9306
1-GHz Preamplifier

- **1-GHz preamplifier for timing applications with pulses from ultra-fast detectors (microchannel plates, microchannel-plate photomultipliers, channeltrons, silicon diodes, photomultipliers, and electron multipliers)**
- **350-ps rise time**
- **Gain ≈ 100 (non-inverting)**
- **100-kHz to 1-GHz bandwidth**
- **Two identical outputs deliver 0 to –2 V pulses on 50-Ω loads**
- **50-Ω input and output impedances, AC-coupled**

The ORTEC Model 9306 1-GHz Preamplifier is optimized for fast timing and counting applications with detectors that deliver pulses with ultra-fast rise times. An output rise time of 350 ps and a non-inverting gain of 100 make the Model 9306 ideal for use with microchannel plates, microchannel-plate photomultipliers, channeltrons, silicon diodes, fast photomultiplier tubes, and electron multipliers. The compact preamplifier case with captive power cord permits close coupling to the detector to minimize sensitivity to environmental noise.

To preserve the ultra-fast rise time, the Model 9306 is designed to accept and deliver signals on high-quality, 50-Ω coaxial cables with SMA connectors and 50-Ω terminations. The input is AC-coupled, with a 50-Ω input impedance, and is protected to a maximum of ±1 V. Two identical outputs are provided for convenient, simultaneous connection to two different instruments. Both outputs are AC-coupled, short-circuit protected, and capable of driving pulse amplitudes from 0 to –2 V into 50-Ω loads.

The Model 9306 1-GHz Preamplifier derives its +24-V DC power from a NIM module or power supply via the captive power cord and standard, 9-pin, D connector. The ORTEC Model 4002P Portable Power Supply and most NIM amplifiers provide the required power on a compatible preamplifier power connector.

Specifications

PERFORMANCE

All specifications are measured with a pulser having a pulse width of 2 ns FWHM, and a rise time of 150 ps. Where significant, the measurement is corrected for the rise times of the pulser, coaxial cable, and oscilloscope. The specifications are identical for OUTPUTS 1 and 2.

GAIN Nominally 100 (50 to 150), non-inverting, into a 50-Ω output load.

OUTPUT RISE TIME Typically 350 ps.

BANDWIDTH (3 dB) Typically 100 kHz to 1 GHz.

NOISE <100 µV rms equivalent input noise over the full bandwidth.

INPUTS AND OUTPUTS

INPUT SMA input connector with 50-Ω input impedance (AC-coupled) and a 10-kΩ resistance to ground. Input protected to a maximum of ±1 V.

OUTPUT 1 SMA output connector provides a linear output range from 0 to –1.75 V and a maximum output of –2 V into a 50-Ω load. Output impedance is 50-Ω, AC-coupled, and short-circuit protected. The unused output must be terminated with a 50-Ω load for proper operation of the other output. An optional SMA 50-Ω terminator is available for this purpose.

OUTPUT 2 Identical to OUTPUT 1.

POWER Input power is supplied through a captive cable (length: 3 m) with a standard preamplifier power connector (9-pin D type). Compatible with ORTEC instruments that provide a preamplifier power connector.

ELECTRICAL AND MECHANICAL

POWER REQUIRED +24 V at 200 mA. Captive power cord with standard 9-pin D connector derives power from any ORTEC instrument equipped with the standard preamplifier power plug (e.g., spectroscopy amplifiers, 4002P Portable Power Supply, 9307 pico-TIMING Discriminator, etc.).

WEIGHT
Net 0.2 kg (0.4 lb).
Shipping 1.1 kg (2.4 lb).

DIMENSIONS Aluminum housing 9.5 x 6.4 x 2 cm (3.75 x 2.5 x 0.8 in.).

Optional Accessories

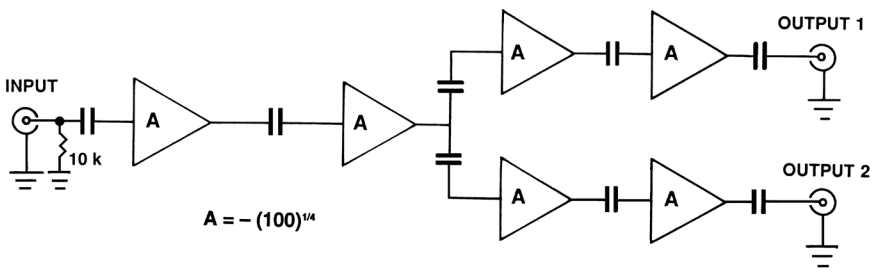
The Model 9306 is designed for use with 50-Ω coaxial signal cables having SMA connectors. The desired optional cables and adapters can be selected from the ordering information. To avoid degradation of the 350-ps rise time through long signal cables, the total length of the input and output signal cables should be ≤1.7 m. If one of the outputs is not used, it must be loaded with an SMA50 terminator.

The Model 9306 should be used with the Model 9307 pico-TIMING™ Discriminator for optimum time resolution with ultra-fast detectors.

Ordering Information

Model	Description
9306	1-GHz Preamplifier
SMA50	50-Ω SMA Terminator (male). **Required to load the unused output with 50 Ω.**
SMA58-0.15	RG-58A/u (50-Ω) Coaxial Cable with SMA Connectors, 0.15-m length
SMA58-0.5	RG-58A/u (50-Ω) Coaxial Cable with SMA Connectors, 0.5-m length
SMA58-1.5	RG-58A/u (50-Ω) Coaxial Cable with SMA Connectors, 1.5-m length
SMA/BNC	SMA to BNC Adapter with male SMA and female BNC
BNC/SMA	BNC to SMA Adapter with male BNC and female SMA





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Specifications subject to change
25-0801