National Semiconductor

MICROCIRCUIT DATA SHEET

MNLM113-2-X REV 1A0

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REFERENCE DIODE

General Description

The LM113 is a temperature compensated, low voltage reference diode. It features extremely-tight regulation over a wide range of operating currents in addition to an unusually-low breakdown voltage and good temperature stability.

The diode is synthesized using transistors and resistors in a monolithic integrated circuit. As such, it has the same low noise and long term stability as modern IC op amps. Further, output voltage of the reference depends only on highly-predictable properties of components in the IC; so they can be manufactured and supplied to tight tolerances.

The characteristics of this reference recommend it for use in bias-regulation circuitry, in low-voltage power supplies or in battery powered equipment. The fact that the breakdown voltage is equal to a physical property of silicon-the energy-band gap voltage-makes it useful for many temperature-compensation and temperature-measurement functions.

Industry Part Number

LM113

NS Part Numbers

LM113-2H-QMLV **
LM113-2H-SMD *
LM113-2H/883

Prime Die

LM113

Controlling Document

See Features Page

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

- SMD : 5962- 8671103XA*, 5962-9684303VXA**

(Absolute Maximum Ratings)
(Note 1)

Power Dissipation	100 mW
Reverse Current	50 mA
Forward Current	50 mA
Storage Temperature Range	-65 C to +150 C
Lead Temperature (Soldering, 10 seconds)	300 C
Operating Temperature Range	-55 C to + 125 C

Note 1: For operating at elevated tempertures, the device must be derated based on a 150 C maximum junction and a thermal resistance of 80C/W junction to case or 440 C/W junction to ambient.

Electrical Characteristics

DC PARAMETERS

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
Vzr	Zener Voltage	Ir = 1 mA			1.195	1.245	V	1
					1.194	1.246	V	2, 3
Delta Vzr	Delta Zener Voltage	0.5mA <= Ir <= 20mA				15	mV	1
		0.5mA <= Ir <= 10mA				15	mV	2, 3
Vf	Forward Voltage Drop	If = 1mA				1	V	1, 2, 3
Rr	Reverse Dynamic Impedance	Ir = 1mA	1			1	Ohm	4
		Ir = 10mA	1			0.8	Ohm	4

DC PARAMETERS: DRIFT VALUES

(The following conditions apply to all the following parameters, unless otherwise specified.)
DC: Delta calculations performed on JAN S and QMLV devices at Group B, Subgroup 5 "ONLY".

Vzr	Zener Voltage	Ir = 1mA			-0.02	0.02	V	1

Note 1: Guaranteed parameter not tested.

Graphics and Diagrams

GRAPHICS#	DESCRIPTION
09385HR	(blank)
MKT-H02ARC	(blank)

See attached graphics following this page.