

Coaxial Frequency Mixer

Level 13 (LO Power +13 dBm) 10 to 2400 MHz

ZEM-M2TMH+



Generic photo used for illustration purposes only

CASE STYLE: V37

Connectors	Model
SMA	ZEM-M2TMH+

+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

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	3
RF	2
IF	1

Features

- low conversion loss, 6.9 dB typ.
- excellent isolation, 43 dB typ. L-R, 44 dB typ. L-I
- wideband, 10 to 2400 MHz

Applications

- VHF/UHF
- cellular
- GPS

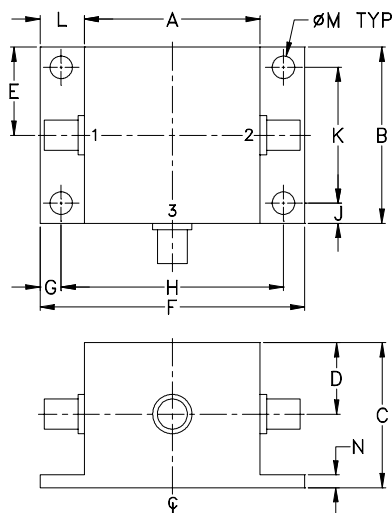
Electrical Specifications

FREQUENCY (MHz)		CONVERSION LOSS (dB)				LO-RF ISOLATION (dB)						LO-IF ISOLATION (dB)					
LO/RF f_L - f_U	IF	Mid-Band m			Total Range Max.	L		M		U		L		M		U	
		\bar{X}	σ	Max.		Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.		
10-2400	10-1000	6.9	0.10	9.0	9.5	49	40	43	35	42	35	49	40	44	30	40	30

1 dB COMP.: +9 dBm typ.

L = low range [f_L to $10 f_L$] M = mid range [$10 f_L$ to $f_U/2$] U = upper range [$f_U/2$ to f_U]
m = mid band [$2f_L$ to $f_U/2$]

Outline Drawing



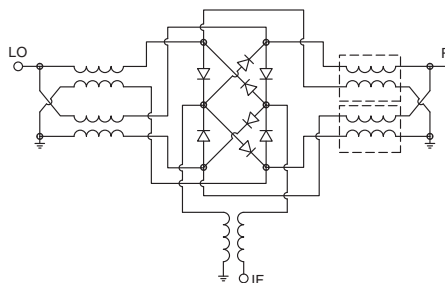
Outline Dimensions (inch/mm)

A	B	C	D	E	F	G
.83	.83	.75	.37	.42	1.25	.10
21.08	21.08	19.05	9.40	10.67	31.75	2.54
H	J	K	L	M	N	wt
1.050	.10	.640	.21	.106	.06	grams
26.67	2.54	16.26	5.33	2.69	1.52	22.0

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
10.00	40.00	6.87	48.7	47.5	1.06	1.43
25.00	55.00	6.77	48.7	47.4	1.02	1.43
40.00	70.00	6.83	48.9	47.3	1.02	1.43
70.00	100.00	6.69	48.9	47.0	1.04	1.39
100.00	130.00	6.64	49.1	46.9	1.06	1.41
200.00	230.00	6.44	47.6	45.9	1.13	1.44
400.00	430.00	6.25	44.0	43.4	1.31	1.56
600.00	630.00	6.31	40.9	41.7	1.40	1.59
700.00	730.00	6.37	40.6	41.2	1.51	1.58
800.00	830.00	6.39	40.6	40.3	1.53	1.59
1000.00	1030.00	6.45	43.2	37.9	1.46	1.62
1200.00	1230.00	6.40	41.9	37.3	1.42	1.74
1300.00	1330.00	6.46	40.3	37.5	1.42	1.81
1500.00	1530.00	6.73	38.5	36.9	1.43	1.80
1700.00	1730.00	6.98	38.8	37.4	1.45	1.83
1800.00	1830.00	7.26	39.3	37.0	1.57	1.85
2000.00	2030.00	7.60	40.2	36.3	1.84	1.73
2200.00	2230.00	7.88	42.3	36.4	1.92	1.56
2300.00	2330.00	7.91	44.9	35.8	1.83	1.50
2400.00	2430.00	7.74	49.9	34.2	1.65	1.44

Electrical Schematic

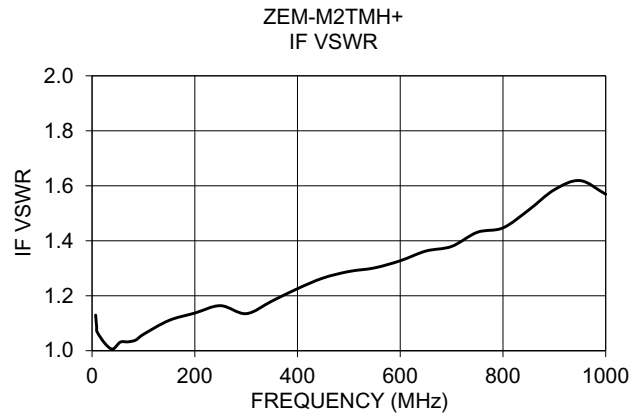
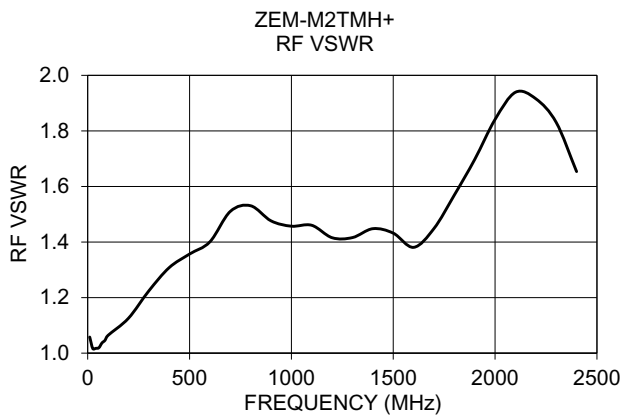
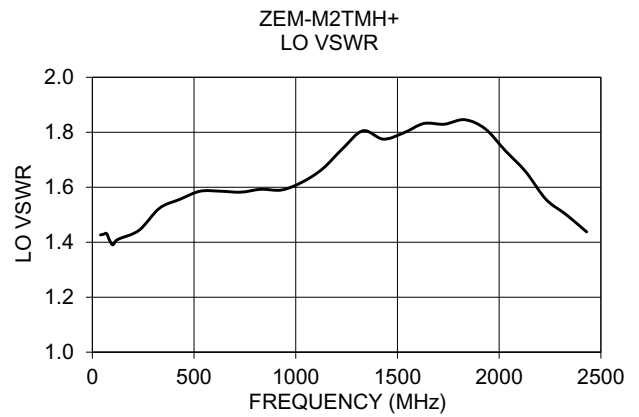
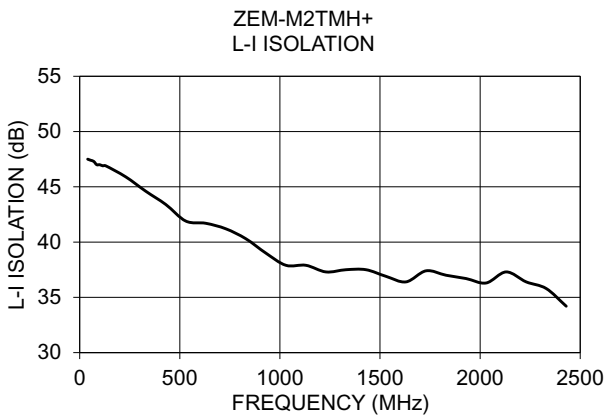
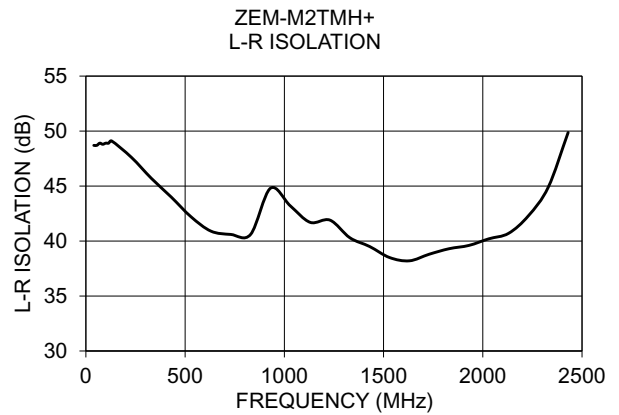
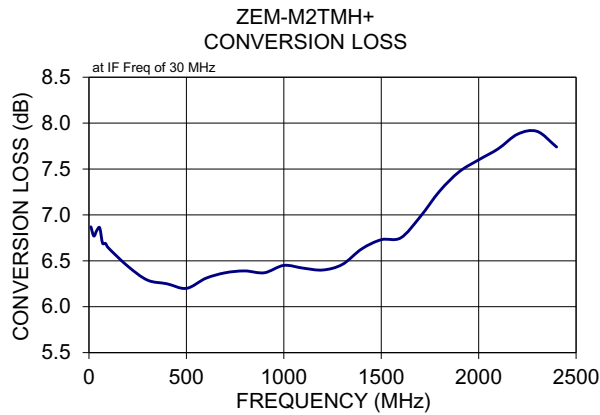


Notes

- 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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Performance Charts



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Frequency Mixer

ZEM-M2TMH+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)			RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)			RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+9dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
		+10	+13	+16			+10	+13	+16			+10	+13	+16
10.1	40.1	7.08	6.60	6.33	10.1	40.1	25.15	28.97	32.47	10.1	40.1	0.74	0.35	0.12
110.1	140.1	7.63	7.15	6.93	110.1	140.1	26.12	29.65	32.53	110.1	140.1	0.50	0.21	0.10
210.1	240.1	7.63	7.14	6.91	210.1	240.1	24.01	26.01	25.68	210.1	240.1	0.57	0.28	0.14
310.1	340.1	7.70	7.21	6.97	310.1	340.1	26.16	27.50	23.94	310.1	340.1	0.53	0.24	0.12
410.1	440.1	7.68	7.23	7.01	410.1	440.1	23.13	22.27	24.50	410.1	440.1	0.62	0.27	0.13
510.1	540.1	7.76	7.27	7.04	510.1	540.1	24.02	21.65	24.89	510.1	540.1	0.52	0.24	0.12
610.1	640.1	7.65	7.23	7.03	610.1	640.1	19.72	22.75	28.32	610.1	640.1	0.64	0.28	0.13
710.1	740.1	7.72	7.30	7.09	710.1	740.1	19.74	23.30	31.49	710.1	740.1	0.62	0.28	0.15
810.1	840.1	7.75	7.35	7.14	810.1	840.1	19.21	25.44	32.07	810.1	840.1	0.63	0.28	0.16
910.1	940.1	7.68	7.32	7.14	910.1	940.1	22.11	27.42	24.29	910.1	940.1	0.72	0.30	0.19
1010.1	1040.1	7.67	7.32	7.15	1010.1	1040.1	21.25	25.88	25.49	1010.1	1040.1	0.67	0.28	0.16
1110.1	1140.1	7.69	7.33	7.16	1110.1	1140.1	22.07	26.44	25.74	1110.1	1140.1	0.68	0.29	0.17
1210.1	1240.1	7.85	7.46	7.25	1210.1	1240.1	22.01	27.48	28.06	1210.1	1240.1	0.56	0.24	0.16
1310.1	1340.1	7.94	7.55	7.34	1310.1	1340.1	22.78	26.98	26.95	1310.1	1340.1	0.59	0.25	0.16
1410.1	1440.1	7.98	7.57	7.36	1410.1	1440.1	24.52	28.03	27.29	1410.1	1440.1	0.61	0.25	0.15
1510.1	1540.1	8.09	7.66	7.45	1510.1	1540.1	22.89	24.87	26.20	1510.1	1540.1	0.59	0.26	0.16
1610.1	1640.1	8.20	7.74	7.51	1610.1	1640.1	24.06	24.11	24.04	1610.1	1640.1	0.58	0.28	0.16
1710.1	1740.1	8.41	7.92	7.66	1710.1	1740.1	22.94	27.78	29.46	1710.1	1740.1	0.56	0.27	0.15
1810.1	1840.1	8.56	8.03	7.78	1810.1	1840.1	22.87	26.83	32.11	1810.1	1840.1	0.49	0.26	0.17
1910.1	1940.1	8.82	8.23	7.93	1910.1	1940.1	21.61	28.29	31.52	1910.1	1940.1	0.47	0.27	0.18
2010.1	2040.1	8.87	8.27	7.93	2010.1	2040.1	24.87	29.41	29.71	2010.1	2040.1	0.44	0.26	0.20
2110.1	2140.1	8.81	8.26	7.93	2110.1	2140.1	24.45	27.64	30.73	2110.1	2140.1	0.56	0.28	0.20
2210.1	2240.1	9.16	8.50	8.14	2210.1	2240.1	22.52	27.88	31.93	2210.1	2240.1	0.45	0.26	0.16
2310.1	2340.1	9.37	8.64	8.22	2310.1	2340.1	21.59	31.68	30.10	2310.1	2340.1	0.41	0.25	0.16
2410.1	2440.1	9.46	8.76	8.31	2410.1	2440.1	22.34	31.62	27.95	2410.1	2440.1	0.41	0.25	0.16
2510.1	2540.1	9.52	8.83	8.39	2510.1	2540.1	22.73	27.63	25.52	2510.1	2540.1	0.34	0.18	0.15
2610.1	2640.1	9.70	9.03	8.59	2610.1	2640.1	23.98	23.42	22.80	2610.1	2640.1	0.38	0.17	0.13
2710.1	2740.1	9.90	9.20	8.77	2710.1	2740.1	22.22	22.33	22.41	2710.1	2740.1	0.29	0.13	0.07
2830.1	2860.1	9.53	8.87	8.46	2830.1	2860.1	20.14	20.52	21.38	2830.1	2860.1	0.44	0.28	0.15
2930.1	2960.1	9.47	8.78	8.37	2930.1	2960.1	19.94	19.78	20.98	2930.1	2960.1	0.48	0.34	0.21
3050.1	3080.1	9.49	8.75	8.32	3050.1	3080.1	21.48	20.12	20.75	3050.1	3080.1	0.55	0.38	0.26
3150.1	3180.1	9.63	8.95	8.48	3150.1	3180.1	21.21	20.85	21.15	3150.1	3180.1	0.48	0.31	0.24
3270.1	3300.1	9.76	9.16	8.70	3270.1	3300.1	20.12	20.08	20.36	3270.1	3300.1	0.44	0.25	0.18
3370.1	3400.1	9.95	9.30	8.83	3370.1	3400.1	20.14	20.20	20.67	3370.1	3400.1	0.44	0.23	0.17
3490.1	3520.1	10.18	9.54	9.01	3490.1	3520.1	21.10	20.99	20.87	3490.1	3520.1	0.47	0.22	0.14
3590.1	3620.1	10.31	9.69	9.18	3590.1	3620.1	21.04	22.26	21.98	3590.1	3620.1	0.53	0.24	0.16
3710.1	3740.1	10.24	9.55	9.11	3710.1	3740.1	19.61	21.25	21.40	3710.1	3740.1	0.75	0.34	0.22
3810.1	3840.1	10.35	9.62	9.18	3810.1	3840.1	18.79	20.44	20.88	3810.1	3840.1	0.80	0.38	0.24
3930.1	3960.1	10.67	9.87	9.38	3930.1	3960.1	19.01	19.98	20.84	3930.1	3960.1	0.79	0.39	0.27
4030.1	4060.1	10.96	10.12	9.61	4030.1	4060.1	19.61	20.09	20.80	4030.1	4060.1	0.80	0.37	0.28



Frequency Mixer

ZEM-M2TMH+

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1210.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=10MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=2410.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+13			+13			+13
1190.1	20.0	7.56	10.1	20.1	7.22	2390.1	20.0	8.33
1150.1	60.0	7.55	130.1	140.1	6.55	2330.1	80.0	8.39
1110.1	100.0	7.56	250.1	260.1	6.60	2270.1	140.0	8.34
1090.1	120.0	7.64	370.1	380.1	6.53	2210.1	200.0	8.30
1050.1	160.0	7.59	490.1	500.1	6.56	2150.1	260.0	8.39
1030.1	180.0	7.57	610.1	620.1	6.58	2090.1	320.0	8.36
990.1	220.0	7.57	730.1	740.1	6.62	2030.1	380.0	8.41
970.1	240.0	7.56	850.1	860.1	6.57	1970.1	440.0	8.59
930.1	280.0	7.57	970.1	980.1	6.63	1910.1	500.0	8.71
910.1	300.0	7.56	1070.1	1080.1	6.60	1850.1	560.0	8.79
870.1	340.0	7.56	1190.1	1200.1	6.64	1790.1	620.0	8.73
850.1	360.0	7.56	1290.1	1300.1	6.72	1730.1	680.0	8.55
810.1	400.0	7.56	1410.1	1420.1	6.75	1670.1	740.0	8.54
790.1	420.0	7.54	1510.1	1520.1	6.88	1610.1	800.0	8.58
750.1	460.0	7.53	1630.1	1640.1	6.97	1550.1	860.0	8.52
730.1	480.0	7.49	1730.1	1740.1	7.18	1490.1	920.0	8.48
690.1	520.0	7.50	1850.1	1860.1	7.51	1430.1	980.0	8.43
670.1	540.0	7.52	1950.1	1960.1	7.60	1370.1	1040.0	8.42
630.1	580.0	7.45	2070.1	2080.1	7.64	1310.1	1100.0	8.41
610.1	600.0	7.43	2170.1	2180.1	7.54	1250.1	1160.0	8.39
570.1	640.0	7.39	2290.1	2300.1	7.50	1190.1	1220.0	8.33
550.1	660.0	7.39	2390.1	2400.1	7.56	1130.1	1280.0	8.32
510.1	700.0	7.37	2510.1	2520.1	7.47	1070.1	1340.0	8.38
490.1	720.0	7.34	2610.1	2620.1	7.58	1010.1	1400.0	8.38
450.1	760.0	7.35	2730.1	2740.1	7.47	950.1	1460.0	8.32
430.1	780.0	7.25	2830.1	2840.1	7.26	890.1	1520.0	8.30
390.1	820.0	7.30	2950.1	2960.1	7.26	830.1	1580.0	8.29
370.1	840.0	7.30	3050.1	3060.1	7.29	770.1	1640.0	8.33
330.1	880.0	7.26	3170.1	3180.1	7.30	710.1	1700.0	8.38
310.1	900.0	7.32	3270.1	3280.1	7.36	650.1	1760.0	8.33
270.1	940.0	7.28	3390.1	3400.1	7.57	590.1	1820.0	8.30
250.1	960.0	7.27	3490.1	3500.1	7.68	530.1	1880.0	8.34
210.1	1000.0	7.28	3610.1	3620.1	7.67	470.1	1940.0	8.24
190.1	1020.0	7.27	3710.1	3720.1	7.75	410.1	2000.0	8.46
150.1	1060.0	7.30	3830.1	3840.1	7.81	350.1	2060.0	8.50
130.1	1080.0	7.32	3930.1	3940.1	8.19	290.1	2120.0	8.53
90.1	1120.0	7.38	4050.1	4060.1	8.66	210.1	2200.0	8.60
70.1	1140.0	7.43	4150.1	4160.1	8.96	150.1	2260.0	8.61
30.1	1180.0	7.43	4270.1	4280.1	9.00	70.1	2340.0	8.68
10.1	1200.0	8.06	4370.1	4380.1	9.83	10.1	2400.0	9.33

Frequency Mixer

ZEM-M2TMH+

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)			RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)					@LO (dBm)		
	+10	+13	+16	+10	+13	+16			+10	+13	+16
40.1	43.70	47.90	51.28	43.45	46.94	49.50	10.1	40.1	25.46	26.08	26.59
140.1	44.94	48.03	49.04	43.94	46.63	47.45	110.1	140.1	26.10	26.84	27.13
240.1	44.33	45.54	45.32	44.17	45.40	44.76	210.1	240.1	27.16	27.72	28.21
340.1	44.55	44.12	43.01	45.24	44.40	42.76	310.1	340.1	28.43	29.11	29.49
440.1	43.67	42.59	41.07	45.45	43.30	41.12	410.1	440.1	29.90	30.80	31.27
540.1	43.23	41.03	39.68	45.84	42.02	39.86	510.1	540.1	30.39	31.40	32.26
640.1	42.71	40.30	38.68	45.06	40.92	38.58	610.1	640.1	31.64	32.17	32.35
740.1	41.89	39.10	37.22	43.86	39.71	37.38	710.1	740.1	31.78	32.24	32.42
840.1	41.88	38.41	36.48	43.49	38.74	36.46	810.1	840.1	32.11	32.23	32.25
940.1	43.16	39.25	37.12	45.26	39.45	36.65	910.1	940.1	34.04	33.84	33.22
1040.1	44.22	41.14	39.16	45.11	40.16	37.32	1010.1	1040.1	35.06	34.82	34.21
1140.1	43.63	40.62	38.86	43.92	39.38	36.86	1110.1	1140.1	34.65	34.20	33.94
1240.1	43.39	40.41	38.58	43.53	39.59	37.20	1210.1	1240.1	35.20	34.85	34.23
1340.1	42.68	40.96	39.54	41.87	39.46	37.48	1310.1	1340.1	33.81	33.24	32.94
1440.1	43.28	41.14	39.58	43.33	40.21	37.66	1410.1	1440.1	36.79	36.95	37.03
1540.1	43.78	42.02	40.73	43.23	40.82	38.26	1510.1	1540.1	37.90	37.50	37.12
1640.1	43.63	42.41	40.81	42.49	41.10	38.53	1610.1	1640.1	36.62	35.49	34.93
1740.1	43.82	42.86	41.49	42.03	40.97	38.53	1710.1	1740.1	35.45	34.59	33.90
1840.1	44.25	43.04	41.74	42.22	40.84	38.56	1810.1	1840.1	32.46	31.89	31.63
1940.1	44.66	43.26	42.36	42.02	40.39	38.84	1910.1	1940.1	28.87	29.07	29.58
2040.1	47.33	43.93	42.20	42.63	39.62	37.54	2010.1	2040.1	27.39	27.85	28.25
2140.1	48.21	47.01	45.31	41.60	39.32	37.28	2110.1	2140.1	27.40	27.46	27.58
2240.1	44.30	43.83	43.14	39.69	37.84	36.24	2210.1	2240.1	29.86	30.14	30.41
2340.1	41.43	41.37	40.99	38.26	36.52	35.01	2310.1	2340.1	29.98	30.16	30.35
2440.1	38.49	38.82	38.66	36.48	35.29	33.97	2410.1	2440.1	30.27	30.48	30.74
2540.1	35.41	36.12	36.53	32.90	32.59	31.94	2510.1	2540.1	31.19	31.07	31.16
2640.1	25.31	26.61	27.70	23.84	24.87	25.50	2610.1	2640.1	32.94	32.89	33.11
2740.1	28.49	29.70	30.86	28.48	28.91	29.05	2710.1	2740.1	21.73	21.55	21.40
2860.1	39.12	40.95	42.76	33.36	32.94	32.34	2830.1	2860.1	26.92	26.77	26.72
2960.1	44.75	44.92	44.66	32.38	31.98	31.45	2930.1	2960.1	27.13	27.03	26.96
3080.1	49.79	47.86	46.20	31.08	30.71	30.26	3050.1	3080.1	27.28	27.28	27.34
3180.1	47.10	45.85	44.87	30.18	30.20	29.91	3150.1	3180.1	27.30	27.32	27.33
3300.1	43.17	42.74	42.31	29.01	29.48	29.54	3270.1	3300.1	27.13	27.23	27.32
3400.1	41.69	41.73	41.54	28.61	29.05	29.22	3370.1	3400.1	26.89	27.17	27.60
3520.1	39.77	40.25	40.62	28.16	29.02	29.29	3490.1	3520.1	27.24	27.44	27.45
3620.1	38.94	39.66	40.16	27.69	28.82	29.43	3590.1	3620.1	28.00	28.62	29.26
3740.1	38.16	38.97	39.81	27.53	28.70	29.66	3710.1	3740.1	27.45	28.26	28.99
3840.1	37.42	38.36	39.32	27.63	28.78	29.96	3810.1	3840.1	27.17	28.25	29.17
3960.1	36.79	37.82	38.80	28.30	29.26	30.45	3930.1	3960.1	25.87	26.86	27.98
4060.1	36.35	37.35	38.28	29.82	30.54	31.66	4030.1	4060.1	24.72	25.62	26.69

Frequency Mixer

ZEM-M2TMH+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)		
		@LO (dBm)		
		+10	+13	+16
10.1	40.1	1.28	1.14	1.10
110.1	140.1	1.13	1.07	1.12
210.1	240.1	1.18	1.12	1.15
310.1	340.1	1.23	1.17	1.19
410.1	440.1	1.28	1.23	1.23
510.1	540.1	1.34	1.27	1.26
610.1	640.1	1.38	1.31	1.30
710.1	740.1	1.44	1.36	1.33
810.1	840.1	1.49	1.40	1.37
910.1	940.1	1.51	1.43	1.40
1010.1	1040.1	1.51	1.43	1.39
1110.1	1140.1	1.55	1.44	1.39
1210.1	1240.1	1.60	1.48	1.41
1310.1	1340.1	1.66	1.53	1.45
1410.1	1440.1	1.66	1.52	1.44
1510.1	1540.1	1.68	1.53	1.44
1610.1	1640.1	1.71	1.55	1.44
1710.1	1740.1	1.74	1.58	1.48
1810.1	1840.1	1.76	1.60	1.51
1910.1	1940.1	1.81	1.64	1.55
2010.1	2040.1	1.80	1.64	1.53
2110.1	2140.1	1.76	1.61	1.52
2210.1	2240.1	1.84	1.70	1.61
2310.1	2340.1	1.86	1.72	1.62
2410.1	2440.1	1.82	1.69	1.60
2510.1	2540.1	1.75	1.64	1.55
2610.1	2640.1	1.62	1.53	1.45
2710.1	2740.1	1.70	1.59	1.52
2830.1	2860.1	1.45	1.35	1.28
2930.1	2960.1	1.35	1.25	1.18
3050.1	3080.1	1.25	1.15	1.07
3150.1	3180.1	1.20	1.12	1.06
3270.1	3300.1	1.17	1.12	1.10
3370.1	3400.1	1.20	1.17	1.17
3490.1	3520.1	1.24	1.23	1.25
3590.1	3620.1	1.32	1.32	1.33
3710.1	3740.1	1.44	1.44	1.45
3810.1	3840.1	1.55	1.55	1.57
3930.1	3960.1	1.66	1.65	1.66
4030.1	4060.1	1.78	1.77	1.77

LO (MHz)	LO VSWR (:1)		
	@LO (dBm)		
	+10	+13	+16
40.1	1.13	1.46	2.15
140.1	1.14	1.41	2.06
240.1	1.15	1.40	2.03
340.1	1.12	1.40	2.00
440.1	1.13	1.40	2.00
540.1	1.09	1.41	2.01
640.1	1.08	1.42	2.02
740.1	1.06	1.44	2.04
840.1	1.04	1.46	2.05
940.1	1.05	1.47	2.07
1040.1	1.09	1.49	2.08
1140.1	1.14	1.50	2.08
1240.1	1.18	1.51	2.09
1340.1	1.21	1.52	2.08
1440.1	1.24	1.51	2.06
1540.1	1.27	1.50	2.03
1640.1	1.29	1.50	2.02
1740.1	1.30	1.50	2.00
1840.1	1.29	1.48	1.98
1940.1	1.27	1.47	1.96
2040.1	1.24	1.46	1.96
2140.1	1.20	1.45	1.96
2240.1	1.16	1.46	1.97
2340.1	1.12	1.48	2.00
2440.1	1.10	1.51	2.03
2540.1	1.15	1.59	2.12
2640.1	1.29	1.75	2.30
2740.1	1.11	1.55	2.05
2860.1	1.28	1.74	2.27
2960.1	1.38	1.84	2.37
3080.1	1.50	1.95	2.47
3180.1	1.58	2.04	2.54
3300.1	1.66	2.07	2.54
3400.1	1.74	2.14	2.58
3520.1	1.81	2.19	2.61
3620.1	1.87	2.24	2.66
3740.1	1.99	2.34	2.77
3840.1	2.14	2.44	2.84
3960.1	2.32	2.57	2.93
4060.1	2.41	2.63	2.95

IF (OUT) (MHz)	IF VSWR @LO=2400MHz (:1)		
	@LO (dBm)		
	+10	+13	+16
10.0	1.13	1.09	1.19
70.0	1.11	1.05	1.18
130.0	1.12	1.05	1.16
190.0	1.16	1.06	1.15
250.0	1.18	1.08	1.14
310.0	1.20	1.11	1.17
370.0	1.23	1.12	1.15
430.0	1.26	1.15	1.16
490.0	1.29	1.17	1.16
550.0	1.32	1.19	1.15
610.0	1.35	1.22	1.18
670.0	1.40	1.27	1.20
730.0	1.41	1.27	1.20
790.0	1.49	1.34	1.26
850.0	1.52	1.36	1.27
910.0	1.54	1.38	1.29
970.0	1.63	1.46	1.35
1030.0	1.64	1.47	1.36
1090.0	1.68	1.51	1.39
1150.0	1.74	1.56	1.44
1210.0	1.77	1.59	1.47
1270.0	1.81	1.62	1.50
1330.0	1.86	1.68	1.55
1390.0	1.85	1.67	1.54
1450.0	1.94	1.75	1.62
1510.0	1.91	1.72	1.59
1570.0	1.96	1.77	1.64
1630.0	1.96	1.78	1.65
1690.0	1.97	1.79	1.67
1750.0	1.96	1.80	1.68
1810.0	1.96	1.80	1.68
1870.0	1.94	1.79	1.68
1930.0	1.92	1.77	1.66
1990.0	2.00	1.85	1.75
2050.0	1.98	1.82	1.70
2110.0	2.03	1.86	1.74
2150.0	2.05	1.88	1.75
2210.0	2.00	1.82	1.69
2250.0	2.01	1.83	1.70
2310.0	2.00	1.82	1.70

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	13	18	17	25	24	38	32	43	26	41
1	-	26	+0	38	13	41	20	37	40	41	45	60
2	76	56	63	61	56	60	57	63	60	65	65	67
3	>90	73	70	71	68	>76	65	>76	63	>76	71	74
4	>90	>76	>76	>76	>76	>76	>76	>76	>76	>76	>76	>76
5	>90	>76	>76	>76	>76	>76	>76	73	>76	>76	>76	>76
6	>90	>76	>76	>76	>76	>76	>76	>76	>76	>76	>76	>76
7	>90	>76	>76	>76	>76	>76	>76	>76	>76	>76	>76	>76
8	>90	>76	>76	>76	>76	>76	>76	>76	71	>76	>76	>76
9	>90	>76	>76	>76	>76	>76	>76	>76	>76	>76	>76	>76
10	>90	>76	>76	>76	>76	>76	>76	>76	>76	>76	>76	>76
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 1205 MHz; -6.00 dBm.
 LO IN: 1235 MHz; +13.00 dBm
 IF OUT: 30 MHz; -13.54 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	23	29	28	36	36	47	47	56	44	53
1	-	26	+0	36	13	42	21	40	41	46	49	65
2	56	47	52	53	46	51	47	70	52	62	59	61
3	84	57	46	57	47	62	51	68	45	57	58	57
4	>90	74	74	67	78	66	74	64	76	63	70	69
5	>90	77	70	>86	68	74	66	79	63	76	63	83
6	>90	84	84	84	83	>86	84	86	80	84	81	78
7	>90	>86	>86	>86	84	>86	84	>86	84	>86	80	>86
8	>90	>86	>86	>86	>86	>86	>86	85	86	84	79	84
9	>90	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86	83
10	>90	>86	>86	>86	>86	>86	>86	>86	>86	>86	82	>86
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 1205 MHz; 4.00 dBm.
 LO IN: 1235 MHz; +13.00 dBm
 IF OUT: 30 MHz; -3.59 dBm

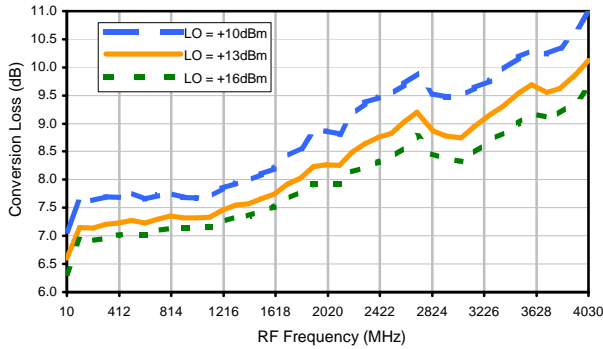
- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
 2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
 3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

Frequency Mixer

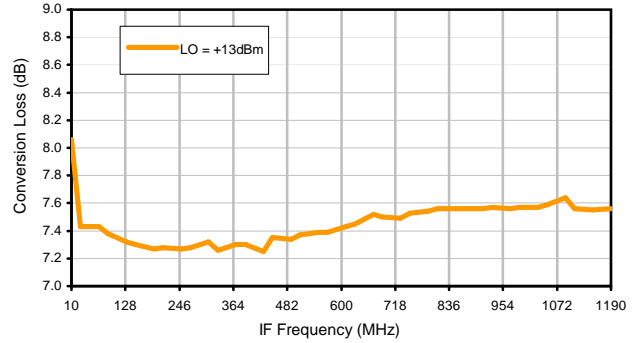
ZEM-M2TMH+

Typical Performance Curves

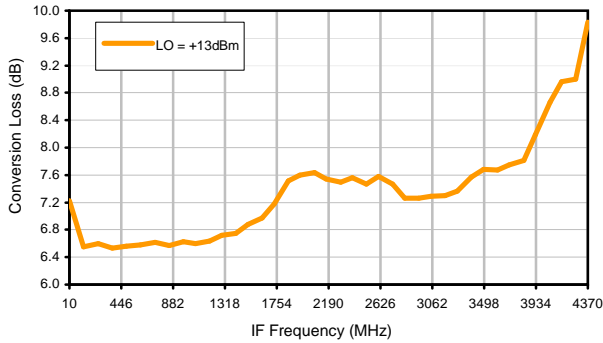
Conversion Loss @ IF=30MHz



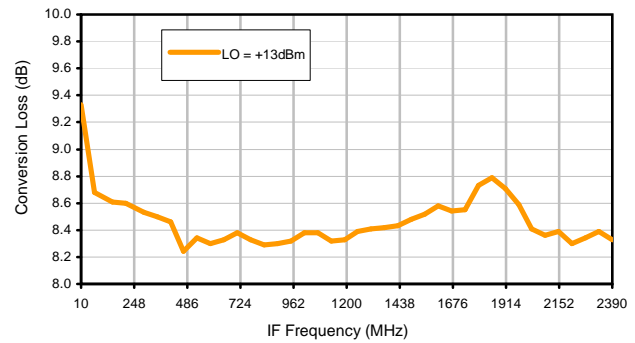
Conversion Loss vs. IF @ RF=1210.1MHz



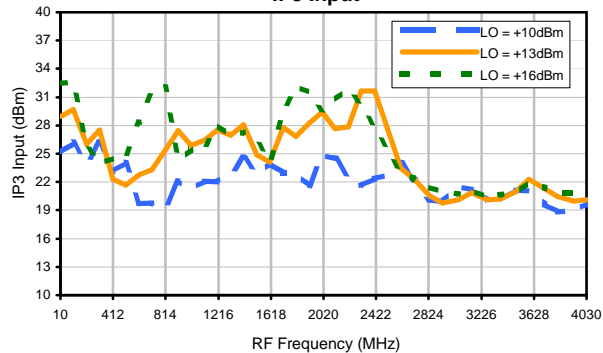
Conversion Loss vs. IF @ RF=10MHz



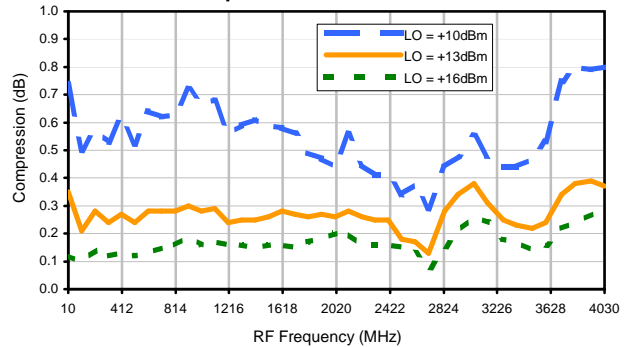
Conversion Loss vs. IF @ RF=2410.1001MHz



IP3 Input

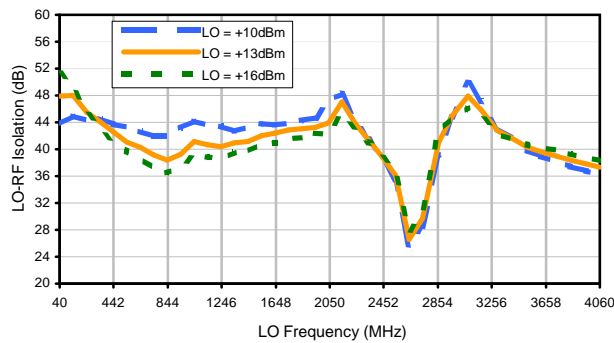


Compression @ RF IN=+9dBm

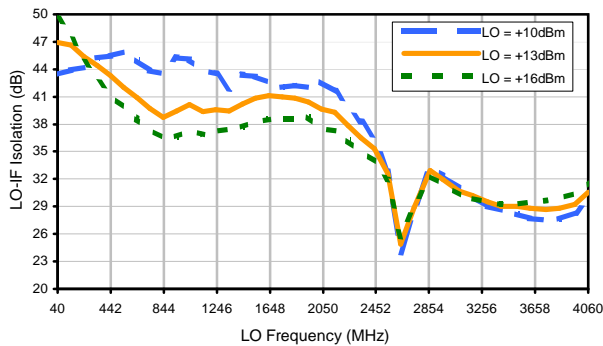


Typical Performance Curves

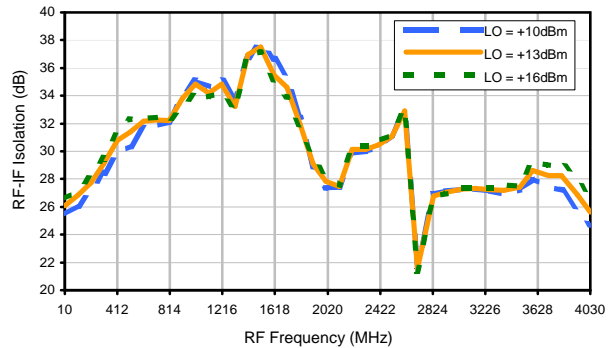
LO-RF Isolation



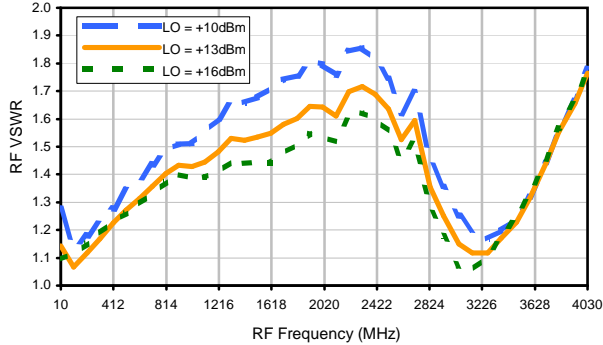
LO-IF Isolation



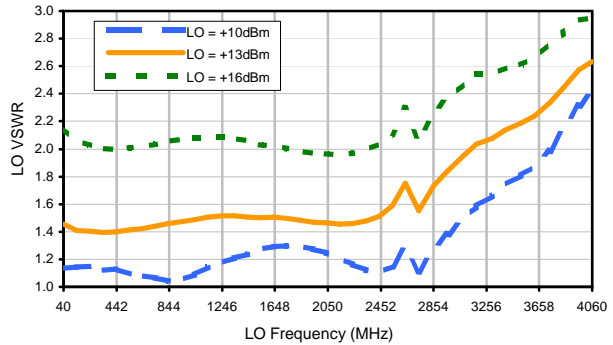
RF-IF Isolation



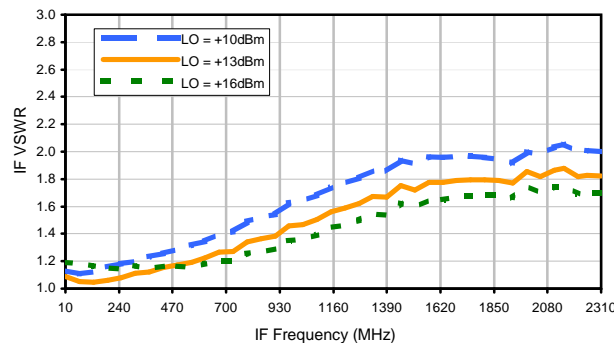
RF VSWR



LO VSWR



IF VSWR



Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	13	18	17	25	24	38	32	43	26	41
1	-	26	+0	38	13	41	20	37	40	41	45	60
2	76	56	63	61	56	60	57	63	60	65	65	67
3	>90	73	70	71	68	>76	65	>76	63	>76	71	74
4	>90	>76	>76	>76	>76	>76	>76	>76	>76	>76	>76	>76
5	>90	>76	>76	>76	>76	>76	>76	73	>76	>76	>76	>76
6	>90	>76	>76	>76	>76	>76	>76	>76	>76	>76	>76	>76
7	>90	>76	>76	>76	>76	>76	>76	>76	>76	>76	>76	>76
8	>90	>76	>76	>76	>76	>76	>76	>76	71	>76	>76	>76
9	>90	>76	>76	>76	>76	>76	>76	>76	>76	>76	>76	>76
10	>90	>76	>76	>76	>76	>76	>76	>76	>76	>76	>76	>76
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 1205 MHz; -6.00 dBm.
 LO IN: 1235 MHz; +13.00 dBm
 IF OUT: 30 MHz; -13.54 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	23	29	28	36	36	47	47	56	44	53
1	-	26	+0	36	13	42	21	40	41	46	49	65
2	56	47	52	53	46	51	47	70	52	62	59	61
3	84	57	46	57	47	62	51	68	45	57	58	57
4	>90	74	74	67	78	66	74	64	76	63	70	69
5	>90	77	70	>86	68	74	66	79	63	76	63	83
6	>90	84	84	84	83	>86	84	86	80	84	81	78
7	>90	>86	>86	>86	84	>86	84	>86	84	>86	80	>86
8	>90	>86	>86	>86	>86	>86	>86	85	86	84	79	84
9	>90	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86	83
10	>90	>86	>86	>86	>86	>86	>86	>86	>86	>86	82	>86
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 1205 MHz; 4.00 dBm.
 LO IN: 1235 MHz; +13.00 dBm
 IF OUT: 30 MHz; -3.59 dBm

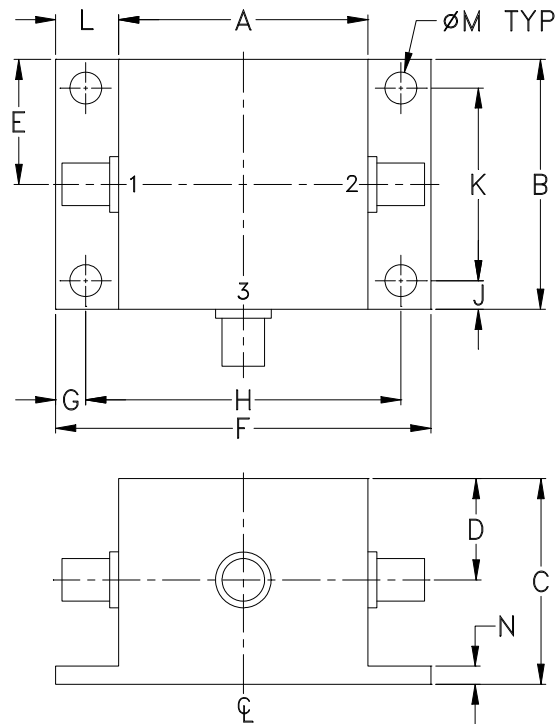
- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
 2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
 3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

Case Style

V

Outline Dimensions

V37



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N	WT GRAMS
V37	.83 (21.08)	.83 (21.08)	.75 (19.05)	.37 (9.40)	.42 (10.67)	1.25 (31.75)	.10 (2.54)	1.050 (26.67)	.10 (2.54)	.640 (16.26)	.21 (5.33)	.106 (2.69)	.06 (1.52)	22.0

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

Notes:

1. Case material: Aluminum alloy.
2. Case finish:
For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.
3. Refer to the individual model data sheet for the type of connectors available.

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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