DESCRIPTION

The A6250C series are precise, low power consumption, high voltage; positive voltage regulators manufactured using CMOS and laser trimming technologies. The series provides large currents with a significantly small dropout voltage. The A6250C consists of a current limiter circuit, a driver transistor, a precision reference voltage and an error correction circuit. The series is compatible with low ESR ceramic capacitors. The current limiter's feedback circuit also operates as a short protect for the output current limiter and the output pin. Output voltage can be set internally by laser trimming technologies. It is selectable in 100mV increments within a range of 1.2V to 5.0V.

The A6250C is available in SOT89-3 and SOT-23 packages.

ORDERING INFORMATION

Package Type	Part Number	
SOT-89-3	K3	A6250CK3R-XX
		A6250CK3VR-XX
SOT-23	E3	A6250CE3R-XX
		A6250CE3VR-XX
Note	XX: Output Voltage 30=3.0V; 33=3.3V V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products Suffix " V " means Halogen free Package		

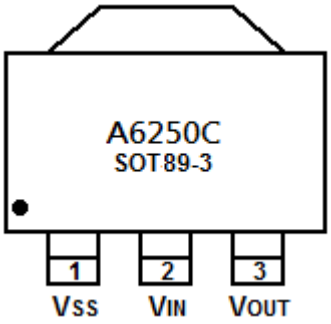
FEATURES

- Output voltage range: 1.2V to 5.0V (selectable in 100mV steps)
- Highly optional accurate: ± 1% or ± 2%
- Dropout voltage: 160mV @ 50mA (3.0V type)
- Low power consumption: 2μA (TYP.)
- Maximum output current: 250mA ($V_{IN} \geq V_{OUT}+1V$)
- Internal protector current limiter and short protector
- Available in SOT89-3 and SOT-23 and Packages

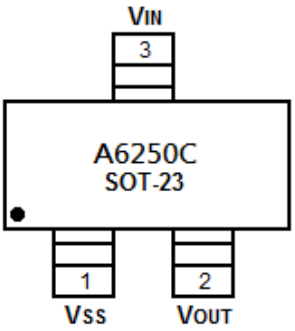
APPLICATION

- Battery powered equipment
- Reference voltage sources
- Cameras, video cameras
- Mobile phones
- Communication tools

PIN DESCRIPTION



Top View



Top View

Pin #		Symbol	Function
SOT89-3	SOT-23		
1	1	V_{SS}	Ground
2	3	V_{IN}	Input
3	2	V_{OUT}	Output

ABSOLUTE MAXIMUM RATINGS

V_{IN}, Input Voltage		V_{SS}-0.3V ~ V_{SS}+6V
V_{OUT}, Output Current		V_{SS}-0.3V ~ V_{IN} +0.3V
P_D, Power Dissipation	SOT-23	250mW
	SOT89-3	500mW
T_{OPR}, Operating Ambient Temperature		-40°C ~85°C
T_{STG}, Storage Temperature		-40°C ~125°C

Stress beyond above listed "Absolute Maximum Ratings" may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

ELECTRICAL CHARACTERISTICS

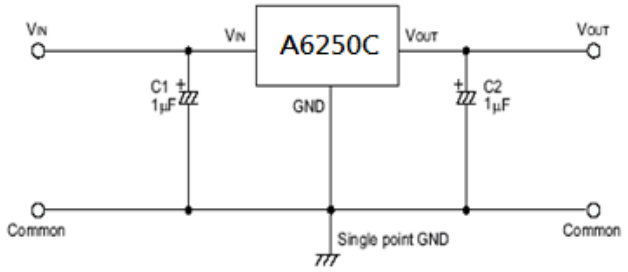
V_{IN}=4.0V,V_{OUT}=3.0V,T=25°C

Parameter	Symbol	Conditions		Min	Typ.	Max	Unit	Circuit
Output Voltage	$V_{OUT(E)1}$	V_{IN} =$V_{OUT(S)}$+1.0V, I_{OUT}=1mA, ± 2%		$V_{OUT(S)}$ ×0.98	$V_{OUT(S)}$	$V_{OUT(S)}$ ×1.02	V	1
		V_{IN} =$V_{OUT(S)}$+1.0V, I_{OUT}=1mA, ± 1%		$V_{OUT(S)}$ ×0.99	$V_{OUT(S)}$	$V_{OUT(S)}$ ×1.01		
Output Current	I_{OUT}	V_{IN}≥$V_{OUT(S)}$+1.0V		250 *1			mA	1
Dropout Voltage	V_{drop}	I_{OUT}= 50mA	1.5V ≤$V_{OUT(S)}$≤2.5V		0.20	0.28	V	1
			2.6V ≤$V_{OUT(S)}$≤3.3V		0.16	0.24		
			3.4V ≤$V_{OUT(S)}$≤5.0V		0.12	0.20		
Line Regulations	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \times V_{OUT}}$	$V_{OUT(S)}$+0.5V ≤V_{IN}≤5.5V I_{OUT}=1mA			0.05	0.2	%/V	
Input Voltage	ΔV_{OUT2}	V_{IN}=$V_{OUT(S)}$+1.0V 1.0mA ≤ I_{OUT} ≤50mA			20	40	mV	
Output Voltage Temperature Characteristics	$\frac{\Delta V_{OUT}}{\Delta T_A \times V_{OUT}}$	V_{IN}=$V_{OUT(S)}$+1.0 V, I_{OUT}=10mA -40°C ≤T_A≤85°C			±100		ppm /°C	
Supply Current	I_{SS1}	V_{IN}=$V_{OUT(S)}$+1.0 V			2		uA	2
Input Voltage	V_{IN}			1.8		6	V	-
Ripple-Rejection	|RR|	V_{IN}=$V_{OUT(S)}$+1.0V , f=1.0kHz V_{RIP}=0.5Vrms, I_{OUT}=10mA			40		dB	1
Short current	I_{SHORT}	V_{IN}=$V_{OUT(S)}$+1.5V			30		mA	1
Current Limiter	I_{LIM}	V_{IN}=$V_{OUT(S)}$+1.5V			380		mA	1

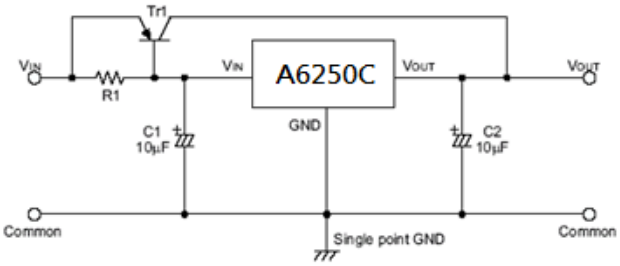
NOTE: Lower input voltage and the output voltage, maximum output current will decrease. Example:
$I_{OUT\ (max)}$=150mA @(V_{IN}=2.5V,V_{OUT}=1.5V)

TYPICAL PERFORMANCE CHARACTERISTICS

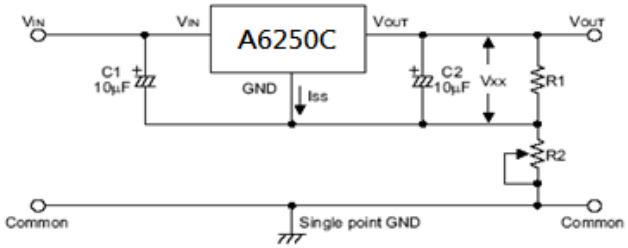
1. Basic circuit



2. High output current positive voltage regulator

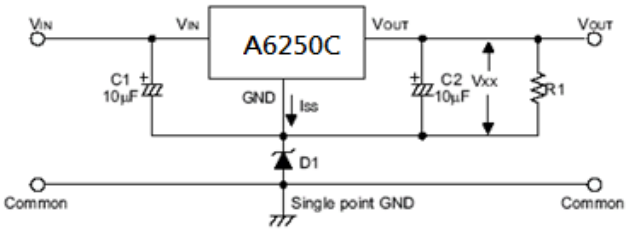


3. Circuit for increasing output voltage



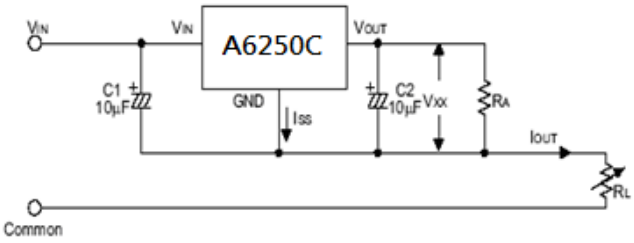
$$V_{OUT} = V_{XX} \left(1 + \frac{R2}{R1}\right) + I_{SS} R2$$

4. Circuit for increasing output voltage



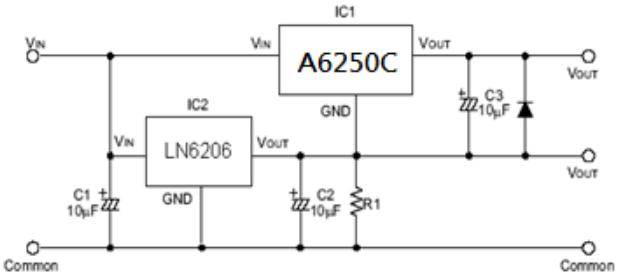
$$V_{OUT} = V_{XX} + V_{D1}$$

5. Constant current regulator



$$I_{OUT} = \frac{V_{XX}}{R_A} + I_{SS}$$

6. Dual supply

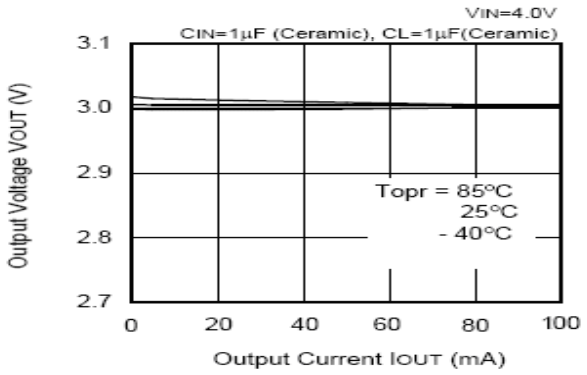


NOTE: The above connection diagram and constant will not guarantee successful operation. Perform thorough evaluation using the actual application to set the constant.

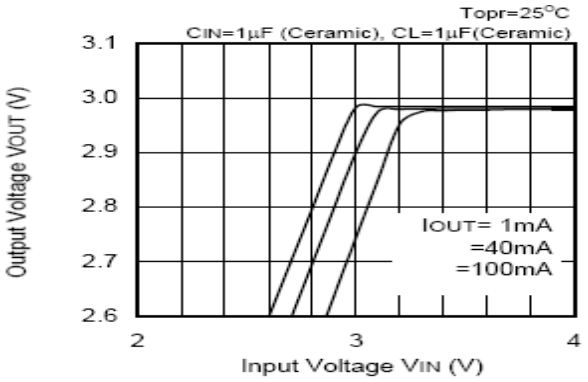
TYPICAL PERFORMANCE CHARACTERISTICS

3.0V output

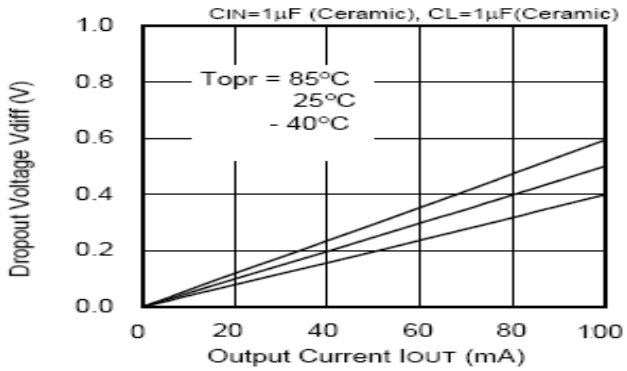
1. Output Voltage vs. Output Current



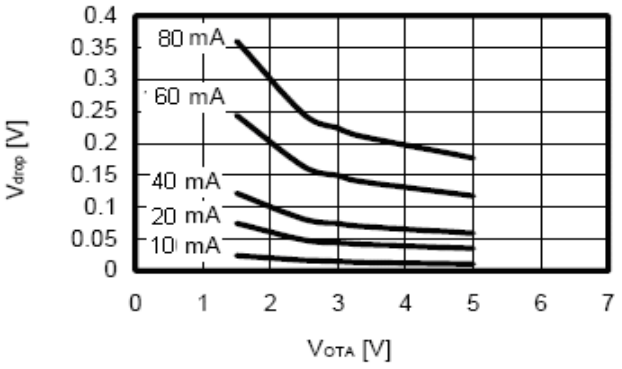
2. Output Voltage vs. Input Voltage



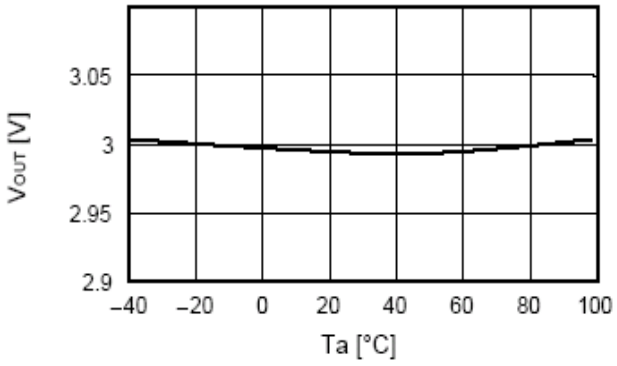
3. Dropout Voltage vs. Output Current



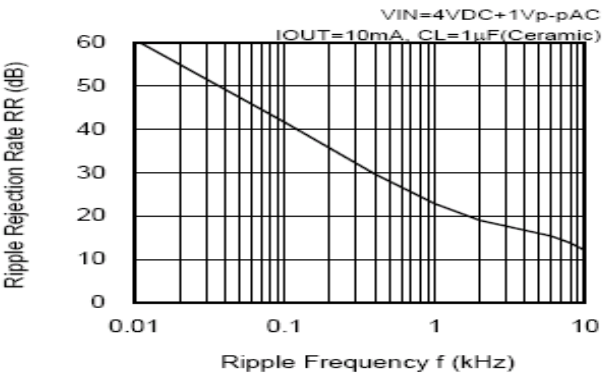
4. Dropout Voltage vs. Output Voltage



5. Output Voltage vs. Ambient Temperature

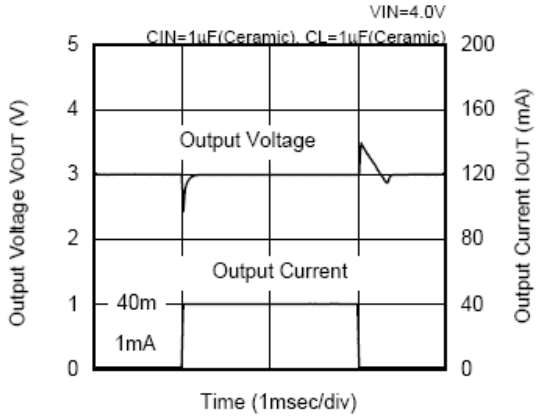


6. Ripple Rejection Rate

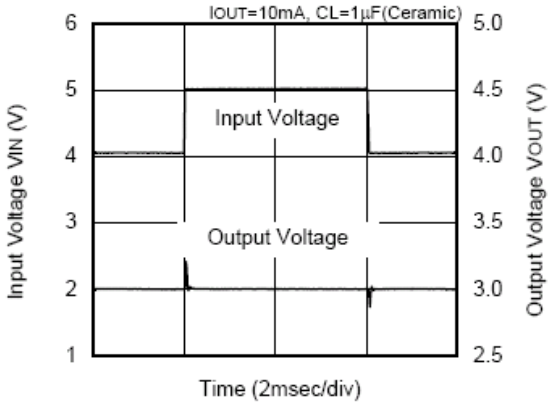


7. Transient Response

Input Transient Response

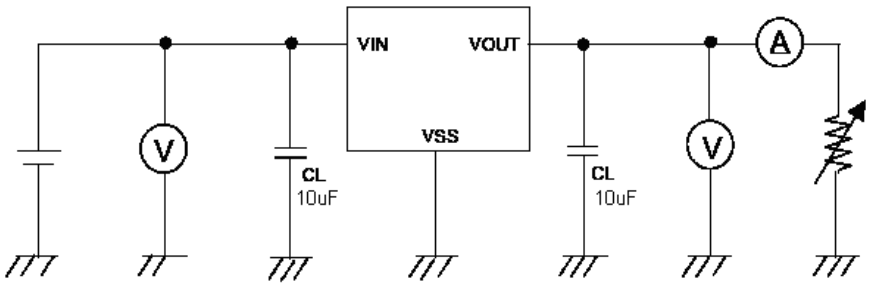


Load Transient Response

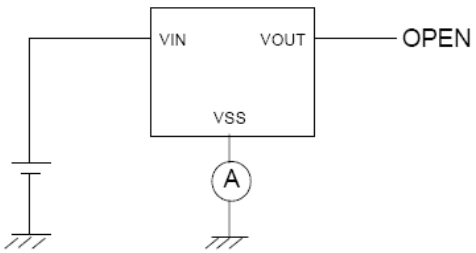


TEST CIRCUIT

1. Circuit 1



2. Circuit 2



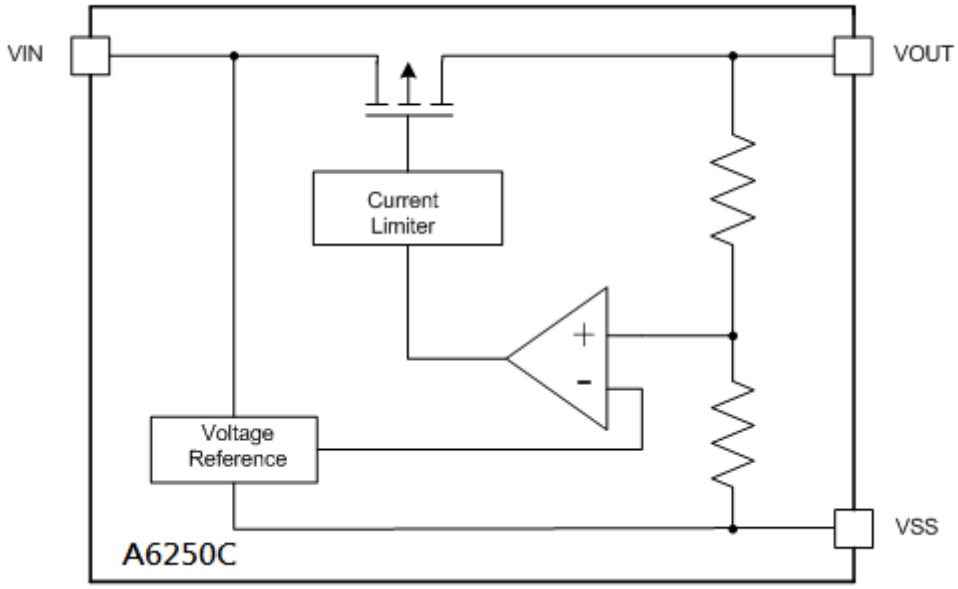
APPLICATION CONDITIONS

Input capacitor (C_{IN}): 1.0μF or more

Output capacitor (C_L):0.1 μF or more (tantalum capacitor)

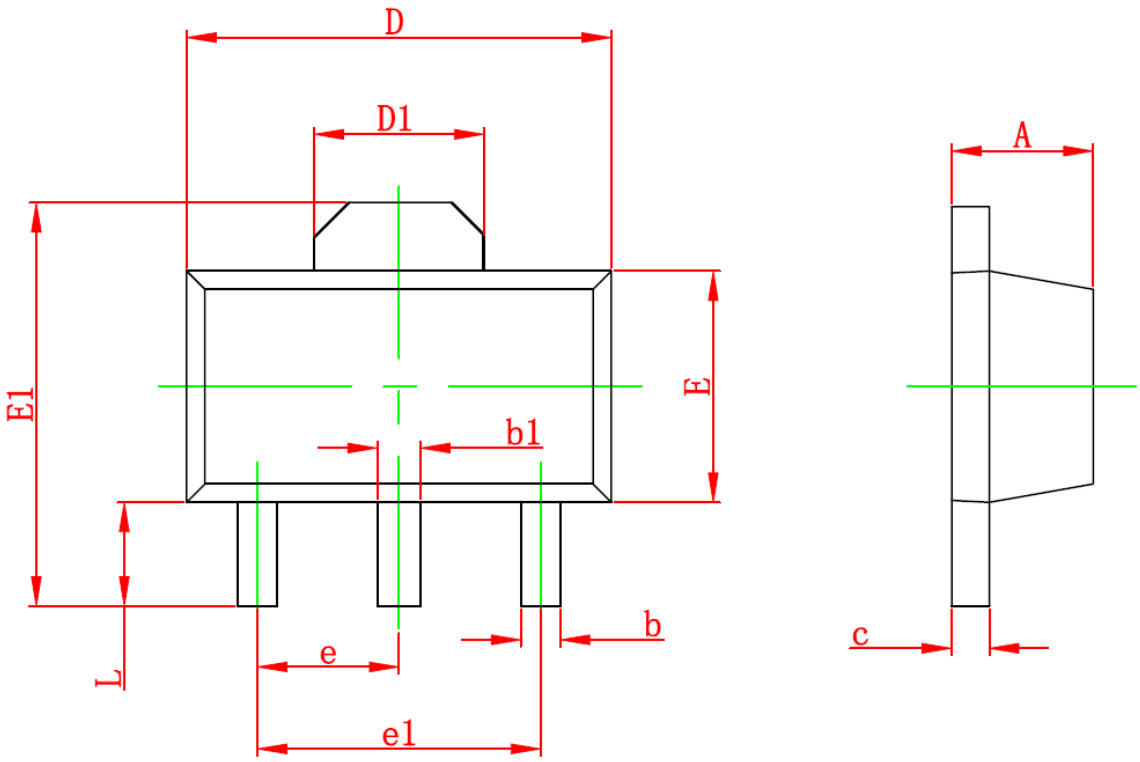
Caution A general series regulator may oscillate, depending on the external components selected. Check that no oscillation occurs with the application using the above capacitor.

BLOCK DIAGRAM



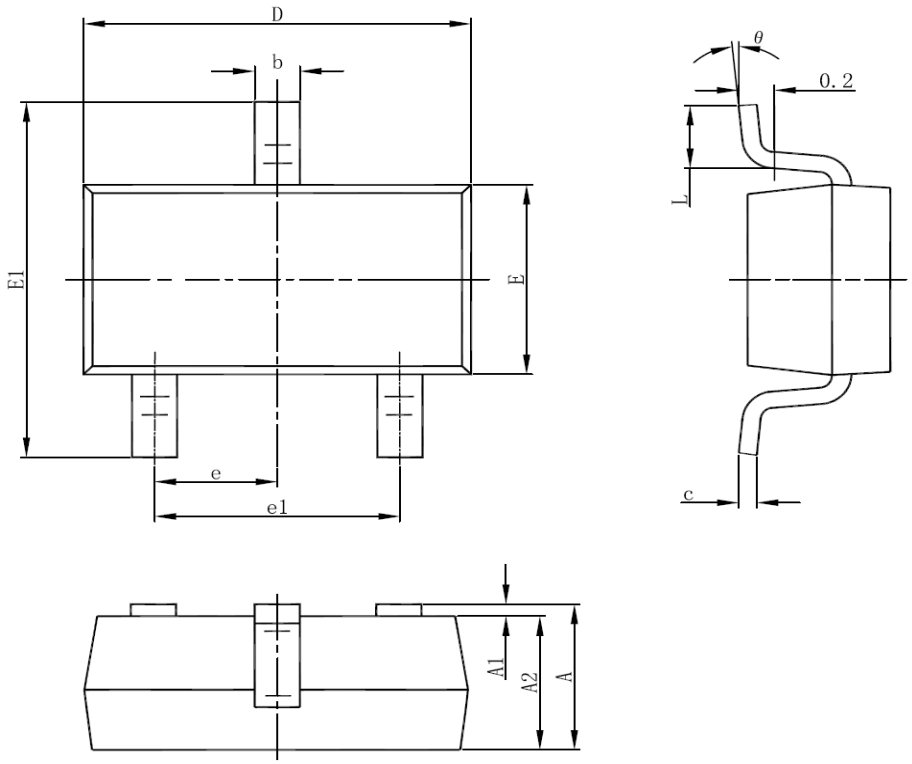
PACKAGE INFORMATION

Dimension in SOT89-3 (Unit: mm)



Symbol	Min	Max
A	1.400	1.600
b	0.320	0.520
b1	0.400	0.580
c	0.350	0.440
D	4.400	4.600
D1	1.550(REF)	
E	2.300	2.600
E1	3.940	4.250
e	1.500(TYP)	
e1	3.000(TYP)	
L	0.900	1.200

Dimension in SOT-23 (Unit: mm)



SYMBOL	MIN	MAX
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.300	0.500
c	0.100	0.200
D	2.820	3.020
E	1.500	1.700
E1	2.650	2.950
e	0.950(BSC)	
e1	1.800	2.000
L	0.300	0.600
θ	0°	8°

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