

## Product Datasheet - Technical Specifications



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**RIGOL**

# PIA1000 Series

Optical-fiber Isolated Probe



## 6 Specifications

All technical specifications are typical values unless otherwise noted. Technical specifications are valid when:

- The probe is calibrated at  $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$  ambient temperature
- The probe is powered by normal power supply
- The temperature, altitude, and humidity of the environment in which the probe is located cannot exceed the limits of the stated environmental requirements.

### Technical Specifications

| Characteristics                           | PIA1020                                                                      | PIA1050                                              | PIA1100                                              |
|-------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------|------------------------------------------------------|
| Bandwidth                                 | 200 MHz                                                                      | 500 MHz                                              | 1 GHz                                                |
| Rise Time                                 | $\leq 1.75$ ns                                                               | $\leq 700$ ps                                        | $\leq 450$ ps                                        |
| CMRR                                      | DC: 180 dB<br>200 MHz: 122 dB                                                | DC: 180 dB<br>500 MHz: 114 dB                        | DC: 180 dB<br>1 GHz: 108 dB                          |
| Propagation Delay                         | 18.5 ns (2 m fiber length)                                                   | 17.2 ns (2 m fiber length)                           | 17.2 ns (2 m fiber length)                           |
| Output Voltage Range                      | $\pm 1.25$ V                                                                 | $\pm 500$ mV                                         | $\pm 500$ mV                                         |
| Noise                                     | $\leq 2$ mVrms@0 dB<br>$\leq 400$ $\mu$ Vrms@20 dB                           | $\leq 2.4$ mVrms@0 dB<br>$\leq 420$ $\mu$ Vrms@20 dB | $\leq 2.4$ mVrms@0 dB<br>$\leq 420$ $\mu$ Vrms@20 dB |
| Power Supply                              | Power supply from the oscilloscope's probe interface or the Type-C interface |                                                      |                                                      |
| DC Gain Accuracy <sup>[1]</sup> (Typical) | 1%                                                                           |                                                      |                                                      |
| Common Mode Voltage                       | 85 kVpk                                                                      |                                                      |                                                      |
| Certification                             | IEC60825-1                                                                   |                                                      |                                                      |

### NOTE

[1]: When the signal is much greater than the oscilloscope's system noise, it is recommended to use the oscilloscope's  $\pm 3$  div DC signal.



### Attenuating Tip

| Probe Model | Atten.Tip        | Atten. Ratio | Input Voltage Range | Non-destructive Voltage (Max.) | Input Impedance (Typ.) |
|-------------|------------------|--------------|---------------------|--------------------------------|------------------------|
| PIA1020     | TIP-MMCX-10X-02  | 10:1         | ±12.5 V             | 1000 Vpp                       | 3.75 MΩ  6 pF          |
|             |                  | 1:1          | ±1.25 V             |                                |                        |
|             | TIP-MMCX-20X-02  | 20:1         | ±25 V               | 1000 Vpp                       | 4.47 MΩ  4 pF          |
|             |                  | 2:1          | ±2.5 V              |                                |                        |
|             | TIP-MCX-500X-02  | 500:1        | ±625 V              | 2500 Vpp                       | 20.20 MΩ  1 pF         |
|             |                  | 50:1         | ±62.5 V             |                                |                        |
| PIA1050     | TIP-MMCX-20X-05  | 20:1         | ±10 V               | 1000 Vpp                       | 4.47 MΩ  4 pF          |
|             |                  | 2:1          | ±1 V                |                                |                        |
|             | TIP-MMCX-50X-05  | 50:1         | ±25 V               | 1000 Vpp                       | 4.19 MΩ  2 pF          |
|             |                  | 5:1          | ±2.5 V              |                                |                        |
|             | TIP-MCX-1000X-05 | 1000:1       | ±500 V              | 2500 Vpp                       | 20.21 MΩ  1 pF         |
|             |                  | 100:1        | ±50 V               |                                |                        |
|             | TIP-MCX-2000X-05 | 2000:1       | ±1000 V             | 2500 Vpp                       | 20.08 MΩ  1 pF         |
|             |                  | 200:1        | ±100 V              |                                |                        |
|             | TIP-MCX-5000X-05 | 5000:1       | ±2500 V             | 3600 Vpp                       | 40.16 MΩ  1 pF         |
|             |                  | 500:1        | ±250 V              |                                |                        |
| PIA1100     | TIP-MMCX-20X-1   | 20:1         | ±10 V               | 1000 Vpp                       | 4.47 MΩ  2 pF          |
|             |                  | 2:1          | ±1 V                |                                |                        |
|             | TIP-MMCX-50X-1   | 50:1         | ±25 V               | 1000 Vpp                       | 4.19 MΩ  2 pF          |
|             |                  | 5:1          | ±2.5 V              |                                |                        |
|             | TIP-MCX-1000X-1  | 1000:1       | ±500 V              | 2500 Vpp                       | 20.21 MΩ  1 pF         |
|             |                  | 100:1        | ±50 V               |                                |                        |
|             | TIP-MCX-2000X-1  | 2000:1       | ±1000 V             | 2500 Vpp                       | 20.08 MΩ  1 pF         |
|             |                  | 200:1        | ±100 V              |                                |                        |
|             | TIP-MCX-5000X-1  | 5000:1       | ±2500 V             | 3600 Vpp                       | 40.16 MΩ  1 pF         |
|             |                  | 500:1        | ±250 V              |                                |                        |

### Adapters and Coaxial Cable

| Accessory Type    | Withstand Voltage Range |
|-------------------|-------------------------|
| MCX Adapter       | <3000 Vpp               |
| MMCX Adapter      | <300 Vpp                |
| MCX Coaxial Cable | <3000 Vpp               |

| Accessory Type     | Withstand Voltage Range |
|--------------------|-------------------------|
| MMCX Coaxial Cable | <300 Vpp                |
| LCX Coaxial Cable  | <8000 Vpp               |

### Mechanical Characteristics

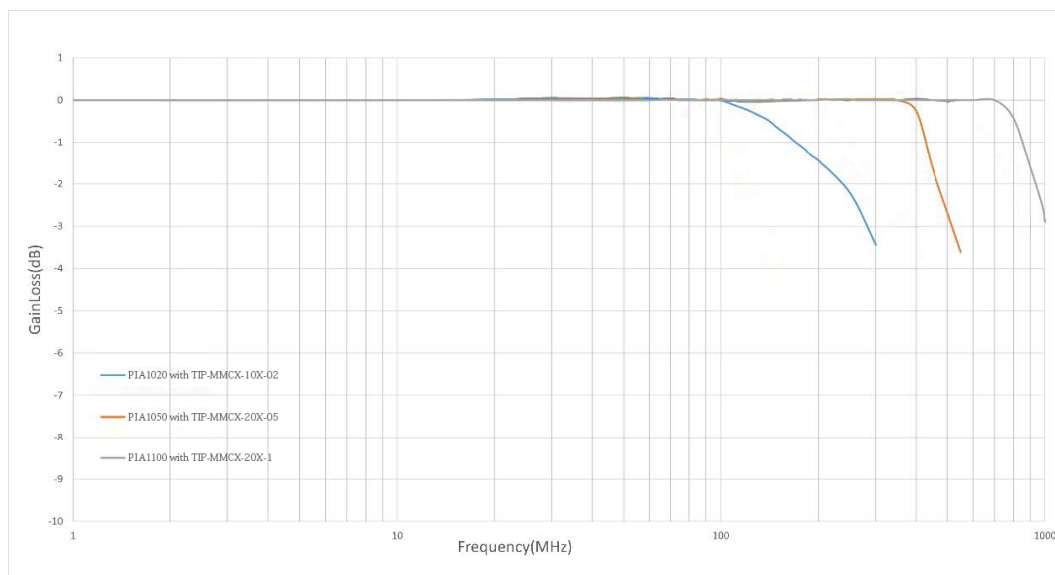
| Characteristics                                  | Specification                |
|--------------------------------------------------|------------------------------|
| Fiber Length (E-O Converter to O-E Converter)    | 2 m                          |
| Cable Length (O-E Converter to Probe Controller) | 25 cm                        |
| Optical-Electrical Converter Size                | 108.6 mm x 45 mm x 22.7 mm   |
| Electrical-Optical Converter Size                | 118 mm x 40.6 mm x 23.7 mm   |
| Probe Controller                                 | 111.5 mm x 28.7 mm x 36.5 mm |

### Environmental Characteristics

| Environmental Characteristics | Status        | Specification                                                                                                                                                                                                                                                        |
|-------------------------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Temperature                   | Operating     | Optical-Electrical converter: 0°C to +40°C<br>Electrical-Optical converter: 0°C to +40°C                                                                                                                                                                             |
|                               | Non-operating | Optical-Electrical converter: -20°C to +70°C<br>Electrical-Optical converter: -20°C to +70°C                                                                                                                                                                         |
| Humidity                      | Operating     | Optical-Electrical converter: 5% to 85% RH (relative humidity) below +40°C, without condensation<br>Electrical-Optical converter: 5% to 85% RH (relative humidity) below +40°C, without condensation                                                                 |
|                               | Non-operating | Optical-Electrical converter: 5% to 85% RH (relative humidity) below +40°C; 5% to 45% RH at +40°C to +70°C, without condensation<br>Electrical-Optical converter: 5% to 85% RH (relative humidity) below +40°C; 5% to 45% RH at +40°C to +70°C, without condensation |

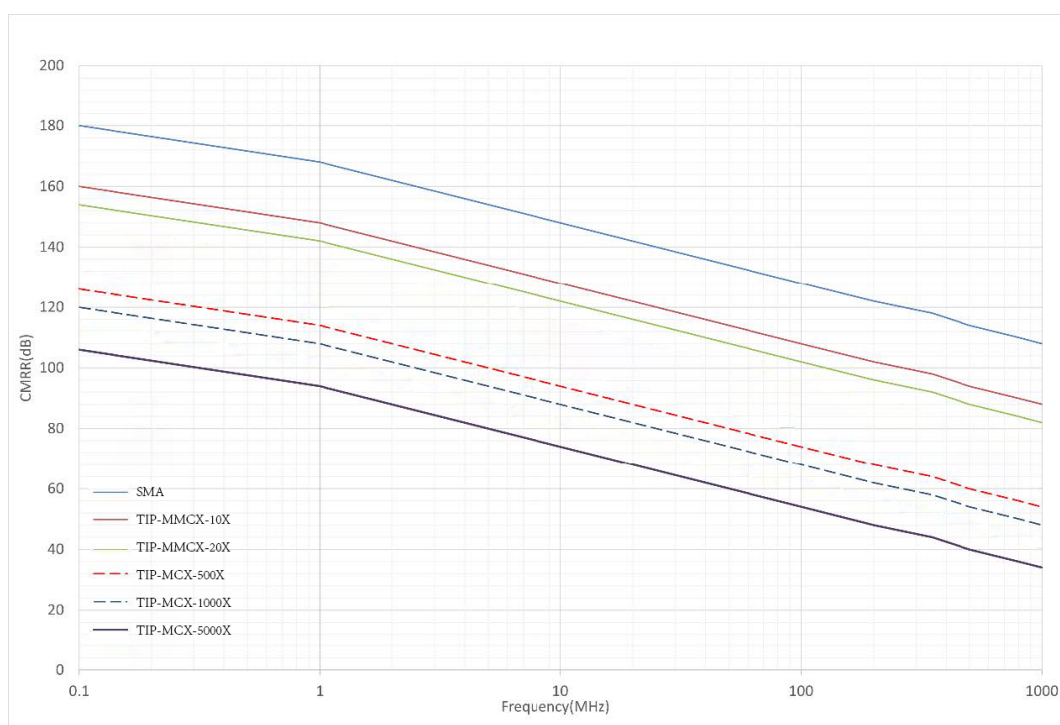
| Environmental Characteristics | Status        | Specification |
|-------------------------------|---------------|---------------|
| Altitude                      | Operating     | 3000 meters   |
|                               | Non-operating | 12,000 meters |

### Amplitude Frequency Characteristic Curve



The figure above shows the amplitude-frequency characteristics of different probe models.

### Attenuating Tip CMRR Curve



The figure above shows the common mode rejection capabilities of different attenuating tips (0dB) at various frequencies.