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**T-BERD/MTS-
2000V2, 4000V2
5800V2**

OCC-4056C

User Manual

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Optical Spectrum Measurement

1

This chapter describes the different stages in carrying out a spectrum analysis of an optical CWDM signal.

NOTE

This manual is an addition to the 5800 Base Unit user manual. For all questions not covered in this manual – particularly concerning safety – please refer to the Base Unit user manual.

The topics discussed in this chapter are as follows:

- “Introducing the OCC-4056C module” on page 4
- “Safety information” on page 5
- “Configuration” on page 9
- “Acquisition” on page 20
- “Result display” on page 21
- “Table display” on page 29
- “Trace & Table display” on page 34
- “Drift measurement” on page 34
- “File management” on page 39
- “Recycling information” on page 40

Introducing the OCC-4056C module



BN 2331/12

Fig. 1 OCC-4056C module

The OCC-4056C is VIAVI's new generation of DWDM analyzer modules. It scans the full C-band wavelength range between 1528 and 1568 nm for commissioning, upgrade, and trouble shooting of DWDM networks. The OCC-4056C offers the functionality and speed of an optical spectrum analyzer in a handheld form at a fraction of the price of an OSA. The measurement result is displayed in a graphical (trace) and numerical (table) format providing detailed information of the power level and the wavelength of DWDM channels.

NOTE

The OCC-4056C is compatible with T-BERD/MTS Version 2 only!

SFP slots The OCC-4056C offers 2 integrated SFP slots for mounting up to 2 SFP transceiver modules or tunable lasers (to be ordered separately). These SFP+ modules can be used as a DWDM stimulus to check DWDM networks together with the DWDM analyzer.

In order to activate the these SFP+ Slots, the tunable SFP SW-option 2331/94.01 needs to be installed. An activated transceiver module connected to the SFP+ slot emits optical radiation at the output "TX". The input "RX" of the transceiver module has no function. The optical laser radiation is indicated by LEDs assigned to the SFP slots. The SFP modules are hot pluggable and can be changed during operation of the OCC-4056C.

Safety information

Conventions This guide uses naming conventions and symbols, as described in the following tables.

Symbol conventions



This symbol represents a general hazard.



This symbol represents a risk of electrical shock.



This symbol represents dangerous laser radiation.

Safety definitions



WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

Proper usage This instrument is intended for measurements on optical fiber devices and systems.

- ⇒ Please make sure the device is not operated outside the permitted ambient conditions.
- ⇒ Observe the specified measurement range.
- ⇒ Always make sure that the device is in proper working order before switching it on.

General laser safety



WARNING

Dangerous laser radiation

- ⇒ Always be aware of the hazard level of the device to be connected.
- ⇒ Connect all optical fibers before switching on the radiation source.
- ⇒ Switch off the laser source before disconnecting the optical fibers.
- ⇒ Never look directly into the output of a laser source or into an optical fiber connected to it.
- ⇒ Always cover unused ports.
- ⇒ Heed the normal precautions for working with laser radiation and consider local regulations.



WARNING

Invisible laser radiation

Laser radiation can cause irreparable damage to eyes and skin.

- ⇒ Follow the laser safety regulations that apply in your area.
- ⇒ Take note of the laser classification of the individual test module.
- ⇒ Take note of the laser classification or hazard level of the device under test.
- ⇒ Make sure that you protect yourself and others from exposure to laser radiation.
- ⇒ Never look into optical outputs of devices or into the plug end surfaces (free ends) of optical fibers.
- ⇒ Always cover disconnected optical plugs or disconnected optical cable connectors with protective caps.
- ⇒ Always switch off the instrument and disconnect it from any fiber optic cables before inspecting or cleaning the optical cable connectors.
- ⇒ Make sure that the fiber optic cables are disconnected from all sources of radiation before they are cleaned or inspected and ensure that they are not reconnected until cleaning or inspection has been completed.

Specific laser safety

To find out the appropriate laser classification, associated wavelengths and optical power levels, see:

- the label on the SFP module
- the “Specifications” chapter in the operating manual of the SFP

In accordance with the laser classification, read and follow the instructions given in the laser safety warnings below.

Laser classification of the SFP transceiver in the SFP slot



CAUTION

SFP laser classification

Use only class 1 laser products in the SFP slots.

However, the user is free to use any other SFP transceiver compatible with the SFP Multi Source Agreement (MSA).

- ⇒ In this case you must observe the laser classification of the inserted SFP transceiver and its safety instructions!

Safety instructions for class 1 laser products



CAUTION

Invisible laser radiation

Class 1 laser products are defined as safe in normal operation under reasonably foreseeable conditions.

⇒ Although the laser radiation from a class 1 laser product will not harm eyes or skin, follow the general laser safety instructions (see General laser safety instructions) to ensure maximum safety when working with laser sources.

Safety instructions for class 1M laser products



WARNING

Invisible laser radiation

Viewing the laser output of a class 1M laser product with certain optical instruments (for example eye loupes, magnifiers, microscopes) within a distance of 100 mm may pose an eye hazard.

- ⇒ Do not expose eyes to the beam within a distance of 100 mm.
- ⇒ Do not view the laser output with optical instruments.
- ⇒ Follow the general laser safety instructions.

Optical surfaces

Dust and fingerprints can damage optical surfaces, particularly when such surfaces are pressed together. To protect the instrument and cables, every cable should be cleaned before it is connected to the instrument. The optical connectors on the instrument should also be cleaned regularly.

- Before cleaning the optical surfaces please pay attention to the notes on safe handling of fiber optical cables and optical connectors.
- To clean the optical connectors, remove the test adapters, dab the end surfaces of the plug pins with cleaning tape and blow out the test adapter using compressed air.
- Always fit protective caps to optical connectors that are not in use.

Ventilation Please refer to the Base Unit user manual for further information.

Battery operation Please refer to the Base Unit user manual for further information.

Start the OCC application

The fiber to be tested is connected to the optical connector.

1. Select the **Fiber Optics** button.
2. Select on the **Home** button.
3. To start the OCC application, select the **OCC** button.

Configuration

After connecting the fiber to be tested to the optical connector, you must select the OCC module (see the Base Unit manual).

To configure the Base Unit in preparation for a OCC test on a fiber, press the **SETUP** button. Two configuration procedures are available:

- “Test Auto WDM mode”
In this case the parameters are selected automatically.
- “Manual configuration”
In this case you may define your own configuration.

Test Auto WDM mode

1. Press the **Test Auto WDM** softkey.
Following configuration will automatically be set.

Parameter	Setting
Acquisition settings	
Sweep	Single
Measurements settings	
Channel detection	Permanent
Signal threshold	Auto
Splitter compensation	No
Results screen settings	
Grid	default = last value used
Alarms	No
Table notes	No
Unit	nm

In case of any parameter setting the **Test Auto WDM** softkey appears.



Fig. 2 Test Auto WDM softkey (1)

Manual configuration

Instead of selecting the Test Auto WDM mode the configuration parameters can be set manually.

The parameter to be modified must be selected by means of the direction keys \blacktriangle and \blacktriangledown . The possible options then appear on the screen: make your choice using the direction keys \blacktriangleleft and \blacktriangleright . Alternatively, change the parameters via the touchscreen.

The various parameters proposed are defined below.

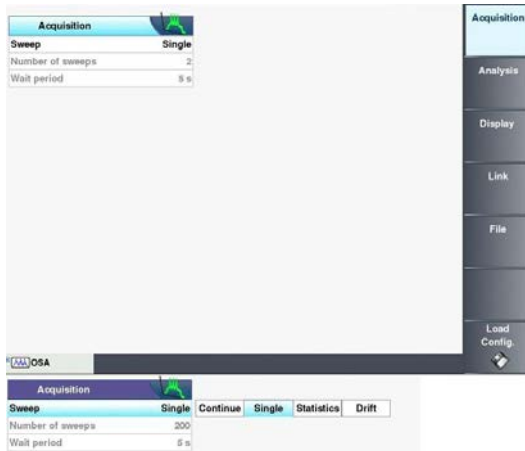


Fig. 3 Configuration for optical spectrum measurements.
(The softkeys available depend on the grid settings.)

Acquisition parameters Sweep

Continuous	There will be a measurement with refreshment of the trace and real time display of results.
Single	There will be one single measurement and the display of its results.
Statistics	In this mode, the number of samples concerned by statistics must be entered (next parameter).
Drift	For measuring power and wavelength over time. The number of sweeps and the latency between the sweeps need to be set.

NOTE

For Drift measurements a Grid needs to be defined and the Channel Detection parameter is set to Grid.

Number of sweeps

- In Statistics mode: between 2 and 1000
- In Drift mode: between 2 and 10000

Wait Period

The Wait Period parameter allows to enter a wait period prior to the measurement start (in Statistics and Drift mode only).

Up to ...	Increments of ...
1 minute	5 seconds
10 minutes	1 minute
60 minutes	5 minutes
24 hours	1 hour

Analysis parameters

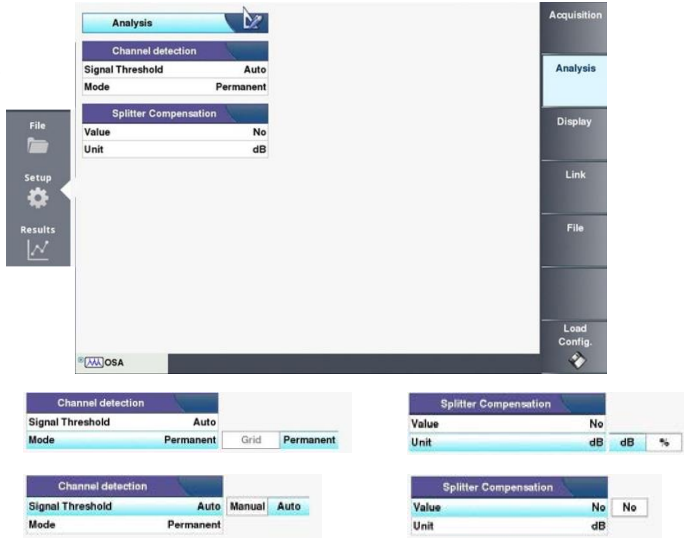


Fig. 4 Analysis parameters

NOTE

Those parameters are only linked to the current active fiber.

Channel Detection¹

Grid

The grid serves as a detection reference: it must therefore be ITU CWDM or Manual. The choice of grid takes priority over the choice **Channel detection**. For example, it is not possible to choose Channel detection = Grid, if the option selected for the grid is «None» or «Conventional».

Permanent

Automatic detection of the channel on each acquisition. In this mode the channels are always detected without making a reference measurement.

1. Attention: All modification of these parameters has immediate repercussions on the trace and entails the loss of the measurement statistics.

NOTE

At the end of an acquisition in permanent mode, it is possible to create a grid on the basis of the channels detected. To do this, press the softkey **Adopt Grid** in the **SETUP** menu.

Signal threshold¹ Threshold for detection of channels (see "[Channel detection threshold](#)" on page 26).

Auto	– The threshold is determined automatically. – To set to Auto: set threshold to -55 dBm.
Manual	– Editable from -54.9 to +10 dBm. – To modify values: use direction keys or Edit Number .

NOTE

Modification of the parameters **Channel selection** and **Signal threshold** will only modify the results if the WDM module present is the one that was used for the acquisition.

Splitter compensation When the measurement is accessed by a splitter, it is possible to compensate for the loss introduced by this element and to display the value measured before or after it.

Go to the **Splitter compensation** line to display a sub-menu proposing the following options:

Value1	Yes: activation of compensation and choice of its value using the keys ◀ and ▶: or the numeric keypad : from 1 to 30 dB (by increments of 1) or 1 to 99% (by increments of 0.1%).
Unit	Choice of compensation in dB or as a percentage of the value measured. For example, with a 10 dB splitter, the results will be augmented by 10 dB. The trace will be offset upwards by 10 dB. A channel measured at -30 dBm will be displayed -20 dBm.

Parameters of display and analysis of the results

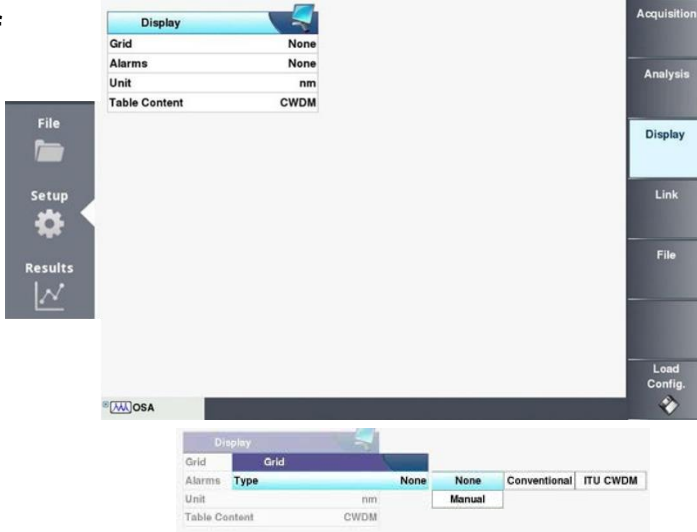


Fig. 5 Display parameters

NOTE

Those parameters are valid for all traces present on the screen.

Grid 1. Go to the **Grid** line to access the Grid sub-menu.

2. Select the **Type** line to see the different choices and modify them if required.

Five possible types of grid are proposed with different corresponding values, some of which are fixed or non-applicable, others editable.

The type **Conventional** and the option **None** do not give access to the parameters of the Grid sub-menu; the others give access to certain options, as shown in the table of the figure.



	None	Conventional	ITU CWDM	Manual
Grid name	–	–	Editable	Editable
ITU standard	–	–	G.692	N/A
First ITU channel (with display in THz)	–	–	Editable, from 196.10 to 191.20THz, by increments of 50 THz	N/A
Channel spacing	–	–	50GHz	N/A
Number of channels	–	–	Editable, from 1 to 99 by increments of 1	Editable from 1 to 256
Define channels	–	–	Sub-menu accessible to display the wavelengths of each channel, name the band, and name each channel.	

NOTE

The maximum real number of channels for ITU grids depends on the value selected for the first channel and the spacing between the channels.

NOTE

It is possible to display the grid with the **View Grid** softkey. A table appears showing the channel number, the name of the channel, the reference wavelength and the alarm thresholds for delta frequency, minimum power and maximum power.

Alarms When **Channel Selection** is positioned on **Grid**, it is possible to activate an alarm system. This system is based on a system of thresholds. Any measurement results that exceed these thresholds are displayed in red in the table, and the icon  appears at the top right of the screen. If all the results are within the thresholds (no result is in red), the icon becomes .

⇒ To activate the alarm system, go to the **Alarms** line and select **Active**.



Fig. 6 Alarm parameters

Thresholds can then be set (using the direction keys or numeric keypad), to global level or to the level of each channel:

Global alarms

Number of channels	Yes/No
Delta channel power¹	“No” or threshold modifiable from 0.1 to 60 dB (for “No” set threshold to Min)
Composite power²	“No” or threshold modifiable from -59.9 dBm to +20 dBm (for “No” set power to Min)

1. Max. acceptable variation between max. power and min. power on all channels
2. Maximum composite power

Channel alarms

Max channel offset¹	Yes/No
Min channel power²	Yes/No
Max channel power³	Yes/No
Channel Number	From «001» to the max. number of channels.
Channel Value	Display of the wavelength of the channel number selected
Delta Offset⁴	From 0 to 10 nm
P Min⁵	From -55 dBm to P Max
P Max⁶	From P Min to +10 dBm

1. Wavelength drift. Selection of the alarm on the basis of the value of Delta Offset
2. The values are then defined in PMin
3. The values are then defined in PMax
4. Delta of frequency
5. Minimum power
6. Maximum power

Notes Table Here the display can be configured and it can be specified whether or not it is possible to enter a note for each channel (see "Table notes" on page 32):

Manual	Allows to manually enter a note for each channel in the results table.
No	Notes function is disabled.

Unit Here the units of the x axis can be selected:

nm	Wavelength in nm
THz	Frequency in THz



Fig. 7 Unit parameters

Table Content Here the table content can be selected.



Fig. 8 Table Content parameters

Link Description Define the parameters in the **Link Description** menu and add a comment.

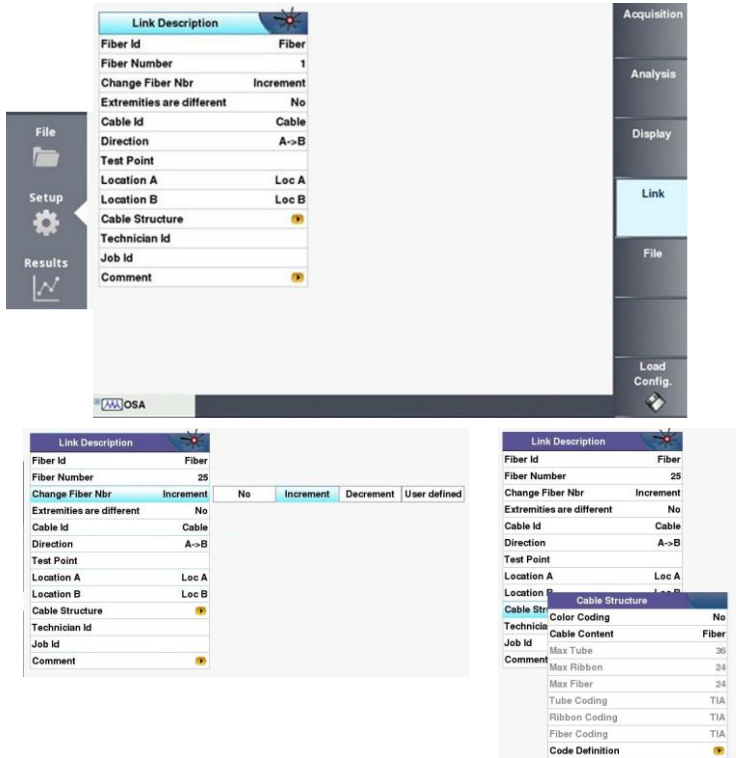


Fig. 9 Link Description parameters

File Configuration In the **File Configuration** menu, the memory management is set.

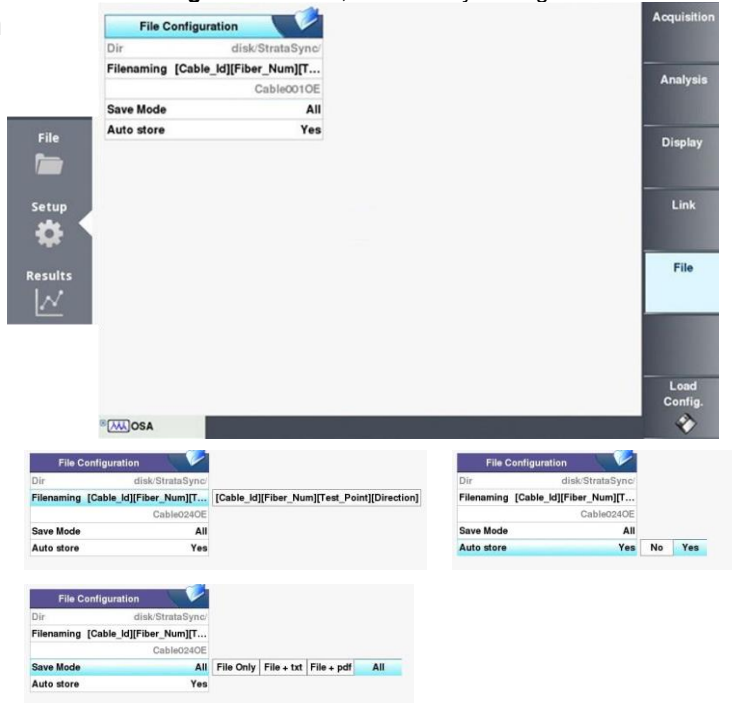


Fig. 10 File Configuration parameters

Acquisition

⇒ To start a measurement press the **START** key.

The OCC-4056C will scan over the entire wavelength range and the measurement result will be displayed in graphical and tabular format.

Trace display functions By pressing the **RESULTS** button the results window is displayed.
The Trace/Table key offers a choice from the following displays:

Trace	Main display of the trace with a single line of the table at the foot of the page. See “Result display” on page 21
Table	Display of the table only. See “Table display” on page 29
Trace + Table	Display of trace, reduced in size, followed by a table of results. See “Trace & Table display” on page 34

Result display

To display the trace only select Trace in the Trace/Table softkey.

Overview

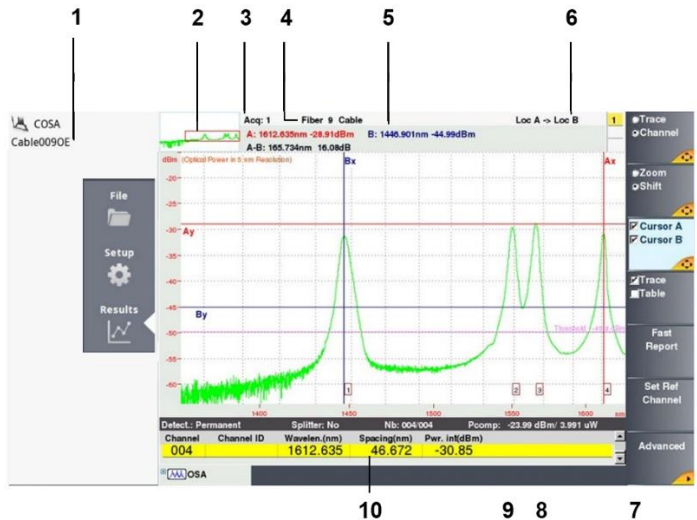


Fig. 11 Example of result display (Trace only)

1. Filename (only if file was stored)
2. Mini-trace
3. Number of acquisition
4. File settings:
The displayed parameters depend on the settings in the File settings menu. Following parameters may be displayed: [Fiber Id] [Fiber Number] [Cable Id]
5. Trace results associated with cursors A and B:
 - A, B: Wavelengths and power at point of trace referenced by cursors A and B
 - A-B: Wavelength and power difference between cursors A and B
6. Alarm result (see “Alarms” on page 15).
7. Trace/Table selection
8. Channel number
9. Trace with markers
10. Table of results (see “Table display” on page 29).

The trace represents power (in dBm) as a function of frequency (in THz) or wavelength (in nm).

NOTE

If several acquisitions are performed, the trace displayed is the one corresponding to the last acquisition.

The softkey give access to following functions and menus:

**Trace
Channel**

Allows to select a trace or a channel (by means of the arrow keys). If only one trace is displayed, this softkey is available but does not allow to select Trace.

- **Trace:** pressing any arrow key selects another trace (at least two traces must be available).
- **Channel:** pressing the ◀ and ▶ keys selects another channel.

**Zoom
Shift**

This softkey is only available if the trace is displayed.

- **Zoom:** pressing the arrow keys zooms the axis according to the selected cursor.
- **Shift:** pressing the arrow keys moves the trace.

**Cursor A
Cursor B**

This softkey is only available if the trace is displayed.

Pressing the softkey selects the cursor: A, B, A+B.

**Trace
Table**

Pressing the softkey offers a choice from the following displays:

- **Trace:** Main display of the trace with a single line of the table at the foot of the page.
- **Trace & Table:** Display of trace, reduced in size but followed by 5 to 8 lines of the table of results.
- **Table:** Display of the table alone.

Table Content Gives access to table related functions.

Advanced

Gives access to further trace related functions.

- Using the cursor** By means of the two cursors A and B following functions are available:
- displaying the power level at the cursor position
 - measuring delta power and total power between two points
 - zooming and shifting the trace according to the cursor positions

Selecting a cursor ⇒ Press the **Cursor A/Cursor B** softkey to select a cursor: A, B, A+B.
A selected cursor is displayed as a solid line, a deselected cursor is displayed as a dotted line.

- Displaying the y-axis cursor**
1. Press the **Advanced** softkey to open the menu.
 2. Press the **Cursor X/Cursor Y** softkey to select **Cursor Y**.

Moving the cursor The cursor can be moved on the trace from one measurement point to the next or by jumping from one channel to the next (both forward and backward).

To move the cursor on the trace:

1. Press the **Cursor X/Cursor Y** softkey to highlight the tab and to select a cursor if needed.
2. Press the ◀ or ▶ key to move the cursor backward or forward.
If both cursors are selected both cursors will be moved in parallel.

To jump from one channel to the next:

1. Press the **Trace/Channel** softkey to highlight the tab.
2. Press the ◀ or ▶ key to jump one channel backward or forward.

The Zoom function Both x- and y-axis can be zoomed.

When zooming the x-axis the area to be zoomed is defined by the selected cursor and its position:

- If only one cursor is selected, the cursor position is kept while the areas left and right to the cursor are zoomed.
- If both cursors are selected the center between both cursors is kept.

To zoom the x-axis:

1. Select a cursor or both cursors and move them to the desired position.
2. Press the **Zoom/Shift** softkey and select **Zoom**.
3. Press the ◀ or ▶ key to reduce or enlarge the x-axis.

To zoom the y-axis:

Zooming the y-axis is independent from the cursor settings.

1. Press the **Zoom/Shift** softkey and select **Zoom**.
2. Press the ▲ or ▼ key to reduce or enlarge the y-axis.

**The Shift
function**

The shift functions moves the trace and keeps the cursor on this positions. Shifting the trace is independent from the cursor settings.

To shift the trace:

1. Press the **Zoom/Shift** softkey and select **Shift**.
2. To shift the trace left or right: press the ◀ or ▶ key.
3. To shift the trace up or down: press the ▲ or ▼ key.

**The
measurement
function**

By setting both cursors two values can be measured:

- **Difference Power (A-B)**: the difference power between the two cursor positions
- **Total Power**: the total power between the two cursor positions
- **Delta power**: slope and difference power between the first and the last detected channel within the area marked by the cursors.

To measure the Difference Power:

⇒ Set the cursors to the desired positions.

The difference power is displayed in the trace result field above the diagram (A-B).

To measure the Total Power:

1. Set the cursors at the desired positions.
2. Press the softkeys **Advanced**, **Measure A<->B** and **Total Power A<->B**.

The space between the trace and the two cursors is greyed out and the power is displayed.

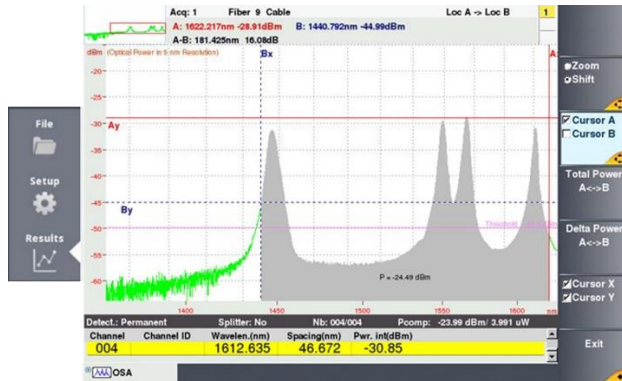


Fig. 12 Example of Total Power measurement

- Pressing the key **Total Power A<->B** a second time removes the result of the total power measurement.

To measure the Delta Power:

- Set the cursors to the desired positions. At least two detected channels must be between the cursors.
- Press the softkeys **Advanced**, **Measure A<->B** and **Delta Power A<->B**.

The first and last maximum are linked by a solid line. The slope in [dB/nm] and the difference power in [dB] are stated below the line.

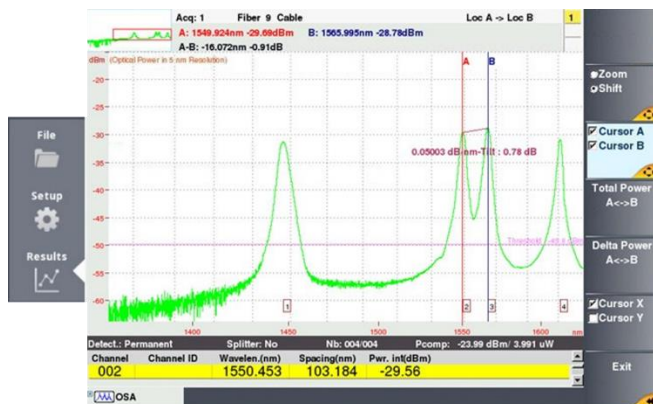


Fig. 13 Example of Delta Power measurement

Channel detection threshold On the trace, some peaks corresponding to noise could be mistaken for channels. It is therefore necessary to fix a power threshold level: only peaks that exceed this threshold will be considered as channels and included in the table of results.

To display or modify this threshold, press the **SETUP** key, then select **Signal threshold**. Modify the value to position it on **Auto**¹ or fix a threshold value.

When set to Auto, the signal threshold is calculated from the actual trace.

Display of a grid The display window of the trace can include a grid to facilitate verification of the position of the channels. Several grids are possible (see the chapter "[Parameters of display and analysis of the results](#)" on page 14).

1. The "Auto" value is obtained by continuing to reduce the value of the threshold below the minimum value of -54.9 dBm

Multiple traces (Overlay) The Overlay functions allows you to display multiple traces in one view and to compare them.

NOTE

The Overlay function is not available in Drift mode.

To add a new trace:

1. Press the **Advanced** softkey, then **Overlay**.
2. Press the **Set New Trace** softkey.
A copy of the previously active trace is added to the display. A new number is added to the trace tab line.
3. Start a new measurement or open the **File** menu and select a trace to be loaded.
The selected trace is overwritten by the new one.

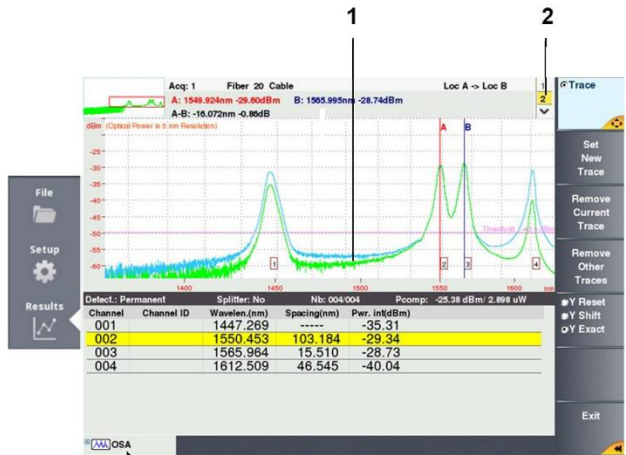


Fig. 14 Displaying multiple traces

1. New trace (active trace in green)
2. Trace number (active trace in orange)

To remove a trace:

1. Press the **Trace** softkey and use the arrow keys to select a trace.
2. Press the **Remove Current Trace** softkey.

Adjusting the yaxis To compare curves the y axis of the curves can be adjusted by the **Y Reset/Y Shift/Y Exact** softkey.

⇒ Press the softkey to select one of the following settings:

- **Y Reset:** All traces are on the the same level at the intersection with the active cursor.
- **Y Shift:** Each trace is shifted 5 dB from the other.
- **Y Exact:** The traces displayed are on the same position according to their injection level.

Displaying the difference of two curves A difference can be build from two curves.
1. Display the two curves.

2. Press the **Advanced** softkey, select **Overlay** and then **2 Curves Diff.**

The difference curve is displayed as a new trace in the diagramm.

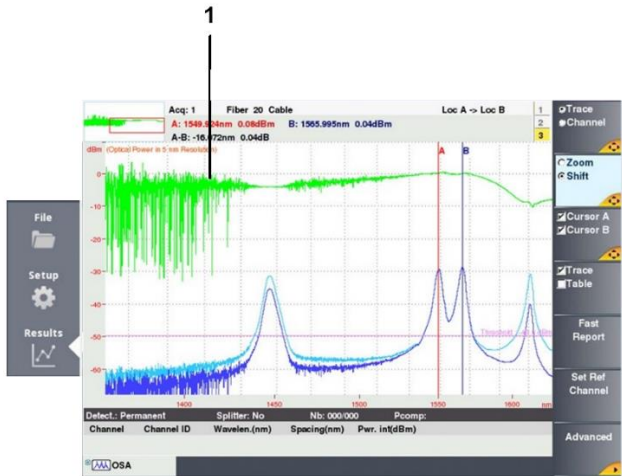


Fig. 15 Difference of two curves (1)

Table display

The table may be displayed in a single line, on half of the screen or the whole screen as a function of the **Trace/Table** key.

Overview

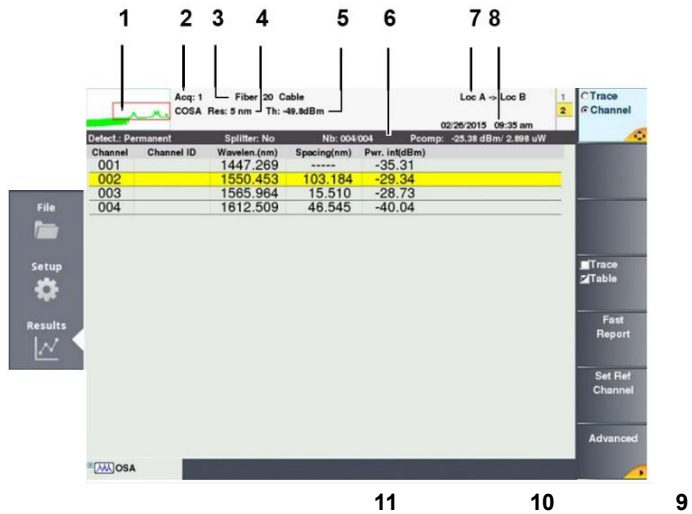


Fig. 16 Example of result display (Table only)

1. Mini-trace
2. Number of acquisition
3. File settings:
The displayed parameters depend on the settings in the File settings menu. Following parameters may be displayed:
[Fiber Id] [Fiber Number] [Cable Id]
4. Comment:
The comment can be entered in the Setup menu.
5. Measurement settings:
 - Res: Resolution
 - Th: Threshold
6. Measurement settings and results:
 - Detect.: Detection **Grid/Permanent**
 - Splitter: Splitter Compensation **Yes/No**
 - Nb: Number of channels **detected/available**
 - Pcomp: Composite power of all channels

7. Direction:
Loc A and **Loc B** will be used as default. If **Origin** and **End Location** are set in the Setup menu, these settings will be used instead.
8. Date and time of measurement
9. The Advanced tab is disabled in the Table only view.
10. Selected channel
11. Table contents:
For further details see following sections "[Table contents](#)" on page 30, and "[Table statistics](#)" on page 31.

Table contents According to the choice made in the **SETUP** menu, the table of results may include:

- either a line for each channel detected (if Channel Selection = Permanent)
- or a line for each graduation, (if Channel Selection = Grid and a grid is selected)

In the absence of statistics (see "[Analysis parameters](#)" on page 12) the parameters given for each channel are as following:

Channel	The number of the channel
Wavelen.	<ul style="list-style-type: none">– Absolute mode: the frequency or the wavelength of the selected channel in [THz] or in [nm]– Relative mode: the frequency or wavelength difference to the reference channel
Offset/Spacing	The column depends on the Channel detection setting: <ul style="list-style-type: none">– Grid: Offset shows deviation from Grid wavelength in [GHz] or in [nm]– Permanent: Spacing shows spacing between the channels in [THz] or in [nm]
Level	<ul style="list-style-type: none">– Absolute mode: the level of the channel in [dBm]– Relative mode: the difference level to the reference channel in dB For the OCC-4056C this parameter indicates the peak channel power level.
P/Pcomp	The ratio between the power of the channel and the composite power in [%].

Table statistics When selecting the Statistics measurement mode and multiple acquisitions are performed, statistics are calculated on the results.

To display these results in the table:

⇒ Press the **Table Content** key, then **Statistics** and set **Stat.** to **On**.

Different Statistics keys are available to choose the content of the table display for each channel.

The following statistics can be selected:

Wavelen.	Wavelength or frequency statistics
Level	Power statistics
Mixed	Wavelength (resp. frequency) and power statistics

When selecting **Wavelen.** or **Level** the display will give current value, average value, max. value, min. value and standard deviation, or delta between min. and max. (selectable).

When selecting **Mixed** the table will show a mixture of statistical results: current, min. and max of wavelength or frequency, and current, min. and max of the power levels.

Channel sort The channels can be classified in the table in ascending order of wavelength (or descending order of frequency, depending on the selected unit) or level.

To modify this order:

1. Press the **Table Contents** key, then **Sort**.
2. Press **Wavel. Sort** or **Level Sort**.

Successive addressing of channels according to the sort type selected

On the trace and in the table, it is possible to move the cursor from one channel to the next in the selected sort order. To do this:

1. Use the key **Cursor A / Cursor B** to choose the cursor A or B to be used on the trace.
2. Press the **Channel** key.
3. Press ◀ and ▶ to move the cursor to the following or preceding channel:

Table notes A note of not more than 40 characters, entered by the user, may be associated with each channel.

NOTE

Each note is associated with a channel. Consequently, if the channel is deleted, the note will be deleted too.

NOTE

These notes appear in the table only if they have been validated in the **SETUP** menu on the **Table notes** line (Result screen). Similarly, this option must be confirmed in order to be able to create a note.

To enter a note:

1. In the table, select the channel.
2. Press the **Table Contents** key, then press **Notes**.
3. Enter the text of the note and confirm its creation.
4. Press the **Exit** key to return to the previous menu if necessary.



NOTE

The table notes are not stored in the measurement results.

Displaying relative results

By default, the table gives the results in absolute values. To obtain these results in relative values with respect to a reference channel:

1. Press the **Table Contents** softkey, then **Relative/Absolute** to select **Relative**.
2. Move the cursor on to the channel that is to serve as the reference.
3. Press the **Set Ref Channel** softkey. The results are recalculated with respect to this channel of reference.

Result colours When Channel Selection is positioned on Grid and the alarm system is activated, measurement results that exceed the defined thresholds are displayed in red, results within the thresholds are displayed in green. (Additionally the icon  indicates that at least one result exceeds the threshold and if all results are within the thresholds (no result is in red), the icon becomes . See "Alarms" on page 15.)

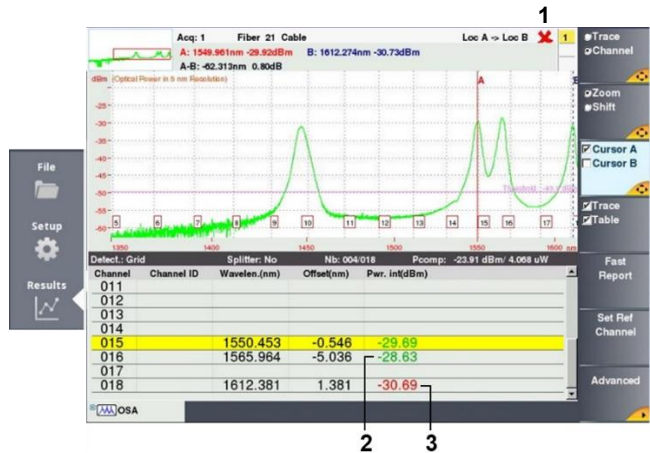


Fig. 17 Displaying multiple traces

1. Not all results are in the thresholds.
2. Results within the thresholds are displayed green.
3. Results outside the thresholds are displayed red.

Trace & Table display

The Trace & Table display is a combination of the trace only and table only displays.

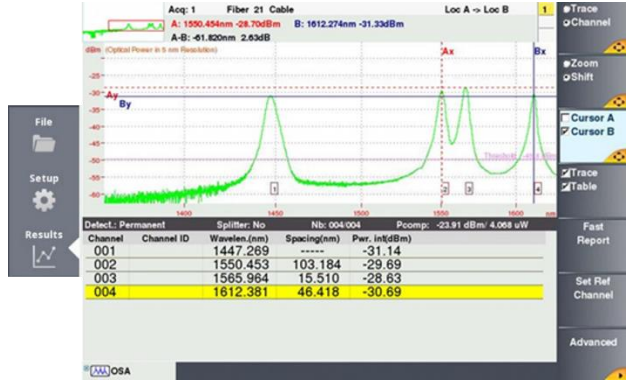


Fig. 18 Example of Delta Power measurement

For explanations about the trace functions please see “[Result display](#)” on page 21, for explanations about the table functions please see “[Table display](#)” on page 29.

Drift measurement

The OCC-4056C modules provide a Drift measurement application to perform multiple measurements and display the recorded results in a graphical format (trace) over the time.

This can be used to monitor the drift of power and wavelength of optical systems or components. This is important to measure the drift of non temperature stabilized transmitter in CWDM networks.

NOTE

A Drift measurement can only be done at predefined wavelengths or frequencies, for this reason a reference Grid needs to be defined and the Channel Detection parameter is set to Grid.

The following parameters need to be set for Drift measurements:

Sweep	Set to Drift.
Number of Sweeps	Defines the number of sweeps (1 to 10.000).
Wait Period	Defines the time between the measurements.

NOTE

Wait period specifies the time between start of one measurement and start of the next measurement and includes the instrument measurement time

All channels defined by the channel Grid can be monitored simultaneously with the drift application. To show the monitored measurement parameter use the **Trace/Channel/Drift** button in the result screen.

This button has a toggle function with the following selections:

Trace	In Drift mode only one trace can be displayed. Thus, Trace can not be selected.
Channel	In Channel mode the up/down cursor change the channel to be displayed over time.
Drift	Activates the drift display showing the selected parameter over time.

Activating the Drift display will show the following screen:



Fig. 19 Example of drift measurement, figure shows wavelength drift over time

In the Drift display the measurement result is shown in a graphical format (trace over time / scans) and a tabular format. The table shows the following parameters:

Wavelen.	Level	Description
Channel	Channel	Number of the displayed channel.
Wavelen. (nm)	Wavelen. (nm)	Wavelength or Frequency of the displayed channel.
L Ref (nm)	Level (dBm)	Reference value of wavelength or power.
L Avg (nm)	P Avg (dBm)	Average value of wavelength or power.
L Min (nm)	P Min (dBm)	Minimum of wavelength or power.
L Max (nm)	P Max (dBm)	Maximum of wavelength or power.
Sdev L (nm) or Delta	Sdev P (dBm) or Delta	Standard deviation or delta (min/max) of wavelength or power.

All Zoom and Shift functions are available in Drift mode.

By using the cursor A it is possible to get access to each measured data point. The Start value as well as the actual cursor position including the time information is shown in the blue field of the table.

NOTE

If the channel power drifts to a power level below the channel detection threshold, the measurement will indicate "No Signal" in the bar above the table.

Reports

Fast Report Fast Report generates a report which is stored in file system.

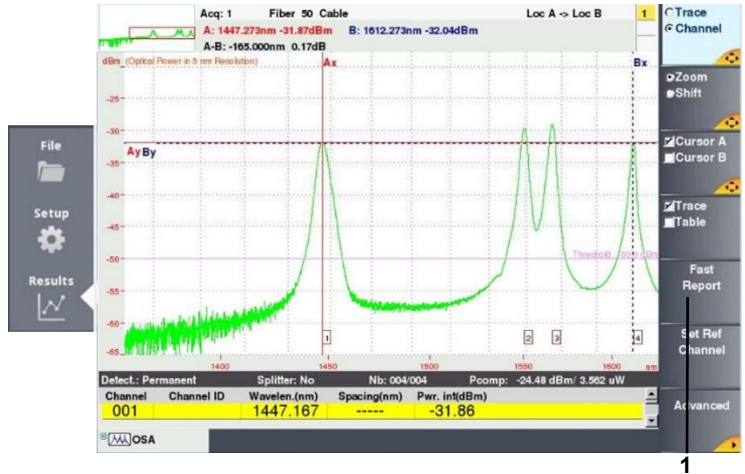


Fig. 20 Fast Report (1)

⇒ To change the Fast Report parameters, select the **Results** button.

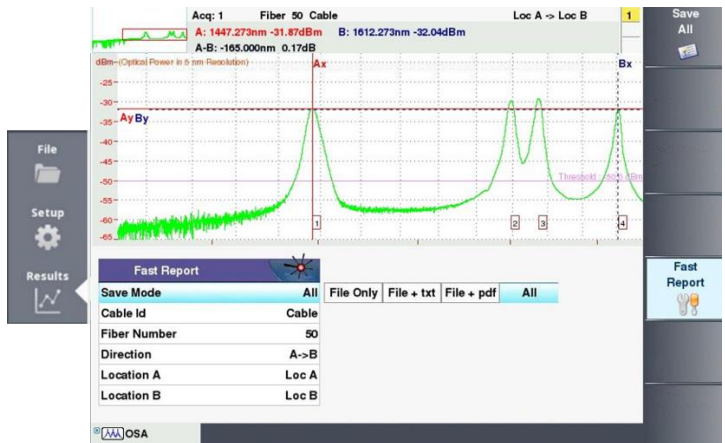


Fig. 21 Fast Report parameters

File system report ⇒ To view the reports on the file system, select the **File** button.

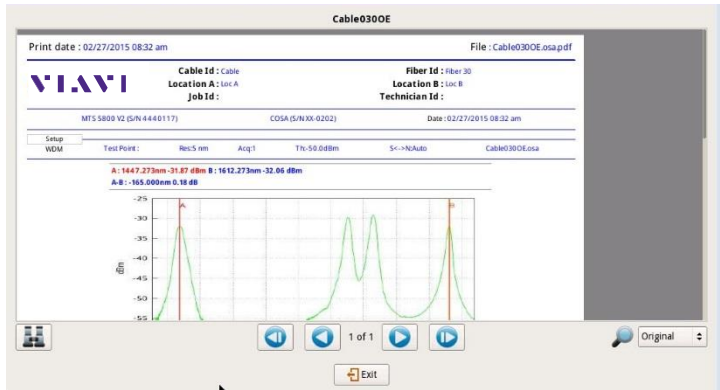


Fig. 22 Report from file system

File management

Storing OSA measurements If Auto store has been selected, then results will be saved automatically. If not, or if you want to save the results under another name, directory etc.:

1. Click on **FILE** key.
2. Select **Setup** with the **Setup/Explorer** key.
3. Modify the parameters you want.
4. Click on **Store Trace**.

The trace is saved with the extension "OSA".

Recalling OSA files Once an OSA file has been stored, recall it using the **Explorer**:

1. Select **Explorer** with the key **Setup/Explorer**.
2. Using directions keys, select the directory and then the file to open.
3. Click on **Load**.
4. Click on **View Trace(s)** or **Load Trace + Config**.

The selected file is opened.

For further informations on file management, please see the chapter "File Management" in the Base Unit user manual.

Recycling information

Environmental Management Program

VIAV | Superb performance and high quality have always characterized VIAVI datacom and telecom measurement technology products. In this same world-class tradition, VIAVI has an established, proactive program of environmental management.

Environmental management is an integral part of VIAVI's business philosophy and strategy requiring the development of long-term, productive solutions to problems in the key areas of economics, technology, and ecology.

A systematic environmental management program at VIAVI is essential in regard to environmental policy and enhances cooperation between ourselves and our business partners.

The program considers

Product design and manufacture Environmental restrictions and requirements are taken into account during planning and manufacture of VIAVI products. This attention ranges from the raw materials and finished components selected for use and the manufacturing processes employed, through to the use of energy in the factory, and right on up to the final stages in the life of a product, including dismantling.

Hazardous materials

VIAVI avoids or uses with care any hazardous or dangerous material in the manufacturing process or the end product. If the use of a dangerous material cannot be avoided, it is identified in product documentation and clearly labeled on the product itself.

Packaging materials

Preference is given to reusable or biodegradable single substance packaging materials whenever possible.

Environmental management partnerships

VIAVI encourages our customers and suppliers who take this responsibility seriously to join VIAVI in establishing their own environmental management programs.

Recycling used products

This product complies with the European Union Waste Electrical and Electronic Equipment directive (WEEE), 2002/96/EC. This product should not be disposed of as unsorted municipal waste and should be collected separately and disposed according to your national regulations.



In the European Union, all equipment purchased from VIAVI after 2005-08-13 can be returned for disposal at the end of its useful life. Measuring systems affected by this can be recognized by the symbol on the right of a crossed-out trash can and a black bar. This symbol can be found either on the device or in the accompanying documents.

Contact your local Technical Assistance Center (TAC) for return and collection services available to you.

RoHS The following pages provide with respect to Chinese Requirements information with regard to the location of restricted hazardous substances within this equipment.

As measuring equipment this equipment is excluded from the European regulations for the restriction of hazardous substances (RoHS).

"中国RoHS" 《电子信息产品污染控制管理办法》（信息产业部，第39号） 附录 (Additional Information required for the Chinese Market only)

本附录按照"中国RoHS"的要求说明了有关电子信息产品环保使用期限的情况，并列出了产品中含有的有毒、有害物质的种类和所在部件。本附录适用于产品主体和所有配件。

环保使用期限：



本标识标注于产品主体之上，表明该产品或其配件含有有毒、有害物质（详情见下表）。其中的数字代表在正常操作条件下至少在产品生产日期之后数年内该产品或其配件内含有的有毒、有害物质不会变异或泄漏。该期限不适用于诸如电池等易耗品。有关正常操作条件，请参见产品用户手册。

产品生产日期请参见产品的原始校准证书。

有毒、有害物质的类型和所在部件

元器件 (Component)	有毒、有害物质和元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr ⁶⁺)	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
产品主体 (Main Product)						
印刷电路板组件 (PCB Assemblies)	X	0	0	0	0	0
内部配线 (Internal wiring)	0	0	0	0	0	0
显示器 (Display)	0	0	0	0	0	0
键盘 (Keyboard)	0	0	0	0	0	0
塑料外壳零件 (Plastic case parts)	0	0	0	0	0	0
配件 (Accessories)	0	0	0	0	0	0

0：代表该部分中所有均质材料含有的该有毒、有害物质含量低于SJ/T11363-2006标准的限值。
X：代表该部分中所有均质材料含有的该有毒、有害物质含量高于SJ/T11363-2006标准的限值。

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