Coaxial

Frequency Mixer

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

ZFY-1+

Generic photo used for illustration purposes only

CASE STYLE: K18

Connectors	Model
BNC	ZFY-1+
SMA	ZFY-1-S+
BRACKET (OPTION "B")	

+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.

Coaxial Connections

LO	1
RF	2
IF	3

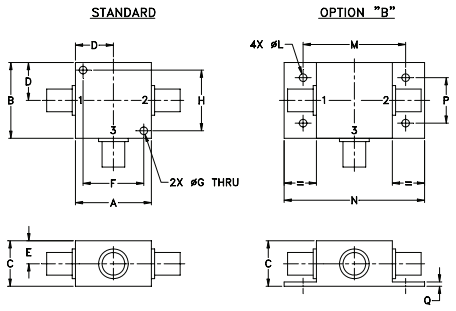
Features

- low conversion loss, 4.85 dB typ.
- good L-R & L-I isolation, 46 dB typ.
- rugged shielded case

Applications

- VHF/UHF
- instrumentation
- federal & defense communications

Outline Drawing



Outline Dimensions (inch / mm)

A	B	C	D	E	F	G	H
1.25	1.25	.75	.63	.38	1.00	.125	1.000
31.75	31.75	19.05	16.00	9.65	25.40	3.18	25.40

J	K	L	M	N	P	Q	wt
--	--	.125	1.688	2.18	.75	.07	grams
--	--	3.18	42.88	55.37	19.05	1.78	70.0

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.
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

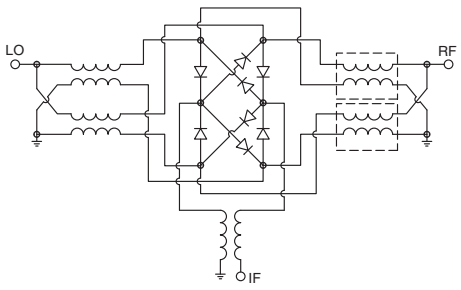
1 dB COMP.: +20 dBm typ.
*IF response from 0.1 to 0.01 MHz falls off 3 dB.

L = low range [f_L to 10 f_L] M = mid range [10 f_L to f_U/_] 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
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

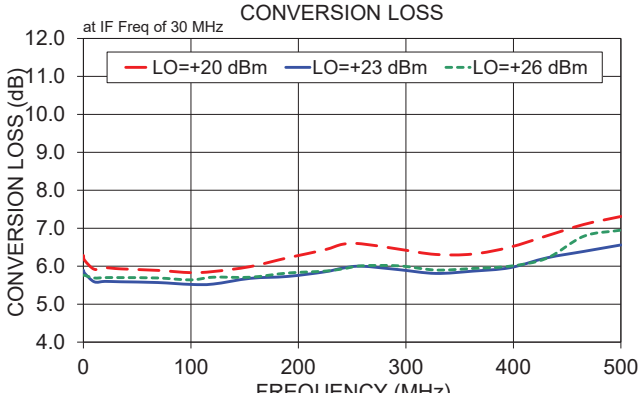
Electrical Schematic



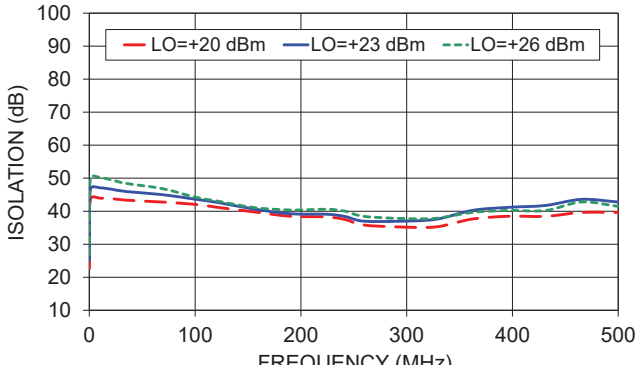
Notes

A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

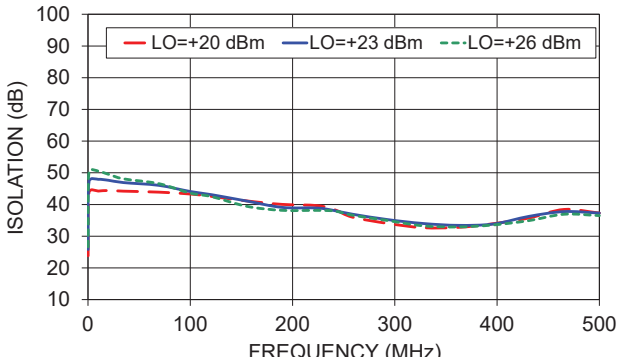
ZFY-1-S+
CONVERSION LOSS



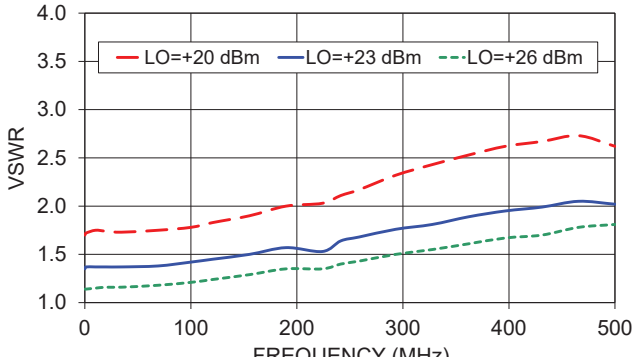
ZFY-1-S+
L-R ISOLATION



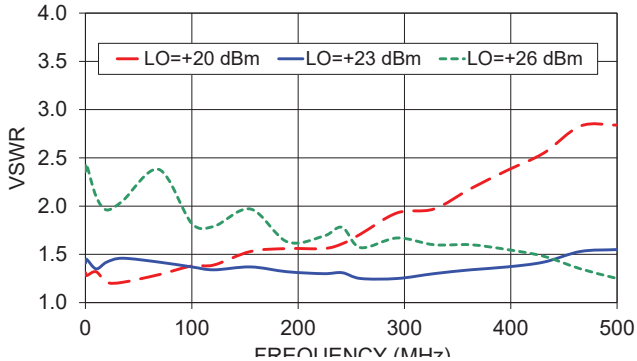
ZFY-1-S+
L-I ISOLATION



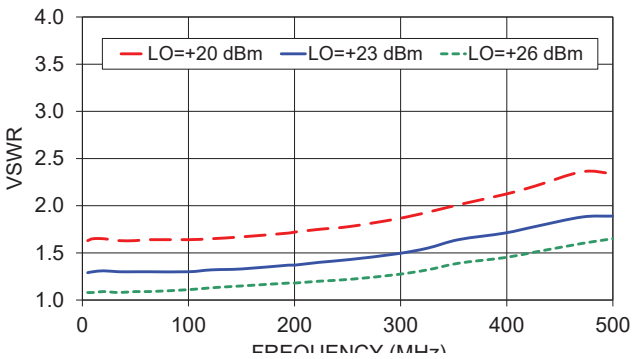
ZFY-1-S+
RF VSWR



ZFY-1-S+
LO VSWR



ZFY-1-S+
IF VSWR



Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

Frequency Mixer ZFY-1+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB) @LO (dBm)		
		+20	+23	+26
0.1	30.1	6.28	5.89	5.76
1.0	31.0	6.16	5.82	5.76
10.0	40.0	5.92	5.59	5.69
20.1	50.1	5.43	5.11	4.95
30.1	60.1	5.49	5.13	4.94
40.1	70.1	5.49	5.13	4.96
50.1	80.1	5.52	5.15	4.98
70.1	100.1	5.75	5.32	5.09
90.1	120.1	5.87	5.44	5.18
110.1	140.1	5.68	5.30	5.09
130.1	160.1	5.81	5.37	5.11
150.1	180.1	6.09	5.49	5.19
170.1	200.1	6.07	5.51	5.24
190.1	220.1	6.26	5.69	5.36
220.1	250.1	6.08	5.50	5.23
250.1	280.1	6.43	5.71	5.41
280.1	310.1	6.29	5.73	5.49
340.1	370.1	6.60	5.85	5.59
370.1	400.1	6.40	5.82	5.63
400.1	430.1	6.32	5.79	5.62
450.1	480.1	7.27	6.28	6.01
500.1	530.1	7.30	6.33	6.01
550.1	580.1	8.11	6.82	6.39
600.1	630.1	7.81	6.64	6.30
650.1	680.1	8.44	7.00	6.60
700.1	730.1	7.77	6.63	6.35
800.1	830.1	7.70	6.76	6.49
900.1	930.1	7.68	6.82	6.53
1000.1	1030.1	8.48	7.64	7.31
1200.1	1230.1	7.62	7.08	6.90
1300.1	1330.1	7.71	7.17	6.98
1400.1	1430.1	7.85	7.29	7.10
1500.1	1530.1	7.92	7.35	7.17
1600.1	1630.1	8.10	7.47	7.26
1700.1	1730.1	8.60	7.78	7.48
1800.1	1830.1	9.10	8.16	7.83
1900.1	1930.1	9.52	8.55	8.20
2000.1	2030.1	10.08	9.11	8.69
2100.1	2130.1	10.66	9.76	9.37
2200.1	2230.1	10.89	10.09	9.69

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm) @LO (dBm)		
		+20	+23	+26
10.1	40.1	32.81	32.55	33.26
20.1	50.1	34.30	35.03	35.57
30.1	60.1	35.53	34.86	35.46
40.1	70.1	34.58	34.98	35.65
50.1	80.1	39.15	34.03	34.78
70.1	100.1	32.12	33.43	32.86
90.1	120.1	30.36	32.76	33.06
110.1	140.1	33.83	33.48	34.86
130.1	160.1	30.69	31.91	34.55
150.1	180.1	28.48	31.64	37.10
170.1	200.1	30.02	32.14	34.82
190.1	220.1	28.03	31.17	34.86
220.1	250.1	30.10	33.72	34.42
250.1	280.1	30.03	35.24	35.23
280.1	310.1	30.49	32.72	35.11
310.1	340.1	32.53	34.72	36.30
340.1	370.1	33.95	39.53	38.21
370.1	400.1	35.83	35.88	35.46
400.1	430.1	37.10	38.33	36.87
450.1	480.1	34.35	36.76	40.14
500.1	530.1	27.51	37.22	38.23
550.1	580.1	35.31	33.62	36.65
600.1	630.1	27.71	37.44	36.09
650.1	680.1	29.19	33.53	34.38
700.1	730.1	31.14	34.14	36.70
800.1	830.1	32.10	31.33	36.17
900.1	930.1	28.96	31.39	35.60
1000.1	1030.1	31.83	35.22	38.80
1100.1	1130.1	30.83	28.87	35.03
1200.1	1230.1	28.60	30.53	37.24
1300.1	1330.1	29.16	33.29	37.49
1400.1	1430.1	27.03	29.28	35.00
1500.1	1530.1	26.14	29.63	33.77
1600.1	1630.1	25.61	30.55	35.66
1700.1	1730.1	25.94	28.31	36.25
1800.1	1830.1	27.14	27.00	31.83
1900.1	1930.1	25.36	26.36	34.39
2000.1	2030.1	24.42	29.20	34.54
2100.1	2130.1	25.67	30.12	32.94
2200.1	2230.1	25.62	29.72	33.50

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+19.92dBm (dB) @LO (dBm)		
		+20	+23	+26
10.1	40.1	1.00	0.52	0.28
20.1	50.1	1.22	0.71	0.43
30.1	60.1	1.36	0.80	0.47
40.1	70.1	1.28	0.73	0.40
50.1	80.1	1.24	0.63	0.32
70.1	100.1	0.91	0.43	0.18
90.1	120.1	0.87	0.47	0.24
110.1	140.1	1.06	0.60	0.33
130.1	160.1	1.18	0.74	0.45
150.1	180.1	1.14	0.70	0.40
170.1	200.1	0.90	0.44	0.19
190.1	220.1	0.70	0.41	0.23
220.1	250.1	1.14	0.71	0.42
250.1	280.1	0.98	0.52	0.28
280.1	310.1	0.67	0.36	0.16
310.1	340.1	1.05	0.60	0.34
340.1	370.1	1.04	0.50	0.25
370.1	400.1	0.56	0.24	0.09
400.1	430.1	0.86	0.41	0.21
450.1	480.1	0.48	0.21	0.07
500.1	530.1	0.46	0.33	0.20
550.1	580.1	0.18	0.12	0.05
600.1	630.1	0.40	0.30	0.17
650.1	680.1	0.20	0.20	0.08
700.1	730.1	0.81	0.37	0.18
800.1	830.1	1.01	0.39	0.18
900.1	930.1	1.07	0.44	0.22
1000.1	1030.1	0.85	0.32	0.15
1100.1	1130.1	1.21	0.46	0.21
1200.1	1230.1	1.35	0.50	0.19
1300.1	1330.1	1.33	0.52	0.21
1400.1	1430.1	1.30	0.54	0.23
1500.1	1530.1	1.29	0.56	0.25
1600.1	1630.1	1.26	0.54	0.23
1700.1	1730.1	1.09	0.48	0.22
1800.1	1830.1	0.97	0.42	0.22
1900.1	1930.1	1.09	0.50	0.26
2000.1	2030.1	1.12	0.55	0.29
2100.1	2130.1	1.22	0.61	0.33
2200.1	2230.1	1.47	0.81	0.44

Mini-Circuits®
IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see minicircuits.com

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=250.1MHz (dB)
		@LO (dBm)
		+23
0.5	249.6	5.91
1.0	249.1	5.87
1.5	248.6	5.85
2.0	248.1	5.85
2.5	247.6	5.82
3.0	247.1	5.83
4.0	246.1	5.81
5.0	245.1	5.82
6.0	244.1	5.81
8.0	242.1	5.78
10.0	240.1	5.75
15.0	235.1	5.64
20.0	230.1	5.65
25.0	225.1	5.69
30.0	220.1	5.79
35.0	215.1	5.82
40.0	210.1	5.76
45.0	205.1	5.73
50.0	200.1	5.73
55.0	195.1	5.79
60.0	190.1	5.93
65.0	185.1	5.96
70.0	180.1	5.85
80.0	170.1	5.77
90.0	160.1	5.94
100.0	150.1	5.99
110.0	140.1	5.84
120.0	130.1	5.95
130.0	120.1	5.87
140.0	110.1	5.86
150.0	100.1	5.87
160.0	90.1	5.87
170.0	80.1	5.74
180.0	70.1	5.80
190.0	60.1	5.88
200.0	50.1	5.79
210.0	40.1	5.72
220.0	30.1	5.70
230.0	20.1	5.63
240.0	10.1	5.60

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=10.1MHz (dB)
		@LO (dBm)
		+23
0.5	10.6	5.17
0.8	10.9	5.16
1.0	11.1	5.14
2.0	12.1	5.10
3.0	13.1	5.09
4.0	14.1	5.09
5.0	15.1	5.09
6.0	16.1	5.09
8.0	18.1	5.12
10.0	20.1	5.12
15.0	25.1	5.14
20.0	30.1	5.18
25.0	35.1	5.19
30.0	40.1	5.13
35.0	45.1	5.06
40.0	50.1	5.10
45.0	55.1	5.14
50.0	60.1	5.17
70.0	80.1	5.12
90.0	100.1	5.11
110.0	120.1	5.19
130.0	140.1	5.04
150.0	160.1	5.15
170.0	180.1	5.12
190.0	200.1	5.04
210.0	220.1	5.14
230.0	240.1	5.00
250.0	260.1	4.99
270.0	280.1	5.02
290.0	300.1	4.98
310.0	320.1	4.99
330.0	340.1	4.97
350.0	360.1	5.00
370.0	380.1	5.00
390.0	400.1	5.01
410.0	420.1	5.00
430.0	440.1	5.03
450.0	460.1	5.14
470.0	480.1	5.14
490.0	500.1	5.22

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=500.1MHz (dB)
		@LO (dBm)
		+23
0.5	499.6	6.43
0.8	499.4	6.44
1.0	499.1	6.40
2.0	498.1	6.35
3.0	497.1	6.33
4.0	496.1	6.32
5.0	495.1	6.30
6.0	494.1	6.29
8.0	492.1	6.28
10.0	490.1	6.26
15.0	485.1	6.24
20.0	480.1	6.27
25.0	475.1	6.30
30.0	470.1	6.37
35.0	465.1	6.40
40.0	460.1	6.36
45.0	455.1	6.32
50.0	450.1	6.31
70.0	430.1	6.29
90.0	410.1	6.35
110.0	390.1	6.33
130.0	370.1	6.52
150.0	350.1	6.45
170.0	330.1	6.46
190.0	310.1	6.59
210.0	290.1	6.50
230.0	270.1	6.67
250.0	250.1	6.93
270.0	230.1	6.80
290.0	210.1	6.90
310.0	190.1	7.06
330.0	170.1	6.87
350.0	150.1	7.03
370.0	130.1	7.08
390.0	110.1	6.82
410.0	90.1	6.87
430.0	70.1	6.68
450.0	50.1	6.60
470.0	30.1	6.59
490.0	10.1	6.40

Mini-Circuits®
IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see minicircuits.com

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB) @LO (dBm)			LO-IF ISOLATION (dB) @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

Mini-Circuits®
IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see minicircuits.com

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

Mini-Circuits®
IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see minicircuits.com

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

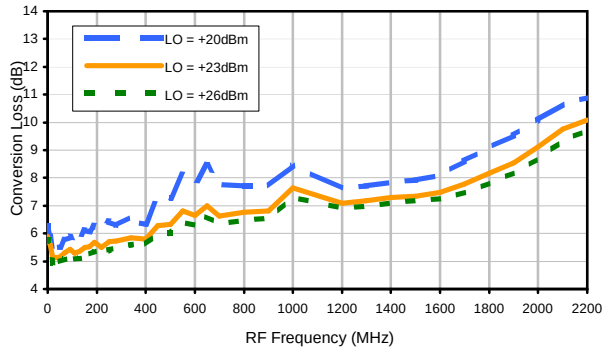
Test conditions:
RF IN: 250.1 MHz; 4.99.00 dBm.
LO IN: 280.01 MHz; +23.00 dBm
IF OUT: 29.91 MHz; -1.02 dBm

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.

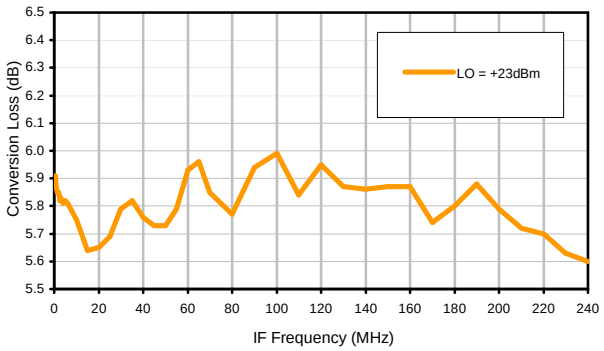
Mini-Circuits®
IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see minicircuits.com

Typical Performance Curves

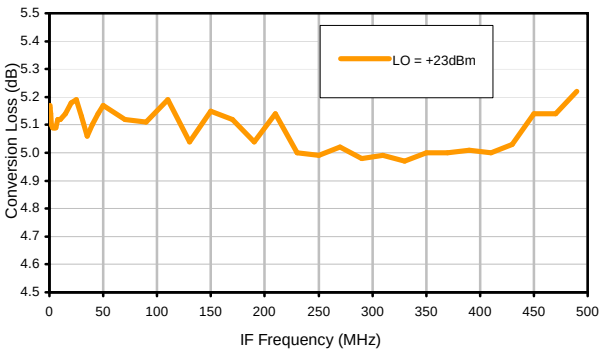
Conversion Loss @ IF=30MHz



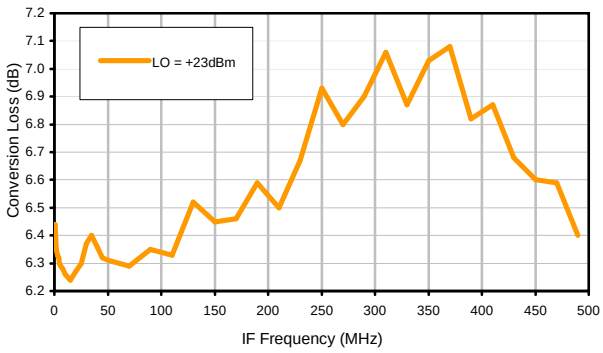
Conversion Loss vs. IF @ RF=250.1MHz



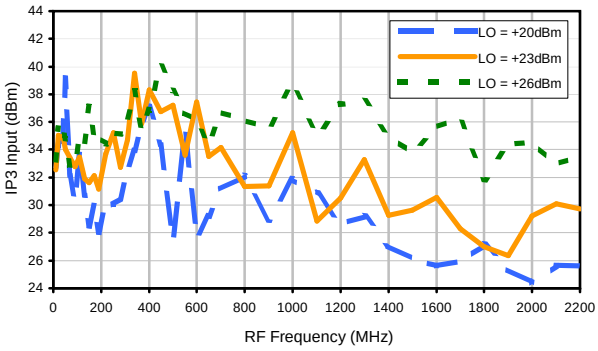
Conversion Loss vs. IF @ RF=10.1MHz



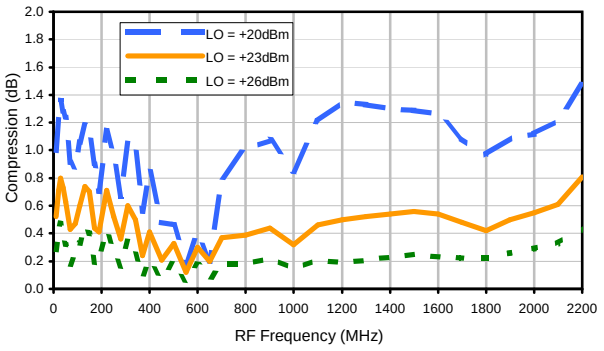
Conversion Loss vs. IF @ RF=500.1MHz



IP3 Input



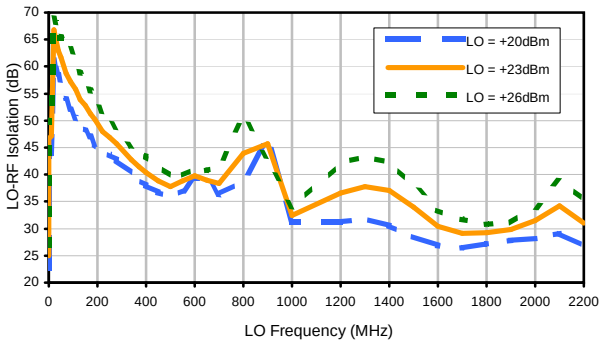
Compression @ RF IN=+19.92dBm



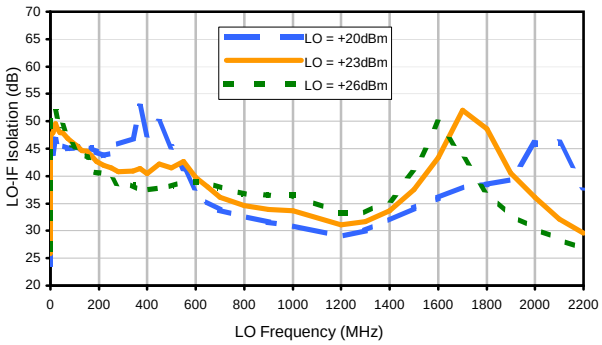
Mini-Circuits®
IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see minicircuits.com

Typical Performance Curves

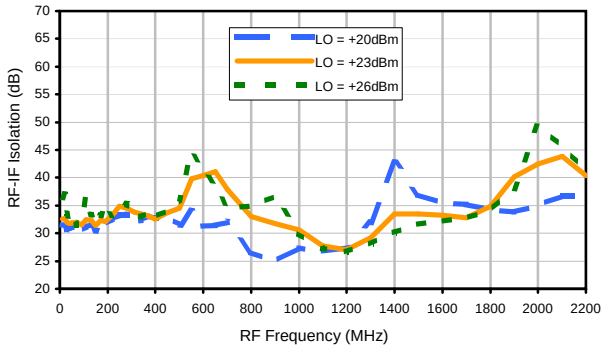
LO-RF Isolation



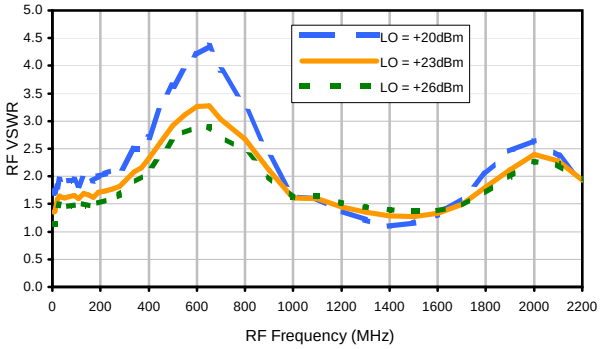
LO-IF Isolation



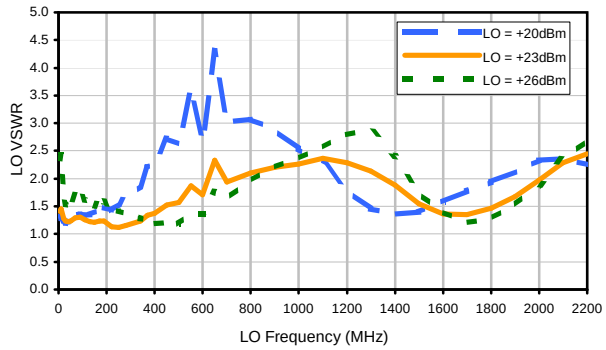
RF-IF Isolation



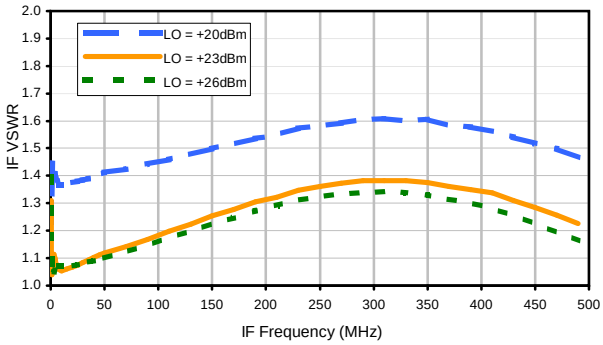
RF VSWR



LO VSWR



IF VSWR



Mini-Circuits®
IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see minicircuits.com

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

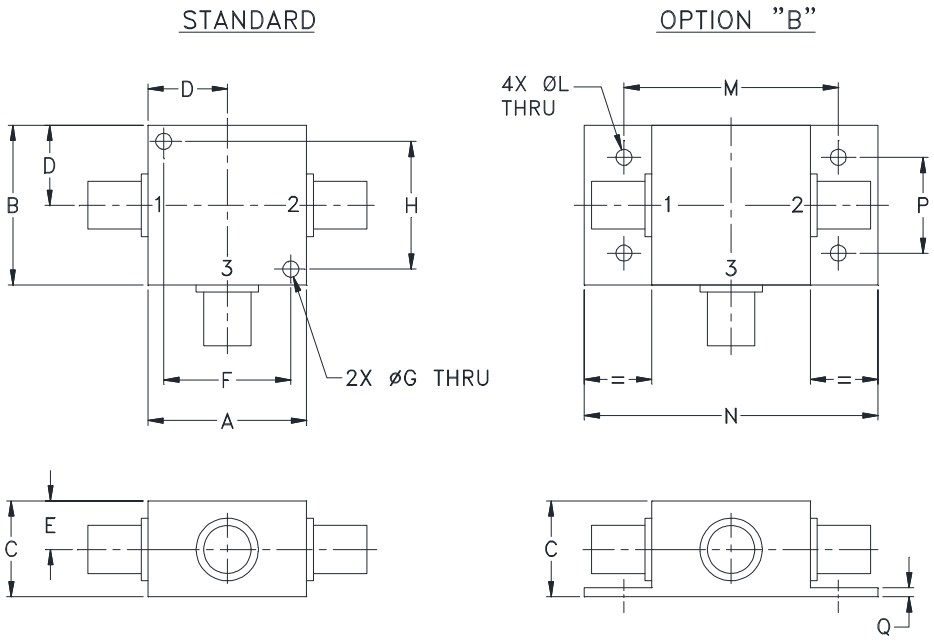
Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

Mini-Circuits®
IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see minicircuits.com

Case Style K

K18

Outline Dimensions



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N
K18	1.25 (31.75	1.25 (31.75)	.75 (19.05)	.63 (16.00)	.38 (9.65)	1.000 (25.40)	.125 (3.18)	1.000 (25.40)	-- --	-- --	.125 (3.18)	1.688 (42.88)	2.18 (55.37)

CASE#	P	Q	WT. GRAMS
K18	.75 (19.05)	.07 (1.78)	70.0

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

Notes:

1. Case material: Aluminum alloy.
2. Case finish:
   For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.
3. Mounting bracket available on request. Add suffix B to part number.
4. For port marking 1, 2, and 3 see specifications data sheet.
5. For bracket version, option B, dimension "C" changes from .75 to .94 inches when connectors are type N.
6. Refer to the individual model data sheet for the type of connectors available.

Mini-Circuits®
INTERNET http://www.minicircuits.com
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010
Mini-Circuits ISO 9001 & ISO 14001 Certified

This document and its contents are the property of Mini-Circuits

Mini-Circuits

Environmental Specifications ENV28

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
Barometric Pressure	100,000 Feet	MIL-STD-202, Method 105, Condition D
Humidity	90% RH, 65°C Units may require bake-out after humidity to restore full performance.	MIL-STD-202, Method 103
Thermal Shock	-65° to 125°C, 5 cycles	MIL-STD-202, Method 107, Condition B
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	100g, 6ms sawtooth, 3 shocks each direction 3 axes (total 18)	MIL-STD-202, Method 213, Condition I

This document and its contents are the property of Mini-Circuits.