GRANDWAY FHO6000 SERIES OTDR PRO

Convenient multi-function fiber optic tester

Design for tough outdoor environment

Comprehensive performance improvement, more accurate and stable test performance

Description:

FHO6000 series Optical Time Domain Reflectometer (OTDR) is an intelligent meter for the detection of fiber communications systems. The new generation FHO6000 series has higher test performance and product stability. Larger dynamics and optimized deadzone can provide more accurate fiber testing.

Whether you want to detect link layer in the construction and installation of optical network or proceed efficient maintenance and trouble shooting, FHO6000 can be your best assistant.

FEATURES

- 7 inch anti-reflection LCD touch screen
- Dynamic range from 26dB to 45dB, small deadzone 0.8m/3.5m
- Excellent FLM(Fiber Link Map)performance make fiber testing simpler and more efficient
- PON online test module (1625nm/1650nm) is optional
- MMF test module (850/1300nm) is optional
- Optimized PON test capability to pass through 1x128 splitter
- Multi function Integrated design, smart and rugged
- Support remote control on PC software via RJ45 cable
- Built-in OTDR trace PDF report and FLM testing PDF report
- Multi-language display and input(more than 14 languages)

APPLICATIONS

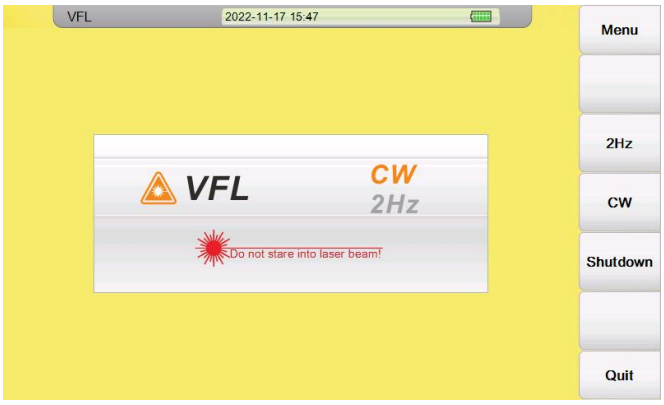
- FTTX test with PON networks
- CATV network testing
- Access network testing
- LAN network testing
- Metro network testing
- Lab and Factory testing
- Live fiber troubleshooting

What you need is all-in-one!

FHO6000 series OTDR is a highly integrated platform that features with four optical module slots, with a large 7-inch color touch screen and built-in optical test functions, making it qualified in the installation,activation and maintenance of FTTx/Access/Metropolitan area/backbone network.

VFL (Visual fault locator)

The 10mw VFL, available as a standard module in FHO5000, offers built-in 650nm visual red light can test up to 10km.

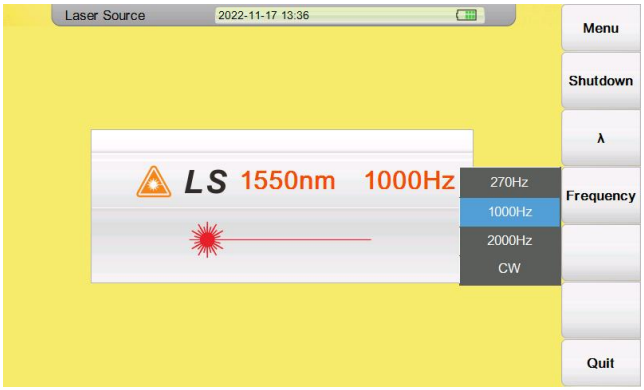


OPM (Optical power meter)

FHO6000 comes with high-precision built-in power meter that let technicians easily verify the presence and the power of a signal.

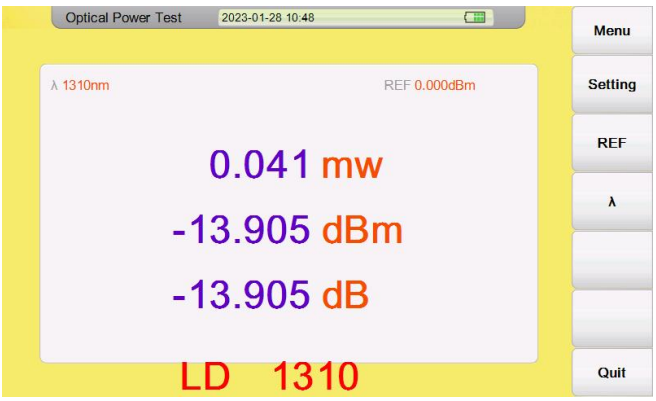
OLS (Optical laser source)

FHO6000 comes with built-in laser source that let technicians easily verify the total loss with a power meter.



Optical Loss Tester

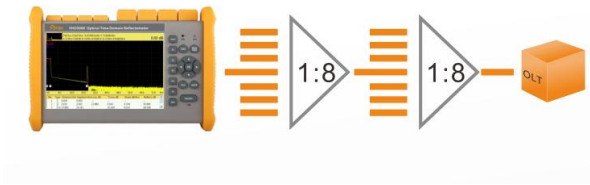
OLS and OPM functions can be enabled at the same time for fiber loss test, No additional test instruments are required.



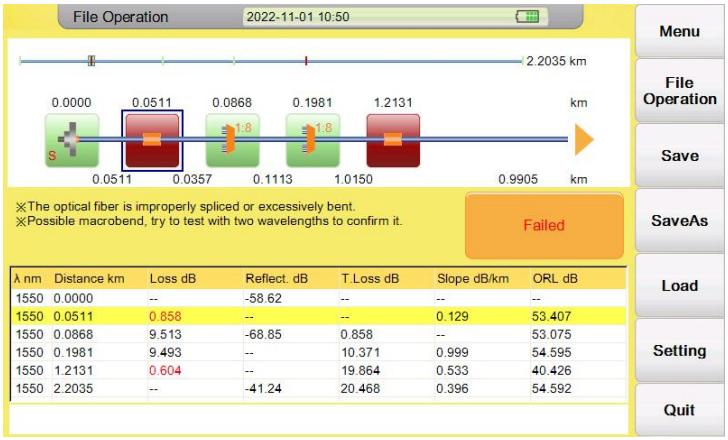
PON Network Online Test

Optimized PON Test Capability

With improved hardware and advanced algorithm, FHO6000 PON series(T40F/T43F/T45F) can easily pass through 1x64 splitter even 1x128 splitter and accurately describe the overall structure of PON network.



In particular, with FLM mode, users can automatically test without complicated settings to obtain the most accurate and intuitively test results. In addition, FLM provides the Pass/Fail function of the PON network, which can intuitively display the failure event in PON network



Pass through 1x8+1x8 splitter network **Pass through 1x16+1x4 splitter network**

Through the built-in optical cut-off filter, the FHO6000 can realize the testing for PON network activation, online measurement and maintenance via 1625nm testing wavelength.

Synchronous optimization of deadzone and dynamic

The FHO6000 optimizes the deadzone and dynamic range performance in both directions, enabling the FHO6000 to have greater dynamic performance at small pulse width and maintain smaller deadzone performance at large pulse width.

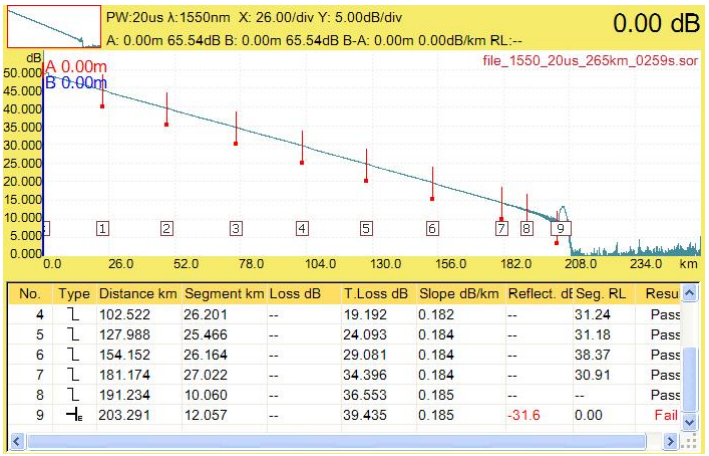
Event deadzone:0.8m

Attenuation deadzone: 3.29m

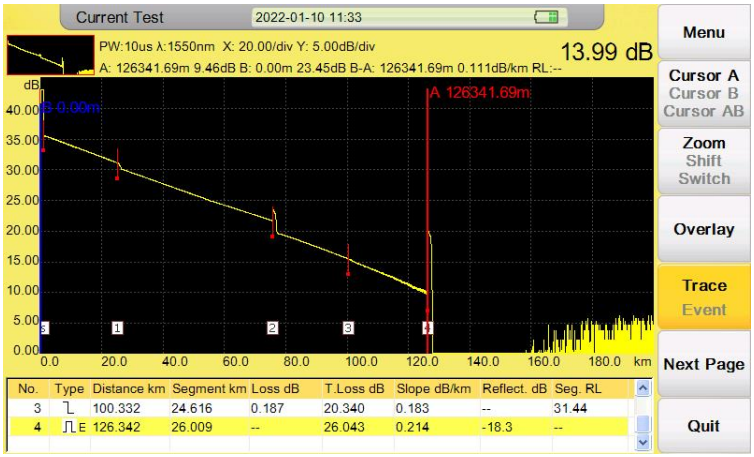
Multiple Dynamic Range (26dB~45dB)

Long Distance Test Capability (over 200km@FHO5000-D45)

The FHO6000 includes various dynamic test modules from a short-distance access network to a long-distance backbone network, support 45dB dynamic range which can test up to 200km. Even the FHO5000-D35 can perform beyond 120km optical fiber test.



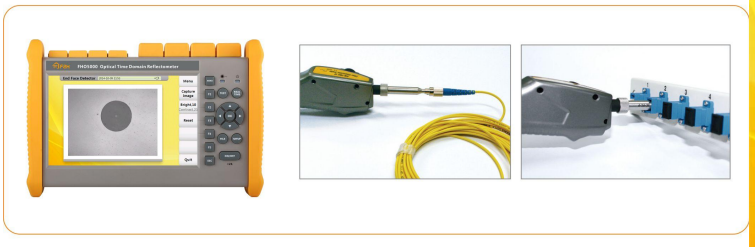
FHO6000-D45 screenshot

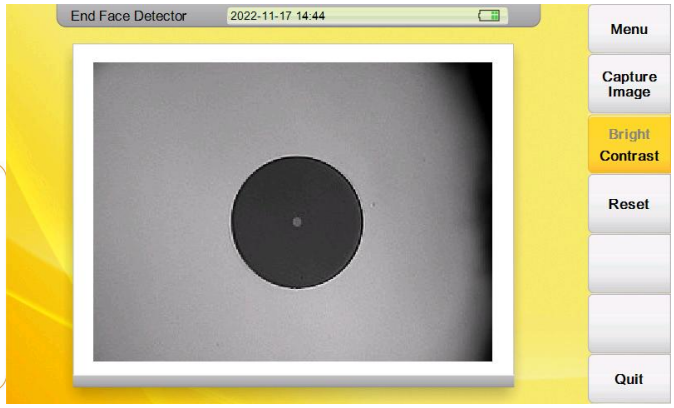


FHO6000-D35 screenshot

EFD (Endface Fiber Detector)

The optional fiber inspection probe facilitates the inspection before the connection. FHO6000 series OTDR offers this capability through a USB port connection, which allows quick and easy inspection of connector end faces for contamination and also enables it capture and store the image. There are two fiber microscope models can work with FHO6000 OTDR. Both fiber microscope resolution is only 1um, and the optical fiber end face can be seen more clearly.

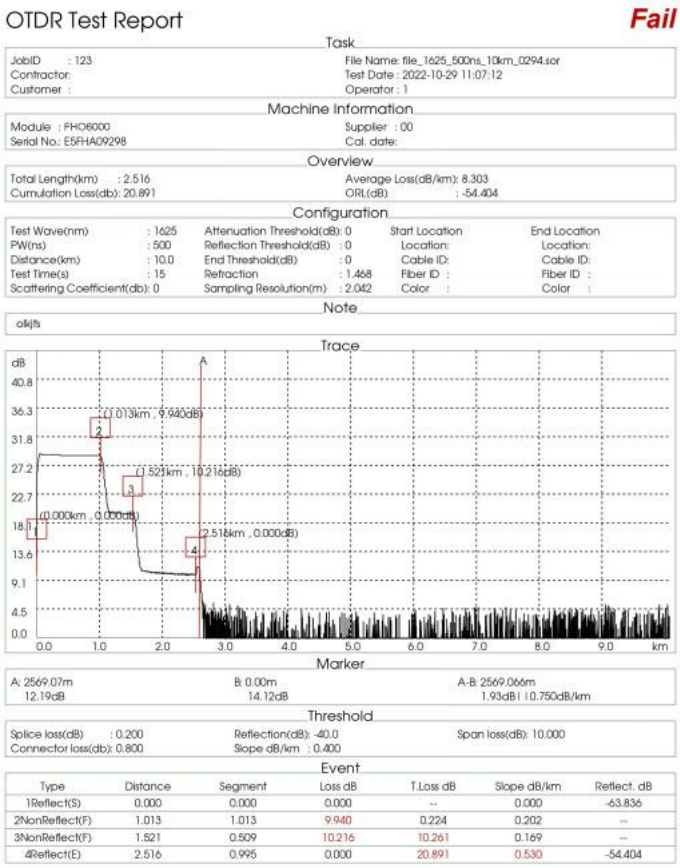




Model	Picture	Standard tips	Resolution	
FIM-4		SC-PC-F(for SC/PC female bulkhead) FC-PC-F(for FC/PC female bulkhead) LC-PC-F(for LC/PC female bulkhead) 2.5PC-M(for 2.5mm/PC male connector)	Image resolution 480x270um	Particle size detection <1um
FIM-18		25-U-M (for 2.5mm/PC male connector) 125-U-M(for 1.25mm/PC male connector) FC-U-F(for FC/PC female bulkhead) SC-U-F(for SC/PC female bulkhead) LC-U-F(for LC/PC female bulkhead)	Image resolution 480x270um	Particle size detection <1um

Bulit-in Generate PDF Report

Multi language OTDR trace PDF report and FLM testing PDF report can be generated directly in the machine.


OTDR Test Report

Fail

Task

JobID : 123
Contractor:
Customer :
File Name: file_1625_500ns_10km_0294.sor
Test Date : 2022-10-29 11:07:12
Operator : 1

Machine Information

Module : FHO6000
Serial No.: E5FHA09298
Supplier : 00
Cal. date:

Overview

Total Length(km) : 2.516
Cumulation Loss(db): 20.891
Average Loss(dB/km): 8.303
ORL(dB) : -54.404

Configuration

Test Wave(nm)	: 1625	Attenuation Threshold(dB): 0		Start Location	End Location
PW(ns)	: 500	Reflection Threshold(dB)	: 0	Location:	Location:
Distance(km)	: 10.0	End Threshold(dB)	: 0	Cable ID:	Cable ID:
Test Time(s)	: 15	Refraction	: 1.468	Fiber ID :	Fiber ID :
Scattering Coefficient(db): 0		Sampling Resolution(m)	: 2.042	Color :	Color :

Note

olkjfs

Trace

Marker

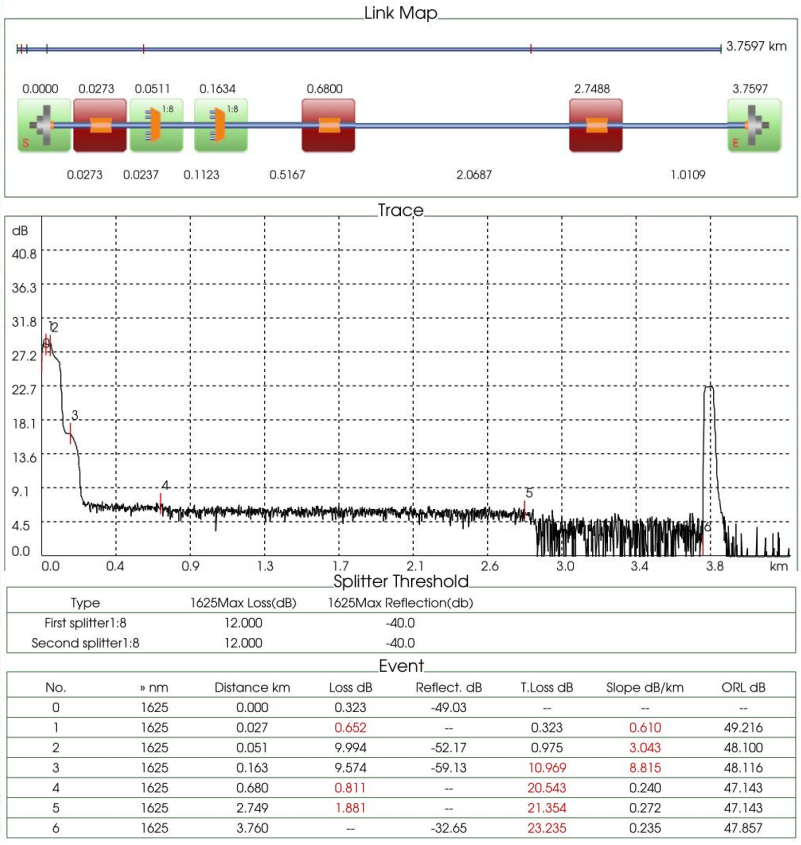
A: 2569.07m 12.19dB
B: 0.00m 14.12dB
A-B: 2569.066m 1.93dB | 0.750dB/km

Threshold

Splice loss(dB) : 0.200
Connector loss(db): 0.800
Reflection(dB): -40.0
Slope dB/km : 0.400
Span loss(dB): 10.000

Event

Type	Distance	Segment	Loss dB	T.Loss dB	Slope dB/km	Reflect. dB
1Reflect(S)	0.000	0.000	0.000	--	0.000	-63.836
2NonReflect(F)	1.013	1.013	9.940	0.224	0.202	--
3NonReflect(F)	1.521	0.509	10.216	10.261	0.169	--
4Reflect(E)	2.516	0.995	0.000	20.891	0.530	-54.404


Link Map

Trace

Splitter Threshold

Type	1625Max Loss(dB)	1625Max Reflection(db)
First splitter1:8	12.000	-40.0
Second splitter1:8	12.000	-40.0

Event

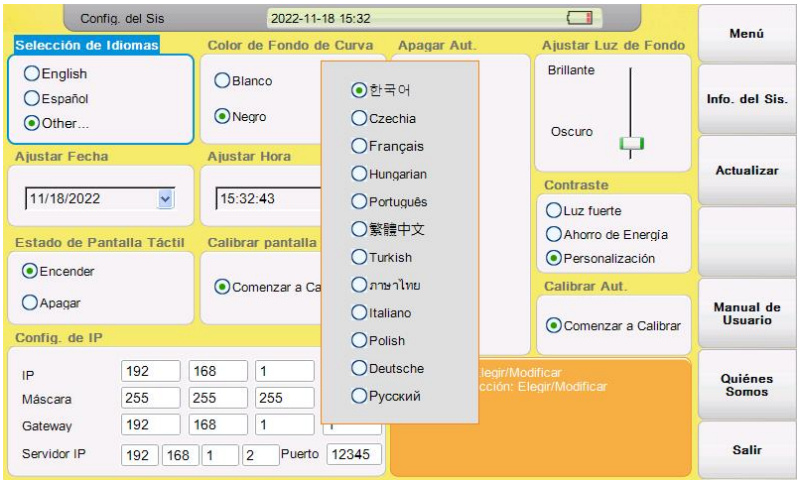
No.	» nm	Distance km	Loss dB	Reflect. dB	T.Loss dB	Slope dB/km	ORL dB
0	1625	0.000	0.323	-49.03	--	--	--
1	1625	0.027	0.652	--	0.323	0.610	49.216
2	1625	0.051	9.994	-52.17	0.975	3.043	48.100
3	1625	0.163	9.574	-59.13	10.969	8.815	48.116
4	1625	0.680	0.811	--	20.543	0.240	47.143
5	1625	2.749	1.881	--	21.354	0.272	47.143
6	1625	3.760	--	-32.65	23.235	0.235	47.857

OTDR Trace PDF Report

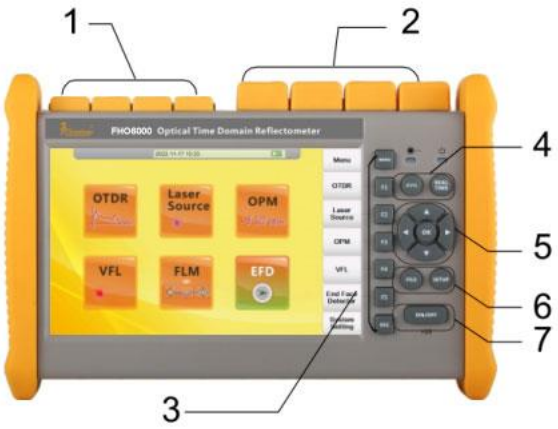
FLM Testing Report

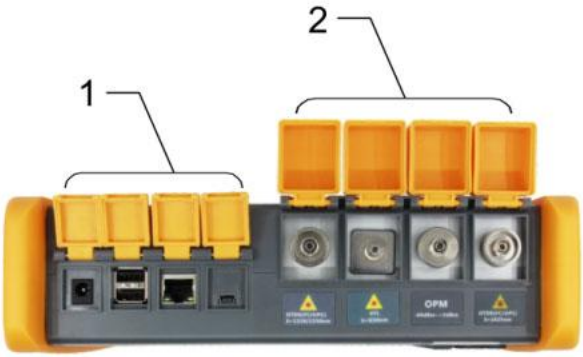
Multi-language Display and Input

FHO6000 supports multiple overseas languages and is applicable to customers in different countries.



Interface Definition





No	Name	Description
1	Electric ports (From left to right)	Charging port: DC input 10V/4A USB 2.0 port: Insert USB disk to upgrade RJ45 Ethernet port: remote control port Mini USB port: Transfer file to PC via USB cable
2	Optical ports (From left to right)	OTDR port1: for 1310nm/1550nm testing VFL port: 2.5mm universal port OPM port: for optical power testing OTDR port2(optional): for 1625nm testing
3	Function key	Menu: Enter the Main menu interface F1-F5:Enter the corresponding menu option ESC: Enter the system setting or back to main menu You can check "System info/language/date/power saving/bright light/IP setting, etc"in system setting
4	Test key	AVG: Perform OTDR average test ; REAL TIME: Perform OTDR realtime test
5	Direction key	Move cursor and confirm
6	File and Setup	File: To enter the saved file storage ; Setup: To enter the OTDR testing setting
7	ON/OFF key	Long press>2s to power on/off the OTDR

Note: Product appearance and parameters are subject to change without notice.

Specification

General

Dimension	253×168×73.5mm/1.5kg (battery included)
Display	7 inch touch screen TFT-LCD with LED backlight
Interface	1×RJ45 port, 3×USB port (USB 2.0, Type A USB×2, Type B USB×1)
Power Supply	10V(dc)/4A, 100V(ac) to 240V(ac), 50~60Hz
Battery	7.4V(dc)/5.2Ah lithium battery (with air traffic certification) Operating time: 8 hours①, Telcordia GR-196-CORE Charging time: <4 hours (power off)

Power Saving	Backlight off: Disable/1 to 99 minutes Auto shutdown: Disable/1 to 99 minutes
Data Storage	Internal memory: 16GB ; >160,000 groups trace
Optical Port	SC/UPC
Language	User selectable (English, traditional Chinese, French, Korean, Russian, Spanish, Portuguese, Turkish, Italian, German, Thai, Hungarian, Czech, Vietnamese, Polish-contact us for availability of others)
Environmental Conditions	Operating temperature and humidity: -10℃~+50℃, ≤95% (non-condensation) Storage temperature and humidity: -20℃~+75℃, ≤95% (non-condensation)
Accessories	Standard: Main unit, power adapter, Lithium battery, FC adapter, USB cord, User guide, carrying case Optional: SC/ST/LC adapter, Bare fiber adapter, Fiber microscope, Launch cable box
Industry Standard	Comply CE/FCC

Technical parameter

Type②	**Testing Wavelength (MM: ±20nm, SM: ±20nm)**	**Dynamic Range (dB)③**	**Event/Attenuation Dead-zone (m)④**
FHO6000-M21	850/1300	19/21	1.2/8
FHO6000-MD21	850/1300 1310/1550	19/21 35/33	1.2/8 1/4
FHO6000-MD22	850/1300 1310/1550	19/21 40/38	1.2/8 1/4
FHO6000-D26	1310/1550	26/24	1/4
FHO6000-D35	1310/1550	35/33	1/4
FHO6000-D40	1310/1550	40/38	0.8/3.5
FHO6000-D43	1310/1550	43/41	0.8/3.5
FHO6000-D45	1310/1550	45/43	0.8/3.5
FHO6000-T26F	1310/1550/1625	26/24/24	1/4

FHO6000-T35F	1310/1550/1625	35/33/33	1/4
FHO6000-T40F	1310/1550/1625	40/38/38	0.8/3.5
FHO6000-T43F	1310/1550/1625	43/41/41	0.8/3.5
FHO6000-T45F	1310/1550/1625	45/43/43	0.8/3.5
FHO6000-TC35F	1310/1550/1650	35/33/33	1/4
FHO6000-TP35	1310/1490/1550	35/33/33	1/4

Test parameter

Fiber Type	SMF, DCF, DSF, NZDSF
Laser Type	Class I Product
Pulse Width	Single mode: 3ns, 5ns, 10ns, 30ns, 50ns, 100ns, 275ns, 500ns, 1μs, 2μs, 5μs, 10μs, 20μs Multi-mode: 3ns, 5ns, 10ns, 20ns, 50ns, 100ns, 200ns, 500ns, 1μs, 2μs
Testing Distance	Single mode: 500m, 2km, 5km, 10km, 20km, 33km, 40km, 80km, 120km, 160km, 265km Multi-mode: 500m, 2km, 5km, 10km, 20km, 40km
Sampling Resolution	Minimum 5cm
Sampling Point	Maximum 256,000 points
Linearity	±0.03dB/dB
scale Indication	X axis: 4m~70m/div, Y axis: Minimum 0.09dB/div
Distance Resolution	0.01m
Distance Accuracy	±(1m+measuring distance×3×10-5+sampling resolution) (excluding IOR uncertainty)
Reflectance Accuracy	Single mode: ±2dB, multi-mode: ±4dB
Group Index Range	1.3000~2.0000, 0.0001 step
Units	Km, miles, feet
OTDR Trace Format	Telcordia universal, SOR, issue 2 (SR-4731) OTDR: User selectable automatic or manual set-up
Loss Mode Methodology	2 pts, LSA dB/km, Auto/ manual, splice loss, reflectance analysis
Automatic Diagnostic	Support OTDR internal self-inspection before fiber testing
Section Analyse	Available, section attenuation, distance and section slope

Real Time Sweep (sec)	Real time sweep: 1Hz Averaging modes: Timed (1 to 3600 sec.)
Fiber Event Analysis	-Non-reflective events: 0.01 to 10dB (0.01dB steps) -Reflective: 0.01 to 32dB (0.01dB steps) -Fiber end/break: 3 to 30dB (1dB steps)
Other Functions	◆ Built in multi-language OTDR/FLM PDF report generation ◆ Live Fiber detect: Verifies presence communication light in optical fiber ◆ Dual wavelength(1310nm/1550nm) analysis-Macro bending detection ◆ Trace overlay and comparison (most 8 traces) ◆ Define the Pass/Fail result of each event through threshold settings ◆ Powerful PC analysis software "OTDRviewer" ◆ Remote control on PC software "Server" via RJ45 cable ◆ Support bidirectional PC analysis software to create template to have bidirectional splice loss report analysis, which can be compatible with other make OTDR ◆ Smart Phone connectivity via bluetooth.

VFL Module

Wavelength	650nm(±20nm)
Power	Class-II laser
Range	12km
Connector	Universal 2.5mm
Launching Mode	CW/2Hz

OPM Module

Wavelength Range	800~1700nm
Detector Type	InGaAS
Display Unit	dBm/dB/mw
Calibrated Wavelength	850/1300/1310/1490/1550/1625/1650nm
Test Range	Type A: -60~+13dBm (Max. Power level +15dBm)

Resolution	0.01dB
Accuracy	± 0.2 dB
Linearity	± 0.06 dB
Modulation Detection	270/1k/2kHz
Connector	SC/UPC and 2.5mm universal or customized

LS Module (Laser Source)

Working Wavelength (±20nm)	1310/1550/1625nm⑤
Wavelength FW HM Spectral Width	<5nm
Output Power	≥-7dBm FP Class I laser
Output Mode	CW/270Hz/1kHz/2kHz
Output Stability	Short term ±0.02 dB within 15 min Long term ±0.2dB within 8 hrs
Accuracy	±0.5dB
Wavelength Identifier	**Support**
Twin Function	**Support Twin test automatic dual wavelength testing with appropriate power meter**
Connector	SC/UPC or customized

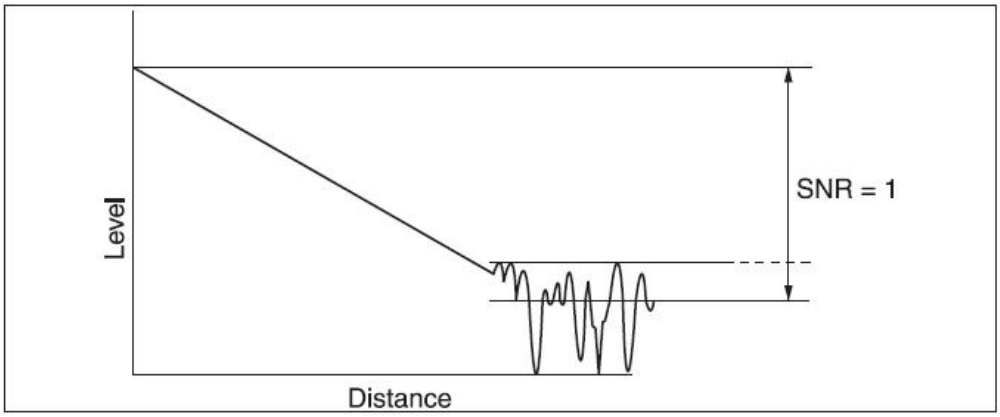
Notes:

①Typical, backlight off, sweeping halted at 25℃, 6 hours typical continuous testing.

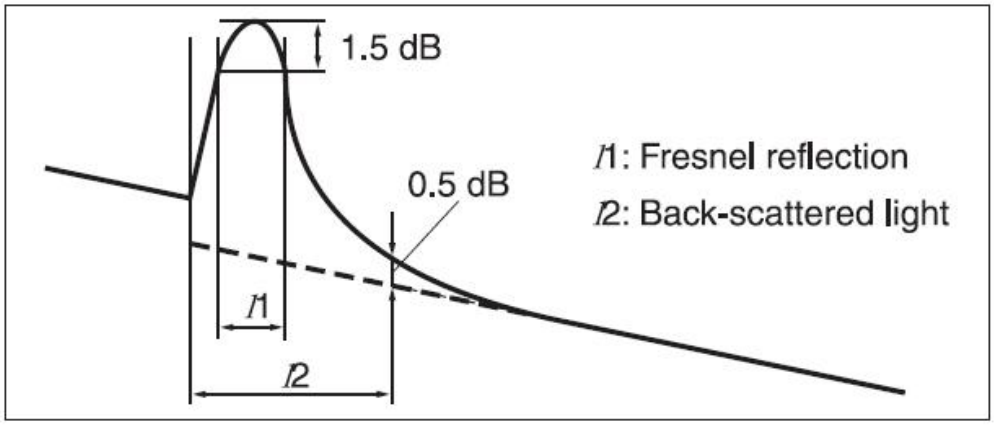
② Model T26F/T35F/T40F/T43F/T45F/TC35F are integrated with optical filter, which allow them to test PON network online (by using 1625nm/1650nm wavelength) and will not interrupt the fiber signal.

③Dynamic range is measured with maximum pulse width, averaging time is 3 minutes, SNR=1; The level difference between the RMS noise level and the level where near end back-scattering occurs.

M-Test Support, Vendor to provide API file of OTDR to RJIL application development team. RJIL shall test and verify whether the OTDR supports RJIL's M-test application. Vendor to support if changes in API required,this is support.



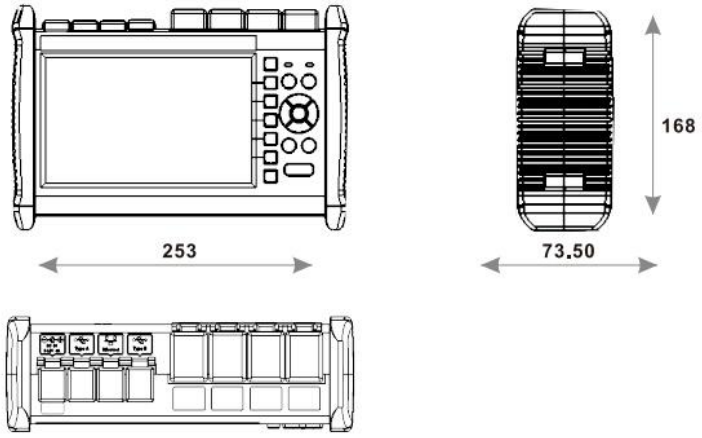
④Dead zone is measured with pulse width of 3ns and return loss under -55dB.



⑤1310/1550nm laser source uses OTDR1 port, and 1625nm or 850/1300nm uses OTDR2 port.

CAUTION:

VIEING THE LASER OUTPUT WITH CERTAIN OPTICAL INSTRUMENTS(FOR EXAMPLE: EYS LOUPES, MAGNIFIERS AND MICROSCOPES) WITHIN A DISTANCE OF 100 MM MAY POSE AN EYS HAZARD.



Unit:mm
Except where noted, tolerance default as:±3%
(if size<10mm, tolerance:±0.3mm)

***Specifications are subject to change without notice.**