

Frequency Mixer

SBL-1X+

Level 7 (LO Power +7 dBm) 10 to 1000 MHz

Maximum Ratings

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

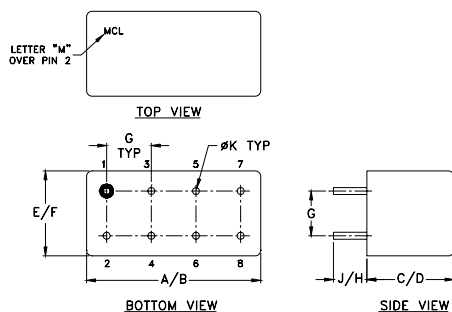
Permanent damage may occur if any of these limits are exceeded.

Pin Connections

LO	8
RF	3,4 [^]
IF	1
GROUND	2,5,6,7
CASE GROUND	2,5,6,7

[^] pins must be connected together externally

Outline Drawing



Outline Dimensions (inch/mm)

A	B	C	D	E	F
.770	.800	.285	.310	.370	.400
19.56	20.32	7.24	7.87	9.40	10.16
G	H	J	K	wt	
.200	.20	.14	.031	grams	
5.08	5.08	3.56	0.79	5.2	

Features

- excellent conversion loss, 5.88 dB typ.
- good L-R & L-I isolation, 40 dB typ.
- rugged welded construction

Applications

- VHF/UHF
- defense & satellite communications



Generic photo used for illustration purposes only

CASE STYLE: A06

+RoHS Compliant

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

Electrical Specifications

FREQUENCY (MHz)		CONVERSION LOSS (dB)				LO-RF ISOLATION (dB)						LO-IF ISOLATION (dB)					
LO/RF	IF	Mid-Band		Total Range		L		M		U		L		M		U	
f_L - f_U		$\bar{X}$	σ	Max.	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.
10-1000	5-500	5.88	.10	7.5	8.0	50	40	40	30	30	20	50	45	40	35	35	25

1 dB COMP.: +1 dBm typ.

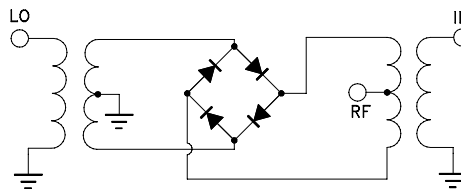
L = low range [f_L to 10 f_L]
m = mid band [$2f_L$ to $f_U/2$]

M = mid range [10 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 +7dBm	LO +7dBm	LO +7dBm	LO +7dBm	LO +7dBm
10.00	40.00	5.91	52.58	57.65	1.11	2.50
20.00	50.00	6.07	51.57	56.10	1.07	2.58
50.00	80.00	5.97	48.88	51.40	1.07	2.46
100.00	70.00	6.02	44.82	46.42	1.08	2.54
160.32	130.32	6.05	42.05	42.49	1.10	2.40
200.00	170.00	6.14	40.99	40.75	1.12	2.34
253.50	223.50	6.19	40.18	39.56	1.16	2.31
315.63	285.63	6.25	38.29	37.94	1.23	2.35
377.76	347.76	6.34	35.80	36.81	1.29	2.38
439.88	409.88	6.56	33.93	35.80	1.34	2.48
500.00	470.00	6.55	31.47	35.23	1.37	2.51
564.13	534.13	6.24	30.58	33.53	1.36	2.60
626.26	596.26	5.86	29.34	34.86	1.33	2.65
657.32	627.32	5.95	29.13	35.78	1.27	2.64
719.45	689.45	5.84	28.51	35.11	1.27	2.84
781.58	751.58	5.77	28.01	34.75	1.40	3.02
812.64	782.64	5.92	27.68	33.85	1.51	3.03
874.76	844.76	5.87	27.52	32.09	1.88	3.15
936.89	906.89	5.87	27.40	30.31	2.10	3.11
1000.00	970.00	6.04	27.28	30.12	2.89	3.07

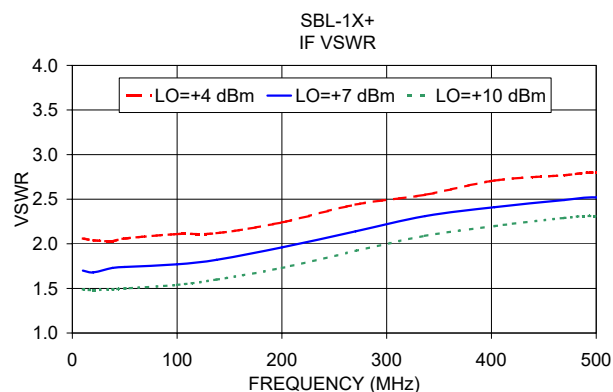
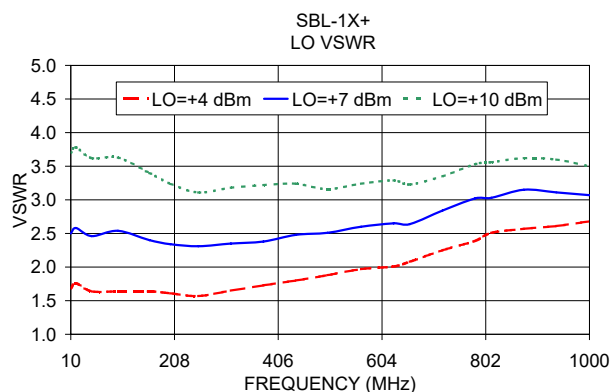
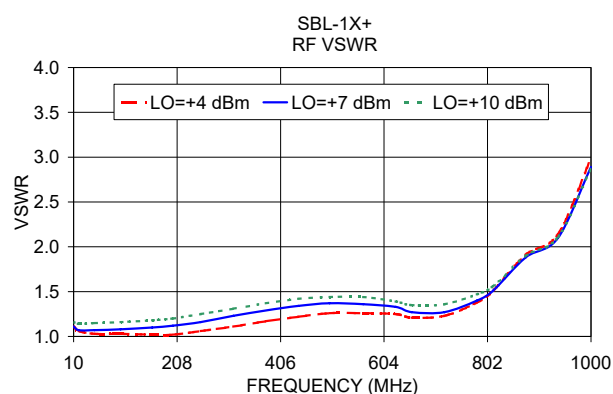
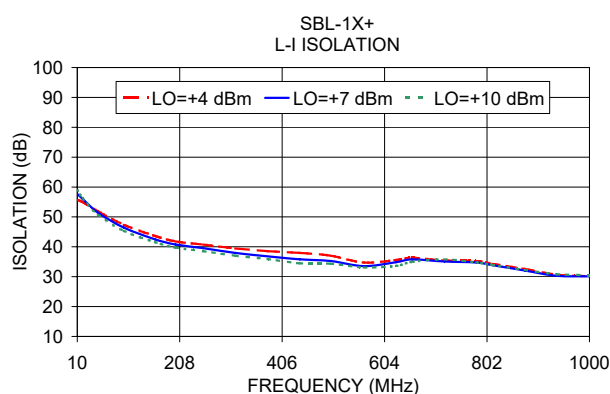
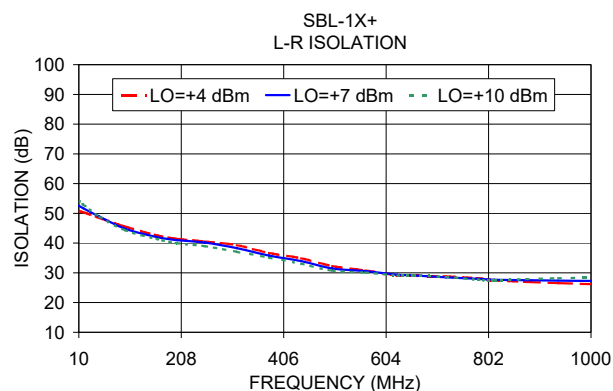
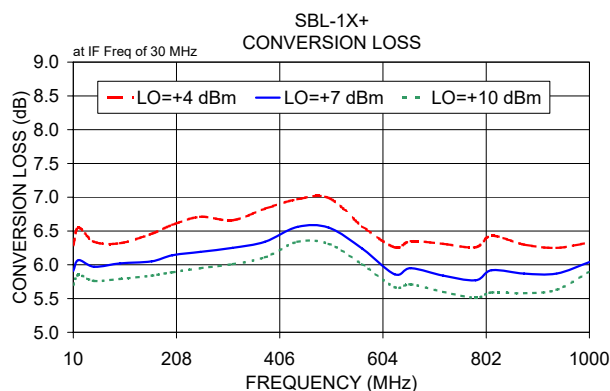
Electrical Schematic



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.
- 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





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Frequency Mixer

SBL-1X+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)		
		@LO (dBm)		
		+4	+7	+10
10.1	40.1	5.85	5.49	5.33
50.4	80.4	6.41	5.89	5.69
90.6	120.6	6.23	5.86	5.67
130.9	160.9	6.32	5.90	5.71
171.1	201.1	6.42	6.01	5.79
211.4	241.4	6.39	5.95	5.74
251.6	281.6	6.58	6.13	5.89
291.9	321.9	6.52	6.10	5.87
332.1	362.1	6.62	6.15	5.93
372.4	402.4	6.82	6.31	6.04
412.6	442.6	6.90	6.39	6.14
452.9	482.9	7.15	6.68	6.42
493.1	523.1	7.14	6.76	6.55
533.4	563.4	7.13	6.79	6.57
573.6	603.6	6.92	6.60	6.43
613.9	643.9	6.78	6.46	6.31
654.2	684.2	6.67	6.30	6.17
694.4	724.4	6.53	6.14	6.00
734.7	764.7	6.57	6.09	5.91
774.9	804.9	6.57	6.02	5.79
815.2	845.2	6.86	6.24	5.93
855.4	885.4	6.74	6.18	5.90
895.7	925.7	6.60	6.07	5.81
935.9	965.9	6.56	6.04	5.77
976.2	1006.2	6.41	5.93	5.69
1016.4	1046.4	6.41	5.94	5.70
1056.7	1086.7	6.38	5.94	5.71
1096.9	1126.9	6.47	6.02	5.77
1137.2	1167.2	6.59	6.15	5.90
1177.4	1207.4	6.73	6.33	6.08
1217.7	1247.7	7.02	6.61	6.35
1257.9	1287.9	7.23	6.90	6.65
1298.2	1328.2	7.61	7.24	6.93
1338.5	1368.5	7.93	7.51	7.20
1378.7	1408.7	8.28	7.81	7.59
1419.0	1449.0	8.66	8.19	8.10
1459.2	1489.2	9.07	8.74	8.75
1499.5	1529.5	9.55	9.31	9.34
1539.7	1569.7	9.95	9.75	9.72
1600.1	1630.1	10.35	10.02	9.82

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)		
		@LO (dBm)		
		+4	+7	+10
10.1	40.1	17.04	15.84	16.50
50.4	80.4	12.38	12.71	13.82
90.6	120.6	12.01	12.93	16.91
130.9	160.9	11.36	16.27	18.68
171.1	201.1	11.48	19.95	15.02
211.4	241.4	14.42	16.30	13.47
251.6	281.6	16.47	13.52	12.51
291.9	321.9	13.98	11.96	12.54
332.1	362.1	11.79	12.01	12.57
372.4	402.4	9.09	9.64	11.25
412.6	442.6	8.12	8.55	10.27
452.9	482.9	7.73	9.27	10.95
493.1	523.1	7.40	8.77	10.85
533.4	563.4	7.20	7.79	9.26
573.6	603.6	7.62	7.82	9.16
613.9	643.9	9.71	9.73	9.45
654.2	684.2	9.85	10.70	10.65
694.4	724.4	10.26	13.51	14.37
734.7	764.7	10.25	13.66	13.79
774.9	804.9	10.06	13.71	13.02
815.2	845.2	7.68	11.57	13.51
855.4	885.4	5.69	7.57	9.03
895.7	925.7	5.92	6.95	8.43
935.9	965.9	5.29	6.06	7.30
976.2	1006.2	5.07	5.90	6.84
1016.4	1046.4	4.94	5.79	6.78
1056.7	1086.7	4.42	5.18	6.50
1096.9	1126.9	4.09	4.97	6.23
1137.2	1167.2	3.45	4.31	5.56
1177.4	1207.4	3.05	3.94	5.39
1217.7	1247.7	2.71	4.00	5.78
1257.9	1287.9	2.68	4.27	6.85
1298.2	1328.2	3.49	6.85	12.13
1338.5	1368.5	6.28	10.82	11.31
1378.7	1408.7	9.90	8.17	10.83
1419.0	1449.0	7.26	8.19	12.64
1459.2	1489.2	6.91	9.31	13.56
1499.5	1529.5	7.49	10.55	13.18
1539.7	1569.7	8.45	10.56	12.65
1600.1	1630.1	9.59	10.67	13.95

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+1dBm (dB)		
		@LO (dBm)		
		+4	+7	+10
10.1	40.1	1.47	1.05	0.81
50.4	80.4	1.35	0.93	0.81
90.6	120.6	1.40	1.04	0.78
130.9	160.9	1.60	1.11	0.85
171.1	201.1	1.51	1.16	0.90
211.4	241.4	1.61	1.22	0.97
251.6	281.6	1.62	1.25	1.00
291.9	321.9	1.69	1.35	1.07
332.1	362.1	1.74	1.38	1.15
372.4	402.4	1.65	1.31	1.14
412.6	442.6	1.53	1.30	1.15
452.9	482.9	1.37	1.10	1.01
493.1	523.1	1.18	0.98	0.87
533.4	563.4	1.25	0.99	0.89
573.6	603.6	1.41	1.12	0.96
613.9	643.9	1.52	1.22	1.05
654.2	684.2	1.61	1.38	1.19
694.4	724.4	1.69	1.52	1.34
734.7	764.7	1.60	1.53	1.42
774.9	804.9	1.47	1.45	1.38
815.2	845.2	1.09	1.02	1.00
855.4	885.4	1.08	0.89	0.82
895.7	925.7	1.12	0.85	0.72
935.9	965.9	1.13	0.80	0.64
976.2	1006.2	1.26	0.86	0.63
1016.4	1046.4	1.24	0.82	0.59
1056.7	1086.7	1.32	0.88	0.61
1096.9	1126.9	1.30	0.85	0.58
1137.2	1167.2	1.24	0.78	0.52
1177.4	1207.4	1.29	0.79	0.56
1217.7	1247.7	1.19	0.76	0.54
1257.9	1287.9	1.24	0.81	0.63
1298.2	1328.2	1.23	0.84	0.68
1338.5	1368.5	1.15	0.87	0.70
1378.7	1408.7	1.19	0.91	0.65
1419.0	1449.0	1.10	0.81	0.56
1459.2	1489.2	1.06	0.73	0.53
1499.5	1529.5	0.93	0.65	0.44
1539.7	1569.7	0.85	0.59	0.39
1600.1	1630.1	0.93	0.66	0.50

REV. X2

SBL-1X+

100818

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

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Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=500.1MHz (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)=1000.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+7			+7			+7
480.0	20.1	6.94	10.0	20.1	5.70	500.0	500.1	6.52
467.9	32.2	6.94	22.6	32.7	5.71	487.4	512.7	6.46
455.9	44.2	6.93	35.1	45.2	5.75	474.9	525.2	6.44
443.8	56.3	7.02	47.7	57.8	5.84	462.3	537.8	6.39
431.8	68.3	7.11	60.3	70.4	5.79	449.7	550.4	6.37
419.7	80.4	7.13	72.8	82.9	5.83	437.2	562.9	6.33
407.7	92.4	7.21	85.4	95.5	5.85	424.6	575.5	6.31
395.6	104.5	7.16	97.9	108.0	5.82	412.1	588.0	6.33
383.6	116.5	7.07	110.5	120.6	5.83	399.5	600.6	6.27
371.5	128.6	7.08	123.1	133.2	5.78	386.9	613.2	6.26
359.5	140.6	7.09	135.6	145.7	5.74	374.4	625.7	6.25
347.4	152.7	7.10	148.2	158.3	5.78	361.8	638.3	6.27
335.4	164.7	7.15	160.8	170.9	5.79	349.2	650.9	6.35
323.3	176.8	7.10	173.3	183.4	5.79	336.7	663.4	6.37
311.3	188.8	7.09	185.9	196.0	5.80	324.1	676.0	6.40
299.2	200.9	7.15	198.5	208.6	5.74	311.5	688.6	6.44
287.2	212.9	7.03	211.0	221.1	5.75	299.0	701.1	6.45
275.1	225.0	6.96	223.6	233.7	5.74	286.4	713.7	6.51
263.1	237.0	7.00	236.2	246.3	5.71	273.8	726.3	6.58
251.0	249.1	6.92	248.7	258.8	5.76	261.3	738.8	6.61
239.0	261.1	7.03	261.3	271.4	5.76	248.7	751.4	6.68
226.9	273.2	7.04	273.8	283.9	5.73	236.2	763.9	6.71
214.9	285.2	6.96	286.4	296.5	5.78	223.6	776.5	6.66
202.8	297.3	6.97	299.0	309.1	5.77	211.0	789.1	6.64
190.8	309.3	6.99	311.5	321.6	5.76	198.5	801.6	6.60
178.7	321.4	6.91	324.1	334.2	5.79	185.9	814.2	6.51
166.7	333.4	6.92	336.7	346.8	5.77	173.3	826.8	6.46
154.6	345.5	6.90	349.2	359.3	5.82	160.8	839.3	6.34
142.6	357.5	6.93	361.8	371.9	5.86	148.2	851.9	6.21
130.5	369.6	7.01	374.4	384.5	5.85	135.6	864.5	6.16
118.5	381.6	6.98	386.9	397.0	5.91	123.1	877.0	6.08
106.4	393.7	6.89	399.5	409.6	5.93	110.5	889.6	6.03
94.4	405.7	6.87	412.1	422.2	5.93	97.9	902.2	6.03
82.3	417.8	6.79	424.6	434.7	5.98	85.4	914.7	5.96
70.3	429.8	6.76	437.2	447.3	5.97	72.8	927.3	5.96
58.2	441.9	6.79	449.7	459.8	5.97	60.3	939.8	5.95
46.2	453.9	6.71	462.3	472.4	6.06	47.7	952.4	5.91
34.1	466.0	6.72	474.9	485.0	6.06	35.1	965.0	5.93
22.1	478.0	6.79	487.4	497.5	6.12	22.6	977.5	5.88
10.0	490.1	6.70	500.0	510.1	6.14	10.0	990.1	5.84

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+4	+7	+10	+4	+7	+10
10.1	64.43	63.09	63.13	78.16	69.23	70.92
50.4	63.41	61.51	60.77	64.98	67.90	68.35
90.6	63.19	60.35	58.73	60.88	61.62	63.58
130.9	62.14	58.91	57.26	57.07	58.65	60.51
171.1	62.20	59.08	56.39	54.87	56.24	57.74
211.4	62.18	58.49	55.85	53.09	54.49	55.90
251.6	60.71	56.97	54.39	51.62	52.93	54.27
291.9	57.38	55.73	53.65	50.28	51.90	53.21
332.1	53.07	52.72	51.34	49.09	50.28	51.44
372.4	50.50	51.17	50.77	47.89	49.07	50.24
412.6	48.00	47.67	47.75	47.85	48.94	50.17
452.9	47.10	47.74	46.77	47.75	48.57	49.35
493.1	46.21	48.24	48.29	47.29	48.84	49.42
533.4	44.55	46.48	48.02	46.32	47.94	49.28
573.6	43.37	44.63	45.78	44.80	45.99	47.22
613.9	42.61	43.74	44.29	43.57	44.47	45.61
654.2	41.46	42.62	42.53	43.20	44.42	45.78
694.4	40.66	42.43	42.31	42.82	44.92	46.87
734.7	39.72	42.68	44.43	41.68	43.85	46.12
774.9	37.78	40.36	43.10	40.70	42.88	45.19
815.2	36.11	38.14	40.60	40.31	42.53	44.95
855.4	34.70	36.44	38.86	40.44	42.67	45.15
895.7	34.36	35.98	38.26	40.67	42.89	45.36
935.9	34.15	35.69	37.98	41.23	43.42	45.80
976.2	34.04	35.53	37.71	41.81	44.04	46.39
1016.4	34.57	36.10	38.16	42.26	44.62	47.22
1056.7	34.48	36.36	38.41	42.28	44.54	47.51
1096.9	35.17	37.44	39.37	41.65	43.37	45.77
1137.2	36.64	39.72	41.35	41.58	42.56	44.03
1177.4	37.33	41.60	44.88	42.56	43.29	44.27
1217.7	37.19	41.56	46.17	44.27	45.08	45.97
1257.9	36.29	39.48	41.90	45.45	46.61	47.69
1298.2	35.39	37.35	38.34	46.51	47.83	48.91
1338.5	34.82	36.17	36.78	47.07	48.30	49.21
1378.7	35.03	35.95	36.42	47.04	47.99	48.72
1419.0	35.27	35.99	36.25	47.51	48.45	49.12
1459.2	35.51	35.92	36.11	47.68	48.48	49.01
1499.5	35.77	36.05	36.16	48.78	49.60	50.05
1539.7	36.38	36.72	36.80	49.19	50.03	50.60
1600.1	37.96	38.34	38.42	51.07	51.65	52.29

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+4	+7	+10
10.1	40.1	43.33	58.76	47.64
50.4	80.4	38.63	38.24	38.02
90.6	120.6	33.77	33.93	34.34
130.9	160.9	31.46	31.73	31.91
171.1	201.1	29.99	30.41	30.51
211.4	241.4	29.25	29.55	29.85
251.6	281.6	28.96	29.49	29.76
291.9	321.9	28.69	29.85	30.44
332.1	362.1	28.38	29.16	29.88
372.4	402.4	28.52	28.93	29.07
412.6	442.6	28.87	29.31	29.60
452.9	482.9	29.37	30.12	30.83
493.1	523.1	28.67	29.78	30.67
533.4	563.4	26.57	27.28	27.72
573.6	603.6	24.56	24.86	24.96
613.9	643.9	23.21	23.21	23.16
654.2	684.2	22.37	22.31	22.23
694.4	724.4	21.77	21.62	21.44
734.7	764.7	21.37	21.06	20.83
774.9	804.9	21.09	20.64	20.26
815.2	845.2	21.02	20.54	20.13
855.4	885.4	20.82	20.33	19.92
895.7	925.7	20.44	20.04	19.61
935.9	965.9	20.21	19.87	19.56
976.2	1006.2	19.73	19.55	19.25
1016.4	1046.4	19.22	19.11	18.94
1056.7	1086.7	18.57	18.50	18.35
1096.9	1126.9	17.85	17.73	17.56
1137.2	1167.2	17.07	16.89	16.75
1177.4	1207.4	16.41	16.15	15.84
1217.7	1247.7	15.71	15.39	15.00
1257.9	1287.9	15.05	14.63	14.17
1298.2	1328.2	14.22	13.71	13.27
1338.5	1368.5	13.43	12.89	12.44
1378.7	1408.7	12.79	12.20	11.82
1419.0	1449.0	12.01	11.51	11.29
1459.2	1489.2	11.53	11.12	10.96
1499.5	1529.5	11.16	10.84	10.71
1539.7	1569.7	10.88	10.66	10.58
1600.1	1630.1	10.77	10.60	10.58

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=1000.1MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+4	+7	+10		+4	+7	+10		+4	+7	+10
10.1	40.1	1.29	1.12	1.03	10.1	1.90	2.71	3.96	10.0	1.50	1.65	1.77
50.4	80.4	1.40	1.18	1.09	50.4	1.98	2.86	4.02	22.6	1.37	1.57	1.68
90.6	120.6	1.38	1.22	1.14	90.6	1.84	2.60	3.56	35.1	1.40	1.58	1.72
130.9	160.9	1.44	1.29	1.22	130.9	1.95	2.78	3.87	47.7	1.36	1.52	1.65
171.1	201.1	1.54	1.39	1.31	171.1	1.87	2.61	3.59	60.3	1.32	1.47	1.60
211.4	241.4	1.63	1.49	1.41	211.4	1.91	2.69	3.70	72.8	1.31	1.46	1.58
251.6	281.6	1.80	1.65	1.56	251.6	1.91	2.69	3.69	85.4	1.36	1.51	1.64
291.9	321.9	1.97	1.80	1.70	291.9	1.90	2.65	3.58	97.9	1.41	1.57	1.70
332.1	362.1	2.15	1.97	1.84	332.1	1.98	2.75	3.73	110.5	1.43	1.59	1.71
372.4	402.4	2.37	2.16	2.02	372.4	1.94	2.67	3.58	123.1	1.40	1.54	1.66
412.6	442.6	2.53	2.30	2.14	412.6	2.02	2.77	3.70	135.6	1.36	1.50	1.60
452.9	482.9	2.71	2.48	2.31	452.9	2.03	2.75	3.64	148.2	1.35	1.48	1.59
493.1	523.1	2.80	2.60	2.44	493.1	2.06	2.77	3.65	160.8	1.38	1.51	1.62
533.4	563.4	2.85	2.65	2.51	533.4	2.12	2.83	3.70	173.3	1.41	1.55	1.66
573.6	603.6	2.84	2.61	2.48	573.6	2.12	2.80	3.62	185.9	1.43	1.56	1.67
613.9	643.9	2.81	2.57	2.42	613.9	2.21	2.90	3.74	198.5	1.43	1.54	1.64
654.2	684.2	2.78	2.50	2.32	654.2	2.23	2.89	3.71	211.0	1.41	1.53	1.62
694.4	724.4	2.75	2.44	2.23	694.4	2.28	2.94	3.75	223.6	1.42	1.53	1.64
734.7	764.7	2.78	2.39	2.14	734.7	2.34	2.97	3.75	236.2	1.44	1.56	1.66
774.9	804.9	2.80	2.38	2.09	774.9	2.36	2.96	3.71	248.7	1.45	1.57	1.66
815.2	845.2	2.89	2.49	2.22	815.2	2.43	3.01	3.74	261.3	1.45	1.55	1.63
855.4	885.4	2.78	2.39	2.14	855.4	2.49	3.05	3.75	273.8	1.43	1.52	1.59
895.7	925.7	2.63	2.23	1.97	895.7	2.57	3.14	3.82	286.4	1.41	1.50	1.58
935.9	965.9	2.55	2.15	1.85	935.9	2.61	3.18	3.86	299.0	1.42	1.51	1.59
976.2	1006.2	2.39	2.01	1.72	976.2	2.67	3.23	3.90	311.5	1.43	1.52	1.60
1016.4	1046.4	2.26	1.89	1.62	1016.4	2.70	3.25	3.91	324.1	1.42	1.50	1.57
1056.7	1086.7	2.17	1.81	1.55	1056.7	2.73	3.27	3.94	336.7	1.39	1.46	1.52
1096.9	1126.9	2.10	1.77	1.53	1096.9	2.79	3.30	3.95	349.2	1.36	1.42	1.48
1137.2	1167.2	2.07	1.78	1.58	1137.2	2.80	3.29	3.91	361.8	1.35	1.42	1.48
1177.4	1207.4	2.08	1.85	1.71	1177.4	2.86	3.33	3.94	374.4	1.37	1.44	1.51
1217.7	1247.7	2.09	1.93	1.86	1217.7	2.89	3.31	3.90	386.9	1.39	1.45	1.51
1257.9	1287.9	2.12	2.04	2.07	1257.9	2.92	3.31	3.88	399.5	1.37	1.43	1.48
1298.2	1328.2	2.20	2.24	2.39	1298.2	2.92	3.26	3.79	412.1	1.32	1.37	1.42
1338.5	1368.5	2.36	2.57	2.84	1338.5	2.92	3.22	3.75	424.6	1.29	1.34	1.40
1378.7	1408.7	2.62	2.98	3.32	1378.7	2.95	3.22	3.75	437.2	1.29	1.35	1.41
1419.0	1449.0	3.00	3.45	3.77	1419.0	2.98	3.22	3.73	449.7	1.30	1.35	1.41
1459.2	1489.2	3.35	3.81	4.09	1459.2	3.08	3.33	3.85	462.3	1.29	1.34	1.39
1499.5	1529.5	3.66	4.08	4.26	1499.5	3.22	3.42	3.88	474.9	1.27	1.30	1.35
1539.7	1569.7	3.83	4.11	4.25	1539.7	3.36	3.52	3.97	487.4	1.23	1.26	1.31
1600.1	1630.1	3.63	3.76	3.79	1600.1	3.67	3.70	4.07	500.0	1.20	1.24	1.31

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	21	30	32	37	29	27	21	52	49	58
1	-	21	+0	38	19	29	42	31	34	36	48	44
2	>100	50	69	53	70	50	61	71	58	60	49	66
3	>100	64	50	69	51	75	52	61	75	64	61	>79
4	>100	>79	>79	76	>79	73	>79	78	>79	>79	>79	>79
5	>100	>79	>79	>79	>79	>79	76	>79	>79	>79	>79	>79
6	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
7	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
8	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
9	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
10	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
RF CAL	0	1	2	3	4	5	6	7	8	9	10	

LO HARMONICS ORDER

Test conditions: RF IN: 500.1 MHz; -14.00 dBm.
LO IN: 530.01 MHz; +7.00 dBm
IF OUT: 29.91 MHz; -20.81 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	31	34	41	49	38	41	37	63	60	68
1	-	21	+0	50	18	34	48	36	39	43	62	57
2	98	46	62	52	62	48	56	69	57	54	46	67
3	>100	47	33	58	38	50	40	46	63	51	56	56
4	>100	85	74	58	71	58	71	58	68	81	68	68
5	>100	77	73	75	51	63	51	64	51	63	74	64
6	>100	>89	>89	89	84	69	83	70	75	71	78	87
7	>100	76	81	86	79	84	65	79	63	72	67	76
8	>100	>89	>89	>89	>89	>89	>89	82	>89	78	84	80
9	>100	>89	>89	89	>89	>89	>89	>89	83	84	79	81
10	>100	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89
RF CAL	0	1	2	3	4	5	6	7	8	9	10	

LO HARMONICS ORDER

Test conditions: RF IN: 500.1 MHz; -4.00 dBm.
LO IN: 530.01 MHz; +7.00 dBm
IF OUT: 29.91 MHz; -10.72 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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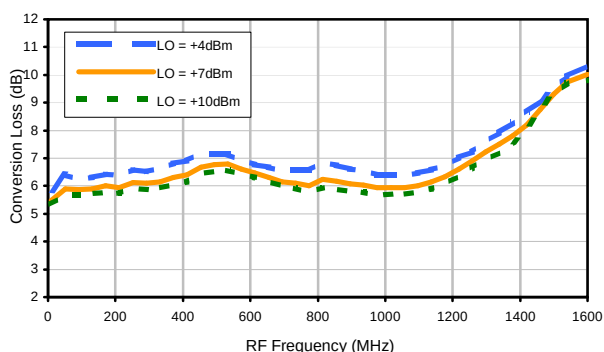
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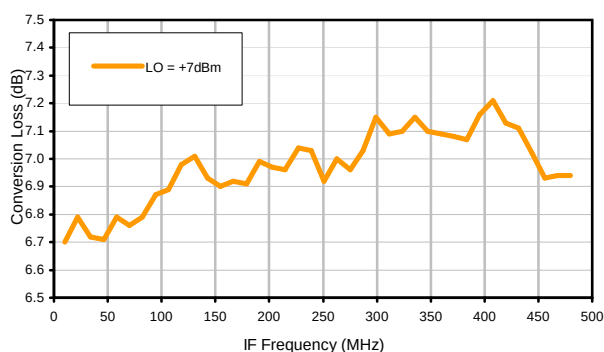


Typical Performance Curves

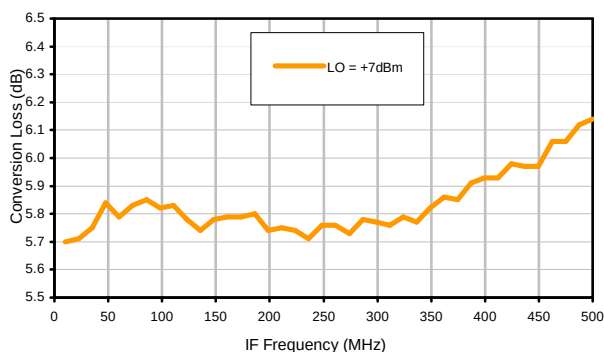
Conversion Loss @ IF=30MHz



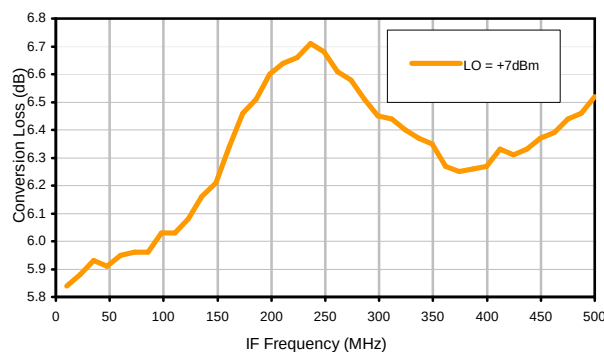
Conversion Loss vs. IF @ RF=500.1MHz



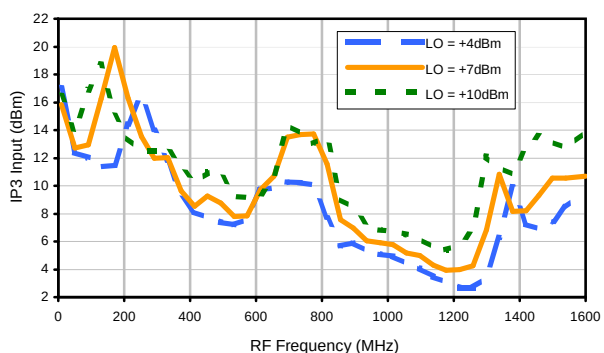
Conversion Loss vs. IF @ RF=10.1MHz



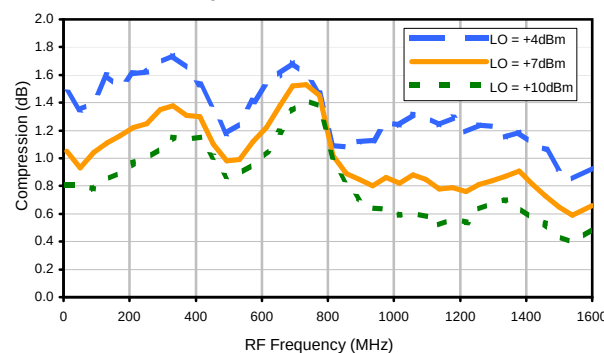
Conversion Loss vs. IF @ RF=1000.1MHz



IP3 Input

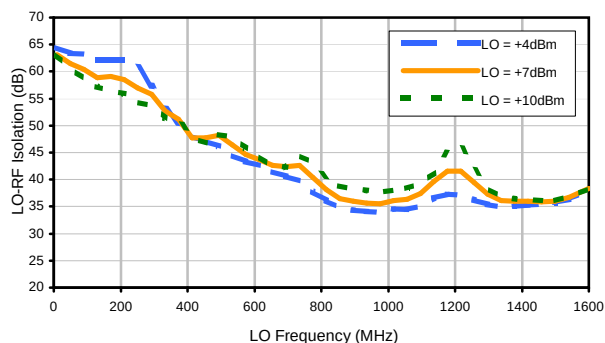


Compression @ RF IN=+1dBm

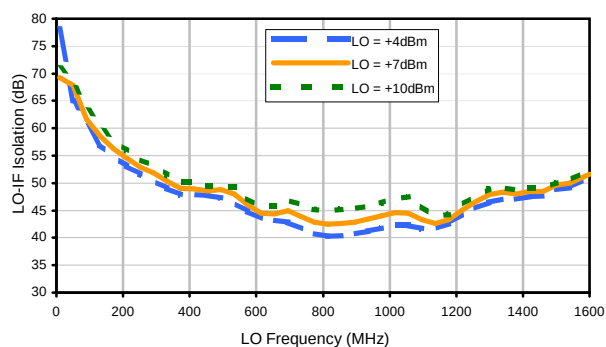


Typical Performance Curves

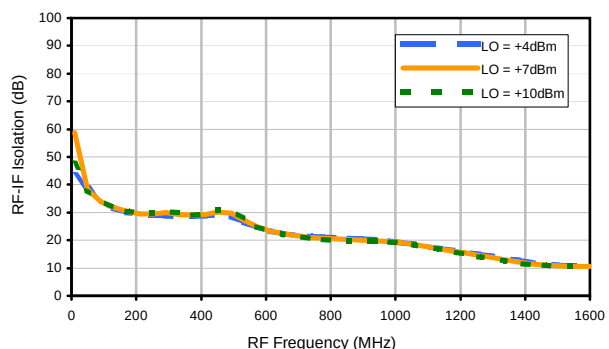
LO-RF Isolation



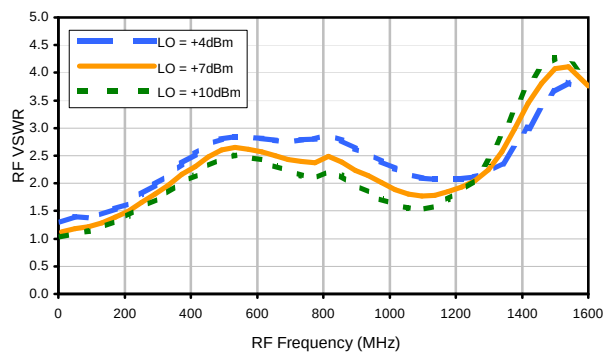
LO-IF Isolation



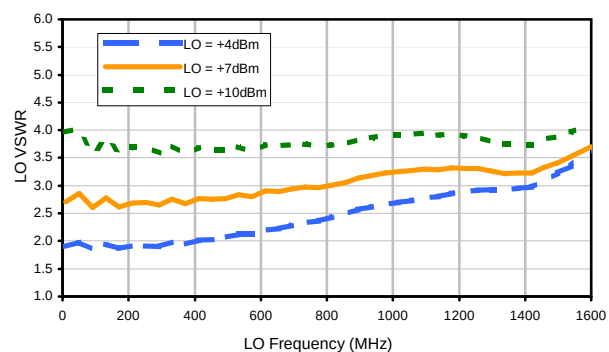
RF-IF Isolation



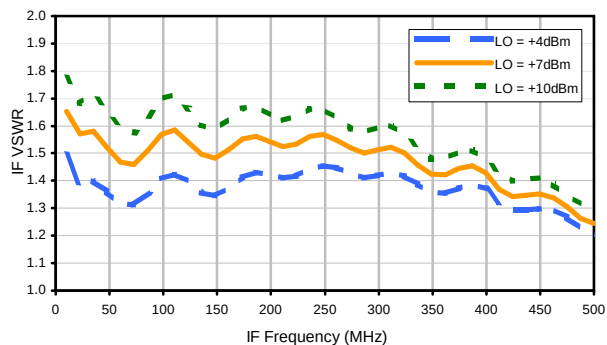
RF VSWR



LO VSWR



IF VSWR



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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	21	30	32	37	29	27	21	52	49	58
1	-	21	+0	38	19	29	42	31	34	36	48	44
2	>100	50	69	53	70	50	61	71	58	60	49	66
3	>100	64	50	69	51	75	52	61	75	64	61	>79
4	>100	>79	>79	76	>79	73	>79	78	>79	>79	>79	>79
5	>100	>79	>79	>79	>79	>79	76	>79	>79	>79	>79	>79
6	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
7	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
8	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
9	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
10	>100	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79	>79
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 500.1 MHz; -14.00 dBm.
LO IN: 530.01 MHz; +7.00 dBm
IF OUT: 29.91 MHz; -20.81 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	31	34	41	49	38	41	37	63	60	68
1	-	21	+0	50	18	34	48	36	39	43	62	57
2	98	46	62	52	62	48	56	69	57	54	46	67
3	>100	47	33	58	38	50	40	46	63	51	56	56
4	>100	85	74	58	71	58	71	58	68	81	68	68
5	>100	77	73	75	51	63	51	64	51	63	74	64
6	>100	>89	>89	89	84	69	83	70	75	71	78	87
7	>100	76	81	86	79	84	65	79	63	72	67	76
8	>100	>89	>89	>89	>89	>89	>89	82	>89	78	84	80
9	>100	>89	>89	89	>89	>89	>89	>89	83	84	79	81
10	>100	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 500.1 MHz; -4.00 dBm.
LO IN: 530.01 MHz; +7.00 dBm
IF OUT: 29.91 MHz; -10.72 dBm

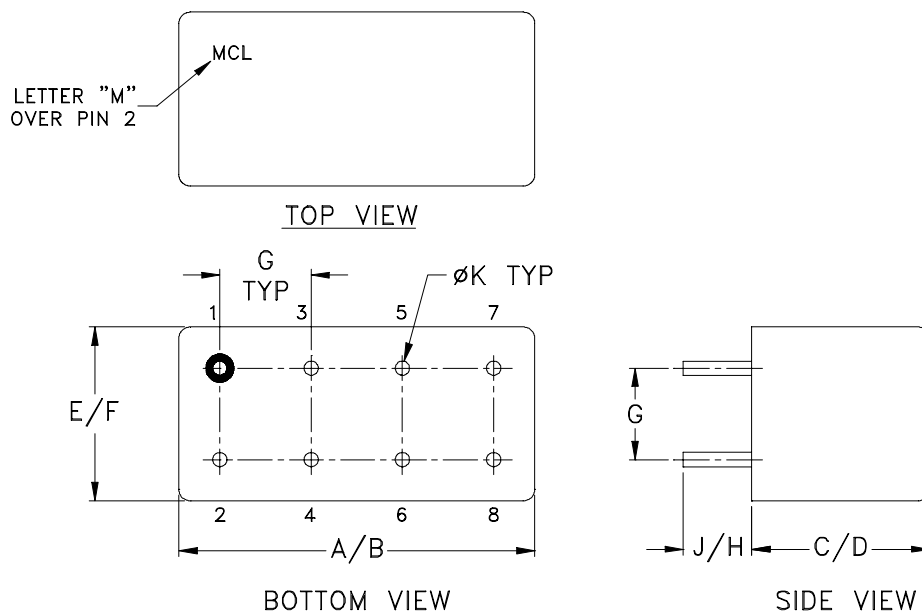
- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

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A01
A04
A05
A06

Outline Dimensions



CASE#	A	B	C	D	E	F	G	H	J	K	WT, GRAM
A01	.770 (19.56)	.800 (20.32)	.385 (9.78)	.400 (10.16)	.370 (9.40)	.400 (10.16)	.200 (5.08)	.20 (5.08)	.14 (3.56)	.031 (.79)	5.2
A04			.200 (5.08)	.210 (5.33)							3.7
A05			.240 (6.10)	.250 (6.35)							3.7
A06			.285 (7.24)	.310 (7.87)							5.2

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

Notes:

- Header material: C.R.S.
Pin material: #52 alloy.
Cover material: Cupro-Nickel.
- Pin finish: Electro Tin-Silver.
- Insulated spacer available. Request P/N B14-045-01.
- Tolerance on pin diameter $\pm .005$ inch.
- Glass meniscus 0.015 inch max.
- Blue bead indicates Pin 1. Pin numbers do not appear on unit, for reference only.



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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
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
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
Moisture Resistance	10 cycles, 24 hours per cycle	MIL-STD-202, Method 106, Condition A, except 50°C and end point electrical test done within 12 hours
Solderability	10X Magnification	J-STD-002, 95% Coverage
Resistance to Solder Heat	260°C for 10 seconds	MIL-STD-202, Method 210, Condition B
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
Terminal Strength	4 1/2 Pound Pull	MIL-STD-202, Method 211, Condition A



Environmental Specifications

ENV30

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
Barometric Pressure	100,000 Feet	MIL-STD-202, Method 105, Condition D