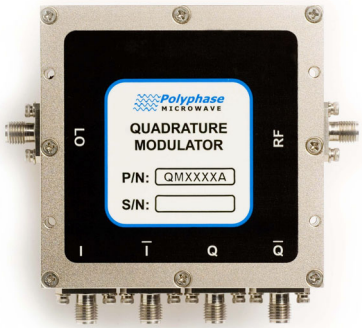
Polyphase MICROWAVE
A Technology Service Corporation Company

QM3040A
QUADRATURE MODULATOR
3000 – 4000 MHz

FEATURES

LO/RF Frequency:	3000 – 4000 MHz
Input IP3:	+17 dBm
Input P1dB:	+7 dBm
Noise Floor:	-173 dBm/Hz
Sideband Suppression:	-38 dBc
LO Leakage:	-40 dBm
LO Power:	+15 dBm

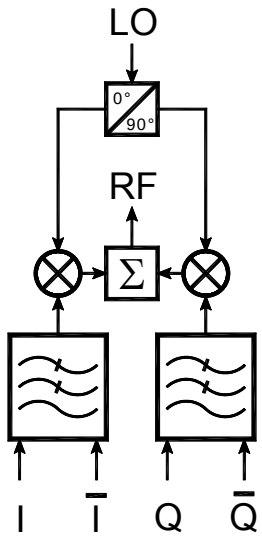


DESCRIPTION

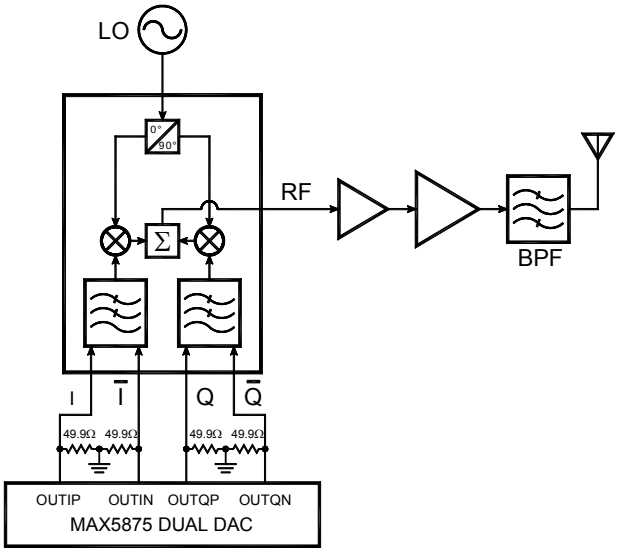
The QM3040A is a quadrature (I/Q) modulator optimized for direct modulation of an RF carrier. Differential I and Q inputs are mixed with the local oscillator (LO) to produce a modulated RF output.

Internally matched lowpass filters provide anti-alias functionality for removing Nyquist images and wideband noise when interfacing to high-speed D/A converters.

For more information on interfacing the QM3040A to high-speed D/A converters and single-ended sources, please see Application Note 101A, "*Driving the QM Series Quadrature Modulators.*"



TYPICAL APPLICATION: DIRECT CONVERSION TRANSMITTER



Polyphase Microwave Inc.
1983 S Liberty Drive
Bloomington, IN 47403

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A Technology Service Corporation Company

www.polyphasemicrowave.com

Phone: + 1 (812) 323 - 8708
Fax: + 1 (812) 323 - 8709

ELECTRICAL SPECIFICATIONS

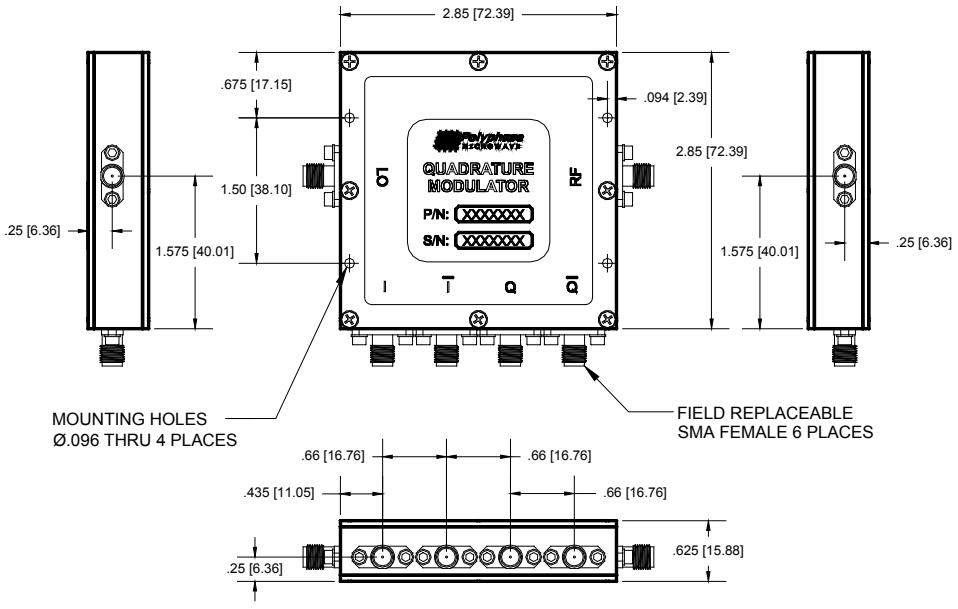
Test Conditions: +25°C, LO = +15 dBm, I/Q inputs = 0 dBm total @ 100 kHz unless otherwise noted.

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
Frequency Range		3000		4000	MHz
LO Power		+13	+15	+16	dBm
LO VSWR			2.0:1		Ratio
RF VSWR			2.0:1		Ratio
I/Q Baseband Filter Bandwidth[1]	<1 dB Flatness	DC		275	MHz
I/Q Baseband Filter Stop Band[1]	>25 dB Rejection	450		5000	MHz
I/Q Differential Input Impedance			100		Ω
Conversion Loss			6.5	8.5	dB
Input IP3	2-Tone, Δf = 1 MHz		+17		dBm
Input P1dB			+7		dBm
LO Leakage at RF Port	No RF input drive		-40	-25	dBm
LO-IF Isolation	No RF input drive		70		dB
Sideband Suppression[2]			-38	-30	dBc
Amplitude Imbalance		-0.4	±0.1	+0.4	dB
Quadrature Phase Error		-4	±1.6	+4	Degree
Output Noise Floor			-173		dBm/Hz
Operating Temperature Range		-40		+85	ºC
LO/RF Input Power w/o Damage				+25	dBm

Notes:

1. Standard lowpass filters. Contact factory for other options.
2. For upper sideband operation: $I = \cos(t)$, $\overline{I} = -\cos(t)$, $Q = \sin(t)$, $\overline{Q} = -\sin(t)$

CASE DRAWING



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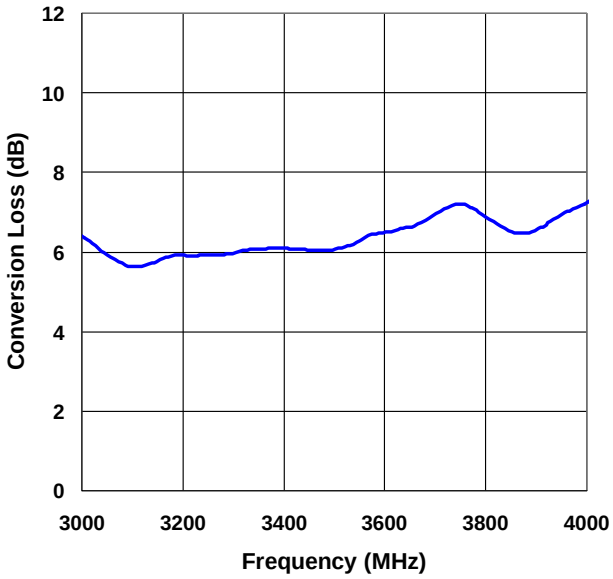
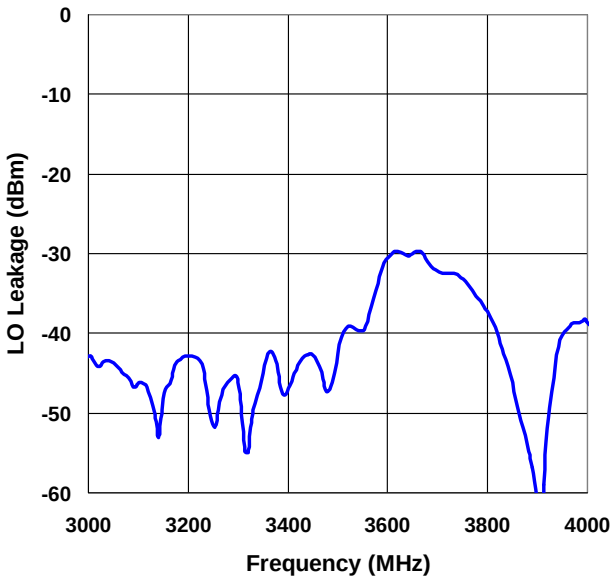
TYPICAL PERFORMANCE CHARACTERISTICS

Standard Test Conditions: +25°C, LO = +15 dBm, I/Q inputs = 0 dBm total @ 100 kHz.

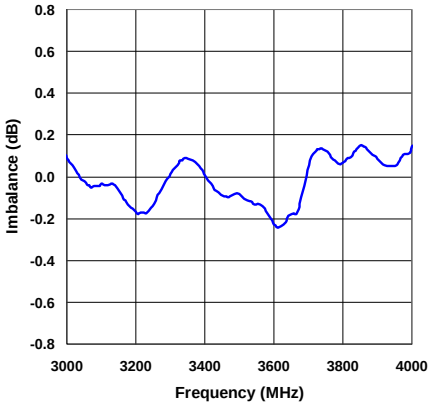
Conversion Loss



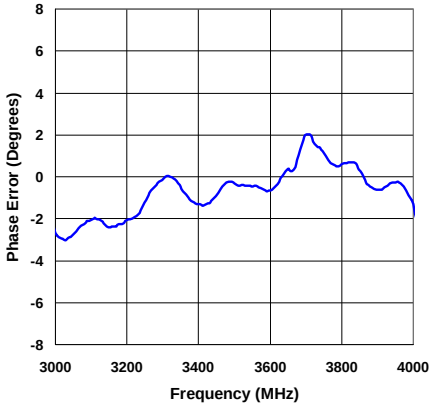
LO Leakage at RF Port



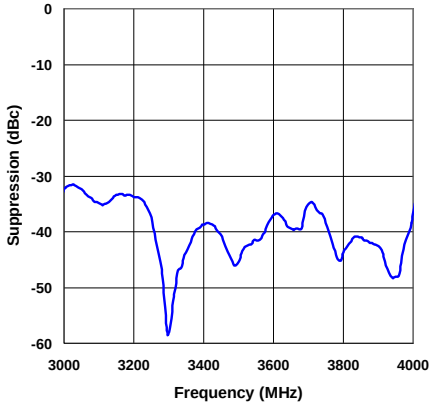
Amplitude Imbalance



Quadrature Phase Error



Sideband Suppression



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