

PAM4 Optical Modulator Evaluation and High-Amplitude Signal Generation

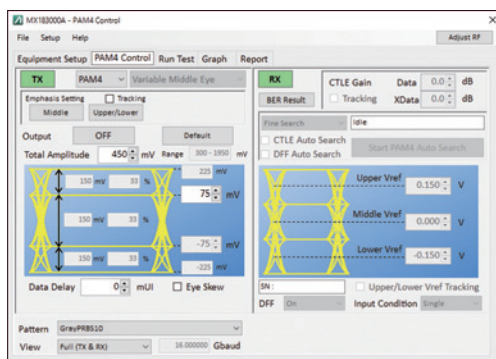
32 Gbaud Power PAM4 Converter G0375A
 Signal Quality Analyzer-R MP1900A
 Signal Quality Analyzer MP1800A

Pulse Amplitude Modulation (PAM) methods are being implemented for next-generation Ethernet standards, such as 400 GbE, to increase communications speed between network equipment. R&D is progressing into optical transceivers for 400 GbE equipment interconnects and optical modulators for E/O signal conversion supporting PAM4. Efficient evaluation of PAM4 optical modulators requires high-amplitude test signals (2 Vp-p for EA modulators, 1 Vp-p for direct modulation) for direct-driving the optical modulator, as well as a signal source for adjusting the 3 Eye Opening of PAM4 signal independently to optimize PAM4-signal transmissions by taking optical output level non-linearity into consideration. The Signal Quality Analyzer-R MP1900A and the Signal Quality Analyzer MP1800A series is ideal for evaluating 400 GbE optical transceivers and optical modulators using the 32 Gbit/s PPG, and expandable 32 Gbaud Power PAM4 Converter G0375A with high PAM4 output amplitude and independent 3 Eye level control functions.

[Target Applications] 200 GbE/400 GbE, CEI-56G, High-Speed Interconnects

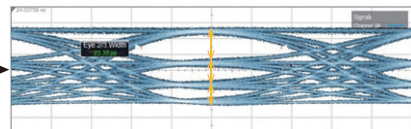
Features

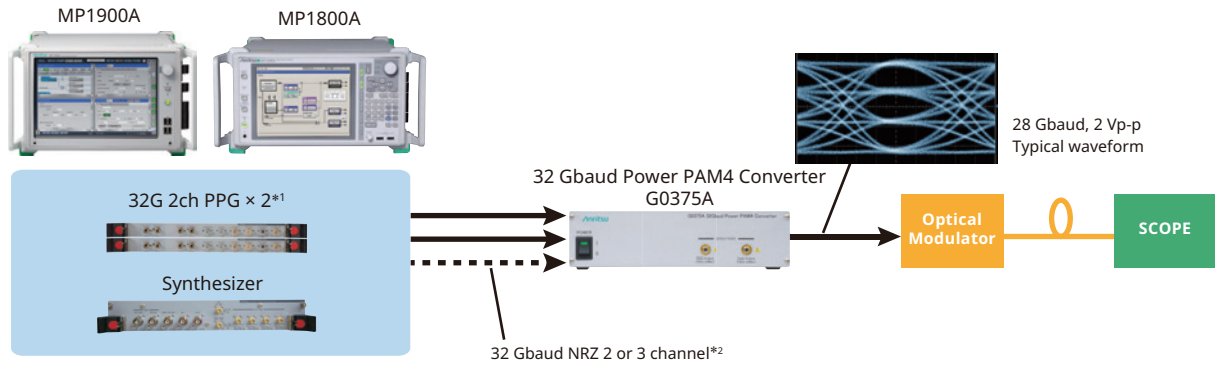
- 10 to 32.1 Gbaud Rates
- Optical Modulator Direct-Driving
 - High Output Amplitude 4 Vp-p max. (Differential)
 - Independent Level Control for 3 Eyes
- High-Quality, Low-jitter Output Waveform



Example of Output Level Control Screen

Independent Amplitude Control
of 3 Eyes from Control Screen





*1: At 3 Eye independent level control; 2ch PPG × 1 for equal level output.
 *2: NRZ 3ch input at 3 Eye independent level control; NRZ 2ch input for equal level output.

Typical Specifications

Item	Specification	Remarks
Number of Outputs	2 (Data, xData)	
Baud Rate	10 to 32.1 Gbaud	
Output Amplitude	2.2 Vp-p (Single-end, maximum) 4.4 Vp-p (Differential, maximum)	
Amplitude Gain Control	-6 to 0 dB	
RJ (rms)	200 fs (typ.)	
Tr/Tf (20 to 80%)	12 ps (typ.)	
Number of Inputs	4 (Data1, xData1, Data2, xData2)	Uses J1735A at PAM4 Linearity control
In/Out Connector	K (f)	

G0375A Data output specifications at signal input from MU183020A.

Ordering Information

Please specify the model/order number, name and quantity when ordering.
 The names listed in the chart below are Order Names. The actual name of the item may differ from the Order Name.

Model	Name	Option	MP1800A Configuration Qty.	MP1900A Configuration Qty.
G0375A	32 Gbaud Power PAM4 Converter	—	1	1
MP1900A	Signal Quality Analyzer-R	—		1
MP1800A	Signal Quality Analyzer	002, 007, 015, 032	1	
MU195020A	21G/32G bit/s SI PPG	001,020,031		1
MU181000B*2	12.5 GHz 4 port Synthesizer	—	1	1
MU183020A	28G/32G bit/s PPG	022, 031	2*1	
J1735A*3	Combiner	—	2	2
J1742A*3	Electrical Length Specified Coaxial Cable (0.84 m, K Connector)	—	2	2
J1728A	Electrical Length Specified Coaxial Cable (0.4 m, K connector)	—, cable for output waveform measurement	(2)	(2)

*1: At Linearity control; 1 for equal level output.
 *2: This module can use the MP1900A and MP1800A
 *3: At Linearity control.

The contents of this document may change without prior notice.