TELEDYNE MICROWAVE SOLUTIONS
Everywhereyoulook™

Rev. 6/12

MMP20291 2.0 TO 20.0 GHz COUGAR MIXERPAK TRIPLE-BALANCED MIXER

Typical Values	MMP20291
LO & RF	2.0 - 20.0 GHz
IF	0.001 - 8.0 GHz
Third Order I.P.	+18.0 dBm
Conversion Loss	7.5 dB
LO Drive (nominal)	+10.0 dBm
High Isolation (LO to RF)	30.0 dB

Cougar MixerPak - Seam Sealed Hermetic Package

SPECIFICATIONS*

Parameter	Port	Frequency (GHz)	Typ. (dB)	Guaranteed -55 to +85 °C Max. (dB)
SSB Conversion Loss and SSB Noise Figure	f_R	2.0 to 10.0	7.5	9.0
	f_L	2.0 to 10.0	7.5	9.0
	f_I	0.001 to 8.0	7.5	9.0
	f_R	10.0 to 20.0	8.0	9.5
	f_L	10.0 to 20.0	8.0	9.5
	f_I	0.001 to 8.0	8.0	9.5
Conversion Comp.	f_R	Level = +8 dBm	–	1.0
Desensitization	f_{R2}	Level = +6 dBm	–	1.0
			Typ. (dB)	**Min. (dB)**
Isolation				
f_R at I	f_R	2.0 to 6.0	32	28
f_R at I	f_R	6.0 to 12.0	25	15
f_R at I	f_R	12.0 to 20.0	25	20
f_L at R	f_L	2.0 to 4.0	22	15
f_L at R	f_L	4.0 to 20.0	32	24
f_L at I	f_L	2.0 to 20.0	27	20
Third Order Intercept		LO = +10 dBm	+16 dBm	—
		LO = +13 dBm	+18 dBm	—

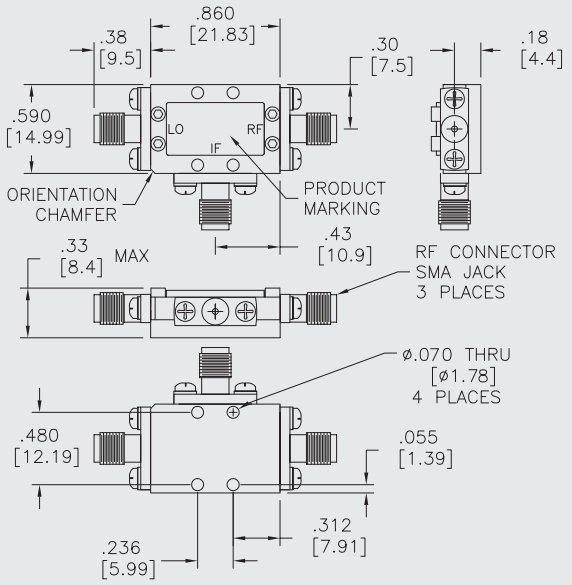
* Measured in a 50-ohm system with nominal LO drive of +10 dBm as a downconverter.

ABSOLUTE MAXIMUM RATINGS

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

MMP20291

Cougar MixerPak



DIMENSIONS ARE IN INCHES [MILLIMETERS]

Harmonic Intermodulation Products
(single tone)

HARMONICS OF f_R (rows 5 → 0) × HARMONICS OF f_L (columns 0 1 2 3 4 5)

	0	1	2	3	4	5
5	96	97	91	94	90	92
	95	93	98	86	90	89
4	86	86	87	87	73	83
	80	95	87	86	68	82
3	71	63	68	53	66	58
	67	66	64	50	64	51
2	43	49	38	54	47	53
	41	52	37	49	60	56
1	22	0	37	12	42	40
	21	0	34	16	35	22
0		-2	-5	13	21	16
		0	-2	16	21	28

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

Harmonic Intermodulation Products
(single tone)

HARMONICS OF f_R (rows 5 → 0) × HARMONICS OF f_L (columns 0 1 2 3 4 5)

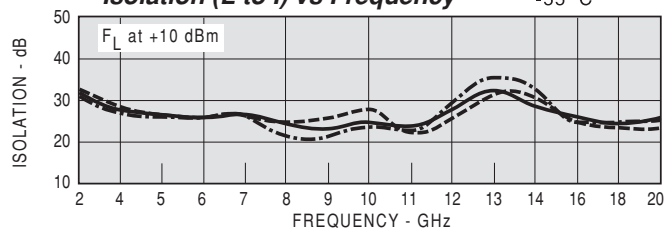
	0	1	2	3	4	5
5	91	92	94	94	96	98
	90	92	93	93	95	97
4	92	92	94	95	95	93
	88	89	90	91	88	92
3	83	75	78	66	79	72
	83	69	74	60	78	64
2	54	60	52	60	57	81
	49	55	47	57	54	64
1	25	0	36	15	47	22
	25	0	40	21	43	33
0		-5	4	17	16	13
		-3	7	16	21	16

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

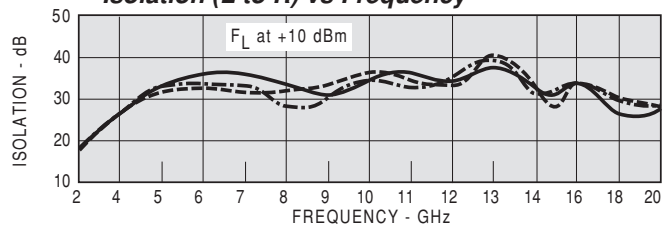
TYPICAL PERFORMANCE

KEY: +25 °C —— +85 °C —·— -55 °C – – –

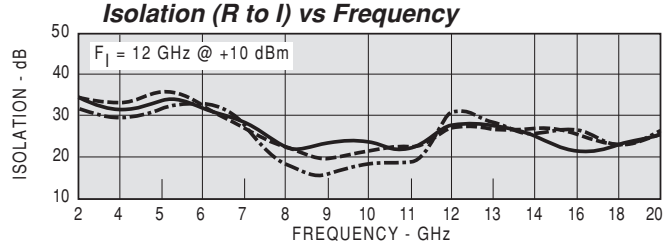
Isolation (L to I) vs Frequency[1]



Isolation (L to R) vs Frequency[1]

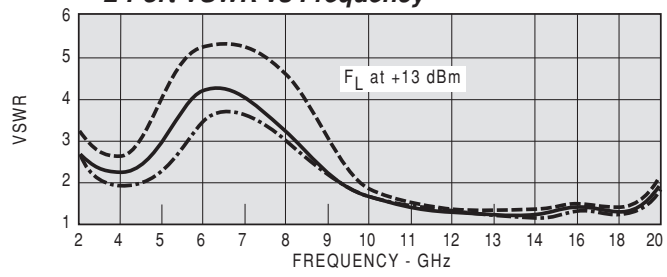


Isolation (R to I) vs Frequency

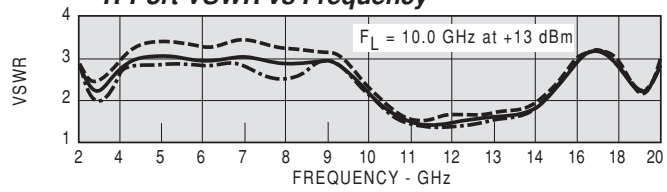


[1]Level of the f_L signal fed through to the R- and I-ports with respect to the level of the f_L signal at the L-port.

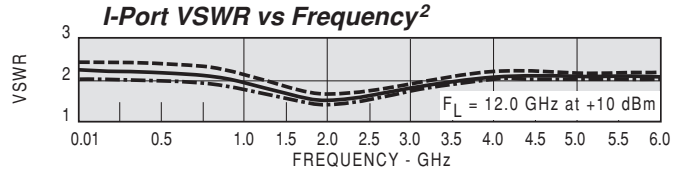
L-Port VSWR vs Frequency[2]



R-Port VSWR vs Frequency[2]

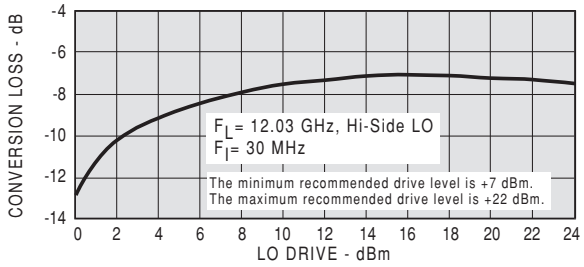


I-Port VSWR vs Frequency[2]

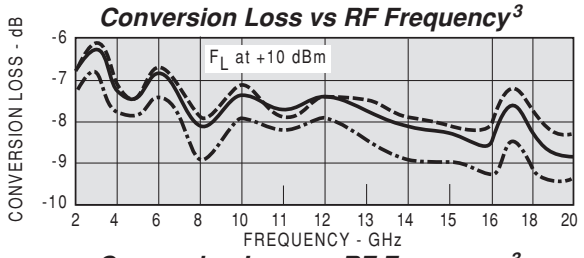


[2] VSWR of the I- and R-ports in a 50-ohm system. Some variation in the R-port VSWR will occur as a function of the L-port frequency as shown above.

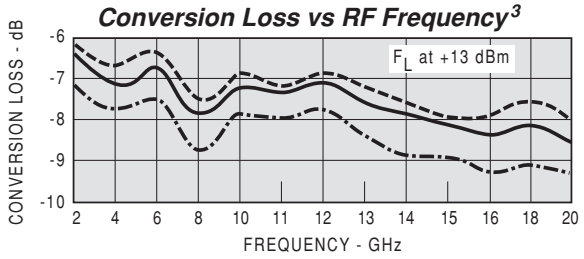
Conversion Loss vs LO Drive Level[3]



Conversion Loss vs RF Frequency[3]

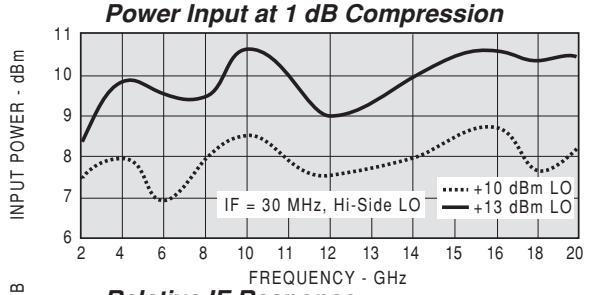


Conversion Loss vs RF Frequency[3]

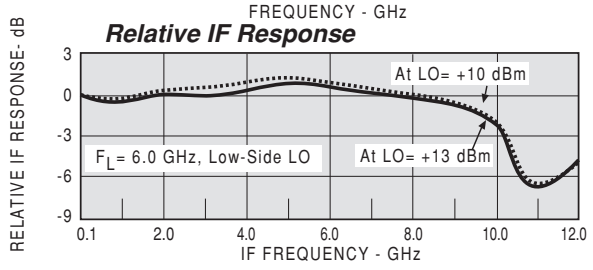


[3]Conversion loss of the mixer when used in an SSB system. The frequency ordinate refers to the R-port (f_R) with f_I at 30 MHz.

Power Input at 1 dB Compression



Relative IF Response



Intercept Point