

Coaxial Frequency Mixer

ZEM-2B+

Level 7 (LO Power +7 dBm) 10 to 1000 MHz

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, 5.74 dB typ.
- broadband, 10 to 1000 MHz
- rugged shielded case

Applications

- VHF/UHF
- cellular
- instrumentation



CASE STYLE: V37

Connectors	Model	Price	Qty.
SMA	ZEM-2B+	\$59.95	(1-9)

+ RoHS compliant in accordance with EU Directive (2002/95/EC)

The +Suffix has been added in order to identify 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)							
		L	M	U	L	M	U					
10-1000	5.74	55	50	30	25	20	55	45	30	20	25	20

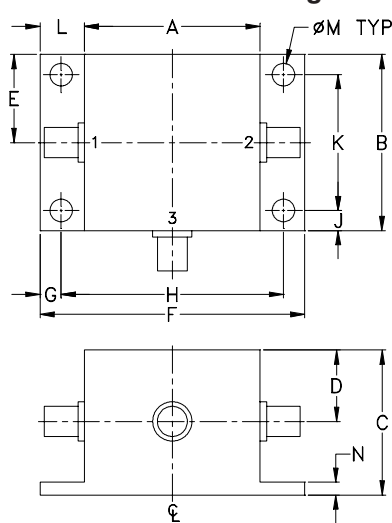
1 dB COMP.: +1 dBm typ.

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 [$2 f_L$ 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)
1.00	31.00	7.23	>67.00	1.30	2.70
2.00	32.00	6.50	>67.00	1.15	2.63
5.00	35.00	5.80	>67.00	1.07	2.77
10.00	40.00	5.62	>67.00	1.06	2.55
20.00	50.00	5.68	>67.00	1.07	2.41
50.00	80.00	5.58	61.94	1.09	2.37
100.00	70.00	5.53	54.33	1.11	2.29
167.34	137.34	5.57	48.65	1.16	2.20
233.87	203.87	5.72	45.10	1.18	2.16
300.40	270.40	5.45	42.56	1.20	2.13
366.94	336.94	5.73	40.45	1.22	2.06
466.74	436.74	5.82	38.33	1.23	2.13
500.00	470.00	5.72	38.80	1.26	2.09
599.81	569.81	6.02	37.43	1.29	2.09
666.34	636.34	6.11	37.94	1.34	2.04
799.41	769.41	6.27	36.06	1.40	2.13
832.68	802.68	6.46	35.22	1.47	2.19
899.21	869.21	7.00	33.77	1.55	2.24
932.48	902.48	7.37	33.17	1.66	2.28
1000.00	969.00	7.63	32.49	1.72	2.30

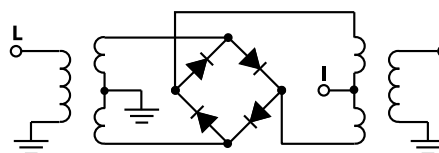
Outline Drawing



Outline Dimensions (inch/mm)

A	B	C	D	E	F	G
.83	.83	.75	.37	.42	1.25	.10
21.08	21.08	19.05	9.40	10.67	31.75	2.54
H	J	K	L	M	N	wt
1.050	.10	.640	.21	.106	.06	grams
26.67	2.54	16.26	5.33	2.69	1.52	22.0

Electrical Schematic



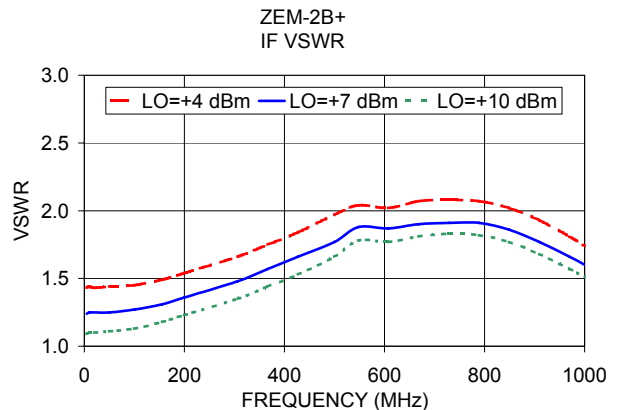
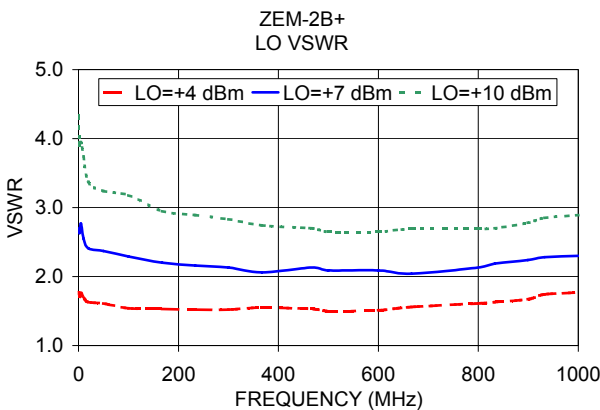
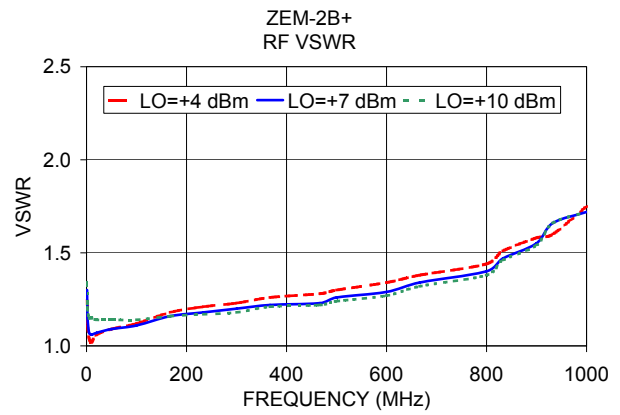
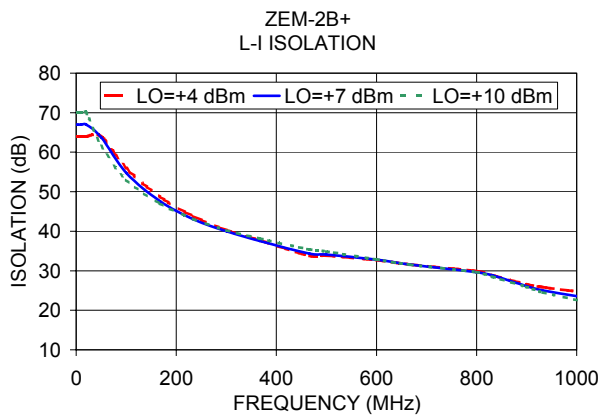
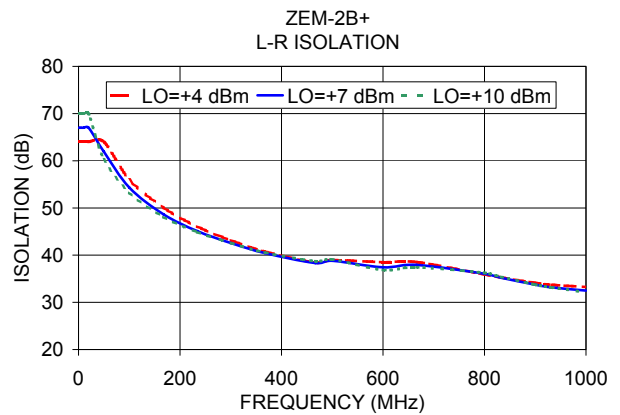
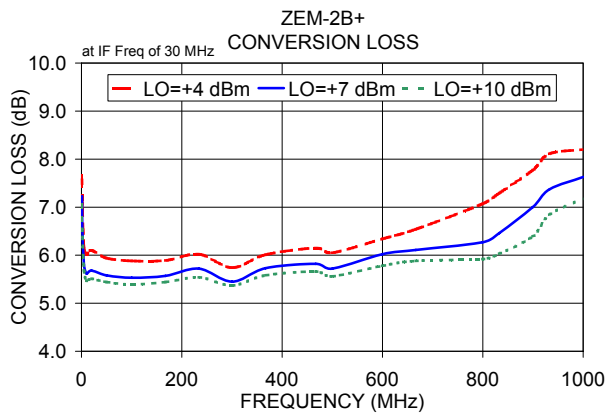
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Notes: 1. Performance and quality attributes and conditions not expressly stated in this specification sheet are intended to be excluded and do not form a part of this specification sheet. 2. Electrical specifications and performance data contained 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-Circuit's 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-Circuit's website at www.minicircuits.com/MCLStore/terms.jsp.

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Frequency Mixer

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Typical Performance Data

RF (MHz)	LO (MHz)	CONVERSION LOSS (dB)			LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
		@LO (dBm)				@LO (dBm)			@LO (dBm)		
		+4	+7	+10		+4	+7	+10	+4	+7	+10
1.0	31.0	7.65	7.23	7.05	1.0	64.00	67.00	70.00	64.00	67.00	70.00
2.0	32.0	6.99	6.50	6.38	2.0	64.00	67.00	70.00	64.00	67.00	70.00
5.0	35.0	6.14	5.80	5.68	5.0	64.00	67.00	70.00	64.00	67.00	70.00
10.0	40.0	6.01	5.62	5.47	10.0	64.00	67.00	70.00	64.00	67.00	70.00
20.0	50.0	6.10	5.68	5.51	20.0	64.00	67.00	70.00	64.00	67.00	70.00
50.0	80.0	5.94	5.58	5.44	50.0	64.00	61.94	60.30	64.00	63.74	61.51
100.0	70.0	5.88	5.53	5.39	100.0	56.03	54.33	53.23	55.98	54.76	53.00
167.3	137.3	5.89	5.57	5.44	167.3	50.05	48.65	48.08	48.75	47.61	47.01
233.9	203.9	6.02	5.72	5.54	233.9	46.08	45.10	44.88	43.82	43.03	43.10
300.4	270.4	5.74	5.45	5.37	300.4	43.14	42.56	42.56	40.29	40.00	40.23
366.9	336.9	6.01	5.73	5.58	366.9	40.77	40.45	40.57	37.73	37.57	38.18
466.7	436.7	6.15	5.82	5.66	466.7	38.41	38.33	38.72	33.78	34.32	35.36
500.0	470.0	6.05	5.72	5.56	500.0	38.98	38.80	39.09	33.83	34.10	34.86
599.8	569.8	6.34	6.02	5.78	599.8	38.50	37.43	36.87	32.71	32.81	32.88
666.3	636.3	6.54	6.11	5.88	666.3	38.54	37.94	37.43	31.60	31.57	31.51
799.4	769.4	7.07	6.27	5.92	799.4	35.96	36.06	36.24	29.94	29.67	29.67
832.7	802.7	7.29	6.46	6.03	832.7	35.29	35.22	35.39	28.80	28.79	28.42
899.2	869.2	7.77	7.00	6.39	899.2	34.14	33.77	33.77	26.59	26.14	25.92
932.5	902.5	8.11	7.37	6.84	932.5	33.72	33.17	33.14	25.85	25.03	24.52
1000.0	969.0	8.20	7.63	7.18	1000.0	33.25	32.49	32.14	24.75	23.59	22.58

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Frequency Mixer

ZEM-2B+

Typical Performance Data

RF/LO (MHz)	RF VSWR (:1)			LO VSWR (:1)			IF (MHz)	IF VSWR (:1)			LO/RF (MHz)	max. DC output (mV)	DC Offset (mV)
	@LO (dBm)			@LO (dBm)				@LO (dBm)			@LO (dBm)		
	+4	+7	+10	+4	+7	+10		+4	+7	+10	+7		
5.0	1.26	1.30	1.34	1.77	2.70	4.33	5.0	1.43	1.24	1.09	1.00	-230.1	0.09
10.0	1.12	1.15	1.20	1.71	2.63	3.91	10.0	1.44	1.25	1.10	2.00	-234.9	0.09
20.0	1.04	1.07	1.15	1.76	2.77	3.95	20.0	1.43	1.25	1.10	5.00	-240.2	0.08
50.0	1.02	1.06	1.15	1.69	2.55	3.74	50.0	1.44	1.25	1.11	20.00	-240.2	0.09
100.0	1.06	1.07	1.14	1.63	2.41	3.37	100.0	1.45	1.27	1.13	50.00	-236.5	0.09
155.8	1.09	1.09	1.14	1.61	2.37	3.24	155.8	1.49	1.31	1.18	100.00	-238.6	0.08
200.0	1.12	1.11	1.14	1.54	2.29	3.18	200.0	1.54	1.36	1.23	161.97	-242.9	0.06
306.5	1.18	1.16	1.16	1.53	2.20	2.95	306.5	1.66	1.48	1.35	200.00	-243.4	0.02
366.8	1.21	1.18	1.17	1.52	2.16	2.89	366.8	1.75	1.57	1.44	290.75	-246.8	0.11
427.1	1.23	1.20	1.18	1.52	2.13	2.83	427.1	1.84	1.66	1.53	322.94	-237.6	0.11
500.0	1.26	1.22	1.21	1.55	2.06	2.74	500.0	1.97	1.77	1.66	387.33	-224.0	0.01
547.7	1.28	1.23	1.22	1.53	2.13	2.70	547.7	2.04	1.88	1.78	451.72	-223.3	0.22
608.0	1.30	1.26	1.24	1.50	2.09	2.65	608.0	2.02	1.87	1.77	500.00	-229.6	0.23
668.3	1.34	1.29	1.27	1.51	2.09	2.65	668.3	2.07	1.90	1.81	580.49	-229.0	0.37
728.7	1.38	1.34	1.32	1.56	2.04	2.69	728.7	2.08	1.91	1.83	644.88	-207.4	0.48
789.0	1.44	1.40	1.38	1.61	2.13	2.69	789.0	2.07	1.91	1.82	709.27	-196.5	1.06
849.3	1.51	1.47	1.46	1.63	2.19	2.70	849.3	2.02	1.86	1.77	773.66	-138.5	0.83
909.6	1.58	1.55	1.54	1.67	2.24	2.78	909.6	1.93	1.77	1.68	838.04	-187.3	0.49
969.9	1.60	1.66	1.66	1.74	2.28	2.85	969.9	1.81	1.66	1.57	902.43	-173.9	0.72
1000.0	1.75	1.72	1.72	1.77	2.30	2.89	1000.0	1.74	1.60	1.51	1000.00	-178.5	0.64

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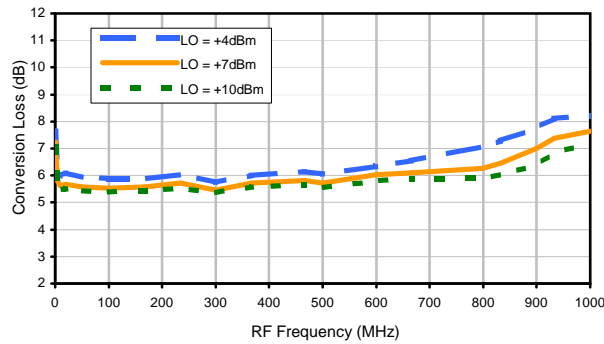


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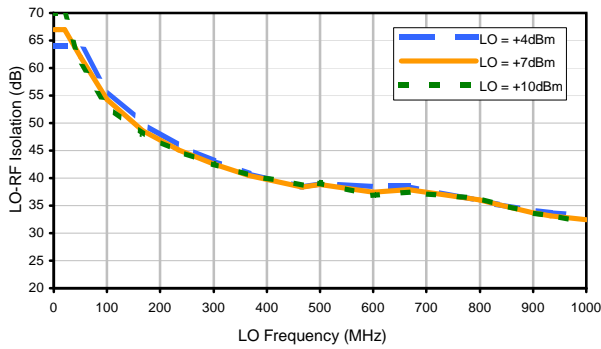


Typical Performance Curves

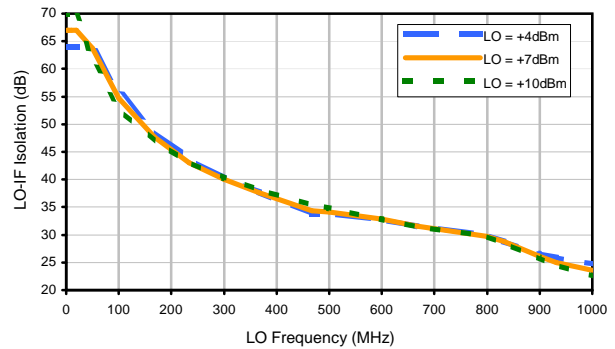
Conversion Loss



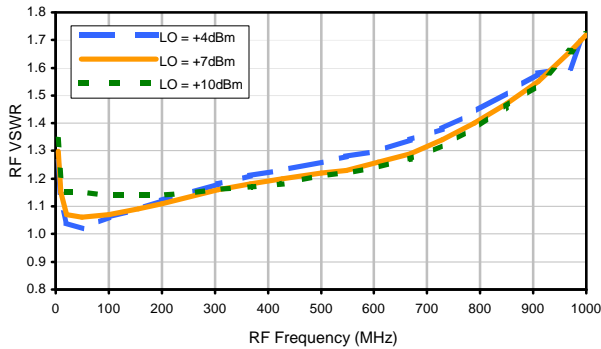
LO-RF Isolation



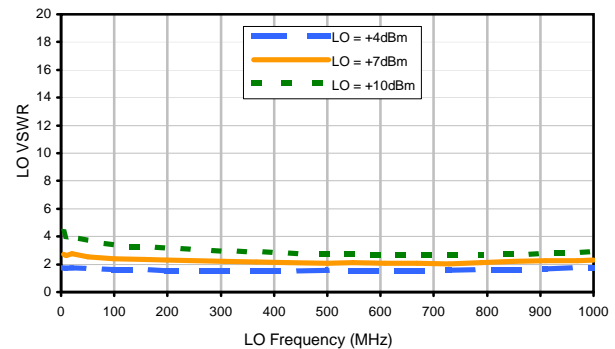
LO-IF Isolation



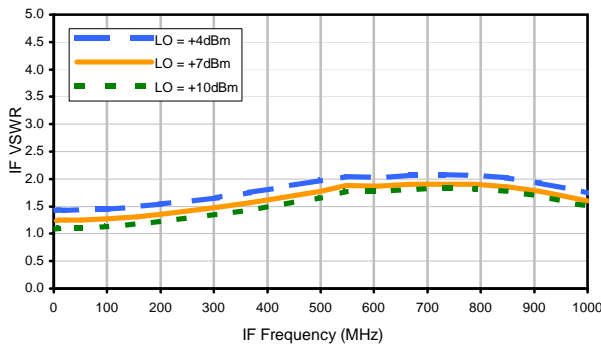
RF VSWR



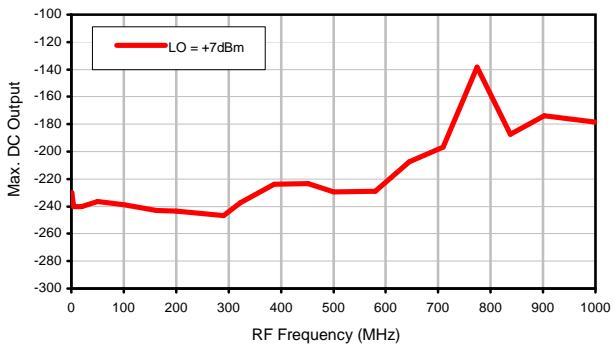
LO VSWR



IF VSWR



Max. DC Output

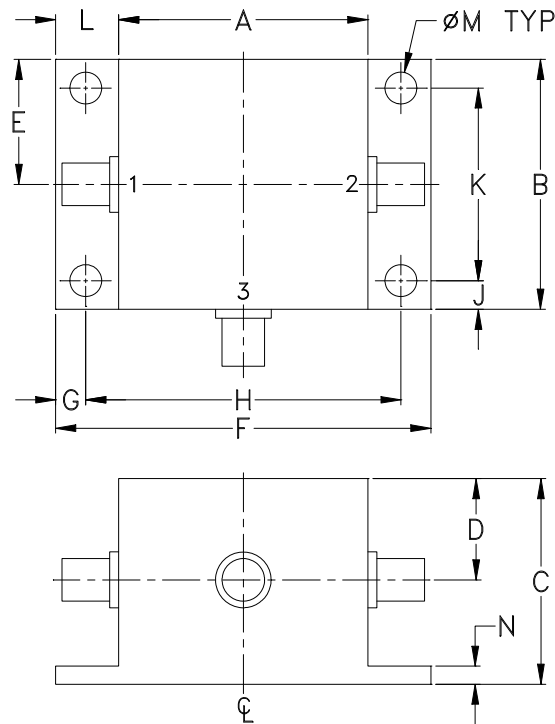


Case Style

V

Outline Dimensions

V37



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N	WT GRAMS
V37	.83 (21.08)	.83 (21.08)	.75 (19.05)	.37 (9.40)	.42 (10.67)	1.25 (31.75)	.10 (2.54)	1.050 (26.67)	.10 (2.54)	.640 (16.26)	.21 (5.33)	.106 (2.69)	.06 (1.52)	22.0

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

Notes:

1. Case material: Aluminum alloy.
2. Case finish:
For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.
3. Refer to the individual model data sheet for the type of connectors available.

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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