

LM140L/LM340L Series 3-Terminal Positive Regulators

General Description

The LM140L series of three terminal positive regulators is available with several fixed output voltages making them useful in a wide range of applications. The LM140LA is an improved version of the LM78LXX series with a tighter output voltage tolerance (specified over the full military temperature range), higher ripple rejection, better regulation and lower quiescent current. The LM140LA regulators have $\pm 2\%$ V_{OUT} specification, 0.04%/V line regulation, and 0.01%/mA load regulation. When used as a zener diode/resistor combination replacement, the LM140LA usually results in an effective output impedance improvement of two orders of magnitude, and lower quiescent current. These regulators can provide local on card regulation, eliminating the distribution problems associated with single point regulation. The voltages available allow the LM140LA to be used in logic systems, instrumentation, Hi-Fi, and other solid state electronic equipment. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltages and currents.

The LM140LA/LM340LA are available in the low profile metal three lead TO-39 (H) and the LM340LA are also available in the plastic TO-92 (Z). With adequate heat sinking the regulator can deliver 100 mA output current. Current limiting is included to limit the peak output current to a safe value. Safe area protection for the output transistor is provided to limit internal power dissipation. If internal power dissipation

becomes too high for the heat sinking provided, the thermal shut-down circuit takes over, preventing the IC from overheating.

For applications requiring other voltages, see LM117L Data Sheet.

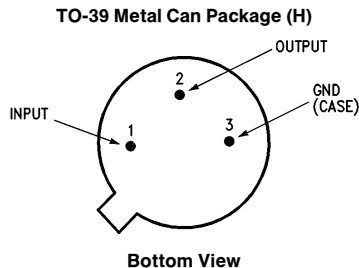
Features

- Line regulation of 0.04%/V
- Load regulation of 0.01%/mA
- Output voltage tolerances of $\pm 2\%$ at $T_j = 25^\circ\text{C}$ and $\pm 4\%$ over the temperature range (LM140LA) $\pm 3\%$ over the temperature range (LM340LA)
- Output current of 100 mA
- Internal thermal overload protection
- Output transistor safe area protection
- Internal short circuit current limit
- Available in metal TO-39 low profile package (LM140LA/LM340LA) and plastic TO-92 (LM340LA)

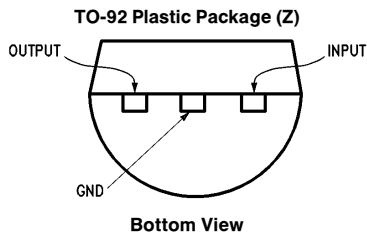
Output Voltage Options

LM140LA-5.0	5V	LM340LA-5.0	5V
LM140LA-12	12V	LM340LA-12	12V
LM140LA-15	15V	LM340LA-15	15V

Connection Diagrams



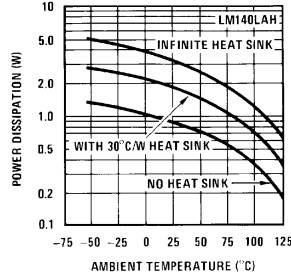
Order Number LM140LAH-5.0, LM140LAH-5.0/883, LM140LAH-12,
LM140LAH-12/883, LM140LAH-15, LM140LAH-15/883, LM340LAH-5.0, LM340LAH-12 or LM340LAH-15
See NS Package Number H03A



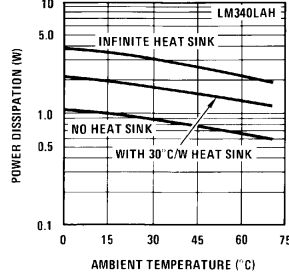
Order Number LM340LAZ-5.0, LM340LAZ-12 or LM340LAZ-15
See NS Package Number Z03A

Typical Performance Characteristics

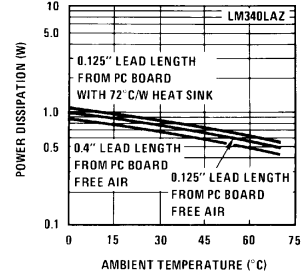
Maximum Average Power Dissipation



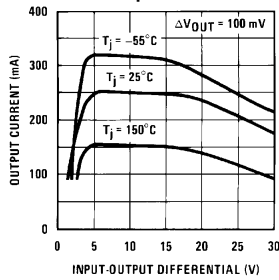
Maximum Average Power Dissipation (Metal Can Package)



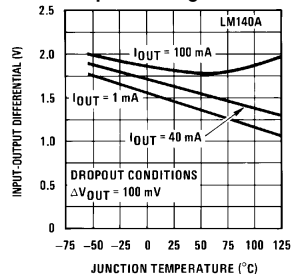
Maximum Average Power Dissipation (Plastic Package)



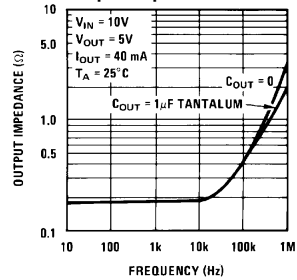
Peak Output Current



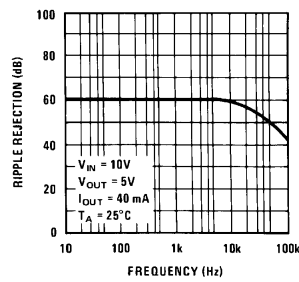
Dropout Voltage



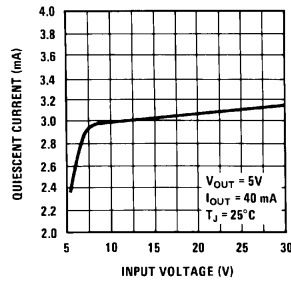
Output Impedance



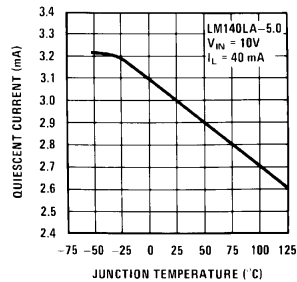
Ripple Rejection



Quiescent Current



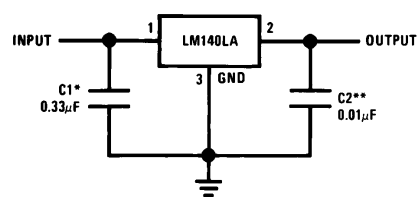
Quiescent Current



TL/H/7782-4

Typical Applications

Fixed Output Regulator

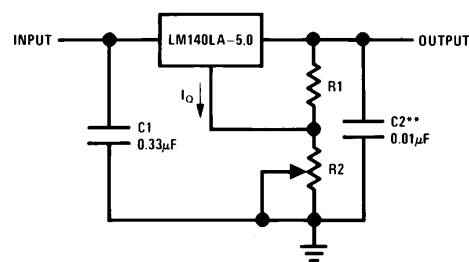


TL/H/7782-5

*Required if the regulator is located far from the power supply filter.

**See note 3 in the electrical characteristics table.

Adjustable Output Regulator

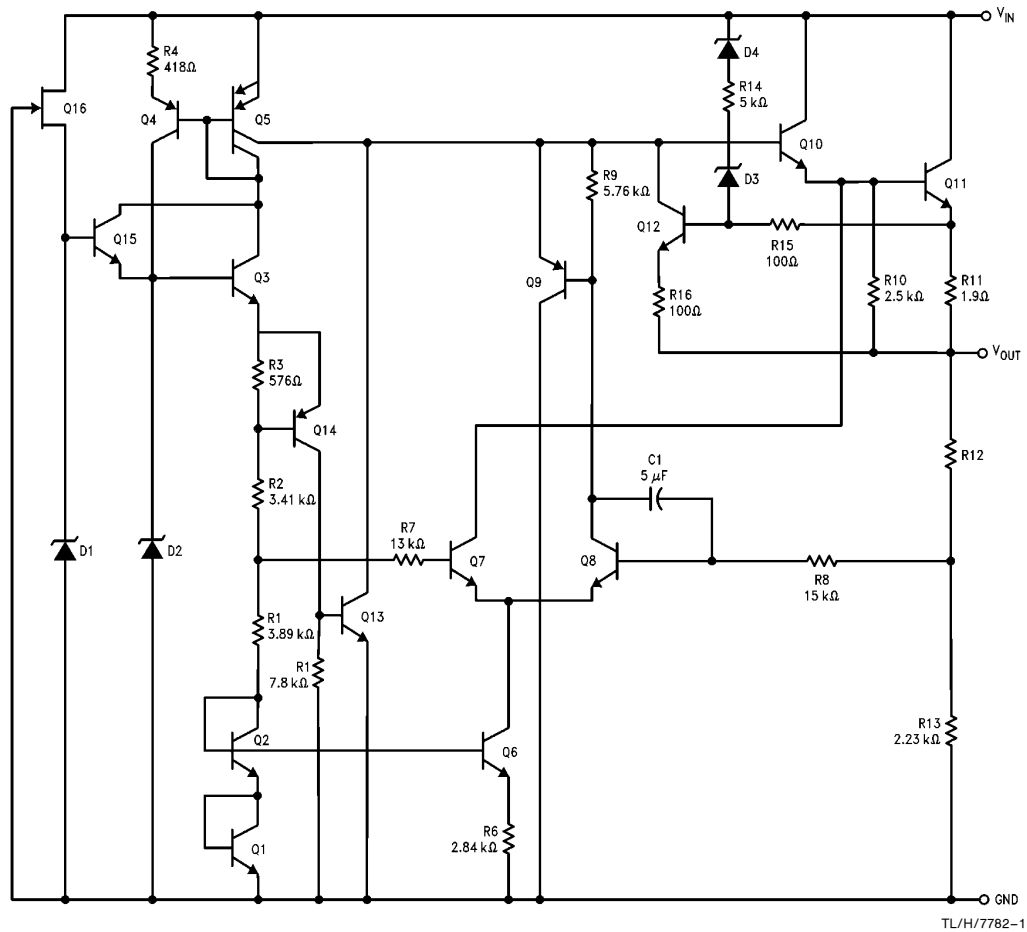


TL/H/7782-6

$$V_{OUT} = 5V + (5V/R1 + I_O) R2$$

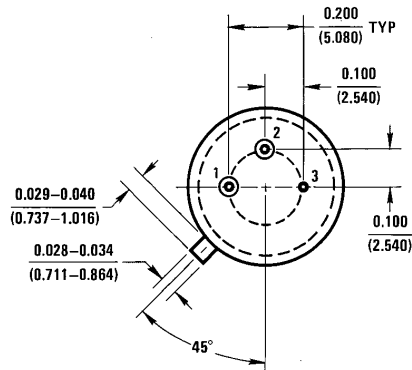
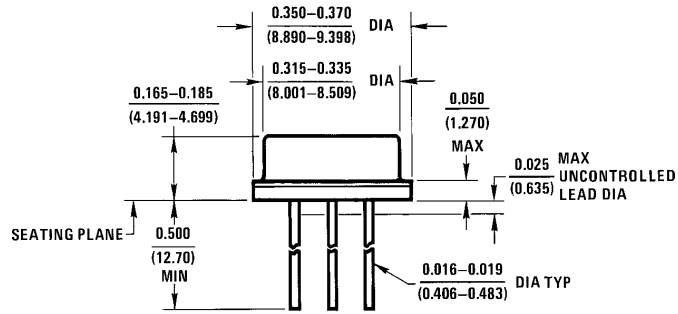
$$5V/R1 = 3 I_O \text{ load regulation (L.) } [(R1 + R2)/R1] \text{ (L. of LM140LA-5.0)}$$

Equivalent Circuit



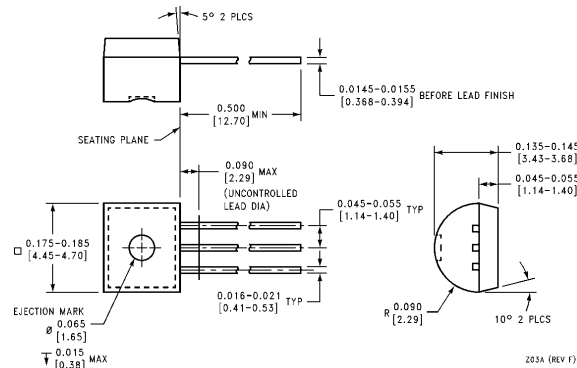
TL/H/7782-1

Physical Dimensions inches (millimeters)



H03A (REV B)

TO-39 Metal Can Package (H)
Order Number LM140LAH-5.0, LM140LAH-5.0/883, LM140LAH-12, LM140LAH-12/883,
LM140LAH-15, LM140LAH-15/883, LM340LAH-5.0, LM340LAH-12 or LM340LAH-15
NS Package Number H03A

Physical Dimensions inches (millimeters) (Continued)

TO-92 Plastic Package (Z)
Order Number LM340LAZ-5.0, LM340LAZ-12, or LM340LAZ-15
NS Package Number Z03A

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