

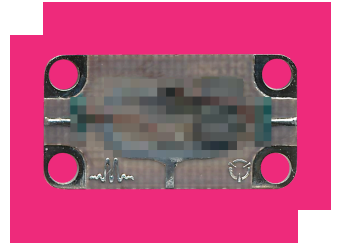
# M1-0620NE-2

## Double-Balanced 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 6.0 to 20.0 GHz
- IF DC to 6.0 GHz
- 5.5 dB Typical Conversion Loss
- 40 dB Typical LO to RF Isolation
- Broadband RF and LO

#### Applications

N/A

#### Functional Block Diagram



#### Part Ordering Options

Part Number	Description	Package	Green Status	Product Lifecycle	Export Classification	Recommended Replacement
<a href="#">M1-0620SE-2</a>	Double-Balanced Mixers	E	Non-RoHS	Not Recommended for New Design	EAR99	<a href="#">MM1-0626HSM-2</a> <a href="#">2MM1-0626SSM-2</a>
<a href="#">M1-0620HE-2</a>	Double-Balanced Mixers	E	Non-RoHS	End of Life	EAR99	<a href="#">MM1-0626HSM-2</a>
M1-0620NE-2	Double-Balanced Mixers	E	<a href="#">Consult Factory</a>	Not Recommended for New Design	EAR99	<a href="#">MM1-0626HSM-2</a>
<a href="#">M1-0620NE-1</a>	Double-Balanced Mixers	E	<a href="#">Consult Factory</a>	Not Recommended for New Design	EAR99	<a href="#">MM1-0626HSM-2</a>
<a href="#">M1-0620ME-2</a>	Double-Balanced Mixers	E	Non-RoHS	Not Recommended for New Design	EAR99	<a href="#">MM1-0222LSM-2</a> <a href="#">2MM1-0626HSM-2</a>
<a href="#">M1-0620ME-1</a>	Double-Balanced Mixers	E	<a href="#">Consult Factory</a>	Not Recommended for New Design	EAR99	<a href="#">MM1-0222LSM-2</a> <a href="#">2MM1-0626HSM-2</a>
<a href="#">M1-0620LE-2</a>	Double-Balanced Mixers	E	Non-RoHS	End of Life	EAR99	<a href="#">MM1-0222LSM-2</a> <a href="#">2MM1-0626HSM-2</a>

Part Number	Description	Package	Green Status	Product Lifecycle	Export Classification	Recommended Replacement
<u>M1-0620LE-2</u>	Double-Balanced Mixers	E	Non-RoHS	End of Life	EAR99	<u>MM1-0222LSM-2MM1-0626HSM-2</u>
<u>M1-0620LE-1</u>	Double-Balanced Mixers	E	<u>Consult Factory</u>	End of Life	EAR99	<u>MM1-0222LSM-2MM1-0626HSM-2</u>

## Table Of Contents

- **Device Overview**

- General Description
- Features
- Applications
- Functional Block Diagram

- **Port Configuration and Functions**

- Port Functions

- **Specifications**

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

- **Mechanical Data**

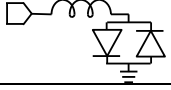
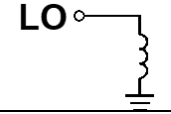
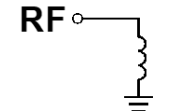
- Outline Drawing

- **Notes**

NOT RECOMMENDED FOR NEW DESIGN

**Port Configuration and Functions**

**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 6 GHz. Blocking capacitor is optional.	
LO	LO	The LO port is DC coupled to ground and AC matched to 50 Ohms from 6 to 20 GHz. Blocking capacitor is optional.	
RF	RF	The RF port is DC coupled to ground and AC matched to 50 Ohms from 6 to 20 GHz. Blocking capacitor is optional.	

NOT RECOMMENDED FOR NEW DESIGN

## 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	-

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**Electrical Specifications**

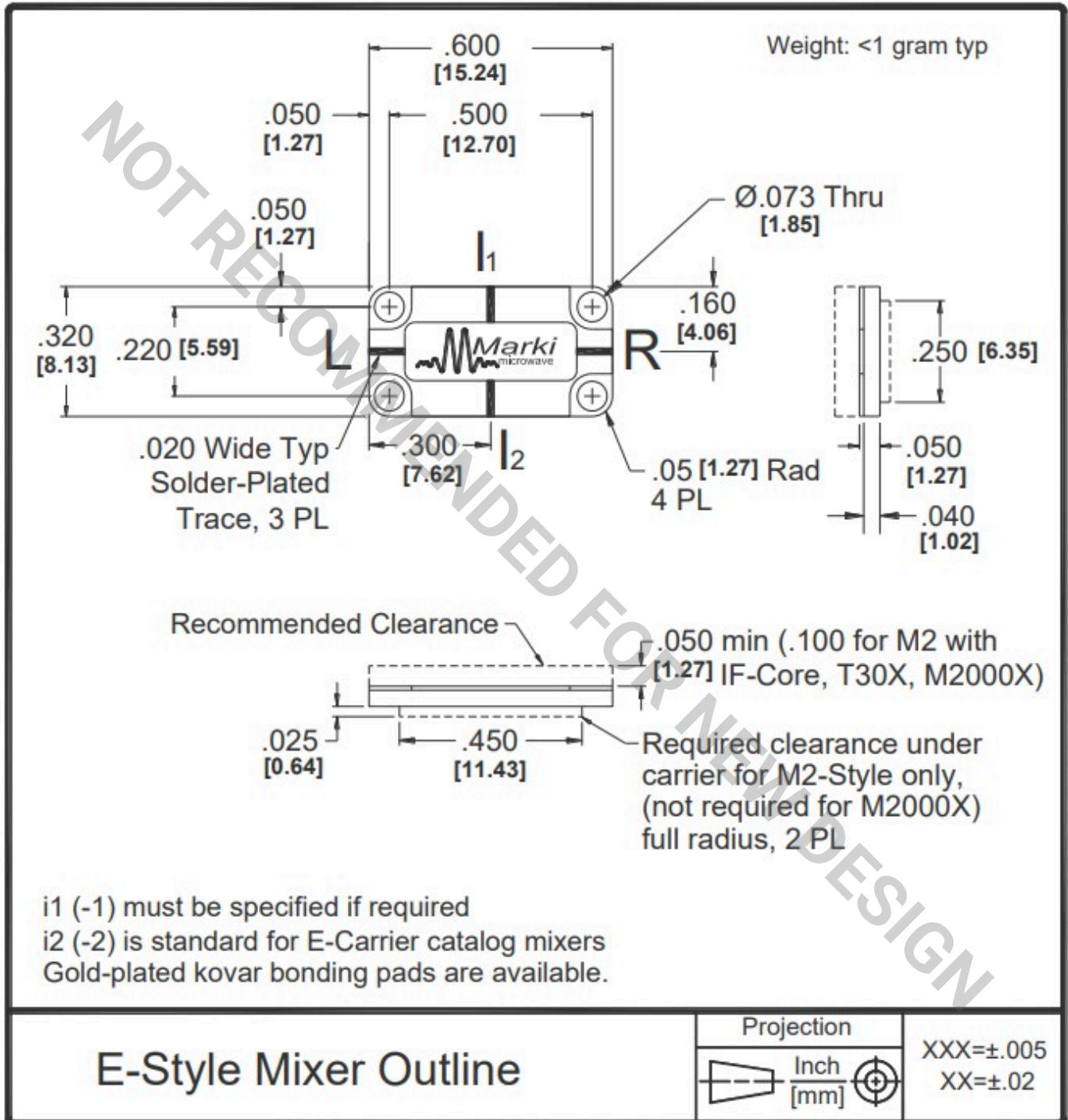
Specifications guaranteed from -55 to +100°C, measured in a 50-Ohm system.

Parameter	Test Conditions	Min	Typ	Max	Unit
Conversion Loss	LO/RF=6-20 GHz IF=3-6 GHz	-	8	13	dB
Conversion Loss	LO/RF=6-20 GHz IF=DC-3 GHz	-	6.5	13	dB
Input 1 dB Compression <sup>1</sup>	LO/RF=6-20 GHz LO drive level, N Diode Option=13-16 dBm	-	8	-	dBm
Input IP3 <sup>2</sup>	LO/RF=6-20 GHz LO drive level, N Diode Option=13-16 dBm	-	17	-	dBm
Isolation, LO to IF	LO/RF=6-20 GHz	-	20	-	dB
Isolation, LO to RF	LO/RF=12-20 GHz	30	40	-	dB
Isolation, LO to RF	LO/RF=6-12 GHz	25	30	-	dB
Isolation, RF to IF	LO/RF=6-20 GHz	-	25	-	dB
IF Frequency Range	-	0	-	6	GHz
Input P1dB	-	-	8	-	dBm
RF Frequency Range	-	6	-	20	GHz

<sup>[1][2]</sup> 1-dB Compression and Third Order Intercept are degraded for LO frequencies below 13 GHz

**Mechanical Data**

**Outline Drawing**



## Notes

### DATA SHEET 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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