GS7805L

1A Positive Voltage Regulator

Product Description

These voltage regulators are monolithic integrated circuits designed as 5V Fixed-Voltage regulators for a wide variety of applications including local, on-card regulation.

These regulators employ internal current limiting, thermal shutdown, and safe-area compensation. With adequate heat sinking they can deliver output currents in excess of 1.0A. Although designed primarily as a fixed voltage regulator, these devices can be used with external components to obtain adjustable voltages and currents.

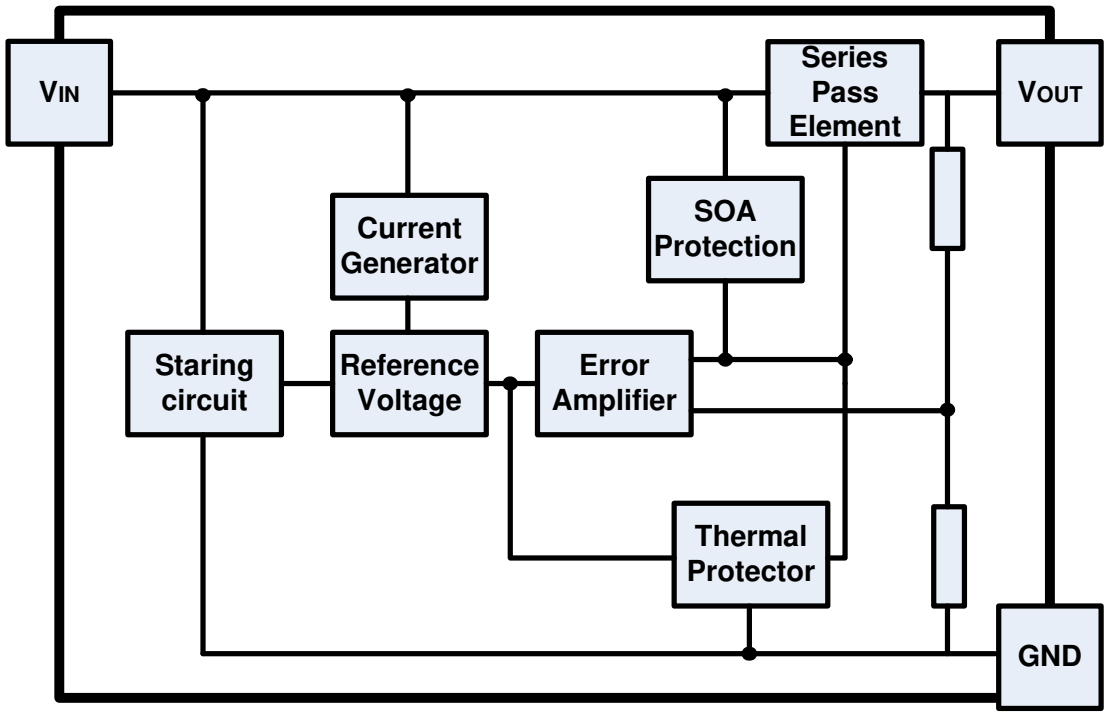
Features

- Output Current in Excess of 1.0 A
- No External Components Required
- Internal Thermal Overload Protection
- Internal Short Circuit Current Limiting
- Output Transistor Safe-Area Compensation
- Output Voltage Offered in 1% and 2% Tolerance
- Available in Surface Mount TO-252 and TO-263 Packages

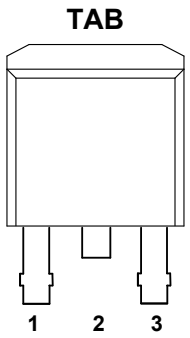
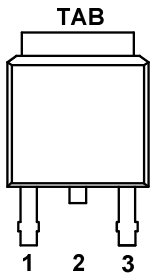
Applications

- Battery Powered Systems
- Portable Consumer Equipment
- Portable Computer
- Radio Control Systems
- Logic Systems
- Power Adapter

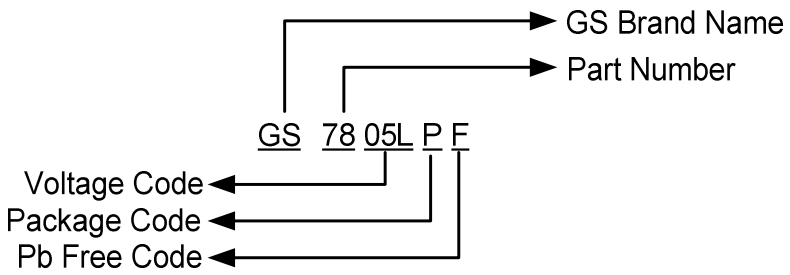
Block Diagram



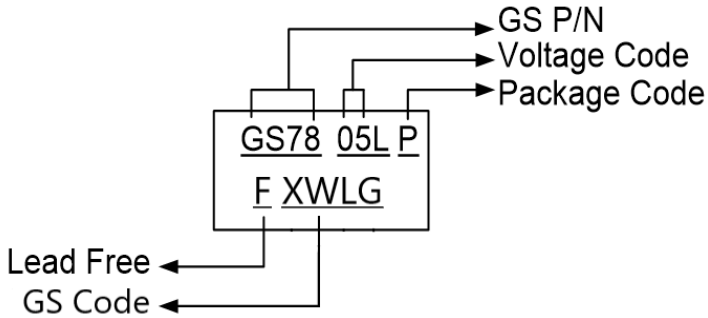
Packages & Pin Assignments

(TO-263)		(TO-252)	
			
Pin No.	**GS7805LMF**	**Pin No.**	**GS7805LDF**
1	V_{IN}	**1**	V_{IN}
2,TAB	GND	**2,TAB**	GND
3	V_{OUT}	**3**	V_{OUT}

Ordering Information



Marking Information



Absolute Maximum Ratings

Symbol	Parameter	Maximum		Unit
V_{IN}	Input Voltage	35		V
PD	Power Dissipation	TO-252	1.2	W
		TO-263	2	
θ_{JA}	Thermal Resistance Junction to Ambient	TO-252	104	ºC/W
		TO-263	62.5	
T_J	Operating Junction Temperature Range	-40 to 125		ºC
T_{STG}	Storage Temperature Range	-65 to 150		ºC
T_{LEAD}	Lead Temperature (Soldering 10 seconds)	260		ºC

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

Recommended Operating Conditions

Parameter	Part number	Min	Max	Unit
Input Voltage	GS7805	7	25	V
Output Current	All	-	1	A
Operating Virtual Junction Temperature	All	0	125	ºC

Electrical Characteristics (V_{IN}=10V, I_O=500mA, T_J=+25ºC, unless otherwise noted.)

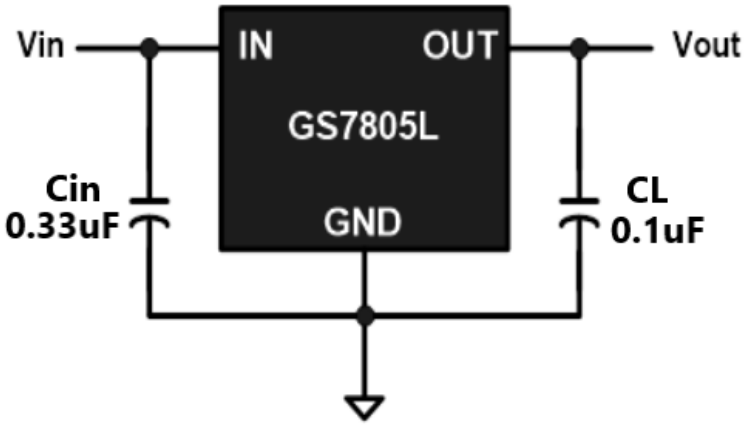
Symbol	Parameter	Test Conditions	GS7805			Unit
			Min	Typ	Max	
V_O	Output Voltage	5.0mA≤I_O≤1.0A, 7V≤V_{IN}≤20V	4.75	5	5.25	V
Reg_{line}	Line Regulation	7V≤V_{IN}≤25V		3	100	mV
		8V≤V_{IN}≤12V		1	50	
Reg_{load}	Load Regulation	5.0mA≤I_O≤1.5A		15	100	mV
		250mA≤I_O≤750mA		5	50	
I_B	Bias Current			4.2	8	mA
ΔI_B	Bias Current Change	7V≤V_{IN}≤25V			1.3	mA
		5.0mA≤I_O≤1.0A			0.5	
RR	Ripple Rejection	8.0V≤V_{IN}≤18V, f=120Hz	62	78		dB
V_I -V_O	Dropout Voltage	I_O=1A, TA=25ºC		2.0		V
V_N	Output Noise Voltage	10Hz ≤ f ≤100kHz		40		μV/V_O
R_O	Output Resistance	f=1.0kHz		0.017		Ω
I_{SC}	Short-Circuit Output Current			750		mA
I_{max}	Peak Output Current			2.2		A
TCV_O	Temperature Coefficient of Output Voltage	I_O = 5.0mA		-1.1		mV/ºC

NOTES:
* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately.
** This specification applies only for dc power dissipation permitted by absolute maximum ratings

Applications Information

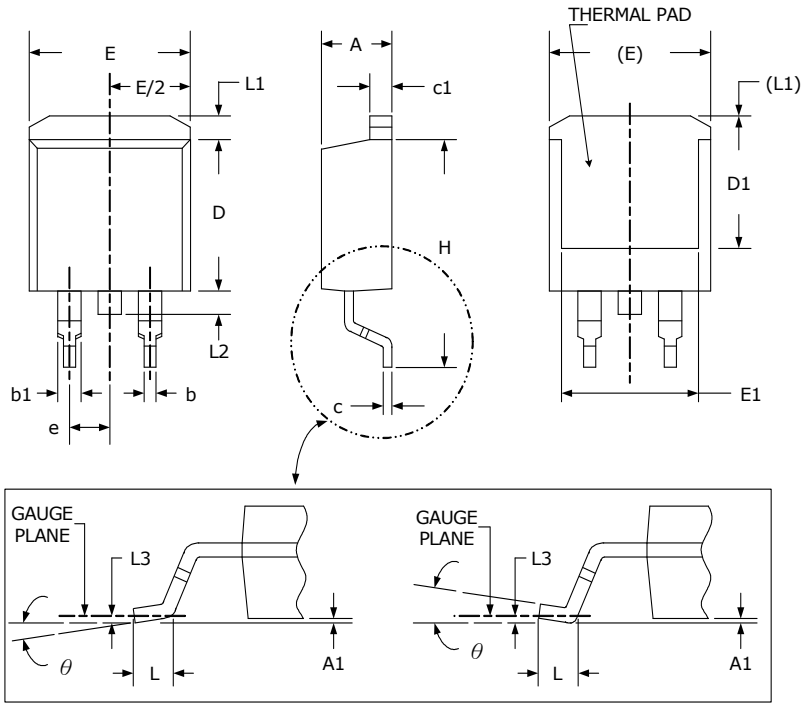
Design Considerations

The GS7805L of fixed 5V voltage regulators are designed with Thermal Overload Protection that shuts down the circuit when subjected to an excessive power overload condition, Internal Short Circuit Protection that limits the maximum current the circuit will pass, and Output Transistor Safe-Area Compensation that reduces the output short circuit current as the voltage across the pass transistor is Increased. In many low current applications, compensation capacitors are not required, However, it is recommended that the regulator input be bypassed with a capacitor if the regulator is connected to the power supply filter with long wire lengths, or if the output load capacitance is large, An input bypass capacitor should be selected to provide good high-frequency characteristics to insure stable operation under all load conditions, advice a 0.33 µF in V input and 0.1µF in V output (please follow the above figure) or larger tantalum. Mylar , or other capacitor having low internal impedance at high frequencies should be chosen, The bypass capacitor should be mounted with the shortest possible leads directly across the regulators input terminals, Normally good construction techniques should be used to minimize ground loops and lead resistance drops since the regulator has no external sense lead.



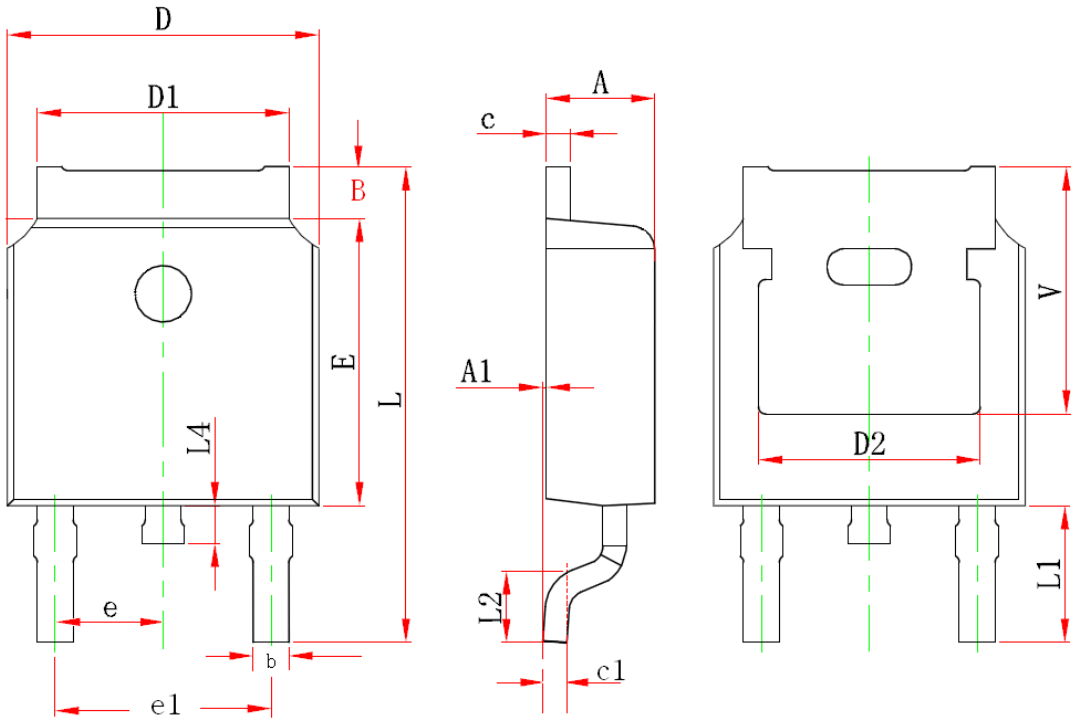
Package Dimension

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
A	2.200	2.400	0.087	0.094
A1	0.000	0.13	0.000	0.0051
B	0.89	1.30	0.035	0.0512
b	0.64	0.88	0.0252	0.0346
C	0.430	0.58	0.017	0.023
C1	0.430	0.60	0.017	0.0236
D	6.350	6.730	0.250	0.265
D1	5.100	5.460	0.200	0.215
E	6.000	6.220	0.236	0.244
e	2.300 TYP		0.091 TYP	
e1	4.500	4.700	0.177	0.185
L	9.400	10.400	0.37	0.409
L1	2.9 REF		0.114 REF	
L2	1.400	1.780	0.055	0.070
L4	0.600	1.01	0.024	0.0398
V	5.350 REF		0.211 REF	
D2	4.830 REF		0.190 REF	

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