Multiple Application Platform (MAP-200)

Platform Overview
Flexible, Dynamic Solution for Comprehensive Optical and Electro-Optical Testing

The JDSU Multiple Application Platform (MAP-200) is designed to help manage the test and measurement needs of an industry that requires flexibility and dynamic performance. Our goal is to offer researchers, designers, and manufacturing engineers a platform that exceeds all others with its modularity, reliability, and flexibility. The MAP-200 module breadth and performance are consistent with the fiber optic technology leadership from JDSU.

**Outstanding Support**

JDSU is committed to providing you with the strongest possible application support—a commitment that extends beyond the operation of our products to understanding the specifics of the measurements being implemented. We believe in learning from every customer interaction. Combining your measurement experiences with ours and leveraging the flexibility and performance of our products, enables us to deliver more powerful solutions.

We strive to optimize measurement performance, reduce cycle times, and minimize ownership costs. Together, we can create solutions within your capital budget that simplify your development, without compromising the performance and reliability necessary to keep your program or factory on track.

Our next-generation products are born out of your needs. Throughout our history, we have listened to our customers with eagerness to explore new ideas and opportunities. These ideas may range from simple product enhancements to new product concepts. We have confidence in our product breadth, yet we are equally driven toward finding innovative ways to add value to your test and measurement applications.
Multiple MAP-200 Mainframe Configurations

The MAP-200 mainframes are offered in three configurations for optimal adaptability within test sets: a three-slot configuration and a 19-inch rack, eight-slot configuration with either front- or rear-facing orientation for optimal fiber routing. All three configurations are 3 RU high. The MAP-200 mainframes include all hardware required for bench-top use, including rubber-accented feet located at the corners for optimal stability and vibration isolation. Investment protection is maximized for previous-generation MAP customers using a simple transition kit that allows the insertion of previously field-deployed MAP modules in the MAP-200 mainframe. The MAP-200 also provides additional cost savings by letting users share the modules within a mainframe.
The MAP-200 Solution Selection Guide

**MAP EDFA**
Available in six configurations: pre-amplifier, booster, booster-high power, mid-span access booster, in-line and booster-DWDM. Features a low noise figure, high output power, and high gain. Currently the high power booster model offers an output of 21 dBm.

Page 14

**MAP Polarization Controller**
An efficient, precise polarization controller that can create any state of polarization. May also be used as part of a polarization state analyzer.

Page 21

**MAP Tunable Filter**
Tunable bandpass filter offers continuous wavelength tuning from 1520 to 1630 nm. The standard model provides 300 mW maximum input power. The high power option provides 1000 mW maximum input power.

Page 25

**MAP Variable Optical Attenuator**
A high resolution, wide wavelength range attenuator. Available with 1 or 2 devices per module, single-mode or multimode fiber, four standard connector types, and tap option or optional power control feature.

Page 17

**MAP Variable Backreflector**
Provides precise levels of return loss to transmitters allowing measurements of system sensitivity or system degradation as a function of backreflection. Available in single-mode or multimode and with an optional coupler for monitoring.

Page 23

**MAP Optical Power Meter**
Features high accuracy, high linearity, and extremely low polarization dependent loss (PDL). Incorporates a standard analog output. Model with 10 mm detector adapter may be used with up to 72 channel multimode ribbon fibers.

Page 29

**MAP Broadband Source**
Offers an amplified spontaneous emission (ASE) output that features flattened high power density across the C-band. The source provides high spectral stability.

Page 34
**MAP Tunable DBR Laser**
New-generation tunable laser ideal for DWDM testing where the capability to change wavelength on demand over the C- and L-bands with 25 GHz spacing is essential.
Page 36

**MAP LED Source**
Provides a high-power light emitting diode (LED)-based light source with variable output power.
Page 41

**MAP Small Channel Count Switch**
A low-cost switch allowing for a number of configurations. The switch is bidirectional, transparent to signal format, and available in both single-mode and multimode versions.
Page 46

**Adapters and Calibrated Jumpers**
For use with the JDSU power meters from the MAP, c-Series, SWS, OCETS, and legacy product lines.
Page 51

**MAP Fabry-Perot Laser**
Produces a stable light source at desired wavelengths. Offers optimal stability and features such as built-in internal modulation capabilities, and variable power control.
Page 38

**MAP Large Channel Count Switch**
A bidirectional switch, allows connections of a common port to up to 50 channels. Available in single- or dual-switch configurations. Exhibits low insertion loss and high return loss.
Page 43

**MAP Utility**
Simplifies the mechanical integration of passive optical components for test sets. Highly configurable and contains passive optical devices such as splitters and taps. Supports angle or flat polish connectors as well as single-mode and multimode fibers.
Page 48
The MAP-200 Solution Selection Guide

**Application Reference Table**

The MAP-200 system of products addresses standard testing requirements in addition to evolving testing challenges. See the table below for a sampling of tests and the appropriate measurement equipment.

<table>
<thead>
<tr>
<th>Test Requirement</th>
<th>Broadband Source</th>
<th>Couplers and Splitters</th>
<th>EDFA</th>
<th>Fabry-Perot Laser</th>
<th>Polarization Controller</th>
<th>Power Meter</th>
<th>Switches</th>
<th>Tunable Filter</th>
<th>Tunable DBR Laser</th>
<th>Variable Backreflector</th>
<th>Variable Optical Attenuator</th>
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<tbody>
<tr>
<td>40GE 10GE</td>
<td>✅</td>
<td>✅</td>
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<td>POLARIZATION DEPENDENT LOSS</td>
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</table>

*Note: The table entries with ✅ indicate the presence of the feature.*
Multiple Application Platform
MAP-200

Key Features
- Available in three mainframe configurations
- GPIB- and LXI-compliant (Ethernet)
- Optional 10.4-inch touch screen display module with integrated keypad and scroll wheel
- DVI port for external display
- USB device ports for external keyboard and mouse
- Hot-swappable module (module can be inserted or removed without powering down)
- Field replaceable controller/power supply module
- Compatible with current MAP modules

Applications
- Enables transceiver and transponder testing
- Permits comprehensive passive and active component, laser, and amplifier testing
- Facilitates 10 G and 40 G system and subsystem testing

Compliance
- Optical source modules, when installed in the MAP Mainframe, meet the requirements of standard IEC 60825-1(2002) and comply with CFR 1040.10 except deviations per Laser Notice No. 50, July 2001 Key Feature Number 4
- CSA/UL/IEC 61010-1
- LXI Class C compliant

The JDSU Multiple Application Platform (MAP-200) is an optical test and measurement platform optimized for cost-effective development and manufacturing of optical transmission network elements. Today’s rapidly changing optical market requires investment in productivity-enhancing technologies and tools, making the MAP-200 scalable test platform the right tool needed in even the most stringent environments.

Based on the previous-generation Multiple Application Platform (MAP), the MAP-200 builds on the differentiation of offering the broadest portfolio of modules in the densest and most configurable platform. The MAP-200 is optimized for test applications in lab and manufacturing environments ranging from insertion loss testing to dispersion penalty testing (see Table 1).

Table 1 List of MAP-200 applications by technology

<table>
<thead>
<tr>
<th>Passives</th>
<th>Lasers and Amplifiers</th>
<th>Optical Transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Insertion Loss</td>
<td>- Gain Flatness</td>
<td>- Stress Receiver Compliance</td>
</tr>
<tr>
<td>- Polarization Dependent Loss</td>
<td>- Output Power</td>
<td>- Jitter Testing</td>
</tr>
<tr>
<td>- Return Loss</td>
<td>- Transient Response</td>
<td>- Sensitivity</td>
</tr>
<tr>
<td></td>
<td>- Spectral Width</td>
<td>- Dispersion Penalty</td>
</tr>
<tr>
<td></td>
<td>- Side Mode Suppression Ratio</td>
<td>- SMSR</td>
</tr>
<tr>
<td></td>
<td>- Wavelength</td>
<td>- Receiver Overload</td>
</tr>
<tr>
<td></td>
<td>- NF and OSNR</td>
<td>- Eye Mask/Extinction Ratio</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- OSNR Sensitivity</td>
</tr>
</tbody>
</table>
Multiple MAP-200 Mainframe Configurations

The MAP-200 mainframes are offered in three configurations for optimal adaptability within test sets: a three-slot configuration and a 19-inch rack, eight-slot configuration with either front- or rear-facing orientation for optimal fiber routing. All three configurations are 3 RU high. The MAP-200 mainframes come standard with hardware required for bench-top use including rubber-accented feet located at the corners for optimal stability and vibration isolation. Investment protection is maximized by use of a simple transition kit, which allows insertion of previously field-deployed MAP modules in the MAP-200 mainframe. Furthermore, the MAP-200 provides additional cost savings by letting users share the modules within a mainframe.

High-Performance MAP-200 Modules

The MAP-200 portfolio of modules include 16 types of high-performance modules including signal conditioning and switching, sources and amplification, and power meters.

MAP Power Meters provide high absolute power measurement accuracy over a broad power and wavelength range. They support a broad combination of fiber types and connectivity option optimized for datacom and telecom applications. High speed data logging capability allows for making transient measurements.

MAP Amplifiers are designed to meet the broadest optical signal amplification applications. They are available at various saturated output power, gain flattened or non-gain flattened, C-band, L-band, and with low noise figure.

MAP Attenuators provide the highest performance optical power control solution. The attenuators offer the lowest insertion loss, highest input power capability, low polarization dependent loss (PDL), high dynamic range, and ultra-flat attenuation over wavelength.

MAP Tunable Filters provide the lowest loss and narrowest bandwidth filter with the highest input power capability in the industry.

MAP Switches are the most configurable optical signal routing solutions in their class. MAP Switches are available in configurations including low channel count matrix (2x2) and single input to multiple outputs ranging from 2 to 50. In the 1x2 and 2x2 format, the modules are available with up to eight switches per single slot module.

MAP Sources are ideal sources for applications requiring a stable stimulus for parametric measurements. The sources are available at key telecom wavelengths, with broad or narrow spectral bandwidth, or with tunable spectrum.

Other functions available in the MAP-200 include a variable backreflector, polarization controller, and utility modules.
Elaborate Local Interface and Friendly Graphical User Interface

To view the graphical user interface (GUI) and for local control, the MAP-200 mainframes are compatible with standard universal serial bus (USB) keyboards, USB mice, and digital video interface (DVI) monitors. For added convenience and flexibility, JDSU offers an optional purpose-built keypad/display module (MAP-200BKD), shown in Figure 1, that provides full local control capabilities. The MAP-200BKD features a scroll wheel, seven soft keys, five navigation buttons, plus seven pre-assigned buttons to navigate the GUI. Touch capability and user-friendly controls come standard for operation with the touch of a finger or with the supplied stylus. Located at the back of the MAP-200BKD module is an industry-standard mounting hole compatible with commercially available display mounts or the purpose-built MAP-200 Keypad Display 19-inch rack-mount kit (MAP-200B09). Alternatively, the GUI can be accessed in a PC environment via a virtual network connection (VNC) client.

When in use with the MAP-230B mainframe, shown in Figure 2b, the MAP-200BKD module can be mounted to the top face of it. Pop-out feet located on the mainframe lets users position the combined unit in a front-facing manner to ensure optimal viewing and interaction with the unit.

Figures 2a and 2b  Suggested MAP-230B and MAP-200BKD implementation. Figure 2a shows the MAP-200BKD mounted on the MAP-230B, an optimal configuration for applications requiring high interactivity with the GUI. Figure 2b shows the MAP-200BKD next to the MAP-280, a configuration that is optimal for applications requiring high interactivity with the device under test (DUT) and the MAP-200 modules, as well as monitoring via the GUI.
Extensive Input/Output Interfaces

The MAP-200 is a USB-, General Purpose Interface Bus- (GPIB-), and Ethernet-enabled device that supports the latest test equipment interface standard, local area network (LAN) extension interface for instrumentation (LXI). LXI is the Ethernet-based successor to GPIB. The LXI standard defines devices using open-standard for system inter-device communication.

All mainframe configurations include:

- GPIB, Ethernet, and USB device ports for remote communication
- 4 USB host ports for installing peripheral devices, including USB drives, a mouse, and a keyboard
- LXI-compliant Trigger Bus connections
- Ethernet reset button
- Laser interlock key in the front and remote interlock connector in the rear
- LXI-compliant light emitting diodes (LEDs) on the front panel
- DVI connector for external monitor

Standard Compliant Automation Drivers

MAP-200 is supplied with Interchangeable Virtual Instrument (IVI) drivers, which are intuitive and optimized for ease of use with popular Application Development Environments such as LabVIEW, Visual C++, Visual Basic, and LabWindows®. These drivers provide full control of the modules and provide drop-in instrument programming capabilities, allowing test programmers to focus on test-level functions and sequences rather than the details required to communicate with the specific modules in the MAP system. The IVI drivers allow for simulation mode that lets Automation Developers capture system configurations so they can perform most of their development off line, freeing hardware for other purposes. These features make test automation development and debugging fast and easy.
## Mainframe Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>MAP-230B</th>
<th>MAP-280</th>
<th>MAP-280R</th>
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</thead>
<tbody>
<tr>
<td><strong>Capacity</strong></td>
<td>3 modules</td>
<td>8 modules</td>
<td>8 modules</td>
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<tr>
<td><strong>Controller</strong></td>
<td></td>
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</tr>
<tr>
<td>CPU</td>
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<td>Power PC architecture</td>
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<tr>
<td>Operating System</td>
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<td>Linux</td>
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</tr>
<tr>
<td>Internal Storage</td>
<td></td>
<td>200 MB user flash storage</td>
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</tr>
<tr>
<td><strong>Interfaces</strong></td>
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<tr>
<td>Remote interface</td>
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<td>USB, GPIB, Ethernet 10/100/1000Base-T</td>
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</tr>
<tr>
<td>USB device compatibility</td>
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<td>Mouse, keyboard, memory stick</td>
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<tr>
<td>Display External</td>
<td></td>
<td>MAP-200KD (optional) or standard DVI monitor</td>
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<tr>
<td><strong>Ports</strong></td>
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<tr>
<td>USB host ports</td>
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<td>2 rear and 2 front</td>
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<tr>
<td>USB device ports</td>
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<td>LAN</td>
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<tr>
<td>GPIB</td>
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<td>1 rear</td>
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<tr>
<td>DVI video</td>
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<td>1 rear</td>
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</tr>
<tr>
<td>LXI triggers</td>
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<td>25-pin Micro-D connectors</td>
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<tr>
<td>Driver type</td>
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<td>IVI-compliant</td>
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<tr>
<td>Driver compatibility</td>
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<td>LabVIEW, LabWindows, Visual C++, Visual Basic</td>
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</tr>
<tr>
<td>Accessibility</td>
<td></td>
<td>Multi-user sharing support</td>
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<tr>
<td><strong>Electrical and Safety</strong></td>
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</tr>
<tr>
<td>Power</td>
<td>100 to 125V AC/200 to 240V AC, 50/60 Hz, Auto-switching</td>
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<tr>
<td>(field-replaceable as part of the power supply controller module)</td>
<td>200 VA</td>
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<td>Power consumption</td>
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<td>Key located in front</td>
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<tr>
<td>Remote interlock</td>
<td>Terminals located in rear</td>
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<tr>
<td><strong>Mechanical and Environment</strong></td>
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<tr>
<td>Rack-mount kit</td>
<td>Optional</td>
<td>Included</td>
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<tr>
<td>Dimensions (W x H x D)(\text{ref})</td>
<td>29.2 x 14.9 x 42.0 cm</td>
<td>49.6 x 14.9 x 42.0 cm</td>
<td>49.6 x 14.9 x 42.0 cm</td>
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<tr>
<td>(11.5 x 5.9 x 16.6 in)</td>
<td>(19.6 x 5.9 x 16.6 in)</td>
<td>(19.6 x 5.9 x 16.6 in)</td>
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<tr>
<td>Weight</td>
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<td>6.8 kg (15 lb)</td>
<td>6.8 kg (15 lb)</td>
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<tr>
<td>Operating temperature</td>
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<td>Storage temperature</td>
<td>−30 to 60°C</td>
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<tr>
<td>Humidity</td>
<td>15–80% RH, 0 to 40°C non-condensing</td>
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</table>

1. The MAP-200 system has been tested and certified to an Altitude of 2,000 metres
2. Mains supply voltage fluctuation shall not exceed 10% of nominal supply voltage
3. Dimensions include bench-top mounting hardware

## MAP-200KD Display Specifications

<table>
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<tr>
<th>Parameter</th>
<th>Specification</th>
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<tbody>
<tr>
<td>Display dimensions (H x W)</td>
<td>10.4-inch color screen</td>
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<td>Resolution</td>
<td>800 x 600 resolution</td>
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<td>Power</td>
<td>Supplied from mainframe via MAP-200A01 Keypad/Display Cable Harness Kit</td>
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<tr>
<td>Weight</td>
<td>1.8 kg (4 lb)</td>
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</table>
Ordering Information

For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at customer.service@jdsu.com.

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Mainframes (Required)</strong></td>
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</tr>
<tr>
<td>MAP-280</td>
<td>MAP-200 8-slot mainframe</td>
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<tr>
<td>MAP-280R</td>
<td>MAP-200 8-slot mainframe factory reversed configuration</td>
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<tr>
<td>MAP-230B</td>
<td>MAP-200 3-slot mainframe</td>
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<tr>
<td><strong>Power Cords (Required)</strong></td>
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<tr>
<td>CORD-AU</td>
<td>Australia/China power cord</td>
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<tr>
<td>CORD-EU</td>
<td>European power cord</td>
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<td>CORD-JP</td>
<td>Japan power cord</td>
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<td>CORD-UK</td>
<td>United Kingdom power cord</td>
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<td>CORD-US</td>
<td>United States power cord</td>
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<td><strong>Accessories (Optional)</strong></td>
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<tr>
<td>MAP-200BKD</td>
<td>MAP-200 stand-alone keypad/display module</td>
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<td>MAP-200A01</td>
<td>MAP-200BKD keypad/display cable harness kit</td>
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<td>MAP-200A03</td>
<td>MAP-200 8-slot mainframe 19-inch rack-mount kit</td>
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<tr>
<td>MAP-200A13</td>
<td>MAP-200 adaptor kit for single width MAP modules (requires one kit per device)</td>
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<td>MAP-200A13D</td>
<td>MAP-200 adaptor kit for double width MAP modules (requires one kit per device)</td>
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<td>MAP-200B09</td>
<td>MAP-200BKD keypad/display module rack-mount kit</td>
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<tr>
<td>MAP-200A10</td>
<td>MAP-200 3-slot mainframe 19-inch rack-mount kit</td>
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<td><strong>Replacement/Spare Parts (Optional)</strong></td>
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<tr>
<td>MAP-200A02</td>
<td>MAP-200 controller for MAP-280 and MAP-230B</td>
</tr>
<tr>
<td>MAP-200A02R</td>
<td>MAP-200 controller for MAP-280R</td>
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<tr>
<td>MAP-200A04</td>
<td>MAP-200 safety interlock key</td>
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<tr>
<td>MAP-200A06</td>
<td>MAP-200 blanking plates (kit of 3)</td>
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<td>MAP-200A07</td>
<td>MAP-200 stylus</td>
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<td>MAP-200A08</td>
<td>MAP-200 3-slot mainframe flip-up feet</td>
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<td>MAP-200A11</td>
<td>MAP-200 detachable side panels for bench-top use</td>
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<tr>
<td>MAP-200A12</td>
<td>MAP-200 handles for detachable side panels</td>
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MAP Erbium-Doped Fiber Amplifier (mEDFA-A1)

Key Features

- Pre-amp, booster and in-line configurations
- High output power and gain maximize operating range
- Low noise figure minimizes optical impairment
- Monitoring and alarms available
- Can be automated when used with MAP-200 LXI-compliant interfaces and IVI drivers

Applications

- In-line, pre-amp and booster amplifier emulation
- Dense wavelength division multiplexing (DWDM) transmission for multi-channel applications
- SONET/SDH systems for single channel applications
- Optical signal-to-noise ratio (OSNR) experiments

The Multiple Application Platform (MAP) Erbium-Doped Fiber Amplifier (mEDFA-A1) is optimized for the industry-leading MAP-200 platform from JDSU. Based on the previous-generation MAP, the MAP-200 is the first photonic layer lab and manufacturing platform that is LAN Extensions for Instrumentation (LXI)-compliant by conforming to the required physical attributes, Ethernet connectivity, and interchangeable virtual instrument (IVI) drivers. The MAP-200 platform is optimized for density and maximum configurability to meet specific application requirements in the smallest possible foot print. The MAP EDFA has a saturated output power ranging from 14 dBm to 21 dBm, features noise figures as low as 3.7 dB and has gain flatness better than 2.0 dB. All MAP EDFA models are available for operation in C- or L-band.

Safety Information

- The MAP EDFA, when installed in a MAP chassis, complies to CE, CSA/UL/IEC61010-1, LXI Class C requirements, meets the requirements of Class 3B in standard IEC 60825-1 (2002), and complies with 21 CFR 1040.1 except deviations per Laser Notice No. 50, July 2001.

INVISIBLE LASER RADIATION
AVOID EXPOSURE TO BEAM
CLASS 3B LASER PRODUCT
(IEC 60825-1, 2002)
MAX. 500 mw, 700-1640 nm
# Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>1550</th>
<th>1552</th>
<th>1554</th>
<th>1558</th>
<th>1590</th>
<th>1592</th>
<th>1594</th>
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</table>
| Amplifier type | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-amp | Booster | Pre-ap...
Ordering Information

For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at customer.service@jdsu.com.

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEDFA-A15500</td>
<td>14 dBm C-band, Single Channel, Pre-amp</td>
</tr>
<tr>
<td>MEDFA-A15520</td>
<td>17 dBm C-band, Single Channel, Booster</td>
</tr>
<tr>
<td>MEDFA-A15522</td>
<td>20 dBm C-band, Single Channel, Booster</td>
</tr>
<tr>
<td>MEDFA-A15540</td>
<td>17 dBm C-band, Single Channel, In-Line Booster</td>
</tr>
<tr>
<td>MEDFA-A15580</td>
<td>21 dBm C-band, DWDM, Booster</td>
</tr>
<tr>
<td>MEDFA-A15900</td>
<td>15 dBm L-band, Single Channel, Pre-amp</td>
</tr>
<tr>
<td>MEDFA-A15920</td>
<td>15 dBm L-band, Single Channel, Booster</td>
</tr>
<tr>
<td>MEDFA-A15940</td>
<td>20 dBm L-band, Single Channel, In-Line Booster</td>
</tr>
</tbody>
</table>

UL is a registered trademark of Underwriters Laboratories, Inc.
MAP Variable Optical Attenuator
(mVOA-A2)

Key Features
- Ultra low insertion loss (<1.0 dB) and outstanding spectral uniformity
- Fastest transition speed in its class (up to 25 dB/s)
- Configurable by user at time of order (fiber type, density, built-in options, high power option)
- Optional built-in power monitor provides comprehensive closed-loop power control settings
- Optional higher power capability can withstand up to 2W input power for single-mode fiber (500 mW for MMF)
- Can be automated when used with MAP-200
- LXI-compliant interfaces and IVI drivers

Applications
- Transmitter dispersion testing and eye mask testing
- Receiver sensitivity testing
- EDFA noise figure and gain flatness testing
- Power meter calibration
- Loss simulation

Safety Information
- The MAP Variable Optical Attenuator, when installed in a MAP chassis, complies to CE, CSA/UL/IEC61010-1, plus LXI Class C requirements.

The Multiple Application Platform (MAP) Variable Optical Attenuator (mVOA-A2) is optimized for the industry-leading JDSU MAP-200 platform. Based on the previous-generation Multiple Application Platform (MAP), the MAP-200 is the first photonic layer lab and manufacturing platform that is LAN Extensions for Instrumentation (LXI)-compliant by conforming to the required physical attributes, Ethernet connectivity, and interchangeable virtual instrument (IVI) drivers. The MAP-200 platform is optimized for density and maximum configurability to meet specific application requirements in the smallest possible foot print.

The mVOA-A2 is a stepper motor and filter based attenuator that takes advantage of the latest available technologies to provide the highest performance optical power level control solution with the lowest optical impairments.

- Ultra low insertion loss to minimize loss budget utilization
- High accuracy and high repeatability to reduce measurement uncertainty
- Fast transition speed to reduce testing time
- Flat spectral response to reduce wavelength dependent uncertainty in multi-wavelength applications (CWDM, DWDM)
- Low backreflection to reduce instabilities due to reflected light
- Optional built-in wavelength calibrated power meter reduces the uncertainty by reducing external connections
- High input power capability for EDFA testing and multi-wavelength applications
The MAP Variable Optical Attenuator is a hot-pluggable cassette designed for use within the Multiple Application Platform (MAP). The MAP is a general purpose high density test and measurement platform for lab or production environments. Up to 16 independently controlled attenuators can be installed in a single MAP chassis.

![Image of Insertion Loss vs Wavelength](image1)

Figure 1: Example of insertion loss of the MAP Variable Optical Attenuator with single-mode fiber

![Image of Spectral Uniformity Relative to 0 dB Attenuation](image2)

Figure 2: Example of spectral uniformity relative to 0 dB attenuation
Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Single-mode</th>
<th>Multimode*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No power control</td>
<td>With power control</td>
</tr>
<tr>
<td>Insertion loss at minimum attenuation^(1, 2, 3)</td>
<td>&lt;1.0 dB^4</td>
<td>&lt;1.7 dB^5</td>
</tr>
<tr>
<td>Maximum input power</td>
<td>+23 dBm/+33 dBm</td>
<td>+23 dBm/+27 dBm</td>
</tr>
<tr>
<td>(Standard power/High power option)^10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wavelength range</td>
<td>1260 to 1650 nm</td>
<td>750 to 1330 nm</td>
</tr>
<tr>
<td>Attenuation range</td>
<td>70 dB</td>
<td>65 dB</td>
</tr>
<tr>
<td>Attenuation flatness</td>
<td>±0.04 dB from 0 to 30 dB</td>
<td>N/A</td>
</tr>
<tr>
<td>Attenuation slew rate (nominal)</td>
<td>25 dB/s typical</td>
<td>20 dB/s typical</td>
</tr>
<tr>
<td>Attenuation setting resolution</td>
<td>0.001 dB</td>
<td>0.001 dB</td>
</tr>
<tr>
<td>Attenuation accuracy</td>
<td>±0.1 dB</td>
<td>±0.1 dB</td>
</tr>
<tr>
<td>Attenuation repeatability</td>
<td>±0.01 dB</td>
<td>±0.01 dB</td>
</tr>
<tr>
<td>Closed loop output power range</td>
<td>N/A</td>
<td>–49 to +11 dBm @1310/1550 ±15 nm</td>
</tr>
<tr>
<td>(In-line power monitor option)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relative power meter uncertainty^(1, 3, 5)</td>
<td>N/A</td>
<td>±0.03 dB</td>
</tr>
<tr>
<td>Power setting repeatability</td>
<td>N/A</td>
<td>±0.015 dB</td>
</tr>
<tr>
<td>Power setting resolution</td>
<td>N/A</td>
<td>0.001 dBm</td>
</tr>
<tr>
<td>Polarization dependent loss (from 0 to 25 dB)^3, 6</td>
<td>&lt;0.08 dB</td>
<td>&lt;0.15 dB</td>
</tr>
<tr>
<td>Return loss’</td>
<td>&gt;55 dB typical APC/45 dB typical PC</td>
<td>&gt;30 dB typical (PC connector)</td>
</tr>
<tr>
<td>Shutter isolation</td>
<td></td>
<td>100 dB typical</td>
</tr>
<tr>
<td>Warm up time</td>
<td></td>
<td>30 minutes</td>
</tr>
<tr>
<td>Calibration period</td>
<td></td>
<td>2 years</td>
</tr>
<tr>
<td>Operating temperature</td>
<td></td>
<td>0 to 50°C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td></td>
<td>–30 to 60°C</td>
</tr>
<tr>
<td>Operating humidity (relative, non-condensing)</td>
<td></td>
<td>&lt;90% @ 23°C, &lt;20% @ 50°C</td>
</tr>
<tr>
<td>Dimensions (W x H x D)</td>
<td>4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>1.1 kg (2.43 lb) single/1.3 kg (2.87 lb) dual</td>
<td></td>
</tr>
</tbody>
</table>

1. At 1310 ±15 nm and 1550 ±15 nm for SM unit and at 850 ±15 nm and 1300 ±15 nm for MM unit
2. Including one mated pair of connectors
3. At 23 ±5°C
4. Not including tap coupler loss, if installed. Add 0.7 dB for tap coupler option
5. Value shown is for 1550 nm. For 1300/1310 nm the value is typical
6. At 1550 nm ±15 mm only
7. At 1550 nm ±15 mm for SMF, 1300 nm ±15 mm for MMF
8. From 1480 nm to 1640 nm relative to 0 dB attenuation
9. For unpolarized light
10. Multimode specifications are valid for category 4 CPR
11. Constant wavelength, constant temperature, constant state of polarization
12. Measured using low coherence laser source
13. Damage at high optical power due to scratched or poorly cleaned connectors may result. For high power applications, incident light must be applied from “IN” port to “OUT” port. JDSU assumes no responsibility for these user conditions
14. From 0 to 45 dB attenuation
For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at customer.service@jdsu.com.

The MAP Variable Optical Attenuators are defined by selecting the required options from the product configurator in the table below. Select one option from each of the three categories (Base, Fiber Type, and Connector Type Options).

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MVOA-A2SS0</td>
<td>Single Attenuator, standard power, no built-in options</td>
</tr>
<tr>
<td>MVOA-A2SS1</td>
<td>Single Attenuator, standard power, 10/90 splitter for external power monitor</td>
</tr>
<tr>
<td>MVOA-A2SSM</td>
<td>Single Attenuator, standard power, with integrated power monitor</td>
</tr>
<tr>
<td>MVOA-A2SH0</td>
<td>Single Attenuator, high power, no built-in options</td>
</tr>
<tr>
<td>MVOA-A2SH1</td>
<td>Single Attenuator, high power, 10/90 splitter</td>
</tr>
<tr>
<td>MVOA-A2SHM</td>
<td>Single Attenuator, high power, with integrated power monitor</td>
</tr>
<tr>
<td>MVOA-A2DS0</td>
<td>Dual Attenuator, standard power, no built-in options</td>
</tr>
<tr>
<td>MVOA-A2DS1</td>
<td>Dual Attenuator, standard power, 10/90 splitter</td>
</tr>
<tr>
<td>MVOA-A2DSM</td>
<td>Dual Attenuator, standard power, with integrated power monitor</td>
</tr>
<tr>
<td>MVOA-A2DH0</td>
<td>Dual Attenuator, high power, no built-in options</td>
</tr>
<tr>
<td>MVOA-A2DH1</td>
<td>Dual Attenuator, high power, 10/90 splitter</td>
</tr>
<tr>
<td>MVOA-A2DHM</td>
<td>Dual Attenuator, high power, with integrated power monitor</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fiber Type Options (Required, select one)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M100</td>
</tr>
<tr>
<td>M101</td>
</tr>
<tr>
<td>M102</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Connector Type Options (Required, select one)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MFP</td>
</tr>
<tr>
<td>MFA</td>
</tr>
<tr>
<td>MSC</td>
</tr>
<tr>
<td>MSU</td>
</tr>
</tbody>
</table>

Sample Configuration

The following configuration specifies a single attenuator, standard power, no built-in options, 9/125 fiber type, and FC/PC connector type.

MVOA-A2SS0 with options M100 and MFP

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The Multiple Application Platform (MAP) Polarization Controller (mPCS-A1) is optimized for the industry-leading JDSU MAP-200 platform. Based on the previous-generation Multiple Application Platform (MAP), the MAP-200 is the first photonic layer lab and manufacturing platform that is LAN Extensions for Instrumentation (LXI)-compliant by conforming to the required physical attributes, Ethernet connectivity, and interchangeable virtual instrument (IVI) drivers. The MAP-200 platform is optimized for density and maximum configurability to meet specific application requirements in the smallest possible footprint.

The mPCS-A1 provides an efficient and precise way of creating any state of polarization. It can also be used as part of a polarization state analyzer. The mPCS-A1 is comprised of three rotating elements: a high extinction ratio polarizer, a quarter-wave plate and a half-wave plate. The controller configuration can be offered with a single-mode (SM) or a polarization maintaining fiber (PMF) input.

The polarization controllers can be combined with other instruments to complete measurement test systems such as erbium-doped fiber amplifier (EDFA) or passive component test sets.

**Key Features**

- Complete polarization control
- Designed to meet IEEE Std. 802.3ae™ 10 GbE testing requirements
- Designed to perform fast polarization dependent loss (PDL) measurements (4-state Mueller method)
- Compact single width cassette
- Very high angular accuracy and absolute fast axis alignment accuracy
- Can be automated when used with MAP-200
- LXI-compliant interfaces and IVI drivers

**Applications**

- Passive component PDL and polarization mode dispersion (PMD) measurements
- EDFA noise and polarization dependent gain (PDG) measurements
- 10 GbE transceiver worst-case relative intensity noise and dispersion penalty measurements
- Optical signal to noise ratio (OSNR) and extinction ratio (ER) measurements

**Safety Information**

- The MAP Polarization Controller, when installed in a MAP chassis, complies to CE, CSA/UL/IEC61010-1, plus LXI Class C requirements.
Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>1310 nm</th>
<th>1550 nm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wavelength range</td>
<td>1260 to 1360 nm</td>
<td>1420 to 1630 nm</td>
</tr>
<tr>
<td>Insertion loss (IL)(^1,3)</td>
<td>&lt;1.5 dB</td>
<td>&lt;1.5 dB</td>
</tr>
<tr>
<td>IL variation with wavelength(^1,3)</td>
<td>±0.1 dB</td>
<td>±0.1 dB</td>
</tr>
<tr>
<td>IL variation with rotation(^1,4)</td>
<td>±0.05 dB</td>
<td>±0.05 dB</td>
</tr>
<tr>
<td>Return loss (RL)</td>
<td>&gt;45 dB</td>
<td>&gt;45 dB</td>
</tr>
<tr>
<td>Extinction ratio(^2)</td>
<td>&gt;40 dB</td>
<td>&gt;40 dB</td>
</tr>
<tr>
<td>Fast axis alignment accuracy</td>
<td>&lt;± 0.5°</td>
<td>&lt;± 0.5°</td>
</tr>
<tr>
<td>Angular accuracy</td>
<td>±0.1°</td>
<td>±0.1°</td>
</tr>
<tr>
<td>Rotational resolution</td>
<td>0.075°</td>
<td>0.075°</td>
</tr>
<tr>
<td>Maximum rotational speed per element</td>
<td>900°/s</td>
<td>900°/s</td>
</tr>
<tr>
<td>Maximum optical input power</td>
<td>100 mW</td>
<td>100 mW</td>
</tr>
<tr>
<td>Calibration</td>
<td>2 years</td>
<td>2 years</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>10 to 40°C</td>
<td>10 to 40°C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>−30 to 60°C</td>
<td>−30 to 60°C</td>
</tr>
<tr>
<td>Humidity</td>
<td>Maximum 95% RH from 10 to 40°C non-condensing</td>
<td>Maximum 95% RH from 10 to 40°C non-condensing</td>
</tr>
<tr>
<td>Dimensions (W x H x D)</td>
<td>4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)</td>
<td>4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)</td>
</tr>
<tr>
<td>Weight</td>
<td>1.6 kg (3.5 lb)</td>
<td>1.6 kg (3.5 lb)</td>
</tr>
</tbody>
</table>

1. From 1520 to 1630 nm for the 1550 nm version
2. Measured with a >45 dB polarized narrow spectral line source
3. At 23°C ±3°C
4. IL variation using an incoherent (broadband) source with both waveplates rotating at differing rates

Ordering Information

For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at customer.service@jdsu.com.

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Base Options (Required, select one)</strong></td>
<td></td>
</tr>
<tr>
<td>MPCS-A1300</td>
<td>Polarization controller, 1260 to 1360 nm</td>
</tr>
<tr>
<td>MPCS-A1500</td>
<td>Polarization controller, 1420 to 1630 nm</td>
</tr>
<tr>
<td><strong>Fiber Type Options (Required, select one)</strong></td>
<td></td>
</tr>
<tr>
<td>M100</td>
<td>9/125 fiber type</td>
</tr>
<tr>
<td>M103</td>
<td>PMF fiber type</td>
</tr>
<tr>
<td><strong>Connector Options (Required, select one)</strong></td>
<td></td>
</tr>
<tr>
<td>MFP</td>
<td>FC/PC connector type</td>
</tr>
<tr>
<td>MFA</td>
<td>FC/APC connector type</td>
</tr>
<tr>
<td>MSC</td>
<td>SC/PC connector type</td>
</tr>
<tr>
<td>MSU</td>
<td>SC/APC connector type</td>
</tr>
</tbody>
</table>

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IEEE Std.802.3ae is a registered trademark of the Institute of Electrical and Electronics Engineers
MAP Variable Backreflector
(mVBR-A1)

Key Features
- Operation at 850/1310 or 1310/1550 nm
- Single-mode or multimode fiber
- Can be automated when used with MAP-200 LXI-compliant interfaces and IVI drivers

Applications
- Transmitter/receiver development and testing
- Reflection testing for connectors
- Quality assurance acceptance testing
- Laser development and production

Safety Information
- The MAP Variable Backreflector, when installed in a MAP chassis, complies to CE, CSA/UL/IEC61010-1, plus LXI Class C requirements.

The Multiple Application Platform (MAP) Variable Backreflector (mVBR-A1) is optimized for the industry-leading JDSU MAP-200 platform. Based on the previous-generation MAP, the MAP-200 is the first photonic layer lab and manufacturing platform that is LAN Extensions for Instrumentation (LXI)-compliant by conforming to the required physical attributes, Ethernet connectivity, and interchangeable virtual instrument (IVI) drivers. The MAP-200 platform is optimized by density and maximum configurability to meet specific application requirements in the smallest possible footprint. The MAP Variable Backreflector cassette provides precise levels of return loss (RL) to transmitters, enabling system sensitivity measurement or system degradation as a function of back-reflection measurement.

When used with a transmitter/receiver pair and characterization equipment, the MAP backreflector can be used to establish the magnitude of reflections that significantly degrade transmission system performance, and to characterize the problems they cause.

The MAP backreflector uses the JDSU linear attenuator prism and high reflectivity mirror to precisely control the level of RL. The cassette is available in single-mode (SM) or multimode (MM) fibers and with an optional coupler for monitoring.

Optical Configurations for the Variable Backreflector Cassette
### Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Single-mode fiber (SMF) without Coupler</th>
<th>Single-mode fiber (SMF) with 50/50 Coupler</th>
<th>Multimode fiber (MMF) without Coupler</th>
<th>Multimode fiber (MMF) with 50/50 Coupler</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wavelength range</td>
<td>1260 to 1650 nm</td>
<td>1260 to 1650 nm</td>
<td>750 to 1350 nm</td>
<td>750 to 1350 nm</td>
</tr>
<tr>
<td>Maximum backreflection level</td>
<td>&gt;–5.0 dB</td>
<td>&gt;–9.5 dB</td>
<td>&gt;–5.0 dB</td>
<td>&gt;–9.5 dB</td>
</tr>
<tr>
<td>Insertion loss (IL) (IN to OUT)</td>
<td>N/A</td>
<td>&lt;5.0 dB</td>
<td>N/A</td>
<td>&lt;6.0 dB</td>
</tr>
<tr>
<td>Relative backreflection setting accuracy</td>
<td>±0.2</td>
<td>±0.2</td>
<td>±0.4</td>
<td>±0.4</td>
</tr>
<tr>
<td>Backreflection setting resolution</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Fiber type</td>
<td>9/125 µm</td>
<td>9/125 µm</td>
<td>50/125 µm or</td>
<td>50/125 µm or</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>62.5/125 µm or</td>
<td>62.5/125 µm or</td>
</tr>
<tr>
<td>Polarization dependent loss (PDL)</td>
<td>&lt;1.0 dB</td>
<td>&lt;1.0 dB</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Maximum optical input power</td>
<td>200 mW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calibration period</td>
<td>2 years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warm-up time</td>
<td>30 minutes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>0 to 50°C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>–30 to 60°C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>&lt;90% at 23°C, &lt;20% at 50°C (relative non-condensing)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions (W x H x D)</td>
<td>4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>1.1 kg (2.43 lb) single backreflector/1.3 kg (2.87 lb) dual backreflector</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. At 1310 ±15 and 1550 ±15 nm for SM units and at 850 ±15 nm and 1310 ±15 nm for MM units
2. Including one mated pair of connectors
3. At 23 ±5°C
4. From maximum backreflection to –40 dB for SM units and from maximum backreflection to –25 dB for MM units

### Ordering Information

For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at customer.service@jdsu.com.

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MVBR-A150</td>
<td>Single Backreflector, no built-in option</td>
</tr>
<tr>
<td>MVBR-A151</td>
<td>Single Backreflector with built-in 50/50 splitter</td>
</tr>
<tr>
<td>MVBR-A1D0</td>
<td>Dual Backreflector, no built-in option</td>
</tr>
<tr>
<td>MVBR-A1D1</td>
<td>Dual Backreflector with built-in 50/50 splitter</td>
</tr>
<tr>
<td><strong>Fiber Type Options (Required, select one)</strong></td>
<td></td>
</tr>
<tr>
<td>M100</td>
<td>9/125 fiber type</td>
</tr>
<tr>
<td>M101</td>
<td>50/125 fiber type</td>
</tr>
<tr>
<td>M102</td>
<td>62.5/125 fiber type</td>
</tr>
<tr>
<td><strong>Connector Options (Required, select one)</strong></td>
<td></td>
</tr>
<tr>
<td>MFP</td>
<td>FC/PC connector type</td>
</tr>
<tr>
<td>MFA</td>
<td>FC/APC connector type (M100 only)</td>
</tr>
<tr>
<td>MSC</td>
<td>SC/PC connector type</td>
</tr>
<tr>
<td>MSU</td>
<td>SC/APC connector type (M100 only)</td>
</tr>
</tbody>
</table>
**MAP Tunable Filter**  
_(mTBF-A1)_

### Key Features
- Available in three FWHM bandwidths (0.11, 0.25, 0.55 nm)
- Low polarization dependent loss (PDL) (<0.3 dB)
- Wide wavelength range (1520 to 1630 nm)
- Can be automated when used with MAP-200 LXI-compliant interfaces and IVI drivers

### Applications
- Spontaneous emission suppression
- Amplifier characterization (Up to 1 W input power)
- BER testing
- Tunable laser-based testing

### Safety Information
- The MAP Tunable Filter, when installed in a MAP chassis, complies to CE, CSA/UL/IEC61010-1, plus LXI Class C requirements.

The Multiple Application Platform (MAP) Tunable Filter (mTBF-A1) is optimized for the industry-leading JDSU MAP-200 platform. Based on the previous-generation MAP, the MAP-200 is the first photonic layer lab and manufacturing platform that is LAN Extensions for Instrumentation (LXI)-compliant by conforming to the required physical attributes. Ethernet connectivity, and interchangeable virtual instrument (IVI) drivers. The MAP-200 platform is optimized for density and maximum configurability to meet specific application requirements in the smallest possible footprint. The MAP Tunable Filter is a tunable bandpass filter that offers continuous wavelength tuning from 1520 to 1630 nm. It is used for applications requiring low insertion loss (IL), high rejection, narrow bandwidth and wavelength tuning resolution of 0.005 nm. The standard model has a maximum input power of 300 mW and the high power option provides a maximum input power of 1000 mW.

Two options are available:
- the peak search option, used to find the absolute maximum transmission power within the filter's wavelength tuning range or a local maximum transmission power within a user-defined wavelength range
- 10% tap option for power monitoring

MAP Tunable Filter is ideal for applications where the user needs to suppress amplified spontaneous emissions (ASE) or isolate specific wavelengths. These applications include amplifier characterization, bit error rate (BER) testing and optical signal-to-noise ratio (OSNR) measurement.
The filter makes use of a diffraction grating to separate the input light along several discrete paths. A stepper-motor rotates the grating to transmit the desired wavelength along the output fiber.

Figure 1. Model "G" filter shape shows the low IL and sharpness of the filter.

Figure 2. mTBF GUI - detailed view
## Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Model C</th>
<th>Model G</th>
<th>Model K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wavelength range</td>
<td>1520 to 1630 nm</td>
<td>1520 to 1630 nm</td>
<td>1520 to 1630 nm</td>
</tr>
<tr>
<td>Optical shape</td>
<td>Gaussian</td>
<td>Gaussian</td>
<td>Gaussian</td>
</tr>
<tr>
<td>–3 dB bandwidth(^1)</td>
<td>0.11 nm ±15%</td>
<td>0.25 nm ±15%</td>
<td>0.55 nm ±15%</td>
</tr>
<tr>
<td>3/20 dB ratio(^2)</td>
<td>0.40 ±0.05</td>
<td>0.31 ±0.05</td>
<td>0.31 ±0.05</td>
</tr>
<tr>
<td>Insertion loss (IL)(^3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1520 to 1610 nm</td>
<td>&lt;6.0 dB</td>
<td>&lt;5.8 dB</td>
<td>&lt;5.8 dB</td>
</tr>
<tr>
<td>1610 to 1630 nm</td>
<td>&lt;8.0 dB</td>
<td>&lt;8.0 dB</td>
<td>&lt;8.0 dB</td>
</tr>
<tr>
<td>Input power(^4)</td>
<td>300 mW or 1 W</td>
<td>300 mW or 1 W</td>
<td>300 mW or 1 W</td>
</tr>
<tr>
<td>Return loss (RL)(^4)</td>
<td>&gt;45 dB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wavelength resolution</td>
<td>0.005 nm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polarization dependent loss (PDL)(^5), 1520 to 1630 nm</td>
<td>&lt;0.3 dB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tuning speed</td>
<td>&gt;5 nm/s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak to average background noise</td>
<td>&gt;45 dB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td>±0.2 nm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak search accuracy</td>
<td>&lt;0.2 dB from output peak power</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polarization mode dispersion (PMD)</td>
<td>&lt;0.3 ps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group delay variation within a –3 dB bandwidth</td>
<td>&lt;5 ps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommended calibration period</td>
<td>1 year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>10 to 35°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>–10 to 60°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions (W x H x D)</td>
<td>8.1 x 13.26 x 37.03 cm (3.19 x 5.22 x 14.58 in)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>2.3 kg (5.07 lb)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Measured at 1550 nm
2. Add 1.2 dB for tap or peak search option
3. At 23°C ±5°C
4. At selected wavelength
5. Input power is within the range of –20 dBm to +20 dBm. Excludes PDL effect
For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at customer.service@jdsu.com.

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Base Options (Required, select one)</strong></td>
<td></td>
</tr>
<tr>
<td>MTBF-A1CS0</td>
<td>Tunable Filter, C Model, 0.11 nm –3 dB Bandwidth, Standard Power (300 mW)</td>
</tr>
<tr>
<td>MTBF-A1GS0</td>
<td>Tunable Filter, G Model, 0.25 nm –3 dB Bandwidth, Standard Power (300 mW)</td>
</tr>
<tr>
<td>MTBF-A1KS0</td>
<td>Tunable Filter, K Model, 0.55 nm –3 dB Bandwidth, Standard Power (300 mW)</td>
</tr>
<tr>
<td>MTBF-A1CH0</td>
<td>Tunable Filter, C Model, 0.11 nm –3 dB Bandwidth, High Power (1 W)</td>
</tr>
<tr>
<td>MTBF-A1GH0</td>
<td>Tunable Filter, G Model, 0.25 nm –3 dB Bandwidth, High Power (1 W)</td>
</tr>
<tr>
<td>MTBF-A1KH0</td>
<td>Tunable Filter, K Model, 0.55 nm –3 dB Bandwidth, High Power (1 W)</td>
</tr>
<tr>
<td><strong>Built-in Options (Optional, select one)</strong></td>
<td></td>
</tr>
<tr>
<td>M10SPLITTER</td>
<td>10% Output Tap option</td>
</tr>
<tr>
<td>MPowMon</td>
<td>Power Monitor option</td>
</tr>
<tr>
<td><strong>Connector Options (Required, select one)</strong></td>
<td></td>
</tr>
<tr>
<td>MFP</td>
<td>FC/PC connector type</td>
</tr>
<tr>
<td>MFA</td>
<td>FC/APC connector type</td>
</tr>
<tr>
<td>MSC</td>
<td>SC/PC connector type</td>
</tr>
<tr>
<td>MSU</td>
<td>SC/APC connector type</td>
</tr>
</tbody>
</table>
MAP Optical Power Meter Module
(mOPM-B1)

Key Features

- Panel mount or remote head configuration
- Single, dual, or quad channel configurations available
- 250 kHz sampling rate for high-speed applications
- 750 to 1700 nm operating wavelength range
- Maximum input power up to 27 dBm available
- Compatible with single-mode and multimode fiber
- Ability to store up to 100,000 data points per channel

Applications

- Amplifier characterization
- Receiver and transmitter testing
- Absolute power measurement
- Optical switching time measurement

Compliance

- The MAP Optical Power Meter, when installed in a MAP chassis, complies with CE, CSA/UL/IEC61010-1, plus LXI Class C requirements

The Multiple Application Platform (MAP-200) Optical Power Meter Module (mOPM-B1) is a second-generation power meter that brings a range of panel mount and remote head configurations to the JDSU MAP-200 platform.

The MAP-200 is the first photonic layer lab and manufacturing platform to be LAN Extensions for Instrumentation (LXI)-compliant, bringing the full power of Ethernet connectivity and ease of use of interchangeable virtual instrument (IVI) drivers to the optical test environment. The MAP-200 platform’s industry-leading density and configurability enables test engineers to meet specific application requirements in the smallest possible footprint.

The MAP Optical Power Meter Module extends the optical power measurement capability of the MAP-200 by offering three grades of optical performance available in panel-mount or remote-head configurations with 1, 2, or 4 inputs per module.

Optical Performance

All three performance grades are based on indium gallium arsenide (InGaAs) detectors and are suitable for applications using single-mode (SM) or multimode (MM) fiber. They feature high accuracy, high linearity, and extremely low polarization dependant loss (PDL). The general purpose grade provides a measurement range of –70 to +10 dBm. The high-performance detector features thermal stabilization, which results in an extended wavelength range and a power measurement range of –80 to +10 dBm. The high power grade extends high-power measurement capability to +27 dBm.
Packaging Options
The mOPM-B1 comes factory-configured with panel-mounted detectors or as an interface module with 1, 2, or 4 electrical connections for remote heads. Remote heads facilitate positioning the detector close to the device under test (DUT) and away from other test equipment. The interface module is compatible with all performance grades of remote head and can accommodate a mix of performance grades. For example, an application requiring a general purpose optical power measurement (OPM) and a high-power OPM could be connected to the same Remote Head Base module, thereby reducing the number of slots used in the MAP-200 chassis.

Enhanced Functionality
All mOPM-B1 configurations support array capture with memory depth of 100,000 points per optical sensor. This feature combined with an adjustable sampling frequency (up to 250 kHz) is ideal for data logging applications or for capturing transient events.

Accessories
For ultimate flexibility, the detector heads offer JDSU AC1xx-series interchangeable detector adapters that are available for most connector types, as well as a fiber holder that permits bare fiber measurements. The mOPM-B1 is supplied with a detector cover and fixed connection (FC)-detector adapter as standard accessories. As an option for remote head users, a 1.8 m (6 foot) extension cable is available.

GUI

Figure 1. mOPM main user interface
**Super Application: OPMscope**

The OPMscope is a Super Application designed for use with the MOPM-B1 line of power meters on the MAP-200 platform. This software feature is an intuitive tool geared for designers and allows graphical representation of optical signals, much like a digital sampling scope, but in the optical domain. This tool can be used to trigger on rising or falling edges, with the ability to see history using pre-trigger data points. It allows users to pan and zoom to see details and monitor transients. It allows export of up to 100,000 captured data for extended analysis from up to four optical heads simultaneously.

**Additional Applications**

- DUT settling time, cross talk, rise time and fall time
- measures synchronization and additional stability
- measures link recovery time
- allows for performance comparison (for example, comparing sequential switching to random switching)

![Figure 2. OPMscope main user interface](image)
# Specifications

## Parameters

<table>
<thead>
<tr>
<th>Parameters</th>
<th>General Purpose</th>
<th>Premium Performance</th>
<th>High Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detector type</td>
<td>InGaAs</td>
<td>TEC InGaAs</td>
<td>Filtered InGaAs</td>
</tr>
<tr>
<td>Detector size</td>
<td>2 mm</td>
<td>3 mm</td>
<td>2 mm</td>
</tr>
<tr>
<td>Wavelength range</td>
<td>800-1650 nm</td>
<td>750-1700 nm</td>
<td>800-1630 nm</td>
</tr>
<tr>
<td>Fiber type</td>
<td>SMF and MMF with NA 0.27 (maximum core size 62.5 µm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dynamic range</td>
<td>+11 dBm to -70 dBm</td>
<td>+11 dBm to -80 dBm</td>
<td>+27 dBm to -45 dBm</td>
</tr>
<tr>
<td>Uncertainty at reference condition 1</td>
<td>± 2.5% (800-1510 nm)</td>
<td>± 2.2% (800-1510 nm)</td>
<td>± 3.9% (800-960 nm)</td>
</tr>
<tr>
<td></td>
<td>± 2.4% (1510-1600 nm)</td>
<td>± 2.3% (1510-1600 nm)</td>
<td>± 3.6% (960-1300 nm)</td>
</tr>
<tr>
<td></td>
<td>± 2.7% (1600-1635 nm)</td>
<td>± 2.5% (1600-1635 nm)</td>
<td>± 3.7% (1300-1510 nm)</td>
</tr>
<tr>
<td>Total uncertainty ²</td>
<td>± 3.2% ±5pW (800-900 nm)</td>
<td>± 3.0% ±1pW (800-1510 nm)</td>
<td>± 4.6% ±100pW (800-900 nm)</td>
</tr>
<tr>
<td></td>
<td>± 5.2% ±5pW (900-960 nm)</td>
<td>± 3.1% ±1pW (1510-1600 nm)</td>
<td>± 7.9% ±100pW (900-960 nm)</td>
</tr>
<tr>
<td></td>
<td>± 3.1% ±5pW (960-1510 nm)</td>
<td>± 3.4% ±1pW (1600-1635 nm)</td>
<td>± 3.9% ±100pW (960-1300 nm)</td>
</tr>
<tr>
<td></td>
<td>± 3.1% ±5pW (1510-1600 nm)</td>
<td>± 3.8% ±5pW (1600-1635 nm)</td>
<td>± 4.4% ±100pW (1300-1510 nm)</td>
</tr>
<tr>
<td>Linearity (at 23 ± 5°C)</td>
<td>± 0.010 dB ±5 pW</td>
<td>± 0.010 dB ±1 pW</td>
<td>±0.010 dB ±100 pW (for -45 dBm to +10 dBm)</td>
</tr>
<tr>
<td>Noise (peak to peak)⁴</td>
<td>2 pW</td>
<td>1 pW</td>
<td>50 pW</td>
</tr>
<tr>
<td>Return loss</td>
<td>&gt;55 dB typ</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relative uncertainty due to polarization⁵</td>
<td>&lt;±0.015 dB</td>
<td>&lt;±0.01 dB</td>
<td>&lt;±0.07 dB</td>
</tr>
<tr>
<td>Maximum number of channels (Panel mount)</td>
<td>1, 2, or 4</td>
<td>1, 2, or 4</td>
<td>1, 2, or 4</td>
</tr>
<tr>
<td>Sampling time</td>
<td>4 µs (250 kHz)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Averaging time</td>
<td>20 µs to 5 s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buffer size</td>
<td>100000 points</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supported connectors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FC, ST, SC, MT-RJ, LC, E2000, MU, MTP, Bare Fiber</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recalibration period</td>
<td>1 year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warm-up time</td>
<td>30 minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>5 to 40°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>15 – 80% Relative humidity, non-condensing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimension (W x H x D)</td>
<td>4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>1.2 kg (2.65 lb)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. For 62.5 µm core fiber, additional uncertainty of 1%/ (PC) or 2%/ (APC) must be added due to overfill of 2mm detector
2. Fiber SMF-28, T=23±5°C, Spectral width of source < 6 nm, Optical Power on detector = -20 dBm
3. SMF 28, N/A of fiber ≤ 0.27, Temperature, humidity and power range per Table
4. 1 second averaging time, 300 consecutive measurements (300s), T=23 ± 5°C
5. All states of polarization, constant power, straight connector, T=23 ± 5°C.
6. WL=1550nm±30nm, MPMHP at WL=1310 nm.
7. For 900 – 960 nm only, uncertainty indicated is for 15-35 °C
8. Note that MT Connector size prevents the use of adjacent channels. Therefore a 4 channel cassette only allows 2 MT input at a time.
### Ordering Information

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Remote Head</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable Length</td>
<td>1.4 m (4.5 feet)</td>
</tr>
<tr>
<td>Dimension</td>
<td>13.8 cm x 5 cm x 5 cm (5.4in x 2in x 2in) excluding cable</td>
</tr>
<tr>
<td>Weight</td>
<td>0.6 kg (1.3 lb)</td>
</tr>
</tbody>
</table>

### Panel-Mount Head Application

**Base Module Options (Required: Panel-mount detector types cannot be mixed and matched)**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOPM-B1PMH</td>
<td>Panel-Mount Head Module</td>
</tr>
</tbody>
</table>

**Panel-Mount Detector Options (Select type and specify quantity)**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Quantity per Module</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOPMGP</td>
<td>2 mm InGaAs Panel-Mount Head General Purpose</td>
<td>1, 2, or 4</td>
</tr>
<tr>
<td>MOPMHP</td>
<td>2 mm InGaAs Panel-Mount Head High Power</td>
<td>1, 2, or 4</td>
</tr>
<tr>
<td>MOPMPP</td>
<td>3 mm InGaAs Panel-Mount Head Premium Performance</td>
<td>1, 2, or 4</td>
</tr>
</tbody>
</table>

### Remote Head Application

**Base Module Options (Required: Select one)**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOPM-B1RH1</td>
<td>Single-Channel Remote Head Module</td>
</tr>
<tr>
<td>MOPM-B1RH2</td>
<td>Dual-Channel Remote Head Module</td>
</tr>
<tr>
<td>MOPM-B1RH4</td>
<td>Quad-Channel Remote Head Module</td>
</tr>
</tbody>
</table>

**Remote Head Options (Select type and specify quantity)**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Quantity per head</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOPM-B1RHGP</td>
<td>2 mm InGaAs Remote Head General Purpose</td>
<td>1</td>
</tr>
<tr>
<td>MOPM-B1RHHP</td>
<td>2 mm InGaAs Remote Head High Power</td>
<td>1</td>
</tr>
<tr>
<td>MOPM-B1RHPP</td>
<td>3 mm InGaAs Remote Head Premium Performance</td>
<td>1</td>
</tr>
</tbody>
</table>

### Optional Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC100</td>
<td>Detector cap</td>
<td><img src="image1.jpg" alt="Image" /></td>
</tr>
<tr>
<td>AC101</td>
<td>FC adapter</td>
<td><img src="image2.jpg" alt="Image" /></td>
</tr>
</tbody>
</table>

### Applications

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSUP-OPMSCOPE</td>
<td>Optical Scope Licensed Super Application for MOPM-B1 Power Meters</td>
</tr>
</tbody>
</table>

### Sample Configuration for Panel Mount

<table>
<thead>
<tr>
<th>Type of Detector</th>
<th>Single Channel</th>
<th>Dual Channel</th>
<th>Quad Channel</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Purpose</td>
<td>MOPM-B1PMH</td>
<td>MOPM-B1PMH</td>
<td>MOPM-B1PMH</td>
</tr>
<tr>
<td>High Power</td>
<td>MOPM-B1PMH</td>
<td>MOPM-B1PMH</td>
<td>MOPM-B1PMH</td>
</tr>
<tr>
<td>Premium Performance</td>
<td>MOPM-B1PMH</td>
<td>MOPM-B1PMH</td>
<td>MOPM-B1PMH</td>
</tr>
</tbody>
</table>

1. All General Purpose and Premium Performance MOPM are supplied with one AC100 and one AC101 per detector. All High Power MOPM are supplied with one AC100 and one high power FC adapter per detector.
**MAP Broadband Source (mBBS-A1)**

---

**Key Features**
- Flattened output power spectrum
- High output power density
- High spectral stability
- Control and monitoring features
- Can be automated when used with MAP-200
- LXI-compliant interfaces and IVI drivers

---

**Applications**
- Optical component spectral tests
- Systems compliance tests
- Optical measurement systems
- Sensor and imaging experiments

---

**Safety Information**
- The MAP Broadband Source, when installed in a MAP chassis, complies to CE, CSA/UL/IEC61010-1, LXI Class C requirements, meets the requirements of Class 3B in standard IEC 60825-1 (2002), and complies with 21 CFR 1040.1 except deviations per Laser Notice No. 50, July 2001.

The Multiple Application Platform (MAP) Broadband Source (mBBS-A1) is optimized for the industry-leading JDSU MAP-200 platform. Based on the previous-generation Multiple Application Platform (MAP), the MAP-200 is the first photonic layer lab and manufacturing platform that is LAN Extensions for Instrumentation (LXI)-compliant by conforming to the required physical attributes, Ethernet connectivity, and interchangeable virtual instrument (IVI) drivers. The MAP-200 platform is optimized for density and maximum configurability to meet specific application requirements in the smallest possible footprint.

Utilizing the latest advances in erbium technology, the MAP BBS offers an amplified spontaneous emission (ASE) output that features flattened high power density across the C-band. The source provides high spectral stability.

The addition of the BBS Cassette can be used for many applications including OSNR (optical signal to noise ratio) experiments, calibration of test equipment, and noise source for active or passive component testing.

The MAP BBS models provide specialized variants and optical performance not available in the Benchtop BBS.

---

Spectral Density Plot
C-band 50 mW
Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>C-Band 50 mW Output Power</th>
<th>C-Band 100 mW Output Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating wavelength range</td>
<td>1527 to 1568 nm</td>
<td>1525 to 1568 nm</td>
</tr>
<tr>
<td>Total optical power (minimum)¹</td>
<td>50 mW</td>
<td>100 mW</td>
</tr>
<tr>
<td>Spectral gain flatness (maximum)ⁱ</td>
<td>1.8 dB</td>
<td>1.8 dB</td>
</tr>
<tr>
<td>Total output power stability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output isolation (minimum)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>Maximum 95% RH non-condensing from 0 to 45°C</td>
<td></td>
</tr>
<tr>
<td>Dimensions (W x H x D)</td>
<td>4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>2.3 kg (5.07 lb)</td>
<td></td>
</tr>
</tbody>
</table>

¹ Measured at 1550 nm at 23°C after one hour warm up
² Flatness range 1529 to 1565 nm for C-Band model

Ordering Information

For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at customer.service@jdsu.com.

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Base Options (Required, select one)</strong></td>
<td></td>
</tr>
<tr>
<td>MBBS-A1C050</td>
<td>C-Band Broadband Source, 50 mW output power</td>
</tr>
<tr>
<td>MBBS-A1C100</td>
<td>C-Band Broadband Source, 100 mW output power</td>
</tr>
<tr>
<td><strong>Connector Options (Required, select one)</strong></td>
<td></td>
</tr>
<tr>
<td>MFP</td>
<td>FC/PC connector type</td>
</tr>
<tr>
<td>MFA</td>
<td>FC/APC connector type</td>
</tr>
</tbody>
</table>

If the configurations available do not meet your performance requirements, please contact your global sales and customer service team to discuss the potential for specialized solutions.

UL is a registered trademark of Underwriters Laboratories, inc.
MAP Tunable DBR Laser (mTLG-A1)

Key Features

- Single, Dual, or Quad channel configurations available
- C- or L-Band tunability
- Wavelength tuning range of 38 nm
- 25 GHz channel spacing
- Narrow linewidth <5 MHz
- C-band features:
  - Output power >12 dBm
  - SMSR 40 dB min

Applications

- Optical amplifier testing
- Tunable laser grids
- DWDM transmission testing
- Fiber characterization
- Transmitter and receiver testing

Compliance

- The MAP Tunable DBR Laser, when installed in a MAP chassis, complies with CE, CSA/UL/IEC61010-1, plus LXI Class C requirements and meets the requirements of Class 1M in standard IEC 60825-1 (A2:2001)

The Multiple Application Platform (MAP-200) Tunable Distributed Bragg Reflection (DBR) laser (mTLG-A1) is a new-generation tunable laser that is ideal for DWDM testing where the capability to change wavelength on demand over the C- and L-bands with 25 GHz spacing is essential.

The MAP-200 is the first photonic layer lab and manufacturing platform to be LAN Extensions for Instrumentation (LXI)-compliant, bringing the full power of Ethernet connectivity and ease of use of interchangeable virtual instrument (IVI) drivers to the optical test environment. The MAP-200 platform’s industry-leading density and configurability enables test engineers to meet specific application requirements in the smallest possible footprint.

The new mTLG-A1 is based on a Sampled Grating Distributed Bragg Reflector (SG-DBR) laser with an integral wavelength locker. Wavelength and output power settings are controlled using the MAP-200 local interface or automation interfaces. The integrated wavelocker and automatic power control loop enable very stable operation.

Figure 1. mTLG screen capture
Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>C-Band</th>
<th>L-Band</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wavelength</td>
<td>Tuning range; 191.30 to 196.10 THz, 1528.77 to 1567.13 nm</td>
<td>186.35 to 190.95 THz, 1570.01 to 1608.76 nm</td>
</tr>
<tr>
<td></td>
<td>Accuracy¹,²,³</td>
<td>±2 GHz (± 0.016 nm)</td>
</tr>
<tr>
<td></td>
<td>Stability 15 minutes; ±0.005 nm Typ</td>
<td>±0.01 nm Typ</td>
</tr>
<tr>
<td></td>
<td>Stability 24 hours; ±0.005 nm Typ</td>
<td>±0.01 nm Typ</td>
</tr>
<tr>
<td></td>
<td>Channel spacing</td>
<td>25 GHz</td>
</tr>
<tr>
<td>Power</td>
<td>Setting range; 7 to 13 dBm</td>
<td>7 to 11 dBm</td>
</tr>
<tr>
<td></td>
<td>Stability 15 minutes; ±0.005 dB Typ</td>
<td>±0.03 dB Typ</td>
</tr>
<tr>
<td></td>
<td>Stability 24 hours; ±0.03 dB Typ</td>
<td>±0.03 dB Typ</td>
</tr>
<tr>
<td></td>
<td>Resolution</td>
<td>&lt;0.1 dB Typ</td>
</tr>
<tr>
<td>Spectral properties</td>
<td>Linewidth; ≤5 MHz</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SMSR; 40 dB min, 45 dB Typ</td>
<td>38 dB min, 45 dB Typ</td>
</tr>
<tr>
<td></td>
<td>RIN; −140 dB/Hz Typ; −135 dB/Hz Max</td>
<td>−138.5 dB/Hz Typ; −133.5 dB/Hz Max</td>
</tr>
<tr>
<td>Other</td>
<td>Fiber type; Polarization maintaining fiber; Slow axis aligned with connector key</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Supported connectors; FC/APC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Warm-up time; 1 hour</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Operating temperature; 10 to 40°C</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Humidity; &lt;80% RH, 10 to 40°C non-condensing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dimension; 4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Weight; 1.3 kg (2.95 lbs) maximum (varies with configuration)</td>
<td></td>
</tr>
</tbody>
</table>

1. At full power.
2. After 1-hour warm up.
3. Constant temperature within 25 ±3°C.
4. Power at max setting: >12 dBm for C-band and >10 dBm for L-band.
5. Natural (instantaneous) linewidth of the laser; with self-homodyne measurements indicated linewidth is typically 50-100 MHz.

Ordering Information

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTLG-A1C10</td>
<td>C-band single laser</td>
</tr>
<tr>
<td>MTLG-A1C20</td>
<td>C-band dual density per module</td>
</tr>
<tr>
<td>MTLG-A1C40</td>
<td>C-band quad density per module</td>
</tr>
<tr>
<td>MTLG-A1L10</td>
<td>L-band single laser</td>
</tr>
<tr>
<td>MTLG-A1L20</td>
<td>L-band dual density per module</td>
</tr>
<tr>
<td>MTLG-A1L40</td>
<td>L-band quad density per module</td>
</tr>
<tr>
<td>MTLG-A1C1L1</td>
<td>C- and L-band dual density per module</td>
</tr>
</tbody>
</table>
MAP Fabry-Perot Laser (mFPL-A1)

Key Features

- Dual independent sources available in a single cassette
- Single-mode (SM)/Multimode (MM) output
- Internal modulation
- Can be automated when used with MAP-200 LXI-compliant interfaces and IVI drivers

Applications

- Insertion loss (IL) testing
- Return loss (RL) testing
- Polarization dependent loss (PDL) testing
- Dense wavelength division multiplexing (DWDM) testing

Compliance

- The MAP Fabry-Perot Laser Source, when installed in a MAP chassis, complies to CE, CSA/UL/IEC61010-1, LXI Class C requirements, meets the requirements of Class 3B in standard IEC 60825-1 (2002), and complies with 21 CFR 1040.1 except deviations per Laser Notice No. 50, July 2001.

The Multiple Application Platform (MAP) Fabry-Perot Laser Source (mFPL-A1) is optimized for the industry-leading JDSU MAP-200 platform. Based on the previous-generation Multiple Application Platform (MAP), the MAP-200 is the first photonic layer lab and manufacturing platform that is LAN Extensions for Instrumentation (LXI)-compliant by conforming to the required physical attributes, Ethernet connectivity, and interchangeable virtual instrument (IVI) drivers. The MAP-200 platform is optimized for density and maximum configurability to meet specific application requirements in the smallest possible footprint.

The mFPL-A1 consists of a Fabry-Perot laser diode combined with a high performance laser driver circuitry for optimal wavelength and power stability. It features internal modulation capabilities and variable power control. Cassettes can be configured with two independent sources for maximum instrumentation density.
### Single-mode (SM) Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>980 nm</th>
<th>1310 nm</th>
<th>1480 nm</th>
<th>1550 nm</th>
<th>1625 nm</th>
<th>1650 nm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak wavelength</td>
<td>980 ±20 nm</td>
<td>1310 ±20 nm</td>
<td>1480 ±20 nm</td>
<td>1550 ±20 nm</td>
<td>1625 ±20 nm</td>
<td>1650 ±20 nm</td>
</tr>
<tr>
<td>Spectral width (FWHM)</td>
<td>&lt;5 nm</td>
<td>&lt;5 nm</td>
<td>&lt;5 nm</td>
<td>&lt;6 nm</td>
<td>&lt;7 nm</td>
<td>&lt;7 nm</td>
</tr>
<tr>
<td>Total power</td>
<td>0 dBm</td>
<td>–3 dBm</td>
<td>–3 dBm</td>
<td>–3 dBm</td>
<td>–3 dBm</td>
<td>–3 dBm</td>
</tr>
<tr>
<td>Fiber type</td>
<td>Flexcor™</td>
<td>SMF-28</td>
<td>SMF-28</td>
<td>SMF-28</td>
<td>SMF-28</td>
<td>SMF-28</td>
</tr>
<tr>
<td>Modulation</td>
<td>0.2 to 20 kHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stability (15 minutes)</td>
<td>±0.005 dB</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connector type</td>
<td>FC/PC, FC/APC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>10 to 40°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>–30 to 60°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions (W x H x D)</td>
<td>4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>0.5 kg (1.1 lb)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. After 30 minute warm-up
2. Measured at constant temperature of 23 ±5°C
3. Modulation duty cycle is adjustable from 15% to 85%. Modulation depth is fixed at 100%
4. Measured at full power

### Multimode (MM) Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>850 nm</th>
<th>1310 nm</th>
<th>1550 nm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak wavelength</td>
<td>850 ±20 nm</td>
<td>1310 ±20 nm</td>
<td>1550 ±20 nm</td>
</tr>
<tr>
<td>Spectral width (FWHM)</td>
<td>&lt;8 nm</td>
<td>&lt;8 nm</td>
<td>&lt;8 nm</td>
</tr>
<tr>
<td>Total power</td>
<td>–3 dBm</td>
<td>–6 dBm</td>
<td>–6 dBm</td>
</tr>
<tr>
<td>Modulation</td>
<td>0.2 to 20 kHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stability (15 minutes)</td>
<td>±0.01 dB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connector type</td>
<td>FC/PC, FC/APC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>10 to 40°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>–30 to 60°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions (W x H x D)</td>
<td>4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>0.5 kg (1.1 lb)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. After 30 minute warm-up
2. Measured at constant temperature of 23 ±5°C
3. Modulation duty cycle is adjustable from 15% to 85%. Modulation depth is fixed at 100%
4. Measured at full power
For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at customer.service@jdsu.com.

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MFPL-A1100</td>
<td>Fabry-Perot mono-wavelength laser source</td>
</tr>
<tr>
<td>MFPL-A1200</td>
<td>Fabry-Perot bi-wavelength laser source</td>
</tr>
<tr>
<td>MWL1650A</td>
<td>1650 nm wavelength</td>
</tr>
<tr>
<td>MWL1625A</td>
<td>1625 nm wavelength</td>
</tr>
<tr>
<td>MWL1550A</td>
<td>1550 nm wavelength</td>
</tr>
<tr>
<td>MWL1480A</td>
<td>1480 nm wavelength</td>
</tr>
<tr>
<td>MWL1310A</td>
<td>1310 nm wavelength</td>
</tr>
<tr>
<td>MWL0980A</td>
<td>980 nm wavelength</td>
</tr>
<tr>
<td>MWL0850A</td>
<td>850 nm wavelength</td>
</tr>
<tr>
<td>M100</td>
<td>9/125 fiber type</td>
</tr>
<tr>
<td>M101</td>
<td>50/125 fiber type (850, 1310 and 1550 nm only)</td>
</tr>
<tr>
<td>M102</td>
<td>62.5/125 fiber type (850, 1310 and 1550 nm only)</td>
</tr>
<tr>
<td>M104</td>
<td>Flexcor fiber (980 nm only)</td>
</tr>
<tr>
<td>MFP</td>
<td>FC/PC connector type</td>
</tr>
<tr>
<td>MFA</td>
<td>FC/APC connector type (M100 only)</td>
</tr>
</tbody>
</table>

1. SM and MM fiber type options cannot be combined in one module
MAP Light Emitting Diode Source (mLED-A1)

Key Features
- Dual independent sources available in a single cassette
- Single-mode (SM)/Multimode (MM) output
- Internal modulation circuitry
- Can be automated when used with MAP-200
- LXI-compliant interfaces and IVI drivers

Applications
- Optical component spectral tests
- Systems compliance tests
- Sensors and imaging

Safety Information
- The MAP LED Source, when installed in a MAP chassis, complies to CE, CSA/UL/IEC61010-1, LXI Class C requirements, meets the requirements of Class 3B in standard IEC 60825-1(2002), and complies with 21 CFR 1040.1 except deviations per Laser Notice No. 50, July 2001.

The Multiple Application Platform (MAP) Light Emitting Diode Source (mLED-A1) is optimized for the industry-leading JDSU MAP-200 platform. Based on the previous-generation Multiple Application Platform (MAP), the MAP-200 is the first photonic layer lab and manufacturing platform that is LAN Extensions for Instrumentation (LXI)-compliant by conforming to the required physical attributes, Ethernet connectivity, and interchangeable virtual instrument (IVI) drivers. The MAP-200 platform is optimized for density and maximum configurability to meet specific application requirements in the smallest possible footprint.

The mLED-A1 is a high-power LED based light source with variable output power. High output power and excellent wavelength stability, combined with built-in modulation circuitry, make this light source suitable for wavelength division multiplexing (WDM) component manufacturing and testing. Other applications of this device include sensing, spectroscopy and amplified spontaneous emissions (ASEs) loading for optical signal-to-noise ratio (OSNR) measurements.
Specifications

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1310 nm</td>
<td>1550 nm</td>
<td>850 nm</td>
<td>1310 nm</td>
<td>1550 nm</td>
</tr>
<tr>
<td>Peak wavelength</td>
<td>1310 ±20 nm</td>
<td>1550 ±20 nm</td>
<td>850 ±20 nm</td>
<td>1310 ±20 nm</td>
<td>1550 ±20 nm</td>
</tr>
<tr>
<td>3 dB width</td>
<td>&gt;40 nm</td>
<td>&gt;40 nm</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Spectral ripple (RB = 0.1 nm)</td>
<td>0.35 dB</td>
<td>0.35 dB</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Total power 1, 2</td>
<td>0 dBm</td>
<td>0 dBm</td>
<td>−3 dBm</td>
<td>−3 dBm</td>
<td>−3 dBm</td>
</tr>
<tr>
<td>Modulation</td>
<td>0.2 to 20 kHz</td>
<td>±0.01 dB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stability (15 minutes) 1, 2, 3</td>
<td>±0.01 dB</td>
<td>FC/PC, FC/PC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connector type</td>
<td>FC/PC, FC/PC</td>
<td>FC/PC, FC/PC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>10 to 40°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>−30 to 60°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions (W x H x D)</td>
<td>4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>0.5 kg (1.1 lb)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. After 30 minute warm-up
2. Measured at constant temperature of 23 ±5°C
3. Measured at full power

Ordering Information

For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at customer.service@jdsu.com.

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLED-A1100</td>
<td>LED mono-wavelength laser source</td>
</tr>
<tr>
<td>MLED-A1200</td>
<td>LED bi-wavelength laser source</td>
</tr>
<tr>
<td>MWL1550A</td>
<td>1550 nm wavelength</td>
</tr>
<tr>
<td>MWL1310A</td>
<td>1310 nm wavelength</td>
</tr>
<tr>
<td>MWL0850A</td>
<td>850 nm wavelength</td>
</tr>
<tr>
<td>M100</td>
<td>9/125 fiber type (1310 and 1550 nm only)</td>
</tr>
<tr>
<td>M101</td>
<td>50/125 fiber type</td>
</tr>
<tr>
<td>M102</td>
<td>62.5/125 fiber type</td>
</tr>
<tr>
<td>MFP</td>
<td>FC/PC connector type</td>
</tr>
<tr>
<td>MFA</td>
<td>FC/APC connector type (M100 only)</td>
</tr>
</tbody>
</table>

If the configurations available do not meet your performance requirements, please contact your global sales and customer service team to discuss the potential for specialized solutions.

UL is a registered trademark of Underwriters Laboratories, inc.
The Multiple Application Platform (MAP) Large Channel Count Switch (mLCS-A1) is optimized for the industry-leading JDSU MAP-200 platform. Based on the previous-generation MAP, the MAP-200 is the first photonic layer lab and manufacturing platform that is LAN Extensions for Instrumentation (LXI)-compliant by conforming to the required physical attributes, Ethernet connectivity, and interchangeable virtual instrument (IVI) drivers. The MAP-200 platform is optimized for density and maximum configurability to meet specific application requirements in the smallest possible footprint.

The MAP Large Channel Count Switch is based on JDSU expanded beam and alignment technologies and exhibits low insertion loss (IL) and high return loss (RL). It is available in single-switch configurations from 1x4 up to 1x50, dual independent switch configurations from 1x4 up to 1x25, and both single and dual independent switch configurations from 2x4 to 2x16. An important element of an optical test bed, optical switches increase throughput by enabling time-saving automation, reduce uncertainty from repeated connector mating, and maximize usage of expensive test equipment.
## Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Single-mode fiber SMF 9/125 Typical/Maximum</th>
<th>Multimode fiber MMF 50/125 and 62.5/125 Typical/Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wavelength range</td>
<td>1270 to 1670 nm</td>
<td>850 to 1350 nm, 750 to 940 nm</td>
</tr>
<tr>
<td>Insertion loss (IL)(^1) (N = number of output channels)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N≤25</td>
<td>0.5 dB/0.7 dB</td>
<td>0.4 dB/0.6 dB</td>
</tr>
<tr>
<td>N&gt;25, 2xN</td>
<td>0.8 dB/1.2 dB</td>
<td>0.7 dB/1.0 dB</td>
</tr>
<tr>
<td>Polarization dependent loss (PDL)(^1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N≤25</td>
<td>0.02 dB/0.04 dB</td>
<td>N/A</td>
</tr>
<tr>
<td>N&gt;25, 2xN</td>
<td>0.04 dB/0.08 dB</td>
<td>N/A</td>
</tr>
<tr>
<td>Return loss (RL)(^1, 2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N≤25</td>
<td>62 dB/57 dB</td>
<td>25 dB/20 dB</td>
</tr>
<tr>
<td>N&gt;25, 2xN</td>
<td>55 dB/45 dB</td>
<td>20 dB/20 dB</td>
</tr>
<tr>
<td>IL Stability</td>
<td>±0.02 dB/±0.025 dB</td>
<td>±0.03 dB/±0.04 dB</td>
</tr>
<tr>
<td>N≤25, 2xN</td>
<td>±0.03 dB/±0.04 dB</td>
<td></td>
</tr>
<tr>
<td>Repeatability sequential switching</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N≤25</td>
<td>±0.005 dB/±0.01 dB</td>
<td></td>
</tr>
<tr>
<td>N&gt;25, 2xN</td>
<td>±0.01 dB/±0.03 dB</td>
<td></td>
</tr>
<tr>
<td>Repeatability random switching</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N≤25</td>
<td>±0.01 dB/±0.05 dB</td>
<td>±0.03 dB/±0.08 dB</td>
</tr>
<tr>
<td>N&gt;25, 2xN</td>
<td>±0.03 dB/±0.08 dB</td>
<td></td>
</tr>
<tr>
<td>Crosstalk</td>
<td>−80 dB/N/A</td>
<td>−80 dB/N/A</td>
</tr>
<tr>
<td>N≤25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N&gt;25, 2xN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switching time (first channel / each additional channel)</td>
<td>25 ms/15 ms</td>
<td></td>
</tr>
<tr>
<td>Maximum input power (optical)</td>
<td>300 mW</td>
<td></td>
</tr>
<tr>
<td>Lifetime</td>
<td>&gt;100 million cycles</td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>−5 to 55°C</td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>−30 to 60°C</td>
<td></td>
</tr>
<tr>
<td>Dimensions (W x H x D)</td>
<td>4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>1.3 kg (2.87 lb) maximum (varies with configuration)</td>
<td></td>
</tr>
</tbody>
</table>

1. Excluding connectors. All optical measurements taken after temperature has been stabilized for one hour
2. RL is based on 1 m pigtail (equivalent to bulkhead version)
For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at customer.service@jdsu.com.

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLCS-A1104B</td>
<td>Single 1x4 switch, bulkheads</td>
</tr>
<tr>
<td>MLCS-A1106B</td>
<td>Single 1x6 switch, bulkheads</td>
</tr>
<tr>
<td>MLCS-A1108B</td>
<td>Single 1x8 switch, bulkheads</td>
</tr>
<tr>
<td>MLCS-A1112P</td>
<td>Single 1x12 switch, pigtails</td>
</tr>
<tr>
<td>MLCS-A1116P</td>
<td>Single 1x16 switch, pigtails</td>
</tr>
<tr>
<td>MLCS-A1124P</td>
<td>Single 1x24 switch, pigtails</td>
</tr>
<tr>
<td>MLCS-A1132P</td>
<td>Single 1x32 switch, pigtails</td>
</tr>
<tr>
<td>MLCS-A1142P</td>
<td>Single 1x42 switch, pigtails</td>
</tr>
<tr>
<td>MLCS-A1150P</td>
<td>Single 1x50 switch, pigtails</td>
</tr>
<tr>
<td>MLCS-A1204B</td>
<td>Dual independent 1x4 switch, bulkheads</td>
</tr>
<tr>
<td>MLCS-A1208P</td>
<td>Dual independent 1x8 switch, pigtails</td>
</tr>
<tr>
<td>MLCS-A1212P</td>
<td>Dual independent 1x12 switch, pigtails</td>
</tr>
<tr>
<td>MLCS-A1216P</td>
<td>Dual independent 1x16 switch, pigtails</td>
</tr>
<tr>
<td>MLCS-A1225P</td>
<td>Dual independent 1x25 switch, pigtails</td>
</tr>
<tr>
<td>MLCS-A1104BD</td>
<td>Single 2x4 E configuration switch, bulkheads</td>
</tr>
<tr>
<td>MLCS-A1108BD</td>
<td>Single 2x8 E configuration switch, bulkheads</td>
</tr>
<tr>
<td>MLCS-A1116PD</td>
<td>Single 2x16 E configuration switch, pigtails</td>
</tr>
<tr>
<td>MLCS-A1204PD</td>
<td>Dual 2x4 E configuration switch, pigtails</td>
</tr>
<tr>
<td>MLCS-A1208PD</td>
<td>Dual 2x8 E configuration switch, pigtails</td>
</tr>
<tr>
<td>MLCS-A1216PD</td>
<td>Dual 2x16 E configuration switch, pigtails</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fiber Type Options (Required, select one)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M100 9/125 fiber type</td>
</tr>
<tr>
<td>M101 50/125 fiber type</td>
</tr>
<tr>
<td>M102 62.5/125 fiber type</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Connector Options (Required, select one)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MFP FC/PC connector type</td>
</tr>
<tr>
<td>MFA FC/APC connector type (for M100 fiber type option only)</td>
</tr>
<tr>
<td>MSC SC/PC connector type</td>
</tr>
<tr>
<td>MSU SC/APC connector type (for M100 fiber type option only)</td>
</tr>
</tbody>
</table>

If the configurations available do not meet your performance requirements, please contact your global sales and customer service team to discuss the potential for specialized solutions.
MAP Small Channel Count Switch
(mSCS-A1)

Key Features

- Insertion loss (IL) <0.8 dB and return loss (RL) >55 dB
- Low polarization dependent loss (PDL) 0.08 dB
- Up to 8 switches per cassette
- Can be automated when used with MAP-200 LXI-compliant interfaces and IVI drivers

Applications

- Dense wavelength division multiplexing (DWDM) channel testing
- Amplifier characterization
- Bit error rate (BER) testing
- Signal routing

Safety Information

- The MAP Small Channel Count Switch, installed in a MAP chassis, complies to CE, CSA/UL/IEC61010-1, plus LXI Class C requirements.

The Multiple Application Platform (MAP) Small Channel Count Switch (mSCS-A1) is optimized for the industry-leading JDSU MAP-200 platform. Based on the previous-generation MAP, the MAP-200 is the first photonic layer lab and manufacturing platform that is LAN Extensions for Instrumentation (LXI)-compliant by conforming to the required physical attributes, Ethernet connectivity, and interchangeable virtual instrument (IVI) drivers. The MAP-200 platform is optimized for density and maximum configurability to meet specific application requirements in the smallest possible footprint.

The mSCS-A1 is based on optical prism and mirror technology that directs incident light into selected output channels. It is available in 1x2 and 2x2 configurations and supports multiple devices per MAP cassette, single-mode or multimode fiber, and four connector types. An important element of an optical test bed, optical switches increase throughput by enabling time-saving automation, reducing uncertainty from repeated connector mating, and maximizing usage of expensive test equipment.
Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Single-mode fiber (SM)</th>
<th>Multimode fiber (MM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wavelength</td>
<td>1310 and 1550 nm</td>
<td>850 and 1310 nm</td>
</tr>
<tr>
<td>Insertion loss (IL)(^1)</td>
<td>(\leq 0.8) dB</td>
<td>(\leq 0.8) dB</td>
</tr>
<tr>
<td></td>
<td>(\leq 1.0) dB</td>
<td>(\leq 1.1) dB</td>
</tr>
<tr>
<td>Return loss (RL)(^1)</td>
<td>(&gt; 55) dB</td>
<td>(&gt; 20) dB</td>
</tr>
<tr>
<td>Polarization dependent loss (PDL)(^1)</td>
<td>(\leq 0.1) dB</td>
<td>N/A</td>
</tr>
<tr>
<td>Repeatability</td>
<td>(\pm 0.05) dB</td>
<td>(\pm 0.02) dB</td>
</tr>
<tr>
<td>Crosstalk</td>
<td>(&lt;-60) dB</td>
<td>(&lt;-35) dB</td>
</tr>
<tr>
<td>Optical input power</td>
<td>300 mW</td>
<td></td>
</tr>
<tr>
<td>Switching speed</td>
<td>10 ms</td>
<td></td>
</tr>
<tr>
<td>Latching</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Lifetime</td>
<td>(&gt;10) million cycles</td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>0 to 50°C</td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>–30 to 60°C</td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>90% relative, non-condensing</td>
<td></td>
</tr>
<tr>
<td>Dimensions (W x H x D)</td>
<td>4.06 x 13.26 x 37.03 cm</td>
<td>1.6 x 5.22 x 14.58 in</td>
</tr>
<tr>
<td>Weight</td>
<td>1.1 kg (2.43 lb)  maximum (varies with configuration)</td>
<td></td>
</tr>
</tbody>
</table>

1. Unless otherwise specified, all specifications at start of life at 23°C ±3°C, 45% RH ±5% and optical input power of –25 to 0 dBm, excluding connectors

Ordering Information

For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at customer.service@jdsu.com.

Base Options (Required, select one)

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSCS-B1112B</td>
<td>MAP SCS Cassette, one 1x2 switch, bulkheads</td>
</tr>
<tr>
<td>MSCS-B1212B</td>
<td>MAP SCS Cassette, two 1x2 switch, bulkheads</td>
</tr>
<tr>
<td>MSCS-B1412P</td>
<td>MAP SCS Cassette, four 1x2 switch, pigtails (for M100 fiber type option only)</td>
</tr>
<tr>
<td>MSCS-B1612P</td>
<td>MAP SCS Cassette, six 1x2 switch, pigtails (for M100 fiber type option only)</td>
</tr>
<tr>
<td>MSCS-B1812P</td>
<td>MAP SCS Cassette, eight 1x2 switch, pigtails (for M100 fiber type option only)</td>
</tr>
<tr>
<td>MSCS-A1122B</td>
<td>MAP SCS Cassette, one 2x2 switch, bulkheads</td>
</tr>
<tr>
<td>MSCS-A1222B</td>
<td>MAP SCS Cassette, two 2x2 switch, bulkheads</td>
</tr>
<tr>
<td>MSCS-A1422P</td>
<td>MAP SCS Cassette, four 2x2 switch, pigtails (for M100 fiber type option only)</td>
</tr>
<tr>
<td>MSCS-A1622P</td>
<td>MAP SCS Cassette, six 2x2 switch, pigtails (for M100 fiber type option only)</td>
</tr>
<tr>
<td>MSCS-A1822P</td>
<td>MAP SCS Cassette, eight 2x2 switch, pigtails (for M100 fiber type option only)</td>
</tr>
</tbody>
</table>

Fiber Type Options (Required, select one)

<table>
<thead>
<tr>
<th>Fiber Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M100</td>
<td>9/125 fiber type</td>
</tr>
<tr>
<td>M101</td>
<td>50/125 fiber type</td>
</tr>
<tr>
<td>M102</td>
<td>62.5/125 fiber type</td>
</tr>
</tbody>
</table>

Connector Options (Required, select one)

<table>
<thead>
<tr>
<th>Connector Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MFP</td>
<td>FC/PC connector type</td>
</tr>
<tr>
<td>MFA</td>
<td>FC/APC connector type (for M100 fiber type optional)</td>
</tr>
<tr>
<td>MSC</td>
<td>SC/PC connector type</td>
</tr>
<tr>
<td>MSU</td>
<td>SC/APC connector type (for M100 fiber type optional)</td>
</tr>
</tbody>
</table>

UL is a registered trademark of Underwriters Laboratories Inc.
Telcordia is a registered trademark of Telcordia Technologies, Inc.
MAP Utility
(mUTL-A1)

Key Features
- Coupling, splitting and mux/demux functionality in a robust package
- Supports single-mode and multimode fibers
- User-defined configurability
- Ideal for individual lane testing on WDM signals for 100GE and 40GE applications

Applications
- Bit error rate (BER) test
- Passive component test
- Optical amplifier test

Safety Information
- The MAP Utility, when installed in a MAP chassis, complies to CE, CSA/UL/IEC61010-1, plus LXI Class C requirements.

The Multiple Application Platform (MAP) Utility (mUTL-A1) is optimized for the industry-leading JDSU MAP-200 platform. Based on the previous-generation MAP, the MAP-200 is the first photonic layer lab and manufacturing platform that is LAN Extensions for Instrumentation (LXI)-compliant by conforming to the required physical attributes, Ethernet connectivity, and interchangeable virtual instrument (IVI) drivers. The MAP-200 platform is optimized for density and maximum configurability to meet specific application requirements in the smallest possible footprint. The MAP Utility is designed to simplify the mechanical integration of passive optical components for test sets. It supports angled or flat polish connectors as well as single-mode (SM) and multimode (MM) fibers.

A blank MAP Utility cassette is available for mechanical mounting of components such as isolators, circulators or fixed attenuators. The cassettes are supplied with mounting hardware and ten bulkhead adapters for ease-of-integration.
### Single-Mode (SM) Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>SM 1x2, 1/99 Coupler (Fused)</th>
<th>SM 1x2, 10/90 Coupler (Fused)</th>
<th>SM 1x2, 30/70 Coupler (Fused)</th>
<th>SM 1x2, 50/50 Coupler (Fused)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiber type</td>
<td>9/125 µm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wavelength</td>
<td>1310/1550 nm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insertion loss (IL)</td>
<td>&lt;24.0/1.2 dB</td>
<td>&lt;11.8/1.2 dB</td>
<td>&lt;6.5/2.4 dB</td>
<td>&lt;4.1 dB</td>
</tr>
<tr>
<td>Optical power handling</td>
<td>300 mW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of slots</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions (W x H x D)</td>
<td>4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>1.0 kg (2.2 lb)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Multimode (MM) Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>MM 10/90 Coupler (Micro-optic)</th>
<th>MM 50/50 Coupler (Micro-optic)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiber type</td>
<td>50/125 or 62.5/125 µm</td>
<td></td>
</tr>
<tr>
<td>Wavelength</td>
<td>850/1310 nm</td>
<td></td>
</tr>
<tr>
<td>IL</td>
<td>&lt;11.8/&lt;1.2 dB</td>
<td>&lt;4.1 dB</td>
</tr>
<tr>
<td>Optical power handling</td>
<td>300 mW</td>
<td></td>
</tr>
<tr>
<td>Number of slots</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Dimensions (W x H x D)</td>
<td>4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)</td>
<td>&lt;1.0 kg (2.2 lb)</td>
</tr>
<tr>
<td>Weight</td>
<td>&lt;1.0 kg (2.2 lb)</td>
<td></td>
</tr>
</tbody>
</table>

### mWDM-A1100GE Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiber type</td>
<td>9/125 µm</td>
</tr>
<tr>
<td>Wavelength</td>
<td>1295.6, 1300.1, 1304.6, 1309.1 nm</td>
</tr>
<tr>
<td>IL</td>
<td>&lt;2.0 dB</td>
</tr>
<tr>
<td>Pass bandwidth</td>
<td>±1.50 nm</td>
</tr>
<tr>
<td>Ripple in passband</td>
<td>&lt;0.5 dB</td>
</tr>
<tr>
<td>Return loss</td>
<td>&gt;45 dB</td>
</tr>
<tr>
<td>Isolation adjacent channel</td>
<td>&gt;15 dB</td>
</tr>
<tr>
<td>Isolation non-adjacent channel</td>
<td>&gt;15 dB</td>
</tr>
<tr>
<td>Internal fiber length</td>
<td>1±0.1 m</td>
</tr>
<tr>
<td>Number of slots</td>
<td>1</td>
</tr>
<tr>
<td>Dimensions (W x H x D)</td>
<td>4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)</td>
</tr>
<tr>
<td>Weight</td>
<td>&lt;1.0 kg (2.2 lb)</td>
</tr>
</tbody>
</table>
## mWDM-A1040GE Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>9/125 µm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiber type</td>
<td>9/125 µm</td>
</tr>
<tr>
<td>Wavelength</td>
<td>1271, 1291, 1311, 1333 nm</td>
</tr>
<tr>
<td>IL</td>
<td>&lt;1.7 dB</td>
</tr>
<tr>
<td>Pass bandwidth</td>
<td>±6.50 nm</td>
</tr>
<tr>
<td>Ripple in passband</td>
<td>&lt;0.5 dB</td>
</tr>
<tr>
<td>Return loss</td>
<td>&gt;45 dB</td>
</tr>
<tr>
<td>Isolation adjacent channel</td>
<td>&gt;30 dB</td>
</tr>
<tr>
<td>Isolation non-adjacent channel</td>
<td>&gt;50 dB</td>
</tr>
<tr>
<td>Internal fiber length</td>
<td>1±0.1 m</td>
</tr>
<tr>
<td>Number of slots</td>
<td>1</td>
</tr>
<tr>
<td>Dimensions (W x H x D)</td>
<td>4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)</td>
</tr>
<tr>
<td>Weight</td>
<td>&lt;1.0 kg (2.2 lb)</td>
</tr>
</tbody>
</table>

## Ordering Information

For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at customer.service@jdsu.com.

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Base Options (Required)</strong></td>
<td></td>
</tr>
<tr>
<td>MUTL-A1000</td>
<td>MAP Utility, Blank</td>
</tr>
<tr>
<td><strong>Splitter Options (Optional, select one, two, or three)</strong></td>
<td></td>
</tr>
<tr>
<td>MUTL-A101SB</td>
<td>MAP Utility, 1% Coupler, Bulkheads</td>
</tr>
<tr>
<td>MUTL-A110SB</td>
<td>MAP Utility, 10% Coupler, Bulkheads</td>
</tr>
<tr>
<td>MUTL-A130SB</td>
<td>MAP Utility, 30% Coupler, Bulkheads</td>
</tr>
<tr>
<td>MUTL-A150SB</td>
<td>MAP Utility, 50% Coupler, Bulkheads</td>
</tr>
<tr>
<td>MWDM-A1100GE</td>
<td>MAP Utility, Mux/Demux, Bulkheads</td>
</tr>
<tr>
<td>MWDM-A1040GE</td>
<td>MAP Utility, Mux/Demux, Bulkheads</td>
</tr>
<tr>
<td><strong>Fiber Type Options (Required if splitter option selected, select one)</strong></td>
<td></td>
</tr>
<tr>
<td>M100</td>
<td>9/125 fiber type</td>
</tr>
<tr>
<td>M101</td>
<td>50/125 fiber type</td>
</tr>
<tr>
<td>M102</td>
<td>62.5/125 fiber type</td>
</tr>
<tr>
<td><strong>Connector Options (Required)</strong></td>
<td></td>
</tr>
<tr>
<td>MFP</td>
<td>FC/PC connector type</td>
</tr>
<tr>
<td>MFA</td>
<td>FC/APC connector type (for M100 fiber type option only)</td>
</tr>
<tr>
<td>MSC</td>
<td>SC/PC connector type</td>
</tr>
<tr>
<td>MSU</td>
<td>SC/APC connector type (for M100 fiber type option only)</td>
</tr>
</tbody>
</table>
AC Adapters are for use with the JDSU power meters from the MAP, c-Series, SWS, OCETS, and legacy product lines.

The AC900 series are new precision adapters with a locking feature for better measurement precision that can be used with the mOPM-B1, mORL-A1, and all c-Series. For compatibility questions, or if you need an adaptor not listed, contact the Technical Assistance Center (TAC) support.

### Measurement Accessories

**AC100 Series**

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC100</td>
<td>Detector cap</td>
</tr>
<tr>
<td>AC101</td>
<td>FC adapter</td>
</tr>
<tr>
<td>AC102</td>
<td>ST adapter</td>
</tr>
<tr>
<td>AC103</td>
<td>SC adapter</td>
</tr>
<tr>
<td>AC104</td>
<td>D4 adapter</td>
</tr>
<tr>
<td>AC108</td>
<td>Diamond HMS-0</td>
</tr>
<tr>
<td>AC112</td>
<td>MT (ribbon connector)</td>
</tr>
<tr>
<td>AC113</td>
<td>Ribbon fiber holder</td>
</tr>
<tr>
<td></td>
<td>(requires AC120)</td>
</tr>
<tr>
<td>AC114</td>
<td>MU</td>
</tr>
<tr>
<td>AC115</td>
<td>E2000</td>
</tr>
<tr>
<td>AC116</td>
<td>FC, ST, SC universal adapter</td>
</tr>
<tr>
<td>AC117</td>
<td>MPO/MTP</td>
</tr>
<tr>
<td>AC118</td>
<td>LC</td>
</tr>
<tr>
<td>AC119</td>
<td>MT-RJ</td>
</tr>
<tr>
<td>AC120</td>
<td>Adapter holder (for AC121 and AC113)</td>
</tr>
<tr>
<td>AC121</td>
<td>Bare fiber holder</td>
</tr>
<tr>
<td></td>
<td>(requires AC120)</td>
</tr>
</tbody>
</table>

**AC900 Series**

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC900</td>
<td>Magnetic quick cap</td>
</tr>
<tr>
<td>AC901</td>
<td>FC adapter</td>
</tr>
<tr>
<td>AC903</td>
<td>SC adapter</td>
</tr>
<tr>
<td>AC917</td>
<td>MPO adapter</td>
</tr>
<tr>
<td>AC918</td>
<td>LC adapter</td>
</tr>
</tbody>
</table>

**Power Cords (Required)**

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CORD-AU</td>
<td>Australia/China power cord</td>
</tr>
<tr>
<td>CORD-EU</td>
<td>European power cord</td>
</tr>
<tr>
<td>CORD-JP</td>
<td>Japan power cord</td>
</tr>
<tr>
<td>CORD-UK</td>
<td>United Kingdom power cord</td>
</tr>
<tr>
<td>CORD-US</td>
<td>United States power cord</td>
</tr>
</tbody>
</table>

**Calibrated Hybrid Jumper**

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Fiber Type</th>
<th>WL Range (µm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH200-07-FAFP</td>
<td>50/125, FAFP</td>
<td>0.8, 1.3</td>
</tr>
<tr>
<td>CH200-09-FAFP</td>
<td>9/125, FAFP</td>
<td>1.3, 1.5</td>
</tr>
<tr>
<td>CH200-17-FAFP</td>
<td>62.5/125, FAFP</td>
<td>0.8, 1.3</td>
</tr>
</tbody>
</table>

**Additional Accessories**

**UCAs (Universal Connector Adapters–Mating Sleeves)**

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC500</td>
<td>FC/PC to FC/PC</td>
</tr>
<tr>
<td>AC501</td>
<td>FC/PC to SC/PC</td>
</tr>
<tr>
<td>AC502</td>
<td>FC/APC to FC/APC</td>
</tr>
<tr>
<td>AC503</td>
<td>FC/APC to SC/APC</td>
</tr>
</tbody>
</table>

**Integrating Spheres**

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC330</td>
<td>33 dBm integrating sphere</td>
</tr>
<tr>
<td></td>
<td>for high power and single fiber</td>
</tr>
<tr>
<td>AC990</td>
<td>Multi-fiber integrating sphere</td>
</tr>
</tbody>
</table>
About Technical Support

JDSU provides dedicated post-sales support with a team that is ready to help you answer any questions or concerns about Instrumentation products.

Standard Technical Support

(Included with every instrumentation product purchase) Our technical support specialists are available live, via our global toll-free 800 number or via e-mail (8:00 AM to 5:00 PM ET, Monday through Friday). If you experience a problem with the operation of a JDSU product, our Technical Support Specialist is trained to work with you, to carry out technical troubleshooting to resolve or confirm the reported problem. If a problem is confirmed, the Technical Support Specialist will take appropriate action to address your needs.

All service (repair, calibration, and upgrade) for our products is provided via the JDSU Technical Support Team.

Replacement user manuals and JDSU software updates are also included in our standard support package.

24-7 Emergency Technical Support

JDSU 24-7 Emergency Technical Support via our global toll-free 800 number is also included in our standard level of support. If you require emergency technical support, a Technical Support Specialist will be paged, and will return your call promptly.

For further information, including Extended Support Options and Technical Training, please contact JDSU.

Contact Support

Regular support hours of operation are 8:00 AM to 5:00 PM ET, Monday through Friday, excluding holidays.

Emergency Technical Support is available 24 hours a day, 7 days a week if your equipment is not functioning and you have an urgent requirement for assistance. Dial one of the telephone numbers and follow the voice prompts to page a specialist.