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

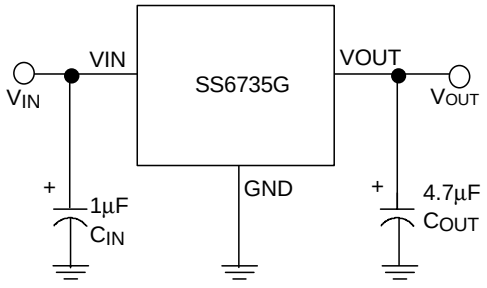
- CD-ROM Drivers.
- LAN Cards.
- Microprocessors.
- DRAM Modules.
- Wireless Communication Systems.
- Battery Powered Systems.

DESCRIPTION

The SS6735G is a 3-pin low-dropout linear regulator with superior characteristics, which include zero base current loss, very low drop-out 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-XX G 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

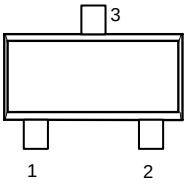
Example: SS6735-18GXTR

→ 1.8V version, in RoHS-compliant SOT-89 package, shipped on tape and reel.

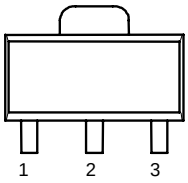
PIN CONFIGURATION

SOT-23-3 (GU)

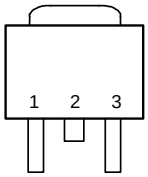
1: GND
2: VOUT
3: VIN



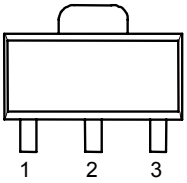
SOT-89 (GX)
TOP VIEW
1: GND
2. VIN
3. VOUT



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 (Assumes no ambient airflow, no heatsink)

SOT-89 Package ..... 160°C/W

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°C, C_{IN}=1μF, C_{OUT}=4.7μF, unless otherwise specified.) (Note1)

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

Note 1: Specifications are guaranteed by Statistical Quality Control (SQC), not by 100% production testing, over the operating temperature range from -40°C to 85°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

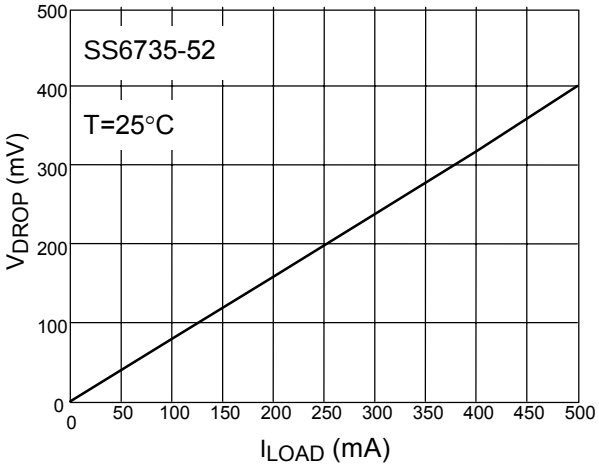


Fig. 1 V_{DROP} vs. I_{LOAD}

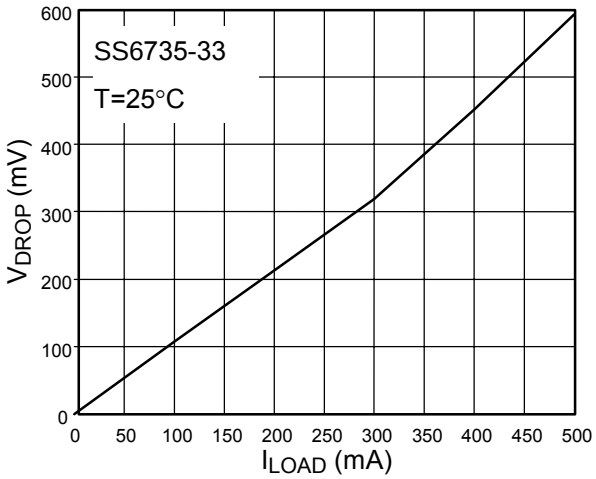


Fig. 2 V_{DROP} vs. I_{LOAD}

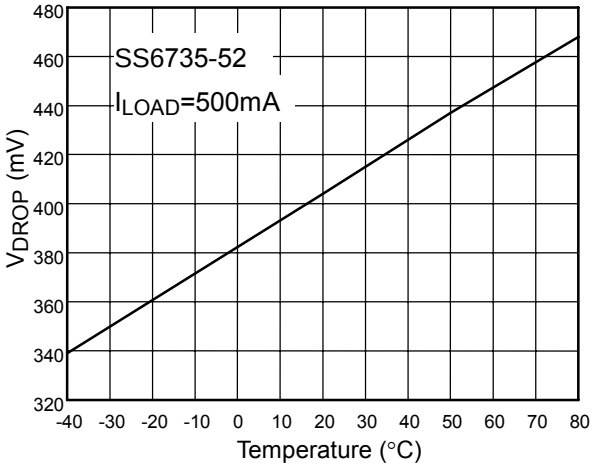


Fig. 3 V_{DROP} vs. Temperature

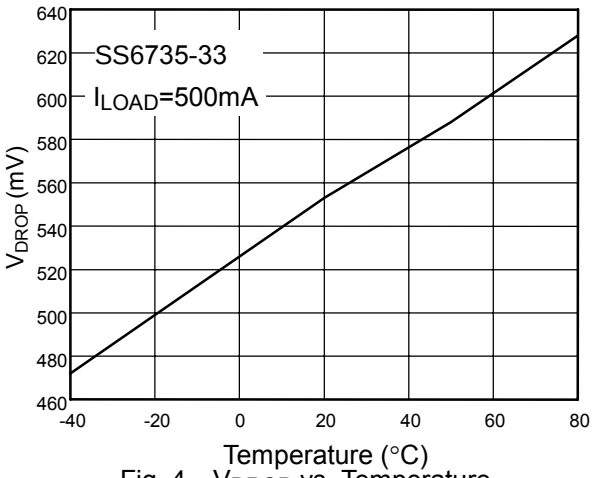


Fig. 4 V_{DROP} vs. Temperature

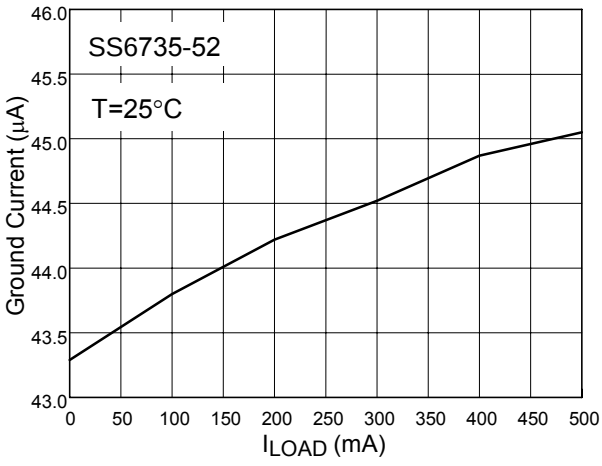


Fig. 5 Ground Current vs. I_{LOAD}

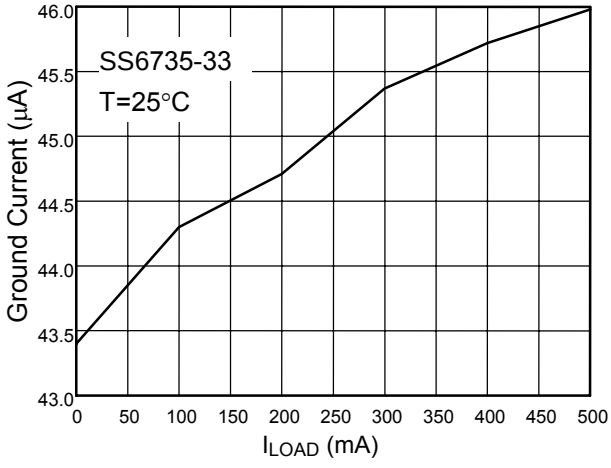


Fig. 6 Ground Current vs. I_{LOAD}

TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

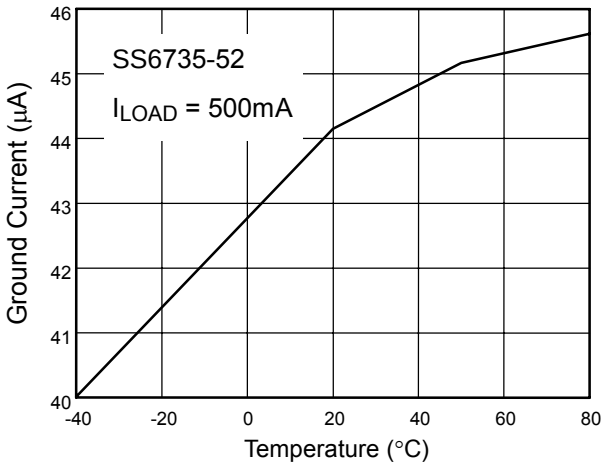


Fig. 7 Ground Current vs. Temperature

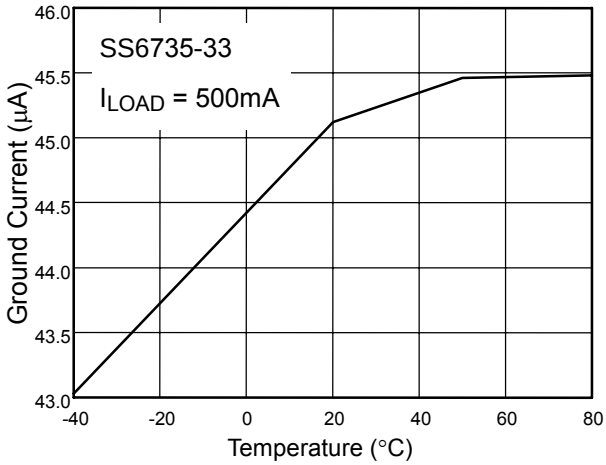


Fig. 8 Ground Current vs. Temperature

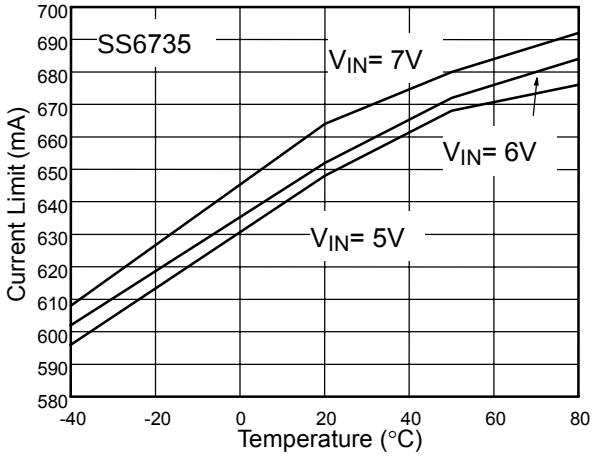
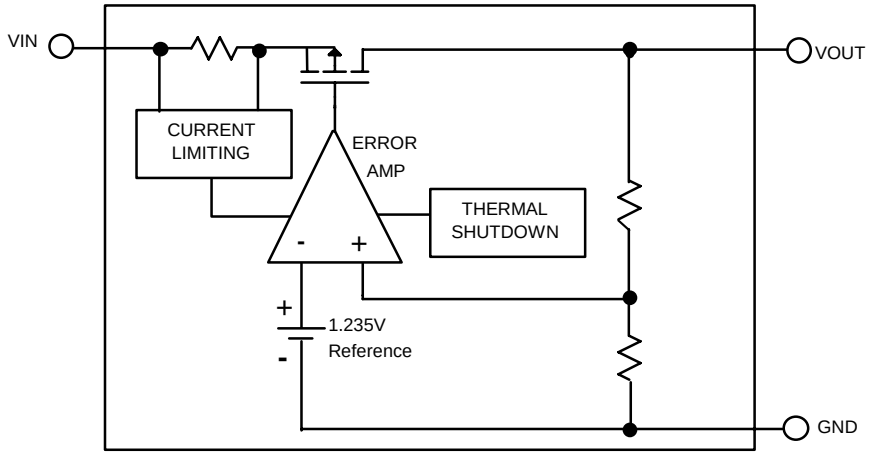


Fig. 9 Current Limit vs. Temperature

BLOCK DIAGRAM



PIN DESCRIPTIONS

VOUT PIN - Output pin.

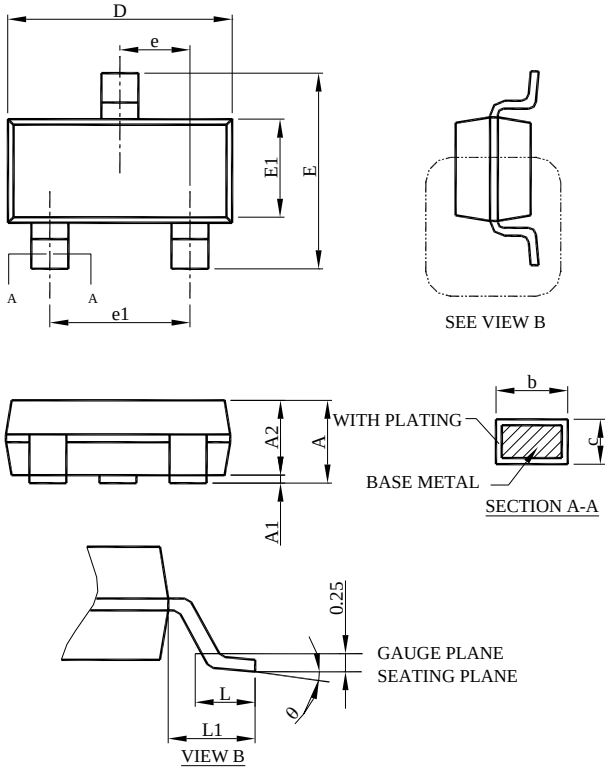
GND PIN - Power GND.

VIN PIN - Power Supply Input.

PHYSICAL DIMENSIONS (unit: mm)

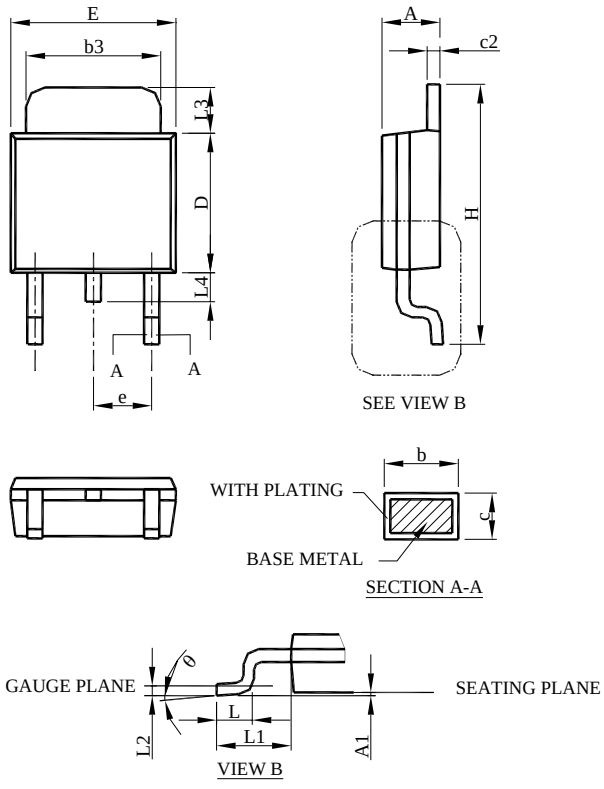
All package options are Pb-free, RoHS compliant.

SOT-23



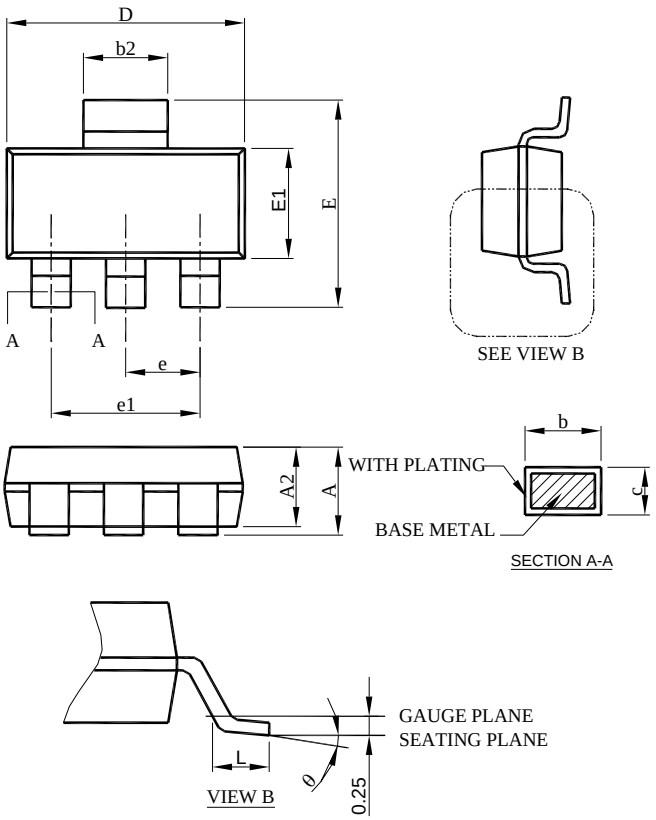
SYMBOL	SOT-23	
	MILLIMETERS	
	MIN.	MAX.
A	0.95	1.45
A1	0.05	0.15
A2	0.90	1.30
b	0.30	0.50
c	0.08	0.22
D	2.80	3.00
E	2.60	3.00
E1	1.50	1.70
e	0.95 BSC	
e1	1.90 BSC	
L	0.30	0.60
L1	0.60 REF	
θ	0°	8°

TO-252



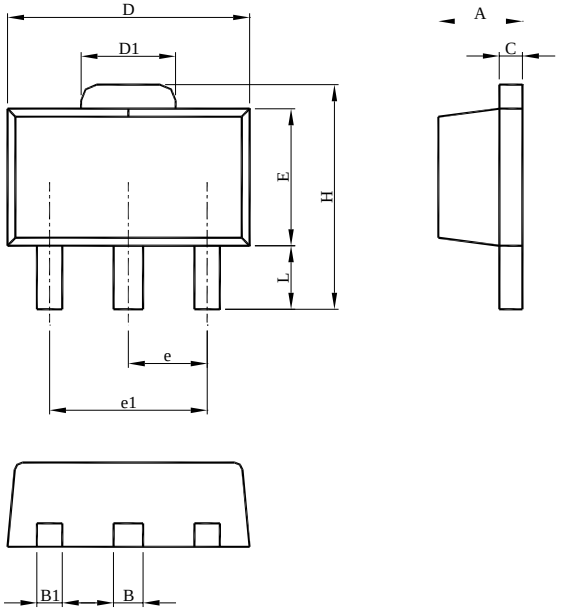
SYMBOL	TO-252-3L	
	MILLIMETERS	
	MIN.	MAX.
A	2.19	2.38
A1	0.00	0.13
b	0.64	0.89
b3	4.95	5.46
c	0.46	0.61
c2	0.46	0.89
D	5.33	6.22
E	6.35	6.73
e	2.28 BSC	
H	9.40	10.41
L	1.40	1.78
L1	2.67 REF	
L2	0.51 BSC	
L3	0.89	2.03
L4	--	1.02
θ	0°	8°

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	
θ	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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