DESCRIPTION

The A6700 series are highly precise, low noise, positive voltage LDO regulators manufactured using CMOS processes. The A6700 series achieves high ripple rejection and low dropout and consists of a standard voltage source, an error correction, current limiter and a phase compensation circuit plus a driver transistor. Output voltage is selectable in 100mV increments within a range of 1.0V ~ 5.0V.

The A6700 series is also compatible with low ESR ceramic capacitors which give added output stability. This stability can be maintained even during load fluctuations due to the excellent transient response of the A6700 series.

The CE function enables the output to be turned off, Resulting in greatly reduced power consumption.

The A6700 is available in SOT-25 and SOT89-5 packages.

ORDERING INFORMATION

Package Type	Part Number	
SOT-25 SPQ: 3,000pcs/Reel	E5	A6700E5R-XX
		A6700E5VR-XX
SOT89-5 SPQ: 1,000pcs/Reel	K5	A6700K5R-XX
		A6700K5VR-XX
Note	XX: Output Voltage, 18=1.8V, 25=2.5V, 28=2.8V, 33=3.3V, 50=5.0V V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

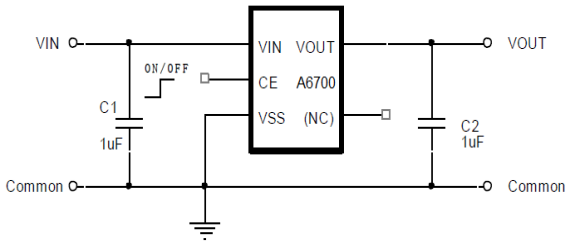
FEATURES

- Output Voltage Range 1.0V to 5.0V (selectable in 100mV steps)
- Highly Accurate ±2%
- Dropout Voltage 50mV @ 100mA (3.0V type)
- High Ripple Rejection 60dB (1 kHz)
- Low Power Consumption 30μA (TYP.)
- Maximum Output Current: more than 700mA ($V_{IN} \geqq V_{OUT}$ + 1V)
- Standby Current less than 0.1μA
- Internal protector : current limiter
- Available in SOT-25 and SOT89-5 Packages.

APPLICATION

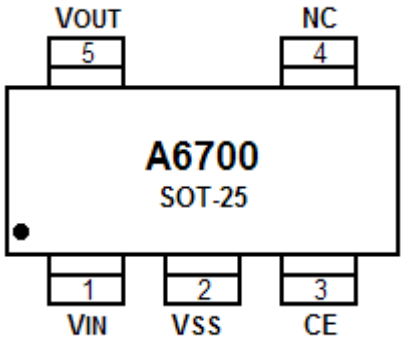
- CD-ROMs，CD-R/RW drive
- DVD drive
- HDD drive
- Cameras, Video cameras
- Portable AV equipment
- Battery powered equipment

TYPICAL APPLICATION

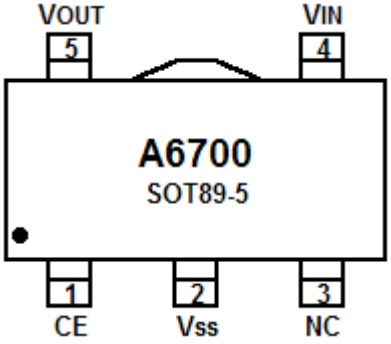


Caution: The above connection diagram and constant will not guarantee successful operation. Perform thorough evaluation using the actual application to set the constant.

PIN DESCRIPTION



Top View



Top View

Pin #		Symbol	Function
SOT-25	SOT89-5		
1	4	V_{IN}	Supply Power
2	2	V_{SS}	Ground
3	1	CE	Enable PIN
4	3	NC	No Connection
5	5	V_{OUT}	Voltage Output

ABSOLUTE MAXIMUM RATINGS

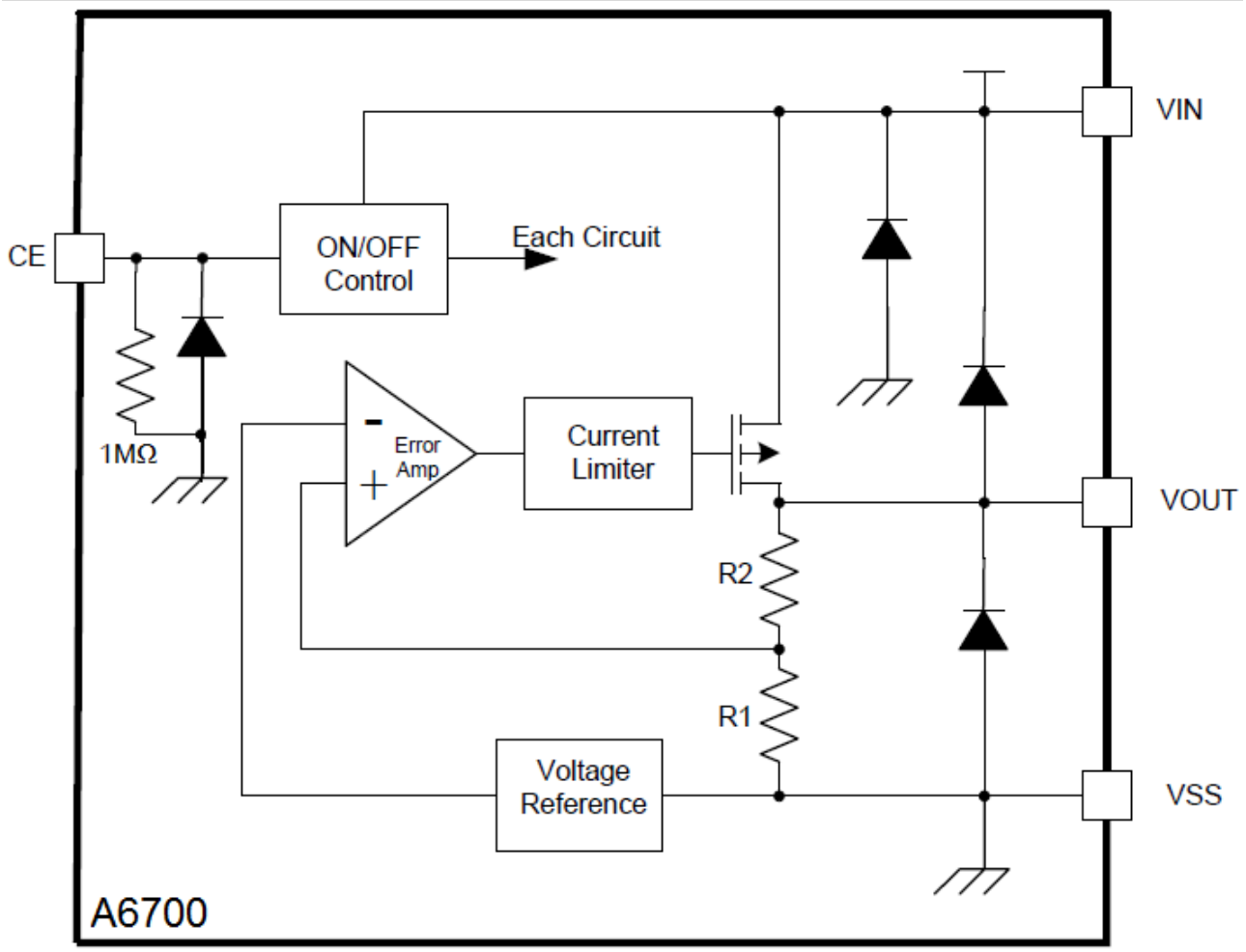
Input Voltage	
V_{IN}	V_{SS}-0.3V ~ V_{SS}+8V
$V_{ON/OFF}$	V_{SS}-0.3V ~ V_{IN}+0.3V
V_{OUT}, Output Voltage	V_{SS}-0.3V ~ V_{IN}+0.3V
P_D, Power Dissipation	
SOT-25	400mW
SOT89-5	500mW
T_{OPR}, Operating Ambient Temperature	-40°C ~ +85°C
T_{STG}, Storage Temperature	-40°C ~ +125°C

Stresses above may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the Electrical Characteristics is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
Output Voltage	$V_{OUT(E)}$	V_{IN} =$V_{OUT(S)}$+1.0V, I_{OUT}=30mA	$V_{OUT(S)}$ ×0.98	$V_{OUT(S)}$	$V_{OUT(S)}$ ×1.02	V
Output Current	I_{OUT}	V_{IN}≥$V_{OUT(S)}$+1.0V	700	-	-	mA
Dropout Voltage	V_{DROP}	I_{OUT}=30mA	-	0.015	0.023	V
		I_{OUT}=100mA	-	0.050	0.075	
Line Regulations	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \times V_{OUT}}$	$V_{OUT(S)}$+0.5V ≤ V_{IN} ≤ 7V, I_{OUT}=30mA	-	0.010	0.2	%/V
Load Regulation	ΔV_{OUT2}	V_{IN}=$V_{OUT(S)}$+1.0V 1.0mA ≤ I_{OUT} ≤100mA	-	15	60	mV
Output Voltage Temperature Characteristics	$\frac{\Delta V_{OUT}}{\Delta T_A \times V_{OUT}}$	V_{IN}=$V_{OUT(S)}$+1.0V, I_{OUT}=10mA -40°C ≤T_A≤85°C	-	±100	-	ppm/ ℃
Supply Current	I_{SS1}	V_{IN}=$V_{OUT(S)}$+1.0V	-	30	-	uA
Input Voltage	V_{IN}		2.0	-	7.0	V
Ripple-Rejection	|PSRR|	V_{IN}=$V_{OUT(S)}$+1.0V, f=1kHz V_{RIP}=0.5Vrms, I_{OUT}=50mA	-	60	-	dB
Short-circuit Current	I_{SHORT}	V_{IN}=$V_{OUT(S)}$+1.0V,V_{CE}=ON V_{OUT}=GND	-	60	-	mA
Current limiter	I_{LIM}	V_{OUT}=3.3V V_{IN}=$V_{OUT(S)}$+1.0 V, V_{CE}=ON	-	1100	-	mA
CE “High” Voltage	V_{CEH}		1.3	-	V_{IN}	V
CE “Low” Voltage	V_{CEL}		-	-	0.25	V
CE “High” Current	I_{CEH}	V_{IN}=V_{CE}=$V_{OUT(T)}$+1.0V	-0.1	-	0.1	uA
CE “Low” Current	I_{CEL}	V_{IN}= $V_{OUT(T)}$+1.0V, V_{CE}=V_{SS}	-0.1	-	0.1	uA

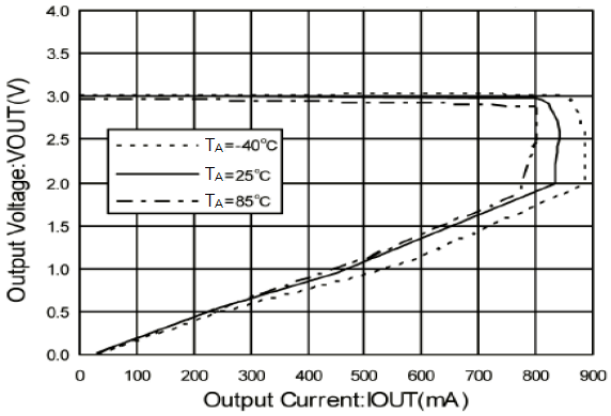
BLOCK DIAGRAM



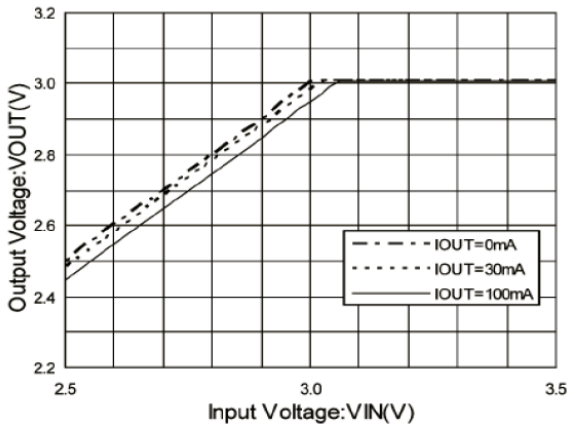
TYPICAL PERFORMANCE CHARACTERISTICS

V_{OUT}=3V

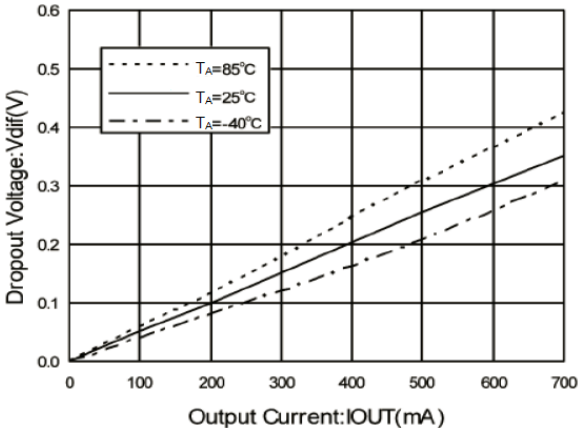
1. Output Voltage vs. Output Current
   C_{IN}=1μF(Ceramic), C_L=1μF(Ceramic), V_{IN}=4.0



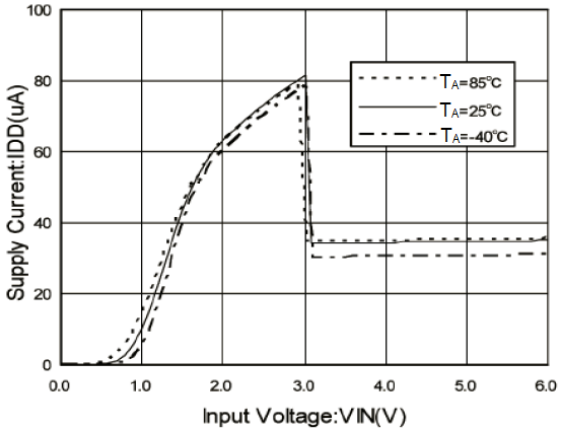
2. Output Voltage vs. Input Voltage (Contd.)
   C_{IN}=1μF(Ceramic), C_L=1μF(Ceramic),T_A=25℃



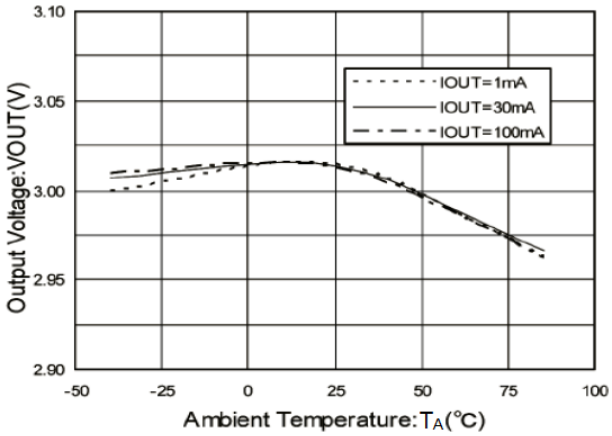
3. Dropout Voltage vs. Output Current
   C_{IN}=1μF(Ceramic), C_L=1μF(Ceramic)



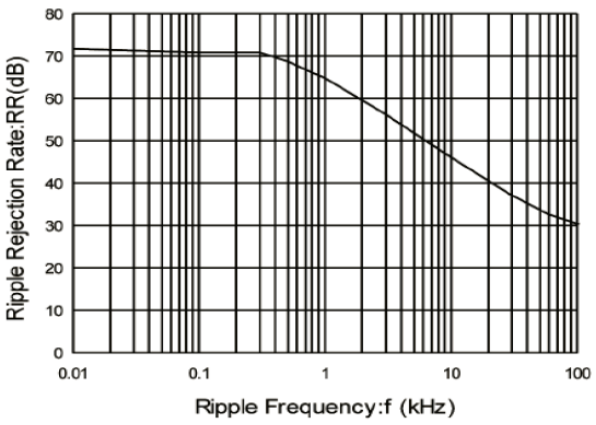
4. Supply Current vs. Supply Voltage
   C_{IN}=1μF(Ceramic), C_L=1μF(Ceramic)



5. Output Voltage vs. Ambient Temperature
   C_{IN}=1μF(Ceramic), C_L=1μF(Ceramic), V_{IN}=4.0



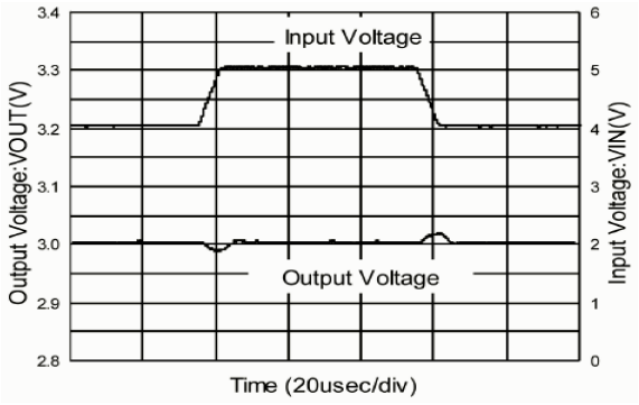
6. Ripple Rejection Rate
   V_{IN}=4VDC+0.5Vp-pAC, I_{OUT}=30mA, T_A=25℃
   C_{IN}=1μF(Ceramic), C_L=1μF(Ceramic)



7. Transient Response

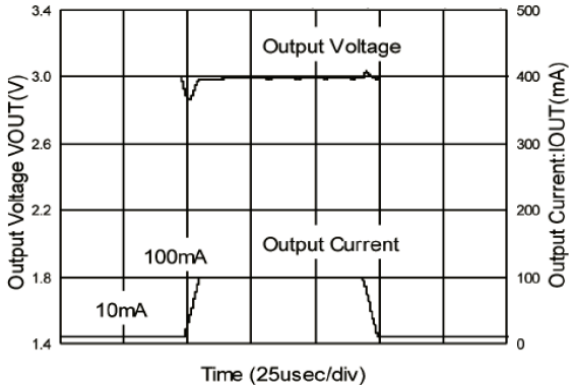
Input Transient Response

I_{OUT}=30mA, t_r=t_f=5μsec, C_L=1μF(Ceramic)
T_A=25℃



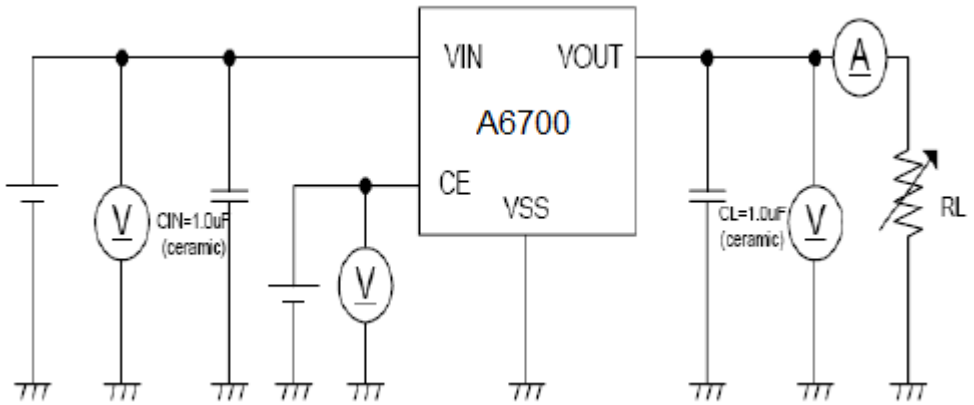
Load Transient Response

V_{IN}=4.0, t_r=t_f=5μsec, C_{IN}=1μF(Ceramic),
C_L=1μF(Ceramic), T_A=25℃

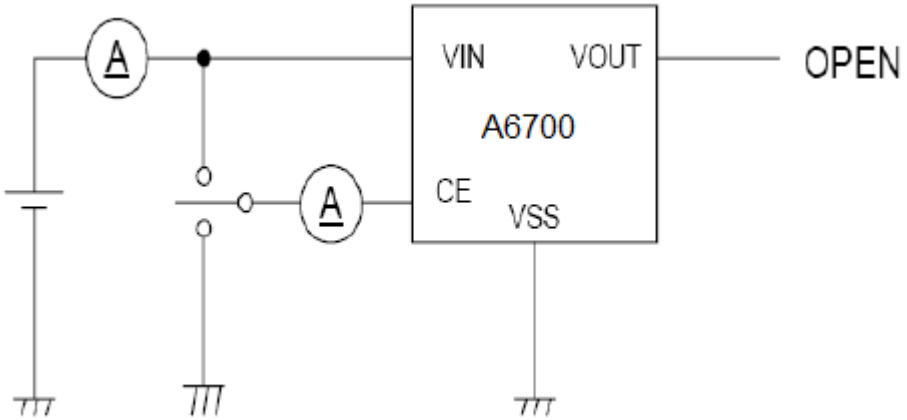


TEST CIRCUITS

1.



2.



Application Conditions

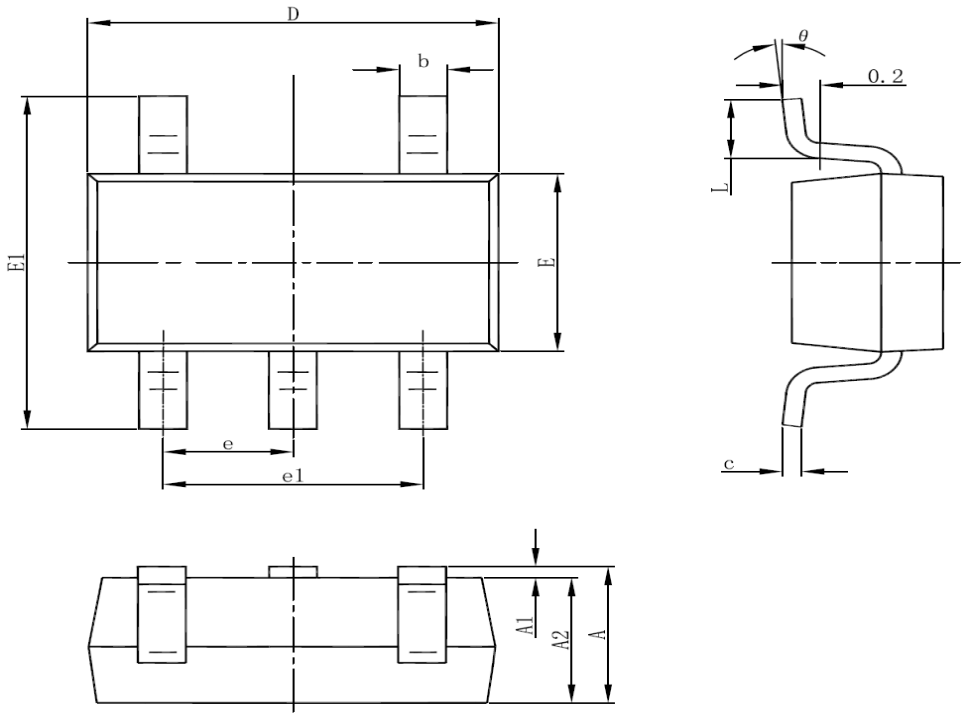
Input capacitor (C_{IN}): 1.0μF or more

Output capacitor (C_L): 1.0μF 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.

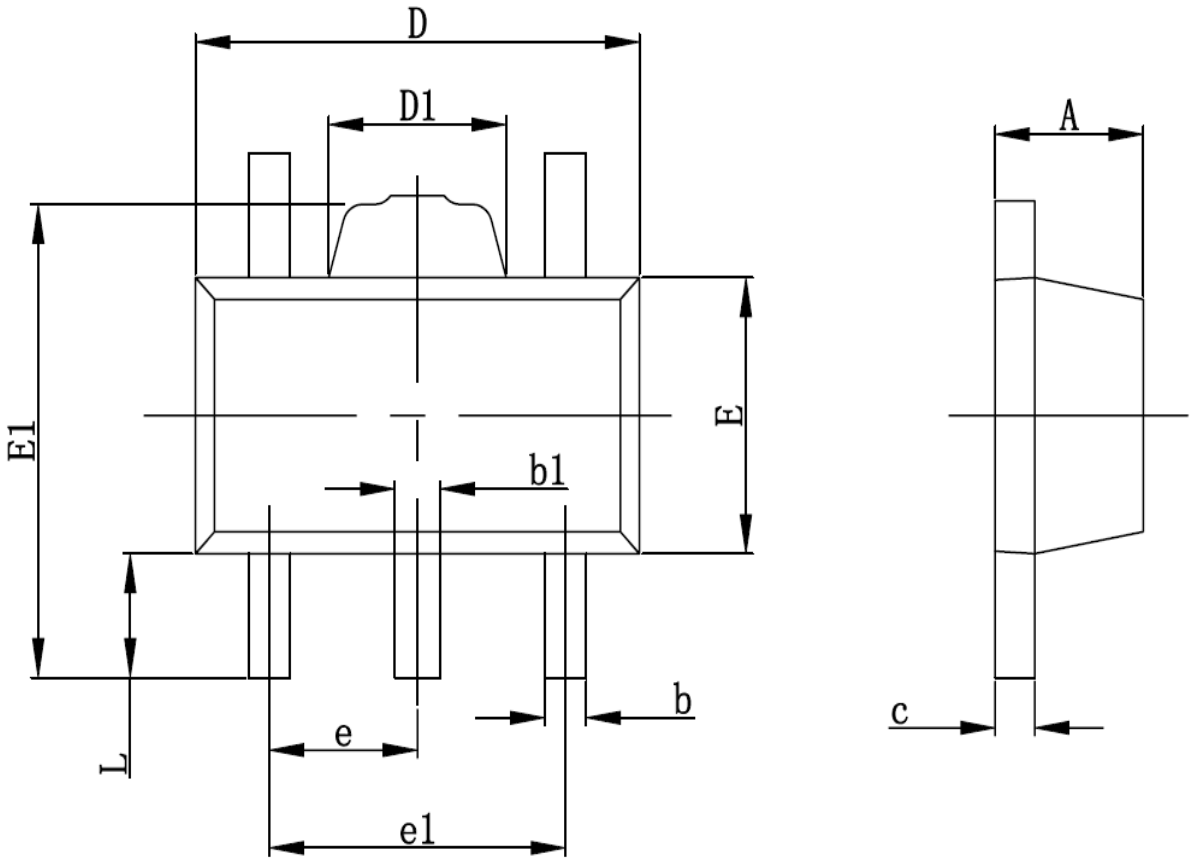
PACKAGE INFORMATION

Dimension in SOT-25 (Unit: mm)



Symbol	Millimeters		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
θ	0°	8°	0°	8°

Dimension in SOT89-5 (Unit: mm)



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.360	0.560	0.014	0.022
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.400	1.800	0.055	0.071
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	2.900	3.100	0.114	0.122
L	0.900	1.100	0.035	0.043

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