Plug-In

Frequency Mixer

Level 23 (LO Power +23 dBm) 10 to 2400 MHz

SAY-11+

Generic photo used for illustration purposes only

CASE STYLE: A01

+RoHS Compliant

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

Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Power	350mW
IF Current	40mA

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

Pin Connections

LO	8
RF	1
IF	3
GROUND	2,5,6,7
CASE GROUND	2,5,6,7
DO NOT USE	4

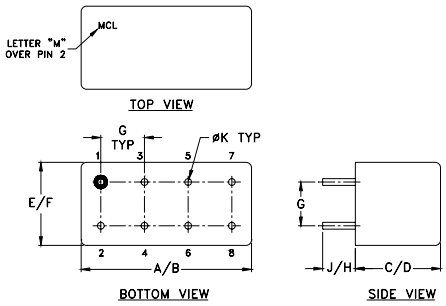
Features

- low conversion loss, 7.40 dB typ.
- wideband, 10 to 2400 MHz
- rugged welded construction
- hermetically sealed

Applications

- VHF/UHF
- GPS
- PCS
- satellite distribution

Outline Drawing



Outline Dimensions (inch / mm)

A	B	C	D	E	F
.770	.800	.385	.400	.370	.400
19.56	20.32	9.78	10.16	9.40	10.16
G	**H**	**J**	**K**		**wt**
.200	.20	.14	.031		grams
5.08	5.08	3.56	0.79		5.2

Electrical Specifications

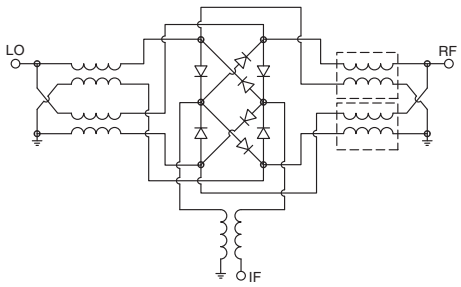
FREQUENCY (MHz)		CONVERSION LOSS (dB)				LO-RF ISOLATION (dB)						LO-IF ISOLATION (dB)					
LO/RF	IF	Mid-Band m			Total Range	L		M		U		L		M		U	
f_L-f_U		$\overline{X}$	σ	Max.	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.
10-2400	5-1000	7.40	0.09	8.5	10	28	20	26	20	25	20	28	20	26	20	25	20

1 dB COMP.: +20 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 +23dBm	LO +23dBm	LO +23dBm	LO +23dBm	LO +23dBm
10.00	40.00	7.46	41.65	30.72	1.55	1.24
20.00	50.00	7.51	43.95	31.06	1.54	1.22
50.00	80.00	7.74	44.45	30.74	1.51	1.31
87.10	57.10	7.81	44.86	29.91	1.50	1.26
100.00	70.00	7.66	44.68	29.62	1.49	1.25
200.00	170.00	7.59	46.21	28.67	1.47	1.22
318.39	288.39	8.03	41.22	28.91	1.45	1.23
500.00	470.00	7.47	37.07	29.62	1.43	1.28
626.77	596.77	7.57	33.53	30.05	1.38	1.34
780.97	750.97	7.27	33.54	31.66	1.34	1.29
1000.00	970.00	7.77	33.08	33.53	1.38	1.23
1089.36	1059.36	7.84	33.62	34.45	1.49	1.33
1243.54	1213.54	8.04	34.16	36.92	1.59	1.35
1397.74	1367.74	8.31	33.51	37.46	1.82	1.48
1500.00	1470.00	8.18	34.49	39.38	1.99	1.58
1706.13	1676.13	8.31	34.41	45.70	2.18	1.69
2000.00	1970.00	8.17	37.07	38.82	2.32	1.71
2091.61	2061.61	8.07	37.89	36.35	2.32	1.68
2245.81	2215.81	7.59	37.54	34.57	2.28	1.74
2400.00	2370.00	7.11	35.91	33.44	2.15	1.77

Electrical Schematic



Notes

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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.
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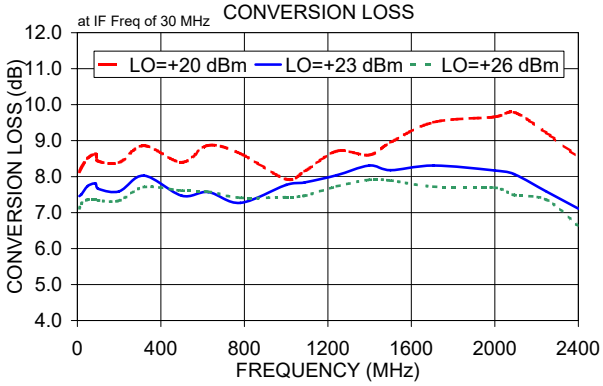
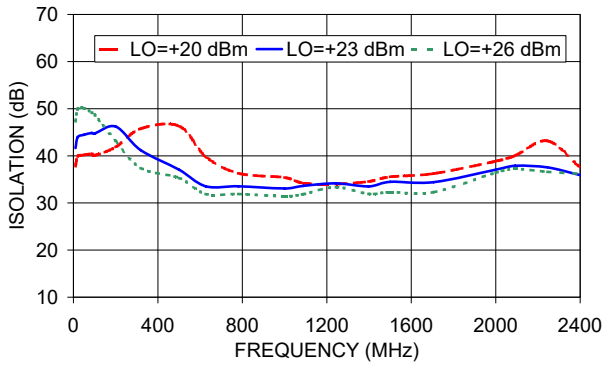
CONVERSION LOSS

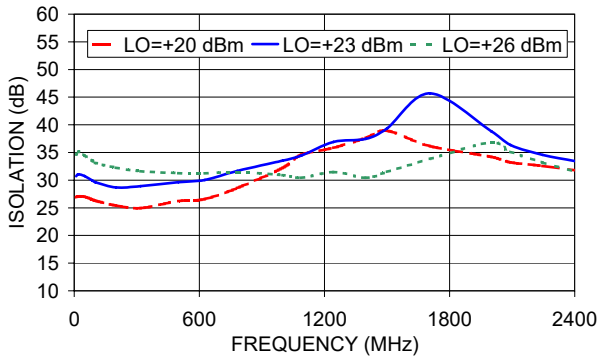
at IF Freq of 30 MHz



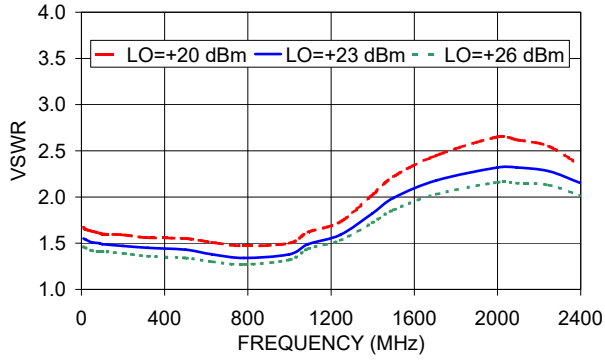
L-R ISOLATION



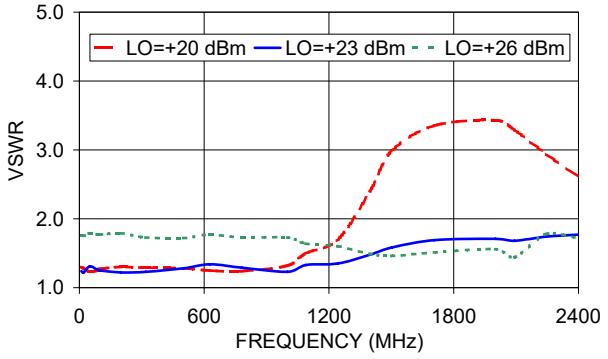
L-I ISOLATION



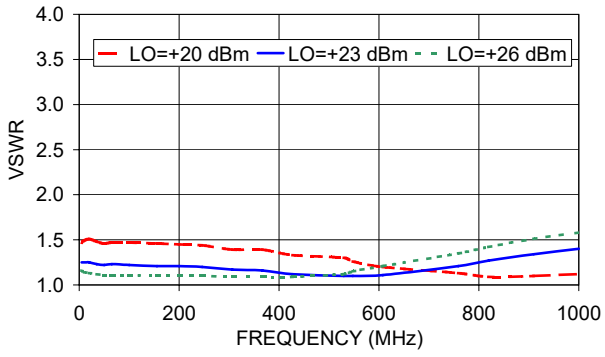
RF VSWR



LO VSWR



IF VSWR



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Frequency Mixer SAY-11+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB) @LO (dBm)		
		+20	+23	+26
10.1	40.1	8.02	7.39	7.08
20.1	50.1	7.85	7.26	6.99
50.1	80.1	7.96	7.32	7.06
70.1	100.1	8.28	7.51	7.19
100.1	130.1	8.30	7.56	7.21
140.1	170.1	8.15	7.49	7.23
180.1	210.1	8.26	7.52	7.27
220.1	250.1	8.11	7.54	7.32
260.1	290.1	8.20	7.47	7.20
300.1	330.1	8.45	7.76	7.41
350.1	380.1	8.19	7.56	7.28
400.1	430.1	8.57	7.89	7.47
500.1	530.1	8.64	7.87	7.46
600.1	630.1	8.57	7.75	7.42
700.1	730.1	8.32	7.60	7.36
800.1	830.1	8.15	7.53	7.32
900.1	930.1	8.10	7.54	7.36
1000.1	1030.1	8.07	7.57	7.34
1100.1	1130.1	8.10	7.58	7.40
1200.1	1230.1	8.20	7.78	7.61
1300.1	1330.1	8.15	7.77	7.65
1400.1	1430.1	8.10	7.71	7.59
1500.1	1530.1	8.13	7.70	7.58
1600.1	1630.1	8.21	7.67	7.50
1700.1	1730.1	8.31	7.82	7.57
1800.1	1830.1	8.38	7.78	7.55
1900.1	1930.1	8.59	7.93	7.64
2000.1	2030.1	8.81	8.25	7.90
2100.1	2130.1	8.69	8.29	8.01
2250.1	2280.1	8.41	8.02	7.87
2400.1	2430.1	8.34	7.93	7.75
2550.1	2580.1	8.62	8.09	7.84
2700.1	2730.1	8.90	8.36	8.15
2850.1	2880.1	9.76	9.19	8.94
3000.1	3030.1	10.46	9.88	9.64
3200.1	3230.1	10.12	9.55	9.30
3400.1	3430.1	10.51	10.00	9.77
3600.1	3630.1	11.80	11.25	11.11
3800.1	3830.1	13.18	12.61	12.55
4000.1	4030.1	15.03	14.13	14.08

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm) @LO (dBm)		
		+20	+23	+26
10.1	40.1	35.31	33.03	33.66
20.1	50.1	31.62	33.35	33.96
50.1	80.1	34.51	33.83	33.71
70.1	100.1	32.13	32.46	33.49
100.1	130.1	31.03	31.92	33.87
140.1	170.1	32.88	38.80	33.67
180.1	210.1	33.34	31.64	31.09
220.1	250.1	32.30	32.50	31.21
260.1	290.1	33.68	30.92	30.77
300.1	330.1	31.00	30.07	29.65
350.1	380.1	38.11	30.28	32.41
400.1	430.1	29.63	28.81	31.26
500.1	530.1	27.92	27.91	32.41
600.1	630.1	28.55	30.44	39.94
700.1	730.1	28.35	32.66	36.41
800.1	830.1	28.13	34.78	35.73
900.1	930.1	28.68	39.46	33.11
1000.1	1030.1	29.82	41.93	34.52
1100.1	1130.1	33.79	34.04	34.93
1200.1	1230.1	34.73	32.44	32.13
1300.1	1330.1	34.01	31.59	32.16
1400.1	1430.1	37.98	30.95	31.85
1500.1	1530.1	33.96	31.88	29.93
1600.1	1630.1	32.06	37.19	37.03
1700.1	1730.1	32.12	35.89	42.67
1800.1	1830.1	30.80	35.44	38.84
1900.1	1930.1	35.09	33.60	33.75
2000.1	2030.1	32.66	32.61	32.60
2100.1	2130.1	29.84	29.34	29.71
2250.1	2280.1	30.11	30.98	30.21
2400.1	2430.1	29.06	31.35	31.20
2550.1	2580.1	26.51	28.45	29.32
2700.1	2730.1	26.47	28.15	29.87
2850.1	2880.1	27.32	27.62	28.97
3000.1	3030.1	28.45	29.15	30.95
3200.1	3230.1	27.53	29.77	29.96
3400.1	3430.1	24.48	25.93	25.85
3600.1	3630.1	25.27	28.12	30.95
3800.1	3830.1	23.69	28.65	29.54
4000.1	4030.1	22.15	24.10	26.93

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+20dBm (dB) @LO (dBm)		
		+20	+23	+26
10.1	40.1	0.87	0.30	0.17
20.1	50.1	1.04	0.44	0.24
50.1	80.1	0.88	0.29	0.12
70.1	100.1	0.62	0.16	0.04
100.1	130.1	0.57	0.15	0.04
140.1	170.1	0.65	0.30	0.12
180.1	210.1	0.72	0.22	0.04
220.1	250.1	0.85	0.30	0.13
260.1	290.1	0.81	0.32	0.19
300.1	330.1	0.67	0.21	0.13
350.1	380.1	0.83	0.35	0.23
400.1	430.1	0.59	0.20	0.16
500.1	530.1	0.53	0.33	0.25
600.1	630.1	0.71	0.48	0.29
700.1	730.1	0.94	0.56	0.31
800.1	830.1	1.19	0.69	0.42
900.1	930.1	1.23	0.73	0.47
1000.1	1030.1	1.21	0.76	0.54
1100.1	1130.1	1.09	0.72	0.54
1200.1	1230.1	0.91	0.51	0.42
1300.1	1330.1	0.93	0.47	0.38
1400.1	1430.1	1.00	0.50	0.38
1500.1	1530.1	1.01	0.47	0.32
1600.1	1630.1	1.18	0.66	0.41
1700.1	1730.1	1.25	0.70	0.46
1800.1	1830.1	1.36	0.84	0.63
1900.1	1930.1	1.33	0.95	0.83
2000.1	2030.1	1.22	0.83	0.85
2100.1	2130.1	1.43	0.86	0.85
2250.1	2280.1	1.75	1.05	0.92
2400.1	2430.1	2.00	1.22	1.03
2550.1	2580.1	1.80	1.06	0.85
2700.1	2730.1	1.85	1.18	0.98
2850.1	2880.1	1.61	1.05	0.91
3000.1	3030.1	1.56	1.09	1.07
3200.1	3230.1	2.09	1.20	0.92
3400.1	3430.1	2.27	1.16	0.73
3600.1	3630.1	2.36	1.04	0.65
3800.1	3830.1	2.65	1.35	0.80
4000.1	4030.1	3.03	1.64	0.63

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1200.1MHz (dB)
		@LO (dBm)
		+23
5.0	1195.1	7.78
10.0	1190.1	7.71
15.0	1185.1	7.70
20.0	1180.1	7.74
25.0	1175.1	7.77
30.0	1170.1	7.78
40.0	1160.1	7.74
50.0	1150.1	7.72
60.0	1140.1	7.77
80.0	1120.1	7.81
100.0	1100.1	7.75
120.0	1080.1	7.81
140.0	1060.1	7.74
160.0	1040.1	7.82
185.0	1015.1	7.77
210.0	990.1	7.69
235.0	965.1	7.68
260.0	940.1	7.70
285.0	915.1	7.61
310.0	890.1	7.56
340.0	860.1	7.53
370.0	830.1	7.56
400.0	800.1	7.49
430.0	770.1	7.52
460.0	740.1	7.55
490.0	710.1	7.47
520.0	680.1	7.55
550.0	650.1	7.57
580.0	620.1	7.67
610.0	590.1	7.62
640.0	560.1	7.72
670.0	530.1	7.84
700.0	500.1	7.69
730.0	470.1	7.80
760.0	440.1	7.82
800.0	400.1	7.92
850.0	350.1	7.82
900.0	300.1	7.97
950.0	250.1	7.86
1000.0	200.1	8.05

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=10.1MHz (dB)
		@LO (dBm)
		+23
5.0	15.1	7.24
10.0	20.1	7.20
15.0	25.1	7.23
20.0	30.1	7.31
25.0	35.1	7.34
30.0	40.1	7.30
40.0	50.1	7.21
50.0	60.1	7.35
60.0	70.1	7.37
80.0	90.1	7.33
100.0	110.1	7.35
120.0	130.1	7.53
140.0	150.1	7.33
160.0	170.1	7.48
185.0	195.1	7.49
210.0	220.1	7.46
235.0	245.1	7.41
260.0	270.1	7.45
285.0	295.1	7.48
310.0	320.1	7.41
340.0	350.1	7.32
370.0	380.1	7.30
400.0	410.1	7.36
430.0	440.1	7.44
460.0	470.1	7.43
490.0	500.1	7.35
520.0	530.1	7.44
550.0	560.1	7.36
580.0	590.1	7.29
610.0	620.1	7.31
640.0	650.1	7.22
670.0	680.1	7.23
700.0	710.1	7.22
730.0	740.1	7.21
760.0	770.1	7.22
800.0	810.1	7.25
850.0	860.1	7.28
900.0	910.1	7.37
950.0	960.1	7.43
1000.0	1010.1	7.51

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=2400.1MHz (dB)
		@LO (dBm)
		+23
5.0	2395.1	8.03
10.0	2390.1	7.91
15.0	2385.1	7.86
20.0	2380.1	7.86
25.0	2375.1	7.85
30.0	2370.1	7.87
40.0	2360.1	7.90
50.0	2350.1	7.89
60.0	2340.1	7.88
80.0	2320.1	7.94
100.0	2300.1	8.01
120.0	2280.1	7.99
140.0	2260.1	7.97
160.0	2240.1	7.97
185.0	2215.1	8.04
210.0	2190.1	8.02
235.0	2165.1	8.01
260.0	2140.1	7.97
285.0	2115.1	8.05
310.0	2090.1	8.03
340.0	2060.1	8.02
370.0	2030.1	8.11
400.0	2000.1	8.21
430.0	1970.1	8.29
460.0	1940.1	8.36
490.0	1910.1	8.45
520.0	1880.1	8.55
550.0	1850.1	8.56
580.0	1820.1	8.70
610.0	1790.1	8.66
640.0	1760.1	8.66
670.0	1730.1	8.72
700.0	1700.1	8.60
730.0	1670.1	8.50
760.0	1640.1	8.49
800.0	1600.1	8.40
850.0	1550.1	8.35
900.0	1500.1	8.25
950.0	1450.1	8.22
1000.0	1400.1	8.20

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB) @LO (dBm)			LO-IF ISOLATION (dB) @LO (dBm)		
	+20	+23	+26	+20	+23	+26
10.1	40.09	43.64	48.14	27.49	31.15	34.03
20.1	41.63	46.13	50.27	27.92	31.52	34.49
50.1	41.97	46.51	49.99	27.43	30.93	33.88
70.1	41.13	45.92	49.75	27.07	30.33	33.11
100.1	41.04	45.89	49.52	26.75	29.75	32.24
140.1	42.00	46.45	47.49	26.40	29.36	32.12
180.1	42.85	46.47	46.81	26.08	29.20	31.88
220.1	44.02	45.34	44.53	25.70	29.11	31.67
260.1	45.01	45.76	44.65	25.43	28.92	31.40
300.1	44.20	42.33	40.88	25.37	28.68	30.52
350.1	42.58	40.93	40.90	26.15	29.33	30.93
400.1	41.09	38.49	38.12	25.75	28.84	29.77
500.1	37.68	35.78	35.97	26.56	28.75	29.32
600.1	34.82	34.58	34.76	27.33	28.69	28.80
700.1	33.67	33.81	33.66	27.49	28.50	28.18
800.1	32.91	33.02	32.99	27.54	27.82	27.11
900.1	32.91	32.88	32.57	27.47	27.31	26.26
1000.1	33.43	33.47	33.04	27.15	26.64	25.48
1100.1	33.87	34.20	33.58	26.72	25.99	24.81
1200.1	33.92	34.43	33.80	26.53	25.75	24.55
1300.1	34.56	34.36	33.70	26.62	25.68	24.42
1400.1	34.88	35.83	34.74	26.94	25.56	24.16
1500.1	35.88	36.37	34.72	26.89	25.63	24.38
1600.1	38.32	36.59	34.38	26.43	25.38	24.58
1700.1	39.61	35.99	33.65	26.69	25.61	24.83
1800.1	39.62	36.77	34.39	27.04	26.16	25.44
1900.1	39.92	36.62	34.62	26.90	26.00	25.46
2000.1	40.11	37.81	35.74	26.66	25.92	25.52
2100.1	40.42	38.99	37.06	26.71	25.99	25.55
2250.1	40.50	39.33	38.08	26.65	25.80	25.05
2400.1	40.65	38.83	38.17	27.00	26.88	26.62
2550.1	38.36	38.65	37.87	27.99	27.80	27.25
2700.1	34.18	34.24	33.53	27.68	28.04	28.38
2850.1	28.14	28.21	27.91	28.62	30.34	31.05
3000.1	23.76	23.97	24.13	32.68	37.15	38.50
3200.1	23.79	24.31	24.67	31.69	37.77	45.28
3400.1	24.73	26.73	28.41	29.89	34.87	39.92
3600.1	24.85	26.49	28.09	28.42	32.65	35.65
3800.1	25.04	26.85	29.06	27.11	30.59	33.86
4000.1	24.83	26.62	29.00	25.77	29.76	32.75

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB) @LO (dBm)		
		+20	+23	+26
10.1	40.1	17.02	16.54	16.42
20.1	50.1	17.10	16.75	16.75
50.1	80.1	16.81	16.55	16.22
70.1	100.1	17.01	16.52	16.01
100.1	130.1	17.39	16.71	16.67
140.1	170.1	17.40	17.34	17.35
180.1	210.1	17.34	17.20	16.84
220.1	250.1	16.92	16.57	16.45
260.1	290.1	16.39	16.40	16.22
300.1	330.1	17.80	17.45	17.44
350.1	380.1	17.25	17.26	17.12
400.1	430.1	18.19	17.84	17.91
500.1	530.1	19.13	18.85	19.05
600.1	630.1	19.60	19.42	19.79
700.1	730.1	20.12	19.77	19.86
800.1	830.1	19.95	19.18	18.92
900.1	930.1	19.58	18.63	18.22
1000.1	1030.1	19.23	18.44	18.09
1100.1	1130.1	20.27	19.07	18.52
1200.1	1230.1	21.36	20.56	20.02
1300.1	1330.1	22.72	21.76	21.39
1400.1	1430.1	23.10	21.78	21.18
1500.1	1530.1	22.92	22.08	21.43
1600.1	1630.1	23.74	23.25	22.50
1700.1	1730.1	22.58	22.49	22.77
1800.1	1830.1	21.75	21.74	22.53
1900.1	1930.1	21.79	21.50	22.09
2000.1	2030.1	22.42	21.57	21.93
2100.1	2130.1	24.48	23.19	22.92
2250.1	2280.1	24.94	25.77	26.41
2400.1	2430.1	24.39	25.96	28.25
2550.1	2580.1	23.40	24.79	26.83
2700.1	2730.1	24.22	25.83	27.52
2850.1	2880.1	22.93	23.56	23.49
3000.1	3030.1	23.35	23.15	22.60
3200.1	3230.1	26.48	27.37	28.74
3400.1	3430.1	27.83	28.46	31.81
3600.1	3630.1	33.01	28.83	27.31
3800.1	3830.1	26.85	24.58	26.37
4000.1	4030.1	26.21	25.75	28.29

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1) @LO (dBm)		
		+20	+23	+26
10.1	40.1	1.20	1.07	1.10
20.1	50.1	1.17	1.04	1.12
50.1	80.1	1.19	1.05	1.11
70.1	100.1	1.24	1.08	1.09
100.1	130.1	1.24	1.10	1.10
140.1	170.1	1.25	1.12	1.13
180.1	210.1	1.25	1.14	1.17
220.1	250.1	1.25	1.17	1.18
260.1	290.1	1.30	1.20	1.20
300.1	330.1	1.33	1.23	1.21
350.1	380.1	1.30	1.23	1.21
400.1	430.1	1.35	1.25	1.21
500.1	530.1	1.32	1.21	1.17
600.1	630.1	1.25	1.12	1.08
700.1	730.1	1.21	1.10	1.05
800.1	830.1	1.30	1.22	1.19
900.1	930.1	1.49	1.41	1.37
1000.1	1030.1	1.69	1.58	1.52
1100.1	1130.1	1.83	1.71	1.64
1200.1	1230.1	1.91	1.78	1.70
1300.1	1330.1	1.86	1.72	1.65
1400.1	1430.1	1.72	1.58	1.50
1500.1	1530.1	1.52	1.40	1.33
1600.1	1630.1	1.33	1.25	1.20
1700.1	1730.1	1.35	1.32	1.30
1800.1	1830.1	1.62	1.58	1.57
1900.1	1930.1	2.04	1.96	1.90
2000.1	2030.1	2.53	2.42	2.31
2100.1	2130.1	2.76	2.60	2.51
2250.1	2280.1	2.42	2.19	2.04
2400.1	2430.1	1.82	1.67	1.57
2550.1	2580.1	1.30	1.29	1.32
2700.1	2730.1	1.25	1.39	1.50
2850.1	2880.1	1.45	1.45	1.48
3000.1	3030.1	1.94	1.76	1.61
3200.1	3230.1	3.76	3.26	2.91
3400.1	3430.1	5.93	7.44	9.48
3600.1	3630.1	5.22	7.31	10.62
3800.1	3830.1	2.20	2.42	2.58
4000.1	4030.1	2.59	2.72	2.81

LO (MHz)	LO VSWR (:1) @LO (dBm)		
	+20	+23	+26
10.1	1.23	1.39	1.96
20.1	1.17	1.32	1.78
50.1	1.15	1.30	1.60
70.1	1.20	1.38	1.86
100.1	1.22	1.39	1.97
140.1	1.15	1.30	1.62
180.1	1.22	1.43	2.07
220.1	1.17	1.29	1.61
260.1	1.19	1.43	2.08
300.1	1.18	1.34	1.69
350.1	1.19	1.43	2.05
400.1	1.11	1.37	1.73
500.1	1.09	1.39	1.77
600.1	1.07	1.43	1.80
700.1	1.07	1.43	1.77
800.1	1.09	1.41	1.73
900.1	1.18	1.42	1.73
1000.1	1.29	1.45	1.74
1100.1	1.36	1.44	1.78
1200.1	1.47	1.45	1.83
1300.1	1.54	1.45	1.81
1400.1	1.56	1.43	1.67
1500.1	1.54	1.36	1.49
1600.1	1.50	1.30	1.39
1700.1	1.49	1.28	1.35
1800.1	1.55	1.28	1.33
1900.1	1.61	1.29	1.28
2000.1	1.75	1.32	1.19
2100.1	1.89	1.36	1.11
2250.1	1.80	1.34	1.16
2400.1	1.83	1.41	1.34
2550.1	1.72	1.44	1.49
2700.1	1.50	1.37	1.48
2850.1	1.56	1.39	1.47
3000.1	1.87	1.50	1.51
3200.1	2.02	1.62	1.76
3400.1	1.69	1.84	2.08
3600.1	1.74	2.12	2.52
3800.1	1.95	2.27	2.51
4000.1	2.58	2.77	2.81

IF (OUT) (MHz)	IF VSWR @LO=2400.1MHz (:1) @LO (dBm)		
	+20	+23	+26
5.0	1.16	1.06	1.09
10.0	1.16	1.05	1.08
15.0	1.16	1.05	1.07
20.0	1.17	1.05	1.07
25.0	1.17	1.05	1.06
30.0	1.17	1.05	1.06
40.0	1.18	1.05	1.06
50.0	1.18	1.06	1.06
60.0	1.18	1.06	1.06
80.0	1.18	1.07	1.07
100.0	1.18	1.08	1.08
120.0	1.19	1.09	1.09
140.0	1.21	1.10	1.10
160.0	1.21	1.11	1.11
185.0	1.23	1.13	1.12
210.0	1.24	1.15	1.14
235.0	1.26	1.17	1.15
260.0	1.28	1.19	1.17
285.0	1.28	1.20	1.18
310.0	1.30	1.21	1.19
340.0	1.31	1.23	1.21
370.0	1.32	1.24	1.22
400.0	1.32	1.25	1.22
430.0	1.33	1.26	1.23
460.0	1.33	1.25	1.23
490.0	1.32	1.24	1.23
520.0	1.31	1.24	1.22
550.0	1.29	1.22	1.22
580.0	1.26	1.20	1.20
610.0	1.24	1.19	1.20
640.0	1.22	1.18	1.20
670.0	1.20	1.18	1.21
700.0	1.18	1.18	1.21
730.0	1.18	1.18	1.23
760.0	1.17	1.18	1.22
800.0	1.16	1.17	1.22
850.0	1.16	1.16	1.20
900.0	1.15	1.13	1.16
950.0	1.15	1.10	1.12
1000.0	1.17	1.09	1.06

Harmonics Tables

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	10	28	27	27	37	39	47	66	41	50
1	-	18	+0	34	16	41	24	57	38	60	53	53
2	85	43	37	43	44	45	40	41	49	56	60	72
3	>121	66	40	56	41	51	43	59	54	55	50	62
4	>123	62	60	70	62	60	59	61	52	63	52	59
5	>124	81	71	68	58	71	58	70	61	67	62	62
6	>121	73	70	70	82	76	75	75	74	69	69	74
7	>123	89	79	85	70	78	72	81	67	83	68	76
8	>124	97	89	84	86	86	82	87	90	90	78	82
9	>121	103	93	106	90	106	84	82	93	84	83	93
10	>121	102	97	101	98	98	105	90	96	95	97	96
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 1200.1 MHz; 14.96.00 dBm.
LO IN: 1230.01 MHz; +23.00 dBm
IF OUT: 29.91 MHz; 7.33 dBm

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	+0	16	16	14	23	24	29	39	19	35
1	-	18	+0	33	16	41	24	46	37	45	48	50
2	93	54	49	52	52	55	48	52	53	62	58	68
3	>122	75	61	71	61	67	62	74	65	69	63	83
4	>122	89	88	89	89	85	87	87	81	90	77	86
5	>122	104	98	105	96	105	93	98	95	104	94	96
6	>121	113	107	112	108	>123	>123	115	107	>122	106	>121
7	>119	>119	>119	>117	119	>119	>120	>120	>117	>120	>117	>121
8	>121	>121	>118	>119	>120	>121	>122	>121	>120	>121	>121	>124
9	>119	>121	>123	>121	>121	>123	>122	>121	>121	>121	>121	>121
10	>120	>121	>120	>123	>121	>119	>121	>123	>123	>123	>121	>124
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

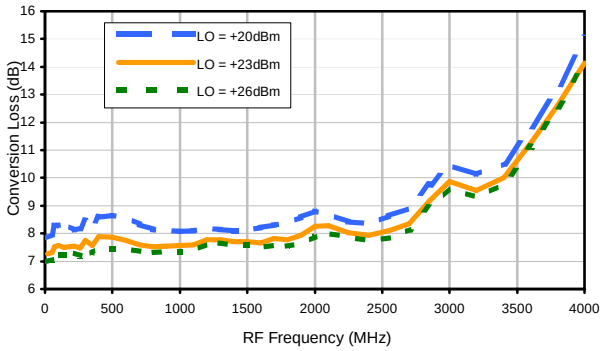
Test conditions: RF IN: 1200.1 MHz; 4.98.00 dBm.
LO IN: 1230.01 MHz; +23.00 dBm
IF OUT: 29.91 MHz; -2.59 dBm

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

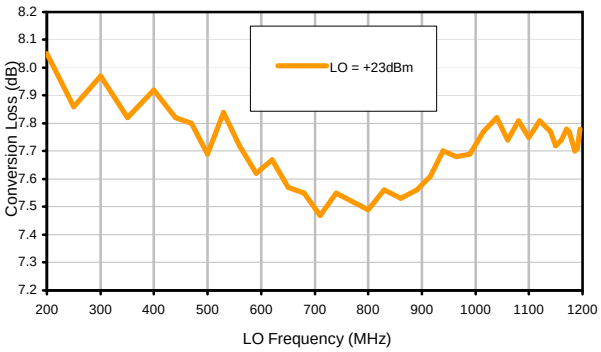
Frequency Mixer SAY-11+

Typical Performance Curves

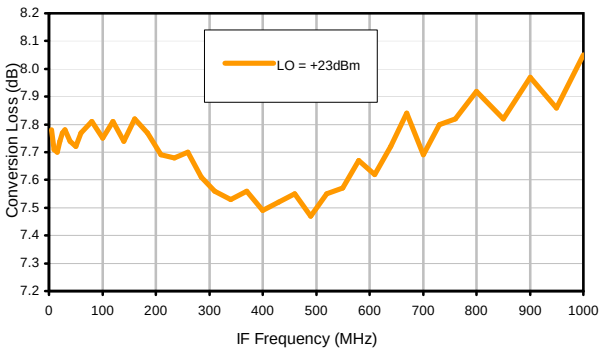
Conversion Loss @ IF=30MHz



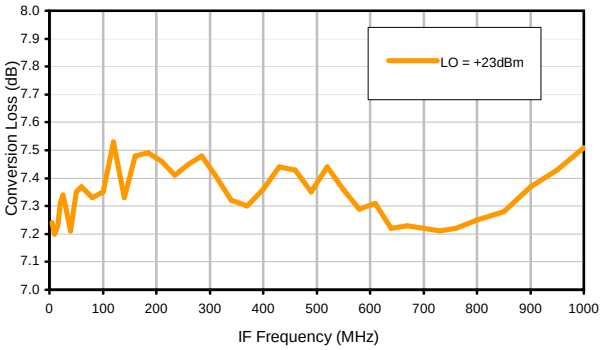
Conversion Loss vs. LO @ RF=1200.1MHz



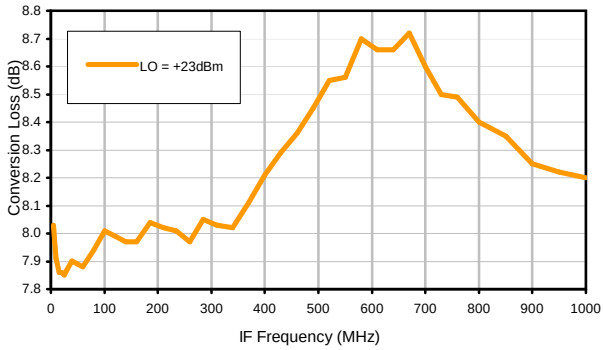
Conversion Loss vs. IF @ RF=1200.1MHz



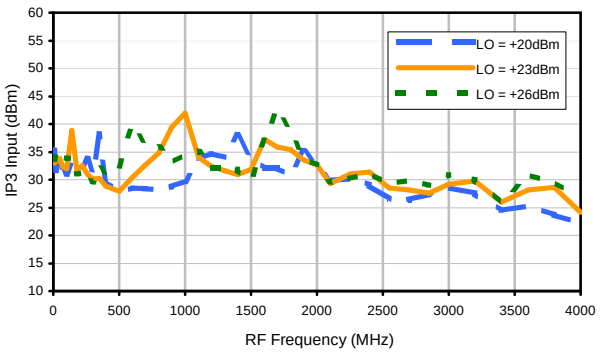
Conversion Loss vs. IF @ RF=10.1MHz



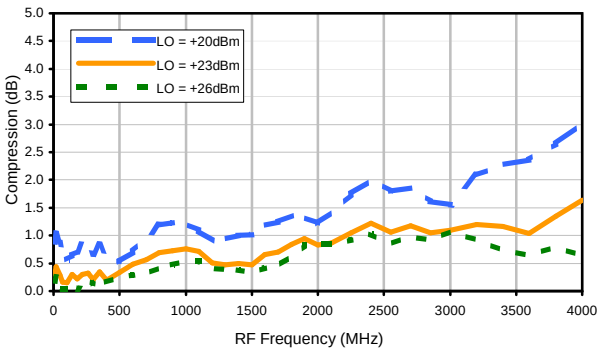
Conversion Loss vs. IF @ RF=2400.1MHz



IP3 Input

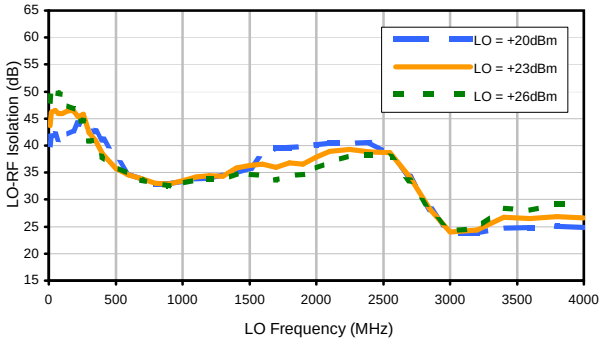


Compression @ RF IN=+20dBm

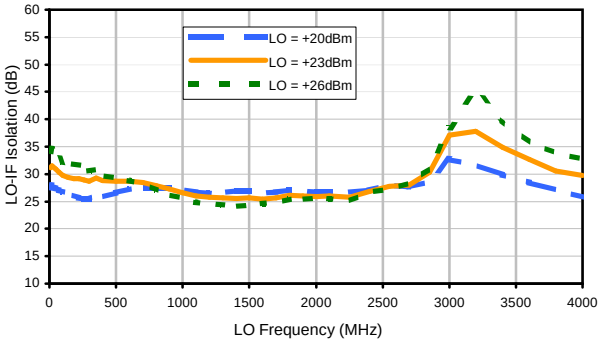


Typical Performance Curves

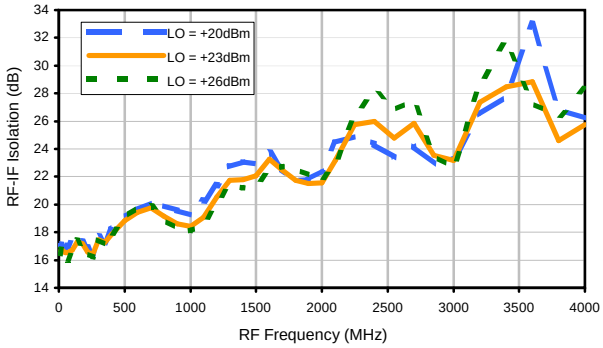
LO-RF Isolation



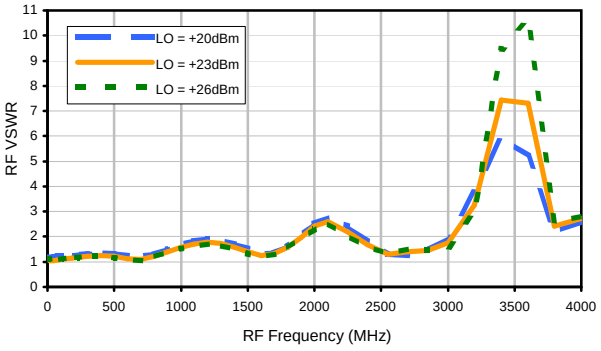
LO-IF Isolation



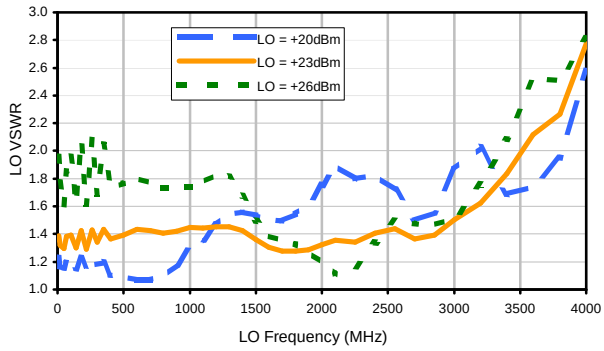
RF-IF Isolation



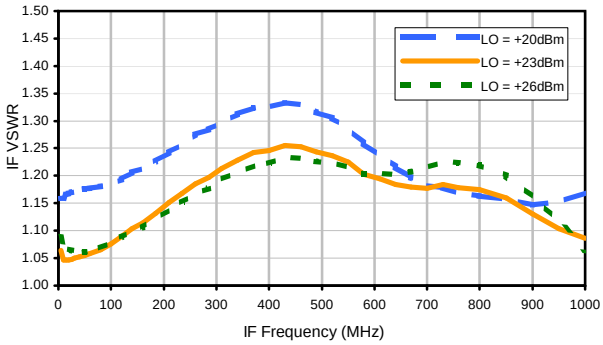
RF VSWR



LO VSWR



IF VSWR



Harmonics Tables

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	10	28	27	27	37	39	47	66	41	50
1	-	18	+0	34	16	41	24	57	38	60	53	53
2	85	43	37	43	44	45	40	41	49	56	60	72
3	>121	66	40	56	41	51	43	59	54	55	50	62
4	>123	62	60	70	62	60	59	61	52	63	52	59
5	>124	81	71	68	58	71	58	70	61	67	62	62
6	>121	73	70	70	82	76	75	75	74	69	69	74
7	>123	89	79	85	70	78	72	81	67	83	68	76
8	>124	97	89	84	86	86	82	87	90	90	78	82
9	>121	103	93	106	90	106	84	82	93	84	83	93
10	>121	102	97	101	98	98	105	90	96	95	97	96
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 1200.1 MHz; 14.96.00 dBm.
LO IN: 1230.01 MHz; +23.00 dBm
IF OUT: 29.91 MHz; 7.33 dBm

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	+0	16	16	14	23	24	29	39	19	35
1	-	18	+0	33	16	41	24	46	37	45	48	50
2	93	54	49	52	52	55	48	52	53	62	58	68
3	>122	75	61	71	61	67	62	74	65	69	63	83
4	>122	89	88	89	89	85	87	87	81	90	77	86
5	>122	104	98	105	96	105	93	98	95	104	94	96
6	>121	113	107	112	108	>123	>123	115	107	>122	106	>121
7	>119	>119	>119	>117	119	>119	>120	>120	>117	>120	>117	>121
8	>121	>121	>118	>119	>120	>121	>122	>121	>120	>121	>121	>124
9	>119	>121	>123	>121	>121	>123	>122	>121	>121	>121	>121	>121
10	>120	>121	>120	>123	>121	>119	>121	>123	>123	>123	>121	>124
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

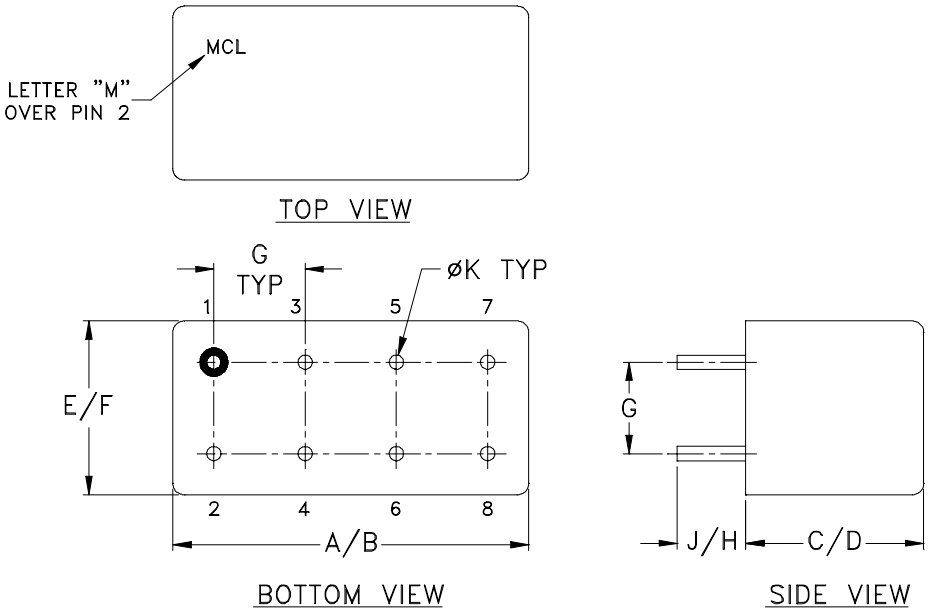
Test conditions: RF IN: 1200.1 MHz; 4.98.00 dBm.
LO IN: 1230.01 MHz; +23.00 dBm
IF OUT: 29.91 MHz; -2.59 dBm

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

Case Style A

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. ± .03; 3 Pl. ± .015

Notes:

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

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Environmental Specifications ENV01

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

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
Gross Leak	125°C Bubble Test	MIL-STD-202, Method 112, Condition D
Barometric Pressure	100,000 Feet	MIL-STD-202, Method 105, Condition D