NON-CATALOG

Coaxial

I&Q Modulator

ZFMIQ-10M

50Ω 9 to 11 MHz

CASE STYLE: J17

Connectors	Model
SMA	ZFMIQ-10M
BRACKET (OPTION "B")	

Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
LO Power	50mW
I&Q current	40mA

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

Coaxial Connections

LO (carrier)	1
RF (signal)	3
I (0°)(ref.)	S
Q (90°)*	2

*Q= I +90° for lower sideband suppression

Features

- rugged shielded case
- excellent 3rd and 5th order harmonic suppression
- good carrier and sideband rejection

Applications

- radar and communication systems

Modulator Electrical Specifications

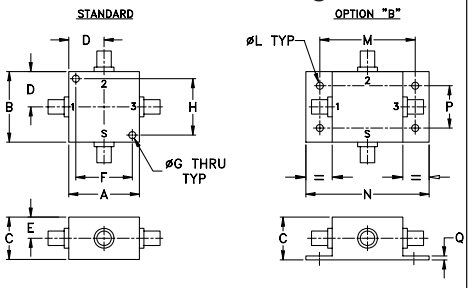
FREQUENCY (MHz) RF (SIGNAL) LO (CARRIER)		I&Q		CONVERSION LOSS (dB)			CARRIER REJECTION (-dBc)		SIDEBAND REJECTION (-dBc)		HARMONIC SUPPRESSION (-dBc) 3XI/Q		5XI/Q	
f_L	f_U	Min.	Max.	$\overline{x}$	σ	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.
9	11	DC	2	5.8	0.20	7.0	41	30	40	30	58	45	68	58

Operating LO power: 10±1dBm
1dB Compression: 0dBm typical
Conversion Loss: (I + Q) power, dBm-RF power, dBm
Carrier and sideband rejections measured at -5dBm I/Q power.

Typical Performance Data

Carrier Freq. (MHz)	Conversion Loss $\overline{x}$ (dB)	Conversion Loss σ (dB)	Sideband Rejection $(\overline{x})$ LSB (-dBc)	Sideband Rejection $(\overline{x})$ USB (-dBc)	Carrier Rejection $(\overline{x})$ LSB (-dBc)	Carrier Rejection $(\overline{x})$ USB (-dBc)	3rd Harmonic Suppression $(\overline{x})$ LSB (-dBc)	3rd Harmonic Suppression $(\overline{x})$ USB (-dBc)	5th. Harmonic Suppression $(\overline{x})$ LSB (-dBc)	5th. Harmonic Suppression $(\overline{x})$ USB (-dBc)	DC Offset $(\overline{x})$ (mV)
9.00	5.75	0.05	35.58	36.08	57.16	56.84	59.79	50.88	67.42	70.24	0.08
9.11	5.74	0.05	35.91	36.34	57.12	57.23	60.05	50.93	67.39	70.97	0.08
9.21	5.76	0.05	36.15	36.57	56.98	57.32	59.95	50.99	67.41	70.92	0.08
9.32	5.75	0.05	36.38	36.88	57.33	56.88	59.83	51.01	67.29	71.08	0.08
9.42	5.75	0.05	36.60	37.17	57.09	57.26	60.02	51.06	67.09	71.26	0.08
9.53	5.75	0.04	36.86	37.38	57.33	57.59	60.13	51.09	67.20	71.66	0.08
9.63	5.74	0.04	37.17	37.62	57.47	57.27	59.87	51.10	67.03	72.10	0.08
9.74	5.75	0.04	37.33	37.84	57.23	56.86	60.06	51.10	66.99	71.83	0.08
9.84	5.74	0.04	37.40	37.92	56.85	57.27	60.39	51.30	67.19	72.23	0.08
9.95	5.74	0.05	37.79	38.40	56.95	57.76	60.28	51.26	67.45	69.86	0.08
10.05	5.74	0.06	37.97	38.68	56.95	56.86	60.29	51.26	67.15	70.00	0.08
10.16	5.74	0.06	38.14	38.80	56.73	57.25	60.17	51.25	67.47	73.11	0.08
10.26	5.77	0.06	38.39	38.96	56.82	57.24	60.15	51.31	67.55	72.08	0.08
10.37	5.76	0.07	38.69	39.40	56.82	57.23	59.95	51.30	67.32	71.97	0.08
10.47	5.78	0.06	38.88	39.56	56.64	57.39	59.91	51.25	67.51	72.22	0.09
10.58	5.77	0.06	39.02	39.64	56.96	57.09	60.13	51.32	67.43	72.29	0.09
10.68	5.75	0.06	39.12	39.63	56.83	57.08	60.23	51.32	67.66	72.08	0.09
10.79	5.78	0.07	39.25	39.80	57.09	57.23	60.03	51.30	67.29	72.10	0.09
10.89	5.79	0.07	39.53	40.09	56.74	57.01	59.84	51.21	67.74	71.68	0.09
11.00	5.78	0.07	39.79	40.25	56.63	57.17	59.63	51.17	67.13	72.17	0.09

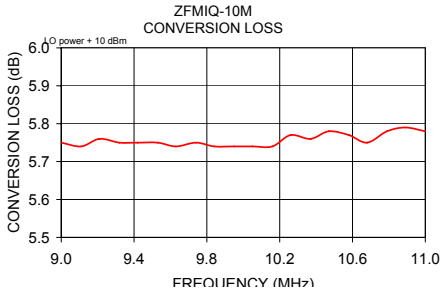
Outline Drawing

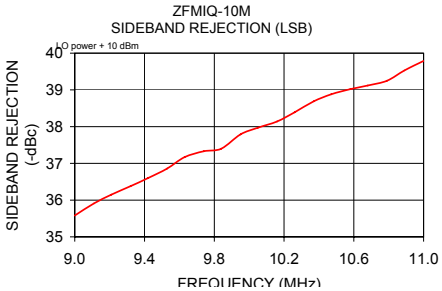


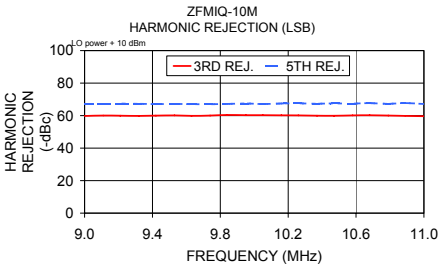
Outline Dimensions (inch / mm)

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

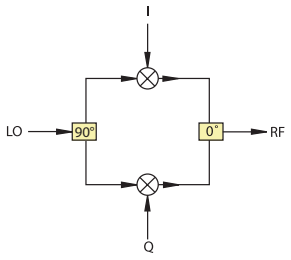
J	K	L	M	N	P	Q	wt
--	--	.125	1.688	2.18	.75	.07	grams
--	--	3.18	42.88	55.37	19.05	1.78	75.0







I&Q modulation block diagram



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

I&Q Modulator ZFMIQ-10M

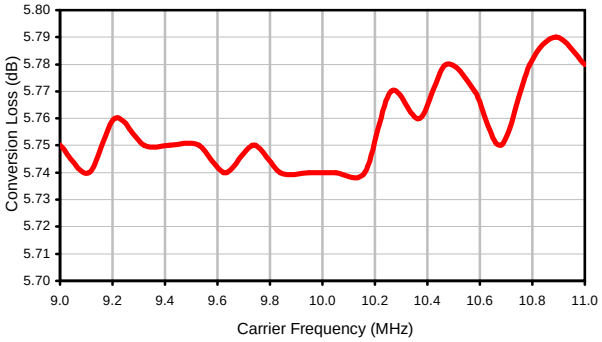
Typical Performance Data

CARRIER FREQ.	CONVERSION LOSS	SIDEBAND REJECTION		CARRIER REJECTION		3rd HARMONIC SUPPRESSION		5th HARMONIC SUPPRESSION		DC OFFSET
		LSB	USB	LSB	USB	LSB	USB	LSB	USB	
(MHz)	(dB)	(-dBc)	(-dBc)	(-dBc)	(-dBc)	(-dBc)	(-dBc)	(-dBc)	(-dBc)	(mV)
9.00	5.75	35.58	36.08	57.16	56.84	59.79	50.88	67.42	70.24	0.08
9.11	5.74	35.91	36.34	57.12	57.23	60.05	50.93	67.39	70.97	0.08
9.21	5.76	36.15	36.57	56.98	57.32	59.95	50.99	67.41	70.92	0.08
9.32	5.75	36.38	36.88	57.33	56.88	59.83	51.01	67.29	71.08	0.08
9.42	5.75	36.60	37.17	57.09	57.26	60.02	51.06	67.09	71.26	0.08
9.53	5.75	36.86	37.38	57.33	57.59	60.13	51.09	67.20	71.66	0.08
9.63	5.74	37.17	37.62	57.47	57.27	59.87	51.10	67.03	72.10	0.08
9.74	5.75	37.33	37.84	57.23	56.86	60.06	51.10	66.99	71.83	0.08
9.84	5.74	37.40	37.92	56.85	57.27	60.39	51.30	67.19	72.23	0.08
9.95	5.74	37.79	38.40	56.95	57.76	60.28	51.26	67.45	69.86	0.08
10.05	5.74	37.97	38.68	56.95	56.86	60.29	51.26	67.15	70.00	0.08
10.16	5.74	38.14	38.80	56.73	57.25	60.17	51.25	67.47	73.11	0.08
10.26	5.77	38.39	38.96	56.82	57.24	60.15	51.31	67.55	72.08	0.08
10.37	5.76	38.69	39.40	56.82	57.23	59.95	51.30	67.32	71.97	0.08
10.47	5.78	38.88	39.56	56.64	57.39	59.91	51.25	67.51	72.22	0.09
10.58	5.77	39.02	39.64	56.96	57.09	60.13	51.32	67.43	72.29	0.09
10.68	5.75	39.12	39.63	56.83	57.08	60.23	51.32	67.66	72.08	0.09
10.79	5.78	39.25	39.80	57.09	57.23	60.03	51.30	67.29	72.10	0.09
10.89	5.79	39.53	40.09	56.74	57.01	59.84	51.21	67.74	71.68	0.09
11.00	5.78	39.79	40.25	56.63	57.17	59.63	51.17	67.13	72.17	0.09

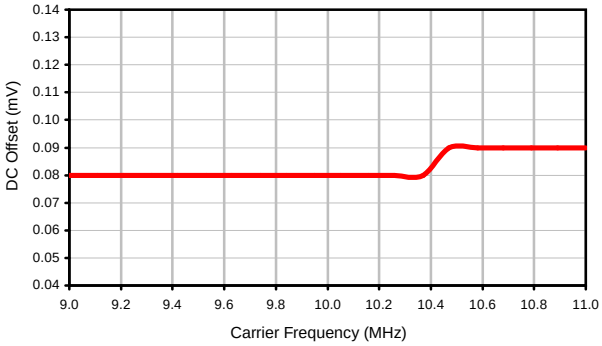
I&Q Modulator ZFMIQ-10M

Typical Performance Curves

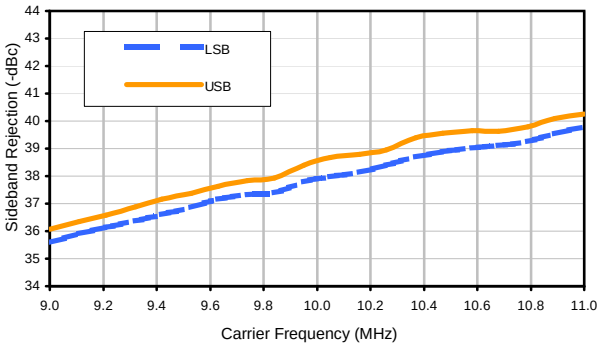
Conversion Loss



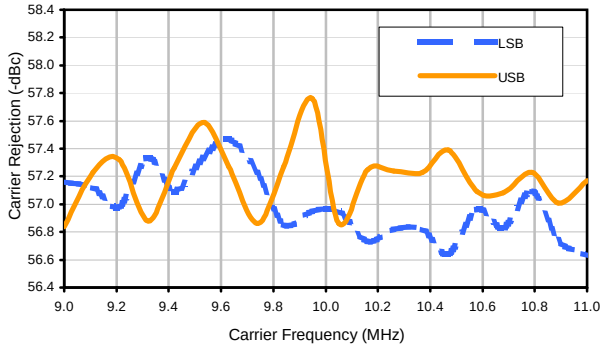
DC Offset



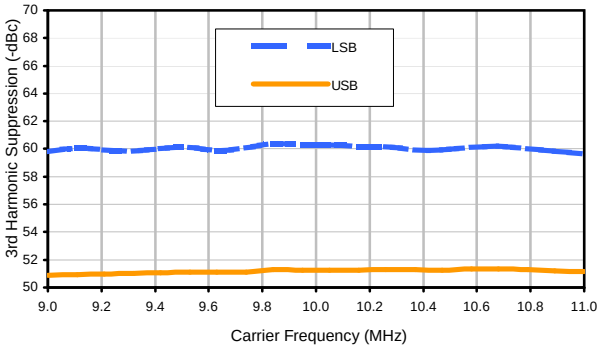
Sideband Rejection



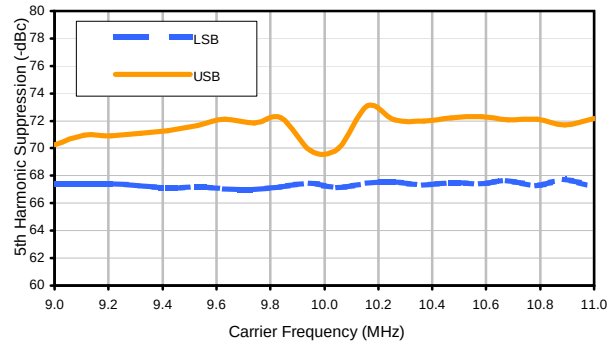
Carrier Rejection



3rd Harmonic Suppression



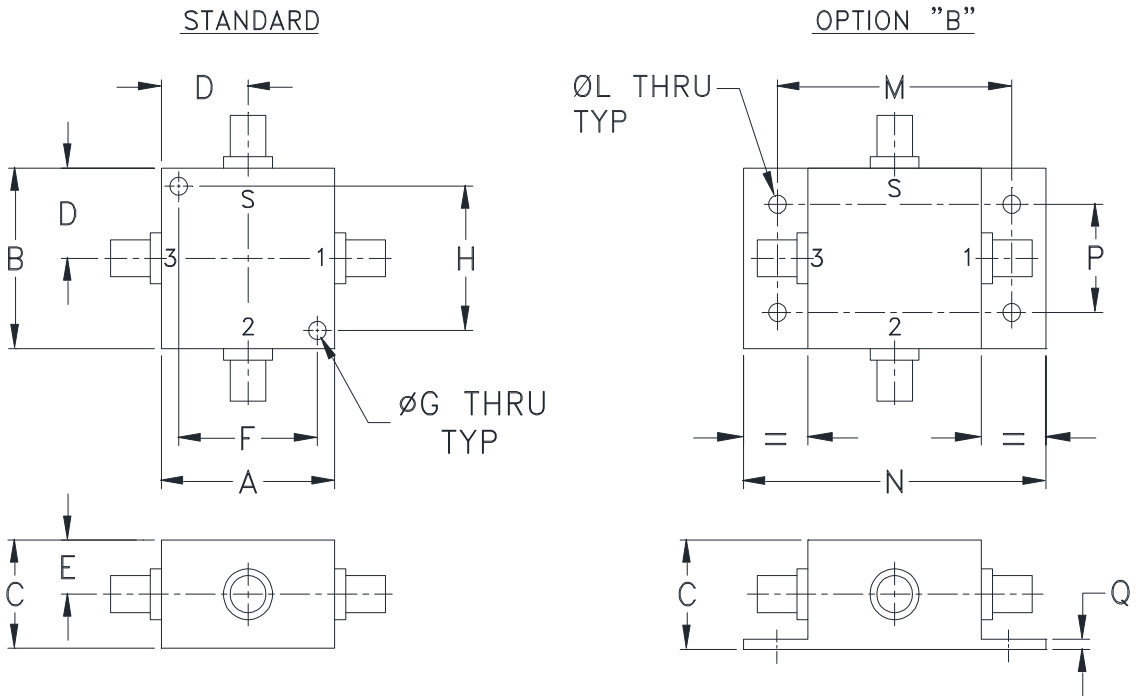
5th Harmonic Suppression



Case Style J

J17

Outline Dimensions



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N
J17	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
J17	.75 (19.05)	.07 (1.78)	75.0

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 bracket version, option B, dimension "C" changes from .75 to .94 inches when connectors are type N.

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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

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