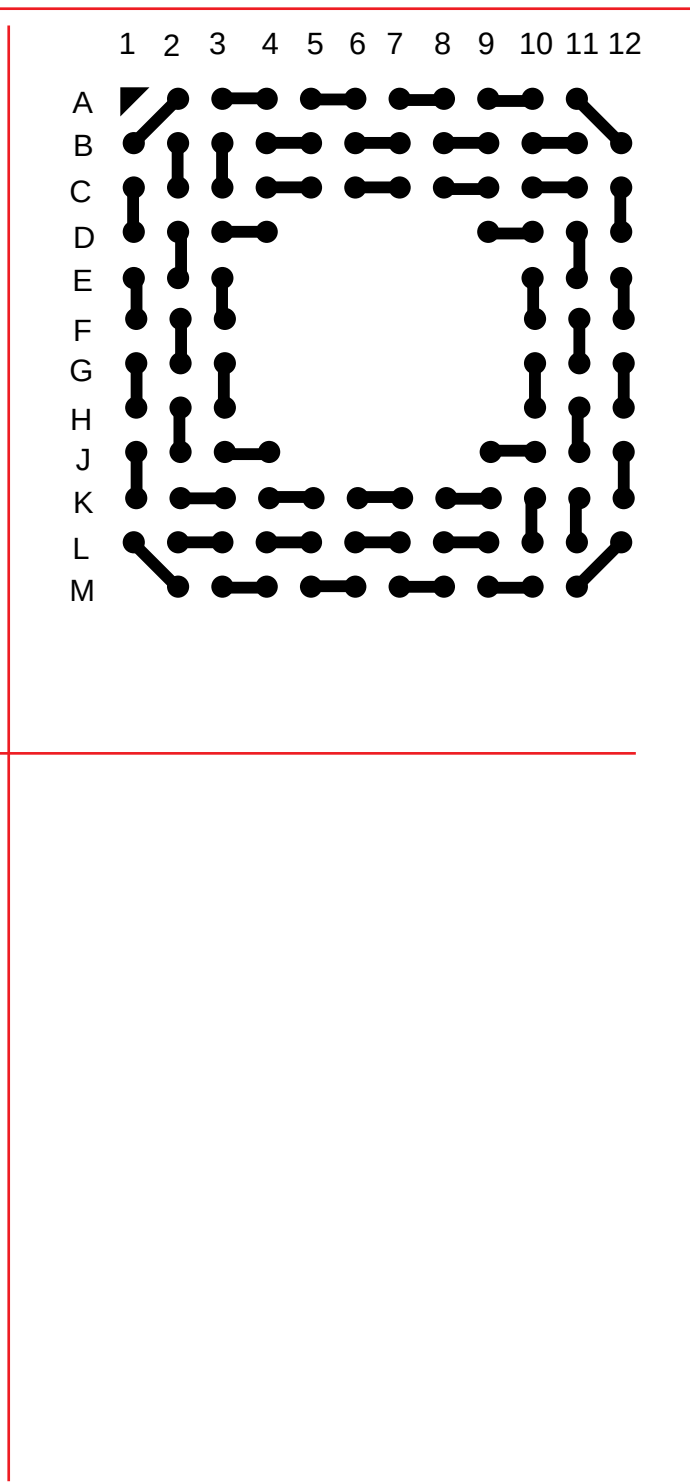
NOTES		REVISIONS		
Note 1	Logo and part number centered	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT Laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY _____		
		Tray Quantity _____		
		Tray Suppliers (ref):		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
108	0.8mm	10mm SQ	12 x 12	3	none	BT

BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

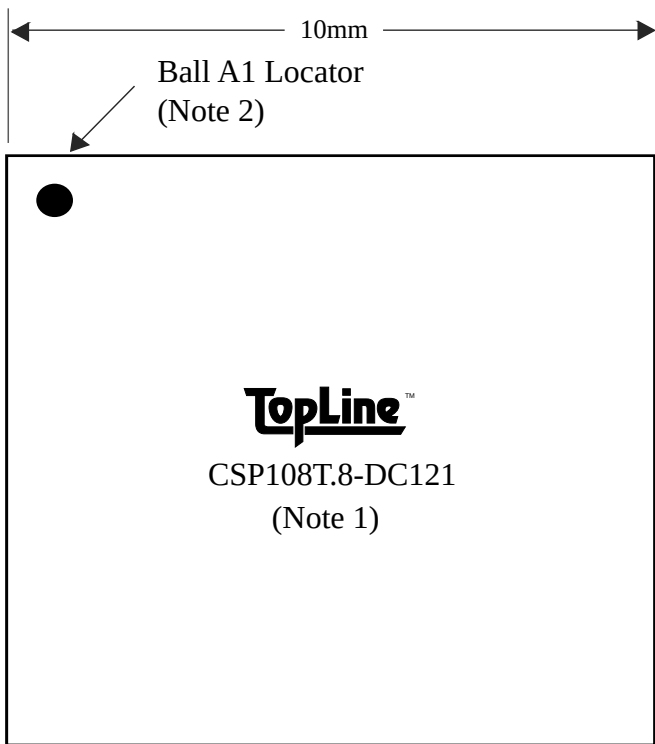
CSP108T.8-DC121

TopLine™

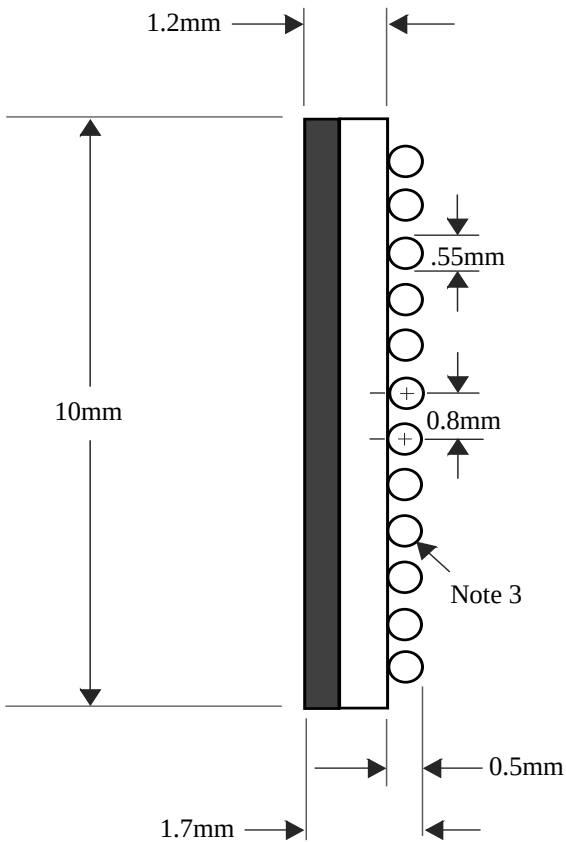
BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
108	0.8mm	10mm SQ	12 x 12	3	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT Laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY10mm		
		Tray Quantity _____		
		Tray Suppliers (ref):		



TEL 1-714-898-3830
FAX 1-714-891-0321

BGA119T1.27-DIE

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
119	1.27mm	14 x 22mm	17 x 7	full	full	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA119T1.27-DIE

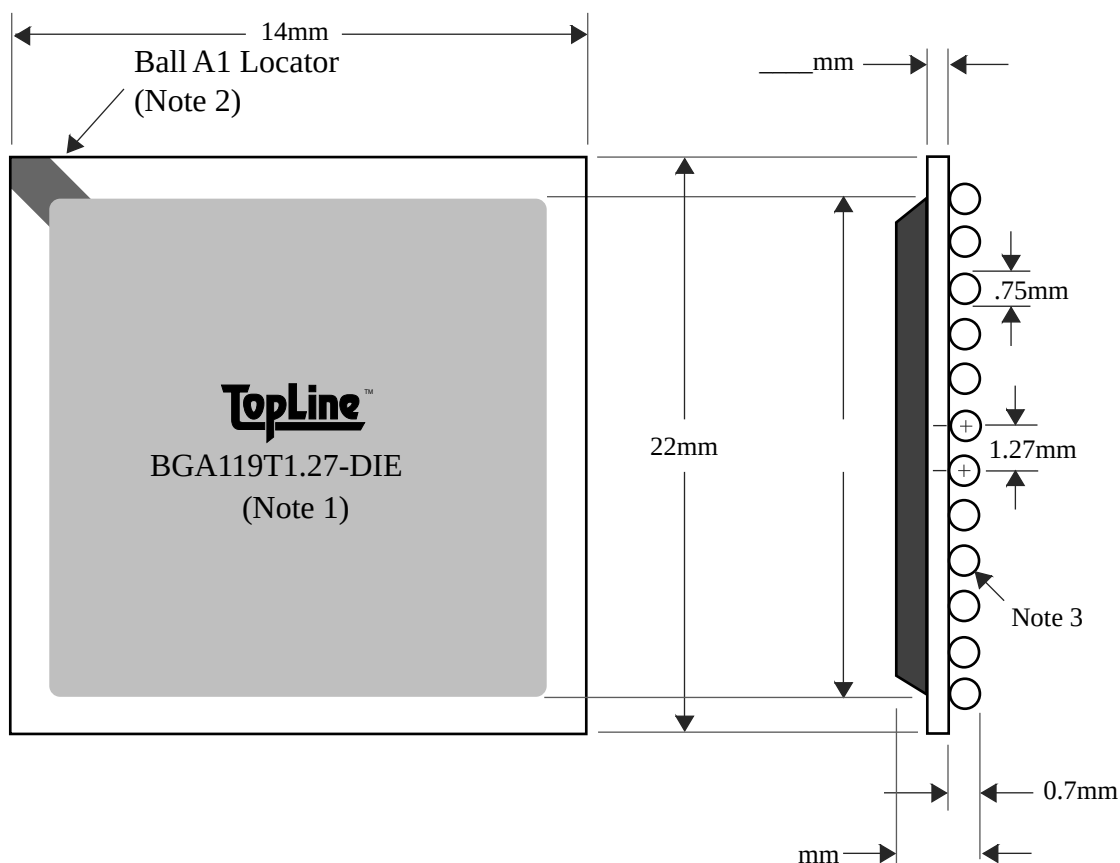
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
119	1.27mm	14 x 22mm	17 x 7	full	full	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

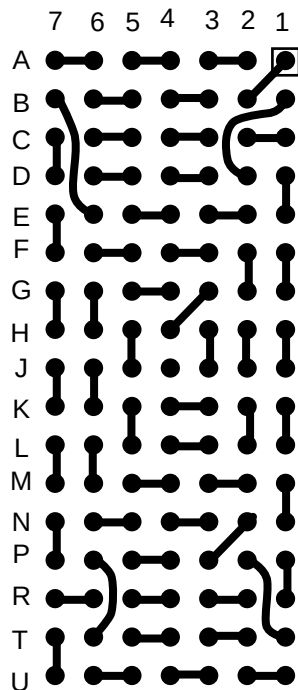
SIDE VIEW



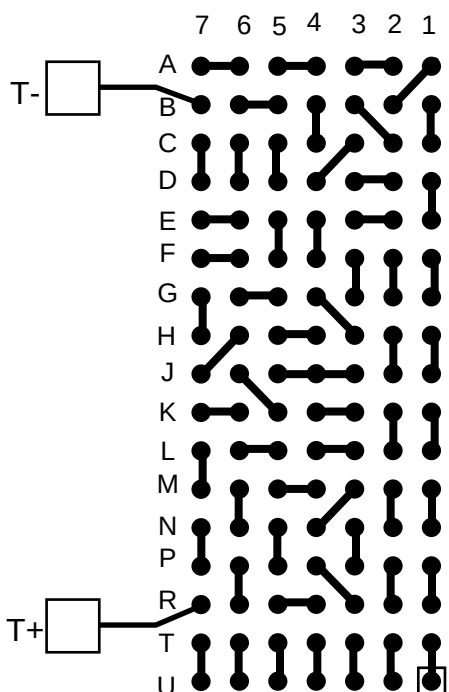
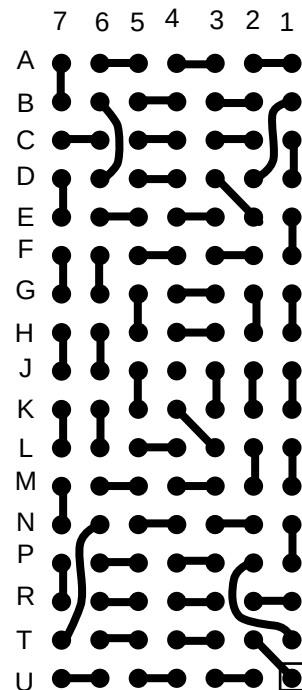
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY14x22-7x12		
		Tray Quantity 84		
		Tray Suppliers (ref):		

BGA119T1.27-DC50

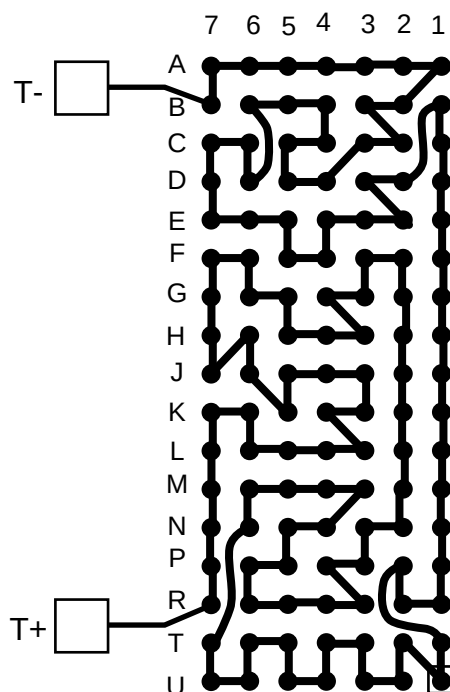
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

BGA119T1.27-DC50

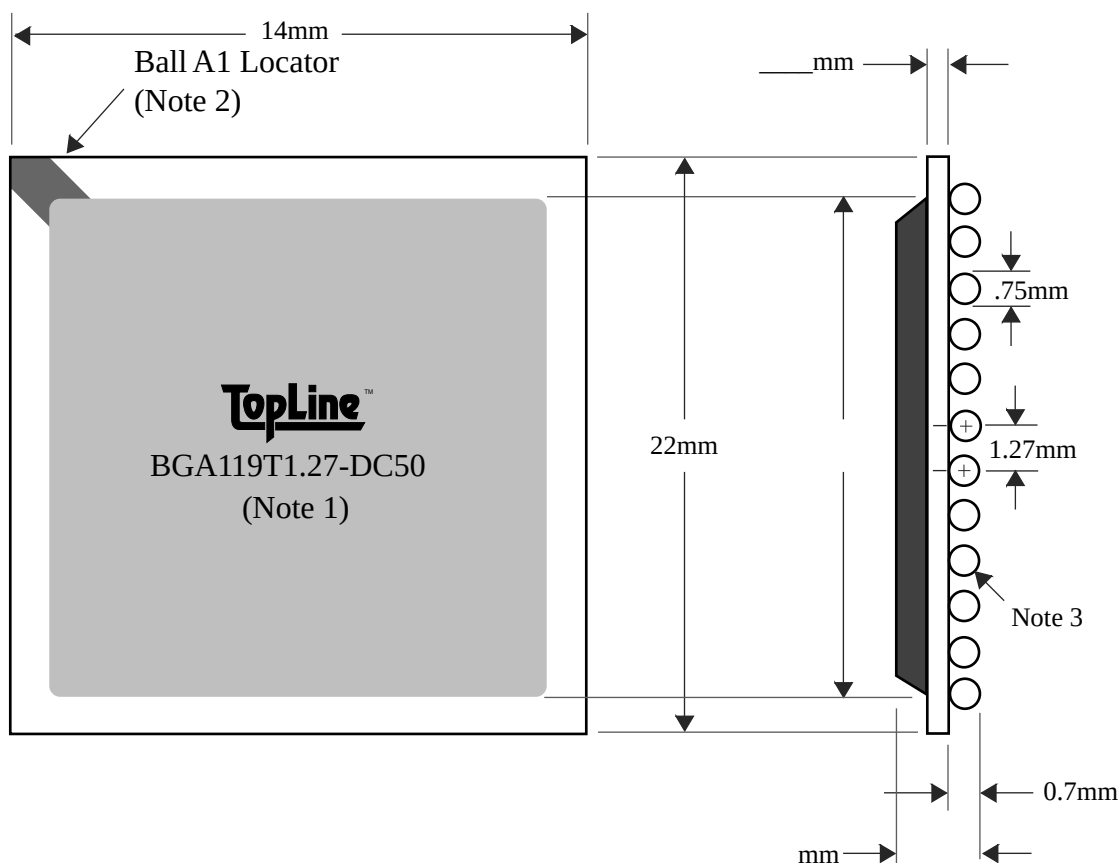
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
119	1.27mm	14 x 22mm	17 x 7	full	full	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

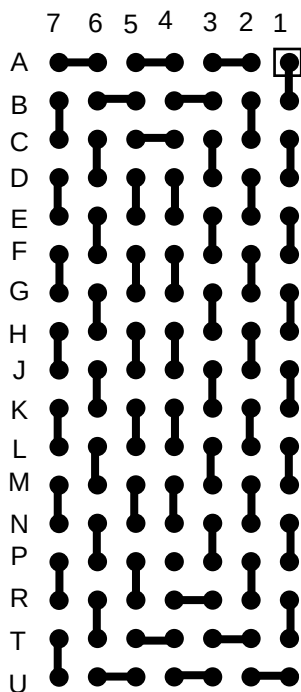
SIDE VIEW



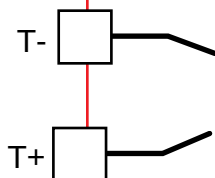
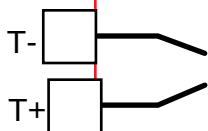
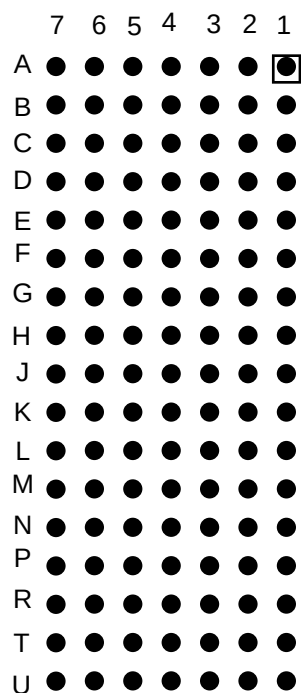
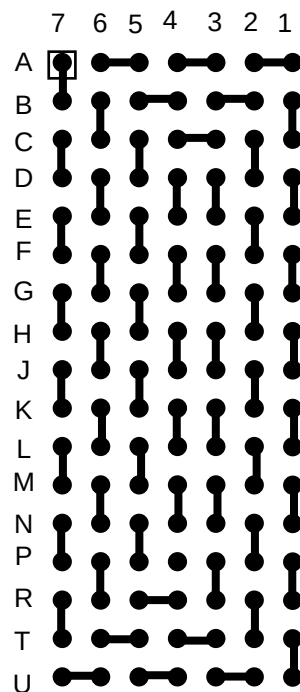
NOTES		REVISIONS	
Note 1	Logo and part number centered White ink or laser marked	Rev	Date Changes
Note 2	Ball A1 locator mark positioned in corner	Subject to discontinuation	
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)	
Note 4	Substrate Material: BT laminate	Tray BGATRAY14x22-7x12 Tray Quantity 84 Tray Suppliers (ref):	

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
119	1.27mm	14 x 22mm	17 x 17	full	full	FR4

BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA119T1.27-DC717

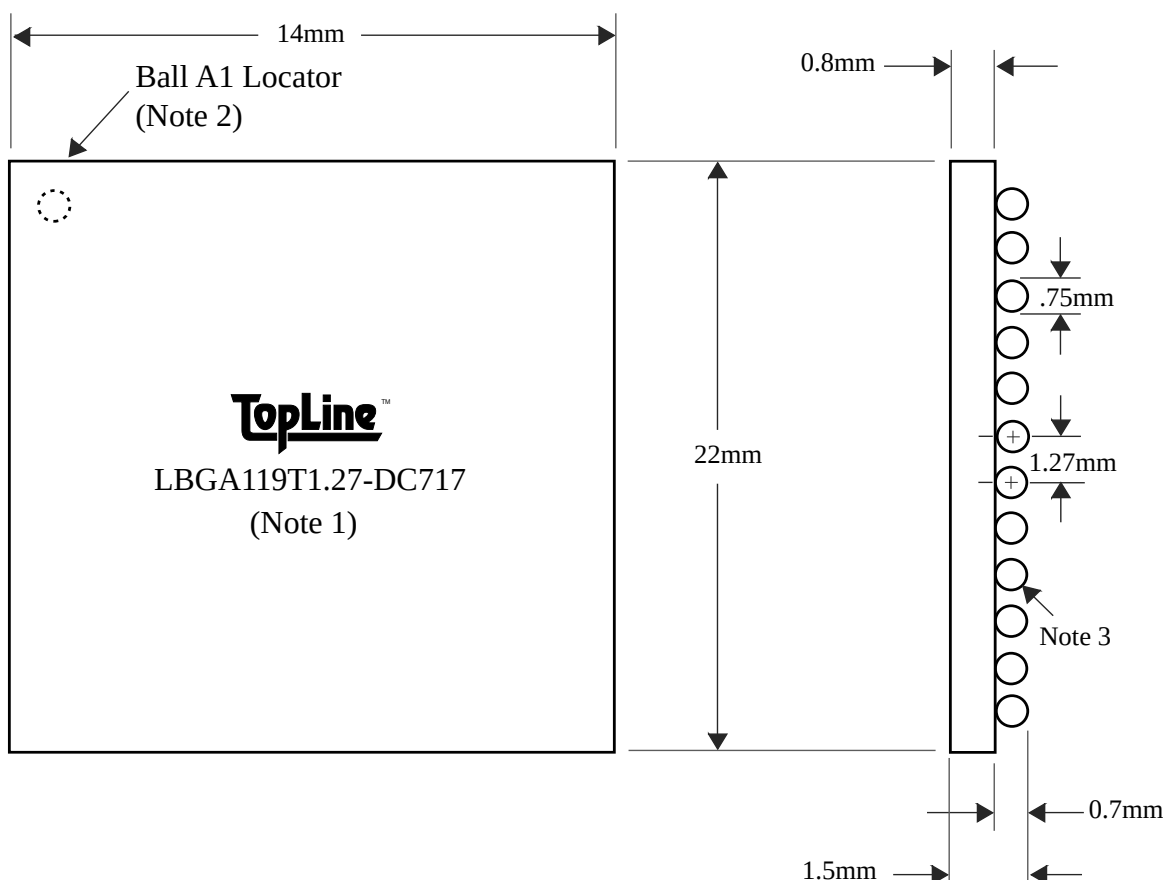
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
119	1.27mm	14 x 22mm	17 x 17	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

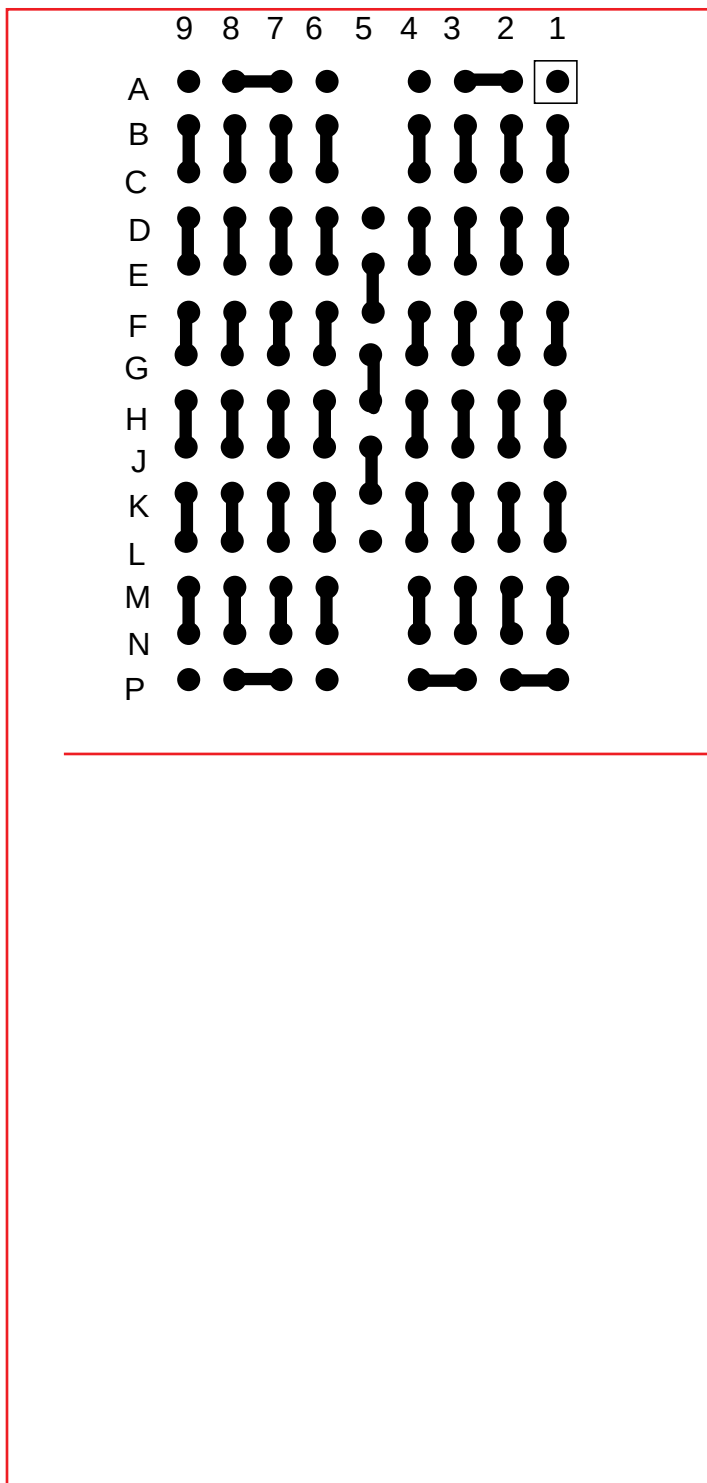
SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY14x22-7x12 Tray Quantity 84 Tray Suppliers (ref):		

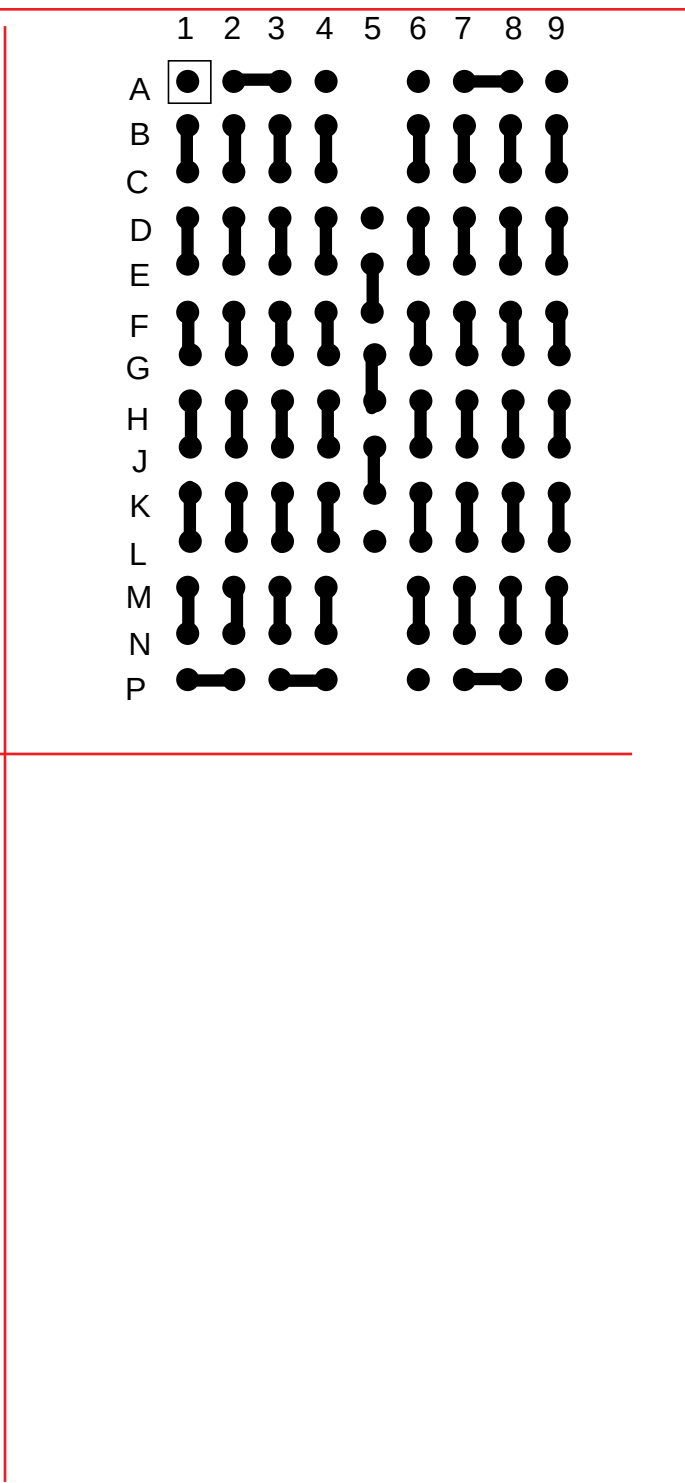
<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
120	0.8mm	9 x 13mm	9 x 14	full	full	BT

BALL VIEW



TEST VEHICLE BOARD

BOTTOM SIDE (TOP X-RAY VIEW)



AFTER MOUNTING TO TEST BOARD

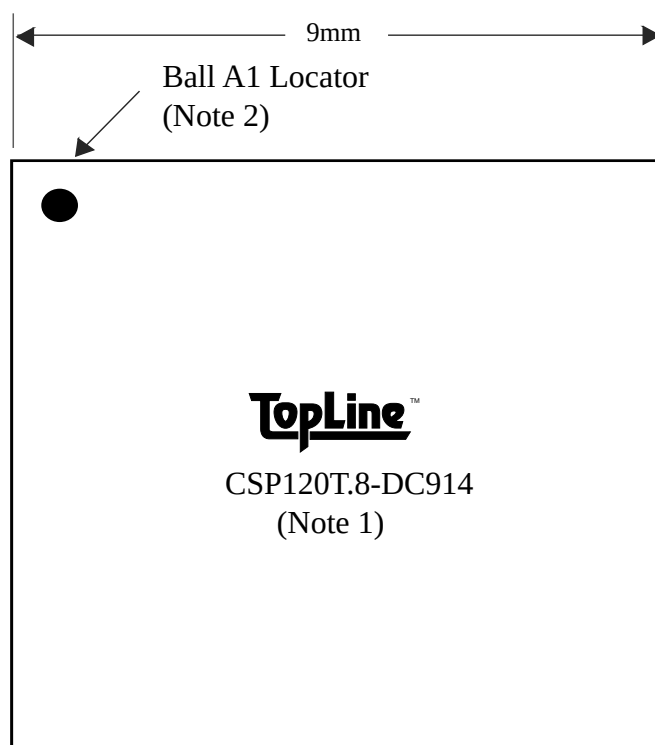
CSP120T.8-DC914

TopLine™

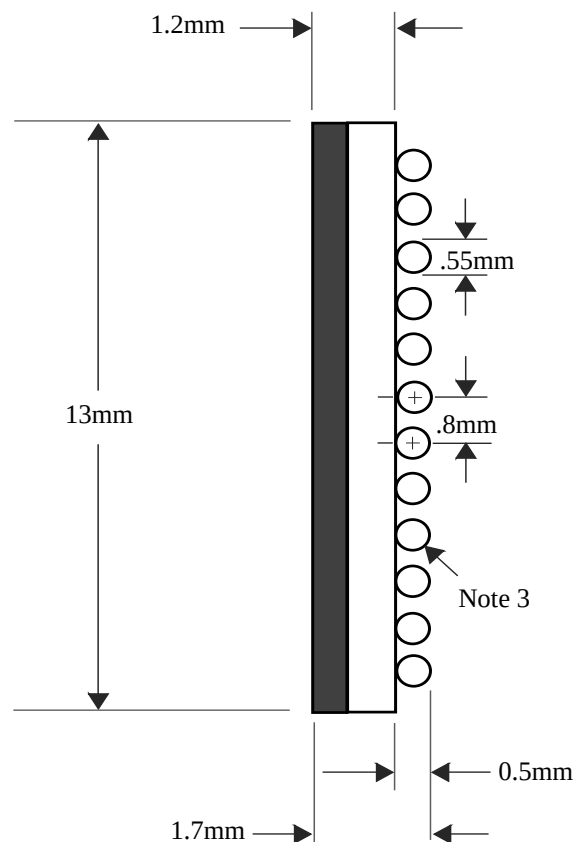
TEL 1-714-898-3830
FAX 1-714-891-0321

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
120	0.8mm	9 x 13mm	9 x 14	full	full	BT

TOP VIEW



SIDE VIEW

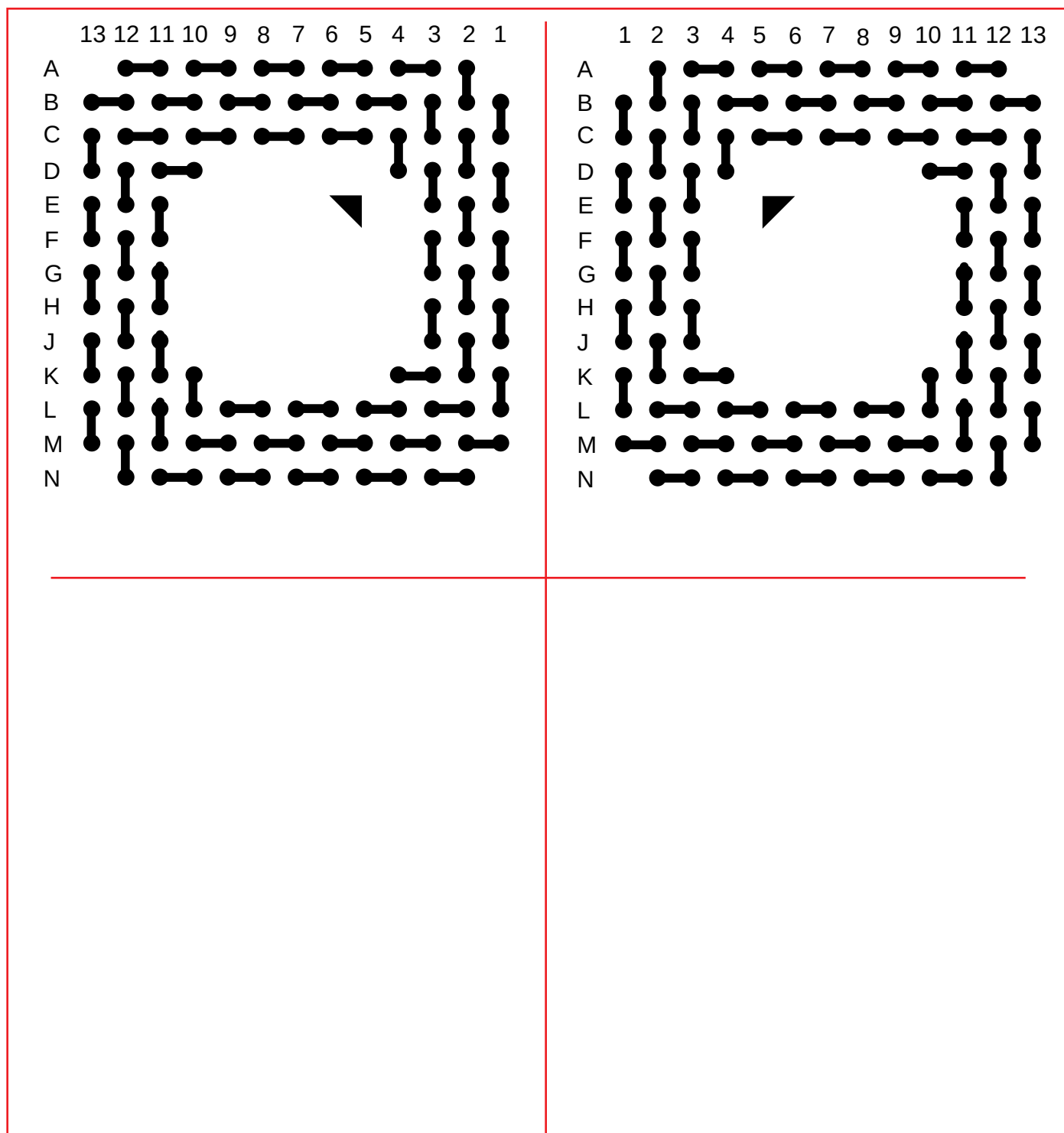


NOTES		REVISIONS		
Note 1	Logo and part number centered	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT Laminate	PACKAGING TRAYS (SEE NOTE 4) Tray BGATRAY _____ Tray Quantity _____ Tray Suppliers (ref): _____		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
120	1.0mm	13mm SQ	13 x 13	3	none	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

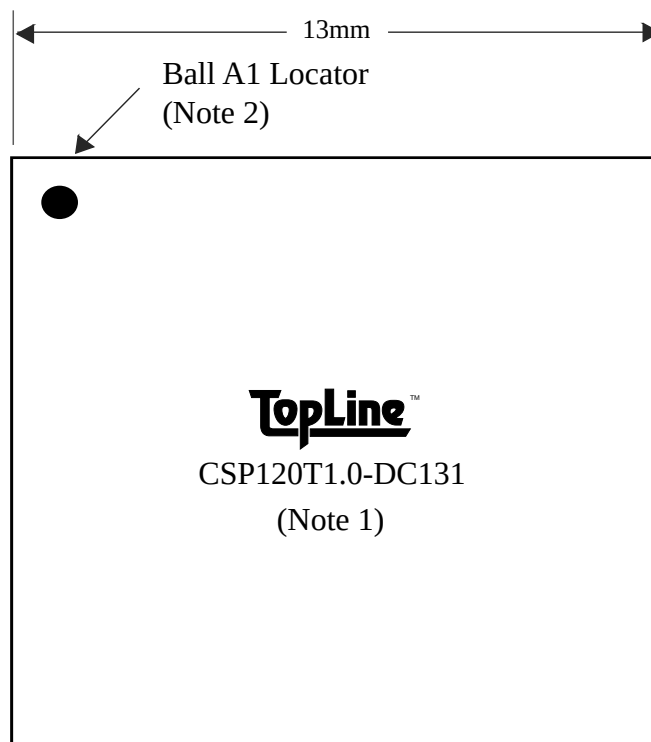
CSP120T1.0-DC131

TopLine™

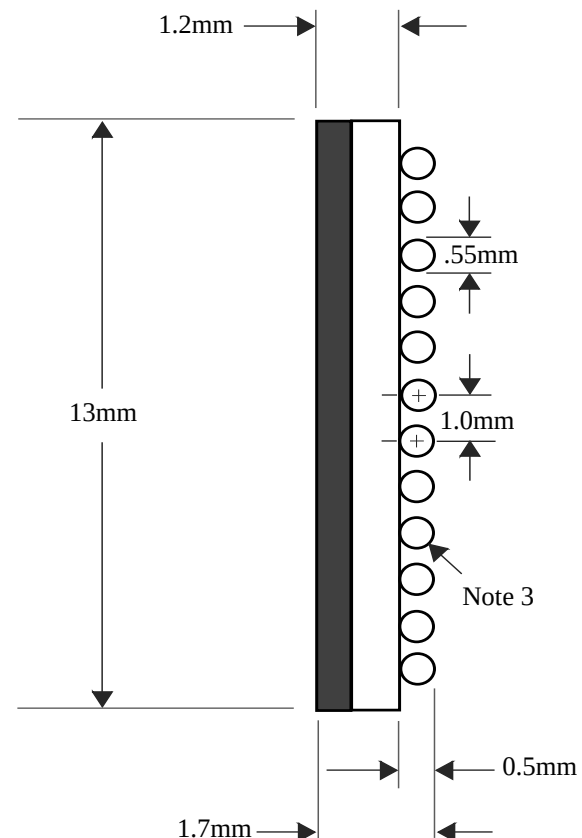
<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
120	1.0mm	13mm SQ	13 x 13	3	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



SIDE VIEW

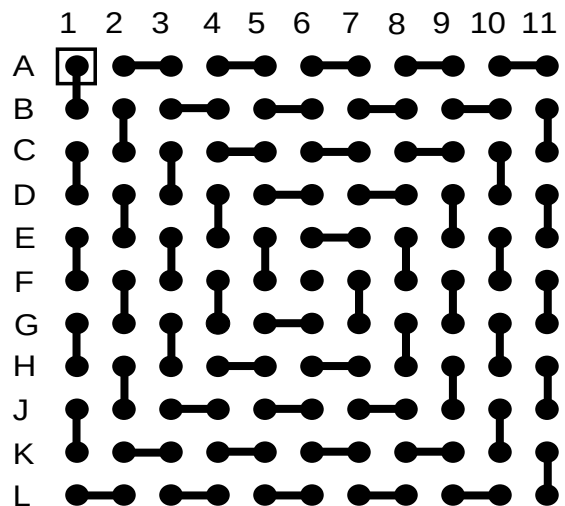
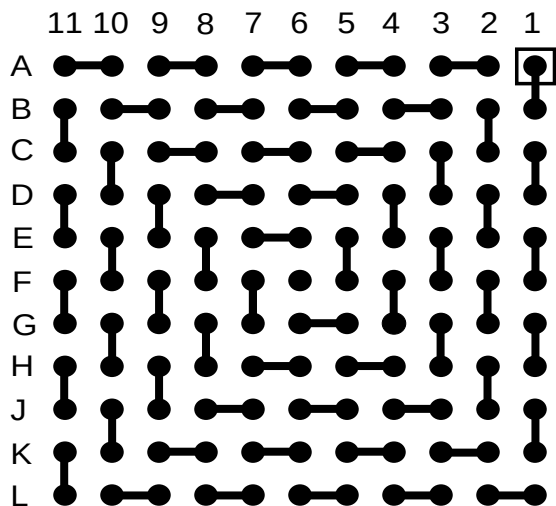


NOTES		REVISIONS		
Note 1	Logo and part number centered	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT Laminate	Tray BGATRAY13mm-8x20 Tray Quantity 160 Tray Suppliers (ref):		

	<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
	121	0.8mm	9mm SQ	11 x 11	full	full	FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

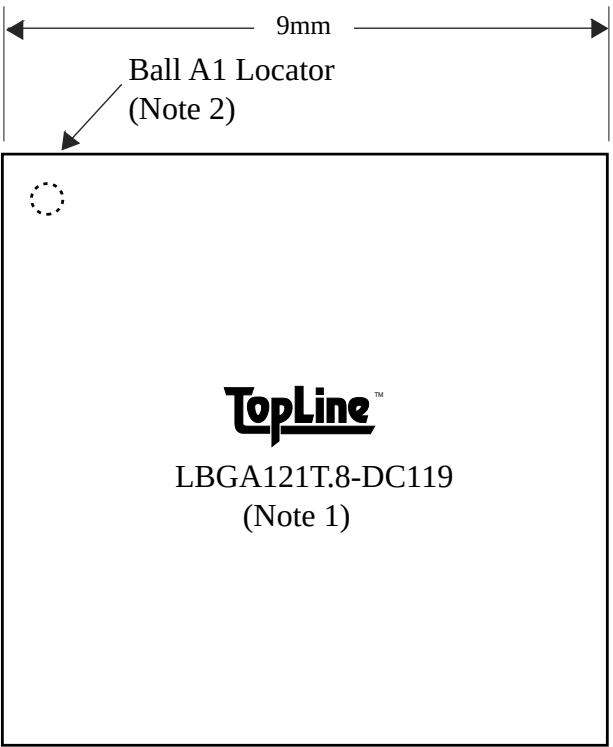
LBGA121T.8-DC119

TopLine™

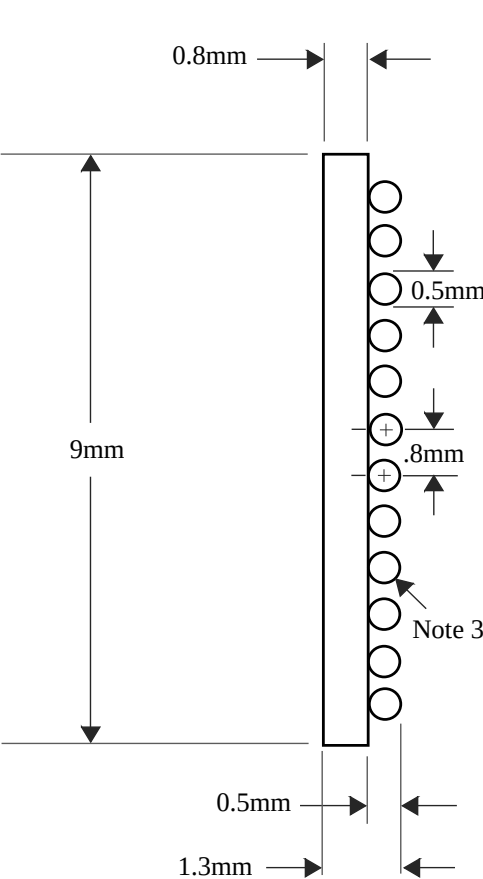
BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
121	0.8mm	9mm SQ	11 x 11	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY9mm-10x26 Tray Quantity 260 Tray Suppliers (ref):		

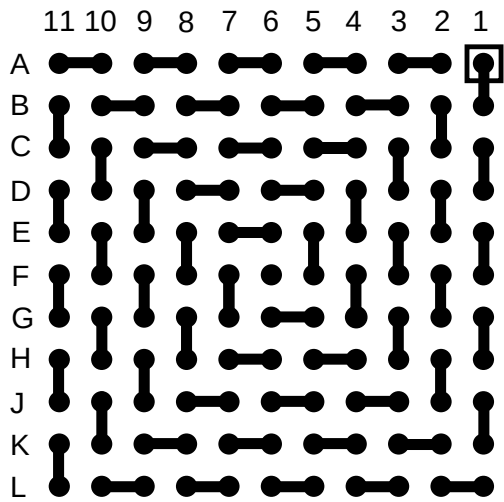


TEL 1-714-898-3830
FAX 1-714-891-0321

LBGA121T1.0-DC119

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
121	1.0mm	11mm SQ	11 x 11	full	full	FR4

BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA121T1.0-DC119

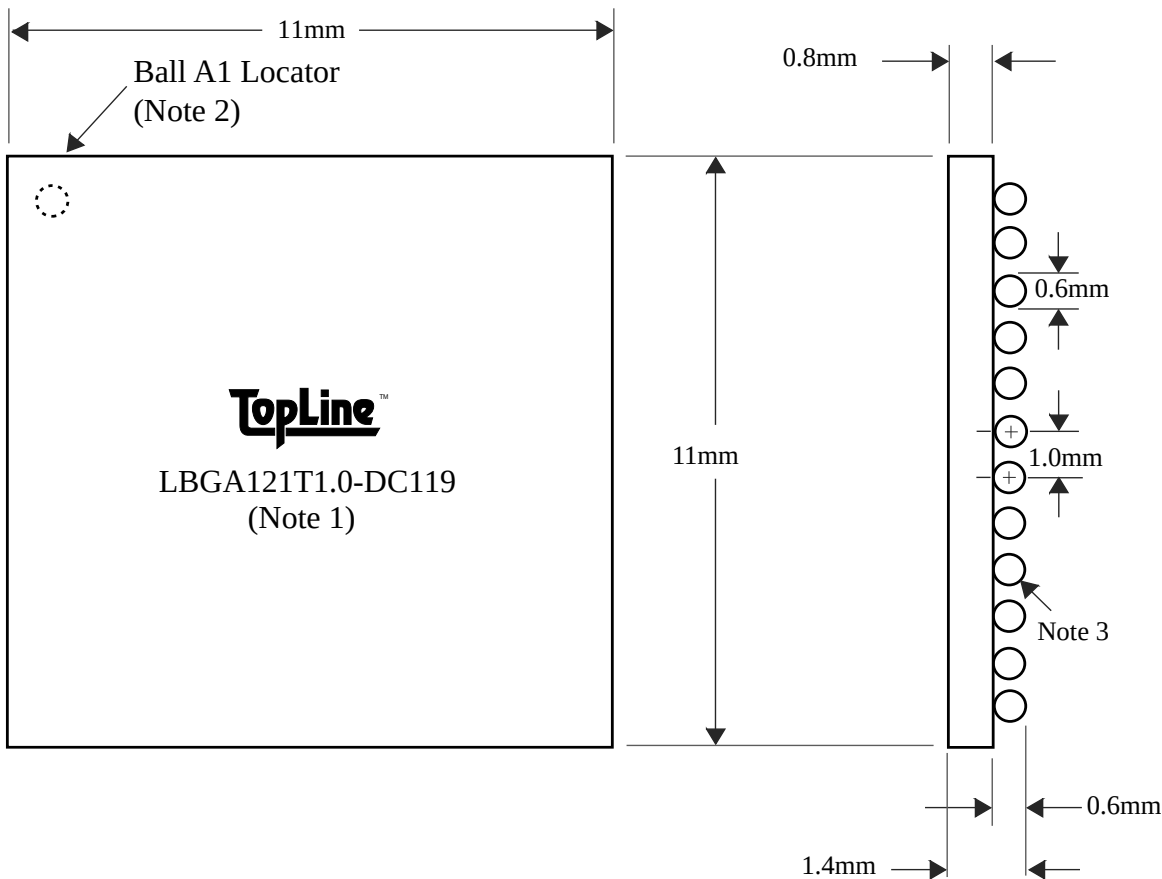
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
121	1.0mm	11mm SQ	11 x 11	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY11mm-8x22 Tray Quantity 176 Tray Suppliers (ref):		



TEL 1-714-898-3830
FAX 1-714-891-0321

BGA121T1.27-ISO

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
121	1.27mm	15mm SQ	11 x 11	full	full	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

	11	10	9	8	7	6	5	4	3	2	1
A	●	●	●	●	●	●	●	●	●	●	●
B	●	●	●	●	●	●	●	●	●	●	●
C	●	●	●	●	●	●	●	●	●	●	●
D	●	●	●	●	●	●	●	●	●	●	●
E	●	●	●	●	●	●	●	●	●	●	●
F	●	●	●	●	●	●	●	●	●	●	●
G	●	●	●	●	●	●	●	●	●	●	●
H	●	●	●	●	●	●	●	●	●	●	●
J	●	●	●	●	●	●	●	●	●	●	●
K	●	●	●	●	●	●	●	●	●	●	●
L	●	●	●	●	●	●	●	●	●	●	●

	1	2	3	4	5	6	7	8	9	10	11
A	●	●	●	●	●	●	●	●	●	●	●
B	●	●	●	●	●	●	●	●	●	●	●
C	●	●	●	●	●	●	●	●	●	●	●
D	●	●	●	●	●	●	●	●	●	●	●
E	●	●	●	●	●	●	●	●	●	●	●
F	●	●	●	●	●	●	●	●	●	●	●
G	●	●	●	●	●	●	●	●	●	●	●
H	●	●	●	●	●	●	●	●	●	●	●
J	●	●	●	●	●	●	●	●	●	●	●
K	●	●	●	●	●	●	●	●	●	●	●
L	●	●	●	●	●	●	●	●	●	●	●

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA121T1.27-ISO

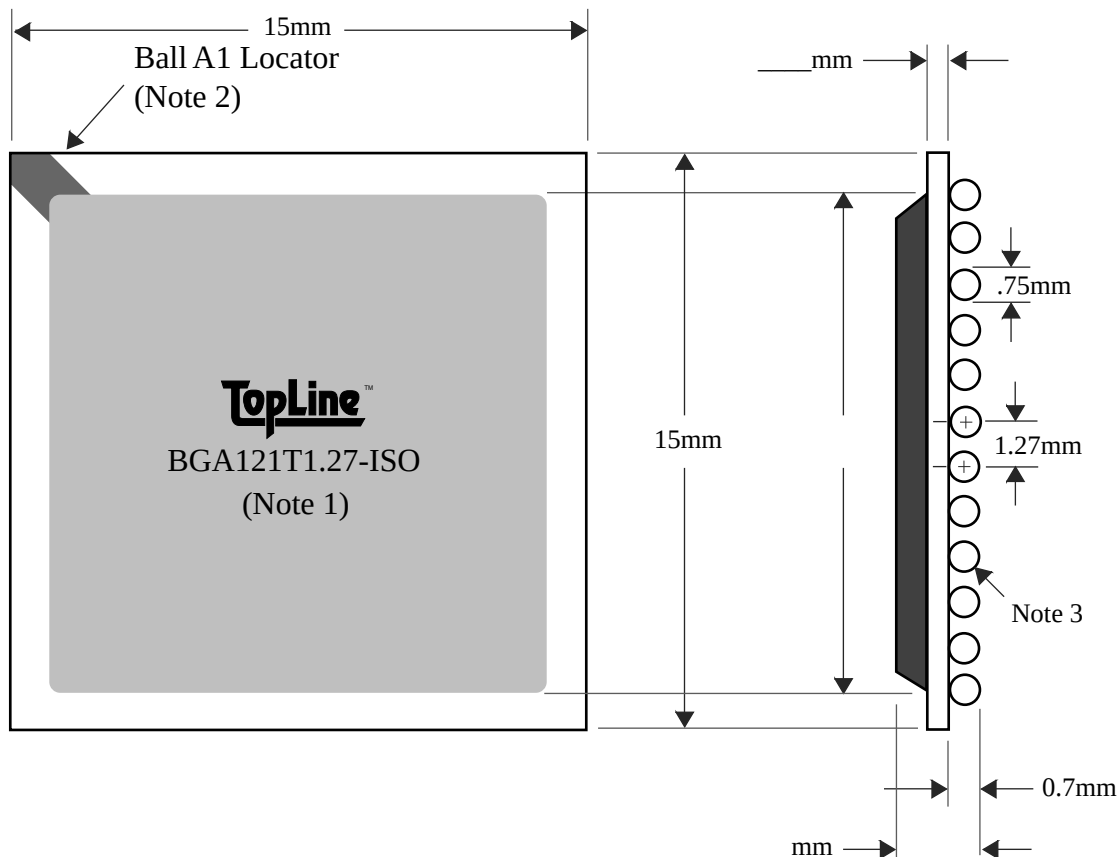
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
121	1.27mm	15mm SQ	11 x 11	full	full	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY15mm-7x18		
		Tray Quantity 126		
		Tray Suppliers (ref):		



TEL 1-714-898-3830
FAX 1-714-891-0321

CBGA121T1.27-DC5

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
121	1.27mm	15mm SQ	11 x 11	full	full	ceramic

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

TEST VEHICLE BOARD

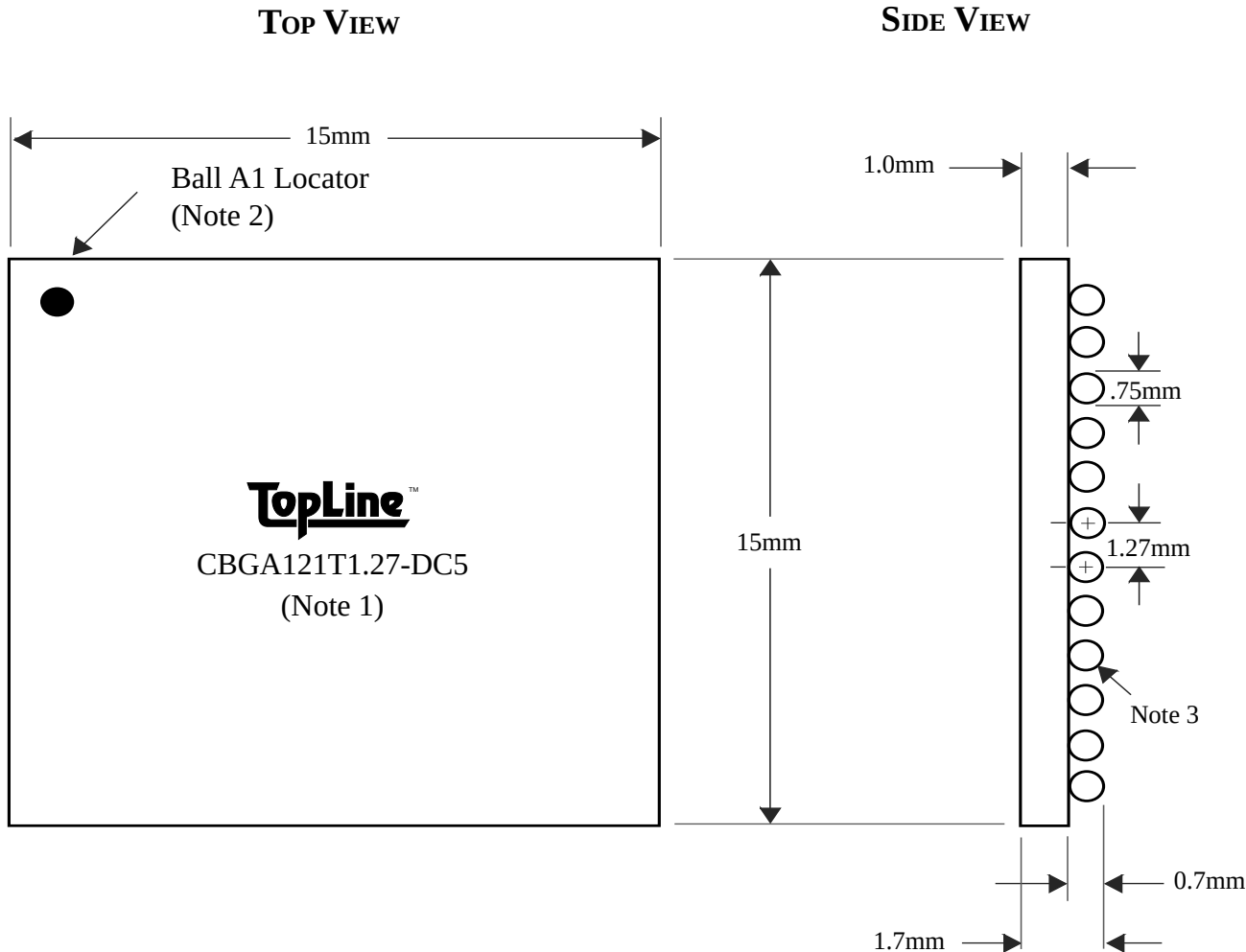
AFTER MOUNTING TO TEST BOARD

CBGA121T1.27-DC5



BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
121	1.27mm	15mm SQ	11 x 11	full	full	ceramic

TEL 1-714-898-3830
FAX 1-714-891-0321



NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 10/90SnPb			
Note 4	Substrate Material: Ceramic			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY15mm-7x18		
		Tray Quantity 126		
		Tray Suppliers (ref):		



TEL 1-714-898-3830
FAX 1-714-891-0321

CBGA121T1.27L-DC5

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
121	1.27mm	15mm SQ	11 x 11	full	full	ceramic

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

CBGA121T1.27L-DC5

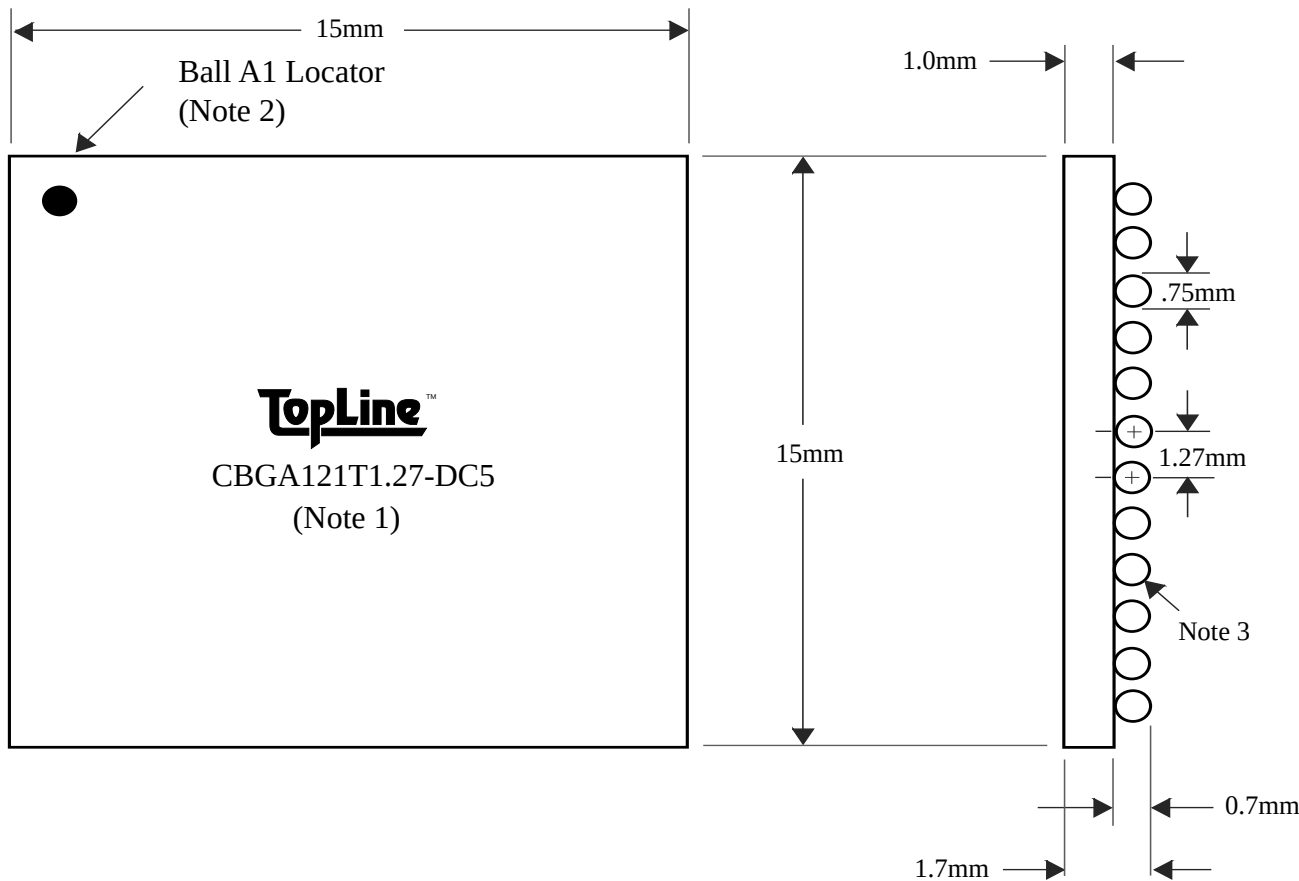


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
121	1.27mm	15mm SQ	11 x 11	full	full	ceramic

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

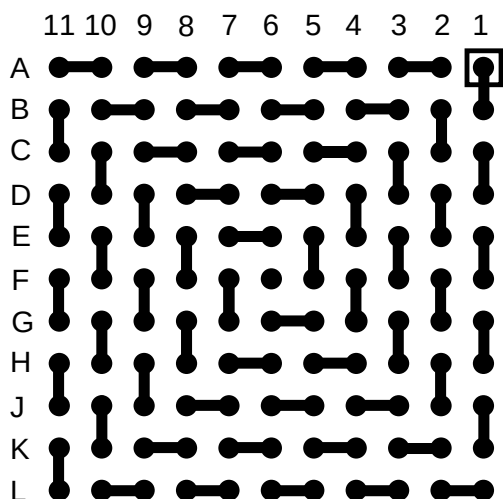
SIDE VIEW



NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 62/36/2 SnPbAg			
Note 4	Substrate Material: Ceramic			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY15mm-7x18 Tray Quantity 126 Tray Suppliers (ref):		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
121	1.27mm	15mm SQ	11 x 11	full	full	FR4

BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA121T1.27-DC119

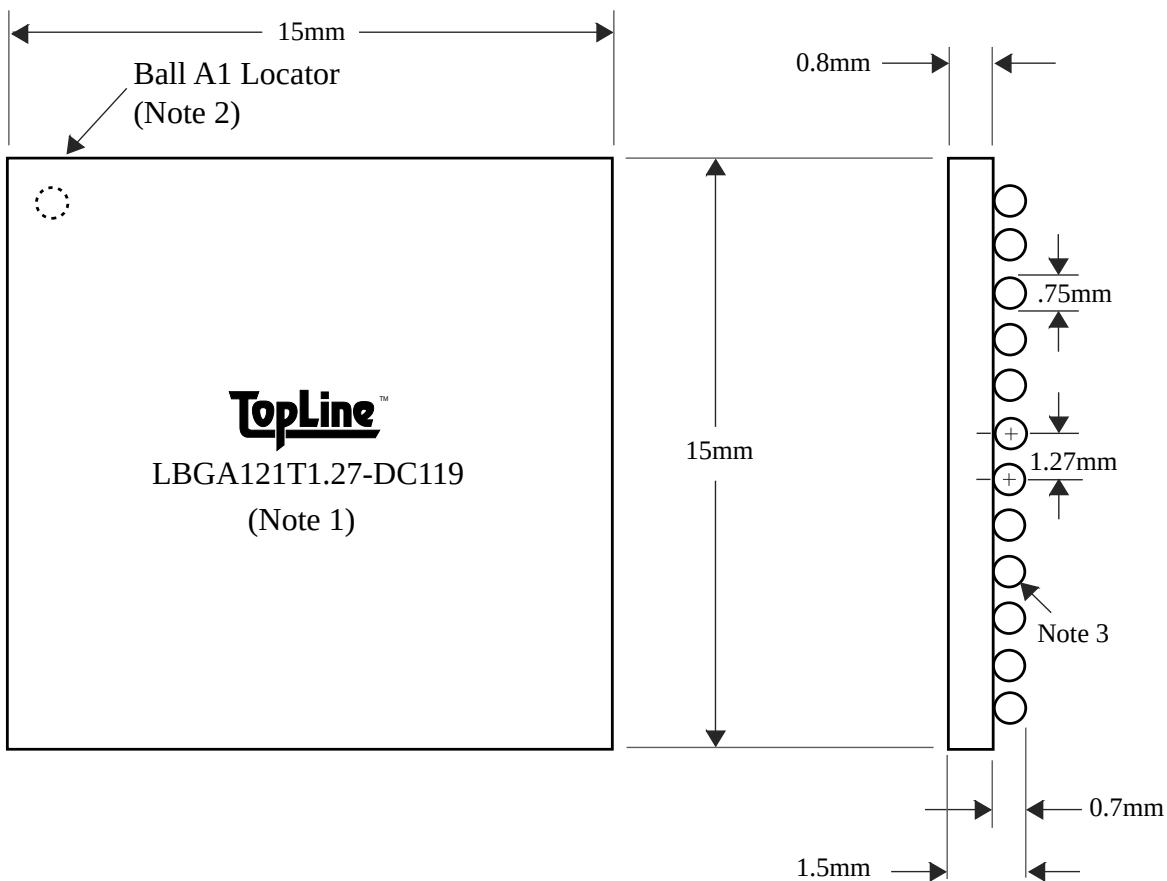
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
121	1.27mm	15mm SQ	11 x 11	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

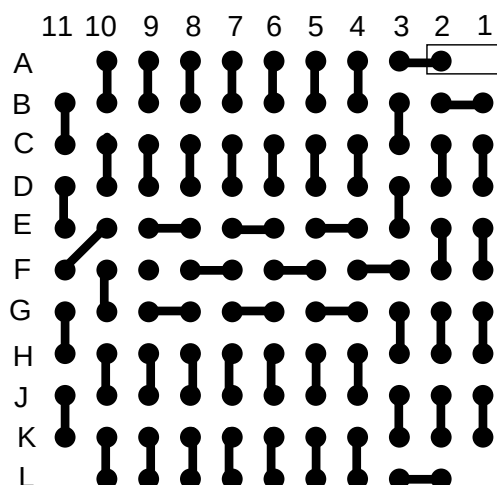
SIDE VIEW



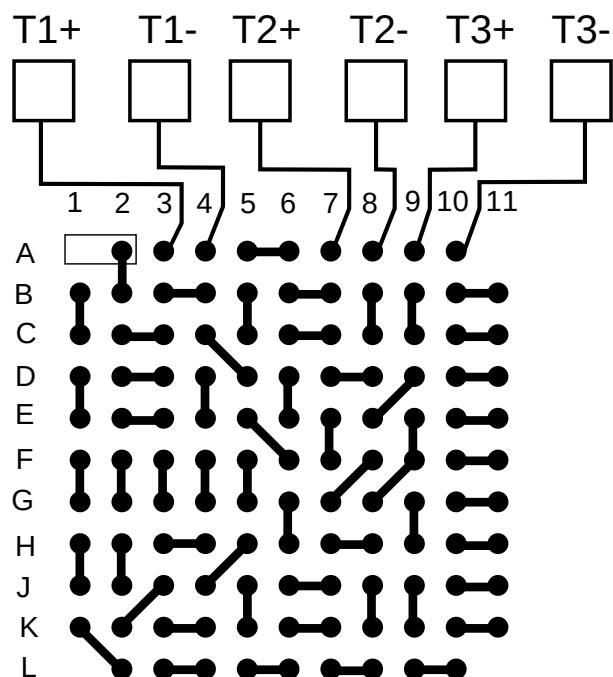
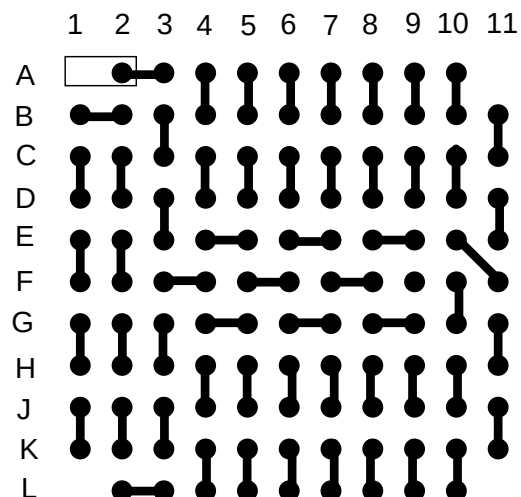
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 62/36/2 SnPbAg			
Note 4	Substrate Material: FR4 laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY15mm-7x18		
		Tray Quantity 126		
		Tray Suppliers (ref):		

BGA121T1.5-DC5

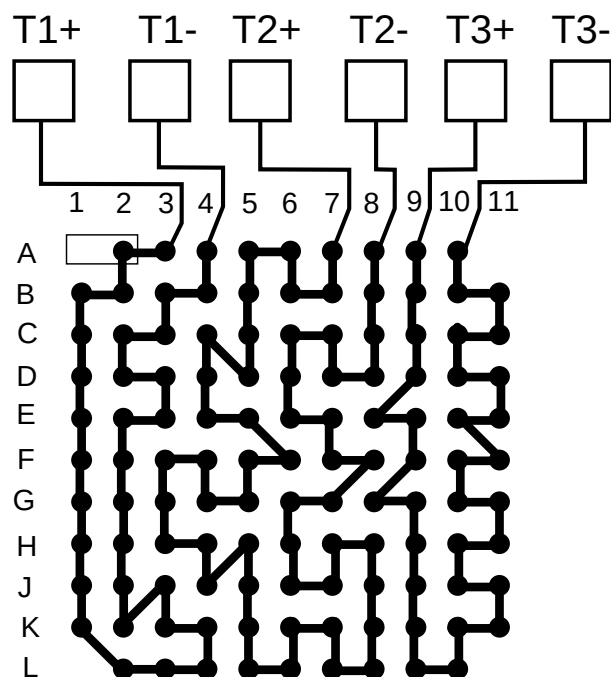
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

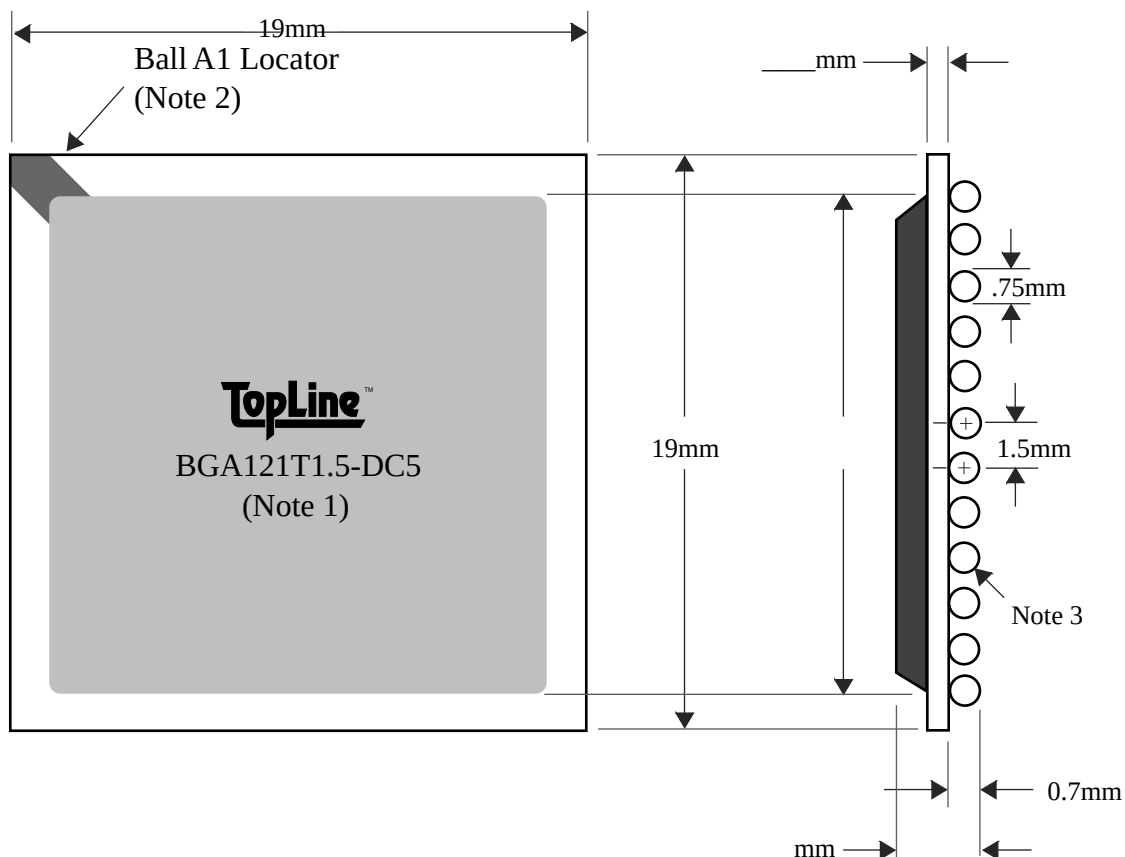


AFTER MOUNTING TO TEST BOARD

TopLine™

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
121	1.5mm	19mm SQ	11 x 11	full	full	BT

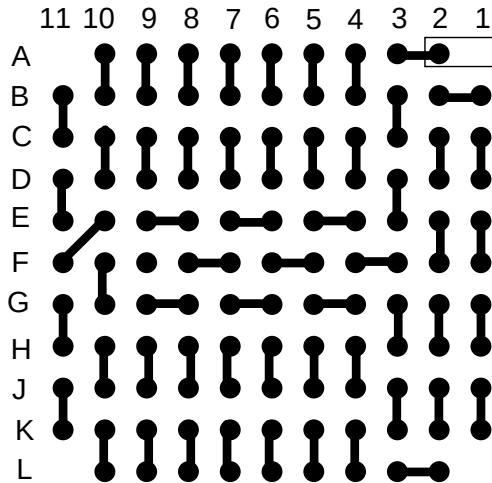
SIDE VIEW



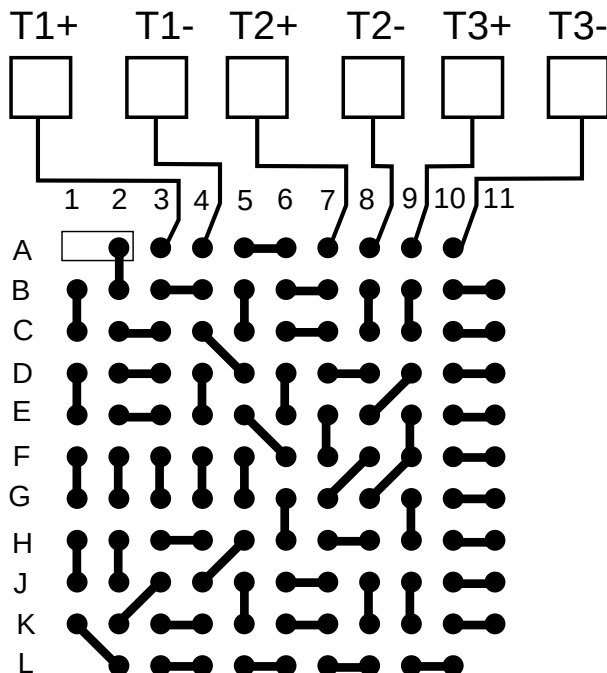
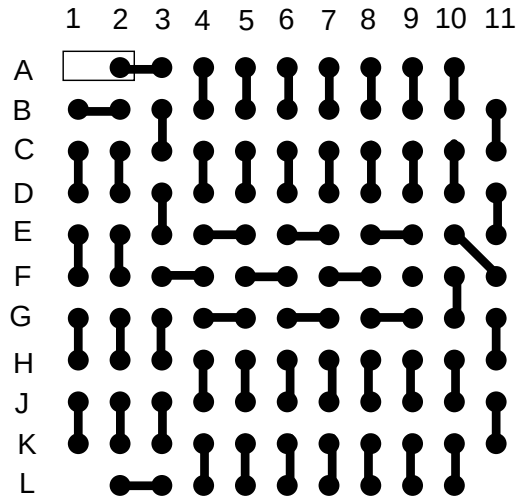
NOTES		REVISIONS	
Note 1	Logo and part number centered White ink or laser marked	<u>Rev</u>	<u>Date</u> <u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner	Subject to Discontinuation	
Note 3	Ball Material: 63/37 SnPb		
Note 4	Substrate Material: BT laminate	PACKAGING TRAYS (SEE NOTE 4) Tray BGATRAY19mm-6x14 Tray Quantity 84 Tray Suppliers (ref):	

LBGA121T1.5-DC5

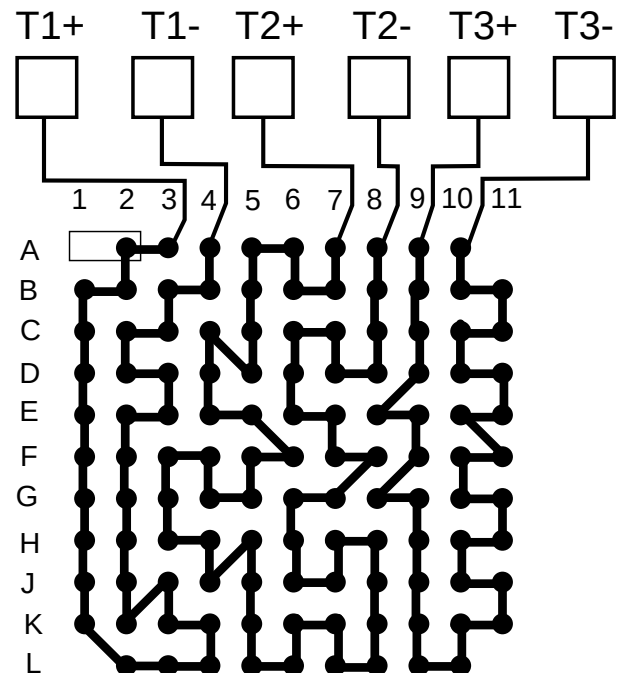
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

LBGA121T1.5-DC5

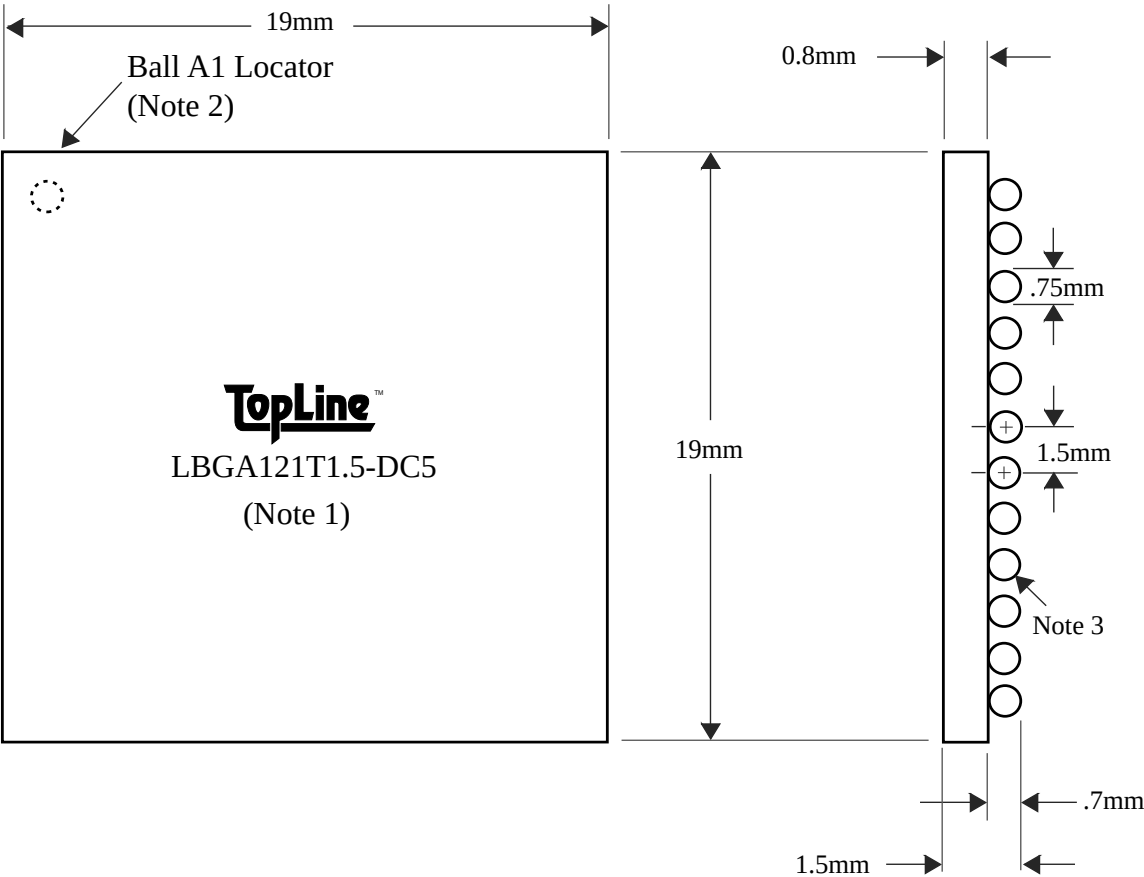


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
121	1.5mm	19mm SQ	11 x 11	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY19mm-6x14 Tray Quantity 84 Tray Suppliers (ref):		



TEL 1-714-898-3830

FAX 1-714-891-0321

CSP128T.8-DC124

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
128	0.8mm	11mm SQ	12 x 12	4	none	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

Daisy Chain to be completed

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

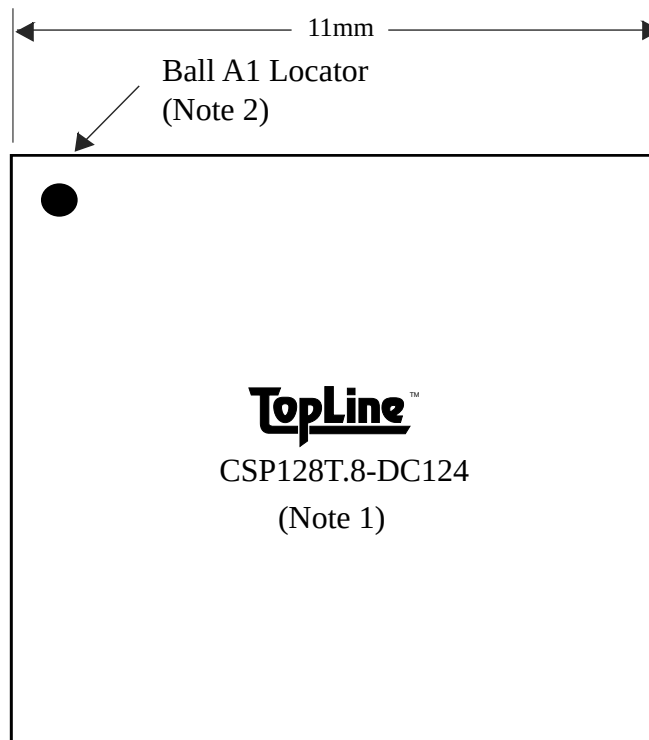
CSP128T.8-DC124

TopLine™

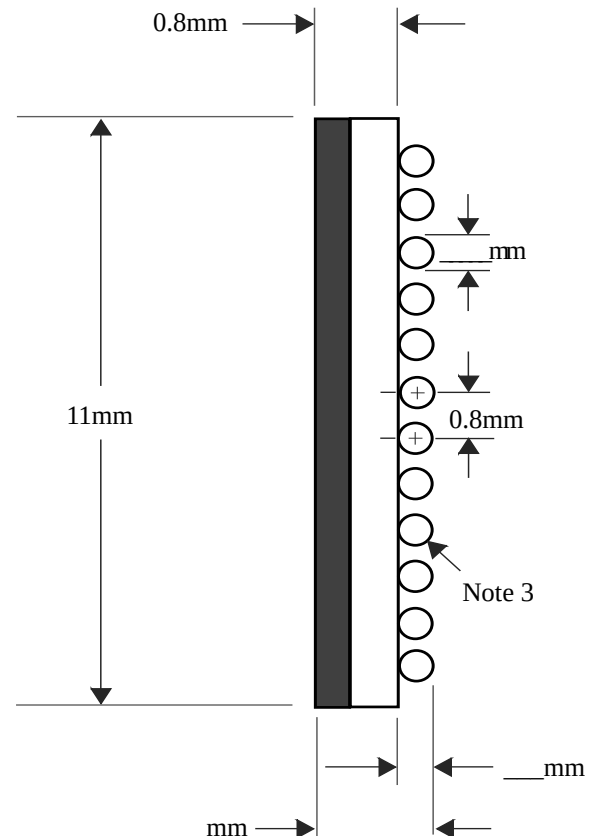
<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
128	0.8mm	11mm SQ	12 x 12	4	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT Laminate	Tray BGATRAY _____		
		Tray Quantity _____		
		Tray Suppliers (ref):		

BALLS

144

PITCH

0.8mm

SIZE

11mm SQ

MATRIX

12 x 12

ROWS

full

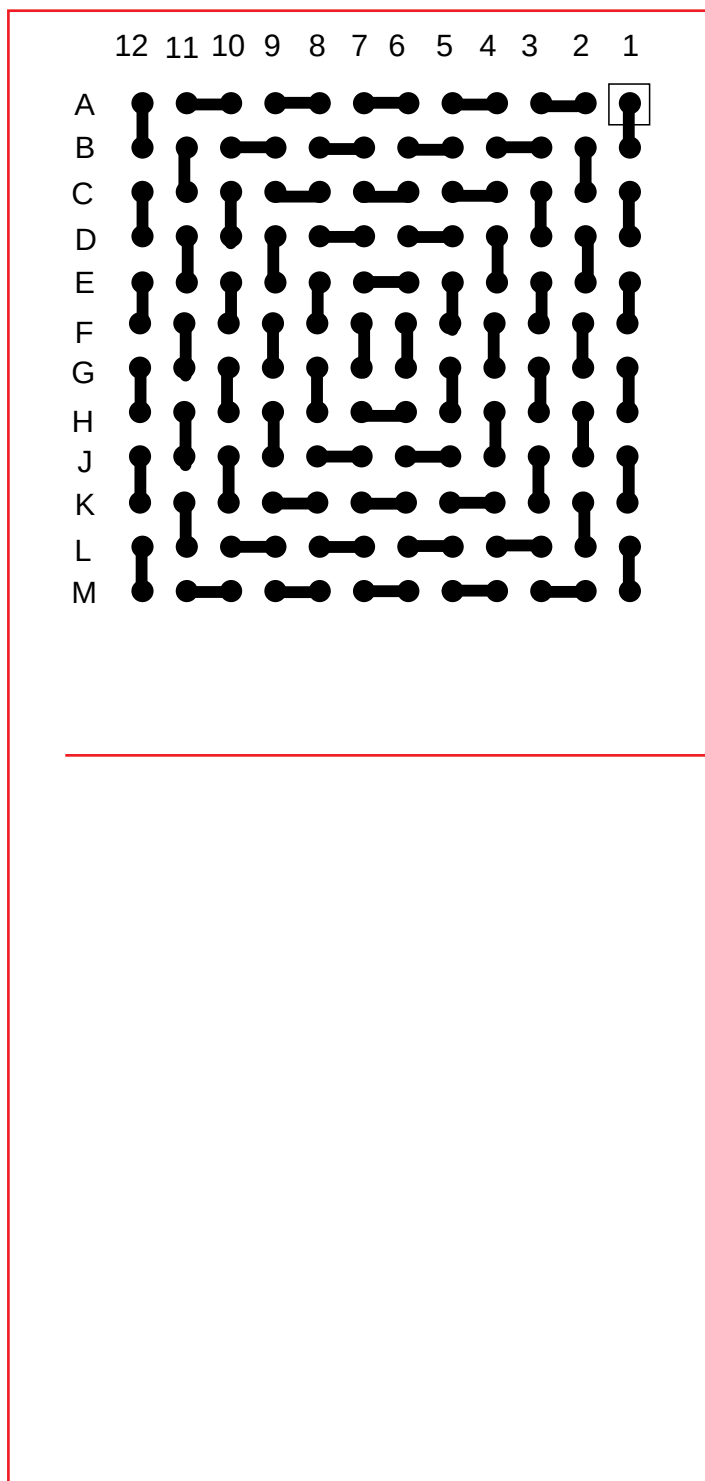
CENTER

full

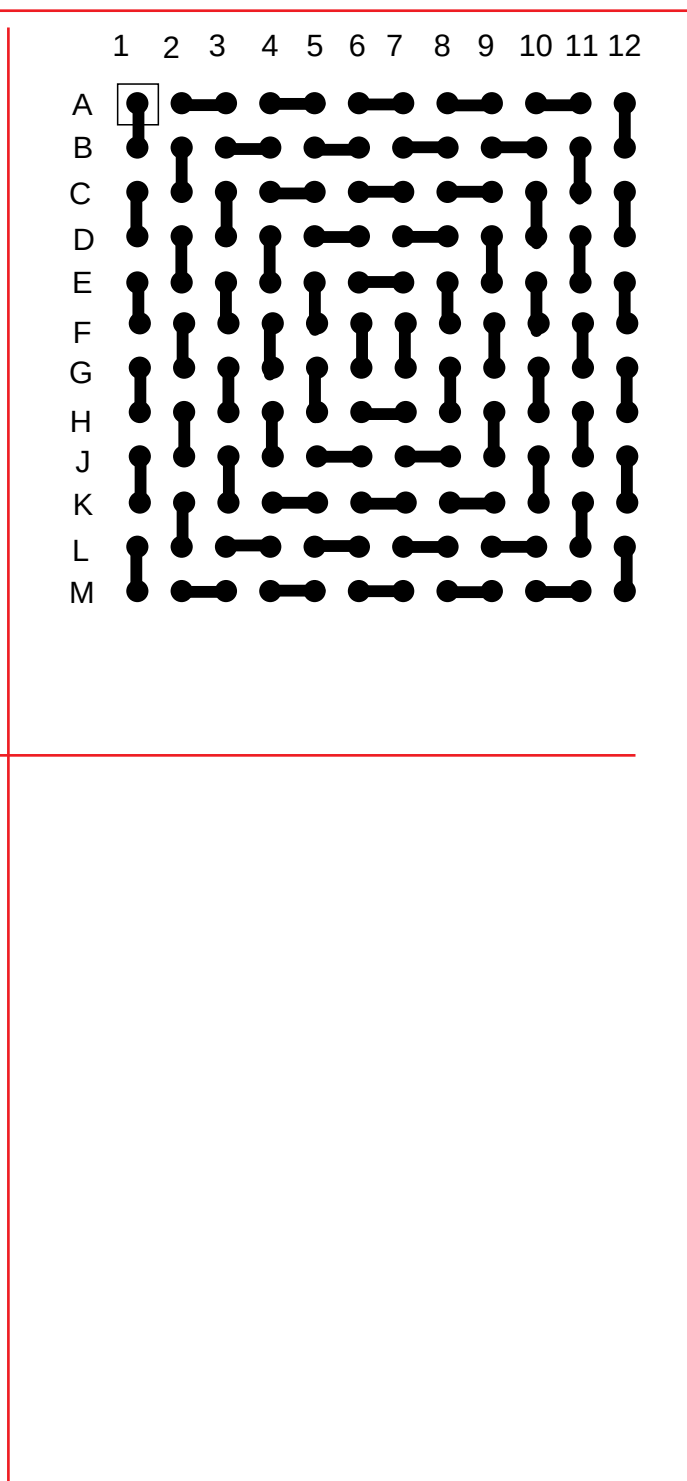
MAT'L

FR4

BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

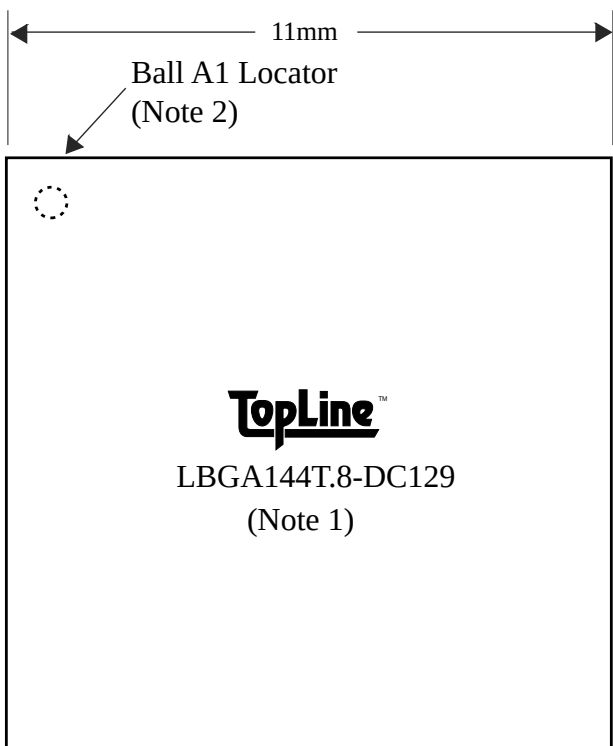
LBGA144T.8-DC129

TopLine™

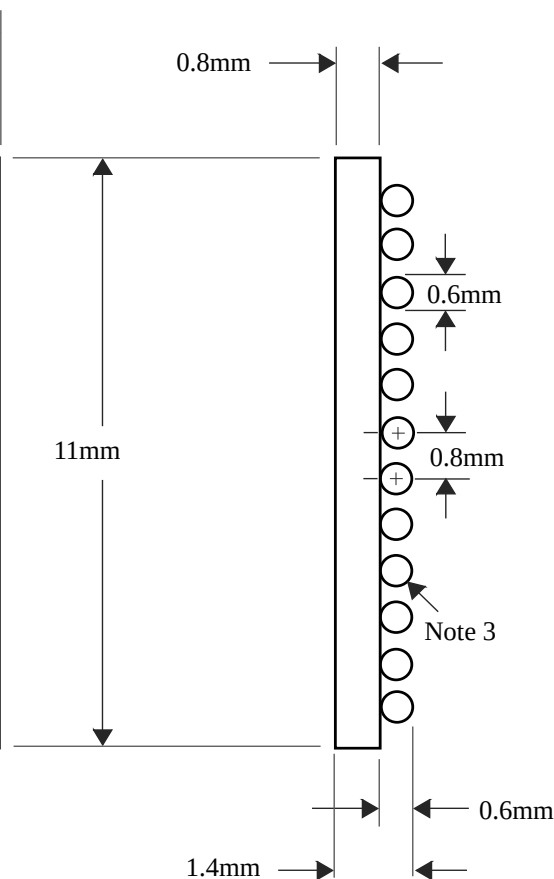
BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
144	0.8mm	11mm SQ	12 x 12	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY11mm-8x22 Tray Quantity 176 Tray Suppliers (ref):		



TEL 1-714-898-3830

FAX 1-714-891-0321

CSP144T1.0-DC127

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
144	1.0mm	13mm SQ	12 x 12	full	full	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

Daisy Chain to be completed

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

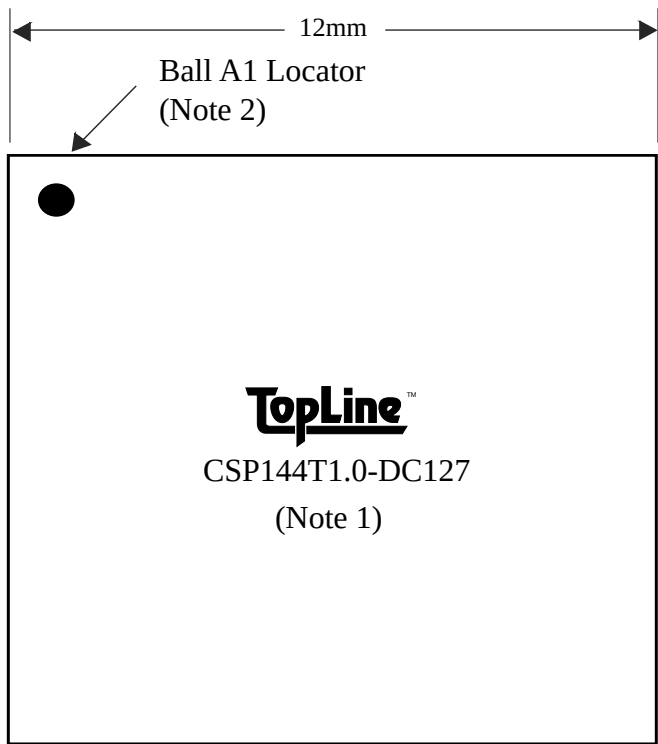
CSP144T1.0-DC127

TopLine™

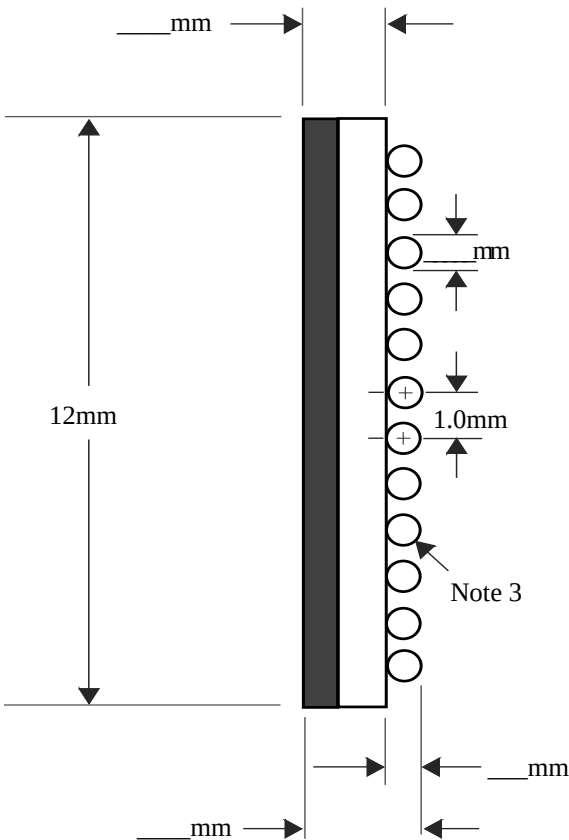
BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
144	1.0mm	13mm SQ	12 x 12	full	full	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT Laminate	Tray BGATRAY_____		
		Tray Quantity _____		
		Tray Suppliers (ref):		



TEL 1-714-898-3830

FAX 1-714-891-0321

BGA144T1.0-ISO

BALLS

144

PITCH

1.0mm

SIZE

13mm SQ

MATRIX

12 x 12

ROWS

full

CENTER

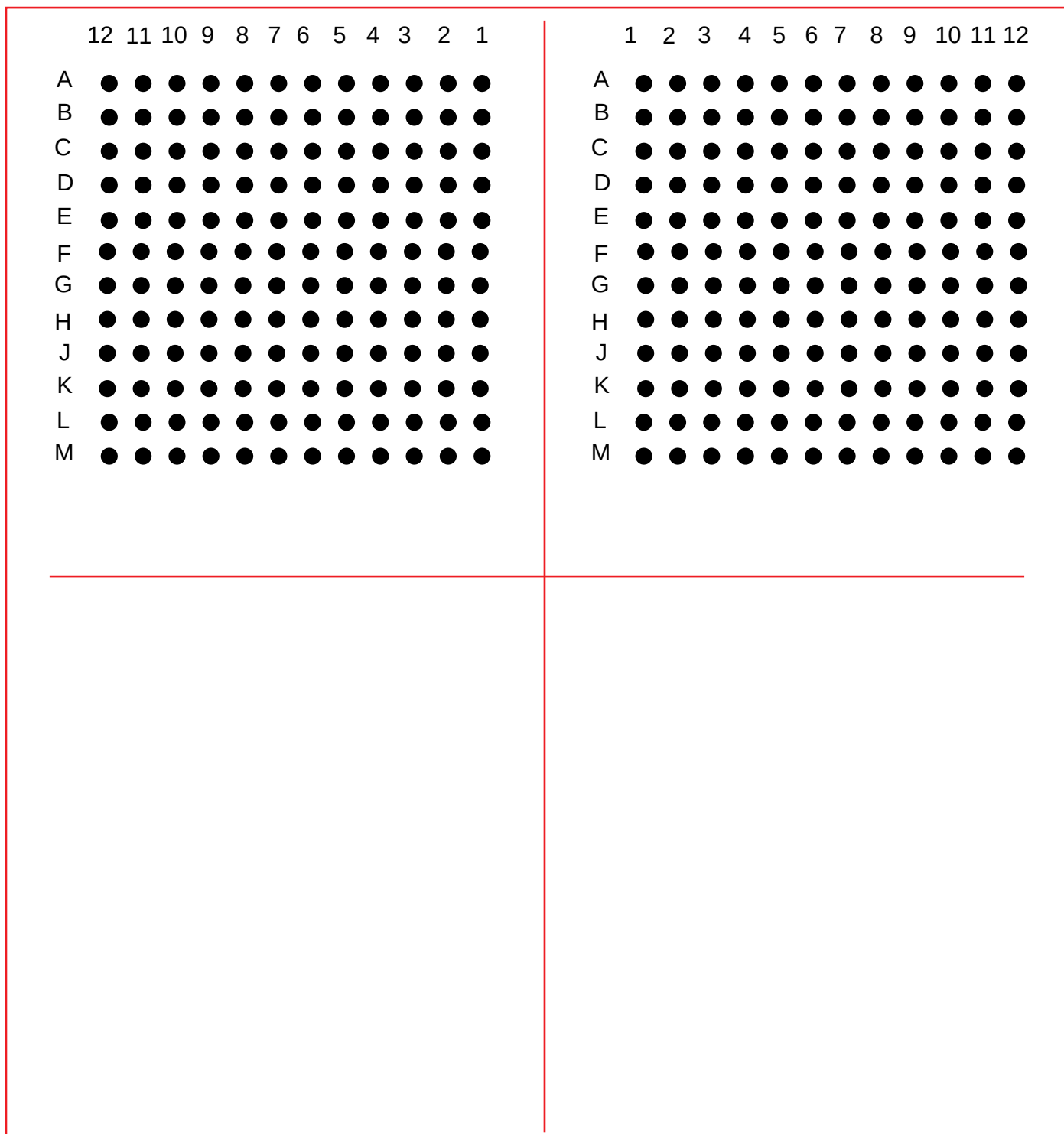
full

MAT'L

BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA144T1.0-ISO

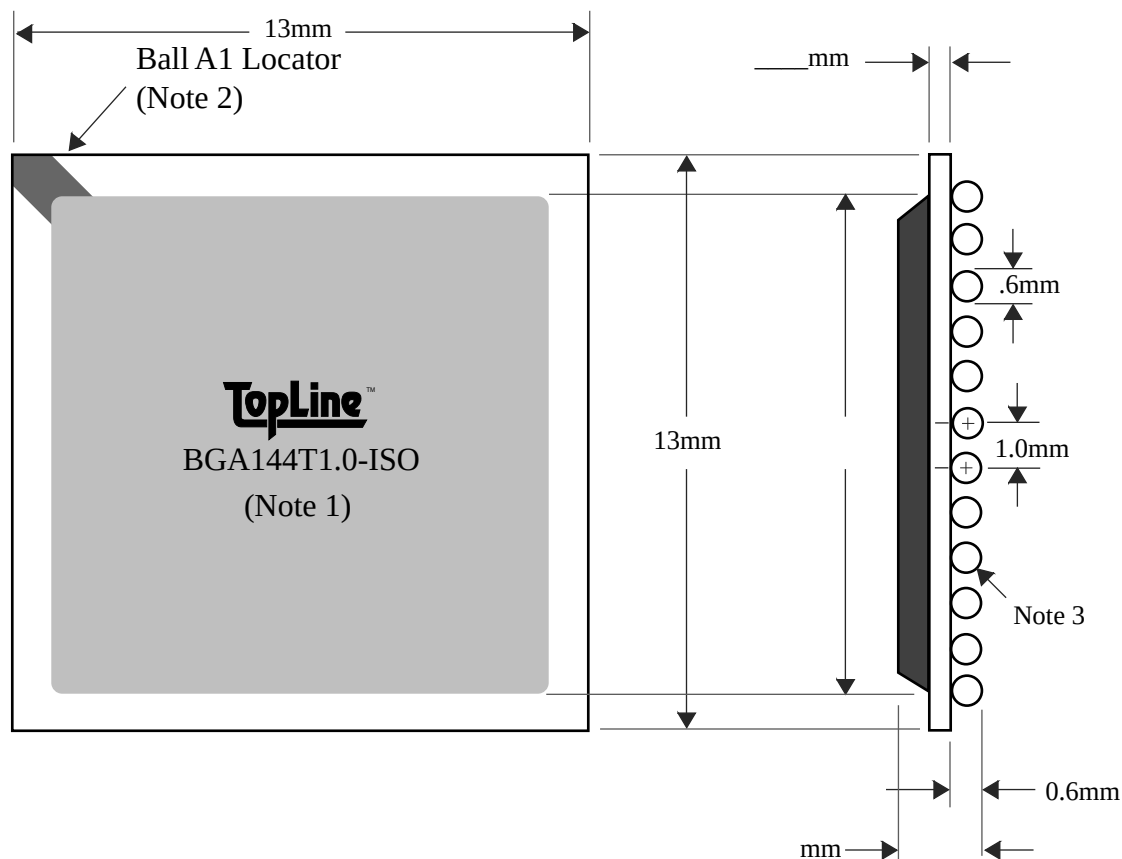
TopLine™

TEL 1-714-898-3830
FAX 1-714-891-0321

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
144	1.0mm	13mm SQ	12 x 12	full	full	BT

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
			11/14/98	Proposed Design
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY3mm-8x20 Tray Quantity 160 Tray Suppliers (ref):		



BGA144T1.0-DC128

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

144

PITCH

1.0mm

SIZE

13mm SQ

MATRIX

12 x 12

ROWS

full

CENTER

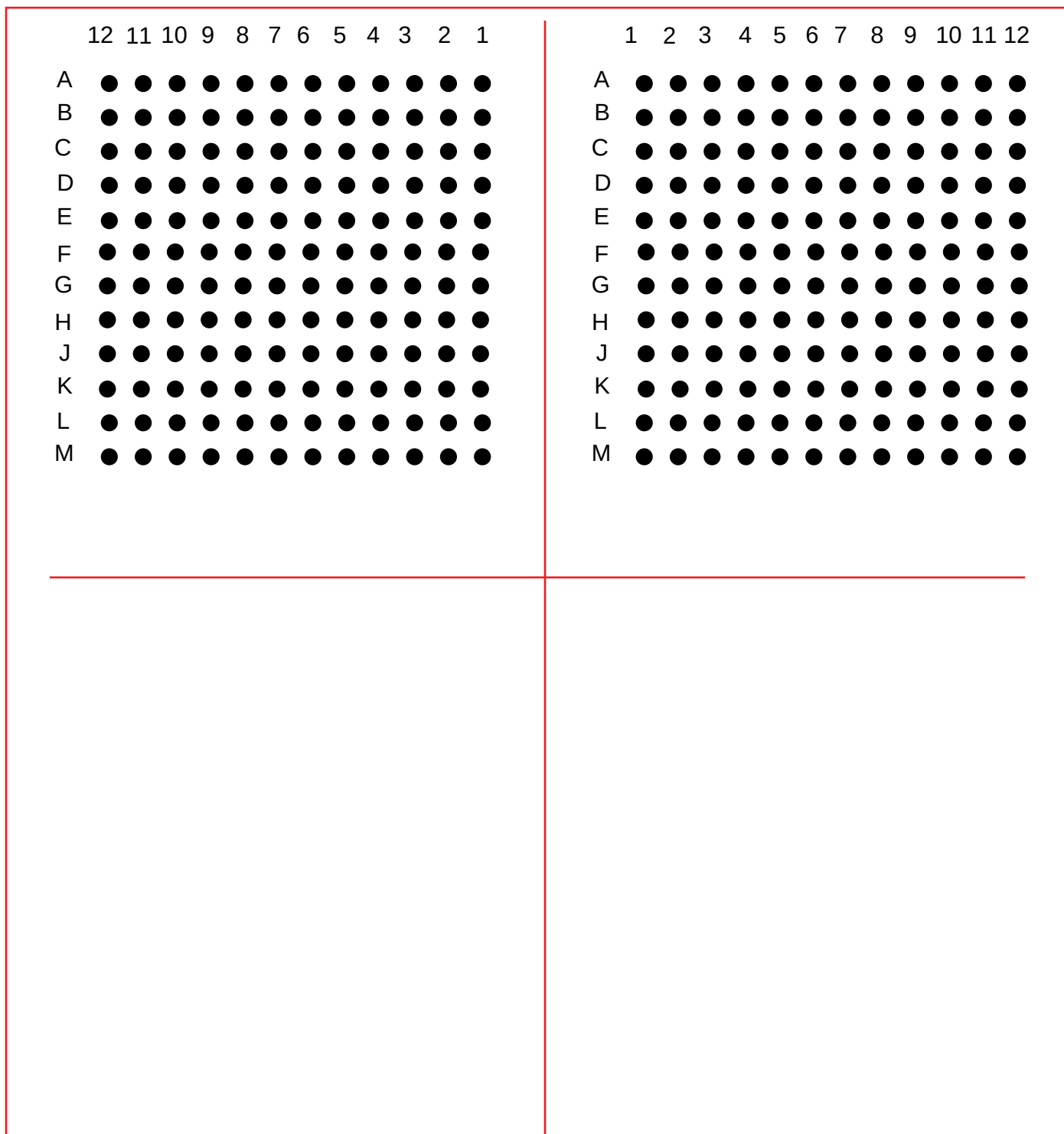
full

MAT'L

BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA144T1.0-DC128

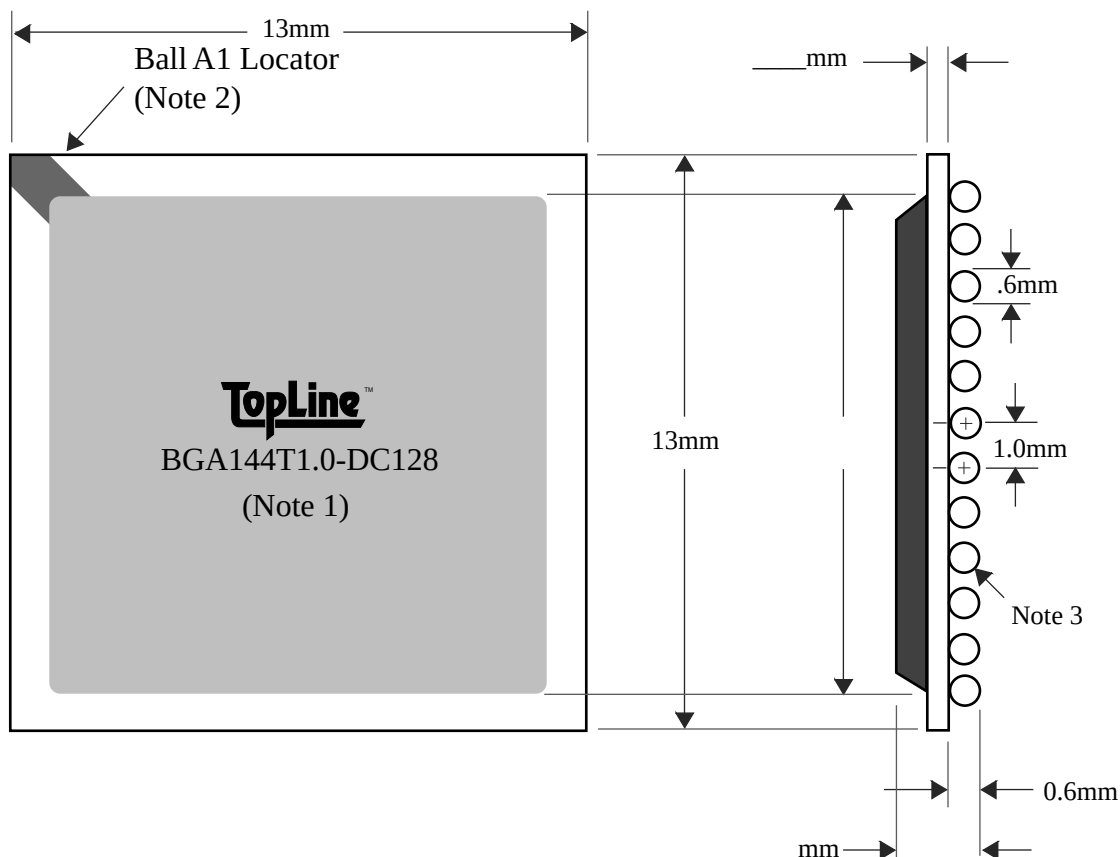
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
144	1.0mm	13mm SQ	12 x 12	full	full	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

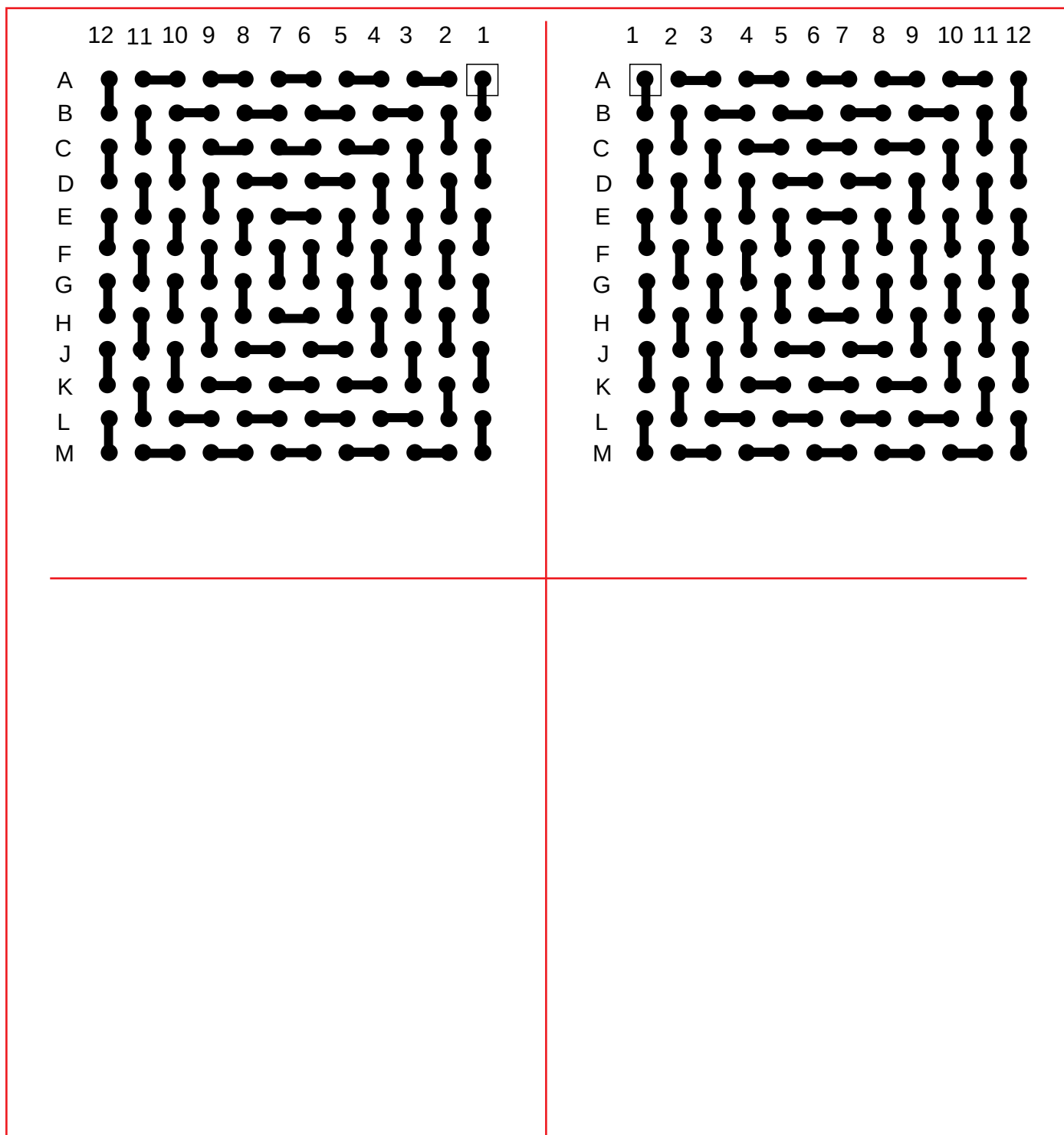


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY3mm-8x20 Tray Quantity 160 Tray Suppliers (ref):		

LBGA144T1.0-DC129

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA144T1.0-DC129

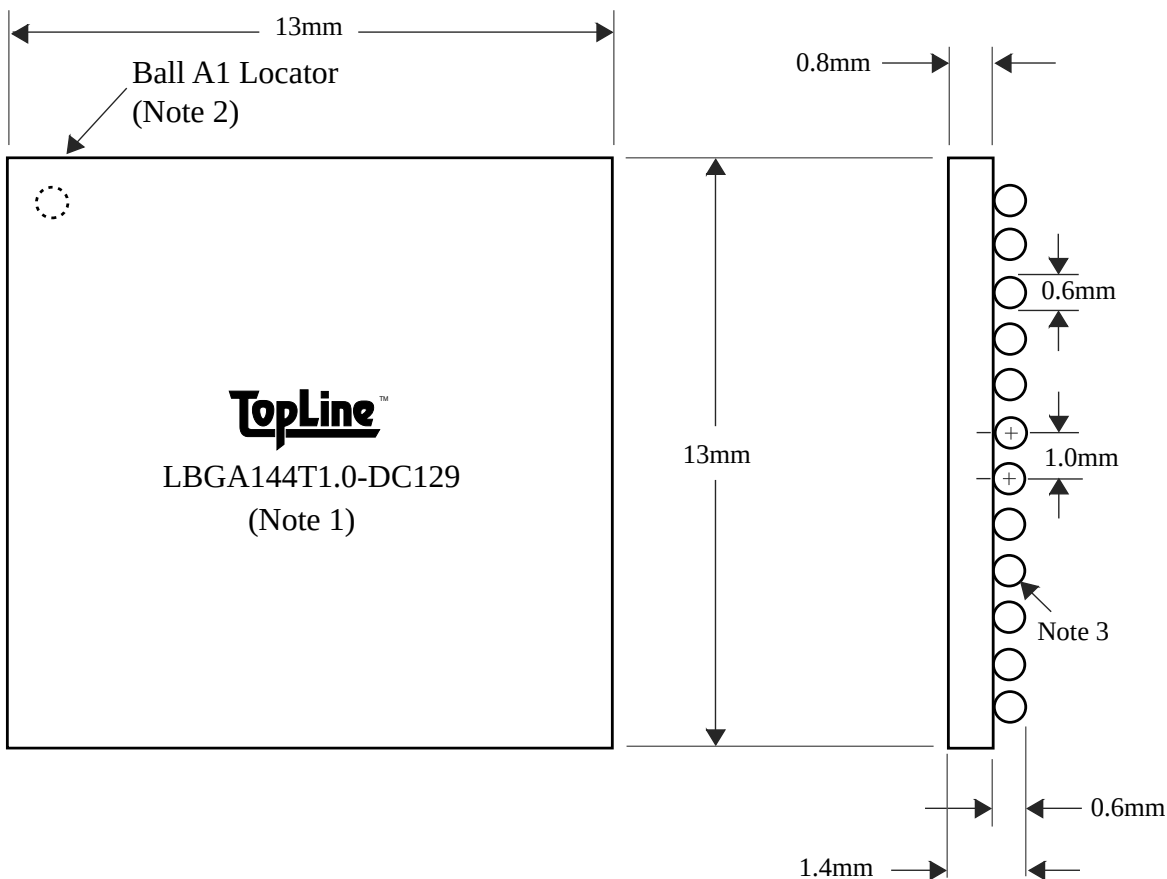
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
144	1.0mm	13mm SQ	12 x 12	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY13mm-8x20 Tray Quantity 160 Tray Suppliers (ref):		

BALLS

156

PITCH

1.0mm

SIZE

15mm SQ

MATRIX

14 x 14

ROWS

4

CENTER

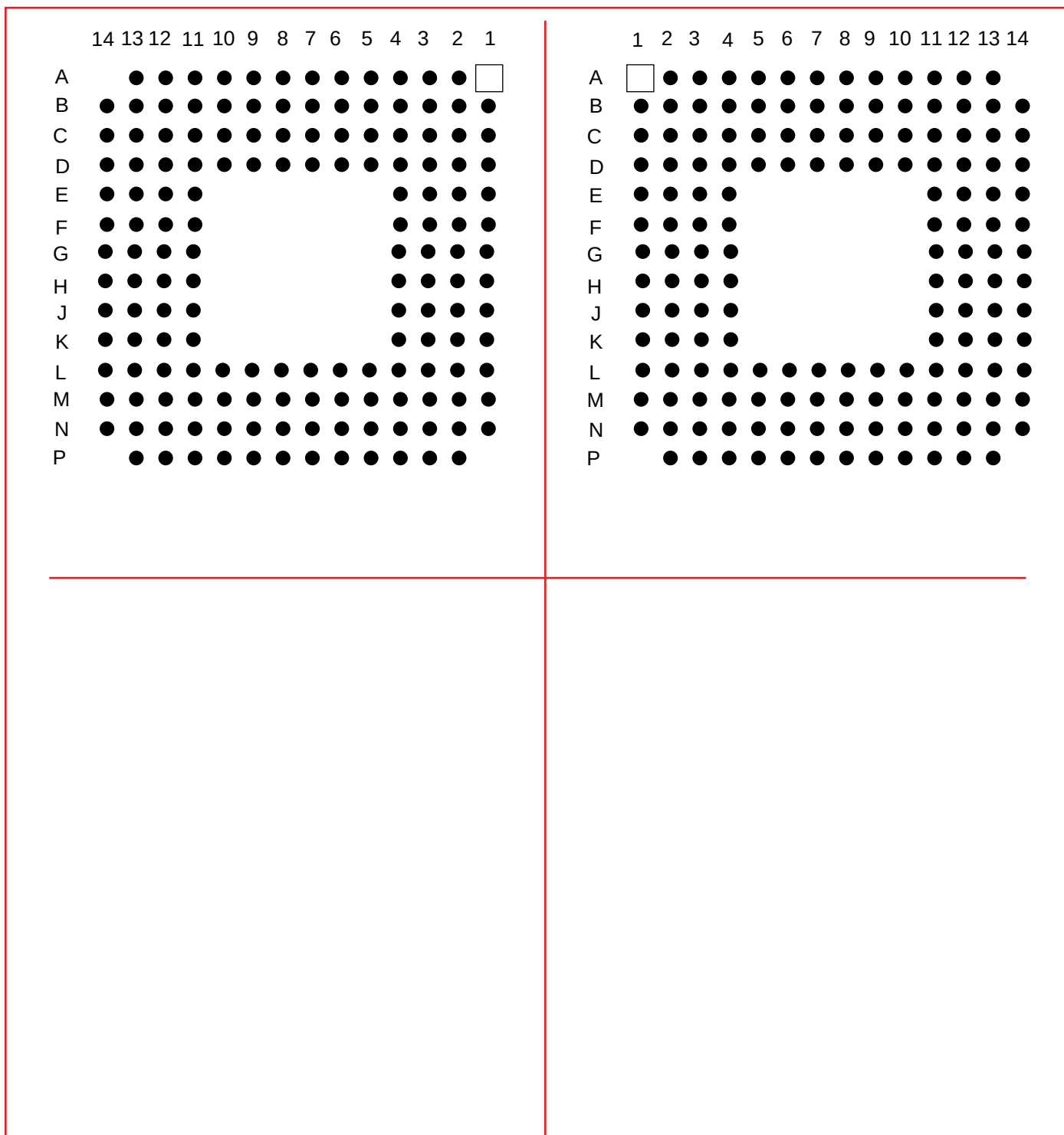
none

MAT'L

BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA156T1.0-ISO

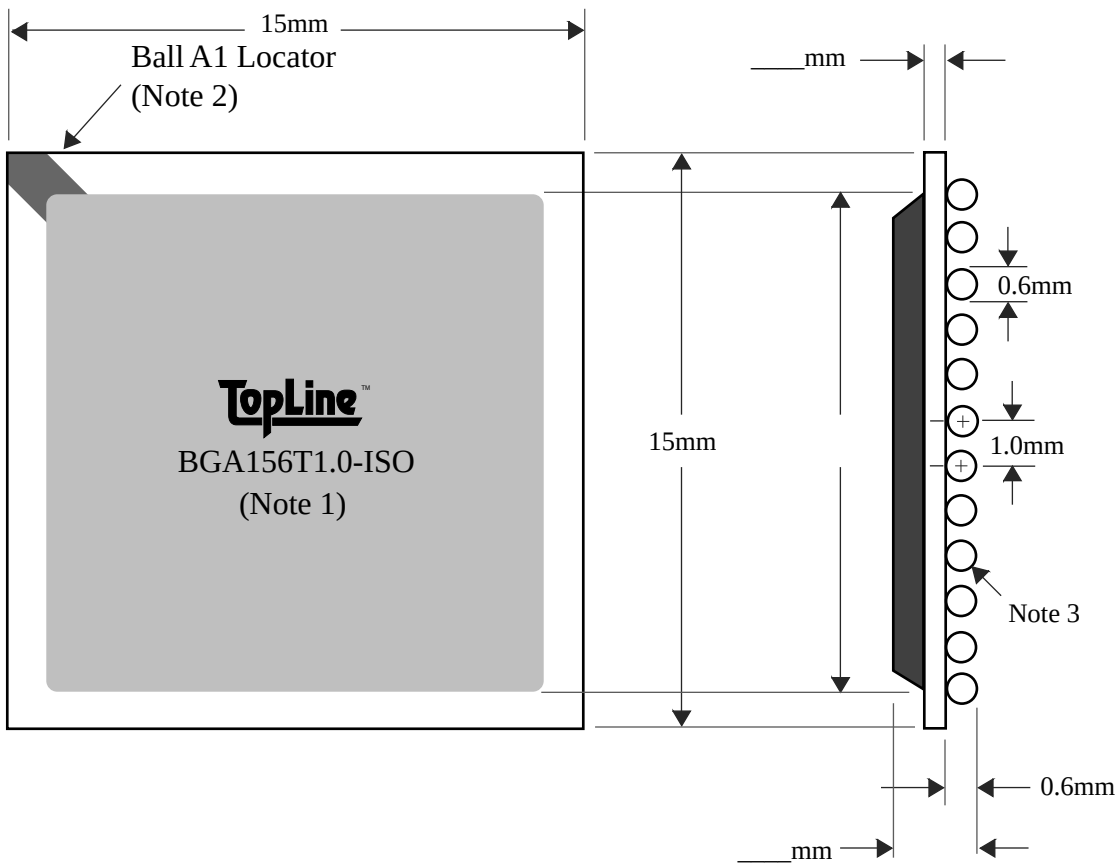


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
156	1.0mm	15mm SQ	14 x 14	4	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY15mm-7x18 Tray Quantity 126 Tray Suppliers (ref):		

BALLS

156

PITCH

1.0mm

SIZE

15mm SQ

MATRIX

14 x 14

ROWS

4

CENTER

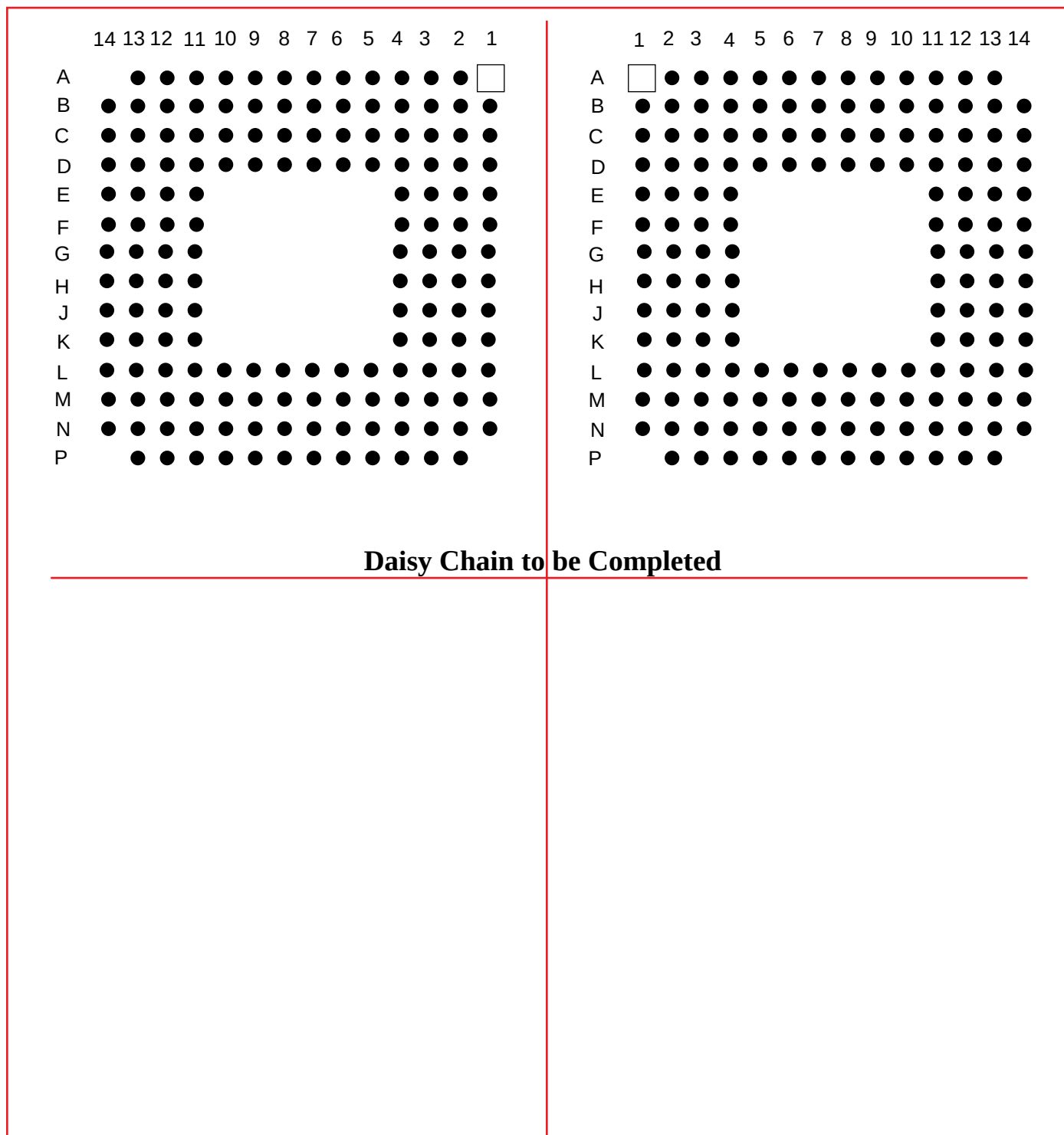
none

MAT'L

BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA156T1.0-DC144

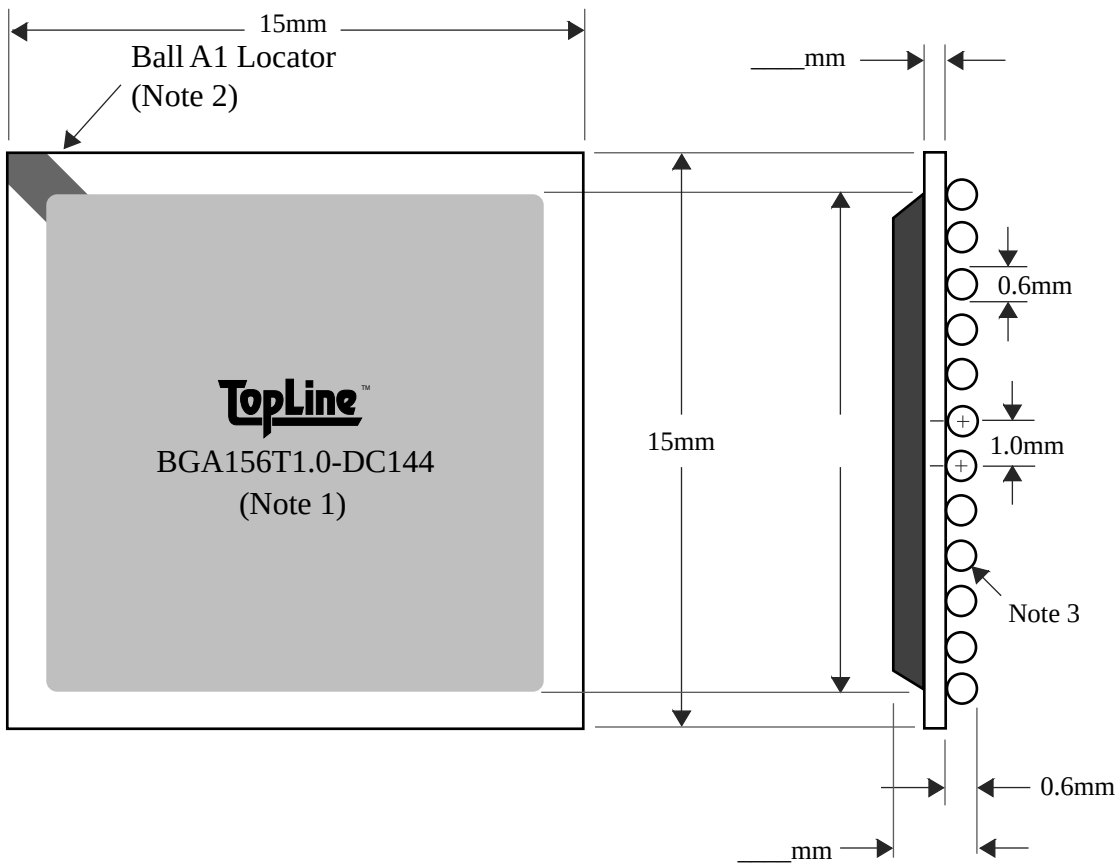
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
156	1.0mm	15mm SQ	14 x 14	4	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY15mm-7x18 Tray Quantity 126 Tray Suppliers (ref):		

BALLS

160

PITCH

1.0mm

SIZE

15mm SQ

MATRIX

14 x 14

ROWS

4

CENTER

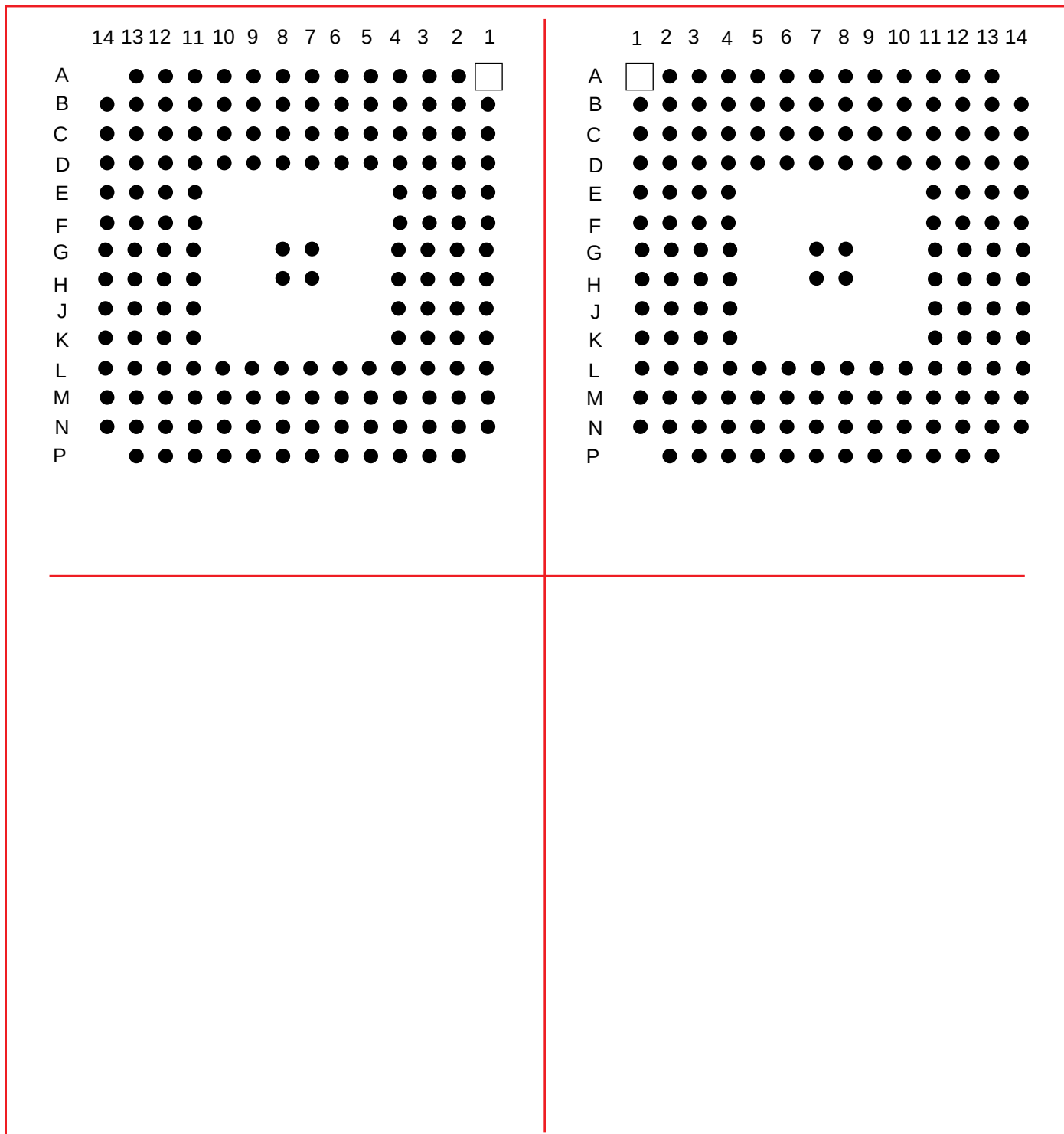
2 x 2

MAT'L

BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

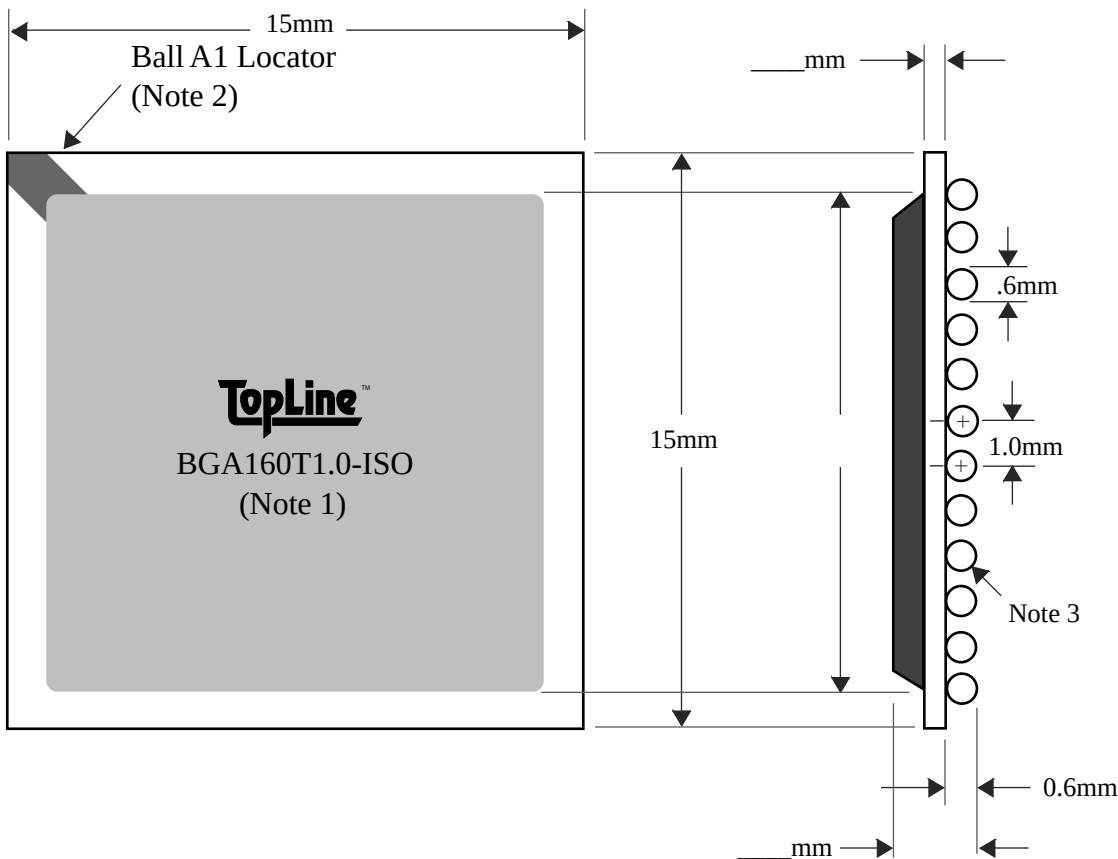
BGA160T1.0-ISO



BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830
160	1.0mm	15mm SQ	14 x 14	4	2 x 2	BT	FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY15mm-7x18 Tray Quantity 126 Tray Suppliers (ref):		

BALLS

160

PITCH

1.0mm

SIZE

15mm SQ

MATRIX

14 x 14

ROWS

4

CENTER

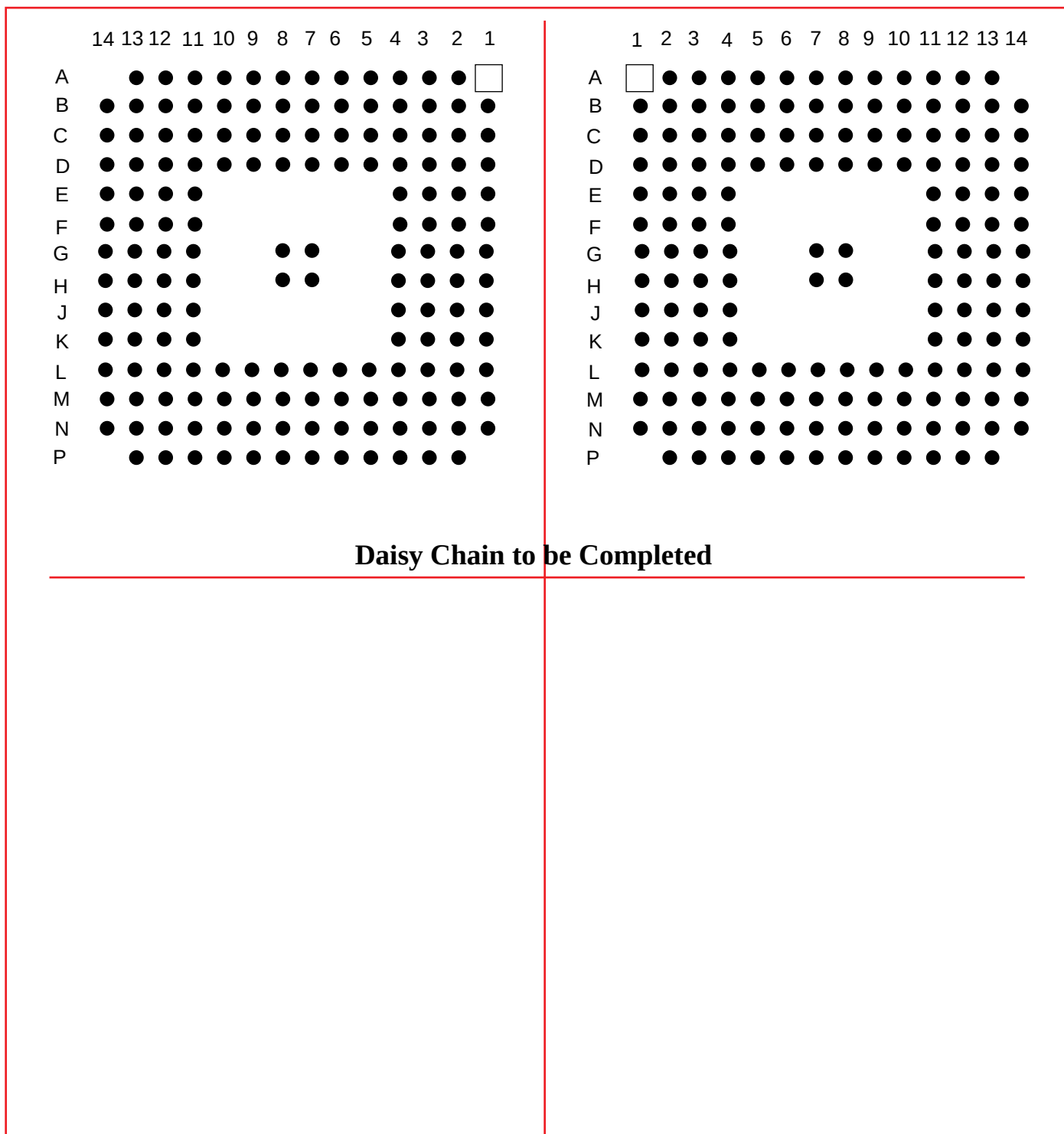
2 x 2

MAT'L

BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

160

PITCH

1.0mm

SIZE

15mm SQ

MATRIX

14 x 14

ROWS

4

CENTER

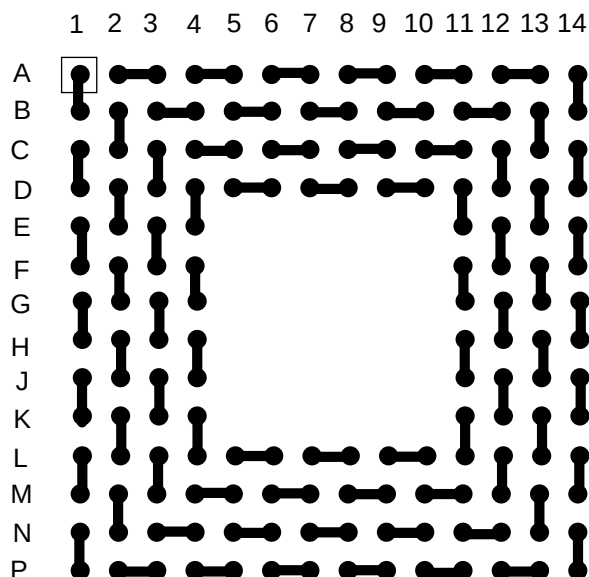
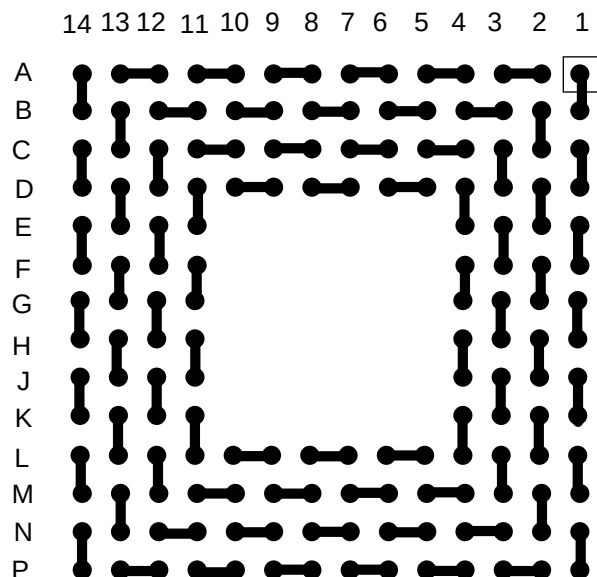
none

MAT'L

BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA160T1.0-DC140

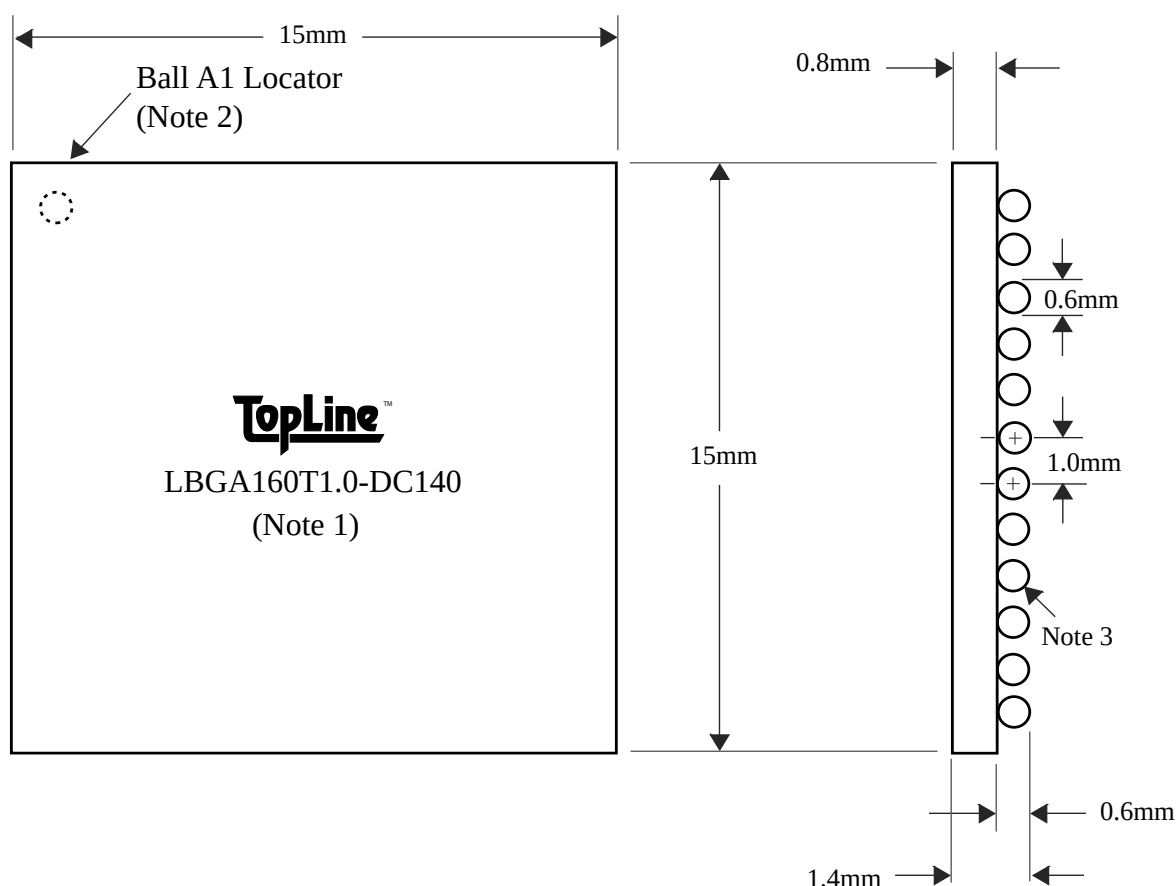
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
160	1.0mm	15mm SQ	14 x 14	4	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY15mm-7x18 Tray Quantity 126 Tray Suppliers (ref):		

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

164

PITCH

1.0mm

SIZE

15mm SQ

MATRIX

14 x 14

ROWS

4

CENTER

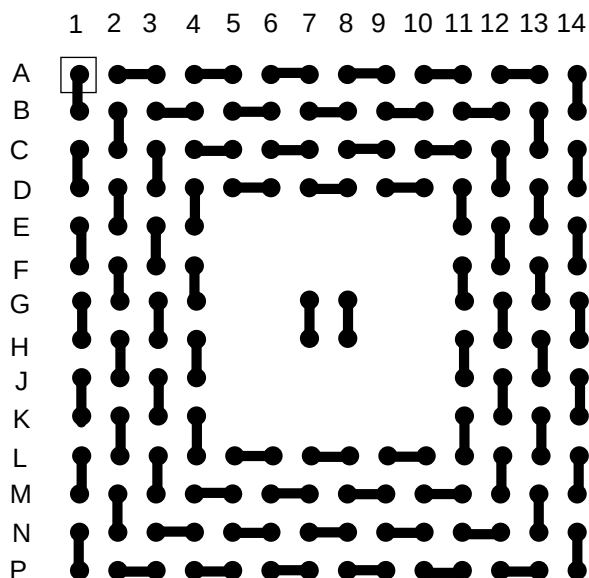
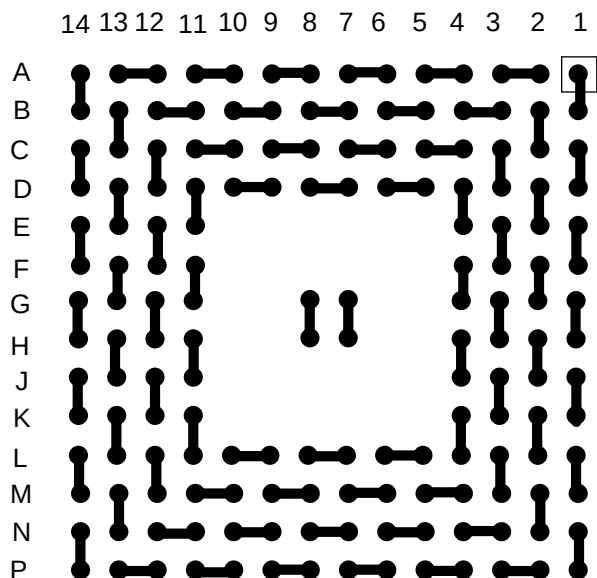
2 x 2

MAT'L

FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA164T1.0-DC142

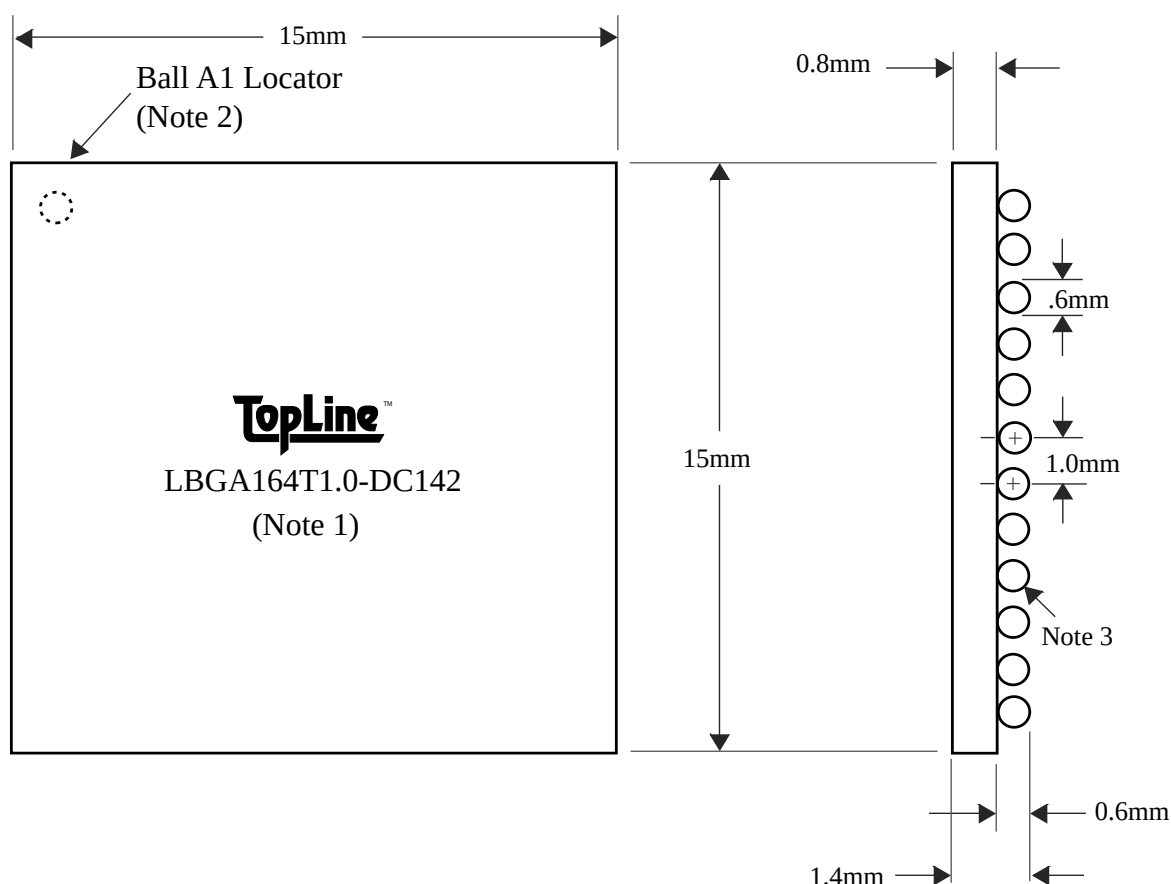
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
164	1.0mm	15mm SQ	14 x 14	4	2 x 2	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY15mm-7x18 Tray Quantity 126 Tray Suppliers (ref):		



TEL 1-714-898-3830

FAX 1-714-891-0321

SBGA168T1.27-DC17#?

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
168	1.27mm	23mm SQ	17 x 17	3	none	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

Daisy Chain to be Completed

TEST VEHICLE BOARD

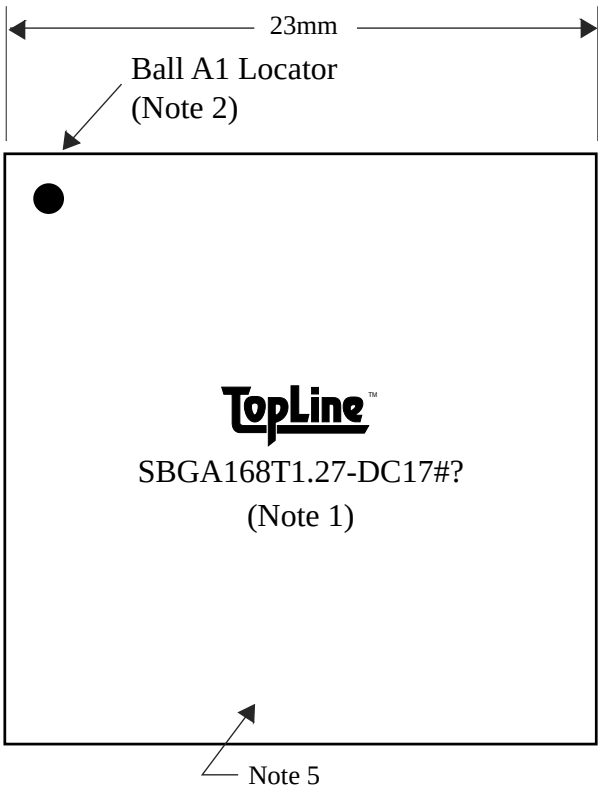
AFTER MOUNTING TO TEST BOARD

SBGA168T1.27-DC17#?

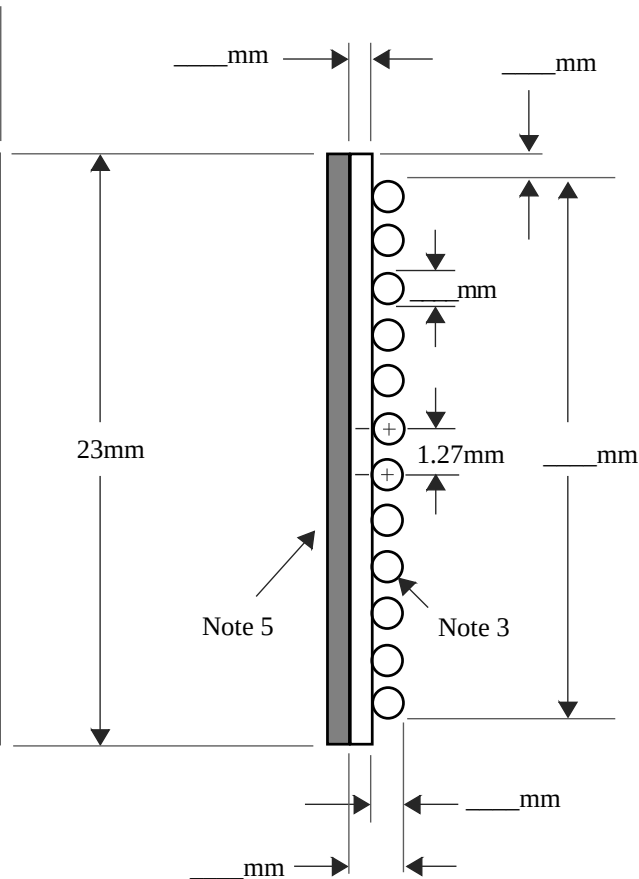


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830
168	1.27mm	23mm SQ	17 x 17	3	none	BT	FAX 1-714-891-0321

TOP VIEW



SIDE VIEW



NOTES	REVISIONS
Note 1 Logo and part number centered	Rev Date Changes
Note 2 Ball A1 locator mark positioned in corner	11/14/98 Proposed Design
Note 3 Ball Material: 63/37 SnPb	
Note 4 Substrate Material: BT laminate	
Note 5 Metal heat sink. Die cavity down	
	PACKAGING TRAYS (SEE NOTE 4)
	Tray BGATRAY
	Tray Quantity
	Tray Suppliers (ref):

BALLS

169

PITCH

0.8mm

SIZE

11mm SQ

MATRIX

13 x 13

ROWS

full

CENTER

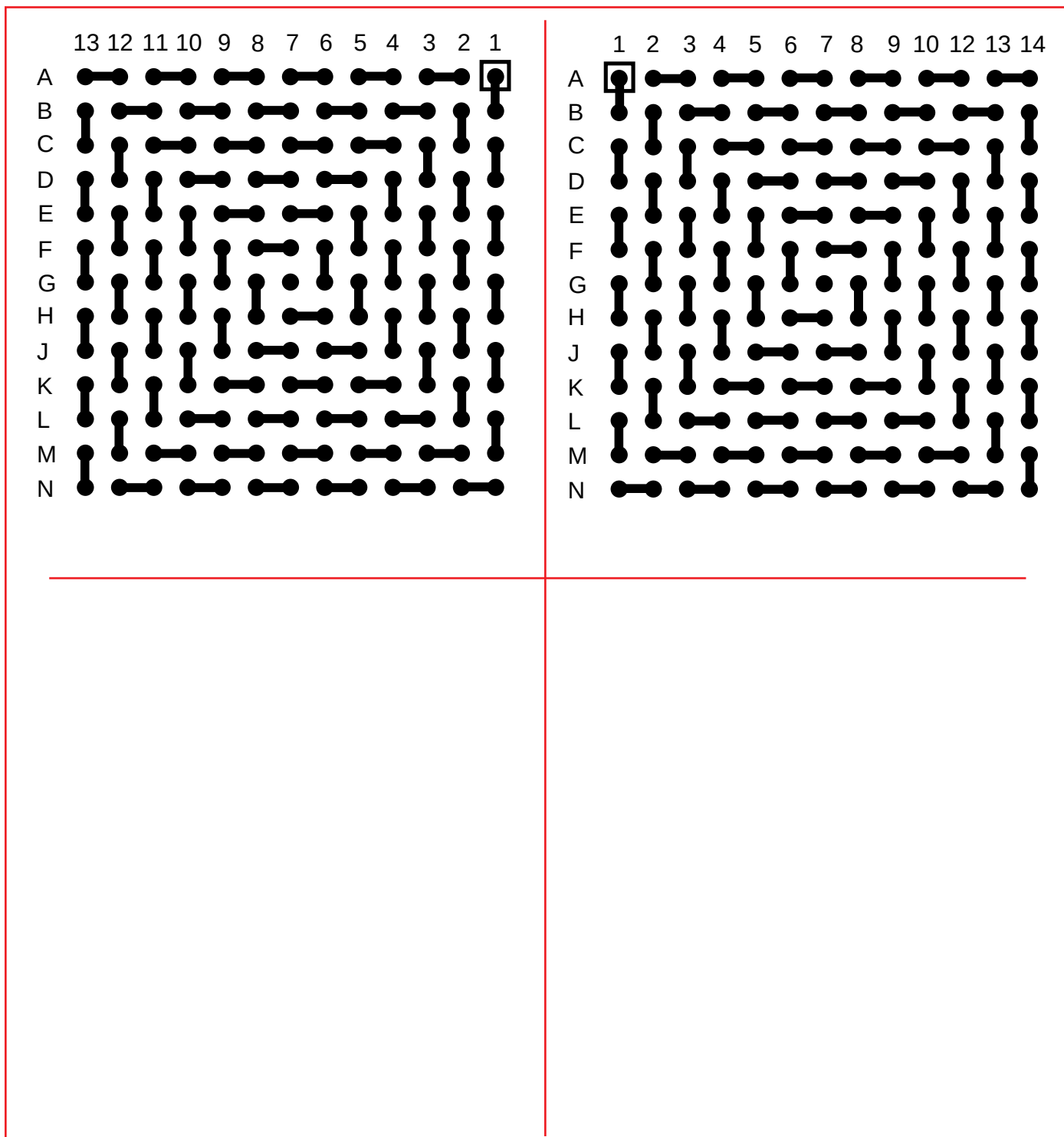
full

MAT'L

FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA169T.8-DC139

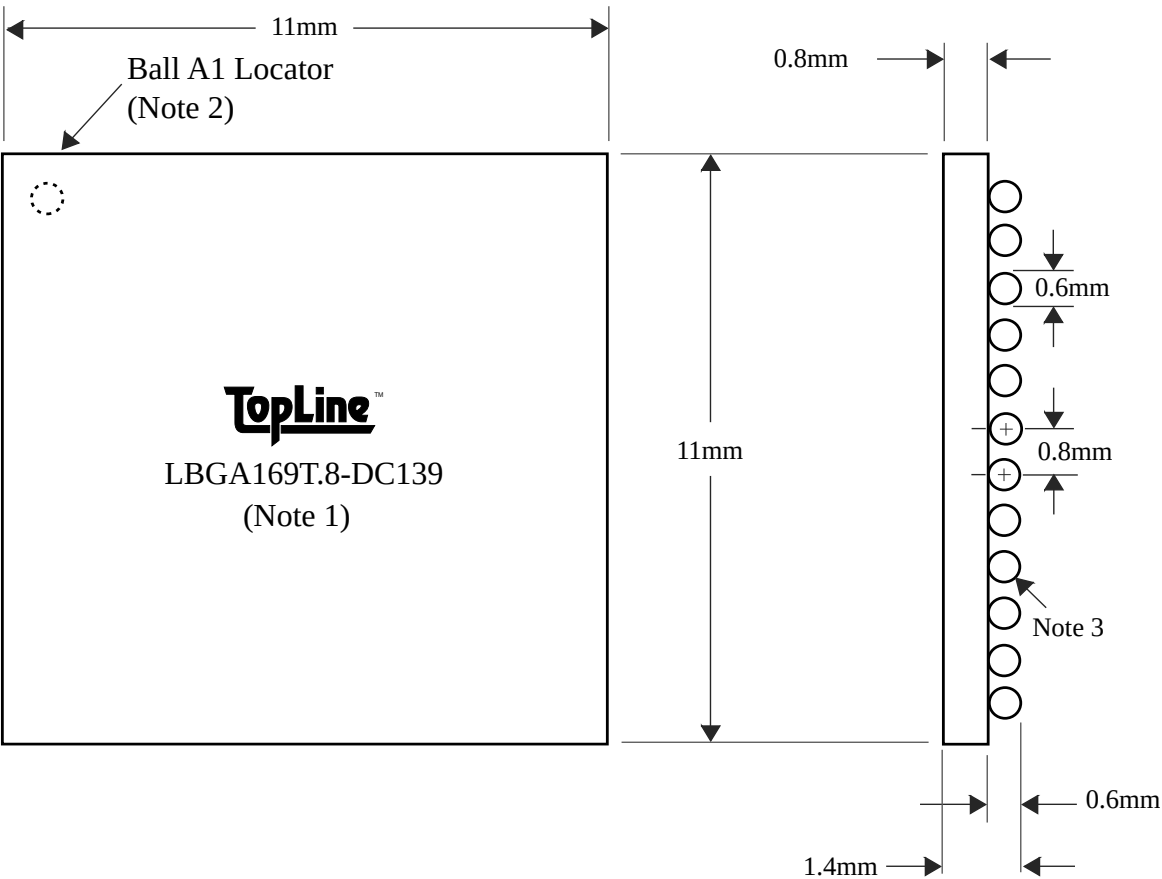
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
169	0.8mm	11mm SQ	13 x 13	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY11mm-8x22 Tray Quantity 176 Tray Suppliers (ref):		

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

169

PITCH

1.0mm

SIZE

13mm SQ

MATRIX

13 x 13

ROWS

full

CENTER

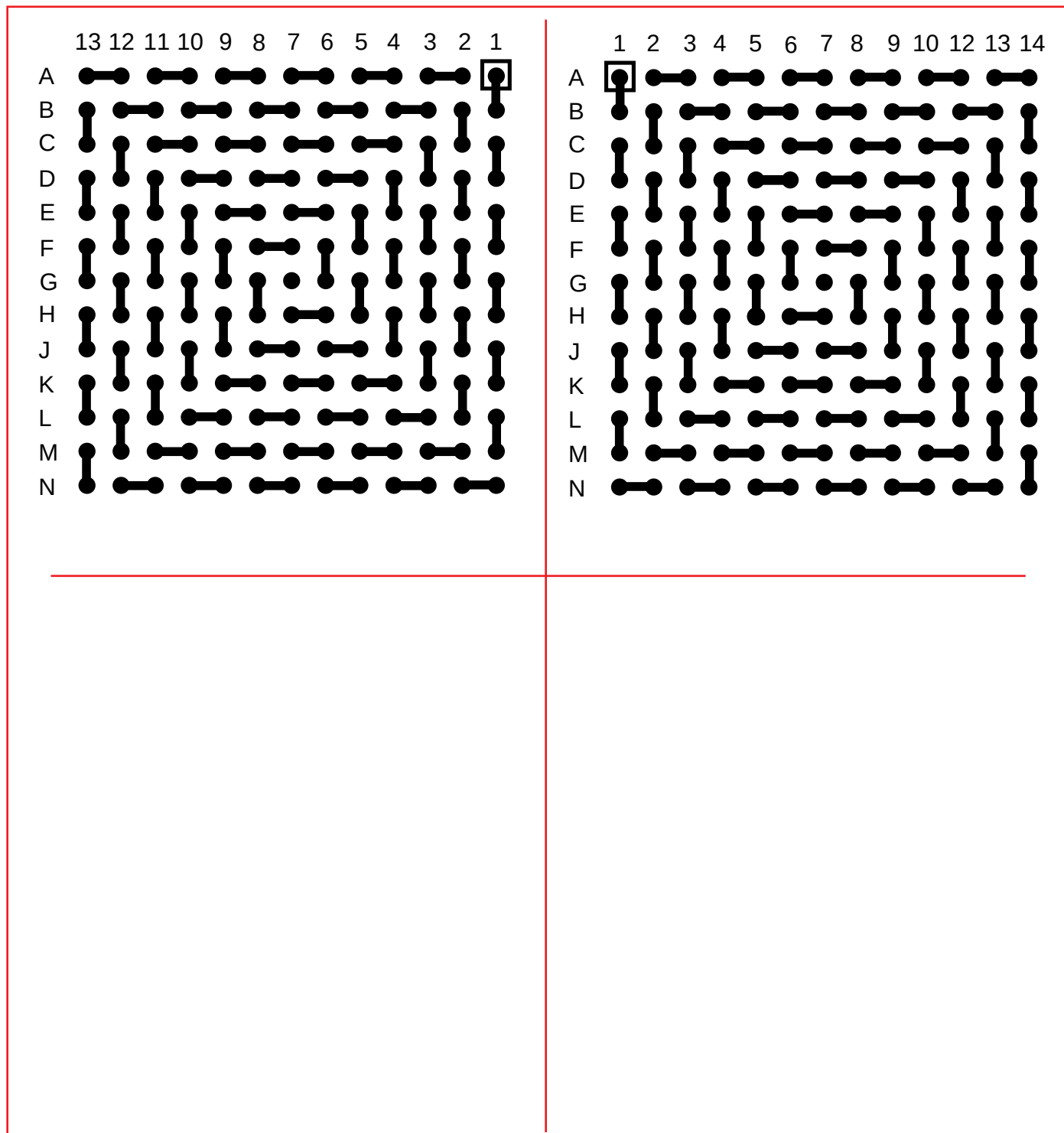
full

MAT'L

FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA169T1.0-DC139

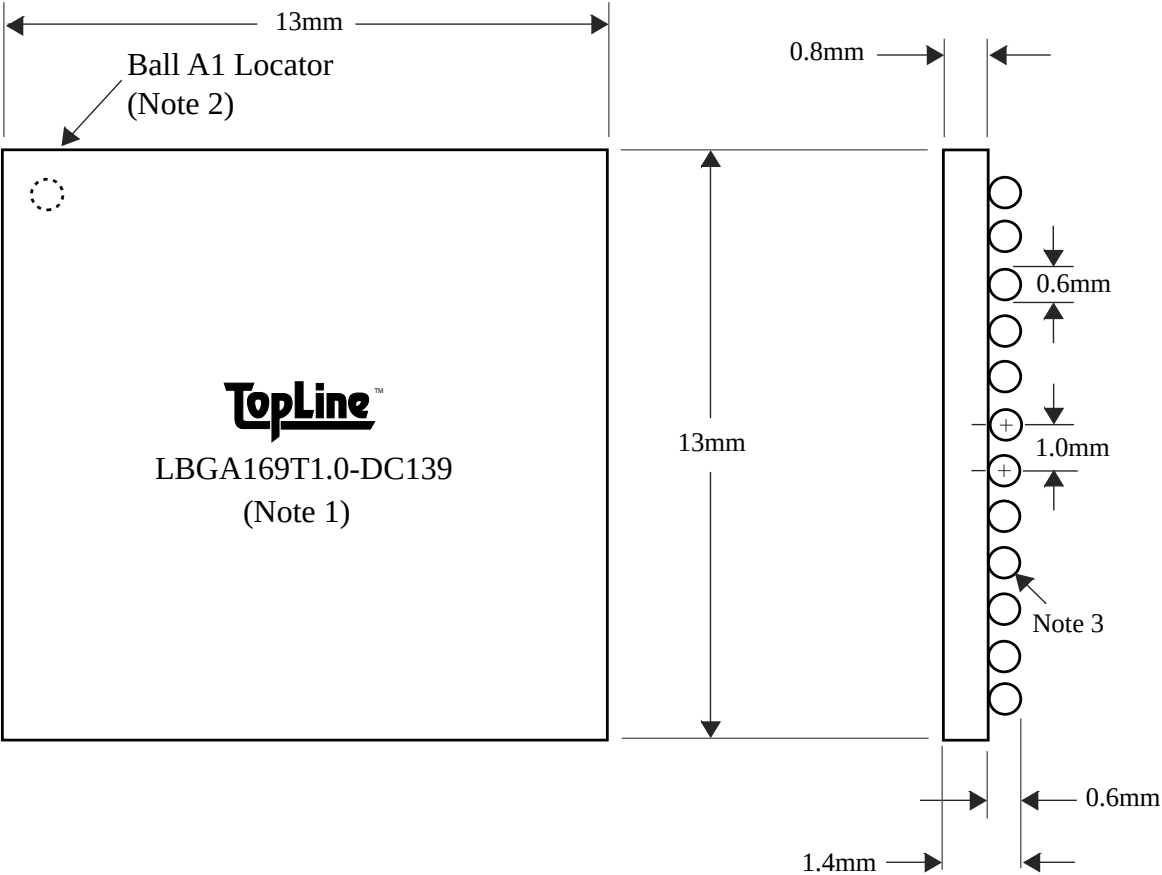
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
169	1.0mm	13mm SQ	13 x 13	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY13mm-8x20 Tray Quantity 160 Tray Suppliers (ref):		

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

169

PITCH

1.27mm

SIZE

17mm SQ

MATRIX

13 x 13

ROWS

full

CENTER

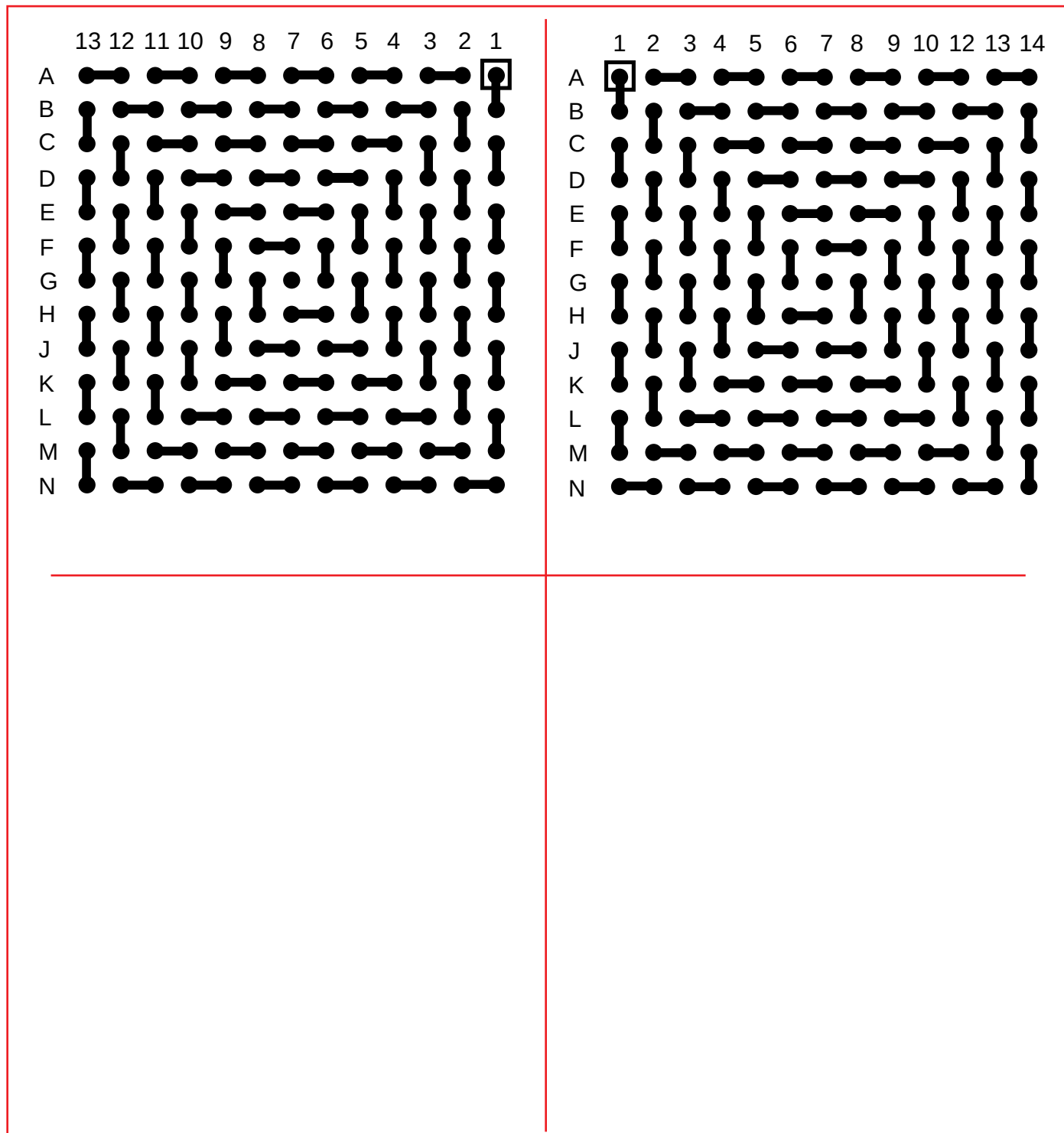
full

MAT'L

FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

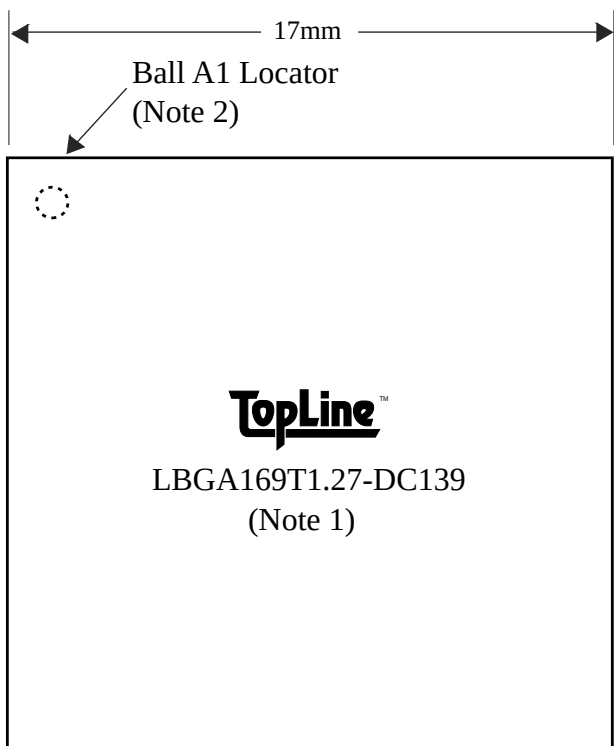
LBGA169T1.27-DC139

TopLine™

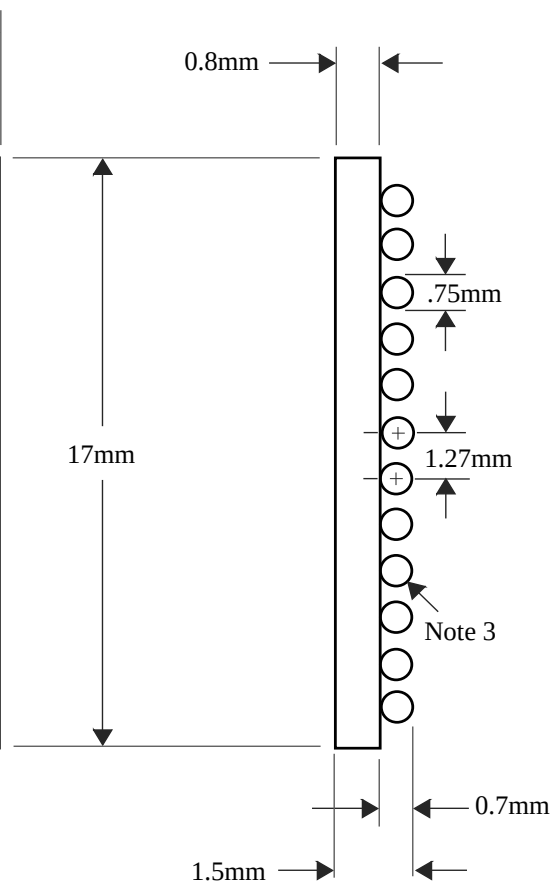
BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
169	1.27mm	17mm SQ	13 x 13	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY17mm-6x15 Tray Quantity 90 Tray Suppliers (ref):		

BALLS

169

PITCH

1.5mm

SIZE

23mm SQ

MATRIX

13 x 13

ROWS

full

CENTER

full

MAT'L

BT

BALL VIEW

	13	12	11	10	9	8	7	6	5	4	3	2	1
A	●	●	●	●	●	●	●	●	●	●	●	●	●
B	●	●	●	●	●	●	●	●	●	●	●	●	●
C	●	●	●	●	●	●	●	●	●	●	●	●	●
D	●	●	●	●	●	●	●	●	●	●	●	●	●
E	●	●	●	●	●	●	●	●	●	●	●	●	●
F	●	●	●	●	●	●	●	●	●	●	●	●	●
G	●	●	●	●	●	●	●	●	●	●	●	●	●
H	●	●	●	●	●	●	●	●	●	●	●	●	●
J	●	●	●	●	●	●	●	●	●	●	●	●	●
K	●	●	●	●	●	●	●	●	●	●	●	●	●
L	●	●	●	●	●	●	●	●	●	●	●	●	●
M	●	●	●	●	●	●	●	●	●	●	●	●	●
N	●	●	●	●	●	●	●	●	●	●	●	●	●

BOTTOM SIDE (TOP X-RAY VIEW)

	1	2	3	4	5	6	7	8	9	10	12	13	14
A	●	●	●	●	●	●	●	●	●	●	●	●	●
B	●	●	●	●	●	●	●	●	●	●	●	●	●
C	●	●	●	●	●	●	●	●	●	●	●	●	●
D	●	●	●	●	●	●	●	●	●	●	●	●	●
E	●	●	●	●	●	●	●	●	●	●	●	●	●
F	●	●	●	●	●	●	●	●	●	●	●	●	●
G	●	●	●	●	●	●	●	●	●	●	●	●	●
H	●	●	●	●	●	●	●	●	●	●	●	●	●
J	●	●	●	●	●	●	●	●	●	●	●	●	●
K	●	●	●	●	●	●	●	●	●	●	●	●	●
L	●	●	●	●	●	●	●	●	●	●	●	●	●
M	●	●	●	●	●	●	●	●	●	●	●	●	●
N	●	●	●	●	●	●	●	●	●	●	●	●	●

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

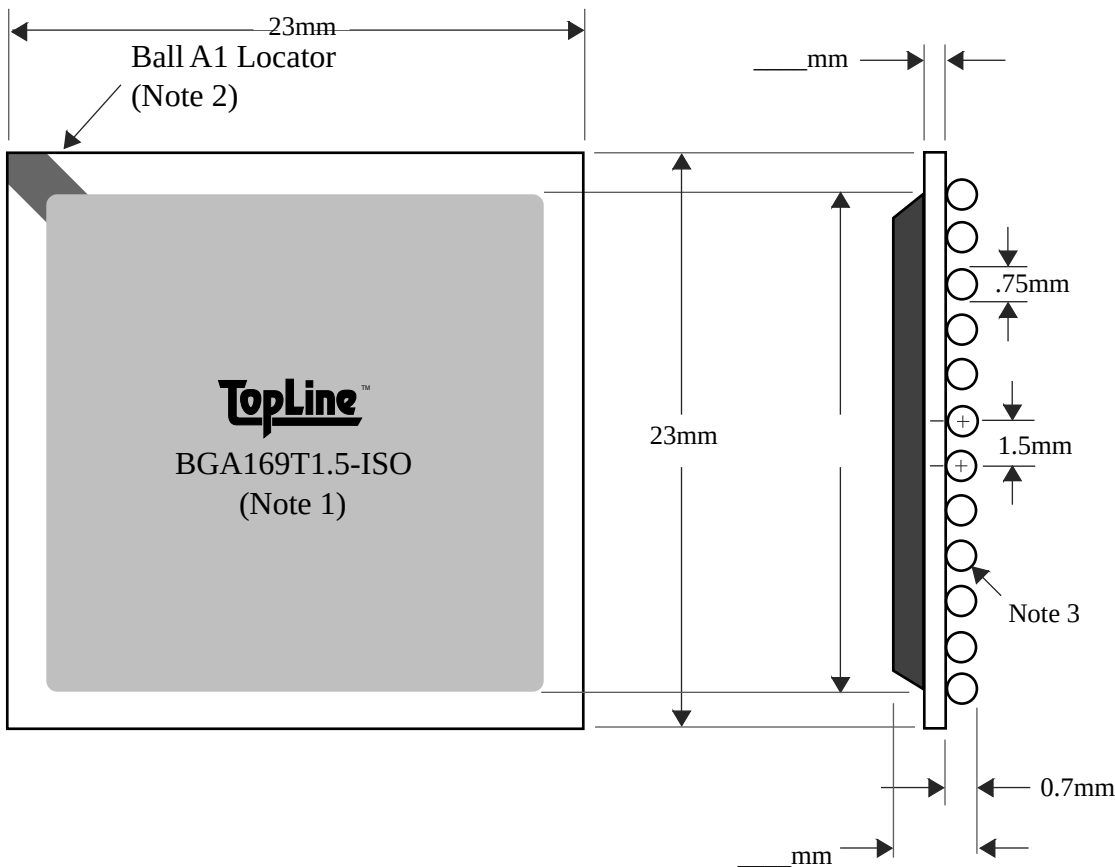
BGA169T1.5-ISO



BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830
169	1.5mm	23mm SQ	13 x 13	full	full	BT	FAX 1-714-891-0321

TOP VIEW

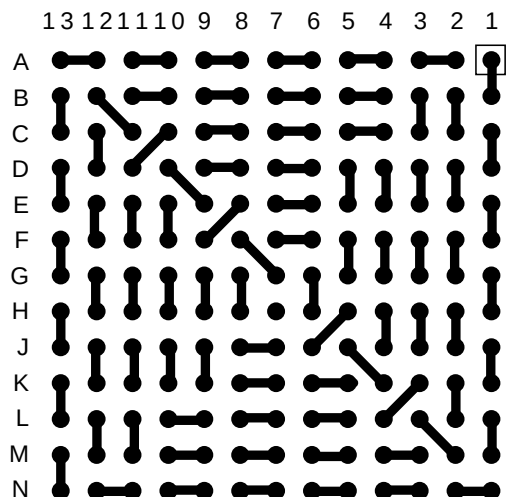
SIDE VIEW



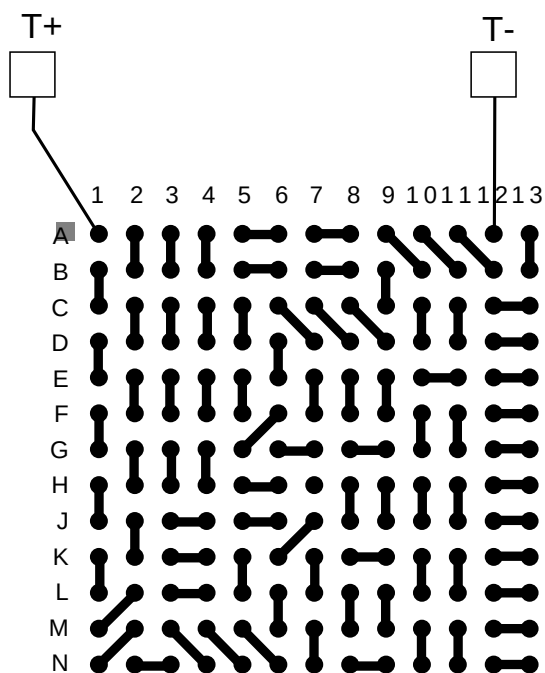
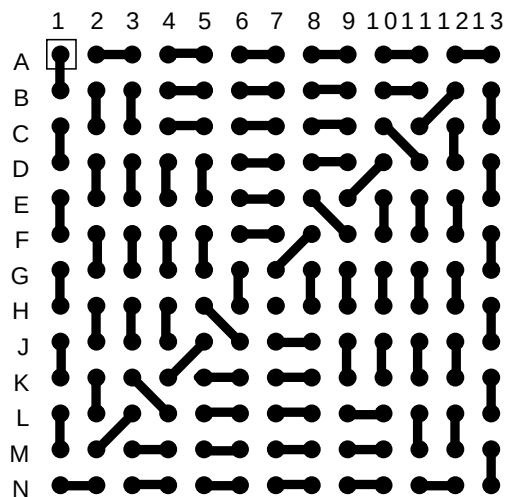
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY23mm-5x12		
		Tray Quantity 60		
		Tray Suppliers (ref):		

BGA169T1.5-DC10

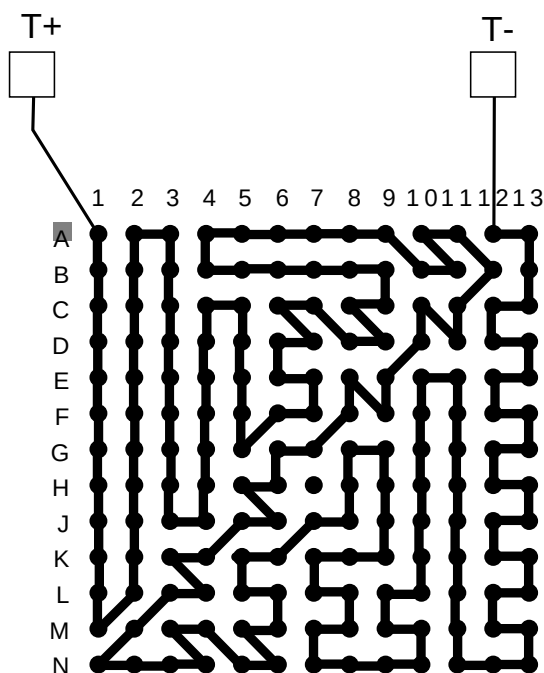
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

BGA169T1.5-DC10

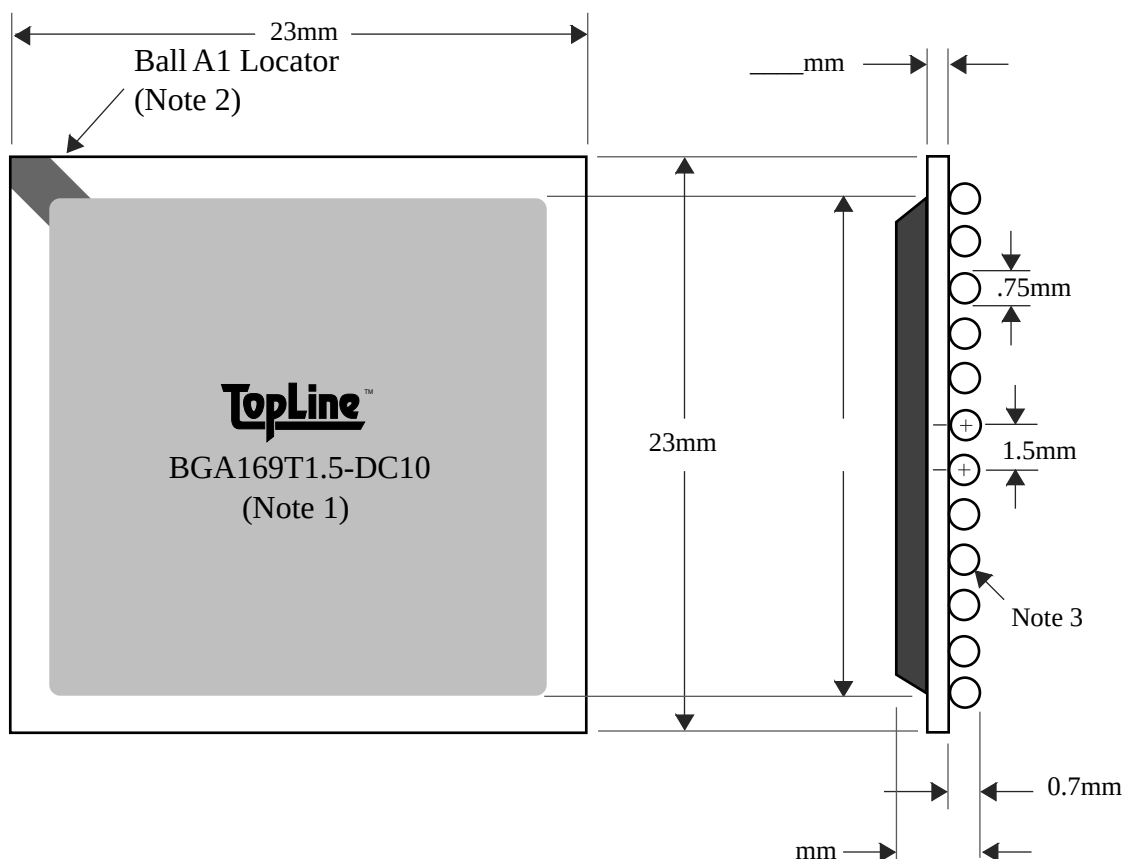
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
169	1.5mm	23mm SQ	13 x 13	full	full	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

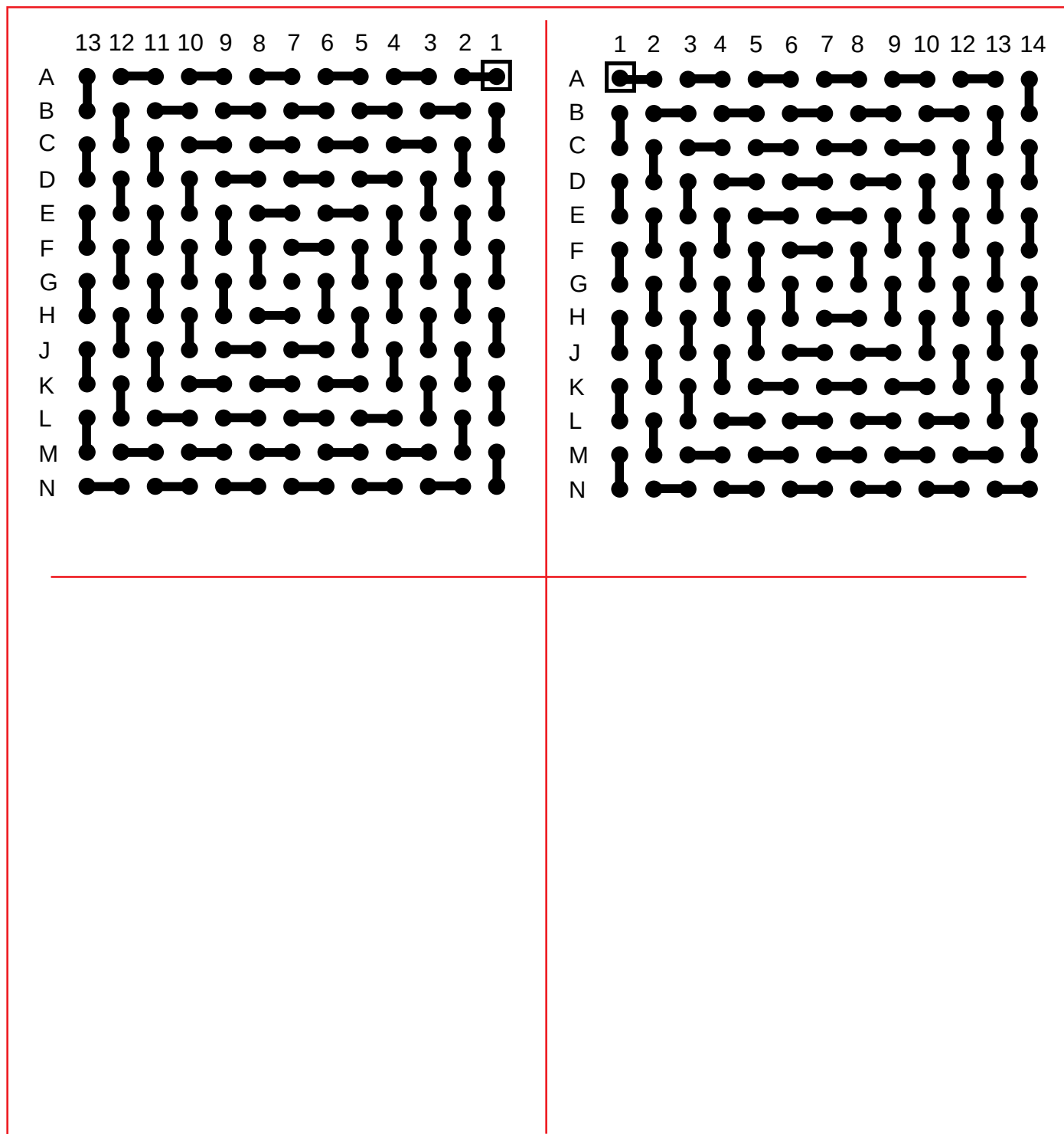


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY23mm-5x12		
		Tray Quantity 60		
		Tray Suppliers (ref):		

BGA169T1.5-DC138

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA169T1.5-DC138

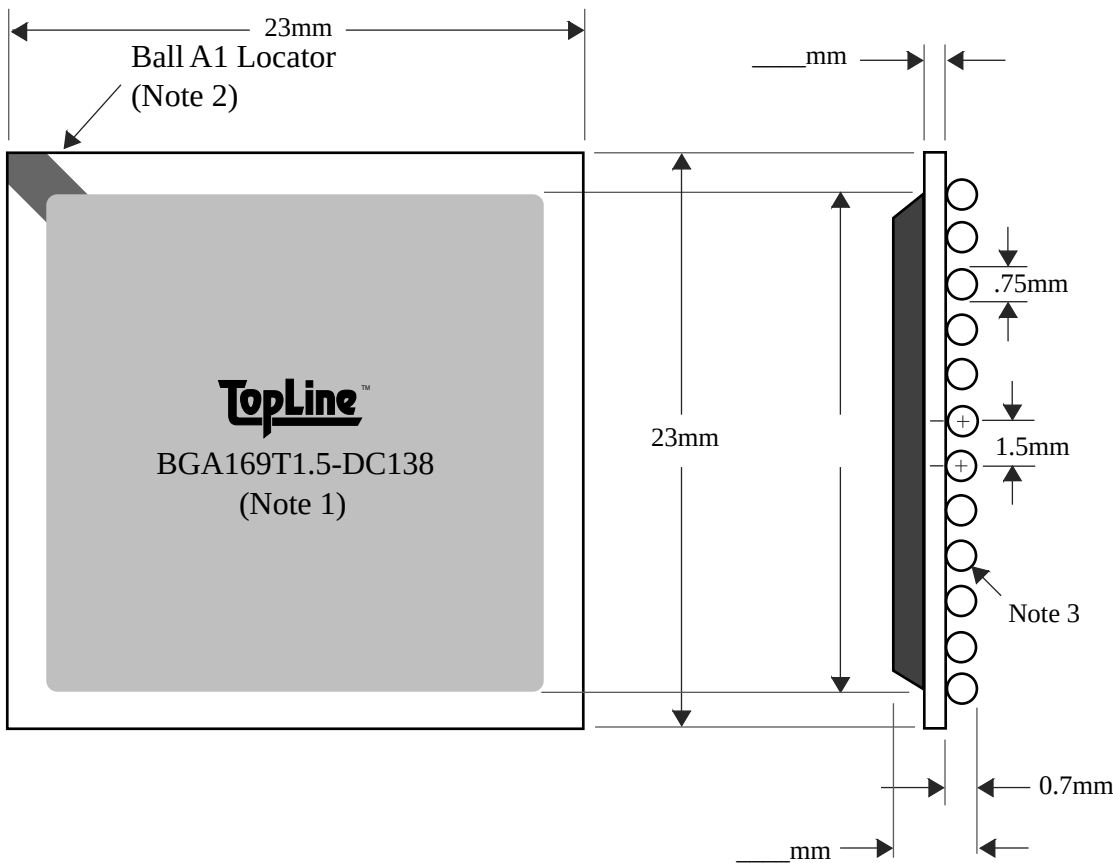


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
169	1.5mm	23mm SQ	13 x 13	full	full	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

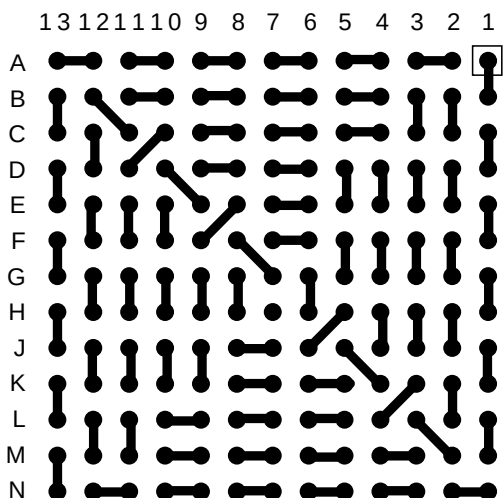
SIDE VIEW



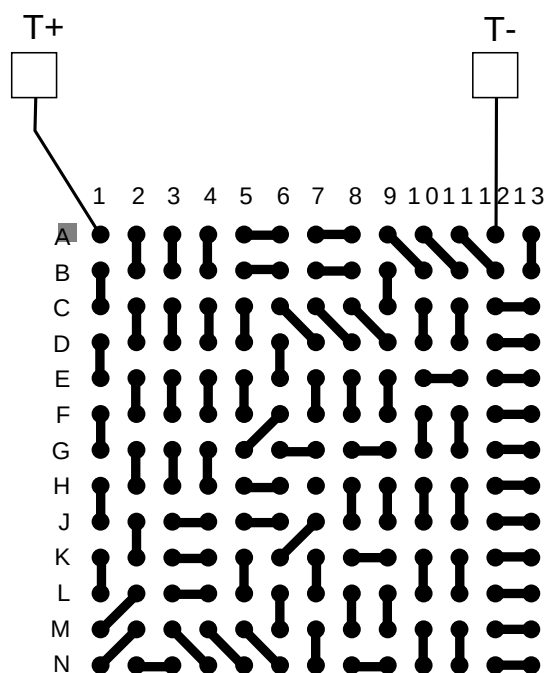
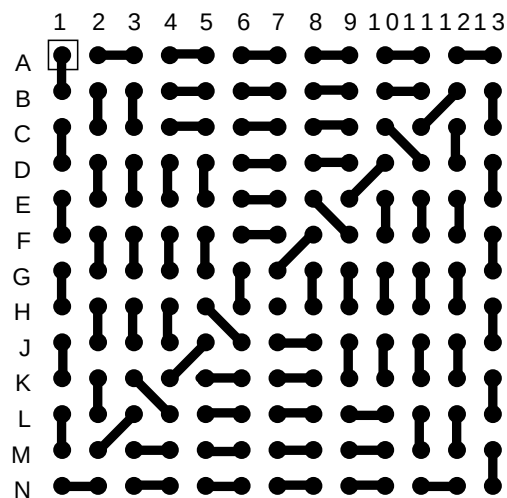
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY23mm-5x12		
		Tray Quantity 60		
		Tray Suppliers (ref):		

LBGA169T1.5-DC10

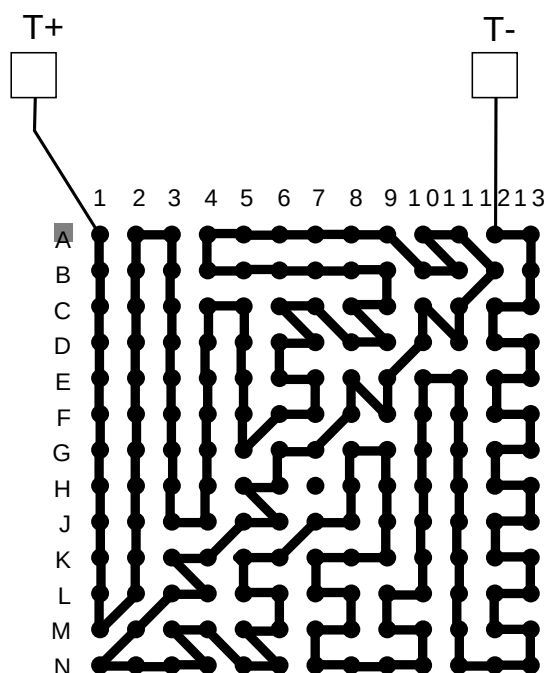
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

LBGA169T1.5-DC10

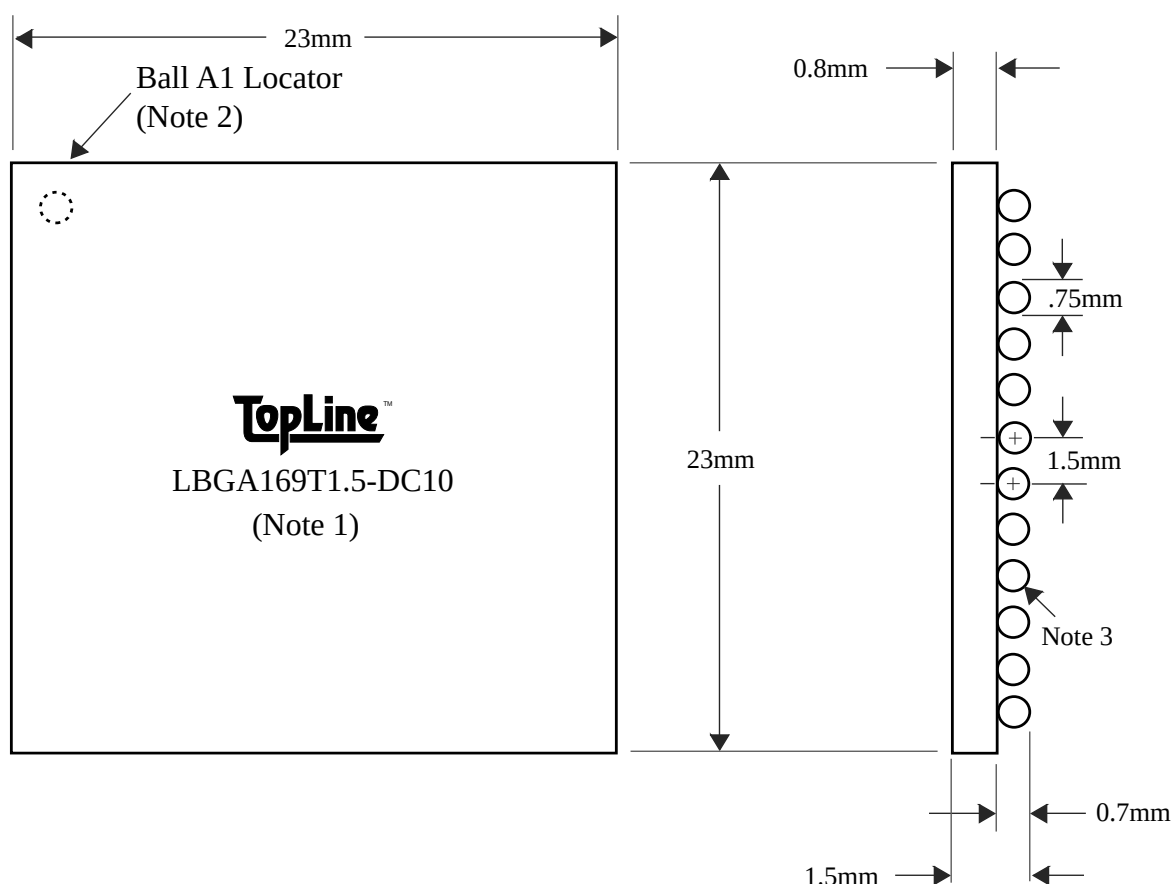
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
169	1.5mm	23mm SQ	13 x 13	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

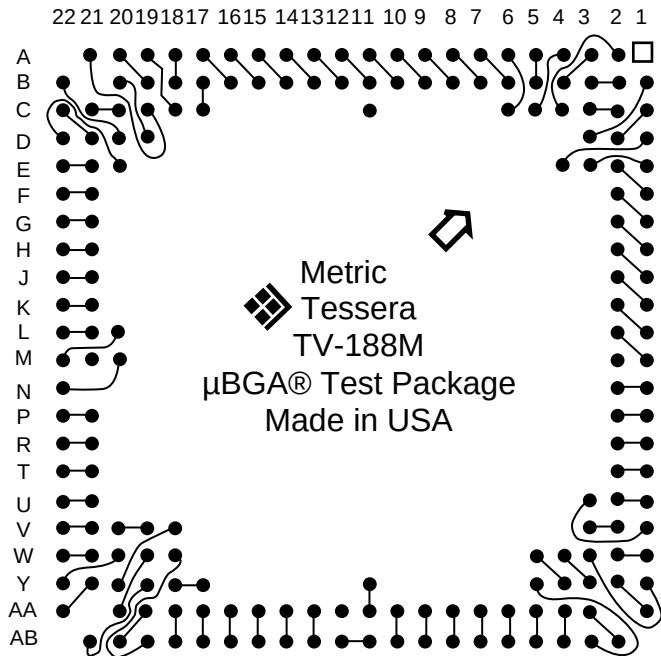
SIDE VIEW



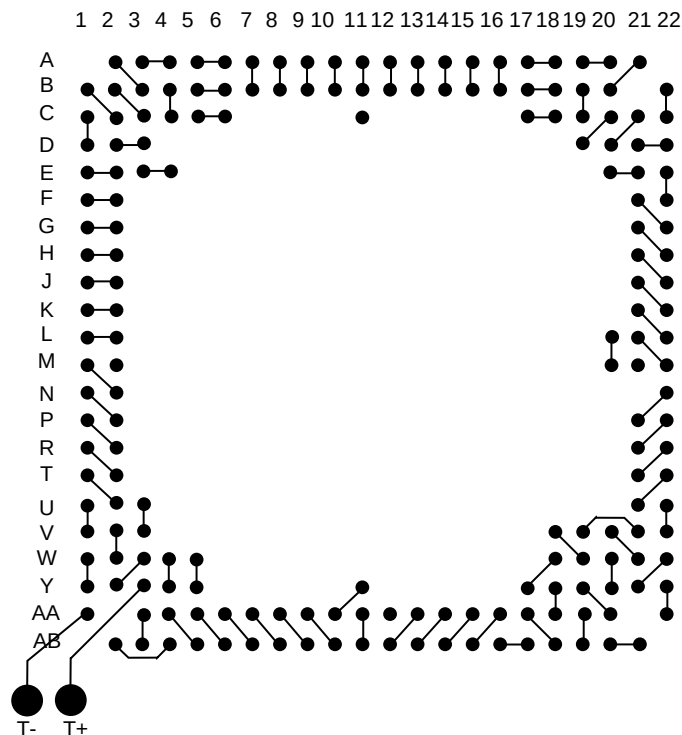
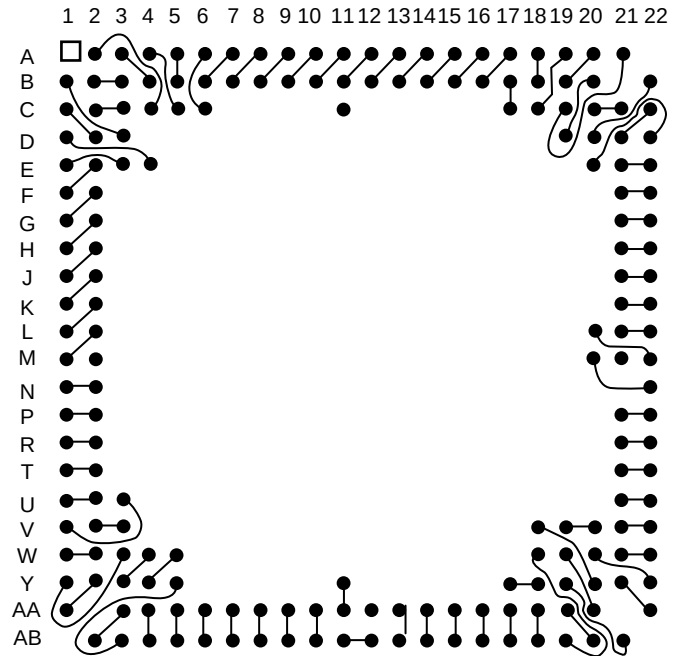
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY23mm-5x12 Tray Quantity 60 Tray Suppliers (ref):		

	<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
	188	0.5mm	13.1mm SQ	22 x 22	2+	none	tape

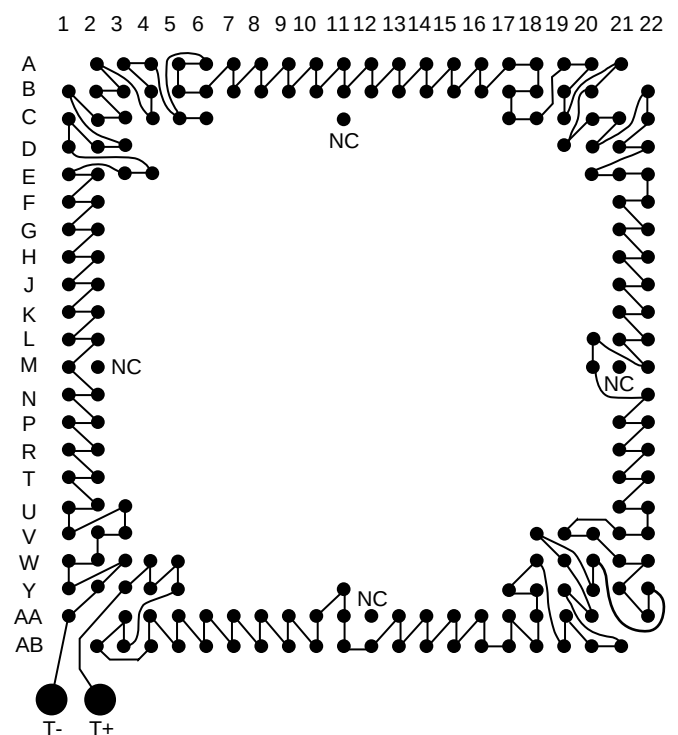
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

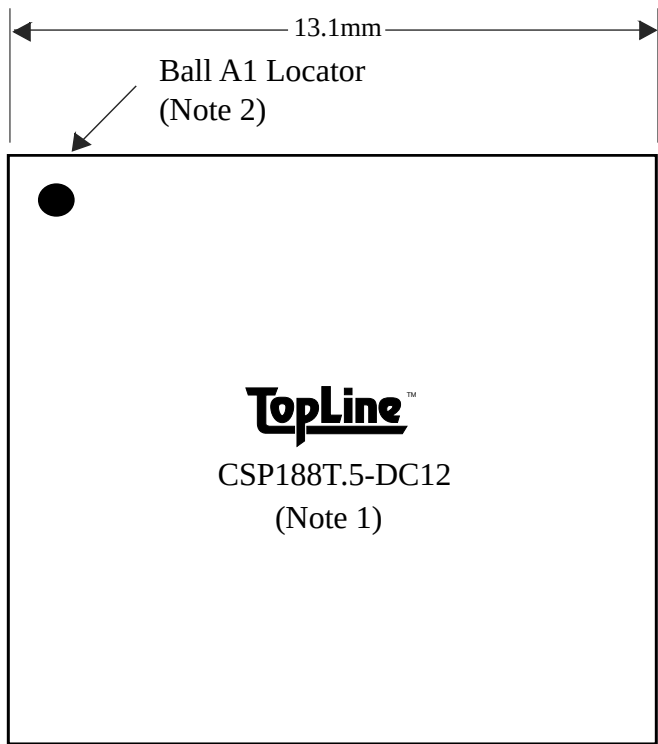
CSP188T.5-DC-12

TopLine™

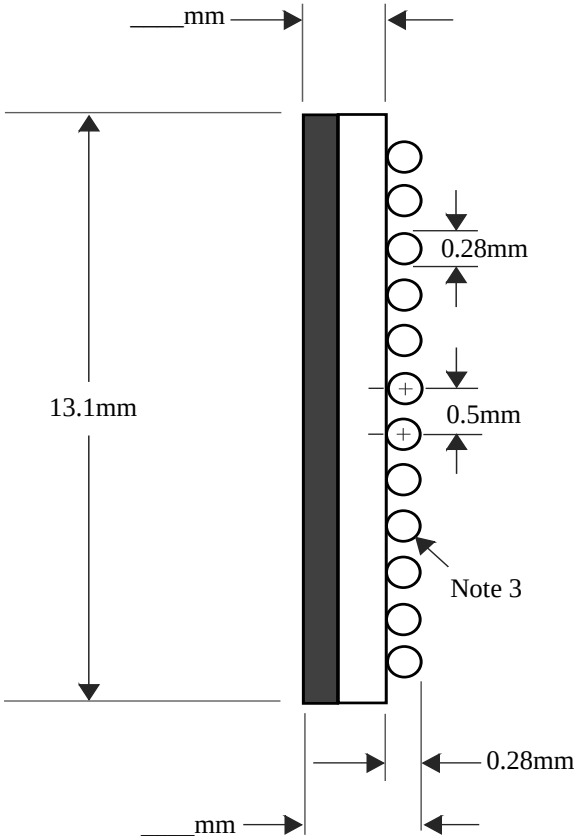
BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
188	0.5mm	13.1mm SQ	22 x 22	2+	none	tape

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



SIDE VIEW

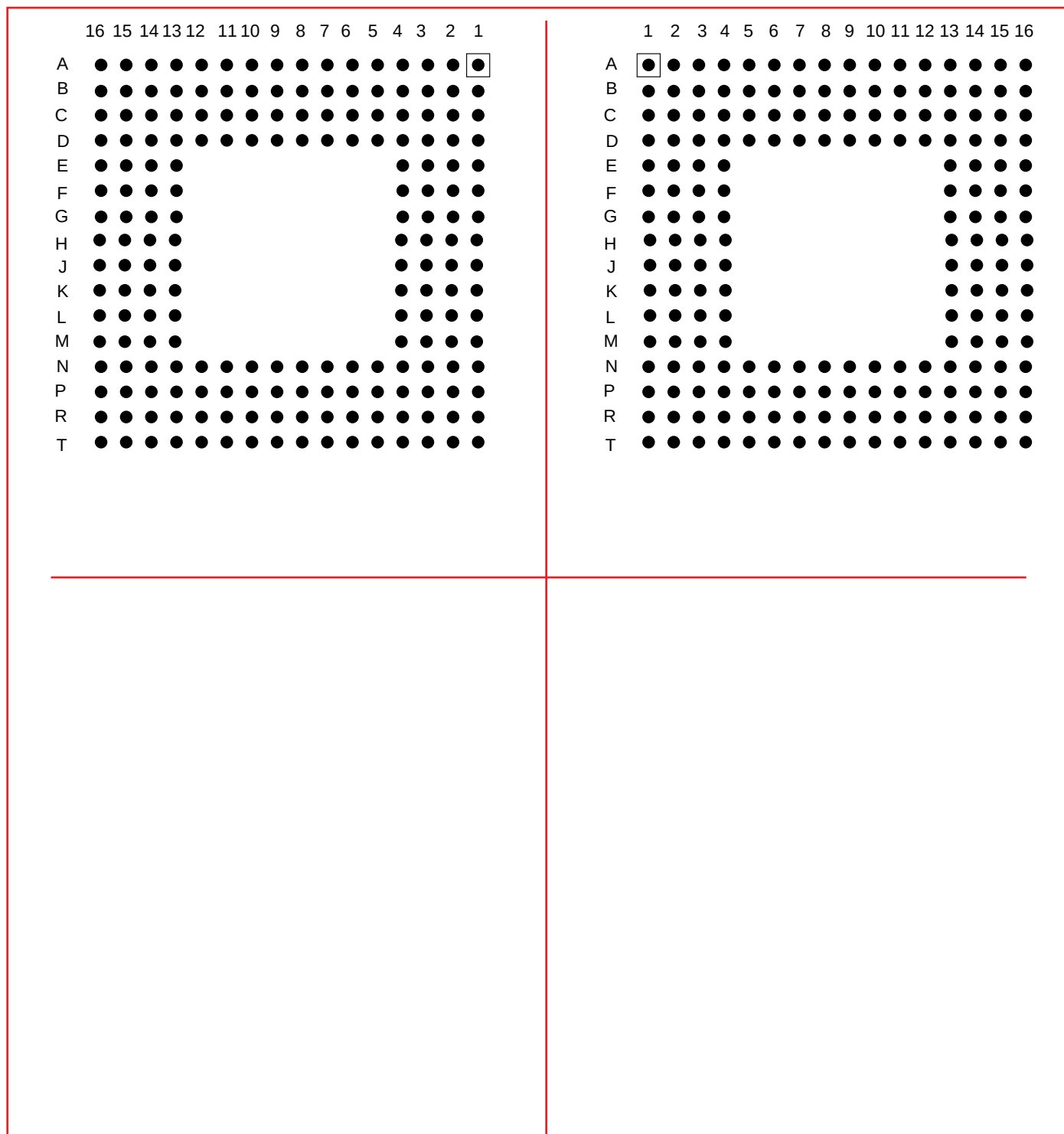


NOTES		REVISIONS		
Note 1	Logo and part number centered	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT Laminate	Tray BGATRAY-TV188 Tray Quantity 25 Tray Suppliers (ref):		

BGA192T1.0-ISO

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA192T1.0-ISO

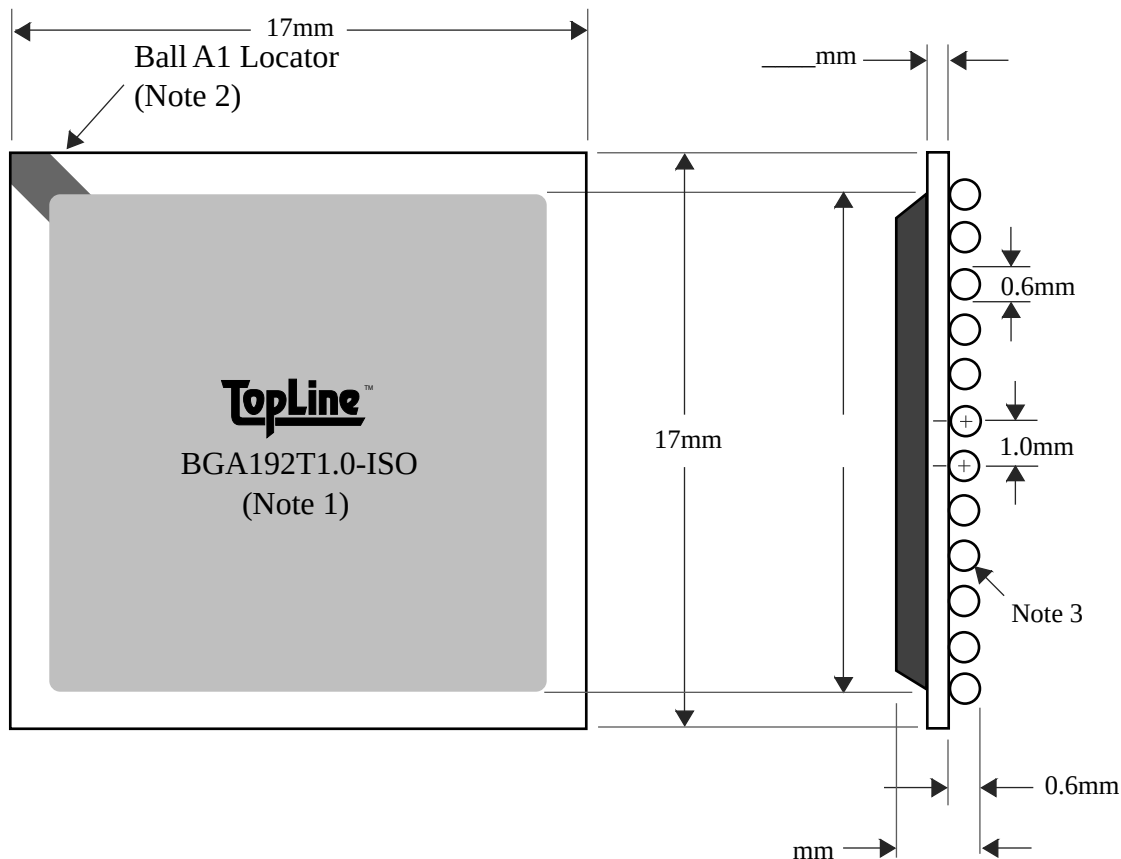
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
192	1.0mm	17mm SQ	16 x 16	4	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

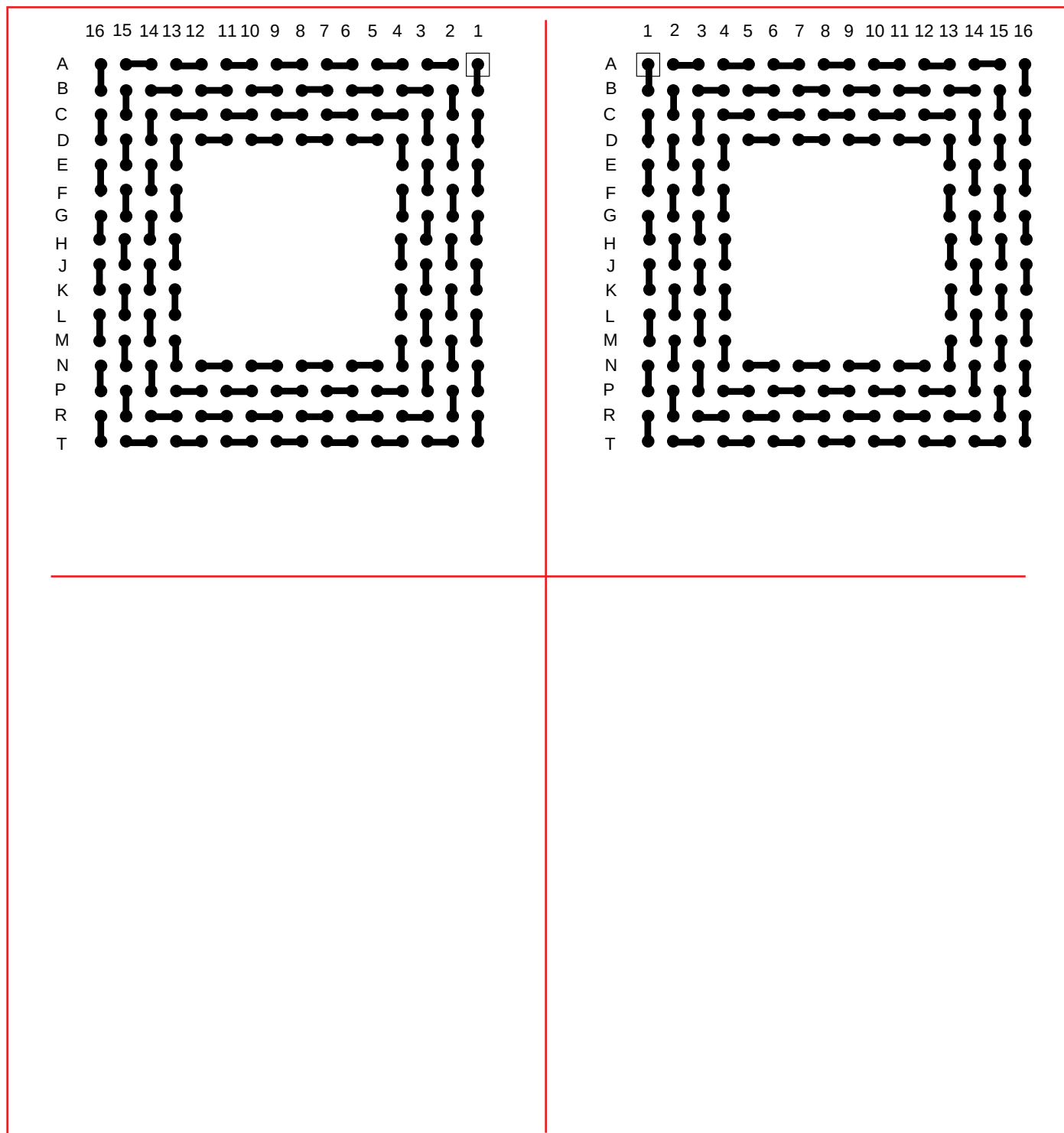


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY17mm-6x15		
		Tray Quantity 90		
		Tray Suppliers (ref):		

LBGA192T1.0-DC160

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA192T1.0-DC160

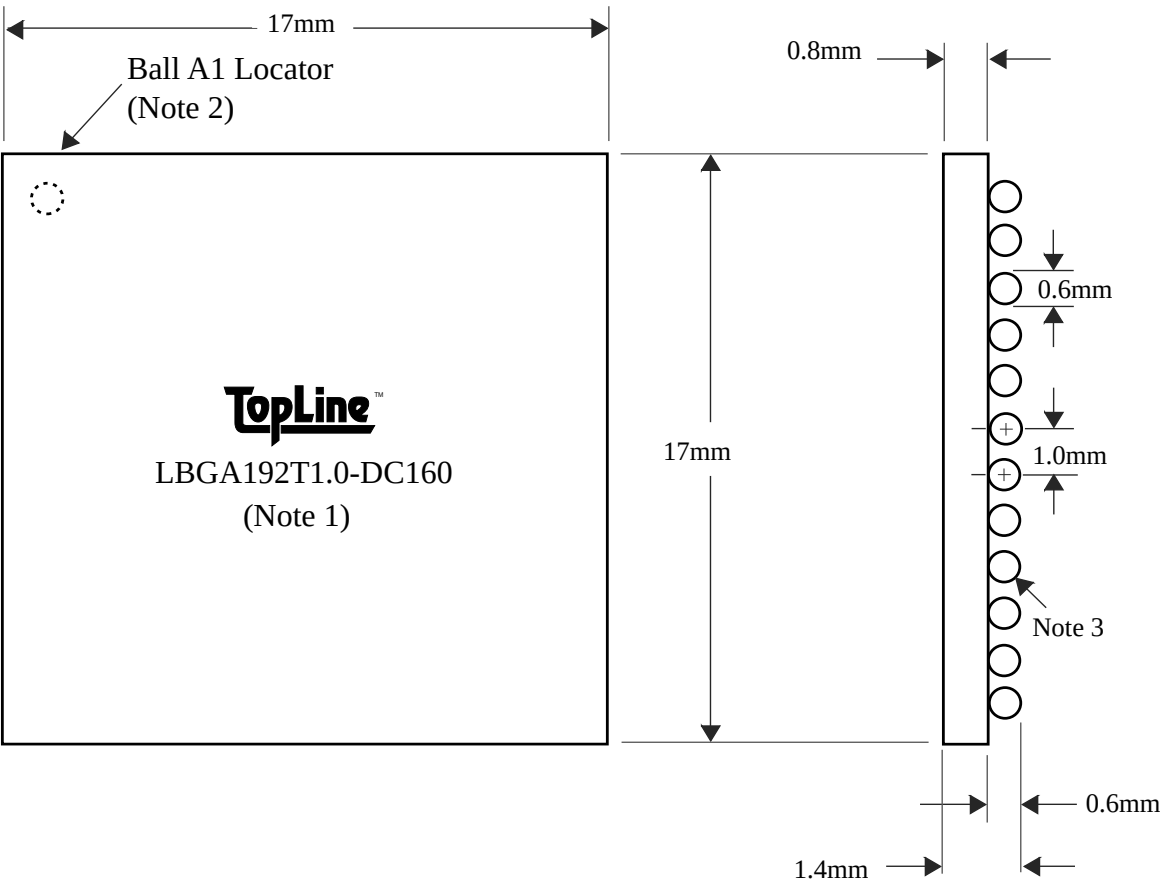
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
192	1.0mm	17mm SQ	16 x 16	4	none	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY17mm-6x15 Tray Quantity 90 Tray Suppliers (ref):		

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

196

PITCH

1.0mm

SIZE

15mm SQ

MATRIX

14 x 14

ROWS

full

CENTER

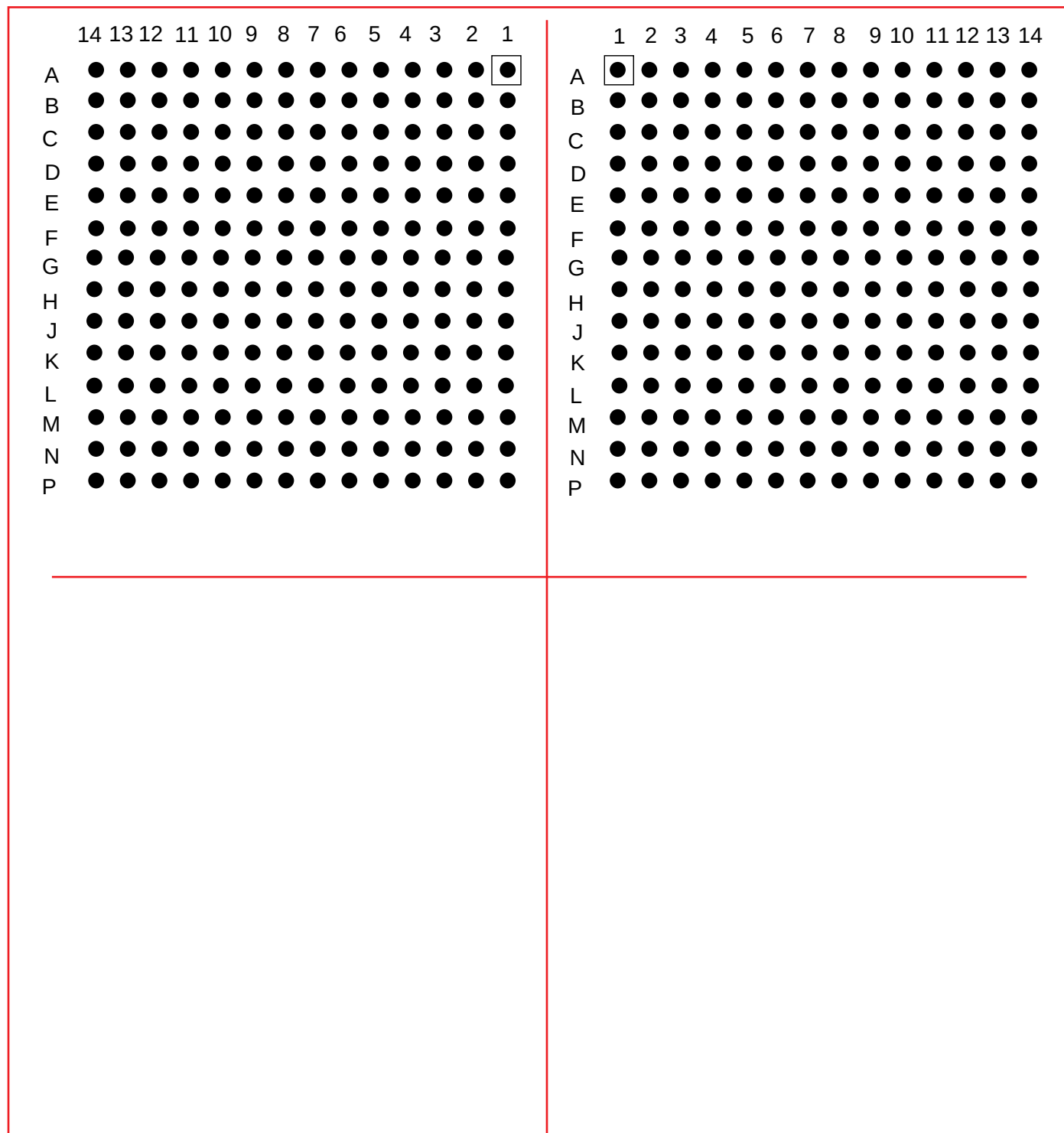
full

MAT'L

BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA196T1.0-ISO-14x14

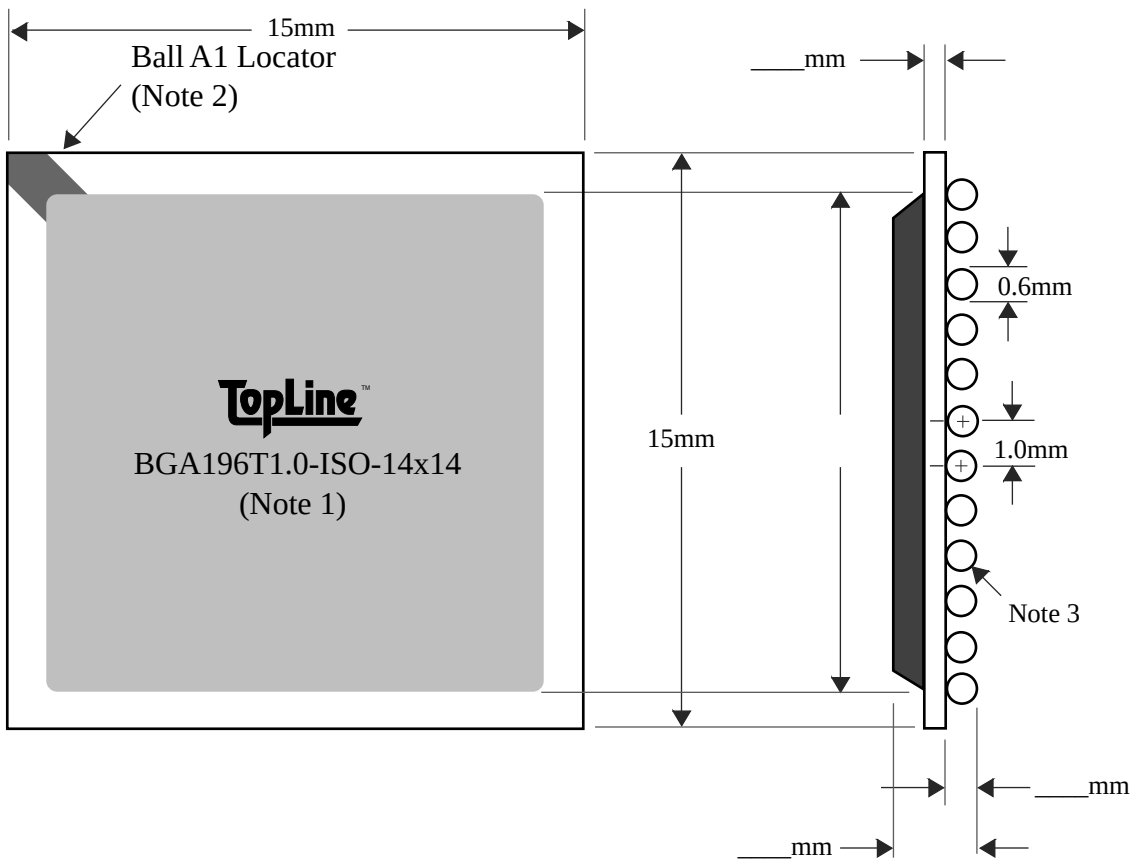
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
196	1.0mm	15mm SQ	14 x 14	full	full	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

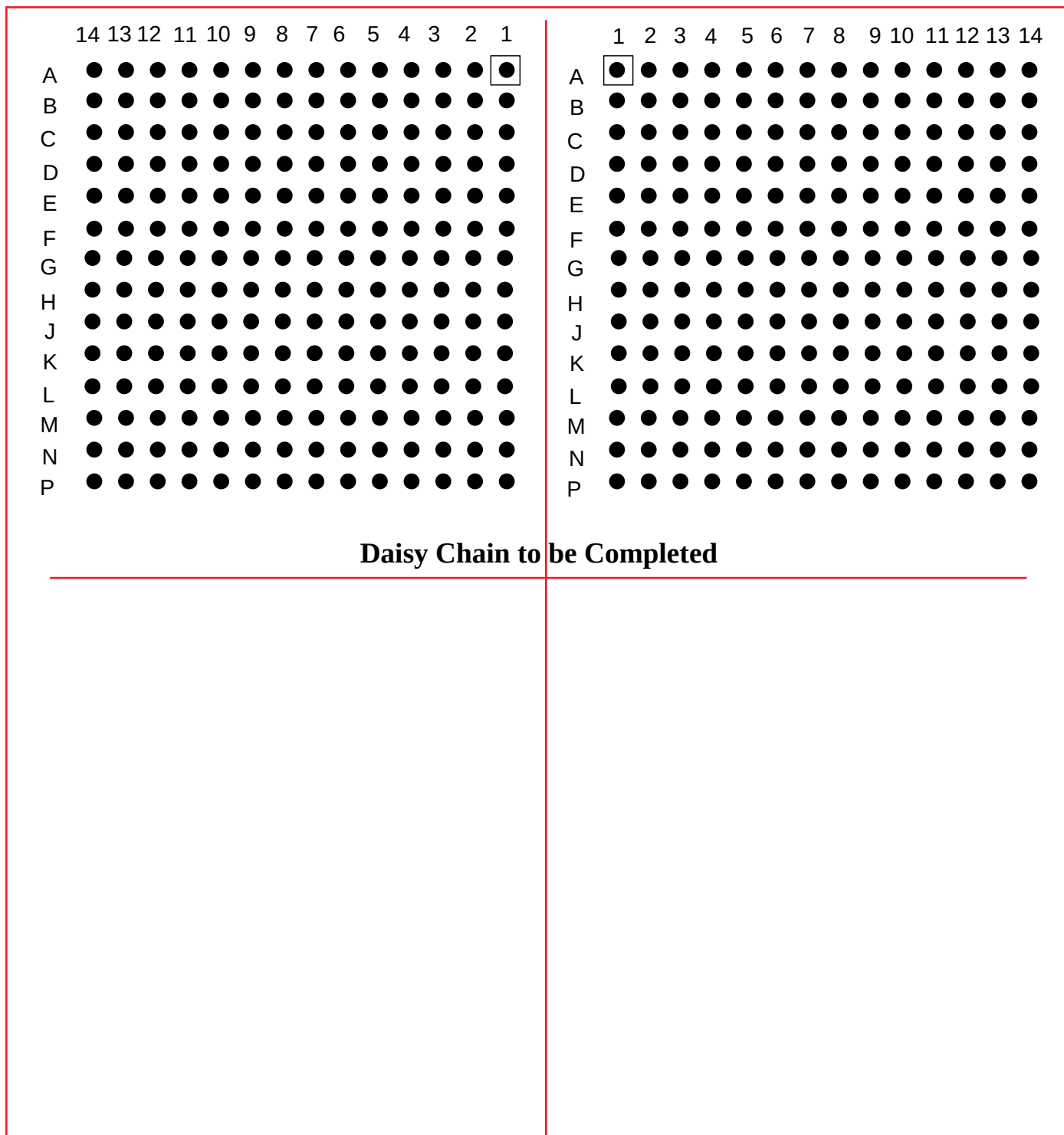
SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY15mm-7x18		
		Tray Quantity 126		
		Tray Suppliers (ref):		

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA196T1.0-DC148

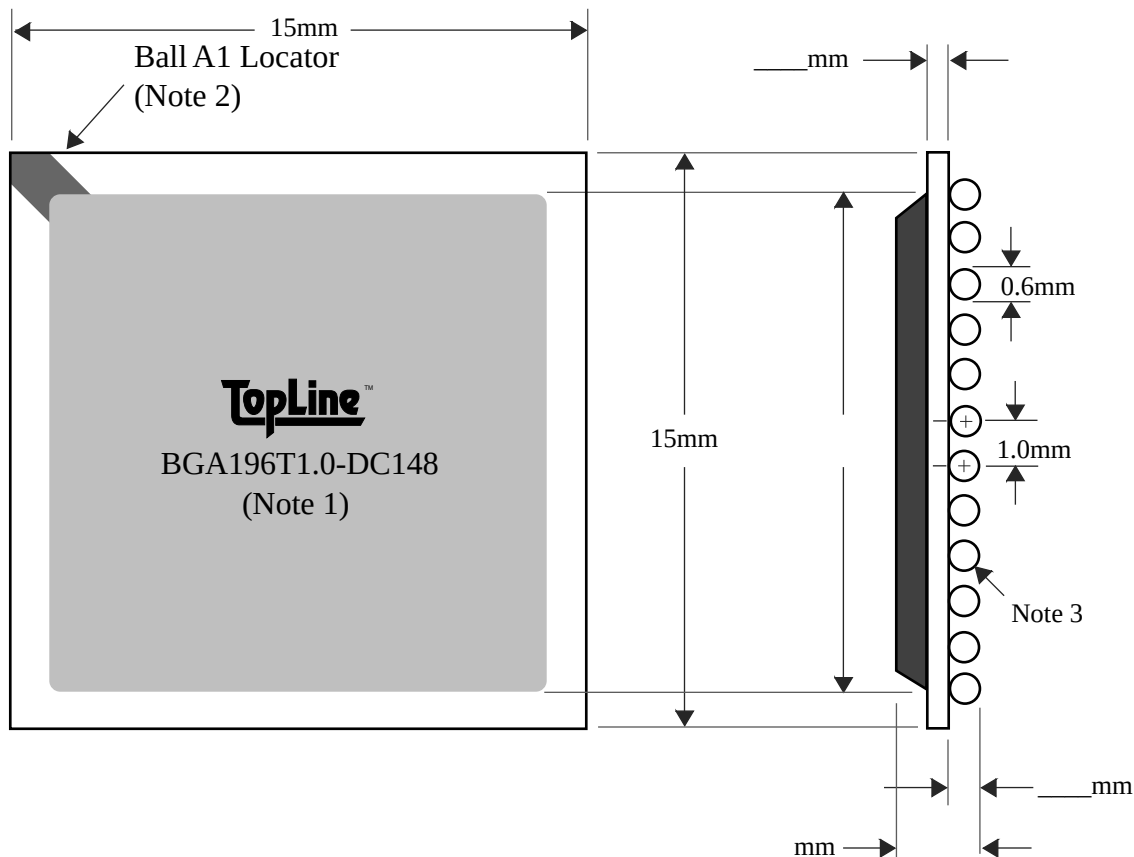
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
196	1.0mm	15mm SQ	14 x 14	full	full	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY15mm-7x18		
		Tray Quantity 126		
		Tray Suppliers (ref):		

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

196

PITCH

1.0mm

SIZE

17mm SQ

MATRIX

16 x 16

ROWS

4

CENTER

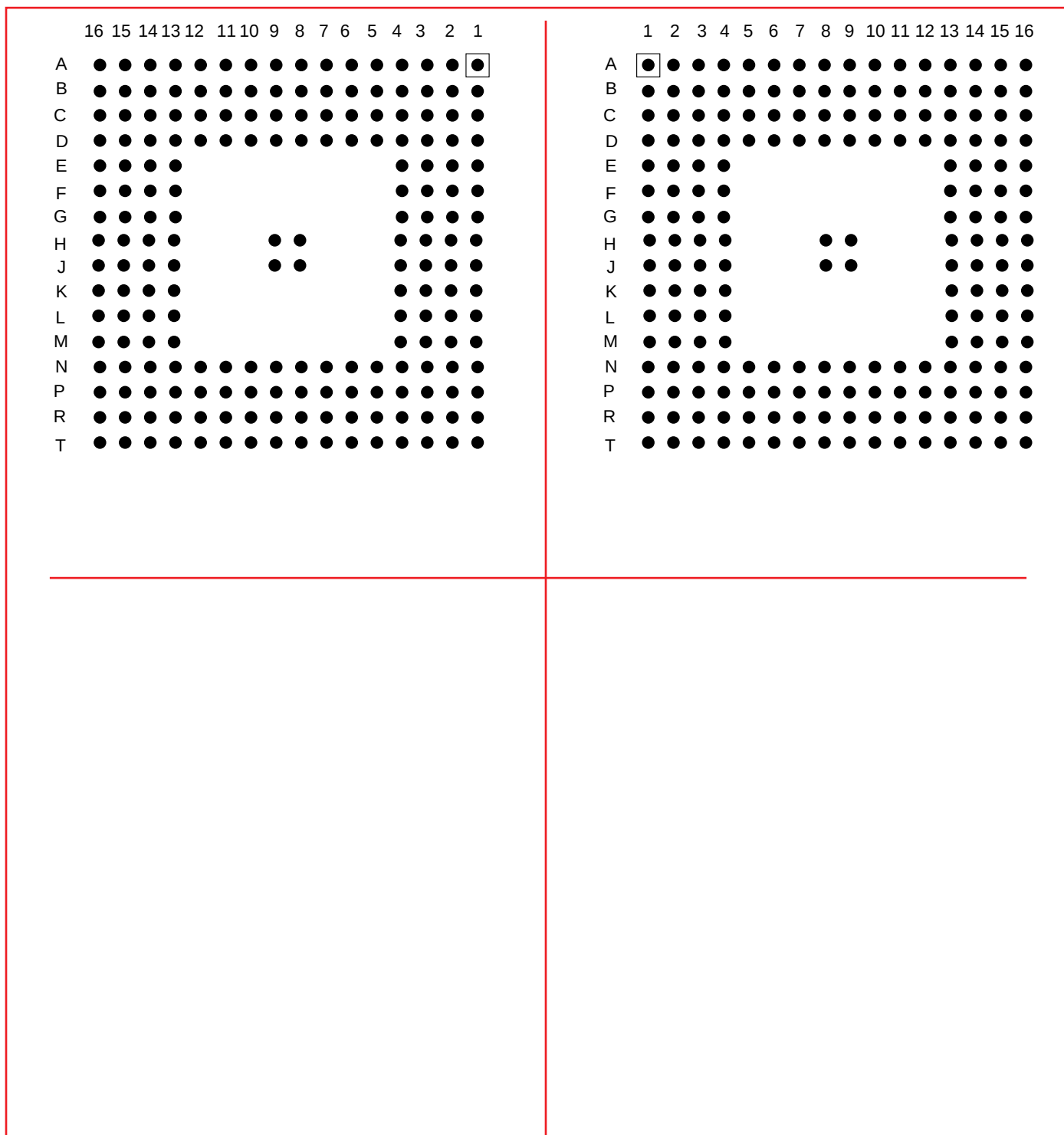
2 x 2

MAT'L

BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA196T1.0-ISO-16x16

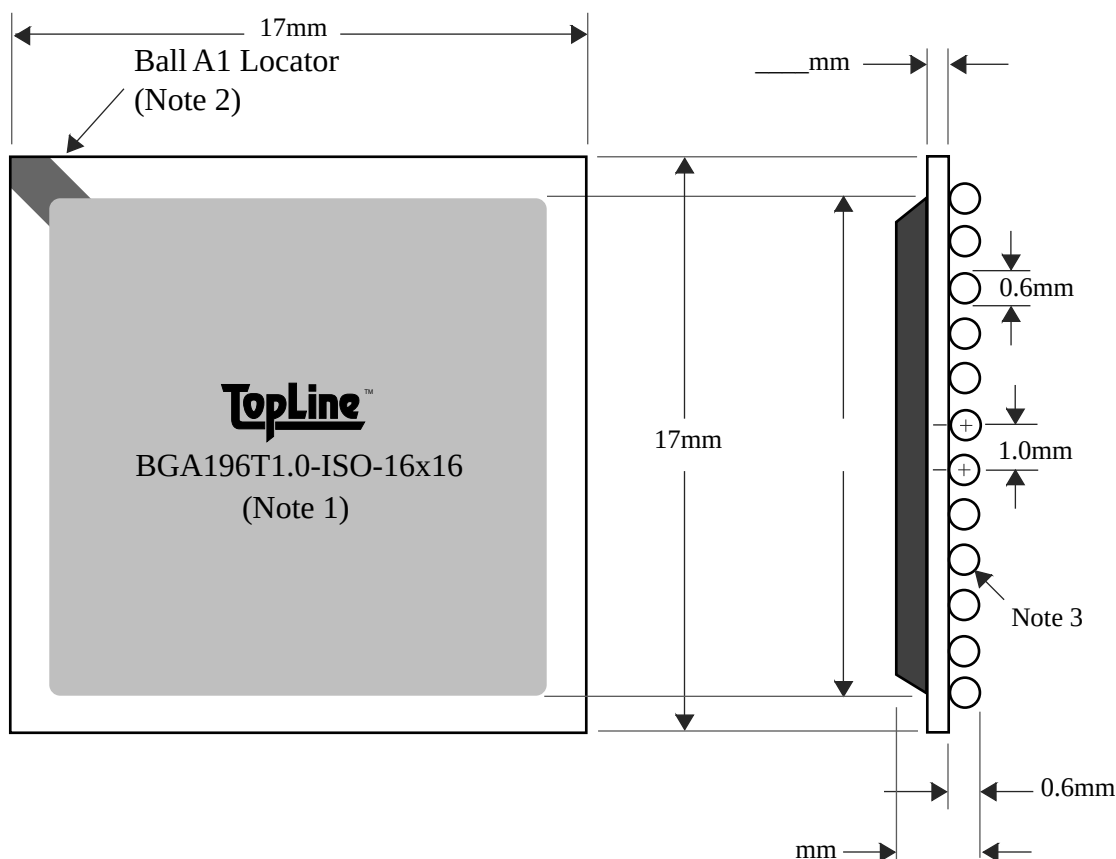
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
196	1.0mm	17mm SQ	16 x 16	4	2 x 2	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

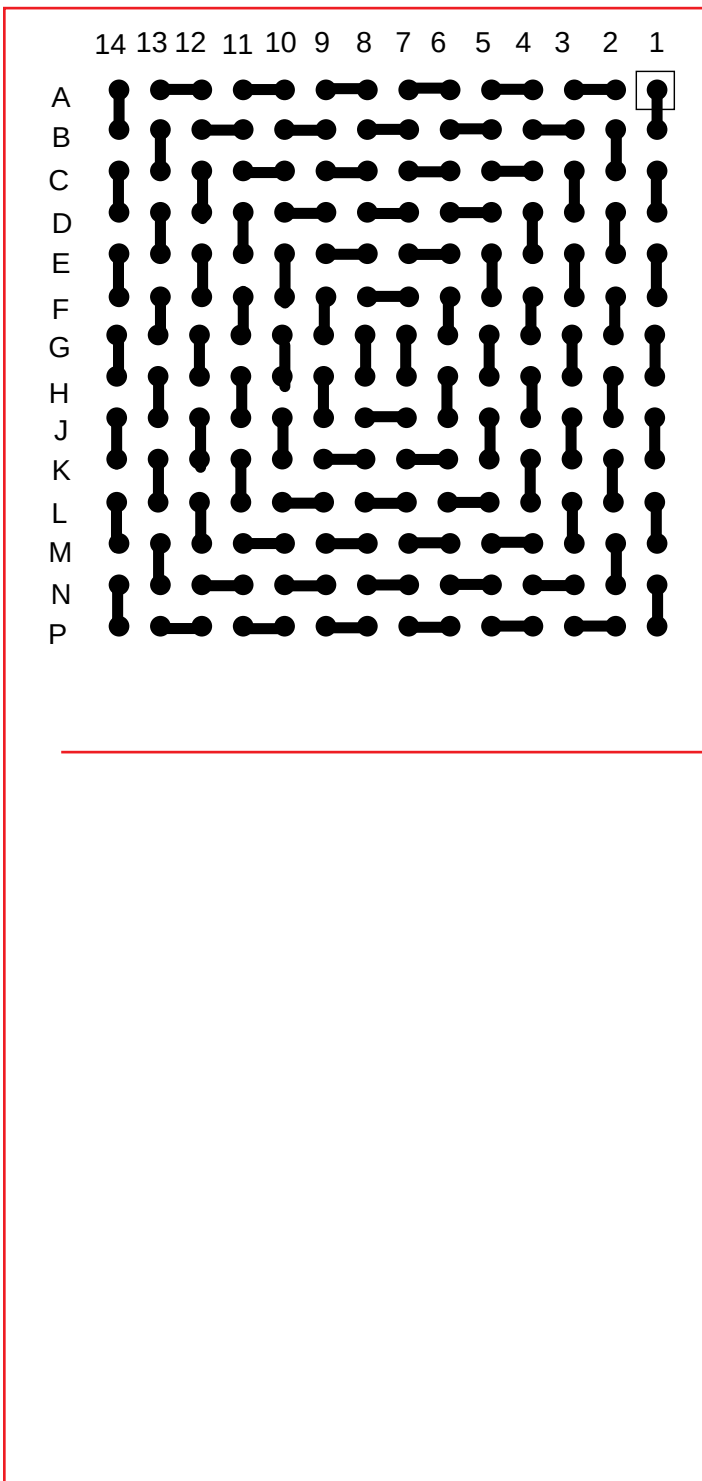
TOP VIEW

SIDE VIEW

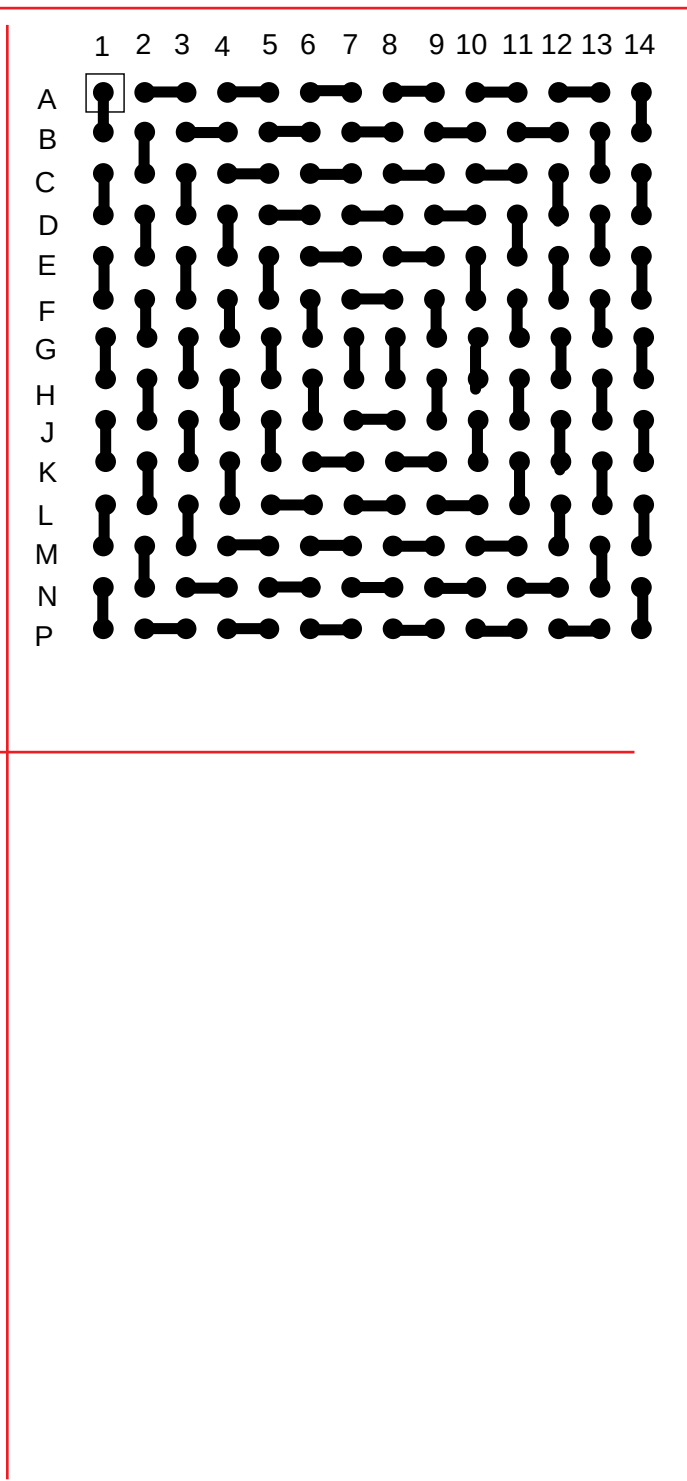


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY17mm-6x15		
		Tray Quantity 90		
		Tray Suppliers (ref):		

BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA196T1.0-DC149

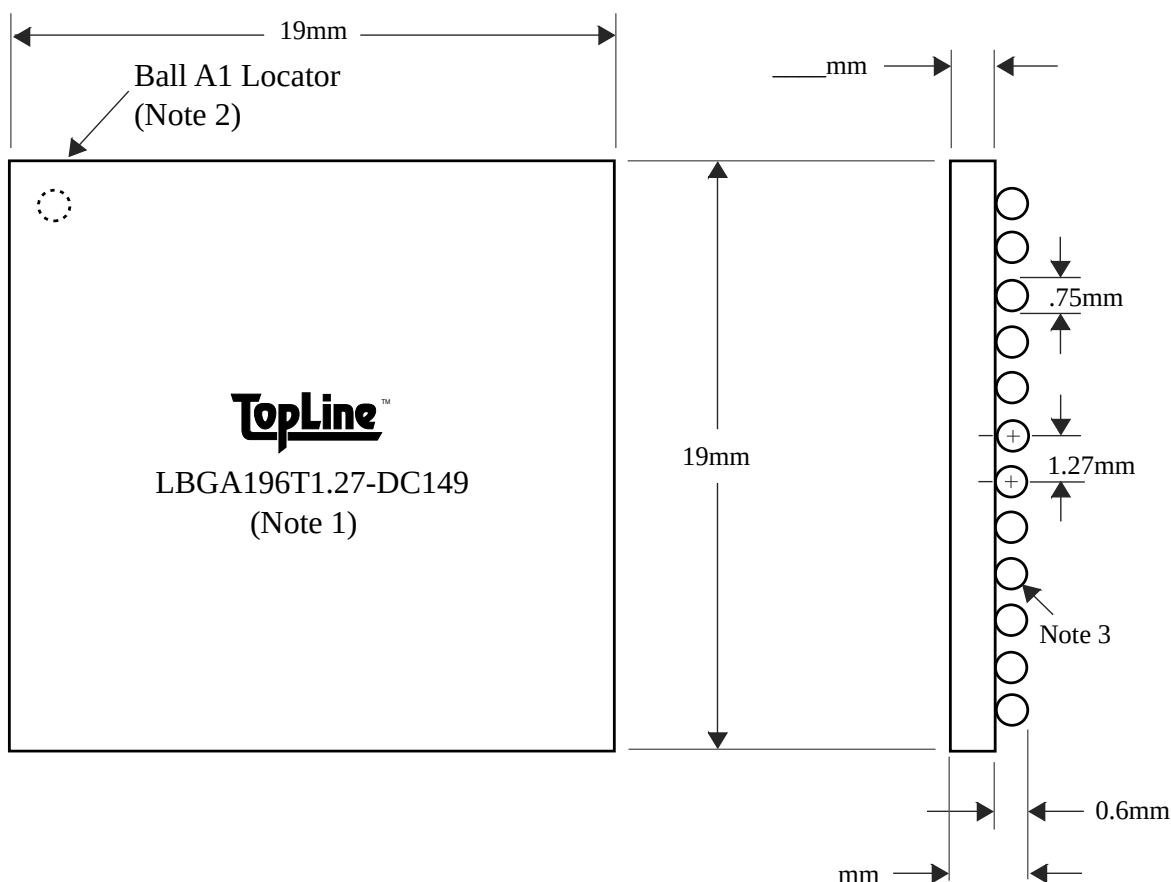
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
196	1.0mm	15mm SQ	14 x 14	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

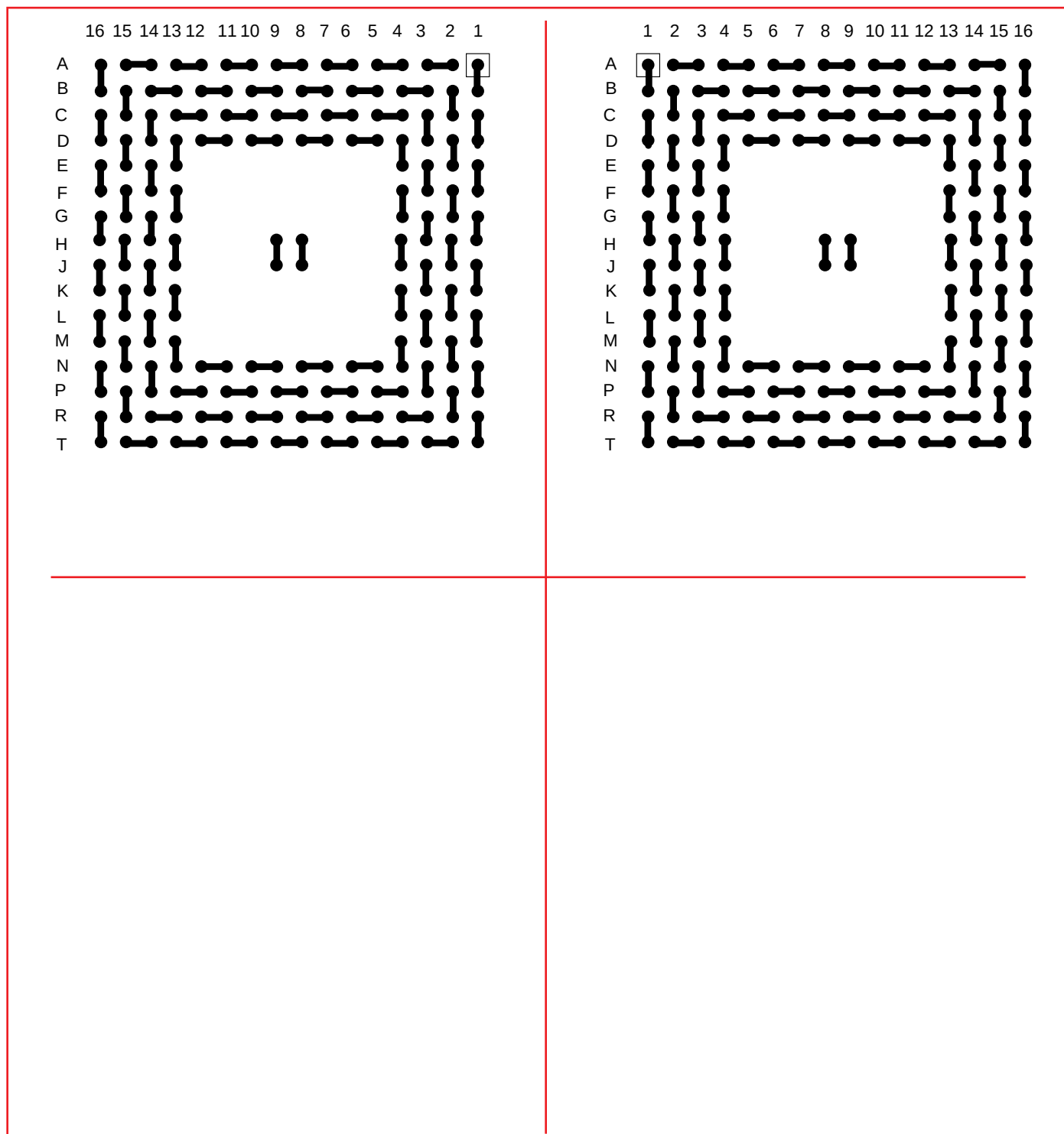


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY15mm-7x18 Tray Quantity 126 Tray Suppliers (ref):		

LBGA196T1.0-DC162

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

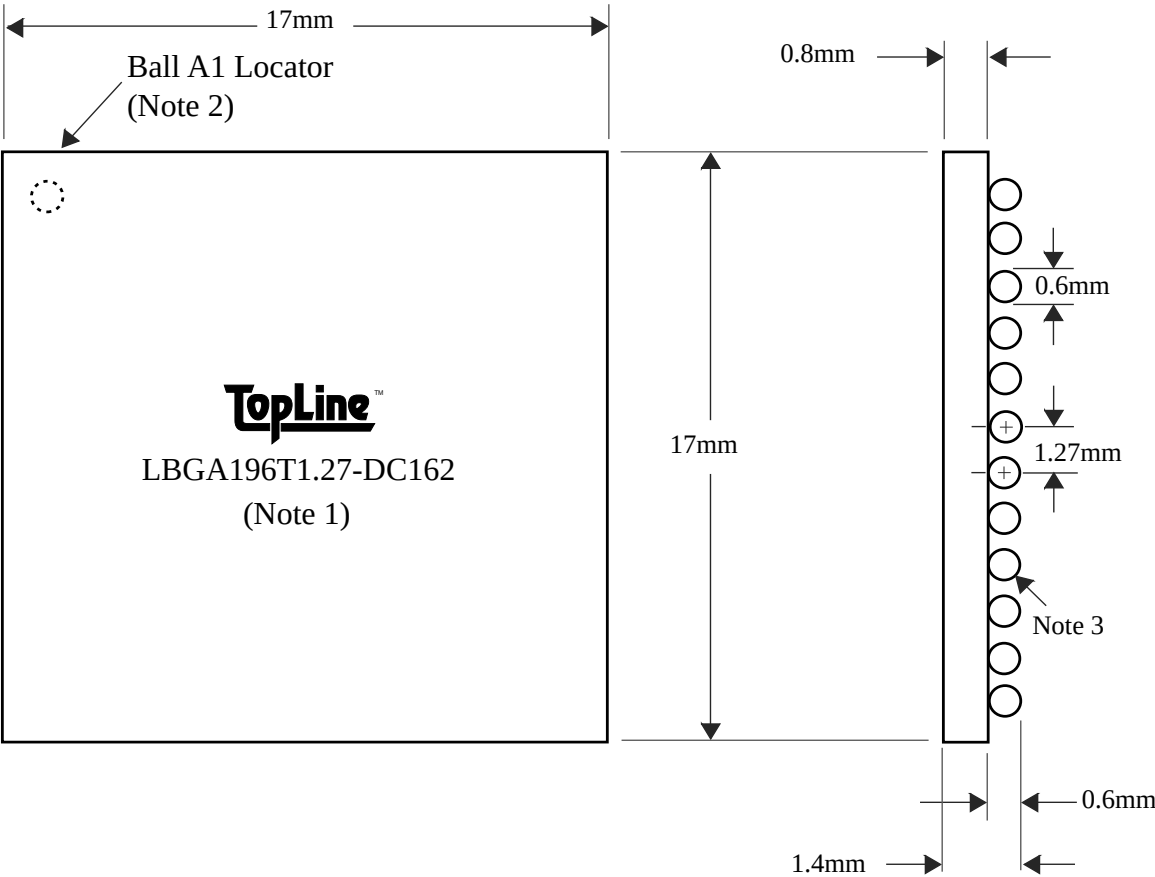
LBGA196T1.0-DC162



BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830
196	1.0mm	17mm SQ	16 x 16	full	2 x 2	FR4	FAX 1-714-891-0321

TOP VIEW

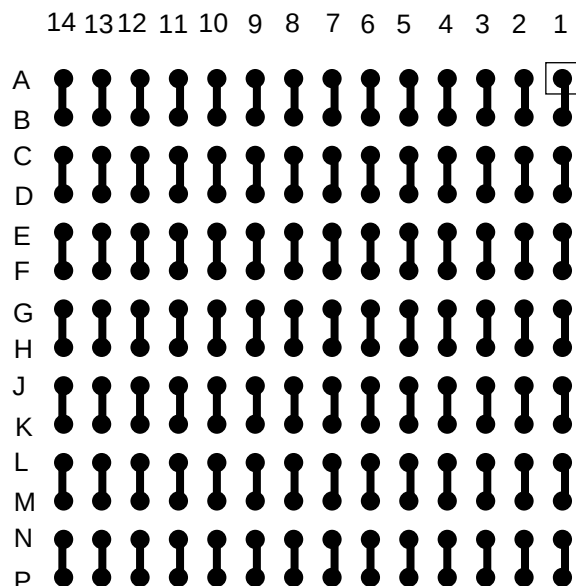
SIDE VIEW



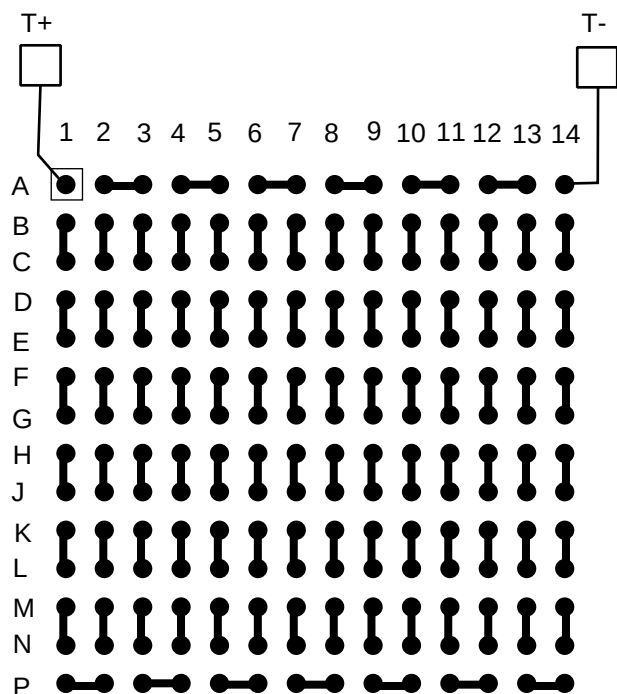
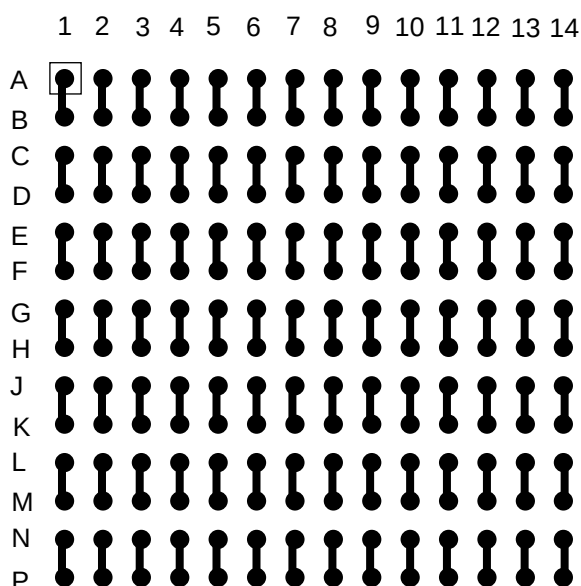
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		4/30/99	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY17mm-6x15 Tray Quantity 90 Tray Suppliers (ref):		

CBGA196T1.27-DC11

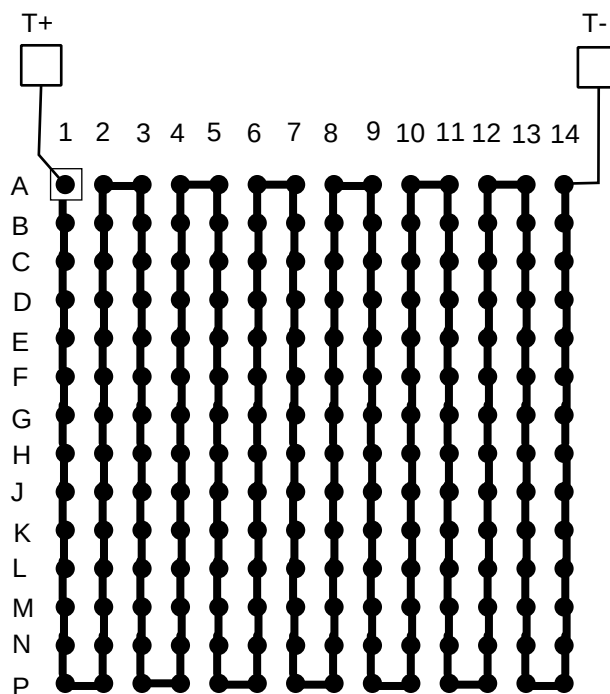
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

CBGA196T1.27-DC11

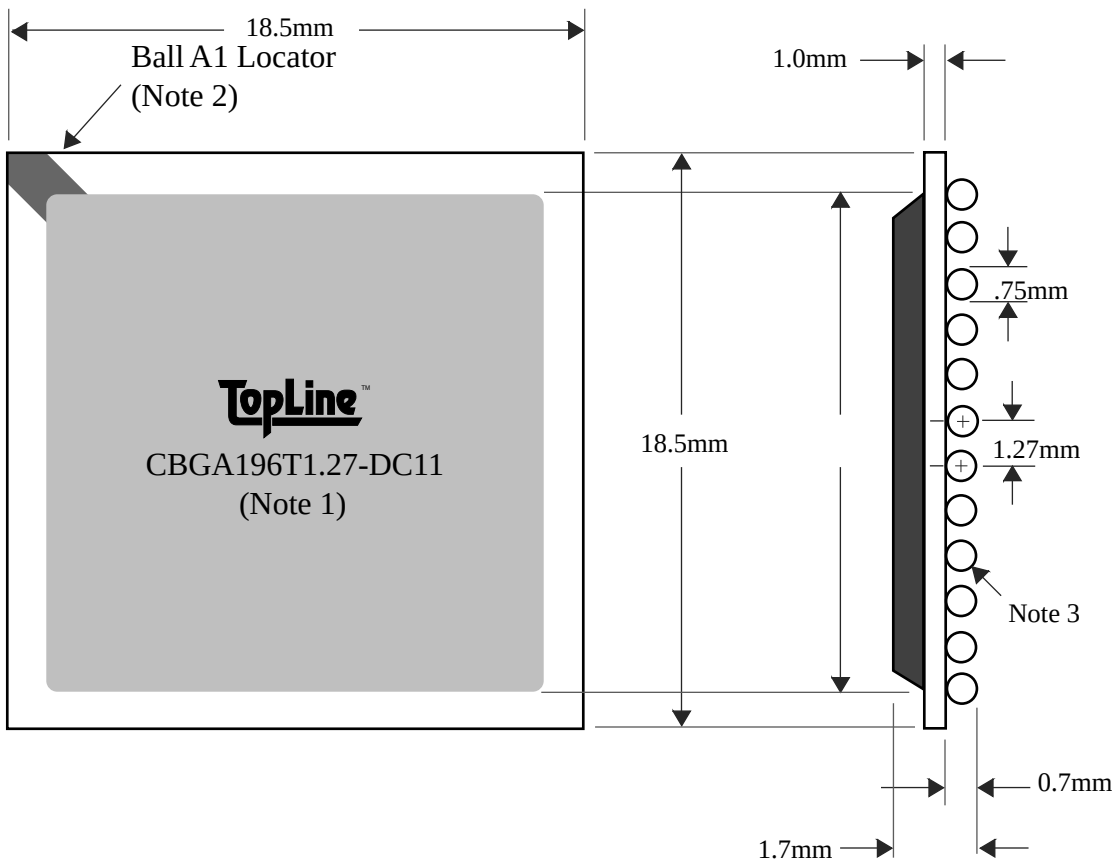


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
196	1.27mm	18.5mm SQ	14 x 14	full	full	ceramic

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 10/90SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY19mm-6x14 Tray Quantity 84 Tray Suppliers (ref):		

BALLS

PITCH

SIZE

MATRIX

ROWS

CENTER

MAT'L

196

1.27mm

18.5mm SQ

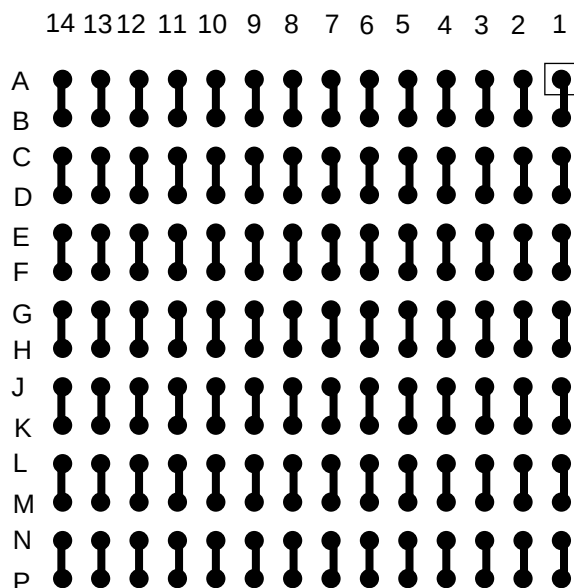
14 x 14

full

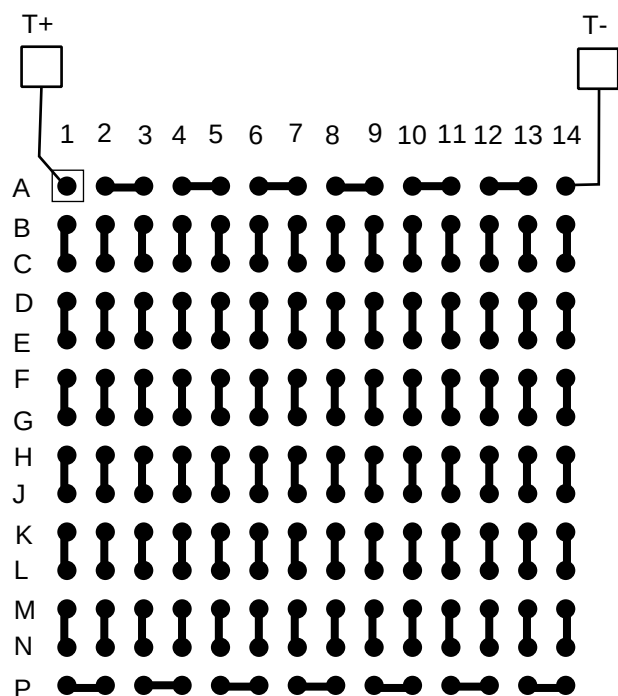
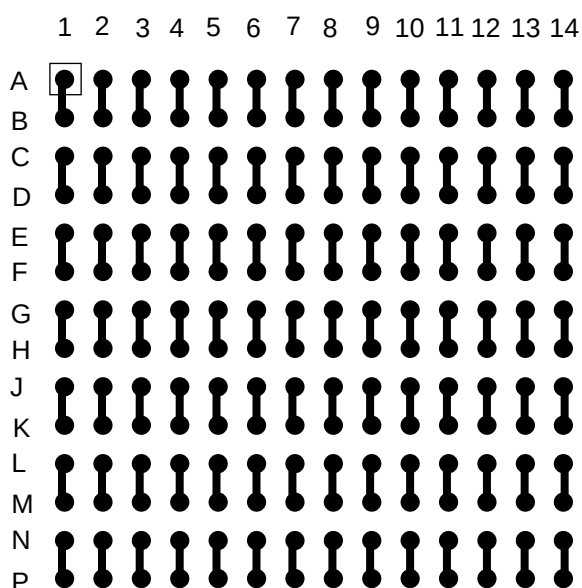
full

ceramic

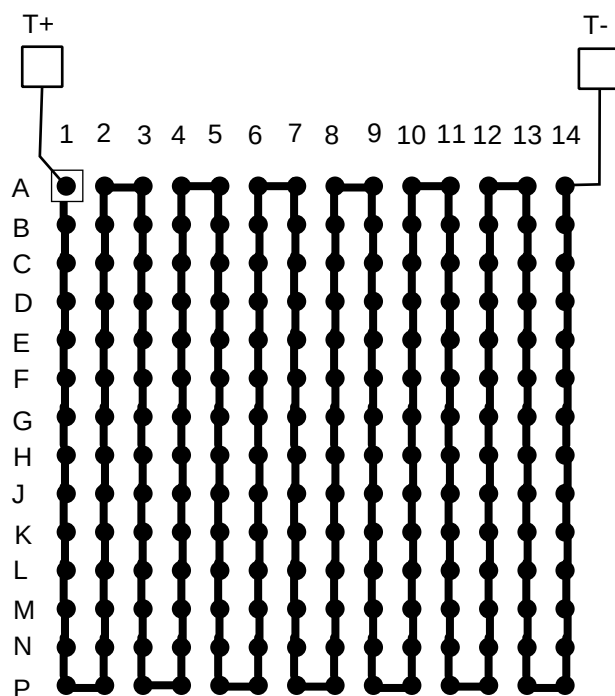
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

CBGA196T1.27L-DC11

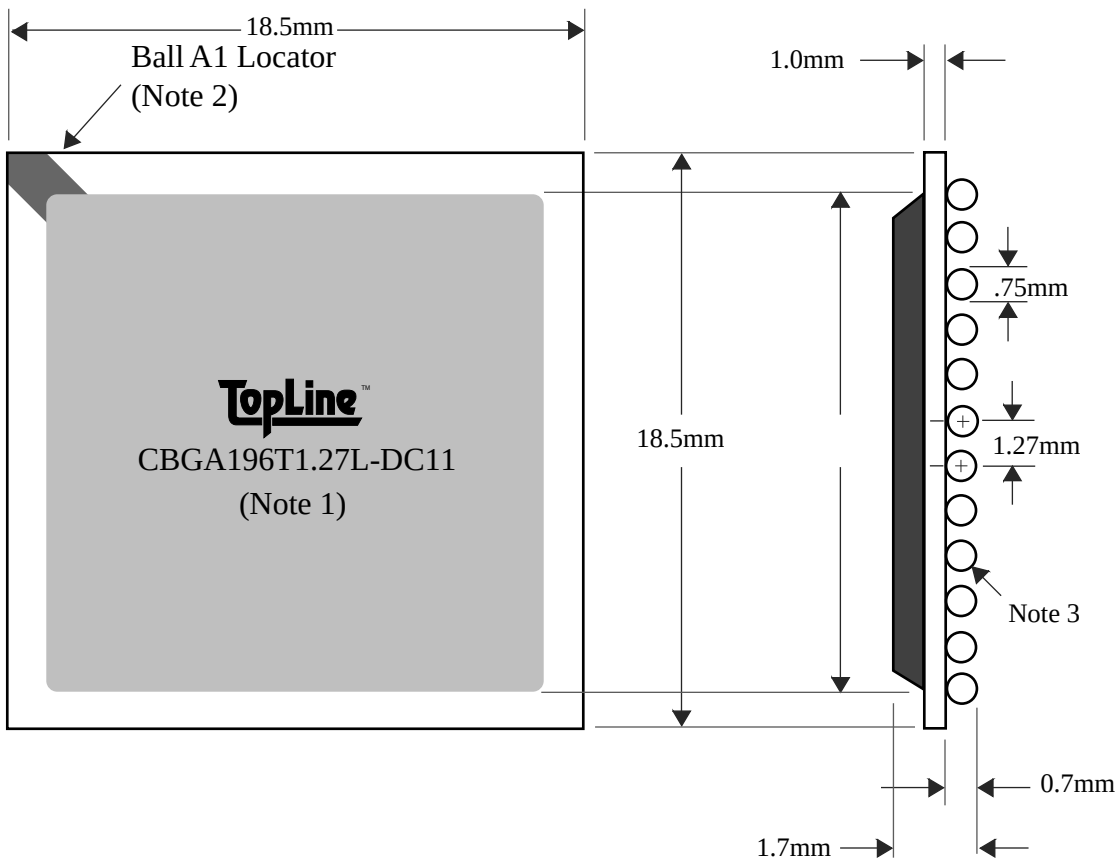


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
196	1.27mm	18.5mm SQ	14 x 14	full	full	ceramic

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY19-6x14 Tray Quantity 84 Tray Suppliers (ref):		

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

196

PITCH

1.27mm

SIZE

19mm SQ

MATRIX

14 x 14

ROWS

full

CENTER

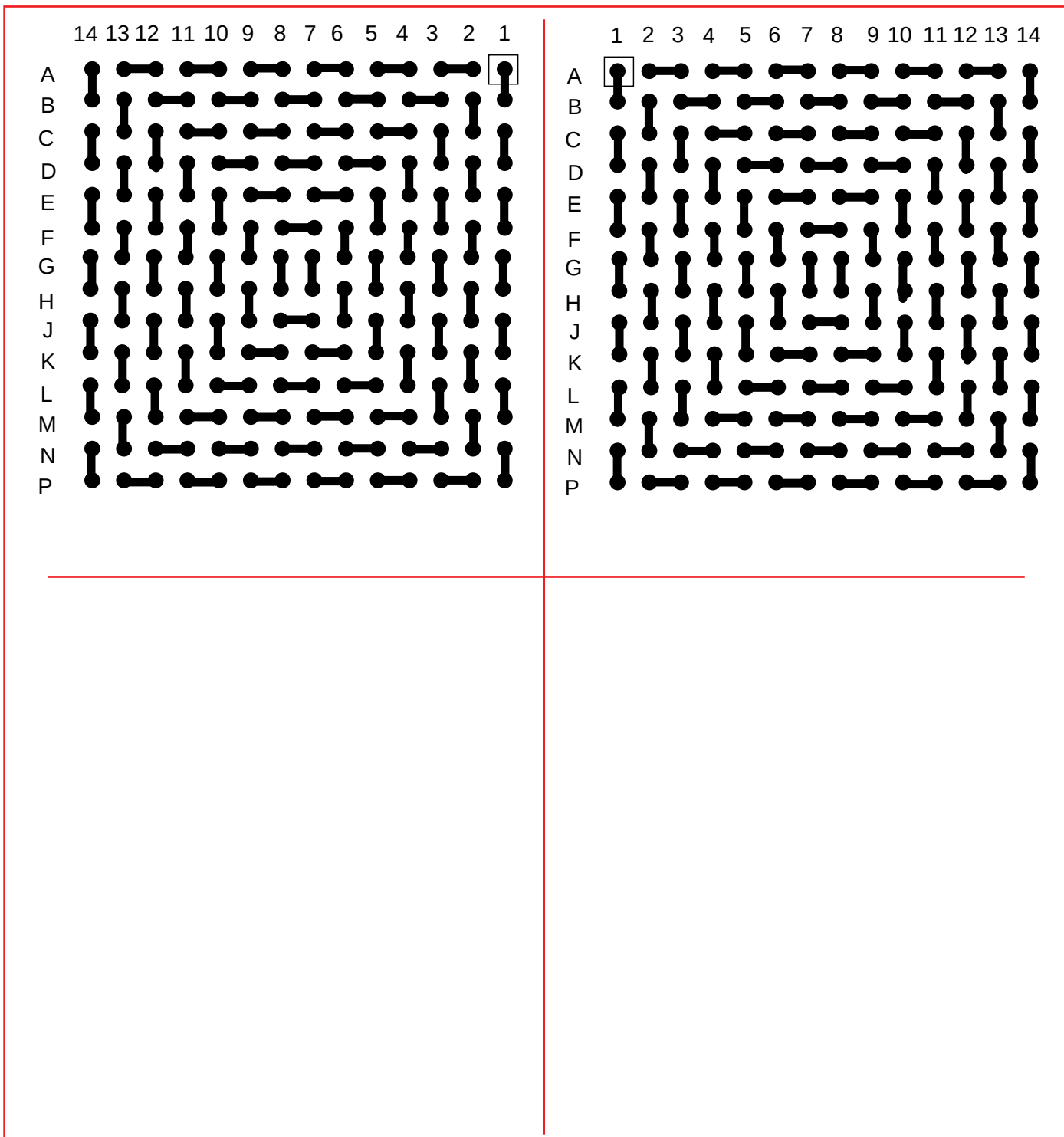
full

MAT'L

FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

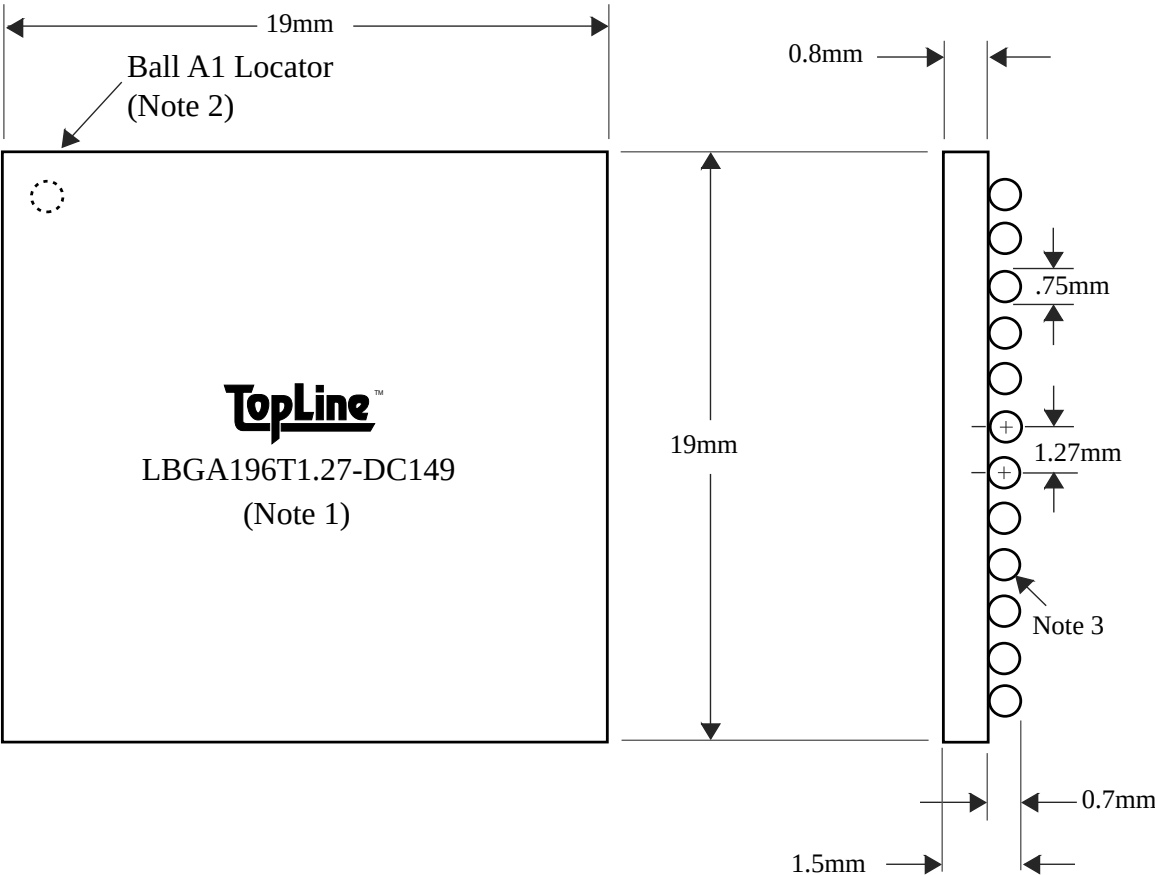
LBGA196T1.27-DC149



BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830
196	1.27mm	19mm SQ	14 x 14	full	full	FR4	FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS	
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date Changes
Note 2	Ball A1 locator mark positioned in corner	11/14/9899	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)	
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY19mm-6x14 Tray Quantity 84 Tray Suppliers (ref):	

BALLS

208

PITCH

1.0mm

SIZE

17mm SQ

MATRIX

16 x 16

ROWS

4

CENTER

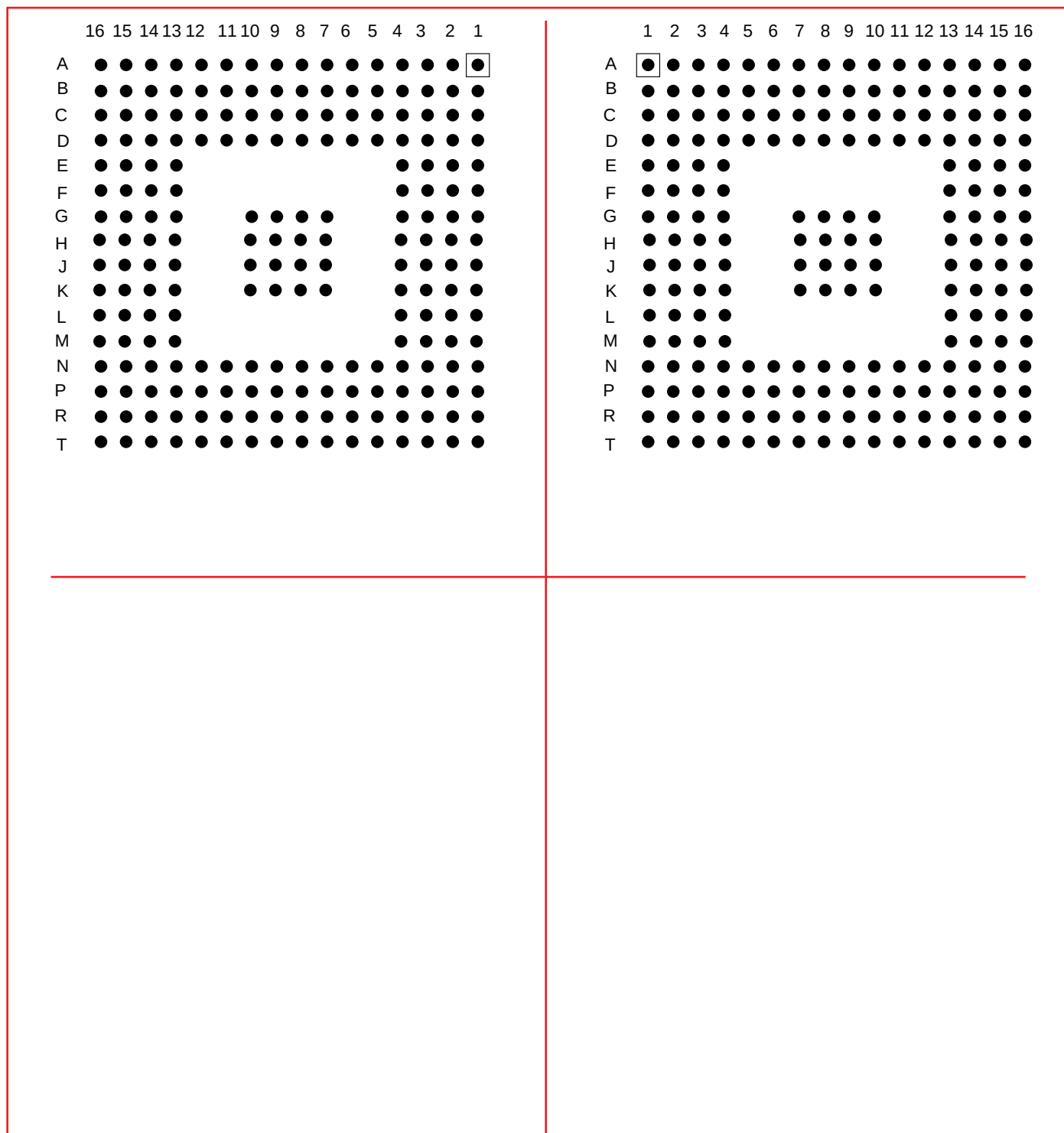
4 x 4

MAT'L

BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA208T1.0-ISO

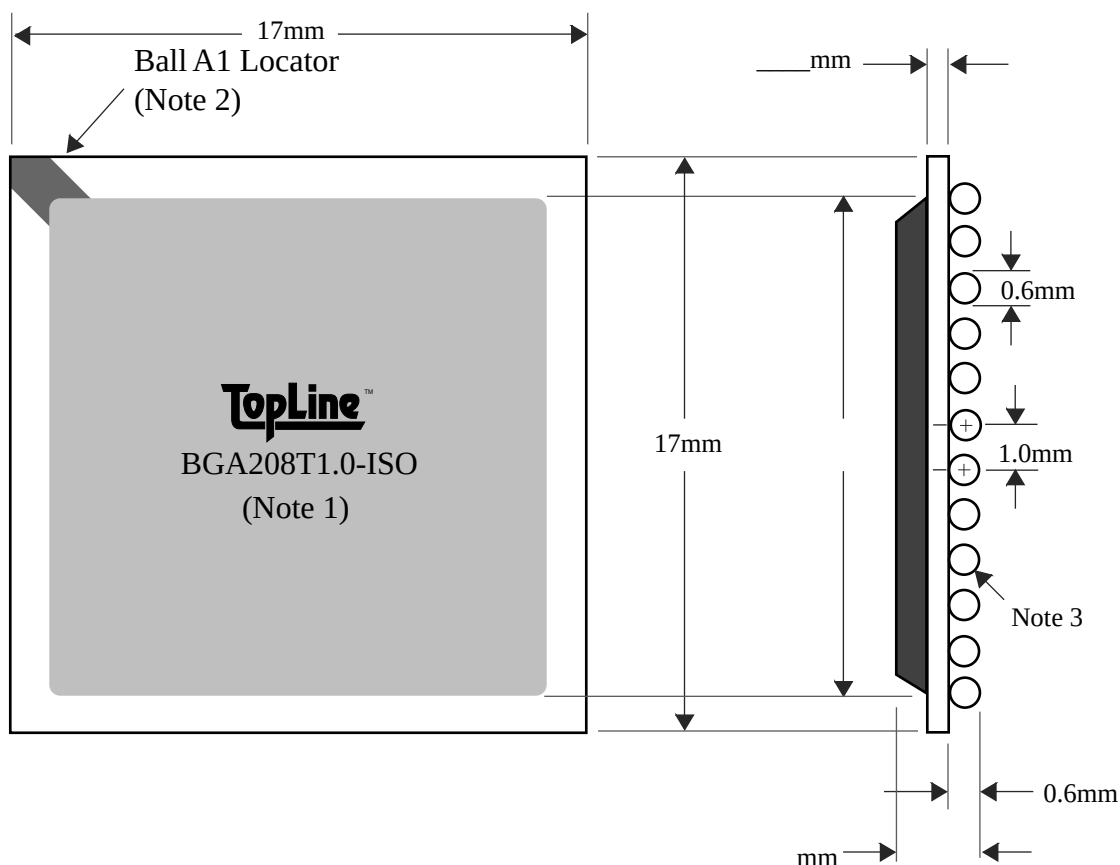
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
208	1.0mm	17mm SQ	16 x 16	4	4 x 4	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY17mm-6x15		
		Tray Quantity 90		
		Tray Suppliers (ref):		

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

208

PITCH

1.0mm

SIZE

17mm SQ

MATRIX

16 x 16

ROWS

full

CENTER

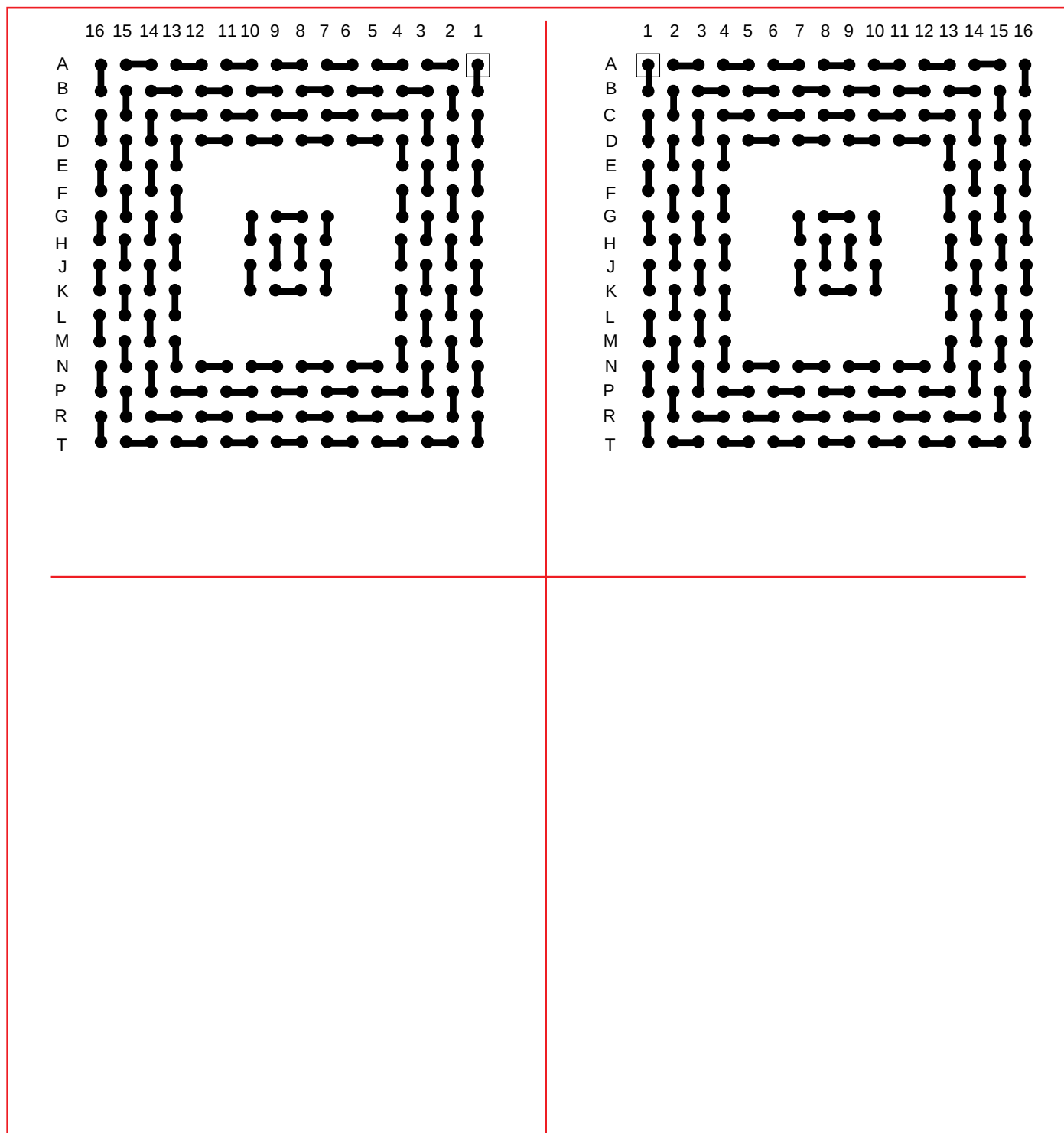
full

MAT'L

FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

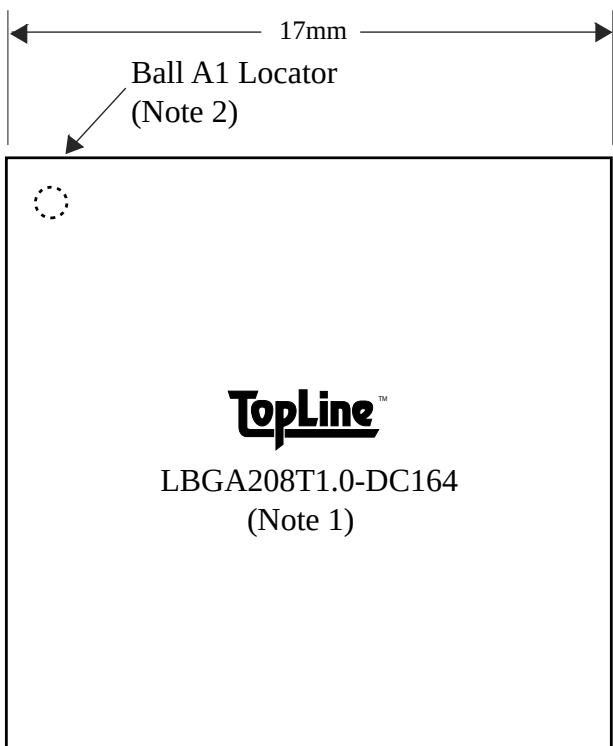
LBGA208T1.0-DC164

TopLine™

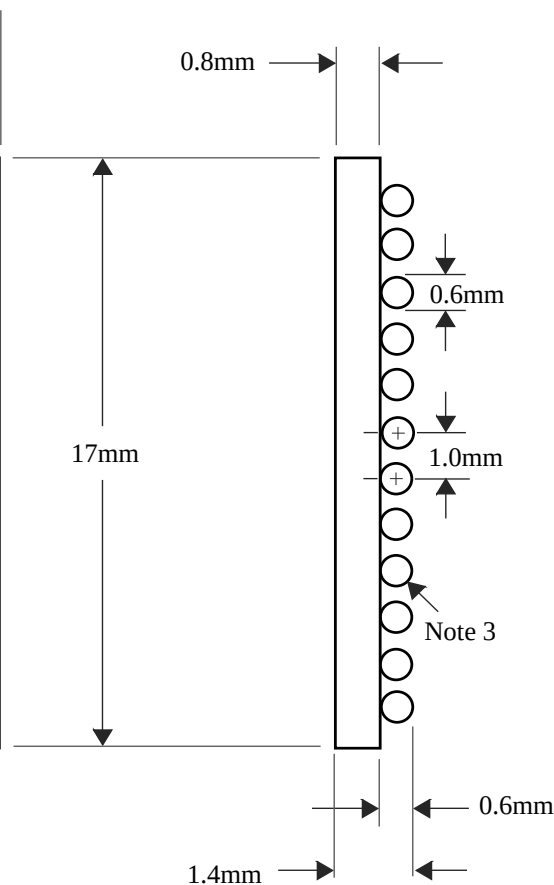
BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
208	1.0mm	17mm SQ	16 x 16	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY17mm-6x15 Tray Quantity 90 Tray Suppliers (ref):		



TEL 1-714-898-3830

FAX 1-714-891-0321

BGA208T1.27-ISO

BALLS

208

PITCH

1.27mm

SIZE

23mm SQ

MATRIX

17 x 17

ROWS

4

CENTER

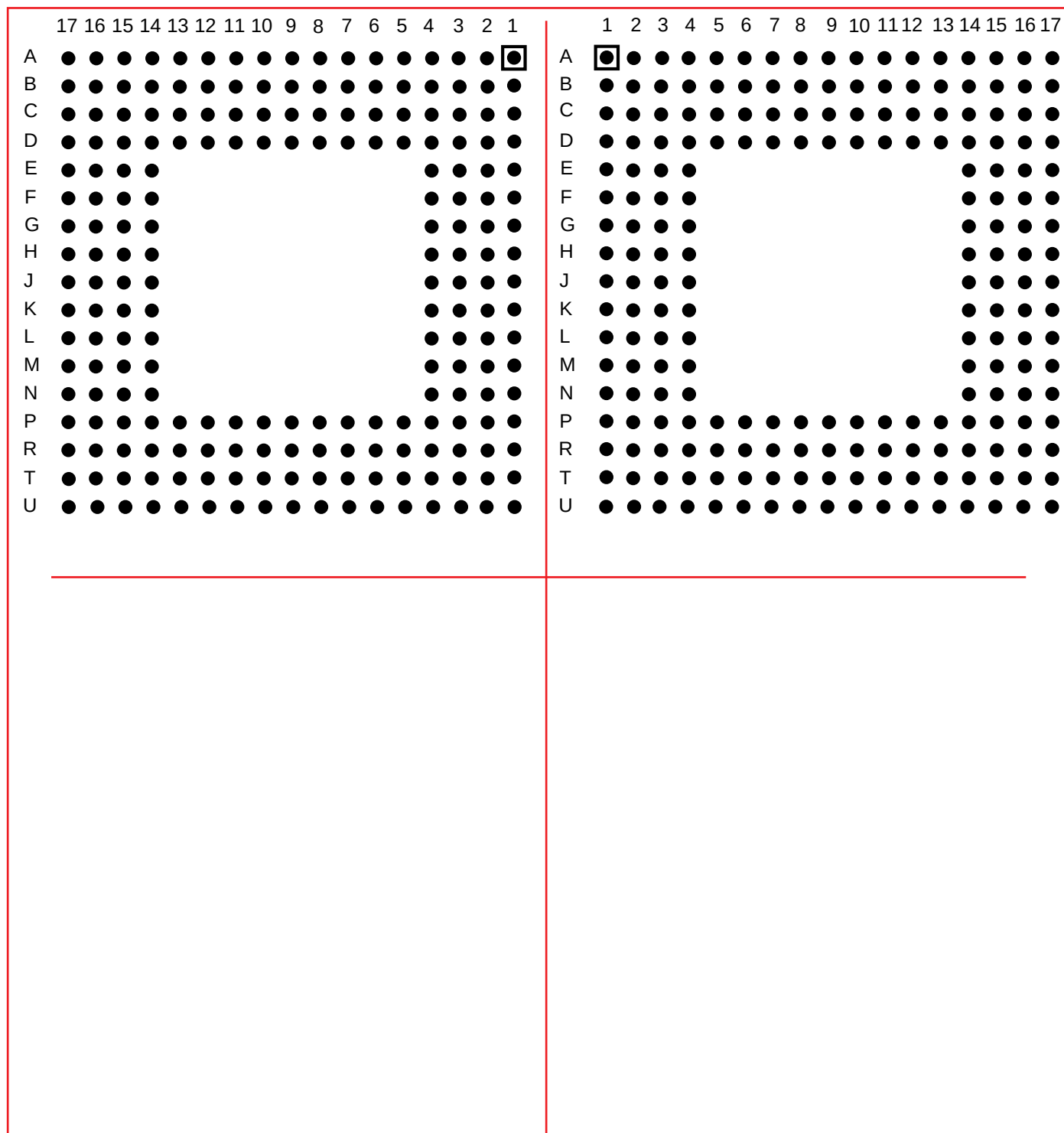
none

MAT'L

BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA208T1.27-ISO

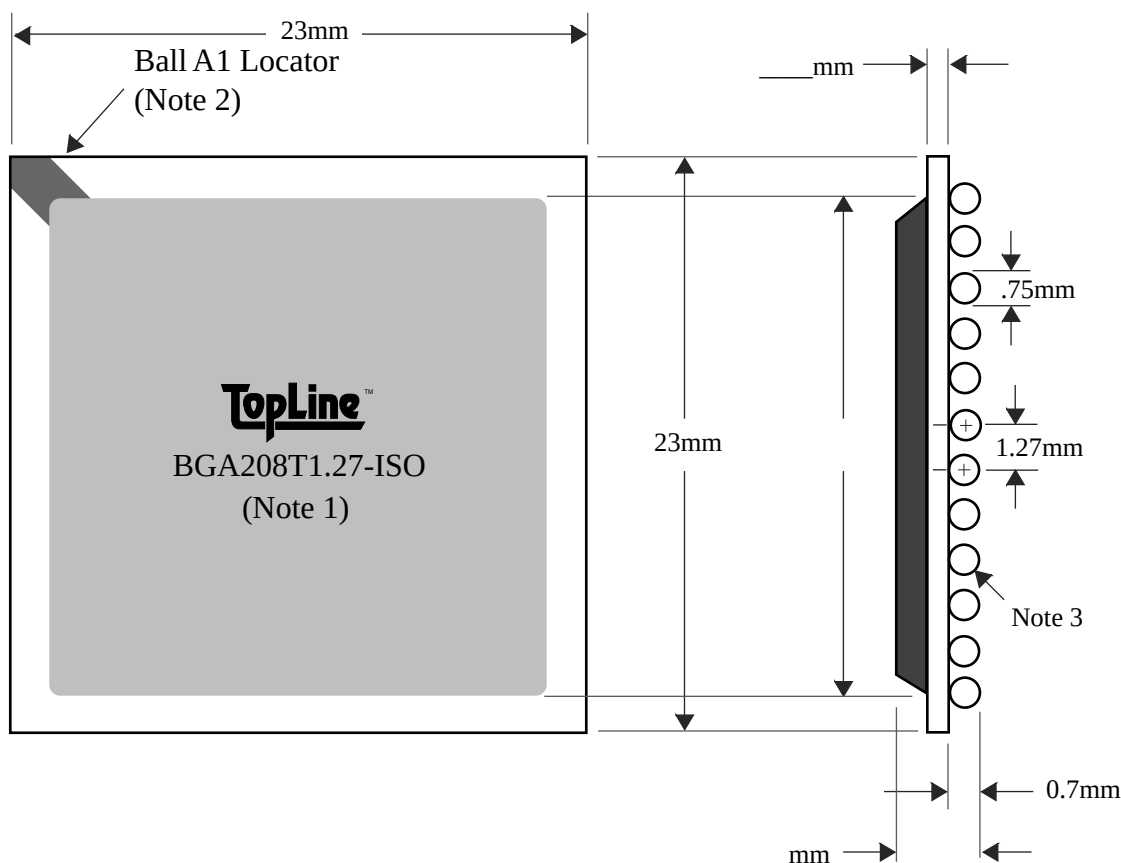
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
208	1.27mm	23mm SQ	17 x 17	4	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

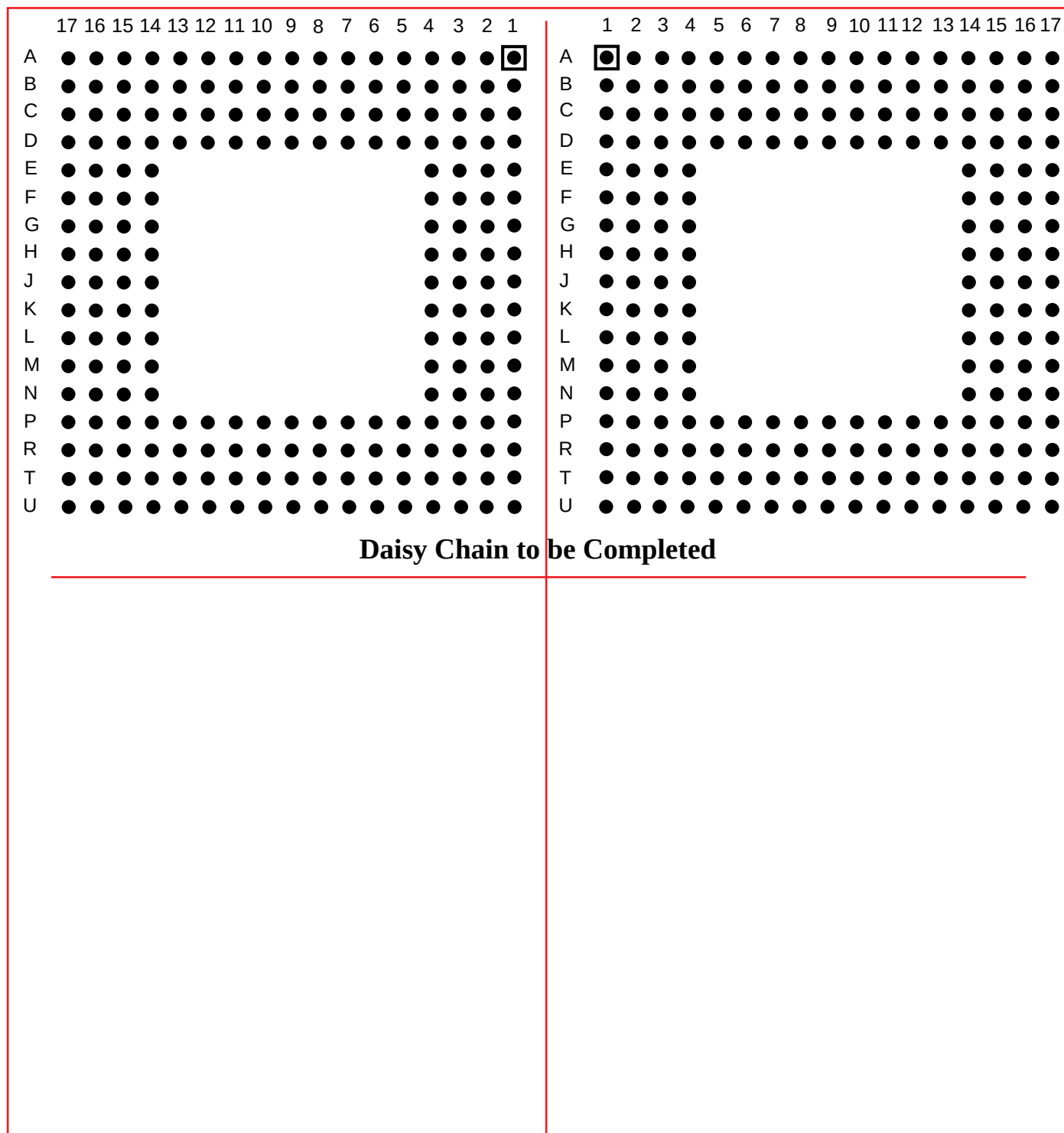


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY23,-5x12		
		Tray Quantity 60		
		Tray Suppliers (ref):		

	<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
TEL 1-714-898-3830							
FAX 1-714-891-0321	208	1.27mm	23mm SQ	17 x 17	4	none	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA208T1.27-DC172

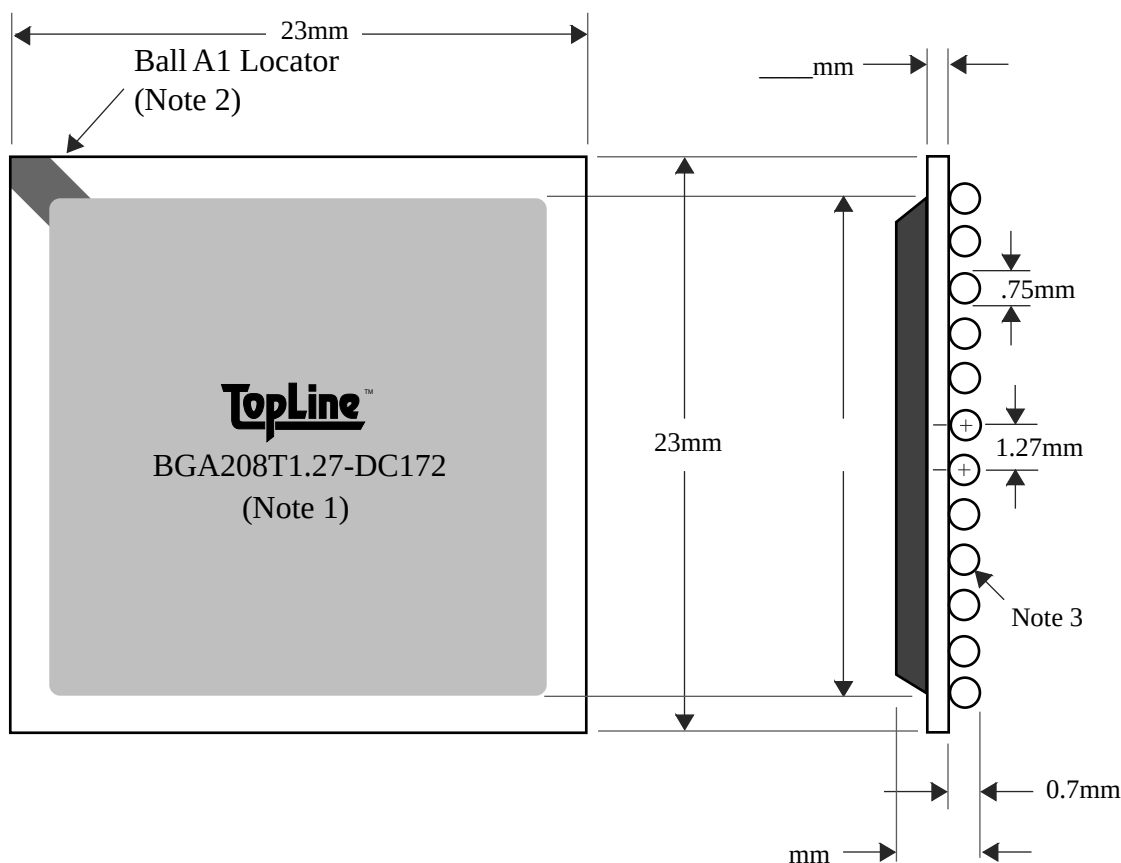
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
208	1.27mm	23mm SQ	17 x 17	4	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY23,-5x12 Tray Quantity 60 Tray Suppliers (ref):		

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

208

PITCH

1.27mm

SIZE

23mm SQ

MATRIX

17 x 17

ROWS

4

CENTER

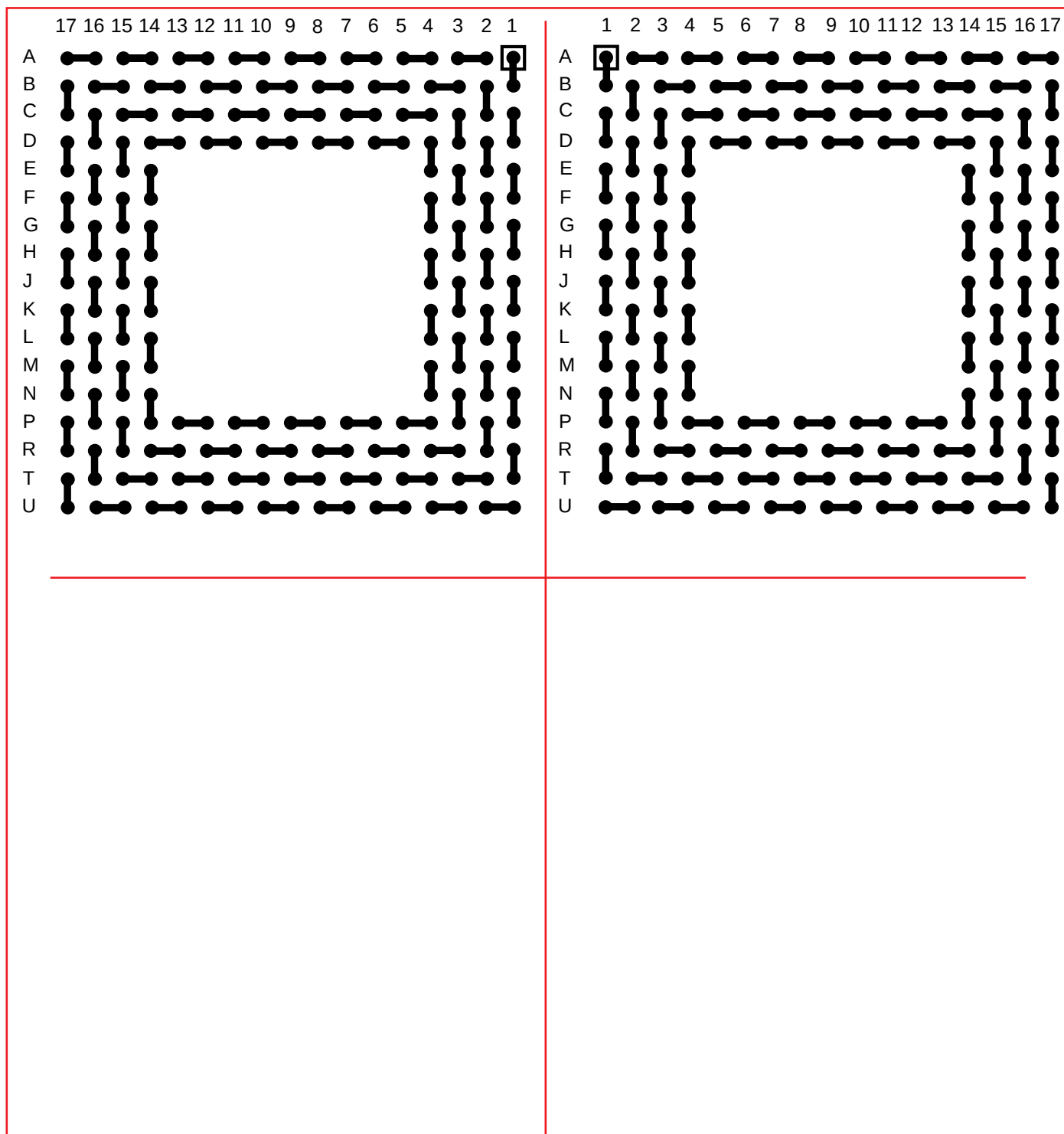
none

MAT'L

BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA208T1.27-DC170

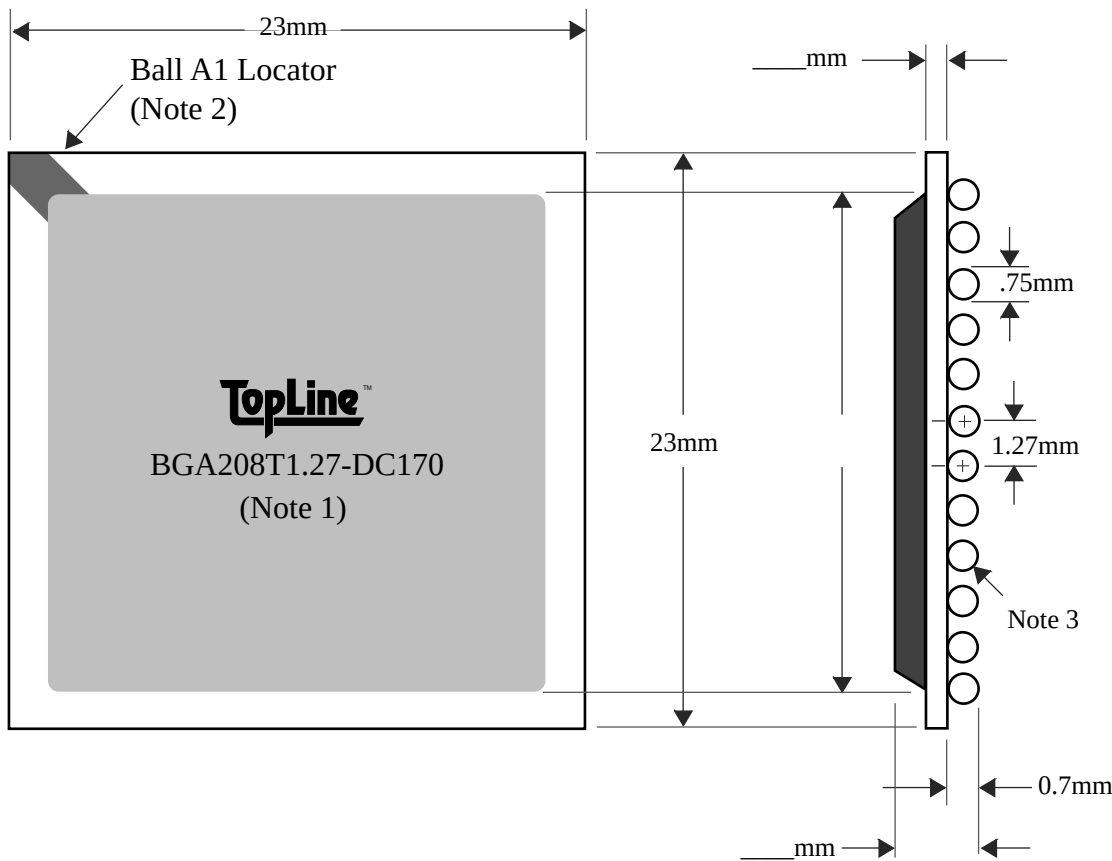
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
208	1.27mm	23mm SQ	17 x 17	4	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

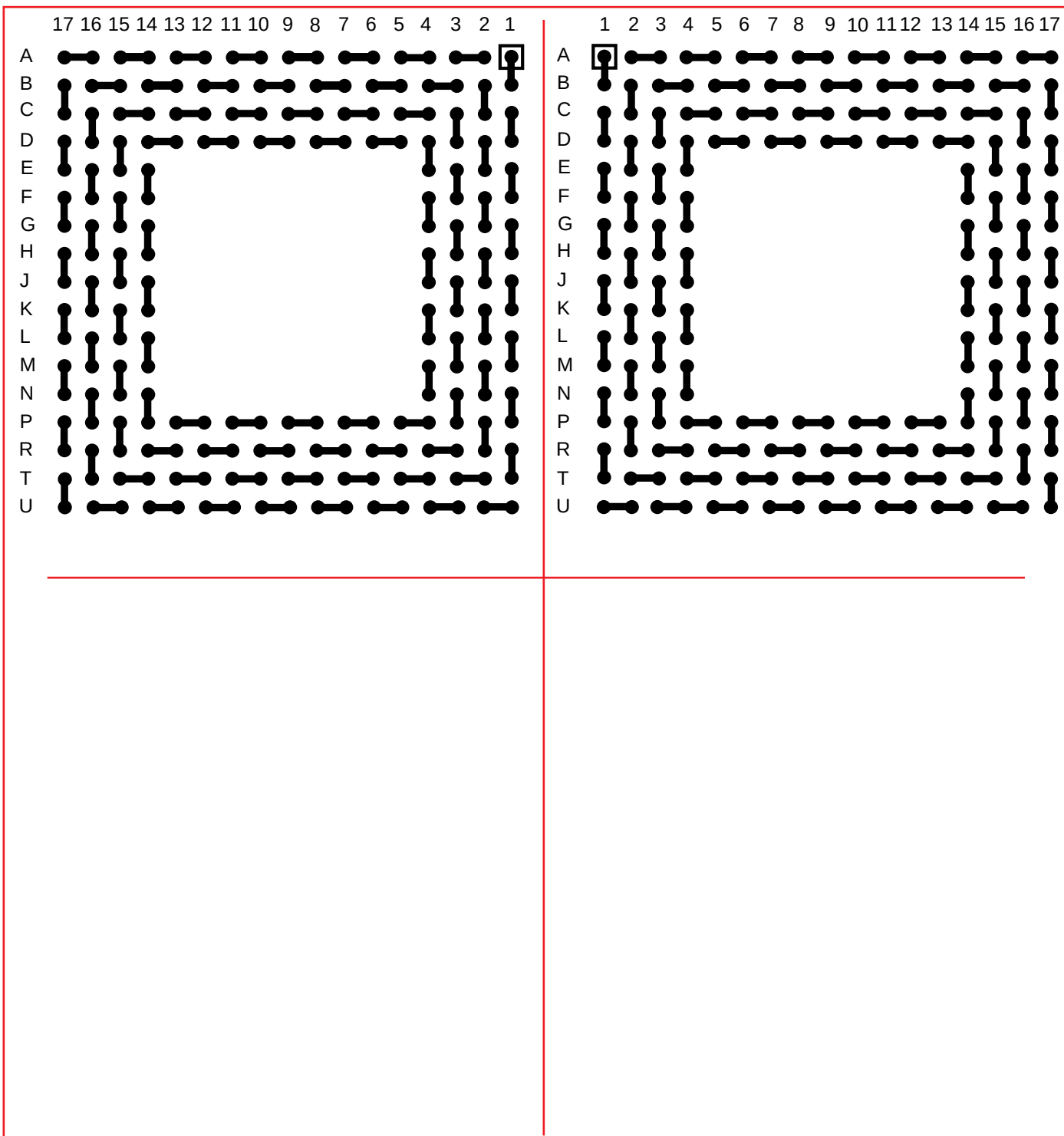


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner	SID		1264141
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY23mm-5x12 Tray Quantity 60 Tray Suppliers (ref):		

TEL 1-714-898-3830	<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
FAX 1-714-891-0321	208	1.27mm	23mm SQ	17 x 17	full	full	FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

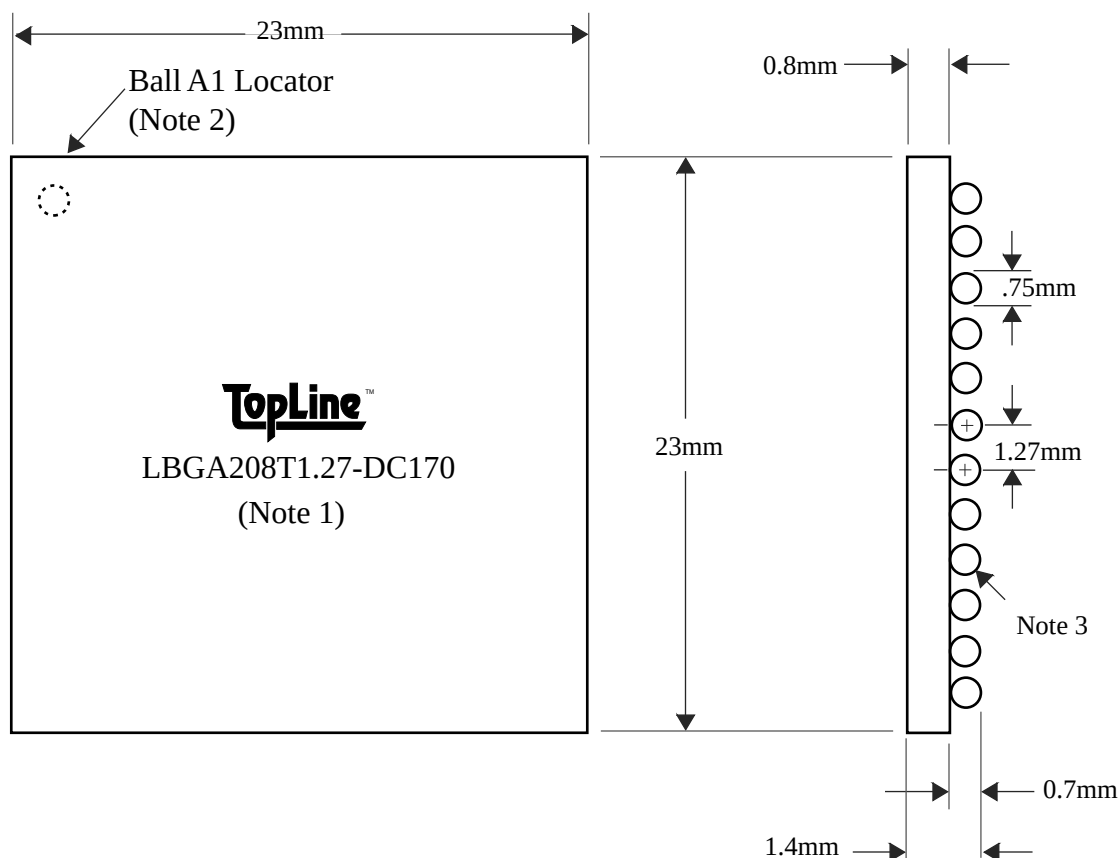
LBGA208T1.27-DC170



BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830 FAX 1-714-891-0321
208	1.27mm	23mm SQ	17 x 17	full	full	FR4	

TOP VIEW

SIDE VIEW

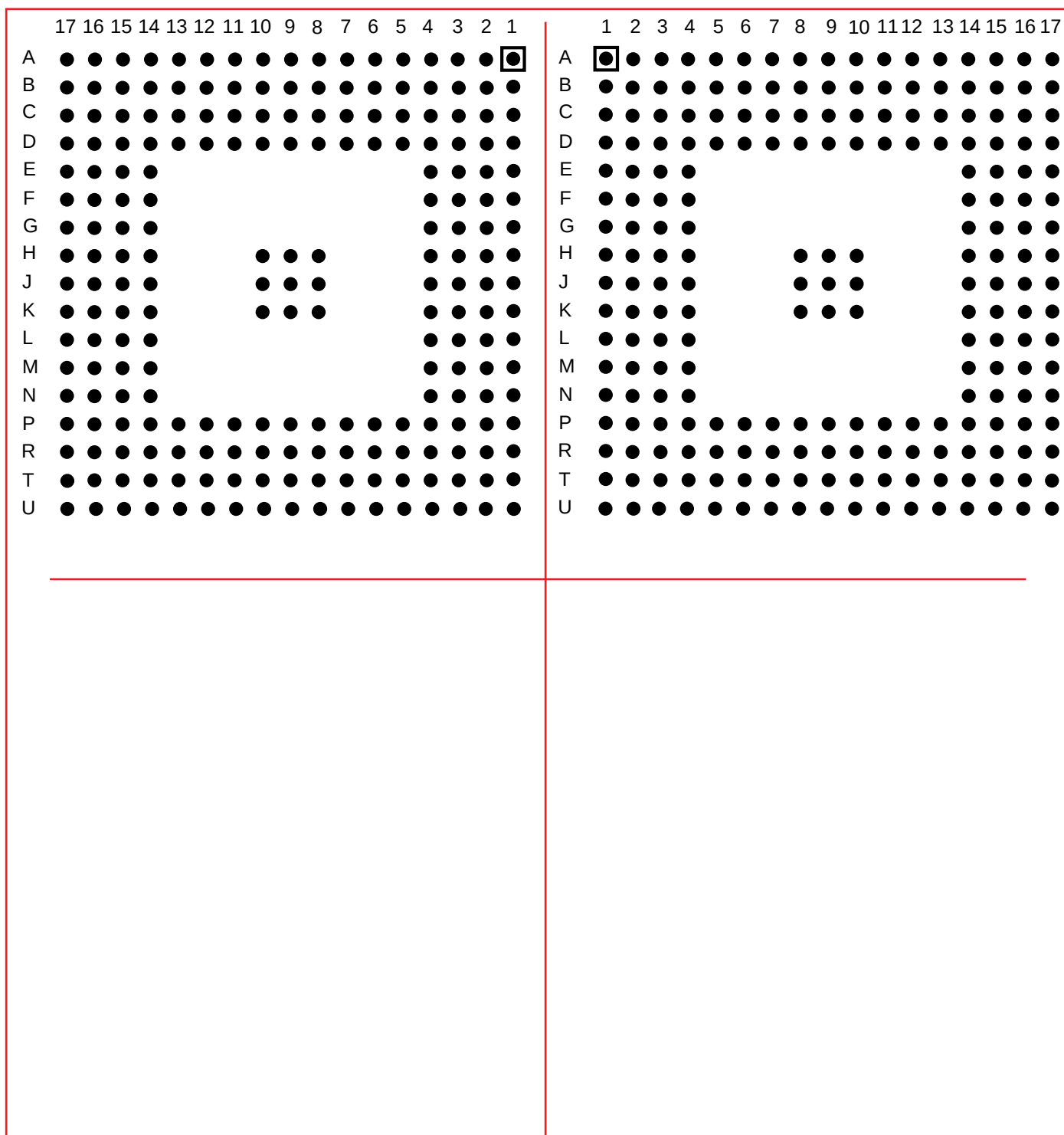


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY23mm-5x12 Tray Quantity 60 Tray Suppliers (ref):		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
217	1.27mm	23mm SQ	17 x 17	4	3 x 3	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA217T1.27-ISO

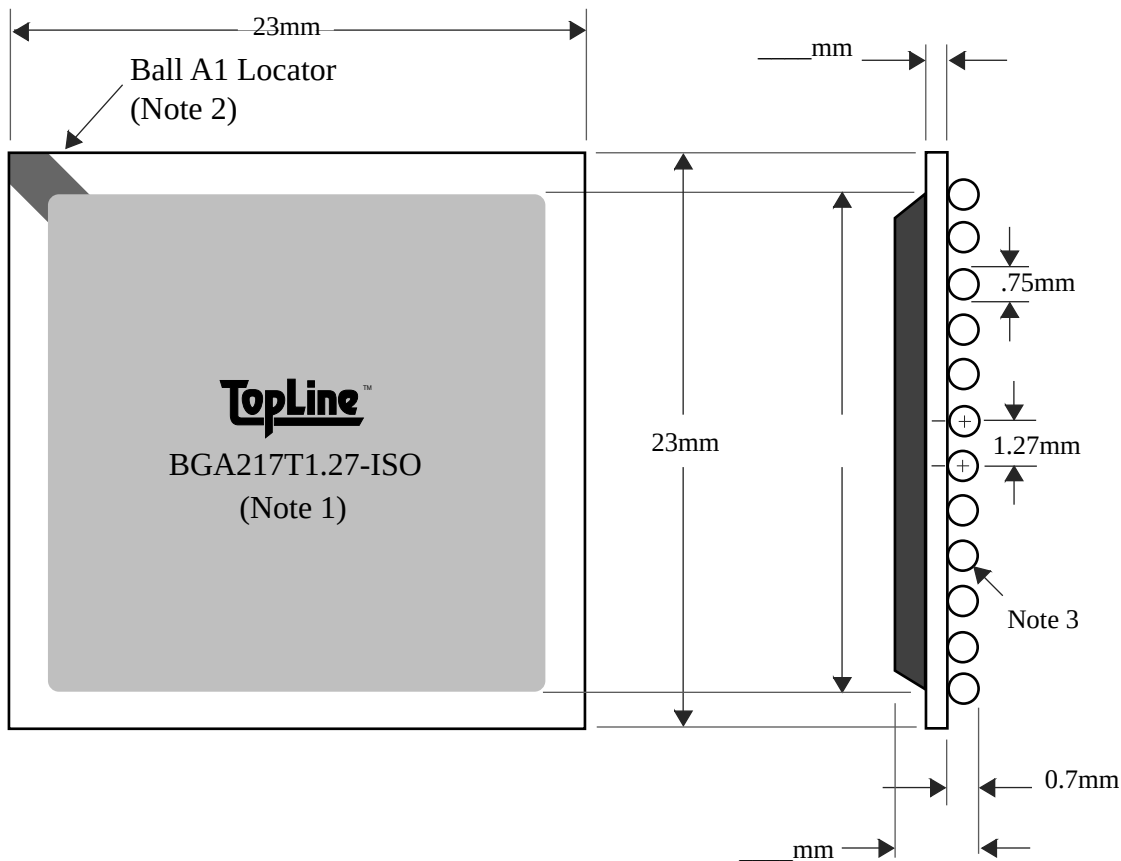


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
217	1.27mm	23mm SQ	17 x 17	4	3 x 3	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner	SID		1264141
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY23mm-5x12 Tray Quantity 60 Tray Suppliers (ref):		



TEL 1-714-898-3830

FAX 1-714-891-0321

BGA217T1.27-DC171

BALLS

217

PITCH

1.27mm

SIZE

23mm SQ

MATRIX

17 x 17

ROWS

4

CENTER

3 x 3

MAT'L

BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA217T1.27-DC171

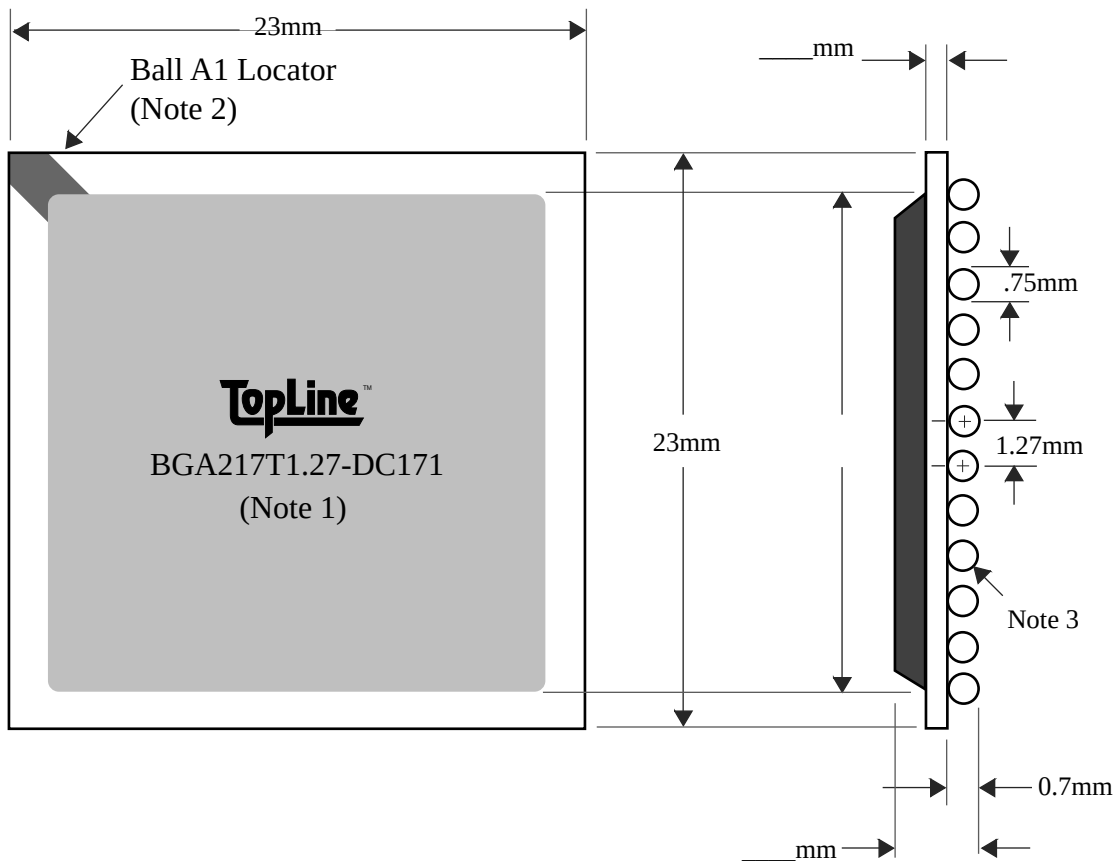
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
217	1.27mm	23mm SQ	17 x 17	4	3 x 3	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY23mm-5x12 Tray Quantity 60 Tray Suppliers (ref):		

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

217

PITCH

1.27mm

SIZE

23mm SQ

MATRIX

17 x 17

ROWS

4

CENTER

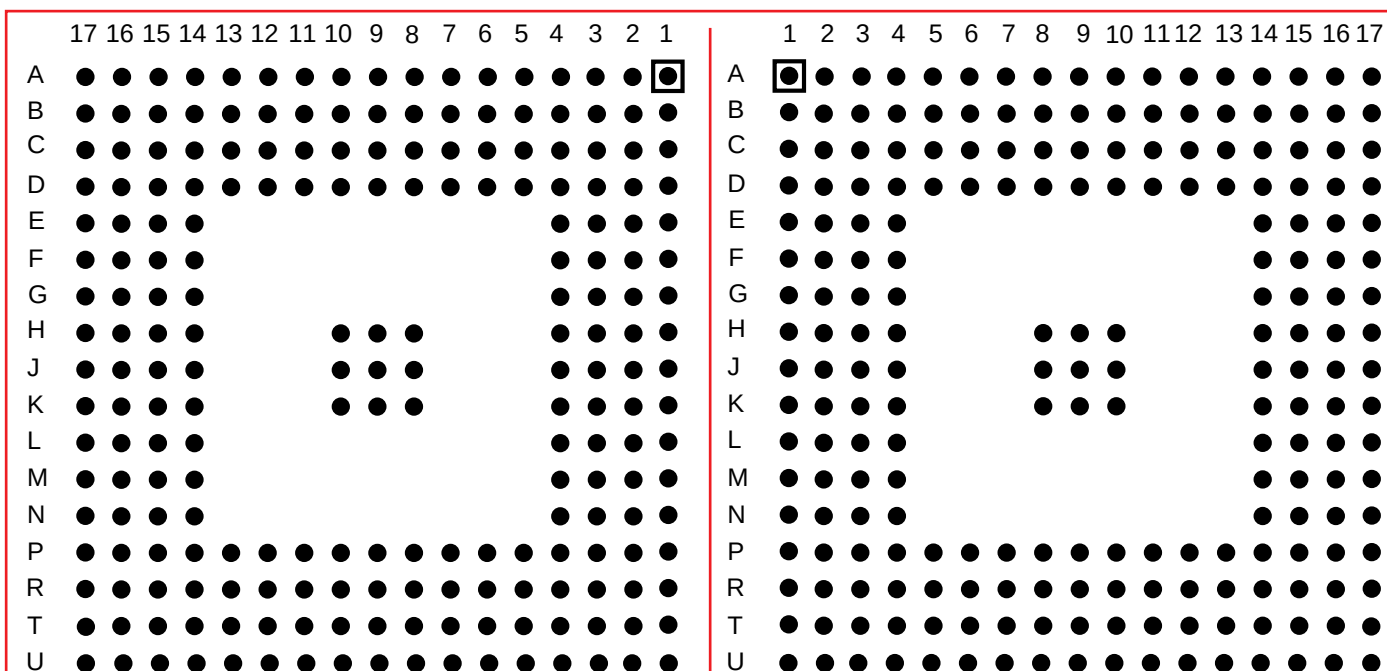
3 x 3

MAT'L

BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



Daisy Chain to be Completed

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA217T1.27-DC174

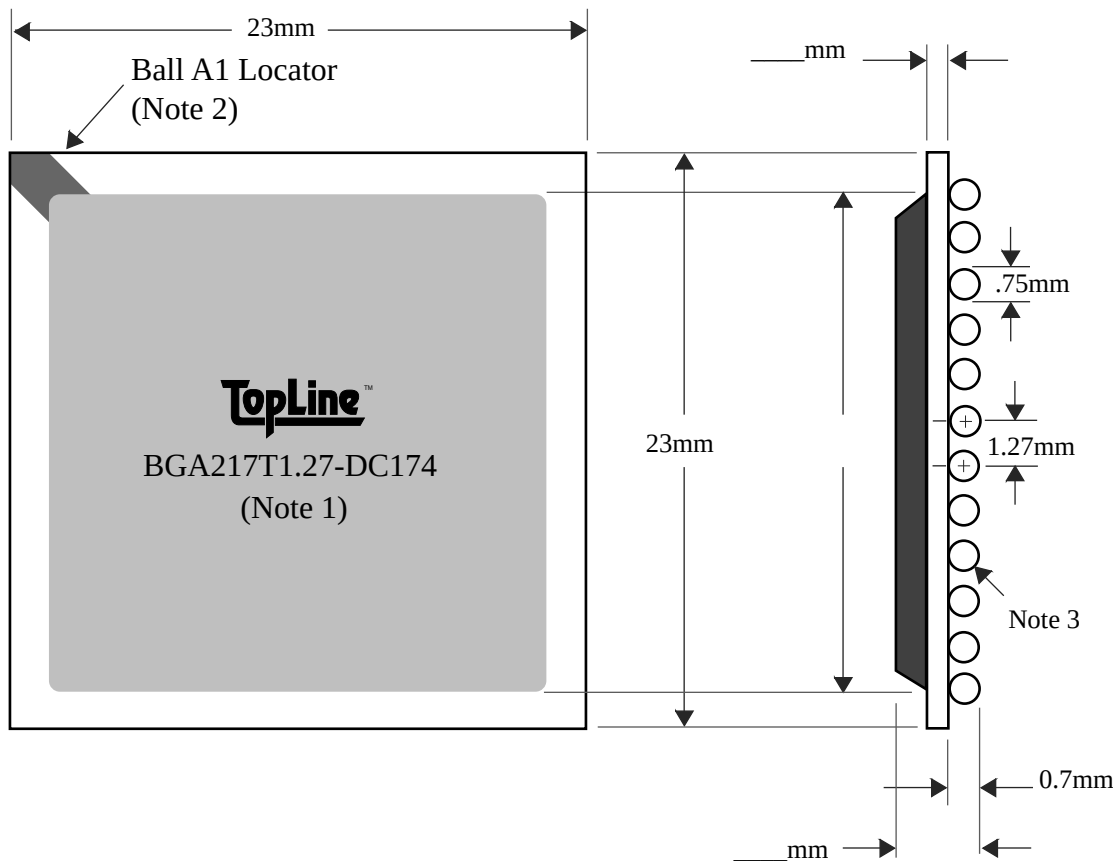


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
217	1.27mm	23mm SQ	17 x 17	4	3 x 3	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner	SID		1264141
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY23mm-5x12 Tray Quantity 60 Tray Suppliers (ref):		

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

217

PITCH

1.27mm

SIZE

23mm SQ

MATRIX

17 x 17

ROWS

4

CENTER

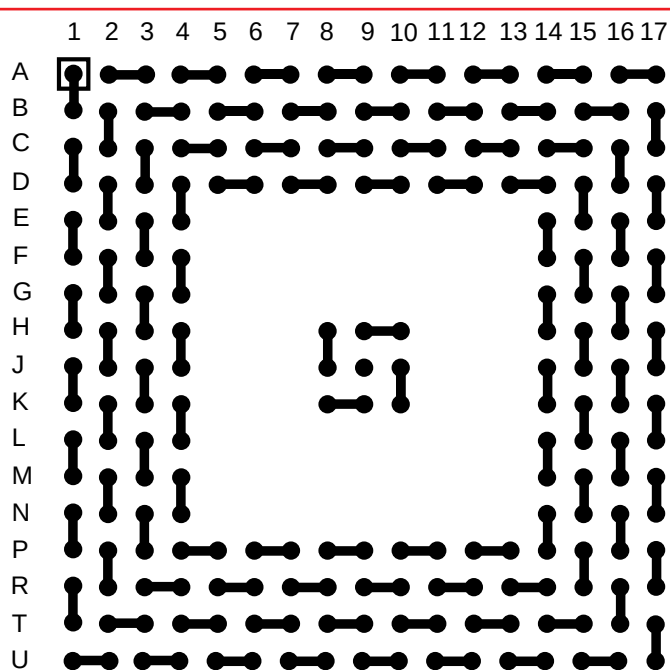
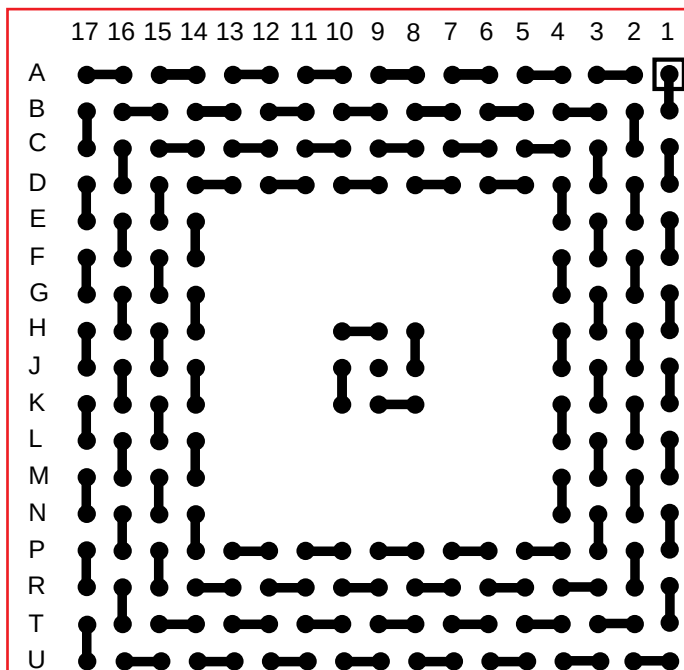
3 x 3

MAT'L

FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA217T1.27-DC173

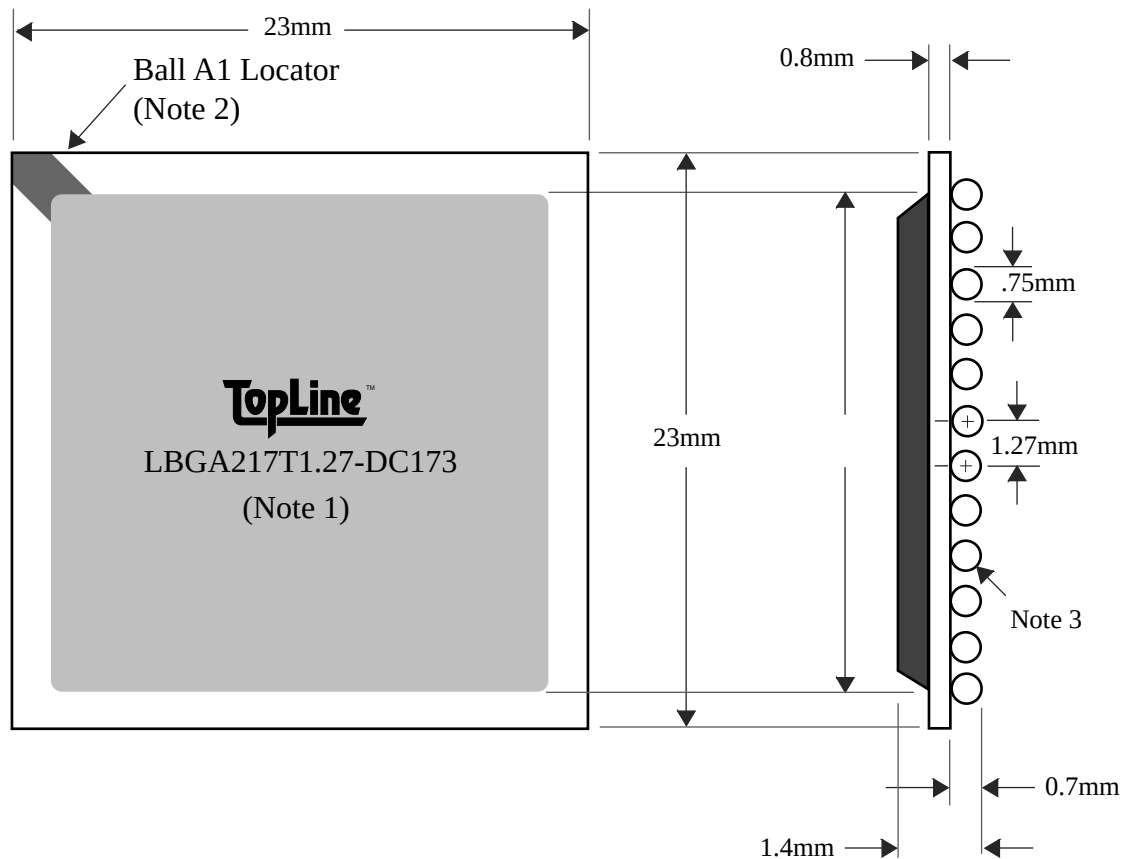
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
217	1.27mm	23mm SQ	17 x 17	4	3 x 3	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

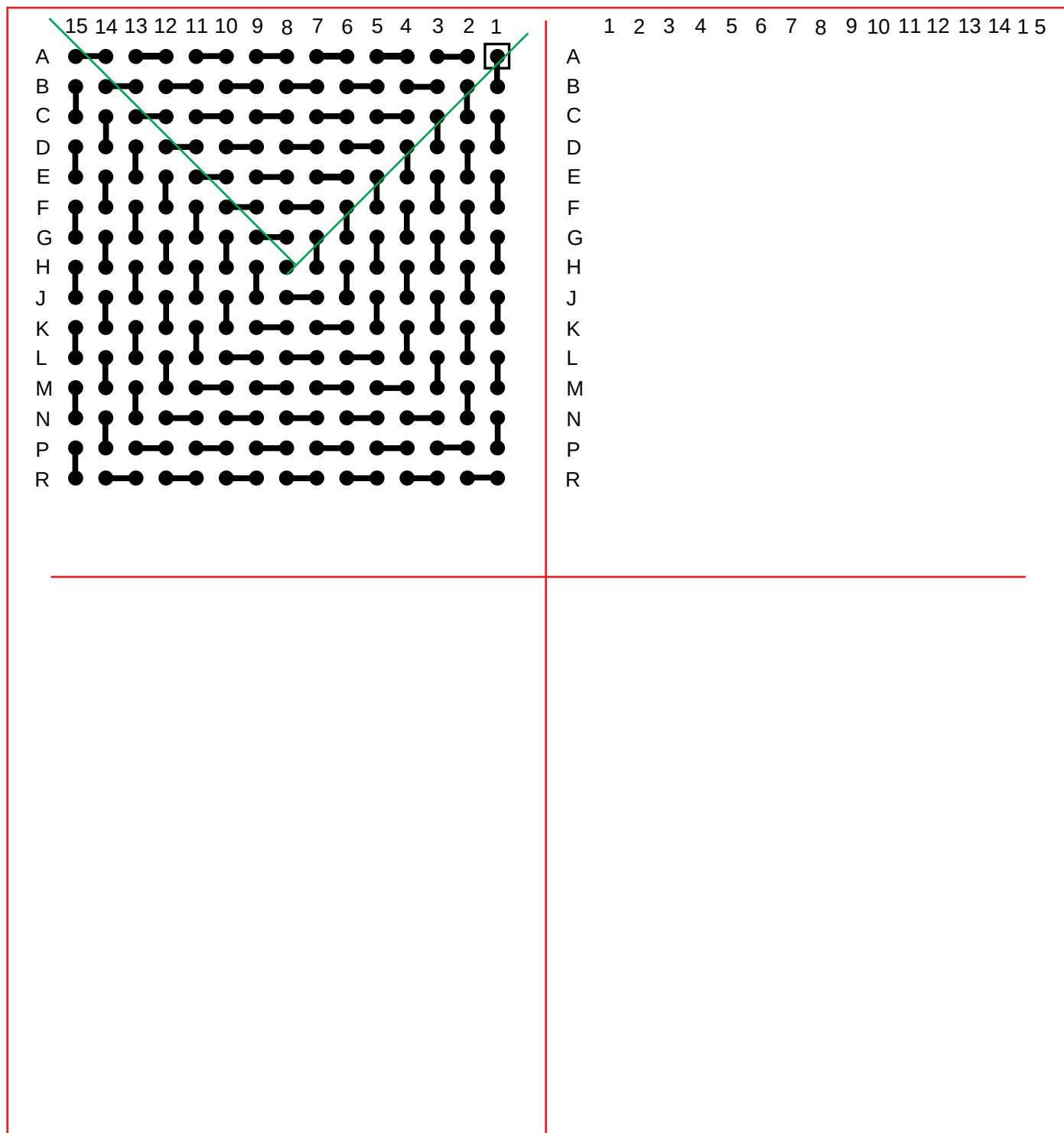


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY23mm-5x12 Tray Quantity 60 Tray Suppliers (ref):		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
225	1.27mm	21mm SQ	15 x 15mm	full	full	ceramic

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

CBGA225T1.27-DC159

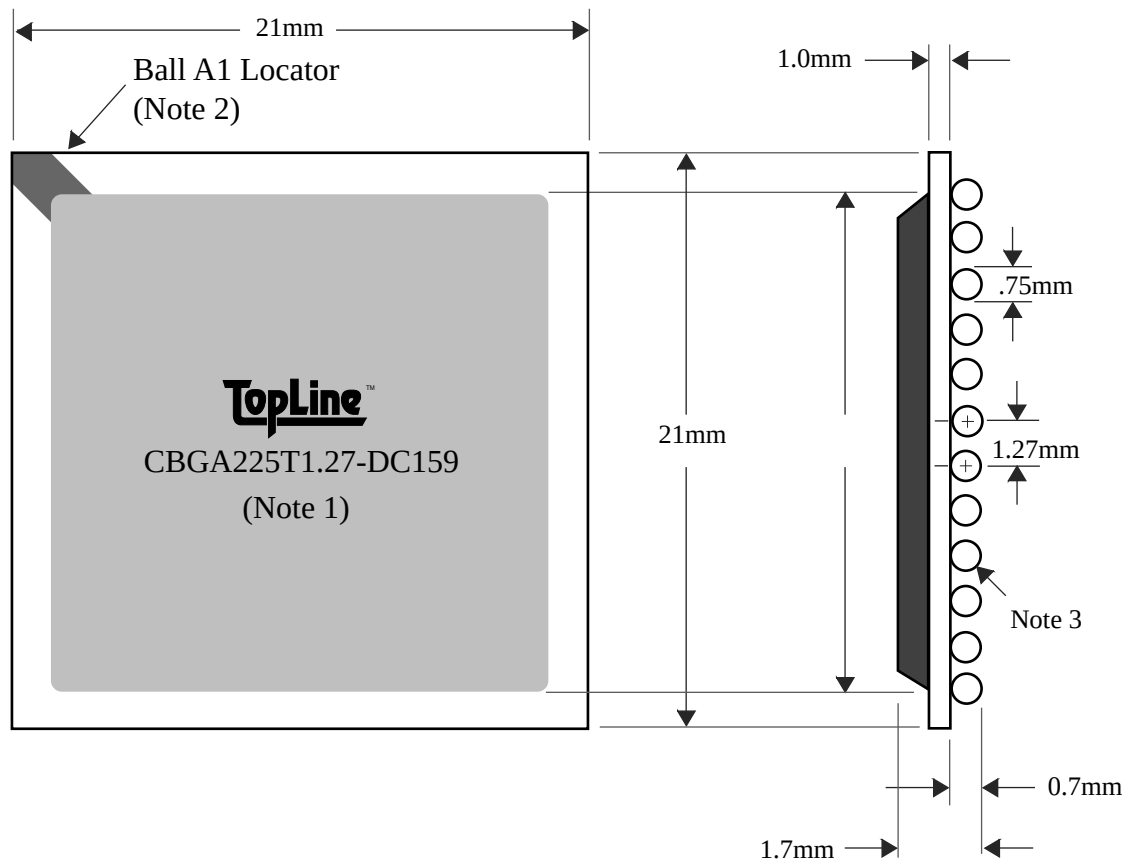
TopLine™

TEL 1-714-898-3830
FAX 1-714-891-0321

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
225	1.27mm	21mm SQ	15 x 15mm	full	full	ceramic

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
			11/14/98	Proposed Design
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 10/90SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY21mm-5x12 Tray Quantity 60 Tray Suppliers (ref):		

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

225

PITCH

1.27mm

SIZE

21mm SQ

MATRIX

15 x 15mm

ROWS

full

CENTER

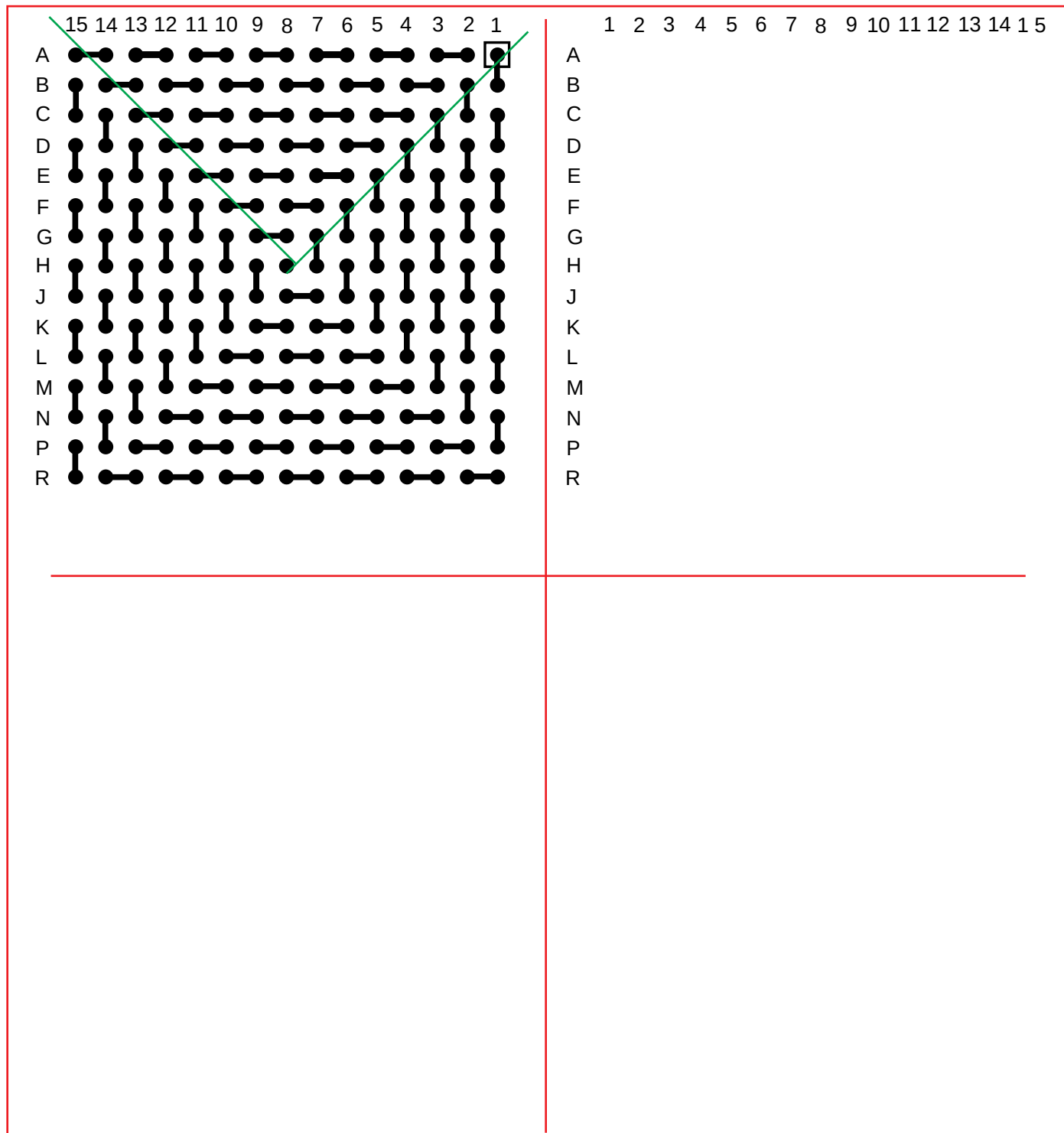
full

MAT'L

ceramic

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

CBGA225T1.27L-DC159

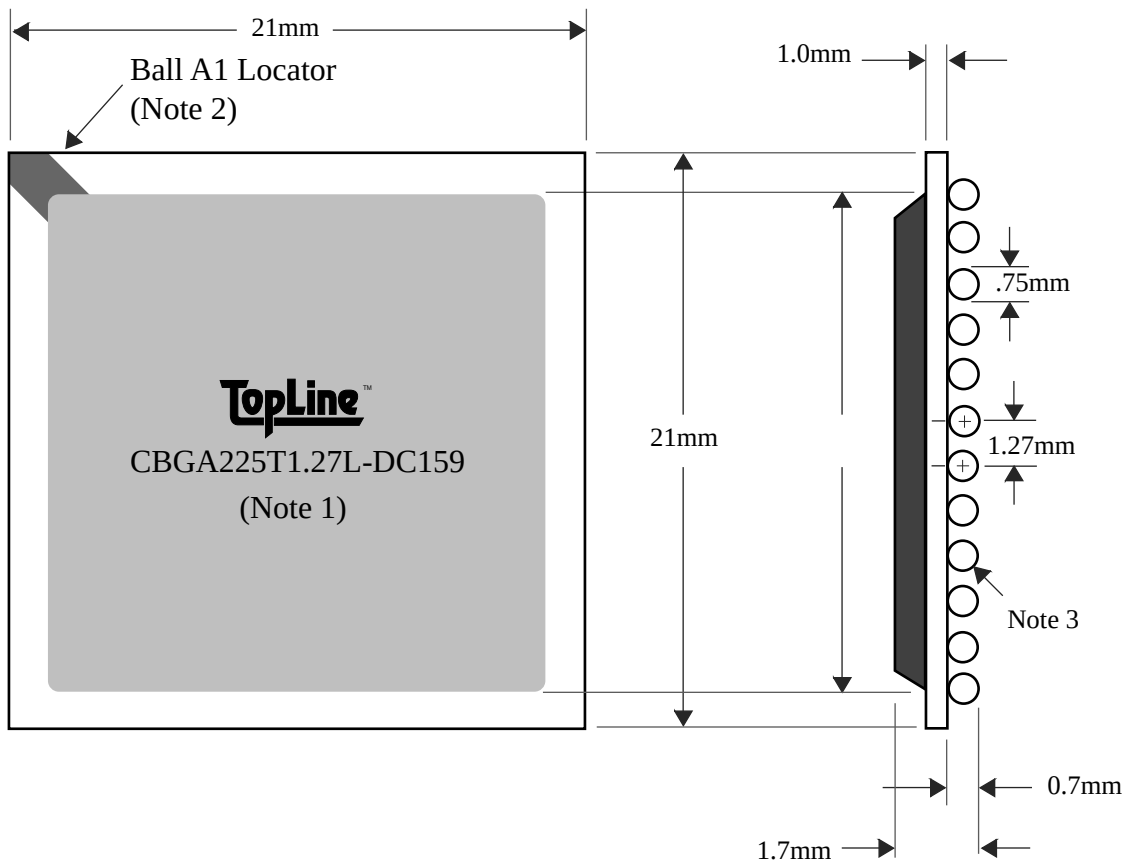
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
225	1.27mm	21mm SQ	15 x 15mm	full	full	ceramic

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



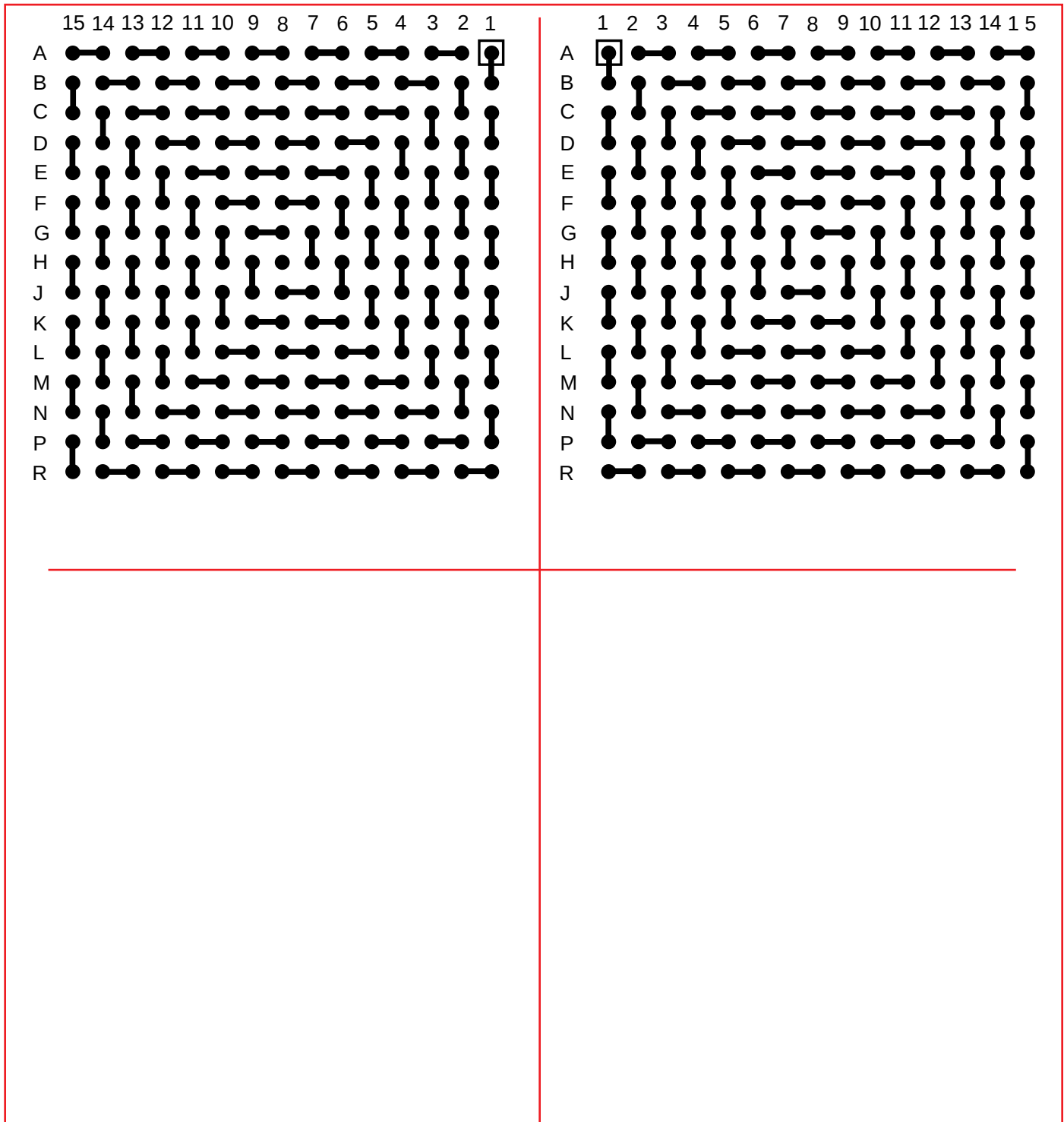
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY21mm-5x12 Tray Quantity 60 Tray Suppliers (ref):		

TEL 1-714-898-3830
FAX 1-714-891-0321

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
225	1.27mm	21mm SQ	15 x 15	full	full	FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

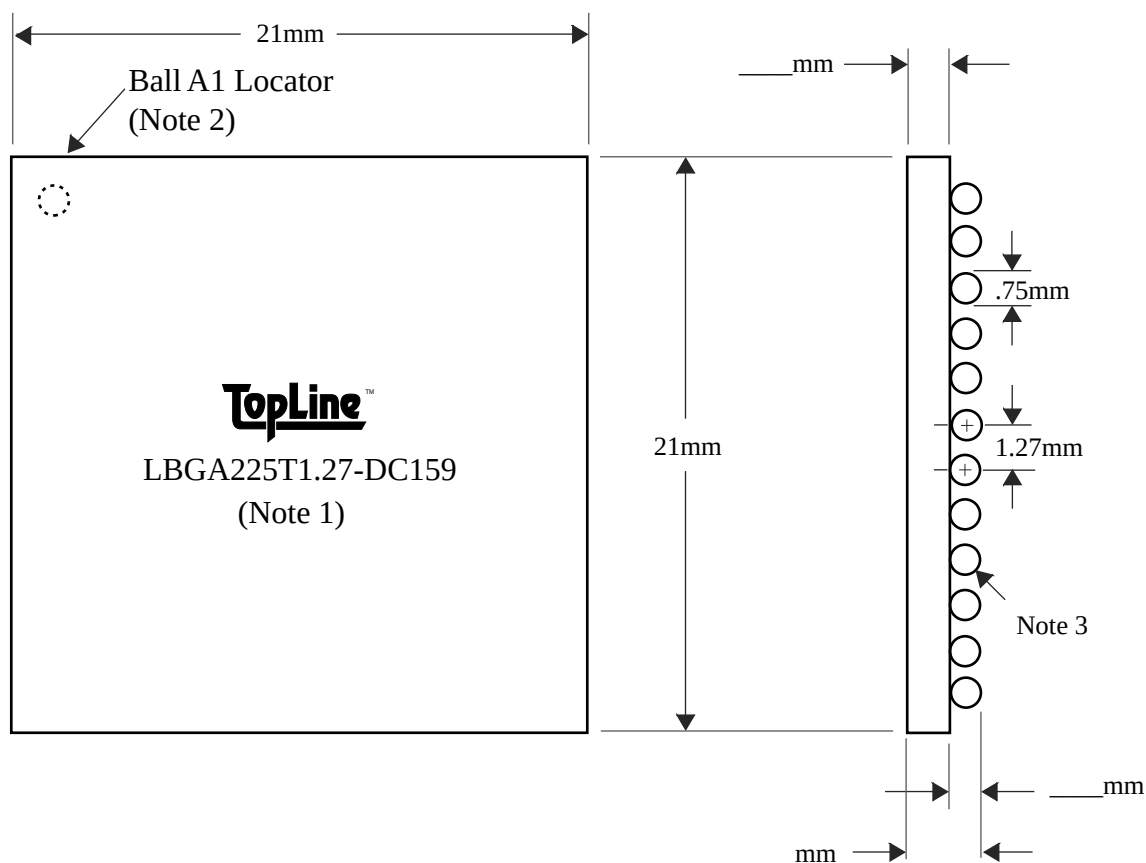
LBGA225T1.27-DC159

TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830 FAX 1-714-891-0321
225	1.27mm	21mm SQ	15 x 15	full	full	FR4	

TOP VIEW

SIDE VIEW

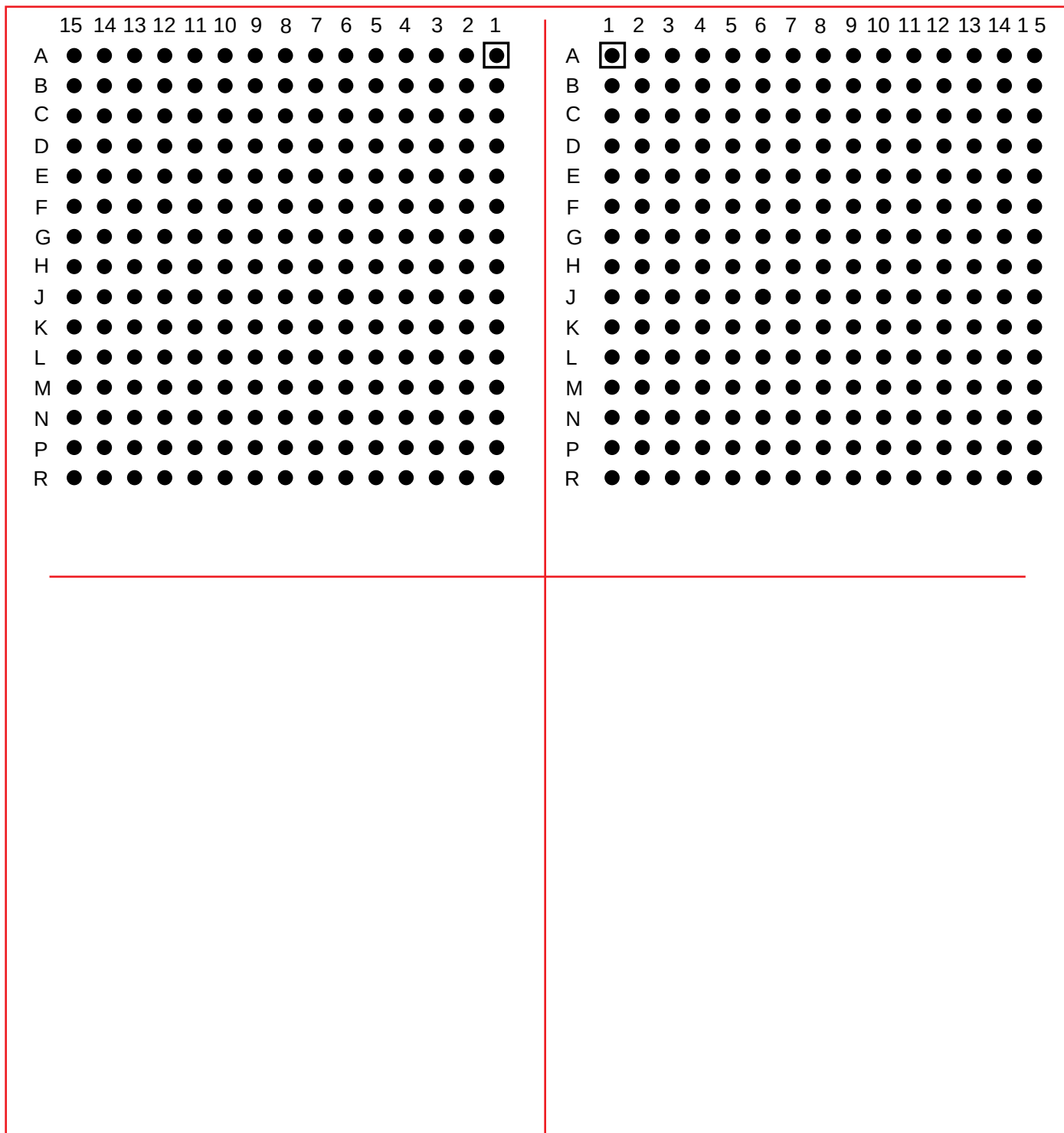


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY21mm-5x12 Tray Quantity 60 Tray Suppliers (ref):		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
225	1.5mm	27mm SQ	15 x 15	full	full	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA225T1.5-ISO

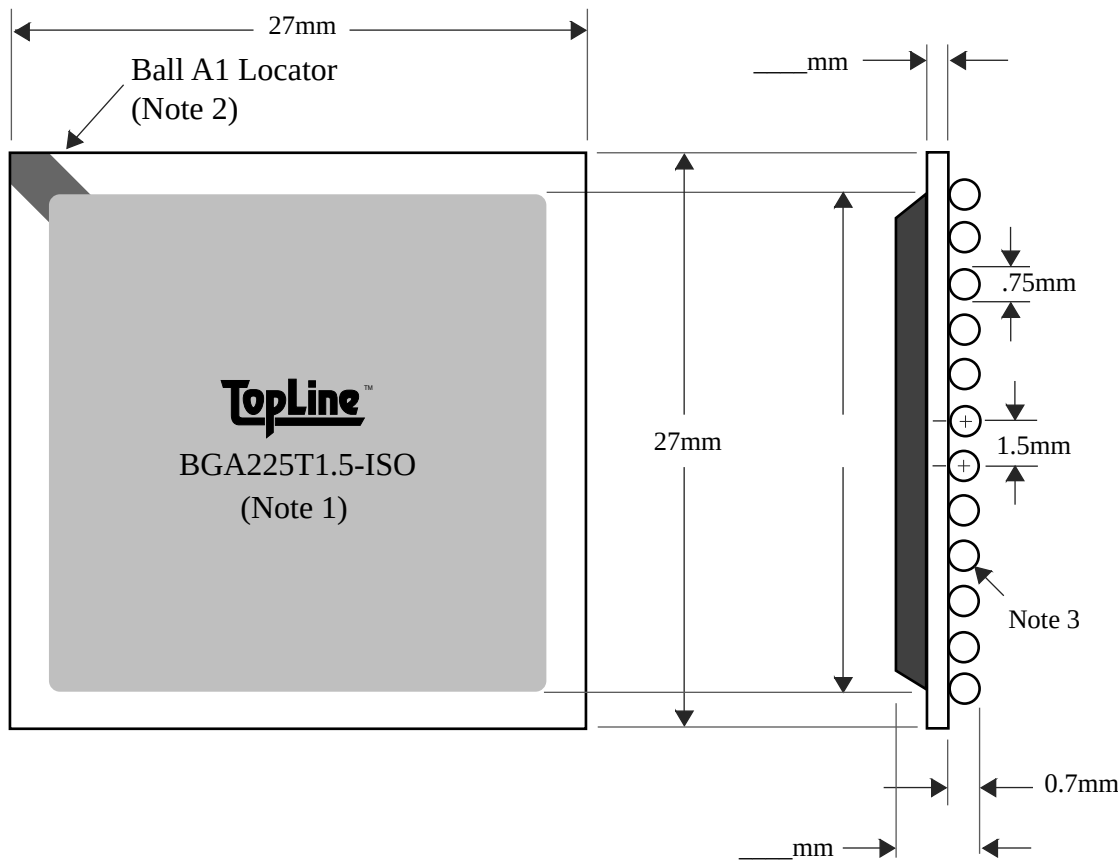


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
225	1.5mm	27mm SQ	15 x 15	full	full	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY27mm-4x10		
		Tray Quantity 40		
		Tray Suppliers (ref):		



TEL 1-714-898-3830

FAX 1-714-891-0321

BGA225T1.5-DC15

BALLS

PITCH

SIZE

MATRIX

ROWS

CENTER

MAT'L

225

1.5mm

27mm SQ

15 x 15

full

full

BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA225T1.5-DC15

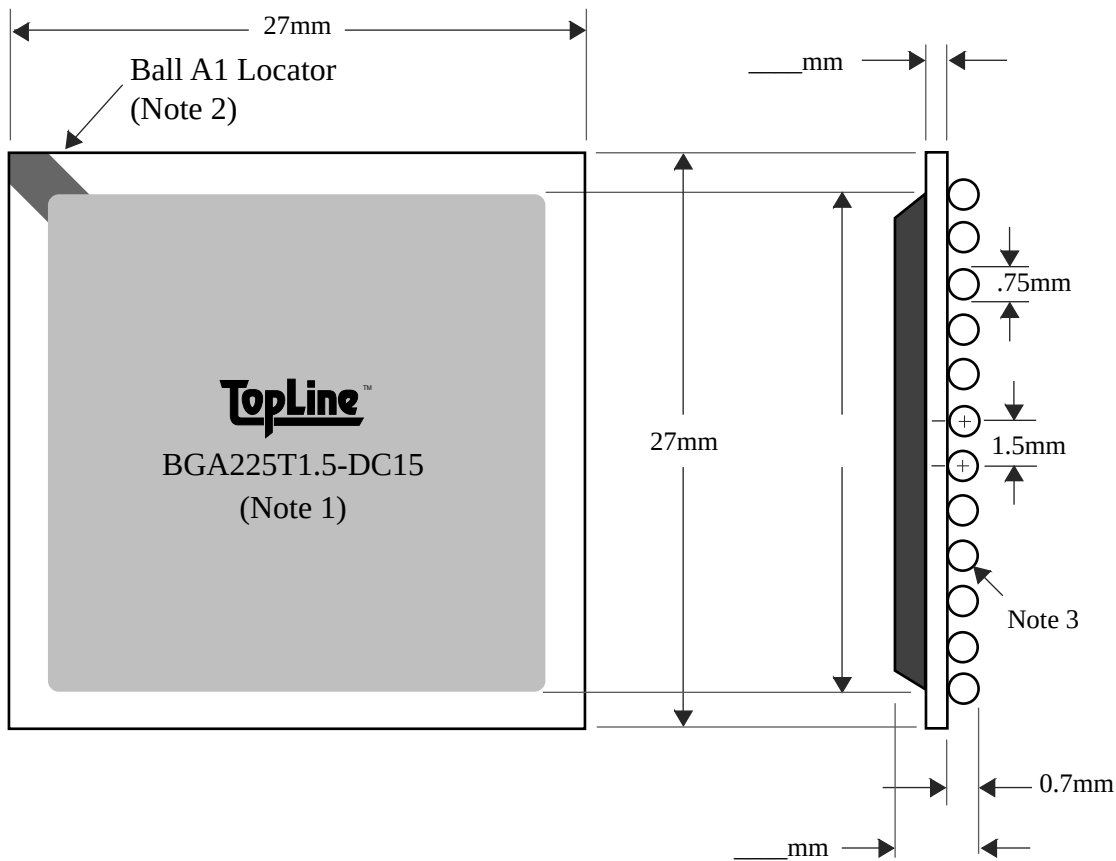
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
225	1.5mm	27mm SQ	15 x 15	full	full	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

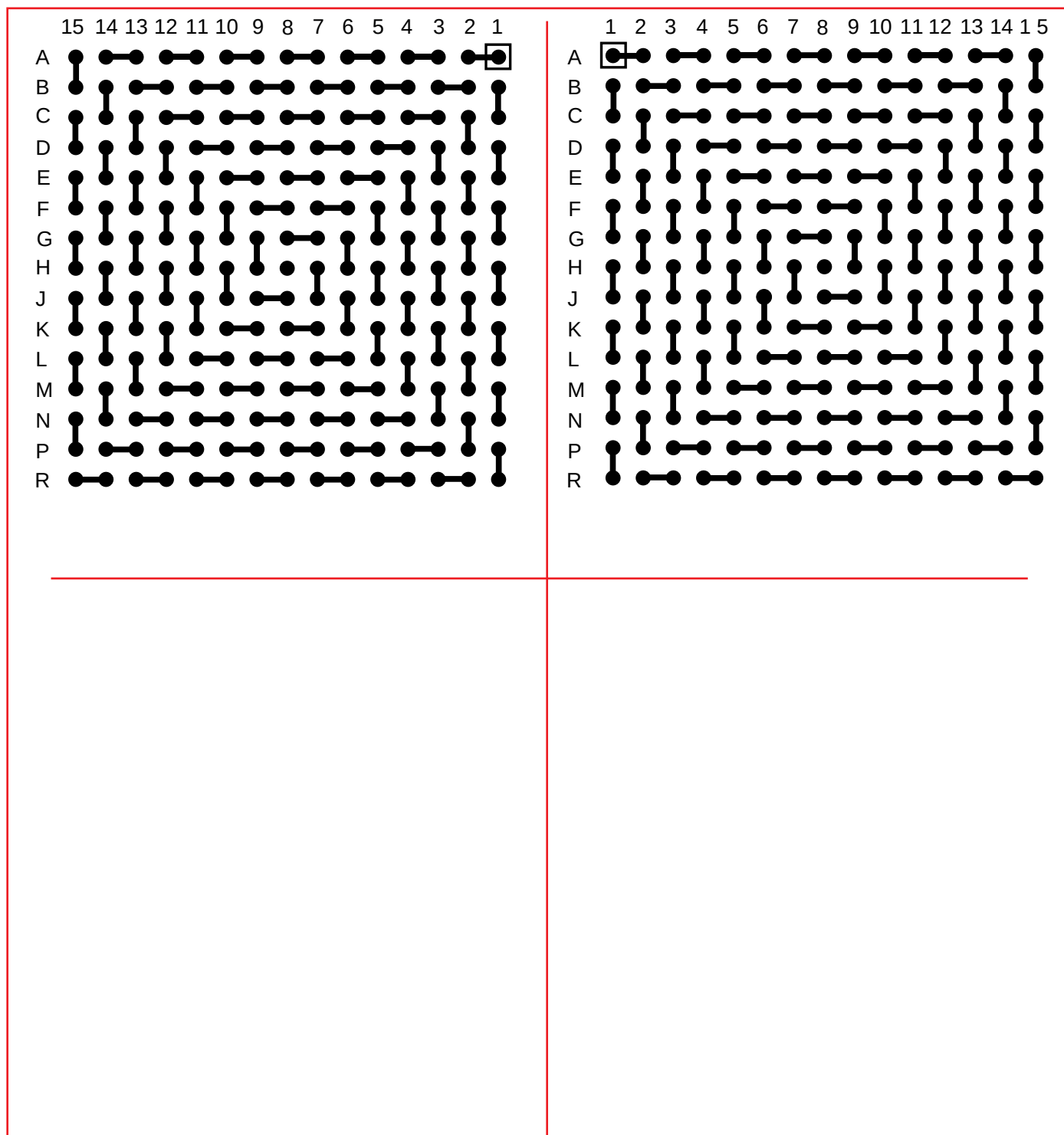


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner	SID		70255
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY27mm-4x10 Tray Quantity 40 Tray Suppliers (ref):		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
225	1.5mm	27mm SQ	15 x 15	full	full	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA225T1.5-DC158

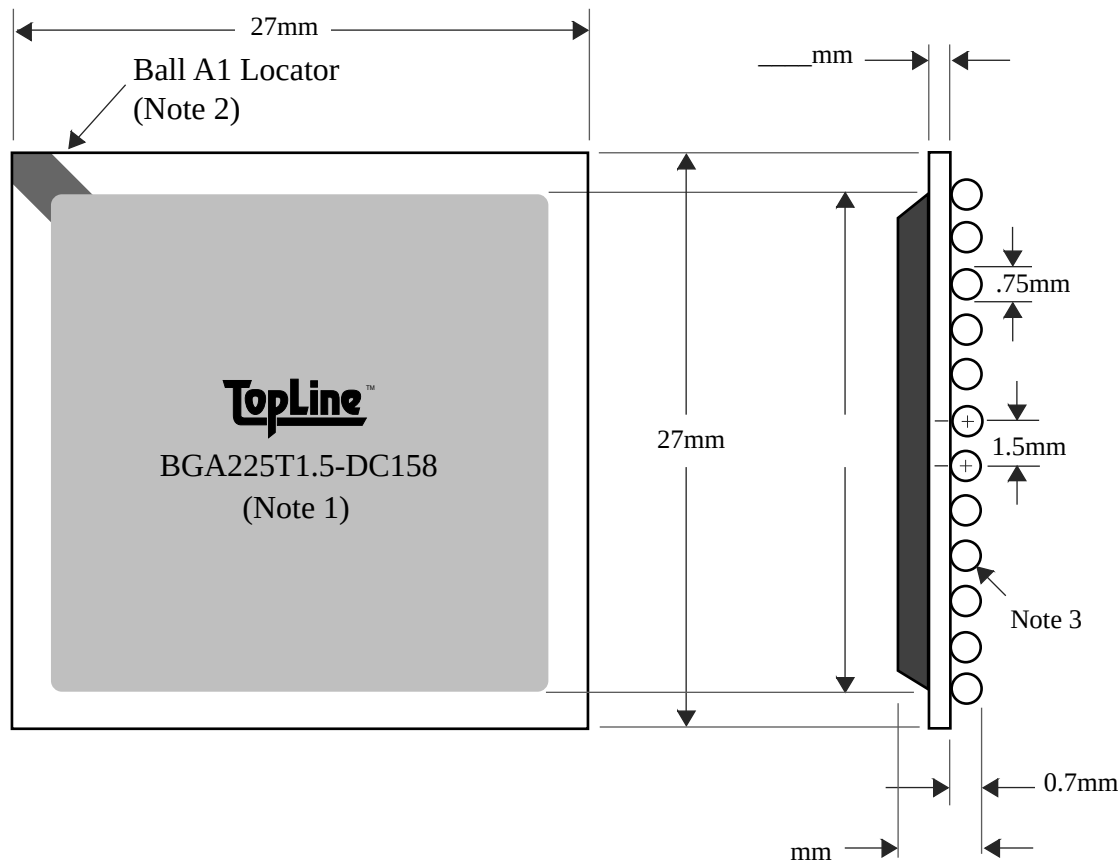
TopLine™

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
225	1.5mm	27mm SQ	15 x 15	full	full	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY27mm-4x10 Tray Quantity 40 Tray Suppliers (ref):		



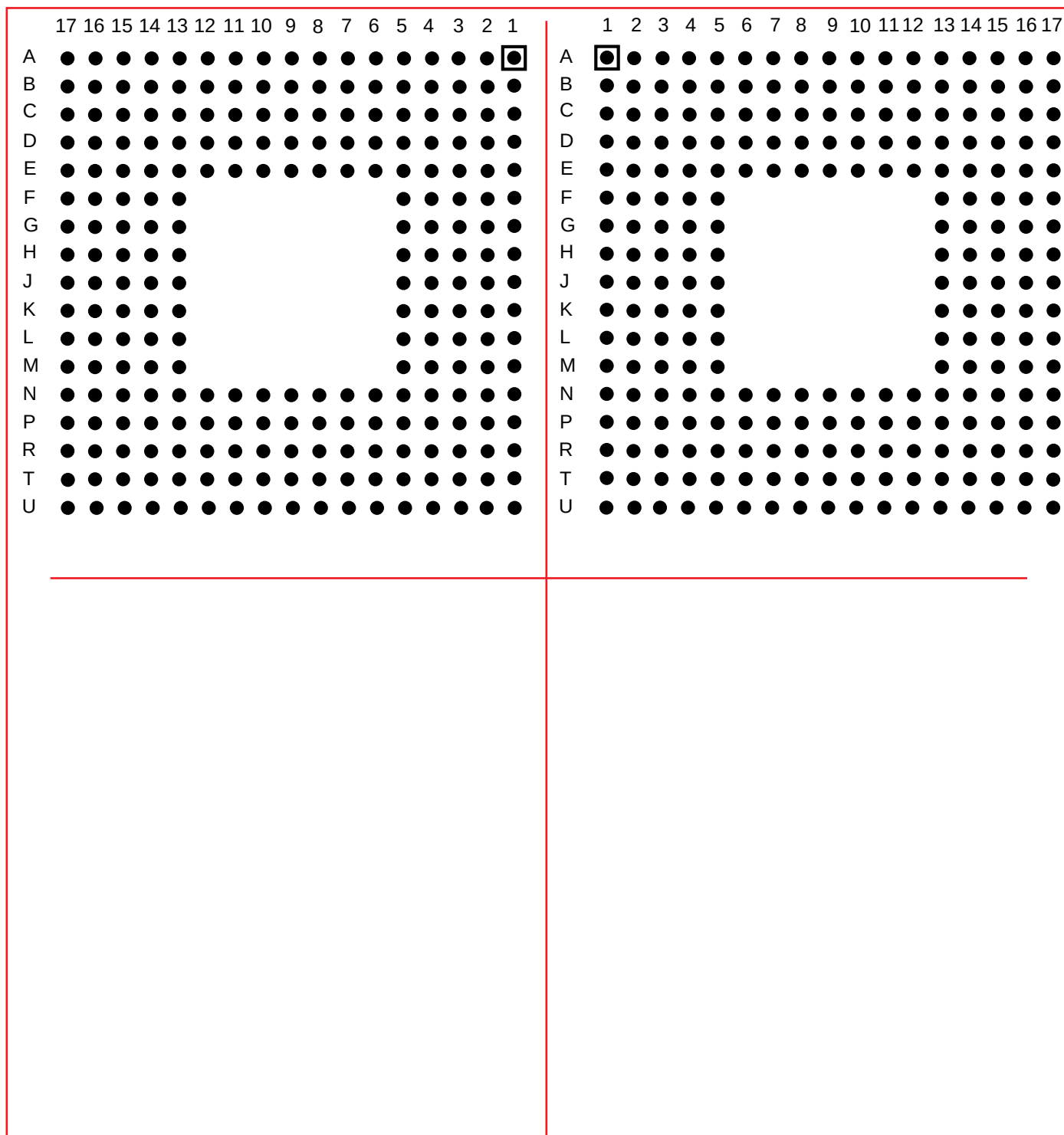
TEL 1-714-898-3830
FAX 1-714-891-0321

BGA240T1.27-ISO

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
240	1.27mm	23mm SQ	17 x 17mm	5	none	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA240T1.27-ISO

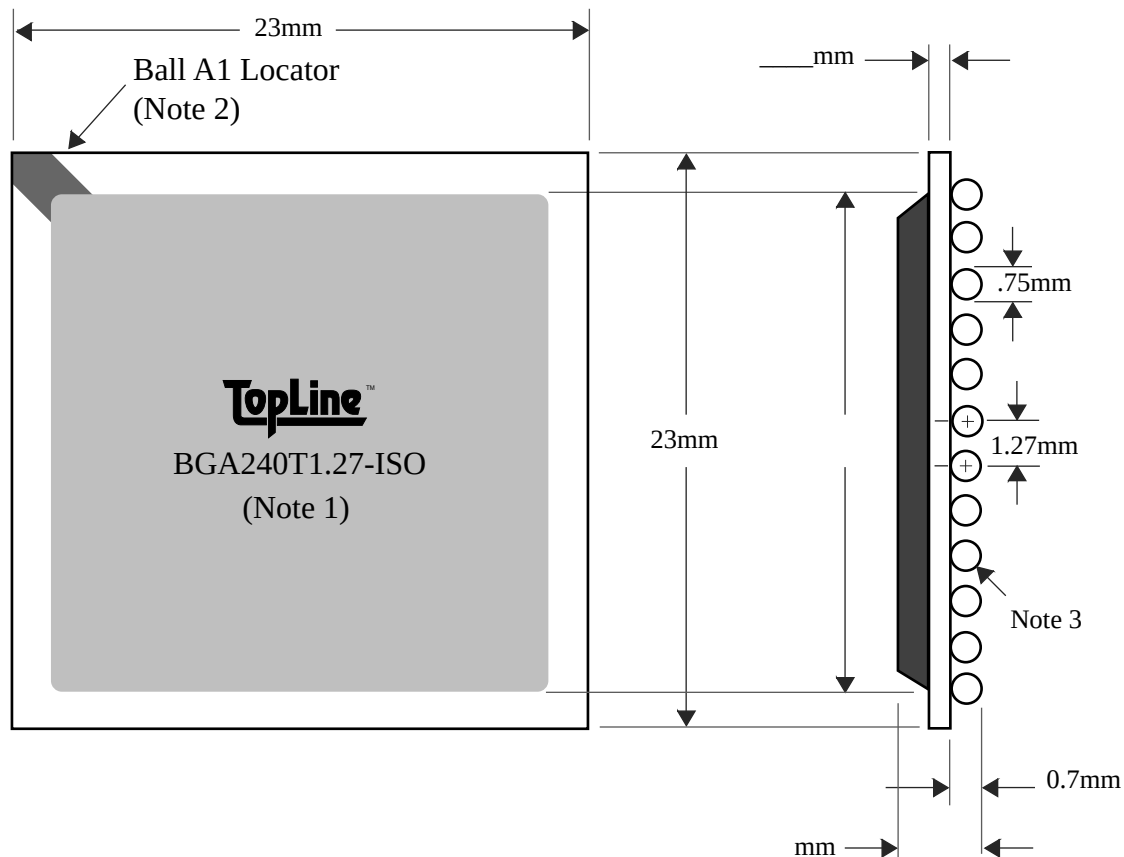
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
240	1.27mm	23mm SQ	17 x 17mm	5	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

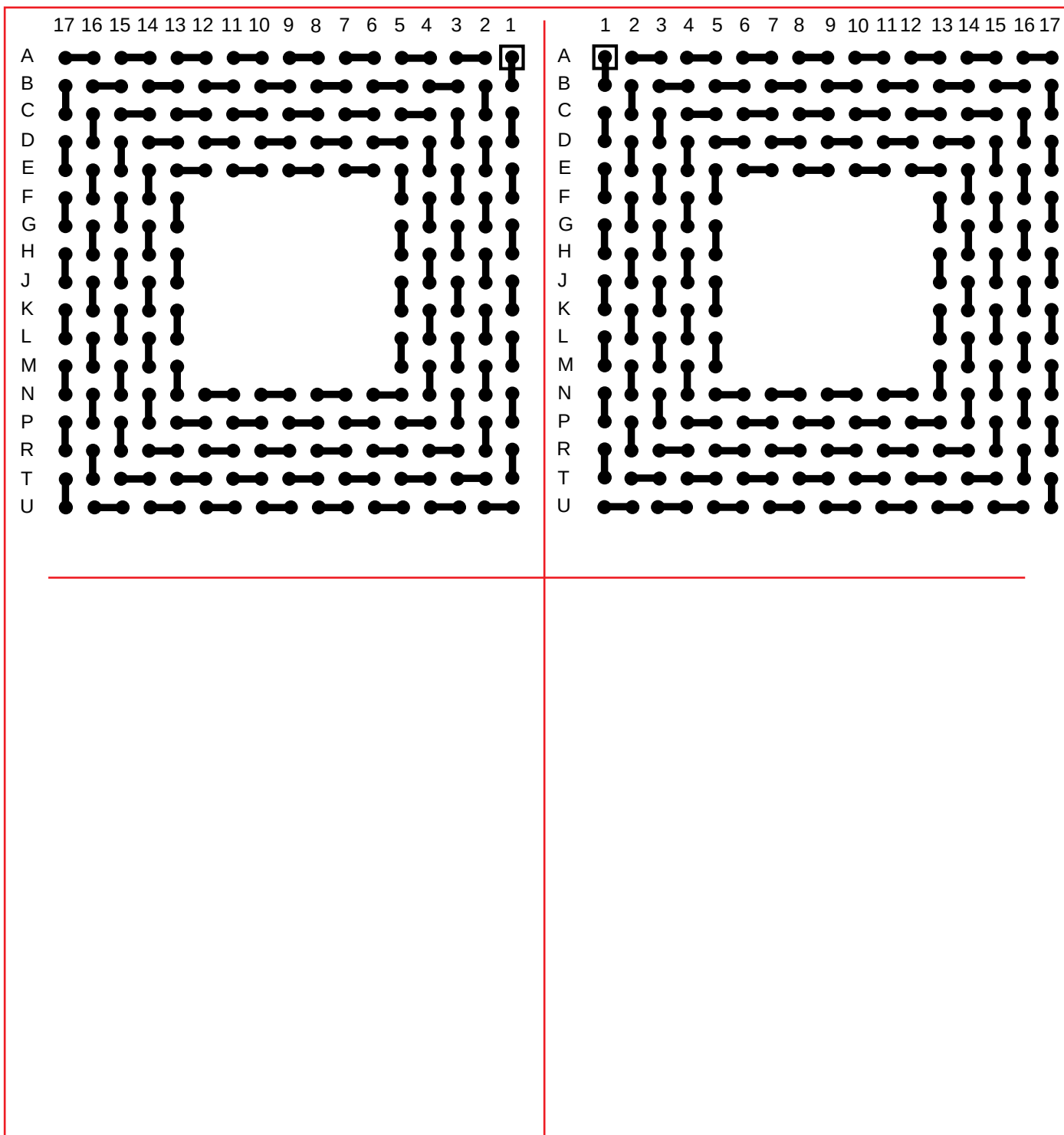


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY23mm-5x12 Tray Quantity 60 Tray Suppliers (ref):		

TEL 1-714-898-3830	<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
FAX 1-714-891-0321	240	1.27mm	23mm SQ	17 x 17	5	none	FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

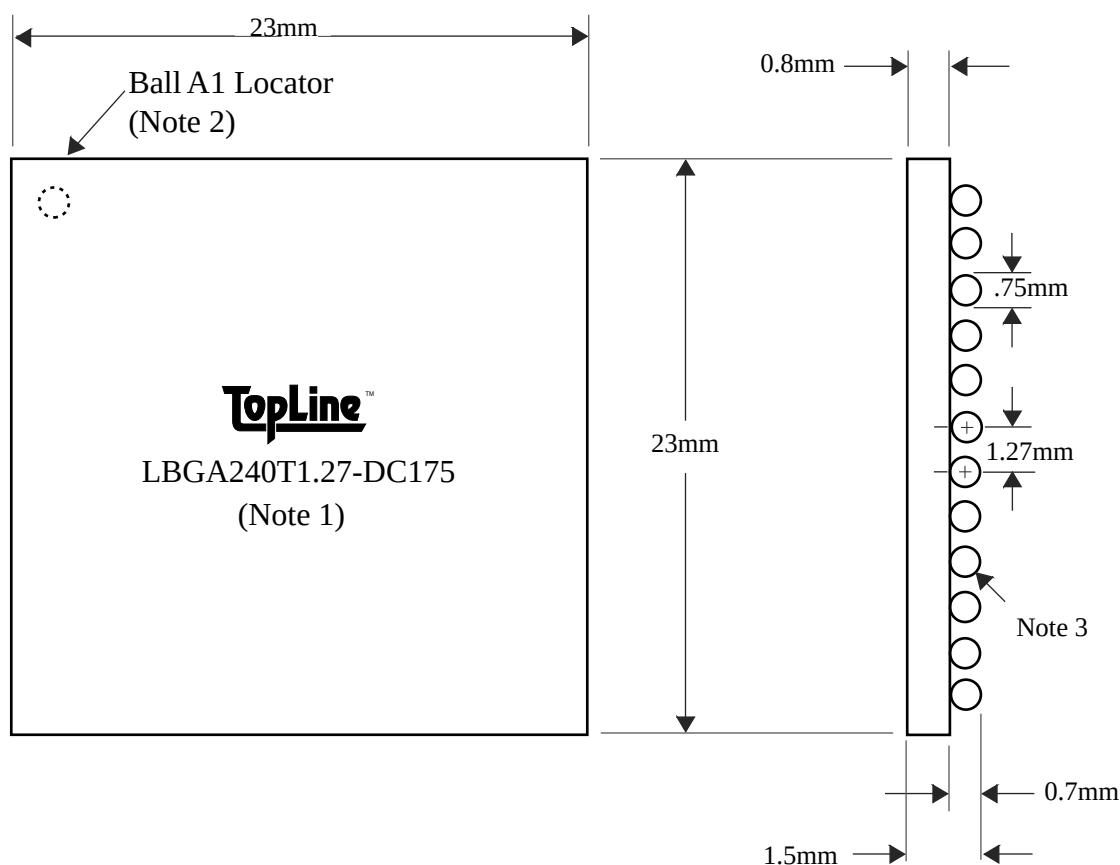
LBGA240T1.27-DC175

TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830
240	1.27mm	23mm SQ	17 x 17	5	none	FR4	FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

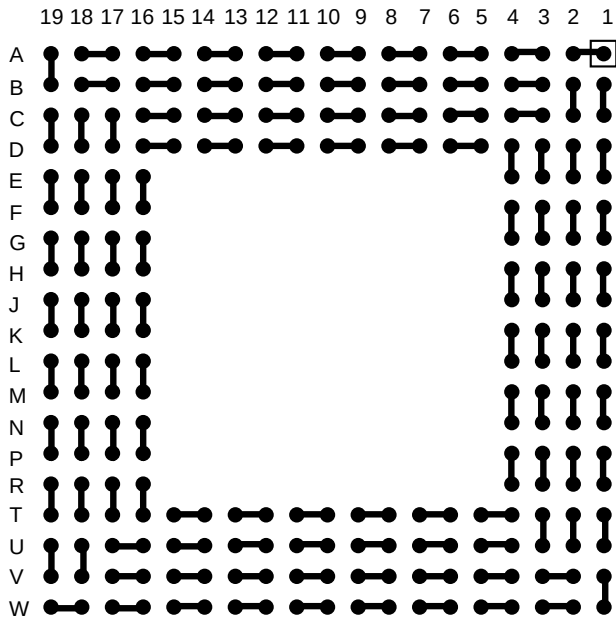


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY23mm-5x12 Tray Quantity 60 Tray Suppliers (ref):		

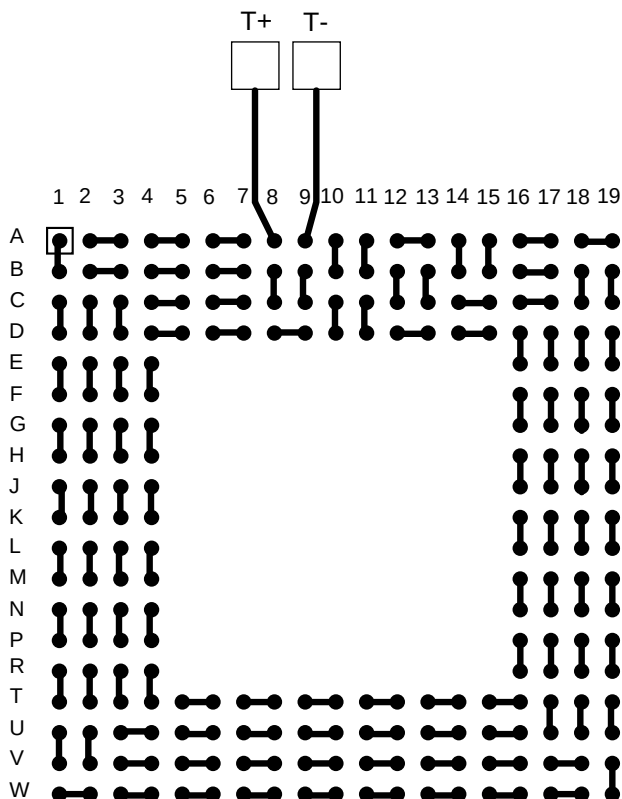
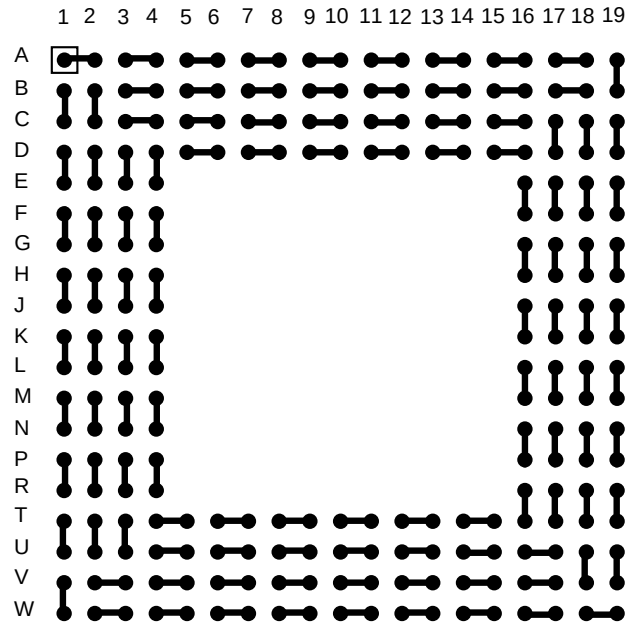
BALLS	PITCH	SIZE
240	1.27mm	27mm SQ

MATRIX	ROWS	CENTER	MAT'L
19 x 19	4	none	BT

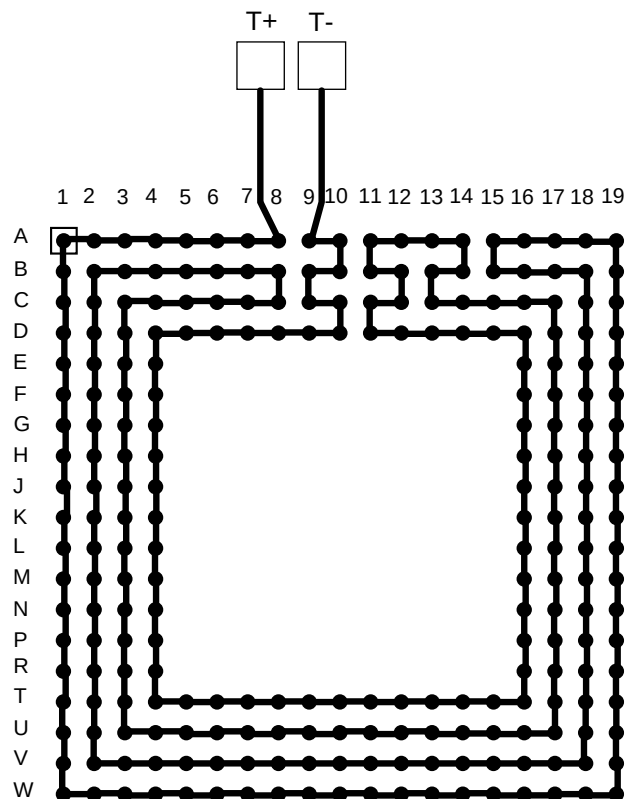
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

BGA240T1.27-DC55

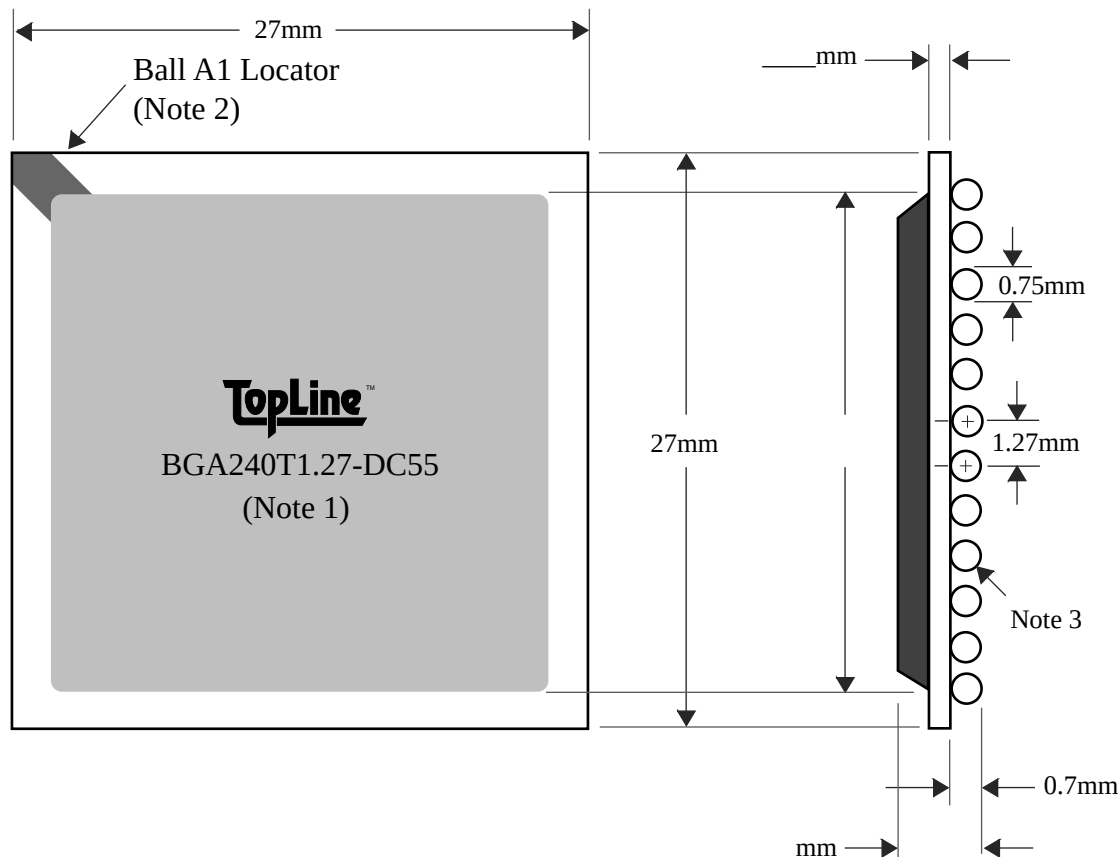
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
240	1.27mm	27mm SQ	19 x 19	4	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

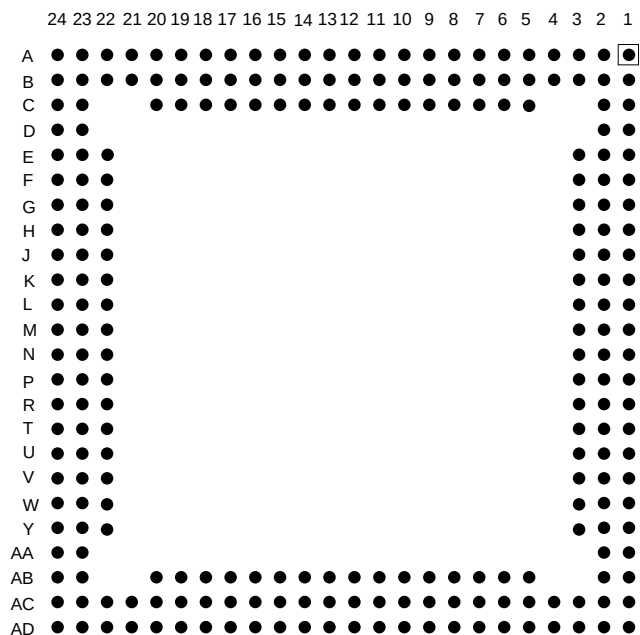
SIDE VIEW



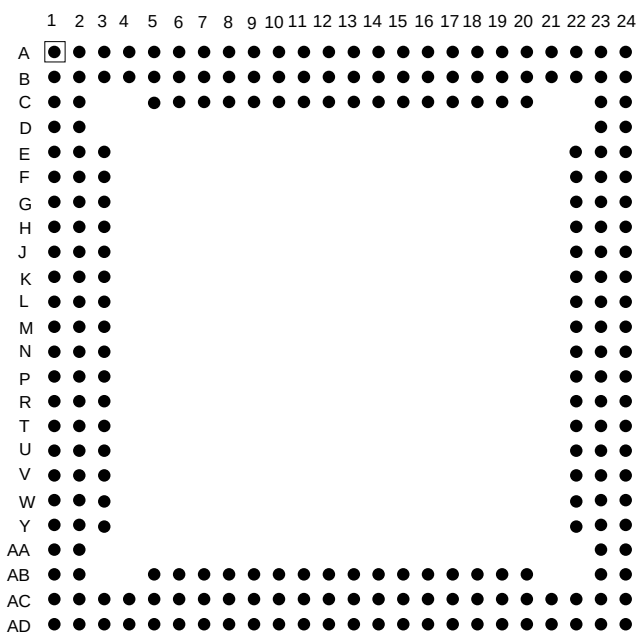
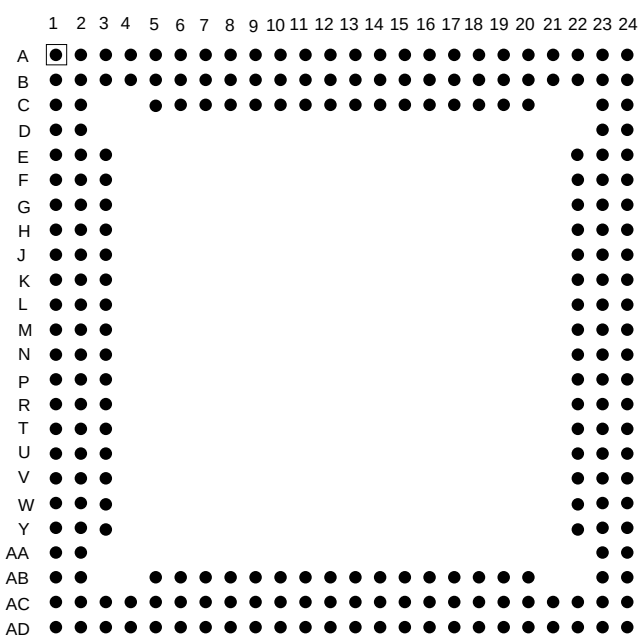
NOTES		REVISIONS	
Note 1	Logo and part number centered White ink or laser marked	Rev	Date Changes
Note 2	Ball A1 locator mark positioned in corner	Subject to discontinuation	
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)	
Note 4	Substrate Material: BT laminate	Tray BGATRAY27mm-4x10 Tray Quantity 40 Tray Suppliers (ref):	

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
240	1.27mm	32.5mm SQ	24 x 24	3	none	ceramic

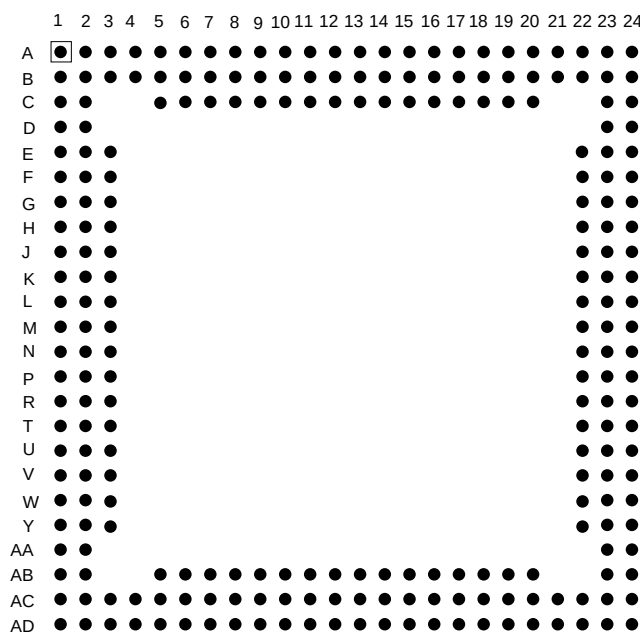
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

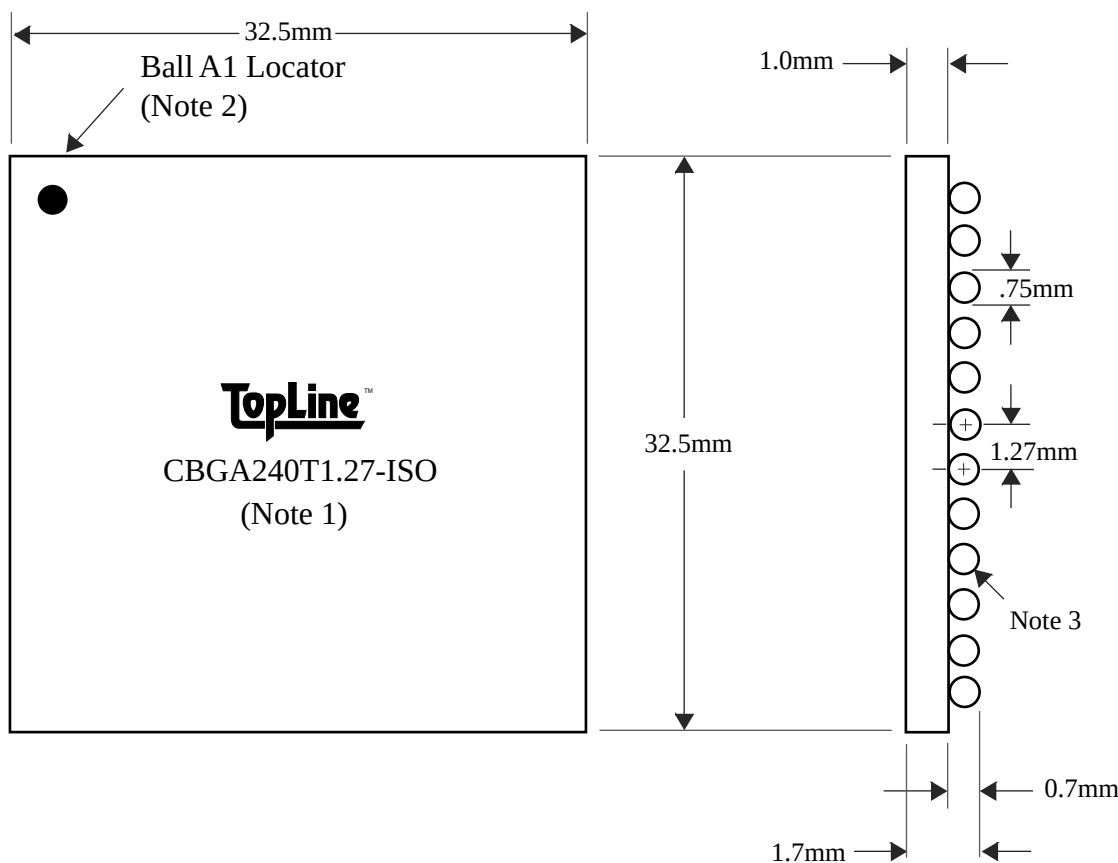
CBGA240T1.27-ISO



BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830
240	1.27mm	32.5mm SQ	24 x 24	3	none	ceramic	FAX 1-714-891-0321

TOP VIEW

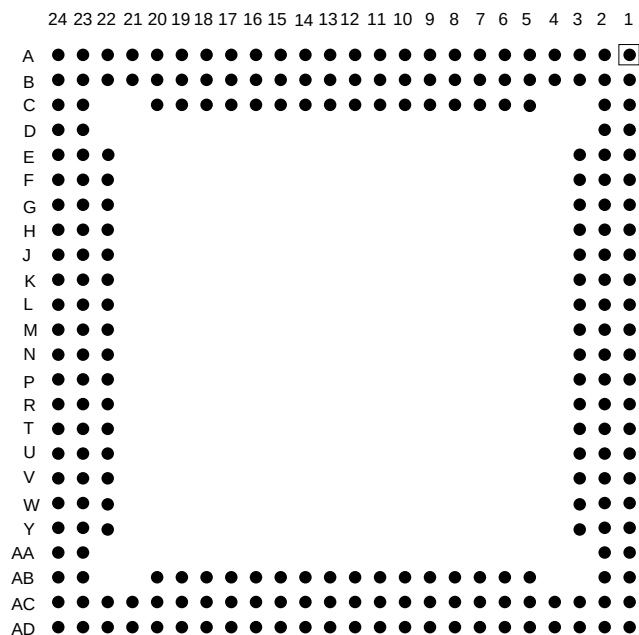
SIDE VIEW



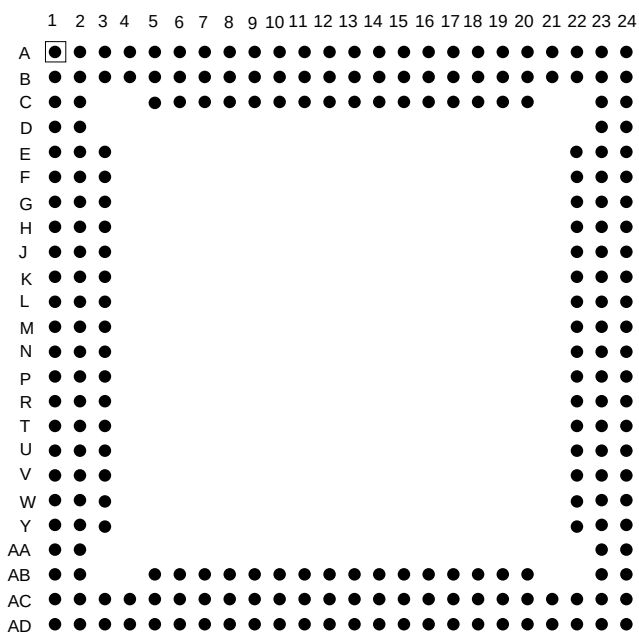
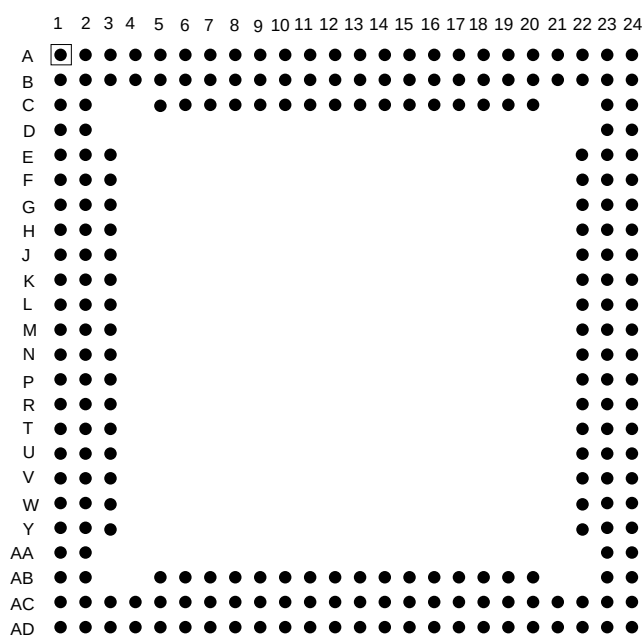
NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 10/90SnPb			
Note 4	Substrate Material: Ceramic			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY35mm-3x8 Tray Quantity 24 Tray Suppliers (ref):		

	<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
TEL 1-714-898-3830							
FAX 1-714-891-0321	240	1.27mm	32.5mm SQ	24 x 24	3	none	ceramic

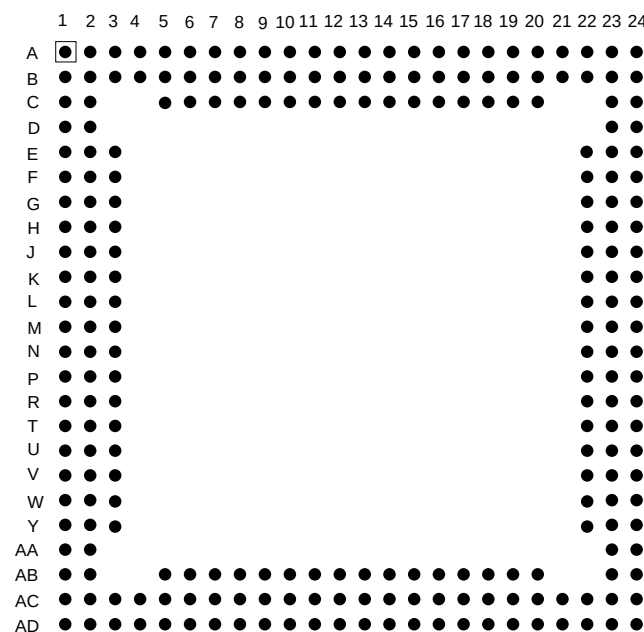
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

CBGA240T1.27L-ISO

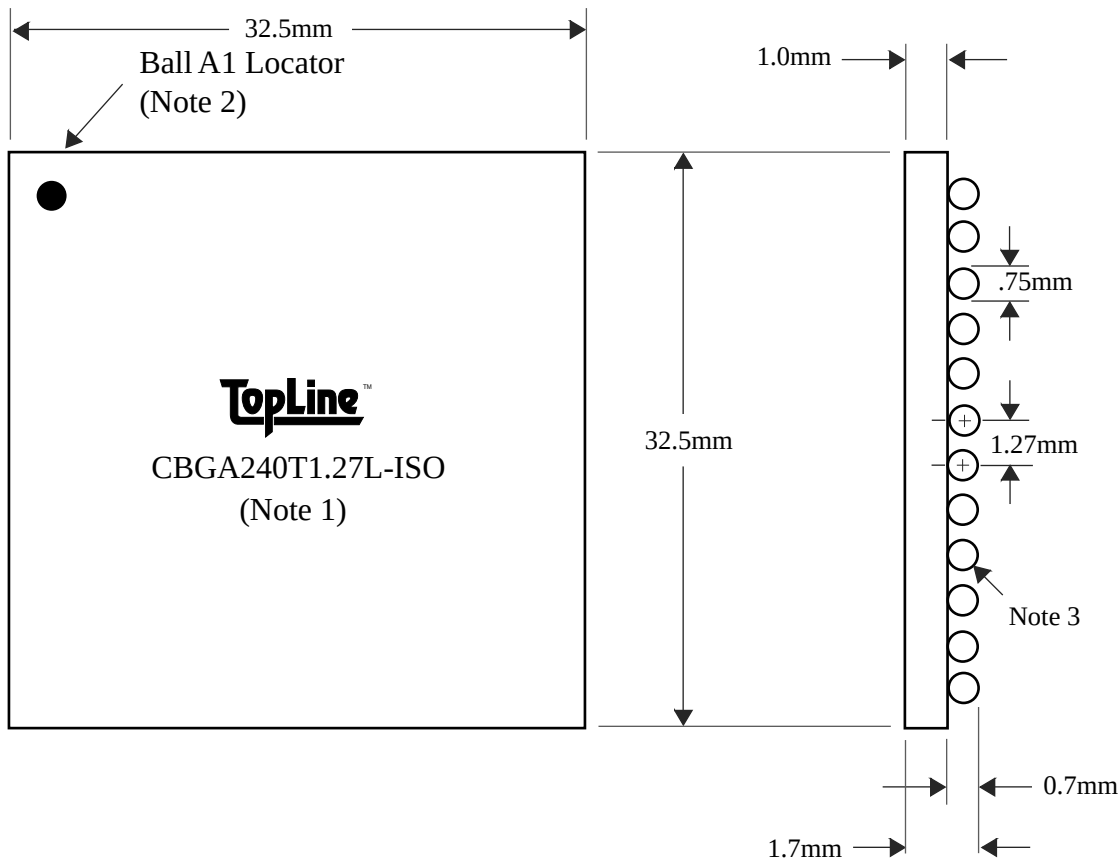


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
240	1.27mm	32.5mm SQ	24 x 24	3	none	ceramic

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

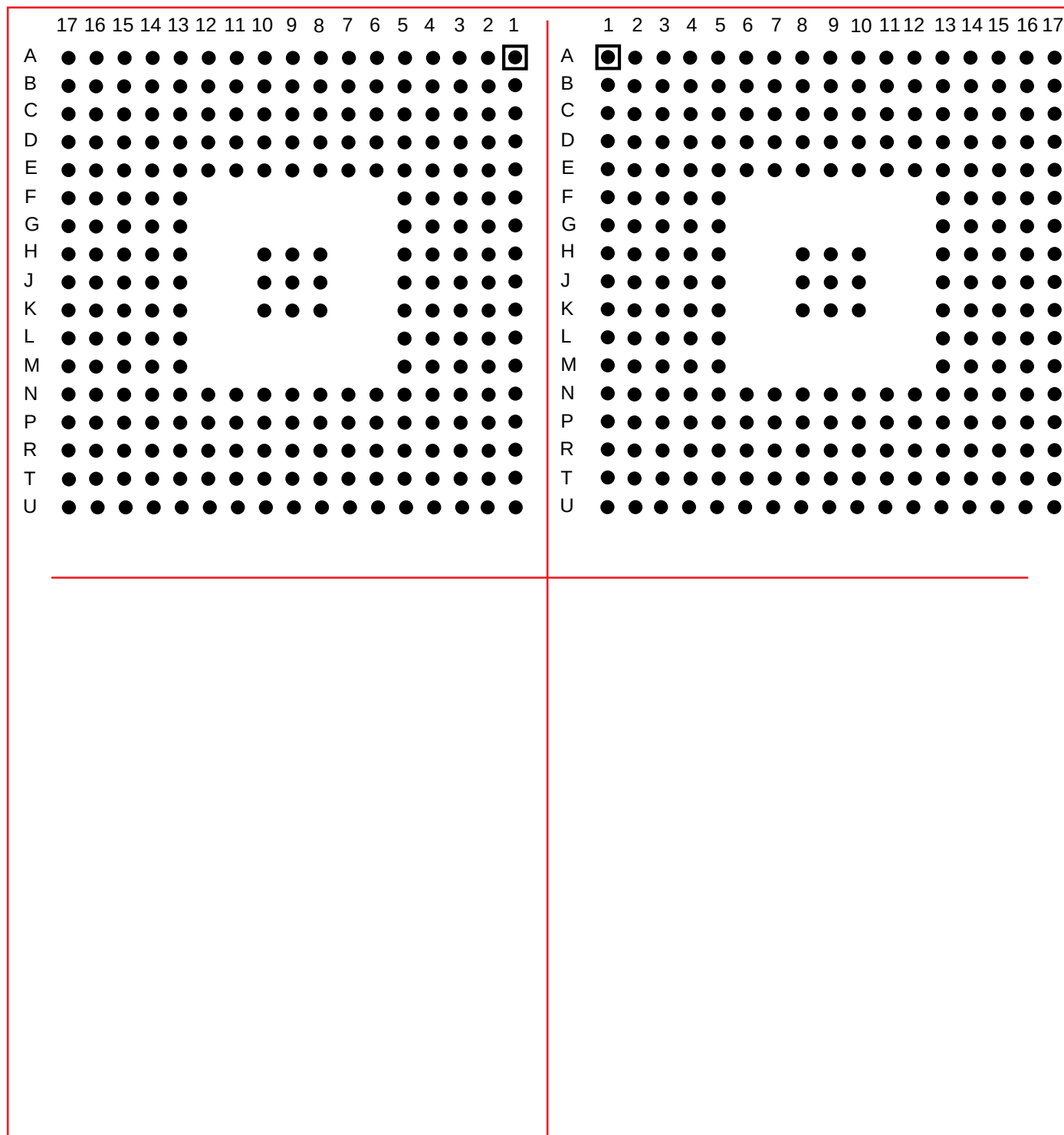


NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 62/36/2			
Note 4	Substrate Material: Ceramic			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY35mm-3x8 Tray Quantity 24 Tray Suppliers (ref):		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
249	1.27mm	23mm SQ	17 x 17	5	3 x 3	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA249T1.27-ISO

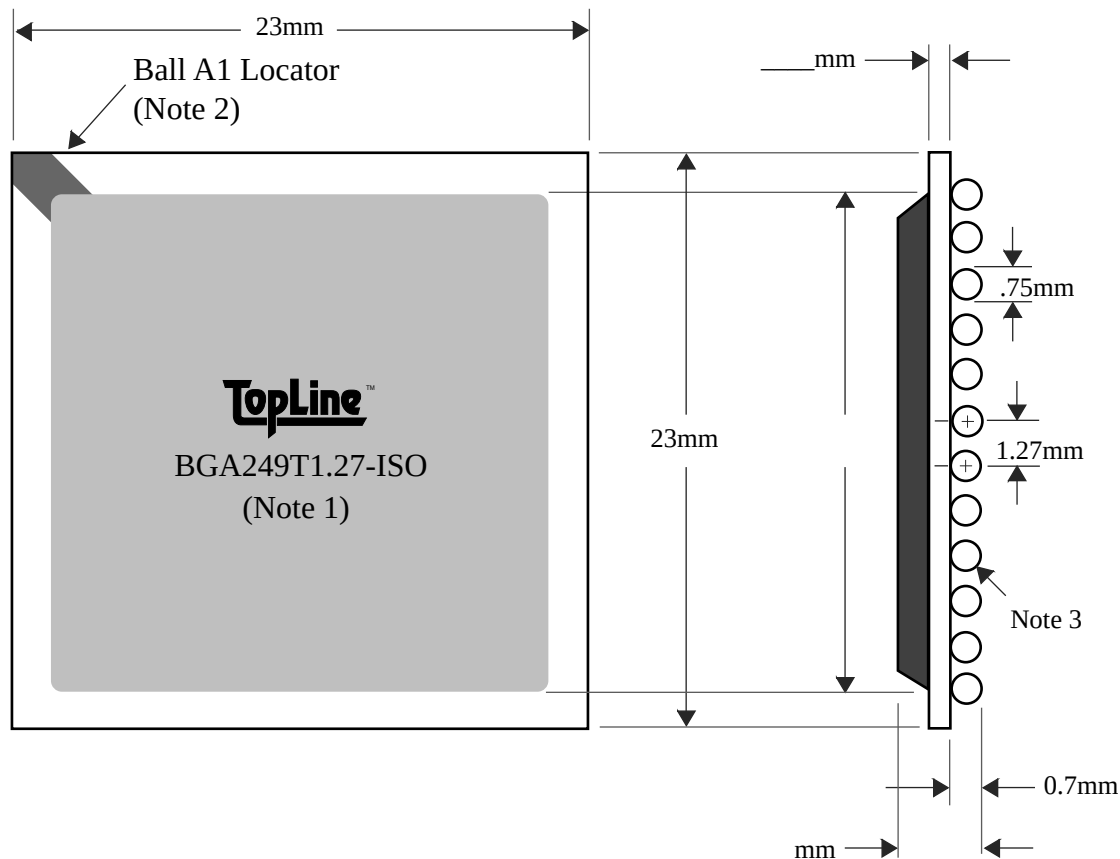
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
249	1.27mm	23mm SQ	17 x 17	5	3 x 3	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY23mm-5x12		
		Tray Quantity 60		
		Tray Suppliers (ref):		

TEL 1-714-898-3830
FAX 1-714-891-0321

BALLS
249

PITCH
1.27mm

SIZE
23mm SQ

MATRIX
17 x 17

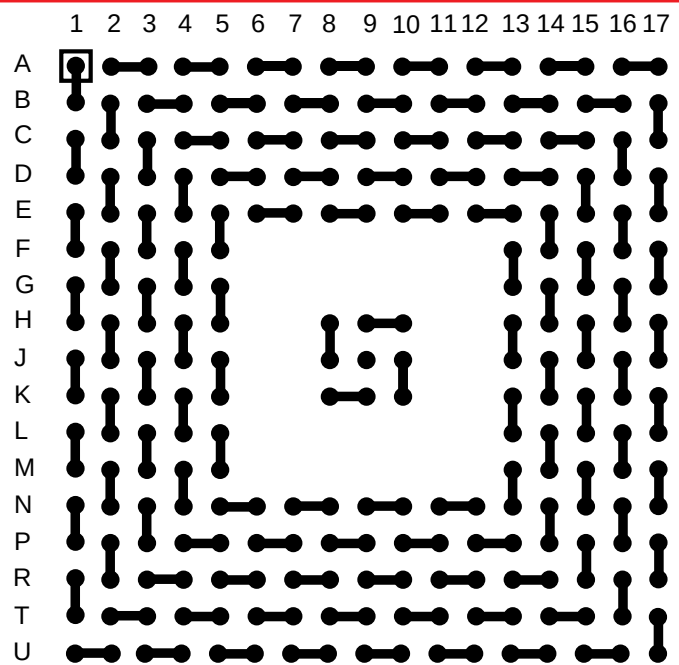
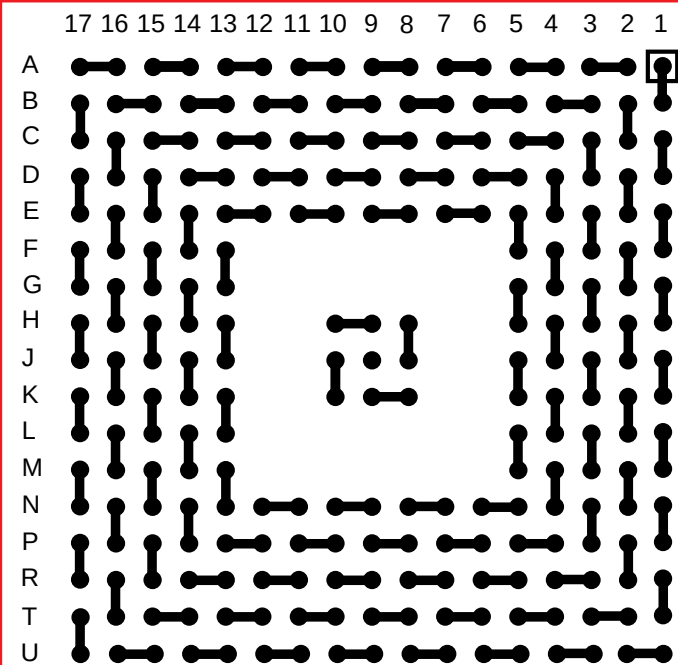
ROWS
5

CENTER
3 x 3

MAT'L
FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

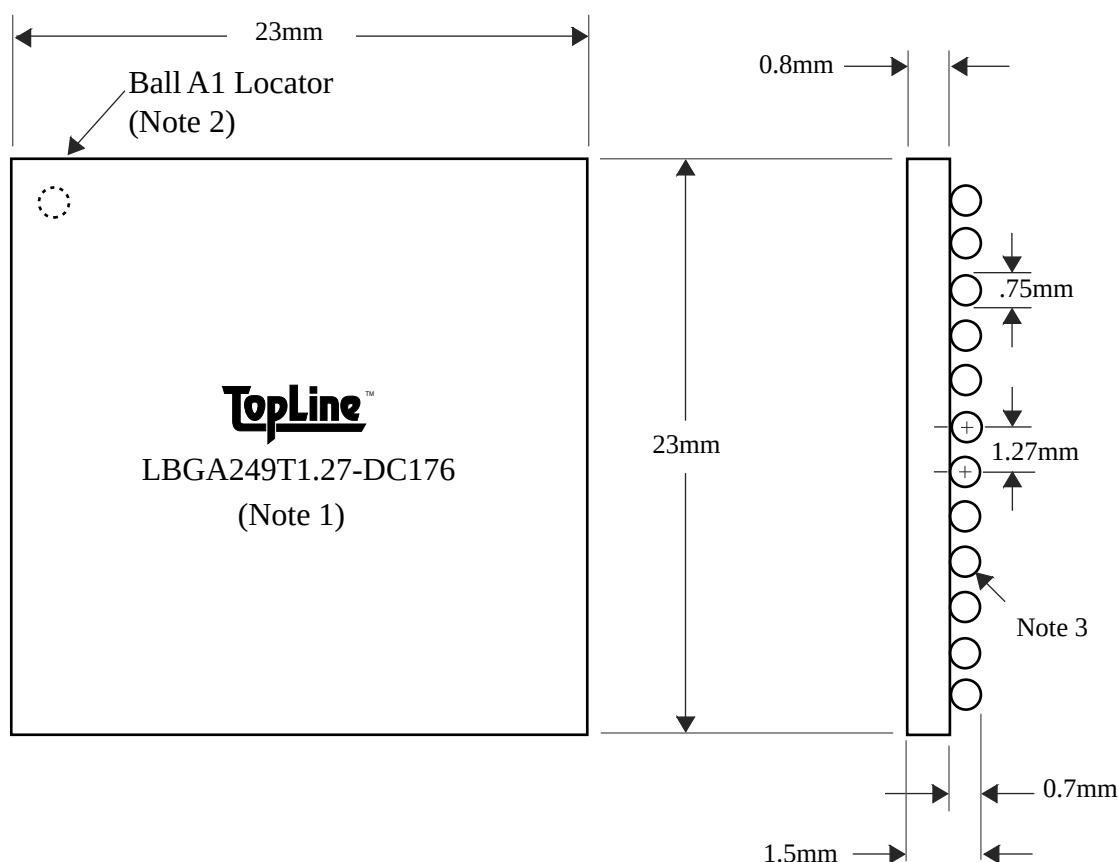
LBGA249T1.27-DC176

TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830
249	1.27mm	23mm SQ	17 x 17	5	3 x 3	FR4	FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

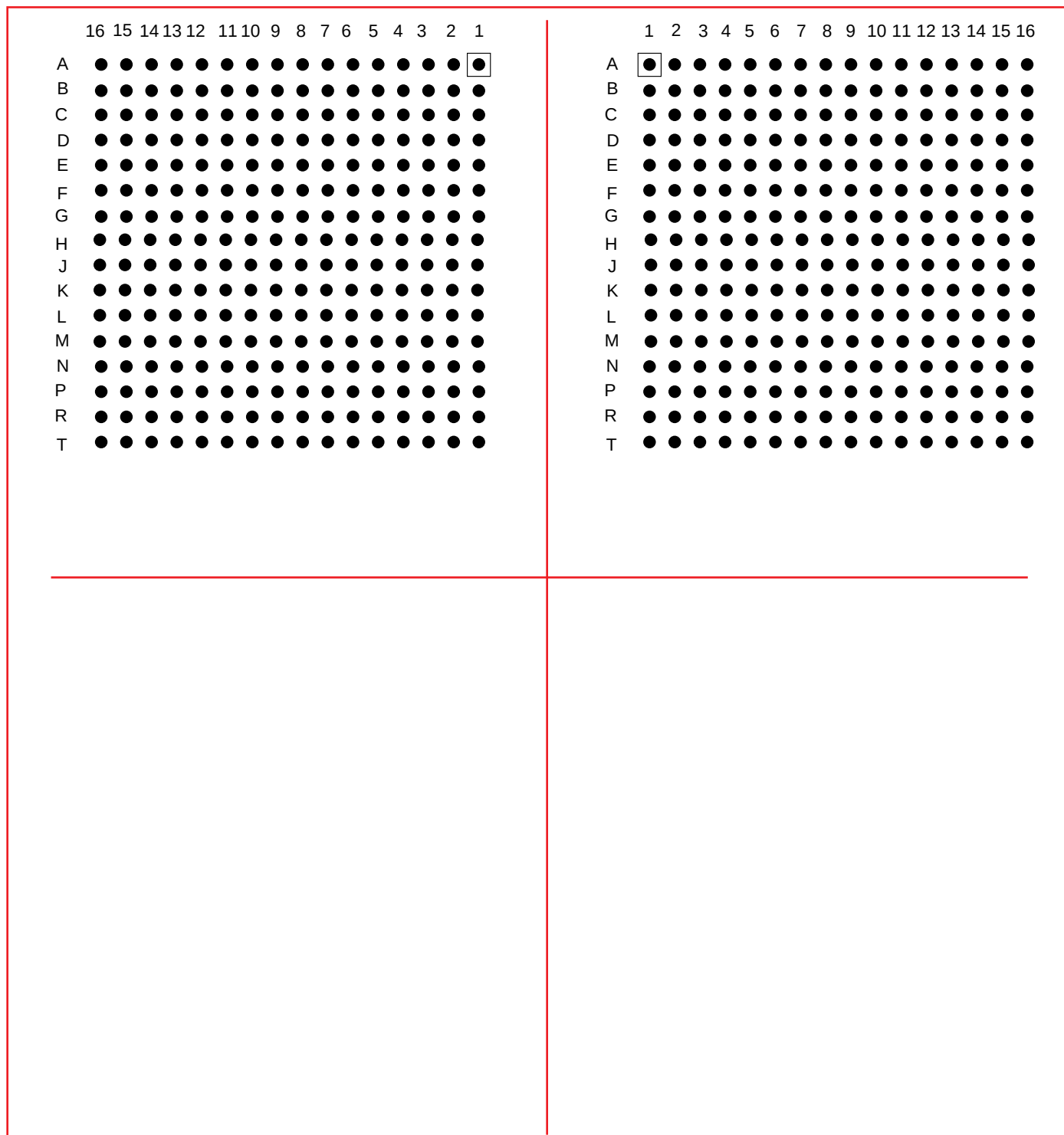


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY23mm-5x12 Tray Quantity 60 Tray Suppliers (ref):		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
256	1.0mm	17mm SQ	16 x 16	full	full	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA256T1.0-ISO

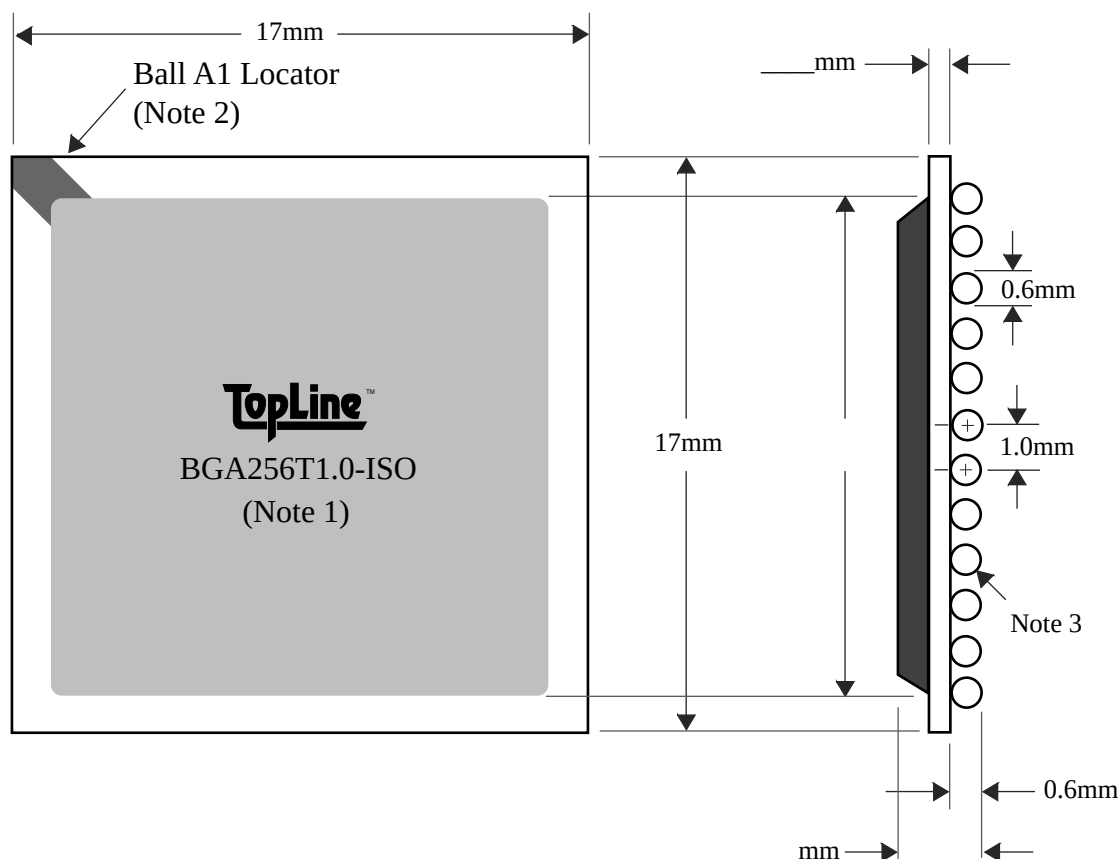
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
256	1.0mm	17mm SQ	16 x 16	full	full	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY17mm-6x15 Tray Quantity 90 Tray Suppliers (ref):		



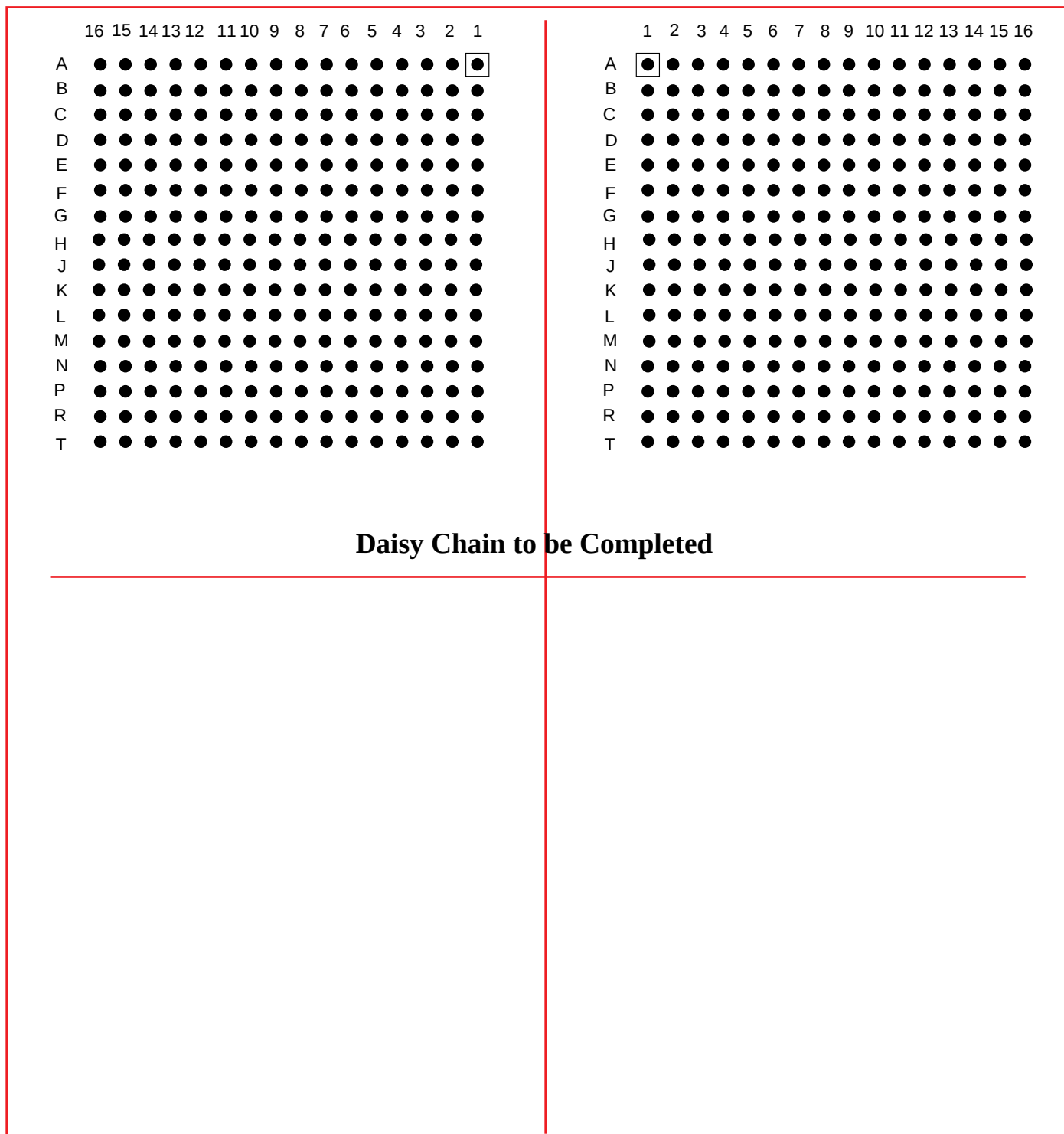
TEL 1-714-898-3830
FAX 1-714-891-0321

BGA256T1.0-DC168

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
256	1.0mm	17mm SQ	16 x 16	full	full	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA256T1.0-DC168

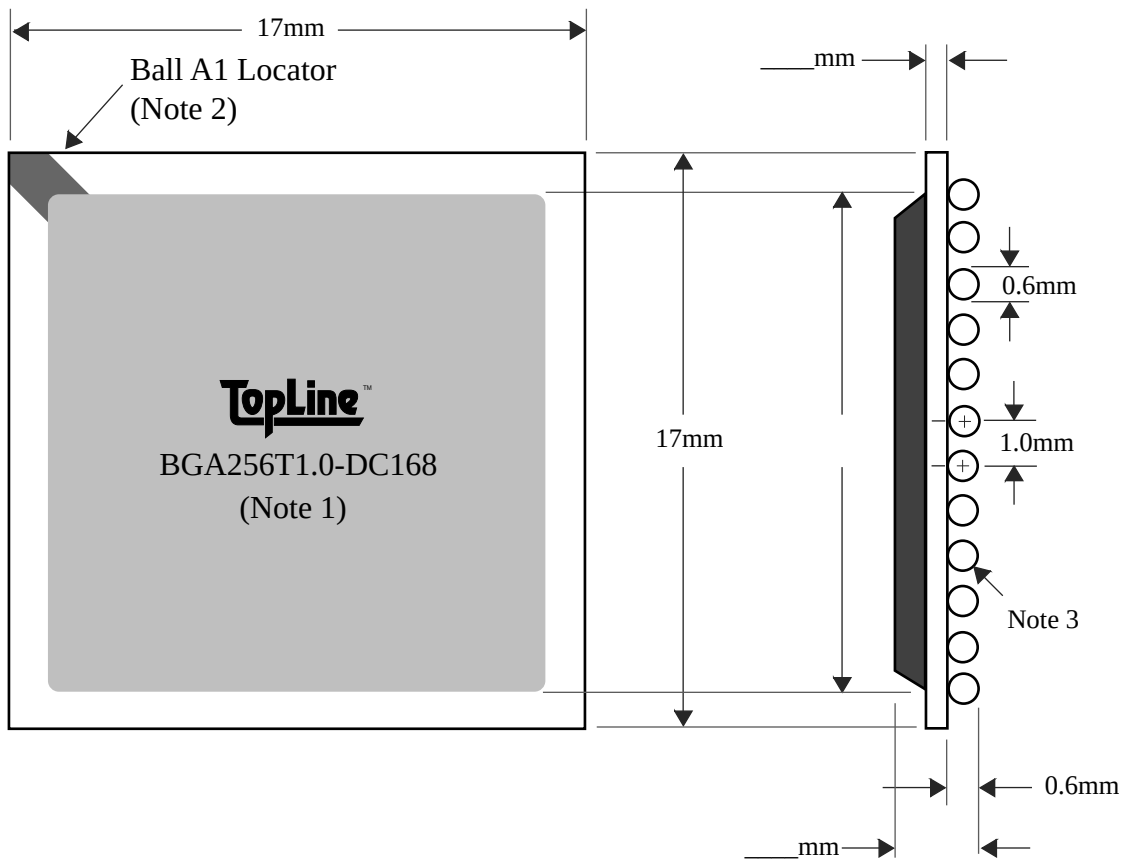
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
256	1.0mm	17mm SQ	16 x 16	full	full	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY17mm-6x15 Tray Quantity 90 Tray Suppliers (ref):		

TEL 1-714-898-3830
FAX 1-714-891-0321

BALLS
256

PITCH
1.0mm

SIZE
17mm SQ

MATRIX
16 x 16

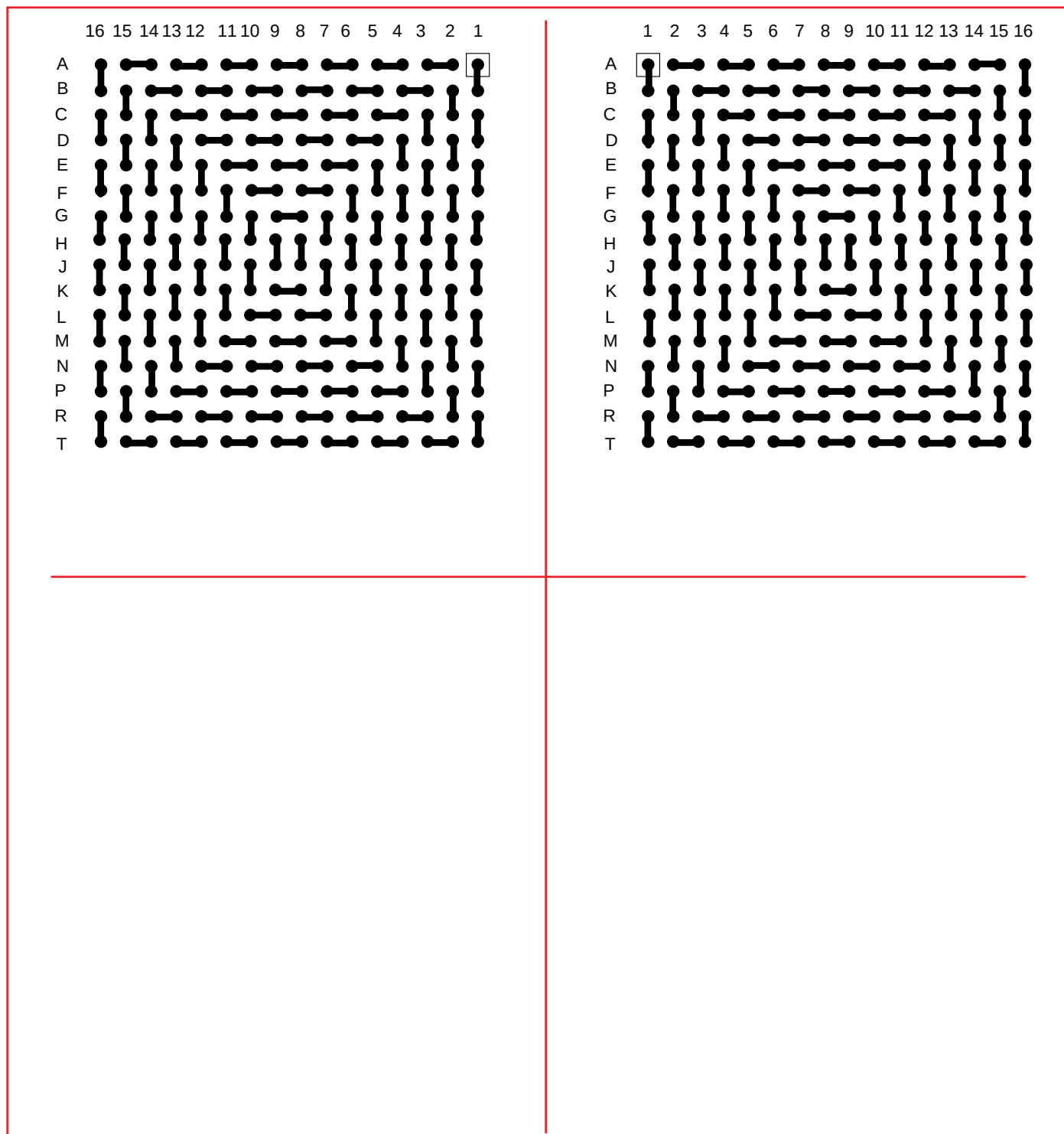
ROWS
full

CENTER
full

MAT'L
FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

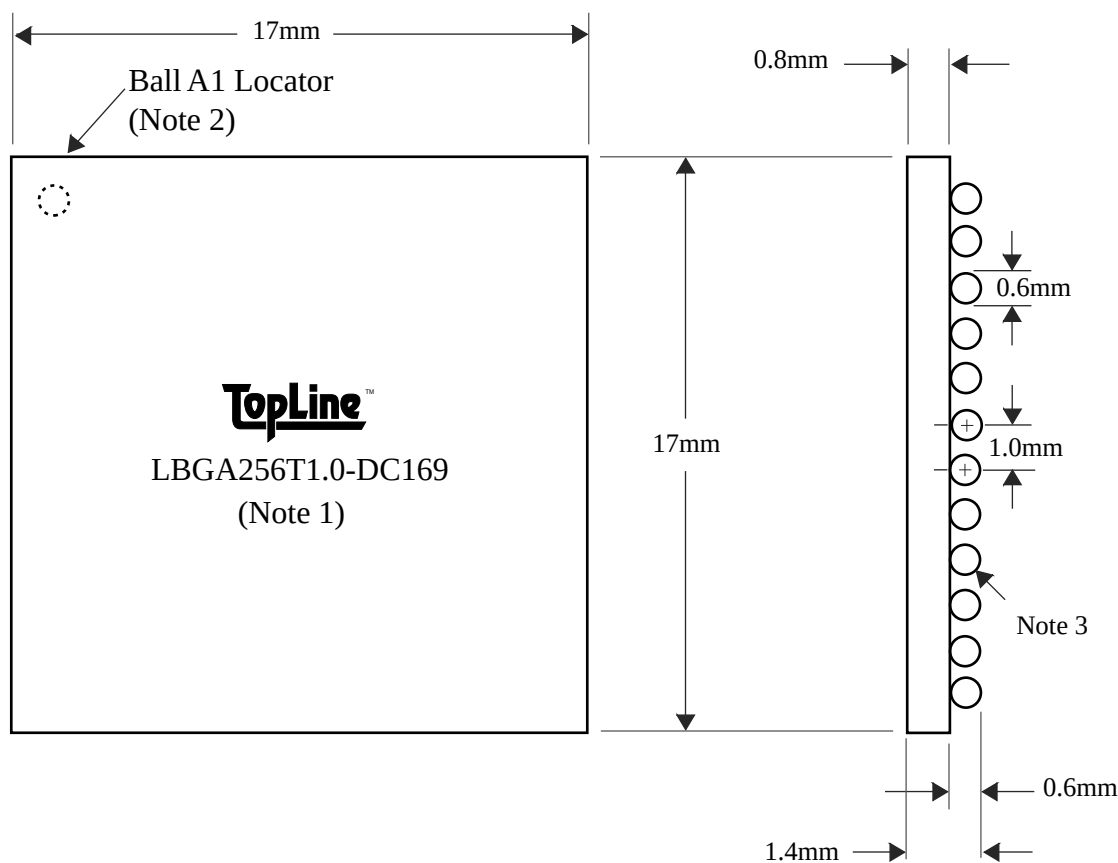
LBGA256T1.0-DC169

TopLine™

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>	TEL 1-714-898-3830
256	1.0mm	17mm SQ	16 x 16	full	full	FR4	FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY17mm-6x15 Tray Quantity 90 Tray Suppliers (ref):		



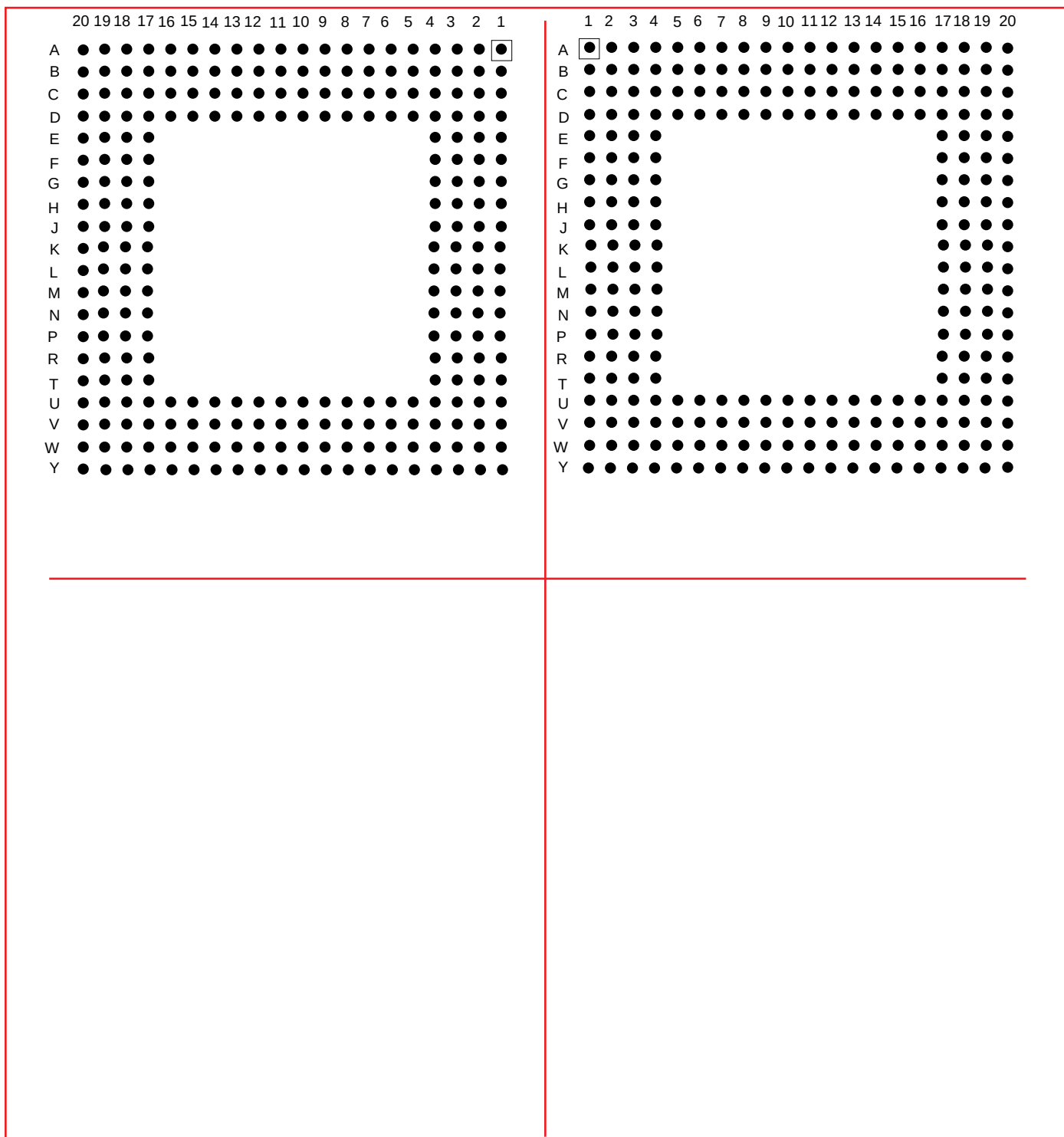
TEL 1-714-898-3830
FAX 1-714-891-0321

BGA256T1.27-ISO

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
256	1.27mm	27mm SQ	20 x 20	4	none	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA256T1.27-ISO

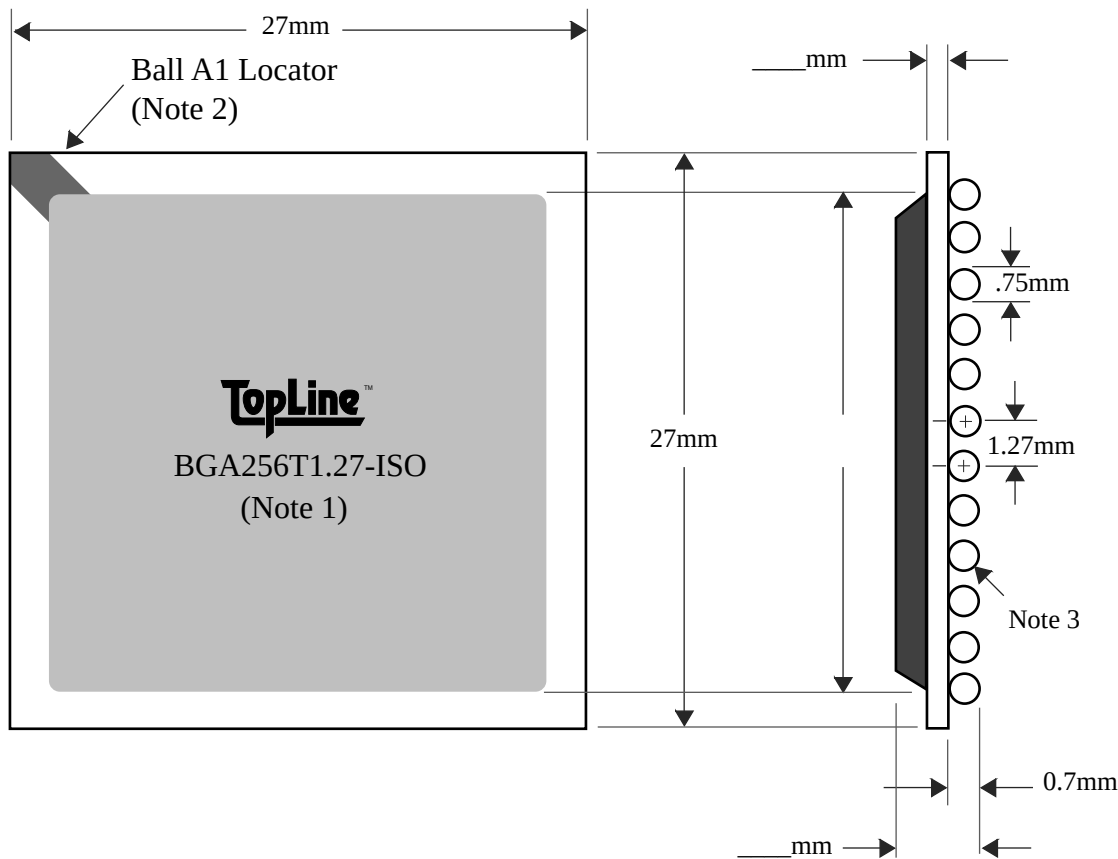


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
256	1.27mm	27mm SQ	20 x 20	4	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

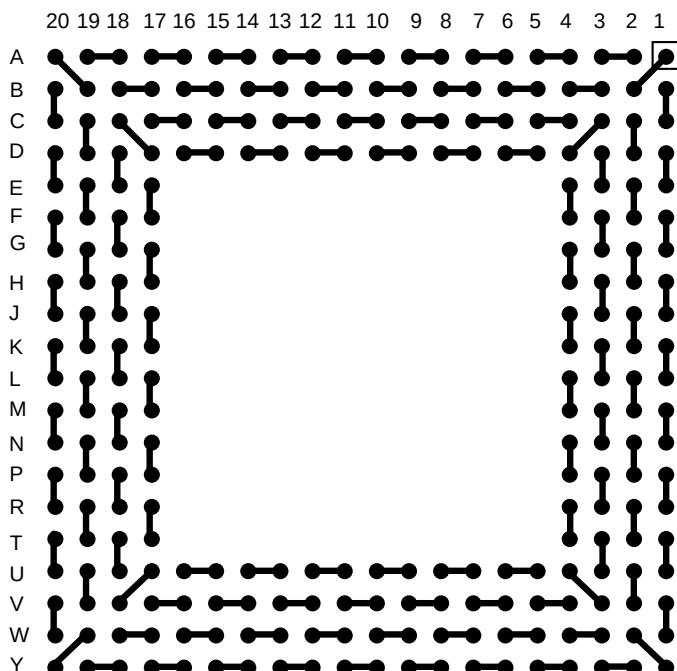
SIDE VIEW



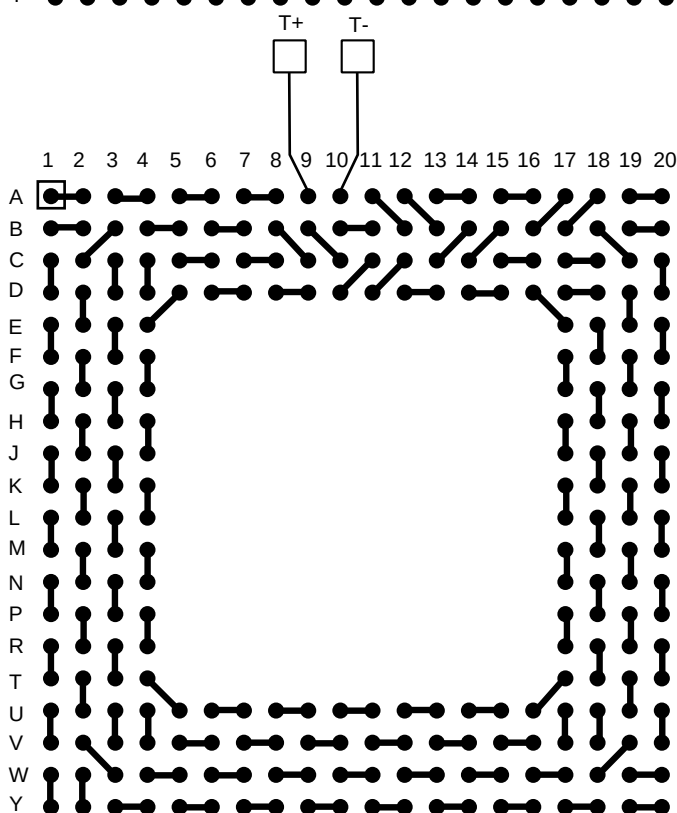
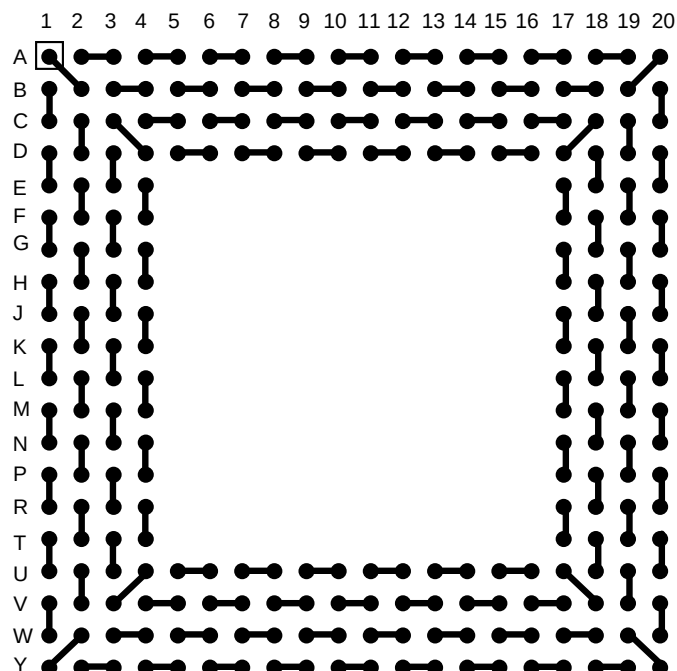
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY27mm-4x10 Tray Quantity 40 Tray Suppliers (ref):		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
256	1.27mm	27mm SQ	20 x 20	4	full	BT

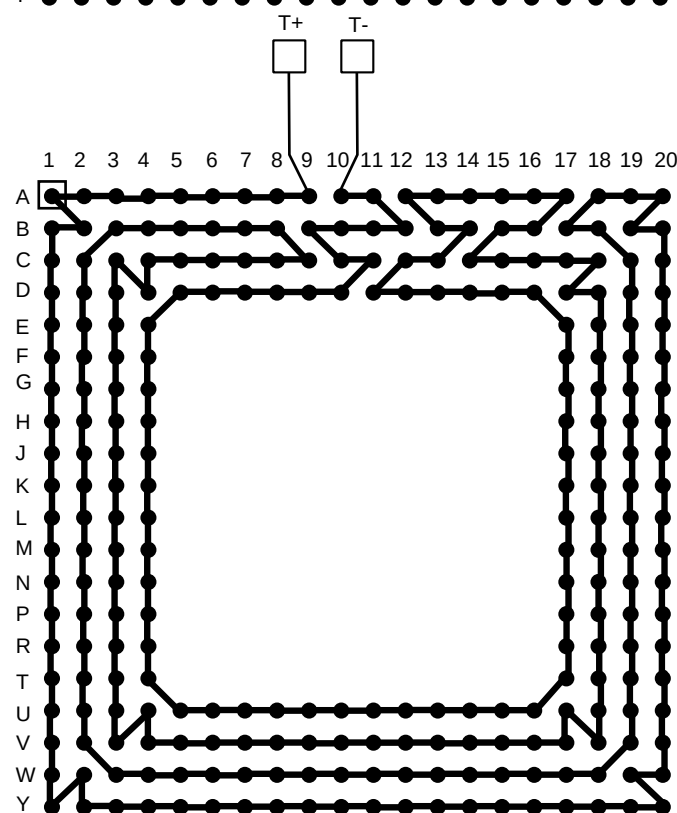
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

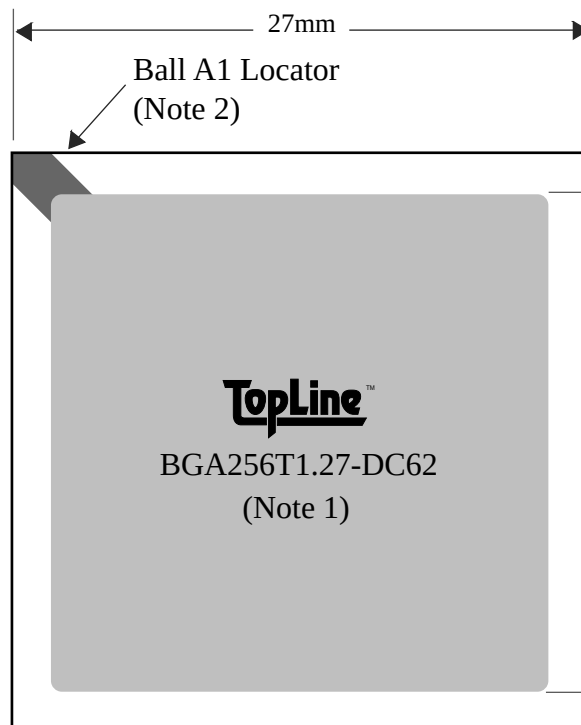
BGA256T1.27-DC62

TopLine™

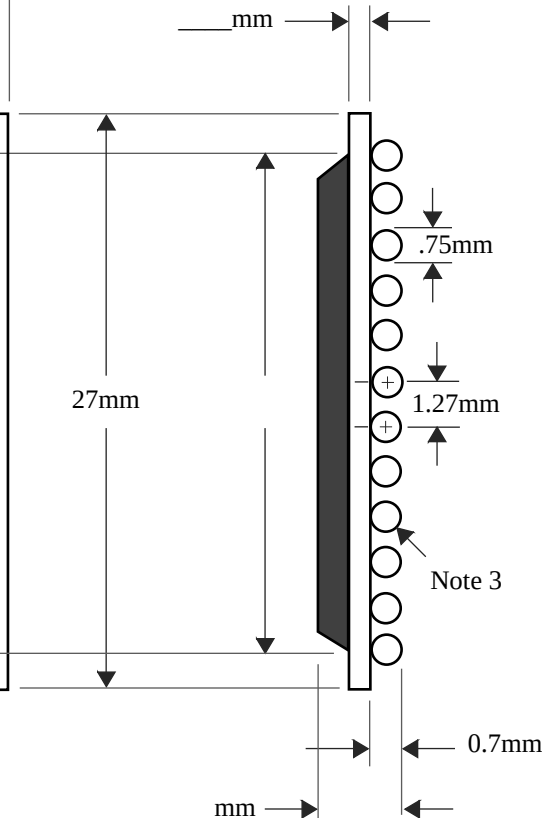
TEL 1-714-898-3830
FAX 1-714-891-0321

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
256	1.27mm	27mm SQ	20 x 20	4	full	BT

TOP VIEW



SIDE VIEW



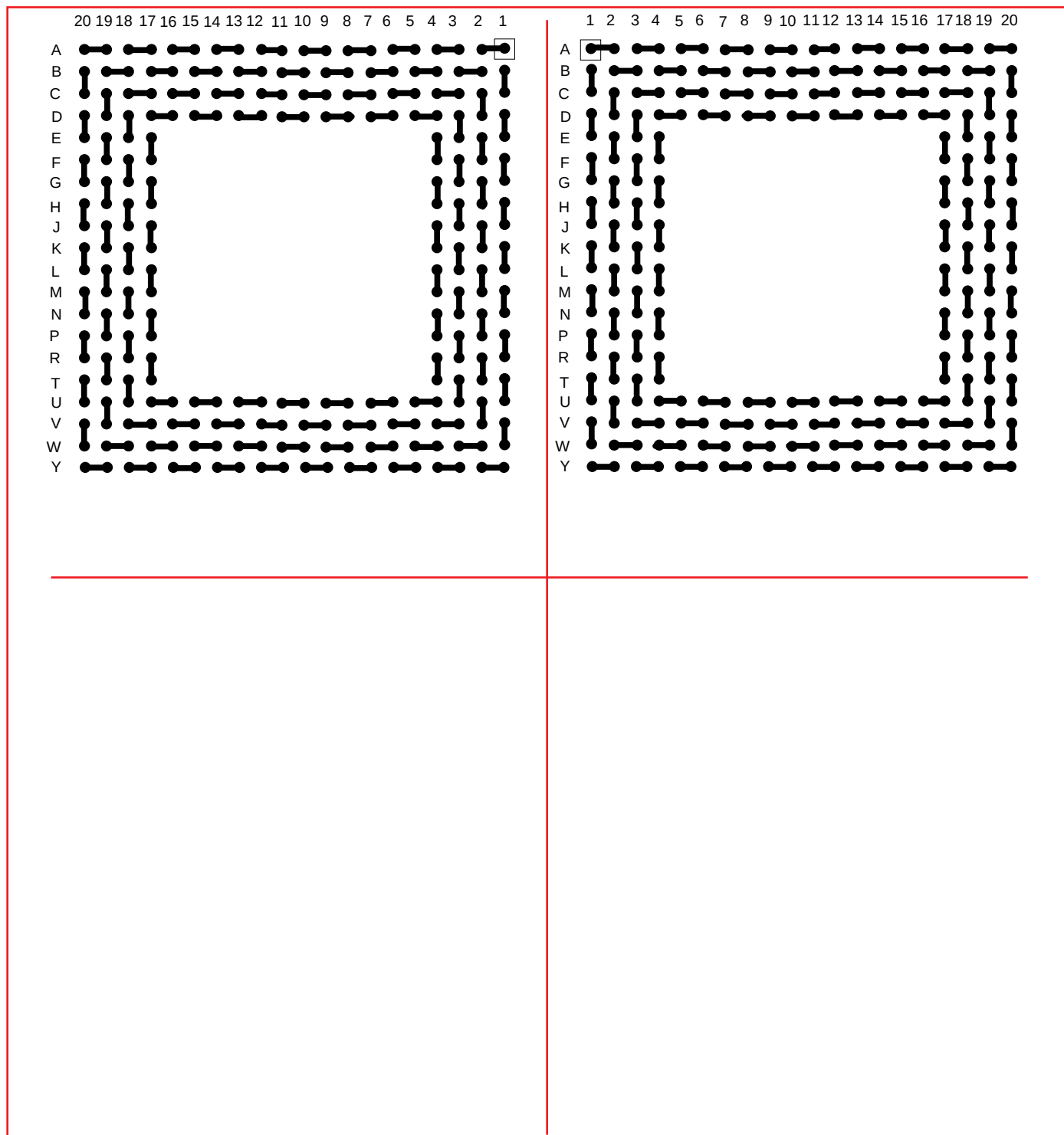
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
			11/14/98	Proposed Design
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY27mm-4x10 Tray Quantity 40 Tray Suppliers (ref):		

TEL 1-714-898-3830
FAX 1-714-891-0321

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
256	1.27mm	27mm SQ	20 x 20	4	none	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA256T1.27-DC200

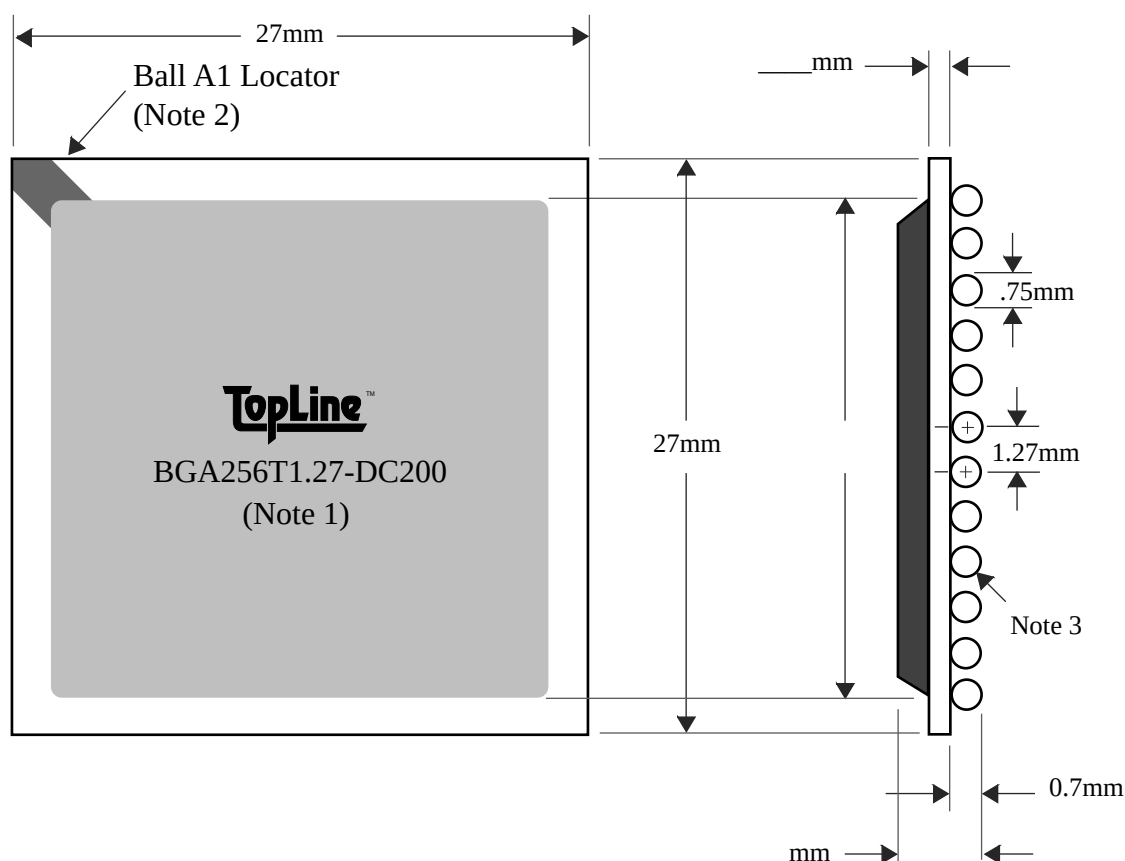
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
256	1.27mm	27mm SQ	20 x 20	4	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

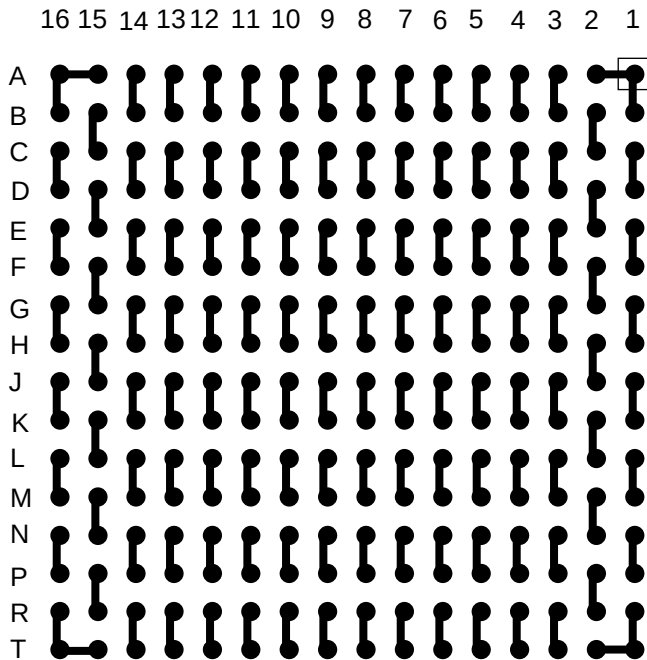


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY27mm-4x10 Tray Quantity 40 Tray Suppliers (ref):		

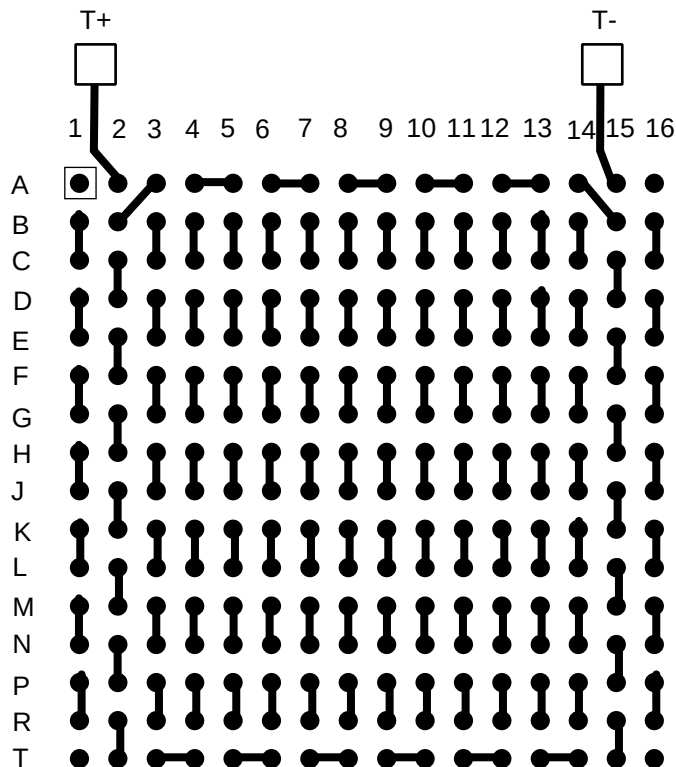
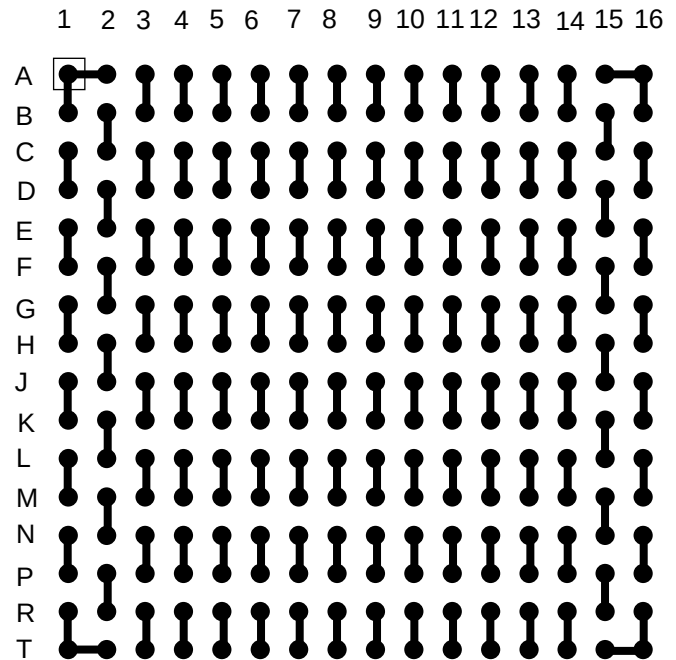
BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
256	1.27mm	21mm SQ	16 x 16	full	full	ceramic

CBGA256T1.27-DC61

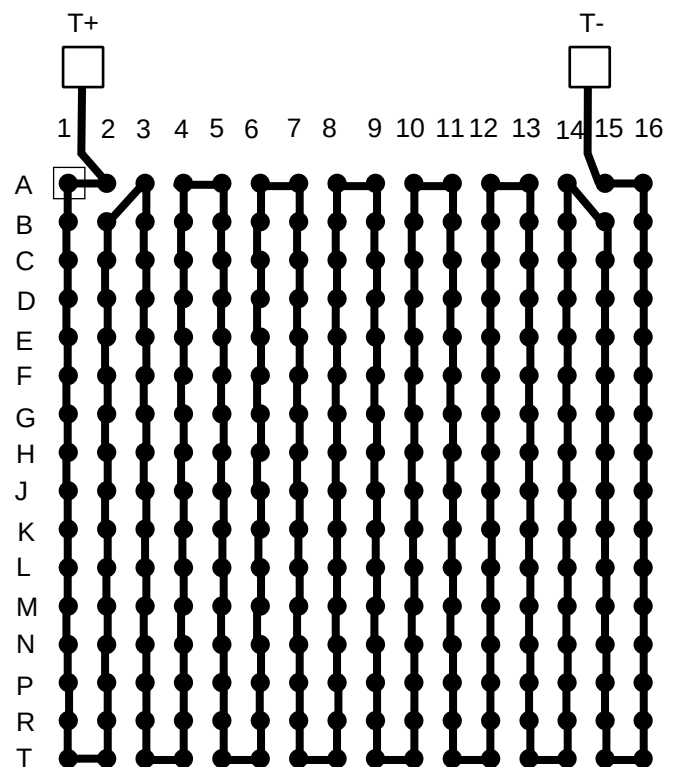
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

CBGA256T1.27-DC61

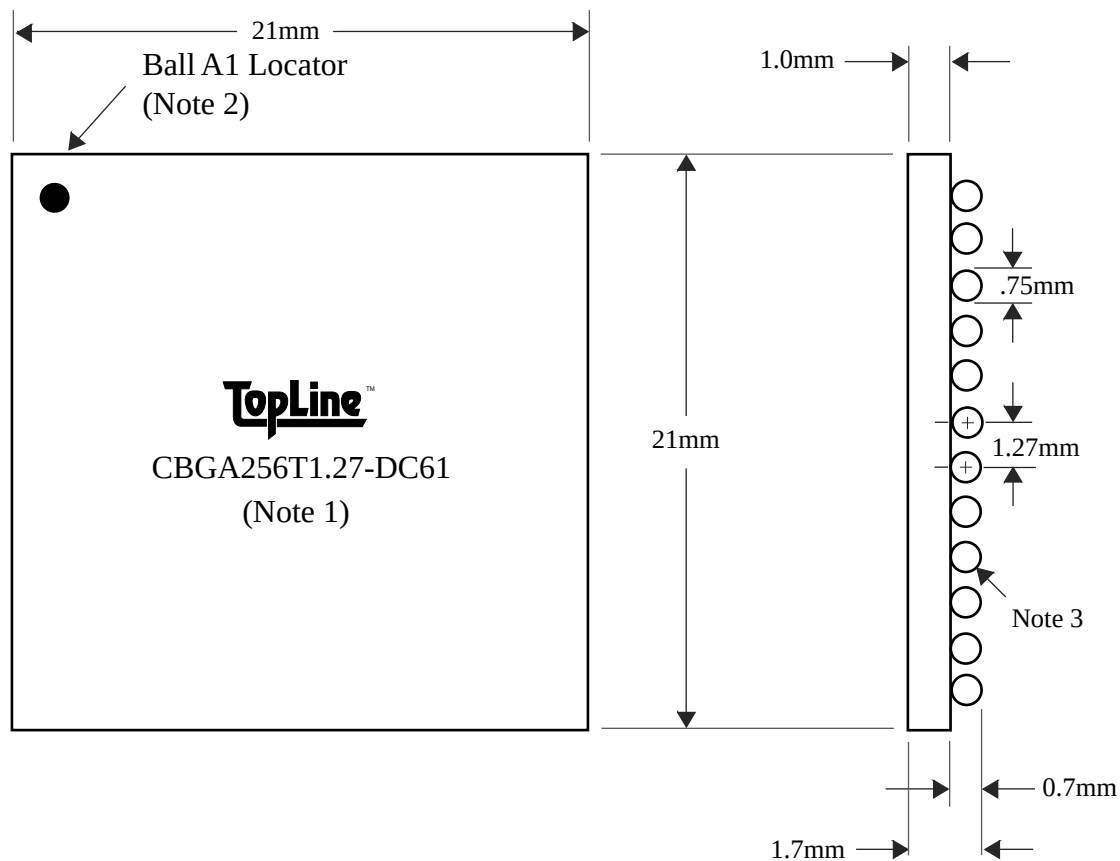
TopLine™

TEL 1-714-898-3830
FAX 1-714-891-0321

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
256	1.27mm	21mm SQ	16 x 16	full	full	ceramic

TOP VIEW

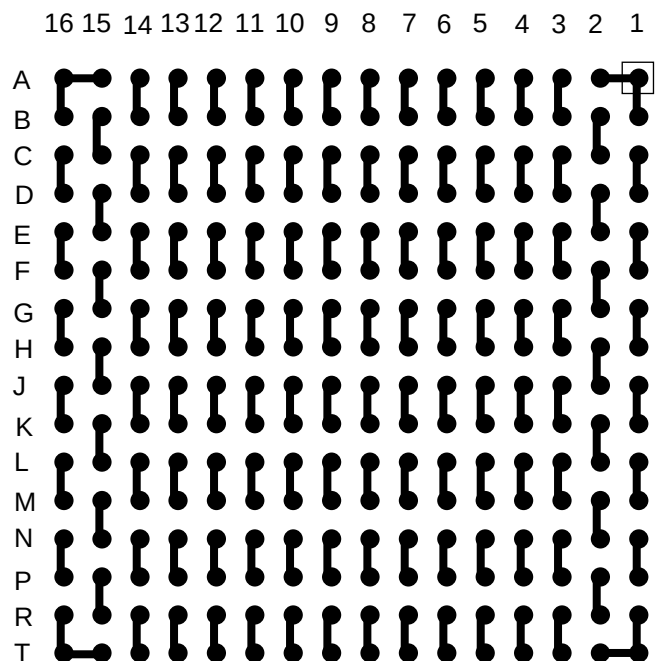
SIDE VIEW



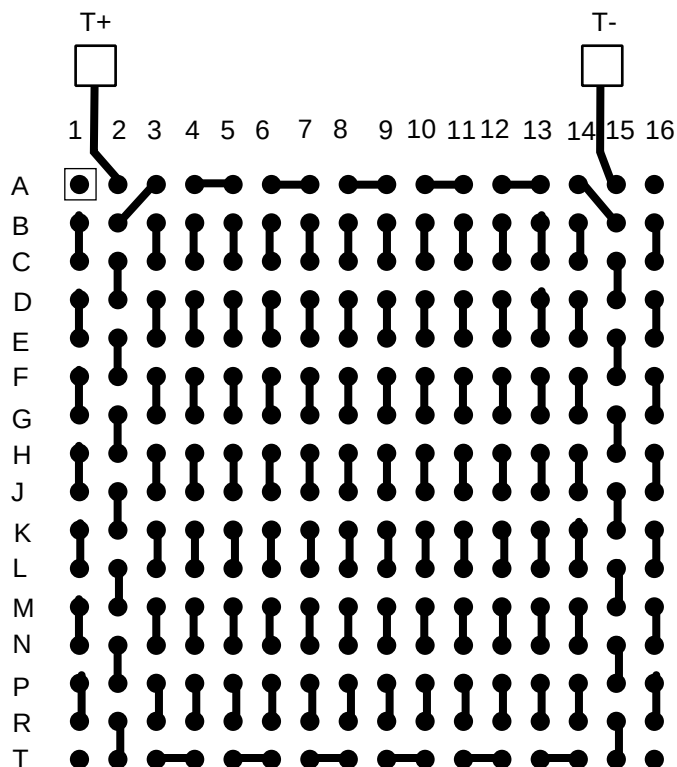
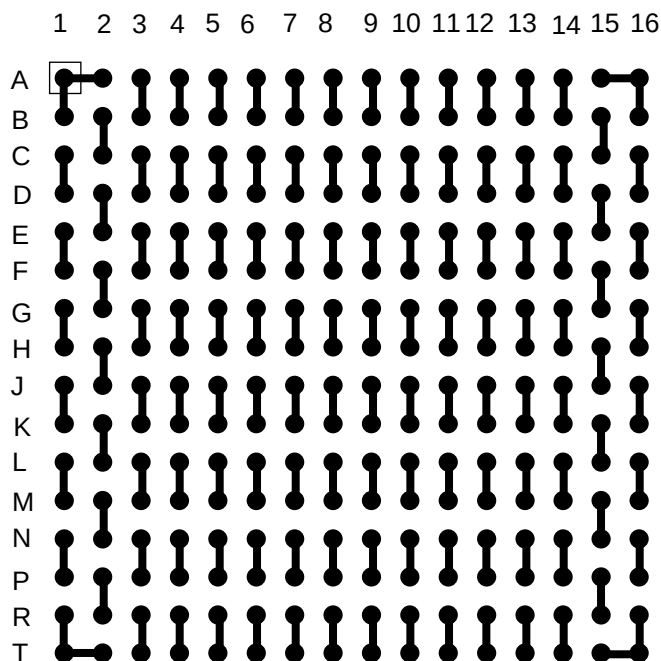
NOTES		REVISIONS	
Note 1	TopLine logo and part number centered Black ink	<u>Rev</u>	<u>Date</u> <u>Changes</u>
			11/14/98 Proposed Design
Note 2	Ball A1 locator mark positioned in corner		
Note 3	Ball Material: 10/90SnPb	PACKAGING TRAYS (SEE NOTE 4)	
		Tray BGATRAY21mm-5x12	
		Tray Quantity 60	
Note 4	Substrate Material: Ceramic	Tray Suppliers (ref):	

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
256	1.27mm	21mm SQ	16 x 16	full	full	ceramic

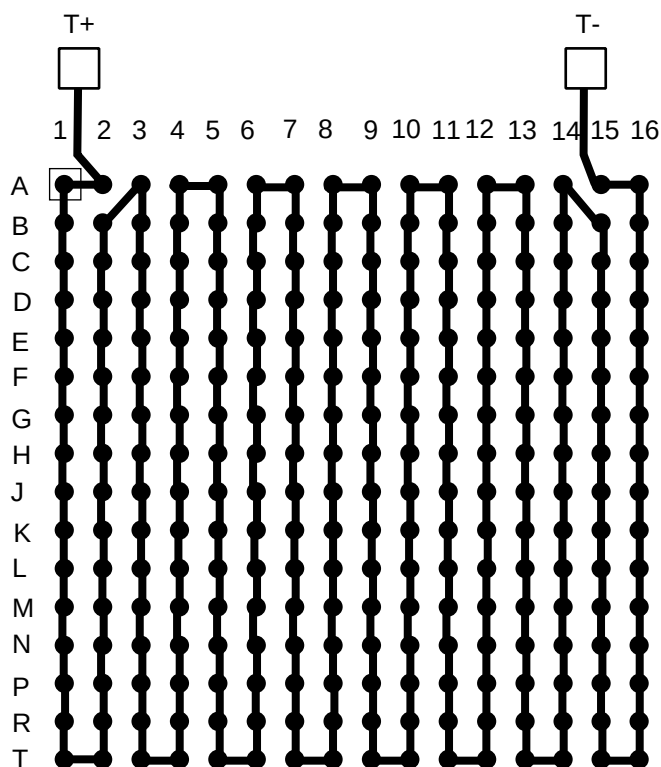
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

CBGA256T1.27L-DC61

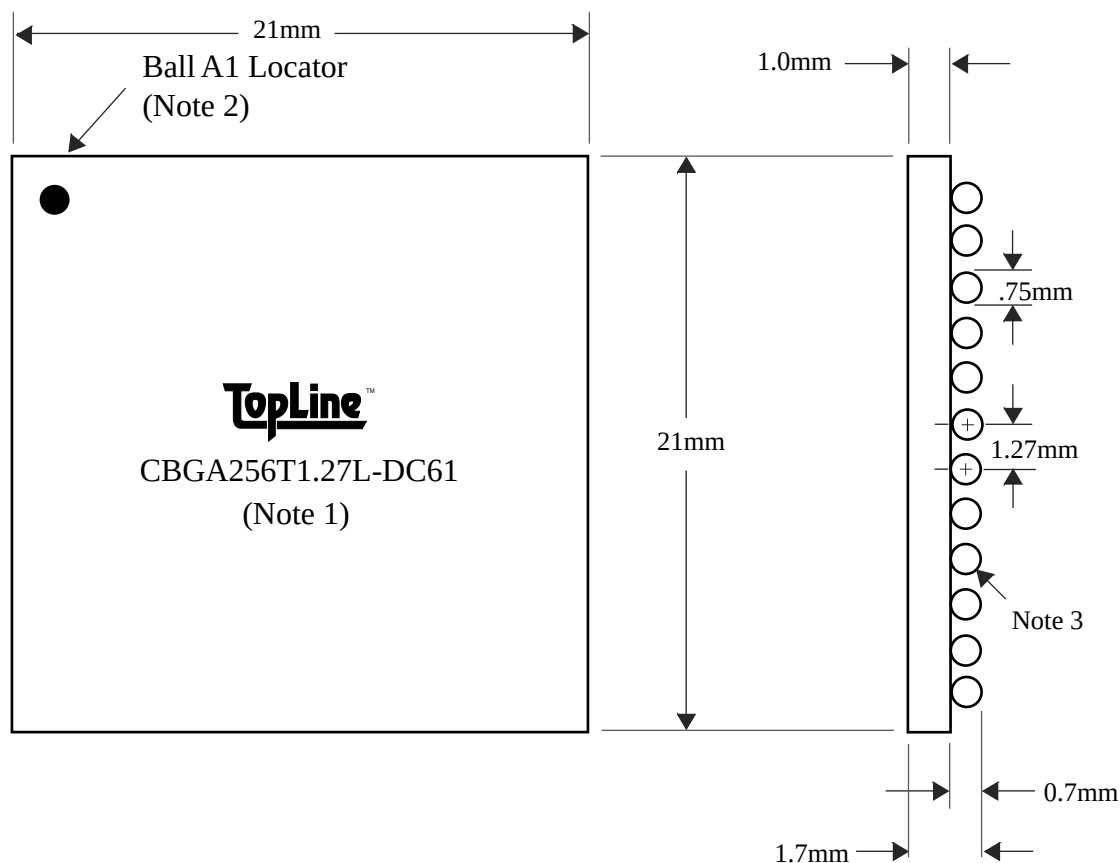
TopLine™

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
256	1.27mm	21mm SQ	16 x 16	full	full	ceramic

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



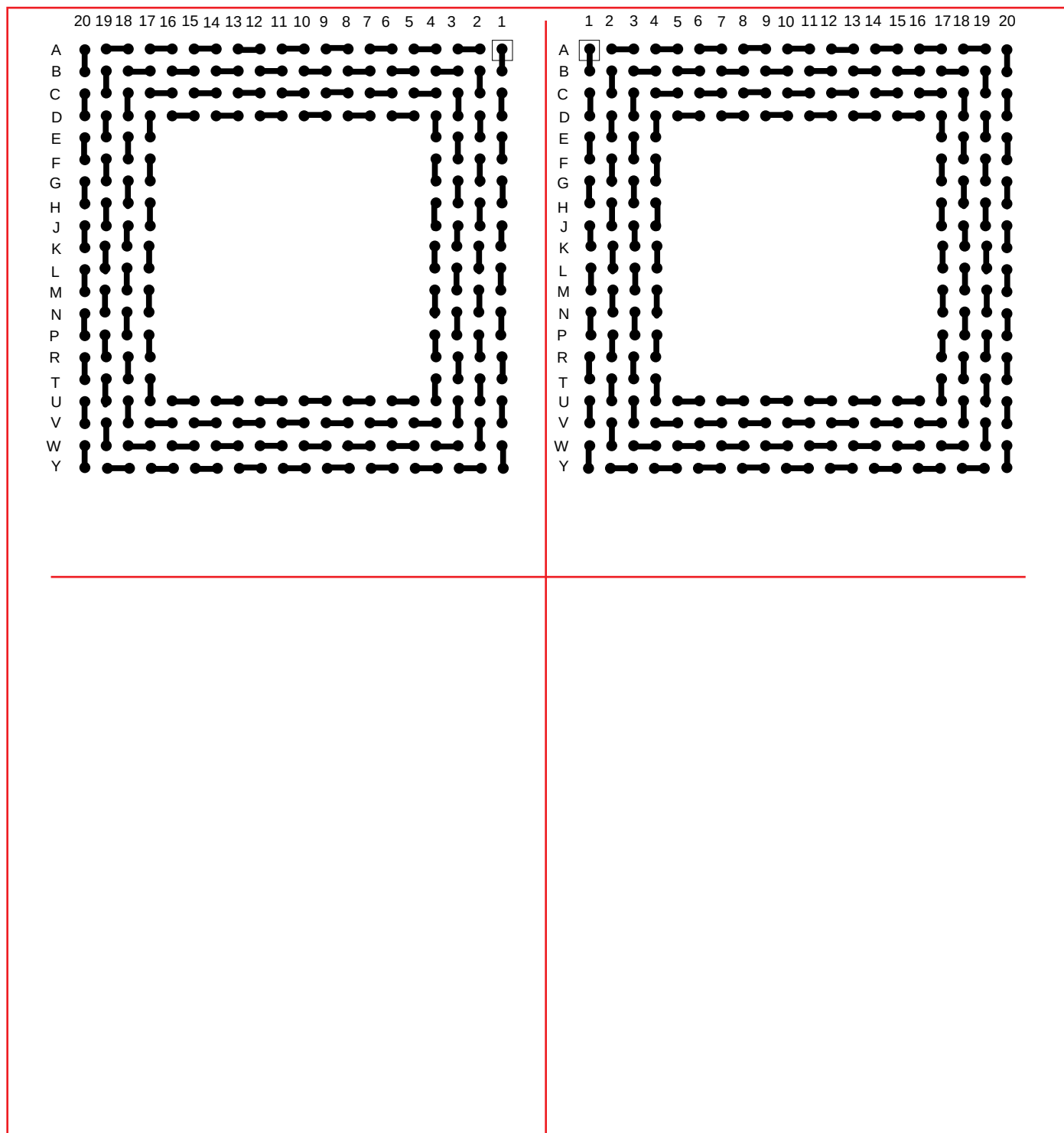
NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner			In Production
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: Ceramic	Tray BGATRAY21mm-5x12 Tray Quantity 60 Tray Suppliers (ref):		

TEL 1-714-898-3830
FAX 1-714-891-0321

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
256	1.27mm	27mm SQ	20 x 20	4	none	FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

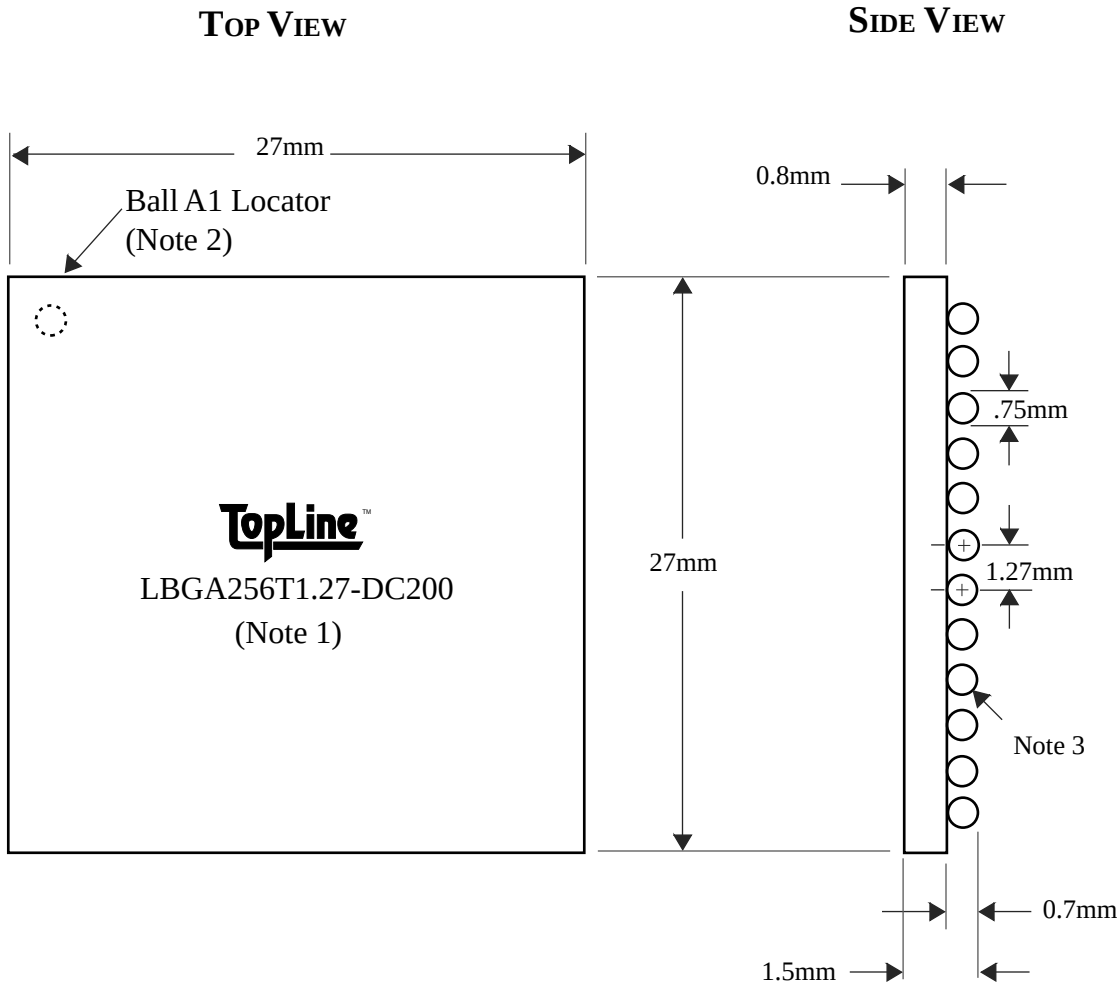


TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA256T.27-DC200

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
256	1.27mm	27mm SQ	20 x 20	4	none	FR4



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
			11/14/98	Proposed Design
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY27mm-4x10 Tray Quantity 40 Tray Suppliers (ref):		
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 62/36/2 SnPbAg			
Note 4	Substrate Material: FR4 laminate			



TEL 1-714-898-3830
FAX 1-714-891-0321

SBGA256T1.27-DC201

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
256	1.27mm	27mm SQ	20 x 20	4	none	BT

BALL VIEW

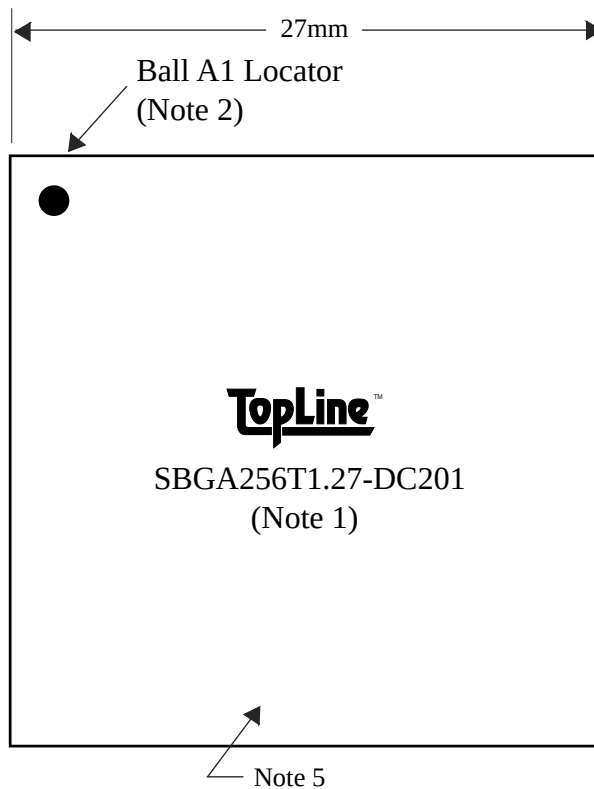
BOTTOM SIDE (TOP X-RAY VIEW)

TEST VEHICLE BOARD

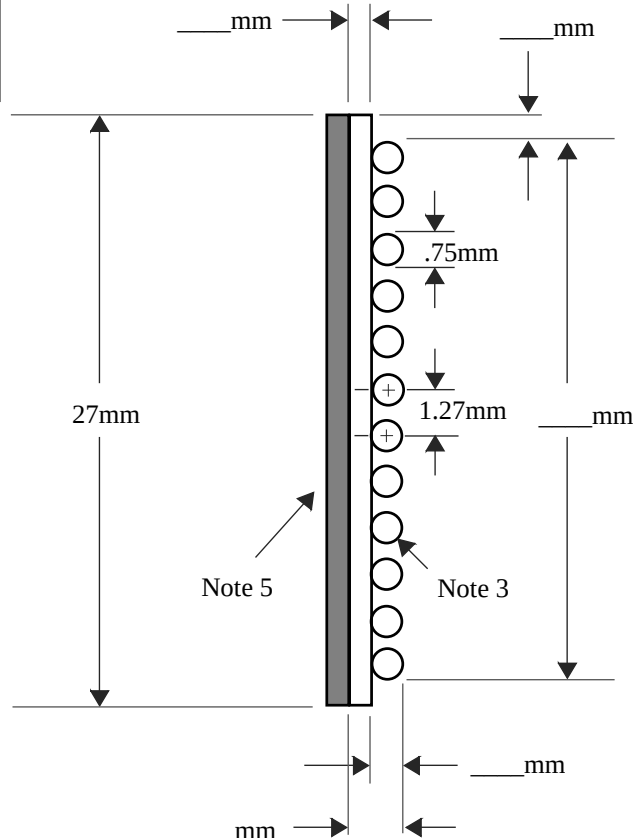
AFTER MOUNTING TO TEST BOARD

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>	TEL 1-714-898-3830
256	1.27mm	27mm SQ	20 x 20	4	none	BT	FAX 1-714-891-0321

TOP VIEW



SIDE VIEW

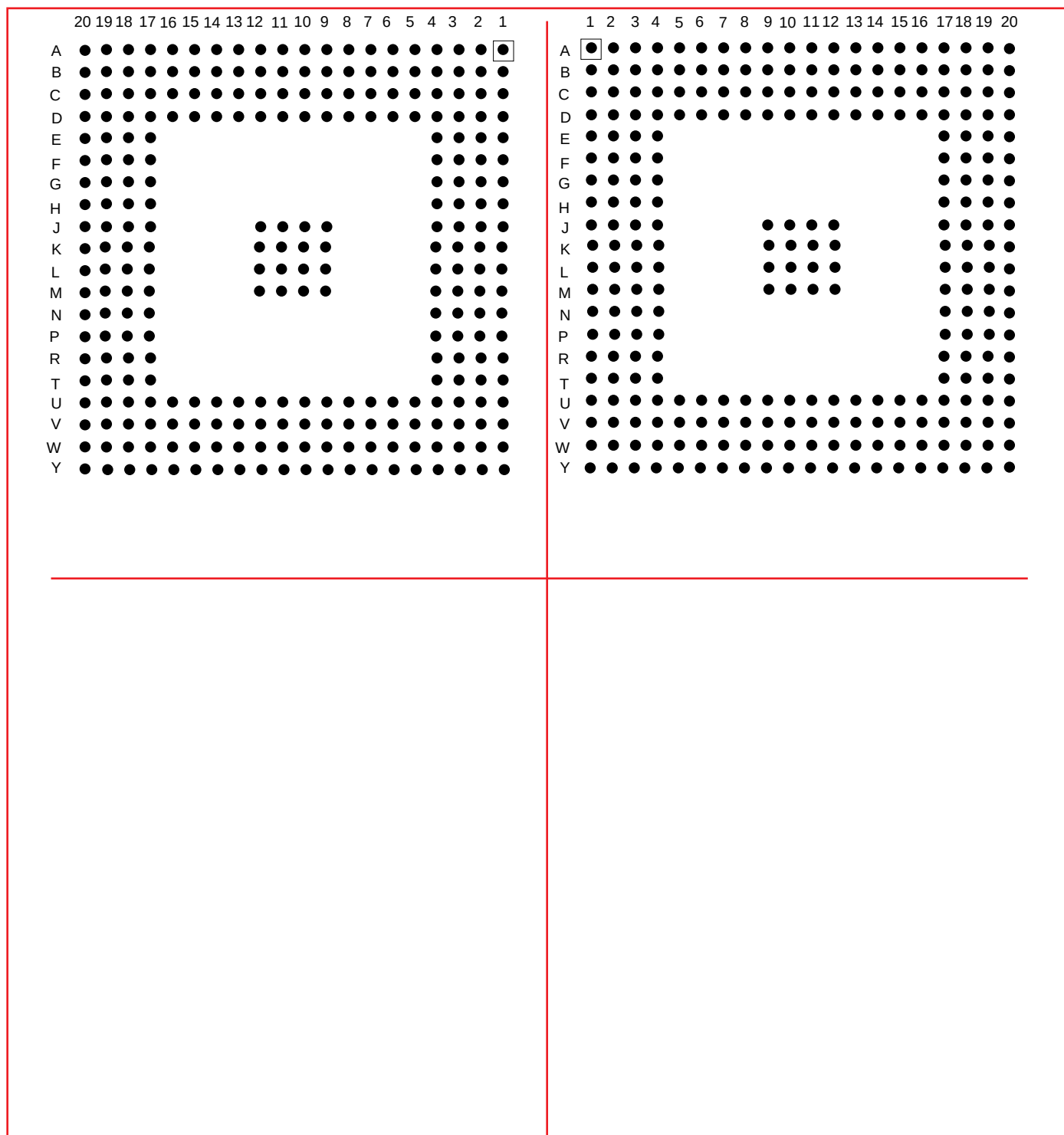


NOTES		REVISIONS		
Note 1	Logo and part number centered	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY_____		
		Tray Quantity _____		
Note 5	Metal heat sink. Die cavity down	Tray Suppliers (ref):		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
272	1.27mm	27mm SQ	20 x 20	4	4 x 4	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA272T1.27-ISO

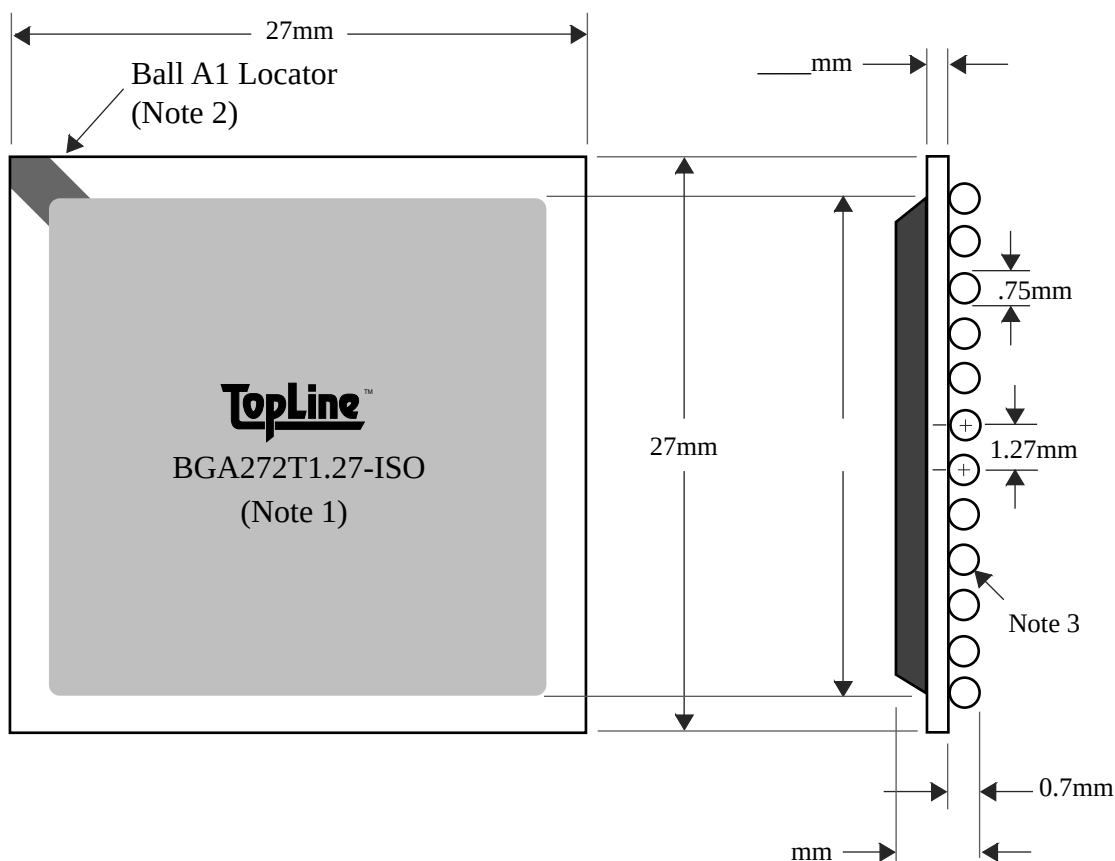
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
272	1.27mm	27mm SQ	20 x 20	4	4 x 4	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



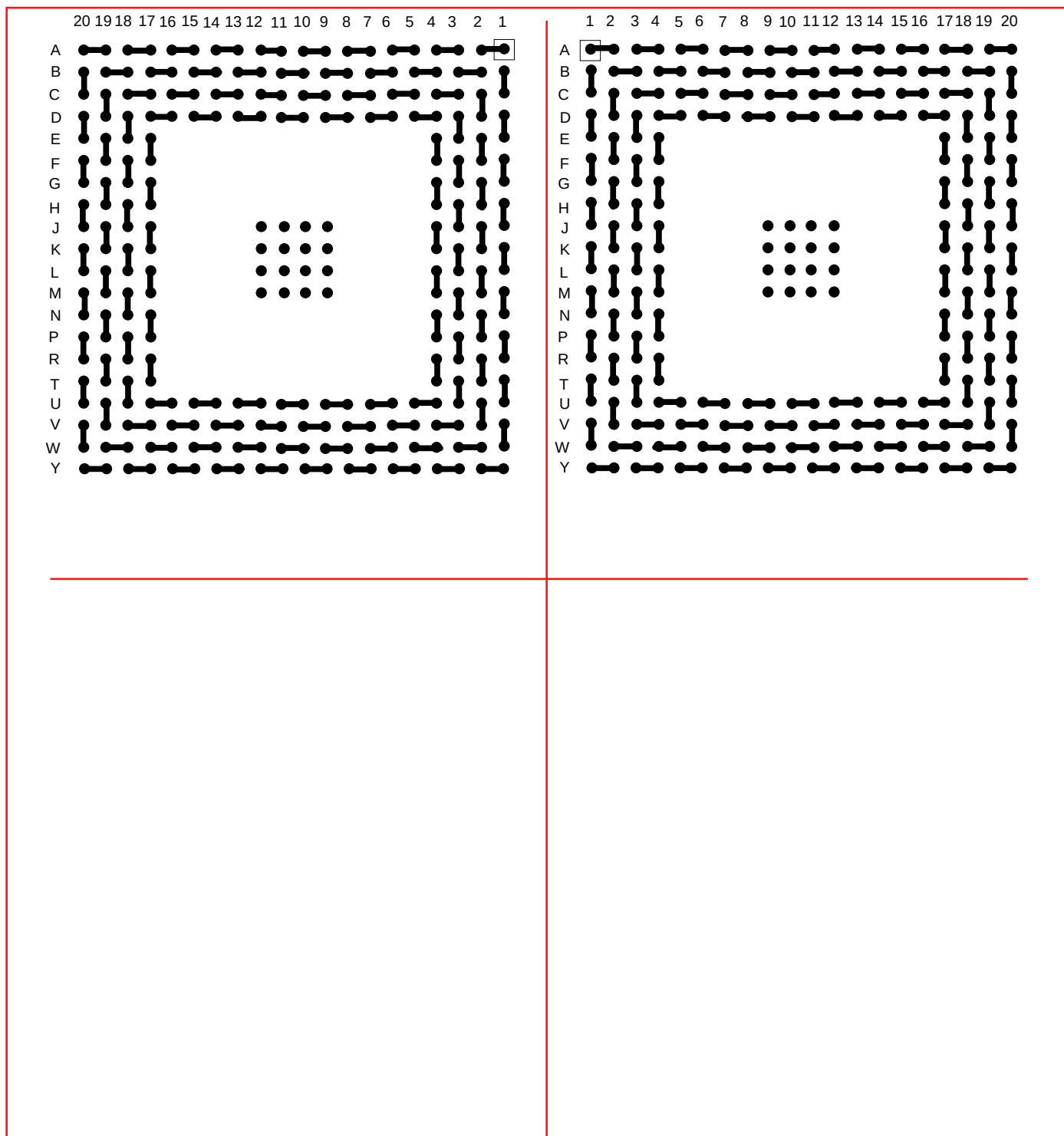
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY27mm-4x10 Tray Quantity 40 Tray Suppliers (ref):		

TEL 1-714-898-3830
FAX 1-714-891-0321

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
272	1.27mm	27mm SQ	20 x 20	4	4 x 4	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA272T1.27-DC202

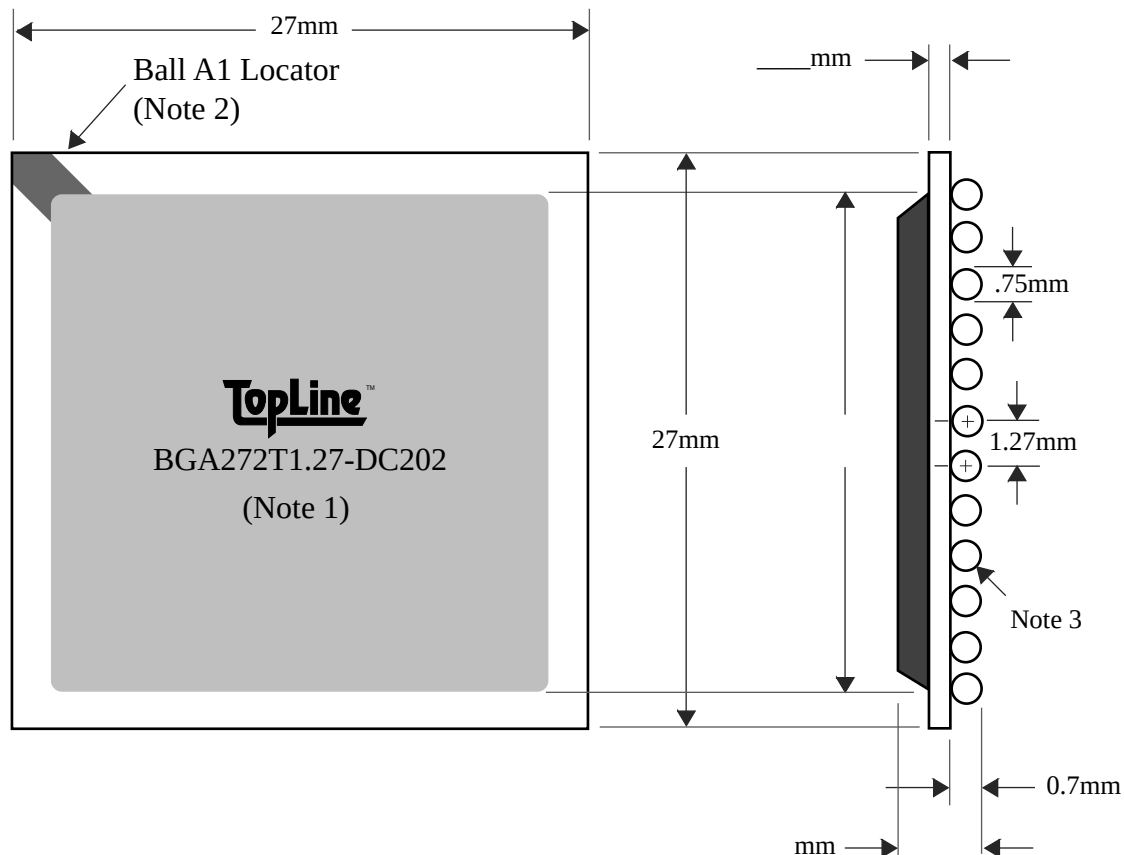
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
272	1.27mm	27mm SQ	20 x 20	4	4 x 4	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



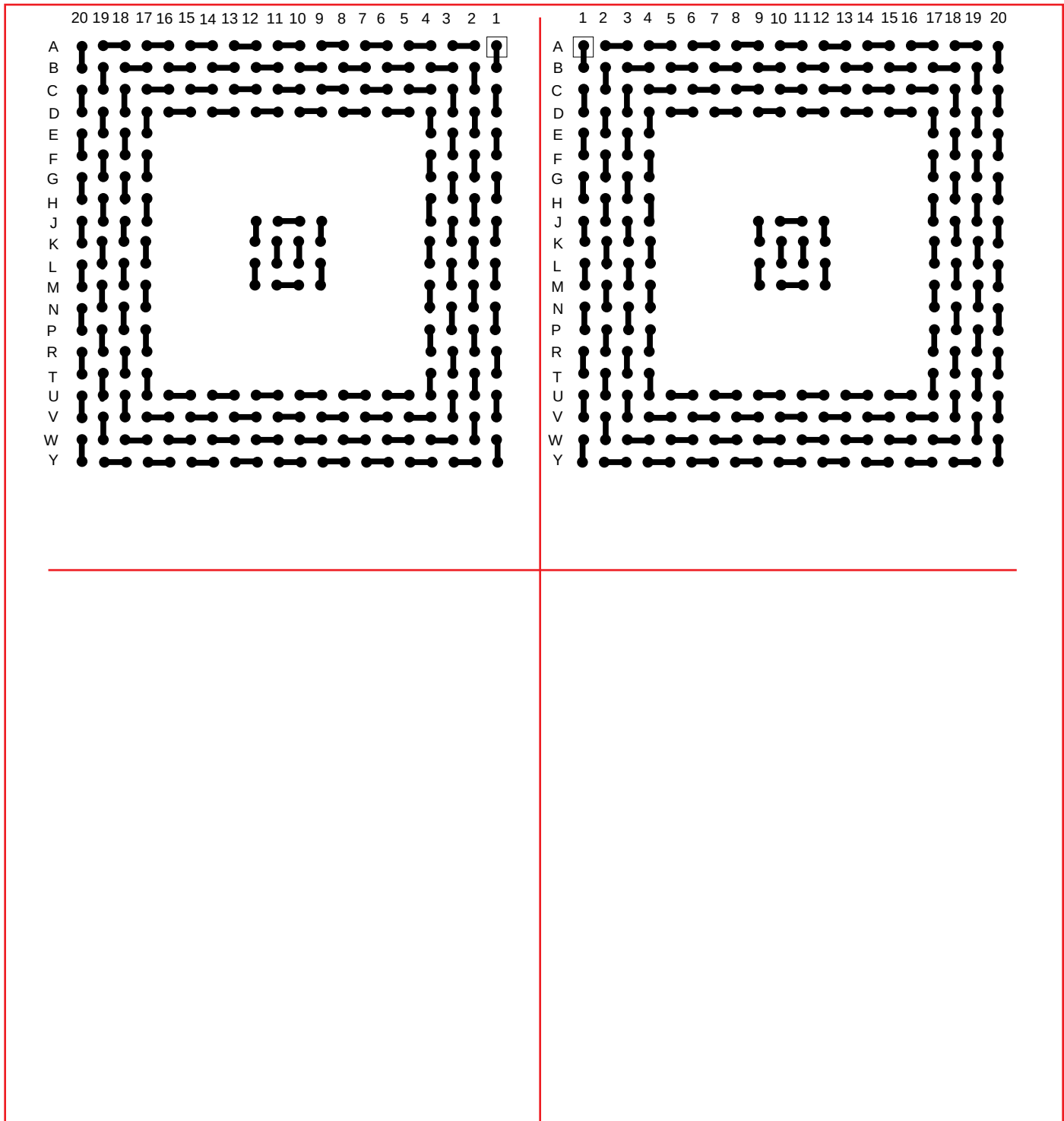
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY27mm-4x10		
		Tray Quantity 40		
		Tray Suppliers (ref):		

TEL 1-714-898-3830
FAX 1-714-891-0321

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
272	1.27mm	27mm SQ	20 x 20	4	4 x 4	FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

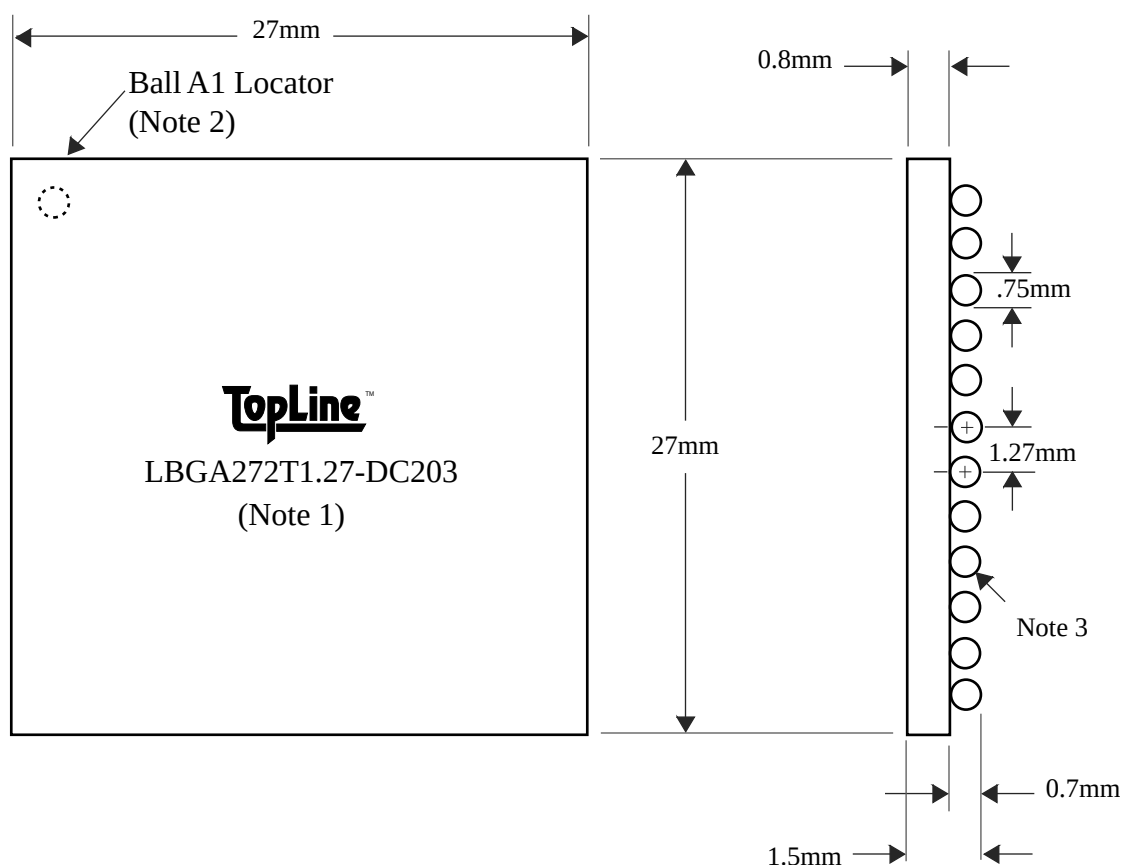
LBGA272T1.27-DC203

TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830 FAX 1-714-891-0321
272	1.27mm	27mm SQ	20 x 20	4	4 x 4	FR4	

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY27mm-4x10 Tray Quantity 40 Tray Suppliers (ref):		



TEL 1-714-898-3830
FAX 1-714-891-0321

BGA288T1.0-ISO

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
288	1.0mm	23mm SQ	22 x 22	4	none	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA288T1.0-ISO

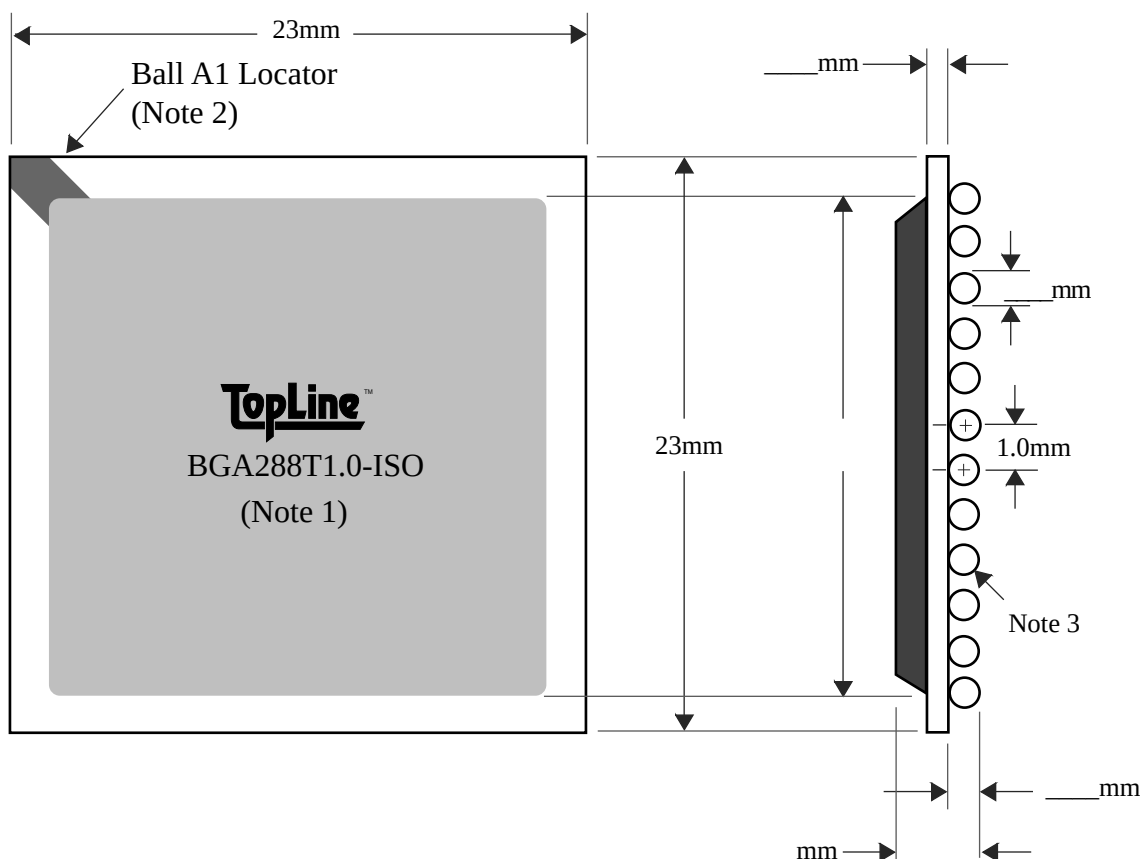
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
288	1.0mm	23mm SQ	22 x 22	4	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY_____		
		Tray Quantity _____		
		Tray Suppliers (ref):		



TEL 1-714-898-3830
FAX 1-714-891-0321

BGA288T1.0-DC221

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
288	1.0mm	23mm SQ	22 x 22	4	none	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA288T1.0-DC221

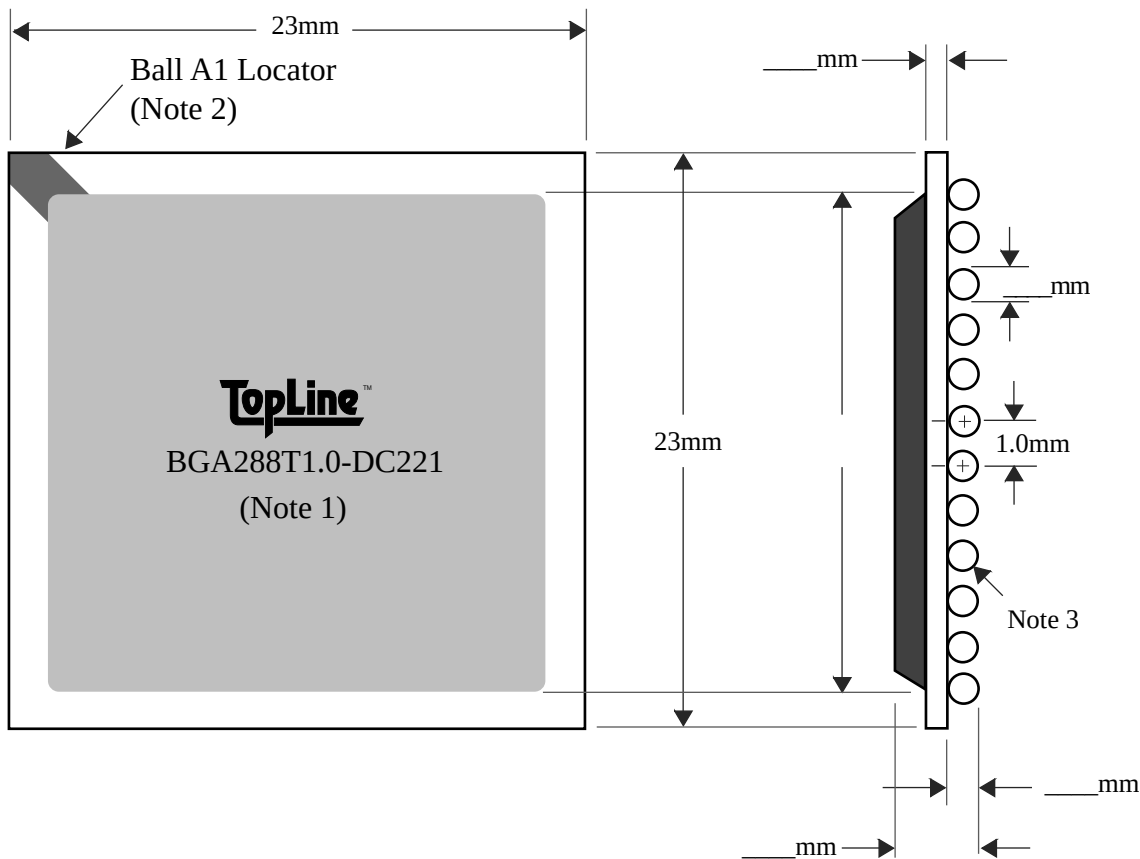


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
288	1.0mm	23mm SQ	22 x 22	4	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY_____		
		Tray Quantity _____		
		Tray Suppliers (ref):		

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

288

PITCH

1.0mm

SIZE

23mm SQ

MATRIX

22 x 22

ROWS

4

CENTER

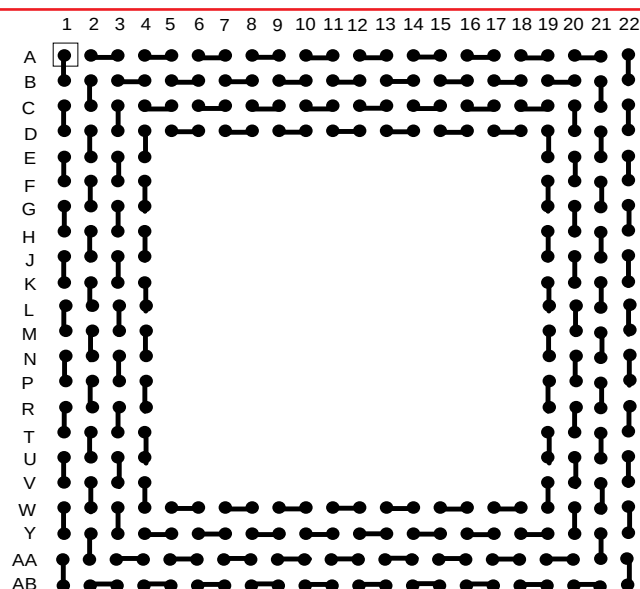
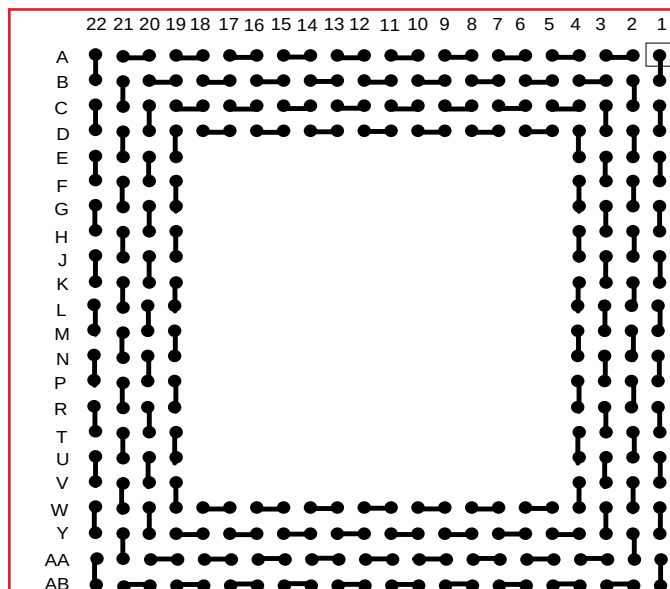
none

MAT'L

FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

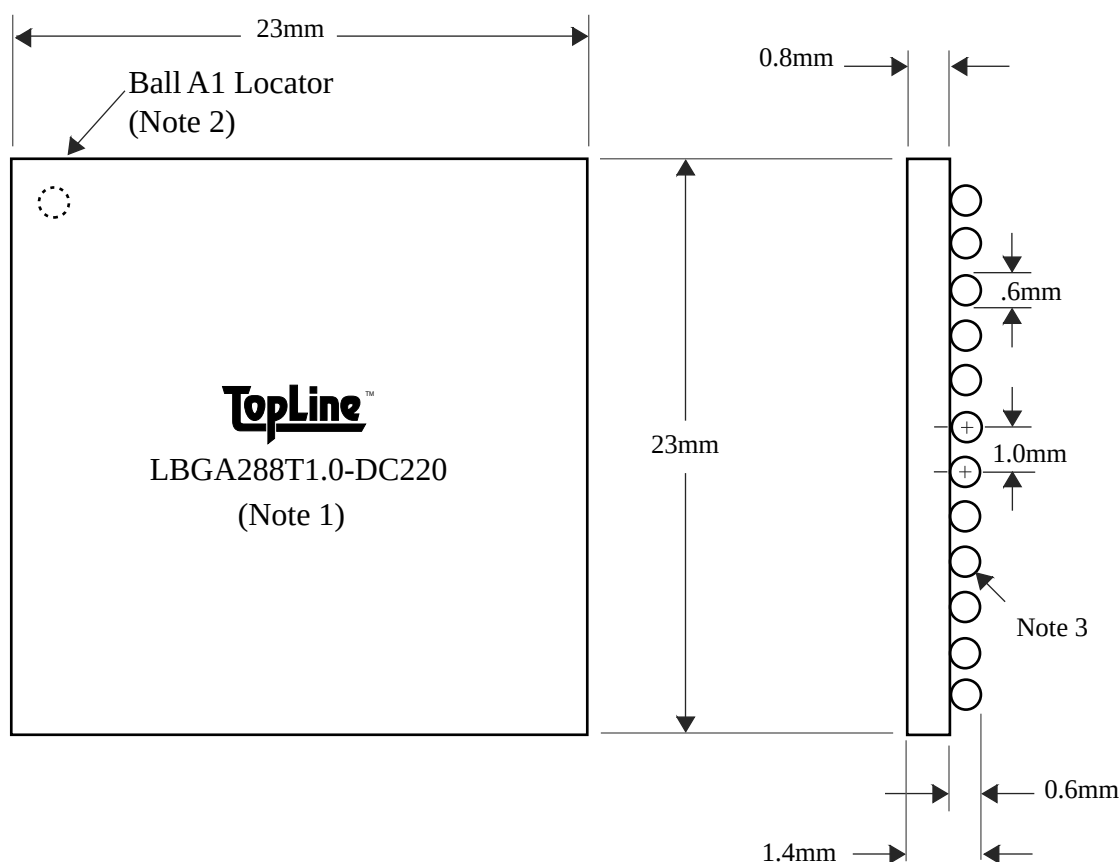
LBGA288T1.0-DC220

TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830
288	1.0mm	23mm SQ	22 x 22	4	none	FR4	FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



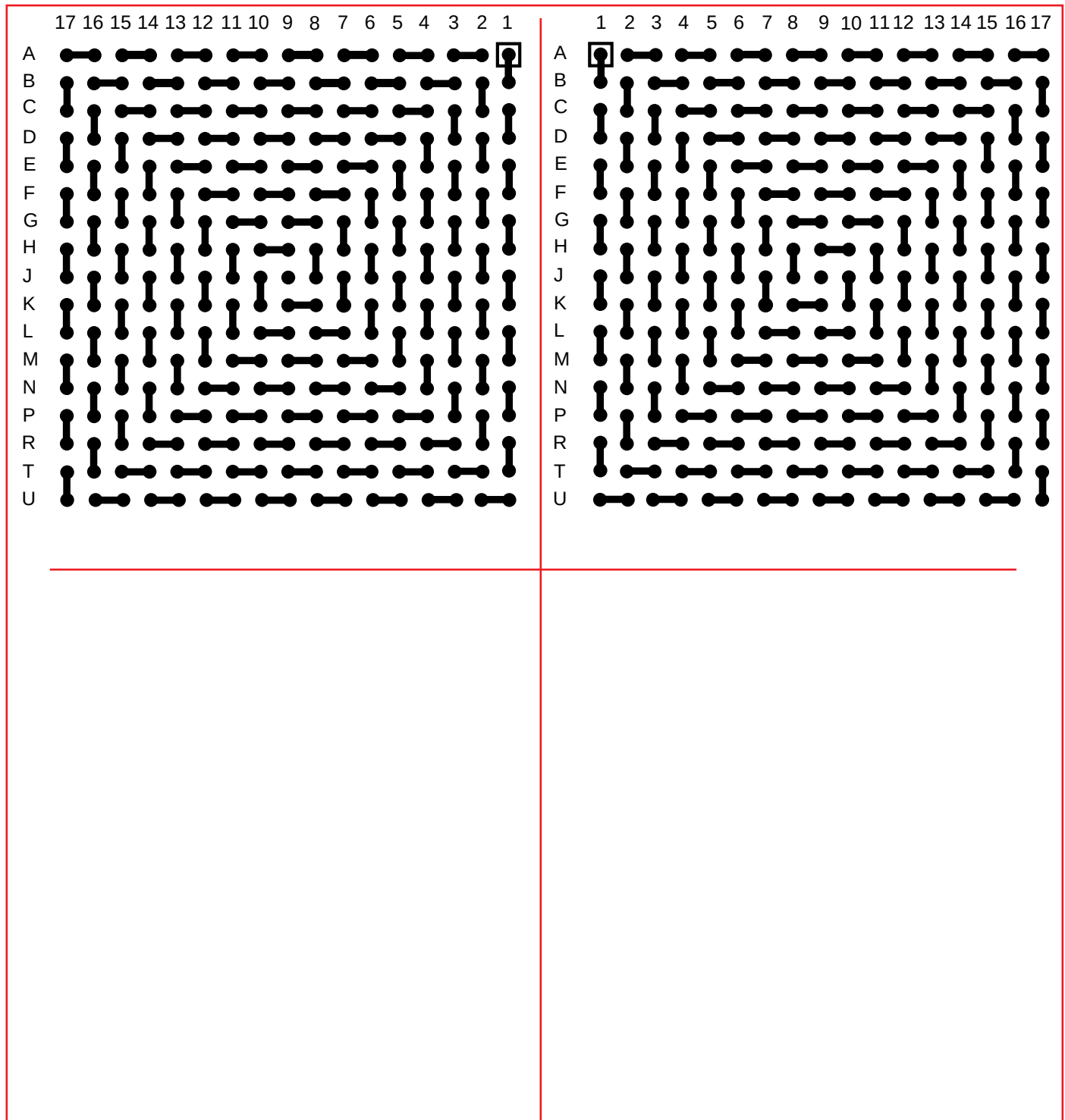
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY23mm-5x12 Tray Quantity 60 Tray Suppliers (ref):		

TEL 1-714-898-3830
FAX 1-714-891-0321

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
289	1.27mm	23mm SQ	17 x 17	full	full	FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA289T1.27-DC179

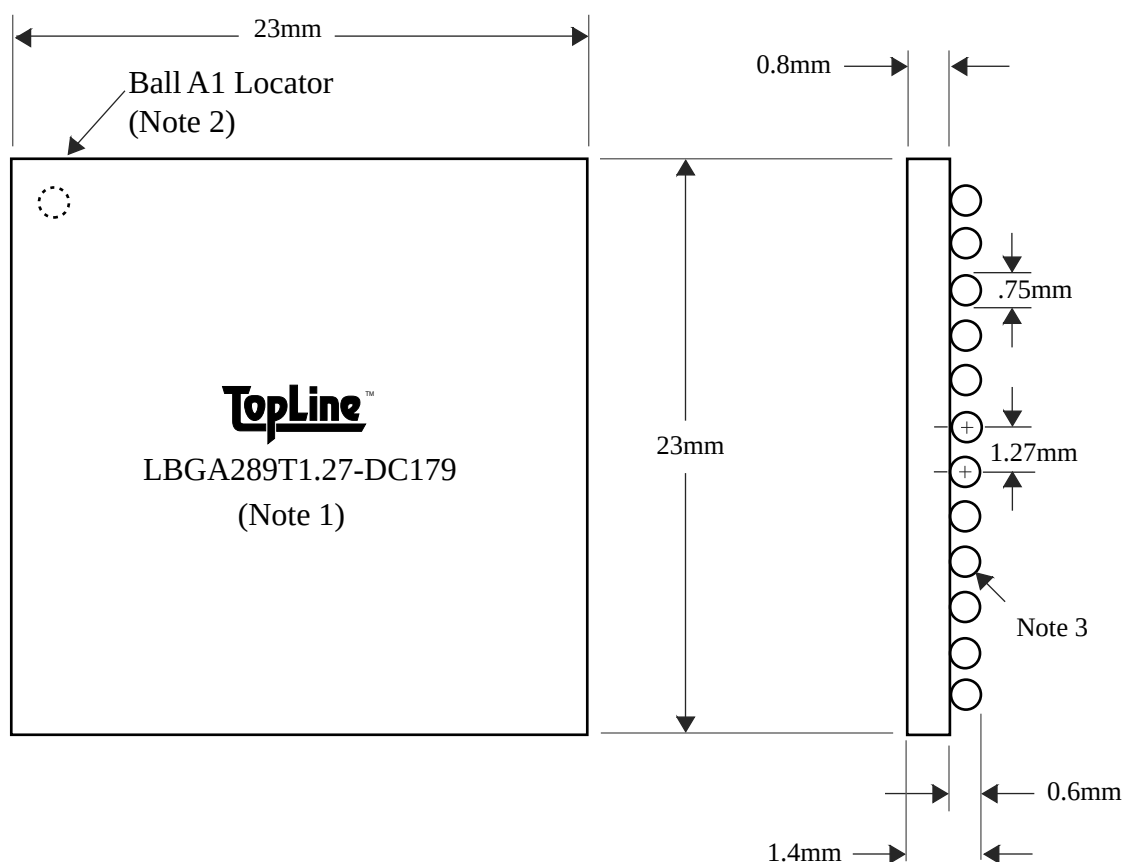
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
289	1.27mm	23mm SQ	17 x 17	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

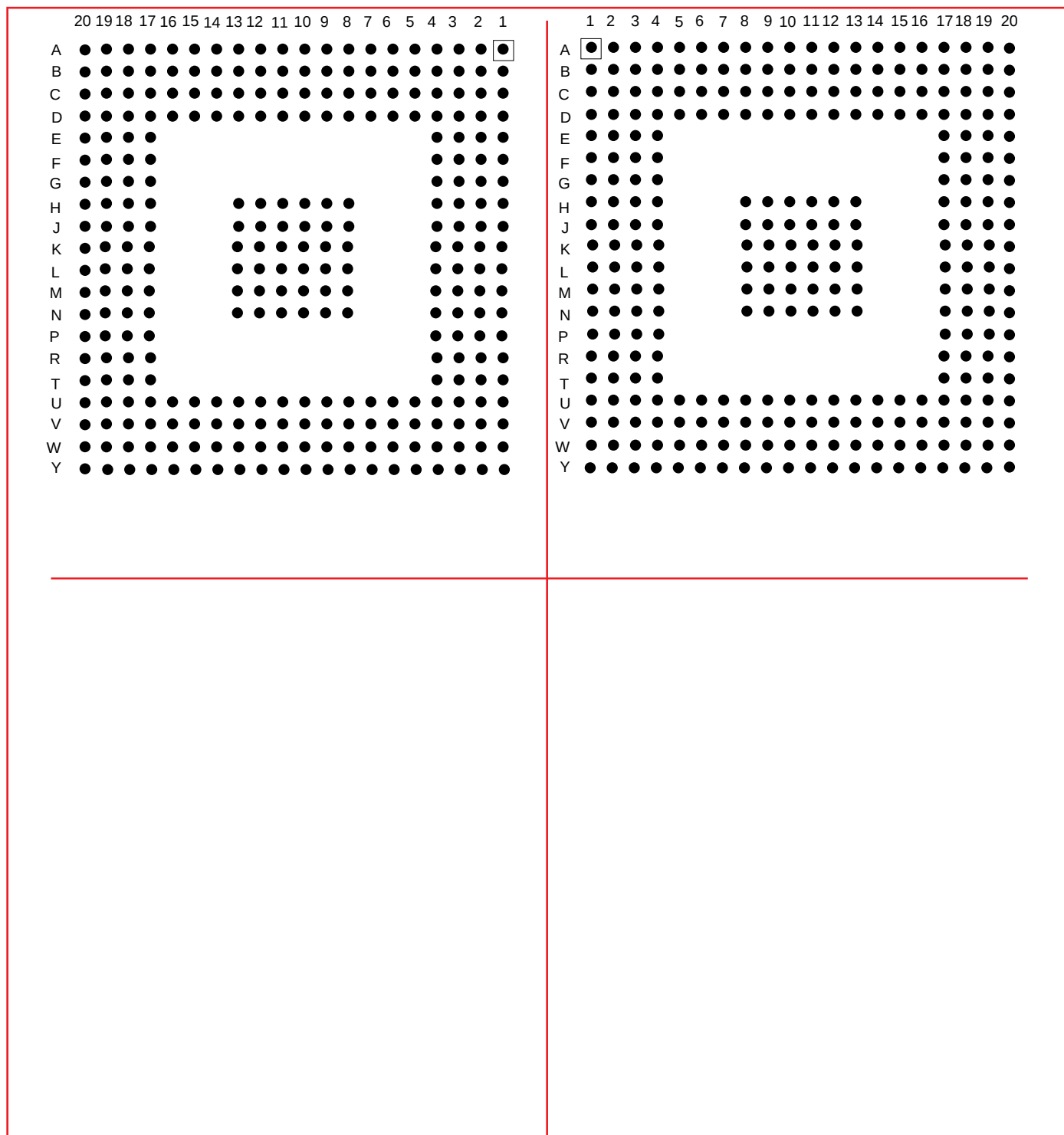


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY23mm-5x12 Tray Quantity 60 Tray Suppliers (ref):		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
292	1.27mm	27mm SQ	20 x 20	4	6 x 6	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA292T1.27-ISO

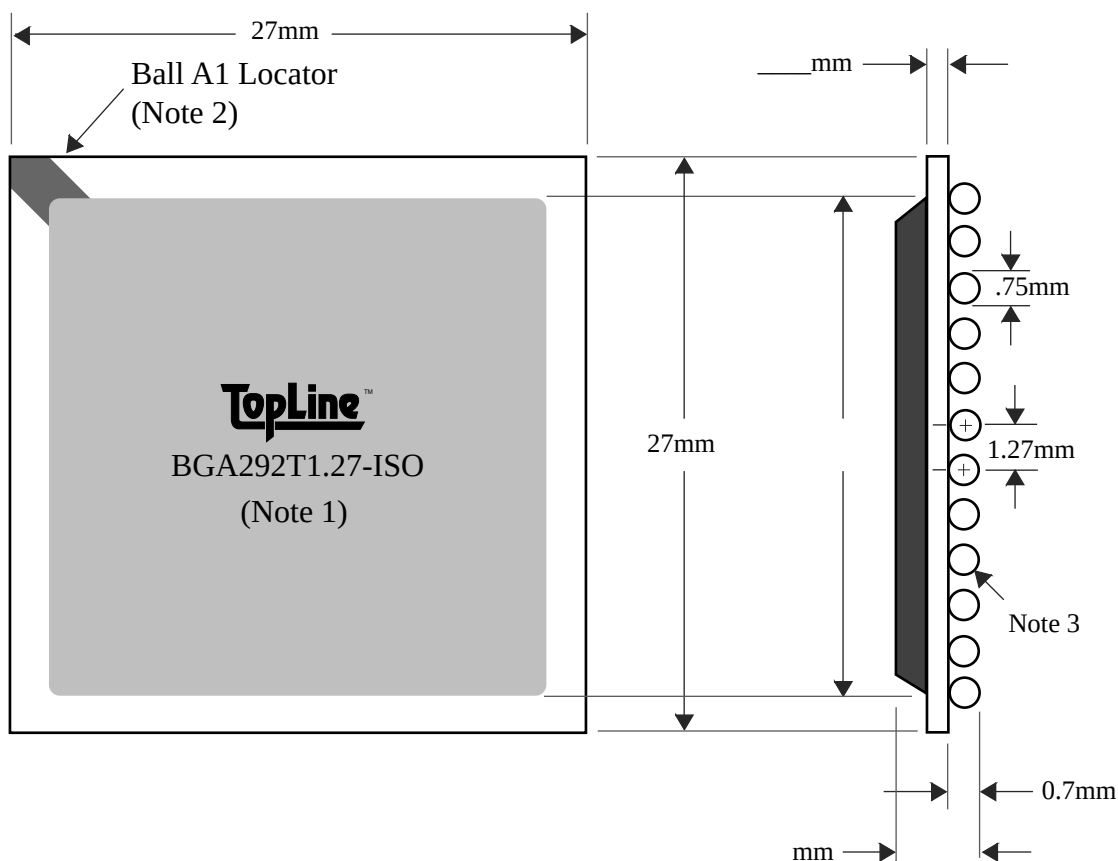
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
292	1.27mm	27mm SQ	20 x 20	4	6 x 6	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY27mm-4x10 Tray Quantity 40 Tray Suppliers (ref):		

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

292

PITCH

1.27mm

SIZE

27mm SQ

MATRIX

20 x 20

ROWS

4

CENTER

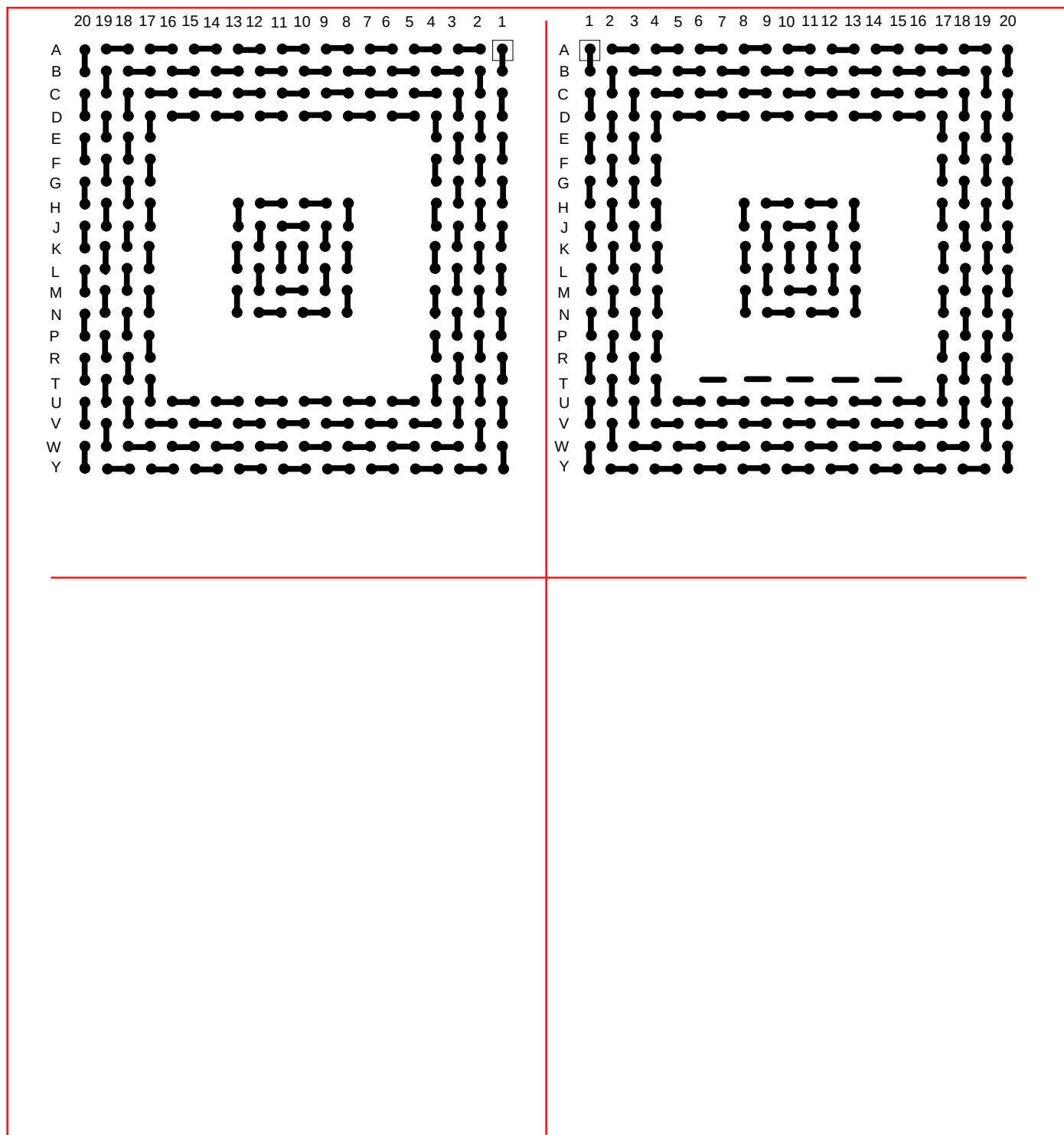
6 x 6

MAT'L

FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

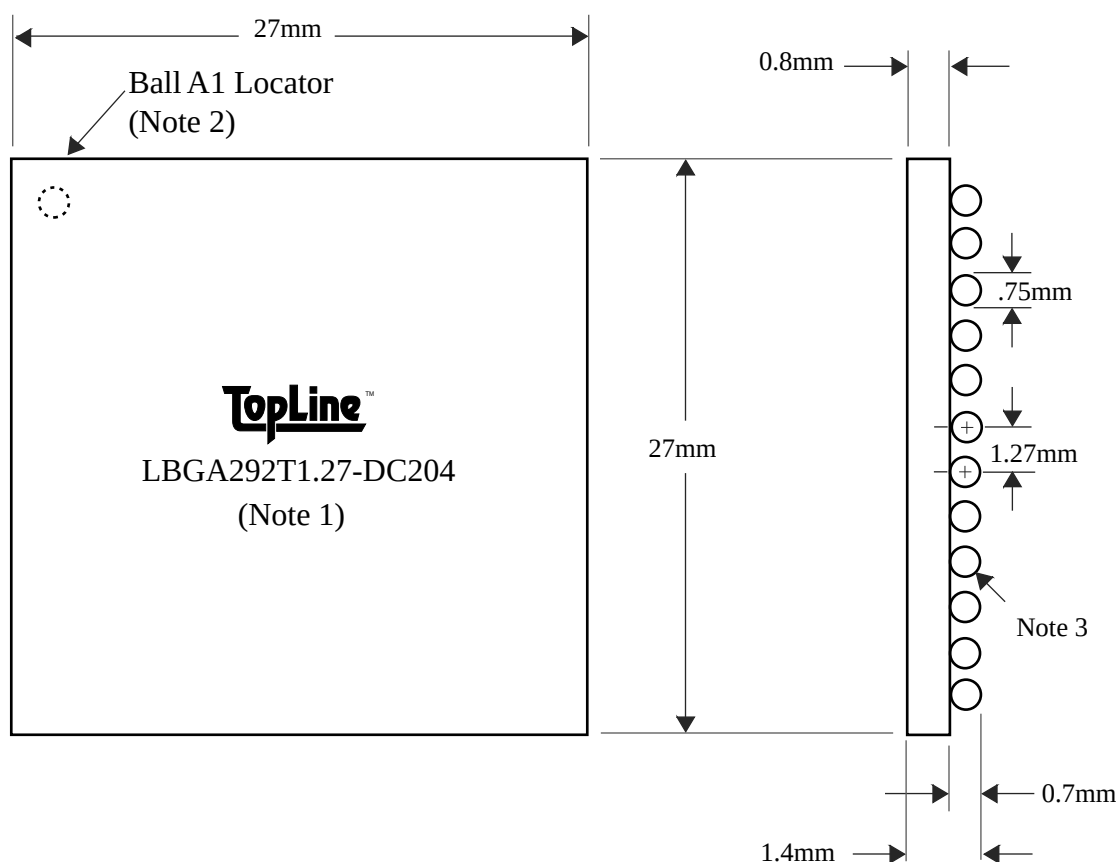
LBGA292T1.27-DC204

TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830 FAX 1-714-891-0321
292	1.27mm	27mm SQ	20 x 20	4	6 x 6	FR4	

TOP VIEW

SIDE VIEW

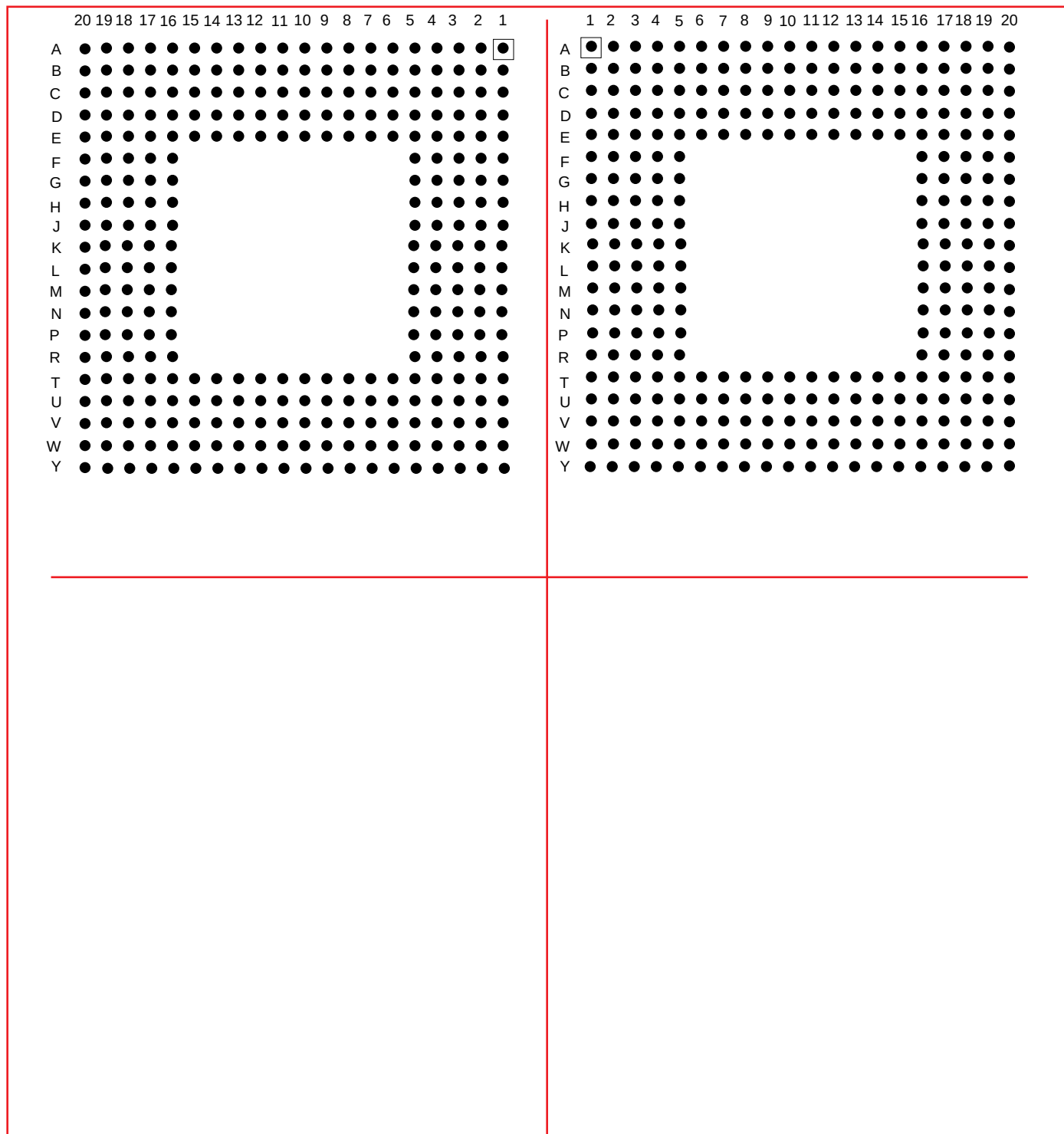


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY27mm-4x10 Tray Quantity 40 Tray Suppliers (ref):		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
300	1.27mm	27mm SQ	20 x 20	5	none	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA300T1.27-ISO

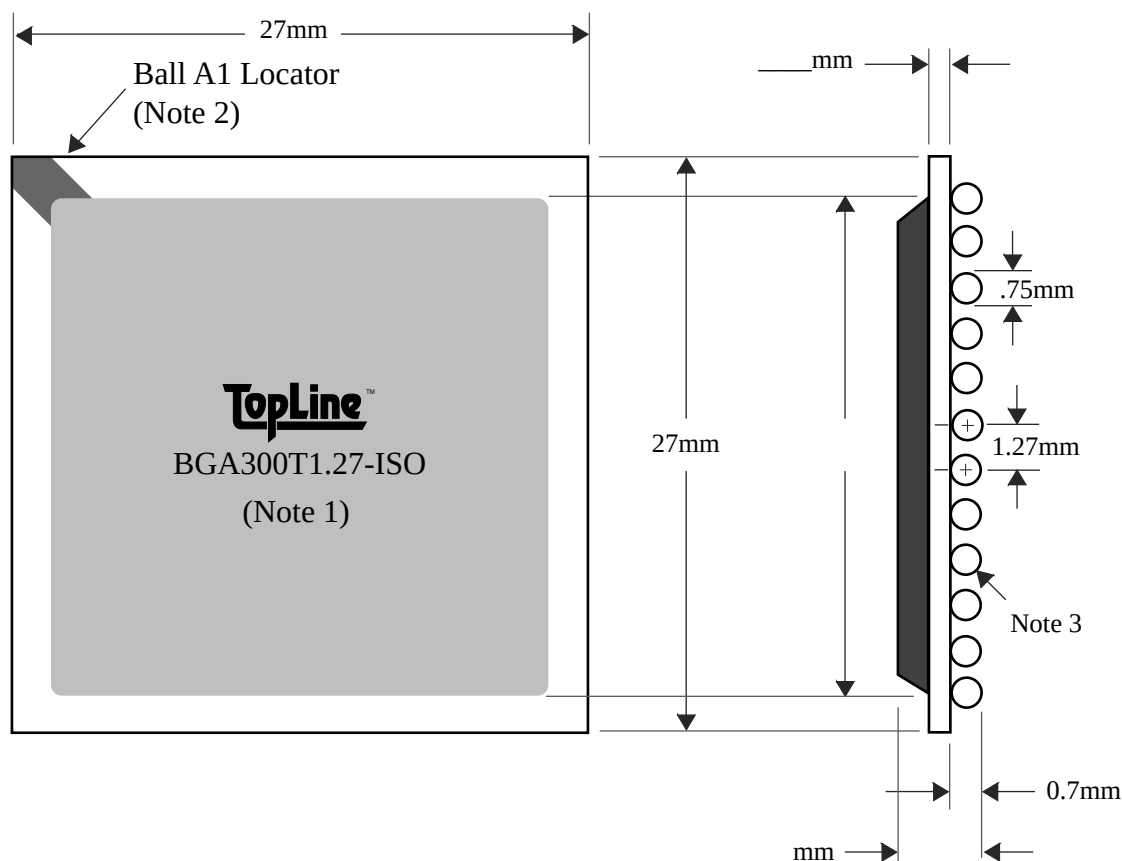
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
300	1.27mm	27mm SQ	20 x 20	5	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



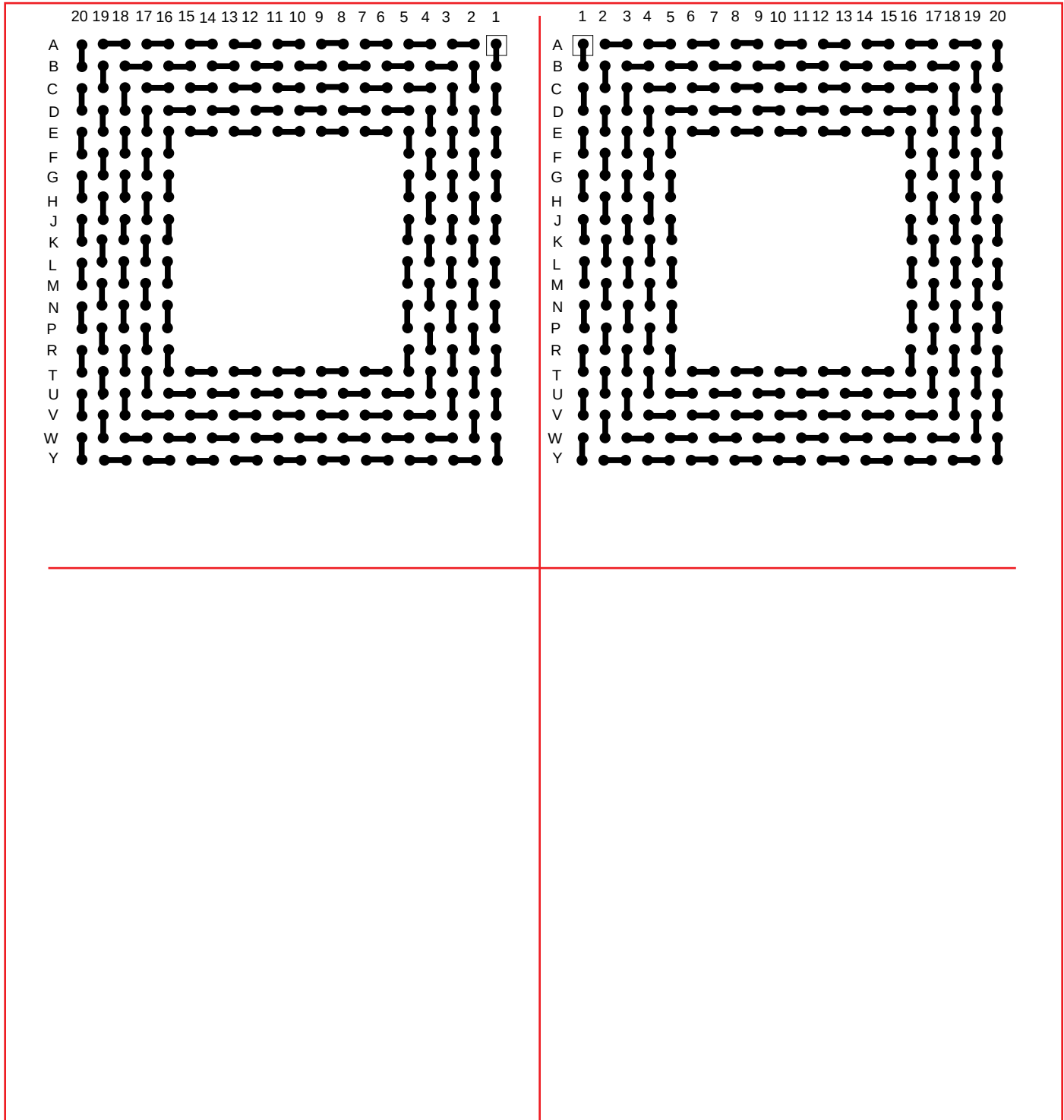
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY27mm-4x10 Tray Quantity 40 Tray Suppliers (ref):		

TEL 1-714-898-3830
FAX 1-714-891-0321

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
300	1.27mm	27mm SQ	20 x 20	5	none	FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

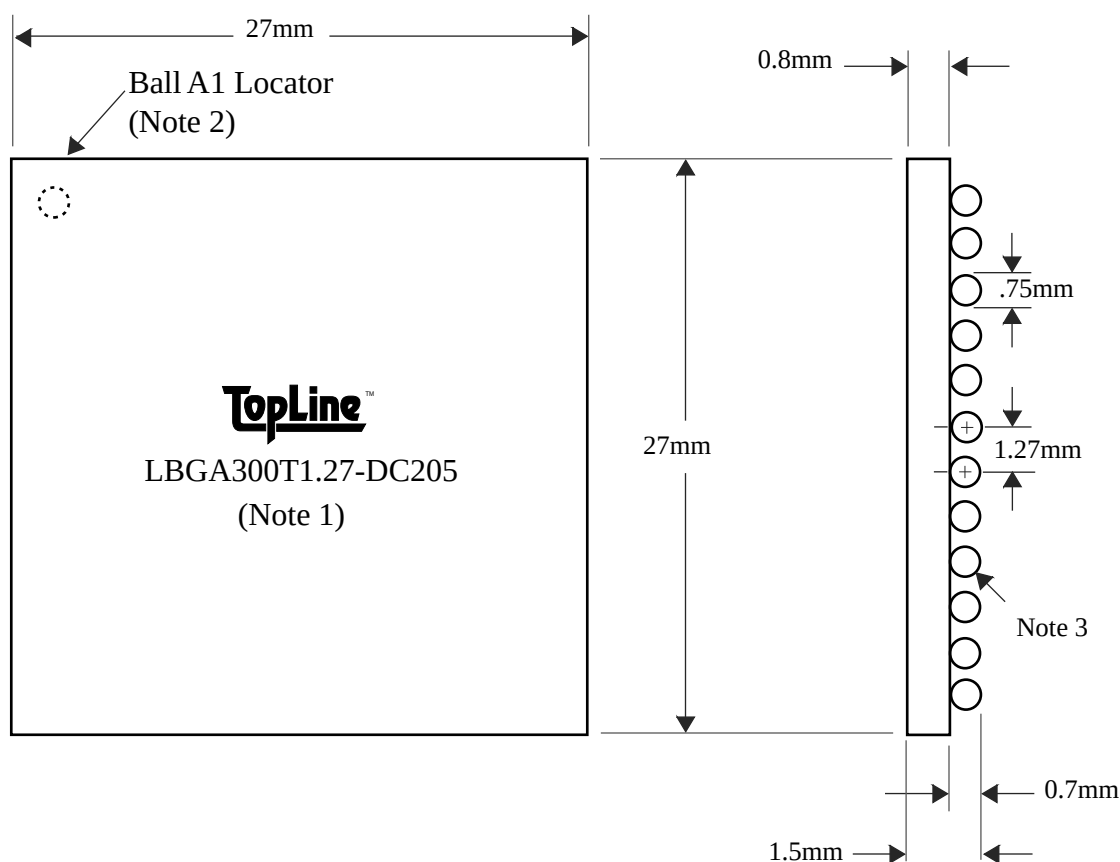
LBGA300T1.27-DC205

TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830 FAX 1-714-891-0321
300	1.27mm	27mm SQ	20 x 20	5	none	FR4	

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY27mm-4x10 Tray Quantity 40 Tray Suppliers (ref):		



TEL 1-714-898-3830
FAX 1-714-891-0321

BGA304T1.27-DC231

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
304	1.27mm	31mm SQ	23 x 23	4	none	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

Daisy Chain to be Completed

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA304T1.27-DC231

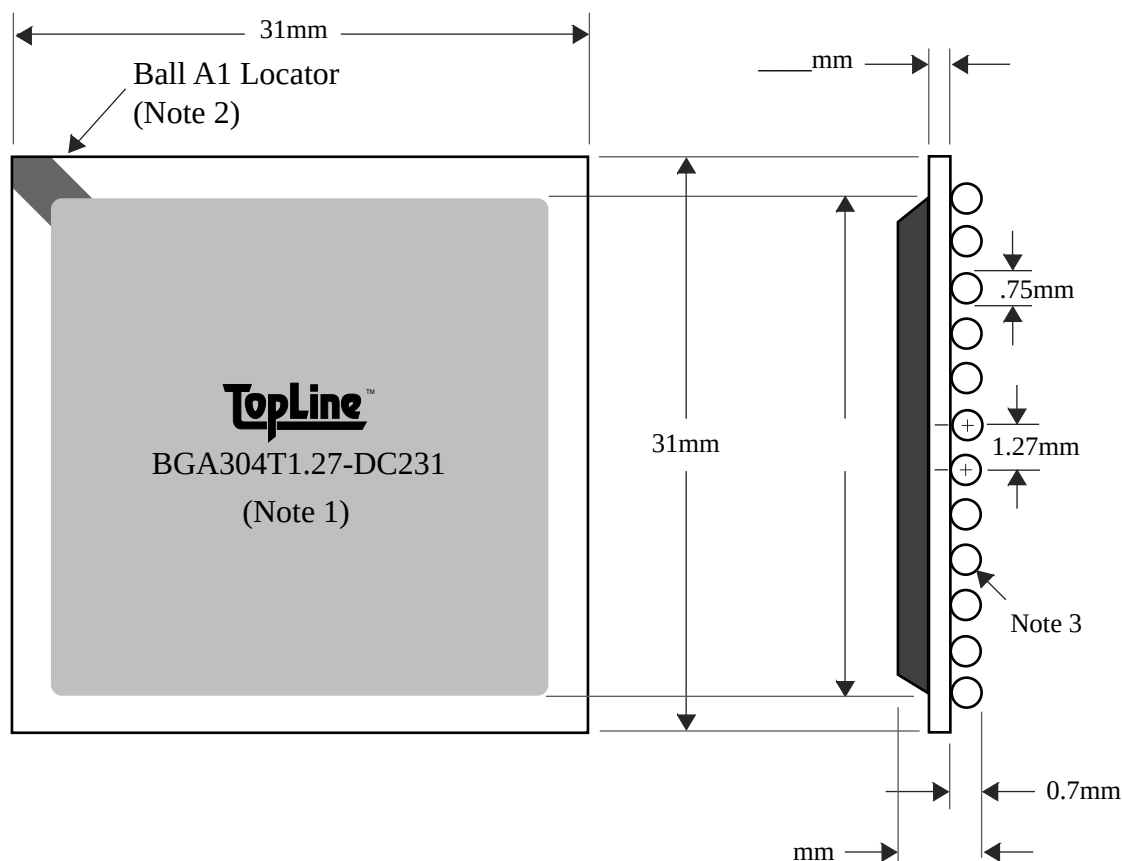
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
304	1.27mm	31mm SQ	23 x 23	4	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

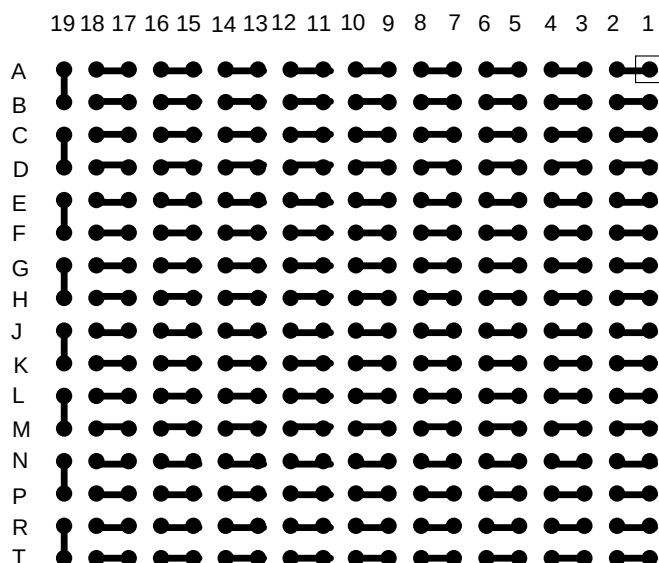
SIDE VIEW



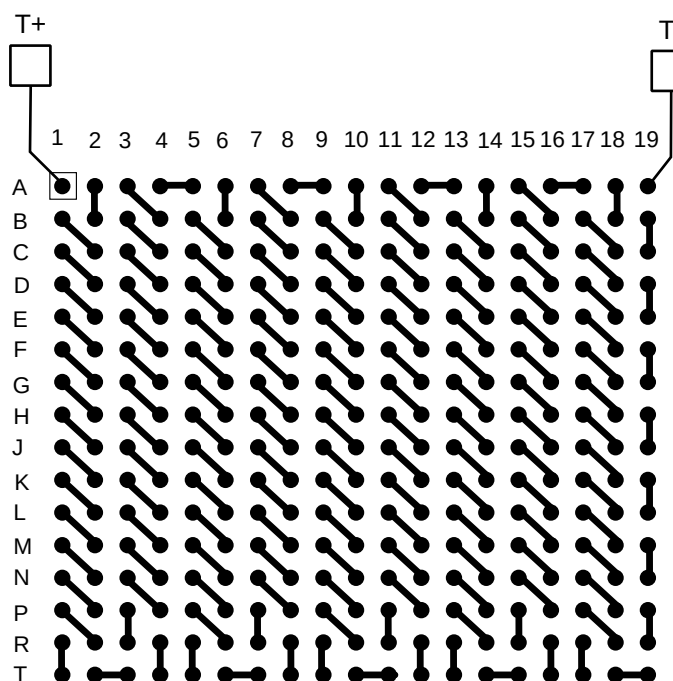
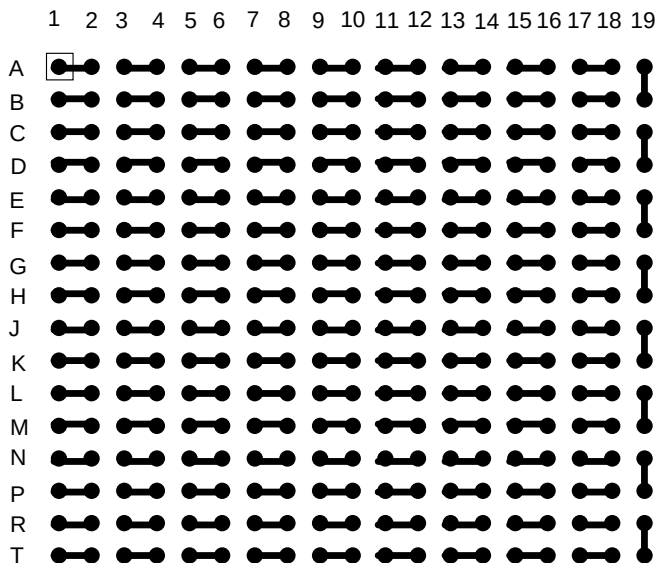
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY _____		
		Tray Quantity _____		
		Tray Suppliers (ref):		

	<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
TEL 1-714-898-3830 FAX 1-714-891-0321	304	1.27mm	21 x 25mm	16 x 19	full	full	ceramic

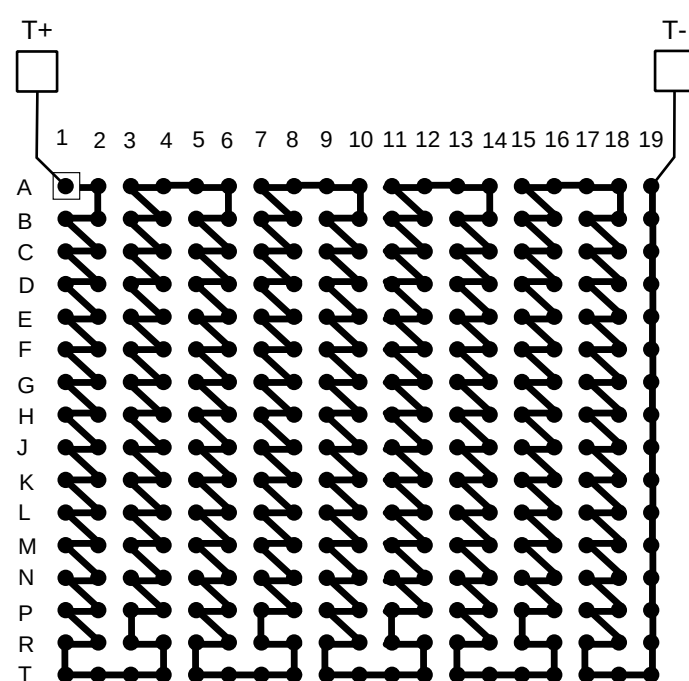
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

CBGA304T1.27-DC63

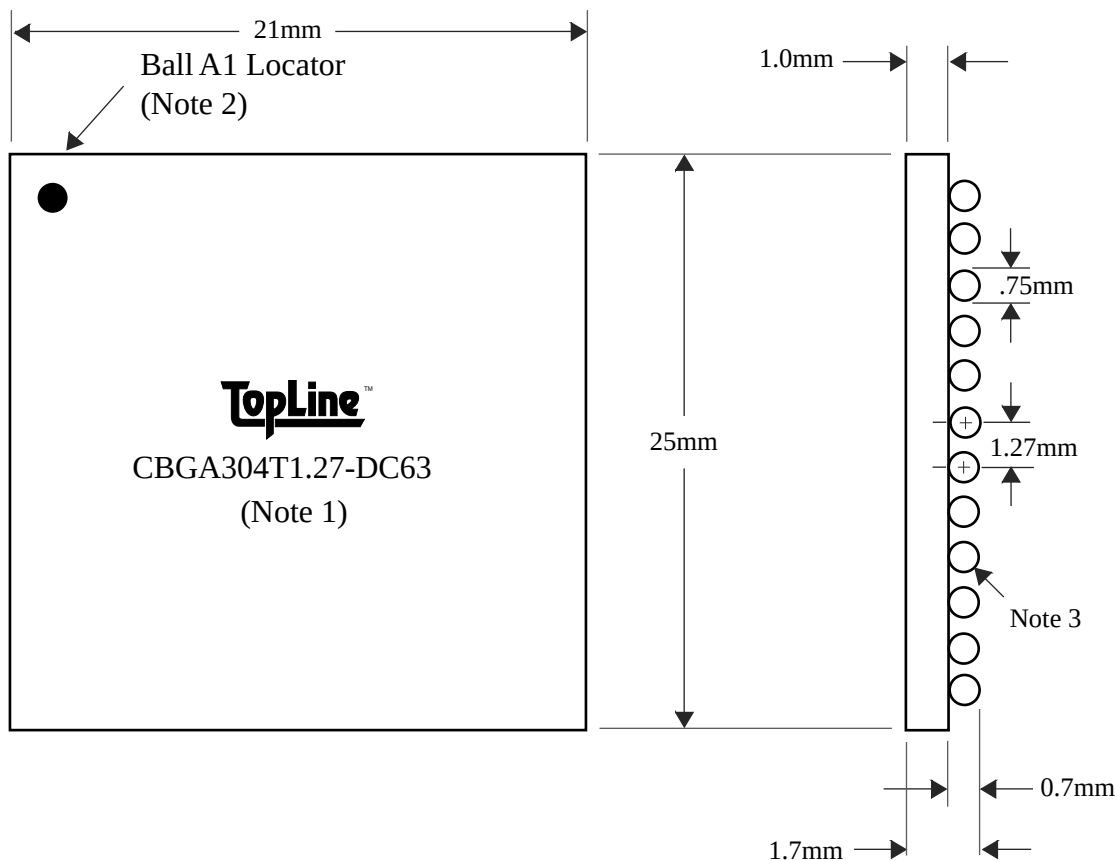
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
304	1.27mm	21 x 25mm	16 x 19	full	full	ceramic

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

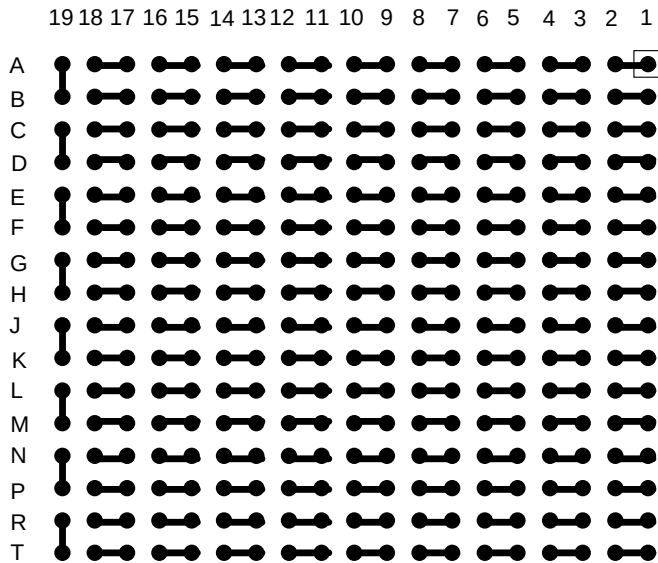
SIDE VIEW



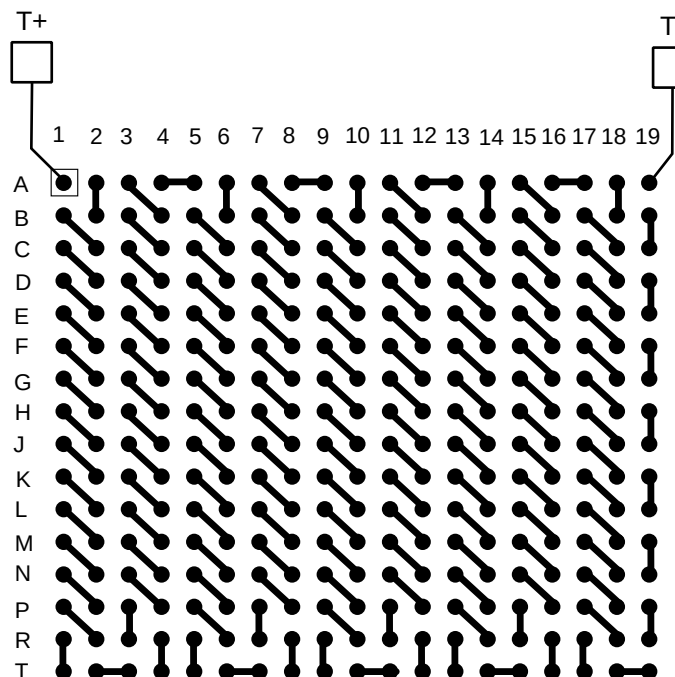
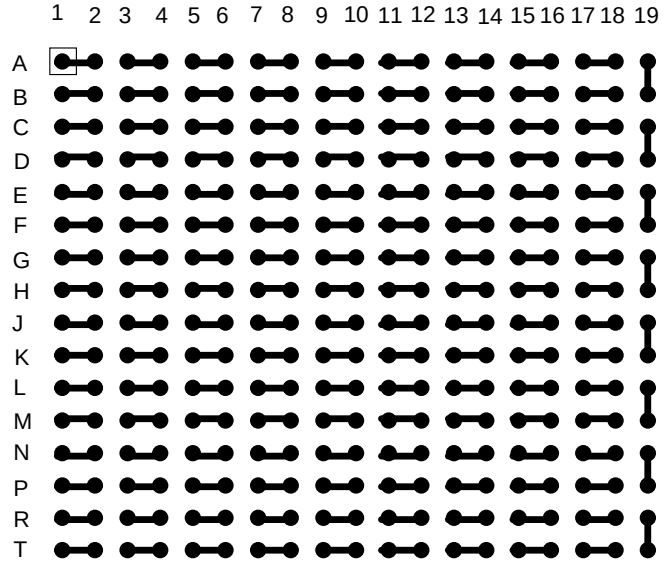
NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 10/90SnPb			
Note 4	Substrate Material: Ceramic			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY21x25-5x11 Tray Quantity 55 Tray Suppliers (ref):		

TEL 1-714-898-3830	<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
FAX 1-714-891-0321	304	1.27mm	21 x 25mm	16 x 19	full	full	ceramic

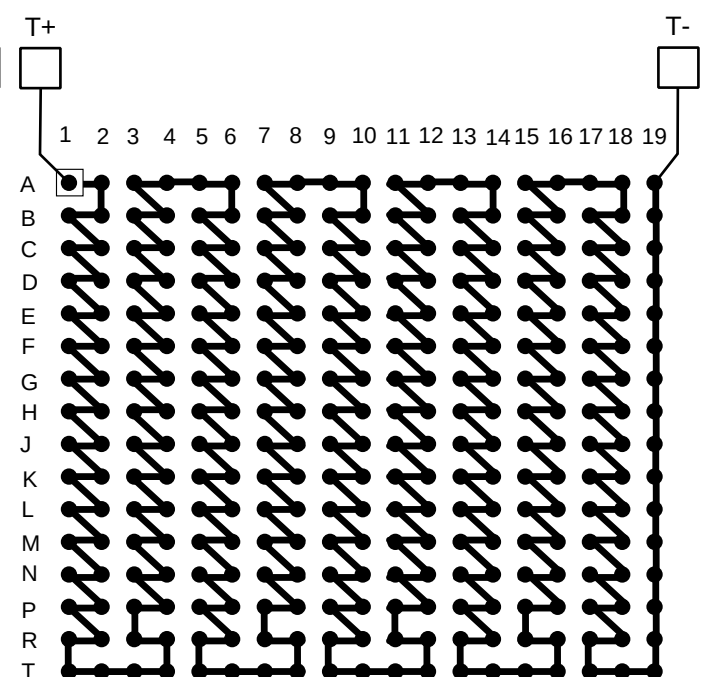
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

CBGA304T1.27L-DC63

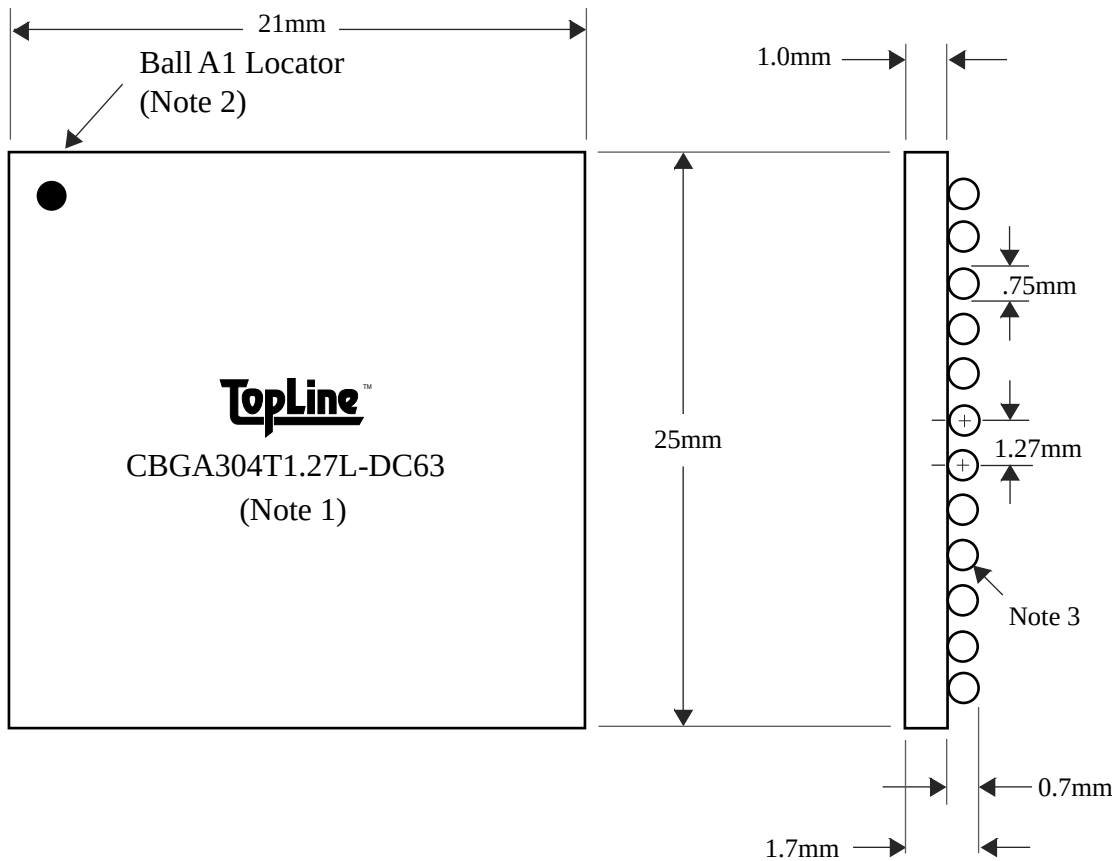


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
304	1.27mm	21 x 25mm	16 x 19	full	full	ceramic

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 62/36/2 SnPbAg			
Note 4	Substrate Material: Ceramic			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY21x25-5x11		
		Tray Quantity 55		
		Tray Suppliers (ref):		



TEL 1-714-898-3830
FAX 1-714-891-0321

LBGA304T1.27-DC233

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
304	1.27mm	31mm SQ	23 x 23	4	none	FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

Daisy Chain to be Completed

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

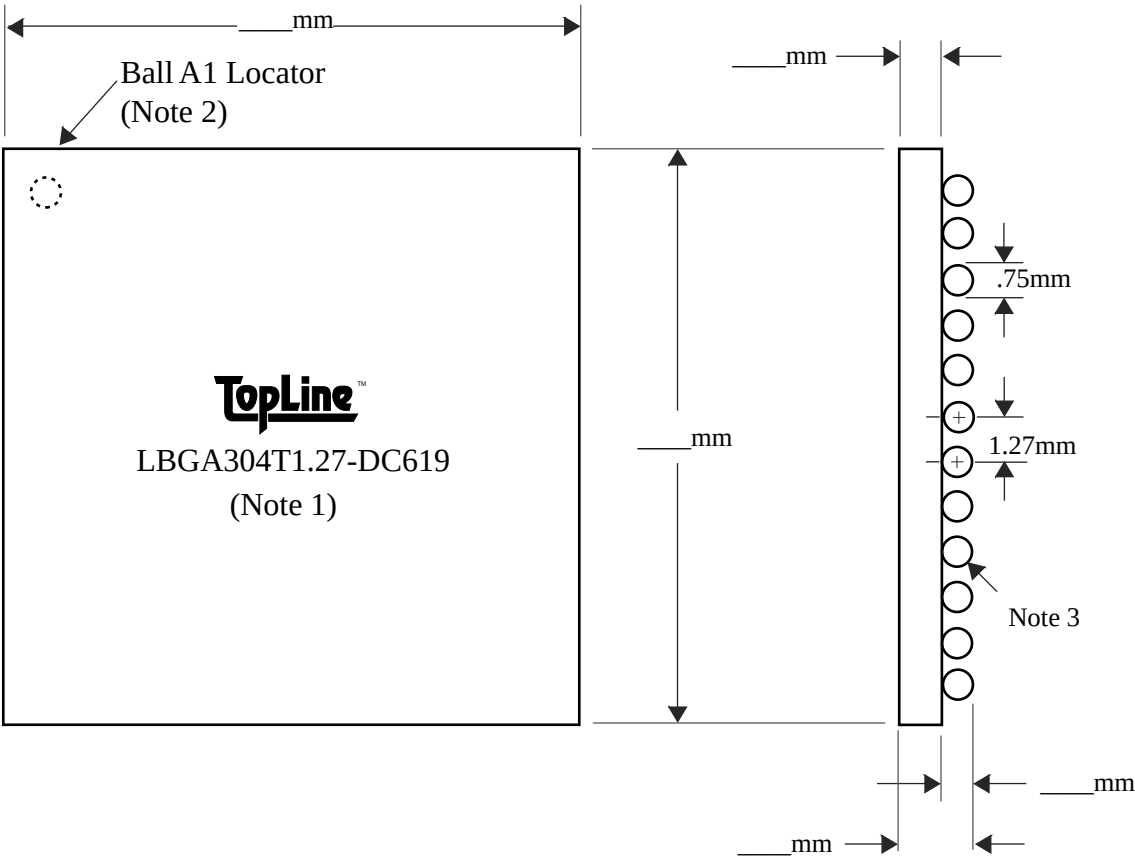
LBGA304T1.27-DC233



BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830
304	1.27mm	31mm SQ	23 x 23	4	none	FR4	FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

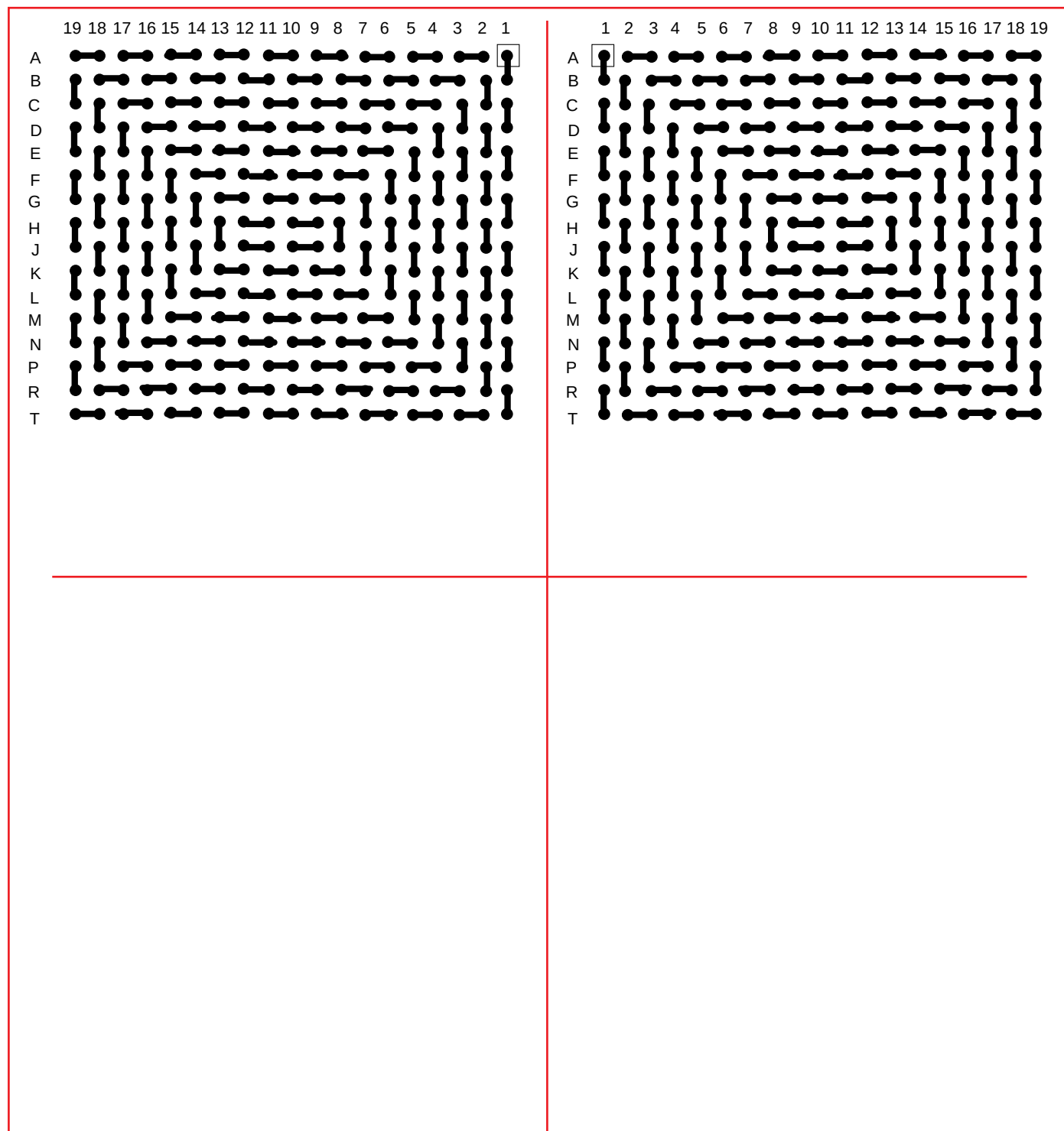


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 62/36/2 SnPbAg			
Note 4	Substrate Material: FR4 laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY_____		
		Tray Quantity _____		
		Tray Suppliers (ref):		

TEL 1-714-898-3830	<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
FAX 1-714-891-0321	304	1.27mm	21 x 25mm	16 x 19	full	full	FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

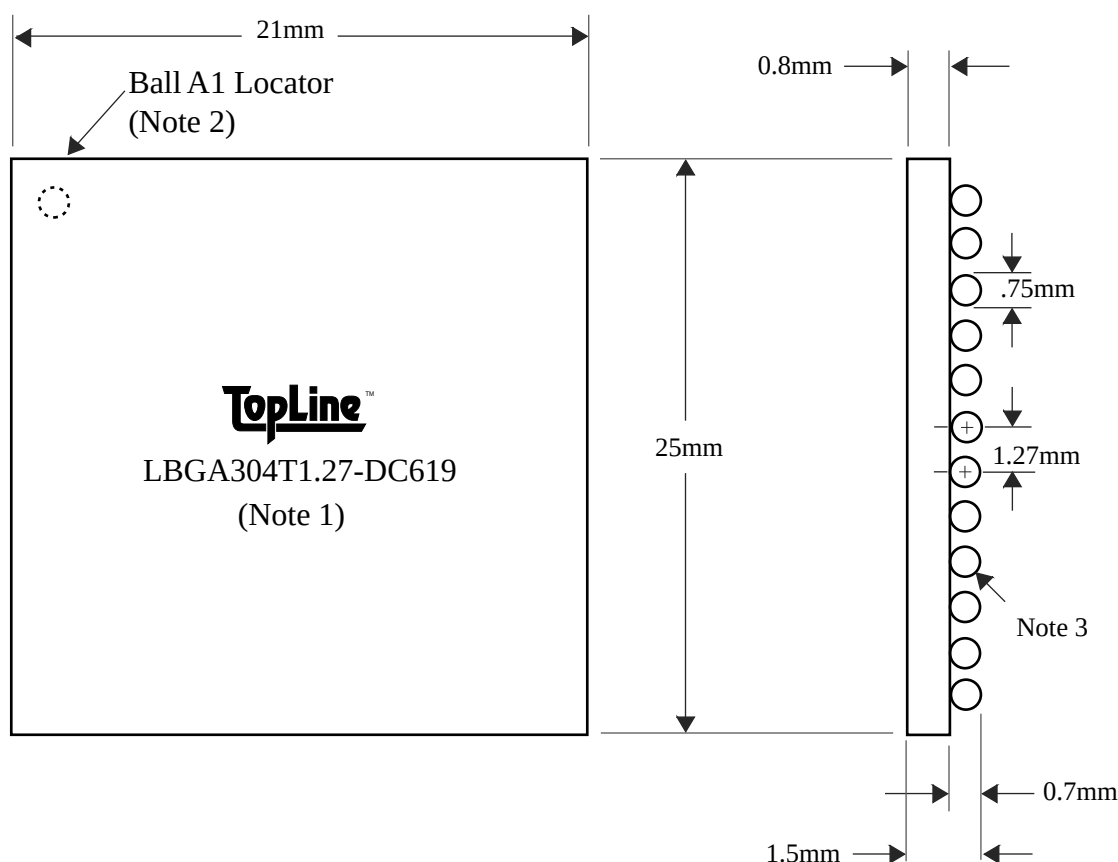
LBGA304T1.27-DC619

TopLine™

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>	TEL 1-714-898-3830
304	1.27mm	21 x 25mm	16 x 19	full	full	FR4	FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY21x25-5x11 Tray Quantity 55 Tray Suppliers (ref):		



SBGA304T1.27-ISO

TEL 1-714-898-3830	<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
FAX 1-714-891-0321	304	1.27mm	31mm SQ	23 x 23	4	none	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

TEST VEHICLE BOARD

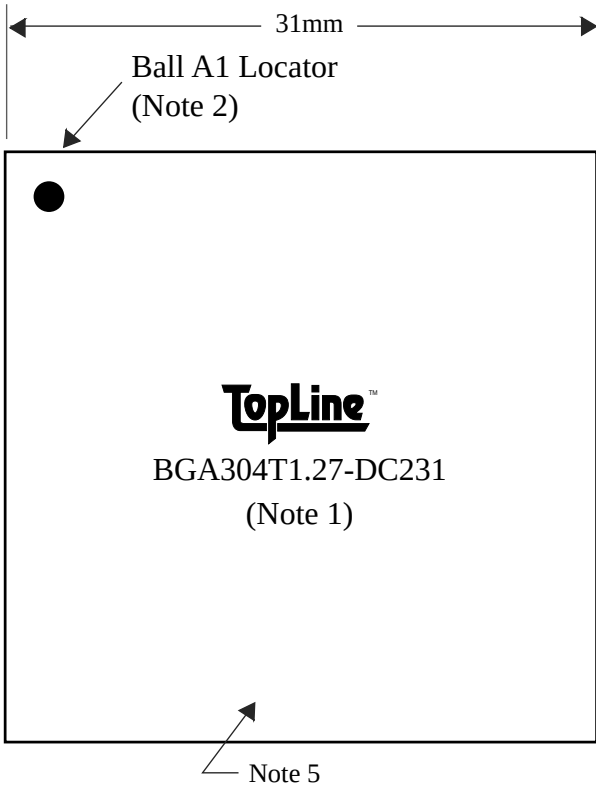
AFTER MOUNTING TO TEST BOARD

SBGA304T1.27-ISO

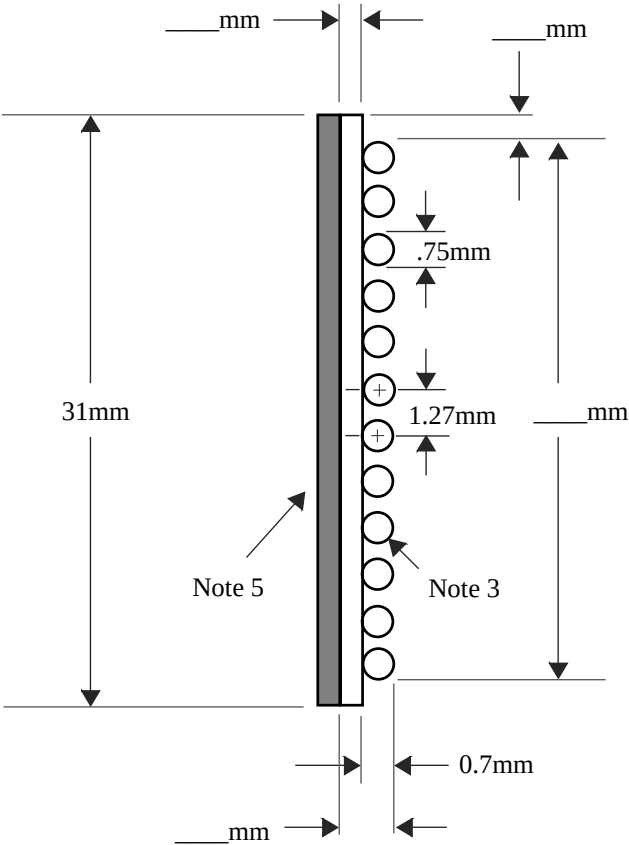


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830
304	1.27mm	31mm SQ	23 x 23	4	none	BT	FAX 1-714-891-0321

TOP VIEW



SIDE VIEW

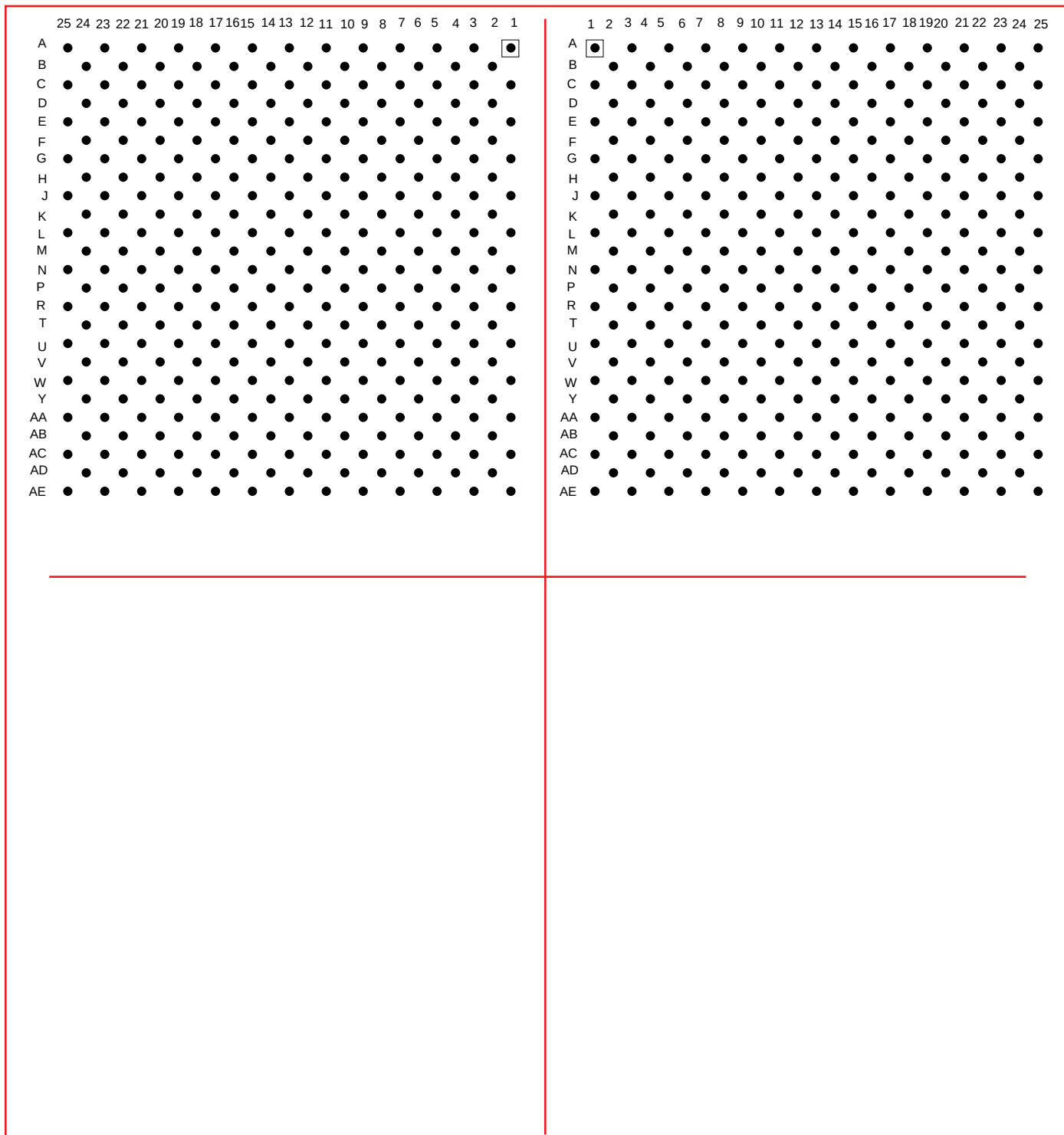


NOTES		REVISIONS		
Note 1	Logo and part number centered	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
Note 5	Metal heat sink. Die cavity down			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY _____		
		Tray Quantity _____		
		Tray Suppliers (ref):		

BGA313T1.27-ISO

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA313T1.27-ISO

TopLine™

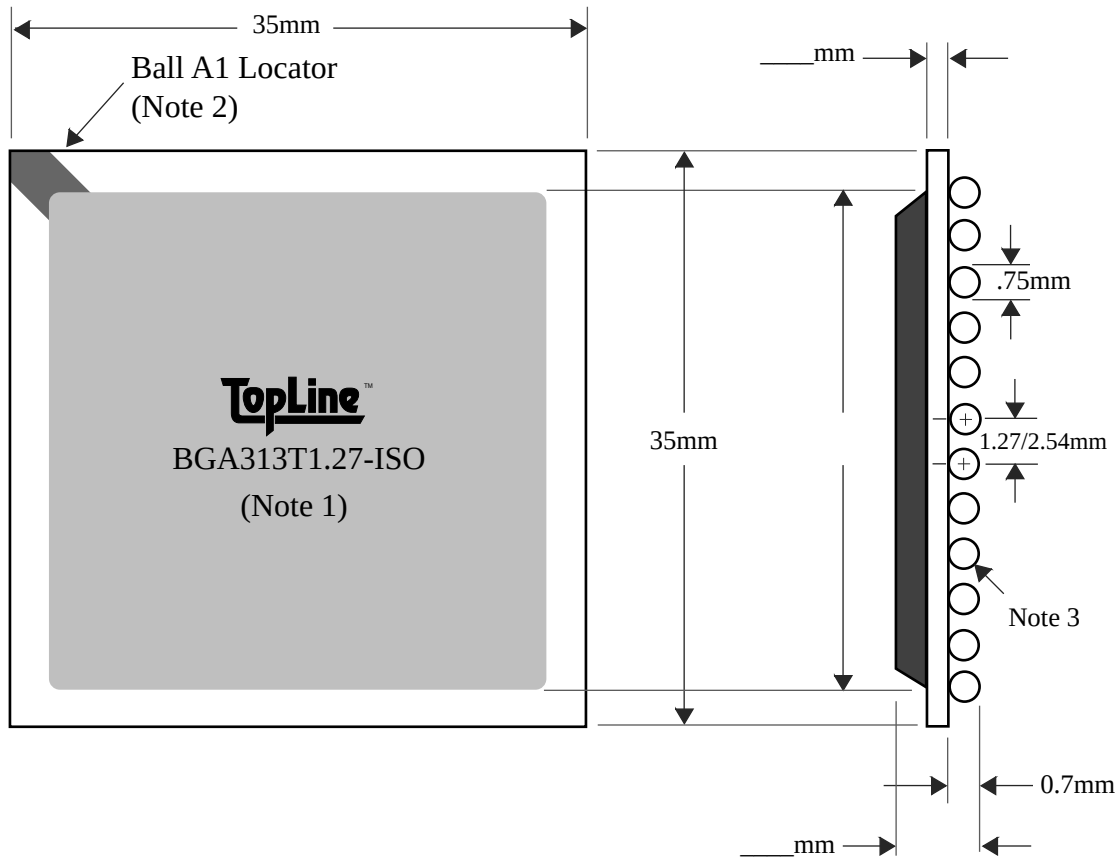
TEL 1-714-898-3830

FAX 1-714-891-0321

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
313	1.27/2.54mm	35mm	25 x 25	staggered	staggered	BT

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
			11/14/98	Proposed Design
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY35mm-3x8 Tray Quantity 24 Tray Suppliers (ref):		



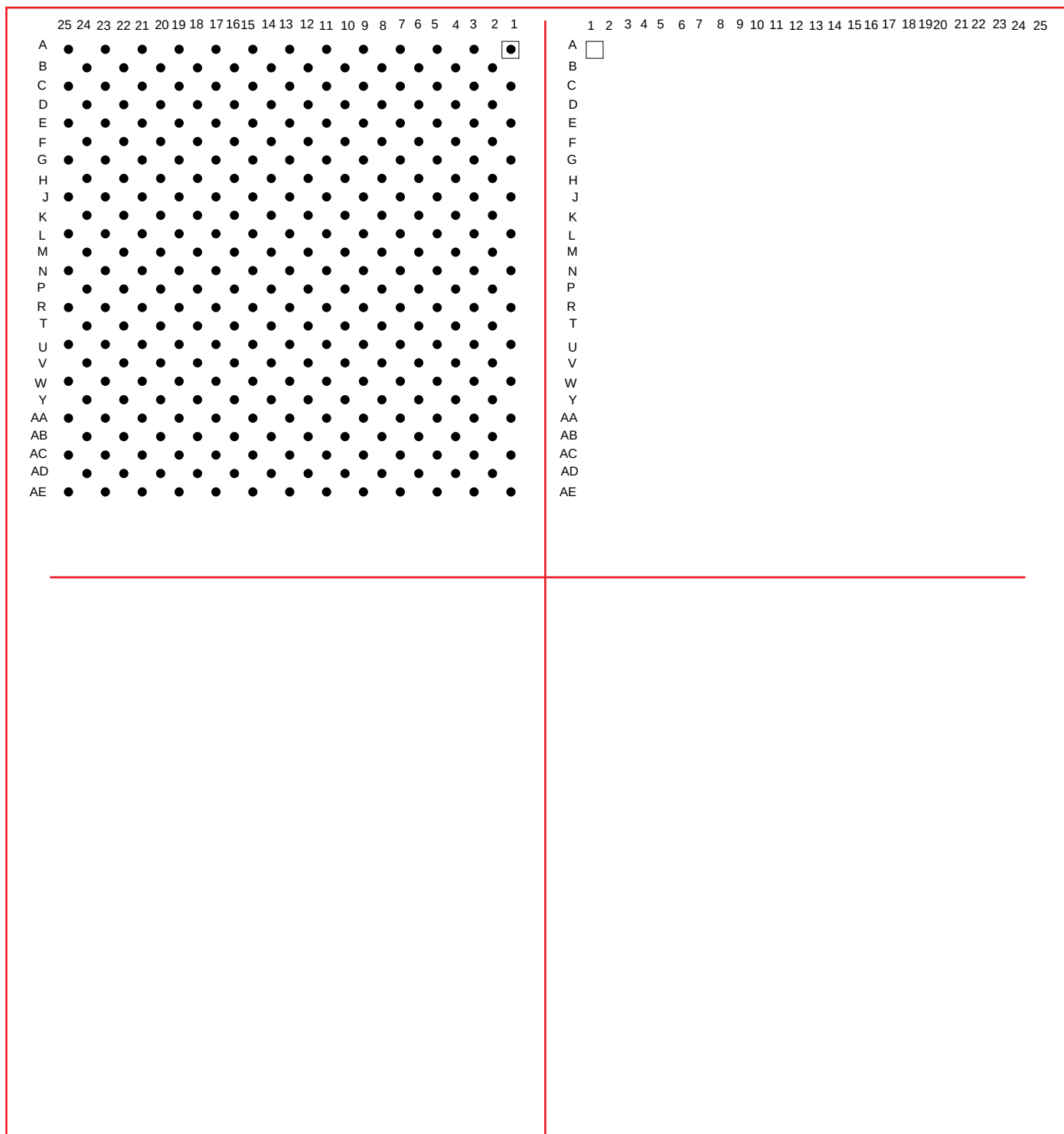
TEL 1-714-898-3830
FAX 1-714-891-0321

BGA313T1.27-DC65

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
313	1.27/2.54mm	35mm SQ	25 x 25	25	staggered	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA313T1.27-DC65

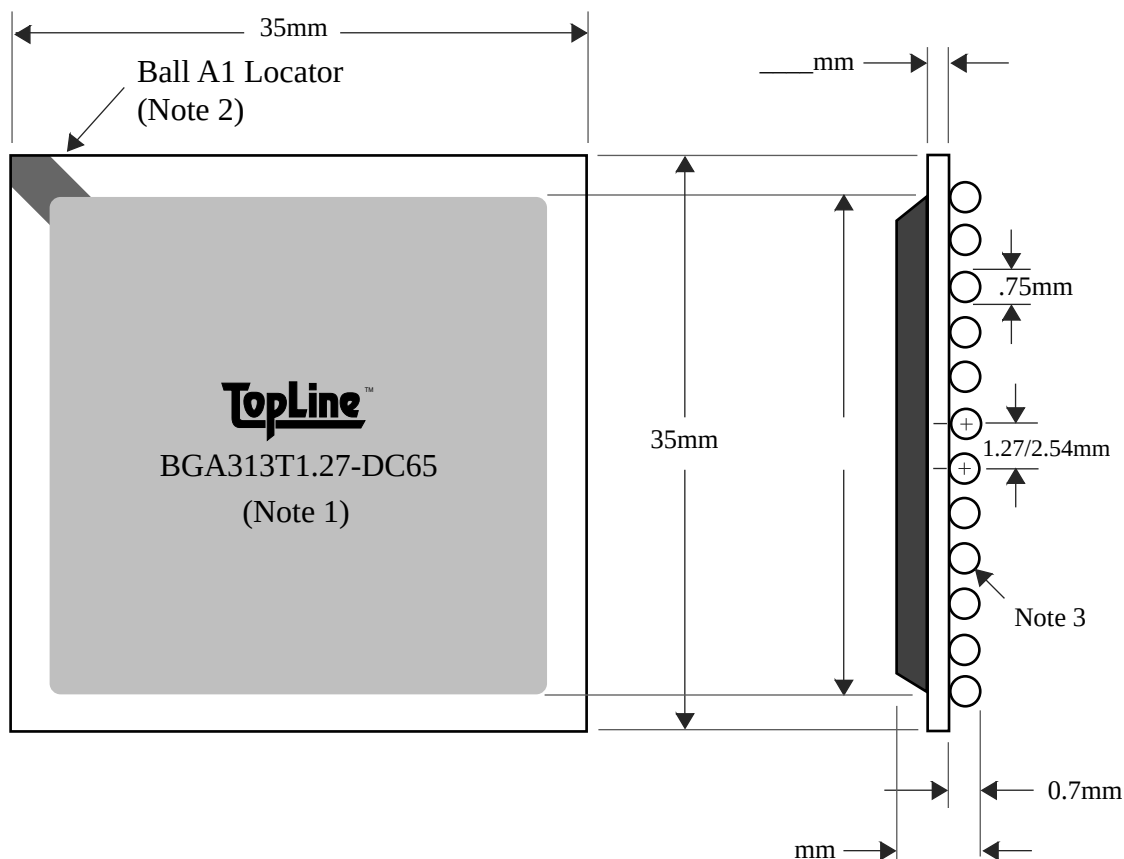
TopLine™

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
313	1.27/2.54mm	35mm SQ	25 x 25	25	staggered	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY35mm-3x8 Tray Quantity 24 Tray Suppliers (ref):		



BGA316T1.27-ISO

TEL 1-714-898-3830	<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
FAX 1-714-891-0321	316	1.27mm	27mm SQ	20 x 20	5	4 x 4	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA316T1.27-ISO

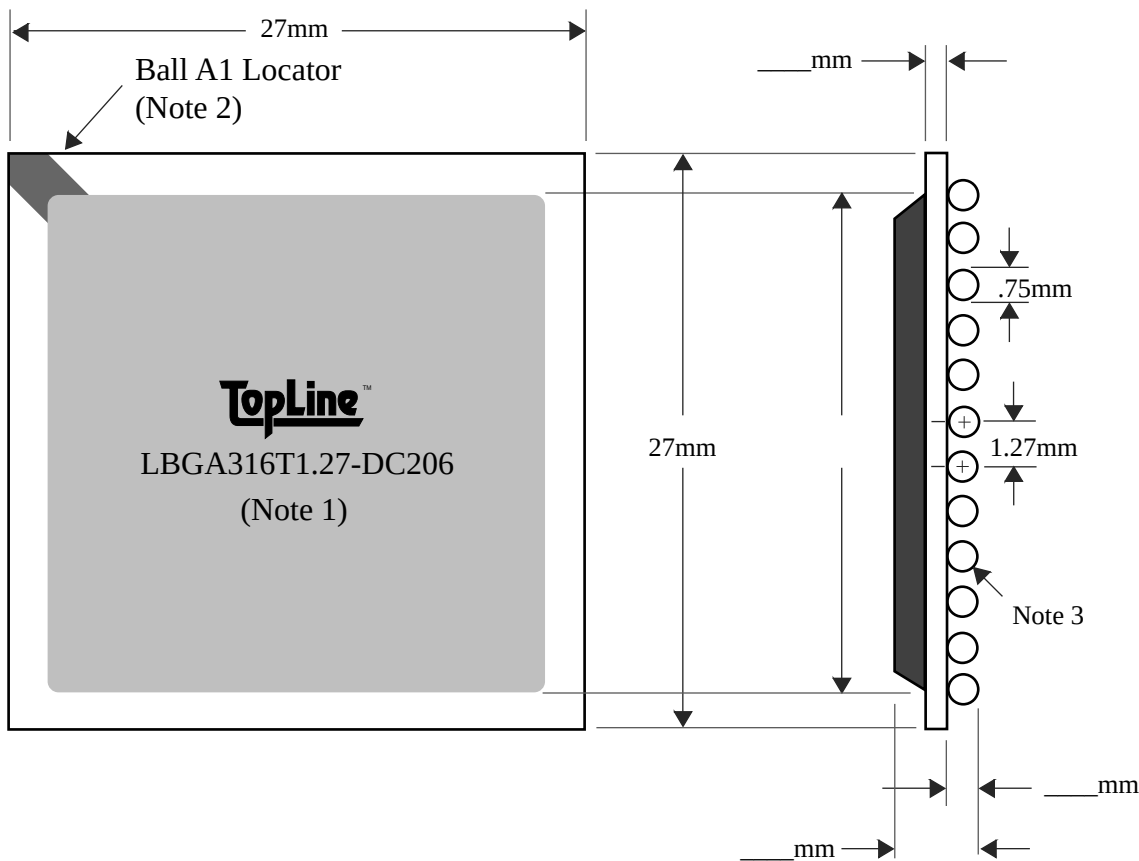
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
316	1.27mm	27mm SQ	20 x 20	5	4 x 4	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



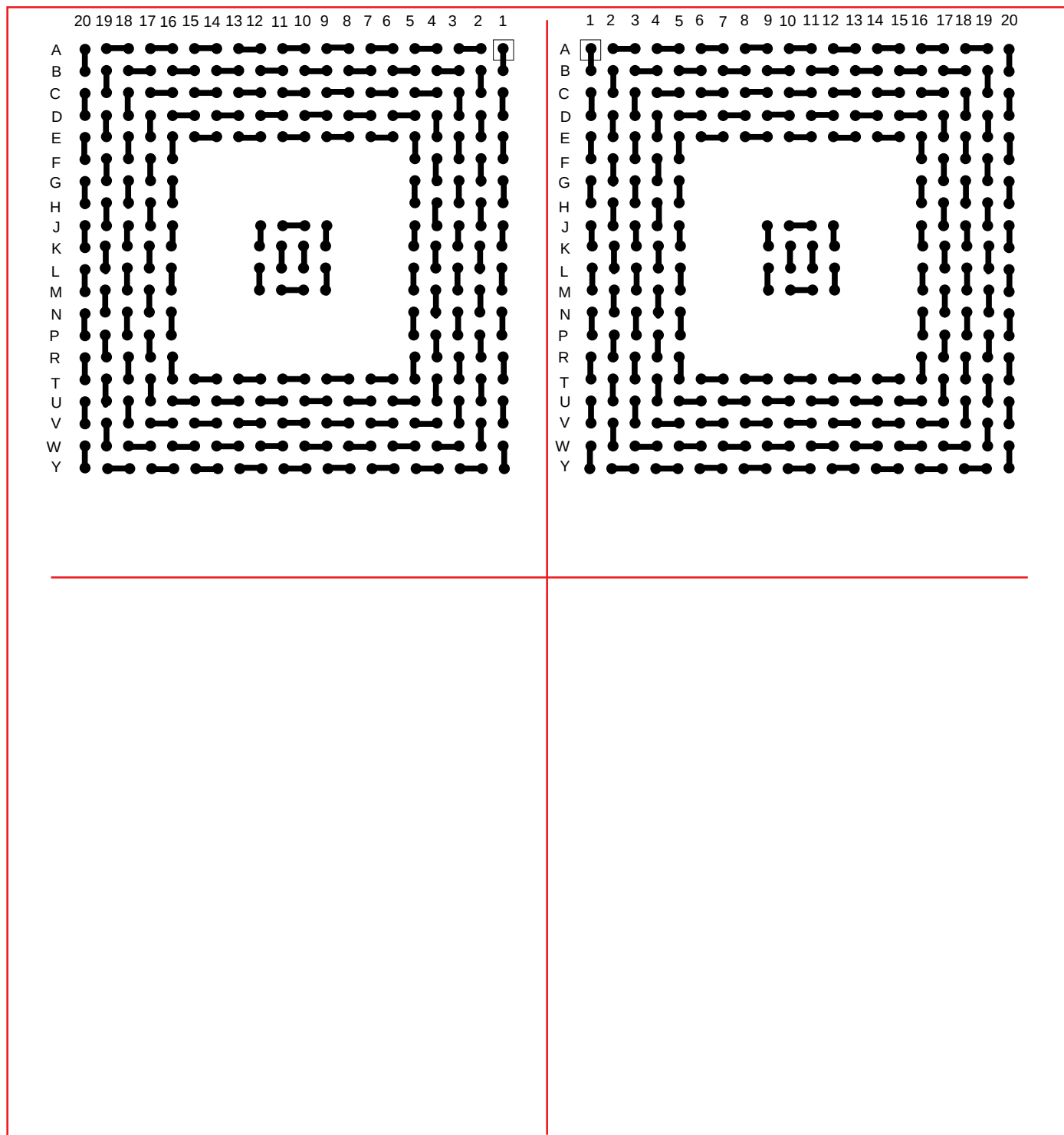
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY _____		
		Tray Quantity _____		
		Tray Suppliers (ref):		

TEL 1-714-898-3830
FAX 1-714-891-0321

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
316	1.27mm	27mm SQ	20 x 20	5	4 x 4	FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA316T1.27-DC206

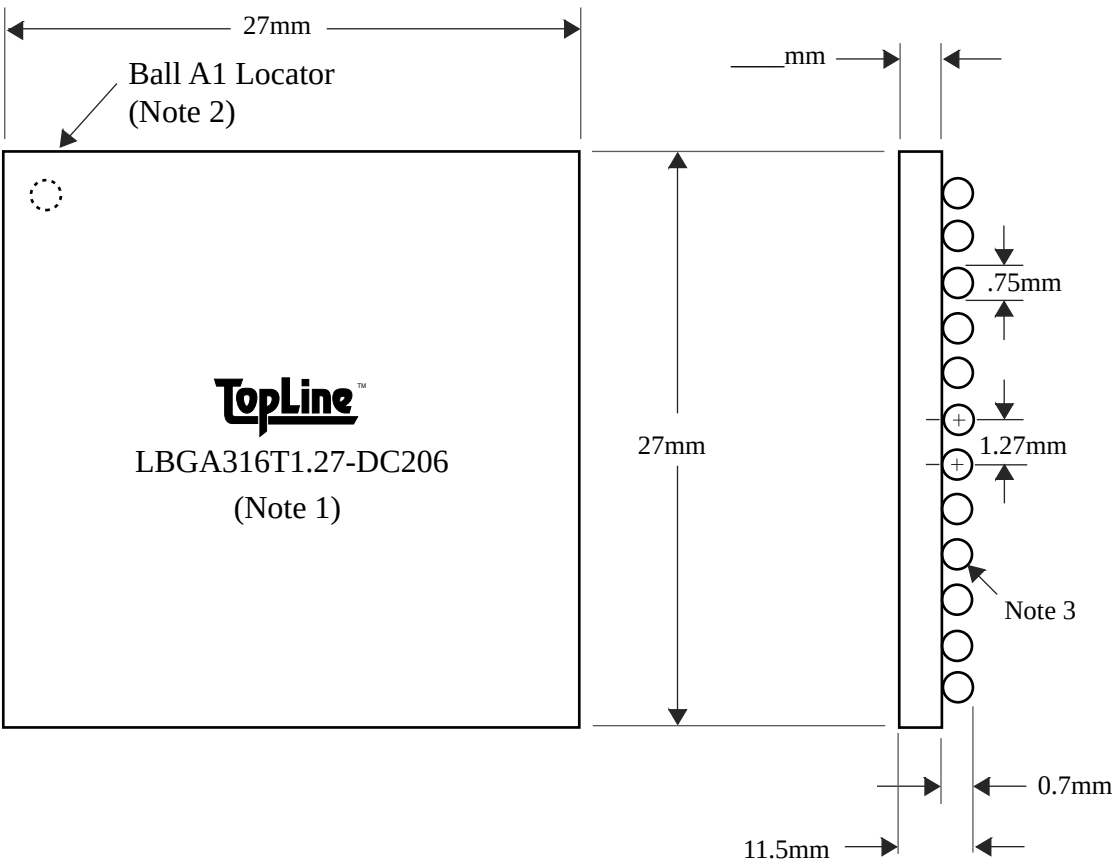
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
316	1.27mm	27mm SQ	20 x 20	5	4 x 4	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

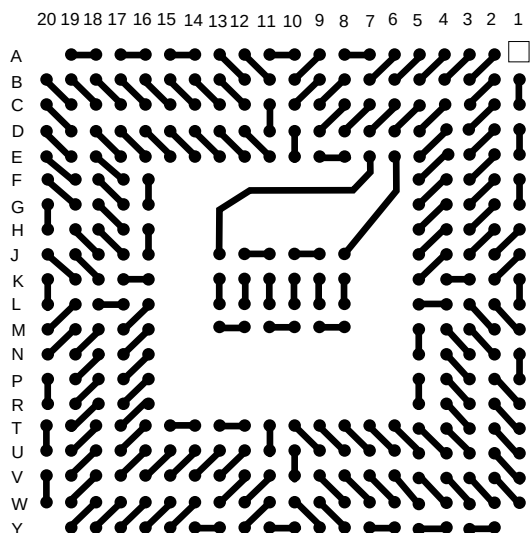
SIDE VIEW



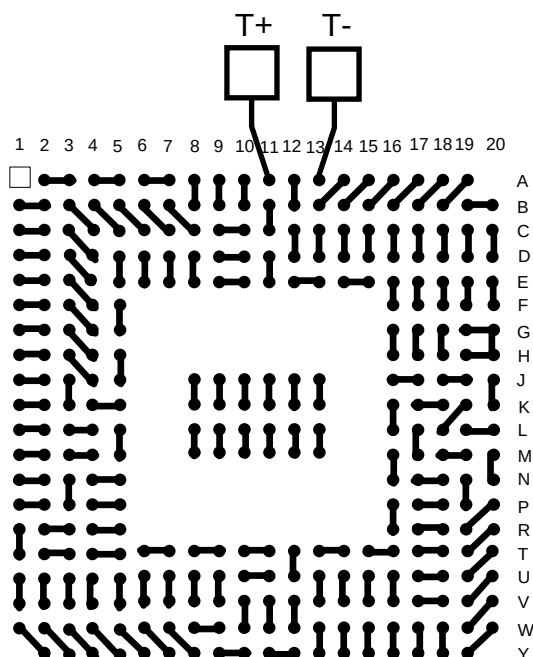
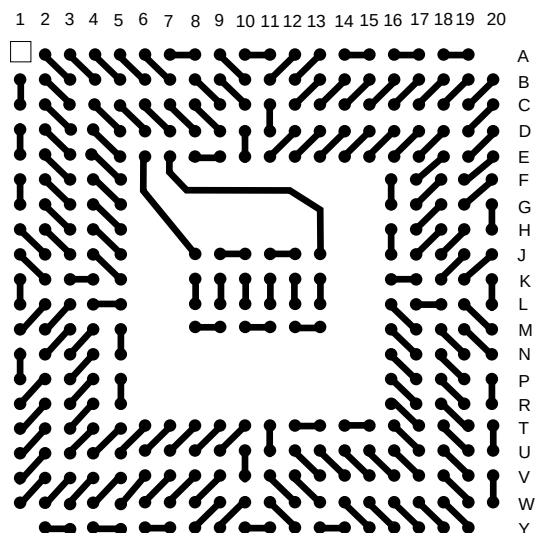
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY27mm-4x10 Tray Quantity 40 Tray Suppliers (ref):		

BGA320T1.0-DC66

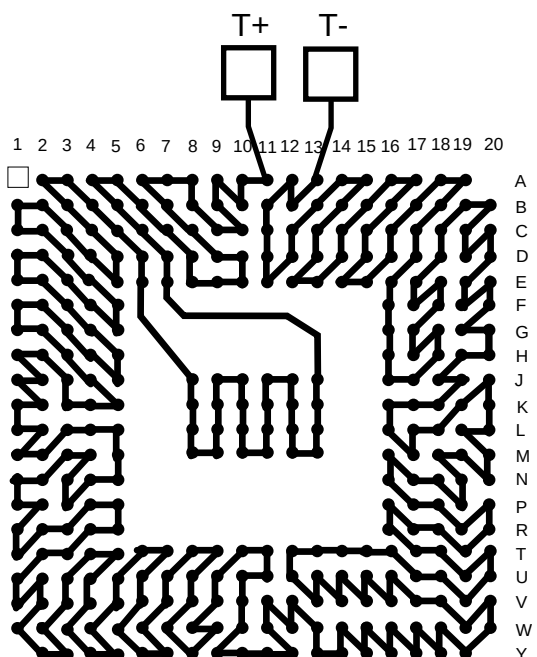
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

BGA320T1.0-DC66

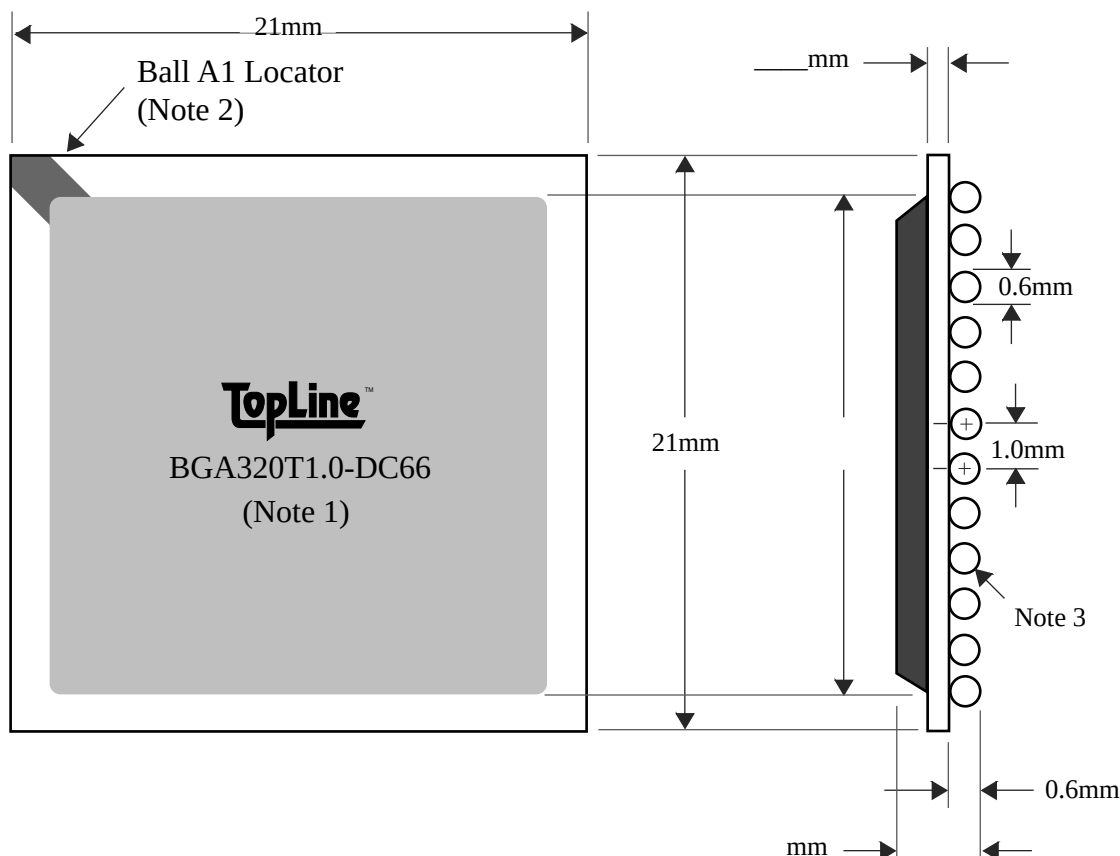
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
320	1.0mm	21mm SQ	20 x 20	5	4 x 6	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY _____		
		Tray Quantity _____		
		Tray Suppliers (ref):		



BGA324T1.0-DC224

TEL 1-714-898-3830
FAX 1-714-891-0321

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
324	1.0mm	23mm SQ	22 x 22	4	6 x 6	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA324T1.0-DC224

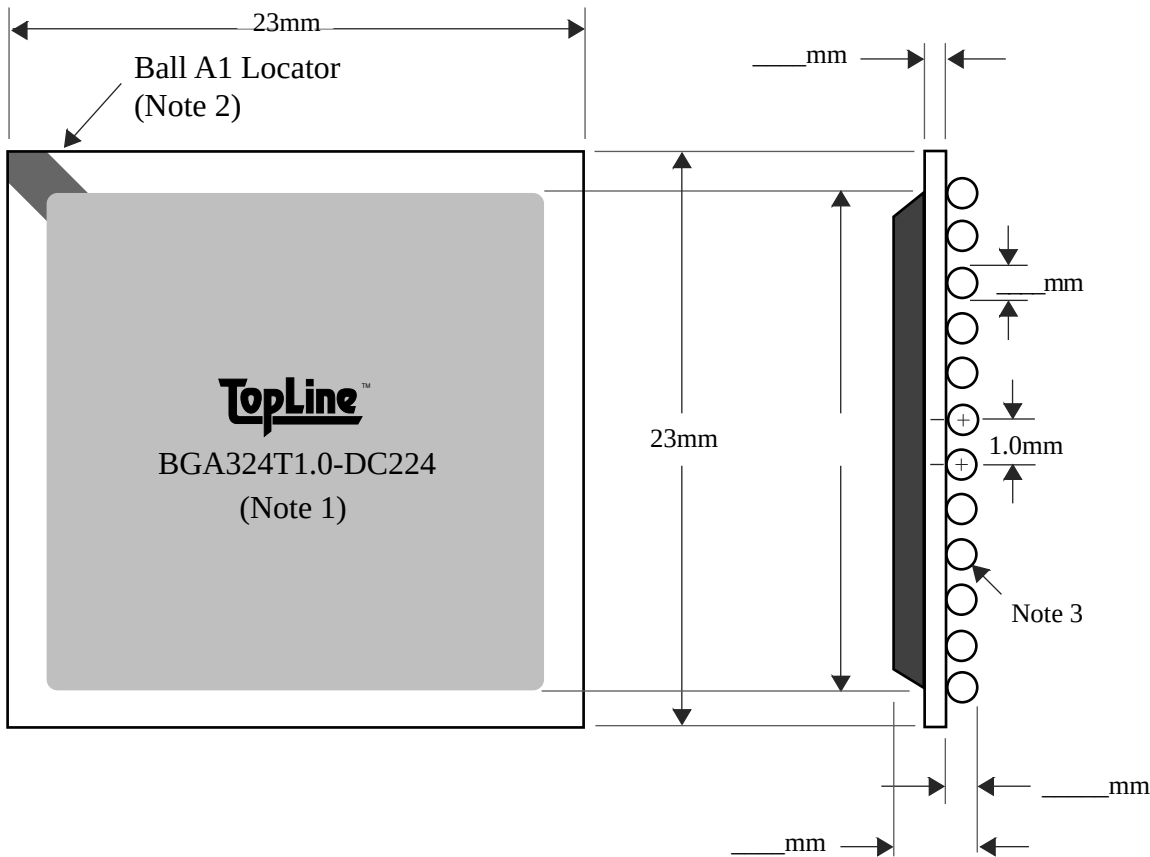
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
324	1.0mm	23mm SQ	22 x 22	4	6 x 6	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

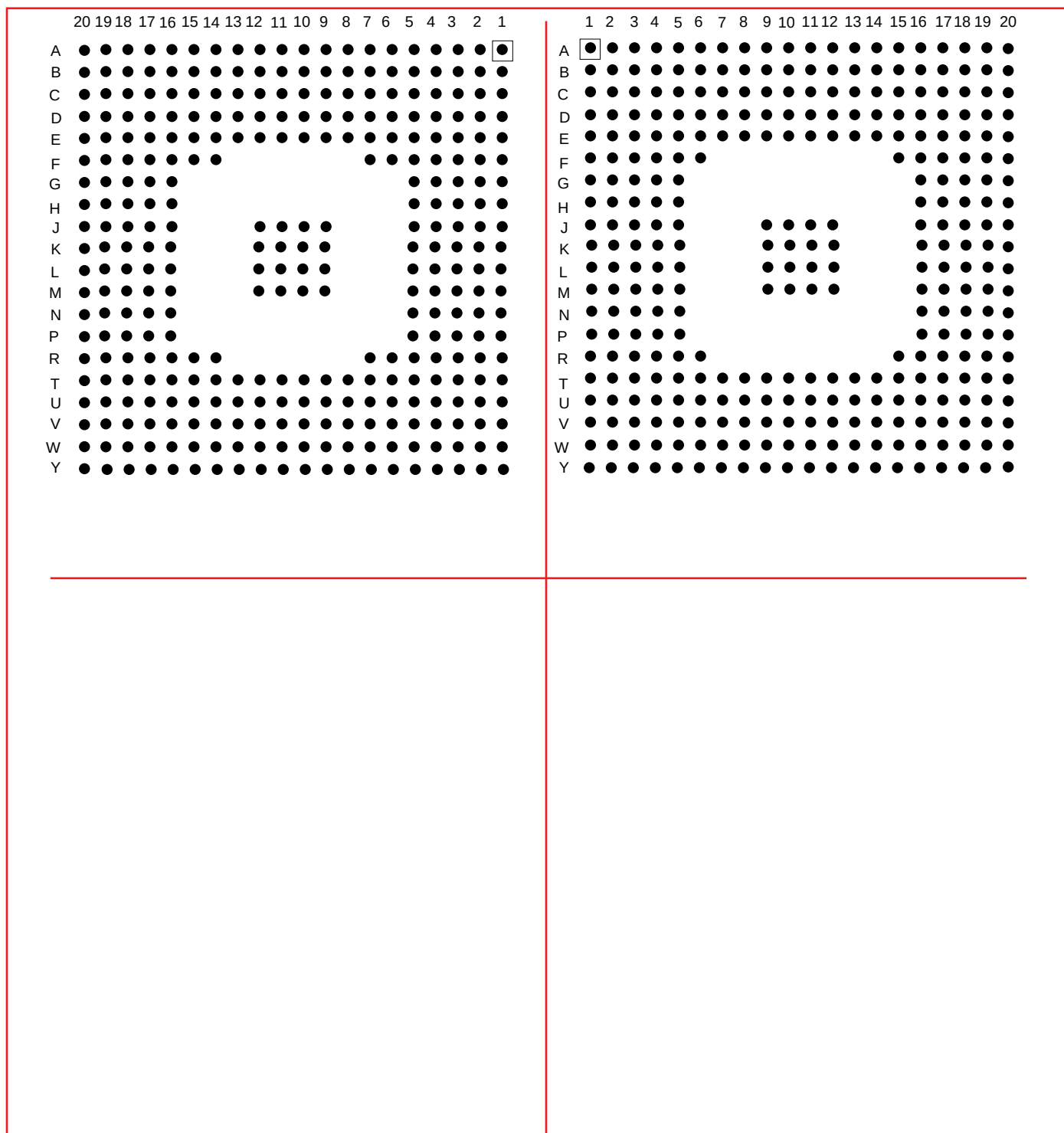


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY _____		
		Tray Quantity _____		
		Tray Suppliers (ref):		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
324	1.27mm	27mm SQ	20 x 20	5	4 x 4	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA324T1.27-ISO

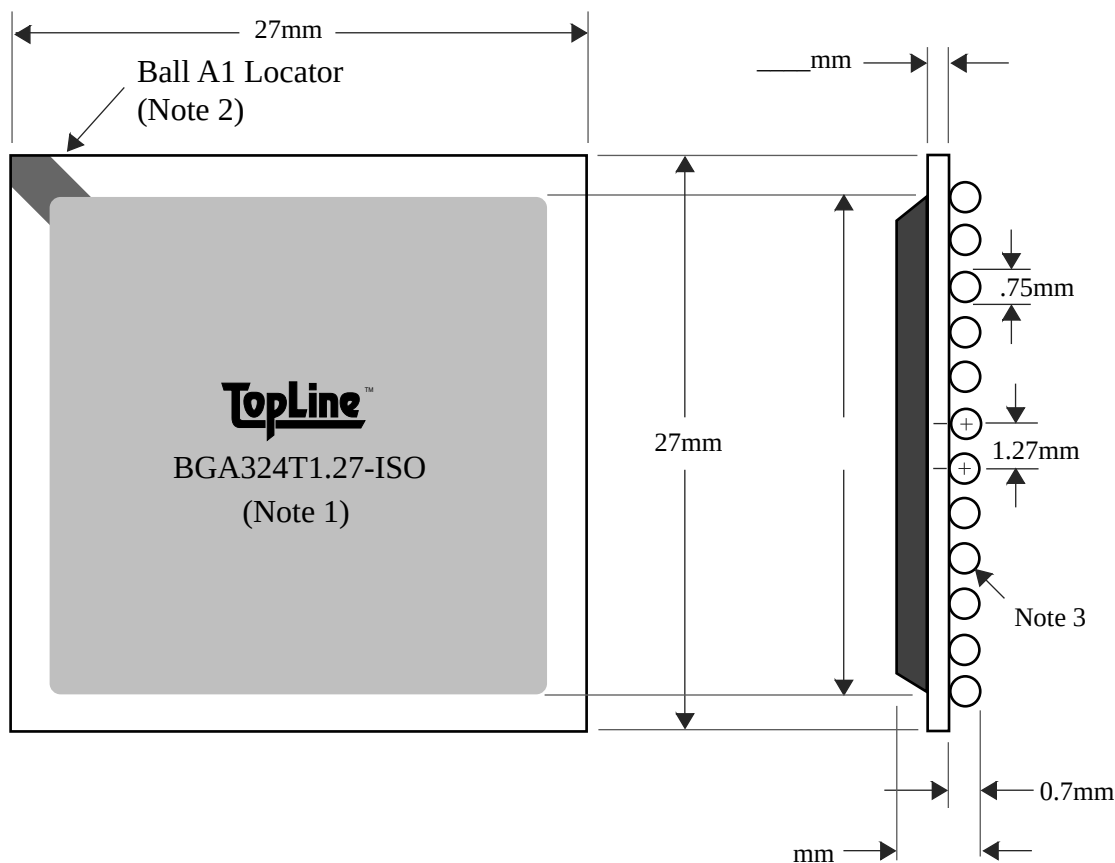
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
324	1.27mm	27mm SQ	20 x 20	5	4 x 4	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY27mm-4x10 Tray Quantity 40 Tray Suppliers (ref):		



TEL 1-714-898-3830
FAX 1-714-891-0321

BGA324T1.27-DC207

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
324	1.27mm	27mm SQ	20 x 20	5	4 x 4	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA324T1.27-DC207

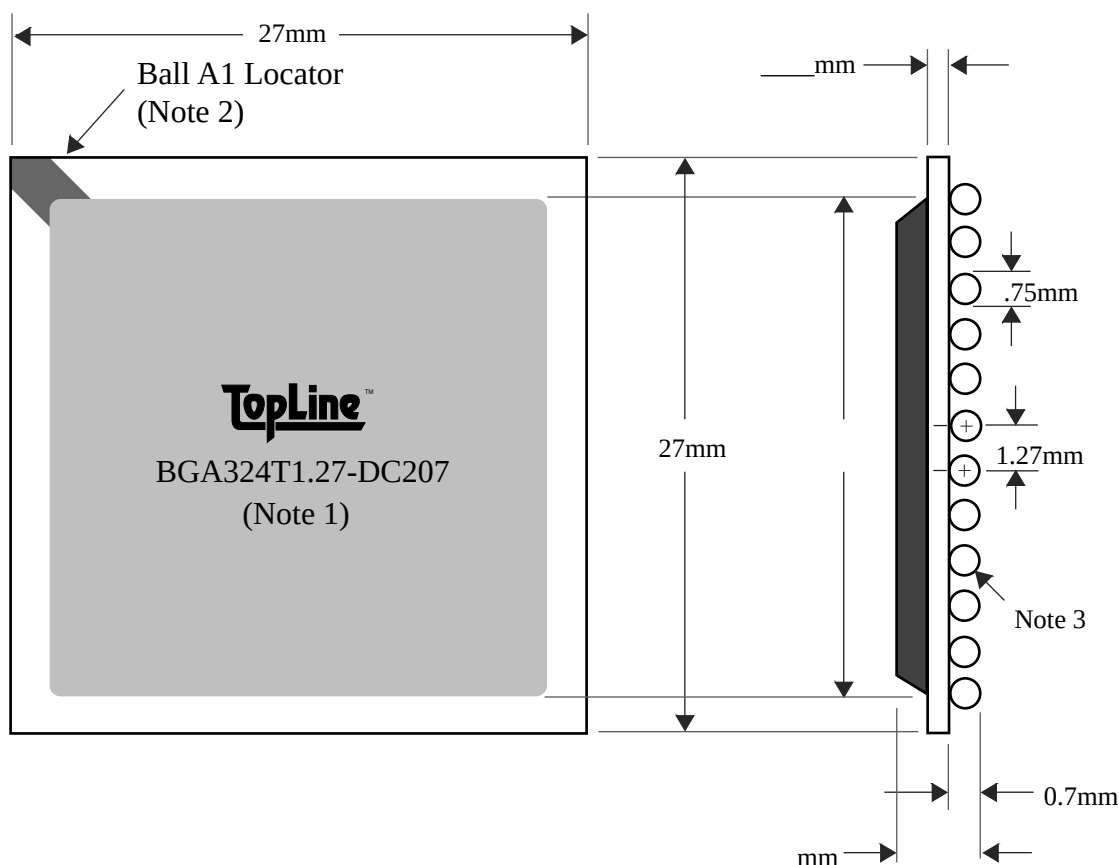
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
324	1.27mm	27mm SQ	20 x 20	5	4 x 4	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY27mm-4x10 Tray Quantity 40 Tray Suppliers (ref):		

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

324

PITCH

1.27mm

SIZE

27mm SQ

MATRIX

20 x 20

ROWS

5

CENTER

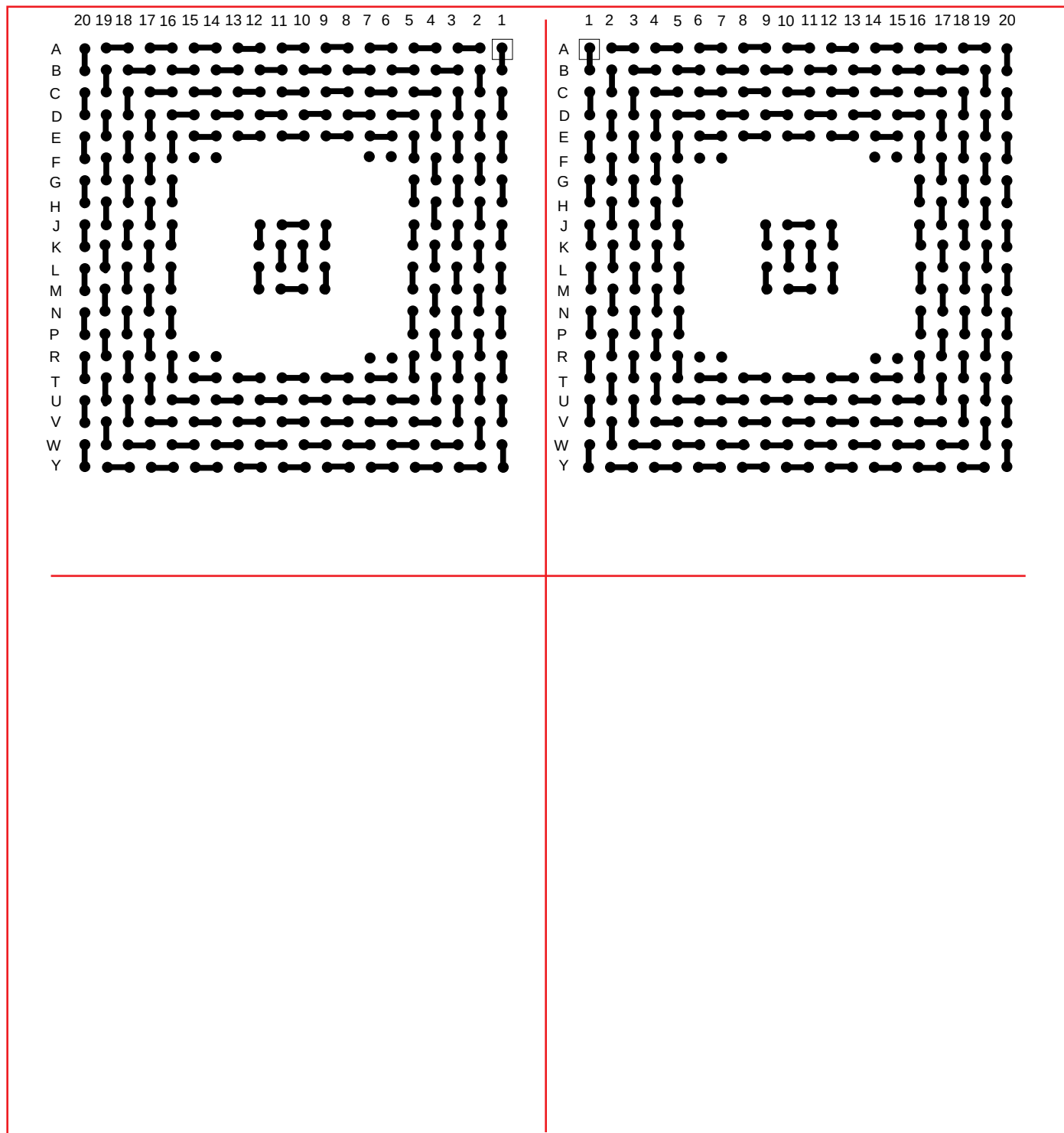
4 x 4

MAT'L

FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA324T1.27-DC207

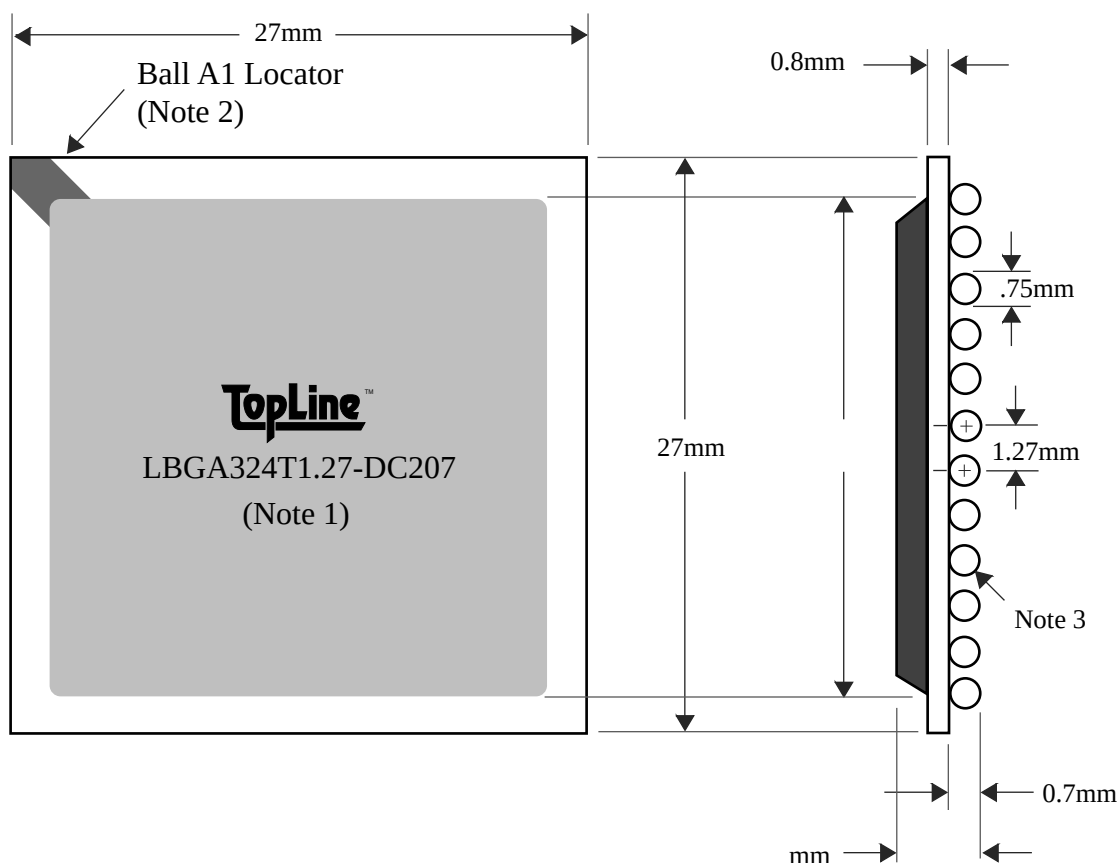
TopLine™

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
324	1.27mm	27mm SQ	20 x 20	5	4 x 4	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

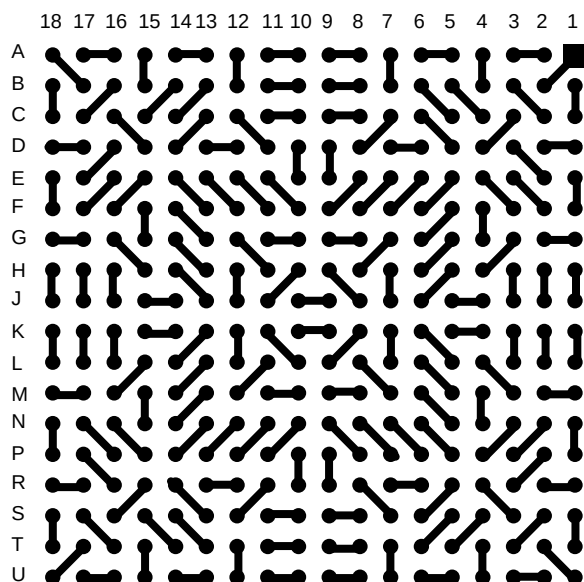
SIDE VIEW



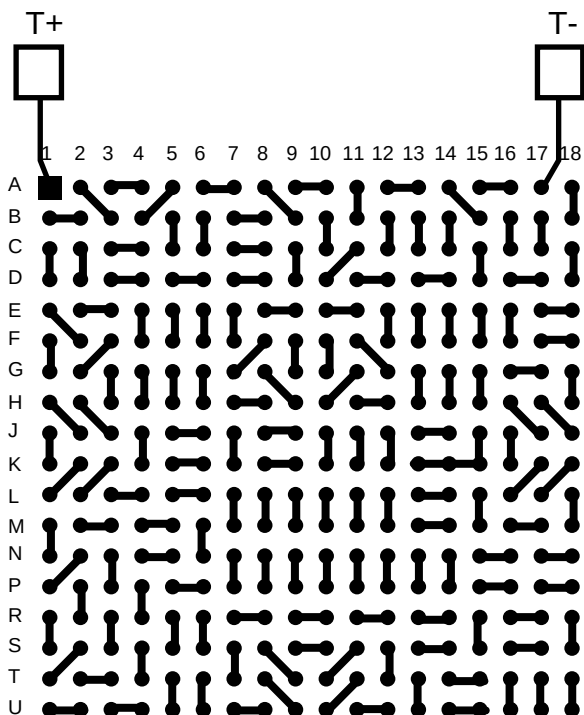
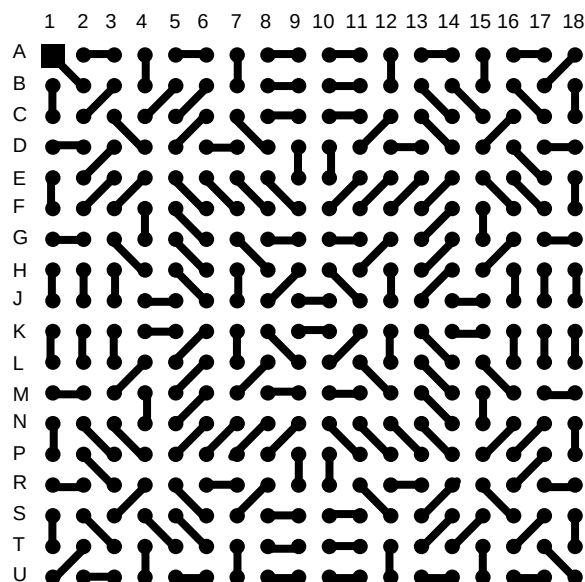
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY27mm-4x10 Tray Quantity 40 Tray Suppliers (ref):		

BGA324T1.5-DC67

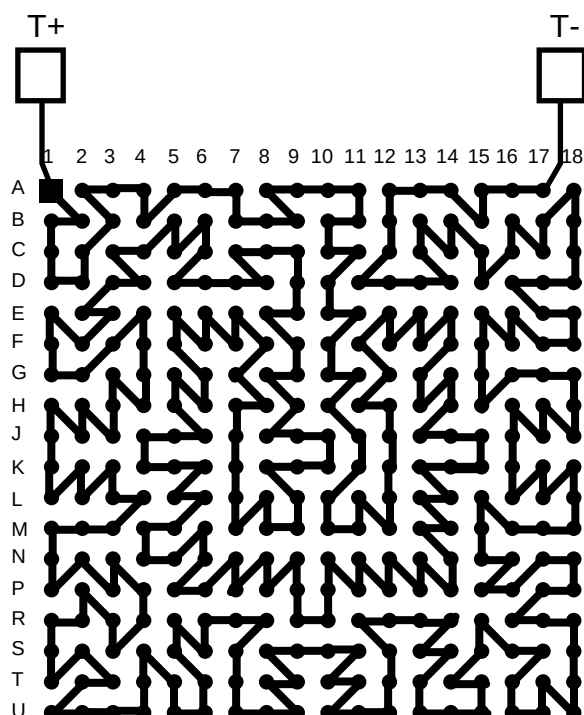
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

BGA324T1.5-DC67

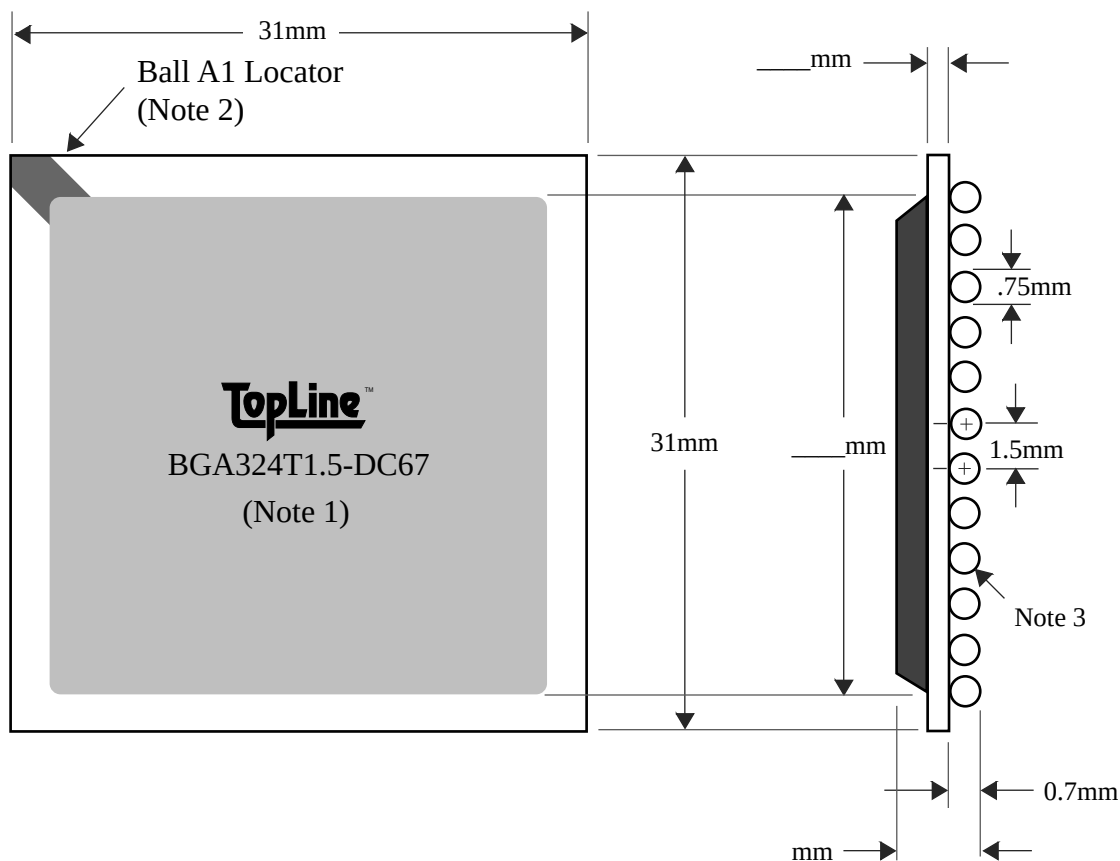
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
324	1.5mm	31mm SQ	18 x 18	full	full	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

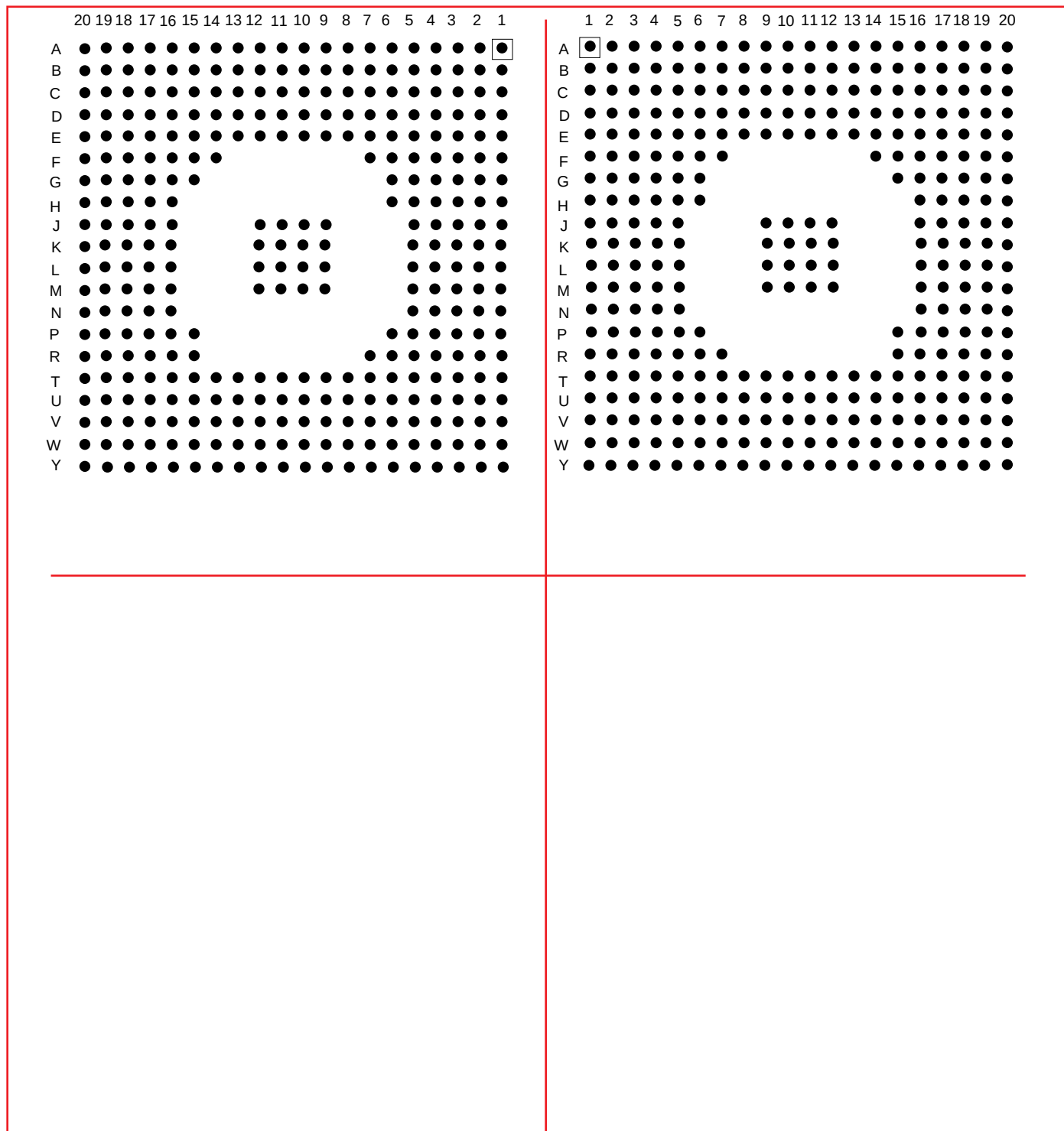


NOTES		REVISIONS	
Note 1	Logo and part number centered White ink or laser marked	Rev	Date Changes
Note 2	Ball A1 locator mark positioned in corner	subject to discontinuation	
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)	
Note 4	Substrate Material: BT laminate	Tray BGATRAY31mm-3x9 Tray Quantity 27 Tray Suppliers (ref):	

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
328	1.27mm	27mm SQ	20 x 20	5	4 x 4	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA328T1.27-DIE

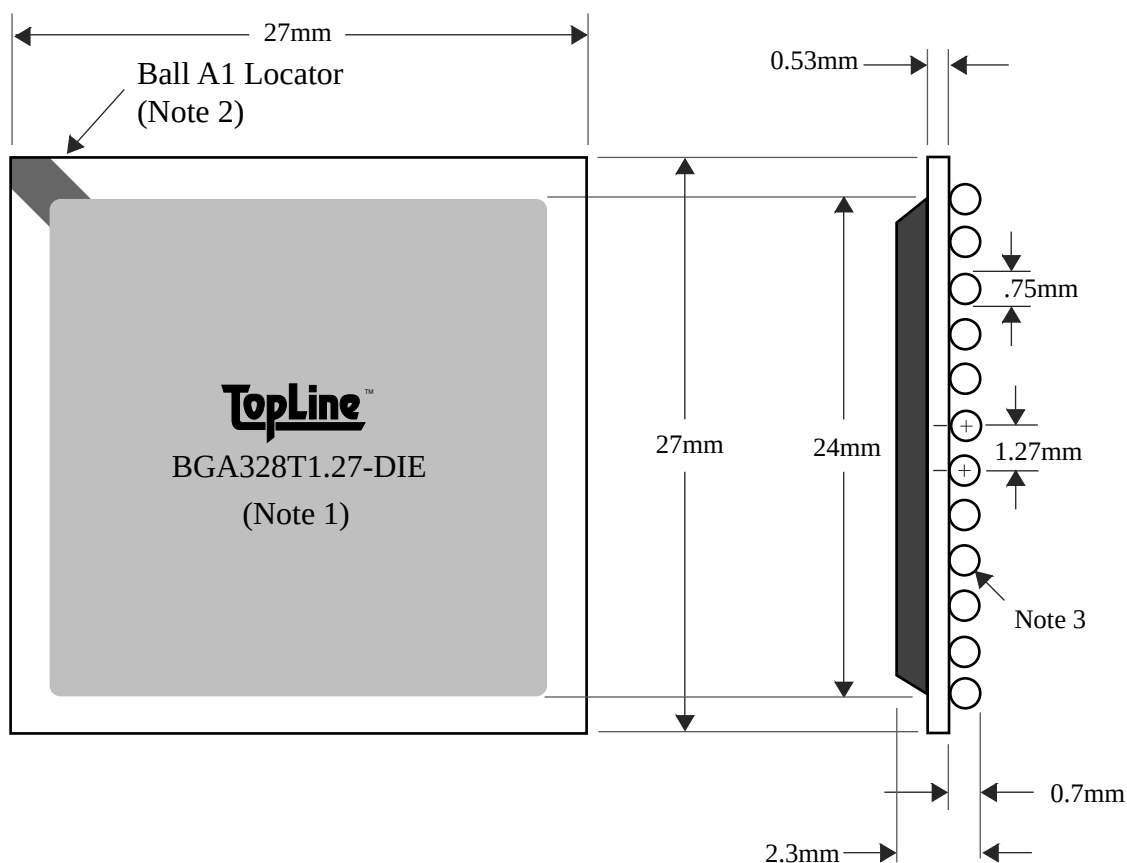
TopLine™

TEL 1-714-898-3830
FAX 1-714-891-0321

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
328	1.27mm	27mm SQ	20 x 20	5	4 x 4	BT

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY27mm-4x10 Tray Quantity 40 Tray Suppliers (ref):		



TEL 1-714-898-3830

FAX 1-714-891-0321

BGA329T1.27-ISO

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
329	1.27mm	31mm SQ	23 x 23	4	5 x 5	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA329T1.27-ISO

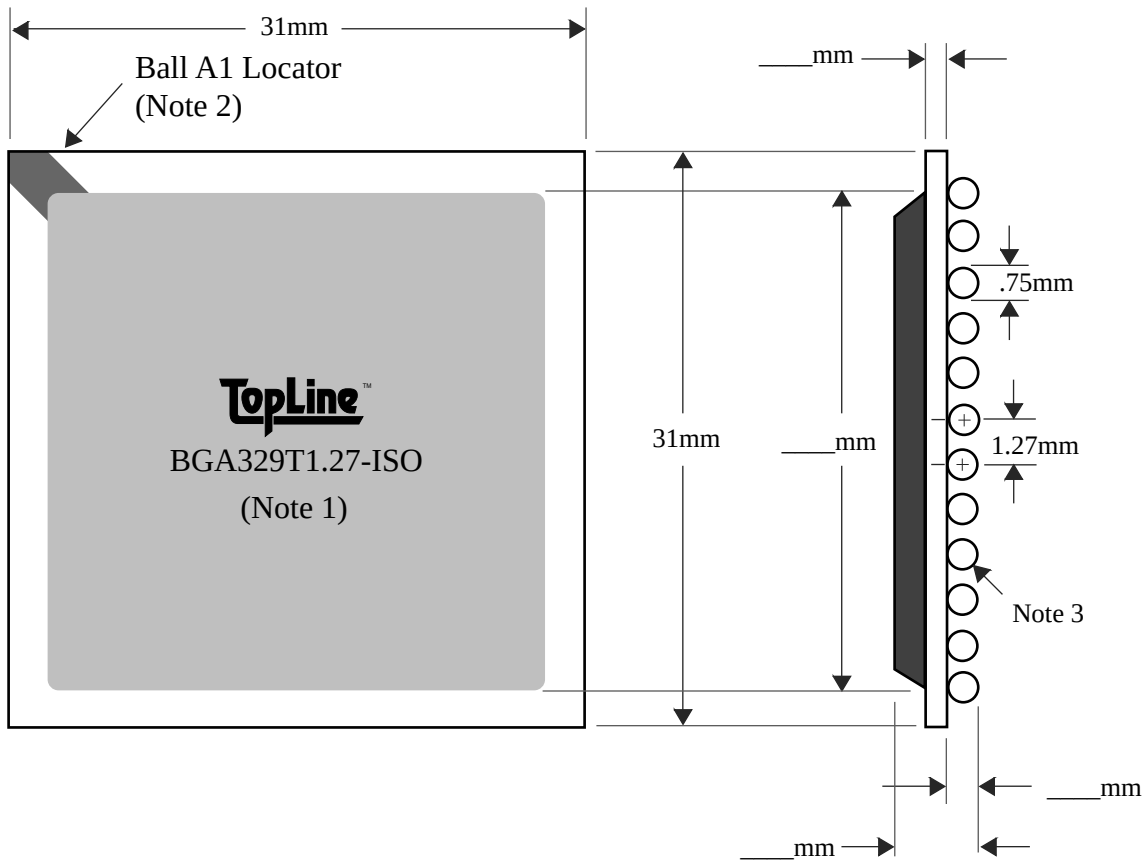
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
329	1.27mm	31mm SQ	23 x 23	4	5 x 5	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY _____		
		Tray Quantity _____		
		Tray Suppliers (ref):		



BGA329T1.27-DC232

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

329

PITCH

1.27mm

SIZE

31mm SQ

MATRIX

23 x 23

ROWS

4

CENTER

5 x 5

MAT'L

BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

Daisy Chain to be Completed

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA329T1.27-DC232

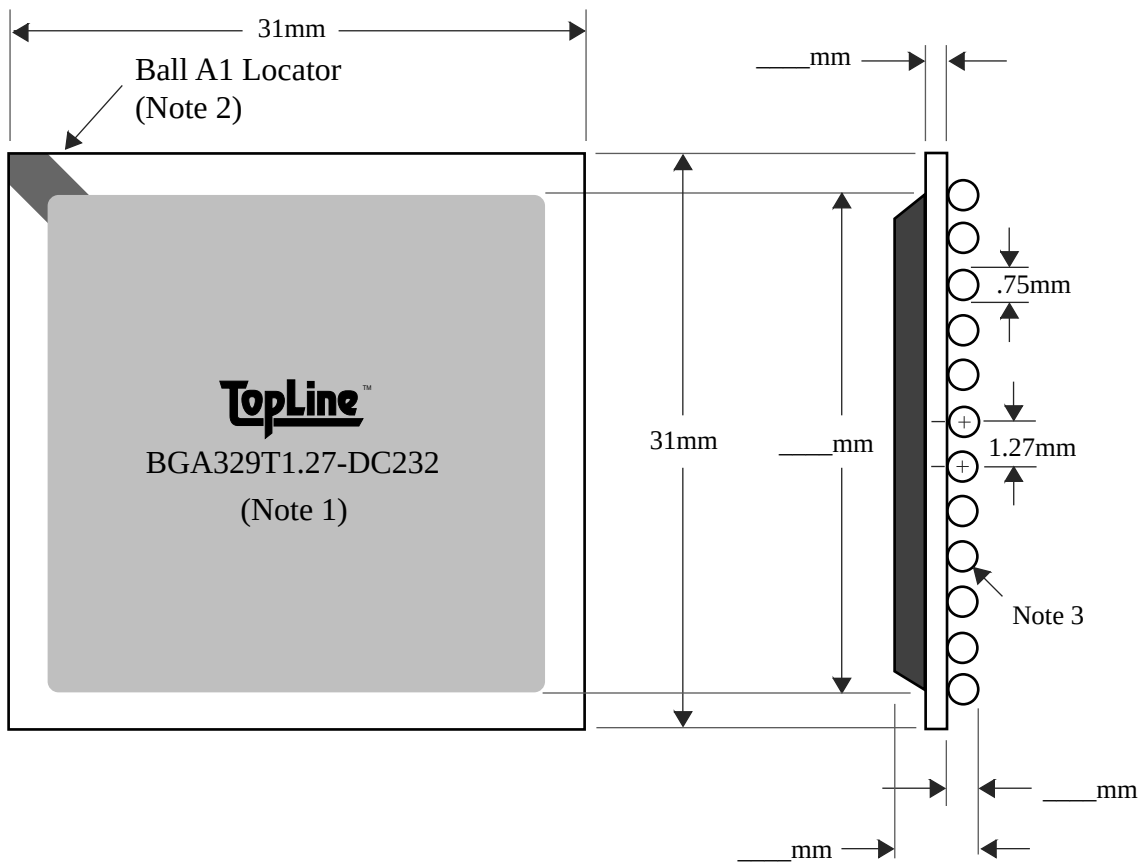


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
329	1.27mm	31mm SQ	23 x 23	4	5 x 5	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

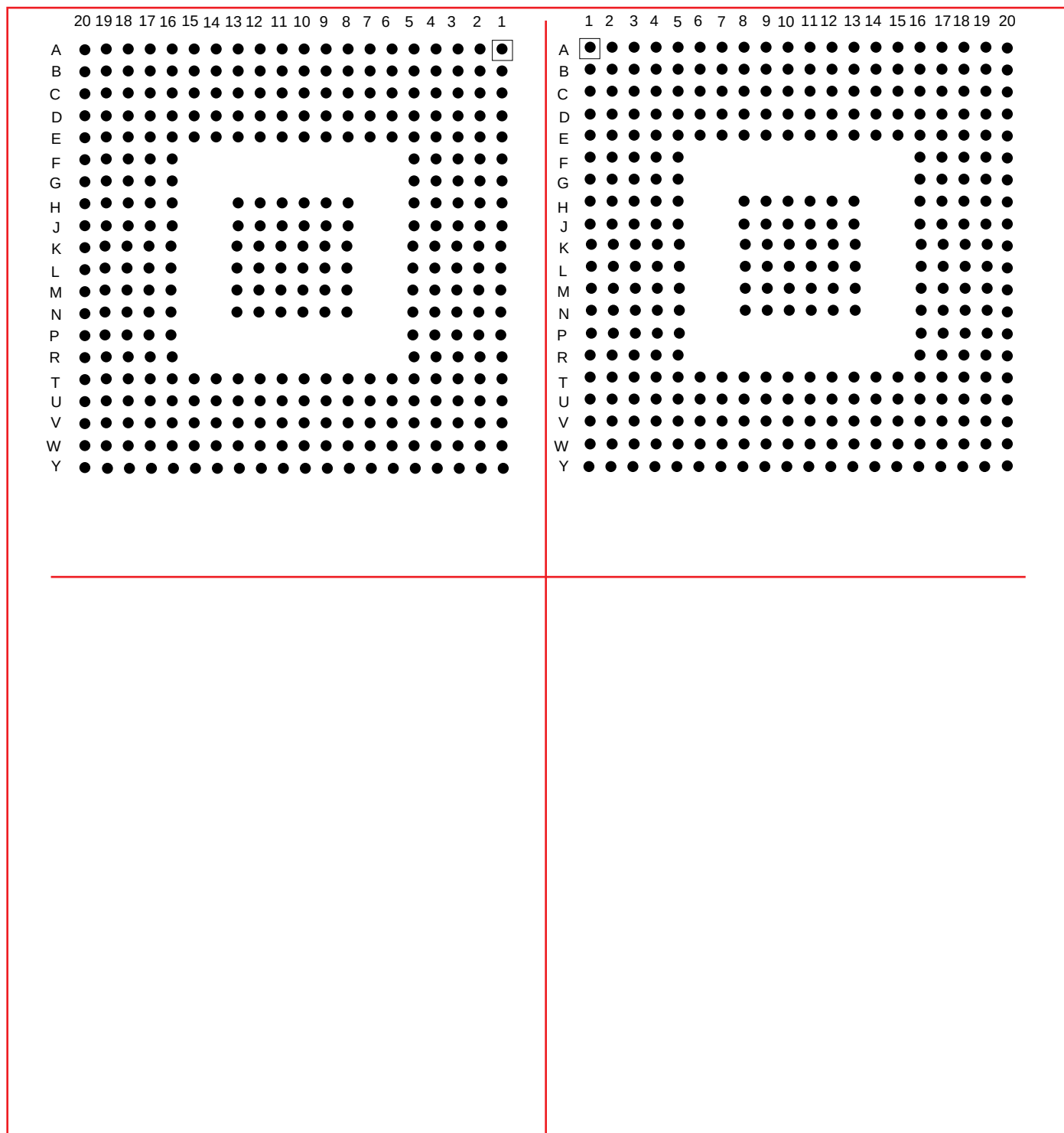


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY _____		
		Tray Quantity _____		
		Tray Suppliers (ref):		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
336	1.27mm	27mm SQ	20 x 20	5	6 x 6	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

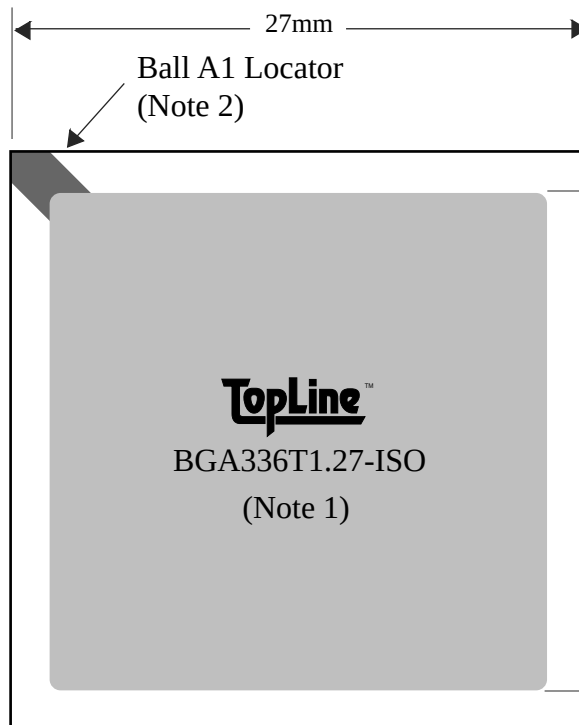
BGA336T1.27-ISO

TopLine™

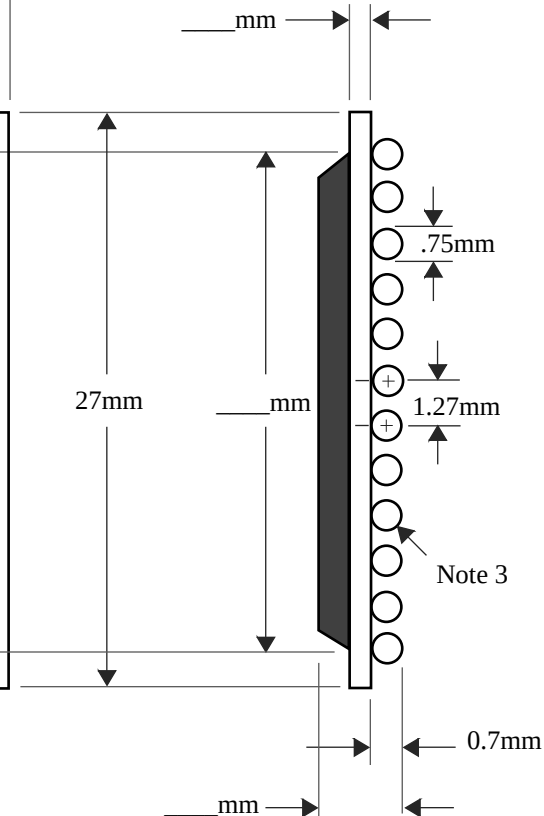
TEL 1-714-898-3830
FAX 1-714-891-0321

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
336	1.27mm	27mm SQ	20 x 20	5	6 x 6	BT

TOP VIEW



SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
			11/14/98	Proposed Design
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY27mm-4x10 Tray Quantity 40 Tray Suppliers (ref):		

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

336

PITCH

1.27mm

SIZE

27mm SQ

MATRIX

20 x 20

ROWS

5

CENTER

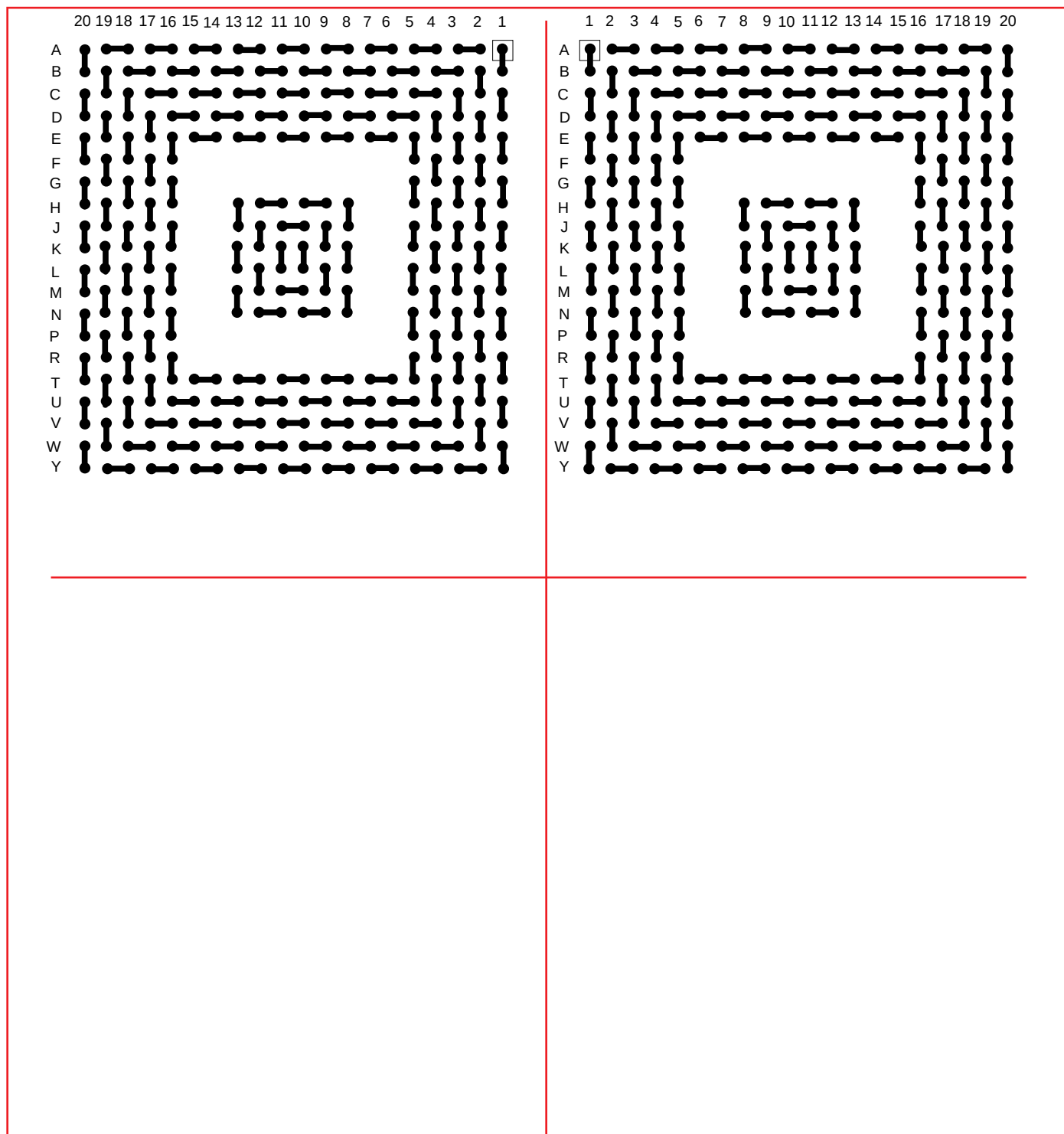
6 x 6

MAT'L

FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA336T1.27-DC208

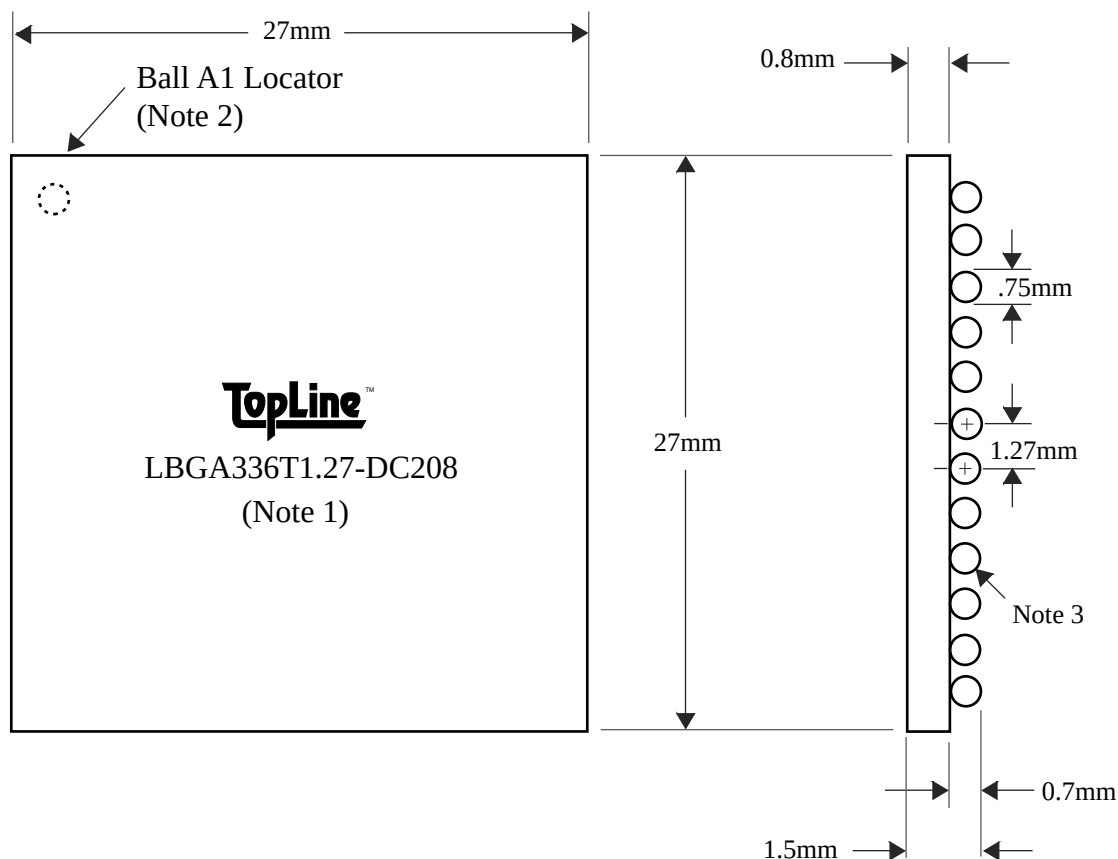
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
336	1.27mm	27mm SQ	20 x 20	5	6 x 6	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

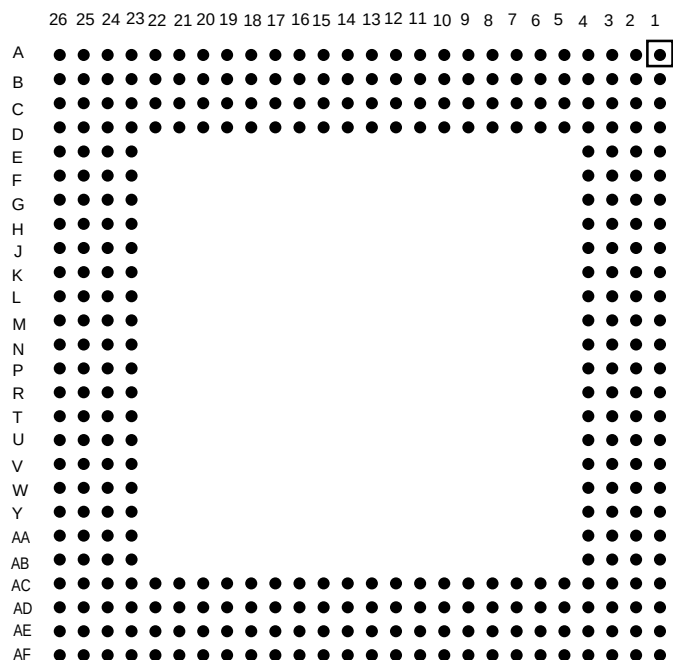
SIDE VIEW



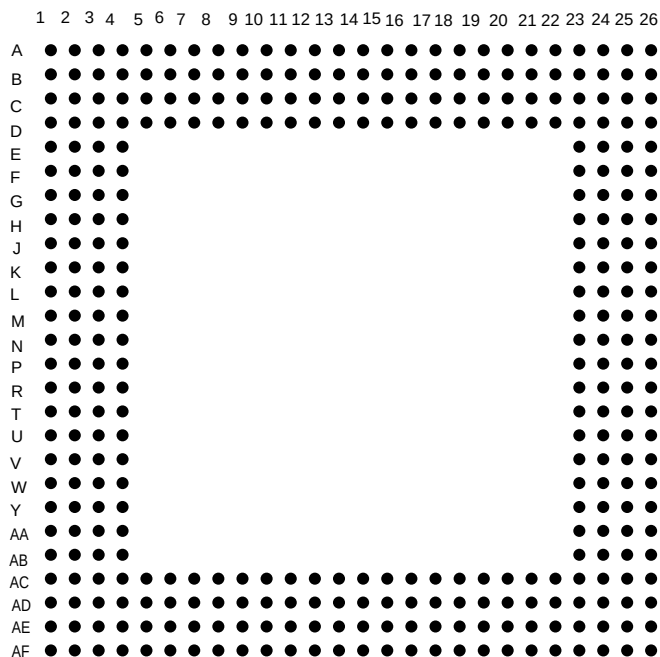
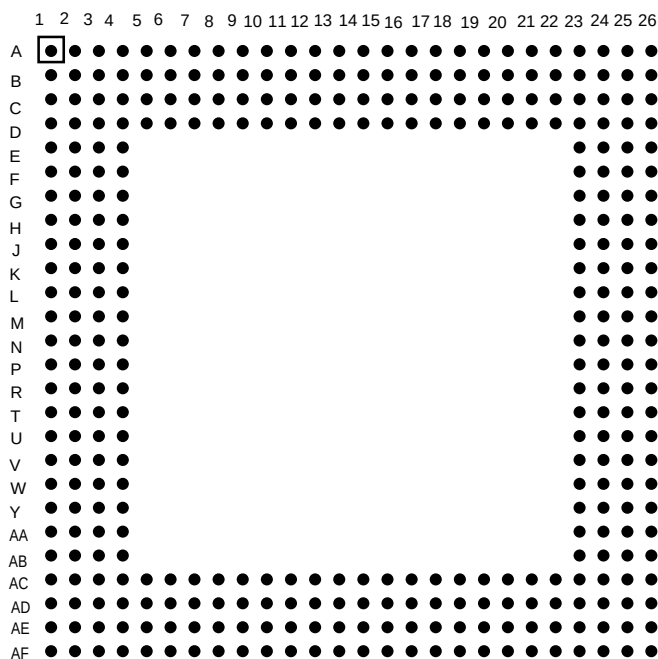
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY27mm-4x10 Tray Quantity 40 Tray Suppliers (ref):		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
352	1.27mm	35mm SQ	26 x 26	4	none	BT

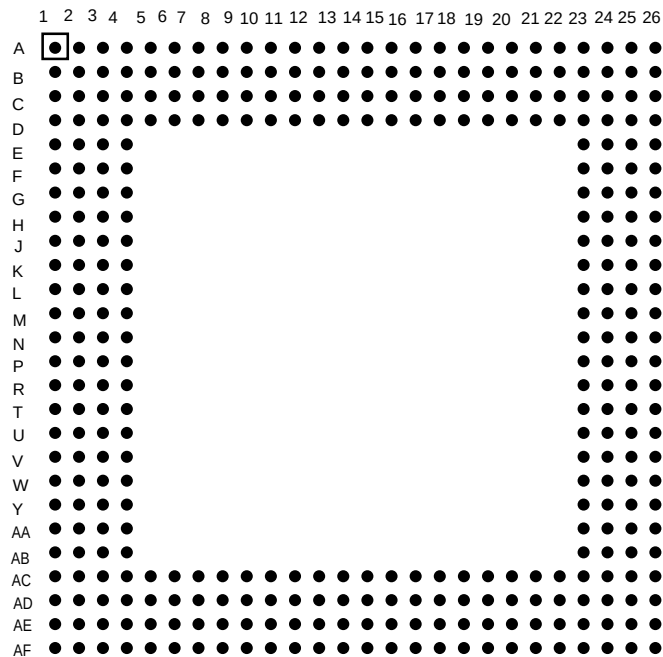
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

BGA352T1.27-ISO

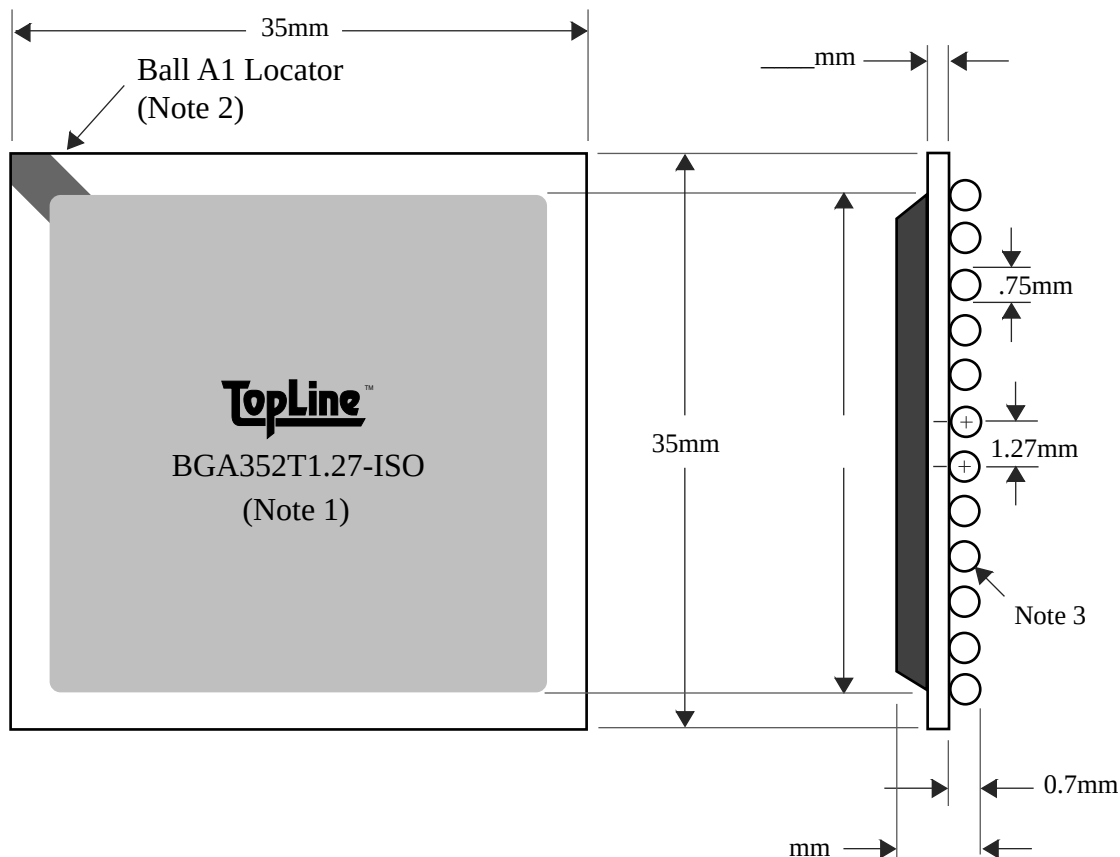
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
352	1.27mm	35mm SQ	26 x 26	4	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

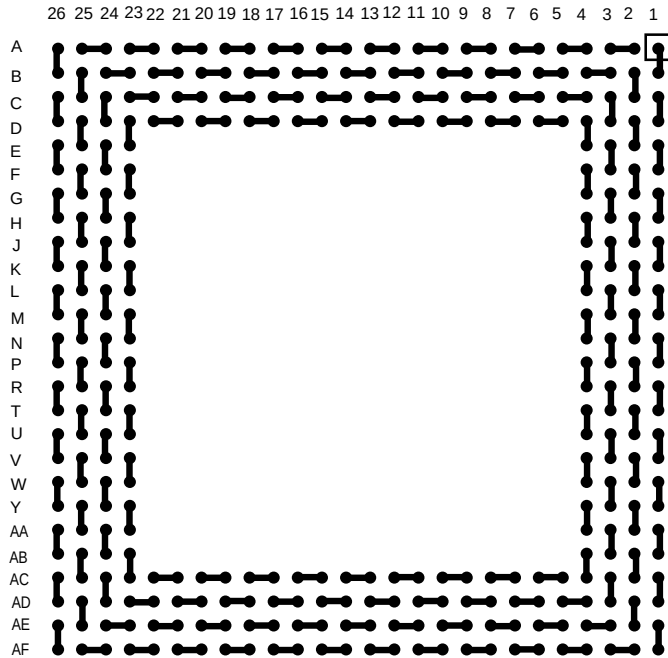


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner	SID		1260553
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY35mm-3x8 Tray Quantity 24 Tray Suppliers (ref):		

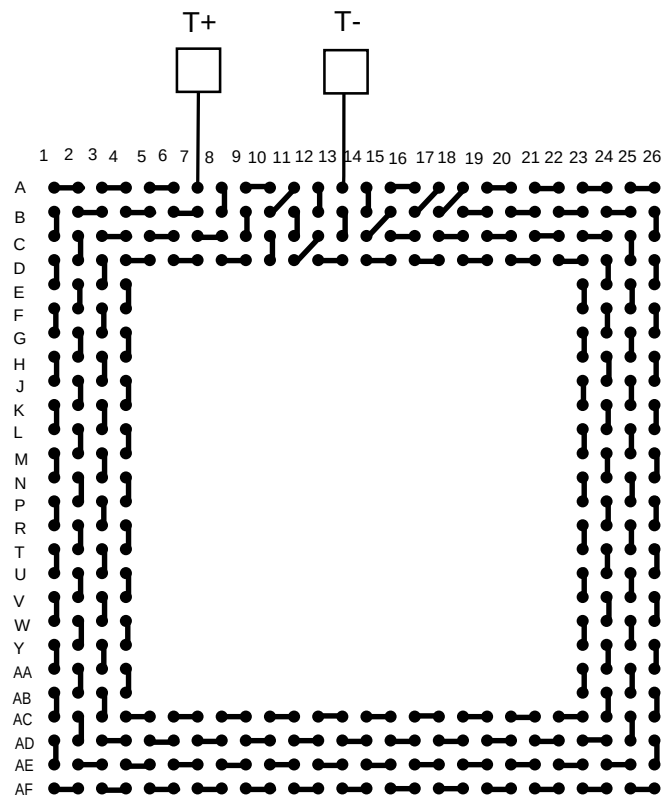
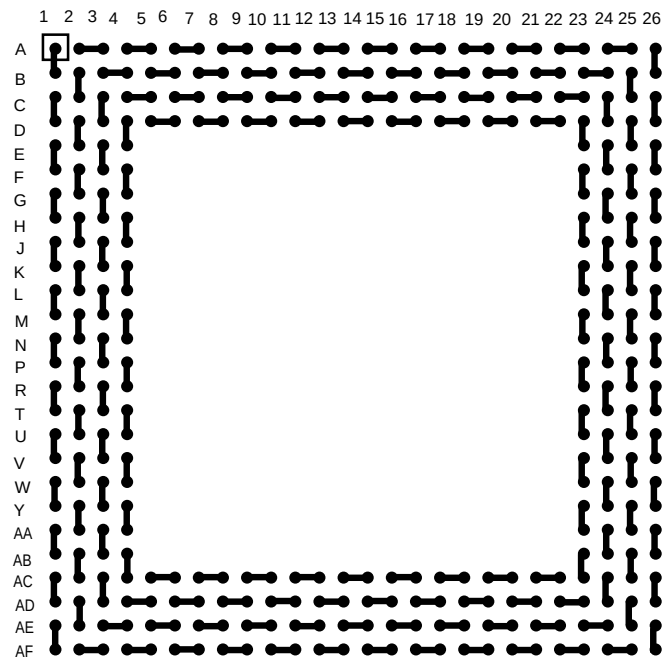
TEL 1-714-898-3830
FAX 1-714-891-0321

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
352	1.27mm	35mm SQ	26 x 26	4	none	BT

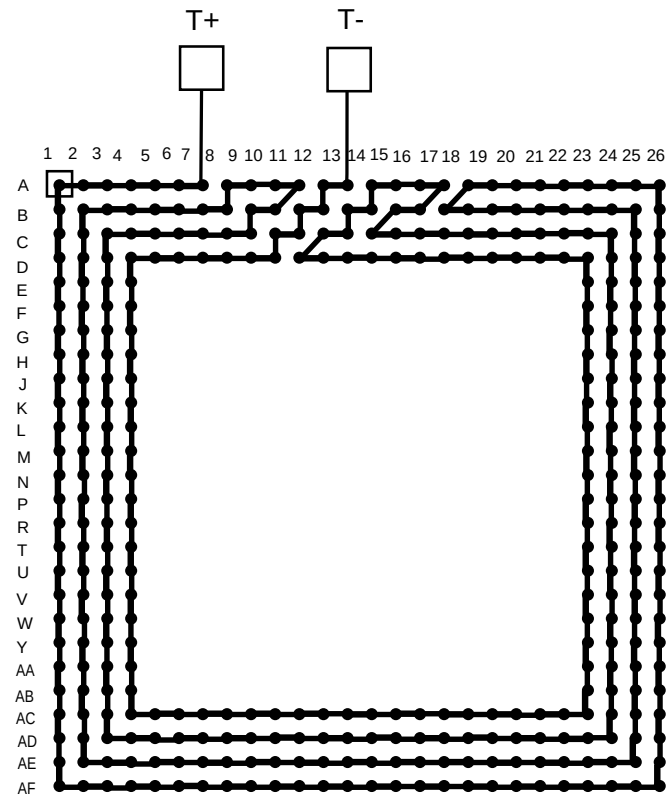
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

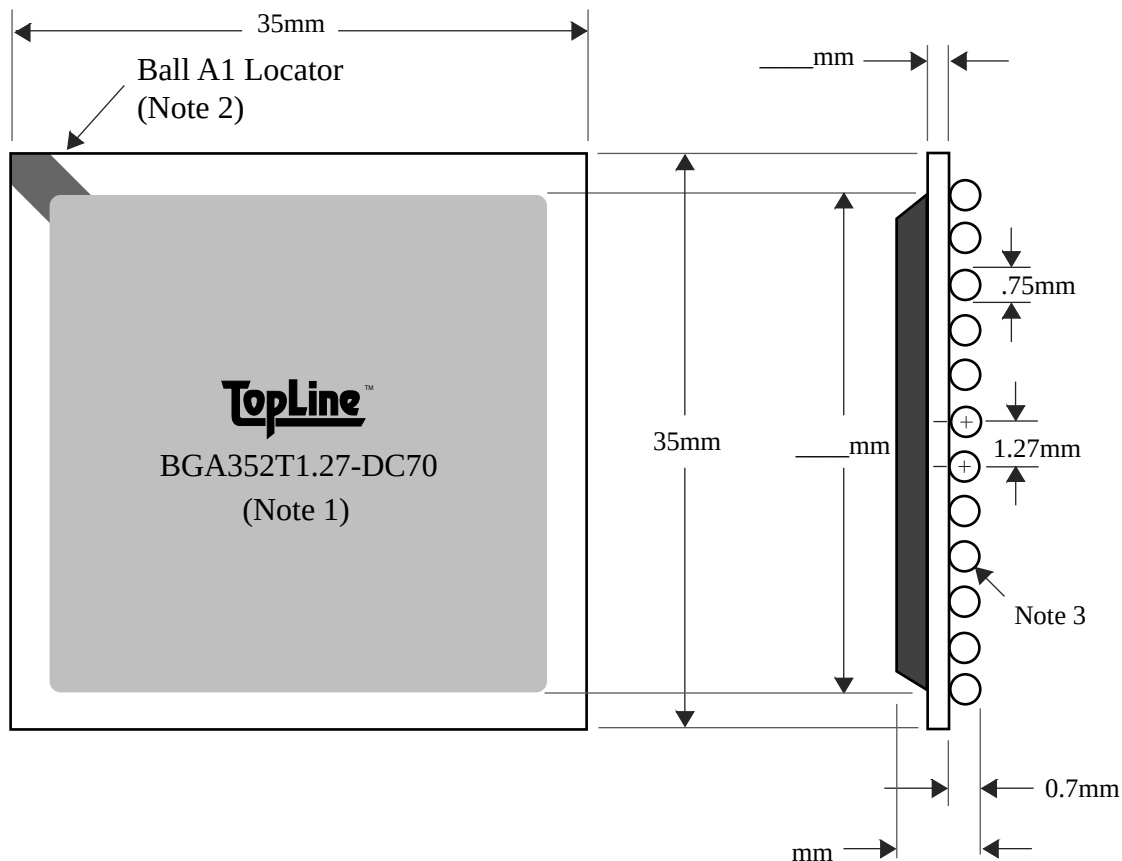


AFTER MOUNTING TO TEST BOARD

TopLine™

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
352	1.27mm	35mm SQ	26 x 26	4	none	BT

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner	PACKAGING TRAYS (SEE NOTE 4) Tray BGATRAY35mm-3x8 Tray Quantity 24 Tray Suppliers (ref):		
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			



TEL 1-714-898-3830
FAX 1-714-891-0321

BGA352T1.27-DC70A

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
352	1.27mm	35mm SQ	26 x 26	4	none	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA352T1.27-DC70A

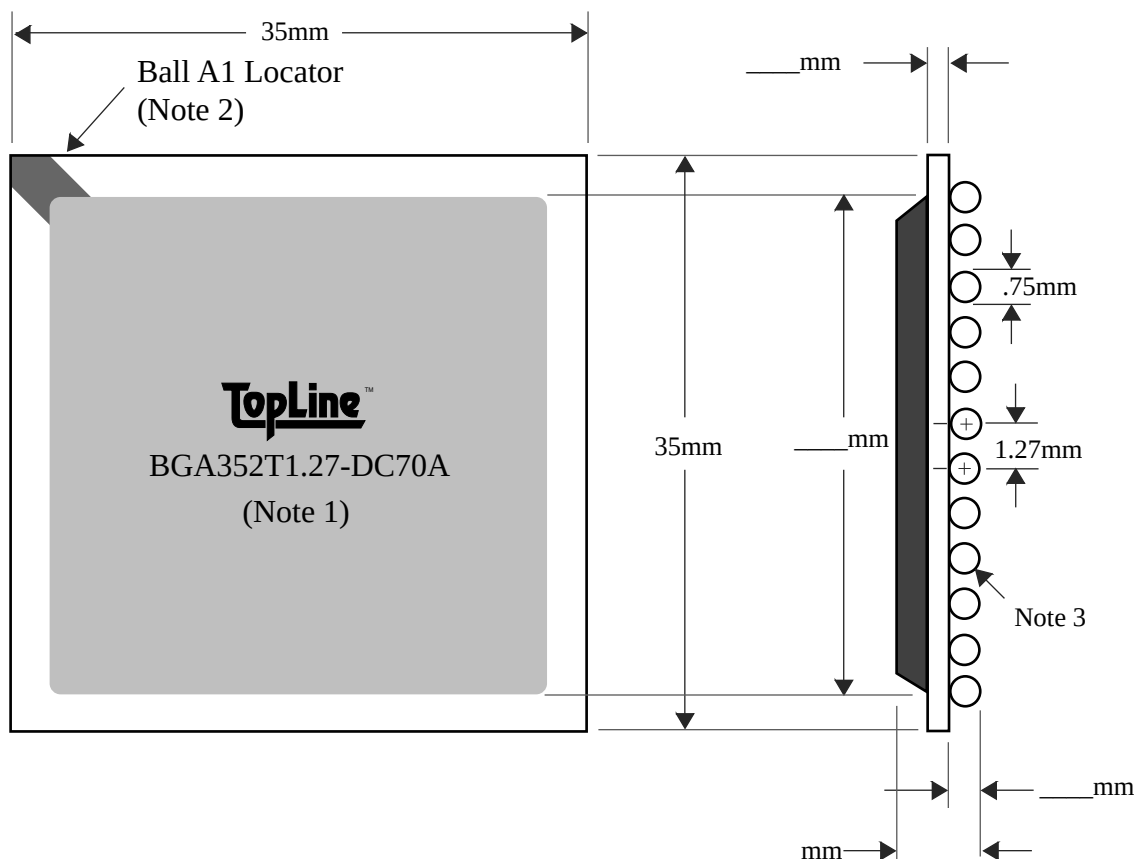
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
352	1.27mm	35mm SQ	26 x 26	4	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY35mm-3x8		
		Tray Quantity 24		
		Tray Suppliers (ref):		



TEL 1-714-898-3830
FAX 1-714-891-0321

SBGA352T1.27-DC70

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
352	1.27mm	35mm SQ	26 x 26	4	none	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

TEST VEHICLE BOARD

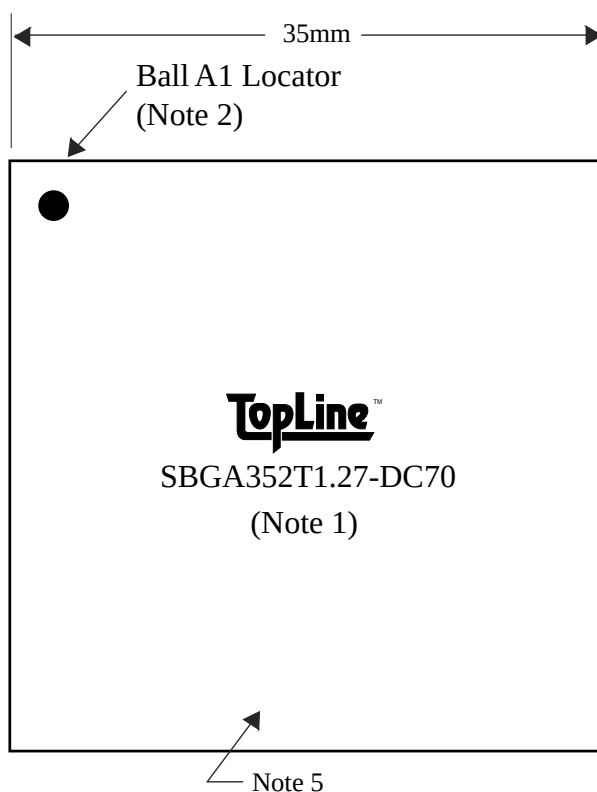
AFTER MOUNTING TO TEST BOARD

SBGA352T1.27-DC70

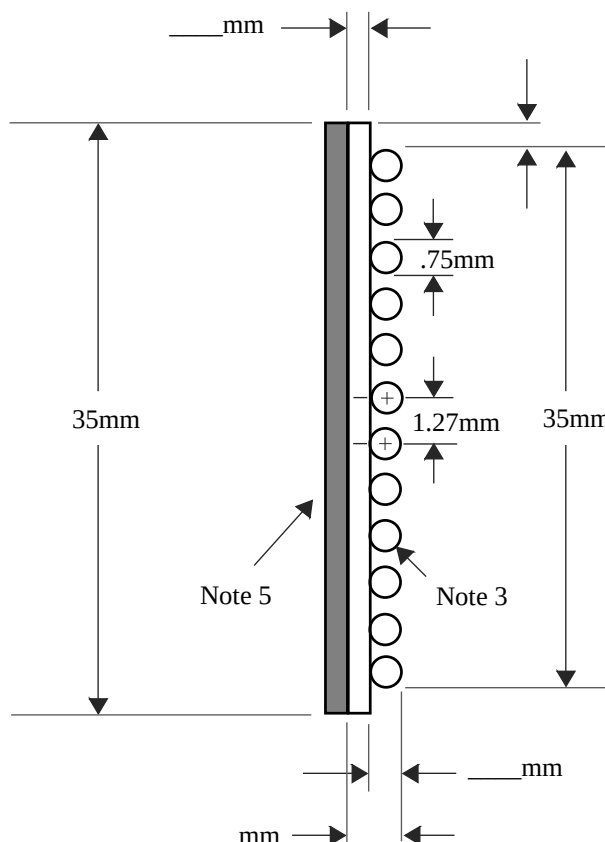
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830
352	1.27mm	35mm SQ	26 x 26	4	none	BT	FAX 1-714-891-0321

TOP VIEW



SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
Note 5	Metal heat sink. Die cavity down			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY _____		
		Tray Quantity _____		
		Tray Suppliers (ref):		



TBGA352T1.27-ISO

TEL 1-714-898-3830
FAX 1-714-891-0321

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
352	1.27mm	35mm SQ	26 x 26	4	none	tape

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

TBGA352T1.27-ISO

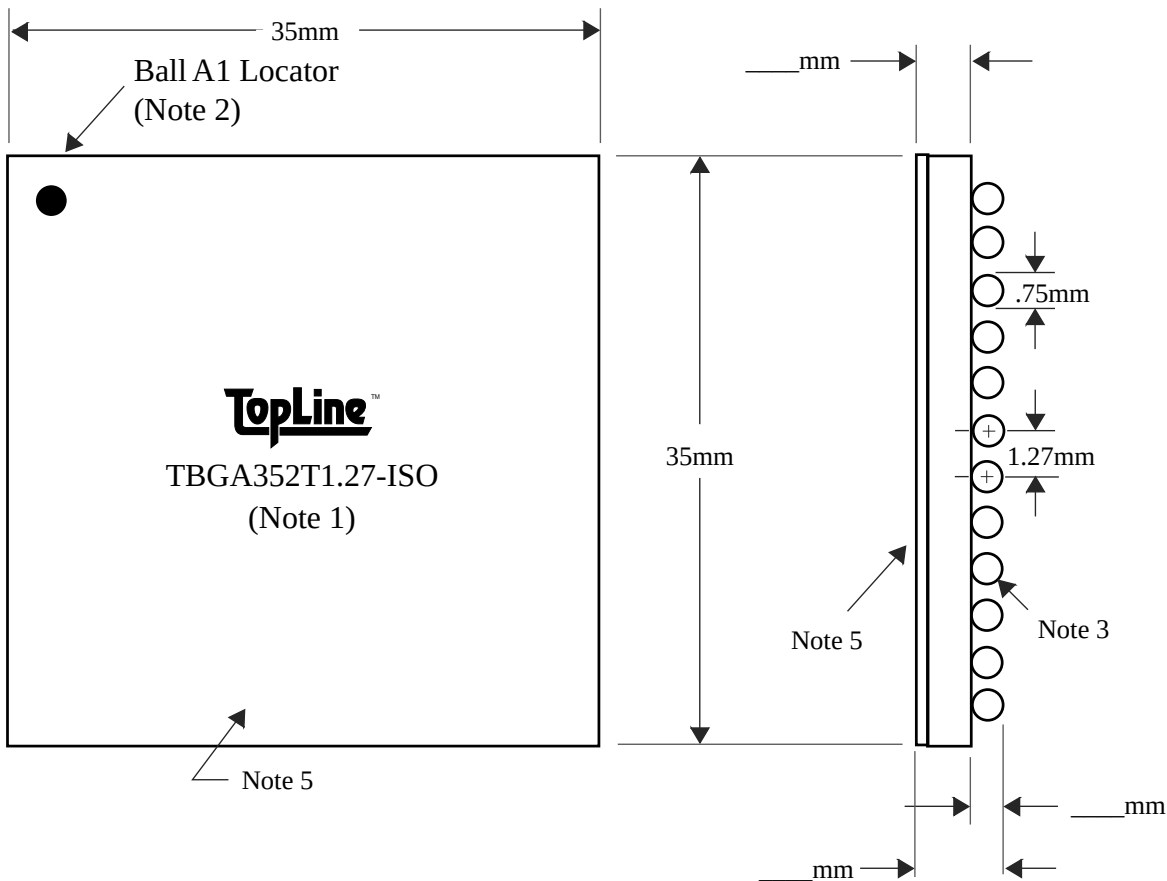


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
352	1.27mm	35mm SQ	26 x 26	4	none	tape

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

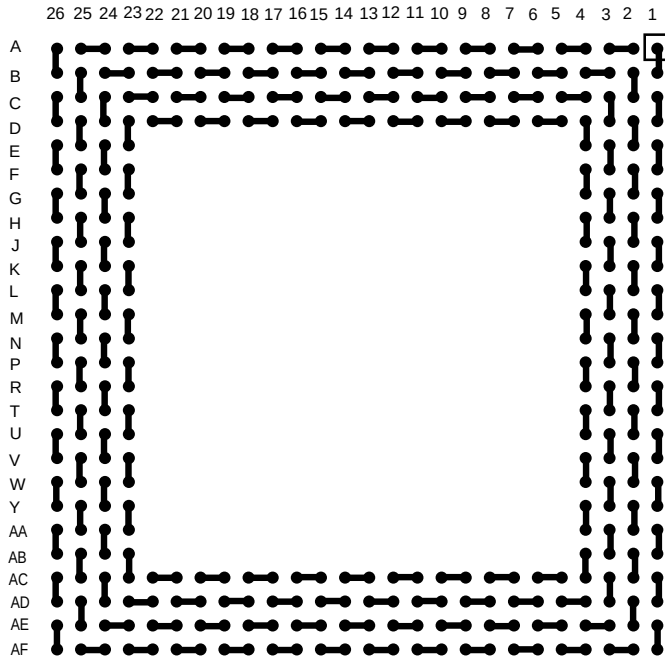
SIDE VIEW



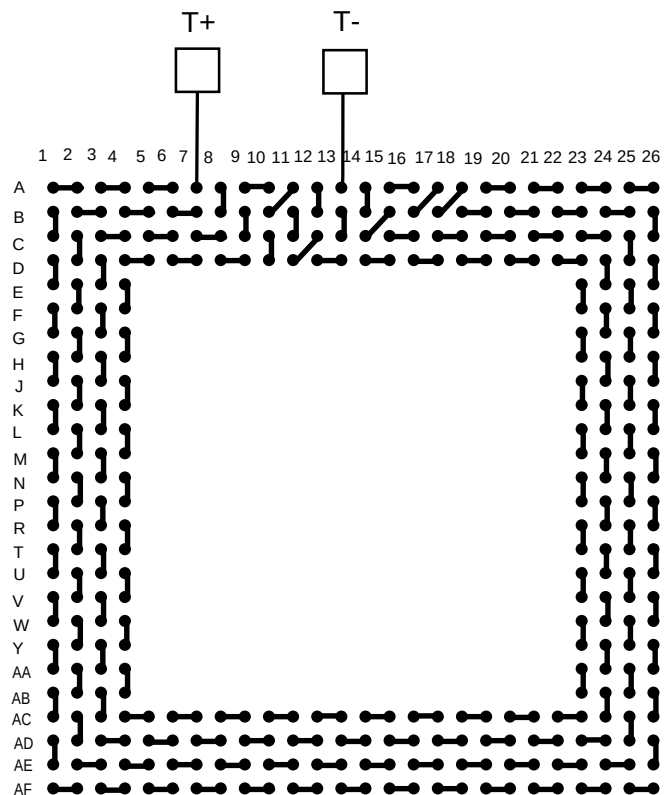
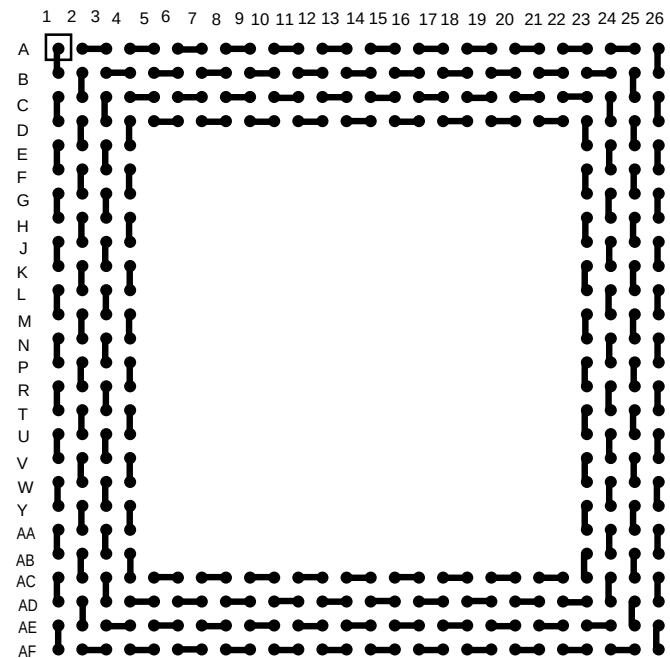
NOTES		REVISIONS		
Note 1	Logo and part number centered on metal heat sink/stiffener	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 10/90 SnPb			
Note 4	Substrate Material: Polyimide tape			
Note 5	Metal stiffener/heat sink			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY _____		
		Tray Quantity _____		
		Tray Suppliers (ref):		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
352	1.27mm	35mm SQ	26 x 26	4	none	FR4

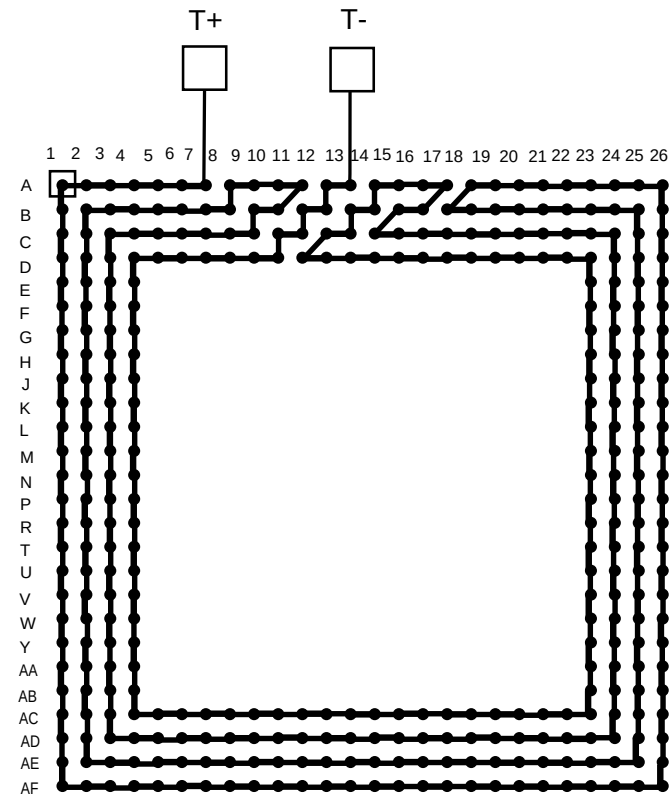
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

LBGA352T1.27-DC70

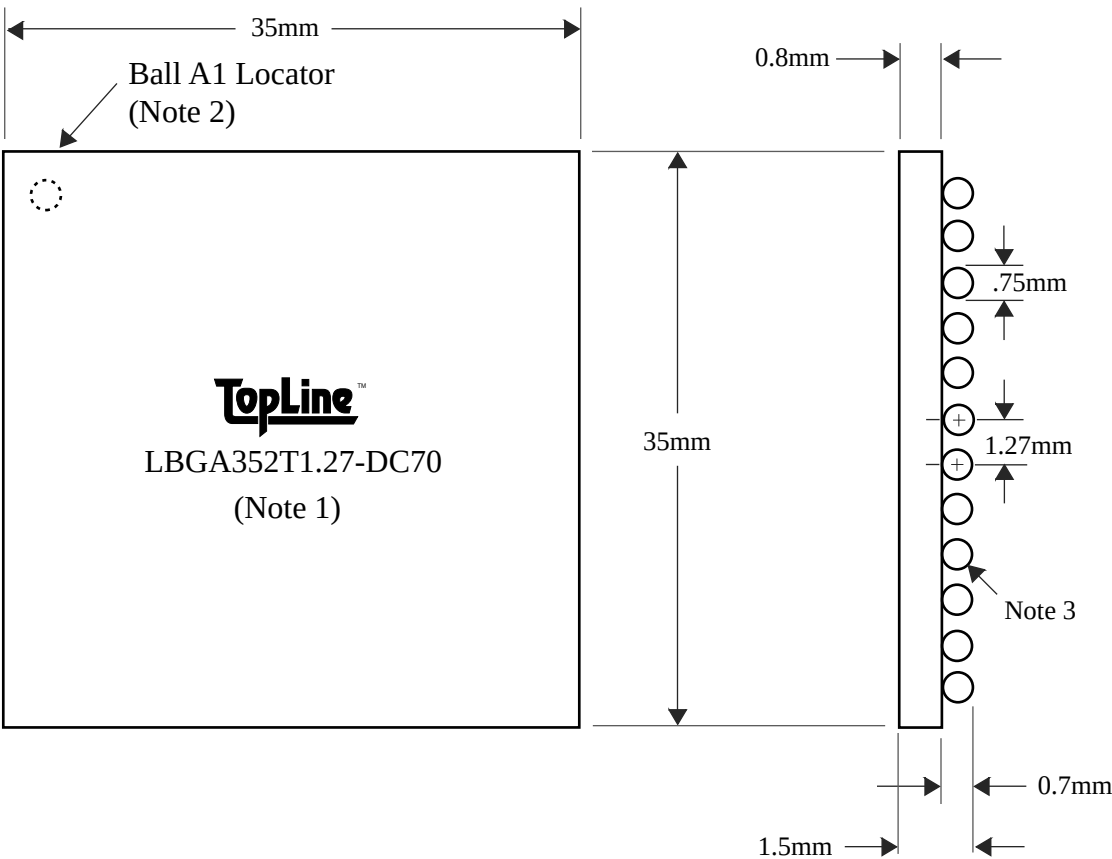
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
352	1.27mm	35mm SQ	26 x 26	4	none	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

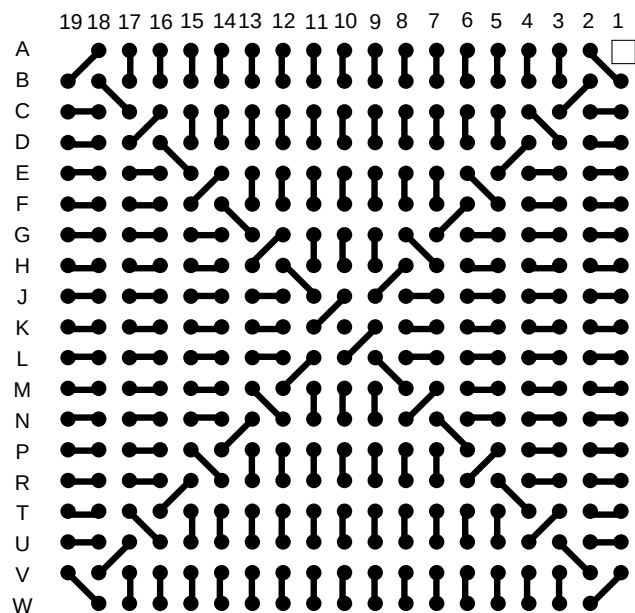
SIDE VIEW



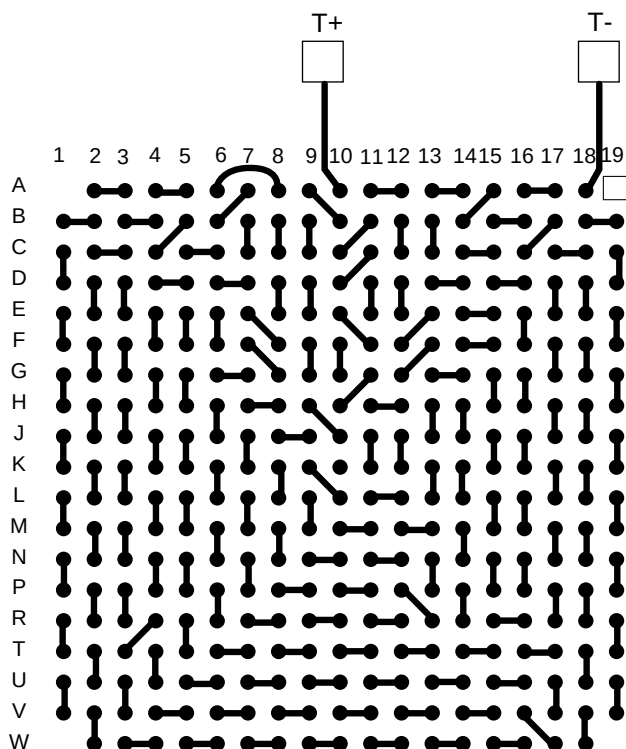
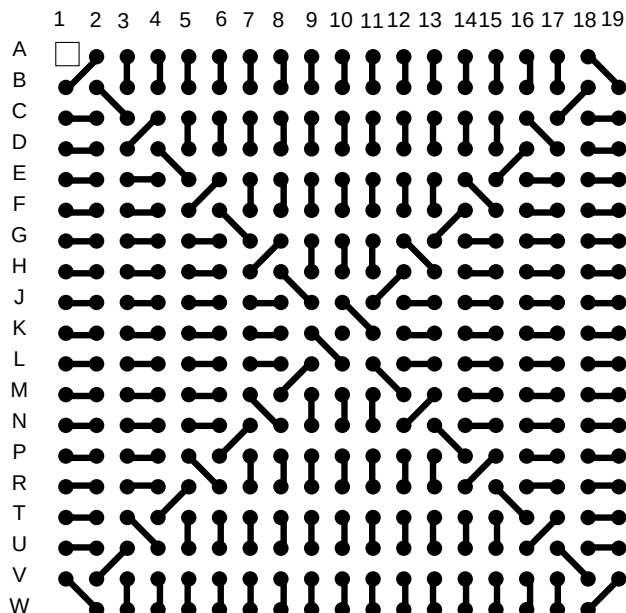
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY35mm-3x8 Tray Quantity 24 Tray Suppliers (ref):		

BGA357T1.27-DC73

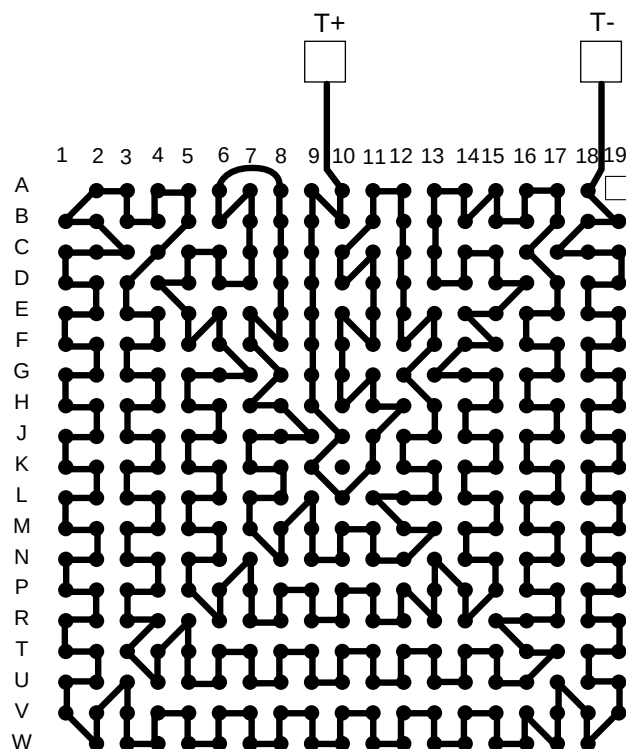
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

BGA357T1.27-DC73

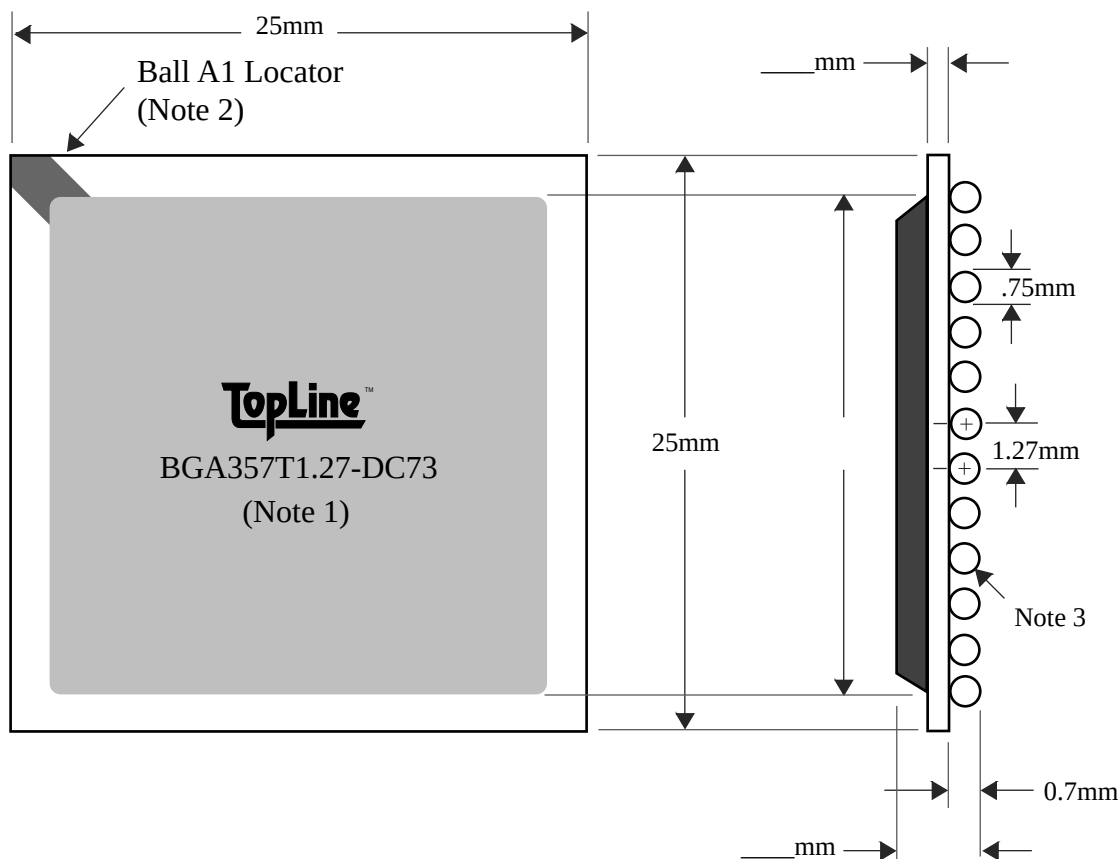
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
357	1.27mm	25mm SQ	19 x 19	full	full	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

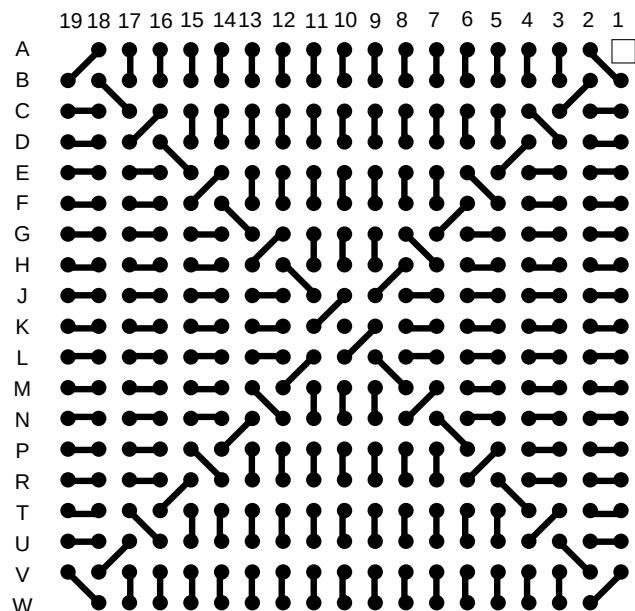
TOP VIEW

SIDE VIEW

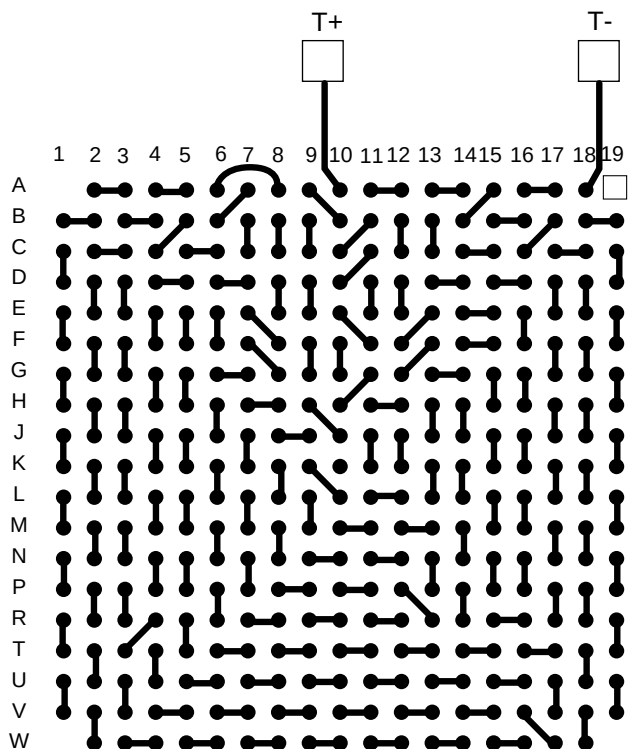
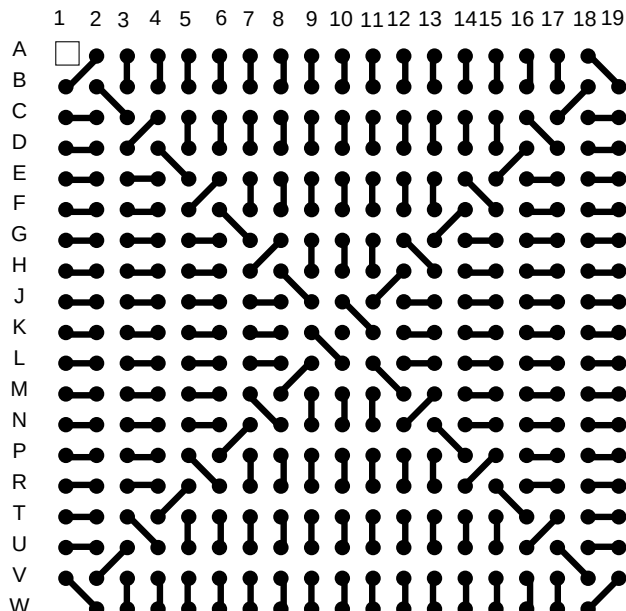


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY25mm-4x11 Tray Quantity 44 Tray Suppliers (ref):		

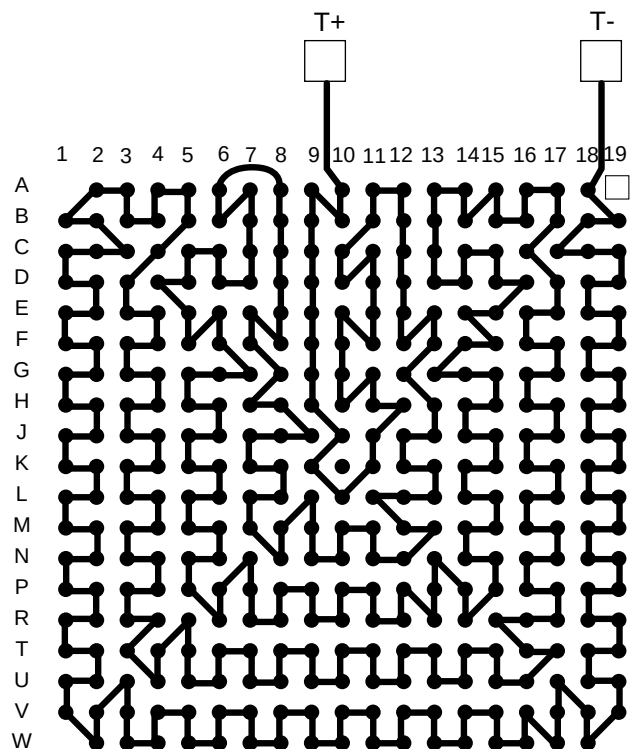
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

LBGA357T1.27-DC73

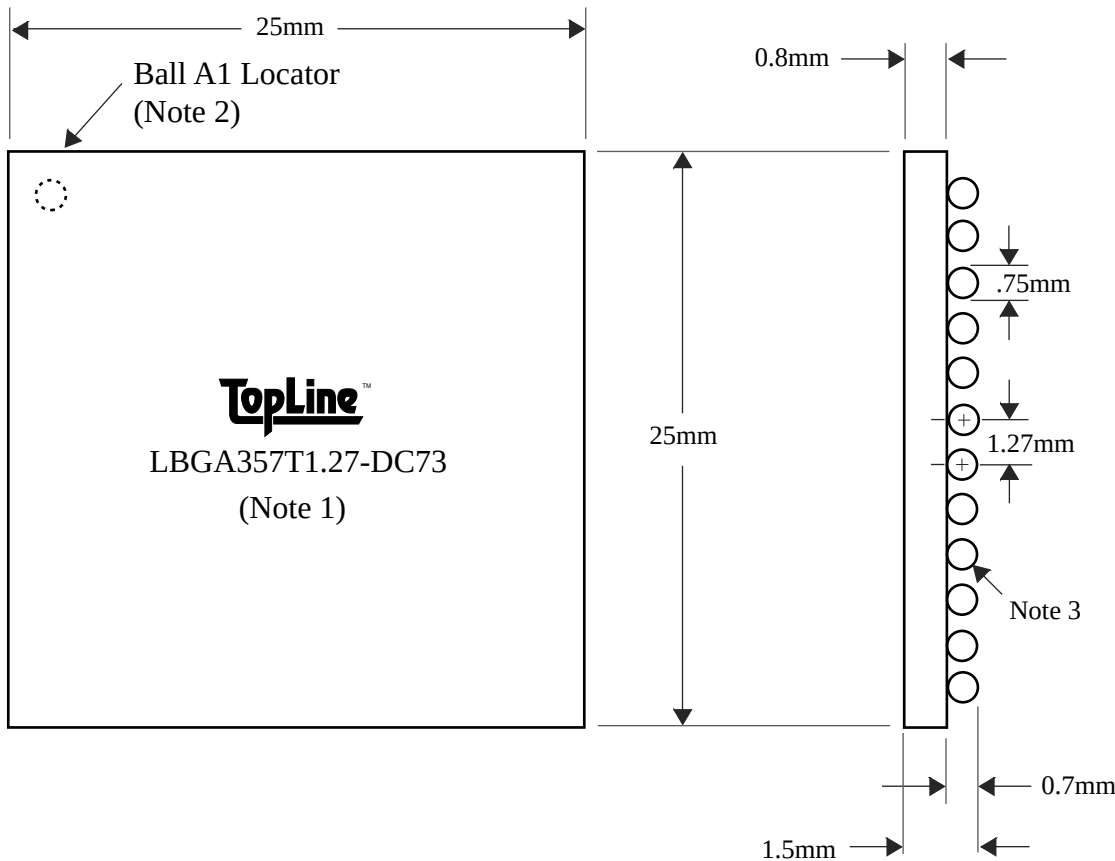


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
357	1.27mm	25mm SQ	19 x 19	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY25mm-4x11 Tray Quantity 44 Tray Suppliers (ref):		



BGA360T1.27-ISO

TEL 1-714-898-3830	<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
FAX 1-714-891-0321	360	1.27mm	31mm SQ	23 x 23	5	none	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA360T1.27-ISO

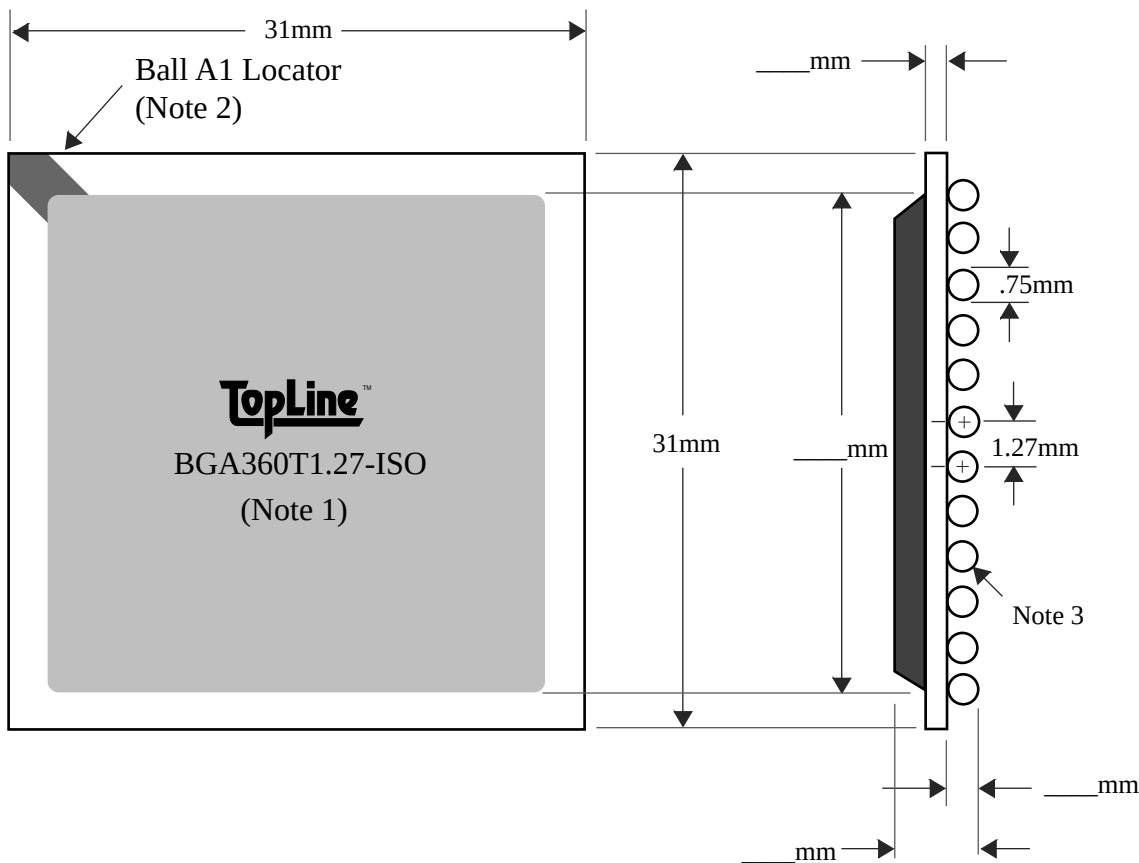


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
360	1.27mm	31mm SQ	23 x 23	5	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

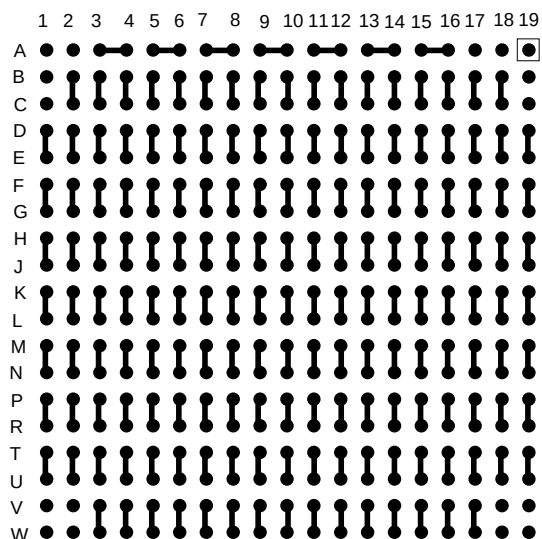
SIDE VIEW



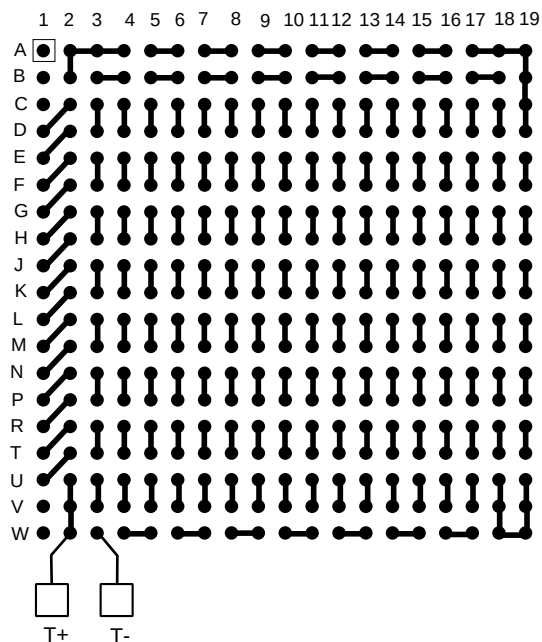
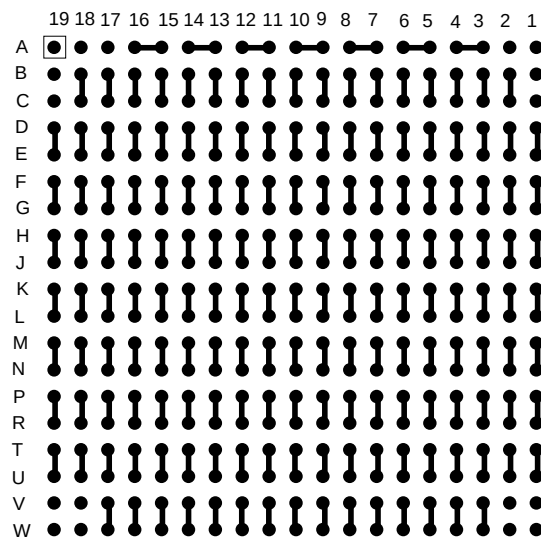
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY_____		
		Tray Quantity _____		
		Tray Suppliers (ref):		

CBGA361T1.27-DC71

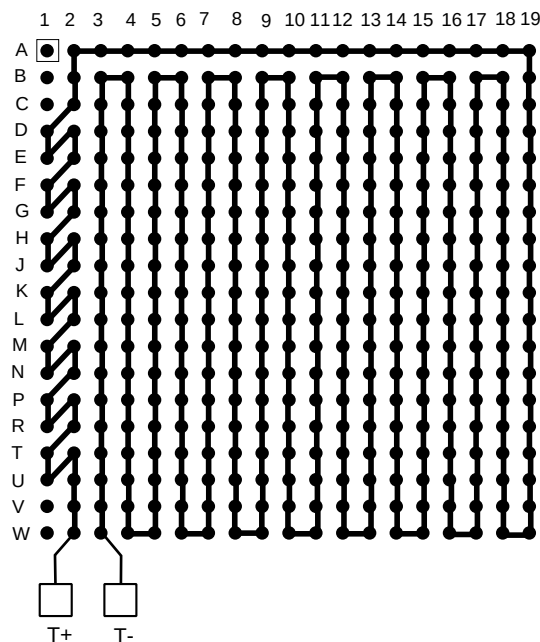
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

CBGA361T1.27-DC71

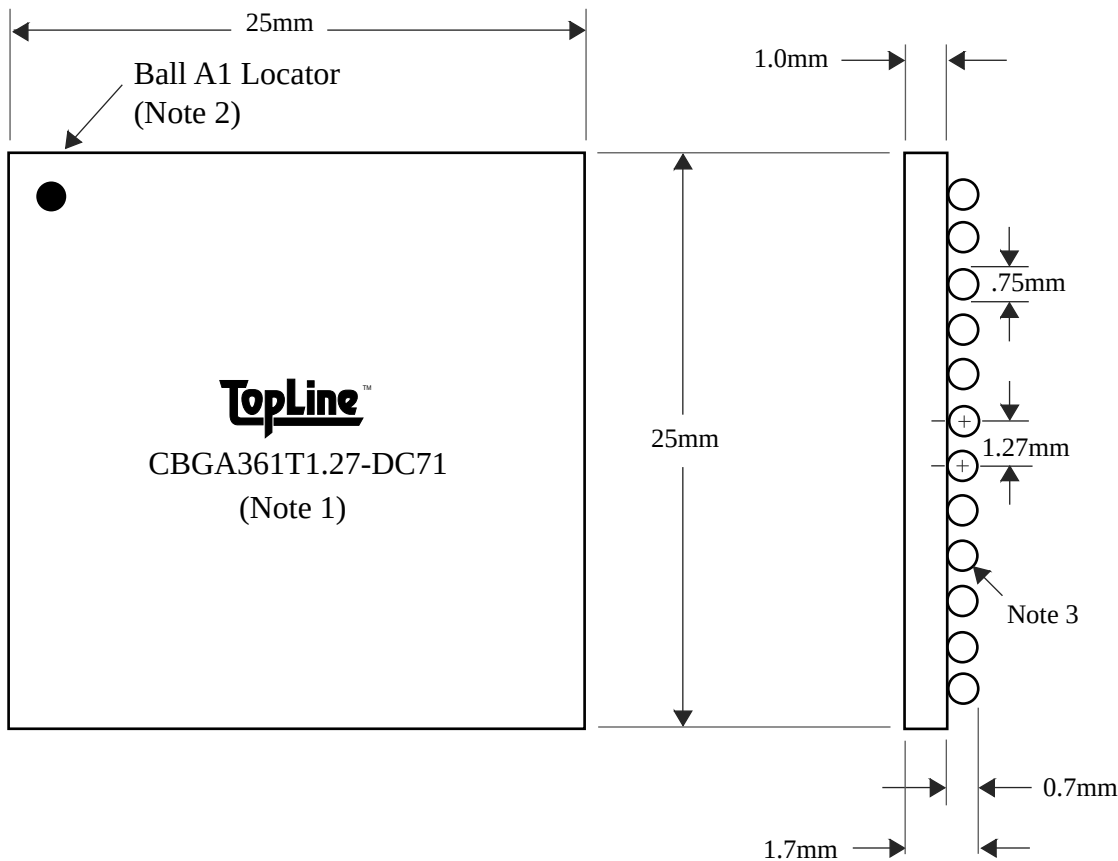
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
361	1.27mm	25mm SQ	19 x 19	full	full	ceramic

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

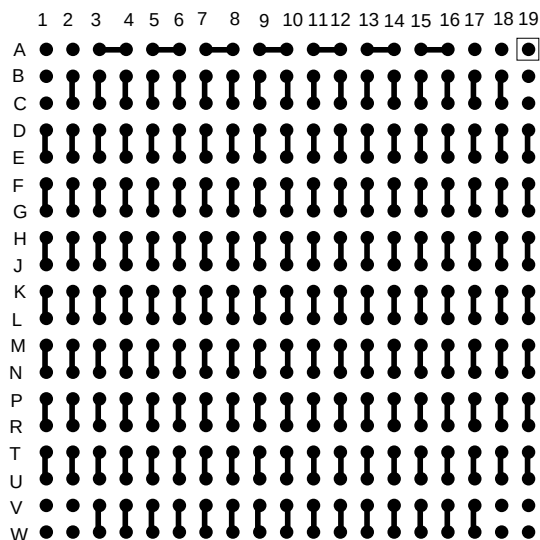


NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 10/90SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: Ceramic	Tray BGATRAY25mm-4x11 Tray Quantity 44 Tray Suppliers (ref):		

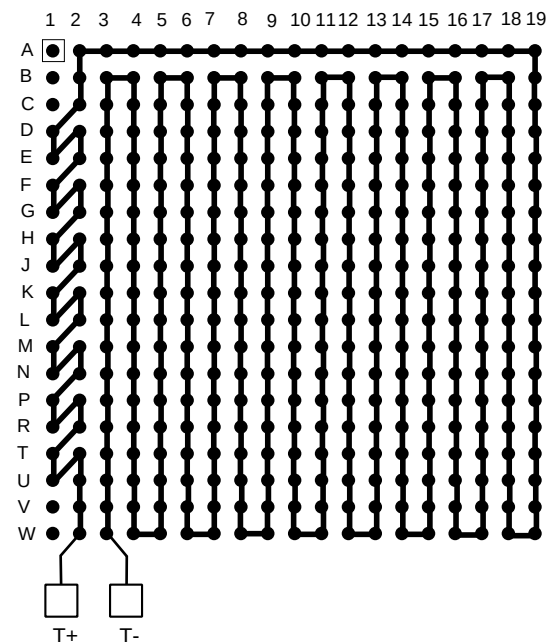
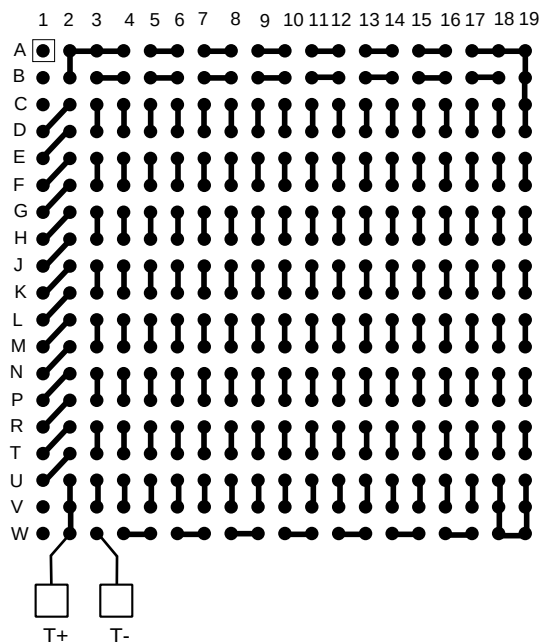
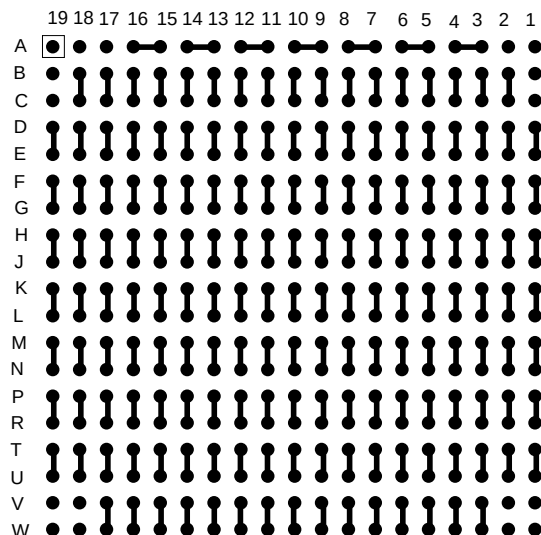
TEL 1-714-898-3830
FAX 1-714-891-0321

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
361	1.27mm	25mm SQ	19 x 19	full	full	ceramic

BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

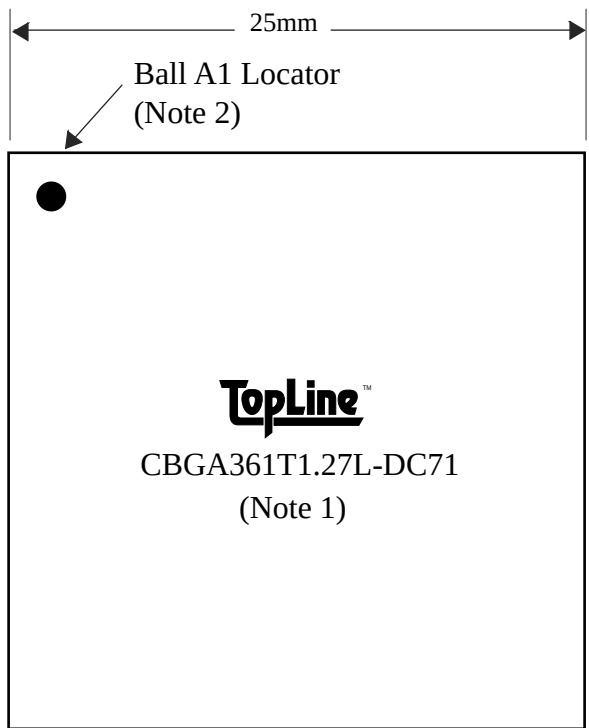
AFTER MOUNTING TO TEST BOARD

CBGA361T1.27L-DC71

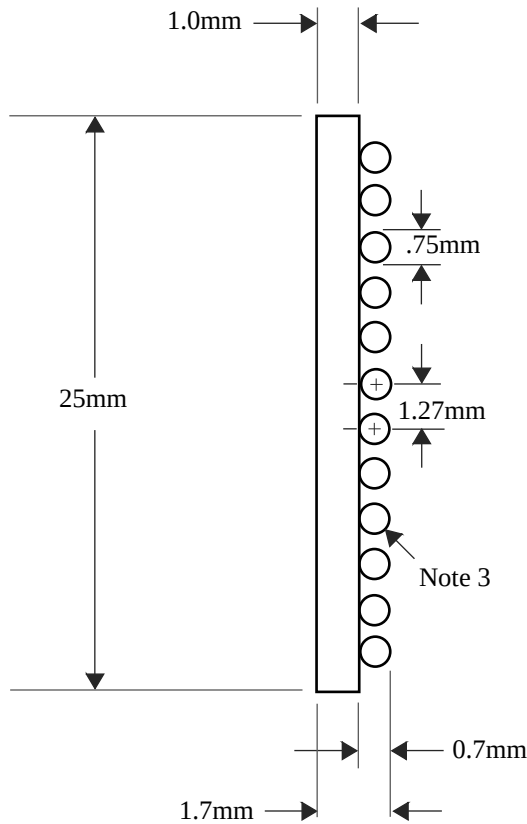
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830
361	1.27mm	25mm SQ	19 x 19	full	full	ceramic	FAX 1-714-891-0321

TOP VIEW



SIDE VIEW



NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 62/36/2 SnPbAg			
Note 4	Substrate Material: Ceramic			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY25mm-4x11 Tray Quantity 44 Tray Suppliers (ref):		



BGA385T1.27-ISO

TEL 1-714-898-3830	<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
FAX 1-714-891-0321	385	1.27mm	31mm SQ	23 x 23	5	5 x 5	BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

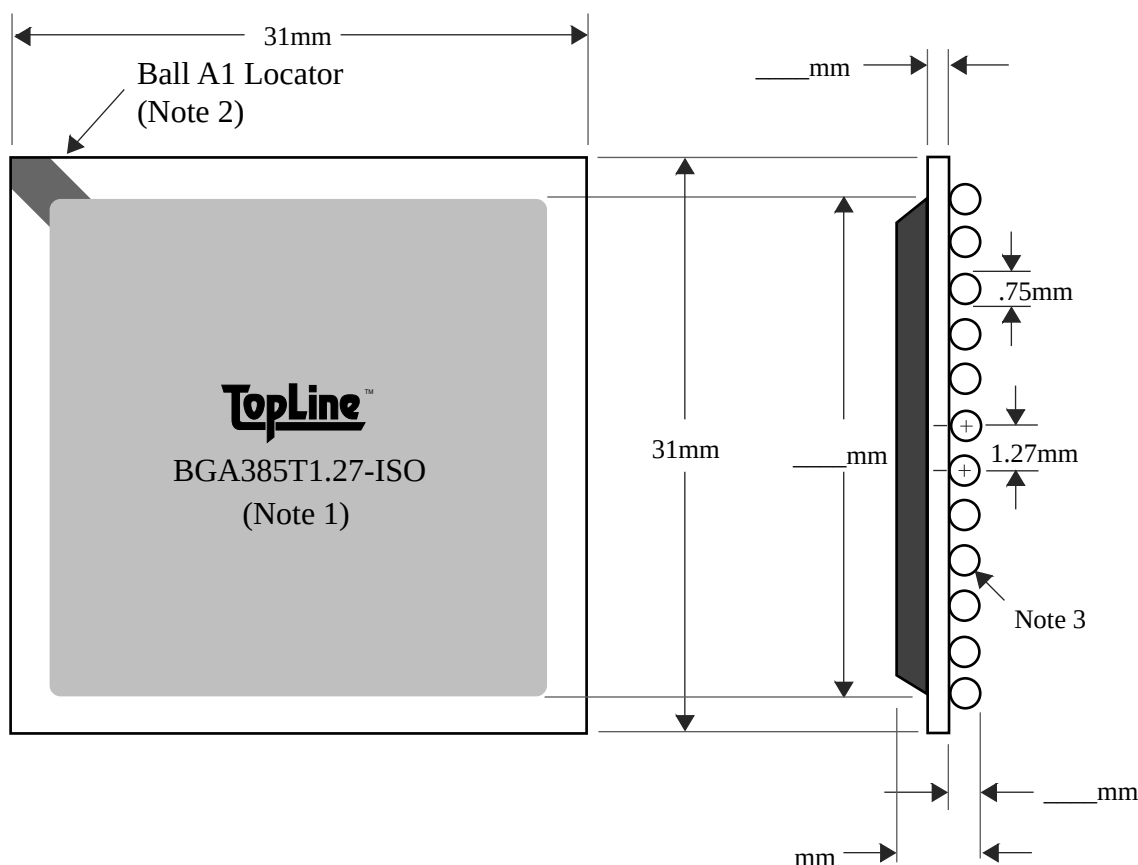
BGA385T1.27-ISO

TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830 FAX 1-714-891-0321
385	1.27mm	31mm SQ	23 x 23	5	5 x 5	BT	

TOP VIEW

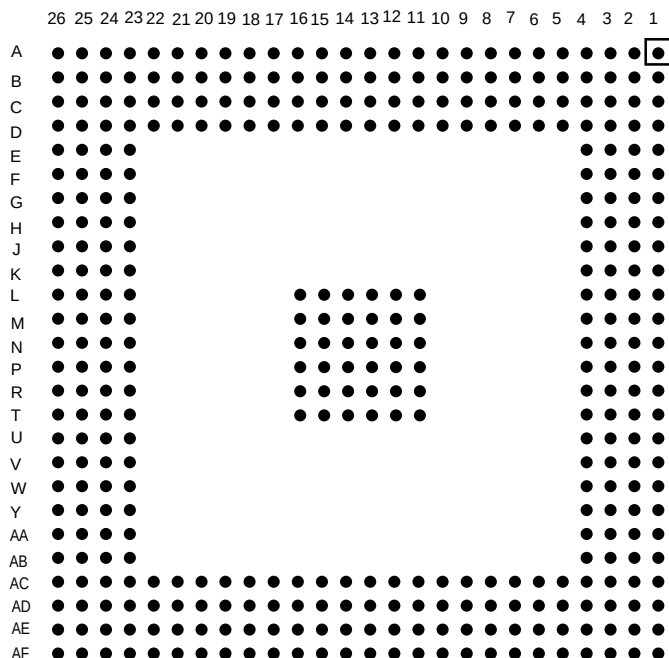
SIDE VIEW



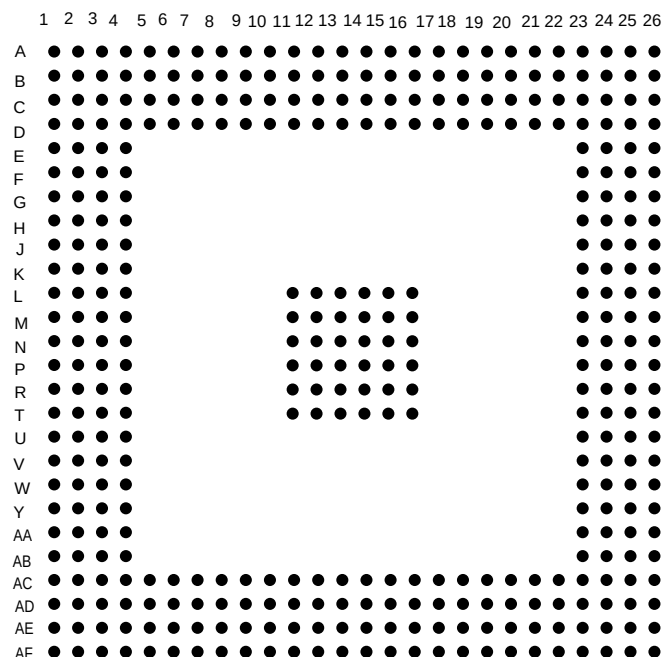
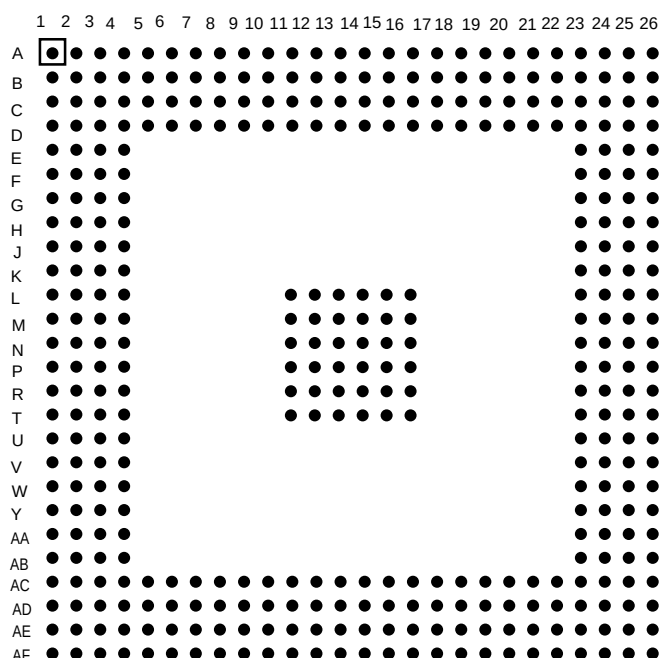
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY _____ Tray Quantity _____ Tray Suppliers (ref):		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
388	1.27mm	35mm SQ	26 x 26	4	6 x 6	BT

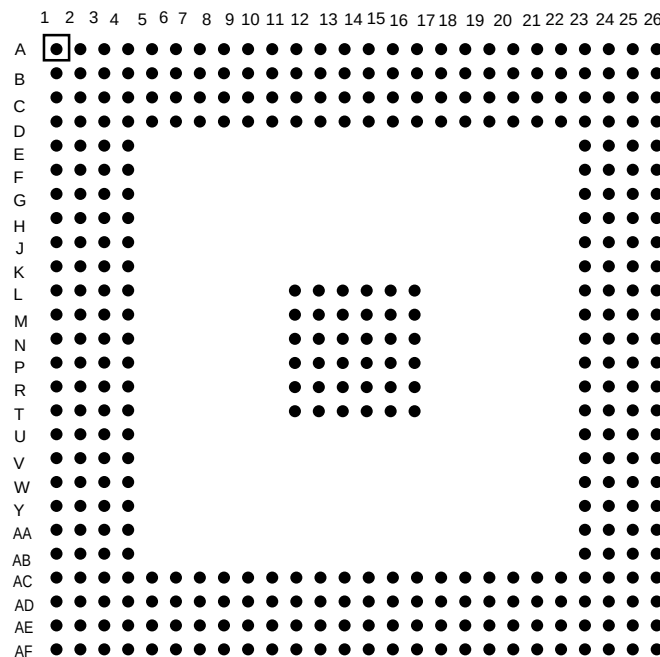
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

BGA388T1.27-ISO

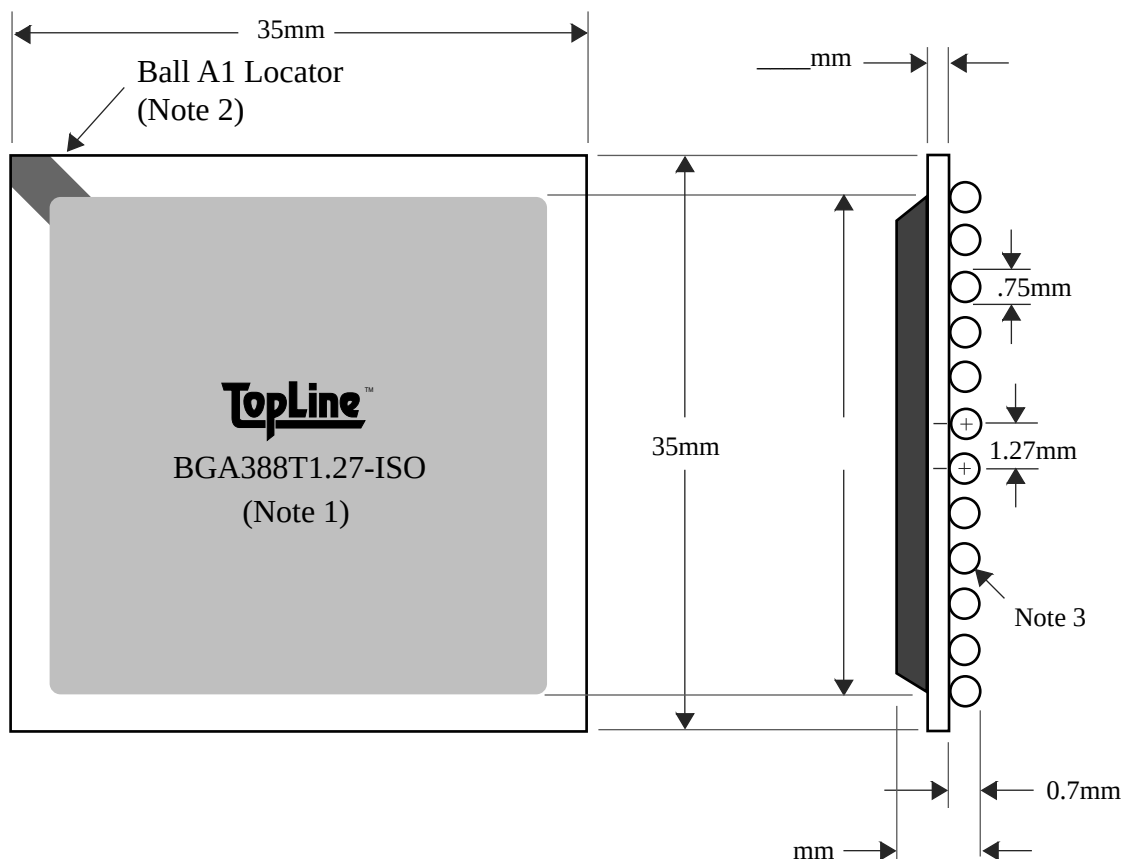
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
388	1.27mm	35mm SQ	26 x 26	4	6 x 6	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY35mm-3x8		
		Tray Quantity 24		
		Tray Suppliers (ref):		

BALLS

388

PITCH

1.27mm

SIZE

35mm SQ

MATRIX

26 x 26

ROWS

4

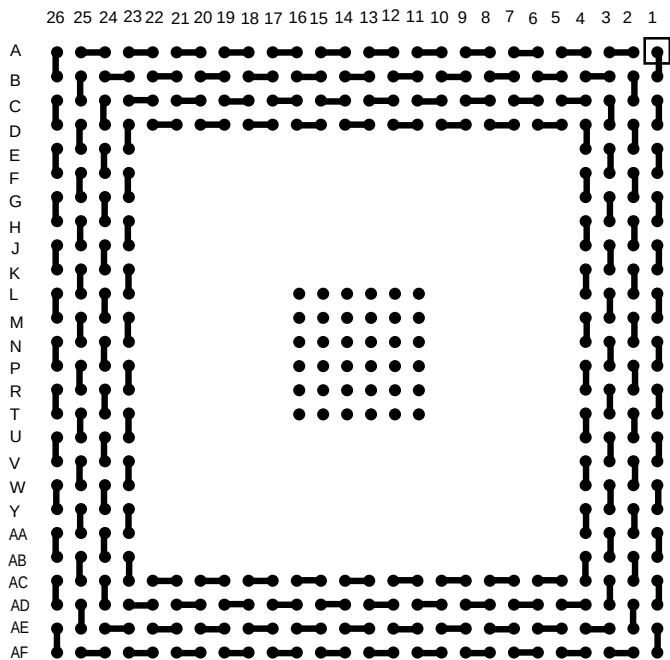
CENTER

6 x 6

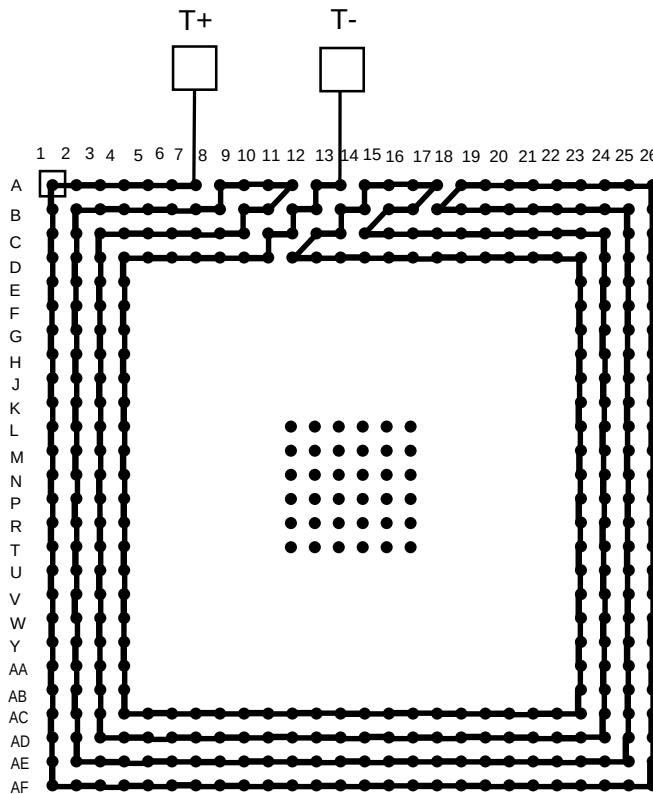
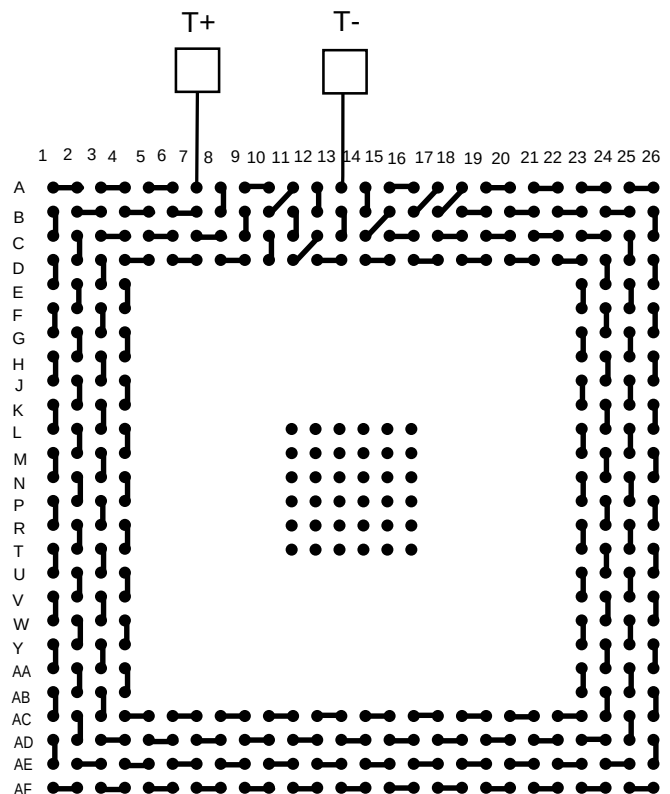
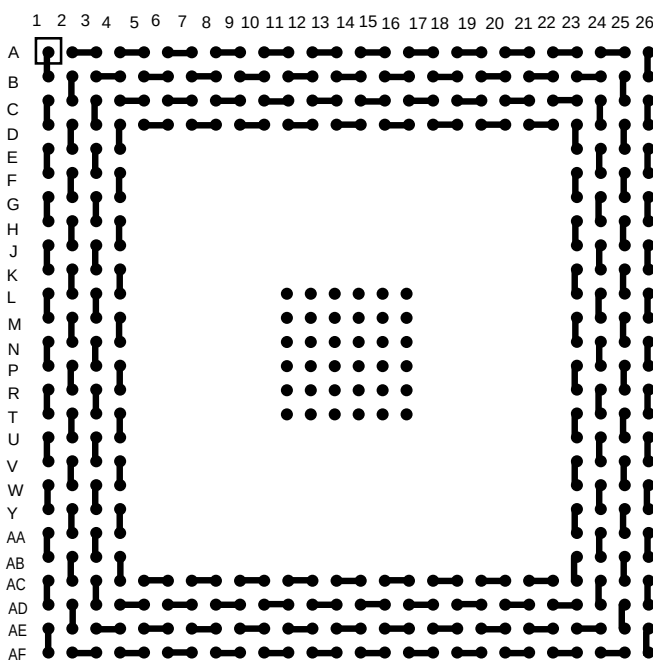
MAT'L

BT

BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA388T1.27-DC72

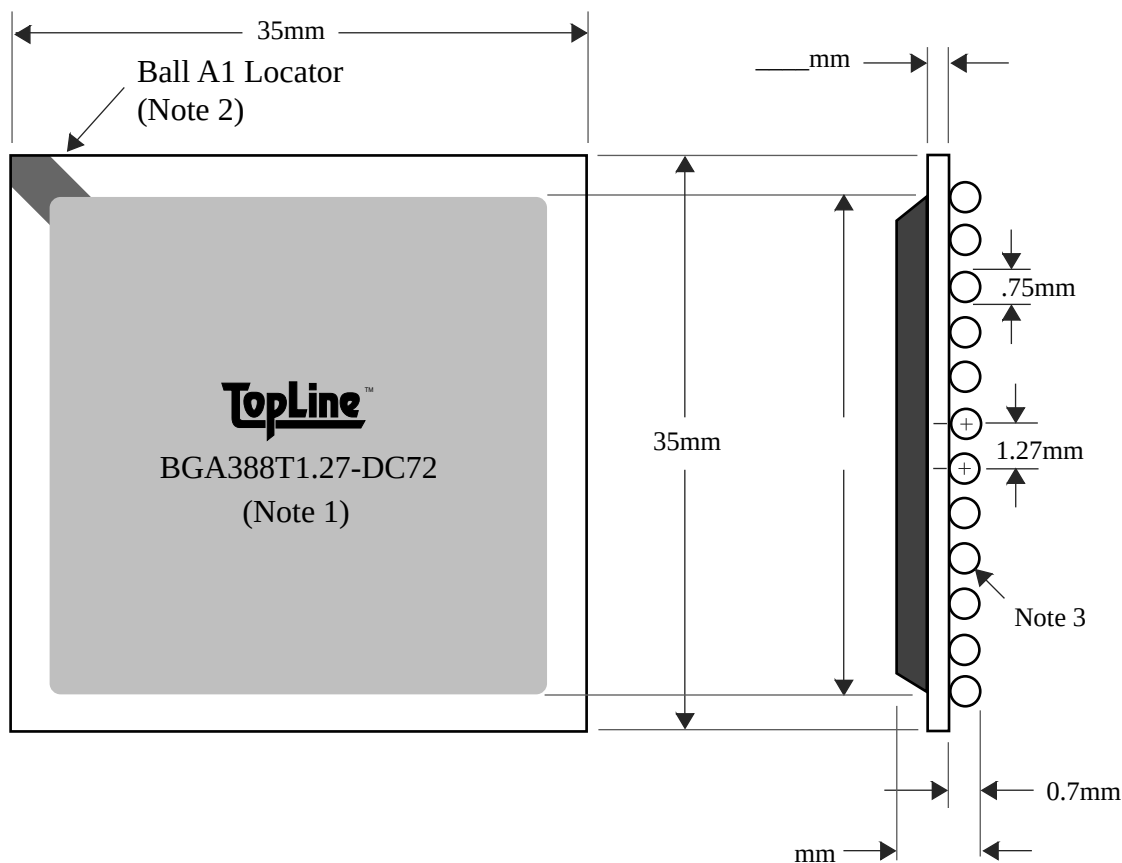
TopLine™

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
388	1.27mm	35mm SQ	26 x 26	4	6 x 6	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

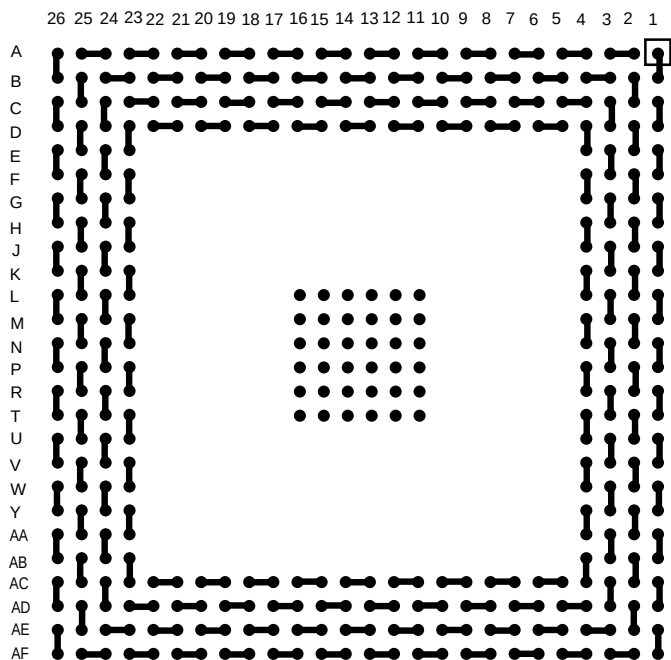
TOP VIEW

SIDE VIEW

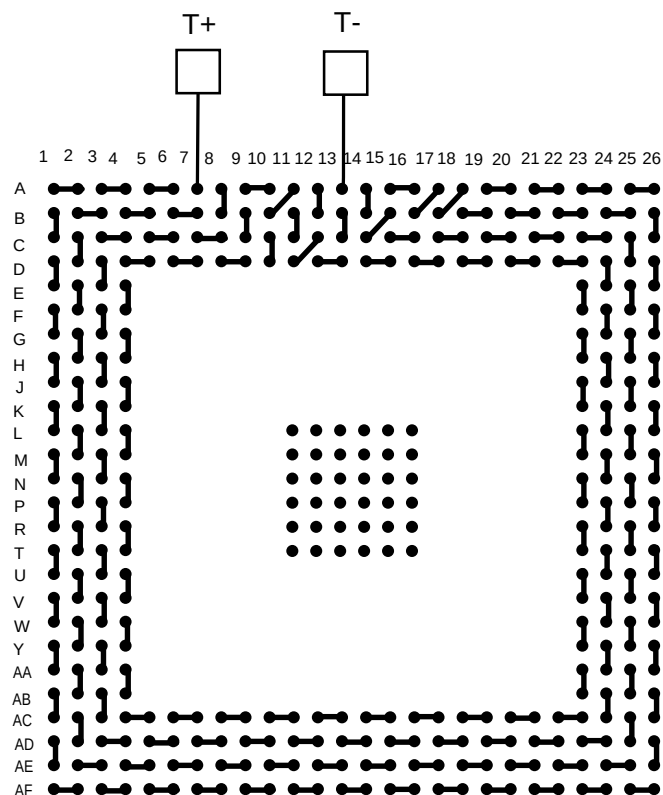
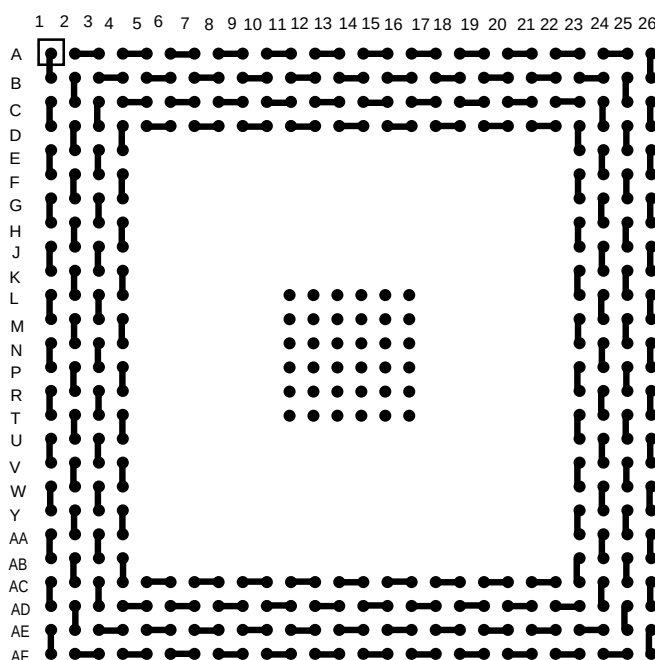


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY35mm-3x8 Tray Quantity 24 Tray Suppliers (ref):		

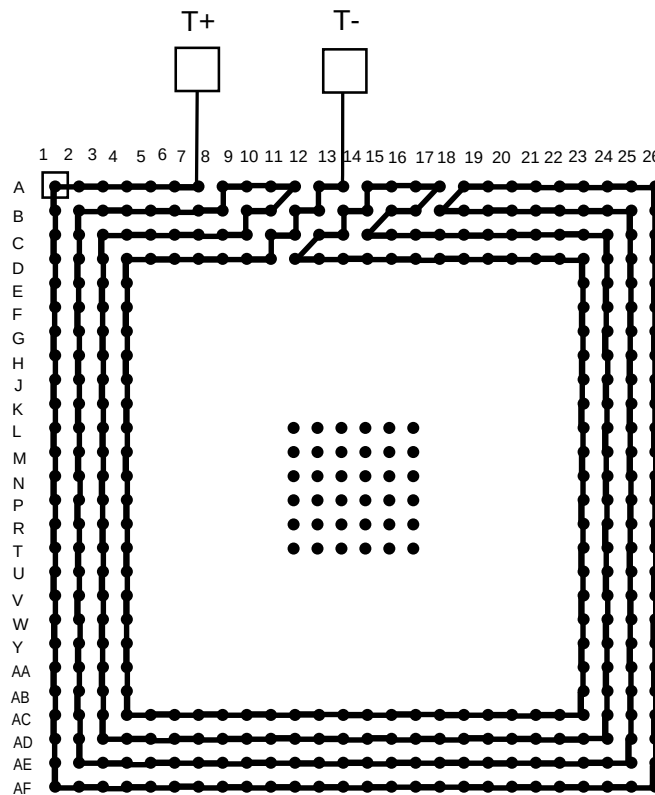
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

BGA388T1.27-DC72A

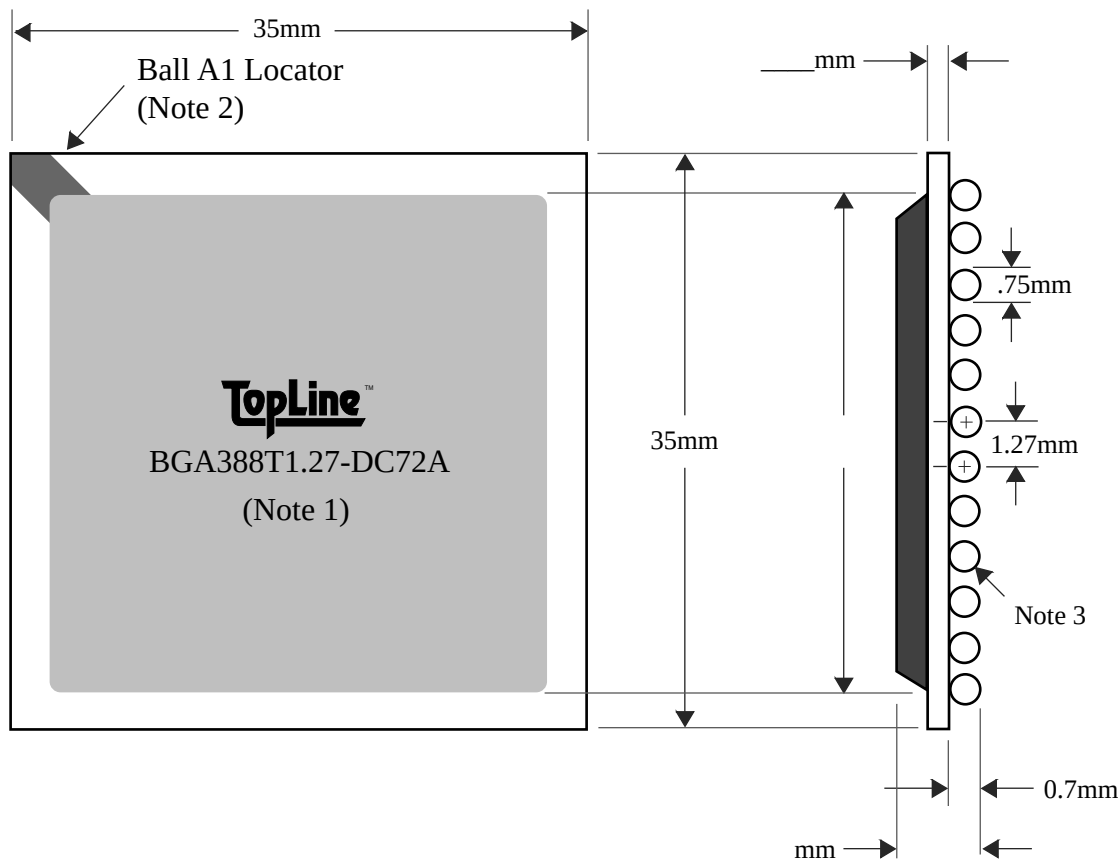
TopLine™

TEL 1-714-898-3830
FAX 1-714-891-0321

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
388	1.27mm	35mm SQ	26 x 26mm	4	6 x 6	BT

TOP VIEW

SIDE VIEW

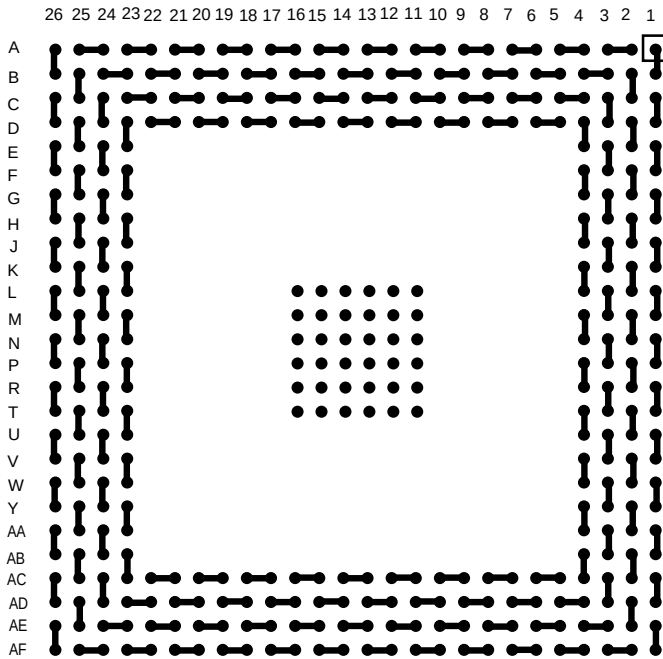


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner	PACKAGING TRAYS (SEE NOTE 4) Tray BGATRAY35mm-3x8 Tray Quantity 24 Tray Suppliers (ref):		
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			

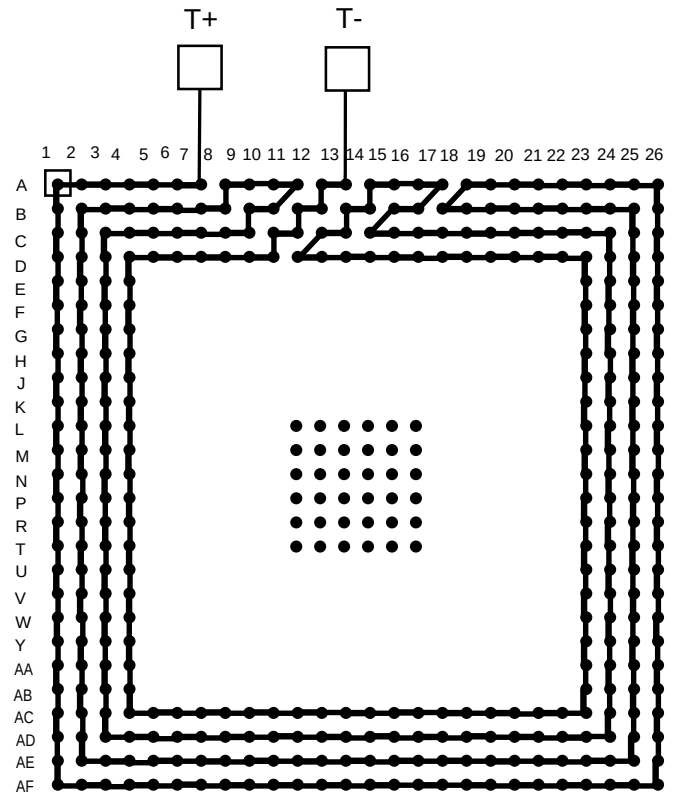
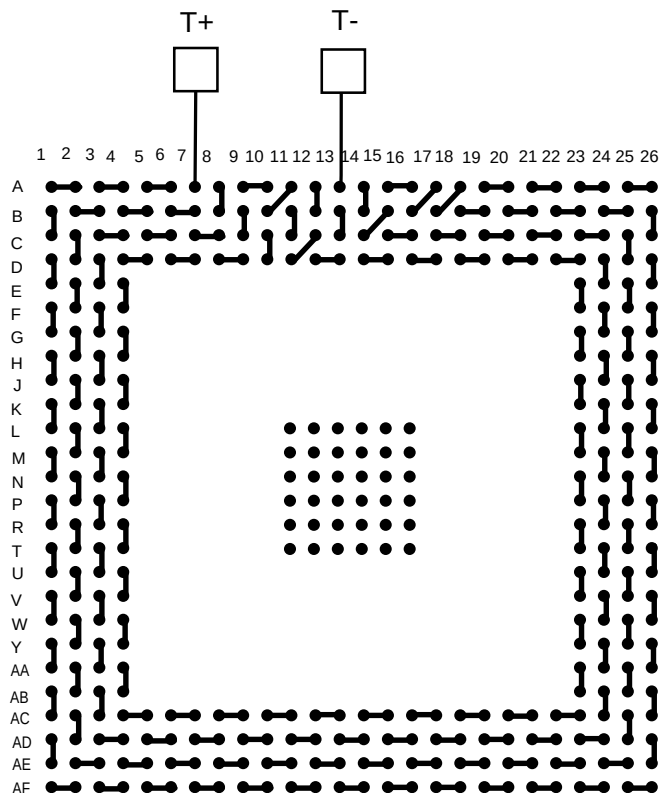
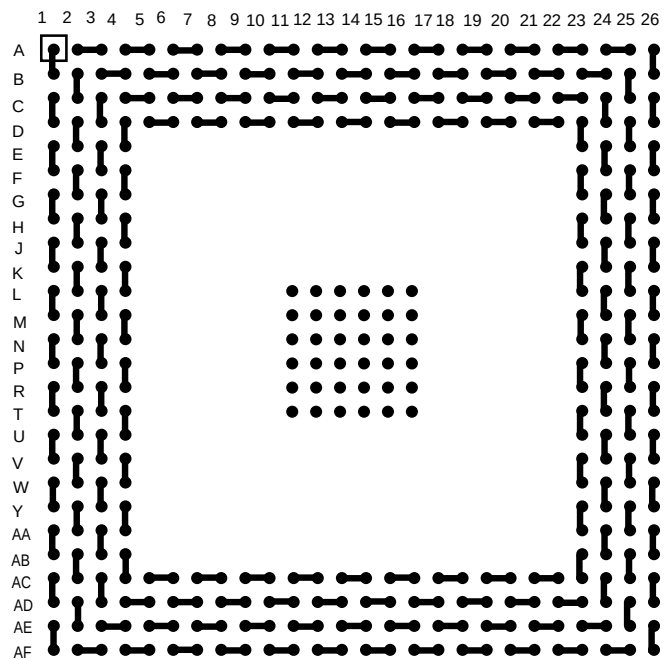
<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
388	1.27mm	35mm SQ	26 x 26	4	6 x 6	FR4

LBGA388T1.27-DC72

BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA388T1.27-DC72

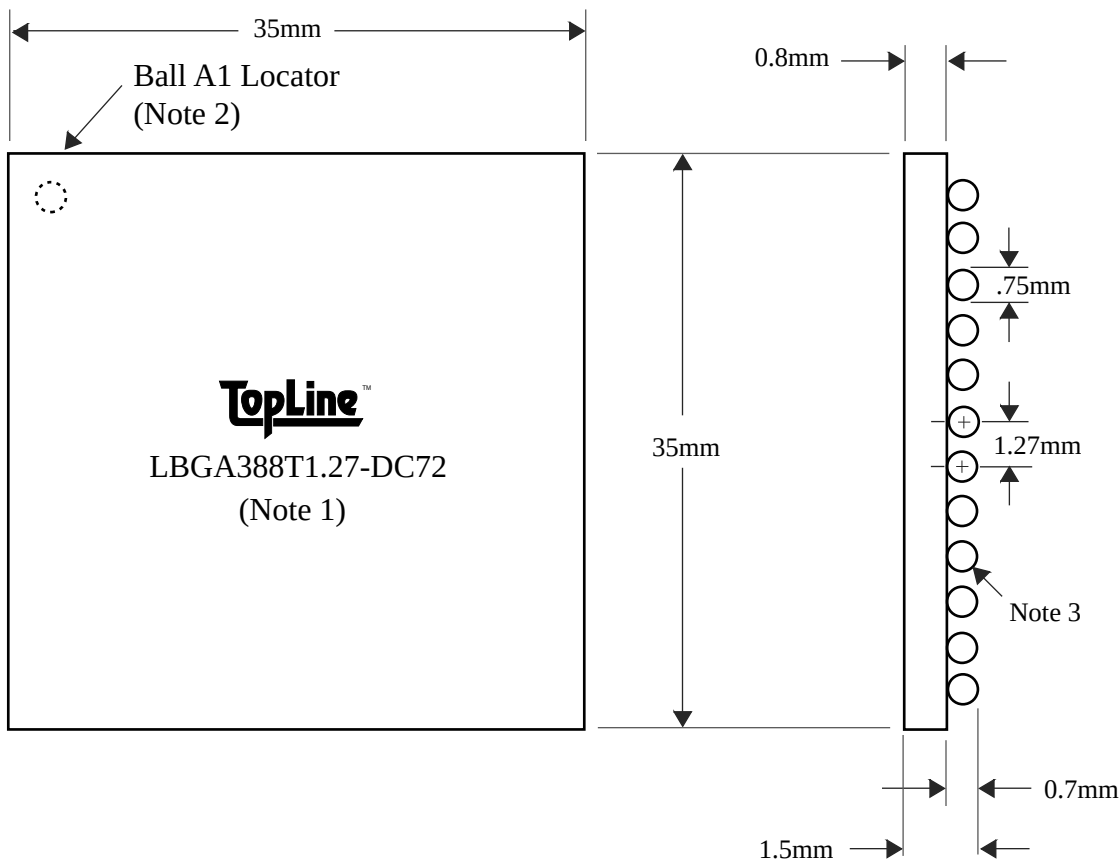
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
388	1.27mm	35mm SQ	26 x 26	4	6 x 6	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

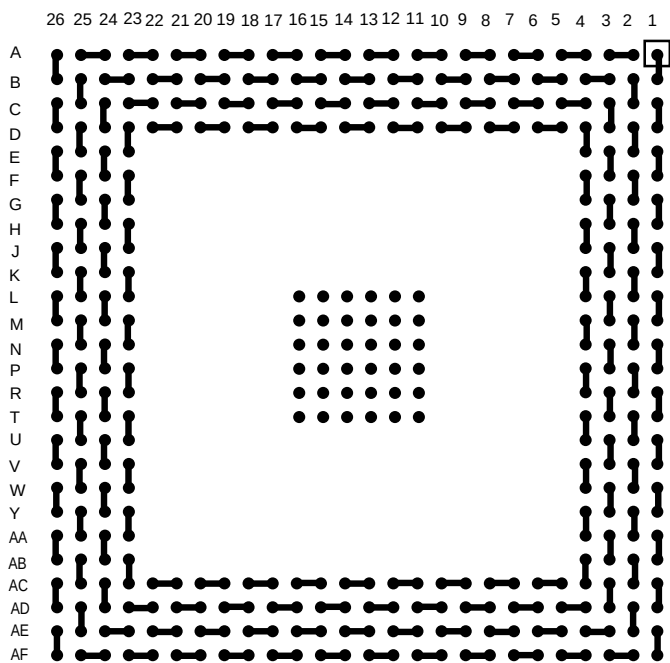
SIDE VIEW



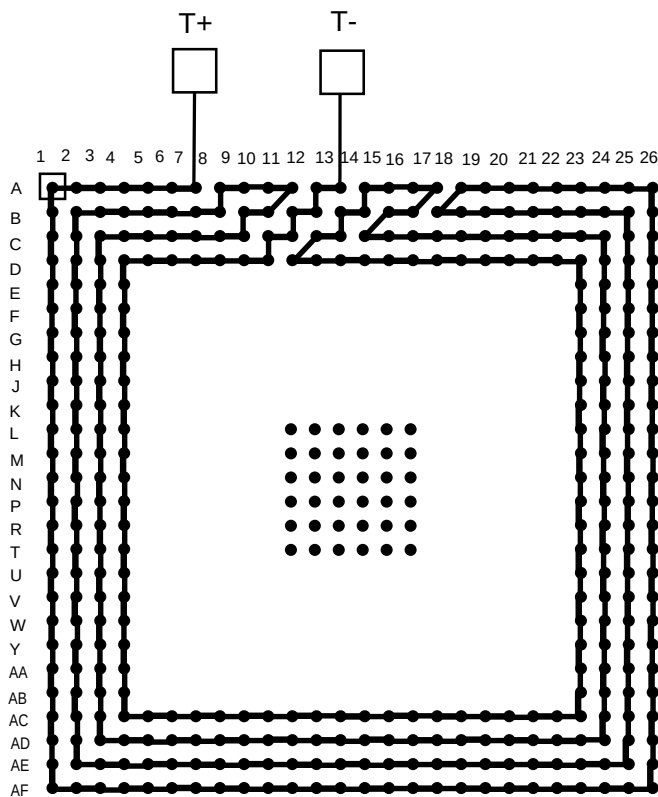
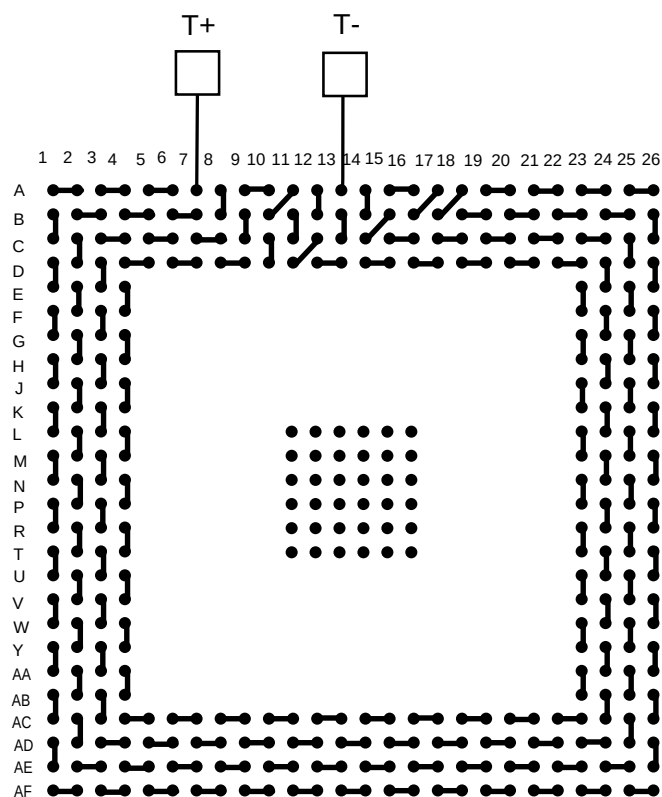
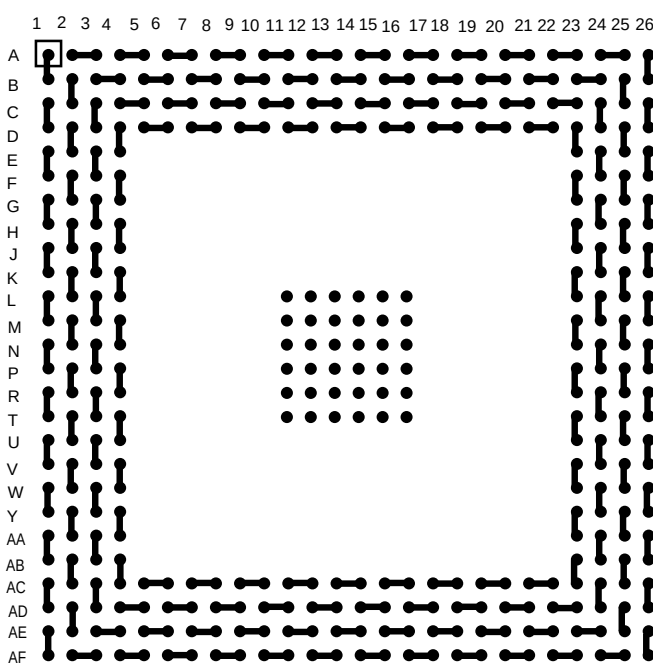
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY35mm-3x8 Tray Quantity 24 Tray Suppliers (ref):		

CBGA388T1.27-DC72

BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

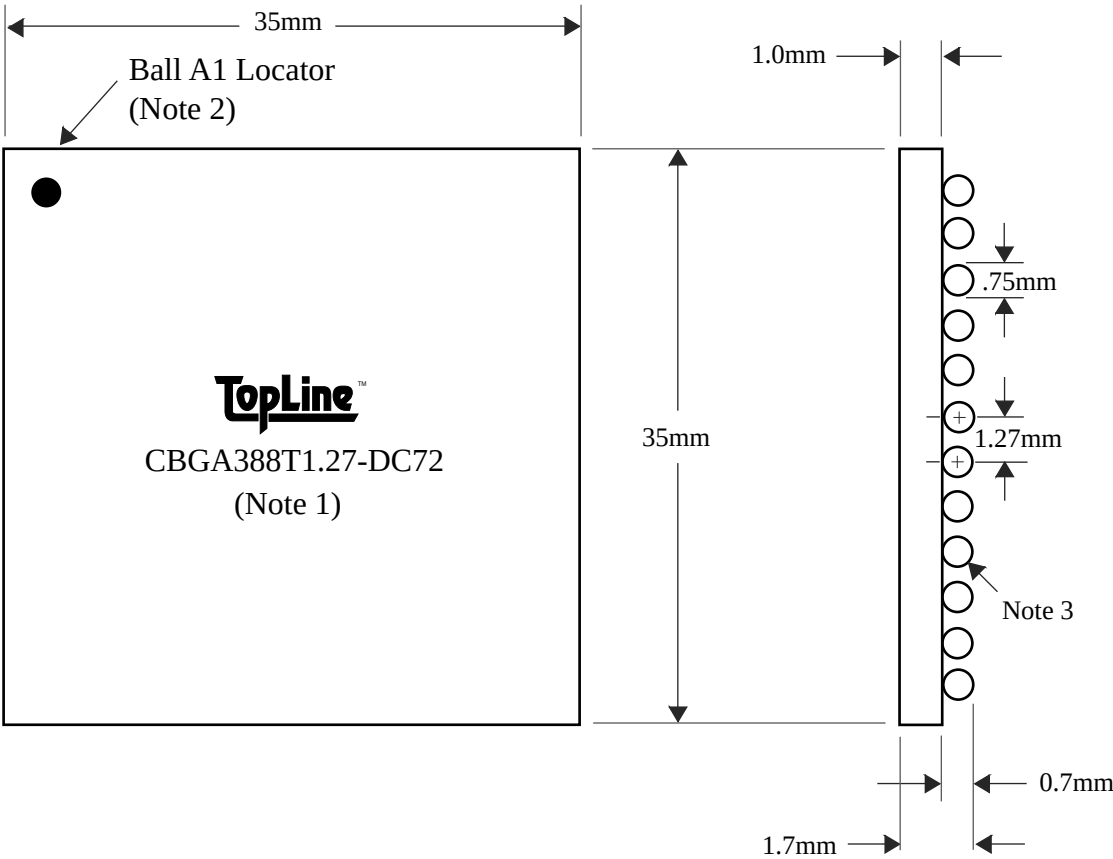
CBGA388T1.27-DC72



BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830
388	1.27mm	35mm SQ	26 x 26	4	6 x 6	ceramic	FAX 1-714-891-0321

TOP VIEW

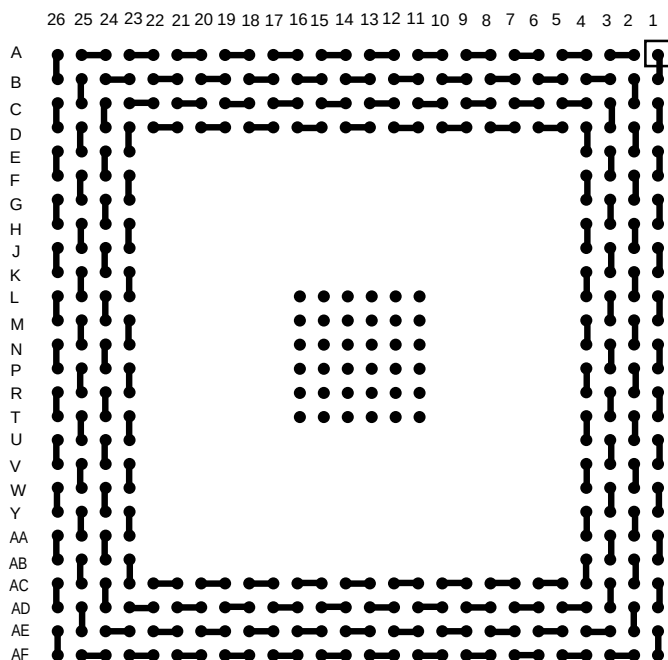
SIDE VIEW



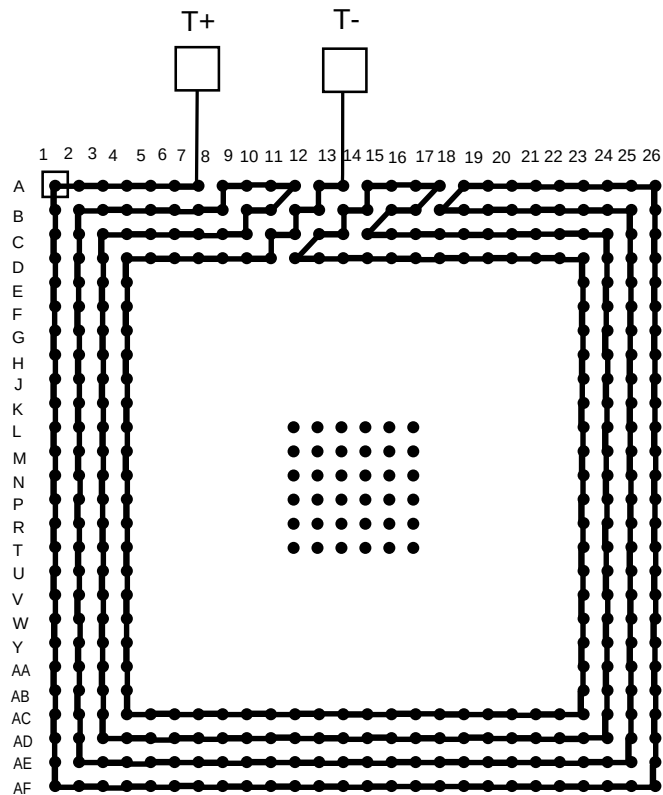
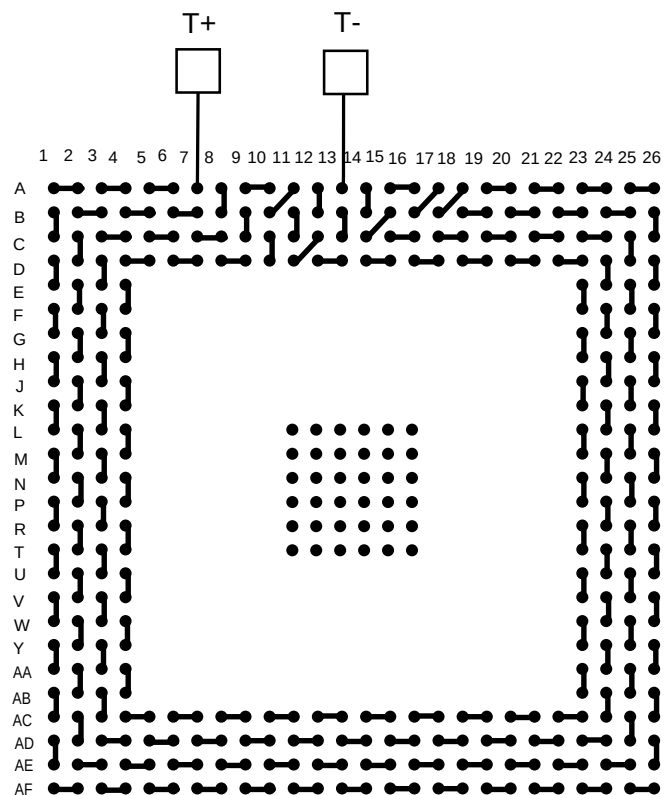
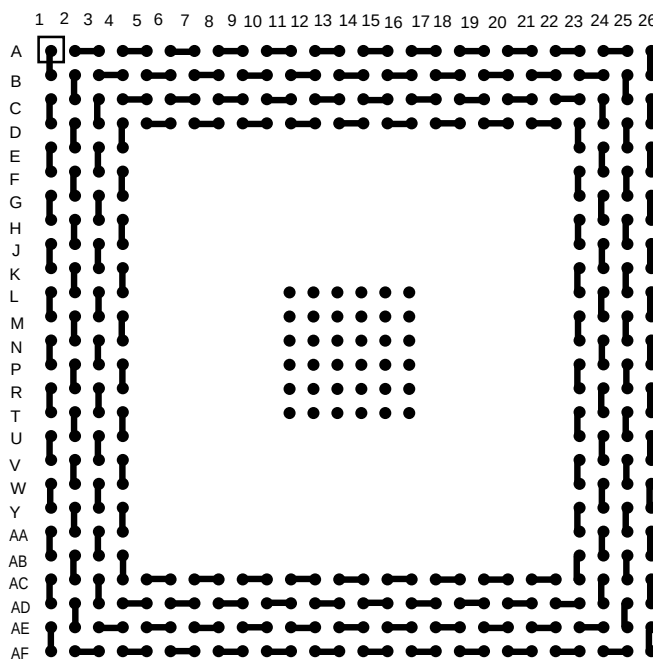
NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 10/90SnPb			
Note 4	Substrate Material: Ceramic			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY35mm-3x8 Tray Quantity 24 Tray Suppliers (ref):		

	<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
TEL 1-714-898-3830 FAX 1-714-891-0321	388	1.27mm	35mm SQ	26 x 26	4	6 x 6	ceramic

BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

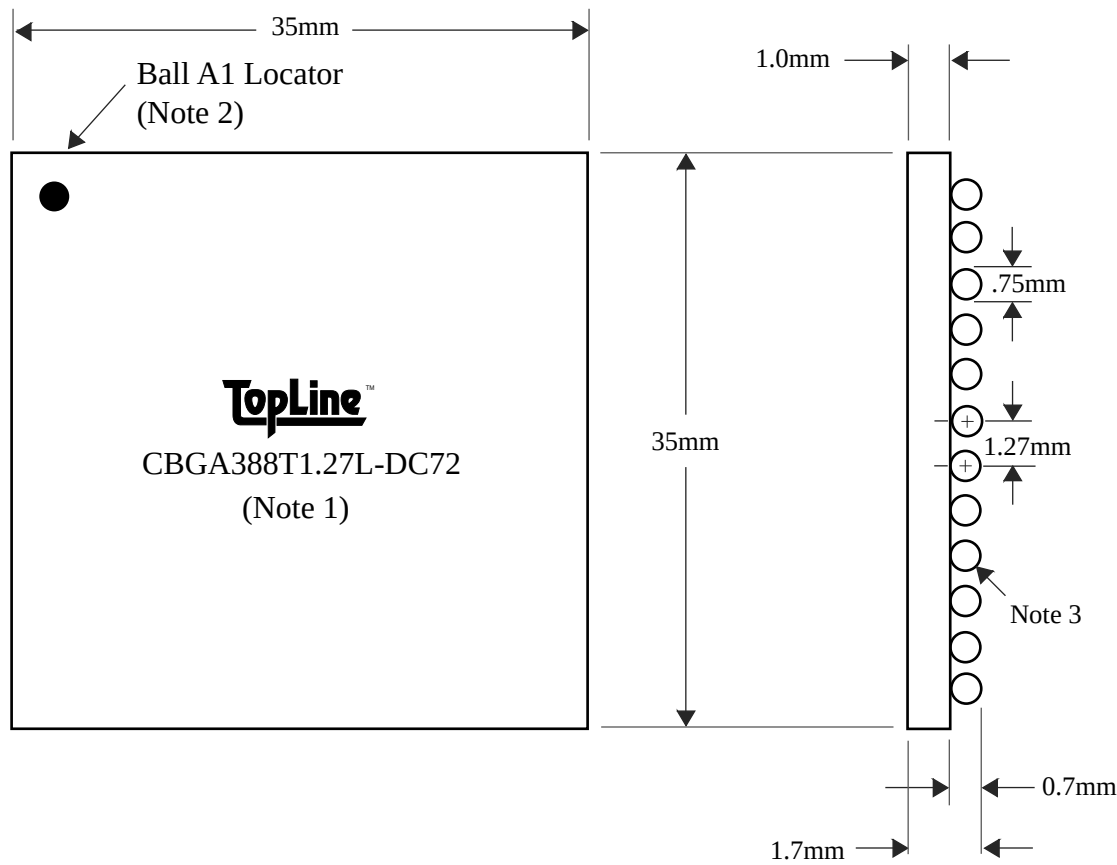
CBGA388T1.27L-DC72



BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830
388	1.27mm	35mm SQ	26 x 26	4	6 x 6	ceramic	FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 62/36/2 SnPbAg			
Note 4	Substrate Material: Ceramic			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY35mm-3x8 Tray Quantity 24 Tray Suppliers (ref):		



TEL 1-714-898-3830
FAX 1-714-891-0321

BGA396T1.27-ISO

BALLS

396

PITCH

1.27mm

SIZE

27mm SQ

MATRIX

27 x 27

ROWS

full

CENTER

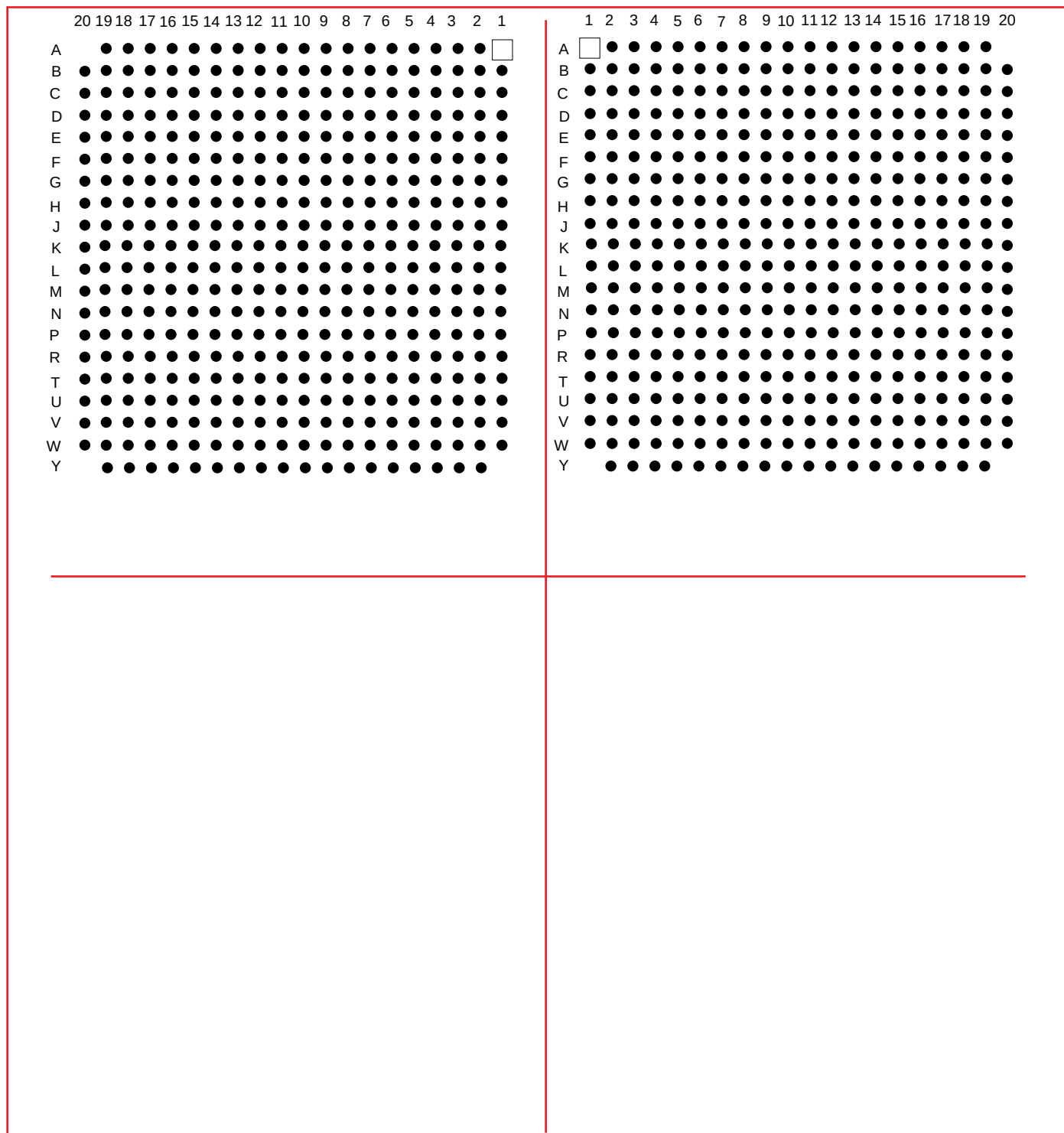
full

MAT'L

BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA396T1.27-ISO

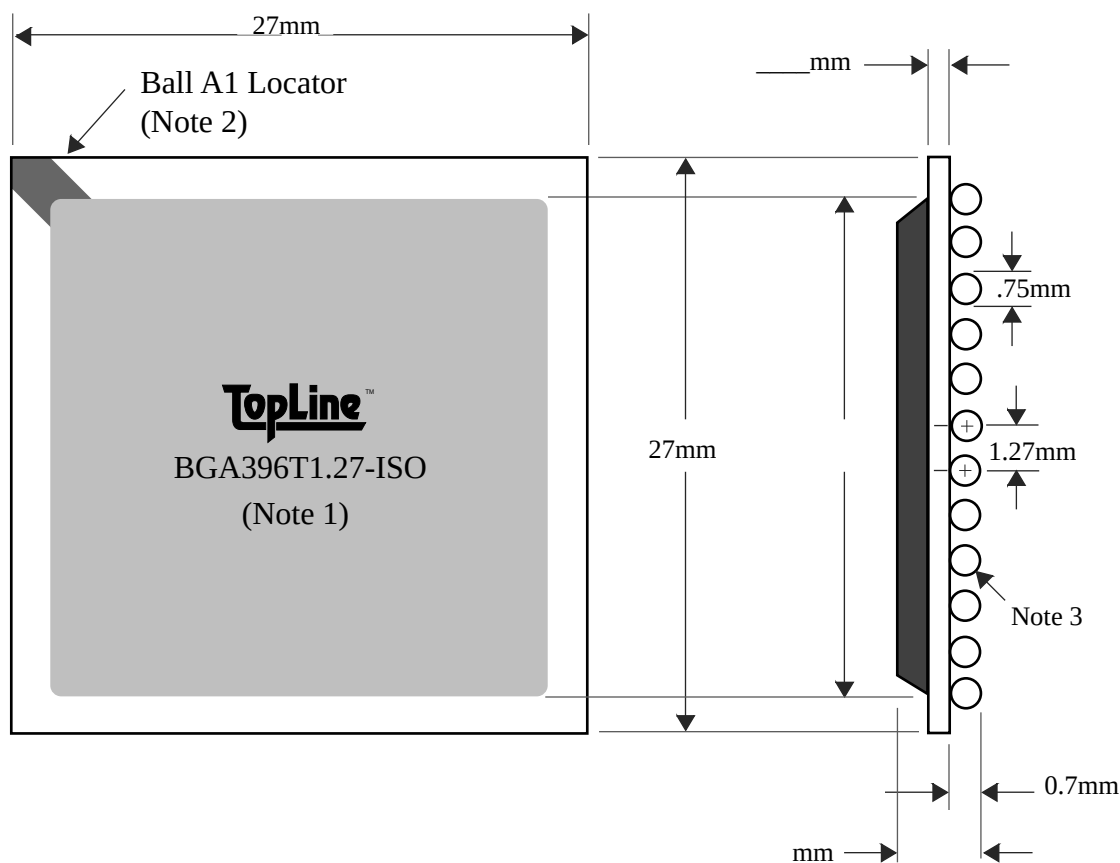
TopLine™

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
396	1.27mm	27mm SQ	27 x 27	full	full	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

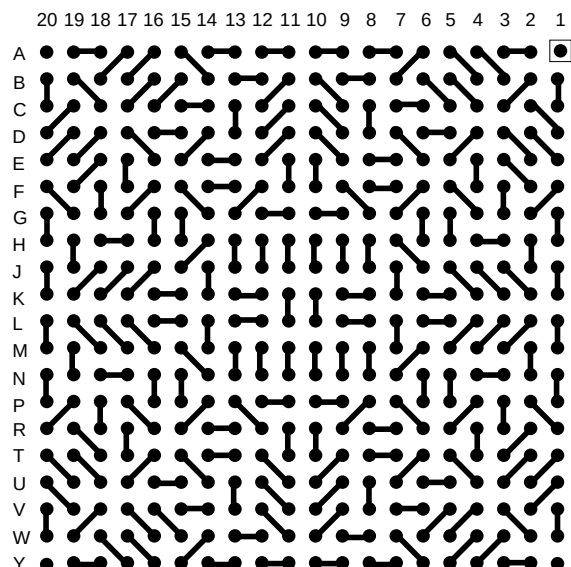
SIDE VIEW



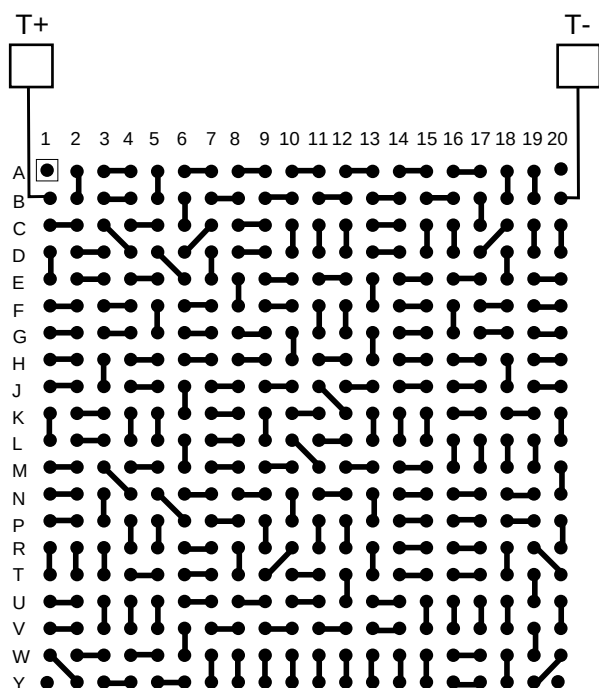
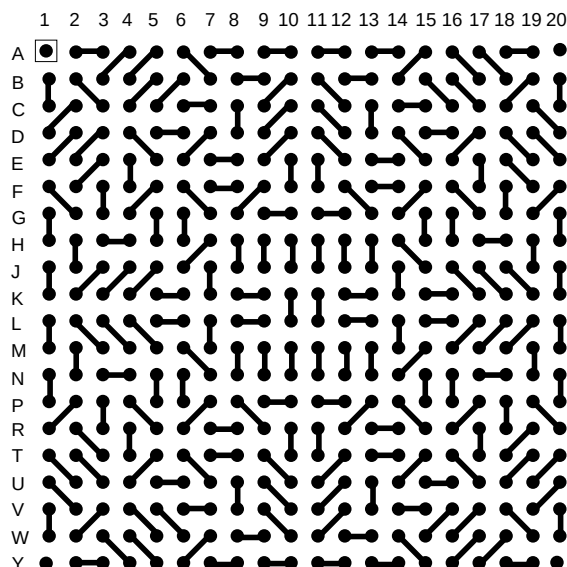
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY27mm-4x10 Tray Quantity 40 Tray Suppliers (ref):		

CBGA400T1.27-DC21

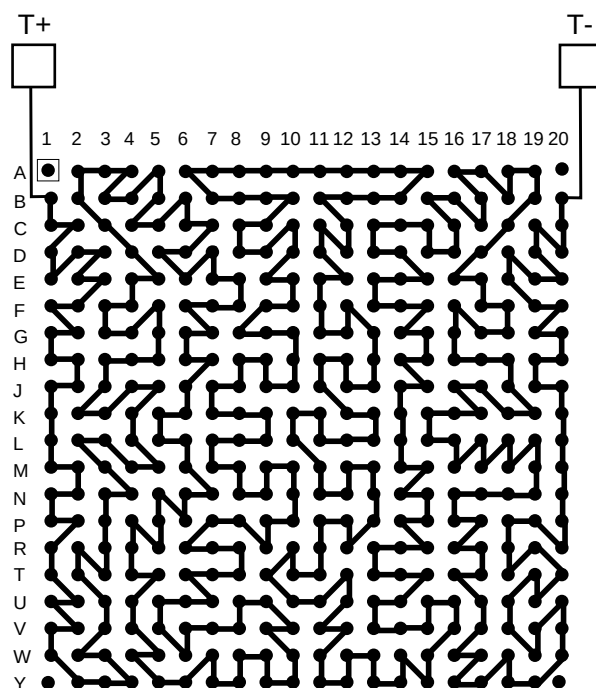
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

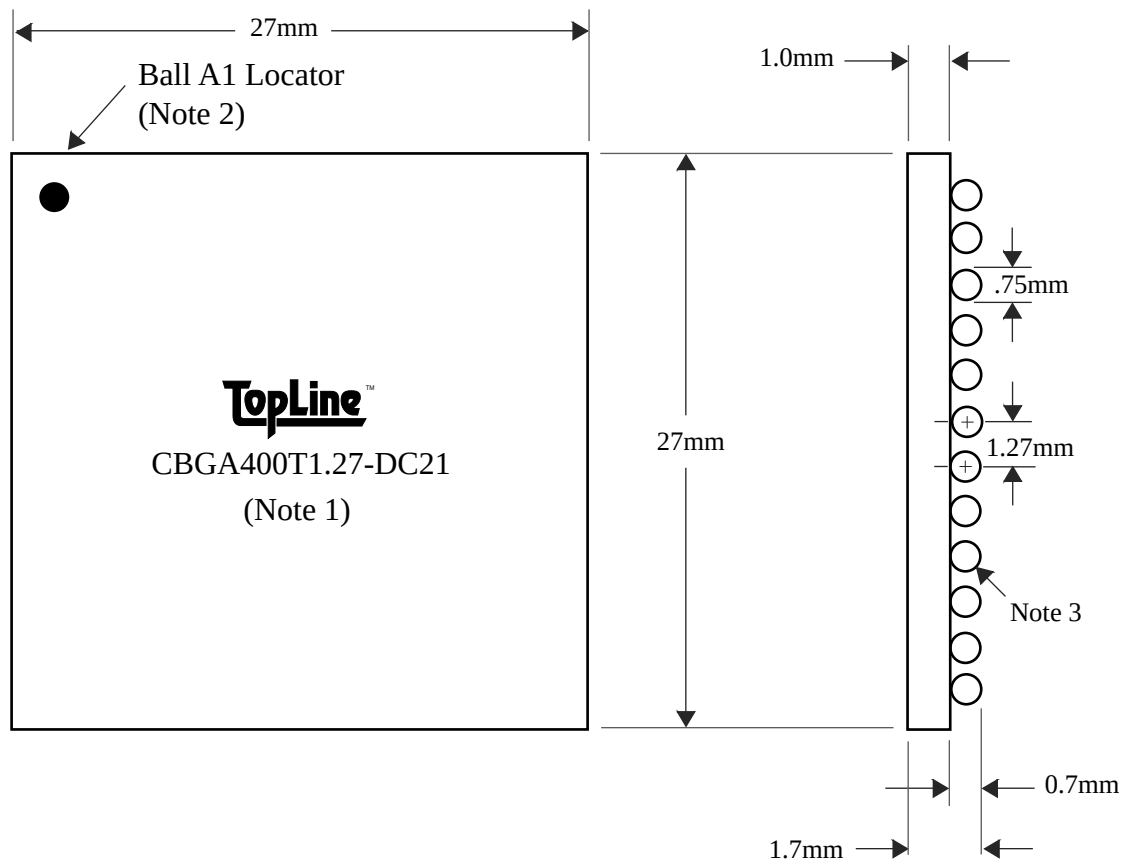


AFTER MOUNTING TO TEST BOARD

TopLine™

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
400	1.27mm	27mm SQ	20 x 20	full	full	ceramic

SIDE VIEW



NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 10/90SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: Ceramic	Tray BGATRAY27mm-4x10 Tray Quantity 40 Tray Suppliers (ref):		

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

400

PITCH

1.27mm

SIZE

27mm SQ

MATRIX

20 x 20

ROWS

full

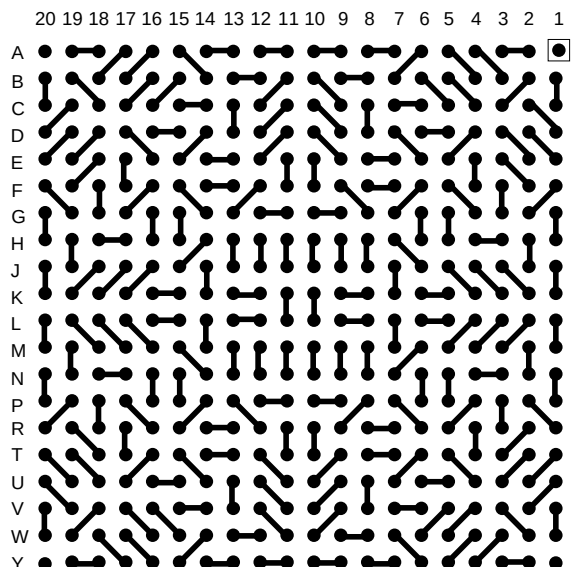
CENTER

full

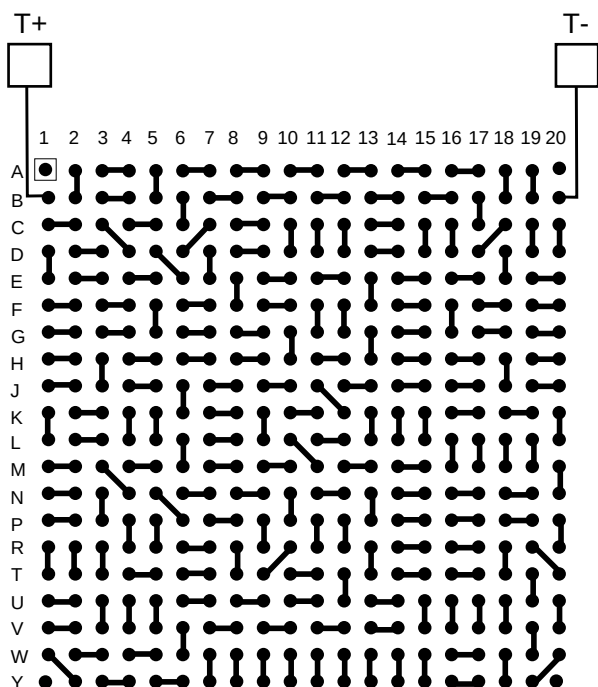
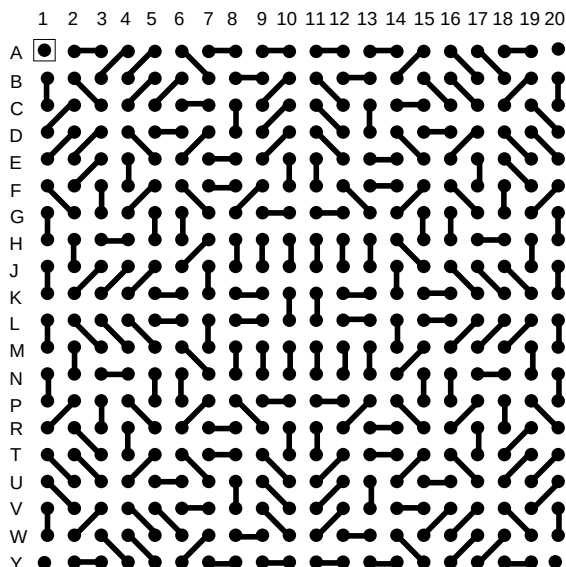
MAT'L

ceramic

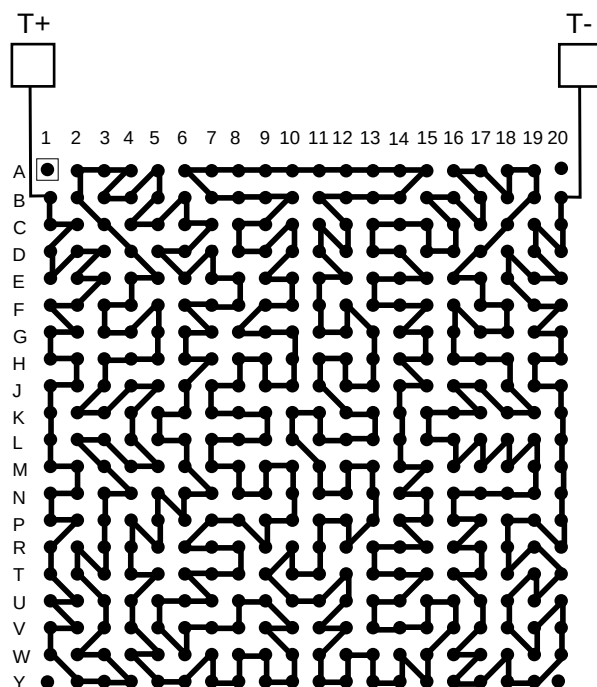
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

CBGA400T1.27L-DC21

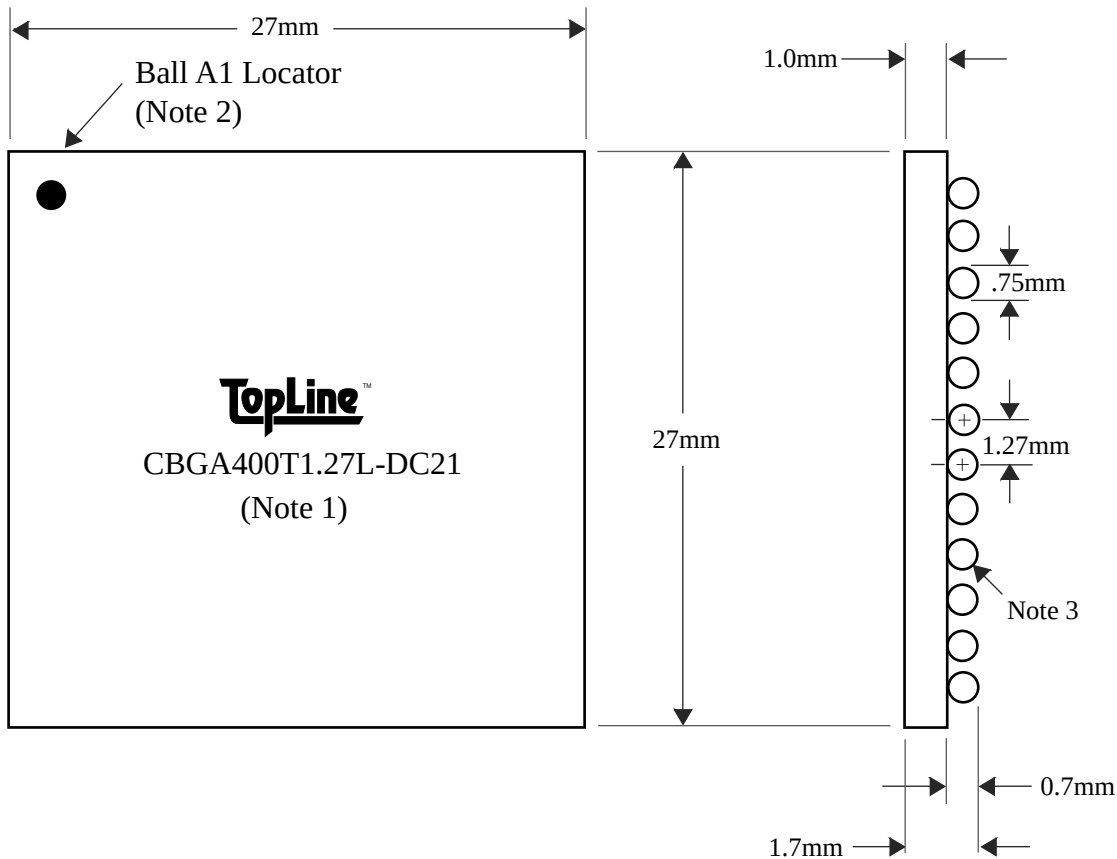
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
400	1.27mm	27mm SQ	20 x 20	full	full	ceramic

TEL 1-714-898-3830
FAX 1-714-891-0321

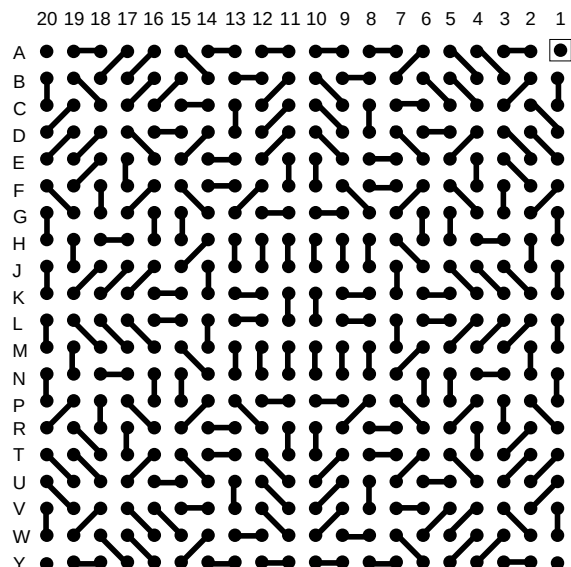
TOP VIEW

SIDE VIEW

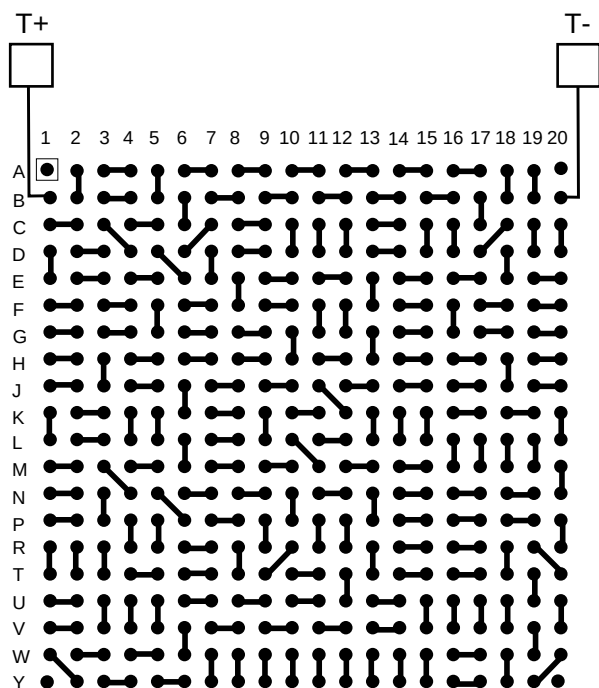
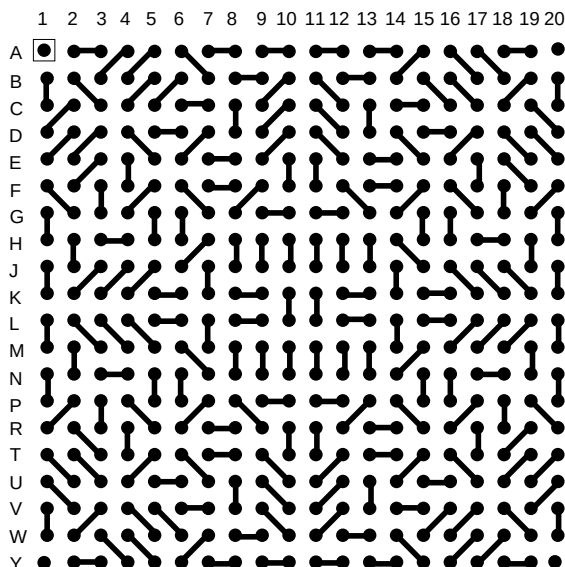


NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 62/36/2 SnPbAg			
Note 4	Substrate Material: Ceramic			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY27mm-4x10		
		Tray Quantity 40		
		Tray Suppliers (ref):		

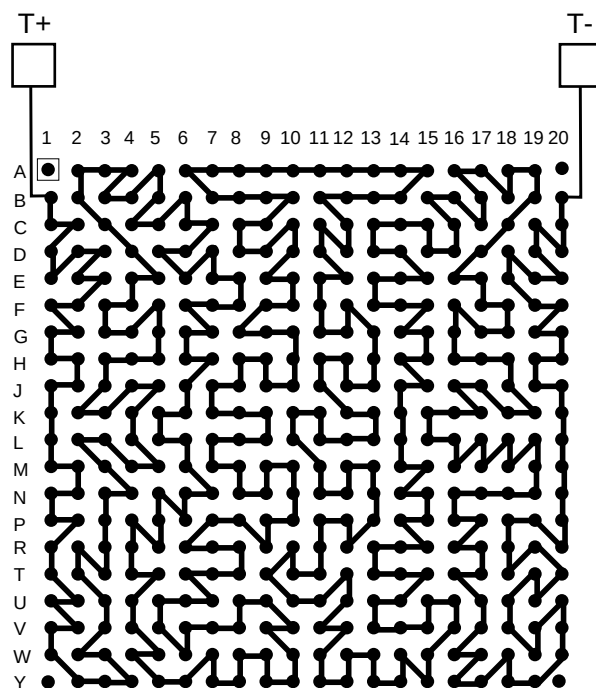
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

LBGA400T1.27-DC21

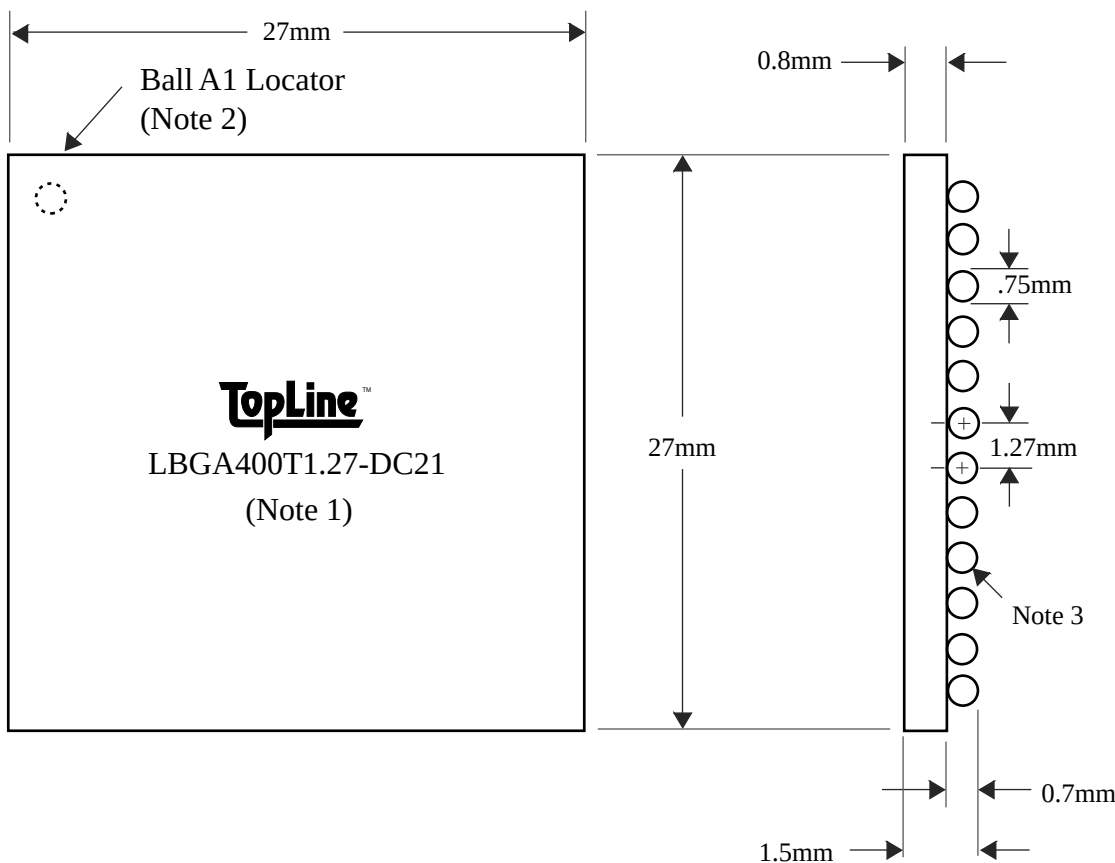


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
400	1.27mm	27mm SQ	20 x 20	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

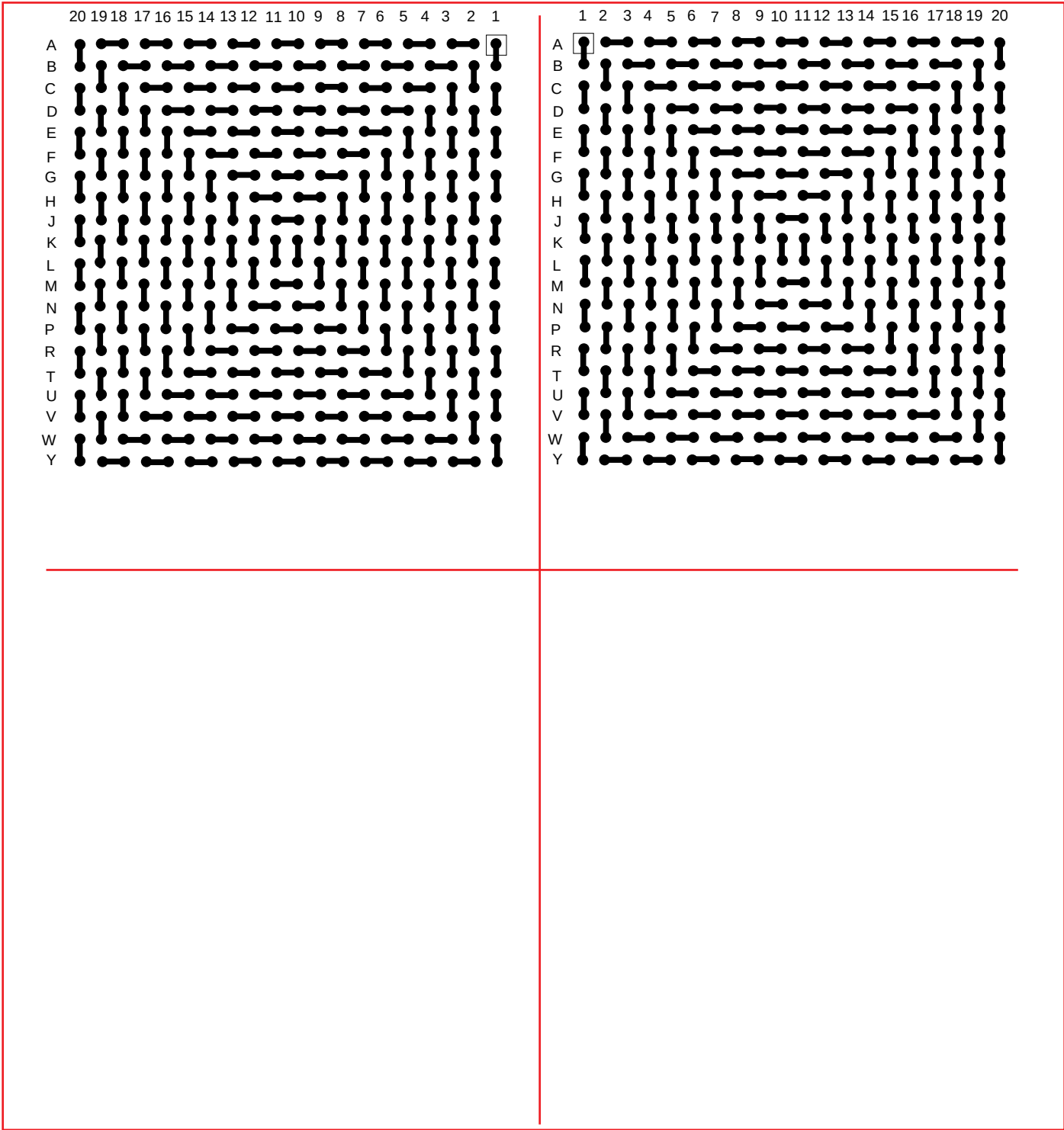


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY27mm-4x10 Tray Quantity 40 Tray Suppliers (ref):		

	<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
	400	1.27mm	27mm SQ	20 x 20	full	full	FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA400T1.27-DC209

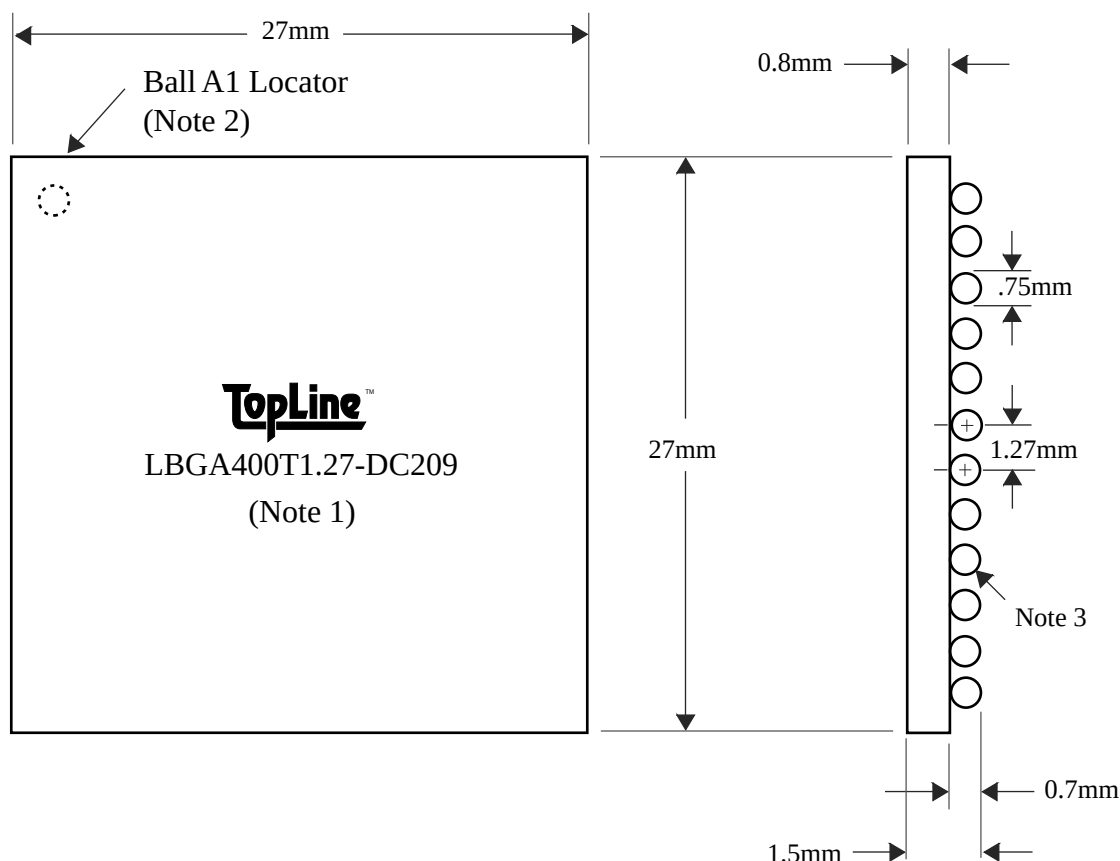
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
400	1.27mm	27mm SQ	20 x 20	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

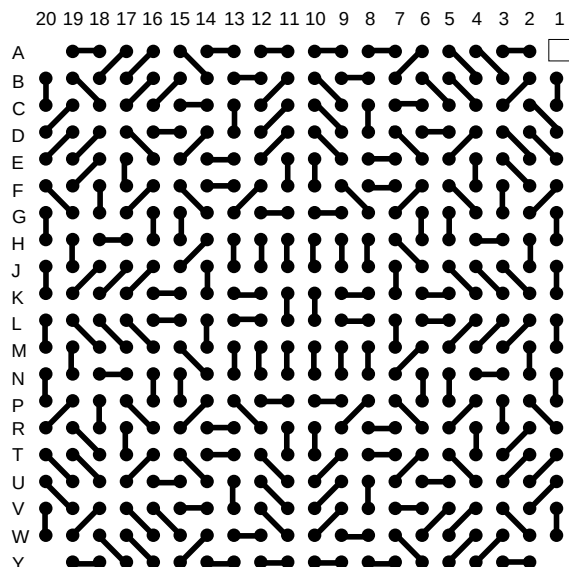


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg			similar to DC75
Note 4	Substrate Material: FR4 laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY27mm-4x10		
		Tray Quantity 40		
		Tray Suppliers (ref):		

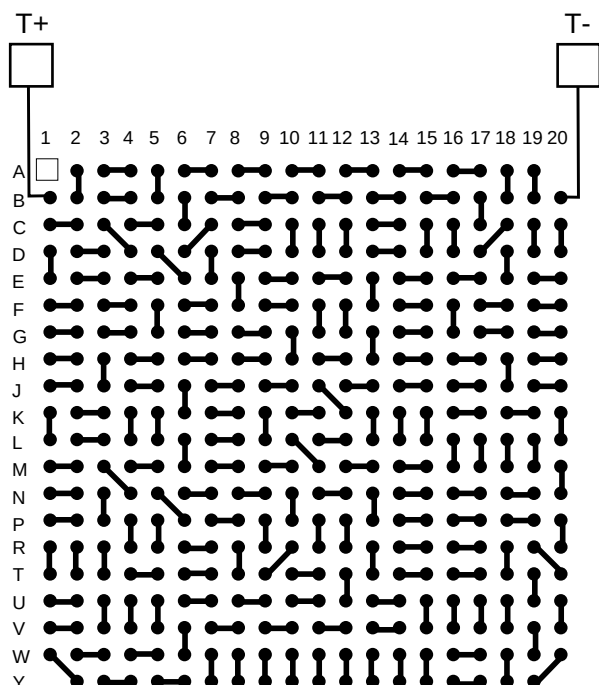
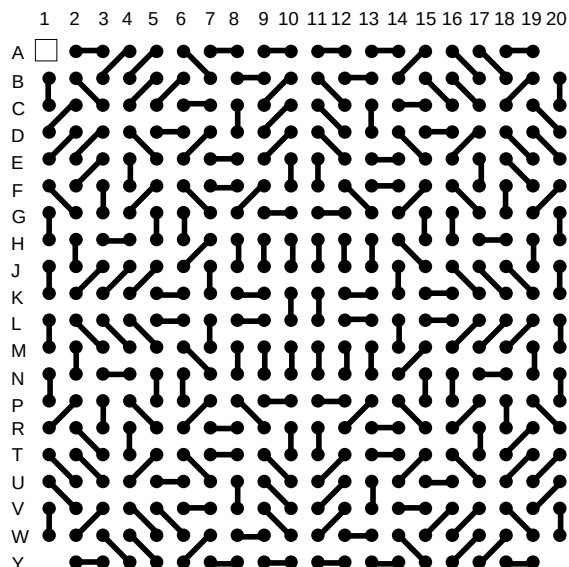
BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
396/400	1.5mm	35mm SQ	20 x 20	full	full	BT

BGA400T1.5-DC20

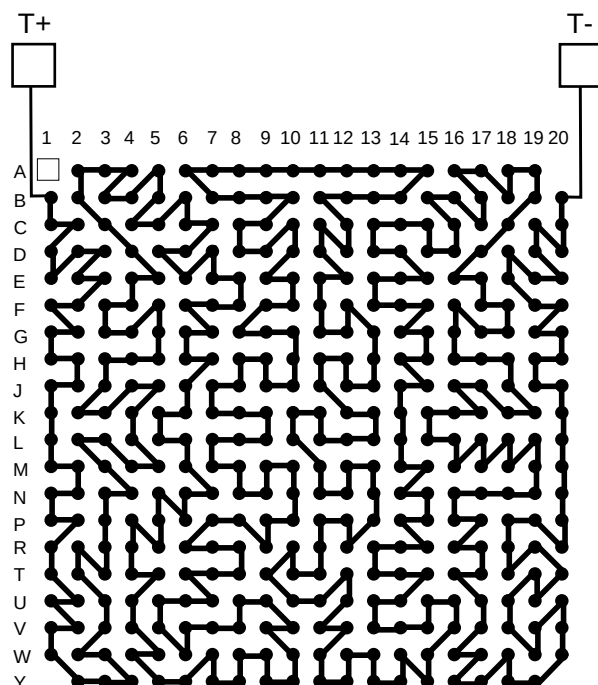
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

BGA400T1.5-DC20

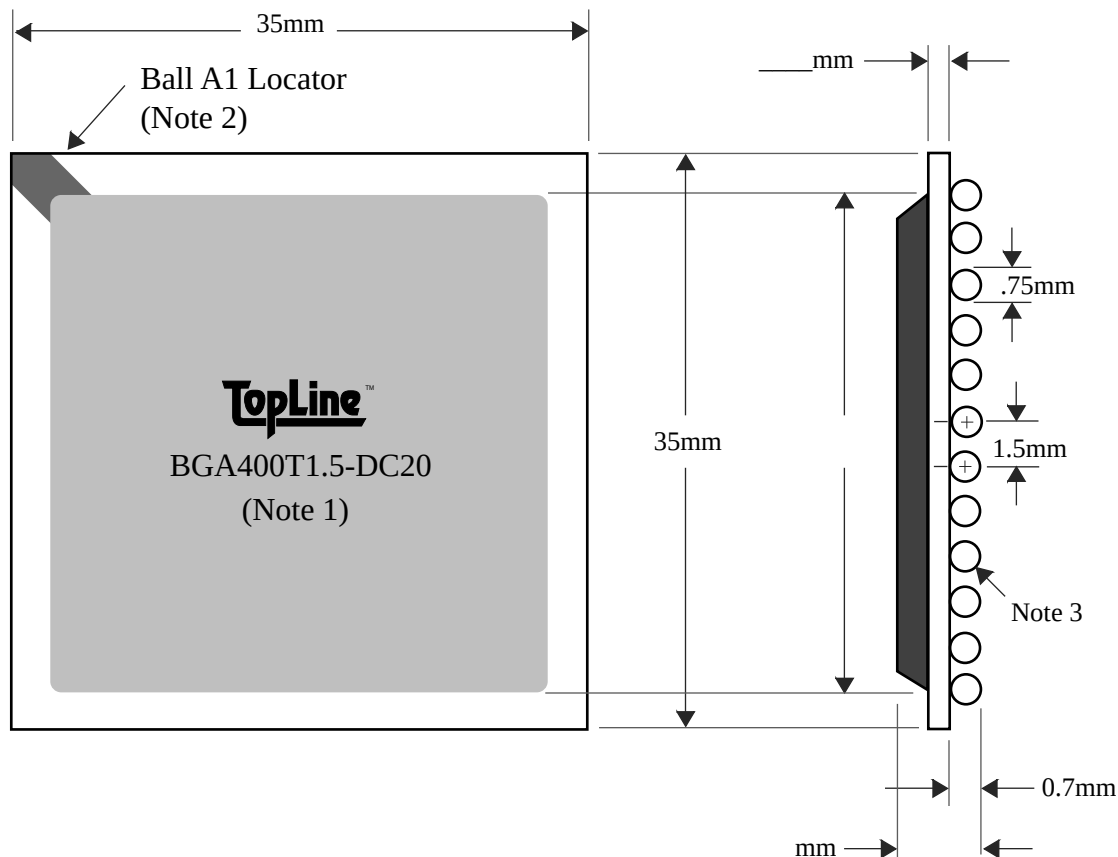
TopLine™

TEL 1-714-898-3830
FAX 1-714-891-0321

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
396/400	1.5mm	35mm SQ	20 x 20	full	full	BT

TOP VIEW

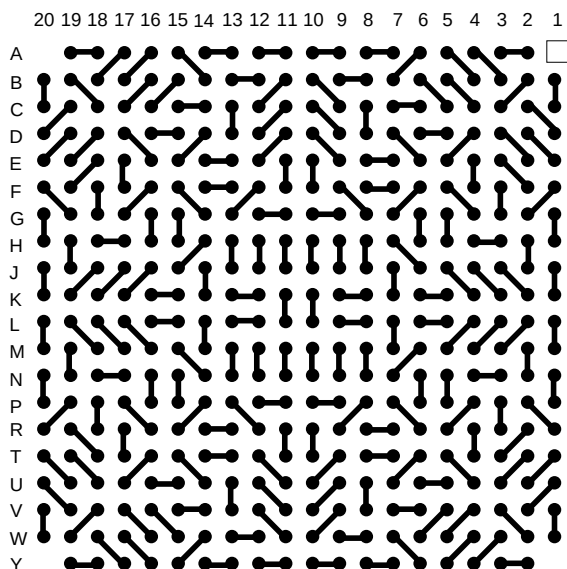
SIDE VIEW



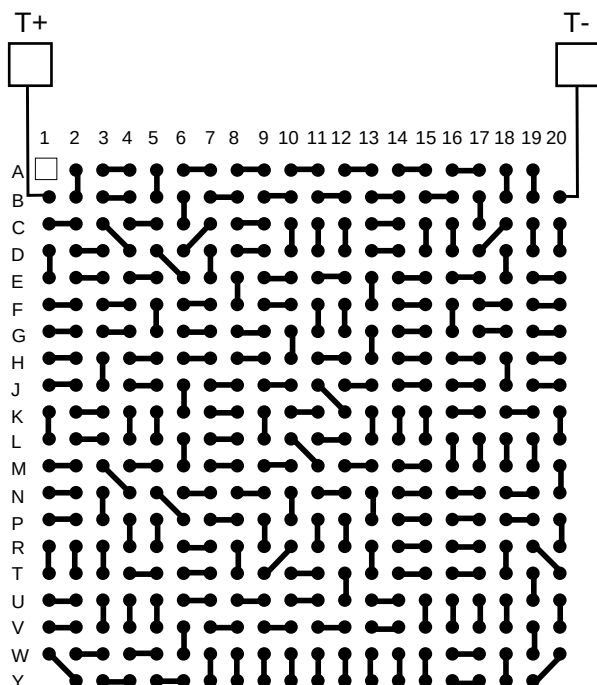
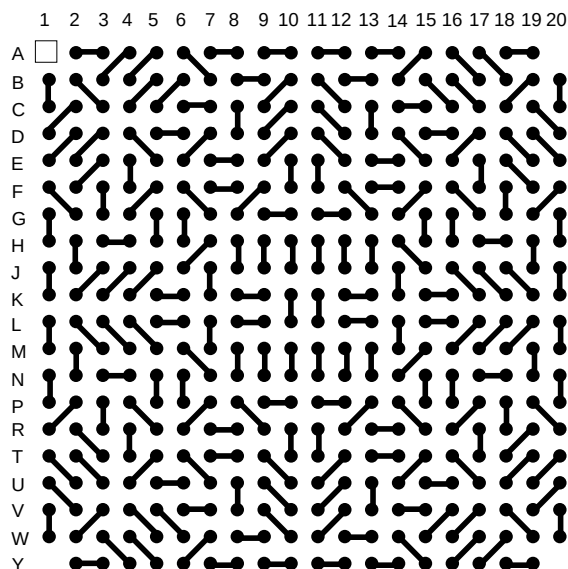
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY35mm-3x8 Tray Quantity 24 Tray Suppliers (ref):		

LBGA400T1.5-DC20

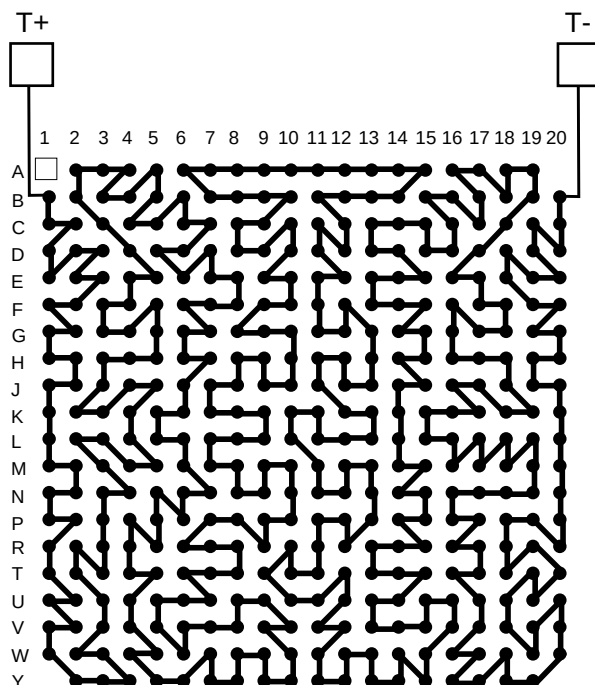
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

LBGA400T1.5-DC20

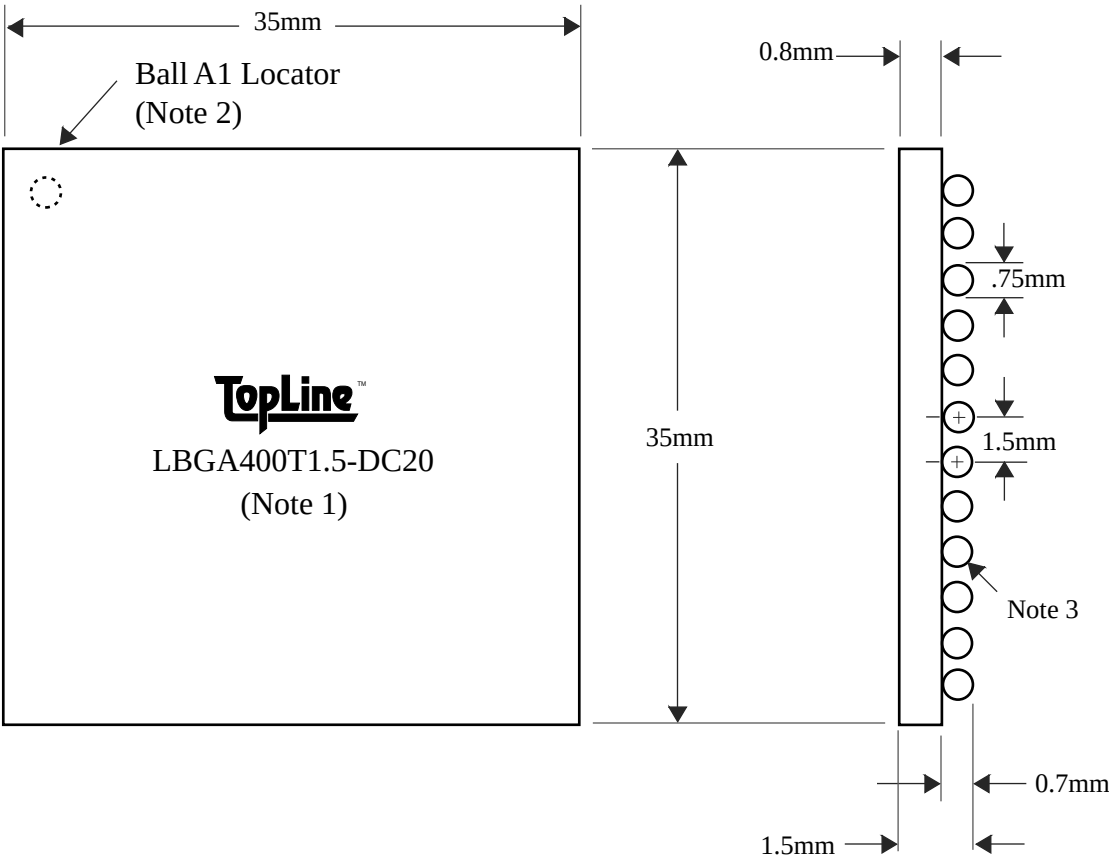


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
396/400	1.5mm	35mm SQ	20 x 20	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

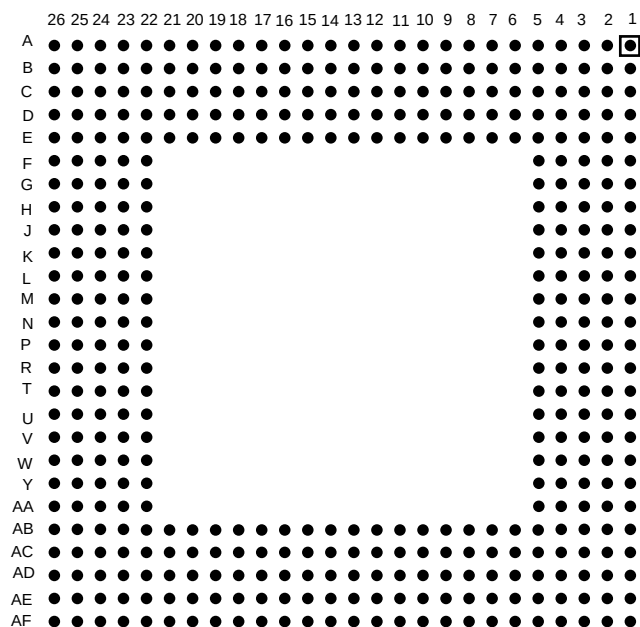
SIDE VIEW



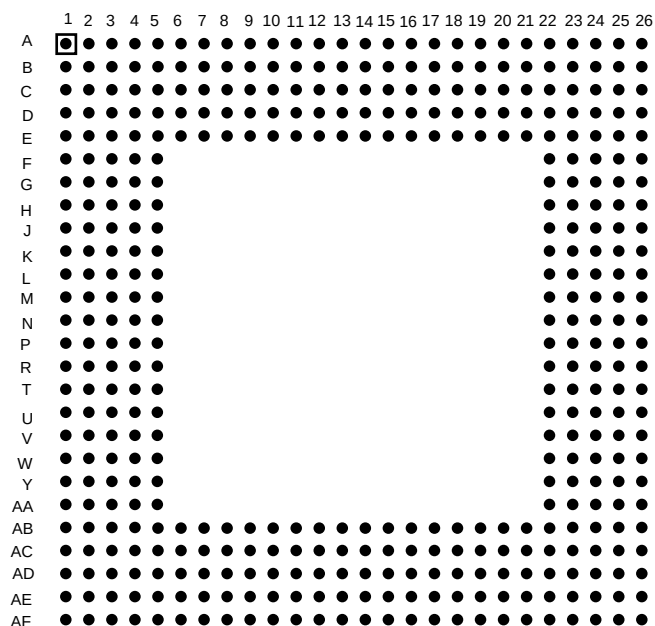
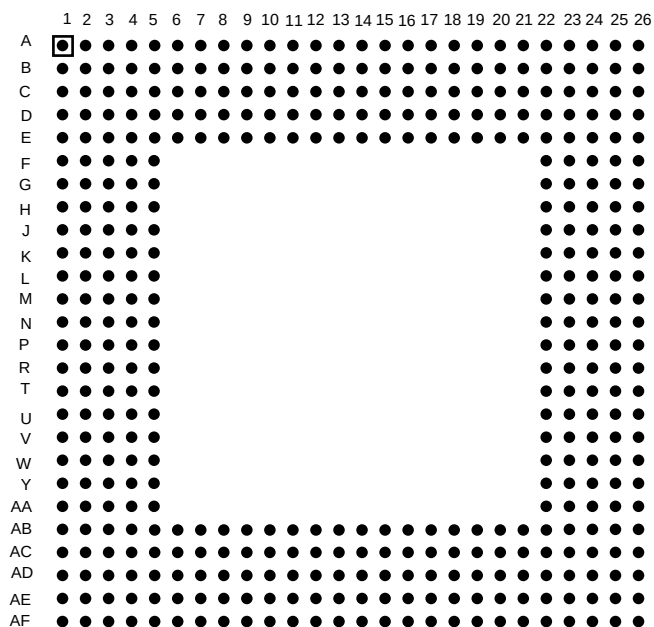
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY35mm-3x8 Tray Quantity 24 Tray Suppliers (ref):		

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
420	1.27mm	35mm SQ	26 x 26	5	none	BT

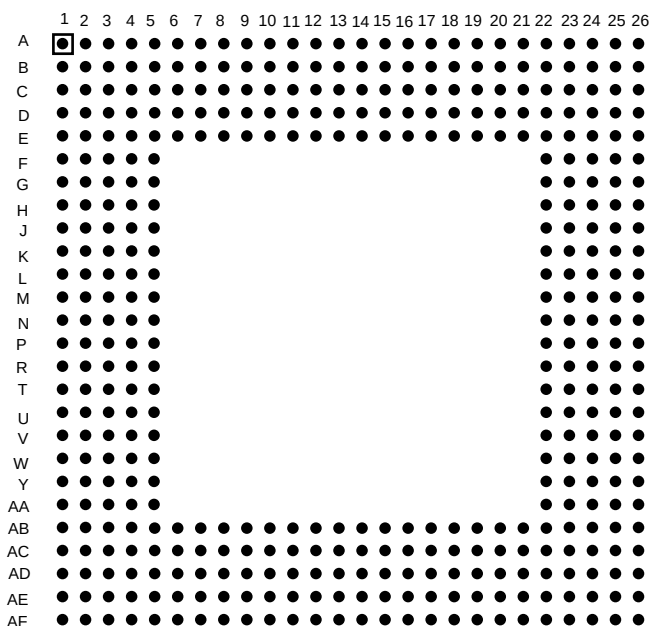
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

BGA420T1.27-ISO

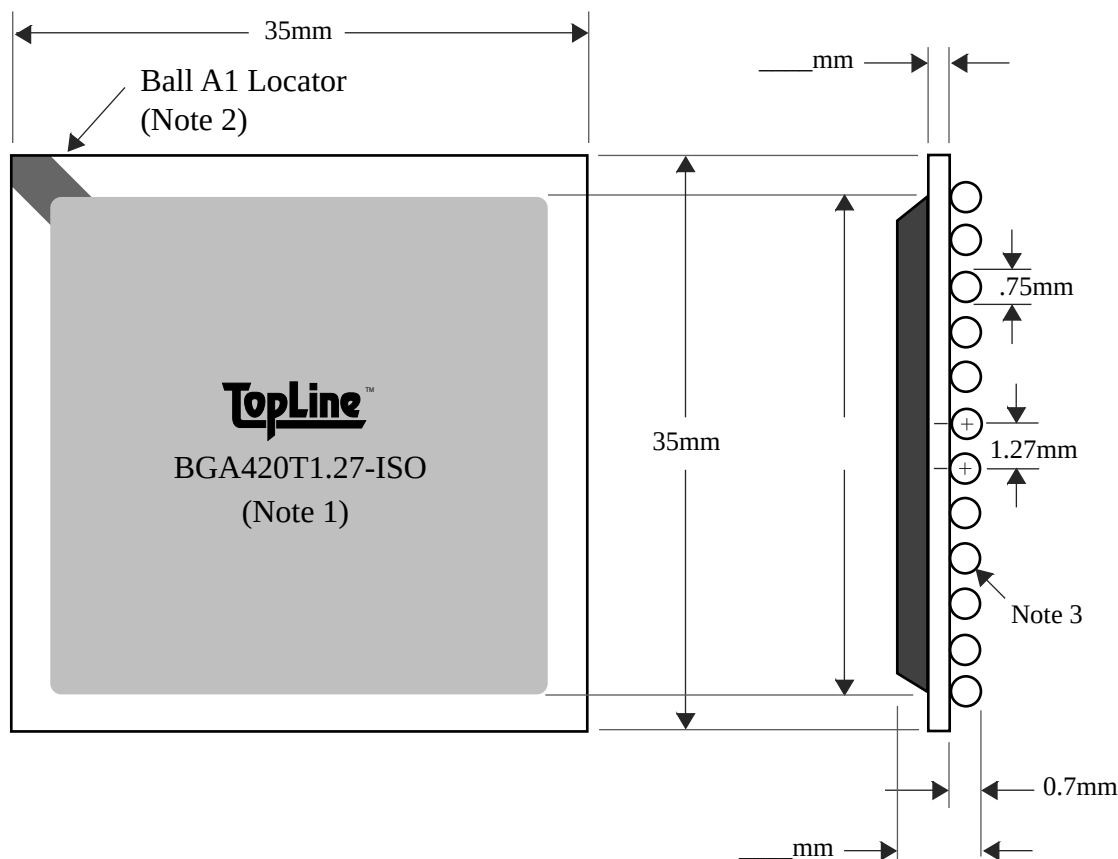
TopLine™

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
420	1.27mm	35mm SQ	26 x 26	5	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

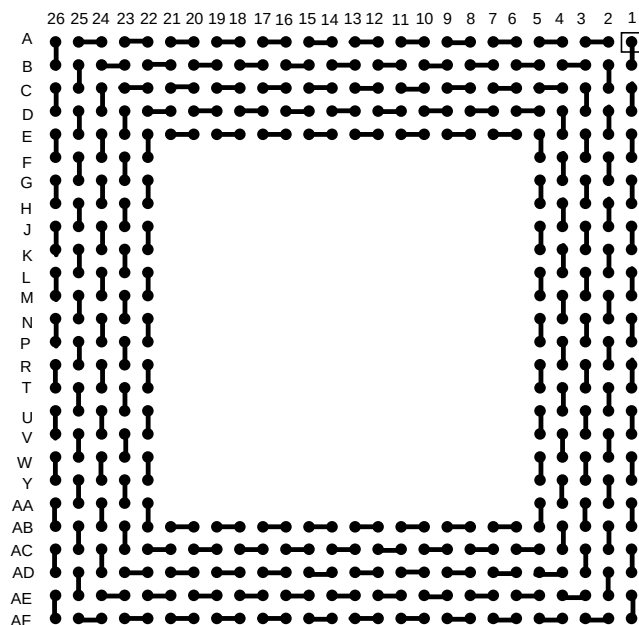
SIDE VIEW



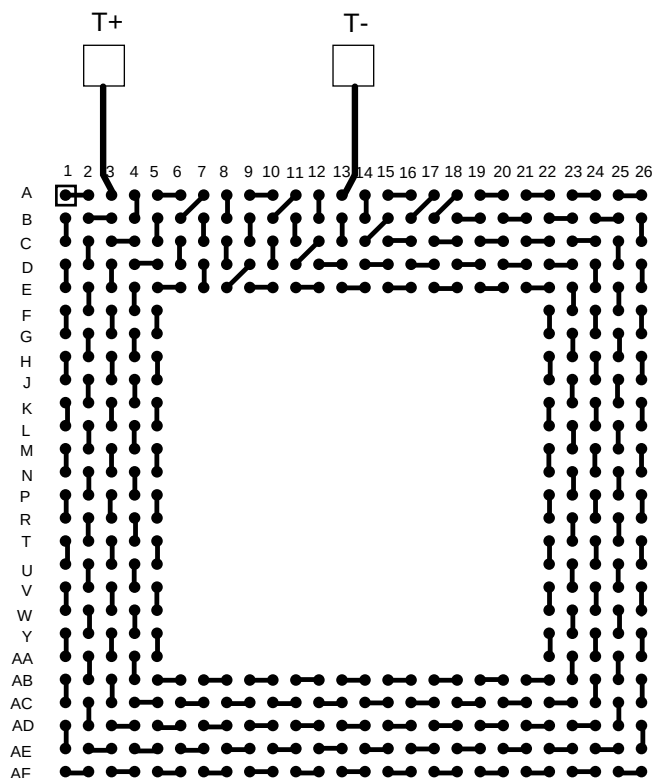
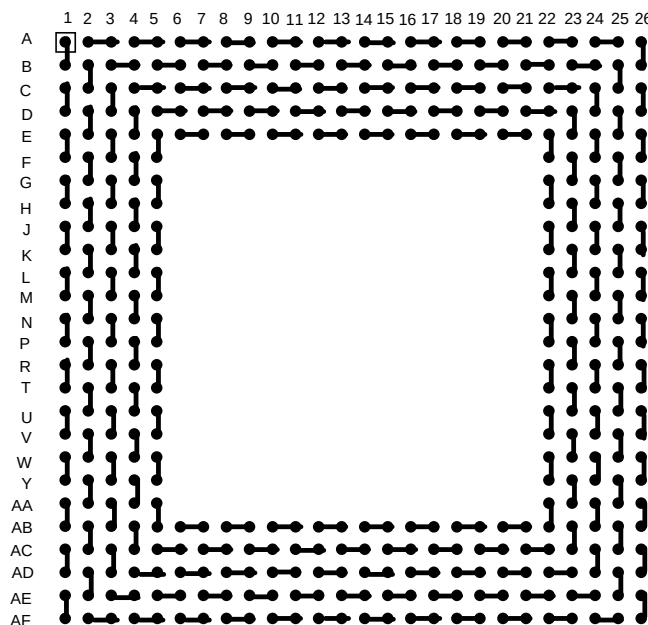
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY35mm-3x8 Tray Quantity 24 Tray Suppliers (ref):		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
420	1.27mm	35mm SQ	26 x 26	5	none	BT

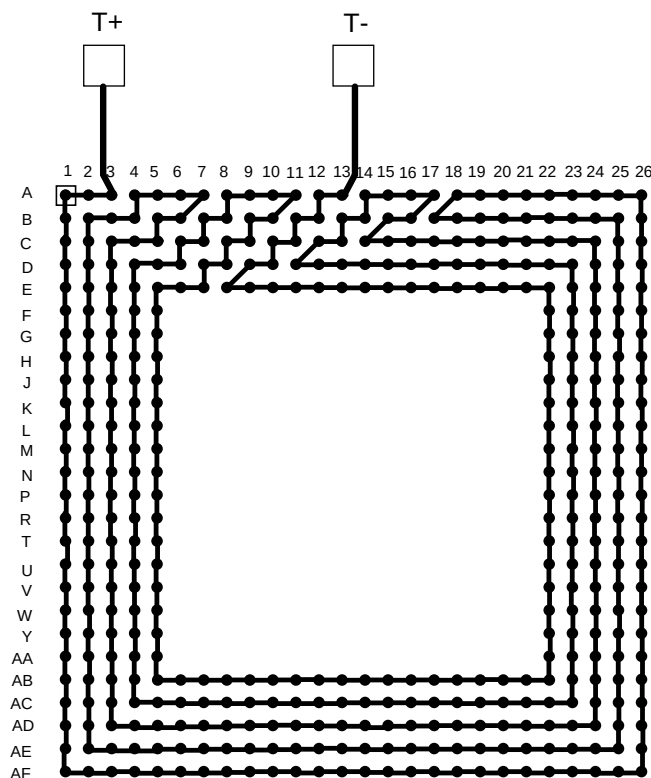
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

BGA420T1.27-DC85

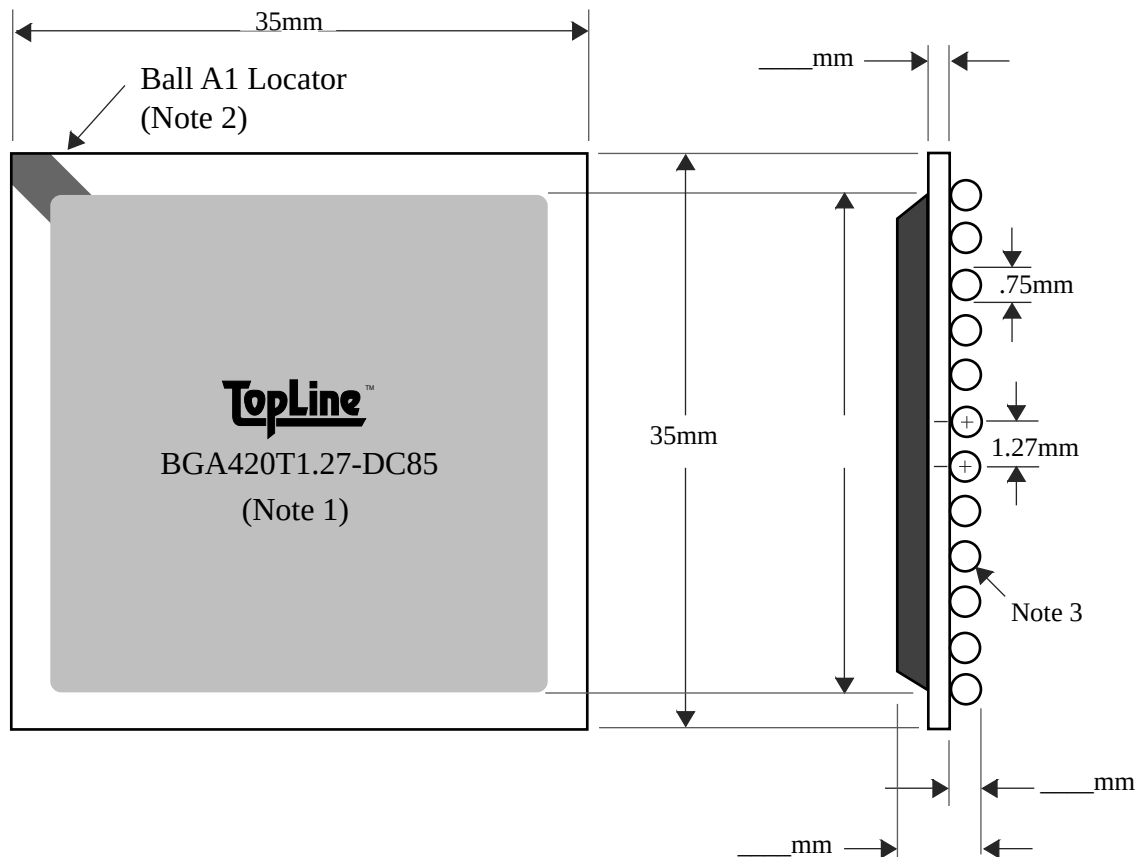
TopLine™

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
420	1.27mm	35mm SQ	26 x 26	5	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
		PACKAGING TRAYS (SEE NOTE 4)		



TEL 1-714-898-3830

FAX 1-714-891-0321

TBGA420T1.27-ISO

BALLS

420

PITCH

1.27mm

SIZE

35mm SQ

MATRIX

26 x 26

ROWS

5

CENTER

none

MAT'L

tape

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

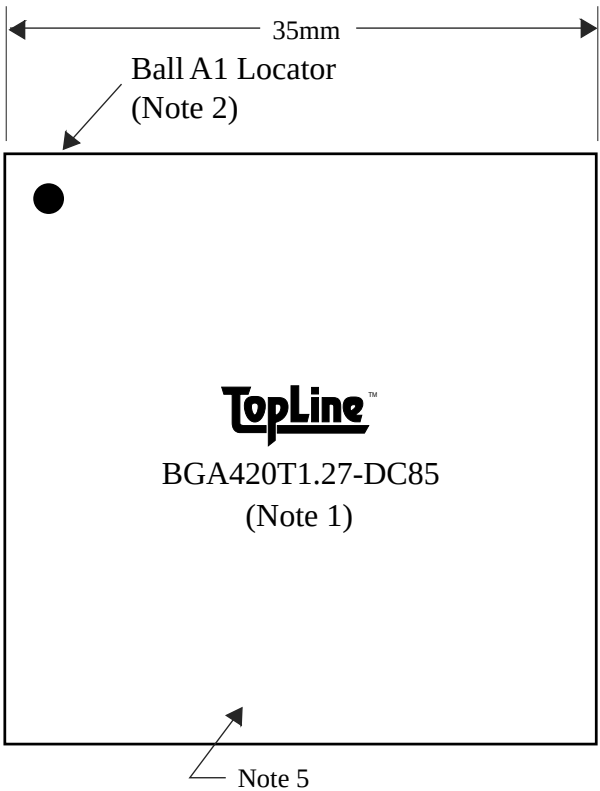
TBGA420T1.27-ISO



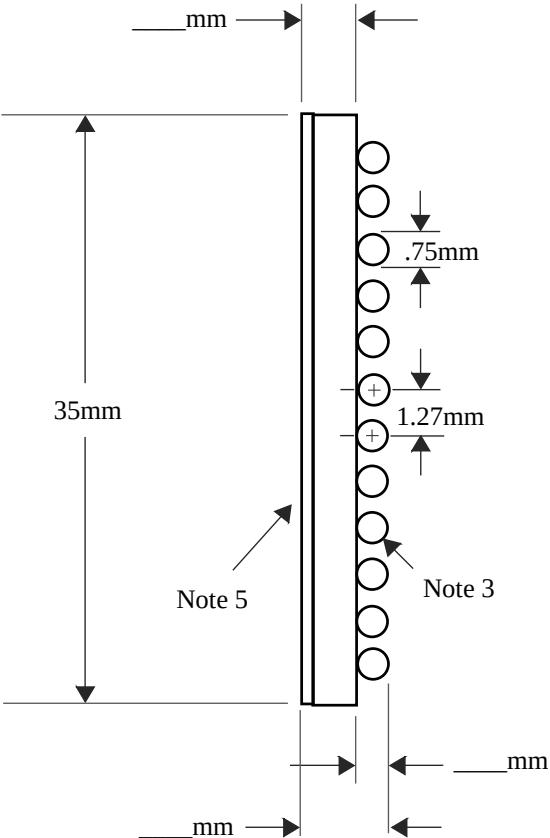
BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
420	1.27mm	35mm SQ	26 x 26	5	none	tape

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



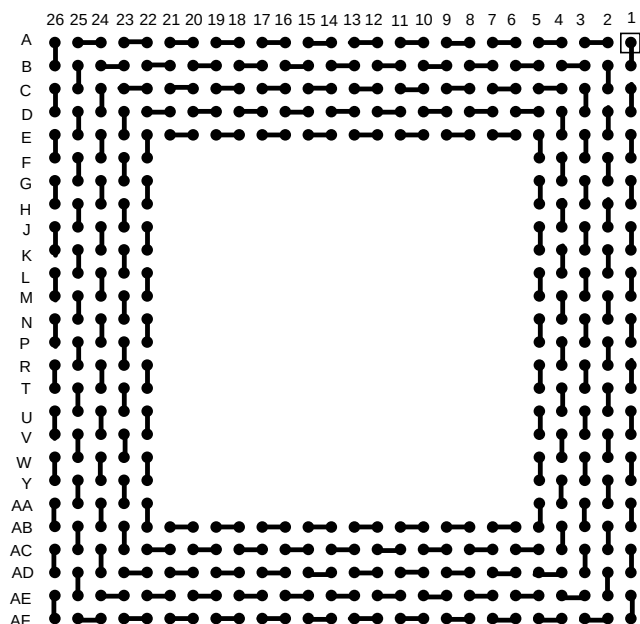
SIDE VIEW



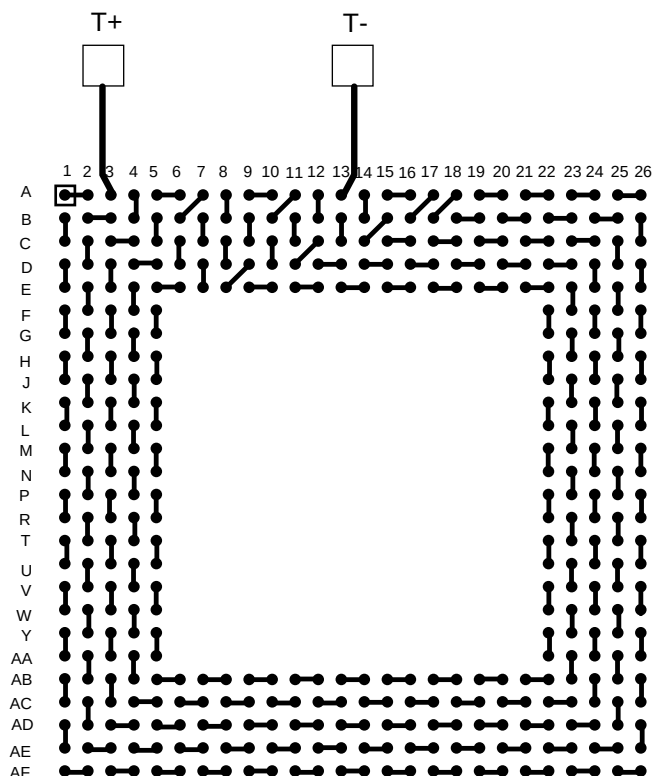
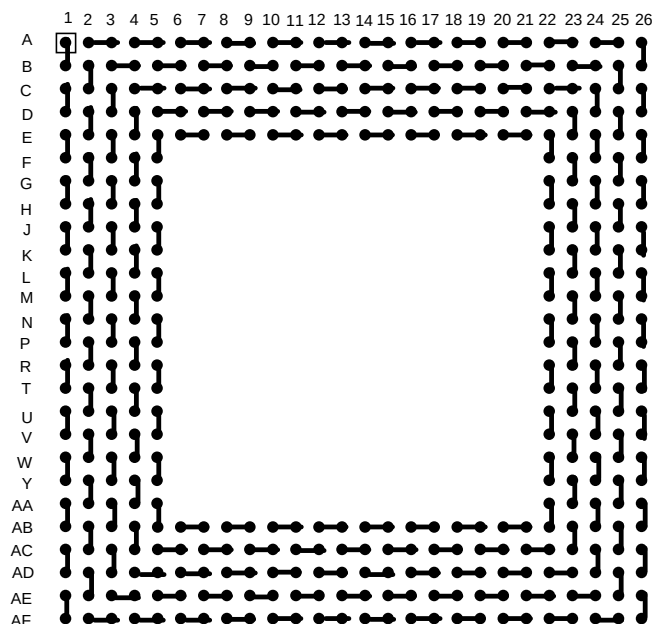
NOTES		REVISIONS		
Note 1	Logo and part number centered on metal heat sink/stiffener	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 10/90 SnPb			
Note 4	Substrate Material: Polyimide tape			
Note 5	Metal stiffener/heat sink			
		PACKAGING TRAYS (SEE NOTE 4)		

LBGA420T1.27-DC85

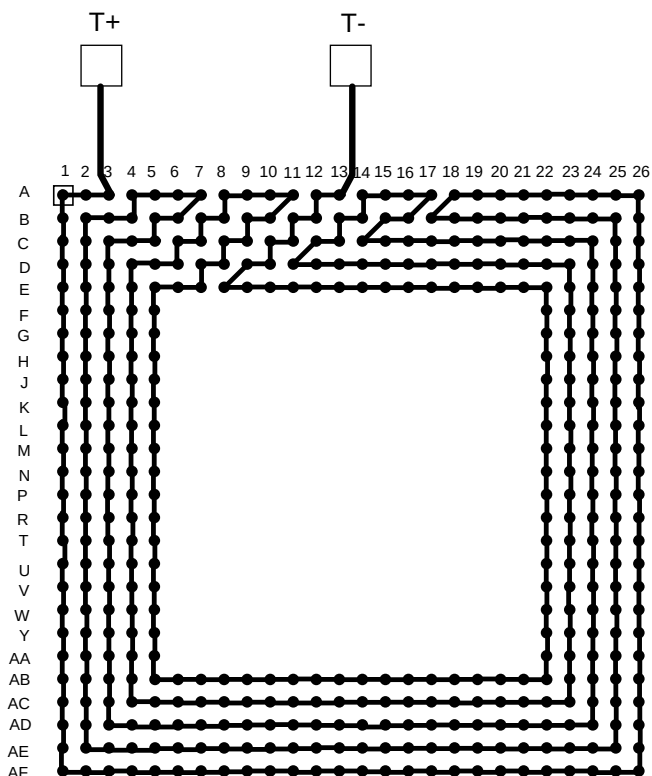
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

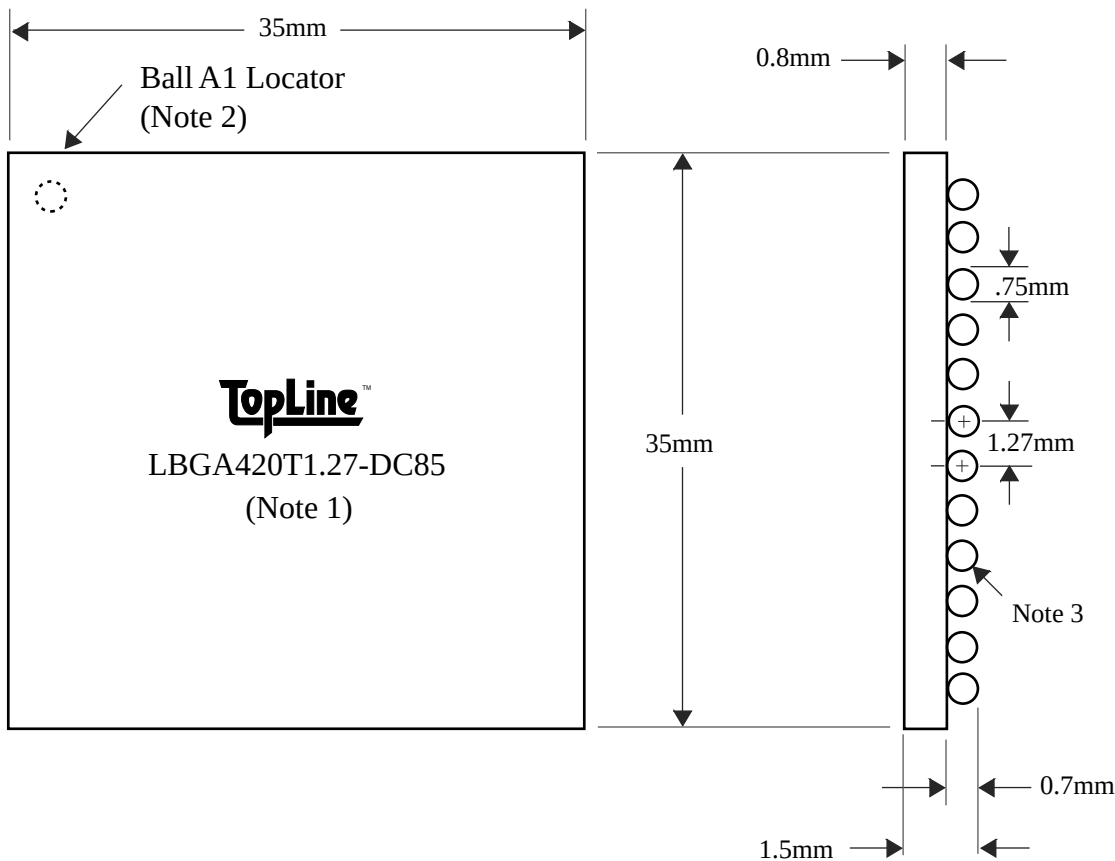
LBGA420T1.27-DC85



BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830
420	1.27mm	35mm SQ	26 x 26	5	none	FR4	FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY35mm-3x8 Tray Quantity 24 Tray Suppliers (ref):		



TEL 1-714-898-3830

FAX 1-714-891-0321

SBGA432T1.27-DC314

BALLS

432

PITCH

1.27mm

SIZE

40mm SQ

MATRIX

31 x 31

ROWS

4

CENTER

none

MAT'L

BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

SBGA432T1.27-DC314

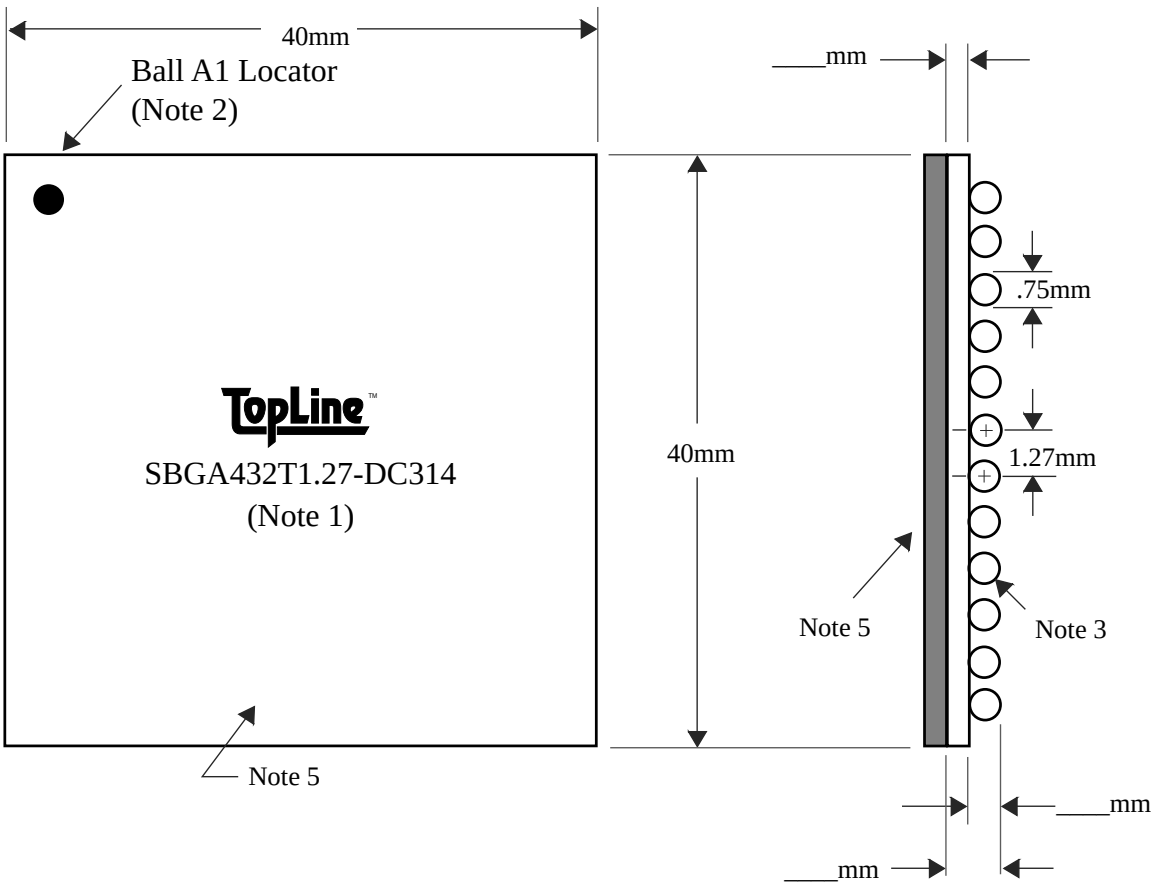


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
432	1.27mm	40mm SQ	31 x 31	4	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

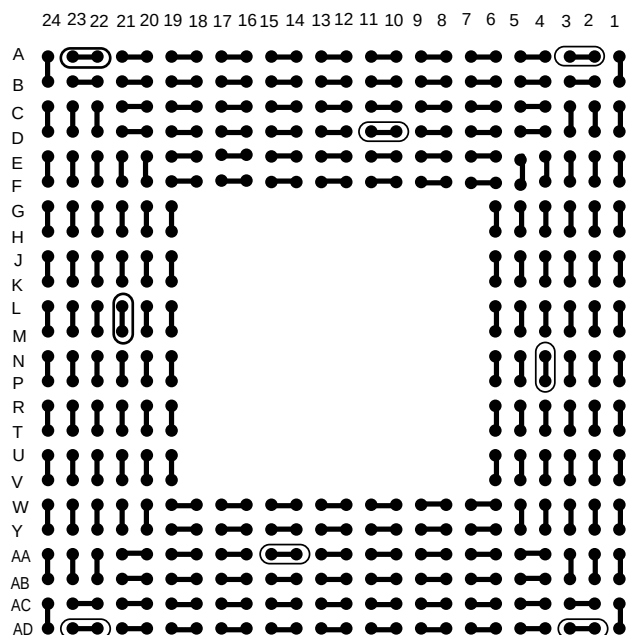
TOP VIEW

SIDE VIEW

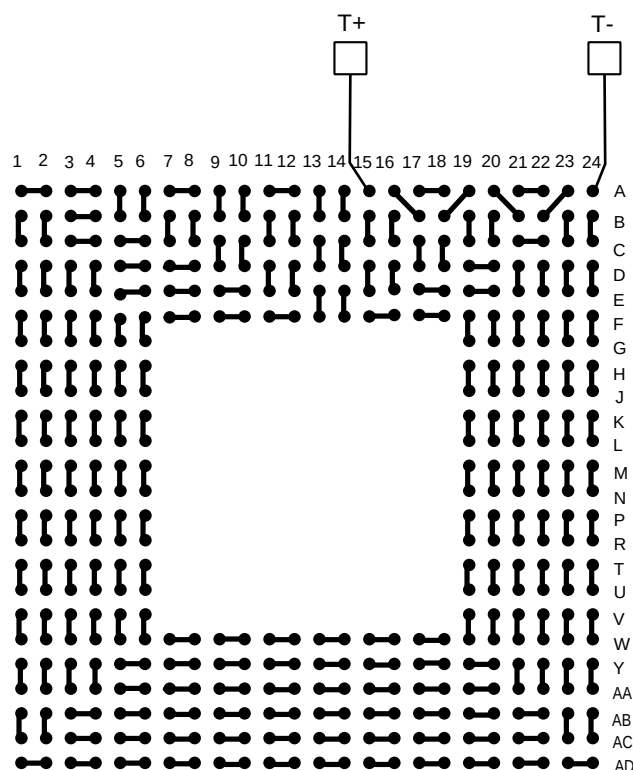
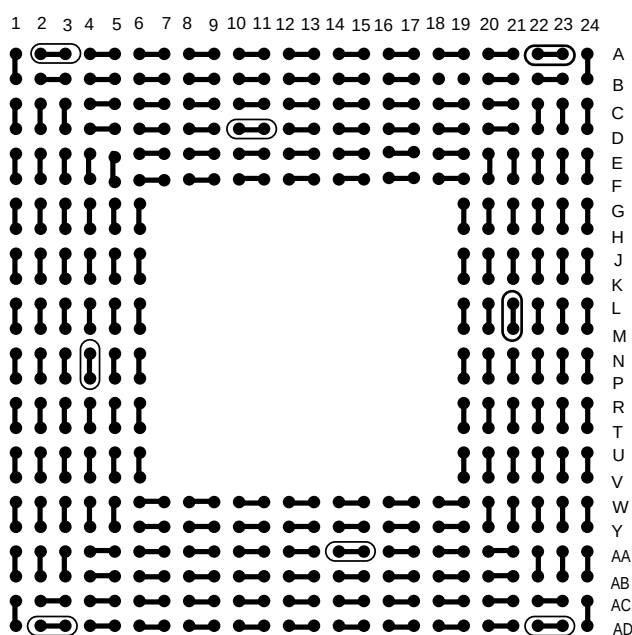


NOTES		REVISIONS		
Note 1	Logo and part number centered	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
Note 5	Metal heat sink. Die cavity down			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY40mm-3x7		
		Tray Quantity 21		
		Tray Suppliers (ref):		

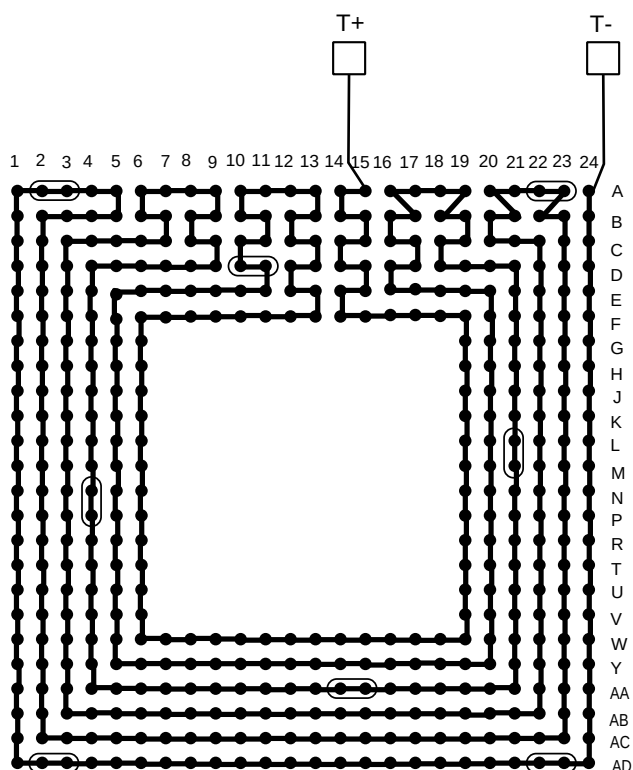
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



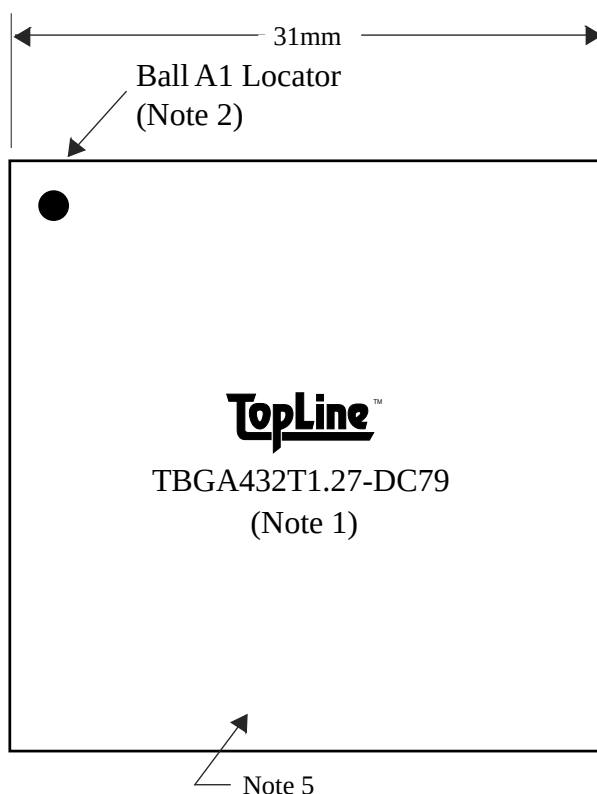
AFTER MOUNTING TO TEST BOARD

TBGA432T1.27-DC79

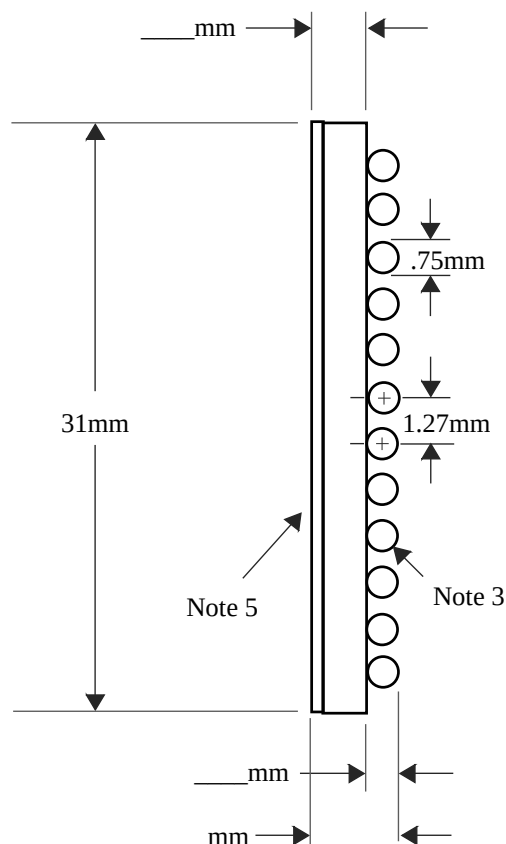
TopLine™

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>	
432	1.27mm	31mm SQ	24 x 24	6	none	tape	TEL 1-714-898-3830 FAX 1-714-891-0321

TOP VIEW



SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered on metal heat sink/stiffener	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 10/90 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: Polyimide tape	Tray BGATRAY31mm-3x9		
Note 5	Metal stiffener/heat sink	Tray Quantity 27		
		Tray Suppliers (ref):		



TEL 1-714-898-3830

FAX 1-714-891-0321

BGA456T1.27-ISO

BALLS

456

PITCH

1.27mm

SIZE

35mm SQ

MATRIX

26 x 26

ROWS

5

CENTER

6 x 6

MAT'L

BT

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA456T1.27-ISO

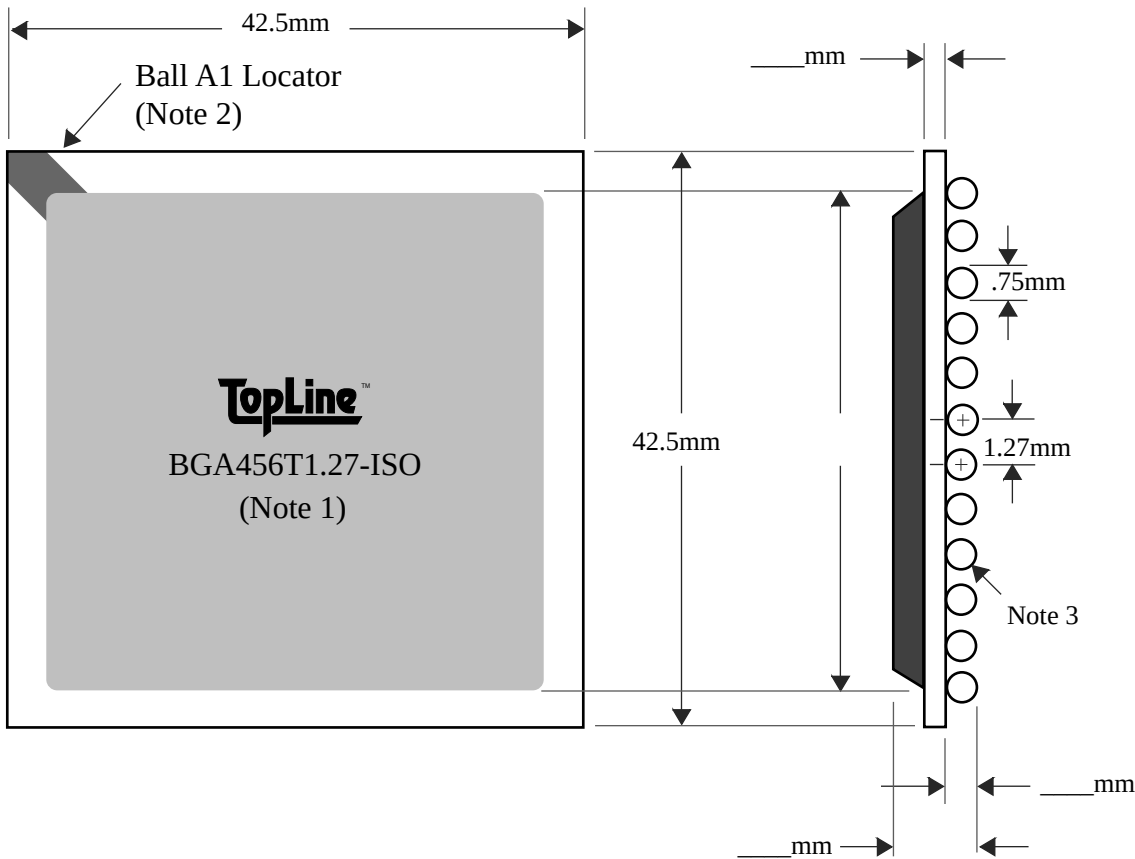
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
456	1.27mm	35mm SQ	26 x 26	5	6 x 6	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY _____ Tray Quantity _____ Tray Suppliers (ref):		



TEL 1-714-898-3830

FAX 1-714-891-0321

BGA480T1.27-ISO

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
480	1.27mm	?mm SQ	?	?	?	?

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

BGA480T1.27-ISO

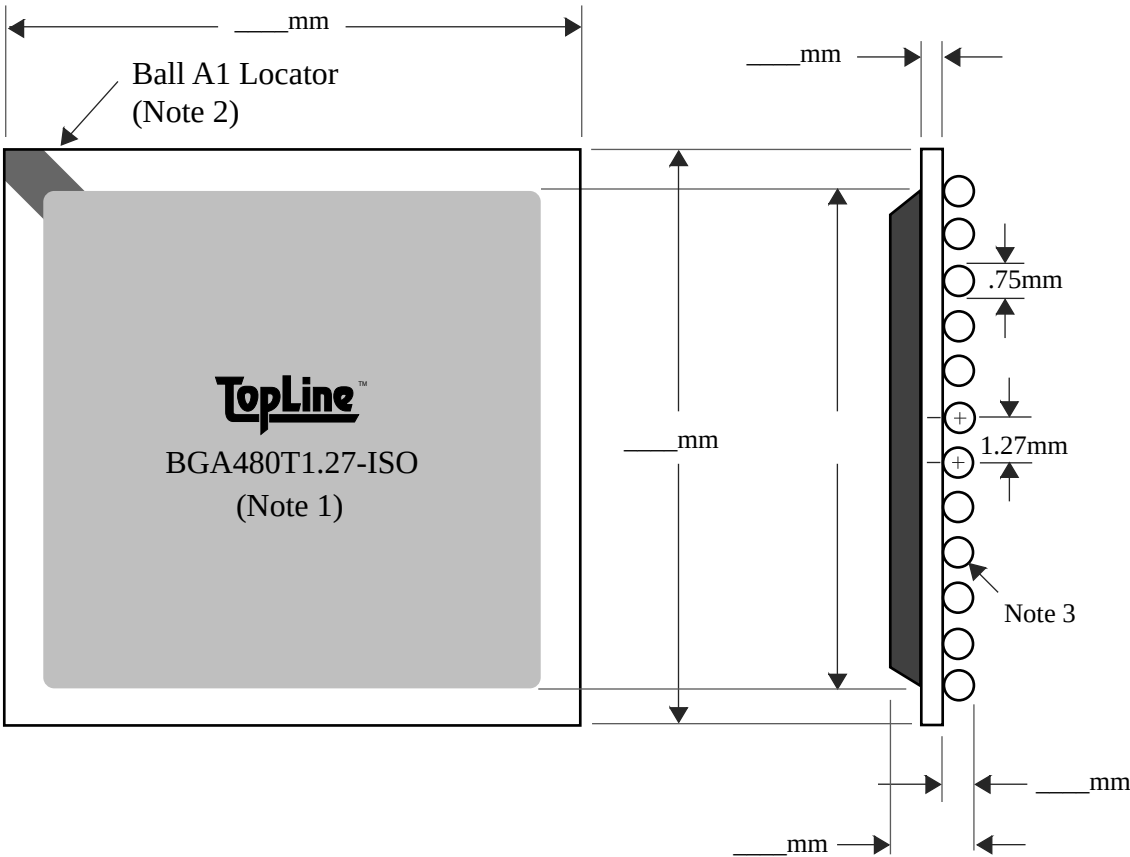


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
480	1.27mm	?mm SQ	?	?	?	?

TEL 1-714-898-3830
FAX 1-714-891-0321

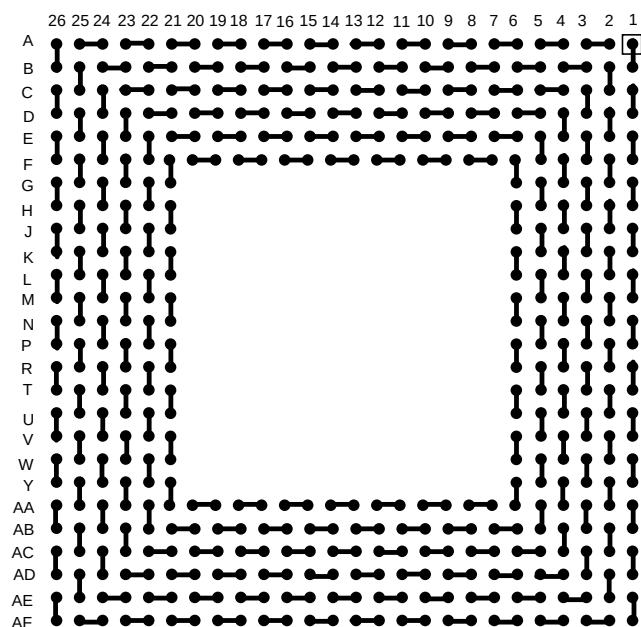
TOP VIEW

SIDE VIEW

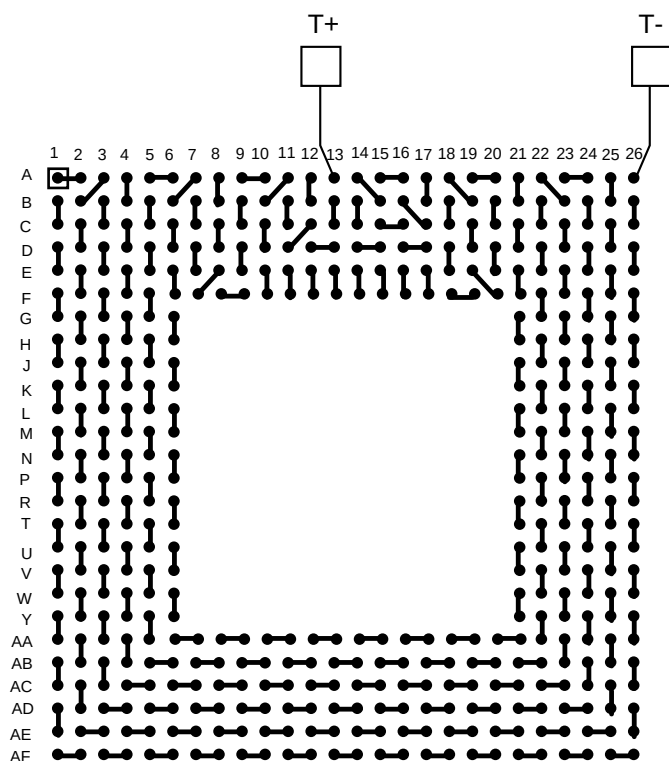
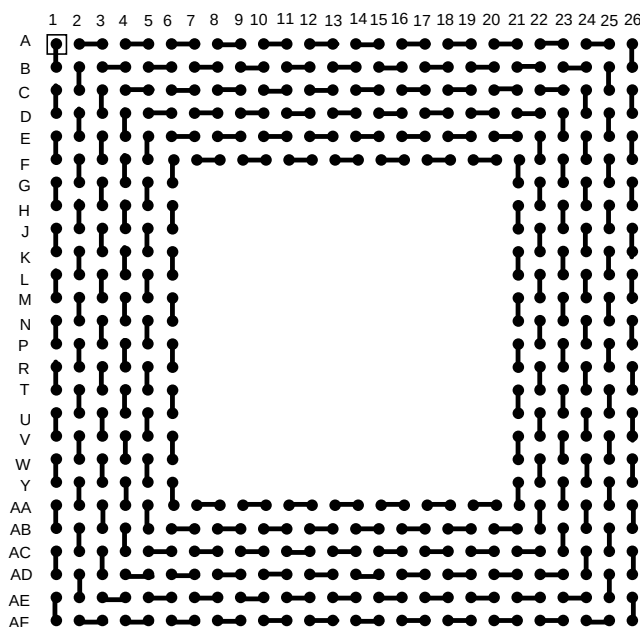


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
			11/14/98	Proposed Design
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY _____ Tray Quantity _____ Tray Suppliers (ref):		
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			

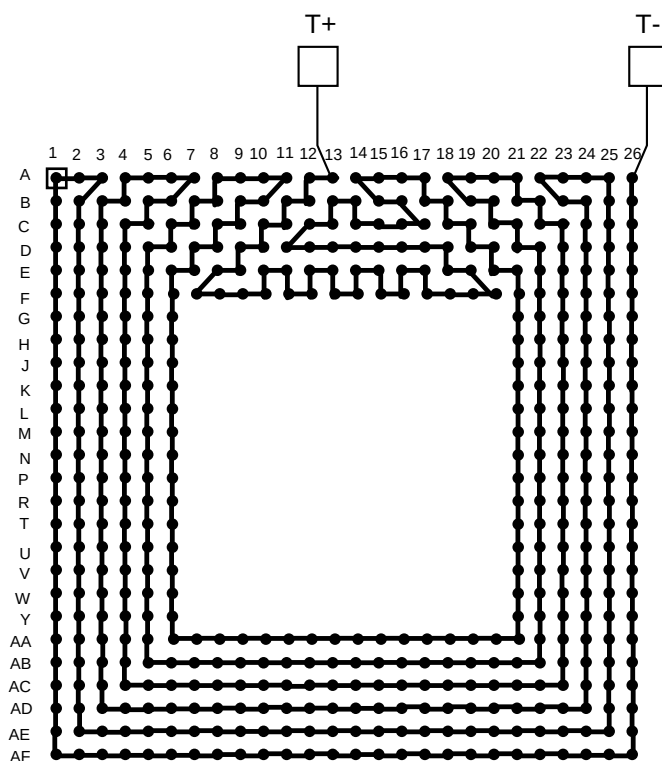
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

BGA480T1.27-DC90

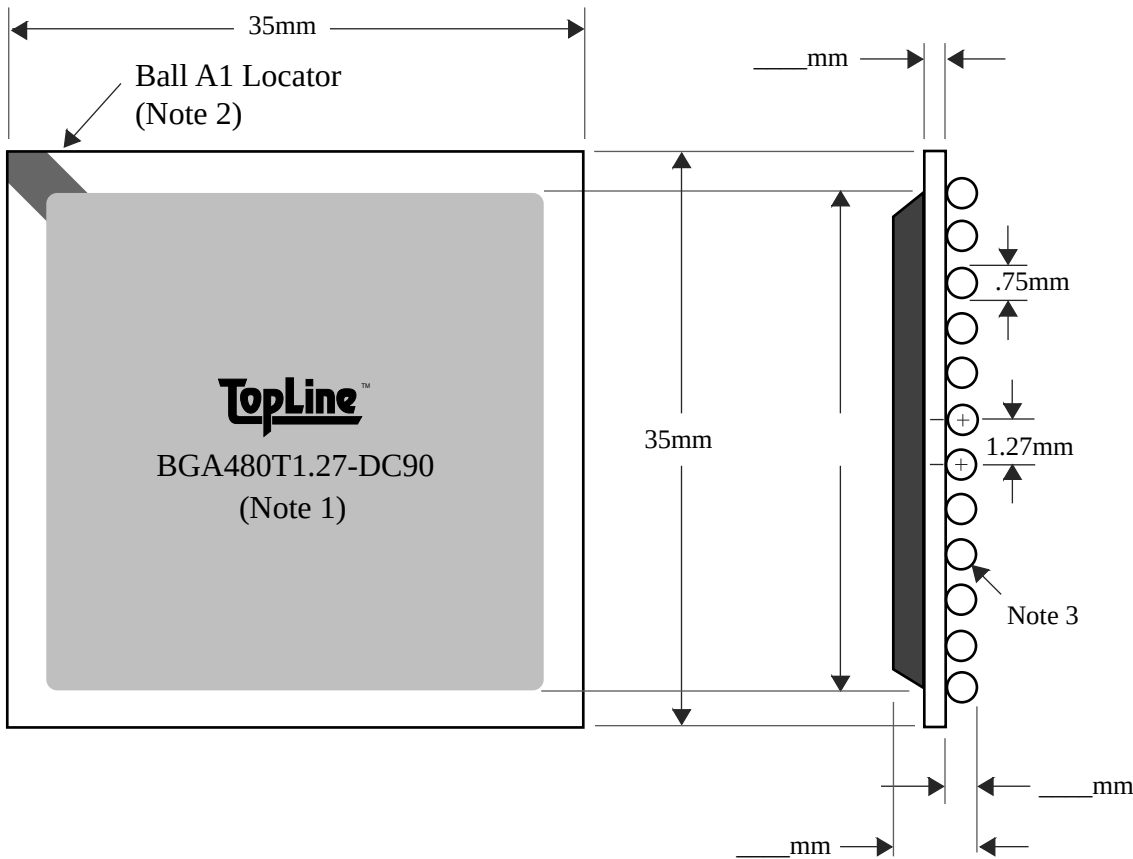
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
480	1.27mm	35mm SQ	26 x 26	6	none	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

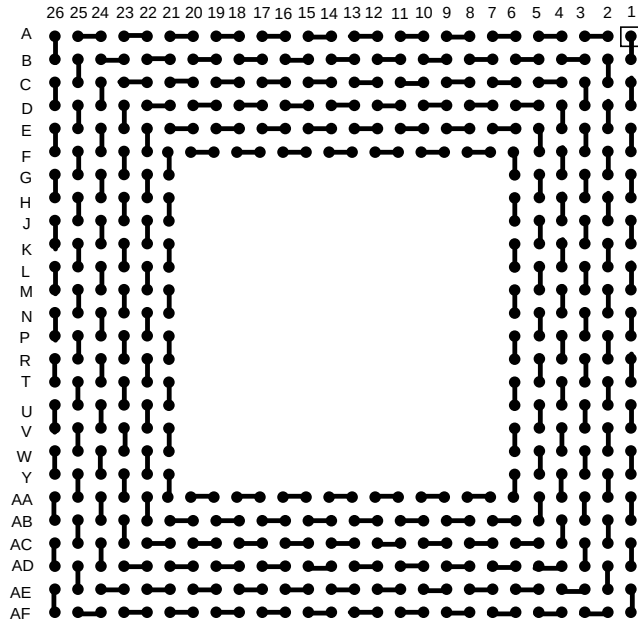
TOP VIEW

SIDE VIEW

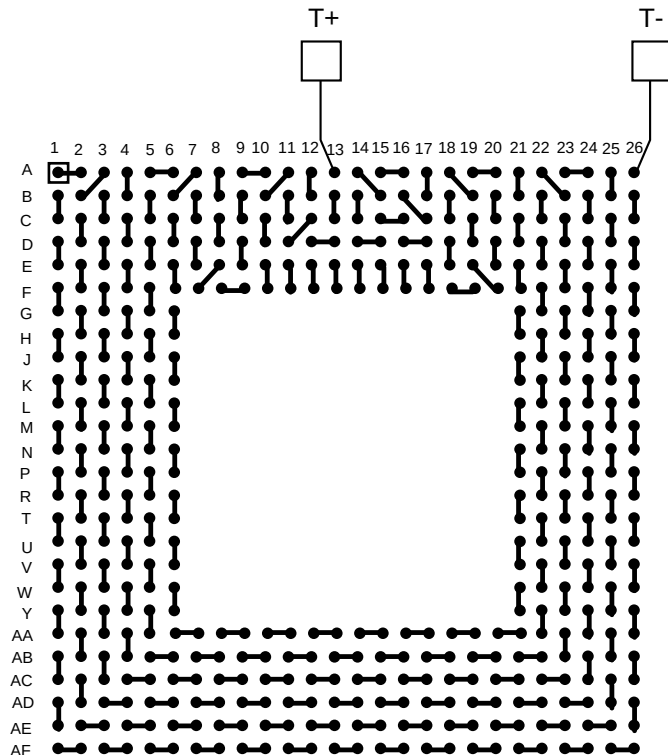
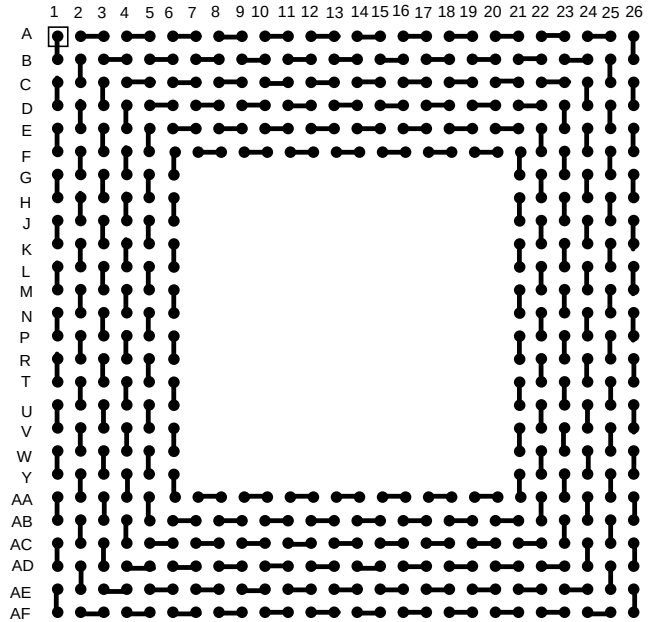


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY35mm-3x8 Tray Quantity 24 Tray Suppliers (ref):		

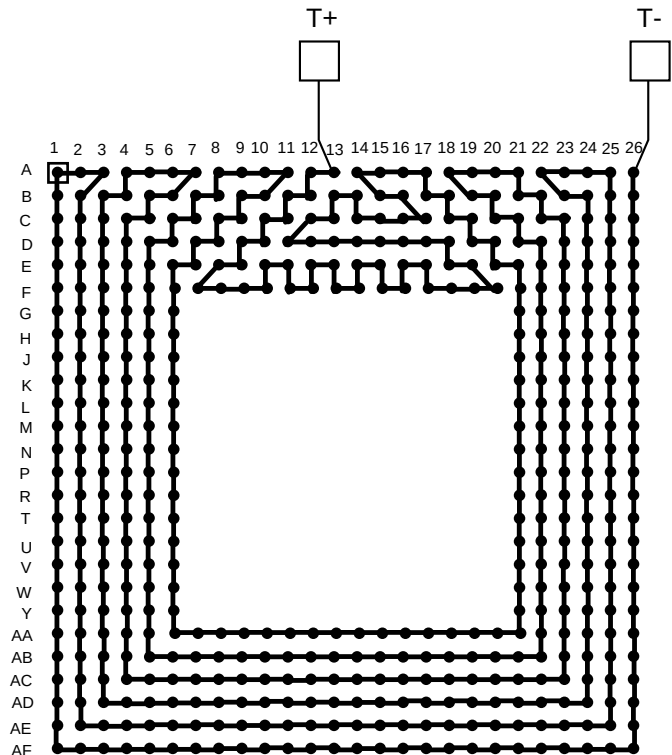
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

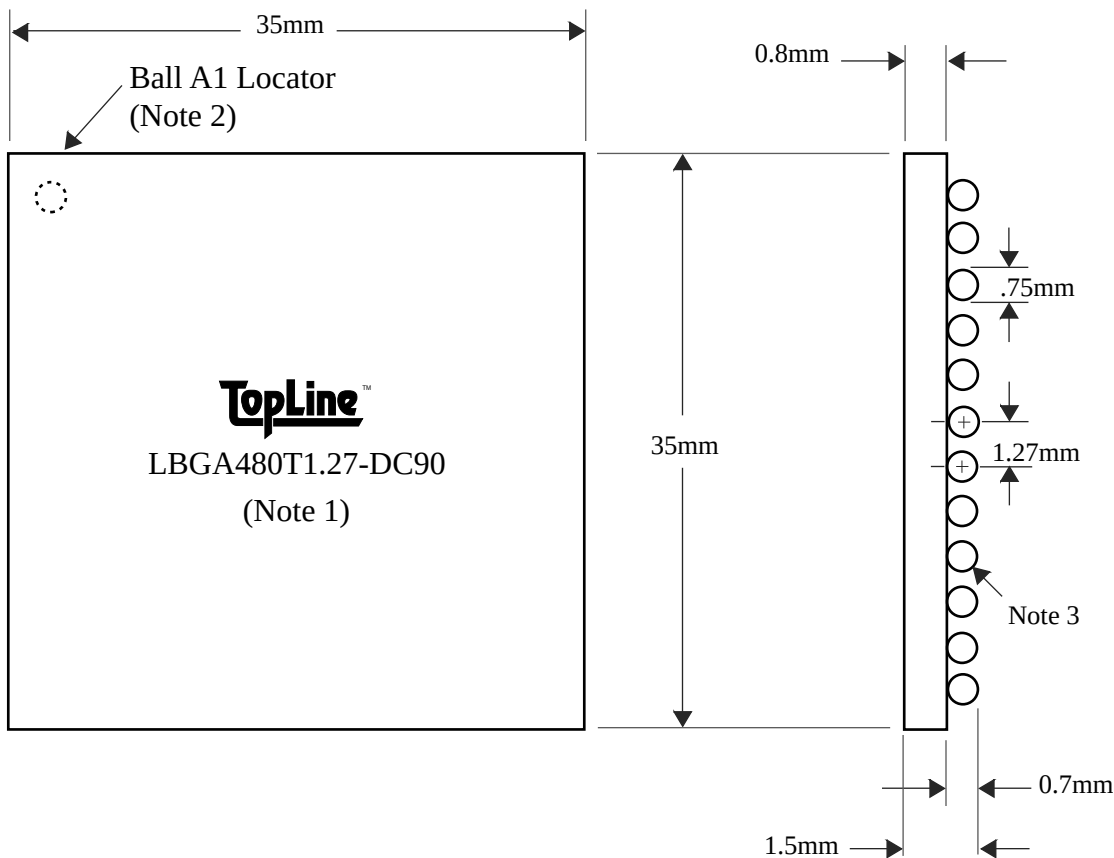
LBGA480T1.27-DC90



BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830
480	1.27mm	35mm SQ	26 x 26	6	none	FR4	FAX 1-714-891-0321

TOP VIEW

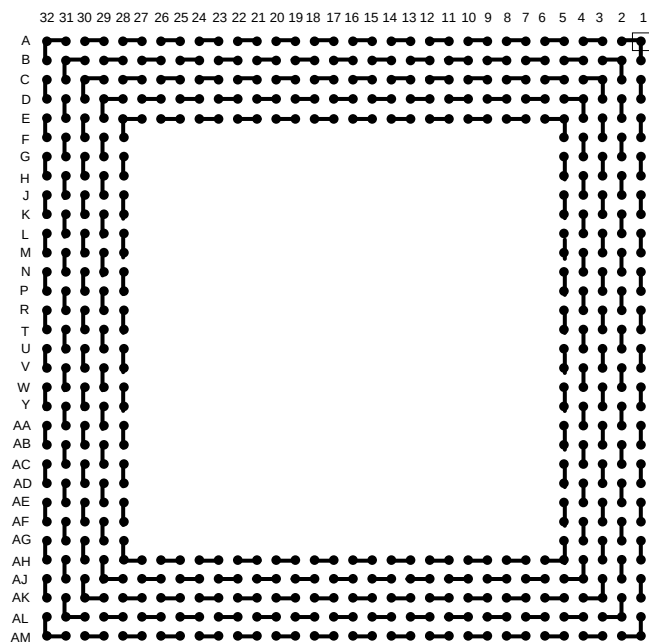
SIDE VIEW



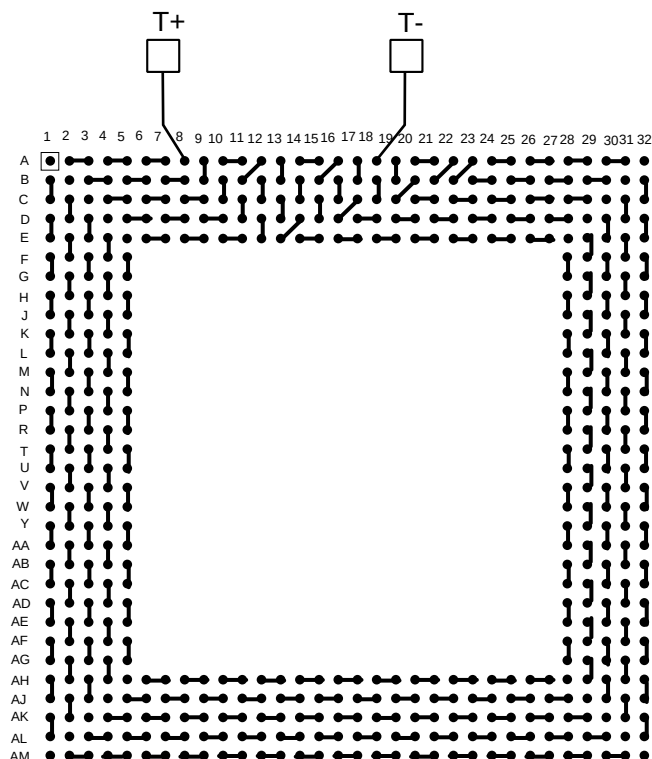
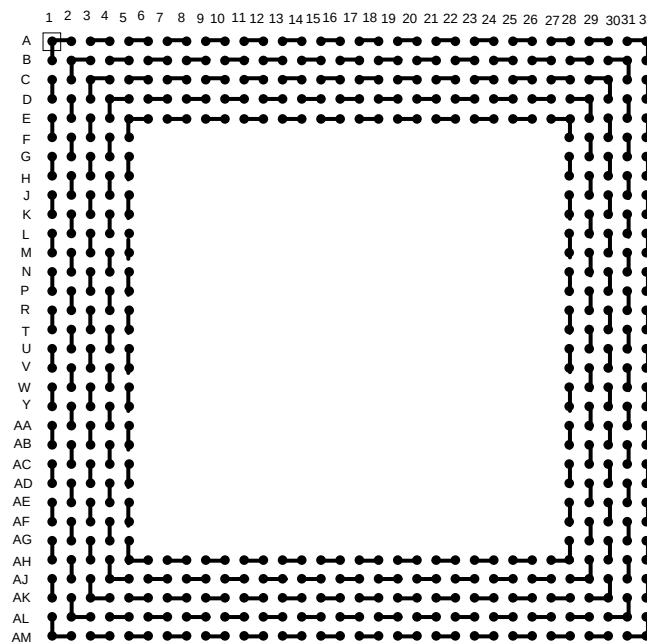
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY35mm-3x8 Tray Quantity 24 Tray Suppliers (ref):		

	<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
TEL 1-714-898-3830							
FAX 1-714-891-0321	540	1.27mm	42.5mm SQ	32 x 32	5	none	BT

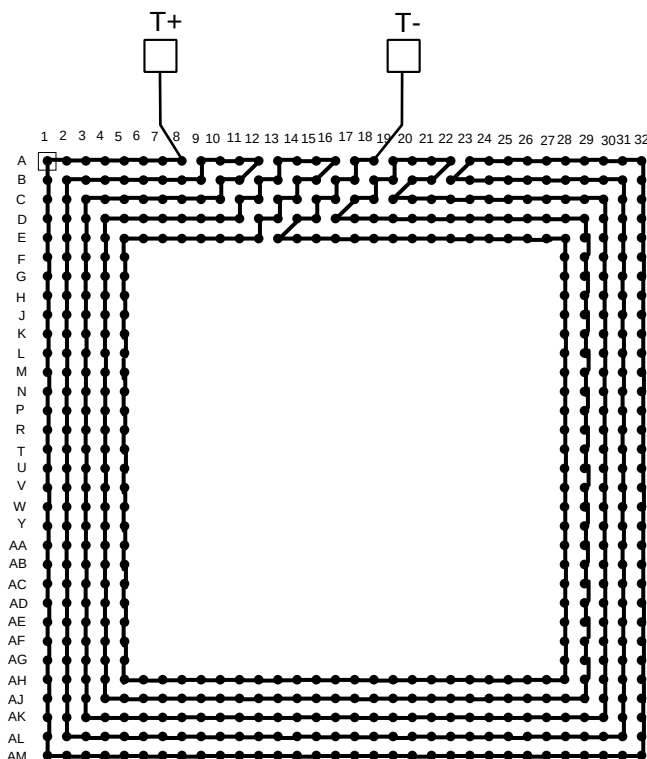
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

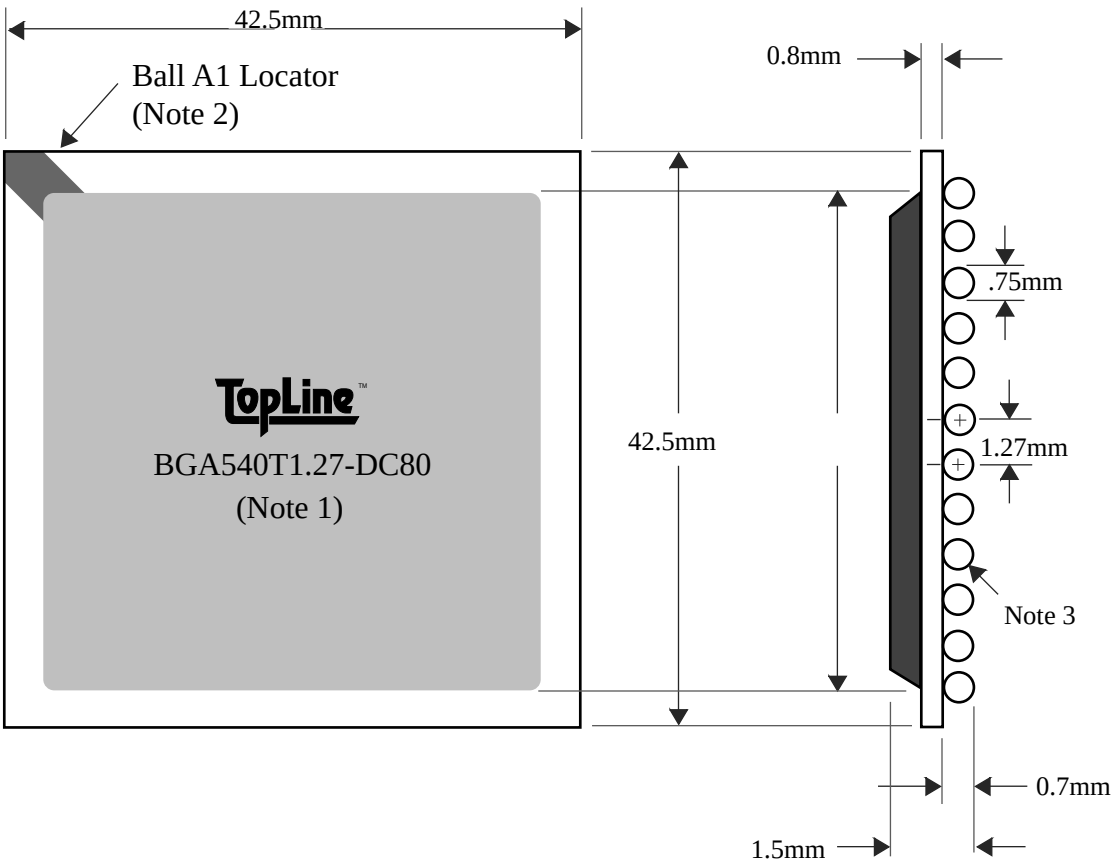
BGA540T1.27-DC80

TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830
540	1.27mm	42.5mm SQ	32 x 32	5	none	BT	FAX 1-714-891-0321

TOP VIEW

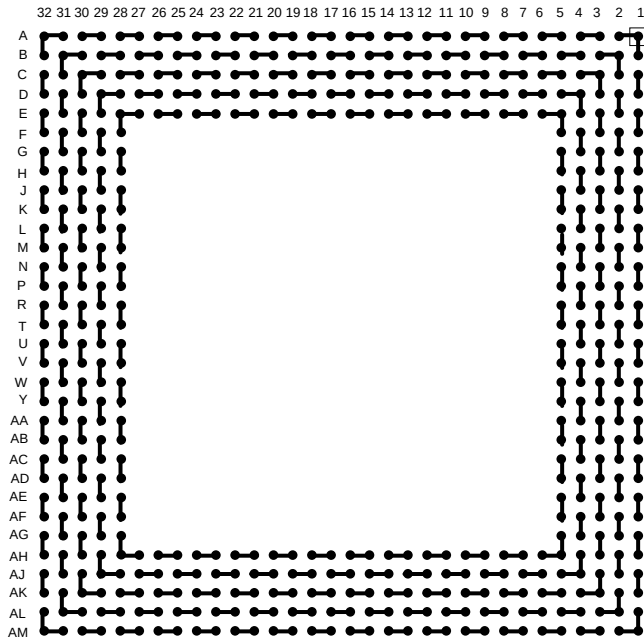
SIDE VIEW



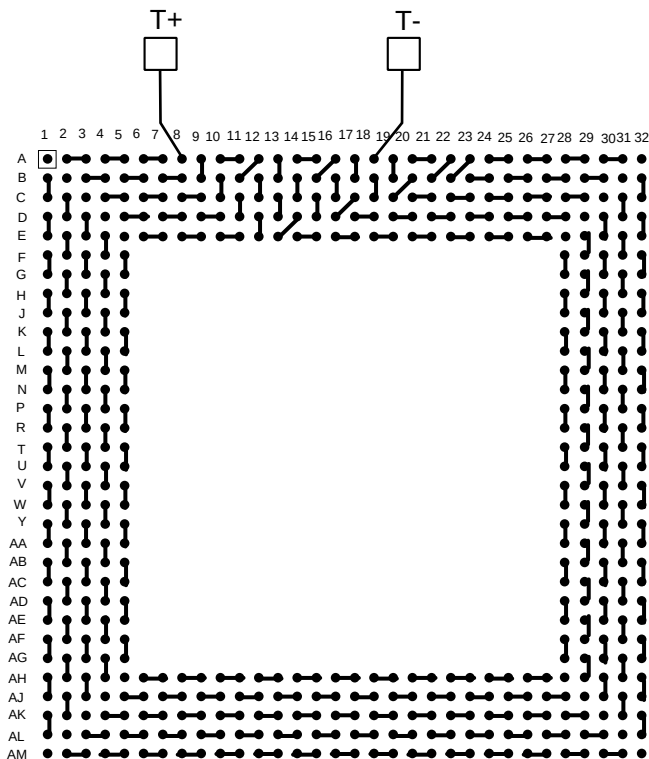
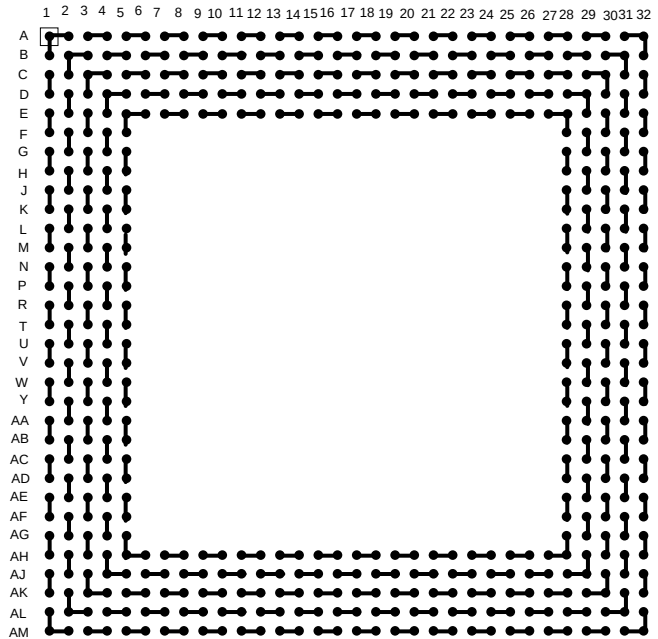
NOTES		REVISIONS		
Note 1	Logo and part number centered White ink or laser marked	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 63/37 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: BT laminate	Tray BGATRAY42.5-2x6 Tray Quantity 12 Tray Suppliers (ref):		

	BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
	540	1.27mm	42.5mm SQ	32 x 32	5	none	FR4

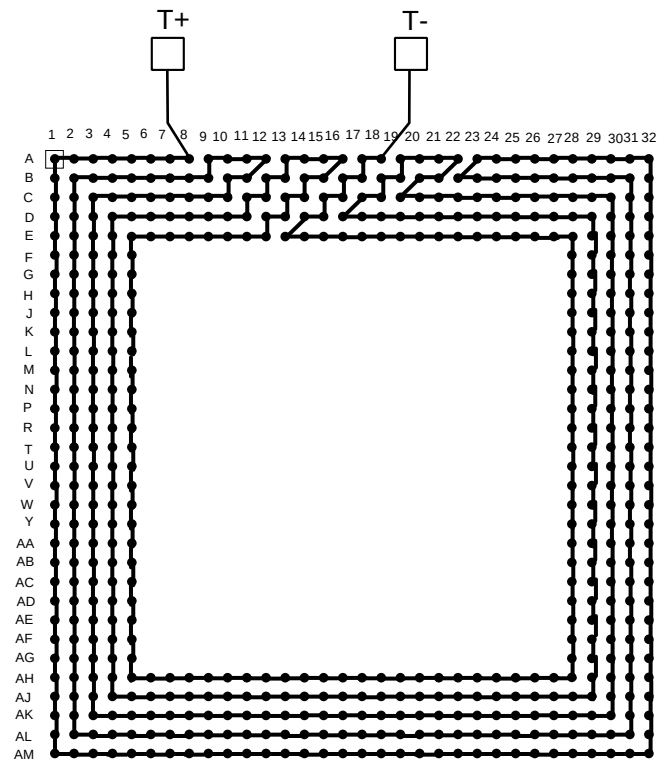
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

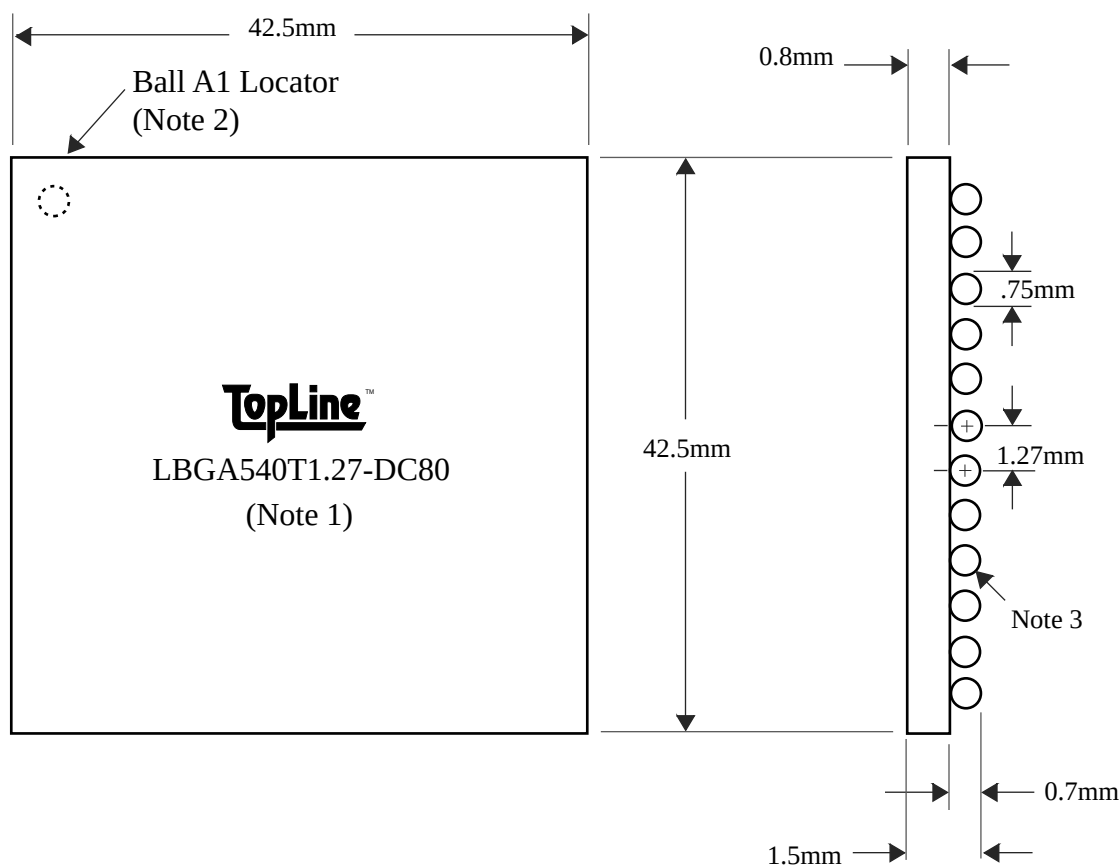
LBGA540T1.27-DC80

TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830 FAX 1-714-891-0321
540	1.27mm	42.5mm SQ	32 x 32	5	none	FR4	

TOP VIEW

SIDE VIEW

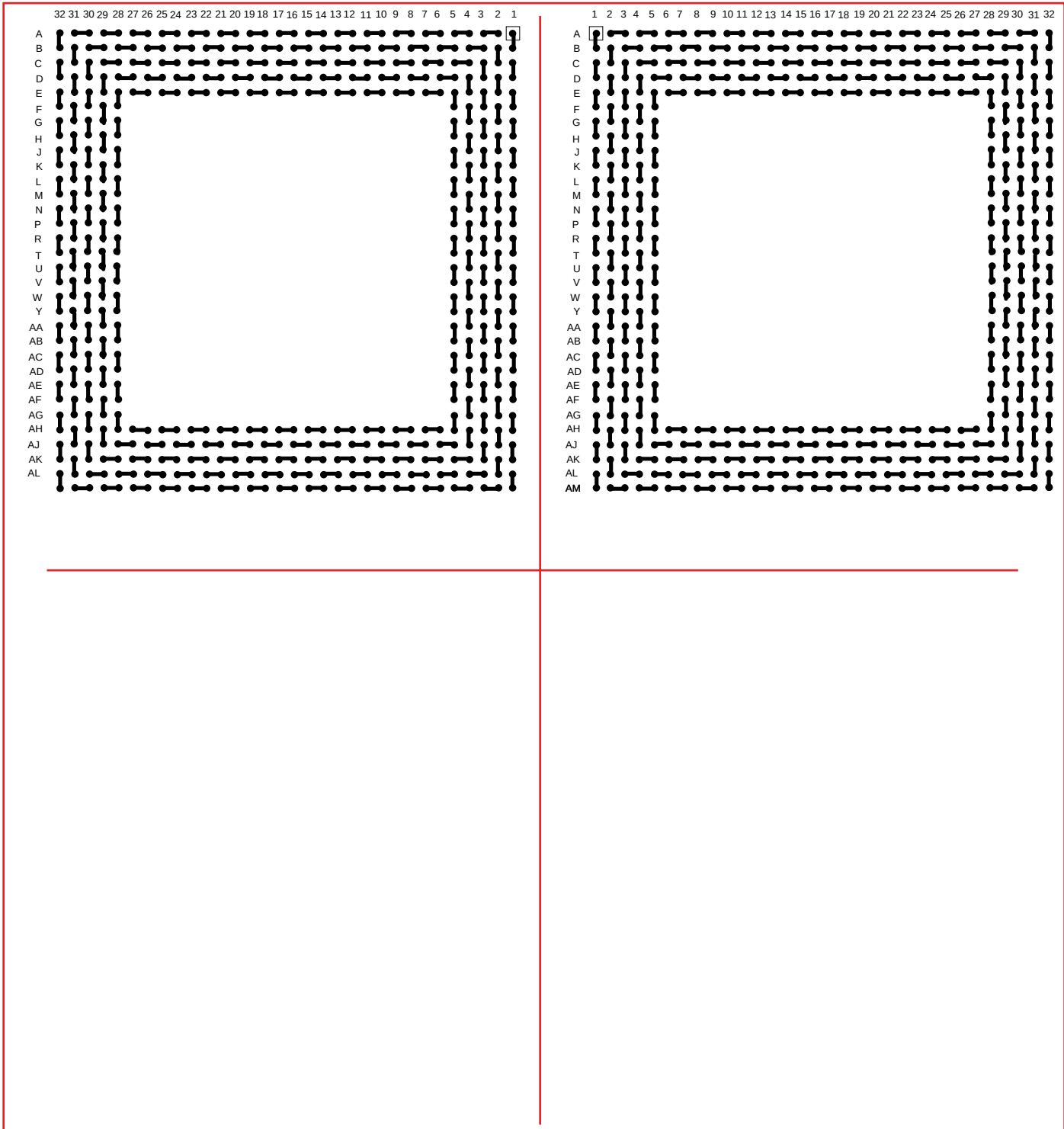


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY42.5-2x6 Tray Quantity 12 Tray Suppliers (ref):		

	BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
	540	1.27mm	42.5mm SQ	32 x 32	5	none	FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

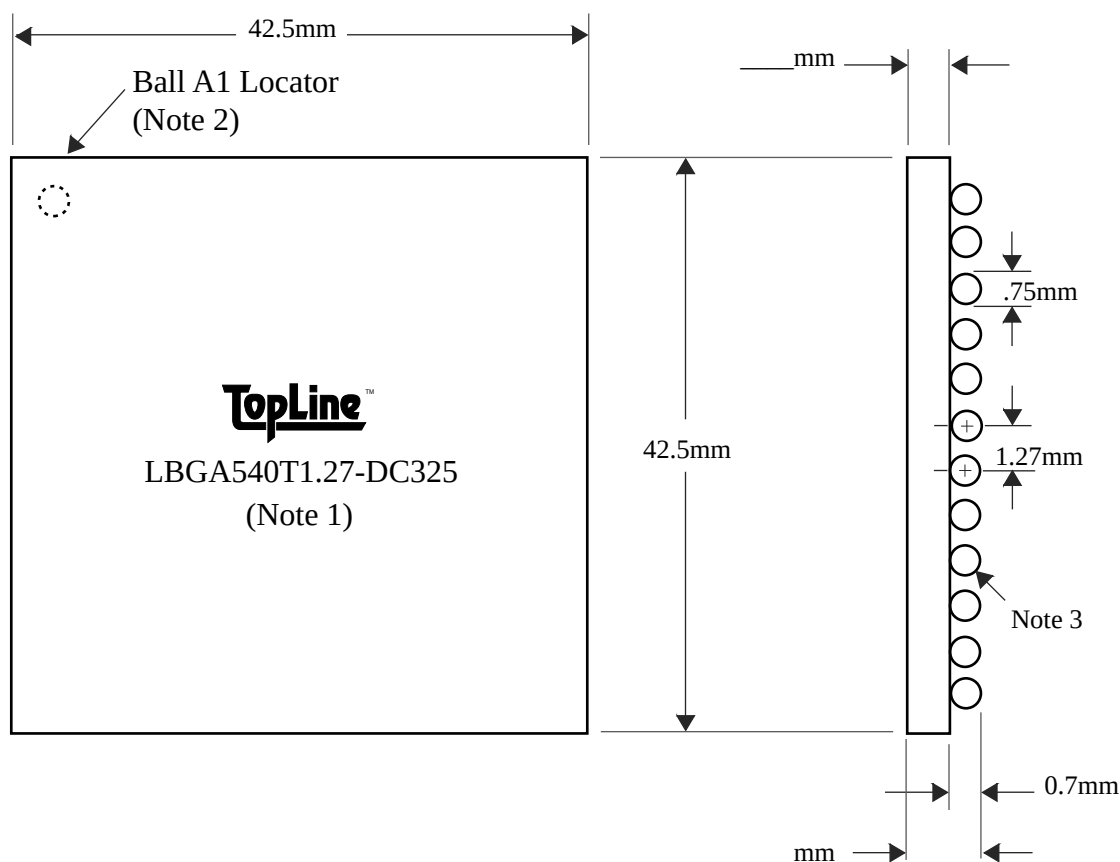
LBGA540T1.27-DC325

TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830 FAX 1-714-891-0321
540	1.27mm	42.5mm SQ	32 x 32	5	none	FR4	

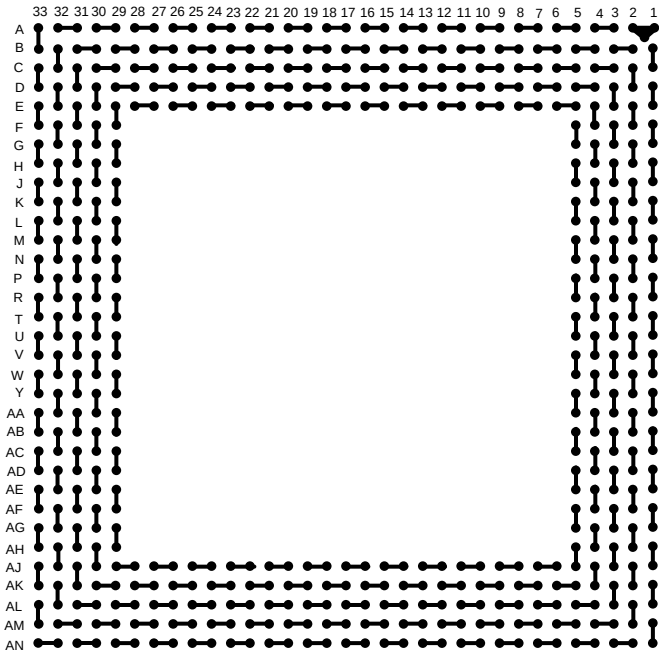
TOP VIEW

SIDE VIEW

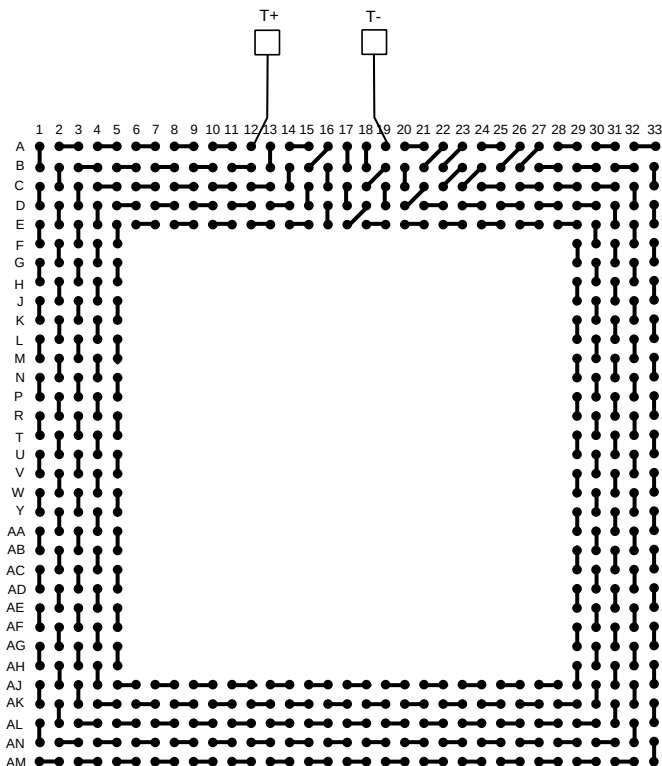
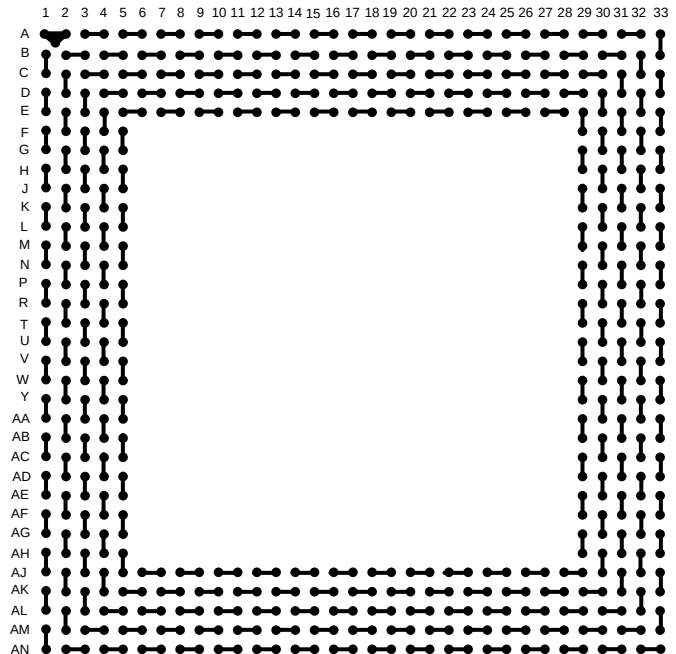


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY42.5-2x6 Tray Quantity 12 Tray Suppliers (ref):		

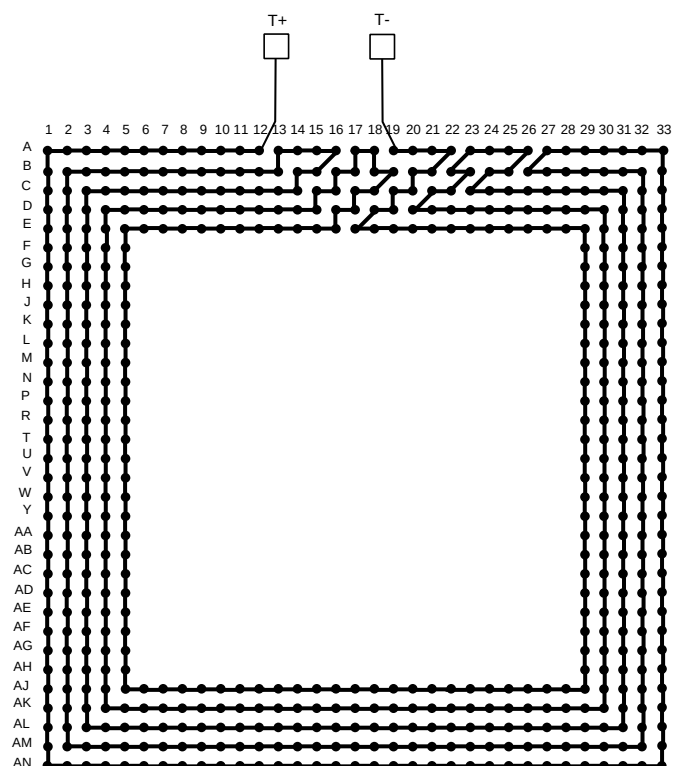
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

SBGA560T1.27-DC87

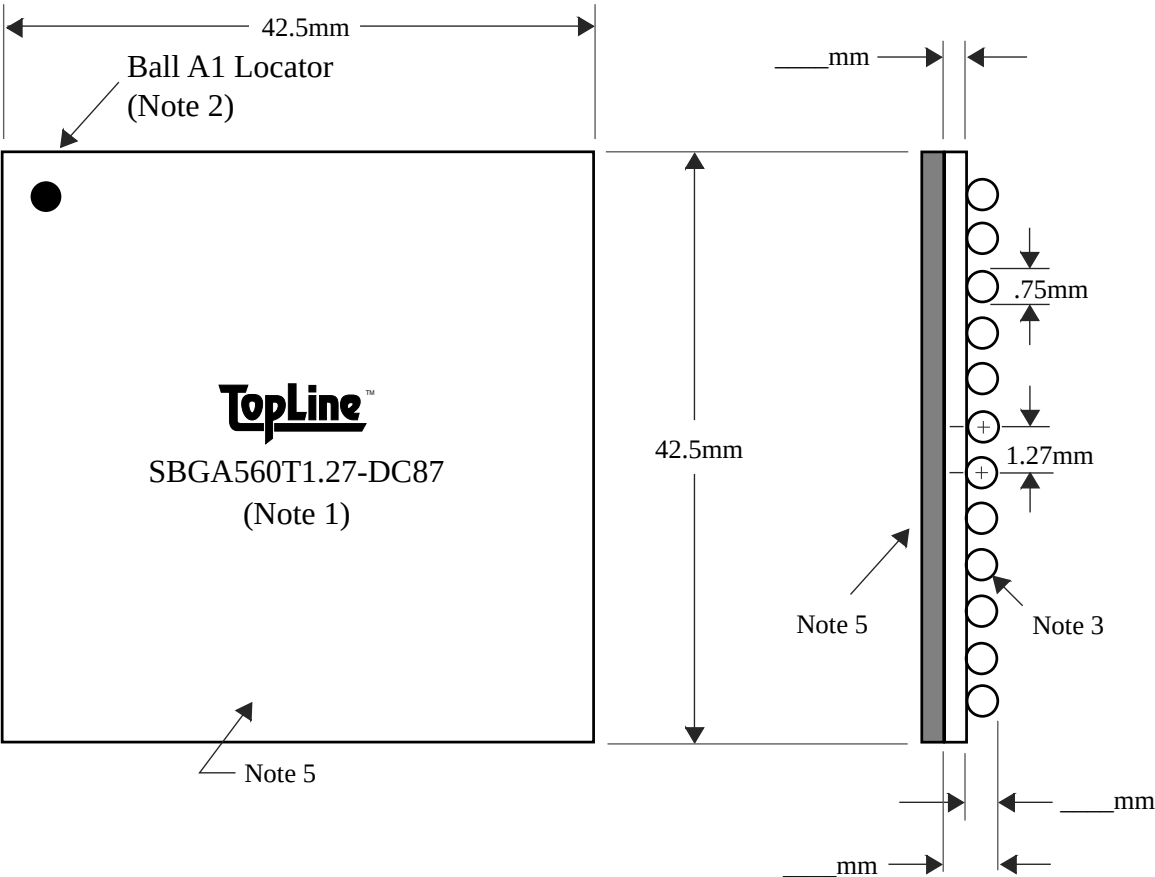


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
560	1.27mm	42.5mm	33 x 33	5	no	BT

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 63/37 SnPb			
Note 4	Substrate Material: BT laminate			
Note 5	Metal heat sink. Die cavity down			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY42.5-2x6		
		Tray Quantity 12		
		Tray Suppliers (ref):		



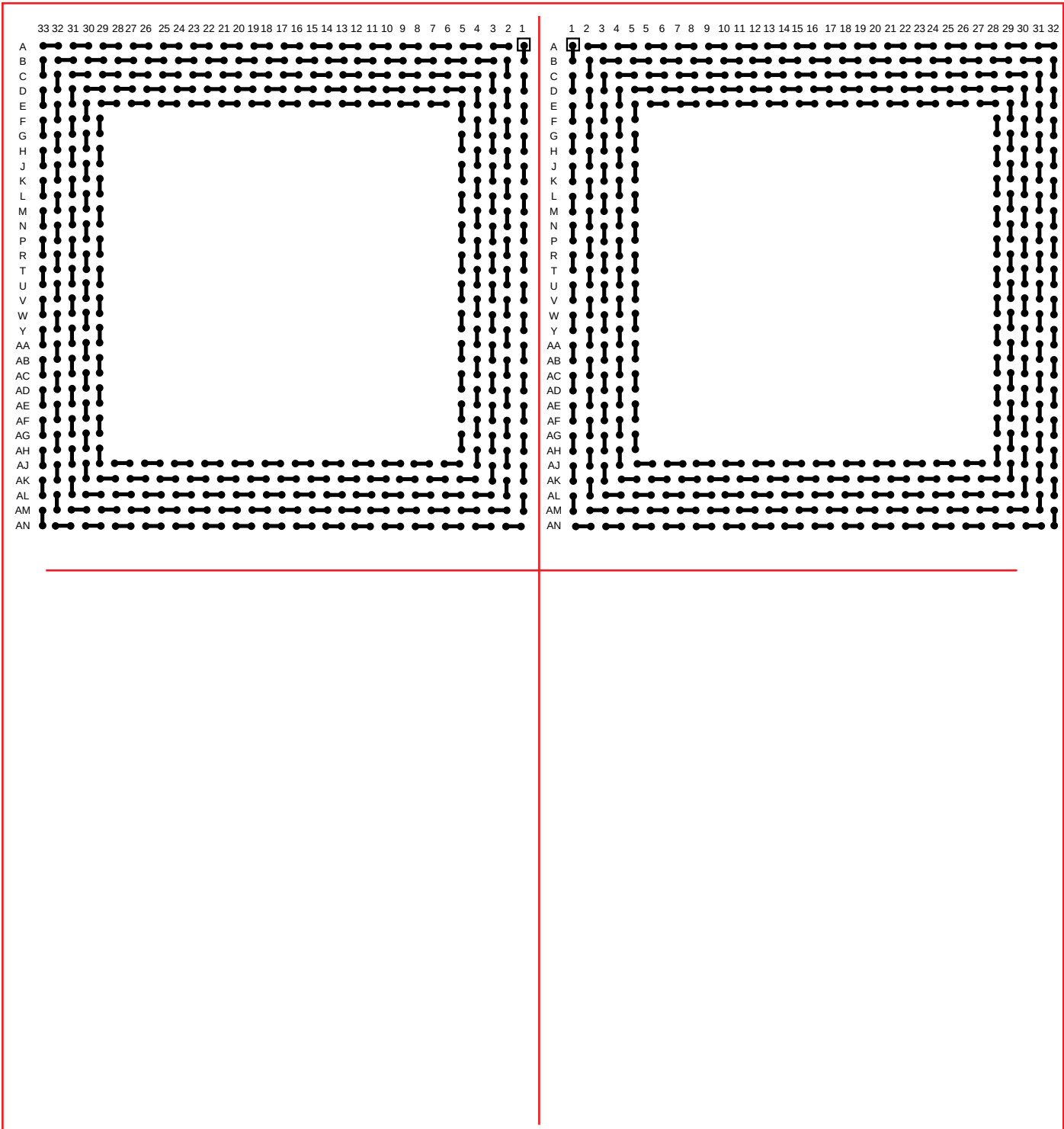
TEL 1-714-898-3830
FAX 1-714-891-0321

LBGA560T1.27-DC335

	BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
	560	1.27mm	42.5mm SQ	33 x 33	5	none	FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

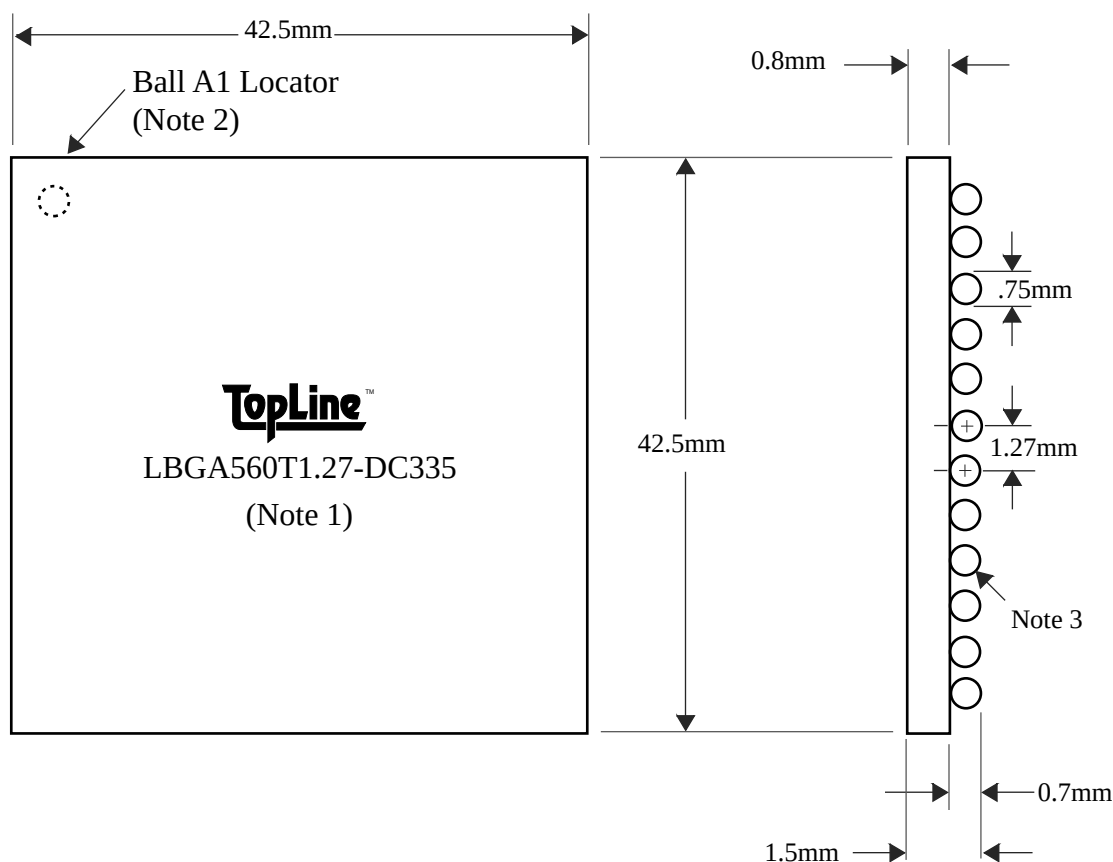
LBGA560T1.27-DC335

TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830 FAX 1-714-891-0321
560	1.27mm	42.5mm SQ	33 x 33	5	none	FR4	

TOP VIEW

SIDE VIEW

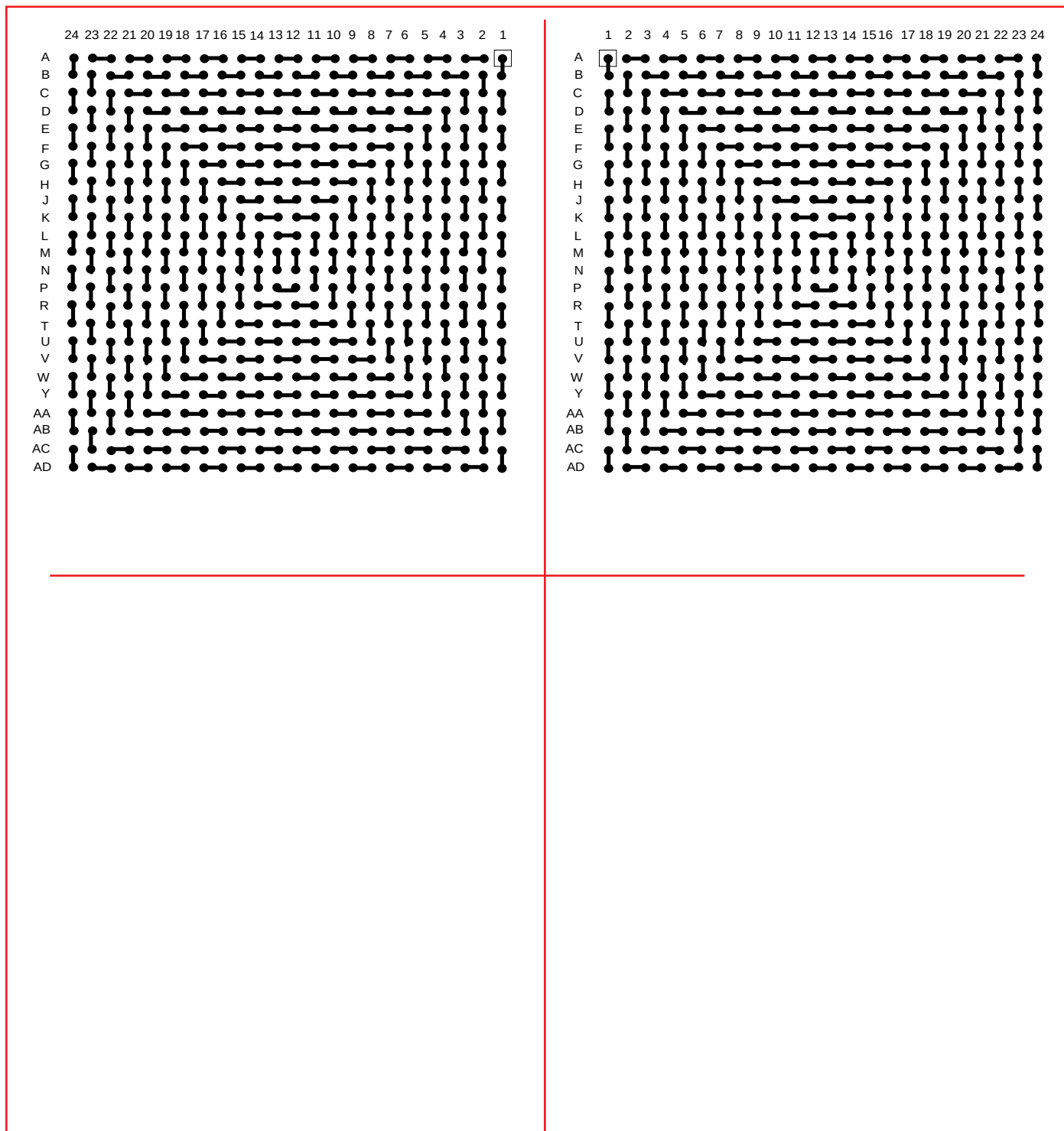


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY42.5-6x12 Tray Quantity 12 Tray Suppliers (ref):		

	<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
	576	1.0mm	25mm SQ	24 x 24	full	full	FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



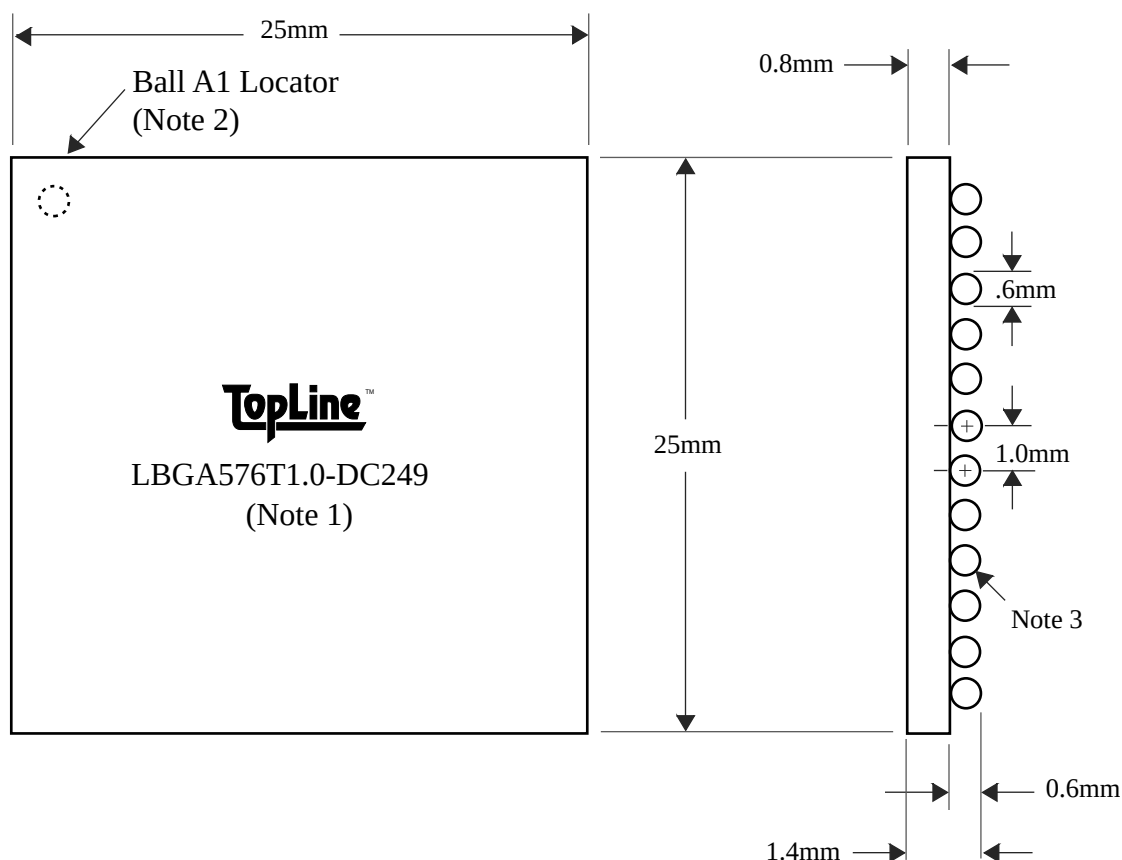
TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

TopLine™

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
576	1.0mm	25mm SQ	24 x 24	full	full	FR4

SIDE VIEW

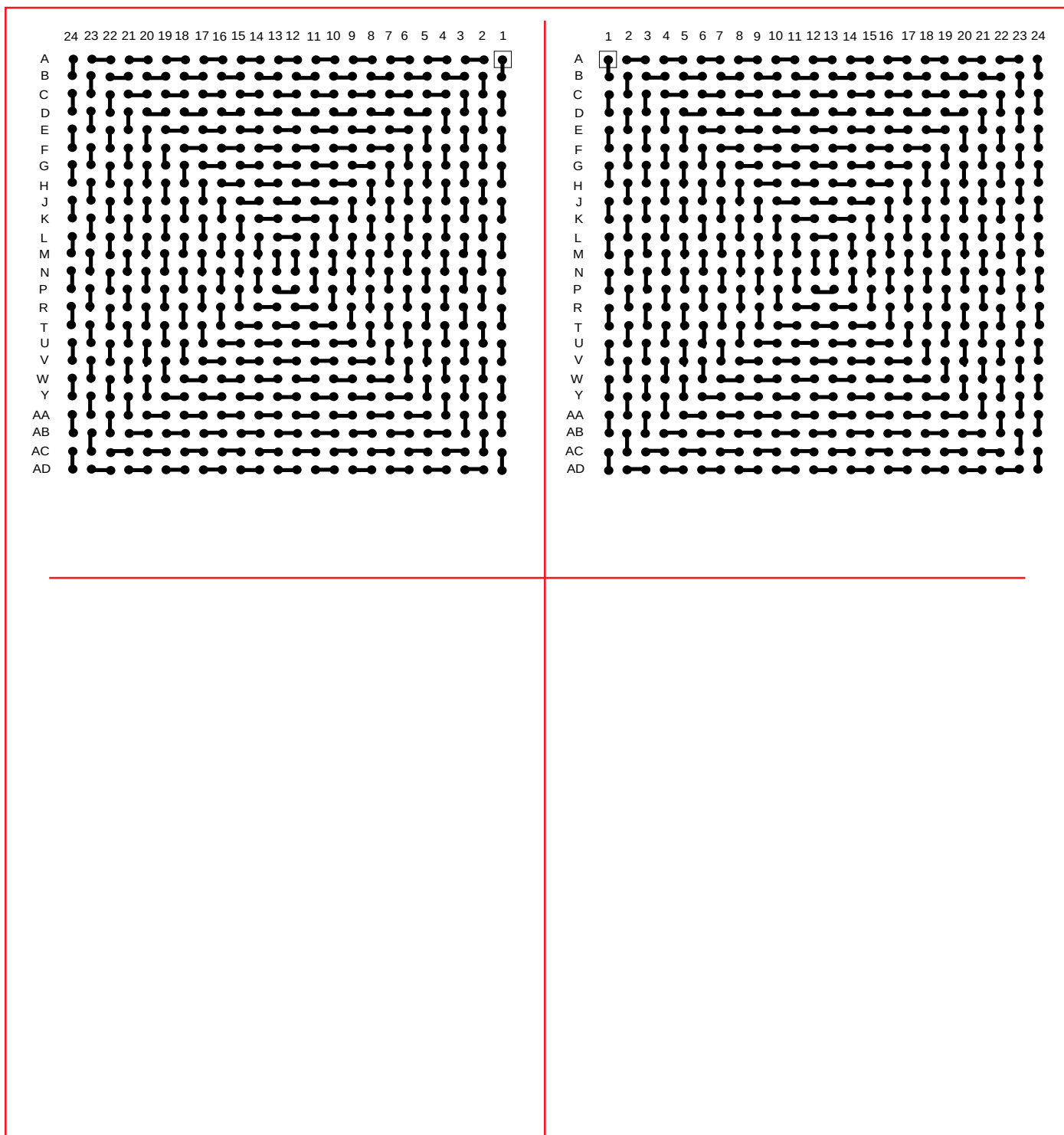


NOTES		REVISIONS	
Note 1	Logo and part number centered White ink on black solder mask	<u>Rev</u>	<u>Date</u> <u>Changes</u>
		11/14/98	Proposed Design
Note 2	Ball A1 locator mark positioned in corner		
Note 3	Ball Material: 62/36/2 SnPbAg		
Note 4	Substrate Material: FR4 laminate		
		PACKAGING TRAYS (SEE NOTE 4)	
		Tray BGATRAY25mm-4x11	
		Tray Quantity 44	
		Tray Suppliers (ref):	
		Camtex	
		Peak	

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
576	1.27mm	32.5mm SQ	24 x 24	24	full	ceramic

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

CBGA576T1.27-DC249

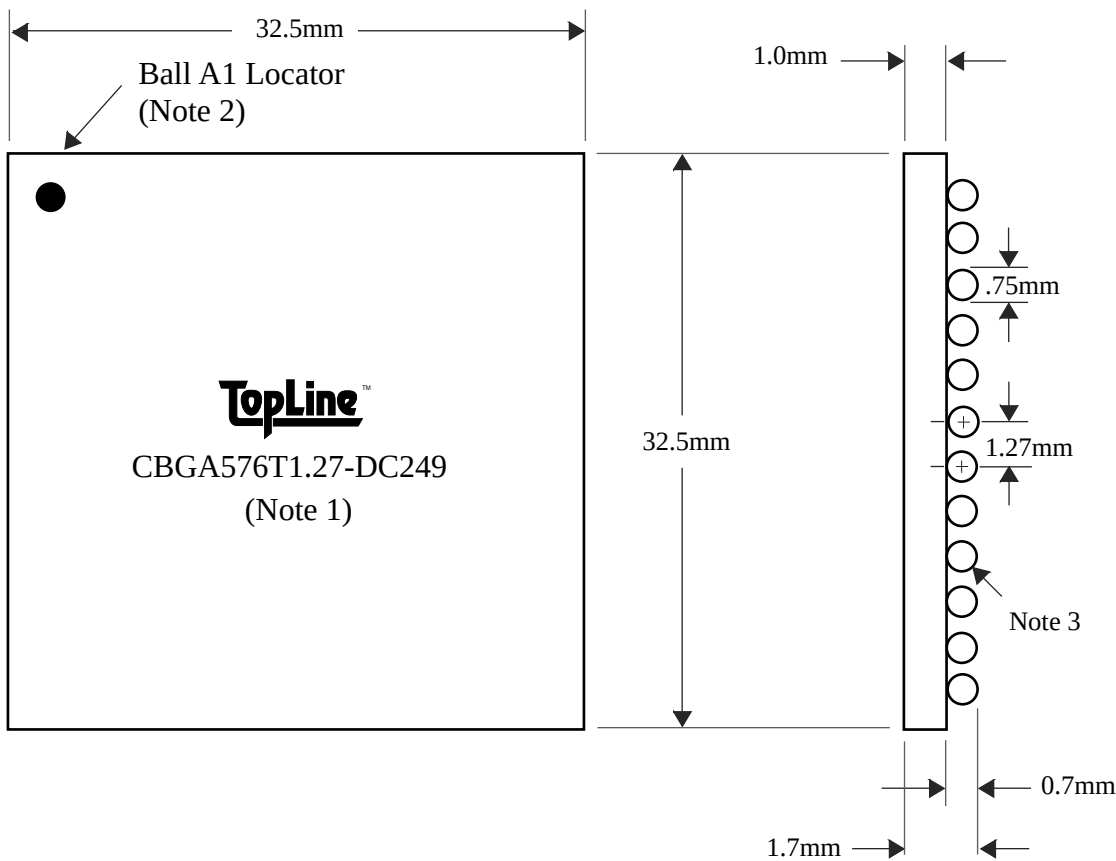


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
576	1.27mm	32.5mm SQ	24 x 24	full	full	ceramic

TEL 1-714-898-3830
FAX 1-714-891-0321

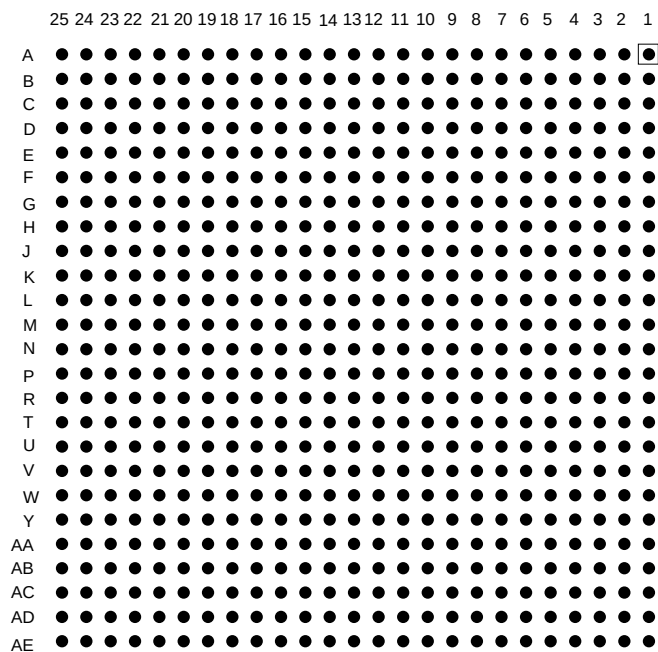
TOP VIEW

SIDE VIEW

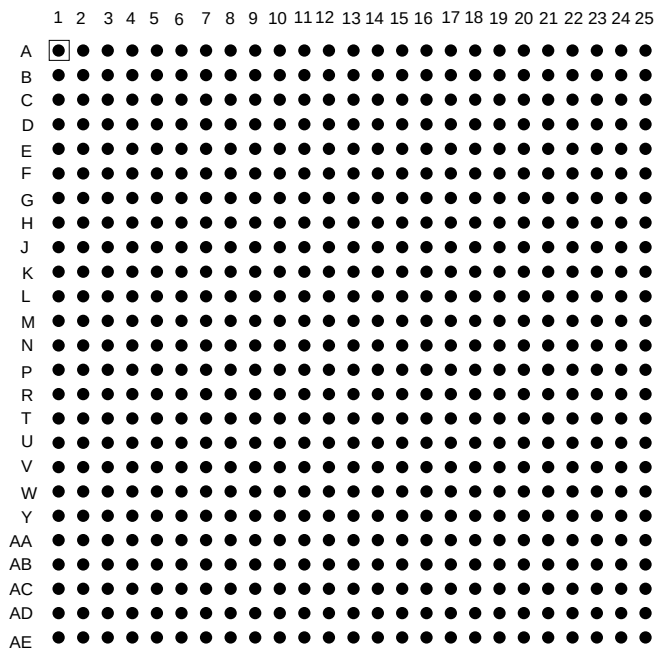
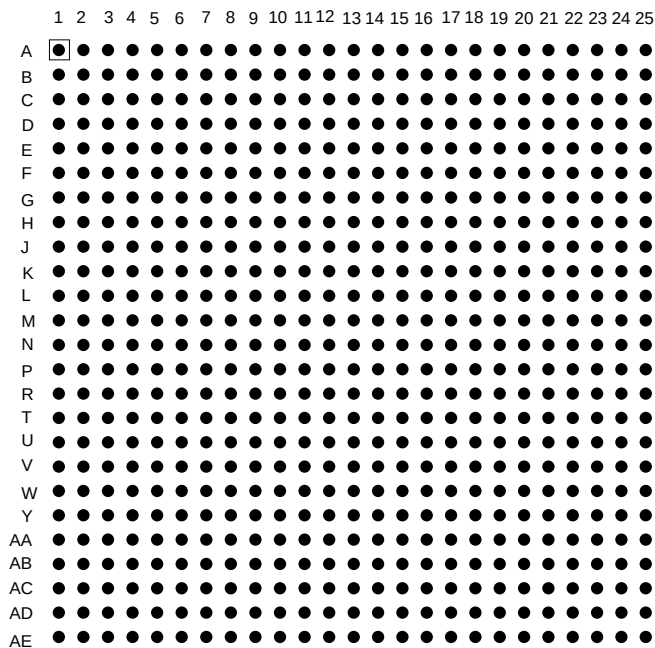


NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 10/90 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: Ceramic	Tray BGATRAY35mm-3x8 Tray Quantity 24 Tray Suppliers (ref): Camtex Peak		

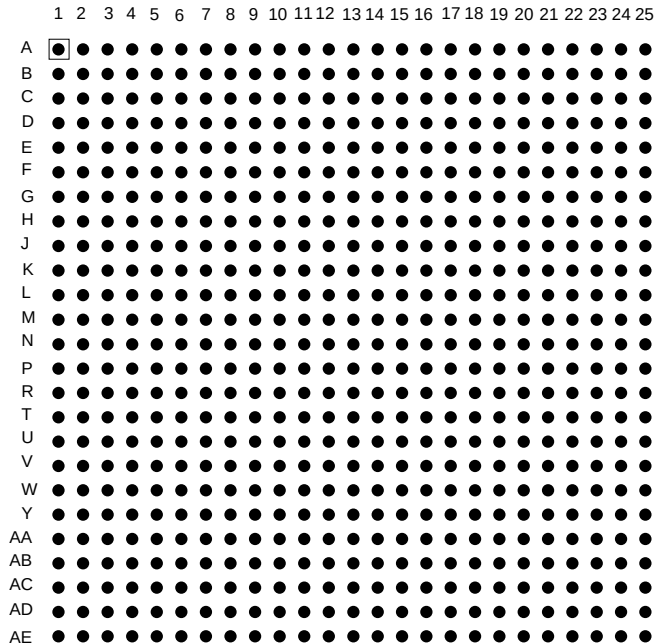
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

CBGA625T1.27-ISO

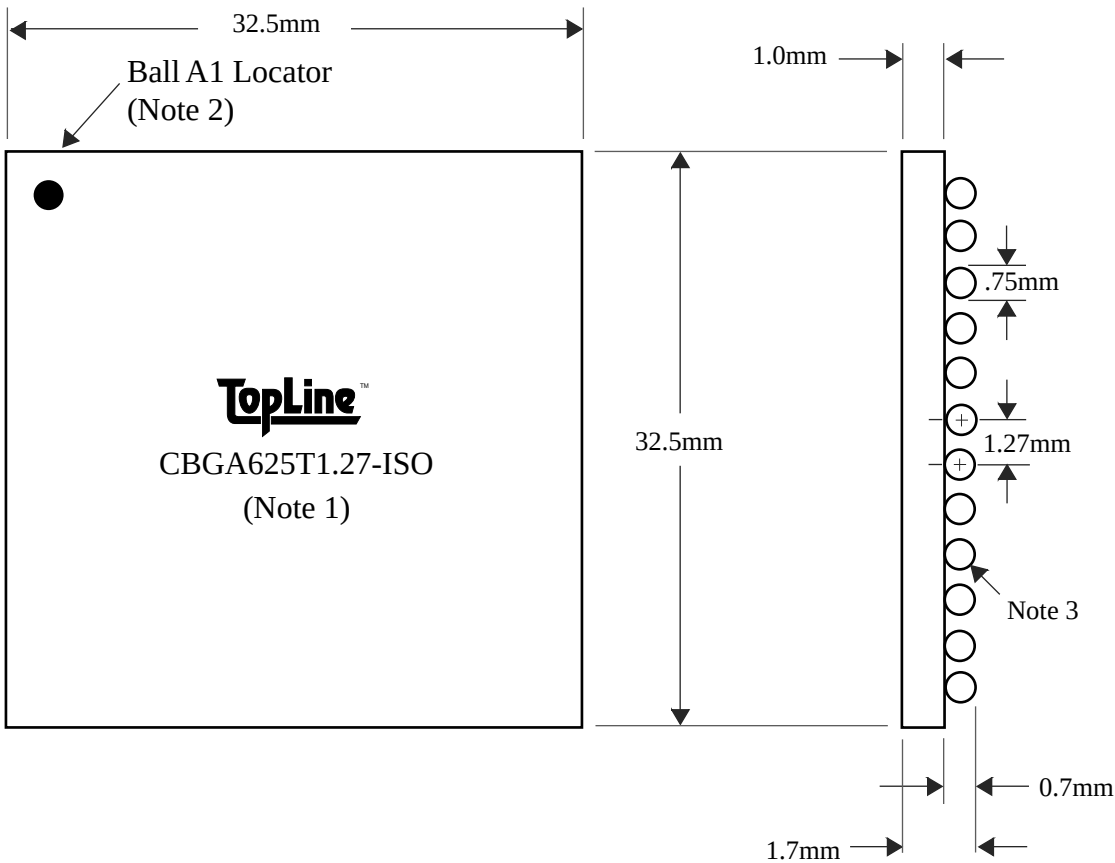


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
625	1.27mm	32.5mm SQ	25 x 25	full	full	ceramic

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 10/90 SnPb			
Note 4	Substrate Material: Ceramic			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY35mm-3x8 Tray Quantity 24 Tray Suppliers (ref):		



TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

625

PITCH

1.27mm

SIZE

32.5mm SQ

CBGA625T1.27L-ISO

MATRIX

25 x 25

ROWS

full

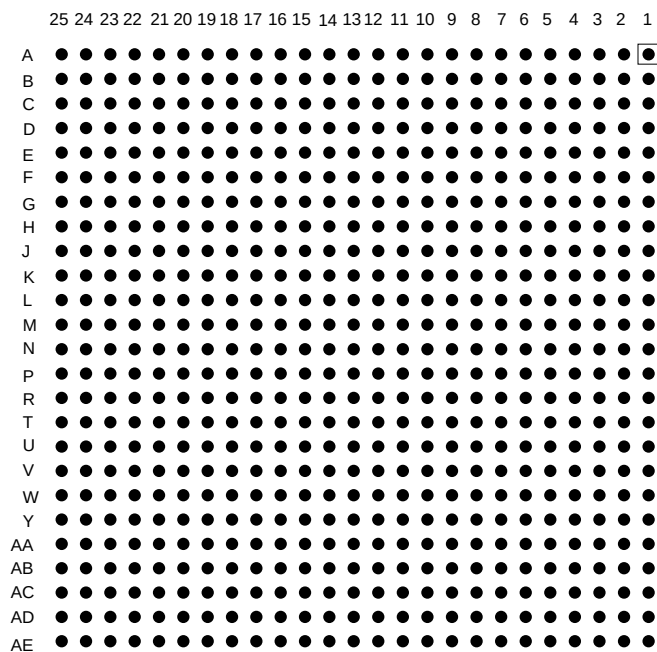
CENTER

full

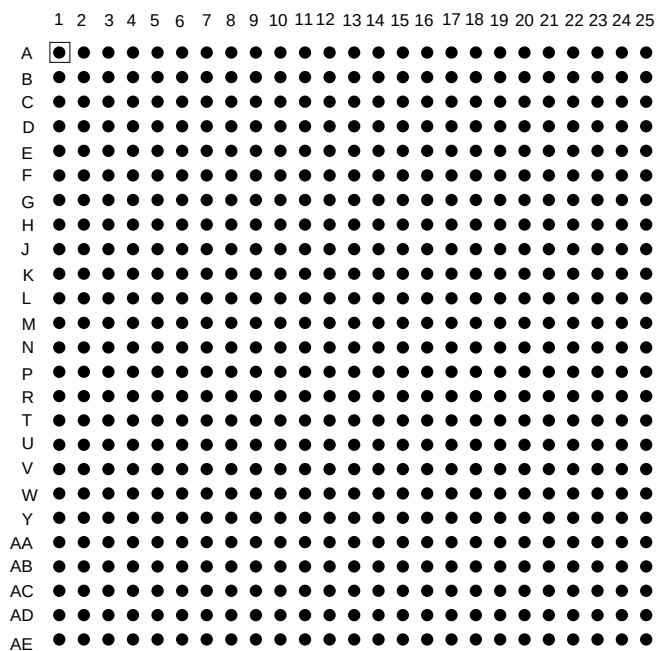
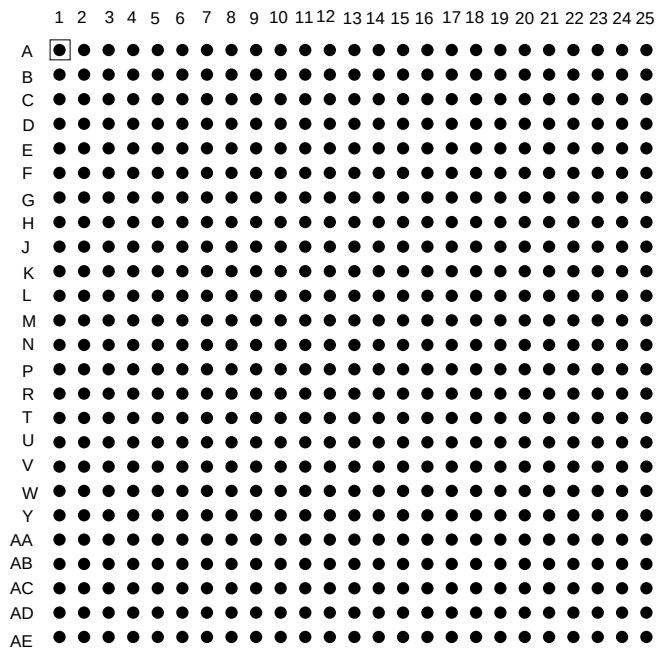
MAT'L

ceramic

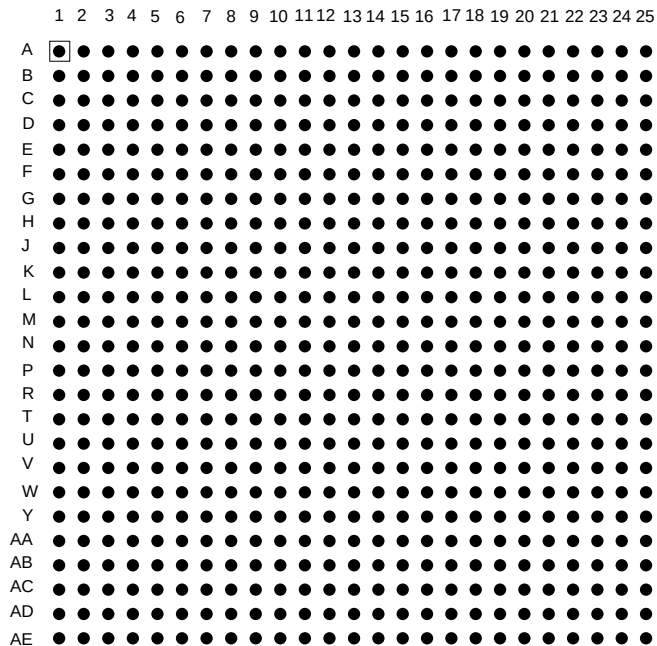
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

CBGA625T1.27L-ISO

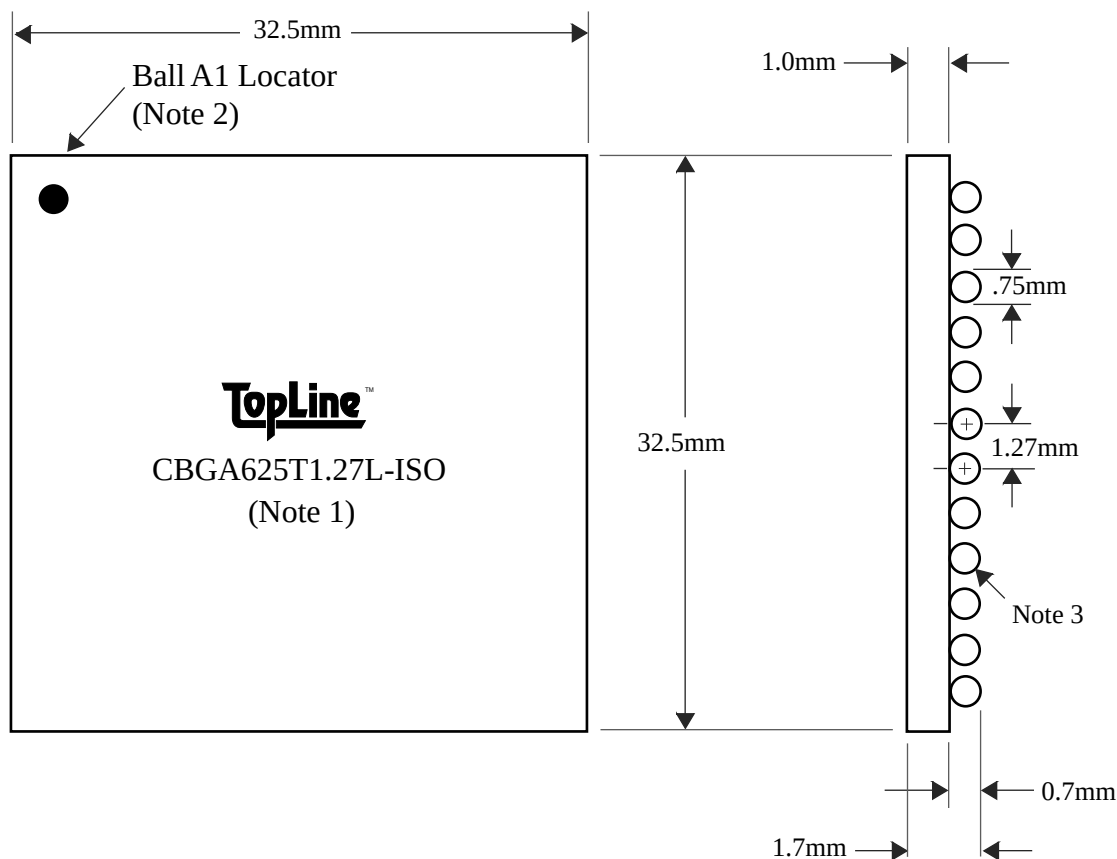
TopLine™

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
625	1.27mm	32.5mm SQ	25 x 25	full	full	ceramic

TEL 1-714-898-3830
FAX 1-714-891-0321

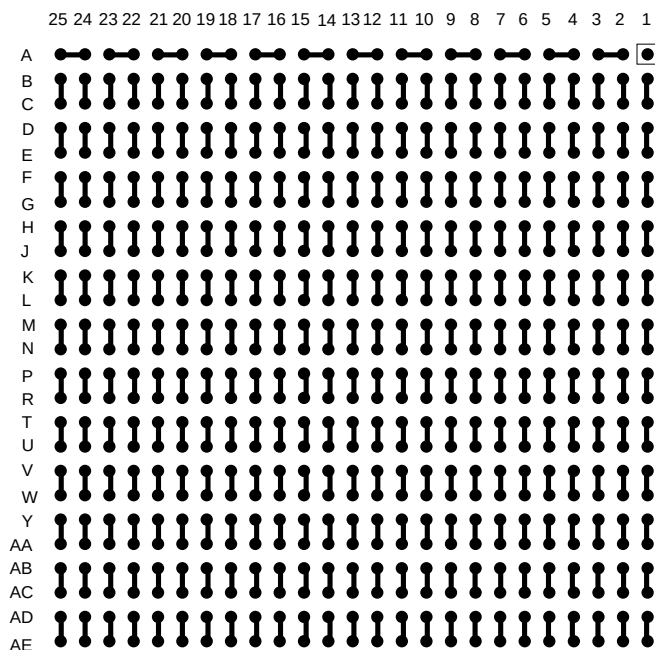
TOP VIEW

SIDE VIEW

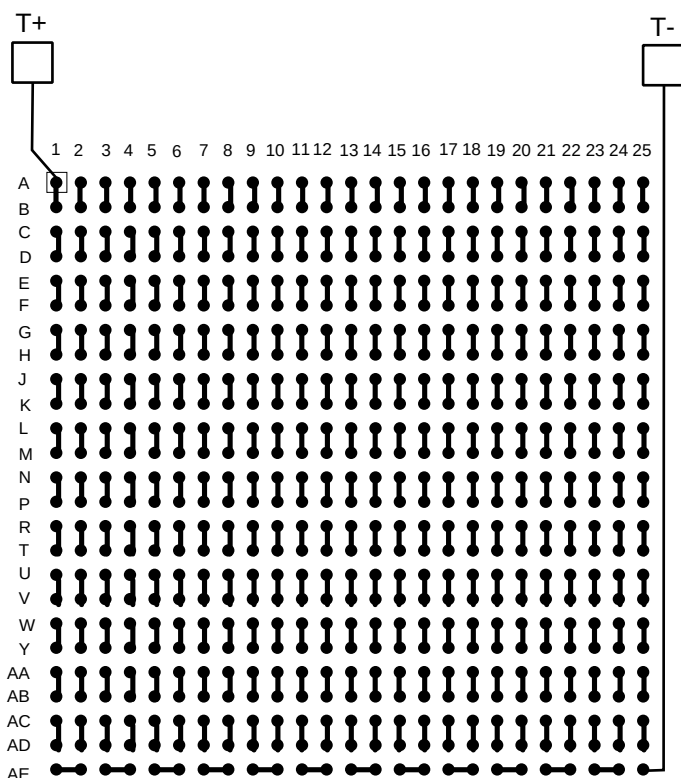
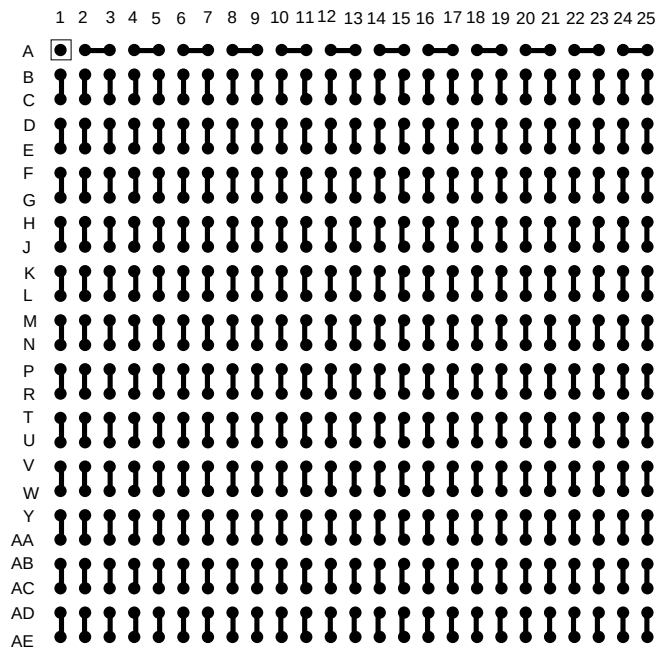


NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 62/36/2 SnPbAg			
Note 4	Substrate Material: Ceramic			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY35mm-3x8 Tray Quantity 24 Tray Suppliers (ref): Camtex Peak		

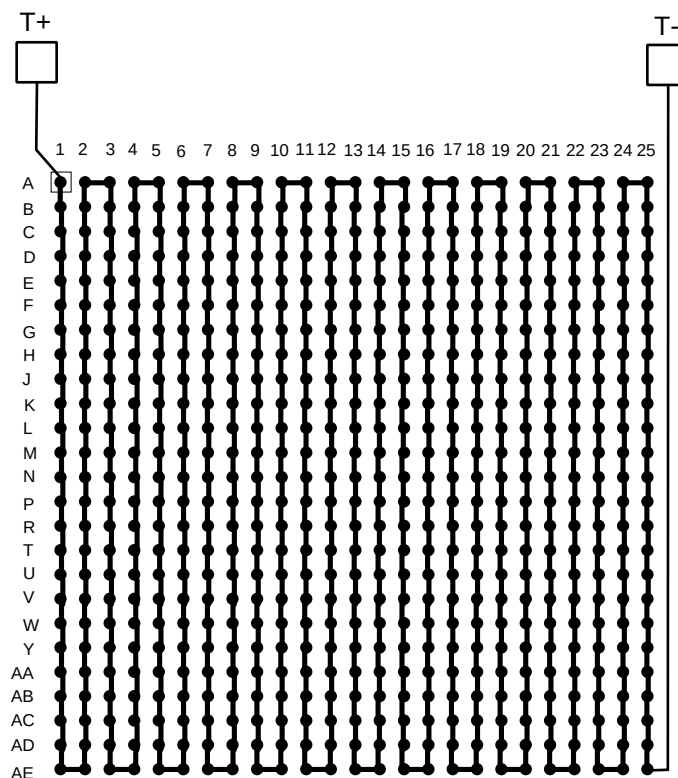
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

CBGA625T1.27-DC81

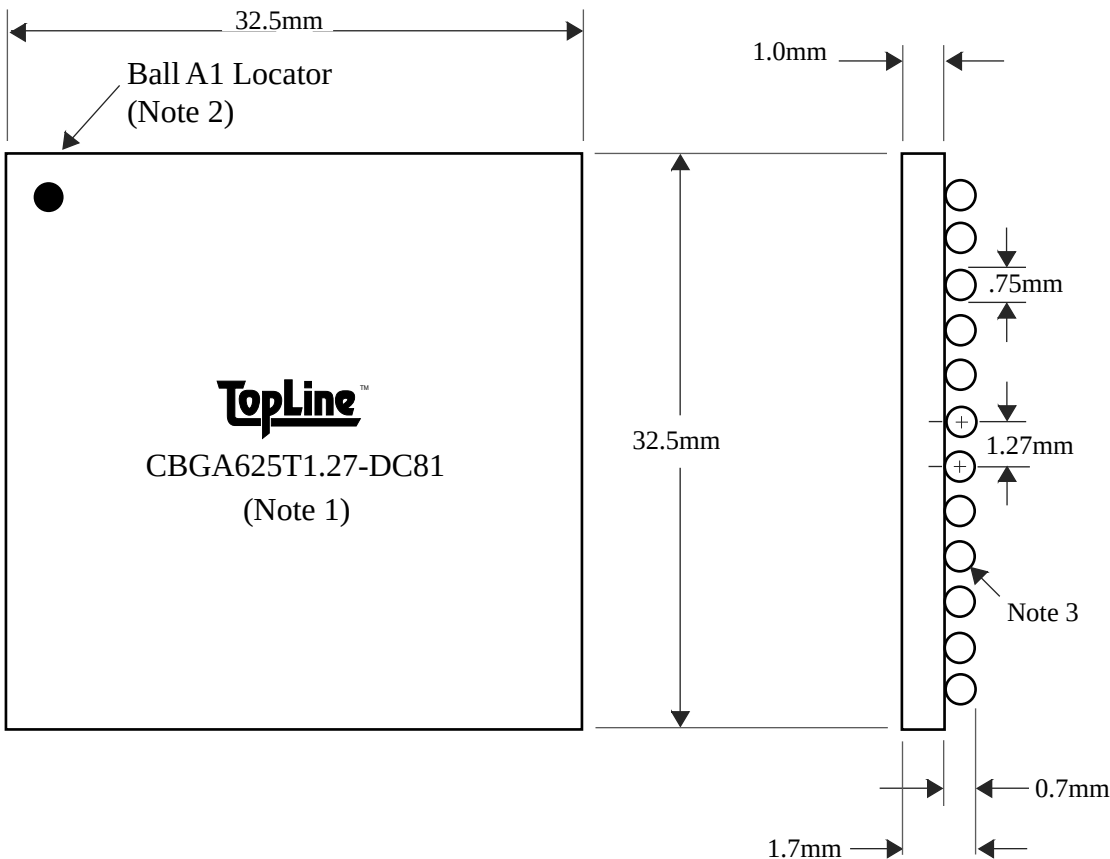
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
625	1.27mm	32.5mm SQ	25 x 25mm	full	full	ceramic

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

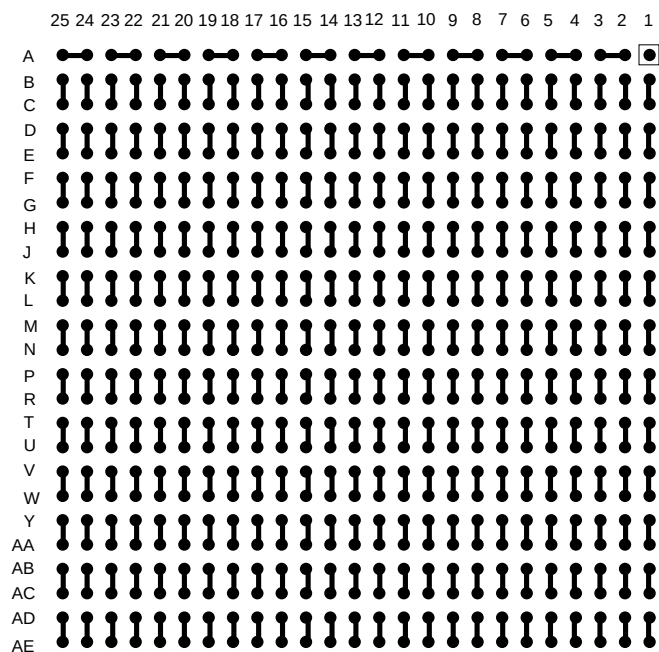


NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 10/90 SnPb			
Note 4	Substrate Material: Ceramic			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY35mm-3x8 Tray Quantity 24 Tray Suppliers (ref): Camtex Peak		

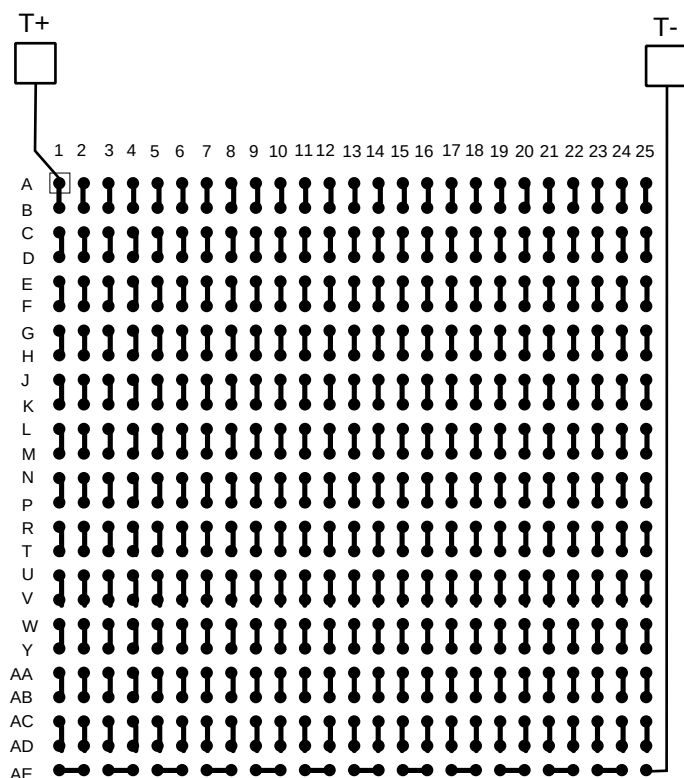
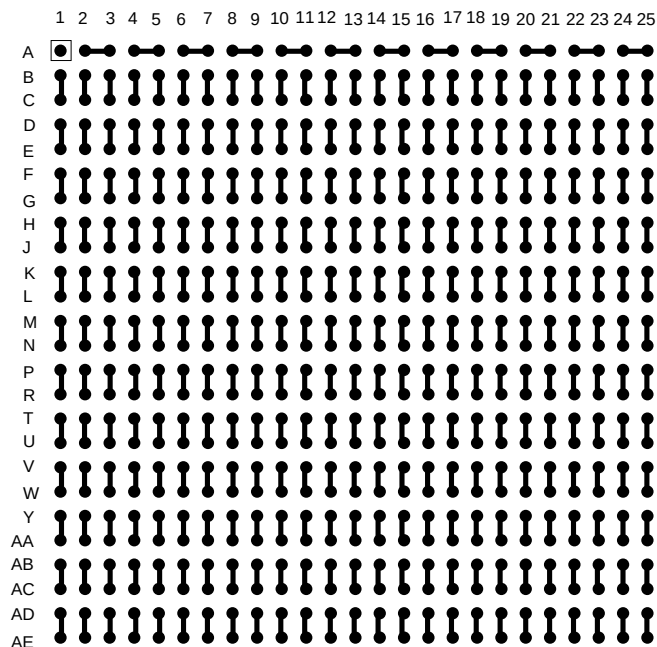
TEL 1-714-898-3830
FAX 1-714-891-0321

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
625	1.27mm	32.5mm SQ	25 x 25mm	full	full	ceramic

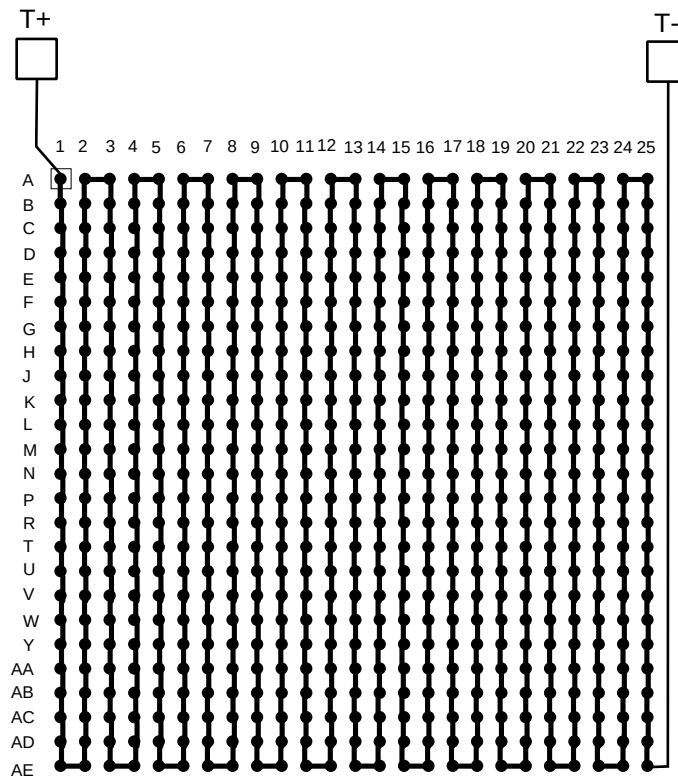
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

CBGA625T1.27L-DC81

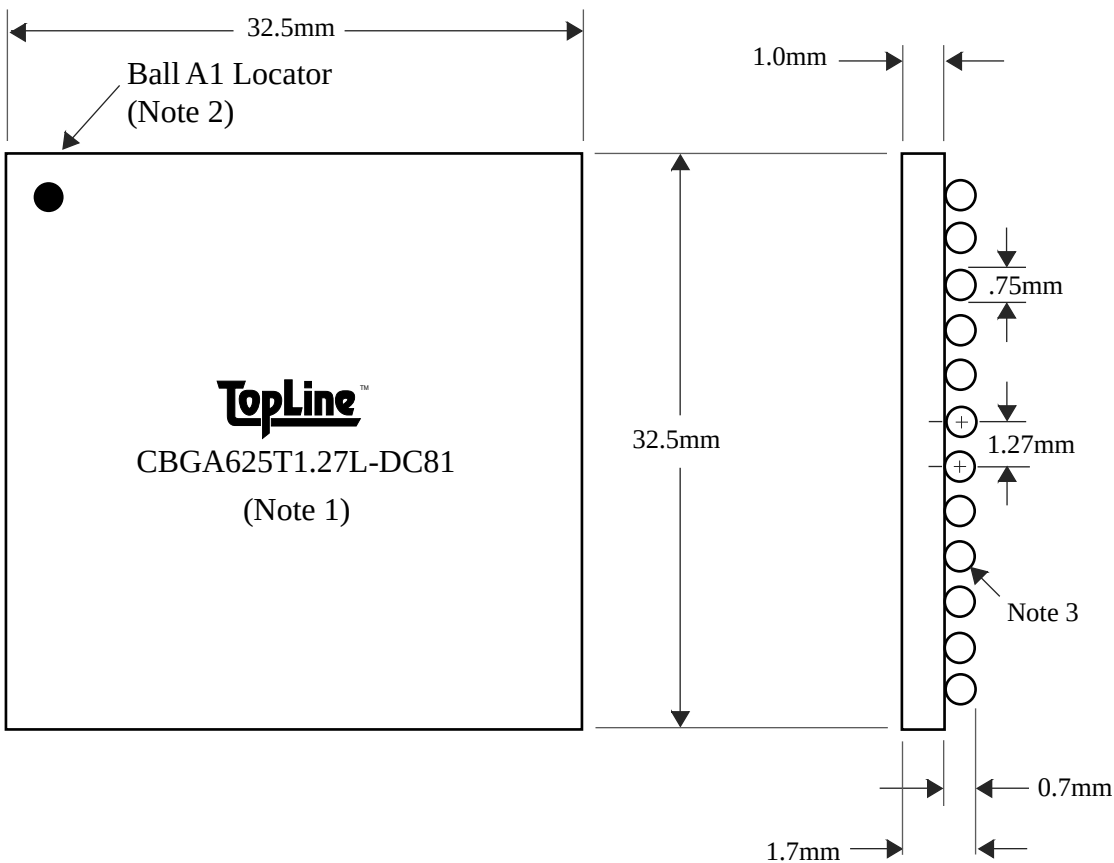
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
625	1.27mm	32.5mm SQ	25 x 25mm	full	full	ceramic

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner			
Note 3	Ball Material: 62/36/2 SnPbAg			
Note 4	Substrate Material: Ceramic			
		PACKAGING TRAYS (SEE NOTE 4)		
		Tray BGATRAY35mm-3x8 Tray Quantity 24 Tray Suppliers (ref): CAMTEX PEAK		

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

625

PITCH

1.27mm

SIZE

32.5mm SQ

MATRIX

25 x 25mm

ROWS

full

CENTER

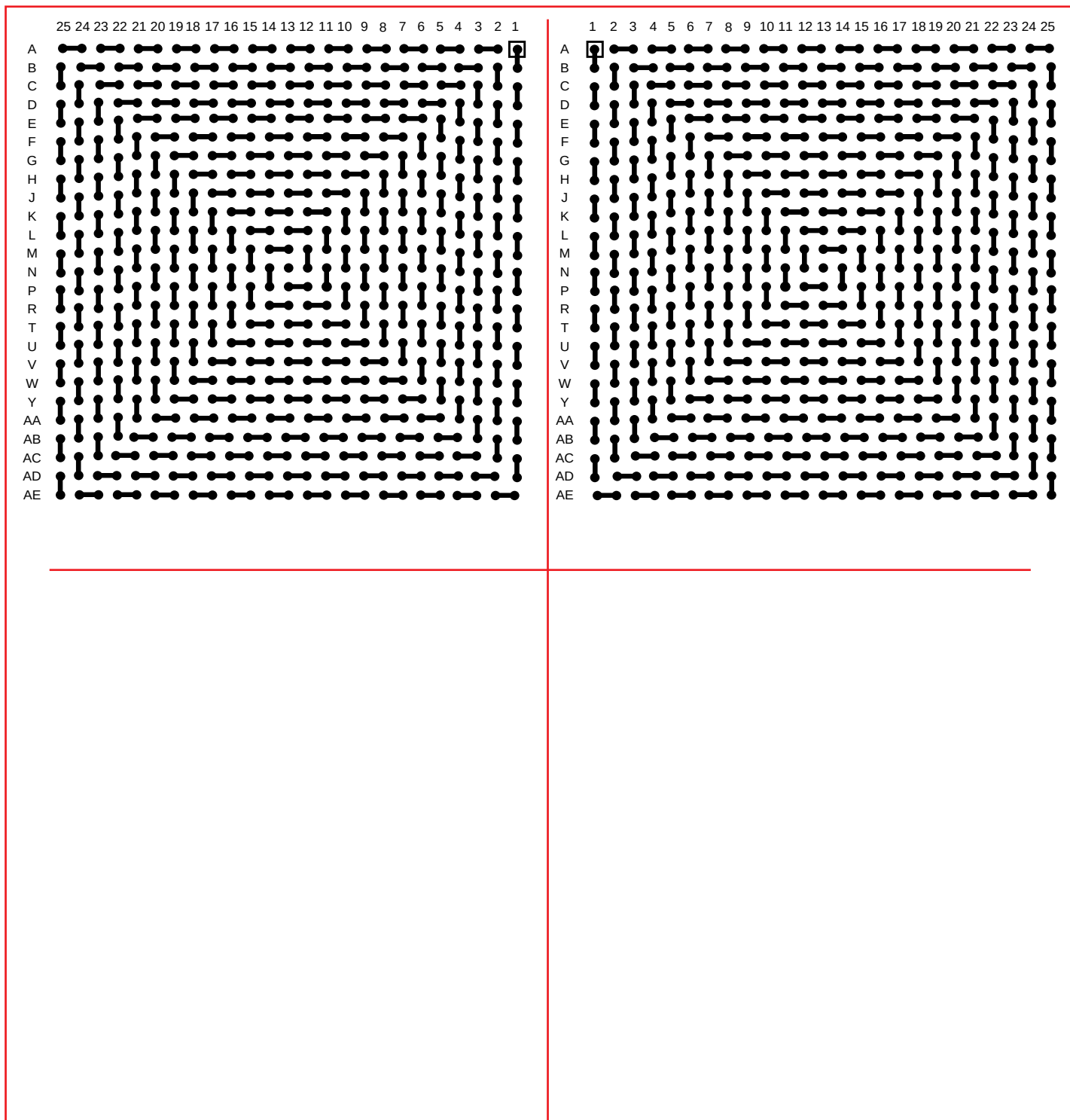
full

MAT'L

ceramic

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

CGA625T1.27-DC259

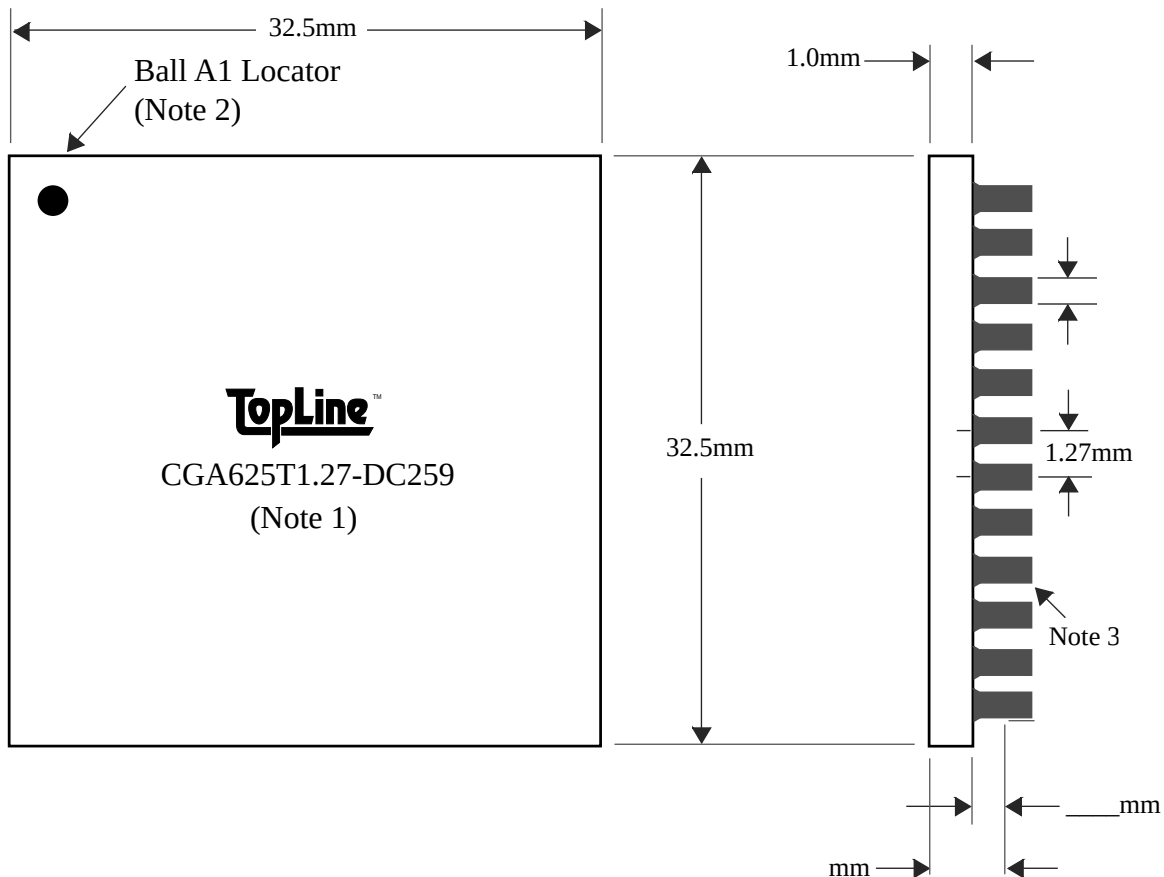
TopLine™

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
625	1.27mm	32.5mm SQ	25 x 25mm	full	full	ceramic

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Column A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Column Material: 63/37	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: Ceramic	Tray CGATRAY32.5-3x8 Tray Quantity 24 Tray Suppliers (ref):		



TEL 1-714-898-3830
FAX 1-714-891-0321

CGA625T1.27-DC259A

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
625	1.27mm	32.5mm SQ	25 x 25mm	full	full	ceramic

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

CGA625T1.27-DC259A

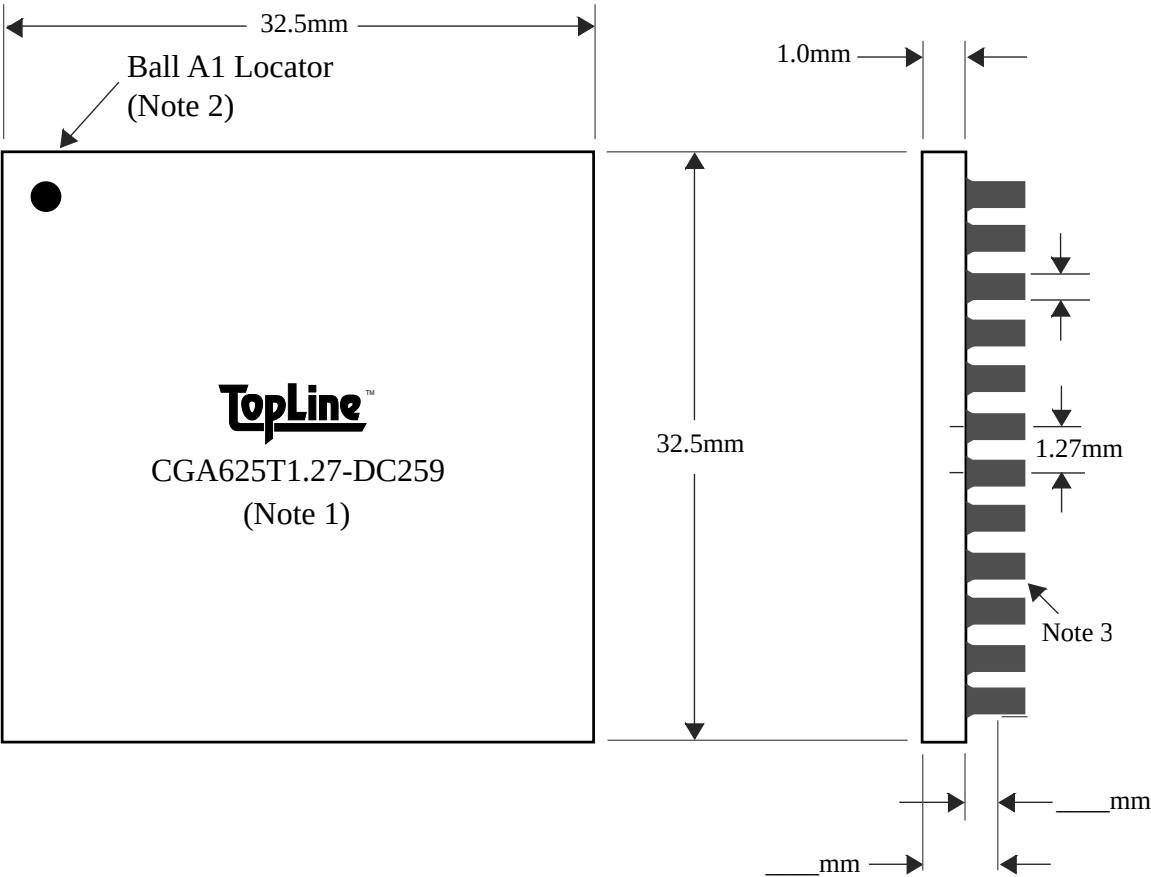


<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
625	1.27mm	32.5mm SQ	25 x 25mm	full	full	ceramic

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Column A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Column Material: 63/37	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: Ceramic	Tray CGATRAY32.5-3x8 Tray Quantity 24 Tray Suppliers (ref):		

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

676

PITCH

1.0mm

SIZE

27mm SQ

MATRIX

26 x 26mm

ROWS

full

CENTER

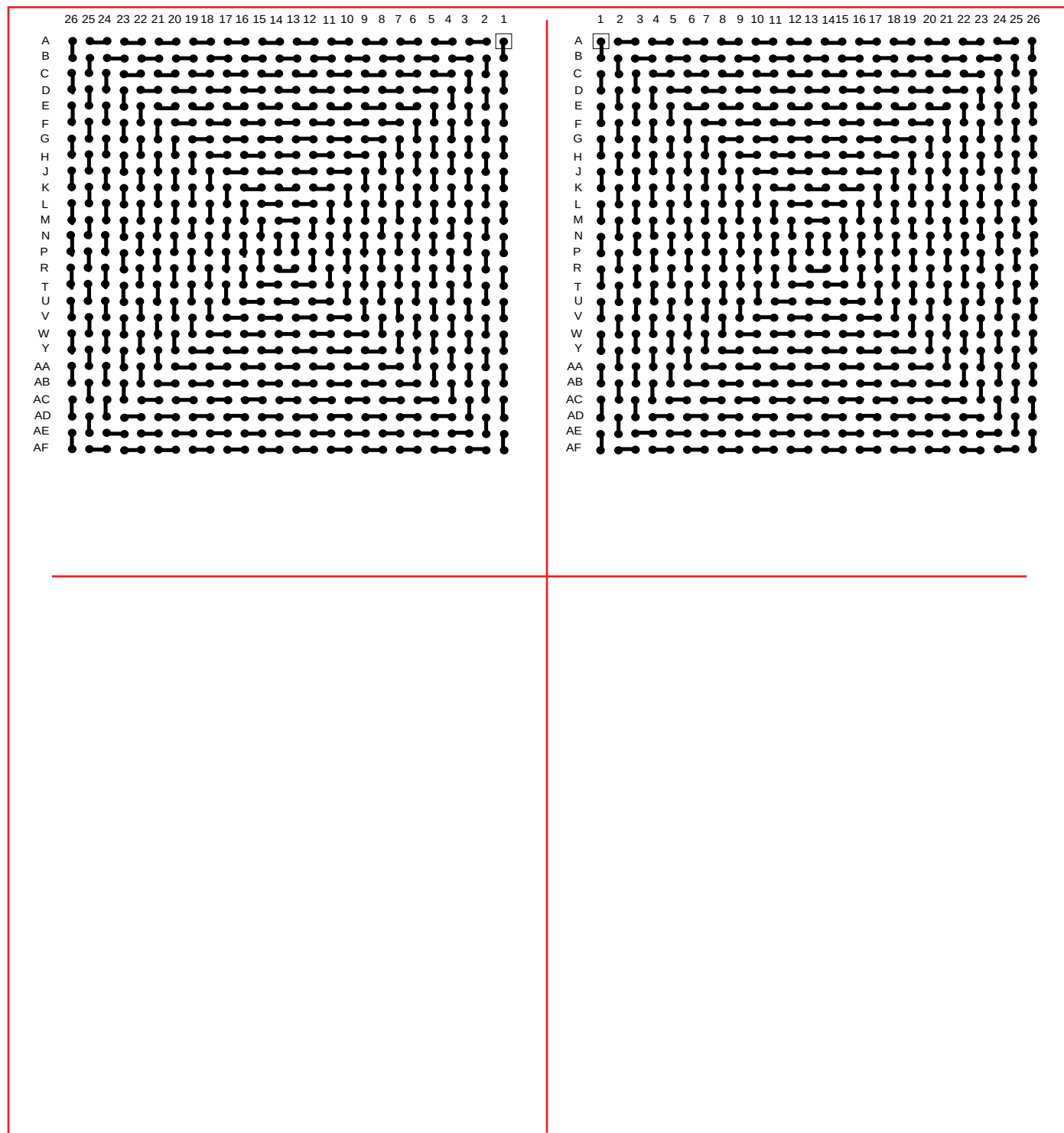
full

MAT'L

FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

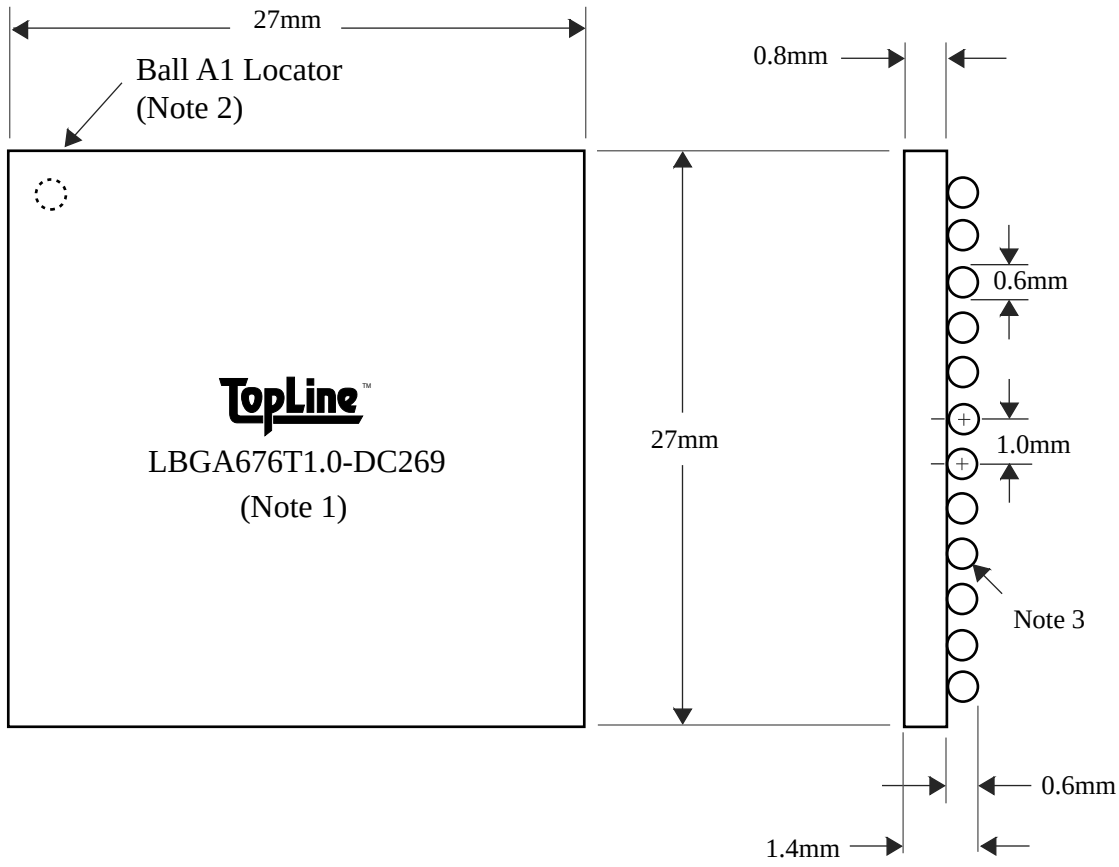
LBGA676T1.0-DC269



BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830
676	1.0mm	27mm SQ	26 x 26mm	full	full	FR4	FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY27x27-4x10 Tray Quantity 40 Tray Suppliers (ref): CAMTEX PEAK		

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

676

PITCH

1.27mm

SIZE

35mm SQ

MATRIX

26 x 26mm

ROWS

full

CENTER

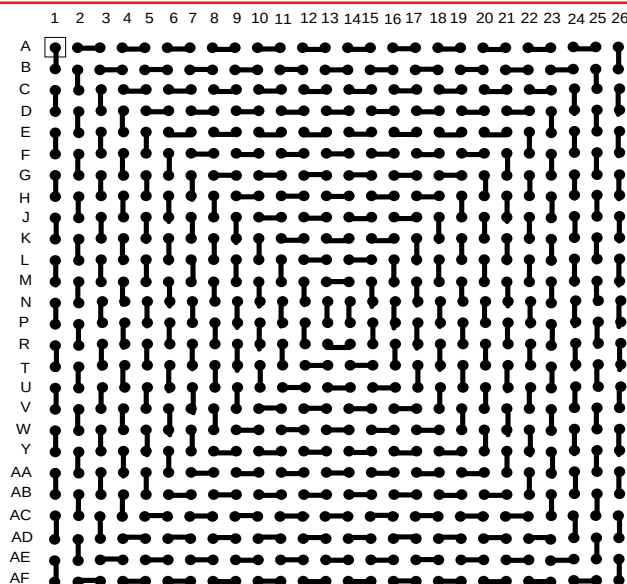
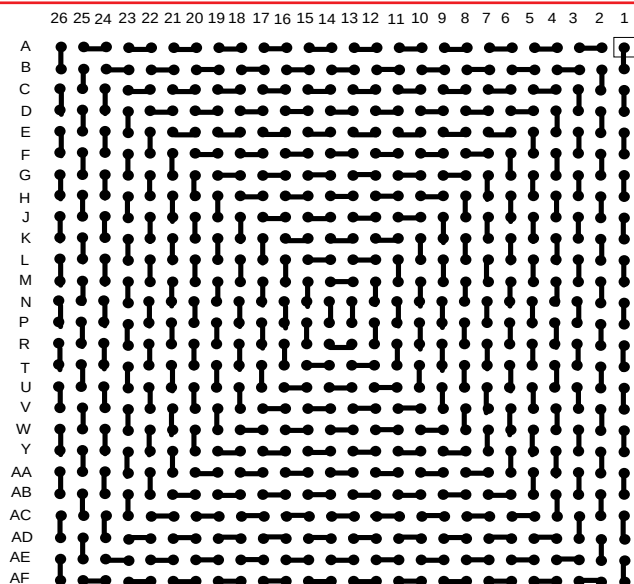
full

MAT'L

ceramic

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

CBGA676T1.27-DC269

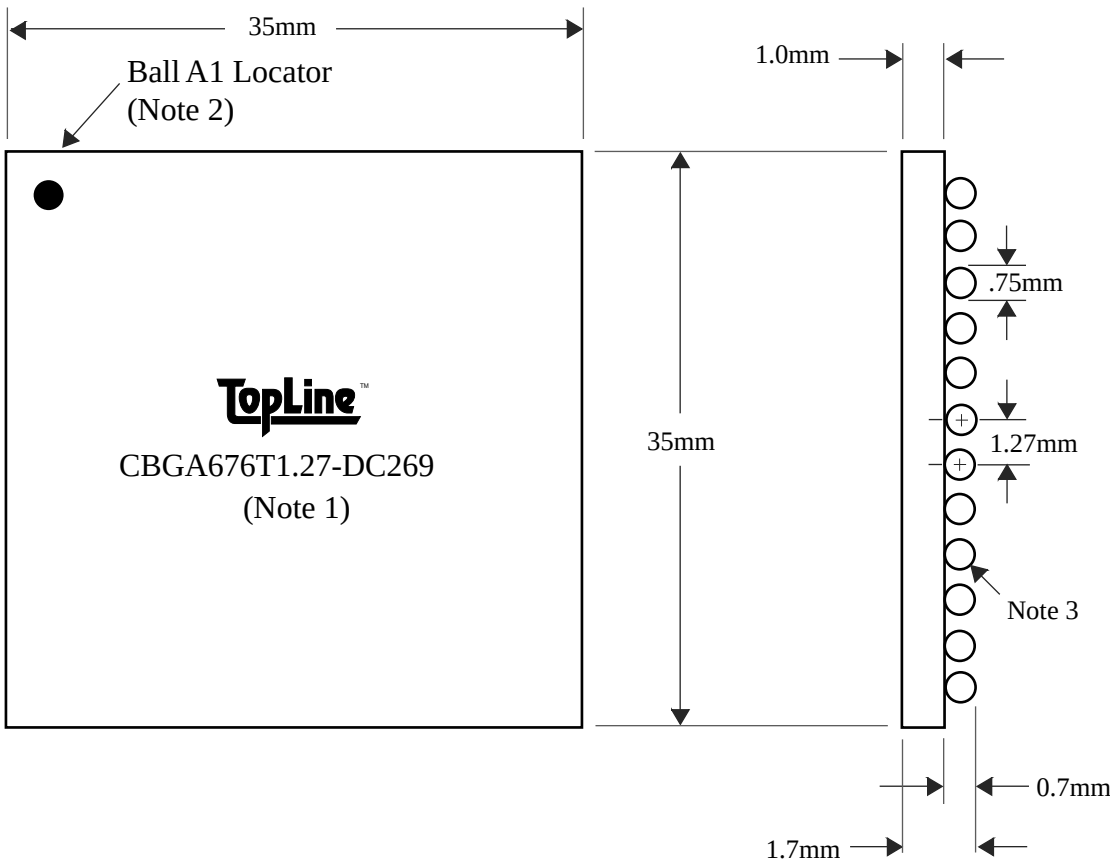
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
676	1.27mm	35mm SQ	26 x 26mm	full	full	ceramic

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

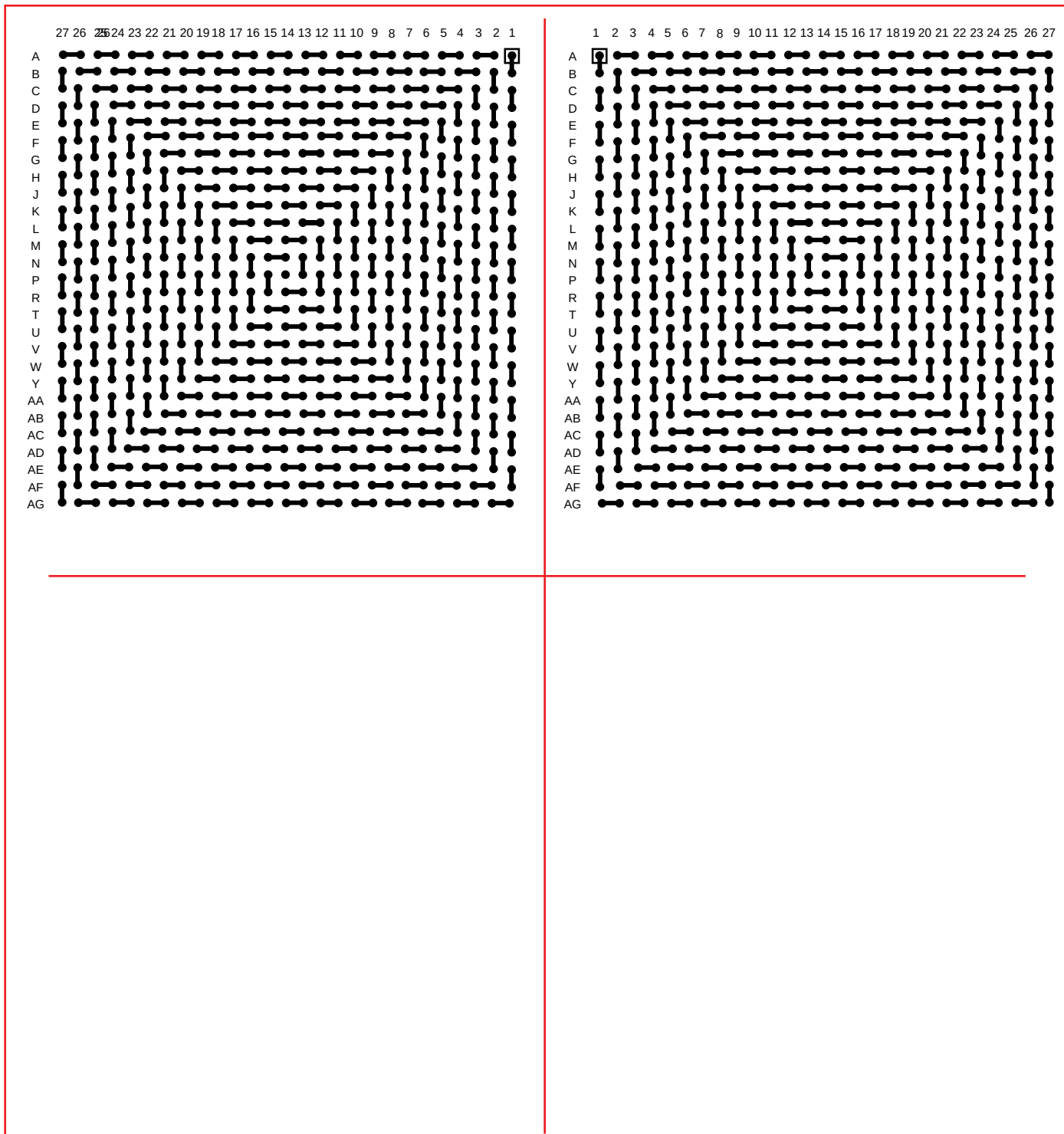


NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 10/90 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: Ceramic	Tray BGATRAY35mm-3x8 Tray Quantity 24 Tray Suppliers (ref): CAMTEX PEAK		

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
729	1.27mm	35mm SQ	27 x 27mm	full	full	ceramic

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



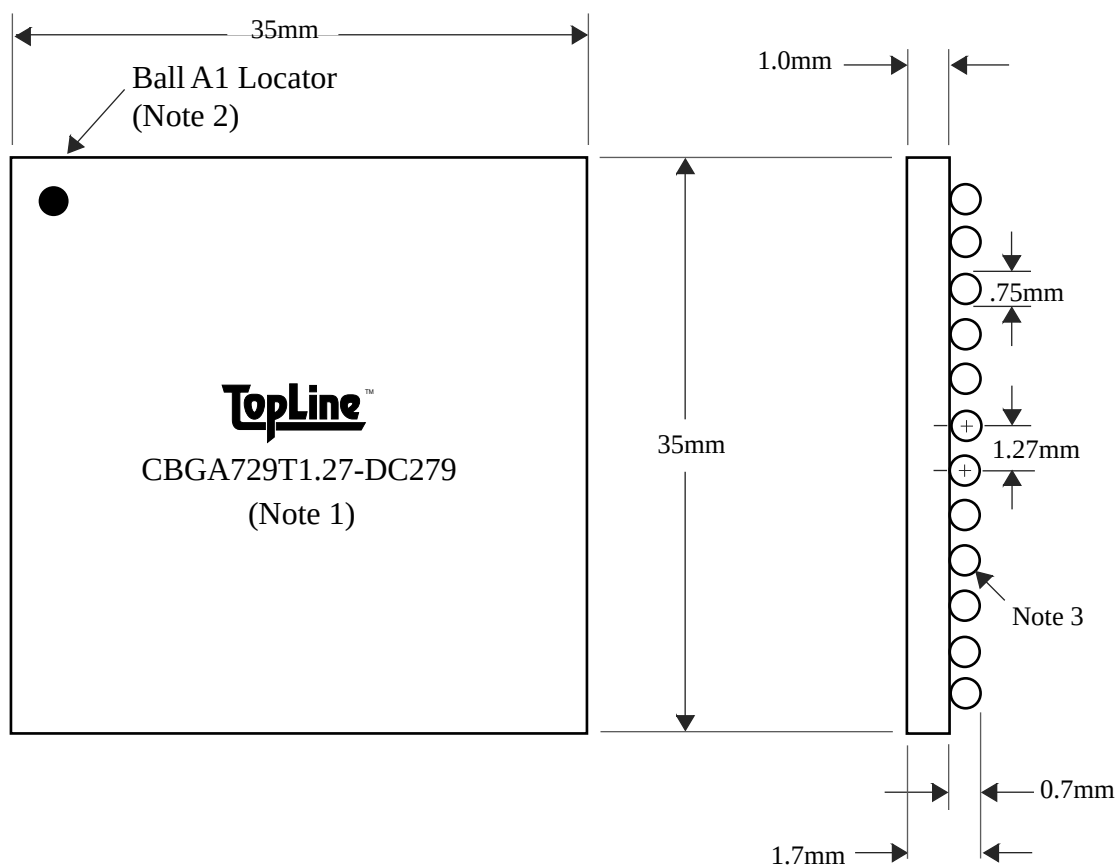
TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

TopLine™

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
729	1.27mm	35mm SQ	27 x 27mm	full	full	ceramic

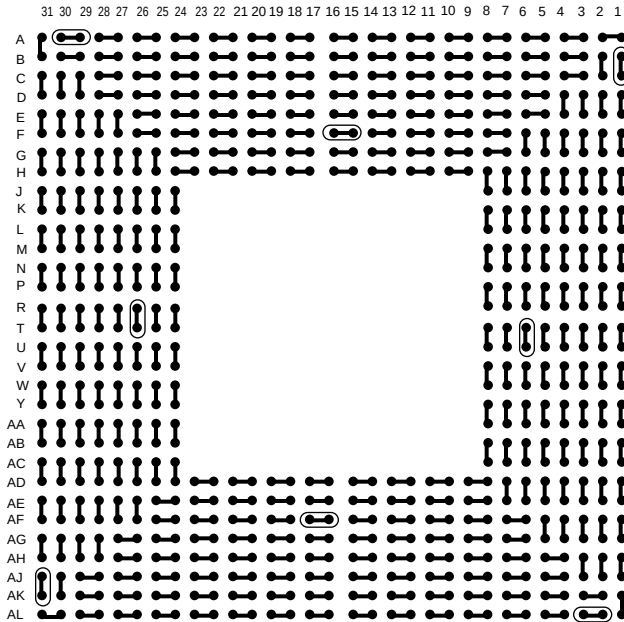
SIDE VIEW



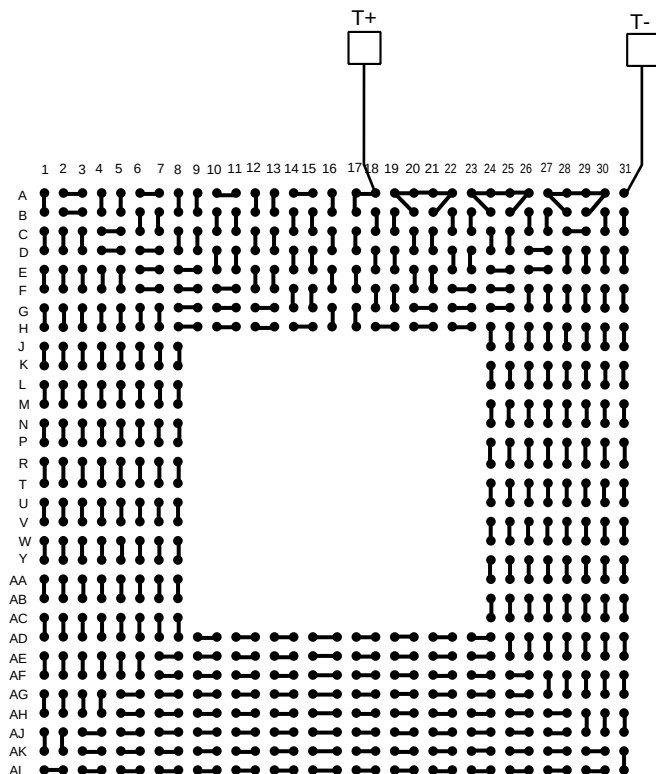
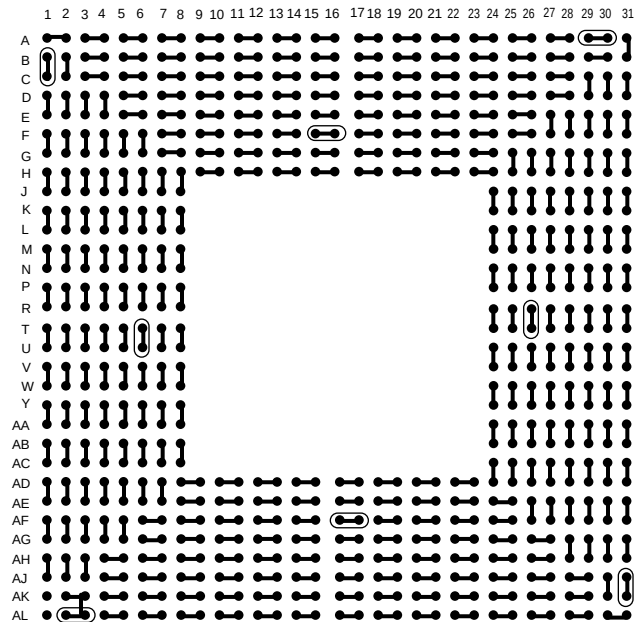
©1999 TopLine All Rights Reserved Rev 4/99

TBGA736T1.27-DC86

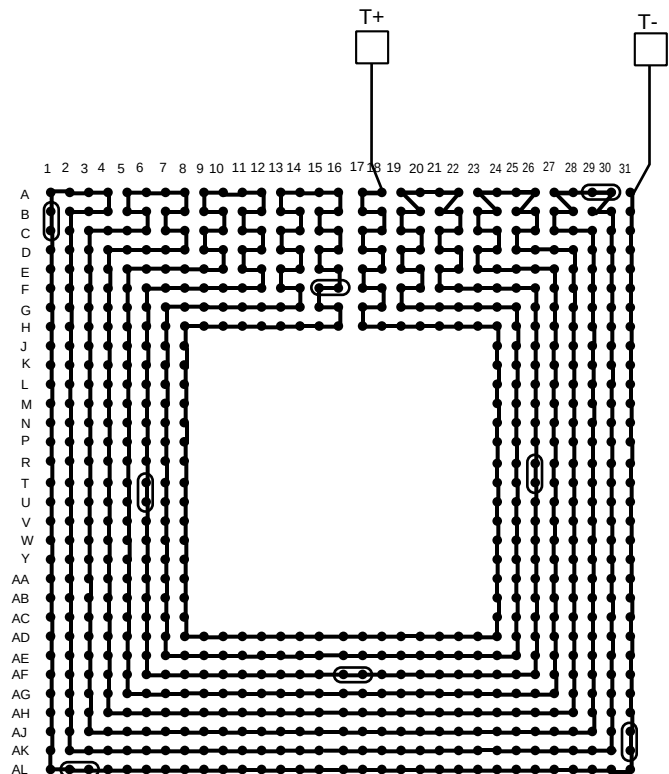
BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD



AFTER MOUNTING TO TEST BOARD

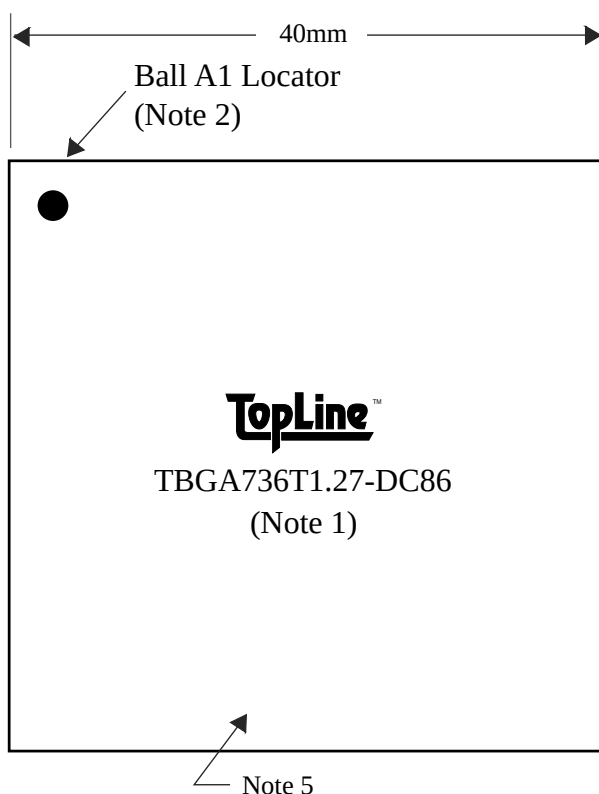
TBGA736T1.27-DC86

TopLine™

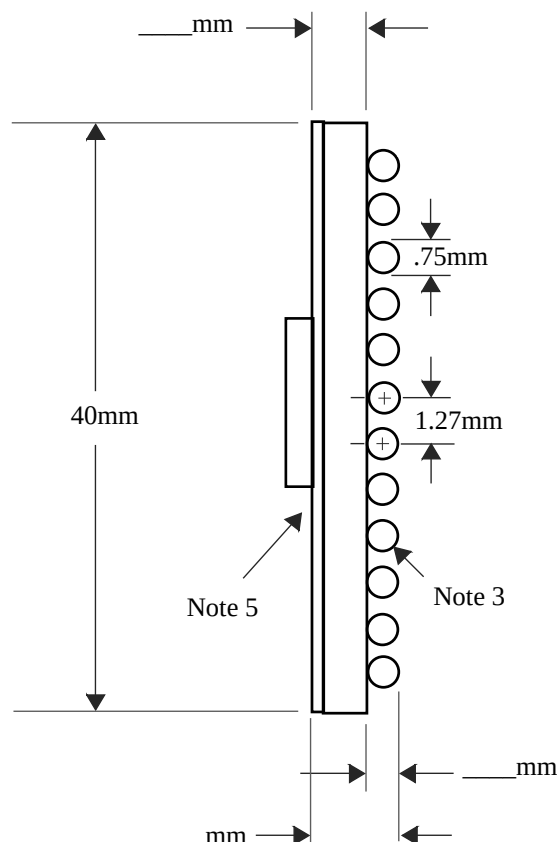
BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
736	1.27mm	40mm SQ	31 x 31mm	8	none	tape

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



SIDE VIEW



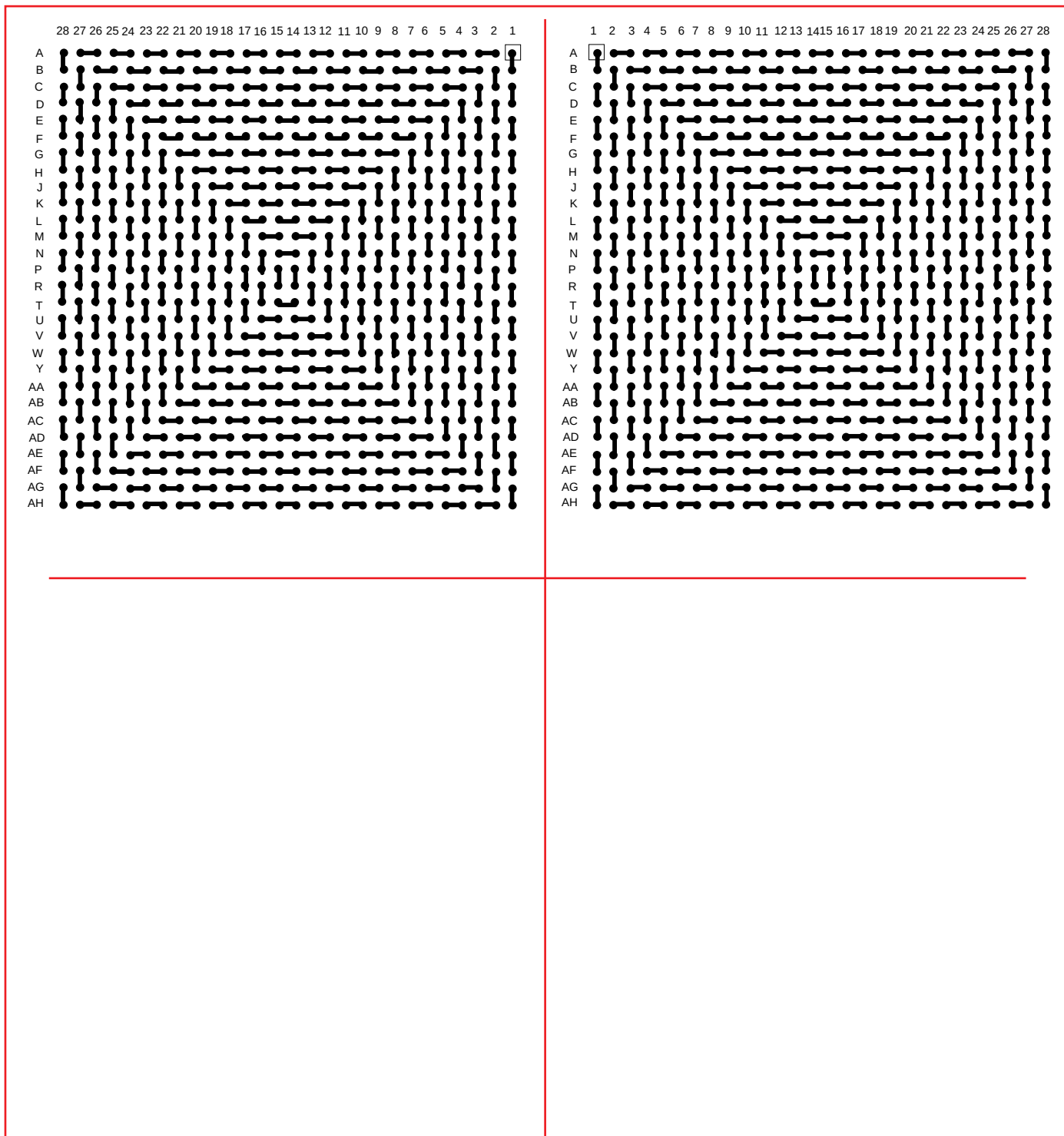
NOTES		REVISIONS	
Note 1	Logo and part number centered on metal heat sink/stiffener	Rev	Date Changes
Note 2	Ball A1 locator mark positioned in corner	subject to discontinuation	
Note 3	Ball Material: 10/90 SnPb		
Note 4	Substrate Material: Polyimide tape		
Note 5	Metal stiffener/heat sink cavity up		
		PACKAGING TRAYS (SEE NOTE 4)	
		Tray BGATRAY40mm-3x7	
		Tray Quantity 21	
		Tray Suppliers (ref):	

TEL 1-714-898-3830
FAX 1-714-891-0321

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
784	1.0mm	29mm SQ	28 x 28mm	full	full	FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

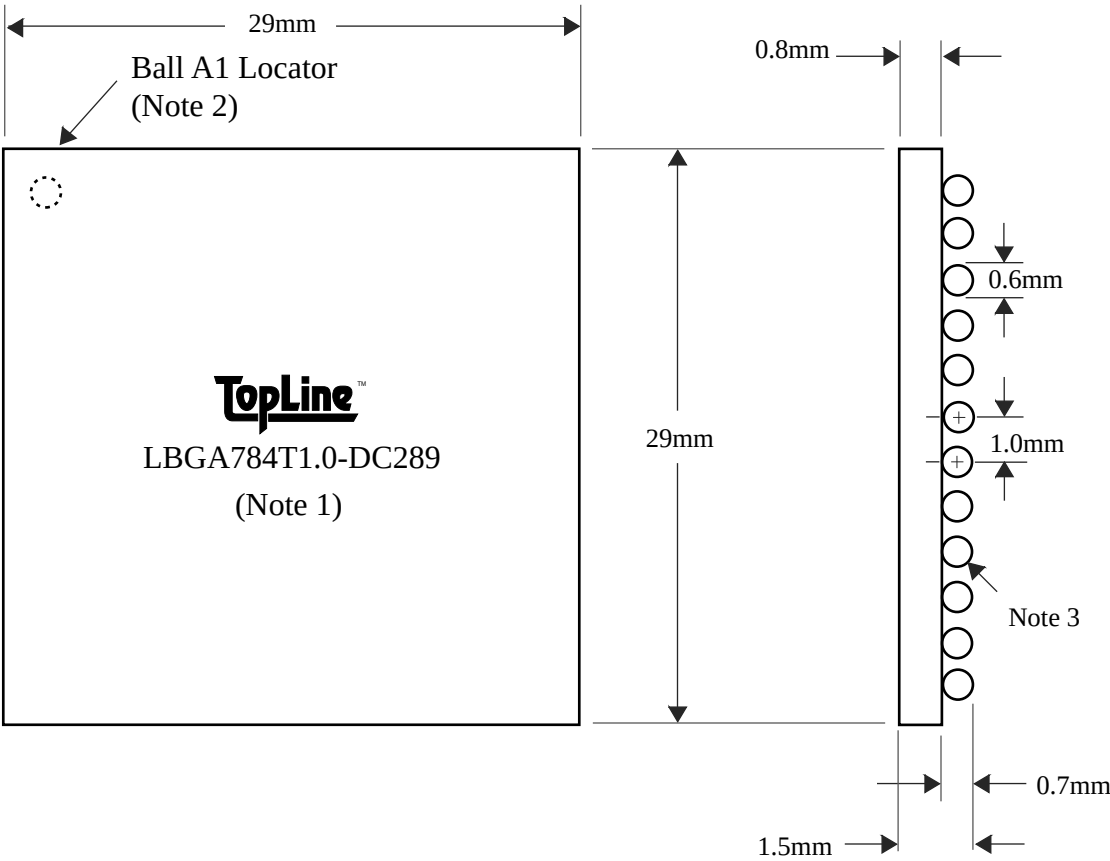
LBGA784T1.0-DC289



BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L	TEL 1-714-898-3830
784	1.0mm	29mm SQ	28 x 28mm	full	full	FR4	FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY29mm-4x9 Tray Quantity 36 Tray Suppliers (ref):		

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

784

PITCH

1.27mm

SIZE

37.5mm SQ

MATRIX

28 x 28mm

ROWS

full

CENTER

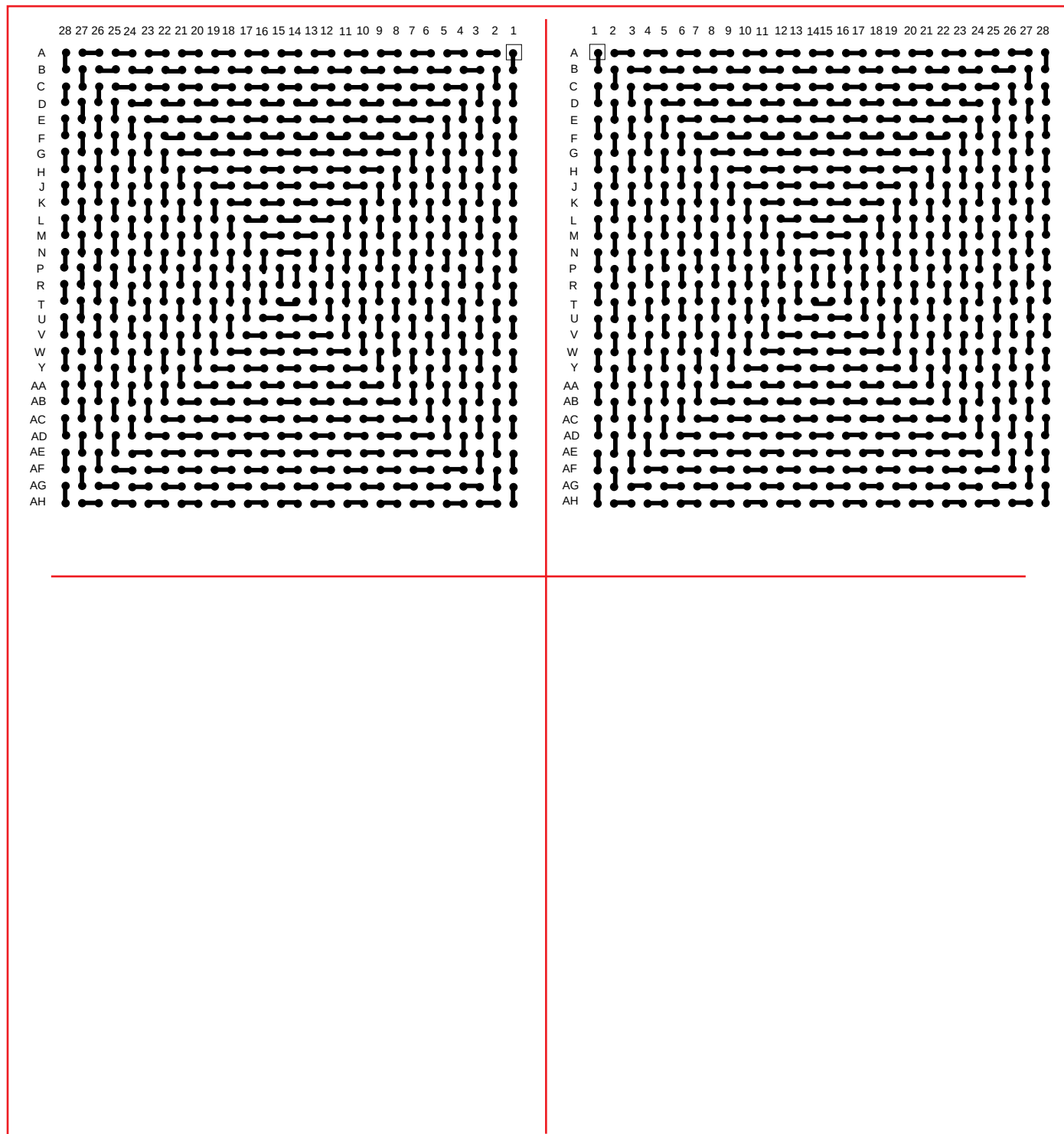
full

MAT'L

ceramic

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



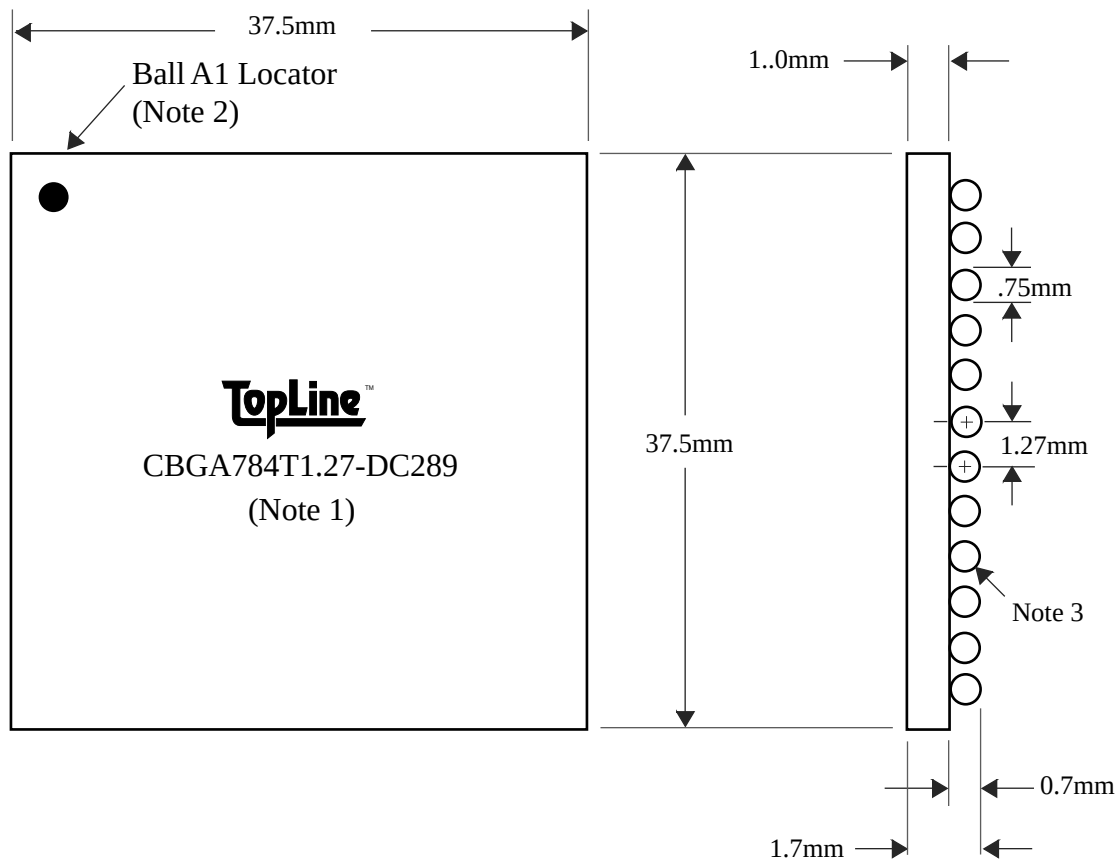
TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

TopLine™

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
784	1.27mm	37.5mm SQ	28 x 28mm	full	full	ceramic

SIDE VIEW



NOTES		REVISIONS	
Note 1	TopLine logo and part number centered Black ink	<u>Rev</u>	<u>Date</u> <u>Changes</u>
		11/14/98	Proposed Design
Note 2	Ball A1 locator mark positioned in corner		
Note 3	Ball Material: 10/90 SnPb	PACKAGING TRAYS (SEE NOTE 4)	
Note 4	Substrate Material: Ceramic	Tray BGATRAY37.5mm-3x7 Tray Quantity 21 Tray Suppliers (ref):	

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

841

PITCH

1.27mm

SIZE

40mm SQ

MATRIX

29 x 29mm

ROWS

full

CENTER

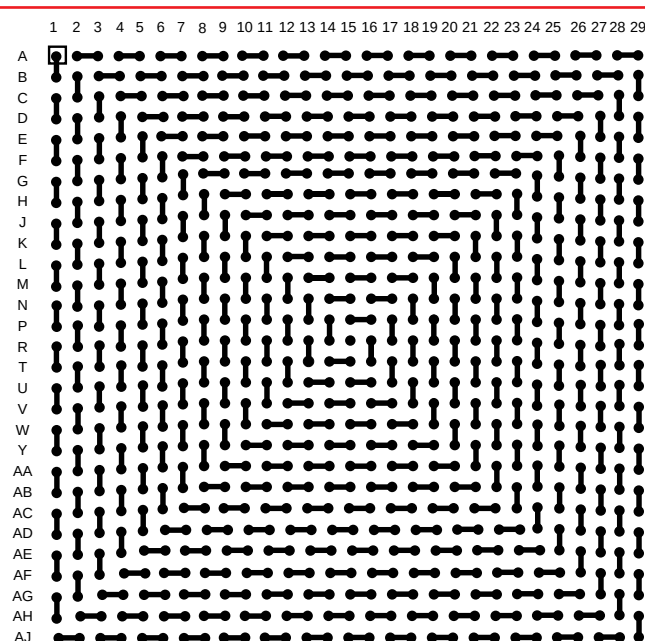
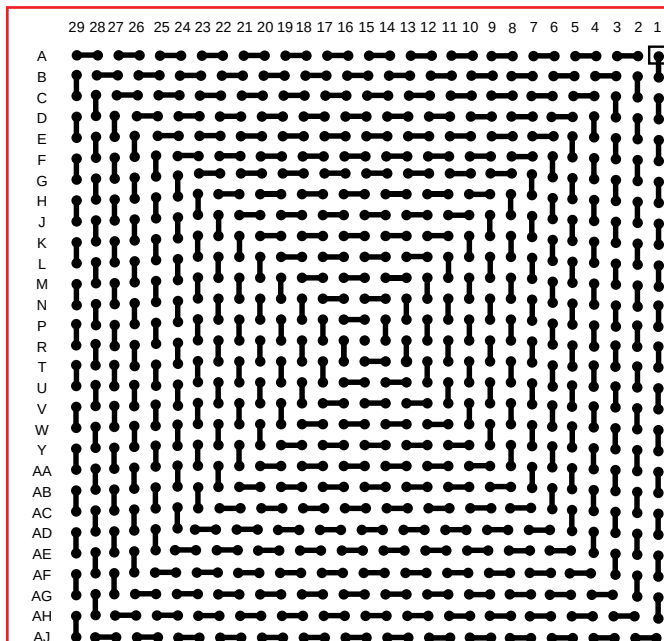
full

MAT'L

ceramic

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

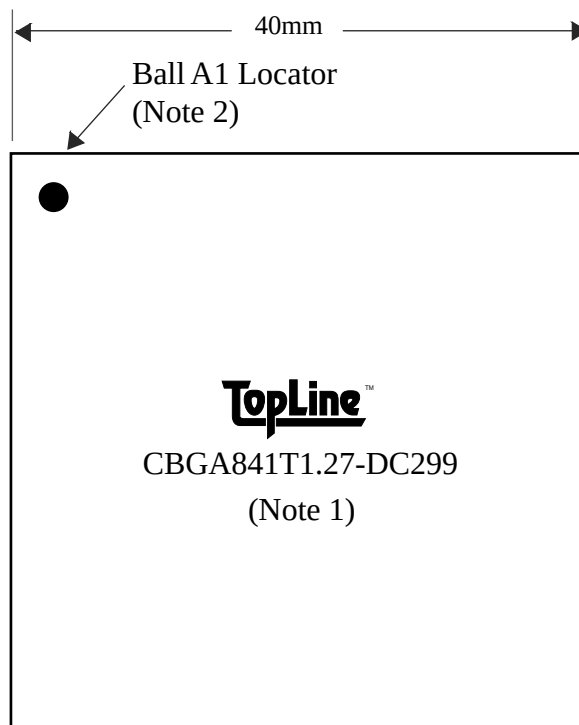


TEST VEHICLE BOARD

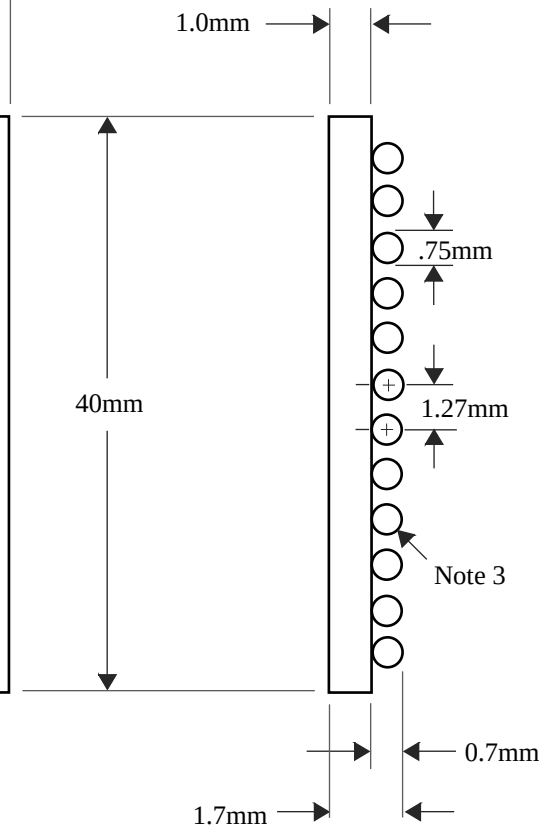
AFTER MOUNTING TO TEST BOARD

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>	TEL 1-714-898-3830
841	1.27mm	40mm SQ	29 x 29mm	full	full	ceramic	FAX 1-714-891-0321

TOP VIEW



SIDE VIEW

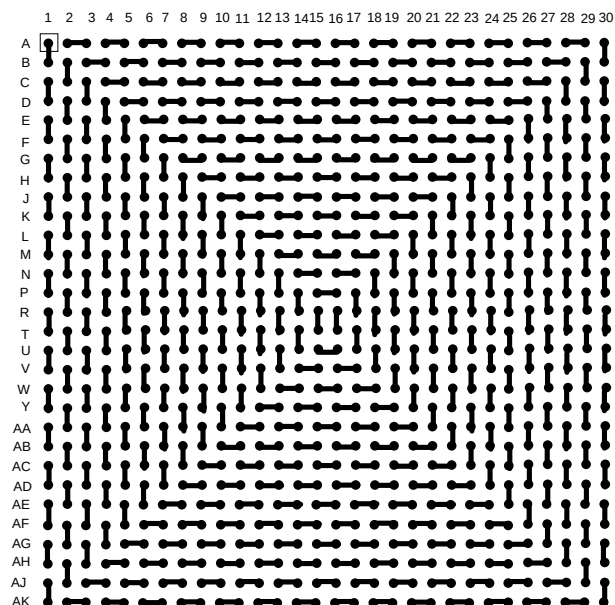
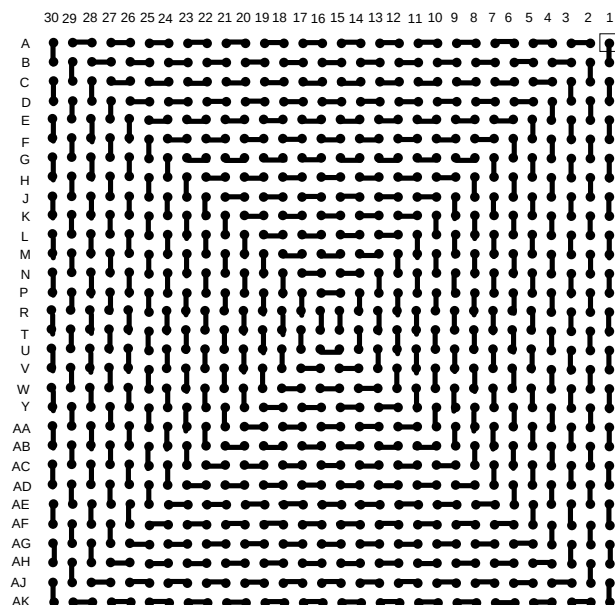


NOTES		REVISIONS	
Note 1	TopLine logo and part number centered Black ink	<u>Rev</u>	<u>Date</u> <u>Changes</u>
		11/14/98	Proposed Design
Note 2	Ball A1 locator mark positioned in corner		
Note 3	Ball Material: 10/90 SnPb	PACKAGING TRAYS (SEE NOTE 4)	
Note 4	Substrate Material: Ceramic	Tray BGATRAY40mm-3x7 Tray Quantity 21 Tray Suppliers (ref):	

	<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
	900	1.0mm	31mm SQ	30 x 30	full	full	FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA900T1.0-DC309

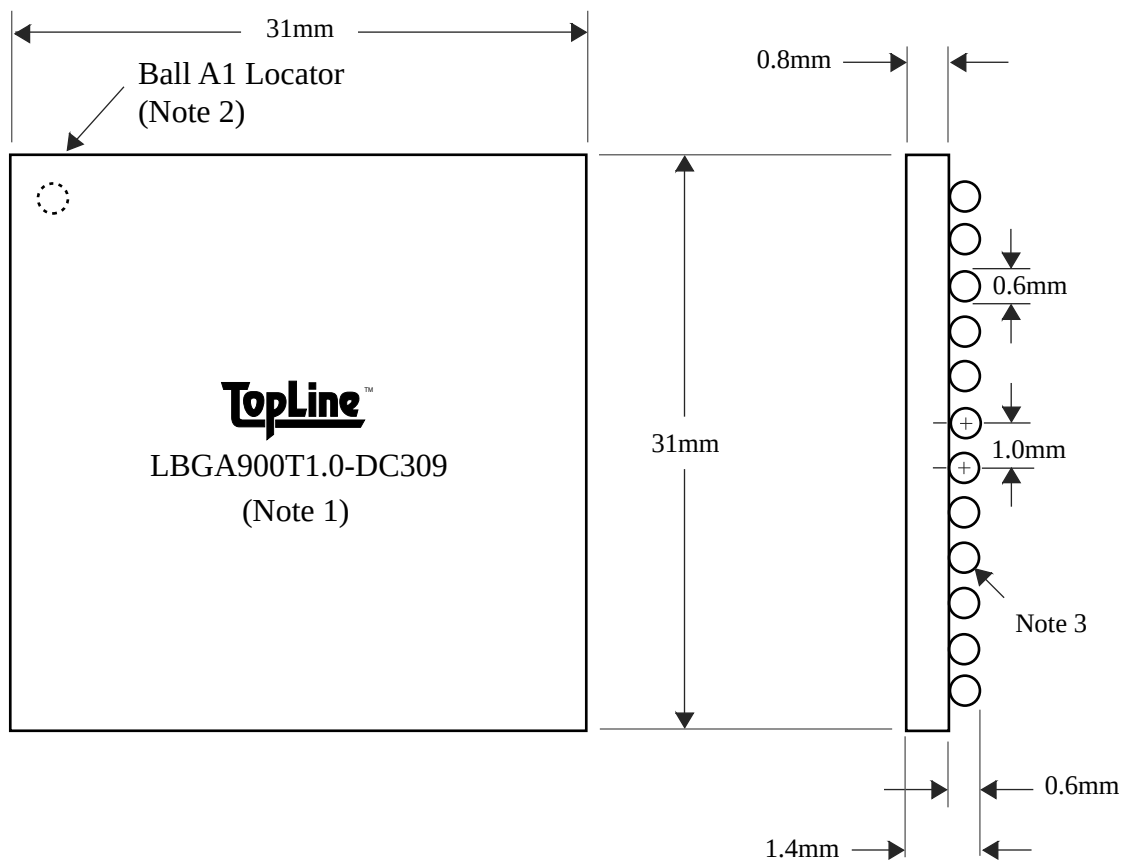


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
900	1.0mm	31mm SQ	30 x 30	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

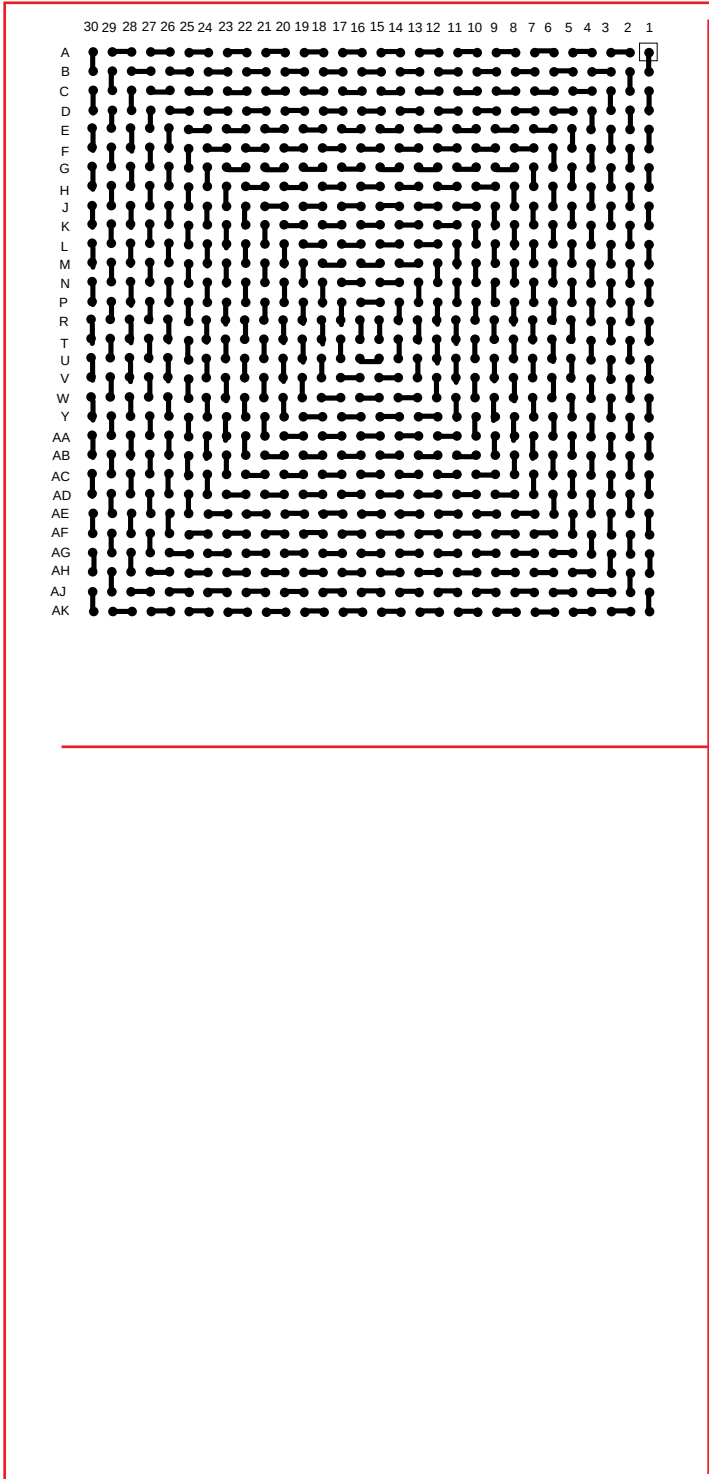


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY31mm-3x9 Tray Quantity 27 Tray Suppliers (ref):		

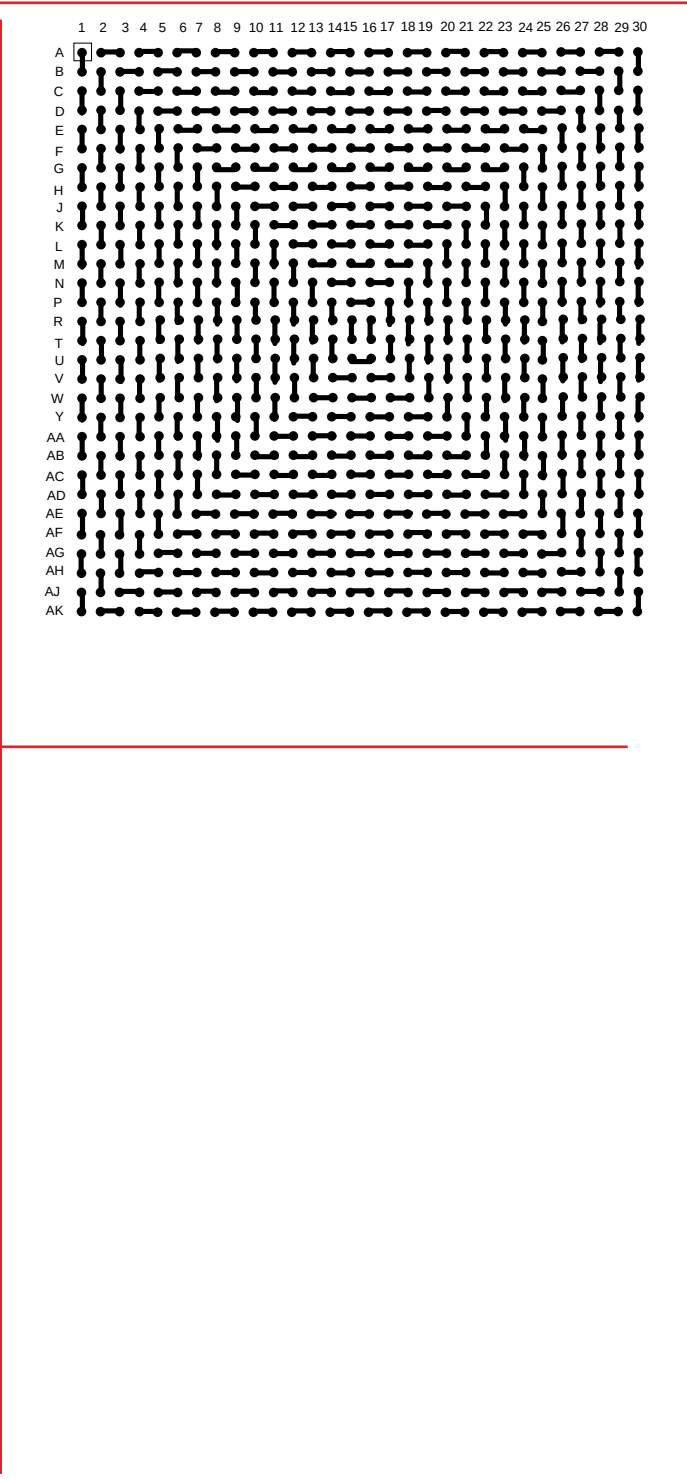
CBGA900T1.27-DC309

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
900	1.27mm	40mm SQ	30 x 30	full	full	ceramic

BALL VIEW



BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

CBGA900T1.27-DC309

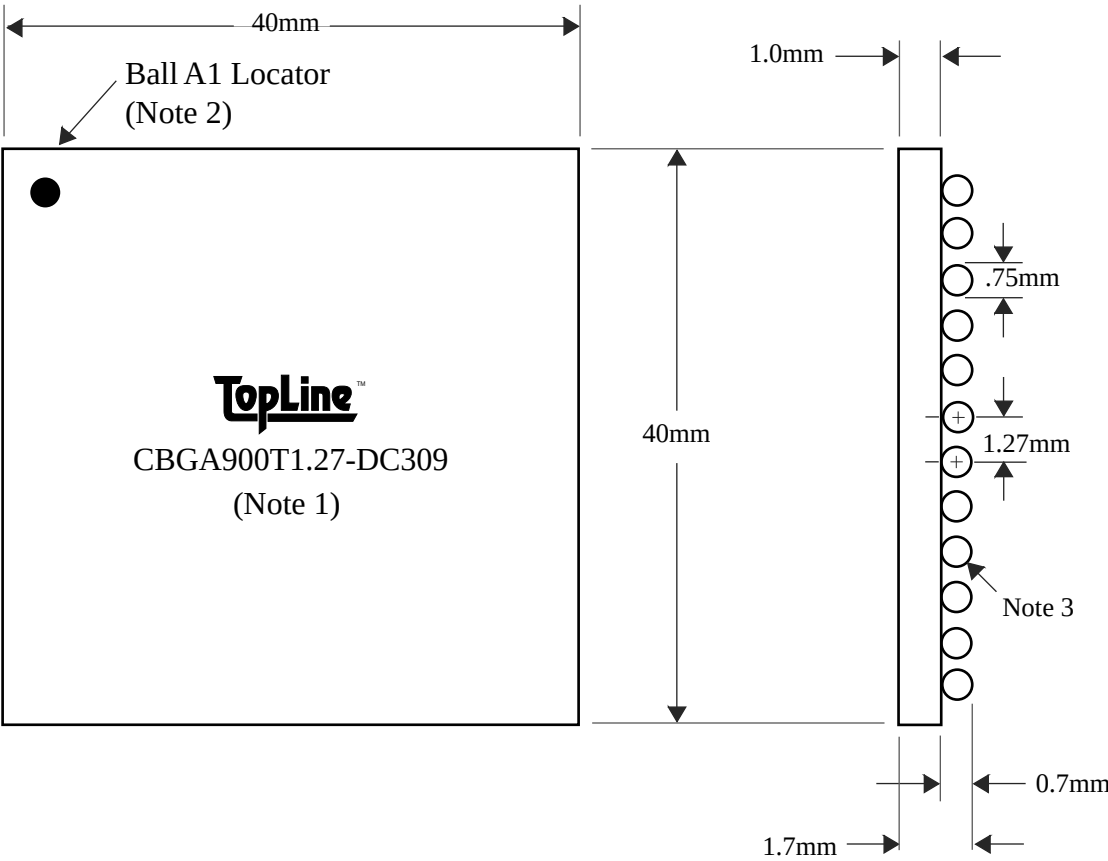
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
900	1.27mm	40mm SQ	30 x 30	full	full	ceramic

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 10/90 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: Ceramic	Tray BGATRAY40mm-3x7 Tray Quantity 21 Tray Suppliers (ref):		



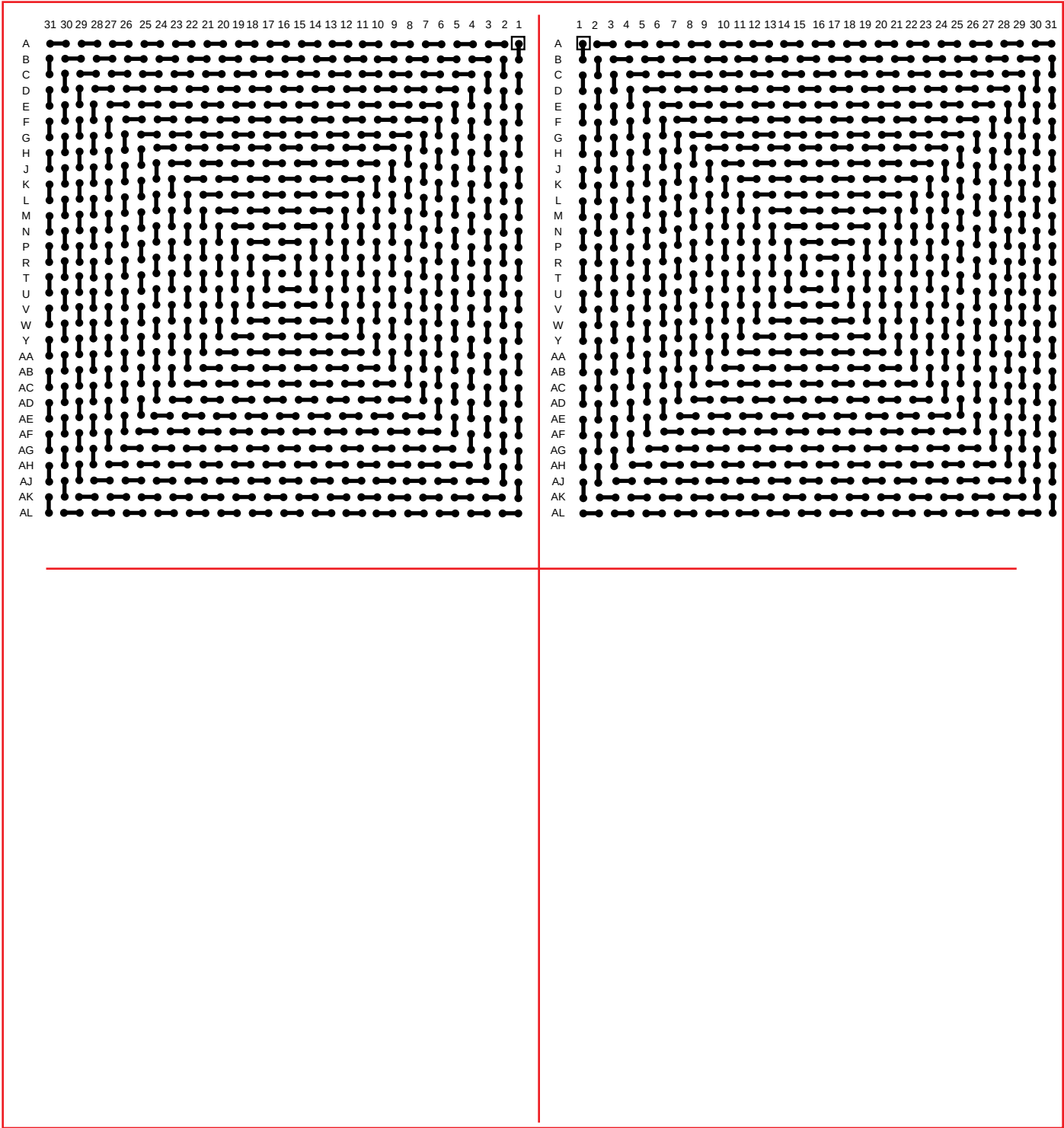
TEL 1-714-898-3830
FAX 1-714-891-0321

CBGA961T1.27-DC319

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
961	1.27mm	42.5mm SQ	31 x 31	full	full	ceramic

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

CBGA961T1.27-DC319

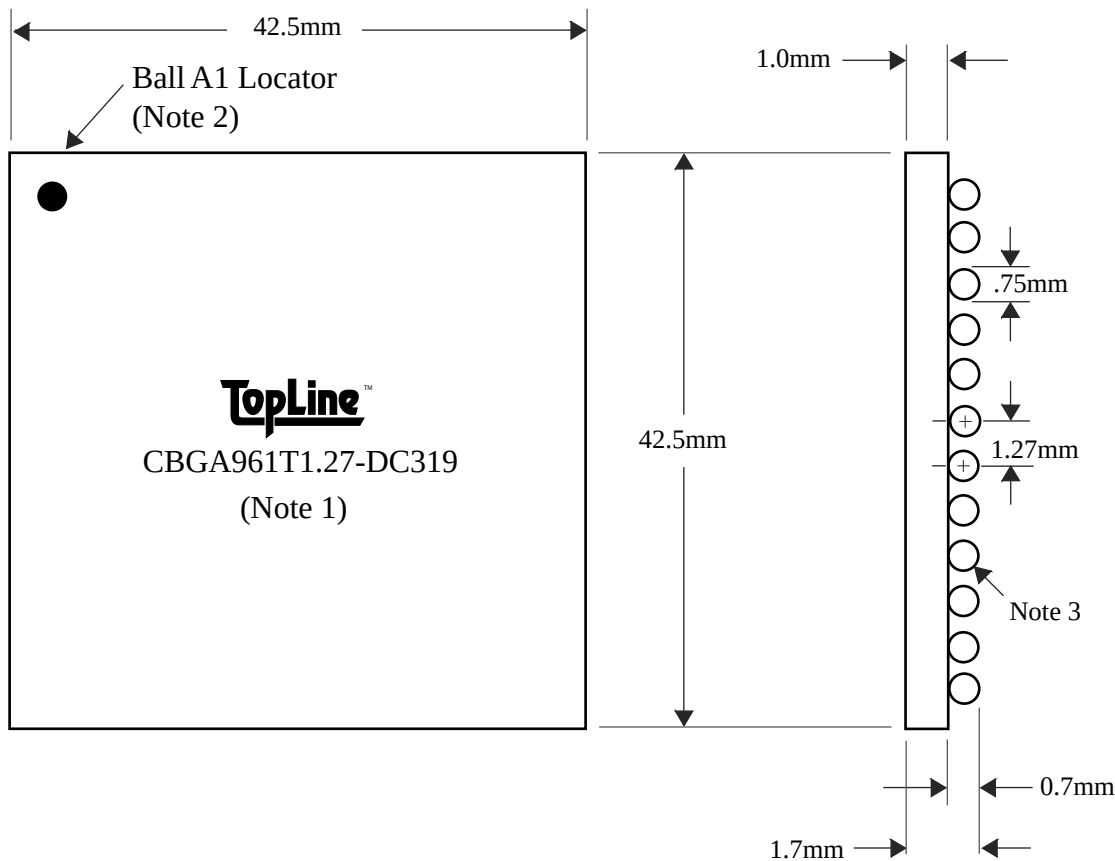


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
961	1.27mm	42.5mm SQ	31 x 31	full	full	ceramic

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

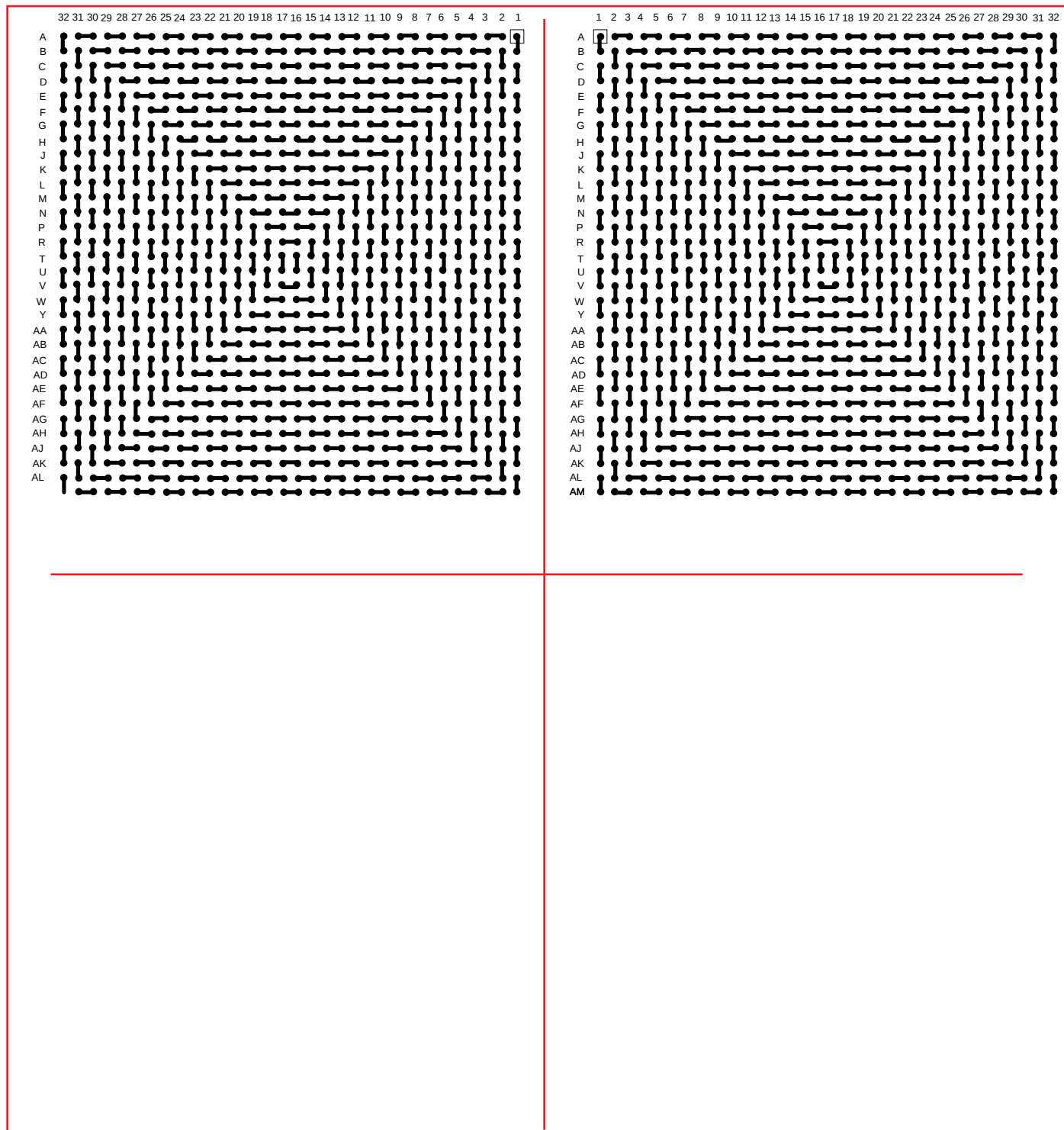


NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 10/90 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: Ceramic	Tray BGATRAY42.5-2x6 Tray Quantity 12 Tray Suppliers (ref):		

	<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
TEL 1-714-898-3830							
FAX 1-714-891-0321	1024	1.0mm	32.5mm SQ	32 x 32	full	full	FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA1024T1.0-DC329

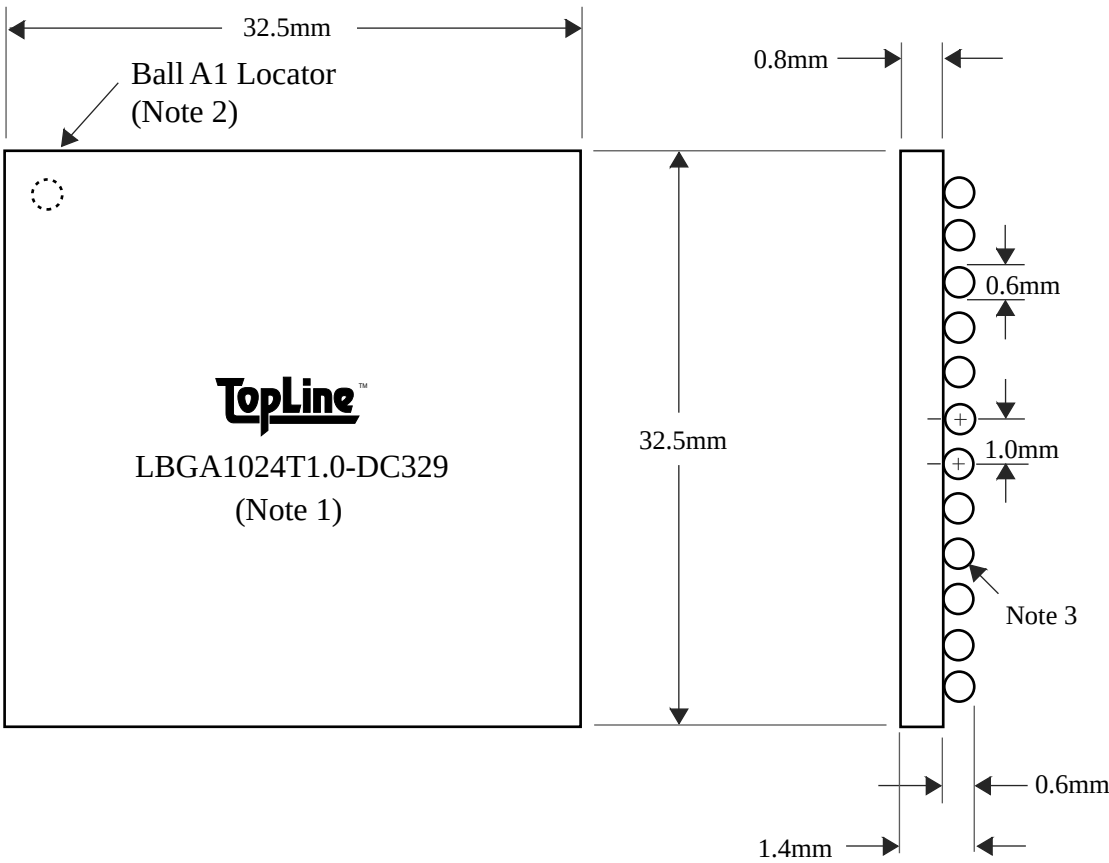


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
1024	1.0mm	32.5mm SQ	32 x 32	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY32.5-3x8 Tray Quantity 24 Tray Suppliers (ref):		

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

1024

PITCH

1.27mm

SIZE

42.5mm SQ

MATRIX

32 x 32

ROWS

full

CENTER

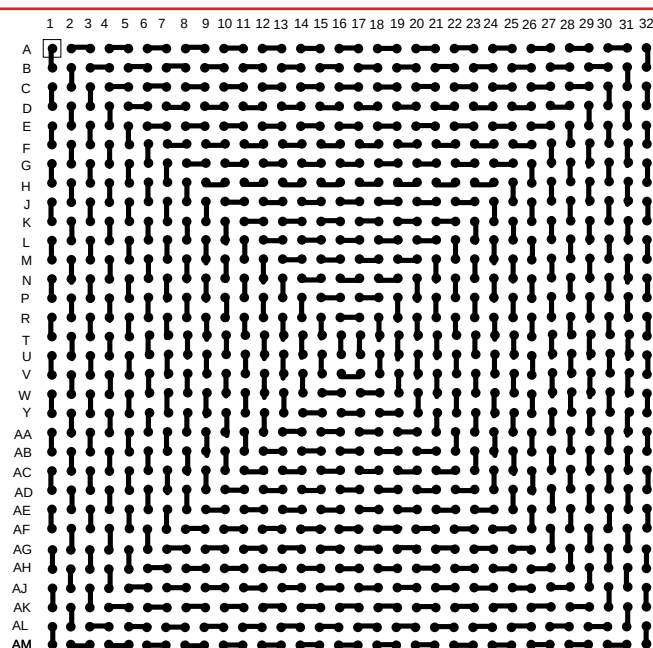
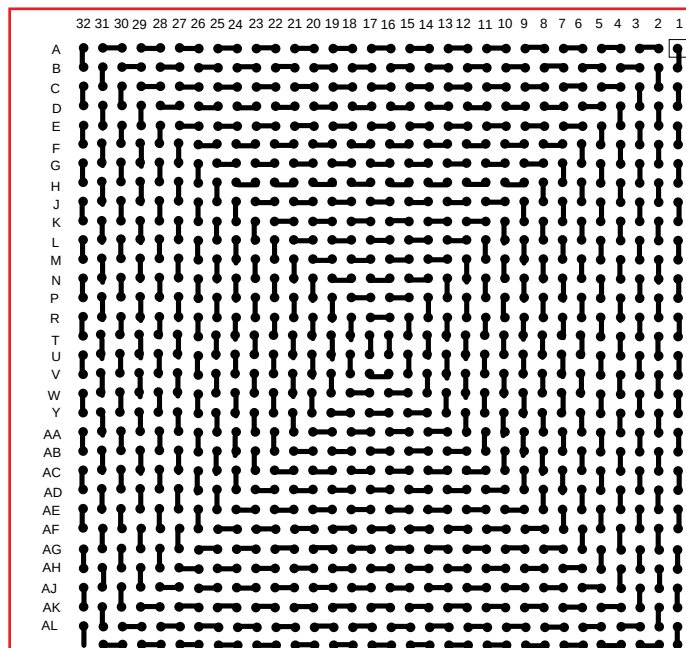
full

MAT'L

ceramic

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

CBGA1024T1.27-DC329

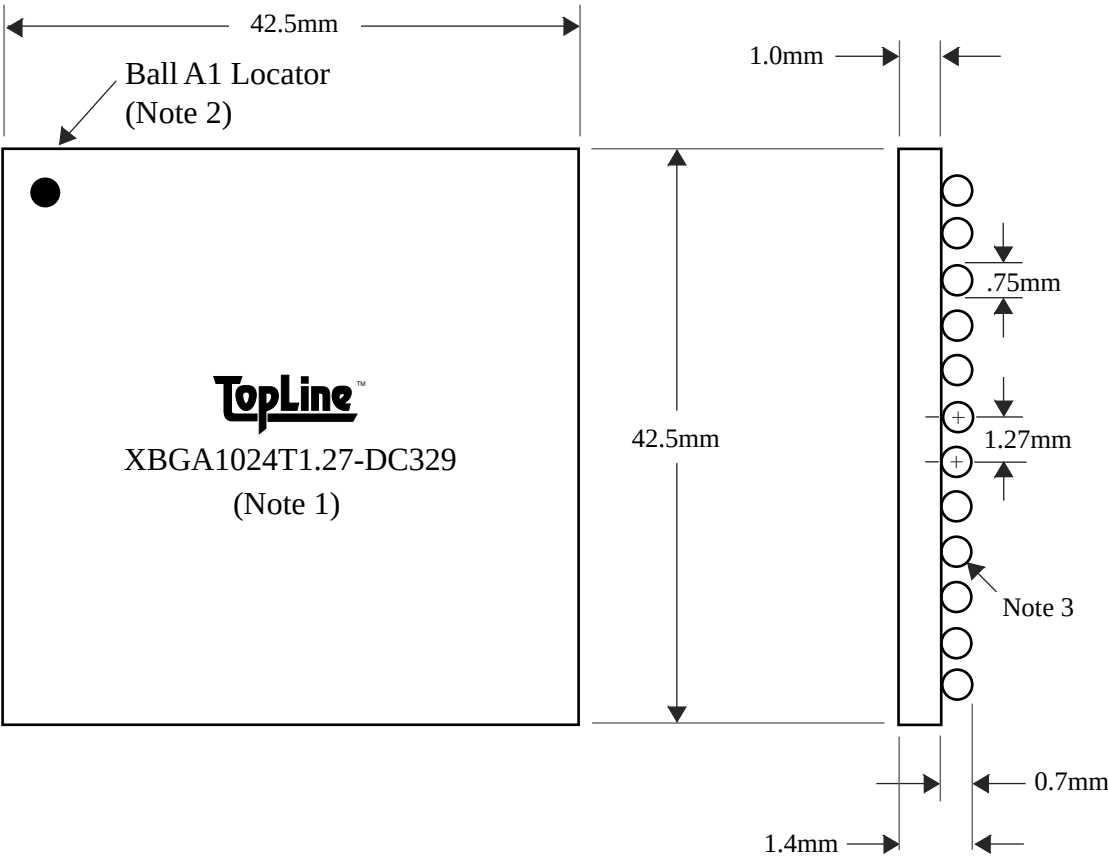
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
1024	1.27mm	42.5mm SQ	32 x 32	full	full	ceramic

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

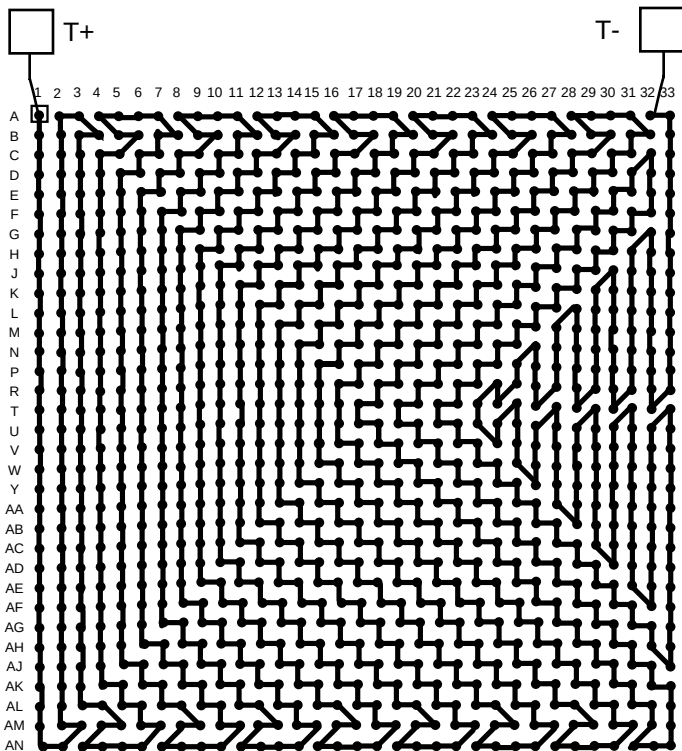
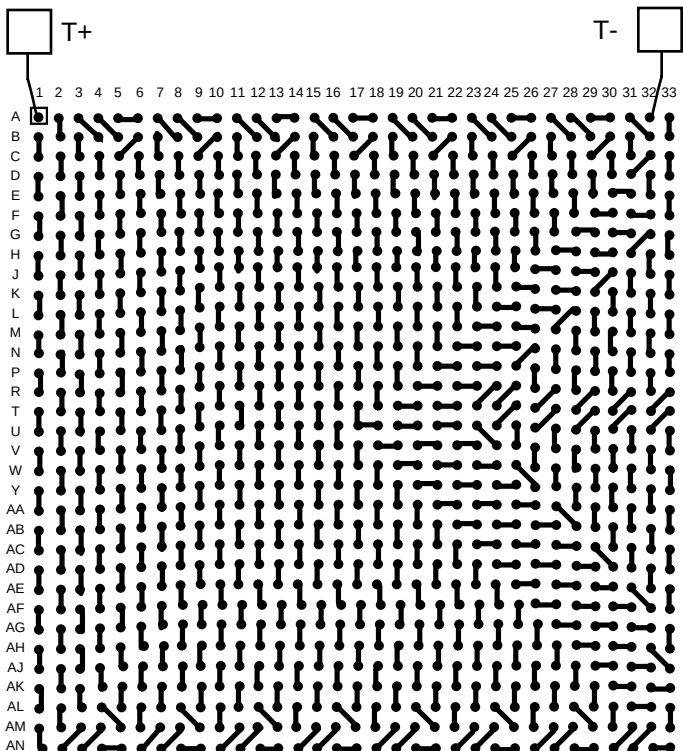
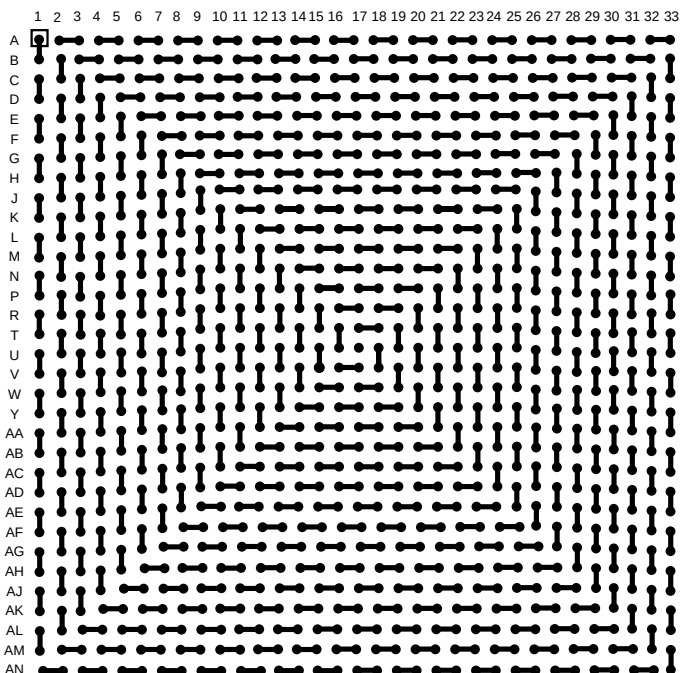
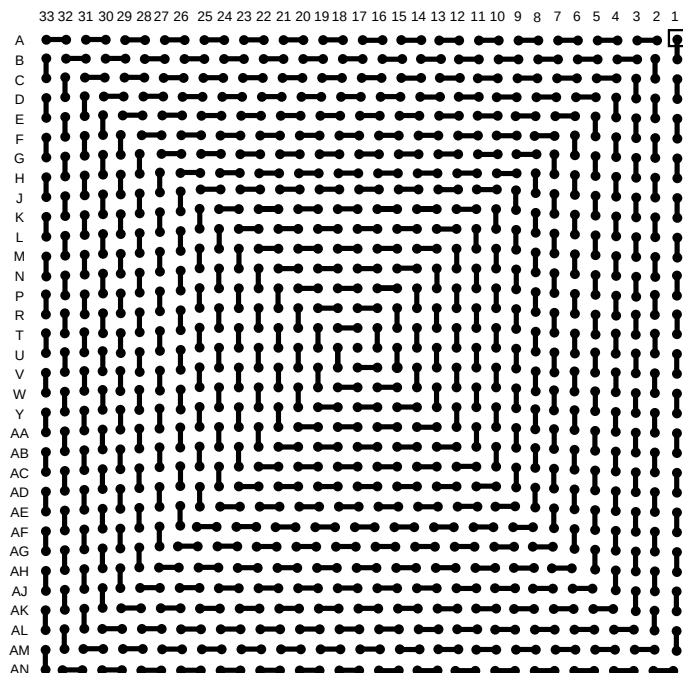


NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 10/90 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: Ceramic	Tray BGATRAY42.5-2x6 Tray Quantity 12 Tray Suppliers (ref):		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
1089	1.27mm	42.5mm	33 x 33	full	N/A	ceramic

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



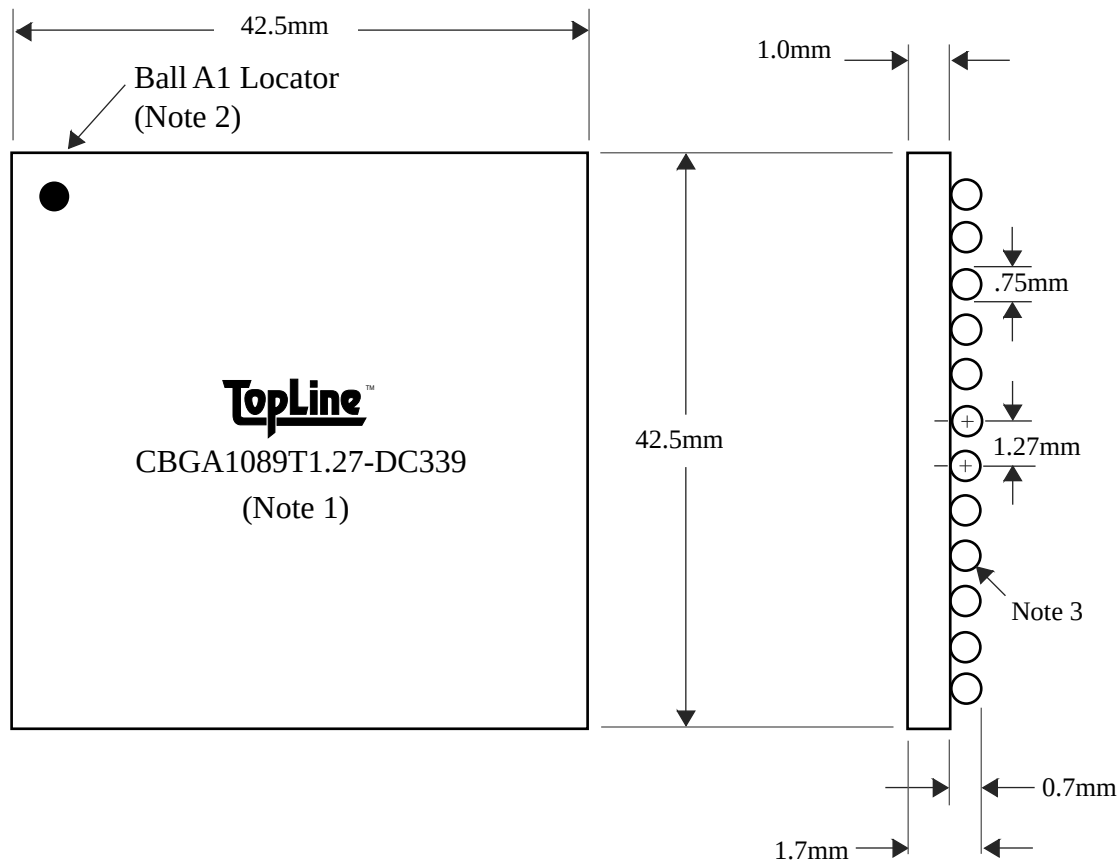
TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

TopLine™

FAX 1-714-891-0321**FAX 1-714-891-0321**

SIDE VIEW



NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner		4/1/99	Proposed Design
Note 3	Ball Material: 10/90 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: Ceramic	Tray CBGATRAY42.5x42.5-2x6 Tray Quantity 12		

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

1089

PITCH

1.27mm

SIZE

42.5mm SQ

MATRIX

33 x 33

ROWS

full

CENTER

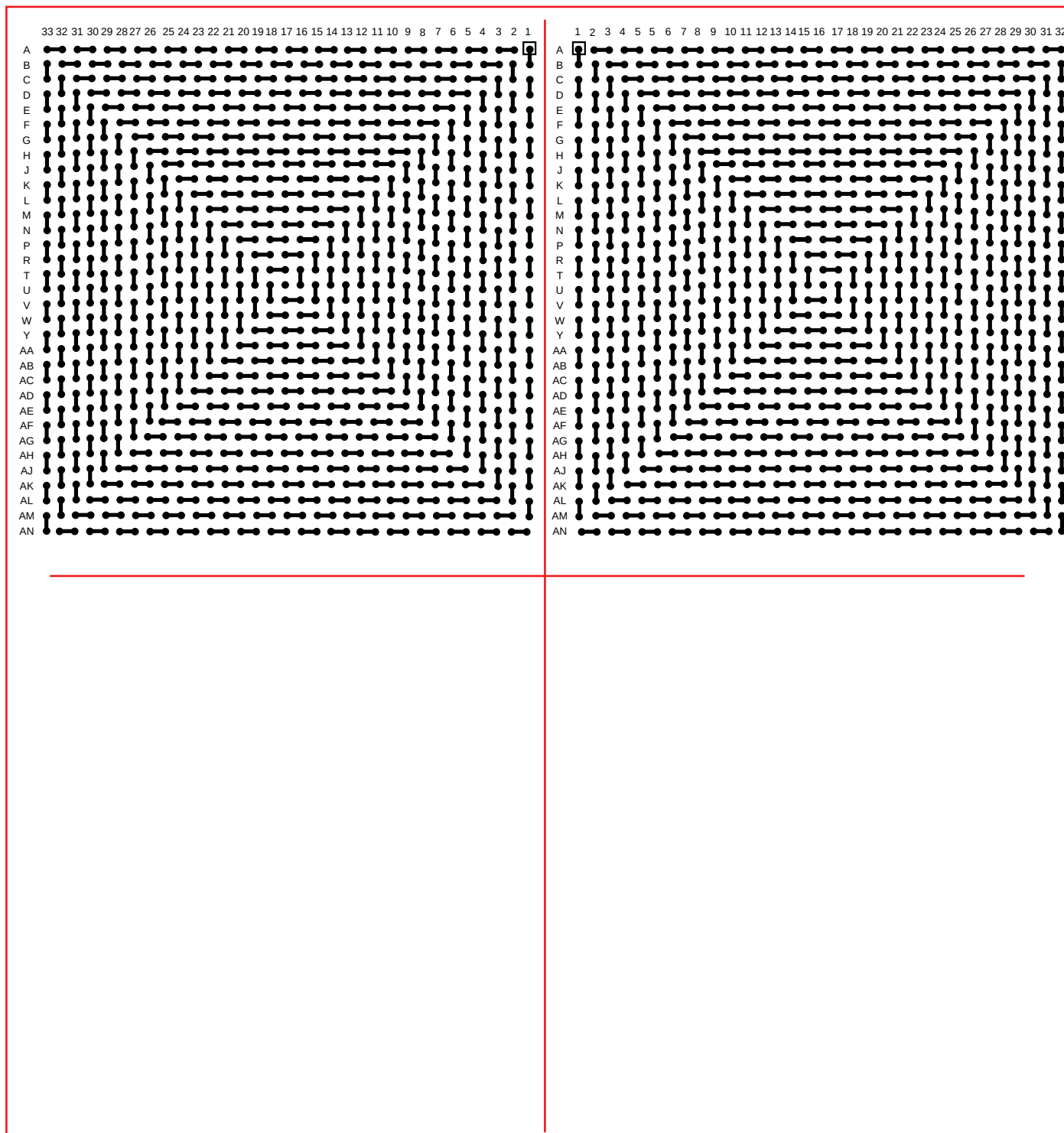
full

MAT'L

ceramic

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

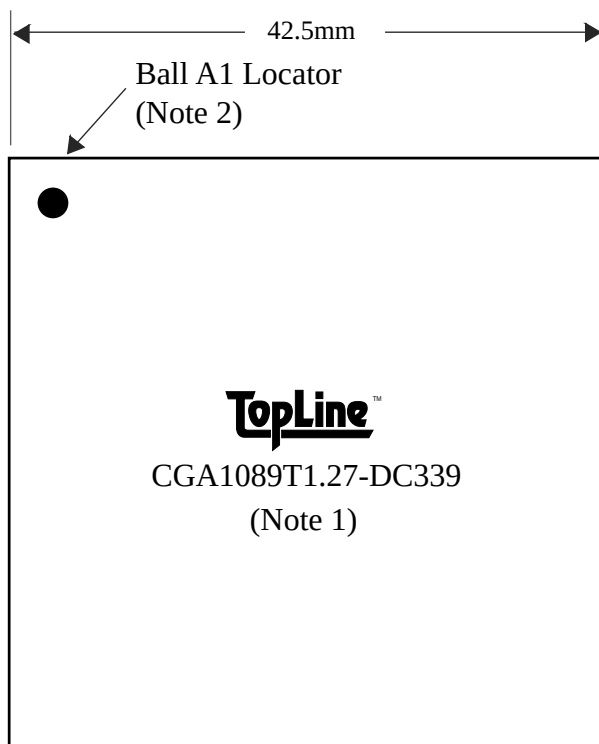
CGA1089T1.27-DC339

TopLine™

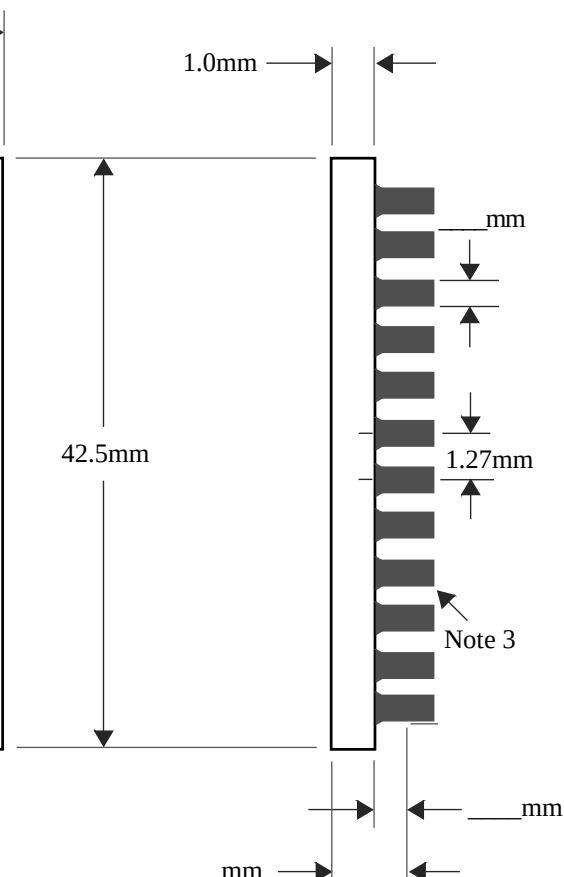
TEL 1-714-898-3830
FAX 1-714-891-0321

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
1089	1.27mm	42.5mm SQ	33 x 33	full	full	ceramic

TOP VIEW



SIDE VIEW



NOTES		REVISIONS	
Note 1	TopLine logo and part number centered Black ink	<u>Rev</u>	<u>Date</u> <u>Changes</u>
		11/14/98	Proposed Design
Note 2	Ball A1 locator mark positioned in corner		
Note 3	Ball Material: 63/37		
Note 4	Substrate Material: Ceramic		
		PACKAGING TRAYS (SEE NOTE 4)	
		Tray CGATRAY42.5-2x6	
		Tray Quantity 12	
		Tray Suppliers (ref):	



TEL 1-714-898-3830
FAX 1-714-891-0321

CGA1089T1.27-DC339A

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
1089	1.27mm	42.5mm SQ	33 x 33	full	full	ceramic

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)

TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

CGA1089T1.27-DC339A

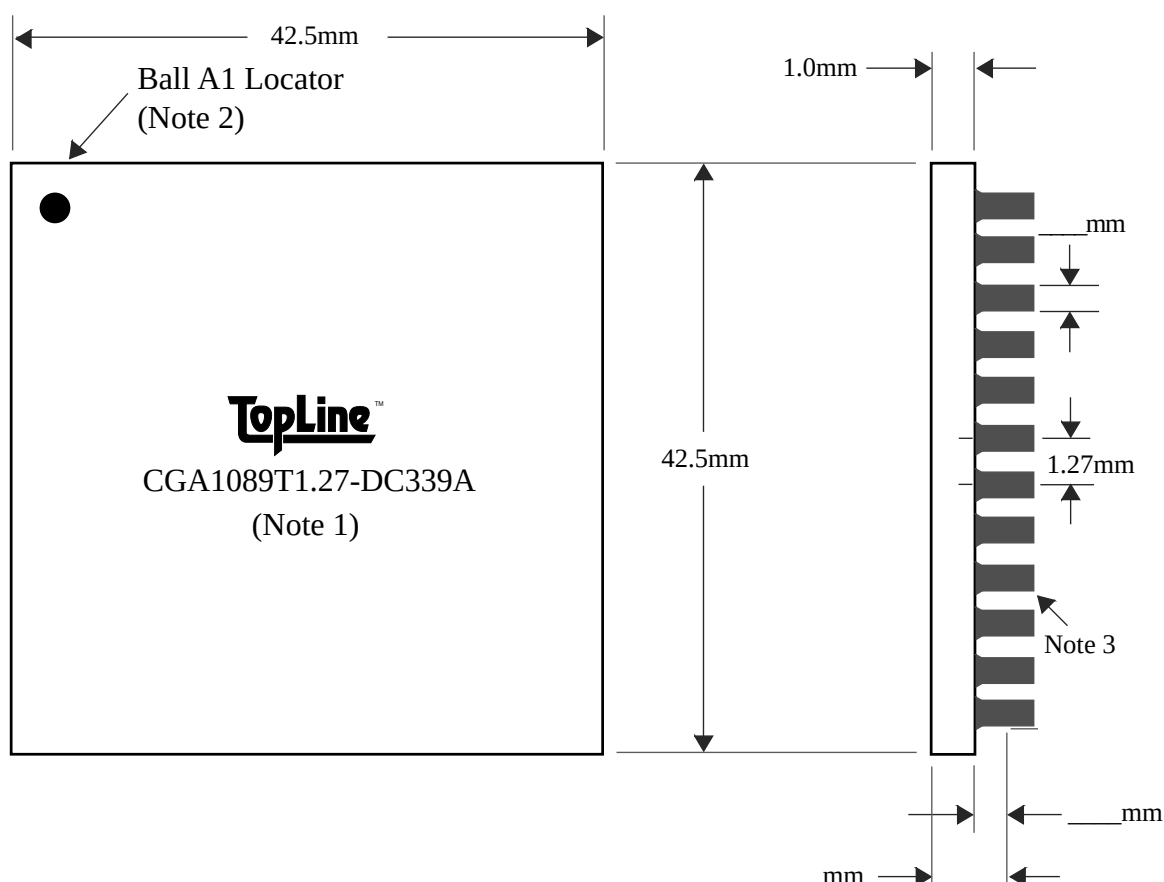
TopLine™

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
1089	1.27mm	42.5mm SQ	33 x 33	full	full	ceramic

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

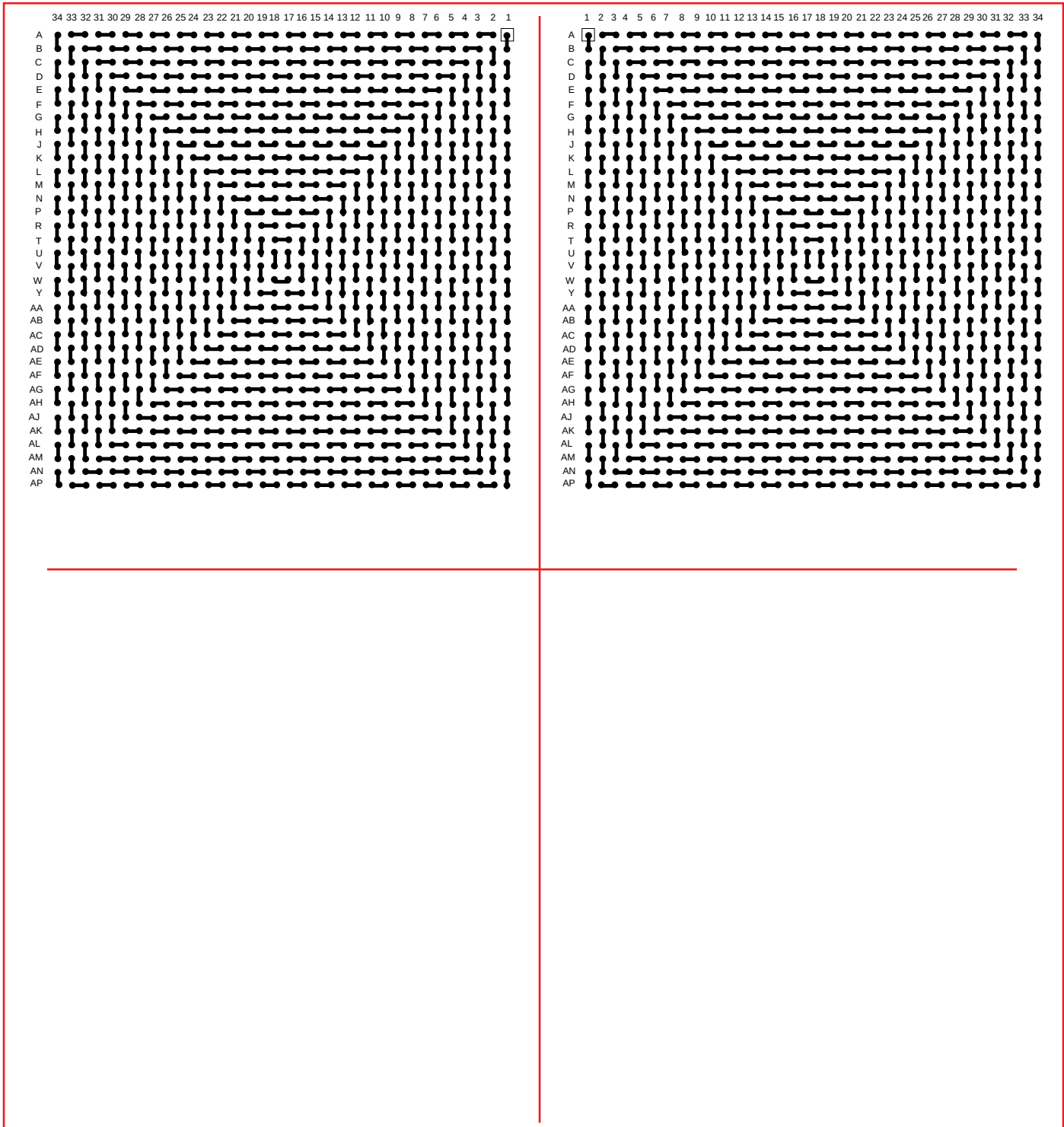


NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 63/37	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: Ceramic	Tray CGATRAY42.5-2x6 Tray Quantity 12 Tray Suppliers (ref):		

	BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
TEL 1-714-898-3830							
FAX 1-714-891-0321	1156	1.0mm	35mm SQ	34 x 34	full	full	FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA1156T1.0-DC349

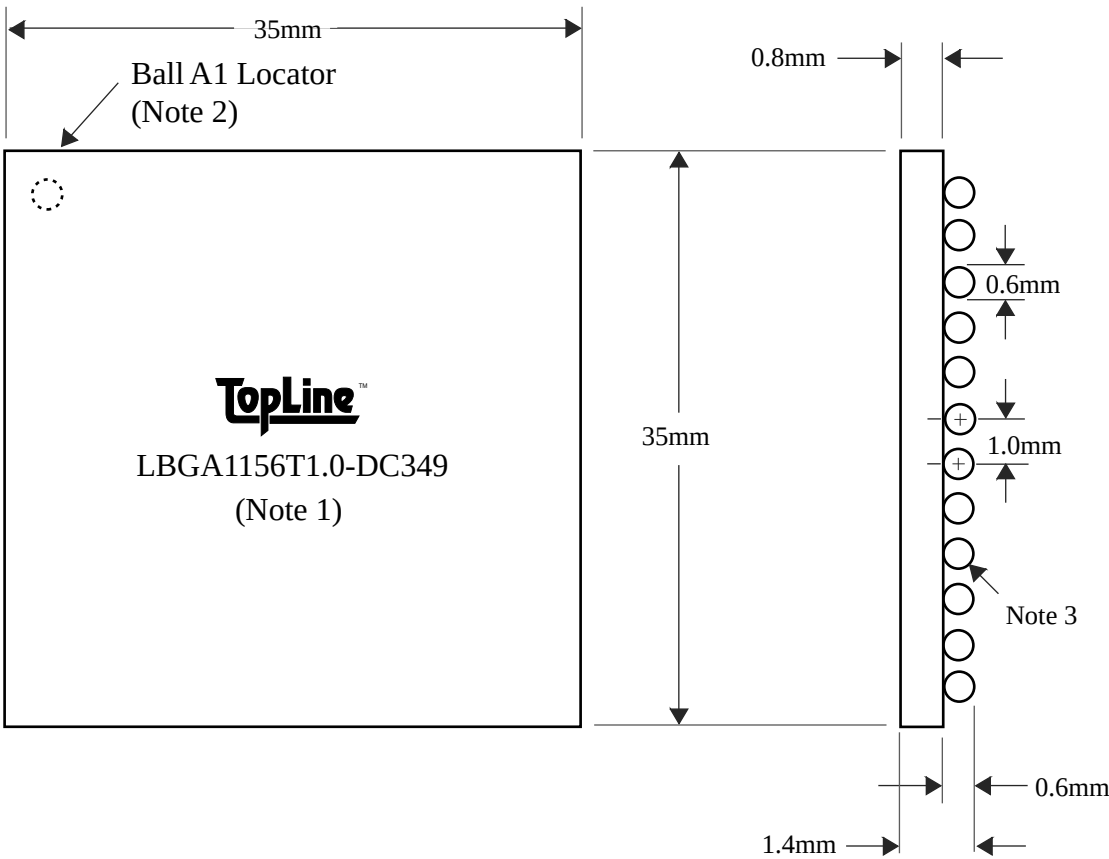


BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
1156	1.0mm	35mm SQ	34 x 34	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY35mm-3x8 Tray Quantity 24 Tray Suppliers (ref):		

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

1156

PITCH

1.27mm

SIZE

45mm SQ

MATRIX

34 x 34

ROWS

full

CENTER

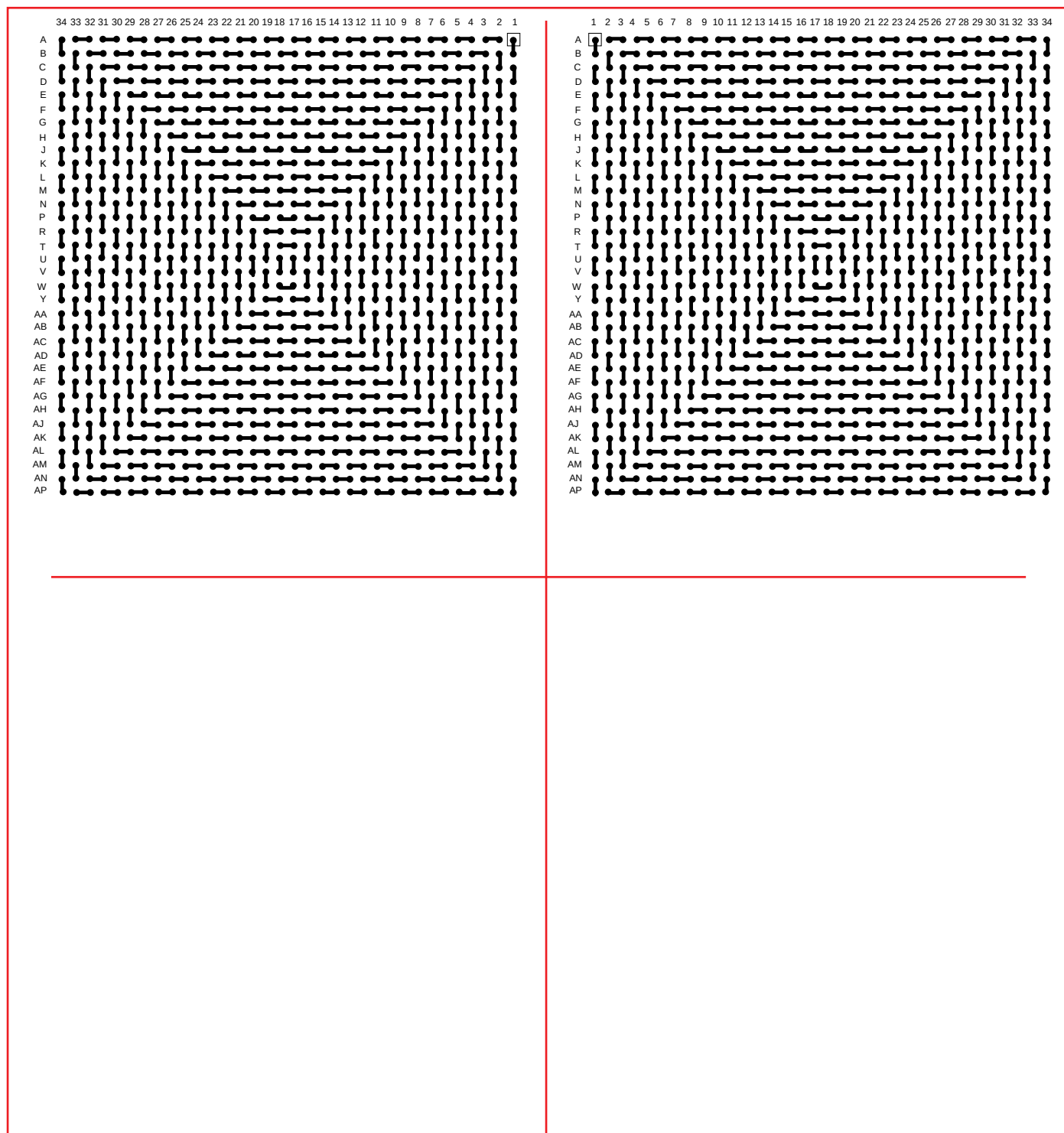
full

MAT'L

ceramic

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



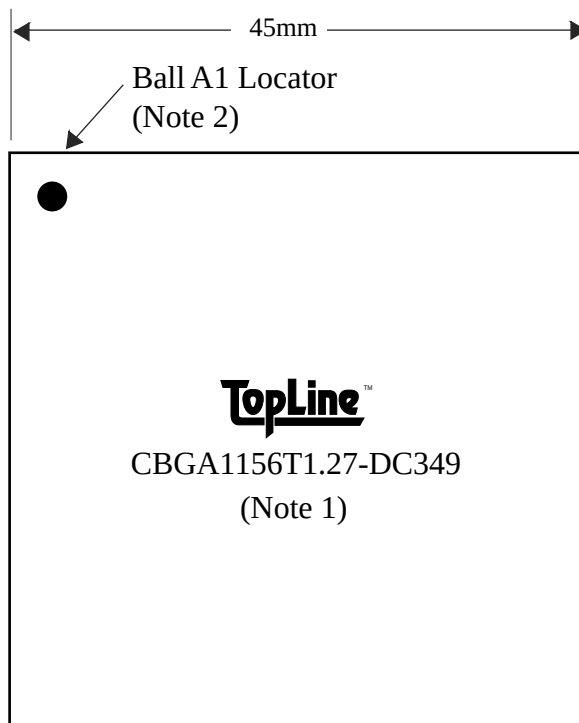
TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

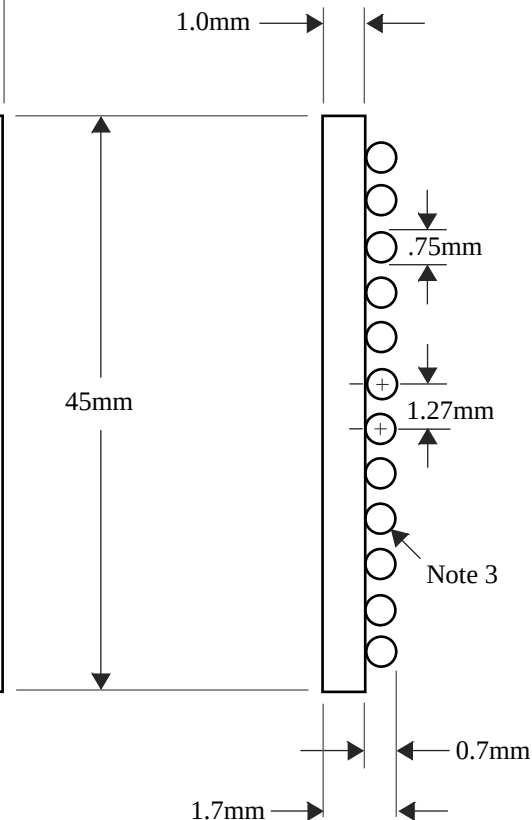
<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
1156	1.27mm	45mm SQ	34 x 34	full	full	ceramic

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW



SIDE VIEW



NOTES		REVISIONS	
Note 1	TopLine logo and part number centered Black ink	<u>Rev</u>	<u>Date</u> <u>Changes</u>
		11/14/98	Proposed Design
Note 2	Ball A1 locator mark positioned in corner		
Note 3	Ball Material: 10/90 SnPb	PACKAGING TRAYS (SEE NOTE 4)	
Note 4	Substrate Material: Ceramic	Tray BGATRAY45mm-2x6 Tray Quantity 12 Tray Suppliers (ref):	

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

1125

PITCH

1.27mm

SIZE

47.5mm SQ

MATRIX

35 x 35

ROWS

full

CENTER

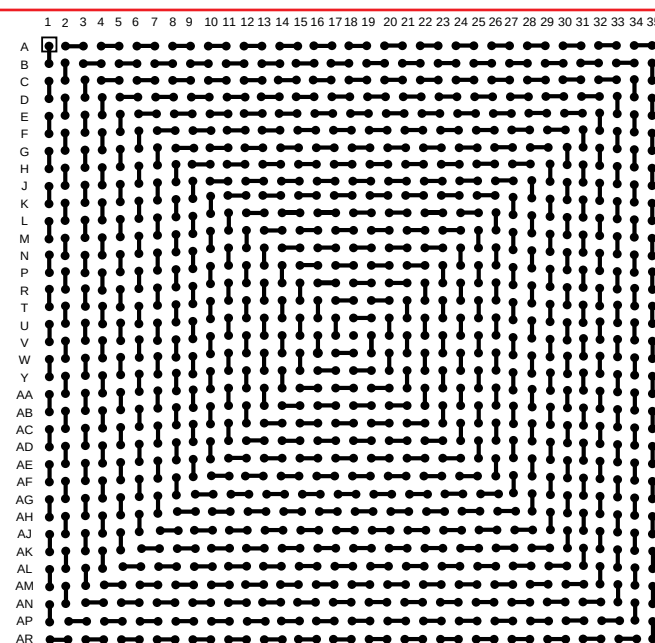
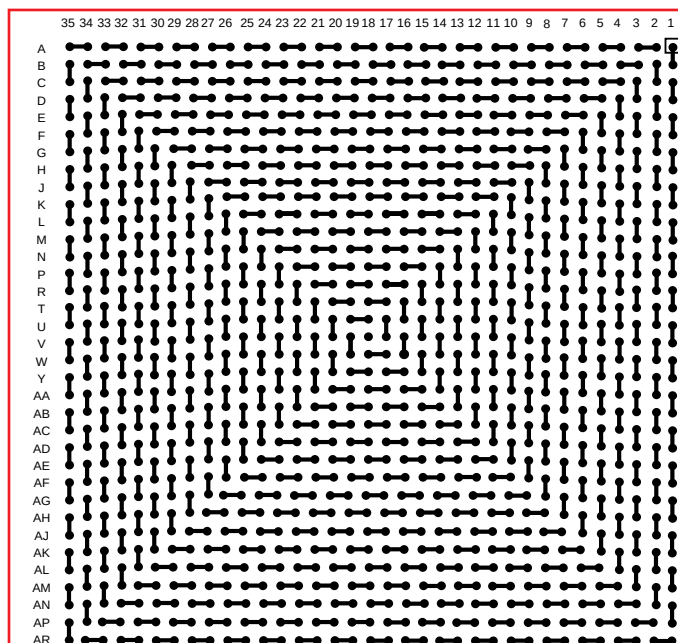
full

MAT'L

ceramic

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

CBGA1225T1.27-DC359

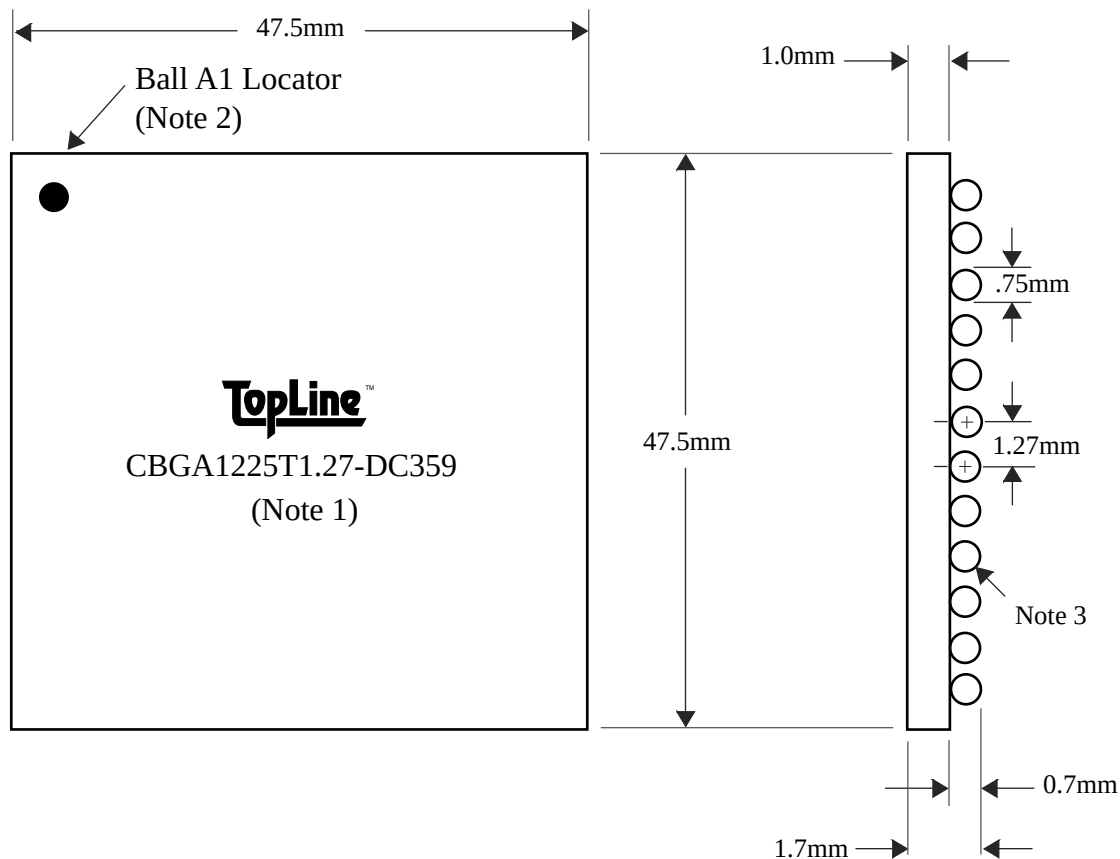
TopLine™

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
1125	1.27mm	47.5mm SQ	35 x 35	full	full	ceramic

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



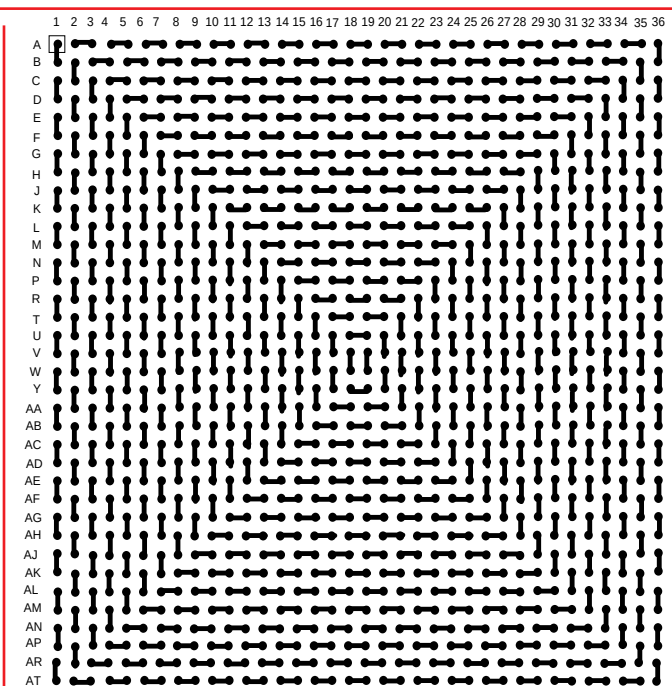
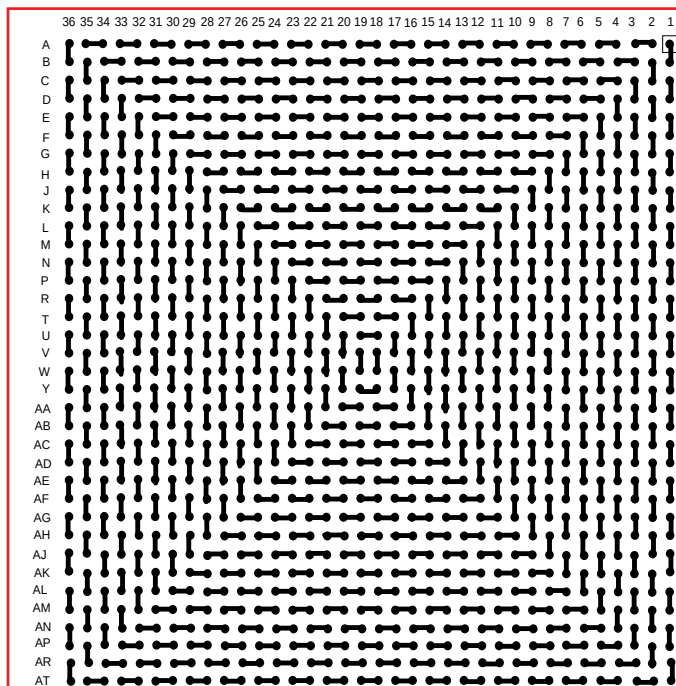
NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 10/90 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: Ceramic	Tray BGATRAY47.5mm-2x6 Tray Quantity 12 Tray Suppliers (ref):		

TEL 1-714-898-3830
FAX 1-714-891-0321

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
1296	1.0mm	37.5mm SQ	36 x 36	full	full	FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA1296T1.0-DC369

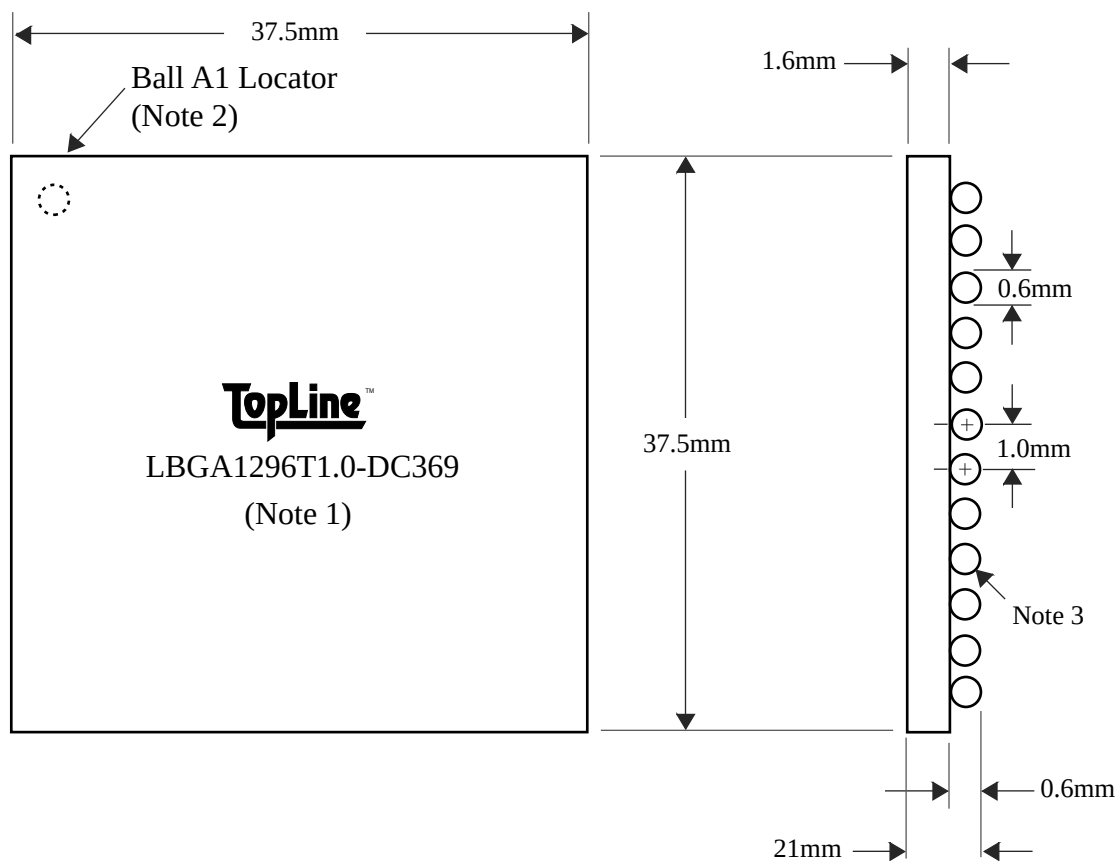
TopLine™

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
1296	1.0mm	37.5mm SQ	36 x 36	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

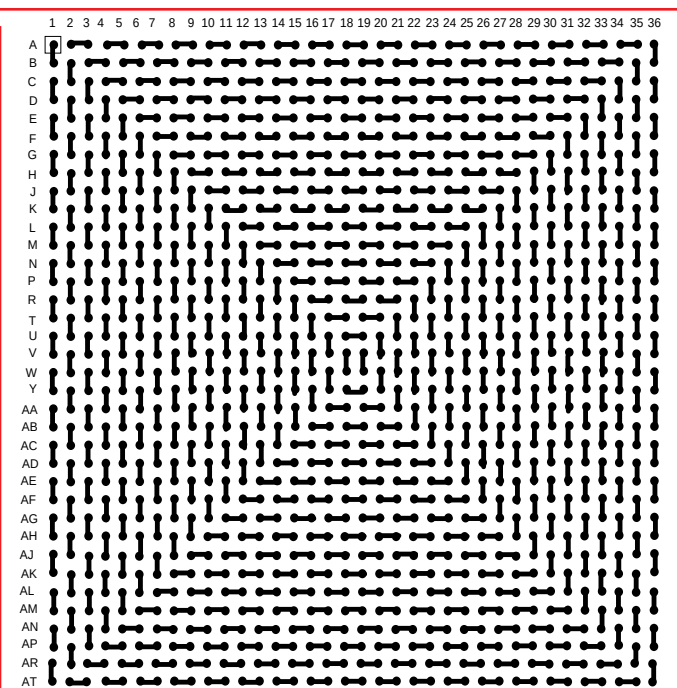
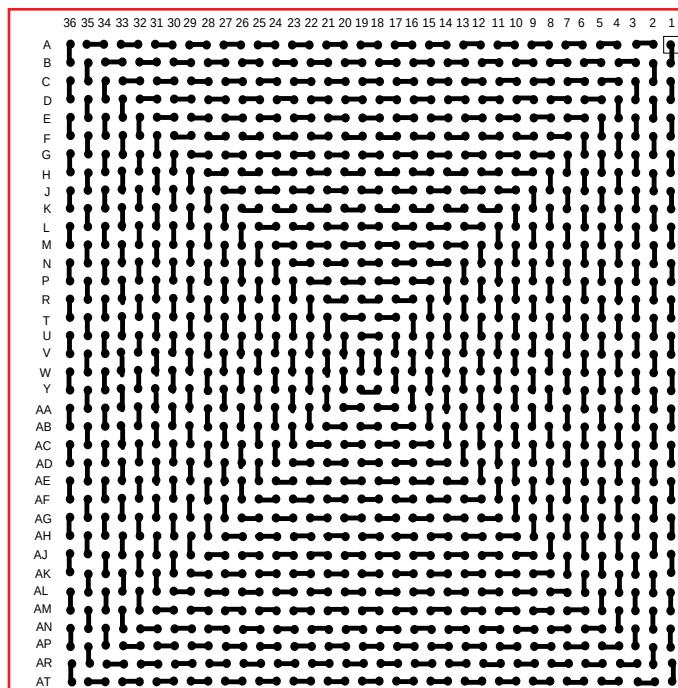


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	<u>Rev</u>	<u>Date</u>	<u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY37.5mm-3x7 Tray Quantity 21 Tray Suppliers (ref):		

	<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
TEL 1-714-898-3830							
FAX 1-714-891-0321	1296	1.27mm	47.5mm	36 x 36	full	full	ceramic

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

CBGA1296T1.27-DC369

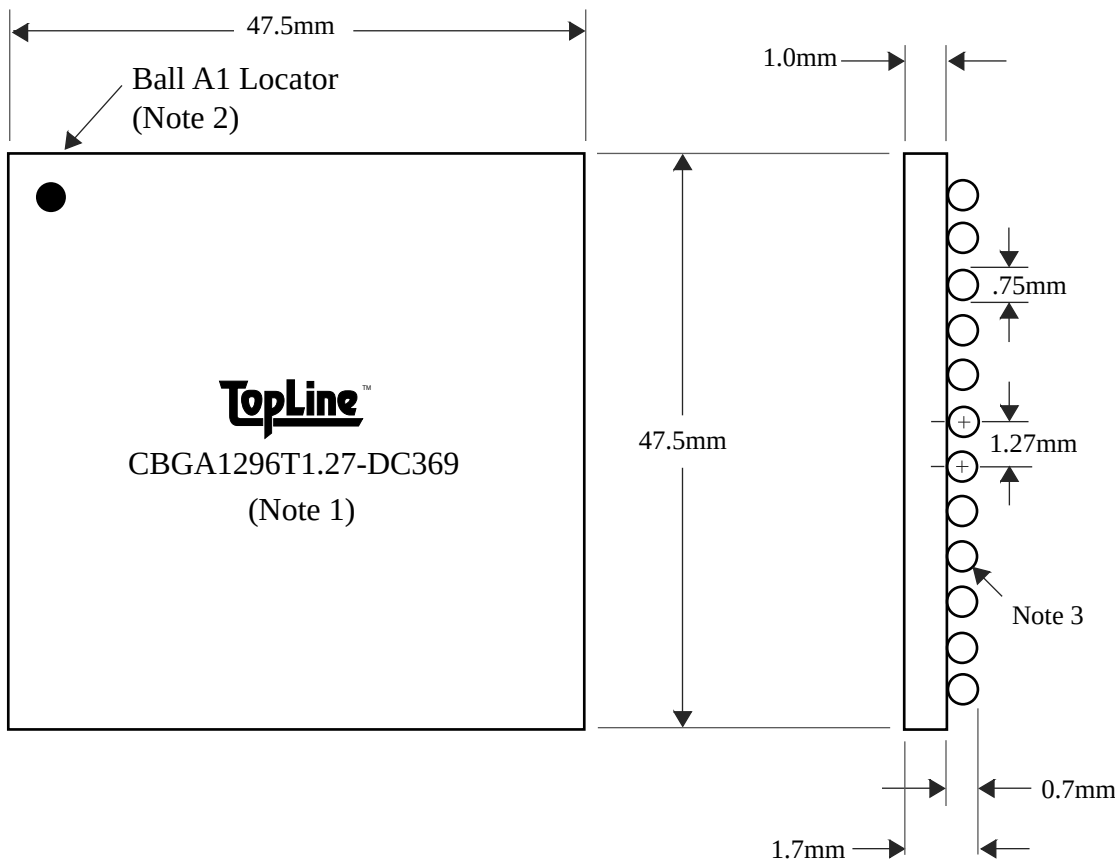
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
1296	1.27mm	47.5mm	36 x 36	full	full	ceramic

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 10/90 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: Ceramic	Tray BGATRAY47.5mm-2x6 Tray Quantity 12 Tray Suppliers (ref):		

TEL 1-714-898-3830

FAX 1-714-891-0321

BALLS

1369

PITCH

1.27mm

SIZE

50mm SQ

MATRIX

37 x 37

ROWS

full

CENTER

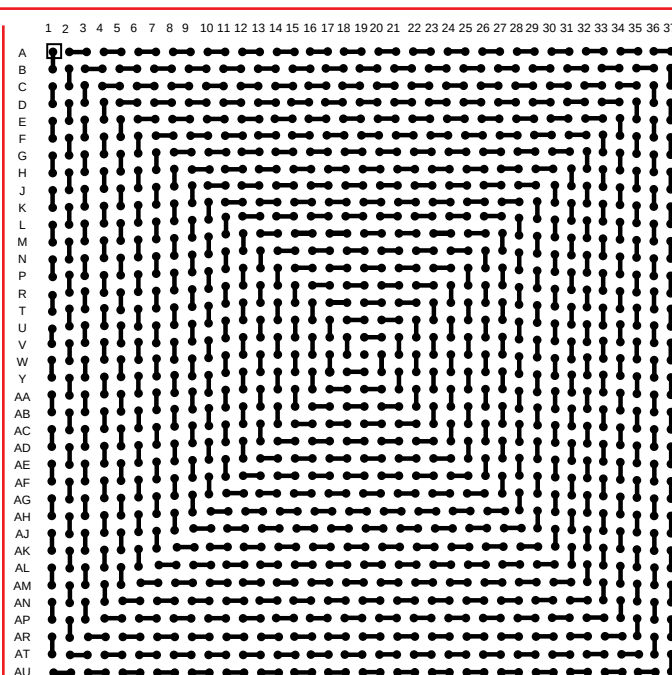
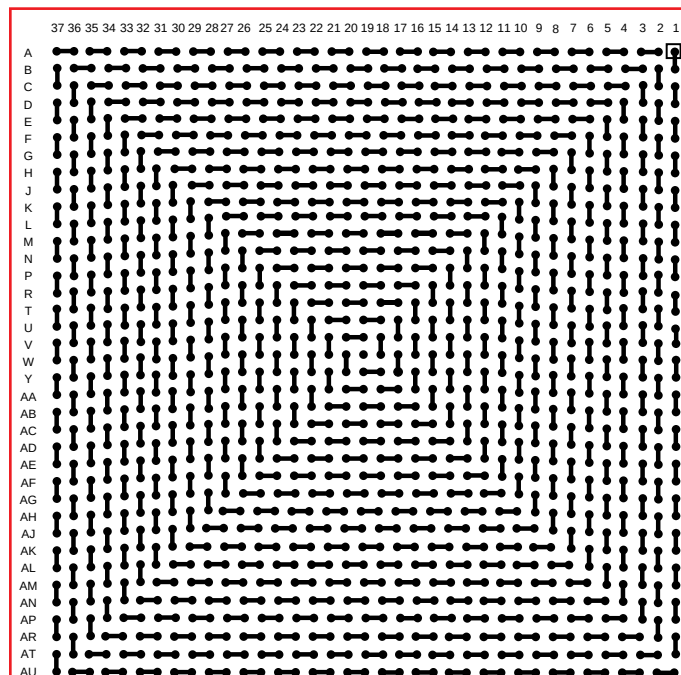
full

MAT'L

ceramic

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

CBGA1369T1.27-DC379

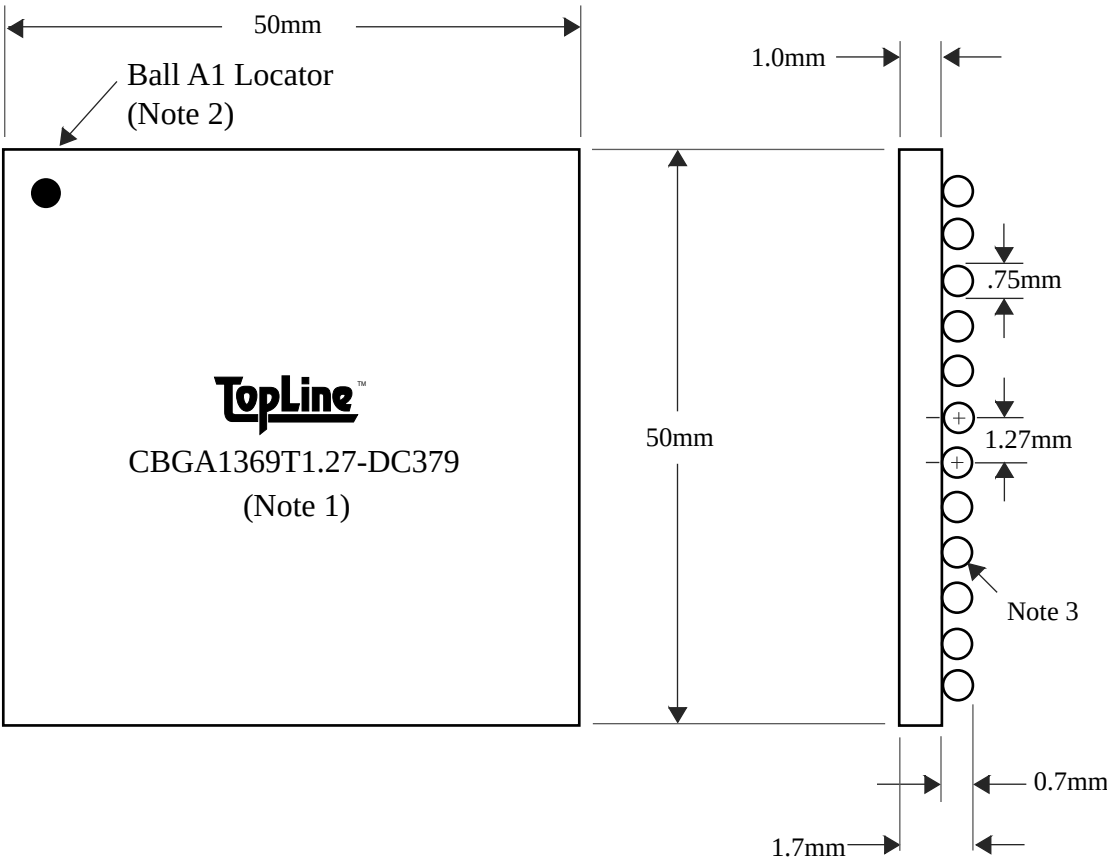
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
1369	1.27mm	50mm SQ	37 x 37	full	full	ceramic

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

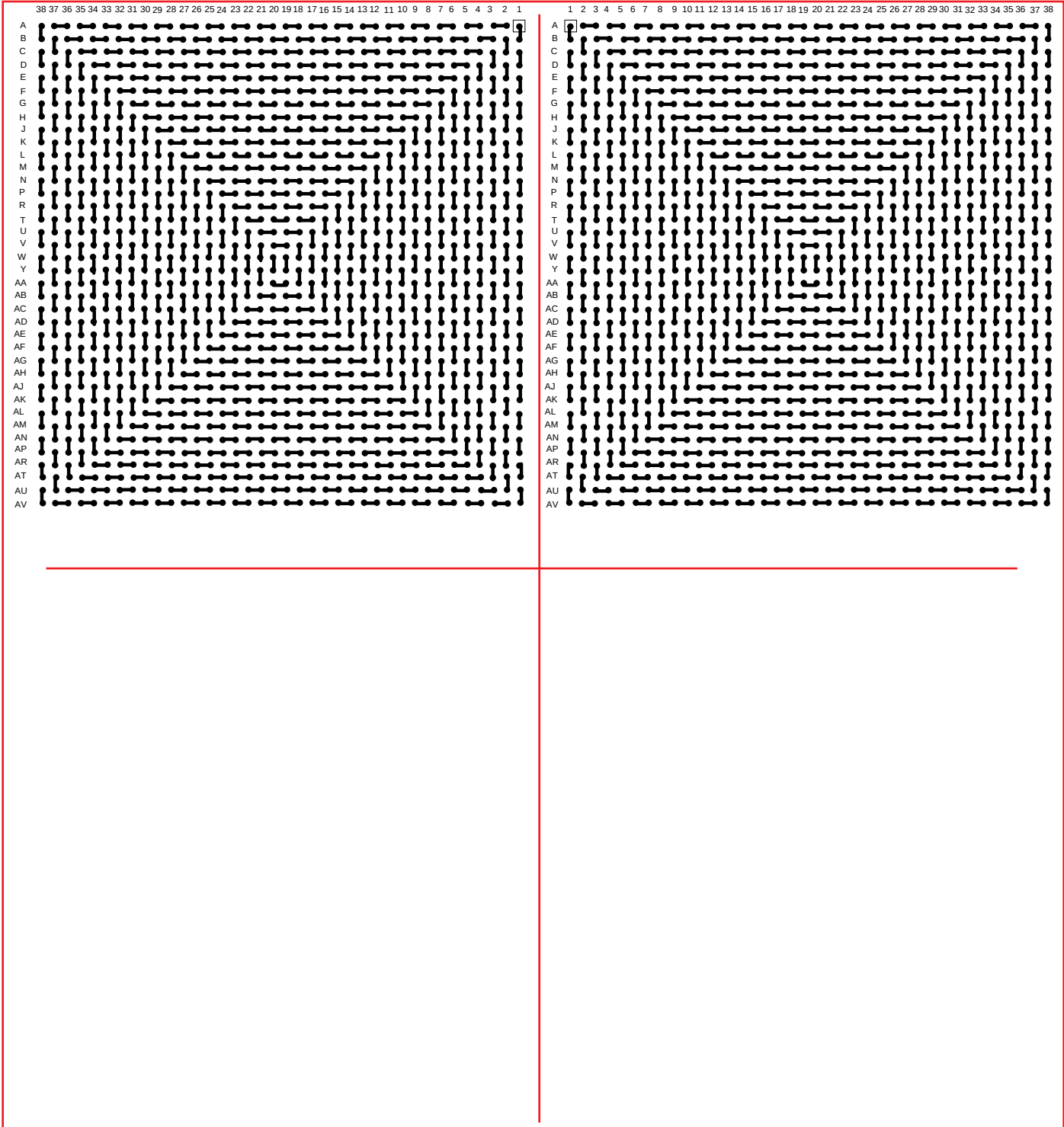


NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 10/90 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: Ceramic	Tray BGATRAY50mm-2x6 Tray Quantity 12 Tray Suppliers (ref):		

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
1444	1.0mm	40mm SQ	36 x 36	full	full	FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA1444T1.0-DC389

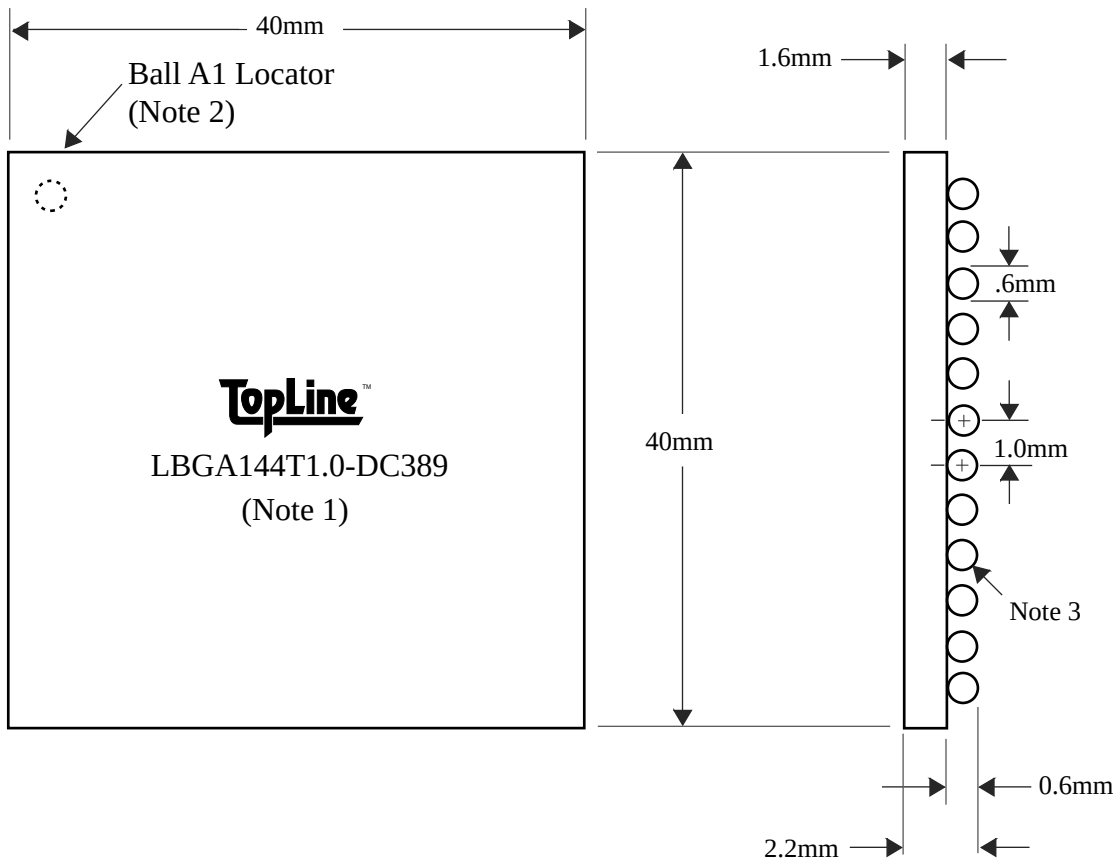
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
1444	1.0mm	40mm SQ	36 x 36	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW

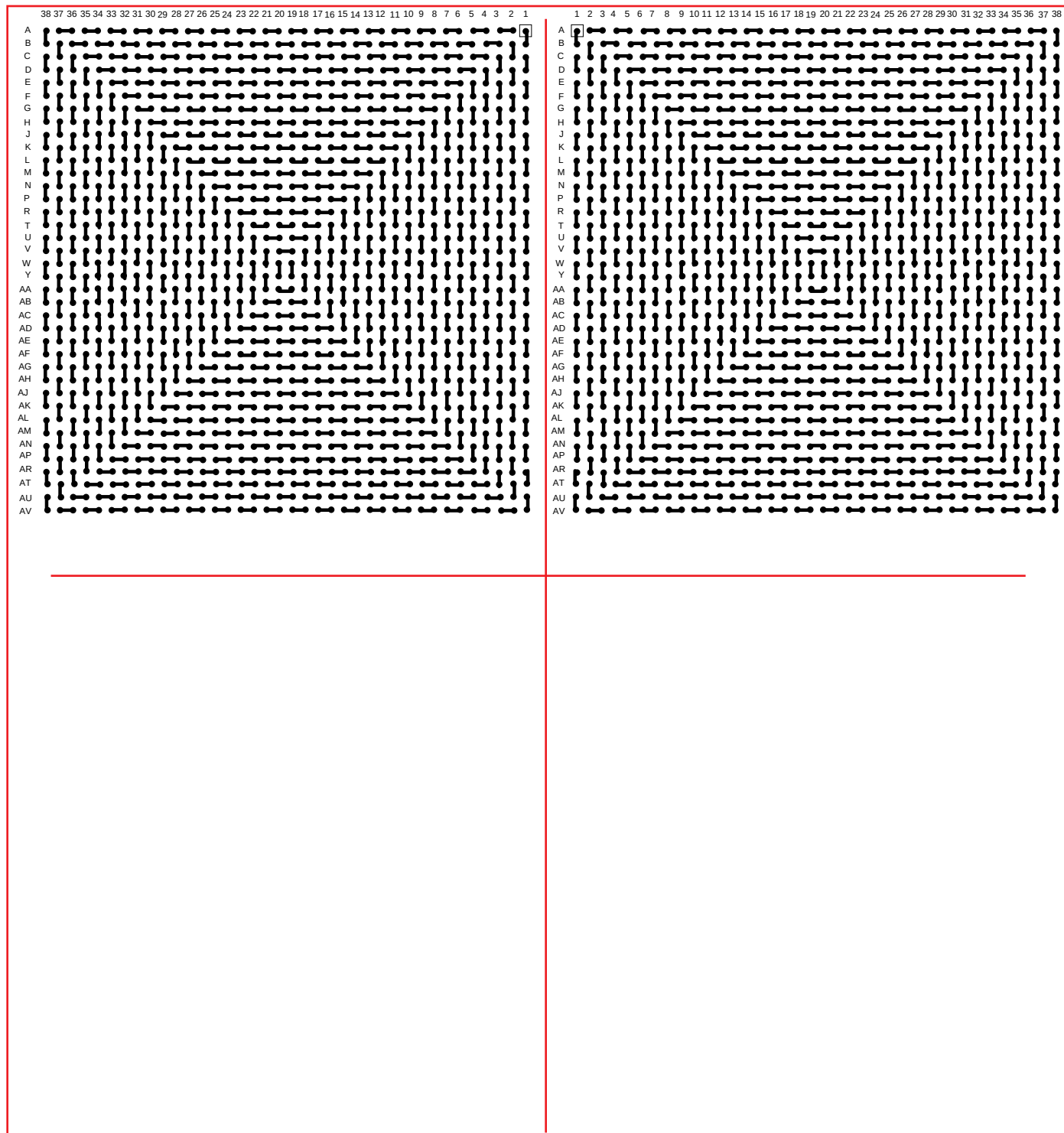


NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY40mm-3x7 Tray Quantity 21 Tray Suppliers (ref):		

	<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
TEL 1-714-898-3830							
FAX 1-714-891-0321	1444	1.27mm	50mm SQ	38 x 38	full	full	ceramic

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



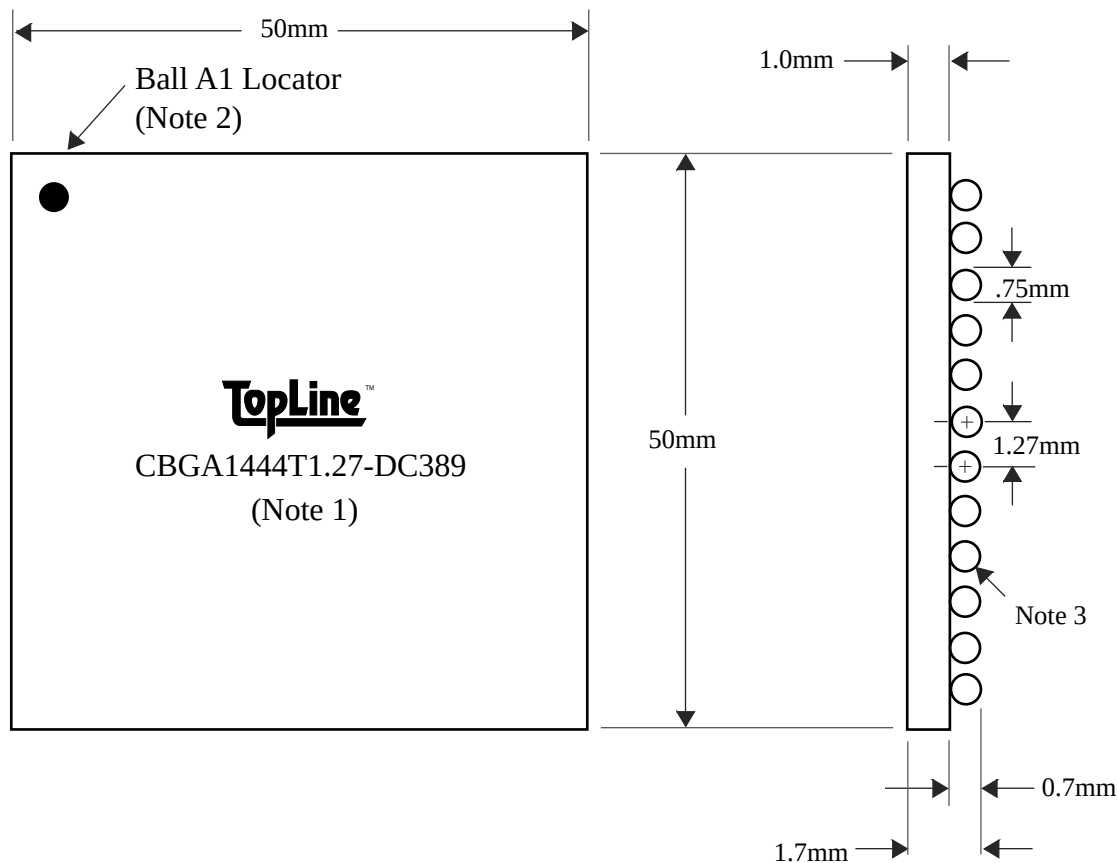
TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

TopLine™

<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
1444	1.27mm	50mm SQ	38 x 38	full	full	ceramic

SIDE VIEW



NOTES		REVISIONS	
Note 1	TopLine logo and part number centered Black ink	<u>Rev</u>	<u>Date</u> <u>Changes</u>
Note 2	Ball A1 locator mark positioned in corner	11/14/98	Proposed Design
Note 3	Ball Material: 10/90 SnPb	PACKAGING TRAYS (SEE NOTE 4)	
Note 4	Substrate Material: Ceramic	Tray BGATRAY50mm-2x6 Tray Quantity 12 Tray Suppliers (ref):	



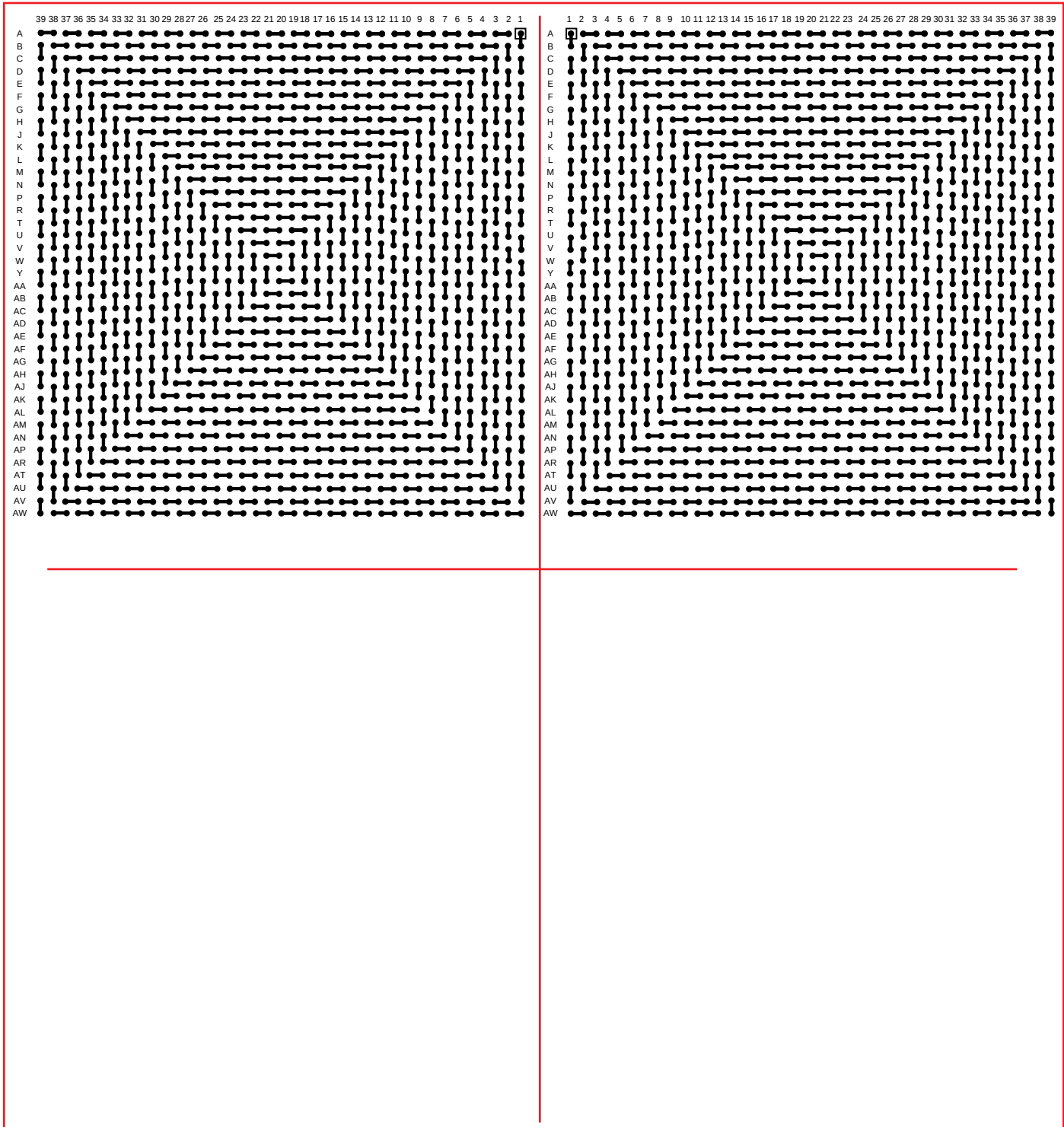
CBGA1521T1.27-DC399

TEL 1-714-898-3830
FAX 1-714-891-0321

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
1521	1.27mm	50mm SQ	39 x 39	full	full	ceramic

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

CBGA1521T1.27-DC399

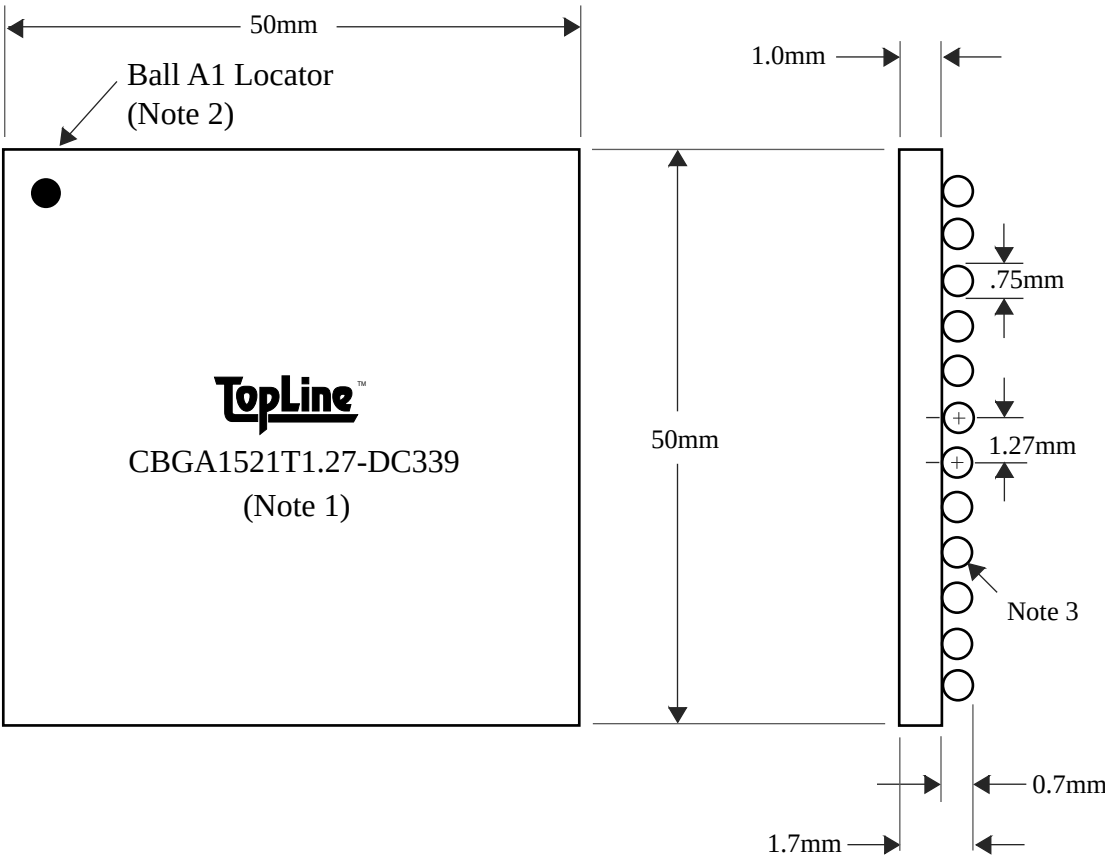
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
1521	1.27mm	50mm SQ	39 x 39	full	full	ceramic

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	TopLine logo and part number centered Black ink	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 10/90 SnPb	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: Ceramic	Tray BGATRAY50mm-2x6 Tray Quantity 12 Tray Suppliers (ref):		

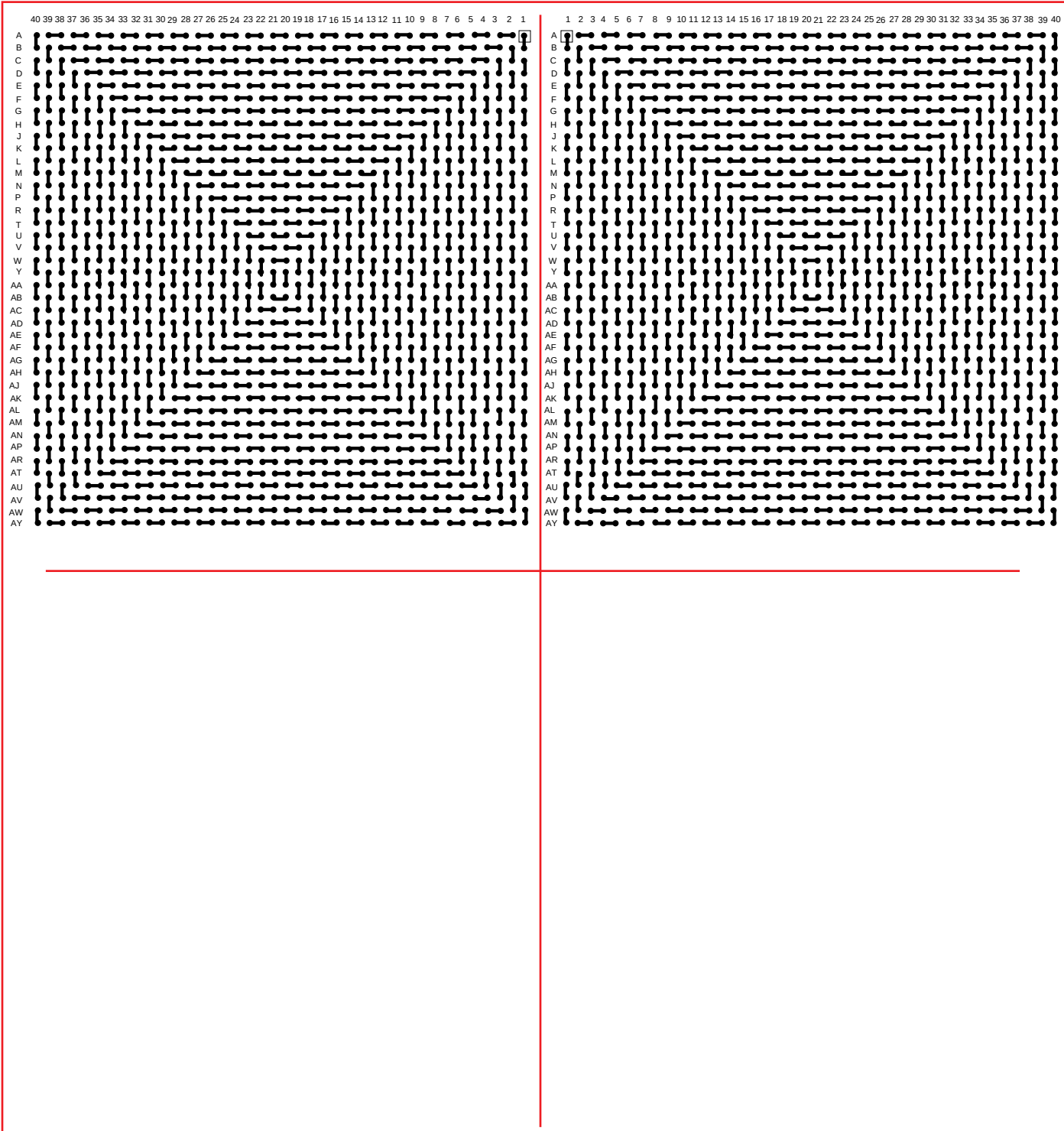


LBGA1600T1.0-DC409

	<u>BALLS</u>	<u>PITCH</u>	<u>SIZE</u>	<u>MATRIX</u>	<u>ROWS</u>	<u>CENTER</u>	<u>MAT'L</u>
TEL 1-714-898-3830 FAX 1-714-891-0321	1600	1.0mm	42.5mm SQ	40 x 40	full	full	FR4

BALL VIEW

BOTTOM SIDE (TOP X-RAY VIEW)



TEST VEHICLE BOARD

AFTER MOUNTING TO TEST BOARD

LBGA1600T1.0-DC409

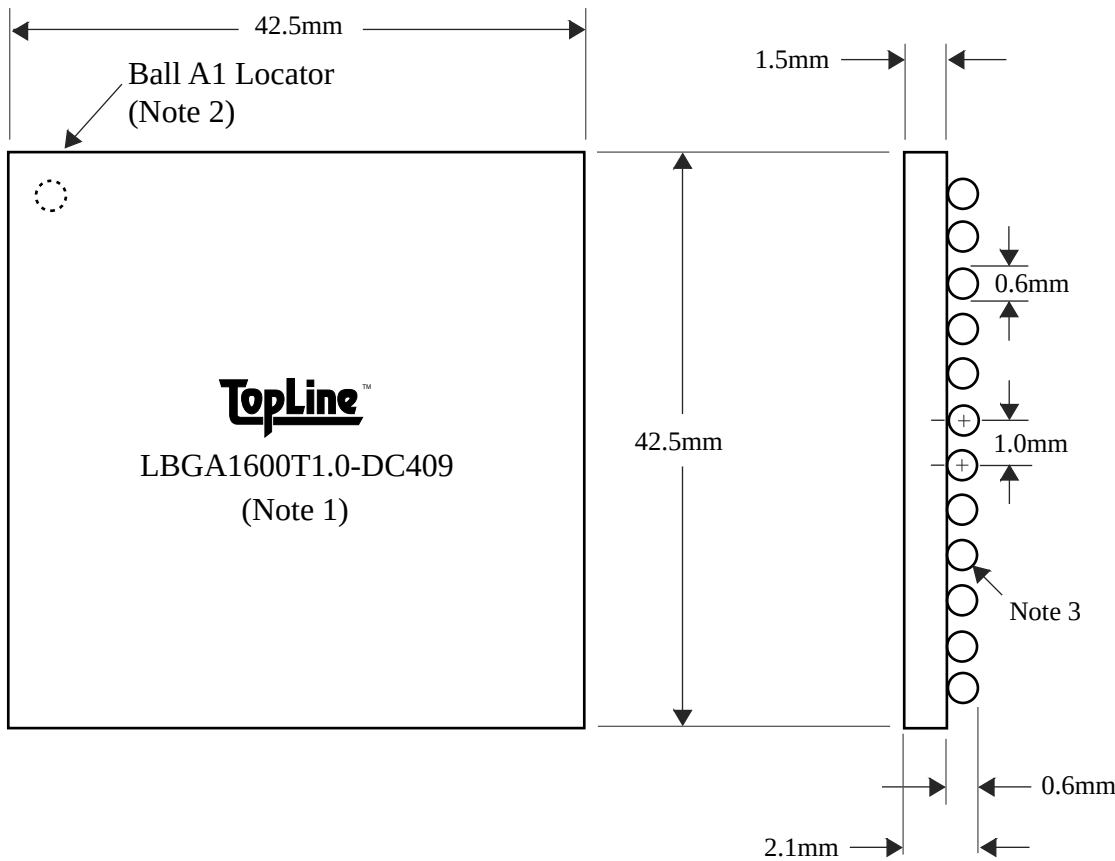
TopLine™

BALLS	PITCH	SIZE	MATRIX	ROWS	CENTER	MAT'L
1600	1.0mm	42.5mm SQ	40 x 40	full	full	FR4

TEL 1-714-898-3830
FAX 1-714-891-0321

TOP VIEW

SIDE VIEW



NOTES		REVISIONS		
Note 1	Logo and part number centered White ink on black solder mask	Rev	Date	Changes
Note 2	Ball A1 locator mark positioned in corner		11/14/98	Proposed Design
Note 3	Ball Material: 62/36/2 SnPbAg	PACKAGING TRAYS (SEE NOTE 4)		
Note 4	Substrate Material: FR4 laminate	Tray BGATRAY42.5mm-2x6 Tray Quantity 12 Tray Suppliers (ref):		