



# Multiple Application Platform (MAP-200)

Platform Overview



# Flexible, Dynamic Solution for Comprehensive Optical and Electro-Optical Testing

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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.

# Targeted Tools—The MAP-200 Solution Selection Guide

## 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.

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## 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.

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## MAP Tunable Filter

Tunable bandpass filter offers continuous wavelength tuning from 1420 to 1630 nm. The standard model provides 300 mW maximum input power. The high power option provides 1000 mW maximum input power.

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## MAP Broadband Source

Offers an amplified spontaneous emission (ASE) output that features flattened high power density across the C-band or C+L-band. The source provides high spectral stability.

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## 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 power control feature.

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## 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.

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## MAP Optical Power Meter

Features 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.

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## MAP DFB Laser

May be used to create an ITU grid in which optical frequency represented by a DFB laser corresponds to the transmitter in the optical network. Can be selected to comply with the 50 GHz ITU grid in the C- and L-band (1527 to 1610 nm) wavelength ranges.

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# The MAP-200 Solution Selection Guide



## MAP DFB Laser - Analog Modulation

Offers 1 GHz of modulation bandwidth from front panel connector. Designed to meet the needs of CATV test. Low distortion ensures accurate CATV receiver test.

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## MAP Fabry-Perot Laser

Produces a stable light source at desired wavelengths. Offers optimal stability and features such as built-in internal and external modulation capabilities, and variable power control.

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## MAP LED Source

Provides a high-power light emitting diode (LED)-based light source with variable output power.

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## MAP Tunable Laser

An external cavity tunable diode laser that offers exceptional speed, accuracy and flexibility at a competitive price.

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## 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.

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## 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.

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## MAP RF Switch

A 50-ohm coaxial switch for routing RF and microwave signals at frequencies up to 26.5 GHz.

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## 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.

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# 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.

	10 Gb/s NETWORK TEST BED	BIT ERROR RATE	EXTINCTION RATIO	EYE MASK	INSERTION LOSS	INTRINSIC JITTER	NOISE FIGURE	OPTICAL GAIN	OSNR	POLARIZATION DEPENDANT GAIN	POLARIZATION DEPENDENT LOSS	RETURN LOSS
Broadband Source	✓				✓				✓		✓	✓
Couplers and Splitters	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DFB Laser	✓				✓	✓	✓	✓		✓	✓	✓
EDFA	✓						✓	✓	✓			
Fabry-Perot Laser	✓				✓						✓	✓
Polarization Controller	✓						✓		✓	✓	✓	✓
Power Meter	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RF Switch	✓	✓		✓		✓						
Switches	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Tunable Filter	✓				✓		✓	✓	✓	✓	✓	✓
Tunable Laser	✓				✓		✓	✓		✓	✓	✓
Variable Backreflector	✓											✓
Variable Optical Attenuator	✓	✓		✓			✓	✓	✓	✓		

# Multiple Application Platform

## MAP-200



MAP-230 (top) and MAP-280 (bottom) mainframes

### 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
- 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).

#### Passives

- Insertion Loss
- Polarization Dependent Loss
- Return Loss

#### Lasers and Amplifiers

- Gain Flatness
- Output Power
- Transient Response
- Spectral Width
- Side Mode Suppression Ratio
- Wavelength
- NF and OSNR

#### Optical Transport

- Stress Receiver Compliance
- Jitter Testing
- Sensitivity
- Dispersion Penalty
- SMSR
- Receiver Overload
- Eye Mask/Extinction Ratio
- OSNR Sensitivity

Table 1 List of MAP-200 applications by technology

### 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.

**MAP Amplifiers** meet the broadest optical signal amplification applications. They are available at various saturated output power, gain flattened or nongain 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, RF switch, and utility modules.



Figure 1 Keypad/display module

### 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-200KD), shown in Figure 1, that provides full local control capabilities. The MAP-200KD 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-200KD 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-200A09). Alternatively, the GUI can be accessed in a PC environment via a virtual network connection (VNC) client.

When in use with the MAP-230 mainframe, shown in Figure 2b, the MAP-200KD 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.



Figure 2a



Figure 2b

Figures 2a and 2b Suggested MAP-230 and MAP-200KD implementation. Figure 2a shows the MAP-200KD mounted on the MAP-230, an optimal configuration for applications requiring high interactivity with the GUI. Figure 2b shows the MAP-200KD 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 come with a built-in simulator 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.

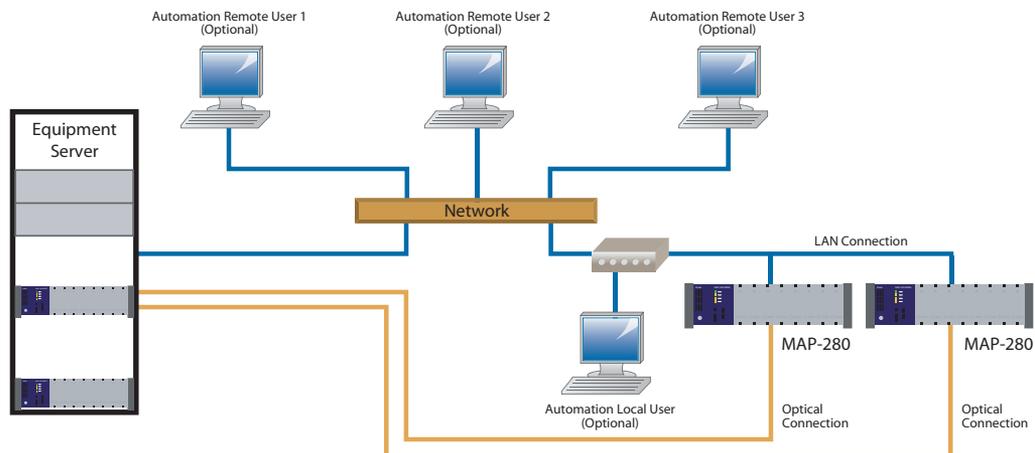


Figure 3 MAP implementation within a shared resource environment

**Mainframe Specifications**

Parameter	MAP-230	MAP-280	MAP-280R
Capacity	3 modules	8 modules	8 modules
Controller		Power PC architecture	
CPU		Linux	
Operating System		200 MB user flash storage	
Internal Storage			
Interfaces		USB, GPIB, Ethernet 10/100/1000BaseT	
Remote interface		Mouse, keyboard, memory stick	
USB device compatibility		External MAP-200KD (optional) or standard DVI monitor	
Display			
Ports		2 rear and 2 front	
USB host ports		1 front	
USB device ports		1 rear	
LAN		1 rear	
GPIB		1 rear	
DVI video		1 rear	
LXI triggers		25-pin Micro-D connectors	
Automation		IVI-compliant	
Driver type		LabVIEW, LabWindows, Visual C++, Visual Basic	
Driver compatibility		Multi-user sharing support	
Accessibility			
Electrical and Safety		100 to 125V AC/200 to 240V AC, 50/60 Hz, Auto-switching (field-replaceable as part of the power supply controller module)	
Power		200 VA	
Power consumption		Key located in front	
Local interlock		Terminals located in rear	
Remote interlock			
Mechanical and Environment			
Rack-mount kit	Optional	Included	Included
Dimensions (W x H x D) <sup>1</sup>	29.2 x 14.9 x 42.0 cm (11.5 x 5.9 x 16.6 in)	49.6 x 14.9 x 42.0 cm (19.6 x 5.9 x 16.6 in)	49.6 x 14.9 x 42.0 cm (19.6 x 5.9 x 16.6 in)
Weight	5.9 kg (13 lb)	6.8 kg (15 lb)	6.8 kg (15 lb)
Operating temperature		0 to 50°C	
Storage temperature		-30 to 60°C	
Humidity		<80% RH, 0 to 40°C non-condensing	

1. Dimensions include bench-top mounting hardware

**MAP-200KD Display Specifications**

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

**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](mailto:customer.service@jdsu.com).

Product Code	Description
<b>Mainframes (Required)</b>	
MAP-280	MAP-200 8-slot mainframe
MAP-280R	MAP-200 8-slot mainframe factory reversed configuration
MAP-230	MAP-200 3-slot mainframe
<b>Power Cords (Required)</b>	
CORD-AU	Australian power cord
CORD-EU	European power cord
CORD-JP	Japan power cord
CORD-UK	United Kingdom power cord
CORD-US	United States power cord
<b>Accessories (Optional)</b>	
MAP-200KD	MAP-200 stand-alone keypad/display module
MAP-200A01	MAP-200KD keypad/display cable harness kit
MAP-200A03	MAP-280 8-slot mainframe 19-inch rack-mount kit
MAP-200A05	MAP-200 adaptor kit for single width MAP modules (requires one kit per device)
MAP-200A05D	MAP-200 adaptor kit for double width MAP modules (requires one kit per device)
MAP-200A09	MAP-200KD keypad/display module rack-mount kit
MAP-200A10	MAP-200 3-slot mainframe 19-inch rack-mount kit
<b>Replacement/Spare Parts (Optional)</b>	
MAP-200A02	MAP-200 controller for MAP-280 and MAP-230
MAP-200A02R	MAP-200 controller for MAP-280R
MAP-200A04	MAP-200 safety interlock key
MAP-200A06	MAP-200 blanking plates (kit of 3)
MAP-200A07	MAP-200 stylus
MAP-200A08	MAP-230 3-slot mainframe flip-up feet
MAP-200A11	MAP-200 detachable side panels for bench-top use
MAP-200A12	MAP-200 handles for detachable side panels

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 LabVIEW is a registered trademark of National Instruments Corporation.  
 UL is a registered trademark of Underwriters Laboratories Inc.

# 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

## 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.

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 3.5 dB and has gain flatness better than 1.4 dB. All MAP EDFA models are available for operation in C- or L-band.

The MAP EDFA models provide specialized variants and optical performance not available in the Benchtop EDFA line. Additional EDFA models are available in the Benchtop EDFA product line for applications requiring higher saturated power or operation in the C+L-band.

INVISIBLE LASER RADIATION  
AVOID EXPOSURE TO BEAM  
CLASS 3B LASER PRODUCT  
(IEC 60825-1, 2002)  
MAX. 500 mw, 700-1680 nm

Specifications								
Parameter	1550	1552	1552	1554	1558	1590	1592	1594
Amplifier type	Pre-amp	Booster	Booster high power	In-line	Booster DWDM	Pre-amp	Booster	In-line
Operating wavelength range	1528 to 1565 nm	1528 to 1565 nm	1528 to 1565 nm	1528 to 1565 nm	1528 to 1563 nm	1565 to 1610 nm	1565 to 1610 nm	1565 to 1610 nm
Input signal	Single channel	Single channel	Single channel	Single channel	Multichannel (DWDM)	Single channel	Single channel	Single channel
Saturated output power (minimum) <sup>1</sup>	≥14 dBm	≥17 dBm	≥20 dBm	≥17 dBm	≥21 dBm	≥15 dBm	≥15 dBm	≥20 dBm
Noise figure (maximum) <sup>2</sup>	≤3.5 dB	≤4.5 dB	≤5.0 dB	≤3.8 dB	≤5.5 dB	≤5.0 dB	≤5.5 dB	≤5.5 dB
Small signal gain (minimum) <sup>3</sup>	≥37 dB	≥30 dB	≥32 dB	≥35 dB	≥25 dB	≥24 dB	≥22 dB	≥28 dB
Input/output monitors	No	Yes	Yes	No	Yes	No	Yes	Yes
Polarization dependent loss (PDL) (maximum)	≤0.2 dB	≤0.2 dB	≤0.2 dB	≤0.2 dB	≤0.25 dB	≤0.3 dB	≤0.3 dB	≤0.3 dB
Polarization mode dispersion (PMD) (maximum)	≤0.5 ps	≤0.4 ps	≤0.4 ps	≤0.5 ps	≤0.65 ps	≤0.6 ps	≤0.6 ps	≤0.6 ps
Input/output isolation (typical)	N/A/32 dB	45/32 dB	45/32 dB	32/32 dB	32/32 dB	N/A/40 dB	40/40 dB	40/40 dB
Spectral gain flatness (maximum) (p-p) <sup>4</sup>	N/A	N/A	N/A	N/A	≤1.4 dB	N/A	N/A	N/A
Operating temperature	0 to 40°C							
Storage temperature	-30 to 60°C							
Humidity	Maximum 95% RH non-condensing from 0 to 45°C							
Dimensions (W x H x D)	4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)							
Weight	1.3 kg (2.87 lb)							

Note: All specifications guaranteed at 1550 nm and at 23°C

- Saturated Output Power measured:
  - at 1550 nm at  $P_{in} = -4$  dBm
  - at 1550 nm at  $P_{in} = -4$  dBm (mid-span) for models 1550, 1552, 1554, 1558
  - at 1590 nm at  $P_{in} = 0$  dBm (mid-span) for models 1590, 1592, 1594
- Noise figure measured:
  - at  $P_{in} = -30$  dBm for model 1550
  - at  $P_{in} = -4$  dBm for models 1552, 1558, 1592
  - at  $P_{in} = -20$  dBm for models 1554, 1590, 1594
- Small signal gain measured:
  - at  $P_{in} = -30$  dBm for model 1550
  - at  $P_{in} = -20$  dBm for model 1552, 1554, 1590, 1592, 1594
  - at  $P_{in} = -4$  dBm for model 1558
- Flatness optimized:
  - for  $P_{in} = -4$  dBm for model 1558

**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.

Product Code	Description
<b>Base Options (Required, select one)</b>	
MEDFA-A15500	14 dBm C-band, Single Channel, Pre-amp
MEDFA-A15520	17 dBm C-band, Single Channel, Booster
MEDFA-A15522	20 dBm C-band, Single Channel, Booster
MEDFA-A15540	17 dBm C-band, Single Channel, In-Line Booster
MEDFA-A15580	21 dBm C-band, DWDM, Booster
MEDFA-A15900	15 dBm C-band, Single Channel, Pre-amp
MEDFA-A15920	15 dBm C-band, Single Channel, Booster
MEDFA-A15940	20 dBm C-band, Single Channel, In-Line Booster
<b>Connector Options (Required, select one)</b>	
MFP	FC/PC connector type
MFA	FC/APC connector type

# 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 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 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 MAP. The MAP is a general purpose, high density test and measurement platform for lab or production environments. Accommodates the installation of up to 16 independently controlled attenuators in a single MAP chassis.

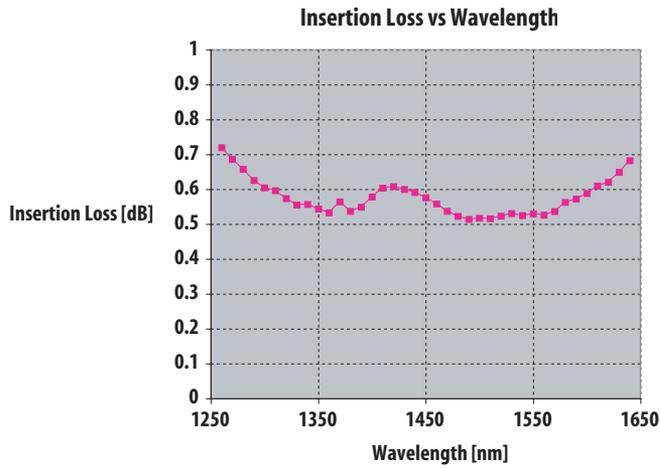


Figure 1: Example of insertion loss of the MAP Variable Optical Attenuator with single-mode fiber

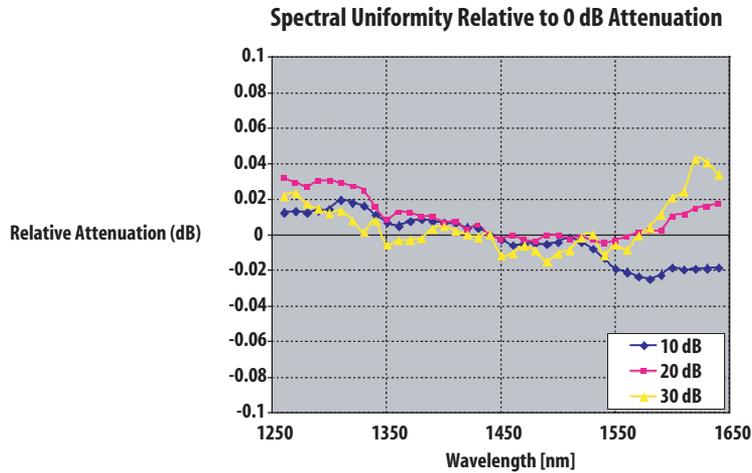


Figure 2: Example of spectral uniformity relative to 0 dB attenuation

**Optical Specifications**

Parameter	Single-mode		Multimode <sup>10</sup>	
	No power control	With power control	No power control	With power control
Insertion loss at minimum attenuation <sup>1,2,3</sup>	≤1.0 dB <sup>4,5</sup>	≤1.7 dB <sup>5</sup>	≤1.5 dB <sup>4</sup>	≤2.2 dB
Maximum input power (Standard power/High power option) <sup>13</sup>	+23 dBm/+33 dBm		+23 dBm/+27 dBm	
Wavelength range	1260 to 1650 nm		750 to 1350 nm	
Attenuation range <sup>1</sup>	70 dB		65 dB	
Attenuation flatness <sup>8,9</sup>	±0.04 dB from 0 to 30 dB		N/A	
Attenuation slew rate (nominal)	25 dB/s typical		20 dB/s typical	
Attenuation setting resolution	0.001 dB		0.001 dB	
Attenuation accuracy <sup>1,3,12,14</sup>	±0.1 dB		±0.1 dB	
Attenuation repeatability, 2σ <sup>3,11,12,14</sup>	±0.01 dB		±0.01 dB	
Closed loop output power range (In-line power monitor option)	N/A	-49 to +11 dBm @ 1310/1550 ±15 nm	N/A	-40 to +5 dBm @ 850/1310 ±15 nm
Relative power meter uncertainty <sup>3,5,9</sup>	N/A	±0.03 dB	N/A	±0.03 dB
Power setting repeatability <sup>5,9</sup>	N/A	±0.015 dB	N/A	±0.015 dB
Power setting resolution	N/A	0.001 dBm	N/A	0.001 dBm
Polarization dependent loss (from 0 to 25 dB) <sup>3,6</sup>	<0.08 dB	<0.15 dB	N/A	N/A
Return loss <sup>7</sup>	>55/45 dB typical (PC/APC connector)		>30 dB typical (PC connector)	
Shutter isolation	100 dB typical			
Warm up time	30 minutes			
Calibration period	2 years			
Operating temperature	0 to 50°C			
Storage temperature	-30 to 60°C			
Operating humidity (relative, non-condensing)	<90% @ 23°C, <20% @ 50°C			
Dimensions (W x H x D)	4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)			
Weight	1.1 kg (2.43 lb) single/1.3 kg (2.87 lb) dual			

1. At 1310 ±15 nm and 1550 ±15 nm for single-mode unit and at 850 ±15 nm and 1300 ±15 nm for multimode 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 nm only
7. At 1550 nm ±15 nm for SMF, 1300 nm ±15 nm 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

**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.

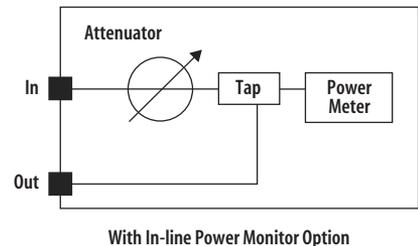
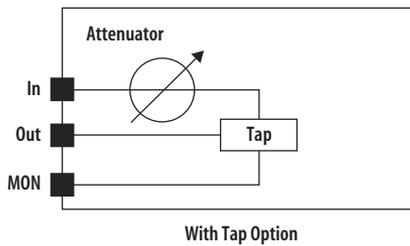
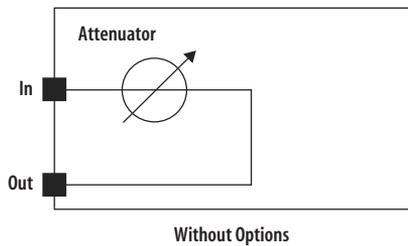
The MAP Variable Optical Attenuators are defined by selecting the required options from the product configurator in the table below. Select one option from each of the three categories (Base, Fiber Type, and Connector Type Options).

Product Code	Description
<b>Base Options (Required, select one)</b>	
MVOA-A2SS0	Single Attenuator, standard power, no built-in options
MVOA-A2SS1	Single Attenuator, standard power, 10/90 splitter for external power monitor
MVOA-A2SSM	Single Attenuator, standard power, with integrated power monitor
MVOA-A2SH0	Single Attenuator, high power, no built-in options
MVOA-A2SH1	Single Attenuator, high power, 10/90 splitter
MVOA-A2SHM	Single Attenuator, high power, with integrated power monitor
MVOA-A2DS0	Dual Attenuator, standard power, no built-in options
MVOA-A2DS1	Dual Attenuator, standard power, 10/90 splitter
MVOA-A2DSM	Dual Attenuator, standard power, with integrated power monitor
MVOA-A2DH0	Dual Attenuator, high power, no built-in options
MVOA-A2DH1	Dual Attenuator, high power, 10/90 splitter
MVOA-A2DHM	Dual Attenuator, high power, with integrated power monitor
<b>Fiber Type Options (Required, select one)</b>	
M100	9/125 fiber type
M101	50/125 fiber type
M102	62.5/125 fiber type
<b>Connector Type Options (Required, select one)</b>	
MFP	FC/PC connector type
MFA	FC/APC connector type
MSC	SC/PC connector type
MSU	SC/APC connector type

**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



# MAP Polarization Controller

## (mPCS-A1)



### 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.

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.

## Specifications

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

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 5°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](mailto:customer.service@jdsu.com).

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

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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

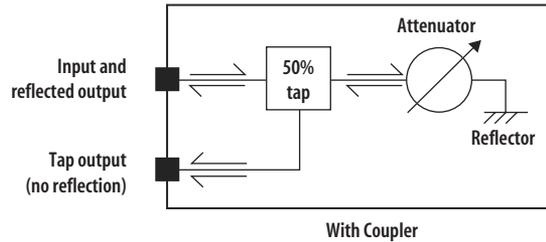
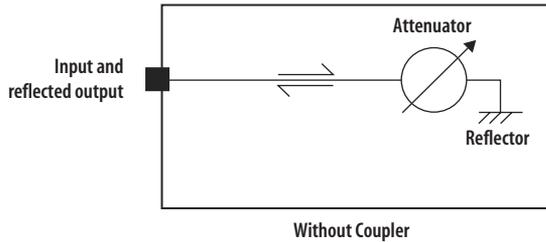
- The MAP Variable Backreflector, when installed in a MAP chassis, complies to CE, CSA/UL/IEC61010-1, plus LXI Class C requirements.

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 (SMF) or multimode (MMF) fibers and with an optional coupler for monitoring.

**Optical Configurations for the Variable Backreflector Cassette**



**Specifications**

Parameter	Single-mode fiber (SMF) without Coupler	Single-mode fiber (SMF) with 50/50 Coupler	Multimode fiber (MMF) without Coupler	Multimode fiber (MMF) with 50/50 Coupler
Wavelength range	1260 to 1650 nm	1260 to 1650 nm	750 to 1350 nm	750 to 1350 nm
Maximum backreflection level	≥5.0 dB	≥9.5 dB	≥5.0 dB	≥9.5 dB
Minimum backreflection level (APC/PC)	≤60/≤45 dB	≤60/≤45 dB	-30/≤30 dB	-30/≤30 dB
Insertion loss (IL)(IN to OUT) <sup>1,2,3</sup>	N/A	<5.0 dB	N/A	<6.0 dB
Relative backreflection setting accuracy <sup>1,3,4</sup>	±0.2	±0.2	±0.4	±0.4
Backreflection setting resolution	0.01	0.01	0.01	0.01
Fiber type	9/125 μm	9/125 μm	50/125 or 62.5/125 μm	50/125 or 62.5/125 μm
Polarization dependent loss (PDL) <sup>1</sup>	<1.0 dB	<1.0 dB	N/A	N/A
Maximum optical input power	200 mW			
Calibration period	2 years			
Warm-up time	30 minutes			
Operating temperature	0 to 50°C			
Storage temperature	-30 to 60°C			
Humidity	<90% at 23°C, <20% at 50°C (relative non-condensing)			
Dimensions (W x H x D)	4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)			
Weight	1.1 kg (2.43 lb) single backreflector/1.3 kg (2.87 lb) dual backreflector			

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

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Product Code	Description
<b>Base Options (Required, select one)</b>	
MVBR-A1S0	Single Backreflector, no built-in option
MVBR-A1S1	Single Backreflector with built-in 50/50 splitter
MVBR-A1D0	Dual Backreflector, no built-in option
MVBR-A1D1	Dual Backreflector with built-in 50/50 splitter
<b>Fiber Type Options (Required, select one)</b>	
M100	9/125 fiber type
M101	50/125 fiber type
M102	62.5/125 fiber type
<b>Connector Options (Required, select one)</b>	
MFP	FC/PC connector type
MFA	FC/APC connector type
MSC	SC/PC connector type

## MAP Tunable Filter (mTBF-A1)



### Key Features

- -3 dB bandwidth available at 0.11, 0.25, 0.55 nm
- Low polarization dependent loss (PDL) (<0.3 dB)
- Wide wavelength range (1420 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 of input power)
- BER testing
- Tunable laser-based testing

### Safety Information

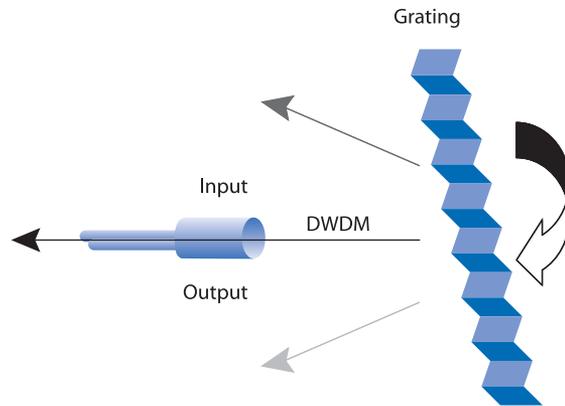
- The MAP Tunable Filter, when installed in a MAP chassis, complies to CE, CSA/UL/IEC61010-1, plus LXI Class C requirements.

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 1420 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.

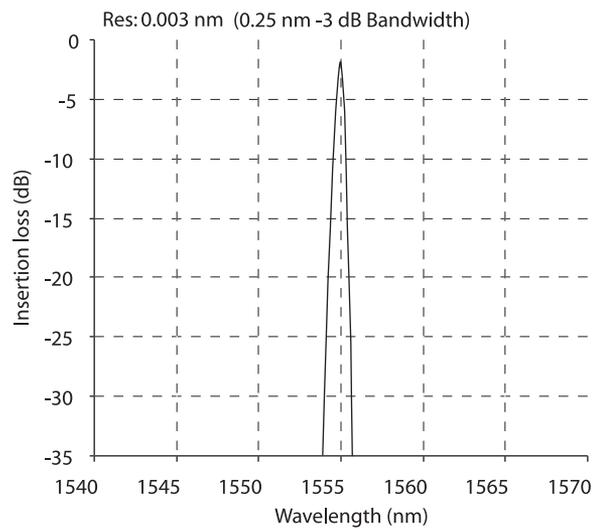
Two options are available:

- 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 percent 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.



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

**Specifications**

Parameter	Model C	Model G	Model K
Wavelength range	1420 to 1630 nm	1420 to 1630 nm	1420 to 1630 nm
Optical shape	Gaussian	Gaussian	Gaussian
-3 dB bandwidth <sup>1</sup>	0.11 nm ±15%	0.25 nm ±15%	0.55 nm ±15%
3/20 dB ratio <sup>1</sup>	0.40 ±0.05	0.31 ±0.05	0.31 ±0.05
Insertion loss (IL) <sup>2</sup>			
1520 to 1610 nm	<6.0 dB	<5.8 dB	<5.8 dB
1480 to 1630 nm	<8.0 dB	<8.0 dB	<8.0 dB
Input power <sup>3</sup>	300 mW or 1 W	300 mW or 1 W	300 mW
Return loss (RL) <sup>4</sup>		>45 dB	
Wavelength resolution		0.005 nm	
Polarization dependent loss (PDL) <sup>5</sup> , 1480 to 1630 nm		<0.3 dB	
Tuning speed		>5 nm/s	
Peak to average background noise		>45 dB	
Accuracy		±0.2 nm	
Peak search accuracy		<0.2 dB from output peak power	
Polarization mode dispersion (PMD)		<0.3 ps	
Group delay variation within a -3 dB bandwidth		<5 ps	
Recommended calibration period		1 year	
Operating temperature		10 to -40°C	
Storage temperature		-10 to 60°C	
Dimensions (W x H x D)	8.1 x 13.26 x 37.03 cm (3.19 x 5.22 x 14.58 in)		
Weight	2.3 kg (5.07 lb)		

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

**Ordering Information**

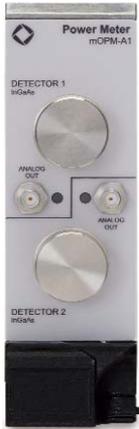
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Product Code	Description
<b>Base Options (Required, select one)</b>	
MTBF-A1CS0	Tunable Filter, C Model, 0.11 nm –3 dB Bandwidth, Standard Power (300 mW)
MTBF-A1GS0	Tunable Filter, G Model, 0.25 nm –3 dB Bandwidth, Standard Power (300 mW)
MTBF-A1KS0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



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

# MAP Optical Power Meter (mOPM-A1)



3 mm InGaAs  
Power Meter with  
Dual Detector  
Configuration

## Key Features

- Low PDL (<0.01 dB)
- Wide wavelength range (800 to 1650 nm)
- High power option (2 W)
- Bare fiber measurements capability
- Can be automated when used with MAP-200 LXI™-compliant interfaces and IVI drivers

The Multiple Application Platform (MAP) Optical Power Meter (mOPM-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. JDSU offers two types of MAP Optical Power Meters: with a 3 mm Indium-Gallium-Arsenide (InGaAs) detector and a 10 mm Germanium (Ge) detector.

## 3 mm InGaAs MAP Power Meter

The MAP InGaAs Optical Power Meter is optimized for applications using single-mode (SM) or multimode (MM) fiber to measure power levels from -80 to 10 dBm over the wavelength range of 800 to 1650 nm. It features high accuracy, high linearity and extremely low polarization dependant loss (PDL). The MAP InGaAs Optical Power Meter Cassette with 3 mm InGaAs detector is available in single or dual configuration and comes with an analog electrical output for external monitoring. The averaging time can be set as low as 100 microns ( $\mu$ s) for high-speed applications.

For ultimate flexibility, the detector heads were designed with JDSU AC100 interchangeable detector adapters that are available for six connector types as well as a fiber holder that permits bare fiber measurements (please refer to the Optional Accessories section). The MAP InGaAs Optical Power Meter is supplied with an FC detector adapter as a standard accessory and an optional integrating sphere may be fastened to the front panel for increased power measurement to 33 dBm (2 W) with decreased PDL to 0.005 dB.

## 10 mm Ge MAP Power Meter

The MAP Ge Optical Power Meter can be used in applications using standard SM or MM fiber as well as SM or MM ribbon cable with fiber counts as high as 72 (see Specifications for further details). The MAP Ge Optical Power Meter can accurately measure power levels from -50 to 3 dBm over the wavelength range of 800 to 1650 nm.

The detector heads are compatible with the JDSU AC400 series interchangeable detector adapters (please refer to the Optional Accessories section). The MAP Ge Optical Power Meter is supplied with an FC detector adapter as a standard accessory.

## Applications

- Dense wavelength division multiplexing (DWDM) channel measurements (Up to 128 channels/controller addresses)
- Amplifier characterization (Up to 2 W of input power)
- Bit error rate (BER) testing
- Precise optical power control ( $\pm 0.01$  dB)
- Receiver and transmitter testing

## Safety Information

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

Specifications

Parameter	3 mm InGaAs MAP Power Meter	10 mm Ge MAP Power Meter
Sensor element	3 mm InGaAs	10 mm Ge
Wavelength range	800 to 1650 nm	800 to 1650 nm
Power range	-80 to 10 dBm	-50 to 3 dBm
Fiber type	SMF and MMF with N/A $\leq 0.27$	
Maximum core diameter for single fiber	62.5 $\mu\text{m}$ (N/A $\leq 0.27$ )	
Maximum core diameter for ribbon cable <sup>1</sup>	N/A	62.5 $\mu\text{m}$ (N/A $\leq 0.27$ )
Uncertainty at reference condition	$\pm 2.5\%$ ( $1200 \leq \lambda \leq 1550 \text{ nm}$ ) <sup>2</sup> $\pm 4.0\%$ ( $800 \leq \lambda < 1200 \text{ nm}$ ) <sup>2</sup> $\pm 3.5\%$ ( $1550 \leq \lambda \leq 1600 \text{ nm}$ ) <sup>2</sup> $\pm 4.0\%$ ( $1600 \leq \lambda \leq 1630 \text{ nm}$ ) <sup>2</sup>	$\pm 4\%$ <sup>3</sup> N/A N/A N/A
Total uncertainty <sup>4,5</sup>	$\pm 4.5\% \pm 5 \text{ pW}$ ( $800 \leq \lambda \leq 1630 \text{ nm}$ )	$\pm 5.5\% \pm 100 \text{ pW}$
Relative uncertainty		
Polarization <sup>6</sup>	$\pm 0.01 \text{ dB}$	$< 0.01 \text{ dB}$
Spectral ripple <sup>7</sup>	$\pm 0.005 \text{ dB}$	$< 0.01 \text{ dB}$
Linearity (at T = 23 $\pm 5$ °C)	$1520 \leq \lambda \leq 1570 \text{ nm}$ -65 to 10 dBm $< \pm 0.02 \text{ dB}$	$\pm 0.025 \text{ dB}$ <sup>8</sup>
Return loss (RL) <sup>9</sup>	$> 55 \text{ dB}$	$> 50 \text{ dB}$
Noise <sup>10</sup> (peak to peak)	$< 5 \text{ pW}$	$< \pm 100 \text{ pW}$
Averaging time	100 $\mu\text{s}$ to 5 s	100 $\mu\text{s}$ to 5 s
Analog output	0 to 2 volts	N/A
Recalibration period	1 year	
Warm-up time	20 minutes	
Operating temperature	5 to 40°C	
Humidity	non-condensing	
Dimensions (W x H x D)	4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in) 8.10 x 13.26 x 37.03 cm (3.19 x 5.22 x 14.58 in)	
Weight	1.2 kg (2.65 lb)	

1. Six rows of 12 fibers with a 0.250 mm vertical and horizontal pitch
2. Reference condition: Fiber type: SMF-28, Ambient temperature: 23  $\pm 3$ °C, Spectral width of source:  $< 1 \text{ nm}$ , Optical power on detector: 100  $\mu\text{W}$  (-10 dBm)
3. Reference condition: CW laser with P = -10 dBm; Wavelength 1550 nm; FWHM  $< 10 \text{ nm}$ ; SM fiber with single channel FC connector adapter; Ambient temperature 25  $\pm 3$ °C
4. Operating conditions: N/A of fiber  $\leq 0.27$  Temperature, humidity and power ranges: as specified. For FC/APC connector N/A = 0.27 add 1%
5. For wavelengths  $> 1600 \text{ nm}$  and temperatures  $> 35$ °C add 1.0%
6. Polarization: Polarization states at fixed wavelength (1550  $\pm 30 \text{ nm}$ ) and constant power; Straight connector; T = 23  $\pm 5$ °C
7. Ripple: 1545  $\leq \lambda \leq 1565 \text{ nm}$ ; Fixed state of polarization; Constant power; Straight connector; T = 23  $\pm 5$ °C
8. For 3 dBm  $> P > -30 \text{ dBm}$
9. RL: At 1310 nm and 1550 nm; 8° angled connector; T = 23  $\pm 5$ °C
10. Noise: Averaging time 1 s; Observation time 300 s; Wavelength 1550 nm; T = 23  $\pm 5$ °C

**Integrating Sphere Specifications**

Parameter	AC330
Attenuation at reference <sup>1</sup>	-30.7 ±0.8 dB
Spectral range	800 to 1650 nm
Wavelength flatness <sup>2</sup>	<±1.5 dB
RL <sup>3</sup>	>65 dB (typical)
Relative uncertainty <sup>4</sup>	<±0.05 dB
Residual polarization dependent loss (PDL) <sup>5</sup>	<0.005 dB
Maximum power <sup>6</sup>	+33 dBm (2 W)
Operating temperature	10 to 40°C, RH 15% to 70%
Storage temperature	-30 to 60°C, RH 15% to 95% non-condensing

1. Measured with wavelength of 1550 nm at 23 ±5°C and RH = 50% with straight connector
2. From 850 nm to 1650 nm, refer to the wavelength of 1310 nm
3. Measured at 1310 nm and 1550 nm with SM fiber and FC/APC connector
4. At reference condition, with 8 degree angled connector, due to the polarization and interference
5. Measured at 1550 nm
6. Continuous Wave (CW) laser

**Ordering Information**

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Product Code	Description
<b>Configuration Options (Required, select one)</b>	
<i>All mOPM-A1 are supplied with one detector cap and one FC detector adaptor per detector</i>	
MOPM-A1100	3 mm InGaAs detector on Channel 1
MOPM-A1110	3 mm InGaAs detector on Channel 1 and 2
MOPM-A1200	10 mm Ge detector on Channel 1
MOPM-A1120	3 mm InGaAs detector on Channel 1 and 10 mm Ge detector on Channel 2
<b>Optional Accessories</b>	
<b>3 mm InGaAs MAP Power Meter</b>	
AC100	Detector cap
AC101	FC detector adapter
AC102	ST detector adapter
AC103	SC detector adapter
AC112	MT ribbon cable adapter
AC114	MU detector adapter
AC115	E2000 detector adapter
AC120	Magnetic fiber holder (requires AC121)
AC121	Single bare fiber plug (requires AC120)
AC330	+33 dBm integrating sphere
<b>10 mm InGaAs MAP Power Meter</b>	
AC400	Detector cap
AC401	FC/PC adapter
AC402	MPO/MTP adapter

# 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.

INVISIBLE LASER RADIATION  
AVOID EXPOSURE TO BEAM  
CLASS 3B LASER PRODUCT  
(IEC 60825-1, 2002)  
MAX. 500 mw, 700-1680 nm

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 or C+L-band. The source provides high spectral stability.

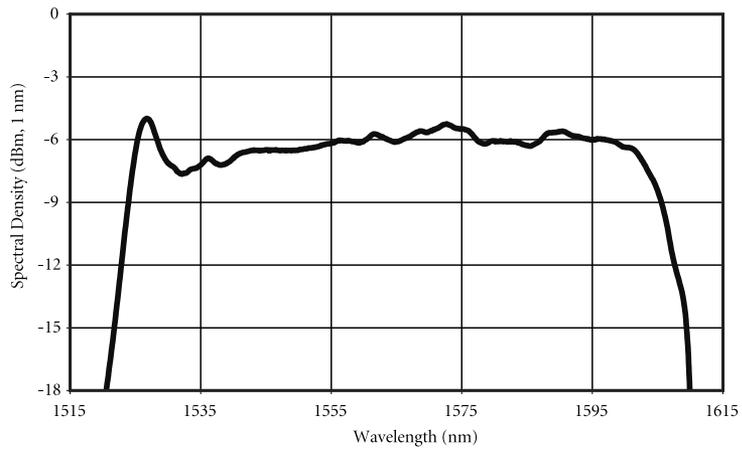
The addition the BBS Cassette can be used for many applications including OSNR (optical signal-to-noise ratio) experiments, calibration of test equipment, and noise source for active or passive component testing.

The MAP BBS models provide specialized variants and optical performance not available in the Benchtop BBS. Additional BBS models are available in the Benchtop BBS product line for applications requiring higher output power.

**Spectral Density Plot  
C-band 50 mW**



**Spectral Density Plot  
C+L-band 20 mW**



**Specifications**

Parameter	C-Band 50 mW Output Power	C-Band 100 mW Output Power	C+L-Band 20 mW Output Power
Operating wavelength range	1527 to 1568 nm	1525 to 1568 nm	1525 to 1610 nm
Total optical power (minimum) <sup>1</sup>	50 mW	100 mW	20 mW
Spectral gain flatness (maximum) <sup>2</sup>	1.6 dB	1.6 dB	2.5 dB
Total output power stability		0.02 dB	
Output isolation (minimum)		45 dB	
Operating temperature		0 to 50°C	
Storage temperature		-30 to 60°C	
Humidity	Maximum 95% RH non-condensing from 0 to 45°C		
Dimensions (W x H x D)	4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)		
Weight	2.3 kg (5.07 lb)		

1. Measured at 1550 nm at 23°C after one hour warm up
2. Flatness range 1529 to 1565 nm for C-Band model and 1526 to 1603 nm for C+L-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.

Product Code	Description
<b>Base Options (Required, select one)</b>	
MBBS-A1C050	C-Band Broadband Source, 50 mW output power
MBBS-A1C100	C-Band Broadband Source, 100 mW output power
MBBS-A1CL20	C+L-Band Broadband Source, 20 mW output power
<b>Connector Options (Required, select one)</b>	
MFP	FC/PC connector type
MFA	FC/APC connector type



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

# MAP DFB Laser (mDFB-A1)



## Key Features

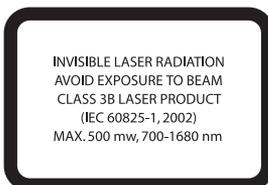
- One or two DFB laser(s) per cassette
- 1.5 nm of wavelength tuning range
- 10 or 20 mW output power
- 200 Hz to 400 kHz modulation
- 100 GHz wavelength spacing
- Single-mode fiber (SMF) and polarization maintaining fiber (PMF) output available
- Can be automated when used with MAP-200 LXI™-compliant interfaces and IVI drivers

## Applications

- DWDM transmission testing
- Optical amplifier testing
- Fiber characterization

## Safety Information

- The MAP DFB, 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 (MAP) Distributed Feedback Source (mDFB-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 mDFB-A1 is an excellent source for dense wavelength division multiplexing (DWDM) system testing. A combination of DFB lasers may be used to create an ITU grid in which optical frequency represented by a DFB laser corresponds to the transmitter in the optical network. The mDFB-A1 can be selected to comply with the 100 GHz ITU grid in the C- and L-band (1529 to 1610 nm). The lasers typically show a side-mode suppression ratio of 40 dB and can be modulated internally from 0.2 to 400 kHz in square, sinusoidal and triangular waves.

**Specifications**

Parameter	Specification
<b>Wavelength</b>	
Range	ITU grid C+L-band (see Channel Code Grid)
Accuracy	±0.03 nm
Stability 15 minutes <sup>1,2,3</sup>	±0.005 nm
Stability 24 hours <sup>1,2,3</sup>	±0.01 nm
Tuning range	≥1.5 nm
Resolution	0.01 nm
<b>Power</b>	
Laser output <sup>4</sup>	10 or 20 mW
Laser power uncertainty <sup>3</sup>	±5%
Stability 15 minutes <sup>1,2,3</sup>	±0.005 dB
Stability 24 hours <sup>1,2,3</sup>	±0.03 dB
Resolution <sup>5</sup>	0.01 dB
Attenuation range	10 dB
<b>Internal modulation<sup>1</sup></b>	
Range <sup>6</sup>	0.2 to 400 kHz
Depth	0 to 100%
Duty cycle	15 to 85%
Function	Square, Sinusoidal and Triangular
<b>Spectral properties</b>	
Width coherence control off	<30 MHz
Width coherence control on	≥500 MHz
Side mode suppression ratio (SMSR)	>40 dB
Optical signal-to-noise ratio (OSNR) (peak to maximum background)	30 dB
Optical isolation	30 dB
Relative intensity noise (RIN)	-140 dB/Hz
Recommended calibration period	1 year
Operating temperature	10 to 40°C
Storage temperature	-30 to 60°C
Dimensions (W x H x D)	4.06 x 13.26 x 37.03 cm (1.6 x 5.22.x 14.58 in)
Weight	0.5 kg (1.1 lb)

1. At full power
2. After 1 hour warm-up
3. Constant temperature within 25 ±3°C
4. Not including options
5. For maximum power to (maximum power -8 dB)
6. Nominal duty cycle is accurate from 0.2 to 100 kHz. Analog modulation bandwidth is 400 kHz

## 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](mailto:customer.service@jdsu.com).

Product Code	Description
<b>Base Options (Required, select one)</b>	
MDFB-A1110	DFB single channel laser source, 10 mW
MDFB-A1210	DFB dual channel laser source, 10 mW
MDFB-A1120	DFB single channel laser source, 20 mW
MDFB-A1220	DFB dual channel laser source, 20 mW
<b>Laser Wavelength Options (Required, select one or two)</b>	
MITUL62	186.2 THz, 1610.06 nm wavelength
MITUL63	186.3 THz, 1609.19 nm wavelength
MITUL64	186.4 THz, 1608.33 nm wavelength
MITUL65	186.5 THz, 1607.47 nm wavelength
MITUL66	186.6 THz, 1606.60 nm wavelength
MITUL67	186.7 THz, 1605.74 nm wavelength
MITUL68	186.8 THz, 1604.88 nm wavelength
MITUL69	186.9 THz, 1604.03 nm wavelength
MITUL70	187 THz, 1603.17 nm wavelength
MITUL71	187.1 THz, 1602.31 nm wavelength
MITUL72	187.2 THz, 1601.46 nm wavelength
MITUL73	187.3 THz, 1600.60 nm wavelength
MITUL74	187.4 THz, 1599.75 nm wavelength
MITUL75	187.5 THz, 1598.89 nm wavelength
MITUL76	187.6 THz, 1598.04 nm wavelength
MITUL77	187.7 THz, 1597.19 nm wavelength
MITUL78	187.8 THz, 1596.34 nm wavelength
MITUL79	187.9 THz, 1595.49 nm wavelength
MITUL80	188 THz, 1594.64 nm wavelength
MITUL81	188.1 THz, 1593.79 nm wavelength
MITUL82	188.2 THz, 1592.95 nm wavelength
MITUL83	188.3 THz, 1592.10 nm wavelength
MITUL84	188.4 THz, 1591.26 nm wavelength
MITUL85	188.5 THz, 1590.41 nm wavelength
MITUL86	188.6 THz, 1589.57 nm wavelength
MITUL87	188.7 THz, 1588.73 nm wavelength
MITUL88	188.8 THz, 1587.88 nm wavelength
MITUL89	188.9 THz, 1587.04 nm wavelength
MITUL90	189 THz, 1586.20 nm wavelength
MITUL91	189.1 THz, 1585.36 nm wavelength
MITUL92	189.2 THz, 1584.53 nm wavelength
MITUL93	189.3 THz, 1583.69 nm wavelength
MITUL94	189.4 THz, 1582.85 nm wavelength
MITUL95	189.5 THz, 1582.02 nm wavelength
MITUL96	189.6 THz, 1581.18 nm wavelength
MITUL97	189.7 THz, 1580.35 nm wavelength
MITUL98	189.8 THz, 1579.52 nm wavelength
MITUL99	189.9 THz, 1578.69 nm wavelength

Product Code	Description
MITUC00	190 THz, 1577.86 nm wavelength
MITUC01	190.1 THz, 1577.03 nm wavelength
MITUC02	190.2 THz, 1576.20 nm wavelength
MITUC03	190.3 THz, 1575.37 nm wavelength
MITUC04	190.4 THz, 1574.54 nm wavelength
MITUC05	190.5 THz, 1573.71 nm wavelength
MITUC06	190.6 THz, 1572.89 nm wavelength
MITUC07	190.7 THz, 1572.06 nm wavelength
MITUC08	190.8 THz, 1571.24 nm wavelength
MITUC09	190.9 THz, 1570.42 nm wavelength
MITUC10	191 THz, 1569.59 nm wavelength
MITUC11	191.1 THz, 1568.77 nm wavelength
MITUC12	191.2 THz, 1567.95 nm wavelength
MITUC13	191.3 THz, 1567.13 nm wavelength
MITUC14	191.4 THz, 1566.31 nm wavelength
MITUC15	191.5 THz, 1565.50 nm wavelength
MITUC16	191.6 THz, 1564.68 nm wavelength
MITUC17	191.7 THz, 1563.86 nm wavelength
MITUC18	191.8 THz, 1563.05 nm wavelength
MITUC19	191.9 THz, 1562.23 nm wavelength
MITUC20	192 THz, 1561.42 nm wavelength
MITUC21	192.1 THz, 1560.61 nm wavelength
MITUC22	192.2 THz, 1559.79 nm wavelength
MITUC23	192.3 THz, 1558.98 nm wavelength
MITUC24	192.4 THz, 1558.17 nm wavelength
MITUC25	192.5 THz, 1557.36 nm wavelength
MITUC26	192.6 THz, 1556.55 nm wavelength
MITUC27	192.7 THz, 1555.75 nm wavelength
MITUC28	192.8 THz, 1554.94 nm wavelength
MITUC29	192.9 THz, 1554.13 nm wavelength
MITUC30	193 THz, 1553.33 nm wavelength
MITUC31	193.1 THz, 1552.52 nm wavelength
MITUC32	193.2 THz, 1551.72 nm wavelength
MITUC33	193.3 THz, 1550.92 nm wavelength
MITUC34	193.4 THz, 1550.12 nm wavelength
MITUC35	193.5 THz, 1549.32 nm wavelength
MITUC36	193.6 THz, 1548.51 nm wavelength
MITUC37	193.7 THz, 1547.72 nm wavelength
MITUC38	193.8 THz, 1546.92 nm wavelength
MITUC39	193.9 THz, 1546.12 nm wavelength
MITUC40	194 THz, 1545.32 nm wavelength
MITUC41	194.1 THz, 1544.53 nm wavelength
MITUC42	194.2 THz, 1543.73 nm wavelength
MITUC43	194.3 THz, 1542.94 nm wavelength
MITUC44	194.4 THz, 1542.14 nm wavelength

**Ordering Information**

Product Code	Description
MITUC45	194.5 THz, 1541.35 nm wavelength
MITUC46	194.6 THz, 1540.56 nm wavelength
MITUC47	194.7 THz, 1539.77 nm wavelength
MITUC48	194.8 THz, 1538.98 nm wavelength
MITUC49	194.9 THz, 1538.19 nm wavelength
MITUC50	195 THz, 1537.40 nm wavelength
MITUC51	195.1 THz, 1536.61 nm wavelength
MITUC52	195.2 THz, 1535.82 nm wavelength
MITUC53	195.3 THz, 1535.04 nm wavelength
MITUC54	195.4 THz, 1534.25 nm wavelength
MITUC55	195.5 THz, 1533.47 nm wavelength
MITUC56	195.6 THz, 1532.68 nm wavelength
MITUC57	195.7 THz, 1531.90 nm wavelength
MITUC58	195.8 THz, 1531.12 nm wavelength
MITUC59	195.9 THz, 1530.33 nm wavelength
MITUC60	196 THz, 1529.55 nm wavelength
<b>Fiber Type Options (Required, select one)</b>	
M100	9/125 fiber type
M103	PMF fiber type
<b>Connector Options (Required, select one)</b>	
MFP	FC/PC connector type
MFA	FC/APC connector type



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

# MAP DFB Laser – Analog Modulation (mDFA-A1)



## Key Features

- 10 mW output power
- 1 GHz of modulation bandwidth
- Very low second- and third-order distortion
- Can be automated when used with MAP-200 LXI™-compliant interfaces and IVI drivers

## Applications

- CATV reference transmitter
- Multitone receiver test

## Safety Information

- The MAP DFB Source with Analog Modulation, 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) Distributed Feedback Source with Analog Modulation (mDFA-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 mDFA-A1 features 1 GHz of modulation bandwidth and low distortion for accurate CATV receiver testing. The cassette features a built-in laser-bias driver and thermo-electric cooler controller for optimal wavelength and power stability.

The radio frequency (RF) modulation is applied through an SMA connector (50 Ohm impedance) on the front panel of the cassette. The RF path is an unamplified connection directly to the laser through an integrated bias-T.

INVISIBLE LASER RADIATION  
AVOID EXPOSURE TO BEAM  
CLASS 3B LASER PRODUCT  
(IEC 60825-1, 2002)  
MAX. 500 mw, 700-1680 nm

**Specifications**

Parameter	Specification
Maximum radio frequency (RF) input power	+13 dBm
Wavelength	1550.1 nm
Wavelength accuracy	±0.1 nm
Laser peak output power	10 dBm
Laser power uncertainty <sup>1,2,3</sup>	±5%
Stability 24 hours <sup>1,2,3</sup>	±0.1 dB
Side mode suppression ratio (SMSR)	>30 dB
Optical isolation	>30 dB
Optical return loss (RL)	>40 dB
Relative intensity noise (RIN)	<-157 dB/Hz
Recommended calibration period	1 year
Spectral linewidth	<3.0 MHz
Bandwidth	1 GHz
Second order distortion <sup>4</sup>	<-34 dBc
Third order distortion <sup>4</sup>	<-44 dBc
Operating temperature	10 to 40°C
Storage temperature	-30 to 60°C
Dimensions (W x H x D)	4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)
Weight	0.5 kg (1.1 lb)

1. At full power
2. After one hour warm-up
3. Constant temperature within 25 ±3°C
4.  $I_F = I_{OP}$ , 35% OMI, F1 = 595.25 MHz, F2 = 553.25 MHz

## 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](mailto:customer.service@jdsu.com).

Product Code	Description
<b>Base Options (Required)</b>	
MDFA-A1000	Modulated DFB laser source
<b>Laser Wavelength Options (Required)</b>	
MITUC34	193.4 THz, 1550.12 nm wavelength
<b>Connector Options (Required, select one)</b>	
MFP	FC/PC connector type
MFA	FC/APC connector type



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

# 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)
- Return loss (RL)
- Polarization dependent loss (PDL) tests
- Dense wavelength division multiplexing (DWDM) test

## Safety Information

- 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.

INVISIBLE LASER RADIATION  
AVOID EXPOSURE TO BEAM  
CLASS 3B LASER PRODUCT  
(IEC 60825-1, 2002)  
MAX. 500 mw, 700-1680 nm

**Single-mode (SM) Specifications**

Parameter	980 nm	1310 nm	1480 nm	1550 nm	1625 nm	1650 nm
Peak wavelength	980 ±20 nm	1310 ±20 nm	1480 ±20 nm	1550 ±20 nm	1625 ±20 nm	1650 ±20 nm
Spectral width (FWHM)	<5 nm	<5 nm	<5 nm	<6 nm	<7 nm	<7 nm
Total power <sup>1,2</sup>	0 dBm	-3 dBm	-3 dBm	-3 dBm	-3 dBm	-3 dBm
Fiber type	Flexcor™	SMF-28	SMF-28	SMF-28	SMF-28	SMF-28
Modulation <sup>3</sup>	0.2 to 20 kHz					
Stability (15 minutes) <sup>1,2,4</sup>	±0.005 dB					
Connector type	FC/PC, FC/APC					
Operating temperature	10 to 40°C					
Storage temperature	-30 to 60°C					
Dimensions (W x H x D)	4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)					
Weight	0.5 kg (1.1 lb)					

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**

Parameter	850 nm	1310 nm	1550 nm
Peak wavelength	850 ±20 nm	1310 ±20 nm	1550 ±20 nm
Spectral width (FWHM)	<8 nm	<8 nm	<8 nm
Total power <sup>1,2</sup>	-3 dBm	-6 dBm	-6 dBm
Modulation <sup>3</sup>	0.2 to 20 kHz		
Stability (15 minutes) <sup>1,2,4</sup>	±0.01 dB		
Connector type	FC/PC, FC/APC		
Operating temperature	10 to 40°C		
Storage temperature	-30 to 60°C		
Dimensions (W x H x D)	4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)		
Weight	0.5 kg (1.1 lb)		

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

**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.

Product Code	Description
<b>Base Options (Required, select one)</b>	
MFPL-A1100	Fabry-Perot mono-wavelength laser source
MFPL-A1200	Fabry-Perot bi-wavelength laser source
<b>Laser Wavelength Options (Required, select one or two)</b>	
MWL1650A	1650 nm wavelength
MWL1625A	1625 nm wavelength
MWL1550A	1550 nm wavelength
MWL1480A	1480 nm wavelength
MWL1310A	1310 nm wavelength
MWL0980A	980 nm wavelength
MWL0850A	850 nm wavelength
<b>Fiber Type Options (Required, select one)</b>	
M100	9/125 fiber type
M101	50/125 fiber type (850, 1310 and 1550 nm only)
M102	62.5/125 fiber type (850, 1310 and 1550 nm only)
M104	Flexcore fiber (980 nm only)
<b>Connector Options (Required, select one)</b>	
MFP	FC/PC connector type
MFA	FC/APC connector type

UL is a registered trademark of Underwriters Laboratories Inc.  
 Flexcor is a registered trademark of Corning Inc.

# 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.

INVISIBLE LASER RADIATION  
AVOID EXPOSURE TO BEAM  
CLASS 3B LASER PRODUCT  
(IEC 60825-1, 2002)  
MAX. 500 mw, 700-1680 nm

**Specifications**

Parameter	Single-mode (SM)	Single-mode (SM)	Multimode (MM)	Multimode (MM)	Multimode (MM)
	1310 nm	1550 nm	850 nm	1310 nm	1550 nm
Peak wavelength	1310 ±20 nm	1550 ±20 nm	850 ±20 nm	1310 ±20 nm	1550 ±20 nm
3 dB width	>40 nm	>40 nm	—	—	—
Spectral ripple (RB = 0.1 nm)	0.35 dB	0.35 dB	—	—	—
Total power <sup>1,2</sup>	0 dBm	0 dBm	-3 dBm	-3 dBm	-3 dBm
Modulation	0.2 to 20 kHz				
Stability (15 minutes) <sup>1,2,3</sup>	±0.01 dB				
Connector type	FC/PC, FC/APC				
Operating temperature	10 to 40°C				
Storage temperature	-30 to 60°C				
Dimensions (W x H x D)	4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)				
Weight	0.5 kg (1.1 lb)				

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.

Product Code	Description
<b>Base Options (Required, select one)</b>	
MLED-A1100	LED mono-wavelength laser source
MLED-A1200	LED bi-wavelength laser source
<b>Laser Wavelength Options (Required, select one or two)</b>	
MWL1550A	1550 nm wavelength
MWL1310A	1310 nm wavelength
MWL0850A	850 nm wavelength
<b>Fiber Type Options (Required, select one)</b>	
M100	9/125 fiber type (1310 and 1550 nm only)
M101	50/125 fiber type
M102	62.5/125 fiber type
<b>Connector Options (Required, select one)</b>	
MFP	FC/PC connector type
MFA	FC/APC connector type



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

# MAP Tunable Laser (mTLS-A1)



## Key Features

- Low ASE
- >110 nm of tunable range over C+L-band
- +8 dBm peak output power
- Polarization maintaining fiber (PMF) output
- Tuning speed up to 100 nm/s
- Mode-hop-free

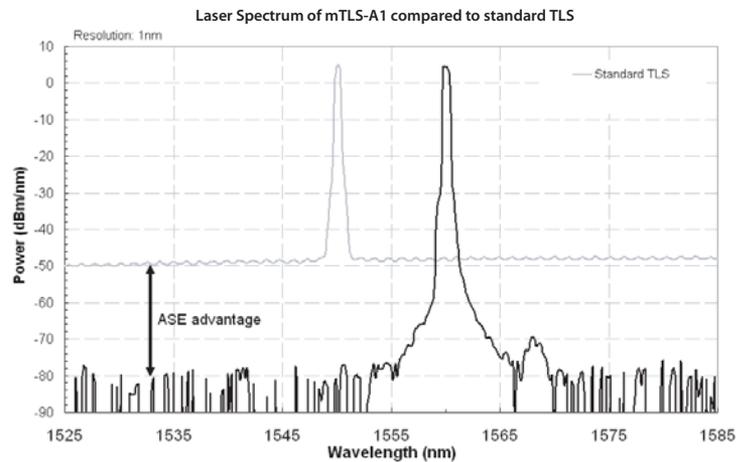
## Applications

- Dense wavelength division multiplexer (DWDM) transmission testing
- Optical amplifier testing
- Fiber characterization
- Transmitter and receiver testing

## Safety Information

- The MAP Tunable 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.

INVISIBLE LASER RADIATION  
AVOID EXPOSURE TO BEAM  
CLASS 3B LASER PRODUCT  
(IEC 60825-1, 2002)  
MAX. 500 mw, 700-1680 nm



The Multiple Application Platform (MAP) Tunable Laser Source (mTLS-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 (LXIC)-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 ability for configuration to meet specific application requirements in the smallest possible footprint.

The MAP Tunable Laser Source is a low amplified spontaneous emission (ASE) external cavity tunable diode laser that offers exceptional speed, accuracy, and flexibility at a competitive price, making it the ideal source for advanced fiber-optic systems and component testing.

The wide wavelength range enables testing over the entire C+L-band range with a single source, while its high speed, mode-hop-free sweeping not only reduces testing time but permits process testing and alignment of components during manufacturing.

As with all MAP products, the MAP Tunable Laser Source may be seamlessly integrated with the extensive family of MAP products which enables complete custom solutions to be rapidly assembled and expanded as needed.

**Specifications**

Parameter	Specification
<b>Wavelength</b>	
Range	1519 to 1630 nm, C+L-band
Accuracy <sup>1,2,3</sup>	±15 pm enhanced accuracy mode <sup>4</sup> , ±60 pm regular mode
Stability <sup>1,2</sup>	±3 pm (typical) (1 hr), ±10 pm (24 hrs)
Repeatability <sup>1,2</sup>	±3 pm (typical) enhanced accuracy mode <sup>4</sup>
Resolution <sup>1,2</sup>	1 pm
Tuning speed	1 to 100 nm/s
<b>Power</b>	
Maximum power	
Over wavelength range	+5.0 dBm (>6.0 dBm typical)
Peak	+8.0 dBm
Stability <sup>1,2</sup>	0.01 dB (1 hr)
Resolution	0.001 dB
Flatness while scanning <sup>4</sup>	0.6 dB over wavelength range
Flatness while stepping	±0.05 dB
<b>Spectral properties</b>	
Line width, coherence control off	<150 kHz
Side mode suppression ratio (SMSR)	45 dB
Signal-to-ASE ratio	See spectral plot (Figure 1)
Relative intensity noise (RIN)	-140 dB/Hz
Fiber/connector type	PMF/APC connector
Fiber extinction ratio	>20 dB
Recommended calibration period	1 yr
Operating temperature	15 to 35°C
Storage temperature	-20 to 50°C
Dimensions (W x H x D)	8.1 x 13.26 x 37.03 cm (3.19 x 5.22 x 14.58 in)
Weight	3.8 kg (8.38 lb)

1. Measured at 25°C ±1°C
2. After 1 hour warm-up
3. Valid for one month after calibration or user wavelength offset setting within ±4°C
4. Fixed power of 3 dBm

**Ordering Information**

Product Code	Description
<b>Base Options (Required)</b>	
MTLS-A1000	Tunable Laser Source
<b>Connector Options (Required)</b>	
MFA	FC/APC connector type

# MAP Large Channel Count Switch (mLCS-A1)



## Key Features

- Insertion loss (IL) <0.7 dB and return loss (RL) >57 dB
- Low polarization dependent loss (PDL) 0.04 dB
- Up to 1x50 switch configurations in a single width cassette

## Applications

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

## Safety Information

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

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 and dual independent switch configurations from 1x4 up to 1x25. 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 expensive testers.

**Specifications**

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

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)

**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.

Product Code	Description
<b>Base Options (Required, select one)</b>	
MLCS-A1104B	Single 1x4 switch, bulkheads
MLCS-A1106B	Single 1x6 switch, bulkheads
MLCS-A1108B	Single 1x8 switch, bulkheads
MLCS-A1112P	Single 1x12 switch, pigtails
MLCS-A1116P	Single 1x16 switch, pigtails
MLCS-A1124P	Single 1x24 switch, pigtails
MLCS-A1132P	Single 1x32 switch, pigtails
MLCS-A1142P	Single 1x42 switch, pigtails
MLCS-A1150P	Single 1x50 switch, pigtails
MLCS-A1204B	Dual independent 1x4 switch, bulkheads
MLCS-A1208P	Dual independent 1x8 switch, pigtails
MLCS-A1212P	Dual independent 1x12 switch, pigtails
MLCS-A1216P	Dual independent 1x16 switch, pigtails
MLCS-A1225P	Dual independent 1x25 switch, pigtails
<b>Fiber Type Options (Required, select one)</b>	
M100	9/125 fiber type
M101	50/125 fiber type
M102	62.5/125 fiber type
<b>Connector Options (Required, select one)</b>	
MFP	FC/PC connector type
MFA	FC/APC connector type (for M100 fiber type option only)
MSC	SC/PC connector type
MSU	SC/APC connector type (for M100 fiber type option only)



If the configurations available do not meet your performance requirements, please contact our 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 expensive testers.

**Common Specifications**

Parameter	Specifications	
	Single-Mode (SM)	Multimode (MM)
Wavelength	1310 and 1550 nm	850 and 1310 nm
Insertion loss (IL) <sup>1</sup>		
1 x 2	≤0.8 dB	≤0.8 dB
2 x 2	≤1.0 dB	≤1.1 dB
Return loss (RL) <sup>1</sup>	>55 dB	>20 dB
Polarization dependent loss (PDL) <sup>1</sup>	≤0.1 dB	N/A
Repeatability	±0.05 dB	±0.02 dB
Crosstalk	<-60 dB	<-35 dB
Optical input power	300 mW	300 mW
Switching speed	10 ms	
Latching	Yes	No
Lifetime	>10 million cycles	
Operating temperature	0 to 50°C	
Storage temperature	-30 to 60°C	
Humidity	90% relative, non-condensing	
Dimensions (W x H x D)	4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)	
Weight	1.1 kg (2.43 lb) maximum (varies with configuration)	

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.

Product Code	Description
<b>Base Options (Required, select one)</b>	
MSCS-A1112B	MAP SCS Cassette, one 1x2 switch, bulkheads
MSCS-A1212B	MAP SCS Cassette, two 1x2 switch, bulkheads
MSCS-A1412P	MAP SCS Cassette, four 1x2 switch, pigtails (for M100 fiber type option only)
MSCS-A1612P	MAP SCS Cassette, six 1x2 switch, pigtails (for M100 fiber type option only)
MSCS-A1812P	MAP SCS Cassette, eight 1x2 switch, pigtails (for M100 fiber type option only)
MSCS-A1122B	MAP SCS Cassette, one 2x2 switch, bulkheads
MSCS-A1222B	MAP SCS Cassette, two 2x2 switch, bulkheads
MSCS-A1422P	MAP SCS Cassette, four 2x2 switch, pigtails (for M100 fiber type option only)
MSCS-A1622P	MAP SCS Cassette, six 2x2 switch, pigtails (for M100 fiber type option only)
MSCS-A1822P	MAP SCS Cassette, eight 2x2 switch, pigtails (for M100 fiber type option only)
<b>Fiber Type Options (Required, select one)</b>	
M100	9/125 fiber type
M101	50/125 fiber type
M102	62.5/125 fiber type
<b>Connector Options (Required, select one)</b>	
MFP	FC/PC connector type
MFA	FC/APC connector type (for M100 fiber type option only)
MSC	SC/PC connector type
MSU	SC/APC connector type (for M100 fiber type option only)

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# MAP RF Switch (mRFS-A1)



## Key Features

- Single or independent dual configurations
- 1 x 2 and bypass versions
- Mechanically latching
- Built-in 50-Ω terminations

## Applications

- Data source selection
- Routing to main analyzer

## Safety Information

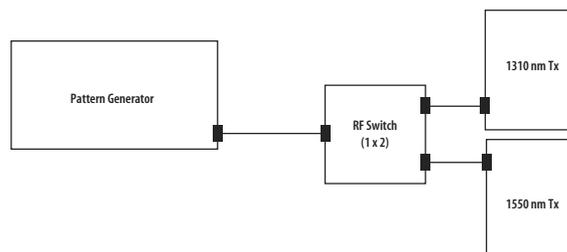
- The MAP RF Switch, when installed in a MAP chassis, complies to CE, CSA/UL/IEC61010-1, plus LXI Class C requirements.

The Multiple Application Platform (MAP) RF Switch (mRFS-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 local area network (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 mRFS-A1 is a 50-Ω coaxial switch for routing RF and microwave signals at frequencies up to 26.5 GHz. Composed of single and dual 1x2 and bypass-type switches, these cassettes are an ideal solution for routing 10 Gb/s signals between power meters, receivers, and spectrum analyzers. The switches are based on mechanical latching actuators with a million-cycle lifetime.

The single and independent dual 1x2 configurations units feature dual built-in 50-Ω terminators for each of the unused ports, allowing efficient use as an A- or B-source selector.

The single and independent dual bypass switches feature a single built-in 50-Ω termination on one of the 'insert' loop ports, which is activated when switch is in the bypass (straight through) state.

## MAP RF Switch Application



**Specifications**

Parameter	Specification
Frequency range	DC to 26.5 GHz
Insertion loss (IL)	0.25 dB: DC to 2 GHz 0.50 dB: 2 to 18 GHz 1.25 dB: 18 to 26.5 GHz
IL repeatability	0.03 dB: DC to 18 GHz 0.50 dB: 18 to 26.5 GHz
Isolation	90 dB: DC to 18 GHz 50 dB: 18 to 26.5 GHz
SWR through line	<1.15: DC to 2 GHz <1.25: 2 to 12.4 GHz <1.40: 12.4 to 18 GHz <1.80: 18 to 26.5 GHz
SWR into load	<1.15: DC to 2 GHz <1.25: 2 to 12.4 GHz <1.30: 12.4 to 18 GHz <1.80: 18 to 26.5 GHz
Connectors	3.5 mm female

**Ordering Information**

Product Code	Description
<b>Base Options (Required, select one)</b>	
MRFS-A1112	MAP RF switch cassette, single 1x2 switch
MRFS-A112B	MAP RF switch cassette, single bypass switch
MRFS-A1212	MAP RF switch cassette, dual 1x2 switch
MRFS-A1112	MAP RF switch cassette, dual bypass switch

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## MAP Utility (mUTL-A1)



### Key Features

- Coupling and splitting functionality in a robust package
- Supports single-mode and multimode fibers
- User-defined configurability

### 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 angle 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**

Parameter	SM 1x2, 1/99 Coupler (Fused)	SM 1x2, 10/90 Coupler (Fused)	SM 1x2, 30/70 Coupler (Fused)	SM 1x2, 50/50 Coupler (Fused)
Fiber type	9/125 $\mu\text{m}$			
Wavelength	1310/1550 nm			
Insertion loss (IL)	<24.0/1.2 dB	<11.8/1.2 dB	<6.5/2.4 dB	<4.1 dB
Optical power handling	300 mW			
Number of slots	1			
Dimensions (W x H x D)	4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)			
Weight	1.0 kg (2.2 lb)			

**Multimode (MM) Specifications**

Parameter	MM 10/90 Coupler (Micro-optic)	MM 50/50 Coupler (Micro-optic)
Fiber type	50/125 $\mu\text{m}$ or 62.5/125 $\mu\text{m}$	
Wavelength	850/1310 nm	
IL	<11.8/1.2 dB	<4.1 dB
Optical power handling	300 mW	
Number of slots	1	
Dimensions (W x H x D)	4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)	
Weight	<1.0 kg (2.2 lb)	

**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.

Product Code	Description
<b>Base Options (Required)</b>	
MUTL-A1000	MAP Utility, Blank
<b>Splitter Options (Optional, select one, two, or three)</b>	
MUTL-A101SB	MAP Utility, 1% Coupler, Bulkheads
MUTL-A110SB	MAP Utility, 10% Coupler, Bulkheads
MUTL-A130SB	MAP Utility, 30% Coupler, Bulkheads
MUTL-A150SB	MAP Utility, 50% Coupler, Bulkheads
<b>Fiber Type Options (Required if splitter option selected, select one)</b>	
M100	9/125 fiber type
M101	50/125 fiber type (for 10%, 50% coupler only)
M102	62.5/125 fiber type (for 10%, 50% coupler only)
<b>Connector Options (Required)</b>	
MFP	FC/PC connector type
MFA	FC/APC connector type (for M100 fiber type option only)
MSC	SC/PC connector type
MSU	SC/APC connector type (for M100 fiber type option only)



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

## Fiber Optic – Production and Lab Test Support



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### 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.

## Notes

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### Test & Measurement Regional Sales

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