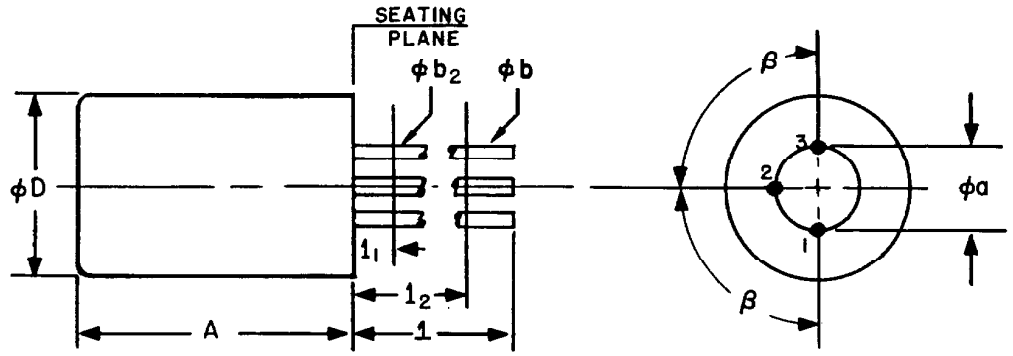
TO-1



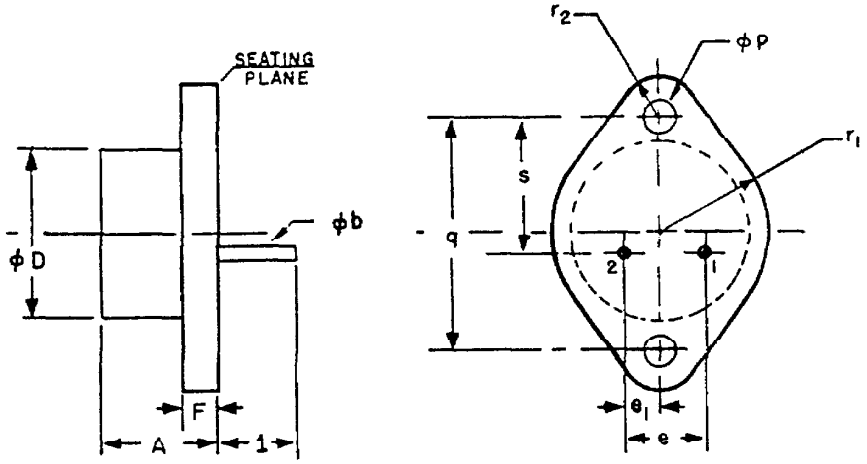
SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
Øa	.061	.081	1.55	2.06	
A		.410		10.41	
Øb		.021		.533	1
$Øb_2$	.016	.019	.406	.483	1
ØD		.240		6.10	
l	1.500		38.10		1
l_1		.050		1.27	
l_2	.250		6.35		1
β	90^o NOMINAL				

NOTES:

1. (THREE LEADS) $Øb_2$ APPLIES BETWEEN l_1 AND l_2. Øb APPLIES BETWEEN l_2 AND 1.5" (38.10 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND 1.5" (38.10 MM) FROM SEATING PLANE.

THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED BY JS-10 FOR REGISTRATION.

TO-3



SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.250	.450	6.35	11.43	
ϕb	.038	.043	.97	1.09	2
ϕD		.875		22.23	
e	.420	.440	10.67	11.18	
e_1	.205	.225	5.21	5.72	
F		.135		3.43	
l	.312		7.92		2
ϕp	.151	.161	3.84	4.09	
q	1.177	1.197	29.90	30.40	
r_1		.525		13.34	
r_2		.188		4.78	
s	.655	.675	16.64	17.15	1

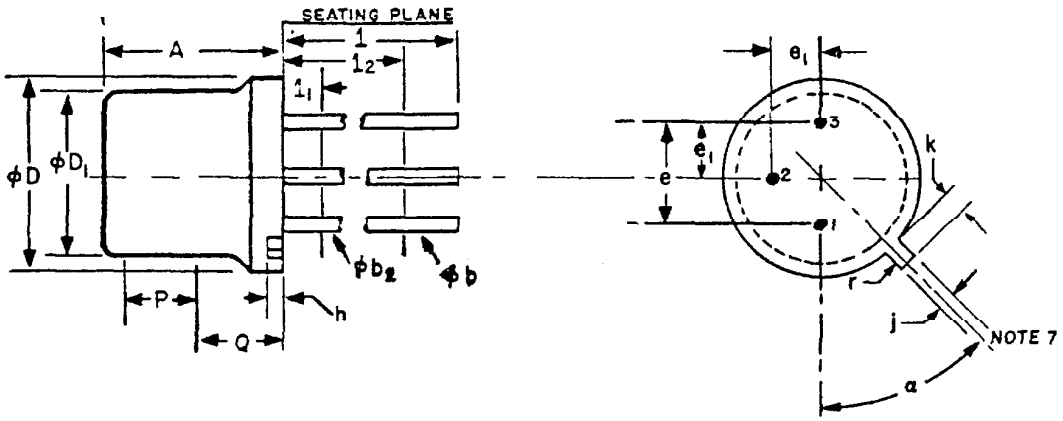
NOTES:

1. THESE DIMENSIONS SHOULD BE MEASURED AT POINTS .050" (1.27 MM) TO .055" (1.40 MM) BELOW SEATING PLANE. WHEN GAGE IS NOT USED, MEASUREMENT WILL BE MADE AT SEATING PLANE.

2. TWO LEADS.

THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED BY JS-10 FOR REGISTRATION

TO-5

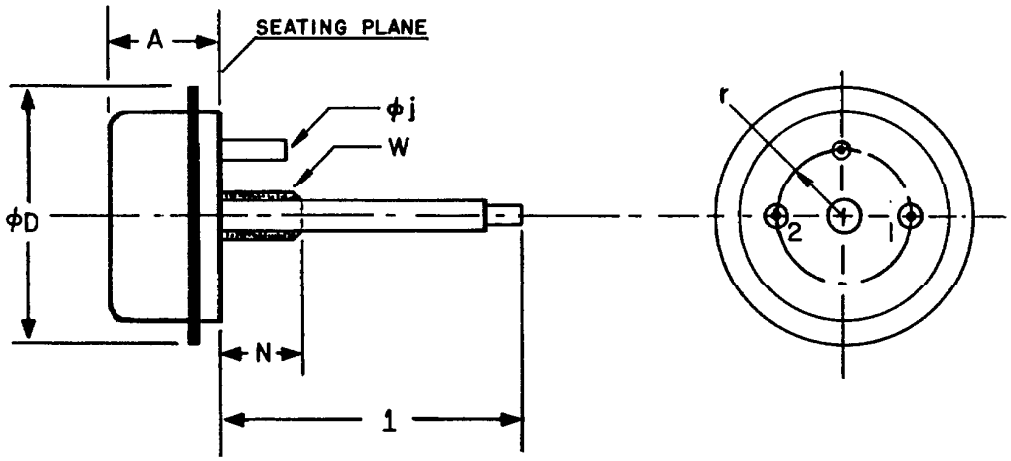


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.240	.260	6.10	6.60	
Øb	.016	.021	.406	.533	2
$Øb_2$	.016	.019	.406	.483	2
ØD	.335	.370	8.51	9.40	
$ØD_1$	.305	.335	7.75	8.51	
e	.200 T.P.		5.08 T.P.		4, 5
e_1	.100 T.P.		2.54 T.P.		5
h	.009	.125	.229	3.18	
j	.028	.034	.711	.864	5
k	.029	.045	.737	1.14	3, 5
l	1.500		38.10		2
l_1		.050		1.27	2
l_2	.250		6.35		2
P	.100		2.54		1
Q					6
r		.007		.179	
α	45^o T.P.				5, 7

NOTES:

1. THIS ZONE IS CONTROLLED FOR AUTOMATIC HANDLING. THE VARIATION IN ACTUAL DIAMETER WITHIN THE ZONE SHALL NOT EXCEED .010" (.254 MM).
2. (THREE LEADS) $Øb_2$ APPLIES BETWEEN l_1 AND l_2. Øb APPLIES BETWEEN l_2 AND 1.5" (38.10 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND 1.5" (38.10 MM) FROM SEATING PLANE.
3. MEASURED FROM MAXIMUM DIAMETER OF THE ACTUAL DEVICE.
4. LEADS HAVING MAXIMUM DIAMETER .019" (.483 MM) MEASURED IN GAGING PLANE .054" (1.37 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE SEATING PLANE OF THE DEVICE SHALL BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITIONS RELATIVE TO THE MAXIMUM-WIDTH TAB.
5. THE DEVICE MAY BE MEASURED BY DIRECT METHODS OR BY THE GAGE AND GAGING PROCEDURE DESCRIBED ON GAGE DRAWING GS-1.
6. DETAILS OF OUTLINE IN THIS ZONE OPTIONAL.
7. TAB CENTERLINE.

TO-6



SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A		.625		15.88	
ØD		1.188		30.18	
1	1.625		41.28		
Øj	.120 NOMINAL		3.05 NOMINAL		1
N	.438 NOMINAL		11.13 NOMINAL		
r	.345 NOMINAL		8.76 NOMINAL		
W					2

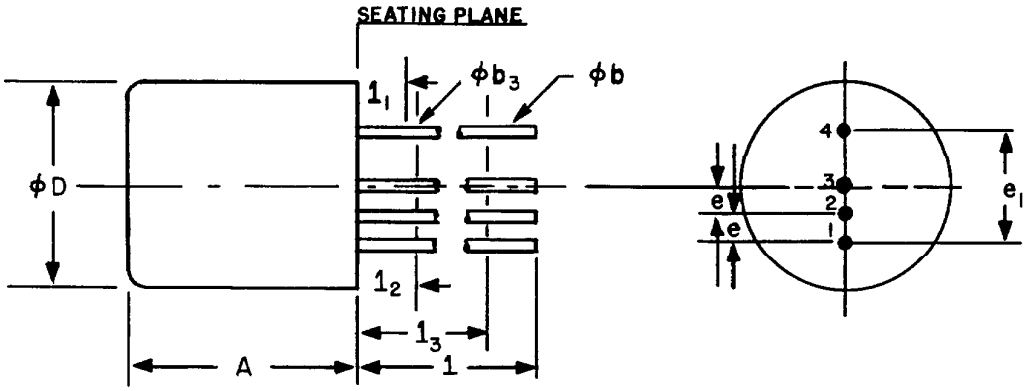
NOTES:

1. INSULATED LOCATOR PIN.

2. 10-32 UNF-2A. MAXIMUM PITCH DIAMETER OF PLATED THREADS SHALL BE BASIC PITCH DIAMETER .1697" (4.31 MM) REFERENCE (SCREW THREAD STANDARDS FOR FEDERAL SERVICES 1957) HANDBOOK H28 1957 P1.

THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED BY JS-10 FOR REGISTRATION.

TO-7



SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A		.375		9.53	
ϕb	.016	.021	.406	.533	2
ϕb_3	.016	.019	.406	.483	2
ϕD		.360		9.14	
e	.041	.055	1.04	1.40	
e_1	.185	.199	4.70	5.05	
1	1.500		38.10		
l_1		.050		1.27	2
l_2		.080		2.03	1, 2
l_3	.250		6.35		2

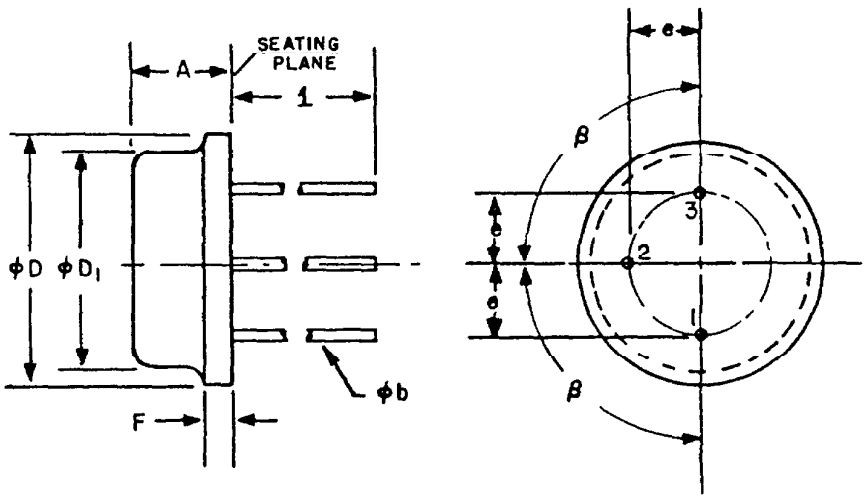
NOTES:

1. EXTERNALLY COATED DEVICES SHALL NOT HAVE COATING ON THE LEADS BEYOND THIS ZONE.

2. (FOUR LEADS) ϕb_3 APPLIES BETWEEN l_1 AND l_3. ϕb APPLIES BETWEEN l_3 AND 1.5" (38.10 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND 1.5" (38.10 MM) FROM SEATING PLANE.

THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED BY JS-10 FOR REGISTRATION.

TO-8



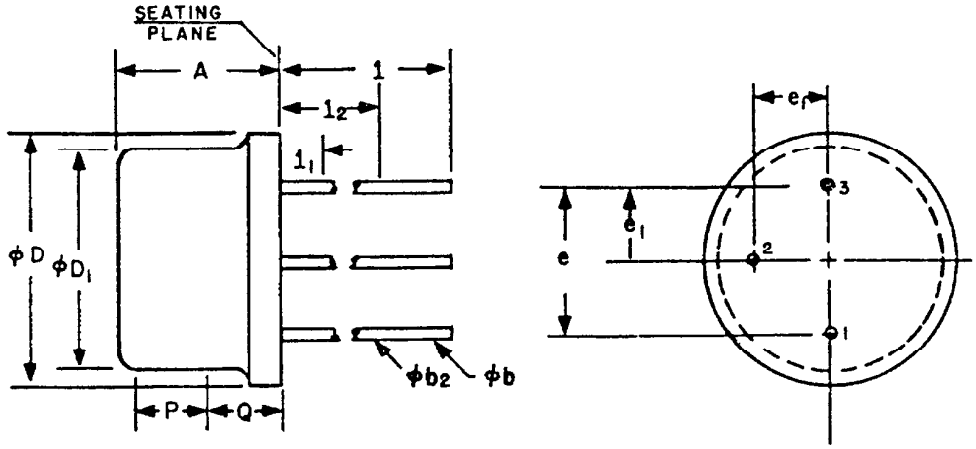
SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.270	.330	6.86	8.38	
ϕb	.027	.033	.686	.838	1
ϕD	.550	.650	13.97	16.51	
ϕD_1	.444	.524	11.28	13.31	
e	.136	.146	3.45	3.71	
F		.115		2.92	
1	.360	.440	9.14	11.18	1
β	90° NOMINAL				

NOTES:

1. THREE LEADS.

THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED BY JS-10 FOR REGISTRATION.

TO-9

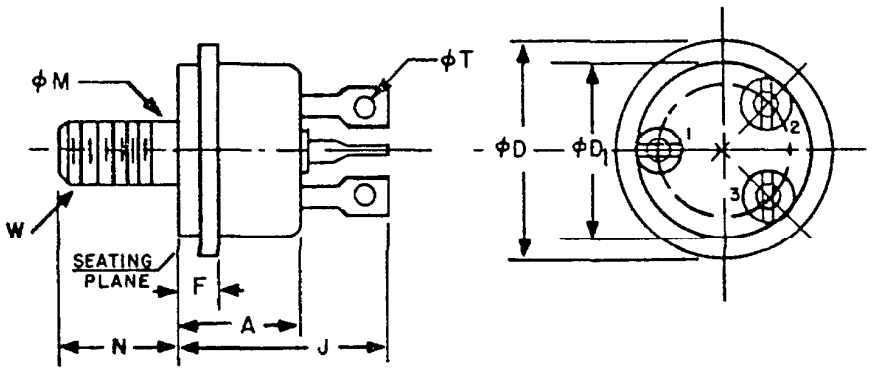


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.200	.260	5.08	6.60	
ϕb	.016	.021	.406	.533	2
ϕb_2	.016	.019	.406	.483	2
ϕD	.290	.370	7.37	9.40	
ϕD_1	.275	.335	6.99	8.51	
e	.200 T.P.		5.08 T.P.		3
e_1	.100 T.P.		2.54 T.P.		
1	.500		12.70		
1_1		.050		1.27	
1_2	.250		6.35		
P	.065		1.65		1
Q		.155		3.94	4

NOTES:

1. THE VARIATION IN ACTUAL DIAMETER WITHIN THIS ZONE SHALL NOT EXCEED .010" (.254 MM).
2. (THREE LEADS) ϕb_2 APPLIES BETWEEN 1_1 AND 1_2. ϕb APPLIES BETWEEN 1_2 AND .5" (12.70 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN 1_1 AND BEYOND .5" (12.70 MM) FROM SEATING PLANE.
3. LEADS HAVING A MAXIMUM DIAMETER .019" (.483 MM) MEASURED IN A GAGING PLANE OF .054" (1.37 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE SEATING PLANE OF THE DEVICE SHALL BE WITHIN .007" (1.78 MM) OF THEIR TRUE POSITIONS (T.P.).
4. DETAILS OF OUTLINE IN THIS ZONE OPTIONAL.

TO-10



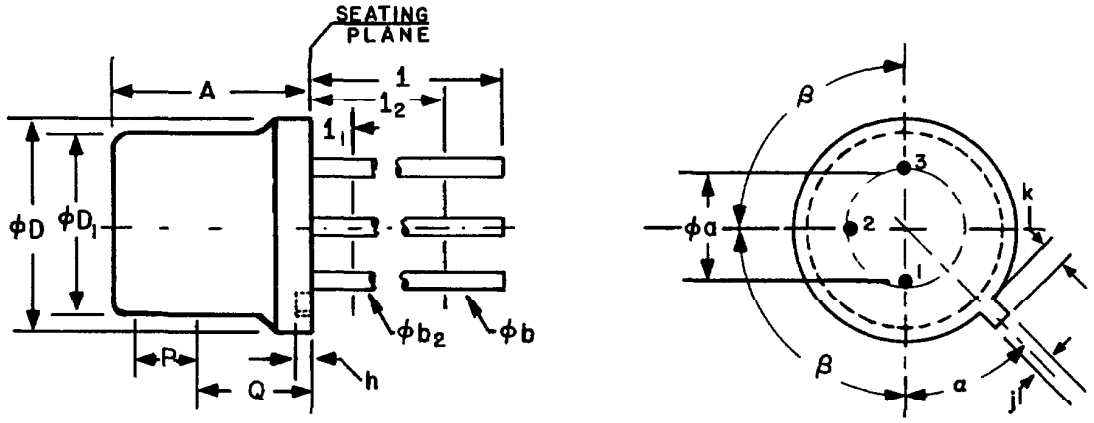
SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.290	.440	7.37	11.18	
ØD		.650		16.51	
$ØD_1$	.410	.560	10.41	14.22	
F	.060	.330	1.52	8.38	
J		.650		16.51	
ØM	.163	.189	4.14	4.80	3
N	.335	.375	8.51	9.53	
ØT	.040		1.02		1
W					2, 3

NOTES:

1. ANGULAR ORIENTATION OF INDIVIDUAL SOLDERED TERMINALS IS UNDEFINED.
2. 10-32 UNF-2A. MAXIMUM PITCH DIAMETER OF PLATED THREADS SHALL BE BASIC PITCH DIAMETER .1697" (4.31 MM) REFERENCE (SCREW THREAD STANDARDS FOR FEDERAL SERVICES 1957) HANDBOOK H28 1957 P1.
3. COMPLETE THREADS SHALL EXTEND TO WITHIN 2-1/2 THREADS OF THE SEATING PLANE.

THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED BY JS-10 FOR REGISTRATION.

TO-11

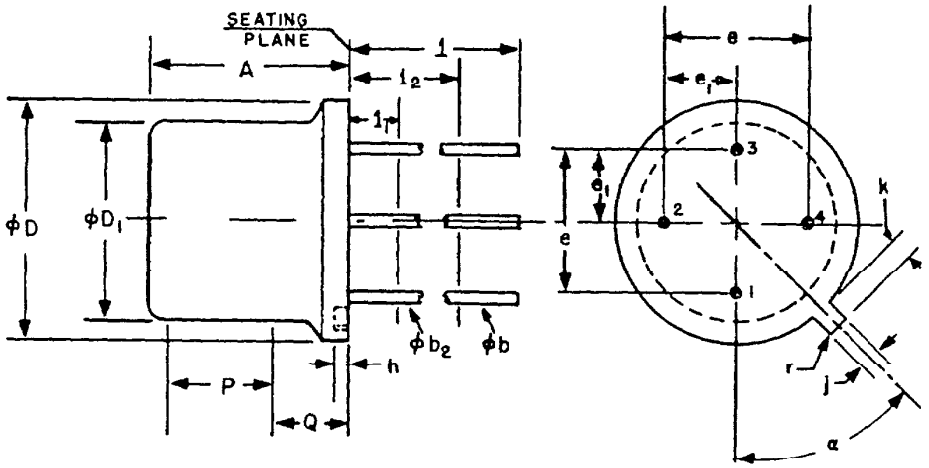


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
Øa	.190	.210	4.83	5.33	
A	.360	.390	9.14	9.91	
Øb	.016	.021	.406	.533	2
$Øb_2$	.016	.019	.406	.483	2
ØD		.370		9.40	
$ØD_1$	.305	.335	7.75	8.51	
h	.009	.125	.229	3.18	
j	.028	.034	.711	.864	
k	.029		.737		3
l	1.500		38.10		2
l_1		.050		1.27	2
l_2	.250		6.35		2
P	.200		5.08		1
Q					4
α	45° NOMINAL				
β	90° NOMINAL				

NOTES:

1. THIS ZONE IS CONTROLLED FOR AUTOMATIC HANDLING. THE VARIATION IN ACTUAL DIAMETER WITHIN THIS ZONE SHALL NOT EXCEED .010" (.254 MM).
2. (THREE LEADS) $Øb_2$ APPLIES BETWEEN l_1 AND l_2. Øb APPLIES BETWEEN l_2 AND 1.5" (38.10 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND 1.5" (38.10 MM) FROM SEATING PLANE.
3. *MEASURED FROM MAXIMUM DIAMETER OF THE ACTUAL DEVICE.*
4. DETAILS OF OUTLINE IN THIS ZONE OPTIONAL.

THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED BY JS-10 FOR REGISTRATION.

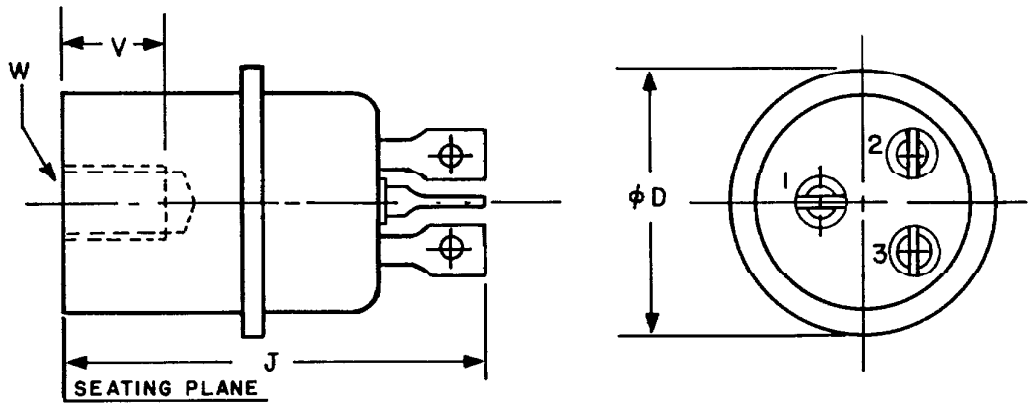


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.240	.260	6.10	6.60	
Øb	.016	.021	.406	.533	2
$Øb_2$	.016	.019	.406	.483	2
ØD	.335	.370	8.51	9.40	
$ØD_1$	.305	.335	7.75	8.51	
e	.200 T.P.		5.08 T.P.		4, 5
e_1	.100 T.P.		2.54 T.P.		5
h	.009	.125	.229	3.18	
j	.028	.034	.711	.864	5
k	.029	.045	.737	1.14	3, 5
l	.500		12.70		2
l_1		.050		1.27	2
l_2	.250		6.35		2
P	.100		2.54		1
Q					6
r		.007		.178	
α	45° T.P.				5, 7

NOTES:

1. THIS ZONE IS UNCONTROLLED FOR AUTOMATIC HANDLING. THE VARIATION IN ACTUAL DIAMETER WITHIN THIS ZONE SHALL NOT EXCEED .010" (.254 MM).
2. (FOUR LEADS) $Øb_2$ APPLIES BETWEEN l_1 AND l_2. Øb APPLIES BETWEEN l_2 AND .5" (12.70 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND .5" (12.70 MM) FROM SEATING PLANE.
3. MEASURED FROM MAXIMUM DIAMETER OF THE ACTUAL DEVICE.
4. LEADS HAVING MAXIMUM DIAMETER .019" (.483 MM) MEASURED IN A GAGING PLANE .054" (1.37 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE SEATING PLANE OF THE DEVICE SHALL BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITIONS RELATIVE TO THE MAXIMUM-WIDTH TAB.
5. THE DEVICE MAY BE MEASURED BY DIRECT METHODS OR BY THE GAGE AND GAGING PROCEDURE DESCRIBED ON GAGE DRAWING GS-1.
6. DETAILS OF OUTLINE IN THIS ZONE OPTIONAL.
7. TAB CENTERLINE.

TO-13



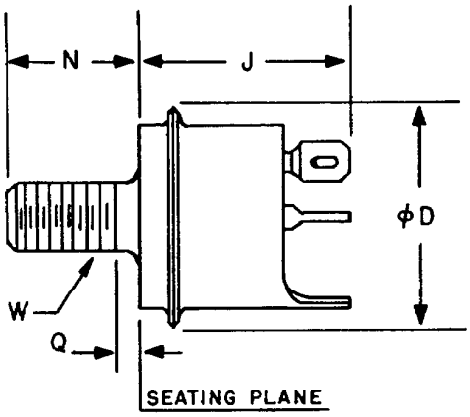
SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
ØD		.650		16.51	
J		1.040		26.42	
V	.250		6.35		
W					1

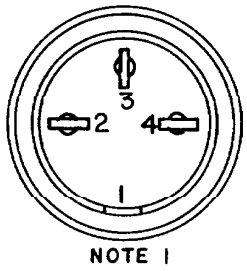
NOTES:

1. 1/4-28 UNF-2B.

THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED BY JS-10 FOR REGISTRATION.

TO-14





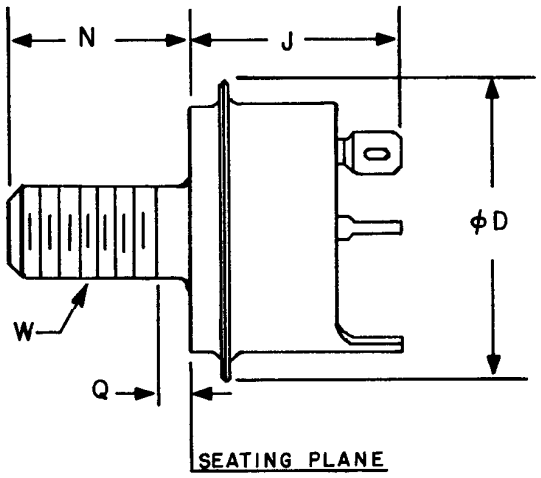
SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
ØD		.650		16.51	
J		.650		16.51	
N	.335	.375	8.51	9.53	
Q		.080		2.03	
W					2

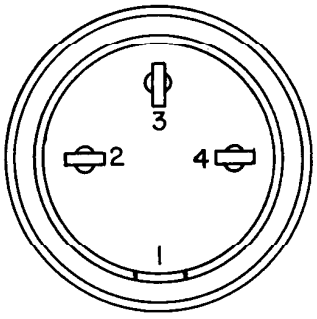
NOTES:

1. TERMINALS MAY BE REFERRED TO BY NUMBER AS FOLLOWS: TERMINAL NO. 1 IS THE ODD TERMINAL AND CONNECTED TO THE CASE. OTHER TERMINALS ARE NUMBERED CLOCKWISE FROM NO. 1.

2. 10-32 UNF-2A. MAXIMUM PITCH DIAMETER OF PLATED THREADS SHALL BE BASIC PITCH DIAMETER .1697" (4.31 MM) REFERENCE (SCREW THREAD STANDARDS FOR FEDERAL SERVICES 1957) HANDBOOK H28 1957 P1.

THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED BY JS-10 FOR REGISTRATION.





NOTE 1

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
ØD		.850		21.59	
J		.650		16.51	
N	.460	.500	11.68	12.70	
Q		.100		2.54	
W					2

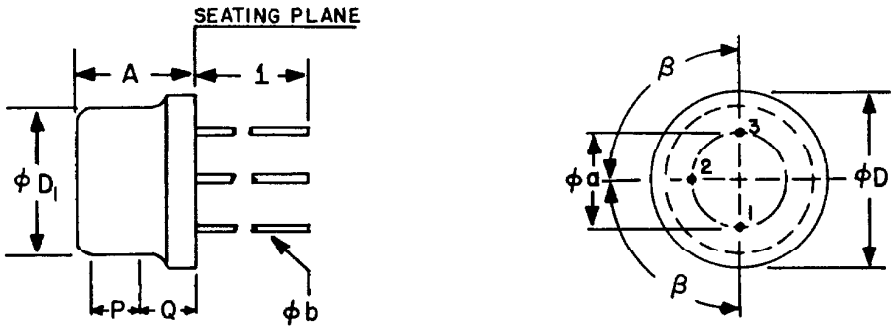
NOTES:

1. TERMINALS MAY BE REFERRED TO BY NUMBER AS FOLLOWS: TERMINAL NO. 1 IS THE ODD TERMINAL AND CONNECTED TO THE CASE. OTHER TERMINALS ARE NUMBERED CLOCKWISE FROM NO. 1.

2. 1/4-28 UNF-2A. MAXIMUM PITCH DIAMETER OF PLATED THREADS SHALL BE BASIC PITCH DIAMETER .2268" (5.76 MM) REFERENCE (SCREW THREAD STANDARDS FOR FEDERAL SERVICES 1957) HANDBOOK H28 P1.

THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED BY JS-10 FOR REGISTRATION.

TO-16



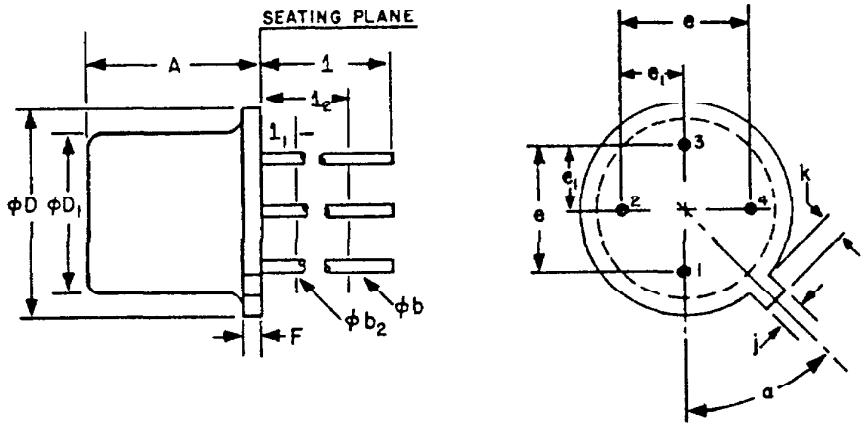
SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
Øa	.190	.210	4.83	5.33	
A	.200	.260	5.08	6.60	
Øb	.016	.019	.406	.483	2
ØD	.370 NOMINAL		9.40 NOMINAL		
$ØD_1$	.275	.335	6.99	8.51	
1	.500		12.70		
P	.100		2.54		1
Q					3
β	90^o NOMINAL				

NOTES:

1. THIS ZONE IS CONTROLLED FOR AUTOMATIC HANDLING. THE VARIATION IN ACTUAL DIAMETER WITHIN THIS ZONE SHALL NOT EXCEED .010" (.254 MM).
2. THE SPECIFIED LEAD DIAMETER APPLIES IN THE ZONE BETWEEN .050" (1.27 MM) AND .250" (6.35 MM) FROM THE SEATING PLANE BETWEEN .250" (6.35 MM) AND .500" (12.70 MM) MAXIMUM OF .021" (.533 MM) DIAMETER IS HELD. OUTSIDE OF THESE ZONES THE LEAD DIAMETER IS NOT CONTROLLED.
3. DETAILS OF OUTLINE IN THIS ZONE OPTIONAL.

THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED BY JS-10 FOR REGISTRATION.

TO-17

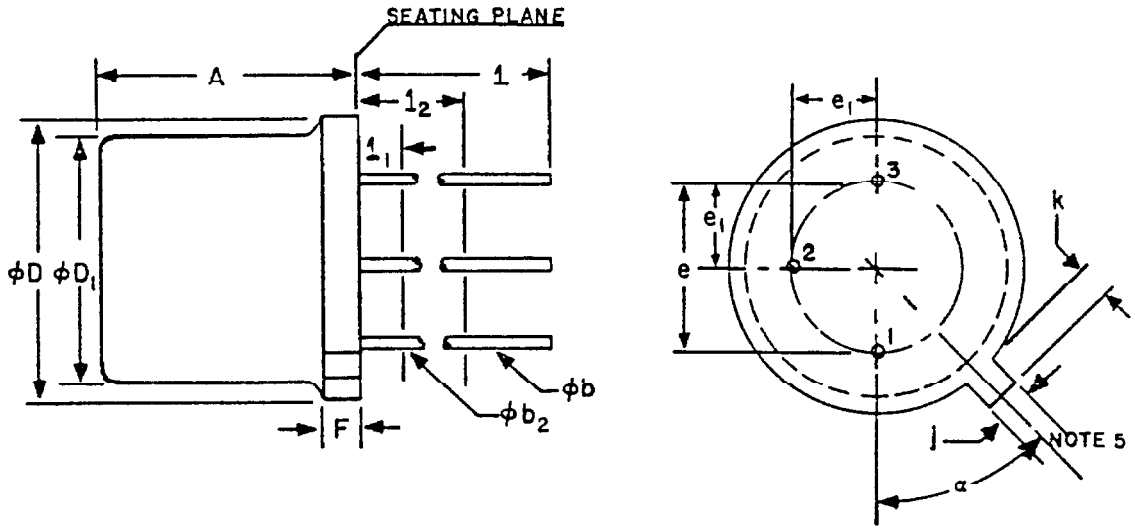


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.165	.210	4.19	5.33	
Øb	.016	.021	.406	.533	1
$Øb_2$	.016	.019	.406	.483	1
ØD	.185	.215	4.70	5.46	
$ØD_1$	.150	.168	3.81	4.27	
e	.071 T.P.		1.80 T.P.		2
e_1	.036 T.P.		.914 T.P.		
F		.030		.762	
j	.030	.045	.762	1.14	
k	.028	.048	.711	1.22	4
1	.500		12.70		1
1_1		.050		1.27	1
1_2	.250		6.35		1
a	45° T.P.				3

NOTES:

1. (FOUR LEADS) $Øb_2$ APPLIES BETWEEN 1_1 AND 1_2. Øb APPLIES BETWEEN 1_2 AND .5" (12.70 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN 1_1 AND BEYOND .5" (12.70 MM) FROM SEATING PLANE.
2. LEADS HAVING MAXIMUM DIAMETERS .019" (.483 MM) MEASURED AT A GAGING PLANE .054" (1.37 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE SEATING PLANE OF THE DEVICE SHALL BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITIONS RELATIVE TO A MAXIMUM-WIDTH TAB AND TO THE .215" (5.46 MM) DIAMETER.
3. TAB CENTERLINE. INDEX TAB FOR VISUAL ORIENTATION ONLY.
4. MEASURED FROM MAXIMUM DIAMETER OF ACTUAL DEVICE.

TO-18

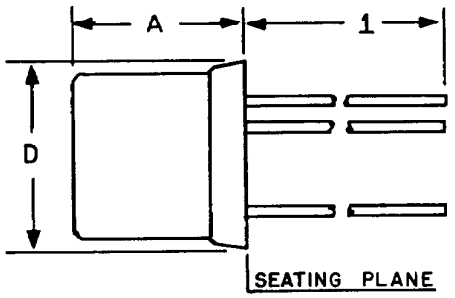


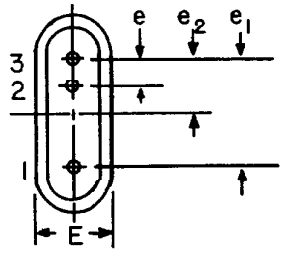
SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.170	.210	4.32	5.33	
Øb	.016	.021	.406	.533	1
$Øb_2$	.016	.019	.406	.483	1
ØD	.209	.230	5.31	5.84	
$ØD_1$	.178	.195	4.52	4.95	
e	.100 T.P.		2.54 T.P.		2, 4
e_1	.050 T.P.		1.27 T.P.		2, 4
F		.030		.762	
j	.036	.046	.914	1.17	4
k	.028	.048	.711	1.22	3
l	.500		12.70		1
l_1		.050		1.27	1
l_2	.250		6.35		1
α	45° T.P.				5

NOTES:

1. (THREE LEADS) $Øb_2$ APPLIES BETWEEN l_1 AND l_2. Øb APPLIES BETWEEN l_2 AND .5" (12.70 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND .5" (12.70 MM) FROM SEATING PLANE.
2. LEADS HAVING MAXIMUM DIAMETER .019" (.483 MM) MEASURED IN GAGING PLANE .054" (1.37 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE SEATING PLANE OF THE DEVICE SHALL BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITIONS RELATIVE TO A MAXIMUM-WIDTH TAB.
3. MEASURED FROM MAXIMUM DIAMETER OF THE ACTUAL DEVICE.
4. THE DEVICE MAY BE MEASURED BY DIRECT METHODS OR BY THE GAGE AND GAGING PROCEDURE DESCRIBED ON GAGE DRAWING GS-2.
5. TAB CENTERLINE.

TO-22

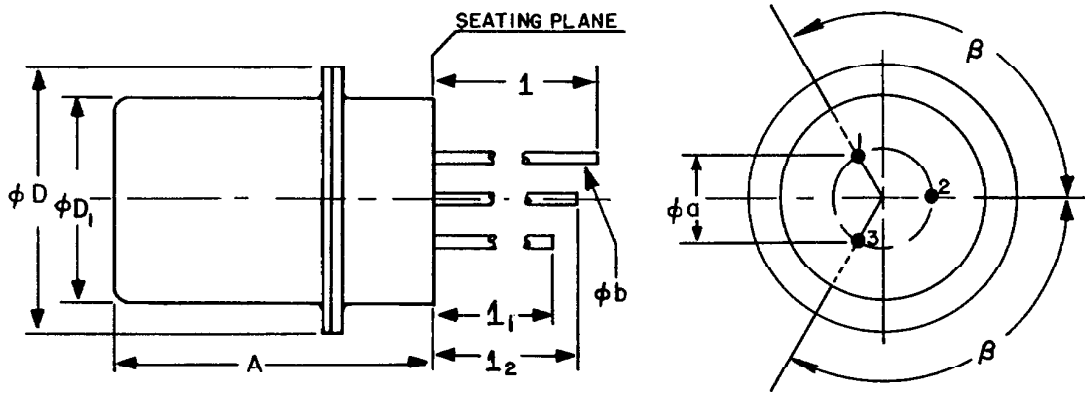




SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A		.320		8.13	
D		.340		8.64	
e	.041	.055	1.04	1.40	
e_1	.185	.199	4.70	5.05	
E		.190		4.83	
1	1.500		38.10		
Q	.089	.103	2.26	2.62	

THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED BY JS-10 FOR REGISTRATION.

TO-23

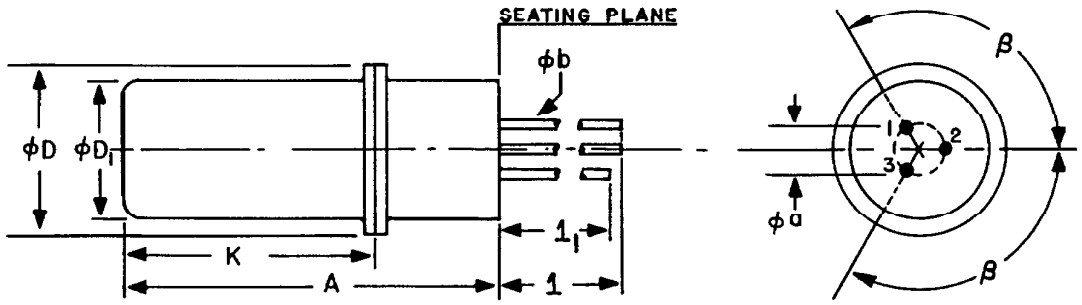


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
Øa	.052 NOMINAL		1.32 NOMINAL		
A		.180		4.57	
Øb	.013 NOMINAL		.330 NOMINAL		1
ØD		.140		3.56	
$ØD_1$		.115		2.92	
1	1.615	1.645	41.02	41.78	1
1_1	1.490	1.520	37.85	38.61	1
1_2	1.552	1.582	39.42	40.18	1
β	120^{o} NOMINAL				

NOTES:

1. THREE LEADS.

THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED BY JS-10 FOR REGISTRATION.



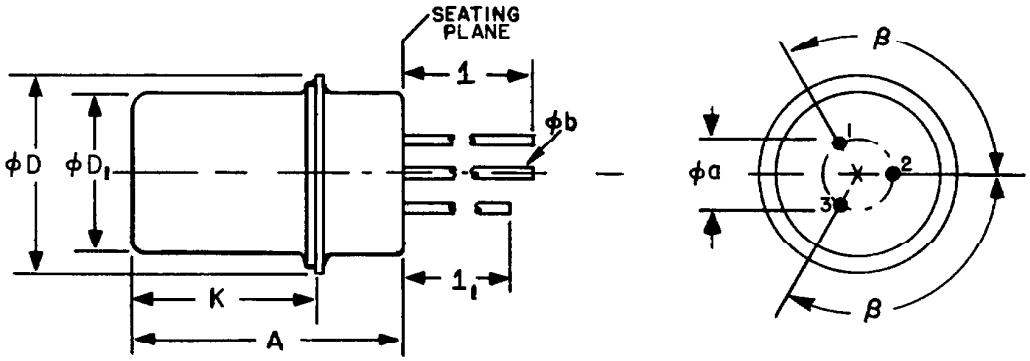
SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
Øa	.070 NOMINAL		1.79 NOMINAL		
A	.425	.475	10.80	12.07	
Øb	.016 NOMINAL		.406 NOMINAL		1
ØD	.195	.225	4.95	5.72	
$ØD_1$	.161	.179	4.09	4.55	
K	.285	.315	7.24	8.00	
l	1.500	1.687	38.10	42.85	1, 2
l_1	1.450	1.637	36.83	41.58	1, 2
β	120° NOMINAL				

NOTES:

1. THREE LEADS.
2. THE MINIMUM DIFFERENCE BETWEEN 1 AND 1_1 SHALL BE .062" (1.57 MM).

THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED BY JS-10 FOR REGISTRATION.

TO-25



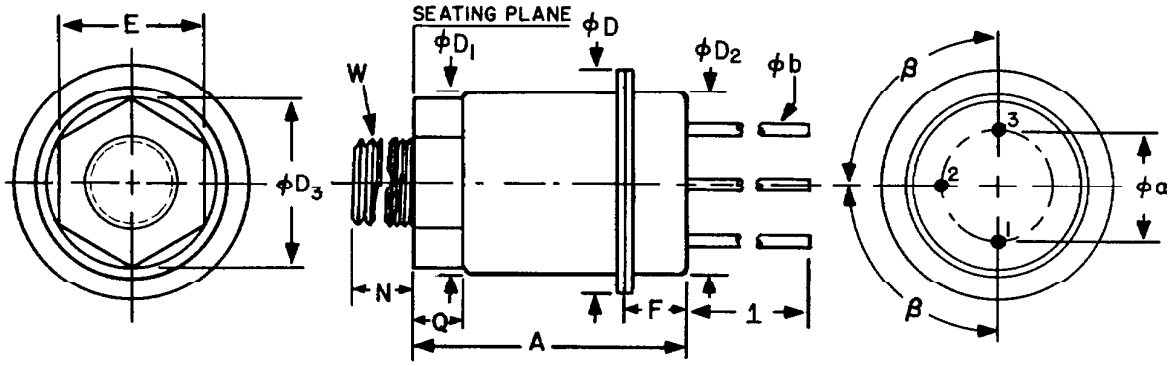
SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
ϕa	.156 NOMINAL		3.96 NOMINAL		
A		.470		11.94	
ϕb	.020 NOMINAL		.508 NOMINAL		1
ØD		.330		8.38	
$ØD_1$		.280		7.11	
K		.295		7.49	
1	1.500		38.10		1, 2
1_l	1.438		36.53		1, 2
β	120° NOMINAL				

NOTES:

1. THREE LEADS.
2. THE MINIMUM DIFFERENCE BETWEEN 1 AND 1_l SHALL BE .062" (1.57 MM).

THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED BY JS-10 FOR REGISTRATION.

TO-26



SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
Øa		.200		5.08	
A	.480	.510	12.19	12.95	
Øb	.016	.019	.406	.482	2
ØD	.360	.370	9.14	9.40	
$ØD_1$	.295	.305	7.49	7.75	
$ØD_2$	.290	.310	7.37	7.87	
$ØD_3$		.289		7.34	
E		.250		6.35	
F	.110	.130	2.79	3.30	
1	1.500	1.688	38.10	42.88	2
N		.375		9.53	
Q	.105	.115	2.67	2.92	
W					1
β	90^o NOMINAL				

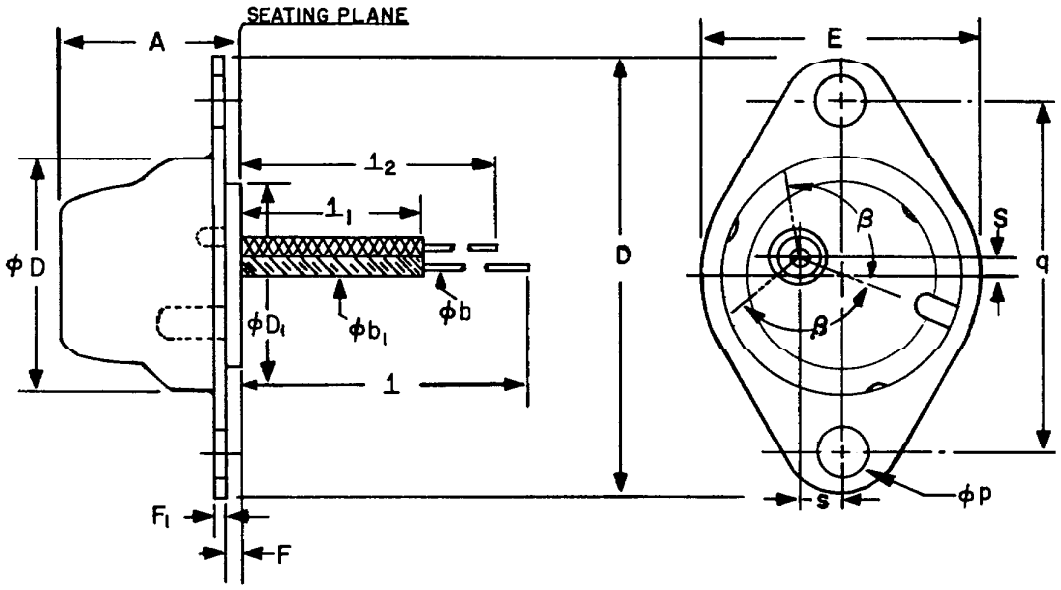
NOTES:

1. 8-32 UNF-2A.

2. THREE LEADS.

THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED BY JS-10 FOR REGISTRATION.

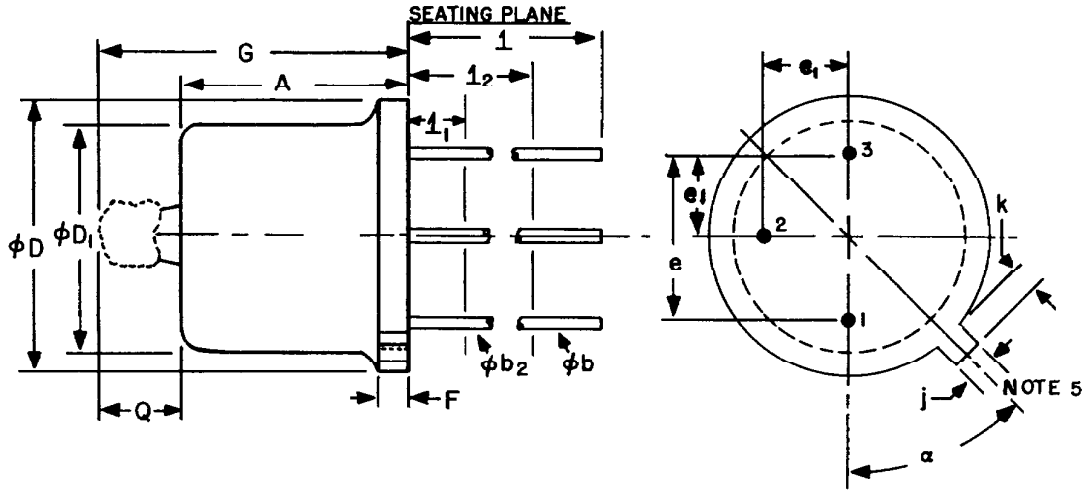
TO-27



SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A		.510		12.95	
Øb	.016 NOMINAL		.406 NOMINAL		
$Øb_1$		.065		1.65	
ØD		.875		22.23	
$ØD_1$		.625		15.88	
D		1.625		41.28	
E		1.125		28.58	
F	.040		1.02		
F_1	.030 NOMINAL		.762 NOMINAL		
1	1.500		38.10		
1_1	.750		19.05		
1_2	1.420		36.07		
Øp	.156 NOMINAL		3.96 NOMINAL		
q	1.187 NOMINAL		30.15 NOMINAL		
S	.049 NOMINAL		1.24 NOMINAL		
s	.135 NOMINAL		3.43 NOMINAL		
β	120° NOMINAL				

THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED BY JS-10 FOR REGISTRATION.

TO-28

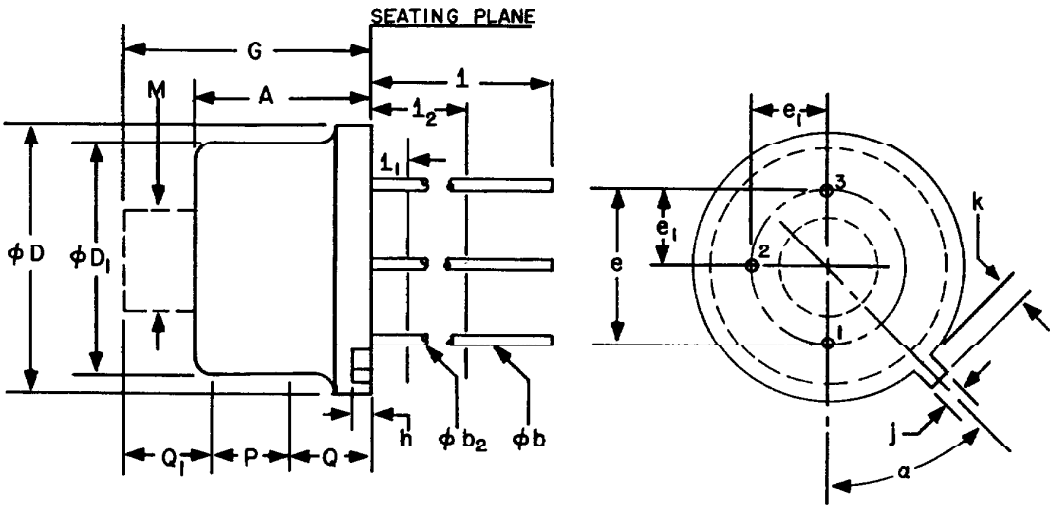


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.170	.210	4.32	5.33	
Øb	.016	.021	.406	.533	2
$Øb_2$	.016	.019	.406	.483	2
ØD	.209	.230	5.31	5.84	
$ØD_1$	.178	.195	4.52	4.95	
e	.100 T.P.		2.54 T.P.		1
e_1	.050 T.P.		1.27 T.P.		1
F		.030		.762	
G		.350		8.89	
j	.036	.046	.914	1.17	1
k	.028	.048	.711	1.22	1, 3
1	1.500		38.10		2
1_1		.050		1.27	2
1_2	.250		6.35		2
Q					4
α	45° T.P.				1, 5

NOTES:

1. MAXIMUM DIAMETER LEADS MEASURED AT POINTS .054" (1.37 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE SEATING PLANE OF THE DEVICE SHALL BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITIONS RELATIVE TO THE MAXIMUM-WIDTH TAB AND MAXIMUM DIAMETER FLANGE.
2. (THREE LEADS) $Øb_2$ APPLIES BETWEEN 1_1 AND 1_2. Øb APPLIES BETWEEN 1_2 AND 1.5" (38.10 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN 1_1 AND BEYOND 1.5" (38.10 MM) FROM SEATING PLANE.
3. MEASURED FROM MAXIMUM DIAMETER OF ACTUAL DEVICE.
4. DETAILS OF OUTLINE IN THIS ZONE OPTIONAL.
5. TAB CENTERLINE.

TO-29

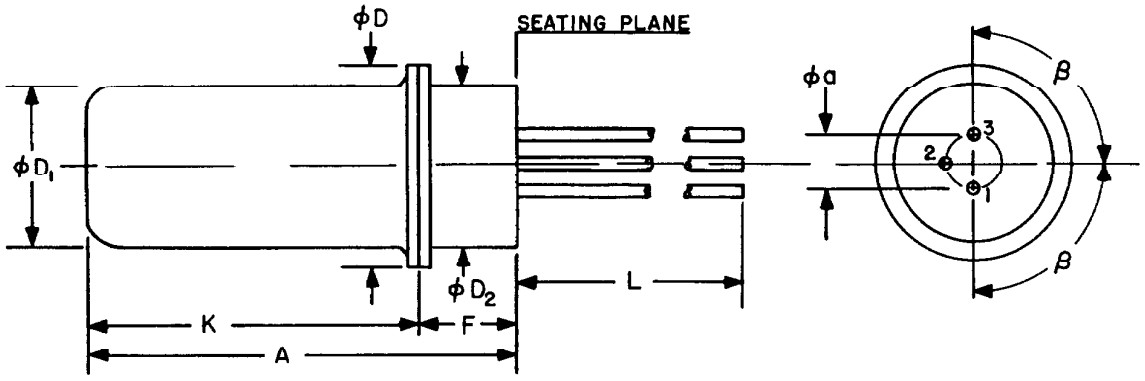


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.200	.260	5.08	6.60	
ϕb	.016	.021	.406	.533	2
ϕb_2	.016	.019	.406	.483	2
ϕD	.335	.370	8.51	9.40	
ϕD_1	.305	.335	7.75	8.51	
e	.200 T.P.		5.08 T.P.		4
e_1	.100 T.P.		2.54 T.P.		4
G		.360		9.14	
h	.009	.125	.229	3.18	
j	.028	.034	.711	.864	4, 5
k	.029	.045	.737	1.14	3, 4, 5
1	1.500		38.10		
1_1		.050		1.27	
1_2	.250		6.35		
M		.150		3.81	
P	.100		2.54		1
Q					6
Q_1					6
a	45° T.P.				5, 7

NOTES:

1. THIS ZONE IS CONTROLLED FOR AUTOMATIC HANDLING. THE VARIATION IN ACTUAL DIAMETER WITHIN THE ZONE SHALL NOT EXCEED .010" (.254 MM).
2. (THREE LEADS) ϕb_2 APPLIES BETWEEN 1_1 AND 1_2. ϕb APPLIES BETWEEN 1_2 AND 1.5" (38.10 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN 1_1 AND BEYOND 1.5" (38.10 MM) FROM SEATING PLANE.
3. MEASURED FROM MAXIMUM DIAMETER OF THE ACTUAL DEVICE.
4. LEADS HAVING MAXIMUM DIAMETER .019" (.483 MM) MEASURED IN GAGING PLANE .054" (1.37 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE SEATING PLANE OF THE DEVICE SHALL BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITIONS RELATIVE TO A MAXIMUM-WIDTH TAB.
5. THE DEVICE MAY BE MEASURED BY DIRECT METHODS OR BY THE GAGE AND GAGING PROCEDURE DESCRIBED ON GAGE DRAWING GS-1.
6. DETAILS OF OUTLINE IN THIS ZONE OPTIONAL.
7. TAB CENTERLINE.

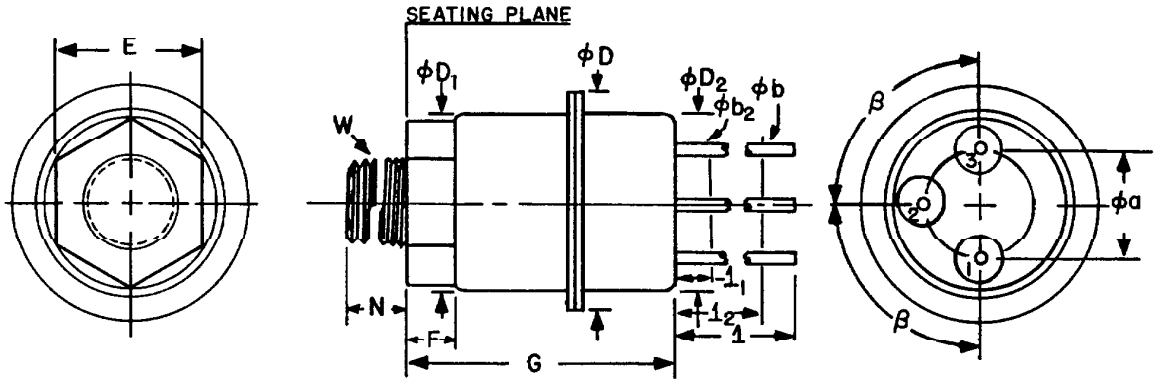
TO-30



SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
Øa	.065	.075	1.65	1.91	
A	.375	.425	9.53	10.80	
ØD	.195	.225	4.95	5.72	
$ØD_1$	.160	.180	4.06	4.57	
$ØD_2$	.166	.176	4.22	4.47	
F	.095	.105	2.41	2.67	
K	.285	.315	7.24	8.00	
L	1.500	1.688	38.10	42.88	
β	90° NOMINAL				

THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED BY JS-10 FOR REGISTRATION.

TO-31



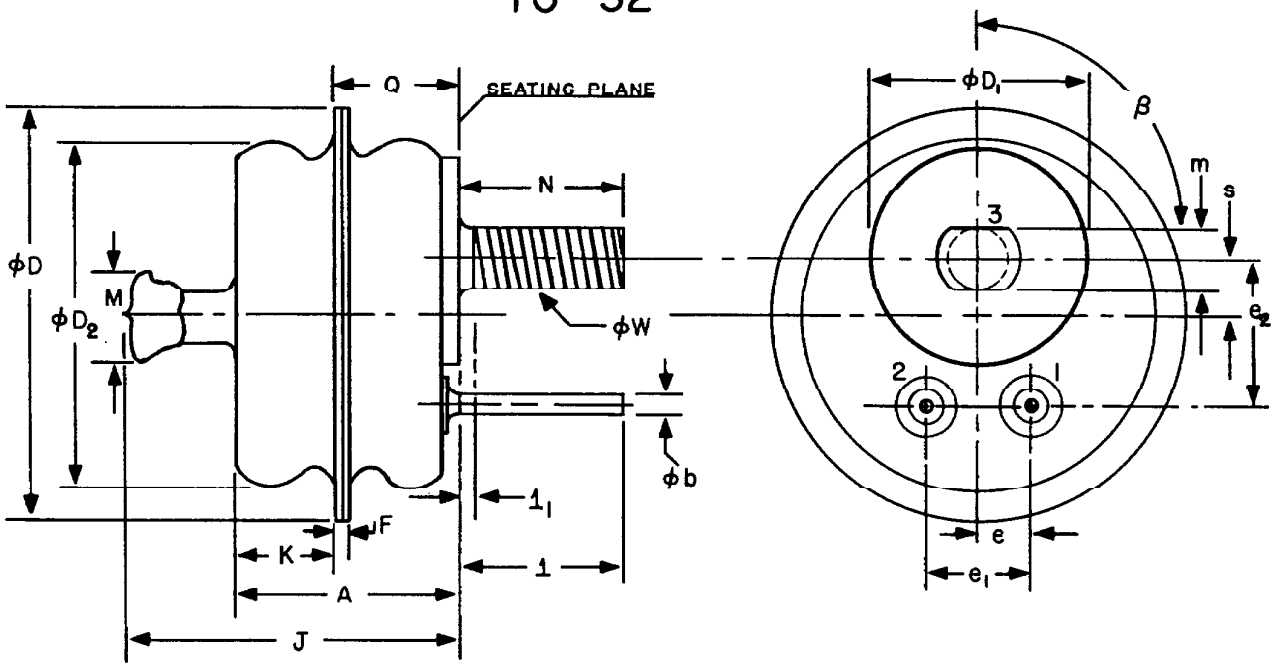
SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.360	.390	9.14	9.91	
ϕa	.200 NOMINAL		5.08 NOMINAL		
ϕb		.021		.533	1
ϕb_2	.016	.019	.406	.483	1
ϕD	.360	.370	9.14	9.40	
ϕD_1	.295	.305	7.49	7.75	
ϕD_2	.290	.310	7.37	7.87	
E	.250		6.35		2
F	.105	.115	2.67	2.92	
1	1.500	1.688	38.10	42.88	
l_1		.050		1.27	
l_2	.250		6.35		
N	.375 NOMINAL		9.53 NOMINAL		
W					3
β	90° NOMINAL				

NOTES:

1. (THREE LEADS) ϕb_2 APPLIES BETWEEN l_1 AND l_2. ϕb APPLIES BETWEEN l_2 AND 1.5" (38.10 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND 1.5" (38.10 MM) FROM SEATING PLANE.
2. HEX FOR STANDARD 1/4" IGNITION WRENCH.
3. 8-32 UNC-2A.

THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED BY JS-10 FOR REGISTRATION.

TO-32



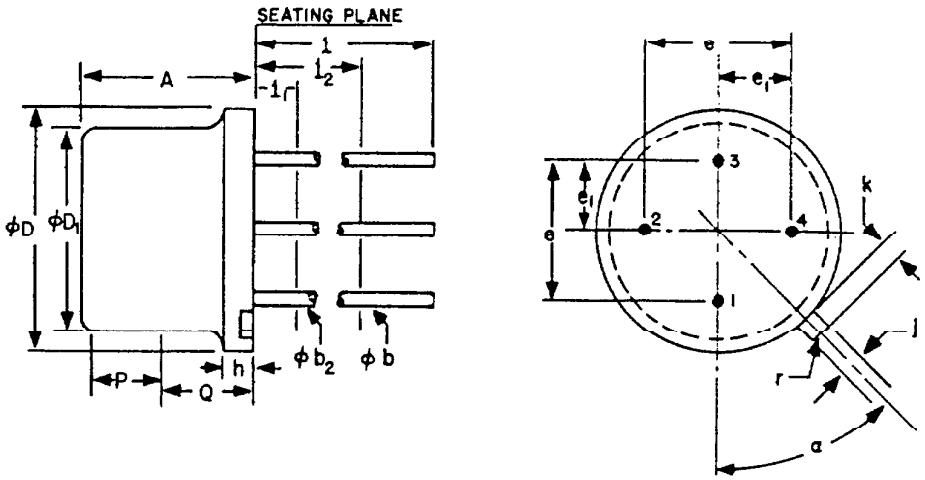
SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A		.475		12.07	
ϕb	.029	.033	.737	.838	
ϕD		.885		22.48	
ϕD_1		.455		11.56	
ϕD_2		.685		17.40	
e	.100 T.P.		2.54 T.P.		1
e_1	.200 T.P.		5.08 T.P.		1
e_2	.300 T.P.		7.62 T.P.		1
F	.020	.040	.508	1.02	
J		.690		17.53	
K	.165		4.19		
l	.281		7.14		
l_1		.015		.381	1, 3
M		.250		6.35	
m	.122	.125	3.10	3.18	
N		.312		7.92	
Q		.310		7.87	
s	.105 T.P.		2.67 T.P.		1
ϕW					2
β	88°	92°	88°	92°	

NOTES:

1. MAXIMUM SIZE LEADS AND STUD MUST BE WITHIN .0055" (.152 MM) OF THE EXACT POSITIONS SHOWN WITH RESPECT TO THE .885" (22.48 MM) MAXIMUM DIAMETER MEASURED AT POINTS .015" (.381 MM) MAXIMUM BELOW SEATING PLANE.
2. 190-32 UNF-2A. MAXIMUM PITCH DIAMETER OF PLATED THREADS SHALL BE BASIC PITCH DIAMETER .190" (4.83 MM) REFERENCE (SCREW THREAD STANDARDS FOR FEDERAL SERVICES 1957) HANDBOOK H28 1957 P1.
3. LEAD DIAMETER IN THIS AREA UNRESTRICTED.

THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED BY JS-10 FOR REGISTRATION.

TO-33

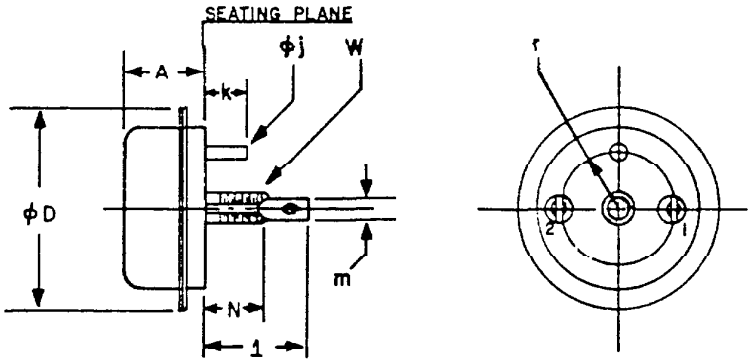


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.240	.260	6.10	6.60	
ϕb	.016	.021	.406	.533	2
$ϕb_2$	.016	.019	.406	.483	2
ϕD	.335	.370	8.51	9.40	
$ϕD_1$	.305	.335	7.75	8.51	
e	.200 T.P.		5.08 T.P.		4, 5
e_1	.100 T.P.		2.54 T.P.		4, 5
h	.009	.125	.229	3.18	
j	.028	.034	.711	.864	5
k	.029	.045	.737	1.14	3, 5
l	1.500		38.10		2
l_1		.050		1.27	2
l_2	.250		6.35		2
P	.100		2.54		1
Q					6
r		.007		.178	
α	45° T.P.				4, 5, 7

NOTES:

1. THIS DEVICE IS CONTROLLED FOR AUTOMATIC HANDLING. THE VARIATION IN ACTUAL DIAMETER WITHIN THE ZONE SHALL NOT EXCEED .010" (.254 MM).
2. (FOUR LEADS) $ϕb_2$ APPLIES BETWEEN l_1 AND l_2. ϕb APPLIES BETWEEN l_2 AND 1.5" (38.10 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND 1.5" (38.10 MM) FROM SEATING PLANE.
3. MEASURED FROM MAXIMUM DIAMETER OF THE ACTUAL DEVICE.
4. LEADS HAVING MAXIMUM DIAMETER .019" (.483 MM) MEASURED IN GAGING PLANE .054" (1.37 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE SEATING PLANE OF THE DEVICE SHALL BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITIONS RELATIVE TO A MAXIMUM-WIDTH TAB.
5. THE DEVICE MAY BE MEASURED BY DIRECT METHODS OR BY THE GAGE AND GAGING PROCEDURE DESCRIBED ON GAGE DRAWING GS-1.
6. DETAILS OF OUTLINE IN THIS ZONE OPTIONAL.
7. TAB CENTERLINE.

TO-36



SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A		.520		13.21	
ØD		1.250		31.75	
Øj		.140		3.56	
k		.312		7.92	1
l	.610	.710	15.49	18.03	
m		.190		4.83	
N	.375	.500	9.53	12.70	
r	.345 NOMINAL			8.76	
W					2

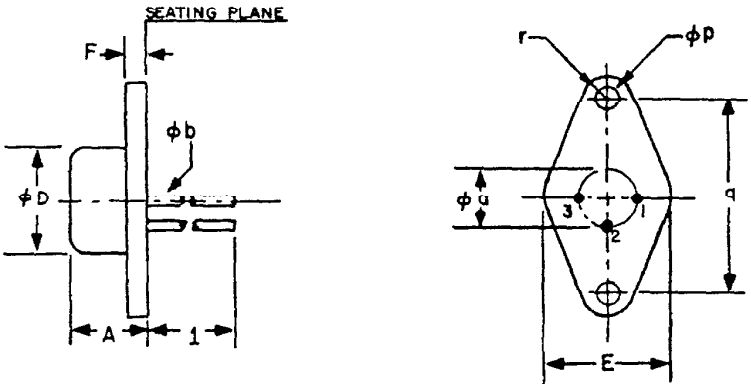
NOTES:

1. INSULATED LOCATOR PIN.

2. 10-32 UNF-2A. MAXIMUM PITCH DIAMETER OF PLATED THREADS SHALL BE BASIC PITCH DIAMETER .1697" (4.31 MM) REFERENCE (SCREW THREAD STANDARDS FOR FEDERAL SERVICES 1957) HANDBOOK H28 1957 P1.

THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED BY JS-10 FOR REGISTRATION.

TO-37



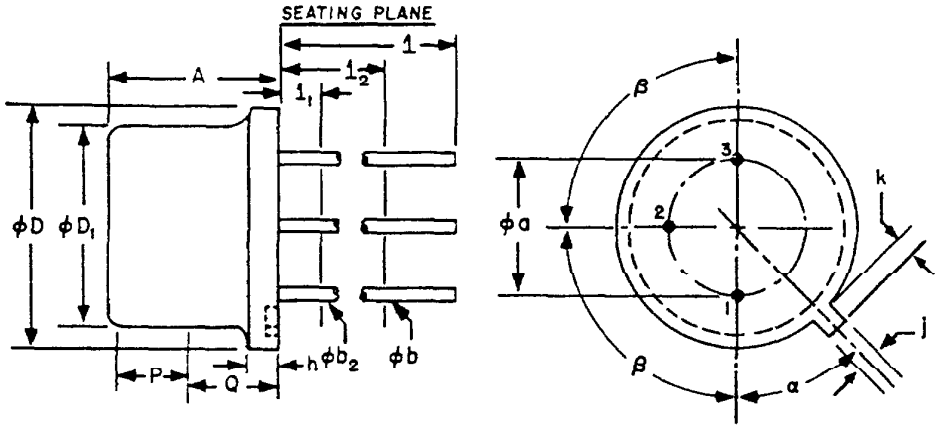
SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
ϕa	.200 NOMINAL		5.08 NOMINAL		
A		.260		6.60	
ϕb	.016	.022	.406	.559	1
ϕD		.320		8.13	
E		.390		9.91	
F		.070		1.78	
l	1.500		38.10		1
ϕp	.120	.130	3.05	3.30	3
q	.552	.572	14.02	14.53	
r		.114		2.90	2

NOTES:

1. THREE LEADS.
2. BOTH ENDS.
3. TWO MOUNTING HOLES.

THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED BY JS-10 FOR REGISTRATION.

TO-39

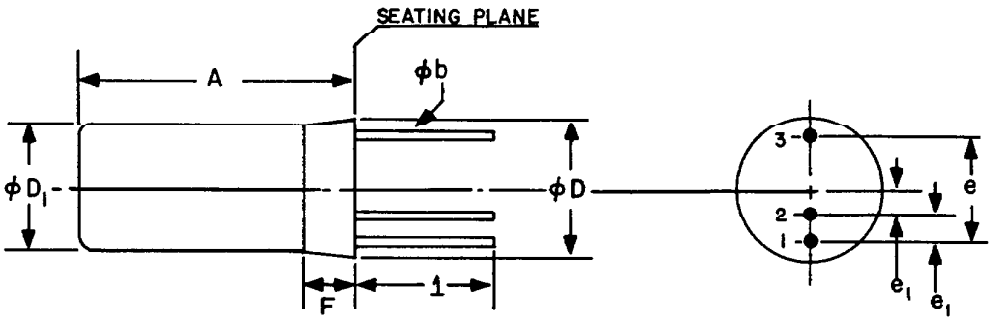


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
Øa	.190	.210	4.83	5.33	
A	.240	.260	6.10	6.60	
Øb	.016	.021	.406	.533	2
$Øb_2$	.016	.019	.406	.483	2
ØD	.350	.370	8.89	9.40	
$ØD_1$	.315	.335	8.00	8.51	
h	.009	.125	.229	3.18	
j	.028	.034	.711	.864	
k	.029	.040	.737	1.02	3
l	.500		12.70		2
l_1		.050		1.27	2
l_2	.250		6.35		2
P	.100		2.54		1
Q					4
α	45^o NOMINAL				
β	90^o NOMINAL				

NOTES:

1. THIS ZONE IS CONTROLLED FOR AUTOMATIC HANDLING. THE VARIATION IN ACTUAL DIAMETER WITHIN THIS ZONE SHALL NOT EXCEED .010" (.254 MM).
2. (THREE LEADS) $Øb_2$ APPLIES BETWEEN l_1 AND l_2. Øb APPLIES BETWEEN l_2 AND .5" (12.70 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND .5" (12.70 MM) FROM SEATING PLANE.
3. MEASURED FROM MAXIMUM DIAMETER OF THE ACTUAL DEVICE.
4. DETAILS OF OUTLINE IN THIS ZONE OPTIONAL.

TO-40

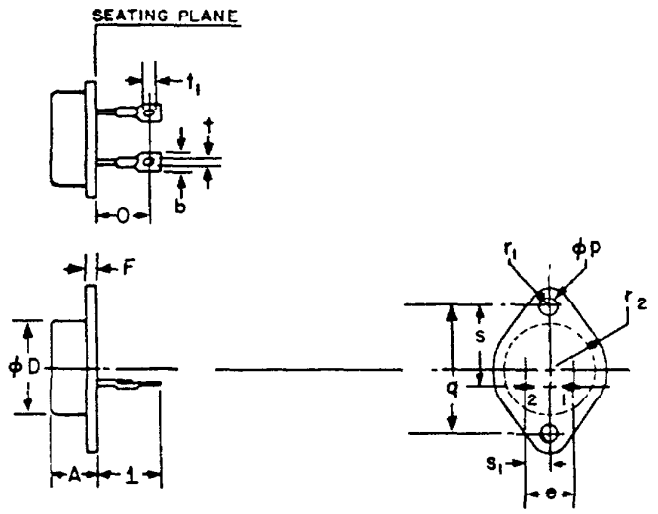


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A		.495		12.57	
ϕb	.016	.019	.406	.483	1
ϕD		.260		6.60	
ϕD_1		.240		6.10	
e	.185	.199	4.70	5.05	
e_1	.041	.055	1.04	1.40	
F		.120		3.05	
1	.172	.202	4.37	5.13	1

NOTES:

1. THREE LEADS.

TO-41



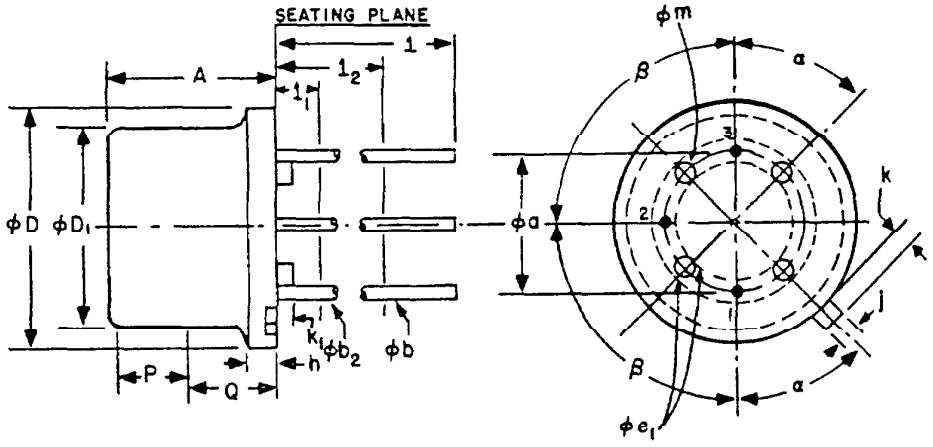
SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.250	.450	6.35	11.43	
b	.125	.210	3.18	5.33	1, 2
ØD		.875		22.23	
e	.420	.440	10.67	11.18	
F		.135		3.43	
l	.560	.680	14.23	17.27	
O	.500	.581	12.70	14.76	
Øp	.151	.161	3.84	4.09	4
q	1.177	1.197	29.90	30.40	
r_1		.188		4.78	3
r_2		.525		13.34	
s	.655	.675	16.64	17.15	
s_1	.205	.225	5.21	5.72	1
t	.072	.120	1.83	3.05	2
t_1	.072	.170	1.83	4.32	2

NOTES:

1. THESE DIMENSIONS SHOULD BE MEASURED AT POINTS .050" (1.27 MM) TO .055" (1.40 MM) BELOW SEATING PLANE. WHEN GAGE IS NOT USED, MEASUREMENT WILL BE MADE AT SEATING PLANE.
2. SQUARE OR RADIUS ON END OF TERMINAL AND/OR HOLE OPTIONAL.
3. AT BOTH ENDS.
4. TWO HOLES.

THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED BY JS-10 FOR REGISTRATION

TO-42



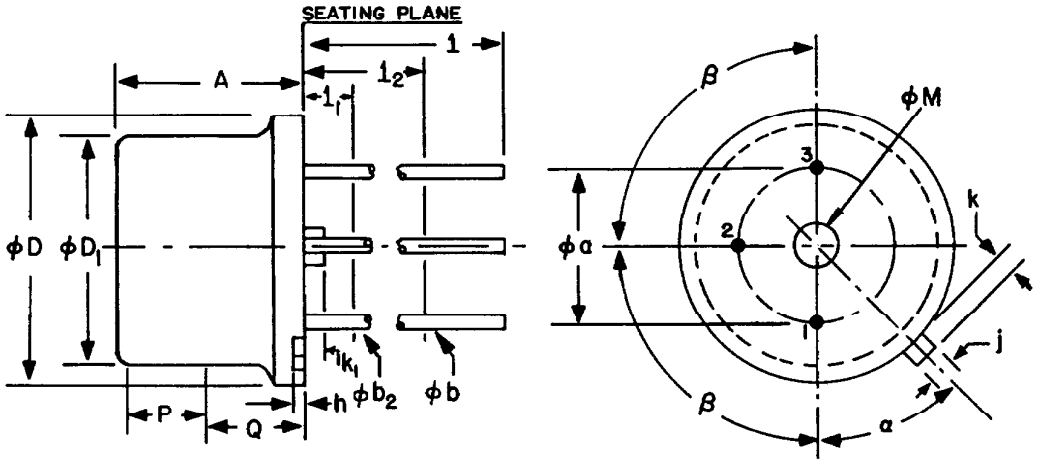
SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
ϕa	.190	.210	4.83	5.33	
A	.200	.260	5.08	6.60	
ϕb	.016	.021	.406	.533	2
ϕb_2	.016	.019	.406	.483	2
ϕD	.290	.370	7.37	9.40	
ϕD_1	.290	.335	7.37	8.51	
ϕe_1	.020	.250	.508	6.35	4
h	.009	.125	.229	3.18	
j	.028	.034	.711	.864	
k	.029		.737		3
k_1	.017	.025	.432	.635	
l	1.500		38.10		2
l_1		.050		1.27	2
l_2	.250		6.35		2
ϕm	.040 NOMINAL		1.02 NOMINAL		
P	.100		2.54		1
Q					5
α	45° NOMINAL				
β	90° NOMINAL				

NOTES:

1. THIS ZONE IS CONTROLLED FOR AUTOMATIC HANDLING. THE VARIATION IN ACTUAL DIAMETER WITHIN THIS ZONE SHALL NOT EXCEED .010" (.254 MM).
2. (THREE LEADS) ϕb_2 APPLIES BETWEEN l_1 AND l_2. ϕb APPLIES BETWEEN l_2 AND 1.5" (38.10 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND 1.5" (38.10 MM) FROM SEATING PLANE.
3. MEASURED FROM MAXIMUM DIAMETER OF THE ACTUAL DEVICE.
4. FOUR EQUALLY SPACED FEET TO LIE WITHIN THIS ZONE. MINIMUM DISTANCE BETWEEN A LEAD AND A FOOT .031" (.788 MM).
5. DETAILS OF OUTLINE IN THIS ZONE OPTIONAL.

THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED BY JS-10 FOR REGISTRATION.

TO-43



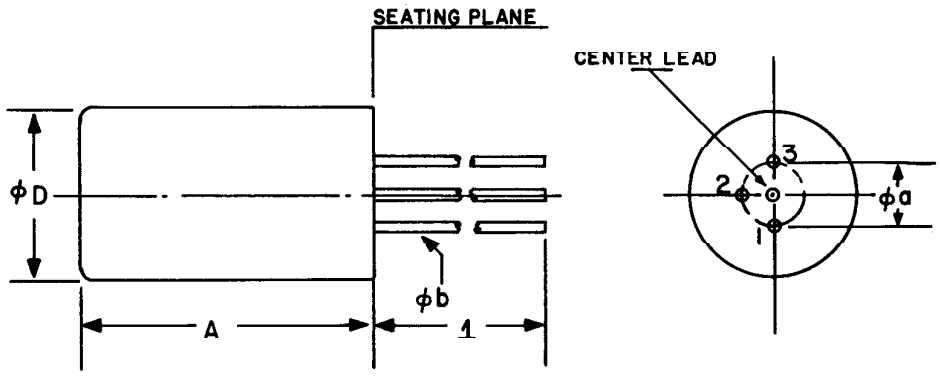
SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
ϕa	.190	.210	4.83	5.33	
A	.200	.260	5.08	6.60	
ϕb	.016	.021	.406	.533	2
ϕb_2	.016	.019	.406	.483	2
ØD	.290	.370	7.37	9.40	
ØD_1	.290	.335	7.37	8.51	
h	.009	.125	.229	3.18	
j	.028	.034	.711	.864	
k	.029		.737		3
k_1	.017	.075	.432	1.91	
l	1.500		38.10		2
l_1		.050		1.27	2
l_2	.250		6.35		2
ØM	.050	.100	1.27	2.54	
P	.100		2.54		1
Q					4
α	45° NOMINAL				
β	90° NOMINAL				

NOTES:

1. THIS ZONE CONTROLLED FOR AUTOMATIC HANDLING. THE VARIATION IN ACTUAL DIAMETER WITHIN THIS ZONE SHALL NOT EXCEED .010" (.254 MM).
2. (THREE LEADS) ϕb_2 APPLIES BETWEEN l_1 AND l_2. ϕb APPLIES BETWEEN l_2 AND 1.5" (38.10 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND 1.5" (38.10 MM) FROM SEATING PLANE.
3. MEASURED FROM MAXIMUM DIAMETER OF THE ACTUAL DEVICE.
4. DETAILS OF OUTLINE IN THIS ZONE OPTIONAL.

THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED BY JS-10 FOR REGISTRATION.

TO-44



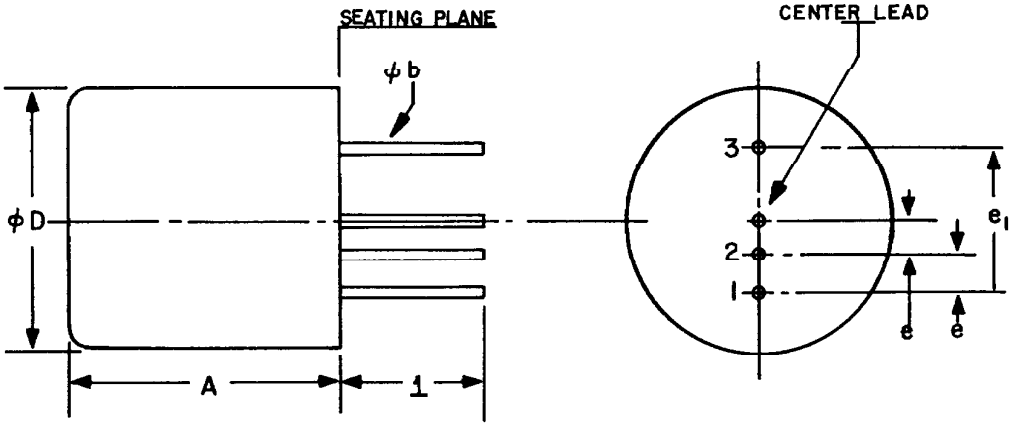
SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
Øa	.064	.080	1.63	2.03	
A		.405		10.29	
Øb	.016	.019	.406	.483	1
ØD		.240		6.10	
1	1.500		38.10		

NOTES:

1. FOUR LEADS.

THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED BY JS-10 FOR REGISTRATION.

TO-45

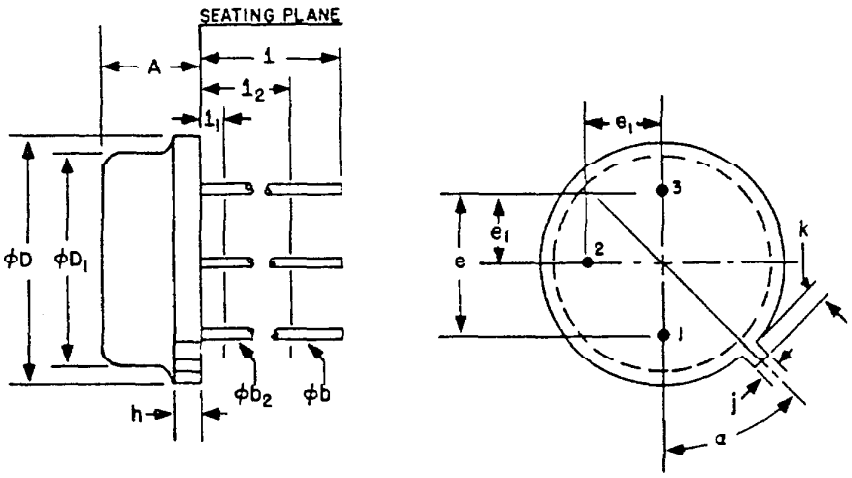


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
Øa	.185	.199	4.70	5.05	
A		.375		9.53	
Øb	.016	.019	.406	.483	1
ØD		.360		9.14	
e	.041	.055	1.04	1.40	
e_1	.185	.199	4.70	5.05	
l	.172	.202	4.37	5.13	1

NOTES:

1. FOUR LEADS.

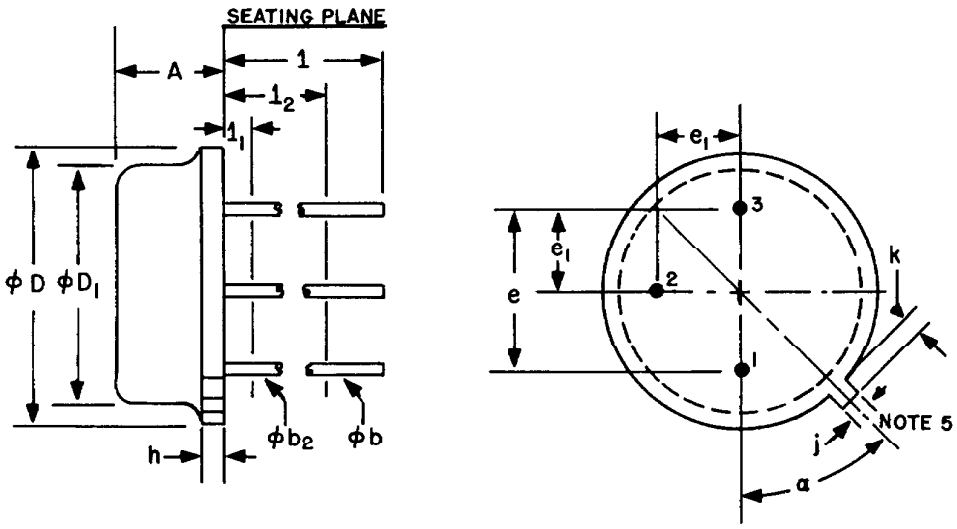
TO-46



SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.065	.085	1.65	2.16	
ϕb	.016	.021	.406	.533	1
$ϕb_2$	.012	.019	.305	.483	1
ϕD	.209	.230	5.31	5.84	
$ϕD_1$	.178	.195	4.52	4.95	
e	.100 T.P.		2.54 T.P.		2
e_1	.050 T.P.		1.27 T.P.		2
h		.040		1.02	
j	.036	.046	.914	1.17	
k	.028	.048	.711	1.22	4
l	.500		12.70		1
l_1		.050		1.27	1
l_2	.250		6.35		1
α	45° T.P.		45° T.P.		3, 5

NOTES:

1. (THREE LEADS) $ϕb_2$ APPLIES BETWEEN l_1 AND l_2. ϕb APPLIES BETWEEN l_2 AND .5" (12.70 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND .5" (12.70 MM) FROM SEATING PLANE.
2. MAXIMUM DIAMETER LEADS AT A GAGING PLANE .054" (1.37 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW SEATING PLANE TO BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITION RELATIVE TO MAXIMUM-WIDTH TAB AND TO THE MAXIMUM .230" (5.84 MM) DIAMETER MEASURED WITH A SUITABLE GAGE. WHEN GAGE IS NOT USED, MEASUREMENT WILL BE MADE AT SEATING PLANE.
3. INDEX TAB FOR VISUAL ORIENTATION ONLY.
4. MEASURED FROM MAXIMUM DIAMETER OF THE ACTUAL DEVICE.
5. TAB CENTERLINE.

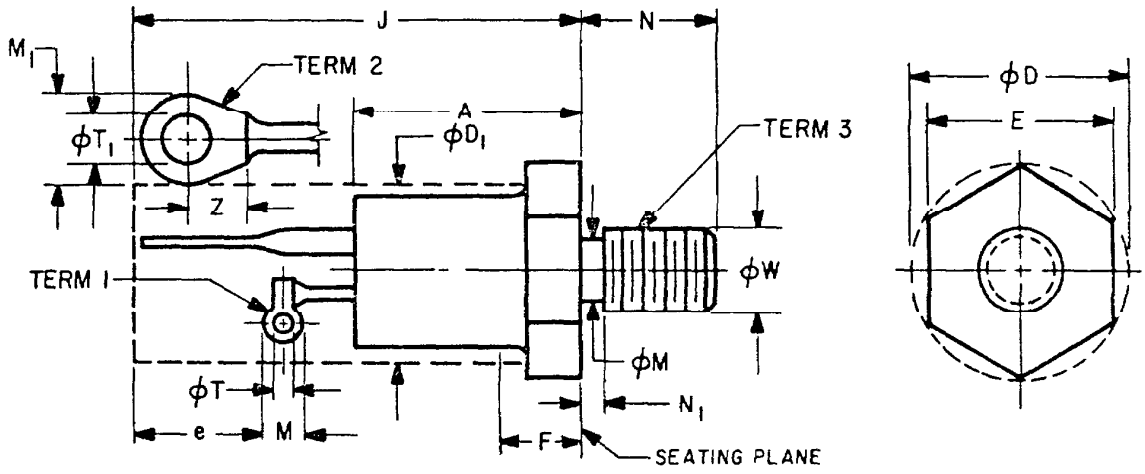


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.065	.085	1.65	2.16	
ϕb	.016	.021	.406	.533	1
ϕb_2	.012	.019	.305	.483	1
ϕD	.240	.270	6.10	6.86	
ϕD_1	.220	.240	5.59	6.10	
e	.141 T.P.		3.58 T.P.		2
e_1	.071 T.P.		1.80 T.P.		2
h		.040		1.02	
j	.015	.025	.381	.635	
k	.015	.025	.381	.635	4
l	.500		12.70		1
l_1		.050		1.27	1
l_2	.250		6.35		1
α	45° T.P.		45° T.P.		3

NOTES:

1. (THREE LEADS) ϕb_2 APPLIES BETWEEN l_1 AND l_2. ϕb APPLIES BETWEEN l_2 AND .5" (12.70 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND .5" (12.70 MM) FROM SEATING PLANE.
2. MAXIMUM DIAMETER LEADS AT A GAGING PLANE .054" (1.37 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE SEATING PLANE TO BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITION RELATIVE TO MAXIMUM-WIDTH TAB AND TO THE MAXIMUM .270" (6.86 MM) DIAMETER MEASURED WITH A SUITABLE GAGE. WHEN A GAGE IS NOT USED, MEASUREMENT WILL BE MADE AT SEATING PLANE.
3. INDEX TAB FOR VISUAL ORIENTATION ONLY.
4. MEASURED FROM MAXIMUM DIAMETER OF THE ACTUAL DEVICE.
5. TAB CENTERLINE.

TO-48



MILLIMETER DIMENSIONS ARE DERIVED FROM ORIGINAL INCH DIMENSIONS

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.330	.505	8.4	12.8	-
ØD	-	.650	-	16.51	-
$ØD_1$	-	.544	-	13.81	5
e	.125	-	3.18	-	4
E	.544	.562	13.82	14.27	-
F	.113	.200	2.88	5.08	3
J	-	1.193	-	30.30	5
ØM	.220	.249	5.59	6.32	6
M	.115	.140	2.93	3.55	1
M_1	.210	.300	5.34	7.62	1
N	.422	.453	10.72	11.50	-
N_1	-	.090	-	2.28	6
ØT	.060	.075	1.53	1.90	-
$ØT_1$	.125	.165	3.18	4.19	-
ØW	.2225	.2268	5.652	5.760	2
Z	.120	-	3.05	-	7

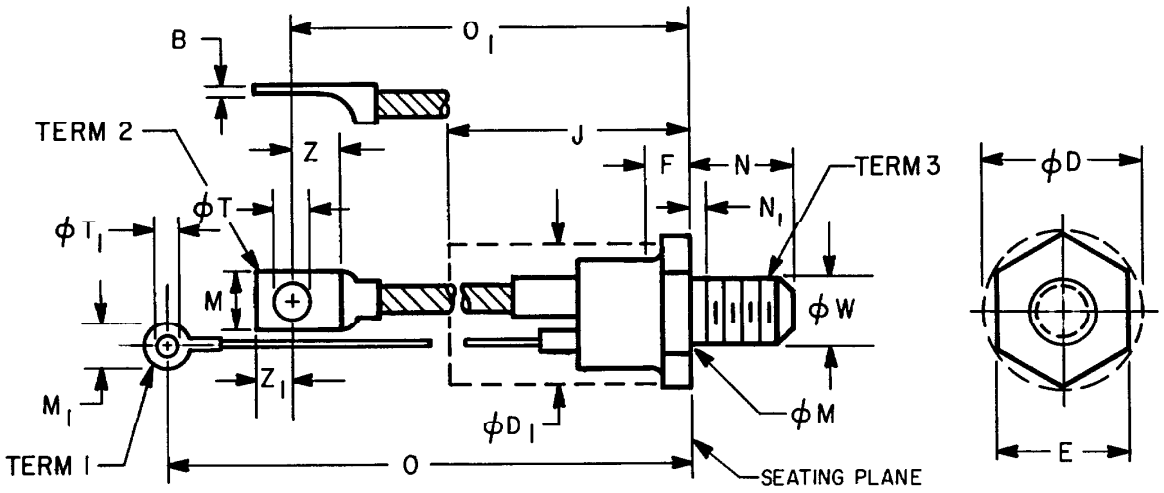
ISSUE	
A	RELEASE NO. 3235
B	RELEASE NO. 3235A

NOTES:

1. CONTOUR & ANGULAR ORIENTATION OF THESE TERMINALS IS OPTIONAL.
2. PITCH DIAMETER OF 1/4-28 UNF-2A (COATED) THREADS (ASA B1.1-1960).
3. A CHAMFER OR UNDERCUT ON ONE OR BOTH ENDS OF HEXAGONAL PORTION IS OPTIONAL.
4. MINIMUM DIFFERENCE IN TERMINAL LENGTHS TO ESTABLISH DATUM LINE FOR NUMBERING TERMINALS.
5. THE DEVICE WITH EXCEPTION OF THE HEXAGON AND THREAD LIES WITHIN THE CYLINDER DEFINED BY $ØD_1$ AND LENGTH J.
6. LENGTH OF INCOMPLETE OR UNDERCUT THREAD OF ØM.
7. MINIMUM FLAT.

ITEM NO. 2210

TO-49



MILLIMETER DIMENSIONS ARE DERIVED FROM ORIGINAL INCH DIMENSIONS

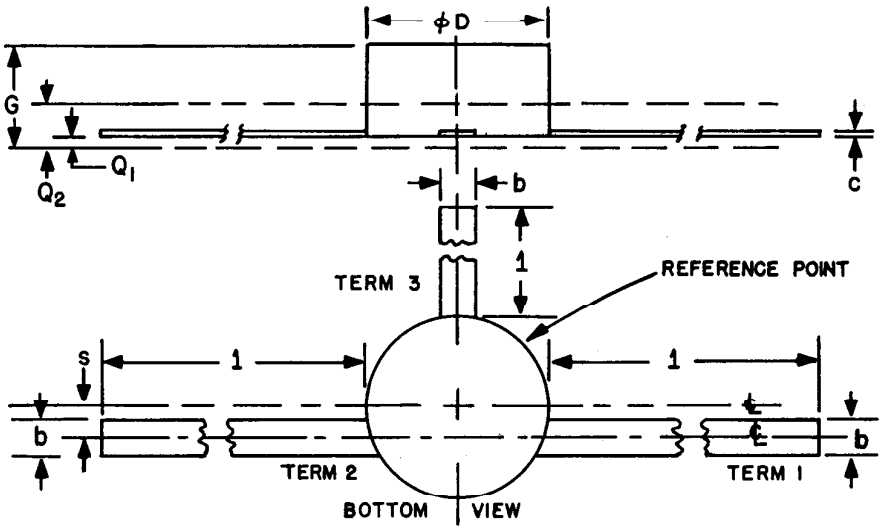
SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
B	.055	.110	1.40	2.79	-
ØD	-	1.227	-	31.16	-
$ØD_1$	-	1.031	-	26.18	1
E	1.031	1.063	26.19	27.00	-
F	.170	.500	4.4	12.7	5
J	-	2.500	-	63.50	1,7
M	.437	.650	11.1	16.5	2
M_1	.215	.300	5.47	7.62	2
ØM	.425	.499	10.80	12.67	3
N	.797	.827	20.25	21.00	-
N_1	-	.125	-	3.17	3
O	6.850	7.500	174.0	190.5	-
O_1	5.775	6.265	146.7	159.1	-
ØT	.250	.310	6.35	7.87	-
$ØT_1$	.140	.150	3.56	3.81	-
ØW	.4619	.4675	11.733	11.874	4
Z	.250	-	6.35	-	6
Z_1	-	.325	-	8.25	-

ISSUE	
A	RELEASE NO. 3228
B	RELEASE NO. 3228D

NOTES:

1. THE DEVICE WITH THE EXCEPTION OF THE HEXAGON, THREAD, AND FLEXIBLE LEAD EXTENSIONS LIES WITHIN THE CYLINDER DEFINED BY $ØD_1$ AND LENGTH J.
2. ANGULAR ORIENTATION OF THESE TERMINALS WITH RESPECT TO HEXAGONAL PORTION IS UNDEFINED. SQUARE OR RADIUS ON END OF TERMINALS IS OPTIONA
3. LENGTH OF INCOMPLETE OR UNDERCUT THREADS OF ØM.
4. PITCH DIAMETER OF 1/2-20 UNF-2A (COATED) THREADS (ASA B1.1-1960).
5. A CHAMFER (OR UNDERCUT) ON ONE OR BOTH ENDS OF HEXAGONAL PORTION IS OPTIONAL.
6. MINIMUM FLAT.
7. SEATED HEIGHT WITH LEAD BENT AT RIGHT ANGLES.

ITEM NO. 270

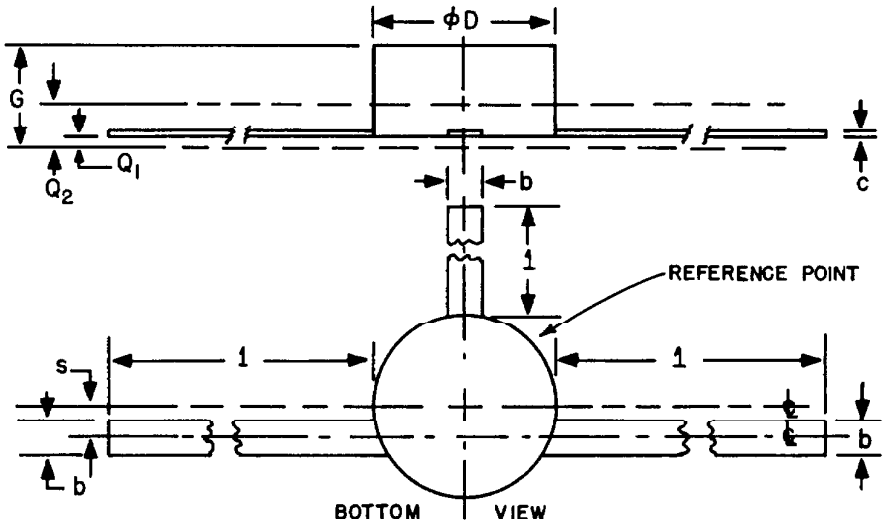


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
b	.015	.028	.381	.711	
c	.003	.005	.076	.127	
ØD	.180	.215	4.57	5.46	2
G	.040	.060	1.02	1.52	
1	.250		6.35		
Q_1		.010		.254	1
Q_2		.025		.635	1
s	.015	.035	.381	.889	1

NOTES:

1. LEADS SHALL EMERGE FROM THE ØD DIMENSION WITHIN THE LIMITS INDICATED BY THE s, Q_1 AND Q_2 DIMENSIONS.

2. MINIMUM AND MAXIMUM DIMENSIONS BOTH APPLY TO THE MAJOR (LARGEST) DIAMETER ONLY.



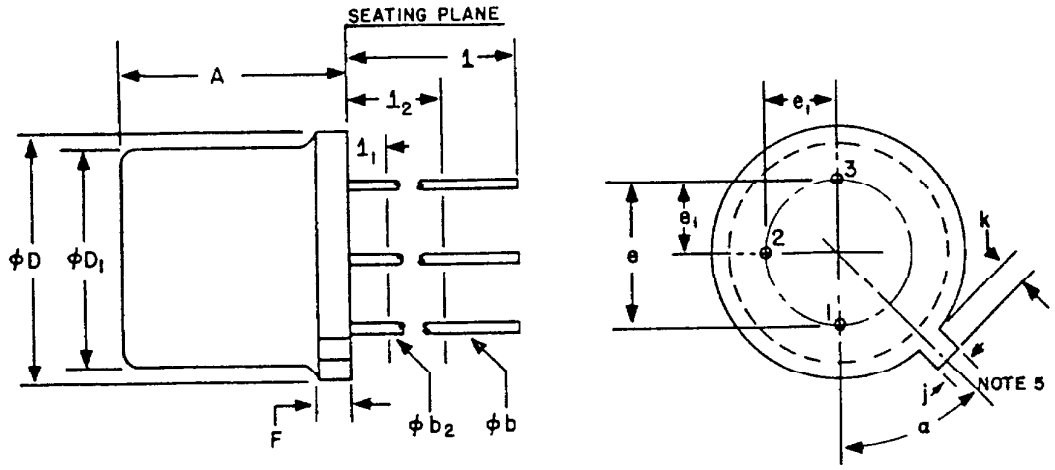
SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
b	.015	.028	.381	.711	
c	.003	.005	.076	.127	
ØD	.140	.165	3.56	4.19	2
G	.040	.060	1.02	1.52	
1	.250		6.35		
Q_1		.010		.254	1
Q_2		.025		.635	1
s	.015	.035	.381	.889	1

NOTES:

1. LEADS SHALL EMERGE FROM THE ØD DIMENSION WITHIN THE LIMITS INDICATED BY THE s, Q_1, AND Q_2 DIMENSIONS.

2. MINIMUM AND MAXIMUM DIMENSIONS BOTH APPLY TO THE MAJOR (LARGEST) DIAMETER ONLY.

TO-52

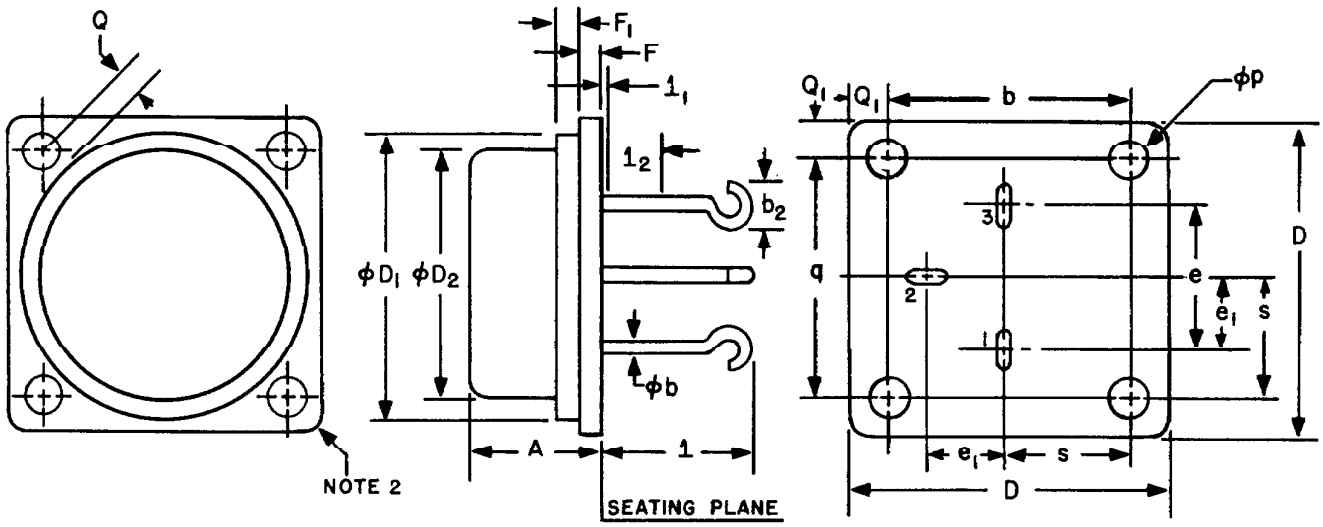


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.115	.150	2.92	3.81	
ϕb		.021		.533	1
ϕb_2	.016	.019	.406	.483	1
ϕD	.209	.230	5.31	5.84	
ϕD_1	.178	.195	4.52	4.95	
e	.100 T.P.		2.54 T.P.		2
e_1	.050 T.P.		1.27 T.P.		
F		.030		.762	
j	.036	.046	.914	1.17	
k	.028	.048	.711	1.22	3
l	.500		12.70		1
l_1		.050		1.27	1
l_2	.250		6.35		
a	45^o T.P.				

NOTES:

1. (THREE LEADS) ϕb_2 APPLIES BETWEEN l_1 AND l_2. ϕb APPLIES BETWEEN l_2 AND .5" (12.70 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND .5" (12.70 MM) FROM SEATING PLANE.
2. LEADS HAVING MAXIMUM DIAMETER .019" (.483 MM) MEASURED IN GAGING PLANE .054" (1.37 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE SEATING PLANE OF THE DEVICE SHALL BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITIONS RELATIVE TO A MAXIMUM-WIDTH TAB.
3. MEASURED FROM MAXIMUM DIAMETER OF THE ACTUAL DEVICE.
4. THE DEVICE MAY BE MEASURED BY DIRECT METHODS OR BY THE GAGE AND GAGING PROCEDURE DESCRIBED ON GAGE DRAWING GS-2.
5. TAB CENTERLINE.

TO-53

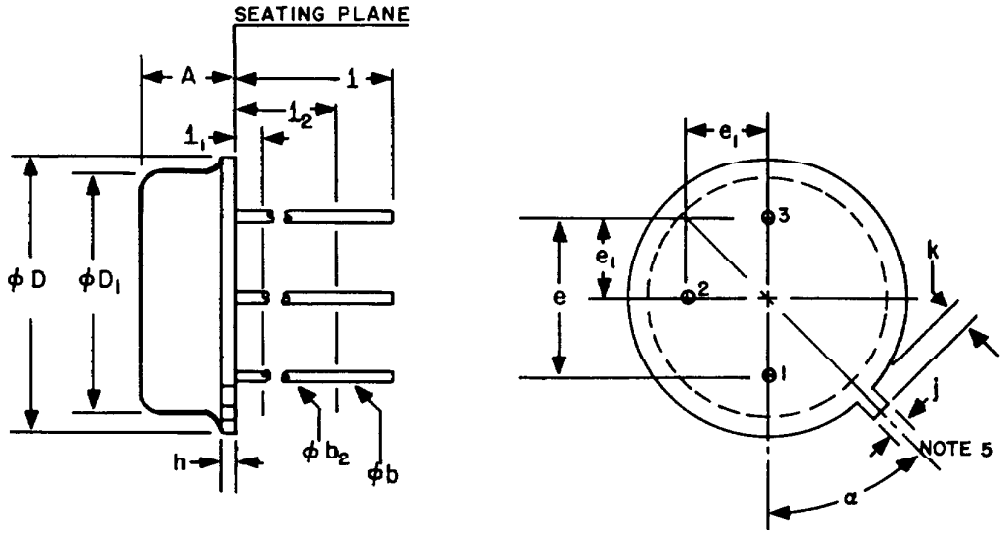


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.305	.355	7.75	9.02	
Øb	.035	.045	.889	1.14	7
b_2	.130	.150	3.30	3.81	7
D	.850	.870	21.59	22.10	
$ØD_1$	.765	.785	19.43	19.94	
$ØD_2$	.670	.680	17.02	17.27	
e	.400 T.P.		10.16 T.P.		3, 4
e_1	.200 T.P.		5.08 T.P.		3, 4
F	.040	.055	1.02	1.40	
F_1	.030	.065	.762	1.65	
l	.370	.420	9.40	10.67	7
l_1	.031		.787		1, 7
l_2	.125		3.18		5
Øp	.096	.106	2.44	2.69	8
q	.670	.690	17.02	17.53	
Q	.075		1.91		6
Q_1	.075	.105	1.91	2.67	
s	.340 T.P.		8.64 T.P.		3, 4

NOTES:

1. LEAD DIAMETER NOT CONTROLLED IN THIS AREA.
2. RADIUS AT CORNERS OF MOUNTING FLANGE OPTIONAL.
3. ANGULAR ORIENTATION OF TERMINAL ENDS AS SHOWN $\pm$ 15°.
4. LEADS HAVING MAXIMUM DIAMETER .045" (1.14 MM) MEASURED IN GAGE PLANE .031" (.787 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE SEATING PLANE OF THE DEVICE SHALL BE WITHIN .010" (.254 MM) OF THEIR TRUE POSITION RELATIVE TO MINIMUM DIAMETER .096" (2.44 MM) HOLES IN THE MOUNTING FLANGE.
5. THE LEADS SHALL BE ESSENTIALLY STRAIGHT WITHIN THIS ZONE.
6. CLEARANCE FROM HOLE CENTERS TO $ØD_1$ FOR MOUNTING FASTENERS.
7. THREE LEADS.
8. FOUR HOLES.

TO-54

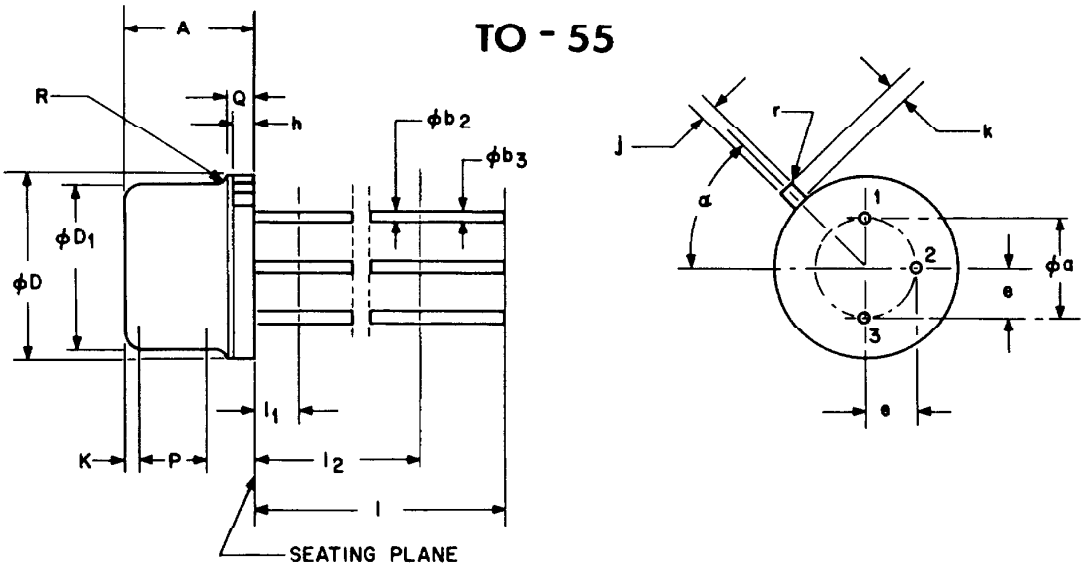


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.050	.060	1.27	1.52	
Øb	.016	.021	.406	.533	1
$Øb_2$	.016	.019	.406	.482	1
ØD	.209	.230	5.31	5.84	
$ØD_1$	.178	.195	4.52	4.95	
e	.100 T.P.		2.54 T.P.		2
e_1	.050 T.P.		1.27 T.P.		2
h		.040		1.02	
j	.036	.046	.914	1.17	
k	.028	.048	.711	1.22	4
l	.500		12.70		1
l_1		.050		1.27	1
l_2	.250		6.35		1
α	45^o T.P.		45^o T.P.		3

NOTES:

1. (THREE LEADS) $Øb_2$ APPLIES BETWEEN l_1 AND l_2. Øb APPLIES BETWEEN l_2 AND .5" (12.70 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND .5" (12.70 MM) FROM SEATING PLANE.
2. MAXIMUM DIAMETER LEADS AT A GAGING PLANE .054" (1.37 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW SEATING PLANE TO BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITION (T.P.) RELATIVE TO MAXIMUM-WIDTH TAB AND TO THE MAXIMUM .230" (5.84 MM) DIAMETER MEASURED WITH A SUITABLE GAGE. WHEN A GAGE IS NOT USED, MEASUREMENT WILL BE MADE AT SEATING PLANE.
3. INDEX TAB FOR VISUAL ORIENTATION ONLY.
4. MEASURED FROM MAXIMUM DIAMETER OF THE ACTUAL DEVICE.
5. TAB CENTERLINE.

TO - 55



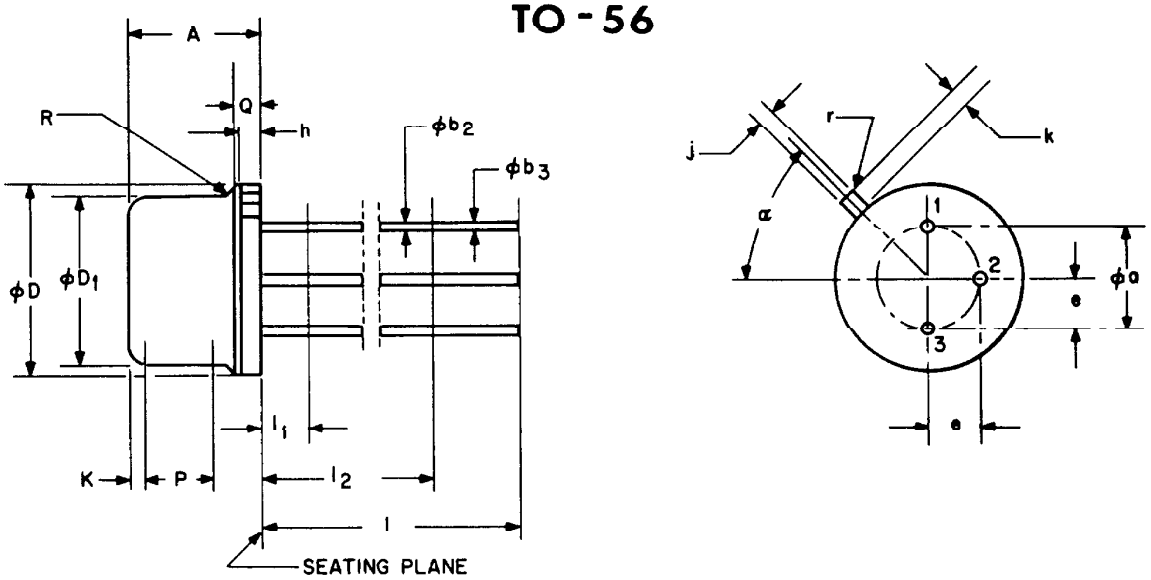
OUTLINE INTENDED FOR AUTOMATIC HANDLING

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	0.242	0.260	6.15	6.60	
ϕ a	0.200		5.08		4
ϕ b_2	0.016	0.019	0.406	0.483	2
ϕ b_3		0.021		0.53	2
ϕ D	0.358	0.370	9.09	9.40	6
ϕ D_1	0.322	0.335	8.18	8.51	7
e	0.100		2.54		
h	0.009	0.041	0.23	1.04	8
j	0.028	0.034	0.711	0.864	
K	0.010		0.25		
k	0.029	0.045	0.74	1.14	3
l	1.500	1.625	38.1	41.3	2
l_1		0.020		0.51	2
l_2	0.250		6.35		2
P	0.150		3.81		1
Q		0.050		1.27	
R		0.010		0.25	
r		0.007		0.18	
α	45^0		45^0		5

NOTES:

1. THIS ZONE IS CONTROLLED FOR AUTOMATIC HANDLING. THE VARIATION IN ACTUAL DIAMETER WITHIN THE ZONE SHALL NOT EXCEED 0.010" (0.25 MM).
2. (3 LEADS) ϕ b_2 APPLIES BETWEEN l_1 AND l_2. ϕ b_3 APPLIES BETWEEN l_2 AND 1.5" FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND 1.5" FROM SEATING PLANE.
3. MEASURED FROM MAXIMUM DIAMETER OF THE ACTUAL DEVICE.
4. LEADS HAVING MAXIMUM DIAMETER (0.019", 0.438 MM) MEASURED IN GAGING PLANE 0.054" + 0.001" - 0.000" (1.372 MM + 0.025 MM - 0.000 MM) BELOW THE SEATING PLANE OF THE DEVICE SHALL BE WITHIN 0.007" (0.178 MM) OF THEIR TRUE LOCATIONS RELATIVE TO A MAXIMUM WIDTH TAB.
5. TAB CENTERLINE.
6. CONCENTRIC TO ϕ a WITHIN 0.006" TOTAL INDICATOR READING. CAP FLANGE SHALL NEVER EXTEND BEYOND HEADER PERIPHERY. 0.005" MAX BURR OR WELD FLASH.
7. CONCENTRIC TO ϕ a WITHIN 0.006" TOTAL INDICATOR READING.
8. APPLIES TO THICKNESS OF TAB.

TO-56



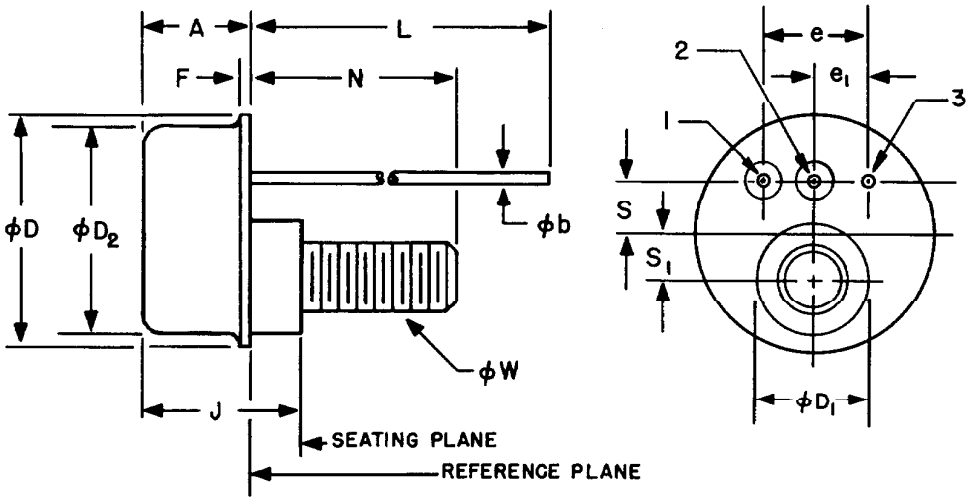
OUTLINE INTENDED FOR AUTOMATIC HANDLING

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	0.170	0.210	4.32	5.33	
ϕ a	0.100		2.54		4
ϕ b_2	0.016	0.019	0.406	0.483	2
ϕ b_3		0.021		0.53	2
ϕ D	0.209	0.230	5.31	5.84	6
ϕ D_1	0.182	0.192	4.62	4.88	7
e	0.050		1.27		
h	0.005	0.015	0.13	0.38	8
j	0.036	0.046	0.91	1.17	
K	0.010		0.25		
k	0.030	0.046	0.76	1.17	3
l	0.500	0.625	12.7	15.9	2
l_1		0.020		0.51	2
l_2	0.250		6.35		2
P	0.125		3.18		1
Q		0.023		0.58	
R		0.010		0.25	
r		0.007		0.18	
α	45°		45°		5

NOTES:

1. THIS ZONE IS CONTROLLED FOR AUTOMATIC HANDLING. THE VARIATION IN ACTUAL DIAMETER WITHIN THE ZONE SHALL NOT EXCEED 0.010" (0.25 MM).
2. (3 LEADS) ϕb_2 APPLIES BETWEEN l_1 AND l_2. ϕb_3 APPLIES BETWEEN l_2 AND 0.5" FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND 0.5" FROM SEATING PLANE.
3. MEASURED FROM MAXIMUM DIAMETER OF ACTUAL DEVICE.
4. LEADS HAVING MAXIMUM DIAMETER (0.019", 0.438 MM), MEASURED IN GAGING PLANE 0.054" + 0.001" - 0.000" (1.372 MM + 0.025 MM - 0.000 MM) BELOW THE SEATING PLANE OF THE DEVICE SHALL BE WITHIN 0.007" (0.178 MM) OF THEIR TRUE LOCATIONS RELATIVE TO MAXIMUM WIDTH TAB.
5. TAB CENTERLINE.
6. CONCENTRIC TO ϕa WITHIN 0.006" TOTAL INDICATOR READING. CAP FLANGE SHALL NEVER EXTEND BEYOND HEADER PERIPHERY. 0.005" MAX BURR OR WELD FLASH.
7. CONCENTRIC TO ϕ a WITHIN 0.006" TOTAL INDICATOR READING.
8. APPLIES TO THICKNESS OF TAB.

TO-57



SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.195	.215	4.96	5.46	
Øb	.016	.019	.407	.482	1, 4
ØD	.440	.460	11.2	11.6	
$ØD_1$	.220	.230	5.59	5.84	
$ØD_2$	.400	.420	10.2	10.7	
e	.200 T.P.		5.08 T.P.		4
e_1	.100 T.P.		2.54 T.P.		4
F		.030		.762	
J	.278	.318	2.11	2.61	
L	1.485	1.525	37.72	38.73	1
N	.380	.410	9.66	10.4	
S	.100 T.P.		2.54 T.P.		4
S_1	.078 T.P.		1.98 T.P.		4
ØW	.1141	.1177	2.895	2.975	2, 3

NOTES:

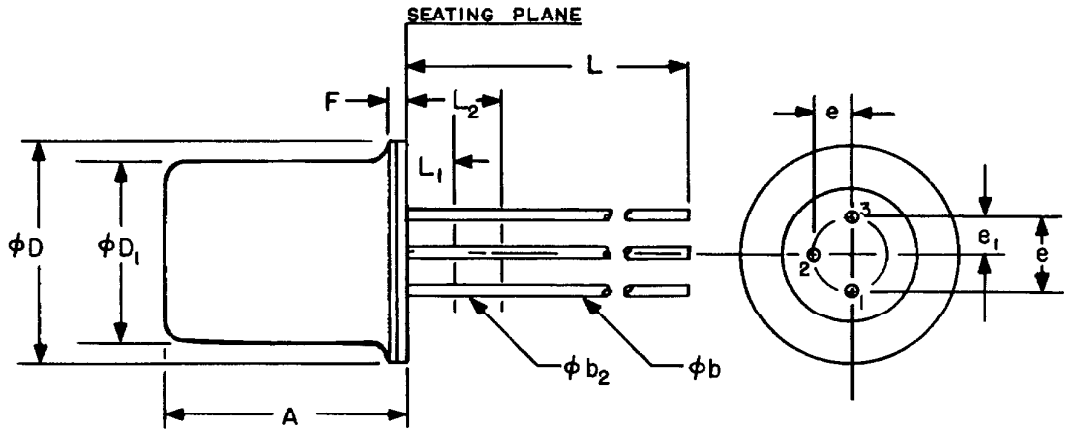
1. (THREE LEADS), THE SPECIFIED LEAD DIAMETER APPLIES TO THE ZONE BETWEEN .050" (1.27 MM) AND .250" (6.35 MM) FROM THE REFERENCE PLANE. BETWEEN .250" (6.35 MM) AND END OF LEAD, A MAXIMUM OF .021" (.533 MM) IS HELD. OUTSIDE OF THE ZONES THE LEAD DIAMETER IS NOT CONTROLLED.

2. 6-32NC-2A. MAXIMUM PITCH DIAMETER OF PLATED THREADS SHALL BE BASIC PITCH DIAMETER (.1177", 2.98 MM). REFERENCE (SCREW THREAD STANDARDS FOR FEDERAL SERVICES 1957) HANDBOOK H28-PART 1.

3. COMPLETE THREADS SHALL EXTEND TO WITHIN THREE THREADS OF THE SEATING PLANE AND SHALL REMAIN WITHIN TOLERANCES TO WITHIN TWO THREADS OF TIP OF STUD.

4. MAXIMUM (.019", .483 MM) DIAMETER LEADS AND MAXIMUM (.230", 5.84 MM) STUD SHOULDER TO BE WITHIN .007" (.178 MM) RADIUS OF TRUE LOCATION RELATIVE TO THE (.460", 11.68 MM) DIAMETER FLANGE AT A GAUGING PLANE .054" (1.37 MM) + .001" (.025 MM), - .000" (.000 MM), FROM THE REFERENCE PLANE.

TO-58

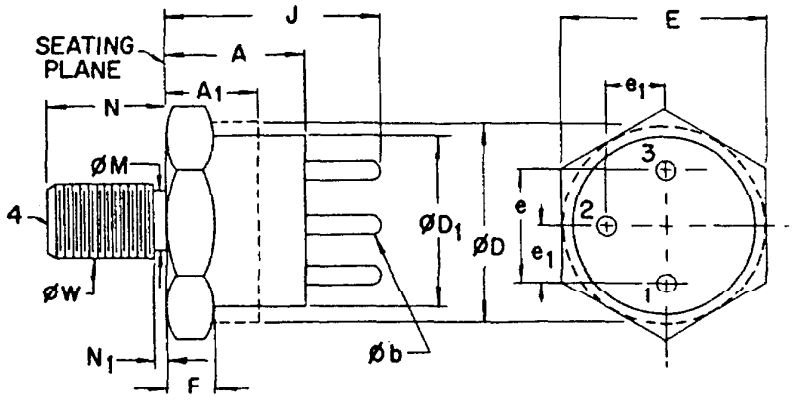


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.320	.350	8.13	8.89	
ϕb		.021		.533	1
ϕb_2	.016	.019	.406	.483	1
ϕD	.255	.275	6.48	6.99	
ϕD_1	.225	.240	5.72	6.10	
e	.100 T.P.		2.54 T.P.		2
e_1	.050 T.P.		1.27 T.P.		2
F	.010	.030	.254	.762	
L	1.500		38.10		1
L_1	.050		1.27		1
L_2		.250		6.35	1

NOTES:

1. (THREE LEADS) ϕb_2 APPLIES BETWEEN L_1 AND L_2. ϕb APPLIES BETWEEN L_2 AND 1.5" (38.10 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN L_1.
2. LEADS HAVING MAXIMUM DIAMETER .019" (.483 MM) MEASURED IN GAGING PLANE .054" (1.37 MM) + .001" (.025 MM) - .001" (.025 MM) BELOW THE SEATING PLANE OF THE DEVICE SHALL BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITION.

TO-60

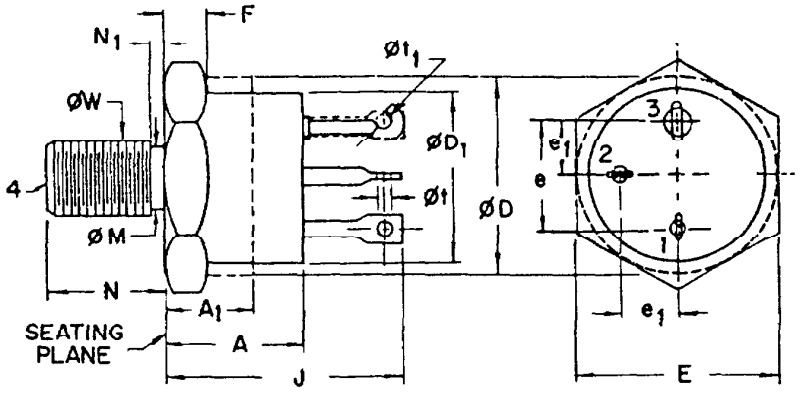


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.215	.320	5.46	8.13	
A_1		.165		4.19	2
Øb	.030	.046	.762	1.17	
ØD	.360	.437	9.14	11.10	2
$ØD_1$	.320	.360	8.13	9.14	
E	.424	.437	10.77	11.10	
e	.185	.215	4.70	5.46	
e_1	.090	.110	2.29	2.79	
F	.090	.135	2.29	3.43	1
J	.355	.480	9.02	12.19	
ØM	.163	.189	4.14	4.80	
N	.375	.455	9.53	11.56	
N_1		.078		1.98	
ØW	.1658	.1697	4.212	4.310	3

NOTES:

1. DIMENSION DOES NOT INCLUDE SEALING FLANGES.
2. PACKAGE CONTOUR OPTIONAL WITHIN DIMENSIONS SPECIFIED.
3. PITCH DIAMETER - THREAD 10-32 UNF-2A (COATED). REFERENCE (SCREW THREAD STANDARDS FOR FEDERAL SERVICES - HANDBOOK H-28).

TO-61

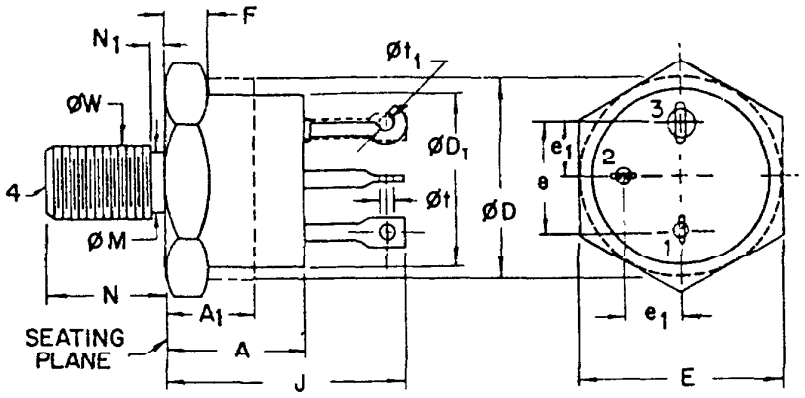


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.325	.460	8.26	11.68	
A_1		.270		6.86	2
ØD	.610	.687	15.49	17.45	2
$ØD_1$	.570	.610	14.48	15.49	
E	.667	.687	16.94	17.45	
e	.340	.415	8.64	10.54	5
e_1	.170	.213	4.32	5.41	5
F	.090	.150	2.29	3.81	1
J	.640	.875	16.26	22.23	
ØM	.220	.249	5.59	6.32	
N	.422	.455	10.72	11.56	
N_1		.090		2.29	
Øt	.047	.072	1.19	1.83	
$Øt_1$	.046	.077	1.17	1.96	4
ØW	.2225	.2268	5.651	5.761	3

NOTES:

1. DIMENSION DOES NOT INCLUDE SEALING FLANGES.
2. PACKAGE CONTOUR OPTIONAL WITHIN DIMENSIONS SPECIFIED.
3. PITCH DIAMETER - THREAD 1/4-28 UNF-2A (COATED). REFERENCE (SCREW THREAD STANDARDS FOR FEDERAL SERVICES - HANDBOOK H-28).
4. THIS TERMINAL CAN BE FLATTENED AND PIERCED OR HOOK TYPE.
5. POSITION OF LEADS IN RELATION TO THE HEXAGON IS NOT CONTROLLED.

TO-62

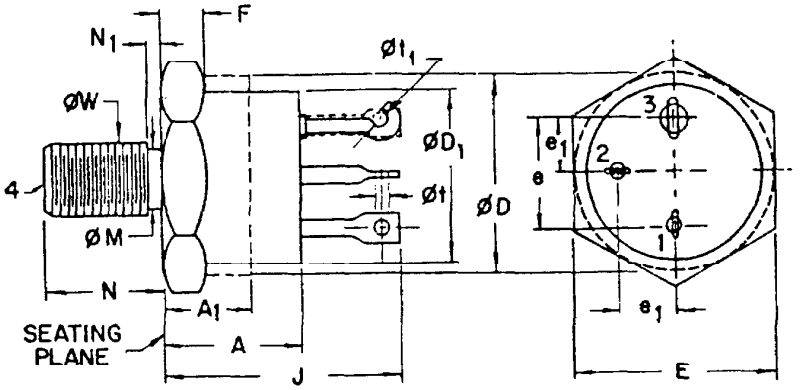


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.360	.434	9.14	11.02	
A_1		.270		6.86	2
øD	.430	.562	10.92	14.27	2
$øD_1$	.410	.430	10.41	10.92	
E	.544	.562	13.82	14.27	
e	.235	.265	5.97	6.73	5
e_1	.115	.135	2.92	3.43	5
F	.090	.150	2.29	3.81	1
J	.687	.737	17.45	18.72	
øM	.163	.189	4.14	4.80	
N	.403	.498	10.24	12.65	
N_1		.078		1.98	
øt	.042	.071	1.07	1.80	
$øt_1$	.046	.069	1.17	1.75	4
øW	.1658	.1697	4.211	4.310	3

NOTES:

1. DIMENSION DOES NOT INCLUDE SEALING FLANGES.
2. PACKAGE CONTOUR OPTIONAL WITHIN DIMENSIONS SPECIFIED.
3. PITCH DIAMETER - THREAD 10-32 UNF-2A (COATED). REFERENCE (SCREW THREAD STANDARDS FOR FEDERAL SERVICES - HANDBOOK H-28).
4. THIS TERMINAL CAN BE FLATTENED AND PIERCED OR HOOK TYPE.
5. POSITION OF LEADS IN RELATION TO THE HEXAGON IS NOT CONTROLLED.

TO-63

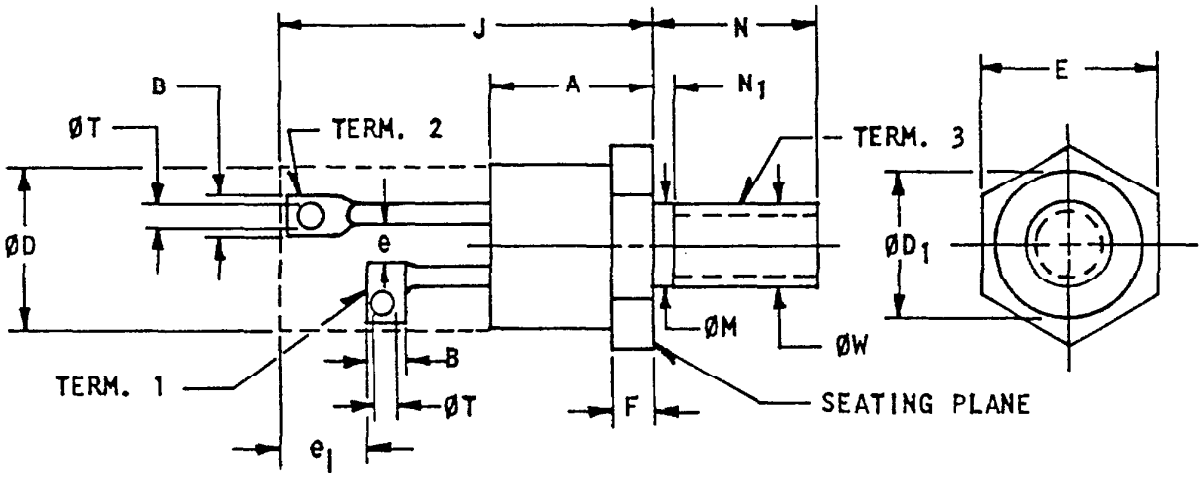


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.480	.535	12.19	13.59	
A_1		.300		7.62	2
ØD	.775	.875	19.69	22.23	2
$ØD_1$	.745	.775	18.92	19.69	
E	.855	.875	21.72	22.23	
e	.485	.515	12.32	13.08	5
e_1	.240	.260	6.10	6.60	5
F	.090	.167	2.29	4.24	1
J	.937	1.030	23.80	26.16	
ØM	.278	.312	7.06	7.92	
N	.460	.495	11.68	12.57	
N_1		.105		2.67	
Øt	.060	.105	1.52	2.67	
$Øt_1$	.060	.105	1.52	2.67	4
ØW	.2806	.2854	7.127	7.249	3

NOTES:

1. DIMENSION DOES NOT INCLUDE SEALING FLANGES.
2. PACKAGE CONTOUR OPTIONAL WITHIN DIMENSIONS SPECIFIED.
3. PITCH DIAMETER - THREAD 5/16-24 UNF-2A (COATED). REFERENCE (SCREW THREAD STANDARDS FOR FEDERAL SERVICES - HANDBOOK H-28).
4. THIS TERMINAL CAN BE FLATTENED AND PIERCED OR HOOK TYPE.
5. POSITION OF LEADS IN RELATION TO THE HEXAGON IS NOT CONTROLLED.

TO-64

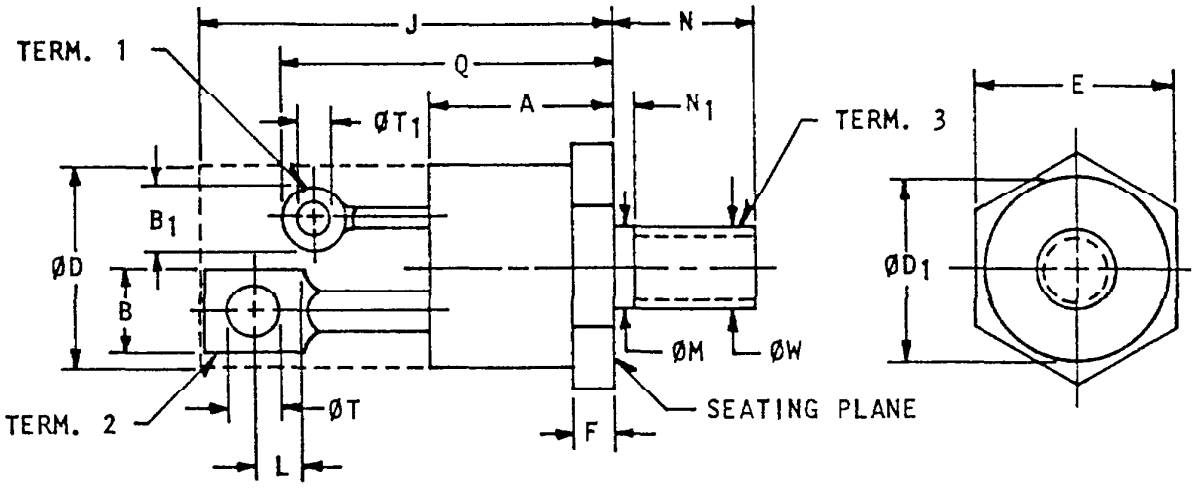


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.300	.400	7.62	10.16	
B	.080	.136	2.03	3.45	1
ØD		.424		10.77	2
$ØD_1$	.400		10.16		3, 4
E	.424	.437	10.77	11.10	
e	.013		.330		7
e_1	.060		1.52		5
F	.060	.175	1.52	4.45	4
J	.700	.855	17.78	21.72	2
ØM	.163	.189	4.14	4.80	
N	.400	.453	10.16	11.51	
N_1		.078		1.98	
ØT	.040	.075	1.02	1.91	
ØW	.1658	.1697	4.212	4.310	6

NOTES:

1. CONTOUR AND ORIENTATION OF FIXED TERMINAL LUGS ARE OPTIONAL.
2. THE OUTLINE CONTOUR (WITH EXCEPTION OF HEXAGON) IS OPTIONAL WITHIN ZONE DEFINED BY ØD AND J.
3. MINIMUM DIAMETER OF SEATING PLANE.
4. A CHAMFER (OR UNDERCUT) ON ONE OR BOTH ENDS OF HEXAGONAL PORTION IS OPTIONAL.
5. MINIMUM DIFFERENCE IN TERMINAL LENGTHS TO ESTABLISH DATUM LINE FOR NUMBERING TERMINALS.
6. PITCH DIAMETER - THREAD 10-32 NF-2A (COATED). REFERENCE (SCREW THREAD STANDARDS FOR FEDERAL SERVICES 1957) HANDBOOK 1957 H28.
7. MINIMUM SPACING BETWEEN TERMINALS.

TO-65

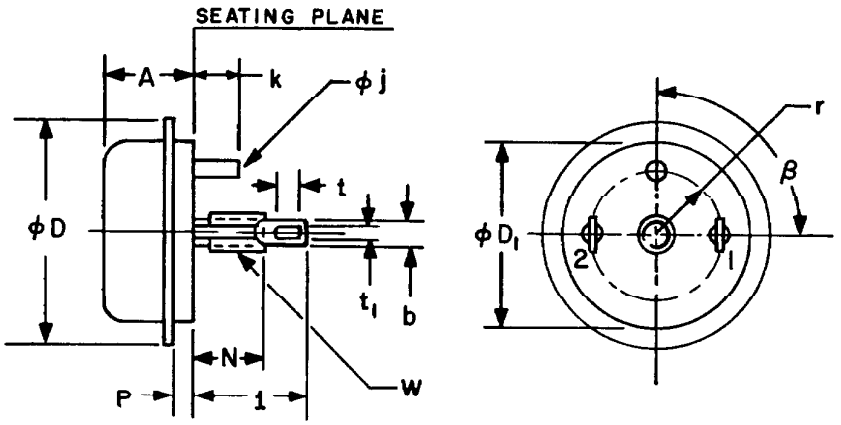


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.300	.565	7.62	14.35	
B	.200	.300	5.08	7.62	1
B_1	.100	.140	2.54	3.56	1
ϕD		.667		16.94	2
ϕD_1	.600		15.24		3, 4
E	.667	.687	16.94	17.45	
F	.113	.200	2.87	5.08	4
J	1.000	1.250	25.40	31.75	2
L	.120		3.05		6
ϕM	.220	.249	5.59	6.32	
N	.422	.453	10.72	11.51	
N_1		.090		2.29	
Q	.700	.885	17.78	22.48	
ϕT	.125	.165	3.18	4.19	
ϕT_1	.055	.075	1.40	1.91	
ϕW	.2225	.2268	5.652	5.760	5

NOTES:

1. CONTOUR AND ORIENTATION OF FIXED TERMINAL LUGS ARE OPTIONAL.
2. THE OUTLINE CONTOUR (WITH EXCEPTION OF HEXAGON) IS OPTIONAL WITHIN ZONE DEFINED BY ØD AND J.
3. MINIMUM DIAMETER OF SEATING PLANE.
4. A CHAMFER (OR UNDERCUT) ON ONE OR BOTH ENDS OF HEXAGONAL PORTION IS OPTIONAL.
5. *PITCH DIAMETER - THREAD 1/4-28 UNF-2A (COATED).* REFERENCE (SCREW THREAD STANDARDS FOR FEDERAL SERVICES 1957) HANDBOOK 1957 H28.
6. MINIMUM FLAT.

TO-67

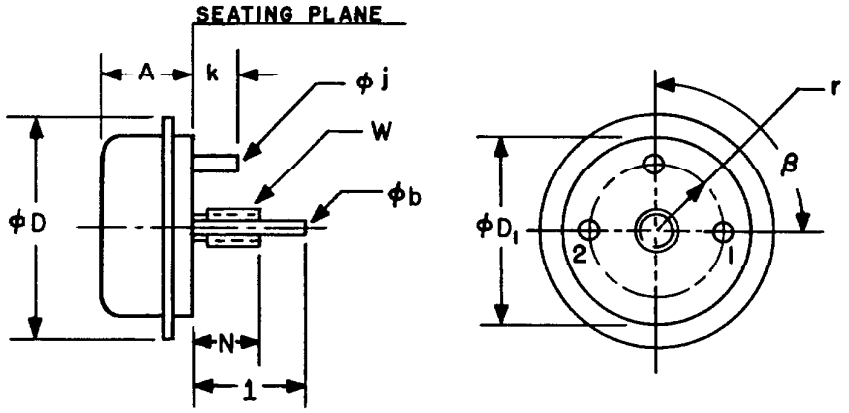


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.275	.500	6.99	12.70	
b	.100	.185	2.54	4.70	
ØD		1.250		31.75	
$ØD_1$	.990	1.010	25.15	25.65	1
Øj	.090	.140	2.29	3.56	4
k	.100	.312	2.54	7.92	4
l	.610	.710	15.49	18.03	
N	.375	.500	9.53	12.70	
P	.050		1.27		
r	.335	.355	8.51	9.02	1
t	.120	.145	3.05	3.68	
t_1	.070	.120	1.78	3.05	
W	.1658	.1697	4.212	4.310	2, 3
β	85°	95°	85°	95°	1

NOTES:

1. MEASURED AT SEATING PLANE.
2. COMPLETE THREADS TO EXTEND TO WITHIN 3-1/2 THREADS OF SEATING PLANE.
3. PITCH DIAMETER OF 10-32 NF-2A (COATED) THREADS. (ASA B1.1-1960)
4. MECHANICAL INDEX.

TO-68

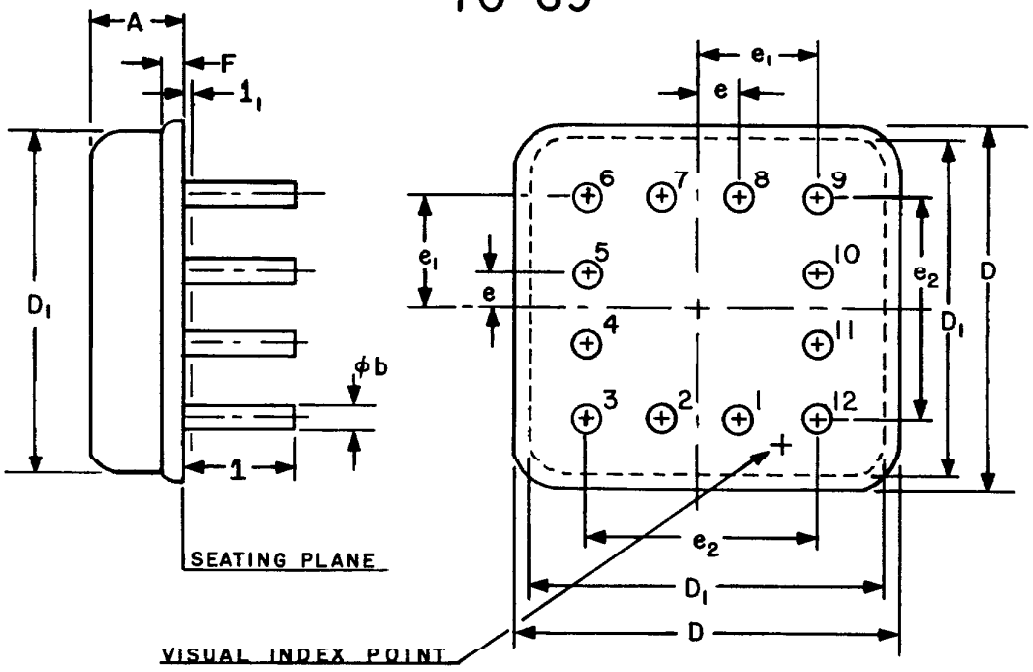


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.275	.500	6.99	12.70	
Øb	.040	.095	1.02	2.41	
ØD		1.250		31.75	
$ØD_1$	.990		25.15		1
Øj	.090	.140	2.29	3.56	4
k	.100	.312	2.54	7.92	4
l	.610	.710	15.49	18.03	
N	.375	.500	9.53	12.70	
r	.335	.355	8.51	9.02	1
W	.1658	.1697	4.212	4.310	2, 3
β	85^o	95^o	85^o	95^o	1

NOTES:

1. MEASURED AT SEATING PLANE.
2. COMPLETE THREADS TO EXTEND TO WITHIN 3-1/2 THREADS OF SEATING PLANE.
3. PITCH DIAMETER OF 10-32 NF-2A (COATED) THREADS. (ASA B1.1-1960)
4. MECHANICAL INDEX.

TO-69



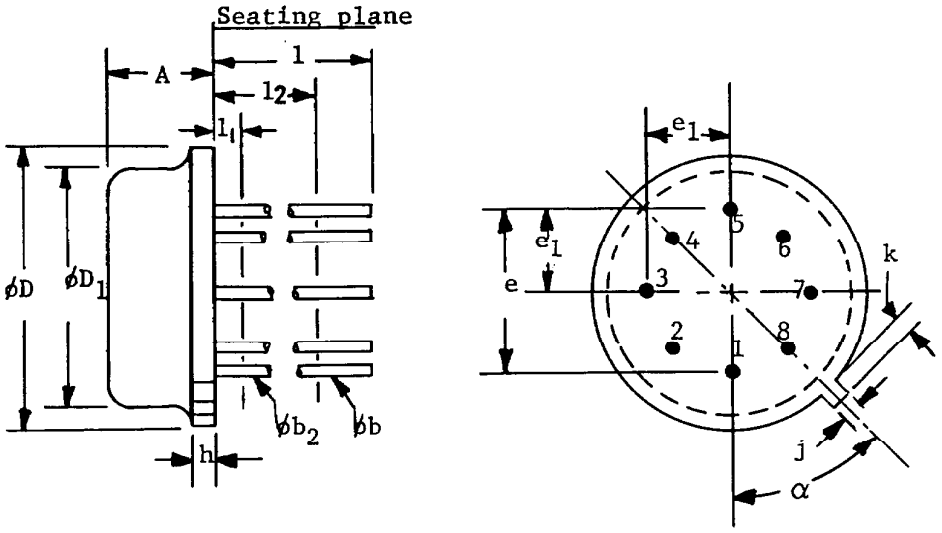
SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.075	.085	1.905	2.159	
ϕb	.016	.019	.406	.483	2
D	.295	.305	7.49	7.75	
D_1	.275	.285	6.99	7.24	
e	.033 T.P.		.838 T.P.		1
e_1	.098 T.P.		2.49 T.P.		1
e_2	.195 T.P.		4.95 T.P.		1
F	.030	.050	.762	1.270	
l	.070		1.78		
l_1		.025		.635	2

NOTES:

1. LEADS HAVING MAXIMUM DIAMETER .019" (.483 MM) MEASURED IN GAGING PLANE .025" (.635 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE SEATING PLANE OF THE DEVICE SHALL BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITIONS.

2. LEAD THICKNESS UNCONTROLLED IN THIS ZONE.

TO-70

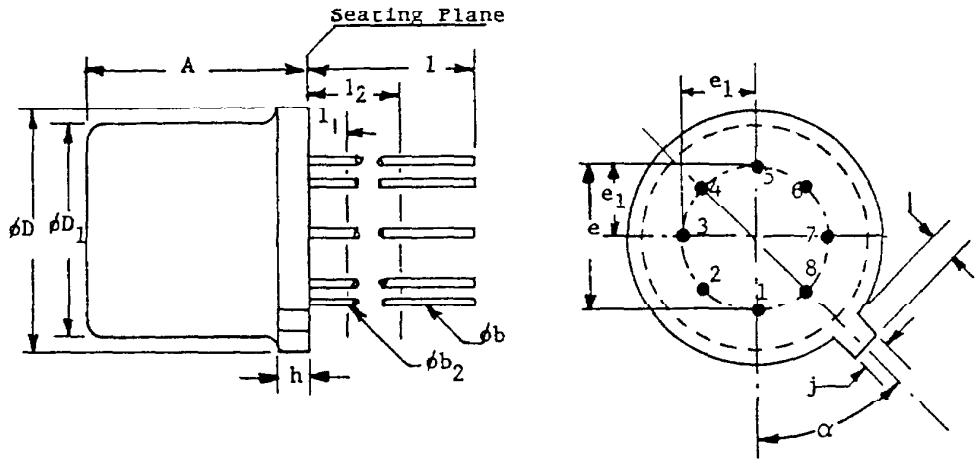


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.065	.085	1.65	2.16	
øb	.016	.021	.406	.533	2
$øb_2$	.016	.019	.406	.483	2
øD	.240	.270	6.10	6.86	
$øD_1$	.205	.240	5.21	6.10	
e	.141 T.P.		3.58 T.P.		4
e_1	.071 T.P.		1.80 T.P.		4
h		.040		1.02	
j	.015	.025	.381	.635	
k	.015	.025	.381	.635	3
l	.500		12.70		2
l_1		.050		1.27	2
l_2	.250		6.35		2
α	45° T.P.		45° T.P.		4, 6

NOTES:

1. (EIGHT LEADS). MAXIMUM NUMBER OF LEADS OMITTED IN THIS OUTLINE, "THREE" (3). THE NUMBER AND POSITION OF LEADS ACTUALLY PRESENT ARE INDICATED IN THE PRODUCT REGISTRATION. OUTLINE DESIGNATION DETERMINED BY THE LOCATION AND MINIMUM ANGULAR SPACING OF ANY TWO ADJACENT LEADS.
2. (ALL LEADS) $øb_2$ APPLIES BETWEEN l_1 AND l_2. øb APPLIES BETWEEN l_2 AND .500" (12.70 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND .500" (12.70 MM) FROM SEATING PLANE.
3. MEASURED FROM MAXIMUM DIAMETER OF THE PRODUCT.
4. LEADS HAVING MAXIMUM DIAMETER .019" (.483 MM) MEASURED IN GAGING PLANE .054" (1.37 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE SEATING PLANE OF THE PRODUCT SHALL BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITION RELATIVE TO A MAXIMUM WIDTH TAB.
5. THE PRODUCT MAY BE MEASURED BY DIRECT METHODS OR BY GAGE.
6. TAB CENTERLINE.

TO-71

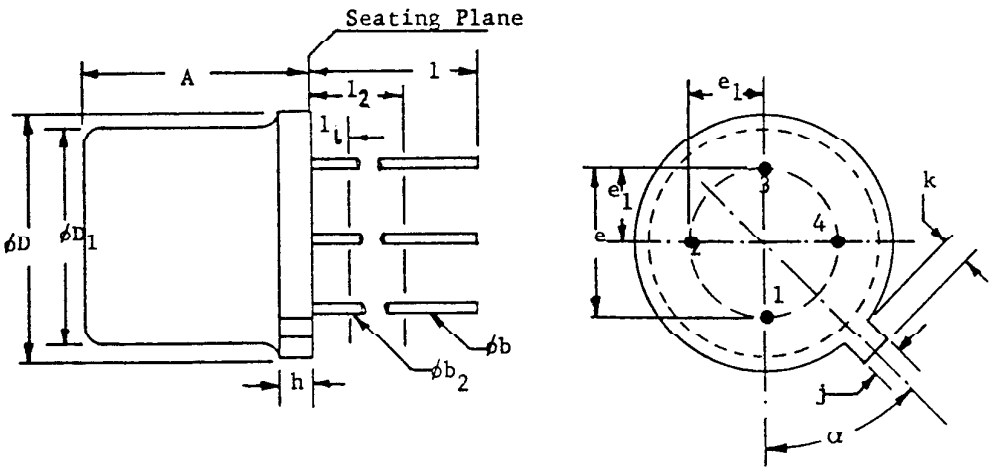


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.170	.210	4.32	5.33	
øb	.016	.021	.406	.533	2
$øb_2$	.016	.019	.406	.483	2
øD	.209	.230	5.31	5.84	
$øD_1$	.175	.195	4.45	4.95	
e	.100 T.P.		2.54 T.P.		4
e_1	.050 T.P.		1.27 T.P.		4
h		.030		.762	
j	.036	.046	.914	1.17	
k	.028	.048	.711	1.22	3
l	.500		12.70		2
l_1		.050		1.27	2
l_2	.250		6.35		2
α	45° T.P.		45° T.P.		4, 6

NOTES:

1. (EIGHT LEADS). MAXIMUM NUMBER OF LEADS OMITTED IN THIS OUTLINE, "THREE" (3). THE NUMBER AND POSITION OF LEADS ACTUALLY PRESENT ARE INDICATED IN THE PRODUCT REGISTRATION. OUTLINE DESIGNATION DETERMINED BY THE LOCATION AND MINIMUM ANGULAR SPACING OF ANY TWO ADJACENT LEADS.
2. (ALL LEADS) $øb_2$ APPLIES BETWEEN l_1 AND l_2. øb APPLIES BETWEEN l_2 AND .500" (12.70 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND .500" (12.70 MM) FROM SEATING PLANE.
3. MEASURED FROM MAXIMUM DIAMETER OF THE PRODUCT.
4. LEADS HAVING MAXIMUM DIAMETER .019" (.483 MM) MEASURED IN GAGING PLANE .054" (1.37 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE SEATING PLANE OF THE PRODUCT SHALL BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITION RELATIVE TO A MAXIMUM WIDTH TAB.
5. THE PRODUCT MAY BE MEASURED BY DIRECT METHODS OR BY GAGE.
6. TAB CENTERLINE.

TO-72

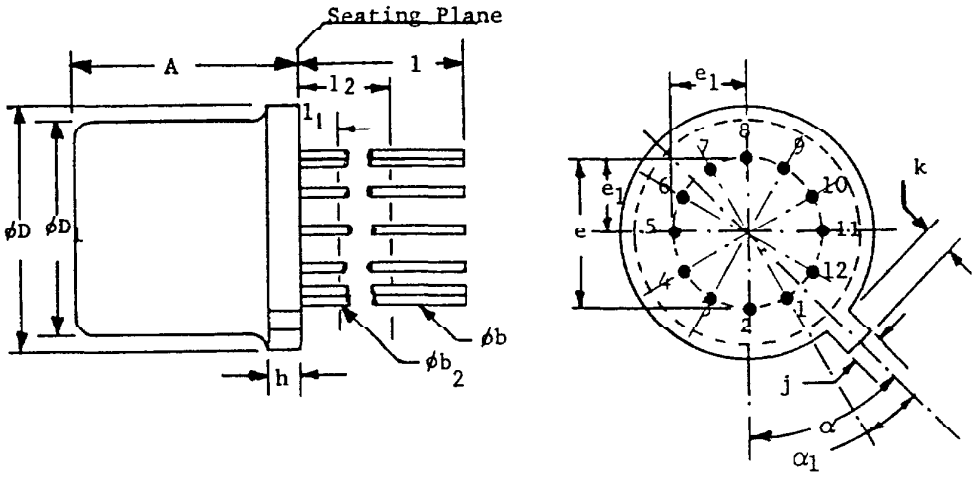


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.170	.210	4.32	5.33	
øb	.016	.021	.406	.533	2
$øb_2$	.016	.019	.406	.483	2
øD	.209	.230	5.31	5.84	
$øD_1$	.178	.195	4.52	4.95	
e	.100 T.P.		2.54 T.P.		4
e_1	.050 T.P.		1.27 T.P.		4
h		.030		.762	
j	.036	.046	.914	1.17	
k	.028	.048	.711	1.22	3
l	.500		12.70		2
l_1		.050		1.27	2
l_2	.250		6.35		2
α	45° T.P.		45° T.P.		4, 6

NOTES:

1. (FOUR LEADS). MAXIMUM NUMBER OF LEADS OMITTED IN THIS OUTLINE, "NONE" (0). THE NUMBER AND POSITION OF LEADS ACTUALLY PRESENT ARE INDICATED IN THE PRODUCT REGISTRATION. OUTLINE DESIGNATION DETERMINED BY THE LOCATION AND MINIMUM ANGULAR OR LINEAR SPACING OF ANY TWO ADJACENT LEADS.
2. (ALL LEADS) $øb_2$ APPLIES BETWEEN l_1 AND l_2. øb APPLIES BETWEEN l_2 AND .500" (12.70 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND .500" (12.70 MM) FROM SEATING PLANE.
3. MEASURED FROM MAXIMUM DIAMETER OF THE PRODUCT.
4. LEADS HAVING MAXIMUM DIAMETER .019" (.483 MM) MEASURED IN GAGING PLANE .054" (1.37 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE SEATING PLANE OF THE PRODUCT SHALL BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITION RELATIVE TO A MAXIMUM WIDTH TAB.
5. THE PRODUCT MAY BE MEASURED BY DIRECT METHODS OR BY GAGE.
6. TAB CENTERLINE.

TO-73



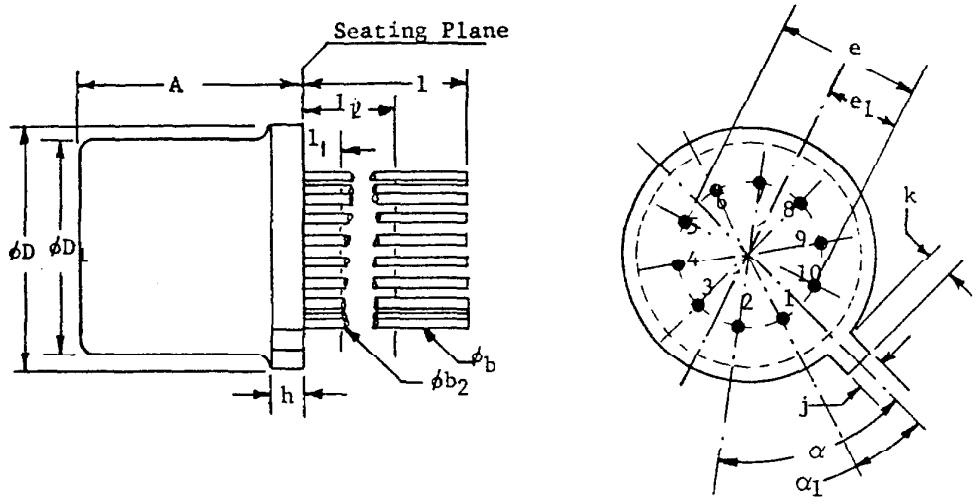
SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.240	.260	6.10	6.60	
øb	.016	.021	.406	.533	2
$øb_2$	.016	.019	.406	.483	2
øD	.335	.370	8.51	9.40	
$øD_1$	.305	.335	7.75	8.51	
e	.200 T.P.		5.08 T.P.		4
e_1	.100 T.P.		2.54 T.P.		4
h		.040		1.02	
j	.028	.034	.711	.864	
k	.029	.045	.737	1.14	3
l	.500		12.70		2
l_1		.050		1.27	2
l_2	.250		6.35		2
α	45° T.P.		45° T.P.		4, 6
$α_1$	15° T.P.		15° T.P.		4, 6

4.6.34

NOTES:

1. (TWELVE LEADS). MAXIMUM NUMBER OF LEADS OMITTED IN THIS OUTLINE, "ONE" (1). THE NUMBER AND POSITION OF LEADS ACTUALLY PRESENT ARE INDICATED IN THE PRODUCT REGISTRATION. OUTLINE DESIGNATION DETERMINED BY THE LOCATION AND MINIMUM ANGULAR SPACING OF ANY TWO ADJACENT LEADS.
2. (ALL LEADS) $øb_2$ APPLIES BETWEEN l_1 AND l_2. øb APPLIES BETWEEN l_2 AND .500" (12.70 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND .500" (12.70 MM) FROM SEATING PLANE.
3. MEASURED FROM MAXIMUM DIAMETER OF THE PRODUCT.
4. LEADS HAVING MAXIMUM DIAMETER .019" (.483 MM) MEASURED IN GAGING PLANE .054" (1.37 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE SEATING PLANE OF THE PRODUCT SHALL BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITION RELATIVE TO A MAXIMUM WIDTH TAB.
5. THE PRODUCT MAY BE MEASURED BY DIRECT METHODS OR BY GAGE.
6. TAB CENTERLINE.

TO-74

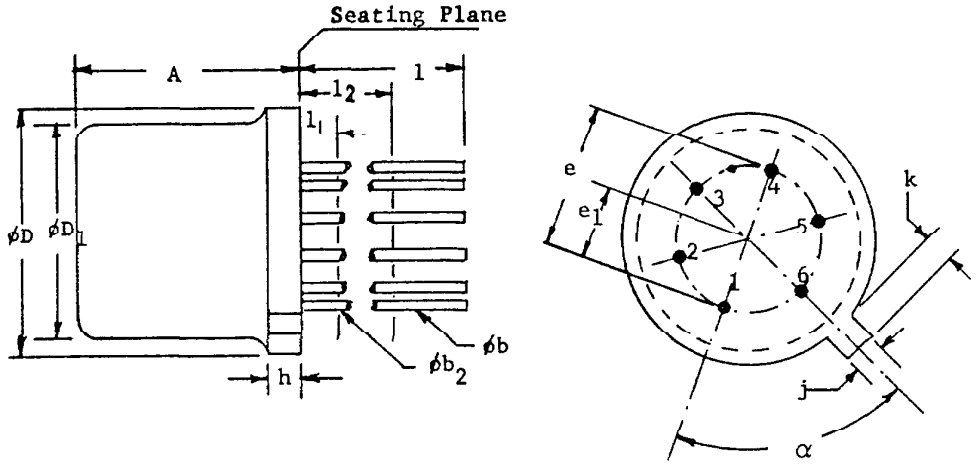


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.240	.260	6.10	6.60	
øb	.016	.021	.406	.533	2
$øb_2$	.016	.019	.406	.483	2
øD	.335	.370	8.51	9.40	
$øD_1$	.305	.335	7.75	8.51	
e_1	.200 T.P.		5.08 T.P.		4
e_1	.100 T.P.		2.54 T.P.		4
h		.040		1.02	
j	.028	.034	.711	.864	
k	.029	.045	.737	1.14	3
l	.500		12.70		2
l_1		.050		1.27	2
l_2	.250		6.35		2
α	54° T.P.		54° T.P.		4, 6
$α_1$	18° T.P.		18° T.P.		4, 6

NOTES:

1. (TEN LEADS). MAXIMUM NUMBER OF LEADS OMITTED IN THIS OUTLINE, "ONE" (1). THE NUMBER AND POSITION OF LEADS ACTUALLY PRESENT ARE INDICATED IN THE PRODUCT REGISTRATION. OUTLINE DESIGNATION DETERMINED BY THE LOCATION AND MINIMUM ANGULAR SPACING OF ANY TWO ADJACENT LEADS.
2. (ALL LEADS) $øb_2$ APPLIES BETWEEN l_1 AND l_2. øb APPLIES BETWEEN l_2 AND .500" (12.70 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND .500" (12.70 MM) FROM SEATING PLANE.
3. MEASURED FROM MAXIMUM DIAMETER OF THE PRODUCT.
4. LEADS HAVING MAXIMUM DIAMETER .019" (.483 MM) MEASURED IN GAGING PLANE .054" (1.37 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE SEATING PLANE OF THE PRODUCT SHALL BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITION RELATIVE TO A MAXIMUM WIDTH TAB.
5. THE PRODUCT MAY BE MEASURED BY DIRECT METHODS OR BY GAGE.
6. TAB CENTERLINE.

TO-75

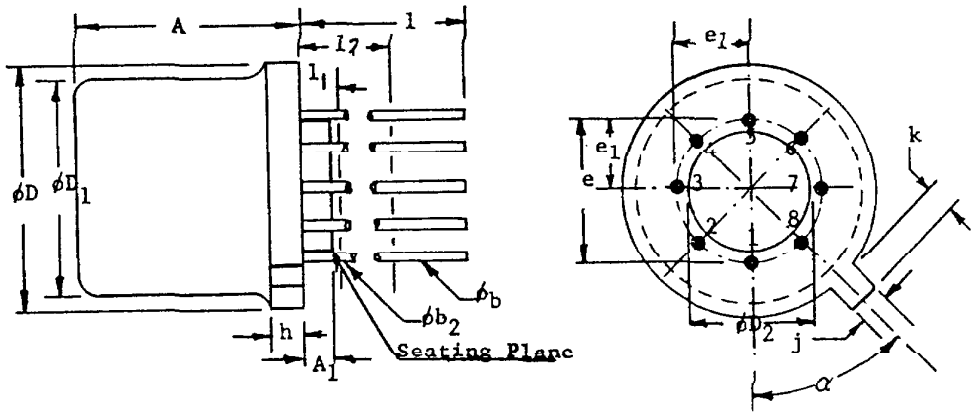


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.240	.260	6.10	6.60	
øb	.016	.021	.406	.533	2
$øb_2$	.016	.019	.406	.483	2
øD	.335	.370	8.51	9.40	
$øD_1$	.305	.335	7.75	8.51	
e	.200 T.P.		5.08 T.P.		4
e_1	.100 T.P.		2.54 T.P.		4
h		.040		1.02	
j	.028	.034	.711	.864	
k	.029	.045	.737	1.14	3
l	.500		12.70		2
l_1		.050		1.27	2
l_2	.250		6.35		2
α	60° T.P.		60° T.P.		4, 6

NOTES:

1. (SIX LEADS). MAXIMUM NUMBER OF LEADS OMITTED IN THIS OUTLINE, "ONE" (1). THE NUMBER AND POSITION OF LEADS ACTUALLY PRESENT ARE INDICATED IN THE PRODUCT REGISTRATION. OUTLINE DESIGNATION DETERMINED BY THE LOCATION AND MINIMUM ANGULAR SPACING OF ANY TWO ADJACENT LEADS.
2. (ALL LEADS) $øb_2$ APPLIES BETWEEN l_1 AND l_2. øb APPLIES BETWEEN l_2 AND .500" (12.70 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND .500" (12.70 MM) FROM SEATING PLANE.
3. MEASURED FROM MAXIMUM DIAMETER OF THE PRODUCT.
4. LEADS HAVING MAXIMUM DIAMETER .019" (.483 MM) MEASURED IN GAGING PLANE .054" (1.37 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE SEATING PLANE OF THE PRODUCT SHALL BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITION RELATIVE TO A MAXIMUM WIDTH TAB.
5. THE PRODUCT MAY BE MEASURED BY DIRECT METHODS OR BY GAGE.
6. TAB CENTERLINE.

TO-76

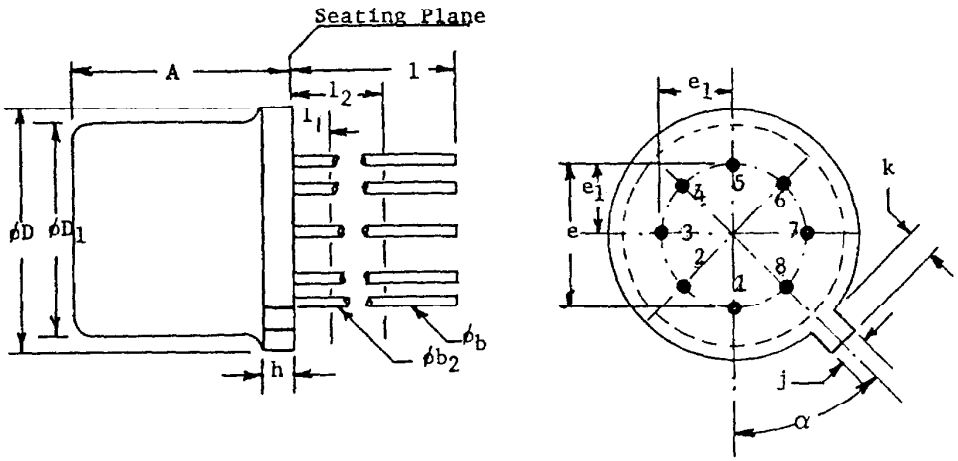


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.240	.260	6.10	6.60	
A_1	.010	.040	.254	1.02	
Øb	.016	.021	.406	.533	2
$Øb_2$	.016	.019	.406	.483	2
ØD	.335	.370	8.51	9.40	
$ØD_1$	.305	.335	7.75	8.51	
$ØD_2$	.140	.160	3.56	4.06	
e	.200 T.P.		5.08 T.P.		4
e_1	.100 T.P.		2.54 T.P.		4
h		.040		1.02	
j	.028	.034	.711	.864	
k	.029	.045	.737	1.14	3
l	.500		12.70		2
l_1		.050		1.27	2
l_2	.250		6.35		2
α	45° T.P.		45° T.P.		4, 6

NOTES:

1. (EIGHT LEADS). MAXIMUM NUMBER OF LEADS OMITTED IN THIS OUTLINE, "THREE" (3). THE NUMBER AND POSITION OF LEADS ACTUALLY PRESENT ARE INDICATED IN THE PRODUCT REGISTRATION. OUTLINE DESIGNATION DETERMINED BY THE LOCATION AND MINIMUM ANGULAR SPACING OF ANY TWO ADJACENT LEADS.
2. (ALL LEADS) $Øb_2$ APPLIES BETWEEN l_1 AND l_2. Øb APPLIES BETWEEN l_2 AND .500" (12.70 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND .500" (12.70 MM) FROM SEATING PLANE.
3. MEASURED FROM MAXIMUM DIAMETER OF THE PRODUCT.
4. LEADS HAVING MAXIMUM DIAMETER .019" (.483 MM) MEASURED IN GAGING PLANE .054" (1.37 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE SEATING PLANE OF THE PRODUCT SHALL BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITION RELATIVE TO A *MAXIMUM WIDTH TAB*.
5. THE PRODUCT MAY BE MEASURED BY DIRECT METHODS OR BY GAGE.
6. TAB CENTERLINE.

TO-77

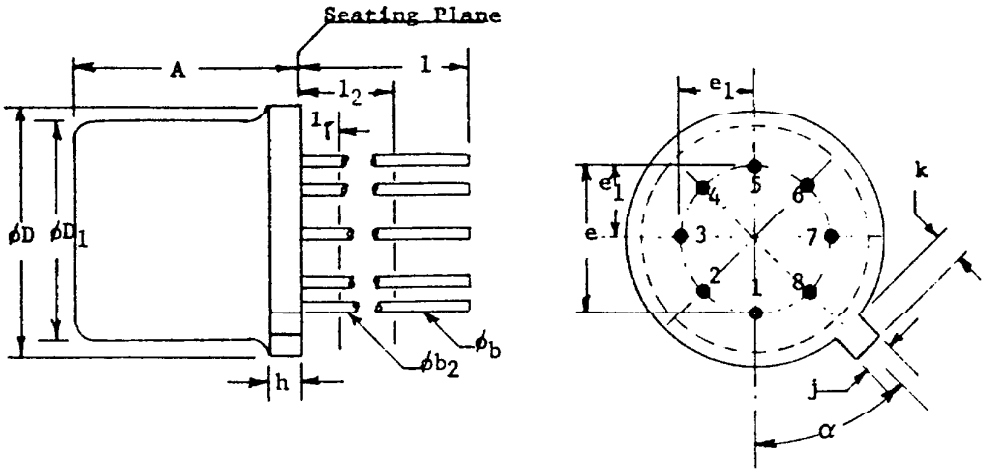


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.240	.260	6.10	6.60	
øb	.016	.021	.406	.533	2
$øb_2$	.016	.019	.406	.483	2
øD	.335	.370	8.51	9.40	
$øD_1$	.305	.335	7.75	8.51	
e	.200 T.P.		5.08 T.P.		4
e_1	.100 T.P.		2.54 T.P.		4
h		.040		1.02	
j	.028	.034	.711	.864	
k	.029	.045	.737	1.14	3
l	.500		12.70		2
l		.050		1.27	2
l_2	.250		6.35		2
α	45° T.P.		45° T.P.		4, 6

NOTES:

1. (EIGHT LEADS). MAXIMUM NUMBER OF LEADS OMITTED IN THIS OUTLINE, "THREE" (3). THE NUMBER AND POSITION OF LEADS ACTUALLY PRESENT ARE INDICATED IN THE PRODUCT REGISTRATION. OUTLINE DESIGNATION DETERMINED BY THE LOCATION AND MINIMUM ANGULAR OR LINEAR SPACING OF ANY TWO ADJACENT LEADS.
2. (ALL LEADS) $øb_2$ APPLIES BETWEEN l_1 AND l_2. øb APPLIES BETWEEN l_2 AND .500" (12.70 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND .500' (12.70 MM) FROM SEATING PLANE.
3. MEASURED FROM MAXIMUM DIAMETER OF THE PRODUCT.
4. LEADS HAVING MAXIMUM DIAMETER .019" (.483 MM) MEASURED IN GAGING PLANE .054" (1.37 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE SEATING PLANE OF THE PRODUCT SHALL BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITION RELATIVE TO A MAXIMUM WIDTH TAB.
5. THE PRODUCT MAY BE MEASURED BY DIRECT METHODS OR BY GAGE.
6. TAB CENTERLINE.

TO-78

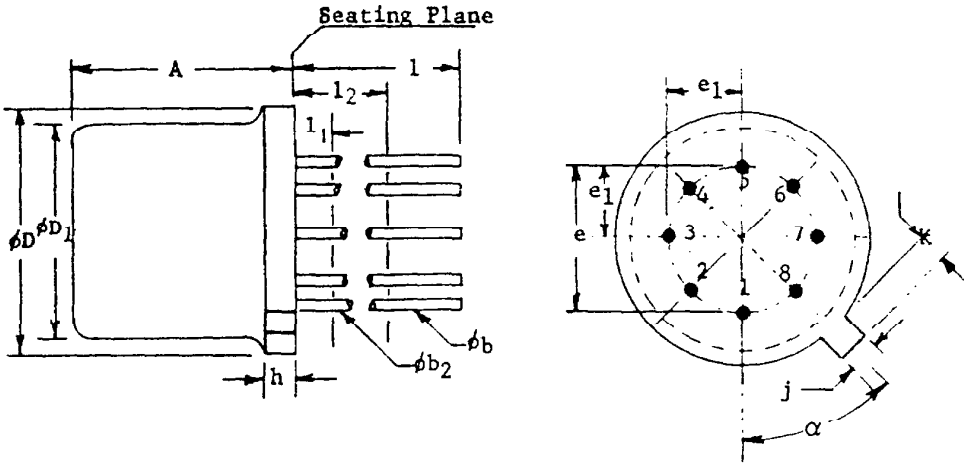


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.165	.185	4.19	4.70	
øb	.016	.021	.406	.533	2
$øb_2$	.016	.019	.406	.483	2
øD	.335	.370	8.51	9.40	
$øD_1$	.305	.335	7.75	8.51	
e	.200 T.P.		5.08 T.P.		4
e_1	.100 T.P.		2.54 T.P.		4
h		.040		1.02	
j	.028	.034	.711	.864	
k	.029	.045	.737	1.14	3
l	.500		12.70		2
l_1		.050		1.27	2
l_2	.250		6.35		2
α	45° T.P.		45° T.P.		4, 6

NOTES:

1. (EIGHT LEADS). MAXIMUM NUMBER OF LEADS OMITTED IN THIS OUTLINE, "THREE" (3). THE NUMBER AND POSITION OF LEADS ACTUALLY PRESENT ARE INDICATED IN THE PRODUCT REGISTRATION. OUTLINE DESIGNATION DETERMINED BY THE LOCATION AND MINIMUM ANGULAR SPACING OF ANY TWO ADJACENT LEADS.
2. (ALL LEADS) $øb_2$ APPLIES BETWEEN l_1 AND l_2. øb APPLIES BETWEEN l_2 AND .500" (12.70 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND .500" (12.70 MM) FROM SEATING PLANE.
3. MEASURED FROM MAXIMUM DIAMETER OF THE PRODUCT.
4. LEADS HAVING MAXIMUM DIAMETER .019" (.483 MM) MEASURED IN GAGING PLANE .054" (1.37 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE SEATING PLANE OF THE PRODUCT SHALL BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITION RELATIVE TO A MAXIMUM WIDTH TAB.
5. THE PRODUCT MAY BE MEASURED BY DIRECT METHODS OR BY GAGE.
6. TAB CENTERLINE.

TO-79

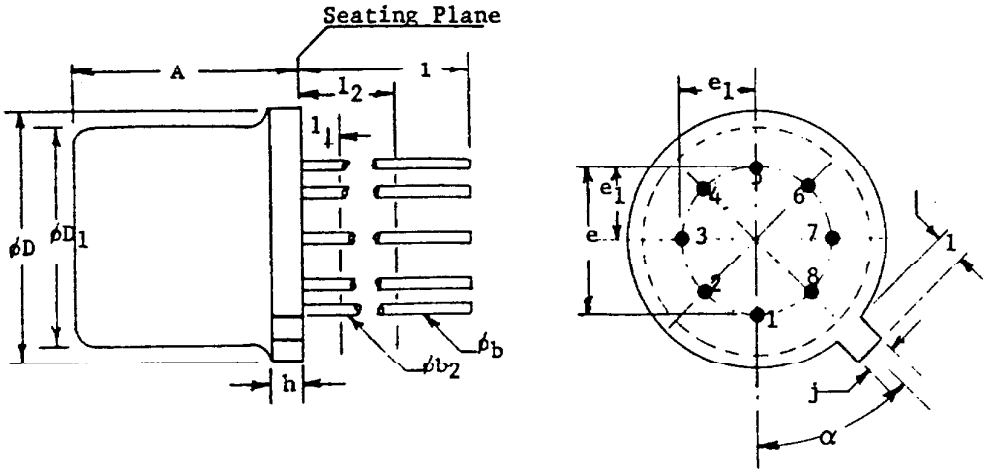


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.140	.160	3.56	4.06	
Øb	.016	.021	.406	.533	2
$Øb_2$	.016	.019	.406	.483	2
ØD	.335	.370	8.51	9.40	
$ØD_1$	.305	.335	7.75	8.51	
e	.200 T.P.		5.08 T.P.		4
e_1	.100 T.P.		2.54 T.P.		4
h		.040		1.02	
j	.028	.034	.711	.864	
k	.029	.045	.737	1.14	3
l	.500		12.70		2
l_1		.050		1.27	2
l_2	.250		6.35		2
α	45° T.P.		45° T.P.		4, 6

NOTES:

1. (EIGHT LEADS). MAXIMUM NUMBER OF LEADS OMITTED IN THIS OUTLINE, "THREE" (3). THE NUMBER AND POSITION OF LEADS ACTUALLY PRESENT ARE INDICATED IN THE PRODUCT REGISTRATION. OUTLINE DESIGNATION DETERMINED BY THE LOCATION AND MINIMUM ANGULAR SPACING OF ANY TWO ADJACENT LEADS.
2. (ALL LEADS) $Øb_2$ APPLIES BETWEEN l_1 AND l_2. Øb APPLIES BETWEEN l_2 AND .500" (12.70 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND .500" (12.70 MM) FROM SEATING PLANE.
3. MEASURED FROM MAXIMUM DIAMETER OF THE PRODUCT.
4. LEADS HAVING MAXIMUM DIAMETER .019" (.483 MM) MEASURED IN GAGING PLANE .054" (1.37 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE SEATING PLANE OF THE PRODUCT SHALL BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITION RELATIVE TO A MAXIMUM WIDTH TAB.
5. THE PRODUCT MAY BE MEASURED BY DIRECT METHODS OR BY GAGE.
6. TAB CENTERLINE.

TO-80



SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.085	.105	2.16	2.67	2
øb	.016	.021	.406	.533	2
$øb_2$	.016	.019	.406	.483	
øD	.335	.370	8.51	9.40	
$øD_1$	.305	.335	7.75	8.51	
e	.200 T.P.		5.08 T.P.		4
e_1	.100 T.P.		2.54 T.P.		4
h		.040		1.02	
j	.028	.034	.711	.864	
k	.029	.045	.737	1.14	3
l	.500		12.70		2
l_1		.050		1.27	2
l_2	.250		6.35		2
α	45° T.P.		45° T.P.		4, 6

NOTES:

1. (EIGHT LEADS). MAXIMUM NUMBER OF LEADS OMITTED IN THIS OUTLINE, "THREE" (3). THE NUMBER AND POSITION OF LEADS ACTUALLY PRESENT ARE INDICATED IN THE PRODUCT REGISTRATION. OUTLINE DESIGNATION DETERMINED BY THE LOCATION AND MINIMUM ANGULAR SPACING OF ANY TWO ADJACENT LEADS.

2. (ALL LEADS) $øb_2$ APPLIES BETWEEN l_1 AND l_2. øb APPLIES BETWEEN l_2 AND .500" (12.70 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND .500" (12.70 MM) FROM SEATING PLANE.

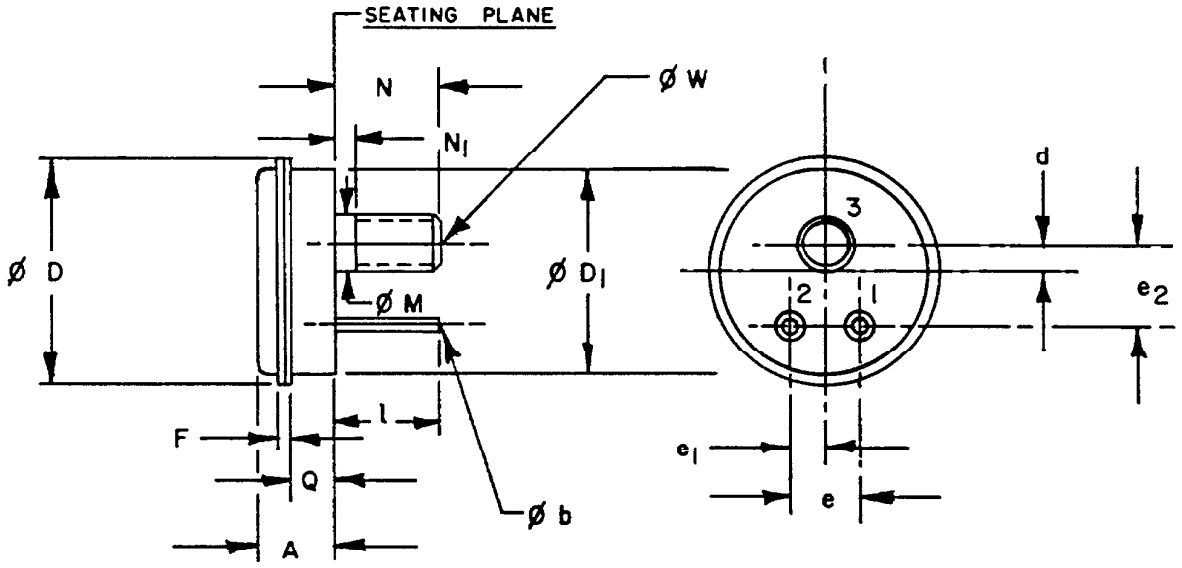
3. MEASURED FROM MAXIMUM DIAMETER OF THE PRODUCT.

4. LEADS HAVING MAXIMUM DIAMETER .019" (.483 MM) MEASURED IN GAGING PLANE .054" (1.37 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE SEATING PLANE OF THE PRODUCT SHALL BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITION RELATIVE TO A MAXIMUM WIDTH TAB.

5. THE PRODUCT MAY BE MEASURED BY DIRECT METHODS OR BY GAGE.

6. TAB CENTERLINE.

TO-81

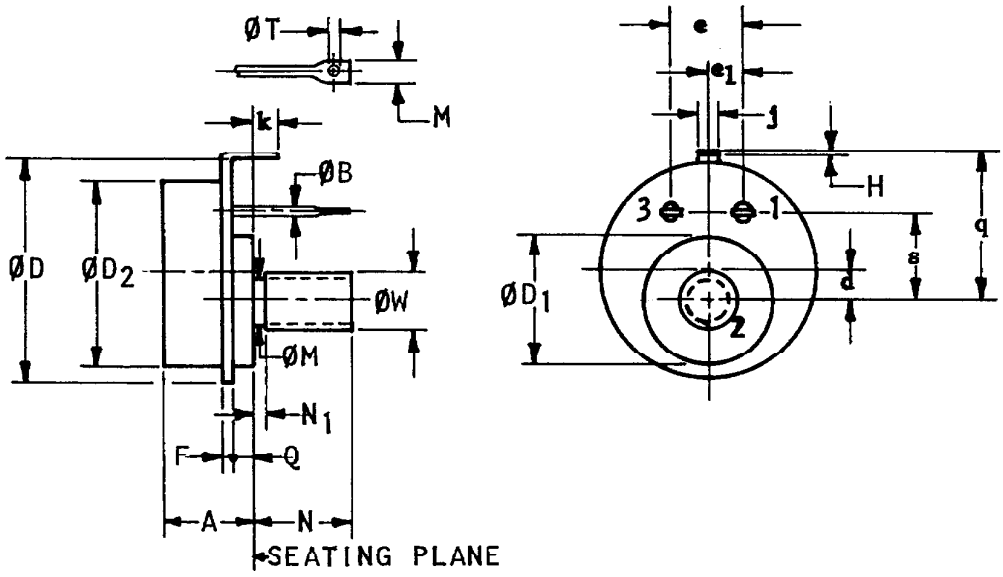


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.380	.415	9.78	10.54	
Øb	.055	.071	1.40	1.80	
ØD	1.230	1.300	31.25	33.02	
$ØD_1$	1.125	1.135	28.68	28.93	1
d	.151	.161	3.84	4.08	1
e	.370	.382	9.40	9.71	1
e_1	.182	.192	4.63	4.87	1
e_2	.435	.450	11.05	11.44	1
F		.065		1.65	
l	.500		12.70		
ØM	.278	.312	7.07	7.92	
N	.545	.575	13.85	14.60	
N_1		.107		2.71	3
Q	.227	.243	5.77	6.17	
ØW	.2806	.2854	7.13	7.24	2

NOTES:

1. MEASURED AT SEATING PLANE.
2. PITCH DIAMETER OF 5/16-24 UNF-2A (COATED) THREAD (ASA B1.1-1960).
3. LENGTH OF INCOMPLETE OR UNDERCUT THREADS.

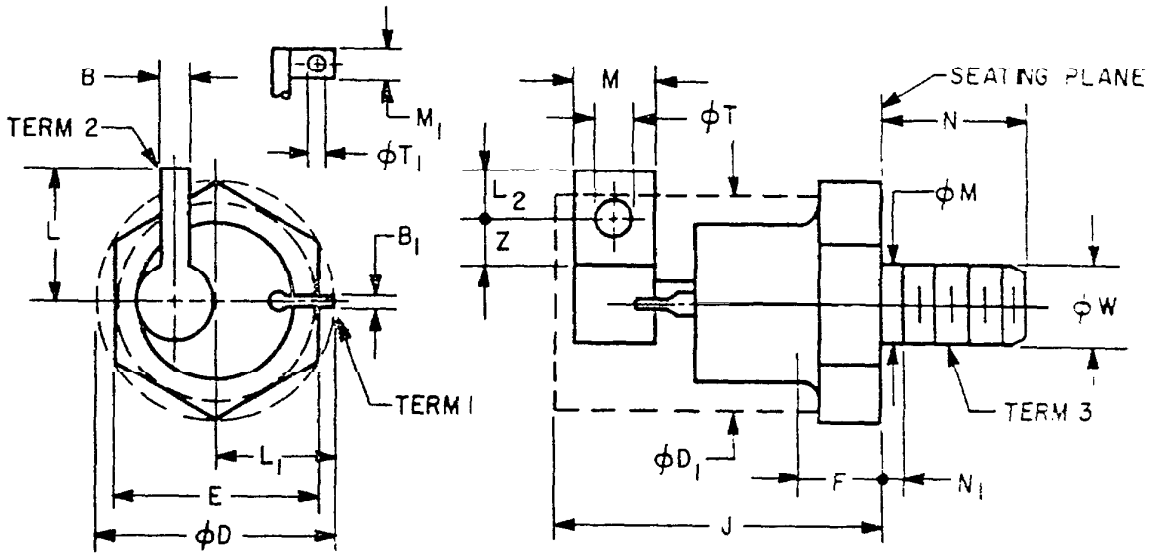
TO-82



SYM.	INCHES		MILLIMETERS		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	.500	.560	12.70	14.22	
ØB	.045	.060	1.15	1.52	5
d	.140	.170	3.56	4.31	
ØD	1.240	1.280	31.50	32.51	
$ØD_1$	.730	.770	18.55	19.55	
$ØD_2$	—	1.125	—	28.57	
e	.360	.400	9.15	10.16	
e1	.180	.200	4.58	5.08	
F	.035	.060	.89	1.52	
k	.130	.190	3.31	4.82	
j	.140	.170	3.56	4.31	
H	.014	.025	.36	.60	
M	.090	.110	2.29	2.79	1
ØM	.278	.312	7.07	7.92	
N	.550	.580	13.97	14.73	
N_1	—	.107	—	2.71	2
q	.810	.850	20.58	21.59	
Q	.110	.140	2.80	3.55	5
s	.480	.520	12.20	13.20	1
ØT	.050	.070	1.27	1.77	4
ØW	.2806	.2854	7.128	7.249	3

NOTES-
1-CONTOUR AND ORIENTATION OF TERMINAL FLATS ARE UNDEFINED.
2-LENGTH OF INCOMPLETE OR UNDERCUT THREADS.
3-PITCH DIA. OF 5/16-24 UNF-2A (COATED) THREADS (ASA B1.1).
4-DIA. OF HOLE OR WIDTH OF SLOT OUT EITHER SIDE OF TERMINALS.
5-LEAD DIAMETER UNCONTROLLED ABOVE THE SEATING PLANE.

TO-83



MILLIMETER DIMENSIONS ARE DERIVED FROM ORIGINAL INCH DIMENSIONS

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
B	.060	.115	1.53	2.92	1
B_1	.012	.050	.31	1.27	1
ØD	-	1.227	-	31.16	-
$ØD_1$	-	1.031	-	26.18	2
E	1.031	1.063	26.19	27.00	-
F	.170	.500	4.4	12.7	3
J	-	1.810	-	45.97	2
L	-	.650	-	16.51	2
L_1	-	.575	-	14.60	2
L_2	.180	-	4.58	-	-
M	.360	.470	9.2	11.9	1
M_1	.115	.160	2.93	4.06	1
ØM	.425	.499	10.80	12.67	4
N	.797	.827	20.25	21.00	-
N_1	-	.125	-	3.17	4
ØT	.180	.260	4.58	6.60	-
$ØT_1$	.060	.080	1.53	2.03	-
ØW	.4619	.4675	11.733	11.874	5
Z	.180	-	4.58	-	6

ISSUE	
A	RELEASE NO. 4974
B	RELEASE NO. 4974D

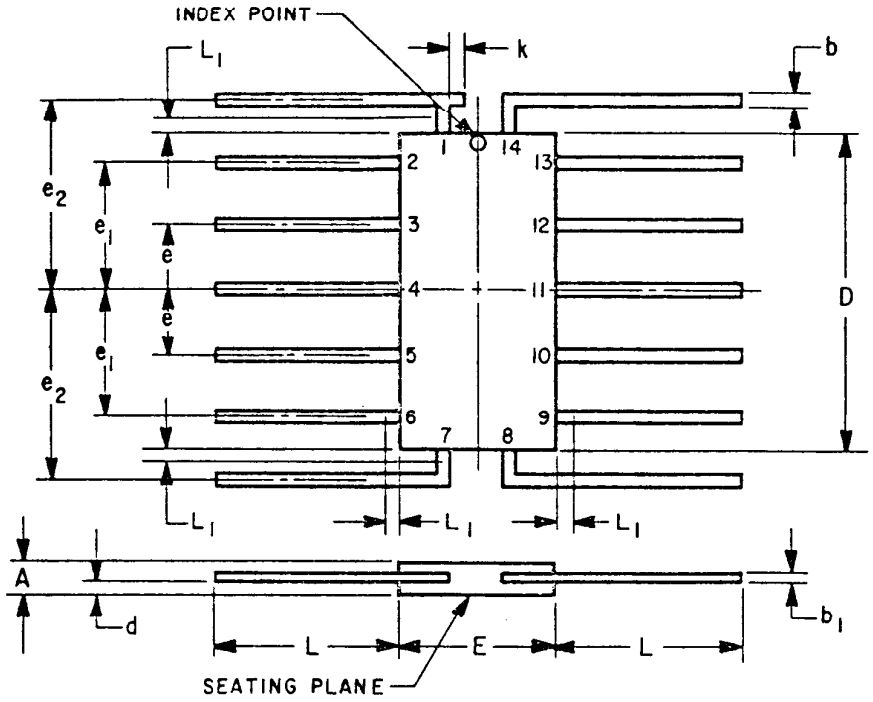
NOTES:

1. CONTOUR AND ORIENTATION OF FIXED TERMINAL LUGS ARE UNDEFINED.
2. THE BODY AND TERMINALS OF THE DEVICE, WITH THE EXCEPTION OF THE EXTENDED LUG LENGTH L AND L1, LIES WITHIN THE CYLINDER DEFINED BY $ØD_1$ AND LENGTH J.
3. A CHAMFER (OR UNDERCUT) ON ONE OR BOTH ENDS OF THE HEXAGONAL PORTIONS IS OPTIONAL.
4. LENGTH OF INCOMPLETE OR UNDERCUT THREADS OF ØM.
5. PITCH DIA. OF 1/2-20 UNF -2A (COATED) THREADS (ASA B1.1-1960).
6. MINIMUM FLAT.

4.6.39

ITEM NO. 217D

TO-84



MILLIMETER DIMENSIONS ARE DERIVED FROM BASIC INCH DIMENSIONS

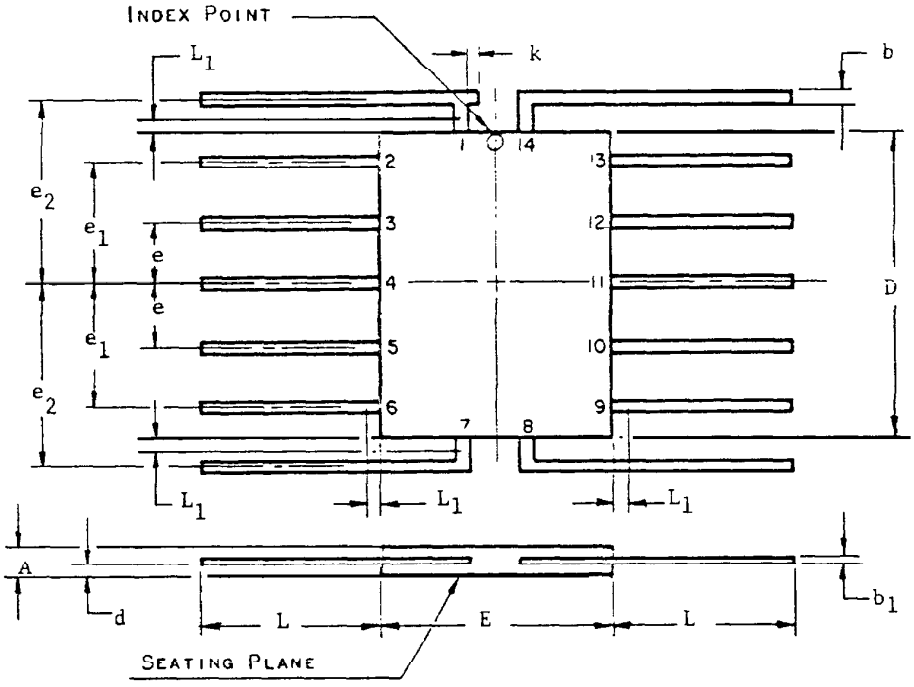
SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.030	.070	.77	1.77	-
b	.010	.019	.254	.482	1
b_1	.003	.006	.077	.152	1
D	.240	.260	6.10	6.60	-
d	.005	.035	.13	.88	-
E	.135	.155	3.43	3.93	4
e	.045	.055	1.15	1.39	2,4
e_1	.095	.105	2.42	2.66	2,4
e_2	.145	.155	3.69	3.93	2,3,4
k	-	.015	-	.38	5
L	.070	-	1.78	-	-
L_1	-	.015	-	.38	1

ISSUE	
A	RELEASE NO. 4974
B	RELEASE NO. 4974C

NOTES:

1. LEAD DIMENSIONS UNCONTROLLED IN THIS ZONE TO ALLOW FOR BODY AND LEAD FINISH IRREGULARITIES.
2. LEADS MISSING FROM THEIR DESIGNATED POSITIONS SHALL ALSO BE COUNTED WHEN NUMBERING LEADS FOR SPECIFIC APPLICATIONS.
3. SPACING AND ANGLE OF THE END LEADS AT THE POINT OF EMERGENCE OF BODY IS NOT CONTROLLED.
4. LEAD SPACING SHALL BE MEASURED WITHIN .030" (.762 MM) FROM THE POINT OF EMERGENCE FROM THE BODY OR, AS IN THE CASE OF END LEAD, FROM THE POINT WHERE THE EXTENSION OF THE BODY OUTLINE INTERSECTS THE END LEADS.
5. MECHANICAL INDEX, OPTIONAL.

TO-85

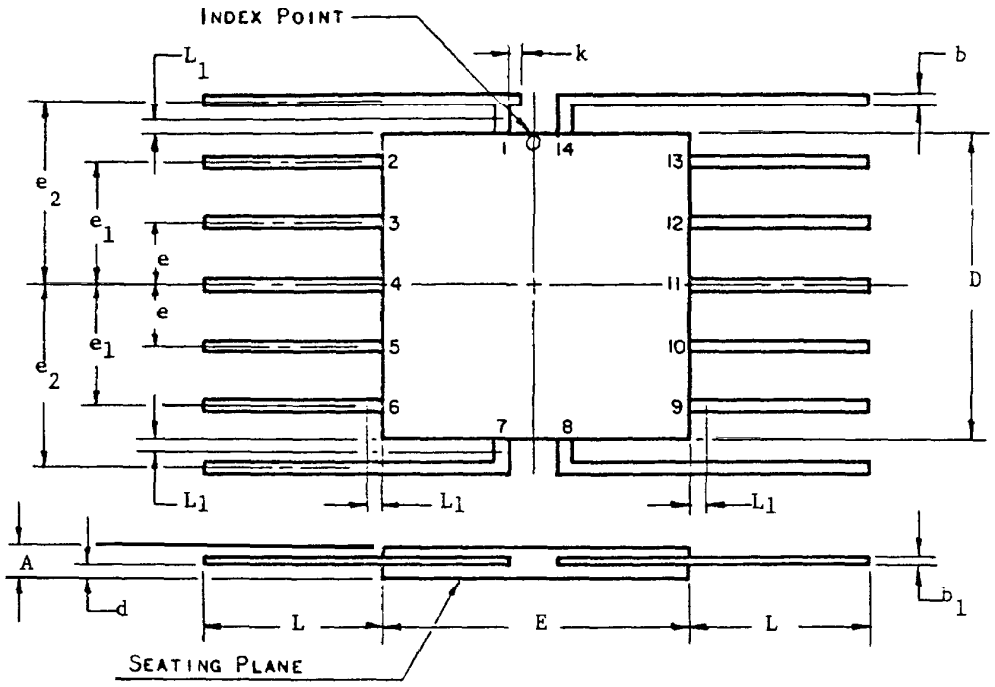


SYMBOL	INCHES		MILLIMETERS		NOTE
	MIN.	MAX.	MIN.	MAX.	
A	.030	.070	.762	1.77	
b	.010	.019	.254	.482	1
b_1	.003	.006	.077	.152	1
D	.240	.275	6.10	6.98	
d	.005	.035	.127	.889	
E	.160	.185	4.07	4.69	4
e	.045	.055	1.15	1.39	2,4
e_1	.095	.105	2.42	2.66	2,4
e_2	.145	.155	3.69	3.93	2,3,4
k	-	.015	-	.381	5
L	.070	-	1.78	-	
L_1	-	.015	-	.381	1

NOTES:

1. LEAD DIMENSIONS UNCONTROLLED IN THIS ZONE TO ALLOW FOR BODY AND LEAD FINISH IRREGULARITIES.
2. LEADS MISSING FROM THEIR DESIGNATED POSITIONS SHALL ALSO BE COUNTED WHEN NUMBERING LEADS FOR SPECIFIC APPLICATIONS.
3. SPACING AND ANGLE OF THE END LEADS AT THE POINT OF EMERGENCE OF BODY IS NOT CONTROLLED.
4. LEAD SPACING SHALL BE MEASURED WITHIN .030 (.762 MM) FROM THE POINT OF EMERGENCE FROM THE BODY OR, AS IN THE CASE OF END LEAD, FROM THE POINT WHERE THE EXTENSION OF THE BODY OUTLINE INTERSECTS THE END LEADS.
5. MECHANICAL INDEX, OPTIONAL

TO-86

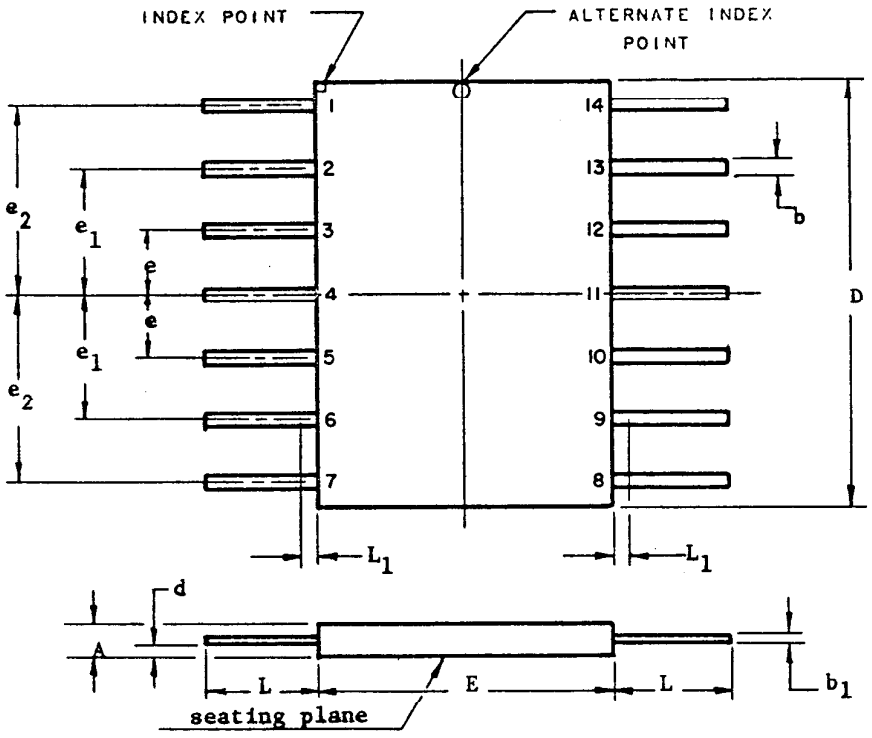


SYMBOL	INCHES		MILLIMETERS		NOTE
	MIN.	MAX.	MIN.	MAX.	
A	.030	.070	.762	1.77	
b	.010	.019	.254	.482	1
b_1	.003	.006	.077	.152	1
D	.240	.275	6.10	6.98	
d	.005	.035	.127	.889	
E	.240	.260	6.10	6.60	4
e	.045	.055	1.15	1.39	2,4
e_1	.095	.105	2.42	2.66	2,4
e_2	.145	.155	3.69	3.93	2,3,4
k	-	.015	-	.381	5
L	.070	-	1.78	-	
L_1	-	.015	-	.381	1

NOTES:

1. LEAD DIMENSIONS UNCONTROLLED IN THIS ZONE TO ALLOW FOR BODY AND LEAD FINISH IRREGULARITIES.
2. LEADS MISSING FROM THEIR DESIGNATED POSITIONS SHALL ALSO BE COUNTED WHEN NUMBERING LEADS FOR SPECIFIC APPLICATIONS.
3. SPACING AND ANGLE OF THE END LEADS AT THE POINT OF EMERGENCE OF BODY IS NOT CONTROLLED.
4. LEAD SPACING SHALL BE MEASURED WITHIN .030 (.762 MM) FROM THE POINT OF EMERGENCE FROM THE BODY OR, AS IN THE CASE OF END LEAD, FROM THE POINT WHERE THE EXTENSION OF THE BODY OUTLINE INTERSECTS THE END LEADS.
5. MECHANICAL INDEX, OPTIONAL

TO-87



4.6.41

SYMBOL	INCHES		MILLIMETERS		NOTE
	MIN	MAX	MIN	MAX	
A	.030	.070	.762	1.77	
b	.010	.019	.254	.482	1
b_1	.003	.006	.077	.152	1
D	.360	.410	9.15	10.41	
d	.005	.035	.127	.889	
E	.240	.275	6.10	6.98	
e	.045	.055	1.15	1.39	2,3
e_1	.095	.105	2.42	2.66	2,3
e_2	.145	.155	3.69	3.93	2,3
L	.070	-	1.78	-	
L_1	-	.015	-	.381	1

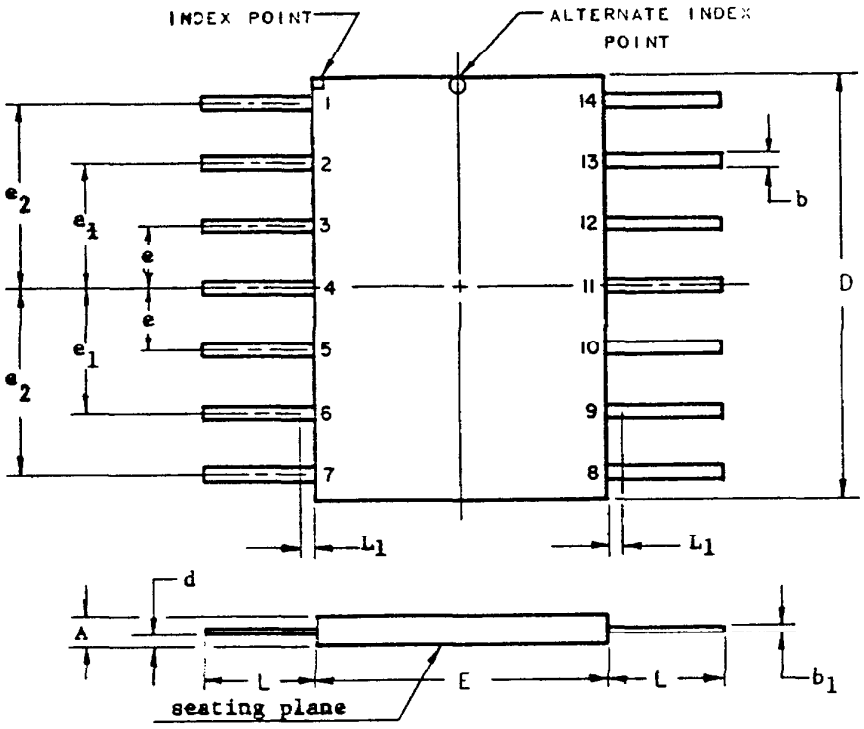
NOTES:

1. LEAD DIMENSIONS UNCONTROLLED IN THIS ZONE TO ALLOW FOR BODY AND LEAD FINISH IRREGULARITIES.

2. LEADS MISSING FROM THEIR DESIGNATED POSITIONS SHALL ALSO BE COUNTED WHEN NUMBERING LEADS FOR SPECIFIC APPLICATIONS.

3. LEAD SPACING SHALL BE MEASURED WITHIN .030 (.762 MM) FROM THE POINT OF EMERGENCE FROM THE BODY.

TO-88

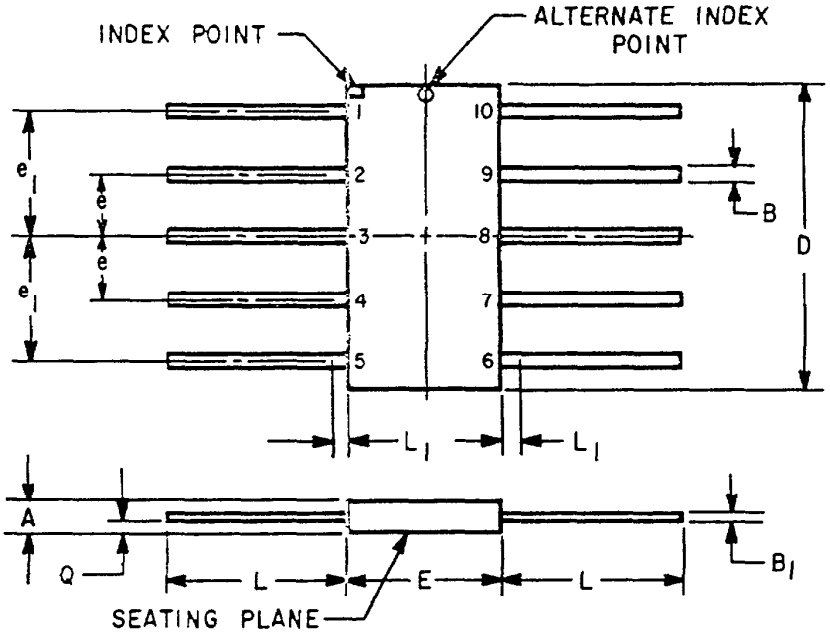


SYMBOL	INCHES		MILLIMETERS		NOTE
	MIN	MAX	MIN	MAX	
A	.030	.070	.762	1.77	
b	.010	.019	.254	.482	1
b_1	.003	.006	.077	.152	1
D	.330	.350	8.38	8.89	
d	.005	.035	.127	.889	
E	.240	.260	6.10	6.60	
e	.045	.055	1.15	1.39	2,3
e_1	.095	.105	2.42	2.66	2,3
e_2	.145	.155	3.69	3.93	2,3
L	.070	-	1.78	-	
L_1	-	.015		.381	1

NOTES:

1. LEAD DIMENSIONS UNCONTROLLED IN THIS ZONE TO ALLOW FOR BODY AND LEAD FINISH IRREGULARITIES.
2. LEADS MISSING FROM THEIR DESIGNATED POSITIONS SHALL ALSO BE COUNTED WHEN NUMBERING LEADS FOR SPECIFIC APPLICATIONS.
3. LEAD SPACING SHALL BE MEASURED WITHIN .030 (.762 MM) FROM THE POINT OF EMERGENCE FROM THE BODY.

TO-89



MILLIMETER DIMENSIONS ARE DERIVED FROM ORIGINAL INCH DIMENSIONS

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.030	.070	.77	1.77	-
B	.010	.019	.254	.482	1
B_1	.003	.006	.077	.152	1
D	.240	.290	6.10	7.36	-
E	.135	.155	3.43	3.93	-
e	.045	.055	1.15	1.39	2,3
e_1	.095	.105	2.42	2.66	2,3
L	.070	-	1.78	-	-
L_1	-	.015	-	.381	1
Q	.005	.035	.127	.889	-

ISSUE	
A	RELEASE NO. 4974
B	RELEASE NO. 4974E

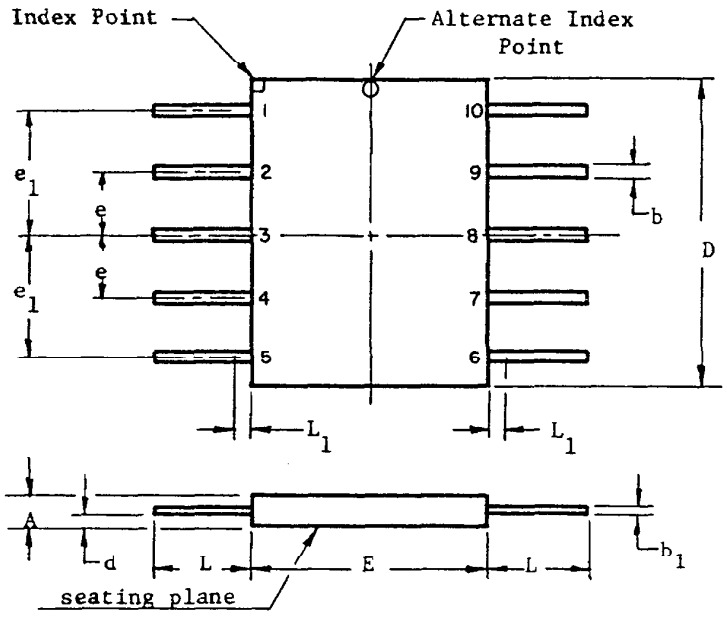
4.6.42

NOTES:

1. LEAD DIMENSIONS UNCONTROLLED IN THIS ZONE TO ALLOW FOR BODY FLASH AND LEAD FINISH BUILD-UP.
2. LEADS MISSING FROM THEIR DESIGNATED POSITIONS SHALL BE COUNTED WHEN NUMBERING LEADS FOR SPECIFIC APPLICATIONS.
3. LEAD SPACING SHALL BE MEASURED WITHIN .030 (.762 MM) FROM THE POINT OF EMERGENCE FROM THE BODY.

ITEM NO. 245E

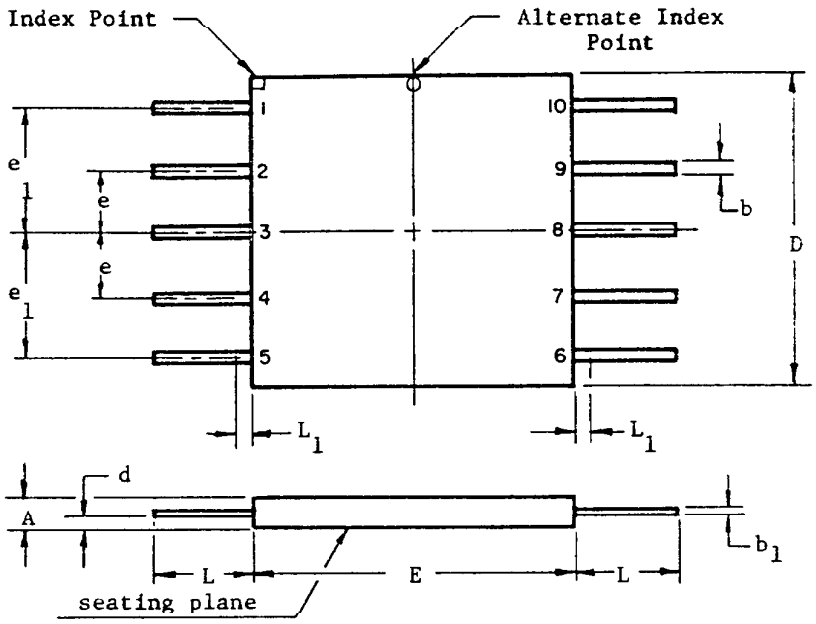
TO-90



SYMBOL	INCHES		MILLIMETERS		NOTE
	MIN	MAX	MIN	MAX	
A	.030	.070	.762	1.77	
b	.010	.019	.254	.482	1
b_1	.003	.006	.077	.152	1
D	.240	.290	6.10	7.36	
d	.005	.035	.127	.889	
E	.160	.185	4.07	4.69	
e	.045	.055	1.15	1.39	2,3
e_1	.095	.105	2.42	2.66	2,3
L	.070	-	1.78	-	
L_1	-	.015	-	.381	1

NOTES:

1. Lead Dimensions uncontrolled in this zone to allow for body and lead finish irregularities.
2. Leads missing from their designated positions shall also be counted when numbering leads for specific applications.
3. Lead spacing shall be measured within .030 (.762 mm) from the point of emergence from the body.

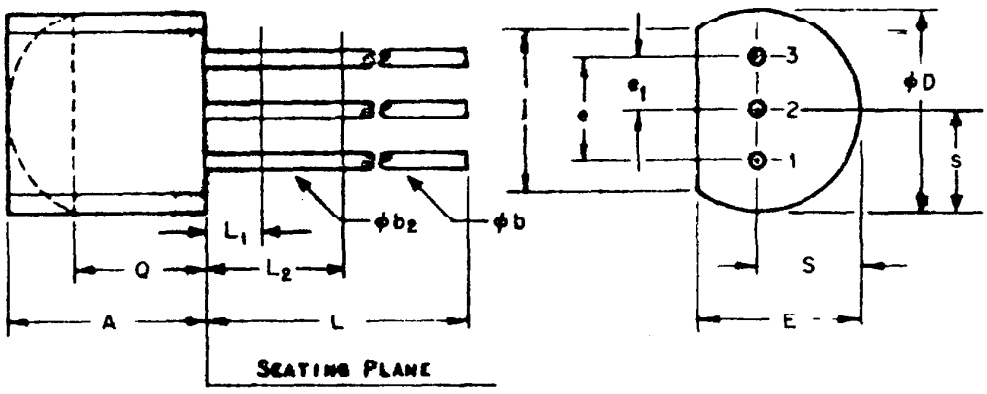


SYMBOL	INCHES		MILLIMETERS		NOTE
	MIN	MAX	MIN	MAX	
A	.030	.070	.762	1.77	
b	.010	.019	.254	.482	1
b_1	.003	.006	.077	.152	1
D	.240	.290	6.10	7.36	
d	.005	.035	.127	.889	
E	.240	.260	6.10	6.60	
e	.045	.055	1.15	1.39	2,3
e_1	.095	.105	2.42	2.66	2,3
L	.070	-	1.78	-	
L_1	-	.015	-	.381	1

NOTES:

1. Lead Dimensions uncontrolled in this zone to allow for body and lead finish irregularities.
2. Leads missing from their designated positions shall also be counted when numbering leads for specific applications.
3. Lead spacing shall be measured within .030 (.762 mm) from the point of emergence from the body.

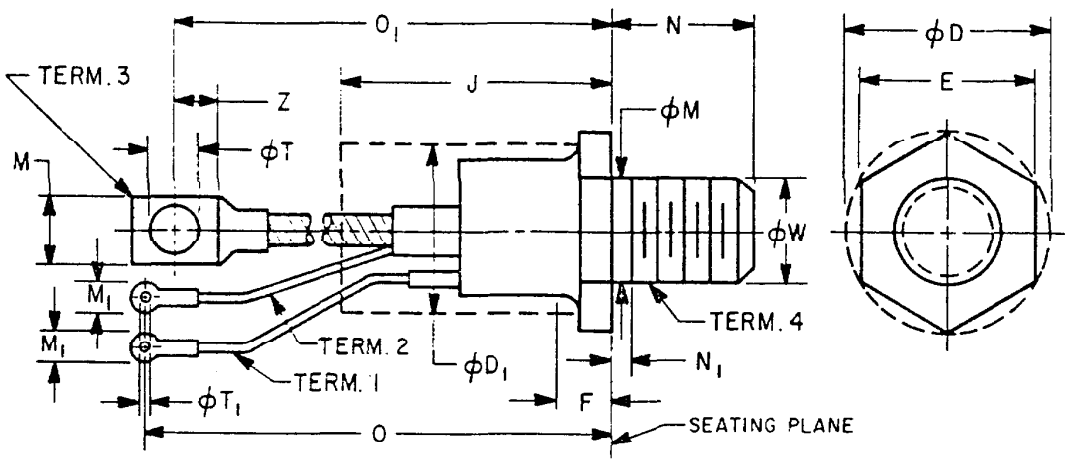
TO-92



SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.170	.210	4.58	5.33	
Øb	.016	.021	.407	.533	1, 3
$Øb_2$	.016	.019	.407	.482	3
ØD	.175	.205	4.96	5.20	
E	.125	.165	3.94	4.19	
e	.095	.105	2.42	2.66	
e_1	.045	.055	1.15	1.39	
j	.135		3.43		
L	.500		12.70		1, 3
L_1		.050		1.27	3
L_2	.250		6.35		3
Q	.115		2.93		2
S	.080	.105	2.42	2.66	

NOTES:

1. THREE LEADS
2. CONTOUR OF THE PACKAGE BEYOND THIS ZONE IS UNCONTROLLED.
3. (THREE LEADS) $Øb_2$ APPLIES BETWEEN L_1 AND L_2. Øb APPLIES BETWEEN L_2 AND .5" (12.70 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN L_1 AND BEYOND .5" (12.70 MM) FROM SEATING PLANE.



MILLIMETER DIMENSIONS ARE DERIVED FROM ORIGINAL INCH DIMENSIONS

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
ØD	-	1.443	-	36.65	-
$ØD_1$	-	1.212	-	30.78	1
E	1.212	1.250	30.79	31.75	-
F	.230	1.000	5.9	25.4	5
J	-	3.625	-	92.07	1,7
M	.530	.755	13.5	19.1	2
ØM	.660	.749	16.77	19.02	3
M_1	.215	.300	5.47	7.62	2,8
N	1.047	1.077	26.60	27.35	-
N_1	-	.156	-	3.96	3
O	7.350	8.100	186.7	205.7	-
O_1	7.350	8.100	186.7	205.7	-
ØT	.260	.350	6.61	8.89	-
$ØT_1$	.140	.155	3.56	3.93	-
ØW	.7029	.7094	17.854	18.018	4
Z	.340	-	8.64	-	6

ISSUE	
A	RELEASE NO. 5072
B	RELEASE NO. 5072A

NOTES:

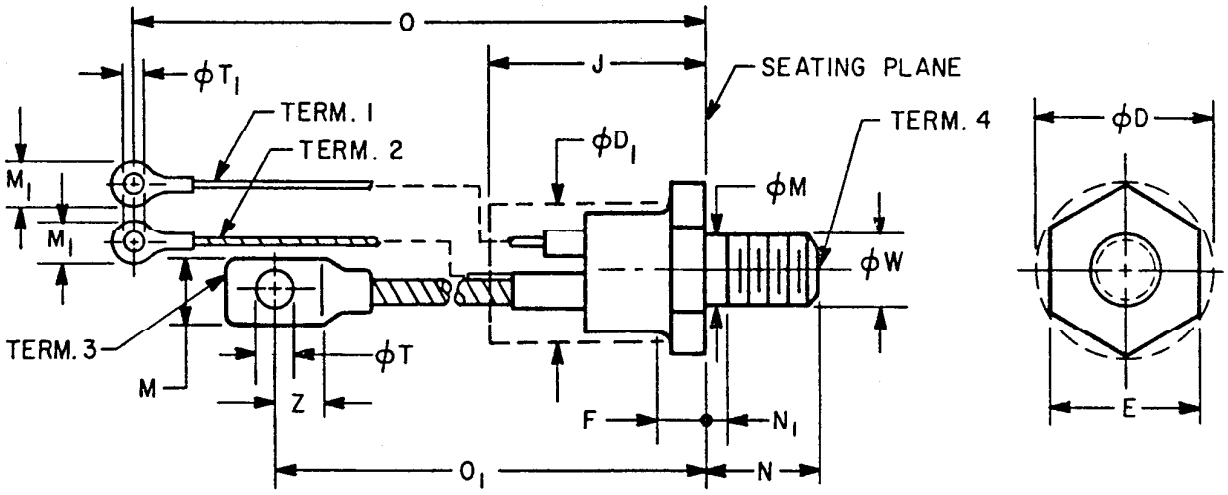
1. THE BODY OF THE DEVICE WITH EXCEPTION OF THE HEXAGON, THREAD, AND FLEXIBLE LEAD EXTENSIONS LIES WITHIN $ØD_1$ AND LENGTH J.
2. ANGULAR ORIENTATION OF THESE TERMINALS WITH RESPECT TO HEXAGON PORTION IS UNDEFINED. SQUARE OR RADIUS ON END OF TERMINALS IS OPTIONAL.
3. LENGTH OF INCOMPLETE OR UNDERCUT THREADS OF ØM.
4. PITCH DIAMETER OF 3/4-16UNF-2A (COATED) THREADS (ASA B1.1-1960).
5. A CHAMFER (OR UNDERCUT) ON ONE OR BOTH ENDS OF HEXAGON PORTION IS OPTIONAL.
6. MINIMUM FLAT.
7. SEATED HEIGHT WITH LEAD BENT AT RIGHT ANGLES.
8. FLEXIBLE LEADS FOR TERMINALS 1 AND 2 ARE IDENTIFIED BY COLOR CODING FOR SPECIFIC APPLICATIONS.

ITEM NO. 222

JEDEC PUBLICATION 95
REGISTERED OUTLINES FOR SEMICONDUCTOR DEVICES

OUTLINE TO-93 | ISSUE B | DATE FEB 1968

TO-94



MILLIMETER DIMENSIONS ARE DERIVED FROM ORIGINAL INCH DIMENSIONS

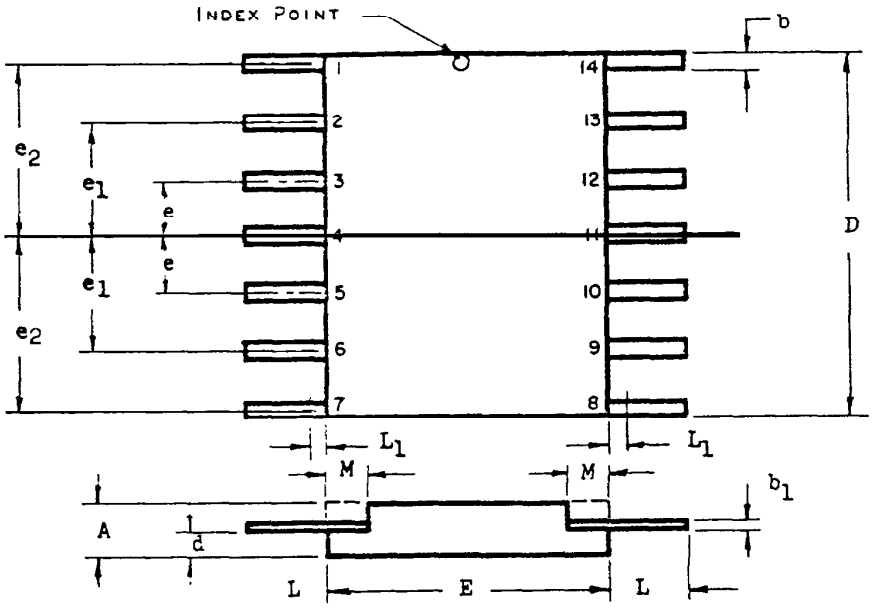
SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
ØD	-	1.227	-	31.16	-
$ØD_1$	-	1.031	-	26.18	1
E	1.031	1.063	26.19	27.00	-
F	.170	.500	4.4	12.7	5
J	-	2.500	-	63.50	1,7
M	.437	.650	11.1	16.5	2
ØM	.425	.499	10.80	12.67	3
M_1	.215	.300	5.49	7.62	2,8
N	.797	.827	20.25	21.00	-
N_1	-	.125	-	3.17	3
O	6.850	7.500	174.0	190.5	-
O_1	5.775	6.265	146.7	159.1	-
ØT	.260	.310	6.61	7.87	-
$ØT_1$	.140	.150	3.56	3.81	-
Øw	.4619	.4675	11.733	11.874	4
Z	.250	-	6.35	-	6

ISSUE	
A	RELEASE NO. 5072
B	RELEASE NO. 5072B

NOTES:

1. THE DEVICE WITH THE EXCEPTION OF THE HEXAGON, THREAD, AND FLEXIBLE LEAD EXTENSION LIES WITHIN THE CYLINDER DEFINED BY $ØD_1$ AND LENGTH J
2. ANGULAR ORIENTATION OF THESE TERMINALS WITH RESPECT TO HEXAGONAL PORTION IS UNDEFINED. SQUARE OR RADIUS ON END OF TERMINALS IS OPTIO
3. LENGTH OF INCOMPLETE OR UNDERCUT THREADS OF ØM.
4. PITCH DIAMETER OF 1/2-20 UNF-2A (COATED) THREADS (ASA B1.1-1960).
5. A CHAMFER (OR UNDERCUT) ON ONE OR BOTH ENDS OF HEXAGONAL PORTION IS OPTIONAL.
6. MINIMUM FLAT.
7. SEATED HEIGHT WITH LEADS BENT AT RIGHT ANGLES.
8. FLEXIBLE LEADS FOR TERM 1 AND 2 ARE IDENTIFIED BY COLOR CODING FOR SPECIFIC APPLICATIONS.

TO-95

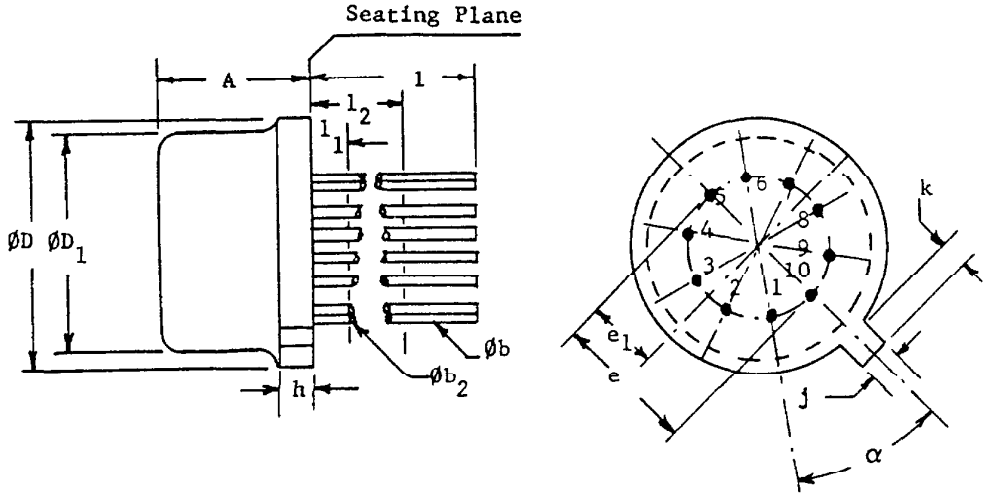


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.030	.070	.762	1.77	
b	.010	.019	.254	.482	
b_1	.003	.006	.077	.152	
D	.308	.329	7.83	8.35	
d	.005	.035	.127	.889	
E	.240	.260	6.10	6.60	
e	.045	.055	1.15	1.39	2, 3
e_1	.095	.105	2.42	2.66	2, 3
e_2	.145	.155	3.69	3.93	2, 3
L	.070		1.78		
L_1		.015		.381	1
M		.040		1.01	4

NOTES:

1. LEAD DIMENSION UNCONTROLLED IN THIS ZONE TO ALLOW FOR BODY AND LEAD FINISH IRREGULARITIES.
2. LEADS MISSING FROM THEIR DESIGNATED POSITIONS SHALL ALSO BE COUNTED WHEN NUMBERING LEADS FOR SPECIFIC APPLICATIONS.
3. LEAD SPACING SHALL BE MEASURED WITHIN .030" (.762 MM) FROM THE POINT OF EMERGENCE FROM THE BODY.
4. IRREGULARITY IN BODY OUTLINE NOT CONTROLLED IN THIS ZONE.

TO-96

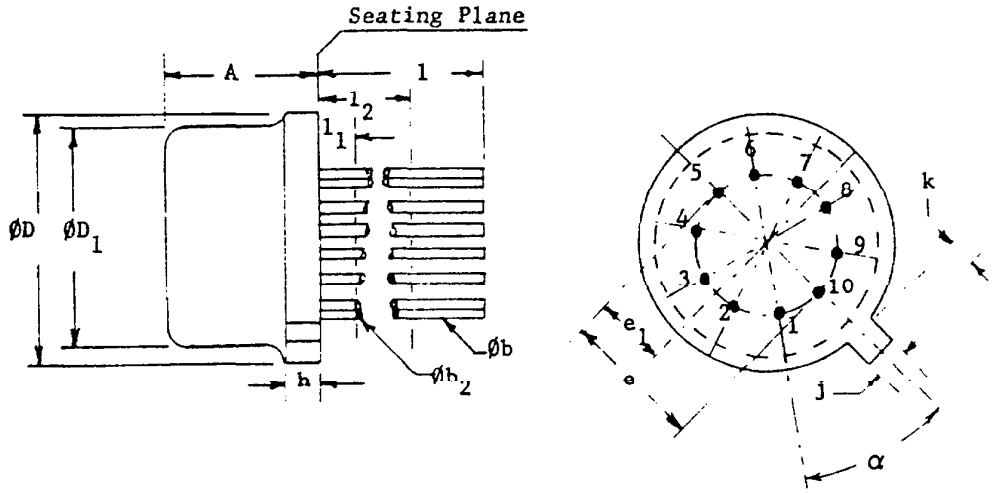


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.240	.260	6.10	6.60	
Øb	.016	.021	.406	.533	2
$Øb_2$	.016	.019	.406	.483	2
ØD	.335	.370	8.51	9.40	
$ØD_1$	.305	.335	7.75	8.51	
e	.230 T.P.		5.84 T.P.		4
e_1	.115 T.P.		2.92 T.P.		4
h		.040		1.02	
j	.028	.034	.711	.864	
k	.029	.045	.737	1.14	3
1	.500		7.62		2
l_1		.050		1.27	2
l_2	.250		6.35		2
α	36° T.P.		36° T.P.		4,6

NOTES:

1. (TEN LEADS). MAXIMUM NUMBER OF LEADS OMITTED IN THIS OUTLINE, "ONE" (1). THE NUMBER AND POSITION OF LEADS ACTUALLY PRESENT ARE INDICATED IN THE PRODUCT REGISTRATION. OUTLINE DESIGNATION DETERMINED BY THE LOCATION AND MINIMUM ANGULAR SPACING OF ANY TWO ADJACENT LEADS.
2. (ALL LEADS) $Øb_2$ APPLIES BETWEEN l_1 and l_2. Øb APPLIES BETWEEN l_2 AND .500" (12.70 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND .500" (12.70 MM) FROM SEATING PLANE.
3. MEASURED FROM MAXIMUM DIAMETER OF THE PRODUCT.
4. LEADS HAVING MAXIMUM DIAMETER .019" (.483 MM) MEASURED IN GAGING PLANE .054" (1.37 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE SEATING PLANE OF THE PRODUCT SHALL BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITION RELATIVE TO A MAXIMUM WIDTH TAB.
5. THE PRODUCT MAY BE MEASURED BY DIRECT METHODS OR BY GAGE.
6. TAB CENTERLINE.

TO-97



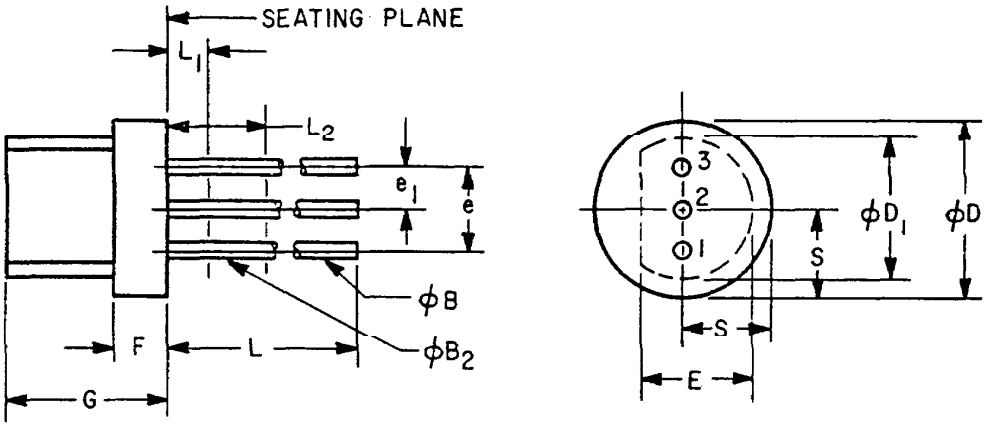
SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.140	.160	3.56	4.06	
Øb	.016	.021	.406	.533	2
$Øb_2$	.016	.019	.406	.483	2
ØD	.335	.370	8.51	9.40	
$ØD_1$	.305	.335	7.75	8.51	
e	.230 T.P.		5.84 T.P.		4
e_1	.115 T.P.		2.92 T.P.		4
h		.040		1.02	
j	.028	.034	.711	.864	
k	.029	.045	.737	1.14	3
l	.500		7.62		2
l_1		.050		1.27	2
l_2	.250		6.35		2
α	36° T.P.		36° T.P.		4,6

4.6.46

NOTES:

1. (TEN LEADS). MAXIMUM NUMBER OF LEADS OMITTED IN THIS OUTLINE, "ONE" (1). THE NUMBER AND POSITION OF LEADS ACTUALLY PRESENT ARE INDICATED IN THE PRODUCT REGISTRATION. OUTLINE DESIGNATION DETERMINED BY THE LOCATION AND MINIMUM ANGULAR SPACING OF ANY TWO ADJACENT LEADS.
2. (ALL LEADS) $Øb_2$ APPLIES BETWEEN l_1 AND l_2. Øb APPLIES BETWEEN l_2 AND .500" (12.70 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND .500" (12.70 MM) FROM SEATING PLANE.
3. MEASURED FROM MAXIMUM DIAMETER OF THE PRODUCT.
4. LEADS HAVING MAXIMUM DIAMETER .019" (.483 MM) MEASURED IN GAGING PLANE .054" (1.37 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE SEATING PLANE OF THE PRODUCT SHALL BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITION RELATIVE TO A MAXIMUM WIDTH TAB.
5. THE PRODUCT MAY BE MEASURED BY DIRECT METHODS OR BY GAGE.
6. TAB CENTERLINE.

TO-98



MILLIMETER DIMENSIONS ARE DERIVED FROM ORIGINAL INCH DIMENSIONS

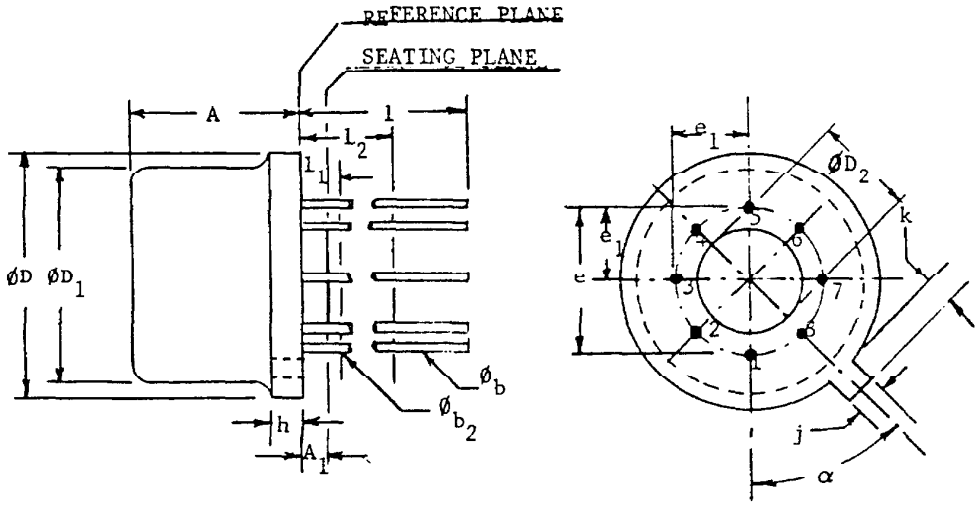
SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
ØD	.190	.205	4.83	5.20	-
$ØD_1$	.165	.190	4.20	4.82	-
ØB	.016	.021	.407	.533	1
$ØB_2$	.016	.019	.407	.482	-
E	.110	.140	2.80	3.55	-
e	.095	.105	2.42	2.66	-
e_1	.045	.055	1.15	1.39	-
F	.055	.075	1.40	1.90	-
G	.200	.265	5.08	6.73	-
L	.500	-	12.70	-	1
L_1	-	.050	-	1.27	1
L_2	.250	-	6.35	-	1
S	.085	.115	2.16	2.92	-

ISSUE	
A	RELEASE NO. 5096
B	RELEASE NO. 5096B
C	RELEASE NO. 5096C

NOTES:

1. (THREE LEADS) $ØB_2$ APPLIES BETWEEN L_1 AND L_2. ØB APPLIES BETWEEN L_2 AND .5" (12.70 MM) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN L_1 AND BEYOND .5" (12.70MM) FROM SEATING PLANE.

TO-99



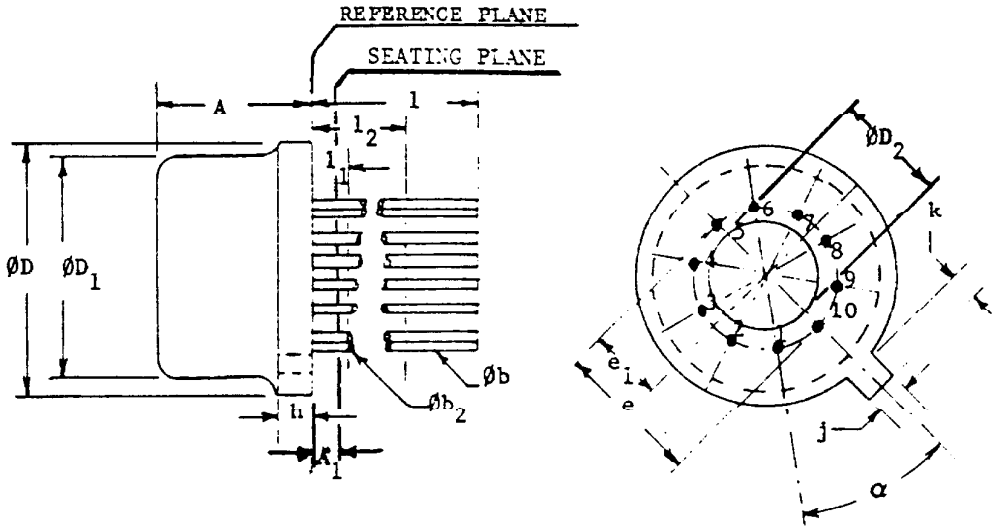
SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.165	.185	4.19	4.70	
A_1	.010	.040	.254	1.02	
$Øb_1$	.016	.021	.406	.533	2
$Øb_2$	.016	.019	.406	.483	2
$ØD_2$	.335	.370	8.51	9.40	
ØD	.305	.335	7.75	8.51	
$ØD_1$	.140	.160	3.56	4.06	
e	.200 T.P.		5.08 T.P.		4
e_1	.100 T.P.		2.54 T.P.		4
h		.040		1.02	
j	.028	.034	.711	.864	
k	.029	.045	.737	1.14	3
l	.500		12.70		2
l_1		.050		1.27	2
l_2	.250		6.35		2
α	45° T.P.		45° T.P.		4,6

4.6.47

NOTES:

1. (EIGHT LEADS). MAXIMUM NUMBER OF LEADS OMITTED IN THIS OUTLINE, "THREE" (3). THE NUMBER AND POSITION OF LEADS ACTUALLY PRESENT ARE INDICATED IN THE PRODUCT REGISTRATION. OUTLINE DESIGNATION DETERMINED BY THE LOCATION AND MINIMUM ANGULAR SPACING OF ANY TWO ADJACENT LEADS.
2. (ALL LEADS) $Øb_2$ APPLIES BETWEEN l_1 and l_2. Øb APPLIES BETWEEN l_2 AND .500" (12.70 MM) FROM REFERENCE PLANE. DIAMETER IS UNCONTROLLED IN l_1 and BEYOND .500" (12.70 MM) FROM REFERENCE PLANE.
3. MEASURED FROM MAXIMUM DIAMETER OF THE PRODUCT.
4. LEADS HAVING MAXIMUM DIAMETER .019" (.483 MM) MEASURED IN GAGING PLANE .054" (1.37 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE REFERENCE PLANE OF THE PRODUCT SHALL BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITION RELATIVE TO A MAXIMUM WIDTH TAB.
5. THE PRODUCT MAY BE MEASURED BY DIRECT METHODS OR BY GAGE.
6. TAB CENTERLINE.

TO-100

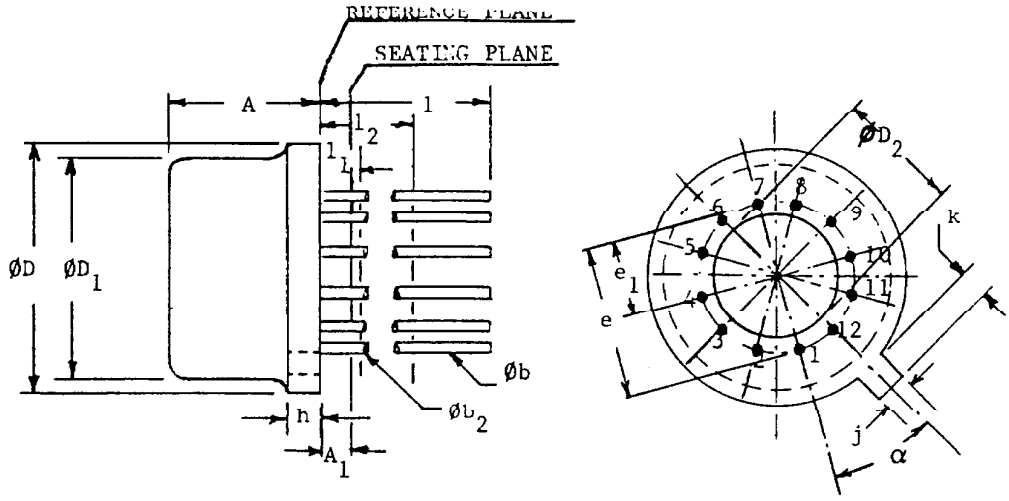


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.165	.185	4.19	4.70	
A_1	.010	.040	.254	1.02	
Øb	.016	.021	.406	.533	2
$Øb_2$	.016	.019	.406	.483	2
ØD	.335	.370	8.51	9.40	
$ØD_1$	.305	.335	7.75	8.51	
$ØD_2$	.140	.160	3.56	4.06	
e	.230 T.P.		5.84 T.P.		4
e_1	.115 T.P.		2.92 T.P.		4
h		.040		1.02	
j	.028	.034	.711	.864	
k	.029	.045	.737	1.14	3
l	.500		12.70		2
l_1		.050		1.27	2
l_2	.250		6.35		2
α	36° T.P.		36° T.P.		4,6

NOTES:

1. (TEN LEADS). MAXIMUM NUMBER OF LEADS OMITTED IN THIS OUTLINE, "ONE" (1). THE NUMBER AND POSITION OF LEADS ACTUALLY PRESENT ARE INDICATED IN THE PRODUCT REGISTRATION. OUTLINE DESIGNATION DETERMINED BY THE LOCATION AND MINIMUM ANGULAR SPACING OF ANY TWO ADJACENT LEADS.
2. (ALL LEADS) $Øb_2$ APPLIES BETWEEN l_1 AND l_2. Øb APPLIES BETWEEN l_2 and .500" (12.70 MM) FROM REFERENCE PLANE. DIAMETER IS UNCONTROLLED IN l_1 and BEYOND .500" (12.70 MM) FROM REFERENCE PLANE.
3. MEASURED FROM MAXIMUM DIAMETER OF THE PRODUCT.
4. LEADS HAVING MAXIMUM DIAMETER .019" (.483 MM) MEASURED IN GAGING PLANE .054" (1.37 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE REFERENCE PLANE OF THE PRODUCT SHALL BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITION RELATIVE TO A MAXIMUM WIDTH TAB.
5. THE PRODUCT MAY BE MEASURED BY DIRECT METHODS OR BY GAGE.
6. TAB CENTERLINE.

TO-101

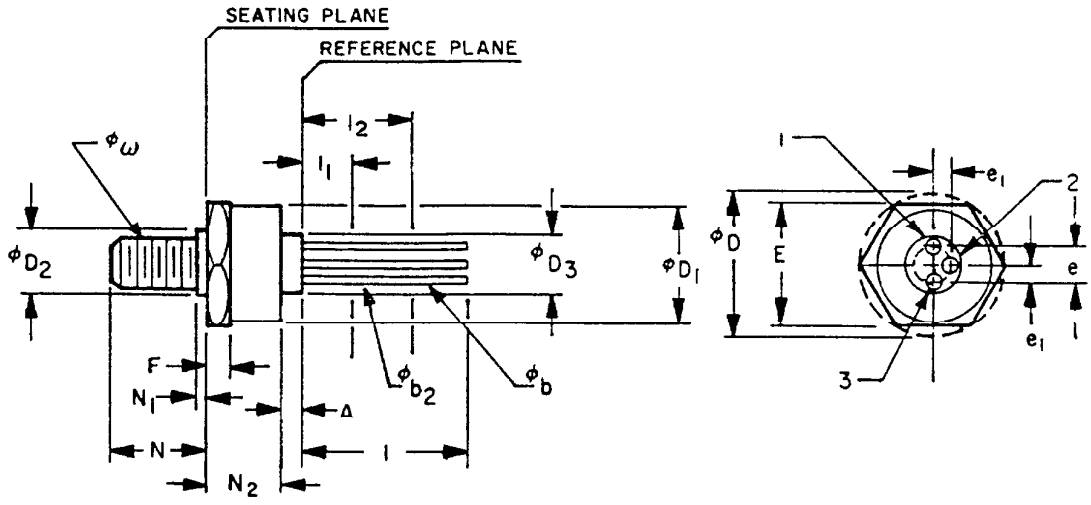


SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.165	.185	4.19	4.70	
A_1	.010	.040	.254	1.02	
Øb	.016	.021	.406	.533	2
Øb2	.016	.019	.406	.483	2
ØD	.335	.370	8.51	9.40	
$ØD_1$	.305	.335	7.75	8.51	
$ØD_2$	.140	.160	3.56	4.06	
e	.230 T.P.		5.84 T.P.		4
e_1	.115 T.P.		2.92 T.P.		4
h		.040		1.02	
j	.028	.034	.711	.864	
k	.029	.045	.737	1.14	3
l	.500		12.70		2
l_1		.050		1.27	2
l_2	.250		6.35		2
α	30° T.P.		30° T.P.		4,6

NOTES:

1. (TWELVE LEADS). MAXIMUM NUMBER OF LEADS OMITTED IN THIS OUTLINE, "ONE" (1). THE NUMBER AND POSITION OF LEADS ACTUALLY PRESENT ARE INDICATED IN THE PRODUCT REGISTRATION. OUTLINE DESIGNATION DETERMINED BY THE LOCATION AND MINIMUM ANGULAR SPACING OF ANY TWO ADJACENT LEADS.
2. (ALL LEADS) $Øb_2$ APPLIES BETWEEN l_1 AND l_2. Øb APPLIES BETWEEN l_2 AND .500" (12.70 MM) FROM REFERENCE PLANE. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND .500" (12.70 MM) FROM REFERENCE PLANE.
3. MEASURED FROM MAXIMUM DIAMETER OF THE PRODUCT.
4. LEADS HAVING MAXIMUM DIAMETER .019" (.483 MM)MEASURED IN GAGING PLANE .054" (1.37 MM) + .001" (.025 MM) - .000" (.000MM) BELOW THE REFERENCE PLANE OF THE PRODUCT SHALL BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITION RELATIVE TO A MAXIMUM WIDTH TAB.
5. THE PRODUCT MAY BE MEASURED BY DIRECT METHODS OR BY GAGE.
6. TAB CENTERLINE.

TO-102



SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.045	.060	1.14	1.52	
Øb	.016	.021	.406	.533	1
$Øb_2$	.016	.019	.406	.483	1
ØD	.413	.433	10.49	11.00	
$ØD_1$	.350	.360	8.89	9.14	
$ØD_2$	.175	.190	4.45	4.83	
$ØD_3$	.162	.169	4.11	4.29	
E	.362	.375	9.19	9.53	
e	.100 T.P.		2.54 T.P.		2
e_1	.050 T.P.		1.27 T.P.		2
F	.065	.070	1.65	1.78	3
l	.500		12.70		
l_1		.050		1.27	
l_2	.250		6.35		
N	.265	.292	6.73	7.42	
N_1	.020	.035	.508	.889	
N_2	.210	.225	5.33	5.72	
ØW	.1141	.1177	2.898	2.990	4

NOTES:

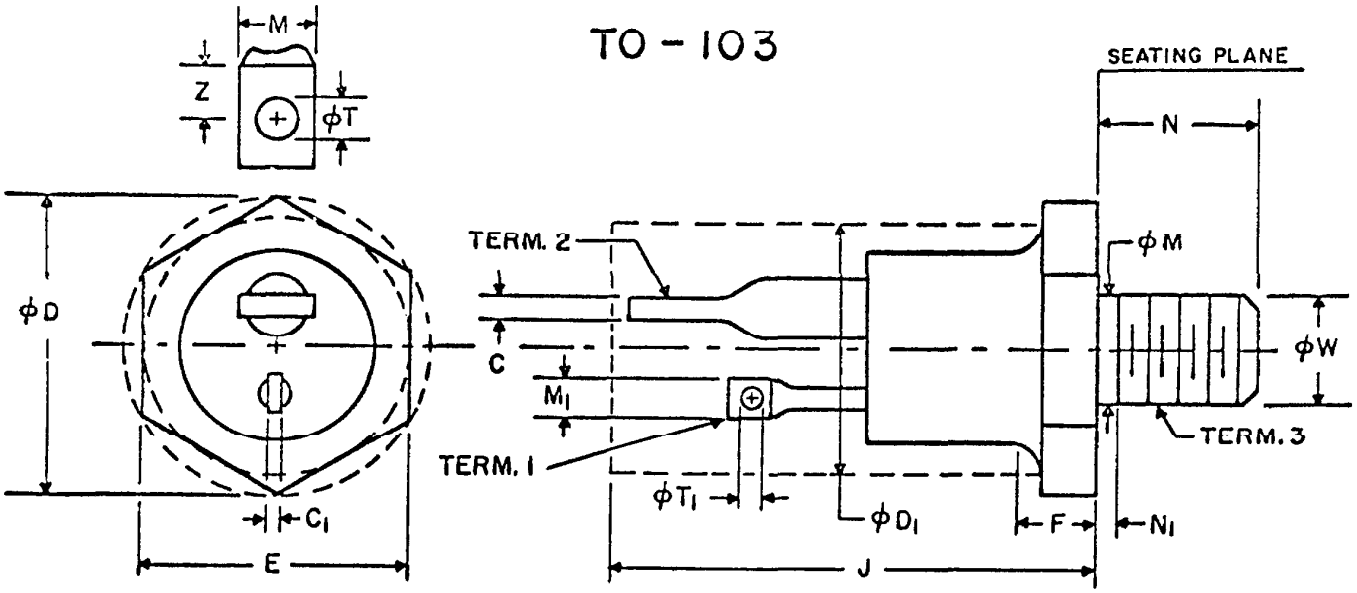
1. (THREE LEADS) $Øb_2$ APPLIES BETWEEN l_1 AND l_2. Øb APPLIES BETWEEN l_2 AND l. DIAMETER IS UNCONTROLLED IN l_1 AND BEYOND .500" (12.70 MM) FROM REFERENCE PLANE.

2. LEADS HAVING MAXIMUM DIAMETER .019" (.483 MM) MEASURED IN GAGING PLANE .054" (1.37 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE REFERENCE PLANE OF THE DEVICE SHALL BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITIONS.

3. A CHAMFER (OR UNDERCUT) ON ONE OR BOTH ENDS OF HEXAGONAL PORTION IS OPTIONAL.

4. PITCH DIAMETER OF 6-32 UNC-2A (COATED) THREADS. (ASA B1.1-1960).

TO-103



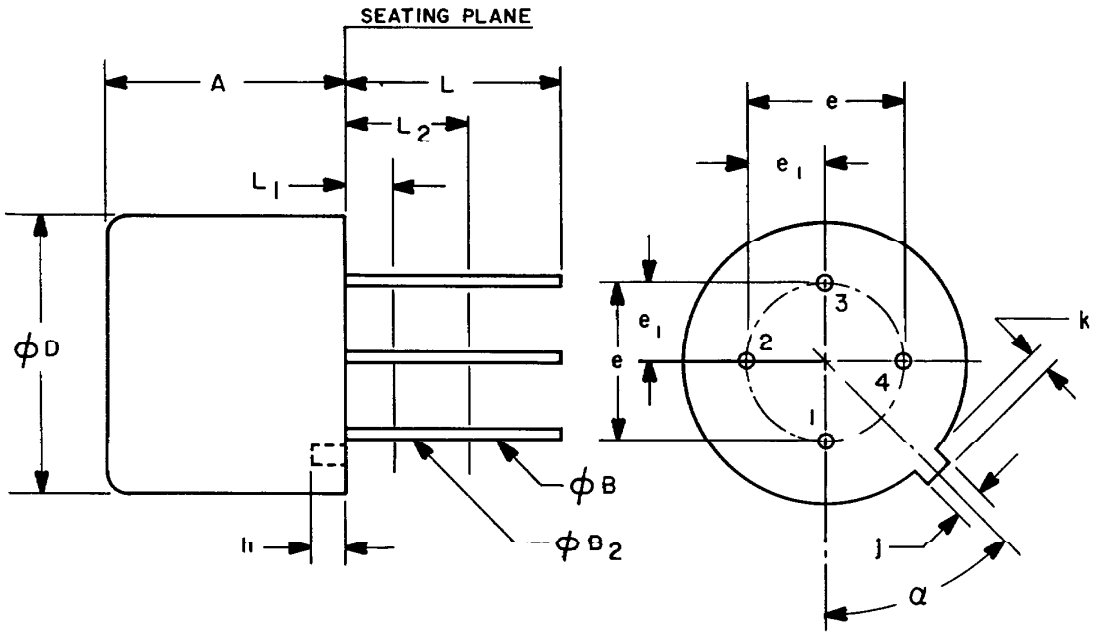
MILLIMETER DIMENSIONS ARE DERIVED FROM ORIGINAL INCH DIMENSIONS

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
C	.065	.100	1.66	2.54	1,7
C_1	.025	.075	.64	1.90	1,7
ØD	-	.866	-	21.99	
$ØD_1$	-	.728	-	18.49	2
E	.728	.750	18.50	19.05	
F	.125	.205	3.18	5.20	3
J	1.200	1.560	30.48	39.62	2
M	.220	.375	5.59	9.52	1,7
M_1	.125	.187	3.18	4.75	1,7
ØM	.280	.310	7.12	7.87	
N	.485	.515	12.32	13.08	
N_1	-	.100	-	2.54	4
ØT	.140	.155	3.56	3.93	
$ØT_1$	.050	.070	1.27	1.77	
ØW	.2806	.2854	7.127	7.249	5
Z	.140	-	3.56	-	6

NOTES:

1. CONTOUR AND ANGULAR ORIENTATION OF FIXED TERMINAL LUGS ARE UNDEFINED.
2. THE BODY AND TERMINALS OF THE DEVICE LIE WITHIN THE CYLINDER DEFINED BY $ØD_1$ AND LENGTH J.
3. A CHAMFER (OR UNDERCUT) ON ONE OR BOTH ENDS OF THE HEXAGONAL PORTION IS OPTIONAL.
4. LENGTH OF INCOMPLETE OR UNDERCUT THREADS OF ØM
5. PITCH DIAMETER OF 5/16-24 UNF-2A (COATED) THREADS (ASA B1.1-1960)
6. MINIMUM FLAT.
7. POSITION OF TERMINALS 1 AND 2 IN RELATION TO HEXAGON IS NOT CONTROLLED.

TO-104



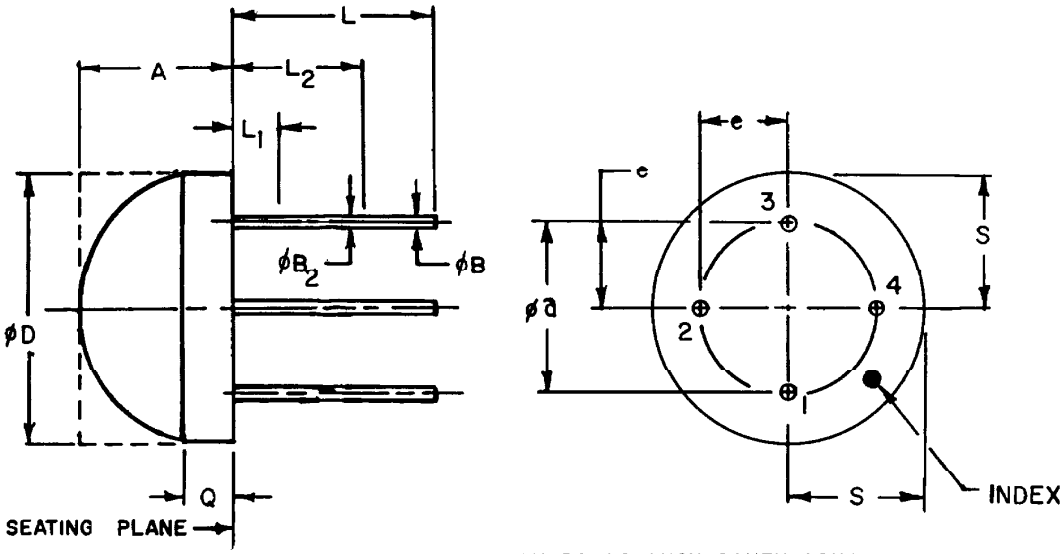
MILLIMETER DIMENSIONS ARE DERIVED FROM BASIC INCH DIMENSIONS

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.170	.210	4.32	5.33	
øB	.016	.021	.407	.533	2
$øB_2$	.016	.019	.407	.482	2
øD	.220	.240	5.59	6.10	
e	.100 T.P.		2.54 T.P.		1, 3
e_1	.050 T.P.		1.27 T.P.		1, 3
h	-	.030	-	.76	
j	.036	.046	.92	1.16	
k	.028	.048	.72	1.21	4
L	.500	-	12.70	-	2
L_1	-	.050	-	1.27	2
L_2	.250	-	6.35	-	2
α	45° T.P.		—		

NOTES:

1. MAXIMUM NUMBER OF LEADS THAT MAY BE OMITTED IN THIS OUTLINE: "ONE" (1). THE NUMBER AND POSITION OF LEADS ACTUALLY PRESENT ARE INDICATED IN THE PRODUCT REGISTRATION.
2. $øB_2$ APPLIES BETWEEN L_1 AND L_2. øB APPLIES BETWEEN L_2 AND L. DIAMETER IS NOT CONTROLLED IN L_1.
3. LEADS HAVING MAXIMUM DIAMETER .019 "(.482MM) MEASURED IN GAGING PLANE .054" (1.372MM)+.001" (.025MM)-.000 "(.000MM) BELOW THE SEATING PLANE OF THE DEVICE SHALL BE WITHIN .007" (.177MM) OF THEIR TRUE POSITIONS RELATIVE TO A MAXIMUM WIDTH TAB.
4. MEASURED FROM ACTUAL MAXIMUM DIAMETER OF øD.

TO-105



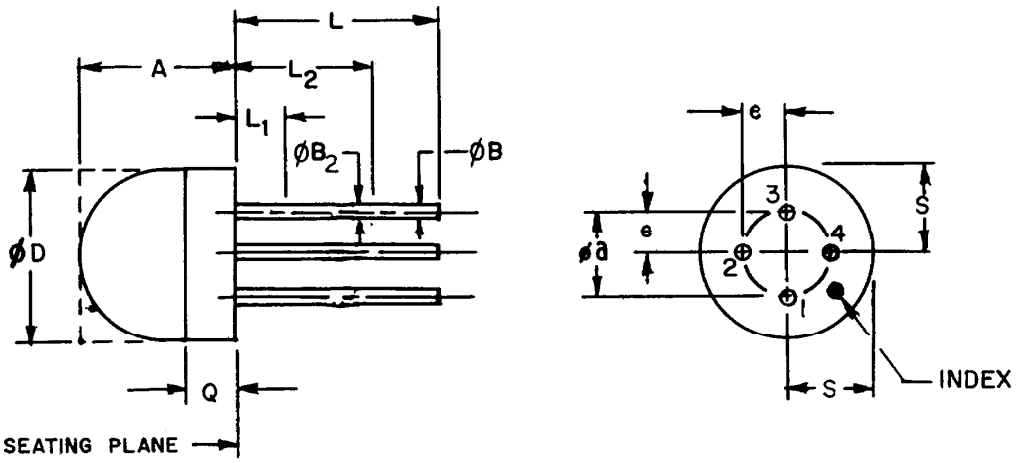
MILLIMETER DIMENSIONS ARE DERIVED FROM BASIC INCH DIMENSIONS

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.120	.240	3.1	6.0	
Ø a	.190	.210	4.83	5.33	
Ø B	.016	.021	.407	.533	1, 2
Ø B_2	.016	.019	.407	.482	1, 2
Ø D	.305	.325	7.75	8.25	
e	.090	.110	2.29	2.79	
L	.500	--	12.70	--	1, 2
L_1	--	.050	--	1.27	1, 2
L_2	.250	--	6.35	--	1, 2
Q	.060	--	1.53	--	3
S	.145	.165	3.69	4.19	

NOTES:

1. MAXIMUM NUMBER OF LEADS THAT MAY BE OMITTED IN THIS OUTLINE: "ONE" (1). THE NUMBER AND POSITION OF LEADS ACTUALLY PRESENT ARE INDICATED IN THE PRODUCT REGISTRATION
2. ØB_2 APPLIES BETWEEN L_1 and L_2. ØB APPLIES BETWEEN L_2 and L. DIAMETER IS NOT CONTROLLED IN L_1.
3. CONTOUR OF PACKAGE BEYOND THIS ZONE IS OPTIONAL, BUT MUST BE WITHIN ØD AND A.
4. VISUAL OR MECHANICAL INDEX IS OPTIONAL IF ONE LEAD IS OMITTED.

TO-106



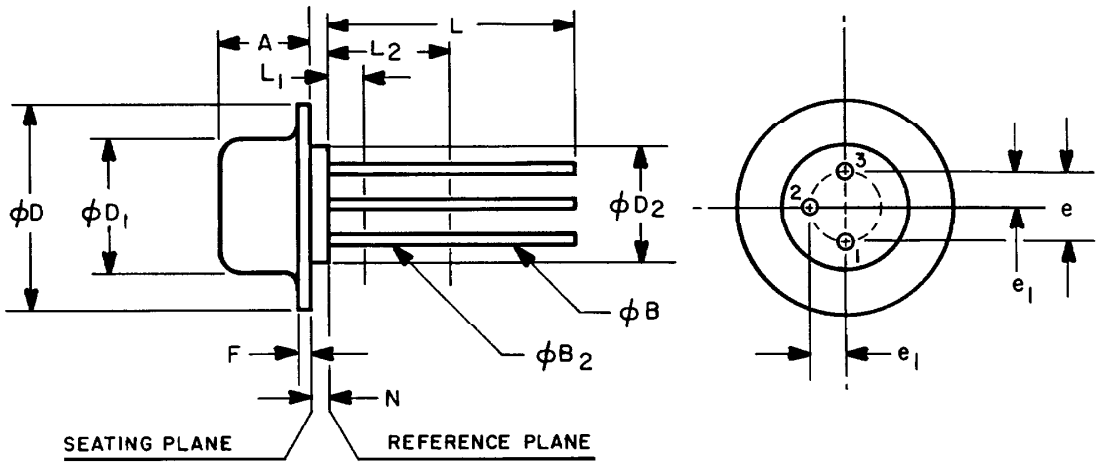
MILLIMETER DIMENSIONS ARE DERIVED FROM BASIC INCH DIMENSIONS

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	.120	.240	3.1	6.0	
øa	.095	.105	2.42	2.66	
øB	.016	.021	.407	.533	1, 2
ϕB_2	.016	.019	.407	.482	1, 2
øD	.192	.222	4.88	5.63	
e	.045	.055	1.15	1.39	
L	.500	--	12.70	--	1, 2
L_1	--	.050	--	1.27	1, 2
L_2	.250	--	6.35	--	1, 2
Q	.060	--	1.53	--	3
S	.090	.115	2.29	2.92	

NOTES:

1. MAXIMUM NUMBER OF LEADS THAT MAY BE OMITTED IN THIS OUTLINE: "ONE" (1). THE NUMBER AND POSITION OF LEADS ACTUALLY PRESENT ARE INDICATED IN THE PRODUCT REGISTRATION.
2. ϕB_2 APPLIES BETWEEN L_1 and L_2. øB APPLIES BETWEEN L_2 and L. DIAMETER IS NOT CONTROLLED IN L_1.
3. CONTOUR OF PACKAGE BEYOND THIS ZONE IS OPTIONAL, BUT MUST BE WITHIN øD AND A.
4. VISUAL OR MECHANICAL INDEX IS OPTIONAL IF ONE LEAD IS OMITTED.

TO-107



MILLIMETER DIMENSIONS ARE DERIVED FROM BASIC INCH DIMENSIONS

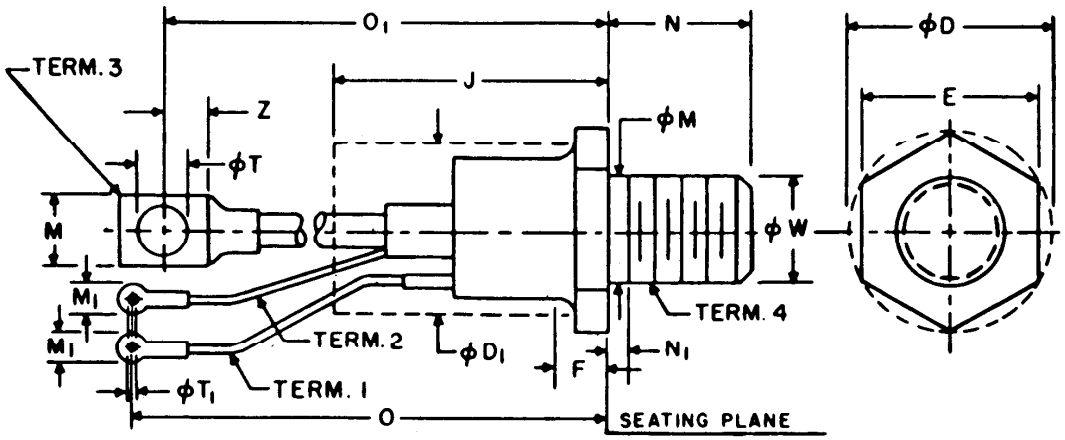
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	.105	.135	2.67	3.42	
Ø B	.016	.021	.407	.533	1
Ø B_2	.016	.019	.407	.482	1
Ø D	.320	.350	8.13	8.89	
Ø D_1	.200	.215	5.08	5.46	
Ø D_2	.160	.170	4.07	4.32	
e	.100 T.P.		2.54 T.P.		2
e_1	.050 T.P.		1.27 T.P.		2
F	-	.030	-	.76	
N	.045	.060	1.15	1.52	
L	.500	-	12.70	-	1
L_1	-	.050	-	1.27	1
L_2	.250	-	6.35	-	1

NOTES:

1. Ø B_2 APPLIES BETWEEN L_1 AND L_2. Ø B APPLIES BETWEEN L_2 AND L. DIAMETER IS NOT CONTROLLED IN L_1.

2. LEADS HAVING MAXIMUM DIAMETER .019" (.482 MM) MEASURED IN GAGING PLANE .054" (1.38 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE REFERENCE PLANE OF THE DEVICE SHALL BE WITHIN .007" (.177 MM) OF THEIR TRUE POSITIONS.

TO - 108



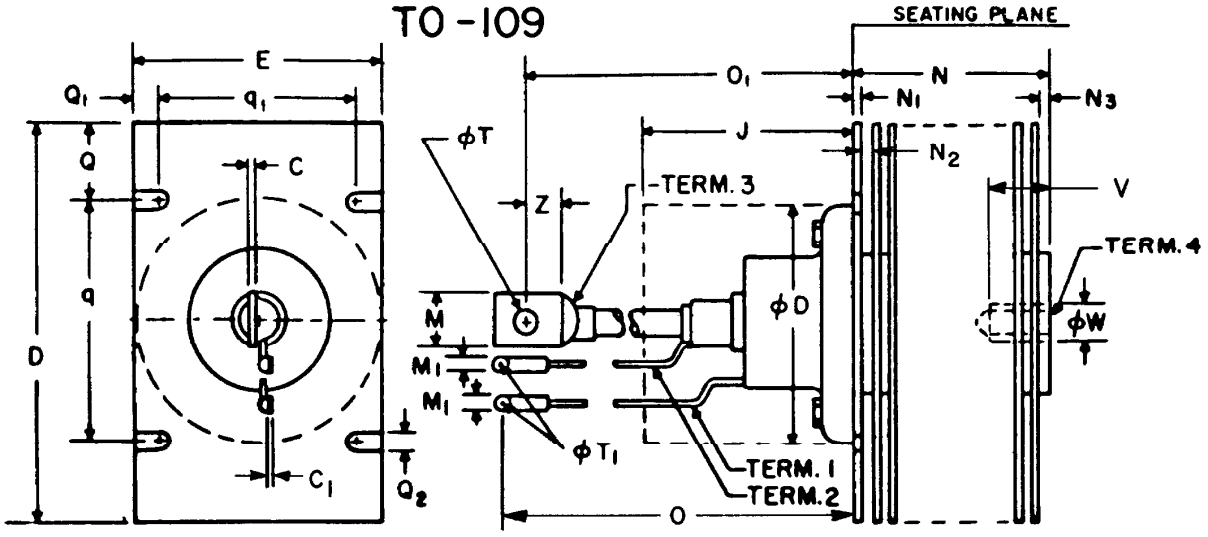
MILLIMETER DIMENSIONS ARE DERIVED FROM ORIGINAL INCH DIMENSIONS

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
ϕD		1.949		49.50	
ϕD_1		1.631		41.42	1
E	1.631	1.688	41.43	42.87	
F	.250	.500	6.35	12.70	5
J		4.000		101.60	1,7
M	.735	1.000	18.67	25.40	2
M_1	.218	.328	5.54	8.33	2,8
ϕM	.880	.999	22.36	25.37	
N	1.375	1.535	34.93	38.98	
N_1		.250		6.35	3
O	9.640	10.140	244.86	257.55	
O_1	9.400	9.780	238.76	248.41	
ϕT	.320	.448	8.13	11.37	
ϕT_1	.140	.172	3.56	4.36	
ϕW	.9382	.9459	23.831	24.025	4
Z	.375		9.53		6

NOTES:

1. THE BODY OF THE DEVICE WITH EXCEPTION OF THE HEXAGON, THREAD, AND FLEXIBLE LEAD EXTENSIONS LIES WITHIN ϕD_1.
2. ANGULAR ORIENTATION OF THESE TERMINALS WITH RESPECT TO HEXAGON PORTION IS UNDEFINED. SQUARE OR RADIUS ON END OF TERMINALS IS OPTIONAL.
3. LENGTH OF INCOMPLETE OR UNDERCUT THREADS OF ϕM
4. PITCH DIAMETER OF 1-12 UNF-2A (COATED) THREADS (ASA B1.1-1960)
5. A CHAMFER (OR UNDERCUT) ON ONE OR BOTH ENDS OF HEXAGON PORTION IS OPTIONAL.
6. MINIMUM FLAT.
7. SEATED HEIGHT WITH LEAD BENT AT RIGHT ANGLES.
8. FLEXIBLE LEADS FOR TERMINALS 1 AND 2 ARE IDENTIFIED BY COLOR CODING FOR SPECIFIC APPLICATIONS.

TO-109



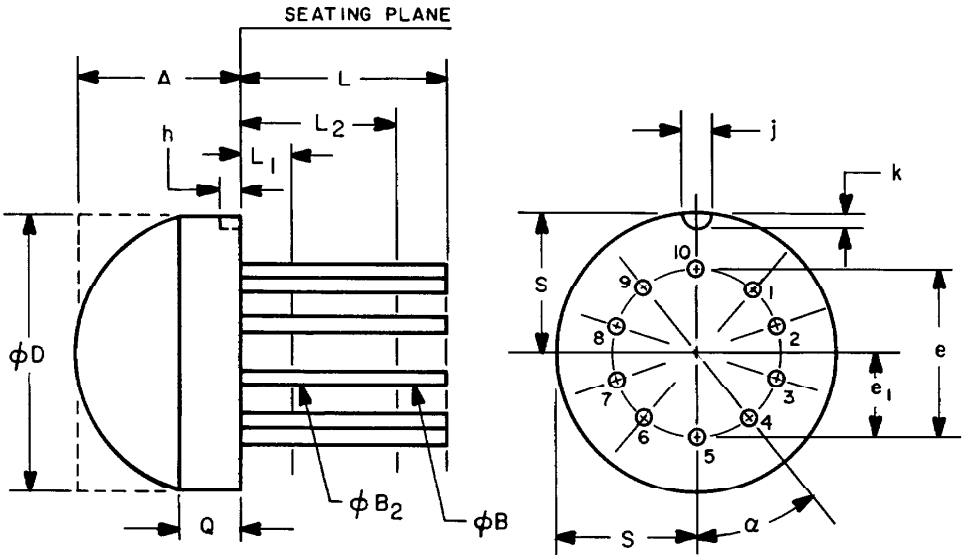
MILLIMETER DIMENSIONS ARE DERIVED FROM ORIGINAL INCH DIMENSIONS

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN	MILLIMETERS MAX	NOTES
C	.100	.200	2.54	5.08	1
C_1	.020	.040	.51	1.02	1
D	4.937	5.063	125.40	128.60	
ØD		3.270		83.05	2
E	3.937	4.063	100.00	103.20	
J		4.000		101.60	2,3
M	.735	1.000	18.67	25.40	1
M_1	.218	.320	5.54	8.12	1,6
N		2.130		54.10	
N_1	.125	.220	3.18	5.58	
N_2	.140		3.56		7
N_3	.080		2.04		
O	9.400	10.250	238.76	260.35	
O_1	9.150	10.141	232.41	257.58	
Q	.968	1.031	24.59	26.18	
Q_1	.468	.531	11.89	13.48	
Q_2	.312	.384	7.93	9.75	
q	2.968	3.031	75.39	76.98	
q_1	2.968	3.031	75.39	76.98	
ØT	.320	.448	8.13	11.37	
ϕT_1	.140	.172	3.56	4.36	
V	.750		19.05		
ØW	.4675	.4731	11.873	12.016	5
Z	.375		9.52		4

NOTES:

1. CONTOUR AND ORIENTATION OF TERMINAL LUGS ARE UNDEFINED.
2. THE BODY OF THE DEVICE WITH THE EXCEPTION OF HEATSINK AND FLEXIBLE LEADS LIES WITHIN ØD.
3. SEATED HEIGHT WITH THE LEAD BENT AT RIGHT ANGLES.
4. MINIMUM FLAT.
5. PITCH DIAMETER OF THREADS - 1/2 - 20 UNF 2B (ASA B1.1-1960)
6. PARALLEL, TWISTED OR COAXIAL FLEXIBLE LEADS FOR TERMINALS 1 AND 2 ARE IDENTIFIED BY COLOR CODING FOR SPECIFIC APPLICATIONS. COAXIAL SHIELDED LEAD HAS SHIELD AS TERMINAL 2.
7. WHEN DIMENSIONS LESS THAN .180 (4.58 MM) ARE USED, CLEARANCE IN THE SECOND FIN WILL BE PROVIDED.

TO-110



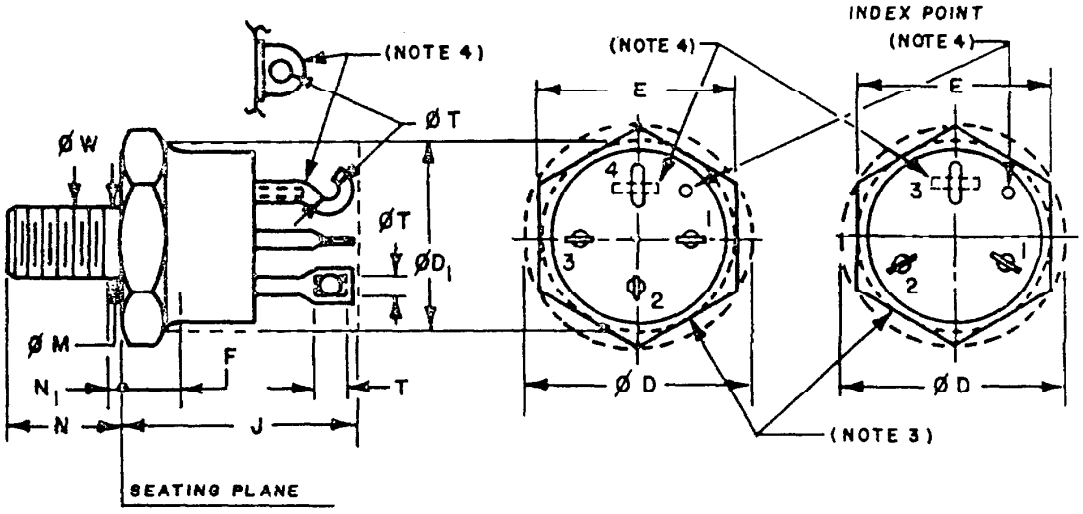
MILLIMETER DIMENSIONS ARE DERIVED FROM BASIC INCH DIMENSIONS

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.120	.240	3.1	6.0	
Ø B	.016	.021	.407	.533	1, 2
Ø B_2	.016	.019	.407	.482	1, 2
Ø D	.310	.330	7.88	8.38	
e	.195	.205	4.96	5.20	
e_1	.098	.102	2.490	2.590	
h	.015	.040	.39	1.01	
j	.025	.050	.64	1.27	
k	.010	.030	.26	.76	
L	.500	-	12.70	-	1, 2
L_1	-	.050	-	1.27	1, 2
L_2	.250	-	6.35	-	1, 2
S	.145	.165	3.69	4.19	
Q	.060	-	1.53	-	3
α	36° T.P.		36° T.P.		

NOTES:

1. (TEN LEADS). MAXIMUM NUMBER OF LEADS THAT CAN BE OMITTED IN THIS OUTLINE, ONE (1).
2. Ø B_2 APPLIES BETWEEN L_1 AND L_2. Ø B APPLIES BETWEEN L_2 AND L. DIAMETER IS NOT CONTROLLED IN L_1.
3. CONTOUR OF PACKAGE BEYOND THIS ZONE OPTIONAL, BUT MUST BE CONFINED WITHIN Ø D AND A.

TO-111



MILLIMETER DIMENSIONS ARE DERIVED FROM BASIC INCH DIMENSIONS

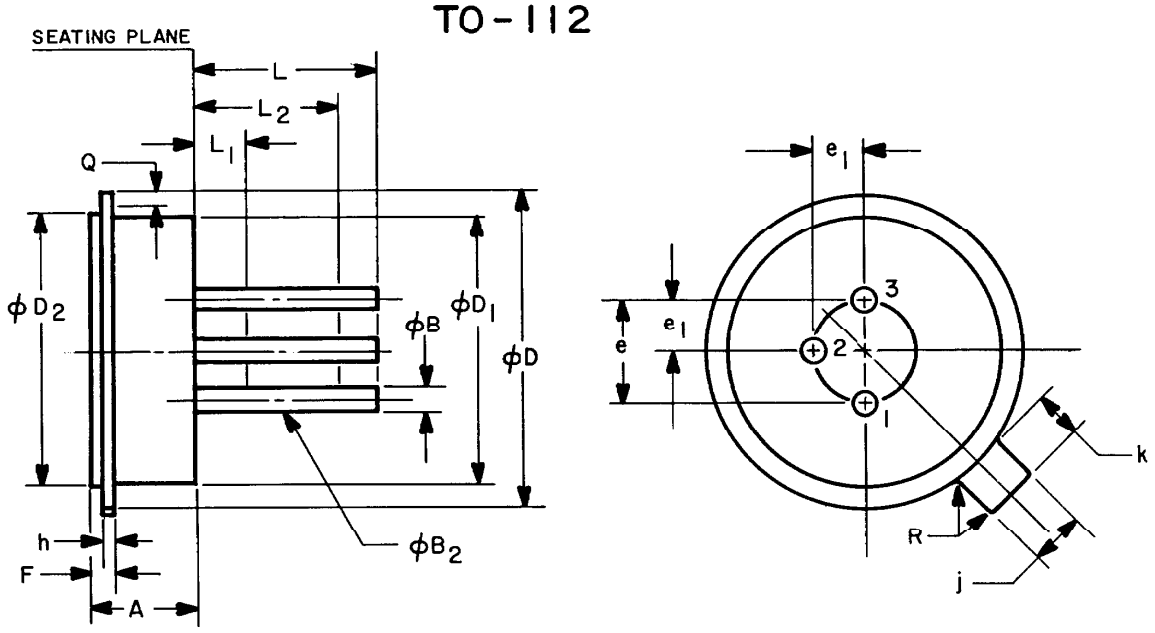
SYMBOL	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX	NOTES
ØD	—	.505	—	12.82	
$ØD_1$	.330	.423	8.39	10.74	1
E	.423	.438	10.75	11.12	2
F	.090	.250	2.3	6.3	5
J	.570	.763	14.5	19.3	1
ØM	.155	.189	3.94	4.80	6
N	.400	.455	10.16	11.55	
N_1	—	.078	—	1.98	6
ØT	.040	.070	1.02	1.77	
T	—	.090	—	2.28	7
ØW	.1658	.1697	4.212	4.310	8

NOTES:

1. Device body and terminals (with exception of hexagon) lie within the cylinder diameter $ØD_1$ and length J.
2. Position of terminals in relation to the hexagon is not controlled.
3. Four terminals. Omission of a maximum of one terminal is optional. Position of the terminals is optional. The number and position of terminals actually present are indicated in the product registration.
4. The use of either a hook, short tab, or tall tab terminal contour is optional. An index point is required when the tall tab terminal contour (identical to the adjacent terminals) option is used.
5. A chamfer (or undercut) on one or both ends of hexagonal portion is optional.
6. Incomplete or undercut threads.
7. Elongated hole in tab is optional.
8. Pitch diameter of 10-32 UNF-2A coated threads (ASA B1.1-1960).

4.6.53

TO-112



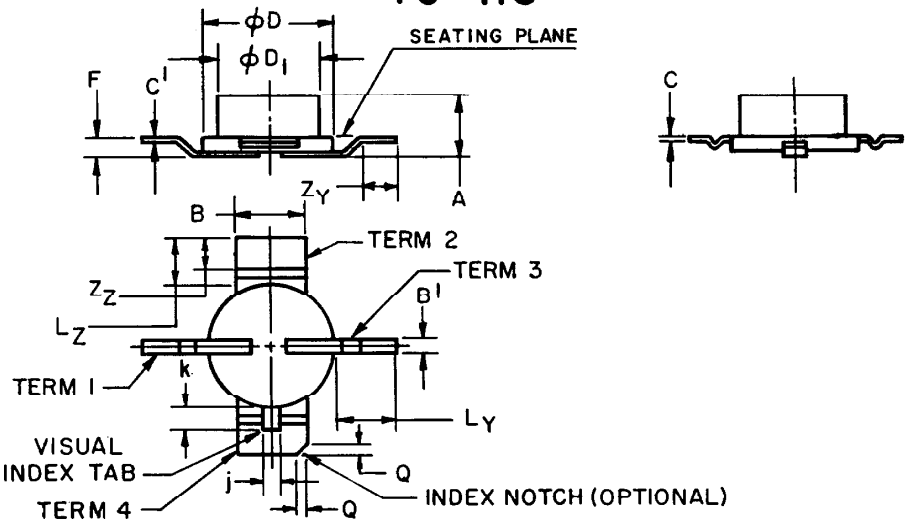
MILLIMETER DIMENSIONS ARE DERIVED FROM BASIC INCH DIMENSIONS

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.090	.115	2.29	2.92	
Ø B	.016	.021	.407	.533	1
Ø B_2	.016	.019	.407	.482	1
Ø D	.305	.320	7.75	8.12	
Ø D_1	.265	.275	6.74	6.98	
Ø D_2	.270	.320	6.86	.812	
e	.100 T.P.		2.54 T.P.		2
e_1	.050 T.P.		1.27 T.P.		
F	.016	.024	.407	.609	
h	.008	.012	.204	.304	
j	.047	.053	1.194	1.346	
k	.047	.053	1.194	1.346	3
L	.400	-	10.16	-	1
L_1	-	.050	-	1.27	1
L_2	.250	-	6.35	-	1
Q	.015	-	.381	-	4
R	-	.009	-	.22	
α	45° T.P.		45° T.P.		5

NOTES:

1. Ø B_2 APPLIES BETWEEN L_1 AND L_2. Ø B APPLIES BETWEEN L_2 AND L. DIAMETER IS NOT CONTROLLED IN L_1.
2. LEADS HAVING MAXIMUM DIAMETER .019" (.482 MM) MEASURED IN GAGING PLANE .054" (1.38 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE SEATING PLANE OF THE DEVICE SHALL BE WITHIN .007" (.178 MM) OF THEIR TRUE POSITIONS RELATIVE TO THE MAXIMUM WIDTH TAB.
3. MEASURED FROM MAXIMUM DIAMETER OF ACTUAL DEVICE.
4. MINIMUM FLAT.
5. TAB CENTERLINE.

TO-113

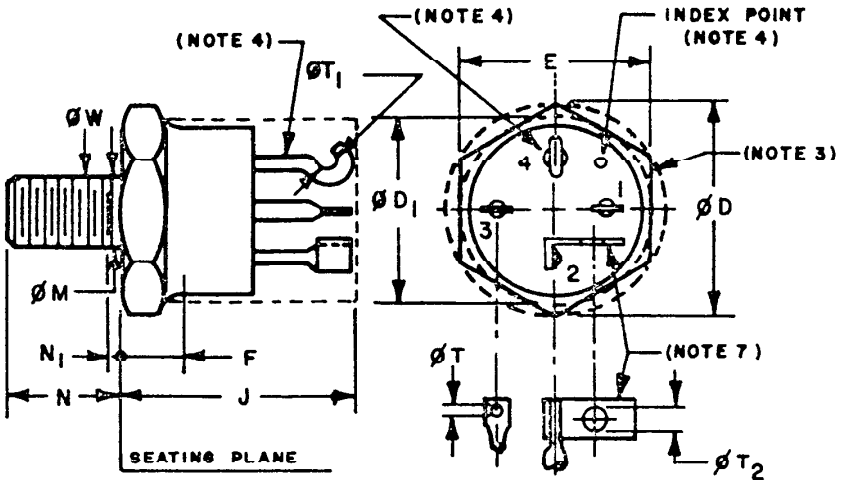


MILLIMETER DIMENSIONS ARE DERIVED FROM BASIC INCH DIMENSIONS

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.080	.100	2.04	2.54	
B	.095	.105	2.42	2.66	2
B'	.012	.025	.31	.63	1
C	.001	.002	.026	.050	2
C'	.001	.003	.026	.076	1
Ø D	.180	.200	4.58	5.08	
Ø D_1	.157	.164	3.988	4.165	
F	-	.025	-	.63	3, 7
j	-	.024	-	.60	
k	-	.033	-	.83	4
L_Y	.088	.130	2.24	3.30	1, 4
L_Z	.060	.080	1.53	2.03	2, 4
Q	-	.020	-	.50	
Z_Y	.040	-	1.02	-	1,5,6,7
Z_Z	.030	-	.77	-	2,5,6,7

NOTES:
1. TERMINALS 1 AND 3.
2. TERMINALS 2 AND 4.
3. ALL TERMINALS.
4. MEASURED FROM MAXIMUM DIAMETER OF ACTUAL DEVICE.
5. FLAT ON TERMINALS.
6. WITH THE DEVICE SEATED IN A .165" (4.20 MM) + .010" (.25 MM), -.000" (.00 MM) HOLE A MAXIMUM FORCE OF 20 GRAMS ON EACH OF THE TERMINALS SHALL CAUSE THE FLATS OF THE TERMINALS TO CONTACT THE SEATING PLANE
7. TERMINAL CONFIGURATIONS OPTIONAL BETWEEN Ø D AND FLATS ON TERMINALS.

TO-114



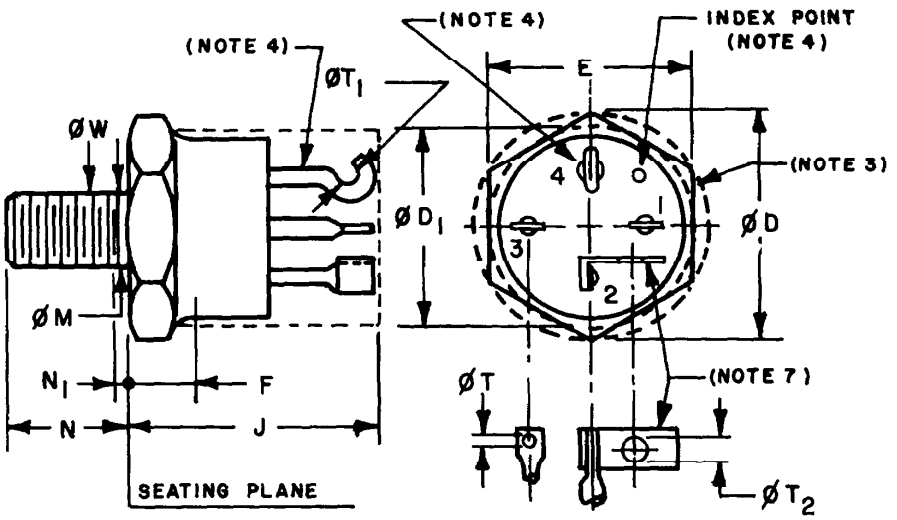
MILLIMETER DIMENSIONS ARE DERIVED FROM BASIC INCH DIMENSIONS

SYMBOL	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX	NOTES
ØD	—	1.227	--	31.16	
$ØD_1$	.885	1.031	22.5	26.1	1
E	1.031	1.063	26.19	27.00	2
F	.090	.400	2.3	10.1	5
J	1.048	1.750	26.7	44.4	1
ØM	.425	.500	10.80	12.70	6
N	.781	.828	19.84	21.03	
N_1	—	.156	--	3.96	6
ØT	.078	.109	1.99	2.76	
$ØT_1$	.234	.281	5.95	7.13	
$ØT_2$	.180	.210	4.58	5.33	7
ØW	.4619	.4675	11.733	11.874	8

NOTES:

1. Device body and terminals (with exception of hexagon) lie within the cylinder diameter $ØD_1$ and length J.
2. Position of terminals in relation to the hexagon is not controlled.
3. Four terminals. Omission of a maximum of one terminal is optional. Position of the terminals is optional. The number and position of terminals actually present are indicated in the product registration.
4. The use of either a hook or tab terminal contour is optional. An index point is required when the tab terminal (identical to the adjacent terminals) contour option is used.
5. A chamfer (or undercut) on one or both ends of hexagonal portion is optional.
6. Incomplete or undercut threads.
7. Use of tab extension is optional.
8. Pitch diameter of $\frac{1}{2}$-20 UNF-2A (coated) threads (ASA B1.1-1960).

TO-115



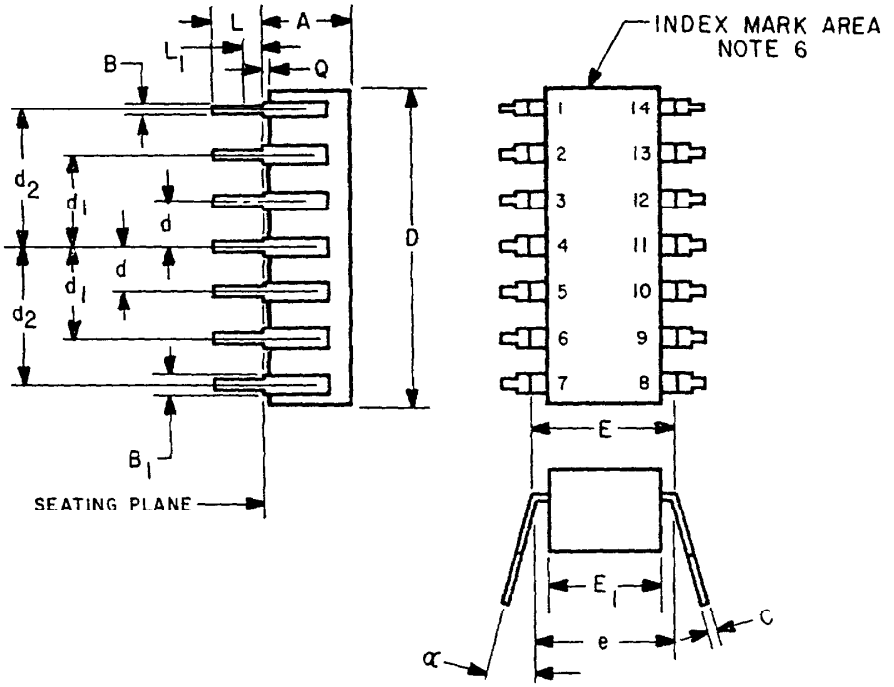
MILLIMETER DIMENSIONS ARE DERIVED FROM BASIC INCH DIMENSIONS

SYMBOL	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX	NOTES
ØD	—	1.443	—	36.65	
$ØD_1$	1.109	1.212	28.2	30.7	1
E	1.212	1.250	30.79	31.75	2
F	.090	.400	2.8	10.1	5
J	1.313	2.250	33.4	57.1	1
ØM	.550	.625	13.97	15.87	6
N	.922	.985	23.42	25.01	
N_1	—	.156	—	3.96	6
ØT	.078	.109	1.99	2.76	
$ØT_1$	.234	.281	5.95	7.13	
$ØT_2$	.250	.281	6.35	7.13	7
ØW	.5828	.5889	14.804	14.958	8

NOTES:

1. Device body and terminals (with exception of hexagon) lie within the cylinder diameter $ØD_1$ and length J.
2. Position of terminals in relation to the hexagon is not controlled.
3. Four terminals. Omission of a maximum of one terminal is optional. Position of the terminals is optional. The number and position of terminals actually present are indicated in the product registration.
4. The use of either a hook or tab terminal contour is optional. An index point is required when the tab terminal (identical to the adjacent terminals) contour option is used.
5. A chamfer (or undercut) on one or both ends of hexagonal portion is optional.
6. Incomplete or undercut threads.
7. Use of tab extension is optional.
8. Pitch of diameter of 5/8-18 UNF-2A (coated) threads (ASA B1.1-1960).

TO-116



MILLIMETER DIMENSIONS ARE DERIVED FROM BASIC INCH DIMENSIONS

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	-	.200	-	5.08	
B	.015	.023	.381	.584	3,7
B_1	.030	.070	.77	1.77	3,7
C	.008	.015	.204	.381	3
D	.660	.785	17.4	19.9	
d	.090	.110	2.29	2.79	1
d_1	.190	.210	4.83	5.33	1
d_2	.290	.310	7.37	7.87	1
E	-	.325	-	8.25	5
E_1	.220	.280	5.59	7.11	
e	.290	.310	7.37	7.87	4
L	.100	-	2.540	-	1,3
L_1	-	.030	-	.76	2
Q	.020	-	.51	-	
α	0°	15°	0°	15°	

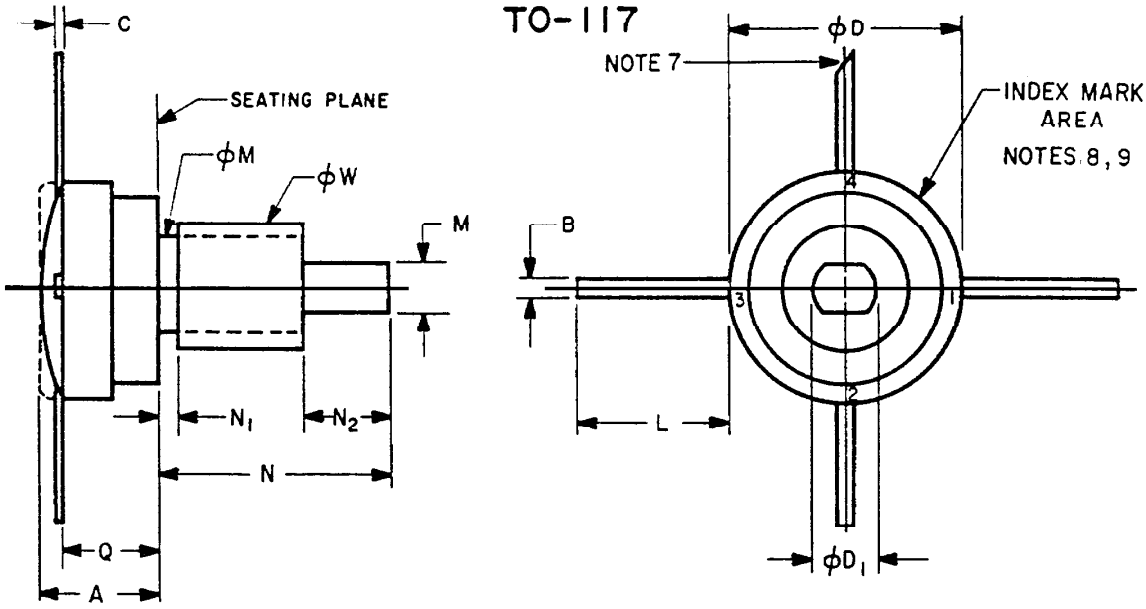
NOTES:

1. LEADS MISSING FROM THEIR DESIGNATED POSITIONS SHALL BE COUNTED WHEN NUMBERING LEADS FOR SPECIAL APPLICATIONS.
2. LEAD SPACING SHALL BE MEASURED WITHIN THIS ZONE.
3. TYPICAL ALL LEADS.
4. INSTALLED POSITION OF LEAD CENTERS.
5. OVERALL INSTALLED WIDTH.
6. INDEX TO BE VISIBLE FROM TOP, THIS END ONLY.
7. LEAD TRANSITION GEOMETRY FROM B TO B1 OPTIONAL ON BODY SIDE OF SEATING PLANE.

ITEM NO. 197 B

JEDEC PUBLICATION 95 REGISTERED OUTLINES FOR SEMICONDUCTOR DEVICES	OUTLINE TO-116	ISSUE A	DATE DEC 66

TO-117



MILLIMETER DIMENSIONS DERIVED FROM BASIC INCH DIMENSIONS

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.140	.230	3.56	5.84	1
B	.027	.033	.686	.838	2
C	.014	.016	.356	.406	2
ØD	.240	.380	6.1	9.6	1
$ØD_1$	.110	.129	2.80	3.27	3
L	.450	-	11.43	-	2,4
M	.055	.065	1.40	1.65	3
ØM	.120	.163	3.05	4.14	5
N	.425	.525	10.8	13.3	-
N_1	-	.078	-	1.98	5
N_2	.115	.145	2.93	3.68	3
Q	.110	.130	2.80	3.30	-
ØW	.1399	.1437	3.554	3.649	6

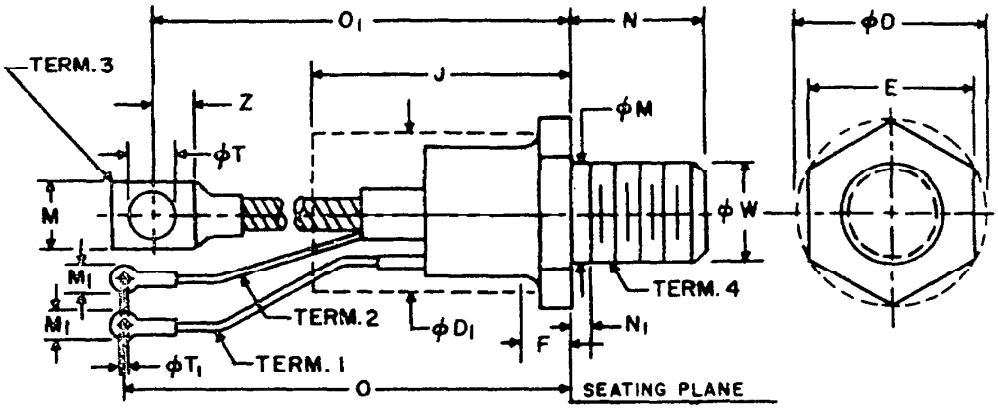
NOTES:

1. BODY CONTOUR OPTIONAL WITHIN ØD AND A.
2. TYPICAL ALL LEADS.
3. ORIENTATION OF FLATS NOT CONTROLLED IN RELATION TO THE LEADS.
4. OMISSION OF ONE LEAD OPTIONAL. THE NUMBER AND POSITION OF LEADS ACTUALLY PRESENT ARE INDICATED IN THE PRODUCT REGISTRATIONS.
5. LENGTH (OR DIAMETER) OF INCOMPLETE OR UNDERCUT THREADS.
6. PITCH DIAMETER OF 8-32 UNC-2A (COATED) THREADS (ASA B1.1-1960).
7. LEAD 4 END CONFIGURATION OPTIONAL.
8. INDEX MARK TO BE VISIBLE FROM TOP.
9. INDEX MARK OPTIONAL FOR THREE-LEAD DEVICES.

4.6.56

ITEM NO. 175G

TO-118



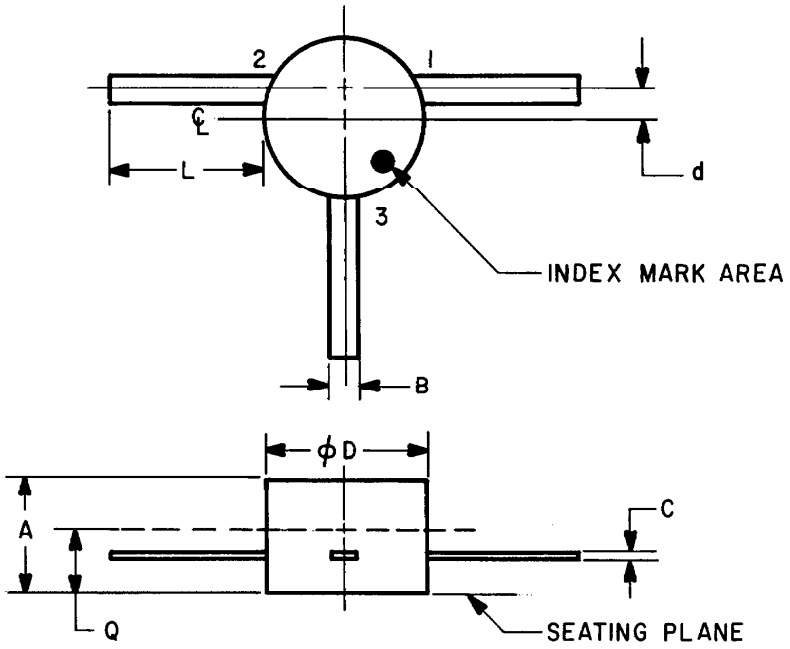
MILLIMETER DIMENSIONS ARE DERIVED FROM BASIC INCH DIMENSIONS

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
ØD	-	1.949	-	49.50	-
$ØD_1$	-	1.631	-	41.42	1
E	1.631	1.688	41.43	42.87	-
F	.250	.500	6.4	12.7	5
J	-	4.000	-	101.60	1,7
M	.735	1.000	18.7	25.4	2
M_1	.260	.328	6.61	8.33	2,8
ØM	.660	.749	16.77	19.02	-
N	1.031	1.095	26.19	27.81	-
N_1	-	.156	-	3.96	3
O	9.640	10.140	244.9	257.5	-
O_1	9.400	9.780	238.8	248.4	-
ØT	.320	.448	8.2	11.3	-
$ØT_1$	.140	.172	3.56	4.36	-
ØW	.7029	.7094	17.854	18.018	4
Z	.375	- -	9.53	-	6

NOTES:

1. THE BODY OF THE DEVICE WITH EXCEPTION OF THE HEXAGON, THREAD, AND FLEXIBLE LEAD EXTENSIONS LIES WITHIN ϕD_1 AND LENGTH J.
2. ANGULAR ORIENTATION OF THESE TERMINALS WITH RESPECT TO HEXAGON PORTION IS UNDEFINED. SQUARE OR RADIUS ON END OF TERMINALS IS OPTIONAL.
3. LENGTH OF INCOMPLETE OR UNDERCUT THREADS OF ϕM
4. PITCH DIAMETER OF 3/4-16 UNF-2A (COATED) THREADS (ASA B1.1-1960)
5. A CHAMFER (OR UNDERCUT) ON ONE OR BOTH ENDS OF HEXAGON PORTION IS OPTIONAL.
6. MINIMUM FLAT.
7. SEATED HEIGHT WITH LEAD BENT AT RIGHT ANGLES.
8. FLEXIBLE LEADS FOR TERMINALS 1 AND 2 ARE IDENTIFIED BY COLOR CODING FOR SPECIFIC APPLICATIONS.

TO-119



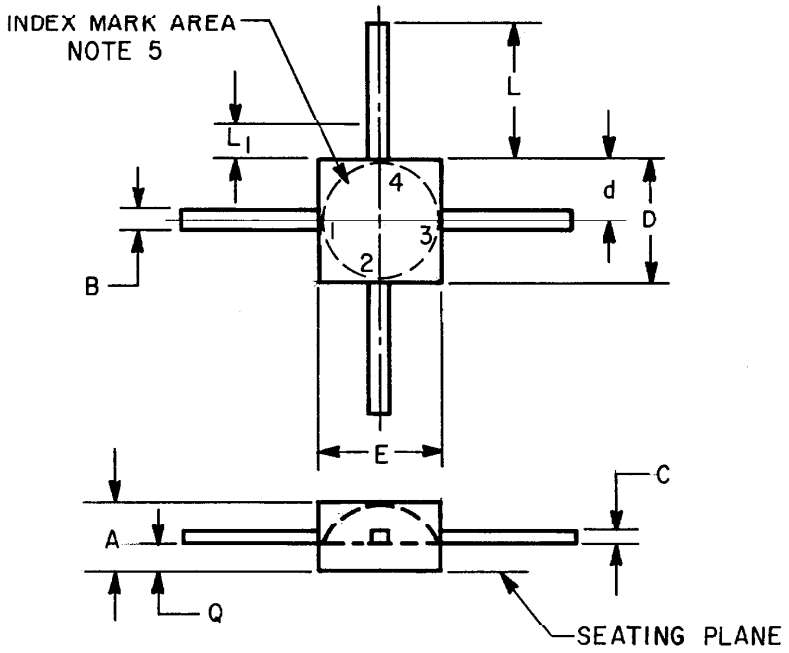
MILLIMETER DIMENSIONS DERIVED FROM BASIC INCH DIMENSIONS

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.040	.065	1.02	1.65	1
B	.020	.028	.508	.711	2
C	.003	.005	.077	.127	2
ØD	.184	.225	4.68	5.71	1
d	-	.035	-	.88	3
L	.240	-	6.10	-	2,4
Q	-	.030	-	.76	3

NOTES:

1. CONTOUR OF BODY OPTIONAL WITHIN ØD AND A. ØD MIN. AND ØD MAX. APPLY ONLY TO GREATEST BODY DIAMETER.
2. TYPICAL ALL LEADS.
3. LEADS SHALL EMERGE FROM THE BODY WITHIN THE LIMITS INDICATED BY THE d AND Q DIMENSIONS.
4. MEASURED FROM GREATEST BODY DIAMETER OF ACTUAL DEVICE.

TO-120



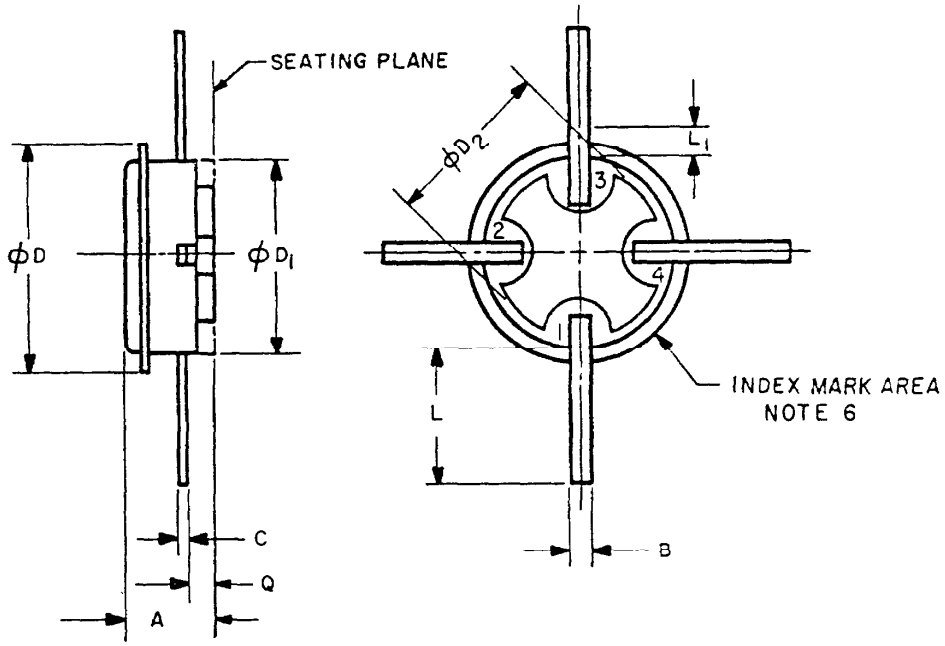
MILLIMETER DIMENSIONS ARE DERIVED FROM ORIGINAL INCH DIMENSIONS

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.030	.062	.77	1.57	1
B	.008	.019	.21	.48	2
C	.003	.007	.077	.177	2
d	.015	.046	.39	1.16	3
D	.067	.092	1.71	2.33	1
E	.067	.088	1.71	2.23	1
L	.100	-	2.54	-	2
L_1	-	.035	-	.88	2,4
Q	.007	.034	.18	.86	-

NOTES:

1. CONFIGURATION OF PACKAGE OPTIONAL WITHIN ZONE DEFINED BY A, D, AND E.
2. TYPICAL ALL LEADS.
3. THIS DIMENSION APPLIES TO LEADS 1 AND 3 ONLY.
4. LEAD DIMENSIONS NOT CONTROLLED IN THIS ZONE TO ALLOW FOR BODY AND LEAD FINISH IRREGULARITIES.
5. INDEX TO BE VISIBLE FROM TOP.
6. OMISSION OF ONE LEAD OPTIONAL. LEADS MISSING FROM THEIR DESIGNATED POSITIONS SHALL BE COUNTED WHEN NUMBERING LEADS FOR SPECIFIC APPLICATIONS. THE NUMBER AND POSITION OF LEADS ACTUALLY PRESENT ARE INDICATED IN THE PRODUCT REGISTRATION.

TO-121



MILLIMETER DIMENSIONS DERIVED FROM BASIC INCH DIMENSIONS

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.145	.200	3.69	5.08	-
B	.035	.046	.89	1.16	1
C	.012	.019	.305	.482	1
ØD	.593	.680	15.07	17.27	-
$ØD_1$	.520	.594	13.21	15.08	2
$ØD_2$	.480	-	12.20	-	3
L	.195	-	4.96	-	1,4
L_1	-	.105	-	2.66	1,4,5
Q	.005	.020	.13	.50	2

NOTES:

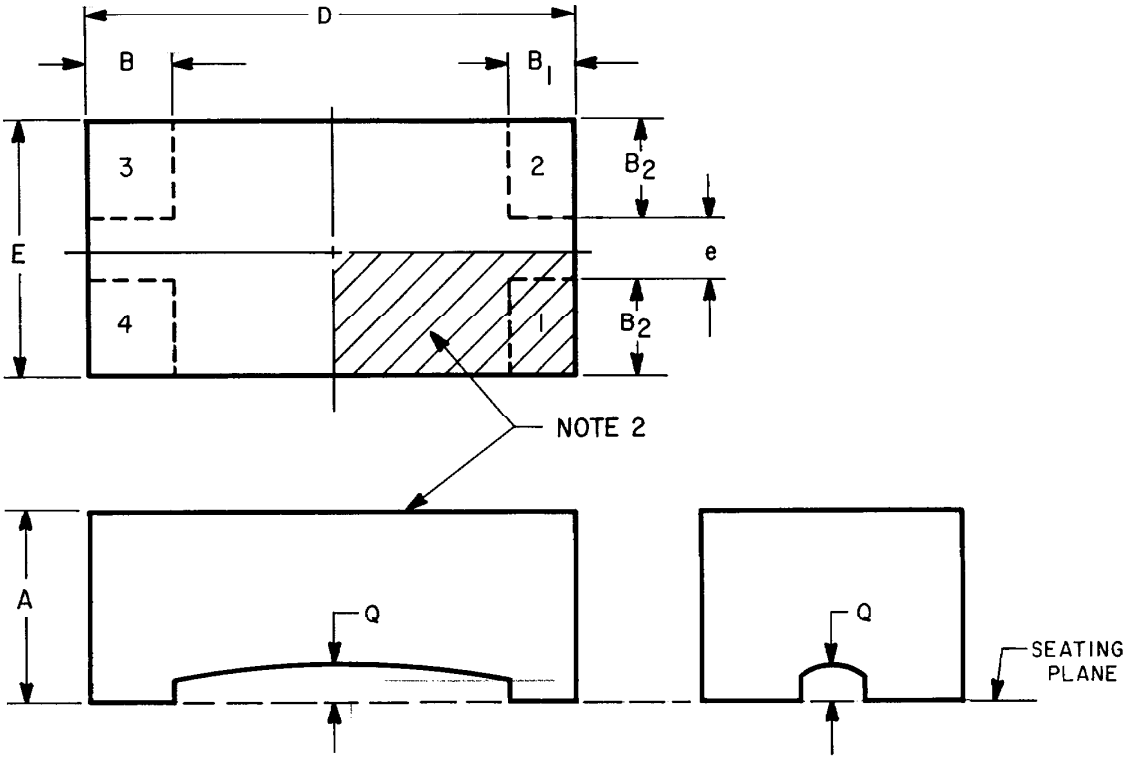
1. TYPICAL ALL LEADS.
2. CONFIGURATION OF PACKAGE OPTIONAL WITHIN ZONE DEFINED BY $ØD_1$ AND Q
3. MINIMUM DIAMETER OF SEATING PLANE.
4. MEASURED FROM INTERSECTION OF LEAD AXIS AND BODY SURFACE OF DIAMETER $ØD_1$.
5. DIMENSIONS, CONFIGURATION, AND POSITION OF LEADS OPTIONAL IN THIS ZONE.
6. INDEX MARK OPTIONAL FOR THREE-LEAD DEVICES.
7. OMISSION OF ONE LEAD OPTIONAL. THE NUMBER AND POSITION OF LEADS ACTUALLY PRESENT ARE INDICATED IN THE PRODUCT REGISTRATION.

4.6.58

ITEM NO. 147G

JEDEC PUBLICATION 95 REGISTERED OUTLINES FOR SEMICONDUCTOR DEVICES	OUTLINE TO-121	ISSUE A	DATE AUG 1967

TO-122



MILLIMETER DIMENSIONS ARE DERIVED FROM BASIC INCH DIMENSIONS

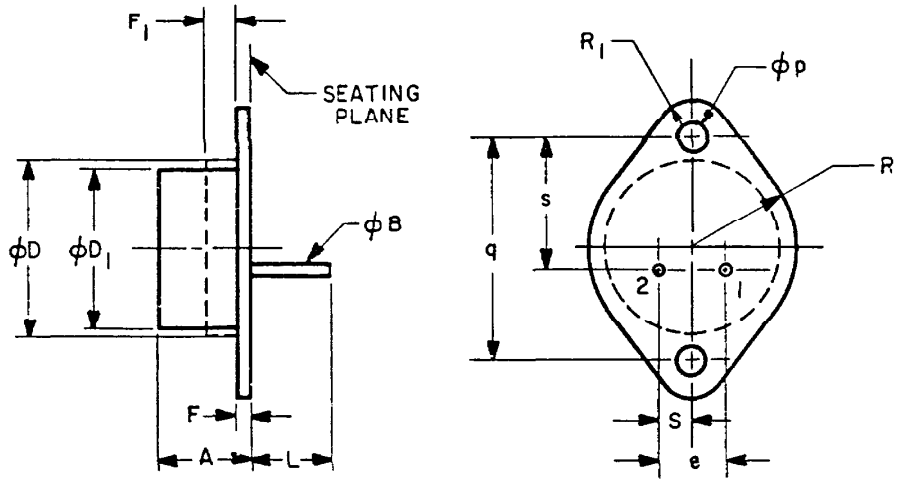
SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	0.027	0.035	0.686	0.889	-
B	0.011	0.017	0.280	0.431	-
B_1	0.008	0.014	0.204	0.355	-
B_2	0.012	0.018	0.305	0.457	3
D	0.070	0.078	1.778	1.981	-
E	0.035	0.043	0.889	1.092	-
e	0.009	0.011	0.229	0.279	3
Q	-	-	-	-	1

NOTES:

1. DETAILS OF THE OUTLINE IN THIS ZONE ARE OPTIONAL EXCEPT THAT THE OUTLINE SHALL NOT EXTEND BEYOND THE SEATING PLANE.
2. AN INDEX MARK SHALL BE LOCATED ON THE TOP SURFACE IN THE QUADRANT ABOVE TERMINAL ONE.
3. THESE TOLERANCES ARE NON-CUMULATIVE.

ITEM NO. 230H

TO-123



MILLIMETER DIMENSIONS ARE DERIVED FROM BASIC INCH DIMENSIONS

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.250	.340	6.35	8.63	-
ØB	.028	.034	.712	.863	-
ØD	-	.620	-	15.74	1
ØD1	.470	.500	11.94	12.70	-
e	.190	.210	4.83	5.33	-
F	.020	.040	.51	1.01	2
F1	-	.050	-	1.27	1
L	.360	-	9.15	-	-
Øp	.142	.152	3.61	3.86	-
q	.958	.962	24.334	24.434	-
R	-	.352	-	8.94	-
R1	-	.147	-	3.73	-
S	.093	.107	2.37	2.71	-
s	.570	.590	14.48	14.98	-

NOTES:

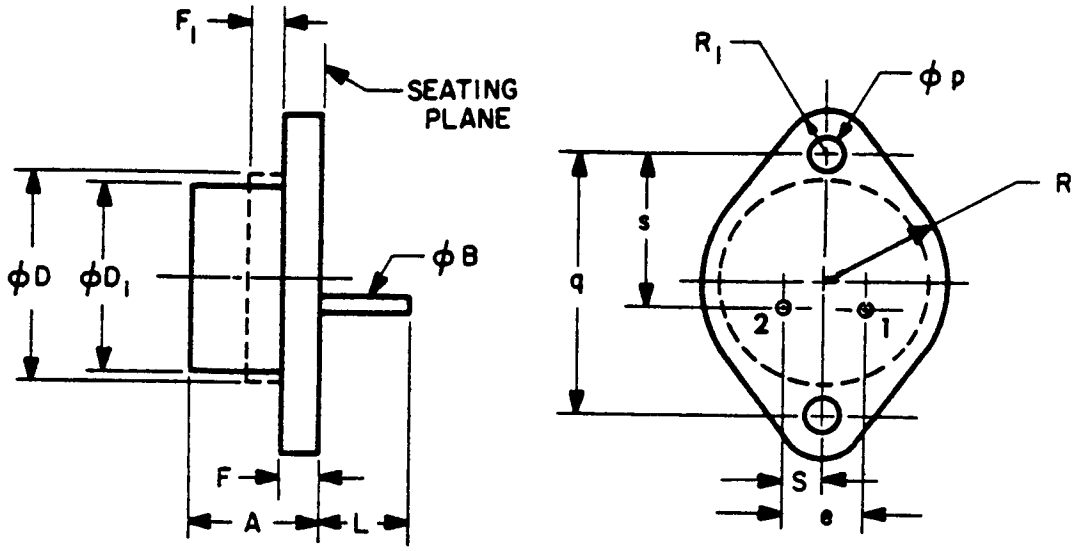
1. OUTLINE CONTOUR OPTIONAL WITHIN ZONE DEFINED BY ØD AND F_1.
2. THE F DIMENSION DOES NOT INCLUDE SEALING FLANGES.

4.6.59

ITEM NO. 218 GA

JEDEC PUBLICATION 95 REGISTERED OUTLINES FOR SEMICONDUCTOR DEVICES	OUTLINE TO-123	ISSUE A	DATE AUG 1967

TO-124



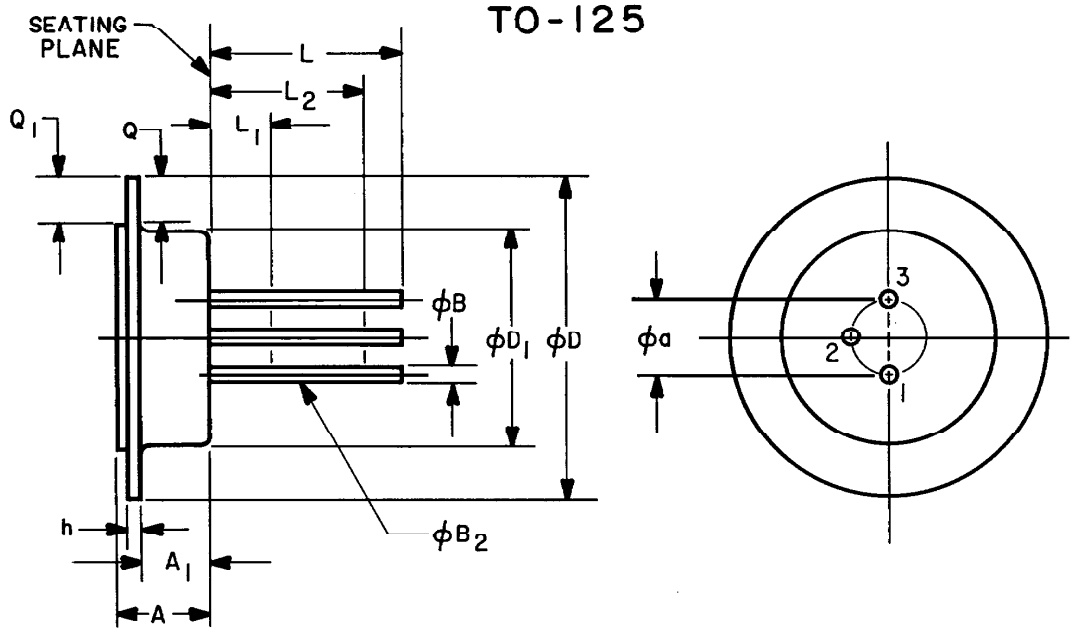
MILLIMETER DIMENSIONS ARE DERIVED FROM BASIC INCH DIMENSIONS

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.250	.355	6.4	9.0	-
ØB	.028	.034	.712	.863	-
ØD	-	.620	-	15.74	1
$ØD_1$	.470	.500	11.94	12.70	-
e	.190	.210	4.83	5.33	-
F	.085	.102	2.16	2.59	2
F_1	-	.050	-	1.27	1
L	.360	-	9.15	-	-
Øp	.142	.152	3.61	3.86	-
q	.958	.962	24.334	24.434	-
R	-	.352	-	8.94	-
R_1	-	.147	-	3.73	-
S	.093	.107	2.37	2.71	-
s	.570	.590	14.48	14.98	-

NOTES:

1. OUTLINE CONTOUR OPTIONAL WITHIN ZONE DEFINED BY ØD AND F_1.
2. THE F DIMENSION DOES NOT INCLUDE SEALING FLANGES.

TO-125



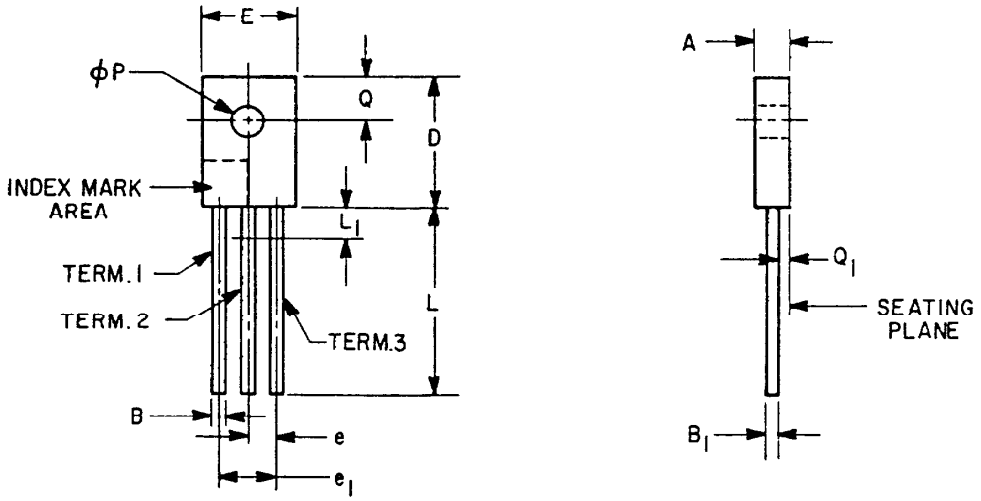
MILLIMETER DIMENSIONS ARE DERIVED FROM BASIC INCH DIMENSIONS

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.099	.123	2.52	3.12	-
øa	.100 T.P.		2.54 T.P.		2
øB	.016	.021	.407	.533	1
$øB_2$	.016	.019	.407	.482	1
øD	.427	.433	10.846	10.998	-
$øD_1$	.284	.290	7.214	7.366	-
h	.008	.012	.204	.304	-
L	.450	-	11.43	-	1
L_1	-	.050	-	1.27	1
L_2	.250	-	6.35	-	1
Q	.058	-	1.48	-	3
Q_1	.032	-	.82	-	3
A_1	.085	.101	2.16	2.56	-

NOTES:

1. $øB_2$ APPLIES BETWEEN L_1 AND L_2. øB APPLIES BETWEEN L_2 AND L. DIAMETER IS NOT CONTROLLED IN L_1.
2. THE CROSS SECTION OF EACH LEAD HAVING A MAXIMUM DIAMETER OF .019" (.482 MM) AND MEASURED IN A GAGING PLANE .054" (1.372 MM) + .001" (.025 MM) - .000" (.000 MM) BELOW THE SEATING PLANE LIES IN A CIRCLE HAVING A DIAMETER OF .033" (.838 MM) CENTERED AT THE TRUE POSITION OF THE LEAD AXIS AT ITS POINT OF EXIT RELATIVE TO A .290" (7.366 MM) MAXIMUM BODY DIAMETER, $øD_1$.
3. MINIMUM FLAT.

TO-126



MILLIMETER DIMENSIONS ARE DERIVED FROM ORIGINAL INCH DIMENSIONS

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.090	.120	2.29	3.04	-
B	.025	.035	.64	.88	4
B_1	.015	.025	.39	.63	-
D	.400	.450	10.16	11.43	-
E	.280	.330	7.12	8.38	-
e	.080	.100	2.04	2.54	3
e_1	.160	.200	4.07	5.08	3
L	.595	.655	15.12	16.63	-
L_1	-	.100	-	2.54	1
ØP	.100	.130	2.54	3.30	-
Q	.130	.175	3.31	4.44	-
Q_1	.035	.065	.89	1.65	-

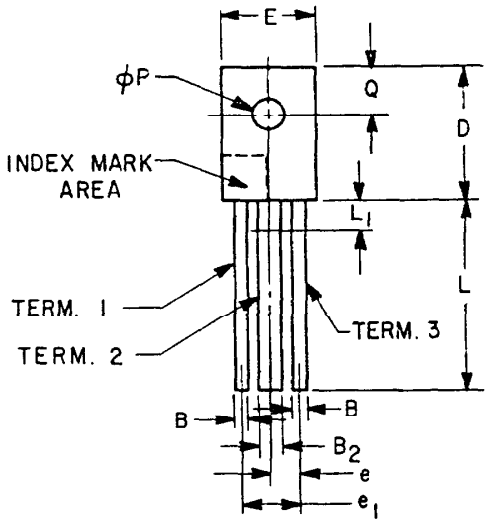
NOTES:

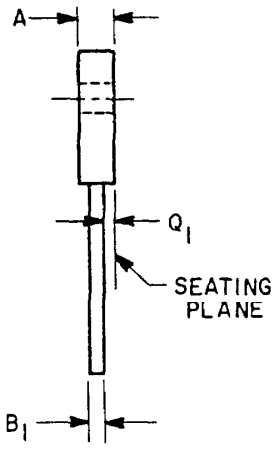
1. LEAD DIMENSIONS NOT CONTROLLED IN THIS ZONE TO ALLOW FOR BODY FLASH AND LEAD FINISH BUILD-UP.
2. MAXIMUM RADIUS OF .050 IN. (1.27 MM) ON ALL BODY EDGES AND CORNERS.
3. LEAD SPACING TO BE MEASURED BETWEEN .100 IN. (2.54 MM) AND .125 IN. (3.17 MM) FROM THE POINT OF EMERGENCE FROM THE BODY.
4. TYPICAL ALL LEADS.

ITEM NO 226G

CHANGES: SEE 11.2.F.20 Ltb.

TO-127





MILLIMETER DIMENSIONS ARE DERIVED FROM ORIGINAL INCH DIMENSIONS

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.120	.150	3.05	3.81	-
B	.041	.051	1.05	1.29	-
B_1	.027	.037	.69	.93	-
B_2	.065	.075	1.66	1.90	-
D	.618	.668	15.70	16.96	-
E	.480	.530	12.20	13.46	-
e	.151	.181	3.84	4.59	3
e_1	.302	.362	7.68	9.19	3
L	.595	.655	15.12	16.63	-
L_1	-	.125	-	3.17	1
ØP	.125	.155	3.18	3.93	-
Q	.180	.225	4.58	5.71	-
Q_1	.035	.065	.89	1.65	-

NOTES:

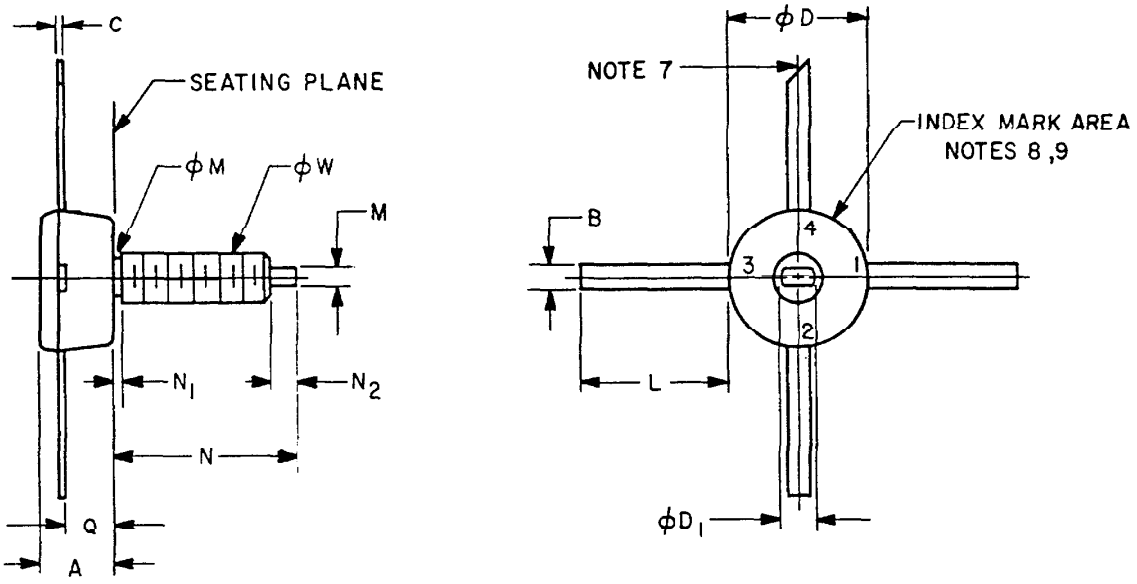
1. LEAD DIMENSIONS NOT CONTROLLED IN THIS ZONE TO ALLOW FOR BODY FLASH AND LEAD FINISH BUILD-UP.
2. MAXIMUM RADIUS OF .050 IN. (1.27 MM) ON ALL BODY EDGES AND CORNERS.
3. LEAD SPACING TO BE MEASURED BETWEEN .125 IN. (3.18 MM) AND .150 IN. (3.81 MM) FROM THE POINT OF EMERGENCE FROM THE BODY.

4.6.67

ITEM NO. 227G

CHANGES: SEE 11.2.F.20 Ltr.

TO-128



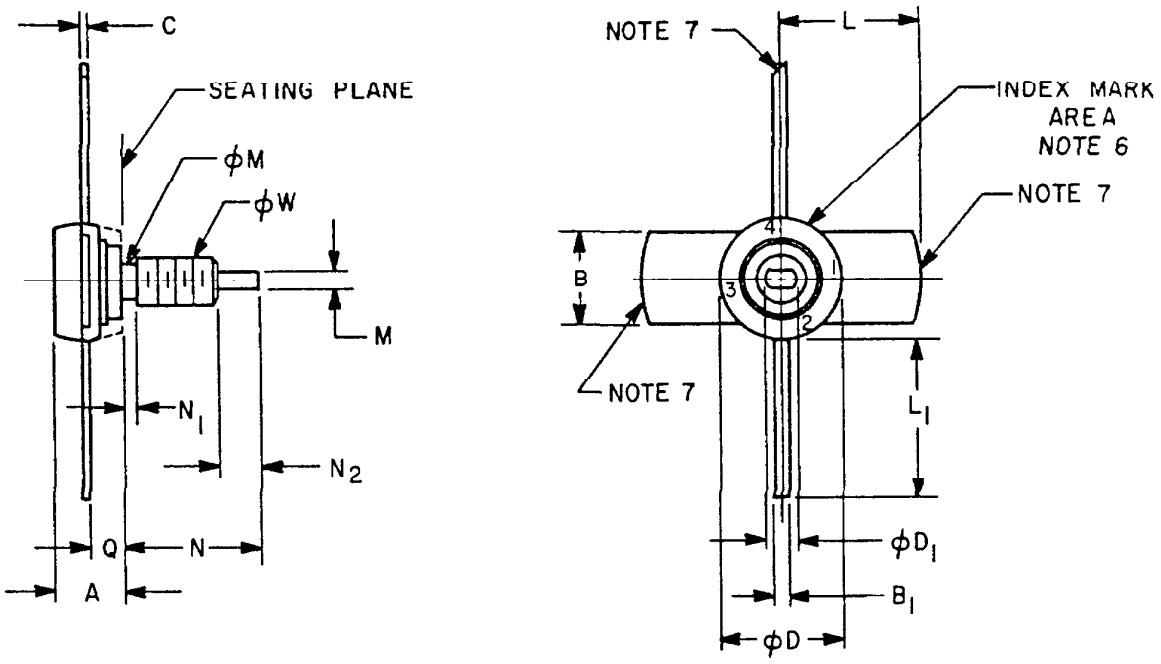
MILLIMETER DIMENSIONS ARE DERIVED FROM ORIGINAL INCH DIMENSIONS

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.280	.285	7.112	7.239	1
B	.088	.092	2.236	2.336	2
C	.014	.016	.356	.406	2
ØD	.450	.500	11.43	12.70	1
$ØD_1$	.100	.120	2.54	3.04	3
L	.480	.500	12.20	12.70	2
M	.056	.064	1.423	1.625	3
ØM	.120	.163	3.05	4.14	-
N	.440	.460	11.18	11.68	-
N_1	-	.078	-	1.98	5
N_2	.115	.145	2.93	3.68	3
Q	.160	.170	4.07	4.31	-
ØW	.1399	.1437	3.554	3.649	6

NOTES:

1. BODY CONTOUR OPTIONAL WITHIN ØD AND A. ØD MIN. APPLIES TO GREATEST BODY DIAMETER.
2. TYPICAL ALL LEADS.
3. ORIENTATION OF FLATS NOT CONTROLLED IN RELATION TO THE LEADS.
4. OMISSION OF ONE LEAD OPTIONAL. THE NUMBER AND POSITION OF LEADS ACTUALLY PRESENT ARE INDICATED IN THE PRODUCT REGISTRATIONS.
5. LENGTH OF INCOMPLETE OR UNDERCUT THREADS OF ØM.
6. PITCH DIAMETER OF 8-32 UNC-2A (COATED) THREADS (ASA B1.1-1960).
7. LEAD 4 END CONFIGURATION OPTIONAL.
8. INDEX MARK TO BE VISIBLE FROM TOP.
9. INDEX MARK OPTIONAL FOR THREE-LEAD DEVICES.

TO-129



MILLIMETER DIMENSIONS ARE DERIVED FROM ORIGINAL INCH DIMENSIONS

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.200	.230	5.08	5.84	1
B	.285	.295	7.24	7.49	-
B_1	.028	.032	.712	.812	-
C	.010	.012	.254	.304	2
ØD	.365	.370	9.271	9.398	1
$ØD_1$	.110	.129	2.80	3.27	3
L	.430	.440	10.93	11.17	-
L_1	-	.550	-	13.97	-
M	.056	.064	1.423	1.625	3
ØM	.120	.163	3.05	4.14	-
N	.440	.460	11.18	11.68	-
N_1	-	.078	-	1.98	4
N_2	.115	.145	2.93	3.68	3
Q	.110	.130	2.80	3.30	-
ØW	.1399	.1437	3.554	3.649	5

NOTES:

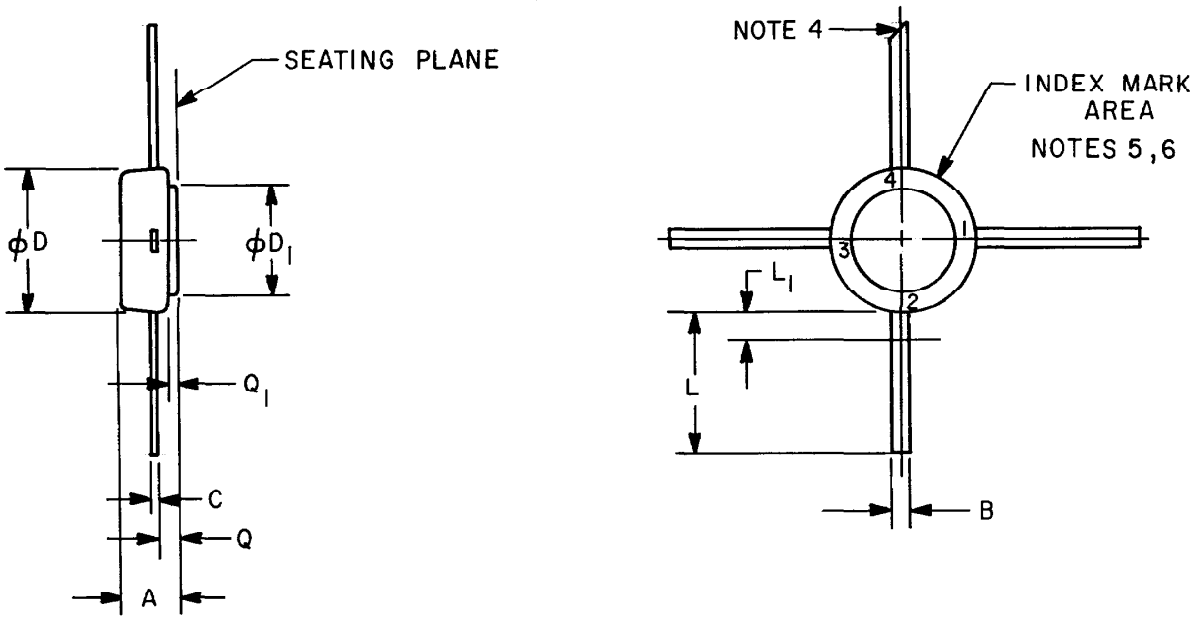
1. BODY CONTOUR OPTIONAL WITHIN ØD AND A. ØD MIN. APPLIES TO GREATEST BODY DIAMETER.
2. TYPICAL ALL LEADS.
3. ORIENTATION OF FLATS NOT CONTROLLED IN RELATION TO THE LEADS.
4. LENGTH OF INCOMPLETE OR UNDERCUT THREADS OF ØM.
5. PITCH DIAMETER OF 8-32 UNC-2A (COATED) THREADS (ASA B1.1-1960).
6. INDEX MARK TO BE VISIBLE FROM TOP.
7. LEAD END CONFIGURATION OPTIONAL.

ITEM NO. 236G

JEDEC PUBLICATION 95
REGISTERED OUTLINES FOR SEMICONDUCTOR DEVICES

OUTLINE	ISSUE	DATE
TO-129	A	MAY 1968

TO-130



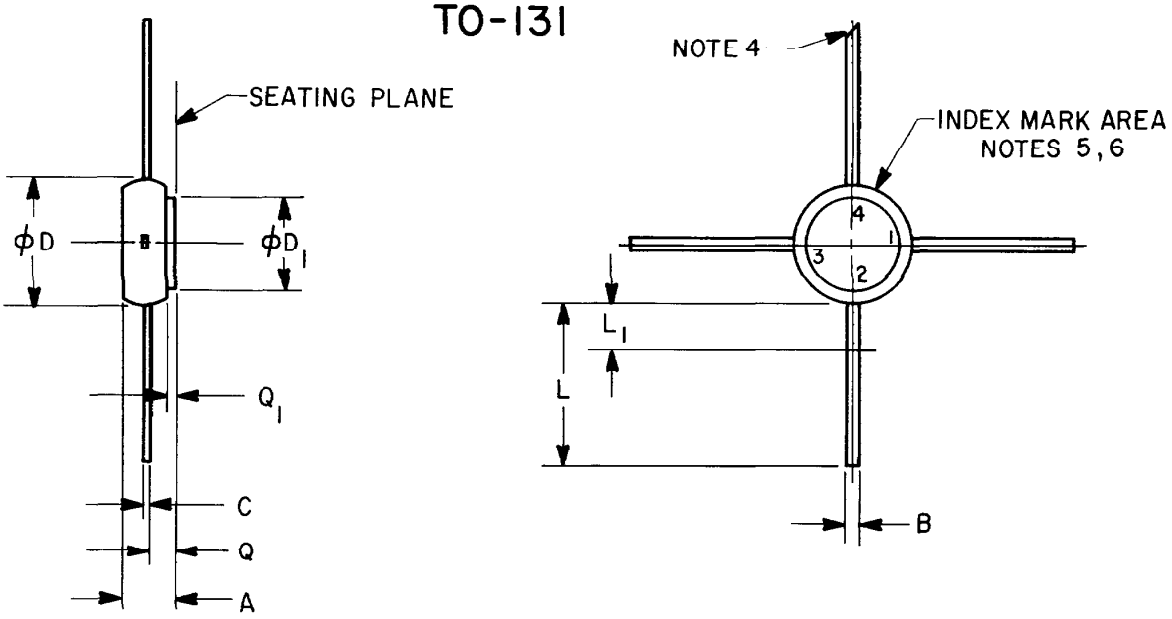
MILLIMETER DIMENSIONS ARE DERIVED FROM ORIGINAL INCH DIMENSIONS

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.170	.180	4.32	4.57	1
B	.028	.032	.712	.812	2
C	.014	.016	.356	.406	2
ØD	.400	.455	10.16	11.55	1
$ØD_1$	.320	.330	8.13	8.38	-
L	.475	.525	12.07	13.33	2,3
L_1	-	.035	-	.88	2,7
Q	.055	-	1.40	-	-
Q_1	.005	.020	.13	.50	-

NOTES:

1. BODY CONTOUR OPTIONAL WITHIN ØD AND A. ØD MIN. APPLIES TO GREATEST BODY DIAMETER.
2. TYPICAL ALL LEADS.
3. OMISSION OF ONE LEAD OPTIONAL. THE NUMBER AND POSITION OF LEADS ACTUALLY PRESENT ARE INDICATED IN THE PRODUCT REGISTRATIONS.
4. LEAD 4 END CONFIGURATION OPTIONAL.
5. INDEX MARK TO BE VISIBLE FROM TOP.
6. INDEX MARK OPTIONAL FOR THREE-LEAD DEVICES.
7. LEAD DIMENSIONS NOT CONTROLLED IN THIS ZONE TO ALLOW FOR BODY AND LEAD FINISH IRREGULARITIES.

TO-131



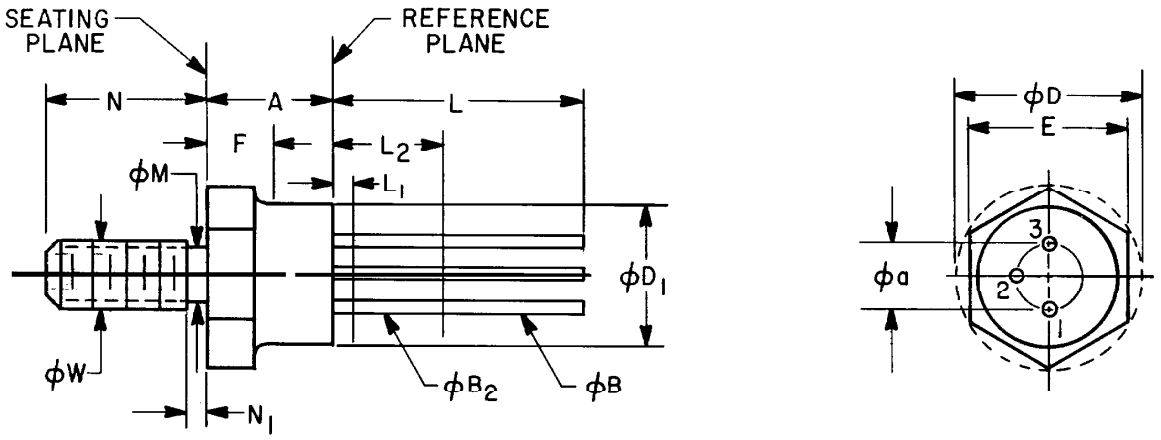
MILLIMETER DIMENSIONS ARE DERIVED FROM ORIGINAL INCH DIMENSIONS

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.145	.185	3.69	4.69	1
B	.028	.032	.712	.812	2
C	.014	.016	.356	.406	2
ØD	.355	.375	9.02	9.52	1
ØD1	.270	.285	6.86	7.23	-
L	.450	.550	11.5	13.9	2,3
L1	-	.035	-	.88	2,7
Q	.055	-	1.40	-	-
Q1	.005	.020	.13	.50	-

NOTES:

1. BODY CONTOUR OPTIONAL WITHIN ØD AND A. ØD MIN APPLIES TO GREATEST BODY DIAMETER.
2. TYPICAL ALL LEADS.
3. OMISSION OF ONE LEAD OPTIONAL. THE NUMBER AND POSITION OF LEADS ACTUALLY PRESENT ARE INDICATED IN THE PRODUCT REGISTRATIONS.
4. LEAD 4 END CONFIGURATION OPTIONAL.
5. INDEX MARK TO BE VISIBLE FROM TOP.
6. INDEX MARK OPTIONAL FOR THREE-LEAD DEVICES.
7. LEAD DIMENSIONS NOT CONTROLLED IN THIS ZONE TO ALLOW FOR BODY AND LEAD FINISH IRREGULARITIES.

TO-132

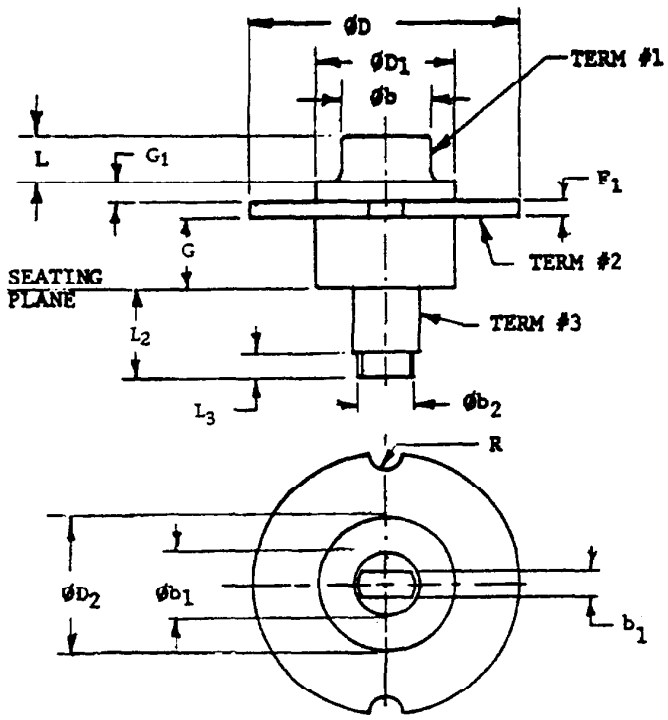


MILLIMETER DIMENSIONS ARE DERIVED FROM ORIGINAL INCH DIMENSIONS

SYMBOL	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.	NOTES
A	.300	.350	7.62	8.89	-
ØA	.200 T.P.		5.08 T.P.		1
ØB	.016	.021	.407	.533	2
$ØB_2$	.016	.019	.407	.482	2
ØD	.400	.505	10.2	12.8	-
$ØD_1$	.390	.410	9.91	10.41	-
E	.423	.438	10.75	11.12	-
F	.120	.150	3.05	3.81	-
L	.475	-	12.07	-	2
L_1	-	.050	-	1.27	2
L_2	.250	-	6.35	-	2
ØM	.163	.189	4.15	4.80	6
N	.422	.453	10.72	11.50	-
N_1	-	.078	-	1.98	6
ØW	.1658	.1697	4.212	4.310	3

NOTES:

1. LEADS SHALL BE LOCATED RELATIVE TO EACH OTHER SUCH THAT THE CROSS SECTION OF EACH LEAD HAVING A MAXIMUM DIAMETER OF .019" (.482 MM) AND MEASURED IN A GAGING PLANE .054" (1.372 MM) + .001" (.025 MM) - .000" (.000 MM) ABOVE THE REFERENCE PLANE LIES IN A CIRCLE HAVING A DIAMETER OF .033" (.84 MM) CENTERED AT THE TRUE POSITION OF THE LEAD AXIS AT ITS POINT OF EXIT. POSITION OF LEAD GROUPING IN RELATION TO THE BODY IS NOT CONTROLLED.
2. (ALL LEADS) DIAMETER IS NOT CONTROLLED IN L_1 AND BEYOND L. $ØB_2$ APPLIES BETWEEN L_1 AND L_2. ØB APPLIES BETWEEN L_2 AND L.
3. PITCH DIAMETER OF 10-32 UNF-2A (COATED) THREADS. (ASA B1.1-1960).
4. ORIENTATION OF LEAD GROUPING IN RELATION TO THE HEXAGON IS NOT CONTROLLED.
5. A CHAMFER (OR UNDERCUT) ON ONE OR BOTH ENDS OF HEXAGONAL PORTION IS OPTIONAL.
6. LENGTH OF INCOMPLETE OR UNDERCUT THREADS OF ØM.

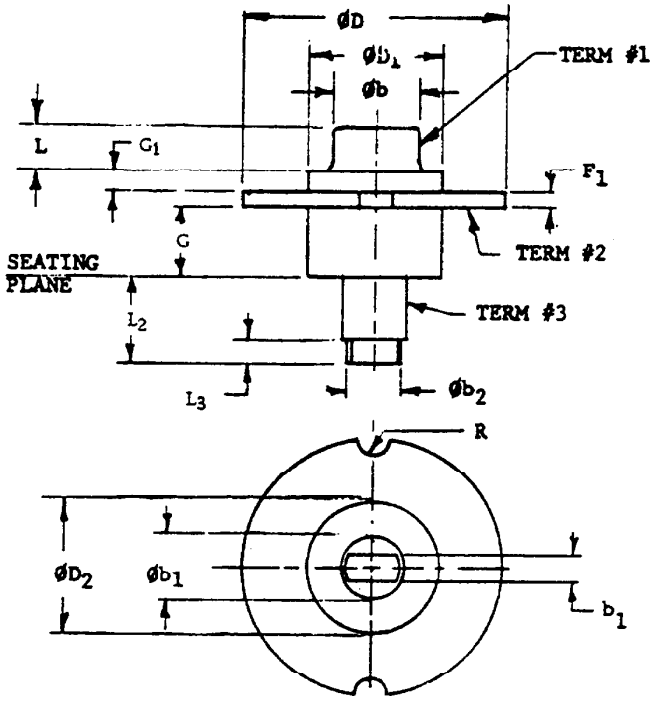


NOTES:

1. Refer to rules for dimensioning semiconductor product outlines included in Publication No. 76.

SYMBOL	VARIATIONS (ALL DIMENSIONS SHOWN IN MILLIMETERS)											
	AA		NOTE			NOTE			NOTE			NOTE
	MIN.	MAX.		MIN.	MAX.		MIN.	MAX.		MIN.	MAX.	
b_1	1.143	1.397										
Øb	4.191	4.445										
$Øb_1$	2.921	3.175										
$Øb_2$	2.29	2.79										
ØD	12.573	12.827										
$ØD_1$	6.223	6.477										
$ØD_2$	6.223	6.477										
F_1	.635	.889										
G	3.69	4.44										
G_1	1.15	1.52										
L	2.42	2.92										
L_2	4.20	4.95										
L_3	1.02	1.52										
R	.686	.838										
NOTE	1											
REF.	Item 277G											
ISSUE	B Oct. 1971											

JEDEC PUBLICATION No. 76 SEMICONDUCTOR DEVICE OUTLINES	TITLE COAXIAL FAMILY	ISSUE B	DATE Oct. 1971	TO-201 VARIATION AA THRU



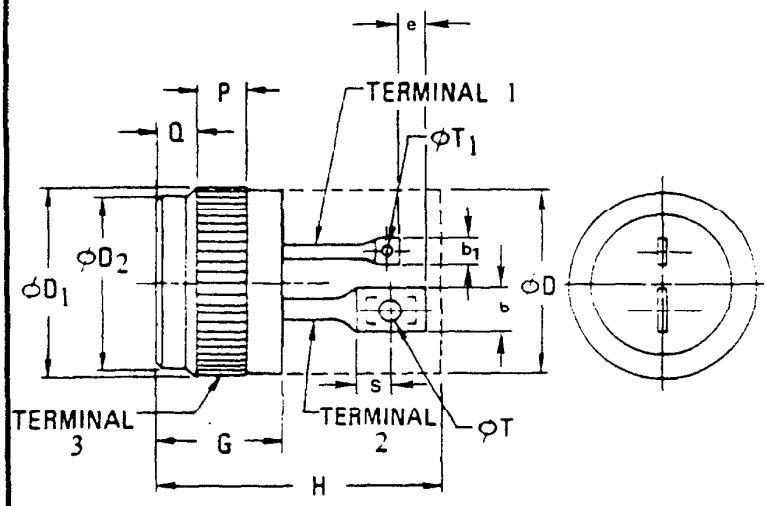
NOTES:

1. Refer to rules for dimensioning semiconductor product outlines included in Publication No. 76.

VARIATIONS (ALL DIMENSIONS SHOWN IN INCHES)

SYMBOL	AA MIN.	AA MAX.	NOTE	MIN.	MAX.	NOTE	MIN.	MAX.	NOTE	MIN.	MAX.	NOTE
b_1	.045	.055										
Øb	.165	.175										
$Øb_1$	.115	.125										
Øb2	.090	.110										
ØD	.495	.505										
$ØD_1$	.245	.255										
$ØD_2$	.245	.255										
F_1	.025	.035										
G	.145	.175										
G_1	.045	.060										
L	.095	.115										
L_2	.165	.195										
L_3	.040	.060										
R	.027	.033										
NOTE	1											
REF.	Item 277C											
ISSUE	B Oct. 1971											

JEDEC PUBLICATION No. 76 SEMICONDUCTOR DEVICE OUTLINES	TITLE COAXIAL FAMILY	ISSUE B	DATE Oct. 1971	TO-201 VARIATION AA THRU



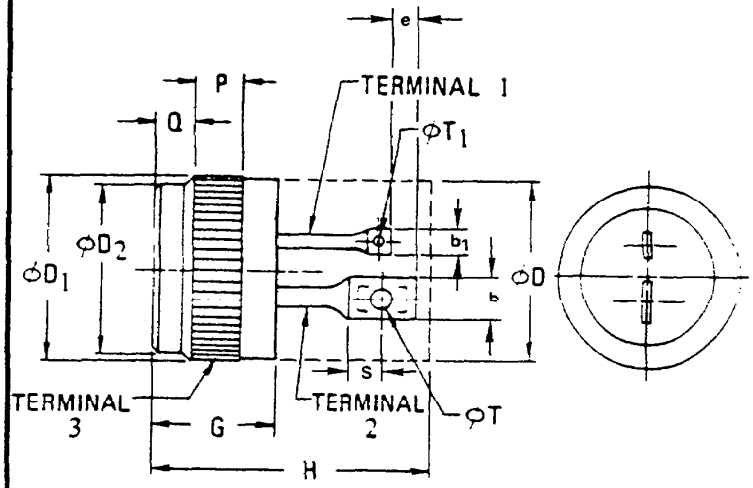
NOTES:

1. REFER TO APPLICABLE SYMBOL LIST.
2. DIMENSIONS AND TOLERANCING PER ANSI Y14.5-1973.
3. OUTLINE CONTOUR IS OPTIONAL WITHIN ZONE DEFINED BY ØD, G MIN. AND H MAX.
4. ELONGATED HOLE IN TERMINAL IS OPTIONAL.
5. CONTOUR AND ORIENTATION OF TERMINAL 1 AND TERMINAL 2 ARE NOT DEFINED.
6. STRAIGHT KNURL SURFACE.
7. TERMINAL 1 TO BE SHORTER THAN TERMINAL 2 FOR IDENTIFICATION.
8. CONTROLLING DIMENSION: INCH.
9. MINIMUM FLAT.

VARIATIONS (ALL DIMENSIONS SHOWN IN MILLIMETERS)

SYMBOL	AA		NOTE	AB		NOTE	AC		NOTE			NOTE
	MIN.	MAX.		MIN.	MAX.		MIN.	MAX.		MIN.	MAX.	
b	-	-		-	-		5.33	7.62				
b_1	-	-		-	-		-	3.56				
ØD	-	12.95	3	-	12.95	3	-	12.95	3			
$ØD_1$	12.726	12.827	6	12.726	12.827	6	12.726	12.827	6			
$ØD_2$	11.82	12.06		11.82	12.06		11.82	12.06				
e	-	-		-	-		3.18	-	7			
G	8.39	9.65		8.39	9.65		8.39	9.65				
H	-	20.32		-	27.50		-	26.49				
P	2.54	-	6	2.54	-	6	2.54	-	6			
Q	2.04	2.46		1.40	2.92		2.04	2.46				
ØT	1.66	2.28	4,5	1.66	4.19	4,5	3.18	4.19	4,5			
$ØT_1$	.89	1.72	5,7	.89	2.15	5,7	1.52	-	5,7			
s	-	-		-	-		3.05	-	9			
NOTE	1,2,8			1,2,8			1,2,8					
REF.												
ISSUE	A OCTOBER 1970											

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE PRESS FIT FAMILY	ISSUE C	DATE 10/18/77	TO-203 VARIATION AA-AC



NOTES:

1. REFER TO APPLICABLE SYMBOL LIST.
2. DIMENSIONS AND TOLERANCING PER ANSI Y14.5-1973.
3. OUTLINE CONTOUR IS OPTIONAL WITHIN ZONE DEFINED BY ØD, G MIN. AND H MAX.
4. ELONGATED HOLE IN TERMINAL IS OPTIONAL.
5. CONTOUR AND ORIENTATION OF TERMINAL 1 AND TERMINAL 2 ARE NOT DEFINED.
6. STRAIGHT KNURL SURFACE.
7. TERMINAL 1 TO BE SHORTER THAN TERMINAL 2 FOR IDENTIFICATION.
8. CONTROLLING DIMENSION: INCH.
9. MINIMUM FLAT.

VARIATIONS (ALL DIMENSIONS SHOWN IN INCHES)

SYMBOL	AA MIN.	AA MAX.	NOTE	AB MIN.	AB MAX.	NOTE	AC MIN.	AC MAX.	NOTE	MIN.	MAX.	NOTE
b	-	-		-	-		.210	.300	5			
b_1	-	-		-	-		-	.140				
ØD	-	.510	3	-	.510	3	-	.510	3			
$ØD_1$	.501	.505	6	.501	.505	6	.501	.505	6			
$ØD_2$	.465	.475		.465	.475		.465	.475				
e	-	-		-	-		.125	-	7			
G	.330	.380		.330	.380		.330	.380				
H	-	.800		-	1.083		-	1.043				
P	.100	-	6	.100	-	6	.100	-	6			
Q	.080	.097		.055	.115		.080	.097				
ØT	.065	.090	4,5	.065	.165	4,5	.125	.165	4,5			
$ØT_1$	.035	.068	5,7	.035	.085	5,7	.060	-	5,7			
S	-	-		-	-		.120	-	9			
NOTE	1,2,8			1,2,8			1,2,8					
REF.												
ISSUE	A OCTOBER 1970			A JANUARY 1977								

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE PRESS FIT FAMILY	ISSUE C	DATE 10/18/77	TO-203 VARIATION AA THRU

NOTES:

1. REFER TO APPLICABLE SYMBOL LIST.
2. DIMENSIONING & TOLERANCING PER ANSI Y14.5-1973.
3. TERMINAL 3 MAY BE FLATTENED AND PIERCED OR HOOK TYPE.
4. POSITION OF LEADS IN RELATION TO THE HEXAGON IS NOT CONTROLLED.
5. FIGURE "A" APPLICABLE.
6. FIGURE "B" APPLICABLE.
7. PACKAGE CONTOUR OPTIONAL WITHIN DIMENSIONS SPECIFIED.
8. COATED THREADS SHALL MEET THE REQUIREMENTS OF ANSI B1.1-1960.
9. LENGTH OF INCOMPLETE OR UNDERCUT THREADS AT ØM.
10. CONTROLLING DIMENSION: INCH.

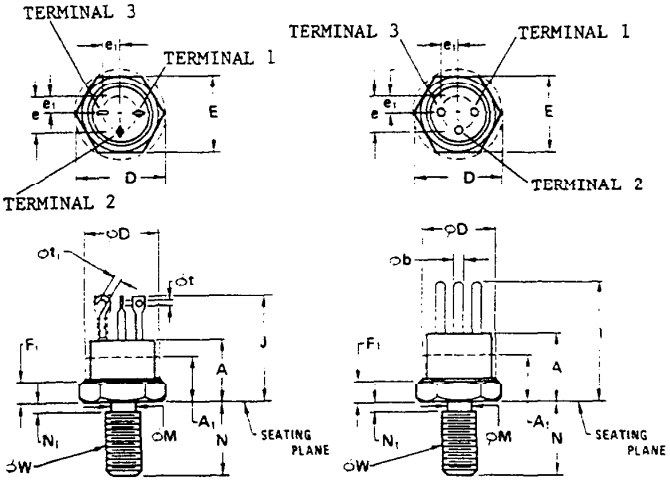


FIGURE "A"

FIGURE "B"

VARIATIONS (ALL DIMENSIONS SHOWN IN MILLIMETERS)

SYMBOL	AA MIN.	AA MAX.	NOTE	AB MIN.	AB MAX.	NOTE	AC MIN.	AC MAX.	NOTE	AD MIN	AD MAX.	NOTE
A	8.2	11.8		5.5	8.1		8.3	11.6		9.15	11.02	
A_1	--	6.35	7	--	4.19	7	--	6.85	7	--	6.85	7
Øb	--	--		.77	1.16		--	--		--	--	
D	11.16	12.82		10.57	12.82		17.91	20.14		12.7	16.4	
ØD	9.66	11.09	7	9.15	11.09	7	15.50	17.44	7	11.0	14.2	7
E	10.77	11.09		10.77	11.09		16.95	17.44		13.82	14.27	
e	4.70	5.46	4	4.70	5.46	4	8.64	10.54	4	5.97	6.73	4
e_1	2.29	2.79	4	2.29	2.79	4	4.32	5.41	4	2.93	3.42	4
F_1	2.29	3.81		2.29	3.42		2.29	3.81		2.29	3.81	
J	14.5	19.3		9.1	12.1		16.3	22.2		17.45	18.71	
ØM	4.15	4.80		4.15	4.80		5.59	6.32		4.15	4.80	
N	10.16	11.55		9.53	11.55		10.72	11.55		10.24	12.64	
N_1	--	1.98	9	--	1.98	9	--	2.28	9	--	1.98	9
Øc	1.02	1.65		--	--		1.20	1.82		1.07	1.80	
$Øt_1$	1.15	1.77	3	--	--		1.17	1.95	3	1.17	1.75	3
ØW	10-32 UNF-2A		8	10-32 UNF-2A		8	1/4-28 UNF-2A		8	10-32 UNF-2A		8
NOTE	1,2,5,10			1,2,6,10			1,2,5,10			1,2,5,10		
REF.	TO-59			TO-60			TO-61			TO-62		
ISSUE	A SEPT 76			A SEPT 76			A SEPT 76			A SEPT 76		

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE: STUD HEX BASE FAMILY (SOLID TERMINALS)	ISSUE: A	DATE: 9/7/76	TO-210 VARIATION AA THRU AD

NOTES:

1. REFER TO APPLICABLE SYMBOL LIST.
2. DIMENSIONING AND TOLERANCING PER ANSI Y14.5 - 1973.
3. TERMINAL 3 MAY BE FLATTENED AND PIERCED OR HOOK TYPE.
4. POSITION OF LEADS IN RELATION TO THE HEXAGON IS NOT CONTROLLED.
5. FIGURE "A" APPLICABLE.
6. FIGURE "B" APPLICABLE.
7. PACKAGE CONTOUR OPTIONAL WITHIN DIMENSIONS SPECIFIED.
8. COATED THREADS SHALL MEET THE REQUIREMENTS OF ANSI B1.1-1960.
9. LENGTH OF INCOMPLETE OR UNDERCUT THREADS AT ØM.
10. CONTROLLING DIMENSION: INCH

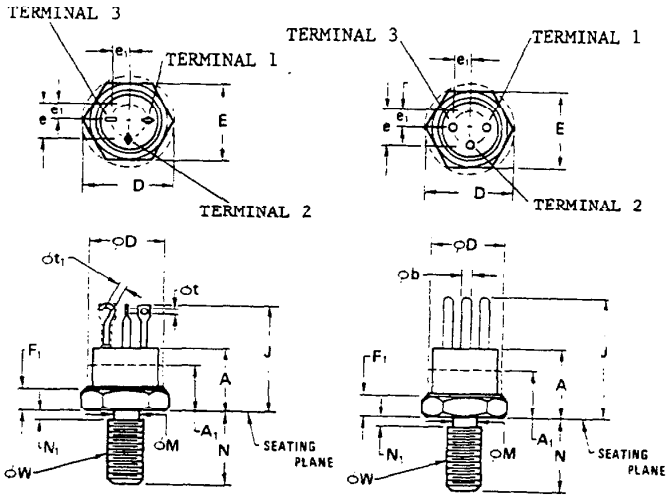
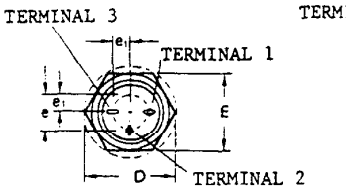


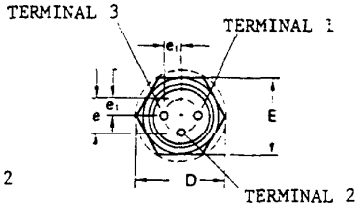
FIGURE "A" FIGURE "B"

VARIATIONS (ALL DIMENSIONS SHOWN IN INCHES)

SYMBOL	AA MIN.	AA MAX.	NOTE	AB MIN.	AB MAX.	NOTE	AC MIN.	AC MAX.	NOTE	AD MIN.	AD MAX.	NOTE
A	.320	.468		.215	.320		.325	.460		.360	.434	
A_1	-	.250	7	-	.165	7	-	.270	7	-	.270	7
Øb	-	-		.030	.046		-	-		-	-	
D	.439	.505		.416	.505		.705	.793		.497	.649	
ØD	.380	.437	7	.360	.437	7	.610	.687	7	.430	.562	7
E	.424	.437		.424	.437		.667	.687		.544	.562	
e	.185	.215	4	.185	.215	4	.340	.415	4	.235	.265	4
e_1	.090	.110	4	.090	.110	4	.170	.213	4	.115	.135	4
F_1	.090	.150		.090	.135		.090	.150		.090	.150	
J	.570	.763		.355	.480		.640	.875		.687	.737	
ØM	.163	.189		.163	.189		.220	.249		.163	.189	
N	.400	.455		.375	.455		.422	.455		.403	.498	
N_1	-	.078	9	-	.078	9	-	.090	9	-	.078	9
ØT	.040	.065		-	-		.047	.072		.042	.071	
ØT1	.045	.070	3	-	-		.046	.077	3	.046	.069	3
ØW	10-32 UNF-2A		8	10-32 UNF-2A		8	1/4-28 UNF-2A		8	10-32 UNF-2A		8
NOTE	1, 2, 5, 10			1, 2, 6, 10			1, 2, 5, 10			1, 2, 5, 10		
REF.	TO-59			TO-60			TO-61			TO-62		
ISSUE	A SEPT 76			A SEPT 76			A SEPT 76			A SEPT 76		

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE STUD HEX BASE FAMILY (SOLID TERMINALS)	ISSUE A	DATE 9/7/76	TO-210 VARIATION AA THRU AD





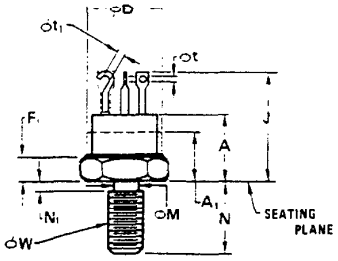


FIGURE "A"

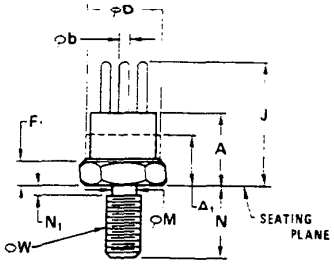


FIGURE "B"

NOTES:

1. REFER TO APPLICABLE SYMBOL LIST.
2. DIMENSIONING AND TOLERANCING PER ANSI Y14.5 - 1973.
3. TERMINAL 3 MAY BE FLATTENED AND PIERCED OR HOOK TYPE.
4. POSITION OF LEADS IN RELATION TO THE HEXAGON IS NOT CONTROLLED.
5. FIGURE "A" APPLICABLE.
6. FIGURE "B" APPLICABLE.
7. PACKAGE CONTOUR OPTIONAL WITHIN DIMENSIONS SPECIFIED.
8. COATED THREADS SHALL MEET THE REQUIREMENTS OF ANSI B1.1-1960.
9. LENGTH OF INCOMPLETE OR UNDERCUT THREADS AT ØM.
10. CONTROLLING DIMENSION: INCH

VARIATIONS (ALL DIMENSIONS SHOWN IN MILLIMETERS)

SYMBOL	AE MIN.	AE MAX.	NOTE			NOTE			NOTE			NOTE
A	12.20	13.58										
A_1	--	7.62	7									
Øb	--	--										
D	22.8	25.6										
ØD	19.7	22.2	7									
E	21.72	22.22										
e	12.32	13.08	4									
e_1	6.10	6.60	4									
F_1	2.29	4.24										
J	23.80	26.16										
ØM	7.07	7.92										
N	11.69	12.57										
N_1	--	2.66	9									
ØT	1.53	2.66										
$ØT_1$	1.53	2.66	3									
ØW	5/16-24 UNF-2A		8									
NOTE	1,2,5,10											
REF.	TO-63											
ISSUE	A SEPT 76											

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE STUD HEX BASE FAMILY (SOLID TERMINALS)	ISSUE A	DATE 9/7/76	TO-210 VARIATION AE

NOTES:

1. REFER TO APPLICABLE SYMBOL LIST.
2. DIMENSIONING & TOLERANCING PER ANSI Y14.5-1973.
3. TERMINAL 3 MAY BE FLATTENED AND PIERCED OR HOOK TYPE.
4. POSITION OF LEADS IN RELATION TO THE HEXAGON IS NOT CONTROLLED.
5. FIGURE "A" APPLICABLE.
6. FIGURE "B" APPLICABLE.
7. PACKAGE CONTOUR OPTIONAL WITHIN DIMENSIONS SPECIFIED.
8. COATED THREADS SHALL MEET THE REQUIREMENTS OF ANSI B1.1-1960.
9. LENGTH OF INCOMPLETE OR UNDERCUT THREADS AT ØM.
10. CONTROLLING DIMENSION: INCH.

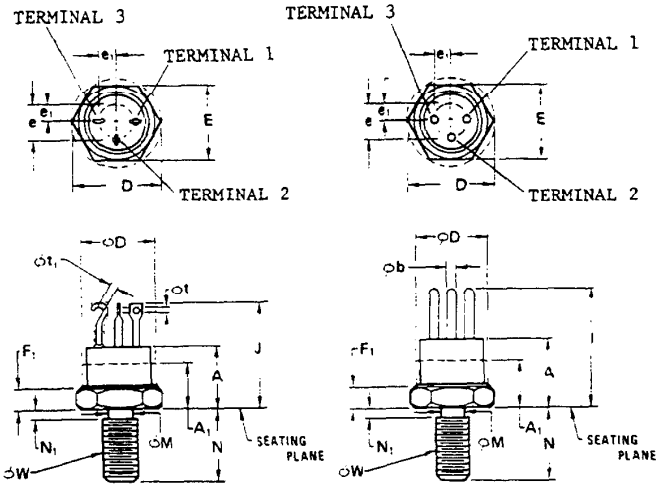
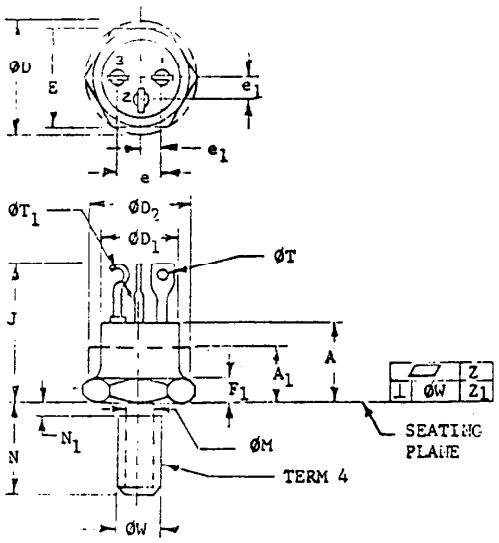


FIGURE "A" FIGURE "B"

VARIATIONS (ALL DIMENSIONS SHOWN IN INCHES)

SYMBOL	AE MIN.	AE MAX.	NOTE			NOTE			NOTE			NOTE
A	.480	.535										
A_1	-	.300	7									
øb	-	-										
D	.895	1.010										
øD	.775	.875	7									
E	.855	.875										
e	.485	.515	4									
e_1	.240	.260	4									
F_1	.090	.167										
J	.937	1.030										
øM	.278	.312										
N	.460	.495										
N_1	-	.105	9									
øT	.060	.105										
øT1	.060	.105	3									
øW	5/16-24 UNF-2A		8									
NOTE	1, 2, 5, 10											
REF.	TO-63											
ISSUE	A SEPT 76											

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE STUD HEX BASE FAMILY (SOLID TERMINALS)	ISSUE A	DATE 9/7/76	TO-210 VARIATION AE



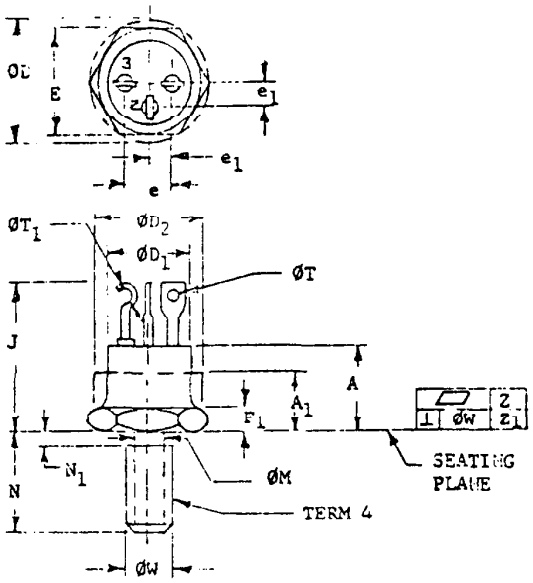
NOTES:

1. Refer to rules for dimensioning semiconductor product outlines included in Publication No. 76.
2. Chamfer or undercut on one or both ends of hexagonal portion is optional.
3. The device contour with the exception of the hexagon is optional within cylinder defined by $ØD_2$ and A_1, $ØD_2$ not to exceed actual E.
4. Terminal 3 can be flattened and pierced or hook type.
5. Angular orientation of terminals with respect to hexagon is optional.
6. ØW is pitch diameter of coated threads. Ref: Screw Thread Standards for Federal Services, Handbook H28, Part I.

VARIATIONS (ALL DIMENSIONS SHOWN IN MILLIMETERS)

SYMBOL	MA MIN.	MA MAX.	NOTE	MB MIN.	MB MAX.	NOTE			NOTE			NOTE
A	8.26	11.68		12.20	13.58							
A_1	—	6.85	3	—	7.62	3						
ØD	—	20.16		—	25.65							
$ØD_1$	14.48	15.49		18.93	19.68							
$ØD_2$	15.50	17.44	3	19.69	22.22	3						
E	17.00	17.47		21.52	22.22							
e	8.64	10.54	5	12.32	13.08	5						
e_1	4.32	5.41	5	6.10	6.60	5						
F_1	2.29	3.81	2	2.29	4.24	2						
J	16.26	22.22		23.80	26.16							
ØM	5.59	6.32		7.07	7.92							
N	10.72	11.55		11.69	12.57							
N_1	—	2.28		—	2.66							
ØT	1.20	1.82		1.53	2.66							
$ØT_1$	1.17	1.95	4	1.53	2.66	4						
ØW	1/4-28UNF-2A		6	5/16-24UNF-2A		6						
Z	—	.050		—	.050							
Z_1	—	.152		—	.152							
NOTE	1, 2, 3, 4, 5			1, 2, 3, 4, 5								
REF.	TO-61			TO-63								
ISSUE	A MARCH, 1971			A MARCH, 1971								

JEDEC SEMICONDUCTOR DEVICE OUTLINES	TITLE STUD HEX BASE FAMILY (SOLID LEADS)	ISSUE A	DATE MAR. 1971	TO-211MA-MB



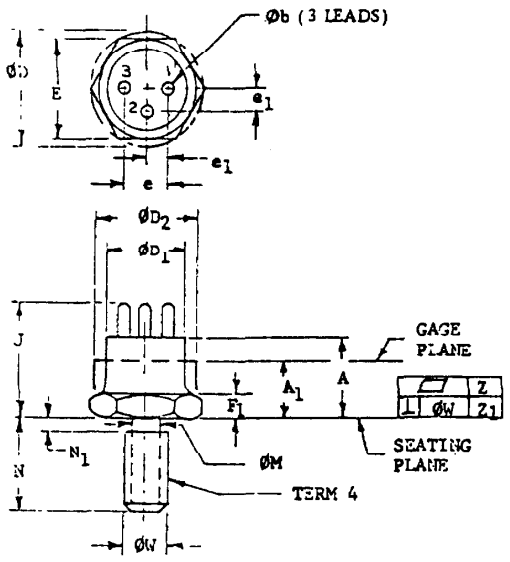
NOTES:

1. Refer to rules for dimensioning semiconductor product outlines included in Publication No. 76.
2. Chamfer or undercut on one or both ends of hexagonal portion is optional.
3. The device contour with the exception of the hexagon is optional within cylinder defined by $ØD_2$ and A_1. $ØD_2$ not to exceed actual E.
4. Terminal 3 can be flattened and pierced or hook type.
5. Angular orientation of terminals with respect to hexagon is optional.
6. ØW is pitch diameter of coated threads. Ref: Screw Thread Standards for Federal Services, Handbook H28, Part I.

VARIATIONS (ALL DIMENSIONS SHOWN IN INCHES)

SYMBOL	MA MIN.	MA MAX.	NOTE	MB MIN.	MB MAX.	NOTE			NOTE			NOTE
A	.325	.460		.480	.535							
A_1	—	.270	3	—	.300	3						
ØD	—	.794		—	1.010							
$ØD_1$	.570	.610		.745	.775							
$ØD_2$	.610	.687	3	.775	.875	3						
E	.669	.688		.847	.875							
e	.340	.415	5	.485	.515	5						
e_1	.170	.213	5	.240	.260	5						
F_1	.090	.150	2	.090	.167	2						
J	.640	.875		.937	1.030							
ØM	.220	.249		.278	.312							
N	.422	.455		.460	.495							
N_1	—	.090		—	.105							
ØT	.047	.072		.060	.105							
$ØT_1$	.046	.077	4	.060	.105	4						
øW	1/4-28 UNF-2A		6	5/16-24 UNF-2A		6						
Z	—	.002		—	.002							
Z_1	—	.006		—	.006							
NOTE	1, 2, 3, 4, 5			1, 2, 3, 4, 5								
REF.	TO-61			TO-63								
ISSUE	A MARCH, 1971			A MARCH, 1971								

JEDEC SEMICONDUCTOR DEVICE OUTLINES	TITLE STUD HEX BASE FAMILY (SOLID LEADS)	ISSUE A	DATE MAR 1971	TO-211MA-MB



NOTES:

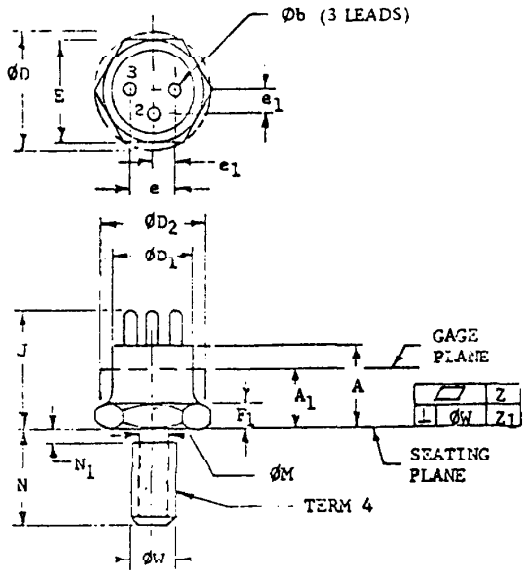
1. Refer to rules for dimensioning semiconductor product outlines in Publication No. 76.
2. Chamfer or undercut on one or both ends of hexagonal portion is optional.
3. The device contour with the exception of the hexagon is optional within cylinder defined by $ØD_2$ and A_1, $ØD_2$ not to exceed actual E.
4. Angular orientation of terminals with respect to hexagon is optional.
5. Pins within .203 DIA of True Position (TP) at Maximum Material Condition (MMC) relative to $ØD_1$ at MMC and $ØD_2$ at MMC.
6. ØW is pitch diameter of coated threads. Ref: Screw Thread Standards for Federal Services, Handbook H28 Part I.

VARIATIONS (ALL DIMENSIONS SHOWN IN MILLIMETERS)

SYMBOL	MA MIN.	MA MAX.	NOTE			NOTE			NOTE			NOTE
A	5.47	8.12										
A_1	—	4.19	3									
Øb	.889	1.143										
ØD	—	12.82										
$ØD_1$	8.13	9.14										
$ØD_2$	9.15	11.09	3									
E	10.75	11.12										
e	5.080 TP		4, 5									
e1	2.540 TP		4, 5									
F_1	2.93	3.42	2									
J	9.78	11.55										
ØM	4.15	4.80										
N	10.72	11.55										
N_1	—	1.98										
ØW	10-32 UNF-2A		6									
Z	—	.050										
Z_1	—	.152										

NOTE	1, 2, 3, 4
REF.	TO-60
ISSUE	A MARCH, 1971

JEDEC SEMICONDUCTOR DEVICE OUTLINES	TITLE STUD HEX BASE FAMILY (SOLID LEADS)	ISSUE A	DATE MAR. 1971	**TO-212MA**



NOTES:

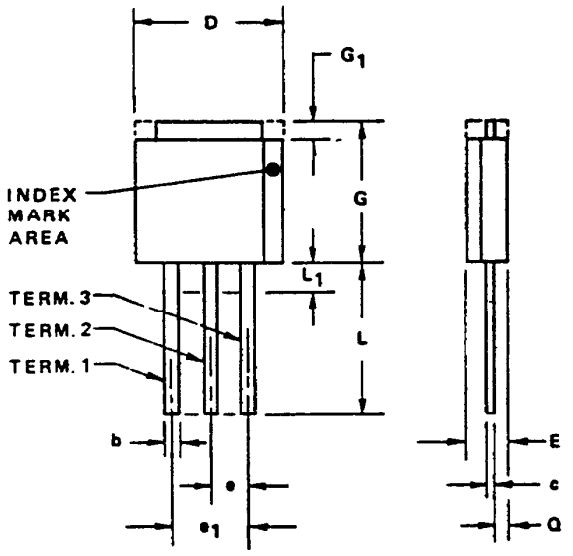
1. Refer to rules for dimensioning semiconductor product outlines in Publication No. 76.
2. Chamfer or undercut on one or both ends of hexagonal portion is optional.
3. The device contour with the exception of the hexagon is optional within cylinder defined by $ØD_2$ and A_1. $ØD_2$ not to exceed actual *E*.
4. Angular orientation of terminals with respect to hexagon is optional.
5. Pins within .008 DIA of True Position (TP) at Maximum Material Condition (MMC) relative to $ØD_1$ at MMC and $ØD_2$ at MMC.
6. ØW is pitch diameter of coated threads. Ref: Screw Thread Standards for Federal Services, Handbook H28 Part I.

VARIATIONS (ALL DIMENSIONS SHOWN IN INCHES)

SYMBOL	MA MIN.	MA MAX.	NOTE			NOTE			NOTE			NOTE
A	.215	.320										
A_1	—	.165	3									
Øb	.035	.045										
ØD	—	.505										
$ØD_1$	.320	.360										
$ØD_2$	.360	.437	3									
E	.423	.438										
e	.200 TP		4, 5									
e_1	.100 TP		4, 5									
F_1	.115	.135	2									
J	.385	.455										
ØM	.163	.189										
N	.422	.455										
N_1	—	.078										
ØW	10-32 UNF-2A		6									
Z	—	.002										
Z_1	—	.006										

NOTE	1, 2, 3, 4
REF.	TO-60
ISSUE	A MARCH, 1971

JEDEC SEMICONDUCTOR DEVICE OUTLINES	TITLE STUD HEX BASE FAMILY (SOLID LEADS)	ISSUE A	DATE MAR. 1971	TO-212MA



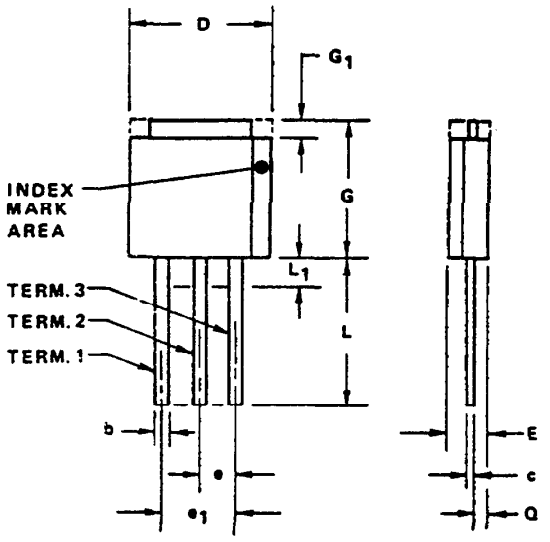
NOTES:

1. REFER TO APPLICABLE SYMBOL LIST.
2. DIMENSIONING AND TOLERANCING PER ANSI Y14.5-1966.
3. LEAD DIMENSIONS UNCONTROLLED IN THIS ZONE TO ALLOW FOR BODY AND LEAD IRREGULARITIES.
4. LEAD SPACING TO BE MEASURED BETWEEN 3.175 AND 3.810 FROM THE POINT OF EMERGENCE FROM THE BODY.
5. CONTROLLING DIMENSIONS: INCH.
6. MILLIMETER DIMENSIONS ARE TAKEN TO THE SAME NUMBER OF PLACES BEYOND THE DECIMAL POINT AS THE CORRESPONDING INCH DIMENSIONS. MAXIMUM CONVERSION ERROR IS NO MORE THAN .02 TIMES THE SMALLEST UNIT VALUE OF CORRESPONDING INCH DIMENSIONS.

VARIATIONS (ALL DIMENSIONS SHOWN IN MILLIMETERS)

SYMBOL	AA MIN.	AA MAX.	NOTE	AB MIN.	AB MAX.	NOTE			NOTE			NOTE
b	1.143	1.397		.585	.736							
c	.254	.660		.254	.660							
D	9.144	10.160		9.144	10.160							
E	3.048	4.826		3.048	4.826							
e	2.413	2.667	4	2.413	2.667	4						
e_1	4.826	5.334	4	4.826	5.334	4						
G	5.588	9.398		5.588	9.398							
G_1	--	1.270		--	1.270							
L	9.424	13.208		9.424	13.208							
L_1	--	2.540	3	--	2.540	3						
J	.991	1.930		.991	1.930							
NOTE	1,2,5,6			1,2,5,6								
REF.												
ISSUE	A June 1974			A June 1974								

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE FLAT MOUNTED FAMILY PERIPHERAL LEADS	ISSUE A	DATE June 1974	TO-221AA-AB



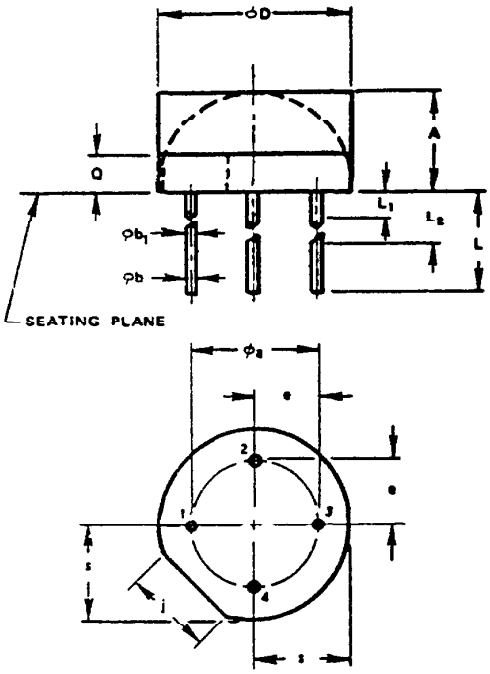
NOTES:

1. REFER TO APPLICABLE SYMBOL LIST.
2. DIMENSIONING AND TOLERANCING PER ANSI Y14.5-1966.
3. LEAD DIMENSIONS UNCONTROLLED IN THIS ZONE TO ALLOW FOR BODY AND LEAD IRREGULARITIES.
4. LEAD SPACING TO BE MEASURED BETWEEN .125 AND .150 FROM THE POINT OF EMERGENCE FROM THE BODY.
5. CONTROLLING DIMENSIONS: INCH.

VARIATIONS (ALL DIMENSIONS SHOWN IN INCHES)

SYMBOL	AA MIN.	AA MAX.	NOTE	AB MIN.	AB MAX.	NOTE			NOTE			NOTE
b	.045	.055		.023	.029							
c	.010	.026		.010	.026							
D	.360	.400		.360	.400							
E	.120	.190		.120	.190							
e	.095	.105	4	.095	.105	4						
e_1	.190	.210	4	.190	.210	4						
G	.220	.370		.220	.370							
G_1	--	.050		--	.050							
L	.371	.520		.371	.520							
L_1	--	.100	3	--	.100	3						
J	.039	.076		.039	.076							
NOTE	1,2,5			1,2,5								
REF.												
ISSUE	A June 1974			A June 1974								

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE: FLAT MOUNTED FAMILY PERIPHERAL LEADS	ISSUE: A	DATE: June 1974	TO-221AA-AB



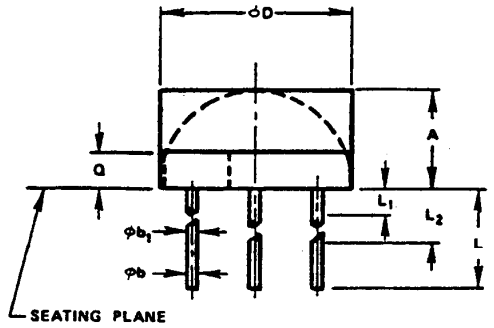
NOTES:

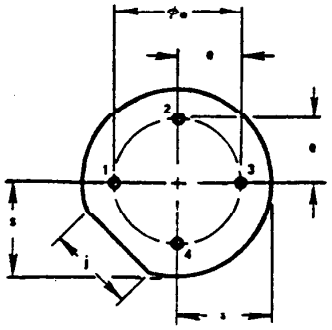
1. REFER TO APPLICABLE SYMBOL LIST.
2. DIMENSIONING AND TOLERANCING PER ANSI Y14.5-1966.
3. LEAD NUMBER 4 OMITTED IN THIS OUTLINE.
4. BODY CONTOUR OPTIONAL BEYOND Q MIN., BUT MUST BE WITHIN øD AND A.
5. $ø b_1$ APPLIES BETWEEN L_1 AND L_2. øb APPLIES BETWEEN L_2 AND L. DIAMETER IS UNCONTROLLED IN L_1 AND BEYOND L MIN.
6. CONTROLLING DIMENSIONS: INCH.
7. MILLIMETER DIMENSIONS ARE TAKEN TO THE SAME NUMBER OF PLACES BEYOND THE DECIMAL POINT AS THE CORRESPONDING INCH DIMENSIONS. MAXIMUM CONVERSION ERROR IS NO MORE THAN .02 TIMES THE SMALLEST UNIT VALUE OF CORRESPONDING INCH DIMENSIONS.

VARIATIONS (ALL DIMENSIONS SHOWN IN MILLIMETERS)

SYMBOL	AA MIN.	AA MAX.	NOTE	AB MIN.	AB MAX.	NOTE			NOTE			NOTE
A	3.048	6.096		3.048	6.096							
øa	4.826	5.334		4.826	5.334							
øb	.407	.533	5	.407	.533	5						
$ø b_1$	.407	.482	5	.407	.482	5						
øD	7.747	8.255		7.747	8.255							
e	2.286	2.794		2.286	2.794							
j	2.032	4.064		2.032	4.064							
L	12.700	15.875	5	12.700	15.875	5						
L_1	--	1.270	5	--	1.270	5						
L_2	6.350	--	5	6.350	--	5						
Q	1.524	--	4	1.524	--	4						
s	3.683	4.191		3.683	4.191							
NOTE	1,2,6,7			1,2,3,6,7								
REF.												
ISSUE	A June 1974			A June 1974								

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE HEADER FAMILY (5.080 PIN CIRCLE)	ISSUE	DATE	TO-222AA-AB





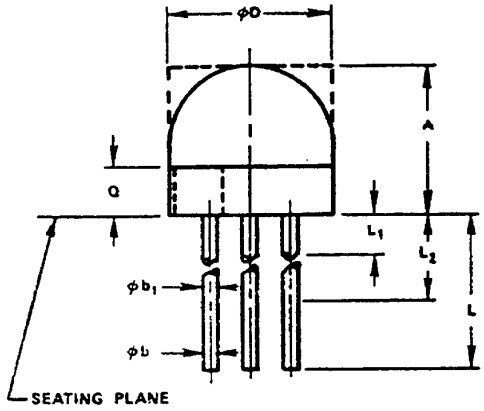
NOTES:

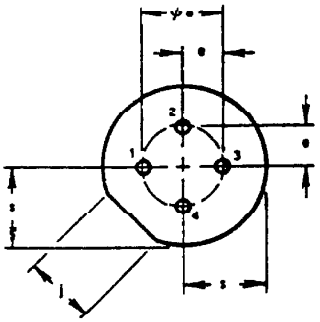
1. REFER TO APPLICABLE SYMBOL LIST.
2. DIMENSIONING AND TOLERANCING PER ANSI Y14.5-1966.
3. LEAD NUMBER 4 OMITTED IN THIS OUTLINE.
4. BODY CONTOUR OPTIONAL BEYOND Q MIN. BUT MUST BE WITHIN øD AND A.
5. $ø b_1$ APPLIES BETWEEN L_1 AND L_2. øb APPLIES BETWEEN L_2 AND L. DIAMETER IS UNCONTROLLED IN L_1 AND BEYOND L MIN.
6. CONTROLLING DIMENSIONS: INCH.

VARIATIONS (ALL DIMENSIONS SHOWN IN INCHES)

SYMBOL	AA MIN.	AA MAX.	NOTE	AB MIN.	AB MAX.	NOTE			NOTE			NOTE
A	.120	.240		.120	.240							
øa	.190	.210		.190	.210							
øb	.016	.021	5	.016	.021	5						
$ø b_1$	.016	.019	5	.016	.019	5						
øD	.305	.325		.305	.325							
e	.090	.110		.090	.110							
j	.080	.160		.080	.160							
L	.500	.625	5	.500	.625	5						
L_1	--	.050	5	--	.050	5						
L_2	.250	--	5	.250	--	5						
Q	.060	--	4	.060	--	4						
s	.145	.165		.145	.165							
NOTE	1,2,6			1,2,3,6								
REF.												
ISSUE	A June 1974			A June 1974								

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE HEADER FAMILY (.200 PIN CIRCLE)	ISSUE A	DATE June 1974	TO-222AA-AB





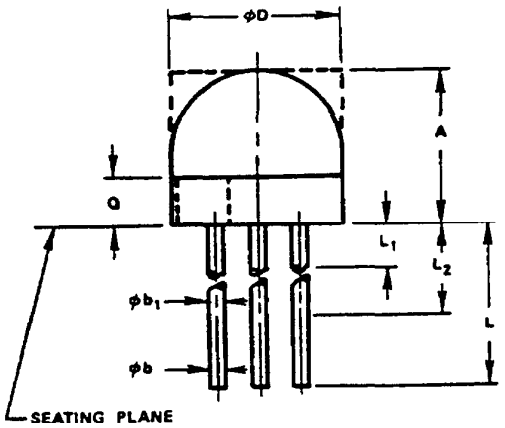
NOTES:

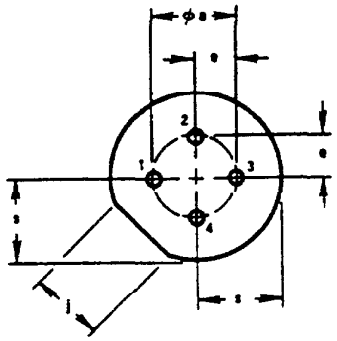
1. REFER TO APPLICABLE SYMBOL LIST.
2. DIMENSIONING AND TOLERANCING PER ANSI Y14.5, 1966.
3. LEAD NUMBER 4 OMITTED IN THIS OUTLINE.
4. BODY CONTOUR OPTIONAL BEYOND Q MIN., BUT MUST BE WITHIN φD AND A.
5. ϕb_1 APPLIES BETWEEN L_1 AND L_2. φb APPLIES BETWEEN L_2 AND L. DIAMETER IS UNCONTROLLED IN L_1 AND BEYOND L MIN.
6. CONTROLLING DIMENSIONS: INCH.
7. MILLIMETER DIMENSIONS ARE TAKEN TO THE SAME NUMBER OF PLACES BEYOND THE DECIMAL POINT AS THE CORRESPONDING INCH DIMENSIONS. MAXIMUM CONVERSION ERROR IS NO MORE THAN .02 TIMES THE SMALLEST UNIT VALUE OF CORRESPONDING INCH DIMENSIONS.

VARIATIONS (ALL DIMENSIONS SHOWN IN MILLIMETERS)

SYMBOL	AA MIN.	AA MAX.	NOTE	AB MIN.	AB MAX.	NOTE			NOTE			NOTE
A	3.048	6.096		3.048	6.096							
φa	2.413	2.667		2.413	2.667							
φb	.407	.533	5	.407	.533	5						
ϕb_1	.407	.482	5	.407	.482	5						
φD	4.877	5.638		4.877	5.638							
e	1.143	1.397		1.143	1.397							
j	1.905	2.540		1.905	2.540							
L	12.700	15.875	5	12.700	15.875	5						
L_1	--	1.270	5	--	1.270	5						
L_2	6.350	--	5	6.350	--	5						
Q	1.524	--	4	1.524	--	4						
s	2.032	2.921		2.032	2.921							
NOTE	1,2,6,7			1,2,3,6,7								
REF.												
ISSUE	A June 1974			A June 1974								

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE HEADER FAMILY (2.540 PIN CIRCLE)	ISSUE A	DATE June 1974	TO-223AA-AB





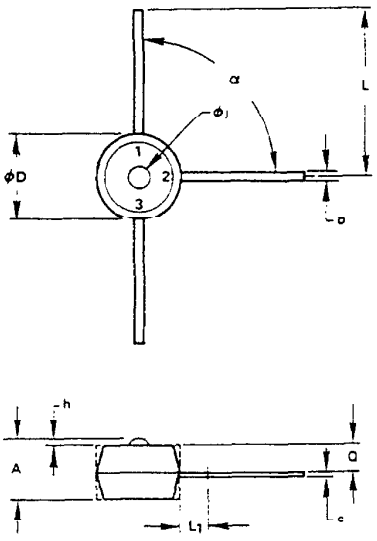
NOTES:

1. REFER TO APPLICABLE SYMBOL LIST.
2. DIMENSIONING AND TOLERANCING PER ANSI Y14.5, 1966.
3. LEAD NUMBER 4 OMITTED IN THIS OUTLINE.
4. BODY CONTOUR OPTIONAL BEYOND Q MIN., BUT MUST BE WITHIN øD AND A.
5. øb1 APPLIES BETWEEN L1 AND L. øb APPLIES BETWEEN L2 AND L. DIAMETER IS UNCONTROLLED IN L1 AND BEYOND L MIN.
6. CONTROLLING DIMENSIONS: INCH.

VARIATIONS (ALL DIMENSIONS SHOWN IN INCHES)

SYMBOL	AA MIN.	AA MAX.	NOTE	AB MIN.	AB MAX.	NOTE			NOTE			NOTE
A	.120	.240		.120	.240							
øa	.095	.105		.095	.105							
øb	.016	.021	5	.016	.021	5						
øb1	.016	.019	5	.016	.019	5						
øD	.192	.222		.192	.222							
e	.045	.055		.045	.055							
j	.075	.100		.075	.100							
L	.500	.625	5	.500	.625	5						
L1	--	.050	5	--	.050	5						
L2	.250	--	5	.250	--	5						
Q	.060	--	4	.060	--	4						
s	.080	.115		.080	.115							
NOTE	1,2,6			1,2,3,6								
REF.												
ISSUE	A June 1974			A June 1974								

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE HEADER FAMILY (.100 PIN CIRCLE)	ISSUE A	DATE June 1974	TO-223AA-AB



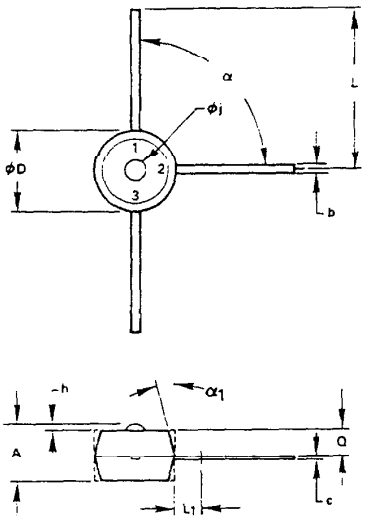
NOTES:

1. REFER TO APPLICABLE SYMBOL LIST.
2. DIMENSIONING AND TOLERANCING PER ANSI Y14.5, 1973.
3. ALL LEADS.
4. CONFIGURATION OF PACKAGE OPTIONAL WITHIN ZONE DEFINED BY A AND ØD.
5. LEAD DIMENSIONS NOT CONTROLLED IN THIS ZONE TO ALLOW FOR BODY AND LEAD FINISH IRREGULARITIES.
6. CONTROLLING DIMENSIONS: INCH.

VARIATIONS (ALL DIMENSIONS SHOWN IN MILLIMETERS)

SYMBOL	MIN.	MAX.	NOTE	MIN.	MAX.	NOTE	MIN.	MAX.	NOTE	MIN.	MAX.	NOTE
A	1.25	1.65	4									
b	.26	.40	3									
c	.11	.15	3									
ØD	1.99	2.33	4									
h	.03	.10										
Øj	.39	.63										
L	4.07	4.57	3									
L_1	-	.76	5									
Q	.51	.76										
α	39°	91°										
α_1	-	15°										
NOTE	1, 2, 6											
REF.												
ISSUE	A Jan. 1976			A Jan. 1976			A Jan. 1976			A Jan. 1976		

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE DISC FAMILY - PERIPHERAL LEADS	ISSUE	DATE	TO-224 AA
		A	12/20/76	



NOTES:

1. REFER TO APPLICABLE SYMBOL LIST.
2. DIMENSIONING AND TOLERANCING PER ANSI Y14.5, 1973.
3. ALL LEADS.
4. CONFIGURATION OF PACKAGE OPTIONAL WITHIN ZONE DEFINED BY A AND ϕD.
5. LEAD DIMENSIONS NOT CONTROLLED IN THIS ZONE TO ALLOW FOR BODY AND LEAD FINISH IRREGULARITIES.
6. CONTROLLING DIMENSIONS: INCH.

VARIATIONS (ALL DIMENSIONS SHOWN IN INCHES)

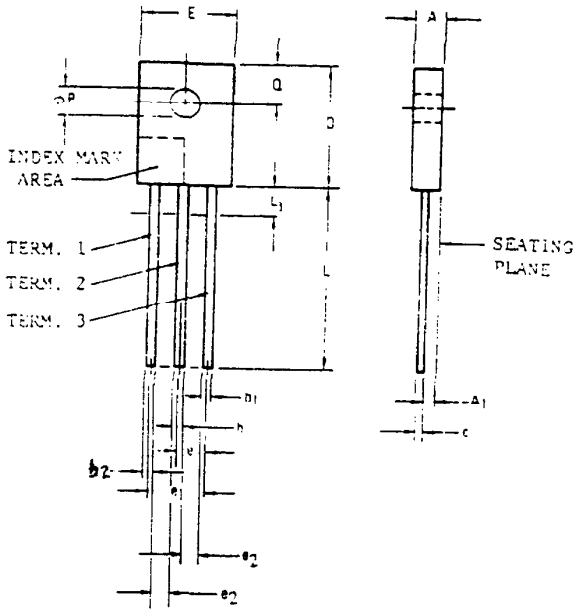
SYMBOL	MIN.	MAX.	NOTE	MIN.	MAX.	NOTE	MIN.	MAX.	NOTE	MIN.	MAX.	NOTE
A	.049	.065	4									
b	.010	.016	3									
c	.004	.006	3									
ϕD	.078	.092	4									
h	.001	.004										
ϕj	.015	.025										
L	.160	.180	3									
L1	--	.030	5									
a	.020	.030										
α	89°	91°										
α1	--	15°										
NOTE	1,2,6											
REF.												
ISSUE	A Jan. 1976			A Jan. 1976			A Jan. 1976			A Jan. 1976		

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE: DISC FAMILY - PERIPHERAL LEADS	ISSUE: A	DATE: 1/20/76

TO-224AA

NOTES

1. REFER TO APPLICABLE SYMBOL LIST
2. LEAD DIMENSIONS NOT CONTROLLED IN THIS ZONE TO ALLOW FOR BODY FLASH AND LEAD FINISH BUILD-UP.
3. MAXIMUM RADIUS OF 1.27 mm ON ALL BODY EDGES AND CORNERS.
4. LEAD SPACING TO BE MEASURED BETWEEN 3.18 mm AND 3.81 mm FROM THE POINT OF EMERGENCE FROM THE BODY.
5. DIMENSIONING AND TOLERANCING PER ANSI Y14.5-1973.
6. e_2 CONTROLLED AT EGRESS OF PACKAGE.
7. CONTROLLING DIMENSION: INCH



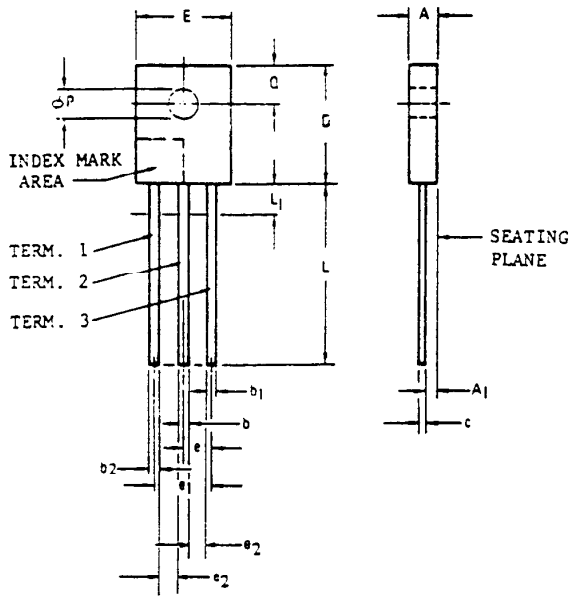
VARIATIONS (ALL DIMENSIONS SHOWN IN MILLIMETERS)

SYMBOL	AA MIN.	AA MAX.	NOTE	AB MIN.	AB MAX.	NOTE			NOTE			NOTE
A	2.29	3.04		3.05	3.81							
A_1	.89	1.65		.89	1.65							
b_1	.51	.66		1.05	1.29							
b	.63	.89		1.05	1.29							
b_2	.51	.66		1.05	1.29							
c	.39	.63		.69	.93							
D	10.16	11.43		15.70	16.96							
E	7.12	8.38		12.20	13.46							
e	2.04	2.54	4	3.84	4.59	4						
e_1	4.07	5.08	4	7.68	9.19	4						
e_2	1.02	-	6	2.03	-	6						
L	14.48	16.63		15.12	16.63							
L_1	-	2.54	2	-	3.17	2						
øP	2.54	3.30		3.18	3.93							
Q	3.31	4.44		4.58	5.71							
NOTE	1,3,5,7			1,3,5,7								
REF.	TO-126			TO-127								
ISSUE	C			A SEPT 76								

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE FLAT MOUNTED FAMILY (PERIPHERAL TERMINALS)	ISSUE C	DATE Nov. 86	TO-225 VARIATION AA THRU AB

NOTES:

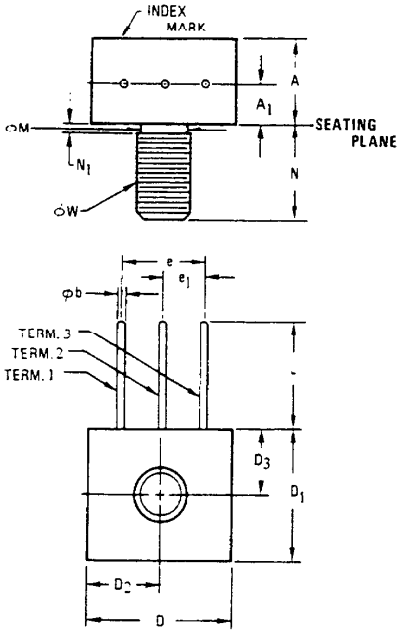
1. REFER TO APPLICABLE SYMBOL LIST.
2. LEAD DIMENSIONS NOT CONTROLLED IN THIS ZONE TO ALLOW FOR BODY FLASH AND LEAD FINISH BUILD-UP.
3. MAXIMUM RADIUS OF .050 ON ALL BODY EDGES AND CORNERS.
4. LEAD SPACING TO BE MEASURED BETWEEN .125 AND .150 FROM THE POINT OF EMERGENCE FROM THE BODY.
5. DIMENSIONING AND TOLERANCING PER ANSI Y14.5-1973.
6. e_2 CONTROLLED AT EGRESS OF PACKAGE.
7. CONTROLLING DIMENSION: INCH.



VARIATIONS (ALL DIMENSIONS SHOWN IN INCHES)

SYMBOL	AA MIN.	AA MAX.	NOTE	AB MIN.	AB MAX.	NOTE			NOTE			NOTE
A	.090	.120		.120	.150							
A_1	.035	.065		.035	.065							
b_1	.020	.026		.041	.051							
b	.025	.035		.041	.051							
b_2	.020	.026		.041	.051							
c	.015	.025		.027	.037							
D	.400	.450		.618	.668							
E	.280	.330		.480	.530							
e	.080	.100	4	.151	.181	4						
e_1	.160	.200	4	.302	.362	4						
e_2	.040	-	6	.080	-	6						
L	.570	.655		.595	.655							
L_1	-	.100	2	-	.125	2						
øP	.100	.130		.125	.155							
Q	.130	.175		.180	.225							
NOTE	1,3,5,7			1,3,5,7								
REF.	TO-126			TO-127								
ISSUE	C			A SEPT 76								

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE	ISSUE	DATE	TO-225
	FLAT MOUNTED FAMILY (PERIPHERAL TERMINALS)	C	Nov. 86	VARIATION AA THRU AB



NOTES:

1. REFER TO APPLICABLE SYMBOL LIST.
2. DIMENSIONING & TOLERANCING PER ANSI Y14.5-1973.
3. COATED THREADS SHALL MEET THE REQUIREMENTS OF ANSI B1.1-1960.
4. LENGTH OF INCOMPLETE OR UNDERCUT THREADS AT ØM.
5. CONTROLLING DIMENSION: INCH.

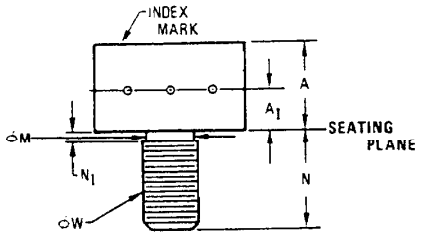
VARIATIONS (ALL DIMENSIONS SHOWN IN MILLIMETERS)

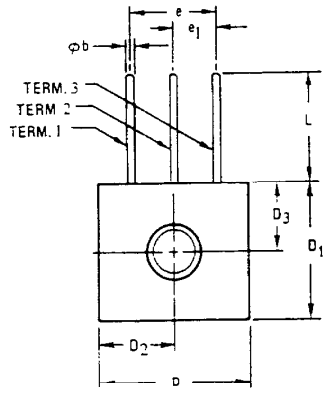
SYMBOL	AA MIN.	AA MAX.	NOTE	AB MIN.	AB MAX.	NOTE	AC MIN.	AC MAX.	NOTE	MIN.	MAX.	NOTE
A	7.62	8.89		8.13	9.39		11.69	12.95				
A_1	4.70	5.46		5.08	5.84		6.86	7.62				
øb	.89	1.14		.89	1.14		1.40	1.65				
D	12.07	13.33		15.88	17.14		24.77	26.03				
D_1	12.07	13.33		14.61	15.87		18.42	19.68				
D_2	6.05	6.65		7.95	8.58		12.40	13.00				
D_3	6.05	6.65		7.32	7.92		9.22	9.82				
e	7.27	7.77		9.28	9.77		14.99	15.49				
e_1	3.64	3.88		4.63	4.87		7.50	7.74				
L	12.07	13.33		12.07	13.33		10.16	11.43				
øM	4.22	4.80		5.67	6.32		7.14	7.89				
N	9.91	11.17		10.04	11.30		11.18	12.44				
N_1	--	1.98	4	--	2.26	4	--	2.64	4			
øW	10-32 UNF-2A		3	1/4-28 UNF-2A		3	5/16-24 UNF-2A		3			
NOTE	1,2,5			1,2,5			1,2,5					
REF.												
ISSUE	A SEPT 76			A SEPT 76			A SEPT 76					

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE: STUD MOUNTED FAMILY (Peripheral Terminals)	ISSUE: A	DATE: 9/7/76	TO-228
				VARIATION AA THRU AC

NOTES:

1. REFER TO APPLICABLE SYMBOL LIST.
2. DIMENSIONING & TOLERANCING PER ANSI Y14.5-1973.
3. COATED THREADS SHALL MEET THE REQUIREMENTS OF ANSI B1.1-1960.
4. LENGTH OF INCOMPLETE OR UNDERCUT THREADS AT ØM.
5. CONTROLLING DIMENSION: INCH.





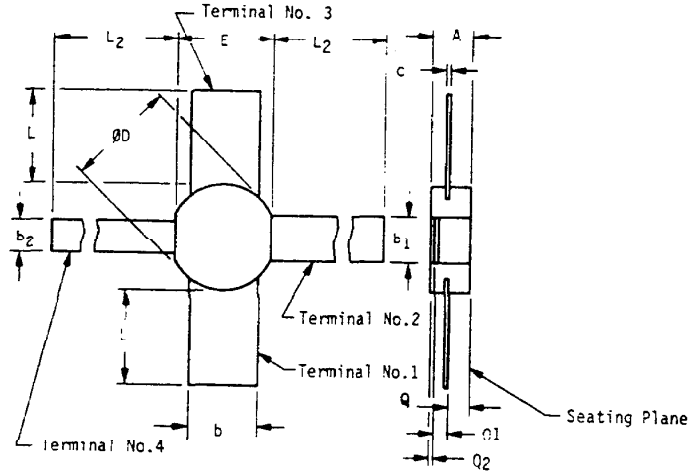
VARIATIONS (ALL DIMENSIONS SHOWN IN INCHES)

SYMBOL	AA		NOTE	AB		NOTE	AC		NOTE			NOTE
	MIN.	MAX.		MIN.	MAX.		MIN.	MAX.		MIN.	MAX.	
A	.300	.350		.320	.370		.460	.510				
A_1	.185	.215		.200	.230		.270	.300				
øb	.035	.045		.035	.045		.055	.065				
D	.475	.525		.625	.675		.975	1.025				
D_1	.475	.525		.575	.625		.725	.775				
D_2	.238	.262		.313	.338		.488	.512				
D_3	.238	.262		.288	.312		.363	.387				
e	.286	.306		.365	.385		.590	.610				
e_1	.143	.153		.182	.192		.295	.305				
L	.475	.525		.475	.525		.400	.450				
øM	.166	.189		.223	.249		.281	.311				
N	.390	.440		.395	.445		.440	.490				
N_1	--	.078	4	--	.089	4	--	.104	4			
øW	10-32 UNF-2A		3	1/4-28 UNF-2A		3	5/16-24 UNF-2A		3			
NOTE	1,2,5			1,2,5			1,2,5					
REF.												
ISSUE	A SEPT 76			A SEPT 76			A SEPT 76					

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE: STUD MOUNTED FAMILY (Peripheral Terminals)	ISSUE: A	DATE: 9/7/76	TO-228
				VARIATION AA THRU AC

NOTES:

1. REFER TO APPLICABLE SYMBOL LIST.
2. DIMENSIONING & TOLERANCING PER ANSI Y14.5-1973.
3. TYPICAL ALL TERMINALS.
4. CONTOUR OPTIONAL WITHIN Q_2, ØD, AND E.
5. CONTROLLING DIMENSION: INCH.



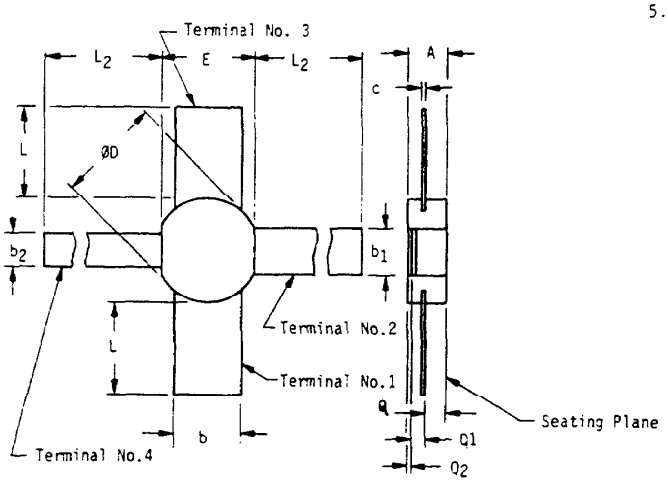
VARIATIONS (ALL DIMENSIONS SHOWN IN MILLIMETERS)

SYMBOL	AA MIN.	AA MAX.	NOTE	MIN.	MAX.	NOTE	MIN.	MAX.	NOTE	MIN.	MAX.	NOTE
A	2.29	3.42										
b	4.96	5.20										
b_1	3.43	3.68										
b_2	2.42	2.66										
c	.102	.254	3									
ØD	7.75	8.12	4									
E	6.99	7.62	4									
L	6.74	7.36										
L_2	11.56	12.95										
Q	1.40	1.77										
Q_1	.64	1.14										
Q_2	-	-	4									
NOTE	1,2,5.											
REF.												
ISSUE	A SEPT 76											

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE STRIPLINE HEADER FAMILY	ISSUE A	DATE 9/7/76	TO-229 VARIATION AA

NOTES:

1. REFER TO APPLICABLE SYMBOL LIST.
2. DIMENSIONING & TOLERANCING PER ANSI Y14.5-1973.
3. TYPICAL ALL TERMINALS.
4. CONTOUR OPTIONAL WITHIN Q_2, ØD, AND E.
5. CONTROLLING DIMENSION: INCH.

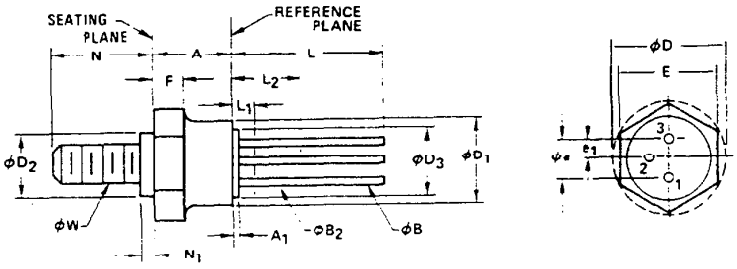


SYMBOL	VARIATIONS (ALL DIMENSIONS SHOWN IN INCHES)											
	AA		NOTE			NOTE			NOTE			NOTE
	MIN.	MAX.		MIN.	MAX.		MIN.	MAX.		MIN.	MAX.	
A	.090	.135										
b	.195	.205										
b_1	.135	.145										
b_2	.095	.105										
c	.004	.010	3									
ØD	.305	.320	4									
E	.275	.300	4									
L	.265	.290										
L_2	.455	.510										
Q	.055	.070										
Q_1	.025	.045										
Q_2	-	-	4									
NOTE	1,2,5.											
REF.												
ISSUE	A SEPT 76											

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE STRIPLINE HEADER FAMILY	ISSUE A	DATE 9/7/76	TO-229 VARIATION AA

NOTES:

1. REFER TO APPLICABLE SYMBOL LIST.
2. DIMENSIONING AND TOLERANCING PER ANSI Y14.5 - 1973.
3. ϕb_2 APPLIES BETWEEN L_1 AND L_2. ϕb APPLIES BETWEEN L_2 AND L. LEAD DIAMETER IS UNCONTROLLED IN L_1 AND BEYOND L MINIMUM.
4. LEADS HAVING MAXIMUM DIAMETER OF .48 MEASURED IN GAUGING PLANE 1.37 + .03-.00 BELOW THE REFERENCE PLANE OF THE DEVICE SHALL BE LOCATED AT TRUE POSITION WITHIN .36 DIAMETER.
5. A CHAMFER (OR UNDERCUT) ON ONE OR BOTH ENDS OF THE HEXAGONAL PORTION IS OPTIONAL.
6. COATED THREADS SHALL MEET THE REQUIREMENTS OF ANSI B1.1-1960.
7. LENGTH OF INCOMPLETE OR UNDERCUT THREADS AT ϕM.
8. POSITION OF LEADS IN RELATION TO THE HEXAGON IS NOT CONTROLLED.
9. CONTROLLING DIMENSIONS: INCH.



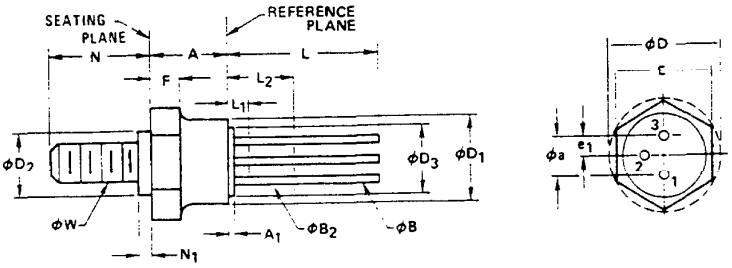
VARIATIONS (ALL DIMENSIONS SHOWN IN MILLIMETERS)

SYMBOL	AA MIN.	AA MAX.	NOTE	AB MIN.	AB MAX.	NOTE			NOTE			NOTE
A	5.34	5.71		7.62	8.89							
A_1	1.15	1.52		-	-							
ϕb	.41	.53		.41	.53							
ϕb_2	.41	.48	3,4	.41	.48	3,4						
ØD	10.49	10.99		10.16	12.82							
$ØD_1$	8.89	9.14		9.91	10.41							
$ØD_2$	4.45	4.82		-	-							
$ØD_3$	4.12	4.29		-	-							
E	9.20	9.52		10.75	11.12							
e	2.54 BSC			5.08 BSC								
e_1	1.27 BSC			2.54 BSC								
F	1.65	1.77		3.05	3.81							
L	12.70	-	3	12.07	-	3						
L_1	-	1.27	3	-	1.27	3						
L_2	6.35	-	3	6.35	-	3						
ØM	-	-		4.14	4.80	7						
N	6.74	7.41		10.72	11.50							
N_1	.51	.89		-	1.98							
ØW	6-32	UNC-2A	6	10-32	UNF-2A	6						
NOTE	1, 2, 5, 8, 9			1, 2, 5, 8, 9								
REF.	TO-102			TO-132								
ISSUE	A FEB 76			A FEB 76								

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE STUD HEX-BASE FAMILY (2.54 & 5.08 PIN CIRCLE)	ISSUE A	DATE 2/24/76
		TO-231	
		VARIATIONS AA THRU AB	

NOTES:

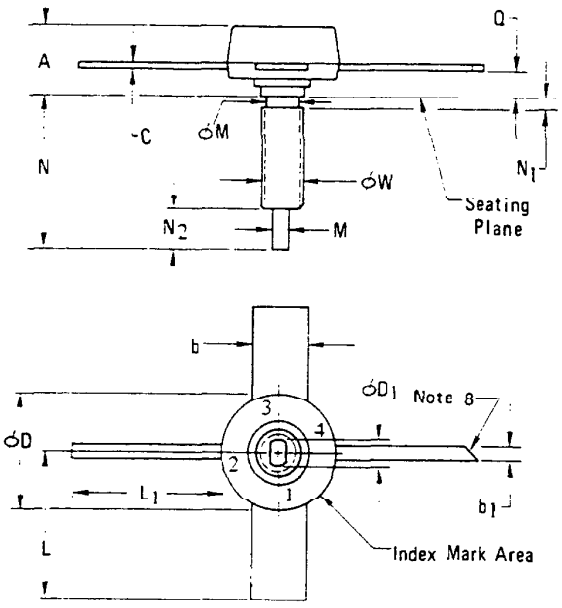
1. REFER TO APPLICABLE SYMBOL LIST.
2. DIMENSIONING AND TOLERANCING PER ANSI Y14.5 - 1973.
3. ϕb_2 APPLIES BETWEEN L_1 AND L_2. ϕb APPLIES BETWEEN L_2 AND L. LEAD DIAMETER IS UNCONTROLLED IN L_1 AND BEYOND L MINIMUM.
4. LEADS HAVING MAXIMUM DIAMETER OF .019 MEASURED IN GAUGING PLANE .054 + .001-.000 BELOW THE REFERENCE PLANE OF THE DEVICE SHALL BE LOCATED AT TRUE POSITION WITHIN .014 DIAMETER.
5. A CHAMFER (OR UNDERCUT) ON ONE OR BOTH ENDS OF HEXAGONAL PORTION IS OPTIONAL.
6. COATED THREADS SHALL MEET THE REQUIREMENTS OF ANSI B1.1-1960.
7. LENGTH OF INCOMPLETE OR UNDERCUT THREADS AT ØM.
8. POSITION OF LEADS IN RELATION TO THE HEXAGON IS NOT CONTROLLED.
9. CONTROLLING DIMENSIONS: INCH



VARIATIONS (ALL DIMENSIONS SHOWN IN INCHES)

SYMBOL	AA MIN.	AA MAX.	NOTE	AB MIN.	AB MAX.	NOTE			NOTE			NOTE
A	.210	.225		.300	.350							
A_1	.045	.060		-	-							
Øb	.016	.021		.016	.021							
$Øb_2$	.016	.019	3,4	.016	.019	3,4						
ØD	.413	.433		.400	.505							
$ØD_1$	.350	.360		.390	.410							
$ØD_2$	.175	.190		-	-							
$ØD_3$	.162	.169		-	-							
E	.362	.375		.423	.438							
e	.100 BSC			.200 BSC								
e_1	.050 BSC			.100 BSC								
F	.065	.070		.120	.150							
L	.500	-	3	.475	-	3						
L_1	-	.050	3	-	.050	3						
L_2	.250	-	3	.250	-	3						
ØM	-	-		.163	.189	7						
N	.265	.292		.422	.453							
N_1	.020	.035		-	.078							
CW	6-32	UNC-2A	6	10-32	UNF-2A	6						
NOTE	1, 2, 5, 8, 9			1, 2, 5, 8, 9								
REF.	TO-102			TO-132								
ISSUE	A FEB 76			A FEB 76								

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE STUD HEX-BASE FAMILY (.100 & .200 PIN CIRCLE)	ISSUE	DATE	TO-231
		A	2/24/76	VARIATIONS AA THRU AB



NOTES:

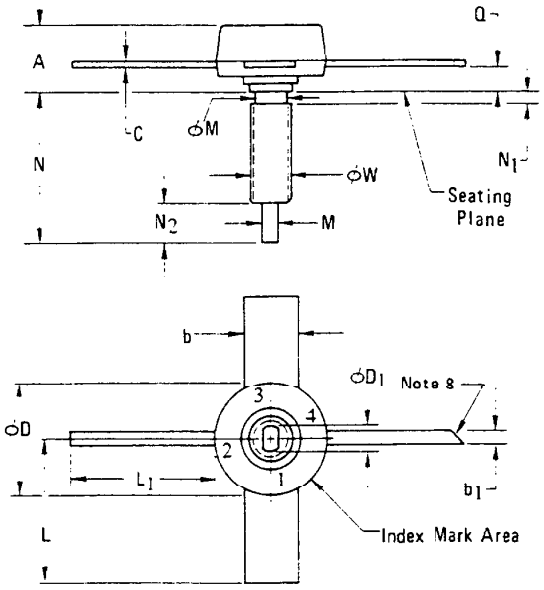
1. REFER TO APPLICABLE SYMBOL LIST.
2. DIMENSIONING AND TOLERANCING PER ANSI Y14.5-1973.
3. BODY CONTOUR OPTIONAL WITHIN ØD AND A. ØD MIN. APPLIES TO GREATEST BODY DIAMETER.
4. TYPICAL ALL TERMINALS.
5. ORIENTATION OF FLATS NOT CONTROLLED IN RELATION TO TERMINALS.
6. OMISSION OF ONE TERMINAL OPTIONAL. THE NUMBER AND POSITION OF TERMINALS ACTUALLY PRESENT ARE INDICATED IN THE PRODUCT REGISTRATIONS.
7. LENGTH OF INCOMPLETE OR UNDERCUT THREADS AT ØM.
8. TERMINAL 4 END OF CONFIGURATION OPTIONAL.
9. INDEX MARK TO BE VISIBLE FROM TOP.
10. INDEX MARK OPTIONAL FOR THREE TERMINAL DEVICES.
11. CONTROLLING DIMENSION: INCH.

VARIATIONS (ALL DIMENSIONS IN MILLIMETERS)

SYMBOL	AA MIN.	AA MAX.	NOTE	AB MIN.	AB MAX.	NOTE	AC MIN.	AC MAX.	NOTE	MIN.	MAX.	NOTE
A	3.56	5.84	3	7.112	7.239	3	5.08	5.84	3			
b	.686	.838	4	2.236	2.336	4	7.24	7.49				
b_1	.686	.838	4	2.236	2.336	4	.712	.812				
c	.356	.406	4	.356	.406	4	.254	.304	4			
ØD	6.1	9.6	3	11.43	12.70	3	9.271	9.398	3			
$ØD_1$	2.80	3.27	5	2.54	3.04	5	2.80	3.27	5			
L	11.43	--	4,6	12.20	12.70	4	10.93	11.17				
L_1	--	--		--	--		--	13.97				
M	1.40	1.65	5	1.423	1.625	5	1.423	1.625	5			
ØM	3.05	4.14		3.05	4.14		3.05	4.14				
N	10.8	13.3		11.18	11.68		11.18	11.68				
N_1	--	1.98	7	--	1.98	7	--	1.98	7			
N_2	2.93	3.68		2.93	3.68		2.93	3.68				
Q	2.80	3.30		4.07	4.31		2.80	3.30				
ØW	8-32	UNC-2A		8-32	UNC-2A		8-32	UNC-2A				
NOTE	1,2,8,9,10,11			1,2,8,9,10,11			1,2,8,9,11					
REF.	TO-117			TO-128			TO-129					
ISSUE	DECEMBER 76			DECEMBER 76			DECEMBER 76					

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE STUD MOUNTED RADIAL LEAD FAMILY	ISSUE A	DATE 12/28/76	TO-232 VARIATIONS AA - AC

NOTES:



1. REFER TO APPLICABLE SYMBOL LIST.
2. DIMENSIONING & TOLERANCING PER ANSI Y14.5-1973.
3. BODY CONTOUR OPTIONAL WITHIN ØD AND A. ØD MIN. APPLIES TO GREATEST BODY DIAMETER.
4. TYPICAL ALL TERMINALS.
5. ORIENTATION OF FLATS NOT CONTROLLED IN RELATION TO TERMINALS.
6. OMISSION OF ONE TERMINAL OPTIONAL. THE NUMBER AND POSITION OF TERMINALS ACTUALLY PRESENT ARE INDICATED IN THE PRODUCT REGISTRATIONS.
7. LENGTH OF INCOMPLETE OR UNDERCUT THREADS AT ØM.
8. TERMINAL 4 END OF CONFIGURATION OPTIONAL.
9. INDEX MARK TO BE VISIBLE FROM TOP.
10. INDEX MARK OPTIONAL FOR THREE TERMINAL DEVICES.
11. CONTROLLING DIMENSION: INCH.

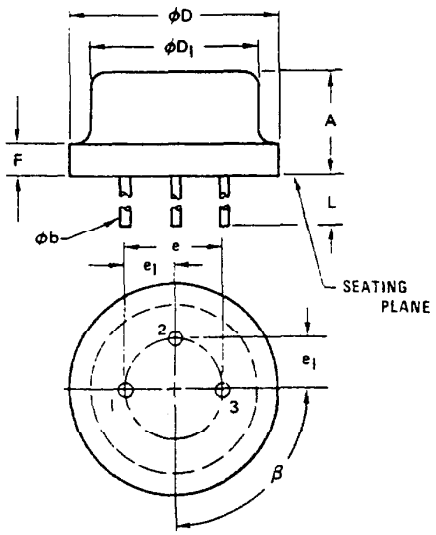
VARIATIONS (ALL DIMENSIONS IN INCHES)

SYMBOL	AA		NOTE	AB		NOTE	AC		NOTE			NOTE
	MIN.	MAX.		MIN.	MAX.		MIN.	MAX.		MIN.	MAX.	
A	.140	.230	3	.280	.285	3	.230	.230	3			
b	.027	.033	4	.088	.092	4	.285	.295				
b_1	.027	.033	4	.088	.092	4	.028	.032				
c	.014	.016	4	.014	.016	4	.010	.012	4			
ØD	.240	.380	3	.450	.500	3	.365	.370	3			
$ØD_1$	.110	.129	5	.100	.120	5	.110	.129	5			
L	.450	-	4,6	.480	.500	4,6	.430	.440				
L_1	-	-		-	-		-	.550				
M	.055	.065	5	.056	.064	5	.056	.064	5			
ØM	.120	.163		.120	.163		.120	.163				
N	.425	.525		.440	.460		.440	.460				
N_1	-	.078	7	-	.078	7	-	.078	7			
N_2	.115	.145		.115	.145		.115	.145				
Q	.110	.130		.160	.170		.110	.130				
ØW	8-32	UNC-2A		8-32	UNC-2A		8-32	UNC-2A				
NOTE	1,2,8,9,10,11			1,2,8,9,10,11			1,2,8,9,11					
REF.	TO-117			TO-128			TO-129					
ISSUE	DECEMBER 76			DECEMBER 76			DECEMBER 76					

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE: STUD MOUNTED RADIAL LEAD FAMILY	ISSUE: A	DATE: 12/28/76	TO-232 VARIATIONS AA - AC

NOTES:

1. REFER TO APPLICABLE SYMBOL LIST.
2. DIMENSIONING & TOLERANCING PER ANSI Y14.5-1973.
3. LEADS HAVING A MAXIMUM DIAMETER OF .838 MEASURED IN GAUGING PLANE 1.372-1.397 BELOW THE SEATING PLANE OF THE DEVICE SHALL BE LOCATED AT POSITION TOLERANCE WITH .356 DIAMETER.
4. CONTROLLING DIMENSION: INCH.
5. THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED FOR REGISTRATION.



VARIATIONS (ALL DIMENSIONS SHOWN IN MILLIMETERS)

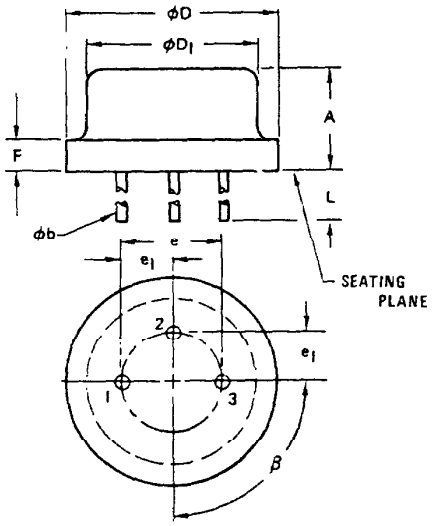
SYMBOL	AA MIN.	AA MAX.	NOTE			NOTE			NOTE			NOTE
A	6.86	8.38										
Øb	.686	.838	3									
ØD	14.0	16.5										
$ØD_1$	11.28	13.30										
e	6.91	7.41										
e_1	3.46	3.70										
F	--	2.92										
L	9.15	11.17										
β	90° Nominal											

NOTE	1,2,4
REF.	TO-8
ISSUE	A JUNE 1976

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE	ISSUE	DATE	TO-233 AA
	HEADER FAMILY 7.112 PIN CIRCLE	A	6/1/76	

NOTES:

1. REFER TO APPLICABLE SYMBOL LIST.
2. DIMENSIONING & TOLERANCING PER ANSI Y14.5-1973.
3. LEADS HAVING MAXIMUM DIAMETER OF .033 MEASURED IN GAUGING PLANE .054-.055 BELOW THE SEATING PLANE OF THE DEVICE SHALL BE LOCATED AT POSITIONAL TOLERANCE WITHIN .014 DIAMETER.
4. CONTROLLING DIMENSIONS: INCH.
5. THIS OUTLINE DOES NOT MEET THE MINIMUM CRITERIA ESTABLISHED FOR REGISTRATION.



VARIATIONS (ALL DIMENSIONS SHOWN IN INCHES)

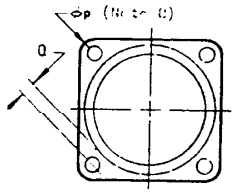
SYMBOL	AA MIN.	AA MAX.	NOTE			NOTE			NOTE			NOTE
A	.270	.330										
Øb	.027	.033	3									
ØD	.550	.650										
$ØD_1$	.444	.524										
e	.272	.292										
e_1	.136	.146										
F	--	.115										
L	.360	.440										
β	90° Nominal											

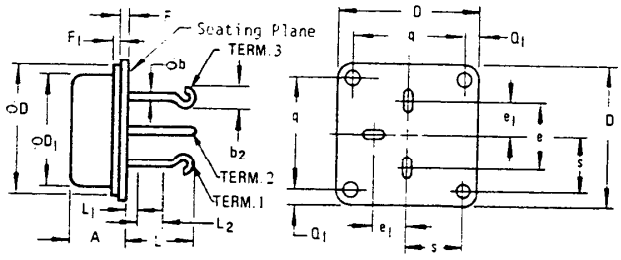
NOTE	1,2,4
REF.	TO-8
ISSUE	A JUNE 1976

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE HEADER FAMILY .280 PIN CIRCLE	ISSUE	DATE	TO-233 AA
		A	6/1/75	

NOTES:

1. REFER TO APPLICABLE SYMBOL LIST.
2. DIMENSIONING & TOLERANCING PER ANSI Y14.5, 1973.
3. TERMINAL DIAMETERS UNCONTROLLED IN THIS ZONE.
4. RADIUS AT CORNERS OF MOUNTING FLANGES OPTIONAL.
5. TERMINALS HAVING MAXIMUM DIAMETER OF 1.14 MEASURED IN GAUGE PLANE .788-.812 BELOW SEATING PLANE SHALL BE WITH .254 POSITION TOLERANCE RELATIVE TO MMC OF HOLES IN MOUNTING FLANGE.
6. CLEARANCE FROM HOLE CENTERS TO ØD FOR MOUNTING FASTENERS.
7. THREE TERMINALS.
8. FOUR HOLES.
9. CONTROLLING DIMENSIONS: INCH.





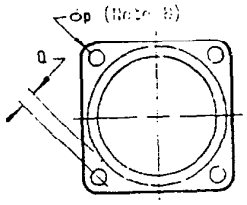
VARIATIONS (ALL DIMENSIONS SHOWN IN MILLIMETERS)

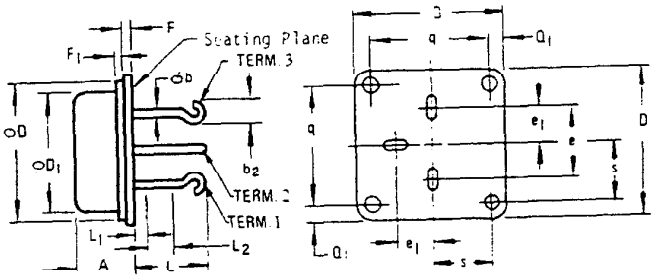
SYMBOL	AA MIN.	AA MAX.	NOTE	MIN.	MAX.	NOTE	MIN.	MAX.	NOTE	MIN.	MAX.	NOTE
A	7.75	9.01										
Øb	.89	1.14	7									
b_2	3.31	3.81	7									
D	21.59	22.09										
ØD	19.44	19.93										
$ØD_1$	17.02	17.27										
e	10.16	BSC	5									
e_1	5.08	BSC	5									
F	1.02	1.39										
F_1	.77	1.65										
L	9.40	10.66	7									
L_1	.79	-	3,7									
L_2	3.18	-										
Øp	2.44	2.69	8									
q	17.02	17.52										
Q	1.91	-	6									
Q_1	1.91	2.66										
s	8.636	BSC										
NOTE	1,2,4,9											
REF.	TO-53											
ISSUE	A JUNE 1976											

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE FLANGE MOUNTED HEADER FAMILY, 10.160 PIN SPACING	ISSUE A	DATE 6/1/76	TO-235 AA

NOTES:

1. REFER TO APPLICABLE SYMBOL LIST.
2. DIMENSIONING & TOLERANCING PER ANSI Y14.5-1973.
3. TERMINAL DIAMETERS UNCONTROLLED IN THIS ZONE.
4. RADIUS AT CORNERS OF MOUNTING FLANGE OPTIONAL.
5. TERMINALS HAVING MAXIMUM DIAMETER OF .045 MEASURED IN GAUGE PLANE .031-.032 BELOW SEATING PLANE SHALL BE WITHIN .010 POSITION TOLERANCE RELATIVE TO MMC OF HOLES IN MOUNTING FLANGE.
6. CLEARANCE FROM HOLE CENTERS TO ØD FOR MOUNTING FASTENERS.
7. THREE TERMINALS.
8. FOUR HOLES.
9. CONTROLLING DIMENSIONS: INCH.

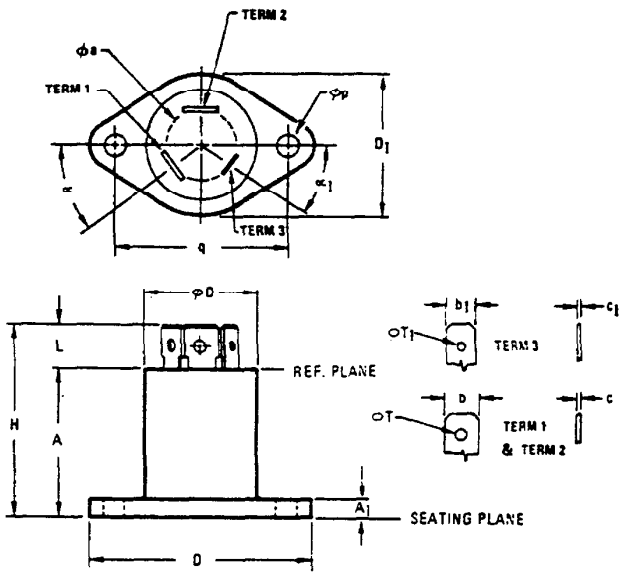




VARIATIONS (ALL DIMENSIONS SHOWN IN INCHES)

SYMBOL	AA MIN.	AA MAX.	NOTE			NOTE			NOTE			NOTE
A	.305	.355										
Øb	.035	.045	7									
b_2	.130	.150	7									
D	.850	.870										
ØD	.765	.785										
$ØD_1$	.670	.680										
e	.400	BSC	5									
e_1	.200	BSC	5									
F	.040	.055										
F_1	.030	.065										
L	.370	.420	7									
L_1	.031	--	3,7									
L_2	.125	--										
Øp	.096	.106	8									
q	.670	.690										
Q	.075	--	6									
Q_1	.075	.105										
s	.340	BSC										
NOTE	1,2,4,9											
REF.	TO-53											
ISSUE	A JUNE 1976											

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE	ISSUE	DATE	TO-235 AA
	FLANGE MOUNTED HEADER FAMILY .400 PIN SPACING	A	6/1/76	



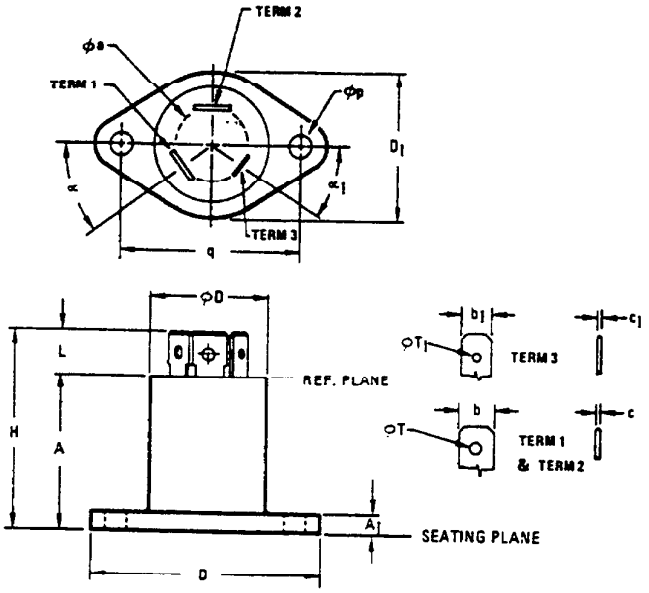
NOTES:

1. REFER TO APPLICABLE SYMBOL LIST.
2. DIMENSIONING AND TOLERANCING PER ANSI Y14.5, 1973.
3. TERMINALS AT MAXIMUM MATERIAL CONDITION, SHALL BE WITHIN .25 DIAMETER OF TRUE POSITION MEASURED AT REF. PLANE.
4. TERMINALS MEET NEMA STANDARDS PUBLICATION NO. DC2-1976.
5. TWO HOLES.
6. CONTROLLING DIMENSION: INCH.

VARIATIONS (ALL DIMENSIONS SHOWN IN MILLIMETERS)

SYMBOL	AA MIN.	AA MAX.	NOTE	AB MIN.	AB MAX.	NOTE	MIN.	MAX.	NOTE	MIN.	MAX.	NOTE
A	-	27.31		-	27.31							
A_1	1.53	3.42		1.53	3.42							
a	12.45 BSC		3	12.45 BSC		3						
b	6.22	6.48	3,4	6.22	6.48	3,4						
b_1	4.57	4.95	3,4	4.57	4.95	3,4						
c	.79	.84		.79	.84							
c_1	.48	.53		.79	.84							
D	38.35	39.88		38.35	39.88							
D_1	24.77	26.67		24.77	26.67							
øD	19.30	22.35		19.30	22.35							
H	-	37.08		-	37.08							
L	8.13	10.29		8.13	10.29							
øp	3.81	4.09	5	3.81	4.09	5						
q	29.90	30.40		29.90	30.40							
øT	1.65	2.03		1.65	2.03							
$øT_1$	1.27	1.52		1.27	1.52							
α	38° BSC			38° BSC								
$α_1$	33° BSC			33° BSC								
NOTE	1,2,6			1,2,6								
REF.	Item 11.2 71			Item 11.2 71								
ISSUE	A JANUARY 1979			A JANUARY 1979								

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE FLANGE MOUNTED HEADER FAMILY (Cylindrical Body) .490 Pin Circle	ISSUE 8	DATE 5-16-80
			TO - 239 AA-AB



NOTES:

1. REFER TO APPLICABLE SYMBOL LIST.
2. DIMENSIONING AND TOLERANCING PER ANSI Y14.5, 1973.
3. TERMINALS AT MAXIMUM MATERIAL CONDITION, SHALL BE WITHIN .010 DIAMETER OF TRUE POSITION MEASURED AT REF. PLANE.
4. TERMINALS MEET NEMA STANDARDS PUBLICATION NO. DC2-1976.
5. TWO HOLES.
6. CONTROLLING DIMENSION: INCH.

VARIATIONS (ALL DIMENSIONS SHOWN IN INCHES)

SYMBOL	AA MIN.	AA MAX.	NOTE	AB MIN.	AB MAX.	NOTE
A	-	1.075		-	1.075	
A1	.060	.135		.060	.135	
a	.490 BSC		3	.490 BSC		3
b	.245	.255	3,4	.245	.255	3,4
b1	.180	.195	3,4	.180	.195	3,4
c	.031	.033		.031	.033	
c1	.019	.021		.031	.033	
D	1.510	1.570		1.510	1.570	
D1	.975	1.050		.975	1.050	
øD	.760	.880		.760	.880	
H	-	1.460		-	1.460	
L	.320	.405		.320	.405	
øp	.150	.161	5	.150	.161	5
q	1.177	1.197		1.177	1.197	
øT	.065	.080		.065	.080	
øT1	.050	.060		.050	.060	
α	38° BSC			38° BSC		
α1	33° BSC			33° BSC		
NOTE	1,2,6			1,2,6		
REF.	Item 11.2 71			Item 11.2 71		
ISSUE	A JANUARY 1979			A JANUARY 1979		

JEDEC SOLID STATE PRODUCT OUTLINES	TITLE FLANGE MOUNTED HEADER FAMILY (Cylindrical Body) .490 Pin Circle	ISSUE B	DATE 5-16-80
			TO - 239 AA-AB