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iQgig-RF

TECHNICAL SPECIFICATIONS

IQgig-RF™ Model B
Technical Specifications



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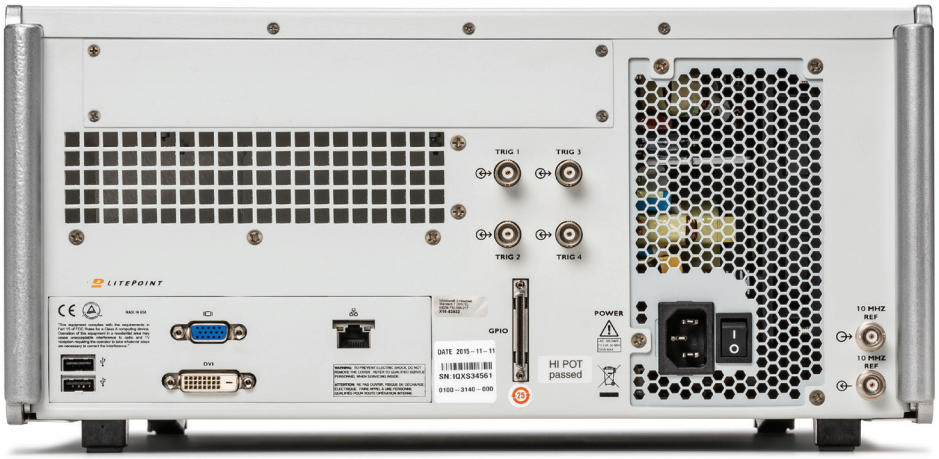
Port Descriptions



IQgig-RF Test Controller Front Panel

I/O	Function	Type
Power Switch	Power On/Off	Push-button Switch
Power Indicator	LED Red – Powered Up, Standby LED Green – Powered Up, Running	LED Indicator
Session Active Indicator	LED Green - Remote session active LED Red - Remote session lock	LED Indicator
Status Indicator	LED Green – No faults/errors detected LED Orange – Software error detected LED Red – Hardware fault detected	LED Indicator
USB (2)	USB Input / Output	Type A
RF1A	Vector Test Head Connection	Proprietary Mixed-Signal Connector
RF2A	Vector Test Head Connection	Proprietary Mixed-Signal Connector
RF1B	Vector Test Head Connection	Proprietary Mixed-Signal Connector
RF2B	Vector Test Head Connection	Proprietary Mixed-Signal Connector
Test Head Indicators	LED Green – Test Head is an input LED Red – Test Head is an output	LED Indicator

'A' denotes the first/bottom module and 'B' denotes the second/top module.



IQgig-RF

I/O	Function	Type
10 MHz REF In	10 MHz Reference In	BNC female
10 MHz REF Out	10 MHz Reference Out	BNC female
TRIG 1	TTL Trigger Input / Output	BNC female
TRIG 2	TTL Trigger Input / Output	BNC female
TRIG 3	TTL Trigger Input / Output	BNC female
TRIG 4	TTL Trigger Input / Output	BNC female
GPIO	General Purpose Input / Output	50-pin connector

IQgig-RF Test Controller Communication I/O

I/O	Function	Type
VGA	Video Output	15-Pin DSUB
DVI	Video Output	DVI-I
USB 1	USB I/O – Keyboard	Type A
USB 2	USB I/O – Mouse	Type A
LAN 1	1000 Base-T LAN	RJ-45



Note: Test heads do not include horn antennas

IQgig-RF Vector Test Head (VTH) I/O

I/O	Function	Type
Controller Interface	Connection to Test Controller	Proprietary Mixed-Signal Connector
Test Port	RF I/O	WR-15
Status Indicator	LED Green – Power on, normal operation	LED Indicator

General Hardware Specifications

RF Vector Signal Analyzer (Vector Test Head)[1]

Parameter	Ports	Value	
Frequency Range	TEST PORT	55 to 70 GHz EVM Measurements available at: CHAN 1: 58.32 GHz CHAN 2: 60.48 GHz CHAN 3: 62.64 GHz CHAN 4: 64.80 GHz CHAN 5: 66.96 GHz	
RF Bandwidth	TEST PORT	1.9 GHz	
Input Power Maximum	TEST PORT	+15 dBm peak	
Input Power Range	TEST PORT	0 to -70 dBm	
Input Power Accuracy	TEST PORT	± 1.5 dB (-5 to -55 dBm)	
Input Power Linearity	TEST PORT	± 1 dB (± 0.5 dB Typ.) (-5 to -55 dBm)	
Spurious (non-harmonics)	TEST PORT	< -50 dBc (50 kHz RBW) (CW) at Input Power = -10 dBm	
Spectral Flatness	TEST PORT	≤ ± 0.8 dB (± 850 MHz)	
Inherent Spurious Floor	TEST PORT	≤ -80 dBm at minimum input attenuation , 1 MHz RBW	
Noise Figure	TEST PORT	≤ 20 dB at minimum input attenuation	
Integrated Phase Noise	TEST PORT	< 0.8 degrees RMS (100 kHz to 100 MHz)	
Digitizer Resolution	TEST PORT	12 bits	
Sampling Data Rate	TEST PORT	300, 600, 1200, 2400 MHz	
Waveform Capture Duration	TEST PORT	at 300 MHz sampling data rate	200 ms
		at 600 MHz sampling data rate	100 ms
		at 1200 MHz sampling data rate	50 ms
		at 2400 MHz sampling data rate	25 ms
Absolute Minimum Trigger Level	TEST PORT	Wideband RF: -30 dBm Video: -40 dBm	
Absolute Maximum Trigger Level	TEST PORT	0 dBm	
Trigger Relative Threshold	TEST PORT	30 dB	
Trigger Level Accuracy	TEST PORT	< ±2 dB	

1 All specifications referenced to the waveguide flange connection at test head

RF Vector Signal Generator (Vector Test Head)[1]

Parameter	Ports	Value
Frequency Range	TEST PORT	CHAN 1: 58.32 GHz CHAN 2: 60.48 GHz CHAN 3: 62.64 GHz CHAN 4: 64.80 GHz CHAN 5: 66.96 GHz
RF Bandwidth	TEST PORT	1.9 GHz
Output Power Settable Range	TEST PORT	+5 to -70 dBm
Output Power Accuracy	TEST PORT	CW: ± 2.0 dB (+5 to -40 dBm), ±3 dB (<-40 dBm)
Output Power Linearity	TEST PORT	± 1 dB (± 0.5 dB Typ.) (+5 to -65 dBm)
Spurious (in channel)[2]	TEST PORT	< -35 dBc CW, or -75 dBm (< 0dBm)
Spurious (out of channel)[3]	TEST PORT	< -20 dBc CW, or -60 dBm, whichever is higher[4]
Spectral Flatness	TEST PORT	≤ ±0.8 dB (±850 MHz)
Integrated Phase Noise	TEST PORT	< 0.8 degrees RMS (100 kHz to 100 MHz)
Carrier Leakage	TEST PORT	< -30 dBc CW (+5 to -30 dBm)
Generator Resolution	TEST PORT	14 bits
Sampling Data Rate	TEST PORT	2400 MHz
Waveform Playback Duration	TEST PORT	25 ms

1 All specifications referenced to the waveguide flange connection at test head
2 Carrier frequency ± 1 GHz
3 Up to carrier Frequency ± 8 GHz
4 55 to 70 GHz

Wireless LAN (802.11ad) Measurement Specification (Vector Test Head)[1]

Measurement	Description	Performance
EVM	EVM averaged over payload based on standard requirements	(Averaged over 20 CPHY/SC packets, 512+/1000+ data symbols long) Preamble only channel estimation Residual VSA EVM: ≤ -30 dB MCS12 (-12 to -33 dBm) Residual VSG EVM: ≤ -30 dB MCS12 (-12 to -33 dBm)
TX Peak Power	Peak power over all symbols (dBm)	VSA power accuracy: ±1.5 dB (-5 to -55 dBm)
TX RMS Power	All: average power of complete data capture (dBm)	
	No gap: average power over all symbols after removal of any gap between packets (dBm)	
TX Max Average Power	Peak value of the amplitude as a moving average over 40 samples (dBm)	
TX Frequency Error	Carrier frequency error (kHz)	VSA measurement error: ≤ ±0.2 ppm calibrated
TX RMS Phase Noise	Integrated phase noise (degrees)	VSA residual integrated phase noise: < 0.8 degrees RMS (100 kHz to 100 MHz)
TX PSD	Power spectral density (dBm/Hz) versus frequency offset center frequency ±850 MHz	
TX Spectral Mask	Transmit spectrum mask	±3.06 GHz, Data packets longer than 10 µs without training fields, RBW = 1 MHz
TX Spectral Flatness	Reflects variation of signal energy as a function of OFDM subcarrier number 802.11ad OFDM signals only	VSA flatness over ≤ ±0.8 dB (±850 MHz)
TX Center Freq. (LO) Leakage (LOFT)		VSA residual < -35 dBc with respect to overall transmit power
TX CCDF (complementary cumulative distribution function)	Probability of peak signal power being greater than a given power level versus peak-to-average power ratio (dB)	
TX Center Frequency Convergence	Converge to within 1ppm of its final value from the start of the packet.	
TX Power On / Power Down Ramp	10 to 90% of average frame power	

1 All specifications referenced to the waveguide flange connection at test head

TX PSDU Data	Recovered binary data sequence, including the MAC header and Frame Check Sequence, if present	
TX Raw Capture Data	I and Q signals versus time	
TX General Waveform Analysis	DC offset, RMS level, minimum/maximum amplitude, peak-to peak amplitude, RMS I- and Q-channel levels	
TX CW Frequency Analysis	Frequency & power of CW tone	
RX Sensitivity	Receiver sensitivity	VSG power accuracy (CW): ± 2.0 dB (+5 to -40 dBm), ±3 dB (<-40 dBm)
RX Maximum Input Level		VSG settable power range: +5 to -70 dBm

Timebase

Parameters	Value
Oscillator Type	OCXO
Frequency	10 MHz
Initial Accuracy (25°C, after 60 minute warm-up)	< ±0.05 ppm
Maximum Aging	< ±0.1 ppm per year
Temperature Stability	< ±0.05 ppm over 0°C to 50°C range, referenced to 25°C
Warm-up Time (to within ±0.1 ppm at 25°C)	< 30 minutes

1 All specifications referenced to the waveguide flange connection at test head

General and Environmental

Parameters	Value
Dimensions	Controller: 16.75" W x 7.4" H x 24" D (426 mm x 188 mm x 610 mm) Test head: 6.2" L x 4.8" D x 1.9" H (157mm x 122 mm x 45 mm)
Weight	Controller (Single module version): 37.8 pounds (17.1 kg) Vector test head and cable: 3.7 pounds (1.7 kg)
Power Consumption (maximum)	< 350 W
Power Consumption (average)	150 W
Power Requirements	100 - 240 VAC, 50-60 Hz
Supported Browsers	Google Chrome, Mozilla Firefox
Operating Temperature	+10°C to +40°C (IEC EN60068-2-1, 2, 14)
Storage Temperature	-20°C to +70°C (IEC EN60068-2-1, 2, 14)
Specification Validity Temperature	20°C to 30°C (valid range for specifications)
Operating Humidity	15% to 95% relative humidity, non-condensing (IEC EN60068-2-30)
EMC	EN61326-1 Class A, EN55011
EMI (Immunity)	EN61000-4
Safety	IEC 61010-1, EN61010-1, UL61010-1:2012 and CAN/CSA-C22.2 No. 61010-1-12
Mechanical Vibration	IEC 60068-2-6 for Sine Vibration and MIL-STD 810G for Random Vibration
Mechanical Shock	ASTM D3332-99
Recommended Connector Torque	SMA: 7 lb-in (0.791 N-m) Test head cable: 5 lb-in (0.565 N-m)
Recommended Calibration Cycle	12 months
Warranty	12 months hardware, 12 months software updates

Order Codes

Code	Product
0100-IGIG-004	IQgig-RF Model B Test Controller and 1 Vector Test Head with controller cable
0100-IGIG-005	IQgig-RF Model B Test Controller and 2 Vector Test Heads with controller cables
0100-IGIG-006	IQgig-RF Model B Test Controller with 2 modules and 2 Vector Test Heads with controller cables
0100-IGIG-007	IQgig-RF Model B Test Controller with 2 modules and 4 Vector Test Heads with controller cables
0300-IGIG-005	WiGig 11ad software measurement suite
0300-IGIG-007	WiGig 11ay software measurement suite. Supports MCS 0 to 16, MCS 17-20 (64QAM). Requires WiGig 11ad SW license as a prerequisite.
0150-IGIG-100	60 GHz Reference Horn Antenna with a UG-385 flange for WR-15 waveguide. Supports frequency range 50 - 75 GHz with a nominal 23 dBi gain.
0150-IGIG-101	60 GHz mmWave Over-the-Air Test Chamber

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