



DESCRIPTION

The A6110A series are highly precise, low noise, positive voltage LDO regulators manufactured using CMOS processes. The A6110A 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 1.5V ~ 5.0V.

The A6110A 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 A6110A series.

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

The A6110A is available in SOT-25 and SOT-89-5 packages.

ORDER INFORMATION

Package Type	Part Number	
SOT-25	E5	A6110AE5R-XX
		A6110AE5VR-XX
SOT-89-5	K5	A6110AK5R-XX
		A6110AK5VR-XX
Note	XX: Output Voltage, 18=1.8V, 33=3.3V R: Tape & Reel V: Halogen free Package	
AiT provides all RoHS products Suffix " V " means Halogen free Package		

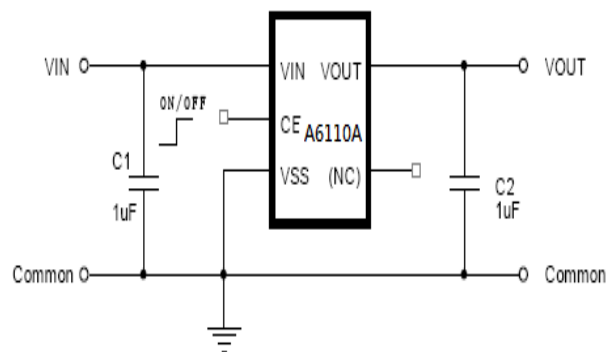
FEATURES

- Output Voltage Range 1.5V to 5.0V (selectable in 100mV steps)
- Highly Accurate $\pm 2\%$
- Dropout Voltage 50mV @ 100mA (3.0V type)
- High Ripple Rejection 60dB (1 kHz)
- Low Power Consumption 30 μ A (TYP.)
- Maximum Output Current: more than 1000mA ($V_{IN} \geq V_{OUT} + 1V$)
- Standby Current less than 0.1 μ A
- Internal protector : current limiter
- Available in SOT-25 and SOT89-5 Packages.

APPLICATION

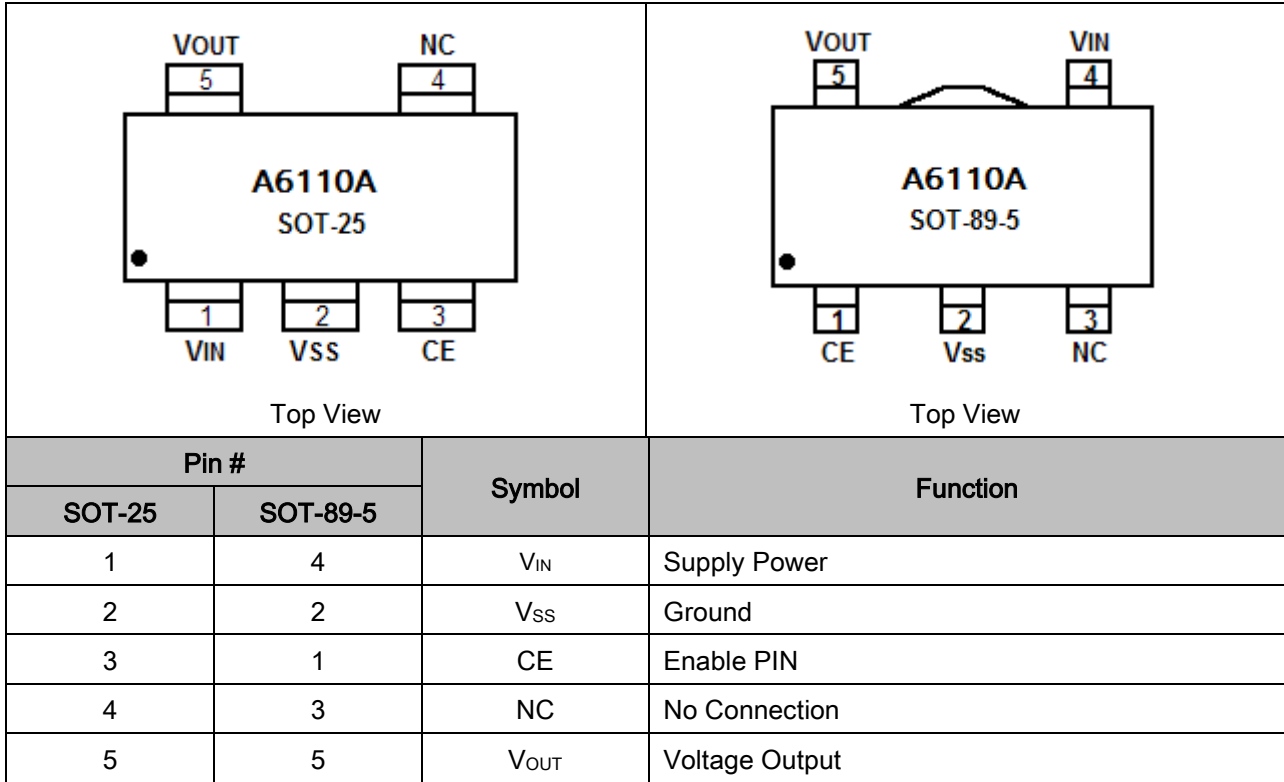
- CD-ROMs , CD-R/RW drive
- DVD drive
- HDD drive
- Cameras, Video cameras
- Portable AV equipment
- Battery powered equipment

TYPICAL APPLICATION





PIN DESCRIPTION





ABSOLUTE MAXIMUM RATINGS

Input Voltage	
V_{IN}	$V_{SS}-0.3V \sim V_{SS}+8V$
$V_{ON/OFF}$	$V_{SS}-0.3V \sim V_{IN}+0.3V$
V_{OUT} , Output Voltage	$V_{SS}-0.3V \sim V_{IN}+0.3V$
P_D , Power Dissipation	
SOT-25	250mW
SOT-89-5	500mW
T_{OPR} , Operating Ambient Temperature	$-40^{\circ}C \sim +85^{\circ}C$
T_{STG} , Storage Temperature	$-40^{\circ}C \sim +125^{\circ}C$

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.

THERMAL RESISTANCE

Package	θ_{JA}	θ_{JC}
SOT-25	250°C/W	130°C/W

NOTE: Thermal Resistance is specified with approximately 1 square of 1 oz copper.

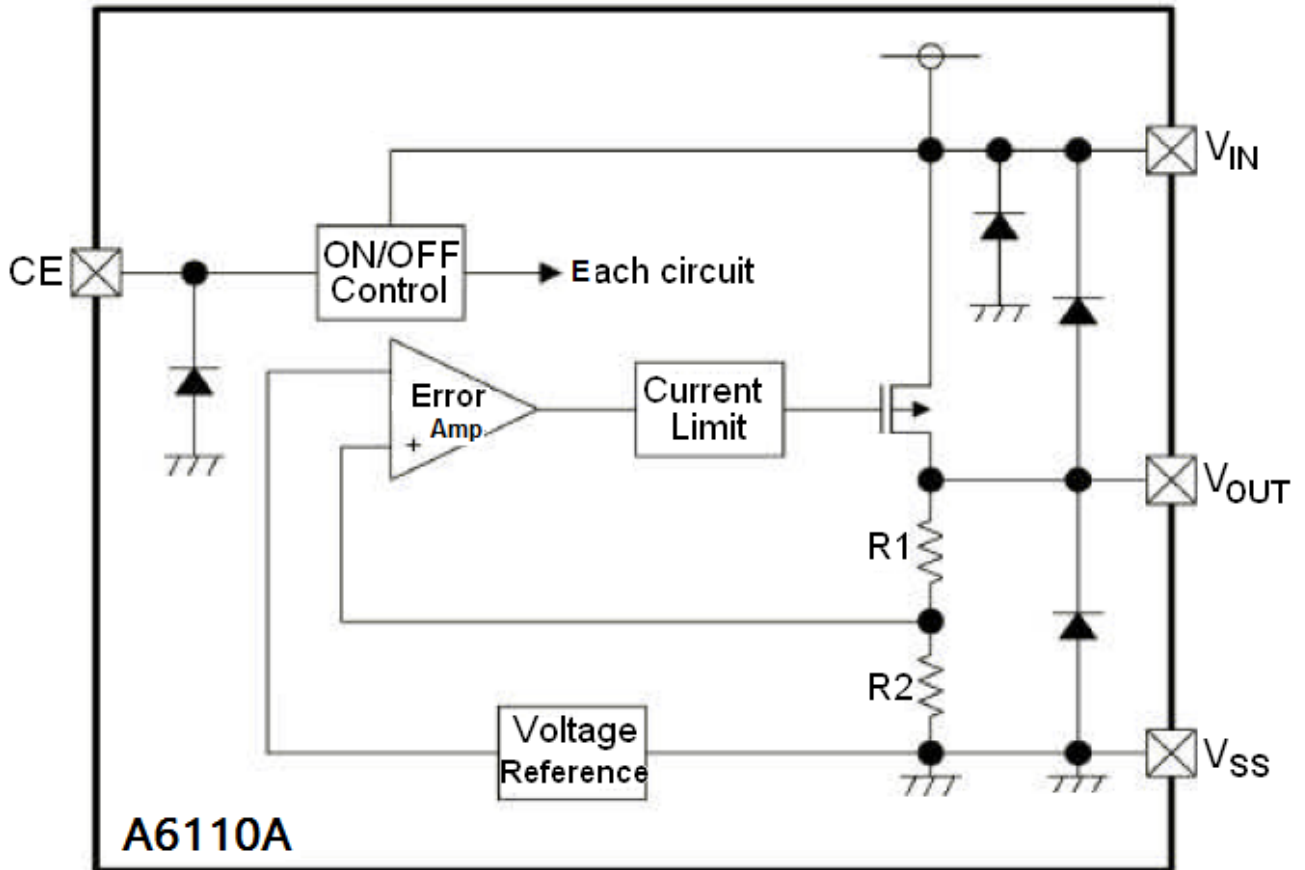


ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
Output Voltage	$V_{OUT(E)}$	$V_{IN} = V_{OUT(S)} + 1.0V, I_{OUT} = 30mA$	$V_{OUT(S)} \times 0.98$	$V_{OUT(S)}$	$V_{OUT(S)} \times 1.02$	V
Output Current	I_{OUT}	$V_{IN} \geq V_{OUT(S)} + 1.0V$	700	-	1000	mA
Dropout Voltage	V_{DROPP}	$I_{OUT} = 30mA$	-	0.015	0.023	V
		$I_{OUT} = 100mA$	-	0.050	0.075	
Line Regulations	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \times V_{OUT}}$	$V_{OUT(S)} + 0.5V \leq V_{IN} \leq 8V,$ $I_{OUT} = 30mA$	-	0.010	0.2	%/V
Load Regulation	ΔV_{OUT2}	$V_{IN} = V_{OUT(S)} + 1.0V$ $1.0mA \leq I_{OUT} \leq 100mA$	-	15	60	mV
Output Voltage Temperature Characteristics	$\frac{\Delta V_{OUT}}{\Delta T_A \times V_{OUT}}$	$V_{IN} = V_{OUT(S)} + 1.0V, I_{OUT} = 10mA$ $-40^\circ C \leq T_A \leq 85^\circ C$	-	± 100	-	ppm/ °C
Supply Current	I_{SS1}	$V_{IN} = V_{OUT(S)} + 1.0V$	-	30	-	uA
Input Voltage	V_{IN}		2.0	-	8	V
Ripple-Rejection	PSRR	$V_{IN} = V_{OUT(S)} + 1.0V, f = 1kHz$ $V_{RIP} = 0.5V_{rms}, I_{OUT} = 50mA$	-	60	-	dB
Short-circuit Current	I_{SHORT}	$V_{IN} = V_{OUT(S)} + 1.0V, V_{CE} \text{ on}$ $V_{OUT} = GND$	-	60	-	mA
Current limiter	I_{LIM}	$V_{IN} = V_{OUT(S)} + 1.0V, V_{CE} = ON$	700	800	1250	mA
CE "High" Voltage	V_{CEH}		1.6	-	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



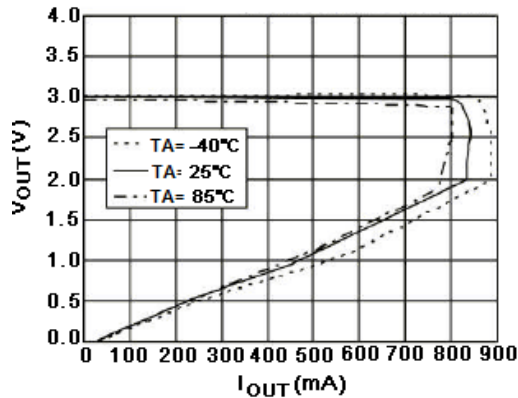
BLOCK DIAGRAM



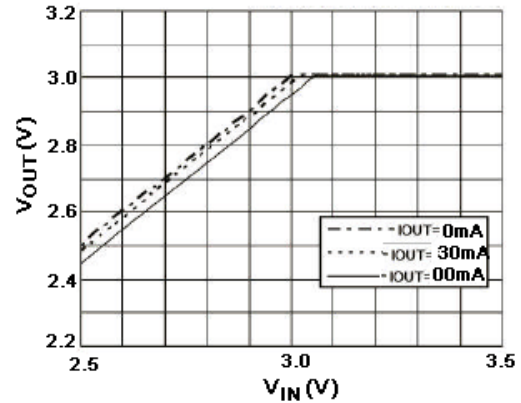


TYPICAL PERFORMANCE CHARACTERISTICS

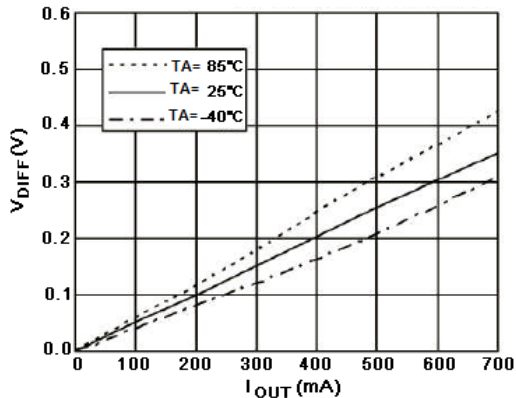
1. Output Voltage vs. Output Current
 $C_{IN}=1\mu\text{F}$ (Ceramic), $C_L=1\mu\text{F}$ (Ceramic), $V_{IN}=4.0$



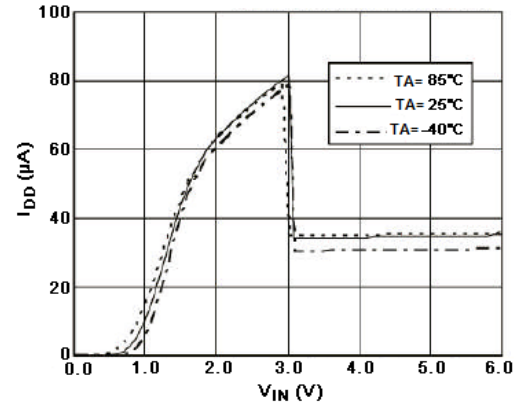
2. Output Voltage vs. Input Voltage (Contd.)
 $C_{IN}=1\mu\text{F}$ (Ceramic), $C_L=1\mu\text{F}$ (Ceramic), $T_A=25^\circ\text{C}$



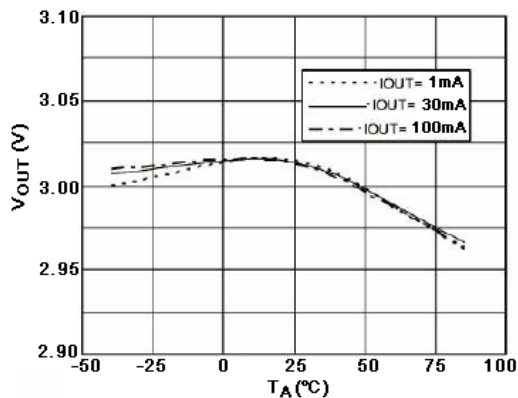
3. Dropout Voltage vs. Output Current
 $C_{IN}=1\mu\text{F}$ (Ceramic), $C_L=1\mu\text{F}$ (Ceramic)



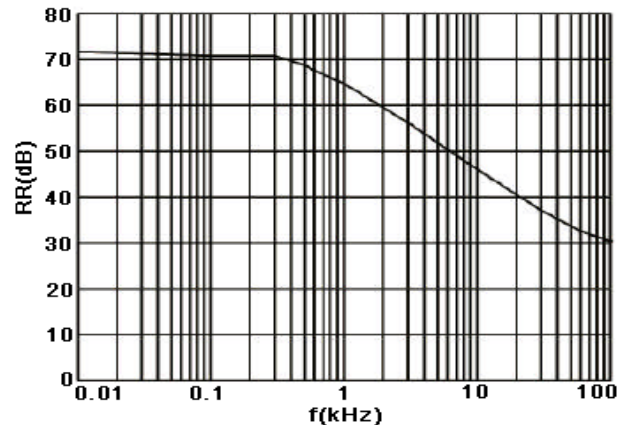
4. Supply Current vs. Supply Voltage
 $C_{IN}=1\mu\text{F}$ (Ceramic), $C_L=1\mu\text{F}$ (Ceramic)



5. Output Voltage vs. Ambient Temperature
 $C_{IN}=1\mu\text{F}$ (Ceramic), $C_L=1\mu\text{F}$ (Ceramic), $V_{IN}=4.0$



6. Ripple Rejection Rate
 $V_{IN}=4\text{VDC}+0.5\text{Vp-pAC}$, $I_{OUT}=30\text{mA}$, $T_A=25^\circ\text{C}$
 $C_{IN}=1\mu\text{F}$ (Ceramic), $C_L=1\mu\text{F}$ (Ceramic)

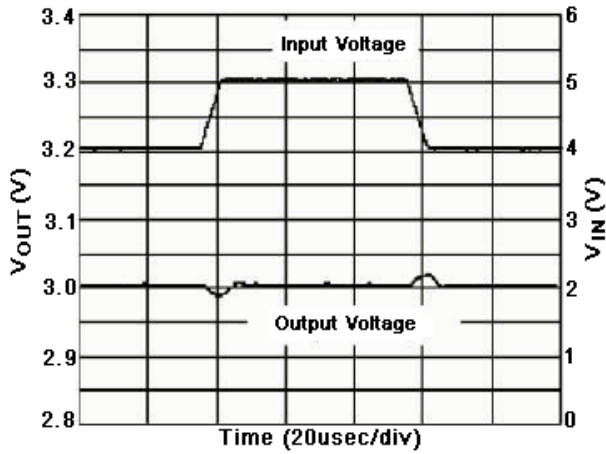




7. Transient Response

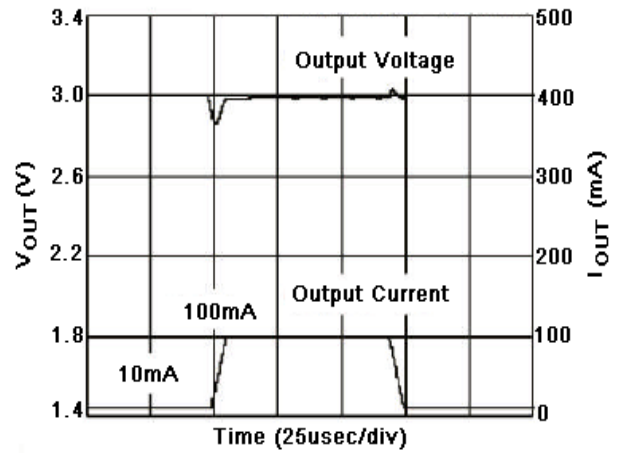
Input Transient Response

$I_{OUT}=30\text{mA}$, $t_R=t_F=5\mu\text{sec}$, $C_L=1\mu\text{F}$ (Ceramic)
 $T_A=25^\circ\text{C}$



Load Transient Response

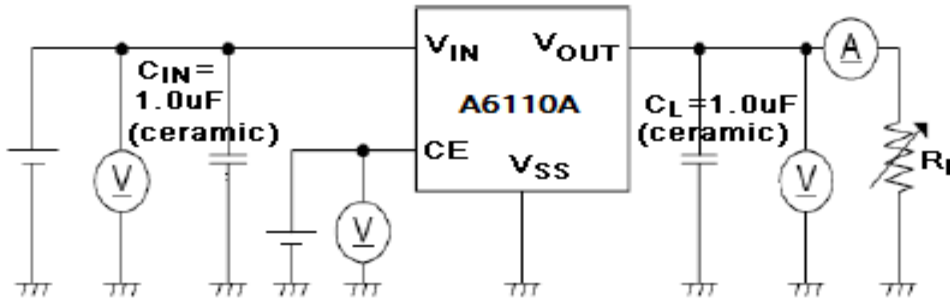
$V_{IN}=4.0$, $t_R=t_F=5\mu\text{sec}$, $C_{IN}=1\mu\text{F}$ (Ceramic),
 $C_L=1\mu\text{F}$ (Ceramic), $T_A=25^\circ\text{C}$



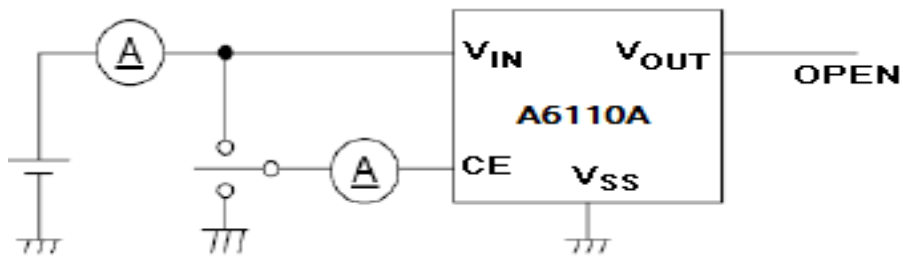


TEST CIRCUITS

1.



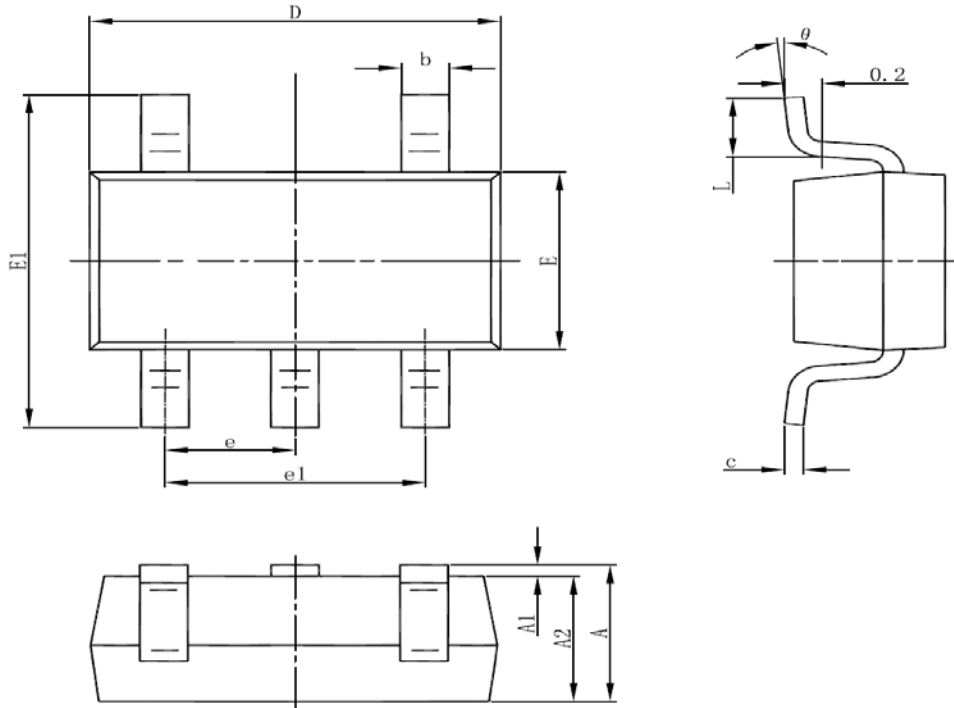
2.





PACKAGE INFORMATION

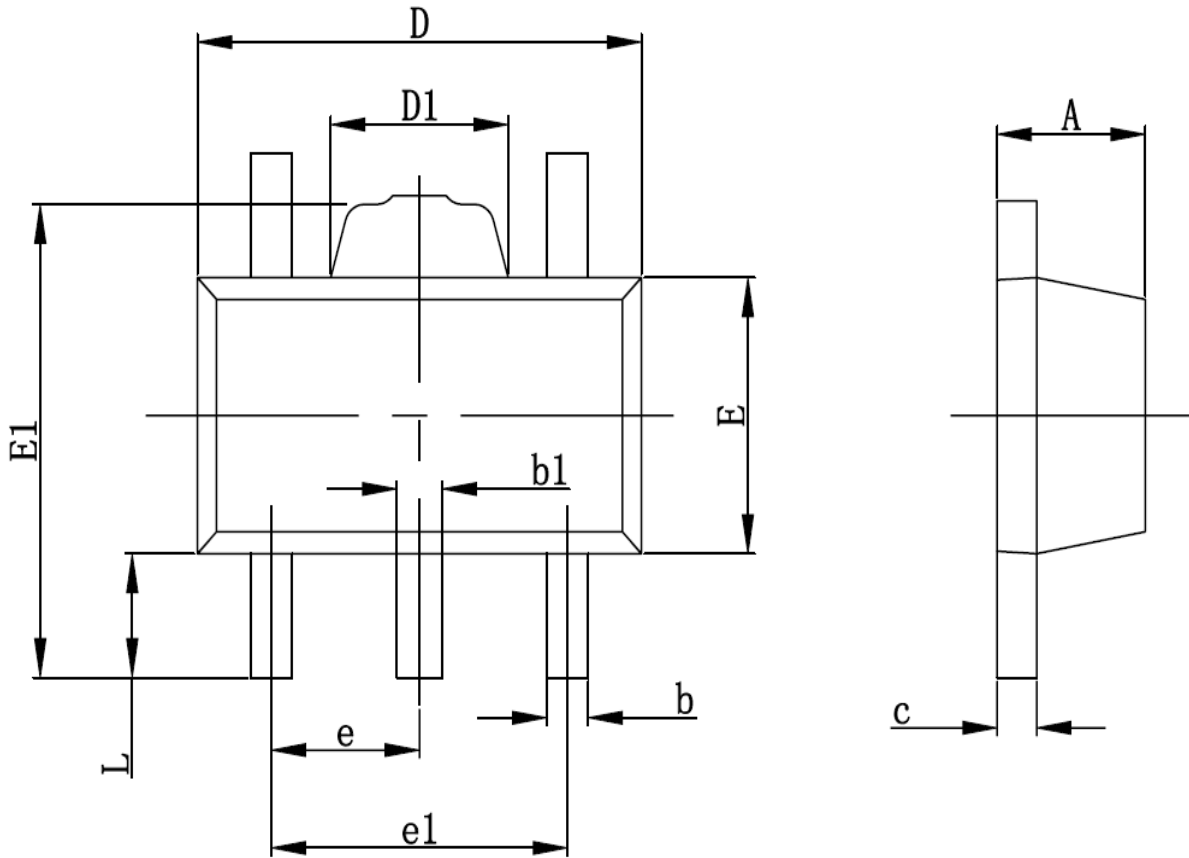
Dimension in SOT-25 (Unit: mm)



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°



Dimension in SOT-89-5 (Unit: mm)



Symbol	Min	Max
A	1.400	1.600
b	0.320	0.520
b1	0.360	0.560
c	0.350	0.440
D	4.400	4.600
D1	1.400	1.800
E	2.300	2.600
E1	3.940	4.250
e	1.500 TYP	
e1	2.900	3.100
L	0.900	1.100



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