Three-Terminal Positive-Voltage Regulator

GENERAL DESCRIPTION

This Series of fixed-voltage monolithic integrated circuit voltage regulators is designed for a wide range of applications. These applications include on-card regulation for elimination of noise and distribution problems associated with single-point regulation. In addition, they can be used with power-pass elements to make high-current voltage regulators. One of these regulators can deliver up to 100 mA of output current. The internal limiting and thermal shutdown features of these regulators male them essentially immune to overload. When used as a replacement for a zener diode-resistor combination, an effective improvement in output impedance can be obtain-ed together with lower-bias current.

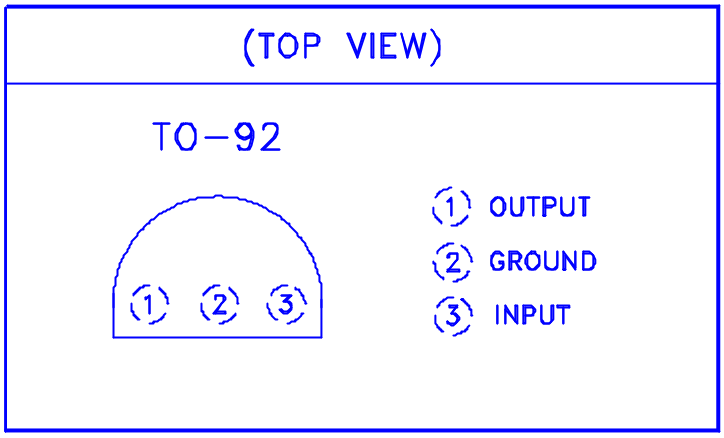
FEATURES

- 3-terminal regulators
- Output current up to 100 mA
- No external component
- Internal thermal overload protection
- Internal short-circuit current limiting

APPLICATIONS

- Linear regulator
- Instrumentation
- Switching power supplies
- PCs, Industrial equipment

PIN CONFIGURAT IONS



DEVICE SELECTION GUIDE

Device	L78L09N
Package	TO-92
Marking	78L09

ABSOLUTE MAXIMUM RATINGS

PARAMETER	VALUE
Input Voltage - V_I	30V
Continuous total power dissipation	(See Note 1)
Storage Temperature Range - T_{STG}	-55 to +150 °C
Junction Temperature - T_J	125 °C
Lead Temperature (Soldering, 10 Seconds) - T_L	260 °C

Note1: To avoid exceeding the design maximum virtual junction temperature, three ratings should not be exceeded. Due to variations in individual device electrical characteristics and thermal resistance, the built-in thermal overload protection may be activated at power levels slightly above or below the rated dissipation.

DISSIPATION RATING TABLE 1 – FREE-AIR TEMPERATURE

PACKAGE	$T_A \leq 25°C$ POWER RATING	DERATING FACTOR	DERATING ABOVE T_A	$T_A = 70°C$ POWER RATING
TO-92	650 mW	6.2 mW/°C	25 °C	350 mW

† The TO-92 package dissipation rating is based on thermal resistance θ_{JA} measured in still air with the device mounted in an Augat socket. The bottom of the package is 10mm (0.375 in) above the stock.

DISSIPATION RATING TABLE 2 – CASE TEMPERATURE

PACKAGE	$T_A \leq 25°C$ POWER RATING	DERATING FACTOR	DERATING ABOVE T_C	$T_C = 125°C$ POWER RATING
TO-92	1600 mW	28.6 mW/°C	94 °C	713 mW

RECOMMENDED OPERATING CONDITIONS

PARAMETER	VALUE
Input Voltage - V_I L78L09	12V to 30V
Output Current - I_{OUT}	100 mA (Max)
Operating Virtual Junction Temperature - T_J	0 to 125 °C

ELECTRICAL SPECIFICATIONS (L78L09)

(V_I =15V, I_O = 40 mA, C_I = 0.33 µF, C_O = 0.1 µF, 0 °C < T_J < +125 °C unless otherwise noted.)

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
Output Voltage	T_J = +25 °C	8.64	9	9.36	V
Line Regulation	T_J = +25 °C 11.5V ≤ V_I ≤ 24V 13V ≤ V_I ≤ 24V		 90 100	 200 150	mV
Load Regulation	T_J = +25 °C 1.0 mA ≤ I_O ≤ 100 mA 1.0 mA ≤ I_O ≤ 40 mA		 20 10	 90 45	mV
Output Voltage	11.5V ≤ V_I ≤ 24V, 1.0 mA ≤ I_O ≤ 40 mA V_I = 15V, 1.0 mA ≤ I_O ≤ 70 mA	8.55 8.55		9.45 9.45	V
Input Bias Current	T_J = +25 °C		2.0	6.0	mA
Input Bias Current Change	13V ≤ V_I ≤ 24V 1.0 mA ≤ I_O ≤ 40 mA			1.5 0.1	mA
Output Noise Voltage	T_A = +25 °C, 10 Hz ≤ f ≤ 100 KHz		49		µV
Ripple Rejection	T_J = +25 °C, f = 120 Hz 18.5V ≤ V_I ≤ 28.5V	38	44		dB
Dropout Voltage	T_J = +25 °C		1.7		V

TO-92 MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	4.445		5.207	H	2.413	2.540	2.667
B	4.318		5.334	I	0.356		0.533
C	12.7		15.5	J			
D	0.356		0.533	K			
E	1.143	1.27	1.397	L			
F	3.175		4.191	M			
G	0.762		1.270	N