

Frequency Mixer

Level 13 (LO Power +13 dBm) 5 to 2500 MHz

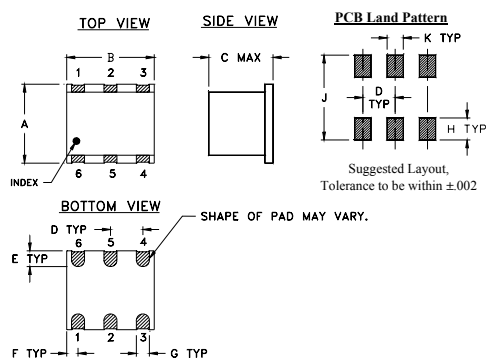
Maximum Ratings

Operating Temperature	-40°C to 85°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	

Pin Connections

LO	1
RF	4
IF	5
GROUND	2,3,6

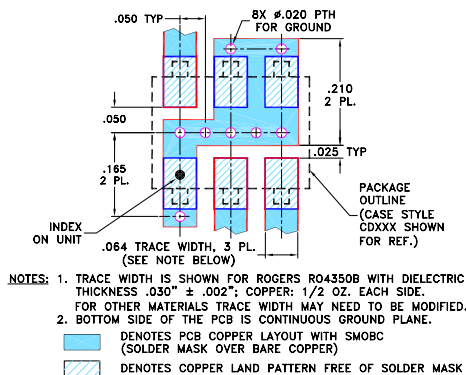
Outline Drawing



Outline Dimensions ($\frac{\text{inch}}{\text{mm}}$)

A	B	C	D	E	F
.250	.31	.20	.100	.050	.055
6.35	7.87	5.08	2.54	1.27	1.40
G	H	J	K		wt
.040	.070	.270	.050		grams
1.02	1.78	6.86	1.27		0.50

Demo Board MCL P/N: TB-03
Suggested PCB Layout (PL-052)



Notes

A. 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.

B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuits' applicable established test performance criteria and measurement instructions.

C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCStore/terms_iso

Features

- excellent L-R isolation, 32 dB typ.
- conversion loss, 7.0 dB typ.
- small size, 0.25"x0.31"x0.2"

Applications

- cellular
- satellite distribution
- GPS

Electrical Specifications

FREQUENCY (MHz)		CONVERSION LOSS (dB)				LO-RF ISOLATION (dB)						LO-IF ISOLATION (dB)						IP3 at center band (dBm)
LO/Rf	IF					L		M		U		L		M		U		
f_L - f_U					Total Range													
		$\bar{X}$	σ	Max.	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.
5-2500	5-1500	7.0	.20	8.5	9.8	54	28	32	23	32	20	34	23	32	25	28	17	17

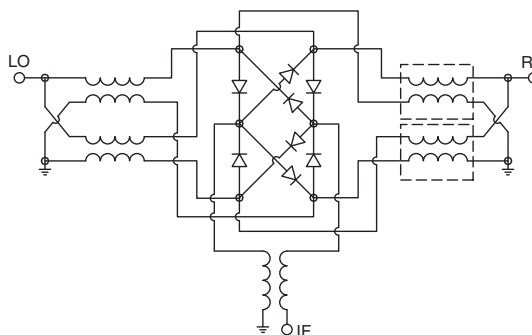
1 dB COMP.: +9 dBm typ.

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

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 +13 dBm	LO +13 dBm	LO +13 dBm	LO +13 dBm	LO +13 dBm
5.00	35.00	6.60	43.66	31.16	1.43	2.14
10.10	40.10	6.47	48.02	33.66	1.42	2.07
20.18	50.18	6.42	53.20	34.80	1.42	2.09
33.51	63.51	6.47	56.82	34.60	1.42	2.09
49.03	79.03	6.46	59.20	34.63	1.42	2.08
81.42	111.42	6.50	57.10	34.59	1.42	2.06
135.23	165.23	6.58	52.43	34.78	1.45	2.08
224.60	194.60	6.60	46.08	35.72	1.52	2.08
373.01	343.01	6.77	40.43	37.11	1.71	1.95
480.71	450.71	6.88	38.16	36.46	1.86	1.92
545.72	515.72	6.82	37.54	35.91	1.95	1.80
798.38	768.38	6.92	36.87	32.89	2.23	1.71
906.34	876.34	6.92	37.27	31.38	2.32	1.62
1168.03	1138.03	7.19	36.90	30.53	2.35	1.61
1250.00	1220.00	7.10	38.52	31.35	2.37	1.62
1505.28	1475.28	6.78	39.76	30.96	2.27	1.65
1800.00	1770.00	6.85	31.84	27.67	2.24	1.57
2000.00	1970.00	7.07	28.62	28.09	2.19	1.62
2200.00	2170.00	7.09	25.62	28.13	2.18	1.77
2500.00	2470.00	7.52	22.96	26.44	1.95	1.99

Electrical Schematic

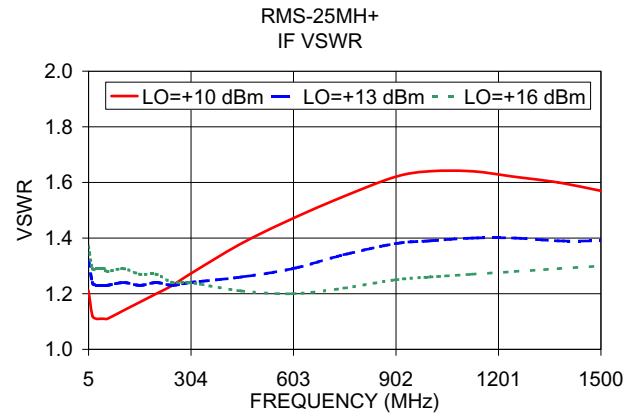
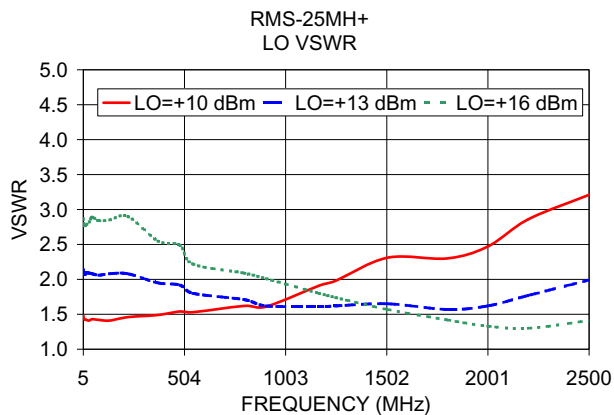
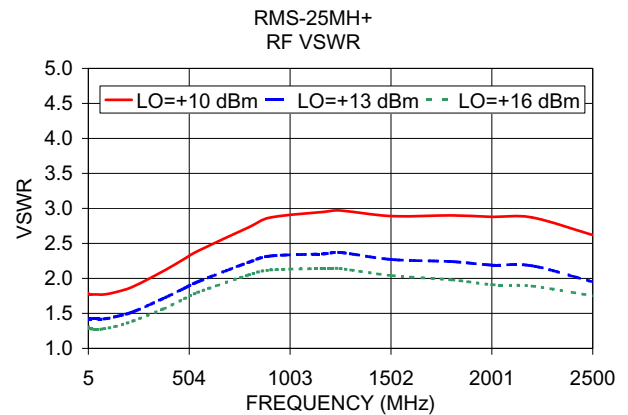
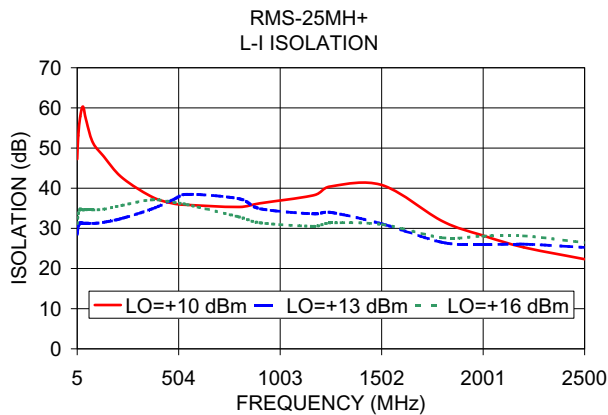
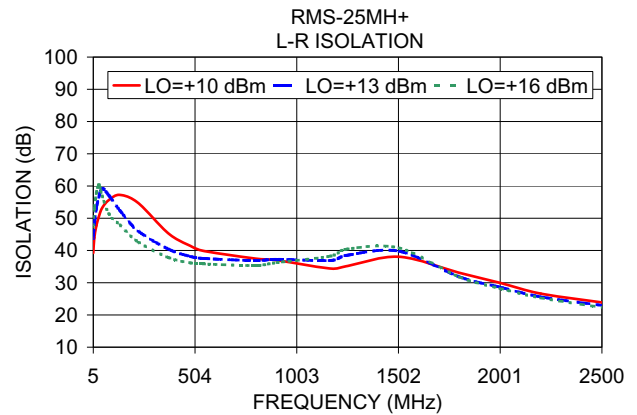
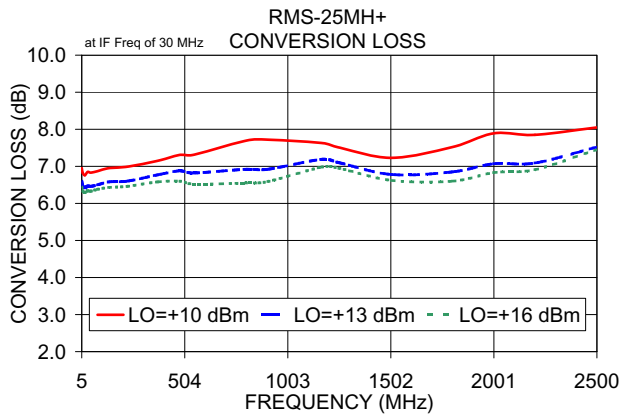


Generic photo used for illustration purposes only

CASE STYLE: TT240

+RoHS Compliant

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



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Frequency Mixer

RMS-25MH+

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	+13	+16			
5.0	35.0	6.95	6.60	6.44	10.1	40.1	24.53	32.08	28.48	10.1	40.1	1.52	0.96	0.63
10.1	40.1	6.82	6.47	6.33	90.4	120.4	25.22	24.32	25.43	90.4	120.4	1.34	0.96	0.65
90.4	120.4	7.27	6.95	6.79	170.7	200.7	23.64	22.60	22.53	170.7	200.7	1.32	0.95	0.67
170.7	200.7	7.33	7.01	6.85	250.9	280.9	20.30	19.91	21.05	250.9	280.9	1.41	1.01	0.69
250.9	280.9	7.42	7.10	6.92	331.2	361.2	18.51	19.12	22.18	331.2	361.2	1.43	1.01	0.72
331.2	361.2	7.49	7.16	6.93	411.5	441.5	17.64	19.30	22.71	411.5	441.5	1.38	1.00	0.76
411.5	441.5	7.58	7.22	6.94	491.8	521.8	17.45	20.78	21.92	491.8	521.8	1.37	1.09	0.83
491.8	521.8	7.70	7.22	6.90	572.0	602.0	16.92	20.31	21.87	572.0	602.0	1.41	1.12	0.88
572.0	602.0	7.77	7.23	6.92	652.3	682.3	17.06	19.70	21.39	652.3	682.3	1.38	1.14	0.91
652.3	682.3	7.83	7.28	6.93	732.6	762.6	17.32	19.58	21.53	732.6	762.6	1.40	1.21	0.97
732.6	762.6	7.86	7.24	6.92	812.9	842.9	17.21	20.41	22.83	812.9	842.9	1.51	1.35	1.09
812.9	842.9	7.75	7.15	6.87	893.2	923.2	16.85	20.05	21.02	893.2	923.2	1.59	1.42	1.13
893.2	923.2	7.71	7.13	6.91	973.4	1003.4	17.29	18.70	19.66	973.4	1003.4	1.56	1.32	1.10
973.4	1003.4	7.77	7.29	7.07	1053.7	1083.7	17.45	19.17	20.08	1053.7	1083.7	1.44	1.15	0.94
1053.7	1083.7	7.94	7.47	7.28	1134.0	1164.0	17.54	19.47	20.65	1134.0	1164.0	1.32	1.06	0.79
1134.0	1164.0	8.06	7.63	7.43	1214.3	1244.3	18.15	19.96	21.55	1214.3	1244.3	1.37	1.00	0.74
1214.3	1244.3	8.07	7.68	7.48	1294.5	1324.5	17.44	19.34	20.88	1294.5	1324.5	1.45	1.04	0.79
1294.5	1324.5	8.02	7.63	7.45	1354.8	1384.8	17.06	18.67	20.38	1354.8	1384.8	1.38	0.99	0.78
1354.8	1384.8	8.04	7.63	7.45	1435.0	1465.0	16.40	18.01	19.39	1435.0	1465.0	1.31	0.97	0.80
1435.0	1465.0	8.05	7.62	7.43	1495.2	1525.2	16.08	17.76	19.09	1495.2	1525.2	1.32	0.98	0.83
1495.2	1525.2	8.03	7.58	7.36	1575.5	1605.5	15.35	17.11	18.36	1575.5	1605.5	1.33	1.04	0.86
1575.5	1605.5	7.98	7.47	7.26	1635.7	1665.7	15.20	16.59	18.16	1635.7	1665.7	1.31	1.04	0.91
1635.7	1665.7	7.94	7.39	7.18	1716.0	1746.0	15.00	15.94	17.27	1716.0	1746.0	1.29	1.02	0.88
1716.0	1746.0	8.02	7.41	7.18	1776.2	1806.2	14.55	15.80	16.91	1776.2	1806.2	1.29	1.07	0.90
1776.2	1806.2	8.12	7.43	7.18	1856.5	1886.5	14.06	15.31	16.57	1856.5	1886.5	1.22	1.01	0.84
1856.5	1886.5	8.15	7.47	7.21	1916.7	1946.7	14.07	15.38	16.75	1916.7	1946.7	1.24	1.03	0.86
1916.7	1946.7	8.07	7.40	7.17	1997.0	2027.0	13.96	15.57	16.97	1997.0	2027.0	1.28	0.99	0.83
1997.0	2027.0	8.00	7.38	7.17	2057.2	2087.2	13.92	15.48	17.07	2057.2	2087.2	1.25	0.91	0.77
2057.2	2087.2	8.03	7.43	7.22	2137.5	2167.5	14.01	15.51	17.16	2137.5	2167.5	1.20	0.85	0.71
2137.5	2167.5	8.11	7.56	7.36	2197.7	2227.7	14.07	15.51	16.95	2197.7	2227.7	1.19	0.85	0.68
2197.7	2227.7	8.25	7.73	7.52	2277.9	2307.9	13.91	15.31	16.75	2277.9	2307.9	1.13	0.76	0.60
2277.9	2307.9	8.42	7.89	7.73	2338.2	2368.2	14.27	15.83	17.24	2338.2	2368.2	1.12	0.74	0.58
2338.2	2368.2	8.45	7.96	7.82	2418.4	2448.4	14.18	15.68	17.30	2418.4	2448.4	1.06	0.72	0.55
2418.4	2448.4	8.59	8.17	8.01	2478.6	2508.6	14.21	15.56	17.27	2478.6	2508.6	1.14	0.75	0.56
2558.9	2588.9	9.12	8.69	8.57	2558.9	2588.9	14.88	16.21	17.66	2558.9	2588.9	1.04	0.67	0.52
2619.1	2649.1	9.36	8.97	8.87	2619.1	2649.1	16.04	16.97	18.16	2619.1	2649.1	0.98	0.65	0.51
2699.4	2729.4	9.60	9.25	9.18	2699.4	2729.4	18.17	18.14	18.57	2699.4	2729.4	0.99	0.63	0.52
2759.6	2789.6	9.70	9.39	9.31	2759.6	2789.6	19.49	18.69	18.69	2759.6	2789.6	1.04	0.62	0.54
2839.9	2869.9	9.92	9.66	9.56	2839.9	2869.9	21.39	19.74	18.57	2839.9	2869.9	0.98	0.61	0.53
2900.1	2930.1	10.18	9.92	9.84	2900.1	2930.1	22.70	21.06	19.50	2900.1	2930.1	0.97	0.61	0.52

Frequency Mixer

RMS-25MH+

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1250.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=10.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=2500.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+13			+13			+13
1240.0	10.1	7.75	10.0	20.1	6.62	1500.0	1000.1	8.53
1199.7	50.4	7.80	50.8	60.9	6.73	1459.2	1040.9	8.48
1159.3	90.8	7.83	91.6	101.7	6.79	1418.4	1081.7	8.39
1119.0	131.1	7.84	132.5	142.6	6.76	1377.5	1122.6	8.34
1078.7	171.4	7.88	173.3	183.4	6.81	1336.7	1163.4	8.29
1038.4	211.7	7.87	214.1	224.2	6.75	1295.9	1204.2	8.24
998.0	252.1	7.91	254.9	265.0	6.75	1255.1	1245.0	8.21
977.9	272.2	7.94	295.8	305.9	6.72	1214.2	1285.9	8.12
937.5	312.6	7.86	336.6	346.7	6.68	1173.4	1326.7	8.08
917.4	332.7	7.95	377.4	387.5	6.67	1132.6	1367.5	8.06
877.0	373.1	8.00	418.2	428.3	6.65	1091.8	1408.3	8.02
856.9	393.2	7.97	459.0	469.1	6.65	1051.0	1449.1	8.01
816.6	433.5	7.98	499.9	510.0	6.61	1010.1	1490.0	7.95
796.4	453.7	7.95	540.7	550.8	6.60	969.3	1530.8	7.97
756.1	494.0	7.90	581.5	591.6	6.61	928.5	1571.6	7.98
735.9	514.2	7.87	622.3	632.4	6.61	887.7	1612.4	7.98
695.6	554.5	7.84	663.2	673.3	6.66	846.8	1653.3	7.97
675.4	574.7	7.85	704.0	714.1	6.70	806.0	1694.1	7.94
635.1	615.0	7.82	744.8	754.9	6.71	765.2	1734.9	7.98
614.9	635.2	7.80	785.6	795.7	6.73	724.4	1775.7	7.98
574.6	675.5	7.82	826.4	836.5	6.72	683.6	1816.5	8.01
554.4	695.7	7.76	867.3	877.4	6.74	642.7	1857.4	8.00
514.1	736.0	7.77	908.1	918.2	6.73	601.9	1898.2	7.98
493.9	756.2	7.73	948.9	959.0	6.80	561.1	1939.0	7.98
453.6	796.5	7.73	989.7	999.8	6.89	520.3	1979.8	7.95
433.4	816.7	7.74	1030.5	1040.6	6.95	479.5	2020.6	7.99
393.1	857.0	7.75	1071.4	1081.5	7.05	438.6	2061.5	7.96
373.0	877.1	7.71	1112.2	1122.3	7.13	397.8	2102.3	8.02
332.6	917.5	7.75	1153.0	1163.1	7.23	357.0	2143.1	8.01
312.5	937.6	7.75	1193.8	1203.9	7.32	316.2	2183.9	8.06
272.1	978.0	7.76	1234.7	1244.8	7.42	275.3	2224.8	8.14
252.0	998.1	7.76	1255.1	1265.2	7.47	254.9	2245.2	8.13
211.6	1038.5	7.80	1295.9	1306.0	7.59	214.1	2286.0	8.18
191.5	1058.6	7.84	1316.3	1326.4	7.62	193.7	2306.4	8.20
151.1	1099.0	7.84	1357.1	1367.2	7.74	152.9	2347.2	8.24
131.0	1119.1	7.86	1377.5	1387.6	7.74	132.5	2367.6	8.26
90.7	1159.4	7.86	1418.4	1428.5	7.82	91.6	2408.5	8.32
70.5	1179.6	7.79	1438.8	1448.9	7.82	71.2	2428.9	8.34
30.2	1219.9	7.74	1479.6	1489.7	7.87	30.4	2469.7	8.34
10.0	1240.1	7.91	1500.0	1510.1	7.88	10.0	2490.1	8.60

REV. X2
RMS-25MH+
100818
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IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS 9100 CERTIFIED • RoHS compliant
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Frequency Mixer

RMS-25MH+

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+10	+13	+16	+10	+13	+16
5.0	39.24	43.66	47.26	28.54	31.16	33.31
10.1	43.96	48.02	53.10	30.47	33.66	36.35
90.4	50.68	49.59	47.01	30.43	33.08	35.00
170.7	46.88	43.20	41.16	30.13	32.06	33.05
250.9	42.96	39.73	38.30	30.29	31.74	32.32
331.2	40.33	37.59	36.27	31.05	31.93	31.78
411.5	38.67	36.05	34.76	31.89	31.97	31.16
491.8	37.14	34.99	33.97	32.48	31.71	30.62
572.0	36.05	34.24	33.14	32.73	31.19	29.80
652.3	35.53	33.64	32.68	32.92	30.66	29.24
732.6	34.88	33.54	32.67	32.64	30.23	28.89
812.9	34.87	33.78	32.96	32.10	29.77	28.69
893.2	35.60	34.52	33.58	31.52	29.41	28.23
973.4	36.22	35.46	34.57	31.18	29.06	28.00
1053.7	36.42	36.37	35.72	31.43	29.36	28.14
1134.0	37.63	37.85	37.20	31.98	29.71	28.34
1214.3	39.19	39.70	39.22	33.45	30.79	29.11
1294.5	42.33	43.61	43.11	35.09	32.03	30.07
1354.8	46.06	50.38	50.06	35.77	32.84	30.76
1435.0	53.52	56.79	53.62	35.34	33.26	31.37
1495.2	61.06	45.81	44.16	34.50	33.21	31.77
1575.5	46.32	40.23	38.73	33.28	32.86	31.99
1635.7	41.97	37.75	36.37	32.42	32.78	32.55
1716.0	37.84	34.86	33.59	31.33	32.25	32.92
1776.2	35.69	33.39	32.39	30.61	31.80	33.06
1856.5	33.27	31.89	31.17	30.32	32.08	34.14
1916.7	31.85	30.79	30.28	30.31	32.48	35.35
1997.0	29.96	29.49	29.30	30.39	33.06	36.60
2057.2	28.69	28.39	28.34	30.51	33.13	36.37
2137.5	27.46	27.06	27.01	30.51	32.55	34.71
2197.7	26.54	26.17	26.18	30.61	32.24	33.61
2277.9	25.46	25.24	25.28	30.77	31.85	32.54
2338.2	24.97	24.72	24.82	30.62	31.31	31.78
2418.4	24.51	24.36	24.33	29.88	30.34	30.73
2558.9	23.24	23.34	23.53	28.61	29.25	29.79
2619.1	22.71	22.92	23.11	28.11	28.85	29.47
2699.4	22.41	22.51	22.89	27.81	28.26	29.02
2759.6	22.28	22.48	22.75	27.94	28.26	28.77
2839.9	21.94	22.23	22.50	27.97	28.30	28.70
2900.1	21.87	22.14	22.38	28.16	28.35	28.68

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+10	+13	+16
10.1	40.1	21.47	21.15	21.32
90.4	120.4	21.67	21.62	21.65
170.7	200.7	22.24	22.29	22.29
250.9	280.9	23.19	23.15	23.22
331.2	361.2	24.33	24.30	24.52
411.5	441.5	25.90	25.91	26.16
491.8	521.8	28.31	28.32	28.62
572.0	602.0	31.64	31.81	32.09
652.3	682.3	36.11	36.05	36.21
732.6	762.6	47.14	41.88	37.77
812.9	842.9	39.56	36.66	33.62
893.2	923.2	33.83	33.65	32.73
973.4	1003.4	30.73	30.64	30.07
1053.7	1083.7	28.02	28.13	27.66
1134.0	1164.0	25.65	25.61	25.20
1214.3	1244.3	23.81	23.74	23.47
1294.5	1324.5	22.76	22.84	22.70
1354.8	1384.8	22.31	22.39	22.35
1435.0	1465.0	21.79	22.00	21.99
1495.2	1525.2	21.45	21.75	21.84
1575.5	1605.5	21.03	21.46	21.65
1635.7	1665.7	20.99	21.64	21.78
1716.0	1746.0	21.19	22.00	22.34
1776.2	1806.2	20.70	21.31	21.65
1856.5	1886.5	20.09	20.37	20.62
1916.7	1946.7	19.78	19.88	20.02
1997.0	2027.0	19.38	19.44	19.48
2057.2	2087.2	19.09	19.11	19.10
2137.5	2167.5	18.67	18.57	18.55
2197.7	2227.7	18.45	18.32	18.31
2277.9	2307.9	18.15	17.96	17.87
2338.2	2368.2	18.17	17.89	17.71
2418.4	2448.4	18.31	17.96	17.65
2478.6	2508.6	18.57	18.04	17.69
2558.9	2588.9	18.92	18.20	17.74
2619.1	2649.1	19.26	18.35	17.84
2699.4	2729.4	19.66	18.73	18.14
2759.6	2789.6	19.97	18.92	18.38
2839.9	2869.9	19.54	18.77	18.25
2900.1	2930.1	19.03	18.41	18.04

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Frequency Mixer

RMS-25MH+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)		
		@LO (dBm)		
		+10	+13	+16
5.0	35.0	1.79	1.43	1.31
10.1	40.1	1.77	1.42	1.28
90.4	120.4	1.02	1.12	1.19
170.7	200.7	1.03	1.07	1.13
250.9	280.9	1.09	1.05	1.08
331.2	361.2	1.16	1.10	1.09
411.5	441.5	1.23	1.17	1.14
491.8	521.8	1.33	1.26	1.22
572.0	602.0	1.44	1.36	1.30
652.3	682.3	1.58	1.48	1.41
732.6	762.6	1.72	1.60	1.52
812.9	842.9	1.84	1.69	1.59
893.2	923.2	1.98	1.80	1.70
973.4	1003.4	2.14	1.96	1.86
1053.7	1083.7	2.27	2.09	1.99
1134.0	1164.0	2.39	2.21	2.11
1214.3	1244.3	2.44	2.27	2.16
1294.5	1324.5	2.49	2.31	2.20
1354.8	1384.8	2.53	2.34	2.23
1435.0	1465.0	2.57	2.36	2.25
1495.2	1525.2	2.59	2.35	2.22
1575.5	1605.5	2.59	2.33	2.20
1635.7	1665.7	2.56	2.29	2.15
1716.0	1746.0	2.57	2.26	2.10
1776.2	1806.2	2.56	2.25	2.07
1856.5	1886.5	2.49	2.18	2.02
1916.7	1946.7	2.42	2.13	1.96
1997.0	2027.0	2.35	2.06	1.90
2057.2	2087.2	2.30	2.03	1.89
2137.5	2167.5	2.23	1.98	1.87
2197.7	2227.7	2.18	1.96	1.86
2277.9	2307.9	2.16	1.94	1.86
2338.2	2368.2	2.15	1.95	1.88
2418.4	2448.4	2.19	2.02	1.97
2478.6	2508.6	2.21	2.08	2.04
2558.9	2588.9	2.22	2.14	2.13
2619.1	2649.1	2.24	2.19	2.19
2699.4	2729.4	2.28	2.26	2.28
2759.6	2789.6	2.34	2.34	2.37
2839.9	2869.9	2.41	2.45	2.49
2900.1	2930.1	2.45	2.51	2.55

LO (MHz)	LO VSWR (:1)		
	@LO (dBm)		
	+10	+13	+16
5.0	1.48	2.14	2.87
10.1	1.43	2.07	2.77
90.4	1.53	2.17	2.96
170.7	1.52	2.15	2.92
250.9	1.53	2.15	2.91
331.2	1.54	2.13	2.86
411.5	1.54	2.08	2.77
491.8	1.54	2.03	2.67
572.0	1.55	1.99	2.59
652.3	1.53	1.95	2.52
732.6	1.50	1.88	2.43
812.9	1.47	1.80	2.33
893.2	1.47	1.74	2.24
973.4	1.50	1.70	2.16
1053.7	1.58	1.69	2.10
1134.0	1.64	1.65	2.01
1214.3	1.71	1.61	1.91
1294.5	1.82	1.60	1.83
1354.8	1.90	1.61	1.79
1435.0	1.99	1.60	1.71
1495.2	2.02	1.57	1.63
1575.5	2.06	1.55	1.54
1635.7	2.10	1.53	1.49
1716.0	2.13	1.50	1.40
1776.2	2.14	1.48	1.32
1856.5	2.18	1.46	1.23
1916.7	2.23	1.46	1.17
1997.0	2.27	1.46	1.09
2057.2	2.29	1.48	1.06
2137.5	2.33	1.50	1.07
2197.7	2.35	1.51	1.12
2277.9	2.33	1.53	1.21
2338.2	2.33	1.56	1.26
2418.4	2.31	1.58	1.34
2478.6	2.29	1.61	1.42
2558.9	2.26	1.65	1.51
2619.1	2.25	1.67	1.57
2699.4	2.22	1.73	1.68
2759.6	2.15	1.74	1.75
2839.9	2.11	1.78	1.84
2900.1	2.06	1.80	1.90

IF (OUT) (MHz)	IF VSWR @LO=2500.1MHz (:1)		
	@LO (dBm)		
	+10	+13	+16
5.0	1.21	1.32	1.37
10.1	1.13	1.34	1.23
50.4	1.14	1.24	1.28
90.6	1.09	1.20	1.23
130.9	1.14	1.18	1.22
171.2	1.15	1.20	1.23
211.5	1.16	1.18	1.21
251.7	1.21	1.22	1.24
292.0	1.20	1.20	1.21
332.3	1.23	1.22	1.22
372.5	1.25	1.22	1.22
412.8	1.27	1.22	1.21
453.1	1.27	1.21	1.20
493.3	1.30	1.22	1.20
533.6	1.29	1.21	1.19
573.9	1.30	1.19	1.17
614.2	1.31	1.21	1.18
654.4	1.30	1.18	1.16
694.7	1.35	1.23	1.19
735.0	1.32	1.21	1.19
775.2	1.34	1.20	1.17
815.5	1.39	1.26	1.22
855.8	1.34	1.21	1.17
896.0	1.42	1.27	1.21
936.3	1.39	1.25	1.21
976.6	1.39	1.23	1.17
1016.9	1.45	1.29	1.22
1057.1	1.38	1.22	1.16
1097.4	1.45	1.28	1.19
1137.7	1.43	1.27	1.19
1177.9	1.40	1.24	1.15
1218.2	1.45	1.28	1.18
1258.5	1.40	1.23	1.14
1298.7	1.44	1.27	1.17
1318.9	1.47	1.29	1.18
1359.2	1.44	1.27	1.17
1379.3	1.42	1.26	1.16
1419.6	1.45	1.28	1.18
1439.7	1.48	1.31	1.20
1480.0	1.44	1.28	1.18
1500.1	1.44	1.28	1.18

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	5	16	18	17	25	30	34	53	45	51
1	-	16	+0	27	17	35	21	30	30	56	42	46
2	87	58	54	63	59	59	54	50	76	67	68	68
3	>100	69	55	65	57	65	56	68	66	67	78	85
4	>100	>86	83	85	83	>86	82	>86	>86	>86	>86	>86
5	>100	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86
6	>100	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86
7	>100	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86
8	>100	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86
9	>100	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86
10	>100	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 1250.1 MHz; -6.00 dBm.
LO IN: 1280.01 MHz; +13.00 dBm
IF OUT: 29.91 MHz; -13.88 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	15	25	27	29	35	41	48	70	53	65
1	-	16	+0	27	16	38	21	34	31	65	45	56
2	77	47	44	48	53	54	43	43	49	62	59	63
3	>100	44	36	46	40	49	40	51	57	48	58	71
4	>100	67	54	64	59	65	73	64	74	61	65	78
5	>100	63	64	61	60	61	55	61	56	64	65	62
6	91	79	75	67	68	71	68	76	75	74	74	72
7	98	88	91	74	70	81	73	72	72	70	67	69
8	>100	>96	87	85	84	78	77	85	77	83	78	85
9	>100	>96	96	>96	95	88	82	85	86	89	91	90
10	96	>96	>96	>96	>96	>96	94	87	85	90	90	90
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 1250.1 MHz; 4.00 dBm.
LO IN: 1280.01 MHz; +13.00 dBm
IF OUT: 29.91 MHz; -3.93 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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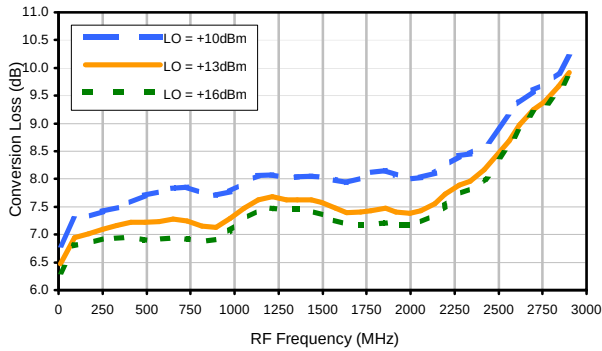


Frequency Mixer

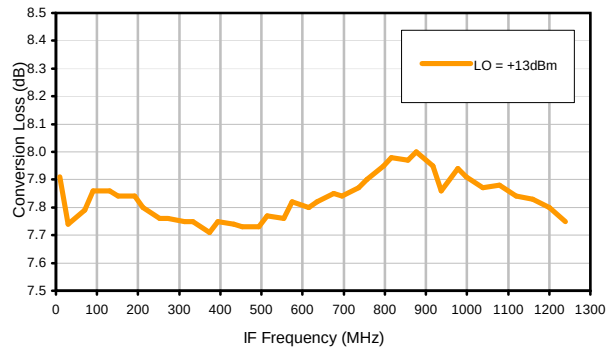
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Typical Performance Curves

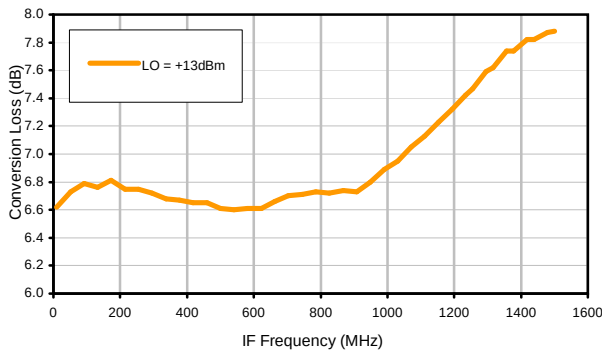
Conversion Loss @ IF=30MHz



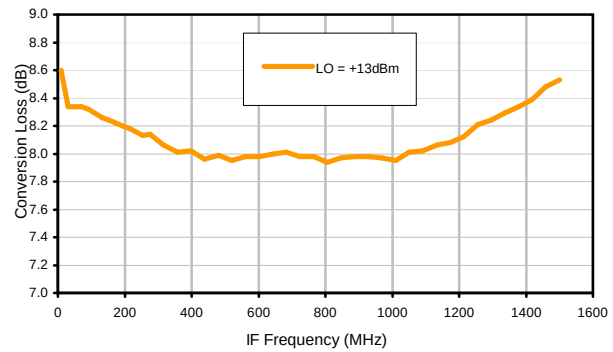
Conversion Loss vs. IF @ RF=1250.1MHz



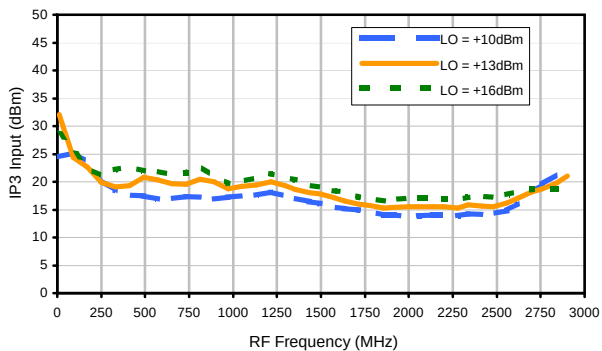
Conversion Loss vs. IF @ RF=10.1MHz



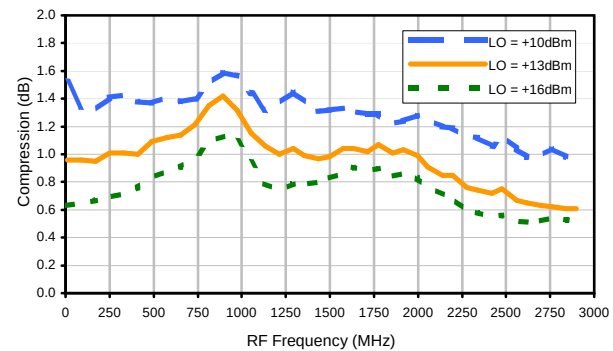
Conversion Loss vs. IF @ RF=2500.1MHz



IP3 Input

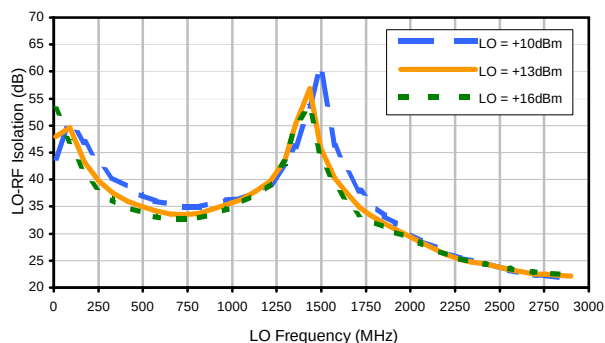


Compression @ RF IN=+9dBm

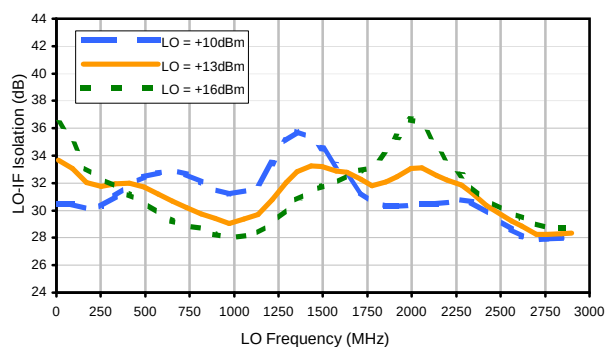


Typical Performance Curves

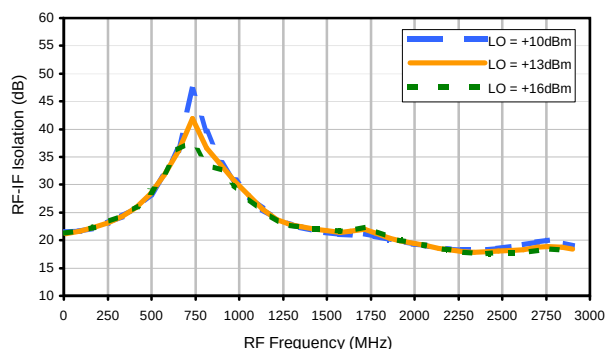
LO-RF Isolation



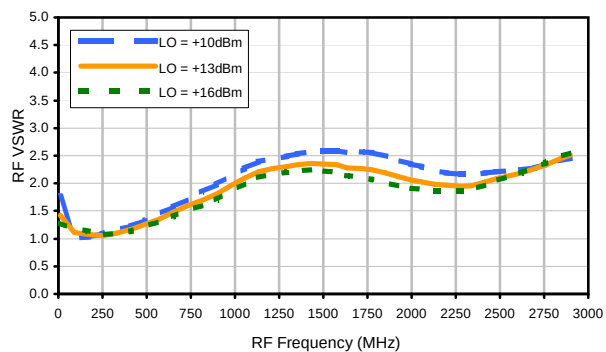
LO-IF Isolation



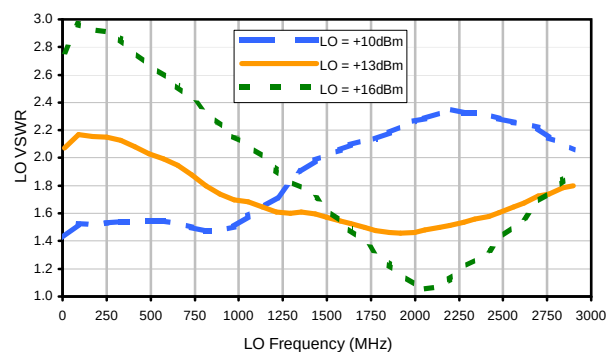
RF-IF Isolation



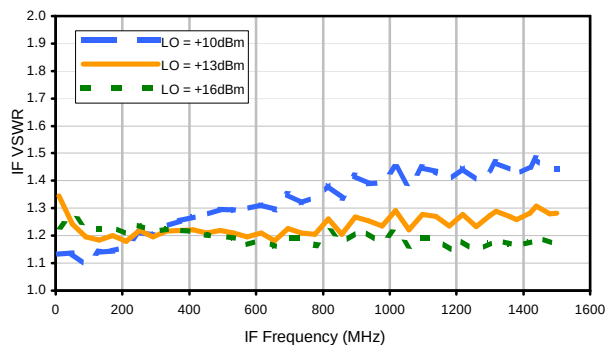
RF VSWR



LO VSWR



IF VSWR



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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	5	16	18	17	25	30	34	53	45	51
1	-	16	+0	27	17	35	21	30	30	56	42	46
2	87	58	54	63	59	59	54	50	76	67	68	68
3	>100	69	55	65	57	65	56	68	66	67	78	85
4	>100	>86	83	85	83	>86	82	>86	>86	>86	>86	>86
5	>100	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86
6	>100	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86
7	>100	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86
8	>100	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86
9	>100	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86
10	>100	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 1250.1 MHz; -6.00 dBm.
LO IN: 1280.01 MHz; +13.00 dBm
IF OUT: 29.91 MHz; -13.88 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	15	25	27	29	35	41	48	70	53	65
1	-	16	+0	27	16	38	21	34	31	65	45	56
2	77	47	44	48	53	54	43	43	49	62	59	63
3	>100	44	36	46	40	49	40	51	57	48	58	71
4	>100	67	54	64	59	65	73	64	74	61	65	78
5	>100	63	64	61	60	61	55	61	56	64	65	62
6	91	79	75	67	68	71	68	76	75	74	74	72
7	98	88	91	74	70	81	73	72	72	70	67	69
8	>100	>96	87	85	84	78	77	85	77	83	78	85
9	>100	>96	96	>96	95	88	82	85	86	89	91	90
10	96	>96	>96	>96	>96	>96	94	87	85	90	90	90
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 1250.1 MHz; 4.00 dBm.
LO IN: 1280.01 MHz; +13.00 dBm
IF OUT: 29.91 MHz; -3.93 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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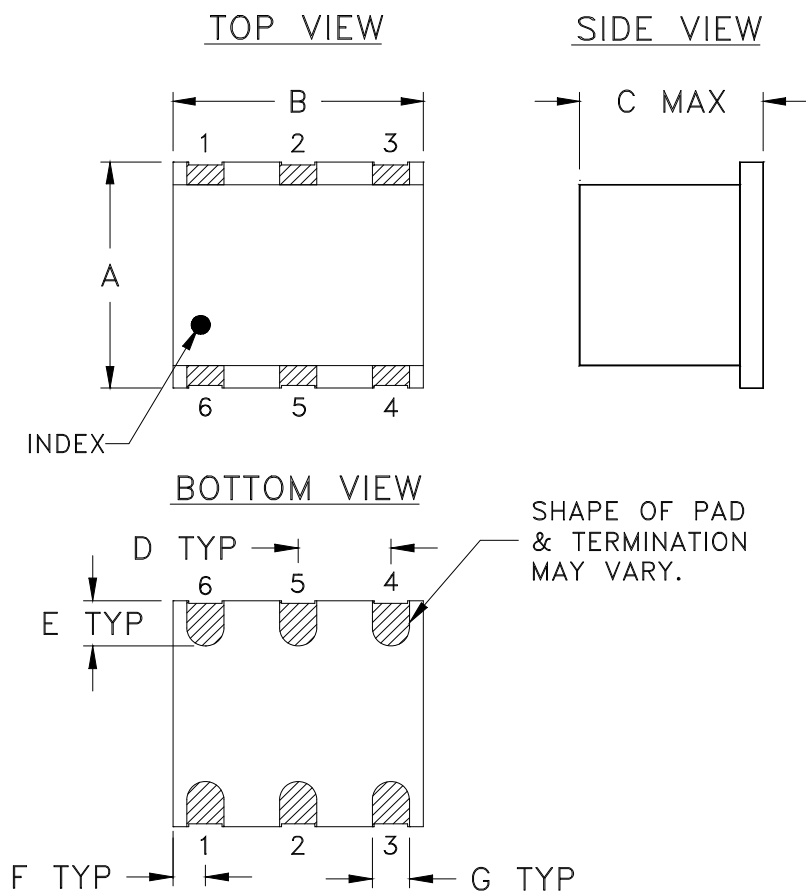
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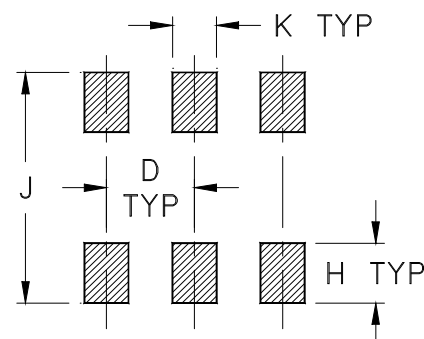
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Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within $\pm .002$

CASE #	A	B	C	D	E	F	G	H	J	K	WT. GRAM
TT240	.250 (6.35)	.31 (7.87)	.20 (5.08)	.100 (2.54)	.050 (1.27)	.055 (1.40)	.040 (1.02)	.070 (1.78)	.270 (6.86)	.050 (1.27)	.50

Dimensions are in inches (mm). Tolerances: 2Pl. $\pm .01$; 3 Pl. $\pm .005$

Notes:

- Case material: Ceramic.
- Termination finish:
 - For RoHS Case Styles: 2-10 μ inch (.05-.25 microns) Gold plate over 100-300 μ inch (2.54-7.62 microns) Nickel plate. All models, (+) suffix.
 - For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.



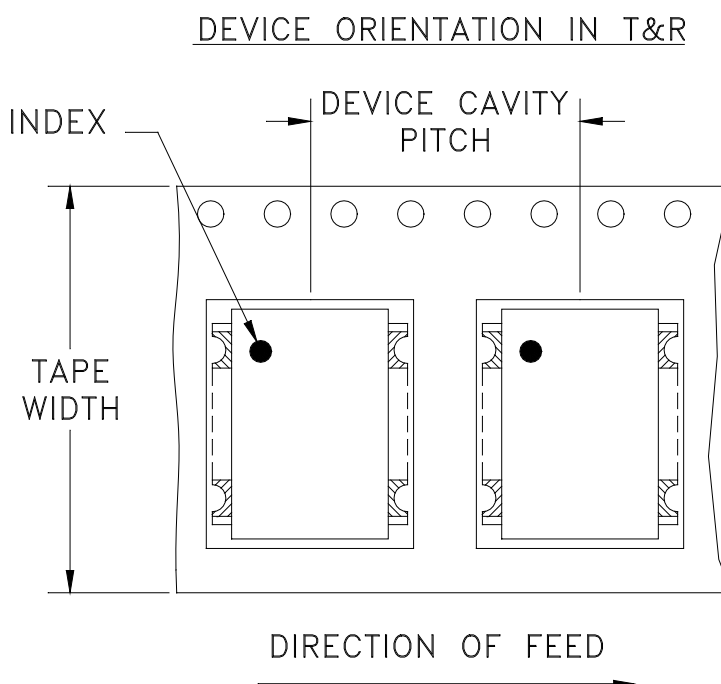
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Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel See note
16	12	7	10
			20
			50
			100
			200
		13	500
			1000

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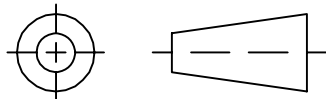


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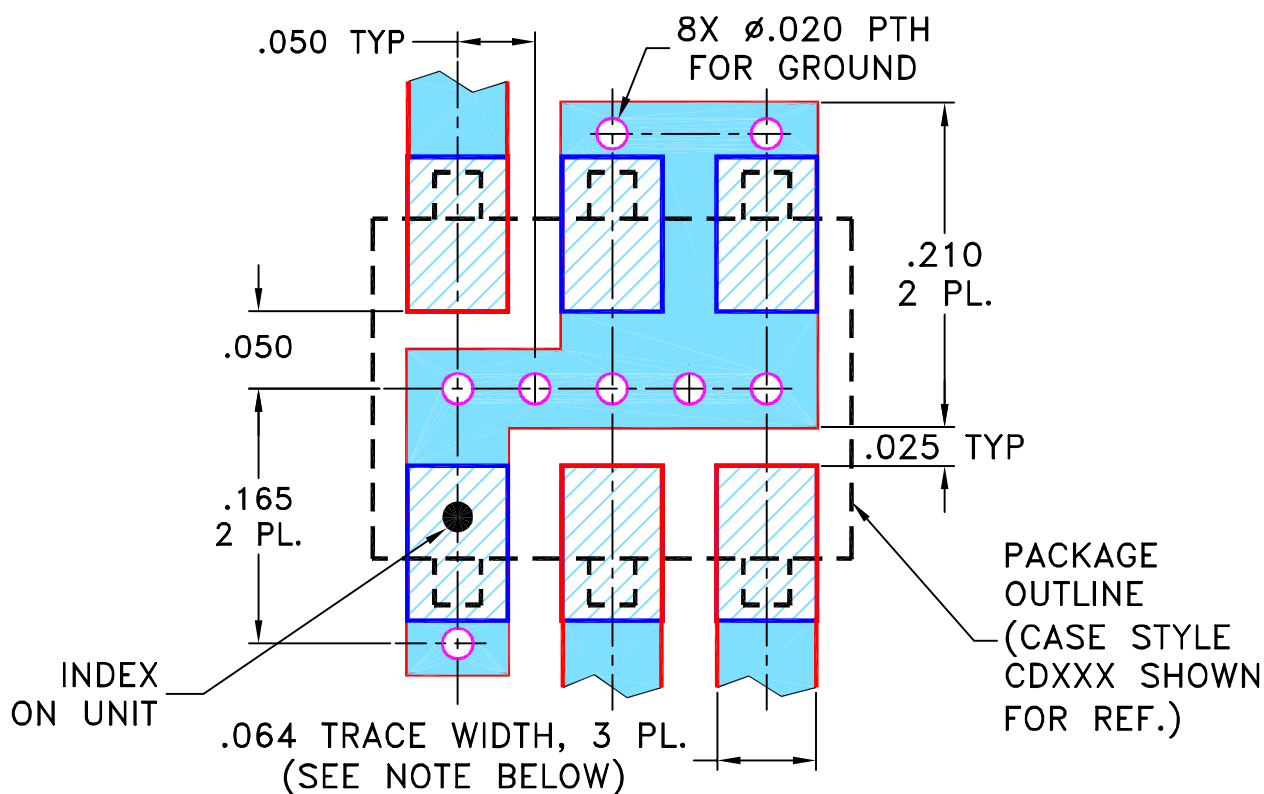
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
A	M101143	ADDED "gk" PIN CONNECTION, TT100 CASE STYLE & NOTE 2	10/10/05	MMG	DJ
B	M102713	ADDED "...WITH SMOBC"	01/17/06	MMG	IL
C	M108637	REMOVED "PIN 1", ADDED INDEX ON UNIT	12/01/06	MYG	FL

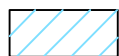
SUGGESTED MOUNTING CONFIGURATION
FOR BH292, CD541/542/636/637, TT100/240 CASE
STYLES, "gk", "ht", "hu", "nd", "w" PIN CONNECTIONS



- NOTES:** 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .030" $\pm$.002"; COPPER: 1/2 OZ. EACH SIDE.
 FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
 2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.



DENOTES PCB COPPER LAYOUT WITH SMOBC
 (SOLDER MASK OVER BARE COPPER)



DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

UNLESS OTHERWISE SPECIFIED

INITIALS

DATE

DIMENSIONS ARE IN INCHES

TOLERANCES ON:

2 PL DECIMALS $\pm$ 3 PL DECIMALS $\pm$.005ANGLES $\pm$ FRACTIONS $\pm$

DRAWN

MMG

07/17/02

CHECKED

WL

08/02/02

APPROVED

DJ

08/05/02



Mini-Circuits®

13 Neptune Avenue
 Brooklyn NY 11235

PL, gk/ht/hu/nd/w, BH292,
 CD541/542/636/637, TT100/240, TB-03

SIZE

A

CODE IDENT

15542

DRAWING NO:

98-PL-052

REV:

C

FILE:

98PL052

SCALE:

8:1

SHEET:

1 OF 1

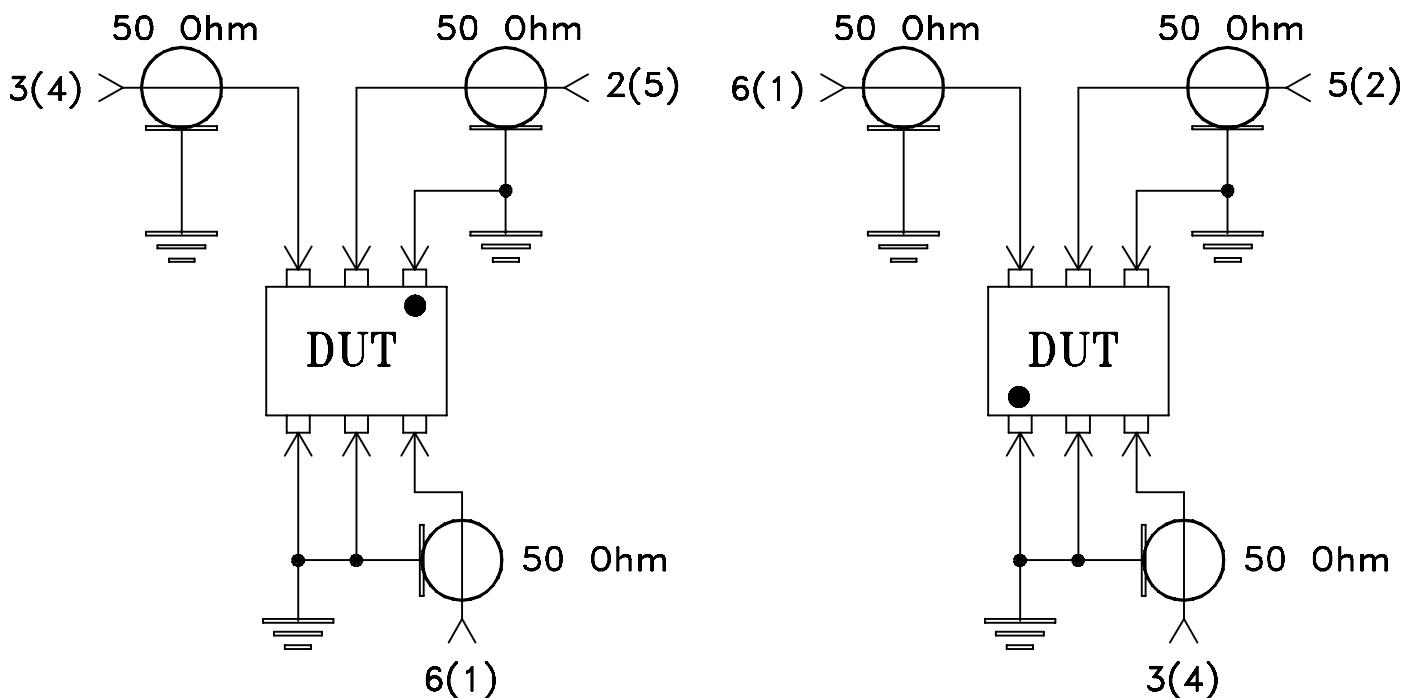
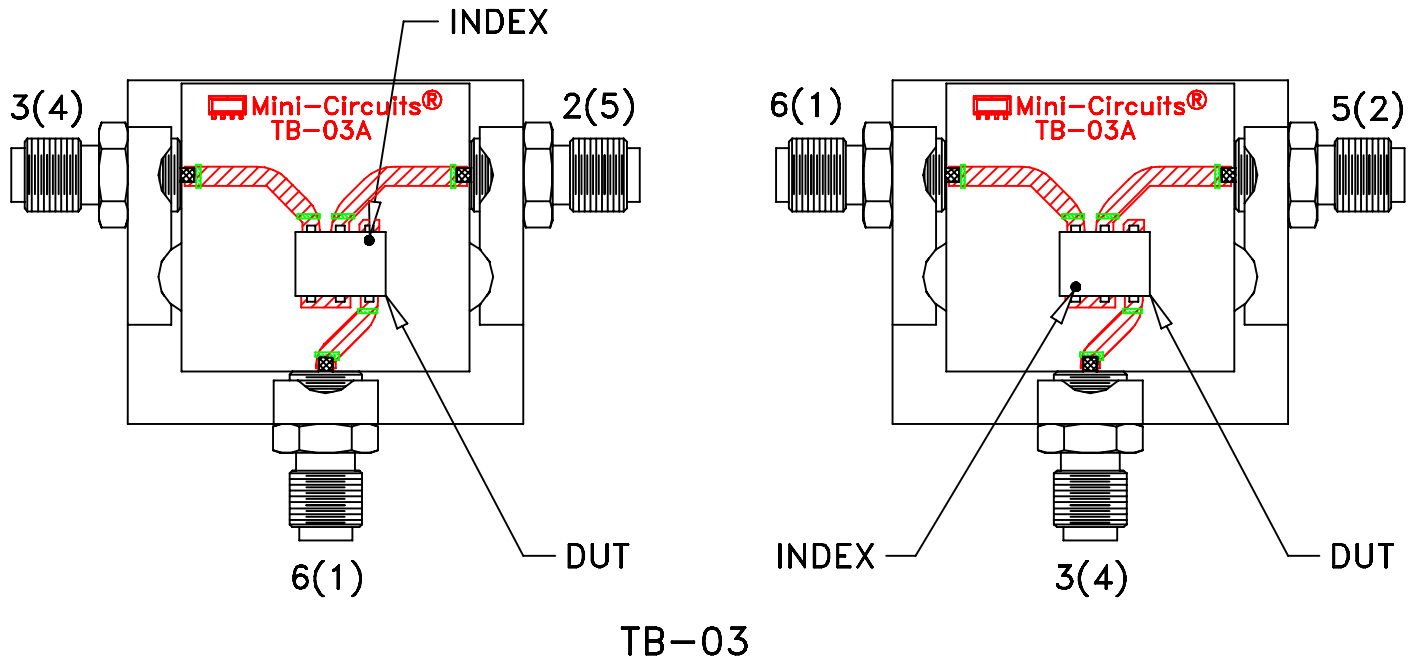
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ASHEETA1.DWG REV:A DATE:01/12/95

Evaluation Board and Circuit

For Pin Connections and DUT Orientation Refer to
Data Sheet of the DUT



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent,
Dielectric Constant=3.5, Thickness=.030 inch.

 **Mini-Circuits®**



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	-40° to 85°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Humidity	90 to 95% RH, 240 hours, 50°C	MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Solder Reflow Heat	Sn-Pb Eutetic Process: 225°C peak Pb-Free Process 245° - 250°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, 95% Coverage
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	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215