

VARIABLE ATTENUATOR

FVA-3100

R&D AND MANUFACTURING – OPTICAL



- Excellent spectral uniformity of ± 0.1 dB
- Monitor output option
- Ultra-low insertion loss
- Programmable—using the front-panel buttons, or the built-in RS-232 or GPIB interfaces
- Singlemode and multimode

First-Class Spectral Uniformity

High-quality components and meticulous calibration procedures make the FVA-3100 Variable Attenuator the instrument of choice for repeatable and accurate attenuation settings (up to 100 dB). The FVA-3100 meets system and component manufacturers' need for accurate EDFA characterization, component and system loss simulation, instrument calibration, power meter linearity measurement and spectral tuning. Its ultra-low insertion loss enables you to optimize the loss budget.

The FVA-3100 is configured for singlemode or multimode fibers. Use it as a stand-alone instrument or mounted on a 19-inch rack (optional).



FVA-3100 with monitor port.

APPLICATIONS

- BER testing
- EDFA characterization
- System/component loss simulation
- Accurate power-level monitoring
- Instrument calibration
- Linearity measurement
- Precision variable optical source output
- Spectral tuning
- Optical margin analysis

KEY FEATURES

- **Spectral flatness**
The FVA-3100-BW option offers high spectral uniformity, allowing you to maintain an attenuation value within ± 0.1 dB throughout the WDM spectrum when characterizing EDFAs or subsystems.
- **Monitor port**
The monitor output port enables accurate power-level monitoring at the receiver end of your system.
- **Attenuation modes**
Choose from three attenuation modes: absolute (including insertion loss), relative (in reference to the 0.00 dB level) or X+B (relative display to any selected reference value).

PROGRAMMABLE AND REMOTELY CONTROLLABLE

Using the front-panel buttons, cycle through a repeatable sequence of up to 100 attenuation steps, with a dwell time of up to 1000 hours per step. The Program mode is ideal for automated bit-error-rate (BER) testing and linearity measurements.

The FVA-3100 can also be programmed remotely through its RS-232 or GPIB interfaces.

EASY TO USE

Access most functions at the touch of a button and manually change attenuation with the FVA-3100's user-defined steps or on-display value editing. The standard GPIB and RS-232 interface and control codes enable remote operation from a PC or test station. Program your own software solutions for complex test procedures and benefit from added computer capabilities. LabVIEW® drivers are available.

SPECIFICATIONS ^a

SINGLEMODE CONFIGURATIONS

Description	SMF without monitor port		SMF with monitor port	
Models	FVA-3100-B	FVA-3100-BW	FVA-3100-BM	FVA-3100-BWM
Fiber type (μm)	9/125	9/125	9/125	9/125
Wavelength range (nm)	1200 to 1650	1200 to 1650	1200 to 1650	1200 to 1650
Max. attenuation (dB)	≥ 70	≥ 65	≥ 70	≥ 65
Insertion loss ^{b, c} (dB)	Typical	1.1	1.1	1.4
	Max.	1.8	1.8	2.2
Resolution (dB)	0.005	0.005	0.005	0.005
Linearity ^d (dB)	± 0.1	± 0.1	± 0.1	± 0.1
Spectral uniformity ^e (dB)	-	± 0.1	-	± 0.1
Repeatability (dB)	± 0.03	± 0.03	± 0.03	± 0.03
Max. PDL ^f (dB)	0.1	0.2	0.1	0.2
Typ. return loss ^{b, g} (dB)	> 55	> 55	> 55	> 55
Max. input power ^h (dBm)	20	20	20	20
Shutter isolation (dB)	> 100	> 100	> 100	> 100
Typ. monitor output (dB)	-	-	14.5	14.5

MULTIMODE CONFIGURATIONS

Description	MMF without monitor port	MMF with monitor port
Models	FVA-3100-C, D, E	FVA-3100-CM, DM
Fiber type (μm)	50/125, 62.5/125, 100/140	50/125, 62.5/125
Wavelength range (nm)	700 to 1350	700 to 1350
Max. attenuation (dB)	≥ 65	≥ 65
Insertion loss ^{b, c} (dB)	Typical	1.3
	Max.	2.0
Resolution (dB)	0.01	0.01
Linearity ^d (dB)	± 0.1	± 0.1
Repeatability (dB)	± 0.03	± 0.03
Typ. return loss ^{b, g} (dB)	> 25	> 25
Max. input power ^h (dBm)	20	20
Shutter isolation (dB)	> 100	> 100
Typ. monitor output (dB)	-	14.5

Notes

- At 23 °C ± 5 °C.
- Measured at 1310 nm and 1550 nm for singlemode units, measured at 850 nm and 1300 nm for multimode units.
- Measured with FC/UPC connectors for singlemode units and FC/PC for multimode units.
- Measured at 1310 nm and 1550 nm (up to 60 dB) for singlemode units and 850 nm and 1300 nm (up to 50 dB) for multimode units, non-polarized light.
- Measured between 1520 nm and 1570 nm at attenuation 20 dB, typical for BWM.
- Measured at 1550 nm, attenuation of < 30 dB.
- The return loss is limited by the return loss of the connectors. The connectors used are FC/APC for singlemode units and FC/PC for multimode units.
- Typical value. Prolonged exposure may damage the unit.

GENERAL SPECIFICATIONS

Size (H X W X D)	117 mm X 222 mm X 333 mm	(4 5/8 in X 8 3/4 in X 13 1/8 in)
Weight	2.6 kg	(5.8 lb)
Temperature	Operating	0 °C to 40 °C (32 °F to 122 °F)
	Storage	-40 °C to 70 °C (-40 °F to 158 °F)
Relative humidity	0 % to 80 % non-condensing	

Instrument Drivers

LabVIEW™ drivers and SCPI commands.

Remote Control

GPIO (IEEE-488.1, IEEE-488.2), RS-232.

Standard Accessories

User guide, Certificate of Compliance, Certificate of Calibration and AC power cord.

ORDERING INFORMATION

FVA-3100-X-XX

Model

FVA-3100-B = 9/125 µm
 FVA-3100-BW = 9/125 µm optimized for spectral flatness
 FVA-3100-C = 50/125 µm
 FVA-3100-D = 62.5/125 µm
 FVA-3100-E = 100/140 µm
 FVA-3100-BM = 9/125 µm with monitor output
 FVA-3100-BWM = 9/125 µm optimized for spectral flatness with monitor output
 FVA-3100-CM = 50/125 µm with monitor output
 FVA-3100-DM = 62.5/125 µm with monitor output

Example: FVA-3100-BW-EI-EUI-89

Note

a. Only available for singlemode models.

Connector

EI-EUI-28 = UPC/DIN 47256
 EI-EUI-76 = UPC/HMS-10/AG
 EI-EUI-89 = UPC/FC narrow key
 EI-EUI-90 = UPC/ST
 EI-EUI-91 = UPC/SC
 EI-EUI-95 = UPC/E-2000
 EA-EUI-28 = APC/DIN 47256^a
 EA-EUI-89 = APC/FC narrow key^a
 EA-EUI-91 = APC/SC^a
 EA-EUI-95 = APC/E-2000^a

Rugged Handheld Solutions

OPTICAL

- OLTs
- Power meters
- Light sources
- Talk sets

COPPER ACCESS

- ADSL/ADSL2+, SHDSL, VDSL test sets
- VoIP and IPTV test sets
- Ethernet test sets
- POTS test sets

Platform-Based Solutions

OPTICAL FIBER

- OTDRs
- OLTs
- ORL meters
- Variable attenuators

DWDM TEST SYSTEMS

- OSAs
- PMD analyzers
- Chromatic dispersion analyzer

TRANSPORT AND DATA COM

- Next Generation SONET/SDH and OTN testers
- SONET/DSn (DS0 to OC-192) testers
- SDH/PDH (64 kb/s to STM-64) testers
- T1/T3, E1 testers
- 10/100M and Gigabit Ethernet testers
- Fibre Channel testers
- 10 Gigabit Ethernet testers

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