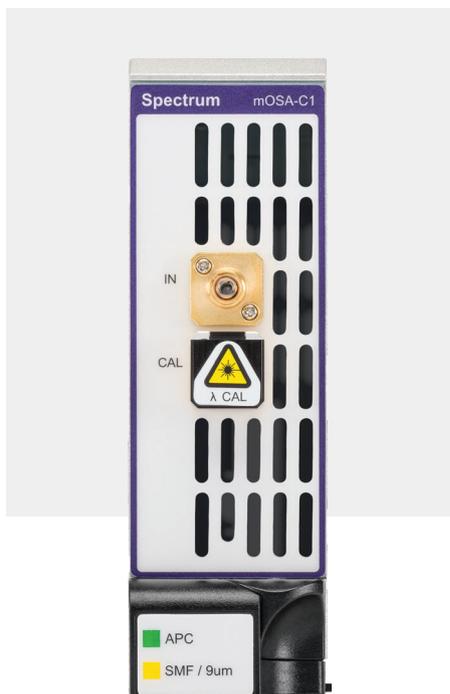


# Optical Spectrum Analyzer (mOSA-C1)

## MAP Series Optical Spectrum Analyzer

The Multiple Application Platform (MAP) Optical Spectrum Analyzer (mOSA-C1) is an optical grating-based spectrum analyzer with lab-grade spectral performance and the size and speed to deploy in production

The MAP Series Optical Spectrum Analyzer (mOSA-C1) is a diffraction grating based spectral measurement system. Based on a next generation monochromator design, the OSA is designed to operate over the full single mode fiber range (1260 to 1660 nm). For the first time, measurement specifications associated with laboratory applications are available in an ultra-compact and modular based measurement system. The industry leading 20 pm resolution bandwidth coupled with measurement scan of 1.6 s over >400 nm allows this OSA to operate in both the lab and in a production line.



### Benefits

- Single slot MAP-300 module; the most compact in its class
- Laboratory performance with the size and speed for production
- Flexible analysis function licensing
- Embedded wavelength calibration artifact

### Features

- 20 pm resolution bandwidth
- 1.6 s measurement time at full span and at full 1 pm resolution
- 1260 to 1660 nm, and C/L-band only option
- >60 dB dynamic range
- PDL 0.2 dB at 1550 nm

### Applications

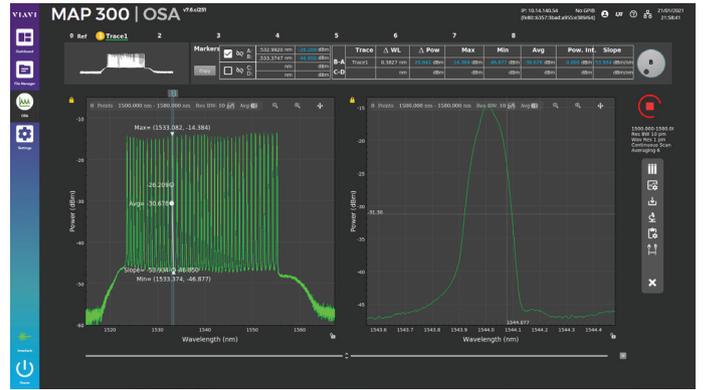
- DWDM Coherent module test
- IEEE client module test (O-band)
- Gain and Noise figure measurements
- CWDM and DWDM component test
- CW Source characterization

### Safety Information

- When installed in a MAP mainframe, complies to CE, CSA/UL/IEC61010-1, LXI Class C requirements, meets the requirements of Class 1M in IEC 60825-1 (2014), and complies with 21 CFR 1040.1 except deviations per Laser Notice No. 50

INVISIBLE LASER RADIATION  
DO NOT VIEW DIRECTLY WITH  
OPTICAL INSTRUMENTS  
CLASS 1M PRODUCT  
(IEC 60825-1)

As part of the VIAVI Solutions MAP mainframe (now on its 3rd generation), the mOSA-C1 can be combined with over 15 optical application modules to provide a complete solution across a large range of optical telecom technologies. This includes coherent and client transceivers, source lasers, optical amplifiers and passive components. The VIAVI MAP mainframe now boasts two industry leading Spectrum Analyzers. The full-band, ultra-fast, ultra-compact grating based mOSA-C1 is complimented by the C-band focused, high resolution coherent measurement based mHROSA-A1.



MAP-300 mOSA super application user interface

A web accessible, simple, and intuitive graphical user interface redefines the user experience and is quick for new users to learn, while boasting advanced features expected by the most demanding users. Remote automation has been dramatically simplified to enable quick, simple integration into PC based automated test environments.

The mOSA is currently compatible with the MAP-300 mainframe family.



Figure 1: The mOSA-C1 is a member of the MAP LightDirect family. The flexibility of the MAP platform enables users to deploy the same OSA in multiple environments. Modules can be combined to build powerful measurement solutions for technology across telecom photonics.

2 Optical Spectrum Analyzer (mOSA-C1)

## Module Details

VIAMI has been a leader in the design of optical test systems for over 30 years dating back to its heritage as JDSU. Decades of geometric optics, alignment, system control and analogue measurement are critical. Leveraging advanced optical components and next generation system on a chip technology, the mOSA-C1 re-imagines the control, speed and just how compact a performance monochromator can be.

### Speed

The direct monochromator drive has been optimized for over 10 years of continuous use with measurements as fast as 1.6 seconds over the full 400 nm of measurement range. Next generation power measurement sub systems allow spectral traces at a full 1 pm resolution, at maximum speed (scanning at 1800 nm/s). Combined, the measurement speed, resolution and available memory give users access to all the data, all the time. Zooming and panning to find regions of interest without having to guess ahead of time simplifies troubleshooting complicated systems. Scanning over smaller ranges is possible and can be used to optimize measurement time.



### Measurement Performance

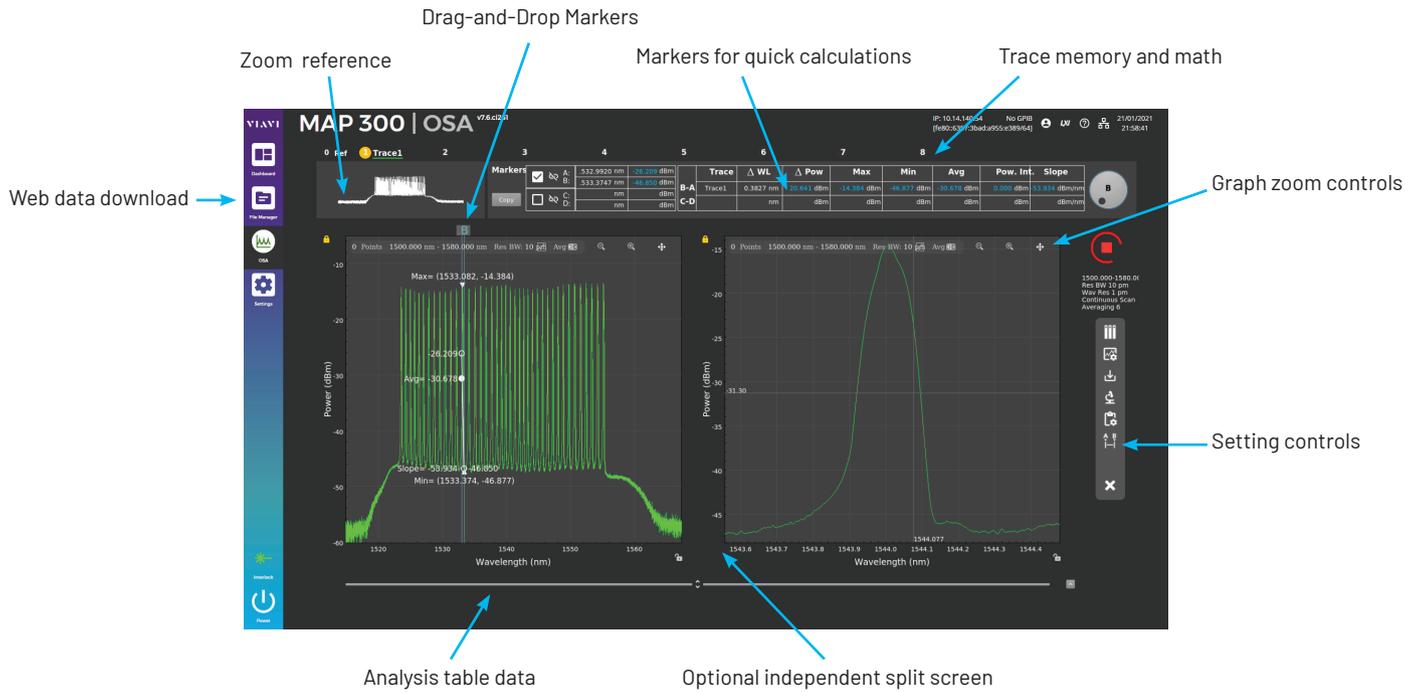
The mOSA-C1 takes the guess work out of creating the optimal settings. OSA performance is both fast and sensitive with enough memory that painful trade-offs between power sensitivity, spectral resolution, measurement speed, and close-in dynamic range are no longer required.



- Increased memory allows the measurement to be acquired at full resolution. Intuitive markers and zoom controls make it easy to find the data you are looking for.
- Averaging low power signals is performed by averaging multiple individual scans, allowing the user to see a region of interest almost immediately. No time is wasted waiting for measurements to complete.
- Industry leading polarization sensitivity over the entire range of 0.05 dB.
- 20 pm resolution bandwidth ensures OSNR measurements are not impacted by tightly packed channels or long tails in the resolution bandwidth at low power.

## Simple and Powerful User Interface

The mOSA-C1 has a powerful yet simple user interface. Users can either access the GUI remotely over a simple web connection, use an HDMI monitor, or order a version with an integrated touchscreen.



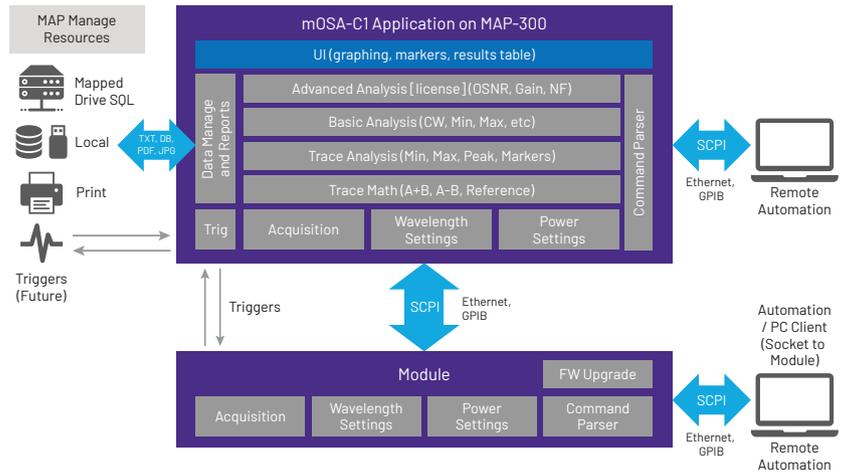
Markers and built-in analysis tools simplify system measurements across all types of technology classes. Trace math and automated referencing can be accomplished with a few simple settings. Optional analysis modules can be added to supplement the standard on board calculations, they include:

Optional Analysis Modules	Part Number	DDUT	Example Measurements
Passive Component	mSUP-OSA-PCOMP-A	CWDM, DWDM	Filter parameters
Transceiver (Client and Lineside)	mSUP-OSA-TX-A	Coherent Optics, Client Optics	CW, OSNR
Amplifier	mSUP-OSA-AMP-A	Optical Amplifier	Noise figure, Gain
CW source	mSUP-OSA-CWSRC-A	DFB, FP, LED and TLS sources	Side mode suppression, central wavelength, Number of modes, Bandwidth

## Remote Automation

Remote automation that is simple, intuitive, and fast to implement is a recognized benefit of all MAP modules. The mOSA-C1 has been developed with these ideas at its core. Using SCPI compliant commands over Ethernet has proven to be simple and efficient. The MAP may be ordered with an optional GPIB port if that is the preferred interface.

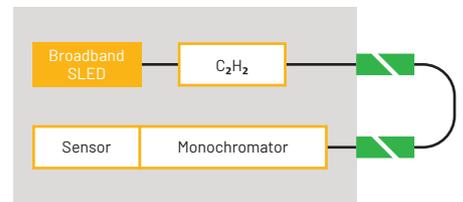
The mOSA-C1 has two remote automation methods. The “Direct-to-Module” method creates a simple set of commands to set-up, initiate and download trace data. This simple data acquisition centered approach is ideal for applications where customer developed analysis will be performed. The low overhead and simple command structures are designed to minimize delays and maximize data collection efficiency. The use of the “Application Environment” interface introduces new advanced functions that can be leveraged to simplify extraction of key parameters and data.



1080.900.0222

## Automated Calibration

Ambient temperature change, vibrations, and shock affect the measurement accuracy of high precision products such as optical spectrum analyzers. The internal calibration source has both an acetylene gas cell and broadband light source. A simple connection on the faceplate is required to connect the input to the mOSA-C1. The calibration process is fully automatic and only takes a few minutes to perform.



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## Mainframe and Modular Family

The VIAVI Multiple Application Platform (MAP) is a modular, rack mountable or benchtop, optical test and measurement platform with mainframes that can host 2, 3 or 8 modules. The LightDirect family of modules are characterized by their simple control and single function nature. Individually or together, they form the foundation of a diverse array of optical test applications.



Light Direct

## Full-Band OSA Specifications

Parameter <sup>1,2,3</sup>	Specification
Fiber type	SM 9/125
Connector <sup>4</sup>	FC/APC and SC/APC
<b>Spectral</b>	
Wavelength Range	1260 to 1660 nm
	237.9 to 180.6 THz
Wavelength Span	0.1 nm to full span
Wavelength Resolution Accuracy	5%
Wavelength Repeatability <sup>5</sup>	± 2.0 pm
Wavelength Accuracy <sup>3,6</sup>	± 10 pm (1550 to 1660 nm)
	± 15 pm (1260 to 1550 nm)
Wavelength Linearity	±10 pm between 1277-1653 nm
Minimum Resolution Bandwidth <sup>7</sup>	20 pm (1260 to 1635 nm)
	35 pm (1635 to 1660 nm)
Minimum Sampling Resolution <sup>8</sup>	1 pm
Close-in Dynamic Range ±200pm from peak <sup>9</sup>	> 45 dB
Built-In Calibration Light Source	Yes (manual connection)
<b>Sweep Time</b>	
10 nm Span	0.8 s   5.5 s (10 averages)
100 nm Span	1.1 s   7.0 s (10 averages)
1500 to 1655 nm (155 nm)	1.5 s   8.5 s (10 averages)
1260 to 1660 (400 nm)	2.7 s   13.0 s (10 averages)
<b>Power</b>	
Maximum Input Power	+20 dBm per channel full range
Maximum Safe Input Power	+25 dBm total input power
Level Sensitivity <sup>9,10</sup>	-62 dBm (1530 to 1660 nm)
	-60 dBm (1260 to 1520 nm)
Maximum Dynamic Range	65 dB (1500 to 1655 nm)
	60 dB (1260 to 1550 nm)
Level Accuracy <sup>11</sup>	± 0.5 dB
Level Linearity	± 0.1 dB
Level Flatness	0.2 dB (1500 to 1655 nm)
Polarization Dependence <sup>12</sup>	0.2 dB at 1550 nm
Optical Return Loss <sup>11</sup>	> 55 dB
<b>Other</b>	
Warm-up Time	Minimum 1 hour
Humidity	15 to 80% RH
Operating Temperature	15 to 35°C (59 to 95°F)
Dimensions	4.1 x 13.3 x 37.0 cm (1.6 x 5.22 x 14.58 in)
Weight	1.3 kg (2.8 lb)
Calibration Period	1 year
Reliability/Lifetime	1x10 <sup>9</sup> scans of continuous operation
Chassis Compatibility	MAP-300 Series

(View footnotes on page 7)

## C- and L-band OSA Specifications

Parameter <sup>1, 2, 3</sup>	Specification
Fiber Type	SM 9/125
Connector <sup>4</sup>	FC/APC and SC/APC
<b>Spectral</b>	
Wavelength Range	1500 to 1655 nm
	199.86 to 181.14 THz
Wavelength Resolution Accuracy	5%
Wavelength Repeatability <sup>5</sup>	± 2 pm
Wavelength Accuracy <sup>3, 6</sup>	± 10 pm
Minimum Resolution Bandwidth <sup>7</sup>	20 pm
Minimum Sampling Resolution <sup>8</sup>	1 pm
Sweep Time (Full Wavelength Range)	1.6 sec. (Single Sweep)
	10.6 sec. (10x averages)
Close-in Dynamic Range ±200 pm from peak <sup>9</sup>	> 35 dB
Built-in Calibration Light Source	Yes (manual connection)
<b>Power</b>	
Maximum Input Power Per Channel	+20 dBm
Maximum Safe Input Power	+25 dBm total input power
Level Sensitivity <sup>9, 10</sup>	-60 dBm
Maximum Dynamic Range	65 dB
Level Accuracy <sup>11</sup>	± 0.5 dB
Level Linearity	± 0.1 dB
Level Flatness	0.2 dB
Polarization Dependence <sup>12</sup>	0.2 dB at 1550 nm
Optical Return Loss <sup>11</sup>	>55 dB
<b>Other</b>	
Warm-Up Time	Minimum 1 hour
Operating Humidity	15 to 80% RH
Operating Temperature	15 to 35°C (59 to 95°F)
Dimensions	4.1 x 13.3 x 37.0 cm (1.6 x 5.22 x 14.58 in)
Weight	1.3 kg (2.8 lb)
Calibration Period	1 year
Optomechanical Reliability/Lifetime	1x10 <sup>9</sup> scans of continuous operation
Mainframe Compatibility	MAP-300 Series

<sup>1</sup> With 9.5/125 µm single-mode (SM) fiber and FC/APC connector

<sup>2</sup> After 90-minute warm-up time

<sup>3</sup> Temperature condition at 23 ±3°C

<sup>4</sup> Might require MAP Series FC/APC-SC/APC mating sleeve (AC503); purchased separately

<sup>5</sup> Measured over 1 minute

<sup>6</sup> After wavelength calibration with built-in reference light source

<sup>7</sup> For all wavelengths below 1635 nm, ± 35 pm elsewhere

<sup>8</sup> For all ranges below 300 nm

<sup>9</sup> Measured at 20 pm resolution bandwidth with 20 averages

<sup>10</sup> (IEC 61746-2 Section 3.24 - Noise level at 98%) on 10 nm windows

<sup>11</sup> With VIAVI Master SM fiber with FC/APC connector

<sup>12</sup> Measured with a broadband source

## Ordering Information

For more information on this or other products and their availability, please contact your local VIAVI account manager or VIAVI directly at 1-844-GO-VIAVI (1-844-468-4284) or to reach the VIAVI office nearest you, visit [viavisolutions.com/contacts](http://viavisolutions.com/contacts).

### Module Part Numbers

Order Code	Description
MOSA-C1A1G1A-M100-MFA	MAP-Series OSA All band general performance manual cal. SMF FC/APC
MOSA-C1CLG1A-M100-MFA	MAP-Series OSA C and L-band general performance manual cal. SMF FC/APC

### Software Analysis Packs Part Numbers

Order Code	Description
mSUP-OSA-PCOMP-A	Passive Components
mSUP-OSA-TX-A	Transceiver (Client and Lineside)
MSUP-OSA-AMP-A	Amplifier License
mSUP-OSA-CWSRC-A	CW Source License

## Accessories

Accessories (Optional)	Product and description	
<b>Inspection and Cleaning Tools</b>	CleanBlastPRO	The patented VIAVI Solutions® CleanBlastPRO fiber end-face cleaning system provides a fast, effective, and cost-efficient solution for removing dirt and debris from connectors in most common applications.
	FiberChek probe microscope	One-button FiberChek Probe delivers a reliable, fully autonomous, handheld inspection solution for every fiber technician.
	P5000i fiber microscope	Automated Fiber Inspection and Analysis Probe provides PASS/FAIL capability to PC, laptops, mobile devices and VIAVI test solutions.
<b>Replacement Parts</b>	Mating sleeves	AC502;FC/APC-FC/APC Universal Connector Adapter
		AC503;FC/APC-SC/APC Universal Connector Adapter

A wider range of inspection tools are available at VIAVI. More information about the products and accessories can be accessed through our website at [www.viavisolutions.com](http://www.viavisolutions.com). For further assistance please contact your local VIAVI account manager or VIAVI directly at 1-844-GO-VIAVI (1-844-468-4284) or to reach the VIAVI office nearest you, visit [viavisolutions.com/contacts](http://viavisolutions.com/contacts).



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