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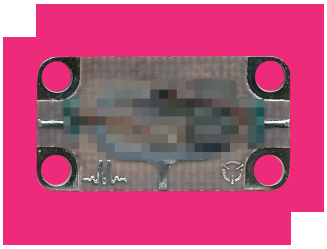
M1-0310LE-2

High Isolation Double-Balanced 3- 10 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.



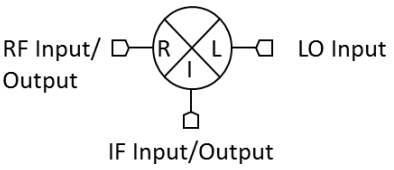
Features

- LO/RF 3.0 to 10.0 GHz
- IF DC to 3.0 GHz
- 6.0 dB Typical Conversion Loss
- 50 dB Typical LO to RF Isolation
- Carrier and Surface Mount Outlines
- Multi-Octave Band RF and LO

Applications

N/A

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Green Status	Product Lifecycle	Export Classification	Recommended Replacement
M1-0310HE-1	High Isolation Double-Balanced 3-10 GHz Mixers	E	Consult Factory	End of Life	EAR99	MM1-0312HSM-2
M1-0310LE-1	High Isolation Double-Balanced 3-10 GHz Mixers	E	Consult Factory	Not Recommended for New Design	EAR99	MM1-0212LSM-2MM1-0312HSM-2
M1-0310LE-2	High Isolation Double-Balanced 3-10 GHz Mixers	E	Consult Factory	Not Recommended for New Design	EAR99	MM1-0212LSM-2MM1-0312HSM-2
M1-0310ME-1	High Isolation Double-Balanced 3-10 GHz Mixers	E	Consult Factory	End of Life	EAR99	MM1-0212LSM-2MM1-0312HSM-2

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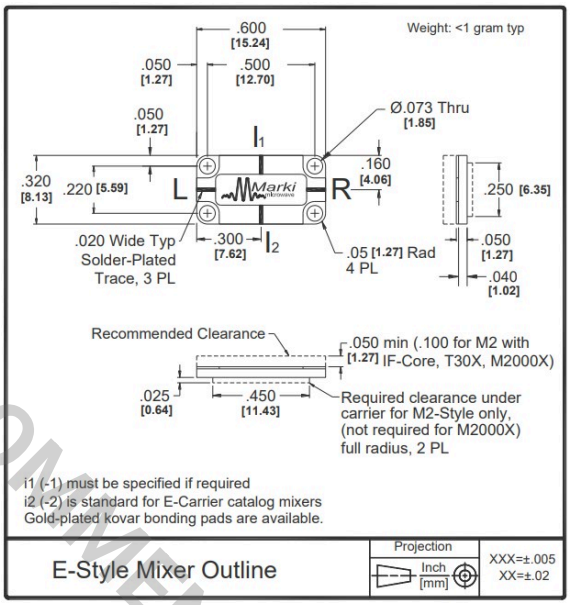
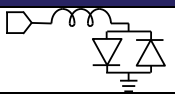
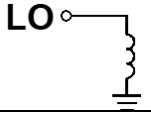
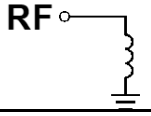
Port Configuration and Functions

Port Diagram



Port Functions

Port	Function	Description	Equivalent Circuit for Package
IF	IF	The IF port is DC coupled to the diodes and AC matched to 50 Ohms from 0 to 3 GHz. Blocking capacitor is optional.	
LO	LO	The LO port is DC coupled to ground and AC matched to 50 Ohms from 3 to 10 GHz. Blocking capacitor is optional.	
RF	RF	The RF port is DC coupled to ground and AC matched to 50 Ohms from 3 to 10 GHz. Blocking capacitor is optional.	

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	7	-	10	-

Electrical Specifications

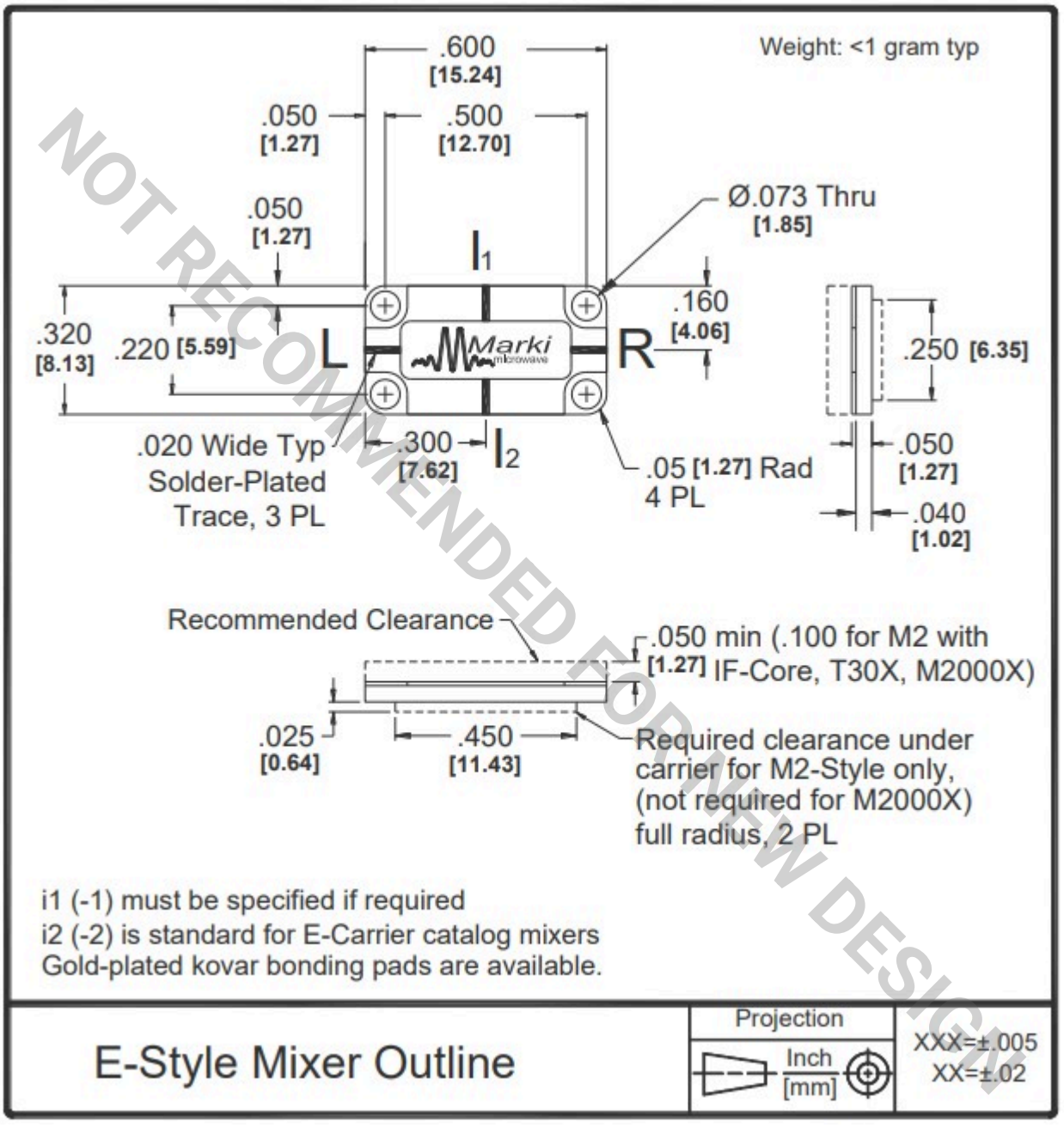
Specifications guaranteed from -55 to +100°C, measured in a 50-Ohm system.

Parameter	Test Conditions	Min	Typ	Max	Unit
Conversion Loss	LO/RF=3-10 GHz IF=1-3 GHz	-	6.5	9.5	dB
Conversion Loss	LO/RF=3-10 GHz IF=DC-1 GHz	-	6	9	dB
Input 1 dB Compression	LO/RF=3-10 GHz LO drive level, L Diode Option=7-10 dBm	-	2	-	dBm
Input IP3	LO/RF=3-10 GHz LO drive level, L Diode Option=7-10 dBm	-	12	-	dBm
Isolation, LO to IF [1]	LO/RF=3-10 GHz	-	40	-	dB
Isolation, LO to RF [2]	LO/RF=3-10 GHz	-	40	-	dB
Isolation, RF to IF [3]	LO/RF=3-10 GHz	-	25	-	dB
IF Frequency Range	-	0	-	10	GHz
Input IP3	-	-	12	-	dBm
Input P1dB	-	-	2	-	dBm
RF Frequency Range	-	3	-	12	GHz

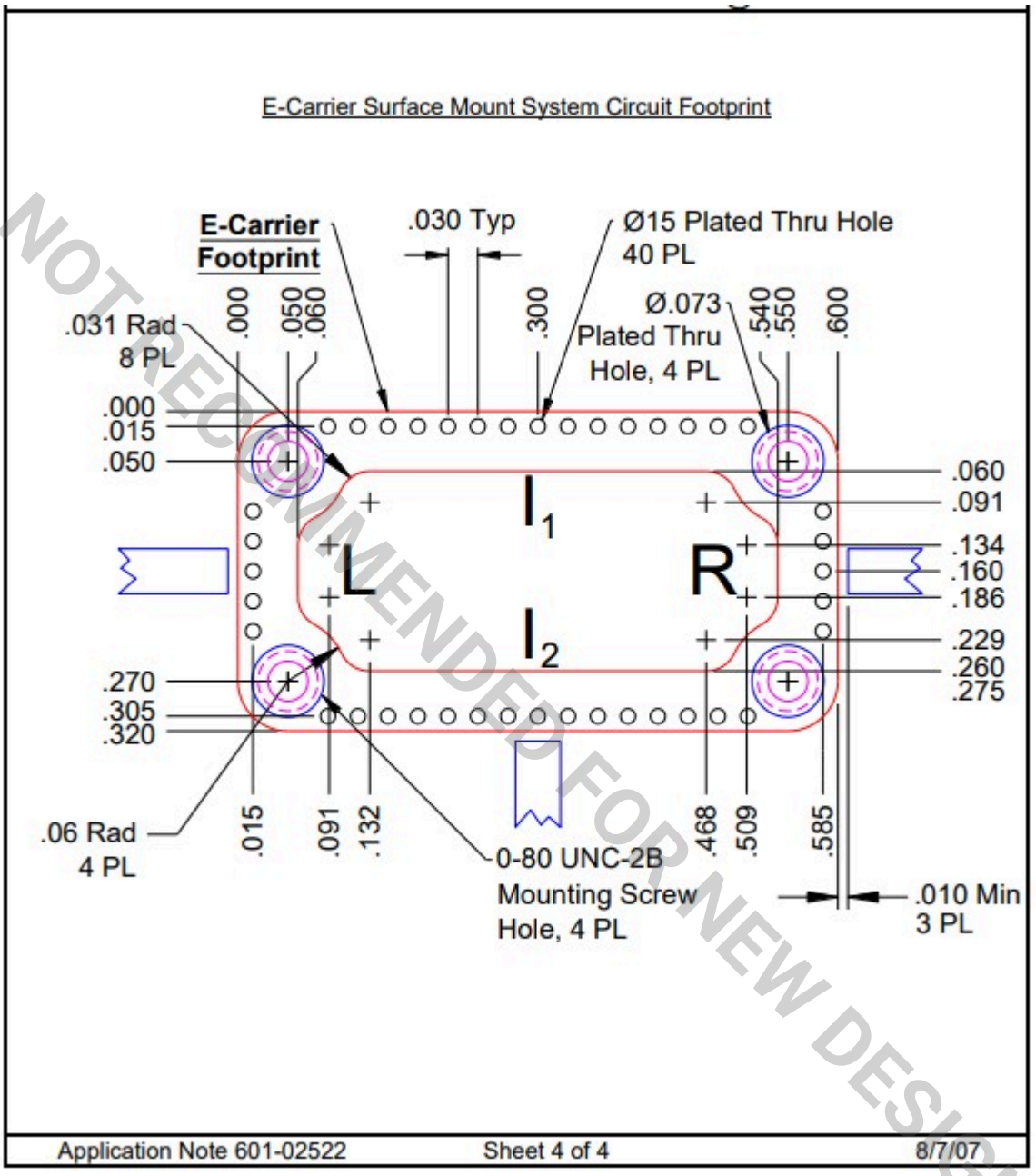
[1][2][3] High 2nd/3rd LO Harmonics can mix to produce a higher intermodulation output than the actual isolation output.

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.

DISCLAIMER