Sales: 408-778-9952 | General: 408-778-4200 | Fax: 408-778-4300
Sales & Customer Support: sales@markimicrowave.com
Tech Support: support@markimicrowave.com

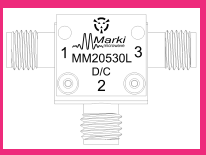
MM2-0530LBH

GaAs MMIC 5-30 GHz Triple Balanced Mixer

DEVICE OVERVIEW

General Description

The MM2-0530LBH is a passive MMIC triple balanced mixer. It features a broadband IF port that spans from 2 to 20 GHz, and has excellent spurious suppression. GaAs MMIC technology improves upon the previous generation of hand assembled, hybrid M2 triple balanced mixers with improved isolations, unit-to-unit repeatability and reliability. The MM2-0530L is available as a wire bondable chip or connectorized bullet housing package.



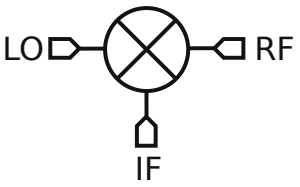
Features

- Broadband IF Port
- Typical Input 1 dB Compression of +9 dBm
- High Input IP3 of +15 dBm
- Excellent LO to IF Isolation
- Unit-to-Unit Repeatability
- RoHS Compliant

Applications

- SATCOM
- Test and Measurement Equipment
- Aerospace and Defense
- Electronic Warfare

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Connectors	Green Status	Product Lifecycle	Export Classification
MM2-0530LBH	GaAs MMIC 5-30 GHz Triple Balanced Mixer	BH	-	REACH RoHS	Released	EAR99

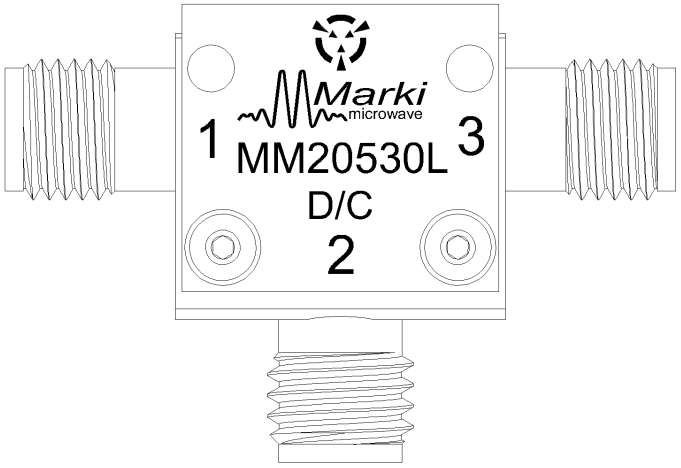
Table Of Contents

Revision History

Revision Code	Revision Date	Comment
-	2026-02-13	Initial Release

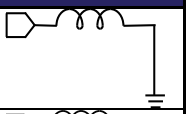
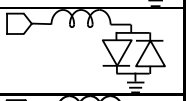
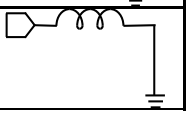
Port Configuration and Functions

Port Diagram

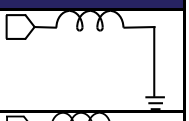
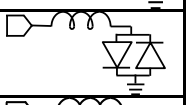
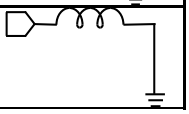


Port Functions

Configuration A

Port	Function	Connector Type	Description	DC Equivalent Circuit
Port 1	LO	2.92F	Port 1 is DC short and AC matched to 50 Ω from 5 to 30 GHz. Blocking capacitor is optional.	
Port 2	IF	2.92F	Port 2 is DC coupled to the diodes. Blocking capacitor is optional.	
Port 3	RF	2.92F	Port 3 is DC short and AC matched to 50 Ω from 5 to 30 GHz. Blocking capacitor is optional.	

Configuration B

Port	Function	Connector Type	Description	DC Equivalent Circuit
Port 1	RF	2.92F	Port 1 is DC short and AC matched to 50 Ω from 5 to 30 GHz. Blocking capacitor is optional.	
Port 2	IF	2.92F	Port 2 is DC coupled to the diodes. Blocking capacitor is optional.	
Port 3	LO	2.92F	Port 3 is DC short and AC matched to 50 Ω from 5 to 30 GHz. Blocking capacitor is optional.	

Specifications

Absolute Maximum Ratings

Parameter	Maximum Rating	Unit
Maximum Operating Temperature	100	°C
Maximum Storage Temperature	125	°C
Minimum Operating Temperature	-55	°C
Minimum Storage Temperature	-65	°C
Port 1 DC Current	21	mA
Port 2 DC Current	15	mA
Port 3 DC Current	24	mA
RF Power Handling (RF+LO), 100°C	20	dBm
RF Power Handling (RF+LO), 25°C	25	dBm

Package Information

Parameter	Details	Rating
ESD	250 to < 500 Volts	HBM Class 1A
Weight	Package name: BH	12g
Dimensions	-	29.01 x 19.84 mm

Recommended Operating Conditions

Parameter	Min	Nominal	Max	Unit
LO Input Power	9	15	17	dBm

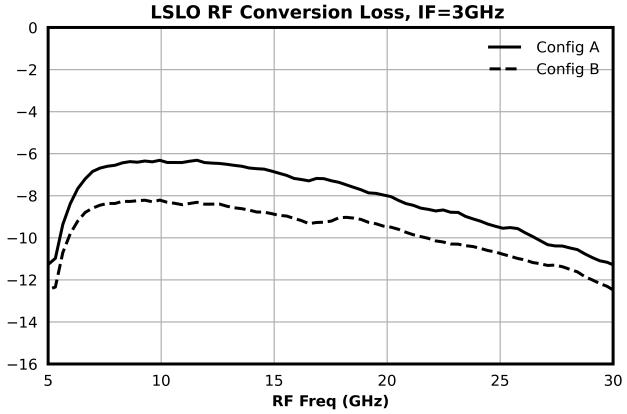
Electrical Specifications

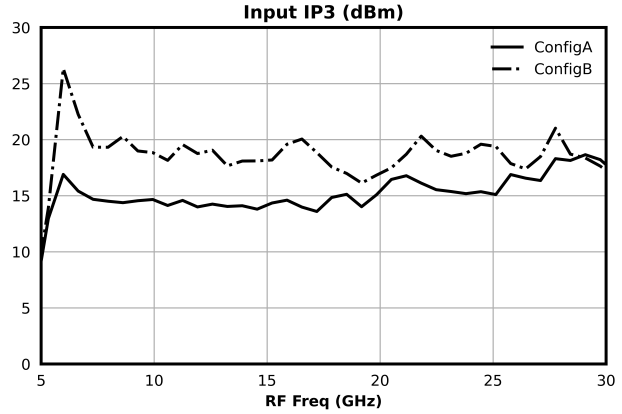
The electrical specifications apply at TA=+25°C in a 50Ω system. Typical data shown is for the connectorized BH package mixer used in the forward direction with a sine wave LO of +15 dBm and RF input power of -10 dBm, aside from linearity measurements. Min and Max limits apply only to our connectorized units and are guaranteed at TA=+25°C.

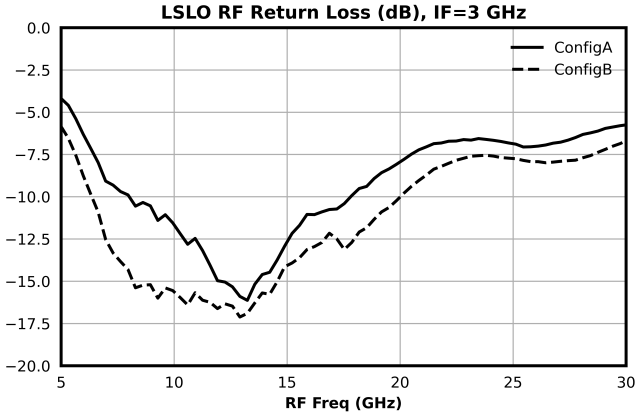
Parameter	Port Configuration	Test Conditions	Min	Typ	Max	Unit
RF Frequency Range	-	-	5	-	30	GHz
LO Frequency Range	-	-	5	-	30	GHz
IF Frequency Range	-	-	2	-	20	GHz
Conversion Loss	A	-	-	7.5	-	dB
Conversion Loss	B	-	-	9.5	-	dB
Input IP3	A	-	-	15	-	dBm
Input IP3	B	-	-	18.5	-	dBm
Input P1dB	A	-	-	9	-	dBm
Input P1dB	B	-	-	9.5	-	dBm
LO-RF Isolation	A	-	-	42	-	dB
LO-RF Isolation	B	-	-	41	-	dB
LO-IF Isolation	A	-	-	46	-	dB
LO-IF Isolation	B	-	-	45	-	dB
RF-IF Isolation	A	-	-	45	-	dB
RF-IF Isolation	B	-	-	46	-	dB
Noise Figure [1]	A	LO/RF=5-30 GHz IF=3 GHz LO Drive = +15.00 dBm	-	7.5	-	dB
Noise Figure [2]	B	LO/RF=5-30 GHz IF=3 GHz LO Drive = +15.00 dBm	-	9.5	-	dB

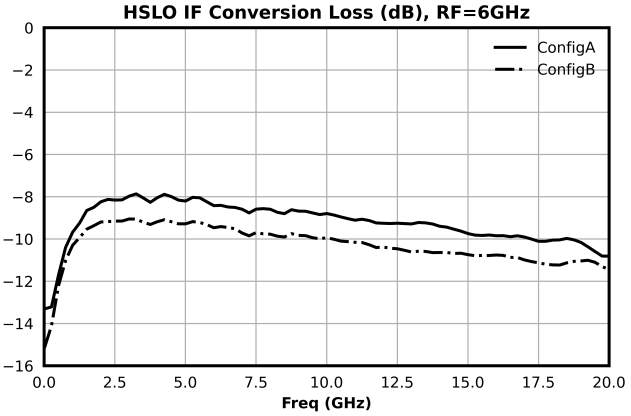
[1][2] Mixer Noise Figure typically measures within 0.5 dB of conversion loss for IF frequencies greater than 5 MHz.

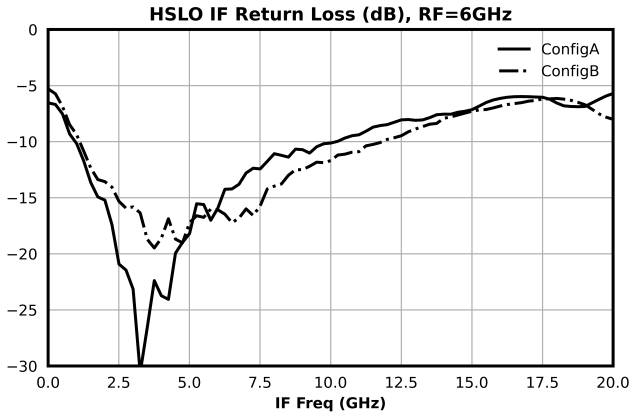
Typical Performance Plot

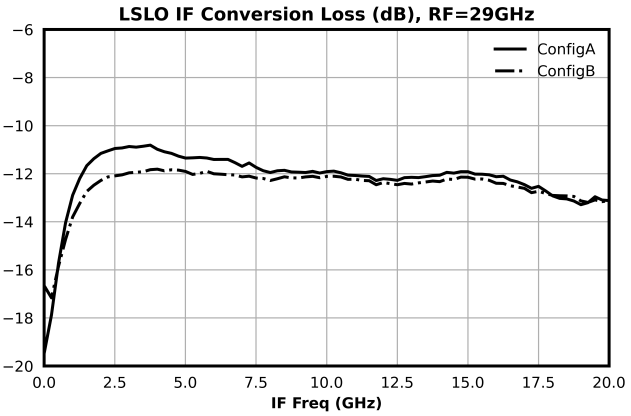


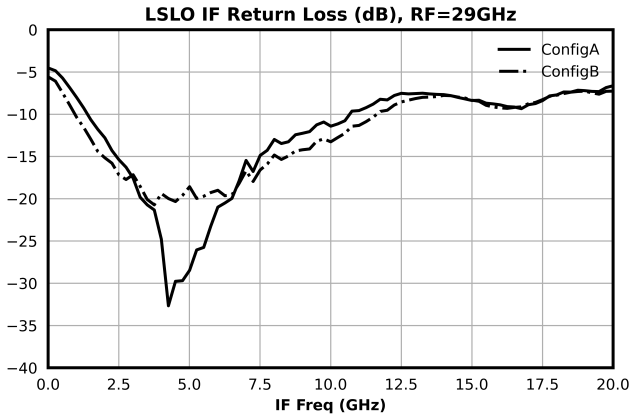


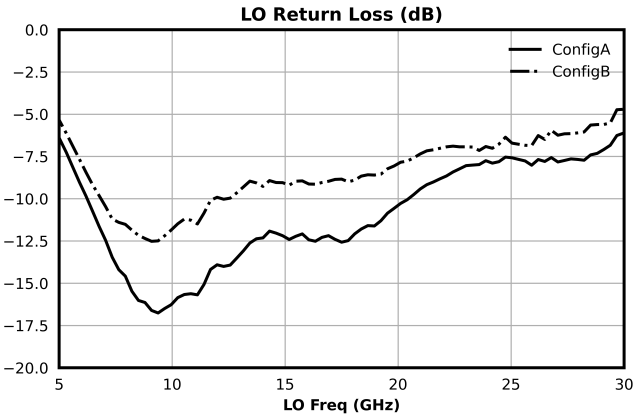


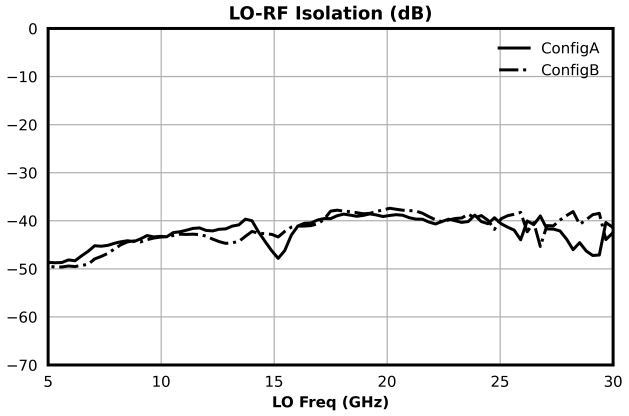


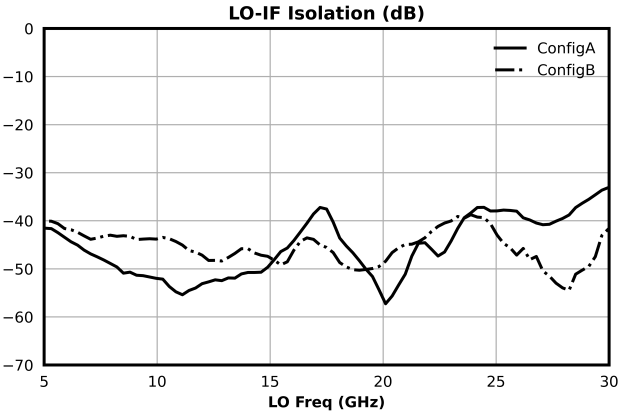


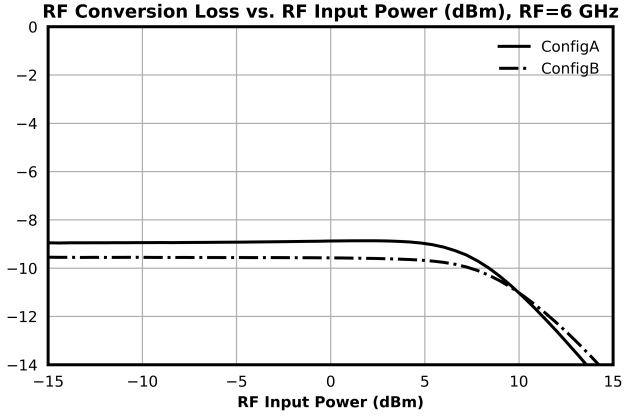


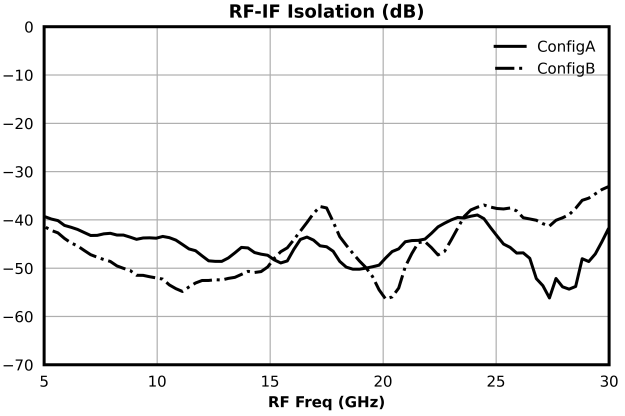


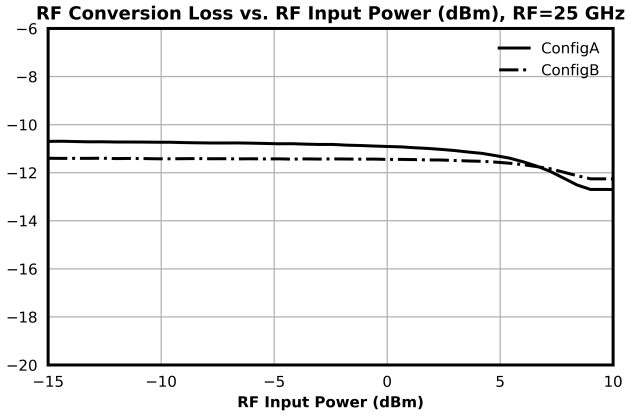




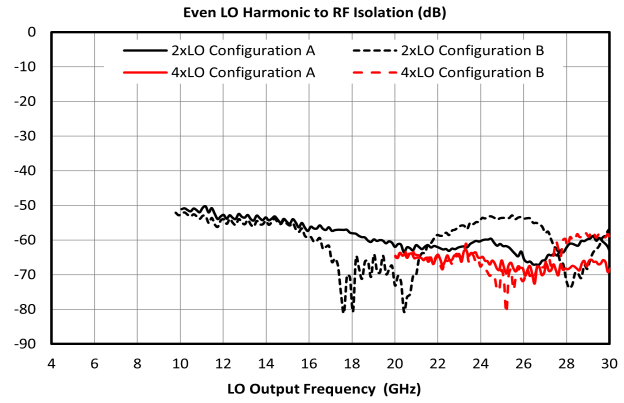


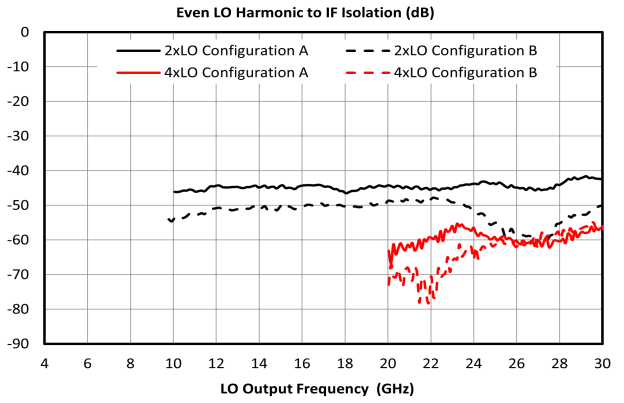


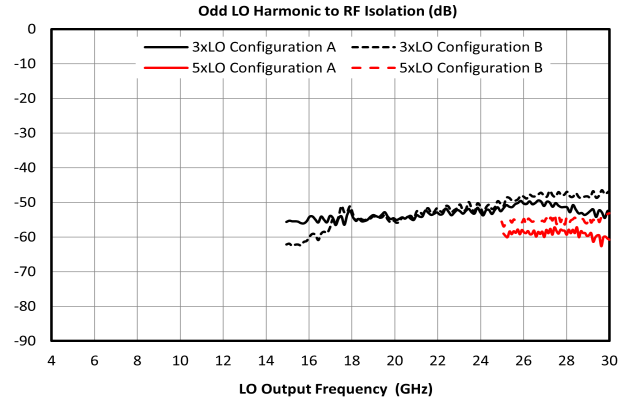


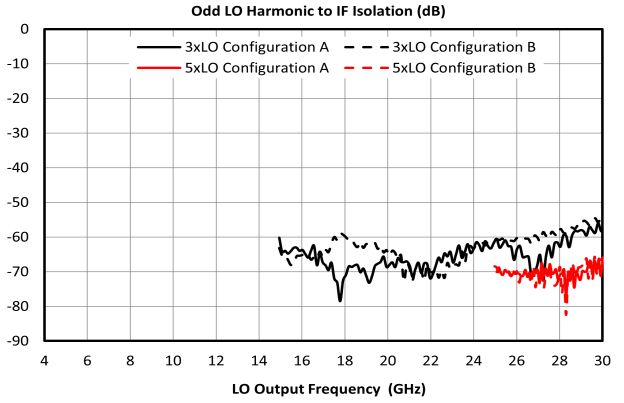


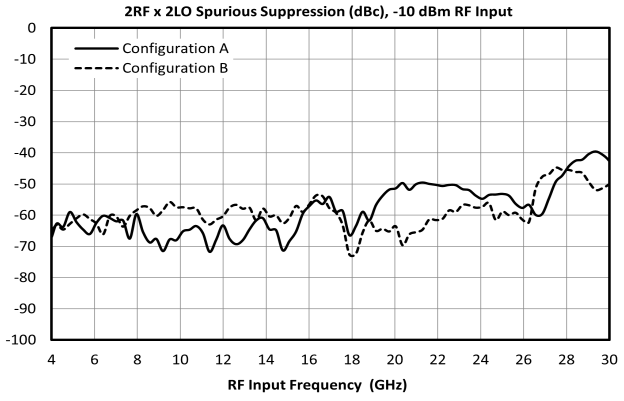
Typical Performance Plots: LO Harmonic Isolation

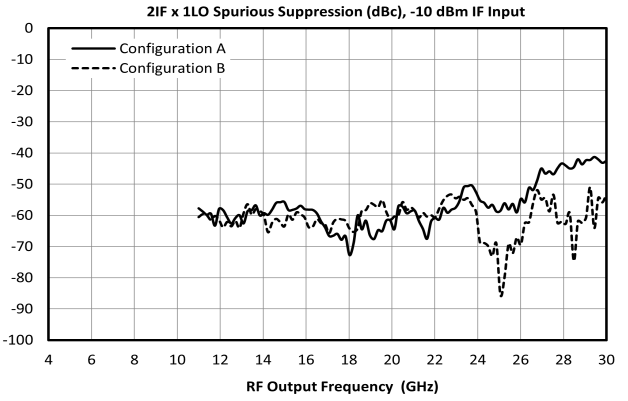












Spur Table

Downconversion Spurious Suppression

Spurious data is taken by selecting RF and LO frequencies (+mLO+nRF) within the 5 to 30 GHz RF/LO bands, which create a 3 GHz IF spurious output. The mixer is swept across the full spurious band and the mean is calculated. The numbers shown in the table below are for a -10 dBm RF input. Spurious suppression is scaled for different RF power levels by (n-1), where "n" is the RF spur order. For example, the 2RFx2LO spur is 69 dBc for the A configuration for a -10 dBm input, so a -20 dBm RF input creates a spur that is (2-1) x (-10 dB) dB lower, or 79 dBc.

Typical Downconversion Spurious Suppression (dBc): Configuration A (Configuration B), Sine Wave LO

-10 dBm RF Input	0xLO	1xLO	2xLO	3xLO	4xLO	5xLO
1xRF	35 (33)	Reference	39 (44)	14 (11)	39 (42)	33 (22)
2xRF	63 (63)	65 (67)	69 (69)	71 (71)	77 (75)	77 (77)
3xRF	77 (78)	77 (82)	91 (90)	85 (87)	94 (91)	86 (86)
4xRF	93 (92)	103 (101)	102 (102)	103 (104)	103 (101)	104 (101)
5xRF	102 (100)	116 (112)	113 (111)	113 (110)	113 (110)	114 (110)

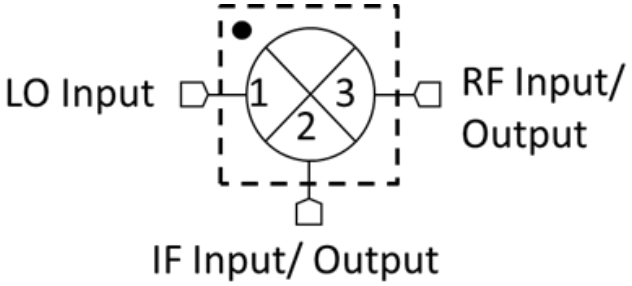
Upconversion Spurious Suppression

Spurious data is taken by mixing a 3 GHz IF with LO frequencies (+mLO+nIF), which creates an RF within the 5 to 30 GHz RF band. The mixer is swept across the full spurious output band and the mean is calculated. The numbers shown in the table below are for a -10 dBm IF input. Spurious suppression is scaled for different IF input power levels by (n-1), where "n" is the IF spur order. For example, the 2IFx1LO spur is typically 84 dBc for the A configuration for a -10 dBm input, so a -20 dBm IF input creates a spur that is (2-1) x (-10 dB) dB lower, or 94dBc.

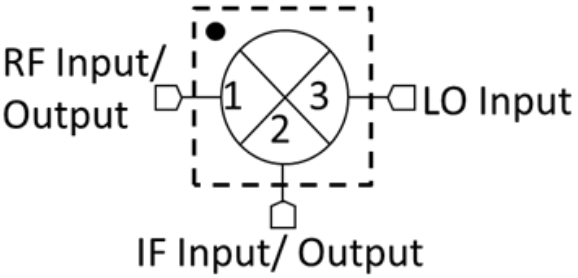
Typical Upconversion Spurious Suppression (dBc): Configuration A (Configuration B), Sine Wave LO

-10 dBm IF Input	0xLO	1xLO	2xLO	3xLO	4xLO	5xLO
1xIF	32 (32)	Reference	39 (45)	14 (12)	39 (43)	31 (22)
2xIF	72 (70)	84 (82)	85 (81)	84 (81)	77 (71)	82 (80)
3xIF	91 (91)	93 (92)	91 (90)	91 (90)	94 (90)	92 (90)
4xIF	94 (93)	101 (101)	101 (99)	102 (103)	97 (100)	101 (102)
5xIF	113 (112)	114 (112)	113 (113)	112 (112)	112 (111)	109 (107)

Application Circuit



Configuration A



Configuration B

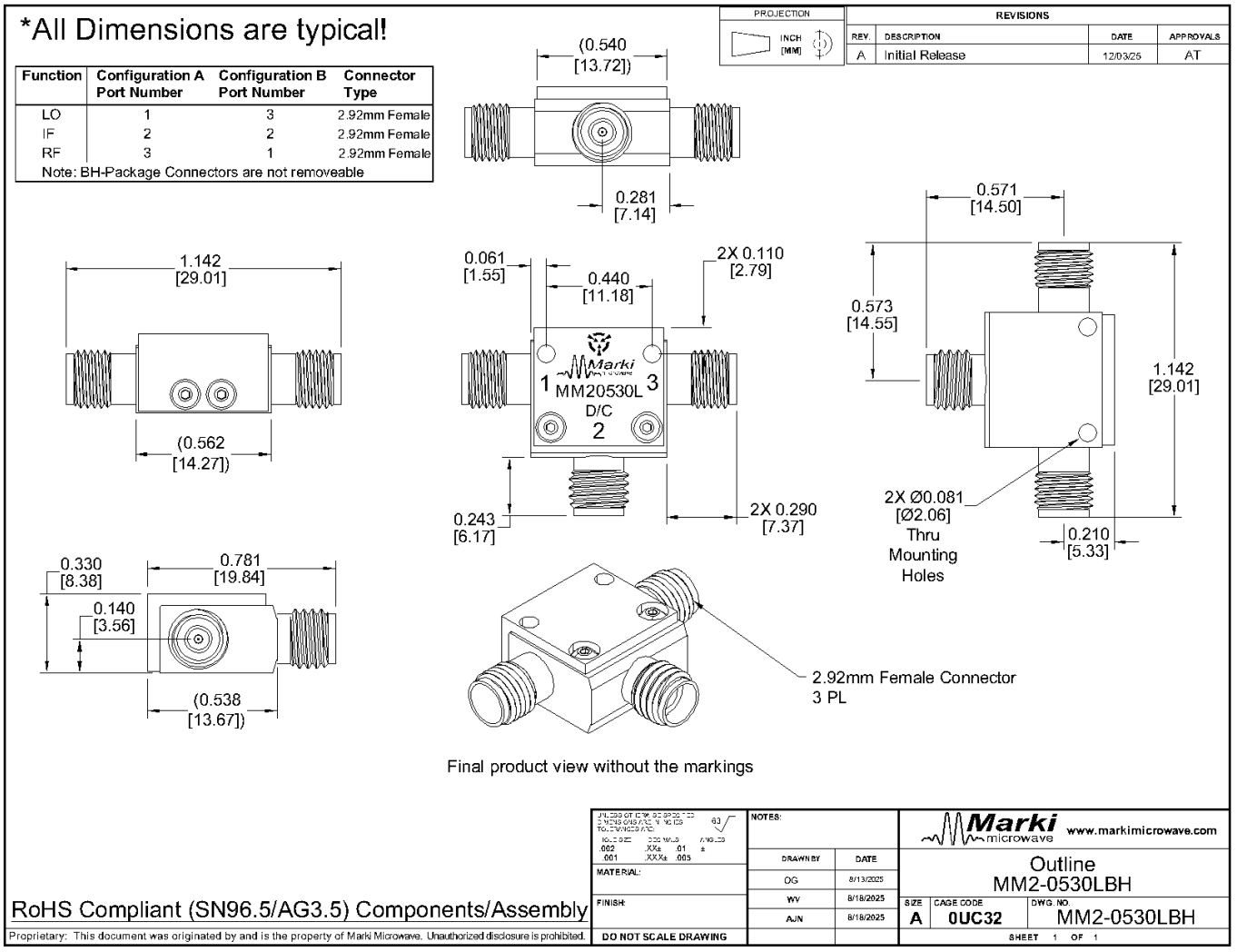
Application Circuit Description

Configuration A/B refer to the same part number (MM2-0530L) used in one of two different ways for optimal spurious performance. For the lowest conversion loss, use the mixer in Configuration A (port 1 as the LO input, port 3 as the RF input or output). If you need to use a lower LO drive, use the mixer in Configuration B (port 1 as the RF input or output, port 3 as the LO input). For optimal spurious suppression, experimentation or simulation is required to choose between Configuration A and B.

Mechanical Data

Outline Drawing

Download : Outline 2D Drawing



DISCLAIMER

MARKI MICROWAVE, LLC., (“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, LLC. All other trademarks used are the property of their respective owners.