DATA SHEET

M9410A VXT PXIe Vector Transceiver

380 MHz to 6 GHz

KEYSIGHT TECHNOLOGIES

Contents

Technical Specifications

Definitions and conditions

Specifications describe the warranted performance of calibrated instruments. Data represented in this document are specifications under the following conditions unless otherwise noted.

- Specifications are valid from 45 to 75 °C for individual module temperature, as reported by the module, and 20 to 35 °C for environment temperature unless otherwise noted
- Calibrated instrument has been stored for a minimum of 2 hours within the allowed operating range
- If instrument has previously been stored at a temperature range inside the allowed storage range, but outside the allowed operating range, instrument must have been stored for a minimum of 2 hours within the allowed operating range before turn-on
- 45-minute warm-up time with the Modular TRX application running
- Calibration cycle maintained
- When used with Keysight M9300A frequency reference and Keysight interconnect cables
- An All Alignment has been run within the previous 7 days
- A Fast Alignment has been run:
    - Within the previous 8 hours
    - If the temperature has changed more than 5°C from the previous Fast Alignment

Typical describes additional product performance information that is not covered by the product warranty. It is performance beyond specifications that 95 percent of the units exhibit with a 95 percent confidence level. This data does not include measurement uncertainty and is valid only at room temperature (approximately 25 °C) after alignment within the stated alignment time and temperature limits.

Nominal values indicate expected performance or describe product performance that is useful in the application of the product but are not covered by the product warranty.

Recommended best practices in use

- Use slot blockers and EMC filler panels in empty module slots to ensure proper operating temperatures. Keysight chassis and slot blockers optimize module temperature performance and reliability of test.
- Set chassis fan to high at environmental temperatures above 45°C.

Vector Signal Analyzer

Performance			
Capture depth			
Standard (Option M02)	256 MSa of IQ data		
Option M05	512 MSa of IQ data		
Frequency			
Frequency range			
Option F06	380 MHz to 6 GHz		
Frequency reference			
Accuracy, aging rate, stability	Refer to M9300A specifications		
Measurement Frequency Accuracy (CW mode)			
Accuracy	(Transmitter frequency x frequency reference accuracy) ± 50 Hz, typical		
Resolution	1 Hz typical		
Analysis Bandwidth			
Standard (Option B3X)	380 to 550 MHz 550 to 1310 MHz 1310 to 5930 MHz 5930 to 6000 MHz	100 MHz 200 MHz 300 MHz (6080 MHz – center frequency) × 2	
Option B6X	380 to 550 MHz 550 to 1310 MHz 1310 to 5780 MHz 5780 to 6000 MHz	100 MHz 200 MHz 600 MHz (6080 MHz – center frequency) × 2	
Option B12	380 to 550 MHz 550 to 1310 MHz 1310 to 2000 MHz 2000 to 5480 MHz 5480 to 6000 MHz	100 MHz 200 MHz 600 MHz 1200 MHz (6080 MHz – center frequency) × 2	
Triggering			
Trigger			
IQ analyzer	Free run, external 1, external 2, RF burst, video, PXI, internal		
Trigger delay range	–150 to 500 ms		
Resolution	1/sample rate		
Amplitude Accuracy and Range			
Maximum average power input			
RF input port	+27 dBm		
Option HDX, Half duplex port	+27 dBm		
Absolute Amplitude Accuracy (CW mode)			
RF input port (in specified frequencies)			
Frequency Range	–70 dBm ≤ Input level < –30 dBm	–30 dBm ≤ Input level ≤ –8 dBm	–8 dBm < Input level ≤ +27 dBm
380 to 680 MHz	< ± 0.45 dB, < ± *0.20 dB typical*	< ± 0.45 dB, < ± *0.20 dB typical*	< ± 0.45 dB, < ± *0.20 dB typical*
680 to 910 MHz	< ± 0.45 dB, < ± *0.25 dB typical*	< ± 0.45 dB, < ± *0.20 dB typical*	< ± 0.50 dB, < ± *0.25 dB typical*
910 to 1310 MHz	< ± 0.55 dB, < ± *0.30 dB typical*	< ± 0.55 dB, < ± *0.30 dB typical*	< ± 0.60 dB, < ± *0.35 dB typical*
1310 to 2000 MHz	< ± 0.60 dB, < ± *0.35 dB typical*	< ± 0.65 dB, < ± *0.35 dB typical*	< ± 0.65 dB, < ± *0.35 dB typical*
2000 to 3500 MHz	< ± 0.70 dB, < ± *0.40 dB typical*	< ± 0.80 dB, < ± *0.45 dB typical*	< ± 0.60 dB, < ± *0.30 dB typical*
3500 to 4500 MHz	< ± 0.65 dB, < ± *0.35 dB typical*	< ± 0.70 dB, < ± *0.35 dB typical*	< ± 0.75 dB, < ± *0.35 dB typical*
4500 to 5400 MHz	< ± 0.90 dB, < ± *0.45 dB typical*	< ± 0.95 dB, < ± *0.45 dB typical*	< ± 0.85 dB, < ± *0.45 dB typical*
5400 to 6000 MHz	< ± 1.20 dB, < ± *0.60 dB typical*	< ± 1.15 dB, < ± *0.60 dB typical*	< ± 1.05 dB, < ± *0.55 dB typical*
Half duplex port, Option HDX (in specified frequencies)			
Frequency Range	–70 dBm ≤ Input level < –30 dBm	–30 dBm ≤ Input level ≤ –8 dBm	–8 dBm < Input level ≤ +27 dBm
380 to 910 MHz	< ± 0.50 dB, < ± *0.25 dB typical*	< ± 0.35 dB, < ± *0.20 dB typical*	< ± 0.45 dB, < ± *0.25 dB typical*
910 to 1310 MHz	< ± 0.60 dB, < ± *0.35 dB typical*	< ± 0.45 dB, < ± *0.25 dB typical*	< ± 0.55 dB, < ± *0.30 dB typical*
1310 to 3500 MHz	< ± 0.75 dB, < ± *0.40 dB typical*	< ± 0.70 dB, < ± *0.35 dB typical*	< ± 0.65 dB, < ± *0.30 dB typical*
3500 to 4500 MHz	< ± 0.95 dB, < ± *0.50 dB typical*	< ± 0.80 dB, < ± *0.40 dB typical*	< ± 0.80 dB, < ± *0.35 dB typical*
4500 to 5400 MHz	< ± 1.15 dB, < ± *0.65 dB typical*	< ± 0.95 dB, < ± *0.50 dB typical*	< ± 1.00 dB, < ± *0.55 dB typical*
5400 to 6000 MHz	< ± 1.35 dB, < ± *0.75 dB typical*	< ± 1.10 dB, < ± *0.55 dB typical*	< ± 1.05 dB, < ± *0.55 dB typical*

Input Voltage Standing Wave Ratio (VSWR), nominal		
	RF input port	Half Duplex Port (configured to input mode)
380 to 1310 MHz	< 1.5:1	< 1.4:1
1310 to 2000 MHz	< 1.7:1	< 1.4:1
2000 to 3500 MHz	< 1.5:1	< 1.4:1
3500 to 4500 MHz	< 1.6:1	< 1.7:1
4500 to 5200 MHz	< 1.7:1	< 1.6:1
5200 to 6000 MHz	< 2.0:1	< 1.6:1
Phase Noise Sidebands (CF = 1 GHz), typical		
1 kHz offset	–112 dBc/Hz	
10 kHz offset	–130 dBc/Hz	
100 kHz offset	–132 dBc/Hz	
1 MHz offset	–134 dBc/Hz	
5 MHz offset	–137 dBc/Hz	
Spurious Responses		
Residual responses, typical		
RF input port; Option HDX, half duplex port; with analyzer ranged to 0 dBm; offset from 10 MHz to 1/2 × analysis bandwidth		
380 to 6000 MHz	< –81 dBm	
Image responses, typical		
Maximum bandwidth		
100 MHz	–57 dBc	
200 MHz	–59 dBc	
300 MHz	–56 dBc[1]	
600 MHz	–48 dBc	
1200 MHz	–49 dBc	
Non-harmonic spurs, nominal		
1 kHz to 10 MHz offset	–85 dBc	
LO Feedthrough (dBr [2]), typical		
	RF input port, with analyzer ranged from –10 to +27 dBm	Option HDX, half duplex port, with analyzer ranged from 0 to +27 dBm
380 to 450 MHz	–58 dBr	–58 dBr
450 to 550 MHz	–56 dBr	–53 dBr
550 to 680 MHz	–53 dBr	–54 dBr
680 to 910 MHz	–55 dBr	–57 dBr
910 to 1310 MHz	–53 dBr	–55 dBr
1310 to 2000 MHz	–52 dBr	–53 dBr
2000 to 3500 MHz	–50 dBr	–49 dBr
3500 to 4500 MHz	–50 dBr	–52 dBr
4500 to 5100 MHz	–47 dBr	–45 dBr
5100 to 6000 MHz	–44 dBr	–42 dBr

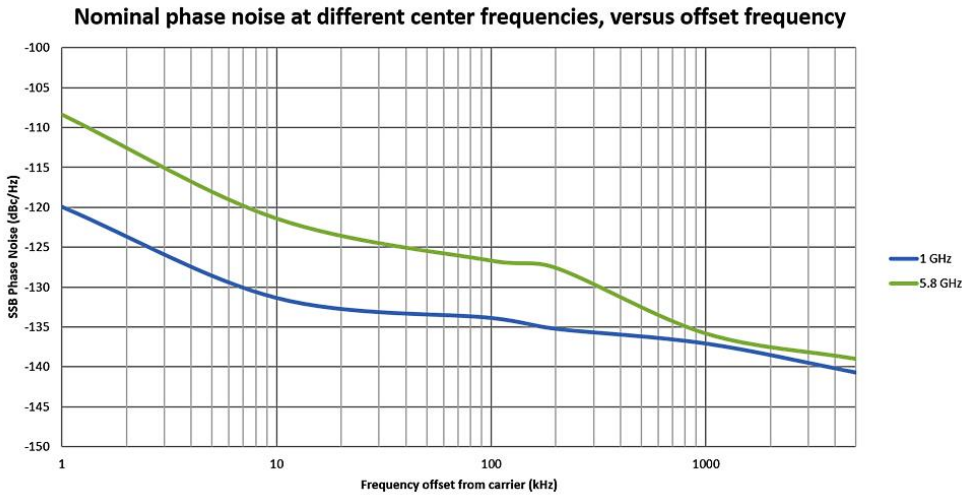

Figure 1. Nominal phase noise from 1 kHz to 5 MHz offset at 1 and 5.8 GHz.

1. –50 dBc for frequencies from 5100 to 6000 MHz
2. dBr is LO feedthrough power relative to the range level of the receiver

Displayed Average Noise Floor (DANL) [1]	
RF input port (in specified frequencies, with analyzer ranged to –70 dBm)	
380 to 680 MHz	–157 dBm, *–160 dBm typical*
680 to 910 MHz	–160 dBm, *–163 dBm typical*
910 to 1310 MHz	–156 dBm, *–159 dBm typical*
1310 to 2000 MHz	–162 dBm, *–165 dBm typical*
2000 to 4500 MHz	–158 dBm, *–162 dBm typical*
4500 to 6000 MHz	–152 dBm, *–155 dBm typical*
Half duplex port, Option HDX (in specified frequencies, with analyzer ranged to –70 dBm)	
380 to 680 MHz	–151 dBm, *–154 dBm typical*
680 to 910 MHz	–154 dBm, *–157 dBm typical*
910 to 1310 MHz	–151 dBm, *–154 dBm typical*
1310 to 2000 MHz	–156 dBm, *–159 dBm typical*
2000 to 3500 MHz	–153 dBm, *–156 dBm typical*
3500 to 4500 MHz	–151 dBm, *–154 dBm typical*
4500 to 6000 MHz	–145 dBm, *–148 dBm typical*
Third-order Intermodulation Distortion (TOI, with analyzer ranged to 0 dBm), nominal	
380 to 4000 MHz	+27 dBm
4000 to 6000 MHz	+23 dBm
IF Flatness, typical	
Maximum bandwidth	Maximum error
100 MHz	± 0.80 dB
200 MHz	± 1.00 dB
300 MHz	± 0.90 dB
600 MHz	± 0.90 dB
1200 MHz	± 1.00 dB

1. Input terminated, log power average, and normalized to 1 Hz bandwidth

Vector Signal Generator

Performance		
Arb sample memory (storage capacity)		
Standard (Option M02)	256 MSa of IQ data	
Option M05	512 MSa of IQ data	
Signal Generation Bandwidth		
	Center frequency	**Maximum bandwidth**
Standard (Option B3X)	380 to 550 MHz	100 MHz
	550 to 1310 MHz	200 MHz
	1310 to 5930 MHz	300 MHz
	5930 to 6000 MHz	(6080 MHz – center frequency) × 2
Option B6X	380 to 550 MHz	100 MHz
	550 to 1310 MHz	200 MHz
	1310 to 5780 MHz	600 MHz
	5780 to 6000 MHz	(6080 MHz – center frequency) × 2
Option B12	380 to 550 MHz	100 MHz
	550 to 1310 MHz	200 MHz
	1310 to 2000 MHz	600 MHz
	2000 to 5480 MHz	1200 MHz
	5480 to 6000 MHz	(6080 MHz – center frequency) × 2
Frequency		
Frequency range		
Option F06	380 MHz to 6 GHz	
Frequency reference		
Accuracy, aging rate, stability	Refer to M9300A specifications	
Frequency Switching Speed [1]		
Baseband frequency offset change [2]	≤ 50 µs, nominal	
Arbitrary frequency change [3]	≤ 200 µs, nominal	
Output Level Range (CW mode), typical		
RF output port		
380 MHz to 6 GHz	–120 to +5 dBm	
Option HDX, half duplex port (configured to output mode)		
380 MHz to 6 GHz	–120 to +5 dBm	
RF output port, Option 1EA		
380 MHz to 6 GHz	–120 to +20 dBm, +25 dBm settable	
Amplitude Switching Speed [1]		
Baseband power level change [4]	≤ 50 µs, nominal	
Arbitrary power level change [5]	≤ 2 ms, nominal	

1. Switching speed depends highly upon the hardware and controller that is used. Measurements were made with the M9410A in an M9018B chassis with the M9037A embedded controller.
2. Mean time from IVI command until baseband frequency changed from 0 to 1 kHz
3. Mean time from IVI command until RF frequency changed from 1.8 to 1.0 GHz
4. Mean time from IVI command until baseband amplitude changed by 5 dB
5. Mean time from IVI command until RF amplitude changed from 0 to –10 dBm

Absolute Level Accuracy (CW mode)	
RF output port (in specified frequencies)	
380 to 550 MHz	
Level ≤ +20 dBm to –15 dBm	< ± 0.55 dB, < ± *0.35 dB typical*
Level ≤ –15 dBm to –80 dBm	< ± 0.55 dB, < ± *0.35 dB typical*
Level ≤ –80 dBm to –120 dBm	< ± 0.80 dB, < ± *0.40 dB typical*
550 to 2000 MHz	
Level ≤ +20 dBm to –15 dBm	< ± 0.70 dB, < ± *0.40 dB typical*
Level ≤ –15 dBm to –80 dBm	< ± 0.55 dB, < ± *0.40 dB typical*
Level ≤ –80 dBm to –110 dBm	< ± 0.85 dB, < ± *0.50 dB typical*
2000 to 3900 MHz	
Level ≤ +20 dBm to –15 dBm	< ± 0.60 dB, < ± *0.35 dB typical*
Level ≤ –15 dBm to –80 dBm	< ± 0.70 dB, < ± *0.45 dB typical*
Level ≤ –80 dBm to –110 dBm	< ± 1.30 dB, < ± *0.75 dB typical*
3900 to 5700 MHz	
Level ≤ +20 dBm to –15 dBm	< ± 0.80 dB, < ± *0.40 dB typical*
Level ≤ –15 dBm to –80 dBm	< ± 1.10 dB, < ± *0.60 dB typical*
Level ≤ –80 dBm to –100 dBm	< ± 1.20 dB, < ± *0.65 dB typical*
5700 to 6000 MHz	
Level ≤ +20 dBm to –15 dBm	< ± 0.80 dB, < ± *0.40 dB typical*
Level ≤ –15 dBm to –80 dBm	< ± 1.10 dB, < ± *0.60 dB typical*
Level ≤ –80 dBm to –90 dBm	< ± 1.20 dB, < ± *0.65 dB typical*
Option HDX, half duplex port (in specified frequencies)	
380 to 550 MHz	
Level ≤ +5 dBm to –15 dBm	< ± 0.50 dB, < ± *0.30 dB typical*
Level ≤ –15 dBm to –80 dBm	< ± 0.50 dB, < ± *0.35 dB typical*
Level ≤ –80 dBm to –90 dBm	< ± 0.65 dB, < ± *0.45 dB typical*
550 to 2000 MHz	
Level ≤ +5 dBm to –15 dBm	< ± 0.55 dB, < ± *0.35 dB typical*
Level ≤ –15 dBm to –80 dBm	< ± 0.60 dB, < ± *0.45 dB typical*
Level ≤ –80 dBm to –90 dBm	< ± 0.75 dB, < ± *0.55 dB typical*
2000 to 3900 MHz	
Level ≤ +5 dBm to –15 dBm	< ± 0.50 dB, < ± *0.30 dB typical*
Level ≤ –15 dBm to –80 dBm	< ± 0.80 dB, < ± *0.55 dB typical*
Level ≤ –80 dBm to –90 dBm	< ± 1.10 dB, < ± *0.75 dB typical*
3900 to 6000 MHz	
Level ≤ +5 dBm to –15 dBm	< ± 0.90 dB, < ± *0.55 dB typical*
Level ≤ –15 dBm to –80 dBm	< ± 1.25 dB, < ± *0.80 dB typical*
Setting Resolution	
0.01 dB	
Output Voltage Standing Wave Ratio (VSWR), nominal	
RF output port (in specified frequencies)	
380 to 4200 MHz	< 1.7:1
4200 to 6000 MHz	< 1.6:1
Option HDX, half duplex port (configured to output mode in specified frequencies)	
380 to 4000 MHz	< 1.7:1
4000 to 5000 MHz	< 2.1:1
5000 to 6000 MHz	< 2.4:1
Harmonics, typical	
RF output port	
+0 dBm output power	< –44 dBc
+10 dBm output power, with Option 1EA	< –35 dBc
Option HDX, half duplex port	
+0 dBm output power	< –42 dBc
Non-harmonic Spurious (CW mode, specified frequency ranges), typical	
RF output port	
+0 dBm output power	< –65 dBc
+10 dBm output power, with Option 1EA	< –65 dBc
Option HDX, half duplex port	
+0 dBm output power	
380 to 3900 MHz	< –65 dBc
3900 to 6000 MHz	< –63 dBc

LO Feedthrough, nominal	
RF output port, > –30 dBm output power	
380 to 3000 MHz	–65 dBc
3000 to 5000 MHz	–55 dBc
5000 to 6000 MHz	–50 dBc
Image Responses, nominal	
Maximum bandwidth	
100 MHz	–55 dBc
200 MHz	–55 dBc
300 MHz	–50 dBc
600 MHz	–50 dBc
1200 MHz	–50 dBc
Sideband Spurious, nominal	
Offset	
1 to 100 kHz	–75 dBc
100 kHz to 1 MHz	–80 dBc
1 to 10 MHz	–80 dBc
Phase Noise, typical	
RF output port, +0 dBm; Option HDX, half duplex port, +0 dBm; Option 1EA, +10 dBm; Center frequency = 1 GHz	
1 kHz offset	≤ –115 dBc/Hz
10 kHz offset	≤ –133 dBc/Hz
100 kHz offset	≤ –138 dBc/Hz
1 MHz offset	≤ –140 dBc/Hz
5 MHz offset	≤ –139 dBc/Hz
Broadband Noise Floor, nominal	
RF output port, output level = +0 dBm	
380 to 1000 MHz	–139 dBm/Hz
1000 to 4500 MHz	–141 dBm/Hz
4500 to 6000 MHz	–137 dBm/Hz
Option HDX, half duplex port, output level = –10 dBm	
380 to 1000 MHz	–148 dBm/Hz
1000 to 4500 MHz	–147 dBm/Hz
4500 to 6000 MHz	–145 dBm/Hz
Third-order Intermodulation Distortion (TOI), typical	
RF output port, output level = +0 dBm	
380 to 3900 MHz	+28 dBm
3900 to 4500 MHz	+27 dBm
4500 to 6000 MHz	+25 dBm
Option HDX, half duplex port, output level = –10 dBm	
380 to 4500 MHz	+18 dBm
4500 to 6000 MHz	+15 dBm
IF Flatness, typical	
Maximum bandwidth	**Maximum error**
100 MHz	± 0.50 dB
200 MHz	± 0.80 dB
300 MHz	± 1.00 dB
600 MHz	± 1.00 dB
1200 MHz	± 1.50 dB

General Specifications

Environmental Characteristics	
Operating temperature	+5 to +45 °C
Storage temperature	–40 to +65 °C
EMC	Complies with European EMC Directive 2014/30/EU • IEC/EN 61326-1 • CISPR 11, Group 1, Class A • AS/NZS CISPR 11 • ICES/NMB-001 This ISM device complies with Canadian ICES-001 Cet appareil ISM est conforme a la norme NMB-001 du Canada
Environmental stress	Samples of this product have been type tested in accordance with the Keysight Environmental Test Manual and verified to be robust against the environmental stresses of storage, transportation, and end-use; those stresses include, but are not limited to, temperature, humidity, shock, vibration, altitude, and power line conditions; test methods are aligned with IEC 60068-2 and levels are similar to MILPRF-28800F Class 3.
Power Requirement	
Power consumption	88 W nominal
Weight	
Net	1.0 kg (2.2 lbs)
Dimension	
M9410A (H x W x D)	130.1 mm x 40.6 mm x 210 mm
Warranty	
The VXT PXIe vector transceiver is supplied with a 1-year warranty	
Calibration Cycle	
The recommended calibration cycle is one year; calibration services are available through Keysight service centers	

Front Panel

Reference	
100 MHz In, 100 MHz Out	Connector: MMPX female, 50 Ω nominal Lock range: ± 1 ppm, nominal Input amplitude: >+10 dBm, nominal Output amplitude: >+10 dBm, nominal
LO Reference	
4.8 GHz In, 4.8 GHz Out	Connector: MMPX female, 50 Ω nominal Input amplitude: >+10 dBm, nominal Output amplitude: >+12 dBm, nominal
RF Connections	
RF Input	Connector: SMA female, 50 Ω nominal
RF Output	Connector: SMA female, 50 Ω nominal
Half Duplex	Connector: SMA female, 50 Ω nominal
Trigger Connections	
Trigger 1, Trigger 2 (Input/Output, selectable)	Connector: MMPX female Input impedance: 1 kΩ or 50 Ω nominal Input level range: 0 to +3.3 V Output impedance: 50 Ω nominal Output level range: 3.3 V LVTTL
DIO Connections	
Ctrl M, Ctrl S	Connector: Micro-HDMI female Level range: 3.3 V LVTTL, LVDS

W-CDMA/HSPA+ Measurement Application Key Specifications[1]

Channel Power	
Absolute power accuracy	± 0.48 dB nominal at 0 dBm input power
QPSK EVM	
Residual EVM	0.90% nominal at –10 dBm input power
Adjacent Channel Power Ratio (ACPR)	
Residual relative power in 3.84 MHz BW	
5 MHz offsets	–65 dBc nominal at 0 dBm input power
Spectrum Emission Mask (SEM)	
Residual relative power (offset)	
Downlink, nominal	
2.515 to 2.715 MHz	–75 dBc in a 30 kHz BW at 0 dBm input power
2.715 to 3.515 MHz	–77 dBc in a 1 MHz BW at 0 dBm input power
3.515 to 4 MHz	–77 dBc in a 1 MHz BW at 0 dBm input power
4 to 8 MHz	–67 dBc in a 1 MHz BW at 0 dBm input power
8 to 12.5 MHz	–66 dBc in a 1 MHz BW at 0 dBm input power
Uplink, nominal	
2.515 to 3.485 MHz	–80 dBc in a 30 kHz BW at 0 dBm input power
4 to 7.5 MHz	–65 dBc in a 1 MHz BW at 0 dBm input power
7.5 to 8.5 MHz	–70 dBc in a 1 MHz BW at 0 dBm input power
8.5 to 12 MHz	–70 dBc in a 1 MHz BW at 0 dBm input power

W-CDMA/HSPA+ Source Key Specifications[1]

Error Vector Magnitude (EVM)			
Composite EVM, RF output port, half duplex port, at 0 dBm output power			
RMS	< 1% nominal		
Adjacent Channel Leakage Ratio (ACLR), RF Output Port, Half Duplex Port, at 0 dBm Output Power, nominal			
Offset	Configuration	Frequency (MHz)	ACLR
Adjacent 5 MHz	1 DPCH 1 carrier	900	–70 dB
Adjacent 10 MHz			–71 dB
Adjacent 5 MHz		1800 to 2000	–70 dB
Adjacent 10 MHz			–72 dB
Adjacent 5 MHz	64 DPCH 1 carrier	900	–69 dB
Adjacent 10 MHz			–70 dB
Adjacent 5 MHz		1800 to 2000	–67 dB
Adjacent 10 MHz			–71 dB

1. For frequencies from 695 MHz to 920 MHz and from 1425 MHz to 2700 MHz

LTE/LTE-Advanced FDD & LTE/LTE-Advanced TDD Measurement Application Specifications[1]

Transmit Power			
Absolute power accuracy		± 0.65 dB nominal at 0 dBm input power	
Error Vector Magnitude (EVM)			
Residual EVM			
20 MHz BW		0.4% nominal at –10 dBm input power	
Adjacent Channel Power			
RF input port; Option HDX, half duplex port; at –20 dBm input power			
		RF input port, nominal	Half duplex port, nominal
E-UTRA (Uplink and downlink)	695 to 910 MHz	–58 dBc	–57 dBc
	910 to 1310 MHz	–55 dBc	–54 dBc
	1310 to 2350 MHz	–60 dBc	–60 dBc
	2350 to 3800 MHz	–60 dBc	–56 dBc
UTRA (Uplink and downlink)	695 to 3800 MHz	–60 dBc	–60 dBc

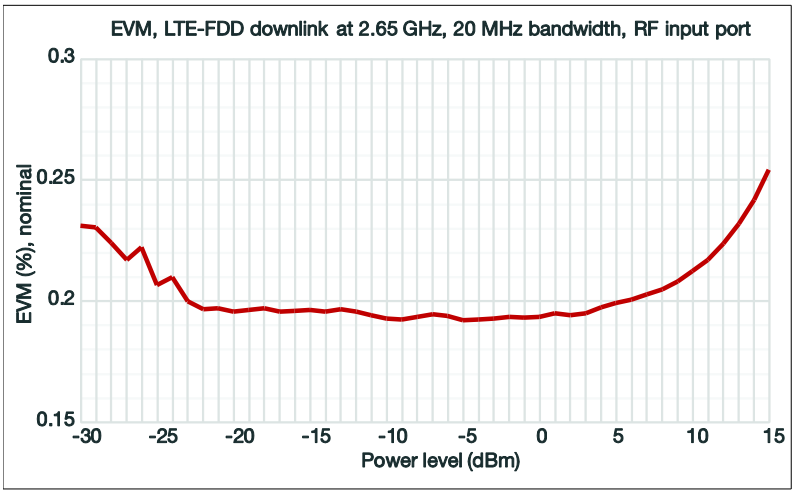

Figure 2. LTE-FDD downlink EVM vs. input power level at 2.65 GHz with 20 MHz bandwidth

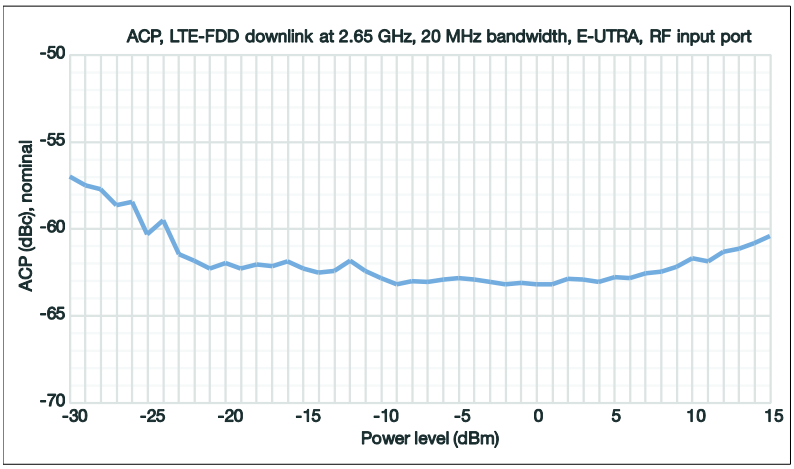

Figure 3. LTE-FDD downlink ACP vs. input power level at 2.65 GHz with 20 MHz bandwidth

1. For frequencies from 695 and 3800 MHz

LTE Source Key Specifications[1]

Error Vector Magnitude (EVM)		
Composite EVM, RF output port, half duplex port, at 0 dBm output power		
RMS	< 0.4% nominal	
Adjacent channel power, RF output port, half duplex port, at 0 dBm output power		
	Adjacent, nominal	Alternate, nominal
900 MHz	–64 dBc	–64 dBc
2 GHz	–65 dBc	–65 dBc

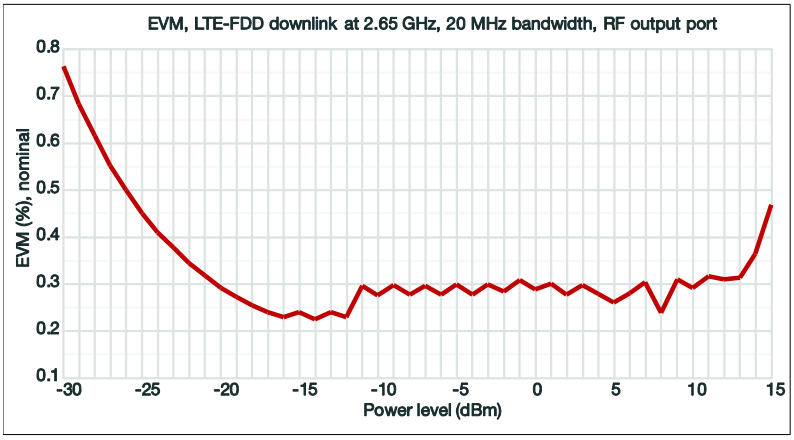

Figure 4. LTE-FDD downlink EVM vs. output power level at 2.65 GHz with 20 MHz bandwidth

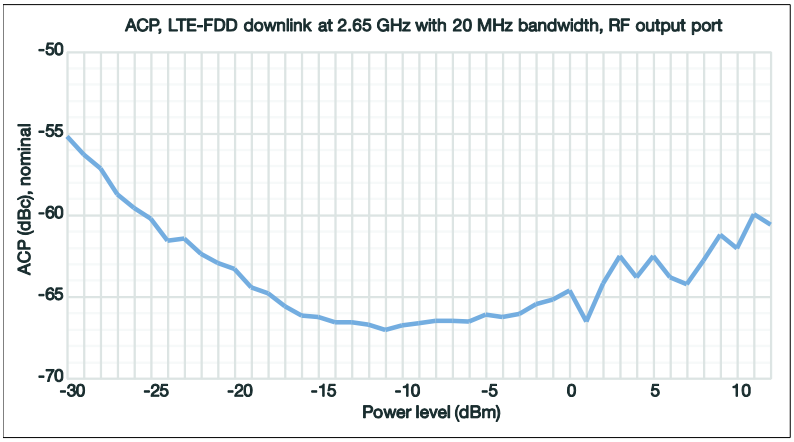

Figure 5. LTE-FDD downlink ACP vs. output power level at 2.65 GHz with 20 MHz bandwidth

1. For specified frequency ranges between 695 and 3800 MHz

WLAN Measurement Application Key Specifications

Modulated Power	
Absolute power accuracy	
2400 MHz to 2483.5 MHz	± 0.29 dB nominal at 0 dBm input power
5150 MHz to 5185 MHz	± 0.61 dB nominal at 0 dBm input power
Error Vector Magnitude (EVM)	
EVM floor conditions Phase Tracking on, Eq Smoothing on, Eq Training Seq only, RF input port, half duplex port, at –20 dBm input power, optimized range, nominal	
802.11a 5.8 GHz	< –48 dB
802.11b 2.4 GHz	< –50 dB
802.11g 2.4 GHz	< –50 dB
802.11n 5.8 GHz 20 MHz	< –48 dB
802.11n 5.8 GHz 40 MHz	< –46 dB
802.11ac 5.8 GHz 80 MHz	< –46 dB
802.11ac 5.8 GHz 160 MHz	< –44 dB
802.11ax 5.8 GHz 80 MHz	< –46 dB
802.11ax 5.8 GHz 160 MHz	< –44 dB

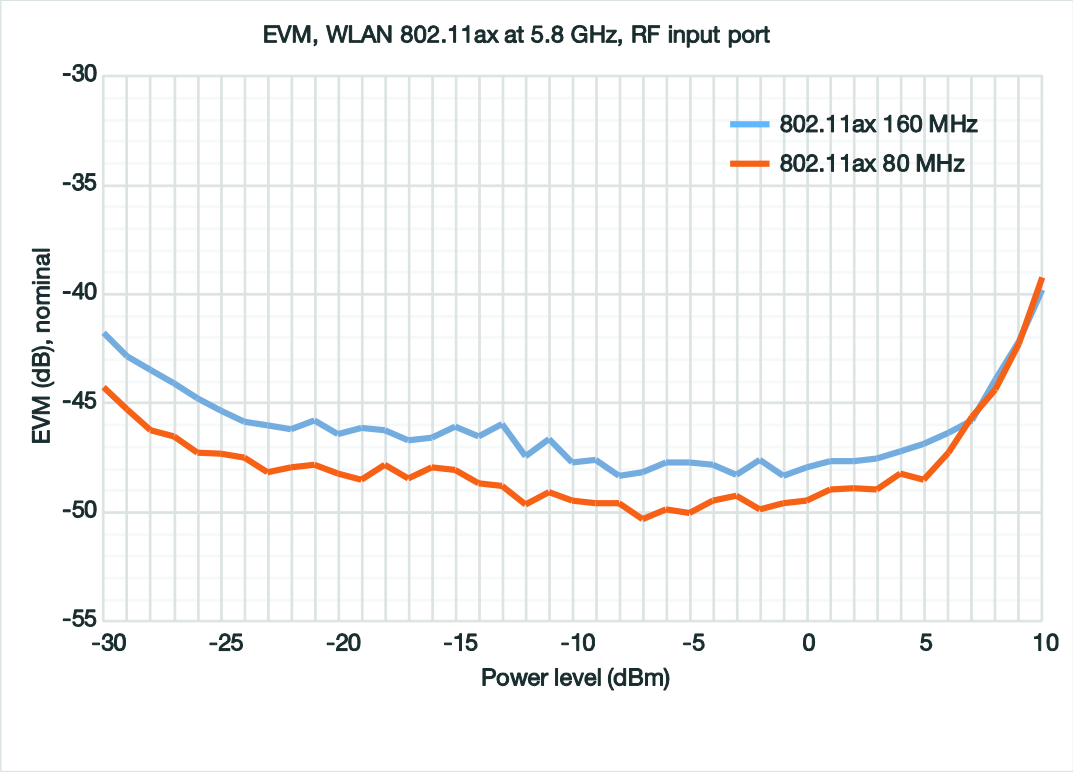

Figure 6. WLAN 802.11ax EVM vs. input power level at 5.8 GHz

WLAN Source Key Specifications

Error Vector Magnitude (EVM)	
RF output port , half duplex port, at –5 dBm to –15 dBm output power, nominal	
802.11a 5.8 GHz	< –46 dB
802.11b 2.4 GHz	< –28 dB
802.11g 2.4 GHz	< –50 dB
802.11n 5.8 GHz 20 MHz	< –46 dB
802.11n 5.8 GHz 40 MHz	< –46 dB
802.11ac 5.8 GHz 80 MHz	< –47 dB
802.11ac 5.8 GHz 160 MHz	< –45 dB
802.11ax 5.8 GHz 80 MHz	< –47 dB
802.11ax 5.8 GHz 160 MHz	< –45 dB

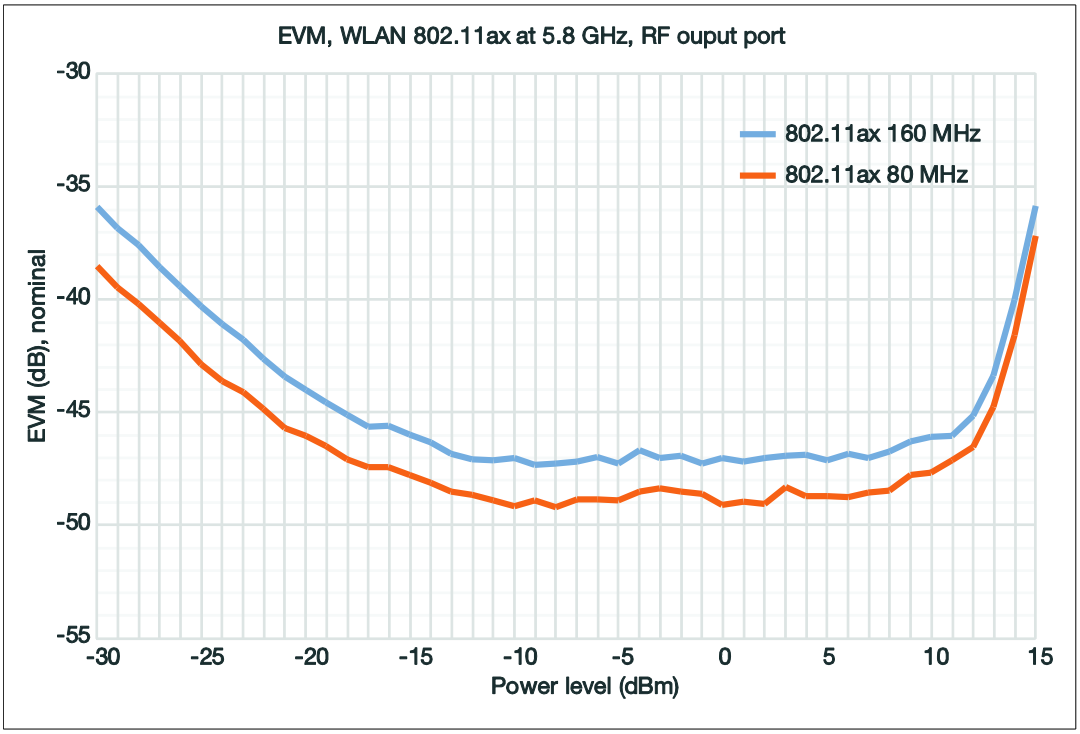

Figure 7. WLAN 802.11ax EVM vs. output power level at 5.8 GHz

5G NR Measurement Application Specifications

Transmit Power	
Absolute power accuracy	± 0.48 dB nominal at 0 dBm input power
Error Vector Magnitude (EVM)	
Residual EVM, RF input port, half duplex port, at –10 dBm input power	
30 kHz SCS, 5 GHz, 100 MHz (64QAM, 256QAM)	0.3% nominal
Adjacent Channel Power	
RF input port, half duplex port, at 0 dBm input power	
30 kHz SCS, 5 GHz, 100 MHz (64QAM, 256QAM)	–56 dBc nominal, noise correction off
	–63 dBc nominal, noise correction on

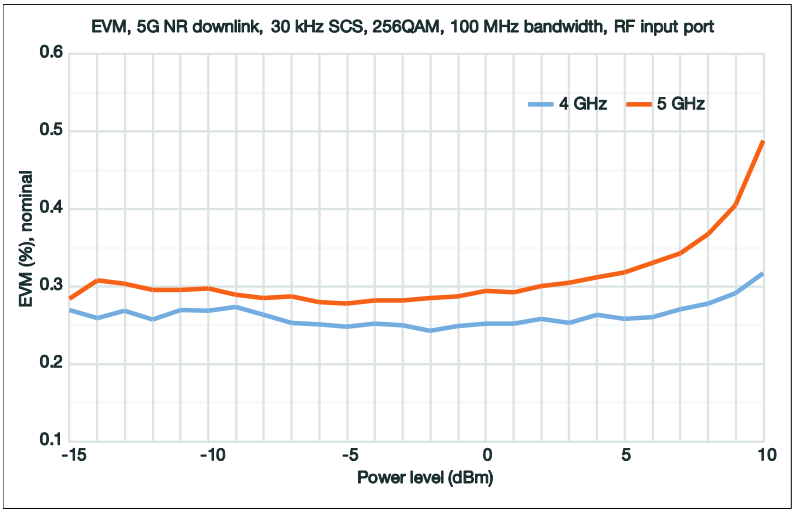

Figure 8. 5G NR downlink EVM vs. input power level at 4 GHz and 5 GHz with 100 MHz bandwidth, 30 kHz SCS, 256QAM

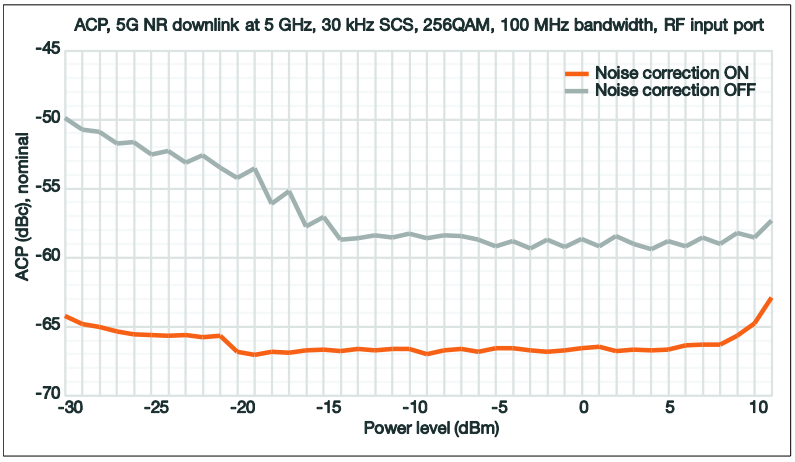

Figure 9. 5G NR downlink ACP vs. input power level at 5 GHz with 100 MHz bandwidth, 30 kHz SCS, 256QAM

5G NR Source Key Specifications

Error Vector Magnitude (EVM)	
Composite EVM, RF output port, half duplex port, at –10 dBm output power	
30 kHz SCS, 4 GHz, 100 MHz (64QAM, 256QAM)	0.4% nominal
30 kHz SCS, 5 GHz, 100 MHz (64QAM, 256QAM)	0.6% nominal
Adjacent Channel Power	
RF output port, half duplex port, at 0 dBm output power	
30 kHz SCS, 4 GHz, 100 MHz (64QAM, 256QAM)	–57 dBc nominal
30 kHz SCS, 5 GHz, 100 MHz (64QAM, 256QAM)	–55 dBc nominal

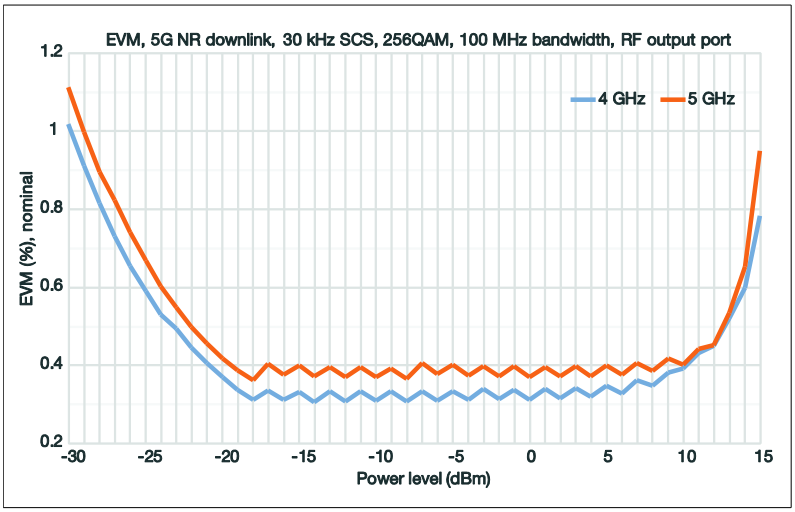

Figure 10. 5G NR downlink EVM vs. output power level at 4 GHz and 5 GHz with 100 MHz bandwidth, 30 kHz SCS, 256QAM

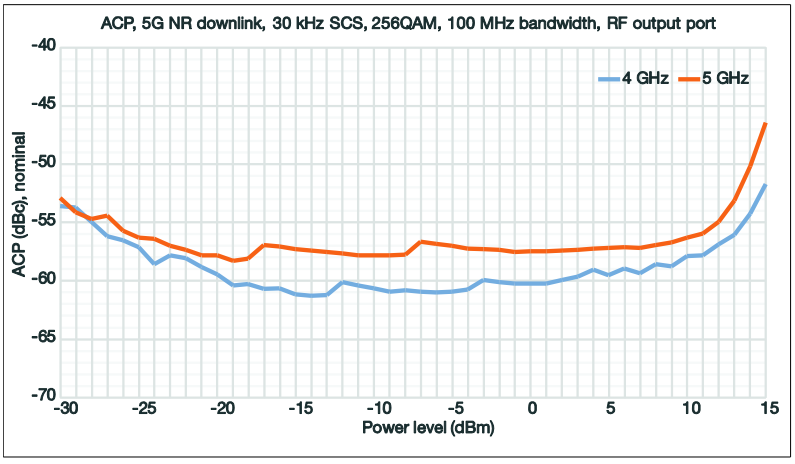

Figure 11. 5G NR downlink ACP vs. output power level at 4 GHz and 5 GHz with 100 MHz bandwidth, 30 kHz SCS, 256QAM

Related Literature

For more detailed product and specification information refer to the following literature and web pages:

- M9410A and M9411A VXT PXIe Vector Transceivers Configuration Guide (literature no. 5992-3303EN)
- M9018B PXIe 18 slot Chassis Data Sheet (literature no. 5992-1481EN)
- M9037A PXIe High Performance Embedded Controller Data Sheet (literature no. 5991-3661EN)
- X-Series Measurement Applications Brochure (literature no. 5989-8019EN)
- Signal Studio Software Brochure (literature no. 5989-6448EN)

Web

Product page:

www.keysight.com/find/M9410A

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