Product Brochure

Anritsu

MP1800A Series

Stressed Receiver Conformance Test Support

MX180002A

Stressed Eye Measurement Control Software

MU181620A

Stressed Eye Transmitter

MU181640A

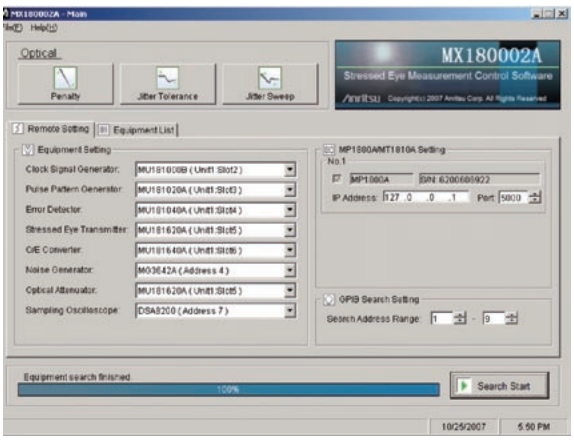
Optical Receiver

High-Accuracy and High-Repeatability Receiver Tests for Optical Modules

The growth of rich-content and triple play services over the Internet is driving intensive R&D and manufacturing of devices and modules for FTTx and 10G services. Interoperability between 10GbE transmission equipment and modules is an important issue and vendors are increasingly requesting support for worst-case conformance tests at the Rx side.
The MU181620A, MU181640A, and MX180002A support stable, high-accuracy, IEEE-compliant 10GBASE-L and E Stressed Receiver Conformance Tests. In addition, the MU181620A Optical Receiver that can be used as reference light source offers optical module vendors a low-cost, space-saving configuration for production lines.

Features

- 10GBASE-L and E Stressed Receiver Conformance Tests
- Measurement using Excellent Repeatability Waveform (Automatic Calibration of OMA, Extinction Ratio, VECP)
- High Repeatability Power Penalty Measurement (±0.3 dB) (Typical value in the same calibrated environment)
- High Speed Setup using User-defined Calibration data
- Reference Light Source for Module Evaluation (Extinction Ratio Variable)
- Dual 1310/1550 nm Wavelength Optical Output (MU181620A)
- Wideband Optical Interface from 0.1 to 12.5 Gbit/s (MU181620A/MU181640A)
- Wide Wavelength Receiver from 750 to 1650 nm (MU181640A)
- Automatic Calibration and Measurement by MX180002A
  - Power Penalty Measurement
  - Jitter Tolerance Measurement
  - Jitter Sweep Measurement



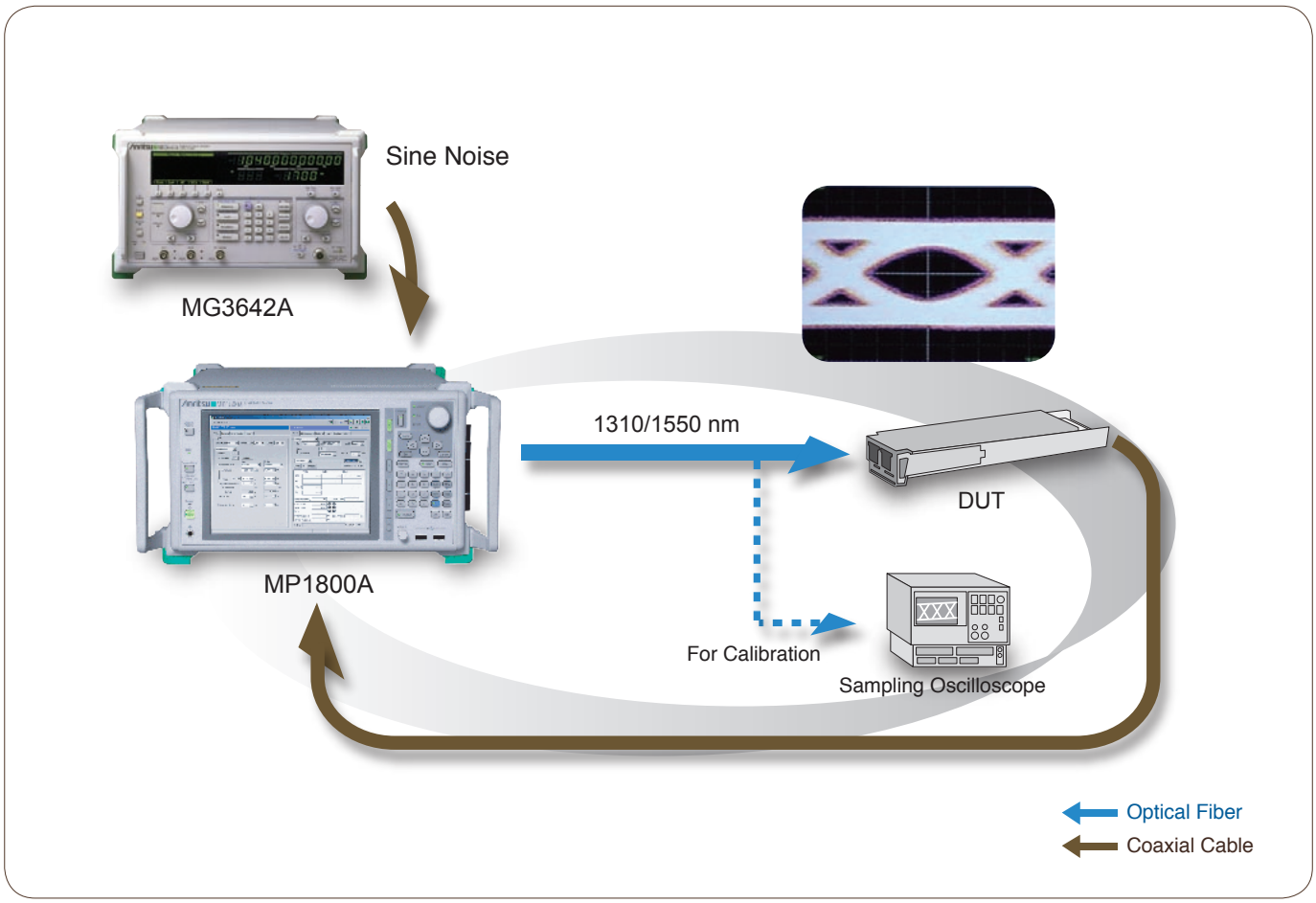
MX180002A Stressed Eye Measurement Control Software

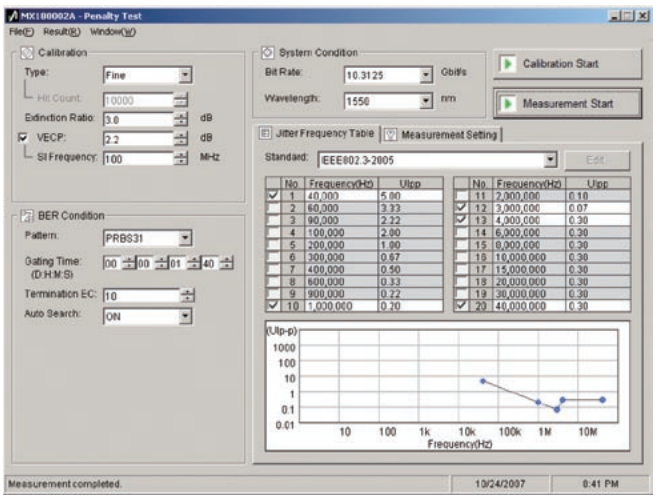
MU181620A Stressed Eye Transmitter

MU181640A Optical Receiver

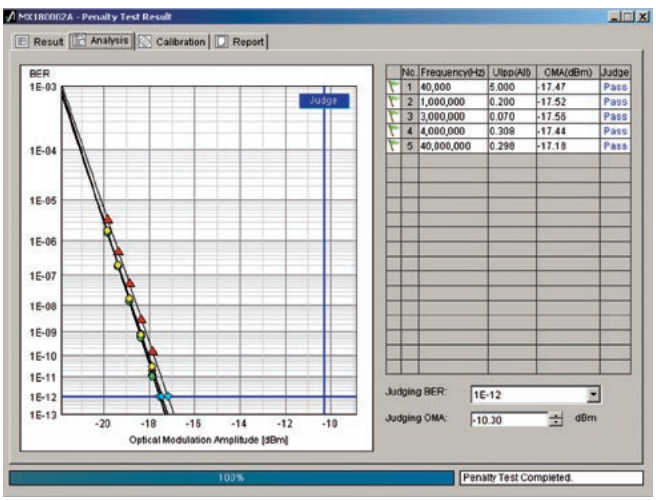
Application

Stressed Receiver Conformance Test





Power Penalty Settings Screen



Power Penalty Results Screen (OMA vs.BER)

• 10GBASE-L and E Stressed Receiver Conformance Tests

Fully IEEE802.3-2005-compliant 10GBASE-L and E Stressed Receiver Conformance Tests are supported for improving interoperability between vendors' transmission equipment and optical modules, and measured data reliability.

• Measurement using Excellent Repeatability Waveform (Automatic Calibration of OMA, Extinction Ratio, VECP)

This supports waveform measurement with high stability and repeatability in any environment by performing easy, high-accuracy, auto-calibration of OMA, Extinction Ratio, and VECP. As a result, there is no need to repeat measurements for different environments, which raises efficiency.

• High Repeatability Power Penalty Measurement (±0.3 dB) (Typical value in the same calibrated environment)

Easy, high-accuracy, auto-calibration supports precise variation of OMA, Extinction Ratio, and VECP (SJ, SI), offering a power penalty measurement repeatability of ±0.3 dB. (Typical value in the same calibrated environment)

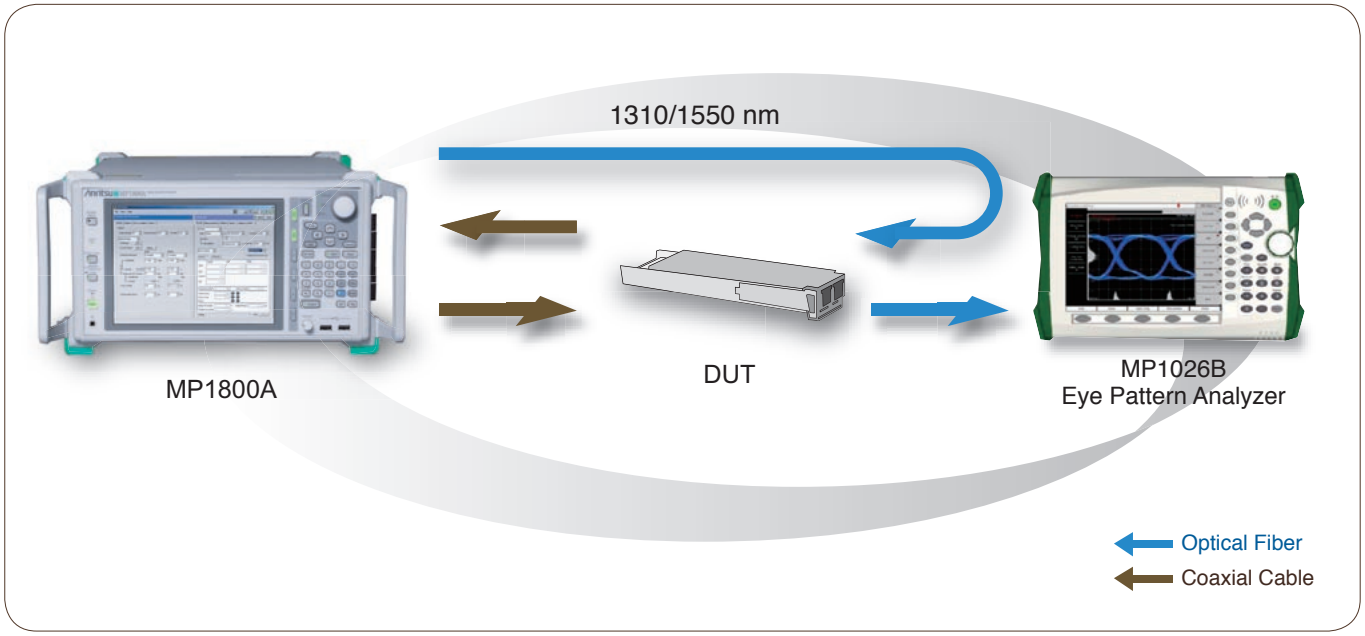
• Dual 1310/1550 nm Wavelength Optical Output (MU181620A)

A MU181620A Stressed Eye Transmitter supports both 1310 and 1550 nm wavelengths, eliminating the need to change modules for different wavelengths and raising work efficiency.

• High Speed Setup using User-defined Calibration data

When the calibration data of the evaluation by the same configuration can be used, it is no need to calibrate. The setup time can be greatly reduced.

Optical Module Simultaneous Tx/Rx Measurement



• Reference Light Source for Module Evaluation

The MU181620A Stressed Eye Transmitter offers high-stability, high-quality, optical output with low temperature dependence, supporting use as a reference light source in addition to Stressed Receiver Conformance Tests. Consequently, because it has the advantages of a multi-channel configuration, both the electrical and optical interfaces of optical modules can be evaluated simultaneously, supporting crosstalk evaluation and shorter evaluation times.

• Dual 1310/1550 nm Wavelength Optical Output (MU181620A)

A MU181620A Stressed Eye Transmitter supports both 1310 and 1550 nm wavelengths, eliminating the need to change modules for different wavelengths and raising work efficiency.

• Double Functionality

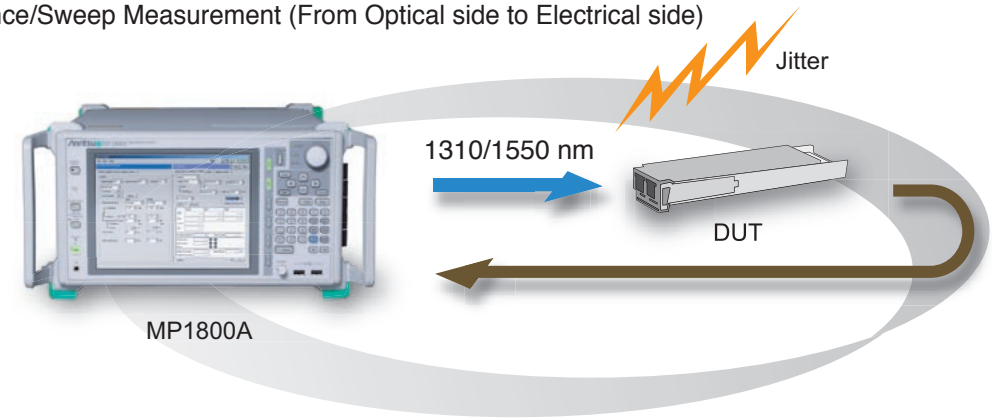
Equipment costs are cut because one unit can be used for both Stressed Receiver Conformance Tests and as a reference light source for module evaluation.

• Simultaneous Tx/Rx E/O Evaluation

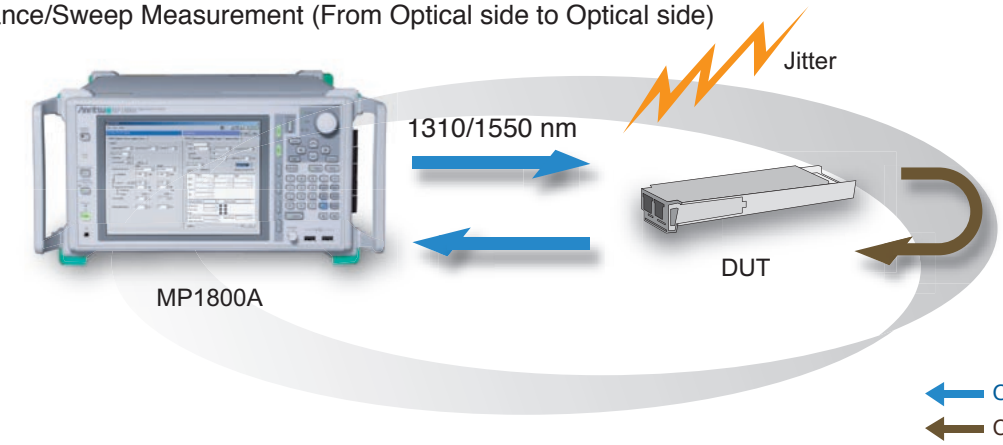
Both Rx sensitivity and module internal interference can be evaluated simultaneously, halving test times.

Jitter Tolerance/Sweep Measurement

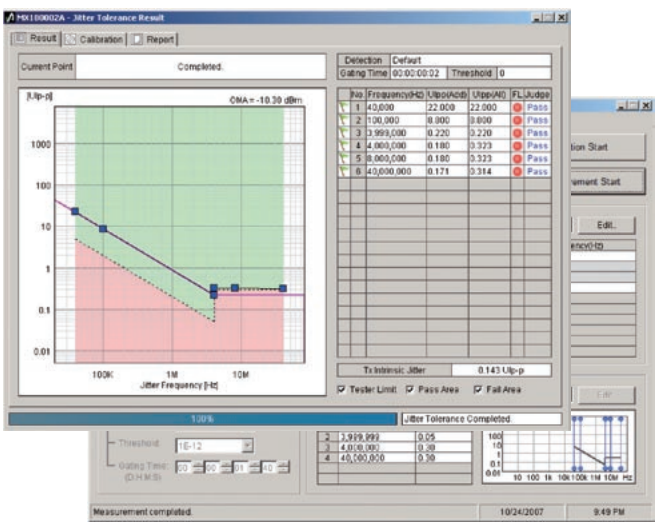
Jitter Tolerance/Sweep Measurement (From Optical side to Electrical side)



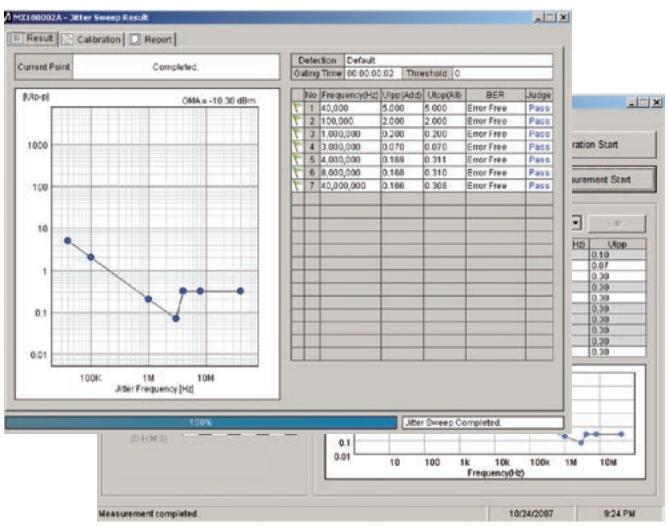
Jitter Tolerance/Sweep Measurement (From Optical side to Optical side)



Optical Fiber
Coaxial Cable



Jitter Tolerance Measurement Screen



Jitter Sweep Measurement Screen

• Supports Two Jitter Measurement Types

In addition to the Power Penalty test, the MX180002A Stressed Eye Measurement Control Software has a Jitter Tolerance function for measuring the Jitter Tolerance margin, as well as a Jitter Sweep function just for Jitter Tolerance Go/No Go evaluation. Jitter Tolerance measurements can be automated by selecting the test matching the application, which cuts measurement times.

Specifications

Reference Light Source

Items	Specifications	
Wavelength	1310 nm	1550 nm
	MU181620A-001 1310 nm Reference Tx MU181620A-003 1310/1550 nm Reference Tx	MU181620A-002 1550 nm Reference Tx MU181620A-003 1310/1550 nm Reference Tx
General Functions	Variable Extinction Ratio, Variable Optical Power, Jitter Injection, High Quality Waveforms	
Configurations	MP1800A (option-014) MU181000A (option-001) MU181020A (option-002, 030) MU181040A (option-002, 030) MU181620A (option-001 or 003)	MP1800A (option-014) MU181000A (option-001) MU181020A (option-002, 030) MU181040A (option-002, 030) MU181620A (option-002 or 003)
Operation Frequency	0.1 to 12.5 Gbit/s	
Output Power (Average)	Min. –4.0 dBm, Max. +4.0 dBm Non-modulation or input opened: Max. +7 dBm	Min. –2.0 dBm, Max. +4.0 dBm Non-modulation or input opened: Max. +7 dBm
Output Power Stability *1	± 0.02 dB	
Center Wavelength	Min. 1290 nm, Max. 1330 nm	Min. 1530 nm, Max. 1565 nm
Side Mode Suppression Ratio	≥30 dB	
Extinction Ratio *2, *3	5.0 to 10.0 dB / 0.1 dB steps	6.0 to 10.0 dB / 0.1 dB steps
VECP *2, *4	≤0.5 dB (In the Center 20% Region of the Eye) (Extinction Ratio: 9.0 dB, Use a reference O/E specified by Anritsu)	
Tr/Tf *2, *5	≤30 ps (20 to 80%)	
Jitter *2	≤0.2 UIp-p, Compliant with IEEE802.3-2005	
Eye Mask *3, *5	Compliant with STM64/OC192 (9.95328 Gbit/s), IEEE802.3-2005 Clause 52 (10.3125 Gbit/s, mask margin ≥30%), STM64/OC192 with FEC (10.709 Gbit/s)	
Output Power Control	–20.0 to –4.0 dBm / 0.01 dB steps	–20.0 to –2.0 dBm / 0.01 dB steps
Output Power Control Accuracy *4	Typical ± 0.5 dB	
Attenuation Variable Setting Range	0.0 to 16.0 dB / 0.01 dB steps	0.0 to 18.0 dB / 0.01 dB steps
Attenuation Variable Setting Range Accuracy *4	Typical ± 0.5 dB	
Connector	FC Connector (PC type), MU181620A-037 SC Connector (PC type), MU181620A-040, user-replaceable	

Stressed Eye

Items	Specifications	
Wavelength	1310 nm	1550 nm
	MU181620A-011 1310 nm Stressed Eye MU181620A-013 1310/1550 nm Stressed Eye	MU181620A-012 1550 nm Stressed Eye MU181620A-013 1310/1550 nm Stressed Eye
General Functions	Fully Compliant with IEEE802.3-2005 10GBASE-L, E Stressed Receiver Conformance Test High Repeatability Power Penalty Measurement (±0.3 dB) (Typical value in the same calibrated environment) Available as Reference Light Source (Refer the above specifications list, if the specification of reference light source is needed.)	
Configurations	MP1800A (option-001, 002, 014) MU181000A (option-001) MU181020A (option-002, 030) MU181040A (option-002, 020, 030) MU181620A (option-011 or 013) MX180002A MG3642A Sampling Oscilloscope (for calibration)	MP1800A (option-001, 002, 014) MU181000A (option-001) MU181020A (option-002, 030) MU181040A (option-002, 020, 030) MU181620A (option-012 or 013) MX180002A MG3642A Sampling Oscilloscope (for calibration)
Operation Frequency	9.95328 Gbit/s or 10.3125 Gbit/s	
Repeatability of Power Penalty Measurement	± 0.3 dB (Typical value in the same calibrated environment)	
Output Power (Average)	Min. –4.0 dBm, Max. +4.0 dBm Non-modulation or input opened: Max. +7 dBm	Min. –2.0 dBm, Max. +4.0 dBm Non-modulation or input opened: Max. +7 dBm
Output Power Stability *1	± 0.02 dB	
Optical Modulation Amplitude *5	≥–5.2 dBm	≥–1.7 dBm
Center Wavelength	Min. 1290 nm, Max. 1330 nm	Min. 1530 nm, Max. 1565 nm
Side Mode Suppression Ratio	≥30 dB	
Extinction Ratio *2, *3	2.0 to 6.0 dB / 0.1 dB steps	2.0 to 5.0 dB / 0.1 dB steps
VECP *2, *3, *4, *6	Min. 1.47 dB, Max. 2.2 dB (In the Center 1% Region of the Eye, without noise input) Min. 2.5 dB, Max. 4.5 dB (In the Center 1% Region of the Eye, noise input: 2.0 Vp-p, 100 MHz)	Min. 1.8 dB, Max. 2.7 dB (In the Center 1% Region of the Eye, without noise input) Min. 3.0 dB, Max. 5.0 dB (In the Center 1% Region of the Eye, noise input: 2.0 Vp-p, 100 MHz)
Jitter *2, *3, *6	≤0.25 UIp-p, Compliant with IEEE802.3-2005	
Eye Mask *2, *3, *6	Compliant with IEEE802.3-2005 Clause 52 (10.3125 Gbit/s)	
Output Power Control	–20.0 to –4.0 dBm / 0.01 dB steps	–20.0 to –2.0 dBm / 0.01 dB steps
Output Power Control Accuracy *4	Typical ± 0.5 dB	
Attenuation Variable Setting Range	0.0 to 16.0 dB / 0.01 dB steps	0.0 to 18.0 dB / 0.01 dB steps
Attenuation Variable Setting Range Accuracy *4	Typical ± 0.5 dB	
Connector	FC Connector (PC type), MU181620A-037 SC Connector (PC type), MU181620A-040, user-replaceable	

∗1: Stability level at one hour after a certain period of time after optical outputs
∗2: Bit Rate 10.3125 Gbit/s
∗3: Use a filter of Bit Rate of 75%
∗4: 20° to 30°C
∗5: Extinction Ratio: 10 dB
∗6: Extinction Ratio: 3.5 dB (1310 nm), Extinction Ratio: 3.0 dB (1550 nm)

Equipment Compositions

Category	Model number	Options	Stressed Eye				Reference Light Source		
			Calibration	1310 nm	1550 nm	1310/1550 nm	1310 nm	1550 nm	1310/1550 nm
SQA	MP1800A	-014	Refer the right configuration	√	√	√	√	√	√
		-001, -002		√	√	√			
	MU181000A						√	√	√
		-001		√	√	√	*1	*1	*1
	MU181020A	-002, -030		√	√	√	√	√	√
	MU181620A	-011*2		√					
		-012*2			√				
		-013*2				√			
		-001*2					√		
		-002*2						√	
		-003*2							√
	MU181640A	-004		*1	*1	*1	*1	*1	*1
	MU181040A	-001 or -002, -030		√	√	√	*1	*1	*1
	MX180002A			√	√	√			
SG	MG3642A		√	√	√	√			
DSO	Oscilloscope *3		√				*1	*1	*1
	MP1026B								

∗1: Select if needed.
∗2: MU181620A-001, 002, 003 are used as reference light source.
MU181620A-011, 012, 013 are used as stressed eye and reference light source

∗3: Recommended Sampling Oscilloscope
DSA8200 Digital Serial Analyzer
80C11 30 GHz Optical Sampling module
Manufactured by Tektronix

86100A/B/C Infiniium DCA-J Main Frame
86106B-410 28GHz Optical Channel
86107A Timebase Reference Module
Manufactured by Agilent

Anritsu

Specifications are subject to change without notice.

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