

**Description:**

The SULR1722A is a 3-pin low dropout linear regulator. The superior characteristics of the SULR1722A include zero base current loss, very low dropout voltage, and 2% accuracy output voltage. Typical ground current remains approximately 55µA, from no load to maximum loading conditions. Dropout voltage at 300mA output current is exceptionally low. Output current limiting and thermal limiting are built in to provide maximal protection to the SULR1722A against fault conditions. The SULR1722A comes in the popular 3-pin SOT-23 package.

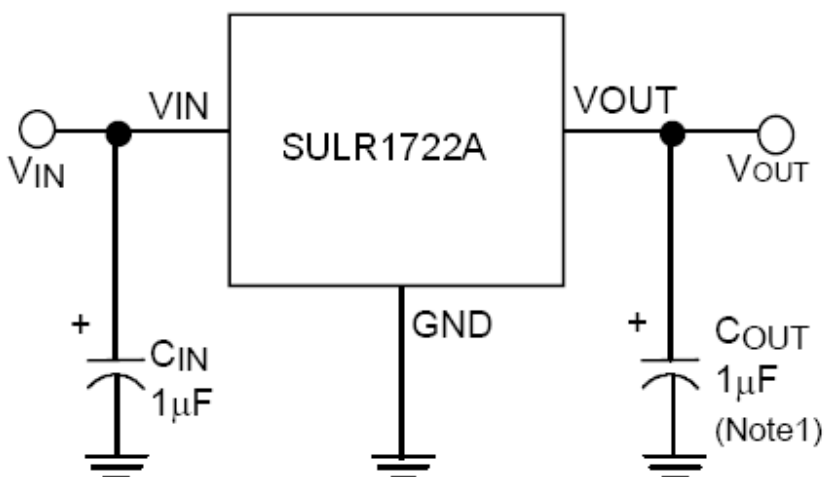
**Features:**

- Low Dropout Voltage of 470mV at 300mA Output Current (3.0V Output Version).
- Guaranteed 300mA Output Current.
- Maximum Input Voltage is 8V
- Low Ground Current at 55µA.
- 2% Accuracy Output Voltage of 1.5V/1.8V/2.0V /2.5V /2.7V/ 3.0V/ 3.3V/ 3.5V/ 3.7V/ 3.8V/5.0V/ 5.2V.
- Needs only 1µF for Stability.
- Current and Thermal Limiting.

**Applications:**

- Voltage Regulator for CD-ROM Drivers.
- Voltage Regulator for LAN Cards.
- Voltage Regulator for Microprocessor.
- Wireless Communication Systems.
- Battery Powered Systems.

**Typical application circuit:**



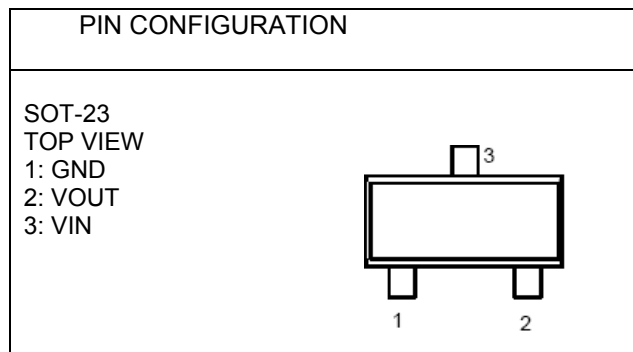
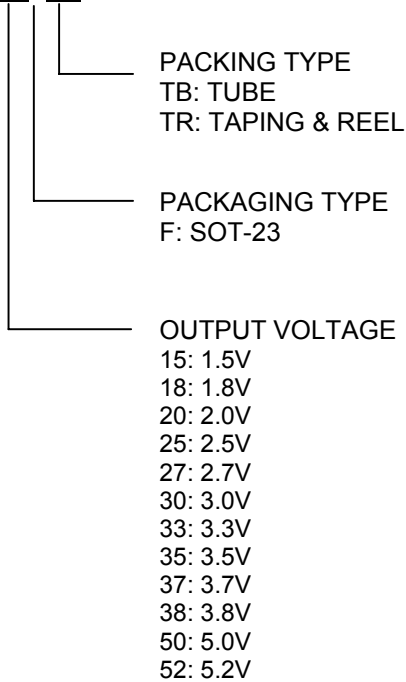
**Low Dropout Linear Regulator**

**Technical Data**  
**Data Sheet N1580, Rev. -**

**300mA Low Dropout Linear Regulator**

**Ordering Information:**

SULR1722A-XXXXX



**Marking Diagram:**

Part No.	Marking
SULR1722A-18FTR	BN18G
SULR1722A-20FTR	BN20G
SULR1722A-25FTR	BN25G
SULR1722A-27FTR	BN27G
SULR1722A-30FTR	BN30G
SULR1722A-33FTR	BN33G
SULR1722A-35FTR	BN35G
SULR1722A-37FTR	BN37G
SULR1722A-52FTR	BN52G



**Absolute Maximum Ratings:**

Input Supply Voltage .....	-0.3~8V
Operating Temperature Range .....	-40°C to 85°C
Maximum Junction Temperature .....	125°C
Storage Temperature Range .....	-65°C ~ 150°C
Lead Temperature (Soldering) 10 sec. ....	260°C
Thermal Resistance Junction to Case SOT-23 .....	130°C/W
Thermal Resistance Junction to Ambient SOT-23.....	180°C/W

(Assume no ambient airflow, no heatsink)

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**

( $C_{IN}=1\mu F$ ,  $C_{OUT}=1\mu F$ ,  $T_A=25^\circ C$ , unless otherwise specified)(Note 2)

PARAMETER	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	$V_{IN}=8V$ , No Load	-2		+2	%
Line Regulation	$I_L=1mA$ , $1.4V \leq V_{OUT} \leq 3.2V$		3	10	mV
	$3.3V \leq V_{OUT} \leq 5.2V$		3	15	
Load Regulation (Note 3)	$I_L=0.1 \sim 300mA$ , $1.4V \leq V_{OUT} \leq 3.9V$		7	20	mV
	$4.0V \leq V_{OUT} \leq 5.2V$		15	40	
Current Limit (Note 4)	$V_{IN}=7V$ , $V_{OUT}=0V$	300			mA
Dropout Voltage (Note 5)	$I_L=300mA$ , $4.0V \leq V_{OUT} \leq 5.2V$		400	500	mV
	$3.0V \leq V_{OUT} \leq 3.9V$		470	570	
	$2.5V \leq V_{OUT} \leq 2.9V$		570	670	
	$2.0V \leq V_{OUT} \leq 2.4V$		800	900	
	$1.4V \leq V_{OUT} \leq 1.9V$		1260	1360	
Ground Current	$I_O=0.1mA \sim I_{MAX}$ , $1.4V \leq V_{OUT} \leq 3.9V$		55	80	$\mu A$
	$4.0V \leq V_{OUT} \leq 5.2V$		55	80	
Thermal Shutdown Hysteresis	Guaranteed by design		20		$^\circ C$

Note 1: To avoid output oscillation, aluminum electrolytic output capacitor is recommended and ceramic capacitor is not suggested.

Note 2: Specifications are production tested at  $T_A=25^\circ C$ . Specifications over the  $-40^\circ C$  to  $85^\circ C$  operating temperature range are assured by design, characterization and correlation with Statistical Quality Controls (SQC).

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 measured with a 1V differential.

**Typical Performance Characteristics**

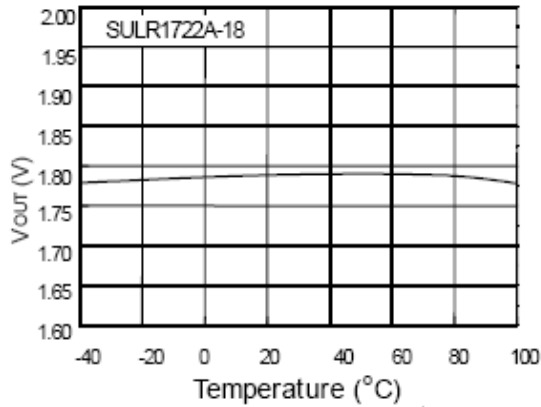


Fig. 1 V<sub>OUT</sub> vs. Temperature

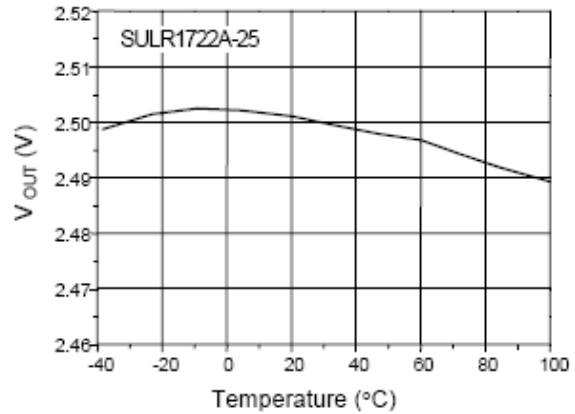


Fig. 2 V<sub>OUT</sub> vs. Temperature

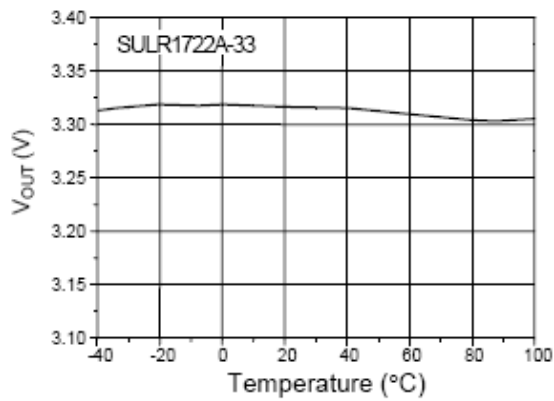


Fig. 3 V<sub>OUT</sub> vs. Temperature

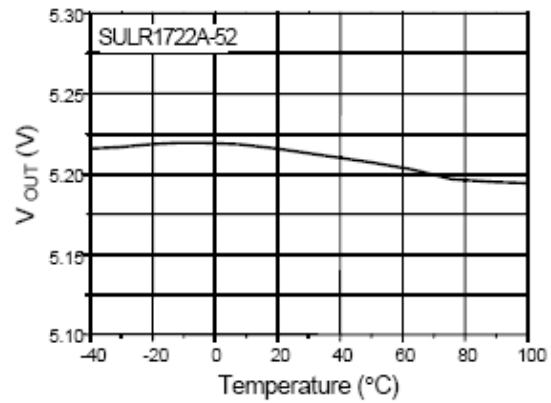


Fig. 4 V<sub>OUT</sub> vs. Temperature

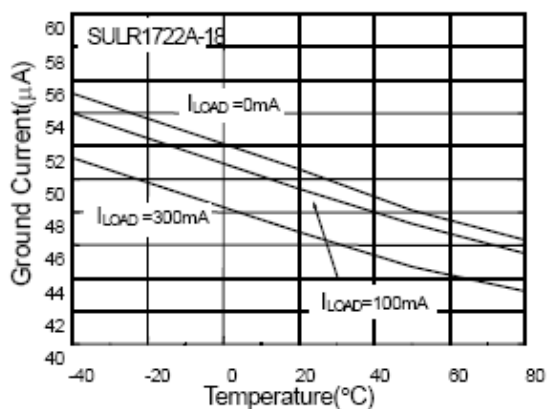


Fig. 5 Ground Current vs. Temperature

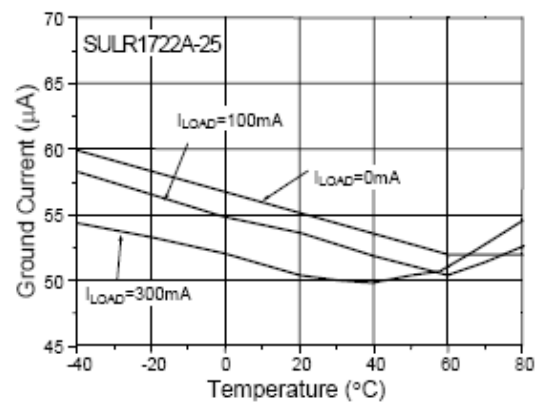


Fig. 6 Ground Current vs. Temperature

**Technical Data**  
**Data Sheet N1580, Rev. -**  
**Typical Performance Characteristics (Continued)**

**300mA Low Dropout Linear Regulator**

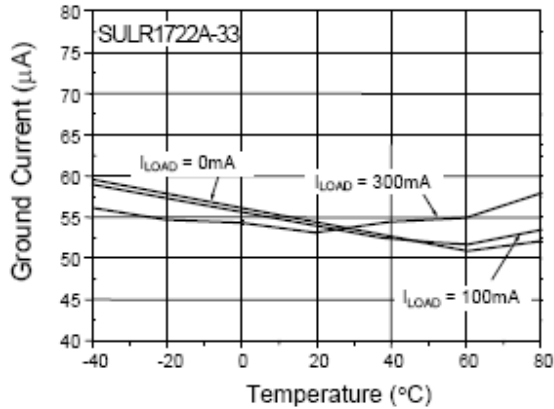


Fig. 7 Ground Current vs. Temperature

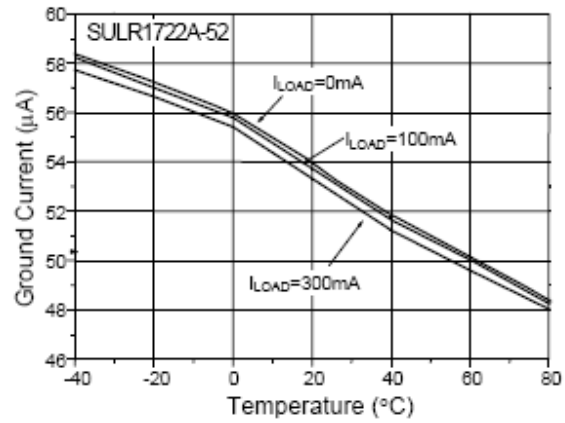


Fig. 8 Ground Current vs. Temperature

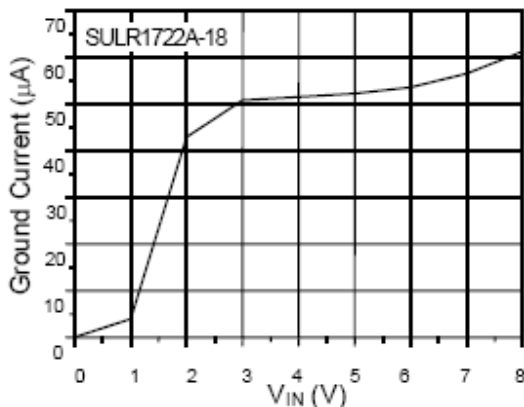


Fig. 9 Ground Current vs.  $V_{IN}$

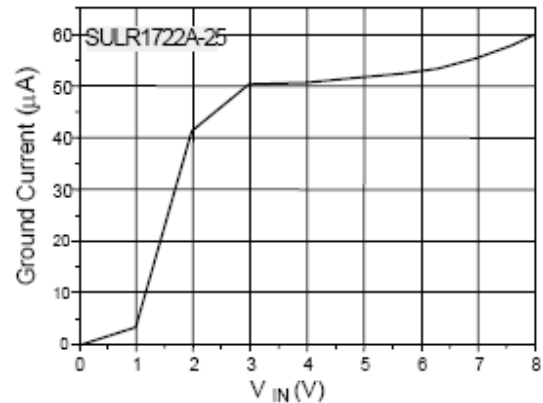


Fig. 10 Ground Current vs.  $V_{IN}$

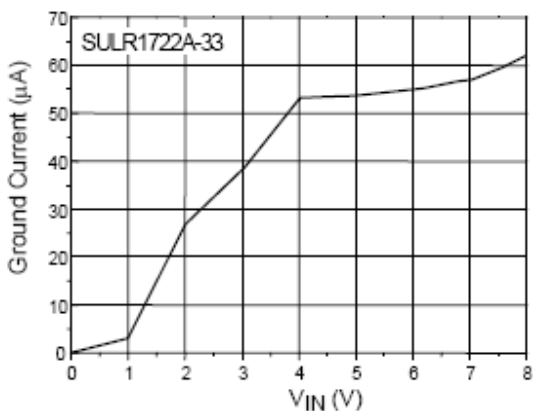


Fig. 11 Ground Current vs.  $V_{IN}$

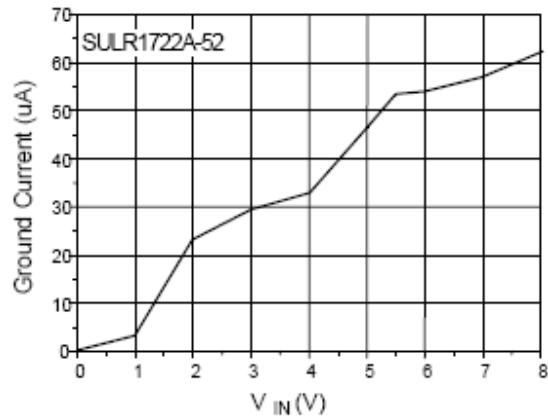


Fig. 12 Ground Current vs.  $V_{IN}$

Technical Data  
 Data Sheet N1580, Rev. -  
 Typical Performance Characteristics (Continued)

300mA Low Dropout Linear Regulator

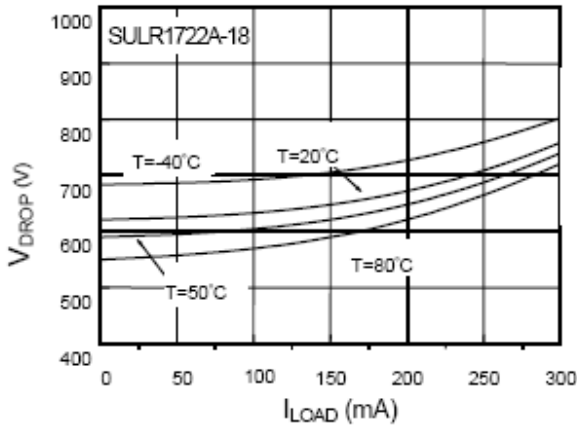


Fig. 13  $V_{DROP}$  vs.  $I_{LOAD}$

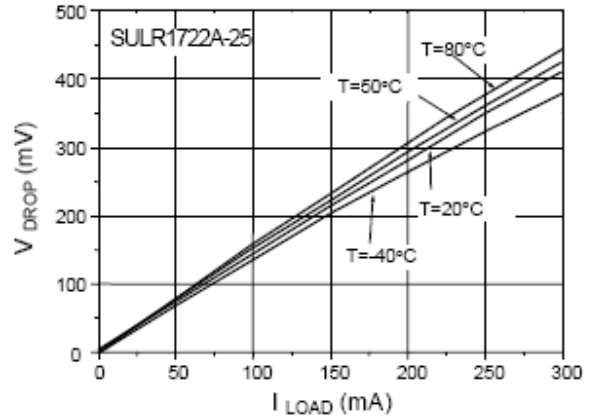


Fig. 14  $V_{DROP}$  vs.  $I_{LOAD}$

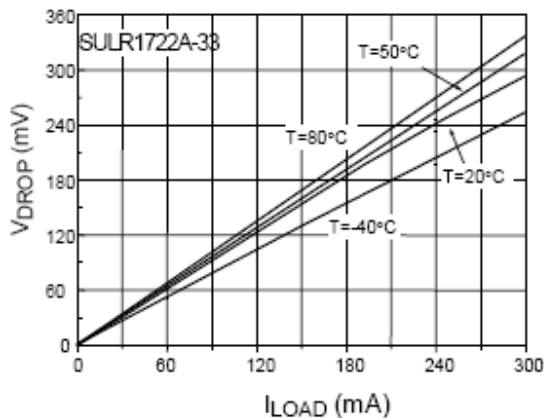


Fig. 15  $V_{DROP}$  vs.  $I_{LOAD}$

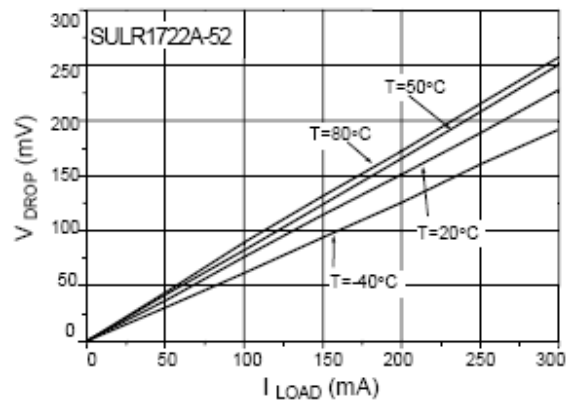


Fig. 16  $V_{DROP}$  vs.  $I_{LOAD}$

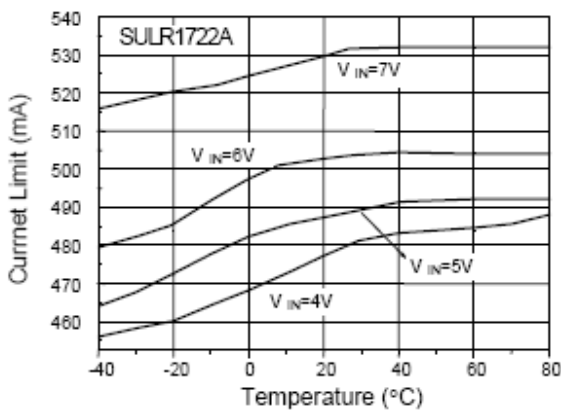
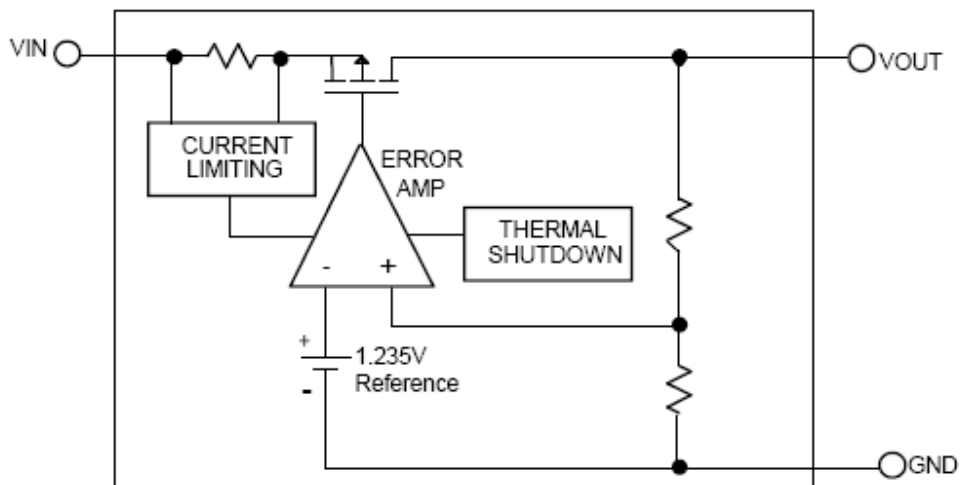


Fig. 17 Current Limit vs. Temperature

**Block Diagram**



**Pin Descriptions**

- VOUT PIN - Output pin.
- GND PIN - Power GND.
- VIN PIN - Power Supply Input.





## Application Information

### INPUT-OUTPUT CAPACITORS

Linear regulators require input and output capacitors to maintain stability. Input capacitor at 1 $\mu$ F with 1 $\mu$ F aluminum electrolytic output capacitor is recommended.

### POWER DISSIPATION

The SULR1722A obtains thermal-limiting circuitry, which is designed to protect the device against overload condition. For continuous load condition, maximum rating of junction temperature must not be exceeded. It is important to pay more attention in thermal resistance. It includes junction to case, junction to ambient. The maximum power dissipation of SULR1722A depends on the thermal resistance of its case and circuit board, the temperature difference between the die junction and ambient air, and the rate of airflow. The rate of temperature rise is greatly affected by the mounting pad configuration on the PCB, the board material, and the ambient temperature. When the IC mounting with good thermal conductivity is used, the junction temperature will be low even when large power dissipation applies.

The power dissipation across the device is  $P = I_{OUT} (V_{IN} - V_{OUT})$ .

The maximum power dissipation is:

$$P_{MAX} = \frac{(T_{J-max} - T_A)}{R_{\theta JA}}$$

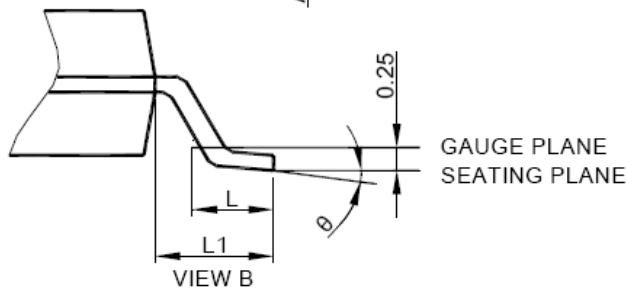
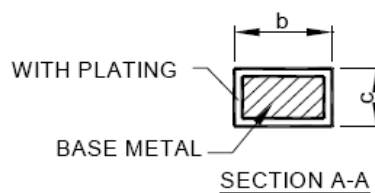
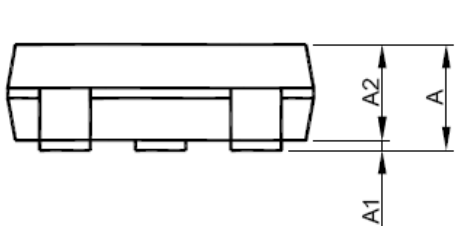
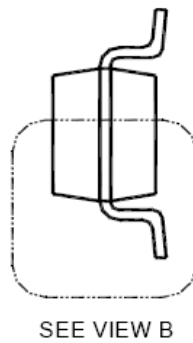
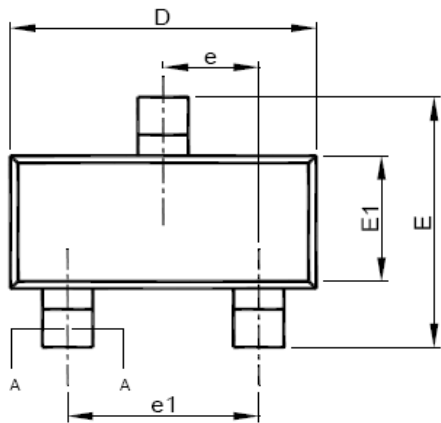
Where  $T_{J-max}$  is the maximum allowable junction temperature (125°C), and  $T_A$  is the ambient temperature suitable in application.

As a general rule, the lower temperature is, the better reliability of the device is. So the PCB mounting pad should provide maximum thermal conductivity to maintain low device temperature.

GND pin performs a dual function for providing an electrical connection to ground and channeling heat away. Therefore, connecting the GND pin to ground with a large pad or ground plane would increase the power dissipation and reduce the device temperature.

Physical Dimensions

SOT-23 (unit: mm)



SYMBOL	SOT-23	
	MILLIMETERS	
	MIN.	MAX.
A	0.95	1.45
A1	0.00	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°

Note: 1. Refer to JEDEC MO-178.

2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 10 mil per side.

3. Dimension "E1" does not include inter-lead flash or protrusions.

4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.



SULR1722A

Technical Data  
Data Sheet N1580, Rev. -

300mA Low Dropout Linear Regulator

**DISCLAIMER:**

- 1- The information given herein, including the specifications and dimensions, is subject to change without prior notice to improve product characteristics. Before ordering, purchasers are advised to contact the SMC - Sangdest Microelectronics (Nanjing) Co., Ltd sales department for the latest version of the datasheet(s).
- 2- In cases where extremely high reliability is required (such as use in nuclear power control, aerospace and aviation, traffic equipment, medical equipment, and safety equipment), safety should be ensured by using semiconductor devices that feature assured safety or by means of users' fail-safe precautions or other arrangement.
- 3- In no event shall SMC - Sangdest Microelectronics (Nanjing) Co., Ltd be liable for any damages that may result from an accident or any other cause during operation of the user's units according to the datasheet(s). SMC - Sangdest Microelectronics (Nanjing) Co., Ltd assumes no responsibility for any intellectual property claims or any other problems that may result from applications of information, products or circuits described in the datasheets.
- 4- In no event shall SMC - Sangdest Microelectronics (Nanjing) Co., Ltd be liable for any failure in a semiconductor device or any secondary damage resulting from use at a value exceeding the absolute maximum rating.
- 5- No license is granted by the datasheet(s) under any patents or other rights of any third party or SMC - Sangdest Microelectronics (Nanjing) Co., Ltd.
- 6- The datasheet(s) may not be reproduced or duplicated, in any form, in whole or part, without the expressed written permission of SMC - Sangdest Microelectronics (Nanjing) Co., Ltd.
- 7- The products (technologies) described in the datasheet(s) are not to be provided to any party whose purpose in their application will hinder maintenance of international peace and safety nor are they to be applied to that purpose by their direct purchasers or any third party. When exporting these products (technologies), the necessary procedures are to be taken in accordance with related laws and regulations..