

MR12 (40KHz~18GHz)
Broadband Microwave APD-TIA Receivers

Technical Specification

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1.0 PRODUCT DESCRIPTION

Guangtai MR12 series microwave broadband optical receiver, adopts high Sensitivity APD diode and limiting amplifier, within bandwidth of 40KHz~18GHz, they are featured with excellent linearity, high responsibility and superior flatness of the RF response in both, power and phase. They provide an outstanding linearity fiber optical communication for analogue wideband microwave application. Due to avoidance of using expensive coaxial cable or wave-guide, there will be no limitation in transmission distance, which improves the signal quality and reliability of the microwave communication. They can be widely applied in microwave communication system such as remote wireless, timing and reference signal distribution, telemetry, measurement and delay line etc as well as 10Gb/s high speed communication system.

MR12 series adopts APD photodiode, low noise TIA and limiting amplifier.

MR12 Four exterior structures available:

MX: module type, RS232 is an option, suitable for OEM, Exterior structure and size of the module as well as the PIN description can be specified by customers

2D: desk top, with RS232and LCD display, suitable for laboratory use

1U, 3U: 19" casing, with RS232, SNMP and LCD display, suitable for direct use in networks.

2.0 PRODUCT FEATURE

- Wide bandwidth 40KHz~18GHz
- Maximum frequency optional: 6GHz, 10GHz, 15GHz, 18GHz
- Superior flatness of RF response
- High responsibility
- High sensitivity, -27.5dBm typical
- Low capacitance high speed InGaAs APD Photo detector
- Low Noise TIA and limiting amplifier
- Output amplitude: 500mVpp
- Full-transparency operation mode, suitable for all kinds of signal code, communication standard and network protocol
- Powerful RS232 communication interface, perfect SNMP function, LCD status display.
- Electromagnetic, RF, thunderbolt assistance
- Four exterior structures available
- Excellent P/P ratio

3.0 MAIN APPLICATION

- Antenna Remoting
- Military communications
- Tracking, telemetry and control
- Phased arrays
- Delay lines
- Microwave RF optical links
- High speed lightwave characterization
- 10Gb/s, 12.5Gb/s communication systems

4.0 Technical index

| Performance | | | | Index | | | Supplement |
|-----------------|----------------------------------|--------|-------|----------------------|-------|-------|-----------------------|
| | | | | Min. | Typ. | Max. | |
| Optical feature | Operating wavelength range | | (nm) | 1260 | | 1620 | |
| | Responsibility | R13 | (A/W) | 0.75 | 0.85 | | 1310nm |
| | | R15 | | 0.8 | 0.9 | | 1550nm |
| | | R16 | | | 0.8 | | 1610nm |
| | Dark current | | (nA) | | 2 | 50 | |
| | Minimum sensitivity | | (dBm) | | -27.0 | -26.0 | |
| | Maximum overload | | (dBm) | -7.0 | -5.0 | | |
| | Optical return loss | | (dB) | 40 | | | |
| | Optical connector | | | SC/APC | | | Option FC/APC, LC/APC |
| RF feature | High frequency (cut-off -3dB) | | (GHz) | 6.0 | | | MR12-06 |
| | | | | 8.0 | | | MR12-08 |
| | | | | 10.0 | | | MR12-10 |
| | | | | 12.0 | | | MR12-12 |
| | | | | 15.0 | | | MR12-15 |
| | | | | 18.0 | | | MR12-18 |
| | -3dB Low frequency | | (KHz) | | 40 | | |
| | In-band ripple | | (dB) | | | ± 1.5 | ≤10GHz |
| | | | | | | ± 2.5 | 12~18GHz |
| | AC output voltage swing | | (mA) | | 400 | | |
| | RF return loss | | (dB) | 8 | | | |
| | RF output coupled | | | | AC | | |
| | RF output connector | | | SMA-F or K-connector | | | |
| General feature | Communication interface | | | RS232 | | | MX,P3 |
| | SNMP interface | | | RJ45 | | | Network management |
| | Power supply | 220VAC | (V) | 90 | 220 | 265 | 1RU, 3RU, 2D |
| | | -48VDC | | -30 | -48 | -72 | 1RU, 3RU |
| | | +12VDC | | +11 | +12 | +12.5 | MX |
| | Power consume | | (W) | | | 5 | MX |
| | Operating temp. | | (℃) | -40 | | +65 | |
| | Storage temp. | | (℃) | -40 | | +85 | |
| | Relative humidity | | (%) | 5 | | 95 | |
| | Size | 1U | (") | 19×11.0×1.75 | | | 19" stander |
| | | 3U | | 19×14.5×5.25 | | | |
| | | 2D | | 12.4×13.0×3.5 | | | Desk-top |
| | | M1 | (mm) | 145×75×28 | | | With RS232 |
| | | M2 | | 70×45×16 | | | Without RS232 |

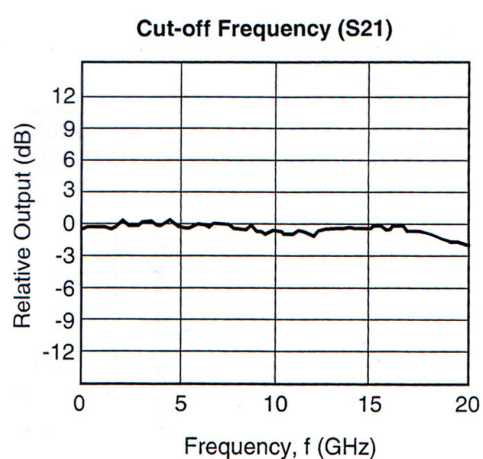
5.0 PRODUCTS SERIES

| Model number | Highest frequency | RF output port | RF Connector | Structure | Optical connector |
|--------------|-------------------|--------------------------------------|-------------------------|-----------------------------------|--|
| MR12-06-K | 6.0GHz | Single port AC coupling output | SMA-F or K-connector | 1U, 3U, 2D, MX, 3P optional | SC/APC, optional FC/APC, LC/APC |
| MR12-08-K | 8.0GHz | | | | |
| MR12-10-K | 10.0GHz | | | | |
| MR12-13-K | 13.0GHz | | | | |
| MR12-15-K | 15.0GHz | | | | |
| MR12-18-K | 18.0GHz | | | | |

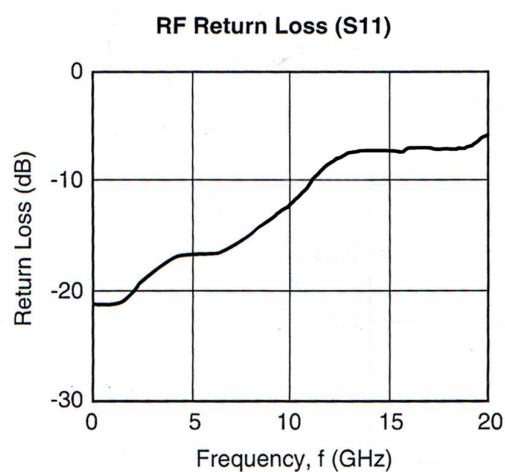
Remark: please refer to ordering information

6.0 Typical performance

1、MR12-20 Cut-off Frequency (S21)



2、MR12-20 RF Return loss (S11)



7.0 ORDERING INFORMATION

7.1 1U, 3U, 2D ordering information

MR 1 2 - □□ - K / □□ - F / S A - 2 2

| Product series | | Optical feature | | RF feature | | High frequency | | RF connector | | Exterior | | Optical port location | | Connector | | Power supply | |
|----------------|-------------------------------|-----------------|------------------------------|------------|----------------------|----------------|-------|--------------|-------------|----------|-------------|-----------------------|-------------|-----------|--------|--------------|--------|
| MR | Microwave optical receiver | 1 | APD | 0 | Without RF Amp | 06 | 6GHz | G | GPO | 2D | Desk-top 2U | F | Front panel | FA | FC/APC | 22 | 220VAC |
| | | 2 | PIN | | | 08 | 8GHz | S | SMA-F | 1U | 1RU | B | Back panel | SA | SC/APC | 11 | 110VAC |
| MT | Microwave optical transmitter | 3 | High-power PIN | 1 | With RF Pre Amp | 10 | 10GHz | K | K-connector | 3U | 3RU | | | LA | LC/APC | 48 | -48VDC |
| | | 4 | High-power PIN with Pre-EDFA | | | 13 | 13GHz | | | MX | Modular | | | | | | |
| | | | | 2 | With RF Limiting Amp | 15 | 15GHz | | | | | | | | | | |
| | | | | | | 18 | 18GHz | | | | | | | | | | |

7.2 Module type ordering information

MR 1 2 - □□ - K / □□ / □ - □□ / □ - 2 / 0 5

| Product series | | Optical feature | | RF feature | | High frequency | | RF connector | | Module class | | RS232 | | Connector | | Connector type | | Leads to fiber diameter | | Leads to fiber length | | | | | | |
|----------------|-------------------------------|-----------------|------------------------------|------------|-----------------|----------------------|-------|--------------|-------------|--------------|------|-------|---------|-----------|--------|----------------|--------|-------------------------|------|-----------------------|------|--|--|--|--|--|
| MR | Microwave optical receiver | 1 | APD | 0 | Without RF Amp | 06 | 6GHz | G | GPO | M1 | No.1 | Y | With | FA | FC/APC | E | Enamel | 1 | Φ1mm | 05 | 0.5m | | | | | |
| | | 2 | PIN | | | 08 | 8GHz | S | SMA-F | M2 | No.2 | 0 | Without | SA | SC/APC | T | Tie-in | 2 | Φ2mm | 10 | 1.0m | | | | | |
| MT | Microwave optical transmitter | 3 | High-power PIN | 1 | With RF Pre Amp | 10 | 10GHz | K | K-connector | M3 | No.3 | | | LA | LC/APC | | | 3 | Φ3mm | 15 | 1.5m | | | | | |
| | | 4 | High-power PIN with Pre-EDFA | | | 13 | 13GHz | | | | | | | | | | | | | | | | | | | |
| | | | | | 2 | With RF Limiting Amp | 15 | 15GHz | | | | | | | | | | | | | | | | | | |
| | | | | | | | 18 | 18GHz | | | | | | | | | | | | | | | | | | |