

Frequency Mixer

SAY-1+

Level 23 (LO Power +23 dBm) 0.1 to 500 MHz



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, 4.85 dB typ.
- high isolation, 46 dB typ. L-R & L-I
- rugged welded construction
- hermetically sealed

Applications

- VHF/UHF
- instrumentation
- defense & federal communication

Electrical Specifications

FREQUENCY (MHz)		CONVERSION LOSS (dB)				LO-RF ISOLATION (dB)						LO-IF ISOLATION (dB)											
LO/RF	IF	Mid-Band m		Total Range Max.	L			M			U			L			M			U			
f_L-f_U		\bar{X}	σ	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	
0.1-500	0.01-500*	4.85	0.18	6.0	7.5	40	20	46	35	40	30	37	23	46	35	40	30						

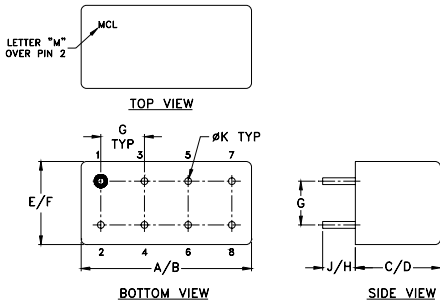
1 dB COMP.: +20 dBm typ.

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]

*IF response from 0.01 to 0.1 MHz falls off 3 dB

m = mid band [$2f_L$ to $f_U/2$]

Outline Drawing



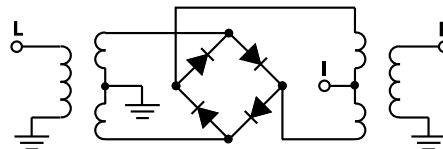
Outline Dimensions (inch/mm)

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	

Typical Performance Data

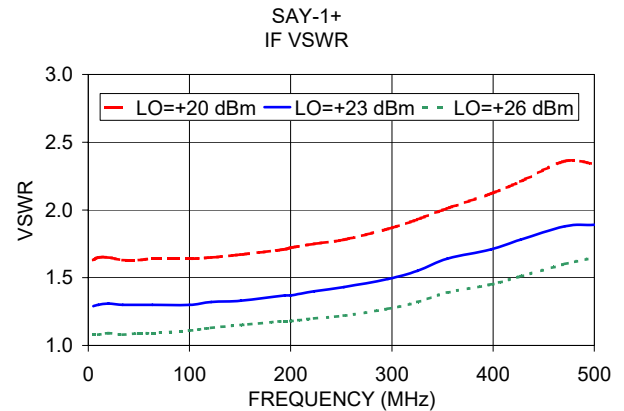
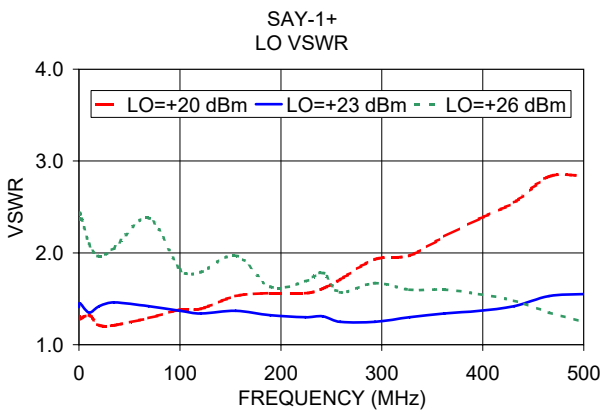
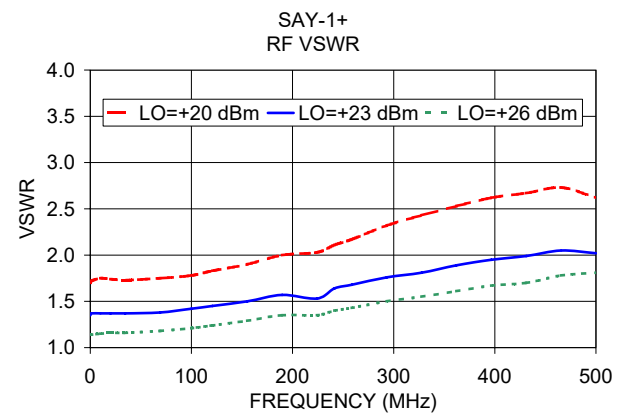
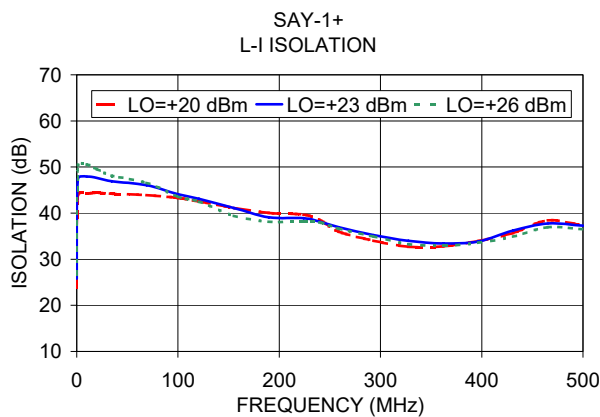
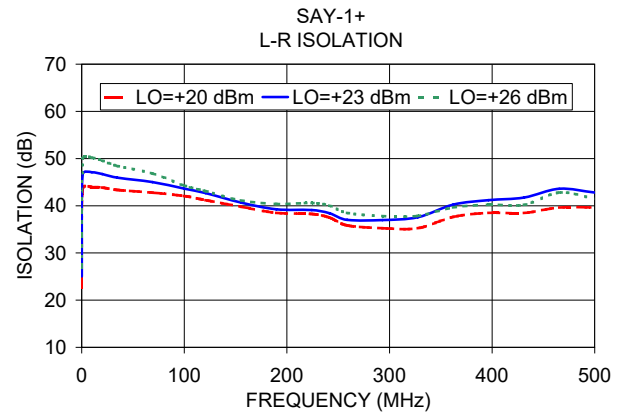
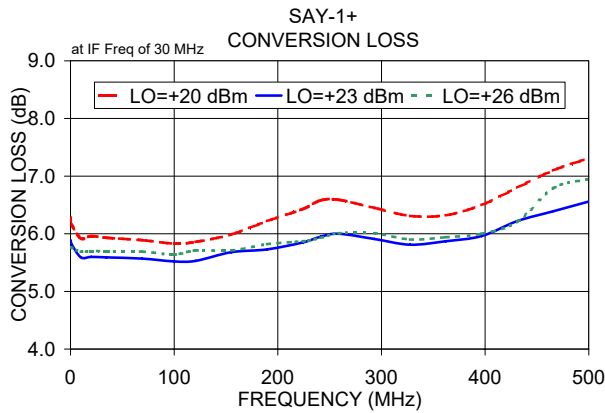
Frequency (MHz)		Conversion Loss (dB)	Isolation L-R (dB)	Isolation L-I (dB)	VSWR RF Port (:1)	VSWR LO Port (:1)
RF	LO	LO +23dBm	LO +23dBm	LO +23dBm	LO +23dBm	LO +23dBm
0.10	30.10	5.89	25.02	25.81	1.35	1.41
1.00	31.00	5.82	46.68	47.33	1.37	1.45
10.00	40.00	5.59	47.08	47.94	1.37	1.35
20.00	50.00	5.60	46.71	47.64	1.37	1.42
34.58	64.58	5.59	45.97	46.92	1.37	1.46
69.05	99.05	5.57	45.02	46.05	1.38	1.42
100.00	70.00	5.52	43.63	44.10	1.42	1.37
120.77	90.77	5.53	42.68	43.10	1.45	1.34
155.24	125.24	5.68	40.68	41.09	1.50	1.37
189.72	159.72	5.73	39.25	39.09	1.57	1.32
224.19	194.19	5.85	39.09	38.89	1.53	1.30
241.43	211.43	5.95	38.42	38.05	1.64	1.31
258.67	228.67	6.00	37.01	36.93	1.68	1.25
293.15	263.15	5.91	36.97	35.23	1.76	1.25
327.62	297.62	5.81	37.56	34.01	1.81	1.30
362.10	332.10	5.87	40.25	33.42	1.89	1.34
396.57	366.57	5.96	41.18	33.85	1.95	1.37
431.05	401.05	6.22	41.74	36.25	1.99	1.42
465.53	435.53	6.39	43.60	37.76	2.05	1.53
500.00	470.00	6.56	42.79	37.30	2.02	1.55

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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SAY-1+

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=+19.92dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
		+20	+23	+26			+20	+23	+26			+20	+23	+26
0.1	30.1	6.28	5.89	5.76	10.1	40.1	32.81	32.55	33.26	10.1	40.1	1.00	0.52	0.28
1.0	31.0	6.16	5.82	5.76	20.1	50.1	34.30	35.03	35.57	20.1	50.1	1.22	0.71	0.43
10.0	40.0	5.92	5.59	5.69	30.1	60.1	35.53	34.86	35.46	30.1	60.1	1.36	0.80	0.47
20.1	50.1	5.43	5.11	4.95	40.1	70.1	34.58	34.98	35.65	40.1	70.1	1.28	0.73	0.40
30.1	60.1	5.49	5.13	4.94	50.1	80.1	39.15	34.03	34.78	50.1	80.1	1.24	0.63	0.32
40.1	70.1	5.49	5.13	4.96	70.1	100.1	32.12	33.43	32.86	70.1	100.1	0.91	0.43	0.18
50.1	80.1	5.52	5.15	4.98	90.1	120.1	30.36	32.76	33.06	90.1	120.1	0.87	0.47	0.24
70.1	100.1	5.75	5.32	5.09	110.1	140.1	33.83	33.48	34.86	110.1	140.1	1.06	0.60	0.33
90.1	120.1	5.87	5.44	5.18	130.1	160.1	30.69	31.91	34.55	130.1	160.1	1.18	0.74	0.45
110.1	140.1	5.68	5.30	5.09	150.1	180.1	28.48	31.64	37.10	150.1	180.1	1.14	0.70	0.40
130.1	160.1	5.81	5.37	5.11	170.1	200.1	30.02	32.14	34.82	170.1	200.1	0.90	0.44	0.19
150.1	180.1	6.09	5.49	5.19	190.1	220.1	28.03	31.17	34.86	190.1	220.1	0.70	0.41	0.23
170.1	200.1	6.07	5.51	5.24	220.1	250.1	30.10	33.72	34.42	220.1	250.1	1.14	0.71	0.42
190.1	220.1	6.26	5.69	5.36	250.1	280.1	30.03	35.24	35.23	250.1	280.1	0.98	0.52	0.28
220.1	250.1	6.08	5.50	5.23	280.1	310.1	30.49	32.72	35.11	280.1	310.1	0.67	0.36	0.16
250.1	280.1	6.43	5.71	5.41	310.1	340.1	32.53	34.72	36.30	310.1	340.1	1.05	0.60	0.34
280.1	310.1	6.29	5.73	5.49	340.1	370.1	33.95	39.53	38.21	340.1	370.1	1.04	0.50	0.25
340.1	370.1	6.60	5.85	5.59	370.1	400.1	35.83	35.88	35.46	370.1	400.1	0.56	0.24	0.09
370.1	400.1	6.40	5.82	5.63	400.1	430.1	37.10	38.33	36.87	400.1	430.1	0.86	0.41	0.21
400.1	430.1	6.32	5.79	5.62	450.1	480.1	34.35	36.76	40.14	450.1	480.1	0.48	0.21	0.07
450.1	480.1	7.27	6.28	6.01	500.1	530.1	27.51	37.22	38.23	500.1	530.1	0.46	0.33	0.20
500.1	530.1	7.30	6.33	6.01	550.1	580.1	35.31	33.62	36.65	550.1	580.1	0.18	0.12	0.05
550.1	580.1	8.11	6.82	6.39	600.1	630.1	27.71	37.44	36.09	600.1	630.1	0.40	0.30	0.17
600.1	630.1	7.81	6.64	6.30	650.1	680.1	29.19	33.53	34.38	650.1	680.1	0.20	0.20	0.08
650.1	680.1	8.44	7.00	6.60	700.1	730.1	31.14	34.14	36.70	700.1	730.1	0.81	0.37	0.18
700.1	730.1	7.77	6.63	6.35	800.1	830.1	32.10	31.33	36.17	800.1	830.1	1.01	0.39	0.18
800.1	830.1	7.70	6.76	6.49	900.1	930.1	28.96	31.39	35.60	900.1	930.1	1.07	0.44	0.22
900.1	930.1	7.68	6.82	6.53	1000.1	1030.1	31.83	35.22	38.80	1000.1	1030.1	0.85	0.32	0.15
1000.1	1030.1	8.48	7.64	7.31	1100.1	1130.1	30.83	28.87	35.03	1100.1	1130.1	1.21	0.46	0.21
1200.1	1230.1	7.62	7.08	6.90	1200.1	1230.1	28.60	30.53	37.24	1200.1	1230.1	1.35	0.50	0.19
1300.1	1330.1	7.71	7.17	6.98	1300.1	1330.1	29.16	33.29	37.49	1300.1	1330.1	1.33	0.52	0.21
1400.1	1430.1	7.85	7.29	7.10	1400.1	1430.1	27.03	29.28	35.00	1400.1	1430.1	1.30	0.54	0.23
1500.1	1530.1	7.92	7.35	7.17	1500.1	1530.1	26.14	29.63	33.77	1500.1	1530.1	1.29	0.56	0.25
1600.1	1630.1	8.10	7.47	7.26	1600.1	1630.1	25.61	30.55	35.66	1600.1	1630.1	1.26	0.54	0.23
1700.1	1730.1	8.60	7.78	7.48	1700.1	1730.1	25.94	28.31	36.25	1700.1	1730.1	1.09	0.48	0.22
1800.1	1830.1	9.10	8.16	7.83	1800.1	1830.1	27.14	27.00	31.83	1800.1	1830.1	0.97	0.42	0.22
1900.1	1930.1	9.52	8.55	8.20	1900.1	1930.1	25.36	26.36	34.39	1900.1	1930.1	1.09	0.50	0.26
2000.1	2030.1	10.08	9.11	8.69	2000.1	2030.1	24.42	29.20	34.54	2000.1	2030.1	1.12	0.55	0.29
2100.1	2130.1	10.66	9.76	9.37	2100.1	2130.1	25.67	30.12	32.94	2100.1	2130.1	1.22	0.61	0.33
2200.1	2230.1	10.89	10.09	9.69	2200.1	2230.1	25.62	29.72	33.50	2200.1	2230.1	1.47	0.81	0.44

REV. X2

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Frequency Mixer

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Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=250.1MHz (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)=500.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+23			+23			+23
0.5	249.6	5.91	0.5	10.6	5.17	0.5	499.6	6.43
1.0	249.1	5.87	0.8	10.9	5.16	0.8	499.4	6.44
1.5	248.6	5.85	1.0	11.1	5.14	1.0	499.1	6.40
2.0	248.1	5.85	2.0	12.1	5.10	2.0	498.1	6.35
2.5	247.6	5.82	3.0	13.1	5.09	3.0	497.1	6.33
3.0	247.1	5.83	4.0	14.1	5.09	4.0	496.1	6.32
4.0	246.1	5.81	5.0	15.1	5.09	5.0	495.1	6.30
5.0	245.1	5.82	6.0	16.1	5.09	6.0	494.1	6.29
6.0	244.1	5.81	8.0	18.1	5.12	8.0	492.1	6.28
8.0	242.1	5.78	10.0	20.1	5.12	10.0	490.1	6.26
10.0	240.1	5.75	15.0	25.1	5.14	15.0	485.1	6.24
15.0	235.1	5.64	20.0	30.1	5.18	20.0	480.1	6.27
20.0	230.1	5.65	25.0	35.1	5.19	25.0	475.1	6.30
25.0	225.1	5.69	30.0	40.1	5.13	30.0	470.1	6.37
30.0	220.1	5.79	35.0	45.1	5.06	35.0	465.1	6.40
35.0	215.1	5.82	40.0	50.1	5.10	40.0	460.1	6.36
40.0	210.1	5.76	45.0	55.1	5.14	45.0	455.1	6.32
45.0	205.1	5.73	50.0	60.1	5.17	50.0	450.1	6.31
50.0	200.1	5.73	70.0	80.1	5.12	70.0	430.1	6.29
55.0	195.1	5.79	90.0	100.1	5.11	90.0	410.1	6.35
60.0	190.1	5.93	110.0	120.1	5.19	110.0	390.1	6.33
65.0	185.1	5.96	130.0	140.1	5.04	130.0	370.1	6.52
70.0	180.1	5.85	150.0	160.1	5.15	150.0	350.1	6.45
80.0	170.1	5.77	170.0	180.1	5.12	170.0	330.1	6.46
90.0	160.1	5.94	190.0	200.1	5.04	190.0	310.1	6.59
100.0	150.1	5.99	210.0	220.1	5.14	210.0	290.1	6.50
110.0	140.1	5.84	230.0	240.1	5.00	230.0	270.1	6.67
120.0	130.1	5.95	250.0	260.1	4.99	250.0	250.1	6.93
130.0	120.1	5.87	270.0	280.1	5.02	270.0	230.1	6.80
140.0	110.1	5.86	290.0	300.1	4.98	290.0	210.1	6.90
150.0	100.1	5.87	310.0	320.1	4.99	310.0	190.1	7.06
160.0	90.1	5.87	330.0	340.1	4.97	330.0	170.1	6.87
170.0	80.1	5.74	350.0	360.1	5.00	350.0	150.1	7.03
180.0	70.1	5.80	370.0	380.1	5.00	370.0	130.1	7.08
190.0	60.1	5.88	390.0	400.1	5.01	390.0	110.1	6.82
200.0	50.1	5.79	410.0	420.1	5.00	410.0	90.1	6.87
210.0	40.1	5.72	430.0	440.1	5.03	430.0	70.1	6.68
220.0	30.1	5.70	450.0	460.1	5.14	450.0	50.1	6.60
230.0	20.1	5.63	470.0	480.1	5.14	470.0	30.1	6.59
240.0	10.1	5.60	490.0	500.1	5.22	490.0	10.1	6.40

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LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+20	+23	+26	+20	+23	+26
0.1	22.66	25.02	26.96	23.83	25.81	26.67
1.0	43.67	46.68	49.99	43.91	47.33	50.33
10.0	43.93	47.08	50.18	44.24	47.94	50.52
20.1	61.26	66.77	69.13	46.60	49.51	51.71
30.1	59.65	64.98	68.14	45.78	48.58	50.55
40.1	58.51	62.94	65.41	45.52	47.97	49.78
50.1	56.82	61.75	65.32	45.61	47.89	49.26
70.1	54.00	58.76	63.59	45.04	46.82	47.23
90.1	52.00	57.20	63.29	45.07	46.13	45.59
110.1	50.40	55.79	61.17	45.18	45.41	44.57
130.1	48.92	53.90	58.70	44.43	44.65	44.16
150.1	48.11	52.78	57.28	45.13	44.49	43.42
170.1	47.00	51.33	55.55	45.12	43.66	41.91
190.1	45.67	50.19	54.58	44.44	42.65	40.63
220.1	44.46	47.96	51.24	43.77	42.01	40.44
250.1	43.66	46.94	49.99	44.23	41.48	39.63
280.1	42.70	45.67	48.53	45.81	40.80	38.10
340.1	40.36	42.71	45.39	46.90	40.92	38.34
370.1	38.91	41.39	44.21	52.67	41.34	37.46
400.1	38.03	40.34	43.33	47.48	40.50	37.42
450.1	36.70	38.83	41.83	49.82	42.18	37.89
500.1	35.93	37.72	39.83	45.21	41.45	38.08
550.1	37.06	38.87	39.81	41.33	42.72	39.08
600.1	39.33	39.83	41.06	37.68	39.77	38.93
650.1	39.40	38.94	40.79	35.27	37.97	38.78
700.1	36.40	38.36	41.28	33.83	36.08	37.83
800.1	38.81	43.99	50.77	32.58	34.63	36.67
900.1	46.71	45.72	42.81	31.59	33.95	36.44
1000.1	31.15	32.50	33.92	31.00	33.62	36.47
1200.1	31.31	36.58	42.12	29.03	31.14	33.33
1300.1	31.90	37.79	43.31	30.00	31.65	33.31
1400.1	30.52	37.10	42.28	31.93	33.66	35.61
1500.1	28.53	33.95	38.03	34.08	37.51	40.68
1600.1	26.86	30.41	33.37	35.97	43.35	49.75
1700.1	26.45	29.18	31.75	37.98	51.99	43.26
1800.1	27.22	29.22	30.78	38.51	48.64	36.94
1900.1	27.86	29.88	31.16	39.38	40.52	32.86
2000.1	28.12	31.50	33.97	45.90	36.08	30.48
2100.1	29.11	34.20	38.95	46.02	32.20	28.41
2200.1	26.74	31.05	35.43	37.92	29.56	26.66

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+20	+23	+26
10.1	40.1	31.56	32.59	36.51
20.1	50.1	31.36	32.67	36.93
30.1	60.1	30.65	31.94	33.58
40.1	70.1	30.98	31.79	32.01
50.1	80.1	31.06	31.83	31.43
70.1	100.1	31.32	31.99	31.55
90.1	120.1	30.53	31.47	32.38
110.1	140.1	31.20	32.39	36.50
130.1	160.1	31.47	32.29	33.26
150.1	180.1	30.49	31.35	31.92
170.1	200.1	31.65	32.32	33.12
190.1	220.1	31.58	32.15	35.16
220.1	250.1	32.57	33.26	33.26
250.1	280.1	33.29	34.82	33.72
280.1	310.1	33.22	34.54	35.17
310.1	340.1	32.02	33.78	34.38
340.1	370.1	32.38	33.44	32.99
370.1	400.1	33.13	33.11	33.58
400.1	430.1	32.73	32.61	33.07
450.1	480.1	32.83	33.68	34.04
500.1	530.1	31.53	34.47	36.15
550.1	580.1	33.90	39.84	44.54
600.1	630.1	31.31	40.39	41.22
650.1	680.1	31.39	41.04	38.77
700.1	730.1	32.03	37.80	34.46
800.1	830.1	26.53	33.01	34.99
900.1	930.1	25.00	31.73	36.75
1000.1	1030.1	27.33	30.57	29.94
1100.1	1130.1	26.75	27.68	27.23
1200.1	1230.1	27.36	26.99	26.67
1300.1	1330.1	31.88	29.22	28.08
1400.1	1430.1	42.67	33.49	30.14
1500.1	1530.1	36.96	33.51	31.62
1600.1	1630.1	35.43	33.21	32.17
1700.1	1730.1	35.25	32.83	32.63
1800.1	1830.1	34.20	34.88	34.16
1900.1	1930.1	33.79	40.15	38.01
2000.1	2030.1	34.98	42.46	49.51
2100.1	2130.1	36.68	43.81	45.62
2200.1	2230.1	36.69	40.39	41.45



Frequency Mixer

SAY-1+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)		
		@LO (dBm)		
		+20	+23	+26
5.0	35.0	1.70	1.35	1.14
10.0	40.0	1.72	1.37	1.14
20.1	50.1	1.81	1.58	1.45
30.1	60.1	1.93	1.65	1.48
40.1	70.1	1.88	1.62	1.47
50.1	80.1	1.86	1.61	1.46
70.1	100.1	1.93	1.63	1.46
90.1	120.1	1.93	1.66	1.49
110.1	140.1	1.84	1.60	1.45
130.1	160.1	1.99	1.69	1.50
150.1	180.1	2.02	1.67	1.47
170.1	200.1	1.92	1.62	1.46
190.1	220.1	2.01	1.71	1.52
220.1	250.1	2.05	1.74	1.56
250.1	280.1	2.12	1.77	1.59
280.1	310.1	2.09	1.81	1.66
340.1	370.1	2.49	2.08	1.89
370.1	400.1	2.49	2.15	1.99
400.1	430.1	2.70	2.32	2.15
450.1	480.1	3.27	2.62	2.37
500.1	530.1	3.63	2.92	2.63
550.1	580.1	3.94	3.11	2.79
600.1	630.1	4.21	3.26	2.88
650.1	680.1	4.37	3.28	2.89
700.1	730.1	3.91	3.04	2.73
800.1	830.1	3.26	2.67	2.44
900.1	930.1	2.37	2.11	2.00
1000.1	1030.1	1.63	1.60	1.62
1100.1	1130.1	1.60	1.60	1.64
1200.1	1230.1	1.37	1.45	1.51
1300.1	1330.1	1.21	1.35	1.45
1400.1	1430.1	1.10	1.28	1.40
1500.1	1530.1	1.16	1.27	1.37
1600.1	1630.1	1.30	1.33	1.38
1700.1	1730.1	1.59	1.49	1.47
1800.1	1830.1	2.04	1.81	1.70
1900.1	1930.1	2.45	2.12	1.99
2000.1	2030.1	2.65	2.39	2.26
2100.1	2130.1	2.38	2.28	2.22
2200.1	2230.1	1.90	1.94	1.95

LO (MHz)	LO VSWR (:1)		
	@LO (dBm)		
	+20	+23	+26
5.0	1.31	1.41	2.36
10.0	1.28	1.45	2.43
20.1	1.23	1.28	1.69
30.1	1.20	1.24	1.53
40.1	1.22	1.22	1.48
50.1	1.24	1.23	1.52
70.1	1.33	1.29	1.71
90.1	1.37	1.31	1.82
110.1	1.34	1.26	1.60
130.1	1.35	1.23	1.46
150.1	1.41	1.22	1.52
170.1	1.46	1.24	1.68
190.1	1.47	1.23	1.58
220.1	1.44	1.13	1.37
250.1	1.55	1.12	1.42
280.1	1.68	1.15	1.38
340.1	1.87	1.23	1.28
370.1	2.21	1.34	1.26
400.1	2.25	1.38	1.19
450.1	2.72	1.52	1.20
500.1	2.62	1.57	1.18
550.1	3.61	1.87	1.37
600.1	2.68	1.71	1.36
650.1	4.31	2.33	1.76
700.1	3.03	1.94	1.64
800.1	3.08	2.10	1.96
900.1	2.89	2.21	2.20
1000.1	2.55	2.26	2.37
1100.1	2.30	2.36	2.56
1200.1	1.79	2.29	2.80
1300.1	1.46	2.14	2.88
1400.1	1.36	1.88	2.40
1500.1	1.40	1.54	1.75
1600.1	1.59	1.36	1.39
1700.1	1.78	1.35	1.21
1800.1	1.94	1.47	1.27
1900.1	2.12	1.67	1.53
2000.1	2.34	1.97	1.89
2100.1	2.36	2.29	2.37
2200.1	2.25	2.45	2.69

IF (OUT) (MHz)	IF VSWR @LO=500.1MHz (:1)		
	@LO (dBm)		
	+20	+23	+26
0.5	1.30	1.31	1.40
0.8	1.23	1.09	1.19
1.0	1.32	1.04	1.10
2.0	1.44	1.11	1.03
3.0	1.44	1.11	1.05
4.0	1.41	1.10	1.06
5.0	1.39	1.08	1.06
6.0	1.38	1.07	1.07
8.0	1.37	1.06	1.07
10.0	1.37	1.05	1.07
15.0	1.37	1.06	1.07
20.0	1.37	1.07	1.07
25.0	1.38	1.08	1.08
30.0	1.38	1.08	1.08
35.0	1.39	1.09	1.09
40.0	1.39	1.10	1.09
45.0	1.41	1.11	1.10
50.0	1.41	1.12	1.10
70.0	1.42	1.14	1.12
90.0	1.44	1.17	1.15
110.0	1.46	1.20	1.18
130.0	1.48	1.22	1.20
150.0	1.50	1.25	1.23
170.0	1.52	1.28	1.25
190.0	1.54	1.30	1.27
210.0	1.55	1.32	1.29
230.0	1.57	1.35	1.31
250.0	1.58	1.36	1.32
270.0	1.59	1.37	1.33
290.0	1.61	1.38	1.34
310.0	1.61	1.38	1.34
330.0	1.60	1.38	1.34
350.0	1.61	1.38	1.33
370.0	1.58	1.36	1.31
390.0	1.58	1.35	1.30
410.0	1.56	1.34	1.28
430.0	1.54	1.31	1.25
450.0	1.52	1.29	1.23
470.0	1.50	1.26	1.19
490.0	1.47	1.23	1.16

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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	23	36	44	54	47	54	54	52	47	57
1	-	33	+0	61	15	47	28	44	33	47	38	52
2	80	56	52	57	53	55	48	57	52	56	55	58
3	91	48	39	50	50	56	38	59	35	55	39	54
4	107	62	53	61	65	64	77	58	55	57	63	57
5	>119	62	48	61	46	60	44	58	44	58	46	61
6	>122	73	63	70	62	75	60	67	57	63	59	66
7	>121	73	57	74	58	71	60	65	60	60	69	63
8	>122	88	69	85	73	103	66	79	65	75	62	72
9	>122	83	74	80	81	74	75	74	67	73	66	69
10	>121	92	77	106	74	92	75	89	78	89	81	94
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 250.1 MHz; 15.07.00 dBm.
 LO IN: 280.01 MHz; +23.00 dBm
 IF OUT: 29.91 MHz; 9.12 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	14	25	26	40	26	35	31	39	40	40
1	-	31	+0	47	17	44	19	40	22	39	26	41
2	90	52	53	56	63	52	45	49	52	47	53	51
3	103	57	57	61	50	64	46	60	47	62	52	61
4	>122	73	66	72	67	72	63	67	66	69	70	66
5	>121	87	79	81	78	83	75	79	73	79	71	83
6	>121	84	84	81	88	85	94	89	87	87	81	85
7	>121	99	97	103	99	108	91	103	88	96	88	96
8	>122	98	96	116	95	103	95	97	92	100	92	102
9	>120	105	101	105	112	108	97	108	95	119	96	114
10	>119	111	116	114	110	109	106	104	110	109	116	113
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 250.1 MHz; 4.99.00 dBm.
 LO IN: 280.01 MHz; +23.00 dBm
 IF OUT: 29.91 MHz; -1.02 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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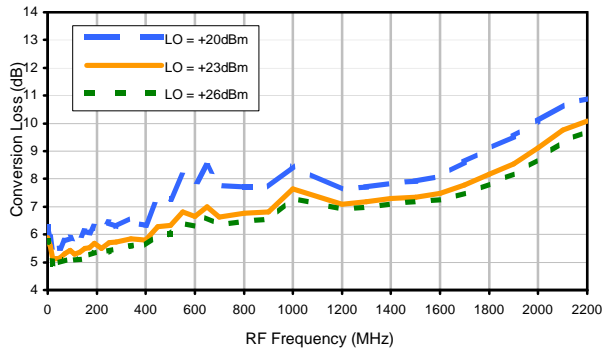


Frequency Mixer

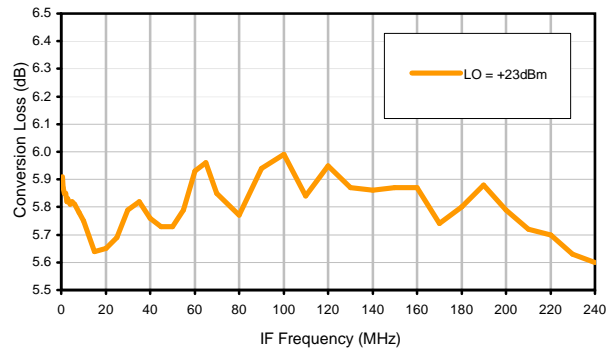
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Typical Performance Curves

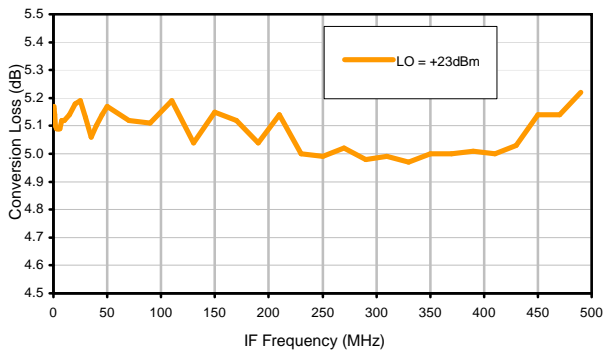
Conversion Loss @ IF=30MHz



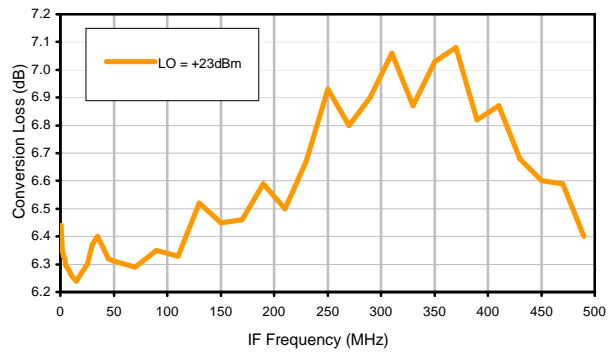
Conversion Loss vs. IF @ RF=250.1MHz



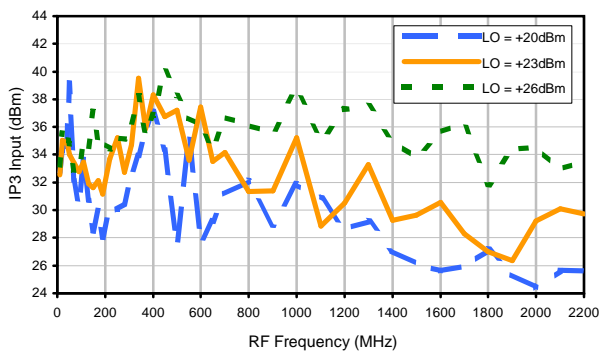
Conversion Loss vs. IF @ RF=10.1MHz



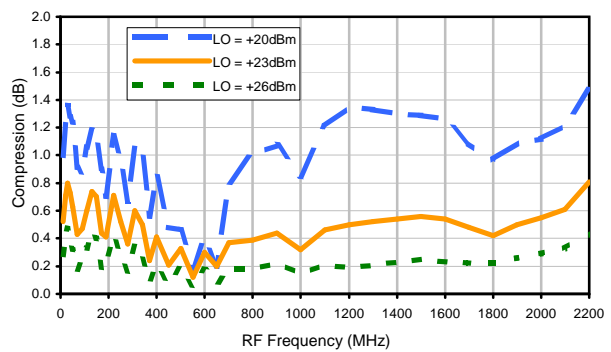
Conversion Loss vs. IF @ RF=500.1MHz



IP3 Input



Compression @ RF IN=+19.92dBm



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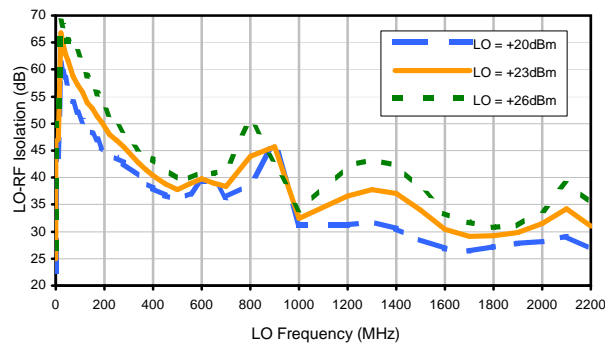


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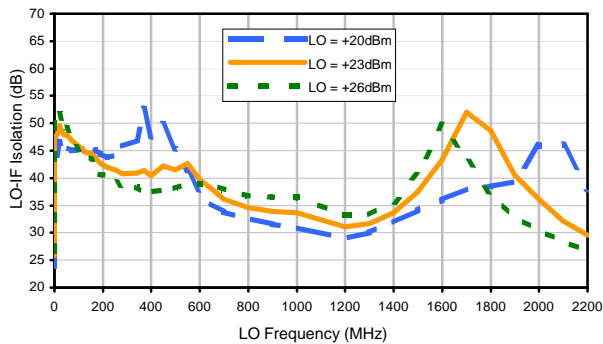


Typical Performance Curves

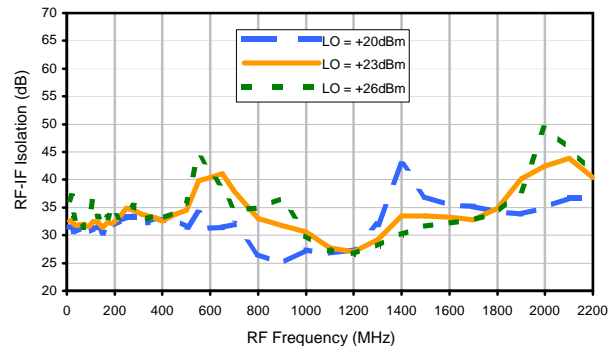
LO-RF Isolation



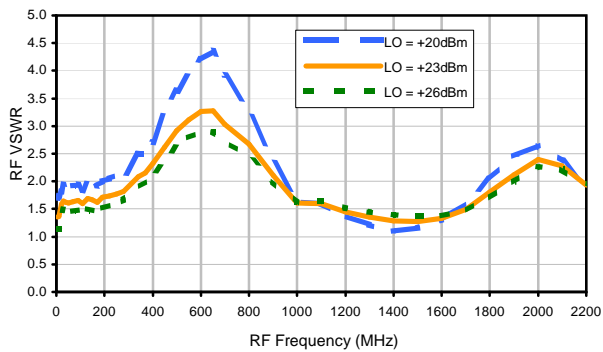
LO-IF Isolation



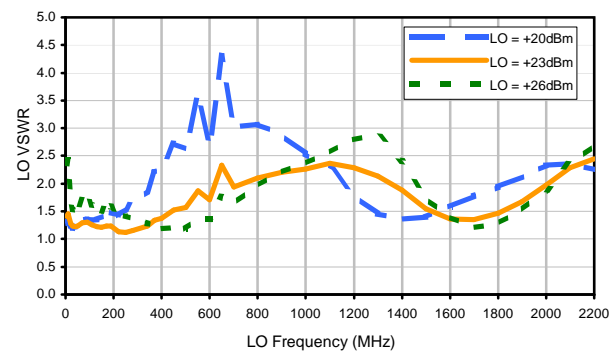
RF-IF Isolation



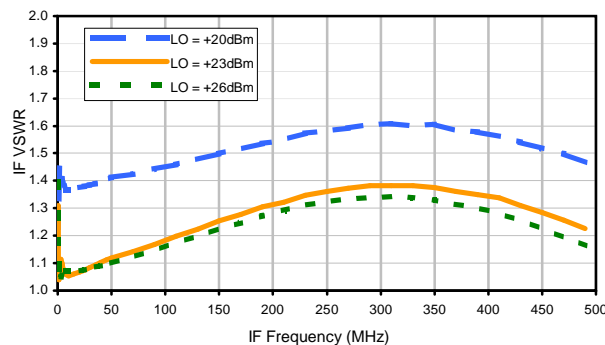
RF VSWR



LO VSWR



IF VSWR



Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	23	36	44	54	47	54	54	52	47	57
1	-	33	+0	61	15	47	28	44	33	47	38	52
2	80	56	52	57	53	55	48	57	52	56	55	58
3	91	48	39	50	50	56	38	59	35	55	39	54
4	107	62	53	61	65	64	77	58	55	57	63	57
5	>119	62	48	61	46	60	44	58	44	58	46	61
6	>122	73	63	70	62	75	60	67	57	63	59	66
7	>121	73	57	74	58	71	60	65	60	60	69	63
8	>122	88	69	85	73	103	66	79	65	75	62	72
9	>122	83	74	80	81	74	75	74	67	73	66	69
10	>121	92	77	106	74	92	75	89	78	89	81	94
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 250.1 MHz; 15.07.00 dBm.
 LO IN: 280.01 MHz; +23.00 dBm
 IF OUT: 29.91 MHz; 9.12 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	14	25	26	40	26	35	31	39	40	40
1	-	31	+0	47	17	44	19	40	22	39	26	41
2	90	52	53	56	63	52	45	49	52	47	53	51
3	103	57	57	61	50	64	46	60	47	62	52	61
4	>122	73	66	72	67	72	63	67	66	69	70	66
5	>121	87	79	81	78	83	75	79	73	79	71	83
6	>121	84	84	81	88	85	94	89	87	87	81	85
7	>121	99	97	103	99	108	91	103	88	96	88	96
8	>122	98	96	116	95	103	95	97	92	100	92	102
9	>120	105	101	105	112	108	97	108	95	119	96	114
10	>119	111	116	114	110	109	106	104	110	109	116	113
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 250.1 MHz; 4.99.00 dBm.
 LO IN: 280.01 MHz; +23.00 dBm
 IF OUT: 29.91 MHz; -1.02 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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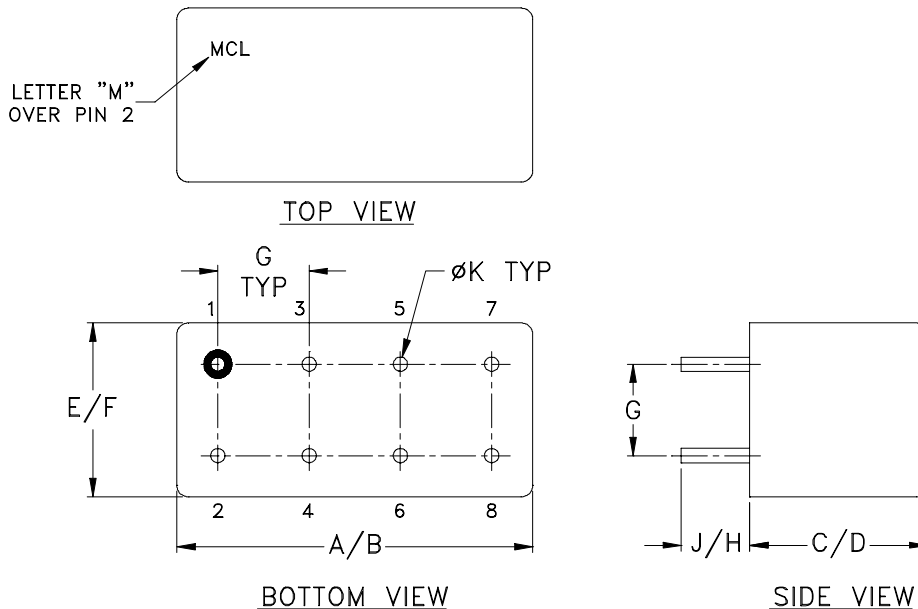


Case Style

A

A01
A04
A05
A06

Outline Dimensions



CASE#	A	B	C	D	E	F	G	H	J	K	WT, GRAM
A01			.385 (9.78)	.400 (10.16)							5.2
A04	.770 (19.56)	.800 (20.32)	.200 (5.08)	.210 (5.33)	.370 (9.40)	.400 (10.16)	.200 (5.08)	.20 (5.08)	.14 (3.56)	.031 (.79)	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



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