National Semiconductor

MICROCIRCUIT DATA SHEET

MNLM169-X REV 0BL

Original Creation Date: 09/18/95
Last Update Date: 11/12/98
Last Major Revision Date: 09/18/95

PRECISION VOLTAGE REFERANCE

Industry Part Number

LM169

NS Part Numbers

LM169H/883*

Prime Die

LM169

Controlling Document

5962-9456101MGA*

Processing

MIL-STD-883, Method 5004

Quality Conformance Inspection

MIL-STD-883, Method 5005

Subgrp	Description	Temp (^{O}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

Electrical Characteristics

DC PARAMETERS: ELECTRICAL CHARACTERISTICS

(The following conditions apply to all the following parameters, unless otherwise specified.)
DC: 13V <= Vin = 17V, 0 <= Iload <= 1.0mA, Cl = <= 200PF

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
	Vout				9.995	10.005	V	1
					8.500	11.500	V	2, 3
	Vout Error				-500	500	ppm	1
					-5	5	mV	1
	Vout Tempco	Tmin < Tj < Tmax	1			5	ppm/C	2, 3
	Line Regulation	13V <= Vin <= 30V	2			4.0	ppm/V	1
			2			8.0	ppm/V	2, 3
		13V<=Vin<=30V	7		-680	680	uV	1
			7		-1360	1360	uV	2, 3
	Load Regulation Sourcing (ppm)	0 to 10mA	3, 4, 6		-8.0	8.0	ppm/mA	1
			3, 4, 6		-20.0	20.0	ppm/mA	2, 3
	Load Regulation Sourcing (Limits)	0 to 10mA	7		-800	800	uV	1
			7		-2000	2000	uV	2, 3
	Load Regulation Sinking (ppm)	0 to -10mA	5, 6			150	ppm/mA	1
			5, 6			350	ppm/mA	2, 3
	Load Regulation Sinking (Limits)	0 to -10mA	7		1	15	mV	1
			7		1	35	mV	2, 3
	Thermal Regulation Sourcing (ppm)	t = 10 msec After Load is Applied	8		-20	20	ppm/100	mW, 1
	Thermal Regulation Sourcing (Limits)	t = 10 msec After Load is Applied	7		-660	660	uV	1
	Supply Current				1.1	1.8	mA	1
					0.3	2.0	mA	2, 3
	Delta Supply Current	13V <= Vin <= 30V			-120	120	uA	1
					-350	350	uA	2, 3
	Short Circuit Current				15	50	mA	1
					11	65	mA	2, 3
	Noise Voltage	10Hz to 1kHZ				30	uVrms	1

Note 1: Temperature Coefficient of Vout is defined as the worst-case delta Vout measured at Specified Temperature divided by the total span of the Specified Temperature Range. There is no guarantee that the Specified Temperature are exactly at the minimum or maximum deviation.
Note 2: ppm of Vout nominal per volt of input voltage change.
Note 3: The LM169 has a class B output, and will exhibit transient at the crossover point. The point occures when the device is required to sink approximately 1.0mA. In some applications it may be advantageous to pre-load the output to either Vin or to ground, to avoid this crossover point.
Note 4: Regulation is measured at constant temperature using pulse testing with a low duty cycle. Changes in output voltage due to heating effects are covered under the specifications for Thermal Regulation and Tempco. Load Regulation is measured at a point on the output pin 1/8 inch below the bottom of the package.
Note 5: In Sinking mode, connect 0.1uF tantalum capacitor from output to ground.
Note 6: ppm of Vout nominal per mA of output current change.
Note 7: Actual test program limits. Same limits as preceeding parameter. (For ease of spec review).
Note 8: Thermal regulation is defined as the change in the output voltage at a time T after a step change of power dissipation of 100mW.

Graphics and Diagrams

GRAPHICS#	DESCRIPTION
H08CRE	(blank)

See attached graphics following this page.

Revision History

Rev	ECN #	Rel Date	Originator	Changes
0BL	M0001688	11/12/98	Barbara Lopez	Changed: MNLM169-X Rev. 0AL to MNLM169-X Rev. 0BL.