Linear Voltage Regulator

multicomp PRO

RoHS Compliant

Description

The Linear Voltage Regulator is a positive 3-terminal voltage regulator in a T0-92 type package. With adequate heat sinking this device can deliver up to 100mA output current. Current limiting is included to limit peak output current to a safe value. Safe area protection for the output transistors is provided to limit internal power dissipation. If internal power dissipation becomes too high for the heat sinking provided, the thermal shutdown circuit takes over preventing the IC from overheating. When used as a zener diode/resistor combination replacement, this device usually results in an effective output impedance improvement of two orders of magnitude, and lower quiescent current. Typical applications include use in logic systems, instrumentation, Hi-Fi, and other solid state electronic equipment. Although designed primarily as a fixed voltage regulator, this device can be used with external components to obtain adjustment voltages and currents.

Features

- Output Voltage Tolerances of ±5% Over the Temperature Range
- Output Current of 100mA
- Internal Thermal Overload Protection - Internal Short-Circuit Current Limiting
- Output Transistor Safe-Area Compensation

Absolute Maximum Ratings

- Input Voltage, V_{IN} = 35V
- Internal Power Dissipation (Note 1), P_D = Internally Limited
- Operating Junction Temperature Range, Tapr = 0°C to +70°C
- Maximum Junction Temperature, T_J = +125°C
- Storage Temperature Range, T_{STG} = -55°C to + 150°C
- Lead Temperature (During soldering, 10 sec.), T_L = +230°C

Note 1. Thermal resistance is typical +60°C/W junction-to-case, +232°C/W junction-to-ambient, and +88°C/W junction-to-ambient at 400ft min of air. The maximum junction temperature shall not exceed +125°C on electrical parameters.

Electrical Characteristics

(V_{OUT} = 15V, V_{IN} = 23V, I_O = 40mA, C_{IN} = 0.33µF, C_{OUT} = 0.1µF, Note 2 unless otherwise specified)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Output Voltage, Note 4	V_O	T_J = +25'C	14.4	15	15.6	V
		1mA ≤ I_O ≤ 70mA, 17.5V ≤ V_{IN} ≤ 30V	14.25	15	15.75	V
Line Regulation (T_J = +25°C)	Reg_{line}	17.5V ≤ V_{IN} ≤ 30V	-	37	250	mV
		20V ≤ V_{IN} ≤ 30V	-	25	140	mV
Load Regulation (T_J = +25°C)	Reg_{load}	1mA ≤ Io ≤ 100mA	-	35	150	mV
		1mA ≤ Io ≤ 40mA	-	12	75	mV
Quiescent Current	I_B	T_J = +25°C	-	3.1	5	mA
		T_J = +125°C	-	-	4.7	mA
Quiescent Current Change	I_B	With line, 20V ≤ V_{IN} ≤ 30V	-	-	1	mA
		With load, 1mA ≤ I_O ≤ 40mA	-	-	0.1	mA

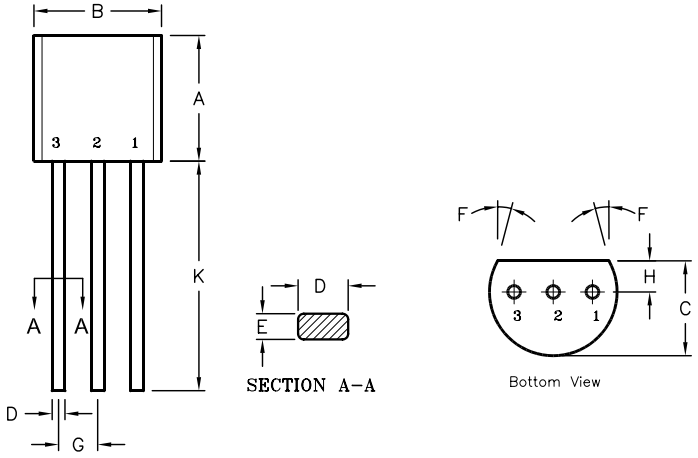
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Output Noise Voltage	V_N	T_J = +25°C, f = 10Hz to 10kHz, Note 3	-	90	-	µV
Ripple Rejection	RR	1 8.5V ≤ YIN ≤ 28.5V, f = 120Hz	37	51	-	dB
Input Voltage Required to Maintain Line Regulation	TCV_O	T_J = +25°C	17.5	-	-	V

Note 2. The maximum steady state usable output current and input voltage are very dependent on the heat sinking and/or lead length of the package. The data above represents pulse test conditions with junction temperatures as indicated at the initiation of the test.

Note 3. Recommended minimum load capacitance of 0.01uF to limit high frequency noise bandwidth.

Note 4. The temperature coefficient of V_{OUT} is typically within ±0.01% V0/°C.

TO-92



Dim.	Min.	Max.
A	4.32	5.33
B	4.45	5.2
C	3.18	4.19
D	0.41	0.55
E	0.35	0.5
F	5°	
G	1.14	1.4
H	1.14	1.53
K	12.7	-

Dimensions : Millimetres

Part Number Table

Description	Part Number
Linear Voltage Regulator, Fixed, 23V_{IN}, 24V_{OUT}, TO-92	78L15