

S9115A 5G Multiband Vector Transceiver

380 MHz to 13 GHz and 22.7 to 49.2 GHz



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System Performance

Conditions

Information and data contained in this data sheet is subject to change without notice.

In addition to the following conditions, the S9115A system performance, documented in this data sheet, is valid for an ambient temperature of 25 °C unless otherwise noted.

- The system is within its calibration cycle.
- The system has been stored at an ambient temperature within the allowed operating range for at least two hours before being powered on.
- The system has been powered on continuously for at least 60 minutes warm-up time, with the IQ Analyzer or X-Series application (e.g. 5G NR) running, and the M1749B mmWave Transceiver powered on (verify that LEDs are on). If the system met these warm-up requirements and there is a brief power shutdown, such as a system reboot, allow 20 minutes of warm-up time after the system is powered back on.
- The alignments have been run in order of “Align Now All”, “Align RRH LO Power”, “Align IF Cable” and “Align RRH Amplitude” for the first use, after the warm-up period.
- The “Align Now All” alignments have been run within the previous 7 days, after the warm-up period.
- A “Fast Alignment” has been run:
 - within the previous 8 hours
 - If the temperature has changed more than 5 °C from when the previous “Fast Alignment” was performed
- The alignments have been run in order of “Align Now All”, “Align RRH Amplitude”, after the warm-up period:
 - If more than 30 days have elapsed since the previous “Align RRH Amplitude” alignment.
- If the IF cables have been disconnected, reconnected, or replaced it is recommended to run “Align Now All”, “Align RRH LO power”, “Align IF Cable” and “Align RRH Amplitude”.

Characteristics

- The characteristics provided in this data sheet for operation at or below 13 GHz are a subset of the specifications for the Keysight M9415A PXIe VXT Vector Transceiver module. For the most recent detailed performance information, refer to the M9415A Data Sheet (literature no. [3120-1518EN](#)). Note that the performance characteristics in that data sheet apply at the input/output connectors of the M9415A module, but in the S9115A system, there is approximately 0.25 to 0.5 dB of insertion loss between the S9115A front panel connectors and the M9415A due to the M9155C switch module and cabling.
- The Sub 13 GHz amplitude characteristics in this data sheet include the effects of the added system insertion loss.
- The M9415A-001 in this S9115A 5G Multi-Band Vector Transceiver is configured with: Option F12 (Frequency Range, 380 MHz to 13 GHz), Option B12 (1.2 GHz BW), Option M05 (512 MSa memory), Option 1EA (High Output Power).

Definitions

Specifications	Describes the performance of parameters covered by the product warranty and apply to temperature ranges 20 to 35 °C, unless otherwise noted.
Typical (typ)	Describes additional product performance information that is not covered by the product warranty. It is performance beyond specifications that 95% of the units exhibit with a 95% confidence level at room temperature (approximately 25 °C). Typical performance does not include measurement uncertainty. Typical performance is not warranted.
Nominal (nom)	Describes the expected mean or average performance, or an attribute whose performance is by design, such as the 50 Ω connector. This data is measured at room temperature (approximately 25 °C). Nominal performance is not warranted.
Measured (meas)	Describes an attribute measured during the design phase for purposes of communicating expected performance, such as amplitude drift vs. time. This data is measured at room temperature (approximately 25 °C). Measured performance is not warranted.

Recommended best practices

- Set chassis fan to high at environmental temperatures above 45 °C.

S9115A Standard Configurations

This data sheet contains system performance for the S9115A base system that is available in the following seven standard configurations with multiple input and output connectors.

- S9115A-TR1/TN1: 5G Multi-Band Vector Transceiver, one RF and mmWave transceiver channel
- S9115A-TR2/TN2: 5G Multi-Band Vector Transceiver, two RF and mmWave transceiver channel
- S9115A-BK1: TR1 with blocker signal capability
- S9115A-RF1: 5G Multi-Band Vector Transceiver, one RF only (no mmWave) transceiver channel
- S9115A-RF2: 5G Multi-Band Vector Transceiver, two RF only (no mmWave) transceiver channel

Each standard configuration allows you to select frequency range options, shown as below:

Frequency option Configuration	RF Transceiver Frequency Range		mmWave Transceiver Frequency Range	
	Option F08	Option F13	Option F43	Option F49
	380 MHz – 8 GHz	380 MHz – 13 GHz	22.7 – 43.5 GHz	22.7 – 49.2 GHz
S9115A-TR1/TN1	√	√	√	√
S9115A-TR2/TN2	√	√	√	√
S9115A-BK1	√	√	√	√
S9115A-RF1	√	√	n/a	n/a
S9115A-RF2	√	√	n/a	n/a

S9115A connectors (Ports 1 to 6)

Each S9115A standard configuration has a different set of output and input connectors (ports):

Please refer to Table 1, and Figures 1, 2 for locations of the referenced connections.

Input/Output ports Configuration	One-Channel				Two-Channel				Blocker signal
	mmWave Transceiver		RF Transceiver		mmWave Transceiver		RF Transceiver		Blocking TRX
	RF Tx/Rx ①	RF Tx/Rx ②	RF Out ③	RF In ④	RF Tx/Rx ①	RF Tx/Rx ②	RF Out ⑤	RF In ⑥	Blocking TRX ⑦
S9115A-TR1/TN1	√	√	√	√					
S9115A-TR2/TN2	√	√	√	√	√	√	√	√	
S9115A-RF1			√	√					
S9115A-RF2			√	√			√	√	
S9115A-BK1	√	√	√	√					√

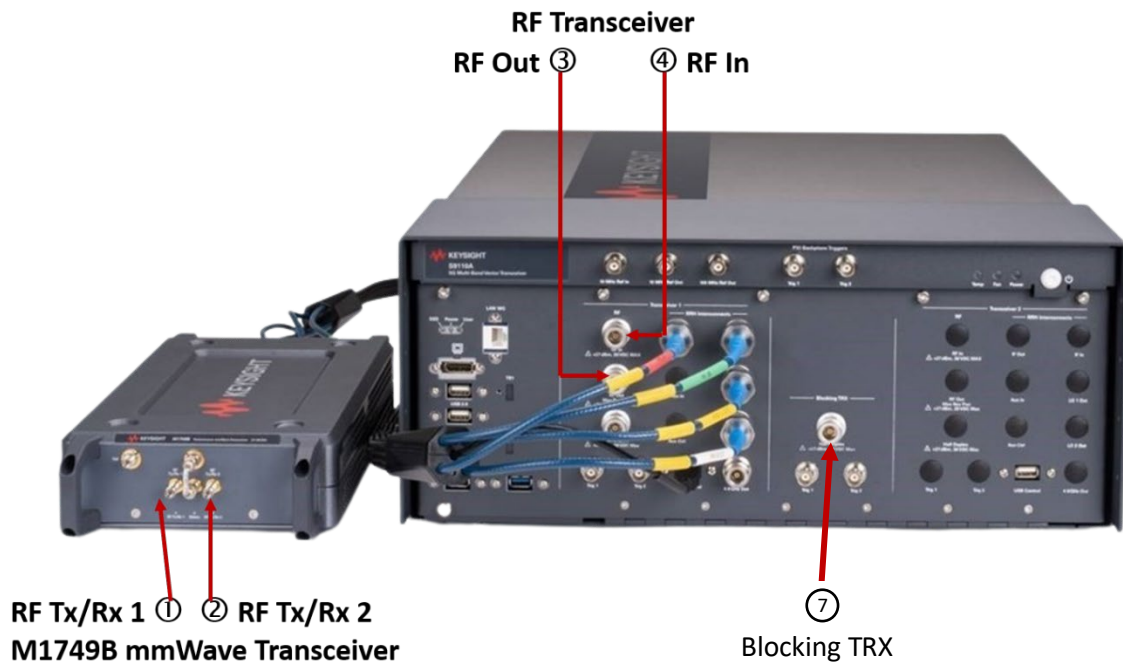


Figure 1. S9115A-TR1/TN1 (with F43 or F49 options) 5G Multi-Band Vector Transceiver configuration

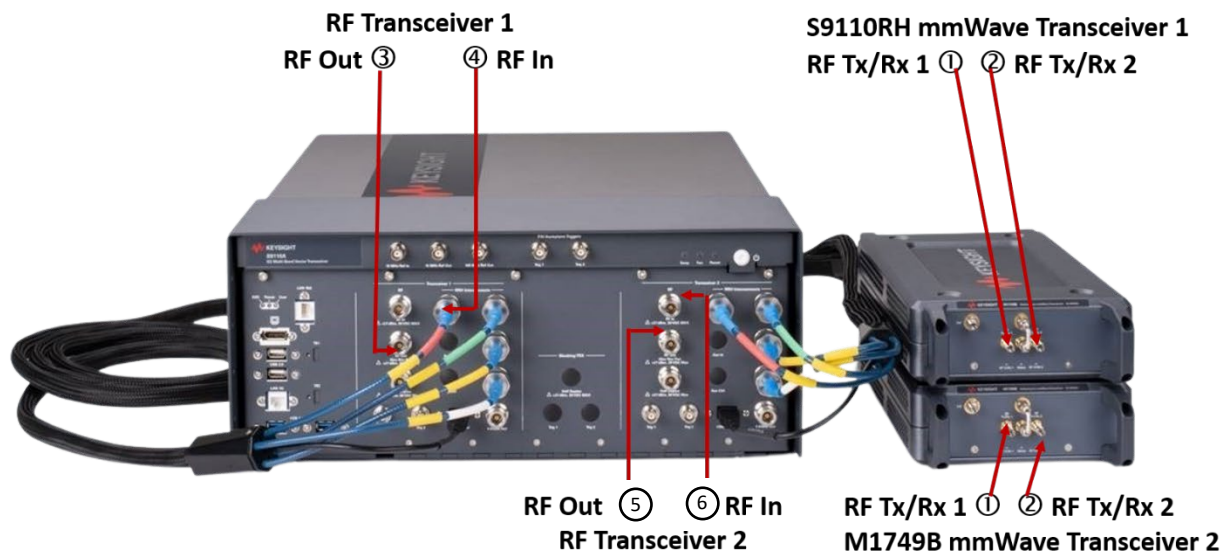


Figure 2. S9115A-TR2/TN2 (with F43 or F49 options) 5G Multi-Band Vector Transceiver configuration

Vector Signal Analyzer (Rx) Performance

Performance			
Capture depth	512 MSa		
Frequency			
	Frequency range		
M1749B mmWave connectors (Option F49)	22.7 to 43.5 GHz settable (F43)		
RF Tx/Rx 1 ① and RF Tx/Rx 2 ②	22.7 to 49.2 GHz settable (F49)		
All S9115A standard configurations RF Transceiver connectors	380 to 13000 MHz		
RF In ④ or RF In ⑥			
	Frequency reference		
Accuracy, aging rate, stability	Refer to Frequency Reference information in General Performance section.		
Signal analysis bandwidth			
	Center frequency	Maximum bandwidth (nominal)	
M1749B mmWave connectors (Option F49)	22.7 to 24.2 GHz	100 MHz	
RF Tx/Rx 1 ① and RF Tx/Rx 2 ②	24.2 to 24.3 GHz	800 MHz	
	24.3 to 49.2 GHz	1.2 GHz	
	380 to 550 MHz	100 MHz	
All S9115A standard configurations RF Transceiver connectors	550 to 1310 MHz	200 MHz	
	1310 to 2000 MHz	600 MHz	
	2000 to 12400 MHz	1200 MHz	
	12400 MHz to 13000 MHz	Bandwidth reduces as 13 GHz edge frequency is approached	
RF In ④ or RF In ⑥			
Amplitude range			
	Frequency range	Settable input level ranges	
M1749BmmWave connectors (Option F49)	22.7 to 43.5 GHz (F43)	–70 dBm to +5 dBm	
RF Tx/Rx 1 ① and RF Tx/Rx 2 ②	22.7 to 49.2 GHz (F49)	–70 dBm to +5 dBm	
All S9115A standard configurations RF transceiver connectors	380 to 13000 MHz	–150 dBm to +27 dBm	
RF In ④ or RF In ⑥			
Half duplex connector (Option HD1, HD2)	380 to 13000 MHz	–150 dBm to +27 dBm	
Absolute amplitude accuracy (CW mode)			
M1749B mmWave connectors (Option F49)	Frequency range	Level	Accuracy
	22.7 to 43.5 GHz	–50 to 0 dBm	≤ ±2.10 dB, ±0.95 dB typical
	43.5 to 49.2 GHz	–50 to –5 dBm	≤ ±1.95 dB, ±0.85 dB typical
All S9115A standard configurations RF transceiver connectors	Frequency range	Level	Accuracy (nominal)
	380 to 1310 MHz	–70 to +10 dBm	≤ ± 0.2 dB
	1310 to 4300 MHz	–70 to +10 dBm	≤ ± 0.3 dB
	4300 to 8400 MHz	–70 to +10 dBm	≤ ± 0.3 dB
	8400 to 11400 MHz	–70 to +10 dBm	≤ ± 0.4 dB
	11400 to 12000 MHz	–70 to +10 dBm	≤ ± 0.4dB
	12000 to 13000 MHz	–70 to +10 dBm	≤ ± 0.4 dB
Half duplex connector (Option HD1, HD2, HDB)	Frequency range	Level	Accuracy (nominal)
	380 to 1310 MHz	–70 to +10 dBm	≤ ± 0.3 dB
	1310 to 4300 MHz	–70 to +10 dBm	≤ ± 0.3 dB
	4300 to 8400 MHz	–70 to +10 dBm	≤ ± 0.3 dB
	8400 to 11400 MHz	–70 to +10 dBm	≤ ± 0.3 dB
	11400 to 12000 MHz	–70 to +10 dBm	≤ ± 0.4 dB
	12000 to 13000 MHz	–70 to +10 dBm	≤ ± 0.4 dB

Linearity (CW mode) (reference power level is -5 dBm)			
M1749B mmWave connectors RF Tx/Rx 1 ① and RF Tx/Rx 2 ②	Frequency range	Input level	Linearity (nominal)
	22.7 - 43.5 GHz	-50 to -20 dBm	≤ ± 1.0 dB
		-20 to 0 dBm	≤ ± 0.75 dB
	43.5 - 49.2 GHz	-50 to -20 dBm	≤ ± 1.0 dB
-20 to -5 dBm		≤ ± 0.75 dB	
Scale fidelity (CW mode)			
M1749B mmWave connectors RF Tx/Rx 1 ① and RF Tx/Rx 2 ②	Frequency range	Input level	Scale fidelity (nominal)
	22.7 - 43.5 GHz	-50 to -40 dBm	≤ ± 0.6 dB
		-40 to 0 dBm	≤ ± 0.3 dB
	43.5 - 49.2 GHz	-50 to -40 dBm	≤ ± 0.6 dB
-40 to -5 dBm		≤ ± 0.3 dB	
IF flatness			
M1749B mmWave connectors RF Tx/Rx 1 ① and RF Tx/Rx 2 ②	Frequency range	Bandwidth	Flatness (nominal)
	24.3 to 43.5 GHz	1200 MHz	± 1.25 dB
	43.5 to 48.6 GHz	1200 MHz	± 1.25 dB
All S9115A standard configurations RF transceiver connectors RF In ④ or RF In ⑥ or half duplex connector	Frequency range	Bandwidth	Flatness (nominal)
	380 to 550 MHz	100 MHz	± 0.80 dB
	550 to 1310 MHz		± 0.35 dB
	1310 to 1620 MHz		± 0.35 dB
	1620 to 2000 MHz		± 0.35 dB
	2000 to 3500 MHz		± 0.15 dB
	3500 to 4300 MHz		± 0.20 dB
	4300 to 12000 MHz		± 0.50 dB
	12000 to 13000 MHz		± 0.50 dB
	380 to 550 MHz	200 MHz	N/A
	550 to 1310 MHz		± 0.40 dB
	1310 to 1620 MHz		± 0.40 dB
	1620 to 2000 MHz		± 0.40 dB
	2000 to 3500 MHz		± 0.25 dB
	3500 to 4300 MHz		± 0.25 dB
	4300 to 12000 MHz		± 0.50 dB
	12000 to 13000 MHz		± 0.50 dB
	380 to 550 MHz	600 MHz	N/A
	550 to 1310 MHz		N/A
	1310 to 1620 MHz		± 0.95 dB
	1620 to 2000 MHz		± 0.30 dB
	2000 to 3500 MHz		± 0.30 dB
	3500 to 4300 MHz		± 0.40 dB
	4300 to 12000 MHz		± 0.70 dB
	12000 to 13000 MHz		± 0.50 dB
	380 to 550 MHz	1200 MHz	N/A
	550 to 1310 MHz		N/A
	1310 to 1620 MHz		N/A
	1620 to 2000 MHz		N/A
	2000 to 3500 MHz		± 0.35 dB
	3500 to 4300 MHz		± 0.45 dB
	4300 to 12000 MHz		± 0.80 dB
	12000 to 13000 MHz		± 0.50 dB

Error vector magnitude (EVM)

Test signal for FR1: 5G NR, 30 kHz subcarrier spacing, 256QAM

Test signal for FR2: 5G NR, 120 kHz subcarrier spacing, 256QAM

M1749B mmWave connectors RF Tx/Rx 1 ① and RF Tx/Rx 2 ②	Frequency range 24.5 to 43.5 GHz	EVM (nominal)
	100 MHz BW	≤ -37 dB, -40 to -30 dBm input power ≤ -43 dB, -30 to -5 dBm input power ≤ -43 dB, -5 to 0 dBm input power
	400 MHz BW	≤ -32 dB, -40 to -25 dBm input power ≤ -42 dB, -25 to -5 dBm input power ≤ -40 dB, -5 to 0 dBm input power
	8 x 100 MHz	≤ -30 dB, -40 to -25 dBm input power ≤ -42 dB, -25 to 0 dBm input power
	Frequency range 43.5 to 49.2 GHz	EVM (nominal)
	100 MHz BW	≤ -37 dB, -40 to -30 dBm input power ≤ -43 dB, -30 to -5 dBm input power
	400 MHz BW	≤ -32 dB, -40 to -25 dBm input power ≤ -42 dB, -25 to -5 dBm input power
	8 x 100 MHz	≤ -30 dB, -40 to -25 dBm input power ≤ -42 dB, -25 to -5 dBm input power
All S9115A standard configurations RF transceiver connectors RF In ④ or RF In ⑥	FR1 (Sub 13 GHz)	EVM (nominal)
	100 MHz BW signal at 5000 MHz	< 0.3% at -10 dBm input power
Adjacent channel leakage ration (ACLR)		
M1749B mmWave connectors RF Tx/Rx 1 ① and RF Tx/Rx 2 ②	Frequency range 22.7 to 43.5 GHz	ACLR (nominal)
	100 MHz BW	≤ -47 dBc, -40 to -30 dBm input power ≤ -50 dBc, -30 to -10 dBm input power ≤ -48 dBc, -10 to 0 dBm input power
	400 MHz BW	≤ -41 dBc, -40 to -30 dBm input power ≤ -44 dBc, -30 to -5 dBm input power ≤ -43 dBc, -5 to 0 dBm input power
	8 x 100 MHz	≤ -37 dBc, -40 to -30 dBm input power ≤ -42 dBc, -30 to -5 dBm input power ≤ -38 dBc, -5 to 0 dBm input power
	Frequency range 43.5 to 49.2 GHz	ACLR (nominal)
	100 MHz BW	≤ -47 dBc, -40 to -30 dBm input power ≤ -50 dBc, -30 to -10 dBm input power ≤ -43 dBc, -10 to 0 dBm input power
	400 MHz BW	≤ -41 dBc, -40 to -30 dBm input power ≤ -44 dBc, -30 to -5 dBm input power ≤ -43 dBc, -5 to 0 dBm input power
	8 x 100 MHz	≤ -37 dBc, -40 to -30 dBm input power ≤ -42 dBc, -30 to -5 dBm input power
All S9115A standard configurations RF transceiver connectors RF In ④ or RF In ⑥	FR1 (Sub 13 GHz)	ACLR (nominal)
	100 MHz BW signal at 5000 MHz	< -63 dBc at 0 dBm input power

Vector Signal Generator (Tx) Performance

Performance		
ARB depth	512 MSa	
Frequency		
	Frequency range	
M1749B mmWave connectors (Option F49)	22.7 to 43.5 GHz, settable (F43)	
RF Tx/Rx 1 ① and RF Tx/Rx 2 ②	43.5 to 49.2 GHz, settable (F49)	
All S9115A standard configurations RF transceiver connectors	380 to 13000 MHz	
RF Out ③ or RF Out ⑤		
Frequency reference		
Accuracy, aging rate, stability	Refer to Frequency Reference information in General Performance section.	
Signal generation bandwidth		
	Center frequency	Maximum bandwidth (nominal)
M1749B mmWave connectors (Option F49)	22.7 to 24.2 GHz	100 MHz
	24.2 to 24.3 GHz	800 MHz
	24.3 to 43.5 GHz	1.2 GHz
	43.5 to 49.2 GHz	1.2 GHz
All S9115A standard configurations RF transceiver connectors	380 to 550 MHz	100 MHz
	550 to 1310 MHz	200 MHz
	1310 to 2000 MHz	600 MHz
	2000 to 12400 MHz	1200 MHz
	12400 MHz to 13000 MHz	Bandwidth reduces as 13 GHz edge frequency is approached
RF Out ③ or RF Out ⑤		
Amplitude range		
	Frequency range	Maximum bandwidth
M1749B mmWave connectors (Option F49)	22.7 GHz - 43.5 GHz	CW: -70 to +10 dBm Modulated: -40 dBm to +5 dBm
	22.7 GHz - 49.2 GHz	CW: -70 to +10 dBm Modulated: -40 dBm to +5 dBm
S9115A option TR1 or TR2 RF transceiver connectors	380 to 13000 MHz	-150 dBm to +27 dBm
RF Out ③		
Option HD1 (RFHD), HD2, HDB	380 to 13000 MHz	-150 dBm to +27 dBm

Absolute amplitude accuracy (CW mode)			
M1749B mmWave connectors (Option F49) RF Tx/Rx 1 ① and RF Tx/Rx 2 ②	Frequency range	Level	Accuracy
	22.7 to 43.5 GHz	–50 to 0 dBm	$\leq \pm 1.95$ dB, ± 0.90 dB typical
	43.5 to 49.2 GHz	–50 to –5 dBm	$\leq \pm 1.85$ dB, ± 0.75 dB typical
S9115A option TR1 or TR2 RF transceiver connectors RF Out ③	Frequency range	Level	Accuracy (nominal)
	380 to 550 MHz	–50 to 0 dBm	$\leq \pm 0.4$ dB
	550 to 4300 MHz	–50 to 0 dBm	$\leq \pm 0.4$ dB
	4300 to 6000 MHz	–50 to 0 dBm	$\leq \pm 0.5$ dB
	6000 to 7800 MHz	–50 to 0 dBm	$\leq \pm 0.5$ dB
	7800 to 10200 MHz	–50 to 0 dBm	$\leq \pm 0.5$ dB
	10200 to 12000 MHz	–50 to 0 dBm	$\leq \pm 0.4$ dB
Half duplex connector (Option HD1, HD2, HDB)	Frequency range	Level	Accuracy (nominal)
	380 to 550 MHz	–50 to 0 dBm	$\leq \pm 0.3$ dB
	550 to 4300 MHz	–50 to 0 dBm	$\leq \pm 0.4$ dB
	1310 to 4300 MHz	–50 to 0 dBm	$\leq \pm 0.5$ dB
	4300 to 8400 MHz	–50 to 0 dBm	$\leq \pm 0.5$ dB
	7800 to 10200 MHz	–50 to 0 dBm	$\leq \pm 0.5$ dB
	10200 to 12000 MHz	–50 to 0 dBm	$\leq \pm 0.5$ dB
	12000 to 13000 MHz	–50 to 0 dBm	$\leq \pm 1.3$ dB
Linearity (CW mode) (reference power level is -5 dBm)			
M1749B mmWave connectors (Option F49) RF Tx/Rx 1 ① and RF Tx/Rx 2 ②	Frequency range	Input level	Linearity (nominal)
		–50 to –30 dBm	$\leq \pm 1.5$ dB
	22.7 – 43.5 GHz	–30 to 0 dBm	$\leq \pm 1.0$ dB
		–50 to –30 dBm	$\leq \pm 1.5$ dB
	43.5 – 49.2 GHz	–50 to –30 dBm	$\leq \pm 1.5$ dB
		–30 to –5 dBm	$\leq \pm 1.0$ dB

IF flatness			
	Frequency range	Bandwidth	Flatness (nominal)
M1749B mmWave connectors (Option F49) RF Tx/Rx 1 ① and RF Tx/Rx 2 ②	24.3 to 43.5 GHz	1200 MHz	± 1.5 dB
	43.5 to 48.6 GHz	1200 MHz	± 1.5 dB
	380 to 550 MHz	100 MHz	± 0.70 dB
	550 to 680 MHz		± 0.40 dB
	680 to 730 MHz		± 0.55 dB
	730 to 1310 MHz		± 0.40 dB
	1310 to 1620 MHz		± 0.55 dB
	1620 to 2000 MHz		± 0.40 dB
	2000 to 3500 MHz		± 0.40 dB
	3500 to 4300 MHz		± 0.40 dB
	4300 to 6000 MHz		± 0.40 dB
	6000 to 9000 MHz		± 0.40 dB
	9000 to 10200 MHz		± 0.40 dB
	10200 to 12000 MHz		± 0.40 dB
	12000 to 13000 MHz		± 0.70 dB
All S9115A standard configurations RF transceiver connectors RF Out ③ or RF HD Out ⑤ or half duplex connector	380 to 550 MHz	200 MHz	N/A
	550 to 680 MHz		± 0.45 dB
	680 to 730 MHz		± 1.05 dB
	730 to 1310 MHz		± 0.45 dB
	1310 to 1620 MHz		± 0.55 dB
	1620 to 2000 MHz		± 0.45 dB
	2000 to 3500 MHz		± 0.45 dB
	3500 to 4300 MHz		± 0.45 dB
	4300 to 6000 MHz		± 0.45 dB
	6000 to 9000 MHz		± 0.45 dB
	9000 to 10200 MHz		± 0.45 dB
	10200 to 12000 MHz		± 0.45 dB
	12000 to 13000 MHz		± 0.70 dB
	380 to 550 MHz	600 MHz	N/A
	550 to 680 MHz		N/A
	680 to 730 MHz		N/A
	730 to 1310 MHz		N/A
	1310 to 1620 MHz		± 0.70 dB
	1620 to 2000 MHz		± 0.50 dB
	2000 to 3500 MHz		± 0.50 dB
	3500 to 4300 MHz		± 1.00 dB
	4300 to 6000 MHz		± 0.55 dB
	6000 to 9000 MHz		± 0.55 dB
	9000 to 10200 MHz		± 0.60 dB
	10200 to 12000 MHz		± 0.65 dB
	12000 to 13000 MHz		± 0.70 dB
	380 to 550 MHz	1200 MHz	N/A
	550 to 680 MHz		N/A
	680 to 730 MHz		N/A
	730 to 1310 MHz		N/A
	1310 to 1620 MHz		N/A
	1620 to 2000 MHz		N/A
	2000 to 3500 MHz		± 0.60 dB
	3500 to 4300 MHz		± 1.00 dB
	4300 to 6000 MHz		± 0.75 dB
	6000 to 9000 MHz		± 0.55 dB
	9000 to 10200 MHz		± 1.10 dB
	10200 to 12000 MHz		± 0.65 dB
	12000 to 13000 MHz		± 0.70 dB

Error vector magnitude (EVM)

Test signal for FR1: 5G NR, 30 kHz subcarrier spacing, 256QAM

Test signal for FR2: 5G NR, 120 kHz subcarrier spacing, 256QAM

M1749B mmWave connectors (Option F49) RF Tx/Rx 1 ① and RF Tx/Rx 2 ②	Frequency range 22.7 to 43.5 GHz	EVM (nominal)
	100 MHz BW	≤ -33 dB, -40 to -30 dBm input power ≤ -42 dB, -30 to 0 dBm input power
	400 MHz BW	≤ -28 dB, -40 to -30 dBm input power ≤ -37 dB, -30 to -25 dBm input power ≤ -41 dB, -25 to 0 dBm input power
	800x 100 MHz BW	≤ -30 dB, -35 to -25 dBm input power ≤ -38 dB, -25 to -5 dBm input power
	Frequency range 43.5 to 49.2 GHz	EVM (nominal)
	100 MHz BW	≤ -33 dB, -40 to -30 dBm input power ≤ -42 dB, -30 to 0 dBm input power
	400 MHz BW	≤ -28 dB, -40 to -30 dBm input power ≤ -37 dB, -30 to -25 dBm input power ≤ -41 dB, -25 to 0 dBm input power
	8 x 100 MHz	≤ -30 dB, -35 to -25 dBm input power ≤ -38 dB, -25 to -5 dBm input power
All S9115A standard configurations RF transceiver connectors RF Out ③ or RF Out ⑤	FR1 (Sub 13 GHz)	EVM (nominal)
	100 MHz BW signal at 5000 MHz	< 0.6% at -10 dBm output power

Adjacent channel leakage ration (ACLR)

Test signal for FR1: 5G NR, 30 kHz subcarrier spacing, 256QAM

Test signal for FR2: 5G NR, 120 kHz subcarrier spacing, 256QAM

M1749B mmWave connectors (Option F49) RF Tx/Rx 1 ① and RF Tx/Rx 2 ②	Frequency range 22.7 to 43.5 GHz	ACLR (nominal)
	100 MHz BW	≤ -47 dBc, -40 to -25 dBm input power ≤ -50 dBc, -25 to -5 dBm input power ≤ -48 dBc, -5 to 0 dBm input power
	400 MHz BW	≤ -43 dBc, -30 to 0 dBm input power ≤ -42 dBc, -35 to -30 dBm input power ≤ -40 dBc, -40 to -35 dBm input power
	8 x 100 MHz	≤ -36 dBc, -40 to -30 dBm input power ≤ -37 dBc, -30 to 0 dBm input power
	Frequency range 22.7 to 49.2 GHz	ACLR (nominal)
	100 MHz BW	≤ -47 dBc, -40 to -25 dBm input power ≤ -50 dBc, -25 to -5 dBm input power
	400 MHz BW	≤ -40 dBc, -30 to -5 dBm input power ≤ -42 dBc, -35 to -30 dBm input power ≤ -43 dBc, -40 to -35 dBm input power
	8 x 100 MHz	≤ -36 dBc, -30 to -5 dBm input power ≤ -37 dBc, -40 to -30 dBm input power
All S9115A standard configurations RF transceiver connectors RF Out ③ or RF Out ⑤	FR1 (Sub 13 GHz)	ACLR (nominal)
	100 MHz BW signal at 4000 MHz	< -57 dBc at 0 dBm input power
	100 MHz BW signal at 5000 MHz	< -55 dBc at 0 dBm input power

General Performance

Environmental characteristics		
S9115A 5G multiband vector transceiver	For indoor use only	
	Altitude up to 6,561.68 ft (2,000 m)	
	Operating temperature 15 to 35° C maximum relative humidity (non-condensing): 85% RH	
Power requirements		
	Voltage & frequency	Power consumption
S9115A base system (PXle chassis with modules, rugged panel, and cables)	100/120 V, 50/60 Hz 220/240 V, 50/60 Hz	1200 W Max (lower range) 1300 W Max (upper range)
M1749B	120 VAC (via supplied 0950-6166 AC/DC adapter)	105 W
Size and weights		
Dimensions		
S9115A base system	Height: 197.8 mm (7.79 in); with feet installed	
	Width: 449.5 mm (17.70 in); with rugged panel	
	Depth: 568.9 mm (22.40 in); with rugged panel (from back bumper to front BNC)	
M1749B	Height: 70 mm (2.76 in)	
	Width: 175 mm (6.89 in)	
	Depth: 345 mm (13.58 in)	
S9101A rack space	2 X 2U x 1 rack width	
Weight		
S9115A-TR1/TN1 base system	20.4 kg (45.0 lbs)	
S9115A-TR2/TN2 base system	22.6 kg (49.8 lbs)	
S9115A-BK1 base system	24.0 kg (53.0 lbs)	
S9115A-RF1 base system	20.9 kg (46.0 lbs)	
S9115A-RF2 base system	22.7 kg (50.0 lbs)	
M1749B	3.5 kg (7.7 lbs)	
Remote programming		
Interface	LAN RJ-45	
Warranty		
Standard 1-year warranty		
Calibration cycle		
The recommended calibration cycle is one year; calibration services are available through Keysight service centers.		

LAN, display port, and USB connectors, M9038A PXle embedded controller

LAN 1 and LAN2 (TCP/IP interface)	
Connectors (Ethernet)	One, 10/100/1000 BASE-T (RJ-45) One, 100/1000/10GB BASE-T (RJ-45)
Video/Dual display ports	
Connectors (video)	One, display port
USB 2.0 and 3.0	
Connectors	Two, USB 2.0 (Type A)
Connectors	Two, USB 3.0 (Type A)

S9115A Base System Front Panel (with Rugged Front Panel)

Frequency reference, 100 MHz Ref Out and 10 MHz Ref In/Out connectors above the rugged front panel

100 MHz Ref Out, frequency reference (if available)	
Accuracy	±16 Hz, typical, within 1 year since last calibration, from 20 to 30 °C. Refer to the Keysight M9300A PXIe Frequency Reference Data Sheet for details on accuracy, aging rate, and stability.
Recommended calibration cycle	1 year
Connector	BNC (f)
Amplitude	9.5 dBm (nominal)
10 MHz Ref Out, frequency reference	
Accuracy	± 1.6 Hz, typical, within 1 year since last calibration, from 20 to 30°C. Refer to the Keysight M9300A PXIe Frequency Reference Data Sheet for details on accuracy, aging rate, and stability.
Recommended calibration cycle	1 year
Connector	BNC (f)
Amplitude	9.5 dBm (nominal)
10 MHz Ref In	
Connects behind rugged panel to M9300A PXIe reference Ref In and locks to another reference with a value from 1 to 110 MHz.	
Connector	BNC (f)
Frequency	1 MHz to 110 MHz, sine wave
Lock range	± 1 ppm (nominal)
Input amplitude	0 to 10 dBm (nominal)
Impedance	50 Ω (nominal)

Trig 1 and Trig 2 connectors above the rugged front panel

Trig 1 and Trig 2	
Connects behind rugged panel to M9019A PXIe Chassis Trig 1 and Trig 2. These two front panel trigger connectors (Trig 1 and Trig 2) above the rugged front panel connect to the PXI [0:7] backplane trigger bus in the M9019A chassis and can be configured as Input or Output.	
Connector	BNC (f)
Direction control	Input or output (configurable)
Output level	3.3 V CMOS (TTL compatible, 5 V tolerant)
Output impedance	50 Ω (typical)
Output trigger source	PXI_Trig0 - PXI_Trig7 (Segment 2 or 3)
Input level	3.3 V CMOS (TTL compatible, 5 V tolerant)
Input impedance	3 kΩ (typical)
Input trigger destination	PXI_Trig0 - PXI_Trig7 (Segment 2 or 3)
Input threshold	1.65 V (typical)
Minimum swing	250 mV (typical)
Minimum pulse width	100 ns (typical)

Transceiver connectors, RF 380 MHz to 13 GHz on the rugged front panel

RF In	
Connector	Type-N (f), 50 Ω (nominal)
Frequency range	380 MHz to 6 GHz
Amplitude	0 VDC, +27 dBm maximum safe input power
RF Out	
Connector	Type-N (f), 50 Ω (nominal)
Frequency range	380 MHz to 6 GHz
Amplitude	0 VDC, +30 dBm maximum applied reverse input power
Half duplex, Option HD1, HD2	
Connector	Type-N (f), 50 Ω (nominal)
Frequency range	380 MHz to 6 GHz
Amplitude	0 VDC, +30 dBm maximum safe input power
Trig 1 and Trig 2	
Connector	BNC (f)
Direction control	Input or Output
Input impedance	1 k Ω or 50 Ω nominal
Input level	Range: 0 to +3.3v
Output impedance	50 Ω nominal
Output Level	+3.3V LVTTTL, LVDS

Transceiver connectors, head mmWave 22.7 to 49.2 GHz on the rugged front panel

IF In, IF Out, and LO/Pwr/Ctrl Out connect to the M1749B.

IF In	
Connector	Type-N (f), 50 Ω (nominal)
Frequency range	380 MHz to 6 GHz
Amplitude	± 10 VDC, +33 dBm maximum
IF Out	
Connector	Type-N (f), 50 Ω (nominal)
Frequency range	380 MHz to 6 GHz
Amplitude	± 10 VDC, +33 dBm maximum
LO1 and LO2 Out	
Connector	Type-N (f), 50 Ω (nominal)
Frequency range	380 MHz to 6 GHz
USB control	
Connector	USB 2.0 (Type A)
4.8 GHz Out (not used with F43/F49 options)	
Connector	Type-N (f), 50 Ω (nominal)

M1749B mmWave Transceiver

Although the M1749B mmWave transceiver is operational from 22.7 to 49.2 GHz, the performance information for the S9115A is only provided for the frequency bands called out in this Data Sheet.

RF Tx/Rx 1 and RF Tx/Rx 2	
Connector	2.4 mm (f), 50 Ω (nominal) These ports can be configured either to supply a mmWave signal to a Device Under Test (DUT) or to receive a mmWave signal from a DUT.
Amplitude	10 VDC, +10 dBm maximum input
Cal (internal use only)	
Connector	2.4 mm (f), 50 Ω (nominal)
Rx IF Out /Tx IF In	
Connector	SMA (f), 50 Ω (nominal)
LO In	
Connector	3.5 mm (f)
9.6 GHz In	
Connector	3.5 mm (f)
9.6 GHz Out	
Connector	3.5 mm (f)
USB	
Connector	USB micro-B (f)
Trig 1/Trig 2	
Connector	SMB (m)
Control (not used with S9115A)	
Connector	SMA (f)
Power	
Connector	19 V DC power supply input

Related Literature

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

Keysight M9019A PXIe 18 slot Chassis, Data Sheet (literature no. [5992-1481EN](#))

Keysight M9038A PXIe High Performance Embedded Controller, Data Sheet (literature no. [3122-1717.EN](#))

Keysight M9410A and M9411A PXIe VXT Vector Transceivers, Data Sheet (literature no. [5992-3331EN](#))

Keysight M9415A and M9416A PXIe VXT Vector Transceivers, Data Sheet (literature no. [3120-1518EN](#))

Product page:

<http://www.keysight.com/find/S9115A>