

Frequency Mixer

Level 17 (LO Power +17 dBm) 0.05 to 300 MHz

TAK-3H+

Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Power	200mW
IF Current	40mA

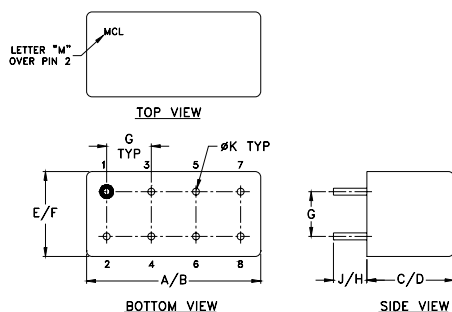
Permanent damage may occur if any of these limits are exceeded.

Pin Connections

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

^ pins must be connected together externally

Outline Drawing



Outline Dimensions (inch/mm)

A	B	C	D	E	F
.770	.800	.240	.250	.370	.400
19.56	20.32	6.10	6.35	9.40	10.16
G	H	J	K	wt	
.200	.20	.14	.031	grams	
5.08	5.08	3.56	0.79	3.7	

Features

- low conversion loss, 4.82 dB typ.
- high isolation, 40 dB typ. L-R, 35 dB typ. L-I
- rugged welded construction
- hermetically sealed

Applications

- VHF
- FM radio
- instrumentation



Generic photo used for illustration purposes only

CASE STYLE: A05

+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)					
		Mid-Band m		Total Range		L		M		U		L		M		U	
LO/RF	IF	$\bar{X}$	σ	Max.	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.
f_L - f_U																	
0.05-300	DC-300	4.82	0.09	7.0	8.5	55	45	40	30	30	25	50	40	35	25	25	20

1 dB COMP.: +14 dBm typ.

L = low range [f_L to $10 f_L$]

M = mid range [$10 f_L$ to $f_U/2$]

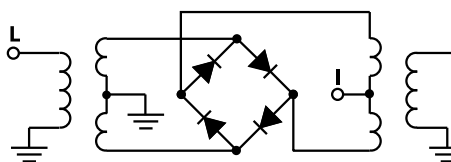
U = upper range [$f_U/2$ to f_U]

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 +17dBm	LO +17dBm	LO +17dBm	LO +17dBm	LO +17dBm
0.05	30.05	5.81	65.01	59.81	1.63	1.53
1.00	31.00	4.70	61.51	56.17	1.64	1.52
2.00	32.00	4.63	62.05	56.05	1.64	1.39
10.00	40.00	4.79	64.41	56.12	1.61	1.53
20.00	50.00	5.00	57.00	52.66	1.61	1.46
29.94	59.94	4.75	51.03	48.60	1.60	1.56
49.23	79.23	4.69	47.42	46.33	1.56	1.51
68.52	98.52	4.67	42.12	42.25	1.53	1.51
87.81	57.81	4.57	38.18	38.54	1.51	1.54
100.00	70.00	4.50	36.56	37.81	1.46	1.59
136.03	106.03	4.45	35.70	36.26	1.40	1.60
155.32	125.32	4.61	33.06	33.98	1.31	1.59
174.61	144.61	4.84	32.15	32.92	1.28	1.59
193.90	163.90	4.96	31.48	32.48	1.22	1.65
213.19	183.19	4.98	29.23	30.80	1.17	1.75
232.48	202.48	5.17	27.78	29.94	1.11	1.87
242.13	212.13	5.27	28.94	32.37	1.05	1.81
261.42	231.42	5.60	31.41	33.19	1.03	1.76
280.71	250.71	6.03	34.81	33.60	1.02	1.78
300.00	270.00	6.64	36.67	31.62	1.02	1.72

Electrical Schematic



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ISO 9001 ISO 14001 AS 9100 CERTIFIED

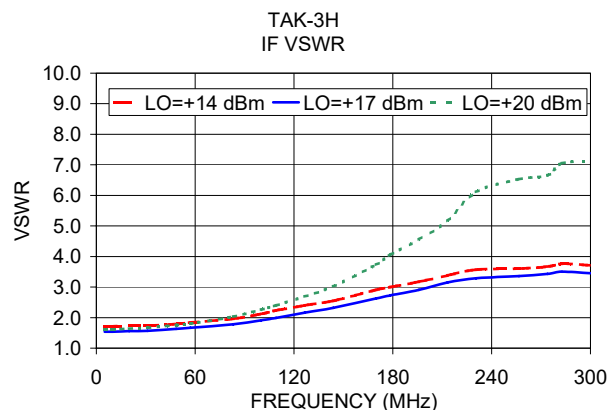
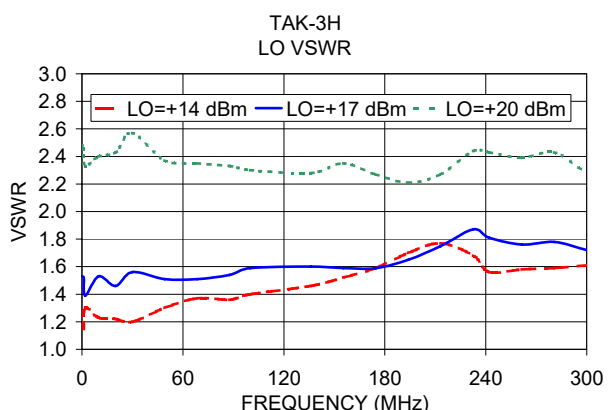
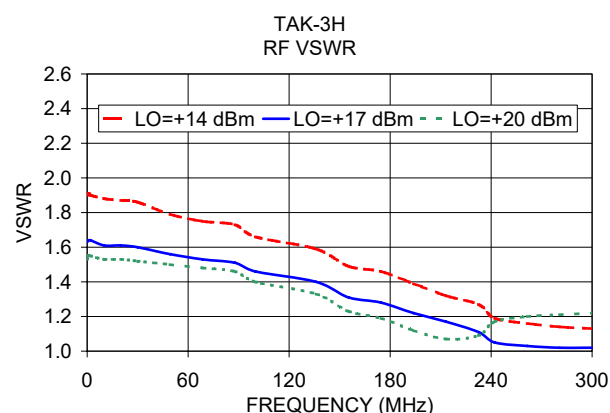
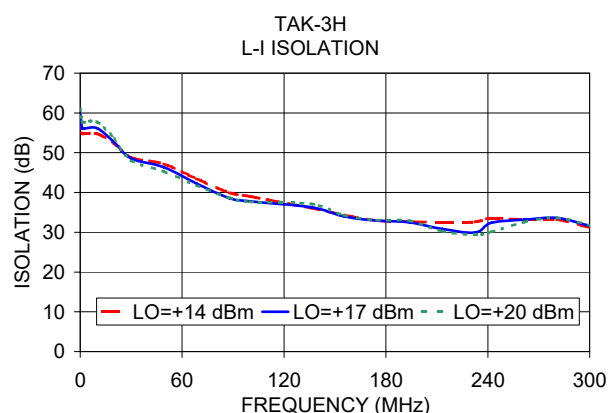
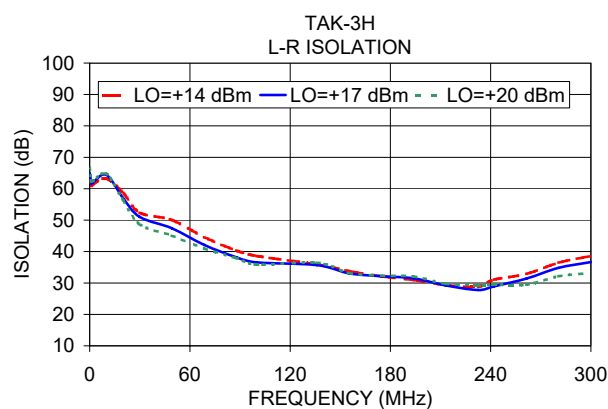
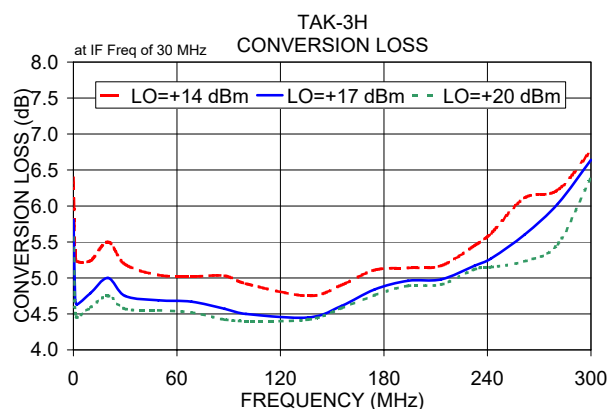
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IF/RF MICROWAVE COMPONENTS

Notes: 1. Performance and quality attributes and conditions not expressly stated in this specification sheet are intended to be excluded and do not form a part of this specification sheet. 2. Electrical specifications and performance data contained herein are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. 3. The parts covered by this specification sheet 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.

For detailed performance specs
& shopping online see web site

REV. A
M98898
TAK-3H+
DJ/TD/CP/AM
200408



Frequency Mixer

TAK-3H+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)		
		@LO (dBm)		
		+14	+17	+20
0.1	30.1	6.39	5.81	5.56
1.0	31.0	5.32	4.70	4.51
2.0	32.0	5.23	4.63	4.45
10.0	40.0	5.24	4.79	4.59
22.7	52.7	5.64	5.26	5.07
35.2	65.2	5.66	5.29	5.11
47.8	77.8	5.69	5.34	5.14
60.4	90.4	5.64	5.29	5.12
72.9	102.9	5.65	5.32	5.12
85.5	115.5	5.65	5.30	5.13
98.0	128.0	5.62	5.32	5.14
110.6	140.6	5.58	5.29	5.15
123.2	153.2	5.66	5.27	5.13
135.7	165.7	5.83	5.38	5.13
148.3	178.3	5.89	5.56	5.29
160.9	190.9	5.86	5.59	5.42
173.4	203.4	5.84	5.59	5.45
186.0	216.0	5.85	5.58	5.44
198.6	228.6	5.90	5.52	5.39
211.1	241.1	6.16	5.61	5.44
236.3	266.3	6.85	6.24	5.67
248.8	278.8	7.01	6.53	6.01
261.4	291.4	6.98	6.59	6.29
273.9	303.9	7.08	6.74	6.48
286.5	316.5	7.12	6.80	6.54
299.1	329.1	7.32	7.02	6.77
311.6	341.6	7.51	7.21	6.94
336.8	366.8	7.83	7.46	6.92
349.3	379.3	7.79	7.30	6.65
361.9	391.9	8.11	7.37	6.69
374.5	404.5	7.95	7.05	6.58
387.0	417.0	7.95	7.03	6.73
399.6	429.6	8.12	7.03	6.74
412.2	442.2	8.09	7.10	6.93
437.3	467.3	8.44	7.36	7.26
449.8	479.8	9.12	7.81	7.72
462.4	492.4	9.53	8.02	8.05
475.0	505.0	10.75	8.73	8.79
487.5	517.5	11.78	9.10	9.16
500.1	530.1	12.65	9.83	9.92

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	31.08	28.29	27.62
22.7	52.7	32.27	27.51	25.95
35.2	65.2	27.65	26.21	25.01
47.8	77.8	27.27	24.88	24.83
60.4	90.4	26.83	24.27	26.73
72.9	102.9	23.08	23.30	26.61
85.5	115.5	22.16	21.94	25.75
98.0	128.0	22.86	24.54	28.86
110.6	140.6	22.97	31.79	27.24
123.2	153.2	21.68	26.64	30.77
135.7	165.7	20.85	23.66	32.22
148.3	178.3	20.74	23.80	25.53
160.9	190.9	22.01	24.85	26.49
173.4	203.4	21.53	24.95	28.59
186.0	216.0	19.82	24.75	27.37
198.6	228.6	19.16	25.46	28.80
211.1	241.1	20.96	26.85	21.97
223.7	253.7	21.99	23.64	22.17
236.3	266.3	17.57	19.58	21.98
248.8	278.8	16.10	15.61	18.44
261.4	291.4	16.10	14.56	14.40
273.9	303.9	16.39	14.70	13.84
286.5	316.5	16.16	15.03	14.37
299.1	329.1	16.71	15.93	15.56
311.6	341.6	16.31	15.91	16.06
324.2	354.2	17.19	16.90	17.42
336.8	366.8	17.13	17.24	17.34
349.3	379.3	17.40	17.31	17.02
361.9	391.9	18.45	17.56	18.17
374.5	404.5	18.24	16.47	18.79
387.0	417.0	20.11	16.55	20.12
399.6	429.6	19.55	17.10	22.05
412.2	442.2	23.10	18.00	23.22
424.7	454.7	22.50	19.36	23.76
437.3	467.3	21.20	19.98	22.41
449.8	479.8	20.90	20.25	22.13
462.4	492.4	20.56	19.96	22.01
475.0	505.0	21.55	20.75	22.50
487.5	517.5	24.89	20.42	21.97
500.1	530.1	23.02	20.24	21.02

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+14dBm (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	1.23	0.78	0.55
22.7	52.7	0.99	0.64	0.45
35.2	65.2	1.06	0.65	0.42
47.8	77.8	1.01	0.62	0.40
60.4	90.4	1.01	0.56	0.39
72.9	102.9	0.95	0.55	0.36
85.5	115.5	1.02	0.50	0.31
98.0	128.0	0.96	0.45	0.30
110.6	140.6	0.95	0.46	0.32
123.2	153.2	0.91	0.53	0.33
135.7	165.7	0.86	0.49	0.38
148.3	178.3	0.80	0.35	0.33
160.9	190.9	0.95	0.36	0.26
173.4	203.4	1.08	0.46	0.33
186.0	216.0	1.32	0.60	0.38
198.6	228.6	1.50	0.82	0.46
211.1	241.1	1.40	1.03	0.51
223.7	253.7	1.22	1.17	0.62
236.3	266.3	1.22	1.10	0.86
248.8	278.8	1.31	1.14	0.96
261.4	291.4	1.47	1.25	0.94
273.9	303.9	1.68	1.35	1.02
286.5	316.5	1.78	1.41	1.12
299.1	329.1	1.60	1.22	0.96
311.6	341.6	1.67	1.21	0.99
324.2	354.2	1.60	1.09	0.93
336.8	366.8	1.44	0.97	0.93
349.3	379.3	1.45	1.03	1.07
361.9	391.9	1.33	1.06	1.05
374.5	404.5	1.47	1.33	1.19
387.0	417.0	1.63	1.45	1.15
399.6	429.6	1.84	1.67	1.21
412.2	442.2	2.11	1.68	1.10
424.7	454.7	2.12	1.74	1.20
437.3	467.3	2.34	1.78	1.13
449.8	479.8	2.33	1.70	1.00
462.4	492.4	2.23	1.67	0.89
475.0	505.0	1.81	1.54	0.67
487.5	517.5	1.73	1.71	0.69
500.1	530.1	1.79	1.72	0.56

REV. X2

TAK-3H+

100818

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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)=150.1MHz (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)=300.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+17			+17			+17
140.0	10.1	5.48	10.0	20.1	5.11	290.0	10.1	6.89
136.7	13.4	5.50	17.2	27.3	5.11	282.8	17.3	6.74
133.3	16.8	5.49	24.4	34.5	4.97	275.6	24.5	6.56
130.0	20.1	5.42	31.5	41.6	4.98	268.5	31.6	6.50
126.7	23.4	5.36	38.7	48.8	5.00	261.3	38.8	6.39
123.3	26.8	5.40	45.9	56.0	5.06	254.1	46.0	6.33
120.0	30.1	5.33	53.1	63.2	5.07	246.9	53.2	6.25
116.7	33.4	5.24	60.3	70.4	5.06	239.7	60.4	6.21
113.3	36.8	5.15	67.4	77.5	5.11	232.6	67.5	6.16
110.0	40.1	5.13	74.6	84.7	5.14	225.4	74.7	6.06
106.7	43.4	5.18	81.8	91.9	5.18	218.2	81.9	6.00
103.3	46.8	5.13	89.0	99.1	5.19	211.0	89.1	5.98
100.0	50.1	5.10	96.2	106.3	5.21	203.8	96.3	5.99
96.7	53.4	5.09	103.3	113.4	5.25	196.7	103.4	5.99
93.3	56.8	5.10	110.5	120.6	5.32	189.5	110.6	5.97
90.0	60.1	5.11	117.7	127.8	5.37	182.3	117.8	5.98
86.7	63.4	5.09	124.9	135.0	5.36	175.1	125.0	5.97
83.3	66.8	5.05	132.1	142.2	5.30	167.9	132.2	6.01
80.0	70.1	5.03	139.2	149.3	5.34	160.8	139.3	5.99
76.7	73.4	5.00	146.4	156.5	5.40	153.6	146.5	6.02
73.3	76.8	5.01	153.6	163.7	5.53	146.4	153.7	6.09
70.0	80.1	5.06	160.8	170.9	5.69	139.2	160.9	6.14
66.7	83.4	5.07	167.9	178.0	5.89	132.1	168.0	6.10
63.3	86.8	5.08	175.1	185.2	6.00	124.9	175.2	6.01
60.0	90.1	5.12	182.3	192.4	5.99	117.7	182.4	5.94
56.7	93.4	5.12	189.5	199.6	5.98	110.5	189.6	5.94
53.3	96.8	5.10	196.7	206.8	6.01	103.3	196.8	5.97
50.0	100.1	5.10	203.8	213.9	6.11	96.2	203.9	5.97
46.7	103.4	5.08	211.0	221.1	6.10	89.0	211.1	6.00
43.3	106.8	5.07	218.2	228.3	6.06	81.8	218.3	6.06
40.0	110.1	5.09	225.4	235.5	5.99	74.6	225.5	6.14
36.7	113.4	5.11	232.6	242.7	6.05	67.4	232.7	6.18
33.3	116.8	5.15	239.7	249.8	6.01	60.3	239.8	6.21
30.0	120.1	5.17	246.9	257.0	6.13	53.1	247.0	6.23
26.7	123.4	5.21	254.1	264.2	6.23	45.9	254.2	6.35
23.3	126.8	5.23	261.3	271.4	6.48	38.7	261.4	6.50
20.0	130.1	5.25	268.5	278.6	6.42	31.5	268.6	6.66
16.7	133.4	5.27	275.6	285.7	6.47	24.4	275.7	6.74
13.3	136.8	5.25	282.8	292.9	6.26	17.2	282.9	6.77
10.0	140.1	5.29	290.0	300.1	6.26	10.0	290.1	6.80

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Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+14	+17	+20	+14	+17	+20
0.1	63.69	65.01	66.59	58.11	59.81	61.05
1.0	61.00	61.51	62.33	54.94	56.17	57.68
2.0	61.43	62.05	62.47	54.78	56.05	57.65
10.0	63.25	64.41	64.74	54.73	56.12	57.68
22.7	76.09	77.69	78.64	60.48	57.58	55.91
35.2	71.82	73.49	75.46	56.93	56.01	54.70
47.8	68.97	70.56	72.90	54.65	53.91	53.57
60.4	66.83	68.35	69.89	51.72	51.56	52.19
72.9	64.79	66.96	69.08	48.71	49.56	50.73
85.5	64.48	65.78	66.70	46.60	47.84	49.05
98.0	62.50	66.41	70.25	44.96	46.67	47.80
110.6	59.98	61.25	63.19	43.82	45.52	46.88
123.2	60.58	62.43	64.08	42.62	44.62	46.05
135.7	62.88	65.85	66.29	40.66	42.05	43.63
148.3	60.56	63.52	64.31	40.87	41.71	42.70
160.9	55.82	59.57	61.68	41.06	42.32	42.73
173.4	52.89	55.34	58.53	40.99	42.96	44.25
186.0	51.33	53.27	55.07	39.31	40.78	42.29
198.6	49.51	51.71	54.20	37.88	39.52	40.86
211.1	49.33	52.26	55.00	37.60	39.45	40.56
236.3	49.89	50.87	51.58	37.38	38.91	38.24
248.8	52.64	52.63	56.00	39.52	38.93	36.84
261.4	53.57	57.89	52.28	40.45	39.65	36.62
273.9	52.70	53.94	50.51	38.81	38.86	37.02
286.5	50.59	51.28	51.15	35.76	35.40	35.45
299.1	47.92	47.02	44.89	34.11	33.93	34.05
311.6	47.24	45.46	43.53	33.73	33.44	33.25
336.8	48.61	46.61	43.41	34.02	33.14	32.23
349.3	47.09	43.95	41.16	34.27	32.92	31.69
361.9	47.40	44.21	41.52	34.94	32.93	30.98
374.5	49.09	45.53	39.44	35.42	33.53	29.35
387.0	45.99	41.39	34.86	34.95	34.10	26.89
399.6	45.46	40.91	33.97	32.75	32.89	25.00
412.2	43.18	40.07	33.19	29.74	30.41	23.35
437.3	34.84	34.66	29.91	24.48	26.11	21.38
449.8	32.05	32.98	28.94	22.48	24.52	20.59
462.4	29.39	30.98	27.87	20.78	23.20	20.25
475.0	27.21	28.76	26.25	19.41	21.85	19.58
487.5	25.66	27.21	25.57	18.28	20.21	18.80
500.1	24.45	25.41	24.54	17.81	18.89	18.06

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	36.96	37.44	37.20
22.7	52.7	32.23	32.64	33.09
35.2	65.2	28.89	29.46	29.70
47.8	77.8	27.10	27.47	27.81
60.4	90.4	25.50	26.13	26.50
72.9	102.9	24.37	24.74	25.02
85.5	115.5	23.89	24.50	24.85
98.0	128.0	23.16	23.87	24.47
110.6	140.6	22.64	23.42	23.92
123.2	153.2	22.13	23.05	23.61
135.7	165.7	21.46	22.27	23.04
148.3	178.3	21.61	22.18	22.81
160.9	190.9	21.96	22.53	22.84
173.4	203.4	22.20	22.87	23.31
186.0	216.0	22.53	23.46	23.98
198.6	228.6	21.49	22.65	23.40
211.1	241.1	20.22	21.74	22.71
223.7	253.7	18.77	20.12	20.80
236.3	266.3	17.73	18.65	19.48
248.8	278.8	16.99	17.60	18.25
261.4	291.4	16.45	16.80	17.13
273.9	303.9	16.23	16.45	16.77
286.5	316.5	15.84	15.92	16.15
299.1	329.1	15.78	15.81	15.96
311.6	341.6	15.59	15.61	15.74
324.2	354.2	15.72	15.75	15.98
336.8	366.8	15.76	15.80	16.18
349.3	379.3	15.62	15.73	16.14
361.9	391.9	15.96	16.07	16.20
374.5	404.5	15.65	15.62	15.51
387.0	417.0	15.55	15.28	14.79
399.6	429.6	15.35	14.68	13.98
412.2	442.2	14.51	13.52	12.94
424.7	454.7	13.87	12.74	12.21
437.3	467.3	12.93	11.79	11.25
449.8	479.8	12.08	11.00	10.59
462.4	492.4	11.28	10.16	9.84
475.0	505.0	10.59	9.37	9.06
487.5	517.5	9.94	8.75	8.49
500.1	530.1	9.26	8.13	7.80

Frequency Mixer

TAK-3H+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=300.1MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+14	+17	+20		+14	+17	+20		+14	+17	+20
5.0	35.0	1.90	1.63	1.53	5.0	1.20	1.53	2.48	5.0	1.70	1.54	1.61
10.0	40.0	1.91	1.64	1.55	10.0	1.15	1.52	2.46	10.0	1.72	1.54	1.62
22.7	52.7	1.80	1.57	1.44	22.7	1.20	1.43	2.15	17.4	3.58	3.21	2.87
35.2	65.2	1.77	1.57	1.43	35.2	1.20	1.46	2.24	24.9	3.23	2.92	2.60
47.8	77.8	1.76	1.55	1.41	47.8	1.19	1.45	2.20	32.3	3.10	2.82	2.51
60.4	90.4	1.76	1.53	1.39	60.4	1.15	1.42	2.12	39.7	2.92	2.67	2.37
72.9	102.9	1.72	1.51	1.38	72.9	1.13	1.40	2.06	47.2	2.88	2.66	2.36
85.5	115.5	1.69	1.44	1.32	85.5	1.13	1.40	2.04	54.6	2.92	2.69	2.39
98.0	128.0	1.63	1.44	1.29	98.0	1.14	1.42	2.08	62.1	2.95	2.73	2.42
110.6	140.6	1.59	1.40	1.30	110.6	1.13	1.45	2.14	69.5	2.97	2.76	2.46
123.2	153.2	1.58	1.38	1.29	123.2	1.11	1.49	2.20	76.9	3.02	2.81	2.52
135.7	165.7	1.61	1.39	1.26	135.7	1.08	1.51	2.23	84.4	3.04	2.83	2.57
148.3	178.3	1.54	1.40	1.27	148.3	1.08	1.52	2.20	91.8	3.09	2.87	2.61
160.9	190.9	1.44	1.32	1.25	160.9	1.10	1.53	2.18	99.2	3.12	2.89	2.64
173.4	203.4	1.36	1.25	1.21	173.4	1.08	1.55	2.19	106.7	3.18	2.94	2.69
186.0	216.0	1.33	1.23	1.21	186.0	1.07	1.58	2.24	114.1	3.18	2.95	2.71
198.6	228.6	1.33	1.24	1.25	198.6	1.09	1.62	2.31	121.5	3.17	2.95	2.72
211.1	241.1	1.39	1.29	1.33	211.1	1.15	1.67	2.37	129.0	3.11	2.91	2.69
223.7	253.7	1.49	1.33	1.38	223.7	1.21	1.70	2.39	136.4	3.06	2.89	2.67
236.3	266.3	1.56	1.37	1.39	236.3	1.27	1.73	2.38	143.8	3.04	2.86	2.65
248.8	278.8	1.62	1.46	1.40	248.8	1.31	1.77	2.38	151.3	3.02	2.85	2.64
261.4	291.4	1.61	1.48	1.42	261.4	1.31	1.83	2.43	158.7	2.99	2.83	2.63
273.9	303.9	1.58	1.49	1.43	273.9	1.33	1.89	2.52	166.2	2.98	2.82	2.64
286.5	316.5	1.54	1.47	1.43	286.5	1.36	1.95	2.62	173.6	2.96	2.80	2.64
299.1	329.1	1.51	1.44	1.39	299.1	1.40	2.02	2.72	181.0	2.99	2.82	2.67
311.6	341.6	1.52	1.45	1.40	311.6	1.44	2.07	2.78	188.5	3.01	2.84	2.68
324.2	354.2	1.43	1.35	1.27	324.2	1.47	2.10	2.81	195.9	3.04	2.86	2.70
336.8	366.8	1.44	1.35	1.20	336.8	1.51	2.12	2.82	203.3	3.01	2.84	2.69
349.3	379.3	1.37	1.24	1.07	349.3	1.54	2.14	2.83	210.8	2.95	2.78	2.63
361.9	391.9	1.41	1.23	1.13	361.9	1.58	2.18	2.87	218.2	2.86	2.69	2.55
374.5	404.5	1.35	1.18	1.16	374.5	1.63	2.24	2.93	225.6	2.80	2.62	2.47
387.0	417.0	1.39	1.28	1.31	387.0	1.70	2.30	2.99	233.1	2.78	2.61	2.44
399.6	429.6	1.46	1.36	1.39	399.6	1.76	2.34	3.01	240.5	2.79	2.61	2.44
412.2	442.2	1.53	1.51	1.55	412.2	1.82	2.37	3.00	247.9	2.76	2.59	2.42
424.7	454.7	1.66	1.62	1.66	424.7	1.87	2.37	2.99	255.4	2.73	2.56	2.39
437.3	467.3	1.72	1.72	1.77	437.3	1.93	2.39	2.98	262.8	2.72	2.54	2.38
449.8	479.8	1.92	1.91	1.95	449.8	2.02	2.45	3.00	270.3	2.76	2.56	2.39
462.4	492.4	2.00	1.96	2.02	462.4	2.12	2.51	3.05	277.7	2.81	2.60	2.41
475.0	505.0	2.21	2.09	2.14	475.0	2.23	2.58	3.10	285.1	2.84	2.61	2.42
487.5	517.5	2.37	2.11	2.14	487.5	2.36	2.65	3.14	292.6	2.80	2.58	2.39
500.1	530.1	2.54	2.19	2.18	500.1	2.48	2.71	3.17	300.0	2.74	2.53	2.37

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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	18	28	20	39	28	42	29	42	39	52
1	-	16	+0	28	15	29	26	43	28	51	33	48
2	>100	70	53	61	51	65	63	65	56	75	52	60
3	>100	54	52	57	46	62	44	60	47	66	51	60
4	>100	77	67	79	69	84	67	76	73	84	72	83
5	>100	87	70	77	68	72	65	76	66	80	89	>93
6	>100	>93	89	92	86	>93	51	90	83	93	85	>93
7	>100	>93	89	93	84	85	82	81	>93	93	92	>93
8	>100	>93	>93	>93	>93	>93	>93	>93	93	>93	>93	>93
9	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
10	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 150.1 MHz; -1.00 dBm.
LO IN: 180.01 MHz; +17.00 dBm
IF OUT: 29.91 MHz; -6.59 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	28	41	31	49	41	58	42	64	50	71
1	-	17	+0	29	14	33	30	46	36	54	43	56
2	80	52	64	56	56	52	63	80	60	64	53	60
3	>100	41	36	44	57	47	47	45	41	56	43	56
4	>100	78	62	66	63	68	71	69	63	75	67	73
5	>100	68	62	63	50	69	44	60	45	64	53	67
6	>100	88	76	80	74	81	55	78	72	73	73	83
7	>100	69	71	70	61	83	61	66	54	69	56	76
8	>100	>103	83	96	82	79	75	82	78	85	74	77
9	>100	83	80	91	86	82	67	72	66	70	64	70
10	>100	85	84	92	86	93	81	89	91	96	82	96
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 150.1 MHz; 9.00 dBm.
LO IN: 180.01 MHz; +17.00 dBm
IF OUT: 29.91 MHz; 3.48 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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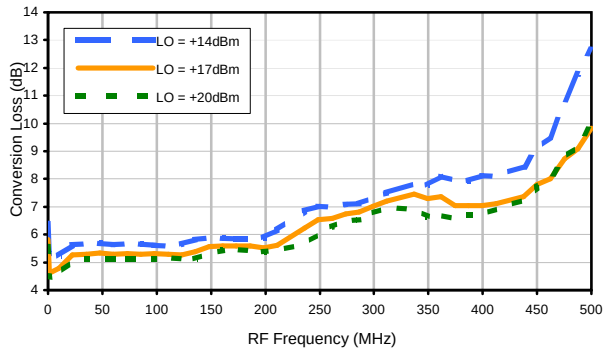


Frequency Mixer

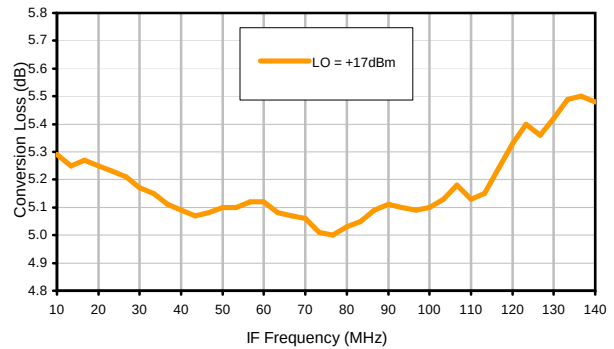
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Typical Performance Curves

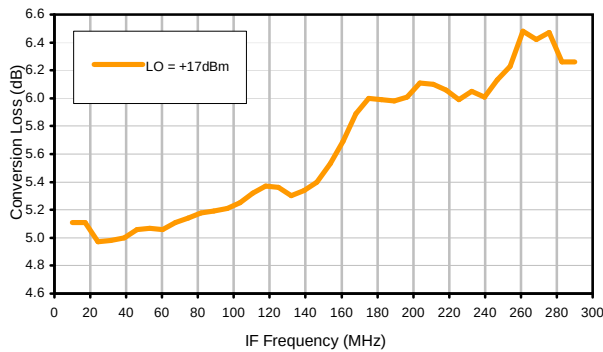
Conversion Loss @ IF=30MHz



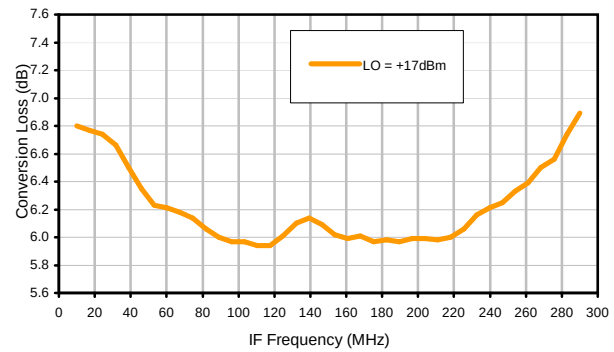
Conversion Loss vs. IF @ RF=150.1MHz



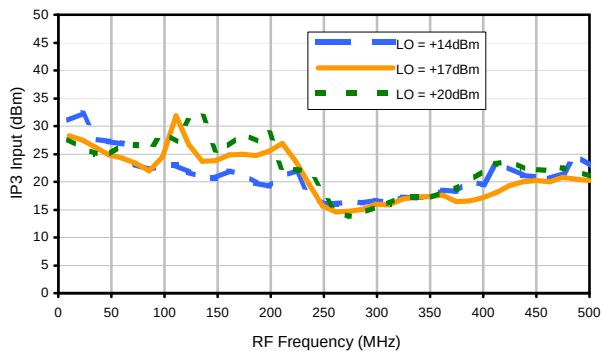
Conversion Loss vs. IF @ RF=10.1MHz



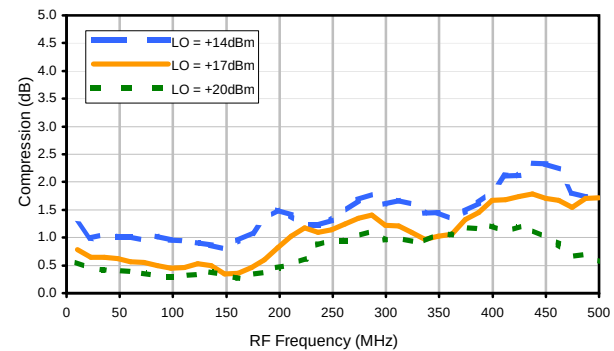
Conversion Loss vs. IF @ RF=300.1MHz



IP3 Input



Compression @ RF IN=+14dBm



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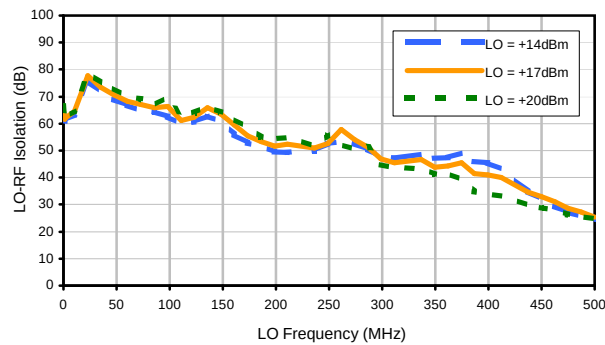


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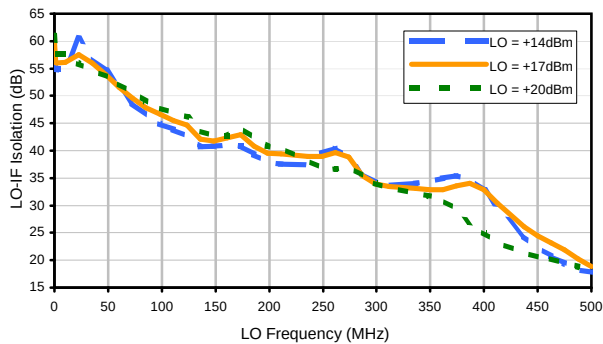


Typical Performance Curves

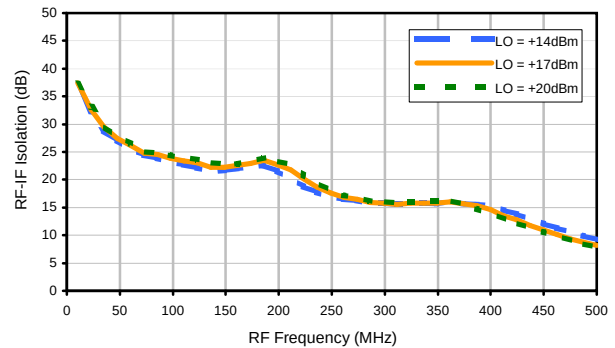
LO-RF Isolation



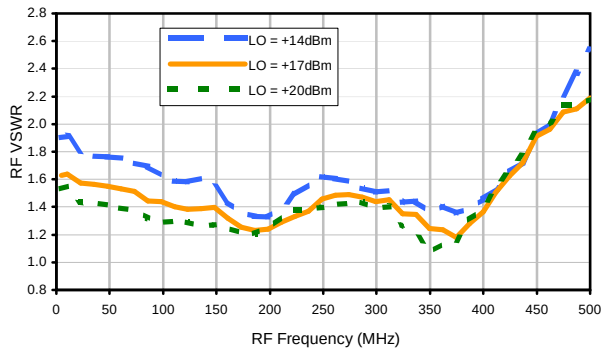
LO-IF Isolation



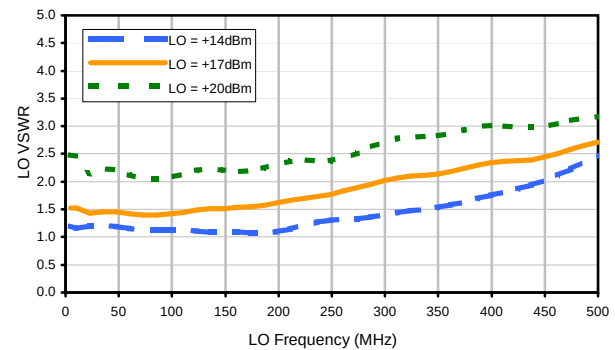
RF-IF Isolation



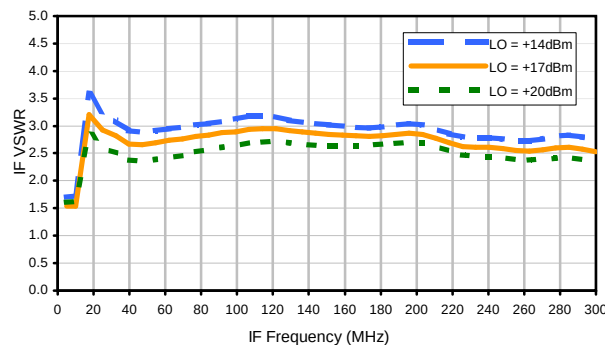
RF VSWR



LO VSWR



IF VSWR



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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	18	28	20	39	28	42	29	42	39	52
1	-	16	+0	28	15	29	26	43	28	51	33	48
2	>100	70	53	61	51	65	63	65	56	75	52	60
3	>100	54	52	57	46	62	44	60	47	66	51	60
4	>100	77	67	79	69	84	67	76	73	84	72	83
5	>100	87	70	77	68	72	65	76	66	80	89	>93
6	>100	>93	89	92	86	>93	51	90	83	93	85	>93
7	>100	>93	89	93	84	85	82	81	>93	93	92	>93
8	>100	>93	>93	>93	>93	>93	>93	>93	93	>93	>93	>93
9	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
10	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 150.1 MHz; -1.00 dBm.
LO IN: 180.01 MHz; +17.00 dBm
IF OUT: 29.91 MHz; -6.59 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	28	41	31	49	41	58	42	64	50	71
1	-	17	+0	29	14	33	30	46	36	54	43	56
2	80	52	64	56	56	52	63	80	60	64	53	60
3	>100	41	36	44	57	47	47	45	41	56	43	56
4	>100	78	62	66	63	68	71	69	63	75	67	73
5	>100	68	62	63	50	69	44	60	45	64	53	67
6	>100	88	76	80	74	81	55	78	72	73	73	83
7	>100	69	71	70	61	83	61	66	54	69	56	76
8	>100	>103	83	96	82	79	75	82	78	85	74	77
9	>100	83	80	91	86	82	67	72	66	70	64	70
10	>100	85	84	92	86	93	81	89	91	96	82	96
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 150.1 MHz; 9.00 dBm.
LO IN: 180.01 MHz; +17.00 dBm
IF OUT: 29.91 MHz; 3.48 dBm

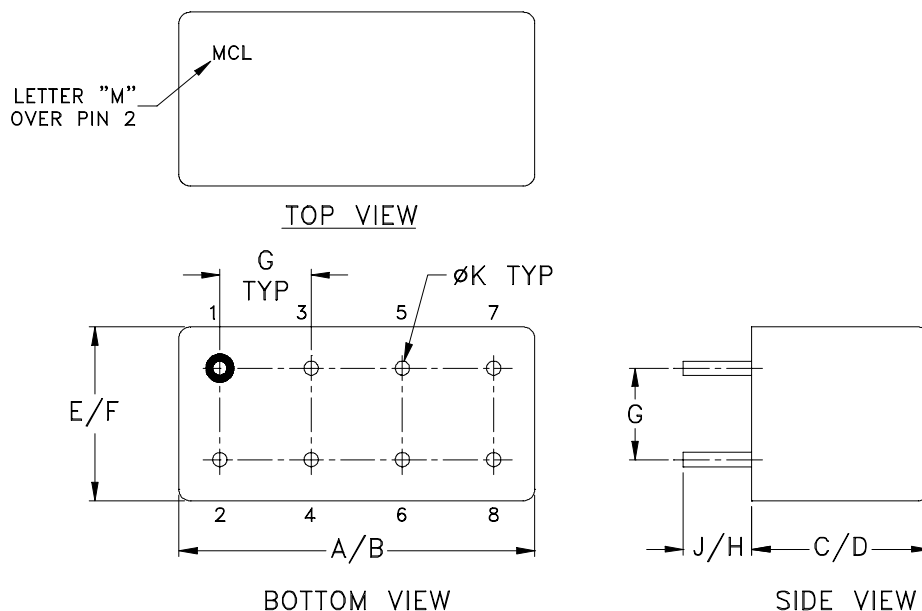
- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

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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

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
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