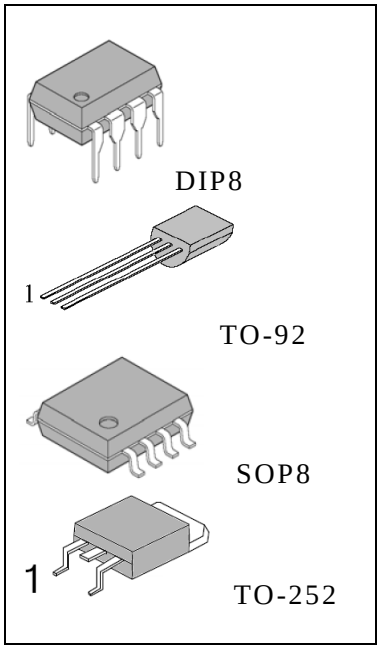
100 mA Low-Dropout Voltage Regulator
BL2950/BL2951

DESCRIPTION

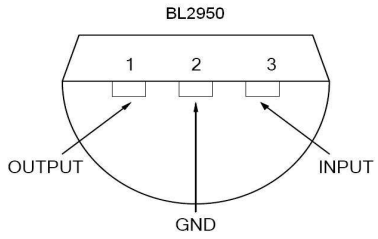
The BL2950/BL2951 are monolithic integrated voltage regulators with low dropout voltage, and low quiescent current. It includes many features that suitable for different applications.



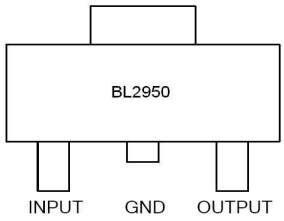
FEATURES

- Fixed output versions, 2.5V, 3V, 3.3V, 3.6V and 5V, are available.
- High accuracy output voltage.
- Extremely low quiescent current and dropout voltage.
- Extremely tight load and line regulation.
- Current and thermal limiting.
- Very low temperature coefficient.
- Logic controlled shutdown and err flog available for 8 pin package.
- Output voltage programmable for BL2951.

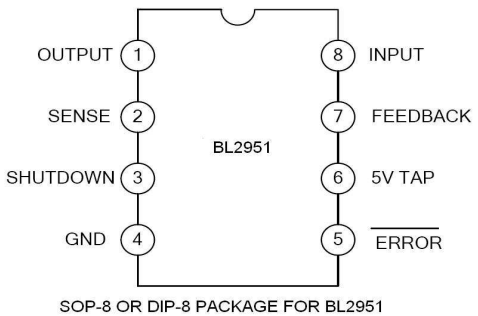
PIN CONFIGURATION



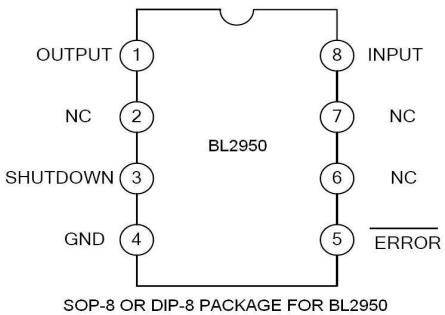
TO-92 Plastic Package Bottom View



SOT-252 Package

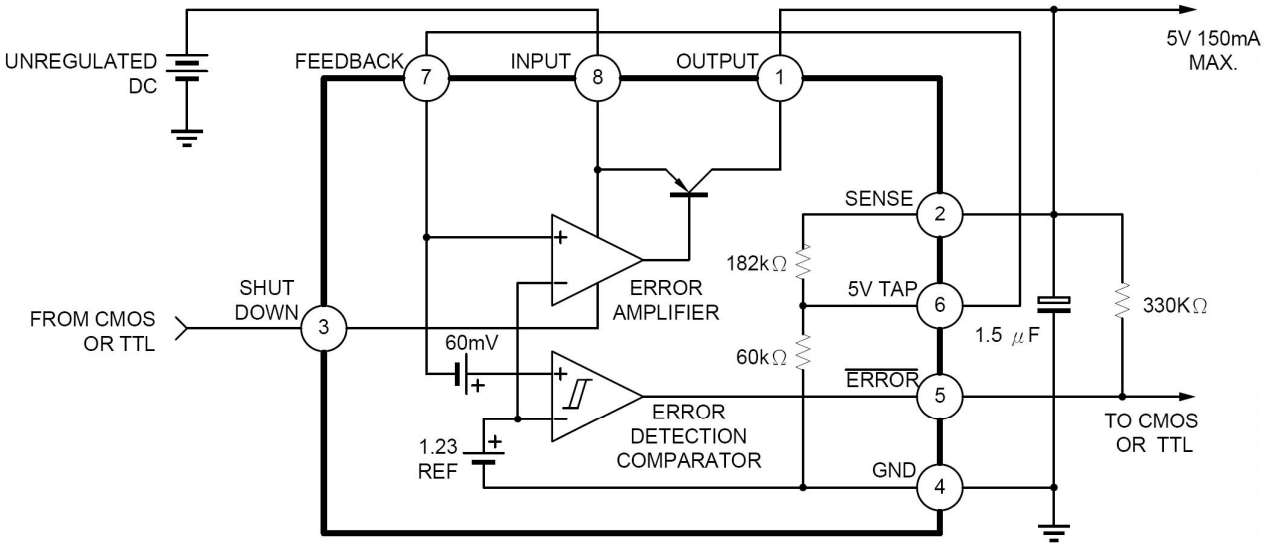


SOP-8 OR DIP-8 PACKAGE FOR BL2951



SOP-8 OR DIP-8 PACKAGE FOR BL2950

BLOCK DIAGRAM



FOR BL2951

ABSOLUTE MAXIMUM RATINGS (Ta=25℃) *

Characteristic	Symbol	Limit	Unit
Supply voltage	Vcc	-0.3 ~ +30	V
Feedback voltage	V_{FB}	-1.5 ~ +30	V
Shutdown voltage	V_{SHDN}	-0.3 ~ +30	V
Power dissipation	P_D	Internally Limited	W
Operation junction temperature	T_J	-40 ~ +125	℃
Storage temperature	T_{STG}	-65 ~ +150	℃

*: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

THERMAL DATA

Characteristic		Symbol	Limit	Unit
Junction-to-Ambient	TO-92	θ_{JA}	160	℃/W
	TO-252		92	
	SOP8		180	
	DIP8		105	
Junction-to-Case	TO-92	θ_{JC}	83	℃/W
	TO-252		6	
	SOP8		45	

ELECTRICAL CHARACTERISTICS

(unless otherwise specified: V_{IN}=6V, I_L=100μA, C_L=1μF ,T_J = 25℃)

For All Version

Characteristic	Symbol	Conditions	Min.	Typ.	Max	Unit
Output voltage	V_{OUT}	T_J = 25℃ *1	V_{OUT} ×0.98	V_{OUT}	V_{OUT} ×1.02	V
		-25℃ ≤ T_J ≤ +85℃ *1	V_{OUT} ×0.98	V_{OUT}	V_{OUT} ×1.02	
Output voltage	V_{OUT}	100μA ≤ I_L ≤ 100mA T_J ≤ $T_{J(max)}$	V_{OUT} ×0.98	V_{OUT}	V_{OUT} ×1.02	V
Output voltage temperature coefficient	TcVo		20		100	ppm /℃
Line regulation	ΔV_{OUT}	6V ≤ V_{IN} ≤ 30V	0.03	0.1	0.2	%
Load regulation	ΔV_{OUT}	100μA ≤ I_L ≤ 100mA	0.04	0.1	0.2	%
Dropout voltage	V_D	I_L =100μA	50	80	150	mV
		I_L =100mA *2	380	450	600	
Ground current	I_G	I_L =100μA	75	120	140	μA
		I_L =100mA	8	12	14	mA
Dropout ground current		V_{IN}=4.5V, I_L =100μA	110	170	200	μA
Current limit	I_{LIMIT}	V_{OUT} =0	160	200	220	mA
Output noise(10Hz~100kHz) (Bypass=0.01μF pins 7 to 1(BL2951)	eN	C_L=1μF			430	μV
		C_L=200μF			160	
		C_L=3.3μF			100	

For BL2951 8pin Version Only

Characteristic		Symbol	Conditions	Min.	Typ.	Max	Unit
Reference voltage		V_{REF}		1.22	1.235	1.25	V
Reference voltage		V_{REF}	Over temperature *4	1.19		1.27	V
Feedback pin bias current		I_{FB}			20	40	nA
Reference voltage temperature coefficient		$V_{REF(TC)}$			50		ppm /℃
Feedback bias current temperature coefficient		$I_{FB(TC)}$			0.1		nA/ ℃
Error Comparator							
Output leakage current		$I_{O(LEAK)}$	V_{OH}=30V			1	μA
Output low voltage		V_{OL}	V_{IN}=4.5V,I_{OL}=400μA			250	mV
Threshold voltage	Upper	V_{THU}	*3	3.2			%VO
	Lower	V_{THL}	*3			7.6	%VO
Hysteresis		V_{HYS}	*3		15		mV

Characteristic		Symbol	Conditions	Min.	Typ.	Max	Unit
Shutdown Input							
Input logic voltage	Low	V_{IL}	Regulator ON		1.3	0.7	V
	High	V_{IH}	Regulator OFF	2.0			
Shutdown pin input current		I_{SHDN}	V_{SHDN}=2.4V		30	50	μA
			V_{SHDN}=30V		450	600	
Regulator output current shutdown		I_{DFF}	V_{SHDN}≧2V, V_{IN}≦30V, V_{OUT}=0 ,Feedback pin tied to 5V Tap.		3	10	μA

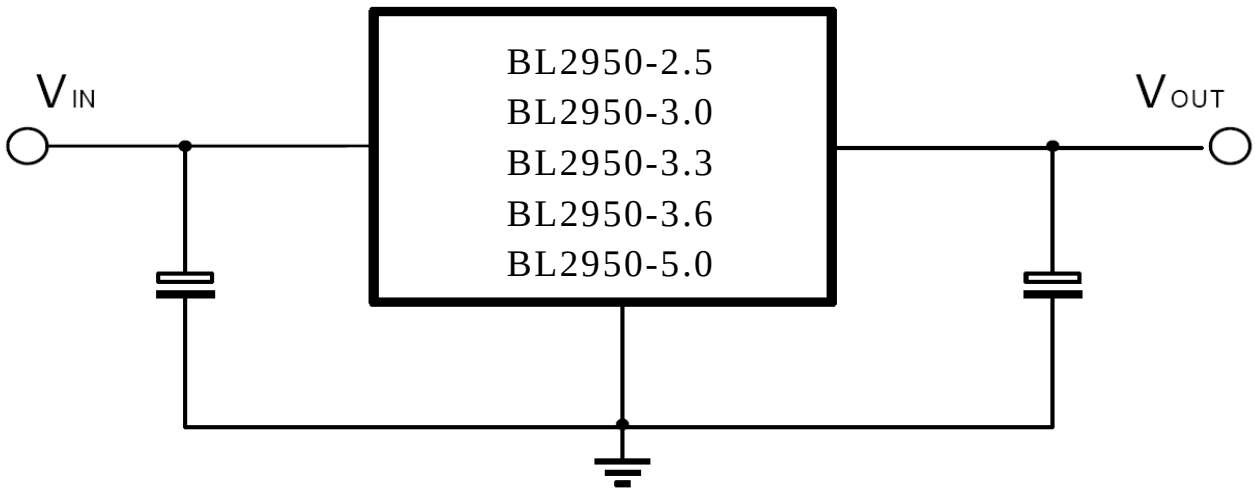
*1. Additional conditions for 8-pin versions are FB pin tied to $5V_{TAP}$, Output tied to Sense (V_{OUT}=5V) and V_{SHDN}≤0.8V

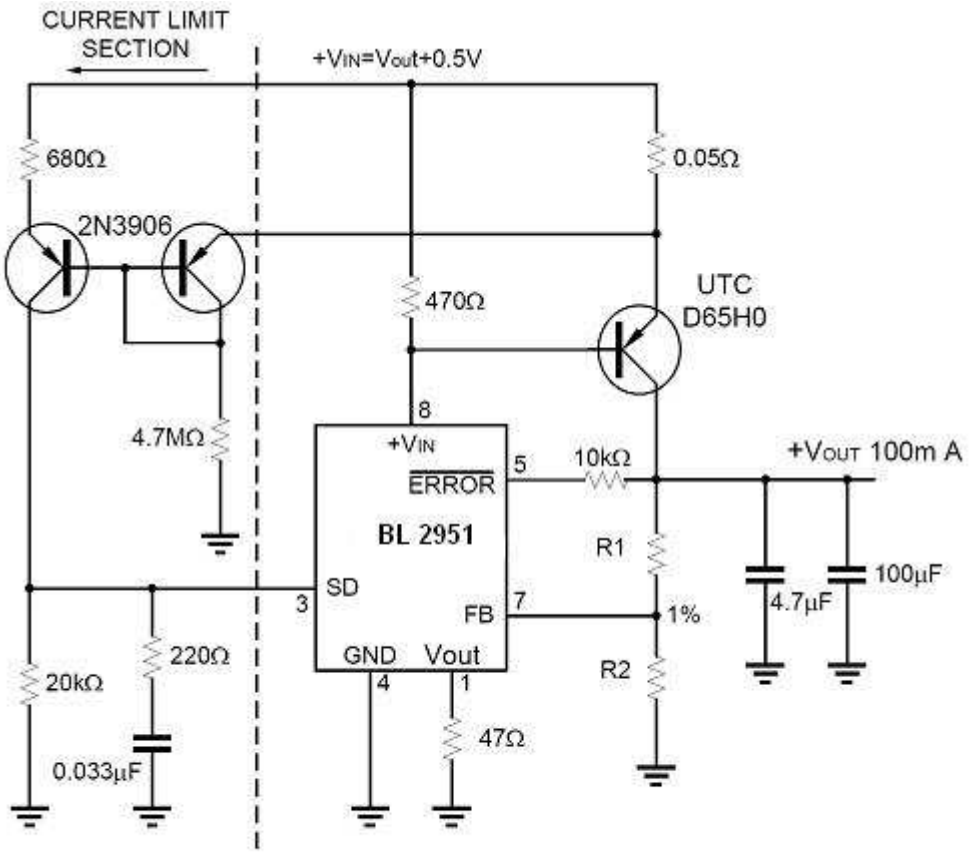
*2. Dropout Voltage is defined as the input to output differential at which the output voltage drops 100mV below its nominal value measured at 1V differential.

*3. Comparator thresholds are expressed in terms of percentage value of voltage output.

*4. V_{REF}≤V_{OUT}≤(V_{IN}-1V), 2.3V≤V_{IN}≤30V, 100μA≤I_L≤100mA, T_J≤$T_{J(MAX)}$

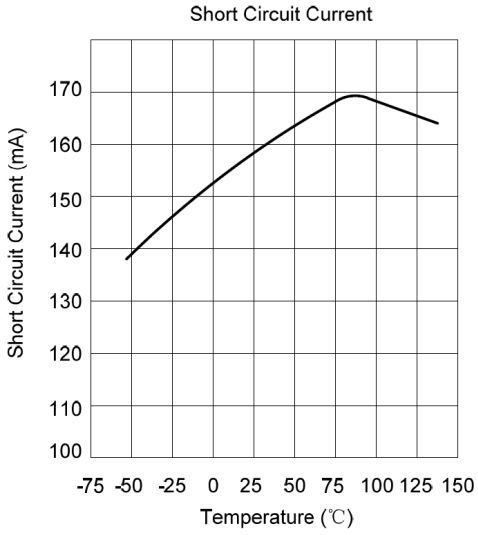
APPLICATION CIRCUITS

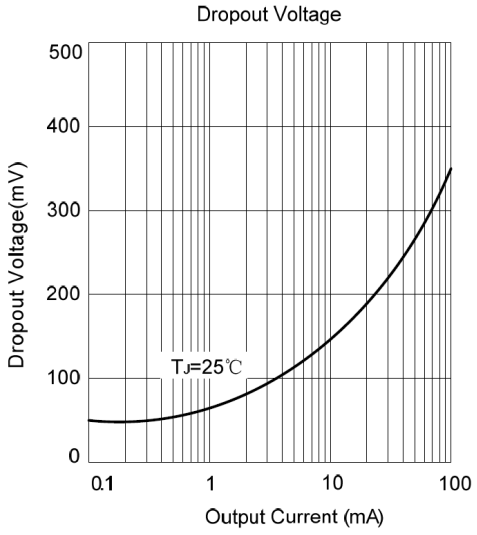




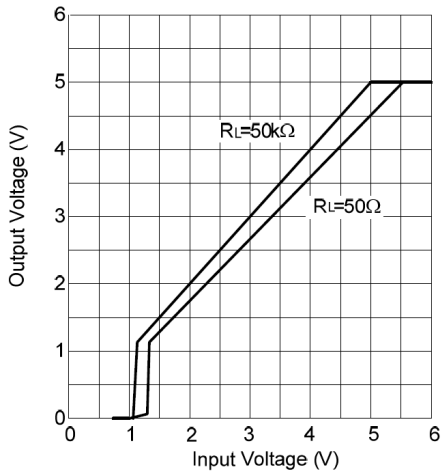
VOUT=1.23V*(1+R1/R2)
For 5V output use internal resistors.Wire pin 6 to 7 and wire pin 2 to +VOUT

CHARACTERISTICS CURVE

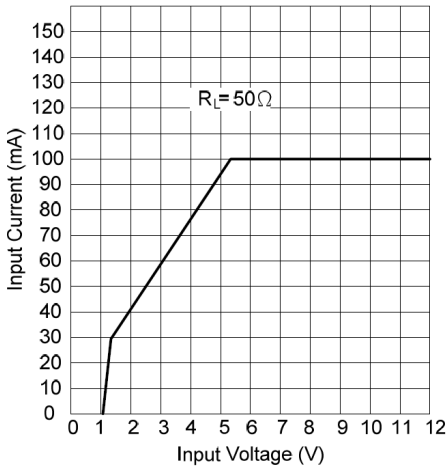




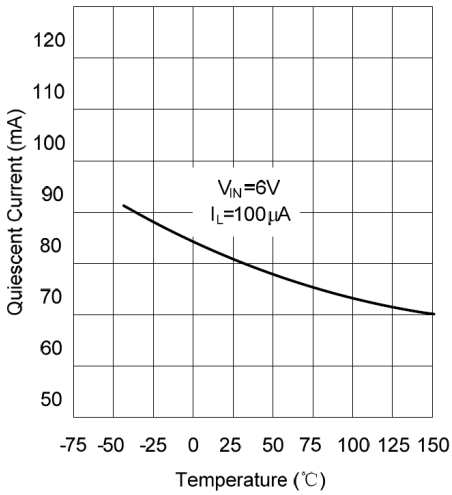
Dropout Characteristics



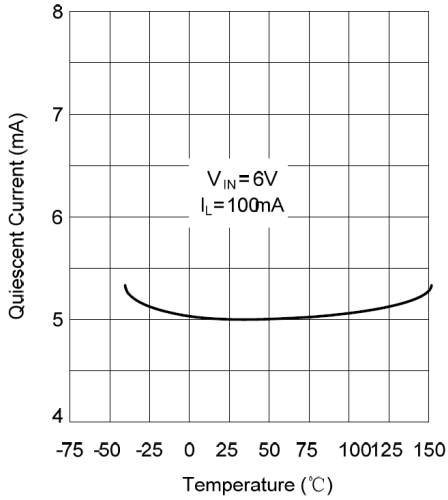
Input Current



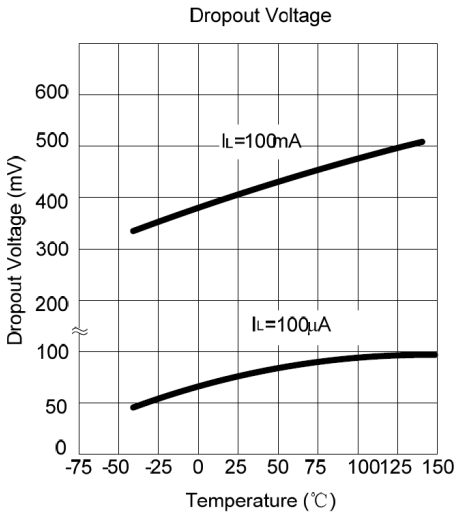
Ground Pin Current



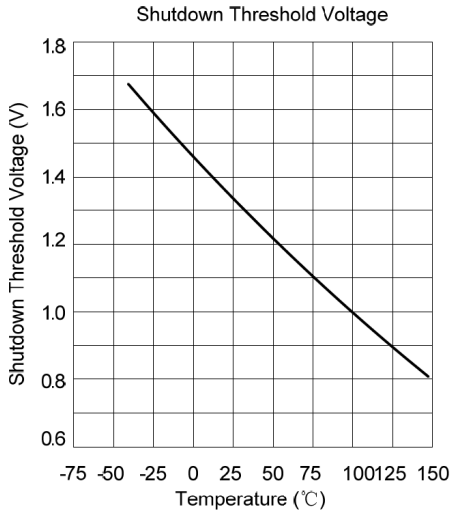
Ground Pin Current



Dropout Voltage

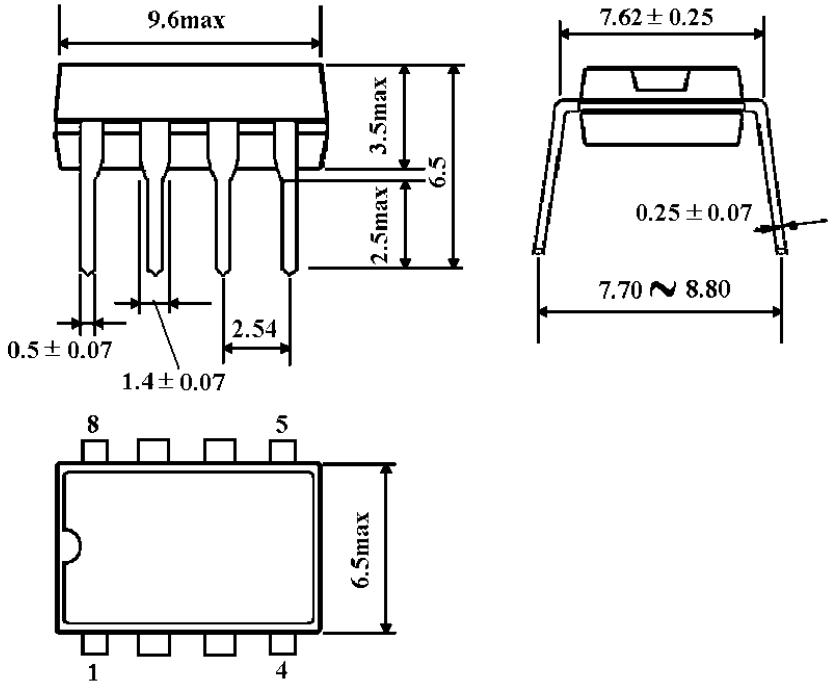


Shutdown Threshold Voltage

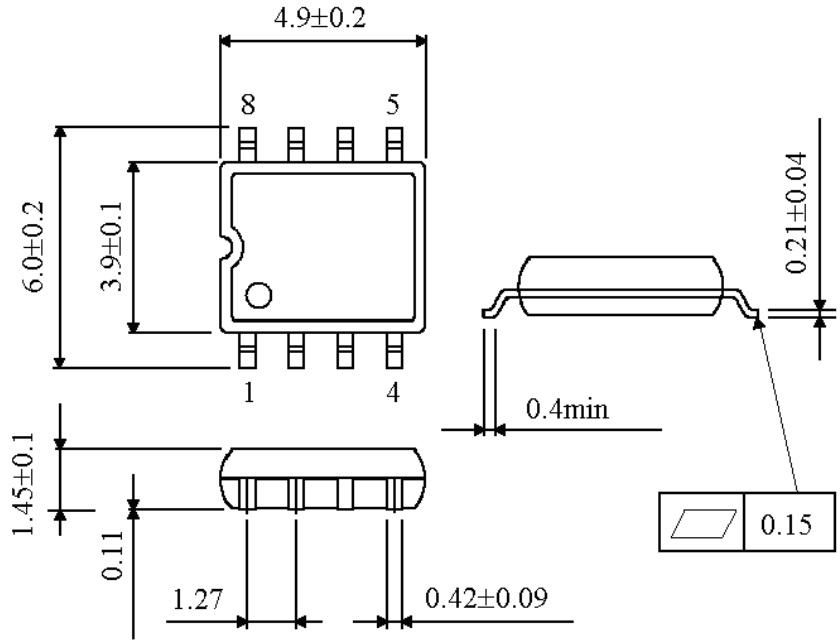


OUTLINE DRAWING

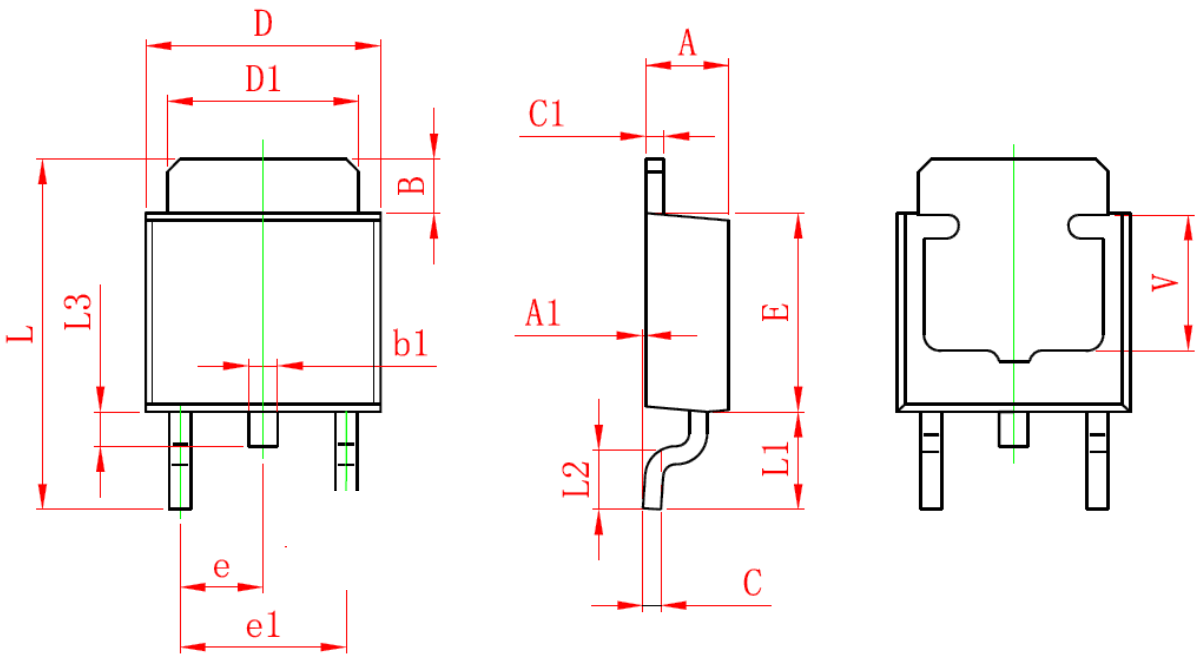
DIP8 Unit: mm



SOP8 Unit:mm

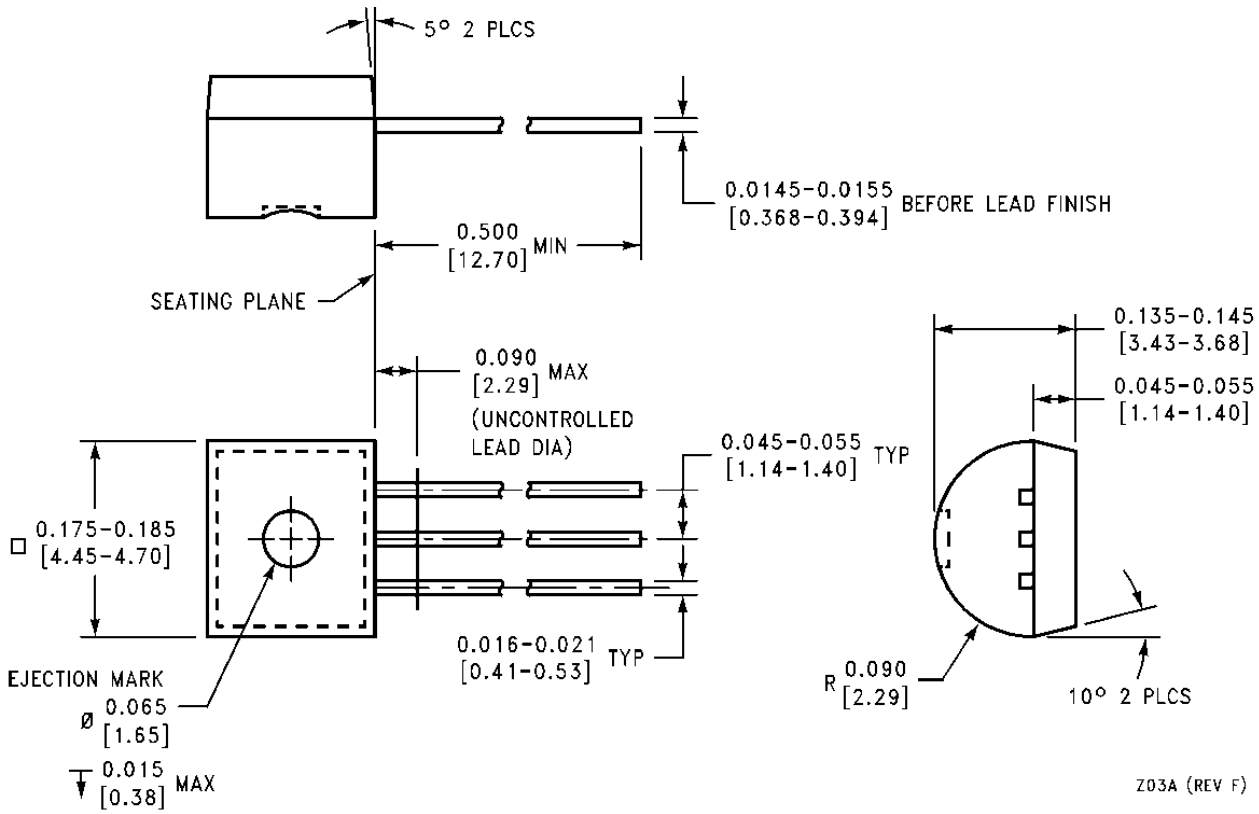


TO-252 Unit: mm



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300 TYP.		0.091 TYP.	
e1	4.500	4.700	0.177	0.185
L	9.500	9.900	0.374	0.390
L1	2.550	2.900	0.100	0.114
L2	1.400	1.780	0.055	0.070
L3	0.600	0.900	0.024	0.035
V	3.800 REF.		0.150 REF.	

TO-92 Unit:mm


5° 2 PLCS
0.0145-0.0155
[0.368-0.394] BEFORE LEAD FINISH
0.500
[12.70] MIN
SEATING PLANE
0.090
[2.29] MAX
(UNCONTROLLED
LEAD DIA)
0.045-0.055
[1.14-1.40] TYP
0.135-0.145
[3.43-3.68]
0.045-0.055
[1.14-1.40]
0.175-0.185
[4.45-4.70]
0.016-0.021
[0.41-0.53] TYP
EJECTION MARK
Ø 0.065
[1.65]
0.015
[0.38] MAX
R 0.090
[2.29]
10° 2 PLCS
Z03A (REV F)