

# HRS-24-H1 (47~2400MHz)

## FTTH CATV & SAT-TV Optical receiver

### PRODUCT DESCRIPTION

Guangtai 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  $V_o=86\text{dB } \mu\text{V}$  (  $\text{Pin}=-2\text{dBm}$  ), 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  $-8\text{dBm}$ , 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 mode with following three types optional:

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

HRS-24-H1/WF: Build-in channel filter, RFTV operating wavelength 1550nm.

HRS-24-H1/WD: Build-in CWDM, RFTV operating wavelength 1550nm, pass wavelength 1310/1490nm, ( Link EPON, GPON ONU ).



### PRODUCT FEATURES

- ▶ Extra-low noise ( 3.8% modulate,  $-8\text{dBm}$  receive,  $\text{CNR} \geq 48\text{dB}$  )
- ▶ 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 )
    - $\text{Pin}=-10\text{dBm}$ ,  $\text{CNR} \geq 44\text{dB}$
    - $\text{Pin}=0\text{dBm}$ ,  $\text{CTB} \leq -65\text{dB}$ ,  $\text{CSO} \leq -65\text{dB}$
  - Digital TV: ( The original signal  $\text{MER}=38.6\text{dBm}$ ,  $\text{BER} < 1.0\text{E}-9$  )
    - $\text{Pin}=-14\text{dBm}$ ,  $\text{MER} \geq 33\text{dB}$  ( MER deterioration  $5\text{dB}$  )
    - $\text{Pin}=-19\text{dBm}$ ,  $\text{BER} < 1.0\text{E}-9$
  - SAT-TV: ( The original signal  $=64\%$  )
    - $\text{Pin}=-15\text{dBm}$ , signal quality  $> 38\%$
- ▶ Extra-low inter modulation indicators
- ▶ High output level (  $\text{Pin}=-2\text{dBm}$ ,  $V_o=86\text{dB } \mu\text{V}$  )
- ▶ In range of 47 ~ 2400MHz, all have good flatness
- ▶ Metal shell, supply safeguards to opt electrical sensing device
- ▶ Low power consumption, high cost performance

### MAIN APPLICATION

- ▶ FTTH
- ▶ FTTP, FTTO

### STATUS INDICATOR

- ▶ Input optical power status indicator :  $0 \sim -10\text{dBm}$       Green
- $> 0\text{dBm}$  &  $< -10\text{dBm}$       Red

- ▶ Large dynamic range of received optical power, high receiving sensitivity :

Analog TV:  $+2\text{dBm} \sim -10\text{dBm}$

Digital TV:  $+2\text{dBm} \sim -19\text{dBm}$

SAT-TV:  $+2\text{dBm} \sim -15\text{dBm}$

## TECHNICAL INDEX

| Performance             |                               |               | Index             |      |         | Supplement                    |
|-------------------------|-------------------------------|---------------|-------------------|------|---------|-------------------------------|
|                         |                               |               | Min.              | Typ. | Max.    |                               |
| Optical feature         | CATV work wavelength          | (nm)          | 1260              |      | 1620    | HRS-24-H1/NC                  |
|                         |                               |               | 1540              | 1550 | 1560    |                               |
|                         | Input wavelength              | (nm)          | 1310, 1490 / 1550 |      |         |                               |
|                         | Pass wavelength               | (nm)          | 1260              | 1310 | 1360    | HRS-24-H1/WF,<br>HRS-24-H1/WD |
|                         |                               |               | 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                        |
|                         | Receiver power range          | (dBm)         | +2                |      | -10     | Analog TV                     |
|                         |                               |               | +2                |      | -19     | Digital TV                    |
|                         |                               |               | +2                |      | -15     | Satellite TV                  |
|                         | Optical return loss           | (dB)          | 55                |      |         |                               |
| RF feature              | Optical connector             |               | SC/APC            |      |         | HRS-24-H1/NC, HRS-24-H1/WF    |
|                         |                               |               | LC/APC            |      |         | HRS-24-H1/WD                  |
|                         | Work bandwidth                | (MHz)         | 47                |      | 2400    |                               |
|                         | Flatness                      | (dB)          | -1.0              |      | +1.0    | 47~862MHz                     |
|                         |                               |               | -2.0              |      | +2.0    | 950~2400MHz                   |
|                         | Output level<br>( 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                   |
| 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                     | (°C)          | -20               |      | +60     |                               |
|                         | Storage temp                  | (°C)          | -40               |      | +85     |                               |
|                         | Work relative humidity        | (%)           | 5                 |      | 59      |                               |
|                         | Size (W)×(D)×(H)              | (mm)          | 88×50×22          |      |         | B-Type                        |
|                         |                               |               | 59.5×98×24        |      |         | C-Type                        |

Remark 1: without optical fiber connector

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

## PRINCIPLE

To EPON or GPON ONU (ONU<sub>1</sub>-1040) ← 1310/1490nm Fiber Out

1310/1490/1550nm Fiber In → From OLT (OLT-1408)

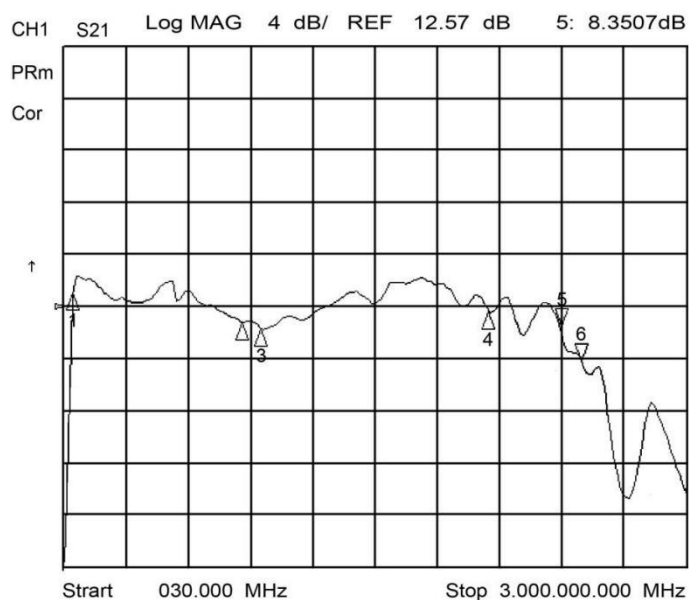
HRS-24-H1/WD

Fiber connector: LC/APC,



CATV & SAT-IF Output  
47~2400MHz

## 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 |

## PRODUCT SERIES

| Model        | Input wavelength    | Operating wavelength | Pass wavelength | Fiber connector |
|--------------|---------------------|----------------------|-----------------|-----------------|
| HRS-24-H1/NC | 1310                | 1260~1620nm          | -               | SC/APC          |
| HRS-24-H1/WF | 1310, 1490 / 1550nm | 1540~1560nm          | -               | SC/APC          |
| HRS-24-H1/WD | 1310, 1490 / 1550nm | 1540~1560nm          | 1310~1490nm     | LC/APC          |

## MODEL EXPLANATION

HRS - 24 - H 1 / □□ - □□ - □

| Product type |                                                | Max high work bandwidth |            | Applicable network |                                 | RF output port feature |                                    | CWDM |                 | Optical connector |        | Exterior |               |
|--------------|------------------------------------------------|-------------------------|------------|--------------------|---------------------------------|------------------------|------------------------------------|------|-----------------|-------------------|--------|----------|---------------|
| HRS          | SAT-TV Optical Receiver                        | 24                      | 47~2400MHz | H                  | High performance apply to FTTH  | 1                      | 1port:47~2400MHz                   | WD   | Build-in CWDM   | LA                | LC/APC | B        | 50×88×22 (mm) |
| 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 | NC                 | Without                         |                        |                                    |      |                 |                   |        |          |               |
| HDS          | SAT-TV Direct Modulated Optical Transmitter    |                         |            | B                  | High output level apply to FTTB |                        |                                    |      |                 |                   |        | C        | 59×98×23 (mm) |