

# MMP20221 2.0 TO 20.0 GHz COUGAR MIXERPAK DOUBLE-BALANCED MIXER

**Typical Values**

<b>LO &amp; RF</b> .....	<b>2.0 - 20.0 GHz</b>
<b>IF</b> .....	<b>DC - 1.0 GHz</b>
<b>Third Order I.P.</b> .....	<b>+12.0 dBm</b>
<b>Conversion Loss</b> .....	<b>5.0 dB</b>
<b>LO Drive (nominal)</b> .....	<b>+7.0 dBm</b>
<b>High Isolation (LO to RF)</b> .....	<b>35.0 dB</b>
<b>Cougar MixerPak - Seam Sealed Hermetic Package</b>	

**MMP20221**

**2.0 - 20.0 GHz**  
**DC - 1.0 GHz**  
**+12.0 dBm**  
**5.0 dB**  
**+7.0 dBm**  
**35.0 dB**

## SPECIFICATIONS\*

**Guaranteed**  
**-55 to +85 °C**

Parameter	Port	Frequency (GHz)	Typ. (dB)	Max. (dB)	
<b>SSB Conversion Loss and SSB Noise Figure</b>	$f_R$	4.0 to 18.0	5.0	7.0	
	$f_L$	4.0 to 18.0	5.0	7.0	
	$f_I$	DC to 0.5	5.0	7.0	
	$f_R$	2.0 to 20.0	7.0	8.0	
	$f_L$	2.0 to 20.0	7.0	8.0	
	$f_I$	DC to 0.5	7.0	8.0	
	$f_I$	0.5 to 1.0	8.0	9.0	
<b>Conversion Comp. Desensitization</b>	$f_R$	Level = +3 dBm	-	1.0	
	$f_{R2}$	Level = +1 dBm	-	1.0	
<b>Isolation</b>			<b>Typ. (dB)</b>	<b>Min. (dB)</b>	
	$f_L$ at R	$f_L$	2.0 to 10.0	35	25
	$f_L$ at I	$f_L$	6.0 to 18.0	25	20
	$f_R$ at I	$f_R$	4.0 to 20.0	30	25
	$f_L$ at R	$f_L$	2.0 to 20.0	20	20
	$f_L$ at I	$f_L$	2.0 to 20.0	20	15
$f_R$ at I	$f_R$	2.0 to 20.0	30	18	
<b>Third Order Intercept</b>		LO = +7 dBm	+12 dBm	-	

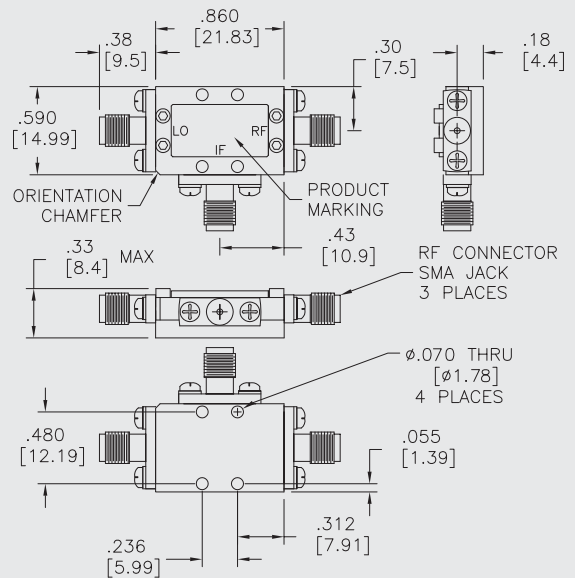
\* Measured in a 50-ohm system with nominal LO drive of +7 dBm as a downconverter.

## ABSOLUTE MAXIMUM RATINGS

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

## MMP20221

### Cougar MixerPak



DIMENSIONS ARE IN INCHES (MILLIMETERS)

### Harmonic Intermodulation Products (single tone)

	>100	>100	99	>100	97	88
5	99	>100	>100	96	97	87
4	>100	95	93	86	81	91
	99	84	83	76	70	77
3	77	64	78	53	70	66
	69	61	70	49	61	65
2	72	49	52	54	69	60
	60	43	46	59	61	54
1	16	0	36	21	46	40
	16	0	34	22	41	51
0		-8	19	13	35	27
		-4	20	15	38	29

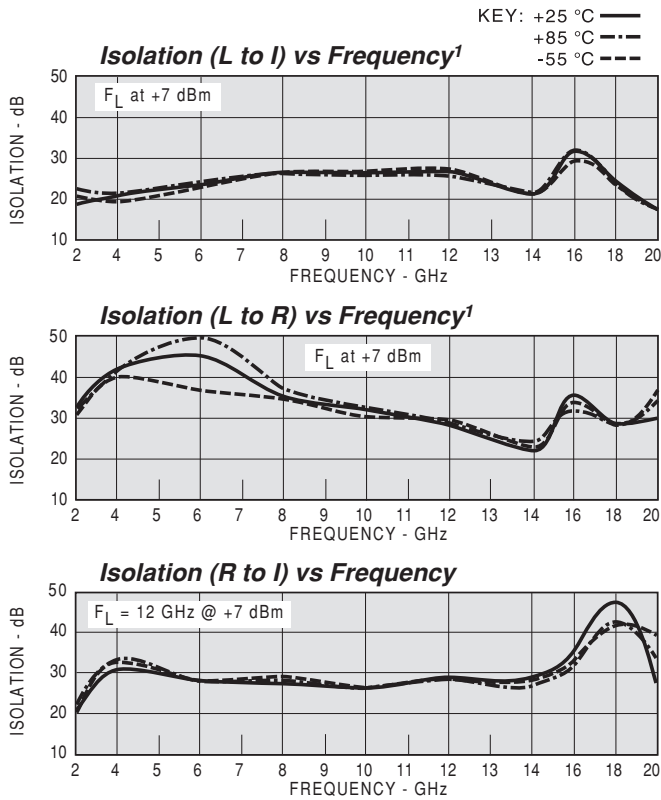
$F_R = 2000 \text{ MHz @ -10 dBm}$        $F_L = 1970 \text{ MHz}$   
 $F_L @ +7 \text{ dBm}$        $F_L @ +10 \text{ dBm}$

### Harmonic Intermodulation Products (single tone)

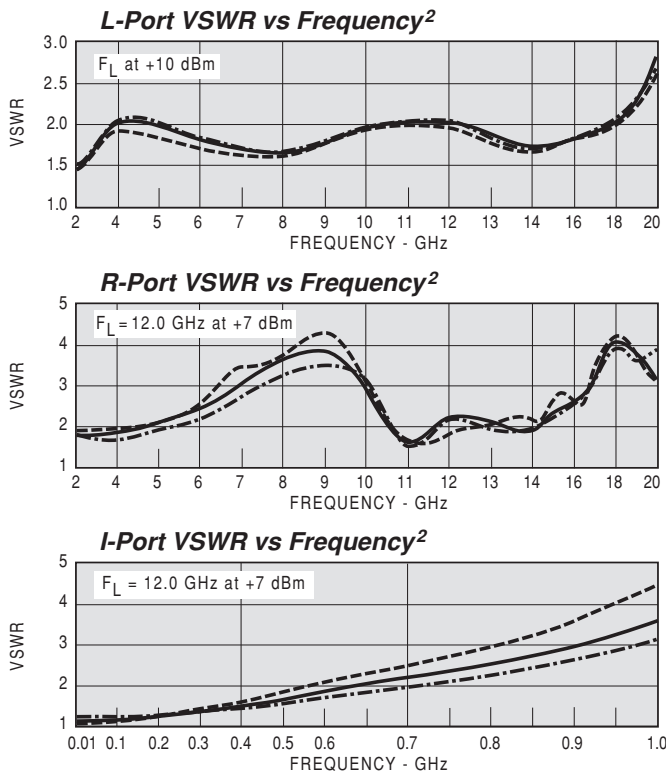
	>100	96	>100	>100	97	89
5	95	95	97	>100	98	80
4	>100	88	>100	91	93	90
	96	91	>100	87	83	88
3	76	71	77	51	72	73
	77	68	76	48	70	72
2	79	51	55	53	73	52
	80	50	52	51	72	53
1	25	0	45	31	43	47
	29	0	40	34	42	52
0		-5	31	10	59	20
		-3	33	12	58	25

$F_R = 4000 \text{ MHz @ -10 dBm}$        $F_L = 3970 \text{ MHz}$   
 $F_L @ +7 \text{ dBm}$        $F_L @ +10 \text{ dBm}$

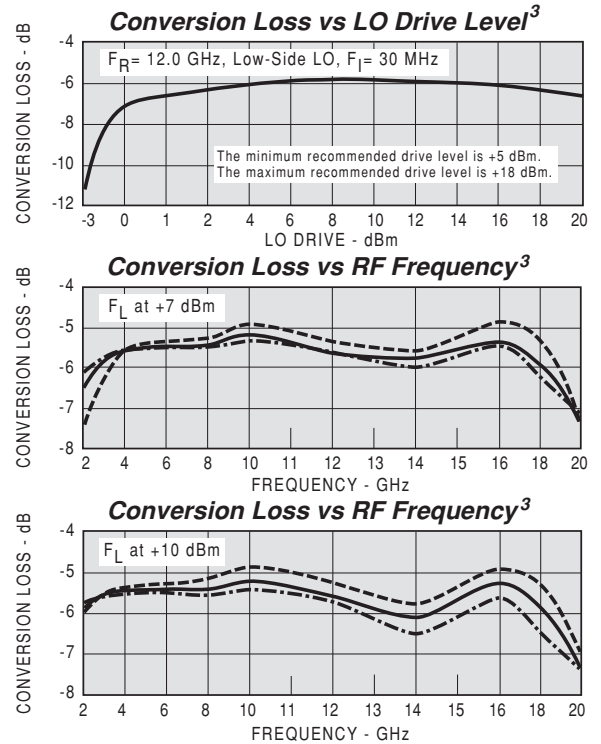
**TYPICAL PERFORMANCE**



<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.

