

# MM8221 2.0 TO 8.0 GHz DOUBLE-BALANCED MIXER

Typical Values	MM8221
LO & RF .....	2.0 - 8.0 GHz
IF .....	DC - 1.5 GHz
Third Order I.P. ....	+10.0 dBm
Conversion Loss .....	5.5 dB
LO Drive (nominal) .....	+7.0 dBm
High Isolation (LO to RF) .....	45.0 dB
Mixer Carrier	

## SPECIFICATIONS\*

Parameter	Port	Frequency (GHz)	Guaranteed -55 to +85 °C		
			Typ. (dB)	Max. (dB)	
SSB Conversion Loss and SSB Noise Figure	$f_R$	3.0 to 8.0	5.0	6.5	
	$f_L$	3.0 to 8.0	5.0	6.5	
	$f_I$	DC to 0.5	5.0	6.5	
	$f_R$	2.0 to 8.0	6.5	7.5	
	$f_L$	2.0 to 8.0	6.5	7.5	
	$f_I$	DC to 0.5	6.5	7.5	
	$f_I$	0.5 to 1.5	8.0	9.0	
Conversion Comp. Desensitization	$f_R$	Level = +1 dBm	-	1.0	
	$f_{R2}$	Level = -1 dBm	-	1.0	
Isolation			Typ. (dB)	Min. (dB)	
	$f_L$ at R	$f_L$	2.0 to 8.0	45	35
	$f_L$ at I	$f_L$	4.0 to 8.0	45	38
	$f_R$ at I	$f_R$	4.0 to 8.0	30	20
	$f_L$ at R	$f_L$	2.0 to 8.0	45	35
	$f_L$ at I	$f_L$	2.0 to 8.0	35	22
	$f_R$	2.0 to 8.0	25	15	
Third Order Intercept		LO = +7 dBm	+10 dBm	-	
		LO = +10 dBm	+12 dBm	-	

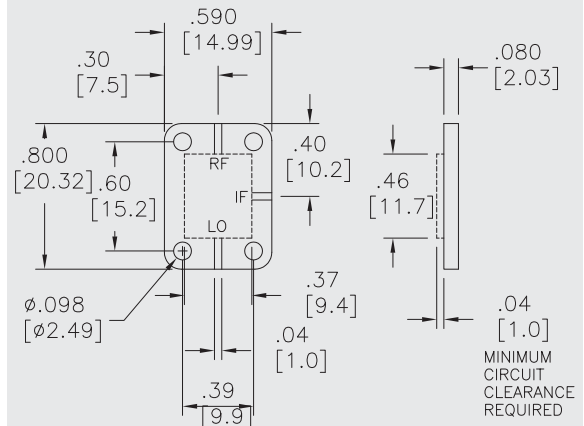
\* Measured in a 50-ohm system with nominal LO drive of +7 dBm as a downconverter.

## ABSOLUTE MAXIMUM RATINGS

Storage Temperature .....	-65 to +150 °C
Peak RF Input Power All Ports .....	+22 dBm @ 25 °C
	derate to +17 dBm @ 100 °C

## MM8221

### Mixer Carrier



DIMENSIONS ARE IN INCHES (MILLIMETERS)

### Harmonic Intermodulation Products (single tone)

HARMONICS OF $f_R$	HARMONICS OF $f_L$					
	0	1	2	3	4	5
5	100	>100	>100	>100	>100	90
4	>100	99	>100	>100	>100	88
3	>100	>100	>100	78	>100	75
2	>100	100	>100	74	90	73
1	99	83	76	55	74	83
0	95	79	72	54	72	80
	72	41	66	40	77	73
	70	41	64	40	76	69
	21	0	32	38	71	59
	21	0	32	39	71	62
		-9	36	23	40	32
		-6	41	24	44	34

$F_R = 2000$  MHz @ -10 dBm  
 $F_L @ +7$  dBm

$F_L = 2030$  MHz  
 $F_L @ +10$  dBm

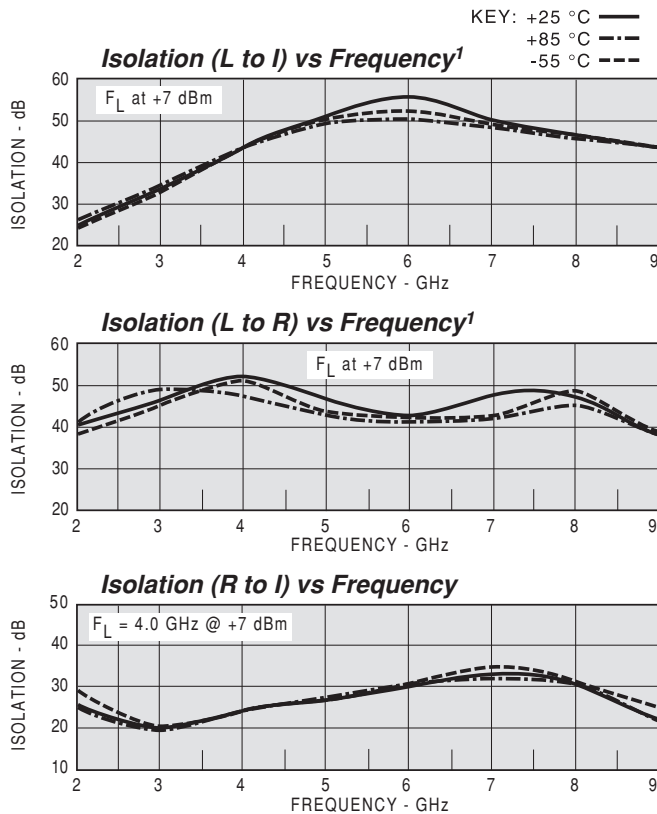
### Harmonic Intermodulation Products (single tone)

HARMONICS OF $f_R$	HARMONICS OF $f_L$					
	0	1	2	3	4	5
5	>100	>100	>100	>100	>100	98
4	>100	>100	>100	>100	>100	91
3	>100	98	99	91	>100	92
2	>100	96	>100	91	97	88
1	70	84	93	54	>100	>100
0	68	83	87	52	>100	99
	>100	52	76	53	83	59
	89	51	68	53	82	59
	47	0	56	47	41	50
	46	0	58	48	40	52
		-1	42	18	49	33
		2	45	19	52	36

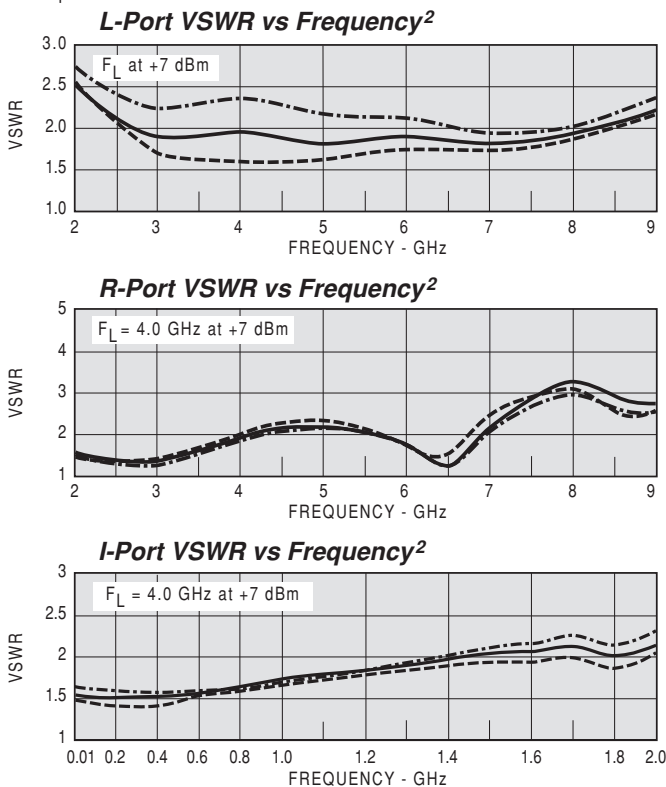
$F_R = 4000$  MHz @ -10 dBm  
 $F_L @ +7$  dBm

$F_L = 4030$  MHz  
 $F_L @ +10$  dBm

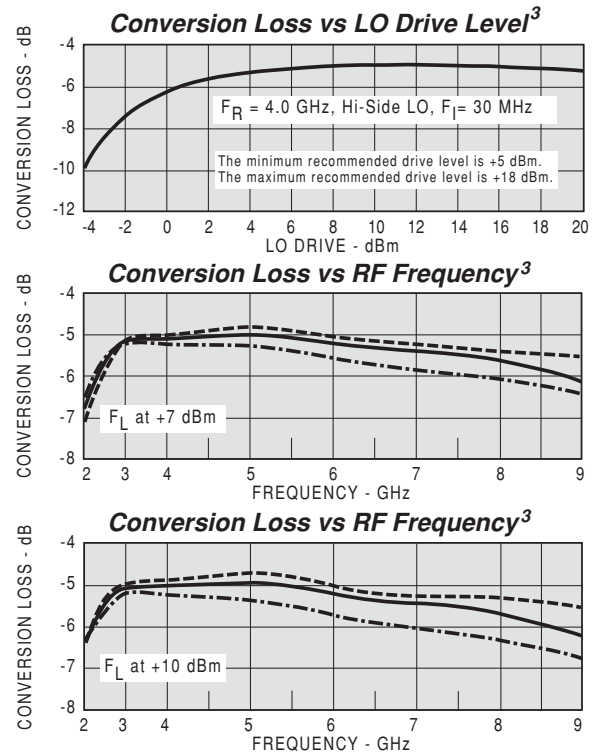
**TYPICAL PERFORMANCE**



<sup>1</sup>Level of the  $f_L$  signal fed through to the R- and I-ports with respect to the level of the  $f_L$  signal at the L-port.



<sup>2</sup> VSWR of the I- and R-ports in a 50-ohm system. Some variation in the R-port VSWR will occur as a function of the L-port frequency as shown above.



<sup>3</sup>Conversion loss of the mixer when used in an SSB system. The frequency ordinate refers to the R-port ( $f_R$ ) with  $f_I$  at 30 MHz.

