



## 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 SOT89-5 packages.

## ORDER INFORMATION

Package Type	Part Number	
SOT-25 SPQ: 3,000pcs/Reel	E5	A6110AE5R-XX
		A6110AE5VR-XX
SOT89-5 SPQ: 1,000pcs/Reel	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		

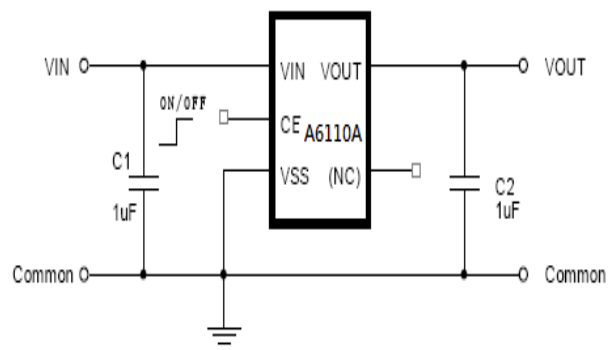
## FEATURES

- 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 $\mu$ A (TYP.)
- Maximum Output Current: more than 1000mA ( $V_{IN} \geq V_{OUT} + 1V$ )
- Standby Current less than 0.1 $\mu$ A
- Internal protector : current limiter
- Available in SOT-25 and SOT89-5 packages.

## APPLICATION

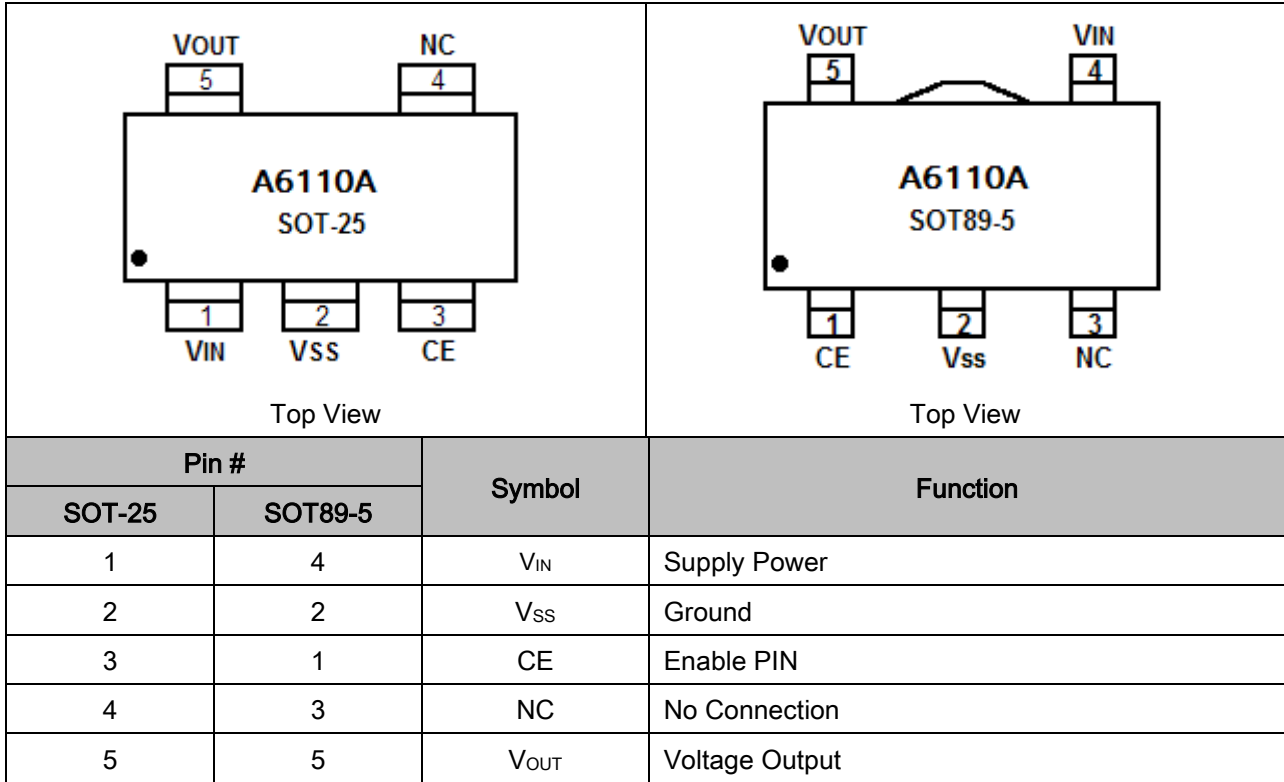
- CD-ROMs , CD-R/RW drive
- DVD drive
- HDD drive
- Cameras, Video cameras
- Portable AV equipment
- Battery powered equipment

## 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
SOT89-5	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	$\theta_{JA}$	$\theta_{JC}$
SOT-25	250°C/W	130°C/W

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

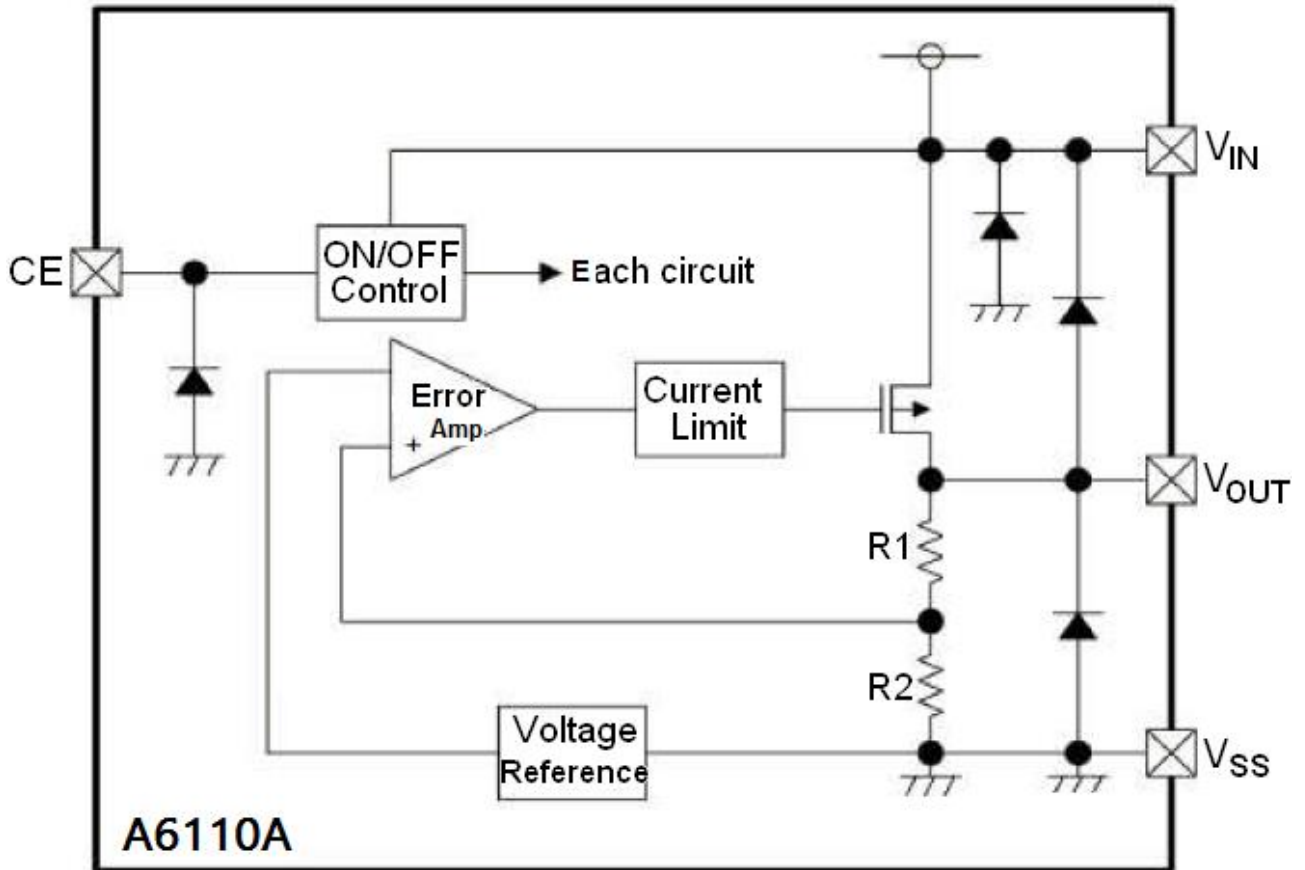


## ELECTRICAL CHARACTERISTICS

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	$\Delta V_{OUT2}$	$V_{IN} = V_{OUT(S)} + 1.0V$ $1.0mA \leq I_{OUT} \leq 100mA$	-	15	60	mV
Output Voltage Temperature Characteristics	$\frac{\Delta V_{OUT}}{\Delta T_A \times V_{OUT}}$	$V_{IN} = V_{OUT(S)} + 1.0V, I_{OUT} = 10mA$ $-40^\circ C \leq T_A \leq 85^\circ C$	-	$\pm 100$	-	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	$V_{CEH}$		1.3	-	$V_{IN}$	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



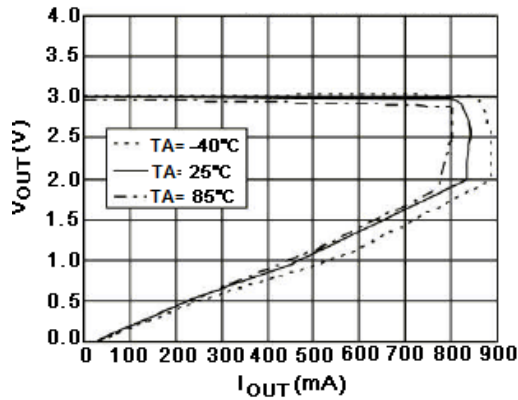
**BLOCK DIAGRAM**



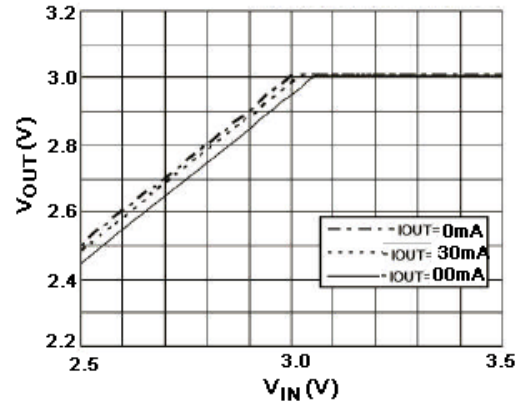


## TYPICAL PERFORMANCE CHARACTERISTICS

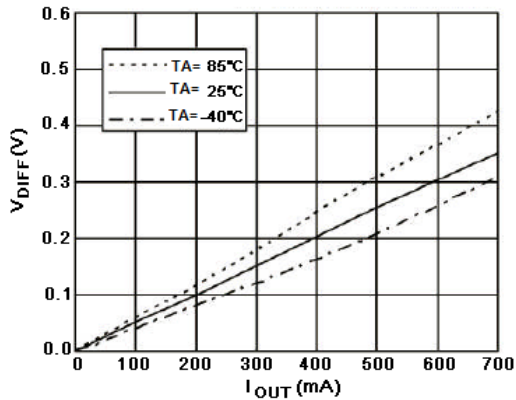
1. Output Voltage vs. Output Current  
 $C_{IN}=1\mu\text{F}$ (Ceramic),  $C_L=1\mu\text{F}$ (Ceramic),  $V_{IN}=4.0$



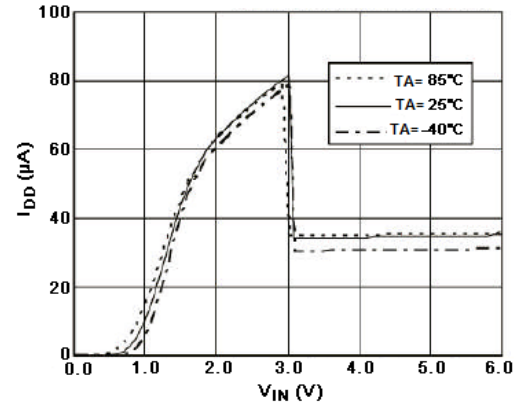
2. Output Voltage vs. Input Voltage (Contd.)  
 $C_{IN}=1\mu\text{F}$ (Ceramic),  $C_L=1\mu\text{F}$ (Ceramic),  $T_A=25^\circ\text{C}$



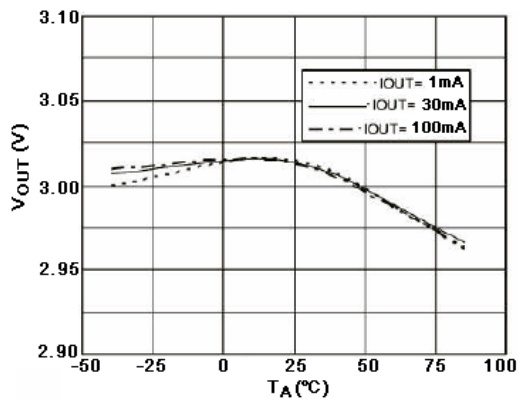
3. Dropout Voltage vs. Output Current  
 $C_{IN}=1\mu\text{F}$ (Ceramic),  $C_L=1\mu\text{F}$ (Ceramic)



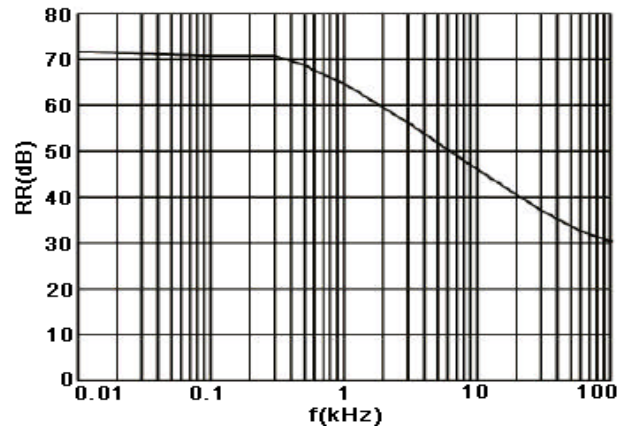
4. Supply Current vs. Supply Voltage  
 $C_{IN}=1\mu\text{F}$ (Ceramic),  $C_L=1\mu\text{F}$ (Ceramic)



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)

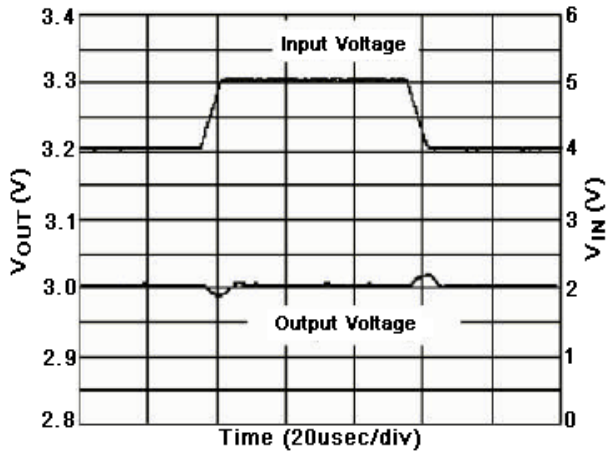




### 7. Transient Response

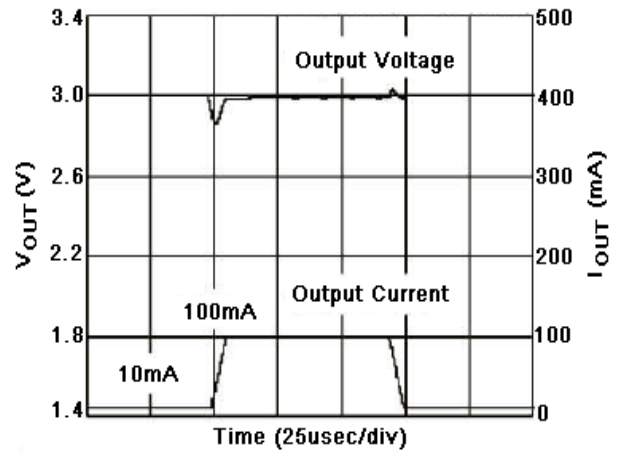
#### Input Transient Response

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



#### Load Transient Response

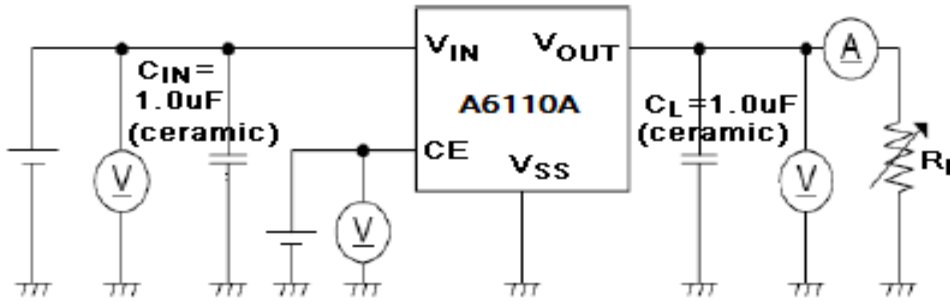
$V_{IN}=4.0$ ,  $t_R=t_F=5\mu\text{sec}$ ,  $C_{IN}=1\mu\text{F}$ (Ceramic),  
 $C_L=1\mu\text{F}$ (Ceramic),  $T_A=25^\circ\text{C}$



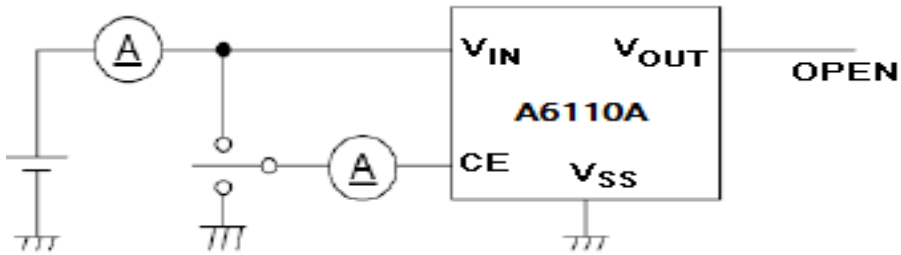


## TEST CIRCUITS

1.



2.

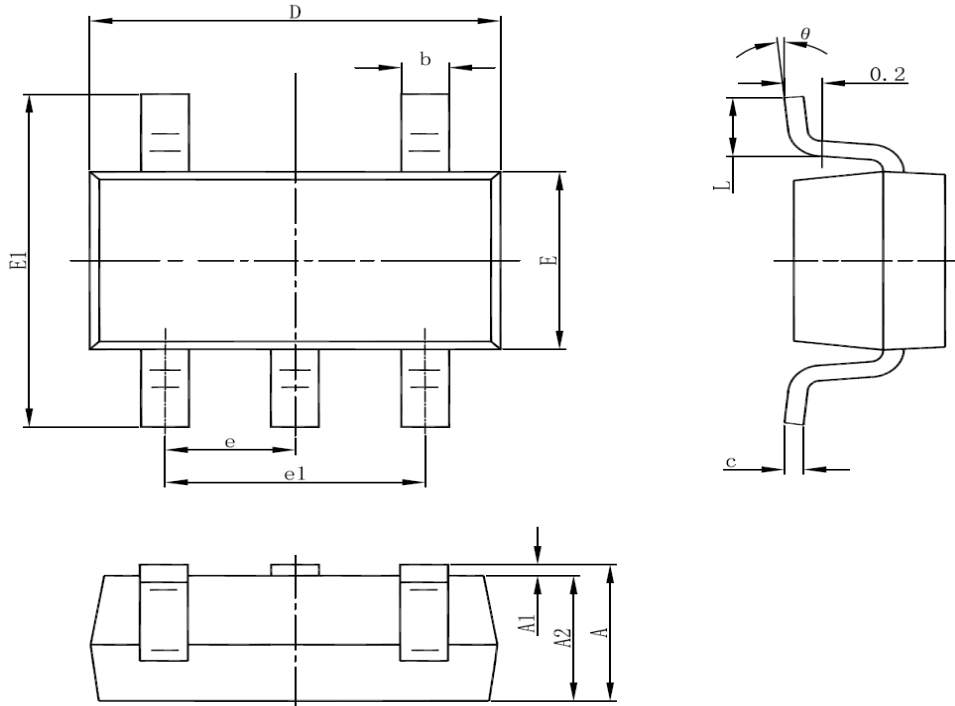






**PACKAGE INFORMATION**

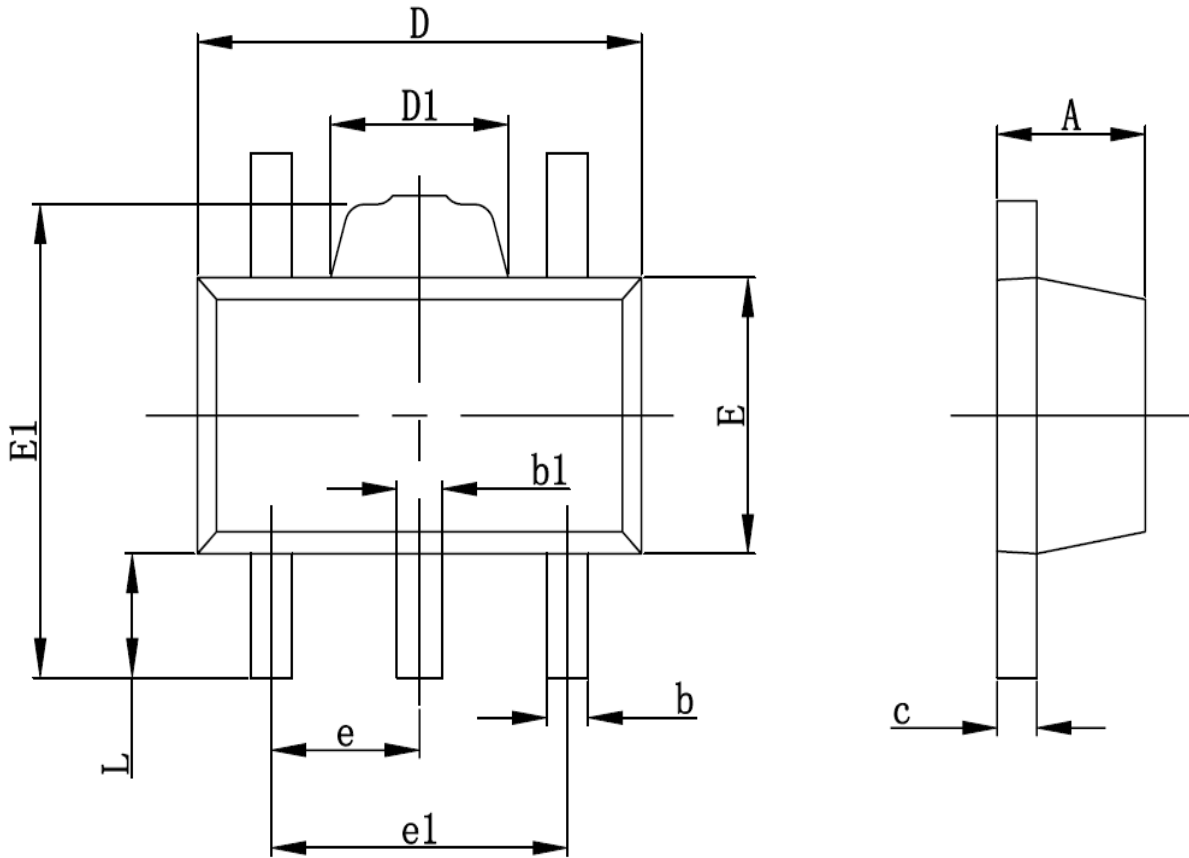
Dimension in SOT-25 (Unit: mm)



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 SOT89-5 (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



## IMPORTANT NOTICE

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