

32 Gbit/s PPG Low Amplitude Output

MU183020A/MU183021A PPG, 41KC-6 6dB ATT

MP1800A Signal Quality Analyzer Series

The I/O voltage amplitude of devices such as high-speed back planes and active optical cables (AOCs), etc., is on a downward trend to assure lower power consumption. As a result, applications requiring low-output-amplitude NRZ signals require insertion of a precision fixed attenuator (ATT) in the PPG output.

The Anritsu MP1800A Signal Quality Analyzer series is a modular-type BERTS with a built-in MU183020A/MU183021A Pulse Pattern Generator (PPG) for outputting high-quality, high-amplitude 32.1 Gbit/s signals. It supports low-jitter, high-speed Tr/Tf, high-quality waveforms with a wide variable amplitude setting range from 0.5 to 3.5 Vp-p. Additionally, it outputs high-quality and low-amplitude NRZ signals when used in combination with the 41KC-6 6dB Precision Fixed Attenuator.

■ Target Applications

- ✓ High-Speed Back Planes
- ✓ Active Optical Cables (AOCs)
- ✓ SERDES, CDR chips

■ Features

- ✓ Wideband 32.1 Gbit/s Bit Rate
- ✓ Low Jitter, High-Speed Tr/Tf
- ✓ 0.125 to 0.875 V Variable Amplitude (using MU18302xA-013 3.5 V Output, 12 dB ATT)
- ✓ External ATT Factor Setting using PPG GUI

MP1800A SQA

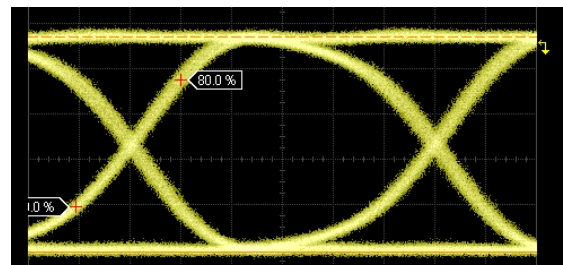


MU183040A 32 Gbit/s PPG



Two 41KC-6 6 dB ATTs
Total 12 dB


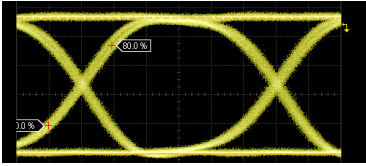
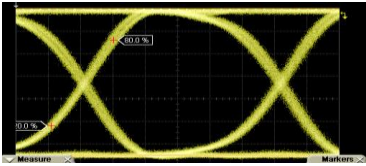

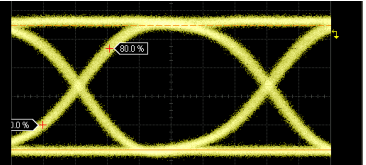
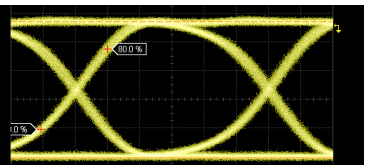
- Jitter: 497 fs rms
- Tr: 10.75 ps, Tf: 10.75 ps



Eye Pattern at 500 mV
(PPG Setting = 2 V)

■ Typical Waveforms

The 41KC-6 covers a wide bandwidth from DC to 40 GHz, using an excellent VSWR to support low-amplitude Data output with no deterioration in PPG output waveform.

Configuration	Amplitude 1 V vs 250 mV	Amplitude 2 V vs 500 mV
<p>PPG Direct Output</p>  <p>The PPG output Data is shown as a waveform for direct observation.</p>	 <p>Eye Pattern at 1 V (PPG Setting = 1 V) Jitter: 533 fs rms Tr: 9.36 ps, Tf: 10.17 ps</p>	 <p>Eye Pattern at 2 V (PPG Setting = 2 V) Jitter: 479 fs rms Tr: 9.75 ps, Tf: 9.86 ps</p>
<p>PPG with 12dB ATT</p>  <p>Inserting two 41KC-6 6-dB fixed attenuators in the PPG output is shown. The waveform with 12 dB of attenuation to suppress the impact of jitter, Tr/Tf, etc., on the waveform.</p>	 <p>Eye Pattern at 250 mV (PPG setting = 1 V) Jitter: 571 fs rms Tr: 10.17 ps, Tf: 10.86 ps</p>	 <p>Eye Pattern at 500 mV (PPG setting = 2 V) Jitter: 497 fs rms Tr: 10.75 ps, Tf: 10.75 ps</p>

Typical values observed using a J1439A coaxial cable (0.8 m, K connectors), 70-GHz band sampling oscilloscope with intrinsic jitter of <200 fs rms. A 10-dB ATT (41C-10) was inserted at the sampling oscilloscope Data input to protect against risk of over-voltage damage.

■ Model-Name-Typical Specifications

- **MU183020A 32 Gbit/s PPG**
- **MU183021A 32 Gbit/s 4ch PPG**

Item	Specifications
Operating Bit Rate	2.4 to 28.1 Gbit/s, 2.4 to 32.1 Gbit/s (Opt-001)
Data Output	Differential, 1/2/4ch (depends on model and option), K-connector, 50 Ω
Amplitude	500 mV to 2.0 Vp-p/2 mV Step (Opt-012, 022) 500 mV to 3.5 Vp-p/2 mV Step (Opt-013, 023)
Offset	-2.0 to +3.3 Voh/1 mV step (Opt-012, 022, 013, 023)
Tr/Tf	12 ps (typical, 20% to 80%, 28.1 Gbit/s, 32.1 Gbit/s, Amplitude 3.5 Vp-p)
Jitter	700 fs (typical, measured with sampling scope with <200 fs rms intrinsic jitter)

- **41KC-6 6dB Precision Fixed Attenuator**

Item	Specifications
General	K(m)-K(f), 50 Ω
Attenuation	6 dB
Attenuation Accuracy	±0.4 dB at DC to 18 GHz, ±0.5 dB at 18 to 26.5 GHz, ±0.8 dB at 26.5 to 40 GHz
SWR	1.10 at DC to 12 GHz, 1.15 at 12 to 18 GHz, 1.18 at 18 to 26.5 GHz, 1.28 at 26.5 to 40 GHz