

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 1.0 A. Although designed primarily as a fixed voltage regulator, these devices can be used with external components to obtain adjustable voltages and currents.

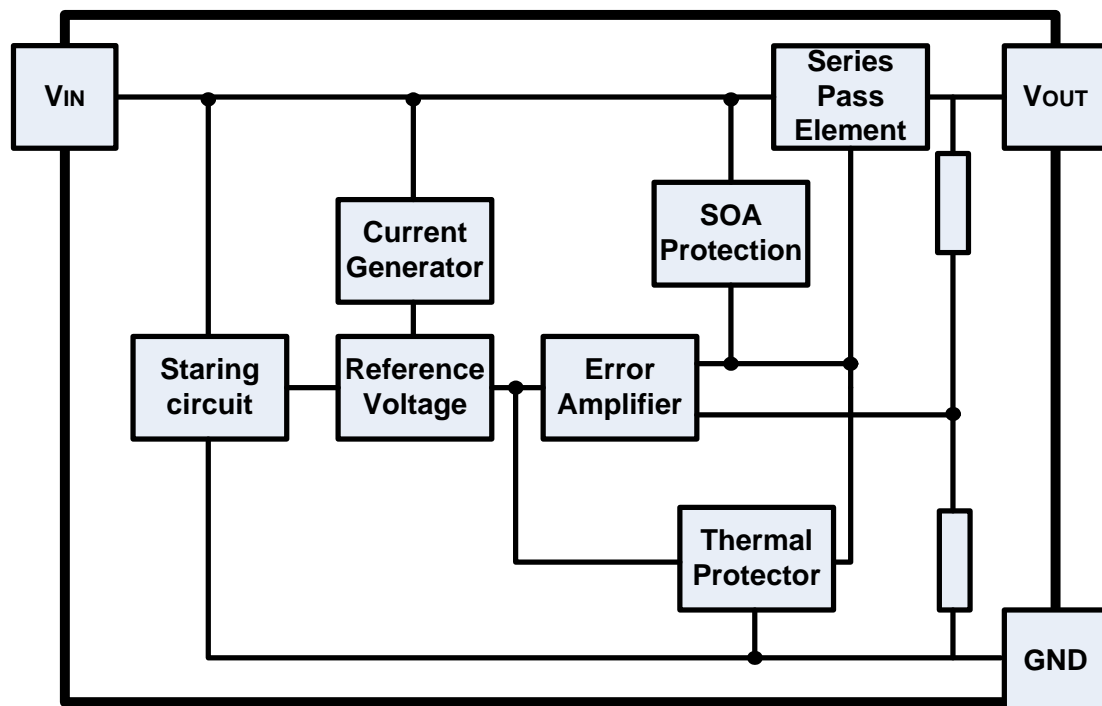
Features

- 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 Standard 3-Lead Transistor Packages

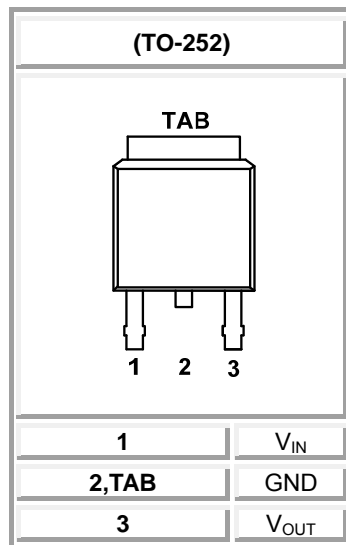
Applications

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

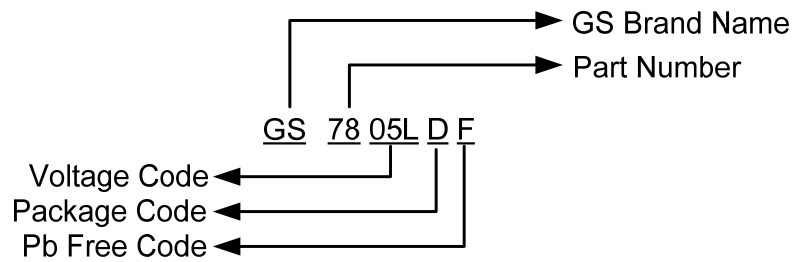
Block Diagram



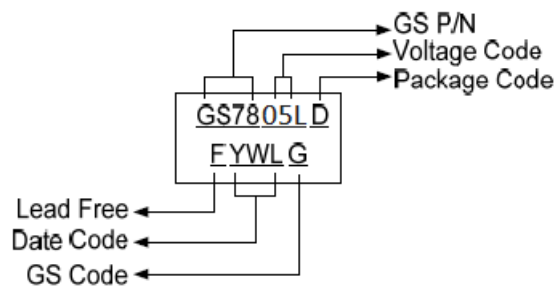
Packages & Pin Assignments



Ordering Information



Marking Information



Absolute Maximum Ratings

Symbol	Parameter	Maximum	Unit
V_{IN}	Input Voltage	35	V
P_D	Power Dissipation	TO-252 1.2	W
θ_{JA}	Thermal Resistance Junction to Ambient	TO-252 104	°C/W
T_{OPR}	Operating Temperature Range	-25 to +125	°C
T_{STG}	Storage Temperature Range	-65 to 150	°C
T_{LEAD}	Lead Temperature (Soldering 10 seconds)	260	°C

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	°C

Electrical Characteristics

($V_{IN}=10V$, $I_O=500mA$, $T_J=+25^\circ C$, unless otherwise noted.)

Symbol	Parameter	Test Conditions	GS7805			Unit
			Min	Typ	Max	
V_O	Output Voltage	$5.0mA \leq I_O \leq 1.0A$, $7V \leq V_{IN} \leq 20V$	4.75	5	5.25	V
Reg_{line}	Line Regulation	$7V \leq V_{IN} \leq 25V$		3	100	mV
		$8V \leq V_{IN} \leq 12V$		1	50	
Reg_{load}	Load Regulation	$5.0mA \leq I_O \leq 1.5A$		15	100	mV
		$250mA \leq I_O \leq 750mA$		5	50	
I_B	Bias Current			4.2	8	mA
ΔI_B	Bias Current Change	$7V \leq V_{IN} \leq 25V$			1.3	mA
		$5.0mA \leq I_O \leq 1.0A$			0.5	
RR	Ripple Rejection	$8.0V \leq V_{IN} \leq 18V$, $f=120Hz$	62	78		dB
$V_I - V_O$	Dropout Voltage	$I_O=1.0A$, $T_A=25^\circ C$		2.0		V
V_N	Output Noise Voltage	$10Hz \leq f \leq 100kHz$		40		$\mu V/V_O$
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		$mV/^\circ C$

NOTES:

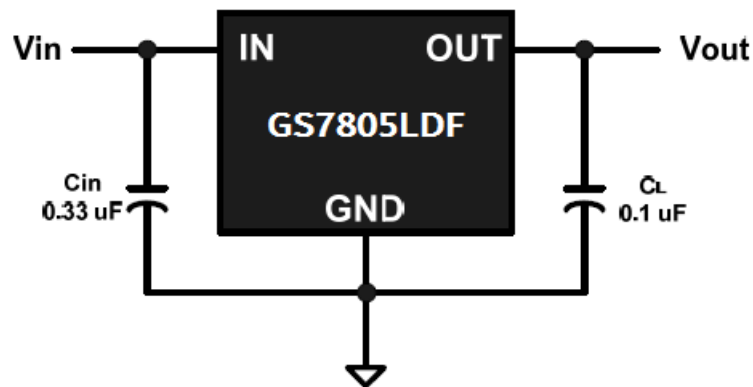
* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately.

** This specification applies only for dc power dissipation permitted by absolute maximum ratings

Applications Information

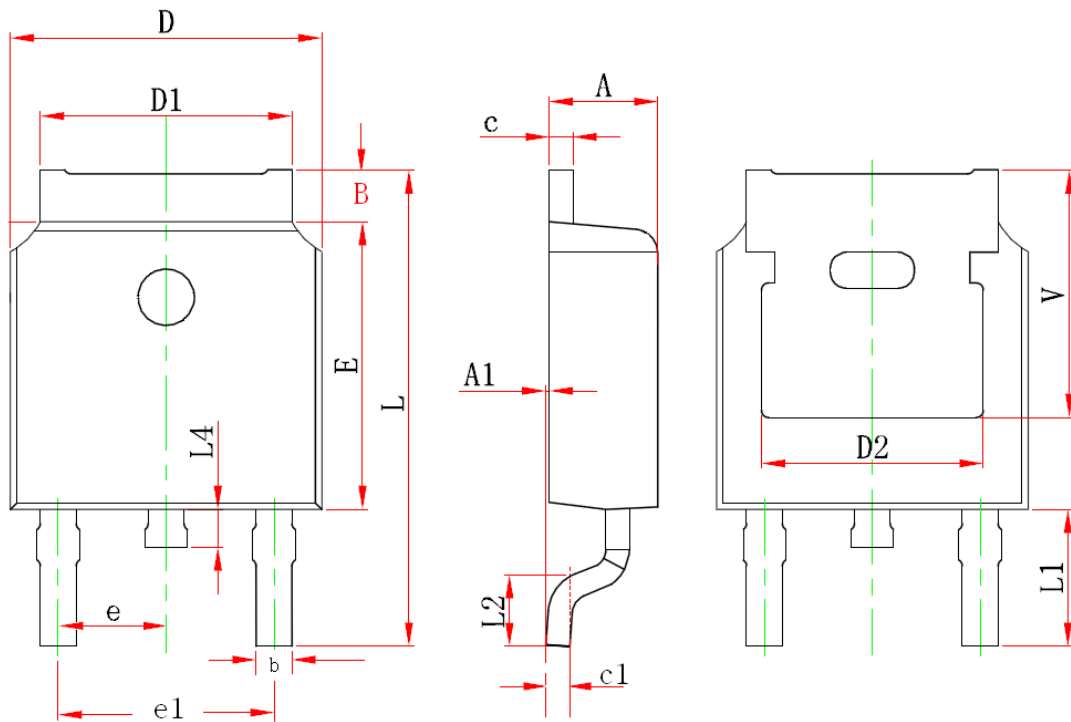
Design Considerations

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, advise a $0.33\ \mu\text{F}$ in V input and $0.1\ \mu\text{F}$ 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-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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