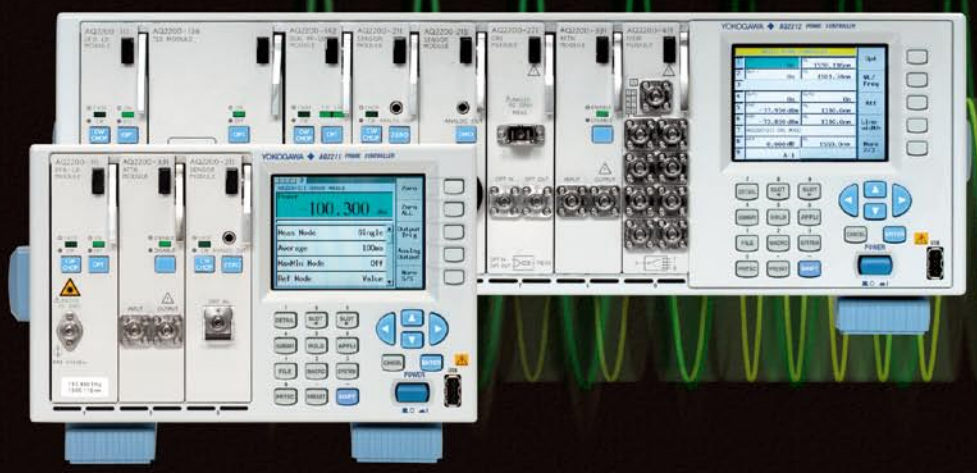
YOKOGAWA

AQ2200 Series

Multi Application Test System



Ideal Measurement Solution for Optical Devices and Optical Transmission Systems

- **A broad lineup of measurement modules**
  Light source, Optical power meter, Optical attenuator, Optical switch etc.
- **Macro programming Function**
  Easy way to build auto-measurement systems, not requiring an external PC to run.
- **Remote Interface : GP-IB, Ethernet, USB**
- **Hot-swappable modules**

Bulletin AQ2200-20EN

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Ideal Measurement Solution for Optical Devices and Optical Transmission Systems

The AQ2200 Multi Application Test System is the ideal system for measuring and evaluating a wide range of optical devices and optical transmission systems. A variety of measurement modules are available, including the following: a high-stability light source, a high-speed optical sensor with low PDL, a high-resolution variable optical attenuator and optical transceiver interface. These modules can be installed in any combination on a single platform, providing an ideal measurement system for a variety of applications.

The AQ2200 Multi Application Test System is available in two different frame controller platforms. Each model has a certain number of slots for connecting modules, so you can select the best platform size for your intended measurement applications.

Frame and Module Lineup

Frame Controller

AQ2211 Frame controller (3 slots)
AQ2212 Frame controller (9 slots)

Light Source Module

AQ2200-111 DFB-LD module (C&L band, 1310nm)

Sensor Module and Sensor Head

AQ2200-211 Sensor module (high sensitivity, long wavelength)
AQ2200-221 Sensor module (2-channel, long wavelength)
AQ2200-215 Sensor module (high power +30dBm)
AQ2200-201 Interface module (for -231 & -241 sensor heads)
AQ2200-231 Optical sensor head (large diameter, long wavelength)
AQ2200-241 Optical sensor head (large diameter, short wavelength)

Optical Attenuator Module

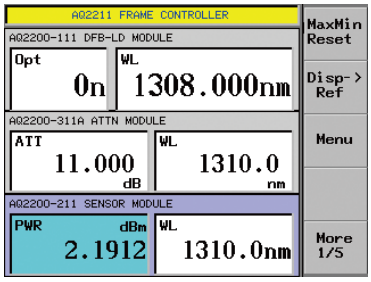
AQ2200-311A ATTN module (standard, monitor output option)
AQ2200-331 ATTN module (with a built-in optical power meter)

Optical Switch Module

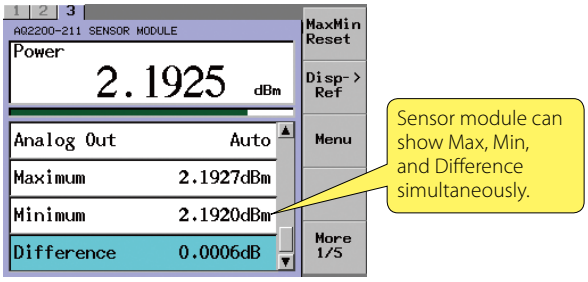
AQ2200-421 OSW module (1×2 or 2×2)
AQ2200-411 OSW module (1×4 or 1×8)
AQ2200-412 OSW module (1×16)

Modules for Optical Transceiver

AQ2200-641 XFP interface module
AQ2200-642 Transceiver interface module
AQ2200-651 SG module



AQ2211 Frame Controller Screen (SUMMARY)



AQ2211 Frame Controller Screen (DETAIL)

Frame controller with convenient functions

◆Hot-swappable

Measurement modules can be inserted or removed without turning off the power. This hot-swapping capability makes it easier to reconfigure your system.

◆USB memory for data storage

The USB makes it easy to quickly save and load data. It saves measurement data in CSV and a screen shot in bmp, so that they can easily be imported into almost any PC application.

◆Multi user function

Up to 5 users can access to the same frame controller simultaneously.
This function contributes to cost-saving and space-saving by sharing a frame.

◆Various remote interfaces

The AQ2211 and AQ2212 frame controllers are equipped with not only IEEE488.2 compliant GP-IB but also Ethernet and USB for remote operation.

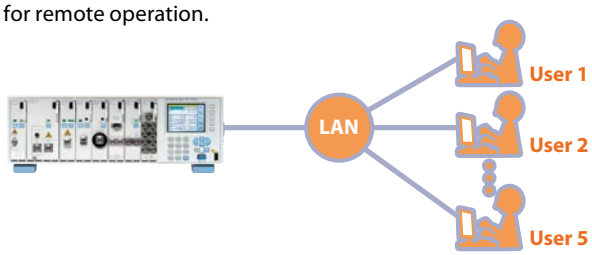


Image of Multi user function

Powerful Features for Automated Testing

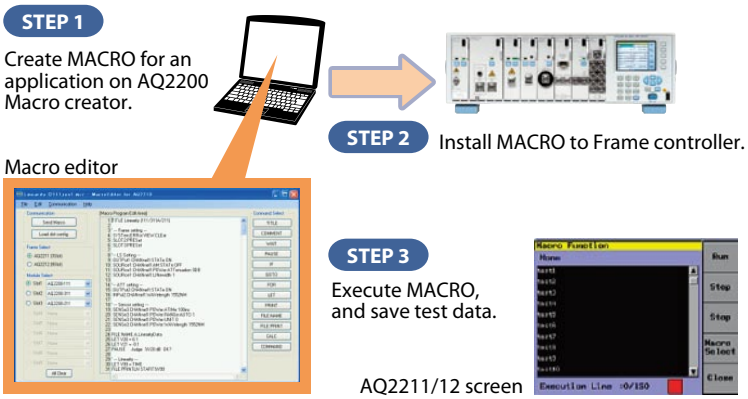
Macro Programming Function

A macro program function makes it easy to build a simple automated measurement system by writing a series of operations in a program, setting measurement conditions, changing test configurations in combination with multiple modules, executing measurements, and saving results.

Step 1: Create a macro program using Macro editor, a PC application software.

Step 2: Install the macro program into Frame controller via GP-IB, Ethernet, or USB.

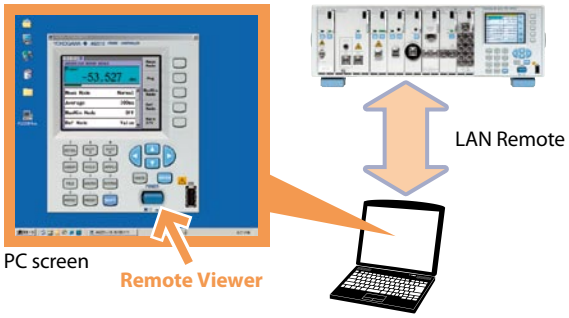
Step 3: Execute the macro program on the frame controller.



*The Macro editor (free software) can be downloaded from our web side.

Remote Viewer Software

The remote viewer software, a free PC application software, enables the AQ2200 Multi-Application Test System to be controlled from your PC via the Ethernet interface. When starting the software and setting up the connection properly, the front panel image of the connected frame controller is displayed on your PC monitor. Using a mouse, you can control the remote frame controller from your PC through operations that are similar to those for the front panel keys of the instrument. It is useful in case that you cannot see or operate the frame directly for the frame being mounted high up in the test stand.

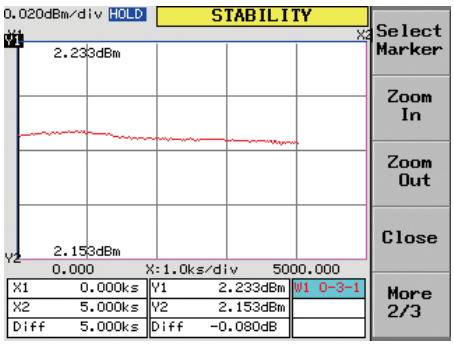


*The remote viewer software (free software) can be downloaded from our web side.

Stability / Logging Function

Stability and logging measure fluctuations in optical power. They can be selected by whether the fluctuation is long-term or short-term.

- **Stability Measurement**
  By measuring the optical signal over a long period of time, you can check the optical power stability up to 99days.
- **Logging Measurement**
  By measuring optical signals that fluctuate over very short periods of time, you can check the transient fluctuation or response with min. 100µs intervals.



Graph Display Screen

Module Lineup

Sensor Module Improved measurement throughput

High-Sensitivity & Low Polarization (AQ2200-211)

- Power range: –110 to +10 dBm
- Polarization dependence : 0.005 dBp-p or less
- Noise level: 0.2 pW or less
- Averaging time : 100 µs (minimum sampling intervals)

Large-diameter (AQ2200-231/-241)

- AQ2200-231: 800-1700 nm
- AQ2200-241: 400-1100 nm
- Power range: –90 to +10 dBm
- Averaging time : 100 µs (minimum sampling intervals)

High-Power (AQ2200-215)

- High Power Measurement: +30dBm
- Power range: -70 to +30 dBm
- Averaging time: 100 µs (minimum sampling intervals)

Dual-Channel (AQ2200-221)

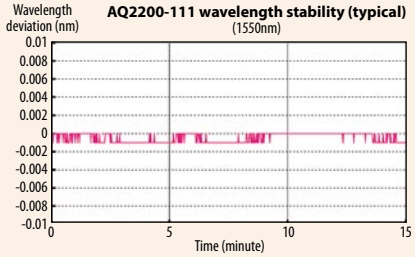
- Compact: Two high-performance sensors in a module.
- Power range: -70 dBm to +10 dBm
- Averaging time : 200 µs (minimum sampling intervals)

Light Sourse Module

DFB-LD Light Source (AQ2200-111)

- Wavelength: 1524.111 to 1620.500 nm
  1310 nm, 1490 nm
- Wavelength stability: ± 0.005 dB or less

Note: Other wavelengths are also available on request



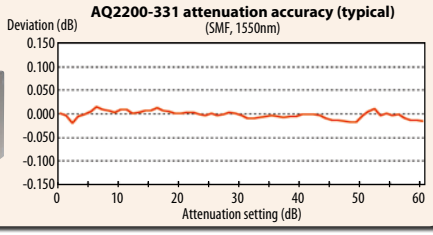
Optical Attenuator module Providing low insertion loss

Standard type (AQ2200-311A)

- Low insertion loss: 1.0 dB (typ.)
- Wide attenuation range: 0 dB to 60 dB (in steps of 0.001 dB)
- Wide wavelength range: 1200 nm to 1700 nm
- Monitor output (optional)
- Low polarization dependence loss: 0.1 dBp-p or less

ATTN w/ Built-in Optical Power Meter (AQ2200-331)

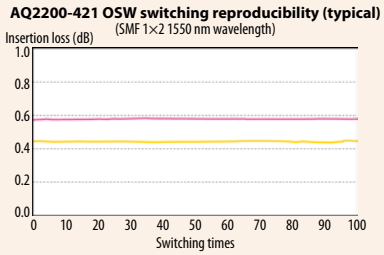
- Attenuation accuracy: within ±0.1 dB
- The output monitor function allows for directly setting the optical power
- SMF (10 / 125 µm) or MMF (62.5 / 125 µm)



Optical Switch Module Superior switching reproducibility

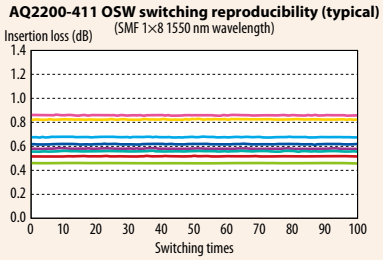
1×2, 2×2 Dual Optical Switch (AQ2200-421)

- Compact: Optical switches of 1 × 2 or 2 × 2 port configuration in a one-slot size module
- Supports SMF (10 / 125 µm) or MMF (62.5 / 125µm)
- Low insertion loss: 1.0 dB (typ.)
- Switching reproducibility: ±0.01dB



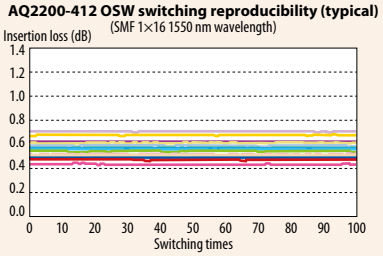
1×4,1×8 Optical Switch (AQ2200-411)

- SMF (10 / 125 µm) or MMF (62.5 / 125µm)
- Switching reproducibility: ±0.01dB
- Low insertion loss: 1.0 dB (typ.)



1×16 Optical Switch (AQ2200-412)

- SMF (10 / 125 µm)
- Switching reproducibility: ±0.01dB
- Low insertion loss: 1.0 dB (typ.)



Optical Transceiver Test module Simplifying 10G transceiver test environment

XFP interface module (AQ2200-641)

- A commercial XFP transceiver can be used
- Adapts to various wavelengths and fiber types by changing the XFP transceiver
- XFP transceiver status such as temperature and alarms can be monitored

Transceiver I/F module (AQ2200-642)

- Compatible with XFP, SFP+, XENPAK
- Power supply, current monitor
- I²C/MDIO interface
- Control signal transmission
- Status signal monitor
- Resistance value monitor

SG module (AQ2200-651)

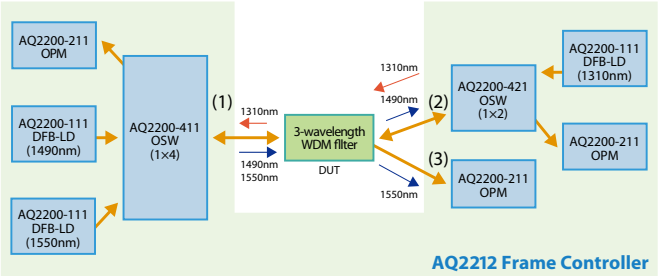
- RF output : 5 channel
- Clock output : 620.0 to 720.0 MHz
  155.0 to 180.0 MHz
- 10MHz reference input / output

Measurement Applications

3-wavelength Optical Filter Measurement System for GE-PON

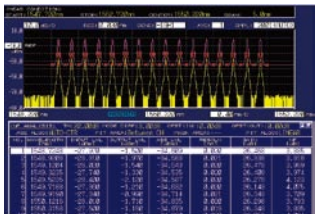
A 3-wavelength optical filter for GE-PON splits 1490 nm and 1550 nm optical signals, and pass a 1310 nm optical signal in the return direction.
This measurement system measures the insertion losses of wavelengths passing between ports and the isolation of wavelengths blocked.

[Measurement items]
- Insertion loss: (1) to (2) 1490 nm, (1) to (3) 1550 nm, (2) to (1) 1310 nm
- Isolation: (1) to (2) 1550 nm, (1) to (3) 1490 nm, (2) to (3) 1310 nm



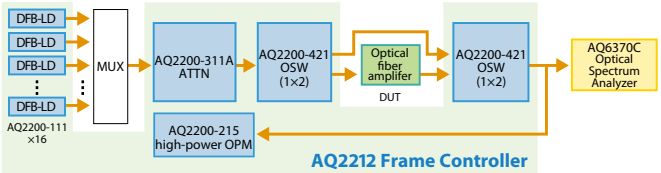
Optical Fiber Amplifier Measurement System

An optical fiber amplifier is an indispensable device for WDM transmission systems. This measurement system characterizes gains and noise figures (NF) of the fiber amplifier by measuring input light to an optical fiber amplifier, which was multiplexed using multiple DFB-LDs, as well as amplified output light with an optical spectrum analyzer. A high-power sensor allows for measuring total output power.



AQ6370C Measurement Screen

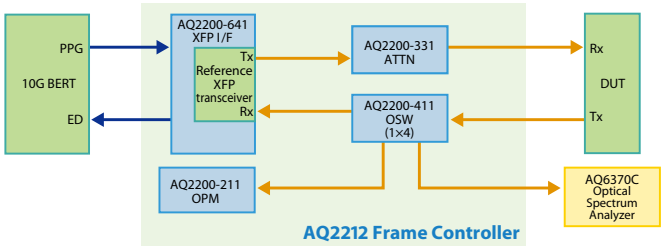
[Measurement items]
- Gain, NF, and total output power

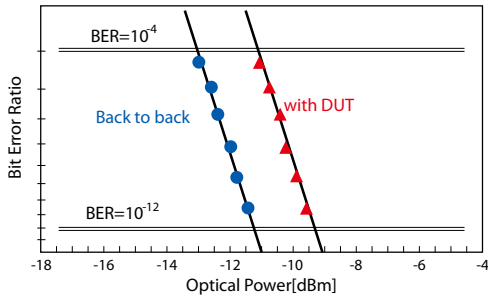


10 Gbit/s Transceiver Measurement System

10 Gbit/s optical transceiver modules such as an XFP are used for 10 G Ethernet system.
Employing commercial XFP transceivers in the AQ2200-641 XFP interface module makes it easy to build optical BERT systems. Changing XFP transceivers enables the adaptation to various wavelengths and fiber types. This measurement system measures major parameters of an optical transceiver defined in the IEE 803.2ae standard.

[Measurement items]
- Receiving sensitivity (BER curve), center wavelength, spectrum width, average optical power, etc.



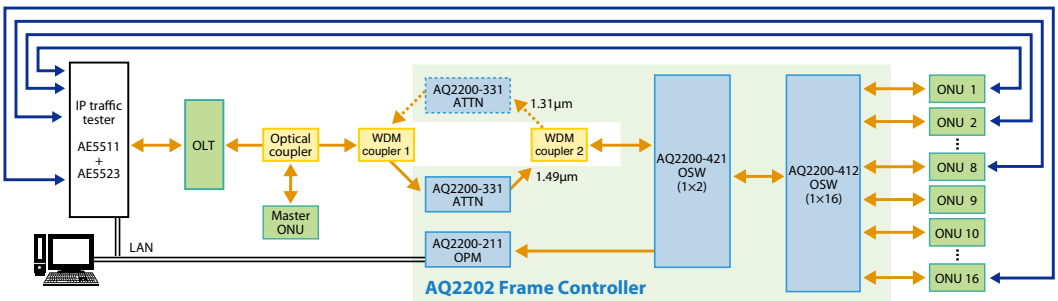


Example of a Transceiver's Receiver Sensitivity Measurement

GE-PON Test System

To evaluate GE-PON systems used for FTTH networks, optical characteristics and IP traffic tests are performed. Since a GE-PON consists of OLTs and multiple ONUs, efficient measurement of multiple ports is required. Use of multiple port optical switches of the AQ2200 series and the IP traffic load generator and tester (AE5511 Traffic Tester Pro) equipped with multi-port interfaces makes it possible to build an efficient automated measurement system. By AQ2200-331 Optical Attenuator equipped with an optical power meter the ONU optical receiving level can be adjusted without changing the fiber connection.

[Measurement items]
- LAN interface test (auto-negotiation, auto-MDIX, flow control, etc.)
- PON interface test (uplink burst control, etc.)
- Alarm test (optical input disruption notification, etc.)
- Traffic test (throughput and delay)
- Optical characteristic test (optical power and optical-receiving sensitivity)



Product Specifications

Frame Controller (AQ2211/2212)

Items		Specifications	
Product name		A2211	AQ2212
Number of slots		3	9
Display		Color LCD, 320×240 dot	
Remote interface	GPIB	IEEE-488 compatible, protocol: IEEE-488.2 compatible	
	Ethernet	IEEE802.3 compatible, connector: RJ-45×1, transmission method: Ethernet (100BASE-TX), protocol: TCP/IP	
	USB	USB Rev1.1 compatible, connector: USB type B×1, protocol: USB-TMC	
External storage interface		USB (USB Rev2.0 compatible, connector: USB type A×1, applicable device: USB mass storage class flash memory)	
Interlock connector		BNC connector	
Functions	Preset applications	Stability, Logging, Swept, Optical return loss (ORL)	
	Control functions	Macro programming, Multi-user, Remote viewer support	
Operation environment	Ambient temperature	5 to 40°C	
	Ambient humidity	20 to 80% RH (no condensation)	
Storage environment	Ambient temperature	- 20 to 60°C	
	Ambient humidity	20 to 80% RH (no condensation)	
Power requirement		100 to 240Vac, 50/60Hz	
Power Consumption (including modules)		170VA	580VA
Dimension (excluding protrusions)		Approx. 212 (W) × 132.5 (H) × 400 (D) mm	Approx. 425 (W) × 132.5 (H) × 500 (D) mm
Mass		Approx. 6kg	Approx. 11kg

DFB-LD Module (AQ2200-111)

Item		Product Specs
Wavelength's specified range		1310 nm, 1490 nm, 1524.111 to 1620.500 nm [*1]
Wavelength accuracy		1310 nm, 1490 nm: Within ±0.05 nm 1524.111 to 1620.500 nm: Within ±0.02 nm
Wavelength setting resolution		0.001 nm
Spectral width	Narrow	5 MHz (typical)
	Wide	100 MHz (typical)
Optical output level		+10 dBm or more
SMSR		1310 nm, 1490 nm: 30 dB or more 1524.111 to 1620.500 nm: 45 dB (typical)
Output level stability	15 minutes	±0.005 dB or less
	24 hours	±0.03 dB or less
Optical attenuation range		10 dB (0.01 dB step)
Wavelength stability	15 minutes	±0.005 nm or less
	24 hours	±0.01 nm or less
Wavelength adjustment range		1.6 nm or more
RIN		-145 dB/Hz (typical)
Internal modulation function		Available
Applicable optical fiber		Select any of SMF (ITU-T G.652) or PMF
Optical connector		FC/Angled PC

*For details, please consult our sales representatives.
[*1] Refer to the list of supported wavelengths in the wavelength code table. If you want a wavelength that is not included in the list, contact us.

Wavelength Code Table

Wavelength Code	Frequency (THz)	Wavelength (nm)	Wavelength Code	Frequency (THz)	Wavelength (nm)	Wavelength Code	Frequency (THz)	Wavelength (nm)	Wavelength Code	Frequency (THz)	Wavelength (nm)
M0290	191.60	1564.679	**M0055**	192.75	1555.343	**M0160**	193.90	1546.119	**M0385**	195.05	1537.003
M0275	191.65	1564.271	**M0050**	192.80	1554.940	**M0165**	193.95	1545.720	**M0400**	195.10	1536.609
M0270	191.70	1563.863	**M0035**	192.85	1554.537	**M0180**	194.00	1545.322	**M0405**	195.15	1536.216
M0255	191.75	1563.455	**M0030**	192.90	1554.134	**M0185**	194.05	1544.924	**M0420**	195.20	1535.822
M0250	191.80	1563.047	**M0015**	192.95	1553.731	**M0200**	194.10	1544.526	**M0425**	195.25	1535.429
M0235	191.85	1562.640	**M0010**	193.00	1553.329	**M0205**	194.15	1544.128	**M0440**	195.30	1535.036
M0230	191.90	1562.233	**M0005**	193.05	1552.926	**M0220**	194.20	1543.730	**M0445**	195.35	1534.643
M0215	191.95	1561.826	**M0000**	193.10	1552.524	**M0225**	194.25	1543.333	**M0460**	195.40	1534.250
M0210	192.00	1561.419	**M000H**	193.15	1552.122	**M0240**	194.30	1542.936	**M0465**	195.45	1533.858
M0195	192.05	1561.013	**M0020**	193.20	1551.721	**M0245**	194.35	1542.539	**M0480**	195.50	1533.465
M0190	192.10	1560.606	**M0025**	193.25	1551.319	**M0260**	194.40	1542.142	**M0485**	195.55	1533.073
M0175	192.15	1560.200	**M0040**	193.30	1550.918	**M0265**	194.45	1541.746	**M0500**	195.60	1532.681
M0170	192.20	1559.794	**M0045**	193.35	1550.517	**M0280**	194.50	1541.349	**M0505**	195.65	1532.290
M0155	192.25	1559.389	**M0060**	193.40	1550.116	**M0285**	194.55	1540.953	**M0520**	195.70	1531.898
M0150	192.30	1558.983	**M0065**	193.45	1549.715	**M0300**	194.60	1540.557	**M0525**	195.75	1531.507
M0135	192.35	1558.578	**M0080**	193.50	1549.315	**M0305**	194.65	1540.162	**M0540**	195.80	1531.116
M0130	192.40	1558.173	**M0085**	193.55	1548.915	**M0320**	194.70	1539.766	**M0545**	195.85	1530.725
M0115	192.45	1557.768	**M0100**	193.60	1548.515	**M0325**	194.75	1539.371	**M0560**	195.90	1530.334
M0110	192.50	1557.363	**M0105**	193.65	1548.115	**M0340**	194.80	1538.976	**W1310**	—	1310.000
M0095	192.55	1556.959	**M0120**	193.70	1547.715	**M0345**	194.85	1538.581	—	—	1490.000
M0090	192.60	1556.555	**M0125**	193.75	1547.316	**M0360**	194.90	1538.186			
M0075	192.65	1556.151	**M0140**	193.80	1546.917	**M0365**	194.95	1537.792			
M0070	192.70	1555.747	**M0145**	193.85	1546.518	**M0380**	195.00	1537.397			

*Please consult our sales representatives as to 1490nm and a wavelength not listed in the table.

Sensor Module (AQ2200-211/-215/-221/-231/-241)

Item		Product Specs				
Product name		AQ2200-211	AQ2200-215	AQ2200-221	AQ2200-231 [*1]	AQ2200-241 [*1]
Number of channels		1	1	2	1	1
Detector type		InGaAs		InGaAs ϕ3 mm	InGaAs ϕ5 mm	Si □10 mm
Wavelength range		700 to 1700 nm	970 to 1660 nm	800 to 1700 nm	800 to 1700 nm	400 to 1100 nm
Power range	CW light	-110 to +10 dBm	-70 to +30 dBm	-70 to +10 dBm	-90 to 10 dBm	
	CHOP light	-110 to +7 dBm	—	—	-90 to +7 dBm	
Applicable fiber type		≦62.5/125 µm (GI), NA≦0.275			≦100/140 µm (SI), NA≦0.3	≦200/230 µm (SI), NA≦0.5
Uncertainty Under reference conditions		±2%	±3%		±2%	±2.5%
Total uncertainty		±3.5% ±0.5 pW	±5.0% ±2.0 nW	±5.0% ±50 pW	±3.5% ±50 pW	±5% ±50 pW
Polarization dependence		0.005 dBp-p or less	0.03 dBp-p (typical)	0.02 dBp-p (typical)	0.025 dBp-p or less	—
Linearity		±0.015 dB ±0.2 pW	±0.05 dB ±2.0 nW	±0.02 dB ±50 pW	±0.015 dB ±50 pW	±0.05 dB ±50 pW
Noise level		0.2 pW or less	2.0 nW or less	50 pW or less		
Averaging time (min.)		100 µs		200 µs	100 µs	
Optical connector		AQ9447 (*) connector adapter	AQ9335C (*) connector adapter			

*For details, please consult our sales representatives.
[*1] An AQ2200-201 interface module is required.

ATTN module (AQ2200-311A/331)

Item	Product Specs			
Product name	AQ2200-311A		AQ2200-331	
Wavelength range	1200 to 1700 nm	800 to 1370 nm	1200 to 1700 nm	800 to 1370 nm
Insertion loss	1.0 dB (typical) 1.6 dB or less		1.9 dB (typical) 2.3 dB or less	
Max. attenuation	60dB	45 dB	60 dB	45 dB
Attenuation accuracy	±0.1 dB or less			
Repeatability	±0.01 dB or less			
Monitor power meter accuracy	—		±5% or less	
Optical return loss (when selecting PC connector)	45 dB or more	20 dB or more	45 dB or more	20 dB or more
Polarization dependence	0.08 dBp-p or less	—	0.1 dBp-p or less	—
Max. input power	+23 dBm			—
Shutter isolation	90 dB or more			
Applicable optical fiber [*1]	SMF (ITU-T G.652)	MMF (62.5/125)(IEC 60793-2)	SMF (ITU-T G.652)	MMF (62.5/125)(IEC 60793-2)
Optical connector	Select any of FC/PC, SC/PC			
Monitor port option				
Monitor port output	-13 dB (typical)			
Insertion loss	2.3 dB or less			
Polarization dependence	0.1 dBp-p or less	—		

* For details, please consult our sales representatives
[*1] Other fiber types not listed are available on request (i.e. GI50).

OSW Module (AQ2200-411/-412/-421)

Item	Product Specs								
Product name	AQ2200-411				AQ2200-412	AQ2200-421			
Port configuration	1×4	1×8	1×4	1×8	1×16	1×2	2×2	1×2	2×2
Number of switch	1		1		1	2		2	
Wavelength	1310 nm/1550nm		850 nm/1300 nm		1310 nm/1550 nm			850 nm/1310 nm	
Insertion loss	1 dB (typical) 1.4 dB or more								
Reproducibility	±0.01 dB or less								
Crosstalk	-60 dB or less		-50 dB or less		-60 dB or less	-50 dB or less			
Return loss	45 dB or more		20 dB or more		45 dB or more	45 dB or more		20 dB or more	
Polarization dependence	0.08 dBp-p or less		—		0.08 dBp-p or less			—	
Applicable optical fiber [*1]	SM (ITU-T G.652)		MMF (62.5/125) (IEC 60793-2)		SM (ITU-T G.652)	SM (ITU-T G.652)		MMF (62.5/125) (IEC 60793-2)	
Optical connector	Select any of FC/PC or SC/PC								

*For details, please consult our sales representatives.
[*1] Other fiber types not listed are available on request (i.e. GI50).

XFP Interface Module (AQ2200-641)

Item		Product Specs	
Data input	DATA IN	Data format	NRZ
		Connector	3.5 mm female
		Note	Direct input to XFP transceiver
	$\overline{\text{DATA}}$ IN	Data format	NRZ
		Connector	3.5 mm female
		Note	Direct input to XFP transceiver
Data output	DATA OUT	Data format	NRZ
		Connector	3.5 mm female
		Note	Direct output to XFP transceiver
	$\overline{\text{DATA}}$ OUT	Data format	NRZ
		Connector	3.5 mm female
		Note	Direct output to XFP transceiver
Reference clock input	REF CLOCK IN	Input level	0.6 Vp-p ±0.3V
		Input frequency	1/64 of bit rate
		Connector	SMA female
Allowable times for insertion and removal of XFP transceiver		200	

*XFP transceiver is not included in this module.

SG Module (AQ2200-651)

Item			Specification
RF OUT (CH1-CH5)	Frequency range		620.0 to 720.0 MHz (when the rate is 1/1)
			155.0 to 180.0 MHz (when the rate is 1/4)
	Frequency resolution		1 Hz
	Frequency accuracy		±2.0 ppm (when using the internal oscillator)
			Depends on the signal received by 10 MHz REF IN (when using an external reference signal)
	Output	Amplitude	0.8 Vp-p ± 0.2 Vp-p
			1.3 Vp-p ± 0.2 Vp-p
		Waveform	Rectangular
		Duty	50 ± 10%
		Terminator condition	50 Ω AC-coupling
	Connector		SMA, female
10MHz REF IN	Input	Frequency range	10 MHz ± 2.0 ppm
		Amplitude	0.3 Vp-p to 1.2 Vp-p
		Duty	50 ± 10%
		Absolute max. rating	1.5 Vp-p
		Terminator condition	50 Ω AC-coupling
	Connector		SMA, female
10MHz REF OUT	Output	Frequency range	10 MHz ± 2.0 ppm (when using the internal oscillator)
			Depends on the signal received by 10 MHz REF IN (when using an external reference signal)
		Amplitude	0.8 Vp-p ± 0.2 Vp-p
		Terminator condition	50 Ω AC-coupling
	Connector		SMA, female

Transceiver I/F module (AQ2200-642)

●Monitoring Specifications

Name		Rating		Measurement Range			Accuracy
		Upper	Lower	Upper	Lower	Reso-lution	
Power supply voltage monitor	PS1	+7.5 V	-0.5 V	+6 V	+2 V	1 mV	± (0.2% of reading + 1 mV)
	PS2	+7.5 V	-0.5 V	+4 V	+2 V		
	PS3	+7.5 V	-0.5 V	+2.5 V	+0.5 V		
	PS4	-7.5 V	+0.5 V	-2 V	-6 V		
	PS5	+7.5 V	-0.5 V	+6 V	+2 V		
Power supply current monitor	PS1	—	—	1.8 A	0 A	1 mA	± (1% of reading + 2 mA)
	PS2			3 A	0 A		
	PS3			1.8 A	0 A		
	PS4			3 A	0 A		
	PS5			2 A	0 A		
Status signal monitor	AIN1	+7.5 V	-0.5 V	+6 V	+0V	0.01 V	± (1% of reading + 20 mV)
	AIN2						
	AIN3						
	AIN4						
	AIN5						
	AIN6						
Resistance value monitor	R1	—	—	10000 Ω	0 Ω	1Ω	± (0.5% of reading +2 Ω)
Power consumption monitor	PSPOWER	—	—	28 W	0 W	0.1 W	See the values for the voltage and current monitors.

●Power Supply Specifications

Name	Voltage Range	Current Limit Range
PS1	+4.750 to +5.250 V	0.10 to 1.80 A
PS2	+3.135 to +3.465 V	0.10 to 3.00 A
PS3	+0.800 to +1.890 V	0.10 to 1.80 A
PS4	–5.460 to –4.940 V	0.10 to 3.00 A
PS5	5.0 or 3.3 V	0.10 to 1.00 A (when 5.0 V is selected)
		0.10 to 2.00 A (when 3.3 V is selected)

Ordering Information

AQ2211 Frame Controller

Model	Suffix	Specifications
735101	—	
	-M	Domestic 3P with 2 to 3 pin conversion adapter
	-D	UL / CSA standard
	-F	VDE standard
	-R	AS standard
	-Q	BS standard
	-H	GB standard

AQ2212 Frame Controller

Model	Suffix	Specifications
735102	—	
	-M	Domestic 3P with 2 to 3 pin conversion adapter
	-D	UL / CSA standard
	-F	VDE standard
	-R	AS standard
	-Q	BS standard
	-H	GB standard

AQ2200-111 DFB-LD Module

Model	Suffix	Specifications
810518901	—	
	- <Wavelength code>	For wavelength code, see Wavelength Code Table
	-FCA	FC / Angled PC
	-P20	Optical output 20mW
	-P10	Optical output 10mW
	-SMF	SM fiebr
	-PMF	PM fiber
	-MODN	Without external modulation
	-MODS	External modulation (SINE)
	-MODC	External modulation (CHOP)

AQ2200-201 Interface Module

Model	Suffix	Specifications
810518905	—	

AQ2200-211 Sensor Module

Model	Suffix	Specifications
810518908	—	
	/FCC	AQ9447 (FC) connector adapter (with a light shielding cap)
	/SCC	AQ9447 (SC) connector adapter (with a light shielding cap)

AQ2200-215 Sensor Module

Model	Suffix	Specifications
735125	—	
	-NON	Without optical connector adapter
	-FCC	AQ9335C (FC) connector adapter (with a light shielding cap)
	-SCC	AQ9335C (SC) connector adapter (with a light shielding cap)
	-LCC	AQ9335C (LC) connector adapter (with a dust protection cap)
	-MUC	AQ9335C (MU) connector adapter (with a dust protection cap)

AQ2200-221 Sensor Module

Model	Suffix	Specifications
735221	—	
	-NON	Without optical connector adapter
	-FCC	AQ9335C (FC) connector adapter (with a light shielding cap)
	-SCC	AQ9335C (SC) connector adapter (with a light shielding cap)
	-LCC	AQ9335C (LC) connector adapter (with a dust protection cap)
	-MUC	AQ9335C (MU) connector adapter (with a dust protection cap)

AQ2200-231 Sensor Module

Model	Suffix	Specifications
810518906	—	
	/FCC	AQ9335C (FC) connector adapter (with a light shielding cap)
	/SCC	AQ9335C (SC) connector adapter (with a light shielding cap)

AQ2200-241 Sensor Module

Model	Suffix	Specifications
810518907	—	
	/FCC	AQ9335C (FC) connector adapter (with a light shielding cap)
	/SCC	AQ9335C (SC) connector adapter (with a light shielding cap)

AQ2200-311A ATTN Module

Model	Suffix	Specifications
735131	—	
	-SA	Optical fiber: SMF
	-G6	Optical fiber: MMF (62.5 / 125)
	-FCC	Optical connector: FC / PC
	-SCC	Optical connector: SC / PC
	/MON	Monitor port

AQ2200-331 ATTN Module

Model	Suffix	Specifications
735133	—	
	-SA	Optical fiber: SMF
	-G6	Optical fiber: MMF (62.5 / 125)
	-FCC	Optical connector: FC / PC
	-SCC	Optical connector: SC / PC

AQ2200-411 OSW Module

Model	Suffix	Specifications
735141	—	
	-04	Port confi guration: 1×4
	-08	Port confi guration: 1×8
	-SA	Optical fiber: SMF
	-G6	Optical fiber: MMF (62.5 / 125)
	-FCC	Optical connector: FC / PC
	-SCC	Optical connector: SC / PC

AQ2200-412 OSW Module

Model	Suffix	Specifications
735143	—	
	-16	Port confi guration: 1×16
	-SA	Optical fiber: SMF
	-FCC	Optical connector: FC / PC
	-SCC	Optical connector: SC / PC

AQ2200-421 OSW Module

Model	Suffix	Specifications
735142	—	
	-21	Port confi guration: Dual 1x2
	-22	Port confi guration: Dual 2x2
	-SA	Optical fiber: SMF
	-G6	Optical fiber: MMF (62.5 / 125)
	-FCC	Optical connector: FC / PC
	-SCC	Optical connector: SC / PC

AQ2200-641 Interface Module

Model	Suffix	Specifications
735161	—	

AQ2200-642 Transceiver I/F Module

Model	Suffix	Specifications
735162	—	

AQ2200-651 SG Module

Model	Suffix	Specifications
735163	—	

Accessories

Product Name	Model	Specifications
AQ2200-901 blank panel	810518926	1 slot size
Rackmount kit for AQ2211	735182-03	For AQ2211 left-side mounting
Rackmount kit for AQ2212	735182-09	For AQ2212 mounting
AQ9441 (FC) universal adapter	813917321-FCC	FC connector for AQ2200-141 / AQ2200-142
AQ9441 (SC) universal adapter	813917321-SCC	SC connector for AQ2200-141 / AQ2200-142
AQ9447 (FC) connector adapter	810804602-FCC	FC connector for AQ2200-211
AQ9447 (SC) connector adapter	810804602-SCC	SC connector for AQ2200-211
AQ9335C (FC) connector adapter	810518909-FCC	FC connector for AQ2200-215 / -221 / -231 / -241
AQ9335C (SC) connector adapter	810518910-SCC	SC connector for AQ2200-215 / -221 / -231 / -241
AQ9335C (LC) connector adapter	M3407JD	LC connector for AQ2200-215 / -221 / -231 / -241 with a dust protection cap
AQ9335C (MU) connector adapter	M3407JE	MU connector for AQ2200-215 / -221 / -231 / -241 with a dust protection cap
Light shielding cap (FC)	810518912-FCC	Light shielding cap for FC connector
Light shielding cap (SC)	810518913-SCC	Light shielding cap for SC connector
Dust protection cap (LC)	M3407HD	Dust protection cap for LC connector
Dust protection cap (MU)	M3407HE	Dust protection cap for MU connector

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