

# GS1084L

## 5A Low Dropout Voltage Regulator

### Product Description

The GS1084L is a low drop voltage regulator able to provide up to 5A output current. The dropout voltage of the device is guaranteed at a maximum 1.5V at the maximum output current, decreasing at lower loads.

The GS1084L is pin compatible with older 3-terminal adjustable regulators, but has better performances in term of drop and output tolerance.

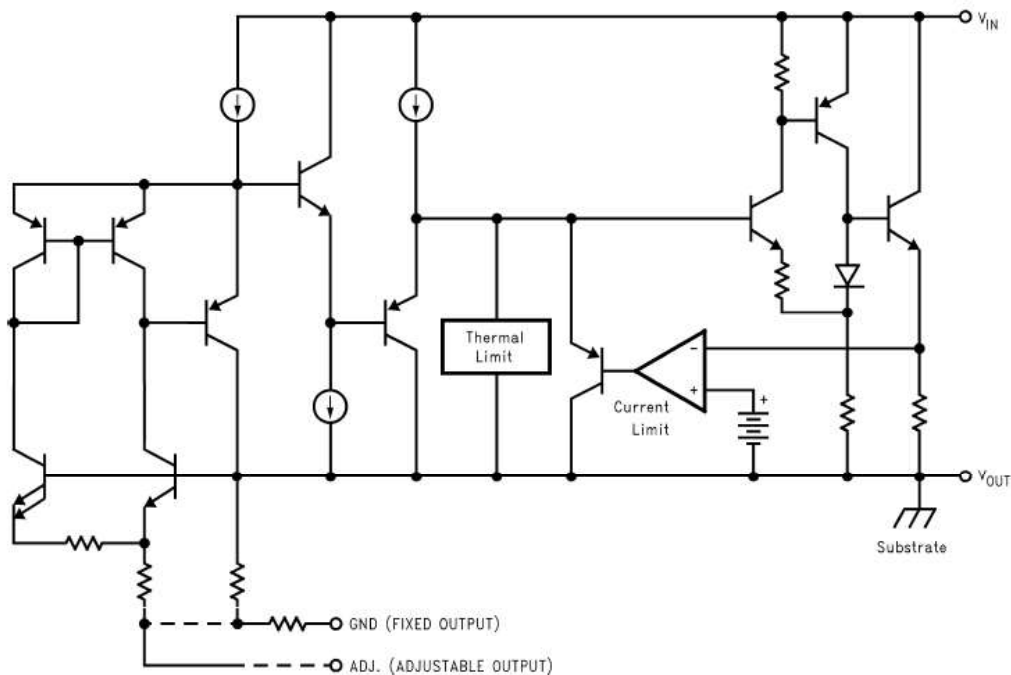
### Features

- Three Terminal Adjustable or Fixed Output Voltages 1.5V, 1.8V, 2.5V, 3.3V and 5V
- Guaranteed Output Current up to 5A
- Typical Dropout 1.3V (at 5A)
- Output Tolerance:  $\pm 2\%$  at 25°C
- Wide Operating Temperature Range: -40°C to 125°C
- Package Available: TO-263, TO-252, and SOT-223

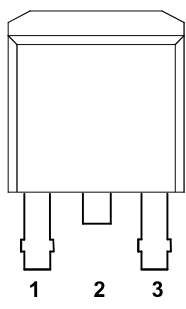
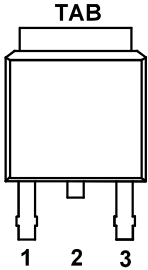
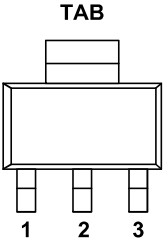
### Applications

- Post Regulators for Switching Supply
- Battery-Powered Circuitry
- Low Voltage Logic Supplies
- High efficiency linear regulators
- Adjustable power supply

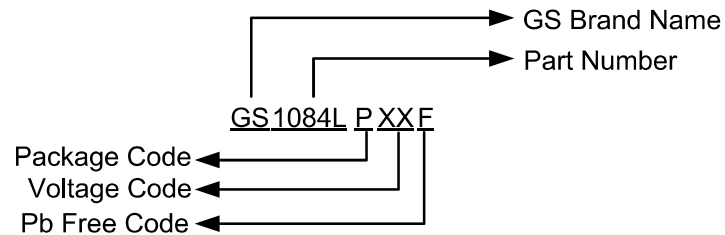
### Block Diagram



## Packages & Pin Assignments

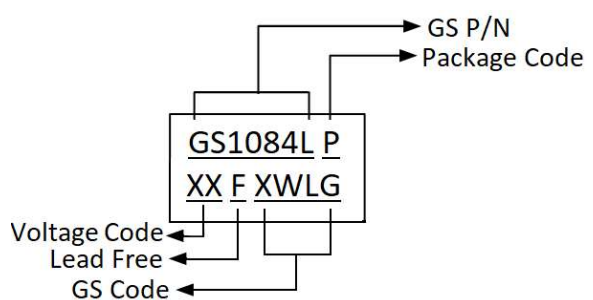
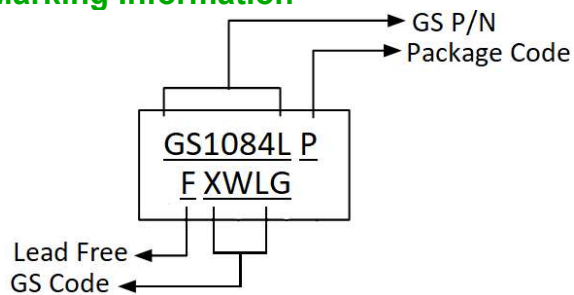
GS1084LM (TO-263)		GS1084LD (TO-252)		GS1084LX (SOT-223)	
					
1	GND/ADJ	1	GND/ADJ	1	GND/ADJ
2	V <sub>OUT</sub>	2	V <sub>OUT</sub>	2	V <sub>OUT</sub>
3	V <sub>IN</sub>	3	V <sub>IN</sub>	3	V <sub>IN</sub>

## Ordering Information



TO-263	TO-252	SOT-223	Output
GS1084LMF	GS1084LDF	GS1084LXF	ADJ
GS1084LM15F	GS1084LD15F	GS1084LX15F	1.5V
GS1084LM18F	GS1084LD18F	GS1084LX18F	1.8V
GS1084LM25F	GS1084LD25F	GS1084LX25F	2.5V
GS1084LM33F	GS1084LD33F	GS1084LX33F	3.3V
GS1084LM50F	GS1084LD50F	GS1084LX50F	5.0V

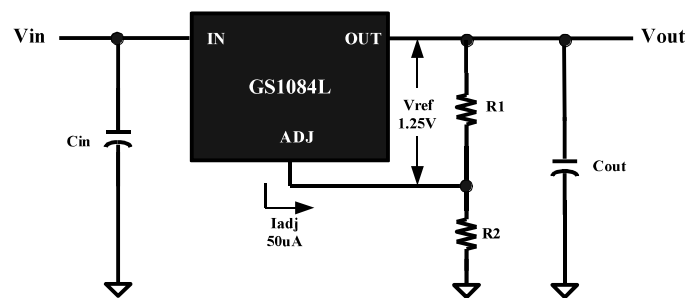
## Marking Information



## Absolute Maximum Ratings

Symbol	Parameter	Maximum Ratings	Units	
$V_{IN}$	Input Voltage	15	V	
$\theta_{JC}$	Thermal Resistance (Junction to Case)	TO-263	3	$^{\circ}\text{C}/\text{W}$
		TO-252	5	
		SOT-223	8	
$\theta_{JA}$	Thermal Resistance (Junction to Ambient)	TO-263	62.5	$^{\circ}\text{C}/\text{W}$
		TO-252	104	
		SOT-223	138	
$P_D$	Internal Power Dissipation	TO-263	2	W
		TO-252	1.2	
		SOT-223	0.9	
$T_J$	Operating Junction Temperature	-40 to 125	$^{\circ}\text{C}$	
$T_{STG}$	Storage Temperature Range	-65 to 150	$^{\circ}\text{C}$	
$T_{LEAD}$	Lead Temperature ( Soldering 10sec)	300	$^{\circ}\text{C}$	

## Typical Applications



$$V_{OUT} = V_{REF} (1 + R2/R1) + I_{ADJ}R2$$

Figure1. Adjustable Voltage Regulator

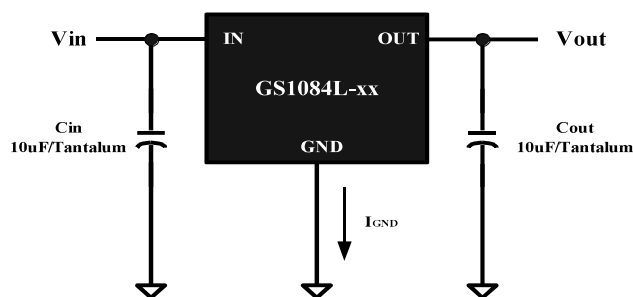


Figure2. Fixed Voltage Regulator

## Electrical Characteristics

$I_{OUT} = 0 \text{ mA}$ , and  $T_J = +25^\circ\text{C}$ , unless otherwise noted

Parameter	Device	Conditions	Min	Typ	Max	Units
Reference Voltage <sub>(1)</sub>	GS1084L	$V_{in}=2.75\text{V}$ , $I_o=10\text{mA}$	1.238	1.250	1.263	V
		$V_{in}=2.7 \text{ to } 7\text{V}$ , $I_o=10\text{mA to } 5\text{A}$	1.225	1.250	1.275	V
Output Voltage	GS1084L- 1.5	$V_{in}=4.0\text{V}$	1.485	1.500	1.515	V
		$V_{in}=3.0\text{V}$ , $I_o= 0\text{mA to } 5\text{A}$	1.470	1.500	1.530	V
	GS1084L- 1.8	$V_{in}=4.3\text{V}$	1.782	1.800	1.818	V
		$V_{in}=3.3\text{V}$ , $I_o= 0\text{mA to } 5\text{A}$	1.764	1.800	1.836	V
	GS1084L- 2.5	$V_{in}=5.0\text{V}$	2.475	2.500	2.525	V
$V_{in}=4.0\text{V}$ , $I_o= 0\text{mA to } 5\text{A}$		2.450	2.500	2.550	V	
GS1084L- 3.3	$V_{in}=5.8\text{V}$	3.267	3.300	3.333	V	
	$V_{in}=4.8\text{V}$ , $I_o= 0\text{mA to } 5\text{A}$	3.234	3.300	3.366	V	
GS1084L- 5.0	$V_{in}=7.5\text{V}$	4.950	5.000	5.050	V	
	$V_{in}=6.5\text{V}$ , $I_o= 0\text{mA to } 5\text{A}$	4.900	5.000	5.100	V	
Line Regulation <sub>(1)</sub>	All	$I_o = 10\text{mA}$ $(V_o+1.5\text{V}) \leq V_{in} \leq 7\text{V}$		0.04	0.2	%
Load Regulation <sub>(1)</sub>	All	$V_{in}=V_o+2.5\text{V}$ , $I_o=0\text{mA to } 5\text{A}$		0.08	0.4	%
Dropout Voltage ( $V_{IN} - V_{OUT}$ ) <sub>(1),(3)</sub>	All	$\Delta V_{OUT}$ , $\Delta V_{REF} = 1\%$ , $I_{OUT} = 5\text{A}$		1.1	1.3	V
Current Limit <sub>(1)</sub>	All			5.5		A
Quiescent Current	All	$V_{IN} = 5\text{V}$		5	10	mA
Ripple Rejection <sub>(1)</sub>	All	$f = 120\text{Hz}$ , $C_{OUT} = 25\mu\text{F}$ Tantalum, $I_{OUT} = 3\text{A}$ , $(V_{IN}-V_{OUT}) = 3\text{V}$ , $C_{ADJ} = 25\mu\text{F}$	60	75		dB
Adjust Pin Current <sub>(1)</sub>	GS1084L			50	120	$\mu\text{A}$
Temperature Stability				0.5		%
Long Term Stability		$T_A = 12.5^\circ\text{C}$ , 1000Hrs		0.03	1	%

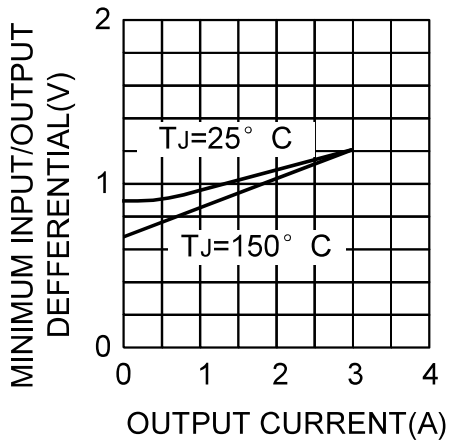
**NOTE 1:** For GS1084L(adjustable)  $V_{ADJ}=0\text{V}$

**NOTE 2:** For the adjustable device the minimum load current is the minimum current required to maintain regulation. Normally the current in the resistor divider used to set the output voltage is selected to meet the minimum load current requirement.

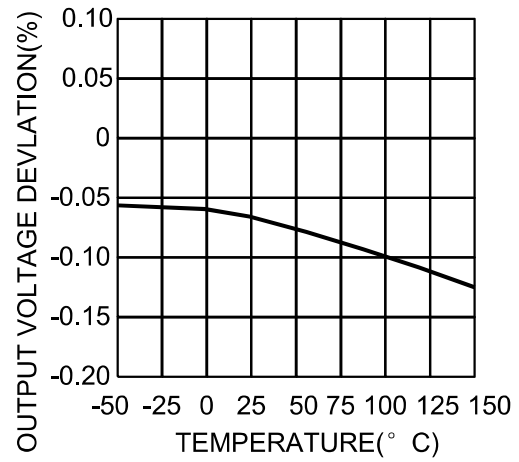
**NOTE 3 :** The specification represent the minimum input/output voltage required to maintain 1% regulation.

## Typical Performance Characteristics

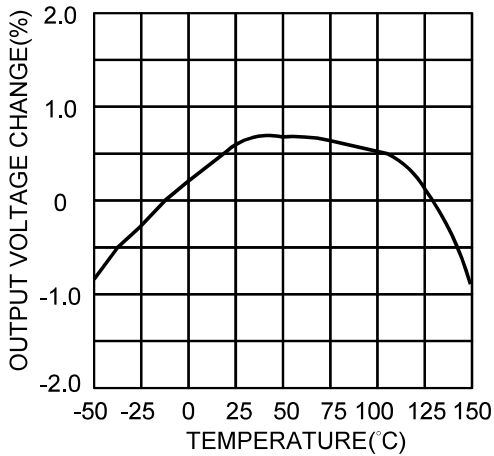
### Dropout Voltage



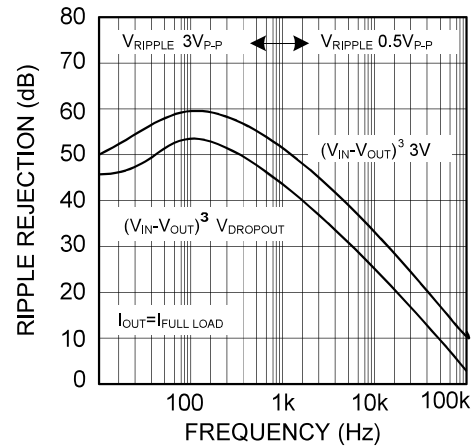
### Load Regulation



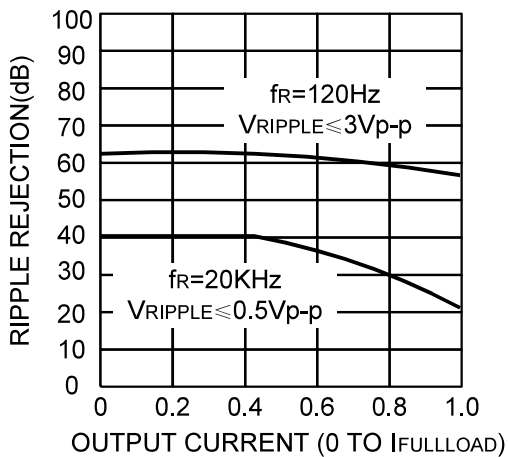
### Temperature Stability



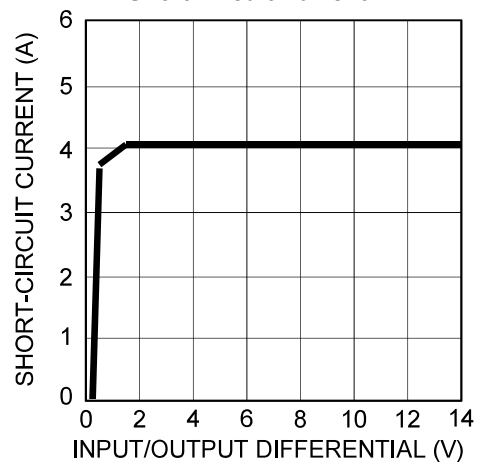
### Ripple Rejection



### Ripple Rejection vs. Current

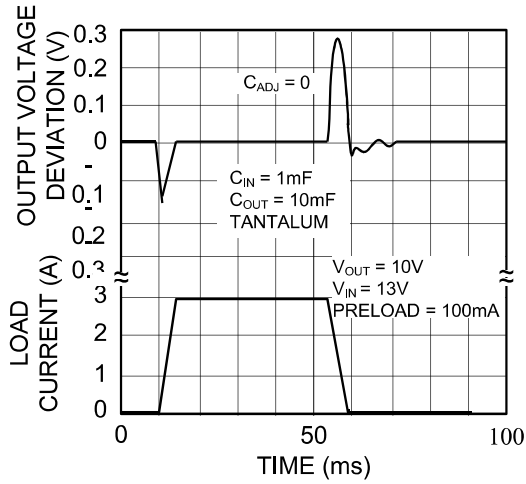


### Short-Circuit Current

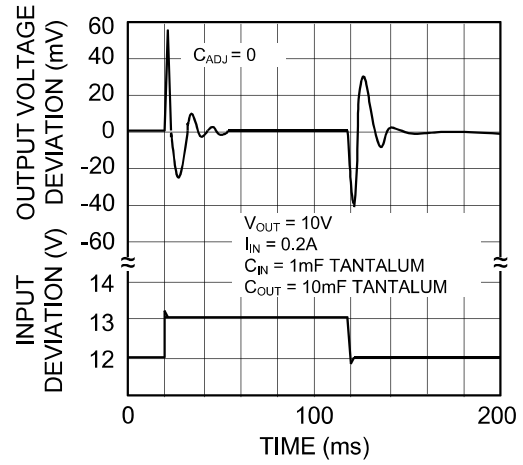


## Typical Performance Characteristics (Continue)

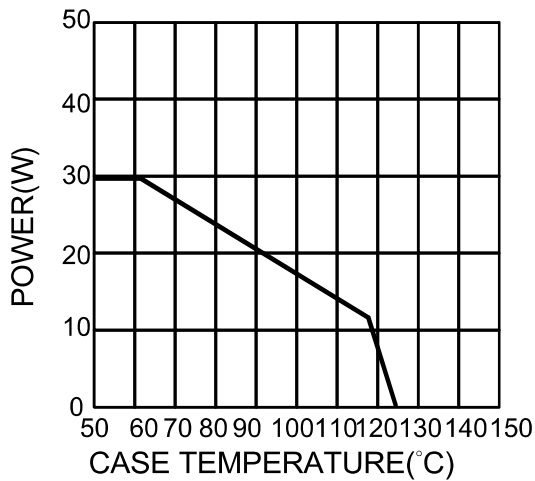
### Load Transient Response



### Line Transient Response

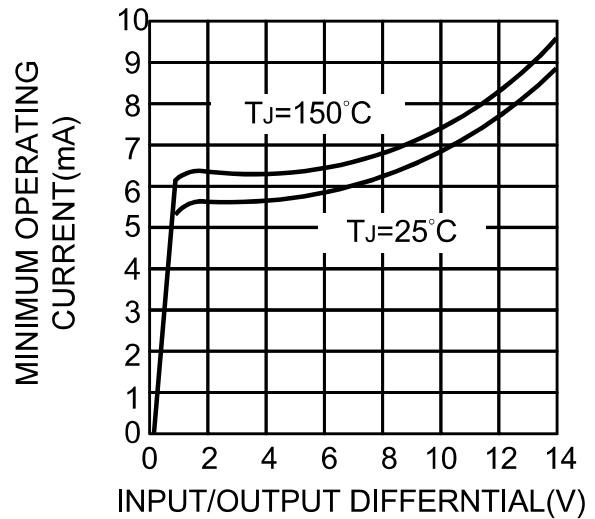


### Line Transient Response

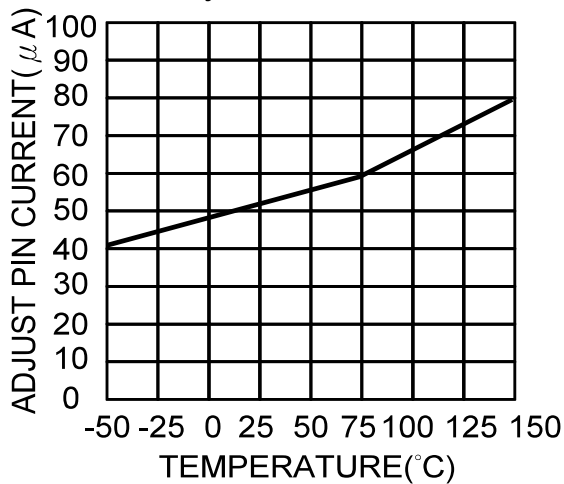


\*AS LIMITED BY MAXIMUM JUNCTION TEMPERATURE

### Minimum Operating Current

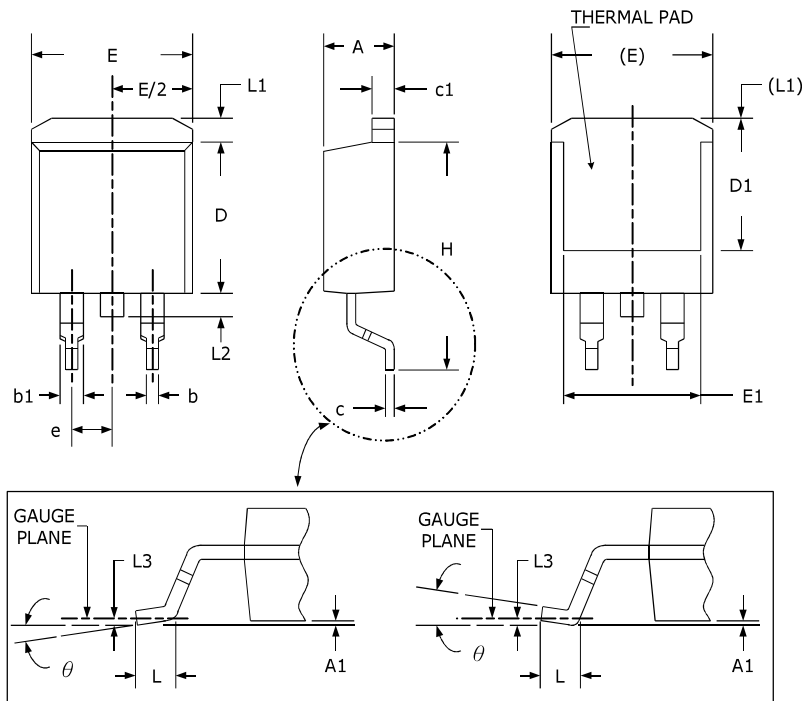


### Adjust Pin Current



## Package Dimension

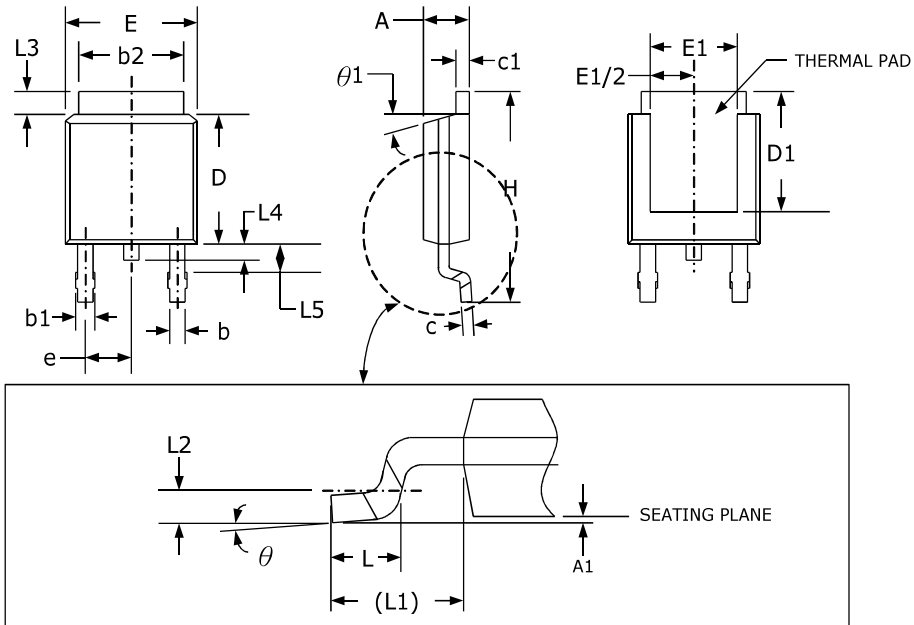
### TO-263 PLASTIC PACKAGE



### Dimensions

SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	4.06	4.83	.160	.190
A1	0	0.25	.000	.010
b	0.51	0.99	.020	.039
b1	1.14	1.78	.045	.070
c	0.38	0.74	.015	.029
c1	1.14	1.65	.045	.065
D	8.38	9.65	.330	.380
D1	6.86	-	.270	-
E	9.65	10.67	.380	.420
E1	6.22	-	.245	-
e	2.54 (TYP)		.100 (TYP)	
H	14.61	15.88	.575	.625
L	1.78	2.79	.070	.110
L1	-	1.68	-	.066
L2	-	1.78	-	.070
L3	0.25 (TYP)		.010 (TYP)	
θ	0°	8°	0°	8°

## TO-252 PLASTIC PACKAGE

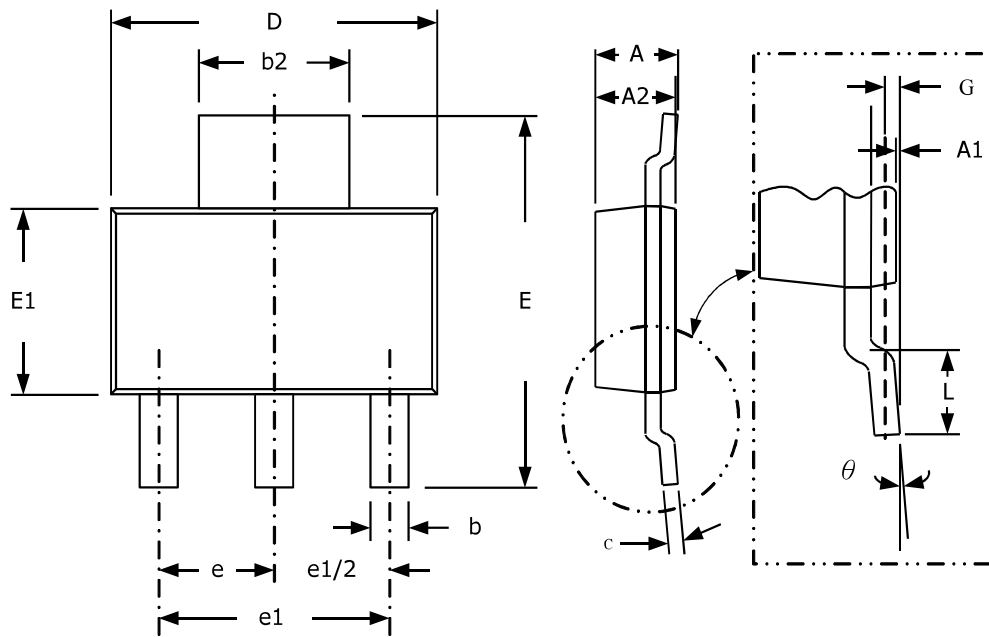


### Dimensions

SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
<b>A</b>	2.18	2.39	.086	.094
<b>A1</b>	-	0.13	-	.005
<b>b</b>	0.64	0.89	.025	.035
<b>b1</b>	0.76	1.14	.030	.045
<b>b2</b>	4.95	5.46	.195	.215
<b>C</b>	0.46	0.61	.018	.024
<b>C1</b>	0.46	0.89	.018	.035
<b>D</b>	5.97	6.22	.235	.245
<b>D1</b>	5.21	-	.205	-
<b>E</b>	6.35	6.73	.250	.265
<b>E1</b>	4.32	-	.170	-
<b>e</b>	2.29 (TYP)		.090 (TYP)	
<b>H</b>	9.40	10.41	.370	.410
<b>L</b>	1.40	1.78	.055	.070
<b>L1</b>	2.74 (TYP)		.108 (TYP)	
<b>L2</b>	0.51 (TYP)		.020 (TYP)	
<b>L3</b>	0.89	1.27	.035	.050
<b>L4</b>	-	1.02	-	.040
<b>L5</b>	1.14	1.52	.045	.060
<b>θ</b>	0°	10°	0°	10°
<b>θ1</b>	0°	15°	0°	15°



## SOT-223-3L PLASTIC PACKAGE







### Dimensions



SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
<b>A</b>	-	1.80	-	.071
<b>A1</b>	0.02	0.10	.001	.004
<b>A2</b>	1.55	1.65	.061	.065
<b>b</b>	0.66	0.84	.026	.033
<b>b2</b>	2.90	3.10	.114	.122
<b>c</b>	0.23	0.33	.009	.013
<b>D</b>	6.30	6.70	.248	.264
<b>E</b>	6.70	7.30	.264	.288
<b>E1</b>	3.30	3.70	.130	.146
<b>e</b>	2.30 (TYP)		.091 (TYP)	
<b>e1</b>	4.60 (TYP)		.181 (TYP)	
<b>L</b>	0.90	-	.035	-
<b>G</b>	0.25 (TYP)		.010 (TYP)	
<b><math>\theta</math></b>	0°	8°	0°	8°

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