

## OPTICAL TIME DOMAIN REFLECTOMETER

### MW9076 Series

1.31/1.45/1.55/1.625  $\mu\text{m}$  (SM), 0.85/1.3  $\mu\text{m}$  (GI)



#### Simple Measurement of Chromatic Dispersion



#### Features

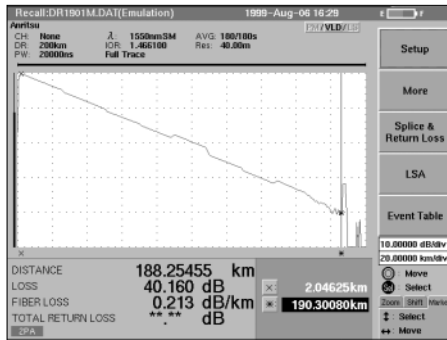
- 45 dB high dynamic range
- 8 m short dead zone
- Simple measurement of chromatic dispersion from one end of optical fiber
- Measurement in 10 s (Full-Auto mode), 0.15 s real-time sweep
- 5 cm high resolution, 50,000 sampling points
- 8.4 inch TFT-LCD color display

Model	MW9076B1	MW9076B	MW9076C	MW9076D1	MW9076J	MW9076K
Optical fiber	SM	SM	SM	SM	GI	GI
Wavelength	1.31/1.55 $\mu\text{m}$ $\pm 25$ nm	1.31/1.55 $\mu\text{m}$ $\pm 25$ nm	1.31/1.55/ 1.625 $\mu\text{m}$ $\pm 25$ nm	1.31/1.45/1.55/ 1.625 $\mu\text{m}$ $\pm 3$ nm	0.85 $\mu\text{m}$ $\pm 30$ nm	0.85/1.3 $\mu\text{m}$ $\pm 30$ nm
Dynamic range	40.5/38.5 dB (typical value)	45/43 dB (typical value)	41.5/39.5/37 dB	34.5/33.5/32.5/30.0 dB	21 dB	21/25 dB
Dead zone (Fresnel/ back-scattered)	1.6/8 m	1.6/8 m	1.6/8 m	3/25 m	2/7 m	2/7 m
Chromatic dispersion				✓		
Light source function		✓	✓	✓	✓	✓
Options	Visible LD	✓	✓	✓	✓	✓
	Optical power meter	✓	✓	✓		
	High power optical power meter	✓	✓	✓		
	Optical channel selector	✓	✓	✓		
Features	<ul style="list-style-type: none"> <li>• High cost performance</li> <li>• Short dead zone</li> <li>• Low cost</li> </ul>	<ul style="list-style-type: none"> <li>• Highest class model</li> <li>• Wide dynamic range</li> <li>• Short dead zone</li> </ul>	<ul style="list-style-type: none"> <li>• Three wavelengths</li> <li>• L-band measurement</li> </ul>	<ul style="list-style-type: none"> <li>• Chromatic dispersion measurement</li> <li>• Four wavelengths</li> <li>• Wavelength accuracy: <math>\pm 3</math> nm</li> </ul>	<ul style="list-style-type: none"> <li>• For GI fiber</li> <li>• Short dead zone</li> </ul>	<ul style="list-style-type: none"> <li>• For GI fiber</li> <li>• Dual wavelengths</li> <li>• Short dead zone</li> </ul>

## Performance and functions

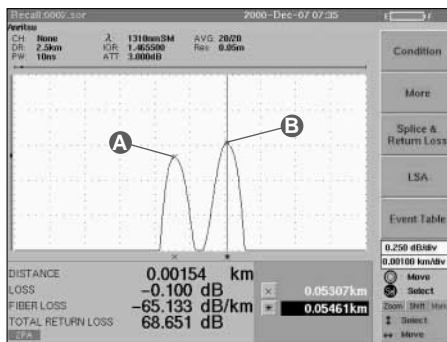
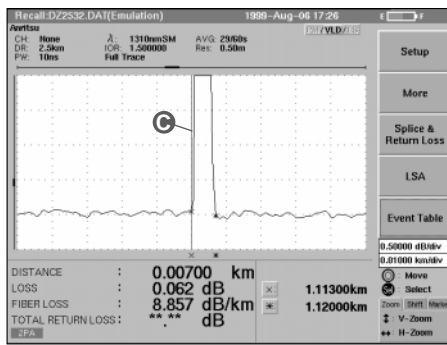
### • High dynamic range

When using a wavelength of 1.55  $\mu\text{m}$ , a point about 190 km distant can be measured.



### • Short dead zone

Clearly measure up to near end by 8 m dead zone (back-scatter, SM unit)



### • Chromatic dispersion measurement

The MW9076D1 has a built-in function for measuring chromatic dispersion even outdoors. The chromatic dispersion can be measured automatically over a wide range from 1300 to 1660 nm from one end of the fiber. The dispersion reproducibility is  $\pm 0.05 \text{ ps}/(\text{nm} \cdot \text{km})^*$  and the dynamic range is 30 dB. The MW9076D1 can be operated from an external PC using remote commands to measure the chromatic dispersion. For detail of the chromatic dispersion measurement, refer to the document of "product introduction MW9076 series Optical Time Domain Reflectometer".

\*: Measured with 25 km of 1.3  $\mu\text{m}$  zero-dispersion fiber (ITU-T G.652) at 1550 nm.

### • Fresnel reflection

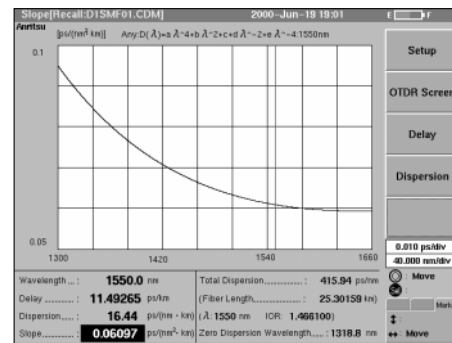
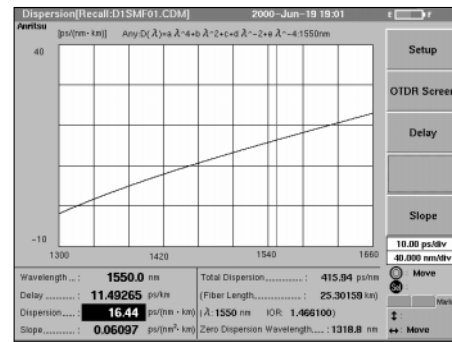
The far-end Fresnel reflection can be measured for four wavelengths (1310/1450/1550/1625 nm).

### • Group delay characteristics

The fitting formula supports cubic or quintic Sellmeier, and polynomials can be applied to various types of fibers.

### • Chromatic dispersion characteristics

The zero and total dispersion can be displayed along with the delay, dispersion and dispersion slope at 0.1 nm steps.



### • High-speed measurement

It takes only 10 seconds to measure and display the waveform and connection loss on one screen. Just one press of the Start key is all that is needed to make measurement.

### • Full automatic mode

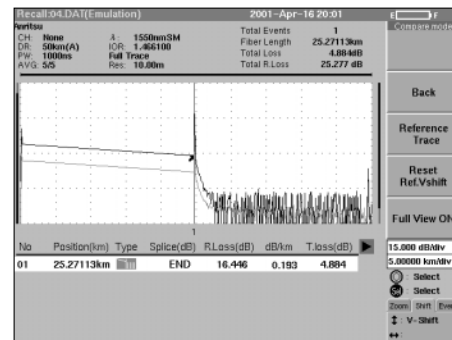
Measurement results are displayed by simply pressing the Start key. All complicated settings of distance range, pulse width, attenuator, and maker can be automatically executed. Measurement speed in this mode was significantly increased. When the wavelengths are set to ALL, wavelengths are automatically changed.

### • Repeated measurement

A series of operations, such as measurement, wavelength switching, data saving, optical channel switching, and next optical fiber measurement, can be executed automatically under preset measurement conditions. This mode is ideal for measuring a multi-core optical fiber.

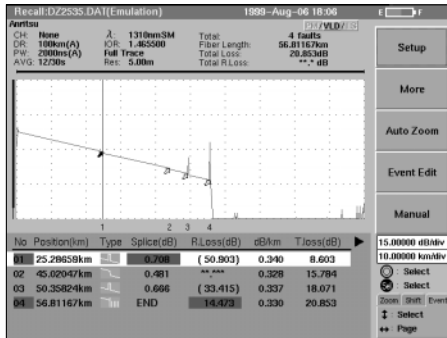
### • Waveform comparison function

Measured and saved data can be compared on the same screen. In addition, differences can be displayed as a waveform for simple observation of distance and level differences. This is useful for checking aging changes or comparing several fibers.



## • Warning level setup function

In automatic measurement mode, an event warning value can also be set in addition to a detection threshold value. For example, the threshold value can be set to the acceptance level, and warning value to a pass/rejection decision level. In this case, all events will be detected, and those exceeding the warning value are displayed in another color, therefore, enabling the operator to easily identify possible "borderline" events.



## • Communication light check function

When measuring a fiber in service, there is a possibility of mis-measurement by an OTDR. To guard against the risk of mis-measurement, this check function checks for the presence of light other than the OTDR optical measurement pulse.

## • Optical channel selector control function

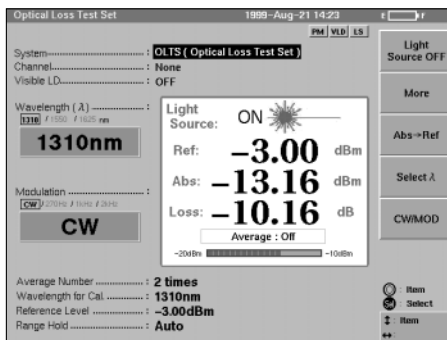
In addition to using the built-in optical channel selector, external MN9662A/9664A Optical Channel Selector can be controlled via the RS-232C interface from an OTDR. By using these selectors, an optical fibercable consisting of up to 32 cores can be measured automatically.

## • Visible LD

A 635 nm visible LD option is available for the detection of breaks and loss points along the fiber to be measured.

## • Light source, power meter

Optical fiber loss can be measured using the optical power meter function and light source function. Two types of optical power meters are supported: One is measurement range of -70 to +3 dBm (MW9076B/B1/C-02 option), the other is measurement range of -50 to +23 dBm (MW9076B/B1/C-03 option).



\* Light source function is mounted on MW9076B/C as standard. Power meter function is optional to MW9076B/B1/C.

## • VGA output terminal

The VGA connector outputs the screen interface to a CRT monitor, which is very useful for production-line applications.

## • Large internal memory

About 18 MB internal memory is provided as standard. The following table shows the number of waveforms which can be saved in each media.

Media	GR196	Analysis
FDD (1.4 MB)	123	67
PC-ATA card (32 MB)	2700	1520
PC-ATA card (256 MB)	16000	10600
Internal memory (18 MB)	1560	860
Hard disk (1 GB)*	32700	32700

Number of data points: 5,000

\*: The hard disk is for the PC card slot (IBM Microdrive DSCM-11000 + PC card adapter)

## MX907600A OTDR Emulation Software

### • Emulation function

Measured waveform data can be analyzed using a PC.

### • Data transmission function

Data files recorded by the MW9076 series can be transferred to a PC via the RS-232C port.

### • Both-end measurement function

A new waveform can be composed by averaging data measured at both ends of an optical fiber.

## Specifications

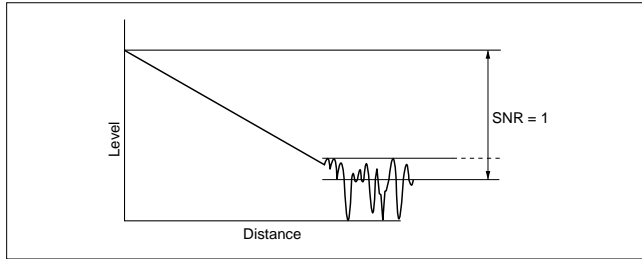
### • Optical Time Domain Reflectometer (main frame)

Model	MW9076B	MW9076C	MW9076B1	MW9076J	MW9076K	MW9076D1
Wavelength	1310/1550 nm ±25 nm*1	1310/1550/1625 nm ±25 nm*1	1310/1550 nm ±25 nm*1	850 nm ±30 nm	850/1300 nm ±30 nm	1310/1450/1550/ 1625 nm ±3 nm*1
Measurable optical fiber	10/125 μm single-mode optical fiber (ITU-T G.652)			62.5/125 μm GI fiber*2		10/125 μm single-mode optical fiber (ITU-T G.652)
Optical connector	FC, SC, DIN, HMS-10/A, ST (replaceable, PC type)			FC, SC, DIN, ST (replaceable, PC type)		FC, SC, DIN, HMS-10/A, ST (replaceable, PC type)
Distance range	1, 2.5, 5, 10, 25, 50, 100, 200, 250, 400 km			1, 2.5, 5, 10, 25, 50, 100 km		1, 2.5, 5, 10, 25, 50, 100, 200, 250, 400 km
Pulse width	10, 20, 50, 100, 500, 1000, 2000, 4000, 10000, 20000 ns			10, 20, 50, 100 ns	10, 20, 50, 100 ns (0.85 μm) 10, 20, 50, 100, 500, 1000 ns (1.3 μm)	10, 20, 50, 100, 500, 1000, 2000, 4000, 10000, 20000 ns
Dynamic range*3, *4 (S/N = 1)	42.5 dB (1.31 μm) 40.5 dB (1.55 μm) *Typical value: 45 dB (1.31 μm) 43 dB (1.55 μm)	41.5 dB (1.31 μm) 39.5 dB (1.55 μm) 37 dB (1.625 μm)	38 dB (1.31 μm) 36 dB (1.55 μm) *Typical value: 40.5 dB (1.31 μm) 38.5 dB (1.55 μm)	21 dB	21 dB (0.85 μm) 25 dB (1.3 μm)	34.5 dB (1.31 μm) 33.5 dB (1.45 μm) 32.5 dB (1.55 μm) 30.0 dB (1.625 μm)
Dead zone (back-scattered light)*5	≤8 m (1.31 μm) ≤9 m (1.55 μm)	≤8 m (1.31 μm) ≤9 m (1.55 μm) ≤12 m (1.625 μm)	≤8 m (1.31 μm) ≤9 m (1.55 μm)	≤7 m (deviation: ±0.5 dB) ≤50 m (deviation: ±0.1 dB)	≤7 m (0.85 μm, deviation: ±0.5 dB) ≤10 m (1.3 μm, deviation: ±0.5 dB) ≤50 m (deviation: ±0.1 dB)	≤25 m
Dead zone (Fresnel reflection)*6	≤1.6 m			≤2 m		≤3 m
Marker resolution	0.05 to 800 m			0.05 to 200 m		0.05 to 800 m
Sampling resolution	0.05 to 80 m			0.05 to 20 m		0.05 to 80 m
Sampling points*7	Quick mode: 5001, 6251 Normal mode: 20001, 25001 High mode: 40001, 50001					
Y-axis scale	0.25, 0.5, 1, 2.5, 5, 10, 15 dB/div (15 dB/div is indicated only at Auto and Full Auto measurement.)					
IOR settings	1.400000 to 1.699999 (0.000001 steps)					
Distance measurement accuracy	±1 m ±3 x measurement distance x 10 <sup>-5</sup> ±marker resolution (excluding uncertainty caused by fiber IOR)					0.1 m ±3 x measurement distance x 10 <sup>-5</sup> ±marker resolution (excluding uncertainty caused by fiber IOR)
Loss measurement accuracy (linearity)	±0.05 dB/dB or ±0.1 dB (whichever is greater)					
Return loss measurement accuracy	±2 dB			±4 dB		±2 dB
Automatic measurement*8	Measurement items: Total loss, total return loss. Each event distance, connection loss, return loss, or reflection amount (displays in table format) Threshold values Connection loss: 0.01 to 9.99 dB (in 0.01 dB steps), Return loss: 20 to 60 dB (in 0.1 dB steps), Fiber-end: 1 to 99 dB (in 1 dB steps) Warning values Splice connection loss: 0.1 to 10 dB (in 0.01 dB steps), Connector connection loss: 0.1 to 10 dB (in 0.01 dB steps), Return loss: 10 to 50 dB (in 0.1 dB steps), Fiber loss: 0.01 to 10 dB (in 0.01 dB steps), Total loss: 0.1 to 60 dB (in 0.1 dB steps), Total return loss: 10 to 50 dB (in 0.1 dB steps), Average loss: 0.01 to 10 dB (in 0.01 dB steps) Number of detected events: Up to 99 Automatic setting: Distance range, pulse width, averaging count (time) Measurement time: ≤60 s (in full automatic measurement mode) Connection check: Automatic check of front panel connector connection quality Communication light check: Check for presence of communication light in optical fiber to be measured					
Manual measurement	Measurement items: Transmission loss and distance between 2 points, loss per unit length between 2 points, connection loss, return loss/reflection amount, total return loss, average loss Real-time sweep: 0.1 to 0.2 second or less*9					

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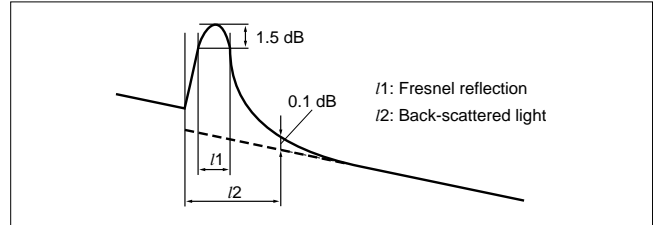
Model	MW9076B	MW9076C	MW9076B1	MW9076J	MW9076K	MW9076D1
Optical loss measurement light source function	<p>Applicable optical fibers: SM optical fiber (ITU-T G.652)</p> <p>Optical connectors: Shared with OTDR (same port)</p> <p>Light-emitting elements: FP-LD</p> <p>Center wavelength: 1310/1550 ±25 nm (MW9076B, CW, 25°C) 1310/1550/1625 ±25 nm (MW9076C, CW, 25°C)</p> <p>Spectrum width: ≤5/10 nm (MW9076B, CW, 25°C) ≤5/10/10 nm (MW9076C, CW, 25°C)</p> <p>Output level accuracy: −3 ±1.5 dBm (CW, 25°C, SM optical fiber: 2 m)</p> <p>Optical output short term stability: ≤0.1 dB [CW, at one point from −10° to +40°C (±1°C), Difference between maximum and minimum values in one min, SM optical fiber cable: 2 m]</p> <p>Output waveform CW, 270 Hz, 1 kHz, 2 kHz (Modulated waves are square waves.) Modulation frequency: 270 Hz/1 kHz/2 kHz ±1.5%</p> <p>Laser safety specification: 21CFR Class 1, IEC 60825-1 Class 1</p>					
Chromatic dispersion measurement	<p>Wavelength range: 1300 to 1660 nm, Wavelength accuracy: ±0.5 nm<sup>*10</sup> (typical), Zero-dispersion repeatability: ±0.6 nm (typical)<sup>*11</sup>, Dispersion repeatability: ±0.05 ps/(nm·km)<sup>*11</sup> * Typical Dynamic range: 30 dB (4% Fresnel, typical)</p>					
Other functions	<p>Waveform storage [Belcore. SOR (GR-196-CORE, SR-4731) or Anritsu. Dat format, user selectable], waveform comparing function, print output (Centronics), repeated measurement function (A series of operations such as wavelength switching, waveform storage, and printing can be executed by pressing a single key.), relative distance set (zero cursor set), calendar clock, distance unit set (km, m, kf, f, mi), title input (up to 32 characters), remaining battery power display</p>					
Laser safety specification	21CFR Class 1, IEC 60825-1 Class 1					
Power	≤35 W max. (at charging), 4 W (in standard state, MU250000A power consumption included.)					
Battery	Continuous operation: 6 h (typical value) <sup>*12</sup>					
Dimensions and mass	<p>290 (W) × 194 (H) × 30 (D) mm (MW9076B/B1/C/J/K main frame) 290 (W) × 194 (H) × 75 (D) mm (MU250000A Display Unit included) ≤1.4 kg ≤4.0 kg (MU250000A display unit and battery pack included)</p> <p>290 (W) × 194 (H) × 77 (D) mm (MW9076D1 main frame) 290 (W) × 194 (H) × 122 (D) mm (with MU250000A Display Unit) ≤3.1 kg (MW9076D1 main frame only), ≤5.7 kg (with MU250000A Display Unit and battery pack included)</p>					
Environmental condition	<p>Operating temperature and humidity: −10° to 40°C, ≤ 85% (no condensation) Storage temperature and humidity: −20° to 60°C, ≤ 85% Vibration: Conforming to MIL-T-28800E Class 3 Shock: 76 cm height, 6 surfaces, 8 corners<sup>*13</sup> Dust-proofing: MIL-T-28800E Drip-proofing: MIL-T-28800E</p>					
EMC	<p>EN61326: 1997/A2: 2001 (Class A) EN61000-3-2: 2000 (Class A) EN61326: 1997/A2: 2001 (Annex A)</p>					
LVD	EN61010-1: 2001 (Pollution Degree 2)					

- \*1 At 25°C, pulse width: 1  $\mu$ s
- \*2 For GI fiber (core diameter: 62.5  $\mu$ m  $\pm$ 3.0 nm, NA: 0.275  $\pm$ 0.015, transmission loss:  $\leq$ 3.2/0.9 dB/km (wavelength: 0.85/1.3  $\mu$ m). At measurement of 50/125  $\mu$ m GI fiber, the dynamic range drops by about 3.0 dB.
- \*3 At 25°C, pulse width: SM 20  $\mu$ s, Average 360 sec., GI 100 ns (0.85  $\mu$ m), 1  $\mu$ s (1.3  $\mu$ m), Average 180 sec.
- \*4 Dynamic range (one-way back-scattered light)  
SNR=1: The level difference between the RMS noise level and the level where near end back-scattering occurs.



- \*5 Pulse width: 10 ns, return loss: SM 40 dB, GI 30 dB, deviation:  $\pm$ 0.1 dB (Refer to the figure right.)
- \*6 Pulse width: 10 ns (Refer to the figure right.)
- \*7 Either value is automatically selected in each mode, depending on the distance range.

- \*8 Automatic measurement is a supporting function which enables to operate easier, it doesn't assure results. As there is a case of miss detection, please check a waveform data, either.
- \*9 At quick mode
- \*10 Compared value with internal wavelength data at chromatic dispersion measurement
- \*11 Measured with 25 km of 1.3  $\mu$ m zero-dispersion fiber (ITU-T G.652) at 1550 nm.  
Not an error from absolute value but repeatability of measured results. Contact Anritsu Corporation in case of measuring ITU-T G.655 fiber.
- \*12 At back light low brightness, measurement not executed.
- \*13 Dropped on the floor of plywood thickness 5 cm fixed by concrete. Not applicable to the MW9076D1.



Note: This product outputs the pulse light of a high peak power. When this product is used in the state where it connected with transmission system, attach a wavelength filter or attenuator to Receiver of transmission system. There is a possibility of damaging Receiver of transmission system because of high power pulse of OTDR.

### • MU25000A/A4 Display Unit

Display	MU25000A Unit: 8.4 inch color, TFT-LCD (640 x 480 pixels, transparent type, with back light) MU25000A4 Unit: 7.8 inch color, STN-LCD (640 x 480 pixels, reflective type, with front light on/off)
Interface	Serial interface: RS-232C-1 (115.2 kbps max.), with D-sub 9-pin connector RS-232C-2 (57.6 kbps max.), with mini-DIN 8-pin connector Printer interface: 8-bit parallel interface (Centronics), with D-sub, 25-pin connector Keyboard interface: IBM US ENGLISH (101 keys) 106 keys compatible, with mini-DIN 6-pin connector VGA output connector: Mini-DIN 10-pin connector
FDD	Built-in 3.5 inch (1.44 MB/720 kB)
Power supply	10 to 26.4 Vdc 100 to 250 Vac (rated), 50/60 Hz, $\leq$ 50 VA max. (Specific AC adapter is used.) Battery: CGR-B/802 Lithium ion battery pack can be used. (mounted in main frame)
Power	$\leq$ 35 W
Dimensions and mass	290 (W) x 194 (H) x 45 (D) mm, $\leq$ 2.2 kg
Environmental conditions	Restricted by memory card specifications when a memory card is mounted. AC adapter: Depend on the conditions of AC adapter Operation temperature and humidity: $-10^{\circ}$ to $+40^{\circ}$ C, $\leq$ 85% (no condensation), $+5^{\circ}$ to $40^{\circ}$ C, $\leq$ 80% (FDD is used.) Storage temperature and humidity: $-20^{\circ}$ to $60^{\circ}$ C, $\leq$ 85% Vibration: Conform to MIL-T-28800E Class 3 Shock: 76 cm height, 6 surfaces, 8 corners* Dust proofing: Conform to MIL-T-28800E Drip proofing: Conform to MIL-T-28800E
EMC	Same as MW9076 series
LVD	Same as MW9076 series

\*: Dropped on the floor of plywood (thickness 5 cm) fixed by concrete

### • Battery pack: CGR-B/802D

Battery	Lithium ion secondary battery
Voltage, capacity	14.4 V, 3440 mAh (49.53 Wh)
Continuous drive time	See the MW9076 series specifications
Charging time	$\leq$ 3 h (charge at the circumference temperature of $0^{\circ}$ to $+40^{\circ}$ C)
Dimensions and mass	134.5 (W) x 89.5 (H) x 20.5 (D) mm, $\leq$ 420 g

### • AC adapter: Z0695 (SA165A-2425V-3)

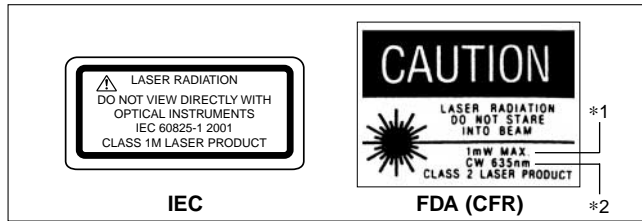
Rated AC input	100 to 240 Vac, 50/60 Hz
Rated DC output	24 Vdc, 2.5 A
Dimensions and mass	122 x 60 x 34 mm, $\leq$ 350 g
Safety specifications	UL, CSA, TÜVCE, CE, NORDIC, PSE
Environmental conditions	Operating temperature and humidity: $0^{\circ}$ to $+40^{\circ}$ C, 80% Storage temperature and humidity: $-20^{\circ}$ to $+80^{\circ}$ C, 90%

### • Visible light source: MW9076B/B1/C/D1/J/K-01

Central wavelength	635 $\pm$ 15 nm (at 25°C)
Optical output	$-3.0 \pm 1.5$ dBm
Output optical fiber	10/125 $\mu$ m, SM (ITU-T G.652)
Optical connector	FC, SC, ST, DIN, HMS-10/A *Replaceable
Optical safety	IEC 60825-1 Class 1M, 21CFR Class 2
Environmental conditions	Same as MW9076 series
EMC	Same as MW9076 series
LVD	Same as MW9076 series

## Safety measures for laser products

This option complies with optical safety standards in Class 1M of the IEC 60825-1 and the FDA (21CFR1040.10, USA) in Class 2; the following descriptive labels are affixed to the product (FDA labels is only affixed to product for export to the USA).



The maximum output is indicated under \*1, and the wavelength under \*2.

Caution: Do not look directly into the laser beam.

### • Optical power meter: MW9076B/B1/C-02, MW0976B/B1/C-03

Applicable optical fiber	10/125 μm, SM (ITU-T G.652)
Optical connector	FC, SC, ST, DIN, HMS-10/A *Replaceable
Wavelength range	1.2 to 1.7 μm
Measurement range	Option 02: +3 to -70 dBm (continuous light) 0 to -73 dBm (modulated light) Option 03: +23 to -50 dBm (continuous light) +20 to -53 dBm (modulated light)
Measurement accuracy	Option 02: ±5% (-10 dBm, 1.31/1.55 μm, continuous light) Option 03: ±5% (-10 dBm, 1.31/1.55 μm, continuous light)
Environmental conditions	Same as MW9076 series
EMC	Same as MW9076 series
LVD	Same as MW9076 series

### • MU960001A/960002A Optical Channel Selector Unit

Model	MU960001A	MU960002A
Configuration	1 x 4	1 x 8
Wavelength range	1.2 to 1.65 μm (The special wavelength are 1.31/1.55 μm.)	
Optical fiber	10/125 μm, SM (ITU-T G.652)	
Optical connector	FC, SC, ST, DIN, HMS-10/A *Replaceable	
Insertion loss	≤2.5 dB	≤4.5 dB
Environmental conditions	Same as MW9076 series (not applicable to the shock)	
Dimensions	290 (W) x 194 (H) x 47 (D) mm	
Mass	≤1.5 kg	≤2.0 kg
EMC	Same as MW9076 series	
LVD	Same as MW9076 series	

\*MU960001A/MU960002A can not be attached to MW9076D1.

## Ordering information

Please specify model/order number, name and quantity when ordering.

Model/Order No.	Name
MW9076B MW9076B1 MW9076C MW9076D1 MW9076J MW9076K	<b>Optical Time Domain Reflectometer (main frame, requires display unit)</b> SMF 1.31/1.55 μm OTDR SMF 1.31/1.55 μm OTDR SMF 1.31/1.55/1.625 μm OTDR SMF 1.31/1.45/1.55/1.625 μm OTDR GIF 0.85 μm OTDR GIF 0.85/1.3 μm OTDR
W1659AE W1660AE	<b>Standard accessories (main frame)</b> MW9076 series operation manual: 1 copy MW9076 series serial interface manual: 1 copy Connector adapter*1: 1 pc Lithium ion battery pack: 1 pc
Z0619	
MU250000A MU250000A4	<b>Units</b> Display Unit (8.4 inch TFT-LCD) Display Unit (7.8 inch STN-LCD)
Z0695	<b>Standard accessories (display unit)</b> AC adapter (SA165A-2524V-3, SINO-AMERICAN ELECTRONIC products) Front cover A-2 power cord*2 (for Japan) A-2 power cord*2 (for USA, Canada, Taiwan) B4 power cord*2 (for UK, Malaysia, South Africa, Hong Kong) C7 power cord*2 (for Europe) S3 power cord*2 (for Oceania, China) P4 power cord*2 (for India) D1 power cord*2 (for Switzerland) Belt with hook
Z0402 0979 J0980 J0981	
J0982 J0983 J1027 J1028 Z0403A	
MU960001A MU960002A	<b>Optical Channel Selector</b> Optical Channel Selector Unit (1 x 4 channels, with connector adapter*1) Optical Channel Selector Unit (1 x 8 channels, with connector adapter*1)
Z0619	<b>Battery pack</b> Lithium ion battery pack
MX907600A	<b>Software</b> OTDR Emulation Software
MW9076B/B1/C/D1/J/K-01 MW9076B/B1/C-02 MW9076B/B1/C-03 MW9076B/B1/C-25 MW9076B/B1/C-26 MW9076B/B1/C/ D1/J/K-37 MW9076B/B1/C/ D1/J/K-38 MW9076B/B1/C/ D1/J/K-39 MW9076B/B1/C/ D1/J/K-40 MW9076B/B1/C/ D1/J/K-43 MW9076B/B1/C-47 MU960001A-37 MU960002A-37 MU960001A-38 MU960002A-38 MU960001A-39 MU960002A-39 MU960001A-40 MU960002A-40 MU960001A-43 MU960002A-43	<b>Options</b> Visible LD (factory option)*1 Optical power meter (factory option)*1,*3 High power optical power meter (factory option)*1,*3 FC - APC connector (angled PC type, factory option) SC - APC connector (angled PC type, factory option) FC connector (user replaceable) ST connector (user replaceable) DIN connector (user replaceable) SC connector (user replaceable) HMS-10/A connector (user replaceable) HRL-10 connector (factory option) FC connector FC connector ST connector ST connector DIN connector DIN connector SC connector SC connector HMS-10/A connector HMS-10/A connector
Z0321A JT8MA3-NT1 JT16MA3-NT1 JT32MA3-NT1 JT64MA3-NT1 JT128MA3-NT1	<b>Application parts</b> Keyboard (PS/2) PC-ATA card (8 MB) PC-ATA card (16 MB) PC-ATA card (32 MB) PC-ATA card (64 MB) PC-ATA card (128 MB)

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Model/Order No.	Name
JT256MA3-NT1	PC-ATA card (256 MB)
JT512MA3-NT1	PC-ATA card (512 MB)
J0057	Optical adapter FC type
J0635□*4	Optical fiber cord [with FC-PC at both ends (SM)]
B0442	Soft carrying case [440 (W) x 310 (H) x 110 (D) mm]
Z0435	Soft carrying case [430 (W) x 300 (H) x 170 (D) mm]
Z0436	Hard carrying case (holds main frame and thermal printer)
J0617B	Replaceable optical connector (FC)
J0618D	Replaceable optical connector (ST)
J0618E	Replaceable optical connector (DIN)
J0618F	Replaceable optical connector (HMS-10/A, HFS-13/A)
J0619B	Replaceable optical connector (SC)
J0441	Total internal reflection cord (SM)
J1039	Total internal reflection cord (SC-PC)
J0654A	Serial interface cord (for remote control with IBM-PC/AT or J-310, 9 pin-9 pin)
J0655A	Serial interface cord (for PC-98 remote control, 9 pin-25 pin)
J0977	Serial interface cord (for connection with external optical channel selector)
J0978	VGA conversion cable (for external monitor)
J0952A	FC · PC-FC · APC(SG)-1M-SM (FC · APC closed width: 2 mm, conforms to seiko-giken)
J0953A	FC · PC-FC · APC(SI)-1M-SM (FC · APC closed width: 2.14 mm, conforms to SSI)
J0954A	SC · PC-SC · APC-1M-SM [return loss: >50 dB (SC · PC), >65 dB (SC · APC)]
Z0282	Ferrule cleaner
Z0283	Ferrule cleaning tape (6 pcs/set)
Z0284	Adapter cleaner (stick type, 200 pcs/set)
J1041A	1.31/1.55 LWPF filter cord (SC · PC), 1 m
SDC60-3020	Car charger (adapter for car battery, DC 10 to 15 V)
<b>Peripherals</b>	
BL-80R2	High speed thermal printer*5
BL-100W	AC adapter (for BL-80R2, AC 100 to 240 V)
DPU-414-31B	Thermal printer*6
PW-4007-U1	AC adapter*6
DPU-414-31B	Thermal printer*7
PW-4007-E1	AC adapter*7
J0614	Printer connection cable (for DPU-414)
<b>Supplies</b>	
BL-80-30	Printer paper (for BL-80R2 thermal printer, 10 rolls/set)
TP411-28CL	Printer paper (for DPU-414 Thermal printer, 10 rolls/set)

\*1: Specify one of FC, ST, DIN, SC or HMS-10/A. When the connector type is not specified, FC is supplied.

\*2: Specify one of A-2, B4, C7, S3, P4 or D1.

\*3: The optical power meter (Option 02) and high-level-input optical power meter (Option 03) cannot be mounted at the same time.

\*4: Specify the optical fiber length as A, B or C (A: 1 m, B: 2 m, C: 3 m)

\*5: Operates only with AC adapter, printing width: 72 mm, printing speed: approximately 13 s (manual measurement result with header), 0° to +40°C, dimensions: 119 (W) x 77 (H) x 174 (D) mm, Sansei products (AC adapter and printer cable are sold separately.)

\*6: 120 VAC ±10 %, 60 Hz, 0° to +40°C, Seiko products (printer cable: sold separately)

\*7: 230 VAC ±10 %, 50 Hz, 0° to +40°C, Seiko products (printer cable: sold separately)