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

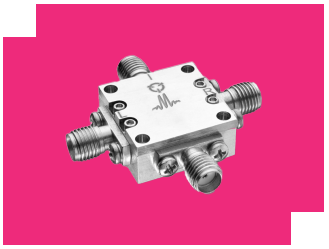
IR-4509MXP-2

Image Reject Double-Balanced 4.5 - 9.0 GHz Mixers

DEVICE OVERVIEW

General Description

The IR-4509 is an image reject mixer that performs single sided downconversion, or "image reject" conversion, and offers excellent image rejection across broad bandwidths. This broadband mixer spans 4.5 to 9 GHz on the RF and LO ports with an IF from 50 to 90 MHz. IR series mixers have generally been replaced with MMIQ mixers with superior performance, repeatability, and availability. IR series mixers are still used in legacy systems and are suitable for laboratory use.



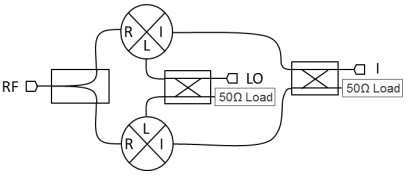
Features

- LO/RF 4.5 to 9.0 GHz
- IF 50 to 90 MHz
- 5.5 dB Typical Conversion Loss
- 30 dB Typical LO to RF Isolation
- 23 dB Typical Image Rejection
- Open Carrier or Connectorized

Applications

N/A

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Connectors	Green Status	Product Lifecycle	Export Classification	Recommended Replacement
IR-4509MXP-2	Image Reject Double-Balanced 4.5 - 9.0 GHz Mixers	XP	Standard	Non-RoHS	Not Recommended for New Design	EAR99	-
IR-4509MXP	Image Reject Double-Balanced 4.5 - 9.0 GHz Mixers	XP	Standard	Non-RoHS	End of Life	EAR99	MMIQ-0416LSQH 0R518
IR-4509LXP	Image Reject Double-Balanced 4.5 - 9.0 GHz Mixers	XP	Standard	Non-RoHS	Not Recommended for New Design	EAR99	-
IR-4509MXP-1	Image Reject Double-Balanced 4.5 - 9.0 GHz Mixers	XP	Standard	Non-RoHS	End of Life	EAR99	MMIQ-0416LSQH 0R518

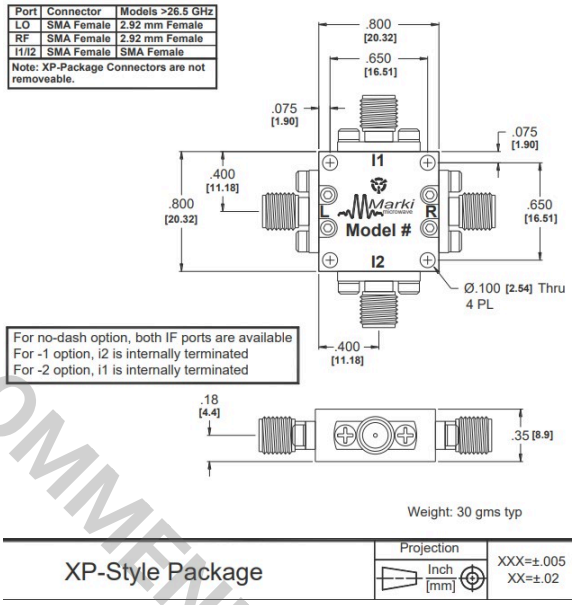
IR-4509MXP-2

Image Reject Double-Balanced 4.5 - 9.0 GHz Mixers

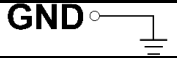
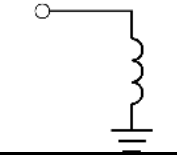
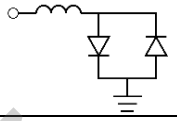
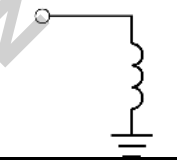
Table Of Contents

Port Configuration and Functions

Port Diagram



Port Functions

Port	Function	Connector Type	Description	Equivalent Circuit for Package
GND	Ground	-	XP package ground taken through metal housing.	
LO	LO Input	SMAF	LO port is DC short and AC matched to 50Ω over the specified LO frequency range.	
Q	Q Input / Output	SMAF	Q port is diode coupled and AC matched to 50Ω over the specified Q port frequency range.	
RF	RF Input / Output	SMAF	RF port is DC short and AC matched to 50Ω over the specified RF frequency range.	

IR-4509MXP-2

Image Reject Double-Balanced 4.5 - 9.0 GHz Mixers

Specifications

Package Information

Parameter	Details	Rating
Weight	Package name: XP	30g
Dimensions	-	20.32 x 20.32 mm

Recommended Operating Conditions

Parameter	Min	Nominal	Max	Unit
LO Input Power	13	-	16	-

Electrical Specifications

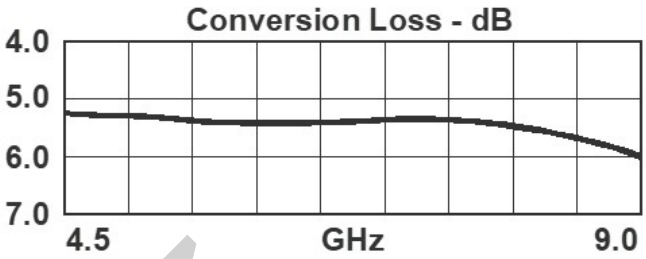
Specifications guaranteed from -55 to +100°C, measured in a 50-Ohm system.

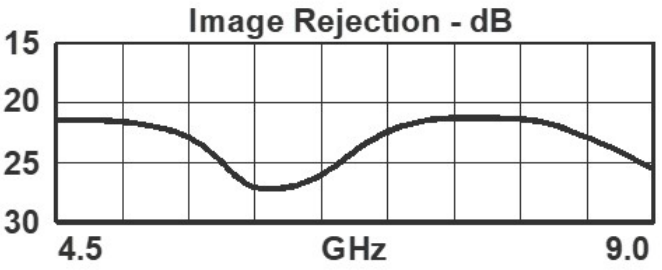
Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Conversion Loss	LO/RF=4.5-9 GHz IF=0.05-0.09 GHz	4.5	9	-	5.5	8	dB
Image Rejection	LO/RF=4.5-9 GHz IF=0.05-0.09 GHz	4.5	9	15	23	-	dB
Input 1 dB Compression	LO/RF=4.5-9 GHz IF=0.05-0.09 GHz M diode level 13-16 dBm	4.5	9	-	6	-	dBm
Input IP3	LO/RF=4.5-9 GHz IF=0.05-0.09 GHz M diode level 13-16 dBm	4.5	9	-	16	-	dBm
Isolation, LO to IF	LO/RF=4.5-9 GHz IF=0.05-0.09 GHz	4.5	9	-	25	-	dB
Isolation, LO to RF	LO/RF=4.5-9 GHz IF=0.05-0.09 GHz	4.5	9	20	30	-	dB
Isolation, RF to IF	LO/RF=4.5-9 GHz IF=0.05-0.09 GHz	4.5	9	-	25	-	dB
IF Frequency Range	-	-	-	0.05	-	0.09	GHz
RF Frequency Range	-	-	-	4.5	-	9	GHz

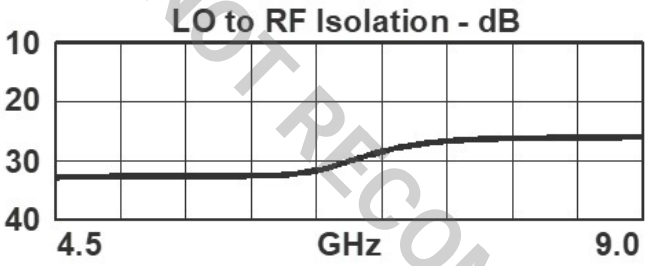
IR-4509MXP-2

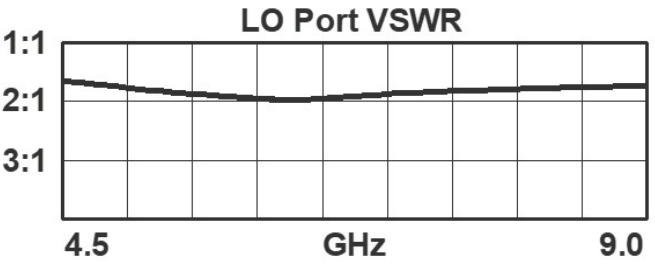
Image Reject Double-Balanced 4.5 - 9.0 GHz Mixers

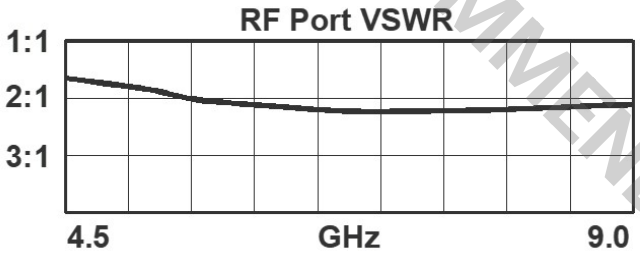
Typical Performance Plots







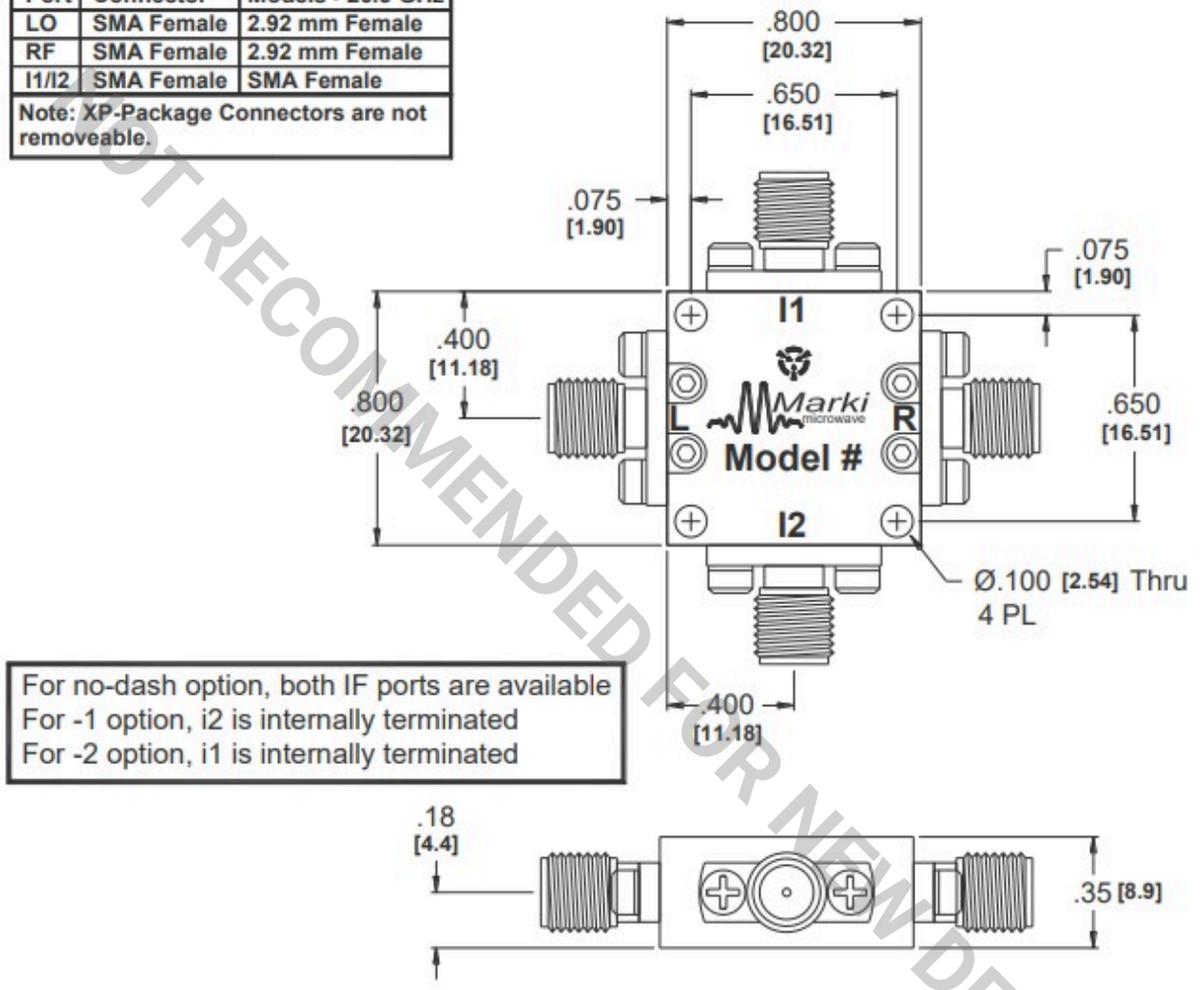




Mechanical Data

Outline Drawing

Port	Connector	Models >26.5 GHz
LO	SMA Female	2.92 mm Female
RF	SMA Female	2.92 mm Female
I1/I2	SMA Female	SMA Female
Note: XP-Package Connectors are not removeable.		



For no-dash option, both IF ports are available
For -1 option, i2 is internally terminated
For -2 option, i1 is internally terminated

Weight: 30 gms typ

XP-Style Package	Projection Inch [mm]	XXX=±.005 XX=±.02

Notes

1. Mixer Conversion Loss Plot IF frequency is 70 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 +26 dBm at +25°C, derated linearly to +23 dBm at +100°C.
6. Specifications are subject to change without notice. Contact Marki Microwave for the most recent specifications and data sheets.
7. Catalog mixer circuits are continually improved. Configuration control requires custom mixer model numbers and specifications.

DISCLAIMER