

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.

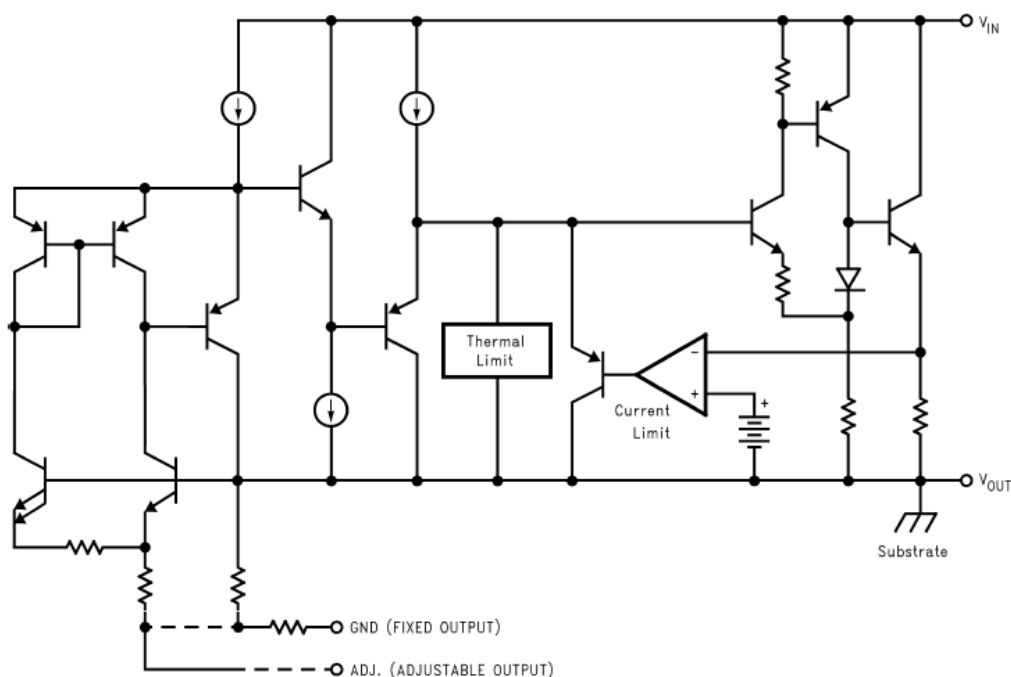
Features

- 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-220, TO-263, TO-252, and SOT-223

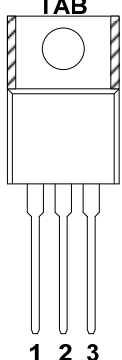
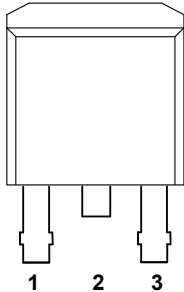
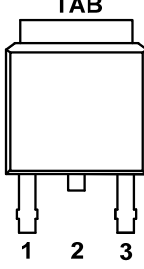
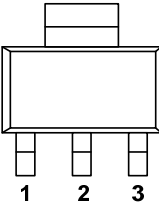
Applications

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

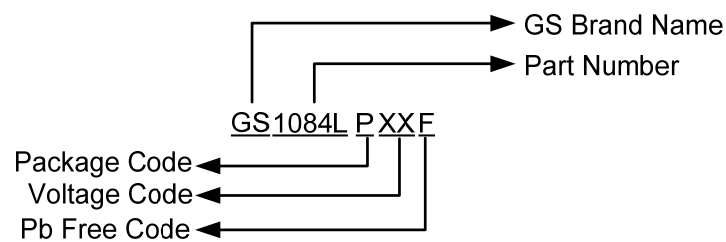
Block Diagram



Packages & Pin Assignments

GS1084LT (TO-220)	GS1084LM (TO-263)	GS1084LD (TO-252)	GS1084LX (SOT-223)
			
1 GND/ADJ	1 GND/ADJ	1 GND/ADJ	1 GND/ADJ
2 V _{OUT}	2 V _{OUT}	2 V _{OUT}	2 V _{OUT}
3 V _{IN}	3 V _{IN}	3 V _{IN}	3 V _{IN}

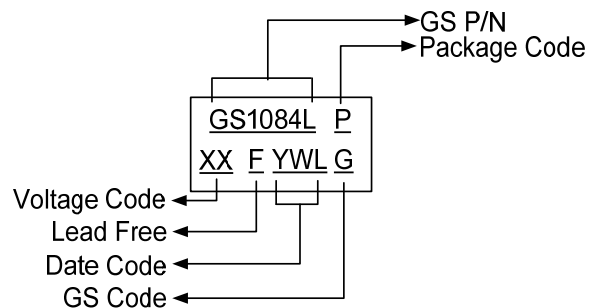
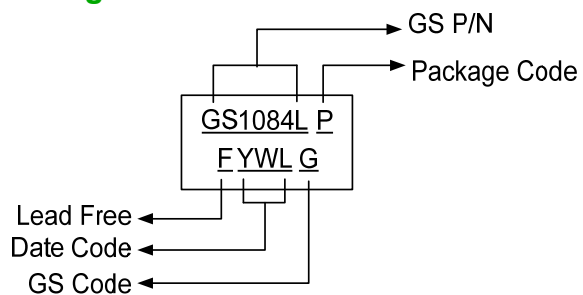
Ordering Information



TO-220	TO-263	TO-252	SOT-223	Output
GS1084LTF	GS1084LMF	GS1084LDF	GS1084LXF	ADJ
GS1084LT15F	GS1084LM15F	GS1084LD15F	GS1084LX15F	1.5V
GS1084LT18F	GS1084LM18F	GS1084LD18F	GS1084LX18F	1.8V
GS1084LT25F	GS1084LM25F	GS1084LD25F	GS1084LX25F	2.5V
GS1084LT33F	GS1084LM33F	GS1084LD33F	GS1084LX33F	3.3V
GS1084LT50F	GS1084LM50F	GS1084LD50F	GS1084LX50F	5.0V

Adjustable Version does not need Voltage Code.

Marking Information

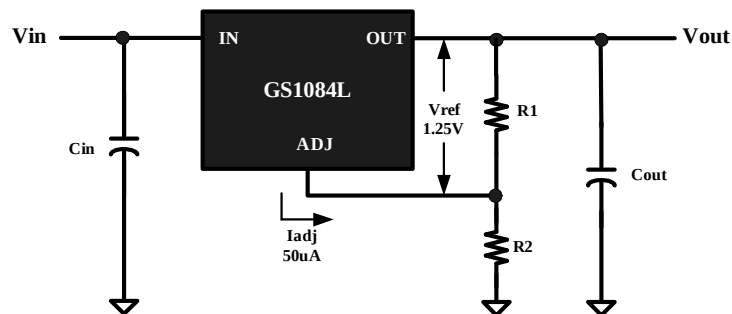


Absolute Maximum Ratings

Symbol	Parameter	Maximum Ratings		Units
V_{IN}	Input Voltage	15		V
θ_{JC}	Thermal Resistance (Junction to Case)	TO-220	3	$^{\circ}\text{C/W}$
		TO-263	3	
		TO-252	5	
		SOT-223	8	
θ_{JA}	Thermal Resistance (Junction to Ambient)	TO-220	62.5	$^{\circ}\text{C/W}$
		TO-263	62.5	
		TO-252	104	
		SOT-223	138	
P_D	Internal Power Dissipation	TO-220	2	W
		TO-263	2	
		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		$^{\circ}\text{C}$

Caution: Stress above the listed absolute maximum rating may cause permanent damage to the device

Typical Applications



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

Figure1. Adjustable Voltage Regulator

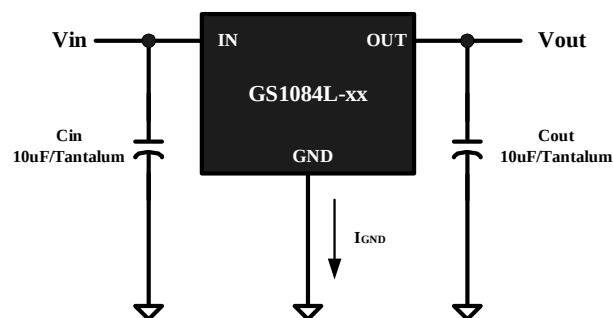


Figure2. Fixed Voltage Regulator

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

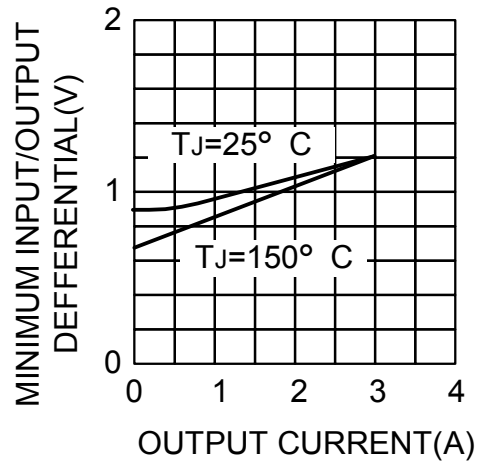
NOTE 1: For GS1084L(adjustable) $V_{ADJ}=0\text{V}$

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.

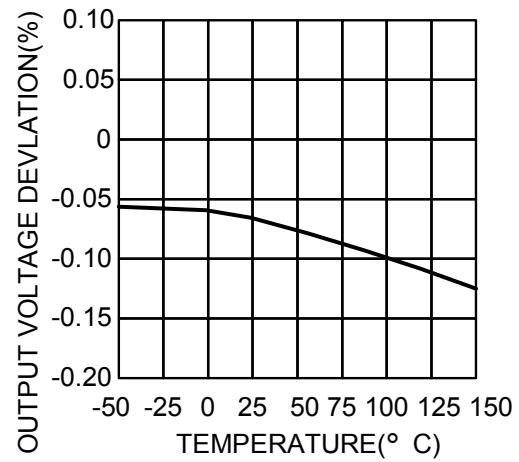
NOTE 3 : The specification represent the minimum input/output voltage required to maintain 1% regulation.

Typical Performance Characteristics

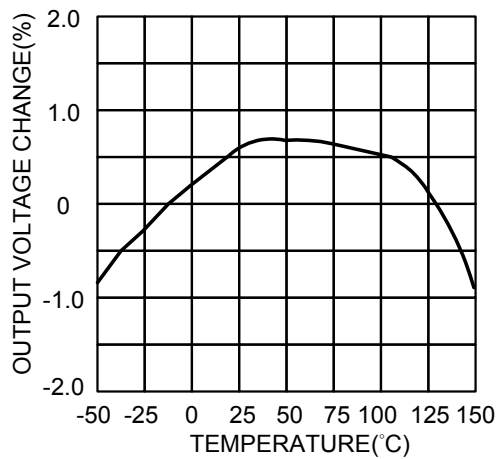
Dropt Voltage



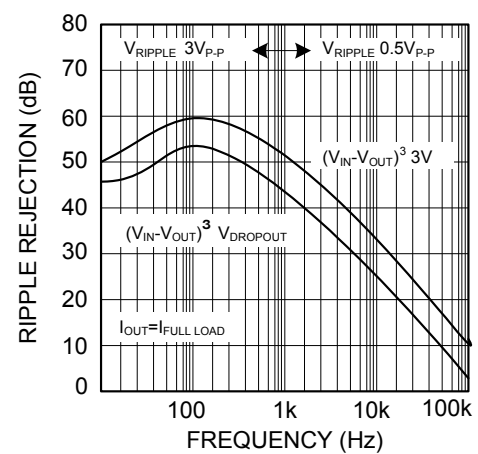
Load Regulation



Temperature Stability

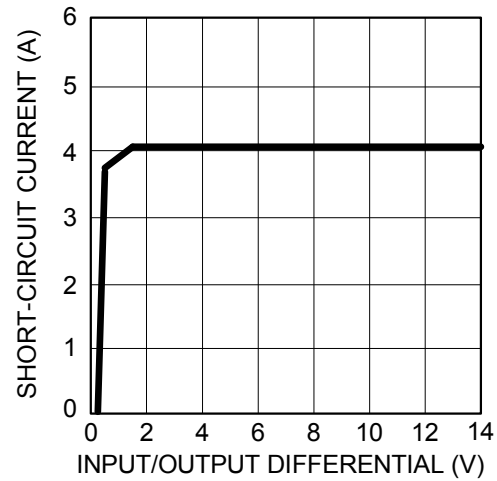
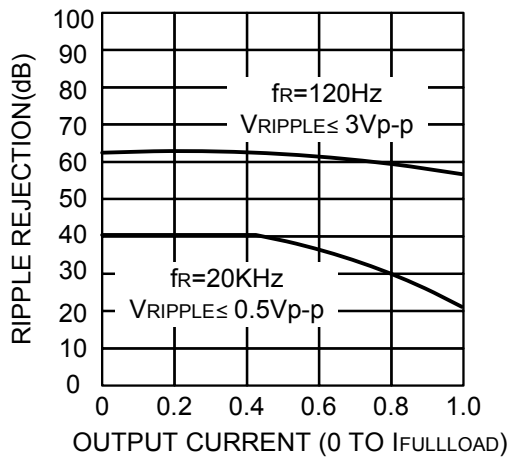


Ripple Rejection



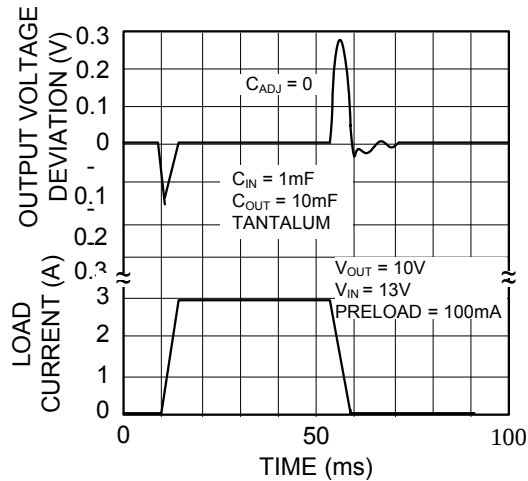
Ripple Rejection vs. Current

Short-Circuit Current

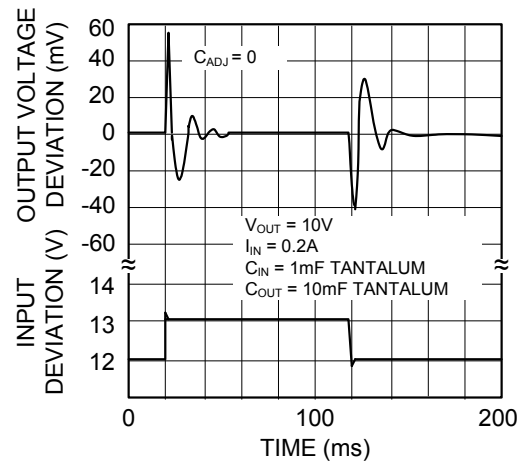


Typical Performance Characteristics (Continue)

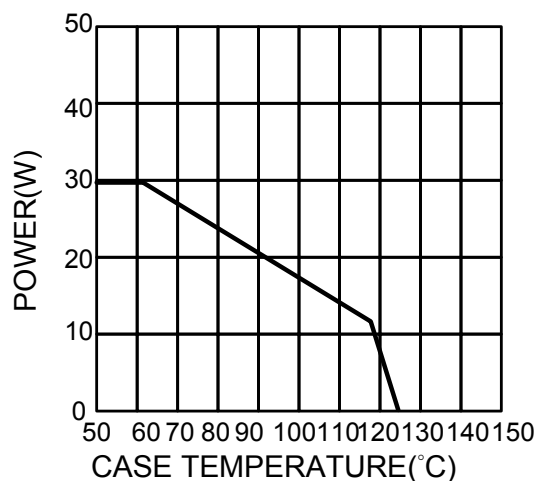
Load Transient Response



Line Transient Response

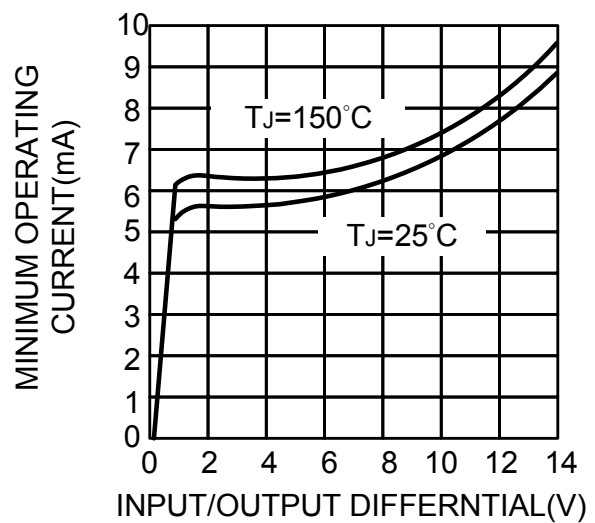


Line Transient Response

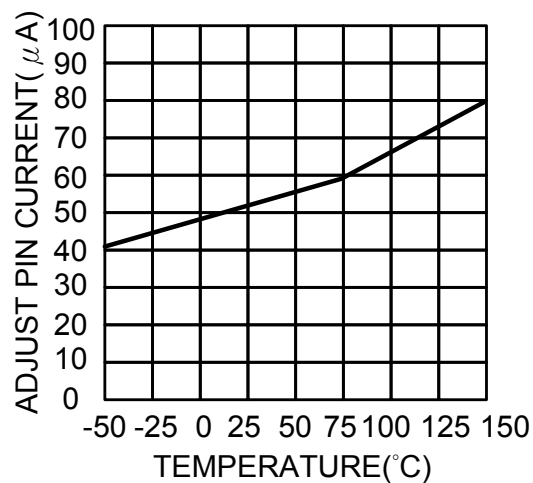


*AS LIMITED BY MAXIMUM JUNCTION TEMPERATURE

Minimum Operating Current

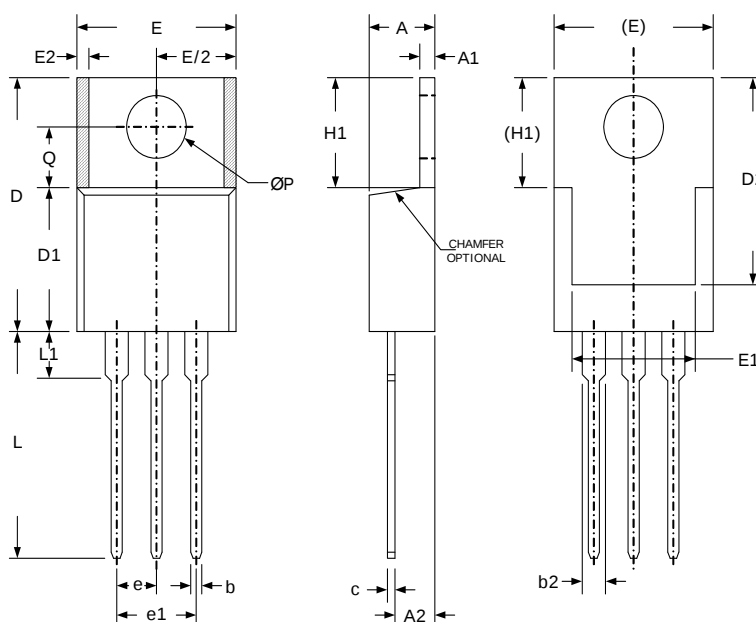


Adjust Pin Current



Package Dimension

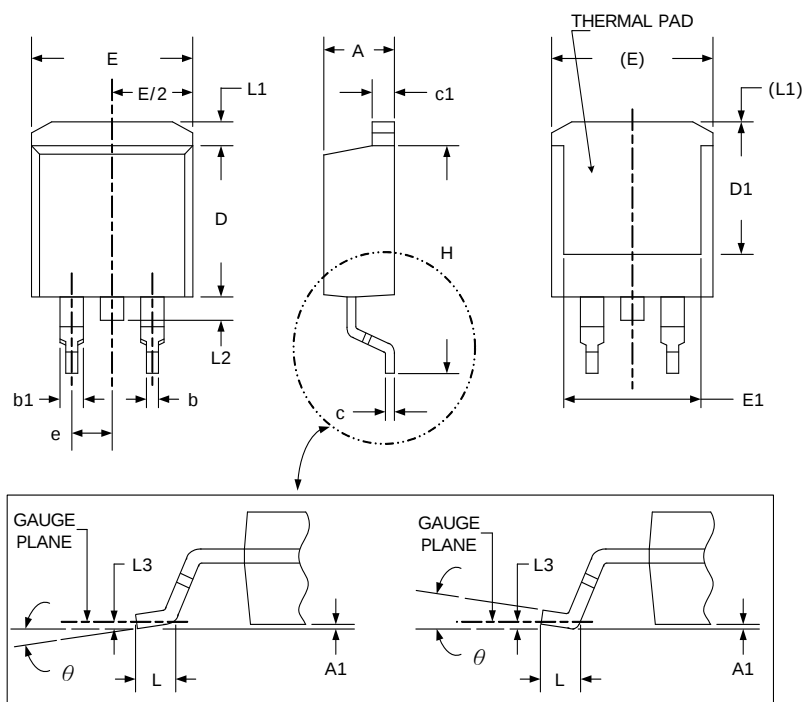
TO-220 PLASTIC PACKAGE



Dimensions				
SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	3.56	4.83	.140	.190
A1	0.51	1.40	.020	.055
A2	2.03	2.92	.080	.115
b	0.38	1.02	.015	.040
b2	1.14	1.78	.045	.070
c	0.36	0.61	.014	.024
D	14.2	16.5	.560	.650
D1	8.38	9.02	.330	.355

D2	12.19	12.88	.480	.507
E	9.65	10.67	.380	.420
E1	6.86	8.89	.270	.350
E2	-	0.76	-	.030
e	2.54 (TYP)		.100 (TYP)	
e1	5.08 (TYP)		.200 (TYP)	
H1	5.84	6.86	.230	.270
L	12.70	14.73	.500	.580
L1	-	6.35	-	.250
ØP	3.53	4.09	.139	.161
Q	2.54	3.43	.100	.135

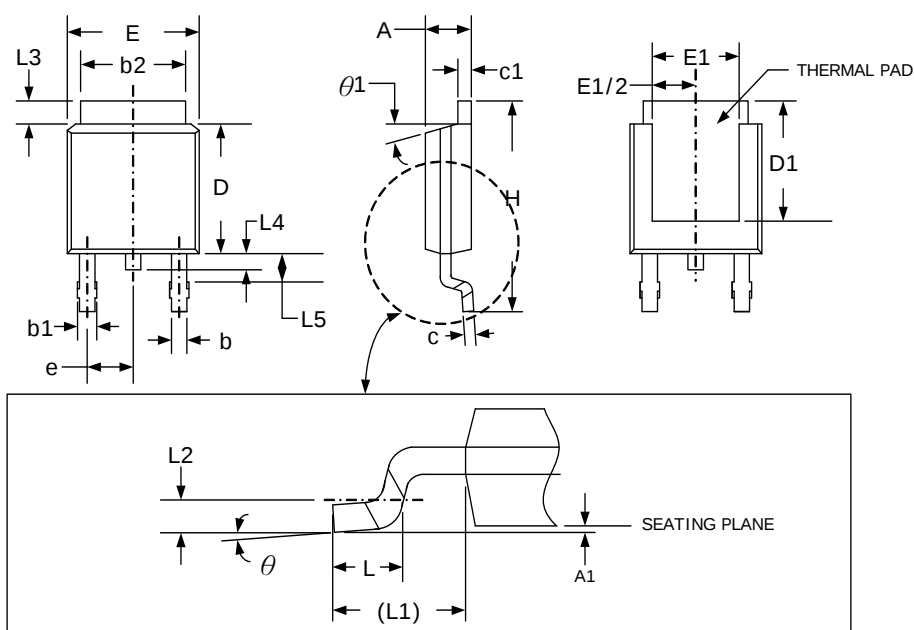
TO-263 PLASTIC PACKAGE



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°

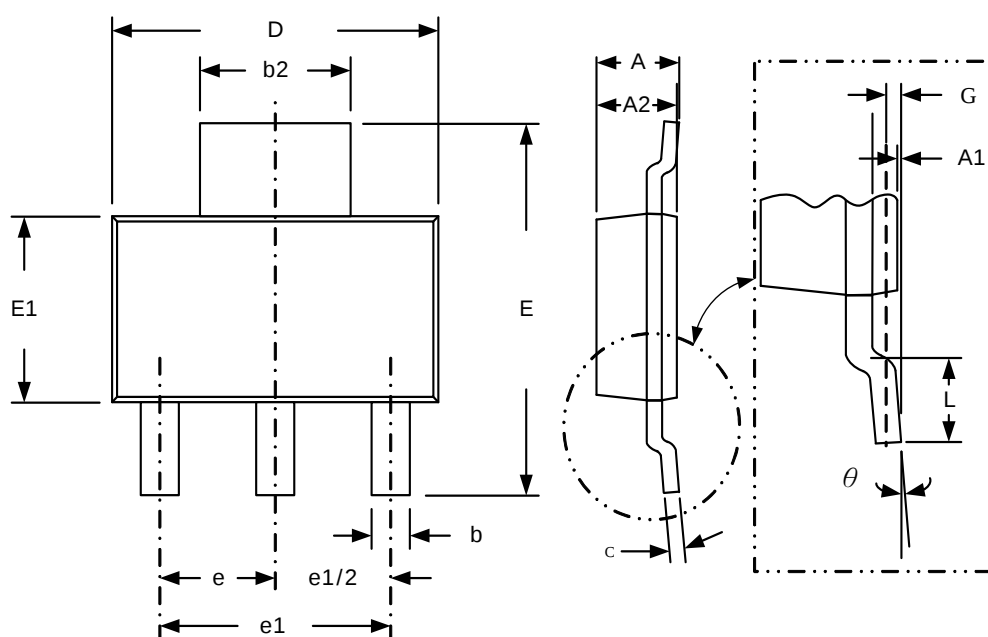
TO-252 PLASTIC PACKAGE



Dimensions				
SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	2.18	2.39	.086	.094
A1	-	0.13	-	.005
b	0.64	0.89	.025	.035
b1	0.76	1.14	.030	.045
b2	4.95	5.46	.195	.215
C	0.46	0.61	.018	.024
C1	0.46	0.89	.018	.035
D	5.97	6.22	.235	.245

D1	5.21	-	.205	-
E	6.35	6.73	.250	.265
E1	4.32	-	.170	-
e	2.29 (TYP)		.090 (TYP)	
H	9.40	10.41	.370	.410
L	1.40	1.78	.055	.070
L1	2.74 (TYP)		.108 (TYP)	
L2	0.51 (TYP)		.020 (TYP)	
L3	0.89	1.27	.035	.050
L4	-	1.02	-	.040
L5	1.14	1.52	.045	.060
θ	0°	10°	0°	10°
θ1	0°	15°	0°	15°

SOT-223-3L PLASTIC PACKAGE



Dimensions				
SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	-	1.80	-	.071
A1	0.02	0.10	.001	.004
A2	1.55	1.65	.061	.065
b	0.66	0.84	.026	.033
b2	2.90	3.10	.114	.122
c	0.23	0.33	.009	.013

D	6.30	6.70	.248	.264
E	6.70	7.30	.264	.288
E1	3.30	3.70	.130	.146
e	2.30 (TYP)		.091 (TYP)	
e1	4.60 (TYP)		.181 (TYP)	
L	0.90	-	.035	-
G	0.25 (TYP)		.010 (TYP)	
θ	0°	8°	0°	8°

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