

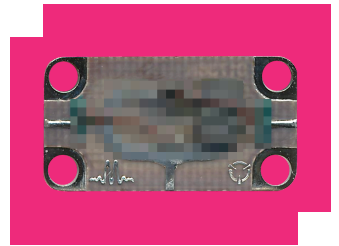
M1-0412NE-1

Double-Balanced 4 - 12 GHz Mixers

DEVICE OVERVIEW

General Description

M1 double balanced mixers are hybrid assemblies that have been hand-tuned to feature low conversion loss and high isolations and a DC IF response. M1 mixers have generally been replaced with MM1 mixers with superior performance, repeatability, and availability. M1 mixers are still used in legacy systems and are suitable for laboratory use.



Features

- LO/RF 4.0 to 12.0 GHz
- IF DC to 4.0 GHz
- 5.0 dB Typical Conversion Loss
- 40 dB Typical LO to RF Isolation
- Very-Broadband LO and RF

Applications

N/A

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Green Status	Product Lifecycle	Export Classification	Recommended Replacement
M1-0412HE-1	Double-Balanced 4 - 12 GHz Mixers	E	Non-RoHS	End of Life	EAR99	MM1-0312HSM-2
M1-0412HE-2	Double-Balanced 4 - 12 GHz Mixers	E	Non-RoHS	End of Life	EAR99	MM1-0312HSM-2
M1-0412NE-1	Double-Balanced 4 - 12 GHz Mixers	E	Consult Factory	End of Life	EAR99	MM1-0312HSM-2
M1-0412NE-2	Double-Balanced 4 - 12 GHz Mixers	E	Consult Factory	Obsolete	EAR99	MM1-0312HSM-2
M1-0412ME-1	Double-Balanced 4 - 12 GHz Mixers	E	Non-RoHS	Not Recommended for New Design	EAR99	MM1-0312HSM-2 MM1-0222LSM-2
M1-0412LE-1	Double-Balanced 4 - 12 GHz Mixers	E	Non-RoHS	Not Recommended for New Design	EAR99	MM1-0312HSM-2 MM1-0222LSM-2
M1-0412LE-2	Double-Balanced 4 - 12 GHz Mixers	E	Non-RoHS	Not Recommended for New Design	EAR99	MM1-0312HSM-2 MM1-0222LSM-2

Part Number	Description	Package	Green Status	Product Lifecycle	Export Classification	Recommended Replacement
<u>M1-0412LE-2</u>	Double-Balanced 4 - 12 GHz Mixers	E	Non-RoHS	Not Recommended for New Design	EAR99	<u>MM1-0312HSM-2</u> <u>MM1-0222LSM-2</u>
<u>M1-0412ME-2</u>	Double-Balanced 4 - 12 GHz Mixers	E	Non-RoHS	Not Recommended for New Design	EAR99	<u>MM1-0312HSM-2</u> <u>MM1-0222LSM-2</u>

Table Of Contents

■ Device Overview

- General Description
- Features
- Applications
- Functional Block Diagram

■ Port Configuration and Functions

- Port Diagram
- Port Functions

■ Specifications

- Package Information
- Recommended Operating Conditions
- Electrical Specifications
- Typical Performance Plots

■ Mechanical Data

- Outline Drawing

■ Footprint Image

■ Notes

END OF LIFE

Specifications

Package Information

Parameter	Details	Rating
Weight	Package name: E	1g
Dimensions	-	15.24 x 8.13 mm

Recommended Operating Conditions

Parameter	Min	Nominal	Max	Unit
LO Input Power	13	-	16	-

END OF LIFE

Electrical Specifications

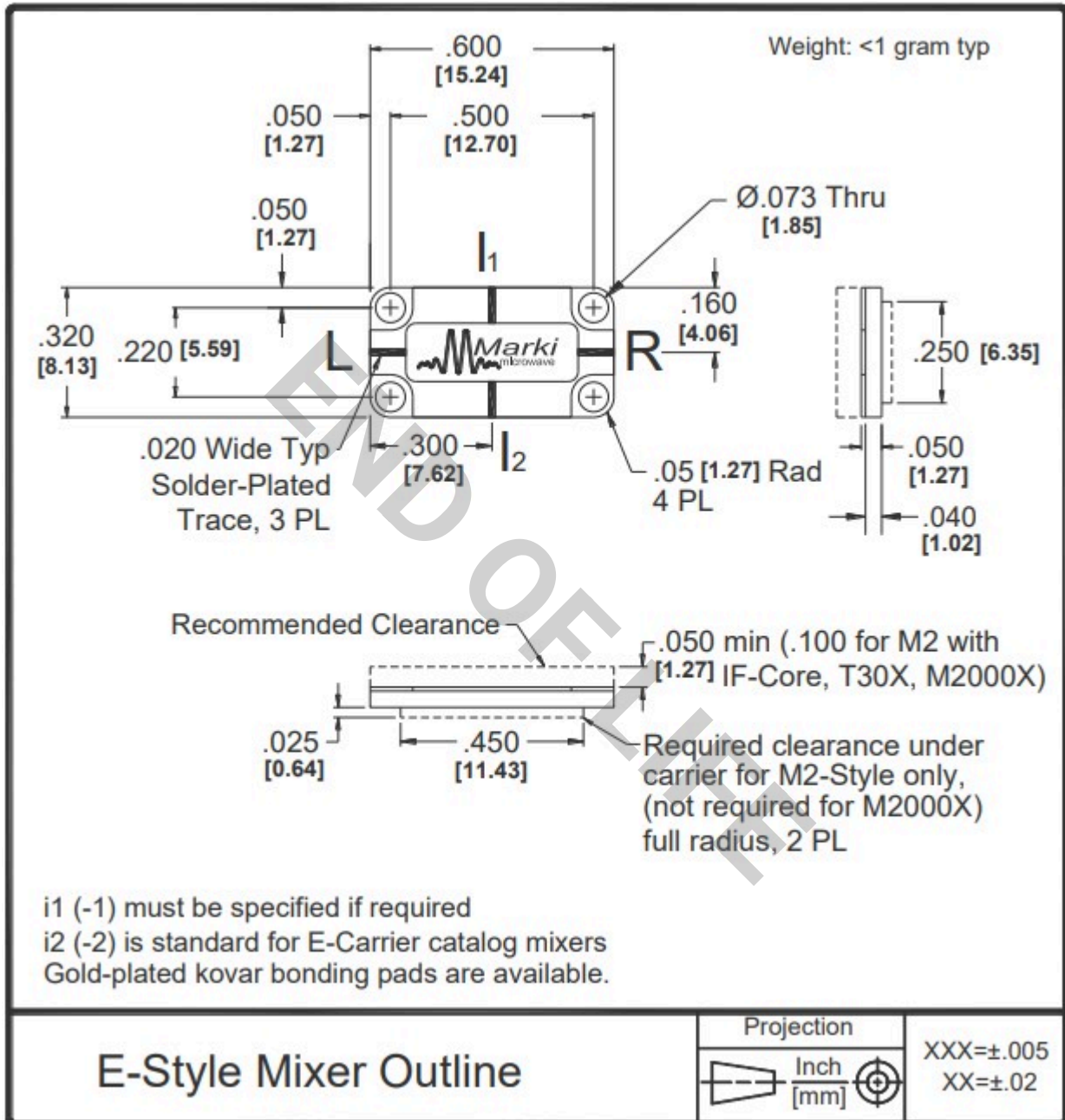
Specifications guaranteed from -55 to +100°C, measured in a 50-Ohm system.

Parameter	Test Conditions	Min	Typ	Max	Unit
Conversion Loss	LO/RF=4-12 GHz IF=1-4 GHz	-	6	8.5	dB
Conversion Loss	LO/RF=4-12 GHz IF=DC-1 GHz	-	5	8	dB
Input IP3	LO/RF=4-12 GHz LO drive level, N Diode Option=13-16 dBm	-	18	-	dBm
Input P1dB	LO/RF=4-12 GHz LO drive level, N Diode Option=13-16 dBm	-	8	-	dBm
LO-IF Isolation	LO/RF=4-12 GHz	-	30	-	dB
LO-RF Isolation	LO/RF=4-12 GHz	25	40	-	dB
RF-IF Isolation	LO/RF=4-12 GHz	-	25	-	dB
IF Frequency Range	-	0	-	4	GHz
Input IP3	-	-	18	-	dBm
Input P1dB	-	-	8	-	dBm
RF Frequency Range	-	4	-	12	GHz

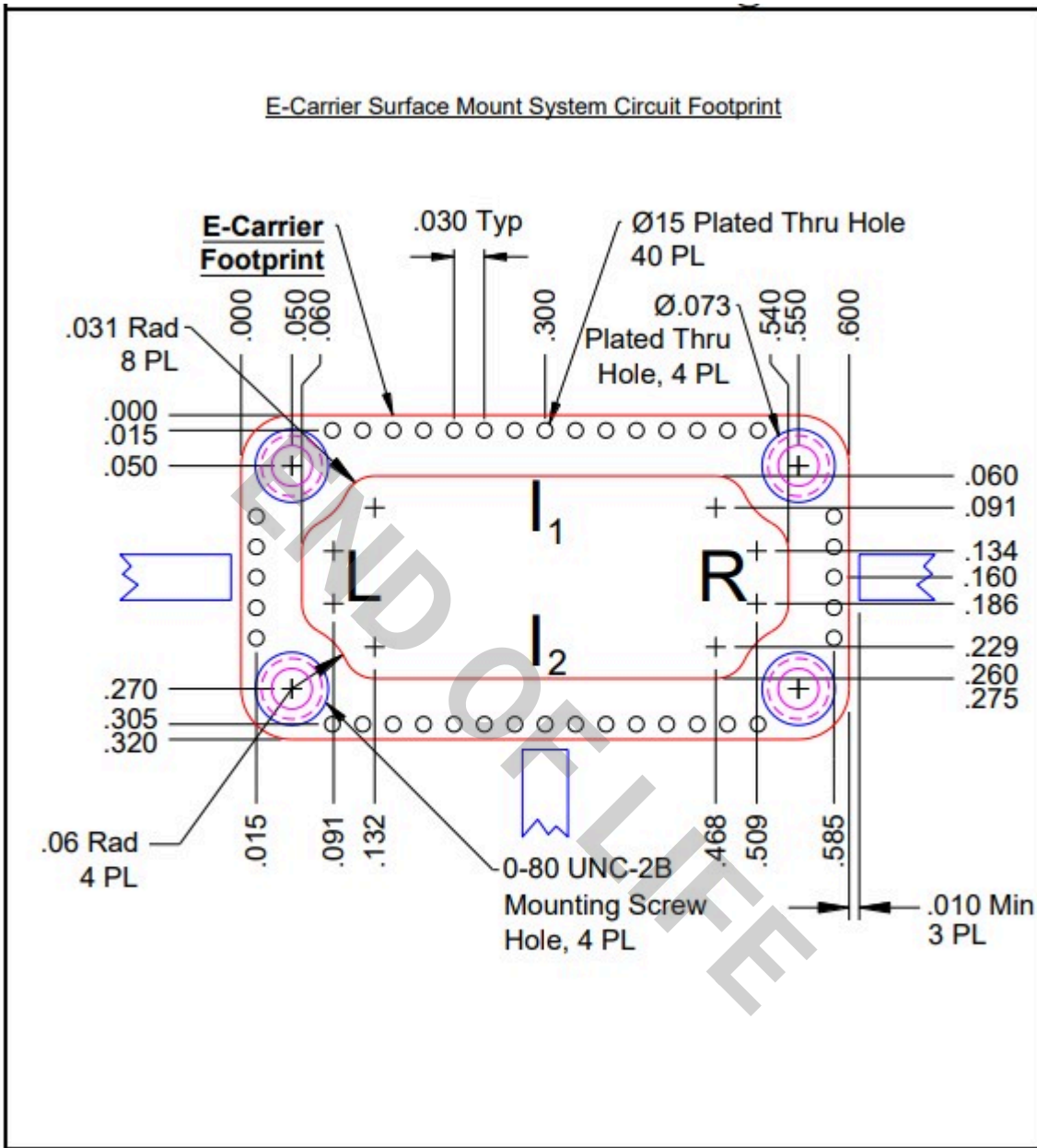
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Mechanical Data

Outline Drawing



Footprint Image



Notes

1. Mixer Conversion Loss Plot IF frequency is 100 MHz.
2. Mixer Noise Figure typically measures within +0.5 dB of conversion loss for IF frequencies greater than 5 MHz.
3. Conversion Loss typically degrades less than 0.5 dB for LO drives 2 dB below the lowest and 3 dB above highest nominal LO drive levels.
4. Conversion Loss typically degrades less than 0.5 dB at +100°C and improves less than 0.5 dB at -55°C.
5. Maximum input power is +23 dBm at +25°C, derated linearly to +20 dBm at +100°C.
6. Specifications are subject to change without notice. Contact Marki Microwave for the most recent specifications and data sheets.
7. Standard configuration for A, B, and C outlines are with connectors and bottom spacer.
8. Catalog mixer circuits are continually improved. Configuration control requires custom mixer model numbers and specifications.

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