Ver. 1.0en

HRS-24-H1 Series

FTTH CATV & SAT-TV Optical receiver

(47~2400MHz)

Technical Specification

CONTENT

1.0 PRODUCT DESCRIPTION

HRS-24-H1 product series is a kind of CATV & SAT-IF optical receiver with high-performance and high-index. 7~2400MHz operate bandwidth. Output level Vo=86dBμV(Pin=-2dBm),suitable for FTTH、FTTP fiber access network. It is a low power consumption, high performance and excellent cost performance CATV & DBS network ONU(Optical network unit).

This series product adopts high sensitivity receiving tube and special low noise matching circuit. Under 3.8% modulation, when transmitting in full channels and with receiving power of –8dBm, the CNR can still reach high index of 48dB and low inter modulation index. If adopting HRS-24-H1, it is only need very low optical power to reach 48dB CNR required by the user.

HRS-24-H1 optical port have following three modes:

HRS-24-H1/NC: RFTV operating in 1260~1620nm wavelength.

HRS-24-H1/WF: Built-in channel filter, RFTV operating in1550nm wavelength.

HRS-24-H1/WD: built-in CWDM, RFTV operating in 1550nm wavelength, via 1310/1490nm wavelength, (casemate EPON、GPON ONU).

2.0 PRODUCT FEATURE

- Extra-low noise（3.8% modulate，-8dBm receive， CNR≥48dB）
- In high operating wavelength 47~2400MHz，adopting CATV & SAT-IF signal transmitting
- Analog TV, Digital TV, SAT-TV, all have excellent features:

  Analog TV: (59CH PAL-D, 3.8% modulation)

  Pin=-10dBm,CNR≥44dB

  Pin=0dBm，CTB≤-65dB, CSO≤-65dB

  Digital TV: (The original signal MER=38.6dBm, BER<1.0E-9)

  Pin=-14dBm, MER≥33dB（MER deterioration5dB）

  Pin=-19dBm, BER<1.0E-9

  SAT-TV: (The original signal =64%)

  Pin=-15dBm, signal quality>38%
- Large dynamic range of received optical power, high receiving sensitivity：

  Analog TV：+2dBm~-10dBm

  Digital TV：+2dBm~-19dBm

  SAT-TV： +2dBm~-15dBm
- Extra-low inter modulation indicators
- High output level（Pin=-2dBm，Vo=86dBμV）
- In range of 47～2400MHz，all have good flatness
- Metal shell, supply safeguards to opt electrical sensing device
- Low power consumption, high cost performance

3.0 MAIN APPLICATION

- FTTH
- FTTP, FTTO

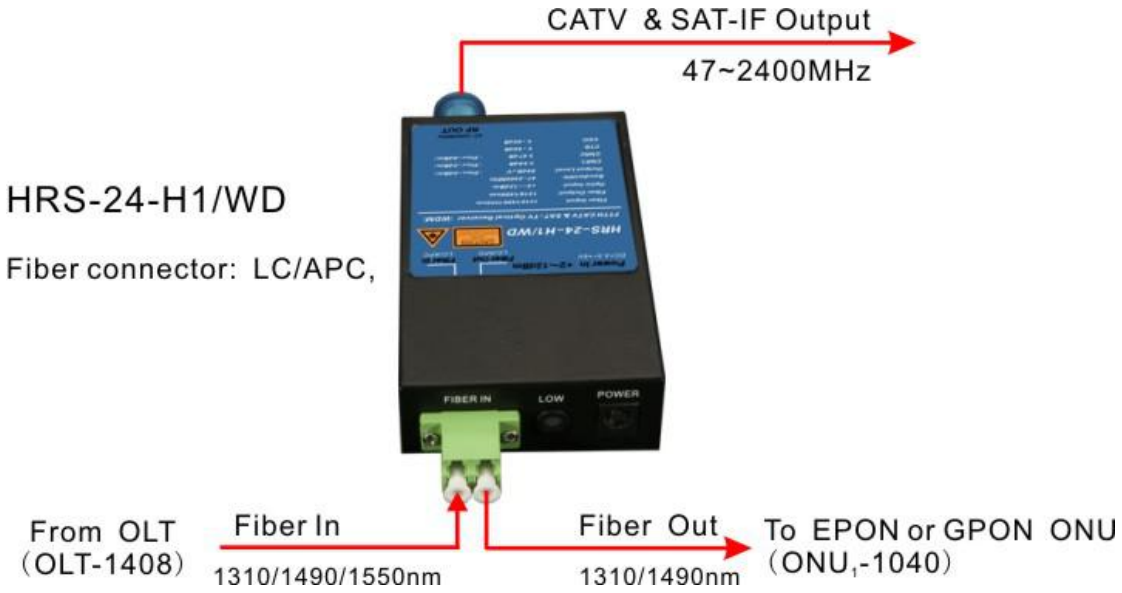
4.0 STATUS INDICATOR

- Input optical power status indicator:

  0~-10dBm Green

  >0dBm & <-10dBm Red

5.0 PRINCIPLE



6.0 TECHNICAL INDEX

Performance				Index			Supplement
				Min	Typ.	Max	
Optical feature	CATV work wavelength		(nm)	1260		1620	HRS-24-H1/NC
				1540	1550	1560	HRS-24-H1/WF, HRS-24-H1/WD
	Input wavelength		(nm)	1310, 1490/1550			
	Pass wavelength		(nm)	1260	1310	1360	
				1480	1490	1500	
	Insertion loss	Pass CH	(dB)			0.4(*1)	
		Reflection CH	(dB)			0.3 (*1)	
	Isolation	Pass CH	(dB)	40	45		
		Reflection CH	(dB)	20	25		
	Responsivity		(A/W)	0.85			1310nm
				0.9			1550nm
	Receiving power range		(dBm)	+2		-10	Analog TV
				+2		-19	Digital TV
				+2		-15	SAT TV
	Optical return loss		(dB)	55			
	Optical connector			SC/APC			HRS-24-H1/NC、WF
				LC/APC			HRS-24-H1/WD
RF feature	Work bandwidth		(MHz)	47		2400	
	Flatness		(dB)	-1.0		+1.0	47~862MHz
				-2.0		+2.0	950~2400MHz
	Output level (Pin=-2dBm)		(dBμV)		86		HRS-24-H1/NC
					84		HRS-24-H1/WD
	Return loss		(dB)	14			47 ~ 862MHz
				8			950~2400MHz
	Output impedance		(Ω)		75		
	Number of RF output port				1		47~2400MHz
	RF connector			F-female			

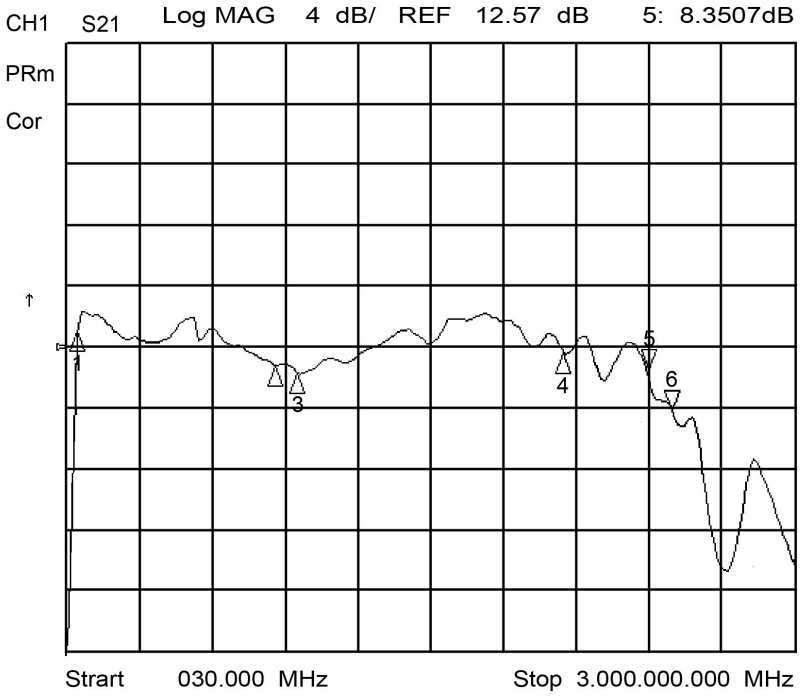
Analog TV link feature	Test channel	CH	59CH (PAL-D)			NTSC/80CH
	OMI	(%)		3.8		
	CNR1 (Pin=-2dBm)	(dB)	55			HRS-24-H1/NC
			54			HRS-24-H1/WD
	CNR2 (Pin=-8dBm)	(dB)	48			HRS-24-H1/NC
			47			HRS-24-H1/WD
	CTB	(dB)			-65	Pin=0dBm
					-70	Pin=-5dBm
	CSO	(dB)			-65	Pin=0dBm
					-69	Pin=-5dBm
	HUM	(dB)			-60	
Digital TV link feature	Test channel		<10CH			Analog
			Digital QAM			47~862MHz
	MER (*2)	(dB)	37			Pin:+2~-10dBm
			33			Pin≥-14dBm
	BER (*2)	(dB)			1.0E-9	Pin:+2~-19dBm
General feature	Power supply	(V)	+4.5		+6	
	Power current	(mA)	180		200	
	Work temp	(℃)	-20		+60	
	Storage temp	(℃)	-40		+85	
	Work relative humidity	(%)	5		59	
	Size	(mm)	59×98×23			(W)×(D)×(H)

Remark1: without optical fiber connector

2: digital TV test signal：MER：38.6dB、BER：<1.0E-9

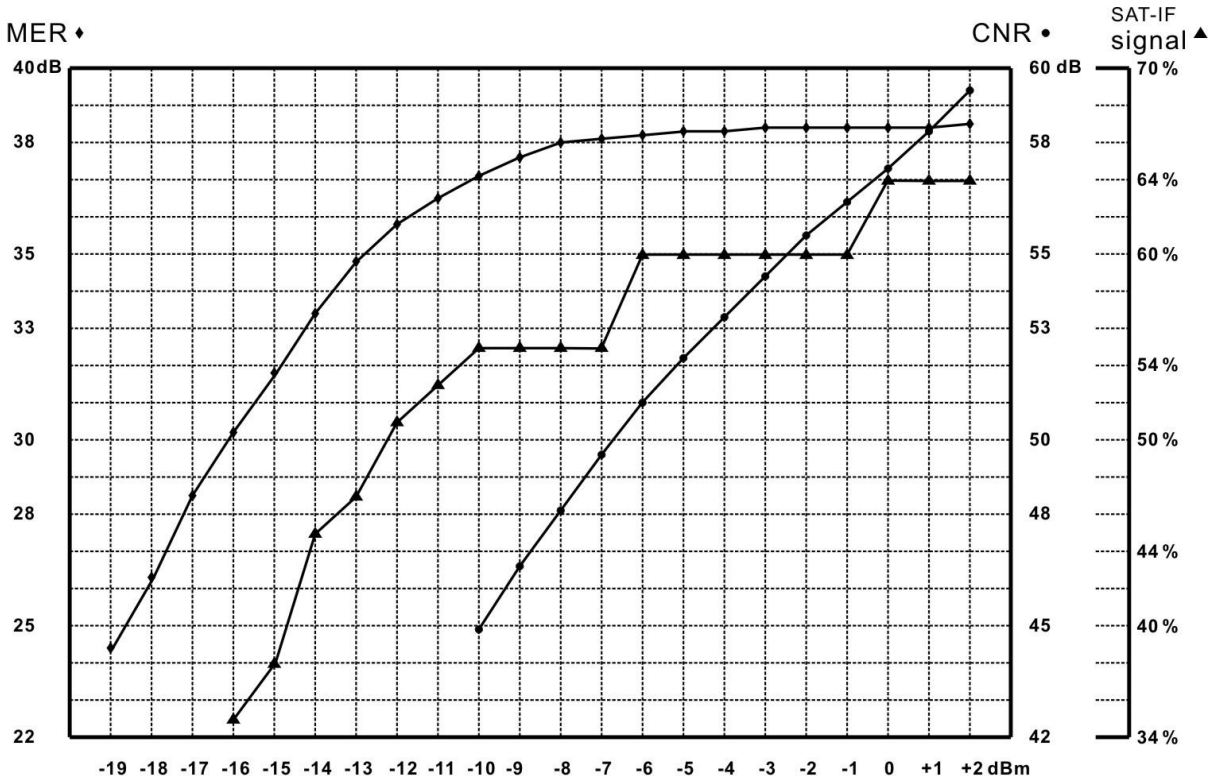
7.0 TEST DATA

7.1 Flatness



1: Mkr	(MHz)	dB
1:	47.00	13.642
2:	862.00	11.325
3:	950.00	10.881
4:	2050.00	12.235
5:	2400.00	10.864
6:	2500.00	8.3507

7.2 CNR, MER Degradation table



Remark: 1. CNR Original signal: 59CH PAL-D, OMI=3.8%

2. Digital TV test signal: MER=38.6dB、BER<1.0E-9

3. SAT-IF test signal: 64%

4. Test model: HRS-24-H1/NC

7.3 Analog TV test data (Pin=+2.0dBm~-10.0dBm)

Pin(dBm)	+2	+1	0	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10
Vo(dBμV)	94.2	92.2	90.4	88.2	86.2	84.5	82.5	80.4	78.3	76.2	74.5	72.4	70.2
CNR(dB)	59.5	58.3	57.3	56.4	55.5	54.4	53.3	52.2	51.0	49.6	48.1	46.6	44.9
CTB(dB)	58.1	65.2	68.1	70.2	69.7	71.3	72.2	71.7	71.1	72.0	71.6	69.0	66.6
CSO(dB)	60.0	62.0	65.0	66.9	67.7	68.3	68.6	69.4	68.0	71.4	69.9	68.9	66.9

Remark:1. testing condition： PAL-D 59CH, OMI＝3.8%

2. Test model: HRS-24-H1/NC

7.4 Digital TV test data (Pin=+2.0dBm~-19.0dBm)

Pin(dBm)	Vo(dBμV)	MER	BER	
			POST	PRE
+2	94.1	38.5	<1.0E-9	<1.0E-9
+1	92.5	38.4	<1.0E-9	<1.0E-9
+0.0	90.1	38.4	<1.0E-9	<1.0E-9
-1.0	88.4	38.4	<1.0E-9	<1.0E-9
-2.0	86.5	38.4	<1.0E-9	<1.0E-9
-3.0	84.3	38.4	<1.0E-9	<1.0E-9
-4.0	82.4	38.3	<1.0E-9	<1.0E-9
-5.0	80.5	38.3	<1.0E-9	<1.0E-9
-6.0	78.5	38.2	<1.0E-9	<1.0E-9
-7.0	76.2	38.1	<1.0E-9	<1.0E-9
-8.0	74.6	38.0	<1.0E-9	<1.0E-9

Pin(dBm)	Vo(dBμV)	MER	BER	
			POST	PRE
-9.0	72.7	37.6	<1.0E-9	<1.0E-9
-10.0	70.4	37.1	<1.0E-9	<1.0E-9
-11.0	68.3	36.5	<1.0E-9	<1.0E-9
-12.0	66.5	35.8	<1.0E-9	<1.0E-9
-13.0	64.4	34.8	<1.0E-9	<1.0E-9
-14.0	62.2	33.4	<1.0E-9	<1.0E-9
-15.0	60.1	31.8	<1.0E-9	<1.0E-9
-16.0	58.6	30.2	<1.0E-9	<1.0E-9
-17.0	56.5	28.5	<1.0E-9	1.7E-7
-18.0	54.3	26.3	<1.0E-9	1.1E-5
-19.0	52.2	24.4	<1.0E-9	2.9E-4

Remark: 1. testing signal：MER：38.6(dB)、BER：<1.0E-9

2. Channel load：<10CH Analog TV 、Digital QAM

3. Test model: HRS-24-H1/NC

8.0 PRODUCT SERIES

Model	Input wavelength	Operating wavelength	Pass wavelength	Fiber connector
HRS-24-H1/NC	1310/1550nm	1250~1600nm	-	SC/APC
HRS-24-H1/WD	1310, 1490/1550nm	1540~1560nm	1310~1490nm	LC/APC
HRS-24-H1/WF	1310, 1490/1550nm	1540~1560nm	-	SC/APC

9.0 Model explanation

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Product type		Max high work bandwidth		Applicable network		RF output port feature		CWDM		Optical connector	
HRS	SAT-TV Optical Receiver	24	47~2400MHz	A	High performance apply to FTTH	1	1port:47~2400MHz	WD	Build-in CWDM	LA	LC/APC
HES	SAT-TV External Modulation Optical Transmitter	22	47~2200MHz			2	1port:47~862MHz, 1port:950~2400MHz	WF	Build-in Filter	SA	SC/APC
		26	47~2600MHz	B	High output level apply to FTTB			NC	Without		
HDS	SAT-TV Direct Modulated Optical Transmitter										