

Coaxial I&Q Modulator

50Ω

66 to 73 MHz

ZFMIQ-70ML



Generic photo used for illustration purposes only

CASE STYLE: J17

Connectors Model
SMA ZFMIQ-70ML
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)				CONVERSION LOSS (dB)			CARRIER REJECTION (-dBc)		SIDE BAND REJECTION (-dBc)		HARMONIC SUPPRESSION (-dBc)					
RF (SIGNAL)		LO (CARRIER)		I&Q		\bar{x}	σ	Max.	Typ.	Min.	Typ.	Min.	3XI/Q		5XI/Q	
f_L	f_U	Min.	Max.	Min.	Max.								Typ.	Min.	Typ.	Min.
66	73	DC	5	5.7	0.1	6.5			38	30	38	30	48	43	58	55

Operating LO power: 10±1dBm

1dB Compression: 0dBm typical

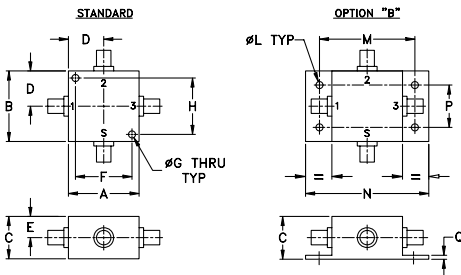
Conversion Loss: (I + Q) power, dBm - RF power, dBm

Carrier and sideband rejections measured at -5dBm I/Q power.

Typical Performance Data

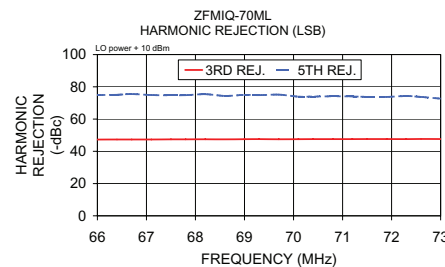
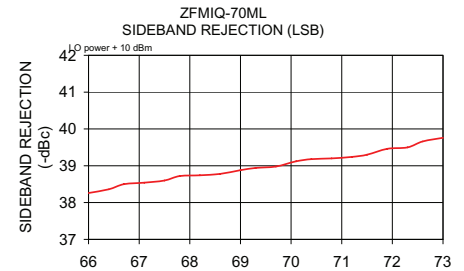
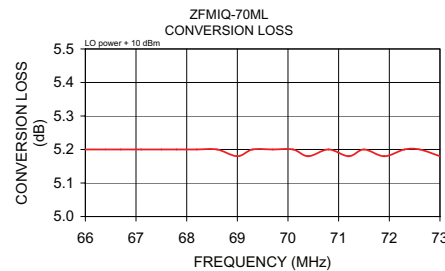
Carrier Freq. (MHz)	Conversion Loss		Sideband Rejection (x)		Carrier Rejection (x)		3rd Harmonic Suppression (x)		5th Harmonic Suppression (x)		DC Offset (mV)
	\bar{x} (dB)	σ (dB)	LSB (-dBc)	USB (-dBc)	LSB (-dBc)	USB (-dBc)	LSB (-dBc)	USB (-dBc)	LSB (-dBc)	USB (-dBc)	
66.00	5.20	0.00	38.26	37.56	54.72	55.04	47.30	47.58	74.90	73.48	0.09
66.40	5.20	0.00	38.36	37.72	54.40	54.88	47.32	47.66	75.06	73.86	0.09
66.70	5.20	0.00	38.50	37.76	54.58	54.66	47.34	47.68	75.52	74.60	0.09
67.10	5.20	0.00	38.54	37.92	54.10	54.64	47.34	47.68	74.94	75.12	0.09
67.50	5.20	0.00	38.60	38.08	54.36	54.30	47.42	47.72	74.76	75.22	0.09
67.80	5.20	0.00	38.72	38.22	53.88	53.98	47.44	47.74	74.84	74.94	0.08
68.20	5.20	0.00	38.74	38.40	53.96	53.92	47.48	47.72	75.42	74.58	0.08
68.60	5.20	0.00	38.78	38.58	53.56	53.70	47.44	47.74	74.38	74.54	0.08
69.00	5.18	0.04	38.88	38.76	53.64	54.10	47.52	47.80	75.04	75.38	0.08
69.30	5.20	0.00	38.94	38.94	53.36	54.12	47.56	47.80	74.86	75.12	0.08
69.70	5.20	0.00	38.98	39.06	53.16	53.78	47.50	47.76	75.14	74.96	0.08
70.10	5.20	0.00	39.12	39.30	53.02	53.70	47.54	47.78	73.92	75.16	0.08
70.40	5.18	0.04	39.18	39.46	53.16	53.52	47.58	47.72	73.98	74.88	0.08
70.80	5.20	0.00	39.20	39.68	53.10	53.54	47.58	47.72	74.16	75.04	0.08
71.20	5.18	0.04	39.24	39.88	53.02	53.34	47.58	47.72	74.02	74.48	0.08
71.50	5.20	0.00	39.30	40.00	52.62	53.52	47.60	47.76	73.80	74.98	0.08
71.90	5.18	0.04	39.46	40.18	52.78	53.30	47.60	47.80	73.76	74.44	0.08
72.30	5.20	0.00	39.50	40.36	52.40	53.58	47.58	47.74	74.30	74.66	0.08
72.60	5.20	0.00	39.66	40.50	52.30	53.22	47.64	47.78	73.72	74.46	0.09
73.00	5.18	0.04	39.76	40.76	52.16	53.02	47.62	47.78	72.70	73.16	0.09

Outline Drawing

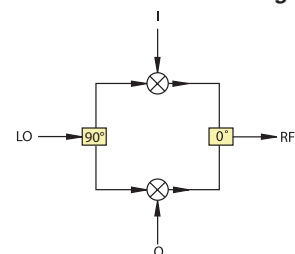


Outline Dimensions (inch/mm)

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

- 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.
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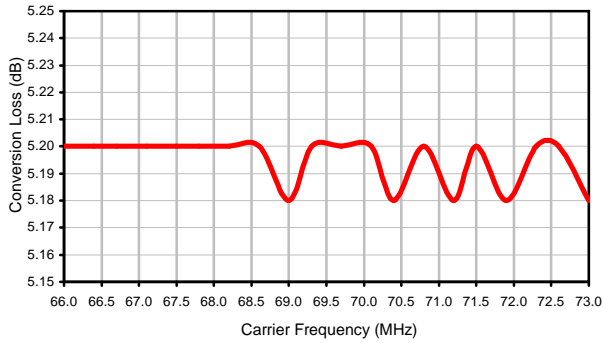


Typical Performance Data

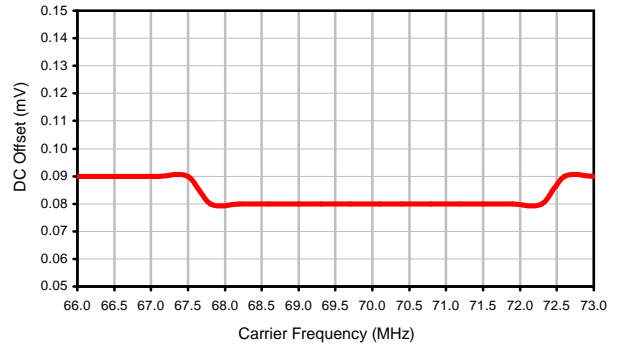
CARRIER FREQ.	CONVERSION LOSS	SIDE BAND REJECTION		CARRIER REJECTION		3rd HARMONIC SUPPRESSION		5th HARMONIC SUPPRESSION		DC OFFSET
		LSB	USB	LSB	USB	LSB	USB	LSB	USB	
(MHz)	(dB)	(-dBc)	(-dBc)	(-dBc)	(-dBc)	(-dBc)	(-dBc)	(-dBc)	(-dBc)	(mV)
66.00	5.20	38.26	37.56	54.72	55.04	47.30	47.58	74.90	73.48	0.09
66.40	5.20	38.36	37.72	54.40	54.88	47.32	47.66	75.06	73.86	0.09
66.70	5.20	38.50	37.76	54.58	54.66	47.34	47.68	75.52	74.60	0.09
67.10	5.20	38.54	37.92	54.10	54.64	47.34	47.68	74.94	75.12	0.09
67.50	5.20	38.60	38.08	54.36	54.30	47.42	47.72	74.76	75.22	0.09
67.80	5.20	38.72	38.22	53.88	53.98	47.44	47.74	74.84	74.94	0.08
68.20	5.20	38.74	38.40	53.96	53.92	47.48	47.72	75.42	74.58	0.08
68.60	5.20	38.78	38.58	53.56	53.70	47.44	47.74	74.38	74.54	0.08
69.00	5.18	38.88	38.76	53.64	54.10	47.52	47.80	75.04	75.38	0.08
69.30	5.20	38.94	38.94	53.36	54.12	47.56	47.80	74.86	75.12	0.08
69.70	5.20	38.98	39.06	53.16	53.78	47.50	47.76	75.14	74.96	0.08
70.10	5.20	39.12	39.30	53.02	53.70	47.54	47.78	73.92	75.16	0.08
70.40	5.18	39.18	39.46	53.16	53.52	47.58	47.72	73.98	74.88	0.08
70.80	5.20	39.20	39.68	53.10	53.54	47.58	47.72	74.16	75.04	0.08
71.20	5.18	39.24	39.88	53.02	53.34	47.58	47.72	74.02	74.48	0.08
71.50	5.20	39.30	40.00	52.62	53.52	47.60	47.76	73.80	74.98	0.08
71.90	5.18	39.46	40.18	52.78	53.30	47.60	47.80	73.76	74.44	0.08
72.30	5.20	39.50	40.36	52.40	53.58	47.58	47.74	74.30	74.66	0.08
72.60	5.20	39.66	40.50	52.30	53.22	47.64	47.78	73.72	74.46	0.09
73.00	5.18	39.76	40.76	52.16	53.02	47.62	47.78	72.70	73.16	0.09

Typical Performance Curves

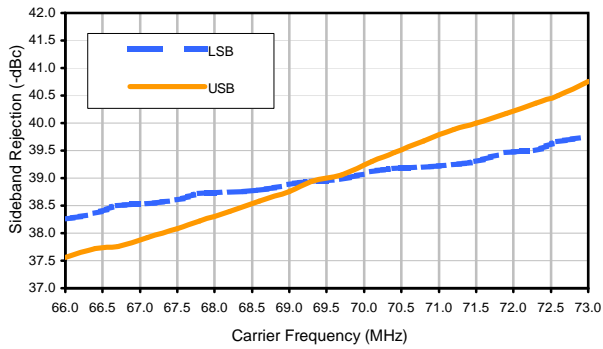
Conversion Loss



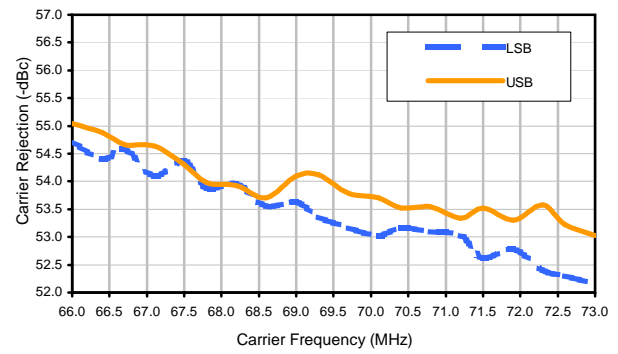
DC Offset



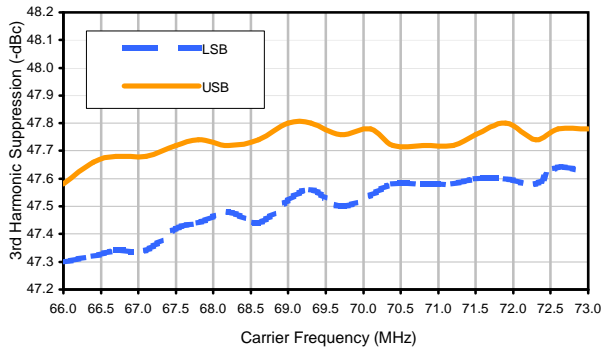
Sideband Rejection



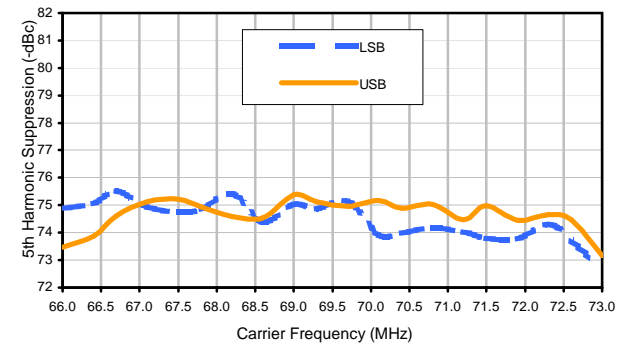
Carrier Rejection



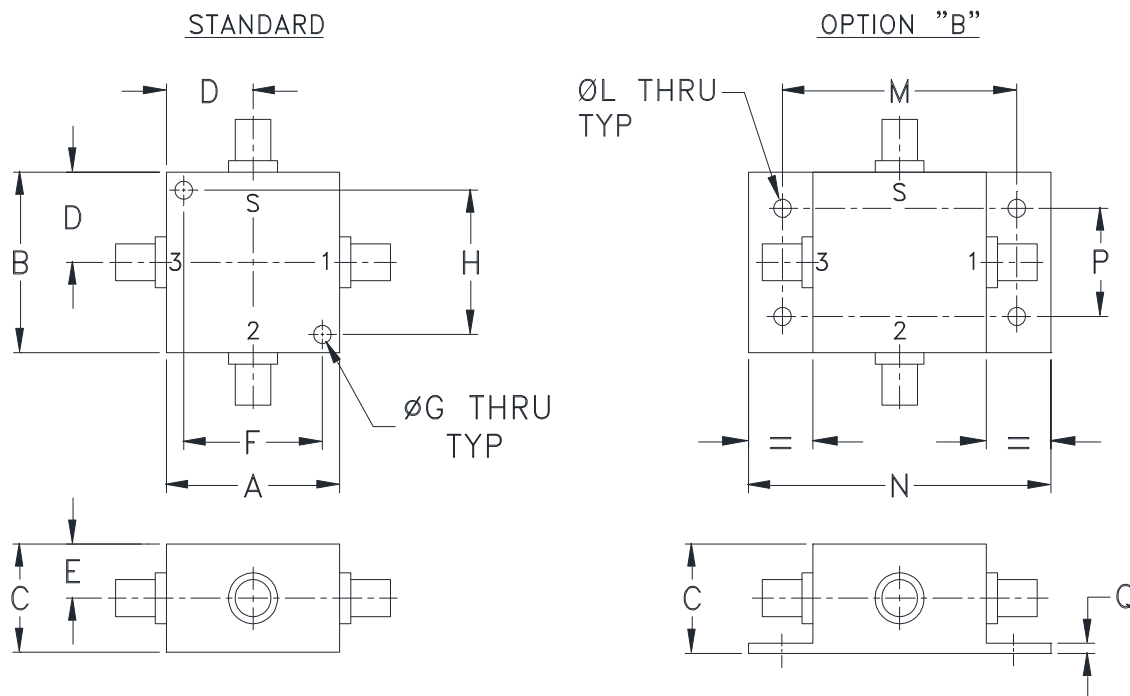
3rd Harmonic Suppression



5th Harmonic Suppression



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. $\pm .03$; 3 Pl. $\pm .015$

Notes:

- Case material: Aluminum alloy.
- Case finish:
For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.
- Mounting bracket available on request. Add suffix B to part number
- For bracket version, option B, dimension "C" changes from .75 to .94 inches when connectors are type N.

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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