

# MMP20281 2.0 TO 20.0 GHz COUGAR MIXERPAK TRIPLE-BALANCED MIXER

**Typical Values**

<b>LO &amp; RF</b> .....	<b>MMP20281</b>
<b>IF</b> .....	<b>2.0 - 20.0 GHz</b>
<b>Third Order I.P.</b> .....	<b>0.001 - 6.0 GHz</b>
<b>Conversion Loss</b> .....	<b>+18.0 dBm</b>
<b>LO Drive (nominal)</b> .....	<b>6.0 dB</b>
<b>High Isolation (LO to RF)</b> .....	<b>+13.0 dBm</b>
<b>Cougar MixerPak - Seam Sealed Hermetic Package</b>	<b>30.0 dB</b>

## SPECIFICATIONS\*

**Guaranteed  
-55 to +85 °C**

Parameter	Port	Frequency (GHz)	Typ. (dB)	Max. (dB)	
<b>SSB Conversion Loss and SSB Noise Figure</b>	$f_R$	3.0 to 20.0	6.0	8.5	
	$f_L$	3.0 to 20.0	6.0	8.5	
	$f_I$	DC to 4.0	6.0	8.5	
	$f_R$	2.0 to 20.0	7.0	8.5	
	$f_L$	2.0 to 20.0	7.0	8.5	
	$f_I$	0.001 to 4.0	7.0	8.5	
	$f_I$	4.0 to 6.0	8.5	9.5	
<b>Conversion Comp. Desensitization</b>	$f_R$	Level = +7 dBm	-	1.0	
	$f_{R2}$	Level = +5 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	20
	$f_L$ at I	$f_L$	2.0 to 10.0	30	20
	$f_R$ at I	$f_R$	2.0 to 6.0	30	20
	$f_R$ at I	$f_R$	14.0 to 20.0	30	20
	$f_L$ at R	$f_L$	10.0 to 20.0	25	15
	$f_L$	10.0 to 20.0	20	15	
	$f_R$	2.0 to 20.0	25	15	
<b>Third Order Intercept</b>		LO = +13 dBm	+16 dBm	-	

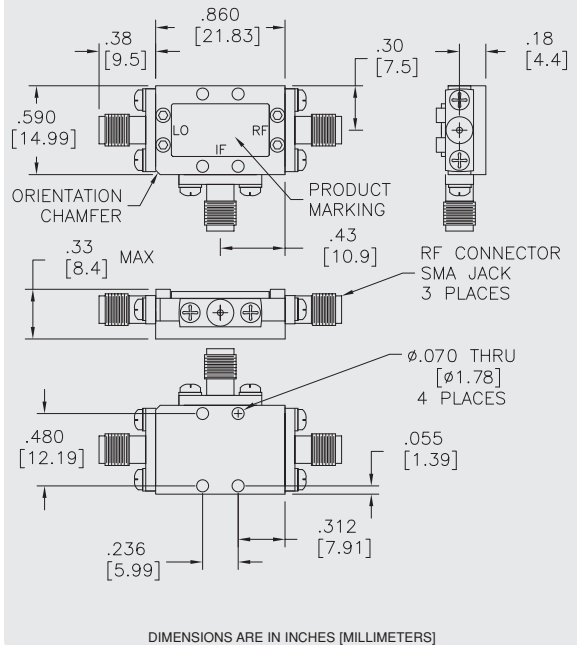
\* Measured in a 50-ohm system with nominal LO drive of +13 dBm as a downconverter.

## ABSOLUTE MAXIMUM RATINGS

<b>Storage Temperature</b> .....	<b>-65 to +150 °C</b>
<b>Peak RF Input Power All Ports</b> .....	<b>+23 dBm @ 25 °C</b>
	<b>derate to +18 dBm @ 100 °C</b>

## MMP20281

### Cougar MixerPak



### Harmonic Intermodulation Products (single tone)

HARMONICS OF $f_R$	0	1	2	3	4	5
5	>100	>100	>100	>100	>100	>100
4	99	>100	>100	97	>100	100
3	>100	>100	>100	98	>100	>100
2	>100	89	95	91	97	91
1	86	78	83	69	83	84
0	79	78	76	70	80	60
	58	61	61	68	62	57
	51	50	53	57	55	54
	23	0	33	14	37	32
	24	0	32	18	37	35
	7	11	12	22	14	14
	8	14	13	25	20	20

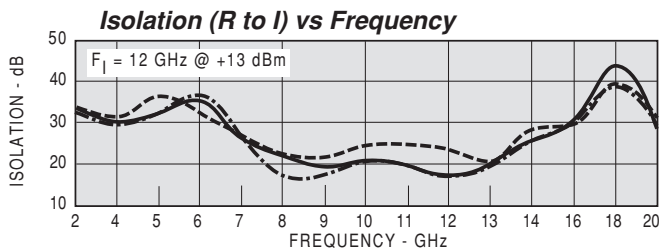
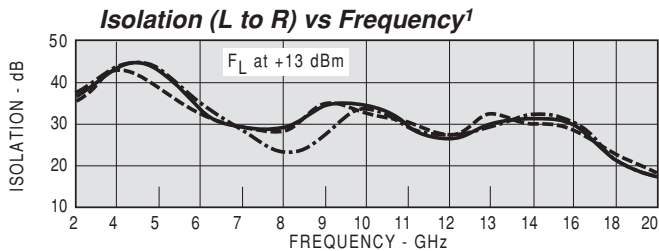
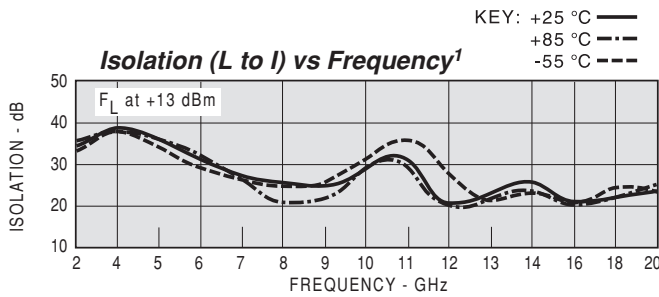
$F_R = 2000$  MHz @ -10 dBm       $F_L = 2030$  MHz  
 $F_L @ +13$  dBm       $F_L @ +16$  dBm

### Harmonic Intermodulation Products (single tone)

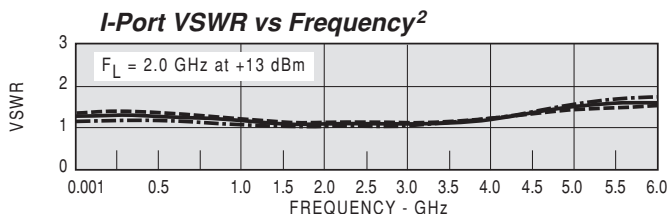
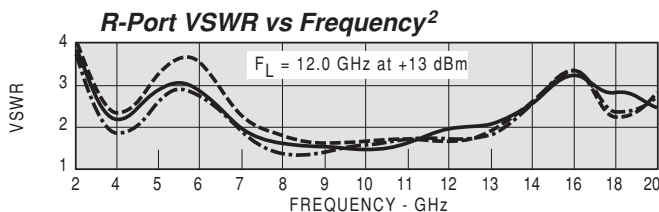
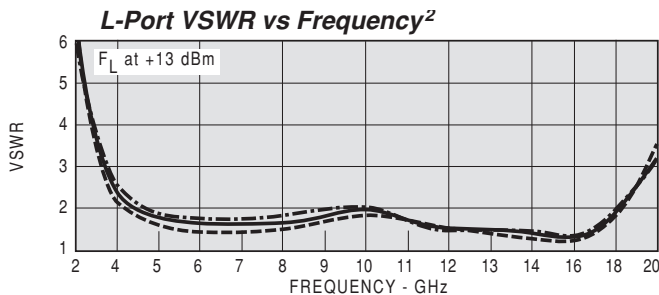
HARMONICS OF $f_R$	0	1	2	3	4	5
5	>100	99	>100	>100	>100	91
4	95	98	98	>100	>100	>100
3	99	>100	>100	97	>100	92
2	98	95	98	88	92	87
1	79	68	80	62	79	71
0	73	62	76	58	74	67
	65	68	59	61	60	56
	64	58	55	55	59	59
	25	0	36	19	40	32
	25	0	37	21	38	37
	6	9	7	33	25	25
	7	11	8	36	26	26

$F_R = 4000$  MHz @ -10 dBm       $F_L = 4030$  MHz  
 $F_L @ +13$  dBm       $F_L @ +16$  dBm

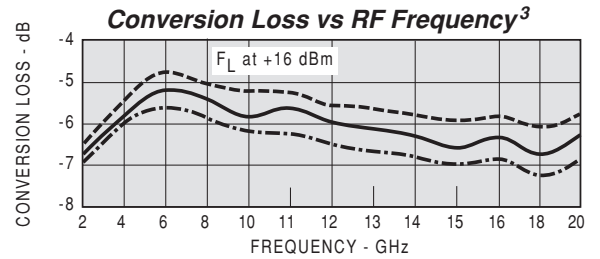
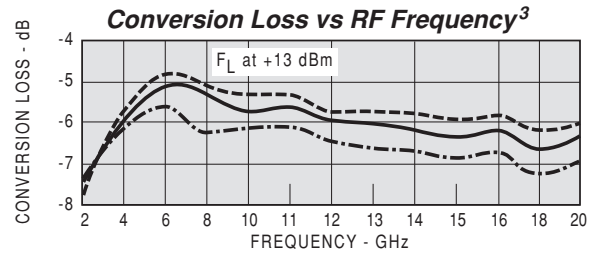
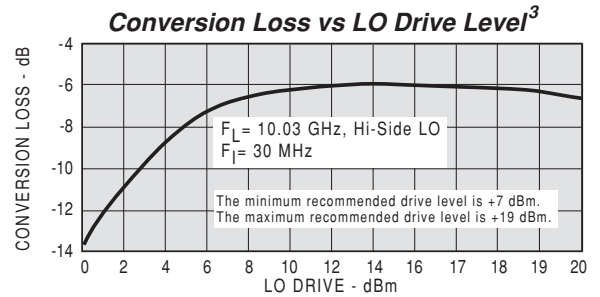
**TYPICAL PERFORMANCE**



<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.

