GS1085L

3A Low Dropout Voltage Regulator

DEC. 2009

Product Description

The GS1085L is a low drop voltage regulator able to provide up to 3A output current. The dropout voltage of the device is guaranteed at a maximum 1.3V at the maximum output current, decreasing at lower loads.

The GS1085L is pin compatible with older 3-terminal adjustable regulators, but has better performances in term of drop and output tolerance.

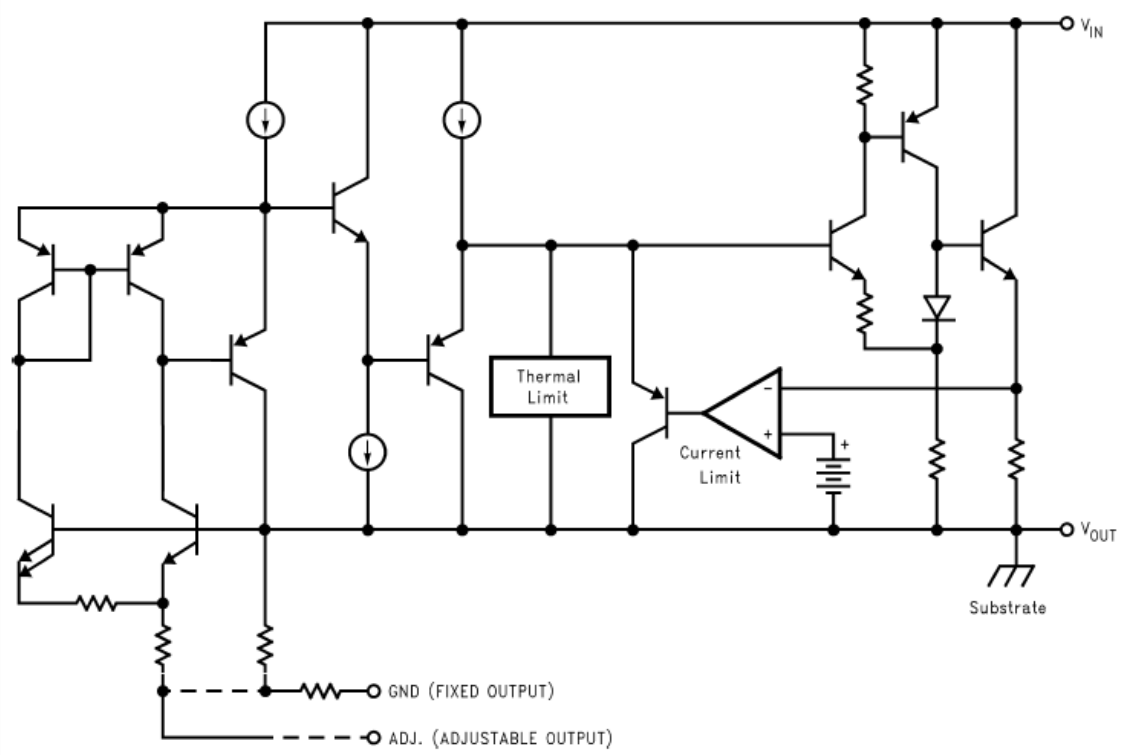
Features

- Three Terminal Adjustable or Fixed Output Voltages 1.5V, 1.8V, 2.5V, 3.3V and 5V
- Guaranteed Output Current up to 3A
- Typical Dropout 1.3V (at 3A)
- Output Tolerance: ±2% at 25 ºC
- Wind Operating Temperature Range: -40 ºC to 125 ºC
- Package Available: TO-220, TO-263, TO-252, and SOT-223

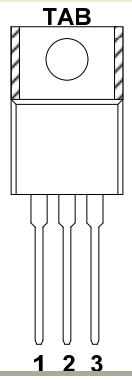
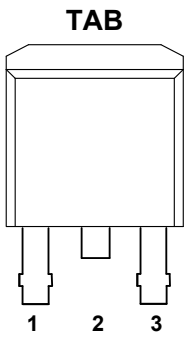
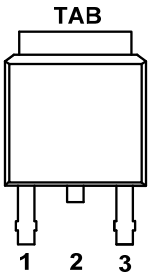
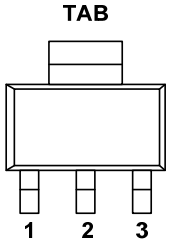
Applications

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

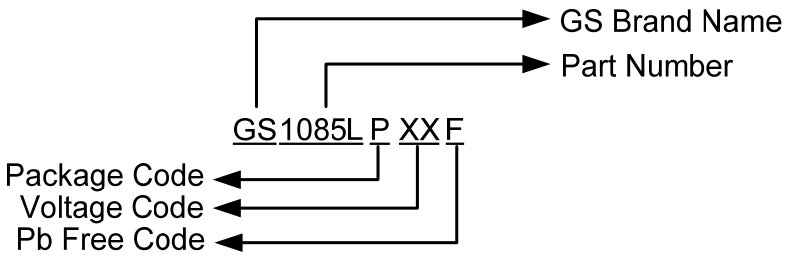
Block Diagram



Packages & Pin Assignments

GS1085LT (TO-220)		GS1085LM (TO-263)		GS1085LD (T0-252)		GS1085LX (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}

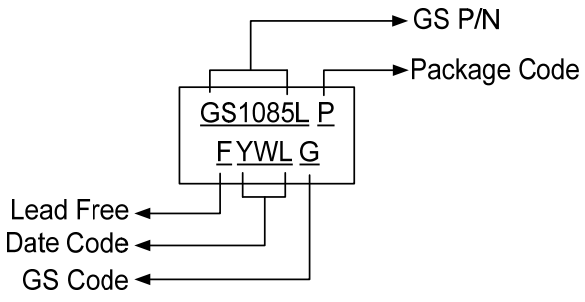
Ordering Information

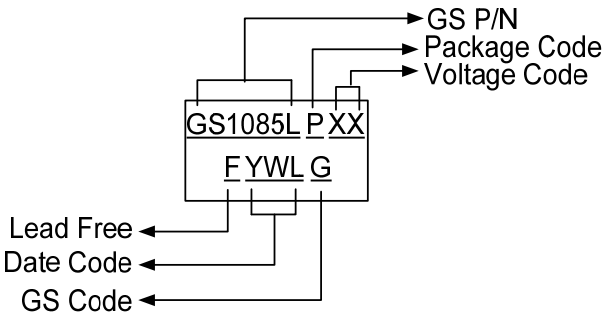


TO-220 T	O-263	TO-252	SOT-223	Output
GS1085LT	GS1085LM	GS1085LD	GS1085LX	ADJ
GS1085LT15	GS1085LM15	GS1085LD15	GS1085LX15	1.5V
GS1085LT18	GS1085LM18	GS1085LD18	GS1085LX18	1.8V
GS1085LT25	GS1085LM25	GS1085LD25	GS1085LX25	2.5V
GS1085LT33	GS1085LM33	GS1085LD33	GS1085LX33	3.3V
GS1085LT50	GS1085LM50	GS1085LD50	GS1085LX50	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	°C/W
		TO-263	3	
		TO-252	5	
		SOT-223 8		
θ_{JA}	Thermal Resistance (Junction to Ambient)	TO-220	62.5	°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		°C
T_{STG}	Storage Range	-65 to 150		°C
T_{LEAD}	Lead Temperature (Soldering 10sec)	300		°C

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

Electrical Characteristics

I_{OUT} = 0 mA, and T_J = +25°C, unless otherwise noted

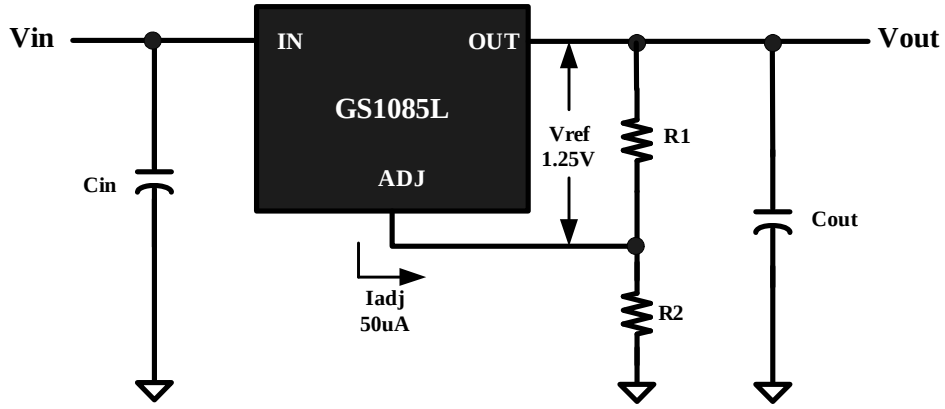
Parameter	Device	Conditions	Min	Typ	Max	Units
Reference Voltage(1)	GS1085L	Vin=2.75V , Io=10mA Vin=2.7 to 7V , Io=10mA to 3A	1.238 1.225	1.250 1.250	1.263 1.275	V V
Output Voltage	GS1085L- 1.5	Vin=4.0V Vin=3.0V , Io= 0mA to 3A	1.485 1.470	1.500 1.500	1.515 1.530	V V
	GS1085L- 1.8	Vin=4.3V Vin=3.3V , Io= 0mA to 3A	1.782 1.764	1.800 1.800	1.818 1.836	V V
	GS1085L- 2.5	Vin=5.0V Vin=4.0V , Io= 0mA to 3A	2.475 2.450	2.500 2.500	2.525 2.550	V V
	GS1085L- 3.3	Vin=5.8V Vin=4.8V , Io= 0mA to 3A	3.267 3.234	3.300 3.300	3.333 3.366	V V
	GS1085L- 5.0	Vin=7.5V Vin=6.5V , Io= 0mA to 3A	4.950 4.900	5.000 5.000	5.050 5.100	V V
Line Regulation(1)	All	I_O =10mA (Vo+1.5V) ≦ Vin ≦ 7V	0.04		0.2	%
Load Regulation(1)	All	Vin=Vo+2.5V , Io=0mA to 3A	0.08		0.4	%
Dropout Voltage (V_{IN} - V_{OUT}) (1),(3)	All	ΔV_{OUT}, ΔV_{REF} = 1%, I_{OUT} = 3A	1.1		1.3	V
Current Limit(1)	All		3	4		A
Quiescent Current	All V	$_{IN}$ =5V		5	10	mA
Ripple Rejection(1)	All	f =120Hz , C_{OUT} = 25µF Tantalum, I_{OUT} = 3A, (V_{IN}-V_{OUT}) = 3V, C_{ADJ} =25µF	60 75			dB
Adjust Pin Current(1)	GS1085L			50	120	µA
Temperature Stability				0.5		%
Long Term Stability		T_A = 25°C, 1000Hrs		0.03	1	%

NOTE 1: For GS1085L(adjustable) V_{ADJ}=0V

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 Applications



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

Figure1. Adjustable Voltage Regulator

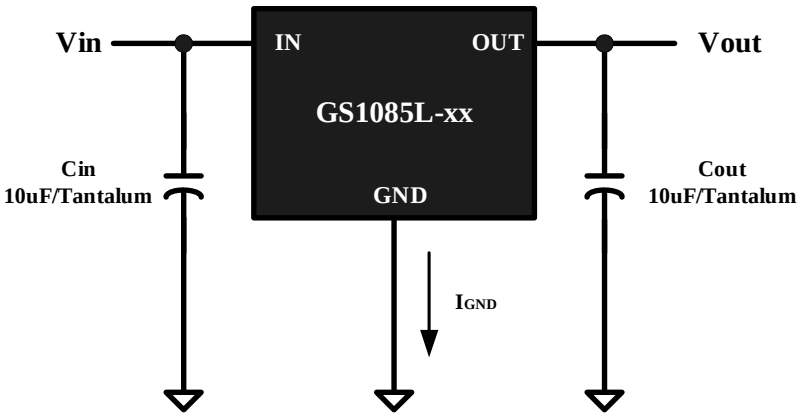
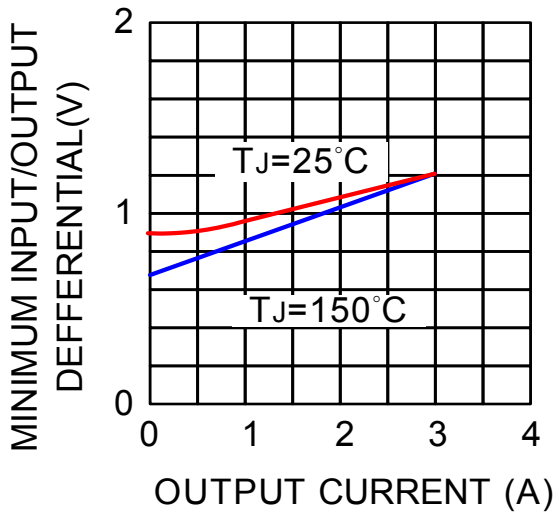


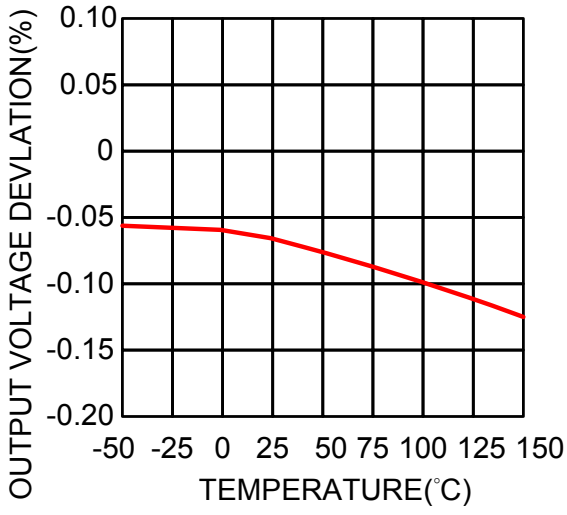
Figure2. Fixed Voltage Regulator

Typical Performance Characteristics

Dropt Voltage

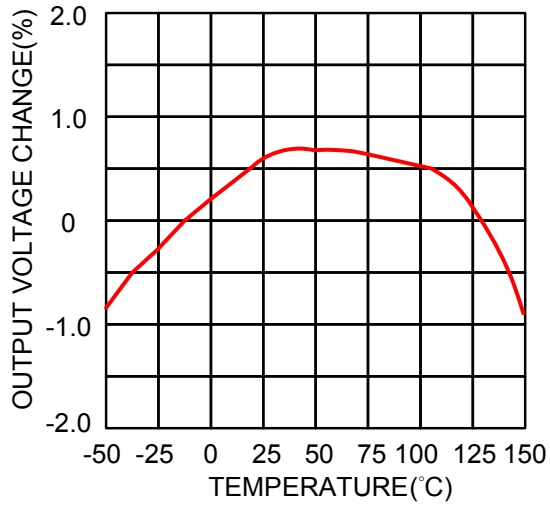


Load Regulation

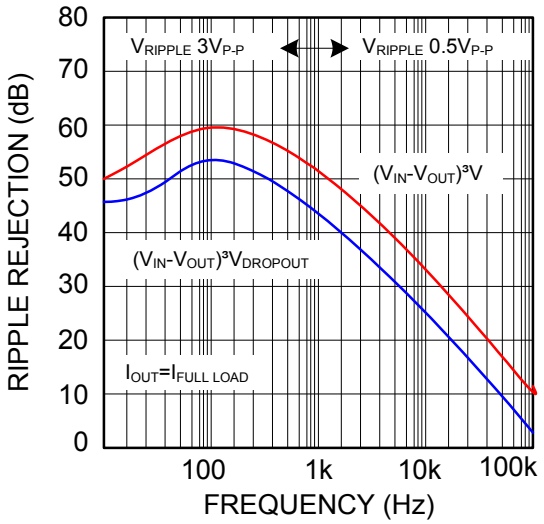


Typical Performance Characteristics(Continue)

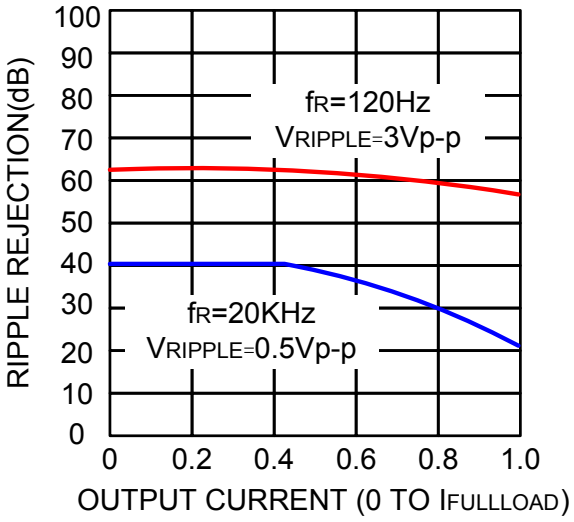
Temperature Stability



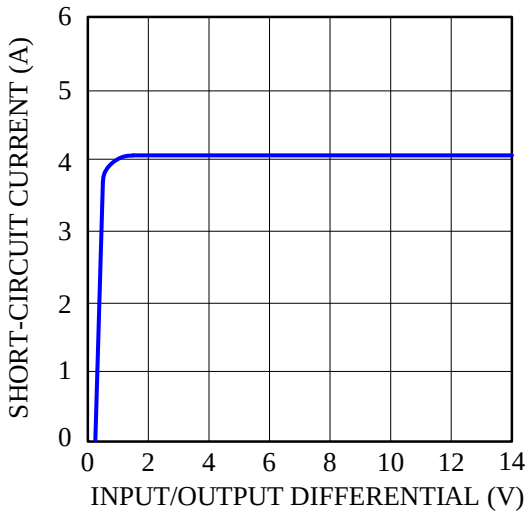
Ripple Rejection



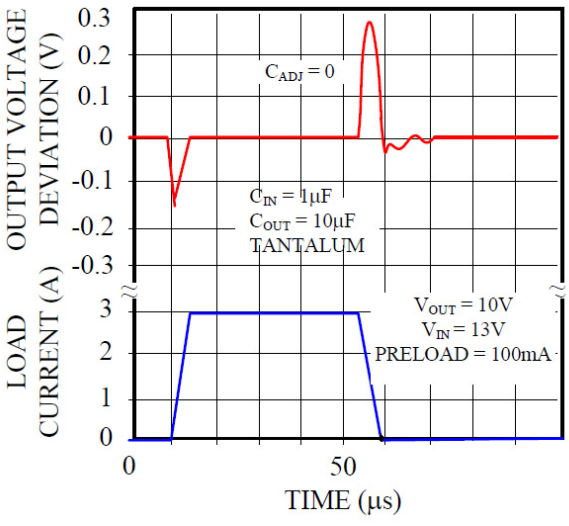
Ripple Rejection vs. Current



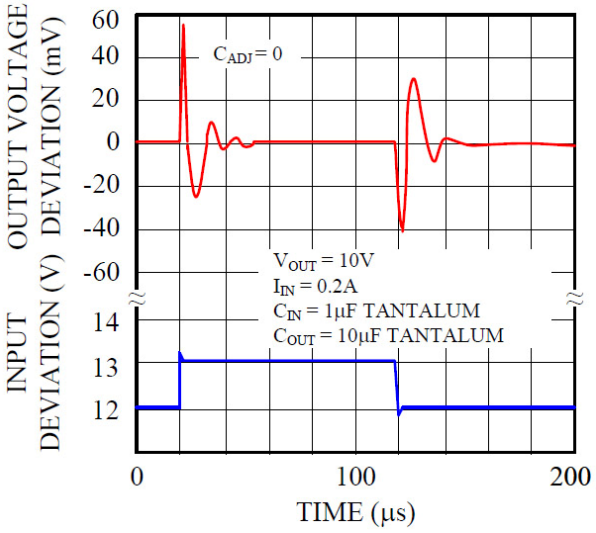
Short-Circuit Current



Load Transient Response

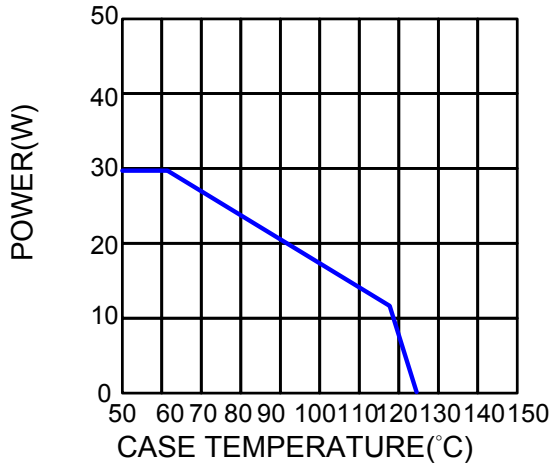


Line Transient Response



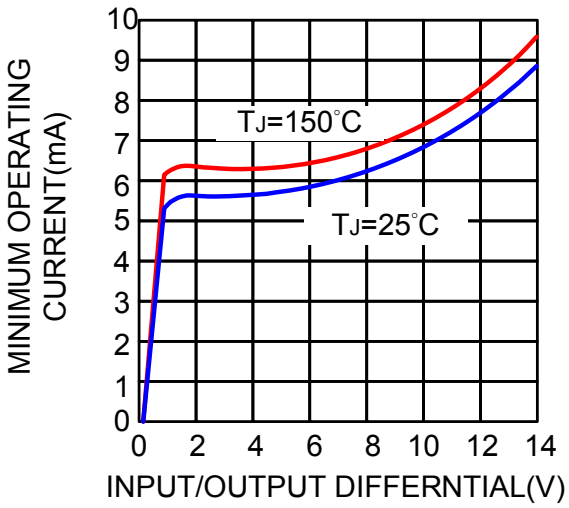
Typical Performance Characteristics(Continue)

Line Transient Response

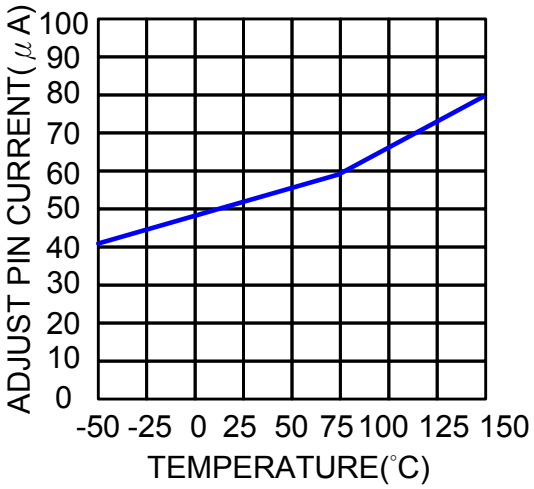


*AS LIMITED BY MAXIMUM JUNCTION TEMPERATURE

Minimum Operating Current

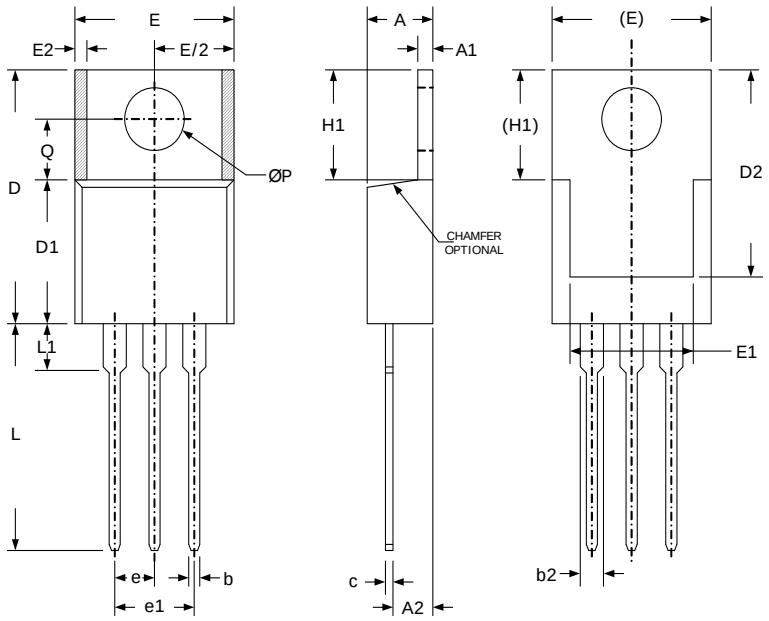


Adjust Pin Current



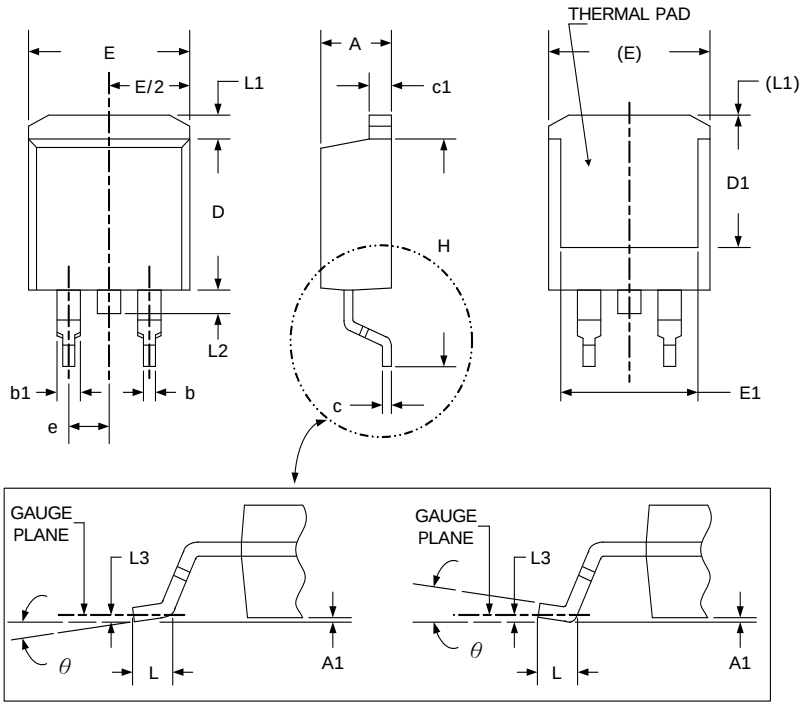
Package Dimension

TO-220 PLASTIC PACKAGE



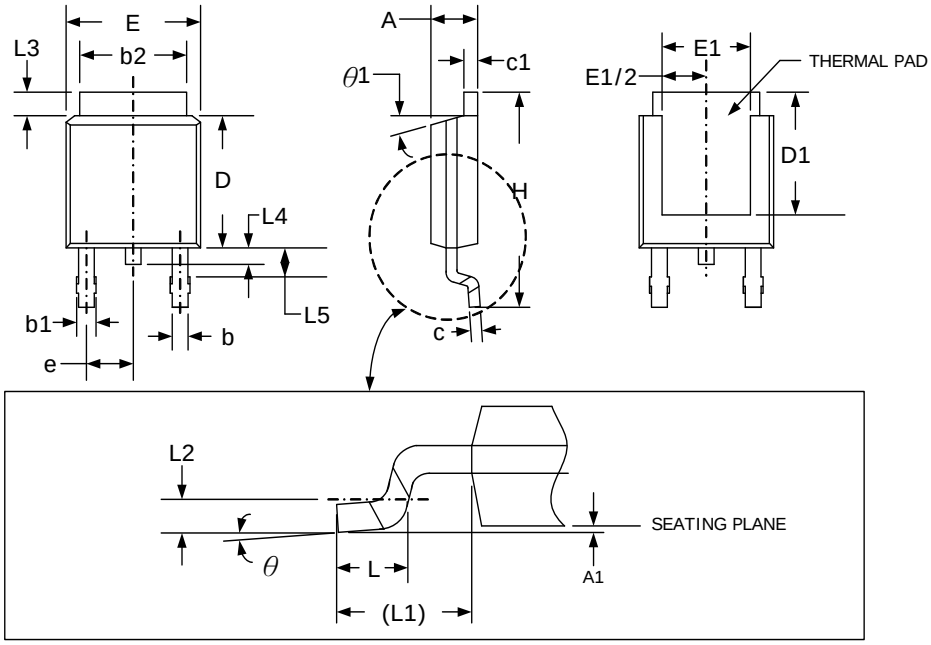
Dimensions				
SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	3.56	4.83	.140	.190
A1	0.51	1.40	.020	.055
A2	2.03	2.92	.080	.115
b	0.38	1.02	.015	.040
b2	1.14	1.78	.045	.070
C	0.36	0.61	.014	.024
D	14.2	16.5	.560	.650
D1	8.38	9.02	.330	.355
D2	12.19	12.88	.480	.507
E	9.65	10.67	.380	.420
E1	6.86	8.89	.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°

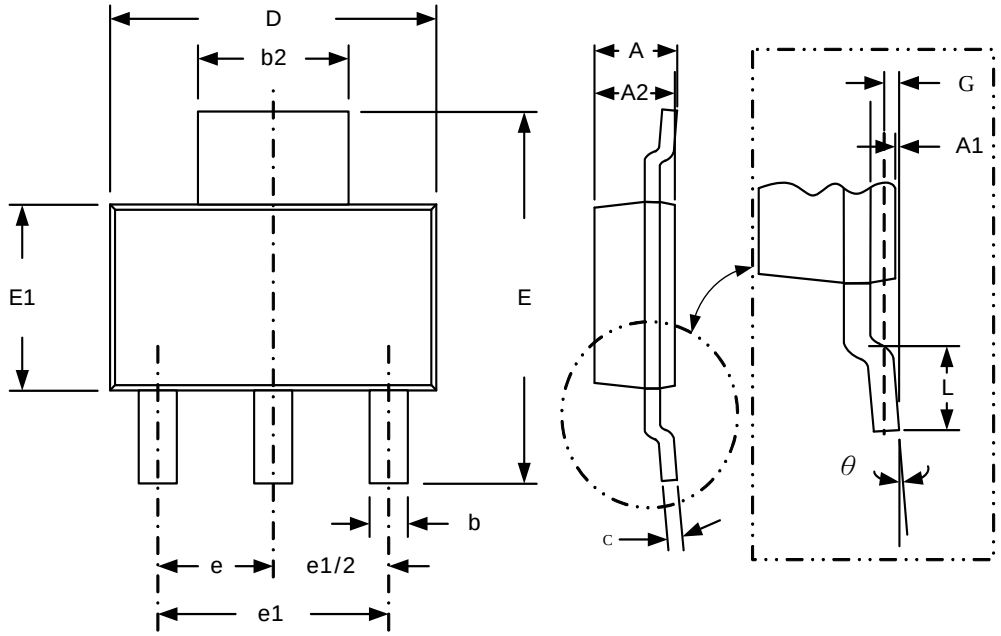
TO-252 PLASTIC PACKAGE



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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