

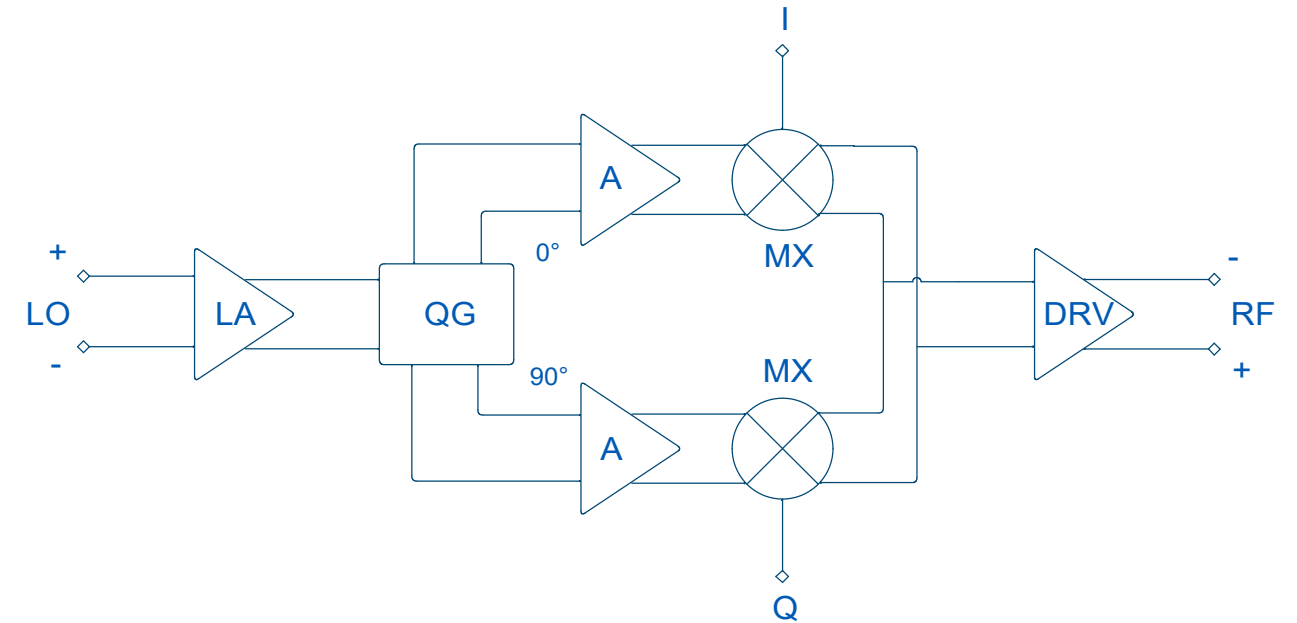
**DESCRIPTION:**

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	

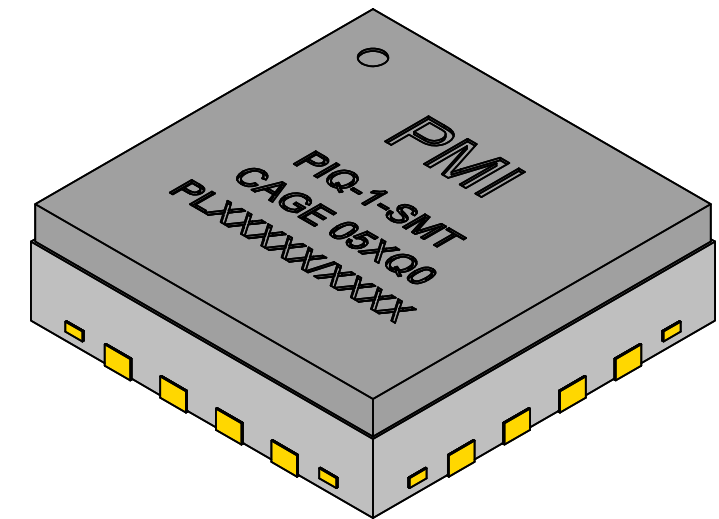
**SPECIFICATIONS:**

- **INPUTS:**..... LO+ (POSITIVE PHASE TERMINAL OF THE LO)  
LO- (NEGATIVE PHASE TERMINAL OF THE LO)  
LO PORTS ARE 100Ω DIFFERENTIAL  
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
- **LO BANDWIDTH:**..... 100 MHz TO 20 GHz  
COMMON MODE DC LEVEL IS NOMINALLY 2.16V ± 100 mV  
LO INPUTS MUST BE DC BLOCKED
- **RF BANDWIDTH:**..... 100 MHz TO 20 GHz  
COMMON MODE DC LEVEL IS NOMINALLY 3.4V ± 100 mV  
RF OUTPUTS MUST BE DC BLOCKED
- **IQ BANDWIDTH:**..... 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)  
DC BLOCKING IS REQUIRED ON THE BASEBAND INPUTS I AND Q WHEN THEY ARE AC-COUPLED
- **LO POWER:**..... 10 dBm MAX.
- **VCC:**..... 4V ± 5%  
BYPASS CAPACITORS RECOMMENDED
- **CURRENT:**..... 250 mA TYP.
- **DC POWER DISSIPATION (W):**..... 1.2 W MAX.
- **PACKAGE SIZE:**..... 0.157" x 0.157" x 0.047"  
[4.0 mm x 4.0 mm x 1.2 mm]
- **EXPOSED PAD (EP) SIZE:**..... 0.091 x 0.091"  
[2.3 mm x 2.3 mm]
- **JEDEC OUTLINE:**..... MO-220 (VGGC-2)
- **ADDITIONAL NOTES:**..... FOR SINGLE ENDED LO DRIVE OR SINGLE ENDED RF OUTPUT, USE BROADBAND BALUNS (DC BLOCKING CAPACITORS ARE STILL REQUIRED). ALTERNATIVELY, USE ONE LO INPUT (OR RF OUTPUT) WHILE TERMINATING THE UNUSED INPUT INTO A 50 Ω LOAD (DC BLOCKING IS STILL REQUIRED)  
HEAT SINKING REQUIRED  
MAX REFLOW TEMPERATURE: 245°C



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




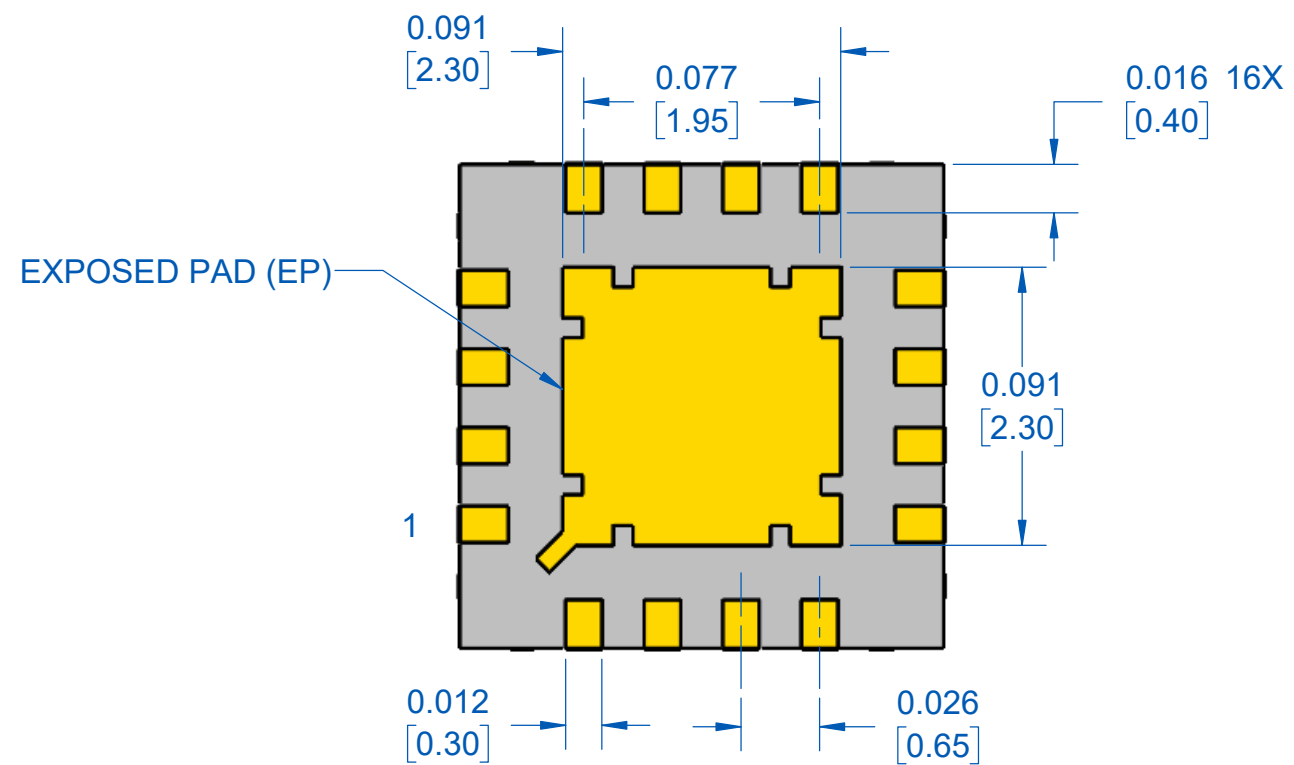
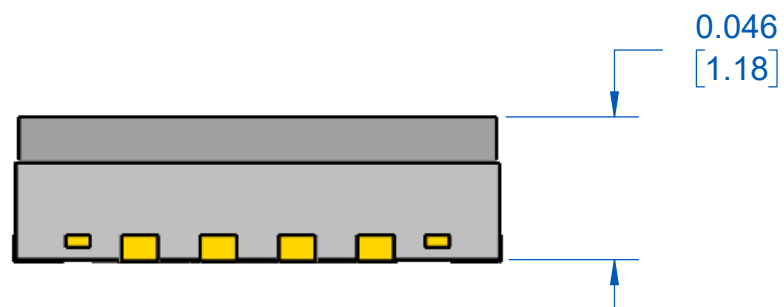
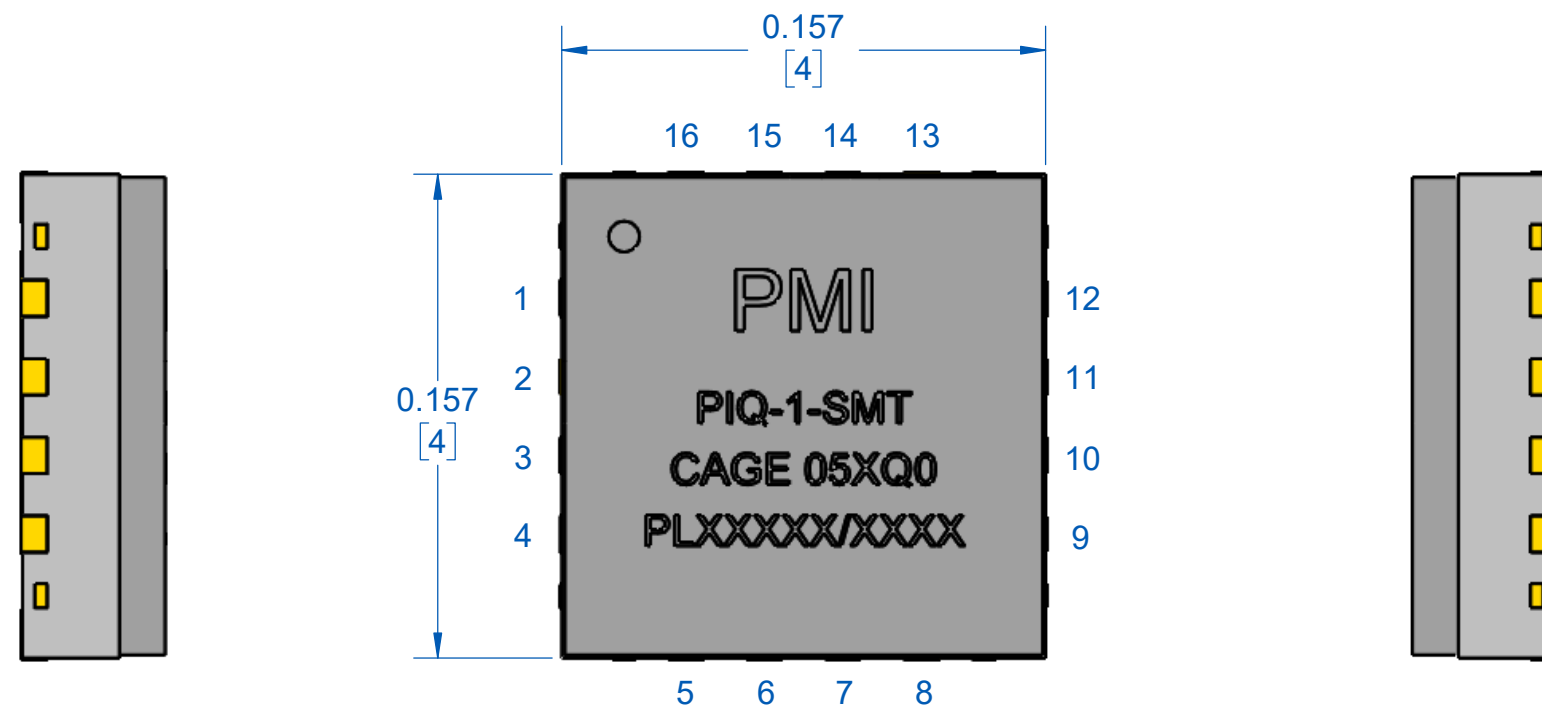
**ENVIRONMENTAL RATINGS:**

- **TEMPERATURE:**..... -55°C TO +85°C (OPERATING)  
-64°C TO +125°C (STORAGE)
- **HUMIDITY:**..... MIL-STD-202, METHOD 103B COND. B
- **SHOCK:**..... MIL-STD-202, METHOD 213B COND. B
- **VIBRATION:**..... MIL-STD-202, METHOD 204D COND. B
- **ALTITUDE:**..... MIL-STD-202, METHOD 105C COND. B
- **TEMPERATURE CYCLE:**..... MIL-STD-202, METHOD 107D COND. A

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

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UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS    DECIMALS    ANGLES ±                    .XX ± 0.02                    ± .XXX ± 0.01		APPROVALS DRAWN    AL REDRAWN ISSUED	DATE 7/28/2025	 PLANAR MONOLITHICS 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			
		TITLE FINAL ASSEMBLY PIQ-1-SMT		SIZE B	FSCM NO. 05XQ0	DWG NO. 27052640	REV. A2
SCALE 16:1			SHEET 1 OF 2				



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TITLE		OUTLINE	
		PIQ-1-SMT	
SIZE	FSCM NO.	DWG NO.	REV.
B	05XQ0	26952640	A2
SCALE 16:1		SHEET 2 OF 2	