WT-1550-EM30 series
Optical Transmitter

WT-1550-EM30 series optical transmitter is 1550nm DFB laser external modulated transmitter. It is specially developed for the CATV signal that satisfy HFC network, cable phone and the long-distance transmission of cable data.

Field of Applications:

- **High-performance long-distance transmission**
- **High-power distribution network**
- **Redundancy loop architecture**
- **FTTx network**
- **RFOG application**
- **DWDM network**

Working principle

WT-1550-EM30 series transmitter has 7 function modules: RF control, DFB laser, optical modulator, SBS control, CSO control, communication/display control and power supply.

Automatic gain control circuit (AGC) or manual gain control circuit (MGC) amplifies the RF signal. AGC or MGC control makes the optical modulator maintain a suitable input level. We use root-mean-square (RMS) optical modulation degree (OMI) to indicate this value.

We recommend general users using the AGC function, and special users can use the MGC function to adjust the CNR/CSO/CTB performance indexes.

The core of transmitter is the optical modulator. The DFB CW laser that works in the 1550nm nearby input the optical modulator, make the laser intensity changed follow the external RF signal voltage, and then generate the AM optical signal.

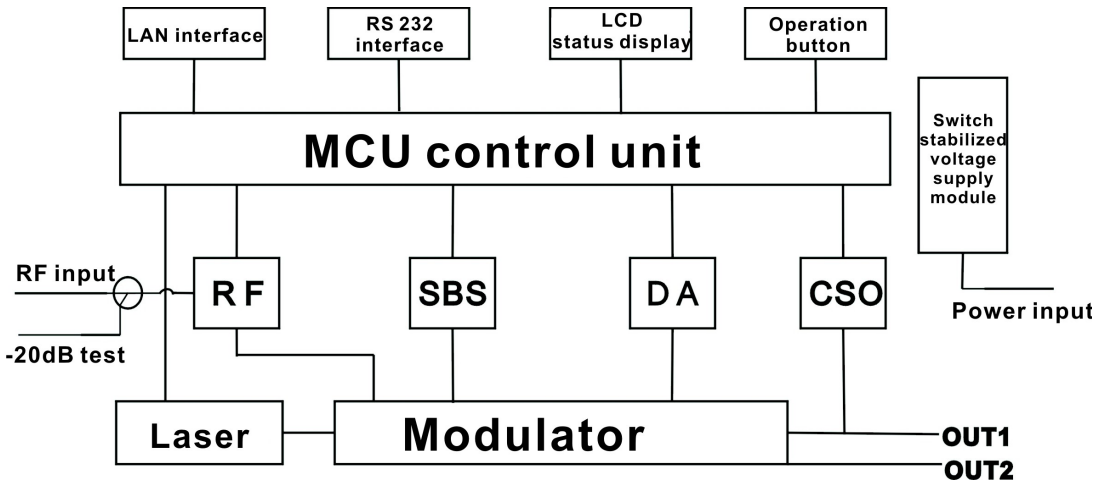
Stimulated Brillouin Scattering (SBS) occurs when the optical fiber incident optical power is greater than a certain threshold value. SBS generate the lower frequency backscattered light which will attenuate the transmission light and return to the laser then destroy its performance. Cause the laser optical power fluctuation, generate large noise, and seriously deteriorate the system carrier to noise ratio (CNR). To improve the SBS threshold, WT-1550-EM30 series optical transmitter adopts SBS control technology which is independent researched and developed by ourselves, the threshold up to 19dBm.

The optical modulator output two-way optical signals. Elicit partial signal from one way input an InGaAs photodiode. This detection optical signal has two functions:

1) Detect whether the laser is normal working. Once the output optical power is 2dB lower than standard power, appear alarm.

2) Detect CSO distortion to optimize the bias point of the optical modulator. The detector circuit normal working need at least two carrier signal input that interval is 24MHz. There is CSO initialization program in the boot process. If the CSO install failed, the RF indicator will flash red, see details in 6.2 Troubleshooting.

Block Diagram



Specification

Optical Parameters

Item	Unit	Value
Optical Wavelength	nm	1545------1560 (or specified by the user)
Side-mode Suppression ratio	dB	>30
Relative Intensity Noise	dB/Hz	<-160
Wavelength Adjustment Range	GHz	+/-50GHz
Optical Power	dBm	2*7, 2*8, 2*9, 2*10
SBS Threshold Value	dBm	+13-----+19 (Continuously adjustable)
Laser Linewidth	MHz	0.3

Model Test Indicators

Test Model	C42	D59	D84
Channel Plan	CENELEC42	PAL D59	PAL D84
Channel Number TV/FM/QAM64	42/0/0	59/0/0	84/0/0
Bandwidth Noise	5	5	5
CNR Tx/Rx	55.5	54.0	52.5
CNR Link 1	55.0	53.5	52.0
CNR Link 2	53.0	52.5	50.5
CNR Link 3	50.5	50.5	49.0
CSO Tx/Rx and Link 1	64	65	65
CSO Link 2	63	65	65
CSO Link 3	62	64	63
CTB	65	65	65

Test conditions

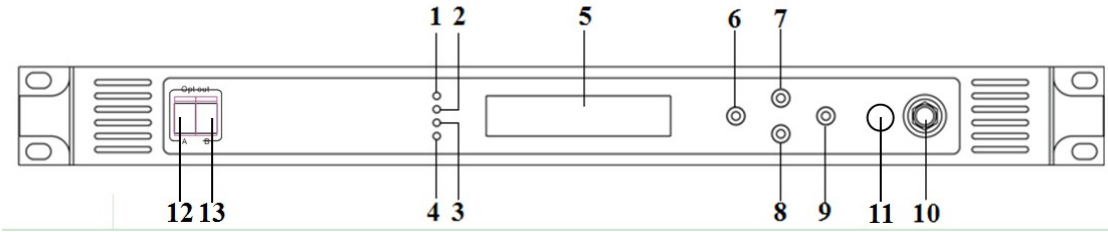
	First stage EDFA	First paragraph fiber length	Second stage EDFA	Second paragraph fiber length	RX
Tx/Rx	No	No	No	no	0dBm
Link 1	No	35km	no	no	0dBm
Link 2	16dBm	65km	no	no	0dBm
Link 3	13dBm	50km	13dBm	50km	0dBm

Technical Data Sheet

Item	Unit	Technical Parameters
RF range	MHz	47-1003
RF flatness	dB	+/-0.75
RF return loss	dB	>16
RF input impedance	Ω	75
RF input connector type		F type
Rated input level	dBμV	80
Input level range	dBμV	78~96 (AGC mode, modulating signal)
AGC control range	dB	+3…-3
MGC adjustable range	dB	0~15
Optical connector		SC/APC, FC/APC
Operating temperature	℃	-5-45
Storage temperature	℃	-30 - +70
Power Source Specification	V	90 ~ 265VAC
		36 ~ 72VDC
Consumption	W	≤60
Dimension	mm	483 (L) X455 (W) X 44 (H)
Total Weight	kg	5.5

Physical Structure

Front Panel



1	Power indicator	**2**	AGC indicator	**3**	RF modulation degree indicator
4	Laser indicator	**5**	LCD	**6**	ESC key
7	UP key	**8**	DOWN key	**9**	Enter key
10	-20dB RF input test port	**11**	RF input port (or on the rear panel, optional)	**12**	Optical output interface A (or on the rear panel, optional)
13	Optical output interface B (or on the rear panel, optional)				