

Features

- Vin Range Up to 40V
- Output Range: 2.6V~5.0V
- Maximum Output Current: 500mA
- PSRR: 75dB@1KHz
- Dropout Voltage: 200mV@I_{OUT}=100mA
- Ultra Low Quiescent Current: 2μA Typ.
- Output Voltage Tolerances of ±2% Over the Temperature Range
- Internal Thermal Overload Protection
- Built-in Foldback Current Limit

Applications

- E-meters, Water Meters and Gas Meters
- Cellphones, Radiophone, Digital Cameras
- Fire Alarm, Smoke Detector
- Appliances and White Goods

General Description

The TX8451 is ultra-low quiescent current regulator features and low dropout voltage. With 2μA quiescent current at no load. The TX8451 retains all of the features that are common to low dropout regulators including a low dropout PMOS pass device, foldback current limiter, and thermal shutdown.

The TX8451 has 40V maximum operating voltage, excellent load transient response, and -40°C to 125°C operating temperature range, and ±2% output voltage tolerance over the entire output current, input voltage, and temperature range.

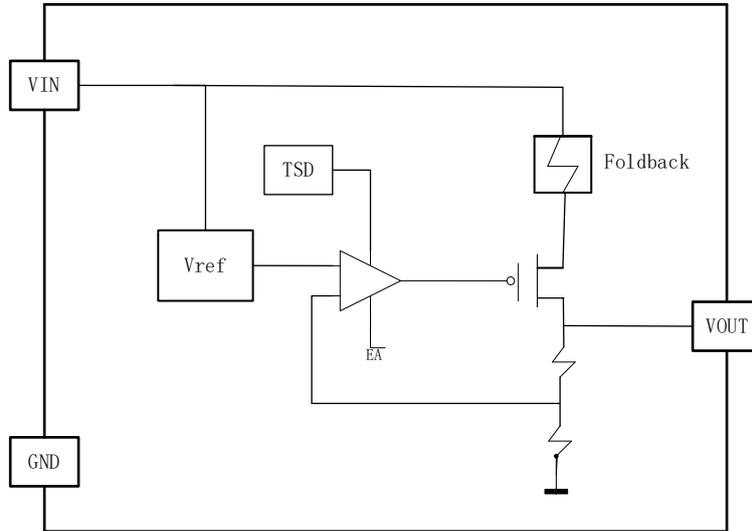
The TX8451 regulators are available in standard SOT23-3L, SOT89-3 and TO92 packages.

Order Information

TX8451-①②③④

Designator	Symbol	Description
①②	Integer	Output Voltage(2.6~5.0V)
③	M	Package: SOT23-3L
	P	Package: SOT89-3
	T	Package: TO92
④	R	Halogen Free

Block Diagram



Pin Assignment

SOT23-3 (Top View)

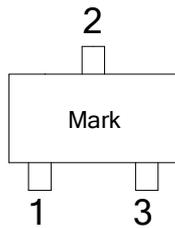


Table1: TX8451-XXMR series (SOT23-3L PKG)

PIN NO.	PIN NAME	FUNCTION
1	GND	GND pin
2	VIN	Input voltage pin
3	VOUT	Output voltage pin

SOT89 (Top View)

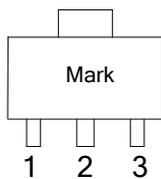


Table2: TX8451-XXPR series (SOT89-3 PKG)

PIN NO.	PIN NAME	FUNCTION
1	GND	GND pin
2	VIN	Input voltage pin
3	VOUT	Output voltage pin

TO92 (Top View)

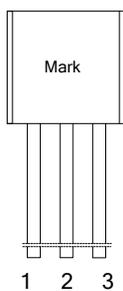


Table3: TX8451-XXTR series (TO92 PKG)

PIN NO.	PIN NAME	FUNCTION
1	GND	GND pin
2	VIN	Input voltage pin
3	VOUT	Output voltage pin

Absolute Maximum Ratings

Input Voltage.....	-0.3V to 45V	Storage Temperature	-55°C to 150°C
V _{EN}	-0.3V to V _{IN}	Lead Temperature(Soldering, 10 sec.)	260°C
V _{OUT}	-0.3V to 12V	Junction Temperature.....	-40°C to 125°C
ESD Rating.....	5.5kV		

Note: These are stress ratings only. Stresses exceeding the range specified under “Absolute Maximum Ratings” may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

Electrical Characteristics

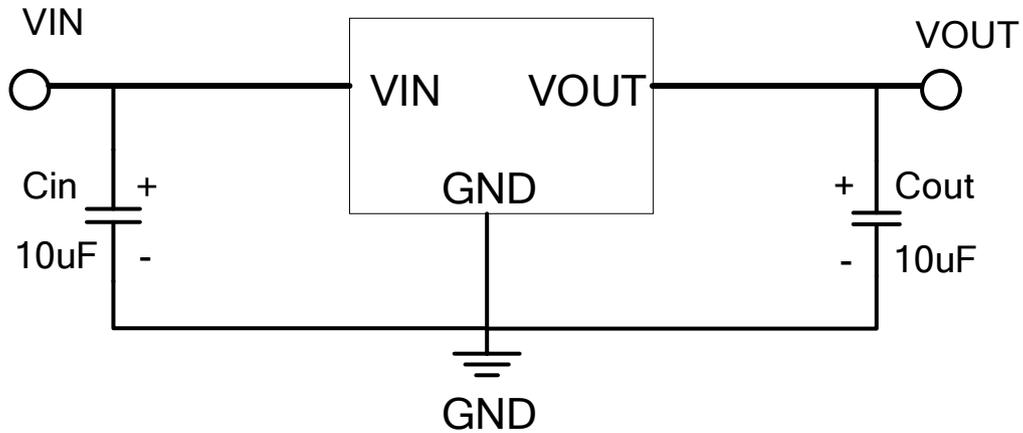
The following specifications apply for V_{IN}=12V, I_{OUT}=1mA, C_{IN}=C_{OUT}=10uF, T_J=25°C, unless specified otherwise.

SYMBOL	ITEMS	CONDITIONS	MIN	TYP	MAX	UNIT
V _{IN}	Input Voltage		2.7		40	V
V _{OUT}	Output Range		2.6		5.0	V
ΔV _{OUT}	Output Voltage Accuracy		-2	V _{OUT}	2	%
I _Q	Quiescent Current	V _{IN} = V _{OUT} + 1V	--	2	--	μA
V _{DROP}	Dropout Voltage	I _{OUT} =100mA	--	0.45	--	V
		I _{OUT} =300mA	--	0.75	--	
ΔV _{LINE}	Line Regulation	V _{IN} = V _{OUT} + 1V to 40V, or V _{IN} = 5V to 40V, if V _{OUT} < 4V	--	30	--	mV
ΔV _{LOAD}	Load Regulation	I _{OUT} = 1mA to 100mA	--	20	--	mV
		I _{OUT} = 1mA to 250mA	--	30	--	
PSRR	Power Supply Rejection Rate V _{IN} =V _{OUT} +1V Ripple=0.2Vp-p I _{OUT} =10mA	Freq.=1kHz	--	75	--	dB
		Freq.=100kHz	--	45	--	
I _{SHORT}	I _{OUT} @ V _{OUT} Short to Ground	V _{IN} =6V, V _{OUT} =0V	--	50	--	mA
T _{SD}	Thermal Shutdown		--	150	--	°C
T _{HY}	Thermal Shutdown Hysteresis		--	130	--	°C

Note1: The parameters of C_{in} and C_{out} must be greater than 4.7uF.

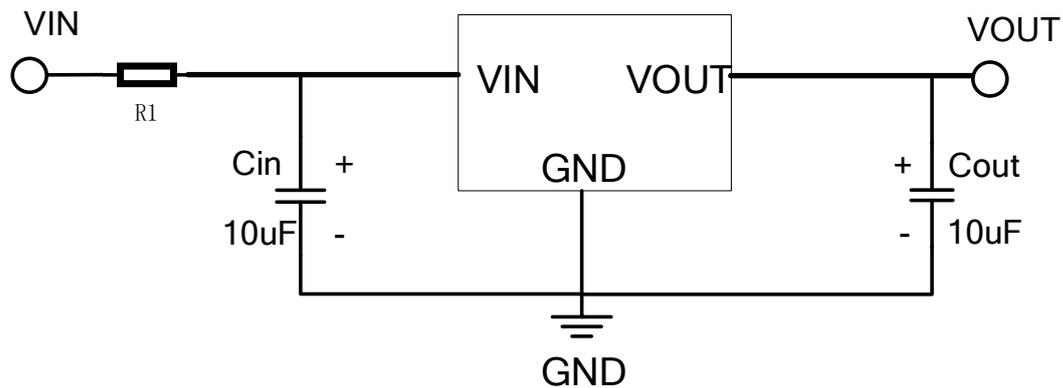
Application Circuits

Typical Application Circuits



Note1: The parameters of C_{in} and C_{out} must be greater than 4.7uF.

External Power Dissipation

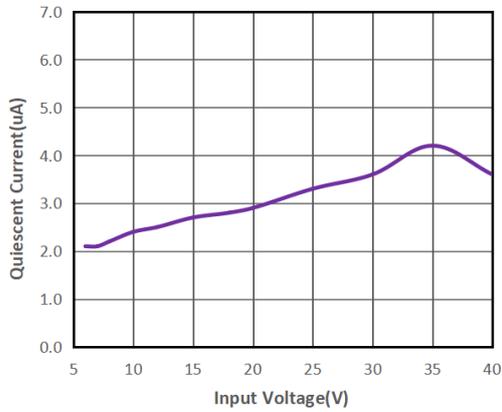


Note2: The resistance value of R_1 should be set to 0.25Ω.

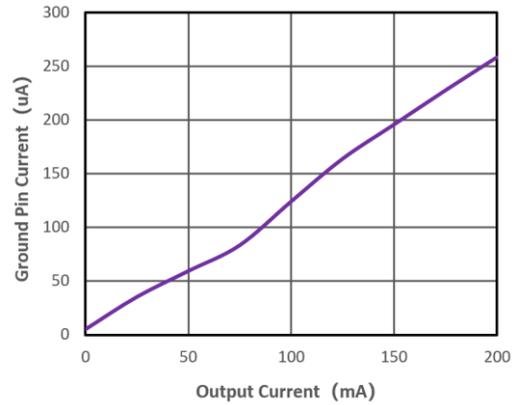
Typical Performance Characteristics

$C_{IN}=10\mu F$, $C_{OUT}=10\mu F$, $T_J=25^\circ C$, unless specified otherwise

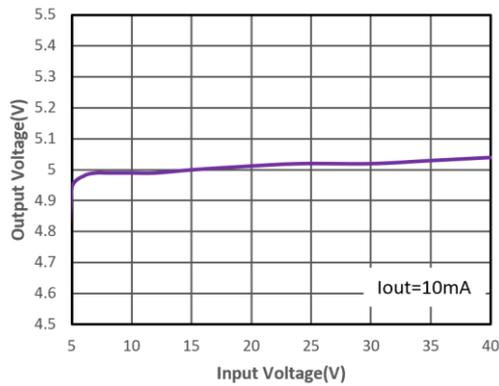
(1) Quiescent Current vs Input Voltage



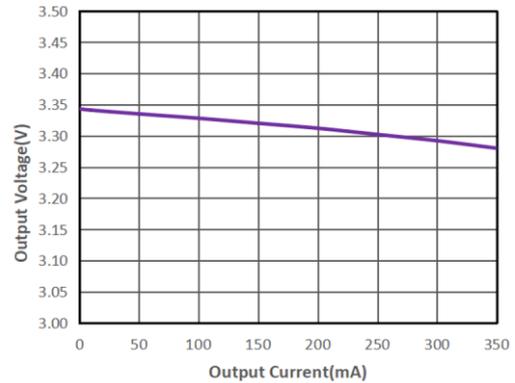
(2) Ground Pin Current vs Output Current



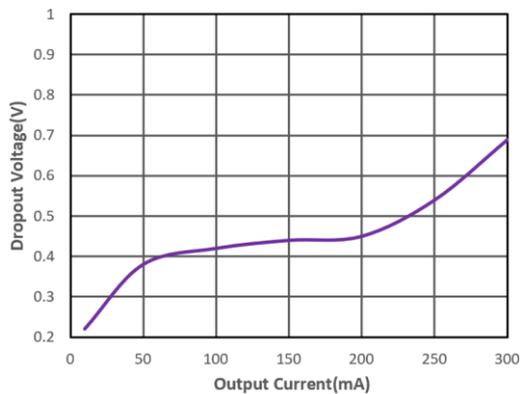
(3) Output Voltage vs Input Voltage



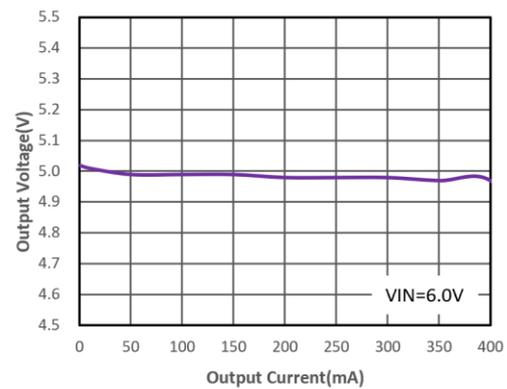
(4) Output Voltage vs Output Current

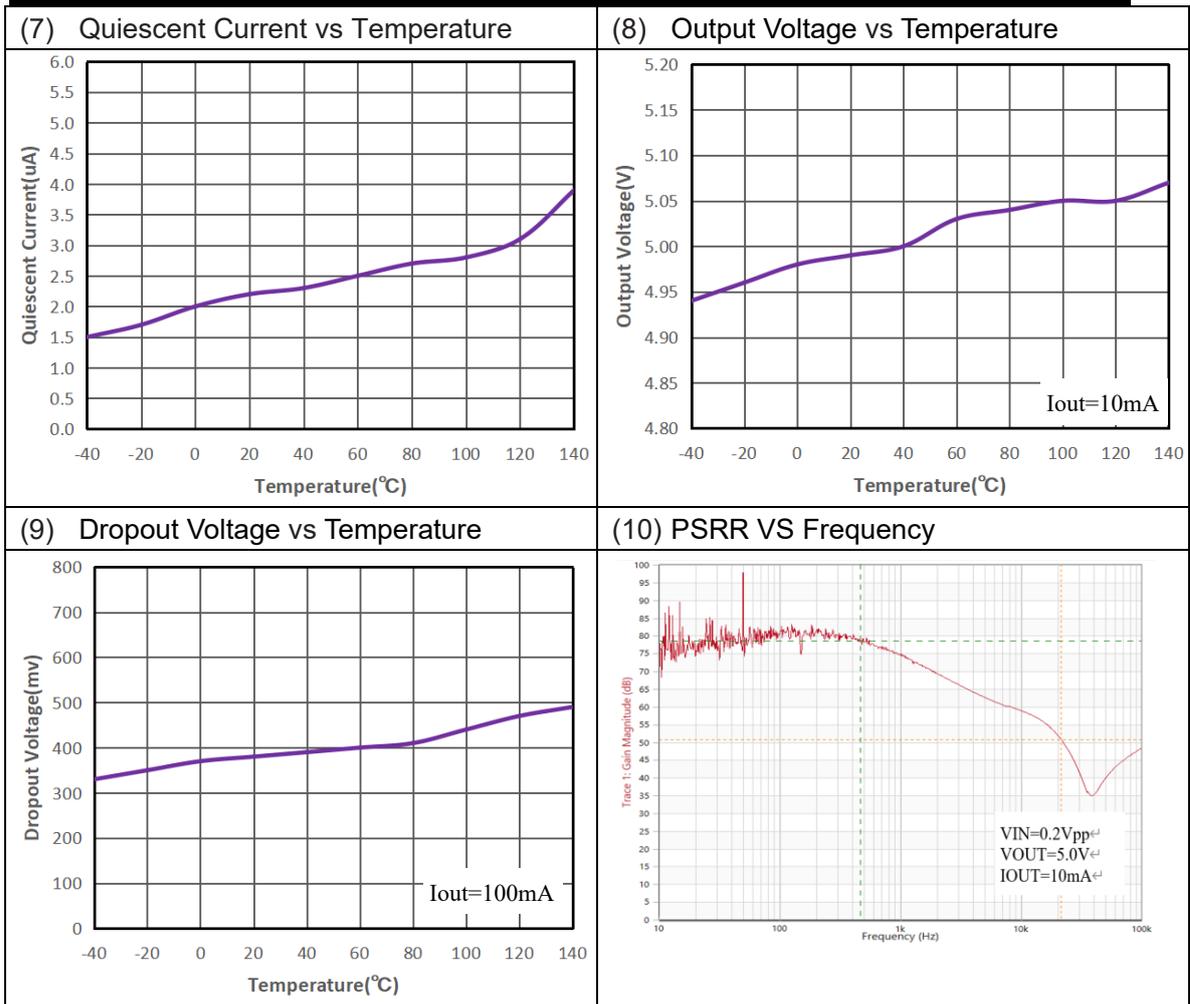


(5) Dropout Voltage vs Output Current

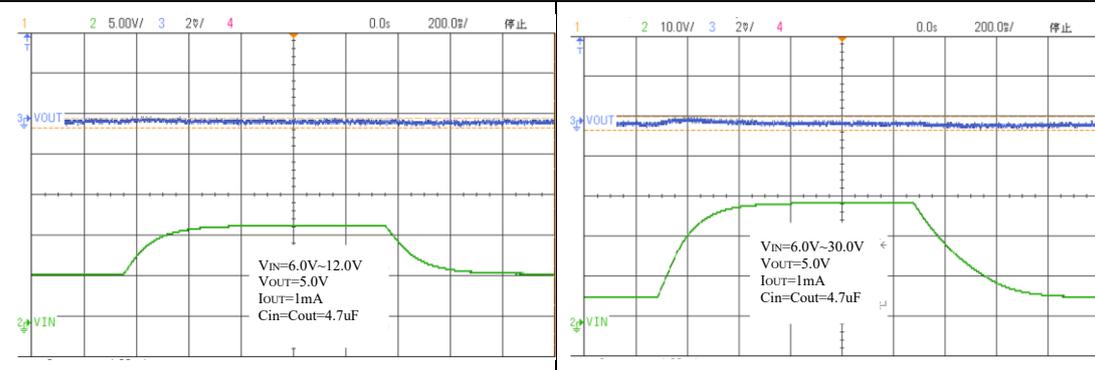


(6) Output Voltage vs Output Current

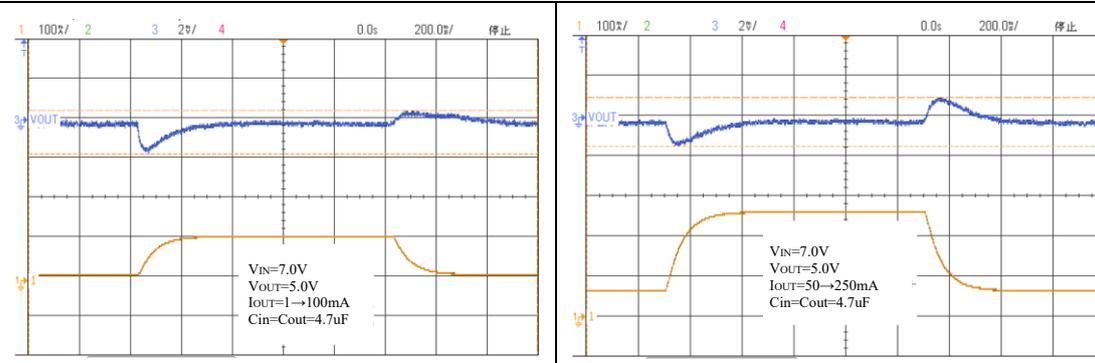




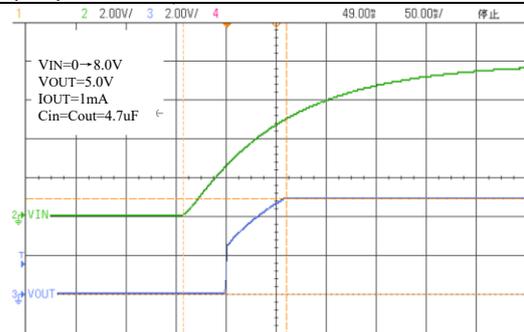
(11) Input Transient Response



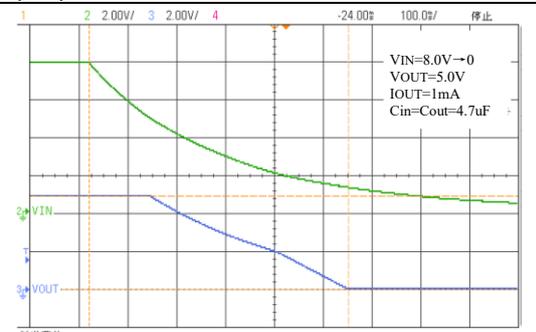
(12) Load Transient Response



(13) Power ON

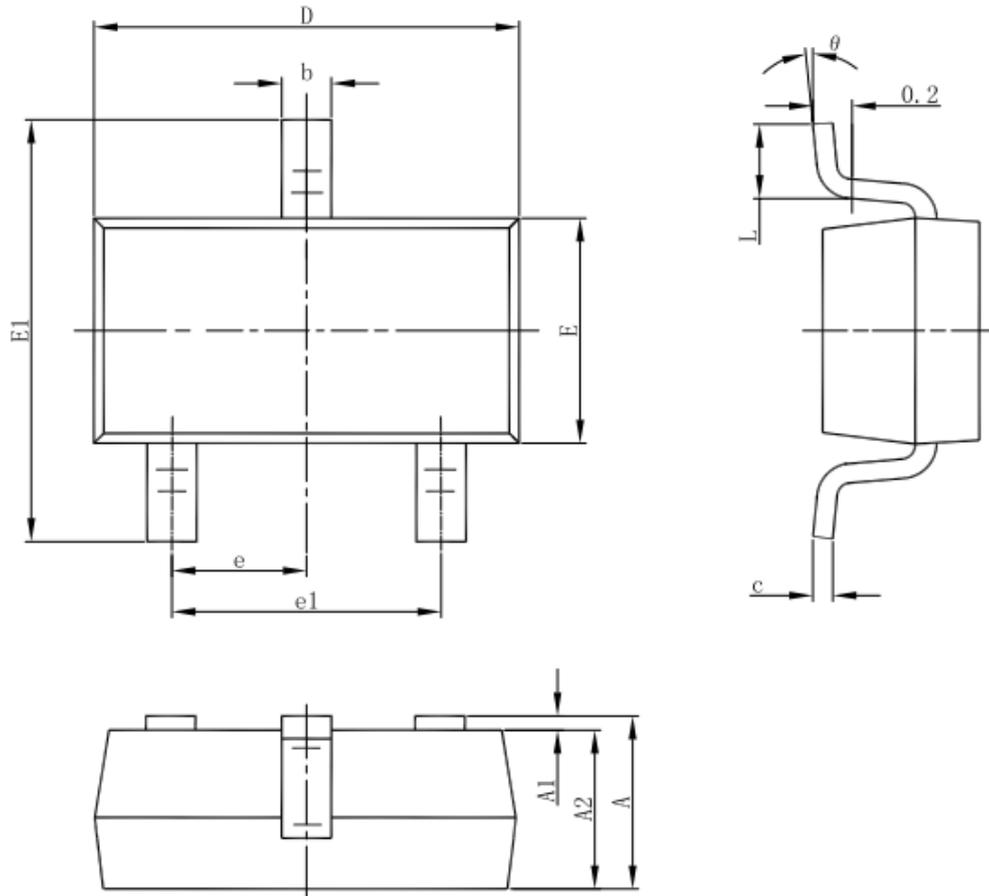


(14) Power OFF



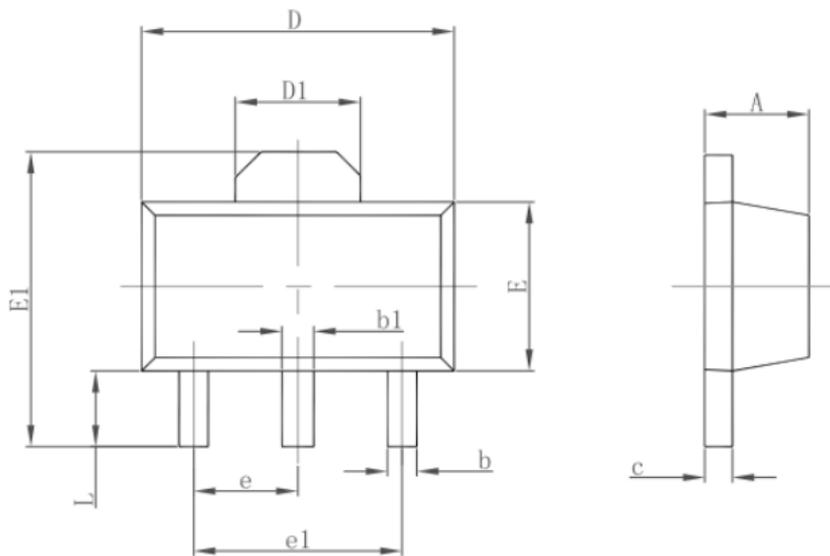
Package Information

3-pin SOT23-3 Outline Dimensions



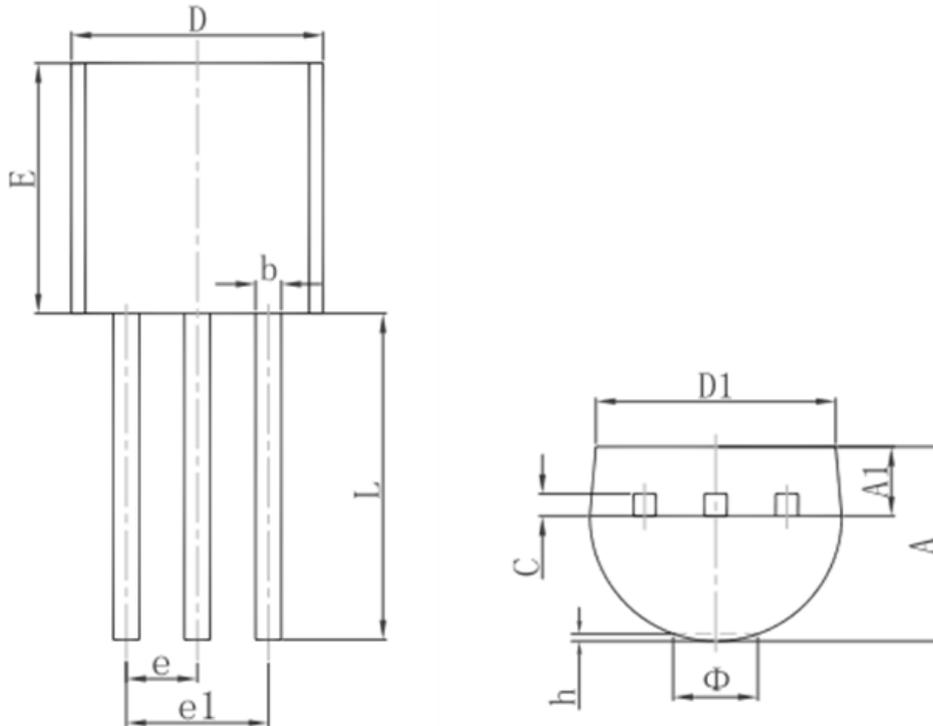
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
theta	0°	8°	0°	8°

SOT89-3L Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP.		0.118 TYP.	
L	0.900	1.200	0.035	0.047

3-pin TO92 Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.300	4.700	0.169	0.185
D1	3.430		0.135	
E	4.300	4.700	0.169	0.185
e	1.270 TYP.		0.050 TYP.	
e1	2.440	2.640	0.096	0.104
L	14.100	14.500	0.555	0.571
Φ		1.600		0.063
h	0.000	0.380	0.000	0.015