

# M1-0204MP

## 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.



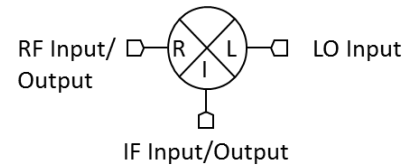
#### Features

- LO/RF 2.0 to 4.0 GHz
- IF DC to 2.0 GHz
- 5.0 dB Typical Conversion Loss
- 35 dB Typical LO to RF Isolation

#### Applications

N/A

#### Functional Block Diagram



#### Part Ordering Options

Part Number	Description	Package	Connectors	Green Status	Product Lifecycle	Export Classification	Recommended Replacement
M1-0204MP	Double-Balanced Mixers	P	<u>Standard</u>	<u>Consult Factory.</u>	Not Recommended for New Design	EAR99	<u>MM1-0212LS</u>
<u>M1-0204HP</u>	Double-Balanced Mixers	P	<u>Standard</u>	<u>Consult Factory.</u>	End of Life	EAR99	<u>MM1-0212HSMM1-0212SS</u>
<u>M1-0204LP</u>	Double-Balanced Mixers	P	<u>Standard</u>	<u>Consult Factory.</u>	Not Recommended for New Design	EAR99	<u>MM1-0212LS</u>
<u>M1-0204NP</u>	Double-Balanced Mixers	P	<u>Standard</u>	<u>Consult Factory.</u>	End of Life	EAR99	<u>MM1-0212LSMM1-0212HS</u>

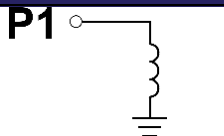
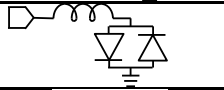
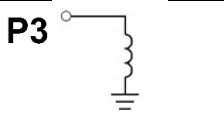
## Table Of Contents

- **Device Overview**
  - General Description
  - Features
  - Applications
  - Functional Block Diagram
- **Port Configuration and Functions**
  - Port Functions
- **Specifications**
  - Package Information
  - Recommended Operating Conditions
  - Electrical Specifications
- **Mechanical Data**
  - Outline Drawing
- **Notes**

NOT RECOMMENDED FOR NEW DESIGN

**Port Configuration and Functions**

**Port Functions**

Port	Function	Connector Type	Description	Equivalent Circuit for Package
Port 1	LO	SMAF	Port 1 is DC short for the P package.	
Port 2	IF	SMAF	Port 2 is diode connected for the P Package.	
Port 3	RF	SMAF	Port 3 is DC short for the P Package.	

NOT RECOMMENDED FOR NEW DESIGN

**Specifications**

**Package Information**

Parameter	Details	Rating
Weight	Package name: P	18g
Dimensions	-	20.32 x 14.99 mm

**Recommended Operating Conditions**

Parameter	Min	Nominal	Max	Unit
LO Input Power	10	-	13	-

NOT RECOMMENDED FOR NEW DESIGN

### Electrical Specifications

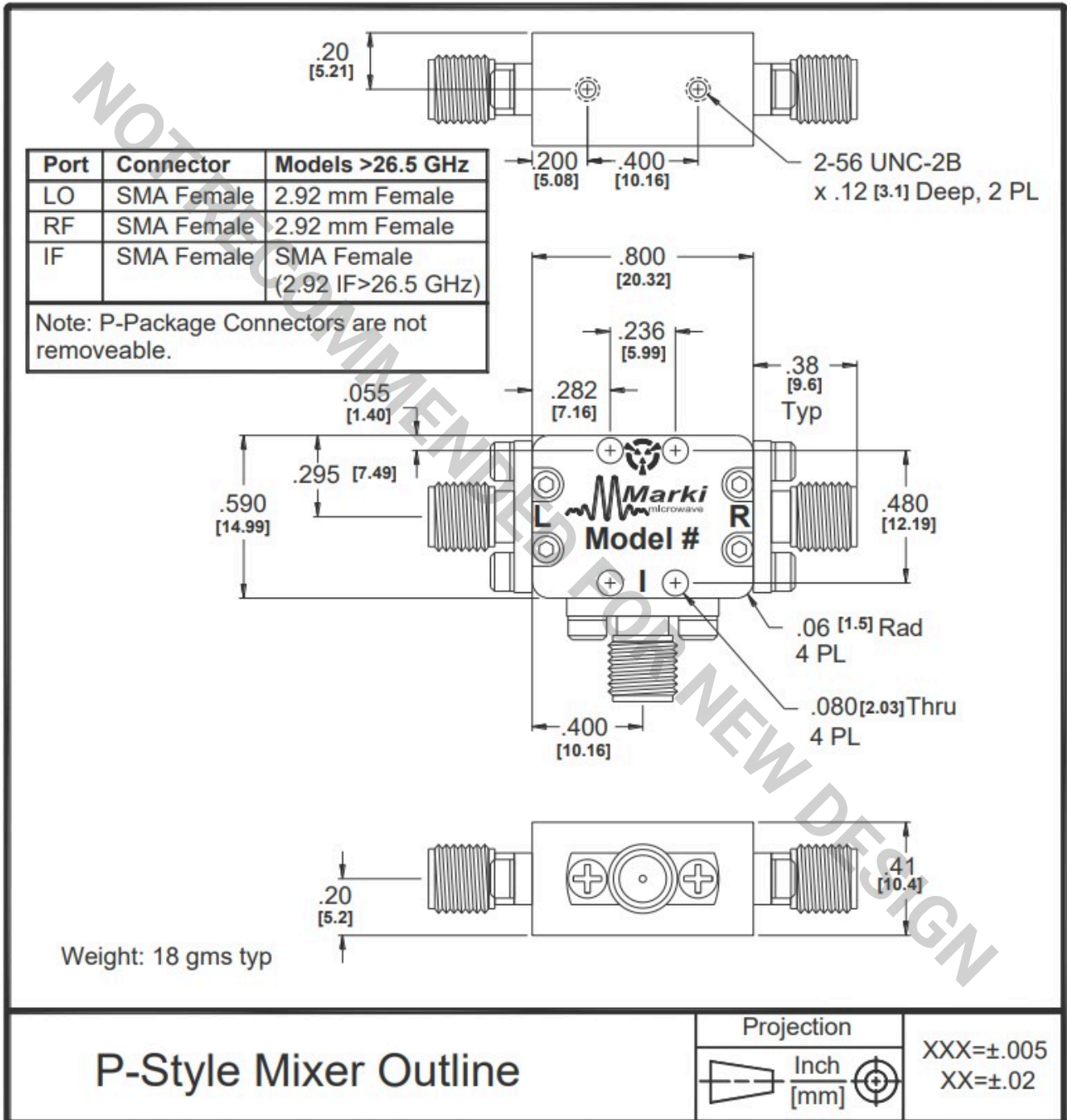
Specifications guaranteed from -55 to +100°C, measured in a 50-Ohm system.

Parameter	Test Conditions	Min	Typ	Max	Unit
Conversion Loss	LO/RF=2-4 GHz IF=1-2 GHz	-	6	8	dB
Conversion Loss	LO/RF=2-4 GHz IF=DC-1 GHz	-	5	7	dB
IF Frequency Range	-	0	-	2	GHz
Input 1 dB Compression	LO/RF=2-4 GHz LO drive level, M Diode Option=10-13 dBm	-	5	-	dBm
Input IP3	LO/RF=2-4 GHz LO drive level, M Diode Option=10-13 dBm	-	15	-	dBm
Isolation, LO to IF	LO/RF=2-4 GHz	-	20	-	dB
Isolation, LO to RF	LO/RF=2-4 GHz	25	38	-	dB
Isolation, RF to IF	LO/RF=2-4 GHz	-	25	-	dB
LO Drive Level	-	10	-	13	dBm
RF Frequency Range	-	2	-	4	GHz
Input 1 dB Compression	-	-	5	-	dBm
Input IP3	-	-	15	-	dBm

**Mechanical Data**

**Outline Drawing**

Download : [Outline 3D Drawing](#) | [Outline 3D STP](#)



## 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