General Description

CP7150X series are low-dropout linear voltage regulators with a built-in voltage reference module, error correction module and phase compensation module. CP7150X series are based on the CMOS process and allow high voltage input with low quiescent current. This series has the function of internal feedback resistor setting from 2.1 to 5.0V. The two output voltage accuracies are: ±1% (VOUT =3.0V,3.3V, 5.0V) and ±2% (other output voltages).

Features

- High output accuracy：
  ± 1%（VOUT =3.0V、3.3V、5.0V）
  ± 2%（Others）
- Input voltage：up to 36 V
- Output voltage：2.1 V ~ 5.0V
- Ultra-low quiescent current (Typ. = 3 μ A)
- Output Current：Iout = 100mA
  （When Vin = 7V and Vout =5V）
- Importation good stability：Typ. 0.05% / V
- Low temperature coefficient
- Ceramic capacitor can be used

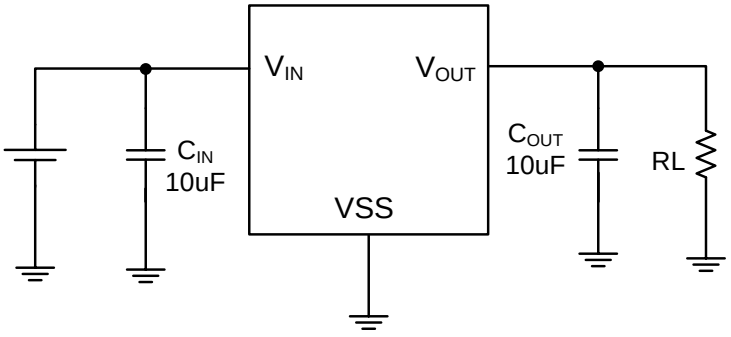
Typical Application

- Electronic weighbridge
- SCM
- Phones, cordless phones
- Security Products
- Water meters, power meters

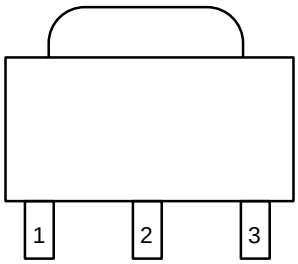
Package

- 3-pin SOT23-3、SOT89-3、TO92

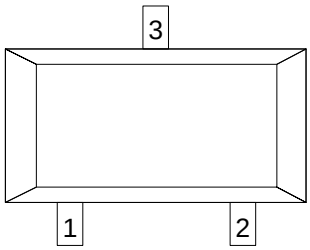
Typical Application Circuit



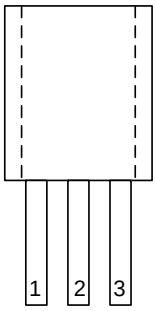
Pin Configuration



SOT89-3



SOT23-3

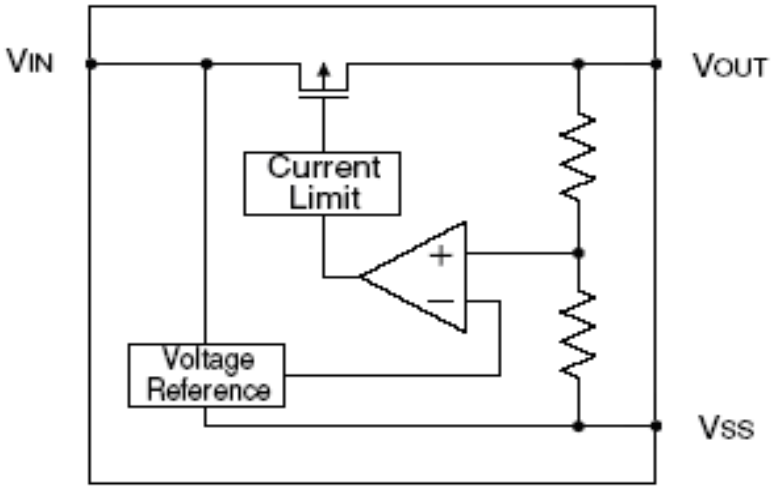


TO92

Pin Assignment

Pin Number		Pin Name	Functions
SOT89-3 / TO92	SOT23-3		
1	1	V_{SS}	Ground
2	3	V_{IN}	Power Input
3	2	V_{OUT}	Output

Block Diagram



Absolute Maximum Ratings

Parameter		Symbol	Ratings	Units
Input Voltage		V_{IN}	36V	
Output Current		I_{OUT}	150	mA
Output Voltage		V_{OUT}	Vss-0.3～V_{IN} +0.3	V
Power Dissipation	SOT89-3	P_D	1.25	W
	TO92		0.83	
	SOT23-3		0.54	
Thermal resistance	SOT89-3	θ_{JA}	100	℃/W
	TO92		150	
	SOT23-3		230	
Operating Temperature Range		T_{OPR}	-45 ~ +85	℃
Storage Temperature Range		T_{STG}	-55 ~ +150	℃
Lead Temperature			260℃，10sec	

Electrical Characteristics

(V_{IN}= V_{OUT}+2.0V，C_{IN}=C_L=10uF，Ta=25^{O}C, unless otherwise noted)

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}(E) (Note 2)	I_{OUT}=10mA, V_{IN}=Vout+2V	V_{OUT}=3.0V,3.3V,5.0V	X 0.99	V_{OUT} (T) (Note 1)	X 1.01	V
			V_{OUT}=others	X 0.98	V_{OUT} (T) (Note 1)	X 1.02	
Input Voltage	V_{IN}					36	V
Maximum Output Current	I_{OUT} _max	V_{IN}=Vout+2V		150			mA
Load Regulation	ΔV_{OUT}	V_{IN}=Vout+2V, 1mA≤I_{OUT}≤100mA			10		mV
Dropout Voltage (Note 3)	V_{dif1}	I_{OUT} =50mA			250		mV
	V_{dif2}	I_{OUT} =100mA			500		mV
	V_{dif3}	I_{OUT} =200mA			1000		mV
Supply Current	I_{SS}	V_{IN}=Vout+2V			3	5	μ A
Line Regulations	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	I_{OUT} =10mA Vout+2V ≤V_{IN}≤18V			0.05		%/V

Note ：

1. V_{OUT} (T) ： Specified Output Voltage

2.V_{OUT} (E) ：Effective Output Voltage (ie. The output voltage when “V_{OUT} (T)+2.0V”is provided at the Vin pin while maintaining a certain Iout value.)

3.V_{DIF}： V_{IN1} –V_{OUT} (E)’

V_{IN1} ： The input voltage when V_{OUT}(E)’ appears as input voltage is gradually decreased.

V_{OUT} (E)’=A voltage equal to 98% of the output voltage whenever an amply stabilized Iout and {V_{OUT} (T) +2.0V} is input.

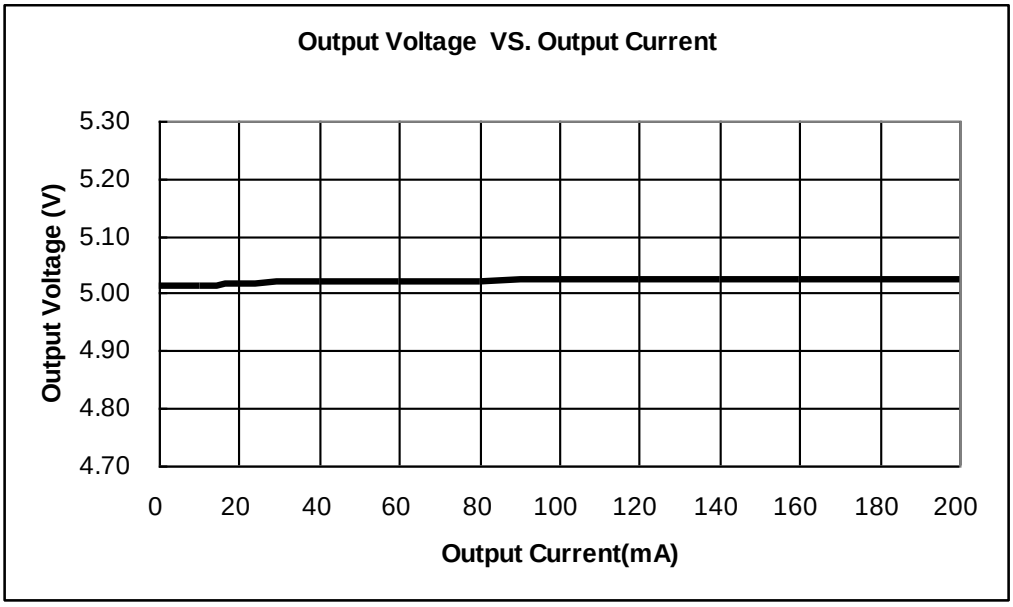
Precautions

- During the test, if AC/DC power supply and the ceramic chip capacitors collocation is used, there may be serious voltage spike phenomenon instantaneously. When the power supply access to 16V, the voltage is rushed to about 30V instantaneously. Because of exceeding the limit voltage of chip, the chip is damaged. If you string a small resistance of 1 ohm in the input end during the test, the peak phenomenon can be avoided.
- In the test, there is serious burr phenomenon only when the AC/DC power is used with ceramic chip capacitors. But electrolytic capacitors and tantalum capacitance won't appear above phenomenon. Please be sure to pay attention to this point when you use AC/DC power.
- In normal use, when any type of capacitor is used with battery or the supply of fire power, the above phenomenon doesn't occur.

Type Characteristics

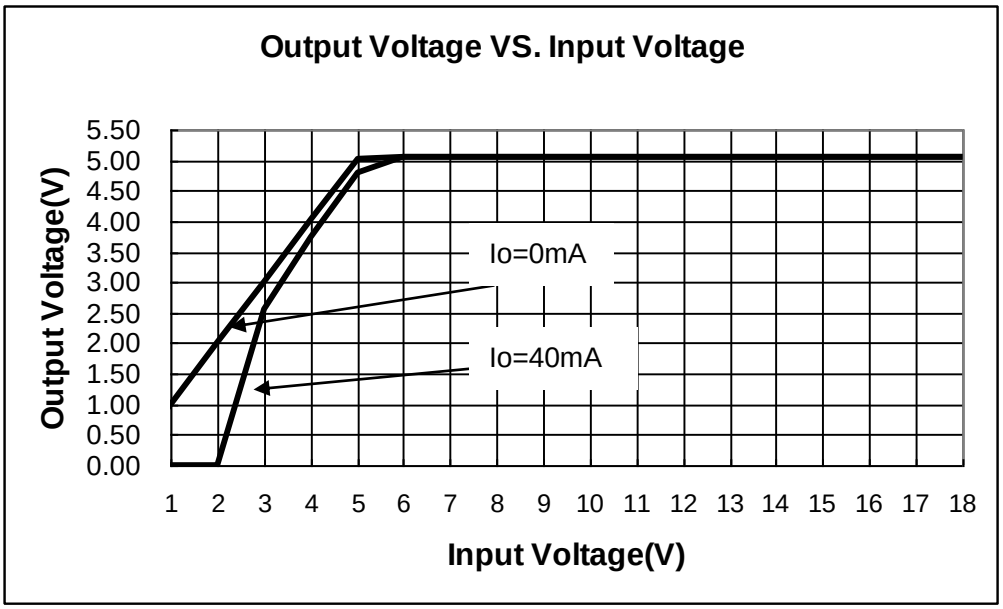
（1）Output CurrentVS.Output Voltage（ **Ta = 25 °C**）

CP7150X



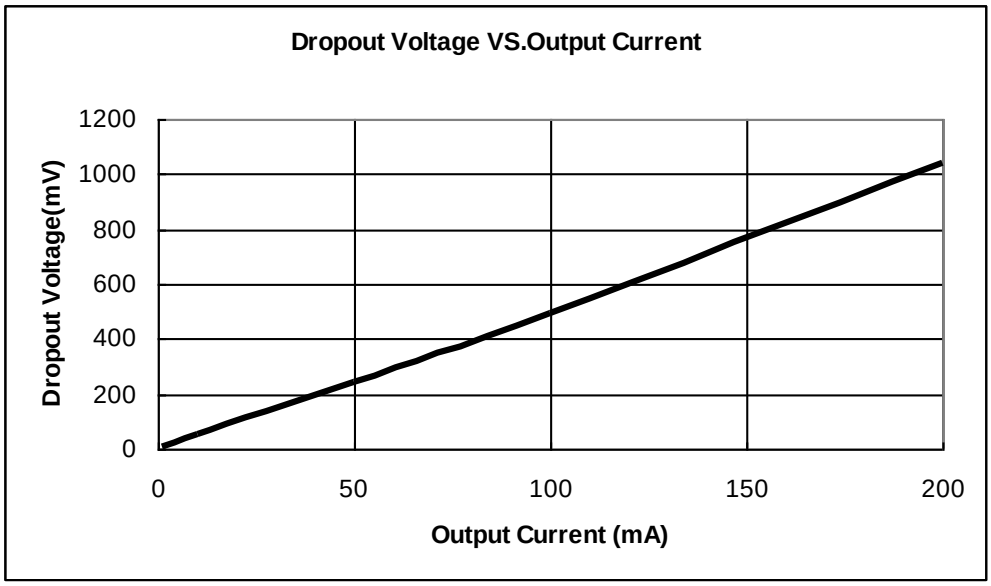
（2）Input VoltageVS.Output Voltage（**Ta = 25 °C**）

CP7150L



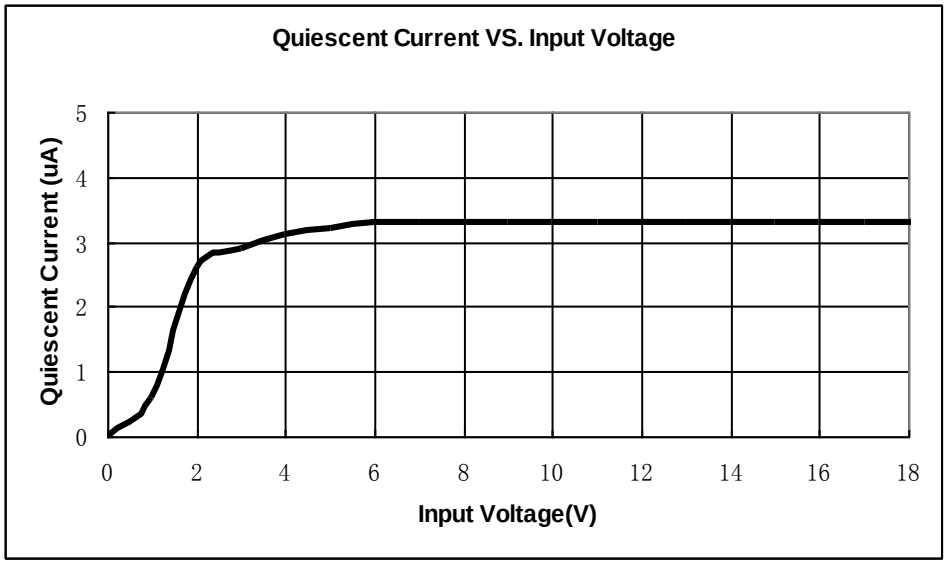
（3）Output Current VS.Droput Voltage（ **Ta = 25 °C**）

CP7150X



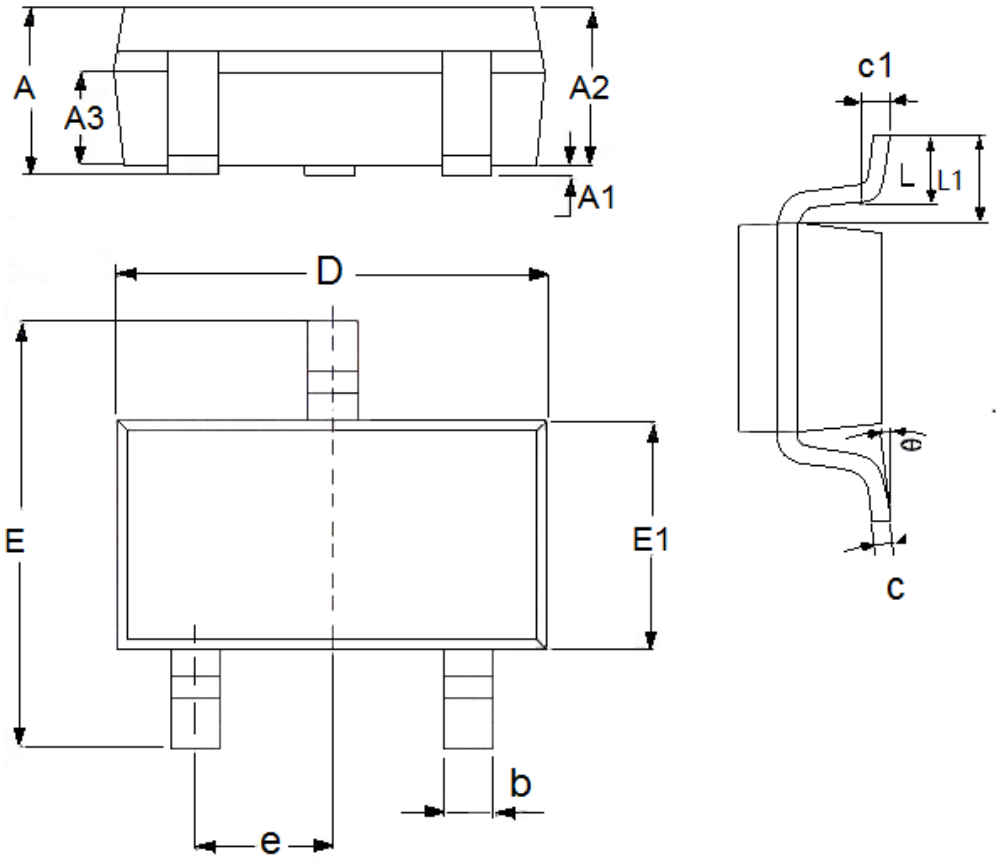
（4）Input Voltage VS. Supply Current（**Ta = 25 °C**）

CP7150L



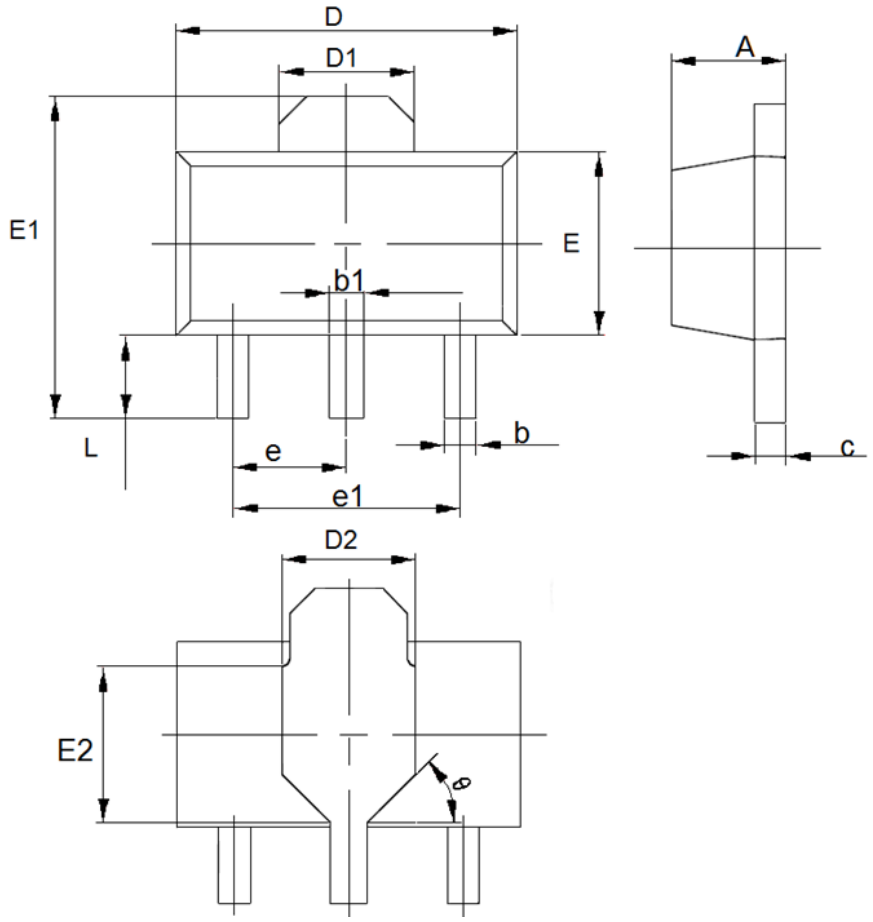
Packaging Information

- **Packaging Type: SOT23-3**



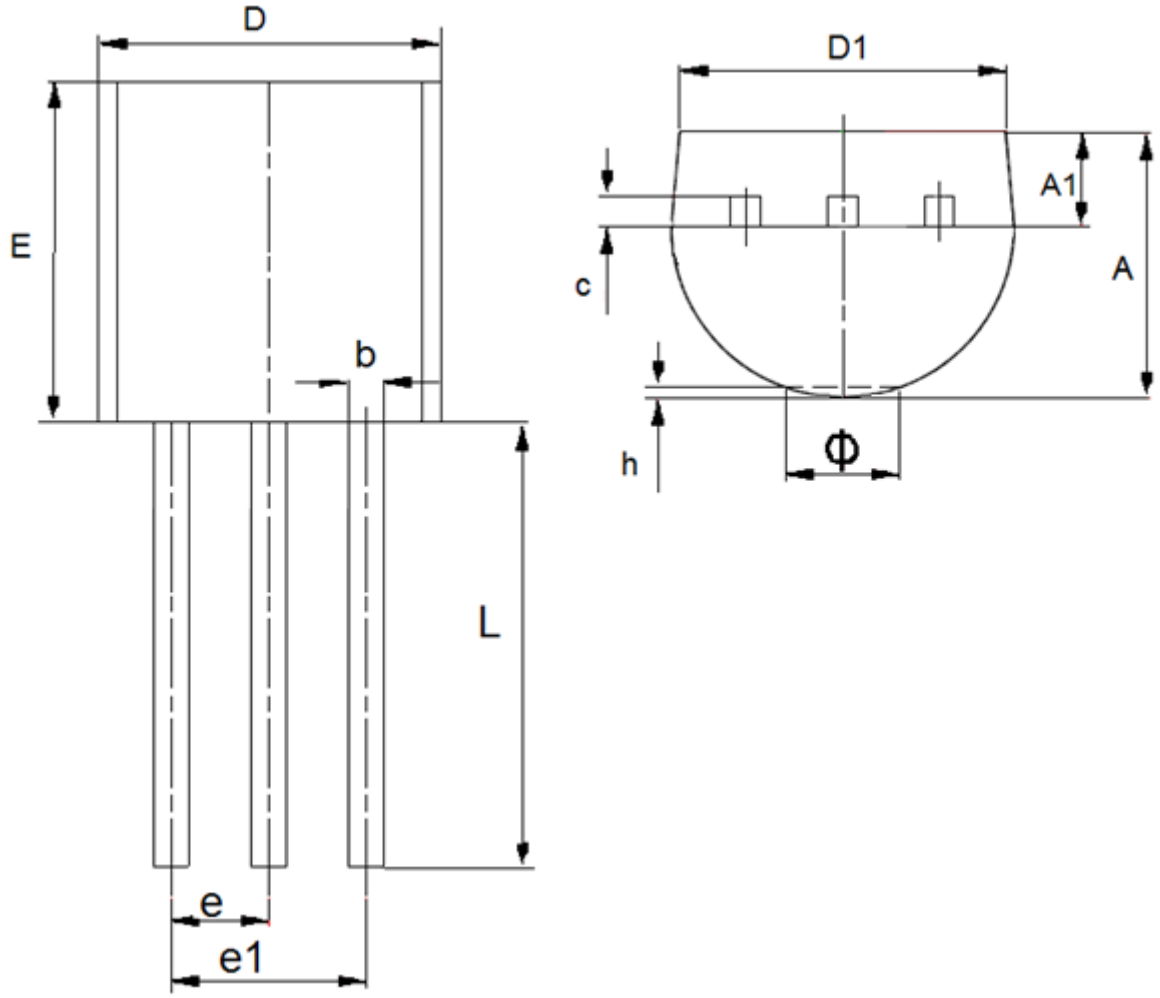
DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	1.05	1.45	0.0413	0.0571
A1	0	0.15	0.0000	0.0059
A2	0.9	1.3	0.0354	0.0512
A3	0.6	0.7	0.0236	0.0276
b	0.25	0.5	0.0098	0.0197
c	0.1	0.25	0.0039	0.0098
D	2.8	3.1	0.1102	0.1220
E	2.6	3.1	0.1023	0.1220
E1	1.5	1.8	0.0591	0.0709
e	0.95(TYP)		0.0374(TYP)	
L	0.25	0.6	0.0098	0.0236
L1	0.59(TYP)		0.0232(TYP)	
θ	0	8°	0.0000	8°
c1	0.2(TYP)		0.0079(TYP)	

- **Packaging Type: SOT89-3**



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	1.4	1.6	0.0551	0.063
b	0.32	0.52	0.0126	0.0205
b1	0.4	0.58	0.0157	0.0228
c	0.35	0.45	0.0138	0.01772
D	4.4	4.6	0.1732	0.1811
D1	1.55(TYP)		0.061(TYP)	
D2	1.75(TYP)		0.0689(TYP)	
e1	3(TYP)		0.1181(TYP)	
E	2.3	2.6	0.0906	0.1023
E1	3.94	4.4	0.1551	0.1732
E2	1.9(TYP)		0.0748(TYP)	
e	1.5(TYP)		0.0591(TYP)	
L	0.8	1.2	0.0315	0.0472
θ	45°		45°	

- **Packaging Type:TO-92**



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	3.3	3.7	0.1299	0.1457
A1	1.1	1.4	0.0433	0.0551
b	0.38	0.55	0.015	0.0217
c	0.36	0.51	0.0142	0.0201
D	4.3	4.7	0.1693	0.185
D1	3.43	—	0.135	—
E	4.3	4.7	0.1693	0.185
e	1.27		0.05	
e1	2.44	2.64	0.0961	0.1039
L	14.1	14.5	0.5551	0.5709
h	0	0.38	0	0.015
Φ	—	1.6	—	0.063

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