



Optical Time Domain Reflectometer

AQ7270 OTDR



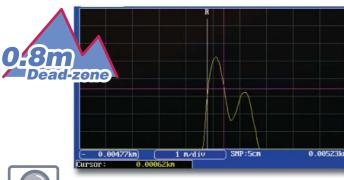
- Short dead zone (0.8 m)
- Wide range of models available supporting FTTH to metro networks
- High performance & easy to use OTDR
- Bright & high contrast 8.4 inch LCD screen



Superior cost performance, easy to operate. Makes your work more efficient.

fiber plorer...

Meets a broad range of measurement needs from FTTH to metro networks. FTTH / FTTB **Metro networks Access networks** CO Optical LAN / WAN

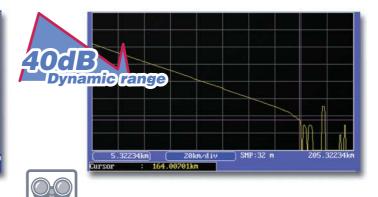


Measure Near ...

Can detect closely spaced events (up to 0.8m*)

Accompanying the rapid proliferation of FTTH is a growing need for detection of reflective events arising from shortdistance mechanical connections. The AQ7270's event dead zone is the shortest in the world, enabling detection of closely spaced events.

*: Based on company research of the field use OTDR, as of November 2006



High dynamic range (up to 40dB)

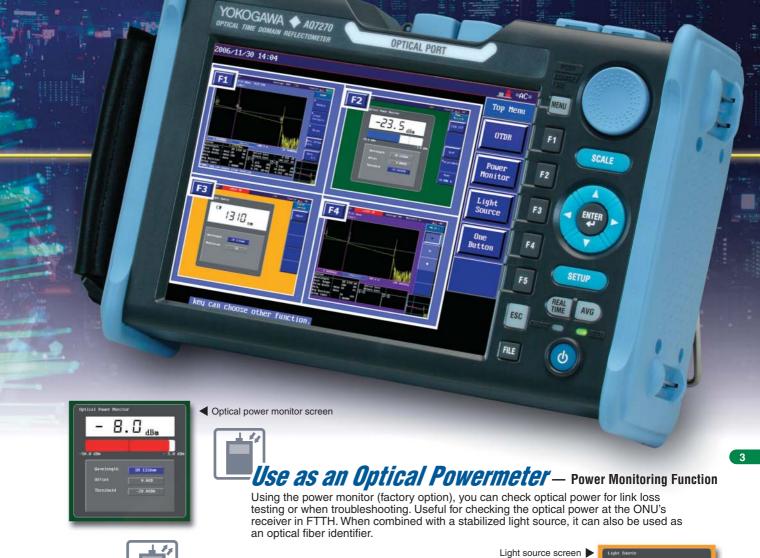
or Far ...

The high dynamic range of the AQ7270 enables accurate measurement of optical fibers in short periods of time. This makes it a powerful tool for evaluation of metro networks with relay distances in excess of 100 km, or FTTH (PON) and other short optical fiber networks with large insertion loss originating from optical couplers.



Powers-up quickly

Now measurements can be started quickly upon arrival at the site. 10 seconds to power-up from completely OFF to fully ON! With such a fast power-up time, battery life can be extended by turning the power off while not in use at the job site without any concern about the power-up time when the (in 10 seconds or less) next job is ready. It's ready when you're ready!



Use as a Light Source — Light Source Function The light source (factory option) can be used for optical fiber identification or optical

loss testing.



High-intensity large LCD

Choose an Ideal OTDR— 11-Model Lineup

From 1- to 4-wavelength models

The AQ7270 comes in eleven models combining different measurement wavelengths and dynamic ranges. Supported wavelengths: 1310, 1490, 1550, 1625, 1650 nm (single mode), 850, and 1300 nm (multi mode).

Typical Model

Applicable Fiber	Number of Wavelengths	Wavelength	Dynamic Range	Model	Descriptions
	1	1550nm	32dB	735020	1550 nm model for access networks and FTTH
		1010/1EE0nm	34/32dB	735022	For installation and maintenance of access networks and FTTH
	2 1310/1550nm	40/38dB	735023	For installation and maintenance of metro networks and access networks	
SMF		1550/1625nm	38/35dB	735024	Supporting maintenance wavelength 1625nm
SIVIE	3	1310/1490/1550nm	34/30/32dB	735025	Three-wavelength model for installation and maintenance of PON systems, supporting 1490 nm
		3	34/32/28dB	735026	Three-wavelength model, supporting a maintenance wavelength of 1625nm
		1310/1550/1625nm	40/38/35dB	735028	High dynamic range three-wavelength model, supporting a maintenance wavelength of 1625nm
MMF	2	850/1300nm	22.5/24dB	735029	Multimode fiber model for LAN maintenance
MMF/SMF	4	850/1300/1310/1550nm	34/32/22.5/24dB	735030	Four-wavelength model for installation and maintenance of LAN and FTTH with support for both multimode and single mode fiber.

Easy of Operation, Supporting Beginners and Experts

The worldwide spread of broadband services has stimulated the installation of optical fiber in metro and access networks, which in turn has increased the demand for portable and reliable test equipment to aid the installation and maintenance of these networks. Our new OTDR has been developed to address these challenges with particular aims of improving operability to boost work efficiency and cost-effectiveness. The AQ7270 carries forward the basic operation of its predecessors (the AQ7250 and AQ7260 OTDR), while adding a Detail mode for trained technicians with functions for setting of measurement conditions and performing manual measurements.

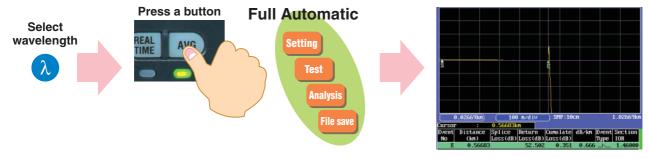
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<u>Automated Measurement Function Increases Working Efficiency!</u>

Automatic Setting of Measurement Conditions – Full Auto Mode

Simply choose the measured wavelength, then press a button.

The AQ7270 automatically sets the optimal measurement conditions, performs measurement, performs event analysis, and saves data. Because you can save to a different file name each time you execute, measurement and accumulation of data is easy.



Measurement with Auto Wavelength Switching – Multi Wavelength Measurement Mode

Prepare multiple wavelengths to measure, then press a button.

Multi Wavelength Measurement is a mode in which multiple specified wavelengths are measured automatically, in order. You can also specify to perform analysis or file saving as needed for each measurement.

Wavelength switches automatically

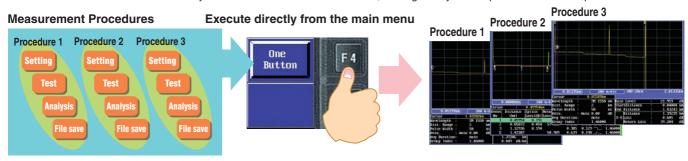




Macro's with Predefined Procedures –One Button Mode

Simply choose previously set measurement procedures, then press a button.

You can execute up to five saved measurement procedures in order. A batch of measurement procedures can be run directly from the main menu. Measurement and analysis conditions can be read from a file, making it easy to set up the measurement procedures.



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Measurement Wizard Menu

Active Line Alarm Message

Plug Check Alarm Message







Fault event

Easy Operation with the Assistance Function!

Measurement Wizard –Assistance setting up measurements

Displays detailed explanations of parameters in the measurement conditions setting menu, and gives guidelines for setting methods. This function assists unskilled users.

Trained users can enter settings freely in Detail mode.

ACTIVE LINE ALARM - Checking for communication light

Never disturb communication lines

There may be concern that technicians inputting the OTDR measurement signal into the communication line could cause communication errors. The live line alarm monitors the fiber's optical power level and diplays an alarm message if it detects optical power at or higher than a specified threshold level, in order to warn the technician not to mistakenly feed the signal into the communication line.

PLUG CHECK FUNCTION - Checking the connection with the OTDR

Never spoil measurements with poor connections or dirty plugs

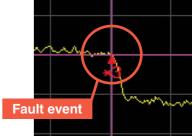
The plug check function monitors the condition of the OTDR's optical input/output connectors and displays an alarm if the connection is not properly made. This function is useful for checking for damage, dirt, or other problems with optical plugs at the OTDR or on the fiber under test, and for helping technicians to remember to connect the fiber

Detecting Abnormal Events – Fault Event Display Function

The fault event display function detects abnormal connection or reflection points and displays them. Of the events detected by the event detection function, abnormal events that cross a specified threshold value are highlighted in the event table and waveform display.

Event	Distance	Sp1ice	Return	Cumu1ate	dB∕km Event	Section
No	(km)	Loss(dB)	Loss(dB)	Loss(dB)	Туре	IOR
1	0.44564	-0.072		0.783	2.067	1.48000
2	0.84975	0.049	56.511	0.892	0.449 __	1.48000
*3	1.11207	0.206		1.037	0.366 —	1.48000
E	1.41085		<46.858	1.340	0.324 __	1.48000

Analysis results with Fault Event Display



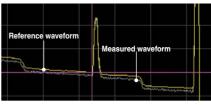
Fault Event Indication on the waveform

Measurement with Comparison to Reference Waveform – Trace Fix Function

You can freeze the display of one trace and overlap it with real time or averaged waveforms for comparison. This is useful to create a template when installing multicore fiber, or for checking aged deterioration during maintenance on existing fiber networks. In addition to the last-measured waveform, a waveform can be loaded from a file to be used as the reference waveform

SETUP KEY –Jump to measurement condition setting menu

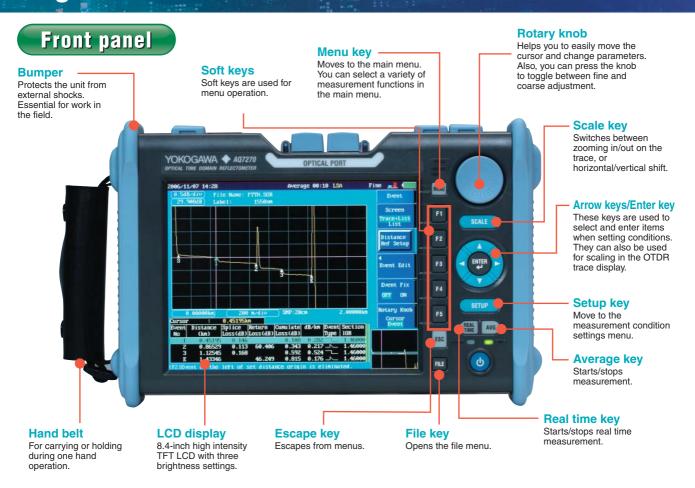
With the new SETUP button on the front panel, it is easy to move to the measurement condition setting menu.

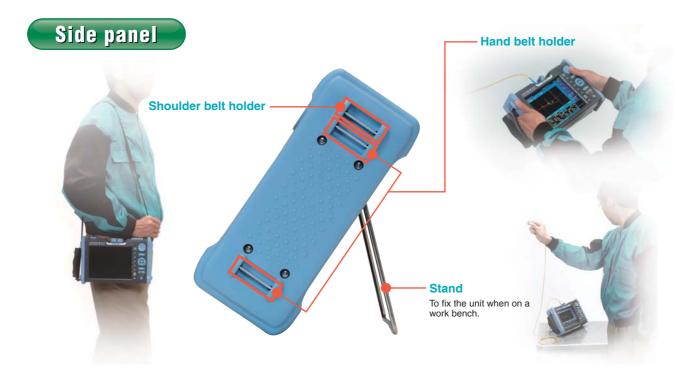


Trace Fix Function



Bright 8.4-Inch LCD Screen Easy to Operate with Rotary knob & Arrow Keys

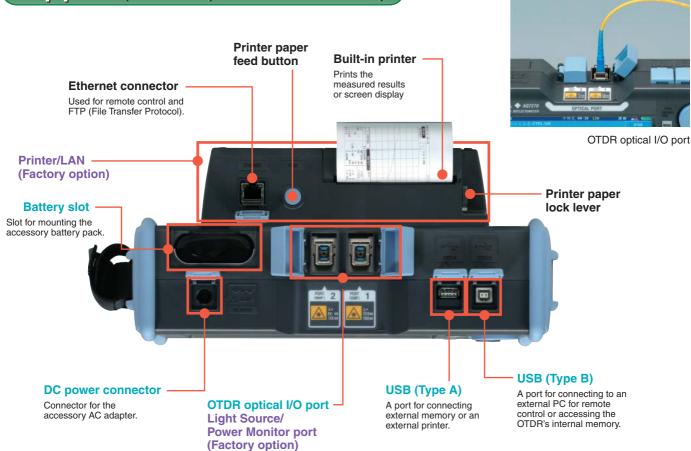




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Top panel (Shown with optional Printer/LAN installed)



OTDR Screen

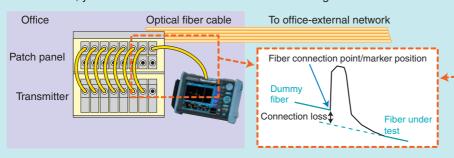


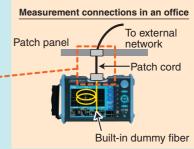
Key Functions

Built-in Dummy Fiber (Factory Option)

Excellent for detecting faults in fiber patch panels!

Fibers in offices frequently involve short distances between connectors. By using the dummy fiber, you can check whether there is any abnormal near-end connection loss. Also, by measuring the connection loss at the near-end connector, you can determine the total fiber loss including that of the connector.





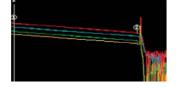


Trace Analysis Functions

For Evaluation of Multicore Fiber —Multi Trace Analysis

Up to four traces can be overlaid on the display for analysis and comparison.

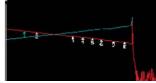
This is useful for evaluating connection point locations and loss after installing multicore fiber.



For Accurate Splice Loss Measurement by Bi-directional Testing —2 Way Trace Analysis

Merges the two traces measured from both directions and finds the correct splice loss.

Connection loss in lines where optical fibers of differing backscatter coefficients are connected can differ depending on the direction. In such cases, you can accurately determine the loss by measuring in both directions and taking an average.

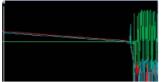


For Evaluation of Aged Deterioration

-Differential Trace Analysis

Displays the difference between two specified traces.

Makes it simple to check aged deterioration of fibers or connection points, or fluctuation in loss between fibers, and other phenomena.

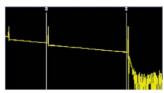


For Evaluation of Total Return Loss

-Section Analysis

Finds the total return loss in specific portions of the fiber.

This type of evaluation is often requested because the multiple reflections from optical fiber networks can affect signal light from transmitters (cable TV etc.).



Smart File Function

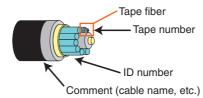
Because the AQ7270 makes it easy to differentiate between measured optical fibers—even complex ones—you can add arbitrary information to file names such as measured wavelength, ID number, tape number, or comments. You can also have the ID number or tape number automatically updated and saved after each measurement.

Trace data can be saved in SOR and CSV format. Also, you can save screens as BMP, JPG, or PNG files. TRB or TRD files saved on Yokogawa's previous AQ7250 and AQ7260 models can also be loaded.

File name setting screen



Concept of the file name structure



Automatic updating of file names



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Language Selection

In addition to English (standard), you can select a display language of French, German, Chinese, Korean, Russian, and others.



USB Function

USB connectivity makes it more convenient to output to external memory or printers, and to set up communication. The AQ7270 comes standard with two USB1.1 compliant connector ports (Type A and Type B).

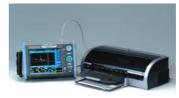
Saving Files to USB Memory—Type A



Using USB memory or a USB hard disk, you can save large amounts of data. Also, you can easily transfer saved data to a PC or other device.



• Printing on an External Printer—Type A



You can print screen images or measured data on USB printers.



• Remotely Controlling the AQ7270 from a PC—Type B



The AQ7270 can be remotely controlled from an external PC by connecting a USB cable from one to the other.*



Accessing the AQ7270 Internal Memory from a PC—Type B



You can easily access to internal memory with USB cable from a PC.*



*: USB type A - type B cable required for remote control.

Measured Data Analysis and Report Creation Tool

AQ7932 OTDR Emulation Software (Sold Separately)

AQ7932 is application software that performs analysis of trace data measured by the AQ7270 OTDR on a PC, and creates reports. The report creation wizard makes this task simple. AQ7270 OTDR data can be easily loaded onto a PC using USB memory or the communication interface.

■ Trace Analysis

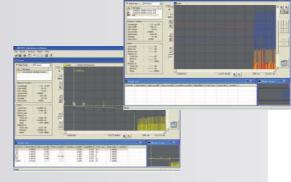
You can edit event search conditions, approximate curve line settings, and other conditions, and then repeat the analysis. And now it is even easier to operate; simply click the function icon with the mouse

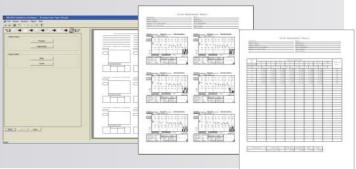
Analysis Functions

Display up to eight traces on screen and perform a variety of different analyses including: multi trace analysis, differential trace analysis for comparing recent waveforms with old ones, and 2 way trace analysis function for analyzing average values of data measured from both directions in the optical fiber.

■ Creating Reports

Compiles trace and measured values from trace files and creates a report. Reports can also be created in Excel or CSV format. Reports are easy to create by following the step-by-step instructions in the report wizard.





Specifications

Description Common Specifications

Horizontal Axis Parameters

Sampling resolution 5 cm, 10 cm, 20 cm, 50 cm, 1 m, 2 m,

4 m, 8 m, 16 m, 32 m

Readout resolution 1 cm (Min.)

Number of sampled data Up to 50,000 points

Group refractive index 1.30000 to 1.79999 (in 0.00001 steps)

Unit of distance km, kf, or miles

Distance measurement accuracy

Offset error: ±1 m

Scale error: Measured distance $\times 2 \times 10^{-5}$ Sampling error: ± 1 sampling resolution

Vertical Axis Parameters

Vertical axis scale 0.2 dB/div, 0.5 dB/div, 1 dB/div,

2 dB/div, 5 dB/div, 7.5 dB/div

Readout resolution 0.001 dB (Min.)

Loss measurement accuracy*

±0.05 dB/dB

OTDR Measurement Function

Distance measurement Displays up to eight digits of the

relative one-way distance between two

arbitrary points on the trace.

Loss measurement Displays one-way loss in steps of 0.001 dB to a maximum of 5 digits.

Displays the one-way loss, loss per unit length, and splice loss between any two given points on the waveform.

Measures return loss and total return

Return loss measurement Measures return loss and total retur loss of a fiber cable or between two arbitrary points on the trace.

OTDR Analysis Functions

Analysis functions Multi trace analysis, 2 way trace analysis, differential trace analysis,

section analysis

section analy

Internal Memory

Memory capacity 1000 waveforms or more

Can store measured waveforms, and

measurement conditions

Display

Display 8.4-inch color TFT LCD

Total number of pixels* 640 (horizontal)×480 (vertical)

* The LCD may contain some pixels that are always ON or always OFF (0.002% or fewer of all displayed pixels including RGB), and is not indicative of a general malfunction.

External Interface

USB 1.1 Type A and Type B, one each

Type A: For external memory or

external printer

Type B: For connecting to an external PC for remote control or access to the OTDR's internal memory.

Optical I/O port

Connector type SC (fixed), FC (fixed), SC universal adapter,

FC universal adapter, No universal

adapter (base)

Number of port 1 or 2*

* Port 2 is only for model 735027 (1650nm), and Model 735030 (850nm/1300nm).

File Formats

File formats Read: SOR, TRD, TRB, SET Write: SOR (Telcordia), SET, CSV,

BMP, JPG, PNG

General Specifications

Laser safety standards class 1 M (IEC60825-1:2001)

Safety standard EN61010-1 Emission EN61326 Class A Immunity EN61326 Annex A

Operating environment 0 to 45°C

Temperature (0 to 35°C when charging the battery) Humidity 85% RH or less (no condensation)

Storage temperature -20 to 60°C

Battery Operation time 6 hours^{*1}
Recharge time 5 hours^{*2}

AC adapter

Rated supply voltage 100 to 240 VAC

Rated supply frequency 50 to 60 Hz Power consumption Max 70 W

(when battery charging, and optional

printer printing)

Dimensions (W) $287 \times (H) 197 \times (D) 85 \text{ mm}$

(not including projections or options)

Weight Approx. 2.8 kg

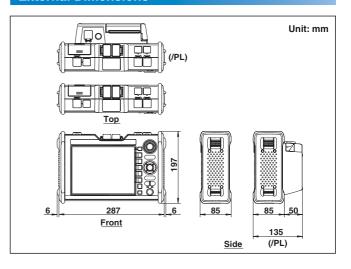
(not including options)

*1 Measurement for 30 seconds in every 10 minutes, without any options, in power save mode (Full Auto 1minute).

*2 Ambient temperature of 23°C, power OFF



External Dimensions



 $^{^{\}star}$ When the measuring loss is 1dB or less, the accuracy is within $\pm 0.05 dB$







▶ ▶ ► Specifications by Model

Single-mode Fiber 1 Wavelength Type

Model	735020	735021	
Wavelength	1550±25nm	1650 ± 5nm *1 ±10nm *2	
Applicable fiber	SM (ITU-T G.652)		
Distance range	500m, 1km, 2km, 5km, 10km, 20km,		
Distance range	50km, 100km, 200km, 300km, 400km		
Pulse width*3	3ns, 10ns, 20ns, 50ns, 100ns, 200ns,		
i dise widiii	500ns, 1us, 2us, 5us, 10us, 20us		
Dynamic range*4	32dB	30dB	
Event dead zone*5, 11	0.8m	0.8m	
Attenuation dead zone*6, 11	8m (typ)	12m (typ)	

Single-mode Fiber 2 Wavelength Type

Model	735022	735023	735024	
Wavelength	1310/1550±25nm	1310/1550±25nm	1550/1625±25nm	
Applicable fiber	SM (ITU-T G.652)			
Distance range	500m, 1km, 2km, 5km, 10km, 20km, 50km,			
Distance range	100km, 200km, 300km, 400km			
Pulse width*3	3ns, 10ns, 20ns, 50ns, 100ns, 200ns, 500ns,			
i dise widiii	1u	1us, 2us, 5us, 10us, 20us		
Dynamic range*4	34/32dB	40/38dB	38/35dB	
Event dead zone*5, 11	0.8m	0.8m	0.8m	
Attenuation dead zone*6, 11	7/8m (typ)	7/8m (typ)	8/12m (typ)	

Single-mode Fiber 3 Wavelength Type

Model	735025	735026	735027	735028	
Wavelength	1310/1490/1550±25nm	1310/1550/1625±25nm	1310/1550±25nm 1650±5nm *1, ±10nm *2	1310/1550/1625±25nm	
Applicable fiber	SM (ITU-T G.652)				
Distance range	500m,	500m, 1km, 2km, 5km, 10km, 20km, 50km, 100km, 200km, 300km, 400km			
Pulse width*3	3ns, 10ns, 20ns, 50ns, 100ns, 200ns, 500ns, 1us, 2us, 5us, 10us, 20us			s, 20us	
Dynamic range*4	34/30/32dB	34/32/28dB	34/32/30dB	40/38/35dB	
Event dead zone*5, 11	0.8m	0.8m	0.8m	0.8m	
Attenuation dead zone*6, 11	7/8/8m (typ)	7/8/12m (typ)	7/8/12m (typ)	7/8/12m (typ)	

Multimode Fiber 2 Wavelength Type

Model	735029
Wavelength	850/1300±30nm
Applicable fiber	GI (50/125, 62.5/125μm)
Distance range	500m, 1km, 2km, 5km, 10km, 20km, 50km, 100km
Pulse width*3,7	10ns, 20ns, 50ns, 100ns, 200ns, 500ns, 1us, 2us, 5us
Dynamic range*8, 10	22.5/24dB
Event dead zone*9, 10, 11	2m (typ)
Attenuation dead zone*6, 10, 11	7/10m (typ)

Multimode/Single-mode Fiber 4 Wavelength Type

Model	735	030
Wavelength	1310/1550±25nm	850/1300nm±30nm
Applicable fiber	SM (ITU-T G.652)	GI (50/125,62.5/125μm)
Distance range	500m, 1km, 2km, 5km, 10km, 20km, 50km, 100km, 200km, 300km,400km	500m, 1km, 2km, 5km, 10km, 20km, 50km, 100km
Pulse width ^{*3}	3ns, 10ns, 20ns, 50ns, 100ns, 200ns, 500ns, 1us, 2us, 5us, 10us, 20us	10ns, 20ns, 50ns, 100ns, 200ns, 500ns, 1us, 2us, 5us ⁷
Dynamic range	34/32dB*4	22.5/24dB*8, 10
Event dead zone	0.8m* ^{5, 11}	2m (typ)*9, 10, 11
Attenuation dead zone	7/8m (typ)*11	7/10m(typ)*6, 10, 11

- *1 At a point -20 dB from the pulse light output peak value (measured 30 min. or more after power ON,

- At a point -20 to horn the pulse hight output peak value (measured 30 min. or more after power ON, ambient temperature of 23°C)
 At a point -60 dB from the pulse light output peak value (measured 30 min. or more after power ON, ambient temperature of 23°C)
 Pulse width setting range depends on the distance range.
 SNR=1, at pulse with 20 µs, distance range 200 km, sampling resolution 32 m, measurement time 3 minutes.
 Pulse width 3 ns, return loss 45 dB or more, at a point 1.5 dB below the peak value (not saturated).
- *6 Pulse width 10 ns, return loss 45 dB or more, at a point where the backscatter level is within ±0.5 dB of the
- or Pulse width of 2 or 5 µs when measured wavelength is 1300 nm

 17 Pulse width of 2 or 5 µs when measured wavelength is 1300 nm

 18 SNR=1, at pulse width 200 ns(850nm), 1 µs(1300nm), measurement time 3 minutes.

 19 Pulse width 10 ns, return loss 45 dB or more, at a point 1.5 dB below the peak value (not satunated).

 110 GI (62.5/125 µm) is measured.

 111 At group refractive index 1.5

 Note: Specifications without any special remarks, assured at 23±2°C

▶▶▶ Factory Installed Option Specifications

Built-in Printer/LAN Functions (/PL option)

Printing method Thermal line-dot Dot density 576 dots/line Paper width 80 mm

Operating environment Temperature 5 to 35°C

Humidity 10 to 80% RH (no condensation)

-20 to 60°C Storage temperature

10BASE-T/100BASE-TX (RJ-45) x1 LAN function

Power Monitoring Function (/PM Option)

Optical port OTDR optical I/O port Measuring range^{*1} -50 to -5 dBm Measurement accuracy² ≤±0.5 dB

 $^{\rm *1}$ CW light, wavelength 1310 nm, absolute max input level = 0 dBm (1 mW) $^{\rm *2}$ When inputting CW light, wavelength 1310 nm, -10 dBm

Light Source Function (Option /LS)

Optical port OTDR optical I/O port Center wavelength OTDR's center wavelengths

Output power -5 dBm or more Modulation frequency CW, 270 Hz

Dummy Fiber (/DM Option)

Optical fiber Single-mode fiber (ITU-T G.652)

Length 100 m

* Dummy fiber option may cause the reduction of dynamic range (0.5dB or less).

Model and Suffix Codes

AQ7270 OTDR

Option			n availa	n availability		
Model	/PM	/LS	/PL	/DF	/SB	Description
735020	0	0	0	0	0	AQ7270 OTDR 1550nm, 32dB
735021	_	0	0	0	0	AQ7270 OTDR 1650nm, 30dB
735022	0	0	0	0	0	AQ7270 OTDR 1310/1550nm, 34/32dB
735023	0	0	0	0	0	AQ7270 OTDR 1310/1550nm, 40/38dB
735024	0	0	0	0	0	AQ7270 OTDR 1550/1625nm, 38/35dB
735025	0	0	0	0	0	AQ7270 OTDR 1310/1490/1550nm, 34/30/32dB
735026	0	0	0	0	0	AQ7270 OTDR 1310/1550/1625nm, 34/32/28dB
735027	○*1	0	0	0	0	AQ7270 OTDR 1310/1550/1650nm, 34/32/30dB
735028	0	0	0	0	0	AQ7270 OTDR 1310/1550/1625nm, 40/38/35dB
735029	_	_	0	_	0	AQ7270 OTDR 850/1300nm, 22.5/24dB
735030	○*2	○*2	0	_	0	AQ7270 OTDR 850/1300/1310/1550nm, 22.5/24dB/34/32dB

*1 : Does not support the 1650nm port *2 : Does not support the 850/1300nm port O : Available — : Not available

	Suffix Code	s Description
Optical	-SCC	SC type Connector
Connector	-FCC	FC type Connector
	-NON	No universal adapter
	-USC	Universal adapter (SC)
	-UFC	Universal adapter (FC)
Language	-HE	English
	-HC	Chinese/English
	-HK	Korean/English
	-HR	Russian/English
Power	-D	UL/CSA standard
Cord	-F	VDE standard
	-R	AS standard
	-Q	BS standard
	-H	GB standard, Complied with CCC
Options	/PM	Optical power monitor
	/LS	Light source
	/PL	Built-in printer, LAN
	/DF	Dummy fiber (SMF)
	/SB	Sholder belt

Example: 735023-USC-HE-D /PM /LS

AQ7270 OTDR 1310/1550nm, 40/38dB, with Universal adapter(SC), English version, with a UL/CSA standard power cord, with power monitor function and with Light source function

■ Standard Accessories

An AC adapter, a power cord, a battery pack, a hand belt, and a set of user's manual (CD-ROM)

Accessories (Optional)

Name	Model	Specifications
Soft carrying case	739860	
Battery pack	739880	
Universal adapter(SC)	SU2005A-SCC	SC type
Universal adapter(FC)	SU2005A-FCC	FC type
Printer roll paper	A9010ZP	80mmx25m
Shoulder belt	B8070CY	
AC adapter	739870-D	UL/CSA standard
	739870-F	VDE standard
	739870-R	AS standard
	739870-Q	BS standard
	739870-H	GB standard, Complied with CCC

Application software

Model	Suffix Codes	Specifications
735070		AQ7932 OTDR Emulation Software (Ver3.0 or later)
	-EN	English

Related Products

OTDR



High performance OTDR that also supports long-distance optical fiber cables, with high dynamic range of up to 45 dB.

LD Light Source



Compact, lightweight 1310/1550 nm 2wavelength light source with 4 switches for easy, safe operation.

Optical Powermeter



Compact, lightweight powermeter designed especially for absolute value measurements for FTTH/LAN work.

Optical Powermeter



Compact, light weight body. Using with a light source, it can measure optical loss. Measured values can be saved to internal memory, making on-site work more efficient.

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