

Coaxial Frequency Mixer

Level 10 (LO Power +10 dBm) 20 to 1500 MHz

NON-CATALOG

ZP-5LH+
ZP-5LH



Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Power	50mW
IF Current	40mA

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

Coaxial Connections

LO	L
RF	R
IF	X

Features

- low conversion loss, 6.9 dB typ.
- excellent L-R isolation, 42 dB typ.
- wideband, 20 to 1500 MHz
- rugged shielded case

Applications

- VHF/UHF
- satellite distribution
- instrumentation

BNC version shown

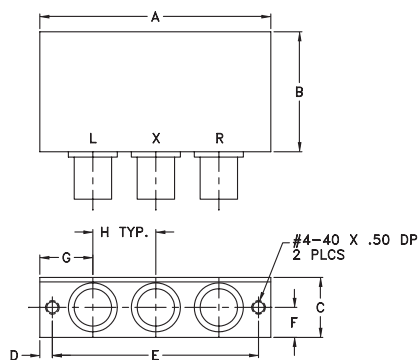
CASE STYLE: GG60

Connectors	Model
BNC	ZP-5LH-(+)
SMA	ZP-5LH-S+

+RoHS Compliant

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

Outline Drawing



Outline Dimensions (inch)

A	B	C	D	E	F	G	H	wt
2.31	1.20	.60	.125	2.062	.30	.53	.63	grams
58.67	30.48	15.24	3.18	52.37	7.62	13.46	16.00	75.0

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		L		M		U		L		M		U	
		$\bar{X}$	σ	Max.	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.
20-1500	DC-1000	6.9	0.27	8.5	9.0	53	40	42	30	38	25	40	25	30	18	22	8

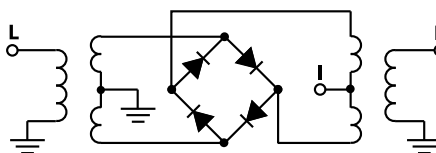
1 dB COMP.: +5 dBm typ.

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 $f_U/2$]

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 +10dBm	LO +10dBm	LO +10dBm	LO +10dBm	LO +10dBm
20.00	50.00	5.60	62.84	53.91	1.43	2.57
50.00	80.00	5.38	57.81	46.30	1.32	2.51
100.00	70.00	5.25	52.60	40.86	1.31	2.50
158.75	128.75	5.20	49.11	38.29	1.34	2.38
200.00	170.00	5.25	47.45	36.98	1.48	2.28
297.50	267.50	5.37	44.43	34.13	1.59	2.36
436.25	406.25	5.54	42.14	31.89	1.91	2.34
500.00	470.00	5.74	41.47	30.68	2.36	2.36
575.00	545.00	5.89	40.90	30.02	2.49	2.36
713.75	683.75	6.61	40.16	28.61	2.97	2.45
750.00	720.00	6.80	39.71	28.48	3.40	2.46
760.00	730.00	6.83	39.62	28.42	3.53	2.48
852.50	822.50	7.07	39.30	28.00	3.80	2.56
991.25	961.25	6.99	38.97	26.26	3.86	2.67
1000.00	970.00	7.07	38.98	26.16	3.95	2.70
1130.00	1100.00	7.19	35.93	24.11	3.91	2.73
1222.50	1192.50	7.02	38.98	22.14	3.77	2.73
1361.25	1331.25	6.88	39.21	19.23	3.65	2.77
1453.75	1423.75	6.78	38.09	16.51	3.54	2.78
1500.00	1470.00	6.66	37.95	16.08	3.47	2.77

Electrical Schematic



Notes

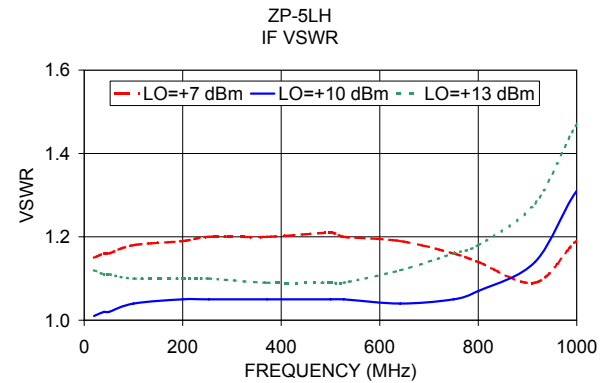
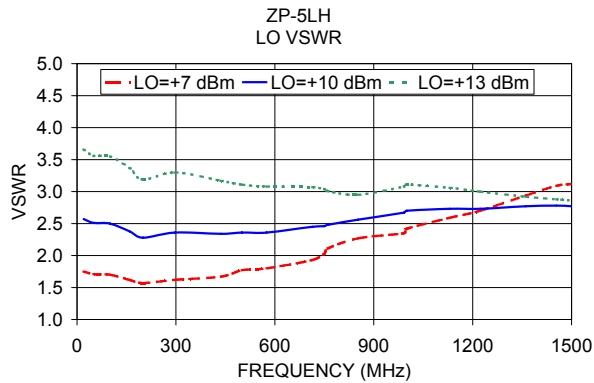
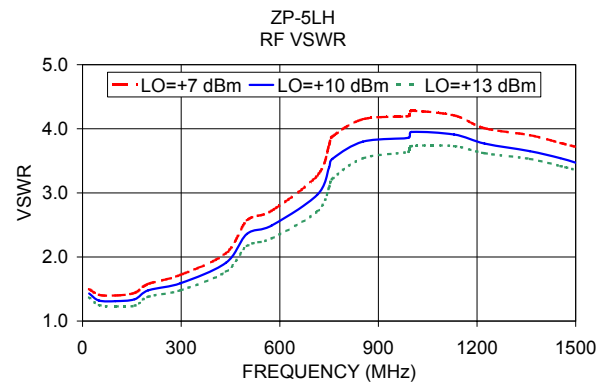
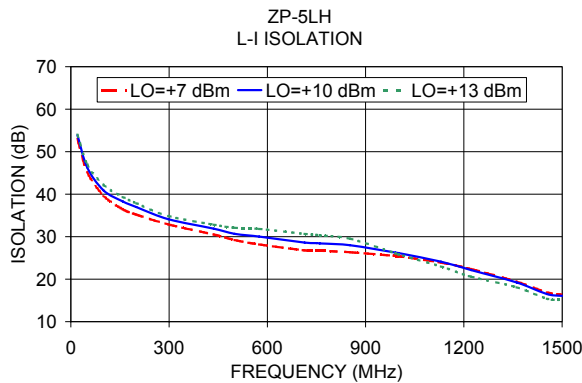
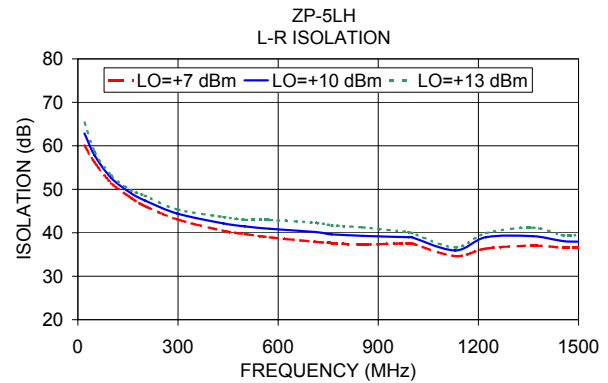
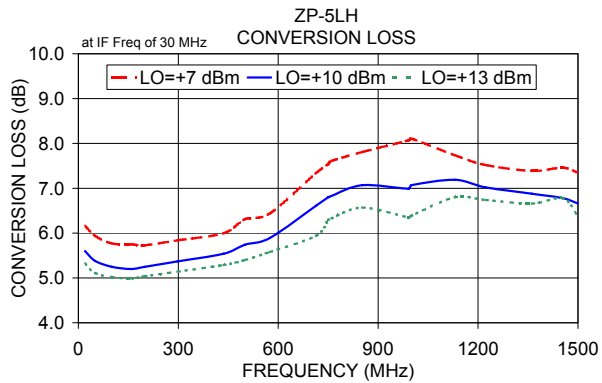
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Performance Charts



Notes

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Frequency Mixer

ZP-5LH+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)		
		@LO (dBm)		
		+7	+10	+13
10.1	40.1	6.53	6.09	5.88
90.9	120.9	5.97	5.61	5.44
171.8	201.8	5.98	5.61	5.45
252.6	282.6	5.98	5.65	5.49
333.5	363.5	6.06	5.75	5.55
414.3	444.3	6.14	5.82	5.62
495.1	525.1	6.29	5.90	5.63
576.0	606.0	6.43	6.04	5.81
656.8	686.8	6.72	6.13	5.74
737.7	767.7	7.22	6.61	6.16
818.5	848.5	7.69	7.04	6.59
899.3	929.3	7.84	6.95	6.40
980.2	1010.2	7.82	6.78	6.32
1061.0	1091.0	7.94	6.99	6.43
1141.8	1171.8	7.72	7.12	6.56
1202.5	1232.5	7.54	6.99	6.57
1283.3	1313.3	7.34	6.91	6.51
1343.9	1373.9	7.24	6.80	6.49
1424.8	1454.8	7.22	6.80	6.53
1485.4	1515.4	7.20	6.77	6.42
1566.3	1596.3	7.18	6.50	6.08
1626.9	1656.9	6.93	6.24	5.96
1707.7	1737.7	6.71	6.14	5.97
1768.4	1798.4	6.70	6.21	6.02
1849.2	1879.2	6.80	6.33	6.11
1909.8	1939.8	7.04	6.46	6.24
1990.7	2020.7	7.47	6.63	6.30
2051.3	2081.3	7.75	6.75	6.38
2132.1	2162.1	8.17	6.76	6.34
2192.8	2222.8	9.09	7.09	6.37
2273.6	2303.6	9.84	7.53	6.52
2334.2	2364.2	9.77	7.63	6.56
2415.1	2445.1	10.13	7.85	6.74
2475.7	2505.7	10.81	8.26	7.09
2556.5	2586.5	11.28	8.44	7.21
2617.2	2647.2	11.36	8.53	7.36
2698.0	2728.0	12.34	9.24	7.63
2758.6	2788.6	12.84	9.75	7.92
2839.5	2869.5	13.08	10.01	8.20
2900.1	2930.1	14.48	10.69	8.45

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)		
		@LO (dBm)		
		+7	+10	+13
10.1	40.1	16.87	18.73	21.05
90.9	120.9	18.15	21.01	17.27
171.8	201.8	16.22	14.62	15.91
252.6	282.6	12.46	14.25	17.11
333.5	363.5	12.51	14.39	16.56
414.3	444.3	12.47	14.12	16.58
495.1	525.1	11.73	15.25	21.60
576.0	606.0	12.16	13.94	15.52
656.8	686.8	11.54	17.55	25.27
737.7	767.7	10.11	12.18	16.23
818.5	848.5	11.08	13.29	15.17
899.3	929.3	10.88	13.00	16.22
980.2	1010.2	11.45	13.78	15.43
1061.0	1091.0	10.52	11.85	13.32
1141.8	1171.8	10.74	10.47	11.14
1202.5	1232.5	11.08	10.91	10.54
1283.3	1313.3	11.59	10.56	10.15
1343.9	1373.9	11.45	10.05	9.27
1424.8	1454.8	10.79	9.70	9.29
1485.4	1515.4	10.34	10.89	14.16
1566.3	1596.3	11.30	15.47	15.69
1626.9	1656.9	13.83	14.04	15.41
1707.7	1737.7	11.74	15.56	18.85
1768.4	1798.4	12.81	17.65	19.34
1849.2	1879.2	14.66	19.11	20.78
1909.8	1939.8	14.71	20.60	22.18
1990.7	2020.7	13.19	18.70	24.39
2051.3	2081.3	12.97	16.85	19.92
2132.1	2162.1	13.73	14.36	17.75
2192.8	2222.8	11.44	11.99	16.53
2273.6	2303.6	9.75	12.45	13.89
2334.2	2364.2	10.86	15.12	14.18
2415.1	2445.1	10.44	14.45	15.97
2475.7	2505.7	9.03	13.19	14.39
2556.5	2586.5	8.96	12.18	13.95
2617.2	2647.2	10.21	11.56	13.06
2698.0	2728.0	7.67	12.39	13.25
2758.6	2788.6	5.44	11.05	13.85
2839.5	2869.5	3.41	8.66	12.86
2900.1	2930.1	1.92	6.77	12.16

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+5dBm (dB)		
		@LO (dBm)		
		+7	+10	+13
10.1	40.1	0.92	0.71	0.55
90.9	120.9	1.28	1.06	0.79
171.8	201.8	1.35	1.04	0.78
252.6	282.6	1.38	0.98	0.74
333.5	363.5	1.35	0.99	0.78
414.3	444.3	1.33	1.04	0.81
495.1	525.1	1.41	1.14	0.93
576.0	606.0	1.71	1.32	1.09
656.8	686.8	1.78	1.59	1.36
737.7	767.7	1.59	1.39	1.32
818.5	848.5	1.35	1.23	1.15
899.3	929.3	1.31	1.34	1.30
980.2	1010.2	1.45	1.55	1.37
1061.0	1091.0	1.16	1.32	1.26
1141.8	1171.8	1.13	1.13	1.12
1202.5	1232.5	1.23	1.13	1.06
1283.3	1313.3	1.23	1.09	1.02
1343.9	1373.9	1.24	1.05	0.98
1424.8	1454.8	1.23	0.99	0.90
1485.4	1515.4	1.31	1.04	0.91
1566.3	1596.3	1.33	1.13	0.86
1626.9	1656.9	1.54	1.15	0.74
1707.7	1737.7	1.70	0.95	0.61
1768.4	1798.4	1.75	0.90	0.61
1849.2	1879.2	1.71	0.90	0.62
1909.8	1939.8	1.80	1.00	0.70
1990.7	2020.7	1.91	1.18	0.85
2051.3	2081.3	1.92	1.30	0.95
2132.1	2162.1	1.68	1.46	1.07
2192.8	2222.8	1.37	1.52	1.21
2273.6	2303.6	1.13	1.45	1.32
2334.2	2364.2	1.20	1.33	1.28
2415.1	2445.1	1.33	1.31	1.23
2475.7	2505.7	1.33	1.47	1.20
2556.5	2586.5	1.20	1.57	1.24
2617.2	2647.2	1.27	1.56	1.24
2698.0	2728.0	1.13	1.60	1.39
2758.6	2788.6	0.77	1.45	1.46
2839.5	2869.5	0.38	1.25	1.54
2900.1	2930.1	-0.43	0.88	1.52

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IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS 9100 CERTIFIED • RoHS compliant

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Frequency Mixer

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Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=750.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=20.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1500.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+10			+10			+10
710.0	40.1	6.11	10.0	30.1	6.00	1000.0	500.1	7.76
692.1	58.0	6.13	30.2	50.3	5.99	979.8	520.3	7.76
674.1	76.0	6.20	50.4	70.5	6.05	959.6	540.5	7.68
656.2	93.9	6.19	70.6	90.7	6.11	939.4	560.7	7.75
638.2	111.9	6.21	90.8	110.9	6.04	919.2	580.9	7.65
620.3	129.8	6.20	111.0	131.1	6.01	899.0	601.1	7.64
602.3	147.8	6.26	131.2	151.3	6.04	878.8	621.3	7.61
584.4	165.7	6.26	151.4	171.5	6.08	858.6	641.5	7.58
566.4	183.7	6.35	171.6	191.7	6.04	838.4	661.7	7.56
548.5	201.6	6.36	191.8	211.9	6.00	818.2	681.9	7.44
530.5	219.6	6.37	212.0	232.1	6.00	798.0	702.1	7.52
512.6	237.5	6.32	232.2	252.3	5.99	777.8	722.3	7.51
494.6	255.5	6.39	252.4	272.5	6.03	757.6	742.5	7.58
476.7	273.4	6.37	272.7	292.8	6.02	737.3	762.8	7.39
458.7	291.4	6.43	292.9	313.0	6.01	717.1	783.0	7.47
440.8	309.3	6.46	313.1	333.2	6.00	696.9	803.2	7.47
422.8	327.3	6.39	333.3	353.4	6.00	676.7	823.4	7.38
404.9	345.2	6.36	353.5	373.6	6.05	656.5	843.6	7.39
386.9	363.2	6.34	373.7	393.8	6.02	636.3	863.8	7.34
369.0	381.1	6.31	393.9	414.0	6.03	616.1	884.0	7.28
351.0	399.1	6.41	434.3	454.4	6.04	575.7	924.4	7.08
333.1	417.0	6.42	454.5	474.6	6.07	555.5	944.6	7.03
315.1	435.0	6.43	494.9	515.0	6.06	515.1	985.0	6.79
297.2	452.9	6.41	515.1	535.2	6.01	494.9	1005.2	6.72
279.2	470.9	6.41	555.5	575.6	6.11	454.5	1045.6	6.66
261.3	488.8	6.45	575.7	595.8	6.07	434.3	1065.8	6.57
243.3	506.8	6.40	616.1	636.2	6.08	393.9	1106.2	6.54
225.4	524.7	6.46	636.3	656.4	6.14	373.7	1126.4	6.56
207.4	542.7	6.47	676.7	696.8	6.17	333.3	1166.8	6.54
189.5	560.6	6.49	696.9	717.0	6.21	313.1	1187.0	6.62
171.5	578.6	6.48	737.3	757.4	6.40	272.7	1227.4	6.72
153.6	596.5	6.52	757.6	777.7	6.35	252.4	1247.7	6.74
135.6	614.5	6.45	798.0	818.1	6.46	212.0	1288.1	6.81
117.7	632.4	6.46	818.2	838.3	6.46	191.8	1308.3	6.81
99.7	650.4	6.38	858.6	878.7	6.54	151.4	1348.7	6.80
81.8	668.3	6.41	878.8	898.9	6.59	131.2	1368.9	6.79
63.8	686.3	6.37	919.2	939.3	6.58	90.8	1409.3	6.80
45.9	704.2	6.46	939.4	959.5	6.65	70.6	1429.5	6.85
27.9	722.2	6.49	979.8	999.9	6.77	30.2	1469.9	6.82
10.0	740.1	6.59	1000.0	1020.1	6.82	10.0	1490.1	7.03

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Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+7	+10	+13	+7	+10	+13
10.1	66.48	65.32	64.64	56.15	59.28	58.27
90.9	56.08	56.42	56.76	40.10	41.45	42.69
171.8	50.94	51.49	52.07	35.33	37.07	38.39
252.6	47.83	48.74	49.41	33.24	34.73	35.68
333.5	45.81	46.85	47.61	31.37	32.66	33.61
414.3	44.19	45.17	45.87	29.89	31.18	32.21
495.1	43.25	44.32	45.13	28.42	29.91	31.16
576.0	42.54	44.01	45.28	26.90	28.54	30.11
656.8	41.08	42.44	43.59	25.84	27.67	29.24
737.7	40.18	41.81	43.12	24.58	26.39	28.28
818.5	39.52	41.38	42.96	23.95	25.51	27.05
899.3	39.34	41.44	43.30	23.46	24.79	25.99
980.2	38.45	40.29	41.77	22.58	23.50	24.11
1061.0	37.40	38.59	39.65	21.66	22.30	22.59
1141.8	36.81	37.71	38.25	20.70	20.97	20.91
1202.5	36.41	37.09	37.62	20.10	20.21	19.98
1283.3	35.83	36.50	36.82	19.31	19.22	18.81
1343.9	35.44	36.06	36.38	18.80	18.54	17.99
1424.8	34.91	35.40	35.84	18.11	17.84	17.28
1485.4	34.45	34.79	35.03	17.47	17.02	16.33
1566.3	33.64	33.88	34.20	16.14	15.43	14.50
1626.9	33.01	33.47	34.09	15.15	14.33	13.75
1707.7	32.71	33.60	34.34	14.04	13.45	12.85
1768.4	32.88	33.33	34.03	13.38	12.78	12.41
1849.2	32.85	33.29	33.71	12.51	12.23	11.93
1909.8	32.98	33.23	33.55	12.02	11.78	11.55
1990.7	32.89	33.09	33.37	11.44	11.26	11.09
2051.3	32.65	33.01	33.29	10.94	11.02	10.85
2132.1	32.52	32.71	32.98	10.60	10.63	10.73
2192.8	32.51	33.64	34.10	10.31	10.48	10.60
2273.6	32.81	34.60	35.68	10.08	10.20	10.40
2334.2	32.54	34.36	36.32	9.89	10.14	10.41
2415.1	32.75	34.23	36.25	9.75	10.00	10.28
2475.7	33.24	35.17	37.06	9.62	10.02	10.34
2556.5	33.66	36.27	38.69	9.63	10.09	10.51
2617.2	33.73	36.72	40.38	9.53	9.97	10.58
2698.0	34.50	38.17	42.69	9.52	10.05	10.72
2758.6	35.24	39.75	46.59	9.72	10.24	10.86
2839.5	35.79	40.53	49.40	9.83	10.43	11.13
2900.1	36.70	41.00	47.61	9.87	10.50	11.22

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+7	+10	+13
10.1	40.1	51.97	57.02	46.63
90.9	120.9	48.39	45.32	44.97
171.8	201.8	42.30	41.64	40.83
252.6	282.6	39.43	38.42	38.15
333.5	363.5	37.19	36.26	35.55
414.3	444.3	34.78	34.16	33.79
495.1	525.1	32.51	31.91	31.80
576.0	606.0	30.99	30.54	30.20
656.8	686.8	29.93	29.25	28.78
737.7	767.7	28.17	27.77	27.26
818.5	848.5	27.19	26.94	26.68
899.3	929.3	27.29	26.88	26.45
980.2	1010.2	28.81	28.23	28.04
1061.0	1091.0	30.47	30.30	30.01
1141.8	1171.8	30.41	30.70	30.78
1202.5	1232.5	29.21	29.57	29.90
1283.3	1313.3	27.18	27.38	27.80
1343.9	1373.9	26.17	26.39	26.67
1424.8	1454.8	24.43	24.90	25.16
1485.4	1515.4	23.63	24.03	24.33
1566.3	1596.3	22.93	23.34	23.49
1626.9	1656.9	22.67	22.97	23.11
1707.7	1737.7	22.30	22.80	23.05
1768.4	1798.4	22.02	22.46	22.83
1849.2	1879.2	21.42	21.87	22.23
1909.8	1939.8	20.86	21.35	21.71
1990.7	2020.7	20.15	20.67	21.06
2051.3	2081.3	19.80	20.42	20.83
2132.1	2162.1	19.45	20.24	20.68
2192.8	2222.8	19.06	20.06	20.64
2273.6	2303.6	19.05	20.07	20.93
2334.2	2364.2	19.39	20.29	21.13
2415.1	2445.1	19.79	20.79	21.52
2475.7	2505.7	19.98	21.20	22.00
2556.5	2586.5	20.69	22.09	23.03
2617.2	2647.2	21.27	22.84	23.82
2698.0	2728.0	21.79	23.37	24.85
2758.6	2788.6	22.41	23.74	25.30
2839.5	2869.5	23.61	24.69	26.11
2900.1	2930.1	24.86	25.72	26.54

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)		
		@LO (dBm)		
		+7	+10	+13
10.1	40.1	1.89	1.85	1.83
90.9	120.9	1.17	1.07	1.05
171.8	201.8	1.19	1.09	1.07
252.6	282.6	1.26	1.19	1.16
333.5	363.5	1.34	1.28	1.25
414.3	444.3	1.42	1.36	1.32
495.1	525.1	1.54	1.46	1.41
576.0	606.0	1.72	1.64	1.59
656.8	686.8	2.01	1.87	1.77
737.7	767.7	2.41	2.27	2.14
818.5	848.5	2.81	2.65	2.52
899.3	929.3	3.16	2.91	2.73
980.2	1010.2	3.47	3.15	2.98
1061.0	1091.0	3.67	3.37	3.15
1141.8	1171.8	3.53	3.31	3.10
1202.5	1232.5	3.36	3.18	3.00
1283.3	1313.3	3.22	3.06	2.88
1343.9	1373.9	3.18	2.99	2.81
1424.8	1454.8	3.08	2.85	2.61
1485.4	1515.4	2.94	2.66	2.41
1566.3	1596.3	2.65	2.30	2.09
1626.9	1656.9	2.38	2.07	1.93
1707.7	1737.7	2.20	1.96	1.84
1768.4	1798.4	2.17	1.95	1.83
1849.2	1879.2	2.14	1.93	1.81
1909.8	1939.8	2.15	1.94	1.80
1990.7	2020.7	2.21	1.97	1.84
2051.3	2081.3	2.29	2.02	1.88
2132.1	2162.1	2.40	2.06	1.89
2192.8	2222.8	2.51	2.06	1.85
2273.6	2303.6	2.45	2.00	1.74
2334.2	2364.2	2.26	1.90	1.66
2415.1	2445.1	2.20	1.86	1.66
2475.7	2505.7	2.28	1.91	1.71
2556.5	2586.5	2.26	1.85	1.67
2617.2	2647.2	2.12	1.74	1.58
2698.0	2728.0	2.03	1.66	1.49
2758.6	2788.6	2.02	1.67	1.50
2839.5	2869.5	2.09	1.74	1.56
2900.1	2930.1	2.30	1.88	1.60

LO (MHz)	LO VSWR (:1)		
	@LO (dBm)		
	+7	+10	+13
10.1	1.65	2.34	3.19
90.9	1.68	2.42	3.35
171.8	1.68	2.39	3.29
252.6	1.70	2.43	3.34
333.5	1.72	2.44	3.32
414.3	1.73	2.42	3.25
495.1	1.75	2.40	3.17
576.0	1.79	2.41	3.15
656.8	1.88	2.47	3.14
737.7	1.93	2.51	3.18
818.5	1.96	2.50	3.14
899.3	1.98	2.45	3.02
980.2	2.06	2.48	3.01
1061.0	2.16	2.59	3.09
1141.8	2.20	2.64	3.11
1202.5	2.21	2.63	3.10
1283.3	2.25	2.65	3.10
1343.9	2.28	2.66	3.08
1424.8	2.27	2.60	3.00
1485.4	2.28	2.58	2.95
1566.3	2.25	2.50	2.87
1626.9	2.22	2.47	2.85
1707.7	2.30	2.55	2.91
1768.4	2.48	2.69	3.02
1849.2	2.75	2.87	3.16
1909.8	2.94	2.97	3.20
1990.7	3.24	3.15	3.29
2051.3	3.47	3.31	3.46
2132.1	3.76	3.50	3.51
2192.8	4.07	3.68	3.62
2273.6	4.35	3.99	3.86
2334.2	4.60	4.23	4.10
2415.1	4.88	4.45	4.35
2475.7	5.16	4.72	4.55
2556.5	5.46	5.00	4.80
2617.2	5.75	5.36	5.04
2698.0	6.11	5.72	5.39
2758.6	6.39	6.03	5.68
2839.5	6.73	6.32	6.03
2900.1	6.94	6.56	6.24

IF (OUT) (MHz)	IF VSWR @LO=1500.1MHz (:1)		
	@LO (dBm)		
	+7	+10	+13
10.0	1.55	1.33	1.17
30.2	1.45	1.22	1.04
50.4	1.40	1.20	1.08
70.6	1.41	1.21	1.00
90.8	1.43	1.22	1.04
111.0	1.47	1.25	1.04
131.2	1.52	1.30	1.09
151.4	1.47	1.26	1.05
171.6	1.42	1.22	1.03
191.8	1.49	1.27	1.07
212.0	1.53	1.31	1.09
232.2	1.48	1.27	1.07
252.4	1.48	1.27	1.10
272.7	1.51	1.30	1.10
292.9	1.50	1.28	1.07
313.1	1.50	1.29	1.10
333.3	1.55	1.33	1.14
353.5	1.54	1.32	1.12
373.7	1.51	1.29	1.11
393.9	1.55	1.33	1.16
434.3	1.57	1.34	1.15
454.5	1.57	1.35	1.18
494.9	1.64	1.40	1.20
515.1	1.62	1.39	1.20
555.5	1.69	1.45	1.24
575.7	1.68	1.44	1.23
616.1	1.75	1.50	1.29
636.3	1.72	1.47	1.25
676.7	1.81	1.55	1.32
696.9	1.82	1.56	1.33
737.3	1.79	1.54	1.33
757.6	1.84	1.58	1.35
798.0	1.90	1.63	1.41
818.2	1.91	1.65	1.42
858.6	1.88	1.62	1.40
878.8	1.96	1.68	1.45
919.2	1.96	1.70	1.48
939.4	1.92	1.68	1.48
979.8	1.98	1.71	1.49
1000.0	2.02	1.75	1.54

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	10	39	26	46	24	43	38	62	47	79
1	-	21	+0	38	19	44	37	49	49	59	57	69
2	86	74	38	58	38	67	51	70	42	56	55	76
3	>100	49	40	52	36	52	43	53	43	63	55	67
4	>100	83	76	80	50	70	52	71	65	67	64	68
5	>100	65	59	63	53	79	47	83	56	75	56	73
6	>100	77	78	85	79	83	66	79	63	79	78	82
7	>100	82	74	82	72	85	63	71	60	71	69	82
8	>100	>93	>93	>93	83	87	88	91	70	>93	71	88
9	>100	>93	>93	>93	91	92	92	86	80	>93	71	90
10	>100	>93	>93	>93	>93	>93	90	>93	>93	>93	83	>93
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 750.1 MHz; 0.00 dBm.
LO IN: 780.01 MHz; +10.00 dBm
IF OUT: 29.91 MHz; -6.67 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	+1	27	15	34	11	31	24	48	37	67
1	-	22	+0	36	20	37	36	46	47	50	53	60
2	>100	74	44	65	44	67	57	68	47	60	66	73
3	>100	74	55	68	50	69	56	76	56	76	62	80
4	>100	>83	>83	>83	81	>83	76	>83	>83	>83	76	>83
5	>100	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83
6	>100	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83
7	>100	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83
8	>100	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83
9	>100	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83
10	>100	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 750.1 MHz; -10.00 dBm.
LO IN: 780.01 MHz; +10.00 dBm
IF OUT: 29.91 MHz; -16.9 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.

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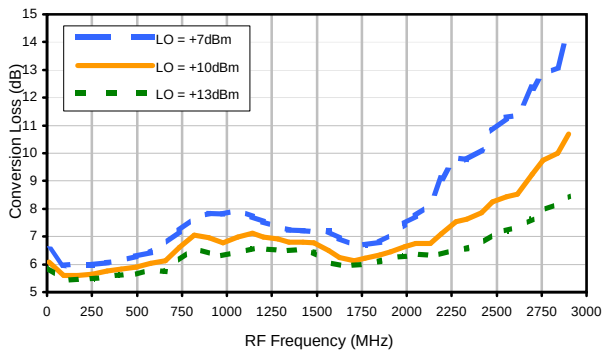


Frequency Mixer

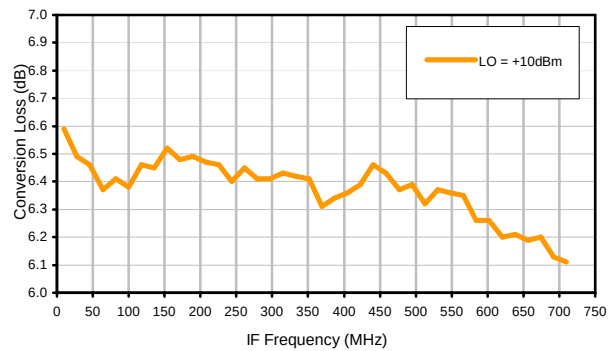
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Typical Performance Curves

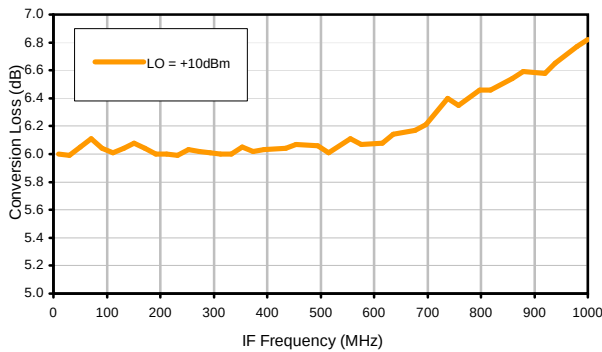
Conversion Loss @ IF=30MHz



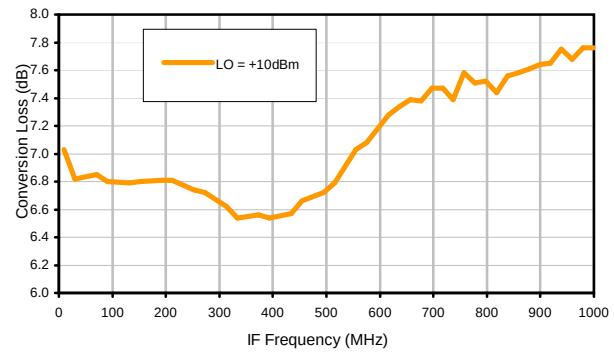
Conversion Loss vs. IF @ RF=750.1MHz



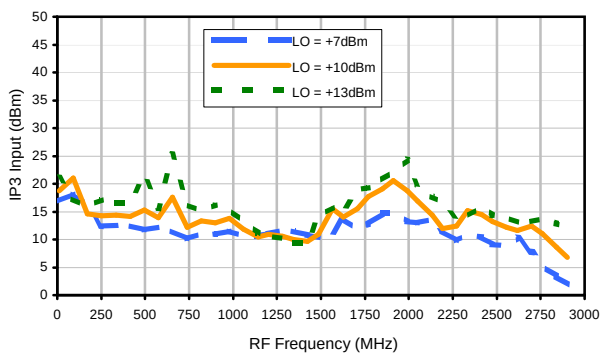
Conversion Loss vs. IF @ RF=20.1MHz



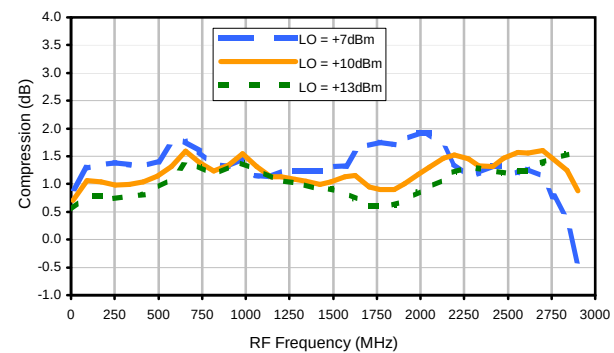
Conversion Loss vs. IF @ RF=1500.1MHz



IP3 Input



Compression @ RF IN=+5dBm



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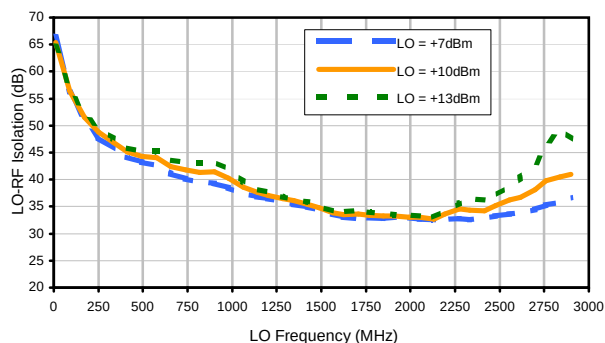


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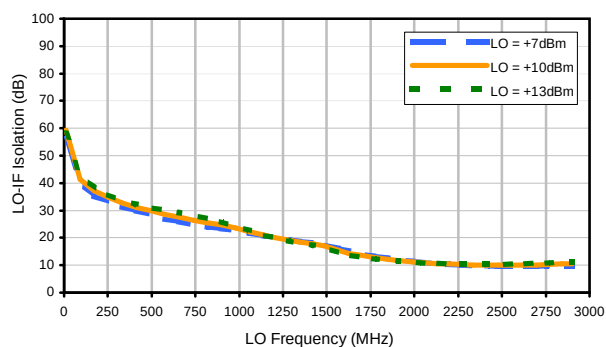


Typical Performance Curves

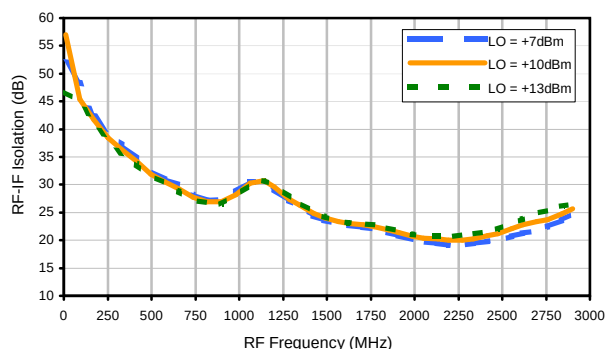
LO-RF Isolation



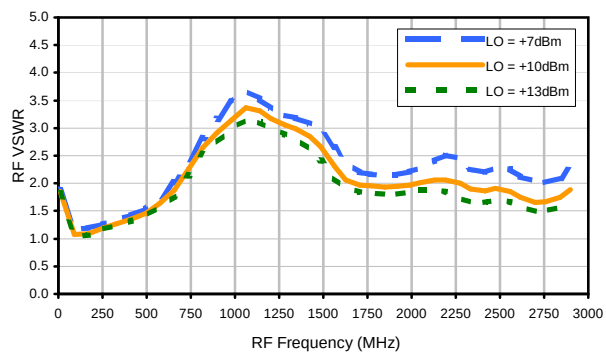
LO-IF Isolation



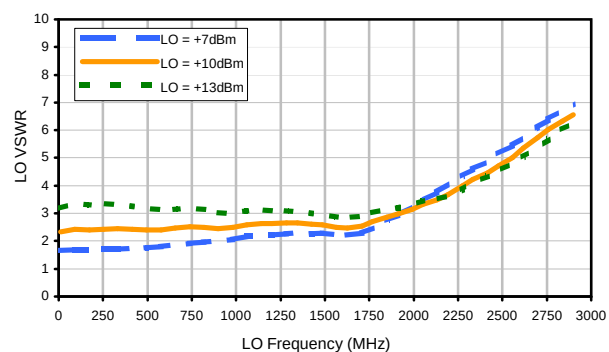
RF-IF Isolation



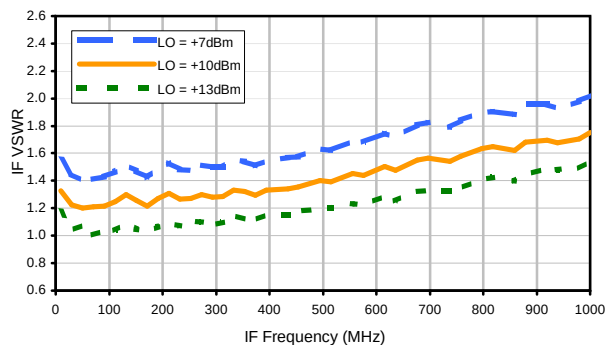
RF VSWR



LO VSWR



IF VSWR



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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	10	39	26	46	24	43	38	62	47	79
1	-	21	+0	38	19	44	37	49	49	59	57	69
2	86	74	38	58	38	67	51	70	42	56	55	76
3	>100	49	40	52	36	52	43	53	43	63	55	67
4	>100	83	76	80	50	70	52	71	65	67	64	68
5	>100	65	59	63	53	79	47	83	56	75	56	73
6	>100	77	78	85	79	83	66	79	63	79	78	82
7	>100	82	74	82	72	85	63	71	60	71	69	82
8	>100	>93	>93	>93	83	87	88	91	70	>93	71	88
9	>100	>93	>93	>93	91	92	92	86	80	>93	71	90
10	>100	>93	>93	>93	>93	>93	90	>93	>93	>93	83	>93
RF CAL	0	1	2	3	4	5	6	7	8	9	10	

LO HARMONICS ORDER

Test conditions:

RF IN: 750.1 MHz; 0.00 dBm.

LO IN: 780.01 MHz; +10.00 dBm

IF OUT: 29.91 MHz; -6.67 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	+1	27	15	34	11	31	24	48	37	67
1	-	22	+0	36	20	37	36	46	47	50	53	60
2	>100	74	44	65	44	67	57	68	47	60	66	73
3	>100	74	55	68	50	69	56	76	56	76	62	80
4	>100	>83	>83	>83	81	>83	76	>83	>83	>83	76	>83
5	>100	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83
6	>100	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83
7	>100	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83
8	>100	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83
9	>100	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83
10	>100	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83	>83
RF CAL	0	1	2	3	4	5	6	7	8	9	10	

LO HARMONICS ORDER

Test conditions:

RF IN: 750.1 MHz; -10.00 dBm.

LO IN: 780.01 MHz; +10.00 dBm

IF OUT: 29.91 MHz; -16.9 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.

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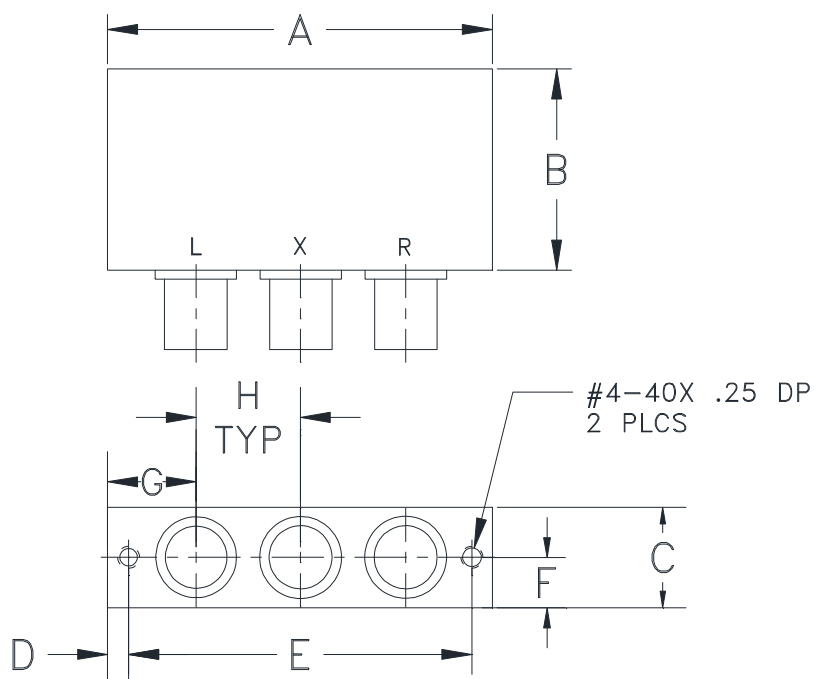


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Outline Dimensions

GG60



CASE #.	A	B	C	D	E	F	G	H	WT. GRAM
GG60	2.31 (58.67)	1.20 (30.48)	.60 (15.24)	.125 (3.18)	2.062 (52.37)	.30 (7.62)	.53 (13.46)	.63 (16.00)	75.0

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

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