




Specifications

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Q8221 Optical Sensor Specifications

							
Model		Q82214		Q82215		Q82216	
Product Type		Short Wavelength General-Purpose		Long Wavelength General-Purpose		Long Wavelength Large-Caliber Medium-Sensitivity	
Wavelength Range		400 to 1100nm		800 to 1750nm			
Power Range		- 80 to +17dBm *1		- 60 to +10dBm *1		- 77 to +10dBm *1	
Range *2	Max.	CW 200mW	CHOP 200mW	CW 20mW	CHOP 20mW	CW 20mW	CHOP 20mW
	Min.	20nW	20nW	2000nW	2000nW	20nW	20nW
Sensor Element		Si 8mm		Ge 5mm		Ge 5mm Cooled	
Optical Input Form	Beam	Possible (optical Input Diameter 8mm)		Possible (optical Input Diameter 5mm)			
	Fiber	Core Diameter 100µm NA 0.3 PC,APC,and Slanted Rubbed Connectors (Use With Appropriate Connector Adaptor For Each)					
Measurement Accuracy *3,*8		CW ± 3.0%	CHOP ± 4.0%	CW ± 3.0%	CHOP ± 4.0%	CW ± 2.5%	CHOP ± 3.5%
At Calibration Wavelength		780nm 1mW 0 to 40°C		1300nm 1mW 0 to 40°C		1300nm 1mW 0 to 40°C	
At Wide Wavelength range		CW ± 5.0%	CHOP ± 6.0%	CW ± 5.0%	CHOP ± 6.0%	CW ± 4.5%	CHOP ± 5.5%
		480 to 900nm 1mW 23 ± 3°C		950 to 1600nm 1mW 23 ± 3°C		950 to 1600nm 1mW 0 to 40°C	
Linearity (At Average Time: 1 sec.)		± 0.5% ± 10pW - 54 to +17dBm 23 ± 3°C		± 0.5% ± 1nW - 37 to +10dBm 23 ± 3°C		± 0.5% ± 20pW - 47 to +10dBm 23 ± 3°C	
		± 1.0% ± 10pW - 57 to +17dBm 23 ± 3°C		± 1.0% ± 1nW - 40 to +10dBm 23 ± 3°C		± 1.0% ± 20pW - 50 to +10dBm 23 ± 3°C	
Noise Level *4	At Averaging Time:1 sec.	- 80dBm		- 60dBm		- 77dBm	
	Without Averaging *5						
	SLOW (approx.9/sec.)	- 75dBm		- 55dBm		- 72dBm	
	FS-1 (approx.30/sec.)	- 71dBm		- 51dBm		- 68dBm	
	FS-2 (approx.50/sec.)	- 69dBm		- 48dBm		- 65dBm	
FS-3 (approx.100/sec.)	- 66dBm		- 45dBm		- 62dBm		
Polarization Dependence (at wavelength 1550nm)				0.03dBp-p (Typical)*6		0.03dBp-p (Typical)*6	
Return Loss	With APC, or slanted Rubbed Connector			60dB or more			
	With high return loss adaptor *7			45dB or more (Typical 47dB)			
	With PC rubbed connector			approx. 14dB			
Dimensions and Mass				Approx. 60(W) × 43(H) × 110(D)mm 270g or less			
Connectors to Adaptor Correspondence List	FC			A08012			
	SC			A08090			
	ST			A08096			
	MU			A08369			
	LC			A08654			
	Plug-in						
	MT Adaptor (Mating to 12-pin SMF)			A08187 (Mating to 12-pin SMF)			
High Return Loss Adaptor Correspondence List *9	FC			A08328			
	SC			A08329			
	ST			A08330			
	Plug-in			A08331			
Connection to the Q8221 Main Unit				Q82202 or Q82203 Interface Plug-in Unit Required. Connection Cable Available as Accessory with Q82202, or Q82203			

*1 Level at Max. is when optical input was received with entire sensor area.

*2 Full Scale of the range. Measurable power range is shown above

*3 CW:Continuous Optical Measurement Mode used. CHOP:270Hz Chopped Light Measurement Mode used

*4 Noise Level with CW Mode and at calibration wavelength (1100nm for Q82214, 1550nm for Q82215, 1550nm for Q82216) is the same as at SLOW.)

*5 SLOW:Integration Time, 100 msec FS-1:Integration Time, 20 msec FS-2:Integration Time, 7 msec

FS-3:Integration Time, 2 msec

*6 Typical Figure (Not Specified)

*7 Low Loss Adaptor (Not Specified)

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Q82227		Q82232		Q82208		Model
Long Wavelength High-Sensitivity High-Power		Long Wavelength High-Sensitivity Low Polarization		Long Wavelength High-Sensitivity		Product Type
900 to 1650nm				800 to 1700nm		Wavelength Range
- 80 to + 27dBm		- 94 to + 10dBm				Power Range
CW 2000mW 20nW	CHOP 2000mW 2000nW	CW 20mW 200pW	CHOP 20mW 200nW	CW 20mW 200pW	CHOP 20mW 200nW	Range *2 Max. Min.
InGaAs Cooled						Sensor Element
Not Possible						Beam
Core Diameter 10 μm, NA 0.19 PC and Slanted Rubbed Connectors		Core Diameter 10 μm, NA 0.19 PC Rubbed Connector		Core Diameter 62.5μm, NA 0.21 PC, APC, and Slanted Rubbed Connectors		Fiber Optical Input Form
CW ± 2.5%	CHOP ± 3.5%	CW ± 2.5%	CHOP ± 3.5%	CW ± 2.5%	CHOP ± 3.5%	Measurement Accuracy*3, *8
		1550nm 1mW 0 to 40°C		1300nm 1mW 0 to 40°C		At Calibration Wavelength
CW ± 4.5%	CHOP ± 5.5%	CW ± 4.5%	CHOP ± 5.5%	CW ± 4.5%	CHOP ± 5.5%	At Wide Wavelength range
950 to 1630nm 1mW 0 to 40°C		950 to 1600nm 1mW 0 to 40°C		1000 to 1650nm 1mW 0 to 40°C		
± 0.5% ± 10pW - 58 to + 27dBm 0 to 40°C		± 0.5% ± 0.4pW - 72 to + 10dBm 0 to 40°C				Linearity (At Average Time: 1sec.)
± 1.0% ± 10pW - 61 to + 27dBm 0 to 40°C		± 1.0% ± 0.7pW - 75 to + 10dBm 0 to 40°C				
- 80dBm		- 94dBm		- 94dBm		At Averaging Time: 1 sec. Noise Level*4
						Without Averaging *5
- 79dBm		- 93dBm		- 91dBm		SLOW (approx. 9/sec.)
- 76dBm		- 90dBm		- 91dBm		FS-1 (approx. 30/sec.)
- 70dBm		- 88dBm		- 90dBm		FS-2 (approx. 50/sec.)
- 67dBm		- 85dBm		- 87dBm		FS-3 (approx. 100/sec.)
0.05dBp-p or less		0.003dBp-p or less		0.02dBp-p or less (Typical 0.015dBp-p)		Polarization Dependence (at wavelength 1550nm)
60dB or more				50dB or more		With APC, or slanted Rubbed Connector Return Loss
45dB or more (Typical 47dB)				43dB or more (Typical 45dB)		With high return loss adaptor*7
approx. 14dB				approx. 14dB		With PC rubbed connector
Approx. 60(W) × 43(H) × 135(D)mm 500g ro less		Approx. 60(W) × 43(H) × 135(D)mm 590g ro less		Plugs into Q8221		Dimensions and Mass
A08340 (Standard Accessory)				A08161 (Standard Accessory)		Connectors to Adaptor Correspondence List
A08338				A08162		FC
A08339				A08163		SC
A08371				A08370		ST
A08655				A08653		MU
				Jack-type Possible		LC
						Plug-in
						MT Adaptor (Mating to 12-pin SMF)
A08328	Usage of high return loss adaptors are not possible			A08328		FC
A08329	Usage of high return loss adaptors are not possible			A08329		SC
A08330	Usage of high return loss adaptors are not possible			A08330		ST
A08331	Usage of high return loss adaptors are not possible			A08331		Plug-in
Q82203 Required Connection Cable Available as Accessory with Q82203				Q82202 or Q82203 Not Required		Connection to the Q8221 Main Unit

*8 Calibrations of Q82215, Q82216 and Q82208 are also available as options (OPT82215+25, OPT82216+25, OPT82208+25).
 Measurement accuracy value for the option sensors are the same as in the chart above at 1550 nm calibration wavelength.

*9 Connection loss with single mode fiber is 0.07dB (typical).

Specifications

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Q81212 Light Source Plug-In Unit

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Photoemission element:	FP-LD
Wavelength:	1550 ±20nm
Spectrum half value:	10nm or less
Output power:	0 ±1 dBm (At the photoemission edge of 2m fiber (SM 10/125 μm))
Output power (Variable):	0 to -6dB, in 0.1dB steps
Stability:	±0.01 dB or less (23±1° C/1min) ±0.05 dB or less (Between 0 to 40°C ±2°C/1h) ±1 dB or less (0 to 40°C/8h)
Output waveform:	CW or chopped light; 270Hz (±0.1%) with duty of 50 ±5%, 2kHz/4kHz (±0.1%) with duty of 50 ±10%
Output connector:	FC type
Preheating time:	60 minutes after power on

Optical Power Measurement

Sensor Plug-in channels:	2 channels (Channels A and B)
Resolution:	0.001 dB at dBm or dB read out (0.0001 dB when data output using GPIB) Max. 199,999 count at W read out
Measurement Mode:	CW, or Chopped light (270Hz±0.2%) measurement mode selectable.
Sensor wavelength sensitivity compensation:	If a wavelength is entered, an internal compensation value for the sensor wavelength sensitivity at that wavelength is automatically applied.
Relative value measurement (dBr):	The value relative to reference value is measured and displayed in dB with a maximum resolution of 0.001 dB. (0.0001 dB when data output using GPIB)
Units display:	W (mW, μW, nW, pW), dBm, dB
Display of measured value:	5-1/2-digit (7 segment FL Device)
Range setting:	Automatic, manual, or remote
Integration time:	100msec, 20msec, 7msec, 2msec
Measurement speed:	Approx. 100 measurements/s (with an integration time of 2 msec, 1 channel operation), Approx. 50 measurements/s (with an integration time of 7 msec, 1 channel operation), Approx. 30 measurements/s (with an integration time of 20 msec, 1 channel operation), Approx. 9 measurements/s (with an integration time of 100 msec, 1 channel operation)
Level meter:	Displays with 11 dots according to the measurement value.
Calculation Function:	A/B, B/A, CF (When W is selected as unit, the measurement value is multiplied by a constant; When dBm is selected, offset is possible)
Maximum hold function:	Displays the maximum measurement value.
Averaging Function:	The number of averaging can be set to 2 to 256 times according to the need using the running averaging method.

Interface Plug-in

A/D error:	±0.01% ±5 count
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Light Source Plug-in Unit

Unit plug-in channels:	2 channels (Channels A and B) maximum
Output power adjustment function:	The output power can be varied from 0 to -6.0 dB, with a setting resolution of 0.1dB. CW or Chopped light (270Hz, 2kHz, 4kHz) mode selectable.
Output mode:	

Other Functions

Record functions, PDL/PDR*	
Measurement functions:	Can store up to 400 measurement data for each of channels A and B in the backup memory. The stored data can be read from a personal computer via the GPIB interface. Values in the memory can be displayed also as Max., Min., Difference (Max.-Min.)
Memory function:	Up to five settings for each of channels A and B can be stored and read.
Direct plotting function:	The measurement data stored by the record function can be plotted directly on an external plotter in the form of graphs.
Brightness control function:	The brightness of the indicator can be adjusted in five steps.

GPIB interface:	IEEE488-1978
Analog output:	Outputs an analog signal proportional to the input optical power.
Output voltage:	0 to +2V (F.S.) for each range
Output impedance:	0.5 or less
Output terminal:	BNC connector

General Specifications

Ambient conditions:	0 to +40°C, RH 85 % or less
Storing conditions:	-25 to +70°C
Power Requirements:	100 to 240 V AC, 48 to 66 Hz
Power Consumption:	50 VA or less (including the plug-in and sensors)
Dimensions:	Approx.212(W) x 88(H) x 360(D)mm
Mass:	3.9kg or less (including the plug-in unit)

Standard Accessories

Power cable:	1
Fuse:	2
Instruction Manual:	1

Optional Accessories

A02463:	Rack Mount Set (EIA Single)
A02464:	Rack Mount Set (EIS twin)
A02263:	Rack Mount Set (JIS Single)
A02264:	Rack Mount Set (JIS twin)
OCS-F2SFW-2:	Optical Fiber Cord (GI 50/125 μm, 2m)
OCS-F2SPS-2:	Optical Fiber Cord (SM 10/125 μm, 2m)

*PDR:Polarization Dependent Ratio

Optical Adaptors Dimensions

A08012 FC Adaptor	A08080 FC type Bare fiber adaptor
A08020 Bare fiber adaptor	A08021 Adaptor cap
A08328 High return loss adaptor	

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Q8221 Optical Sensors Dimensions

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Q82214, Q82215, Q82216 Optical Sensor

Sensor	Q82214	Q82215	Q82216
max optical input diameter(A)	8.5mm	5mm	5mm
distance to central protection glass(B)	2mm	1.3mm	0.9mm
distance to central optical input surface(C)	3.1mm	3.1mm	3.1mm

Q82227, Q82232 Optical Sensor

Q8221

Product Type	Sensor	Model	Accessories
Interface	For Q82214/15/16	Q82202	Connection Cable
	For Q82214/15/16/Q732	Q82203	Connection Cable
Optical Sensor		Q82208	A08161
		Q82214	
		Q82215	
		Q82216	
		Q82227	A08340
		Q82232	A08340
Light Source	1550nm LD	Q81212	
Adaptor	FC	For Q82214/15/16	A08012
	D4	For Q82214/15/16	A08013
	Bare Fiber	For Q82214/15/16	A08020
	Bare Fiber Adaptor Cap	For Q82214/15/16	A08021
	SMA	For Q82214/15/16	A08028
	FC Type Bare Fiber Adaptor	For All Sensor	A08080
	SC	For Q82214/15/16	A08090
	ST	For Q82214/15/16	A08096
	MU	For Q82214/15/16	A08369
	LC	For Q82214/15/16	A08654
	FC	For Q82208	A08161
	SC	For Q82208	A08162
	ST	For Q82208	A08163
	MU	For Q82208	A08370
	LC	For Q82208	A08653
	FC	For Q82227/82232	A08340
	SC	For Q82227/82232	A08338
	ST	For Q82227/82232	A08339
	MU	For Q82227/82232	A08371
	LC	For Q82227/82232	A08655
	FC Type High Return Loss Adaptor	For All Sensor	A08328
	SC Type High Return Loss Adaptor	For All Sensor	A08329
	ST Type High Return Loss Adaptor	For All Sensor	A08330
	PI Type High Return Loss Adaptor	For All Sensor	A08331
	Remove Proof Cap	For Q82227	A08332



Please be sure to read the product manual thoroughly before using the products.
Specifications may change without notification.

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