

GaAs DOUBLE-BALANCED MIXER

MM1-2567LS

The MM1-2567LS is a passive GaAs double balanced MMIC mixer suitable for both up and down-conversion applications. As with all Marki Microwave mixers, it features excellent conversion loss, isolation and spurious performance across a broad bandwidth and in a small form factor. The MM1-2567LS is available in a connectorized package. Owing to its passive balun circuitry, the mixer can be used in two different configurations: Configuration A for highest efficiency and Configuration B for the best spurious performance and lowest LO drive. Refer to page 2 for more information on the operating configurations.



Features

- Connectorized Package
- Broadband Performance
- Excellent Unit-to-Unit Repeatability
- Extremely Low LO Drive Operation

Electrical Specifications - Specifications guaranteed from -55 to +100°C, measured in a 50Ω system. Specifications are shown for Configurations A (B). See page 2 for port locations.

Parameter	LO (GHz)	RF (GHz)	IF (GHz)	Min	Typ	Max	Diode Option LO drive level (dBm)
Conversion Loss	25-60		DC-30		9 (15)	16 (21)	
Isolation (dB) LO-RF LO-IF RF-IF	25-67				See Plots		
Input 1 dB Compression (dBm)					+1 (+5)		L-Config. A: +10 to +16 (L-Config. B: +6 to +12)
Input Two-Tone Third Order Intercept Point (dBm)					+9 (+15)		L-Config. A: +10 to +16 (L-Config. B: +6 to +12)

Part Number Options

Model Number	Description
MM1-2567LS ¹	Connectorized, L-Diode

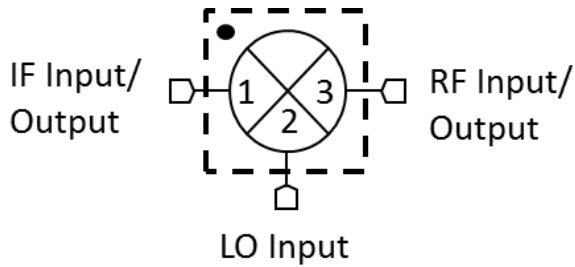
¹Note: For port locations and I/O designations, refer to the drawings on page 2 of this document.

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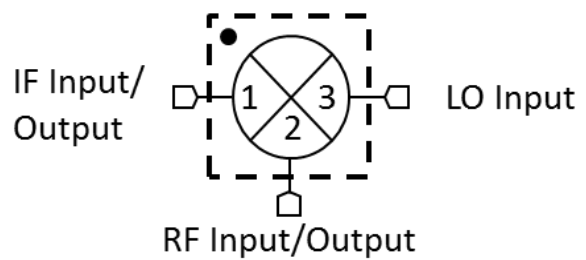
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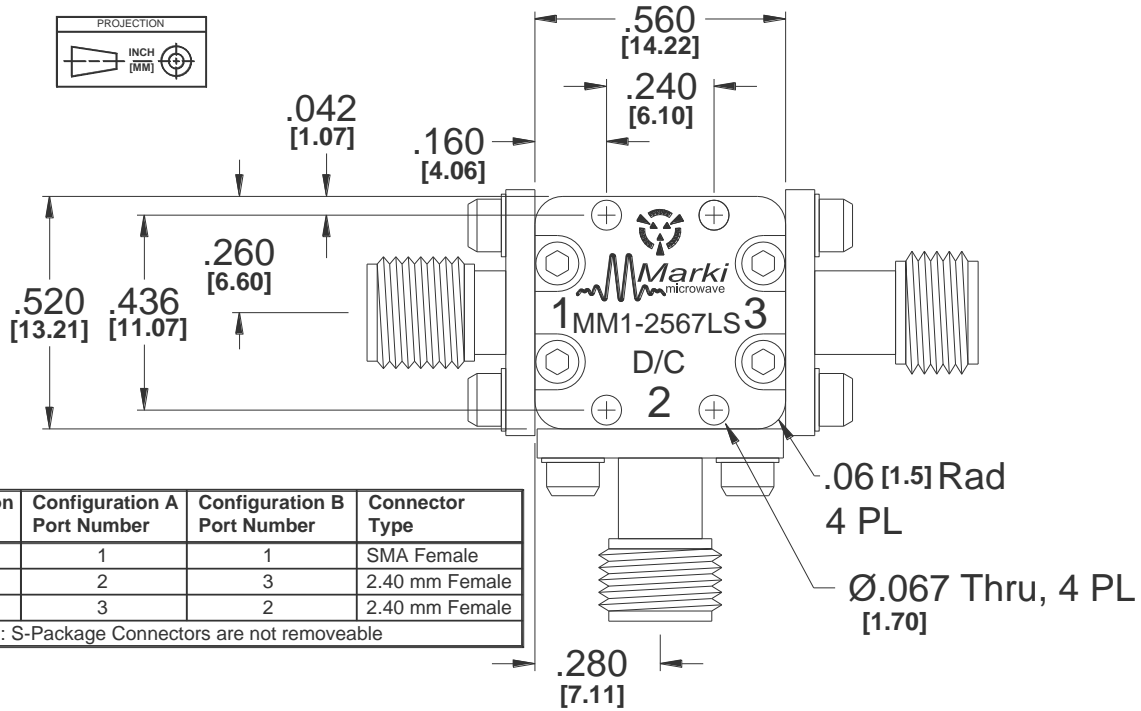
LO/RF 25 to 67 GHz
IF DC to 30 GHz



Configuration A

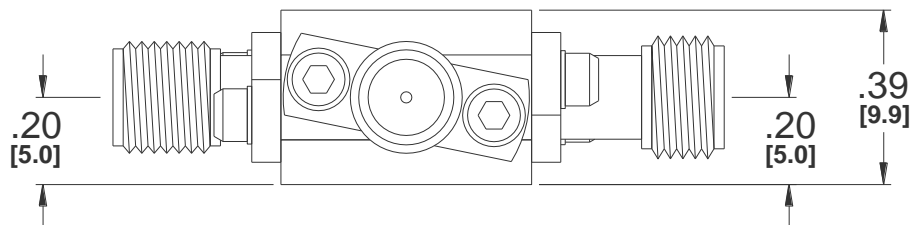


Configuration B



Function	Configuration A Port Number	Configuration B Port Number	Connector Type
IF	1	1	SMA Female
LO	2	3	2.40 mm Female
RF	3	2	2.40 mm Female

Note: S-Package Connectors are not removable



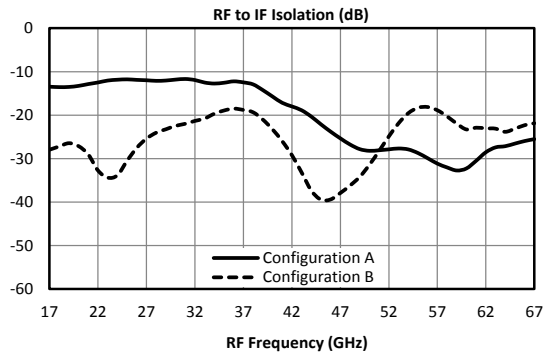
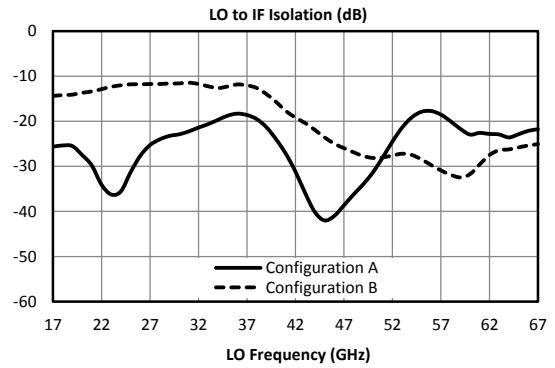
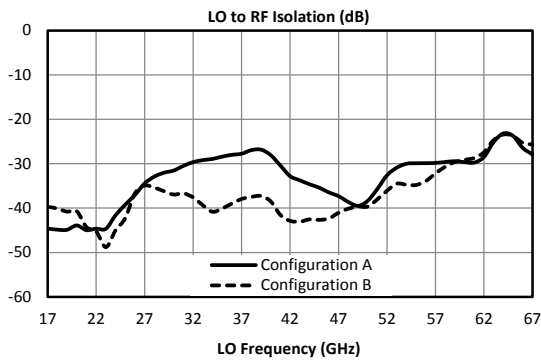
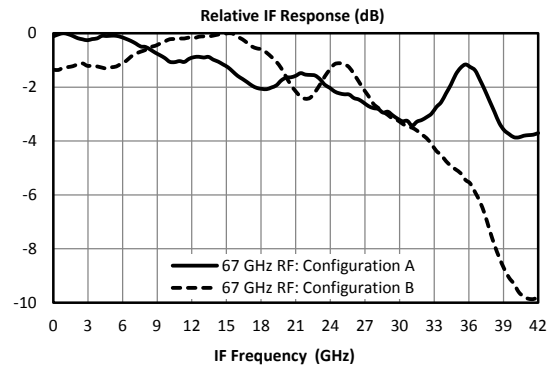
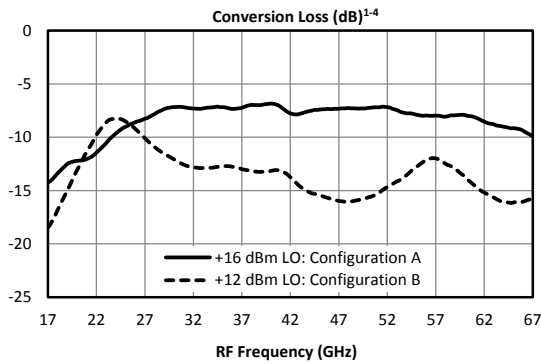
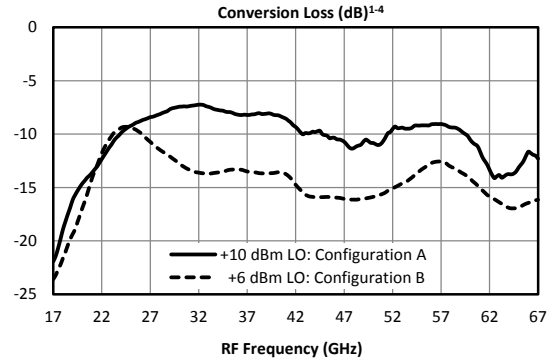
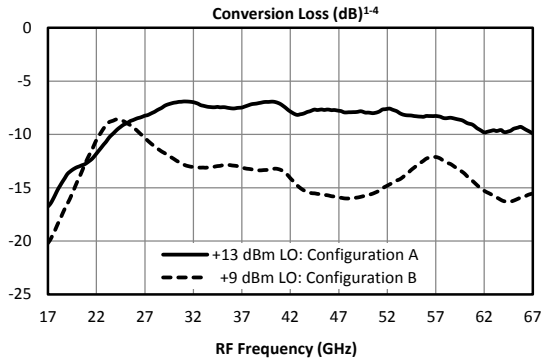
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LO/RF 25 to 67 GHz
IF DC to 30 GHz

Typical Performance



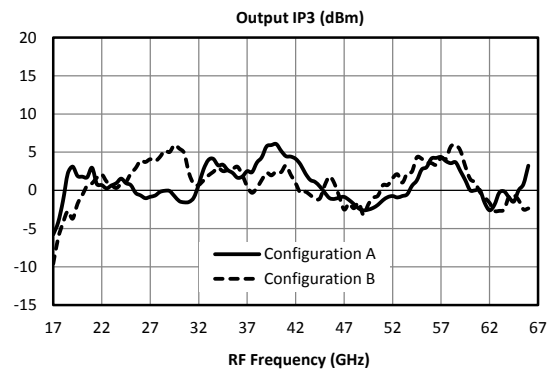
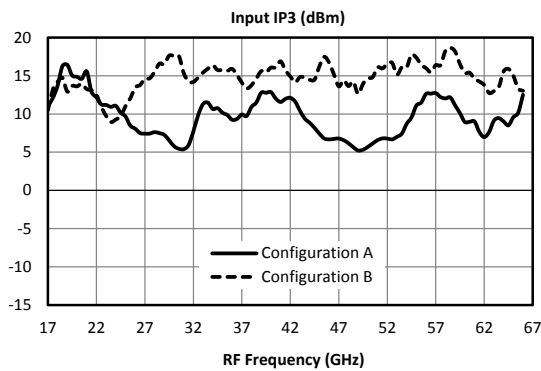
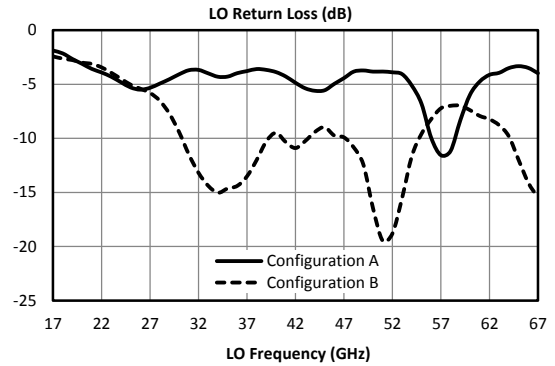
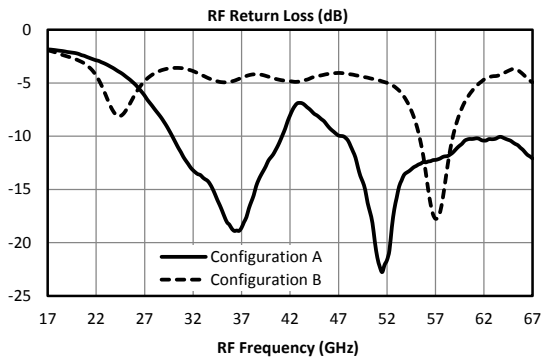
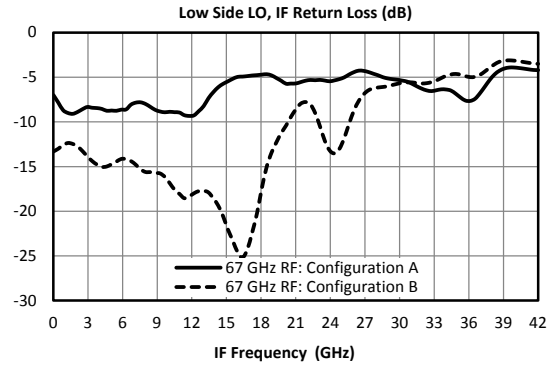
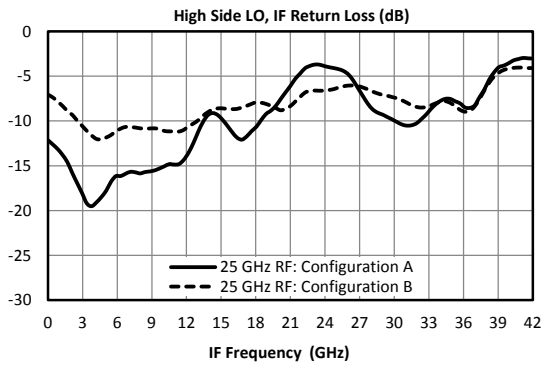
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LO/RF 25 to 67 GHz
IF DC to 30 GHz

Typical Performance



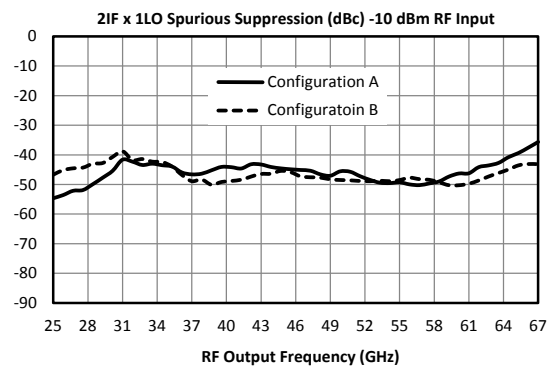
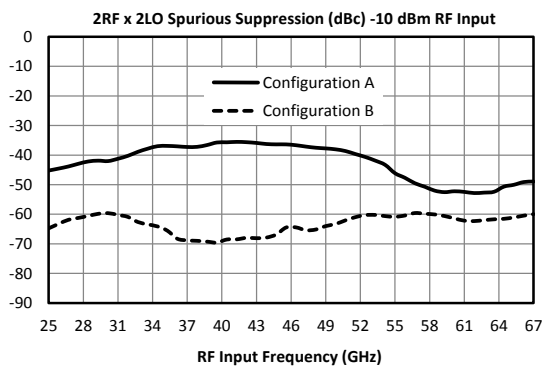
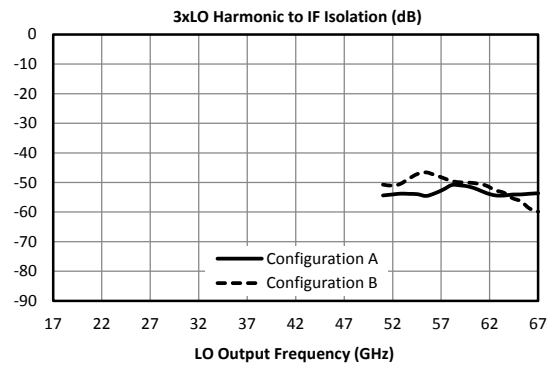
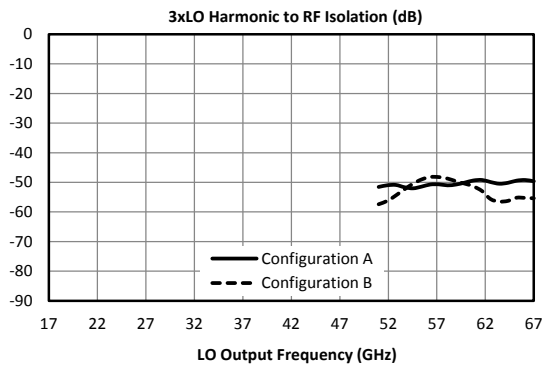
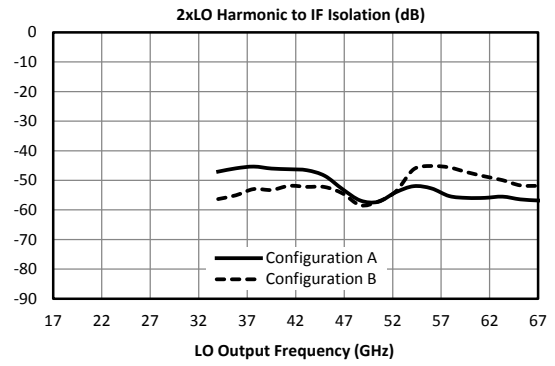
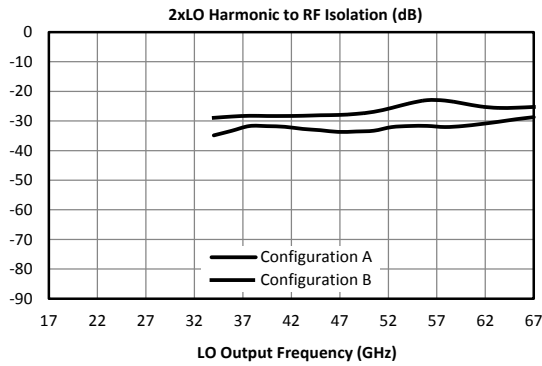
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IF DC to 30 GHz

Typical Performance



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LO/RF 25 to 67 GHz
IF DC to 30 GHz

Downconversion Spurious Suppression

Spurious data is taken by selecting RF and LO frequencies ($\pm mLO \pm nRF$) within the 25 to 67 GHz RF/LO bands, which create a 100 MHz 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 53 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 53 dBc.

Typical Downconversion Spurious Suppression (dBc): L Diode, A Configuration (B Configuration) ⁵

-10 dBm RF Input	0xLO	1xLO	2xLO	3xLO	4xLO	5xLO
1xRF	14 (13)	Reference	24 (27)	11 (16)	35 (36)	26 (29)
2xRF	57 (60)	36 (42)	43 (63)	31 (50)	41 (52)	38 (49)
3xRF	83 (77)	51 (49)	48 (73)	50 (69)	53 (73)	51 (68)
4xRF	107 (105)	94 (85)	80 (104)	78 (108)	79 (103)	73 (101)
5xRF	120 (116)	114 (108)	103 (108)	105 (123)	90 (119)	91 (118)

Upconversion Spurious Suppression

Spurious data is taken by mixing a 100 MHz IF with LO frequencies ($\pm mLO \pm nIF$), which creates an RF within the 25 to 67 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 46 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 56 dBc.

Typical Upconversion Spurious Suppression (dBc): L Diode, A Configuration (B Configuration) ⁵

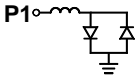


-10 dBm IF Input	0xLO	1xLO	2xLO	3xLO	4xLO	5xLO
1xIF	12 (19)	Reference	16 (28)	10 (14)	38 (50)	29 (29)
2xIF	39 (45)	46 (48)	40 (37)	50 (44)	41 (39)	51 (52)
3xIF	62 (67)	54 (53)	53 (61)	58 (57)	54 (63)	44 (51)
4xIF	95 (96)	95 (92)	82 (83)	91 (88)	76 (75)	84 (85)
5xIF	113 (111)	109 (106)	102 (102)	105 (105)	101 (103)	91 (92)

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LO/RF 25 to 67 GHz
IF DC to 30 GHz

Port	Description	DC Interface Schematic
Port 1	Port 1 is DC coupled to the diodes. Blocking capacitor is optional.	
Port 2	Port 2 is DC short to ground and AC matched to 50 Ohms from 25 to 67 GHz. Blocking capacitor is optional.	
Port 3	Port 3 is DC short to ground and AC matched to 50 Ohms from 25 to 67 GHz. Blocking capacitor is optional.	

Absolute Maximum Ratings	
Parameter	Maximum Rating
Port 2 DC Current	1 Amp
Port 3 DC Current	1 Amp
Port 1 DC Current	50 mA
RF Power Handling (RF+LO)	+25 dBm at +25°C, derated linearly to +20 dBm at +100°C
Operating Temperature	-55°C to +100°C
Storage Temperature	-65°C to +125°C

DATA SHEET NOTES:

- Mixer Conversion Loss Plot IF frequency is 100 MHz.
- Mixer Noise Figure typically measures within 0.5 dB of conversion loss for IF frequencies greater than 5 MHz.
- 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.
- Conversion Loss typically degrades less than 0.5 dB at +100°C and improves less than 0.5 dB at -55°C.
- Unless otherwise specified, Configuration A data is taken with +13 dBm LO drive, and Configuration B is taken with +9 dBm drive
- Specifications are subject to change without notice. Contact Marki Microwave for the most recent specifications and data sheets.
- Catalog mixer circuits are continually improved. Configuration control requires custom mixer model numbers and specifications.

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