



20MM-LR4X2050 SERIES

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

Technical Specification

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1.0 PRODUCT DESCRIPTION

20MM-LR4X2050 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-LR4X2050 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.

Different CATV network of signal sources, transmission distance, the system of indicators demand is not exactly the same. 20MM-LR4X2050 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 FTTx PON technique. Triple-play compatible with DBS
- Can choose four internal configuration models to adapt different CATV network application
- 20MM-LR4X2050, build-in DWDM. multiplexing 5 optical signal and transmitter in one fiber
- 20MM-LR4X2050 apply FTTx PON, seamless link with EPON, GPON's ONU
- 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
- FTTx PON

4.0 TECHNICAL INDEX

Performance			Index	supplement
RX Optical feature	Operating wavelength	(nm)	1528~1563	100GHz, ITU standard wavelength
	Wavelength adjustable range	(nm)	±1.6	±200GHz
	Wavelength adjustable mode		±0.05nm 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 RX output port		1	20MM-LR4X20501-RX
	RX responsivity	(A/W)	≥0.9	1550nm
	RX input power range ¹⁾	(dBm)	0~ -13	
	Number of RX output port		1	RW (for ONU)
	Return loss	(dB)	≥50	
	Connector		SC/APC	Optional FC/APC, LC/APC
	Optical receive tube type		PIN	RX
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	
CATV	Equivalent noise level	(dB/Hz)	>115	
	Link gain ³⁾	(dB)	25	
	Operating bandwidth	(MHz)	45~862	
	Input level (Pin)	(dBmV)	15~25	AGC
	Flatness	(dB)	≤±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	≤600MHz
			≤-53	>600MHz
Transmission distance		(Km)	5	D05
			10	D10
			15	D15
General feature	Power supply	(V)	95~260VAC	
	Power consume	(W)	<50	
	Operating temp.	(°C)	-5~+65	
	Relative humidity	(%)	<85	
	Size	(mm)	263×198×35	(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 CATV optical receiver test data

Pin (dBm)	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11
Vo (dBμV)	90.7	88.7	86.7	84.7	82.7	80.7	78.7	76.7	74.7	72.7	70.7
CNR (dB)	56.1	55.6	54	53	51.7	50.3	49.1	48.2	46.8	45.5	43.7
CTB (dB)	63	65	65	65	65	67	68	67	65	65	65
CSO (dB)	62	63	64	65	65	65	65	65	63	63	63

- Note:
- 1、test situation: PAL-D59CH, OMI=3.8%
 - 2、DWDM inset loss is not include

5.2 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	Frequenc y (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-LR4X2050 standard wavelength 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

AU Technical Support 1800-AERIAL²³⁷⁴²⁵ www.matchmaster.com.au

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