



## Typical Characteristics for PIQ-0R5G2G-360-20-CD-1

PMI MODEL PIQ-0R5G2G-360-20-CD-1 IS A 0.5 TO 2.0 GHz HIGH PERFORMANCE I/Q VECTOR MODULATOR WITH 2 X 12 BIT MONOTONIC TTL COMPATIBLE CHANNELS (I AND Q). THIS MODEL OFFERS A FULL 360 DEGREES OF PHASE SHIFT WITH A MINIMUM OF 20 dB OF AMPLITUDE CONTROL.



**August 31, 2016**  
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## Typical Characteristics for PIQ-0R5G2G-360-20-CD-1

### Summary Test Data @ 25°C

TEST. ITEM NO	PARAMETERS	SPECIFIED VALUE	TEST RESULTS
1	Frequency Range	500MHz-2GHz	<b>500MHz-2GHz</b>
2	Phase Range, 0.5- 2 GHz	360°	<b>360 °</b>
3	Attenuator Dynamic Range	20 dB	<b>25 dB</b>
4	VSWR:	1.6:1 MAX	<b>1.59 :1</b>
5	Insertion Loss	11 dB MAX	<b>10.54 dB</b>
6	Attenuation vs. Frequency	±1.5 dB TYP.	<b>±1.5 dB TYP.</b>
7	Phase vs. Frequency	±10.0° TYP.	<b>±10.0 ° TYP.</b>
8	Control Logic	2 x 12 BITS (I and Q) TTL compatible.	<b>Verified</b>
9	Control Slopes	Linear	<b>Verified</b>
10	Switching Speed	500 nSec MAX.	<b>420 nSec</b>
11	Power Supply	+12 to 15V @ 100 mA -12 to 15V @ 100 mA	<b>+15 @ 87 mA</b> <b>-15 @ 24 mA</b>

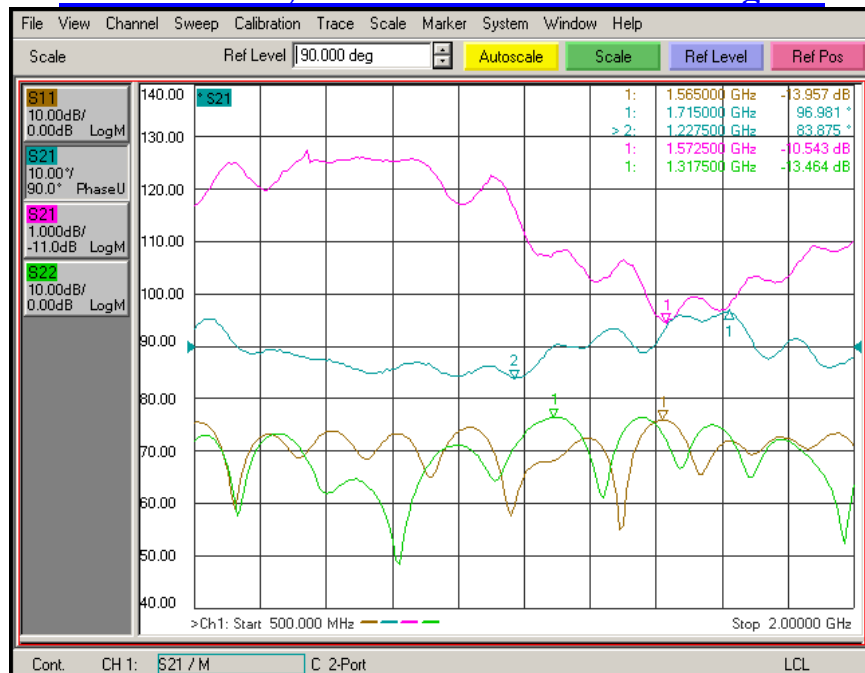


# Typical Characteristics for PIQ-0R5G2G-360-20-CD-1

## Insertion Loss, VSWR and Phase @ 0 Degrees



## Insertion Loss, VSWR and Phase @ 90 Degrees

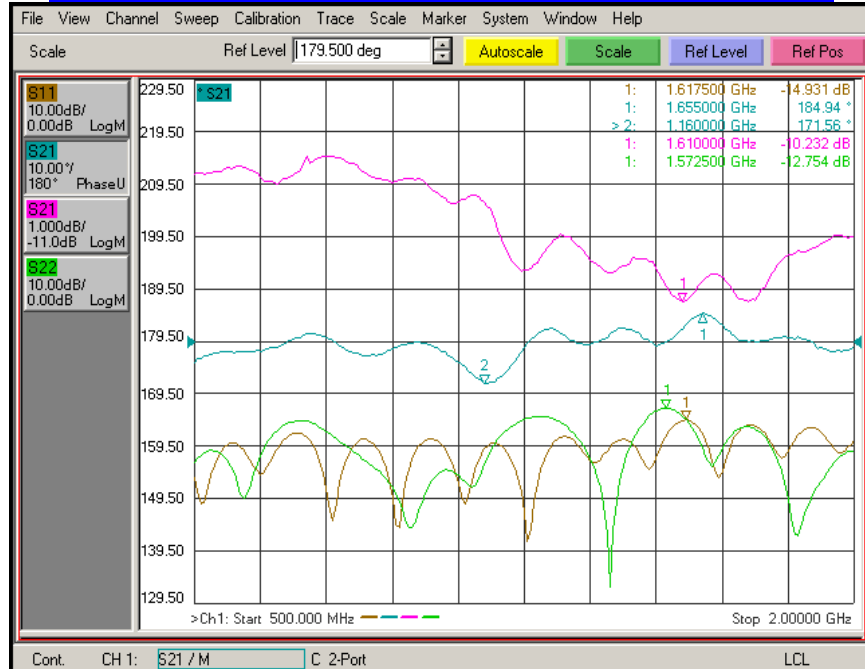


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# Typical Characteristics for PIQ-0R5G2G-360-20-CD-1

## Insertion Loss, VSWR and Phase @ 180 Degrees



## Insertion Loss, VSWR and Phase @ 270 Degrees



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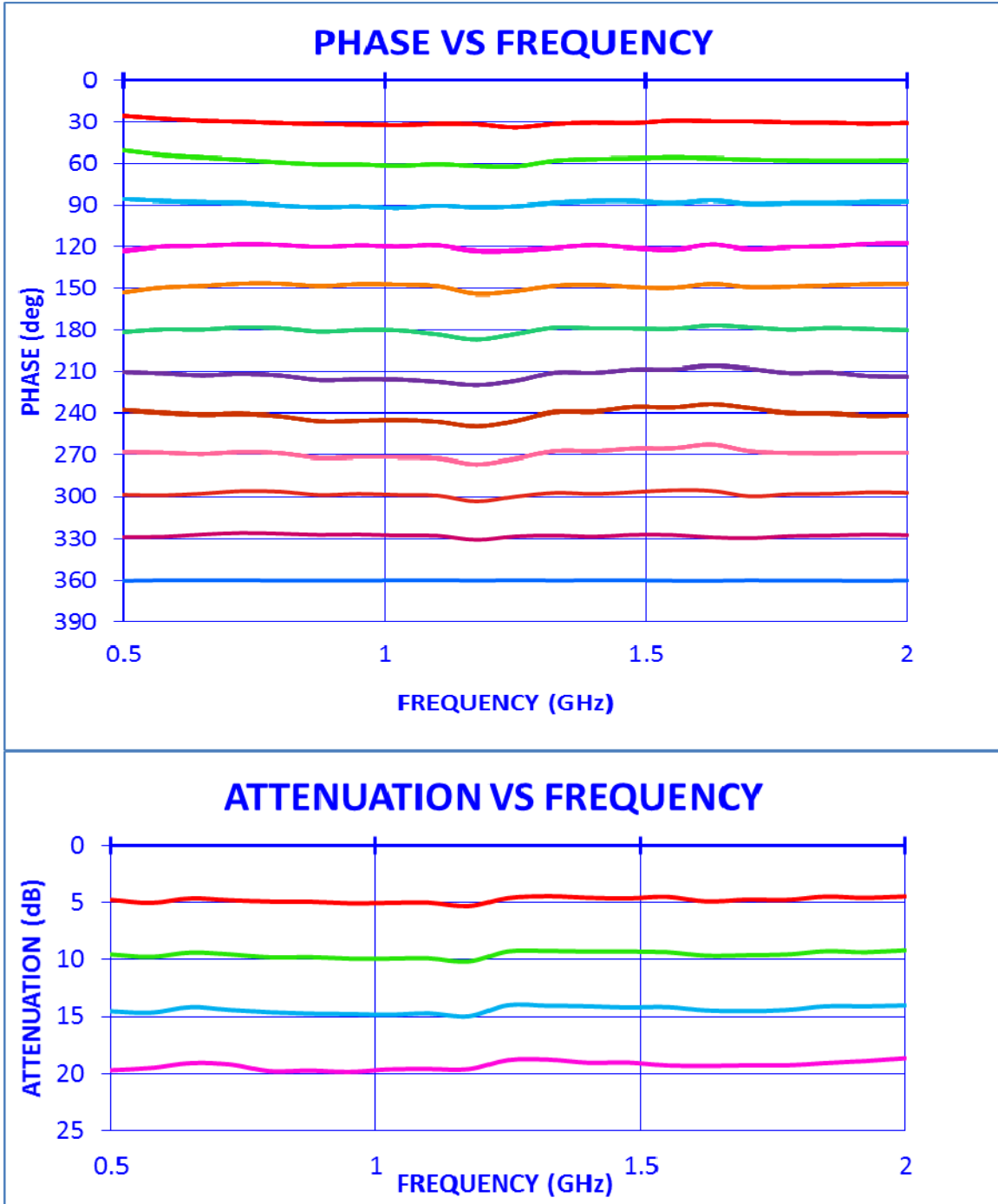
## Max Attenuation





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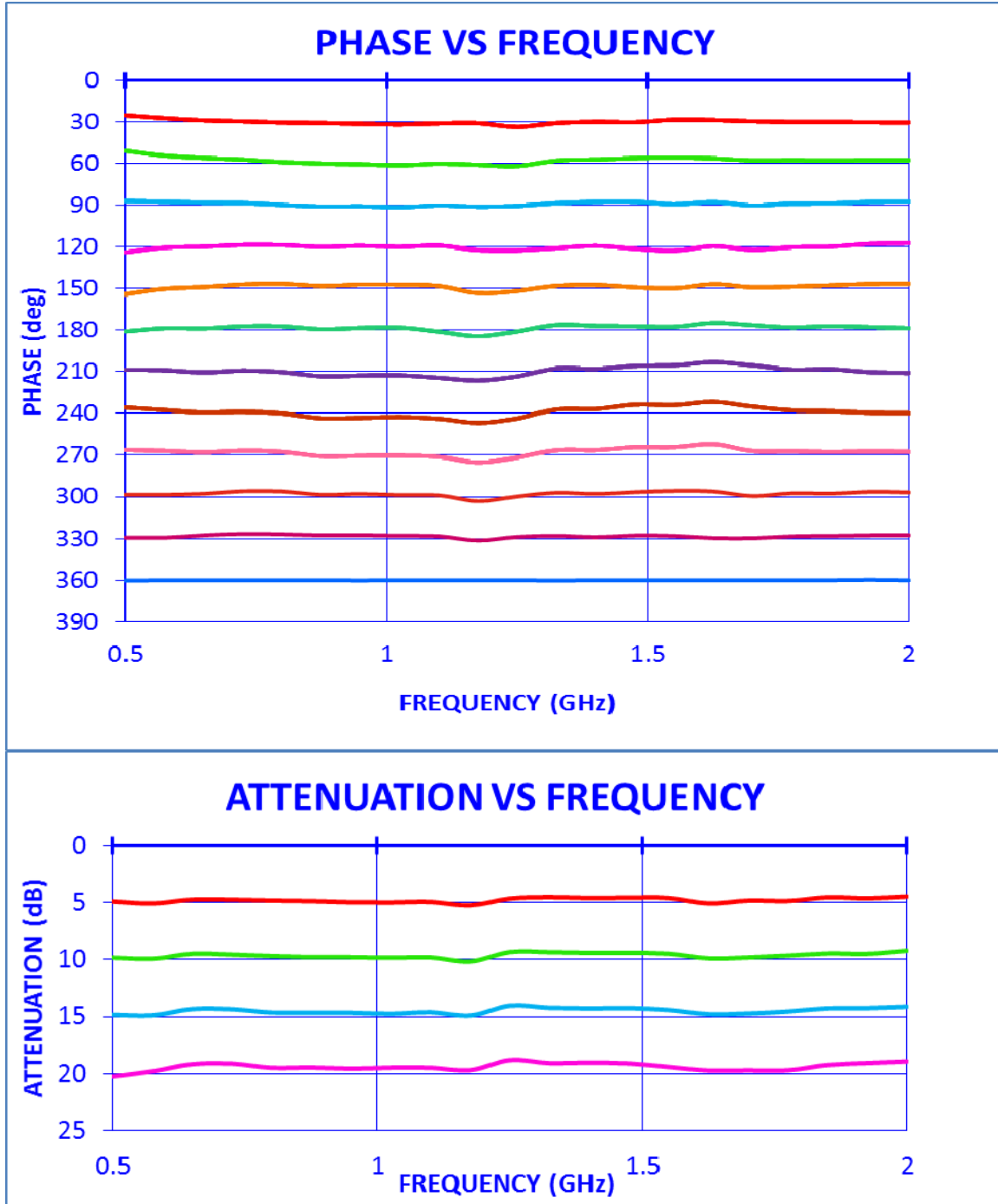
Graph Data @ 25°C





# Typical Characteristics for PIQ-0R5G2G-360-20-CD-1

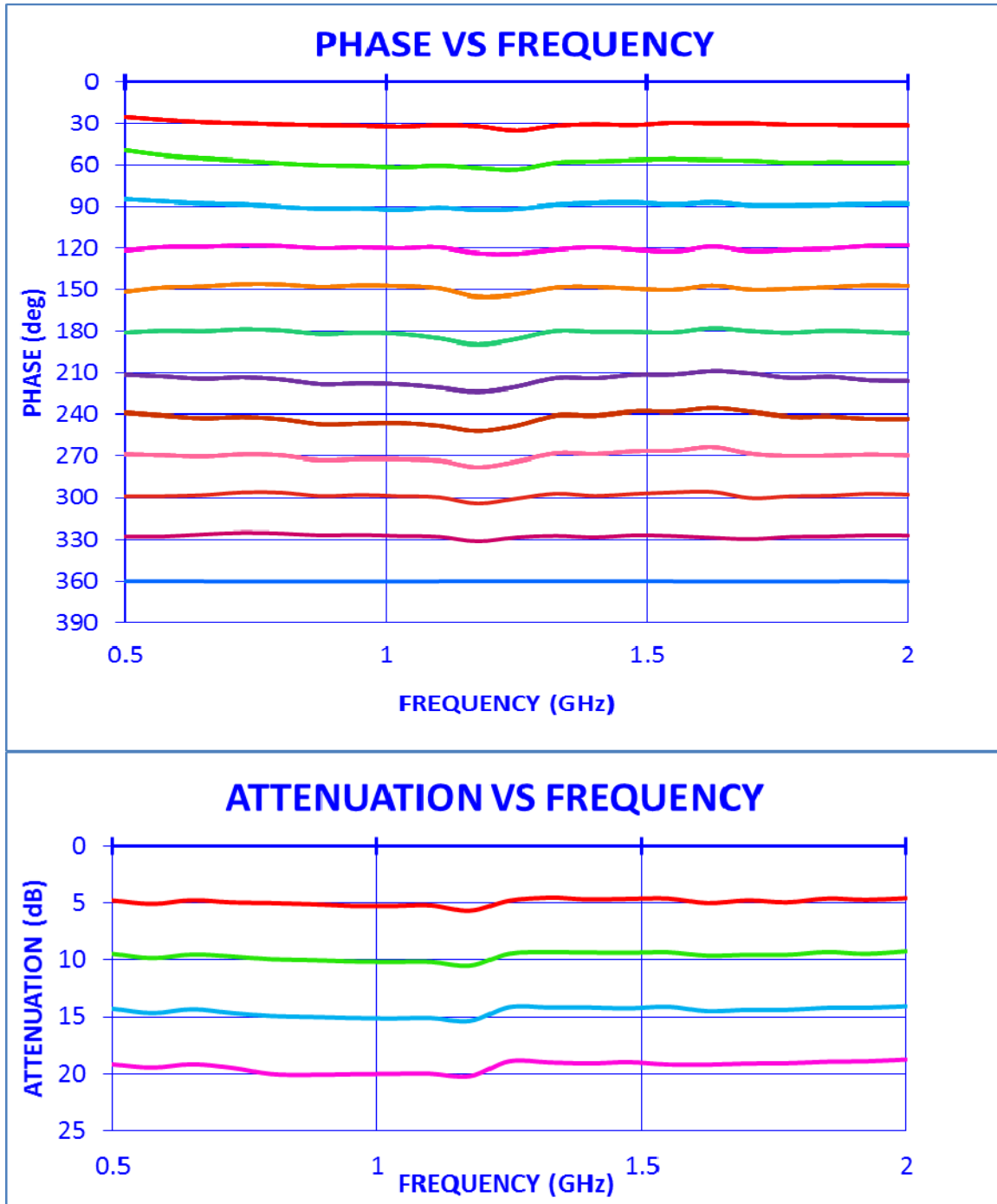
Graph Data @ +60°C





# Typical Characteristics for PIQ-0R5G2G-360-20-CD-1

Graph Data @ -10°C

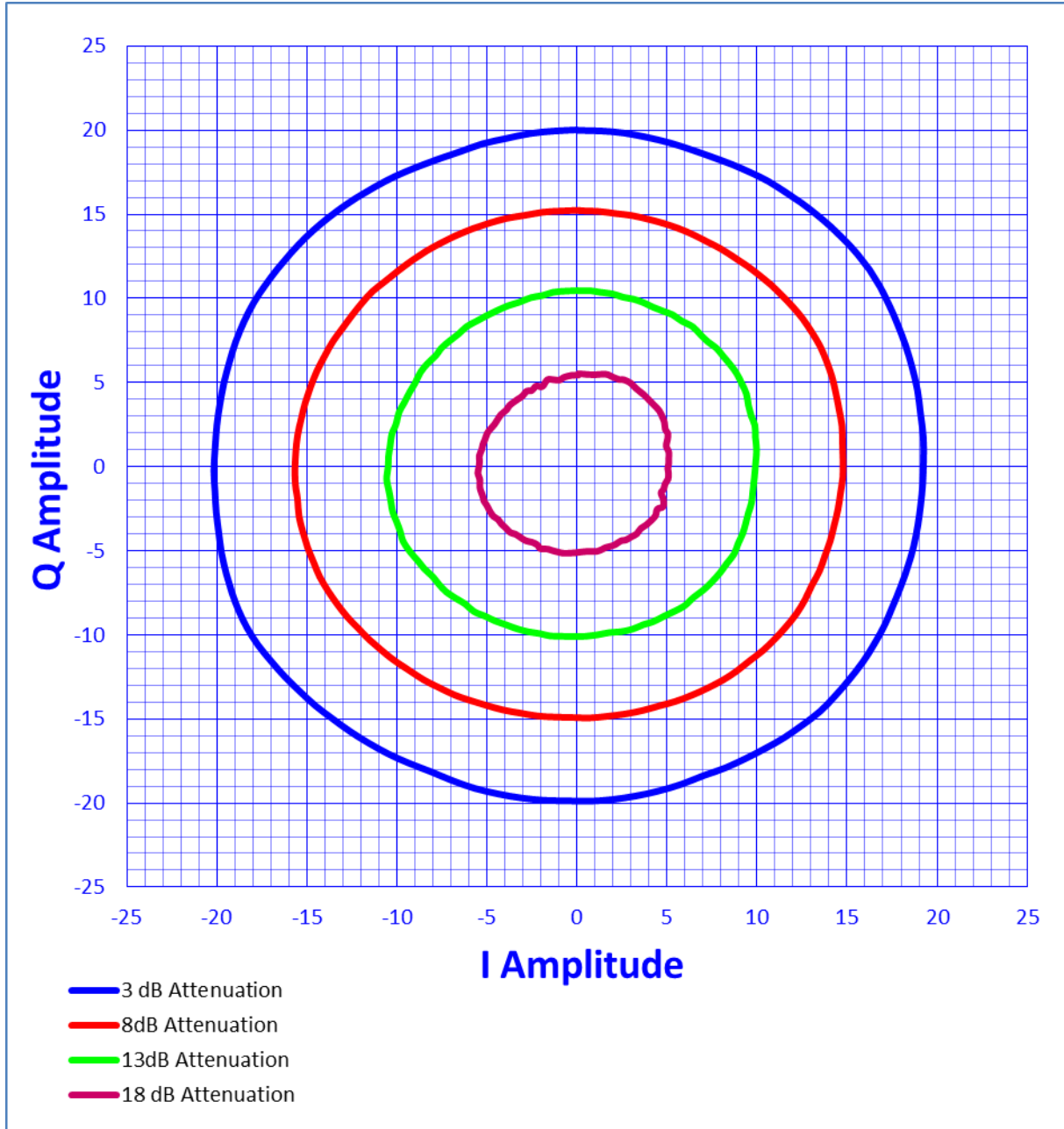






# Typical Characteristics for PIQ-0R5G2G-360-20-CD-1

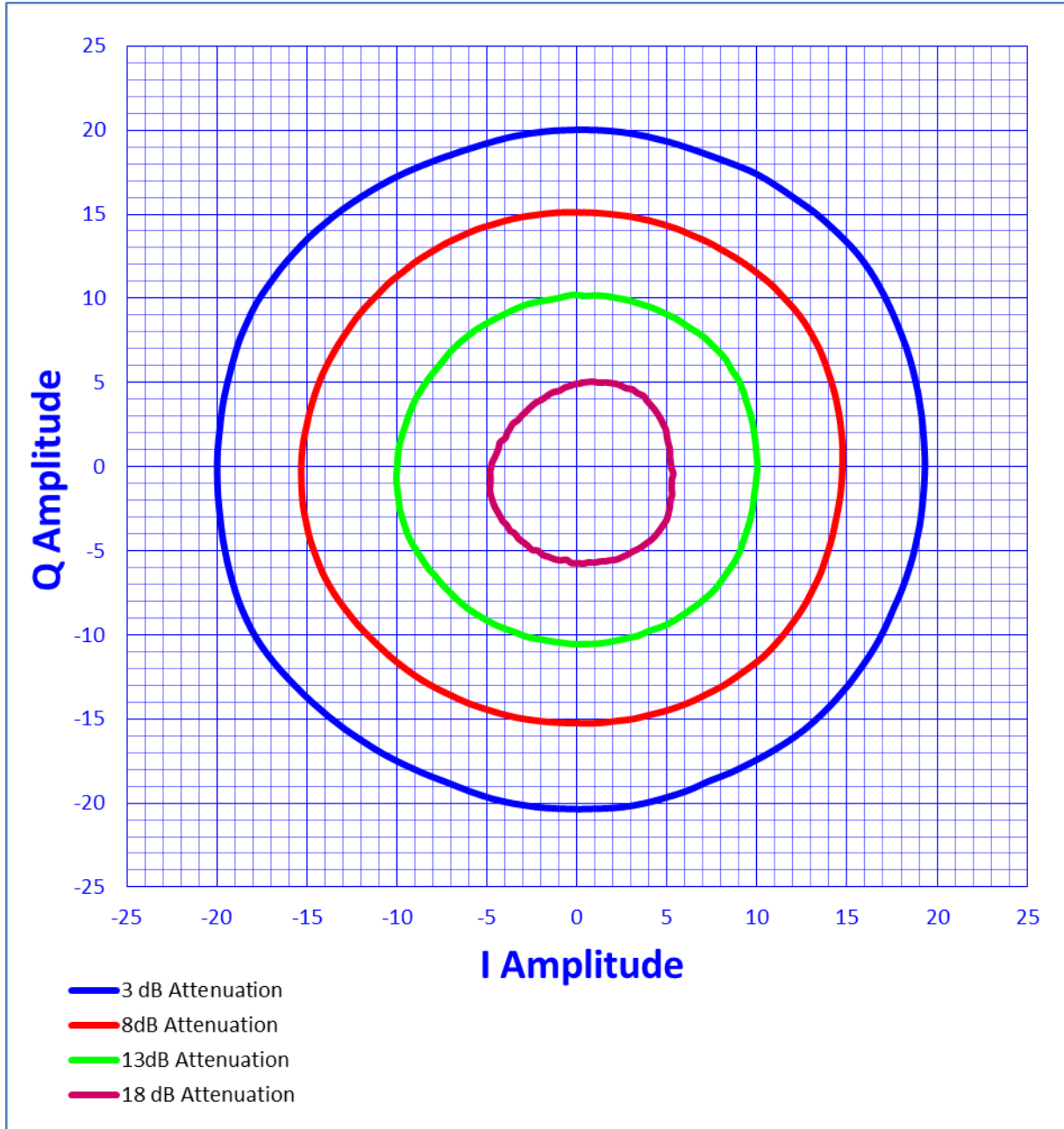
Polar Data @ +25°C





# Typical Characteristics for PIQ-0R5G2G-360-20-CD-1

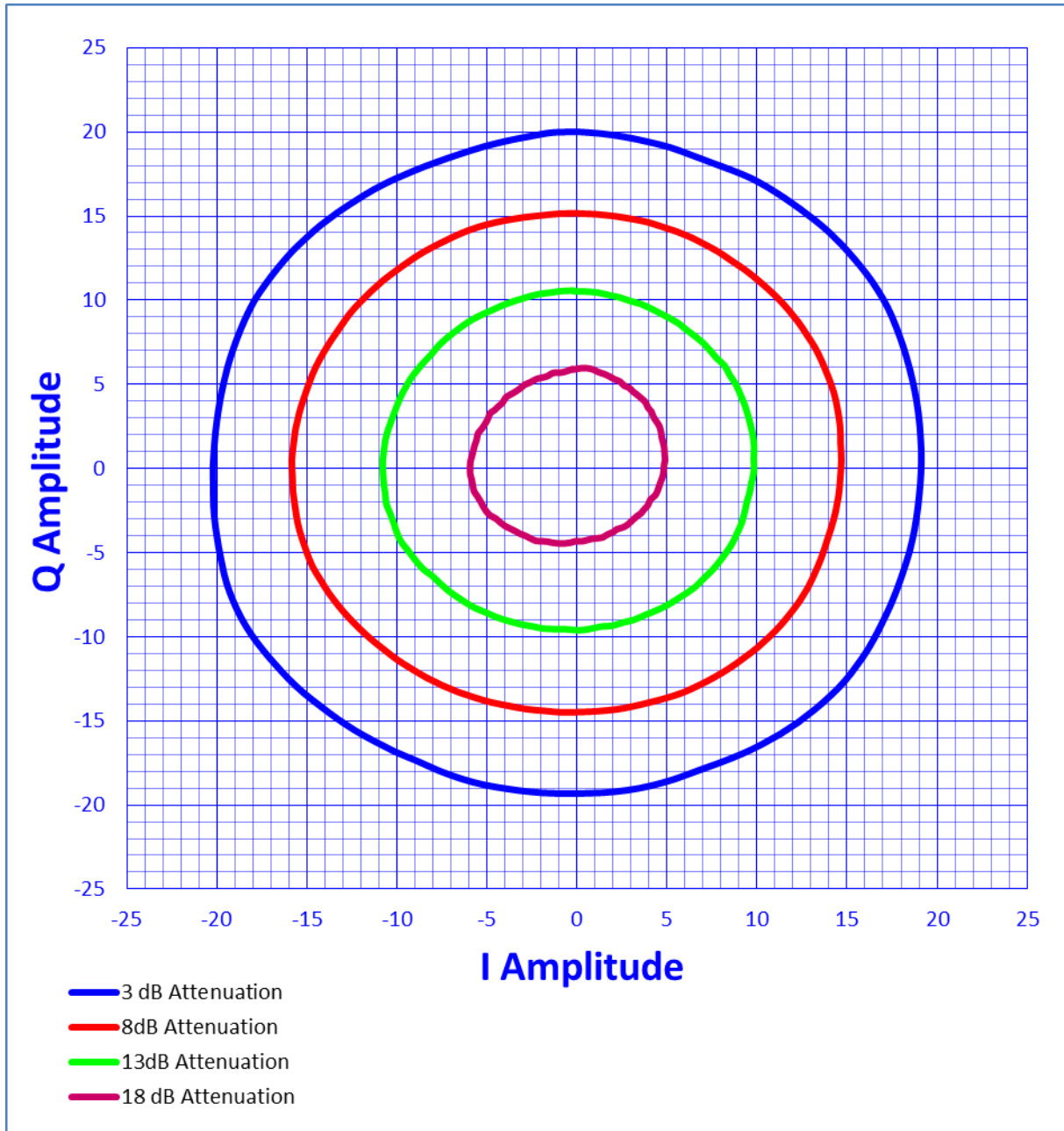
Polar Data @ +60°C





# Typical Characteristics for PIQ-0R5G2G-360-20-CD-1

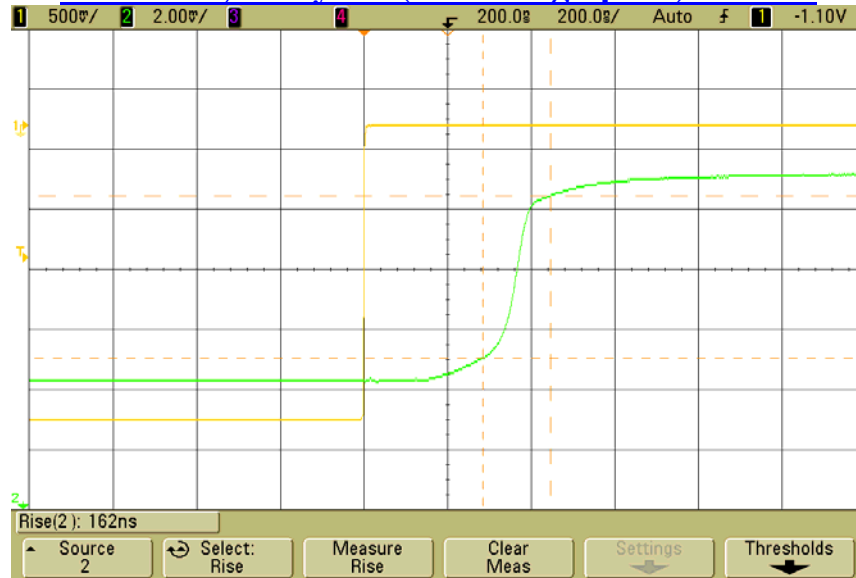
Polar Data @ -10°C



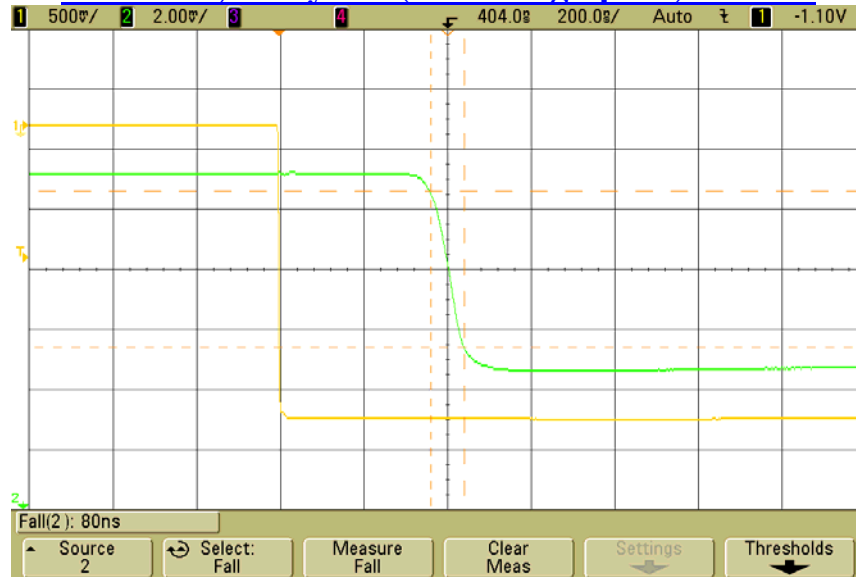


# Typical Characteristics for PIQ-0R5G2G-360-20-CD-1

## Rise Time, Delay On (Switching Speed) @ 25°C



## Fall Time, Delay Off (Switching Speed) @ 25°C



Yellow Trace(1):

Input Signal

Green Trace(2):

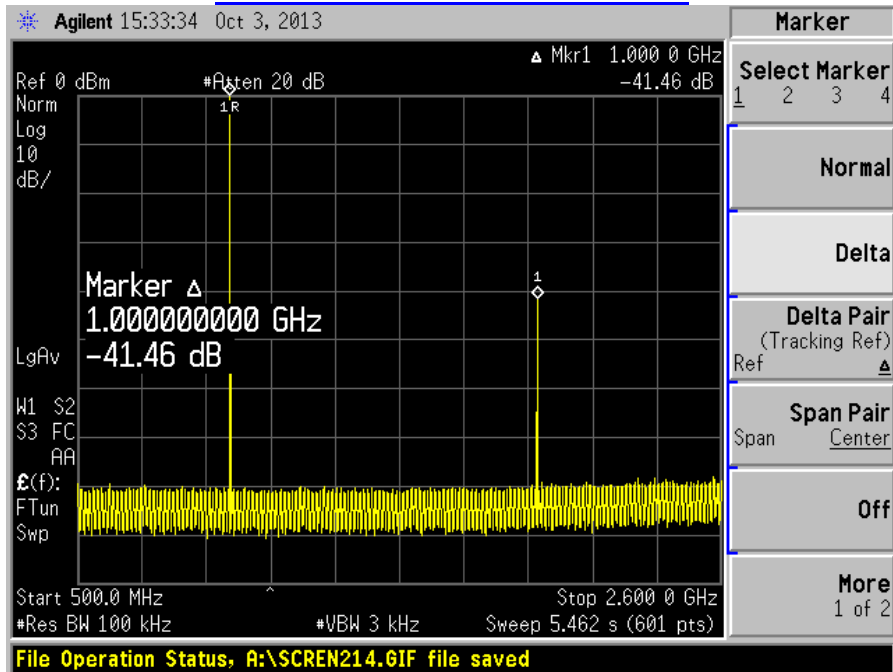
Phase Response

(Measured with a Mixer)

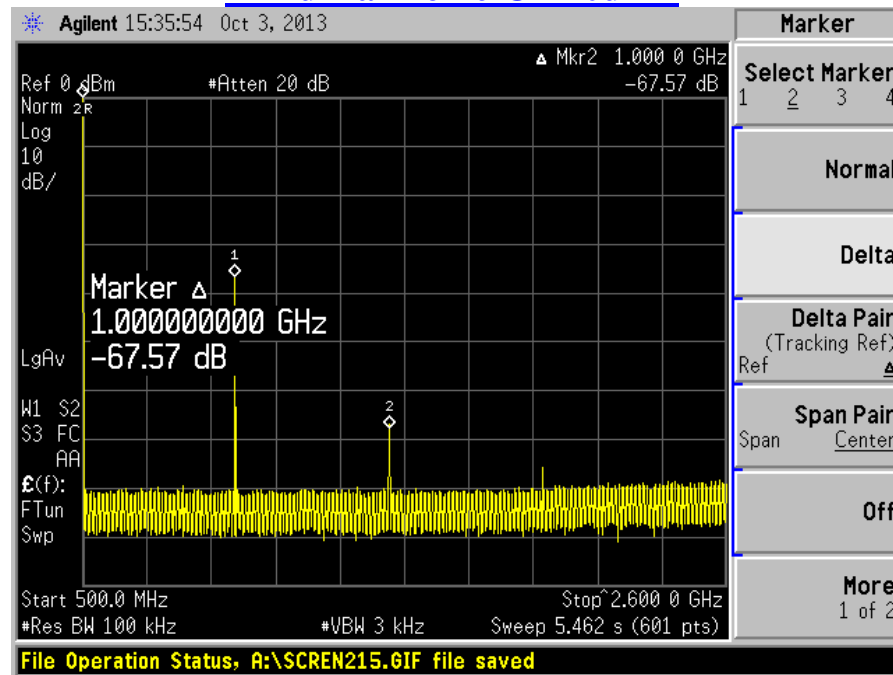


# Typical Characteristics for PIQ-0R5G2G-360-20-CD-1

## Second Harmonic @ +10dBm



## Third Harmonic @ +10dBm





# Typical Characteristics for PIQ-0R5G2G-360-20-CD-1

REVISIONS		
REV	DESCRIPTION	DATE
1	ORIGINAL RELEASE	4-08-13

**DESCRIPTION**  
 PMI MODEL PIQ-0R5G2G-360-20-CD-1 IS A 0.5 TO 2.0 GHz HIGH PERFORMANCE 1/Q VECTOR MODULATOR WITH 2 X 12 BIT MONOTONIC TTL COMPATIBLE CHANNELS (I AND Q). THIS MODEL OFFERS A FULL 360 DEGREES OF PHASE SHIFT WITH A MINIMUM OF 20 dB OF AMPLITUDE CONTROL.

**SPECIFICATIONS**

- FREQUENCY RANGE: 0.5-2.0 GHz
- DYNAMIC RANGE: 20 dB & 360 DEGREES
- RF INPUT POWER: +5 dBm CW, 1.0 Watt MAX
- INSERTION LOSS: 11.0 dB MAX
- VSWR: 1.6:1 MAX (50 OHM SYSTEM)
- ATTENUATION VS FREQUENCY: ± 1.5 dB TYP.
- PHASE VS FREQUENCY: ± 10.0 DEGREES TYP.
- CONTROL LOGIC: 2X12 BITS (I & Q), TTL COMPATIBLE
- CONTROL SLOPES: LINEAR
- SWITCHING SPEED: 500 nSec MAX
- TEMPERATURE COEFFICIENT: ± 0.035 dB/°C & ± 0.17 Deg/°C
- POWER SUPPLY: ± 12V TO ± 15V @ ±100mA MAX
- RF CONNECTORS: SMA FEMALE INPUT AND OUTPUT
- POWER/LOGIC CONNECTIONS: DC-37P, SUB MINIATURE D MULTI-PIN
- SIZE: 5.00" X 5.00" X 1.00"
- FINISH: GRAY EPOXY POLIMIDE COATING IAW MIL-C-22750, TYPE I OVER EPOXY POLIMIDE PRIMER IAW MIL-P-23377, TYPE I, CLASS 1 OR 3.

37-PIN CONNECTOR PIN-OUT		
PIN	FUNCTION	FUNCTION
1	I-5	I-4
2	I-6	I-7
3	I-8	I-3
4	I-9	I-2
5	I-10	I-1 (LSB)
6	I-11	I-12 (MSB)
7	NC	26 NC
8	+12 TO +15V	27 NC
9	GND	28 GND
10	GND	29 NC
11	-12 TO -15V	30 NC
12	Q-3	31 NC
13	Q-2	32 Q-4
14	Q-1 (LSB)	33 NC
15	Q-5	34 NC
16	Q-6	35 Q-12 (MSB)
17	Q-7	36 Q-11
18	Q-8	37 Q-10
19	Q-9	

PMI CONFIDENTIAL AND PROPRIETARY

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 ISO 9001:2008 CERTIFIED

APPROVALS	DATE	TITLE	PRODUCT FEATURE
JGS	4-08-13		PIQ-0R5G2G-360-20-CD-1
DESIGN		SIZE FROM NO.	REV.
MODIFIED		A 05X00	27019201
SCALE		SCALE N/S	SHEET 1 OF 2

**ENVIRONMENTAL RATINGS**

- TEMPERATURE RANGE: -10°C TO +60°C (OPERATING)  
-65°C TO +125°C (STORAGE)
- HUMIDITY: MIL-STD-202G, METHOD 103B COND. B
- SHOCK: MIL-STD-202G, METHOD 213B COND. B
- VIBRATION: MIL-STD-202G, METHOD 204D COND. B
- ALTITUDE: MIL-STD-202G, METHOD 105C COND. B
- TEMPERATURE CYCLE: MIL-STD-202G, METHOD 107D COND. A

NOTE: SPECIFICATIONS WILL VARY OVER OPERATING TEMPERATURE  
 NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION  
 XXX \$0.020  
 XXXX \$0.010  
 ALL DIMENSIONS ARE IN INCHES TOLERANCES: XXXX .0010