Coaxial

Frequency Mixer

Level 7 (LO Power +7 dBm) 0.04 to 400 MHz

ZFM-3+

Generic photo used for illustration purposes only

CASE STYLE: K18

Connectors	Model
BNC	ZFM-3+
SMA	ZFM-3-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	50mW
IF Current	40mA

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

Coaxial Connections

LO	1
RF	2
IF	3

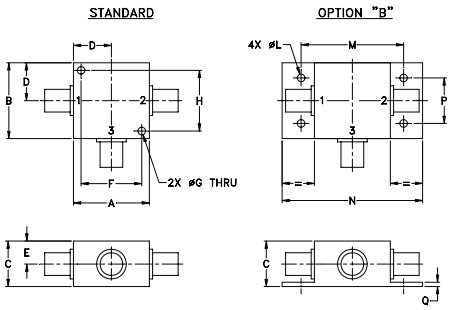
Features

- low conversion loss, 4.78 dB typ.
- high L-R isolation, 50 dB typ, L-I, 45 dB typ.
- rugged shielded case

Applications

- VHF
- FM radio
- defense & federal communications
- instrumentation

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.
0.04-400	DC-400	4.78	0.03	7.0	8.0	60	50	50	35	35	25	55	40	45	30	35	25

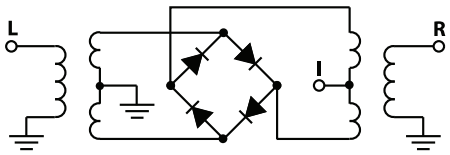
1 dB COMP.: +1 dBm typ.

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 +7dBm	LO +7dBm	LO +7dBm	LO +7dBm	LO +7dBm
0.04	30.04	6.15	>67.00	>67.00	1.24	2.69
0.05	30.05	5.52	>67.00	>67.00	1.25	2.55
0.07	30.07	5.12	>67.00	>67.00	1.25	2.67
0.10	30.10	4.92	>67.00	>67.00	1.24	2.63
0.50	30.50	4.77	>67.00	>67.00	1.23	2.55
1.00	31.00	4.76	>67.00	63.53	1.23	2.45
5.00	35.00	4.75	>67.00	60.91	1.21	2.48
10.00	40.00	4.75	>67.00	60.97	1.21	2.42
20.00	50.00	4.74	>67.00	58.52	1.19	2.42
60.87	90.87	4.73	50.40	49.37	1.18	2.36
100.00	70.00	4.63	44.80	44.05	1.16	2.38
162.61	132.61	4.79	39.22	39.87	1.15	2.46
200.00	170.00	4.95	37.18	37.86	1.13	2.40
230.44	200.44	4.89	35.78	37.67	1.13	2.42
281.31	251.31	5.05	33.68	35.71	1.13	2.41
315.23	285.23	5.25	34.22	33.98	1.14	2.56
349.14	319.14	5.32	35.64	34.07	1.14	2.63
366.10	336.10	5.37	35.56	34.58	1.14	2.68
383.05	353.05	5.44	35.25	34.26	1.15	2.69
400.00	370.00	5.56	34.72	32.46	1.15	2.76

Electrical Schematic



Notes
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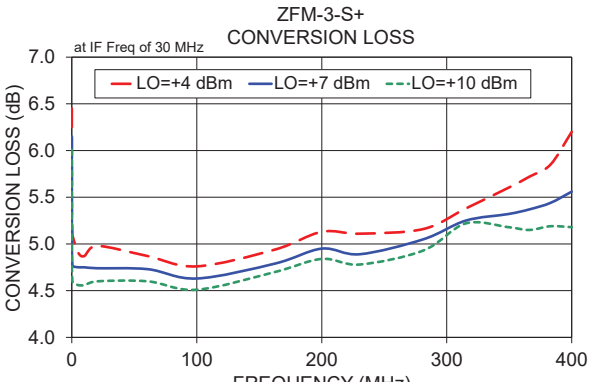

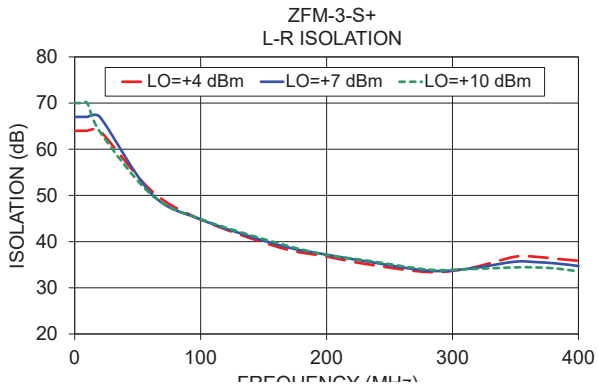

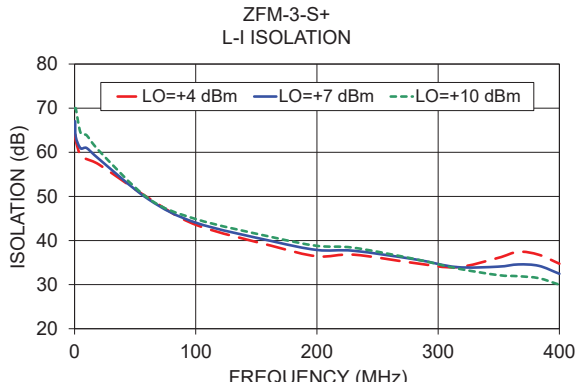

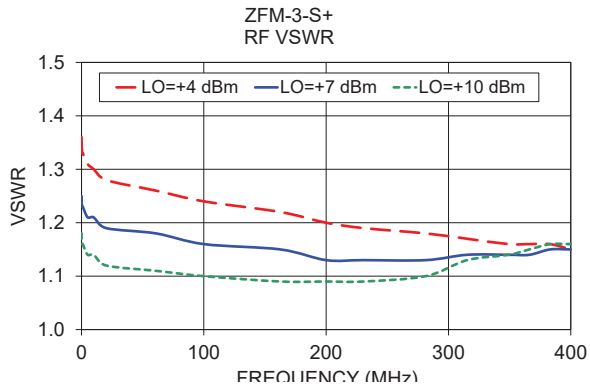

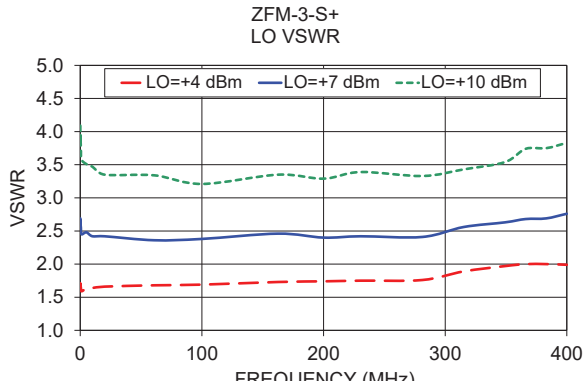

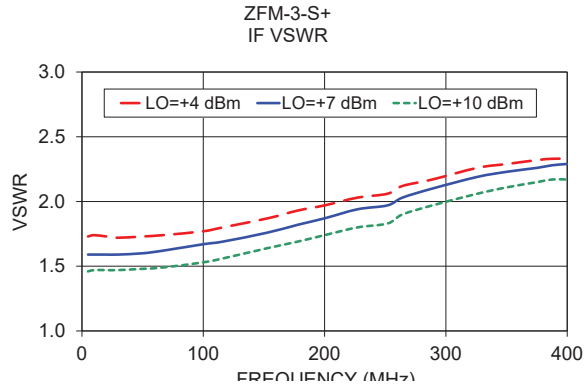

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Frequency Mixer ZFM-3+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB) @LO (dBm)		
		+4	+7	+10
0.04	30.04	6.45	6.15	6.01
0.05	30.05	5.82	5.52	5.36
0.07	30.07	5.44	5.12	4.99
0.1	30.1	5.30	4.92	4.76
0.5	30.5	5.10	4.77	4.60
1.0	31.0	5.07	4.76	4.59
5.0	35.0	4.91	4.75	4.56
10.0	40.0	4.87	4.75	4.56
26.5	56.5	4.95	4.75	4.64
59.3	89.3	4.90	4.72	4.61
75.7	105.7	4.89	4.71	4.61
92.2	122.2	4.93	4.76	4.66
108.6	138.6	4.96	4.78	4.68
125.0	155.0	4.98	4.82	4.72
157.8	187.8	5.02	4.86	4.77
174.2	204.2	5.01	4.85	4.77
190.6	220.6	5.09	4.92	4.82
207.0	237.0	5.21	4.99	4.85
239.8	269.8	5.37	5.19	5.03
256.3	286.3	5.36	5.21	5.10
272.7	302.7	5.36	5.22	5.14
289.1	319.1	5.42	5.27	5.21
305.5	335.5	5.51	5.34	5.26
338.3	368.3	5.72	5.50	5.41
354.7	384.7	5.90	5.60	5.44
371.1	401.1	6.15	5.74	5.47
387.5	417.5	6.37	5.97	5.58
403.9	433.9	6.60	6.23	5.76
436.8	466.8	6.96	6.54	6.09
453.2	483.2	7.22	6.80	6.38
469.6	499.6	7.55	7.13	6.75
486.0	516.0	7.70	7.28	6.97
502.4	532.4	7.82	7.39	7.11
535.2	565.2	7.89	7.55	7.27
551.6	581.6	8.05	7.74	7.43
568.0	598.0	8.22	7.98	7.75
584.5	614.5	8.39	8.15	8.00
600.9	630.9	8.67	8.47	8.39
633.7	663.7	9.39	9.26	9.30
650.1	680.1	9.84	9.74	9.79

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm) @LO (dBm)		
		+4	+7	+10
10.1	40.1	18.34	18.12	19.29
26.5	56.5	15.46	16.47	17.00
42.9	72.9	15.83	16.32	18.84
59.3	89.3	14.90	17.08	26.69
75.7	105.7	15.53	20.21	21.09
92.2	122.2	15.69	21.92	19.52
108.6	138.6	17.27	19.72	15.31
125.0	155.0	15.96	19.66	15.62
141.4	171.4	16.57	18.74	15.23
157.8	187.8	14.48	13.78	14.60
174.2	204.2	10.86	9.57	9.61
190.6	220.6	13.18	11.49	11.69
207.0	237.0	21.67	16.79	15.17
223.4	253.4	18.96	26.39	21.19
239.8	269.8	12.73	11.76	13.59
256.3	286.3	10.71	10.03	9.84
272.7	302.7	10.27	9.73	9.89
289.1	319.1	9.58	8.94	9.57
305.5	335.5	9.68	9.46	11.23
321.9	351.9	9.85	10.88	13.21
338.3	368.3	9.46	12.39	14.57
354.7	384.7	7.04	11.87	16.12
371.1	401.1	3.90	9.26	14.09
387.5	417.5	1.59	4.94	9.88
403.9	433.9	0.63	2.54	6.03
420.4	450.4	0.62	1.91	4.57
436.8	466.8	0.90	1.96	4.13
453.2	483.2	1.51	2.36	4.19
469.6	499.6	3.21	3.85	5.69
486.0	516.0	4.63	5.15	7.03
502.4	532.4	6.23	6.75	9.10
518.8	548.8	8.20	9.20	13.44
535.2	565.2	8.50	10.98	24.22
551.6	581.6	8.72	11.06	13.65
568.0	598.0	8.40	10.17	12.17
584.5	614.5	7.91	9.30	11.52
600.9	630.9	7.55	9.15	11.65
617.3	647.3	7.68	9.57	12.27
633.7	663.7	8.04	10.37	12.57
650.1	680.1	8.83	11.29	12.78

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+1dBm (dB) @LO (dBm)		
		+4	+7	+10
10.1	40.1	1.41	1.12	0.86
26.5	56.5	1.37	1.07	0.83
42.9	72.9	1.42	1.09	0.85
59.3	89.3	1.37	1.06	0.81
75.7	105.7	1.29	1.00	0.76
92.2	122.2	1.29	0.97	0.75
108.6	138.6	1.32	1.03	0.81
125.0	155.0	1.25	0.96	0.75
141.4	171.4	1.19	0.88	0.68
157.8	187.8	1.16	0.89	0.67
174.2	204.2	1.13	0.86	0.68
190.6	220.6	1.12	0.85	0.67
207.0	237.0	1.12	0.87	0.67
223.4	253.4	1.06	0.85	0.65
239.8	269.8	1.07	0.85	0.67
256.3	286.3	1.17	0.91	0.71
272.7	302.7	1.29	0.99	0.78
289.1	319.1	1.46	1.10	0.83
305.5	335.5	1.62	1.16	0.85
321.9	351.9	1.74	1.19	0.87
338.3	368.3	1.90	1.28	0.94
354.7	384.7	2.04	1.45	1.07
371.1	401.1	2.11	1.65	1.23
387.5	417.5	2.18	1.80	1.42
403.9	433.9	2.18	1.82	1.55
420.4	450.4	2.04	1.75	1.55
436.8	466.8	1.97	1.73	1.54
453.2	483.2	1.80	1.58	1.41
469.6	499.6	1.56	1.36	1.18
486.0	516.0	1.50	1.29	1.06
502.4	532.4	1.52	1.29	1.02
518.8	548.8	1.49	1.19	0.93
535.2	565.2	1.53	1.19	1.00
551.6	581.6	1.50	1.15	1.01
568.0	598.0	1.45	1.08	0.91
584.5	614.5	1.46	1.10	0.88
600.9	630.9	1.45	1.05	0.80
617.3	647.3	1.34	0.93	0.68
633.7	663.7	1.25	0.87	0.67
650.1	680.1	1.15	0.81	0.67

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Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=200.1MHz (dB) @LO (dBm) +7
190.0	10.1	5.22
185.4	14.7	5.19
180.8	19.3	5.17
176.2	23.9	5.14
171.5	28.6	5.12
166.9	33.2	5.09
162.3	37.8	5.07
157.7	42.4	5.05
153.1	47.0	5.02
148.5	51.6	5.00
143.8	56.3	4.99
139.2	60.9	4.99
134.6	65.5	4.98
130.0	70.1	4.97
125.4	74.7	4.96
120.8	79.3	4.96
116.2	83.9	4.96
111.5	88.6	4.95
106.9	93.2	4.95
102.3	97.8	4.94
97.7	102.4	4.94
93.1	107.0	4.94
88.5	111.6	4.93
83.8	116.3	4.93
79.2	120.9	4.94
74.6	125.5	4.94
70.0	130.1	4.96
65.4	134.7	4.95
60.8	139.3	4.94
56.2	143.9	4.94
51.5	148.6	4.92
46.9	153.2	4.92
42.3	157.8	4.91
37.7	162.4	4.90
33.1	167.0	4.90
28.5	171.6	4.88
23.8	176.3	4.88
19.2	180.9	4.88
14.6	185.5	4.89
10.0	190.1	4.89

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=10.1MHz (dB) @LO (dBm) +7
10.0	20.1	4.68
19.7	29.8	4.72
29.5	39.6	4.74
39.2	49.3	4.73
49.0	59.1	4.76
58.7	68.8	4.79
68.5	78.6	4.80
78.2	88.3	4.81
87.9	98.0	4.84
97.7	107.8	4.87
107.4	117.5	4.91
117.2	127.3	4.93
126.9	137.0	4.92
136.7	146.8	4.96
146.4	156.5	5.00
156.2	166.3	5.01
165.9	176.0	5.00
175.6	185.7	5.03
185.4	195.5	5.07
195.1	205.2	5.06
204.9	215.0	5.06
214.6	224.7	5.06
224.4	234.5	5.07
234.1	244.2	5.14
243.8	253.9	5.24
253.6	263.7	5.35
263.3	273.4	5.46
273.1	283.2	5.52
282.8	292.9	5.50
292.6	302.7	5.50
302.3	312.4	5.47
312.1	322.2	5.37
321.8	331.9	5.34
331.5	341.6	5.29
341.3	351.4	5.26
351.0	361.1	5.27
360.8	370.9	5.27
370.5	380.6	5.28
380.3	390.4	5.30
390.0	400.1	5.33

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=400.1MHz (dB) @LO (dBm) +7
390.0	10.1	6.77
380.3	19.8	6.67
370.5	29.6	6.60
360.8	39.3	6.52
351.0	49.1	6.46
341.3	58.8	6.41
331.5	68.6	6.36
321.8	78.3	6.33
312.1	88.0	6.34
302.3	97.8	6.36
292.6	107.5	6.34
282.8	117.3	6.31
273.1	127.0	6.30
263.3	136.8	6.28
253.6	146.5	6.25
243.8	156.3	6.25
234.1	166.0	6.26
224.4	175.7	6.26
214.6	185.5	6.28
204.9	195.2	6.28
195.1	205.0	6.33
185.4	214.7	6.34
175.6	224.5	6.31
165.9	234.2	6.28
156.2	243.9	6.23
146.4	253.7	6.17
136.7	263.4	6.11
126.9	273.2	6.08
117.2	282.9	6.05
107.4	292.7	6.07
97.7	302.4	6.05
87.9	312.2	6.01
78.2	321.9	5.96
68.5	331.6	5.90
58.7	341.4	5.83
49.0	351.1	5.75
39.2	360.9	5.70
29.5	370.6	5.69
19.7	380.4	5.71
10.0	390.1	5.74

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Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB) @LO (dBm)			LO-IF ISOLATION (dB) @LO (dBm)		
	+4	+7	+10	+4	+7	+10
0.04	64.00	67.00	70.00	64.00	67.00	70.00
0.05	64.00	67.00	70.00	64.00	67.00	70.00
0.07	64.00	67.00	70.00	64.00	67.00	70.00
0.1	64.00	67.00	70.00	64.00	67.00	70.00
0.5	64.00	67.00	70.00	64.00	67.00	70.00
1.0	64.00	67.00	70.00	62.64	63.53	70.00
5.0	64.00	67.00	70.00	59.16	60.91	64.41
10.0	64.00	67.00	70.00	58.46	60.97	63.86
26.5	63.64	63.74	64.07	68.51	67.00	63.99
59.3	56.40	57.07	57.61	59.54	58.60	57.92
75.7	54.38	55.00	55.47	56.44	56.36	55.91
92.2	52.53	53.30	53.92	54.83	55.18	54.58
108.6	51.42	52.05	52.43	53.51	53.60	52.81
125.0	49.40	50.12	50.74	52.77	53.18	52.24
157.8	49.08	49.80	50.11	50.76	49.69	48.46
174.2	47.15	48.30	48.92	53.73	50.60	47.63
190.6	44.41	45.24	46.10	53.19	52.00	48.69
207.0	43.23	43.82	44.60	52.99	49.95	47.58
239.8	44.72	44.69	44.95	44.98	43.33	42.13
256.3	46.05	45.83	45.40	41.80	40.57	39.69
272.7	47.71	47.16	46.28	40.85	39.28	38.38
289.1	47.80	47.00	46.10	39.90	38.12	37.25
305.5	47.46	46.56	45.14	41.22	37.98	36.35
338.3	42.22	42.40	41.90	44.60	36.27	32.98
354.7	40.09	40.42	40.36	43.95	35.36	32.12
371.1	38.65	39.37	39.91	42.50	35.06	31.48
387.5	37.78	38.46	39.13	39.02	33.74	30.49
403.9	37.12	37.45	37.86	37.78	33.32	29.88
436.8	37.33	37.91	38.27	34.50	32.98	29.63
453.2	37.59	38.29	38.74	32.59	31.50	29.11
469.6	37.67	38.56	39.14	31.17	30.32	28.26
486.0	37.37	37.94	38.03	29.85	29.15	27.16
502.4	36.40	36.96	36.68	28.92	28.54	26.31
535.2	35.20	35.15	33.64	26.51	25.98	23.22
551.6	34.46	33.90	31.90	25.22	24.26	21.47
568.0	33.13	32.03	29.87	24.06	22.70	19.99
584.5	31.32	29.94	27.94	22.91	21.36	18.92
600.9	29.98	28.61	26.77	21.70	20.24	18.10
633.7	26.75	25.67	24.23	19.21	18.24	16.61
650.1	25.12	24.22	22.91	17.99	17.19	15.72

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB) @LO (dBm)		
		+4	+7	+10
10.1	40.1	38.99	37.34	36.05
26.5	56.5	32.65	32.27	31.88
42.9	72.9	29.18	29.08	29.02
59.3	89.3	26.91	26.99	26.92
75.7	105.7	25.62	25.69	25.71
92.2	122.2	24.42	24.73	24.91
108.6	138.6	23.61	23.78	23.94
125.0	155.0	23.72	23.91	24.00
141.4	171.4	23.61	24.14	24.42
157.8	187.8	23.25	24.08	24.81
174.2	204.2	23.05	23.69	24.29
190.6	220.6	23.19	23.62	24.05
207.0	237.0	23.97	24.32	24.74
223.4	253.4	25.47	25.88	26.25
239.8	269.8	26.73	27.52	28.43
256.3	286.3	25.99	26.76	27.68
272.7	302.7	23.49	24.02	24.51
289.1	319.1	20.80	21.11	21.40
305.5	335.5	19.00	19.18	19.25
321.9	351.9	17.53	17.59	17.61
338.3	368.3	16.54	16.48	16.47
354.7	384.7	15.82	15.76	15.78
371.1	401.1	15.40	15.28	15.33
387.5	417.5	15.02	14.91	14.98
403.9	433.9	14.87	14.73	14.80
420.4	450.4	14.83	14.75	14.76
436.8	466.8	14.68	14.60	14.67
453.2	483.2	14.55	14.45	14.48
469.6	499.6	14.28	14.16	14.21
486.0	516.0	13.70	13.60	13.71
502.4	532.4	13.15	13.12	13.21
518.8	548.8	12.51	12.54	12.63
535.2	565.2	12.03	12.05	12.02
551.6	581.6	11.51	11.47	11.36
568.0	598.0	10.92	10.80	10.63
584.5	614.5	10.41	10.27	10.03
600.9	630.9	9.83	9.63	9.32
617.3	647.3	9.14	8.88	8.53
633.7	663.7	8.45	8.16	7.82
650.1	680.1	7.79	7.47	7.19

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Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1) @LO (dBm) +4	+7	+10
5.0	35.0	1.36	1.24	1.18
10.0	40.0	1.36	1.25	1.18
26.5	56.5	1.36	1.25	1.17
42.9	72.9	1.33	1.22	1.15
59.3	89.3	1.32	1.21	1.14
75.7	105.7	1.27	1.17	1.11
92.2	122.2	1.25	1.15	1.09
108.6	138.6	1.24	1.15	1.09
125.0	155.0	1.22	1.13	1.08
141.4	171.4	1.18	1.09	1.05
157.8	187.8	1.17	1.07	1.04
174.2	204.2	1.14	1.06	1.03
190.6	220.6	1.11	1.04	1.02
207.0	237.0	1.10	1.04	1.07
223.4	253.4	1.10	1.06	1.12
239.8	269.8	1.06	1.07	1.13
256.3	286.3	1.05	1.10	1.16
272.7	302.7	1.09	1.17	1.23
289.1	319.1	1.14	1.23	1.30
305.5	335.5	1.16	1.26	1.33
321.9	351.9	1.17	1.26	1.32
338.3	368.3	1.15	1.24	1.29
354.7	384.7	1.09	1.18	1.23
371.1	401.1	1.01	1.10	1.16
387.5	417.5	1.06	1.03	1.11
403.9	433.9	1.15	1.08	1.08
420.4	450.4	1.26	1.20	1.16
436.8	466.8	1.34	1.28	1.24
453.2	483.2	1.46	1.40	1.36
469.6	499.6	1.64	1.58	1.55
486.0	516.0	1.74	1.70	1.69
502.4	532.4	1.88	1.86	1.85
518.8	548.8	2.03	2.02	2.03
535.2	565.2	2.13	2.13	2.13
551.6	581.6	2.28	2.29	2.26
568.0	598.0	2.43	2.42	2.39
584.5	614.5	2.53	2.52	2.48
600.9	630.9	2.65	2.61	2.58
617.3	647.3	2.72	2.68	2.65
633.7	663.7	2.76	2.71	2.68
650.1	680.1	2.80	2.73	2.69

LO (MHz)	LO VSWR (:1) @LO (dBm) +4	+7	+10
5.0	1.71	2.69	4.09
10.0	1.64	2.55	3.82
26.5	1.66	2.44	3.42
42.9	1.62	2.34	3.25
59.3	1.60	2.30	3.18
75.7	1.62	2.34	3.24
92.2	1.67	2.43	3.36
108.6	1.68	2.43	3.35
125.0	1.66	2.36	3.22
141.4	1.63	2.30	3.12
157.8	1.65	2.32	3.14
174.2	1.69	2.39	3.24
190.6	1.74	2.46	3.34
207.0	1.74	2.44	3.29
223.4	1.74	2.38	3.18
239.8	1.74	2.36	3.14
256.3	1.77	2.43	3.23
272.7	1.83	2.52	3.37
289.1	1.87	2.57	3.43
305.5	1.88	2.54	3.36
321.9	1.87	2.48	3.26
338.3	1.89	2.48	3.24
354.7	1.96	2.55	3.33
371.1	2.06	2.67	3.46
387.5	2.15	2.79	3.58
403.9	2.18	2.84	3.61
420.4	2.15	2.82	3.59
436.8	2.14	2.81	3.59
453.2	2.17	2.86	3.67
469.6	2.22	2.95	3.79
486.0	2.27	3.00	3.85
502.4	2.27	2.97	3.79
518.8	2.25	2.91	3.70
535.2	2.25	2.90	3.67
551.6	2.28	2.92	3.68
568.0	2.32	2.96	3.71
584.5	2.34	2.97	3.72
600.9	2.35	2.95	3.67
617.3	2.36	2.93	3.63
633.7	2.39	2.94	3.62
650.1	2.46	2.99	3.65

IF (OUT) (MHz)	IF VSWR @LO=400.1MHz (:1) @LO (dBm) +4	+7	+10
5.0	1.73	1.59	1.46
10.0	1.74	1.59	1.47
20.0	2.01	1.60	1.39
30.0	2.02	1.61	1.40
40.0	2.02	1.61	1.41
50.0	2.03	1.63	1.43
60.0	2.04	1.64	1.45
70.0	2.05	1.66	1.47
80.0	2.06	1.67	1.48
90.0	2.06	1.68	1.50
100.0	2.07	1.70	1.52
110.0	2.09	1.73	1.55
120.0	2.11	1.75	1.57
130.0	2.10	1.76	1.59
140.0	2.11	1.77	1.61
150.0	2.11	1.79	1.64
160.0	2.13	1.80	1.66
170.0	2.14	1.82	1.68
180.0	2.14	1.84	1.70
190.0	2.15	1.86	1.73
200.0	2.17	1.88	1.75
210.0	2.17	1.89	1.77
220.0	2.16	1.89	1.78
230.0	2.15	1.90	1.79
240.0	2.15	1.90	1.81
250.0	2.16	1.92	1.82
260.0	2.18	1.93	1.83
270.0	2.18	1.94	1.85
280.0	2.19	1.96	1.87
290.0	2.18	1.96	1.88
300.0	2.17	1.95	1.88
310.0	2.15	1.94	1.86
320.0	2.12	1.92	1.85
330.0	2.11	1.91	1.84
340.0	2.11	1.90	1.84
350.0	2.11	1.90	1.84
360.0	2.11	1.90	1.84
370.0	2.11	1.90	1.84
380.0	2.10	1.90	1.84
390.0	2.09	1.89	1.83
400.0	2.26	2.09	2.06

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Harmonics Tables

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	20	30	13	34	17	36	27	38	38	44
1	-	19	+0	25	11	39	23	43	39	40	37	42
2	>100	59	55	56	56	58	49	61	54	77	62	79
3	>100	68	64	66	68	71	66	69	73	72	65	69
4	>100	>81	>81	>81	>81	>81	>81	>81	>81	>81	>81	>81
5	>100	>81	>81	>81	>81	>81	>81	>81	>81	>81	>81	>81
6	>100	>81	>81	>81	>81	>81	78	>81	>81	>81	>81	>81
7	>100	>81	>81	>81	>81	>81	>81	66	>81	>81	>81	>81
8	>100	>81	>81	>81	>81	>81	>81	>81	61	>81	>81	>81
9	>100	>81	>81	>81	>81	>81	>81	>81	>81	51	>81	>81
10	>100	>81	>81	>81	>81	>81	>81	>81	>81	>81	79	>81
RF CAL		0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:
RF IN: 200.1 MHz; -14.00 dBm.
LO IN: 230.01 MHz; +7.00 dBm
IF OUT: 29.91 MHz; -19.03 dBm

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	29	39	24	52	28	50	39	52	52	58
1	-	20	+0	26	12	36	24	50	38	48	46	50
2	97	55	51	53	51	54	46	56	50	70	55	62
3	>100	52	39	45	41	45	37	54	49	54	54	51
4	>100	67	68	65	64	64	65	64	56	72	65	80
5	>100	71	60	67	55	74	52	84	53	63	63	67
6	>100	89	82	82	81	81	75	80	78	79	78	85
7	>100	>91	89	84	82	76	70	74	65	72	62	89
8	>100	>91	>91	>91	>91	87	>91	>91	75	87	87	91
9	>100	>91	89	89	88	>91	78	86	82	67	83	87
10	>100	>91	>91	>91	>91	>91	>91	>91	>91	>91	>91	>91
RF CAL		0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:
RF IN: 200.1 MHz; -4.00 dBm.
LO IN: 230.01 MHz; +7.00 dBm
IF OUT: 29.91 MHz; -9.07 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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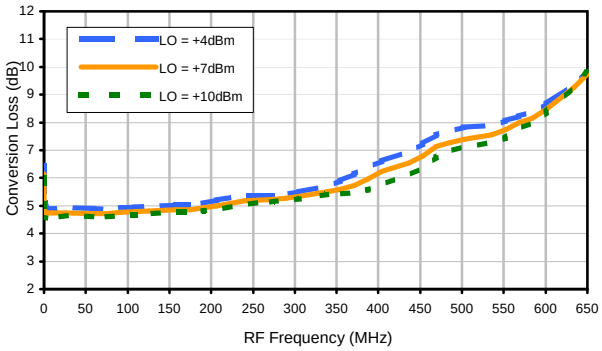
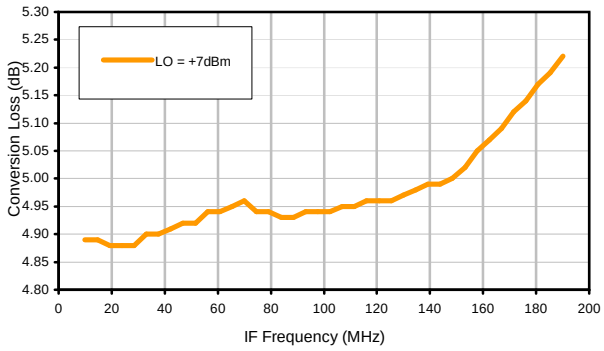
Frequency Mixer ZFM-3+

Typical Performance Curves

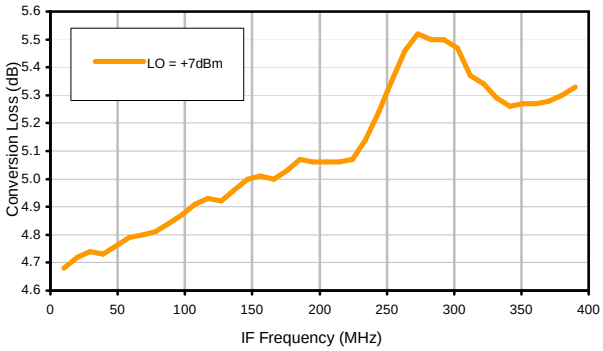
Conversion Loss @ IF=30MHz



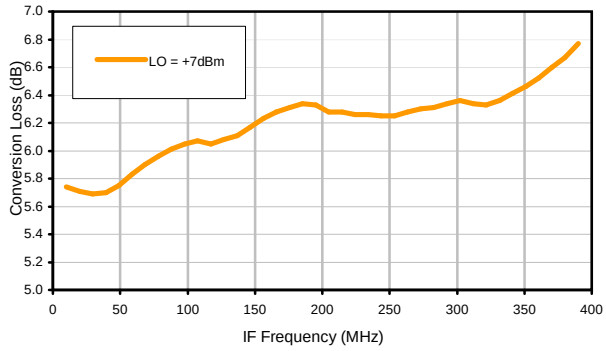
Conversion Loss vs. IF @ RF=200.1MHz



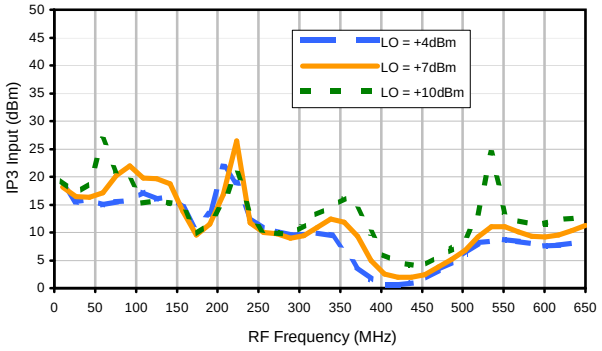
Conversion Loss vs. IF @ RF=10.1MHz



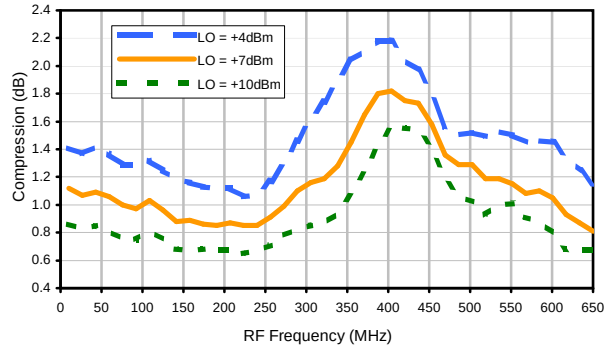
Conversion Loss vs. IF @ RF=400.1MHz



IP3 Input



Compression @ RF IN=+1dBm



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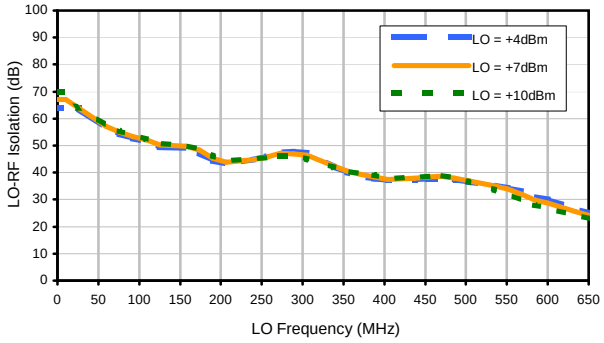
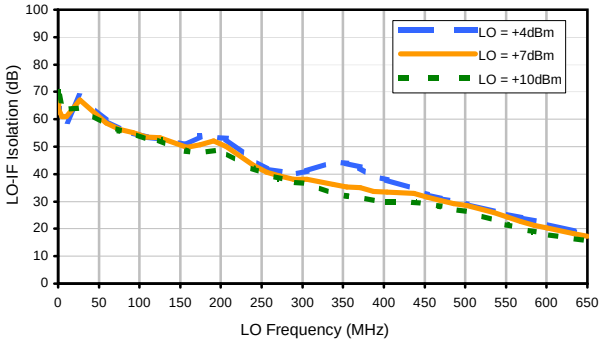
Typical Performance Curves

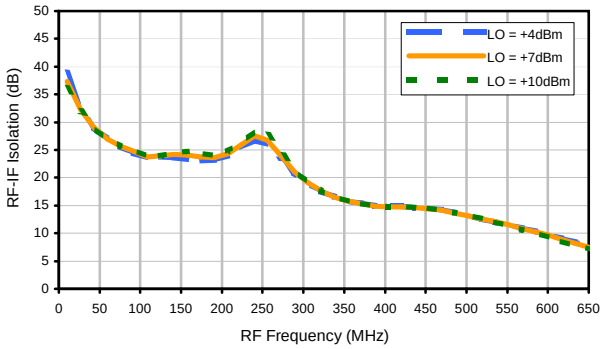
LO-RF Isolation



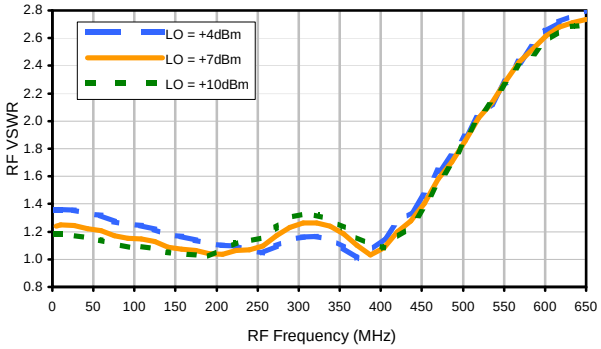
LO-IF Isolation



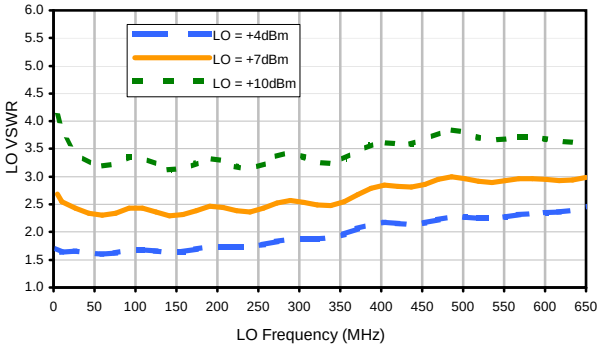
RF-IF Isolation



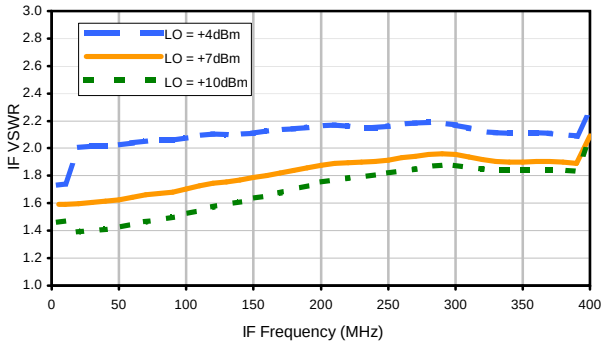
RF VSWR



LO VSWR



IF VSWR



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Harmonics Tables

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	20	30	13	34	17	36	27	38	38	44
1	-	19	+0	25	11	39	23	43	39	40	37	42
2	>100	59	55	56	56	58	49	61	54	77	62	79
3	>100	68	64	66	68	71	66	69	73	72	65	69
4	>100	>81	>81	>81	>81	>81	>81	>81	>81	>81	>81	>81
5	>100	>81	>81	>81	>81	>81	>81	>81	>81	>81	>81	>81
6	>100	>81	>81	>81	>81	>81	78	>81	>81	>81	>81	>81
7	>100	>81	>81	>81	>81	>81	>81	66	>81	>81	>81	>81
8	>100	>81	>81	>81	>81	>81	>81	>81	61	>81	>81	>81
9	>100	>81	>81	>81	>81	>81	>81	>81	>81	51	>81	>81
10	>100	>81	>81	>81	>81	>81	>81	>81	>81	>81	79	>81
RF CAL		0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:
RF IN: 200.1 MHz; -14.00 dBm.
LO IN: 230.01 MHz; +7.00 dBm
IF OUT: 29.91 MHz; -19.03 dBm

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	29	39	24	52	28	50	39	52	52	58
1	-	20	+0	26	12	36	24	50	38	48	46	50
2	97	55	51	53	51	54	46	56	50	70	55	62
3	>100	52	39	45	41	45	37	54	49	54	54	51
4	>100	67	68	65	64	64	65	64	56	72	65	80
5	>100	71	60	67	55	74	52	84	53	63	63	67
6	>100	89	82	82	81	81	75	80	78	79	78	85
7	>100	>91	89	84	82	76	70	74	65	72	62	89
8	>100	>91	>91	>91	>91	87	>91	>91	75	87	87	91
9	>100	>91	89	89	88	>91	78	86	82	67	83	87
10	>100	>91	>91	>91	>91	>91	>91	>91	>91	>91	>91	>91
RF CAL		0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:
RF IN: 200.1 MHz; -4.00 dBm.
LO IN: 230.01 MHz; +7.00 dBm
IF OUT: 29.91 MHz; -9.07 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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IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS 9100 CERTIFIED RoHS compliant
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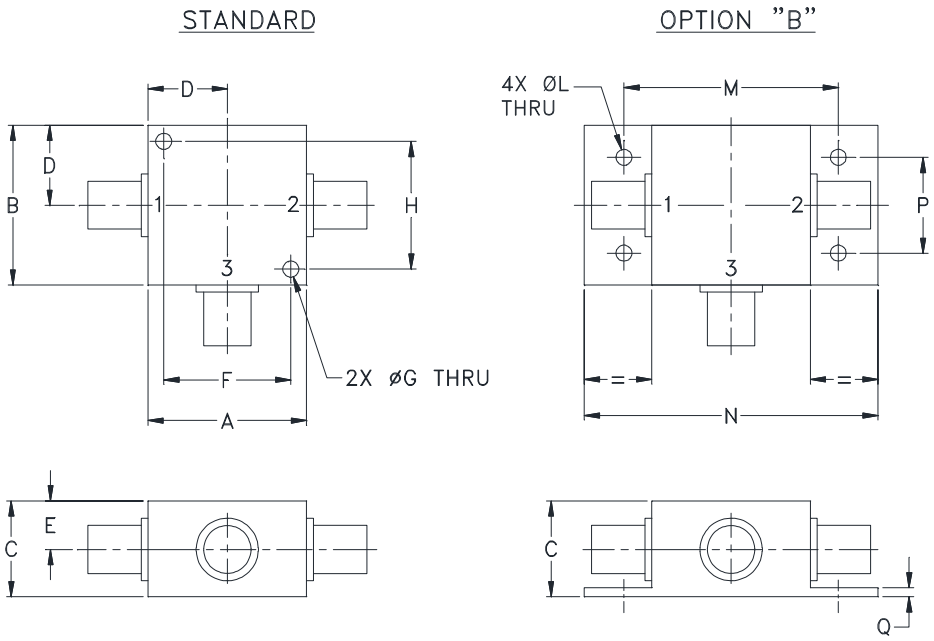
The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see minicircuits.com

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.

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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

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