E7515P UXM 5G Wireless Test Platform

5G NR / LTE / Wi-Fi / 380 MHz to 7.125 GHz / extension to high IF / wide BW per RF port / AoA test / internal fading

All-in-One Compact Unit

The Keysight E7515P UXM 5G wireless test platform is a highly integrated signaling test platform with multiformat stack support, rich processing power, and abundant RF resources. Supporting the latest 3GPP Release 15 and beyond plus Wi-Fi 7 specifications. Maximize cellular capabilities, increase number of CC's, BW, etc; and add Wi-Fi RF to Application and Wi-Fi to Cellular interworking testing.

KEYSIGHT

Vector signal analyzer performance

	E7515P-00A
Frequency and time specification	
Operating frequency range • Default • E7515P-507 • E7515P-512 • E7515P-515 (pre-requires -512)	 • 380 MHz to 6 GHz • 380 MHz to 7.125 GHz • 380 MHz to 12 GHz • 380 MHz to 15 GHz
Frequency setting resolution	1 Hz
Frequency accuracy	See Time base specifications
VSWR all RF_in / RF_out	
380 MHz to 600 MHz > 600 MHz to 2GHz > 2GHz to 4GHz > 4GHz to 6GHz > 6 GHz to 8 GHz > 8 to 11.5 GHz > 11.5 to 15 GHz	< 1.5 nominal < 1.5 nominal < 1.5 nominal < 1.5 nominal < 1.5 nominal < 2.4 nominal < 2.4 nominal
Amplitude and range specifications	
CW level accuracy +5 to +30dBm for all Receiver ports 380 MHz to 3GHz > 3GHz to 4.2GHz > 4.2GHz to 6GHz > 6 GHz to 7.125 GHz > 7.125GHz to 8 GHz > 7.125GHz to 15 GHz -60 to +5dBm for all Receiver ports 380 MHz to 3GHz > 3GHz to 4.2GHz > 4.2GHz to 6GHz > 6 GHz to 7.125 GHz > 7.125GHz to 8 GHz > 7.125GHz to 15 GHz -40 to +5dBm for all receiver ports 380 MHz to 4.2GHz 4.2 GHz to 7.125GHz	 ±0.45 dB nominal ±0.45 dB nominal ±0.45 dB nominal ±0.45 dB nominal ±1.0 dB nominal ±1.0 dB nominal ±0.3 dB typical ±0.3 dB typical ±0.3 dB typical ±0.3 dB typical ±1 dB nominal ±1 dB nominal ±1.23 dB warranted ±1.23 dB warranted
Level flatness Over 100 MHz bandwidth relative to central frequency 380 MHz to 3GHz > 3GHz to 4.2GHz > 4.2GHz to 6GHz > 6 GHz to 7.125 GHz > 7.125GHz to 8 GHz > 7.125GHz to 15 GHz Over 800 MHz bandwidth relative to central frequency 380 MHz to 3GHz > 3GHz to 4.2GHz > 4.2GHz to 6GHz > 6 GHz to 7.125 GHz > 7.125GHz to 8 GHz > 7.125GHz to 15 GHz	 ±0.25 dB typical ±0.25 dB typical ±0.25 dB typical ±0.3 dB typical ± 0.6 dB nominal ± 0.6 dB nominal ±0.35 dB typical ±0.35 dB typical ±0.35 dB typical ±0.35 dB typical ±0.5 dB nominal ±0.5 dB nominal

Over 1600 MHz bandwidth relative to central frequency 380 MHz to 3GHz > 3GHz to 4.2GHz > 4.2GHz to 6GHz > 6 GHz to 7.125 GHz > 7.125GHz to 8 GHz > 7.125GHz to 15 GHz	 ±0.4 dB typical ±0.4 dB typical ±0.4 dB typical ±0.4 dB typical ±0.8 dB nominal ±0.8 dB nominal
Noise spectral density all RF_in/RF_out ports RF_out set to max DL power RF_out set to OFF 380 MHz to 6 GHz 6 GHz to 7.125 GHz > 7.125GHz to 8 GHz > 7.125GHz to 15 GHz	 < –150 dBm/Hz nominal < –150 dBm/Hz nominal < –150 dBm/Hz nominal < –140 dBm/Hz nominal < –140 dBm/Hz nominal
Maximum CW input level RF_in/ RF_out ports	+29 dBm nominal

Vector signal generator performance

	E7515P-00A
Frequency and time specification	
Operating frequency range • Default • E7515P-507 • E7515P-512 • E7515P-515 (pre-requires -512)	 • 380 MHz to 6 GHz • 380 MHz to 7.125 GHz • 380 MHz to 12 GHz • 380 MHz to 15 GHz
Frequency setting resolution	1 Hz
Frequency accuracy	See Time base specifications
VSWR all RF_in / RF_out	
380 MHz to 600 MHz > 600 MHz to 2GHz > 2GHz to 4GHz > 4GHz to 6GHz > 6 GHz to 7.125 GHz > 7.125 to 10 GHz > 10 to 15 GHz	< 1.25 nominal < 1.25 nominal < 1.50 nominal < 1.50 nominal < 1.50 nominal < 1.50 nominal < 2.35 nominal
Amplitude and range specifications	
CW output level accuracy -110dBm to -50dBm for all Transmitter ports 380MHz to 3GHz > 3GHz to 4.2GHz > 4.2 GHz to 6 GHz > 6 GHz to 7.125 GHz > 7.125 to 15 GHz -50dBm to -3dBm for all Transmitter ports 380MHz to 4.2GHz > 4.2GHz to 6GHz > 6 GHz to 7.125 GHz > 7.125 to 15 GHz -50dBm to -3dBm for all Transmitter ports 380MHz to 4GHz 4.2 GHz to 7.125 GHz	 ±0.69 dB typical ±0.5 dB typical ±0.5 dB typical ±0.5 dB typical ±1.5 dB nominal ±0.35 dB typical ±0.4 dB typical ±0.4 dB typical ±1 dB nominal ±1.23 dB warranted / ±0.35 dB typical ±1.23 dB warranted / ±0.4 dB typical
Output level setting resolution	
Output level settling time No amplitude change, frequency change within band Amplitude change, no frequency change Frequency change	 ±1.0 dB within 100µs nominal ±0.1 dB within 25 µs nominal ±0.1 dB within 100ms nominal
Output Level flatness Over 100 MHz bandwidth relative to central frequency 380 MHz to 3GHz > 3GHz to 4.2GHz > 4.2GHz to 6GHz > 6 GHz to 7.125 GHz > 7.125 to 15 GHz Over 800 MHz bandwidth relative to central frequency 380 MHz to 3GHz > 3GHz to 4.2GHz > 4.2GHz to 6GHz > 6 GHz to 7.125 GHz > 7.125 to 15 GHz	 ±0.15 dB typical ±0.25 dB typical ±0.35 dB typical ±0.4 dB typical ± 0.8 dB nominal ±0.2 dB typical ±0.35 dB typical ±0.45 dB typical ±0.45 dB typical ±1 dB nominal

Over 1600 MHz bandwidth relative to central frequency 380 MHz to 3GHz > 3GHz to 4.2GHz > 4.2GHz to 6GHz > 6 GHz to 7.125 GHz > 7.125GHz to 15 GHz	 ±0.2 dB typical ±0.35 dB typical ±0.45 dB typical ±0.45 dB typical ±1.05 dB nominal
Wideband noise floor (for DL at max CW power)	-140dBm/Hz nominal
Maximum reverse power (Operating) All RF_in/ RF_out ports	 +29 dBm average power, nominal +42 dBm peak power, nominal
Maximum reverse power (Damage) All RF_in/ RF_out ports	 +29 dBm average power, nominal +42 dBm peak power, nominal
Maximum output power All RF_in/RF_out ports	+7dBm (PEP) up to 4 GHz +5dBm (PEP) up to 6 GHz 0 dBm (PEP) up to 12 GHz -5 dBm (PEP) up to 15 GHz
Phase noise 380MHz to 7.125GHz 7.125MHz to 15Ghz	 -100 dBc at 10kHz, nominal -105 dBc at 100kHz, nominal -120 dBc at 1MHz, nominal -95 dBc at 10kHz, nominal -98 dBc at 100kHz, nominal -115 dBc at 1MHz, nominal
Harmonics	
Attenuation of 2nd harmonic all RF_in/ RF_out ports 80 MHz to 4 GHz, power < –10 dBm 4 to 6 GHz, power < - 10 dBm 6 to 7.125GHz, power < –10 dBm 7.125 GHz to 12 GHz, power < -15 dBm* 12 GHz to 15 GHz, power < -20 dBm*	 > 30 dBc nominal > 30 dBc nominal > 30 dBc nominal > 30 dBc nominal > 30 dBc nominal
Attenuation of 3rd harmonic all RF_in/ RF_out ports 380 MHz to 4 GHz, power < –10 dBm 4 to 6 GHz, power < - 10 dBm 6 to 7.125GHz, power < –10 dBm 7.125 GHz to 12 GHz, power < -15 dBm* 12 GHz to 15 GHz, power < -20 dBm*	 > 40 dBc nominal > 40 dBc nominal > 40 dBc nominal > 40 dBc nominal > 40 dBc nominal

mmWave transceiver control module

The UXM 5G can add optional boards to control external mmWave transceivers from Keysight.

Product options	
Code	E7515P-MW1 mmWave transceiver control module
Number of units	Max 2 in E7515P-00A
Oher	Require N6702C Power Supply Mainframe with power modules
Mechanical Specs	
Dimensions ((H x W x L))	PICMG AMC.0 Single Full-Size
Weight	0.4 Kg
Location	Fitted inside E7515P chassis
Power Supply	
DC power in, ports, voltage	1 port, 36V
RF Specs	
Clock Output, number of ports	2
Clock signal frequency	9.6 GHz
Clock signal phase noise	-125 dBc/Hz, with 10 kHz offset, nominal -128 dBc/Hz, with 100 kHz offset, nominal -135 dBc/Hz, with 1 MHz offset, nominal -150 dBc/Hz, with 10 MHz offset, nominal
LO/Trigger/Modem, number of ports	4
LO signal, type	CW
LO signal, frequency range	2 to 12 GHz (configurable via E7515P platform software)
LO signal, frequency resolution	1 Hz, nominal
LO signal, output power	+0 dBm at 9.6 GHz, nominal
LO signal phase noise	-115 dBc/Hz, with 10 kHz offset, nominal -120 dBc/Hz, with 100 kHz offset, nominal -130 dBc/Hz, with 1 MHz offset, nominal -140 dBc/Hz, with 10 MHz offset, nominal
Trigger type	ASK/FSK

Instrument specifications

Input power requirements	
Voltage and frequency	100/120/220/240 VAC, 50/60 Hz, nominal
Power consumption (Fully loaded configuration)	1800 W max
Additional Specifications	
Dimensions (H x W x L) Without feet and handles With feet and handles	 309 mm x 436 mm x 554 mm 323 mm x 453 mm x 554 mm
Weight Fully loaded configuration	 E7515P-00A: 45 kg
Operating temperature	+10 to +40 °C, 30 g/m³ absolute humidity, 5 to 85% non-condensing relative humidity
Storage temperature	-40 to +70 °C, 50 g/m³ absolute humidity, 5 to 85% non-condensing relative humidity
Altitude	Up to 2000 m
EMC	Complies with European EMC Directive 2004/108/EC • IEC/EN 61326-1 • CISPR Pub 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. • South Korean Class A EMC declaration: This equipment is Class A suitable for professional use and is for use in electromagnetic environments outside of the home. • A급 기기 (업무용 방송통신기 자재) • 이기기는 업무용(A급) 전자파 적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.
Mechanical resistance	EN60068-2-6, EN60068-2-27, EN60068-2-64
Safety	Complies with European Low Voltage Directive 2006/95/EC • IEC/EN 61010-1, 3rd edition • Canada: CAN/CSA C22.2 No. 61010-1012 • USA: UL std no. 61010-1, 3rd Edition • Acoustic statement (European Machinery Directive 2002/42/EC, 1.7.4.2u) Acoustic noise emission, LpA <70 dB, Operator position, Normal operation mode, Per ISO 7779
RF Connections	
RF_in/ RF_out ports	N-type female, 50 Ω nominal
Other connectors and interfaces	
Display/Manual user interface	15.4 in (391 mm) active matrix, color, 1280 x 800-pixel resolution TFT-LCD flat panel display with touch panel controls
USB ports Front panel Rear panel	 2x USB 2.0 2x USB 3.0
LAN (local area network) ports (control)	One external, 1 Gbps, LAN port rear panel One external, 1 Gbps, LAN port front panel
LAN (local area network) ports (data)	40 Gbps connectivity (rear panel) (E7515P-00A)
QSFP+ connectivity	4 ports, in E7515P-00A

Digital data acquisition	
General memory budgets and considerations Available memory (capture and/or playback)	 16GB total
Signal acquisition IQ data acquisition channels Samples rates Maximum sample storage	 8 in E7515P-00A 30.72, 61.44, 122.88, 245.76 and 491.52 MSa/s 1GSa per UL RF_in port
Maximum capture size	4GB per channel
Trigger control	Immediate and external
Analyzer bandwidth	20 MHz bandwidth (30.72 MSa/s) 50 MHz bandwidth (61.44 MSa/s) 100 MHz bandwidth (122.88 MSa/s) 200 MHz bandwidth (245.76 MSa/s) 400 MHz bandwidth (491.52 MSa/s)
Gaussian noise generator	
Independent channels	16
RF_IN/ RF_OUT port	Configured via RFIO
Digital frequency offset	-800MHz+BW_{Noise}/2 to 800MHz-BW_{Noise}/2 in E7515P-00A
Continuous wave generation	
Independent channels	8
RF_IN/ RF_OUT port	Configured via RFIO
Digital frequency offset	-800 to 800 MHz in E7515P-00A
Arbitrary wave generation	
Independent channels	8
Antenna output	Configured via RFIO
Digital frequency offset	-800MHz+BW_{Signal}/2 to 800MHz-BW_{Signal}/2 in E7515P-00A
Memory allocation for arbitrary wave generation	16 GB (shared with digital data acquisition)
Waveform sampling rate Bandwidth 20MHz Bandwidth 50MHz Bandwidth 100MHz Bandwidth 200MHz Bandwidth 400MHz	 30.72 MSa/s 61.44 MSa/s 122.88 MSa/s 245.76 MSa/s 491.52 MSa/s
Maximum waveform file size	4 GB
Waveform play modes	Single, continuous
Time base	
Standard frequency reference Maximum frequency drift Warm-up time	 ± 50 ppb/2 years 30 min
External clock time reference	
Connector type	SMA connector 10 MHz IN, rear panel
Frequency Sine wave Square wave (greater than 40% ON duty cycle) Input voltage range Impedance	 10 MHz 10 MHz 0.4 to 2 Vpp 50 Ω nominal
Format alignment trigger	
External connector	SMA Channel 0
Trigger duration	Samples resolution = (1 / 30.72) x 10^{-6} 1 to 2^{31}-1 samples
Trigger offset delay	In terms of 1/6 of the period of the sample
Trigger period	1 to 2^{31}-1 samples
External connector	Up to 8, SMA connector (Input, Output)
Arm channel for receiving trigger	Only input channels
External trigger generation	Only output channels
Base band fader	
Fading blocks (100 MHz)	40

Warranty and calibration	
Standard warranty	One year
Recommended calibration cycle	One year

5G NR measurements

Modulation and channels	
Signal structure	TDD, FDD (with appropriate software license)
Signal bandwidth	100MHz
EVM performance (-10 dBm channel power, 256 QAM, 1 CC 100 MHz)	**E7515P-00A/00B/00C**
380 MHz to 3 GHz	0.70%, typical
3 to 6 GHz	0.70%, typical

Definitions and Conditions

The specifications in this document apply to E7515P UXM 5G Wireless Test Platforms with following configuration identifiers:

UXM 5G Config Identifier	Description
E7515P-00A	E7515P UXM 5G Wireless Test Platform, configuration 00A

The test set will meet its specifications when

- The test set is within its calibration cycle.
- The test set has been stored at an ambient temperature within the allowed operating range for at least two hours before being turned on; if it had previously been stored at a temperature range inside the allowed storage range, but outside the allowed operating range.
- The test set has been turned on for at least 30 minutes.

Specification

Specifications describe the performance parameters covered by the product warranty and are valid from 20 to 30 °C unless otherwise noted.

Typical

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, shown in italics, does not include measurement uncertainty, and is valid only at room temperature, 23 °C.

Nominal

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.

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KEYSIGHT

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