

Data Sheet

# VIAVI

## Radio Analysis Module

Modules for OneAdvisor 800 Wireless

RA09MA-O

RA18MA-O

RA32MA-O

RA44MA-O

### Specification\* Conditions

The specifications apply under these conditions:

- The instrument has been turned on for at least 15 minutes
- The instrument is operating within a valid calibration period
- Data with no tolerance are considered typical values
- Typical and nominal values are defined as:
  - Typical: An average value of 80% of the performance of production units
  - Nominal: A general, descriptive term or parameter



\*All specifications are subject to change without notice

## Frequency and Time Specifications

Option	Frequency range	
RA09MA-O	9 kHz to 9 GHz	
RA18MA-O	9 kHz to 18.5 GHz	
RA32MA-O	9 kHz to 32 GHz	
RA44MA-O	9 kHz to 44 GHz	
Frequency Reference		
Accuracy	±0.05 ppm (0 to 50° (32 to 122°F)) + aging	
Accuracy with GPS	±10 ppb	GPS lock
	±20 ppb	Hold over (72 hours)
Aging	±0.5 ppm/year	
	±25 ppb with GPS	
Frequency readout accuracy (start, stop, center, marker)		
	± (readout frequency x frequency reference accuracy + RBW centering + 0.5 x horizontal resolution + 2 Hz)	horizontal resolution = frequency span/trace # RBW center = 15% x RBW
Frequency Span		
Range	0 Hz (zero span), 9 kHz to max frequency of each option	
Resolution	1 Hz	
Accuracy	± (2 x RBW centering + horizontal resolution)	
Sweep time readout	The time required to complete a sweep from start to finish, including tuning, data acquisition and process	
Trace Update		Nominal
	25 traces/sec	Span = 260 MHz RBW = 100 kHz
Sweep Time		Nominal
Range	0.4 ms to 1000 sec	
	24 µs to 200 sec	zero span
Accuracy	±2%	zero span
Type	Continuous, Single	
Mode	Gated sweep (requires option ONA-SP-GSS), Normal, Fast	
Trigger		
Trigger source	Free run, video, external	
Trigger delay	Range: 0 to 200 sec	
	Resolution: 6 µs	
Resolution bandwidth (RBW)		Nominal
Range	1 Hz to 10 MHz	-3 dB bandwidth
		1-3-10 sequence
Accuracy	±10%	
Video bandwidth (VBW)		Nominal
Range	1 Hz to 10 MHz	-3 dB bandwidth
		1-3-10 sequence
Accuracy	±10%	

## Amplitude Accuracy and Range Specifications

Amplitude Range		
Measurement range	9 kHz to 18.5 GHz: DANL to +25 dBm	
	> 18.5 GHz to 32 GHz: DANL to +20 dBm (RA32MA-O)	
	> 18.5 GHz to 44 GHz: DANL to +20 dBm (RA44MA-O)	
Input attenuator range	9 kHz to 18.5 GHz: 0 to 55 dB in 5 dB steps	
	> 18.5 GHz to 32 GHz: 0 to 50 dB in 5 dB steps (RA32MA-O)	
	> 18.5 GHz to 44 GHz: 0 to 50 dB in 5 dB steps (RA44MA-O)	
Preamplifier		Nominal
Frequency range	10 MHz to 9 GHz (RA09MA-O)	
	10 MHz to 18.5 GHz (RA18MA-O)	
	10 MHz to 32 GHz (RA32MA-O)	
	10 MHz to 44 GHz (RA44MA-O)	
Gain	20 dB	
Max RF Input Operating Level		
	9 kHz to 18.5 GHz: +25 dBm, ±50 VDC	Average CW power
	> 18.5 GHz to 32 GHz: +20 dBm, ±50 VDC (RA32MA-O)	Average CW power
	> 18.5 GHz to 44 GHz: +20 dBm, ±50 VDC (RA44MA-O)	Average CW power
Display Range		
Log/Linear scale	10 divisions	
	1 to 20 dB/division in 1 dB	
Scale units	dBm, dBV, dBmV, dBμV, V, mV, W, mW	
Reference Level		
Range	-150 to +100 dBm	
Resolution	Log scale: 0.1 dB	
	Linear scale: 1 % of reference level	
Trace		
Detectors	Normal, positive peak, negative peak, sample, average (RMS)	
Number	6	
States	Clear/write, maximum hold, minimum hold, capture, load, blank, trace math, trace info	
Functions	Time expired maximum hold and minimum hold, trace math, trace info	
Marker		
Type	Normal, delta, delta pair, marker table	
Number	6	
Functions	Noise marker, frequency count	
Marker to ->	Peak, next peak, next peak right, next peak left, min search, always peak	
	Center, start, stop	
Audio beep	Tone change with signal strength	
Marker table	Display 6 markers	

## Amplitude Accuracy and Range Specifications continued

### Absolute Amplitude Accuracy

Preamplifier off: input signal  $\geq$  -50 dBm, auto-coupled, 15-minute warm-up

Preamplifier on: -90 dBm < input signal < -50 dBm, auto-coupled, 15-minute warm-up

20° to 30°C	250 kHz to 6 GHz	$\pm 1.0$ dB, $\pm 0.5$ dB (T)
	> 6 GHz to 18.5 GHz	$\pm 1.0$ dB, $\pm 0.5$ dB (T)
	> 18.5 GHz to 32 GHz (RA32MA-O)	$\pm 1.5$ dB, $\pm 0.8$ dB (T)
	> 18.5 GHz to 44 GHz (RA44MA-O)	$\pm 1.5$ dB, $\pm 0.8$ dB (T)
-10° to 55°C	250 kHz to 12 GHz	$\pm 1.5$ dB, $\pm 1.0$ dB (T)
	> 12 GHz to 18.5 GHz	$\pm 1.7$ dB, $\pm 1.2$ dB (T)
	> 18.5 GHz to 32 GHz (RA32MA-O)	$\pm 2.0$ dB, $\pm 1.5$ dB (T)
	> 18.5 GHz to 36 GHz (RA44MA-O)	$\pm 2.0$ dB, $\pm 1.5$ dB (T)
	> 36 GHz to 44 GHz (RA44MA-O)	$\pm 2.5$ dB, $\pm 1.5$ dB (T)

Input VSWR		Nominal
10 MHz to 18.5 GHz	1.5:1	@ 10 dB Attenuation with Normal mode
> 18.5 GHz to 22 GHz	1.5:1 (RA32MA-O)	
> 22 GHz to 32 GHz	1.7:1 (RA32MA-O)	
> 22 GHz to 44 GHz	1.7:1 (RA44MA-O)	

## Dynamic Range Specifications

### Displayed Average Noise Level (DANL)

1 Hz RBW, 1 Hz VBW, 50  $\Omega$  termination, 0 dB attenuation, RMS detector

High Linear Mode (Preamplifier Off)	10 MHz to 7 GHz	-134 dBm, -139 dBm (T)	
	> 7 GHz to 14.7 GHz	-130 dBm, -135 dBm (T)	
	> 14.7 GHz to 18.5 GHz	-128 dBm, -134 dBm (T)	
	> 18.5 GHz to 22.5 GHz (RA32MA-O)	-125 dBm, -130 dBm (T)	
	> 22.5 GHz to 32 GHz (RA32MA-O)	-117 dBm, -122 dBm (T)	
	> 32 GHz to 40 GHz (RA44MA-O)	-110 dBm, -117 dBm (T)	
	> 40 GHz to 44 GHz (RA44MA-O)	-105 dBm, -112 dBm (T)	
Normal Mode (Preamplifier Off)	10 MHz to 7 GHz	-137 dBm, -141 dBm (T)	
	> 7 GHz to 14.7 GHz	-134 dBm, -138 dBm (T)	
	> 14.7 GHz to 18.5 GHz	-131 dBm, -137 dBm (T)	
	> 18.5 GHz to 32 GHz (RA32MA-O)	-133 dBm, -137 dBm (T)	
	> 32 GHz to 40 GHz (RA44MA-O)	-130 dBm, -137 dBm (T)	
	> 40 GHz to 44 GHz (RA44MA-O)	-125 dBm, -133 dBm (T)	
Preamplifier On	10 MHz to 7 GHz	-158 dBm, -161 dBm (T)	Preamp 1
	>7 GHz to 14.7 GHz	-155 dBm, -158 dBm (T)	Preamp 1
	>14.7 GHz to 18.5 GHz	-150 dBm, -153 dBm (T)	Preamp 1
	>18.5 GHz to 32 GHz (RA32MA-O)	-158 dBm, -161 dBm (T)	Preamp 1
	>32 GHz to 44 GHz (RA44MA-O)	-148 dBm, -152 dBm (T)	Preamp 1
	10 MHz to 7 GHz	-163 dBm, -166 dBm (T)	Preamp 1 and 2
	> 7 GHz to 14.8 GHz	-160 dBm, -163 dBm (T)	Preamp 1 and 2
	> 14.8 GHz to 18.5 GHz	-157 dBm, -160 dBm (T)	Preamp 1 and 2
	> 18.5 GHz to 32 GHz (RA32MA-O)	-158 dBm, -163 dBm (T)	Preamp 1 and 2
	> 32 GHz to 44 GHz (RA44MA-O)	-155 dBm, -160 dBm (T)	Preamp 1 and 2

## Dynamic Range Specifications continued

Second Harmonic Distortion			
	10 MHz to 9.25 GHz	< -75 dBc, typical	Input -30 dBm Peak detector (High Linearity Mode)
	9.25 GHz to 16 GHz (RA32MA-O)	< -75 dBc, typical	
	16 GHz to 22 GHz (RA44MA-O)	< -72 dBc, typical	
Third-Order Inter-Modulation (Third-Order Intercept: TOI)			
	10 MHz to 8 GHz	+16 dBm, typical	High Linearity Mode
	> 8 GHz to 18.5 GHz	+20 dBm, typical	
	> 18.5 GHz to 22 GHz (RA32MA-O)	+15 dBm, typical	
	> 22 GHz to 32 GHz (RA32MA-O)	+20 dBm, typical	
	> 22 GHz to 44 GHz (RA44MA-O)	+20 dBm, typical	
Spur Free Dynamic Range			
	2/3 (TOI-DANL) in 1 Hz RBW	> 105 dB, 107 dB (T)	@ 2 GHz
Spurious			
Inherent residual response	Input terminated, 0 dB attenuation, Preamp off		
	Sweep Tuned: 10 kHz RBW, 1 kHz VBW, RMS detector, Normal Mode		
	Real time: RBW: 30 kHz, VBW: 30 kHz, Peak detector, Span = 100 MHz, Normal Mode		
	9 kHz to 6 GHz		
	Sweep tuned: -95 dBm		Typical
	Exceptions: -90 dBm @ 244.378 MHz		
	Real time: -75 dBm		Typical
	Exceptions: -70 dBm @ 5386 MHz		
	Notice Spurs: -80 dBm @ 27.785 MHz, 38.375 MHz, 127.68 MHz, 1795.34 MHz, 2909 MHz		
	> 6 GHz to 18.5 GHz		
	Sweep tune: -85 dBm		Typical
	Notice spurs: -90 dBm @ 6.163 GHz, 10.665 GHz, 12.50 GHz, 14.220 GHz		
	Real time: -70 dBm		Typical
	> 18.5 GHz to 32 GHz (RA32MA-O)		
	Sweep tune: -85 dBm Typical		
	Notice spurs: -90 dBm @ 19.750 GHz		
	Real time: -70 dBm		Typical
	> 32 GHz to 33 GHz (RA44MA-O)		
	Sweep tune: -85 dBm		Typical
	Real time: -70 dBm		Typical
> 33 GHz to 44 GHz (RA44MA-O)			
Sweep tune: -85 dBm		Typical	
Real time: -65 dBm		Typical	

Input-related spurious	0 dB attenuation, Preamp off	
	Sweep tuned: Peak detector, Span < 1 GHz, 1 kHz RBW, 100 Hz VBW, Normal Mode, carrier offset > 5 MHz	
	9 kHz to 18.5 GHz	-25 dBm Input signal
	Sweep tune: -70 dBc	Typical
	> 18.5 GHz to 32 GHz (RA32MA-O)	-30 dBm Input signal
	Sweep tune: -65 dBc	Typical
	> 32 GHz to 33 GHz (RA44MA-O)	-30 dBm Input signal
	Sweep tune: -65 dBc	Typical
	> 33 GHz to 44 GHz (RA44MA-O)	-30 dBm Input signal
	Sweep tune: -60 dBc	Typical
LO feedthrough to input	9 kHz to 18.5 GHz: <-80 dBm	
	>18.5 GHz to 32 GHz: <-70 dBm (RA32MA-O)	
	>18.5 GHz to 44 GHz: <-70 dBm (RA44MA-O)	
<b>Single Sideband (SSB) Phase Noise</b>		
	-102 dBc/Hz, -105 dBc/Hz (T) @ 10 kHz offset	@ 1 GHz, Input level -18 dBm, RMS detector, Normal Mode
	-106 dBc/Hz, -109 dBc/Hz (T) @ 100 kHz offset	
	-117 dBc/Hz, -120 dBc/Hz (T) @ 1 MHz offset	

## Measurements

Measurement	
Channel Power	Channel power
	Spectral Density
	PAR (Peak to Average Ratio)
Occupied Bandwidth	Occupied bandwidth
	Integrated power
	Occupied power
	x dB bandwidth
Spectrum Emission Mask	Reference power
	Peak level at defined range
	Reference power
	Peak level at defined range
Adjacent Channel Power (ACP)	Reference power
	Absolute power at defined frequency offset
	Relative power at defined frequency offset
Multi-ACP (Adjacent Channel Power)	Reference power at lowest defined frequency
	Reference power at highest defined frequency
	Absolute power at defined frequency offset
	Relative power at defined frequency offset
Spurious Emissions	Peak power at defined range
	Frequency of peak power at defined range
Total Harmonic Distortion	Power level at each harmonic
	% of THD
Field Strength	Field strength power at markers

## RF Power Meter (Standard)

General Parameters	
Display range	-100 to +100 dBm
Offset range	0 to 60 dB
Resolution	0.01 dB or 0.1 x W (x = m, $\mu$ , p)
Internal RF power sensor	
Frequency range	RA09MA-O: 10 MHz to 9 GHz
	RA18MA-O: 10 MHz to 18.5 GHz
	RA32MA-O: 10 MHz to 32 GHz
	RA44 MA-O: 10 MHz to 44 GHz
Span	1 kHz to max frequency of each option
Dynamic range	10 MHz to 18.5 GHz: -100 to +25 dBm
	> 18.5 GHz to 32 GHz: -100 to +20 dBm (RA32MA-O)
	> 18.5 GHz to 44 GHz: -100 to +20 dBm (RA44MA-O)
Accuracy	Same as spectrum analyzer

## External RF Power Sensor (Requires External RF Power Sensor)

General Parameters			
Display range	-100 to +100 dBm		
Offset range	0 to 60 dB		
Resolution	0.01 dB or 0.1 x W (x = m, $\mu$ , p)		
Directional power sensor			
Model	<b>JD731B</b>	<b>JD733A</b>	
Frequency range	300 MHz to 3.8 GHz	150 MHz to 3.5 GHz	
Dynamic range	Average: 0.15 to 150 W	Average: 0.1 to 50 W	
	Peak: 4 to 400 W	Peak: 0.1 to 50 W	
Measurement type	Forward/Reverse average power, Forward peak power, VSWR		
Accuracy	$\pm(4\%$ of reading + 0.05 W) <sup>1,2</sup>		
Connector type	Type-N female on both ends		
Terminating power sensor			
Model	<b>JD732B</b>	<b>JD734B</b>	<b>JD736B</b>
Measurement type	Average	Peak	Average and Peak
Frequency range	20 MHz to 3.8 GHz		
Dynamic range	-30 to + 20 dBm		
Accuracy	$\pm 7\%$ <sup>1</sup>		
Connector type	Type-N female		

<sup>1</sup>CW condition at 15 to 35°C (59 to 95°F)

<sup>2</sup>Forward power



## GNSS Connectivity with Antenna (Option ONA-SP-GNSS)

GNSS receiver type	
	Built-in type
GNSS time and location	
GNSS information	Latitude, longitude, Satellite, Status, GPS Engine, Satellite view, ID, and C/N
GNSS time and location	Time, Latitude, and longitude on display
	Time, Latitude, and longitude on trace
High-Frequency Accuracy	
GNSS lock	±10 ppb
Hold over for 3 days	±20 ppb (0 to 50°C)   15 minutes after satellite locked
Connector	SMA, female
Supplied antenna	SMA (m), 3.3 VDC or 5 VDC

## Bluetooth Connectivity (Option ONA-MF-BT)

Interface type	Build-in type
Mode	Personal area network (PAN)
	File transfer profile (FTP)

## Wi-Fi Connectivity (Option ONA-MF-WIFI)

Interface type	Build-in type
Interface standard	IEEE 802.11 b/g/n
Wireless mode	Infrastructure mode
Internet protocol version	IPv4, IPv6

## Real Time Spectrum Analyzer (Option ONA-SP-RT50/RT100)

Frequency range		
RA09MA-O	9 kHz to 9 GHz	
RA18MA-O	9 kHz to 18.5 GHz	
RA32MA-O	9 kHz to 32 GHz	
RA44MA-O	9 kHz to 44 GHz	
Frequency Span		
ONA-SP-RT50	50 MHz real time	Supports panoramic persistence view
ONA-SP-RT100	110 MHz real time	Supports panoramic persistence view
Acquisition		
IF bandwidth	50 MHz or 110 MHz	
Resolution bandwidth	30 kHz to 10 MHz	Depends on span, 1-3-10 sequence
A/D converter	245.76 Msps, 16 bits	
FFT lengths	8192	
Maximum acquisition time	1000 ms	
Minimum IQ resolution	8.138 ns	
Probability of Intercept (POI)	33.59 $\mu$ s at normal 1.92 $\mu$ s at high	Span: 100 MHz
Spectrum Display		
Trace Detectors	Normal, positive peak, negative peak, sample, average (RMS)	
Trace Number	6	
Trace States	Clear/write, maximum hold, minimum hold, capture, load, blank	
Marker Type	Normal, delta, delta pair, marker table	
Marker Number	6	
Marker to ->	Peak, next peak, next peak right, next peak left, min search, always peak Center, start, stop	
Audio beep	Tone change with signal strength	
Marker table	Display 6 markers	
Persistence Spectrum Display		
Spectrum processing rate	$\leq$ Max 15,000/s	
DPX bitmap resolution	201 x 801	
Marker information	Frequency, amplitude, signal density	
Dwell time per step	100 ms to 100 s	
Trace processing	Color-graded bitmap, +Peak, -Peak, average	
Trace length	801	
Marker Type	Normal, delta, marker table	
Marker Number	6	
Marker to ->	Peak, next peak, next peak right, next peak left, min search, always peak Center, start, stop	
Audio beep	Tone change with signal strength	

Marker table	Display 6 markers
<b>Persistence Spectrogram Display</b>	
Trace detection, Trace length, memory depth	+Peak, -Peak, Average (RMS)
Time resolution per line	100 ms to 1sec, user selectable

## Interference Analyzer (Option ONA-SP-INTAN)

<b>Measurement</b>	
Spectrum Analyzer	Sound indicator, interference ID, spectrum recorder
Spectrogram	Collect up to 72 hours of data
RSSI	Collect up to 72 hours of data
Interference Finder	
Radar Charter	
Spectrum replayer	Playback recorded data using OneAdvisor 800

## Route Map (Option ONA-SP-RM)

Mode	Spectrum analyzer, Realtime spectrum analyzer	
Plot method	Time, position, GNSS	
Plot legend	Excellent, very good, good, poor	User definable range
Map type	Outdoor (position information embedded)	Import maps using VIAVI JDMapcreator
	Indoor (No position information embedded)	
Measurement item	RSSI	
	ACP	

## Gated Sweep (Option ONA-SP-GSS)

Gate method	Gated FFT
Gated delay range	0 to 100 ms
Gated length	1 us to 100 ms
Trigger source	External, Internal and GNSS

## Channel Scanner (Option ONA-SP-CHSC)

Frequency range	RA09MA-O: 10 MHz to 9 GHz
	RA18MA-O: 10 MHz to 18.5 GHz
	RA32MA-O: 10 MHz to 32 GHz
	RA44MA-O: 10 MHz to 44 GHz
Measurement range	10 MHz to 18.5 GHz: -110 to +25 dBm
	> 18.5 GHz to 32 GHz: -110 to +20 dBm (RA32MA-O)
	> 18.5 GHz to 44 GHz: -110 to +20 dBm (RA44MA-O)
Measurements	Channel scanner: 1 to 20 channels
	Frequency scanner: 1 to 20 frequencies
	Customer scanner: 1 to 20 channels or frequencies

## RFoCPRI Interference Analyzer (Option ONA-SP-CPRI17/8/18)

General Parameters		
Optical Interface	Dual SFP/SFP+ (supports all MSA compliant SFP modules)	
Line rates	CPRI Rates 1 to 7	Option: ONA-SP-CPRI17
	CPRI Rate 8	Option: ONA-SP-CPRI8
	CPRI Rates 1 to 8	Option: ONA-SP-CPRI18
Resolution Bandwidth (RBW)	Range: 10 kHz to 100 kHz, 7.5 kHz	-3 dB bandwidth 1-3-10 step
	Accuracy $\pm 10\%$	Nominal
Video Bandwidth (VBW)	Range: 10 kHz to 100 kHz, 7.5 kHz	-3 dB bandwidth 1-3-10 step
	Accuracy $\pm 10\%$	Nominal
CPRI Parameters	IQ Sample width	4 – 20 bits
	Mapping Method	1 and 3
	Bandwidth	3.84 MHz x N, where N=1 to 8
	TX clock	Internal, External, Recovered
	Port Type	Master, Slave
Measurements		
Link Status	LOS, LOF, SDI, RAI, Optic RX Level	Port 1 and Port 2
SFP Information	Wavelength, Vendor, Vendor PN, Vendor Rev, Power level type, Diagnostic byte, Nominal rate, Min rate, Max RX level, Max TX level	Port 1 and Port 2
Interference Analyzer	Spectrum	Single, Dual, and Quad Chart
	Spectrogram	Single and Dual spectrum Chart with 2-D and 3-D waterfall diagram
	Interference ID	
	Sound Indicator	
	PRB Table	
	Spectrum Replayer	
	IQ Activity Scan	

## Blind Scanner for FR1 (Option ONA-SP-BS)

General parameters		
Frequency range	LTE LTE-FDD: Band 1 to 14, 17 to 26 LTE-TDD: Band 33 to 43	
	NR FR1 Band: 410 MHz to 7.125 GHz	
Minimum detectable level	LTE -125 dBm	SS-RSRP
	NR FR1 Band: -120 dBm	SS-RSRP
Input signal level	Up to +25 dBm	
Supported bandwidth	Up to 100 MHz	
Sub-Carrier Spacing (SCS)	NR: 15 kHz and 30 kHz LTE & DSS: 15 kHz	
CP Type for LTE	Normal and Extended	
Frame Period for NR and DSS	5, 10, 20, 40, 80, 160 ms	

Measurements		
<b>NR</b>	<b>LTE</b>	<b>DSS</b>
SS-RSRP	SS-RSRP	SS-RSRP
SSB Frequency	Duplex type	Duplex type
	Carrier Frequency	Carrier Frequency
	Carrier Bandwidth	Carrier Bandwidth

## Blind Scanner for FR2 (Option ONA-SP-BS-FR2)

General parameters		
Frequency range	NR FR2 Band: 24 GHz to 44 GHz	
Minimum detectable level	NR FR2 Band: -110 dBm	S-SS RSRP
Input signal level	Up to +20 dBm	
Supported bandwidth	Up to 100 MHz	
Sub-Carrier Spacing (SCS)	NR: 60 kHz	
CP Type for LTE	Normal and Extended	
Frame Period for NR and DSS	5, 10, 20, 40, 80, 160 ms	

Measurements		
<b>NR</b>		
SS-RSRP		
SSB Frequency		

## EMF Analyzer (Options ONA-SP-EMF-SA)

General Parameters	
Supported Antenna	G700050381: 400 MHz to 6 GHz Isotropic Antenna (VIAVI) G700050366: 650 MHz – 4 GHz (VIAVI) G700050367: 650 MHz – 6 GHz (VIAVI) USLP9143: 300 MHz – 7 GHz (Schwarzbeck) USLP9143B: 200 MHz – 7 GHz (Schwarzbeck) USLP9142: 800 MHz – 5 GHz (Schwarzbeck)
Measurement Time	1 – 60 minutes
Dwell Time	1 – 60 seconds
Units	dB $\mu$ V/m, dBmV/m, dBV/m, V/m, W/m <sup>2</sup> , dBm/m <sup>2</sup> , A/m, dBA/m, mW/cm <sup>2</sup> , %
Frequency error	±10 Hz + ref freq accuracy, 99% confidence level
Limit	ICNIRP 2020 Occupational ICNIRP 2020 General Public ARPANSA Occupational ARPANSA General Public BGV B11 Exposure area 1 26. BlmSchV General Public FCC 1997 Occupational FCC 1997 General Public ICNIRP 1998 Occupational ICNIRP 1998 General Public IEEE C95.1 2005 Upper Tier IEEE C95.1 2005 General Public Italy CM 2003 Exposure Italy CM 2003 Attention Safety Code 6 (2015) Uncontrolled Safety Code 6 (2015) Controlled Safety Code 6 (2009) Uncontrolled Safety Code 6 (2009) Controlled Safety Code 6 (99-EHD-237) Exposed Workers Safety Code 6 (99-EHD-237) General Public
Measurements (ONA-SP-EMF-SA)	
<b>Spectrum (Integrated Power)</b> Isotropic* EMF Power Accumulated Isotropic* EMF Power: AVG, MAX, MIN	<b>Scanner</b> EMF power of multiple frequency Bands Chart and Table View

\* Requires Isotropic Antenna, G700050381

## 5G NR EMF Analyzer (Option ONA-SP-EMF-NR or ONA-SP-5GOTA)

General Parameters	
Frequency range	FR1 Band: 410 MHz to 7125 GHz, Antenna dependent
Input signal range	-60 to +25 dBm
Supported bandwidth	5 MHz, 10 MHz, 15 MHz, 20 MHz, 25 MHz, 30 MHz, 40 MHz, 50 MHz, 60 MHz, 70 MHz, 80 MHz, 90 MHz, and 100 MHz
Supported Antenna	G700050381: 400 MHz to 6 GHz Isotropic Antenna (VIAVI) G700050366: 650 MHz – 4 GHz (VIAVI) G700050367: 650 MHz – 6 GHz (VIAVI) USLP9143: 300 MHz – 7 GHz (Schwarzbeck) USLP9143B: 200 MHz – 7 GHz (Schwarzbeck) USLP9142: 800 MHz – 5 GHz (Schwarzbeck)
Measurement Time	1 – 60 minutes
Dwell Time	1 – 60 seconds
Units	dB $\mu$ V/m, dBmV/m, dBV/m, V/m, W/m <sup>2</sup> , dBm/m <sup>2</sup> , A/m, dBA/m, mW/cm <sup>2</sup> , %
Frequency error	$\pm$ 10 Hz + ref freq accuracy, 99% confidence level
Limit	ICNIRP 2020 Occupational ICNIRP 2020 General Public ARPANSA Occupational ARPANSA General Public BGV B11 Exposure area 1 26. BImSchV General Public FCC 1997 Occupational FCC 1997 General Public ICNIRP 1998 Occupational ICNIRP 1998 General Public IEEE C95.1 2005 Upper Tier IEEE C95.1 2005 General Public Italy CM 2003 Exposure Italy CM 2003 Attention Safety Code 6 (2015) Uncontrolled Safety Code 6 (2015) Controlled Safety Code 6 (2009) Uncontrolled Safety Code 6 (2009) Controlled Safety Code 6 (99-EHD-237) Exposed Workers Safety Code 6 (99-EHD-237) General Public

### Measurements (ONA-SP-EMF-SA, ONA-SP-EMF-NR or ONA-SP-5GOTA)

#### Beam

PCI, RSRP, Extrapolated RSRP

#### EMF Power

Extrapolated Isotropic\* EMF Power  
Extrapolated Accumulated Isotropic\* EMF Power:  
AVG, MAX, MIN

\* Requires Isotropic Antenna, G700050381

## LTE/LTE-A FDD Analyzer (Option ONA-SP-LTEFDDOTA and ONA-SP-LTEFDSIA)

General Parameters		
Frequency range	Bands 1 to 14, 17 to 26	
Minimum detectable level	-125 dBm	S-SS RSRP
Input signal range	-75 to +25 dBm	
Channel power accuracy	±1.0 dB (typical)	
Supported bandwidths	1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, and 20 MHz	
Frequency error	±0.05 ppm	
Residual EVM	2.0% (typical)	@ -20 dBm
Measurements		
RF Analysis (Common)	Signal Analysis (ONA-SP-LTEFDSIA)	
<b>Channel Power</b>	<b>Power vs. Time (Frame)</b>	
Channel power	Physical Cell ID, Group ID, Sector ID	
Spectral density	Frame Average Power	
Peak to average power	I-Q Origin Offset, Time Offset	
<b>Occupied bandwidth</b>	Subframe Power	
Occupied bandwidth	First, Second Slot Power	
Integrated power	<b>Constellation</b>	
Occupied power	MBSFN*, RS Power	
<b>Spectrum Emission Mask</b>	PDSCH/Data* QPSK EVM	
Reference power	PDSCH/Data* 16 QAM EVM	
Peak level at defined range	PDSCH/Data* 64 QAM EVM	
<b>ACLR</b>	PDSCH/Data* 256 QAM EVM	
Reference power	Data EVM RMS and Peak	
Abs power at defined range	Frequency Error, Time Error	
Rel power at defined range	<b>Data Channel</b>	
<b>Multi-ACLR</b>	Physical Cell ID, Group ID, Sector ID, MBSFN*	
Lowest reference power	Resource Block Power	
Highest reference power	I-Q Diagram, Power, Modulation Format, IQ Origin Offset, EVM RMS, EVM peak	
Abs power at defined range	<b>Control Channel</b>	
Rel power at defined range	Physical Cell ID, Group ID, Sector ID, MBSFN*	
<b>Spurious Emission</b>	Channel Summary Table	
Peak frequency at defined range	EVM, Abs/Rel Power, Modulation Type	
Peak level at defined range	Each Control Channel's I-Q Diagram, Modulation Format, Frequency Error, IQ Origin Offset, EVM RMS/Peak	

\*Measurement is performed when MBMS is enabled



## LTE/LTE-A FDD Analyzer (Option ONA-SP-LTEFDDOTA and ONA-SP-LTEFDSIA) continued

<b>Subframe</b>
Physical Cell ID, Group ID, Sector ID, MBSFN*
Subframe Power
Channel Summary Table EVM, Abs/Rel Power, Modulation Type
Subframe Summary OFDM Symbol Power, Frequency Error, Time Error, Data EVM RMS and Peak, RS EVM RMS and Peak, IQ Imbalance
<b>Frame</b>
Physical Cell ID, Group ID, Sector ID, MBSFN*
Frame Power
Channel Summary Table EVM, Abs/Rel Power, Modulation Type
Subframe Summary OFDM Symbol Power, Frequency Error, Data EVM RMS and Peak, RS EVM RMS and Peak, IQ Imbalance
<b>Time Alignment Error</b>
Physical Cell ID, Group ID, Sector ID
Time Alignment Error
RS Power Difference
Time Alignment Error Trend
Antenna 0,1,2,3 RS Power, Antenna 0,1,2,3 RS EVM, Antenna 0,1,2,3 RS Delta Time
<b>Data Allocation Map</b>
Data Allocation vs Frame
Frame Data Utilization
OFDM Symbol Power
Data Allocation vs Subframe
Subframe Data Utilization
Resource Block Power
<b>Carrier Aggregation</b>
Component carriers: up to 5 Subframe Power, P-SS, S-SS, PBCH, RS power and EVM, Data QPSK, 16 QAM, 64 QAM, 256 QAM power and EVM, MBSFN RS* power and EVM, Physical Cell ID, Frequency Error, Time Alignment Error, Antenna port
<b>Power Statistics CCDF</b>
Average Power, Max Power, Crest Factor

<b>OTA Analysis (ONA-SP-LTEFDDOTA)</b>
<b>OTA Channel Scanner (up to 6)</b>
Bar Graph for Channel Power, RSRP
Table Summary PCI, Channel Power, RSSI, RSRP, RSRQ, RS SINR, S-SS RSSI, Time Error, Frequency Error, Antenna Port, Time Error Trend
<b>OTA ID Scanner (up to 6)</b>
Bar Graph for RSRP, S-SS RSSI, RSRQ, S-SS Ec/Io, RS SINR
Table Summary PCI, RSRP, RSRQ, P-SS SNR, RS SINR, S-SS RSSI, P-SS RSRP, S-SS RSRP, S-SS Ec/Io, Time Error
<b>Multipath Profile</b>
Physical Cell ID, Group ID, Sector ID
Ant 0 RS Relative Power, Delay
Ant 1 RS Relative Power, Delay
Ant 2 RS Relative Power, Delay
Ant 3 RS Relative Power, Delay
<b>Control Channel</b>
Physical Cell ID, Group ID, Sector ID, MBSFN*, RS Power Trend
Control Channel Table P-SS, S-SS Power and EVM, PBCH, PCFICH Power, PBCH, PCFICH EVM, RS0, RS1, RS2, RS4 Power, RS0, RS1, RS2, RS4 EVM
Frequency Error, Time Offset,
Time Alignment Error
<b>Datagram</b>
Datagram
Resource Block Power
Data Utilization
<b>Route Map</b>
RSRP, RSRQ, RS SINR, S-SS RSSI, P-SS RSRP, S-SS RSRP, S-SS Ec/Io, P-SS SNR
<b>Freq/Time/Power Variation</b>
Frequency, Time Error Trend
Frequency, Time Error
RS Power Trend
RS 0,1,2,3 Power

\*Measurement is performed when MBMS is enabled

## LTE/LTE-A TDD Analysis (Option ONA-SP-LTETDDOTA and ONA-SP-LTETDSIA)

General Parameters		
Frequency range	Bands 1 to 14, 17 to 26	
Minimum detectable level	-125 dBm	S-SS RSRP
Input signal range	-75 to +25 dBm	
Channel power accuracy	±1.0 dB (typical)	
Supported bandwidths	1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, and 20 MHz	
Frequency error	±0.05 ppm	
Residual EVM	2.0% (typical)	@ -20 dBm
Measurements		
RF Analysis (Common)	Signal Analysis (ONA-SP-LTETDSIA)	
<b>Channel Power</b>	<b>Power vs. Time (Frame)</b>	
Channel power	Physical Cell ID, Group ID, Sector ID	
Spectral density	Frame Average Power	
Peak to average power	I-Q Origin Offset, Time Offset	
<b>Occupied bandwidth</b>	UpPTS Power, DWPTS Power	
Occupied bandwidth	Subframe Power	
Integrated power	First, Second Slot Power	
Occupied power	GP Power	
<b>Spectrum Emission Mask</b>	<b>Power vs. Time (Slot)</b>	
Reference power	Physical Cell ID, Group ID, Sector ID	
Peak level at defined range	Slot Average Power	
<b>ACLR</b>	Transition Period Length	
Reference power	Off Power	
Abs power at defined range	<b>Constellation</b>	
Rel power at defined range	MBSFN*, RS Power	
<b>Multi-ACLR</b>	PDSCH/Data* QPSK EVM	
Lowest reference power	PDSCH/Data* 16 QAM EVM	
Highest reference power	PDSCH/Data* 64 QAM EVM	
Abs power at defined range	PDSCH/Data* 256 QAM EVM	
Rel power at defined range	Data EVM RMS and Peak	
<b>Spurious Emission</b>	Frequency Error, Time Error	
Peak frequency at defined range	<b>Data Channel</b>	
Peak level at defined range	Physical Cell ID, Group ID, Sector ID, MBSFN*	
	Resource Block Power	
	I-Q Diagram, Power, Modulation Format, IQ Origin Offset, EVM RMS, EVM peak	
	<b>Control Channel</b>	
	Physical Cell ID, Group ID, Sector ID, MBSFN*	
	Channel Summary Table	
	EVM, Abs/Rel Power, Modulation Type	

\*Measurement is performed when MBMS is enabled

## LTE/LTE-A TDD Analysis (Option ONA-SP-LTETDDOTA and ONA-SP-LTETDSIA) continued

Each Control Channel's I-Q Diagram, Modulation Format, Frequency Error, IQ Origin Offset, EVM RMS/Peak
<b>Subframe</b>
Physical Cell ID, Group ID, Sector ID, MBSFN*
Subframe Power
Channel Summary Table EVM, Abs/Rel Power, Modulation Type
Subframe Summary OFDM Symbol Power, Frequency Error, Time Error, Data EVM RMS and Peak, RS EVM RMS and Peak, IQ Imbalance
<b>Time Alignment Error</b>
Physical Cell ID, Group ID, Sector ID
Time Alignment Error
RS Power Difference
Time Alignment Error Trend
Antenna 0,1,2,3 RS Power, Antenna 0,1,2,3 RS EVM, Antenna 0,1,2,3 RS Delta Time
<b>Data Allocation Map</b>
Data Allocation vs Frame
Frame Data Utilization
OFDM Symbol Power
Data Allocation vs Subframe
Subframe Data Utilization
Resource Block Power
<b>Carrier Aggregation</b>
Component carriers: up to 5 Subframe Power, P-SS, S-SS, PBCH, RS power and EVM, Data QPSK, 16 QAM, 64 QAM, 256 QAM power and EVM, MBSFN RS* power and EVM, Physical Cell ID, Frequency Error, Time Alignment Error, Antenna port
<b>Power Statistics CCDF</b>
Average Power, Max Power, Crest Factor

<b>OTA Analysis (ONA-SP-LTETDDOTA)</b>
<b>OTA Channel Scanner (up to 6)</b>
Bar Graph for Channel Power, RSRP
Table Summary PCI, Channel Power, RSSI, RSRP, RSRQ, RS SINR, S-SS RSSI, Time Error, Frequency Error, Antenna Port, Time Error Trend
<b>OTA ID Scanner (up to 6)</b>
Bar Graph for RSRP, S-SS RSSI, RSRQ, S-SS Ec/Io, RS SINR
Table Summary PCI, RSRP, RSRQ, P-SS SNR, RS SINR, S-SS RSSI, P-SS RSRP, S-SS RSRP, S-SS Ec/Io, Time Error
<b>Multipath Profile</b>
Physical Cell ID, Group ID, Sector ID
Ant 0 RS Relative Power, Delay
Ant 1 RS Relative Power, Delay
Ant 2 RS Relative Power, Delay
Ant 3 RS Relative Power, Delay
<b>Control Channel</b>
Physical Cell ID, Group ID, Sector ID, MBSFN*, RS Power Trend
Control Channel Table P-SS, S-SS Power and EVM, PBCH, PCFICH Power, PBCH, PCFICH EVM, RS0, RS1, RS2, RS4 Power, RS0, RS1, RS2, RS4 EVM
Frequency Error, Time Offset,
Time Alignment Error
<b>Datagram</b>
Datagram
Resource Block Power
Data Utilization
<b>Route Map</b>
RSRP, RSRQ, RS SINR, S-SS RSSI, P-SS RSRP, S-SS RSRP, S-SS Ec/Io, P-SS SNR
<b>Freq/Time/Power Variation</b>
Frequency, Time Error Trend Frequency, Time Error
RS Power Trend RS 0,1,2,3 Power

\*Measurement is performed when MBMS is enabled

## DSS Analysis (ONA-SP-DSSOTA and ONA-SP-DSSSIA)

General Parameters		
Frequency range	LTE FDD: Band 1 to 14, 17 to 26 LTE TDD: Band 33 to 43	
Minimum detectable level	LTE: -125 dBm NR: -110 dBm	S-SS RSRP
Input signal level	FR1 Band: -70 to +25 dBm	
Supported bandwidth	5 MHz, 10 MHz, 15 MHz, and 20 MHz	
Frequency error	±0.05 ppm with GPS	
Residual EVM	2.0 % (typical)	@ -20 dBm
Measurements (Option: ONA-SP-DSSOTA)		
RF Analysis (Common)	Signal Analysis (ONA-SP-DSSSIA)	
<b>Channel Power</b>	<b>Constellation</b>	
Channel power	RS Power, PBCH DMRS Power	
Spectral density	PDSCH LTE,NR QPSK EVM	
Peak to average power	PDSCH LTE,NR 16 QAM EVM	
<b>Occupied bandwidth</b>	PDSCH LTE,NR 64 QAM EVM	
Occupied bandwidth	PDSCH LTE,NR 256 QAM EVM	
Integrated power	LTE,NR Data EVM RMS	
Occupied power	LTE,NR Data EVM Peak	
<b>Spectrum Emission Mask</b>	Frequency Error, Time Error	
Reference power	<b>Channel Mapper</b>	
Peak level at defined range	LTE, NR Physical Cell ID	
<b>ACLR</b>	LTE, NR Group and Sector ID	
Reference power	LTE Channels' allocation in RB (P-SS, S-SS, PBCH, RS, PDCCH, PDSCH, PCFICH, PHICH)	
Abs power at defined range	NR Channels' allocation in RB (P-SS, S-SS, PBCH, PBCH DMRS, PDCCH, PDSCH)	
Rel power at defined range	<b>Control Channel</b>	
<b>Multi-ACLR</b>	LTE, NR Physical Cell ID	
Lowest reference power	LTE, NR Group and Sector ID	
Highest reference power	Subframe Power	
Abs power at defined range	Channel Summary Table	
Rel power at defined range	LTE: P-SS, S-SS, PBCH, RS, PCFICH, PHICH, PDCCH NR: P-SS, R-SS, PBCH DMRS, PBCH, PDCCH DMRS, PDCCH EVM, Abs/Rel Power, Modulation Type	
<b>Spurious Emission</b>	Each Control Channel's I-Q Diagram, Modulation Format, Frequency Error, IQ Origin Offset, EVM RMS/Peak	
Peak frequency at defined range	<b>Subframe</b>	
Peak level at defined range	LTE, NR Physical Cell ID	
	LTE, NR Group and Sector ID	
	Subframe Power	
	Bar Graph for Agg RE Power, Agg RS Power	

## DSS Analysis (ONA-SP-DSSOTA and ONA-SP-DSSSIA) continued

### Channel Summary Table

LTE: P-SS, S-SS, PBCH, RS, PDFICH, PHICH,  
PDCCH, Data QPSK, 16 QAM, Data 64 QAM,  
Data 256 QAM

NR: P-SS, S-SS, PBCH DMRS, PBCH, PDCCH DMRS,  
PDCCH, Data QPSK, Data 16, 64, 256 QAM

EVM, Abs/Rel Power,

Modulation Type

### Subframe Summary

OFDM Symbol Power

Frequency Error, Time Error

LTE Data EVM RMS and Peak

NR Data EVM RMS and Peak

RS EVM RMS and Peak

IQ Imbalance

### Frame

LTE, NR Physical Cell ID

LTE, NR Group and Sector ID

Frame Power

### Channel Summary Table

LTE: P-SS, S-SS, PBCH, RS, PDFICH, PHICH, PDCCH  
Data QPSK, Data 16, 64, 256 QAM

NR: P-SS, S-SS, PBCH DMRS, PBCH, PDCCH DMRS,  
PDCCH, Data QPSK, Data 16, 64, 256 QAM

### Frame Summary

OFDM Symbol Power

Frequency Error, Time Error

LTE Data EVM RMS and Peak

NR Data EVM RMS and Peak

RS EVM RMS and Peak

### Time Alignment Error

LTE, NR Physical Cell ID

LTE, NR Group and Sector ID

Time Alignment Error

RS Power Difference

Time Alignment Error Trend

Antenna 0,1,2,3 RS Power,

Antenna 0,1,2,3 RS EVM,

Antenna 0,1,2,3 RS Delta Time

## OTA Analysis (ONA-SP-DSSOTA)

### Power vs. Time (Frame)

LTE Physical Cell ID

LTE Group and Sector ID

Frame Average Power

I-Q Origin Offset, Time Offset

Subframe Power

First/Second Slot Power

### Power vs. Time (Slot)

LTE Physical Cell ID

LTE Group and Sector ID

Slot Average Power

Transition Period Length

Off Power

OTA Channel Scanner (up to 3)

Bar Graph for  
Channel power, RSRP

Table Summary

LTE: PCI, Channel Power, S-SS RSSI, S-SS RSRP,  
P-SS RSRQ, S-SS SINR, Antenna Port

NR: PCI, Channel Power, RS RSSI, RS RSRP,  
RS RSRQ, RS SINR, Antenna Port

### OTA ID Scanner (up to 6)

Bar Graph for  
LTE RSRP, S-SS RSSI, RS SINR  
NR P-SS, S-SS RSRP, S-SS SINR

Table Summary

LTE: PCI, RSRP, RSRQ, P-SS SNR, RS SINR,  
SS-SS RSSI, P-SS RSRP, S-SS RSRP, S-SS Ec/Io

NR: PCI, SSB Index, S-SS RSRP, P-SS RSRP, P-SS SNR,  
S-SS SINR, S-SS RSRQ

### Multipath Profile

LTE, NR Physical Cell ID

LTE, NR Group and Sector ID

LTE: RS 0,1 Rel. Power, Delay

NR: P-SS, S-SS Rel Power, Delay

### OTA Control Channel

LTE, NR Physical Cell ID

LTE, NR Group and Sector ID

Power Trend for

LTE: RS 0 and RS 1

NR: P-SS and S-SS

Table Summary

LTE: P-SS, S-SS, PBCH

NR: P-SS, S-SS, PBCH Power and EVM RMS

Frequency Error, Time Offset

Time Alignment Error

## DSS Analysis (ONA-SP-DSSOTA and ONA-SP-DSSIA) continued

### OTA Analysis (ONA-SP-DSSOTA) continued

#### Route Map

PCI, RSRP, RSRQ, SINR, SNR

#### Freq/Time/Power Variation

Frequency, Time Error Trend

Frequency, Time Error

RS Power Trend

RS 0,1 Power

## 5G NR Signal Analysis (Option ONA-SP-5GOTA and ONA-SP-5GSIA)

### General Parameters

Frequency range	FR1 Band: 410 MHz to 7125 GHz FR2 Band: 24 GHz to 44 GHz	
Minimum detectable level	FR1 Band: -120 dBm FR2 Band: -110 dBm	S-SS RSRP
Input signal level	FR1 Band: -75 to +25 dBm FR2 Band: -70 to +20 dBm	
Channel power accuracy	±1.0 dB typical	
Supported bandwidths	Up to 100 MHz	
Frequency error	±0.05 ppm	
Residual EVM	2.0 % typical	@ -20 dBm

### Measurements

#### RF Analysis (Common)

##### Channel Power

Channel Power, EIRP

Spectral Density

Peak to Average Power

##### Occupied bandwidth

Occupied bandwidth

Integrated power

Occupied power

##### Spectrum Emission Mask

Reference power

Peak level at defined range

##### ACLR

Reference power

Abs power at defined range

Rel power at defined range

##### Multi-ACLR

Lowest reference power

Highest reference power

Abs power at defined range

Rel power at defined range

#### Spurious Emission

Peak frequency at defined range

Peak level at defined range

#### Signal Analysis (ONA-SP-5GSIA)

##### Power vs. Time (Slot)

Symbol Average Power

Transition Period Length

Off Power

##### Power vs. Time (Frame)

Frame Average Power

I-Q Original Offset

Time Error, Slot Power

##### Constellation

S-SS RSRP, PCI, SSB Index

PDSCH QPSK EVM

PDSCH 16 QAM EVM

PDSCH 64 QAM EVM

PDSCH 256 QAM EVM

EVM RMS and Peak

Frequency Error, Time Error

##### Allocation Mapper

Power level on RB and Slot

## 5G NR Signal Analysis (Option ONA-SP-5GOTA and ONA-SP-5GSIA) continued

### OTA Analysis (ONA-SP-5GOTA)

#### Beam Analyzer

Bar Graph for  
S-SS RSRP, SINR, P-SS RSRP

Table Summary  
PCI, SSB Index, S-SS RSRP, P-SS RSRP, P-SS SNR,  
S-SS SINR, S-SS RSRQ, S-SS RSSI, Time Error,  
PBCH DM-RS RSRP, EVM

#### Beam Availability Index

Bar Graph for Beam Index

PCI, SSB Power, P-SS RSRP

S-SS RSRP, SINR, RSSI

PBCH RSRP, PBCH EVM

PBCH DM-RS EVM

PBCH DM RSRP, SSB EIPR

IQ Diagram  
PBCH/PBCH DM-RS

#### Carrier Scanner (up to 8)

Bar Graph for  
Channel power, RSRP

Table Summary  
PCI, SSB Index, S-SS RSRP, Channel Power, PBCH EVM,  
Frequency Error, Time Error, S-SS RSSI, PBCH DM-RS  
EVM, PBCH DM-RS RSRP, Frequency, Time Error Trend

IQ Diagram  
PBCH/PBCH DM-RS

MIB decode

#### Multipath Profile

Physical Cell ID

Group and Sector ID

P-SS, S-SS Rel Power, Delay

#### Freq/Time/Power Variation

Frequency, Time Error Trend

Frequency, Time Error

RS Power Trend

Channel Power, S-SS RSRP

#### Route Map

PCI, P-SS, S-SS RSRP, S-SS SINR

## 5G TM Signal Analysis (ONA-SP-5GNR-TM1 and ONA-SP-5GNR-TM2 )

General Parameters		
Frequency range	FR1 Band: 410 MHz to 7.125 GHz	
	FR2 Band: 24 GHz to 44 GHz	
Input signal level	FR1 Band: -75 to +25 dBm	
	FR2 Band: -70 to +20 dBm	
Channel power accuracy	±1.0 dB (typical)	
Supported bandwidths	Up to 100 MHz	
Frequency error	±0.05 ppm	
Residual EVM	2.0 % (typical)	@ -20 dBm
Standard	3GPP TS 38.141 series v15.2.0, v15.4.0, v16.4.0, v16.5.0 and after	
Measurements		
<b>BS output power</b> BS output power/EIRP power Spectral density Peak to average power	<b>Operation band unwanted emissions</b> Reference power Peak level at defined range	
<b>Occupied bandwidth</b> Occupied bandwidth Integrated power Occupied power	<b>Transmitter spurious emissions</b> Peak frequency at defined range Peak level at defined range	
<b>ACLR</b> Reference power Abs power at defined range Rel power at defined range	<b>Transmit on/off power</b> Symbol average power Transition period length Off power	
<b>Multi-ACLR</b> Lowest reference power Highest reference power Abs power at defined range Rel power at defined range	<b>Modulation Quality</b> PDSCH QPSK EVM PDSCH 16QAM EVM PDSCH 64QAM EVM PDSCH 256QAM EVM Frequency error Resource element power OFDM symbol power	
<b>Operation band unwanted emissions</b> Reference power Peak level at defined range	<b>MIMO Time Alignment Error</b> Time alignment error PDSCH DM-RS power difference Antenna 1000: PDSCH DM-RS power, Time offset Antenna 1001: PDSCH DM-RS power, Time offset Antenna 1000/1001 Time offset trend	
<b>Transmitter spurious emissions</b> Peak frequency at defined range Peak level at defined range	<b>CA time Alignment Error (up to 8 carriers)</b> Time alignment error trend Time alignment error PDSCH DM-RS power difference PDSCH DM-RS power, Time offset	



## NSA OTA Analysis (Option ONA-SP-NSAOTA)

General Parameters		
Frequency range	LTE LTE-FDD: Bands 1 to 14, 17 to 26 LTE-TDD: Bands 33 to 43	
	NR FR1 Band: 410 MHz to 7125 GHz FR2 Band: 24 GHz to 44 GHz	
Minimum detectable level	LTE -125 dBm	S-SS RSRP
	NR FR1 Band: -120 dBm FR2 Band: -110 dBm	S-SS RSRP
Input signal level	FR1 Band: -75 to +25 dBm	
	FR2 Band: -70 to +20 dBm	
Channel power accuracy	±1.0 dB typical	
Supported bandwidths	Up to 100 MHz	
Frequency error	±0.05 ppm	
Residual EVM	2.0 % typical	@ -20 dBm

### Measurements (Option: ONA-SP-DSSOTA)

NSA Analyzer	NSA Scanner	Route map
Up to 8 LTE/NR carriers	Up to 8 LTE/NR carriers	Up to 8 LTE/NR carriers
Fast mode: Strongest PCI	NR Scanner	Fast mode
Normal mode: Multi PCIs	Fast Mode	Strongest PCI
NR Analyzer:	Strongest PCI,	Normal mode
Bar Graph for	S-SS RSRP, Channel Power	Multi PCIs
S-SS, P-SS RSRP, S-SS SINR	Normal Mode	RSRP, RSRQ, SINR, SNR
Table Summary	Strongest PCI, SSB Index,	
PCI, SSB index, S-SS RSRP	S-SS RSRP, Channel Power,	
P-SS RSRP, P-SS SNR, S-SS SINR	PBCH EVM, Freq Error,	
S-SS RSRQ, S-SS RSSI,	Time Error, S-SS RSSI,	
PBCH DM-RS RSRP, EVM,	PBCH DM-RS EVM	
Time Error	PBCH DM-RS RSRP	
LTE Analyzer:	LTE Scanner	
Bar Graph for	Fast Mode	
RSRP, S-SS RSSI,	Strongest PCI,	
RS SINR/RS SINR, S-SS Ec/Io	RSRP, Channel Power	
Table Summary	Normal Mode	
RSRP, RSRQ, P-SS SNR, RS SINR,	Strongest PCI,	
S-SS RSSI, P-SS RSRP, S-SS RSRP	RSRP, Channel Power	
S-SS Ec/Io, Time Error	RS EVM, Frequency Error,	
	Time Error, S-SS RSSI	

## General Information

RF In		
Connect Type	9 kHz to 9 GHz: Type-N female	(RA09MA-O)
	9 kHz to 18.5 GHz: Type-N female	(RA18MA-O)
	9 kHz to 32 GHz: Type-N female/2.92 mm male	(RA32MA-O)
	9 kHz to 44 GHz: Type-N female/2.92 mm male	(RA44MA-O)
Impedance	50 $\Omega$	Nominal
Damage level	+27 dBm, $\pm$ 50 VDC	Average CW power
Trigger In/Out, GNSS		
Connect Type	SMA, female	
Impedance	50 $\Omega$	Nominal
Reference In		
Connect Type	SMA, female	
Impedance	50 $\Omega$	Nominal
Frequency	10 MHz, 13 MHz, 15 MHz	
Input range	-5 to +5 dBm	
SFP Cage		
SFP+	2 ports	
QSFP	1 port	
Battery Operation		
Type	14.4 V, 6800 mAh (Lithium ion)	Accepts two additional PEM (Power Expansion module)
Operation time	Standard: > 2 hours, mode dependent	Typical
	Optional (Two PEMs): > 5 hours, mode dependent	Typical
	New battery with fully charged battery	
Operating Temperature		
AC power	0 to 40°C (32 to 104°F)	Battery charging
Battery	-10 to 55°C (14 to 131°F)	
Storage Temperature		
	-20 to 60°C (4 to 140°F)	
Maximum Humidity		
	95% RH (noncondensing)	
Environmental		
Vibration Random	MIL-PRF-28800F Class 2	
Shock	MIL-PRF-28800F	
Bench handling	MIL-PRF-28800F	
Transit drop	MIL-PRF-28800F Class 2	

## General Information continued

EMC	
IEC/EN 61326-1:2006 (complies with European EMC)	
ISPR11:2009 +A1:2010	
ESD	
IEC/EN 61000-4-2	
Size and Weight (standard configuration with OneAdvisor 800)	
Weight (with one battery)	RA09MA-O: < 4.4 kg (9.70 lb.)
	RA18MA-O: < 4.4 kg (9.70 lb.)
	RA32MA-O: < 4.7 kg (10.36 lb.)
	RA44MA-O: < 4.7 kg (10.36 lb.)
Size (W x H x D)	270 X 170 X 117 mm (10.6 x 6.7 x 4.6 in)
Warranty	
	3 years
Recommended calibration cycle	
	1 year

## Ordering Information

Part number	Description	Note
ONA-800A	OneAdvisor ONA 800A Mainframe with Display	Requires one radio analysis module
Radio Analysis Modules		
RA09MA-O	Frequency 9 kHz to 9 GHz with Optical Hardware	
RA18MA-O	Frequency 9 kHz to 18.5 GHz with Optical Hardware	
RA32MA-O	Frequency 9 kHz to 32 GHz with Optical Hardware	
RA44MA-O	Frequency 9 kHz to 44 GHz with Optical Hardware	
Other External Modules		
CAA06MA	6 GHz Cable and Antenna Analyzer Module	
CAA06MB	6 GHz Cable and Antenna Analyzer Module with Bias Power and Bias-Tee	
ONA-MF2-PEM	Power Expansion Module	
Options		
ONA-CAA-2P	2 Port Transmission Measurement	
ONA-CAA-RFS	RF CW Source	
ONA-SP-RT50	Realtime Spectrum Analyzer 50 MHz	
ONA-SP-RT100	Realtime Spectrum Analyzer 110 MHz	
ONA-MF-BT	Bluetooth Connectivity	
ONA-MF-WIFI	Wi-Fi Connectivity	
SAA-ADVISOR	SMART ACCESS ANYWHERE FOR VIAVI ADVISOR PRODUCTS	
ONA-SP-GNSS	GNSS Connectivity with Antenna	

## Ordering Information continued

ONA-SP-RM	Route Map
ONA-SP-INTAN	Interference Analysis
ONA-SP-GSS	Gated Sweep Spectrum
ONA-SP-TAGS	TDD Auto Gated Spectrum
ONA-SP-CHSC	Channel Scanner
ONA-SP-BS	Blind Scanner for FR1
ONA-SP-BS-FR2	Blind Scanner for FR2
ONA-SP-EMF-SA	EMF Analysis
ONA-SP-EMF-NR	EMF Analysis for 5G NR
ONA-SP-LTEFDDOTA	LTE/LTE-A FDD OTA Analysis
ONA-SP-LTEFDSIA	LTE/LTE-A FDD Signal Analysis
ONA-SP-LTETDDOTA	LTE/LTE-A TDD OTA Analysis
ONA-SP-LTETDSIA	LTE/LTE-A TDD Signal Analysis
ONA-SP-DSSOTA	DSS OTA Analysis
ONA-SP-DSSSIA	DSS Signal Analysis
ONA-SP-NSAOTA	NSA OTA Analysis
ONA-SP-5GOTA	5G NR Beamforming Analysis
ONA-SP-5GSIA	5G NR Signal Analysis
ONS-SP-CPS	5G NR Cell Phase Synchronization
ONA-SP-5GNR-TM1	5G NR TM Signal Analysis
ONA-SP-5GNR-TM2	5G NR TM Signal Analysis for Releases 15 and 16
ONA-SP-CPRI17	RFoCPRI Line Rates 1 to 7 for Interference Analysis
ONA-SP-CPRI8	RFoCPRI Line Rate 8 for Interference Analysis
ONA-SP-CPRI18	RFoCPRI Line Rates 1 to 8 for Interference Analysis

## Optional Accessories

Accessory - RF Calibrators	
JD78050509	Y- Calibration Kit Type-N(m), DC TO 6 GHz, 50 ohm
JD78050510	Y- Calibration Kit DIN(m), DC to 6 GHz, 50 ohm
JD70050509	EZ-CAL Kit Type-N(m), DC to 6 GHz, 50 ohm
Accessory - RF Cables	
G700050530	RF cable DC to 8 GHz Type-N(m) to Type-N(m), 1.0 m
G700050531	RF cable DC to 8 GHz Type-N(m) to Type-N(f), 1.5 m
G700050532	RF cable DC to 8 GHz Type-N(m) to Type-N(f), 3.0 m
G710050533	RF cable DC to 18 GHz Type-N(m) to SMA(m), 1.5 m
G710050534	RF cable DC to 18 GHz Type-N(m) to QMA(m), 1.5 m
G710050535	RF cable DC to 18 GHz Type-N(m) to SMB(m), 1.5 m
G710050536	RF cable DC to 6 GHz Type-N(m) to DIN(f), 1.5 m
G710050537	RF cable DC to 4 GHz Type-N(m) to 1.0/2.3 (m), 1.5 m
G700050540	Phase-stable RF cable w grip DC to 6 GHz Type-N(m) to Type-N(f), 1.5 m
G700050541	Phase-stable RF cable w grip DC to 6 GHz Type-N(m) to DIN(f), 1.5 m
G700050550	RF cable DC to 40 GHz, K(m) to K(m), 0.8 m
G700050551	RF cable DC to 40 GHz, K(m) to K(f), 0.8 m
G700050552	RF cable DC to 40 GHz, K(m) to K(f), 1.5 m
Accessory - RF Antennas	
G700050340	Mag Mount RF omni antenna Type-K (f), 26 GHz to 40 GHz
G700050342	Mag mount RF omni antenna with LNA; Type-K(f), 26 GHz to 40 GHz
G700050343	Factory upgrade of existing G700050340 with LNA
G700050345	Mag Mount RF Omni Antenna 617-960/1700-6000 MHz 8 ft. LL-195 with N-plug
G700050350	RF omni antenna Type-N(m), 3300 to 3800 MHz
G700050353	RF omni antenna Type-N(m), 806 to 896 MHz
G700050354	RF omni antenna Type-N(m), 870 to 960 MHz
G700050355	RF omni antenna Type-N(m), 1710 to 2170 MHz
G700050356	RF omni antenna Type-N(m), 720 to 800 MHz
G700050357	RF omni antenna Type-N(m), 2300 to 2700 MHz
G700050363	RF yagi antenna Type-N(f), 1750 to 2390 MHz, 10.2 dBd
G700050365	RF yagi antenna Type-N(f), 866 to 960 MHz, 9.8 dBd
G700050366	RF yagi antenna SMA(f), 700 to 4000 MHz, 1.85 dBd
G700050367	RF yagi antenna SMA(f), 700 to 6000 MHz, 2.85 dBd
G700050381	Isotropic Antenna Type-N(m), 400 MHz to 6 GHz
G700050370	RF directional horn antenna kit, K(f), 26.5 GHz to 40 GHz, 15 dBi
G700050390	GPS SMA mount antenna

## Optional Accessories continued

### Accessory - RF Adapters (Connector and Adapters)

G700050571	Adapter Type-N(m) to DIN(f), DC to 7.5 GHz, 50 ohm
G700050572	Adapter DIN(m) to DIN(m), DC to 7.5 GHz, 50 ohm
G700050573	Adapter Type-N(m) to SMA(f), DC to 18 GHz, 50 ohm
G700050574	Adapter Type-N(m) to BNC(f), DC to 4 GHz, 50 ohm
G700050575	Adapter Type-N(f) to Type-N(f), DC to 18 GHz 50 ohm
G700050576	Adapter Type-N(m) to DIN(m), DC to 7.5 GHz, 50 ohm
G700050577	Adapter Type-N(f) to DIN(f), DC to 7.5 GHz, 50 ohm
G700050578	Adapter Type-N(f) to DIN(m), DC to 7.5 GHz, 50 ohm
G700050579	Adapter DIN(f) to DIN(f), DC to 7.5 GHz, 50 ohm
G700050580	Adapter Type-N(m) to Type-N(m), DC to 11 GHz 50 ohm
G700050581	Adapter N(m) to QMA(f), DC to 6 GHz, 50 ohm
G700050582	Adapter N(m) to QMA(m), DC to 6 GHz, 50 ohm
G700050583	Adapter N(m) to 4.1/9.5 MINI DIN (f), DC to 6 GHz, 50 ohm
G700050584	Adapter N(m) to 4.1/9.5 MINI DIN (m), DC to 6 GHz, 50 ohm
G700050585	Adapter N(m) to 4.3-10 (f), DC to 6 GHz, 50 ohm
G700050586	Adapter N(m) to 4.3-10 (m), DC to 6 GHz, 50 ohm
G700050587	Adapter N(f) to SMA (f), DC to 18 GHz, 50 ohm

### Accessory - RF Filters

G700050601	Bandpass filter 696 MHz to 716 MHz, N(m) to N(f), 50 ohm
G700050602	Bandpass filter 776 MHz to 788 MHz, N(m) to N(f), 50 ohm
G700050603	Bandpass filter 806 MHz to 849 MHz, N(m) to N(f), 50 ohm
G700050604	Bandpass filter 1710 MHz to 1755 MHz, N(m) to N(f), 50 ohm
G700050605	Bandpass filter 1850 MHz to 1910 MHz, N(m) to N(f), 50 ohm
G700050606	Bandpass filter 703 MHz to 748 MHz, N(m) to N(f), 50 ohm
G700050607	Bandpass filter 832 MHz to 862 MHz, N(m) to N(f), 50 ohm
G700050608	Bandpass filter 880 MHz to 915 MHz, N(m) to N(f), 50 ohm
G700050609	Bandpass filter 1710 MHz to 1785 MHz, N(m) to N(f), 50 ohm
G700050610	Bandpass filter 1920 MHz to 1980 MHz, N(m) to N(f), 50 ohm
G700050611	Bandpass filter 2500 MHz to 2570 MHz, N(m) to N(f), 50 ohm
G700050612	Bandpass filter 663 MHz to 698 MHz, N(m) to N(f), 50 ohm
G700050613	Bandpass filter 3300 MHz to 3800 MHz, N(m) to N(f), 50 ohm
G700050614	Bandpass filter 788 MHz to 798 MHz, N(m) to N(f), 50 ohm
G700050615	Bandpass filter 2305 MHz to 2315 MHz, N(m) to N(f), 50 ohm
G700050616	Bandpass Filter 3300 MHz to 4200 MHz, N(m) to N(f), 50 ohm

## Optional Accessories continued

Accessory - RF Power Sensors	
JD731B	Directional power sensor (peak and average power) 300 to 3800 MHz
JD732B	Terminating power sensor (Average Power) 20 to 3800 MHz
JD733A	Directional power sensor (peak and average power) 150 to 3500 MHz
JD734B	Terminating power sensor (peak power) 20 to 3800 MHz
JD736B	Terminating power sensor (average/peak power) 20 to 3800 MHz
Accessory - RF Miscellaneous	
G710050581	Attenuator 40 dB, 100 W, DC to 4 GHz (unidirectional)
G710050585	RF directional coupler, 700 to 4000 MHz, 30 dB, 50 W Input/output; Type-N(m) to Type-N(f), tap off; Type-N(f)
G710050586	RF combiner, 700 to 4000 MHz, Type-N(f) to Type-N(m)
G710050587	4x1 RF combiner, 700 to 4000 MHz, Type-N(f) to Type-N(m)
JD70050007	AntennaAdvisor handle
Accessory - General	
G700050150	98 Wh Lithium-Ion Battery
G700050128	OneAdvisor 800 120 Watts DC to DC Car Cigarette Lighter Charger Adapter
G700050127	OneAdvisor 800 AC/DC Power Adapter 160 W, 19 V
G700050701	OneAdvisor 800 with RA/SPA module hard carrying case with wheels
ONA-800A-WCL	OneAdvisor 800 Large Wrap Case for RA Module
ONA-800A-BP	OneAdvisor 800 Backpack
ONA-800A-HS	Hand Strap for OneAdvisor 800 - Replacement
ONA-800A-FC	Front Cover for OneAdvisor 800 - Replacement