

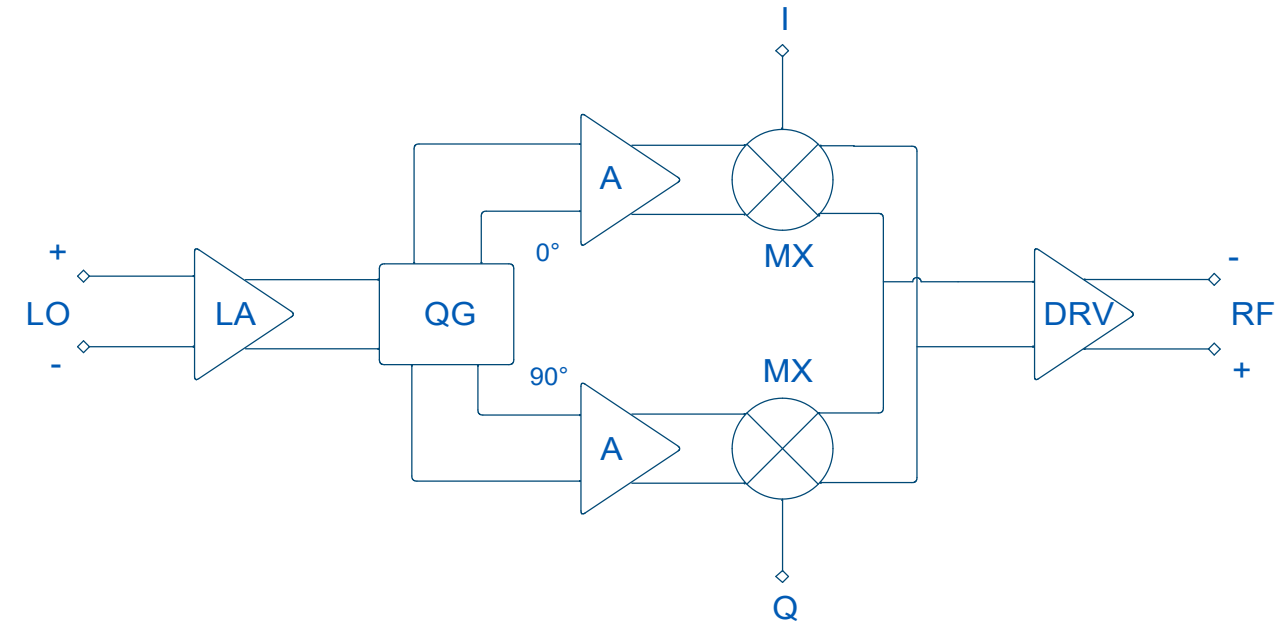
DESCRIPTION:

THE PIQ-1-SMT IS AN INTEGRATED BROADBAND IQ VECTOR MODULATOR WITH FULLY DIFFERENTIAL INPUTS AND OUTPUTS (LO AND RF) PORTS AND SINGLE ENDED ON THE BASEBAND (I AND Q) INPUTS. AN ON-CHIP BROADBAND QUADRATURE GENERATOR NETWORK ALLOWS THE PIQ-1-SMT TO ACHIEVE MULTI-OCTAVE FREQUENCY COVERAGE. THE PIQ-1-SMT OPERATES WITH A SINGLE POSITIVE VCC = 4V @ 250 mA SUPPLY AND IS SUPPLIED IN A QFN PACKAGE.

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A1	ORIGINAL RELEASE	7/21/25	
	A2	ECN #26-0022	2/8/26	
	A3	ECN #26-0071	3/24/26	

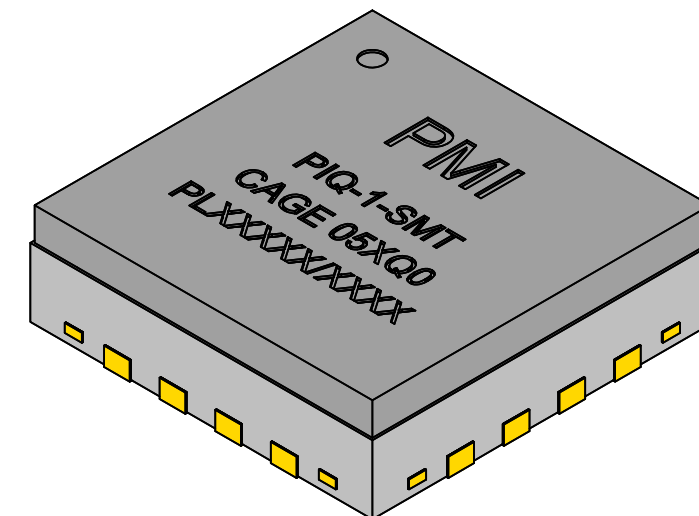
SPECIFICATIONS (PAGE 1):

- **INPUTS:**..... LO+ (POSITIVE PHASE TERMINAL OF THE LO)
 LO- (NEGATIVE PHASE TERMINAL OF THE LO)
 LO PORTS ARE 100Ω DIFFERENTIAL
 LO COMMON MODE DC LEVEL IS NOMINALLY 2.16V ± 100 mV
 LO INPUTS MUST BE DC BLOCKED
 I (IN-PHASE COMPONENT)
 Q (QUADRATURE-PHASE COMPONENT)
 I AND Q PORTS ARE 50Ω SINGLE-ENDED
- **OUTPUTS:**..... RF+ (POSITIVE PHASE TERMINAL OF THE RF)
 RF- (NEGATIVE PHASE TERMINAL OF THE RF)
 RF PORTS ARE 100Ω DIFFERENTIAL
 COMMON MODE DC LEVEL IS NOMINALLY 3.4V ± 100 mV
 RF OUTPUTS MUST BE DC BLOCKED
- **LO FREQUENCY RANGE:**..... 100 MHz TO 20 GHz
- **LO INPUT POWER:**..... -10 TO 10 dBm
- **RF FREQUENCY RANGE:**..... 100 MHz TO 20 GHz
- **RF OUTPUT POWER:**..... -12 dBm TYP.
- **BASEBAND I/Q BANDWIDTH:**..... 10 GHz (DC TO 10 GHz)
 I AND Q INPUT CAN BE USED DC COUPLED OR AC COUPLED
 DC: 0 TO 2.16V. COMMON MODE LEVEL IS 1.08V ± 50 mV
 AC: UP TO 10 GHz. LINEAR TO 0 dBm IN TOTAL (EQUIVALENT TO -3 dBm AT BOTH I AND Q)
- **I/Q COMMON-MODE BIAS:**..... 1.08V ± 50 mV
- **CARRIER (LO) LEAKAGE:**..... -42 dBc TYP.
- **VOLTAGE CONVERSION GAIN:**..... -20 dB TYP.
- **I/Q GAIN IMBALANCE:**..... 0.5 dB TYP.
- **QUADRATURE PHASE ERROR:**..... 1° MAX.
- **SIDEBAND SUPPRESSION:**..... 30 dB TYP. (W/ ARB AT 1 MHz, SIN & COS ON I AND Q)
- **VSWR:**..... 2.5:1 TYP. (LO+, LO-, RF+, RF-)
 2.0:1 TYP. (I, Q)
- **RF-LO ISOLATION:**..... -50 dBc TYP.
- **LO-BASEBAND ISOLATION:**..... -45 dBc TYP.
- **RF-BASEBAND ISOLATION:**..... -40 dBc TYP.
- **I-Q CROSSTALK:**..... -40 dBc TYP.
- **P1dB:**..... -5 dBm TYP.
- **IP3:**..... 5 dBm TYP.
- **IP2:**..... 45 dBm TYP.
- **HARMONIC DISTORTION:**..... 2nd HARMONIC: -35 dBc TYP.
 3rd HARMONIC: -20 dBc TYP.
 4th HARMONIC: -50 dBc TYP.
 5th HARMONIC: -35 dBc TYP.
- **SPURIOUS EMISSIONS:**..... -30 dBm TYP.
- **SFDR:**..... 20 dB TYP.




LO = Local oscillator input
 LA = Limiting amplifier
 QG = Quadrature generator
 MX = Mixer
 DRV = Driver
 A = Amplifier
 RF = RF output
 I/Q = Vector modulation inputs

PIN FUNCTIONS	
EP	GND
PIN 1	GND
PIN 2	LO+
PIN 3	LO-
PIN 4	GND
PIN 5	VCC
PIN 6	GND
PIN 7	Q
PIN 8	GND
PIN 9	GND
PIN 10	RF+
PIN 11	RF-
PIN 12	GND
PIN 13	GND
PIN 14	I
PIN 15	GND
PIN 16	VCC



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NOTE: SPECIFICATIONS WILL VARY OVER TEMPERATURE
 NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± .XX ± 0.02 ± .XXX ± 0.01		APPROVALS	DATE	 7309-A GROVE ROAD FREDERICK, MARYLAND 21704 USA TEL: (301) 662-5019, FAX: (301) 662-1731 WEB: WWW.QUANTICPMI.COM, EMAIL: SALES@QUANTICPMI.COM ISO 9001 CERTIFIED		
		DRAWN AL REDRAWN ISSUED	7/28/2025			
		SIZE	FSCM NO.	DWG NO.	REV.	
		B	05XQ0	27052640	A3	
		SCALE	16:1		SHEET 1 OF 2	

