1310nm 60nm Single Mode Tunable Filter

Product Description

High-speed tunable bandpass filter. As a two-port optical module, the input port receives broadband multi-wavelength light and only a small portion of the incident signal within the passband is allowed to pass through the filter and directed to the output port. The center wavelength of the selected band can be tuned to anywhere within the operating wavelength range. In our design flexibility, transmission bandwidth, wavelength tuning range can be customized. The voltage-controlled filter requires no moving parts, has fast tuning speed, and is compact and small in size. Our filters are used as suppression filters in optical systems to improve laser signal-to-noise ratio in wavelength scanning engines of optical spectrum analyzers (OSAs) and in system diagnostic communication systems.

Part Number

TOF-1310-500-60-SA

Product features

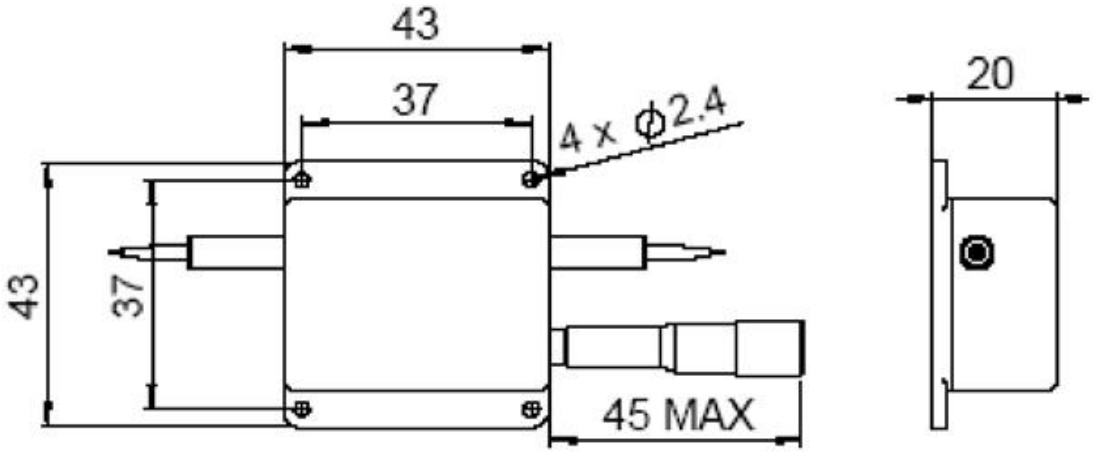
High-speed wavelength tuning 、 Wide operating wavelength range 、 Flat-top/Gaussian filter shapes、 No moving parts、 Over 1 billion cycles

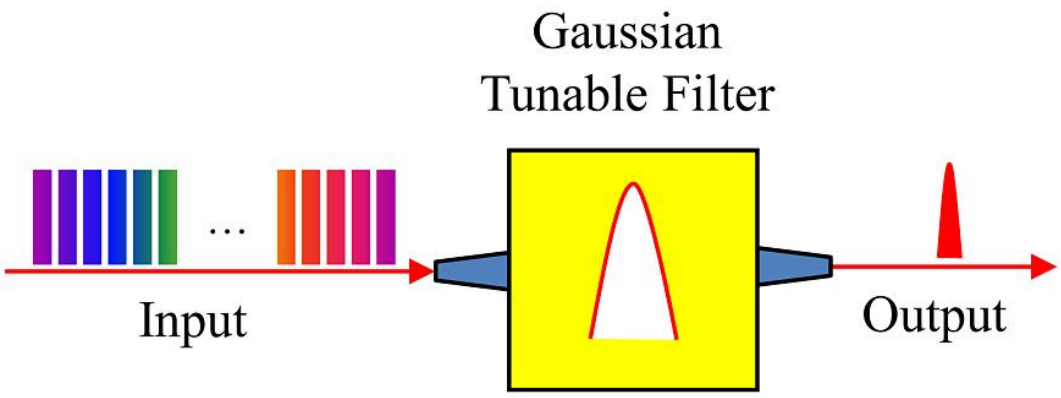
Application area

Optical spectrum analyzer engine、 ASE noise suppression、 Optical channel diagnostics、 Test and measurement instruments、 Channel selection for wavelength lockers

Parameters

Dimensional Drawing



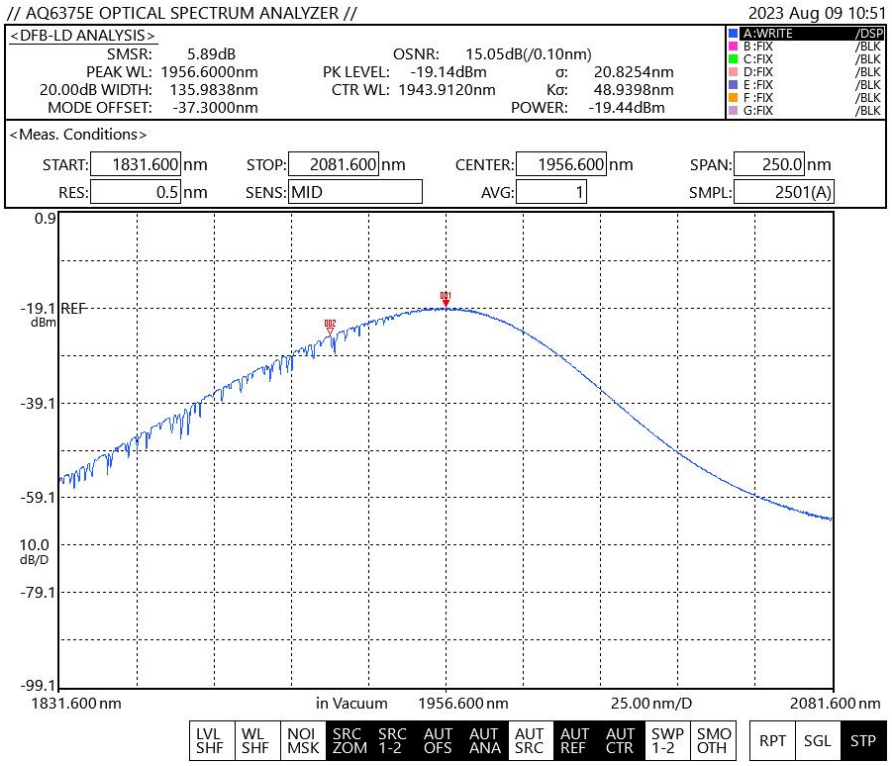


Technical parameters:

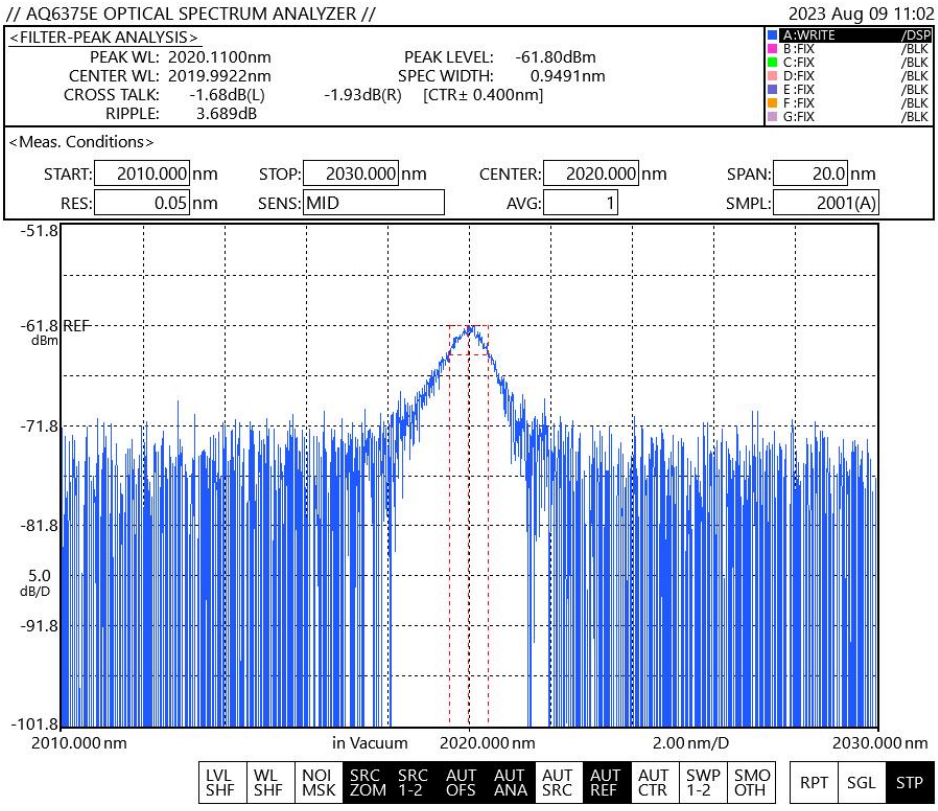
Parameters	Min	Typical	Max	Unit
Center wavelength	–	1060, 1310, 1550, 2000	–	nm
Tuning range[1]	–	60	80	nm
Tuning resolution	–	0.1	–	nm
Insertion loss[2]	2	3	4	dB
Bandwidth @-3dB	–	1	1.2	nm
Bandwidth @-20dB	–	10	–	nm
Sideband suppression	–	30	–	dB
PDL (SM fiber only)	–	0.15	0.35	dB
PMD (SM fiber only)	–	–	0.5	ps
Extinction ratio (PM fiber only)	18	23	–	dB
Return loss	40	–	–	dB
Operating power (CW)[3]	–	0.5	15**	W
Operating temperature	0	20	60	° C
Storage temperature	-10	–	70	° C
Dimensions	–	43 L x 43 W x 20 H	–	mm

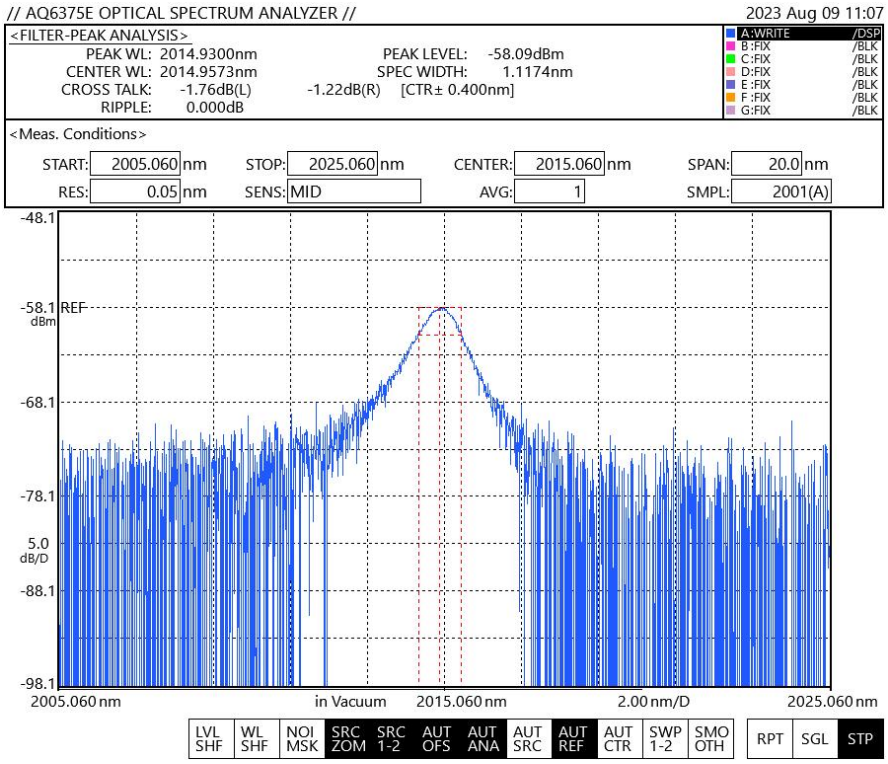
[1]. Longer wavelength and larger tuning range.
[2]. Small core fiber has greater loss. Loss data tested with broadband light source without connector.
[3]. Supports customized service of high operating power up to 15W.

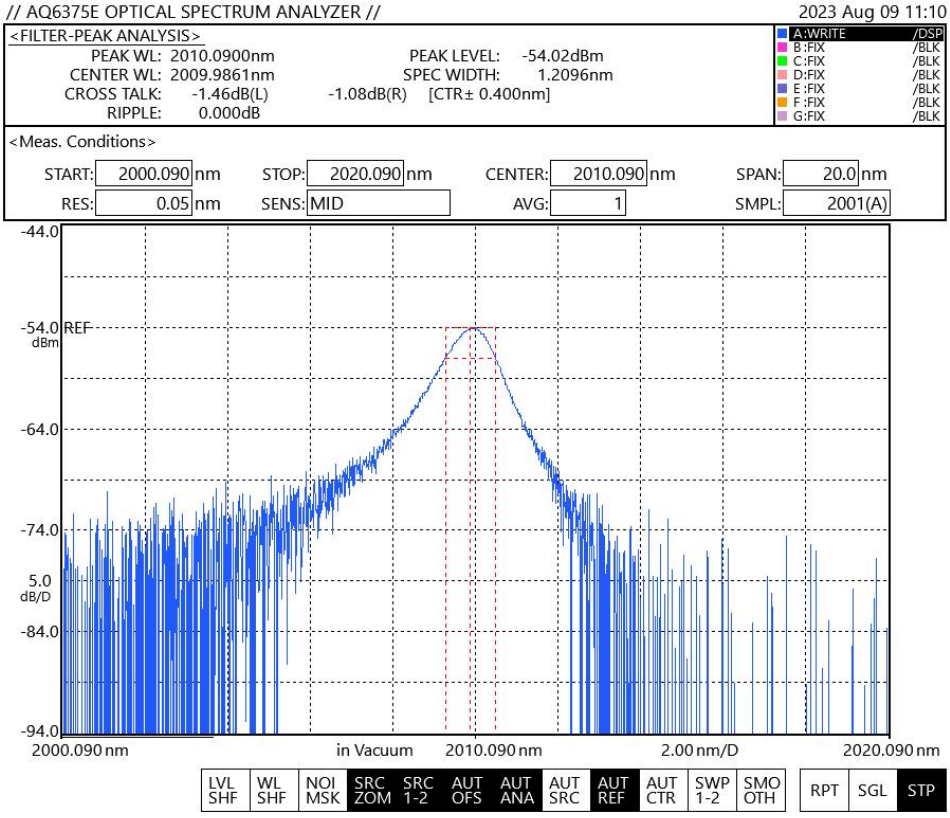
Test light source spectrum

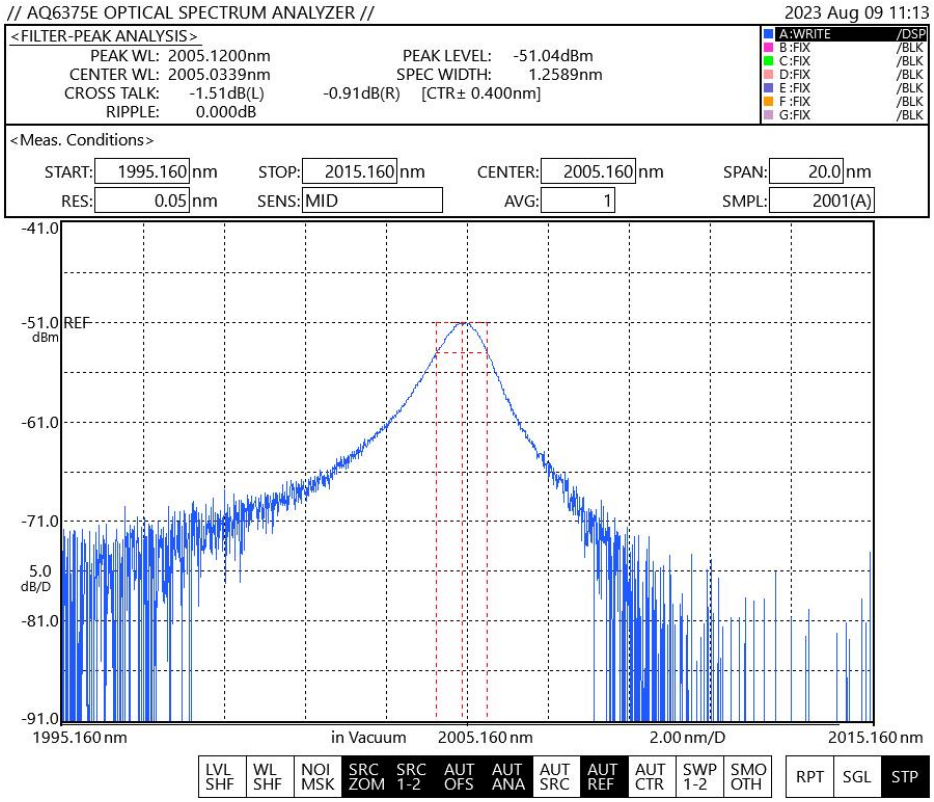


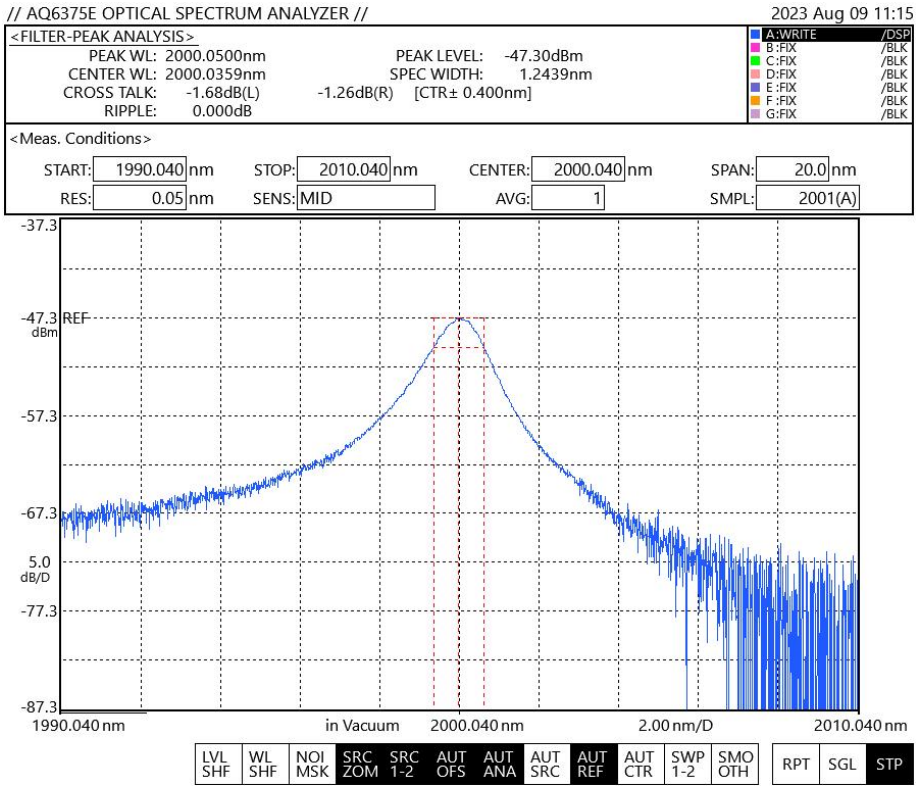
Measured spectrum

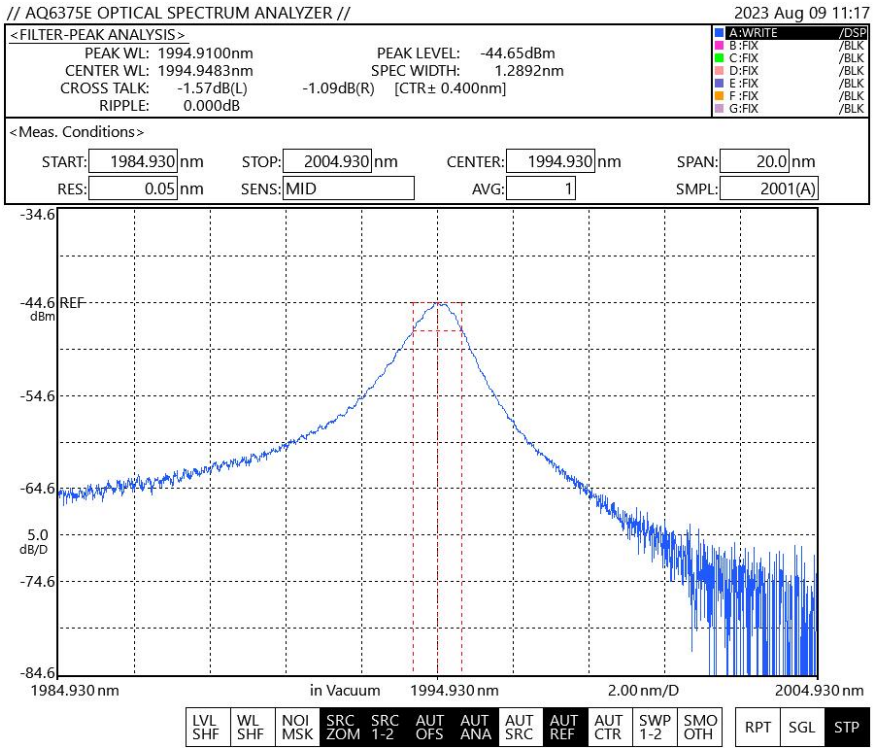


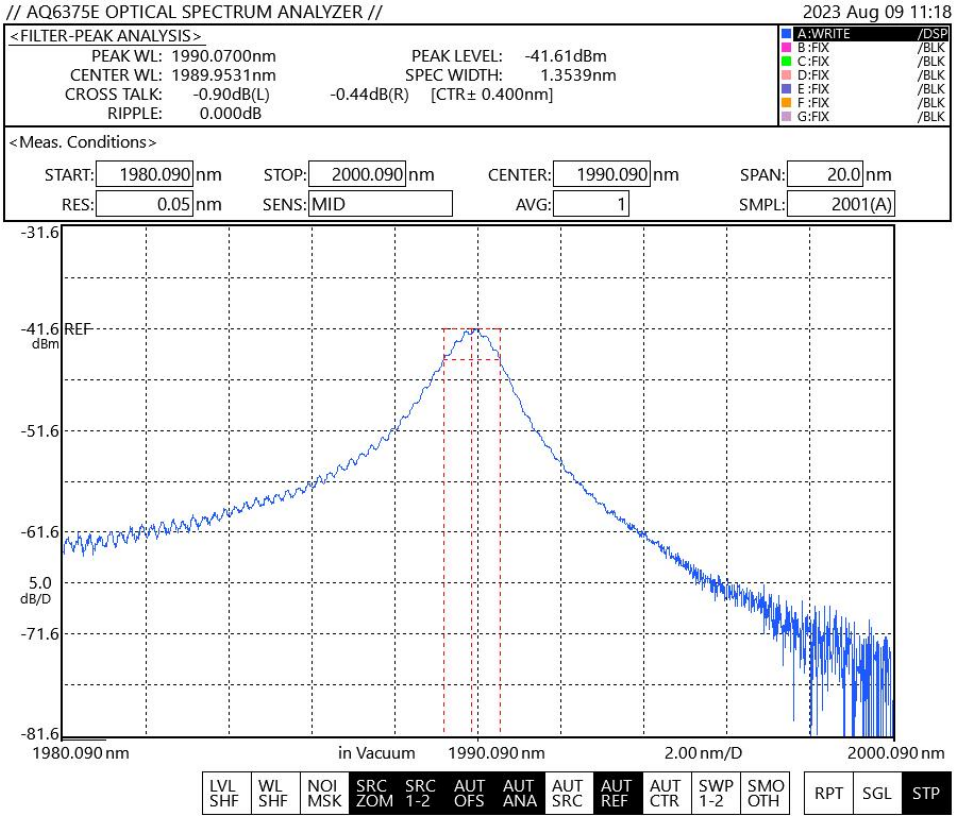

// AQ6375E OPTICAL SPECTRUM ANALYZER //
2023 Aug 09 11:07
<FILTER-PEAK ANALYSIS>
PEAK WL: 2014.9300nm
CENTER WL: 2014.9573nm
CROSS TALK: -1.76dB(L)
RIPPLE: 0.000dB
PEAK LEVEL: -58.09dBm
SPEC WIDTH: 1.1174nm
-1.22dB(R) [CTR± 0.400nm]
A:WRITE /DSP
B:FIX /BLK
C:FIX /BLK
D:FIX /BLK
E:FIX /BLK
F:FIX /BLK
G:FIX /BLK
<Meas. Conditions>
START: 2005.060 nm
STOP: 2025.060 nm
CENTER: 2015.060 nm
SPAN: 20.0 nm
RES: 0.05 nm
SENS: MID
AVG: 1
SMPL: 2001(A)
-48.1
-58.1 dBm
REF
-68.1
-78.1
5.0 dB/D
-88.1
-98.1
2005.060 nm
in Vacuum
2015.060 nm
2.00 nm/D
2025.060 nm
LVL SHF
WL SHF
NOI MSK
SRC ZOM
SRC 1-2
AUT OFS
AUT ANA
AUT SRC
AUT REF
AUT CTR
SWP 1-2
SMO OTH
RPT
SGL
STP

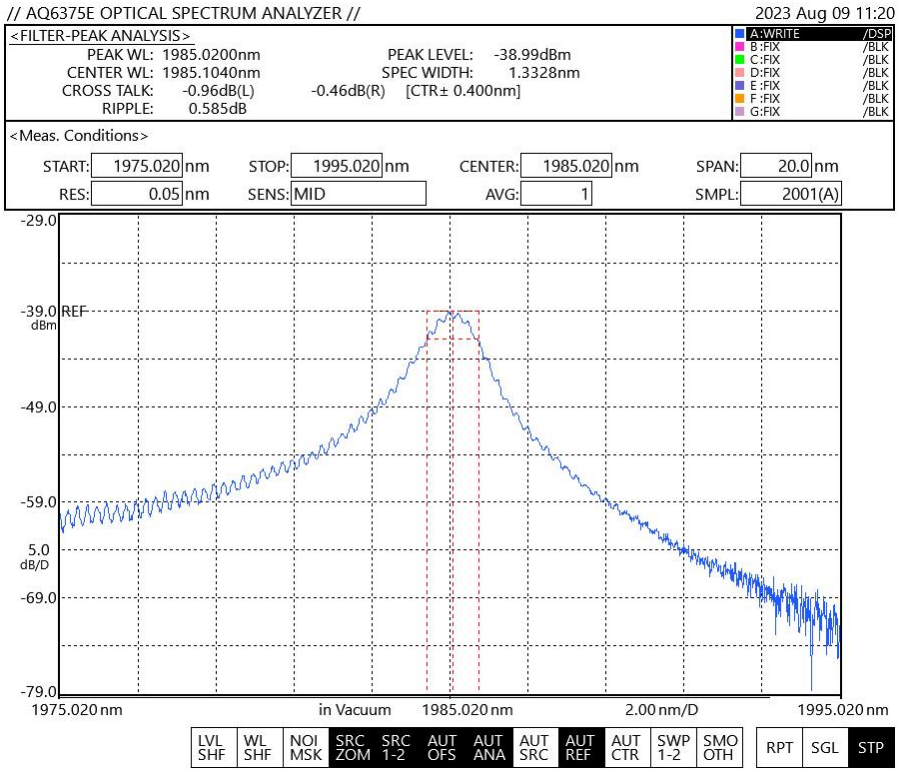

// AQ6375E OPTICAL SPECTRUM ANALYZER //
2023 Aug 09 11:10
<FILTER-PEAK ANALYSIS>
PEAK WL: 2010.0900nm
CENTER WL: 2009.9861nm
CROSS TALK: -1.46dB(L)
RIPPLE: 0.000dB
PEAK LEVEL: -54.02dBm
SPEC WIDTH: 1.2096nm
-1.08dB(R) [CTR± 0.400nm]
A:WRITE /DSP
B:FIX /BLK
C:FIX /BLK
D:FIX /BLK
E:FIX /BLK
F:FIX /BLK
G:FIX /BLK
<Meas. Conditions>
START: 2000.090 nm
STOP: 2020.090 nm
CENTER: 2010.090 nm
SPAN: 20.0 nm
RES: 0.05 nm
SENS: MID
AVG: 1
SMPL: 2001(A)
-44.0
-54.0 dBm
REF
-64.0
-74.0
5.0 dB/D
-84.0
-94.0
2000.090 nm
in Vacuum
2010.090 nm
2.00 nm/D
2020.090 nm
LVL SHF
WL SHF
NOI MSK
SRC ZOM
SRC 1-2
AUT OFS
AUT ANA
AUT SRC
AUT REF
AUT CTR
SWP 1-2
SMO OTH
RPT
SGL
STP

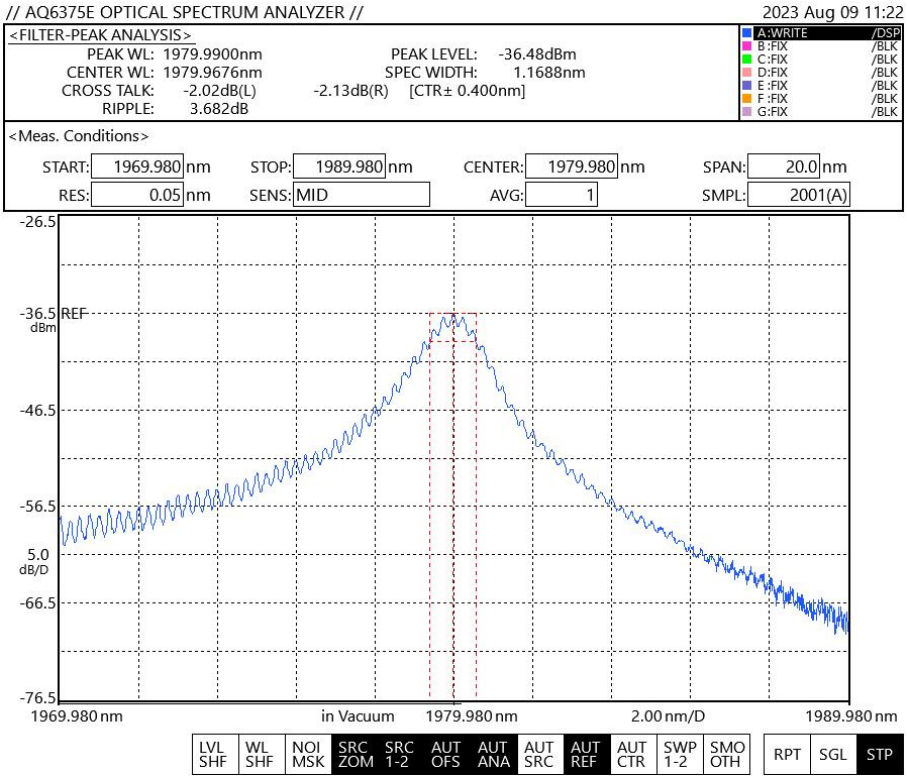

// AQ6375E OPTICAL SPECTRUM ANALYZER //
2023 Aug 09 11:13
<FILTER-PEAK ANALYSIS>
PEAK WL: 2005.1200nm
PEAK LEVEL: -51.04dBm
CENTER WL: 2005.0339nm
SPEC WIDTH: 1.2589nm
CROSS TALK: -1.51dB(L) -0.91dB(R) [CTR± 0.400nm]
RIPPLE: 0.000dB
A:WRITE /DSP
B:FIX /BLK
C:FIX /BLK
D:FIX /BLK
E :FIX /BLK
F :FIX /BLK
G:FIX /BLK
<Meas. Conditions>
START: 1995.160 nm
STOP: 2015.160 nm
CENTER: 2005.160 nm
SPAN: 20.0 nm
RES: 0.05 nm
SENS: MID
AVG: 1
SMPL: 2001(A)
-41.0
-51.0 REF dBm
-61.0
-71.0
5.0 dB/D
-81.0
-91.0
1995.160 nm
in Vacuum
2005.160 nm
2.00 nm/D
2015.160 nm
LVL SHF
WL SHF
NOI MSK
SRC ZOM
SRC 1-2
AUT OFS
AUT ANA
AUT SRC
AUT REF
AUT CTR
SWP 1-2
SMO OTH
RPT
SGL
STP

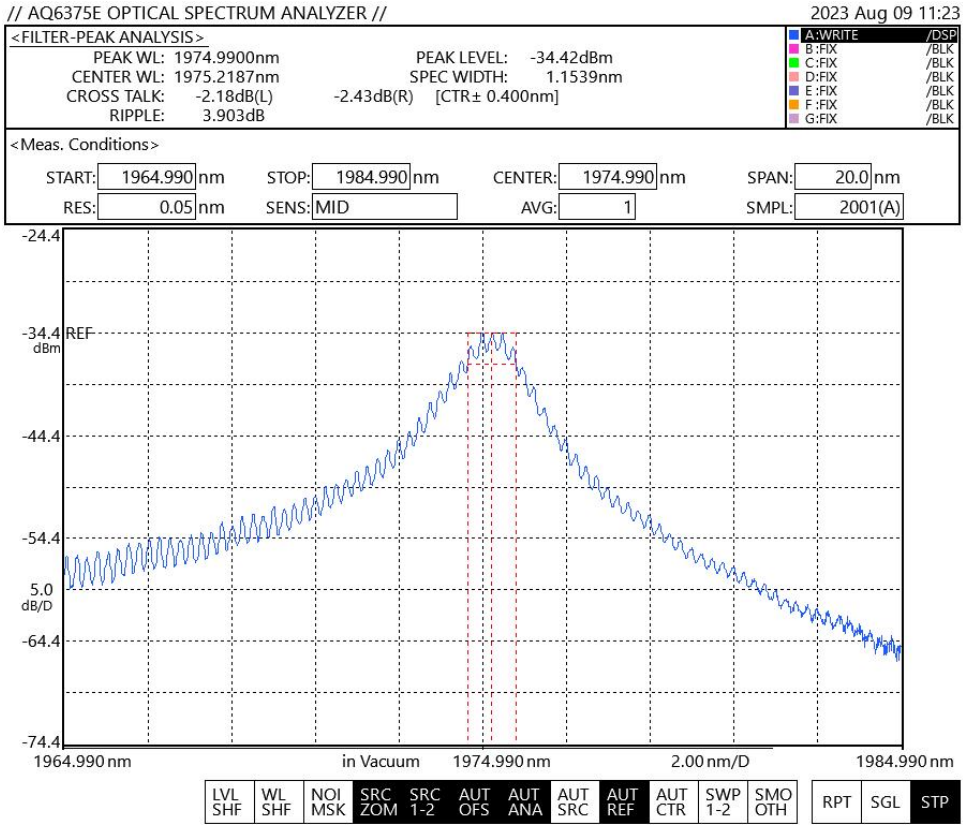

// AQ6375E OPTICAL SPECTRUM ANALYZER //
2023 Aug 09 11:15
<FILTER-PEAK ANALYSIS>
PEAK WL: 2000.0500nm
PEAK LEVEL: -47.30dBm
CENTER WL: 2000.0359nm
SPEC WIDTH: 1.2439nm
CROSS TALK: -1.68dB(L) -1.26dB(R) [CTR± 0.400nm]
RIPPLE: 0.000dB
A:WRITE /DSP
B:FIX /BLK
C:FIX /BLK
D:FIX /BLK
E :FIX /BLK
F :FIX /BLK
G:FIX /BLK
<Meas. Conditions>
START: 1990.040 nm
STOP: 2010.040 nm
CENTER: 2000.040 nm
SPAN: 20.0 nm
RES: 0.05 nm
SENS: MID
AVG: 1
SMPL: 2001(A)
-37.3
-47.3 REF dBm
-57.3
-67.3
5.0 dB/D
-77.3
-87.3
1990.040 nm
in Vacuum
2000.040 nm
2.00 nm/D
2010.040 nm
LVL SHF
WL SHF
NOI MSK
SRC ZOM
SRC 1-2
AUT OFS
AUT ANA
AUT SRC
AUT REF
AUT CTR
SWP 1-2
SMO OTH
RPT
SGL
STP

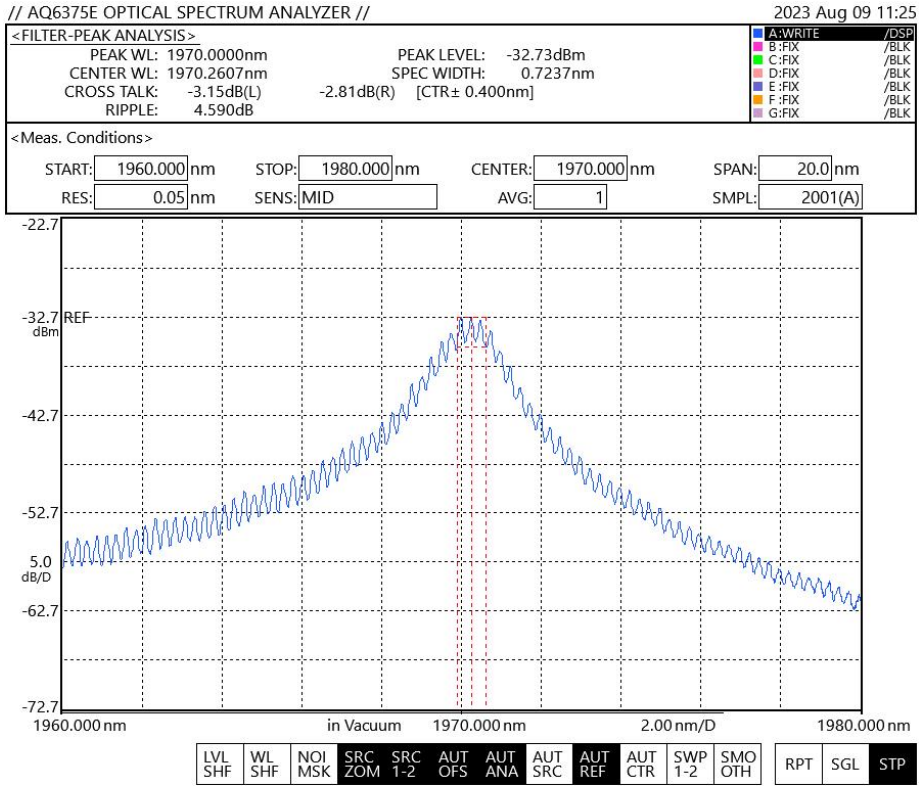

// AQ6375E OPTICAL SPECTRUM ANALYZER //
2023 Aug 09 11:17
<FILTER-PEAK ANALYSIS>
PEAK WL: 1994.9100nm
CENTER WL: 1994.9483nm
CROSS TALK: -1.57dB(L)
RIPPLE: 0.000dB
PEAK LEVEL: -44.65dBm
SPEC WIDTH: 1.2892nm
-1.09dB(R) [CTR± 0.400nm]
A:WRITE /DSP
B:FIX /BLK
C:FIX /BLK
D:FIX /BLK
E:FIX /BLK
F:FIX /BLK
G:FIX /BLK
<Meas. Conditions>
START: 1984.930 nm
STOP: 2004.930 nm
CENTER: 1994.930 nm
SPAN: 20.0 nm
RES: 0.05 nm
SENS: MID
AVG: 1
SMPL: 2001(A)
-34.6
-44.6 REF dBm
-54.6
-64.6
5.0 dB/D
-74.6
-84.6
1984.930 nm
in Vacuum
1994.930 nm
2.00 nm/D
2004.930 nm
LVL SHF
WL SHF
NOI MSK
SRC ZOM
SRC 1-2
AUT OFS
AUT ANA
AUT SRC
AUT REF
AUT CTR
SWP 1-2
SMO OTH
RPT
SGL
STP


// AQ6375E OPTICAL SPECTRUM ANALYZER //
2023 Aug 09 11:18
<FILTER-PEAK ANALYSIS>
PEAK WL: 1990.0700nm
CENTER WL: 1989.9531nm
CROSS TALK: -0.90dB(L)
RIPPLE: 0.000dB
PEAK LEVEL: -41.61dBm
SPEC WIDTH: 1.3539nm
-0.44dB(R) [CTR± 0.400nm]
A:WRITE /DSP
B:FIX /BLK
C:FIX /BLK
D:FIX /BLK
E:FIX /BLK
F:FIX /BLK
G:FIX /BLK
<Meas. Conditions>
START: 1980.090 nm
STOP: 2000.090 nm
CENTER: 1990.090 nm
SPAN: 20.0 nm
RES: 0.05 nm
SENS: MID
AVG: 1
SMPL: 2001(A)
-31.6
-41.6 REF dBm
-51.6
-61.6
5.0 dB/D
-71.6
-81.6
1980.090 nm
in Vacuum
1990.090 nm
2.00 nm/D
2000.090 nm
LVL SHF
WL SHF
NOI MSK
SRC ZOM
SRC 1-2
AUT OFS
AUT ANA
AUT SRC
AUT REF
AUT CTR
SWP 1-2
SMO OTH
RPT
SGL
STP

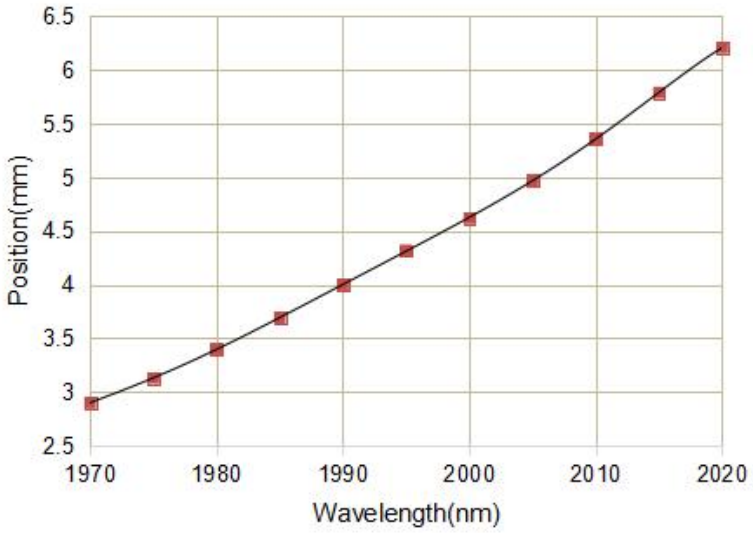

// AQ6375E OPTICAL SPECTRUM ANALYZER //
2023 Aug 09 11:20
<FILTER-PEAK ANALYSIS>
PEAK WL: 1985.0200nm
PEAK LEVEL: -38.99dBm
CENTER WL: 1985.1040nm
SPEC WIDTH: 1.3328nm
CROSS TALK: -0.96dB(L)
-0.46dB(R) [CTR± 0.400nm]
RIPPLE: 0.585dB
A:WRITE /DSP
B:FIX /BLK
C:FIX /BLK
D:FIX /BLK
E:FIX /BLK
F:FIX /BLK
G:FIX /BLK
<Meas. Conditions>
START: 1975.020 nm
STOP: 1995.020 nm
CENTER: 1985.020 nm
SPAN: 20.0 nm
RES: 0.05 nm
SENS: MID
AVG: 1
SMPL: 2001(A)
-29.0
-39.0 dBm
REF
-49.0
-59.0
5.0 dB/D
-69.0
-79.0
1975.020 nm
in Vacuum
1985.020 nm
2.00 nm/D
1995.020 nm
LVL SHF
WL SHF
NOI MSK
SRC ZOM
SRC 1-2
AUT OFS
AUT ANA
AUT SRC
AUT REF
AUT CTR
SWP 1-2
SMO OTH
RPT
SGL
STP


// AQ6375E OPTICAL SPECTRUM ANALYZER //
2023 Aug 09 11:22
<FILTER-PEAK ANALYSIS>
PEAK WL: 1979.9900nm
PEAK LEVEL: -36.48dBm
CENTER WL: 1979.9676nm
SPEC WIDTH: 1.1688nm
CROSS TALK: -2.02dB(L)
-2.13dB(R) [CTR± 0.400nm]
RIPPLE: 3.682dB
A:WRITE /DSP
B:FIX /BLK
C:FIX /BLK
D:FIX /BLK
E:FIX /BLK
F:FIX /BLK
G:FIX /BLK
<Meas. Conditions>
START: 1969.980 nm
STOP: 1989.980 nm
CENTER: 1979.980 nm
SPAN: 20.0 nm
RES: 0.05 nm
SENS: MID
AVG: 1
SMPL: 2001(A)
-26.5
-36.5 dBm
REF
-46.5
-56.5
5.0 dB/D
-66.5
-76.5
1969.980 nm
in Vacuum
1979.980 nm
2.00 nm/D
1989.980 nm
LVL SHF
WL SHF
NOI MSK
SRC ZOM
SRC 1-2
AUT OFS
AUT ANA
AUT SRC
AUT REF
AUT CTR
SWP 1-2
SMO OTH
RPT
SGL
STP


// AQ6375E OPTICAL SPECTRUM ANALYZER //
2023 Aug 09 11:23
<FILTER-PEAK ANALYSIS>
PEAK WL: 1974.9900nm
PEAK LEVEL: -34.42dBm
CENTER WL: 1975.2187nm
SPEC WIDTH: 1.1539nm
CROSS TALK: -2.18dB(L) -2.43dB(R) [CTR± 0.400nm]
RIPPLE: 3.903dB
A:WRITE /DSP
B:FIX /BLK
C:FIX /BLK
D:FIX /BLK
E:FIX /BLK
F:FIX /BLK
G:FIX /BLK
<Meas. Conditions>
START: 1964.990 nm
STOP: 1984.990 nm
CENTER: 1974.990 nm
SPAN: 20.0 nm
RES: 0.05 nm
SENS: MID
AVG: 1
SMPL: 2001(A)
-24.4
-34.4 REF
dBm
-44.4
-54.4
5.0
dB/D
-64.4
-74.4
1964.990 nm
in Vacuum
1974.990 nm
2.00 nm/D
1984.990 nm
LVL SHF
WL SHF
NOI MSK
SRC ZOM
SRC 1-2
AUT OFS
AUT ANA
AUT SRC
AUT REF
AUT CTR
SWP 1-2
SMO OTH
RPT
SGL
STP


// AQ6375E OPTICAL SPECTRUM ANALYZER //
2023 Aug 09 11:25
<FILTER-PEAK ANALYSIS>
PEAK WL: 1970.0000nm
PEAK LEVEL: -32.73dBm
CENTER WL: 1970.2607nm
SPEC WIDTH: 0.7237nm
CROSS TALK: -3.15dB(L) -2.81dB(R) [CTR± 0.400nm]
RIPPLE: 4.590dB
A:WRITE /DSP
B:FIX /BLK
C:FIX /BLK
D:FIX /BLK
E:FIX /BLK
F:FIX /BLK
G:FIX /BLK
<Meas. Conditions>
START: 1960.000 nm
STOP: 1980.000 nm
CENTER: 1970.000 nm
SPAN: 20.0 nm
RES: 0.05 nm
SENS: MID
AVG: 1
SMPL: 2001(A)
-22.7
-32.7 REF
dBm
-42.7
-52.7
5.0
dB/D
-62.7
-72.7
1960.000 nm
in Vacuum
1970.000 nm
2.00 nm/D
1980.000 nm
LVL SHF
WL SHF
NOI MSK
SRC ZOM
SRC 1-2
AUT OFS
AUT ANA
AUT SRC
AUT REF
AUT CTR
SWP 1-2
SMO OTH
RPT
SGL
STP

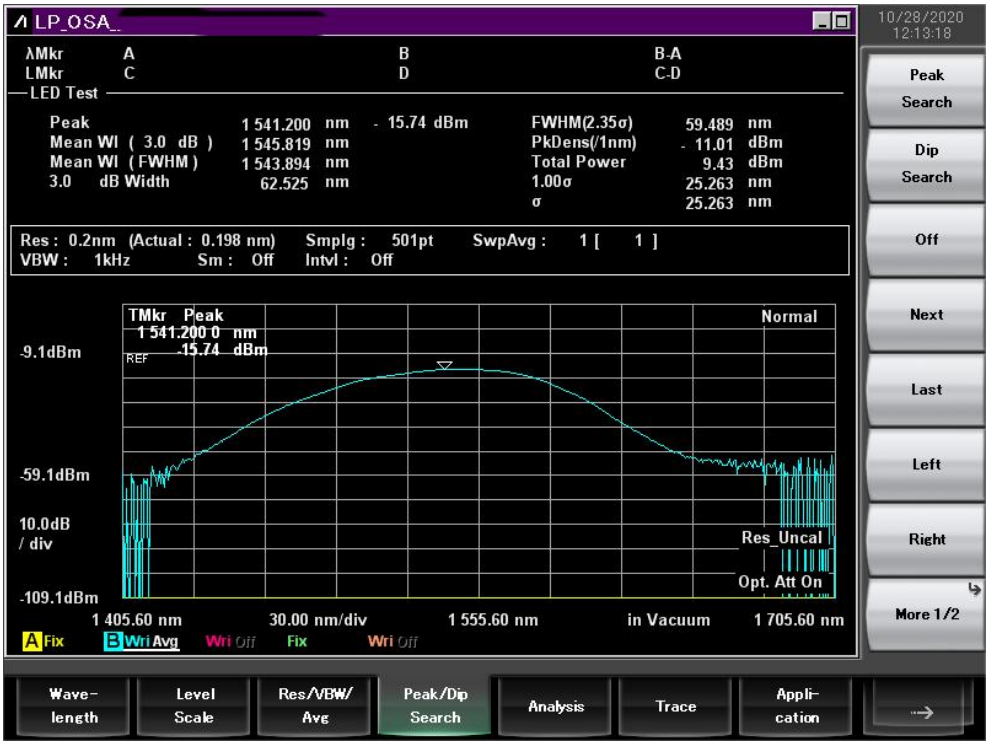
The relation between entral wavelength and rotary knob position



Test light source:

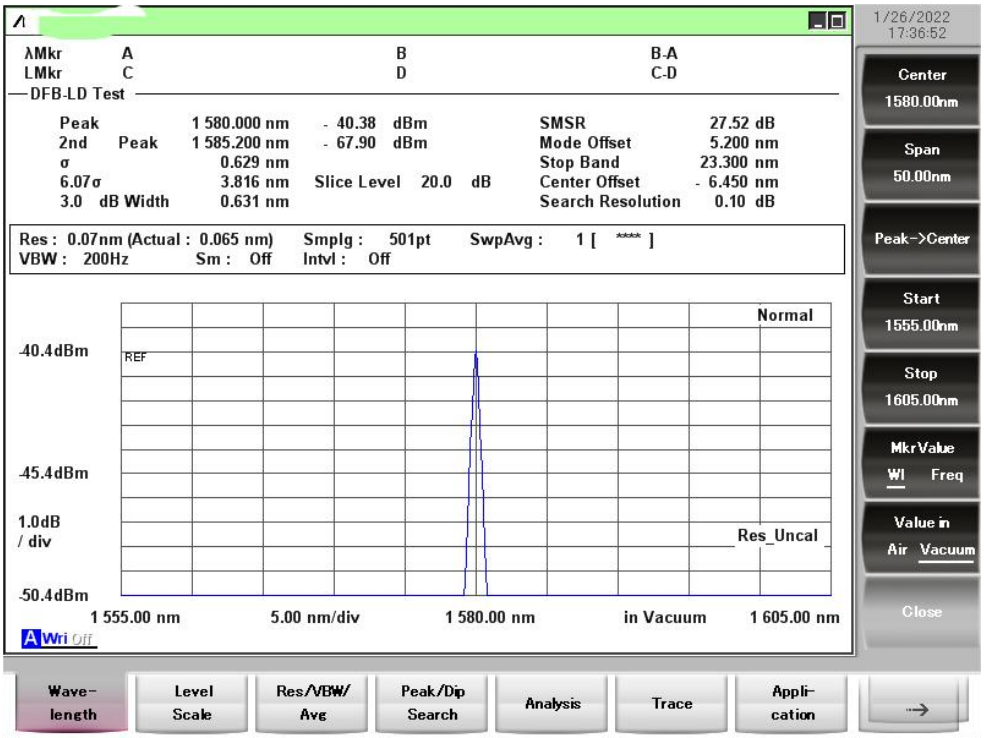
PN： PL-SLD-1550-A-A81-SA

SN：S17062686

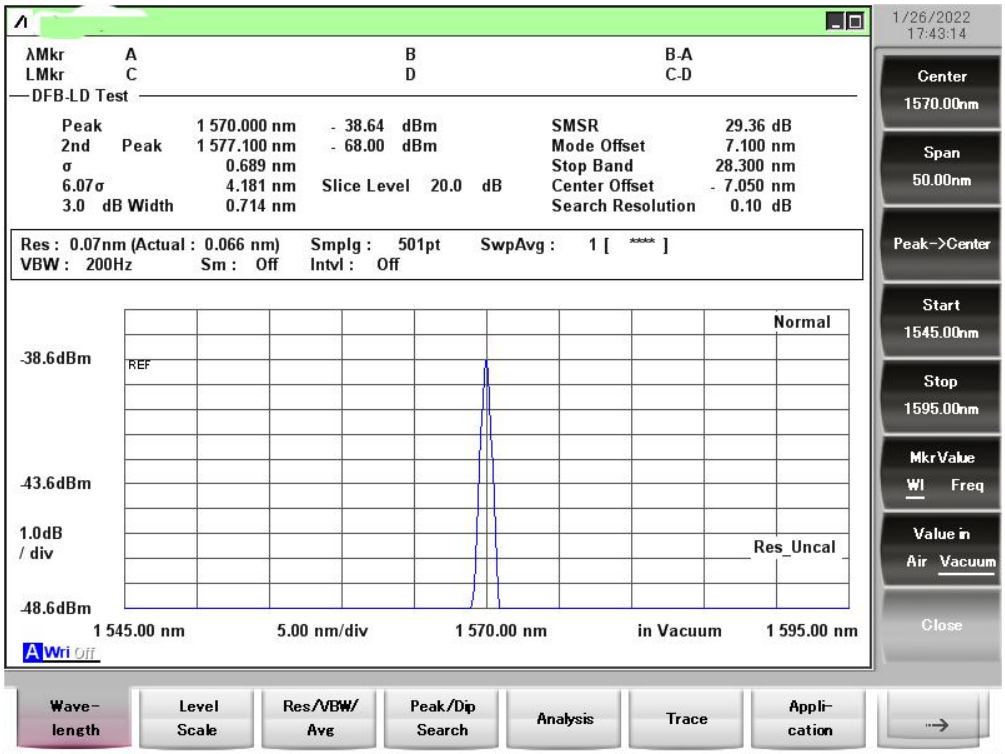


Test light source spectrum

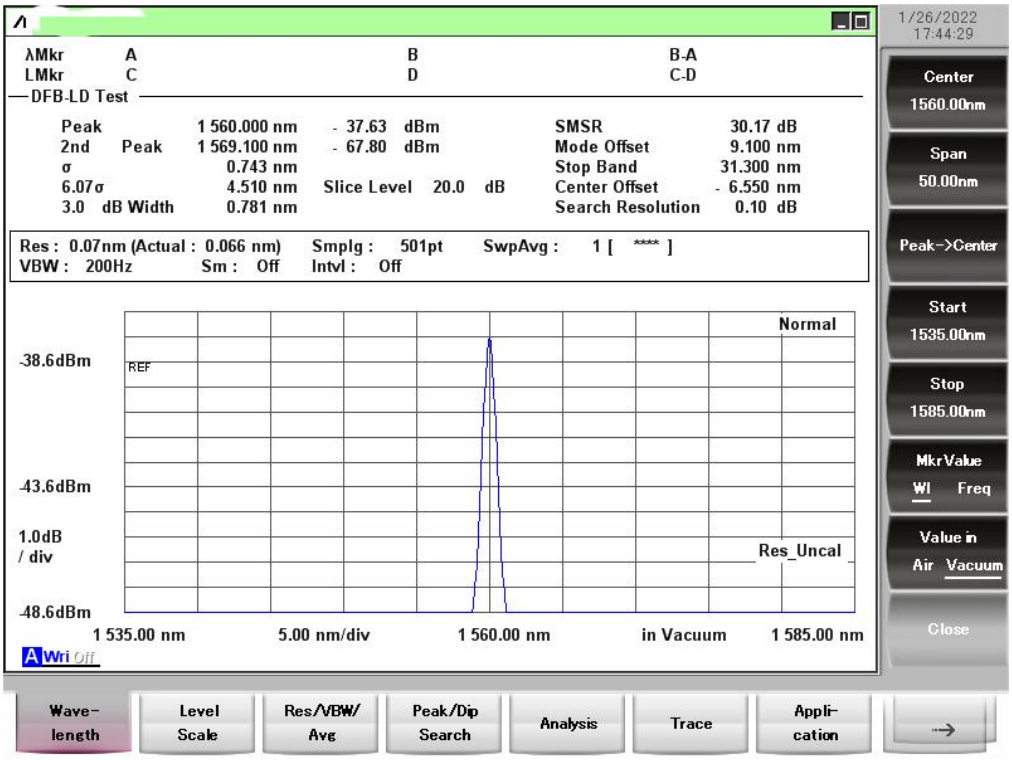
1. Measured spectrum



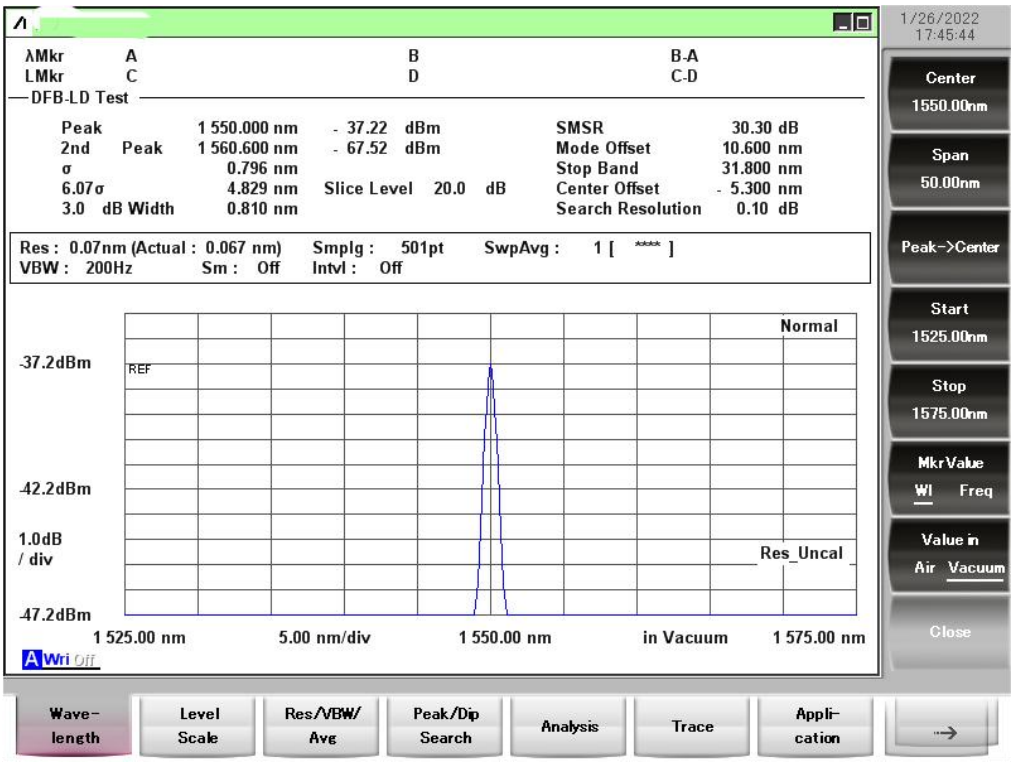
1580nm



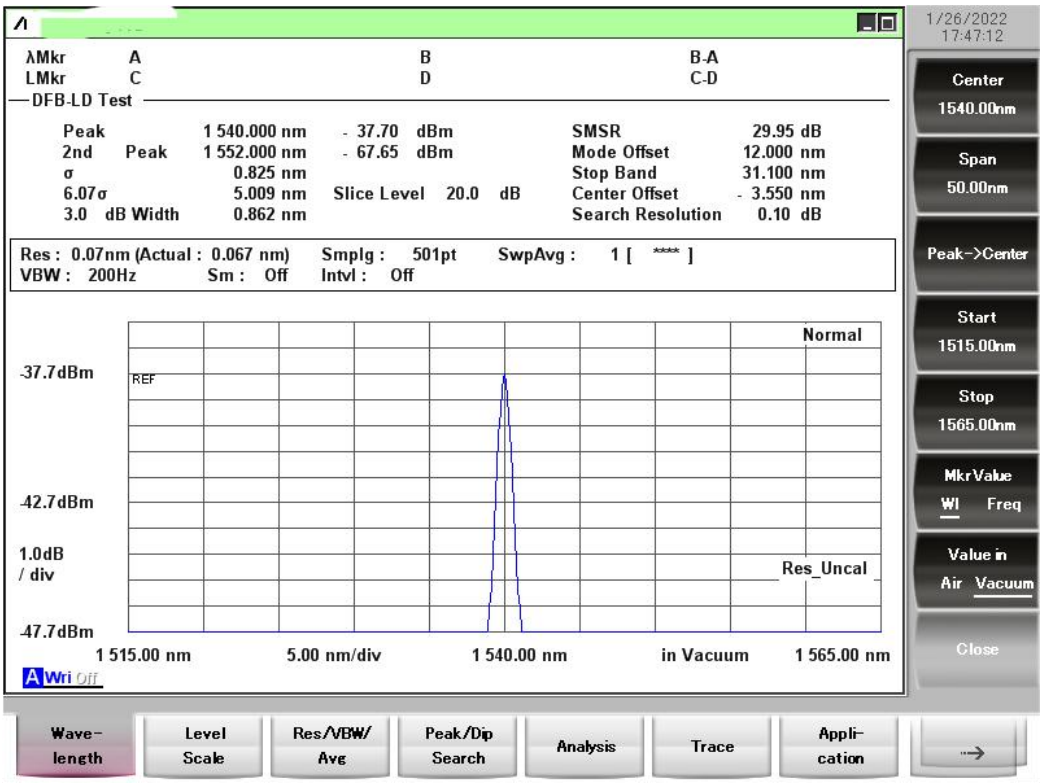
1570nm



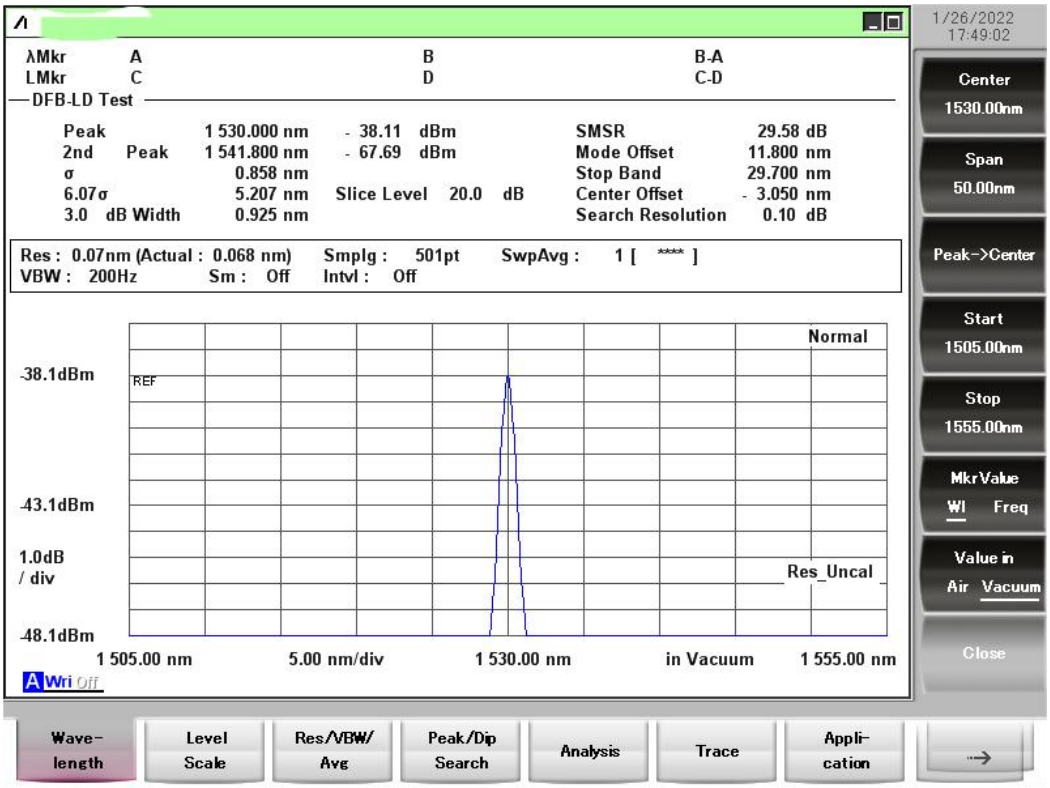
1560nm



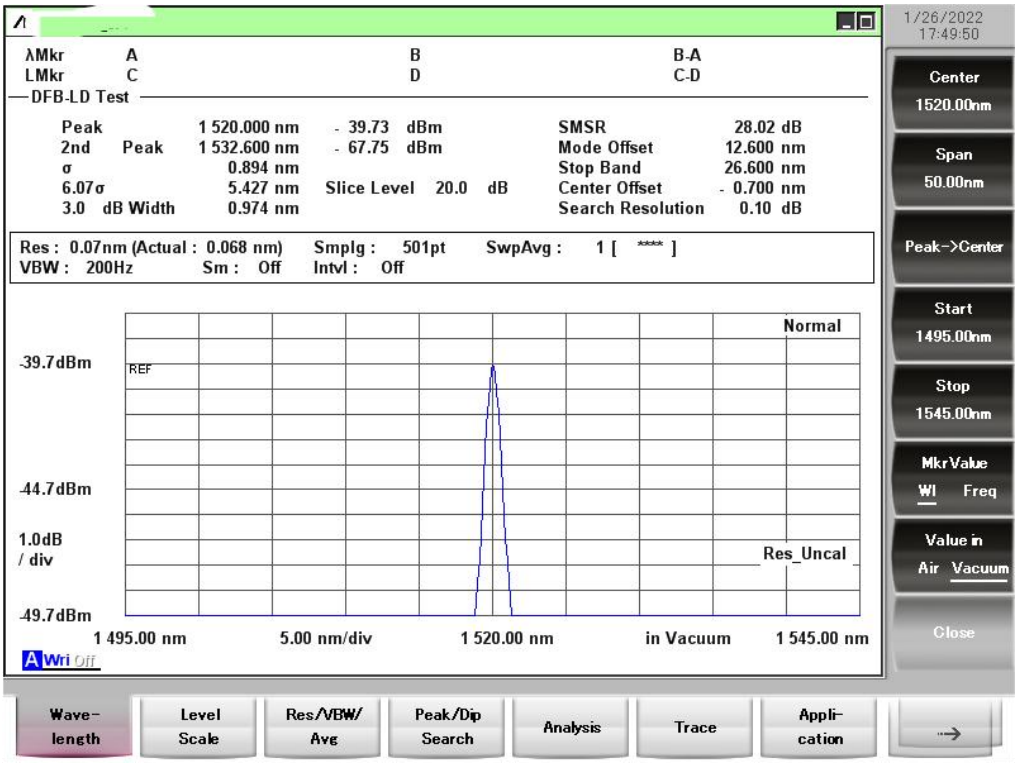
1550nm



1540nm



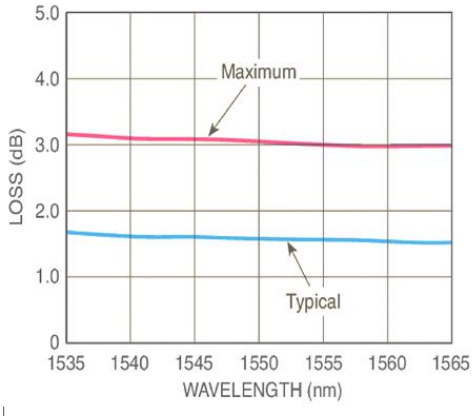
1530nm

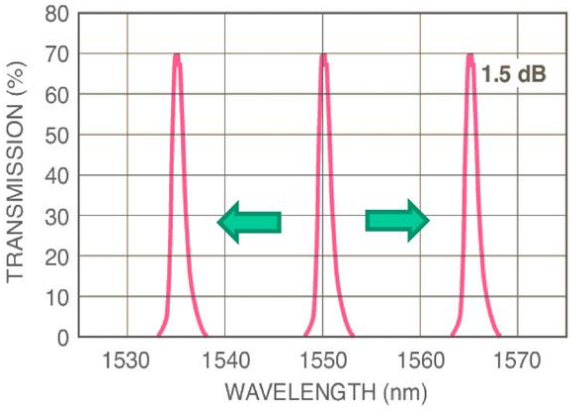


1520nm

2. Relationship between wavelength and knob position

Wavelength(nm)	Knob Location
1520	4.48
1530	5.07
1540	5.68
1550	6.4
1560	7.2
1570	8.2
1580	9.6





Order Info:

TOF- □□□□-☆-A8▽- XX

□□□□: Wavelength

1060: 1060nm

1310:1310nm

1550: 1550nm

*****

1620: 1620nm

1850:1850nm

1950:1950nm

2000:2000nm

2100:2100nm

☆ : Handling Power

500: 500mW

5000: 5W

▽: Tuning Range

60: ±30nm

100: ±50nm

XX: Fiber and Connector Type

SA=HI1060(The single-mode optical fiber of the corresponding wavelength band is 1060nm as an example)+ FC/APC

SP=HI1060+ FC/PC

PA=PM980 Fiber+ FC/APC

PP=PM980 Fiber+ FC/APC