General Description

The B337 is adjustable 3-terminal negative voltage regulators capable of supplying −1.5 A or more currents over an output voltage range of −1.25 V to −37 V. It requires only two external resistors to set the output voltage and one output capacitor for frequency compensation. The circuit design has been optimized for excellent regulation and low thermal transients. Further, the B337 feature internal current limiting, thermal shutdown and safe-area compensation, making it virtually blowout-proof against overloads.

Features

- 1.5-A Output Current
- Line Regulation 0.01%N (Typical)
- Load Regulation 0.3%(Typical)
- 77-dB Ripple Rejection
- 50 ppm/C Temperature Coefficient
- Thermal Overload Protection
- Internal Short-Circuit Current Limiting Protections

Order Information

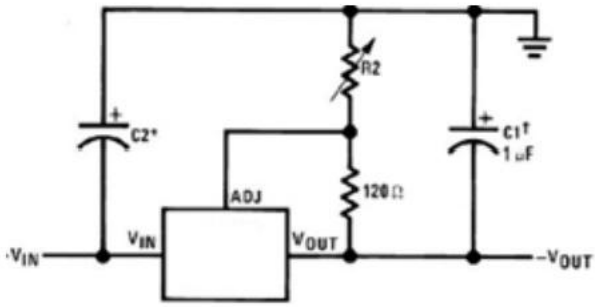
PART NUMBER	PACKAGE	BODY SIZE (NOM)
B337	SOT-223 (4)	3.50 mm×6.50 mm
	TO (3)	8.255 mm×8.255 mm
	TO-220 (3)	10.16mmx14.986 mm

(1)For all available packages,see the orderable addendum at the end of the data sheet.The LF01 is a lead formed (bent) version of the TO-220 package.

Applications

- Industrial Power Supplies
- Factory Automation Systems
- Building Automation Systems
- PLC Systems
- Instrumentation
- IGBT Drive Negative Gate Supplies
- Networking
- Set-Top Boxes

Adjustable Negative Voltage Regulator



Full output current not available at high input-output voltages

$$-V_{OUT} = -1.25V\left(1+\frac{R2}{120}\right)+\left(-I_{ADJ}\times R2\right)$$

Full output current not available at high input-output voltages

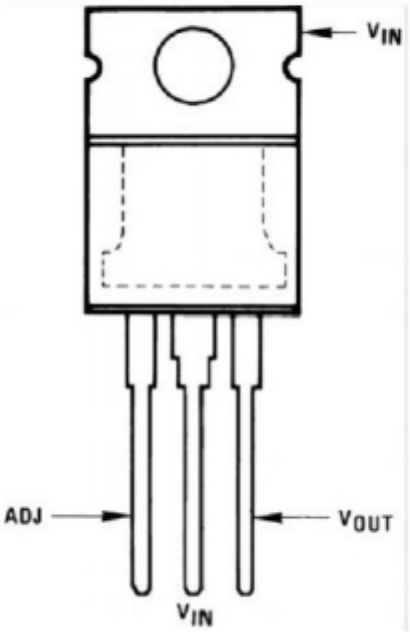
$$-V_{OUT} = -1.25V\left(1+\frac{R2}{120}\right)+\left(-I_{ADJ}\times R2\right)$$

+C1=1-µF solid tantalum or 10-µF aluminum electrolytic required for stability

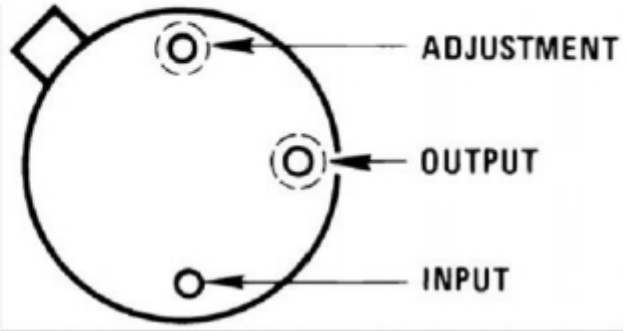
Output capacitors in the range of 1-µF to 1000-µF of aluminum or tantalum electrolytic are commonly used to provide mproved output impedance and rejection of transients

4 Pin Configuration and Functions

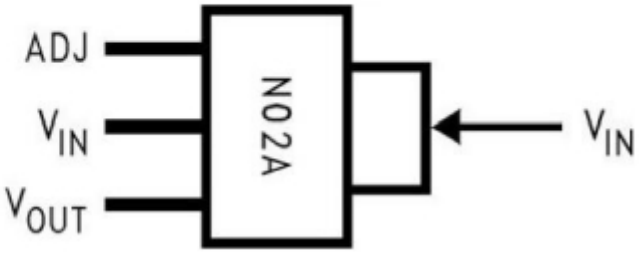
TO-220 Plastic Package
Package Number NDE0003B
Front View



TO Metal Can Package
3-Pin Package Number NDT0003A
Bottom View



SOT-223
3-Lead Package Marked NO2A
Front View



Pin Functions

PIN				I/O	DESCRIPTION
NAME	TO-220	TO	SOT-223		
ADJ	1	1	1		Adjust pin
N	2,TAB	3,CASE	2,4		Input voltage pin for the regulator
OUT	3	2	3	O	Output voltage pin for the regulator

5 Specifications

5.1 Absolute Maximum Ratings

	MIN	MAX	UNIT
Power dissipation	Internally Limited		
Input-output voltage differential	-0.3	40	V
Operating junction temperature	0	125	℃
Storage temperature,Tstq	-65	150	℃

5.2 Recommended Operating Conditions

over operating free-air temperature range (unless otherwise noted)

		MIN	MAX	UNIT
Operating junction temperature	**B337**	**0**	**125**	**℃**

5.3 Electrical Characteristics

Unless otherwise specified, these specifications apply 0°C ≤ Tj≤ 125°C for the B337; $V_{IN} - V_{OUT}$ = 5 V; and I_{OUT} = 0.1 A for the TO package and I_{OUT} = 0.5 A for the SOT-223 and TO-220 packages. Although power dissipation is internally limited,
these specifications are applicable for power dissipations of 2 W for the TO and SOT-223, and 20 W for the TO-220. I_{MAX} is 1.5 A for the SOT-223 and TO-220 packages, and 0.2 A for the TO package.

PARAMETER	TEST CONDITIONS		LM137			LM337-N			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Line regulation	T_J = 25°C, 3 V ≤ $\lvert V_{IN} - V_{OUT}\rvert$ ≤ 40 V(1) I_L = 10 mA			0.01	0.02		0.01	0.04	%/V
Load regulation	T_J = 25°C, 10 mA ≤ I_{OUT}≤ I_{MAX}			0.3%	0.5%		0.3%	1%	
Thermal regulation	T_J = 25°C, 10-ms Pulse			0.002	0.02		0.003	0.04	%/W
Adjustment pin current				65	100		65	100	μA
Adjustment pin current charge	10 mA ≤ I_L≤ I_{MAX} 3 V ≤ $\lvert V_{IN} - V_{OUT}\rvert$ ≤ 40 V, T_A = 25°C			2	5		2	5	μA
Reference voltage	3 V ≤ $\lvert V_{IN} - V_{OUT}\rvert$ ≤ 40 V,(2)	T_J = 25°C (2)	−1.225	−1.25	−1.275	−1.213	−1.25	−1.287	V
	10 mA ≤ I_{OUT}≤ I_{MAX}, P ≤ P_{MAX}	−55°C ≤ T_J≤ 150°C	−1.2	−1.25	−1.3	−1.2	−1.25	−1.3	V
Line regulation	3 V ≤ $\lvert V_{IN} - V_{OUT}\rvert$ ≤ 40 V,(1)			0.02	0.05		0.02	0.07	%/V
Load regulation	10 mA ≤ I_{OUT}≤ I_{MAX}, (1)			0.3%	1%		0.3%	1.5%	
Temperature stability	$T_{MIN} \le T_j \le T_{MAX}$			0.6%			0.6%		
Minimum load current	$\lvert V_{IN} - V_{OUT}\rvert$ ≤ 40 V			2.5	5		2.5	10	mA
	$\lvert V_{IN} - V_{OUT}\rvert$ ≤ 10 V			1.2	3		1.5	6	mA
Current limit	$\lvert V_{IN} - V_{OUT}\rvert$ ≤ 15 V	K, DCY and NDE package	1.5	2.2	3.5	1.5	2.2	3.7	A
		NDT package	0.5	0.8	1.8	0.5	0.8	1.9	A
	$\lvert V_{IN} - V_{OUT}\rvert$ = 40 V, T_J = 25°C	K, DCY and NDE package	0.24	0.4		0.15	0.4		A
		NDT package	0.15	0.17		0.1	0.17		A
RMS output noise, % of V_{OUT}	T_j = 25°C, 10 Hz ≤ f ≤ 10 kHz			0.003%			0.003%		
Ripple rejection ratio	V_{OUT} = −10 V, f = 120 Hz			60			60		dB
	C_{ADJ} = 10 μF		66	77		66	77		dB
Long-term stability	T_J = 125°C, 1000 Hours			0.3%	1%		0.3%	1%	

(1) Regulation is measured at constant junction temperature, using pulse testing with a low duty cycle. Changes in output voltage due to heating effects are covered under the specification for thermal regulation. Load regulation is measured on the output pin at a point ⅛ in. below the base of the TO packages.
(2) Selected devices with tightened tolerance reference voltage available.

5.4 Typical Characteristics

(NDE Package)

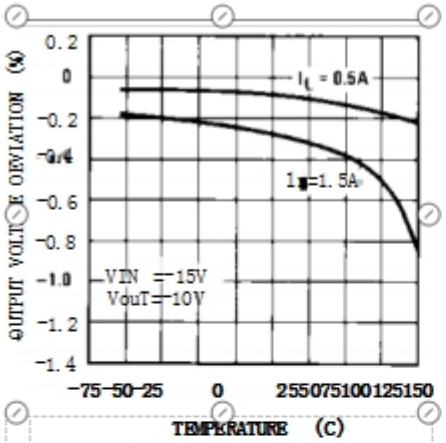


Figure 1. Load Regulation

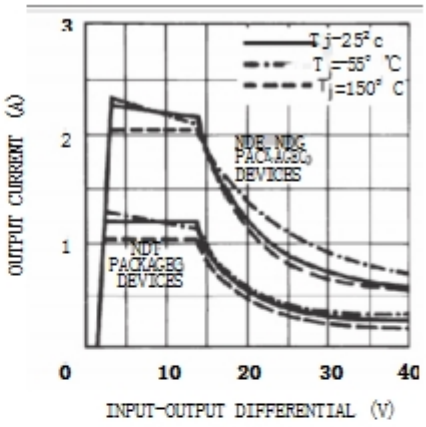


Figure 2. Current Limit

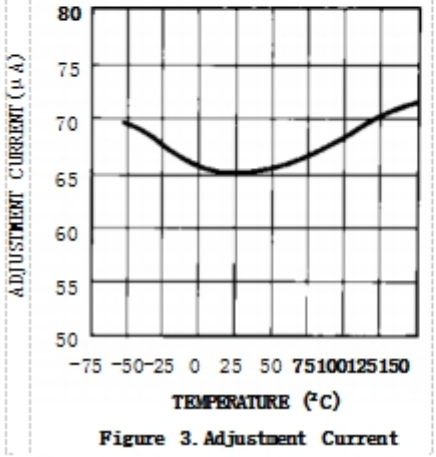


Figure 3. Adjustment Current

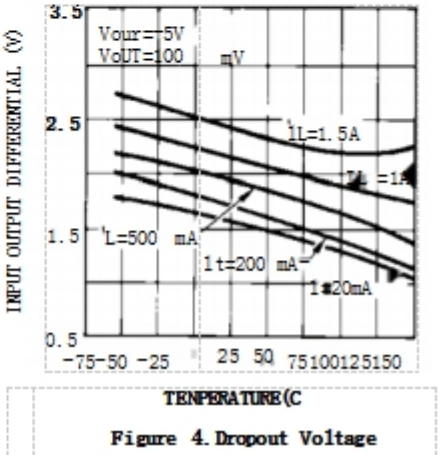


Figure 4. Dropout Voltage

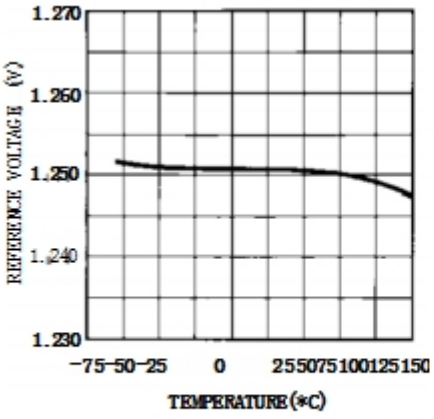


Figure 5. Temperature Stability

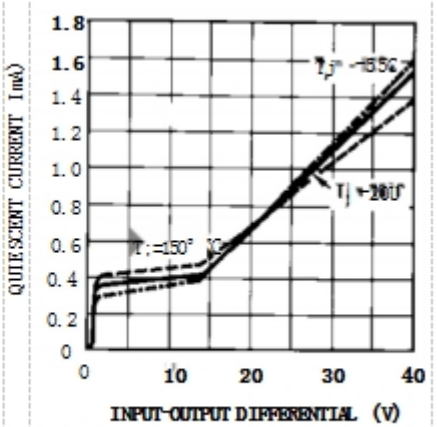


Figure 6. Minimum Operating Current

Typical Characteristics (continued)

(NDE Package)

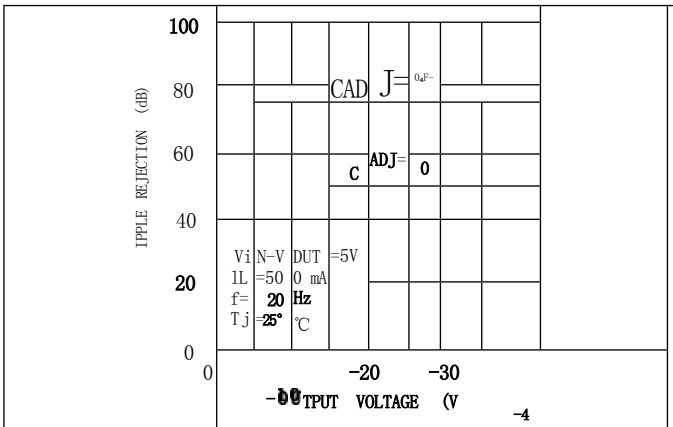


Figure 7. Ripple Rejection

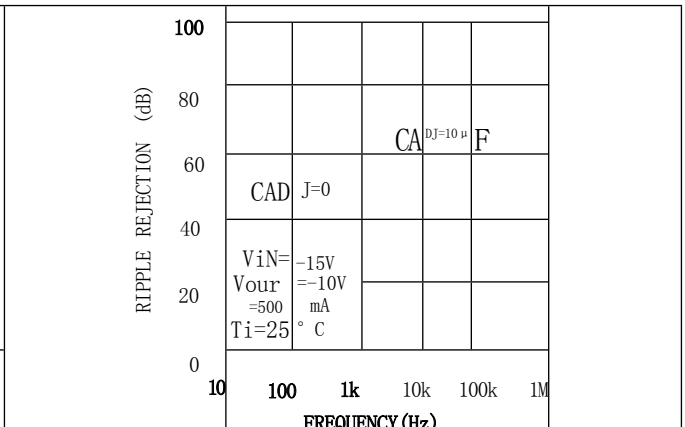


Figure 8. Ripple Rejection

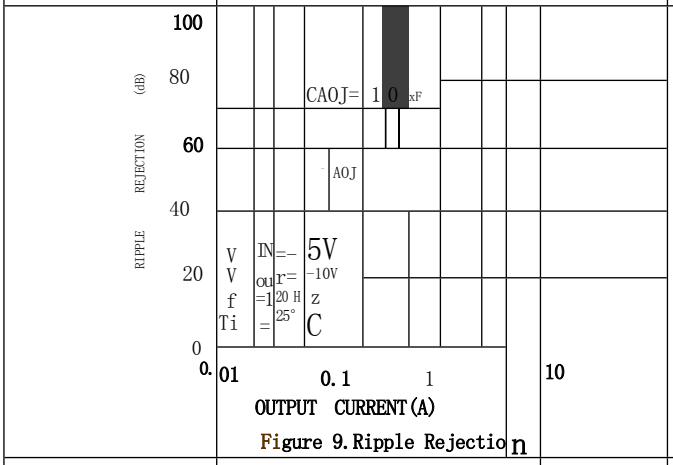


Figure 9. Ripple Rejection

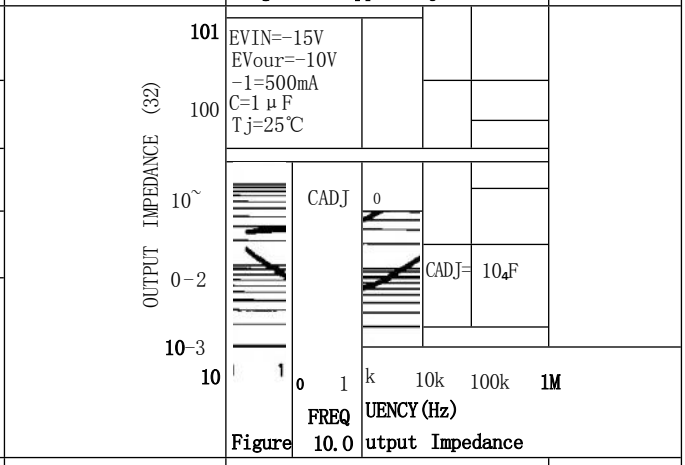


Figure 10.0 utput Impedance

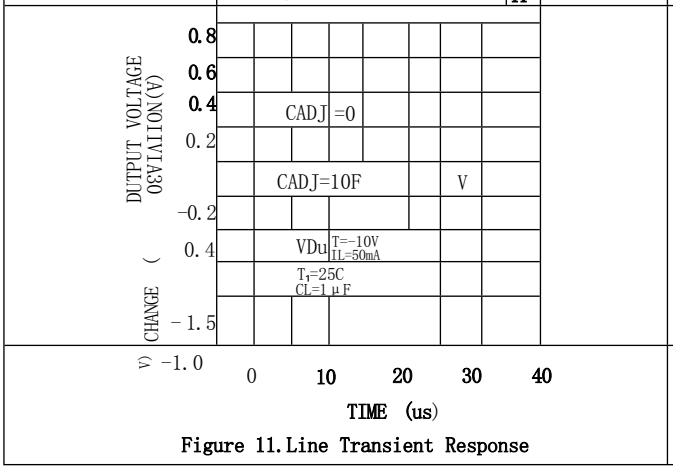


Figure 11. Line Transient Response

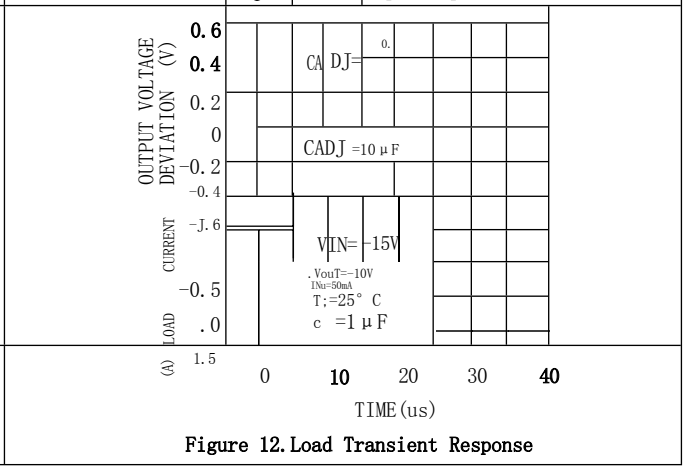
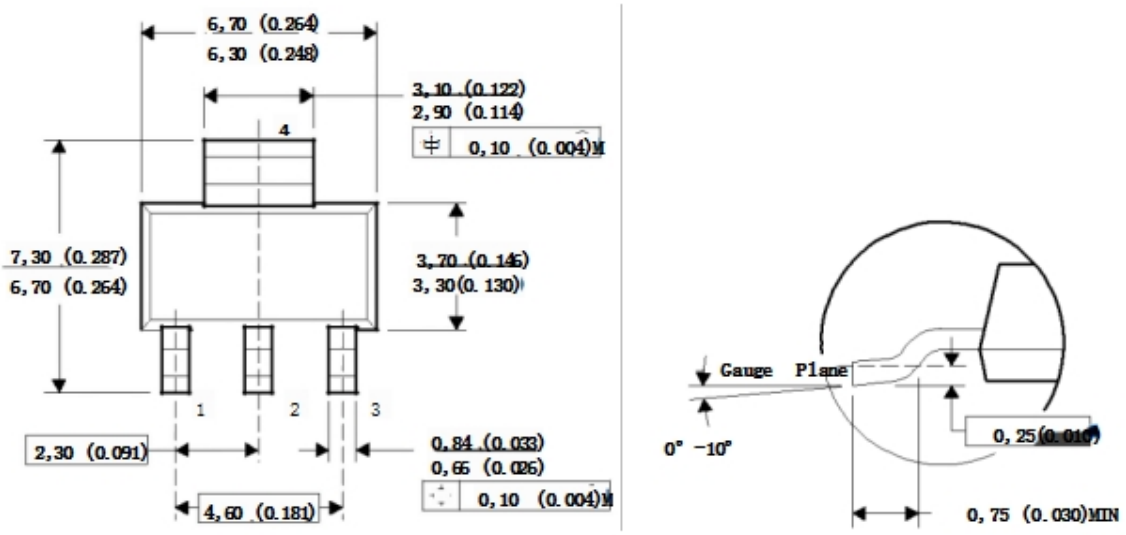
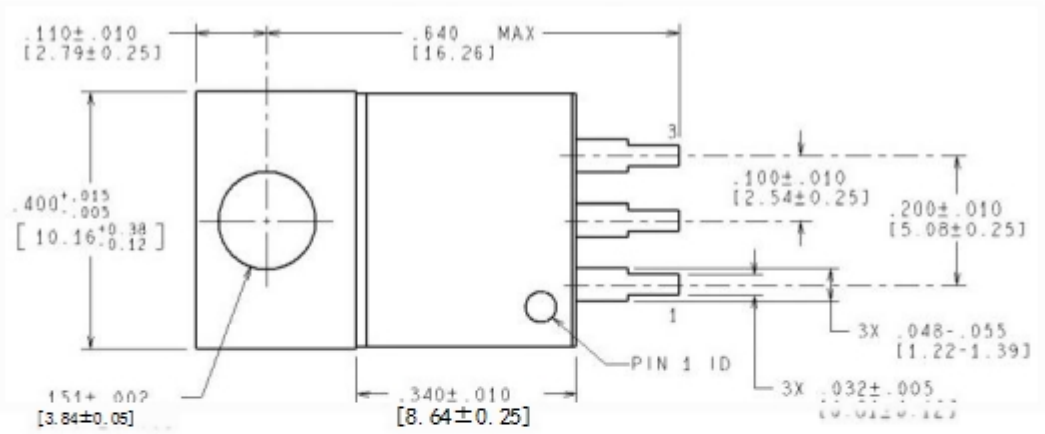


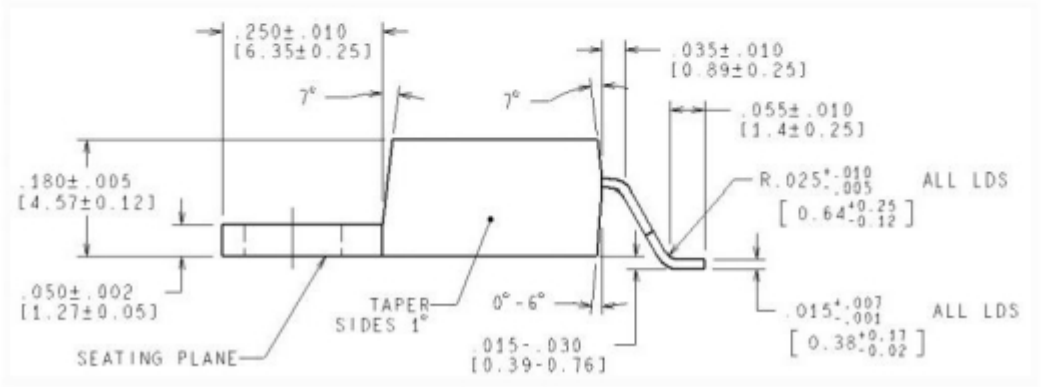
Figure 12. Load Transient Response

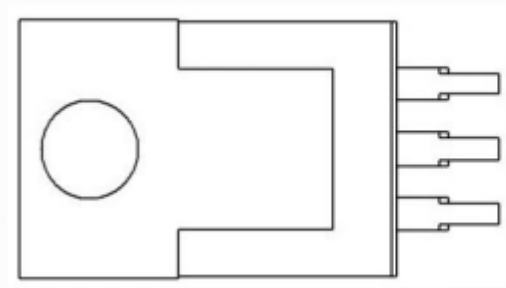
DCY (R-PDSO-G4) **PLASTIC SMALL OUTLINE**



NOTES:A.All linear dimensions are in millimeters (inches).
B.This drawing is subject to change without notice.
C.Body dimensions do not include mold flash or protrusion.
D.Falls within JEDEC TO-261 Variation AA.

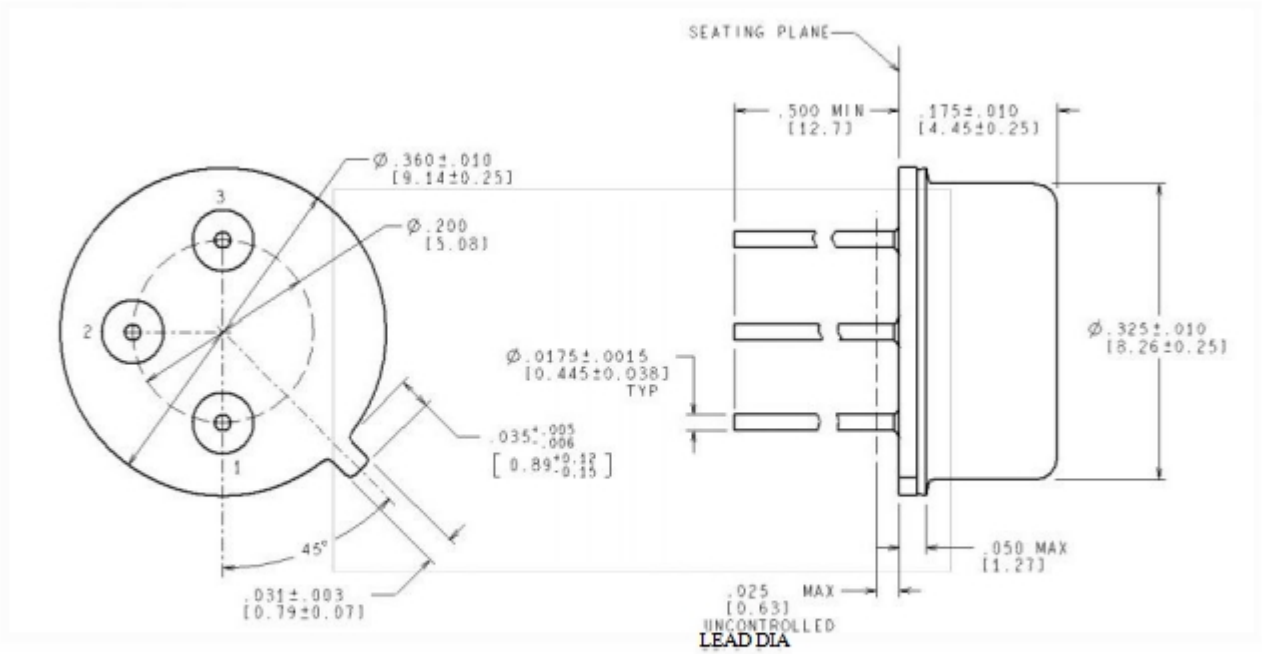






CONTROLLING DIMENSION IS INCH
VALUES IN [] ARE MILLIMETERS
DIMENSIONS IN (~) FOR REFERENCE ONLY

T03F(Rev B)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Ø.200
[5.08]
3
2
1
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TYP
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45°
.050 MAX
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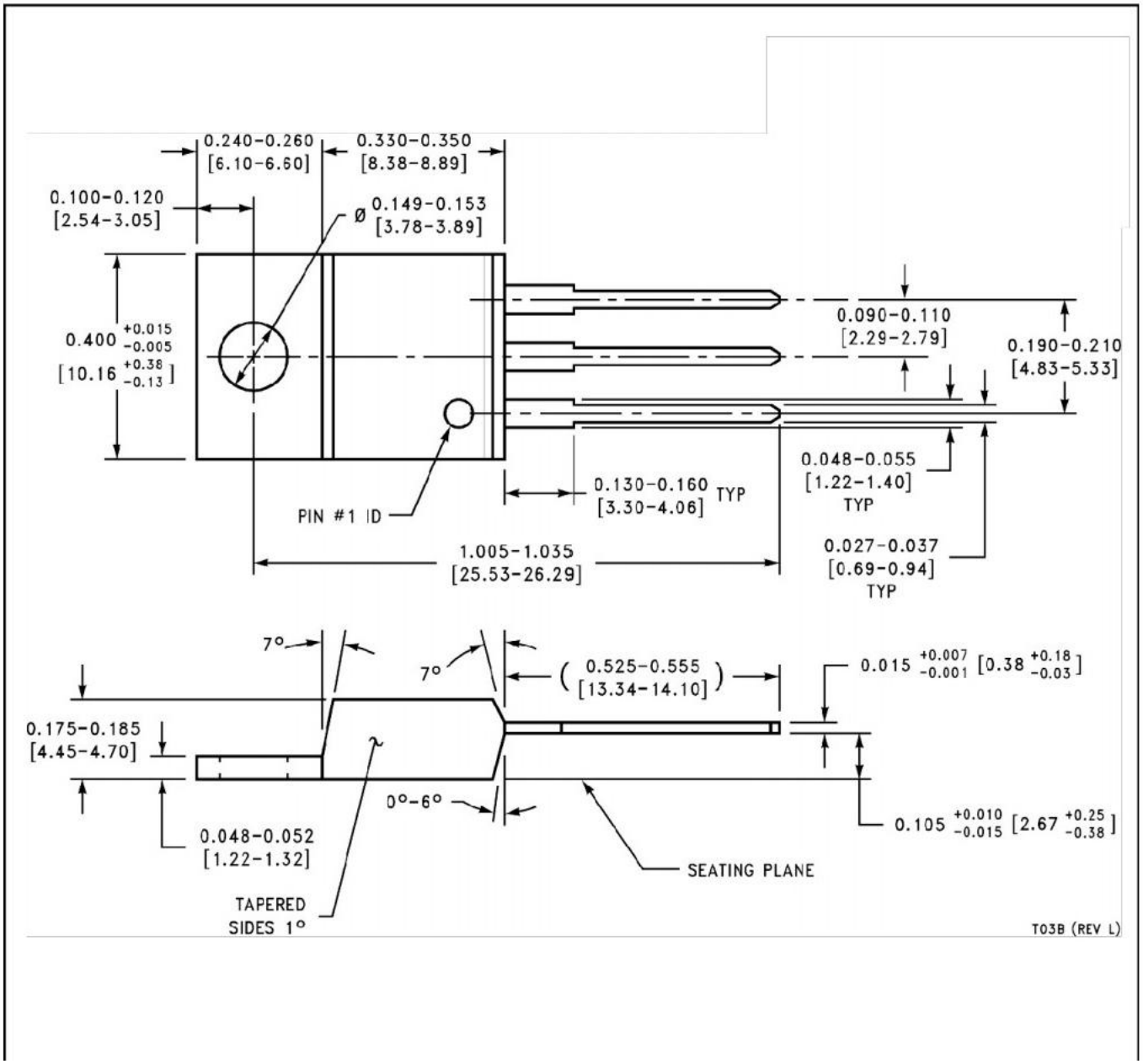
MIL-PRF-38535
CONFIGURATION CONTROL
H03A (Rev D)


0.240-0.260
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0.330-0.350
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0.100-0.120
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Ø 0.149-0.153
[3.78-3.89]
0.400 +0.015 -0.005
[10.16 +0.38 -0.13]
0.090-0.110
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0.190-0.210
[4.83-5.33]
PIN #1 ID
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[3.30-4.06]
0.048-0.055
[1.22-1.40]
TYP
1.005-1.035
[25.53-26.29]
0.027-0.037
[0.69-0.94]
TYP
7°
7°
(0.525-0.555
[13.34-14.10])
0.015 +0.007 -0.001 [0.38 +0.18 -0.03]
0.175-0.185
[4.45-4.70]
0°-6°
0.105 +0.010 -0.015 [2.67 +0.25 -0.38]
0.048-0.052
[1.22-1.32]
SEATING PLANE
TAPERED
SIDES 1°
TO3B (REV L)