

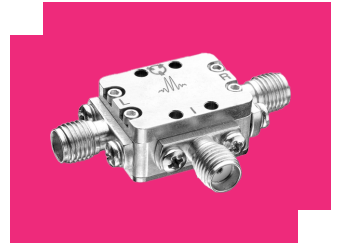
M1-0616MA

Double-Balanced Mixer

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.



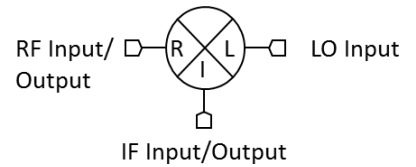
Features

- LO/RF 6.0 to 16.0 GHz
- IF DC to 4.0 GHz
- 5.5 dB Typical Conversion Loss
- 35 dB Typical LO to RF Isolation
- Broadband RF and LO

Applications

N/A

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Connectors	Green Status	Product Lifecycle	Export Classification	Recommended Replacement
M1-0616MP	Double-Balanced Mixers	P	Standard	Consult Factory.	Not Recommended for New Design	EAR99	MM1-0320HS MM1-0320LS
M1-0616LP	Double-Balanced Mixers	P	Standard	Non-RoHS	End of Life	EAR99	MM1-0320LS
M1-0616NP	Double-Balanced Mixers	P	Standard	Consult Factory.	End of Life	EAR99	MM1-0320HS
M1-0616MA	Double-Balanced Mixer	A	Standard	Consult Factory.	Not Recommended for New Design	EAR99	-
M1-0616HP	Double-Balanced Mixers	P	Standard	Consult Factory.	End of Life	EAR99	MM1-0320HS

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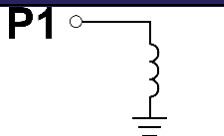
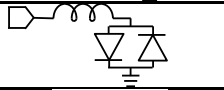
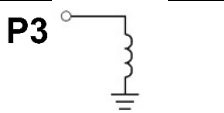
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Revision History

Revision Code	Revision Date	Comment
-	2015-01-01	Initial Datasheet Release
A	2024-03-07	Revised electrical specs table for Conversion Loss and LO-to-RF Isolation specifications.

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
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.

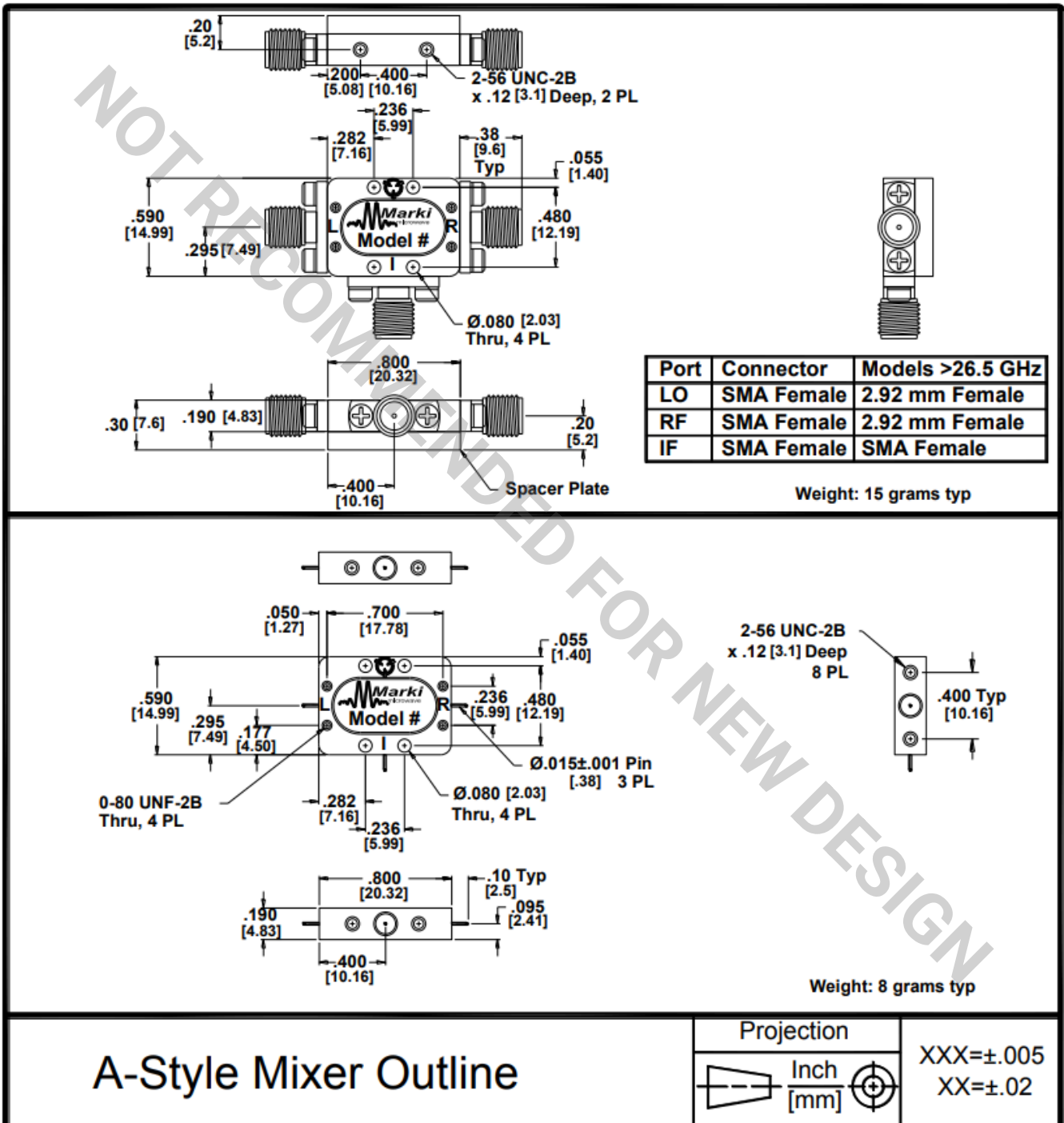
Parameter	Test Conditions	Min	Typ	Max	Unit
Conversion Loss	LO/RF=6-16 GHz IF=2-4 GHz	-	6.5	10.5	dB
Conversion Loss	LO/RF=6-16 GHz IF=DC-2 GHz	-	5.5	8	dB
IF Frequency Range	-	0	-	4	GHz
Input 1 dB Compression	LO/RF=6-16 GHz LO drive level, M Diode Option=10-13 dBm	-	5	-	dBm
Input 1 dB Compression	-	-	5	-	dBm
Input IP3	LO/RF=6-16 GHz LO drive level, M Diode Option=10-13 dBm	-	15	-	dBm
Input IP3	-	-	15	-	dBm
Isolation, LO to IF	LO/RF=6-16 GHz	-	30	-	dB
Isolation, LO to RF	LO/RF=6-16 GHz	20	35	-	dB
Isolation, RF to IF	LO/RF=6-16 GHz	-	25	-	dB
RF Frequency Range	-	6	-	16	GHz

NOT RECOMMENDED FOR NEW DESIGN

Mechanical Data

Outline Drawing

Download : [Outline 2D Drawing](#) | [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.

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