YOKOGAWA

AQ2200 series

Multi Application Test System

Data sheet

Bulletin AQ2200-21EN

Frame Controller (AQ2211 / AQ2212)

Items		Specifications	
Product name		AQ2211	AQ2212
Number of slots		3	9
Display		Color LCD, 320×240 dots	
Remote interface	GPIB	IEEE-488 compatible, protocol: IEEE-488.2 compatible	
	Ethernet	IEEE802.3 compatible, connector: RJ-45x1, transmission method: Ethernet (100BASE-TX), protocol: TCP/IP	
	USB	USB Rev1.1 compatible, connector: USB type Bx1, protocol: USB-TMC PC system requirements: Windows 2000 (SP4 or later)/Windows XP/Windows Vista *1	
External storage interface		USB (USB Rev2.0 compatible, connector: USB type Ax1, applicable device: USB mass storage class flash memory)	
Trigger	In	Connector: BNCx1, TTL level, Pulse width: 50 μs or more, Impedance: approx. 5 kΩ	
	Out	Connector: BNCx1, TTL level, Pulse width: approx. 50 μs, Impedance: approx. 100 Ω	
Interlock connector		BNC connector	
Functions	Preset applications	Stability, Logging, 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)	
	Altitude	2000 m or more	
Storage environment	Ambient temperature	-20 to 60°C	
	Ambient humidity	20 to 80% RH (no condensation)	
	Altitude	3000 m or more	
Power requirement		100 to 240 Vac, 50/60 Hz	
Power Consumption (including modules)		170 VA	580 VA
Dimensions (excluding protrusions)		Approx. 212(W)×132.5(H)×400(D)mm	Approx. 425(W)×132.5(H)×500(D)mm
Mass		Approx. 6 kg	Approx. 11 kg
Safety standard		EN 61010-1, Overvoltage category (installation category) II, Pollution degree 2	
Emissions		EN 61326-1 class A, EN 55011 class A group 1, C-Tick EN 55011 class A group 1, EN 61000-3-2, EN 61000-3-3	
Immunity		EN 61326-1 Table 2 (for industrial locations)	

*1 A separate driver is required.

DFB-LD Module (AQ2200-111)

Items		Specifications
Center wavelength		1310 ±10 nm, 1490 ±10 nm *1
Wavelength accuracy *2, *17		±0.05 nm or less
Wavelength setting resolution		0.001 nm
Spectral linewidth *3	Narrow	5 MHz (typ.)
	Wide	100 MHz (typ.)
Optical output level *2, *4		+10 dBm or more
SMSR *3		30 dB or more
Optical output level stability *5	15 minutes	±0.005 dB or less
	24 hours	±0.03 dB or less
Optical attenuation range		10 dB (0.01 dB steps)
Wavelength stability *2	15 minutes	±0.005 nm or less
	24 hours	±0.01 nm or less
Wavelength adjustment width *2, *6		1.6 nm or more
RIN *3, *7		-145 dB/Hz (typ.)
Internal modulation function		CHOP modulation (100 Hz to 300 kHz)
Applicable optical fiber		Select any of SMF (ITU-T G.652) or PMF
Optical connector *8		FC/Angled PC
Dimensions (excluding protrusions)		Approx. 31(W)×117(H)×321.5(D)mm, 1slot wide
Mass		Approx. 0.9 kg
Laser safety standard class		Class 1M (IEC 60825-1:2007)

Optional Specifications

Items		Specifications
High power (-P20) *2	Optical output *4, *16	+13 dBm or more
PMF (-PMF)	Polarization extinction ratio *9	20 dB or more
External sine modulation (-MODS) *10, *16	Modulation frequency	100 Hz to 300 kHz
	Input connector	SMA *12
	Input impedance	Approx. 50 Ω
	Maximum input voltage	2 Vp-p
External CHOP modulation (-MODC) *10, *16	Modulation frequency	100 Hz to 300 kHz
	External modulation optical pulse delay time	1 μs (typ.) *13, *14
	External modulation optical pulse rise time	1 μs or less *13, *15
	External modulation optical pulse fall time	1 μs (typ.) *13, *15
	Input connector	SMA *12
	Input impedance	Approx. 2 kΩ
	Input level	TTL level

* All values in the specifications assume a warm-up period of one hour.
* The environmental conditions are subject to the specification of frame controller, unless otherwise specified.
* 1 Please contact us about other wavelengths.
* 2 Ambient temperature: 23±2°C (constant temperature), CW light, attenuation: 0.0 dB, center wavelength, outgoing point of connection fiber (FC/Angled PC-FC/SPC, 2 m, SMF), spectral linewidth: NARROW
* 3 CW light, attenuation: 0.0 dB, center wavelength
* 4 When using the master cord
* 5 Ambient temperature: 23±2°C (constant temperature), CW light, attenuation: 0.0 dB, center wavelength, outgoing point of connection fiber (FC/Angled PC-FC/SPC, 2 m, SMF), spectral linewidth: WIDE
* 6 Setting resolution: 0.001 nm, reference wavelength: ±0.4 nm or more
* 7 Spectral linewidth: NARROW, frequency: 100 kHz to 2.5 GHz
* 8 Step type
* 9 CW light, attenuation: 0.0 dB, spectral linewidth: NARROW, outgoing end of the optical connector mounted on the panel
*10 The external sine modulation option and external CHOP modulation option cannot be selected at the same time.
*11 Input modulation signal: 2 Vp-p or less
*12 Use a 50 Ω coaxial cable that is 3 m in length or less to connect the external modulation input connector.
*13 Modulation signal: 100 Hz, attenuation: 0.0 dB, spectral linewidth: NARROW
*14 Modulated optical output delay time for the input modulation signal.
*15 10 to 90% of the optical output signal rise or fall time.
*16 The high output and external modulation options are not applicable for the 1490 nm wavelength.
*17 Before shipping (not including changes due to the passage of time)

●Laser Safety Information

This laser light source is classified into “IEC60825-1: 2007; Class 1M”. This specification complies with “21CFR 1040.10” except for deviation points arising from strict observation of “Laser Notice No. 50” issued on June 24, 2007.

Laser class 1M label

Using an optical instrument, such as a loupe, magnifying glass, or microscope, when observing the laser beam from a distance of less than 100 mm may cause eye injury.

INVISIBLE LASER RADIATION
DO NOT VIEW DIRECTLY WITH
OPTICAL INSTRUMENTS
CLASS 1M LASER PRODUCT
(IEC 60825-1:2007)

Grid TLS Module (AQ2200-131 / -132)

Items		Specifications			
Product name		AQ2200-131, AQ2200-132			
Number of channel		AQ2200-131: 1, AQ2200-132: 2			
Device type		Standard type		Advanced type	
Frequency band		C-band	L-band	C-band	L-band
Frequency (Wavelength) range		196.10 to 191.70 THz (1528.77 to 1563.86 nm)	190.90 to 186.50 THz (1570.42 to 1607.47 nm)	196.25 to 191.50 THz (1527.60 to 1565.50 nm)	190.95 to 186.35 THz (1570.01 to 1608.76 nm)
Grid spacing		100 GHz, 50 GHz		100 GHz, 50 GHz, 25 GHz and Manual (min. 0.1 GHz)	
Frequency (Wavelength) setting resolution		—		0.1 GHz (0.8 pm@1550 nm)	0.1 GHz (0.8 pm@1590 nm)
Frequency (Wavelength) fine turning range		—		±6 GHz (typ.)(±48 pm@1550 nm)	±6 GHz (typ.)(±51 pm@1590 nm)
Frequency (Wavelength) fine turning resolution		—		1 MHz (typ.)(8 fm@1550 nm)	1 MHz (typ.)(8 fm@1590 nm)
Absolute frequency (wavelength) accuracy *1, *2, *4, *6		±2.5 GHz (±20 pm@1550 nm)	±2.5 GHz (±21 pm@1590 nm)	±2.5 GHz (±20 pm@1550 nm)	±2.5 GHz (±21 pm@1590 nm)
Frequency (Wavelength) stability 24hours *1, *2, *3, *6		±0.3 GHz (typ.)(2.4 pm@1550 nm)	±0.3 GHz (typ.)(2.5 pm@1590 nm)	±0.3 GHz (typ.)(2.4 pm@1550 nm)	±0.3 GHz (typ.)(2.5 pm@1590 nm)
Frequency (Wavelength) tuning time		30 sec. or less			
Optical output level *1, *2, *4, *6		+12.0 dBm or more	+9.0 dBm or more	+12.5 dBm or more	
Attenuation range		4 dB (resolution: 0.1 dB(typ.))		6 dB (resolution: 0.01 dB(typ.))	
Output level stability 24hours *1, *2, *3, *6		±0.03 dB (typ.)			
Spectral linewidth *5, *6		3 MHz (typ.)		100 kHz (typ.)	
SMSR *5, *6		45 dB (typ.)			
RIN *5, *6, *7		-135 dB/Hz (typ.)	-130 dB/Hz (typ.)	-145 dB/Hz (typ.)	
Fiber type		PANDA PMF, Slow axis, in line with connector key			
Optical connector		Select any of FC/PC *8 or FC/Angled PC *9			
Dither function*10	SBS suppression dither frequency	—		20.8 kHz	
	SBS suppression FM modulation range	—		0 to 1000 MHz	
Dimensions (excluding protrusions)		Approx. 31(W)×117(H)×321.5(D) mm, 1-slot wide			
Mass		Approx. 0.8 kg			
Laser safety standard class		Class 1M (IEC 60825-1:2007)			

* After 30 minutes warm up.
* The environmental conditions are subject to the specification of frame controller, unless otherwise specified.
* 1 When a PM fiber is used.
* 2 Advanced type: At grid mode on, A grid spacing is except a manual setting.
* 3 At constant temperature (within ±0.5°C)
* 4 Ambient temperature: 23±5°C
* 5 Dither function: OFF
* 6 At maximum output power
* 7 20 MHz to 10 GHz
* 8 Optical return loss: 40 dB or more
* 9 Step type, narrow key
*10 Characteristics

●Laser Safety Information

This laser light source is classified into "IEC60825-1: 2007; Class 1M". This specification complies with "21CFR 1040.10" except for deviation points arising from strict observation of "Laser Notice No. 50" issued on June 24, 2007.

Laser class 1M label

Using an optical instrument, such as a loupe, magnifying glass, or microscope, when observing the laser beam from a distance of less than 100 mm may cause eye injury.

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CLASS 1M LASER PRODUCT
(IEC 60825-1:2007)

Sensor Module (AQ2200-215 / -221)

Items		Specifications	
Product name		AQ2200-215	AQ2200-221
Number of channels		1	2
Detector type		InGaAs	InGaAs ϕ3 mm
Wavelength range		970 to 1660 nm	800 to 1700 nm
Power range (CW)		-70 to +30 dBm	-70 to +10 dBm
Minimum display resolution		1/10,000	
Applicable fiber type		≦62.5/125 μm (GI), NA≦0.275	
Uncertainty under reference conditions		±3 % *1	±3 % *2
Total uncertainty		±5.0 %±2 nW *3, *12	±5.0 %±50 pW *4
Polarization dependence		0.03 dBp-p (typ.) *5	0.02 dBp-p (typ.) *6
Linearity		±0.05 dB±2 nW *7, *12	±0.02 dB±50 pW *8
Noise level		2 nW or less *9	50 pW or less *10
Averaging time (minimum)		100 μs	200 μs
Analog output	Mode	AUTO, LINEAR, LOG	—
	Output voltage	Approx. 0 to 2 V	
	Connector type	Mini plug	
	Output impedance	Approx. 1kΩ	
Optical connector		AQ9335C (*) connector adapter *11	
Logging function	Measurement power range	Fixed	
	Minimum data sampling interval	100 μs	200 μs
	Maximum number of data samples	20,000	10,000
Stability function	Minimum data sampling interval	100 ms	
	Maximum number of data samples	20,000	10,000
	Maximum measurement time	99 days	
Dimensions (excluding protrusions)		Approx. 31(W)×117(H)×321.5(D)mm, 1slot wide	
Mass		Approx. 0.7 kg	Approx. 0.9 kg

* All values in the specifications assume a warm-up period of one hour.
* The environmental conditions are subject to the specification of frame controller, unless otherwise specified.
* 1 Power level: 100 μW (-10 dBm), CW ligth, Wavelength: 1310±20 nm, Light source spectrum width: 10 nm or less, Ambient temperature: 23±2°C, Optical fiber: SM (ITU-T G.652), Optical connector: FC/PC, Wavelength setting error: 0.5 nm or less, Changes to the measuring instrument due to the passage of time are not included in these conditions. Add 0.5% for each year since the last calibration.
* 2 Power level: 100 μW (-10 dBm), CW ligth, Wavelength:1310±20 nm, Light source spectrum width: 10 nm or less, Ambient temperature:23±1°C, Optical fiber: SM (ITU-T G.652), Optical connector: FC/PC, Wavelength setting error: 0.5 nm or less, Changes to the measuring instrument due to the passage of time are not included in these conditions. Add 0.5% for each year since the last calibration.
* 3 Power level: 1 μW ot 1 W (-30 dBm to +30 dBm), CW ligth, Wavelength range: 1260 to 1620 nm, Optical fiber: ≦50 GI, NA≦0.2 (add ±2% if 62.5 GI and NA≦0.275), Auto range, Averaging:1sec, Other conditions are the same as *1's conditions.
* 4 Power level: 10 mW to 100 nW(-40 dBm to +10 dBm), CW ligth, Wavelength range: 1200 to 1600nm (add ±3% for wavelengths less than 1200 nm; add ±30 pW for wavelengths from 1600 to 165 nm), Optical fiber: ≦50 GI, NA≦0.2 (add ±2% if 62.5 GI and NA ≦ 0.275), Auto range, Averaging: 1 sec, Other condition are the same as *2's conditions.
* 5 Wavelength: 1550±30 nm, Ambient temperature: 23±2°C, Optical fiber: SM (ITU-T G.652), Optical connector: FC/PC
* 6 Wavelength: 1550±30 nm, Ambient temperature: 23±1°C, Optical fiber: SM (ITU-T G.652), Optical connector: FC/PC
* 7 Power level: 1 μW to 1 W (-30 dBm to +30 dBm), CW light, Wavelength range: 1260 to 1620nm, Ambient temperature: 23±2°C (constant temperature), Optical fiber: SM (ITU-T G.652), Auto range, Averaging: 1 sec
* 8 Power level: 10 mW to 100 nW (-40 dBm to +10 dBm), CW light, Wavelength range: 1200 to 1600 nm (add ±30 pW for wavelengths from 1600 to 1650 nm), Ambient temperature: 23±1°C (constant temperature), Optical fiber: SM (ITU-T G.652), Auto range, Averaging: 1 sec
* 9 Wavelength range: 1260 to 1620 nm, Ambient temperature: 23±2°C (constant temperature), Averaging: 1 sec
*10 Wavelength: 1200 to 1600 nm (add ±30 pW for wavelengths from 1600 to 1650 nm), Ambient temperature: 23±1°C (constant temperature), Averaging: 1 sec
*11 Select FC, SC, LC, or MU
*12 Add 0.001 dB/mW if the input power is greater than 10 mW.

ATTN Module (AQ2200-311A / -331)

Items	Specifications			
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 *2	1.0 dB (typ.) *1, *3, *4 1.6 dB or less *1, *3	1.0 dB (typ.) *4 1.6 dB or less *11	1.9 dB (typ.) *1, *3, *5	1.9 dB (typ.) *5, *11
Max. attenuation	60 dB	45 dB	60 dB	45 dB
Attenuation accuracy *2	±0.1 dB or less *3, *6, *7	±0.1 dB or less *9	±0.1 dB or less *3, *6, *7	±0.1 dB or less *9
Repeatability *2	±0.01 dB or less *1, *8	±0.01 dB or less *8, *9	±0.01 dB or less *1, *8	±0.01 dB or less *8, *9
Display resolution	0.001 dB			
Monitor power meter accuracy	—		±5% or less *2, *10, *12, *14	±5 % or less *2, *14, *16
Optical return loss	45 dB or more *3, *6, *13	20 dB or more *9	45 dB or more *3, *6, *13	20 dB or more *9
Polarization dependence	0.08 dBp-p or less *3, *6	—	0.1 dBp-p or less *3, *6	—
Max. input power	+23 dBm	—	+23 dBm	—
Shutter isolation	90 dB or more			
Applicable optical fiber	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 or SC/PC			
Monitor port option			—	
Monitor port output *15	-13 dB (typ.) *1, *2, *3	-13 dB (typ.) *2, *9		
Insertion loss *2	2.3 dB or less *1, *3	2.3 dB or less *11		
Optical return loss	45 dB or more *3, *6, *13			
Polarization dependence	0.1 dBp-p or less *3, *6			
Dimensions (excluding protrusions)	Approx. 31(W)×117(H)×321.5(D)mm, 1slot wide			
Mass	Approx. 0.9 kg			

* All values in the specifications assume a warm-up period of one hour. Unless otherwise noted, all specified values include connectors.
* For models with GI specifications, all specified values are guaranteed when a light source that is excited in steady mode is used.
* The environmental conditions are subject to the specification of frame controller, unless otherwise specified.
* 1 Wavelength: 1550±15 nm, 1310±15 nm
* 2 Ambient temperature: 23±2°C (constant temperature)
* 3 When using the master cord (SMF)
* 4 Connectors not included
* 5 Connectors not included. 2.3 dB or less when connectors are included.
* 6 wavelength: 1550±15 nm
* 7 0.15 dB or less if the wavelength is 1310±15 nm
* 8 2 σ
* 9 Wavelength: 850 nm, 1310 nm
*10 Polarization dependence is not included.
*11 Wavelength: 850 nm. Add 0.5 dB if the wavelength is 1310 nm.
*12 Any one wavelength within 1310±15 nm or 1550±15 nm
*13 When using PC connectors (return loss 48 dB or more)
*14 Output power: -10 dBm
*15 Output ratio
*16 Wavelength: 850 nm

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

Items	Specifications								
Product name	AQ2200-411				AQ2200-412	AQ2200-411			
Port configuration	1×4	1×8	1×4	1×8	1×16	1×2	2×2	1×2	2×2
Nunber of switch	1		1		1	2		2	
Wavelength	1310 nm/1550 nm		850 nm/1310 nm		1310 nm/1550 nm			850 nm/1310 nm	
Insertion loss *3, *5	1.0 dB (typ.) *1, *4		1.0 dB (typ.) *2		1.0 dB (typ.) *1, *4	1.0 dB (typ.) *1, *4		1.0 dB (typ.) *2	
Reproducibility *3, *6	±0.01 dB or less *1		±0.01 dB or less *2		±0.01 dB or less *1	±0.01 dB or less *1		±0.01 dB or less *2	
Crosstalk	-60 dBm or less *1, *4		-50 dBm or less *2		-60 dBm or less *1, *4	-50 dBm or less *1, *4		-50 dBm or less *2	
Optical return loss	45 dB or more *1, *4, *7		20dB or more *2		45 dB or more *1, *4, *7	45 dB or more *1, *4, *7		20 dB or more *2	
Maximum input power	+23 dBm		—		+23 dBm	—		—	
Polarization dependence	0.08 dBp-p or less *1, *4		—		0.08 dBp-p or less *1, *4	0.08 dBp-p or less *4, *8		—	
Applicable optical fiber	SMF (ITU-T G.652)		MMF (62.5/125) (IEC 60793-2)		SMF (ITU-T G.652)	SMF (ITU-T G.652)		MMF (62.5/125) (IEC 60793-2)	
Optical connector	Select any of FC/PC or SC/PC								
Dimensions (excluding protrusions)	Approx. 31(W)×117(H)×321.5(D)mm, 1slot wide				Approx. 62.5(W)×117(H)×321.5(D)mm, 2 slots wide	Approx. 31(W)×117(H)×321.5(D)mm, 1slot wide			
Mass	Approx. 0.8 kg				Approx. 1.5 kg	Approx. 0.7 kg			

* All values in the specifications assume a warm-up period of one hour. Unless otherwise noted, all specified values include connectors.
* For models with GI specifications, all specified values are guaranteed when a light source that is excited in steady mode is used.
* The environmental conditions are subject to the specification of frame controller, unless otherwise specified.
* 1 Wavelength: 1310±15 nm, 1550±15 nm
* 2 Wavelength: 850 nm, 1300 nm
* 3 Ambient temperature: 23±2°C (constant temperature)
* 4 When using the master cord (SMF)
* 5 Connectors not included. 1.4 dB or less when connectors are included.
* 6 2 σ
* 7 When using PC connectors (return loss 48 dB or more)
* 8 Wavelength: 1550±15 nm

Transceiver I/F module (AQ2200-642)

●Monitoring Specifications

Name		Rating		Measurement Range			Accuracy *1
		Upper	Lower	Upper	Lower	Resolution	
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	+0 V	0.01 V	±(1% of reading+20 mV)
	AIN2						
	AIN3						
	AIN4						
	AIN5						
	AIN6						
Resistance value monitor	R1	—	—	10000 Ω	0 Ω	1 Ω	±(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)

●Control Signal Transmission Specifications

Items		Specifications	
DC response			
	CTRL01 (1.2 V) to CTRL07 (1.2 V)	VOL max	0.2 V (100 μA), 0.3 V (1 mA)
		VOH min	1.0 V (100 μA), 0.9 V (1 mA)
		IOL max	+1 mA
		IOH mini	-1 mA
	CTRL08 (3.3 V) to CTRL17 (3.3 V)	VOL max	0.5 V (3 mA)
		VOH min	2.5 V (3 mA)
		IOL max	+3 mA
		IOH mini	-3 mA

●I²C Bus Signal Specifications

Items		Specifications	
Signal rate		100 kHz/400 kHz	
DC response			
	SDA	VOL max	0.5 V
		VOH min	-(Open Drain)
		IOL max	+3 mA
		IOH max	-(Open Drain)
		VIL max	0.7 V
		VIH max	1.7 V
	SCL	VOL max	0.5 V
		VOH min	-(Open Drain)
		IOL max	+3 mA
		IOH max	-(Open Drain)
		VIL max	0.7 V
		VIH max	1.7 V

●MDIO Bus Signal Specifications

Items		Specifications	
Signal rate		625 kHz/1.25 MHz/2.5 MHz	
DC response			
	MDIO	VOL max	0.35 V
		VOH min	-(Open Drain)
		IOL max	+3 mA
		IOH max	-(Open Drain)
		VIL max	0.2 V
		VIH max	1.0 V
	MDC	VOL max	0.35 V
		VOH min	0.85 V (3 mA)
		IOL max	+3 mA
		IOH max	+3 mA
		VIL max	—
		VIH max	—

●General Specifications

Items	Specifications
Dimensions (excluding protrusions)	Approx. 62.5(W)×117(H)×321.5(D)mm, 2 slots wide
Mass	Approx. 1.5 kg

* The environmental conditions are subject to the specification of frame controller, unless otherwise specified.
*1 Ambient temperature: 23±2°C, warm-up period: 20 minutes

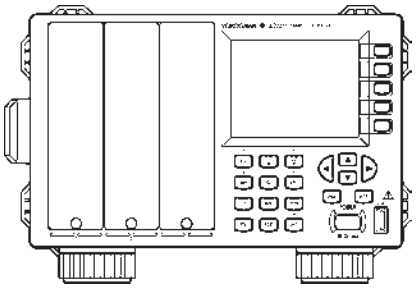
SG Module (AQ2200-651)

Items			Specifications
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
10 MHz 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
10 MHz 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
Dimensions (excluding protrusions)			Approx. 62.5(W)×117(H)×321.5(D)mm, 2 slots wide
Mass			Approx. 1.5 kg

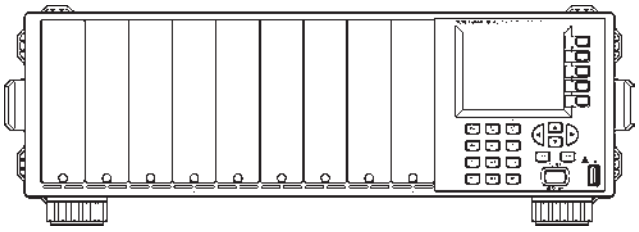
* The environmental conditions are subject to the specification of frame controller, unless otherwise specified.

Front view

AQ2211/2212 Frame Controller

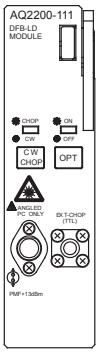


AQ2211

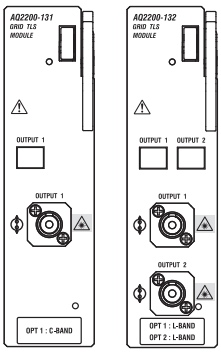


AQ2212

AQ2200-111
DFB-LD Module

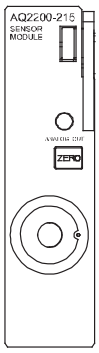


AQ2200-131/-132
Grid TLS Module

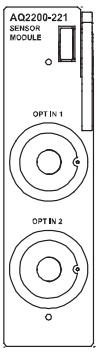


AQ2200-131 AQ2200-132

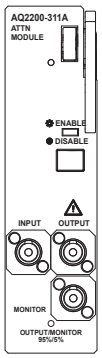
AQ2200-215
Sensor Module



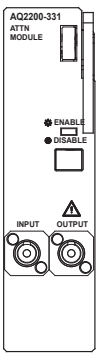
AQ2200-221
Sensor Module



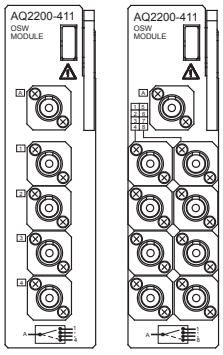
AQ2200-311A
ATTN Module



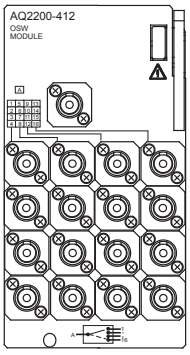
AQ2200-331
ATTN Module



AQ2200-411
OSW Module



AQ2200-412
OSW Module



AQ2200-421
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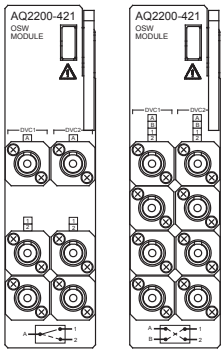
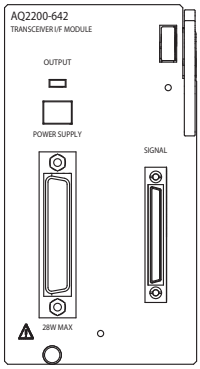
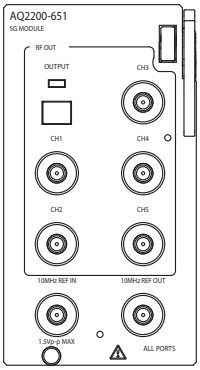


AQ2200-642
Transceiver I/F Moudule



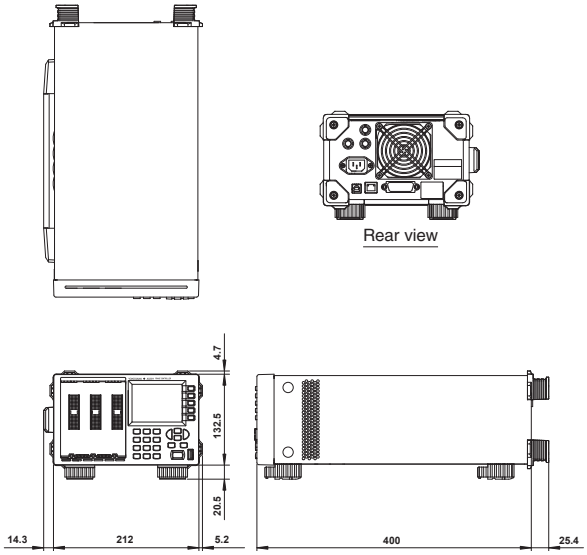
AQ2200-651
SG Module



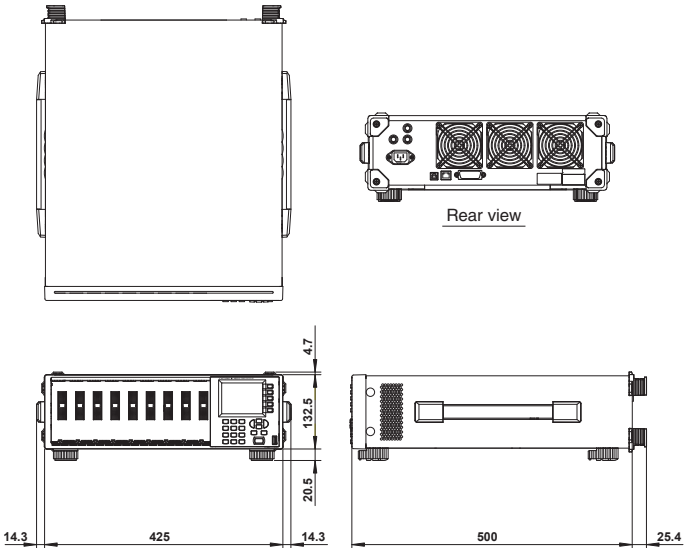
External Dimensions

Unit: mm
Tolerances: ±3 % (tolerancesare ±0.3 mm when below 10 mm)

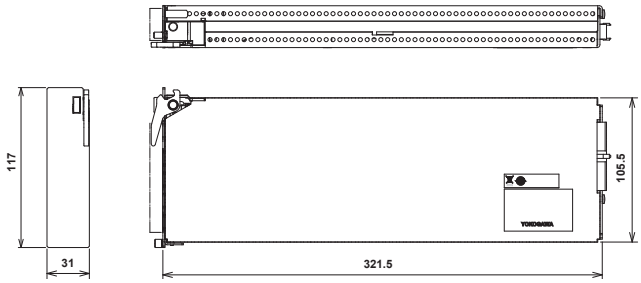
AQ2211 Frame Controller



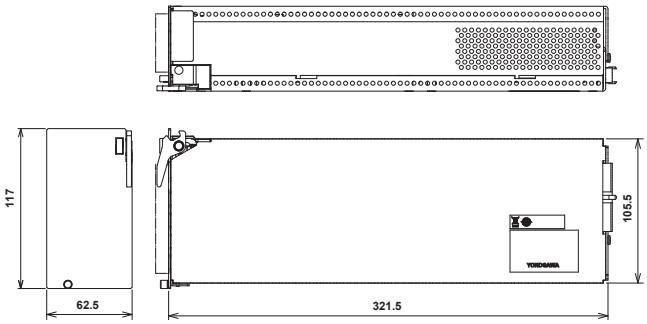
AQ2212 Frame Controller



AQ2200 Series 1-Slot Size Module



AQ2200 Series 2-Slot Size Module



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