PCB Vibration Attenuation

DAMPEN VIBRATION

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Low Frequency Vibration Damage
PCB Vibration Bending
PCB Vibration Bending

MUCH BENDING

With PID

LESS BENDING

No PID
Solution from NASA USA

$PID = \text{Particle Impact Damping}$

Schematic
Inside **PID**

Tungsten Ball (W)
1 Ball = 0.073g
13,700 Balls = 1Kg
PID Model

- (W) Tungsten Balls
- Al Aluminum or Cu Copper
- Mount
- PCB
NOTES: (UNLESS OTHERWISE SPECIFIED).  
1) DIMENSIONS: INCHES [MM].

SECTION A-A

COVER PKG

TOP VIEW

SIDE VIEW

BOTTOM VIEW

Tungsten Ball


.095 .095

704046

700013

.125 [3.175]

.136 [3.45] .125

8-32 UNC THRU ALL 3 PLACES EQ SP ON A Ø .750 BC

APPROVALS: DATE

DRAWN: J. Hayes 8/31/2016

ENG: M. Hart 8/31/2016

TITLE: TUNABLE PID
PARTICLE IMPACT DAMPER

SCALE: 2:1

DRAWING NO.: 70002

REV.

DO NOT SCALE DRAWING

SHEET 1 OF 2
Design Rule #1

Mass of PID = 10% PCB

- PID: 100g
- PCB: 1Kg
Design Rule #2

Fill “W” 90% PKG

W = 90%

EMPTY = 10%

“W” Tungsten Ball
Design Rule #3

Mount PID Center of PCB

PID @ CENTER
Weibull Failure Analysis
19x PCB

Failure 00:12 hr
No PID

Failure 05:10 hr
With PID
2 Minute Video
How *PID* Works

https://youtu.be/P4SQuBaKXWw
Applications for \textit{PID} \\

**Environments**
- Military - Space
- Telecommunication
- High Reliability
- Automotive
- Special Applications
Thank You!

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