Fiber Optic – Production and Lab Test

Multiple Application Platform

JDSU

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

The JDSU Multiple Application Platform (MAP) 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 optical cassette's breadth and performance are consistent with the fiber optic technology leadership from JDSU. For over 20 years, JDSU has been committed to meeting your physical layer testing challenges.

MAP Console software is an out-of-the-box application. It provides an intuitive, user-friendly environment to ensure that your test and measurement systems can be integrated quickly and efficiently.

Outstanding Support

JDSU is committed to providing you with the strongest possible application support – a commitment that goes beyond the operation of our products. It extends to understanding the specifics of the measurements you are implementing. We believe in learning from every customer interaction. By combining your measurement experiences with ours and leveraging the flexibility and performance of our products, we can deliver a more powerful solution.

Our goal is to find ways to optimize measurement performance, reduce cycle times and minimize your cost of ownership. Working together, we can create solutions that meet your capital budget and simplify your development, without compromising the performance and the reliability you need to keep your program or factory on track.

Our next generation products are driven by your needs. Throughout our history, we have worked hard to listen to our customers and are eager to explore new ideas and opportunities. They may range from simple product enhancements to new product concepts. We have confidence in our product breadth, but are equally driven to continue to find new ways to add value to your test and measurement applications.

Targeted Tools–The MAP Solution Selection Guide

MAP Master

A flexible instrumentation platform ideal for optical or the test and measurement applications. A 19-inch rackmountable chassis featuring: 8-slot capacity, over 15 hot-swappable instrument cassettes, color display, dynamic MAP firmware and console that automatically identifies installed cassettes, reversibility for front/rear access, ActiveX console and drivers with simulation mode.

MAP Benchtop

Bring the power of MAP to your lab bench!

An economical solution for test sets requiring 3 or fewer instrumentation cassettes.

The MAP Solution Selection Guide

MAP EDFA

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

Page 13

MAP Polarization Controller

An efficient and precise polarization controller that can create any state of polarization. May also be used as part of a polarization state analyzer.

Page 19

MAP Tunable Grating Filter

A tunable bandpass filter that offers continuous wavelength tuning from 1420 to 1630 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.

Page 24

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.

Page 32

MAP Precision Attenuator with Power Control

A high resolution, wide wavelength range attenuator. Available with 1 or 2 devices per cassette, single-mode or multimode fiber, four standard connector types, and tap option or power control feature.

Page 16

MAP Variable Backreflector

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

Page 21

MAP 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

Page 28

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-band and L-band (1527 to 1610 nm) wavelength ranges.

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The MAP 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.

Page 39

MAP Fabry-Perot Laser

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

Page 42

MAP LED Source

A high-power Light Emitting Diode (LED)-based light source with variable output power.

Page 45

MAP Tunable Laser

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

Page 47

MAP Large Channel Count Switch

A bidirectional switch, allowing the connection of a common port to any number of channels up to 50. Available in single or dual-switch configurations. Exhibits low insertion loss and high return loss.

Page 49

MAP Small Channel Count Switch

A low-cost switch allowing for a number of configurations. The switch is bidirectional, transparent to signal format, and available in both single-mode and multimode versions.

Page 52

MAP RF Switch

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

Page 55

MAP Utility

Simplifies the mechanical integration of passive optical components for test sets. Highly configurable, 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 Solution Selection Guide

Application Reference Table

The MAP 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. Refer to the Test and Measurement Reference section for a comprehensive guide to test and measurement applications.

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

Multiple Application Platform
MAP Series

MAP Master

MAP Benchtop

Key Features

- **Hot-swappable cassettes (cassettes can be inserted or removed without powering down)**
- **Dynamic MAP firmware and console that automatically identifies installed cassettes**
- **PC-based MAP Console program with drivers, ActiveX, Dynamic link libraries (DLL), LabVIEW and simulation mode**
- **Color display**
- **RS-232 and GPIB interface**

Applications

- Periodic reconfiguration and/or expansion capability
- High reliability/availability in a 24/7 manufacturing environment

Safety Information

- Optical source cassettes, when installed in the MAP chassis, meet the requirements of standard IEC 60825-1(2002) and comply with 21 CFR 1040.10 except deviations per Laser Notice No. 50, July 2001
- CE Compliance plus UL3101-1 and CAN/CSA-C22.2 No. 1010.1

The Multiple Application Platform (MAP) is a flexible instrumentation platform used for optical test and measurement applications. It is available in two formats: a 19-inch 8-slot Master (MAP+2M00) and a 9.5-inch 3-slot Benchtop (MAP+2B00). They feature a common hot-swappable backplane compatible with over 15 different types of instrumentation cassettes.

The MAP Master and MAP Benchtop include a 9-key keypad, color display and remote communication ports.

Chassis Selection

MAP is used when instrumentation selection needs to be based on current requirements without compromising future requirements. The MAP+2B00 and MAP+2M00 provide the most cost-effective solutions for test sets requiring three or fewer cassettes and four to eight cassettes respectively. In both cases, future expansions are possible by populating the empty slots (if available) or adding a second independent MAP+2B00 or MAP+2M00.

MAP Master (MAP+2M00)

The MAP Master is built on a fully modular architecture. The main controller module, power supply module, keypad/display module and remote interface module are all field replaceable, thus making maintenance fast and simple. The keypad/display module and remote interface module of the MAP Master is interchangeable for rear mounting. Handling and rackmounting are made easy by using the practical handles located at the front and back of each chassis. When used on a bench, the tilting feet hold the chassis at an optimal angle for monitor visibility and keypad accessibility.

Key Features

- **Front or back fiber connection**
- **8-slot capacity**
- **All modules are field replaceable:**
  - **controller**
  - **power supply**
  - **keypad/display**
  - **remote interface**

MAP Benchtop (MAP+2B00)

The MAP Benchtop brings the MAP products to your lab bench without compromising performance. Its form factor and lower cost make it ideal for small test-sets. When test needs grow, software applications developed for the MAP Benchtop can be transferred to a MAP Master without any modifications.

Key Features

- **3-slot capacity**
- **compatible with external USB keyboard**

MAP Master Reconfigurability

Connectors Accessible at Front

Front

Rear

Connectors Accessible at Rear

Front

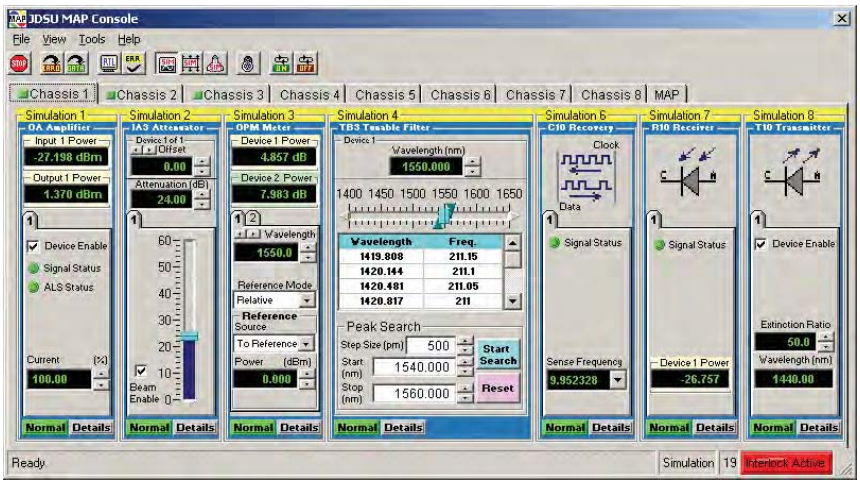
Rear

Software

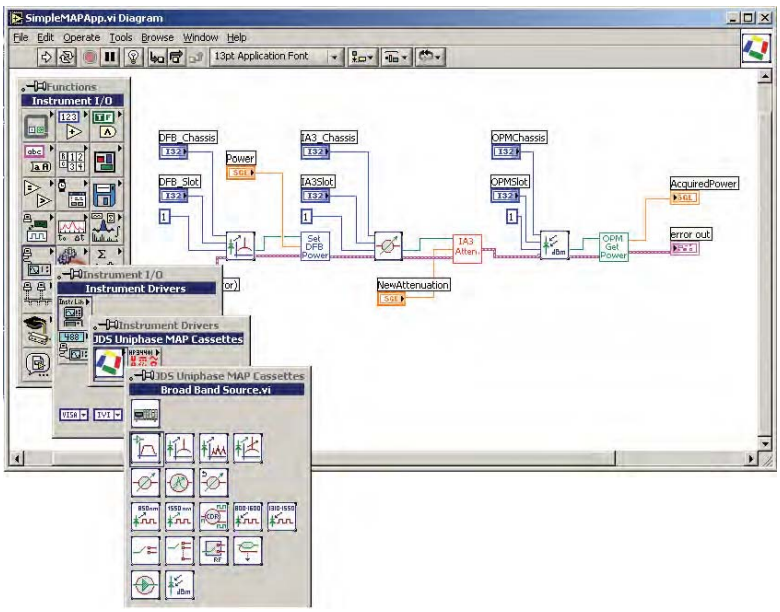
Intuitive MAP Console and Drivers

MAP is supplied with comprehensive PC-based instrument drivers and MAP Console for added functionality. Drivers supplied include ActiveX, DLL, and LabVIEW. These provide full control of the cassettes and are compatible with all the standard Automation Development Environments (ADEs) including LabVIEW, Visual Basic™, and TestPoint™. These drivers 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 cassettes in the MAP system. During test execution, the MAP Console can also be placed in a supervisory mode and used to monitor and control the MAP platform to help support troubleshooting and to minimize downtime. The MAP Console comes with a built-in simulator allowing Automation Developers to capture system configurations who do most of their development off-line, freeing real hardware for other purposes. These features make test automation development and debugging fast and easy.

View of MAP Console Program



Typical LabVIEW Implementation of the ActiveX Drivers



Specifications

Parameter	MAP Master	MAP Benchtop
Capacity	8 single-slot cassettes/chassis	3 single-slot cassettes/chassis
Power	100 to 125 V AC / 200 to 240 V AC, 50/60 Hz Field-replaceable	100 to 125 V AC 200 to 240 V AC, 50/60 Hz
Power consumption	200 V A	200 V A
Mounting	Rackmount Benchtop (front, center, or rear)	Rackmount Benchtop (front)
Rackmount kit	Included	Optional (MAP+2A10)
Display LCD color	VGA	VGA
Display dimensions (H x W)	7 x 5 cm	7 x 5 cm
Resolution	640 x 234 pixels	640 x 234 pixels
Remote interface	RS-232, GPIB	RS-232, GPIB
External keyboard	N/A	USB Keyboard
Video output	N/A	VGA
Video input	N/A	BNC Connector (NTSC)
VGA output	N/A	15-pin D-sub connector
Safety interlock	Fail-safe hardware-controlled	
Operating temperature	0 to 50 °C	
Storage temperature	-30 to 60 °C	
Humidity	< 80% RH, 0 to 40 °C non-condensing	
Dimensions (W x H x D)	44.91 x 13.24 x 52.37 cm (3U high, standard 19-inch width)	22.5 x 14.8 x 43.0 cm (3U high, standard 1/2 19-inch width)
Weight	14.3 kg	8.6 kg

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.

MAP Master Chassis (MAP+2M00)

Product Code	Description
MAP+2A01	MAP 19-inch Chassis
MAP+2A02	MAP Power Supply Module
MAP+2M01	MAP Master Main Control Module
MAP+2M02	MAP Master Local Interface Module
MAP+2M03	MAP Master Remote Interface Module
MAP+2A03	MAP Rackmount Kit
MAP+2A06	MAP Cassette Blanking Plates (8)
MAP+2A04	MAP Safety Interlock Key
MAP+2A09	MAP Software and Documentation CD
10108925	MAP User's Manual
21057090	MAP Programming Guide

MAP Benchtop (MAP+2B00)

Product Code	Description
MAP+2A04	MAP Safety Interlock Key
MAP+2A06	MAP Cassette Blanking Plates (3)
MAP+2A09	MAP Software and Documentation CD
10108925	MAP User's Manual
21057090	MAP Programming Guide
Option	
MAP+2A10	Optional 19-inch rackmount kit

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MAP Erbium-Doped Fiber Amplifier

EDFA Series

For stand-alone applications, the MAP EDFA may be used as a benchtop

Key Features

- **High output power and gain**
- **Low noise figure**
- **Monitoring and alarms**

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

- This optical source cassette, when installed in the MAP chassis, complies to CE requirements plus UL3101-1 and CAN/CSA-C22.2 No.1010.1, 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) Erbium-Doped Fiber Amplifier (EDFA) Cassette combines the optical performance of the traditional JDSU EDFA benchtop models, with the flexibility and modularity of the MAP. Nine standard configurations are available to meet your needs. The MAP EDFA has a saturated output power ranging from 14 dBm to 21 dBm, features noise figures as low as 3.3 dB and has gain flatness better than 1.4 dB. The MAP EDFA's are available for operation in the 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.

Specifications

Parameter	1546	1550	1552	1552	1554	1558	1590	1592	1594
Amplifier type	Mid-span access booster DWDM	Pre-amp	Booster	Booster high power	In-line	Booster DWDM	Pre-amp	Booster	In-line
Operating wavelength range	1540 to 1560 nm	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	Multichannel (DWDM)	Single channel	Single channel	Single channel	Single channel	Multichannel (DWDM)	Single Channel	Single Channel	Single Channel
Saturated output power (minimum)[1]	≥ 17 dBm	≥14 dBm	≥17 dBm	≥ 20 dBm	≥ 17 dBm	≥ 21 dBm	≥ 15 dBm	≥ 15 dBm	≥ 20 dBm
Noise figure (maximum)[2]	≤ 5.5 dB	≤ 3.3 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)[3]	≥ 23 dB (MS loss ≤ 10 dB)	≥ 37 dB	≥ 30 dB	≥ 32 dB	≥ 35 dB	≥ 25 dB	≥ 24 dB	≥ 22 dB	≥ 28 dB
Input/output monitors	Yes	No	Yes	Yes	No	Yes	No	Yes	Yes
Polarization dependent loss (PDL) (maximum)	≤ 0.3 dB	≤ 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)	≤ 0.6 ps	≤ 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)	32/32 dB	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)[4]	≤ 1.6 dB	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 13.24 x 39.5 cm								
Weight	2.3 kg								

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

1. Saturated Output Power measured:
   at 1550 nm at P_{in} = -4 dBm
   at 1550 nm at P_{in} = -6 dBm for model 1546
   at 1550 nm at P_{in} = -4 dBm (mid-span) for models 1550, 1552, 1554, 1558
   at 1590 nm at P_{in} = -4 dBm (mid-span) for models 1590 , 1592, 1594
2. Noise figure measured:
   at P_{in} = -6 dBm (pre-amp) for model 1546
   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
3. Small signal gain measured:
   at Pin = -6 dBm for model 1546
   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
4. Flatness optimized:
   for P_{in} = -4 dBm for model 1558
   for P_{in} = -6 dBm for model 1546

Ordering Information

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Sample: MAPO+1E15520FP20

MAPO+1E □□□□ □ □□ □ **0**

Code	Description
1546	Mid-span access booster
1550	C-Band Pre-amp
1552	C-Band Booster
1554	C-Band In-line
1558	Booster DWDM
1590	L-Band Pre-amp
1592	L-Band Booster
1594	L-Band In-line

Code	Characteristics
0	Unflattened
2	Flattened (1546 and 1558 only)

Code	Connector Type
FP	FC/PC
FA	FC/APC

Code	Output Power
0	Standard output power
2	Booster high output power, 20 dBm (available for 1552 only)

Code	Characteristics
0	Standard

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MAP Precision Attenuator

For stand-alone applications, the MAP Precision Attenuator may be used as a benchtop

Key Features

- **Low insertion loss (IL) ≤ 1.5 dB**
- **Low polarization dependent loss (PDL) 0.05 dB**
- **Wide wavelength range**
- **High return loss (RL) ∅ 60 dB**

Applications

- Dense wavelength division multiplexing (DWDM) channel equalization (up to 128 channel /controller address)
- Amplifier characterization
- Bit error rate (BER) testing
- Precise optical power control (± 0.01 dB)
- Loss simulation in DWDM fiber links
- Receiver and transmitter testing

Safety Information

- This cassette, when installed in a MAP chassis, complies to CE requirements plus UL3101-1 and CAN/CSA-C22.2 No. 1010.1

The Multiple Application Platform (MAP) Precision Attenuator is a high resolution, wide wavelength range attenuator used in applications such as analog systems and high bit-rate digital systems. The attenuator is built on proven industry leading technology for maximum reliability and performance.

Many configurations are available: single or dual device per single width cassette, single-mode (SM) or multimode (MM) fiber, four standard connector types, and tap option or in-line power monitor feature. The power control option can function as an in-line power monitor.

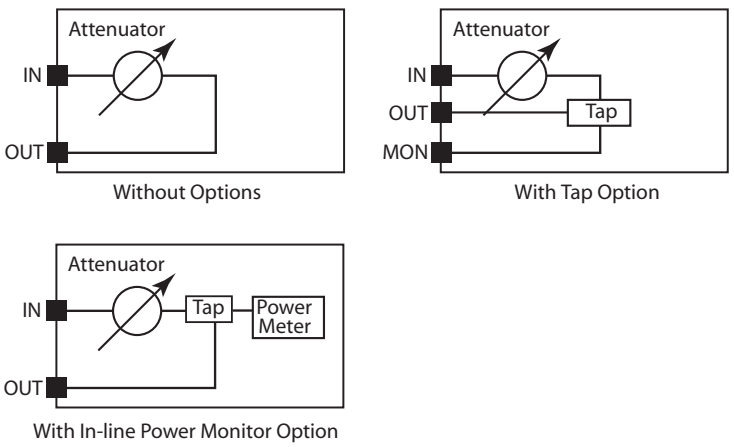
Continued

Application: Controlling Output Power

One of the primary applications of an attenuator is to create a precise signal of known output power. With the MAP Precision Attenuator, three options are possible:

- A standard attenuator. To control output power, measurement of the input power is required prior to testing. Output power is externally calculated based on the set attenuation. Figure (a) shows a standard attenuator.
- A standard output tap. Calibration of the output power is achieved through use of an external power meter and calibration of the tap path loss. Adjustments for changes in input power require external adjustments of the attenuator. Figure (b) shows the implementation of the standard output tap.
- An internal in-line power monitor. Output powers can be set directly with internal calibration and monitoring compensating for input power and path losses. In addition, the unit may be set into a closed-loop mode where out put power is dynamically controlled. Figure (c) shows the internal in-line power monitor.

Figure 1: Optical Configuration of the Attenuator Cassette



Specifications

Parameter	Single-mode fiber (SMF) without Power Monitor	Single-mode fiber (SMF) with Power Monitor	Multimode fiber (MMF) without Power Monitor	Multimode fiber (MMF) with Power Monitor
Wavelength range	1260 to 1650 nm	1260 to 1650 nm	750 to 1350 nm	750 to 1350 nm
Insertion loss (IL)[1, 2, 3] at minimum attenuation	≤ 1.5 dB[4]	≤ 2.2 dB	≤ 2.2 dB[4]	≤ 3.2 dB
Attenuation range	60 dB	60 dB	45 dB	45 dB
Attenuation repeatability[3,5]	± 0.01 dB	± 0.01 dB	0.01 dB	0.01 dB
Attenuation accuracy[3,6]	± 0.1 dB	± 0.1 dB	± 0.1 dB	± 0.1 dB
Attenuation slew rate (nominal)	>10 dB/s typical	>10 dB/s typical	> 7 dB/s typical	> 7 dB/s typical
Attenuation setting resolution	0.001 dB	0.001 dB	0.001 dB	0.001 dB
Maximum input power	23 dBm	23 dBm	23 dBm	23 dBm
Polarization dependent loss (PDL)[3, 7]	≤ 0.05 dB[4]	≤ 0.15 dB	N/A	N/A
Return loss (RL) (APC and PC connector)[4,8]	> 60/45 dB	> 60/45 dB	> 35/30 dB	> 35/30 dB
Closed-loop output power range (in-line power monitor option)	N/A	-49 to 11 dBm at 1310/1550 ± 15 nm	N/A	-40 to 5 dBm at 850/1310 ± 15 nm
Relative power meter uncertainty[3,5,9,10]	N/A	± 0.03 dB	N/A	± 0.03 dB
Power setting repeatability[5,9]	N/A	± 0.015 dB	N/A	± 0.015 dB
Power setting resolution	N/A	0.001 dBm	N/A	0.001 dBm
Shutter isolation	> 100 dB			
Calibration period	2 years			
Warm-up time	30 minutes			
Operating temperature	0 to 50 °C			
Storage temperature	- 30 to 60 °C			
Operating humidity	< 90 % at 23°C, < 20 % at 50 °C (relative, non-condensing)			
Dimensions (W x H x D)	4.06 x 13.24 x 39.5 cm			
Weight	1.1 kg (single) /1.3 kg (dual)			

1. At 1310 ± 15 and 1550 ± 15 nm for SM unit and at 850 ± 15 and 1310 ± 15 for MM unit.
2. Including one mated pair of connectors.
3. At 23 ± 5 °C.
4. Not including tap coupler loss, if installed.
5. Constant wavelength, constant temperature, constant state of polarization.
6. Maximum specification at 1310 ± 15 and 1550 ± 15 nm for SM unit and at 850 ± 15 and 1310 ± 15 for MM unit. Outside these wavelength ranges, the typical accuracy is the greater of ± 0.1 dB or ± 0.003 dB/dB.
7. At 1310 ± 15 and 1550 ± 15 nm.
8. At 1550 ± 15 nm for SMF and 1310 ± 15 for MMF.
9. Over output power range.
10. Add 0.01 dB/dBm for output power below - 45 dBm at 1310 and 1550 nm and output power below -40 dBm at 850 nm.

Ordering Information

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Sample: MAPA+2319101FA

MAPA+23 □□ □ □ □ □□

Code	Fiber Type (µm)
19	50/125, 750 to 1350 nm
29	62.5/125, 750 to 1350 nm
70	9/125, 1200 to 1700 nm

Code	Built-in Options
0	None
1	50/50 coupler
9	10/90 coupler
X	In-line power monitor

Code	Port Type
0	Bulkheads
1	3 mm pigtails (2 m long)

Code	Connector Type (all ports)
FP	FC/PC
FA	FC/APC
SC	SC/PC
SU	SC/APC

Code	Cassette Type
1	Single attenuator
2	Dual attenuator (identical)

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.

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MAP Polarization Controller

For stand-alone applications, the MAP Polarization Controller may be used as a benchtop

Key Features

- **Complete polarization control**
- **Designed to meet IEEE Std. 802.3aeTM 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**

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

- This cassette, when installed in a MAP chassis, complies to CE requirements plus UL3101-1 and CAN/CSA-C22.2 No. 1010.1.

The Multiple Application Platform (MAP) Polarization Controller Cassette 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 single width MAP Polarization Controller Cassette is comprised of three rotating elements: a high extinction ratio polarizer, a quarter-wave plate and a half-wave plate. Each element can be controlled locally from the MAP local interface or remotely through the RS-232 or GPIB. 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)[1, 3]	< 1.5 dB	< 1.5 dB
IL variation with wavelength[1,3]	± 0.1 dB	± 0.1 dB
IL variation with rotation[1,3,4]	± 0.05 dB	± 0.05 dB
Return loss (RL)	> 45 dB	> 45 dB
Extinction ratio[2]	> 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 13.24 x 39.5 cm	
Weight	1.6 kg	

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

MAPP+10 □□ □ □□

Code	Model
1S	Controller SMF input
1P	Controller PMF input (FC connectors, 1550 nm only)

Code	Wavelength (nm)
3	1260 to 1360
5	1420 to 1630

Code	Connector Type
FP	FC/PC
FA	FC/APC
SC	SC/PC
SU	SC/APC

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MAP Variable Backreflector

For stand-alone applications, the MAP Variable Backreflector may be used as a benchtop

Key Features

- **0.01 dB resolution**
- **Operation at 850/1310 or 1310/1550 nm**
- **SM or MM fiber**

Applications

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

Safety Information

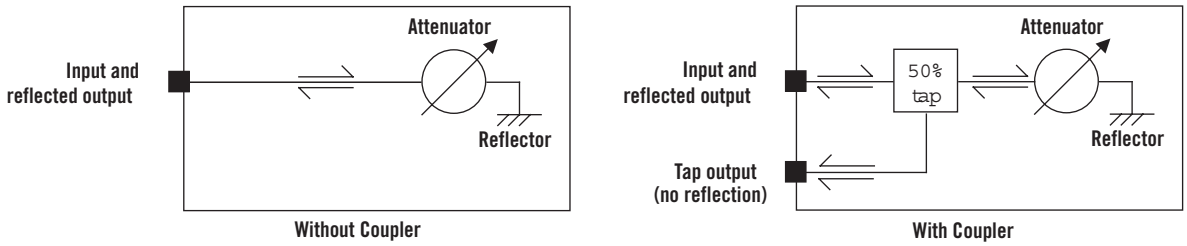
- This cassette, when installed in a MAP chassis, complies to CE requirements plus UL3101-1 and CAN/CSA-C22.2 No. 1010.1.

The Multiple Application Platform (MAP) Variable Backreflector Cassette provides precise levels of return loss (RL) to transmitters, which allows measurements of system sensitivity or system degradation as a function of backreflection.

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

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

Figure 1: 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) [1,2,3]	N/A	< 5.0 dB	N/A	< 6.0 dB
Relative backreflection setting accuracy [1,3,4]	± 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)[1]	< 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)	Single width cassette (4.06 x 13.24 x 39.5 cm)			
Weight	1.1 kg (single) / 1.3 kg (dual)			

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

Sample: MAPV+2B70100FA

MAPV+2B □□ □ □ **0** □□

Code	Fiber Type (µm)
19	50/125
29	62.5/125
70	9/125

Code	Cassette Type
1	Single
2	Dual

Code	Built-in Option
0	None
1	Coupler

Code	Port Type
0	Bulkheads

Code	Connector Type
FP	FC/PC
FA	FC/APC
SC	SC/PC
SU	SC/APC

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MAP Tunable Grating Filter

For stand-alone applications, the MAP Tunable Grating Filter may be used as a benchtop

Key Features

- **Narrow bandwidth**
- **Low polarization dependent loss (PDL) (< 0.3 dB)**
- **Wide wavelength range (1420 to 1630 nm)**
- **High power input (1 W)**

Applications

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

Safety Information

- This cassette, when installed in a MAP chassis, complies to CE requirements plus UL3101-1 and CAN/CSA-C22.2 No. 1010.1

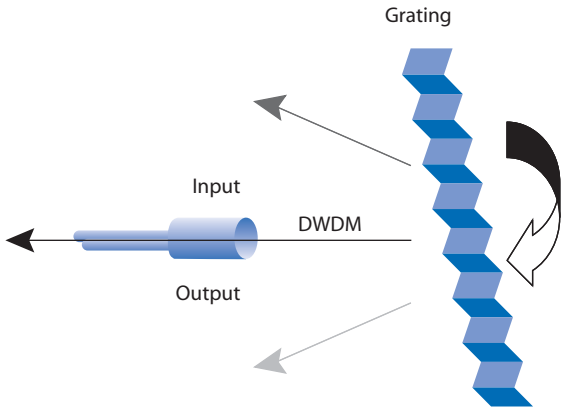
The Multiple Application Platform (MAP) Tunable Grating Filter Cassette is a tunable bandpass filter that offers continuous wavelength tuning from 1420 to 1630 nm. It is used for applications requiring low insertion loss (IL), high rejection, narrow bandwidth and wavelength tuning resolution of 0.005 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.

Three options are available:

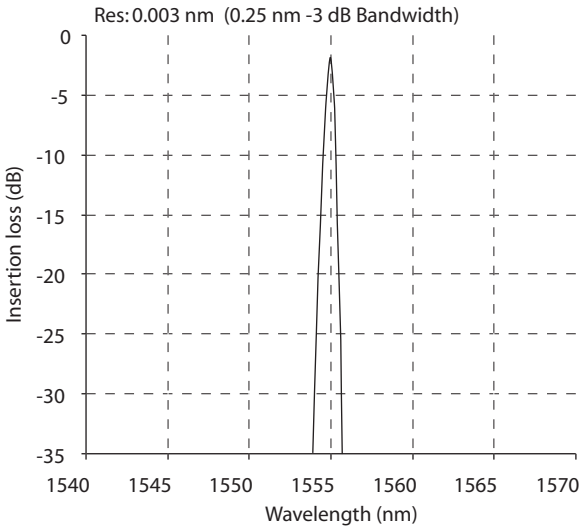
- the peak search option, used to find the absolute maximum transmission power within the filter's wavelength tuning range or a local maximum transmission power within a user-defined wavelength range
- 10% tap option for power monitoring
- 50% tap option for power monitoring.

MAP Tunable Grating Filter Cassette 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 MAP Tunable Grating Filter Cassette is the next generation replacement of the Benchtop Tunable Grating Filter (TB9 series).



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[1]	0.11 nm ± 15%	0.25 nm ± 15%	0.55 nm ± 15%
3/20 dB ratio[1]	0.40 ± 0.05	0.31 ± 0.05	0.31 ± 0.05
Insertion loss (IL)[2]			
1520 to 1630 nm	< 6.0 dB	< 4.5 dB	< 4.5 dB
1450 to 1630 nm	< 8.0 dB	< 6.0 dB	< 6.0 dB
Input power[3]	300 mW or 1 W	300 mW or 1 W	300 mW
Return loss (RL)[4]	> 45 dB		
Wavelength resolution	0.005 nm		
Polarization dependent loss (PDL)[5], 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)	8.12 x 13.24 x 39.5 cm		
Weight	2.3 kg		

1. Measured at 1550 nm.
2. Not including tap coupler loss if installed.
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

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.

Sample: MAPF+1GGP51FP

MAPF +1G □

Code	Bandwidth
C	Model C (0.11 nm)
G	Model G (0.25 nm)
K	Model K (0.55 nm)

Code	Input Power
0	300 mW
P	1 W (Models C and G only)

Code	Option
0	None
1	50/50 coupler
9	10/90 coupler
X	Peak search

1

Code	Port Type
1	Bulkheads

Code	Connector Types
FP	FC/PC
FA	FC/APC
SC	SC/PC
SU	SC/APC

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.

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MAP Power Meter

3 mm InGaAs Power Meter with Dual Detector Configuration

For stand-alone applications, the MAP Power Meter may be used as a benchtop

Key Features

- **Low PDL (< 0.01 dB)**
- **Wide wavelength range (800 to 1650 nm)**
- **High power option (2 W)**
- **Dual detector option**
- **Bare fiber measurements capability**

JDSU offers two types of Multiple Application Platform (MAP) Power Meter Cassettes. The first is a power meter with a 3 mm InGaAs detector and the second is a power meter with 10 mm Ge detector.

3 mm InGaAs MAP Power Meter

The 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 a high accuracy, high linearity and extremely low polarization dependant loss (PDL). The MAP 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 µs for high-speed applications.

For ultimate flexibility, the detector heads were designed with the JDSU AC100 interchangeable detector adapters. Detector adapters 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 cassette is supplied with an FC detector adapter as a standard accessory. An optional integrating sphere may be fastened to the front panel allowing for increased power measurement capability to 33 dBm (2 W) with decreased PDL to 0.005 dB.

10 mm Ge MAP Power Meter

This versatile 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 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 cassette 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 (± 0.01 dB)
- Receiver and transmitter testing

Safety Information

- This cassette, when installed in a MAP chassis, complies to CE requirements plus UL3101-1 and CAN/CSA-C22.2 No. 1010.1

Dual Detector Power Meter with an Integrating Sphere on Detector 2

10 mm Ge Power Meter

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 ≤ 0.27	
Maximum core diameter for single fiber	62.5 µm (N/A ≤ 0.27)	
Maximum core diameter for ribbon cable[1]	N/A	62.5 µm (N/A ≤ 0.27)
Uncertainty at reference condition	± 2.5 % (1200 ≤ λ ≤ 1550 nm)[2]	± 4 %[3]
	± 4.0 % (800 ≤ λ< 1200 nm)[2]	N/A
	± 3.5 % (1550 ≤ λ ≤ 1600 nm)[2]	N/A
	± 4.0 % (1600 ≤ λ ≤ 1630 nm)[2]	N/A
Total uncertainty[4,5]	± 4.5 % ± 5 pW (800 ≤ λ ≤ 1630 nm)	± 5.5 % ± 100 pW
Relative uncertainty		
Polarization[6]	± 0.01 dB	< 0.01 dB
Spectral ripple[7]	± 0.005 dB	< 0.01 dB
Linearity (at T = 23 ± 5 °C)	1520 ≤ λ ≤ 1570 nm -65 to 10 dBm < ± 0.02 dB	± 0.025 dB[8]
Return loss (RL)[9]	> 55 dB	> 50 dB
Noise[10] (peak to peak)	< 5 pW	< ± 100 pW
Averaging time	100 µs to 5 s	100 µs 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 13.24 x 39.5 cm	8.12 x 13.24 x 39.5 cm
Weight	1.2 kg	

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 ± 3 °C, Spectral width of source: < 1 nm, Optical power on detector: 100 µW (- 10 dBm).
3. Reference condition: CW laser with P = -10 dBm; Wavelength 1550 nm; FWHM < 10 nm; SM fiber with single channel FC connector adapter; Ambient temperature 25 ± 3 °C.
4. Operating conditions: NA of fiber ≤ 0.27 Temperature, humidity and power ranges: as specified. For FC/APC connector N/A = 0.27 add 1 %.
5. For wavelengths >1600 nm and temperatures > 35 °C add 1.0 %.
6. Polarization: Polarization states at fixed wavelength (1550 ± 30 nm) and constant power; Straight connector; T = 23 ± 5 °C.
7. Ripple: 1545 ≤ λ ≤ 1565 nm; Fixed state of polarization; Constant power; Straight connector; T = 23 ± 5 °C.
8. For 3 dBm > P > - 30 dBm.
9. RL: At 1310 nm and 1550 nm; 8 ° angled connector; T = 23 ± 5 °C.
10. Noise: Averaging time 1 s; Observation time 300 s; Wavelength 1550 nm; T = 23 ± 5 °C.

Integrating Sphere Specifications

Parameter	AC330
Attenuation at reference[1]	-30.7 ± 0.8 dB
Spectral range	800 to 1650 nm
Wavelength flatness[2]	< ± 1.5 dB
RL[3]	> 65 dB (typical)
Relative uncertainty[4]	< ± 0.05 dB
Residual polarization dependent loss (PDL)[5]	< 0.005 dB
Maximum power[6]	+ 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

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.

Sample: MAPM+2PS12

MAPM +2P [S] [ ] [ ]

Code	Detector Type
S	Performance standard

Code	Detector[1] Type
1	3 mm InGaAs
2	10 mm Ge

Code	Detector[2] Type
0	None
1	3 mm InGaAs
2	10 mm Ge[1]

1. Not applicable if a 10 mm detector has been ordered for detector
2. A Dual 10 mm Ge detector cannot be ordered.

Optional Accessories

3 mm InGaAs MAP Power Meter

Product Code	Description
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

10 mm InGaAs MAP Power Meter

Product Code	Description
AC400	Detector cap
AC401	FC/PC adapter
AC402	MPO/MTP adapter

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MAP Broadband Source

For stand-alone applications, the MAP Broadband Source may be used as a benchtop

Key Features

- **Flattened output power spectrum**
- **High output power density**
- **High spectral stability**
- **Control and monitoring features**

Applications

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

Safety Information

- This optical source cassette, when installed in the MAP chassis, complies to CE requirements plus UL3101-1 and CAN/CSA-C22.2 No.1010.1, 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

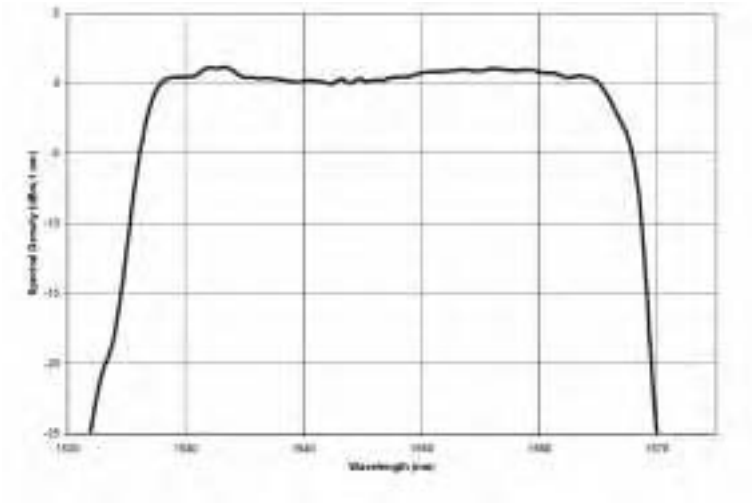
The Multiple Application Platform (MAP) Broadband Source (BBS) Cassette combines the optical performance of the JDSU BBS benchtop instruments with the flexibility and modularity of the MAP.

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.

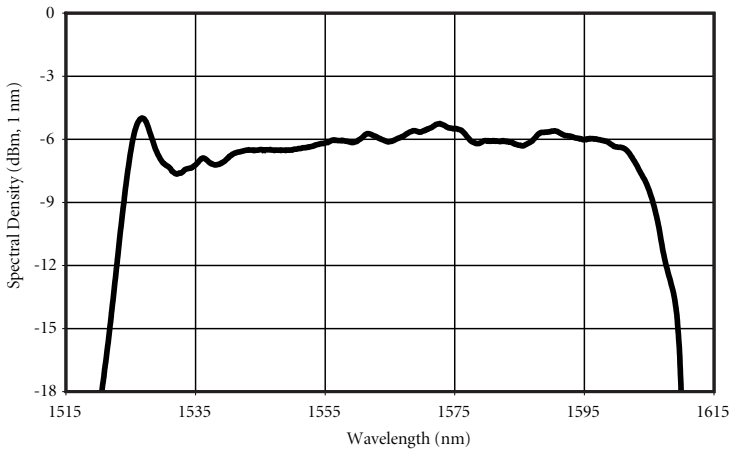
The addition of the BBS Cassette can be used for many applications including OSNR (optical signal to noise ratio) experiments, calibration of test equipment, and noise source for active or passive component testing.

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

Spectral Density Plot
MAPB+1E1550 C-band 50 mW



Spectral Density Plot
MAPB+1E1560 C+L-band 20 mW



Specifications

Parameter	1550 50 mW Output Power	1550 100 mW Output Power	1560 20 mW Output Power
Operating wavelength range	1527 to 1568 nm	1525 to 1568 nm	1525 to 1610 nm
Total optical power (minimum)[1]	50 mW	100 mW	20 mW
Spectral gain flatness (maximum)[2]	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 13.24 x 39.5 cm		
Weight	2.3 kg		

1. Measured at 1550 nm at 23 °C after one hour warm up.
2. Flatness range 1529 to 1565 nm for 1550 model and 1526 to 1603 nm for 1560 model.

Ordering Information

Sample: MAPB+1E1550FP0

MAPB +1E □□□□ □□ □

Code	Band
1550	C-band, 1527 to 1568 nm
1560	C+L-band, 1525 to 1610 nm

Code	Connector Type
FP	FC/PC
FA	FC/APC

Code	Output power
0	50 mW output power for C-band, 20 mW for C+L-band
1	100 mW output power (C-band 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.

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WEBSITE: www.jdsu.com

MAP DFB Laser

For stand-alone applications, the MAP DFB Laser may be used as a benchtop

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
- 50 GHz wavelength spacing
- Single-mode fiber (SMF) and polarization maintaining fiber (PMF) output available

Applications

- DWDM transmission testing
- Optical amplifier testing
- Fiber characterization

Safety Information

- This optical source cassette, when installed in the MAP chassis, complies to CE requirements plus UL3101-1 and CAN/CSA-C22.2 No.1010.1, 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) Distributed Feedback (DFB) Laser Cassette 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 standard MAP DFB Laser can be selected to comply with the 50 GHz ITU grid in the C- and L-band (1527 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
Wavelength	
Range	ITU grid C+L-band (see Channel Code Grid)
Accuracy	± 0.03 nm
Stability 15 minutes[1, 2, 3]	± 0.005 nm
Stability 24 hours[1, 2, 3]	± 0.01 nm
Tuning range	∅ 1.5 nm
Resolution	0.01 nm
Power	
Laser output[4]	10 or 20 mW
Laser power uncertainty[3]	± 5 %
Stability 15 minutes[1, 2, 3]	± 0.005 dB
Stability 24 hours[1, 2, 3]	± 0.03 dB
Resolution[5]	0.01 dB
Attenuation range	10 dB
Internal modulation	
Range[6]	0.2 to 400 kHz
Depth	0 to 100%
Duty cycle	15 to 85%
Function	Square, Sinusoidal and Triangular
Spectral properties	
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 13.24 x 39.5 cm
Weight	0.5 kg

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.

Channel Code Grid

Code	Frequency (THz)	Wavelength (nm)	Code	Frequency (THz)	Wavelength (nm)	Code	Frequency (THz)	Wavelength (nm)
18620	186.20	1610.06	18945	189.45	1582.44	19275	192.75	1555.34
18625	186.25	1609.62	18950	189.5	1582.02	19280	192.80	1554.94
18630	186.30	1609.19	18955	189.55	1581.60	19285	192.85	1554.54
18635	186.35	1608.76	18960	189.60	1581.18	19290	192.90	1554.13
18640	186.40	1608.33	18965	189.65	1580.77	19295	192.95	1553.73
18645	186.45	1607.90	18970	189.70	1580.35	19300	193.00	1553.33
18650	186.50	1607.47	18975	189.75	1579.93	19305	193.05	1552.93
18655	186.55	1607.04	18980	189.80	1579.52	19310	193.10	1552.52
18660	186.60	1606.61	18985	189.85	1579.10	19315	193.15	1552.12
18665	186.65	1606.17	18990	189.90	1578.69	19320	193.20	1551.72
18670	186.70	1605.74	18995	189.95	1578.27	19325	193.25	1551.32
18675	186.75	1605.31	19000	190.00	1577.86	19330	193.30	1550.92
18680	186.80	1604.89	19005	190.05	1577.44	19335	193.35	1550.52
18685	186.85	1604.46	19010	190.10	1577.03	19340	193.40	1550.12
18690	186.90	1604.03	19015	190.15	1576.61	19345	193.45	1549.72
18695	186.95	1603.60	19020	190.20	1576.20	19350	193.50	1549.32
18700	187.00	1603.17	19025	190.25	1575.78	19355	193.55	1548.92
18705	187.05	1602.74	19030	190.30	1575.37	19360	193.60	1548.52
18710	187.10	1602.31	19035	190.35	1574.95	19365	193.65	1548.12
18715	187.15	1601.88	19040	190.40	1574.54	19370	193.70	1547.72
18720	187.20	1601.46	19045	190.45	1574.13	19375	193.75	1547.32
18725	187.25	1601.03	19050	190.50	1573.71	19380	193.80	1546.92
18730	187.30	1600.60	19055	190.55	1573.30	19385	193.85	1546.52
18735	187.35	1600.17	19060	190.60	1572.89	19390	193.90	1546.12
18740	187.40	1599.75	19065	190.65	1572.48	19395	193.95	1545.72
18745	187.45	1599.32	19070	190.70	1572.06	19400	194.00	1545.32
18750	187.50	1598.89	19075	190.75	1571.65	19405	194.05	1544.92
18755	187.55	1598.47	19080	190.80	1571.24	19410	194.10	1544.53
18760	187.60	1598.04	19085	190.85	1570.83	19415	194.15	1544.13
18765	187.65	1597.62	19090	190.90	1570.42	19420	194.20	1543.73
18770	187.70	1597.19	19095	190.95	1570.01	19425	194.25	1543.33
18775	187.75	1596.76	19100	191.00	1569.59	19430	194.30	1542.94
18780	187.80	1596.34	19105	191.05	1569.18	19435	194.35	1542.54
18785	187.85	1595.91	19110	191.10	1568.77	19440	194.40	1542.14
18790	187.90	1595.49	19115	191.15	1568.36	19445	194.45	1541.75
18795	187.95	1595.07	19120	191.20	1567.95	19450	194.50	1541.35
18800	188.00	1594.64	19125	191.25	1567.54	19455	194.55	1540.95
18805	188.05	1594.22	19130	191.30	1567.13	19460	194.60	1540.56
18810	188.10	1593.79	19135	191.35	1566.72	19465	194.65	1540.16
18815	188.15	1593.37	19140	191.40	1566.31	19470	194.70	1539.77
18820	188.20	1592.95	19145	191.45	1565.91	19475	194.75	1539.37
18825	188.25	1592.52	19150	191.50	1565.50	19480	194.80	1538.98
18830	188.30	1592.10	19155	191.55	1565.09	19485	194.85	1538.58
18835	188.35	1591.68	19160	191.60	1564.68	19490	194.90	1538.19
18840	188.40	1591.26	19165	191.65	1564.27	19495	194.95	1537.79
18845	188.45	1590.83	19170	191.70	1563.86	19500	195.00	1537.40
18850	188.50	1590.41	19175	191.75	1563.46	19505	195.05	1537.00
18855	188.55	1589.99	19180	191.80	1563.05	19510	195.10	1536.61
18860	188.60	1589.57	19185	191.85	1562.64	19515	195.15	1536.22
18865	188.65	1589.15	19190	191.90	1562.23	19520	195.20	1535.82
18870	188.70	1588.73	19195	191.95	1561.83	19525	195.25	1535.43
18875	188.75	1588.30	19200	192.00	1561.42	19530	195.30	1535.04
18880	188.80	1587.88	19205	192.05	1561.01	19535	195.35	1534.64
18885	188.85	1587.46	19210	192.10	1560.61	19540	195.40	1534.25
18890	188.90	1587.04	19215	192.15	1560.20	19545	195.45	1533.86
18895	188.95	1586.62	19220	192.20	1559.80	19550	195.50	1533.47
18900	189.00	1586.20	19225	192.25	1559.39	19555	195.55	1533.07
18905	189.05	1585.78	19230	192.30	1558.98	19560	195.60	1532.68
18910	189.10	1585.37	19235	192.35	1558.58	19565	195.65	1532.29
18915	189.15	1584.95	19240	192.40	1558.17	19570	195.70	1531.90
18920	189.20	1584.53	19245	192.45	1557.77	19575	195.75	1531.51
18925	189.25	1584.11	19250	192.50	1557.36	19580	195.80	1531.12
18930	189.30	1583.69	19255	192.55	1556.96	19585	195.85	1530.73
18935	189.35	1583.27	19260	192.60	1556.56	19590	195.90	1530.33
18940	189.40	1582.85	19265	192.65	1556.15	19595	195.95	1529.94
			19270	192.70	1555.75	19600	196.00	1529.55

Ordering Information

MAP Single DFB Laser Cassette
Sample: MAPL+2U119630190FP

MAPL +2U1 □□□□□ □ □ □ □□

Code	Channel Code
XXXXX	See channel code grid

Code	Output Power
1	10 mW
2	20 mW

Code	Tap Option
0	None
4	1/99 coupler

Code	Connector Type Bulkheads
FP	FC/PC
FA	FC/APC

Code	Fiber Type, With Options
7	SMF28, no option
9	PMF, no option

MAP Dual DFB Laser Cassette
Sample : MAPL+2U2196301962027FP

MAPL+2U2 □□□□□ □□□□□ □ □ □□

Code	Channel Code
XXXXX	See channel code grid

Code	Channel Code
XXXXX	See channel code grid

Code	Output Power
1	10 mW
2	20 mW

Code	Fiber Type, Option
7	SMF28, no option
9	PMF, no option
5	SMF28, monitor port 1 % option
4	PMF, monitor port 1 % option

Code	Connector Type Bulkheads
FP	FC/PC
FA	FC/APC

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.

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MAP DFB Laser - Analog Modulation

For stand-alone applications, the MAP DFB Laser may be used as a benchtop

Key Features

- **10 mW output power**
- **1 GHz of modulation bandwidth**
- **Very low second and third order distortion**

Applications

- CATV reference transmittter
- Multitone receiver test

Safety Information

- This optical source cassette, when installed in the MAP chassis, complies to CE requirements plus UL3101-1 and CAN/CSA-C22.2 No.1010.1, 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

Multiple Application Platform (MAP) DFB Laser Cassette with Analog Modulation 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.

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 [1,2,3]	± 5 %
Stability 24 hours[1,2,3]	± 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[4]	< -34 dBc
Third order distortion[4]	< -44 dBc
Operating temperature	10 to 40 °C
Storage temperature	-30 to 60 °C
Dimensions (W x H x D)	4.06 x 13.24 x 39.5 cm
Weight	0.5 kg

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

Sample: MAPL+1A119340FA

MAPL+1A [1] [1][9][3][4][0] [ ][ ]

Code	Number of Channels
1	Single channel

Code	Channel Code
19340	1550.12 nm wavelength

Code	Connector Type
FP	FC/PC
FA	FC/APC

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MAP Fabry-Perot Laser

For stand-alone applications, the MAP Fabry-Perot Laser may be used as a benchtop

Key Features

- **Dual independent sources available in a single cassette**
- **Control and monitoring features**
- **Single-mode (SM)/Multimode (MM) output**
- **Internal/external modulation**

Applications

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

The Multiple Application Platform (MAP) Fabry-Perot Laser Cassette consists of a Fabry-Perot laser diode combined with a high performance laser driver circuitry for optimal wavelength and power stability. It features internal and external modulation capabilities and variable power control. Cassettes can be configured with two independent sources for maximum instrumentation density.

Safety Information

- This optical source cassette, when installed in the MAP chassis, complies to CE requirements plus UL3101-1 and CAN/CSA-C22.2 No.1010.1, 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

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[1,2]	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[3]	0.2 to 20 kHz					
Stability (15 minutes)[1,2,4]	± 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 13.24 x 39.5 cm					
Weight	0.5 kg					

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[1,2]	-3 dBm	-6 dBm	-6 dBm
Modulation[3]	0.2 to 20 kHz		
Stability (15 minutes)[1,2,4]	± 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 13.24 x 39.5 cm		
Weight	0.5 kg		

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

Sample: MAPL+1F072FA

MAPL+1F [0] [ ] [ ] [ ][ ]

Code	Output Power
0	Standard

Code	Wavelength (nm)
1	850
2	980
3	1310
4	1480
5	1550
6	1625
7	1310/1550
8	1650
9	850/1310
A	1550/1625
B	1550/1650
C	1480/1550
J	1490/1625

Code	Fiber Type (µm)
1	50/125
2	62.5/125
7	9/125
8	Flexcor 1060

Code	Connector Type
FP	FC/PC
FA	FC/APC

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MAP Light Emitting Diode Source

For stand-alone applications, the MAP LED Source may be used as a benchtop

Key Features

- **Dual independent sources available in a single cassette**
- **Control and monitoring features**
- **Single-mode (SM)/Multimode (MM) output**
- **Internal/external modulation circuitry**

Applications

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

Safety Information

- This optical source cassette, when installed in the MAP chassis, complies to CE requirements plus UL3101-1 and CAN/CSA-C22.2 No.1010.1, 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) Light Emitting Diode (LED) Source Cassette is a high-power LED based light source with variable output power. High output power and excellent wavelength stability, combined with built in modulation circuitry, make this light source suitable for wavelength division multiplexing (WDM) component manufacturing and testing. Other applications of this device include sensing, spectroscopy and amplified spontaneous emissions (ASEs) loading for optical signal to noise ratio (OSNR) measurements.

Specifications

Parameter	Single-mode (SM) 1310 nm	Single-mode (SM) 1550 nm	Multimode (MM) 850 nm	Multimode (MM) 1310 nm	Multimode (MM) 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=0.1nm)	0.35 dB	0.35 dB	-	-	-
Total power[1,2]	0 dBm	0 dBm	-3 dBm	-3 dBm	-3 dBm
Modulation	0.2 to 20 kHz				
Stability (15 minutes)[1,2,3]	± 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 13.24 x 39.5 cm				
Weight	0.5 kg				

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

Ordering Information

Sample : MAPB+1L057FP

MAPB+1L 0 □ □ □□

Code	Output Power
0	Standard

Code	Wavelength (nm)
1	850
3	1310
5	1550
7	1310/1550
9	850/1310

Code	Fiber Type (µm)
1	50/125
2	62.5/125
7	9/125

Code	Connector Type
FP	FC/PC
FA	FC/APC

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.

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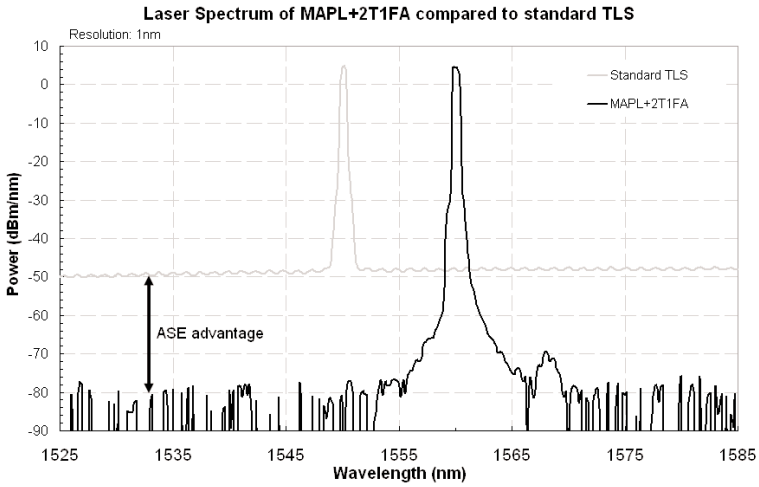
MAP Tunable Laser

For stand-alone applications, the MAP Tunable Laser may be used as a benchtop

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 100nm/s
- Mode-hop-free



Applications

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

Safety Information

This optical source cassette, when installed in the MAP chassis, complies to CE requirements plus UL3101-1 and CAN/CSA-C22.2 No.1010.1, 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) Tunable Laser Cassette is a low ASE external cavity tunable diode laser that offers exceptional speed, accuracy and flexibility at a competitive price, making it the ideal source for advanced fiberoptic 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 cassettes, it may be seamlessly integrated with the extensive family of MAP cassettes, which enables complete custom solutions to be rapidly assembled and expanded as needed.

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

Specifications

Parameter	Specification
Wavelength	
Range	1519 to 1630 nm, C+L-band
Accuracy[1,2,3]	± 15 pm enhanced accuracy mode[4], ± 60 pm regular mode
Stability[1,2]	± 3 pm (typical) (1 hour), ± 10 pm (24 hours)
Repeatability[1,2]	± 3 pm (typical) enhanced accuracy mode[4]
Resolution[1,2]	1 pm
Tuning speed	1 to 100 nm/s
Power	
Maximum power	
Over wavelength range	+ 5.0 dBm (> 6.0 dBm typical)
Peak	+ 8.0 dBm
Stability[1,2]	0.01 dB (1 hour)
Resolution	0.001 dB
Flatness while scanning[4]	0.6 dB over wavelength range
Flatness while stepping	± 0.05dB
Spectral properties	
Line width, coherence control off	< 150 kHz
Side mode supperession ratio (SMSR)	45 dB
Signal to ASE ratio	See spectral plot
Relative intensity noise (RIN)	- 140 dB/Hz
Fiber/connector type	Polarization maintaining fiber (PMF)/APC connector
Fiber extinction ratio	> 20 dB
Recommended calibration period	1 year
Operating temperature	15 to 35 °C
Storage temperature	- 20 to 50 °C
Dimensions (W x H x D)	8.12 x 13.24 x 39.5 cm
Weight	3.8 kg

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

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 sales@jdsu.com.

Please use the part number below to order the MAP Tunable Laser.

MAPL+2T1FA

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MAP Large Channel Count Switch

For stand-alone applications, the MAP Large Channel Count Switch may be used as a benchtop

Key Features

- **Low IL < 0.7 dB**
- **Low polarization dependent loss (PDL) 0.04 dB**
- **Wide wavelength range**
- **High RL > 57 dB**

Applications

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

Safety Information

- This cassette, when installed in a MAP chassis, complies to CE requirements plus UL3101-1 and CAN/CSA-C22.2 No. 1010.1.

The Multiple Application Platform (MAP) Large Channel Count Switch Cassette is bidirectional and allows the connection of a common port to any number of channels up to 50. The cassette is available in single or dual-switch configurations.

The MAP switch cassette is based on JDSU expanded beam and alignment technologies and exhibits low insertion loss (IL) and high return loss (RL).

Specifications

Parameter	Single-mode fiber SMF 9/125 Typical / Maximum	Multimode fiber MMF 50/125 and 62.5/125 Typical / Maximum
Wavelength range (N = number of output channels)	1270 to 1670 nm	850 to 1350 nm, 750 to 940 nm
Insertion loss (IL)		
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)[1]		
N ≤ 25	0.02 dB / 0.04 dB	N/A
N > 25	0.04 dB / 0.08 dB	N/A
Return loss (RL)[2]		
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 13.24 x 39.5 cm	
Weight	1.3 kg 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.

Sample: MAPS+1K70104N1FP

MAPS+1K □□ □□□□□ □□

Code	Fiber Type (µm)
18	50/125, 850 to 1310 nm
28	62.5/125, 850 to 1310 nm
70	9/125, 1270 to 1670 nm

Code	Switch Configuration
104N1	Single switch, 1 x 04, non-latching, bulkheads
106N1	Single switch, 1 x 06, non-latching, bulkheads
108N1	Single switch, 1 x 08, non-latching, bulkheads
112N3	Single switch, 1 x 12, non-latching, pigtail 2 m long
116N3	Single switch, 1 x 16, non-latching, pigtail 2 m long
124N3	Single switch, 1 x 24, non-latching, pigtail 2 m long
132N3	Single switch, 1 x 32, non-latching, pigtail 2 m long
142N3	Single switch, 1 x 42, non-latching, pigtail 2 m long
150N3	Single switch, 1 x 50, non-latching, pigtail 2 m long
204N1	Two switches, 1 x 4, non-latching, bulkheads
208N3	Two switches, 1 x 08, non-latching, pigtail 2 m long
212N3	Two switches, 1 x 12, non-latching, pigtail 2 m long
216N3	Two switches, 1 x 16, non-latching, pigtail 2 m long
225N3	Two switches, 1 x 25, non-latching, pigtail 2 m long

Code	Connector Type
FP	FC/PC
FA	FC/APC
SC	SC/PC
SU	SC/APC

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.

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MAP Small Channel Count Switch

For stand-alone applications, the MAP Small Channel Count Switch may be used as a benchtop

Key Features

- **Low insertion loss (IL) < 0.8 dB**
- **Low polarization dependent loss (PDL) 0.08 dB**
- **High return loss (RL) > 55 dB**
- **Up to 8 switches per cassette**

Applications

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

Safety Information

- This cassette, when installed in a MAP chassis, complies to CE requirements plus UL3101-1 and CAN/CSA-C22.2 No. 1010.1.

The Multiple Application Platform (MAP) Small Channel Count Switch is a single width cassette that is able to accommodate a number of switches with varying channel counts.

The switch redirects input light by an optical prism or mirror into a selected output channel. The switch is bidirectional, transparent to signal format, available in both single-mode (SM) and multimode (MM) versions.

Special density and functionality cassettes can be made available on a custom order basis.

Common Specifications

Parameter	Specifications	
	Single-Mode (SM)	Multimode (MM)
Insertion loss (IL)[1]		
1 x 2	≤ 0.8 dB	≤ 0.8 dB
2 x 2	≤ 1.0 dB	≤ 1.1 dB
Return loss (RL)[2]	> 55 dB	> 20 dB
Polarization dependent loss (PDL)[2]	≤ 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	8 ms	10 ms
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 13.24 x 39.5 cm	
Weight	1.1 kg maximum (varies with configuration)	

1. Unless otherwise specified, all specifications at start of life at 23 °C ± 3 °C and 45 % RH ± 5 %.
2. At 23 °C ± 3 °C at specified test wavelengths (850/1310 MM or 1310/1550 SM) and optical input power of -25 to 0 dBm, excluding connectors.
3. Drift of any channel at ± 3 °C deviation of ambient temperature without changing channels (excludes repeatability).
4. Repeatability as per Telcordia GR-1073-CORE (100 cycles, max-min/peak-to-peak).

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.

Single-Mode Sample: MAPS+2W73823FPL

MAPS+2W 7 3 □ □ □ □ □ L

Code	Fiber Type (µm)
73	9/125, 1310/1550 nm

Code	Number of Independent Switches
1	One switch per cassette
2	Two switches per cassette
4	Four switches per cassette
6	Six switches per cassette
8	Eight switches per cassette

Code	Type of Switches
2	1 x 2
A	2 x 2

Code	Port Type
1	Bulkheads (only for one or two switches)
3	Pigtails (2 m long)

Code	Connector Type (all ports)
FP	FC/PC
FA	FC/APC
SC	SC/PC
SU	SC/APC

Code	Latching
L	Latching

Multimode Sample: MAPS+2W162T1FP

MAPS+2W □ □ □ □ □ □ □ □

Code	Fiber Type (µm)
16	50/125, 850/1310 nm
26	62.5/125, 850/1310 nm

Code	Number of Independent Switches
1	One switch per cassette
2	Two switches per cassette

Code	Type of Switches
T	1 x 2
X	2 x 2

Code	Port Type
1	Bulkheads
3	Pigtails (2 m long)

Code	Connector Type (all ports)
FP	FC/PC
FA	FC/APC
SC	SC/PC
SU	SC/APC

Code	Latching
Blank	Non-latching

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MAP RF Switch

For stand-alone applications, the MAP RF Switch may be used as a benchtop

Key Features

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

Applications

- Data source selection
- Routing to main analyzer

Configurations

- Single 1 x 2, dual independent 1 x 2
- Single bypass, dual independent bypass

Safety Information

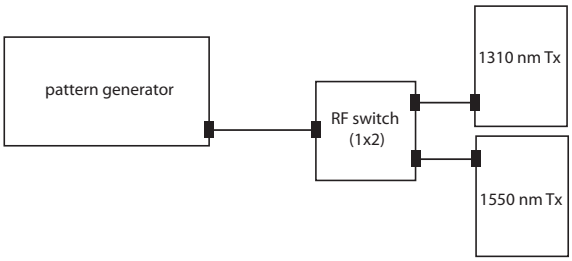
- This cassette, when installed in a MAP chassis, complies to CE requirements plus UL3101-1 and CAN/CSA-C22.2 No. 1010.1.

The Multiple Application Platform (MAP) RF switch cassette is a 50 Ohm coaxial switch for routing RF and microwave signals at frequencies up to 26.5 GHz. Comprising of single and dual 1 x 2 and bypass-type switches, these cassettes are an ideal solution for routing 10 Gb 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 1 x 2 configurations units feature dual built-in 50 Ohm 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 Ohm 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 18GHz 50 dB: 18 to 26.5GHz
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

Sample: MAPS+1R112

MAPS+1R ☐ ☐☐

Code	Number of Switches
1	1 switch
2	2 independent switches

Code	Type of Switch
12	1 x 2 switch
2B	Bypass
MX	1 x 2 and bypass

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MAP Utility

For stand-alone applications, the MAP Utility may be used as a benchtop

Key Features

- **Many tap ratios available**
- **Up to 3 couplers per cassette**
- **SM and MM**

Applications

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

Safety Information

- This cassette, when installed in a MAP chassis, complies to CE requirements plus UL3101-1 and CAN/CSA-C22.2 No. 1010.1.

The Multiple Application Platform (MAP) Utility Cassette is designed to simplify the mechanical integration of passive optical components for test sets. It is a highly configurable cassette that contains passive optical devices such as 1 x 4 splitters, 1 x 8 splitters and taps. It supports angle or flat polish connectors and single-mode (SM) and multimode (MM) fibers.

A blank cassette is available for mechanical mounting of components such as isolators, circulators or fixed attenuators. The cassettes are supplied with mounting hardware and up to ten bulkhead adapters for ease of integration.

Single-Mode (SM) Specifications

Parameter	SM 1x2, 1/99 Tap/ Coupler (Fused)	SM 1x2, 10/90 Tap/ Coupler (Fused)	SM 1x2, 30/70 Tap/ Coupler (Fused)	SM 1x2, 50/50 Tap/ Coupler (Fused)	SM 1x4 Splitter/ Coupler (Fused)	SM 1x8 Splitter/ Coupler (Fused)
Fiber type	9/125 µm					
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	8.0 dB	11.5 dB
Optical power handling	300 mW					
Number of slots	1					
Dimensions (W x H x D)	4.06 x 13.24 x 39.5 cm					
Weight	< 1.0 kg					

Multimode (MM) Specifications

Parameter	MM 10/90 Tap/Coupler (Micro-optic)	MM 50/50 Tap/Coupler (Micro-optic)
Fiber type	50/125 µm or 62.5/125 µm	
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 13.24 x 39.5 cm	
Weight	< 1.0 kg	

Ordering Information

MAP Utility Cassette with Built-in Splitter/Coupler
Sample: MAPU +1SFP12103700

MAPU+1S □□ □□□□ □ □□ **0**

Code	Connector Type
FP	FC/PC
FA	FC/APC
SC	SC/PC
SU	SC/APC

Code	Coupler / Tap Ratio
1201	1x2 tap/coupler, 1/99 (9/125 only)
1210	1x2 tap/coupler, 10/90
1230	1x2 tap/coupler, 30/70 (9/125 only)
1250	1x2 tap/coupler, 50/50
1400	1x4 tap/coupler
1800	1x8 splitter/coupler

Code	Number of Devices
1	1
2	2 [1]
3	3 [2]

Code	Fiber Type (µm)
10	50/125 at 850/1310 nm (micro-optic) [2]
20	62.5/125 at 850/1310 nm (micro-optic) [2]
70	9/125 at 1310/1550 nm (fused)

1. Not available for 1x8 splitter/coupler.
2. Not available for 1x4 tap/coupler and 1x8 splitter/coupler.

Blank MAP Utility Cassette
Sample: MAPU +10FP04000000

MAPU+10 □□ □□ **000000**

Code	Connector Type
FP	FC/PC
FA	FC/APC
SC	SC/PC
SU	SC/APC

Code	Number of Bulkhead Connectors
01	1
02	2
03	3
04	4
05	5
06	6
07	7
08	8
09	9
10	10

Note: Standard accessories included with a blank MAP Utility Cassette: splice holders, fiber holders, coupler mounts.

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.

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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 - 5:00 PM ET,Monday through Friday) If you are experiencing a problem with the operation of a 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 ensure the appropriate action is taken to address your needs.

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

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

24-7 Emergency Technical Support

24-7 Emergency Technical Support via our global toll-free 800 number is alsoincluded 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 - 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.