

# 500mA Low Dropout Linear Regulator

## FEATURES

- Low dropout voltage of 650mV at an output current of 500mA (3.0V output version).
- Guaranteed 500mA output current.
- Low ground current of 65µA
- Output voltage accuracy of 2% at 1.8V/ 2.0V /2.5V /2.7V/ 3.0V/ 3.3V/ 3.5V/ 3.7V/ 3.8V/ 5.0V/5.2V
- Only needs 4.7µF output capacitor for stability.
- Current and thermal limiting.

 **Pb-free, RoHS compliant.**

## APPLICATIONS

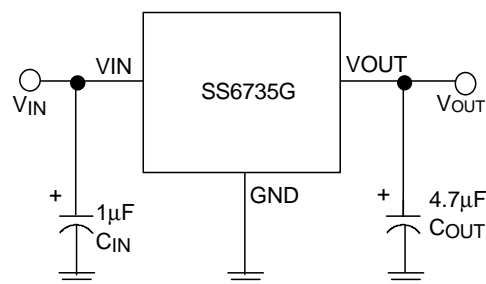
- CD-ROM Drivers.
- LAN Cards.
- Microprocessors.
- DRAM Modules.
- Wireless Communication Systems.
- Battery Powered Systems.

## DESCRIPTION

The SS6735G is a 3-pin low-dropout linear regulator with superior characteristics, which include zero base current loss, very low dropout voltage, and output voltage accuracy of 2%. Typical ground current remains approximately 65µA, for loads ranging from zero to maximum. Dropout voltage at an output current of 100mA is exceptionally low. Built-in output current limiting and thermal limiting provide maximum protection against fault conditions.

The SS6735G is available in RoHS-compliant SOT-23-3, SOT-223, SOT-89, and TO-252 packages.

## TYPICAL APPLICATION CIRCUIT



**Low Dropout Linear Regulator**  
( $C_{IN}$  and  $C_{OUT}$  should be electrolytic capacitors)

**ORDERING INFORMATION**

SS6735-XXG X XX

 Packing:  
 TR: Tape and reel

 Package type:  
 E: TO-252  
 U: SOT-23-3  
 X: SOT-89-3  
 Y: SOT-223

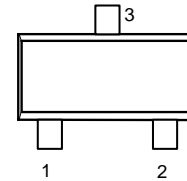
G: Pb-free, RoHS compliant.

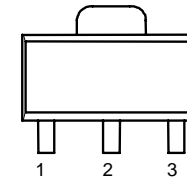
 Output voltage:  
 18: 1.8V  
 20: 2.0V  
 25: 2.5V  
 27: 2.7V  
 30: 3.0V  
 33: 3.3V  
 35: 3.5V  
 37: 3.7V  
 38: 3.8V  
 50: 5.0V  
 52: 5.2V

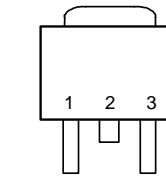
Example: SS6735-18GXTR  
 → 1.8V version, in RoHS-compliant  
 SOT-89 package, shipped  
 on tape and reel.

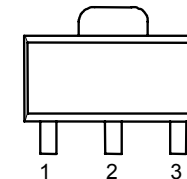
**PIN CONFIGURATION**

SOT-23-3 (GU)

 1: GND  
 2: VOUT  
 3: VIN

 SOT-89 (GX)  
 TOP VIEW

 1: GND  
 2: VIN  
 3: VOUT

 TO-252 (GE)  
 TOP VIEW

 1: VOUT  
 2: GND  
 3: VIN

 SOT-223 (GY)  
 TOP VIEW

 1: VOUT  
 2: GND  
 3: VIN

**SOT-23 MARKING**

Part No.	GU	Part No.	GU
SS6735-18GU	CE18P	SS6735-35GU	CE35P
SS6735-20GU	CE20P	SS6735-37GU	CE37P
SS6735-25GU	CE25P	SS6735-38GU	CE38P
SS6735-27GU	CE27P	SS6735-50GU	CE50P
SS6735-30GU	CE30P	SS6735-52GU	CE52P
SS6735-33GU	CE33P		

**SOT-89 MARKING**

Part No.	GX
SS6735-18GX	CF18P
SS6735-20GX	CF20P
SS6735-25GX	CF25P
SS6735-27GX	CF27P
SS6735-30GX	CF30P
SS6735-33GX	CF33P
SS6735-35GX	CF35P
SS6735-37GX	CF37P
SS6735-38GX	CF38P
SS6735-50GX	CF50P
SS6735-52GX	CF52P

**SOT-223 MARKING**

Part No.	GY
SS6735-18GY	CC18P
SS6735-20GY	CC20P
SS6735-25GY	CC25P
SS6735-27GY	CC27P
SS6735-30GY	CC30P
SS6735-33GY	CC33P
SS6735-35GY	CC35P
SS6735-37GY	CC37P
SS6735-38GY	CC38P
SS6735-50GY	CC50P
SS6735-52GY	CC52P

**ABSOLUTE MAXIMUM RATINGS**

Input Supply Voltage.....	-0.3 ~12V
Operating Temperature Range .....	-40°C~ 85°C
Storage Temperature Range .....	-65°C~150°C
Maximum Junction Temperature.....	125°C
Lead Temperature (Soldering) 10 sec. ....	260°C
Thermal Resistance Junction to Ambient	SOT-89 Package ..... 160°C/W
(Assumes no ambient airflow, no heatsink)	TO-252 Package ..... 100°C/W
	SOT-23 Package ..... 180°C/W
	SOT-223 Package ..... 155°C/W

**Absolute Maximum Ratings are those values beyond which the life of a device may be impaired.**

**TEST CIRCUIT**

Refer to the TYPICAL APPLICATION CIRCUIT

**ELECTRICAL CHARACTERISTICS** ( $T_A=25^{\circ}\text{C}$ ,  $C_{IN}=1\mu\text{F}$ ,  $C_{OUT}=4.7\mu\text{F}$ , unless otherwise specified.) (Note1 )

PARAMETER	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT	
Output Voltage	No Load					
	SS6735-52	$V_{IN}=5.5\sim 12\text{V}$	5.100	5.200	5.300	V
	SS6735-50	$V_{IN}=5.5\sim 12\text{V}$	4.900	5.000	5.100	
	SS6735-38	$V_{IN}=4.1\sim 12\text{V}$	3.725	3.800	3.875	
	SS6735-37	$V_{IN}=4.0\sim 12\text{V}$	3.625	3.700	3.775	
	SS6735-35	$V_{IN}=4.0\sim 12\text{V}$	3.430	3.500	3.570	
	SS6735-33	$V_{IN}=4.0\sim 12\text{V}$	3.235	3.300	3.365	
	SS6735-30	$V_{IN}=4.0\sim 12\text{V}$	2.940	3.000	3.060	
	SS6735-27	$V_{IN}=4.0\sim 12\text{V}$	2.646	2.700	2.754	
	SS6735-25	$V_{IN}=4.0\sim 12\text{V}$	2.450	2.500	2.550	
SS6735-20	$V_{IN}=4.0\sim 12\text{V}$	1.960	2.000	2.040		
SS6735-18	$V_{IN}=4.0\sim 12\text{V}$	1.764	1.800	1.836		
Output Voltage Temperature Coefficient	(Note 2)		50		PPM/ $^{\circ}\text{C}$	
Line Regulation	$I_L=1\text{mA}$ , $1.4\text{V}\leq V_{OUT}\leq 3.2\text{V}$	$V_{IN}=4\text{V}\sim 12\text{V}$		3	10	mV
	$3.3\text{V}\leq V_{OUT}\leq 5.2\text{V}$	$V_{IN}=5.5\text{V}\sim 12\text{V}$		3	10	
Load Regulation (Note 3)	$I_L=0.1\sim 500\text{mA}$ $1.4\text{V}\leq V_{OUT}\leq 3.9\text{V}$	$V_{IN}=5\text{V}$		10	30	mV
	$4.0\text{V}\leq V_{OUT}\leq 5.2\text{V}$	$V_{IN}=7\text{V}$		20	50	
Current Limit (Note 4)	$V_{IN}=7\text{V}$ , $V_{OUT}=0\text{V}$		500		mA	
Dropout Voltage (Note 5)	$I_L=500\text{mA}$	$4.0\text{V}\leq V_{OUT}\leq 5.2\text{V}$		510		mV
		$3.0\text{V}\leq V_{OUT}\leq 3.9\text{V}$		650		
		$2.5\text{V}\leq V_{OUT}\leq 2.9\text{V}$		780		
		$2.0\text{V}\leq V_{OUT}\leq 2.4\text{V}$		1100		
		$1.4\text{V}\leq V_{OUT}\leq 1.9\text{V}$		1400		
Ground Current	$I_O=0.1\text{mA}\sim I_{MAX}$ $1.4\text{V}\leq V_{OUT}\leq 3.9\text{V}$	$V_{IN}=5\sim 12\text{V}$		65	90	$\mu\text{A}$
	$4.0\text{V}\leq V_{OUT}\leq 5.2\text{V}$	$V_{IN}=7\sim 12\text{V}$		65	90	

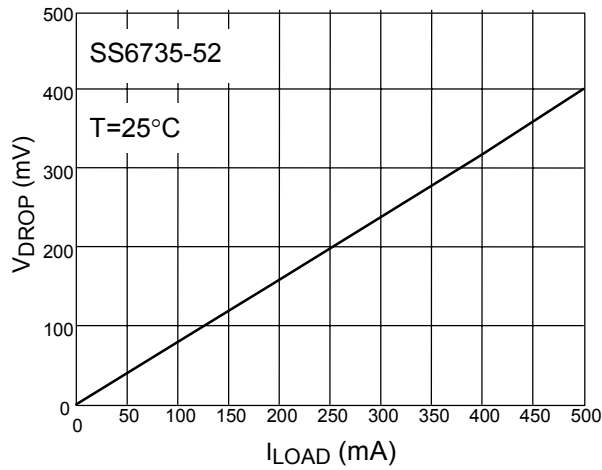
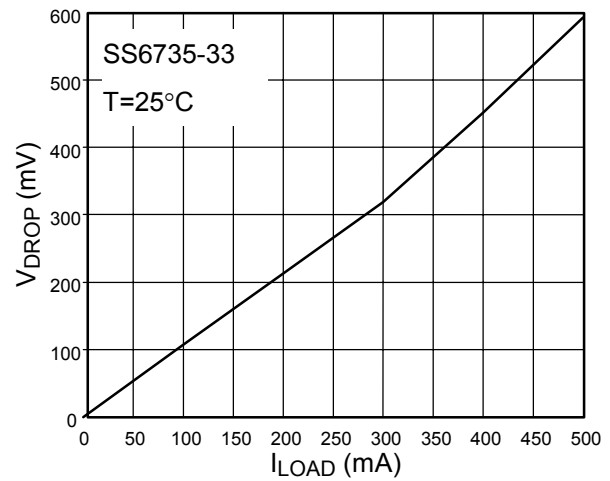
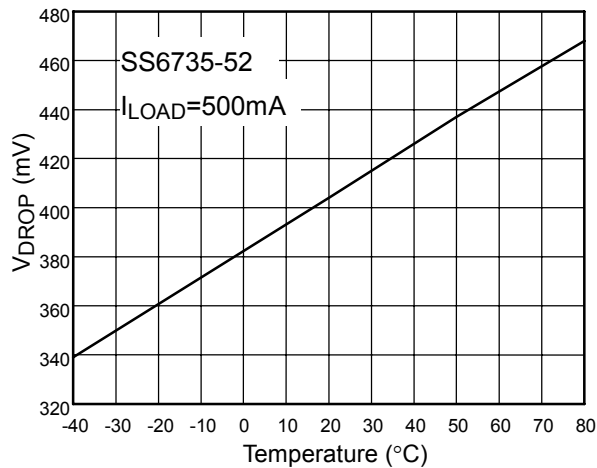
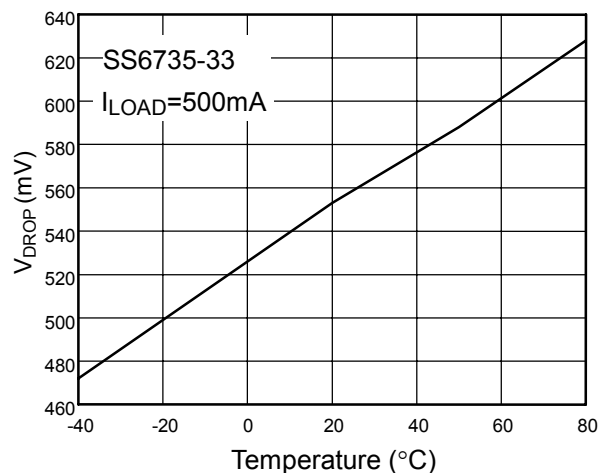
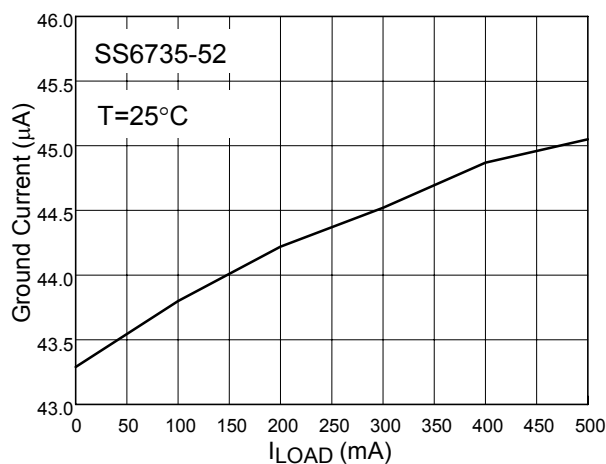
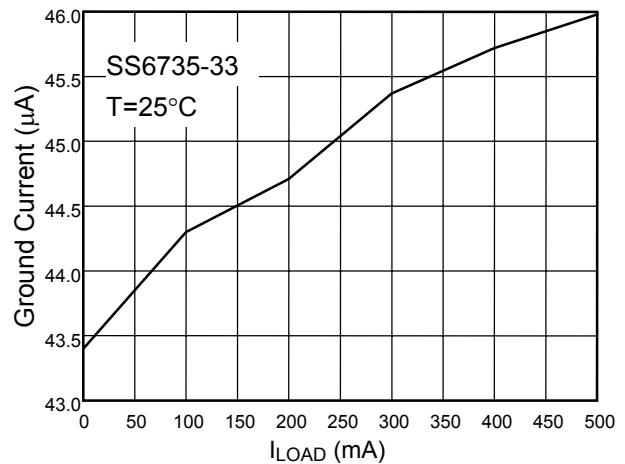
Note 1: Specifications are guaranteed by Statistical Quality Control (SQC), not by 100% production testing, over the operating temperature range from  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$ .

Note 2: Guaranteed by design.

Note 3: Regulation is measured at constant junction temperature, using pulse testing with a low ON time.

Note 4: Current limit is measured by pulsing a short time.

Note 5: Dropout voltage is defined as the input to output differential at which the output voltage drops 100mV below the value of the output voltage measured with a 1V differential.

**TYPICAL PERFORMANCE CHARACTERISTICS**

**Fig. 1 V<sub>DROP</sub> vs. I<sub>LOAD</sub>**

**Fig. 2 V<sub>DROP</sub> vs. I<sub>LOAD</sub>**

**Fig. 3 V<sub>DROP</sub> vs. Temperature**

**Fig. 4 V<sub>DROP</sub> vs. Temperature**

**Fig. 5 Ground Current vs. I<sub>LOAD</sub>**

**Fig. 6 Ground Current vs. I<sub>LOAD</sub>**

TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

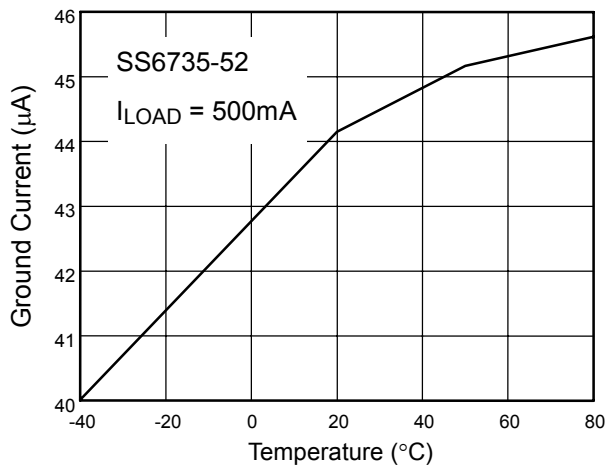


Fig. 7 Ground Current vs. Temperature

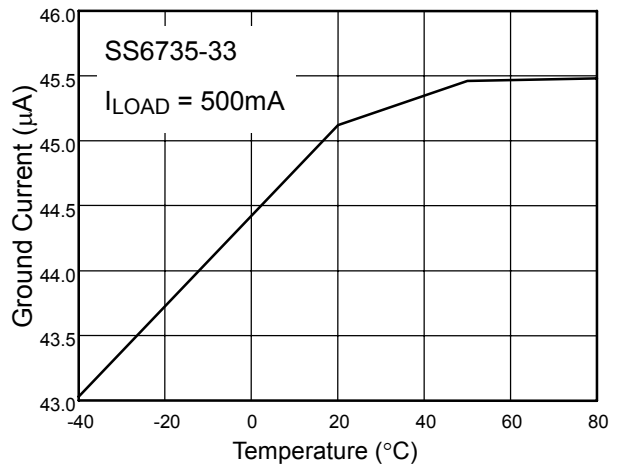


Fig. 8 Ground Current vs. Temperature

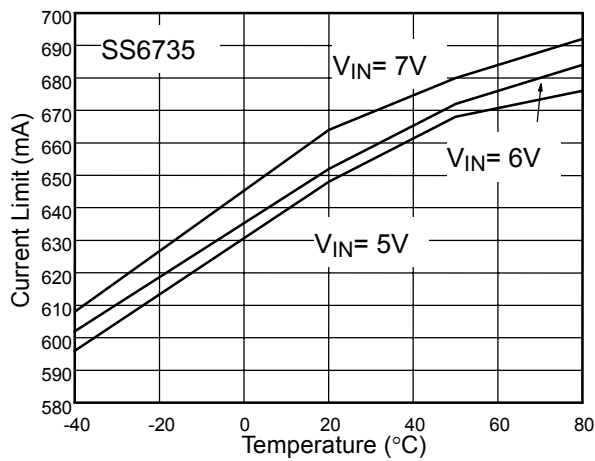
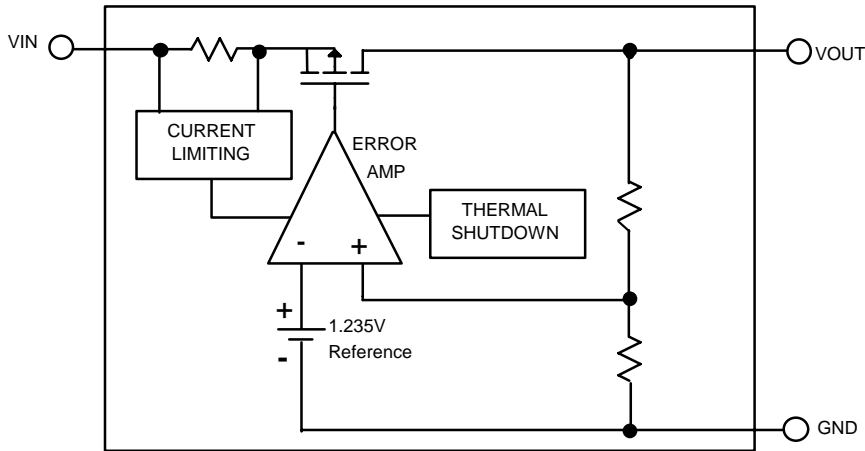


Fig. 9 Current Limit vs. Temperature

## BLOCK DIAGRAM



## PIN DESCRIPTIONS

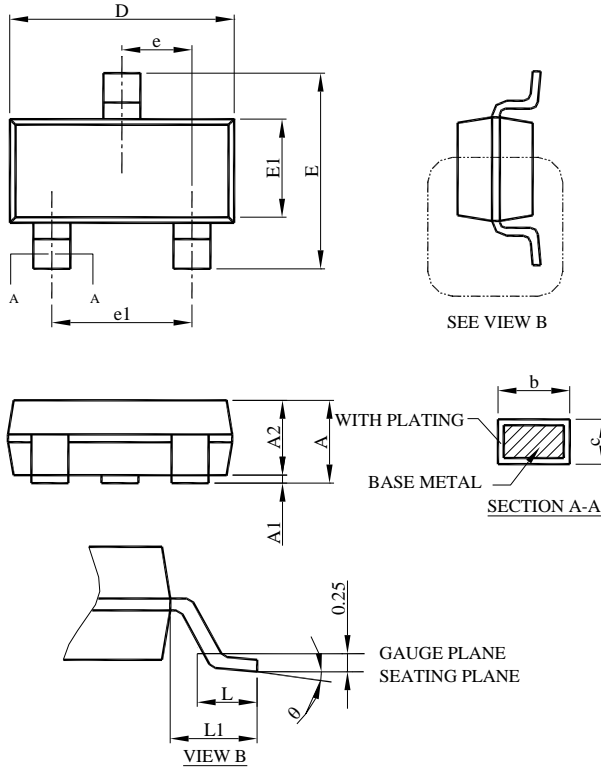
VOUT PIN - Output pin.

GND PIN - Power GND.

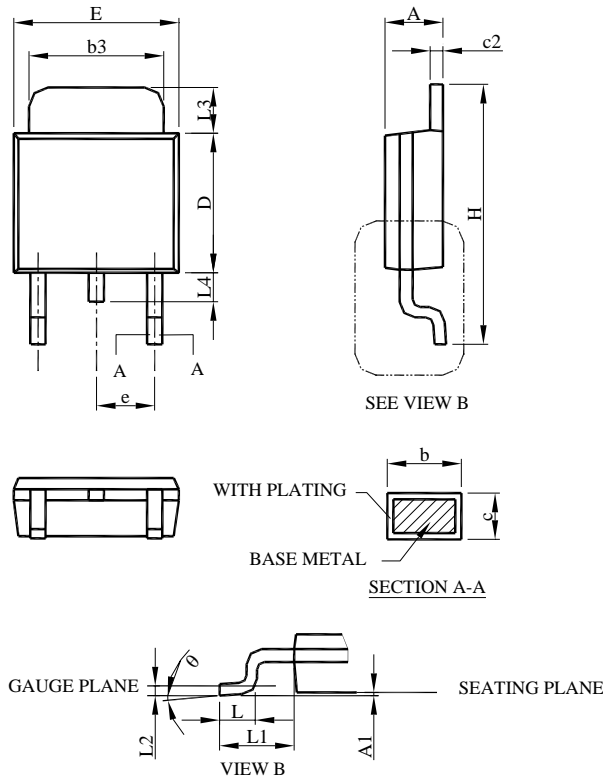
VIN PIN - Power Supply Input.

**PHYSICAL DIMENSIONS (unit: mm)**

All package options are Pb-free, RoHS compliant.

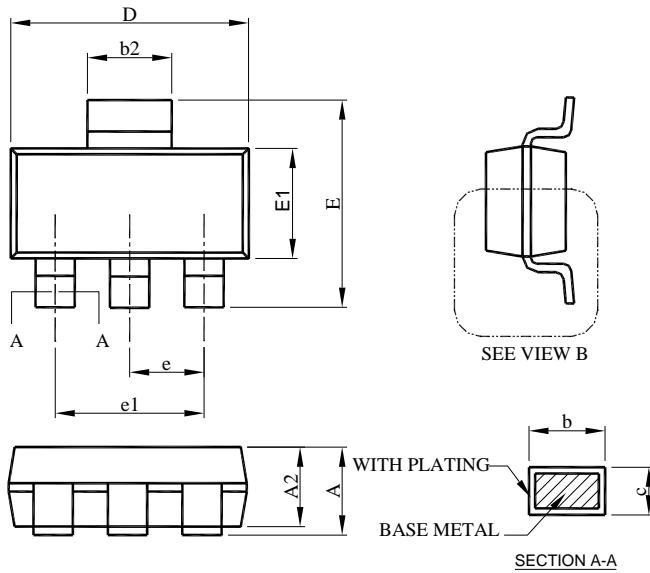
**SOT-23**


SYMBOL	SOT-23	
	MILLIMETERS	
	MIN.	MAX.
A	0.95	1.45
A1	0.05	0.15
A2	0.90	1.30
b	0.30	0.50
c	0.08	0.22
D	2.80	3.00
E	2.60	3.00
E1	1.50	1.70
e	0.95 BSC	
e1	1.90 BSC	
L	0.30	0.60
L1	0.60 REF	
θ	0°	8°

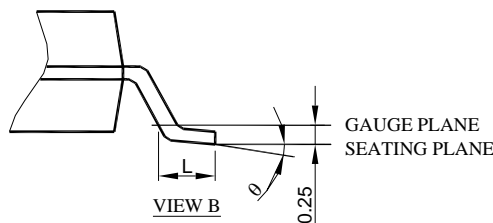
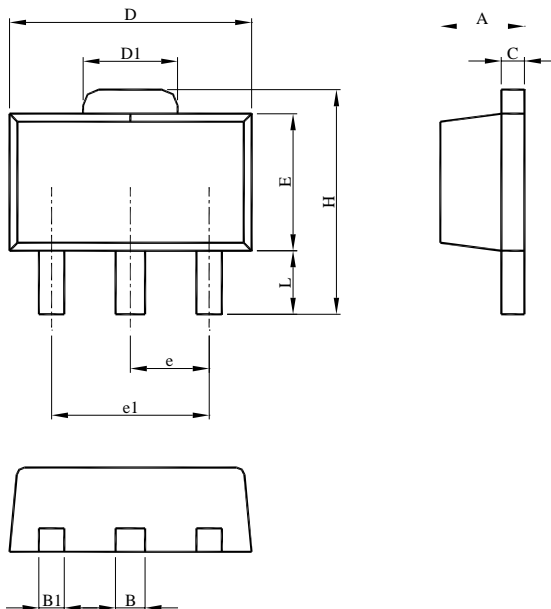
**TO-252**


SYMBOL	TO-252-3L	
	MILLIMETERS	
	MIN.	MAX.
A	2.19	2.38
A1	0.00	0.13
b	0.64	0.89
b3	4.95	5.46
c	0.46	0.61
c2	0.46	0.89
D	5.33	6.22
E	6.35	6.73
e	2.28 BSC	
H	9.40	10.41
L	1.40	1.78
L1	2.67 REF	
L2	0.51 BSC	
L3	0.89	2.03
L4	--	1.02
θ	0°	8°



**SOT-223**


SYMBOL	SOT-223	
	MILLIMETERS	
	MIN.	MAX.
A1		1.80
A1	0.02	0.10
A2	1.55	1.65
b	0.66	0.84
b2	2.90	3.10
c	0.23	0.33
D	6.30	6.70
E	6.70	7.30
E1	3.30	3.70
e	2.30 BSC	
e1	4.60 BSC	
L	0.90	
$\theta$	0°	8°


**SOT-89**


SYMBOL	SOT-89	
	MILLIMETERS	
	MIN.	MAX.
A	1.40	1.60
B	0.44	0.56
B1	0.36	0.48
C	0.35	0.44
D	4.40	4.60
D1	1.50	1.83
E	2.29	2.60
e	1.50 BSC	
e1	3.00 BSC	
H	3.94	4.25
L	0.89	1.20

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