Vision 1550nm External Modulation Optical Transmitter · GS8510 Series

Technical Specification

CONTENT

1.0 PRODUCT DESCRIPTION

With the development of DTV, VOD, Triple-play and FTTx, the information volume of CATV network is increasing rapidly, and bandwidth of 47~862MHz in central station will not be able to satisfy the requirement of single subscriber. In order to provide more interactive service capacity for subscribers, the second-grade service area has to be built in sub-station (second-grade network). In sub-station, the optical signal down-loaded from the central station will be converted into RF signal, then FDM (frequency division multiplexing) with marginal server of the sub-station, it will serve the subscribers in second-grade area through 1550nm Optical transmitter, EDFA and optical splitters. Radius of the area are generally 20km~40km.

How to select 1550nm optical transmitter for second-grade service area is always a difficulty. Take technical feature and long-term development of the network into consideration, we should select 1550nm Externally Modulated optical transmitter, however, such transmitter with reasonable price which can be suitable for Second-grade service area is unavailable in the current market. Considering the traditional cost, 1550nm Internal Modulated optical transmitter will be selected to have a test.

Internal Modulated will generate serious laser chip effect (bias current of the laser will be modulated by signal, optical spectrum will shift and shake). Chip effect will interact with dispersion of standard single fiber 1550nm window, which causes serious distortion (CNR deterioration). The distortion will be more serious with the increasing of transmission distance, bandwidth and number of channels. For many years, we have developed a lot of research and experiments in chip compensation of Internal Modulated, but do not have any breakthrough yet. The most advanced 1550nm Internally Modulated optical transmitter in the world can only transmit the signal for 15Km with CSO ≤ -57dB in the bandwidth of 600MHz, while its price is very expensive. But CSO ≤ -57dB is the lowest threshold for end subscribers. Therefore, the current 1550nm Internal Modulated optical transmitter cannot meet the technical requirements of the developing networking of second-grade service area.

We are the well-known manufacture in analog externally modulated optical transmitter in the world. GS8510, a kind of low cost 1550nm Externally Modulated Optical transmitter, is specially designed for networking application of second-grade service area. It is named as GS8510

second-grade service area 1550nm Externally Modulated Optical Transmitter. GS8510 series Externally Modulated CATV transmitter adopts low noise, narrow bandwidth, and continuous wave laser DFB laser as its ligGS source and adopts low cost single-output LiNbO3 external modulator that is specially designed by JDS-U to modulate signal , which reduce the cost of the transmitter largely. Based on a series of characterized optimization and technical innovation, it can reach excellent system index with flatness ≤ 0.75dB in-band 47~862MHz, 13dBm SBS, point to point >50Km, (0dBm receiving) CSO ≤ -65dB, CTB ≤ -65dB, CNR ≥ 52dB. The whole unit is equipped with perfect RS232 communication interface, SNMP network management, 1+1 back-up power supply, and casing temperature auto-control. All the optical port can be installed in the front panel (The back panel is also available if needed).

GS8510 second-grade service area 1550nm Externally Modulated Optical Transmitter, with its high index, high reliability and outstanding P/P ratio, is an ideal choice for second-grade service area.

GS8510C: single output, operation wavelength 1547~1564nm, laser linearity width 1MHz, SBS: 13dBm.

GS8510U: single output, ITU standard wavelength adjustable. Through LCD menu and the button on the front panel, laser wavelength can be set and adjusted with ±0.05nm stepping in the range of ±200GHz (±1.6nm). It is applied for upgrading and expansion of WDM networking.

2.0 PRODUCT FEATURE

- High performance: no laser chip, low dispersion distortion, high extinction ratio, with excellent characteristic within 40~862MHz in-band.
- Narrow linearity width (Typ=1MHz), low noise, DFB continuous wave laser.
- The operating bandwidth is up to 47~1080MHz.
- High index: unique innovation technology, offers excellent CNR, CTB and CSO.
- SBS: 13dBm, point to point>50Km optical transmission.
- ITU standard wavelength, ±200GHz (±1.6nm) adjustable.
- AGC/MGC mode is optional at spot. OMI can be optimized at spot.
- Optional RS232 communication interface and SNMP.
- Optional 1+1power supply backup.
- Casing temperature auto-control.
- Excellent P/P ratio.

3.0 MAIN APPLICATION

- Used in second-grade service area of sub-station. With excellent P/P ratio, provide second-grade users with high quality and high reliability value added service such as RFTV, IPTV, VOD and so on. It can avoid the limitation on transmission bandwidth and distance as well as system CSO deterioration caused by laser chirp for adopting 1550nm direction modulated optical transmitter.

4.0 Technique index

Performance			Index		Supplement
Optic feature	Operating wavelength	(nm)	1540~1563		GS8510C
			ITU-TG.692		GS8510U
	Wavelength adjustable range	(nm)	±1.6 (±200GHz)		GS8510U
	Wavelength adjustable mode		±0.05nm stepping		GS8510U
	Linewidth	(MHz)	≤1		FWHM(△λ)
	Side mode suppression ratio	(dB)	≥45		SMSR
	Equivalent noise intensity	(dB/Hz)	≤-160		RIN (20~1000MHz)
	Output power	(dBm)	1×5		Optional 1×3, 1×6, 1×7
	Return loss	(dB)	≥55		
	optical fiber connector		SC/APC		Optional FC/APC,LC/APC
RF feature	Work bandwidth	(MHz)	47-862		GS8510-086
			47~1000		GS8510-100 (optional)
			47~1080		GS8510-108 (optional)
	Input level	(dBmV)	18~28		AGC
	Flatness	(dB)	≤±0.75		45~862MHz
			≤±1.5		862~1000MHz (optional)
	Return loss	(dB)	>16		
	Input impedance	(Ω)	75		
	RF port		F-Female		
Link feature	Transmit channel		PAL-D/60CH	PAL-D/99CH	
	CNR1	(dB)	≥52	≥50.5	Back to back
	CNR2	(dB)	≥50.5	≥49	50Km optical fiber, 0dBm receive
	CTB	(dB)	≤-65	≤-65	
	CSO	(dB)	≤-65	≤-65	
	SBS restrain	(dBm)	13		
General feature	SNMP network management interface		RJ45		

	Communication interface		RS232	
	Power supply	(VAC)	90~265	50/60Hz
		(VDC)	-48	30~72
	Power Consume	(W)	≤50	Single power works
	Operating temp.	(℃)	0~50	Machine temp. control automatically
	Storage temp.	(℃)	-40~85	
	Operating relative humidity	(%)	5~95	
	Size	(")	19×14.5×1.75 (W)x(D)x(H)	

5.0 PRODUCT SERIES

Model	Output Power(dBm)	Operating wavelength(nm)	SBS Restrain(dBm)	System index(59 routes PAL-D)			
				CNR1	CNR2	CTB	CSO
GS8513C	Single fiber 1×3	1540~1563	13	≥52	≥50	≤-65	≤-65
GS8515C	Single fiber 1×5			≥52	≥50.5	≤-65	≤-65
GS8516C	Single fiber 1×6			≥52	≥51	≤-65	≤-65
GS8517C	Single fiber 1×7			≥52	≥51	≤-65	≤-65
GS8513U	Single fiber 1×3	1528~1563nmITU wavelength adjustable		≥52	≥50	≤-65	≤-65
GS8515U	Single fiber 1×5			≥52	≥50.5	≤-65	≤-65
GS8516U	Single fiber 1×6			≥52	≥51	≤-65	≤-65
GS8517U	Single fiber 1×7			≥52	≥51	≤-65	≤-65

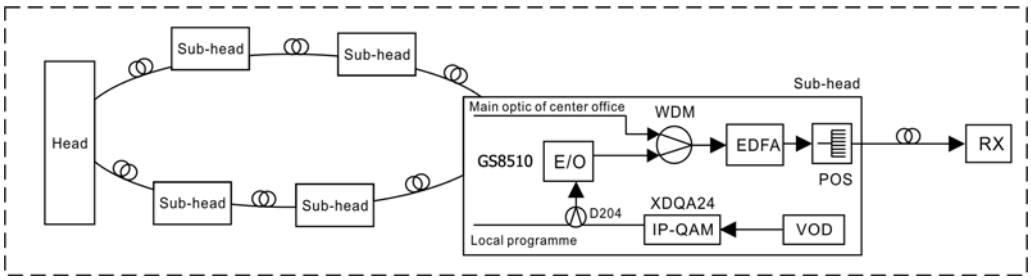
Test condition:

CNR1: Tx to Rx, 0dBm receiving.

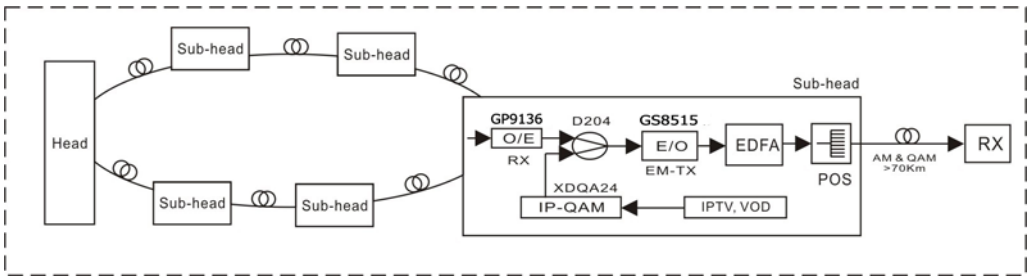
CNR2: 13dBm EDFA (NF4.5~5.5dB), 50km fiber, 0dBm receiving.

6.0 NETWORK APPLICATION DIAGRAM

GS8510 is typically used in the substation full optical relay for inter-cut local programs and providing IPTV, VOA value-added business.



Applied in second transmission of sub-station (FTTx), supply with IP/QAM, VOD VAS



7.0 Model explanation

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Product type		Product series		Number of output port		Output power		Operating wavelength		Wavelength		Network management		Connector		Number of power supply		Power supply		ITU Grid Ch. No.	
GS	Analogue optical transmitter	85	1550nm external modulation 47~862MHz	1	Single fiber output	3	3dBm	C	1548~1563nm	086	47~860MHz	0	No	FA	FC/APC	S	Single PS	22	220VAC	23	1558.98nm
		95	1550nm external modulation 47~2700MHz	2	Dual fiber output	5	5dBm	U	1528~1563nm ITU wavelength adjustable	100	47~1000MHz	1	Built-in	SA	SC/APC	D	Dual PS	11	110VAC	30	1553.33nm
		35	1550nm external modulation 950~27002MHz			6	6dBm			108	47~1080MHz			LA	LC/APC			48	-48VDC	37	1547.72nm
						7	7dBm														

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