VIAVI Solutions

Data Sheet

VIAVI
MAP-200 O-Band Optical Amplifier

The Multiple Application Platform (MAP) O-band Optical Amplifier (mSRC-C23000SA) is a single-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 scenarios 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.

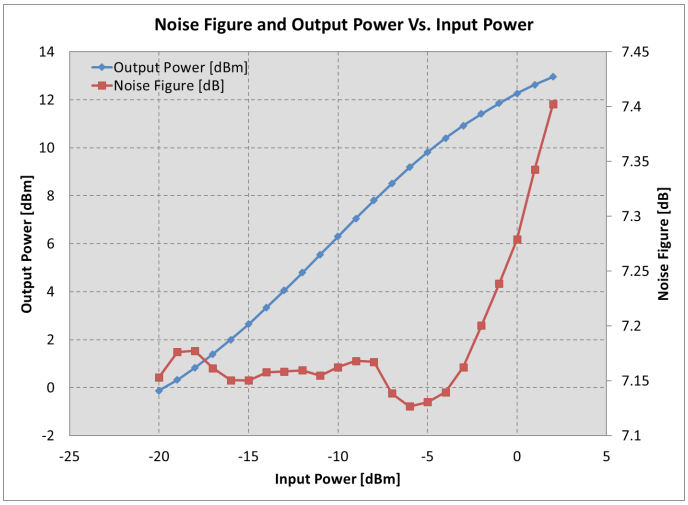

Figure 1: Example gain vs input power for the mSRC-C23000SA

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

Compliance

- 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

Light Direct

Figure 2: MAP-200 O-Band Optical Amplifier Graphic Interface UI

Figure 3: The MAP-200 has more than 15 modules and three chassis sizes (2-Slot MAP-220C shown)

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

The mSRC-C23000SA has a simple, intuitive graphical user interface (UI) for use in R&D environments. The UI provides controls for setting the power level from 10% to 100% or disabling the power entirely. As part of the LightDirect family of MAP-200 modules, the mSRC-C23000SA supports communications over Ethernet or GPIB, and can be directly managed using a PC-based automation system or via VNC. It can be deployed in all MAP-200 chassis—the compact 2-slot MAP-220C chassis and the larger 3-slot and 8-slot rack-mount chassis (MAP-230B and MAP-280, respectively). The mSRC-C23000SA, along with a wide range of other MAP-200 modules that includes amplifiers, precision attenuators, power meters, and spectrum analyzers, help make the MAP-200 series the ideal modular photonics test platform.

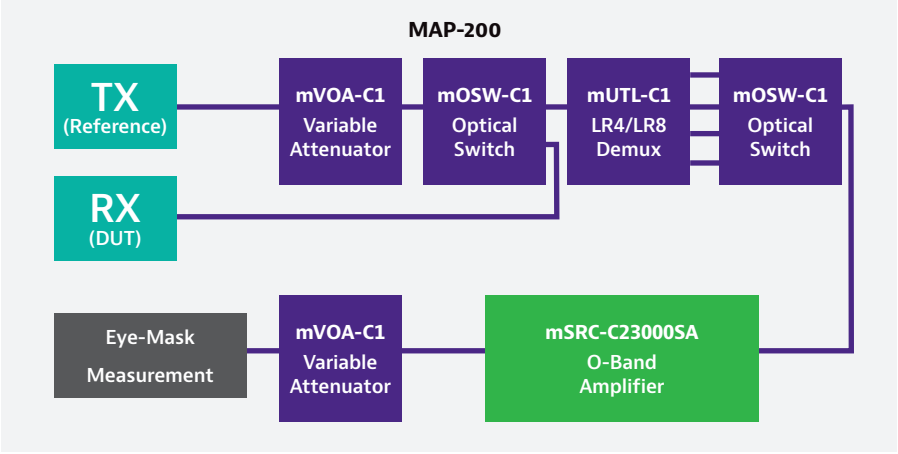

Figure 4: The amplifier is used to improve eye-mask measurements

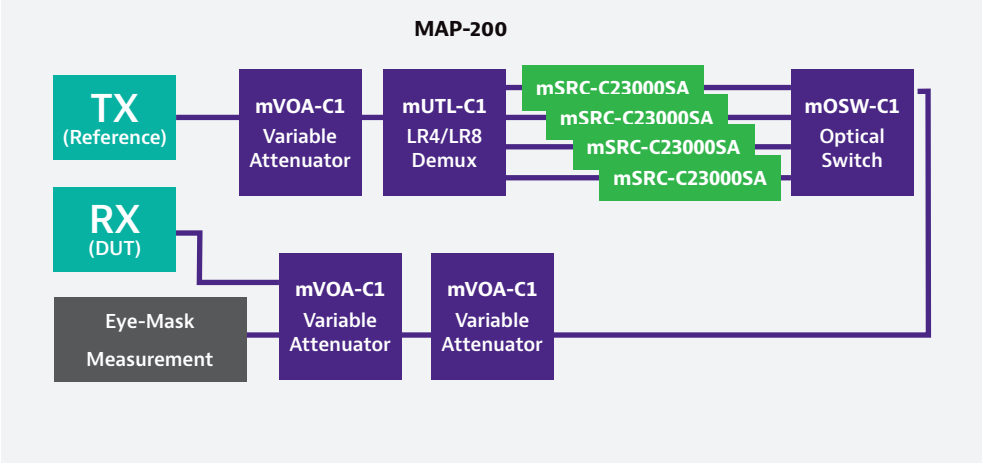

Figure 5: Four amplifiers (one per carrier) are used to enable overload testing

Integration of the mSRC-C23000SA requires the use of additional optical modules. Figure 4 and Figure 5 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 4 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 5 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.

Specifications

Specification[1,2]	O-band Optical Amplifier (mSRC-C23000SA)
Peak Wavelength	1310 nm
Operating Wavelength	1270 - 1340 nm
Input Power Range	-30 to 3 dBm
Small Signal Gain @ 1310nm -25dBm input	> 10 dB (13 dB typical)
Saturated Output Power @ 1310nm 3dBm input	> 10 dBm
Noise Figure @ 1310nm -25dBm input	≤ 9 dB
Polarization Dependent Gain @ 1310nm -25dBm input	≤ 3.5 dB
Attenuation when Disabled	> 45 dB
Spectral Ripple (OSA RB = 0.1nm)	< 1 dB (0.5 dB typical)
TEC Stabilized	Yes
Power Control Mode	Constant Current
Fiber Type[3]	Single Mode
Connector Type	FC/APC
Operation Temperature	5 to 40°C
Operation Humidity	Max 85% RH, non-condensing from 5 to 40°C
Storage Temperature	-30 to 60°C
Dimensions (W x H x D)	4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)
Weight	1.3 kg

1. All optical measurements were done after minimum 30 minutes warming up
2. Maximum current, controlled environment 23±1°C, APC connector (SM) direct to power meter or OSA
3. For IEC 60793-2-50 Type B1.3/ ISO 11801 OS2-compliant single-mode fiber

Part Numbers

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

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