3. 1550nm Directly Modulated Optical Transmitter Module

WOS-WT-1550-4K

1. Product Overview

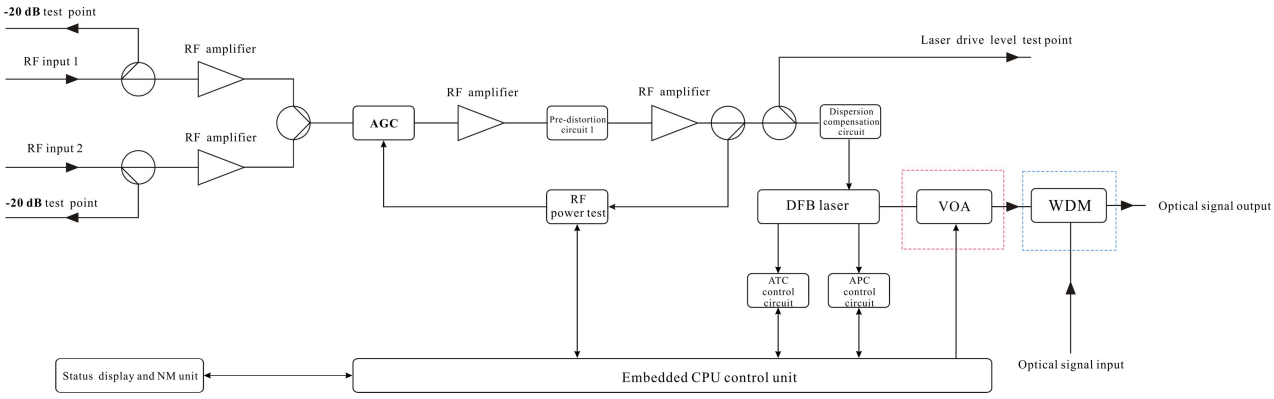
In accordance with the planning of the Next Generation Broadcasting Network (NGB) and various PON standards, 1550nm is defined as the transmission wavelength for HFC downstream.

The high cost of 1550nm external modulated transmitter and dispersion effects of 1550nm directly modulated transmitter make network transformation difficult. Thus we create the 1550nm directly modulated optical transmitter with electronically controlled dispersion compensation. It supports up to 1.2GHz band and DOCSIS 3.1 system. Two RF inputs, high isolation, QAM and IPQAM available. Support a transmission distance of 50KM with electronically controlled dispersion compensation. Built-in CWDM is optional for multi-wavelength networking.

2. Performance Characteristics

- Support hot swap
- 1.2GHZ band, support DOCSIS 3.1 system
- Two RF inputs with high isolation
- High-quality RF insertion capability
- Optional CWDM for external optical input
- Electronically controlled dispersion compensation, support a transmission distance of 50KM
- Low cost solution and external modulation capable
- Optional ITU standard wavelength

3. Block Diagram

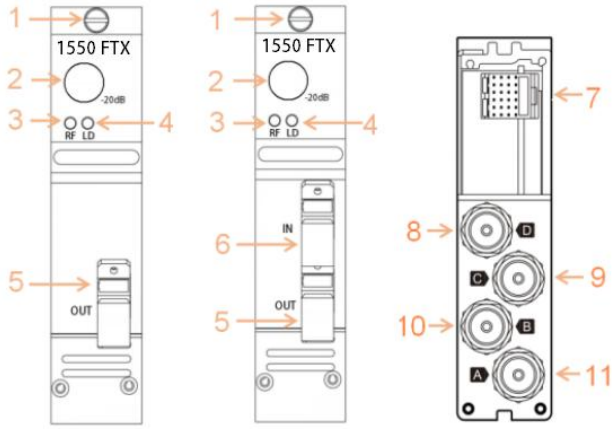


Note: The optical attenuator in the red dashed box and the wavelength division multiplexer in the blue dashed box are optional.

4. Technique Parameters

Item	Unit	Parameter	
Optical part			
Optical wavelength	nm	ITU wavelength	
Laser type		Butterfly-typed DFB laser	
Optical modulation mode		Direct optical intensity modulation	
Optical connector type		FC/APC or SC/APC	
Output optical power	mW	10	The insertion loss of the VOA and CWDM is excluded.
Laser signal input (main channel)	dBm	-5～10	
RF part			
Frequency range	MHz	47～870/1003/1218	
RF input level	dBuV	77± 5	
Flatness in band	dB	± 0.75	
Input return loss	dB	≥ 16	
RF AGC control range	dB	±5	
RF MGC adjustable range	dB	0～20	
RF input isolation	dB	≥ 50	Isolation between two RF inputs
RF input test port	dB	-20±1	
Laser drive level test port	dB	-20±1	
Electronically controlled optical attenuator tolerance	dB	≤1: ATT 0-15dB	
		≤3: ATT 16-20dB	
CNR	dB	≥ 48	550MHZ 59CH analog signal 77dBuV/CH
C/CSO	dB	≥ 58	550-870MHZ 40CH digital signal 67dBuV/CH
C/CTB	dB	≥ 63	25 Km, -1dBm input
CNR	dB	≥ 46	550MHZ 59CH analog signal 77dBuV/CH
C/CSO	dB	≥ 55	550-870MHZ 40CH digital signal 67dBuV/CH
C/CTB	dB	≥ 63	50Km, -1dBm input
MER	dB	≥ 40	25 Km, -1dBm input, 96CH digital 77dBuV/CH
		≥ 39	50 Km, -1dBm input, 96CH digital 77dBuV/CH
Others			
Maximum power consumption	W	≤10	
Operating temperature	℃	-5 ～ + 55	
Storage temperature	℃	-30 ～ + 70	
Weight	Kg	1	

5. Structure Description



Standard type front panel WDM type front panel Rear panel

	Standard type	WDM type	Note
1	Module fixing screw	Module fixing screw	
2	Laser drive level test port	Laser drive level test port	-20dB
3	Laser drive level indicator	Laser drive level indicator	Green: 60～120dBuV Red: outside the range
4	Laser operating indicator	Laser operating indicator	Green: laser on Red: laser off
5	Optical power output	Optical power output	
6		Optical signal input	
7	Module socket	Module socket	
8	Input 2 test port	Input 2 test port	-20dB
9	Input 1 test port	Input 1 test port	-20dB
10	RF signal input 2	RF signal input 2	
11	RF signal input 1	RF signal input 1	

6. Operation instructions of the display menu

Once the module is installed, the corresponding slot in the display menu will highlight the module which is online. After entering the submenu, the following parameters can be seen:

Out Power XX.XdBm	Laser output power	
RFLevel XX.XdBuV	Laser drive level	
LaserTemp XX.X℃	Laser temperature	
LaserBias XXmA	Laser bias current	
Laser Tec XXmA	Laser cooling current	
InPutPowerXX.XdBm	External input optical power	
OutPwrAfAtt XX.XdBm	The power of the laser after being attenuated	Matched with the type with optical attenuator
OpAttCtrl Auto	Optical signal attenuation mode: Auto, Manual	Matched with the type with optical attenuator
AutoThreshold XXdB	Difference between the external input optical signal and the laser signal before passing WDM	Valid when OpAttCtrl selects Auto
ManualATT XXdB	Manually set the attenuation value of the laser signal	Valid when OpAttCtrl selects Manual
CurRFMode AGC	AGC, MGC optional	
AGCOffset XdB	AGC offset, adjustable range: ±5dB	Valid when CurRFMode selects AGC

MGCAtt	**XdB**	MGC attenuation, adjustable range 0~15dB	Valid when CurRFMode selects MGC
ChanNum	**84**	Number of transmission channels, 1 to 100	
Wavelength	**1550**	Wavelength	
LaserCtrl	**ON**	Laser switch, ON, OFF	
Set Fiber Length	**XX KM**	Set dispersion compensation distance, 0-50KM, 1KM stepping	
DevTemp	**XX.X℃**	Module internal temperature	
SN		Serial number	
Version		Software version number	
WorkTime		Total operating hours of the equipment	

7. Installation

- This module can be installed in slots 1-16 and can be fully configured.
- Check whether the pins on the rear of the module are bent.
- Install the module in place along the guide and tighten the screws.
- Avoid direct observation and contact with the fiber tip. You must confirm the equipment is off when cleaning the port.

8. Naming Specification

WOS-WT-1550-DM-I-XX-S-4K

- 4K: matched with WOS-4000 optical communication platform
- Fiber connector type
  S: SC/APC; F: FC/APC
- Output optical power
  10: 10mW; other specifications are as similar
- Product specification (Note 1)
- 1550nm optical transmitter (module)

Standard 10mW (10dBm), other power is not recommended.

Note 1:

DM-I: standard type, 1.2G, support RF insertion with high isolation, electric dispersion compensation. (Not distinguish between 860M, 1G, 1.2G)

DM-II: Standard + built-in WDM wavelength division multiplexer.

DM-III: Standard + built-in VOA (electrically controlled Variable Optical Attenuator).

DM-IV: Standard + built-in WDM + built-in VOA.

Note 2:

The output of I to IV models can use ITU standard wavelengths. Please specify the wavelength in the order.

Note 3: When selecting a WDM model, please specify the WDM parameters in the order.