

MNLM113-1-X REV 1A0

 Original Creation Date: 11/07/96
 Last Update Date: 03/17/97
 Last Major Revision Date: 11/07/96

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

Prime Die

LM113

NS Part Numbers

 LM113-1H-QMLV **
 LM113-1H-SMD *
 LM113-1H/883

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 : 5962-8671102XA*, 5962-9684302VXA**

(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 temperatures, 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			1.210	1.232	V	1
					1.206	1.234	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, Sugroup 5 "ONLY".

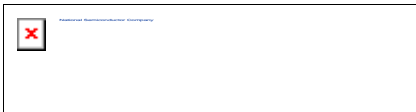
Vzr	Zener Voltage	Ir = 1mA			-0.02	0.02	V	1
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Note 1: Guaranteed parameter not tested.

Graphics and Diagrams

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

See attached graphics following this page.



LM113 Precision Reference

Generic P/N 113

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Parametric Table	
Output Current, max (Amp)	.02
Reference Voltage	1.22 V
Initial Accuracy (+/-), max(%) (%)	5
Operating Current, (mA) (mA)	.50

General Description

The LM113/LM313 are temperature compensated, low voltage reference diodes. They feature extremely-tight regulation over a wide range of operating currents in addition to an unusually-low breakdown voltage and good temperature stability.




The diodes are synthesized using transistors and resistors in a monolithic integrated circuit. As such, they have 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.

Features

- Low breakdown voltage: 1.220V
- Dynamic impedance of 0.3 Ohm from 500 μ A to 20 mA
- Temperature stability typically 1% over-55°C to 125°C range (LM113), 0°C to 70°C (LM313)
- Tight tolerance: \pm 5%, \pm 2% or \pm 1%



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.

Datasheet

Title	Size (in Kbytes)	Date	 View Online	 Download	 Receive via Email
LM113/LM313 Reference Diode	126 Kbytes	7-Jan-96	View Online	Download	Receive via Email
LM113 Mil-Aero Datasheet MNLM113-1-X	11 Kbytes		View Online	Download	Receive via Email
LM113 Mil-Aero Datasheet MNLM113-2-X	11 Kbytes		View Online	Download	Receive via Email
LM113 Mil-Aero Datasheet MNLM113-X	186 Kbytes		View Online	Download	Receive via Email




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Package Availability, Models, Samples & Pricing

Part Number	Package		Status	Models		Samples & Electronic Orders	Budgetary Pricing		Std Pack Size	Package Marking
	Type	# pins		SPICE	IBIS		Quantity	\$US each		
LM113H	TO-46	2	Full production	N/A	N/A		1K+	\$6.8000	bag of 100	[logo]¢2¢T LM113H
5962-8671102XA	TO-46	2	Full production	N/A	N/A		50+	\$23.5000	tray of 20	[logo]¢Z¢S¢4¢A 8671102XA Q\$E

5962-8671101XA	TO-46	2	Full production	N/A	N/A	.	50+	\$8.0500	tray of 20	[logo]çZçSç4çA 8671101XA Q\$E
LM113WG-MPR	Ceramic SOIC	10	Full production	N/A	N/A	.			tray of N/A	çZçSç4çA LM113WG-MPRPROTO [logo] \$E
5962-9684302VXA	TO-46	2	Full production	N/A	N/A	.	50+	\$245.0000	tray of 20	[logo]çZçSç4çA 9684302VXA \$E
5962-9684301VXA	TO-46	2	Full production	N/A	N/A	.	50+	\$235.0000	tray of 20	[logo]çZçSç4çA 9684301VXA\$E
LM113WG-QML	Ceramic SOIC	10	Full production	N/A	N/A	.			tray of N/A	çZçSç4çA LM113WG-QML 9684301QZA [logo] \$E
5962-9684301VZA	Ceramic SOIC	10	Full production	N/A	N/A	.	50+	\$266.0000	tray of 54	[logo] \$E çZçSç4çA 9684301VZA
LM113 MDS	die		Full production	N/A	N/A	.			N/A	-
LM113G MW8	wafer		Full production	N/A	N/A	.			N/A	-

Application Notes

Title	Size (in Kbytes)	Date	 View Online	 Download	 Receive via Email
AN-56: 1.2 Volt Reference	116 Kbytes	4-Nov-95	View Online	Download	Receive via Email
AN-154: 1.3 Volt IC Flasher, Oscillator, Trigger or Alarm	279 Kbytes	4-Nov-95	View Online	Download	Receive via Email

LB-24: Versatile IC PreAmplifier Makes Thermocouple Amplifier with Cold Junction Compensation	66 Kbytes	28-Jun-96	View Online	Download	Receive via Email
AN-110: Application Note 110 Fast IC Power Transistor with Thermal Protection	333 Kbytes	1-May-98	View Online	Download	Receive via Email
LB-21: Instrumentational Amplifiers	61 Kbytes	28-Jun-96	View Online	Download	Receive via Email
AN-178: Applications for an Adjustable IC Power Regulator	95 Kbytes	4-Nov-95	View Online	Download	Receive via Email
AN-222: Application Note 222 Super Matched Bipolar Transistor Pair Sets New Standards for Drift and Noise	399 Kbytes	24-Feb-99	View Online	Download	Receive via Email
LB-28: Linear Brief 28 General Purpose Power Supply	69 Kbytes	1-May-98	View Online	Download	Receive via Email
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