

MNLM140LA-15-H REV 0B0

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THREE TERMINAL POSITIVE REGULATORS

General Description

The LM140LA is an improved version of the LM78LXX series with a tighter output voltage tolerance, 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 order 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, 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.

With adequate heat sinking the regulator can deliver 100mA 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 over-heating.

Industry Part Number

LM140LA

NS Part Numbers

LM140LAH-15/883

Prime Die

LM142A

Processing

MIL-STD-883, Method 5004

Quality Conformance Inspection

MIL-STD-883, Method 5005

Subgrp	Description	Temp (°C)
1	Static tests at	+25
2	Static tests at	+125
3	Static tests at	-55
4	Dynamic tests at	+25
5	Dynamic tests at	+125
6	Dynamic tests at	-55
7	Functional tests at	+25
8A	Functional tests at	+125
8B	Functional tests at	-55
9	Switching tests at	+25
10	Switching tests at	+125
11	Switching tests at	-55

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)
- Output current of 100 mA
- Internal thermal overload protection
- Output transistor safe area protection
- Internal short circuit current limit

(Absolute Maximum Ratings)

Input Voltage	35V
Internal Power Dissipation	Internally Limited
Operating Temperature Range	-55 C to +125 C
Maximum Junction Temperature	+150 C
Storage Temperature Range	-65 C to +150 C
Lead Temperature Soldering (10 seconds)	+300 C
Thermal Resistance	
ThetaJA	
H-Pkg (Still Air @ 0.5W)	201 C/W
H-Pkg (500LF/Min Air flow @ 0.5W)	79 C/W
ThetaJC	
H-Pkg (@ 1.0W)	38 C/W
ESD Susceptibility (Note 1)	TBD

Note 1: Human body model, 100pF discharged through 1.5K Ohms

Electrical Characteristics

DC PARAMETERS

(The following conditions apply to all the following parameters, unless otherwise specified.)

DC: $V_{in} = 23V$, $I_L = 40\text{ mA}$

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
Iq	Quiescent Current					4.5	mA	1
						4.2	mA	2
Vout	Output Voltage				14.7	15.3	V	1
		$V_{in} = 30V$, $I_L = 5mA$			14.4	15.6	V	1, 2, 3
		$V_{in} = 30V$, $I_L = 100mA$			14.4	15.6	V	1, 2, 3
		$V_{in} = 17.6V$, $I_L = 5mA$			14.4	15.6	V	1, 2, 3
		$V_{in} = 17.6V$, $I_L = 100mA$			14.4	15.6	V	1, 2, 3
Rload	Load Regulation	$I_L = 5mA$ to $40mA$			-50	50	mV	1
		$I_L = 5mA$ to $100mA$			-100	100	mV	1
Rline	Line Regulation	$I_L = 100mA$, $17.3V \leq V_{in} \leq 30V$			-70	70	mV	1
		$17.3V \leq V_{in} \leq 30V$			-70	70	mV	1
Delta Iq	Quiescent Current Change	$5mA \leq I_L \leq 40mA$			-0.1	0.1	mA	1, 2, 3
		$17.5V \leq V_{in} \leq 35V$			-0.5	0.5	mA	1

AC PARAMETERS

Rr	Ripple Rejection	$f = 120Hz$, $e_{in} = 1V(RMS)$			47		db	4
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DC PARAMETERS: DRIFT VALUES

(The following conditions apply to all the following parameters, unless otherwise specified.)

DC: $V_{in} = 23V$, $I_L = 40mA$. "Deltas not required on B-Level product. Deltas required for S-Level product ONLY as specified on Internal Processing Instructions (IPI)."

Iq	Quiescent Current				-0.9	0.9	V	1
Vout	Output Voltage				-0.075	0.075	V	1