1.8V 1A Positive Voltage Regulator

Features

- Output current in excess of 1A
- Output voltage accuracy +2.5%/-2%
- Quiescent current typically 480µA
- Internal short-circuit current-limit
- Internal over-temperature protection

Applications

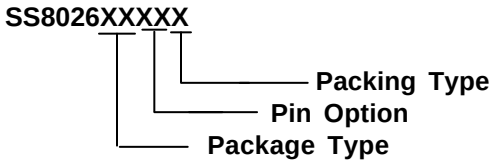
- PC motherboard
- ADSL/Cable Modem
- Set-Top Box
- LAN switch/Hub
- Broadband/Router

General Description

The SS8026 positive 1.8V voltage regulator features the ability to source 1A of output current. The typical quiescent current is 0.48mA.

Familiar regulator features such as over-temperature and over-current protection circuits are provided to prevent it from being damaged by abnormal operating conditions.

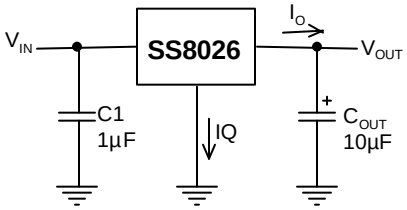
Ordering Information



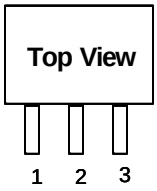
PACKAGE TYPE	PIN OPTION			PACKING
	1	2	3	
T2 : SOT-89	1 : V_{OUT}	GND	V_{IN}	TR : Tape & Reel
T3 : TO 220	2 : V_{OUT}	V_{IN}	GND	TB : Tubes
T4 : TO 252	3 : GND	V_{OUT}	V_{IN}	
T5 : TO-263	4 : GND	V_{IN}	V_{OUT}	
T6 : SOT-223	5 : V_{IN}	GND	V_{OUT}	
	6 : V_{IN}	V_{OUT}	GND	

Typical Application

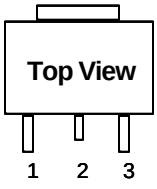
[Note 4] : Type of C_{OUT}



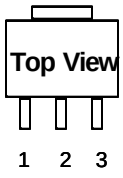
Pin Configuration



TO-220



TO-252 and TO-263



SOT-223 and SOT-89

Absolute Maximum Ratings (Note 1)

Input Voltage……7V
Power Dissipation Internally Limited…. (Note 2)
Maximum Junction Temperature…….150°C
Storage Temperature Rang….-65°C ≤ T_J ≤+150°C
Lead Temperature, Time for Wave Soldering
SOT 223 Package……260°C, 4s
Continuous Power Dissipation (T_A = +25°C)
SOT 89 (1)……0.5W
SOT 223(1)……0.8W
TO 252(1) 1.0W

Note (1): See Recommended Minimum Footprint

Operating Conditions (Note 1)

Input Voltage……2.7V~6.5V
Temperature Range……0°C ≤ T_J ≤125°C

Electrical Characteristics

V_{IN} =3.3V, I_O = 1A, C_{IN} = 1µF, C_{OUT} =10µF, All specifications apply for T_A = T_J = 25°C. [Note 3]

PARAMETER	CONDITIONS			MIN	TYP	MAX	UNITS
Output Voltage	10mA ≤ I_O ≤ 1A			1.764	1.800	1.845	V
Line Regulation	3V ≤ V_{IN} ≤ 6.5V, I_O = 10mA				3	30	mV
Load Regulation	10mA ≤ I_O ≤ 1A				30	50	mV
Output Impedance	200mA DC and 100mA AC, fo = 120Hz				80		mΩ
Quiescent Current	V_{IN} = 3.3V				480		µA
Ripple Rejection	f_i = 120Hz,V_{ripple} =1V_{P-P}, Io = 100mA				53		dB
Dropout Voltage	I_O = 0A				880		mV
	I_O = 100mA				895		
	I_O = 500mA				950		
	I_O = 1A				1160		
Output Current	Continuous Test, T_A = 25°C, T_J 150°C, V_{OUT} within ±2%	V_{IN} = 3V(SOT 223)	Minimum footprint (0.0625 square inch)		660		mA
		V_{IN} = 3.3V(SOT 223)	Mounted on 0.53 square inch pcb area		1		A
		V_{IN} = 3.3V(SOT 89)	Mounted on 0.16 square inch pcb area		0.5		A
Short Circuit Current					1.6		A
Over Temperature					150		°C

Note 1: Absolute Maximum Ratings are limits beyond which damage to the device may occur. Operating Conditions are conditions under which the device functions but the specifications might not be guaranteed. For guaranteed specifications and test conditions see the Electrical Characteristics.

Note 2: The maximum power dissipation is a function of the maximum junction temperature, T_{Jmax}, total thermal resistance, θ_{JA}, and ambient temperature T_A. The maximum allowable power dissipation at any ambient temperature is T_{jmax}-T_A / θ_{JA}. If this dissipation is exceeded, the die temperature will rise above 150°C and the IC will go into thermal shutdown. For the SS8026 in SOT 89 package, θ_{JA} is 250°C/W. For the SS8026 in SOT 223 package, θ_{JA} is 156°C/W; in TO 252 package, θ_{JA} is 125°C/W. (See recommend minimum footprint). The safe operation in SOT 89, SOT 223, TO 252 package, can be seen in "Typical Performance Characteristics" (Safe Operating Area).

Note3: Low duty pulse techniques are used during test to maintain junction temperatures as close to ambient as possible.

Note4: The output capacitor should be a tantalum or aluminum type.

Definitions

Dropout Voltage

The input/output voltage differential at which the regulator output no longer maintains regulation against further reductions in input voltage. Measured when the output drops 100mV below its nominal value. Dropout voltage is affected by junction temperature, load current and minimum input supply requirements.

Line Regulation

The change in output voltage for a change in input voltage. The measurement is made under conditions of low dissipation or by using pulse techniques such that the average chip temperature is not significantly affected.

Load Regulation

The change in output voltage for a change in load current at constant chip temperature. The measurement is made under conditions of low dissipation or by using pulse techniques such that the average chip temperature is not significantly affected.

Maximum Power Dissipation

The maximum total device dissipation under which the regulator will operate within specifications.

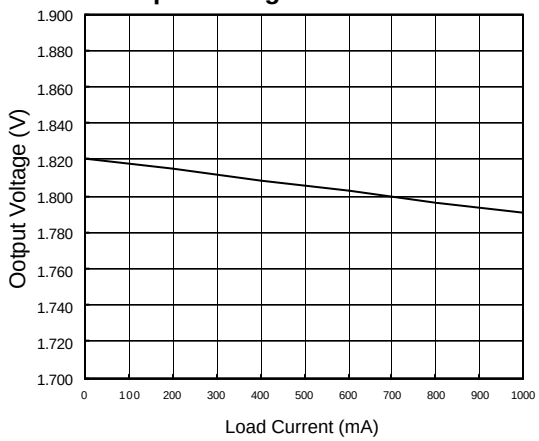
Quiescent Bias Current

Current which is used to operate the regulator chip and is not delivered to the load.

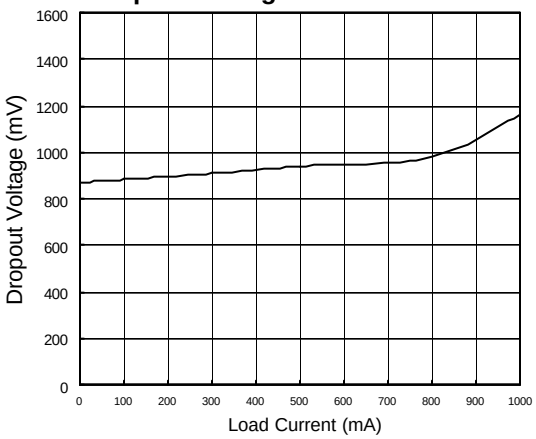
Typical Performance Characteristics

(V_{IN}= +3.3V, C_{IN}=1µF, C_{OUT}=10µF, T_A=25°C, unless otherwise noted.)

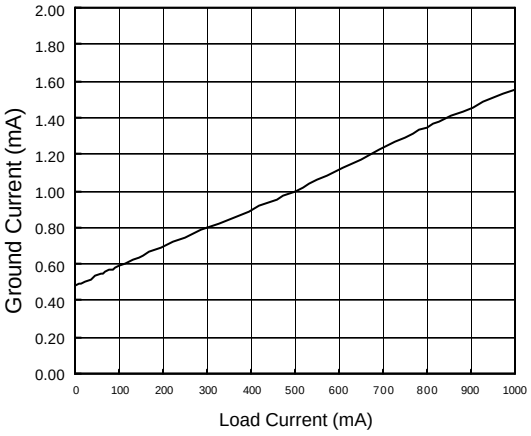
Output Voltage vs. Load Current



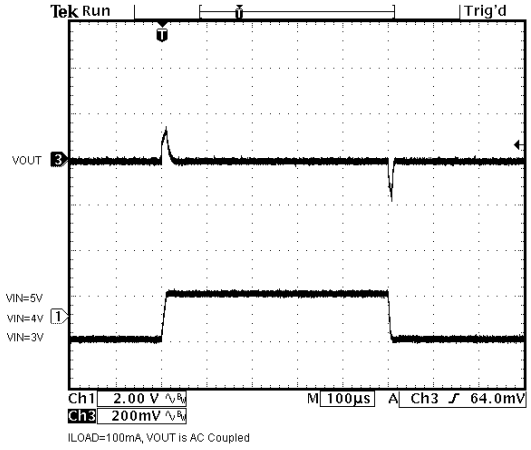
Dropout Voltage vs. Load Current



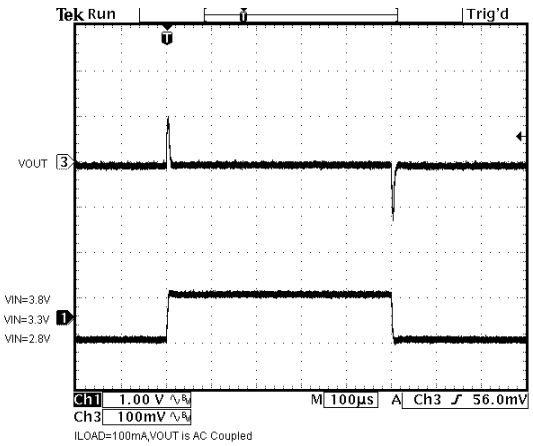
Ground Current vs. Load Current



Line Transient

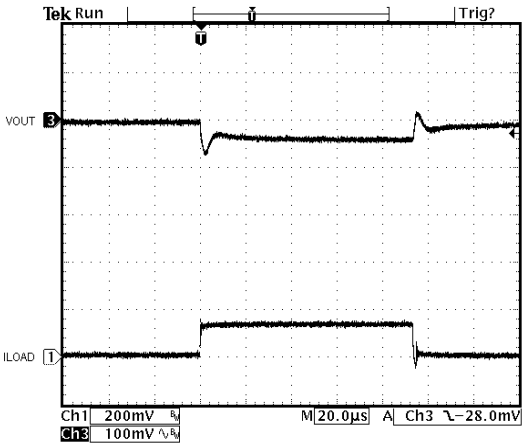


Line Transient



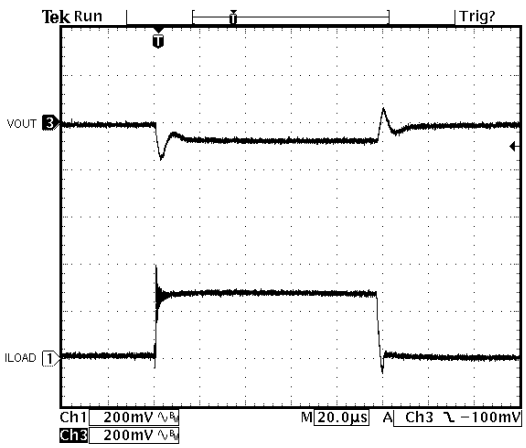
Typical Performance Characteristics (continued)

Load Transient



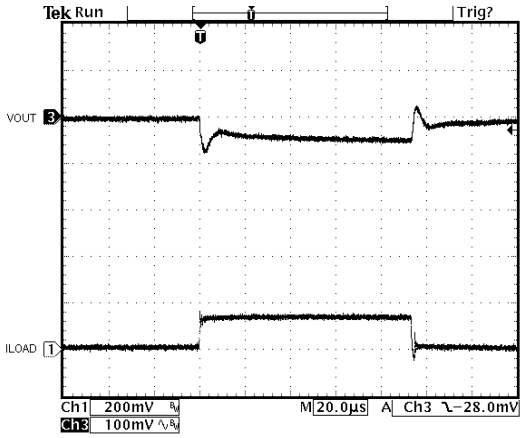
VIN=3.3V, ILOAD = 0mA to 500mA , VOUT is AC Coupled

Load Transient



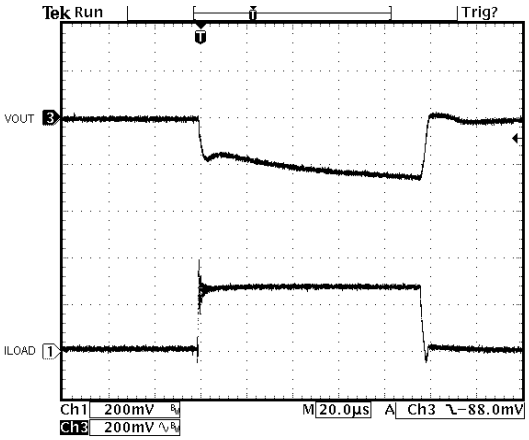
VIN=3.3V , ILOAD = 0mA to 1A , VOUT is AC Coupled

Load Transient



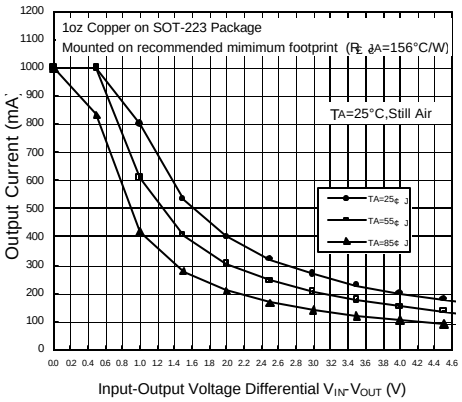
VIN=2.9V, ILOAD = 0mA to 500mA , VOUT is AC coupled

Load Transient



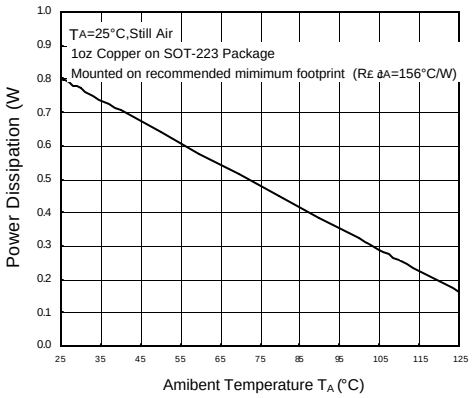
VIN=2.9V, ILOAD = 0mA to 1A , VOUT is AC Coupled

Safe Operating Area of SOT 223

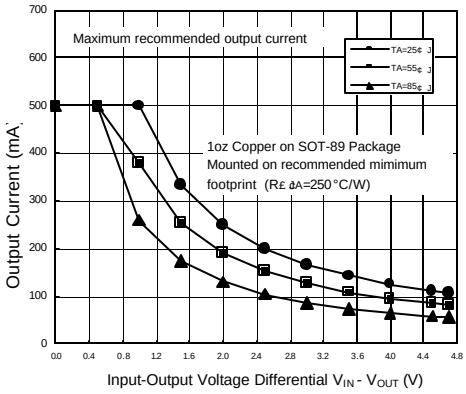


Note: $V_{IN(max)}$ <= 6.5V

Maximum Power Dissipation of SOT 223

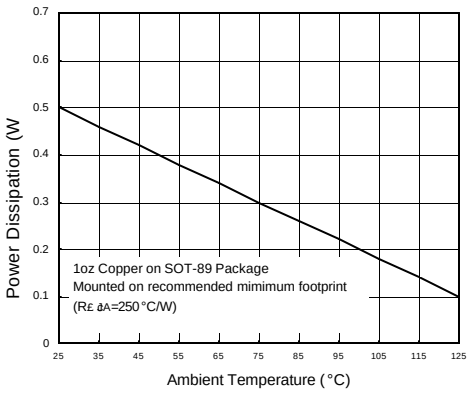


Safe Operating Area of SOT-89 [Power Dissipation Limit]

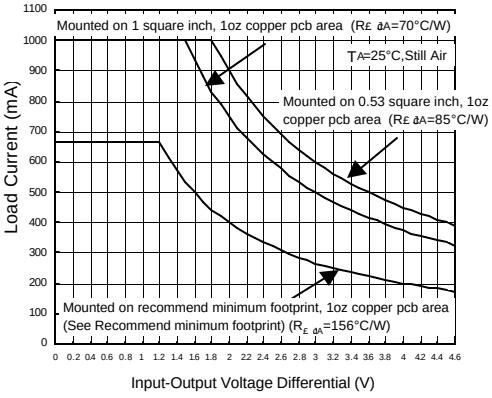


Note: $V_{IN(max)}$ <= 6.5V

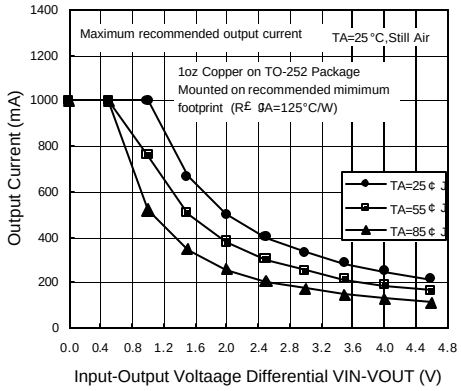
Maximum Power Dissipation of SOT-89



Safe Operating Area of SOT 223

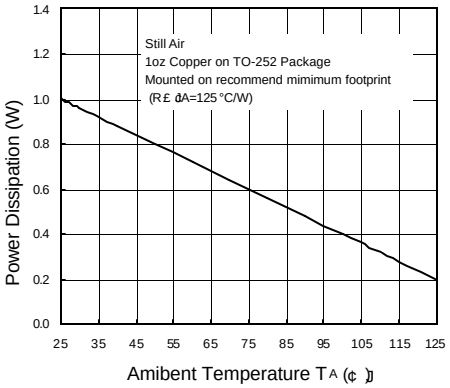


Safe Operating Area of TO 252

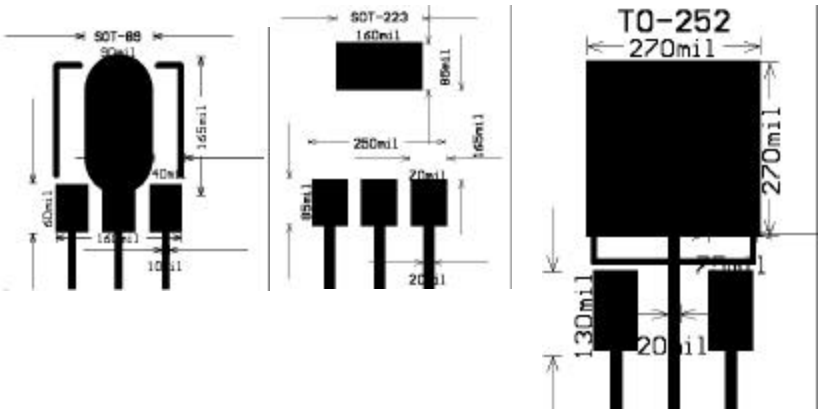


Note: $V_{IN(max)}$ <= 6.5V

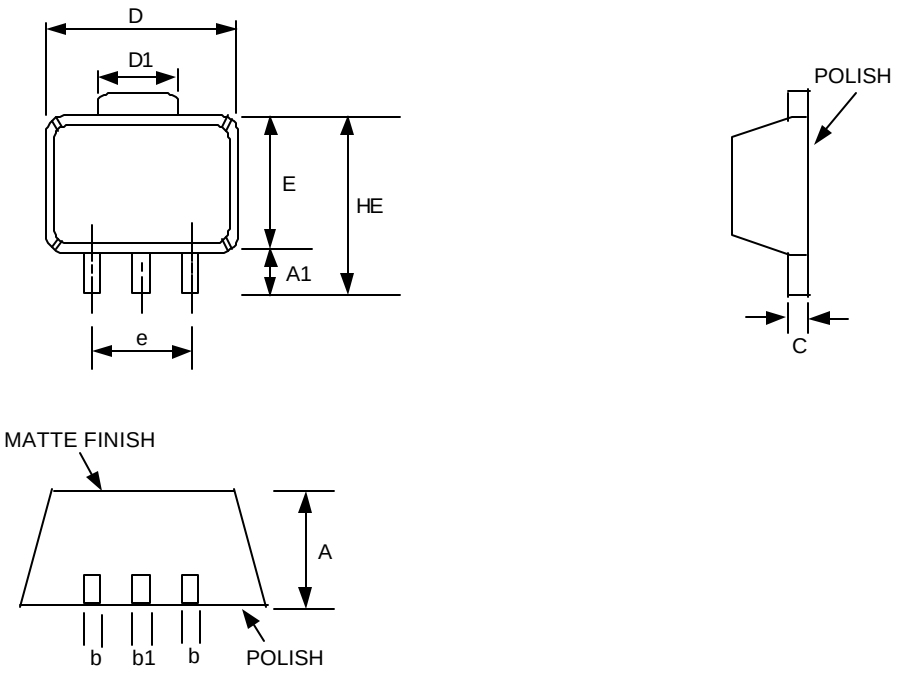
Maximum Power Dissipation of TO 252



Recommend Minimum Footprint

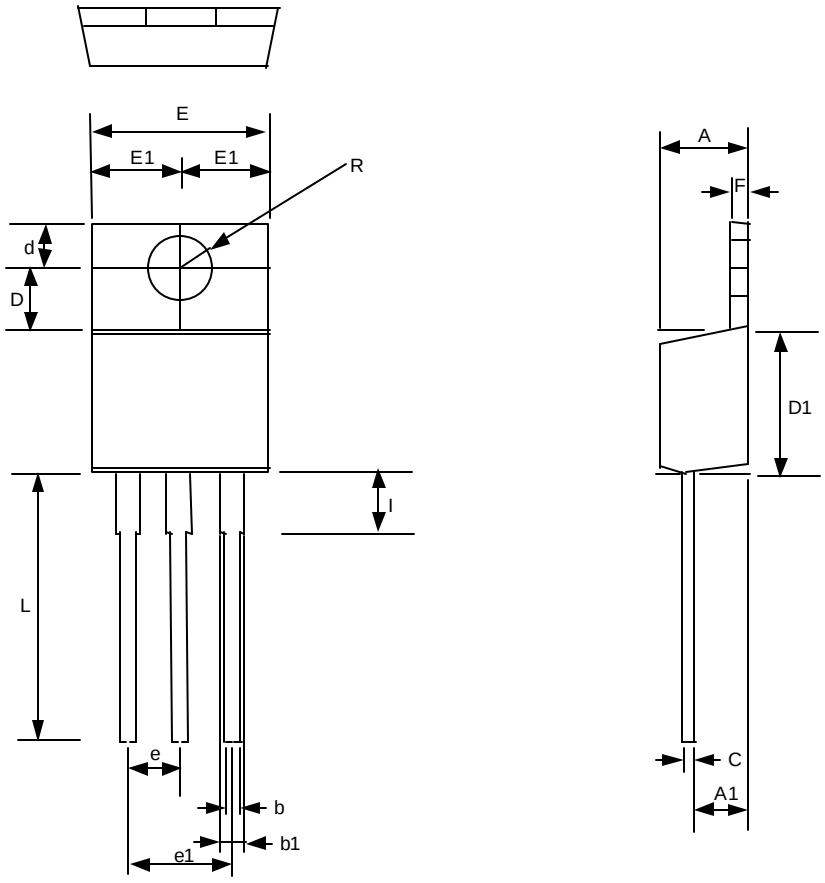


Package Information



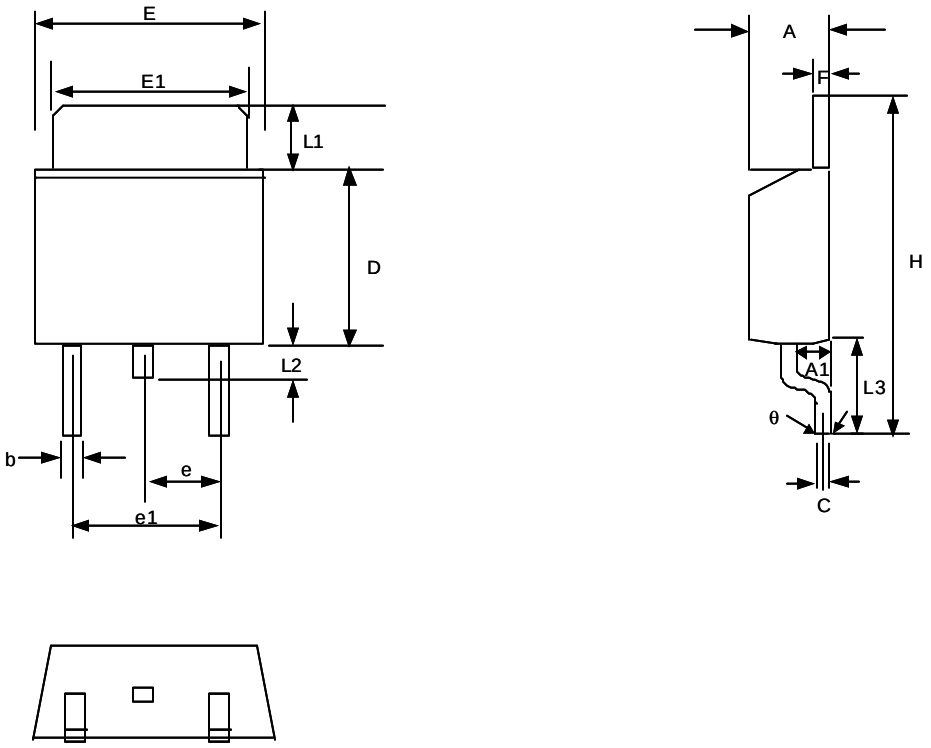
SOT-89 (T2) Package

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.40	1.50	1.60	0.055	0.059	0.063
A1	0.80	1.04	-----	0.031	0.041	-----
b	0.36	0.42	0.48	0.014	0.016	0.048
b1	0.41	0.47	0.53	0.016	0.018	0.020
C	038	0.40	0.43	0.014	0.015	0.017
D	4.40	4.50	4.60	0.173	0.177	0.181
D1	1.40	1.60	1.75	0.055	0.062	0.069
HE	-----	-----	4.25	-----	-----	0.167
E	2.40	2.50	2.60	0.094	0.098	0.102
e	2.90	3.00	3.10	0.114	0.118	0.122



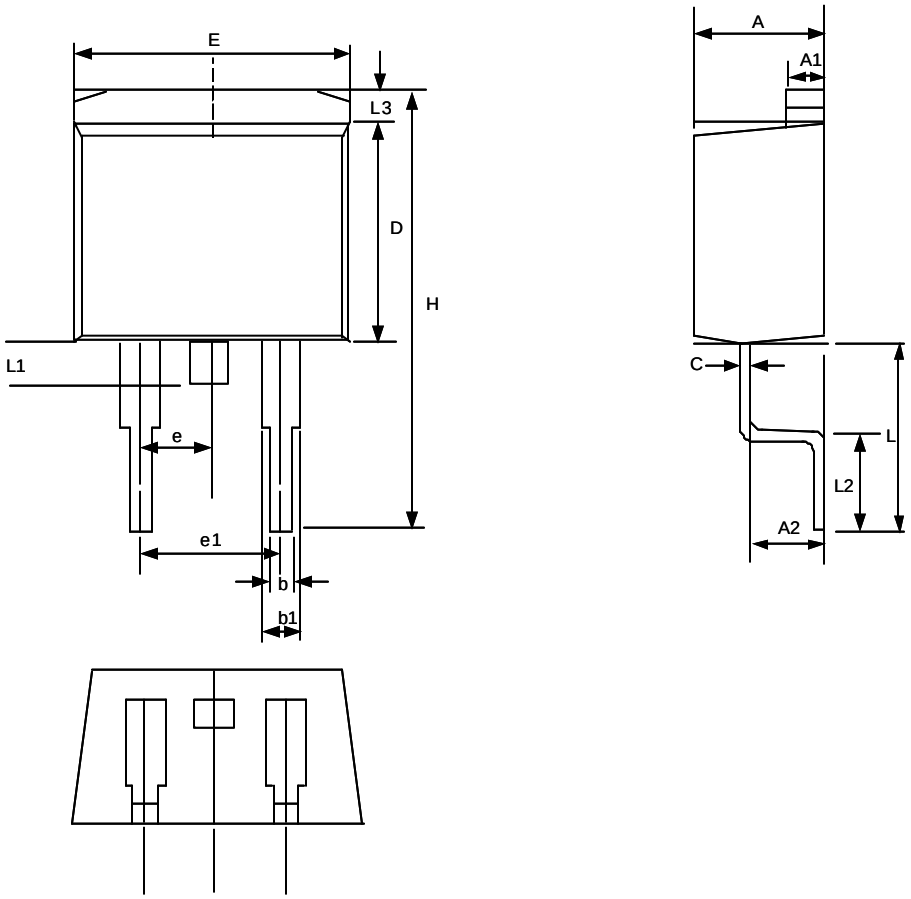
TO-220 (T3) Package

SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.318	4.826	0.170	0.190
A1	2.46	2.72	0.097	0.107
b	0.69	0.94	0.027	0.037
b1	1.143	1.397	0.045	0.055
C	0.304	0.460	0.012	0.018
D	3.429	3.683	0.135	0.145
D1	8.53	9.04	0.336	0.356
d	2.62	2.87	0.103	0.113
E	9.906	10.40	0.390	0.410
E1	2.84	5.13	0.112	0.202
e	2.29	2.79	0.090	0.110
e1	4.83	5.33	0.190	0.210
F	1.143	1.397	0.045	0.055
I	3.454	3.962	0.136	0.156
L	13.589	14.351	0.535	0.565



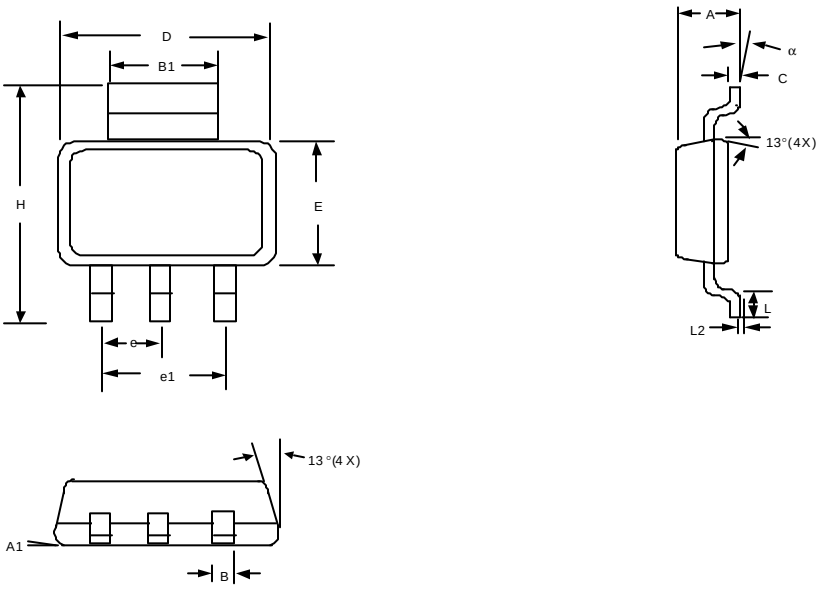
TO-252 (T4) Package

SYMBOL	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.19	2.38	0.086	0.094
A1	0.89	1.27	0.035	0.050
b	0.64	0.89	0.025	0.035
C	0.46	0.58	0.018	0.023
D	5.97	6.22	0.235	0.245
E	6.35	6.73	0.250	0.265
E1	5.21	5.46	0.205	0.215
e	2.26BSC		0.09BSC	
e1	3.96	5.18	0.156	0.204
F	0.46	0.58	0.018	0.023
L1	0.89	2.03	0.035	0.080
L2	0.64	1.02	0.025	0.040
L3	2.40	2.80	0.095	0.110
H	9.40	10.40	0.370	0.410
θ	0°	4°	0°	4°



TO-263 (T5) Package

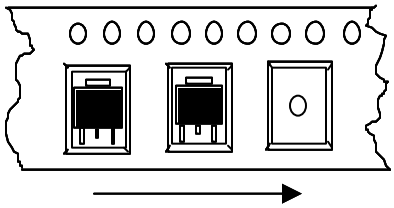
SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.30	4.70	0.169	0.185
A1	1.22	1.32	0.048	0.055
A2	2.45	2.69	0.104	0.106
b	0.69	0.94	0.027	0.037
b1	1.22	1.40	0.048	0.055
C	0.36	0.56	0.014	0.022
D	8.64	9.652	0.340	0.380
E	9.70	10.54	0.382	0.415
e	2.29	2.79	0.090	0.110
e1	4.83	5.33	0.190	0.210
H	14.60	15.78	0.575	0.625
L	4.70	5.84	0.185	0.230
L1	1.20	1.778	0.047	0.070
L2	2.24	2.84	0.088	0.111
L3	1.40MAX		0.055MAX	



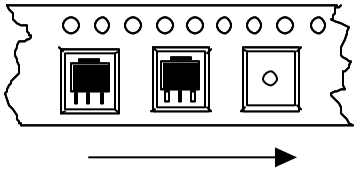
SOT-223 (T6) Package

SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.55	1.80	0.061	0.071
A1	0.02	0.12	0.0008	0.0047
B	0.60	0.80	0.024	0.031
B1	2.90	3.10	0.114	0.122
C	0.24	0.32	0.009	0.013
D	6.30	6.70	0.248	0.264
E	3.30	3.70	0.130	0.146
e	2.30 BSC		0.090 BSC	
e1	4.60 BSC		0.181 BSC	
H	6.70	7.30	0.264	0.287
L	0.90 MIN		0.036 MIN	
L2	0.06 BSC		0.0024 BSC	
a	0º	10º	0º	10º

Package Orientation on tape



Feed Direction
TO-252, TO-263 Package Orientation



Feed Direction
SOT 89, SOT-223 Package Orientation