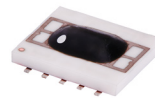


Ceramic

Frequency Mixer WIDE BAND

Level 7 (LO Power+7 dBm) 3800 to 12000 MHz

MCA1-12G+



Generic photo used for illustration purposes only

CASE STYLE: DZ885

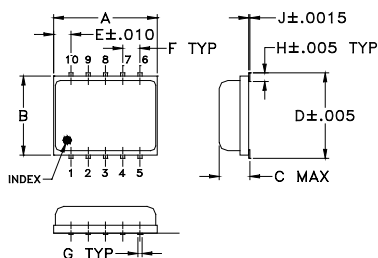
Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Power	50 mW
IF Current	40 mA
Permanent damage may occur if any of these limits are exceeded.	

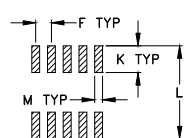
Pin Connections

LO	10
RF	5
IF	3
GROUND	1,2,4,6,7,8,9

Outline Drawing



PCB Land Pattern

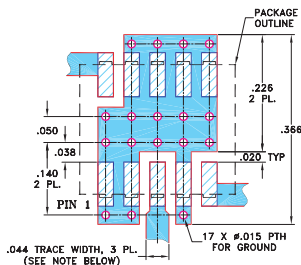


Suggested Layout,
Tolerance to be within ±.002

Outline Dimensions (inch)

A	B	C	D	E	F	G
.30	.250	.085	.266	.050	.050	.012
7.62	6.35	2.16	6.76	1.27	1.27	0.30
H	J	K	L	M		wt
.029	.004	.085	.296	.030		grams
0.74	0.10	2.16	7.52	0.76		0.25

Demo Board MCL P/N: TB-144 Suggested PCB Layout (PL-045)



- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020" ± .0015"; 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.
3. DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
4. DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

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-Circuit's 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/MCLStore/terms.jsp

Features

- wide bandwidth, 3800 to 12000 MHz
- low conversion loss, 6.2 dB typ.
- high L-R isolation, 32 dB typ.
- IF, DC to 1800 MHz
- LTCC double balanced mixer
- aqueous washable
- low cost
- low profile, 0.08"
- protected by US Patent 7,027,795

Applications

- satellite up and down converters
- line of sight links
- defense radar
- defense communication
- federal fixed service

Electrical Specifications (T_{AMB}=-55°C to 100°C)

FREQUENCY (MHz)		CONVERSION LOSS (dB)			LO-RF ISOLATION (dB)		LO-IF ISOLATION (dB)		IP3 at center band (dBm)
LO/RF f _L -f _U	IF	$\bar{X}$	σ	Max.	Typ.	Min.	Typ.	Min.	
3800-12000	DC-1800								
3800-6500	DC-1800	5.4	0.2	8.3*	32	18	13	8	11
6500-9500	DC-1800	6.2	0.1	8.0*	38	25	40	23	8
9500-12000	DC-1800	6.0	0.2	8.5*	26	18	21	17	10

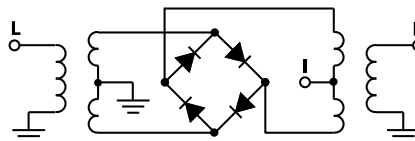
1 dB COMPR. +1 dBm typ.

* Conversion loss at 30 MHz IF, increases with IF frequency.

Typical Performance Data at 25°C

Frequency (MHz)		Conversion Loss (dB)	Isolation L-R (dB)	Isolation L-I (dB)	VSWR RF Port (:1)	VSWR LO Port (:1)
RF	LO	LO +7dBm	LO +7dBm	LO +7dBm	LO +7dBm	LO +7dBm
3800.10	3770.10	5.64	30.15	10.49	1.81	2.93
4200.10	4170.10	5.12	31.14	11.80	1.81	2.57
4600.10	4570.10	4.96	29.60	13.89	1.48	3.07
5000.10	4970.10	5.78	29.71	13.15	2.07	2.22
5400.10	5370.10	6.23	22.64	12.43	1.64	2.95
5800.10	5770.10	6.67	24.41	17.17	1.80	2.67
6200.10	6170.10	5.79	30.53	25.46	1.68	3.58
6600.10	6570.10	5.57	41.04	32.74	1.59	3.45
7000.10	6970.10	5.93	47.90	35.58	2.35	3.15
7400.10	7370.10	5.64	40.88	37.64	1.85	2.52
7800.10	7770.10	6.28	37.93	40.88	1.92	2.59
8200.10	8170.10	5.81	39.67	46.44	1.84	2.51
8600.10	8570.10	5.63	35.96	45.14	2.02	2.04
9000.10	8970.10	5.80	36.27	36.70	2.22	2.07
9400.10	9370.10	6.02	31.32	29.66	2.34	2.06
9800.10	9770.10	6.47	29.70	24.93	2.16	3.15
10200.10	10170.10	6.21	29.25	25.01	1.90	2.68
10800.10	10770.10	5.46	25.88	30.01	1.65	2.08
11200.10	11170.10	6.12	24.47	27.61	1.97	1.93
12000.10	11970.10	7.23	21.86	27.34	1.73	1.43

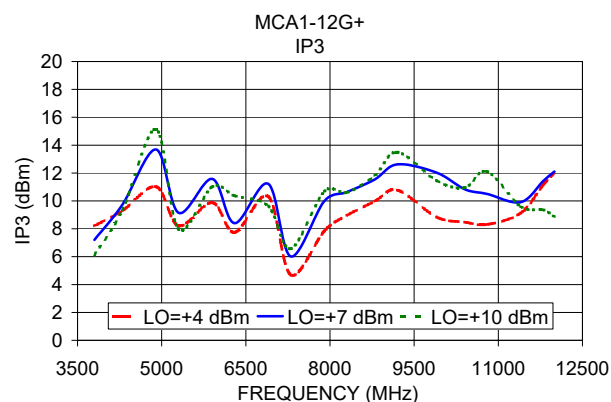
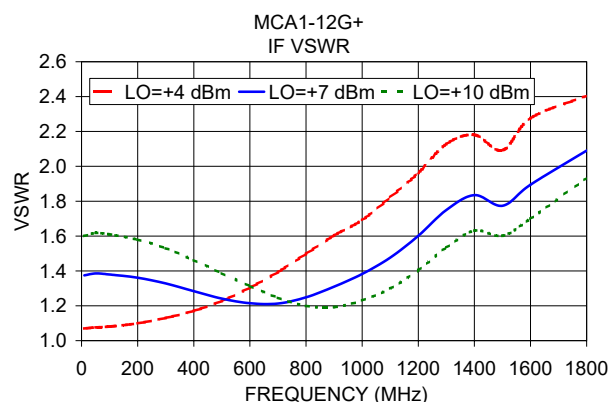
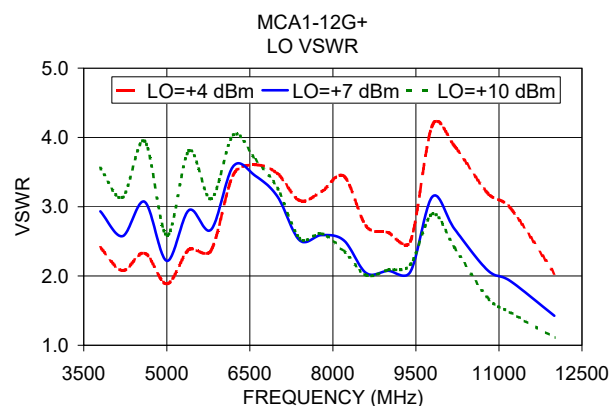
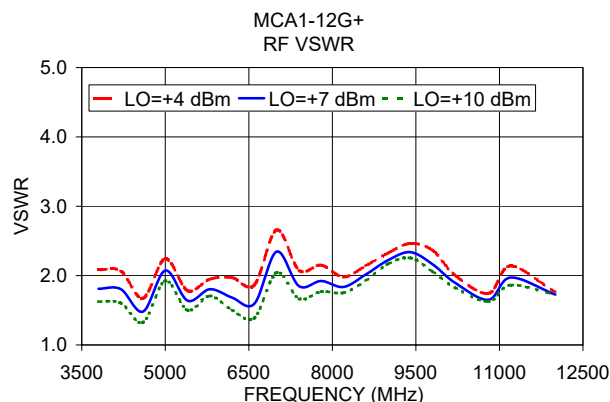
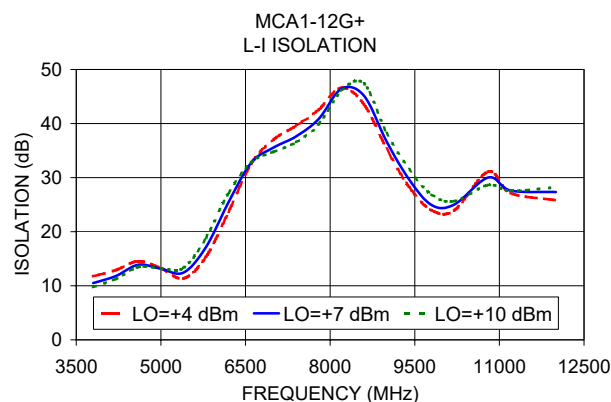
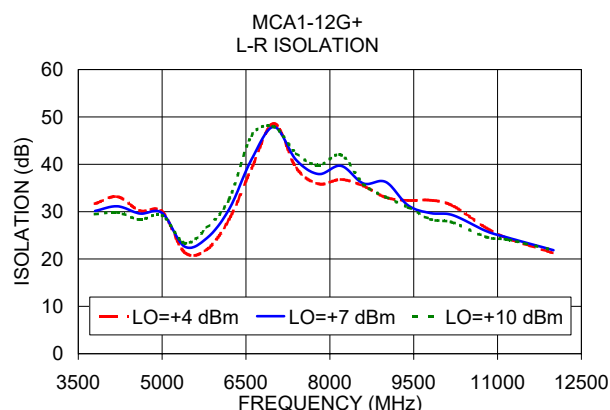
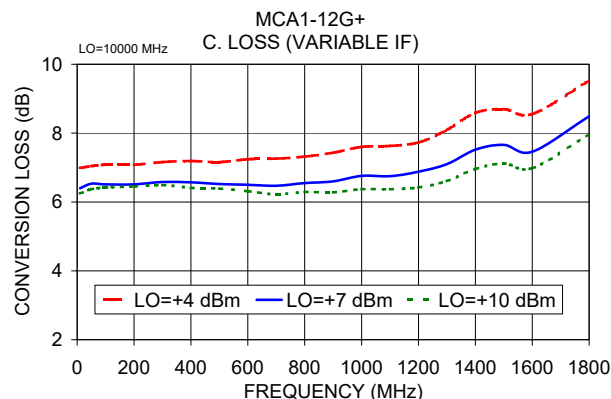
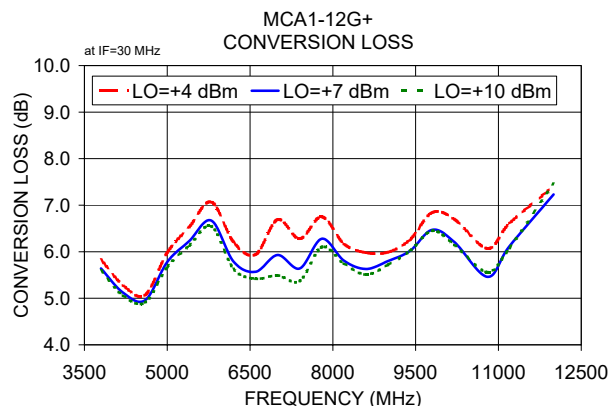
Electrical Schematic



Mini-Circuits®

www.minicircuits.com P.O. Box 350166, Brooklyn, NY 11235-0003 (718) 934-4500 sales@minicircuits.com

REV. D
M151107
ED-11119/1
MCA1-12G+
DJ/RS/CP/AM
200512
Page 1 of 2



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.
- 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/MCLStore/terms.jsp



Frequency Mixer

MCA1-12G+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)		
		@LO (dBm)		
		+4	+7	+10
2900.1	2870.1	13.55	11.85	10.34
3152.6	3122.6	9.42	8.45	7.87
3405.1	3375.1	7.16	6.54	6.18
3657.6	3627.6	5.74	5.32	5.09
3910.1	3880.1	5.19	4.93	4.78
4162.6	4132.6	4.99	4.82	4.76
4415.1	4385.1	4.96	4.75	4.67
4667.6	4637.6	5.03	4.96	5.06
4920.1	4890.1	5.07	4.99	5.11
5172.6	5142.6	6.53	6.12	5.91
5425.1	5395.1	6.46	6.22	6.17
5677.6	5647.6	7.00	6.69	6.56
5930.1	5900.1	6.47	6.17	6.06
6182.6	6152.6	6.11	5.79	5.69
6435.1	6405.1	6.36	5.94	5.74
6687.6	6657.6	6.36	5.89	5.66
6940.1	6910.1	7.36	6.78	6.46
7192.6	7162.6	7.34	6.71	6.25
7445.1	7415.1	6.69	6.15	5.79
7697.6	7667.6	6.48	5.95	5.68
7950.1	7920.1	6.22	5.68	5.47
8227.9	8197.9	5.74	5.33	5.22
8480.4	8450.4	5.84	5.39	5.20
8758.1	8728.1	5.85	5.37	5.25
9010.6	8980.6	5.97	5.53	5.41
9288.3	9258.3	6.08	5.73	5.68
9540.8	9510.8	6.35	5.92	5.91
9818.6	9788.6	6.70	6.57	7.31
10071	10041	7.22	7.43	8.40
10349	10319	7.15	7.05	7.16
10601	10571	7.20	7.07	7.15
10879	10849	7.37	7.20	7.25
11132	11102	8.16	7.65	7.43
11409	11379	8.50	8.04	7.86
11662	11632	7.92	7.42	7.27
11940	11910	7.77	7.28	7.21
12192	12162	7.70	7.19	7.17
12470	12440	8.18	7.58	7.48
12722	12692	7.87	7.50	7.79
13000	12970	12.39	10.70	11.56

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)		
		@LO (dBm)		
		+4	+7	+10
2900.1	2870.1	1.69	4.72	6.04
3152.6	3122.6	8.83	8.58	8.63
3405.1	3375.1	5.36	7.63	6.74
3657.6	3627.6	9.07	9.90	8.83
3910.1	3880.1	9.48	9.06	8.47
4162.6	4132.6	9.84	9.81	9.35
4415.1	4385.1	8.88	8.27	7.61
4667.6	4637.6	10.76	11.49	10.73
4920.1	4890.1	12.34	13.49	12.69
5172.6	5142.6	14.53	13.58	10.00
5425.1	5395.1	10.64	10.54	7.90
5677.6	5647.6	10.92	12.12	10.63
5930.1	5900.1	11.23	13.72	13.84
6182.6	6152.6	8.98	10.74	13.11
6435.1	6405.1	9.52	9.73	12.23
6687.6	6657.6	9.32	9.11	10.56
6940.1	6910.1	13.26	20.59	13.20
7192.6	7162.6	8.83	9.37	9.31
7445.1	7415.1	7.74	8.61	8.83
7697.6	7667.6	7.48	8.57	8.79
7950.1	7920.1	6.61	8.67	9.32
8227.9	8197.9	6.46	8.56	9.40
8480.4	8450.4	6.55	8.63	9.27
8758.1	8728.1	6.13	8.74	9.52
9010.6	8980.6	6.56	9.46	10.52
9288.3	9258.3	7.41	10.57	11.47
9540.8	9510.8	7.43	10.73	10.33
9818.6	9788.6	10.07	10.70	6.74
10071	10041	10.09	9.93	13.40
10349	10319	14.44	14.65	14.26
10601	10571	15.84	16.45	15.45
10879	10849	15.81	17.61	17.63
11132	11102	19.92	18.89	18.43
11409	11379	12.37	14.46	15.37
11662	11632	10.71	12.31	13.29
11940	11910	10.54	11.99	12.55
12192	12162	12.96	12.55	12.95
12470	12440	12.52	12.14	11.56
12722	12692	9.07	9.17	5.39
13000	12970	1.98	4.69	10.36

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+1dBm (dB)		
		@LO (dBm)		
		+4	+7	+10
2900.1	2870.1	2.02	2.02	1.90
3152.6	3122.6	1.43	1.54	1.62
3405.1	3375.1	1.75	1.62	1.57
3657.6	3627.6	1.90	1.80	1.86
3910.1	3880.1	1.99	1.80	1.76
4162.6	4132.6	1.80	1.63	1.64
4415.1	4385.1	1.48	1.43	1.53
4667.6	4637.6	1.10	0.88	0.87
4920.1	4890.1	0.99	0.74	0.78
5172.6	5142.6	1.47	1.37	1.48
5425.1	5395.1	1.43	1.35	1.41
5677.6	5647.6	0.88	0.70	0.68
5930.1	5900.1	0.80	0.57	0.51
6182.6	6152.6	0.74	0.46	0.37
6435.1	6405.1	0.82	0.52	0.32
6687.6	6657.6	0.86	0.62	0.45
6940.1	6910.1	0.69	0.56	0.46
7192.6	7162.6	0.77	0.72	0.73
7445.1	7415.1	0.92	0.76	0.68
7697.6	7667.6	0.91	0.70	0.64
7950.1	7920.1	1.20	0.91	0.81
8227.9	8197.9	1.35	0.94	0.78
8480.4	8450.4	1.18	0.90	0.81
8758.1	8728.1	1.28	0.89	0.80
9010.6	8980.6	1.18	0.84	0.78
9288.3	9258.3	1.10	0.87	0.96
9540.8	9510.8	0.93	0.79	1.09
9818.6	9788.6	0.85	0.92	1.13
10071	10041	0.95	0.68	0.37
10349	10319	0.55	0.56	0.79
10601	10571	0.38	0.41	0.58
10879	10849	0.31	0.25	0.31
11132	11102	0.28	0.26	0.30
11409	11379	0.13	0.26	0.42
11662	11632	0.26	0.32	0.57
11940	11910	0.34	0.37	0.61
12192	12162	0.43	0.43	0.73
12470	12440	0.42	0.54	1.00
12722	12692	1.50	1.46	1.75
13000	12970	1.49	1.60	0.48

Frequency Mixer

MCA1-12G+

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=7900MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=3790MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=12010.09MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+7			+7			+7
2399.9	5500.1	11.63	10.1	3800.1	5.20	1910.0	10100	10.61
2282.4	5617.6	10.66	70.1	3860.1	5.01	1870.0	10140	10.48
2164.8	5735.2	9.67	130.1	3920.1	4.97	1830.0	10180	10.32
2047.3	5852.7	9.81	190.1	3980.1	4.97	1790.0	10220	10.09
1929.8	5970.2	9.21	250.1	4040.1	5.04	1750.0	10260	9.76
1812.2	6087.8	8.66	310.1	4100.1	5.03	1710.0	10300	9.53
1694.7	6205.3	8.68	370.1	4160.1	5.02	1670.0	10340	9.40
1577.1	6322.9	7.76	430.1	4220.1	5.04	1610.0	10400	9.49
1459.6	6440.4	7.43	490.1	4280.1	4.97	1570.0	10440	9.45
1342.1	6557.9	7.16	550.1	4340.1	5.04	1510.0	10500	9.26
1224.5	6675.5	6.57	610.1	4400.1	5.02	1470.0	10540	9.18
1107.0	6793.0	6.21	670.1	4460.1	5.01	1410.0	10600	8.92
989.5	6910.5	5.94	730.1	4520.1	5.01	1370.0	10640	8.74
871.9	7028.1	5.85	790.1	4580.1	4.97	1310.0	10700	8.64
754.4	7145.6	5.87	850.1	4640.1	4.85	1270.0	10740	8.63
636.9	7263.1	5.63	910.1	4700.1	4.78	1210.0	10800	8.58
519.3	7380.7	5.64	970.1	4760.1	4.76	1170.0	10840	8.58
401.8	7498.2	5.66	1030.1	4820.1	4.85	1110.0	10900	8.45
284.3	7615.7	5.72	1090.1	4880.1	4.81	1070.0	10940	8.45
147.1	7752.9	5.68	1150.1	4940.1	5.00	1010.0	11000	8.24
29.6	7870.4	5.83	1210.1	5000.1	5.01	970.0	11040	8.20
112.1	8012.1	5.78	1270.1	5060.1	5.09	910.0	11100	8.07
234.5	8134.5	5.88	1330.1	5120.1	5.17	870.0	11140	8.00
377.4	8277.4	5.82	1390.1	5180.1	5.16	810.0	11200	7.96
499.9	8399.9	5.93	1450.1	5240.1	5.35	770.0	11240	7.90
642.7	8542.7	6.16	1510.1	5300.1	5.46	710.0	11300	7.77
765.2	8665.2	6.05	1570.1	5360.1	5.62	670.0	11340	7.71
908.1	8808.1	6.25	1630.1	5420.1	5.45	610.0	11400	7.40
1030.5	8930.5	6.55	1690.1	5480.1	5.73	570.0	11440	7.38
1173.4	9073.4	6.48	1750.1	5540.1	5.64	510.0	11500	7.26
1295.9	9195.9	6.57	1810.1	5600.1	5.61	470.0	11540	7.15
1438.7	9338.7	6.55	1870.1	5660.1	6.24	410.0	11600	7.16
1561.2	9461.2	6.68	1930.1	5720.1	6.27	370.0	11640	7.20
1704.1	9604.1	6.70	1990.1	5780.1	6.57	310.0	11700	7.28
1826.5	9726.5	6.92	2070.1	5860.1	6.76	270.0	11740	7.31
1969.4	9869.4	7.42	2130.1	5920.1	6.94	210.0	11800	7.24
2091.9	9991.9	8.04	2210.1	6000.1	7.61	170.0	11840	7.37
2234.8	10135	8.09	2270.1	6060.1	8.95	110.0	11900	7.24
2357.2	10257	9.37	2350.1	6140.1	9.82	70.0	11940	7.39
2500.1	10400	10.16	2410.1	6200.1	10.66	10.0	12000	7.61

Frequency Mixer

MCA1-12G+

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+4	+7	+10	+4	+7	+10
2930.1	33.01	34.69	34.25	5.20	4.97	4.98
3182.6	39.74	48.08	46.33	7.79	7.87	7.44
3435.1	32.09	33.95	35.75	10.23	9.69	9.35
3687.6	32.33	32.37	32.59	12.07	11.08	10.48
3940.1	33.43	32.77	32.22	13.18	11.76	11.01
4192.6	32.69	31.25	29.67	14.01	12.82	11.61
4445.1	32.58	29.61	27.71	14.28	12.94	12.17
4697.6	27.58	25.84	24.79	14.13	13.32	12.66
4950.1	28.15	26.40	25.62	13.09	12.86	12.76
5202.6	27.61	27.77	27.07	11.68	12.09	12.46
5455.1	23.66	24.42	25.02	11.30	12.30	13.11
5707.6	22.85	24.31	25.31	14.25	15.78	17.08
5960.1	25.40	26.78	27.54	18.99	20.86	22.55
6212.6	27.16	28.80	29.41	23.66	25.61	27.09
6465.1	29.68	31.35	31.86	28.43	29.55	30.07
6717.6	30.68	32.38	33.15	31.99	31.53	30.85
6970.1	35.62	37.35	38.49	31.51	30.29	29.77
7222.6	33.29	34.04	34.39	32.97	31.94	31.03
7475.1	33.73	33.88	34.11	33.74	32.82	32.19
7727.6	34.45	33.79	33.44	34.37	33.78	33.45
7980.1	34.55	33.35	32.57	36.20	35.80	35.61
8257.8	33.63	32.04	31.12	39.51	39.41	39.36
8510.3	32.93	31.08	29.25	47.55	45.97	44.40
8788.1	30.78	29.00	27.39	41.83	45.75	46.27
9040.6	27.43	26.07	25.12	45.10	50.49	52.70
9318.3	25.53	24.43	23.43	37.85	43.24	50.77
9570.8	23.69	23.00	22.30	37.38	33.65	30.94
9848.6	21.18	20.94	20.64	25.20	23.75	22.77
10101	21.12	21.13	21.12	19.38	19.91	20.00
10379	21.74	22.23	21.93	20.61	20.76	19.93
10631	21.98	22.30	22.58	20.67	20.63	20.60
10909	22.85	23.33	23.70	20.48	20.92	21.33
11162	23.55	24.56	24.95	20.41	21.49	21.93
11439	25.23	25.69	25.93	20.63	22.06	23.30
11692	25.21	25.38	25.05	20.94	22.59	24.29
11970	22.53	22.89	22.94	20.94	22.21	23.89
12222	20.53	21.09	21.41	21.56	22.08	22.87
12500	18.16	19.00	19.33	20.60	19.93	19.31
12752	16.89	18.17	19.10	17.57	16.46	16.25
13030	18.85	19.83	21.21	15.86	14.70	14.87

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+4	+7	+10
2900.1	2870.1	23.53	23.45	23.70
3152.6	3122.6	26.71	28.65	31.17
3405.1	3375.1	32.13	35.31	36.64
3657.6	3627.6	30.39	30.95	30.71
3910.1	3880.1	29.09	28.72	28.21
4162.6	4132.6	25.08	24.02	23.16
4415.1	4385.1	21.58	20.52	19.66
4667.6	4637.6	17.51	16.55	15.77
4920.1	4890.1	14.93	14.30	13.81
5172.6	5142.6	14.77	14.21	13.35
5425.1	5395.1	9.44	9.24	9.11
5677.6	5647.6	8.84	9.14	9.27
5930.1	5900.1	10.88	11.39	11.66
6182.6	6152.6	13.13	13.76	14.12
6435.1	6405.1	14.74	15.43	15.99
6687.6	6657.6	16.12	16.67	17.10
6940.1	6910.1	17.48	17.81	18.07
7192.6	7162.6	18.97	19.30	19.44
7445.1	7415.1	21.91	22.21	22.44
7697.6	7667.6	25.22	25.41	25.45
7950.1	7920.1	28.72	28.27	27.82
8227.9	8197.9	28.71	27.40	26.57
8480.4	8450.4	26.42	25.65	25.05
8758.1	8728.1	23.28	23.17	22.96
9010.6	8980.6	21.40	21.50	21.47
9288.3	9258.3	20.47	20.88	21.09
9540.8	9510.8	20.26	20.65	20.89
9818.6	9788.6	20.98	21.74	22.56
10071	10041	19.83	20.80	21.56
10349	10319	19.78	20.37	20.75
10601	10571	20.55	21.17	21.61
10879	10849	20.98	21.70	22.23
11132	11102	21.09	21.56	21.97
11409	11379	23.40	24.03	24.42
11662	11632	26.35	27.54	28.04
11940	11910	27.66	27.80	27.48
12192	12162	26.72	25.40	24.77
12470	12440	24.89	23.18	22.54
12722	12692	22.86	21.19	20.38
13000	12970	22.48	19.83	18.96

Frequency Mixer

MCA1-12G+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=12000MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+4	+7	+10		+4	+7	+10		+4	+7	+10
2900.1	2870.1	3.40	2.80	2.39	2930.1	2.61	2.84	2.92	10.1	1.08	1.17	1.37
3152.6	3122.6	3.01	2.62	2.32	3182.6	3.30	3.58	3.91	90.1	1.08	1.17	1.37
3405.1	3375.1	2.29	2.09	1.96	3435.1	3.25	3.66	4.17	170.1	1.09	1.21	1.41
3657.6	3627.6	1.90	1.70	1.58	3687.6	2.88	3.41	4.05	250.1	1.14	1.21	1.40
3910.1	3880.1	1.66	1.47	1.36	3940.1	2.57	3.19	3.88	330.1	1.19	1.18	1.35
4162.6	4132.6	1.56	1.38	1.28	4192.6	2.42	3.11	3.86	410.1	1.25	1.15	1.28
4415.1	4385.1	1.65	1.43	1.33	4445.1	2.13	2.77	3.47	490.1	1.29	1.10	1.22
4667.6	4637.6	1.56	1.35	1.27	4697.6	1.97	2.57	3.23	570.1	1.35	1.11	1.18
4920.1	4890.1	1.43	1.21	1.06	4950.1	1.86	2.40	3.00	650.1	1.47	1.17	1.11
5172.6	5142.6	2.63	2.31	2.02	5202.6	1.83	2.33	2.94	730.1	1.59	1.27	1.11
5425.1	5395.1	2.11	1.92	1.74	5455.1	1.85	2.35	2.86	810.1	1.74	1.39	1.20
5677.6	5647.6	1.97	1.89	1.82	5707.6	1.98	2.40	3.00	890.1	1.87	1.51	1.31
5930.1	5900.1	2.07	1.93	1.83	5960.1	2.14	2.54	3.11	970.1	2.10	1.72	1.48
6182.6	6152.6	2.13	1.88	1.74	6212.6	2.40	2.73	3.23	1050.1	2.31	1.90	1.64
6435.1	6405.1	2.30	1.98	1.75	6465.1	2.73	3.05	3.55	1130.1	2.49	2.06	1.78
6687.6	6657.6	2.68	2.31	2.02	6717.6	3.06	3.27	3.71	1210.1	2.49	2.10	1.83
6940.1	6910.1	2.82	2.44	2.15	6970.1	3.21	3.37	3.80	1290.1	2.61	2.22	1.95
7192.6	7162.6	3.36	3.05	2.72	7222.6	3.39	3.39	3.76	1370.1	2.74	2.33	2.04
7445.1	7415.1	3.05	2.76	2.45	7475.1	3.75	3.54	3.81	1450.1	2.84	2.42	2.13
7697.6	7667.6	2.83	2.50	2.22	7727.6	4.03	3.50	3.63	1530.1	2.75	2.38	2.10
7950.1	7920.1	2.33	2.03	1.84	7980.1	3.93	3.23	3.25	1610.1	2.66	2.36	2.11
8227.9	8197.9	1.93	1.66	1.49	8257.8	3.98	3.09	2.92	1690.1	2.77	2.46	2.20
8480.4	8450.4	1.77	1.51	1.32	8510.3	3.61	2.79	2.66	1770.1	2.82	2.49	2.22
8758.1	8728.1	1.53	1.28	1.15	8788.1	3.45	2.56	2.30	1850.1	2.62	2.30	2.05
9010.6	8980.6	1.37	1.26	1.26	9040.6	3.42	2.43	2.07	1930.1	2.28	2.03	1.83
9288.3	9258.3	1.46	1.46	1.50	9318.3	3.46	2.30	1.81	2010.1	2.09	1.91	1.75
9540.8	9510.8	1.64	1.65	1.71	9570.8	2.86	1.92	1.46	2090.1	2.11	1.95	1.80
9818.6	9788.6	1.94	1.98	2.12	9848.6	2.32	1.61	1.23	2170.1	2.11	1.91	1.75
10071	10041	2.48	2.63	2.78	10101	1.95	1.41	1.15	2250.1	1.91	1.72	1.58
10349	10319	2.75	2.72	2.71	10379	1.51	1.12	1.30	2310.1	1.79	1.69	1.60
10601	10571	3.22	3.18	3.16	10631	1.36	1.34	1.65	2390.1	1.77	1.71	1.64
10879	10849	3.00	2.92	2.91	10909	1.71	1.73	2.06	2450.1	1.83	1.81	1.76
11132	11102	3.42	3.18	3.01	11162	2.22	2.05	2.25	2530.1	1.83	1.85	1.83
11409	11379	3.33	3.13	2.97	11439	2.79	2.32	2.33	2590.1	1.92	2.03	2.06
11662	11632	3.52	3.24	3.02	11692	2.96	2.31	2.17	2670.1	2.14	2.29	2.33
11940	11910	3.31	3.04	2.87	11970	2.82	2.15	1.92	2730.1	2.25	2.41	2.45
12192	12162	2.83	2.46	2.28	12222	2.50	1.89	1.58	2810.1	2.40	2.62	2.69
12470	12440	2.72	2.37	2.16	12500	1.85	1.42	1.13	2870.1	2.82	3.13	3.26
12722	12692	2.25	1.98	1.74	12752	1.28	1.31	1.40	2950.1	3.19	3.48	3.60
13000	12970	2.09	1.55	1.52	13030	2.16	1.89	1.68	3010.1	3.21	3.55	3.69

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	7	48	26	---	---	---	---	---	---	---
1	-	19	+0	38	37	43	---	---	---	---	---	---
2	85	55	65	56	>70	59	64	---	---	---	---	---
3	>90	>70	>70	>70	59	>70	>70	>70	---	---	---	---
4	---	---	>70	>70	>70	>70	>70	>70	>70	---	---	---
5	---	---	---	>70	>70	>70	>70	>70	>70	>70	---	---
6	---	---	---	---	>70	>70	>70	>70	>70	>70	>70	---
7	---	---	---	---	---	>70	>70	>70	>70	>70	>70	>70
8	---	---	---	---	---	---	>70	>70	>70	>70	>70	>70
9	---	---	---	---	---	---	---	>70	>70	>70	>70	>70
10	---	---	---	---	---	---	---	---	>70	>70	>70	>70
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

Test conditions:

RF IN: 7750 MHz; -14.00 dBm.

LO IN: 7780 MHz; +7.00 dBm

IF OUT: 30 MHz; -20.15 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	17	50	38	---	---	---	---	---	---	---
1	-	19	+0	41	37	44	---	---	---	---	---	---
2	65	46	56	45	65	54	60	---	---	---	---	---
3	69	52	64	59	38	58	62	70	---	---	---	---
4	---	---	>80	70	>80	60	>80	66	75	---	---	---
5	---	---	---	>80	>80	>80	58	79	75	>80	---	---
6	---	---	---	---	>80	>80	>80	73	>80	77	>80	---
7	---	---	---	---	---	>80	>80	>80	75	>80	>80	>80
8	---	---	---	---	---	---	>80	>80	>80	>80	>80	>80
9	---	---	---	---	---	---	---	>80	>80	>80	>80	>80
10	---	---	---	---	---	---	---	---	>80	>80	>80	>80
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 7750 MHz; -4.00 dBm.

LO IN: 7780 MHz; +7.00 dBm

IF OUT: 30 MHz; -10.34 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.

REV. X3

MCA1-12G+

101027

Page 5 of 5



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

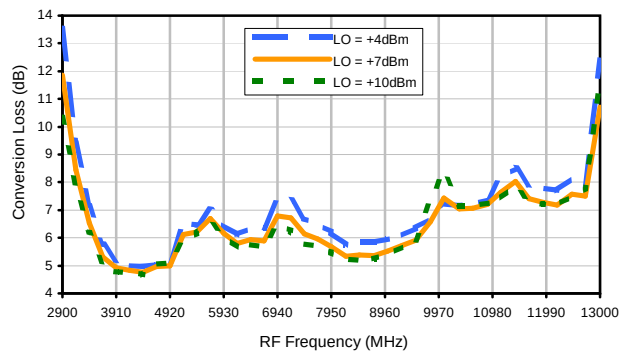


The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see

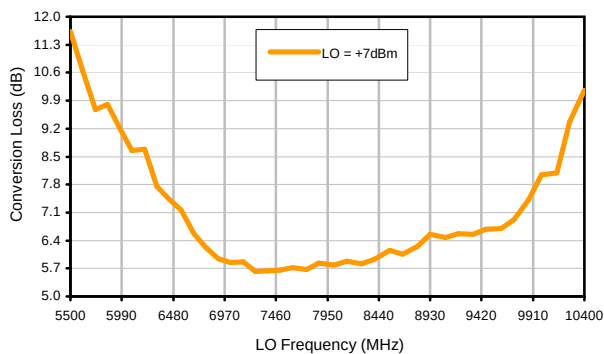


Typical Performance Curves

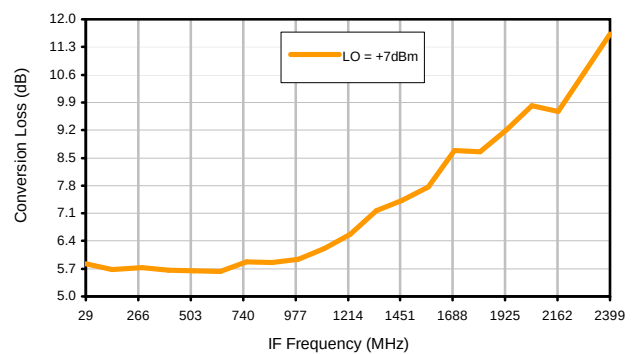
Conversion Loss @ IF=30MHz



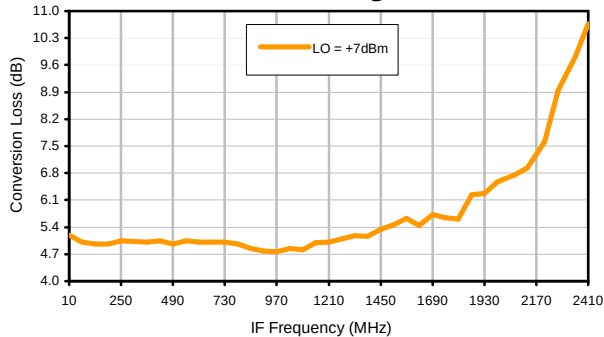
Conversion Loss vs. LO @ RF=7900MHz



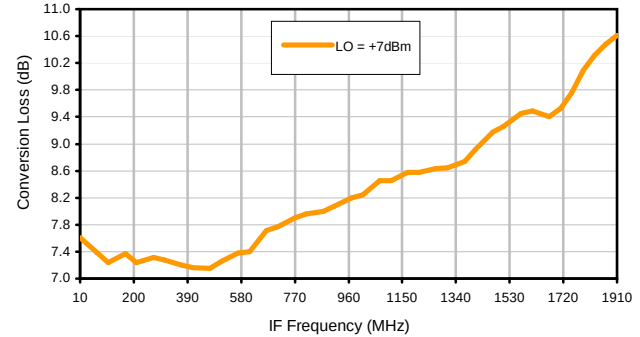
Conversion Loss vs. IF @ RF=7900MHz



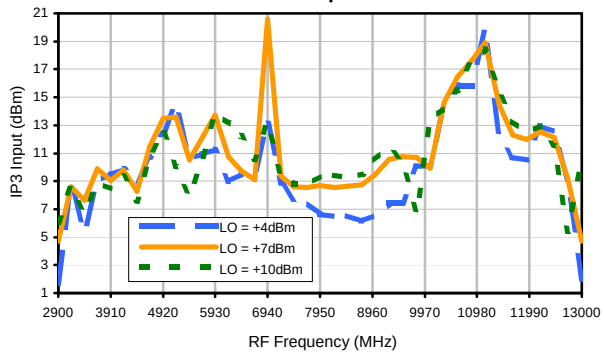
Conversion Loss vs. IF @ RF=3790MHz



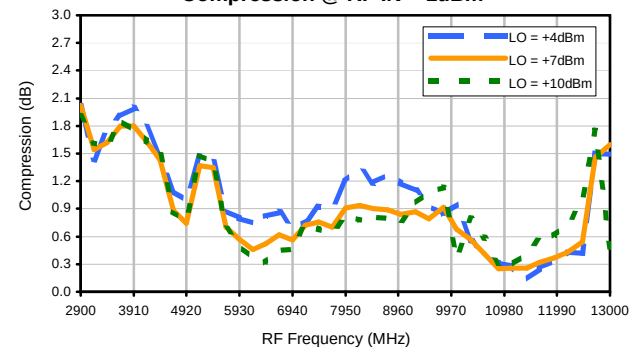
Conversion Loss vs. IF @ RF=12010.09MHz



IP3 Input

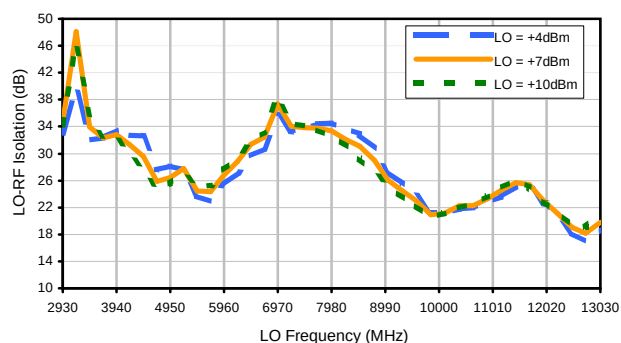


Compression @ RF IN=+1dBm

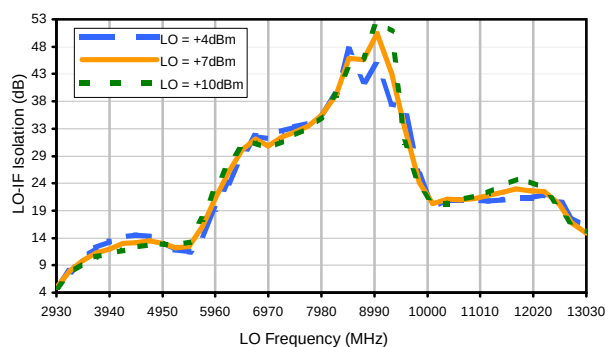


Typical Performance Curves

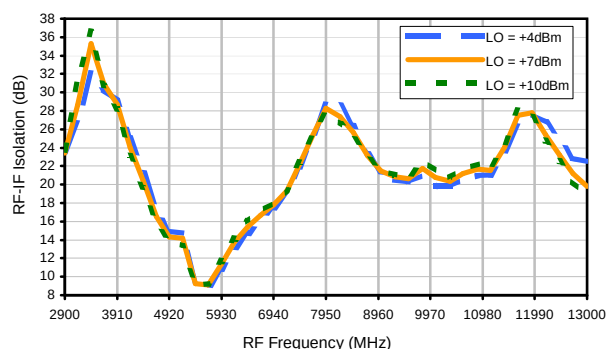
LO-RF Isolation



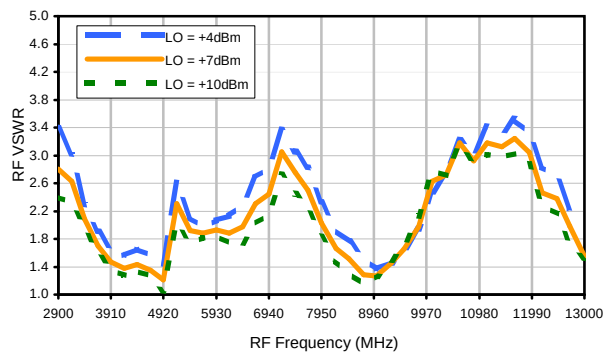
LO-IF Isolation



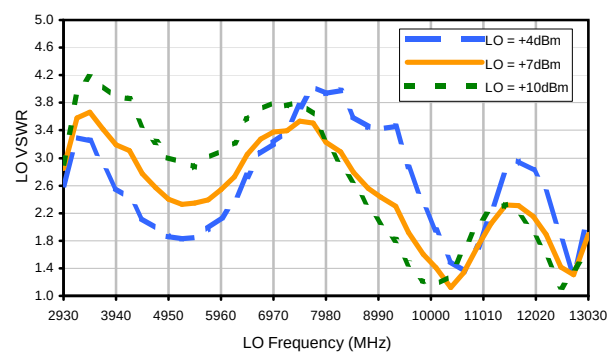
RF-IF Isolation



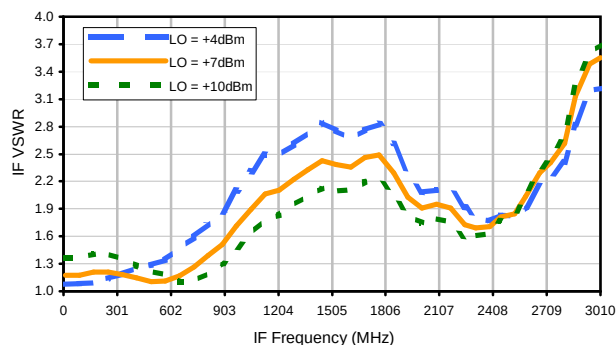
RF VSWR



LO VSWR



IF VSWR



Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	7	48	26	---	---	---	---	---	---	---
1	-	19	+0	38	37	43	---	---	---	---	---	---
2	85	55	65	56	>70	59	64	---	---	---	---	---
3	>90	>70	>70	>70	59	>70	>70	>70	---	---	---	---
4	---	---	>70	>70	>70	>70	>70	>70	>70	---	---	---
5	---	---	---	>70	>70	>70	>70	>70	>70	>70	---	---
6	---	---	---	---	>70	>70	>70	>70	>70	>70	>70	---
7	---	---	---	---	---	>70	>70	>70	>70	>70	>70	>70
8	---	---	---	---	---	---	>70	>70	>70	>70	>70	>70
9	---	---	---	---	---	---	---	>70	>70	>70	>70	>70
10	---	---	---	---	---	---	---	---	>70	>70	>70	>70
RF CAL	0	1	2	3	4	5	6	7	8	9	10	

Test conditions:

RF IN: 7750 MHz; -14.00 dBm.
LO IN: 7780 MHz; +7.00 dBm
IF OUT: 30 MHz; -20.15 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	17	50	38	---	---	---	---	---	---	---
1	-	19	+0	41	37	44	---	---	---	---	---	---
2	65	46	56	45	65	54	60	---	---	---	---	---
3	69	52	64	59	38	58	62	70	---	---	---	---
4	---	---	>80	70	>80	60	>80	66	75	---	---	---
5	---	---	---	>80	>80	>80	58	79	75	>80	---	---
6	---	---	---	---	>80	>80	>80	73	>80	77	>80	---
7	---	---	---	---	---	>80	>80	>80	75	>80	>80	>80
8	---	---	---	---	---	---	>80	>80	>80	>80	>80	>80
9	---	---	---	---	---	---	---	>80	>80	>80	>80	>80
10	---	---	---	---	---	---	---	---	>80	>80	>80	>80
RF CAL	0	1	2	3	4	5	6	7	8	9	10	

LO HARMONICS ORDER

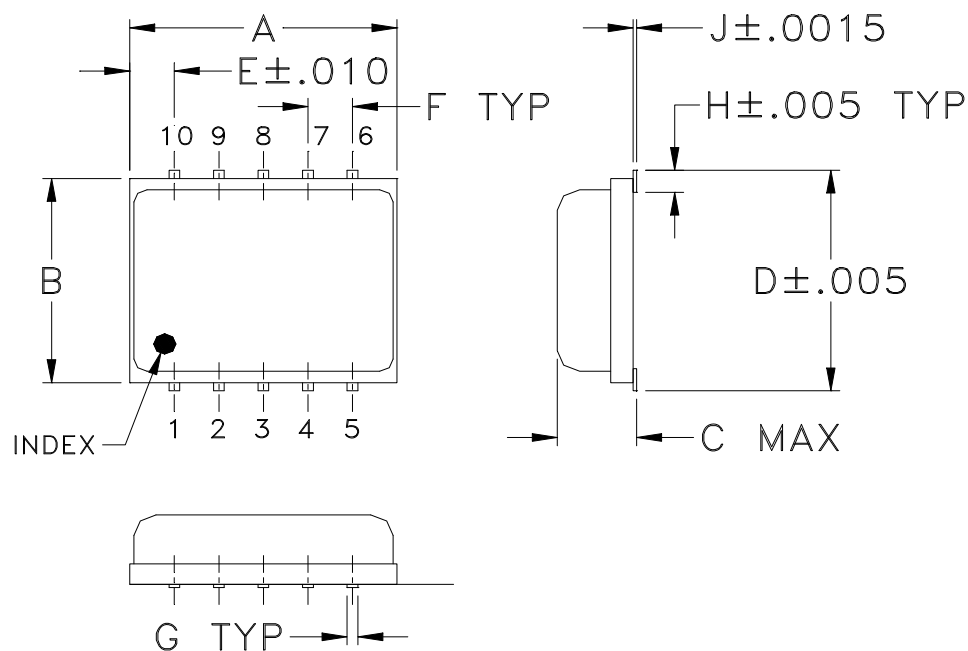
Test conditions:

RF IN: 7750 MHz; -4.00 dBm.
LO IN: 7780 MHz; +7.00 dBm
IF OUT: 30 MHz; -10.34 dBm

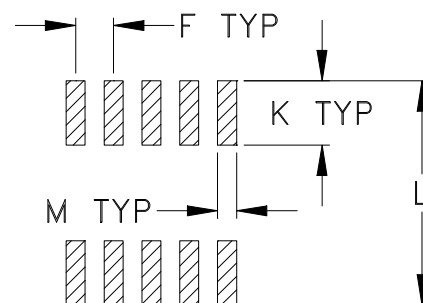
- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

Outline Dimensions

DZ885
DZ1034



PCB Land Pattern



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

CASE#	A	B	C	D	E	F	G	H	J	K	L	M	WT. GRAMS
DZ885	.30 (7.62)	.250 (6.35)	.085 (2.16)	.266 (6.76)	.050 (1.27)	.050 (1.27)	.012 (0.30)	.029 (0.74)	.004 (0.10)	.085 (2.16)	.296 (7.52)	.030 (0.76)	0.25
DZ1034			.105 (2.67)										0.3

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

Notes:

- Case material: Plastic encapsulation on Ceramic base.
- Termination finish:
 - For RoHS Case Styles: Tin plate. All models, (+) suffix.
 - For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.



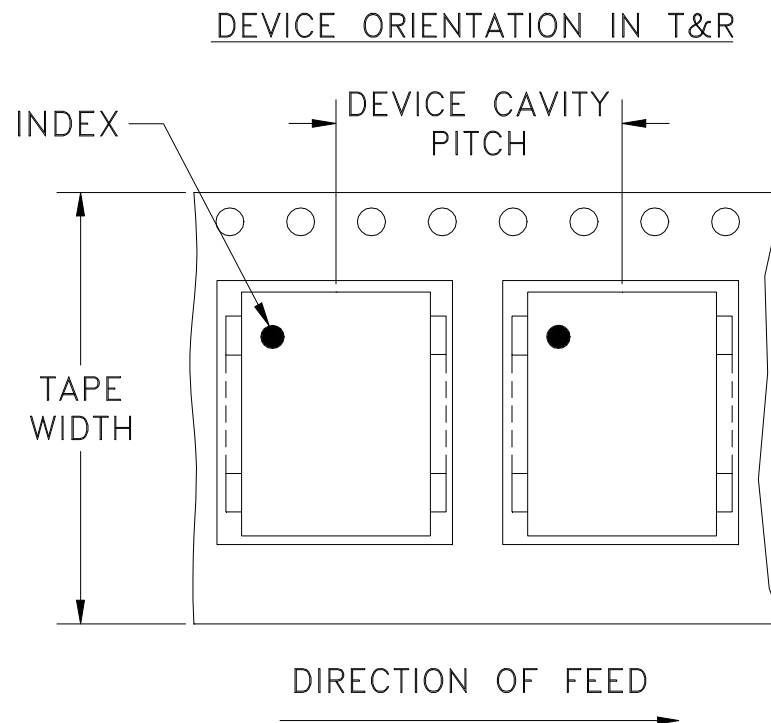
INTERNET <http://www.minicircuits.com>

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010

Mini-Circuits ISO 9001 & ISO 14001 Certified

Tape & Reel Packaging TR-F34



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel see note	
16	12	7	Small quantity standard (see note)	20
				50
				100
				200
		13	Standard	500
				1000

Note: Availability of small reel quantity varies by model.
Refer to pricing and availability on individual model dashboard.

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf



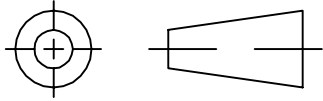
INTERNET <http://www.minicircuits.com>

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010

Mini-Circuits ISO 9001 & ISO 14001 Certified

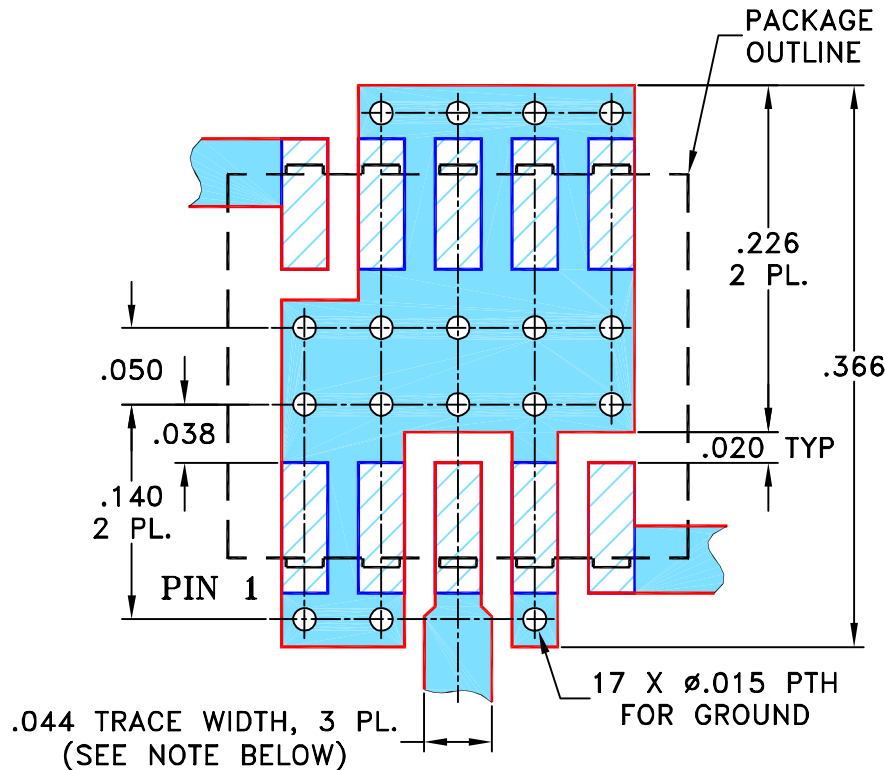
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
A	M81781	UPDATED PCB LAYOUT	06/07/02	GF	DJ
B	M82377	UPDATED DRAWING	07/31/02	AV	WL
C	M102713	ADDED NOTE 2 & "...WITH SMOBC"	01/17/06	MMG	IL
D	M135488	ADDED DZ1650, CHANGED PIN CONN.	02/02/12	GF	DJ

SUGGESTED MOUNTING CONFIGURATION FOR DZ883, DZ885 & DZ1650 CASE STYLES, "10MX01" PIN CONNECTION



- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020" $\pm$.0015"; 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

DRAWN

AV

05/08/02

TOLERANCES ON:

CHECKED

DB

05/16/02

2 PL DECIMALS $\pm$

APPROVED

WL

05/16/02

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

Mini-Circuits®

THIS DOCUMENT AND ITS CONTENTS ARE THE PROPERTY OF MINI-CIRCUITS. EXCEPT FOR USE EXPRESSLY GRANTED, IN WRITING, TO ITS VENDORS, VENDEE AND THE UNITED STATES GOVERNMENT, MINI-CIRCUITS RESERVES ALL PROPRIETARY DESIGN, USE, MANUFACTURING AND REPRODUCTION RIGHTS THERETO. THESE CONTENTS SHALL NOT BE USED, DUPLICATED OR DISCLOSED TO ANY OUTSIDE PARTY, IN WHOLE OR IN PART, WITHOUT WRITTEN PERMISSION OF MINI-CIRCUITS.

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



Mini-Circuits® 13 Neptune Avenue
Brooklyn NY 11235

PL, 10MX01, DZ883/885/1650, TB-144

SIZE

A

CODE IDENT

15542

DRAWING NO:

98-PL-045

REV:

D

FILE:

98PL045

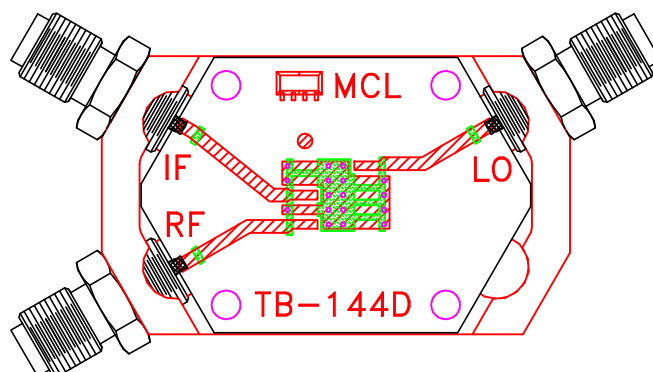
SCALE:

8:1

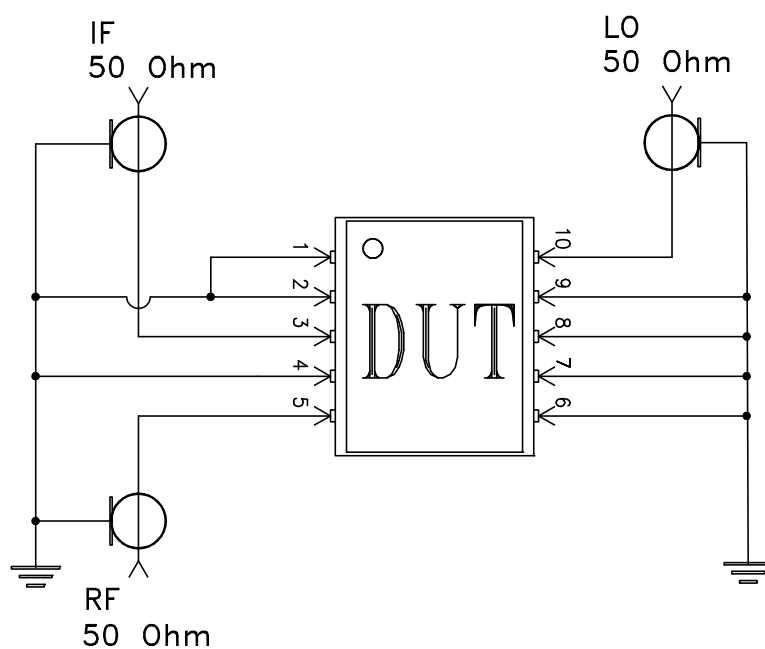
SHEET:

1 OF 1

Evaluation Board and Circuit



TB-144



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent, Dielectric Constant=3.5, Thickness=.020 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	-55° to 100°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Autoclave	15 psig, 100% RH, 121°C, 96 hours	JESD22-A102-C, Condition C
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Solder Reflow Heat	Sn-Pb Eutectic Process: 225°C peak Pb-Free Process: 250°C peak	J-STD-020, Table 4-1, 4-2 and 5-2; Figure 5-1
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 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