

# VIAVI

## Semiconductor Optical Amplifier (SOA)

The Multiple Application Platform (MAP) O-band Optical Amplifier (mSRC-C23000SA/mSRC-C23300SA) is a single or dual channel, polarization-independent semiconductor optical amplifier (SOA). It is a specialized variant of the mSRC-C2 family of stabilized semiconductor light sources.



As loss requirements for 100GE, 200GE and 400GE transmission continue to decrease, optical amplifiers have become a critical element in the test automation tool kit, alongside attenuators, power meters and switches. There are three key reasons that require amplification in a manufacturing test system:

- The base test system automation and the use of attenuators, switches, and mux/demux optics create path losses that exceed the path loss allowance.
- The reference transmitter power is not high enough to achieve an overload condition.
- Tests in manufacturing might be performed in loopback mode, and the DUT TX does not have enough power to achieve overload and guarantee interoperability.

The mSRC-C23000SA and mSRC-C23300SA and provide enough gain to overcome these issues and ensure receivers can be verified over their full dynamic range.

### Key Benefits

- > 10 dB of small signal gain in the O-band.
- Saturated output power > 10 dB.
- Operating range from 1270 to 1340 nm with minimal spectral ripple.
- Polarization independent input.
- Temperature stabilized features.

### Applications

- Testing LR4 and LR8 100GE, 200GE and 400GE interfaces.
- RX overload and recovery testing.
- Broadband light source for passive component testing.

### Safety Information

- When installed in a MAP chassis, the module complies with CE, CSA/UL/IEC61010-1, LXI Class C requirements, meets the requirements of Class 3B in standard IEC 60825-1 (2014), and complies with 21 CFR 1040.1 except deviations per Laser Notice No. 50, July 2001.

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

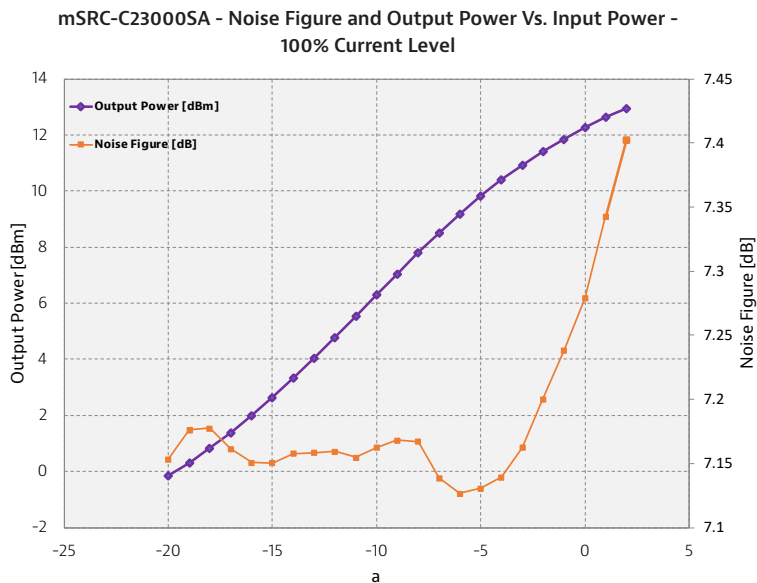


Figure 1 - Example gain vs input power for the mSRC-C23000SA

The bandwidth of the amplifier can support the wavelengths used in the LR4 and LR8 interfaces. When set to the disabled state, the amplifier can provide > 50dB of attenuation and effectively isolate an individual carrier.

## Functional Description

The SOA is mainly used to amplify an optical signal directly without the need to convert it to an electrical signal first. The use of the semiconductor as a gain medium increases the optical launch power to compensate for losses in the optical system. Integration of the VIAVI mSRC-C23000SA/mSRC-C23300SA require the use of additional optical modules. Figure 2 and

Figure 3 provide implementation examples. A VOA at the input ensures that the launch power into the SOA is far from saturation. The VOA also ensures the best noise figure by allowing the amplifier to operate at 100%. Optical switches and mux/demux optics automate loopback and eye-mask measurements.

Figure 2 shows a system that enables either an individual lane to be extracted and tested or a loopback test to be performed. This implementation improves eye-mask measurements, with minimal disruption to the loopback test. Figure 3 shows the use of four amplifiers to amplify each lane individually. This implementation allows for overload testing.

If eye-mask or power measurements per lane are required, three of the amplifiers can be set to the disabled state to block unwanted carriers.

In both implementations, care must be taken to ensure minimal return loss at all connection points. Most importantly, ensure that all conditions necessary for safe handling and operation are met while working with optical amplifiers.

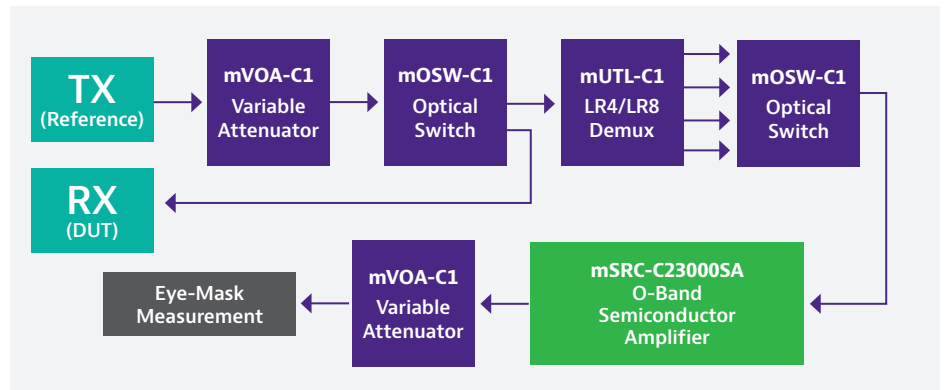


Figure 2 - The amplifier is used to improve eye-mask measurements

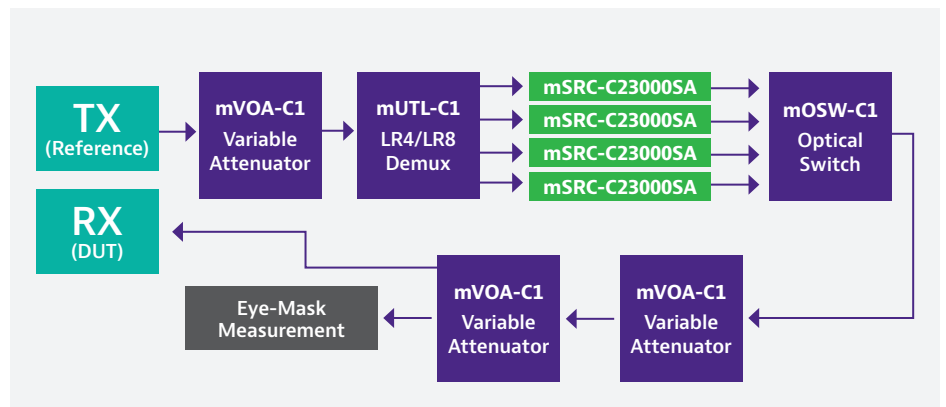


Figure 3 - Four amplifiers (one per carrier) are used to enable overload testing

An intuitive graphic user interface (GUI) is optimized for use in either a laboratory or a manufacturing environment. Efficient transition between summary and detailed views allow users to operate at a system level or access the full power of a module. The GUI provides controls for setting the power level from 10% to 100% or disabling the power entirely.

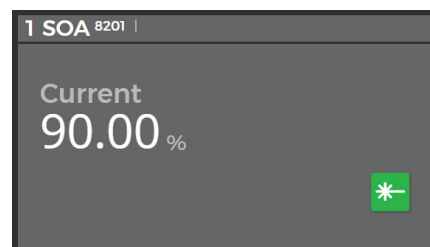


Figure 4 - SOA MAP-300 summary view GUI

## Chassis and Modular Family

The VIAVI Multiple Application Platform (MAP) is a modular, rack mountable or benchtop, optical test and measurement platform with chassis' that can host 2, 3 or 8 application 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. The web enabled multiuser interface is simple and intuitive. LXI compliant with a full suite of SCPI based automation drivers and PC based management tools, the VIAVI MAP is optimized for both the lab to manufacturing environments.

The SOA is part of the LightDirect module family. Alongside the many other modules, such as light sources, polarization scramblers, power meters, and spectrum analyzers, the MAP series is the ideal, modular platform for photonic system and module testing.

The SOA is compatible with all current MAP-300 and MAP-200 chassis.



LightDirect

## Specifications

Specification <sup>1,2</sup>	O-band Optical Amplifier (mSRC-C23000SA)
Peak wavelength	1310 nm (228.85 THz)
Operating Wavelength	1270 – 1340 nm (223.73 – 236.06 THz)
Input Power Range	-30 to 3 dBm
Small Signal Gain 1t 1310nm -25 dBm input	> 10 dB (13 dB typical)
Saturated Output Power @ 1310nm 3dBm input	> 10 dBm
Noise Figure at 1310nm -25 dBm input	≤ 9 dB
Polarization Dependent Gain at 1310nm -25 dBm input	≤ 3.5 dB
Attenuation when disabled	> 45 dB
Spectral Ripple (OSA = 0.1 nm)	< 1 dB (0.5 dB typical)
TEC Stabilized	Yes
Power Control Mode	Constant Current
Fiber Type <sup>3</sup>	Single Mode
Connector Type	FC/APC
Operation Temperature	10 to 40
Operation Humidity	Max 85% RH, non-condensing 10 to 40
Storage Temperature	-30 to 60
Dimensions (W x H x D)	4.06 x 13.26 x 37.03 (1.6 x 5.22 x 14.58 in)
Weight	1.3 kg

<sup>1</sup>All optical measurements were done after minimum 30 minutes warming up

<sup>2</sup>Maximum current, controlled environment 23±1°C, APC connector (SM) direct to power meter or OSA

<sup>3</sup>For IEC 60793-2-50 Type B1.3/ ISO 11801 OS2-compliant single-mode fiber

## 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](https://viavisolutions.com/contacts).

Part Number	Description
MSRC-C23000SA-M100-MFA	O-band Semiconductor Optical Amplifier SMF FC/APC
MSRC-C23300SA-M100-MFA	Dual 1310 nm Semiconductor Optical Amplifier SMF FC/APC

## Accessories

Accessories (Optional)	Product and description	
Inspection and cleaning tool	CleanBlast	The patented VIAVI Solutions® CleanBlast fiber end-face cleaning system provides a fast, effective, and cost-efficient solution for removing dirt and debris from connectors in most common applications. It is available in a benchtop and portable version
	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 & Analysis Probe provides PASS/FAIL capability to PC, laptops, mobile devices and VIAVI test solutions.
Replacement Parts	Mating sleeves	AC500;FC/PC-FC/PC Universal Connector Adapter
		AC501;FC/PC-SC/PC Universal Connector Adapter
		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](https://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](https://viavisolutions.com/contacts).