

Data Sheet

VIAVI

Radio Analysis Module

Module for OneAdvisor 800

SPA06MA

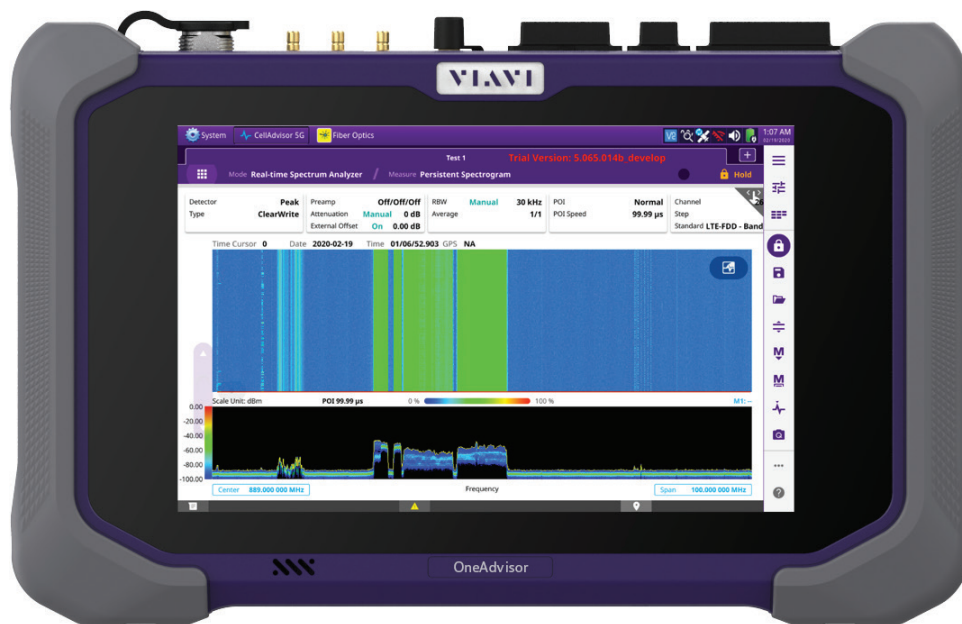
SPA06MA-O

Family of radio analysis modules that pair with the OneAdvisor 800.

Test capabilities include: spectrum analysis, signal analysis, RFoCPRI interference analysis, Ethernet, and O-DU-Emulation.

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: performance statistic represented by 80% of production units
 - Nominal: a general, descriptive term or parameter



Spectrum Analyzer (Option: SPA06MA-O or SPA06MA)

Frequency Range		
9 kHz to 6 GHz		
Frequency Reference		
Stability	±0.5 ppm (-30 to 85°C) + aging	
Accuracy with GPS	±25 ppb	GPS lock
	±50 ppb	GPS Holdover (over 30 min after losing GPS lock. Temperature variation < 8°C)
Aging	±1 ppm/year	
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 6 GHz	
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
	15 trace/ sec	Span = 10 MHz
		RBW 3 kHz Fast
Sweep Time		Nominal
Range	0.4 ms to 600 s manual	Sweep
	1 μs to 600 s	zero span
Accuracy	±2 %	zero span
Type	Continuous, Single	
Mode	Gated sweep (requires option ONA-SP-GSS), Normal and FFT modes, Fast	
Trigger		
Trigger Source	Free video, external, GPS, Internal	
Trigger Delay	Range: 0 to 10 s	
	Resolution: 6 μs	
Resolution Bandwidth (RBW)		Nominal
Range	1 Hz to 3 MHz	~ 3 dB bandwidth
		1-3-10 sequence
Accuracy	±10%	
Video Bandwidth (VBW)		Nominal
Range	1 Hz to 3 MHz	~ 3 dB bandwidth
		1-3-10 sequence
Accuracy	±10%	

Spectrum Analyzer (continued)

Amplitude Range		
Measurement range	9 kHz to 6 GHz: DANL to +25 dBm	
Input attenuator range	9 kHz to 6 GHz: 0 to 55 dB in 5 dB steps	
Preamplifier		
Frequency range	10 MHz to 6 GHz	
Gain	20 dB	
Max RF Input Operating Level		
	9 kHz to 6 GHz: +25 dBm, ±50 VDC	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	-120 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	
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	
Absolute Amplitude Accuracy		
Preamplifier Off: input signal ≥ -50 dBm, auto-coupled, 15-minute warm-up		
Preamplifier On: -90 dBm < input signal < -50 dBm, auto-coupled, 15-minute warm-up		
9 kHz to 5 MHz	± 2.0 dB, ± 1.0 dB (T)	20 to 30°C (68 to 86°F)
5 MHz to 3.2 GHz	± 1.3 dB, ± 1.0 dB (T)	
3.2 GHz to 6 GHz	± 1.5 dB, ± 1.0 dB (T)	
9 kHz to 6 GHz	± 2.5 dB, ± 2 dB (T)	0 to 50°C (32 to 131°F)
Input VSWR		Nominal
9 kHz to 6 GHz: 1.9:1 (Nominal)		@ 10 dB Attenuation

Spectrum Analyzer (continued)

Displayed Average Noise Level (DANL)

1 Hz RBW, 1 Hz VBW, 50 Ω termination, 0 dB attenuation, RMS detector

Preamplifier Off	9 kHz to 10MHz	-140 dBm, -142 dBm (T)
	10 MHz to 1.87 GHz	-141 dBm, -143 dBm (T)
	1.87 GHz to 4.0 GHz	-140 dBm, -142 dBm (T)
	4.0 GHz to 6.0 GHz	-138 dBm, -140 dBm (T)
Preamplifier On	9 kHz to 10MHz	-140 dBm, -142 dBm (T)
	10 MHz to 4.0 GHz	-158 dBm, -161 dBm (T)
	4.0 GHz to 6.0 GHz	-157 dBm, -160 dBm (T)

Second Harmonic Distortion

500 MHz to 3.0 GHz	< -60 dBc, typical	Input -40 dBm
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Third-Order Inter-Modulation (Third-Order Intercept: TOI)

10 MHz to 6.0 GHz	+9 dBm, typical	Preamp Off
10 MHz to 6.0 GHz	-11 dBm, typical	Preamp On

Spur Free Dynamic Range

2/3 (TOI-DANL) in 1 Hz RBW	> 101 dB, typical	@ 1 GHz
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Spurious

Inherent Residual Response	Input terminated, 0 dB attenuation, Preamp off	
	Sweep Tuned: 10 kHz RBW, 1 kHz VBW, Peak detector	
	Real time: RBW: 30 kHz, VBW: 30 kHz, Peak Mode, Span = 100 MHz	
	9 kHz to 6 GHz	
	Sweep tuned: -95 dBm	Typical
	Real time: -90 dBm	Typical
Input-related Spurious	0 dB attenuation, Input signal= -25 dBm, Preamp off	
	Sweep tuned: Peak detector, Span < 1 GHz	
	9 kHz to 6 GHz (10 kHz RBW, 1 kHz VBW)	
	Images and blockers: < -75 dBc	
Sidebands	< -60 dBc	
LO Feedthrough to Input	9 kHz to 6 GHz: < -85 dBm	

Single Sideband (SSB) Phase Noise

-94 dBc/Hz, -96 dBc/Hz (T) @ 10 kHz offset	@ 1 GHz
-97 dBc/Hz, -99 dBc/Hz (T) @ 100 kHz offset	
-107 dBc/Hz, -110 dBc/Hz (T) @ 1 MHz offset	

Spectrum Analyzer (continued)

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
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

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

GPS Receiver Type	
	Built-in type
GPS Time and Location	
GPS Information	Latitude, longitude, Satellite, Status
GPS Time and Location	Time, Latitude, and longitude on display
	Time, Latitude, and longitude on trace
High-Frequency Accuracy	
GPS Lock	±25 ppb
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 a/b/g/n/ac
Wireless Mode	Infrastructure mode
Internet Protocol Version	IPv4, IPv6

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

Frequency range		
	100 MHz to 6 GHz (Usable from 9 kHz)	
Frequency Span		
Option ONA-SP-RT50	50 MHz real time	
Option ONA-SP-RT100	100 MHz real time	100 MHz step sequence
Acquisition		
IF Bandwidth	50 MHz or 100 MHz	
Resolution Bandwidth	30 kHz to 3 MHz	1-3-10 sequence
A/D Converter	245.76 Msps	
FFT Lengths	8192	
Maximum Acquisition Time	1000 ms	
Minimum IQ resolution	8.138 ns	
Probability of Intercept (POI)	1.92 μs	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	≤ 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	

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

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

Persistence Spectrogram Display

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)

Measurement

Spectrum Analyzer	Sound indicator, interference ID, spectrum recorder logging up to 72 hours
Spectrogram	Collect up to 72 hours of data
RSSI	Collect up to 72 hours of data
Interference Finder	Triangulation
Radar Chart	Interference Localization
Spectrum replayer	Playback recorded data using OneAdvisor 800

TDD Auto Gated Spectrum (Option: ONA-SP-TAGS)

General Parameters

Supported Technology	5G NR
Gated Method	Gated FFT
Gated Delay range	0 t 10 ms
Gated Length	1 to 14 symbols
Trigger Source	PSS/SSS

Measurement

Spectrum
Spectrogram
Persistent Spectrum
Persistent Spectrogram
RSSI
Interference Finder
Radar Chart

Route Map (Option ONA-SP-RM)

Mode	Spectrum analyzer	
Plot Method	Time, position, GPS	
Plot Legend	Excellent, very good, good, poor	User definable range
Map Type	Outdoor (position information embedded)	Import maps using VIAVI Mapcreator
	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	Internal, External, GPS

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

General Parameters

Optical Interface	Dual SFP/SFP+ (supports all MSA compliant SFP modules)	Supported with CA5000-F001-O and CA5000-F002-O
Line rates	CPRI Rate 1 to 7	Option: ONA-SP-CPRI17
	CPRI Rate 8	Option: ONA-SP-CPRI8
	CPRI Rate 1 to 8	Option: ONA-SP-CPRI18
Resolution Bandwidth (RBW)	- 3dB bandwidth	10 kHz to 100 kHz with 1-3 step 7.5 kHz
	Accuracy	±10% (nominal)
Video Bandwidth (VBW)	- 3dB bandwidth	10 kHz to 100 kHz with 1-3 step 7.5kHz
	Accuracy	±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	

LTE/LTE-A FDD Analyzer

General Parameters				
Frequency Range	Band 1 to 32, 65 to 76, 85, 87, 88			
Input Signal Range	−65 to +25 dBm			
Supported Bandwidth	1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, and 20 MHz			
Frequency Error	±10 Hz + ref freq accuracy, 99% confidence level			
Measurements (Option: ONA-SP-LTEFDOTA)				
Channel Power Channel power Spectral density Peak to average power	Occupied bandwidth Occupied bandwidth Integrated power Occupied power	Spectrum emission 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 Absolute power at defined range Relative power at defined range
Channel Scanner (Up to 6 Carriers) PCI (Group, Sector ID), Channel power (dBm), RSSI, RSRP, RSRQ, RS-SINR, Antenna port	D Scanner (up to 6 PCI) PCI (Group, Sector ID), RSRP, RSRP, P-SS SNR, S-SS SINR, S-SS RSSI, P-SS RSRP, S-SS RSRP, S-SS Ec/Io	Control Channel Physical Cell ID, Group ID, Sector ID, MBSFN* RS Power & EVM trend Absolute power, EVM, phase for P-SS, S-SS, PBCH, PCFICH, RS0, RS1, RS2, RS3 Frequency Error Time Error Time Alignment Error	Route Map Date and Time, Latitude, Longitude, PCI(Group, Sector ID), RSRP, RSRQ, RS-SINR, S-SS RSSI, P-SS,/S-SS power, S-SS Ec/Io	Freq/Time/Power Variation Frequency Offset Time Offset RS Power
Measurements (Option: ONA-SP-LTEFDSIA)				
Constellation MBSFN* RS power PDSCH/Data* QPSK EVM PDSCH/Data* 16 QAM EVM PDSCH/Data* 64 QAM EVM PDSCH/Data* 256 QAM EVM Data EVM RMS Data EVM peak Frequency error Time error	Subframe Physical Cell ID, Group ID, Sector ID MBSFN* Subframe power Channel summary table EVM, relative or absolute power, modulation type for P-SS, S-SS, PBCH, PCFICH, PHICH, PDCCH, RS, MBSFN RS* Data QPSK, 16/64/256 QAM Subframe summary OFDM symbol power, Frequency error, time error Data EVM RMS, data EVM peak, RS EVM RMS, RS EVM peak IQ Imbalance	Frame Summary Frame Physical Cell ID, Group ID, Sector ID MBSFN* Frame power Channel summary table EVM, relative or absolute power, modulation type for P-SS, S-SS, PBCH, PCFICH, PHICH, PDCCH, RS, MBSFN RS* PBSCH/PMCH QPSK, 16/64/256 QAM Subframe summary OFDM symbol power, Frequency error, IQ-origin offset, Data EVM RMS, Data EVM peak EVM RMS, EVM peak	Data Allocation Map Frame data utilization OFDM symbol power Data allocation vs frame Subframe data utilization Resource block power Data allocation vs subframe	Power vs. Time (Frame) Frame average power I-Q origin offset, Time Offset Subframe power First slot power Second slot power Physical Cell ID, Group ID, Sector ID

*Measurement is performed when MBMS is enabled

LTE/LTE-A TDD Analyzer

General Parameters				
Frequency Range	Band 33 to 53			
Input Signal Range	−65 to +25 dBm			
Supported Bandwidth	1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, and 20 MHz			
Frequency Error	±10 Hz + ref freq accuracy, 99% confidence level			
Measurements (Option ONA-SP-LTETDOTA)				
Channel Power Channel power Spectral density Peak to average power	Occupied bandwidth Occupied bandwidth Integrated power Occupied power	Spectrum emission 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 Absolute power at defined range Relative power at defined range
Channel Scanner (Up to 6 Carriers) PCI (Group, Sector ID), Channel power (dBm), RSSI, RSRP, RSRQ, RS-SINR, Antenna port	ID Scanner (up to 6 PCI) PCI (Group, Sector ID), RSRP, RSRP, P-SS SNR, S-SS SINR, S-SS RSSI, P-SS RSRP, S-SS RSRP, S-SS Ec/Io	Control Channel Physical Cell ID, Group ID, Sector ID, MBSFN* RS Power & EVM trend Absolute power, EVM, phase for P-SS, S-SS, PBCH, PCFICH, RS0, RS1, RS2, RS3 Frequency Error Time Error Time Alignment Error	Route Map Date and Time, Latitude, Longitude, PCI(Group, Sector ID), RSRP, RSRQ, RS-SINR, S-SS RSSI, P-SS,/S-SS power, S-SS Ec/Io	Freq/Time/Power Variation Frequency Offset Time Offset RS Power
Measurements (Options ONA-SP-LTETDSIA)				
Constellation MBSFN* RS power PDSCH/Data* QPSK EVM PDSCH/Data* 16 QAM EVM PDSCH/Data* 64 QAM EVM PDSCH/Data* 256 QAM EVM Data EVM RMS Data EVM peak Frequency error Time error	Subframe Summary Frame Physical Cell ID, Group ID, Sector ID MBSFN* Frame power Channel summary table EVM, relative or absolute power, modulation type for P-SS, S-SS, PBCH, PCFICH, PHICH, PDCCH, RS, MBSFN RS* PBSCH/PMCH QPSK, 16/64/256 QAM Subframe summary OFDM symbol power, Frequency error, IQ-origin offset, Data EVM RMS, Data EVM peak EVM RMS, EVM peak	Data Allocation Map Frame data utilization OFDM symbol power Data allocation vs frame Subframe data utilization Resource block power Data allocation vs subframe	Power vs. Time (Frame) Frame average power I-Q origin offset, Time Offset Subframe power First slot power Second slot power Physical Cell ID, Group ID, Sector ID	

*Measurement is performed when MBMS is enabled

5G NR Signal Analyzer

General Parameters				
Frequency Range	FR1: 410 MHz to 6 GHz			
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			
Frequency Error	±10 Hz + ref freq accuracy, 99% confidence level	- 60 dBm to + 25 dBm		
	2.0% Typical for QPSK	- 60 dBm to + 25 dBm		
Measurements (Option: ONA-SP-5GOTA)				
Channel Power Channel power EIRP Spectral Density Peak to average power	Occupied bandwidth Occupied bandwidth Integrated power Occupied power	Spectrum emission Reference power Peak level at defined range	ACLR Reference power Abs power at defined range Rel power at defined range	
Carrier Scanner (Up to 8 Carriers) PCI, SSB Index, Channel Power, S-SS RSRP, PBCH EVM, Time Error (us), Freq Error (Hz)	Beam Analyzer (up to 8 beams) PCI (Group, Sector ID), SSB Index (DM-RS, PBCH), S-SS RSRP, P-SS RSRP, P-SS SINR, S-SS SINR, S-SS RSRQ	Route Map Date and Time, Latitude, Longitude, PCI(Group, Sector ID), Beam Index, S-SS RSRP, S-SS SINR (dB), P-SS RSRP, S-SS RSRQ (dB), P-SS SNR (dB)	Freq / Time / Power Variation Frequency Offset Time Offset RS Power	Multipath Profile PCI (Group, Sector ID), SSB Index P-SS delay profile S-SS delay profile
Measurements (Options: ONA-SP-5GSIA)				
Power vs Time (Frame) Frame average power IQ Origin Offset Time Error Slot Power	Power vs Time (Slot) Symbol Average Power Transient period lenght OffPower	Constellation PDSCH/Data QPSK EVM PDSCH/Data 16QAM EVM PDSCH/Data 64QAM EVM PDSCH/Data 256QAM EVM Data EVM RMS, Peak Frequency error	Allocation Mapper Frame Power Frame Utilization Slot Power Slot Utilization	
Measurements (Option: ONA-SP-CPS)				
Sync Analysis Sync Error bar chart PCI, S-SS RSRP, Sync Error, Time Error, S-SS SINR, S-SS RSRQ		Sync Route Map Map view Primary: PCI, Time Error, S-SS RSRP 2nd: PCI, Time Error, Sync Error, S-SS RSRP		

DSS Signal Analyzer

General Parameters		
Frequency Range	LTE FDD: Band 1 to 14, 17 to 26	
	LTE TDD: Band 33 to 43	
Minimum Detectable Level	LTE: -117 dBm	S-SS RSRP
	NR: -117 dBm	
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	3.0 % (typical)	@ -20 dBm
Measurements (Option: ONA-SP-DSSOTA)		
Channel Power		OTA Channel Scanner (up to 3)
Channel power		Channel power and RSRP bar graph
Spectral density		LTE: PCI, RS RSSI, RS RSRP, RS RSRQ, RS SINR
Peak to average power		NR: PCI, P-SS RSSI, P-SS RSRP, P-SS RSRQ, P-SS SINR
Occupied Bandwidth		OTA ID Scanner (up to 6)
Occupied bandwidth		LTE: PCI, RSRP, RSRQ, P-SS SNR, S-SS SINR,
Integrated power		S-SS RSSI, P-SS, S-SS, S-SS Ec/Io
Occupied power		NR: PCI, SSB index, S-SS RSRP, P-SS RSRP,
Spectrum Emission Mask		S-SS SINR, S-SS RSRQ
Reference power		OTA Multipath Profile
Peak level at defined range		LTE: RS0, RS1, RS2, RS3 Ec/Io, Delay
ACLR		NR: P-SS, S-SS Ec/Io, Delay
Reference power		LTE/NR Physical Cell ID, Group ID, Sector ID
Abs power at defined range		OTA Control Channel
Rel power at defined range		LTE: P-SS, S-SS, PBCH, RS power and EVM
Multi-ACLR		NR: P-SS, S-SS, PBCH power and EVM
Lowest reference power		Frequency error, Time error,
Highest reference power		Time alignment error
Abs power at defined range		LTE/NR Physical Cell ID, Group ID, Sector ID
Rel power at defined range		OTA Route map
Spurious Emission		RSPR, RSRP, SINR, SNR, PCI
Peak frequency at defined range		Freq/Time Error Variation
Peak level at defined range		Frequency error trend
Power vs. Time (frame)		Time error trend
Frame average power		RS0, RS1, RS2, RS3 power trend
I-Q origin offset, Time offset, Subframe power,		
First slot power, Second slot power		
LTE Physical cell ID, Group ID, Sector ID		
Power vs. Time (Slot)		
Slot average power		
Transition period length		
Off power		
LTE Physical cell ID, Group ID, Sector ID		

DSS Signal Analyzer continued

Measurements (Option: ONA-SP-DSSSIA)

Constellation	Channel Mapper	Control Channel	Subframe	Frame	Time Alignment Error
RS power	LTE channels' allocation in RB block	Subframe power	Subframe power	Frame avg power	Time alignment error trend
PBCH DMRS power	P-SS, S-SS, PBCH, RS, PDCCH, PDSCH, PCFICH, PHICH	Channel summary on EVM, power and mod. type	Channel summary on EVM, power and mod. type	Channel summary on EVM, power and mod. type	Time alignment error, RS power difference
PDSCH LTE/NR QPSK EVM	NR channels' allocation in RB block	LTE control channels (P-SS, S-SS, PBCH, PCFICH, PHICH, PDCCH, RS)	LTE control channels (P-SS, S-SS, PBCH, PCFICH, PHICH, PDCCH, RS) and data channels of QPSK, 16 QAM, 64 QAM, 256 QAM	LTE control channels (P-SS, S-SS, PBCH, PCFICH, PHICH, PDCCH, RS) and data channels of QPSK, 16 QAM, 64 QAM, 256 QAM	Antenna 0 LTE RS power, EVM, time difference
PDSCH LTE/NR 16 QAM EVM	P-SS, S-SS, PBCH, PBCH DMRS, PDCCH, PDSCH	NR control Channels (P-SS, S-SS, PBCH DMRS, PBCH, PDCCH DMRS, PDCCH)	NR control Channels (P-SS, S-SS, PBCH, PBCH DMRS, PDCCH, PDCCH DMRS, PDSCH DMRS) and data channels of QPSK, 16 QAM, 64 QAM, 256 QAM	NR control Channels (P-SS, S-SS, PBCH, PBCH DMRS, PDCCH, PDCCH DMRS, PDSCH DMRS) and data channels of QPSK, 16 QAM, 64 QAM, 256 QAM	Antenna 1 LTE RS power, EVM, time difference
PDSCH LTE/NR 64 QAM EVM	LTE/NR Physical cell ID, Group ID, Sector ID	Each control channel's IQ diagram, Modulation format, Frequency error, IQ origin offset, EVM RMS, EVM peak	Subframe summary	Frame summary	Antenna 2 LTE RS power, EVM, time difference
PDSCH LTE/NR 256 QAM EVM		LTE/NR Physical cell ID, Group ID, Sector ID	OFDM symbol power, Frequency error, Time error, LTE/NR Data EVM RMS, peak, RS EVM RMS, peak, IQ imbalance	OFDM symbol power, Frequency error, Time error, LTE/NR Data EVM RMS, peak, RS EVM RMS, peak	Antenna 3 LTE RS power, EVM, time difference
LTE/NR Data EVM RMS, peak			LTE/NR Physical cell ID, Group ID, Sector ID	LTE/NR Physical cell ID, Group ID, Sector ID	Antenna NR PSS power, EVM, time difference
Frequency Error, Time error					LTE/NR Physical cell ID, Group ID, Sector ID

NSA Analyzer (Option ONA-SP-NSAOTA)

General Parameters		
Frequency Range	LTE-FDD: Band 1 to 14, 17 to 26	
	LTE-TDD: Band 33 to 43	
	NR: 410 MHz to 6 GHz	
Minimum Detectable Level	LTE: -117 dBm	SS-RSRP
	NR: -117 dBm	
Input Signal Level	Up to +25 dBm	
Supported Bandwidth	Up to 100 MHz	
Frequency Error	±0.05 ppm with GPS	-60 dBm to + 25 dBm
Residual EVM	3.0 % (typical)	@ -20 dBm

Measurements (Option: ONA-SP-NSAOTA)		
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	Fast mode	Fast mode: Strongest PCI
Normal mode: Multi PCIs	NR scanner	Normal mode: Multi PCIs
NR Analyzer	Strongest Cell ID	NR Analyzer
Cell ID/SSB index	SS-RSRP/Channel power	Cell ID/SSB index
SS-RSRP/PS-RSRP	LTE scanner	SS-RSRP/PS-RSRP
PS-SNR/SS-SINR/SS-RSRQ	Strongest Cell ID	PS-SNR/SS-SINR/SS-RSRQ
LTE Analyzer	RSRP/Channel power	LTE Analyzer
Cell ID	Normal mode	Cell ID
RSRP, RSRQ, PS-SNR, SS-SINR,	NR scanner	RSRP,RSRQ,PS-SNR,SS-SINR
S-SS RSSI, P-SS, S-SS, S-SS Ec/Io	Strongest Cell ID/SSB index	S-SS RSSI, P-SS,S-SS,S-SS Ec/Io
	SS-RSRP/Channel power	
	PBCH EVM	
	Frequency error, Time error	
	LTE scanner	
	Strongest Cell ID	
	RSRP/Channel power	
	RS EVM	
	Frequency error, Time error	

RAN Analyzer (Option ONA-SP-5GRAN)

Measurements		
5G NR Signal Analysis	Real-time Spectrum Analysis	TDD Auto Gated Spectrum
Beam Analyzer	RtSA Persistent Spectrum	TAGS Spectrum
Freq / Time / Power Variation	RtSA Persistent Spectrogram	TAGS Spectrogram
Allocation Mapper		TAGS Persistent Spectrum
		TAGS Persistent Spectrogram

GMS/GPRS/EGDE Signal Analyzer

General Parameters		
Frequency range	450 MHz to 500 MHz	
	820 MHz to 965 MHz	
	1700 MHz to 1995 MHz	
Input signal range	−40 to +25 dBm	Except output of spectrum
Burst power	±1.0 dB	
Frequency error	±10 Hz + frequency reference accuracy	99% confidence level
GMSK modulation quality		
Phase RMS accuracy	±1.5 degrees	(0 < Phase RMS < 8)
Residual error	2 degrees (typical)	
Phase peak accuracy	±2.5 degrees	(0 < Phase peak < 20)
8 PSK modulation quality		
EVM accuracy	±1.5%	(2% < EVM < 8%)
Residual error	2.5%	
RF power vs. time	±0.25 symbol	

Measurements (ONA-SP-GSMOTA)

Channel Power	Occupied Bandwidth	Spectrum Emission Mask	Spurious Emissions
Channel power	Occupied bandwidth	Reference power	Peak frequency at defined range
Spectral density	Integrated power	Peak level at defined range	Peak level at defined range
Peak to average power	Occupied power		
Channel Scanner	Frequency Scanner	Multipath Profile	Modulation Analyzer
Channels	Frequencies	Frame average power	Frame avg power trend
Absolute power	Absolute power	SNR, delay	C/I trend
Group (traffic, control)	Group (traffic, control)		Frame average power
BSIC (NCC, BCC)	BSIC (NCC, BCC)		BSIC, frame no. and time
			C/I, frequency error
			Burst Power
			Modulation type

Measurement (ONA-SP-GSMSIA)

Power vs. Time (slot)	Power vs. Time (frame)	Constellation
Burst power	Frame average power	Burst power
Max/min point	Burst power (Slot 0 to 7)	Modulation type
	TSC (Slot 0 to 7)	Frequency error
		Phase error RMS/Peak
		I/Q origin offset*, TSC, BSIC, C/I*
		EVM RMS*, EVM Peak*, EVM 95th*

*Measurements performed for 8PSK modulation signals (EDGE) Only

Blind Scanner (Option ONA-SP-BS)

General parameters		
Frequency Range	LTE-FDD: Band 1 to 14, 17 to 26	
	LTE-TDD: Band 33 to 43	
	NR: 410 MHz to 6 GHz	
Minimum Detectable Level	LTE: -111 dBm	SS-RSRP
	NR: -115 dBm	
Input Signal Level	Up to +25 dBm	
Supported Bandwidth	Up to 100 MHz	
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 (Option: ONA-SP-BS)

NR	LTE	DSS
SSB Frequency	Carrier Frequency	Carrier Frequency
SS-RSRP	Carrier Bandwidth	Carrier Bandwidth
MCC*/MNC*	SS-RSRP	SSB Frequency
Cell-ID*	Duplex type	SS-RSRP
	MCC/MNC	Duplex type
	Cell-ID	MCC/MNC
		Cell-ID

* 5G NR StandAlone mode only

On-line Route Map (Option: ONA-SP-ORM)

General parameters		
Supported mode	LTE-FDD Analyzer	Spectrum Analyzer
	LTE-FDD Analyzer	Interference Analyzer
	5G NR	TDD Auto Gated Spectrum
	NSA Analyzer	Real Time Spectrum Analyzer
	DSS Signal Analyzer	Channel Scanner
Operation Mode	On-line map: Seamless map update	
	Off-line map: limited to predefined area. Up to 5 steps Zoom level	
Map type	Open Street Map	

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	dBµV/m, dBmV/m, dBV/m, V/m, W/m2, dBm/m2, A/m, dBA/m, mW/cm2, %
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)

Spectrum (Integrated Power)

Isotropic* EMF Power

Accumulated Isotropic* EMF Power: AVG, MAX, MIN

Scanner

EMF Power of multiple frequency bands

Chart view

Table view

* Requires Isotropic Antenna, G700050381

5G NR EMF Analyzer (Options ONA-SP-EMF-SA, ONA-SP-EMF-NR or ONA-SP-5GOTA)

General Parameters		
Frequency Range	FR1 Band, 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 – 4GHz (VIAVI) G700050367: 650 MHz – 6GHz (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	dBμV/m, dBmV/m, dBV/m, V/m, W/m2, dBm/m2, A/m, dBA/m, mW/cm2, %	
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, ONA-SP-EMF-NR or ONA-SP-5GOTA)

Beam	EMF Power
PCI, RSRP, Extrapolated RSRP	Extrapolated Isotropic* EMF Power Extrapolated Accumulated Isotropic* EMF Power: AVG, MAX, MIN

Channel Scanner (Option: ONA-SP-CHSC)

General Parameters	
Frequency Range	10 MHz to 6GHz
Measurement Range	-110 to +25 dBm
Measurements	
Channel Scanner	
Frequency Scanner	
Custom Scanner	

* Requires Isotropic Antenna, G700050381

Ethernet

Test Interfaces/Bit Rates	
10M/100M/1GE LAN	Option: ONA-SP-10M1GE
10GigE LAN	Option: ONA-SP-10GE
25GE LAN	Option: ONA-SP-25GE
100GE LAN	Option: ONA-SP-100GE
Interface Type	
10M-1GE/10GE/25GE LAN	SFP/SFP+/SFP28: Port 1
100GE LAN	QSFP: Port 1
General	
Line Rate Traffic Tx and RX for all Interfaces	
Single Stream Generation/Analysis	
Layer 2	
Layer 3 (IPv4)	
Modes Of Operation	
Terminate	
Loopback	
Timing	
Recovered from Rx	
Internal (Stratum 3)	
Recovered from External	
Ethernet and IP Layer	
Layer 2 (802.3 and DIX)	
Layer 3 (IPv4)	
VLAN (Single tag)	
Workflows	
RFC 2544	
Y:1564	
QuickCheck	
Optics Self-Test	
Measurements	
Throughput	
Frame Loss	
Roundtrip Delay	
Packet Jitter	

IEEE 1588v2 PTP (Option: ONA-SP-10G1588 / ONA-SP-25G1588)

10G, and 25G Tx/Rx

IPv4 and IPv6

1588v2 Master Emulation 1-step and 2-step

1588v2 Slave Emulation

Encapsulations supported: None, VLAN, and Q-in-Q

Packet Delay Variation Measurements on Control Plane Traffic

Compliance: Add ipdv add per message type

Frame/Packet Capture and Decode via Wireshark

Comments: Message rates for announce request sync

Layer 2 1588v2 Messaging

Layer 4 1588v2 Messaging for IPv4

Message rates Multicast: fastest 2/16/64/64 (DelayResponse/Announce/Sync/DelayRequest) ; slowest one message every 16 seconds

Message rates Unicast: fastest 2/16/16/16 (DelayResponse/Announce/Sync/DelayRequest); slowest one message every 16 seconds

Support for Unicast and Multicast Address Mode

Support for Forwardable and Non-forwardable Address

Static unicast message negotiation: ON or OFF

Thresholds for Delay, PDV and Time Error

Single- and Dual Step operation in both slave and master modes

Master Mode Clock Classes Supported

Primary

Primary Holdover

Arbitrary

Arbitrary Holdover

Primary A

Arbitrary A

1588v2 Delay Measurements (Master/Slave)

Comments: Requires Precision Timing Reference Module

One-way (Master to Slave and Slave to Master) Delay

Comments: Requires Precision Timing Reference Module

Differential Delay and Delay Asymmetry Measurements

Time Error Measurements (1ns resolution)

max |TE| Measurement

cTE Measurement

Wander Analysis of Time Error Measurement

Automated Time Error Measurement workflow.

Enhanced PTP analysis

- Floor packet analysis
- Extended runtime
- Noise Floor Reduction
- User Specified Ethernet Cable Delay
- cTE Calculation

PTP Check

- Support of a workflow to automate getting PTP Time Error results
- PTP Check available for G.8275.1 layer 2 and layer 4
- 10GE, and 25GE

Testing can be performed as per G.8265.1, G.8275.1, G.8275.2

IPv6 (Option: ONA-SP-IPv6)

10G, and 25G Tx/Rx

LED Indicators

IP Packet Detect

Statistics	Util % stats, Packet Rate, Packet Size, Tx/Rx Mbps at L3
Link Stats	Tx/Rx Packet Counts, Tx Router Solicitations, Rx Router Advertisements, Unicast Packets, Multicast Packets, Binned sized packets in categories
Link Counts	Src Global IP Address, Src Link-Local IP Address, IP Gateway, Subnet Prefix Length, Dest IP Address, Dest MAC Address
Config Status	IP Packet Length Errors, Acterna Payload Errors, Packet Error Rate, Lost Frames, Frame Loss Ratio, Out of Sequence Frames
Errors	Throughput, Frame Loss, Packet Jitter, Latency, Errors

Graphs

Setups

Ping Support

NDP Support	Manual, Stateful, Stateless
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IP Source Address

IP Destination Address

Traffic Class

Flow Label

Hop Limit	ATPv3 (Acterna Test Payload), Fill Byte
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Payload Type

IPv6 5G NR Discovery

Discover MAC Address, VLAN ID, IPv6 addresses over 10 GE and 25 GE interfaces

IP (Layer 3) Traffic Filtering

- Destination address
- Source address
- Source Subnet mask
- TOS/DSCP fields (IPv4)
- Protocol (IPv4)
- IPv6 Traffic Class

IPv6 Next Header

Payload analysis on/off

Capture/Decode (Option: ONA-SP-1GECAP / ONA-SP-10GECAP / ONA-SP-25GECAP)

1G, 10G, and 25G Tx/Rx

Wirespeed Capture

Integrated Wireshark on the TestSet	Comments: Viewing capture files can be performed directly on the test set and not require a separate laptop/PC.
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256MB Capture Buffer

Triggers and filters

Tx and Rx Capture	Comments: Captures traffic on the test interface receiver and transmitter.
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Frame Slicing

BERT (Option: ONA-SP-CPRI18L2)

CPRI All rate from 1 to 8

Pattern Losses

Pattern Loss Seconds

Bit Errors

Bit Error Rate

Bit Error Seconds

Bit Error-Free Seconds

Bit Error-Free Seconds, %

General Information**RF In**

Connect Type	Type-N, female	
Impedance	50 Ω	Nominal
Damage Level	+33 dBm, $\pm$ 50 VDC	Average CW power

GNSS

Connect Type	SMA, female	
Impedance	50 Ω	Nominal

Ext. Ref In and Trigger In/Out

Connect Type	SMB, female	
Impedance	50 Ω	Nominal
Frequency	10 MHz, 13 MHz, 15 MHz	
Input Range	-5 to +5 dBm	

SFP Cage

SFP+	3 ports	SPA06MA-O only
QSFP	2 ports	

Battery Operation

Option SPA06MA-O	> 2.0 hours	Spectrum mode with 30% LCD brightness
Option SPA06MA	> 3 hours	

Size and Weight

Weight	< 1.4 kg (3.0 lb.)	
Size (W x H x D)	269mm X 170mm X 41mm with bumper	

Recommended calibration cycle

	1 year	
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