

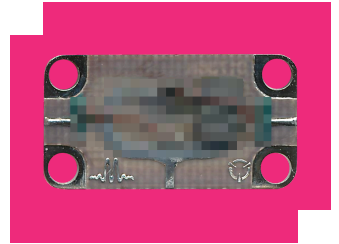
M1-0620ME-2

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.



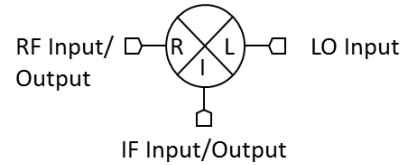
Features

- 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 |
|-----------------------------|------------------------|---------|---------------------------------|--------------------------------|-----------------------|---|
| M1-0620HE-2 | Double-Balanced Mixers | E | Non-RoHS | End of Life | EAR99 | MM1-0626HSM-2 |
| M1-0620NE-2 | Double-Balanced Mixers | E | Consult Factory | Not Recommended for New Design | EAR99 | MM1-0626HSM-2 |
| M1-0620SE-2 | Double-Balanced Mixers | E | Non-RoHS | Not Recommended for New Design | EAR99 | MM1-0626HSM-2 2MM1-0626SSM-2 |
| M1-0620NE-1 | Double-Balanced Mixers | E | Consult Factory | Not Recommended for New Design | EAR99 | MM1-0626HSM-2 |
| M1-0620ME-2 | Double-Balanced Mixers | E | Non-RoHS | Not Recommended for New Design | EAR99 | MM1-0222LSM-2 2MM1-0626HSM-2 |
| M1-0620ME-1 | Double-Balanced Mixers | E | Consult Factory | Not Recommended for New Design | EAR99 | MM1-0222LSM-2 2MM1-0626HSM-2 |
| M1-0620LE-2 | Double-Balanced Mixers | E | Non-RoHS | End of Life | EAR99 | MM1-0222LSM-2 2MM1-0626HSM-2 |

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


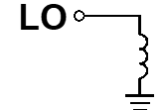
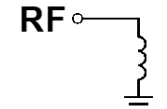
Table Of Contents

- **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 | 10 | - | 13 | - |

NOT RECOMMENDED FOR NEW DESIGN

Electrical Specifications

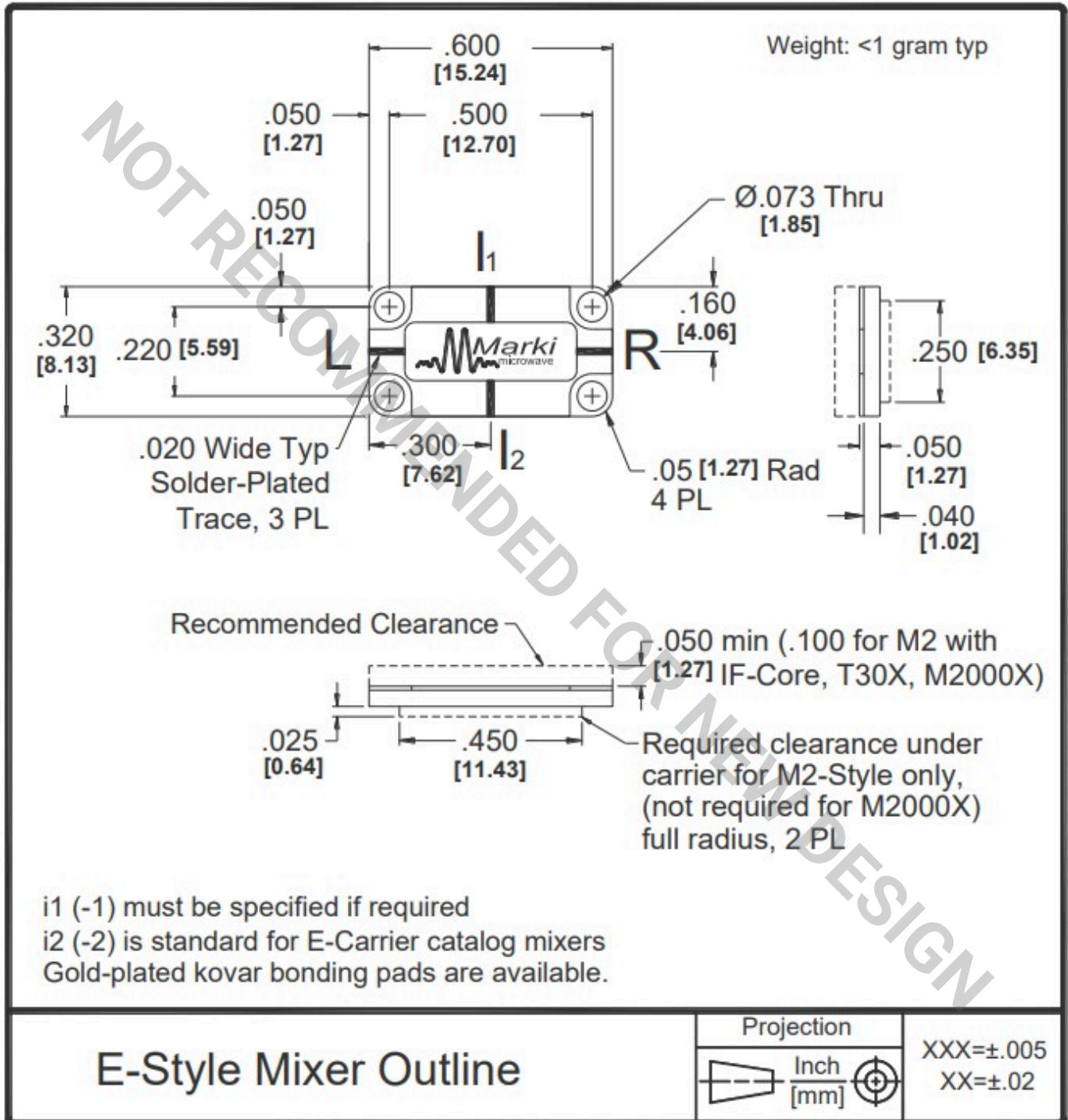
Specifications guaranteed from -55 to +100°C, measured in a 50-Ohm system.

| Parameter | Test Conditions | Min | Typ | Max | Unit |
|-------------------------------------|--|-----|-----|-----|------|
| Conversion Loss | LO/RF=6-20 GHz IF=3-6 GHz | - | 6.5 | 8.5 | dB |
| Conversion Loss | LO/RF=6-20 GHz IF=DC-3 GHz | - | 5.5 | 7.5 | dB |
| Input 1 dB Compression ¹ | LO/RF=6-20 GHz LO drive level, M Diode Option=10-13 dBm | - | 5 | - | dBm |
| Input IP3 ² | LO/RF=6-20 GHz LO drive level, M Diode Option=10-13 dBm | - | 15 | - | dBm |
| Isolation, LO to IF | LO/RF=6-20 GHz | - | 20 | - | dB |
| Isolation, LO to RF | LO/RF=6-20 GHz | 30 | 40 | - | dB |
| Isolation, RF to IF | LO/RF=6-20 GHz | - | 25 | - | dB |
| IF Frequency Range | - | 0 | - | 6 | GHz |
| Input 1 dB Compression | - | - | 5 | - | dBm |
| Input IP3 | - | - | 15 | - | dBm |
| RF Frequency Range | - | 6 | - | 20 | GHz |

^{[1][2]} 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.

DISCLAIMER

MARKI MICROWAVE, INC., ("MARKI") PROVIDES TECHNICAL SPECIFICATIONS AND DATA (INCLUDING DATASHEETS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, AND OTHER INFORMATION AND RESOURCES "AS IS" AND WITH ALL FAULTS. MARKI DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT. These resources are intended for developers skilled in the art designing with Marki products. You are solely responsible for (1) selecting the appropriate products for your application, (2) designing, validating, and testing your application, and (3) ensuring your application meets applicable standards and other requirements. Marki makes no guarantee regarding the suitability of its products for any particular purpose, nor does Marki assume any liability whatsoever arising out of your use or application of any Marki product. Marki grants you permission to use these resources only for development of an application that uses Marki products. Other reproduction or use of these resources is strictly prohibited. No license is granted to any other Marki intellectual property or to any third-party intellectual property. Marki reserves the right to make changes to the product(s) or information contained herein without notice. MARKI MICROWAVE and T3 MIXER are trademarks or registered trademarks of Marki Microwave, Inc. All other trademarks used are the property of their respective owners.

© 2022 - 2025, Marki Microwave, Inc