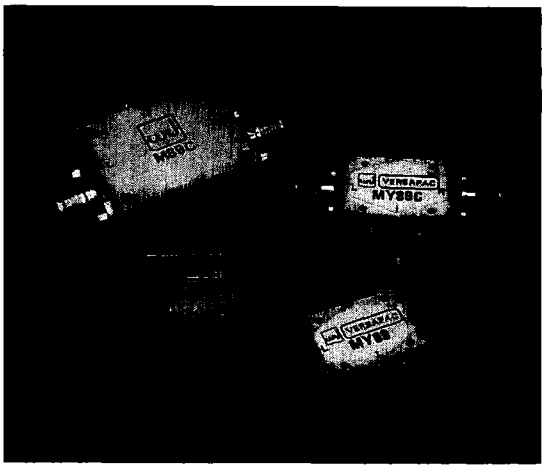
M89 / M89C
MY89 / MY89C

TRIPLE-BALANCED MIXER

- LO, RF } 2 TO 18 GHz
- IF 1 TO 8 GHz
- LO DRIVE +10 dBm (NOMINAL)
- WIDE BANDWIDTH
- MIL–M–28837 EQUIVALENT LEVEL SCREENING AVAILABLE



Guaranteed Specifications[1,2]

Characteristics	Typ.	+25°C	-54°C to +85°C	Test Conditions
SSB Conversion Loss and SSB Noise Figure (Max.)	7.5 dB	10.0 dB	10.5 dB	f_R 2 to 10 GHz f_L 2 to 18 GHz f_I 1 to 8 GHz
	8.0 dB	10.5 dB	11.0 dB	f_R 10 to 18 GHz f_L 2 to 18 GHz f_I 2 to 8 GHz
Isolation (Min.)				
L to R	28 dB	15 dB	13 dB	f_L 2 to 18 GHz
L to I	32 dB	16 dB	14 dB	f_L 2 to 18 GHz
Conversion Compression	1.0 dB			f_R level +4 dBm f_L level +10 dBm
Third-Order Input Intercept Point	+14 dBm			f_{R1} 6.00 GHz at -6 dBm f_{R2} 6.01 GHz at -6 dBm f_L 10.0 GHz at +10 dBm
	+18.5 dBm			f_{R1} 15.00 GHz at -6 dBm f_{R2} 15.01 GHz at -6 dBm f_L 18.0 GHz at +10 dBm

Notes:

1. Measured in a 50-ohm system with nominal LO drive and downconverter application only, unless otherwise specified.
2. Typical values are measured at 25°C and are not guaranteed. Typical performance applies to the MINPAC™ model and does not necessarily reflect the performance of the VERSAPAC® model.

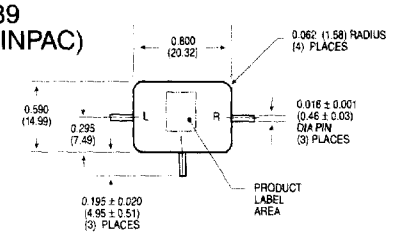
Absolute Maximum Ratings

Operating Temperature .....-54°C to +100°C
Storage Temperature .....-65°C to +100°C
Peak Input Power .....+26 dBm max. at +25°C, +23 dBm max. at +100°C

Weight M89: 12 grams (0.42 oz.) max. M89C: 40 grams (1.41 oz.) max.
MY89: 7.0 grams (0.28 oz.) max. MY89C: 20.0 grams (0.70 oz.) max.

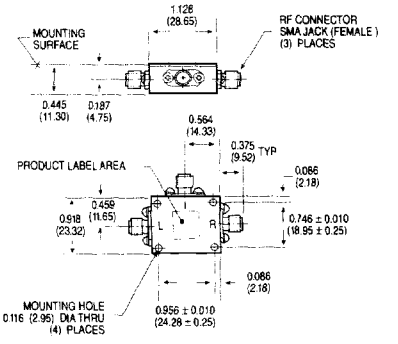
Outline Drawings

M89
(MINPAC)



DIMENSIONS ARE IN INCHES (MILLIMETERS)
±.015 (.38) UNLESS OTHERWISE SPECIFIED

M89C
(CONNECTORIZED)



DIMENSIONS ARE IN INCHES (MILLIMETERS)
±.015 (.38) UNLESS OTHERWISE SPECIFIED

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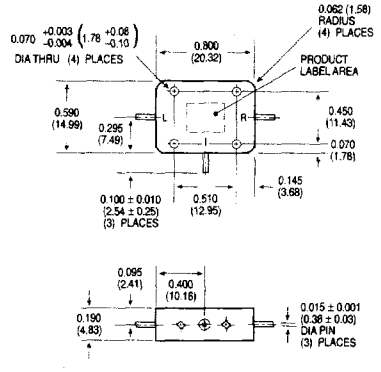
Outline Drawings

MY89 (VERSAPAC)



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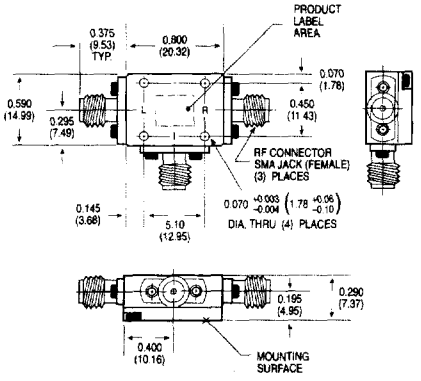
±.015 (.38) UNLESS OTHERWISE SPECIFIED

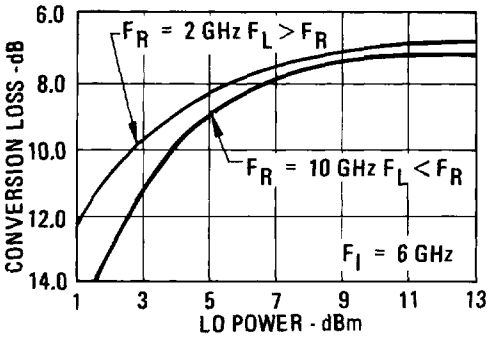
MY89C (CONNECTORIZED)



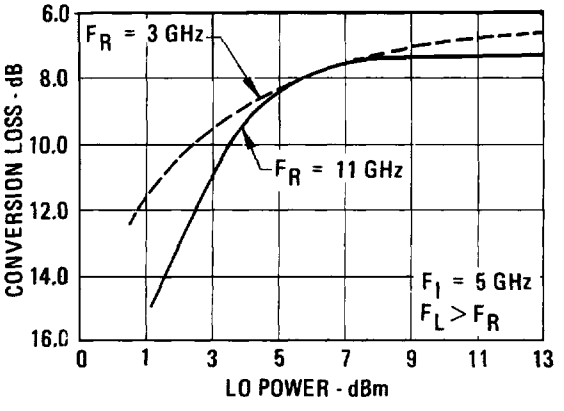
DIMENSIONS ARE IN INCHES (MILLIMETERS)
±.015 (.38) UNLESS OTHERWISE SPECIFIED

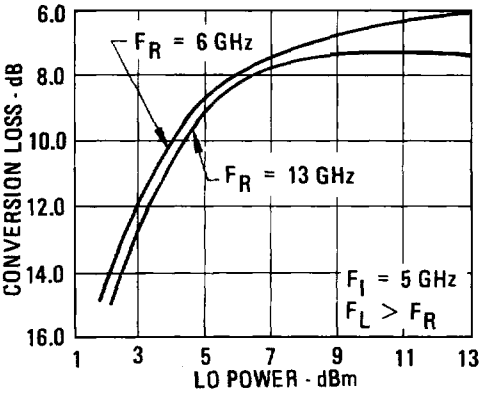
Typical Performance at 25°C*

Conversion Loss vs. LO Drive Power



Drive Level: The maximum recommended drive level is +16 dBm. This upper level has been established by the desire to avoid a serious increase in noise figure and a loss of isolation. Operation at +16 dBm is rcommended to achieve best two-tone performance and best suppression of the intermodulation products.





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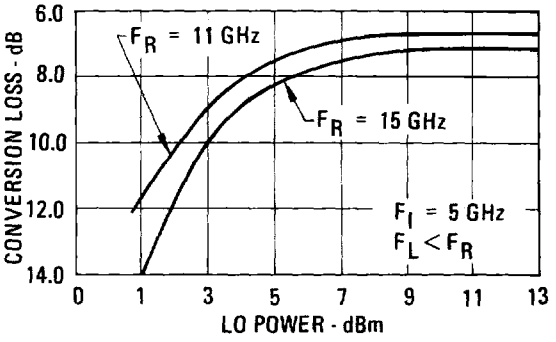
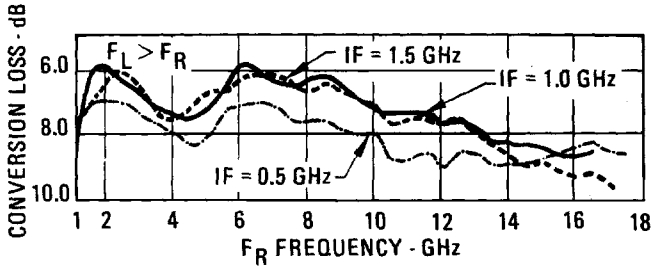
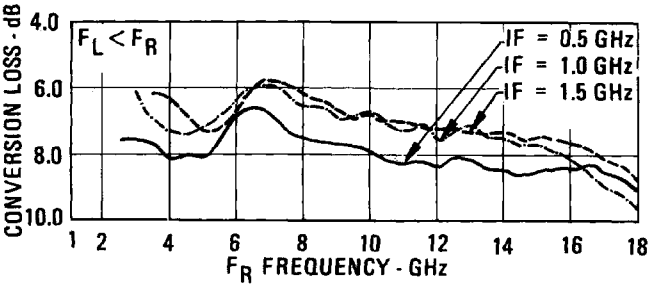
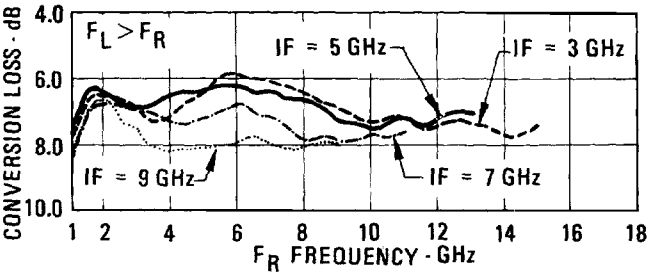
Conversion Loss vs. LO Drive Power

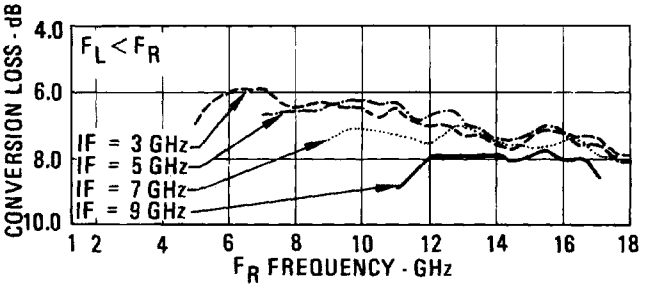


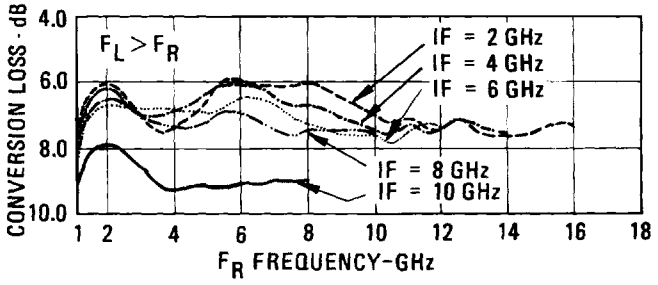
Conversion Loss vs. Frequency, LO Power @ +10 dBm

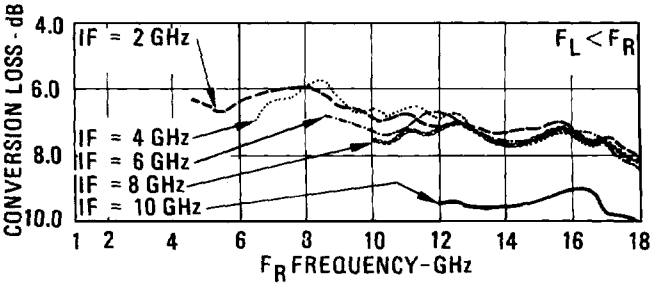




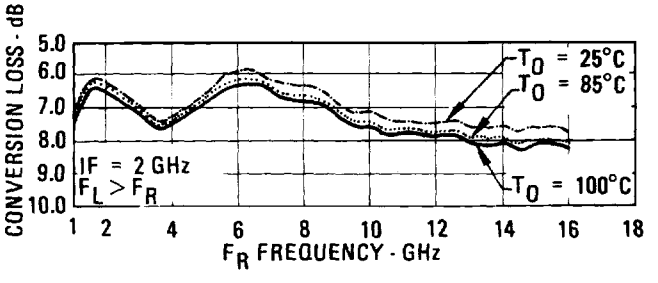


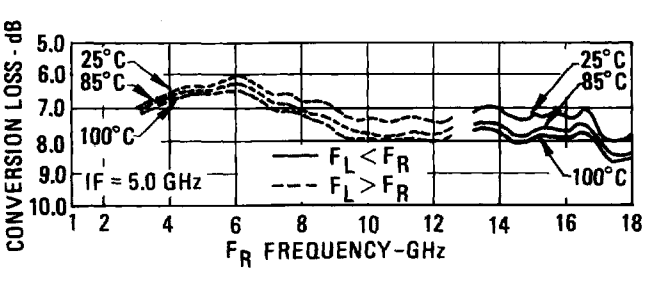






Conversion Loss vs. Frequency and Temperature, LO Power @ +10 dBm





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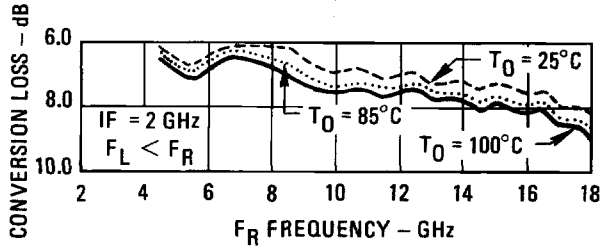
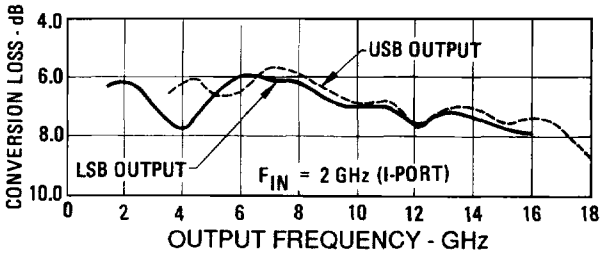
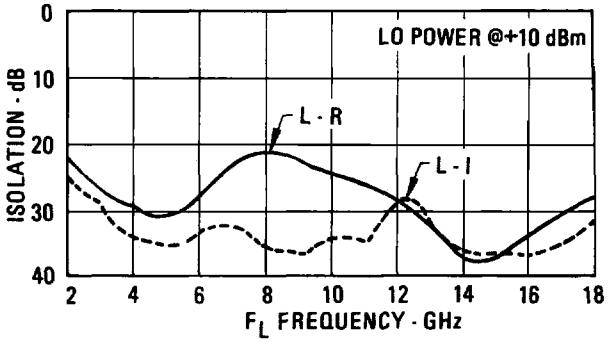
Conversion Loss vs. Frequency and Temperature, LO Power @ +10 dBm

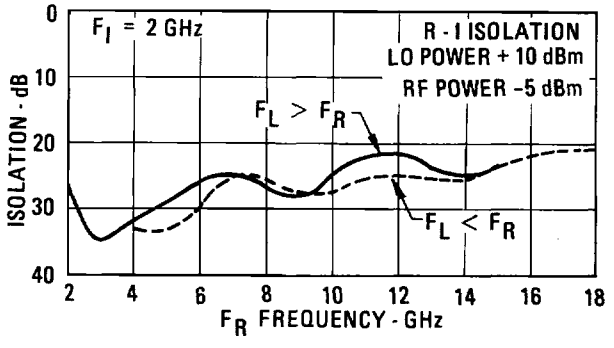


Up Conversion Loss vs. Output Frequency LO Power @+10 dBm

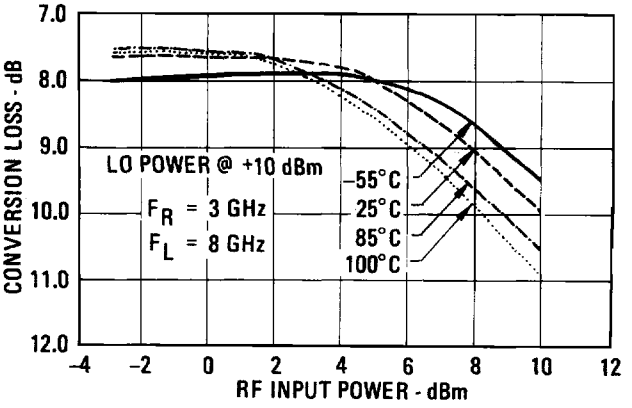


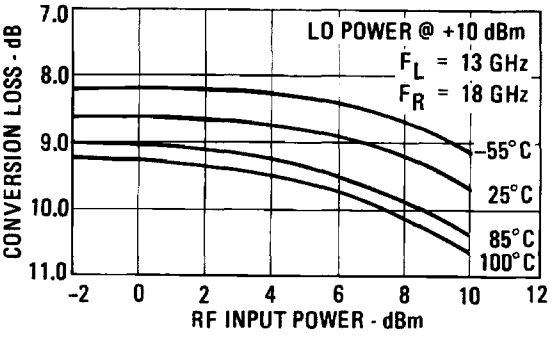
Isolation vs. Frequency

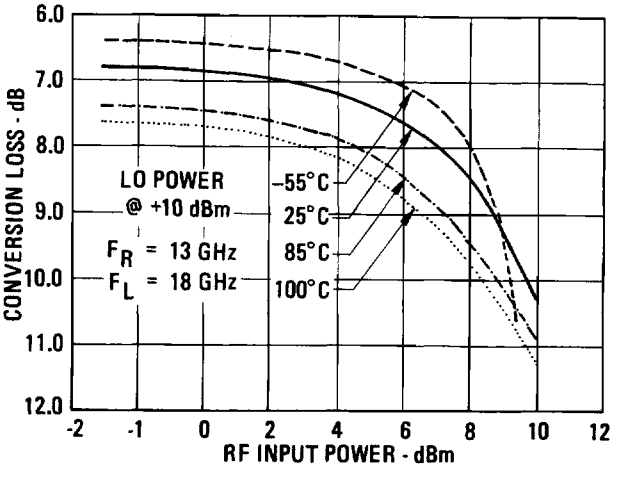


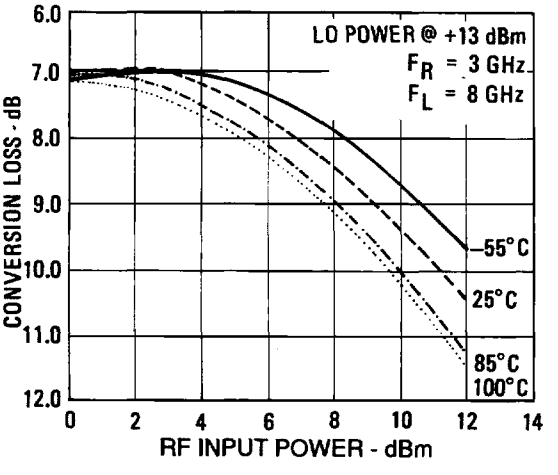


Conversion Loss vs. Input Power and Temperature









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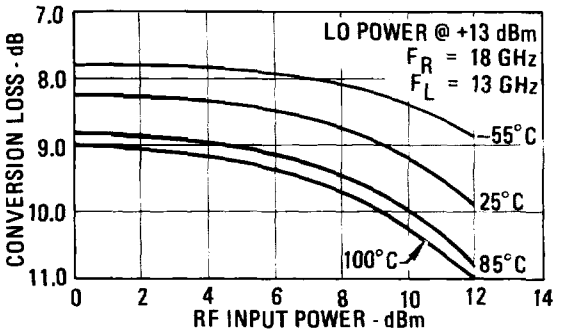
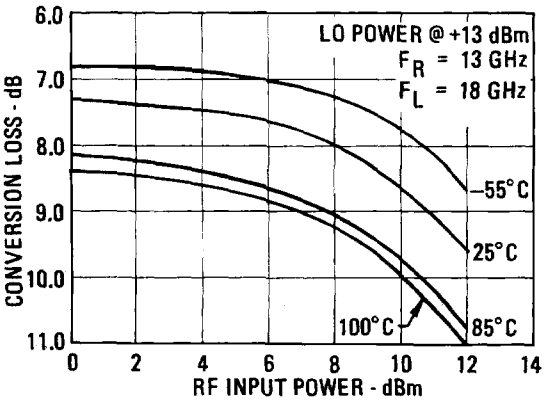
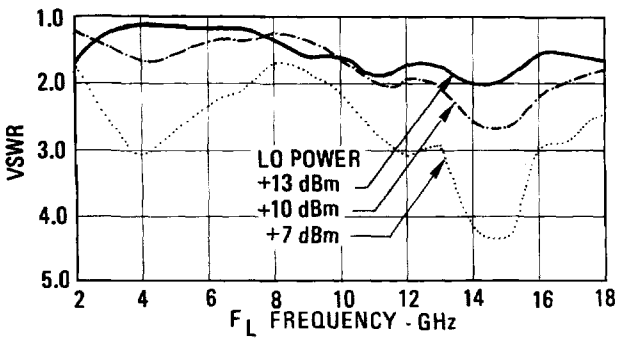
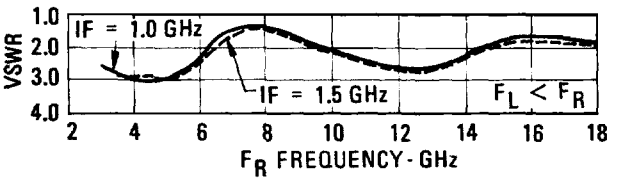
Conversion Loss vs. Input Power and Temperature (cont.)

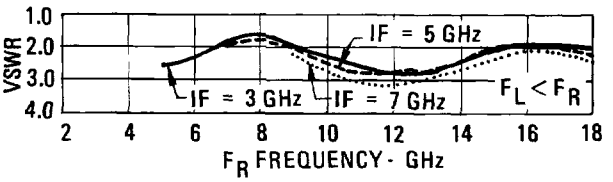




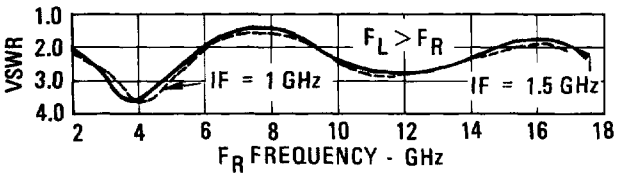
L-Port VSWR vs. Frequency

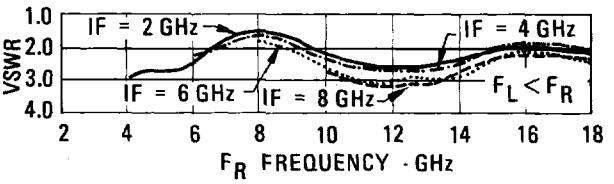


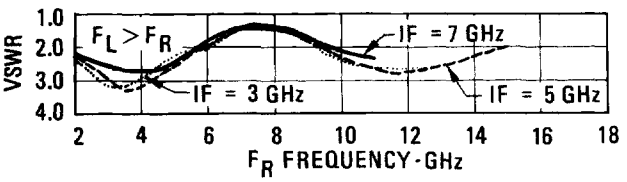


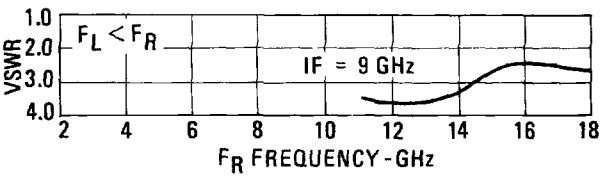


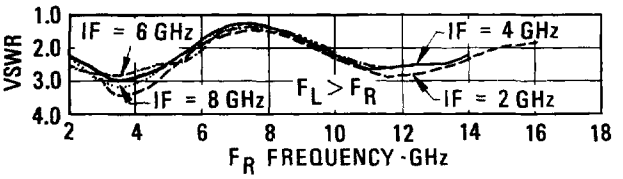
R-Port VSWR vs. Frequency, LO Power @ +10 dBm



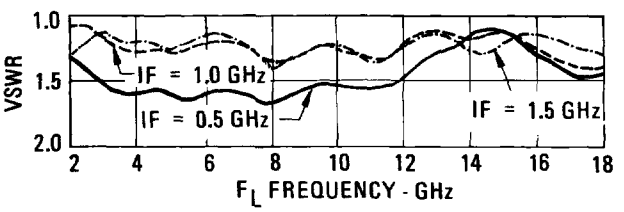


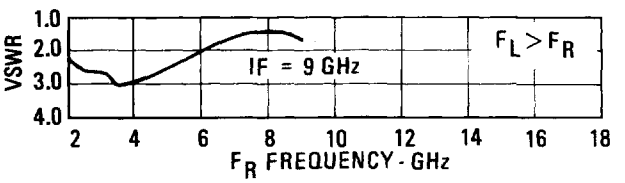


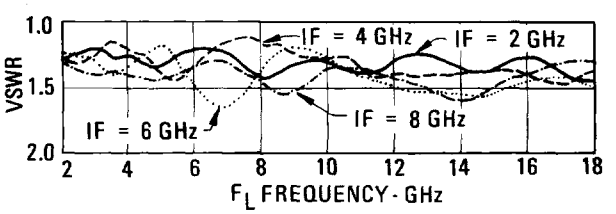




I-Port VSWR vs. Frequency, LO Power @ +10 dBm







*Typical performance applies to the MINPAC™ model and does not necessarily reflect the performance of the VERSAPAC® model.

Typical Performance at 25°C*

f_L Characteristic Single Tone IM	Suppression (dB) Input 0 dBm	Input -5 dBm	Input -10 dBm	Test Conditions
f_R f_L				
1 x 1	0	0	0	f_R = 2 GHz
1 X 2	40.0	42.0	42.0	f_L = 4.1 GHz at
2 X 2	42.0	49.0	54.0	+10 dBm
3 X 2	61.0	68.0	>70.0	
3 X 1	42.0	52.0	62.0	
3 X 3	58.0	63.0	68.0	
4 X 1	77.0	>80.0	>80.0	
4 X 3	65.0	79.0	>80.0	
4 X 4	63.0	>68.0	>70.0	
5 X 1	74.0	>77.0	>77.0	
5 X 2	72.0	>76.0	>76.0	
5 X 3	63.0	>75.0	>75.0	
5 X 4	75.0	>75.0	>75.0	
1 x 1	0	0	0	f_R = 4.1 GHz
1 X 3	18.0	18.0	18.0	f_L = 2.0 GHz at
1 X 4	46.0	46.0	45.0	+10 dBm
1 X 5	35.0	40.0	41.0	
2 X 1	43.0	47.0	52.0	
2 X 2	44.0	46.0	51.0	
2 X 3	42.0	45.0	50.0	
2 X 5	41.0	44.0	44.0	
3 X 2	60.0	>66.0	>68.0	
3 X 3	56.0	67.0	>67.0	
3 X 4	59.0	68.0	>70.0	
3 X 5	57.0	62.0	67.0	
4 X 4	59.0	>67.0	>67.0	
4 X 5	63.0	>69.0	>69.0	
1 x 1	0	0	0	f_R = 18 GHz
1 X 2	30.0	30.0	29.0	f_L = 10.1 GHz at
2 X 3	55.0	59.0	63.0	+10 dBm
2 X 4	43.0	48.0	52.0	
3 X 5	46.0	55.0	64.0	
1 x 1	0	0	0	f_R = 10.1 GHz
2 X 1	44.0	49.0	55.0	F_L = 18 GHz at
3 X 2	55.0	65.0	>68.0	+10 dBm
4 X 2	59.0	74.0	>76.0	
5 X 3	73.0	>74.0	>74.0	

Characteristic Harmonics of f_L	Output Power R- Port	I-Port	Test Conditions
f_L	-12 dBm	-15 dBm	f_L 2 GHz at +10 dBm
2 f_L	-22 dBm	-18 dBm	
3 f_L	-25 dBm	-24 dBm	
4 f_L	-31 dBm	-31 dBm	
5 f_L	-38 dBm	-31 dBm	
f_L	-22 dBm	-28 dBm	f_L 4.5 GHz at +10 dBm
2 f_L	-27 dBm	-25 dBm	
3 f_L	-41 dBm		
4 f_L	-37 dBm		
f_L	-12 dBm		f_L 9 GHz at +10 dBm
2 f_L	-30 dBm		
f_L	-24 dBm		f_L 4 GHz at +10 dBm
2 f_L	-22 dBm		

*Typical performance applies to the MINPAC™ model and does not necessarily reflect the performance of the VERSAPAC® models.

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Typical Performance at 25°C*

LO Power =+10 dBm into L-Port
f_{OUT} = 2 to 18 GHz at R-Port

I-Port Input	(GHz)	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
fL (GHz)											
2.0	LSB	—	—	—	—	6.91	—	7.29	6.48	7.60	10.02
	USB	6.60	—	6.92	6.64	6.40	6.74	7.03	7.95	8.88	9.76
2.5	LSB	—	—	—	—	—	7.01	7.42	7.25	7.75	8.32
	USB	7.04	6.23	6.31	6.84	6.30	6.65	7.34	7.43	8.78	9.78
3.0	LSB	6.04			—	6.27		7.30	7.55	—	9.53
	USB	7.9	6.67	—	6.33	6.62	6.51	7.39	7.58	7.46	9.90
3.5	LSB	6.21	—	—	—	—	6.51	—	7.46	7.98	9.72
	USB	7.48	6.90	5.83	5.96	6.37	7.05	7.12	7.69	7.68	9.58
4.0	LSB	6.77	6.07	—	—	—	6.27	7.55	—	8.40	9.55
	USB	7.27	6.31	5.57	—	6.43	7.15	7.24	6.88	8.02	9.63
4.5	LSB	7.00	6.35	—	—	—	—	6.64	7.80	—	9.65
	USB	6.77	6.33	5.91	5.48	6.47	6.94	7.62	6.96	8.02	9.81
5.0	LSB	7.89	7.69	6.50	—	—	—	6.75	7.87	8.45	—
	USB	6.01	5.51	6.02	5.91	—	7.35	6.73	7.20	7.76	8.94
5.5	LSB	7.58	8.16	6.43	—	—	—	—	7.05	8.74	9.69
	USB	5.89	5.52	6.20	6.54	6.03	7.19	7.04	7.28	8.21	8.87
6.0	LSB	7.19	7.62	7.76	6.12	—	—	—	6.95	8.68	10.22
	USB	6.39	5.99	6.09	6.61	6.77	—	7.29	7.26	7.38	9.45
6.5	LSB	6.68	7.10	7.86	5.57	—	—	—	—	7.72	10.95
	USB	5.87	6.08	6.35	6.53	7.02	6.37	7.16	7.72	7.40	9.25
7.0	LSB	5.97	6.69	7.27	7.81	6.46	—	—	—	7.73	10.64
	USB	6.43	6.22	6.64	6.82	6.20	6.90	—	7.00	7.97	9.42
7.5	LSB	6.15	6.08	6.70	7.38	6.79	—	—	—	—	9.32
	USB	6.53	6.97	6.60	6.90	6.54	6.99	7.33	6.89	7.84	9.99
8.0	LSB	6.16	5.75	6.18	6.34	6.61	6.42	—	—	—	9.50
	USB	6.68	6.99	6.95	6.03	6.97	7.18	6.71	—	8.42	10.51
8.5	LSB	6.78	6.32	6.11	6.66	6.81	6.43	—	—	—	—
	USB	7.42	6.95	7.40	6.95	7.30	7.89	7.13	7.18	8.58	—
9.0	LSB	6.68	6.19	5.81	6.08	5.67	6.15	6.13	—	—	—
	USB	6.96	7.08	6.34	7.10	7.39	7.01	7.62	7.80	—	—
9.5	LSB	6.76	6.33	6.16	6.11	6.54	6.80	6.38			
	USB	7.25	7.72	7.12	7.32	7.64	7.08	7.66	8.21	—	—
10.0	LSB	6.62	6.38	6.15	5.94	6.30	5.88	6.34	5.89	—	—
	USB	7.50	6.46	7.22	7.39	6.89	7.56	8.09	8.88	—	—
10.5	LSB	7.29	6.74	6.34	6.05	6.41	6.85	7.15	6.41	—	—
	USB	7.97	7.07	7.59	7.67	7.08	7.45	8.08	—	—	—
11.0	LSB	7.30	6.65	6.66	6.14	6.10	6.57	6.41	6.71	6.46	—
	USB	6.50	7.20	7.36	6.92	7.51	7.84	8.62	—	—	—
11.5	LSB	7.66	7.41	6.89	6.58	6.37	6.64	7.33	7.69	7.13	—
	USB	7.30	7.70	7.81	7.32	7.53	8.13	—	—	—	—
12.0	LSB	7.62	7.25	6.82	6.71	6.26	6.17	6.75	6.43	7.33	7.97
	USB	7.39	7.29	6.94	7.51	7.86	8.66	—	—	—	—
12.5	LSB	7.89	7.28	7.54	7.01	6.64	6.39	6.79	7.38	8.01	8.40
	USB	7.63	7.72	7.34	7.48	8.19				—	—
13.0	LSB	6.69	7.47	7.22	6.81	6.88	6.44	6.45	6.93	7.11	8.90
	USB	7.61	7.04	7.57	7.83	8.51	—	—	—	—	—
13.5	LSB	7.50	7.83	7.32	7.44	7.14	6.96	6.84	6.82	8.01	9.42
	USB	8.18	7.30	7.52	8.10	—	—	—	—	—	—
14.0	LSB	7.90	6.52	7.49	7.30	6.86	6.99	6.91	6.89	7.95	8.80
	USB	7.71	7.57	7.89	8.47	—	—	—	—	—	—
14.5	LSB	8.40	7.40	7.83	7.36	7.68	7.54	7.31	7.39	7.77	9.49
	USB	8.23	7.84	8.05	—	—	—	—	—	—	—
15.0	LSB	8.51	7.42	6.46	7.46	7.34	7.30	7.65	7.46	7.87	9.38
	USB	8.79	8.10	8.49	—	—	—	...	—	—	—
15.5	LSB	8.93	7.84	7.28	7.78	7.54	7.80	7.99	7.39	7.91	9.29
	USB	9.11	8.35	—	—	—	—	—	—	—	—
16.0	LSB	8.27	7.60	7.30	6.47	7.76	7.74	7.82	7.90	7.94	9.55
	USB	9.49	8.80	—	—	—	—	—	—	—	—
16.5	LSB	9.09	7.98	7.71	7.36	7.85	7.74	7.92	7.83	7.77	9.01
	USB	10.18	—	—	—	—	—	—	—	—	—
17.0	LSB	9.19	7.20	7.48	7.48	6.73	7.96	8.06	7.53	8.39	9.13
	USB	—	—	—	—	—	—	—	—	—	—
17.5	LSB	9.63	7.74	8.21	7.77	7.55	7.97	7.82	8.00	8.15	9.13
	USB			—	—	—	—	—	—	—	—
18.0	LSB	9.62	7.83	7.23	7.59	7.52	6.88	7.93	8.09	8.02	9.78
	USB	—	—	—	—	—	—	—	—	—	

*Typical performance applies to the MINPAC™ model and does not necessarily reflect the performance of the VERSAPAC® models.