

Optical Receiver

User Manual

Two output:

Type A: Yatai YT8684-2 (AGC) super low optical power receiving user manual

Type B: Yatai YT8684-2 (AGC / MGC switching) super low optical power receiving user manual

Type C: Yatai YT8684-2 (universal type) super low optical power receiving user manual

Four output:

Type A: Yatai YT8684-4 (AGC) super low optical power receiving user manual

Type B: Yatai YT8684-4 (AGC / MGC switching) super low optical power receiving user manual

Type C: Yatai YT8684-4 (universal type) super low optical power receiving user manual

一、Preface:

Construction of fiber-optic cable networks is not fully developed, and with the increase of the number of users, we always hope the optical fiber can extend a few kilometers longer on the basis of the original optical node network. The solution is usually assigned to the original optical node greater optical power; or directly to do allocation by passive optical node in order to save investment. Generally optical receiver can not get the ideal system indicators.

Based on existing network, neither change or increase optical power distribution nor its network structure, and to let new added optical node

achieve good performance, adopting Yantai Yatai ultra-low optical power receiver can be a cost-effective solution to this problem.

Our optical receiver adopts international-advanced GaAs HBT integrated circuit technique, thus optical receiver has very low noise power. When receiving optical power is -6dBm, CNR still can be above 50 dB, so it can save transmitting optical power and this effect is more remarkable when receiving optical power is low.

Using the ultra low optical power receiver technology can extend the length of the optical fiber transmission with a relatively small investment and also can find a new method for construction of a large optical fiber network. On one hand, it saves on optical power and investments, on the other hand, the existing network infrastructure maintains.

二、 Operation Principle:

$$(CNR)_s = \frac{C_i}{N_{th} + N_{sh} + N_{RIN}}$$

N_{th} : Receiver's thermal noise power

N_{sh} : Photoelectric conversion shot noise power

N_{RIN} : Laser relative intensity noise power

C_i : Input optical power

Thermal noise is proportional to the noise figure of the receiver amplifier; shot noise is proportional to the received optical power.

When input optical power is -3~-2dBm, N_{sh} plays a leading role(N_{th}

and NRIN 's influence to CNR is relatively low and can be neglected). If input optical power is lower, Nsh will reduce accordingly, the effect of Nth can not be ignored (Nsh and NRIN 's influence to CNR is relatively low and can be neglected).

We use GaAs HBT integrated circuit technique, and the noise factor is about 1.5dB (bandwidth: 50 ~ 860MHz) , whose noise figure is 4 ~ 5dB lower than other CATV amplifier module. When receiving optical power is very low, 7582 and 8682 receivers also have lower Nth than other ordinary module receivers, thus improving receiving sensitivity.

三、AGC function

Type A: AGC; Type B: AGC/MGC switching type; Type C: Universal type

When input power is -7dBm to +1dBm , optically controlled plate output level is: 72dBu.

Yatai adopts low noise processing circuit, better solves the problem of increasing of noise when input power is -7dBm. When input power is -7dBm to +1dBm, CRN、CTB and CSO all cater to national standard.

四、Specifications

Forward optical parameters:

Item	Unit	Parameters	Remark
Input optical wavelength	nm	1100-1600	
Output port		Two output	
		Four output	
Operation bandwidth	MHz	47~862	

Optical connector		FC/APC or SC/APC	
Optical power receiving range	dBm	-7~+2 (-3dBm is better)	
Reflection loss	dB	≥60	
Flatness In band	dB	±0.75dB	
Output level	dBμv	≥105	
C/N	dB	≥51	
CTB	dB	-66	
CSO	dB	-63	
Output reflection loss	dB	≥16 (47-750MHz)	
Output Impedance	Ω	75	
Input Voltage Range	V	AC110~260 or 35~95	
Power Consumption	W	Two output: 12~15	
		Four output: 17~20	
Dimension	mm	Two output: 250×200×110	
		Four output: 330×230×130	

Reverse transmission performance parameters:

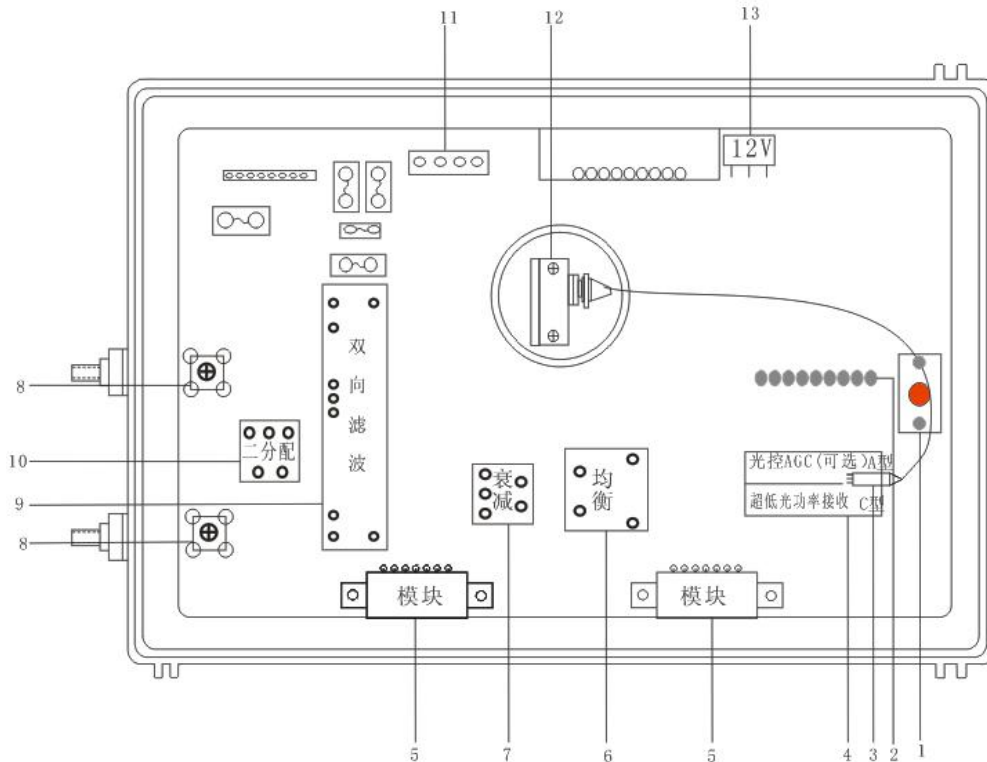
Item	Unit	Parameters	Remark
optical wavelength	nm	1310±10	
Optical connector		FC/APC or SC/APC	
Optical link frequency response	dB	≤±1.0	
Output power	mw	1~10	
Rf input level	dBμv	80	
Reflection loss	dB	≥16	

五、Receiving optical power and CNR relation table

Receiving optical power (dBm)	-9	-8	-7	-6	-5	-4	-3	-2
CNR (dB)	47	48	49	50	51	52	53	54
——	Fiber to		FTTZ			Fiber Trunk		

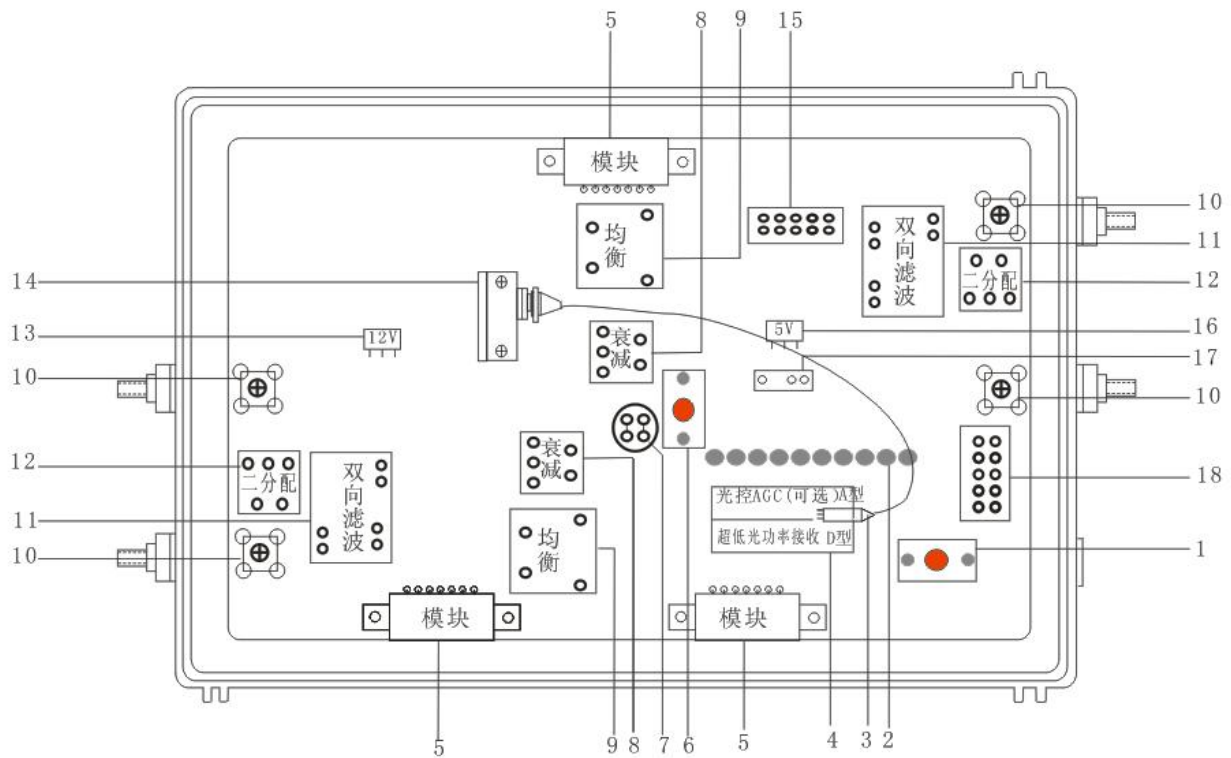
	LOUDONG	
CTB	-66dB	
CSO	-63dB	
Output level (99CH)	106dBuv (@-3dBm power receiving)	
Flatness in band	±0.75dB	

六、Two-output structure diagram



- 1) Type B AGC/MGC switch button
- 2) Optical power indicator
- 3) Detector
- 4) Photoelectric conversion ultralow power receiving plate (Type C)
AGC low power plate (type A)
- 5) Module
- 6) Equilibrium
- 7) Attenuator
- 8) RF output port
- 9) Two-way filtering
- 10) FP-204 allocation
- 11) Power outlet
- 12) Flange bracket
- 13) 12V

七、 Four-output structure diagram



- 1) AGC/MGC switch button (on the lid)
- 2) Optical power indicator
- 3) Detector
- 4) Photoelectric conversion ultralow power receiving plate (Type C)
AGC low power plate (type A)
- 5) Module
- 6) AGC/MGC switch button (On the main board)
- 7) Two distribution
- 8) Attenuator
- 9) Equilibrium
- 10) RF output port
- 11) Bi-directional filtering
- 12) FP-204 allocation
- 13) 12V
- 14) Flange bracket
- 15) Network management interface
- 16) 5V
- 17) Power outlet
- 18) Optical power indicator light socket