

Coaxial Frequency Mixer

Level 13 (LO Power +13 dBm) 3700 to 7000 MHz

Maximum Ratings

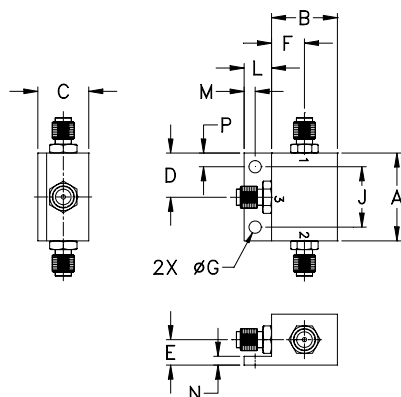
Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Power	200mW
IF Current	40mA

Permanent damage may occur if any of these limits are exceeded.

Coaxial Connections

LO	1
RF	2
IF	3

Outline Drawing



Outline Dimensions (inch)

A	B	C	D	E	F	G	H
1.00	.75	.58	.50	.29	.38	.140	--
25.40	19.05	14.73	12.70	7.37	9.65	3.56	--
J	K	L	M	N	P	wt	
.687	--	.32	.13	.10	.16	grams	
17.45	--	8.13	3.30	2.54	4.06	25.0	

Features

- wide frequency range, 3700 to 7000 MHz
- low conversion loss, 4.7 dB typ.
- high L-R isolation, 37 dB typ.

Applications

- SATCOM
- instrumentation
- defense & federal communications
- SHF

ZMX-7GMH



Generic photo used for illustration purposes only

CASE STYLE: BU413

Connectors	Model
SMA	ZMX-7GMH

Electrical Specifications

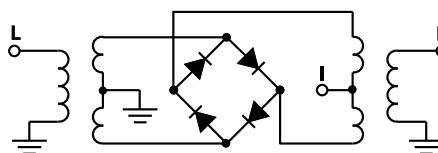
FREQUENCY (MHz)		CONVERSION LOSS (dB)			LO-RF ISOLATION (dB)		LO-IF ISOLATION (dB)	
LO/RF	IF							
f_L - f_U		$\overline{X}$	σ	Total Range Max.	Typ.	Min.	Typ.	Min.
3700-7000	DC-2000	4.7	0.20	8.0	37	20	17	8

1 dB COMP.: +9 dBm typ.

Typical Performance Data

Frequency (MHz)		Conversion Loss (dB)	Isolation L-R (dB)	Isolation L-I (dB)	VSWR RF Port (:1)	VSWR LO Port (:1)
RF	LO	LO +13dBm	LO +13dBm	LO +13dBm	LO +13dBm	LO +13dBm
3700.00	3730.00	4.90	32.88	11.42	4.38	2.01
3886.79	3916.79	4.95	31.48	11.82	4.42	1.92
4000.00	4030.00	4.98	33.88	11.83	4.32	1.92
4198.11	4228.11	5.03	38.98	12.38	3.29	2.07
4384.91	4414.91	5.01	37.98	12.84	2.28	2.41
4571.70	4601.70	4.73	35.25	13.27	1.74	2.67
4758.49	4788.49	4.71	35.44	14.07	2.29	2.73
5000.00	4970.00	4.35	40.91	14.80	2.26	3.00
5194.34	5164.34	4.17	39.16	15.42	2.08	3.09
5381.13	5351.13	4.15	37.97	15.73	1.97	3.17
5567.92	5537.92	4.10	35.50	15.75	1.86	3.18
5754.72	5724.72	4.11	39.07	15.80	1.82	2.93
5941.51	5911.51	4.70	35.83	16.04	1.78	3.46
6000.00	5970.00	4.55	35.31	16.19	1.72	3.47
6190.57	6160.57	4.24	34.76	16.05	1.61	3.57
6377.36	6347.36	4.20	34.16	16.17	1.51	3.26
6564.15	6534.15	4.27	33.69	16.22	1.43	2.56
6750.94	6720.94	4.27	33.14	16.57	1.39	2.56
6937.74	6907.74	4.42	31.48	16.81	1.39	2.46
7000.00	6970.00	4.39	30.37	16.87	1.38	3.17

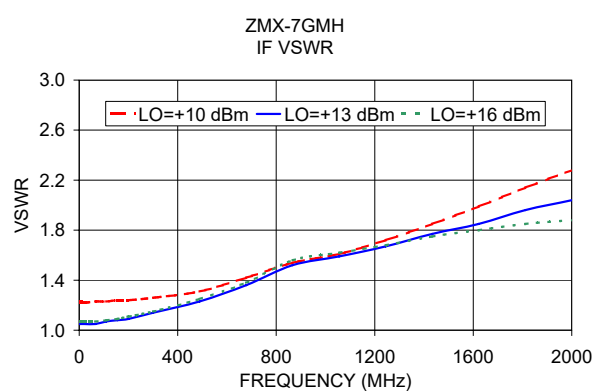
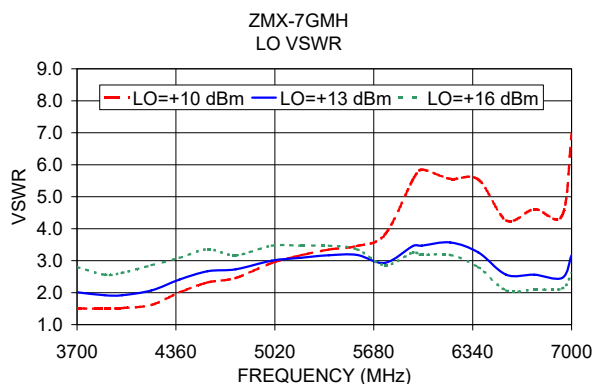
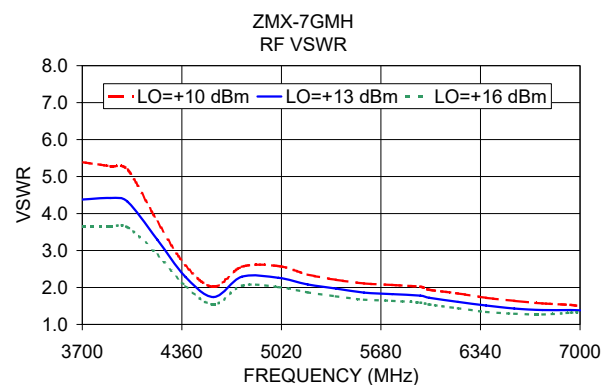
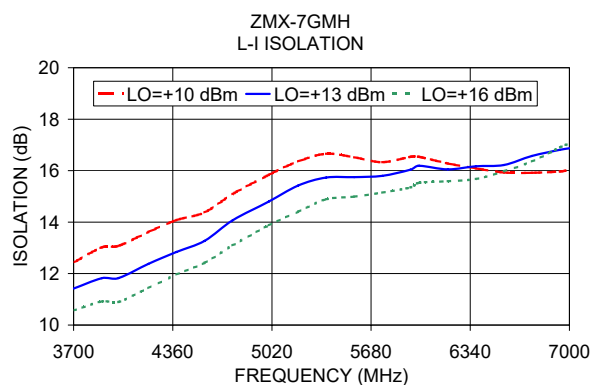
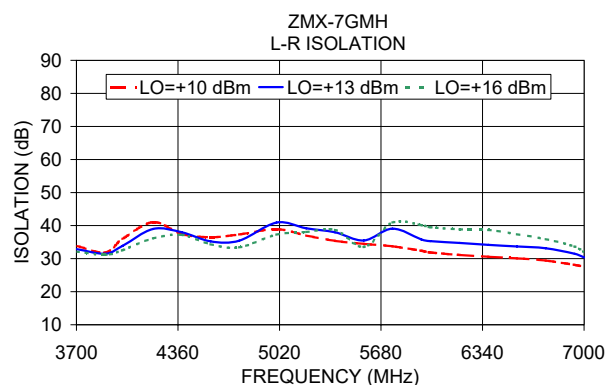
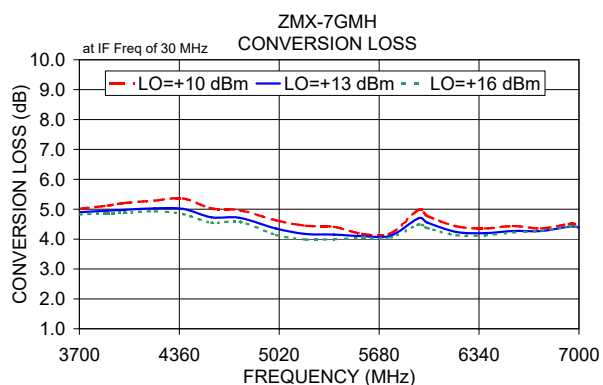
Electrical Schematic



Notes

- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
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Frequency Mixer

ZMX-7GMH

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)		
		@LO (dBm)		
		+10	+13	+16
1500.1	1530.1	12.14	10.50	11.97
1762.6	1792.6	11.98	8.88	7.98
2025.1	2055.1	9.87	8.29	7.49
2287.6	2317.6	8.36	7.50	6.94
2550.1	2580.1	7.81	6.90	6.49
2812.6	2842.6	6.82	6.28	6.10
3075.1	3105.1	6.04	5.79	5.70
3337.6	3367.6	5.98	5.78	5.74
3600.1	3630.1	6.19	5.97	5.90
3862.6	3892.6	6.02	5.84	5.81
4125.1	4155.1	5.96	5.76	5.71
4387.6	4417.6	6.05	5.84	5.78
4650.1	4680.1	5.92	5.67	5.62
4912.6	4942.6	5.84	5.55	5.50
5175.1	5205.1	5.76	5.43	5.39
5437.6	5467.6	5.61	5.28	5.26
5700.1	5730.1	5.74	5.36	5.34
5962.6	5992.6	6.34	5.82	5.71
6225.1	6255.1	5.97	5.47	5.38
6487.6	6517.6	5.86	5.40	5.32
6750.1	6780.1	5.78	5.28	5.20
7038.9	7068.9	5.66	5.17	5.13
7301.4	7331.4	5.43	5.13	5.17
7590.1	7620.1	5.54	5.26	5.31
7852.6	7882.6	5.78	5.44	5.46
8141.4	8171.4	5.69	5.46	5.50
8403.9	8433.9	5.49	5.34	5.41
8692.6	8722.6	5.52	5.36	5.42
8955.1	8985.1	5.60	5.43	5.46
9243.8	9273.8	5.65	5.49	5.50
9506.3	9536.3	5.99	5.80	5.77
9795.1	9825.1	6.03	5.86	5.84
10057.6	10087.6	6.20	6.05	6.05
10346.3	10376.3	6.48	6.28	6.28
10608.8	10638.8	7.47	6.60	6.48
10897.6	10927.6	7.62	6.83	6.79
11160.1	11190.1	7.33	6.83	6.86
11448.9	11478.9	8.06	7.39	7.38
11711.3	11741.3	9.04	8.03	8.12
12000.1	12030.1	12.52	10.68	11.00

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)		
		@LO (dBm)		
		+10	+13	+16
1500.1	1530.1	12.55	13.72	20.60
1762.6	1792.6	12.56	19.28	20.03
2025.1	2055.1	19.49	31.85	23.03
2287.6	2317.6	19.72	17.77	20.32
2550.1	2580.1	15.87	16.30	17.81
2812.6	2842.6	16.63	18.44	18.32
3075.1	3105.1	19.77	20.25	19.17
3337.6	3367.6	19.47	20.96	20.10
3600.1	3630.1	19.23	19.97	20.49
3862.6	3892.6	18.87	18.43	18.49
4125.1	4155.1	19.45	19.43	17.55
4387.6	4417.6	17.94	20.09	19.23
4650.1	4680.1	15.45	17.72	17.99
4912.6	4942.6	15.41	16.87	17.81
5175.1	5205.1	15.22	15.95	17.53
5437.6	5467.6	15.32	15.67	16.59
5700.1	5730.1	16.47	16.58	16.99
5962.6	5992.6	17.26	16.54	15.94
6225.1	6255.1	14.23	15.06	14.91
6487.6	6517.6	14.50	15.37	15.50
6750.1	6780.1	14.12	15.54	15.46
7038.9	7068.9	13.76	16.30	16.69
7301.4	7331.4	15.17	16.97	17.50
7590.1	7620.1	15.75	17.35	17.63
7852.6	7882.6	16.50	17.95	18.17
8141.4	8171.4	16.67	18.03	18.00
8403.9	8433.9	17.27	18.44	18.38
8692.6	8722.6	17.67	18.30	17.98
8955.1	8985.1	17.37	18.28	18.06
9243.8	9273.8	17.11	18.26	18.06
9506.3	9536.3	16.96	18.41	18.49
9795.1	9825.1	16.13	17.83	18.29
10057.6	10087.6	15.94	17.67	18.23
10346.3	10376.3	15.04	17.05	18.58
10608.8	10638.8	12.68	15.63	17.48
10897.6	10927.6	13.98	16.70	18.10
11160.1	11190.1	15.61	17.22	18.20
11448.9	11478.9	16.55	17.39	16.22
11711.3	11741.3	13.64	15.05	13.14
12000.1	12030.1	13.42	16.67	16.09

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+9dBm (dB)		
		@LO (dBm)		
		+10	+13	+16
1500.1	1530.1	0.57	0.65	-0.04
1762.6	1792.6	0.22	1.21	1.04
2025.1	2055.1	0.69	1.01	1.13
2287.6	2317.6	1.18	1.04	1.12
2550.1	2580.1	1.32	1.18	1.09
2812.6	2842.6	1.57	1.35	1.10
3075.1	3105.1	1.58	1.30	1.12
3337.6	3367.6	1.34	1.08	0.96
3600.1	3630.1	1.06	0.90	0.76
3862.6	3892.6	0.99	0.86	0.79
4125.1	4155.1	0.92	0.83	0.79
4387.6	4417.6	0.86	0.70	0.70
4650.1	4680.1	0.92	0.72	0.70
4912.6	4942.6	1.02	0.74	0.68
5175.1	5205.1	1.06	0.70	0.60
5437.6	5467.6	1.26	0.80	0.61
5700.1	5730.1	1.01	0.60	0.47
5962.6	5992.6	0.86	0.64	0.48
6225.1	6255.1	1.23	0.91	0.70
6487.6	6517.6	1.47	1.06	0.84
6750.1	6780.1	1.68	1.20	1.00
7038.9	7068.9	1.58	1.09	1.03
7301.4	7331.4	1.48	1.05	1.00
7590.1	7620.1	1.41	0.97	0.96
7852.6	7882.6	1.29	0.89	0.97
8141.4	8171.4	1.34	1.05	1.15
8403.9	8433.9	1.40	1.10	1.20
8692.6	8722.6	1.51	1.19	1.26
8955.1	8985.1	1.44	1.16	1.20
9243.8	9273.8	1.44	1.22	1.30
9506.3	9536.3	1.21	1.09	1.17
9795.1	9825.1	1.28	1.11	1.23
10057.6	10087.6	1.24	1.01	1.17
10346.3	10376.3	1.49	0.85	0.96
10608.8	10638.8	2.08	0.95	0.82
10897.6	10927.6	1.55	0.67	0.70
11160.1	11190.1	1.05	0.53	0.78
11448.9	11478.9	0.64	0.47	0.83
11711.3	11741.3	0.72	0.70	1.01
12000.1	12030.1	0.74	0.94	0.69

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=5350MHz (dB)
		@LO (dBm)
		+13
1649.9	3700.1	5.47
1569.9	3780.1	5.56
1489.9	3860.1	5.62
1409.9	3940.1	5.57
1329.9	4020.1	5.62
1249.9	4100.1	5.62
1169.9	4180.1	5.64
1089.9	4260.1	5.63
1009.9	4340.1	5.58
929.9	4420.1	5.46
849.9	4500.1	5.42
770.0	4580.0	5.38
690.0	4660.0	5.29
610.0	4740.0	5.29
530.0	4820.0	5.31
450.0	4900.0	5.30
370.0	4980.0	5.25
290.0	5060.0	5.20
210.0	5140.0	5.20
130.0	5220.0	5.22
50.0	5300.0	5.30
30.0	5380.0	5.34
110.0	5460.0	5.31
210.0	5560.0	5.34
290.0	5640.0	5.33
390.0	5740.0	5.26
470.0	5820.0	5.34
570.0	5920.0	5.51
650.0	6000.0	5.51
750.0	6100.0	5.59
830.0	6180.0	5.78
930.1	6280.1	5.97
1010.1	6360.1	6.19
1110.1	6460.1	6.41
1190.1	6540.1	6.55
1290.1	6640.1	6.66
1370.1	6720.1	6.72
1470.1	6820.1	6.80
1550.1	6900.1	6.81
1650.1	7000.1	6.82

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=3690MHz (dB)
		@LO (dBm)
		+13
10.1	3700.1	6.20
90.1	3780.1	5.92
170.1	3860.1	5.94
250.1	3940.1	6.01
330.1	4020.1	6.02
410.1	4100.1	6.02
490.1	4180.1	6.13
570.1	4260.1	6.13
650.1	4340.1	6.14
710.1	4400.1	6.33
790.1	4480.1	6.35
850.1	4540.1	6.29
930.1	4620.1	6.42
990.1	4680.1	6.46
1070.1	4760.1	6.49
1130.1	4820.1	6.61
1210.1	4900.1	6.63
1270.1	4960.1	6.65
1350.1	5040.1	6.69
1410.1	5100.1	6.50
1490.1	5180.1	6.59
1550.1	5240.1	6.63
1630.1	5320.1	6.85
1690.1	5380.1	6.91
1770.1	5460.1	7.25
1830.1	5520.1	7.19
1910.1	5600.1	7.53
1970.1	5660.1	7.70
2050.1	5740.1	7.97
2110.1	5800.1	8.11
2190.1	5880.1	8.25
2250.1	5940.1	8.53
2330.1	6020.1	8.64
2390.1	6080.1	8.89
2470.1	6160.1	9.29
2530.1	6220.1	9.49
2610.1	6300.1	9.90
2670.1	6360.1	10.07
2750.1	6440.1	10.53
2810.1	6500.1	10.86

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=7010.1MHz (dB)
		@LO (dBm)
		+13
2810.0	4200.1	10.28
2730.0	4280.1	9.62
2650.0	4360.1	8.73
2570.0	4440.1	8.01
2490.0	4520.1	7.50
2410.0	4600.1	6.97
2330.0	4680.1	6.61
2250.0	4760.1	6.50
2170.0	4840.1	6.42
2110.0	4900.1	6.23
2030.0	4980.1	6.10
1970.0	5040.1	6.05
1890.0	5120.1	5.82
1830.0	5180.1	5.71
1750.0	5260.1	5.67
1690.0	5320.1	5.59
1610.0	5400.1	5.42
1550.0	5460.1	5.43
1470.0	5540.1	5.41
1410.0	5600.1	5.30
1330.0	5680.1	5.31
1270.0	5740.1	5.43
1190.0	5820.1	5.44
1130.0	5880.1	5.60
1050.0	5960.1	5.51
990.0	6020.1	5.48
910.0	6100.1	5.40
850.0	6160.1	5.26
770.0	6240.1	5.10
710.0	6300.1	5.02
630.0	6380.1	4.99
570.0	6440.1	5.00
490.0	6520.1	5.01
430.0	6580.1	4.95
350.0	6660.1	4.92
290.0	6720.1	4.91
210.0	6800.1	4.97
150.0	6860.1	5.01
70.0	6940.1	4.99
10.0	7000.1	5.37

Frequency Mixer

ZMX-7GMH

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+10	+13	+16	+10	+13	+16
1530.1	25.57	26.35	31.51	8.01	9.82	15.27
1792.6	35.94	44.91	33.68	7.57	9.97	12.69
2055.1	30.89	30.28	28.42	7.64	9.44	11.39
2317.6	25.81	26.45	26.78	7.02	8.21	9.34
2580.1	25.29	25.41	26.09	6.91	7.60	8.41
2842.6	27.41	27.74	27.59	7.33	8.24	8.75
3105.1	31.43	30.82	30.02	8.74	9.59	9.76
3367.6	34.77	32.73	31.88	11.02	11.34	10.94
3630.1	35.15	33.97	33.05	12.77	12.53	11.97
3892.6	34.41	34.18	33.70	14.37	13.81	12.87
4155.1	38.36	37.19	35.59	15.74	14.85	13.74
4417.6	43.14	42.28	40.35	17.48	15.98	14.83
4680.1	40.18	40.97	39.97	18.47	16.94	15.76
4942.6	37.67	37.27	37.12	19.39	17.60	16.67
5205.1	42.83	42.12	40.86	19.94	18.38	17.42
5467.6	40.34	40.81	42.29	20.60	18.94	18.15
5730.1	44.74	41.81	39.80	20.87	19.59	18.73
5992.6	39.32	43.69	52.70	21.00	20.04	19.26
6255.1	36.59	40.30	44.56	20.94	20.41	19.91
6517.6	36.07	39.36	43.38	21.04	20.86	20.27
6780.1	33.91	36.96	40.76	21.04	21.06	20.67
7068.9	32.27	35.18	38.35	21.39	21.29	21.33
7331.4	31.46	34.32	37.52	21.28	21.75	21.91
7620.1	30.21	32.57	35.29	21.56	21.85	22.21
7882.6	29.34	31.21	33.42	22.53	22.79	23.32
8171.4	28.19	30.06	31.77	25.53	26.10	26.29
8433.8	27.85	29.49	30.57	28.48	29.54	30.25
8722.6	27.85	29.22	29.82	29.58	31.55	33.19
8985.1	27.37	28.53	29.14	29.65	31.90	33.93
9273.8	26.54	27.42	28.13	29.79	31.79	33.67
9536.4	24.80	25.87	26.75	29.67	31.32	32.80
9825.1	23.36	24.61	25.61	29.80	30.93	31.88
10087.6	21.28	22.72	23.77	29.51	30.17	30.67
10376.3	18.75	20.24	21.19	28.66	28.75	28.69
10638.8	16.24	17.75	18.73	26.49	26.72	26.80
10927.6	16.50	17.67	18.79	24.67	25.41	26.43
11190.1	18.91	20.70	22.08	26.38	27.60	28.53
11478.8	22.28	24.90	27.72	29.42	29.53	29.55
11741.3	23.41	26.45	29.75	31.97	30.53	29.03
12030.1	24.54	23.24	21.58	35.31	31.68	29.89

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+10	+13	+16
1500.1	1530.1	14.36	11.77	9.61
1762.6	1792.6	11.62	10.56	9.95
2025.1	2055.1	12.31	10.92	10.49
2287.6	2317.6	14.60	13.25	12.79
2550.1	2580.1	17.27	17.43	17.55
2812.6	2842.6	23.31	24.19	24.31
3075.1	3105.1	28.00	28.16	28.31
3337.6	3367.6	29.35	29.04	28.84
3600.1	3630.1	29.55	29.19	28.79
3862.6	3892.6	29.23	29.18	29.06
4125.1	4155.1	29.89	29.87	29.82
4387.6	4417.6	31.66	31.73	31.79
4650.1	4680.1	32.34	32.59	32.75
4912.6	4942.6	33.07	33.37	33.57
5175.1	5205.1	34.45	34.79	35.01
5437.6	5467.6	35.34	35.75	36.08
5700.1	5730.1	36.48	36.55	36.65
5962.6	5992.6	38.02	38.12	38.34
6225.1	6255.1	36.89	36.86	36.97
6487.6	6517.6	37.02	36.67	36.60
6750.1	6780.1	36.62	35.98	35.33
7038.9	7068.9	34.95	34.27	33.75
7301.4	7331.4	32.74	32.22	31.83
7590.1	7620.1	30.30	29.92	29.65
7852.6	7882.6	28.31	28.10	27.93
8141.4	8171.4	27.66	27.67	27.65
8403.9	8433.9	29.09	29.15	29.28
8692.6	8722.6	31.45	31.58	31.71
8955.1	8985.1	33.65	33.74	33.90
9243.8	9273.8	35.96	36.00	36.16
9506.3	9536.3	37.90	37.89	37.95
9795.1	9825.1	40.38	40.18	40.25
10057.6	10087.6	43.38	42.89	42.75
10346.3	10376.3	45.85	45.16	44.59
10608.8	10638.8	42.10	41.91	41.67
10897.6	10927.6	37.65	38.00	37.94
11160.1	11190.1	38.41	38.48	38.05
11448.9	11478.9	36.80	35.89	34.63
11711.3	11741.3	30.73	29.91	28.81
12000.1	12030.1	25.47	25.18	24.94

Frequency Mixer

ZMX-7GMH

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=7000MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+10	+13	+16		+10	+13	+16		+10	+13	+16
1500.1	1530.1	8.72	6.66	4.38	1530.1	9.13	5.56	3.89	10.0	1.09	1.09	1.21
1762.6	1792.6	7.73	5.30	4.45	1792.6	6.30	3.99	3.70	90.0	1.09	1.11	1.21
2025.1	2055.1	5.54	4.41	3.82	2055.1	3.81	2.85	2.99	170.0	1.09	1.11	1.23
2287.6	2317.6	5.38	4.53	4.00	2317.6	2.79	2.30	2.50	250.0	1.09	1.11	1.23
2550.1	2580.1	4.92	4.26	3.86	2580.1	2.44	2.14	2.48	330.0	1.12	1.08	1.20
2812.6	2842.6	4.10	3.67	3.43	2842.6	2.29	2.11	2.46	410.0	1.15	1.05	1.16
3075.1	3105.1	3.88	3.56	3.37	3105.1	1.85	1.86	2.31	490.0	1.15	1.05	1.16
3337.6	3367.6	3.77	3.39	3.21	3367.6	1.52	1.83	2.44	570.0	1.14	1.07	1.18
3600.1	3630.1	3.63	3.30	3.06	3630.1	1.26	1.76	2.36	650.0	1.14	1.09	1.21
3862.6	3892.6	3.73	3.30	3.05	3892.6	1.21	1.80	2.48	730.0	1.18	1.12	1.23
4125.1	4155.1	3.73	3.29	2.91	4155.1	1.30	1.86	2.53	810.0	1.24	1.17	1.26
4387.6	4417.6	3.38	3.04	2.77	4417.6	1.49	1.88	2.48	890.0	1.28	1.19	1.27
4650.1	4680.1	3.45	2.99	2.66	4680.1	1.77	2.03	2.57	970.0	1.29	1.19	1.26
4912.6	4942.6	3.37	2.80	2.50	4942.6	1.96	2.08	2.54	1050.0	1.30	1.19	1.26
5175.1	5205.1	3.07	2.46	2.18	5205.1	2.39	2.28	2.56	1130.0	1.36	1.27	1.33
5437.6	5467.6	3.13	2.45	2.07	5467.6	2.63	2.36	2.57	1210.0	1.47	1.37	1.40
5700.1	5730.1	2.75	2.12	1.77	5730.1	2.96	2.37	2.39	1290.0	1.56	1.44	1.46
5962.6	5992.6	3.11	2.53	2.18	5992.6	3.24	2.41	2.27	1370.0	1.58	1.42	1.42
6225.1	6255.1	2.87	2.31	1.95	6255.1	3.53	2.35	2.05	1450.0	1.63	1.46	1.45
6487.6	6517.6	2.71	2.23	1.86	6517.6	3.76	2.36	1.92	1530.0	1.73	1.53	1.49
6750.1	6780.1	2.32	1.84	1.47	6780.1	4.15	2.36	1.79	1610.0	1.81	1.58	1.53
7038.9	7068.9	2.13	1.67	1.39	7068.9	4.05	2.15	1.55	1690.0	1.87	1.60	1.52
7301.4	7331.4	1.87	1.54	1.30	7331.4	3.72	1.97	1.33	1770.0	1.95	1.67	1.56
7590.1	7620.1	1.68	1.39	1.21	7620.1	3.22	1.77	1.19	1850.0	2.10	1.79	1.66
7852.6	7882.6	1.76	1.46	1.28	7882.6	2.95	1.68	1.31	1930.0	2.28	1.93	1.76
8141.4	8171.4	1.59	1.38	1.23	8171.4	2.54	1.70	1.64	2010.0	2.40	2.04	1.83
8403.9	8433.9	1.48	1.29	1.17	8433.8	2.38	1.82	1.93	2090.0	2.54	2.18	1.96
8692.6	8722.6	1.56	1.43	1.34	8722.6	2.02	1.94	2.31	2170.0	2.61	2.27	2.07
8955.1	8985.1	1.58	1.49	1.44	8985.1	1.84	2.14	2.71	2250.0	2.62	2.31	2.12
9243.8	9273.8	2.03	1.94	1.90	9273.8	1.78	2.40	3.17	2310.0	2.65	2.33	2.14
9506.3	9536.3	2.00	1.92	1.91	9536.4	1.89	2.60	3.43	2390.0	2.92	2.62	2.44
9795.1	9825.1	2.27	2.20	2.17	9825.1	2.20	2.97	3.87	2450.0	2.95	2.71	2.57
10057.6	10087.6	2.31	2.26	2.25	10087.6	2.59	3.32	4.22	2530.0	3.09	2.95	2.87
10346.3	10376.3	2.39	2.26	2.21	10376.3	2.91	3.42	4.09	2590.0	3.38	3.24	3.17
10608.8	10638.8	3.24	2.75	2.62	10638.8	2.59	2.89	3.35	2670.0	3.61	3.58	3.57
10897.6	10927.6	2.64	2.22	2.07	10927.6	1.99	2.22	2.61	2730.0	3.96	4.09	4.16
11160.1	11190.1	2.97	2.54	2.27	11190.1	2.94	2.81	3.08	2810.0	4.54	4.82	4.98
11448.9	11478.9	2.81	2.35	2.08	11478.8	5.03	3.92	3.84	2870.0	4.46	4.80	4.99
11711.3	11741.3	2.80	2.36	2.02	11741.3	7.41	4.68	4.06	2950.0	4.88	5.42	5.74
12000.1	12030.1	3.87	3.37	2.86	12030.1	8.47	5.04	4.06	3010.0	6.09	6.86	7.25

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	+6	41	16	55	---	---	---	---	---	---
1	-	30	+0	54	39	49	52	---	---	---	---	---
2	76	71	57	49	58	73	56	71	---	---	---	---
3	>90	>78	>78	>78	56	>78	>78	>78	>78	---	---	---
4	>90	>78	>78	>78	>78	>78	>78	>78	>78	>78	---	---
5	---	---	>78	>78	>78	>78	>78	>78	>78	>78	>78	---
6	---	---	---	>78	>78	>78	>78	>78	>78	>78	>78	>78
7	---	---	---	---	>78	>78	>78	>78	>78	>78	>78	>78
8	---	---	---	---	---	>78	>78	>78	>78	>78	>78	>78
9	---	---	---	---	---	---	>78	>78	>78	>78	>78	>78
10	---	---	---	---	---	---	---	>78	>78	>78	>78	>78
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 5350 MHz; -6.00 dBm.
LO IN: 5380 MHz; +13.00 dBm
IF OUT: 30 MHz; -11.72 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	4	51	27	63	---	---	---	---	---	---
1	-	30	+0	56	39	49	55	---	---	---	---	---
2	56	60	46	38	49	67	49	69	---	---	---	---
3	77	62	66	74	35	71	66	67	67	---	---	---
4	>90	80	80	>88	74	58	67	80	67	76	---	---
5	---	---	>88	86	88	>88	58	84	82	79	85	---
6	---	---	---	>88	>88	>88	>88	72	84	>88	80	88
7	---	---	---	---	>88	>88	>88	>88	73	>88	>88	87
8	---	---	---	---	---	>88	>88	>88	>88	84	>88	>88
9	---	---	---	---	---	---	>88	>88	>88	>88	87	>88
10	---	---	---	---	---	---	---	>88	>88	>88	>88	>88
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

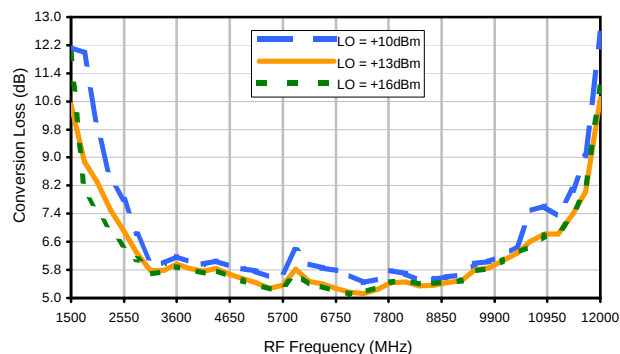
LO HARMONICS ORDER

Test conditions: RF IN: 5350 MHz; 4.00 dBm.
LO IN: 5380 MHz; +13.00 dBm
IF OUT: 30 MHz; -1.87 dBm

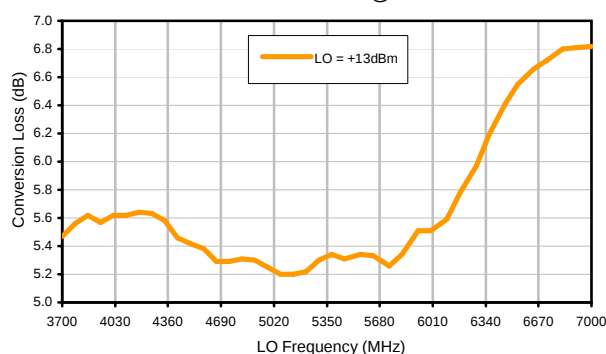
- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

Typical Performance Curves

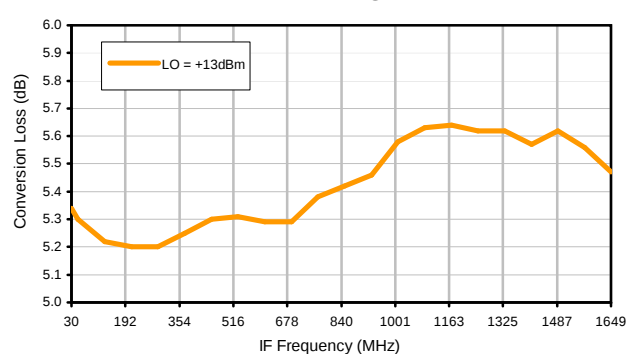
Conversion Loss @ IF=30MHz



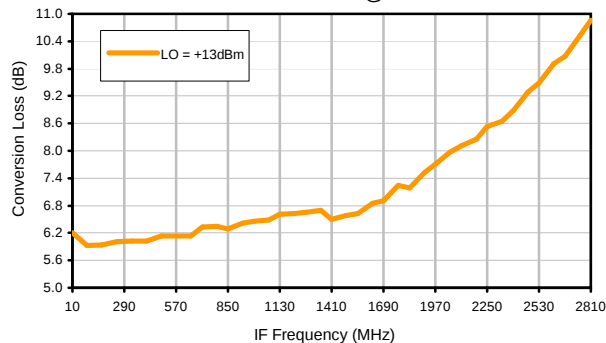
Conversion Loss vs. LO @ RF=5350MHz



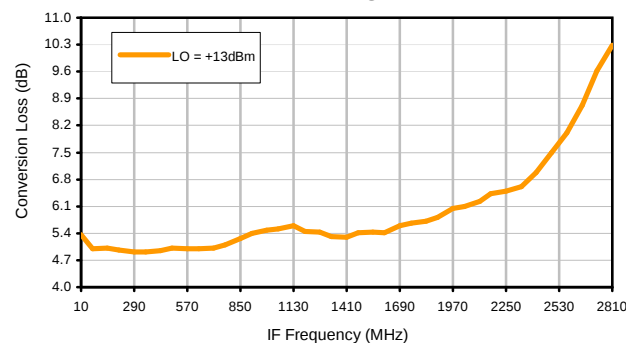
Conversion Loss vs. IF @ RF=5350MHz



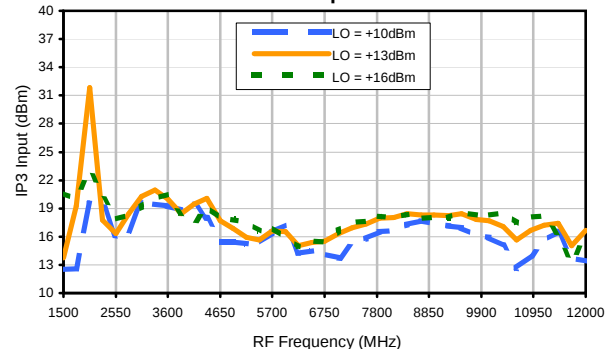
Conversion Loss vs. IF @ RF=3690MHz



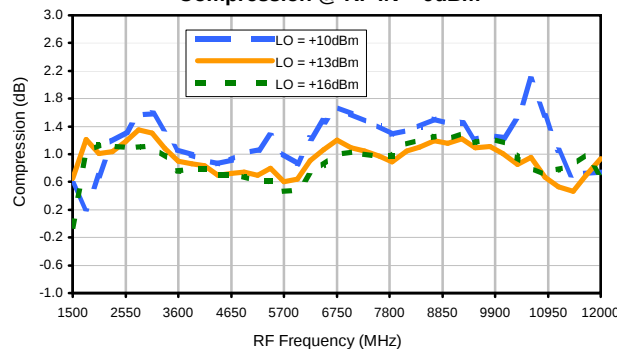
Conversion Loss vs. IF @ RF=7010.1MHz



IP3 Input

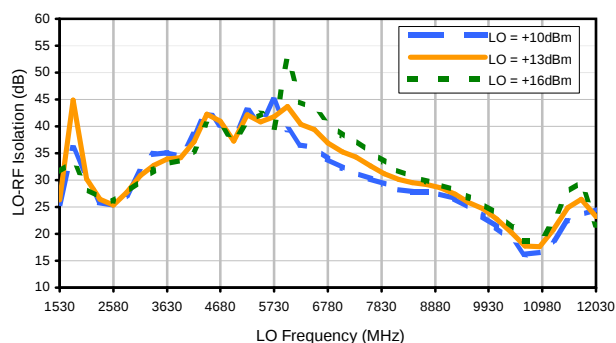


Compression @ RF IN=+9dBm

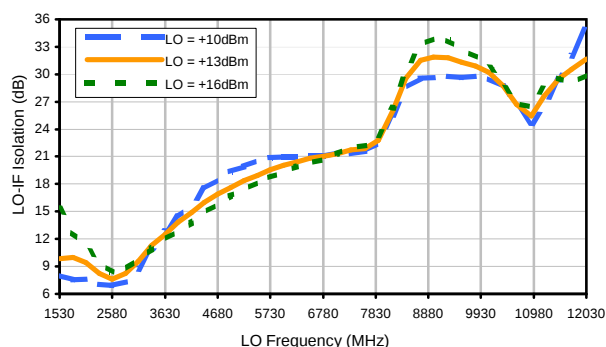


Typical Performance Curves

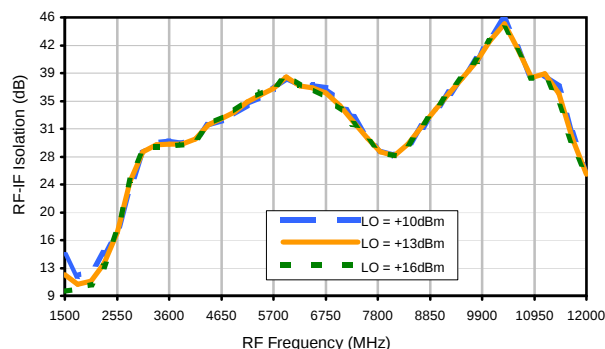
LO-RF Isolation



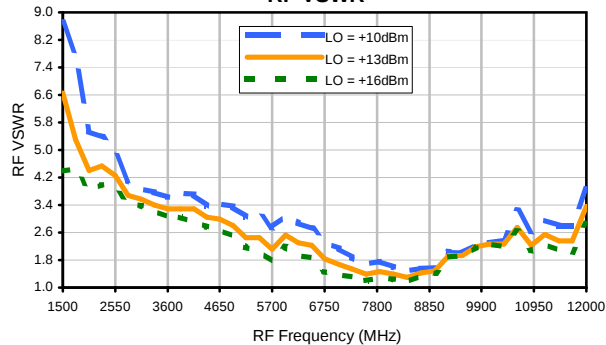
LO-IF Isolation



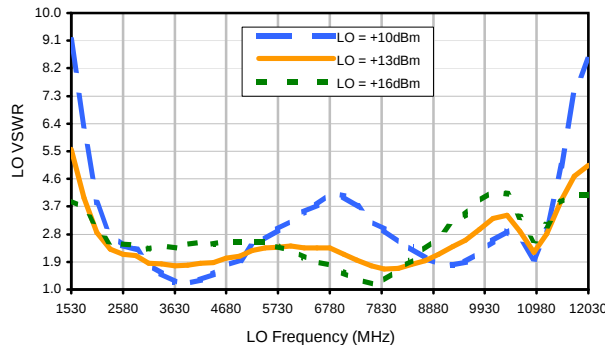
RF-IF Isolation



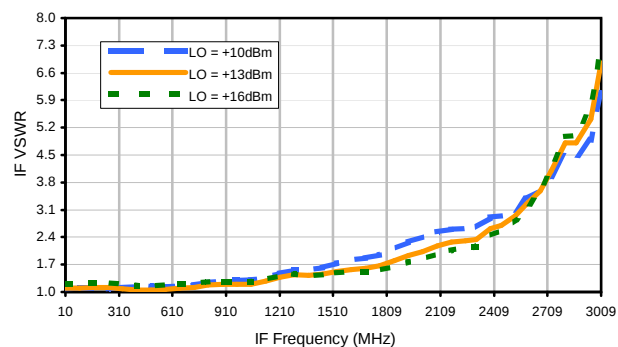
RF VSWR



LO VSWR



IF VSWR



Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	+6	41	16	55	---	---	---	---	---	---
1	-	30	+0	54	39	49	52	---	---	---	---	---
2	76	71	57	49	58	73	56	71	---	---	---	---
3	>90	>78	>78	>78	56	>78	>78	>78	>78	---	---	---
4	>90	>78	>78	>78	>78	>78	>78	>78	>78	>78	---	---
5	---	---	>78	>78	>78	>78	>78	>78	>78	>78	>78	---
6	---	---	---	>78	>78	>78	>78	>78	>78	>78	>78	>78
7	---	---	---	---	>78	>78	>78	>78	>78	>78	>78	>78
8	---	---	---	---	---	>78	>78	>78	>78	>78	>78	>78
9	---	---	---	---	---	---	>78	>78	>78	>78	>78	>78
10	---	---	---	---	---	---	---	>78	>78	>78	>78	>78
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 5350 MHz; -6.00 dBm.
LO IN: 5380 MHz; +13.00 dBm
IF OUT: 30 MHz; -11.72 dBm

RF HARMONICS ORDER

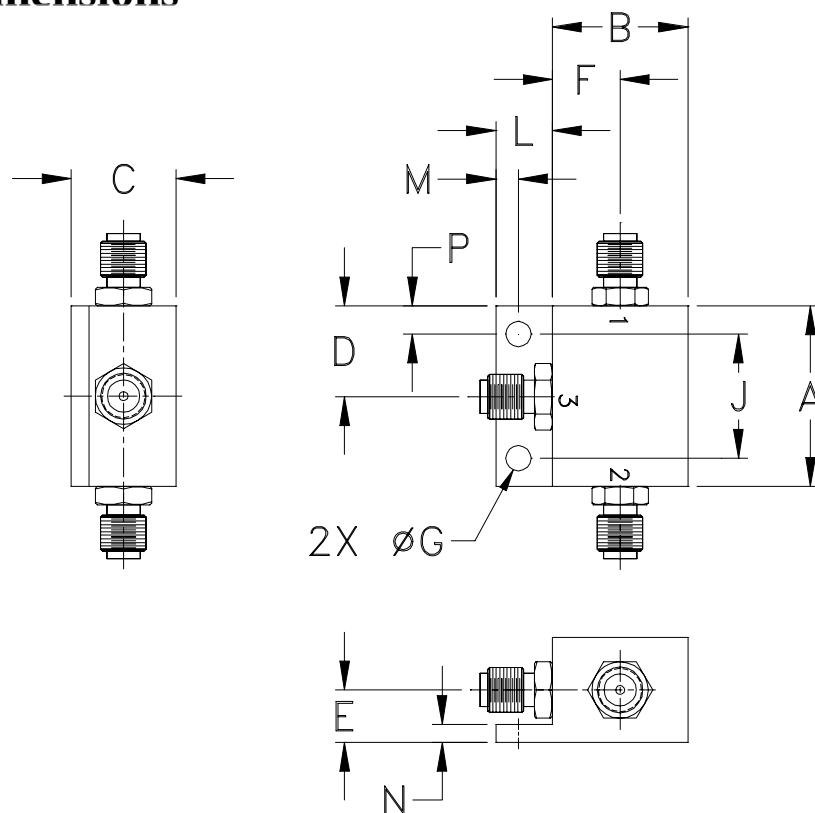
	(-dBm)	(-dBc)										
0	-	-	4	51	27	63	---	---	---	---	---	---
1	-	30	+0	56	39	49	55	---	---	---	---	---
2	56	60	46	38	49	67	49	69	---	---	---	---
3	77	62	66	74	35	71	66	67	67	---	---	---
4	>90	80	80	>88	74	58	67	80	67	76	---	---
5	---	---	>88	86	88	>88	58	84	82	79	85	---
6	---	---	---	>88	>88	>88	>88	72	84	>88	80	88
7	---	---	---	---	>88	>88	>88	>88	73	>88	>88	87
8	---	---	---	---	---	>88	>88	>88	>88	84	>88	>88
9	---	---	---	---	---	---	>88	>88	>88	>88	87	>88
10	---	---	---	---	---	---	---	>88	>88	>88	>88	>88
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 5350 MHz; 4.00 dBm.
LO IN: 5380 MHz; +13.00 dBm
IF OUT: 30 MHz; -1.87 dBm

- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

Outline Dimensions



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N
BU413	1.00 (25.40)	.75 (19.05)	.58 (14.73)	.50 (12.70)	.29 (7.37)	.38 (9.65)	.140 (3.56)	--	.687 (17.45)	--	.32 (8.13)	.13 (3.30)	.10 (2.54)

CASE#	P	WT. GRAMS
BU413	.16 (4.06)	25

Dimensions are in inches (mm). Tolerances: 2 Pl. $\pm .03$; 3 Pl. $\pm .015$

Notes:

- Case material: Aluminum alloy.
- Case finish:
For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.



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All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-55° to 100°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Barometric Pressure	100,000 Feet	MIL-STD-202, Method 105, Condition D
Humidity	90% RH, 65°C Units may require bake-out after humidity to restore full performance.	MIL-STD-202, Method 103
Thermal Shock	-65° to 125°C, 5 cycles	MIL-STD-202, Method 107, Condition B
Vibration (High Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D
Mechanical Shock	100g, 6ms sawtooth, 3 shocks each direction 3 axes (total 18)	MIL-STD-202, Method 213, Condition I