

20MM-LT1X2050 SERIES

4 SAT-IF & 1 CATV DWDM Optical Transmitter
950MHz~2400 MHz

Technical Specification

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1.0 PRODUCT DESCRIPTION

20MM-LT1X2050-TER series is putting C-Band ITU standard wavelength 4 SAT-IF and 1 CATV transmitter or optical receiver into a 1RU 19" standard chassis. Multiplexing 5 optic (TX) or de-multiplexing (RX) through DWDM, and transmit in one fiber. Can be used for high-quality transmission of the same satellite VL, VH, HL, HH different polarization of the 4-way SAT-IF signals and 1 way CATV signals. Installation flexibility.

DWDM index. One fiber can transmit 40 multiple optical signals in C-Band, 100GHz channel space. Can use EDFA amplifier to achieve long-distance, wide range FTTH, and compatible with every FTTx PON technique. Achieve DBS and Triple-play amalgamation.

20MM-LT1X2050-TER build-in DWDM. After 4 SAT-IF signal and 1 CATV signal multiplexing/de-multiplexing in the equipment, then input (RX) or output (TX) through a SC/APC in front panel or back panel.

20MM-LT1X2050-TER optical transmitter adopts ITU wavelength can be tuned high linearity, with cooling DFB laser, direct modulated. High performance wavelength tuning and control circuit steadily then the working wavelength of the laser can be adjust and stabilize control in the range of ± 1.6 , and output power adjustable function adapt with DWDM. Perfect laser APC, ATC control circuit assures long life and high credibility working of the laser. CATV adopts pre-distortion compensation RF AGC drive circuit. SAT-IF with high linearity IF amplifier circuit of AGC adjustable, TG type. Also can choose no IF amplifier TO type. TO type allows high power level input.

Different CATV network of signal sources, transmission distance, the system of indicators demand is not exactly the same. 20MM-LT1X2050-TER designed specifically for CATV four kinds of internal configuration model, can be adapted to different applications.

2.0 PRODUCT FEATURE

- Adopt DWDM, C-Band, 100GHz, ITU wavelength, transmit 4 ways, 8 ways, 16 ways, 32 ways SAT-IF optical signal in one fiber
- Can use EDFA to achieve long distance and big range FTTH
- Compatible with any FTTH PON technique. Triple-play compatible with DBS
- Can choose four internal configuration models to adapt different CATV network application
- 1RU standard chassis, combiner 4 SAT-IF and 1 CATV optical transmitter or optical receiver
- 20MM-LT1X2050-TER, build-in DWDM. multiplexing 5 optical signal and transmitter in one fiber
- HDBS-5100DW adopt 19" standard chassis, LCD in front panel provides situation display and fault diagnose, standard RS232 communication interface, SNMP network management function
- High linearity, with cooling DFB laser, 1550nm ITU wavelength $\pm 1.6\text{nm}$ can be tuned
- Optical transmitter output power 0 ~ -3dBm adjustable, apply to DWDM
- CATV optical transmitter with pre-distortion compensation and AGC control
- SAT-IF optical transmitter, can choose with AGC high linearity IF amplify circuit, TG type. Also can choose no IF amplify TO type. TO type allows high power level input
- 4 ways optical transmitter can supply +13VDC or +18VDC to LNB
- Strong ability to anti-electromagnetism, RF and thunderbolt
- Agility and convenient for install and use
- The most excellent performance to price ratio in this industry

3.0 MAIN APPLICATION

- Multi-channel satellite SAT-IF and CATV signal over long distance and large area optical fiber distribute system
- Second-stage service area (substation, sub head end) CATV compatible with multi-channel satellite SAT-IF
- FTTH PON

4.0 TECHNICAL INDEX

Performance		Index	supplement	
TX Optical feature	Operating wavelength	(nm)	1528~1563	100GHz, ITU standard wavelength
	Wavelength adjustable range	(nm)	± 1.6	± 200 GHz
	Wavelength adjustable mode		± 0.05 nm stepping	
	Wavelength stability	(pm/°C)	-1~0	TC=20~70°C
	Size mode suppression ratio	(dB)	>45	SMSR
	Equivalent noise level	(dB/Hz)	≤ -160	20~1000MHz(CATV)
			≤ -145	20~2700MHz(SAT-IF)
	Number of TX output port		1	
	TX output power ¹⁾	(dBm)	6 (4mW)	
	Number of RX output port		1	RW (for ONU)
	Return loss	(dB)	≥ 50	
	Connector		SC/APC	Optional FC/APC, LC/APC
Laser type		Cooling DFB	TX with ISO	
SAT-IF feature	Operating bandwidth	(MHz)	950~2400	
	Input range	(dBm)	-25~-14	TG with IF amplification (AGC)
			-6~+10	TO without IF amplification
	Output range	(dBm)	-15~-40	
	Flatness	(dB)	0.5	40MHz
			± 1.0	950~2400MHz
	Input impedance	(Ω)	75	
	RF return loss	(dB)	12	
	RF connector		F-female	
	C/IM3 ²⁾	(dB)	≥ 55	
Equivalent noise level	(dB/Hz)	>115		
Link gain ³⁾	(dB)	25		
CATV adopt DMTX feature	Operating bandwidth	(MHz)	45~862	
	Input level (Pin)	(dBmV)	15~25	AGC
	Flatness	(dB)	$\leq \pm 1.0$	45~862MHz
	Return loss	(dB)	>16	
	RF connector		F-Female	
	Impedance	(Ω)	75	

	CNR	(dB)	≥ 50.5	PAL-D/60CH
	CTB	(dB)	≤ -63	
	CSO	(dB)	≤ -58	$\leq 600\text{MHz}$
			≤ -53	$> 600\text{MHz}$
	Transmission distance	(Km)	5	D05
			10	D10
15			D15	
General feature	Serial interface		RS232	
	SNMP network management interface		RJ45	
	Power supply	(V)	95~260VAC	
	Power consume	(W)	<50	
	Operating temp.	($^{\circ}\text{C}$)	-5~+65	
	Relative humidity	(%)	<85	
	Size	(mm)	483×267×44	(W) × (D) × (H)

Remarks: 1. DWDM insertion loss is not included.

2. C/IM3 is defined as the ratio between the peak of carrier signal and triple beat (IM3) by using a two-tone test (1.0GHz and 1.1GHz).

3. -40dBm RF input test

5.0 Link performance

Optical fiber input (dB)	Link loss (dB)	CNR (dB)	Link gain (dB)	RF output level (dBm/Ch.)
-13	14	30.18	-2	-38
-12	13	32.18	0	-36
-11	12	34.13	2	-34
-10	11	38.59	6	-32
-8	9	40.11	8	-30
-7	8	42.18	10	-28
-6	7	44.24	12	-26
-5	6	45.67	14	-24
-4	5	46.53	16	-22
-3	4	46.76	18	-20
-2	3	46.92	20	-18
-1	2	47.01	22	-16
0	1	47.03	24	-14

Note; 1. DWDM insert loss is not include, TX Output=6dBm

2. Digital satellite receiver input level typical is -60dBm ~ -30dBm

5.1 100GHz DWDM technique parameter

Performance			HDWDM-108	HDWDM-116	HDWDM-132
Working wavelength	(nm)	C/L-Band			
Working center wavelength	(nm)	ITU			
Center wavelength accuracy	(nm)	±0.3			
Channel spacing	(GHz)	100			
Channel band pass (@-0.5dB bandwidth)	(nm)	≥0.22			
Band pass insert loss (without connector)	dB	≤3.0	≤5.2	≤10.0	
Channel consistency	(dB)	≤1.5	≤2.0	≤3.0	
Channel ripple	(dB)	≤0.5			
Isolation	Border upon	(dB)	≥30		
	Not border upon		≥40		
Polarization dependence loss	(dB)	≤0.15			
Polarization mode dispersion	(ps)	≤0.10			
Direction	(dB)	≥50			
Return loss	(dB)	≥50			
Pass power	(mW)	≤500			
Connector type		NO			
Optical fiber type		SMF-28e with 900um loose tube			
Optical fiber length	(m)	≥1.0 (module type)			
Working temperature	(°C)	0~+70			
Storage temperature	(°C)	-40~+85			
Optical fiber connector		SC/APC, adjustable LC/APC、FC/APC			
Size	Module	(mm)	120 X 80 X 12	120 X 80 X 18	1420 X 115 X 14.5
	19" rack	(")	19 X 10 X 1.75		

6.0 Wavelength configuration table

6.1 ITU-TG 692 C-Band 100GHz(0.8nm) wavelength table

Channel number	Frequency (THz)	Working wavelength (nm)	Channel number	Frequency (THz)	Working wavelength (nm)
61	196.1	1528.77	38	193.8	1547.72
60	196.0	1529.55	37	193.7	1545.32
59	195.9	1530.33	36	193.6	1548.51
58	195.8	1531.12	35	193.5	1549.32
57	195.7	1531.90	34	193.4	1550.12
56	195.6	1532.68	33	193.3	1550.92
55	195.5	1533.47	32	193.2	1551.72
54	195.4	1534.25	31	193.1	1552.52
53	195.3	1535.04	30	193.0	1553.33
52	195.2	1535.82	29	192.9	1554.13
51	195.1	1536.61	28	192.8	1554.94
50	195.0	1537.40	27	192.7	1555.75
49	194.9	1538.19	26	192.6	1556.55
48	194.8	1538.98	25	192.5	1557.36
47	194.7	1539.77	24	192.4	1558.17
46	194.6	1540.56	23	192.3	1558.98
45	194.5	1541.35	22	192.2	1559.79
44	194.4	1542.14	21	192.1	1560.61
43	194.3	1542.94	20	192.0	1561.42
42	194.2	1543.73	19	191.9	1562.23
41	194.1	1544.53	18	191.8	1563.05
40	194.0	1546.12	17	191.7	1563.86
39	193.9	1546.92			

6.2 20MM-LT1X2050-TERstandardwavelength configuration

(S)

VL-SAT-IF	1550.92nm	VH-SAT/RF	1552.52nm
HL-SAT-IF	1554.13nm	HH-SAT-IF	1555.75nm
CATV-RF	1557.36nm	IP/QAM/RF	1558.98nm

7.0 Product series

7.1 TX

Model	Output power (dBm)		RX number		Optical port number			Wave length configuration	Optical connector
	SAT-IF	CATV	SAT-IF	CATV	Input	Output	Pass		
20MM-LT1X2050-TER	6	6				1		S	
	10	10				1		S	
	6	6				5		X	
	10	10				5		X	
6	6				1		S		
					5		X		
10	10				1		S		
					5		X		
6	0				1		S		
10									
6	6				1		S		
10									

Note: 1、CWDM insert loss is not include.

2、TX can choose TO type, without IF amplify

7.2 DWDM

Model	Exterior	Optical port number			Pass wavelength	Optical connector
		Output	Input	Pass		
DWDM-104-TX-C-SA	19" rack	1	4		adjustable	SC/APC
DWDM-108-TX-C-SA		1	8			
DWDM-116-TX-C-SA		1	16			
DWDM-132-TX-C-SA		1	32			

Note: 1、Module type adjustable (M)。

2、Channel number and channel wavelength can be specify by users