

MP1821A

50G/56Gbit/s MUX

MP1822A

50G/56Gbit/s DEMUX



R&D into Fast 40G and Ultra-fast 50G Devices for Next-Generation Communications

Internet Exchanges (IX) and ISPs require larger network capacities as more Internet users access more rich-content services over faster access networks such as DSL, LTE, WiMAX, FTTx, etc. To meet these needs, IEEE, ITU-T, and OIF are working to define issues and new standards for next-generation 40 Gbit/s and 100 Gbit/s networks. These new standards use WDM transmission equipment and phase-modulation technologies to curb symbol rate but further expansion of transmission capacity requires higher symbol rates.

The MP1821A 50G/56Gbit/s MUX and MP1822A 50G/56Gbit/s DEMUX supports operation frequencies up to 56 Gbit/s to meet these needs. Moreover, a full line of versatile functions and excellent performance for R&D into 40 Gbit/s fast next-generation devices, and ultra-fast 50 Gbit/s optical modules, supports customers with the perfect solution for bringing new products to market as early as possible.

■ Key Features

Supports 56 Gbit/s Max. Operation Frequency

Anritsu provides the best measurement solutions for fundamental R&D in the 40 Gbit/s market and ultra-fast next-generation communications at more than 50 Gbit/s.

Compact Remote Head

Shorter cables to the DUT keep signal quality high.

It supports direct evaluation of wafer on the probe station. Troubleshooting at the early R&D phase cuts repeat work and time to product rollout.

Sophisticated Waveform

High-speed Tr/Tf and low-jitter waveforms are ideal for evaluating electronic devices. In addition, direct driving of modulators without an external amplifier supports high-quality measurement results.

- 8 ps (20 to 80%) high-speed Tr/Tf time
- 4 psp-p low-jitter waveform
- 3.5 Vp-p max. high amplitude waveform
- 30 to 70% wide crosspoint adjustment function

Automatic Measurement Function

Eye Margin, Eye Diagram, Bathtub, Q, ISI Analysis and Capture functions are supported. A full range of versatile analysis functions help cut design verification times.

Pre-Code/De-code Functions

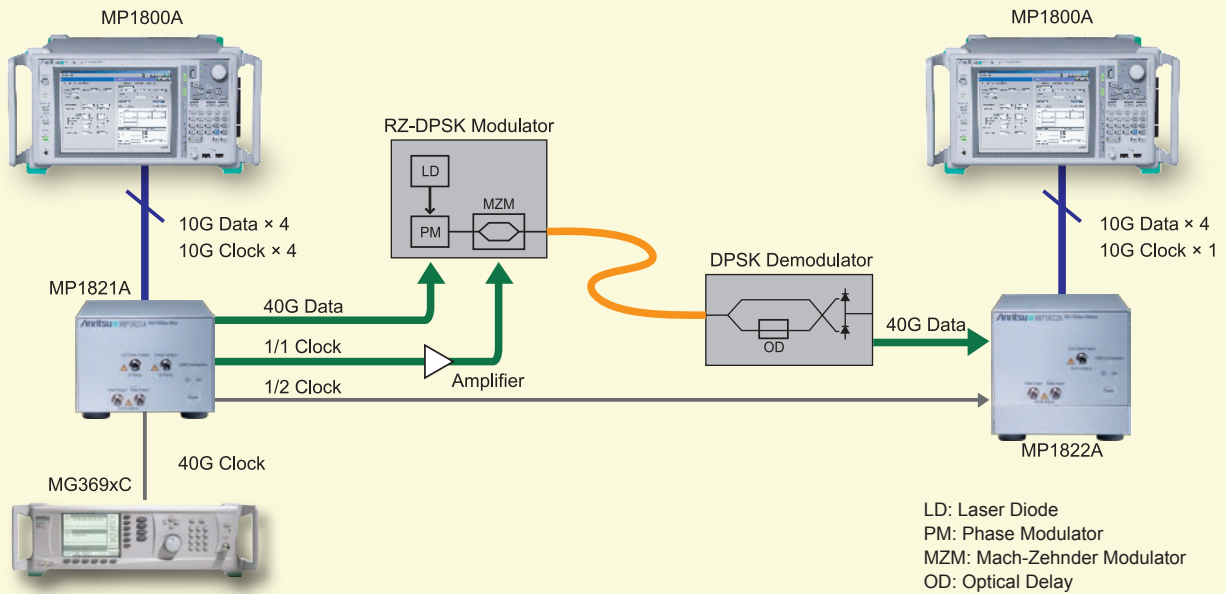
40G DPSK/ODB modulation signals are generated to evaluate optical modulators using the pre-code function. Moreover, the de-code function performs logic evaluation of pre-code blocks.

Flexible Expandability

The MP1800A Signal Quality Analyzer supports operating frequencies from 0.1 Gbit/s to 28 Gbit/s. Moreover, combination with the MP1821A/22A expands supported speeds to 56 Gbit/s and minimizes R&D investment for next-generation technologies.

Application Example

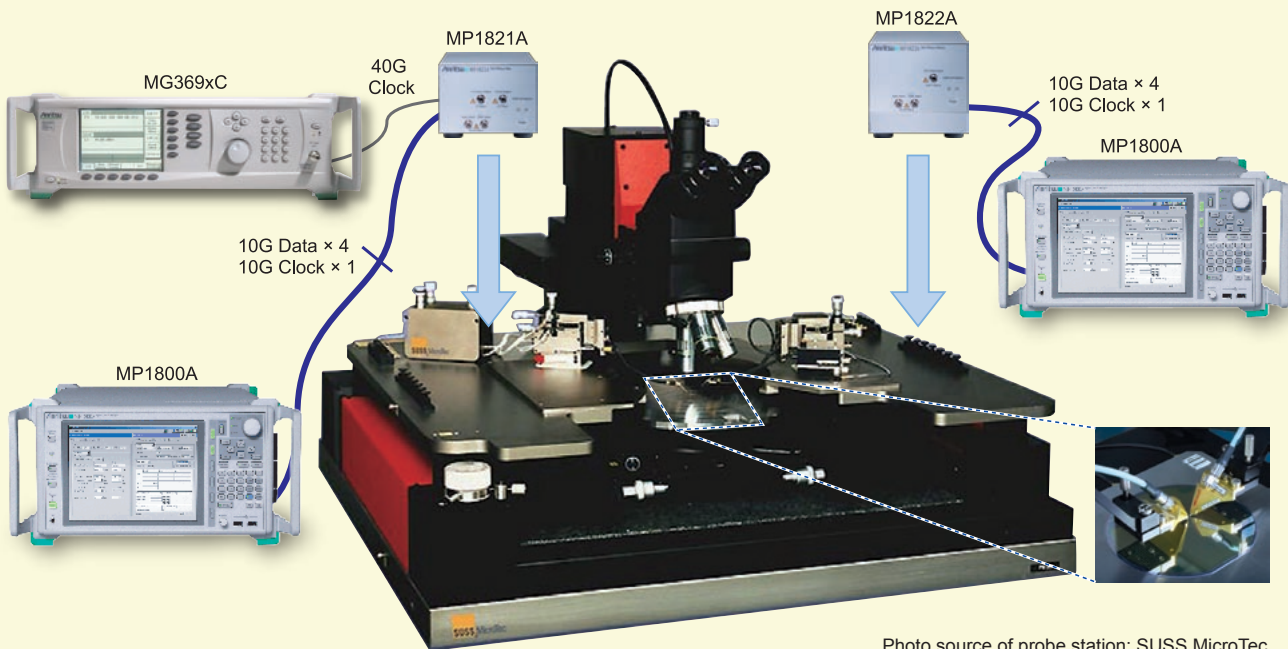
Ultra-fast Optical Module Evaluation



Anritsu Solution

- Compact Remote Head: Minimizes cable effects for assured high signal quality.
- Sophisticated Waveform: Direct driving of modulators without external amplifier supports high-quality measurements.
- Pre-Code/De-code Functions: Generates 40G DPSK/ODB supported modulation signals for evaluation.

Ultra-fast Device-On-wafer Evaluation

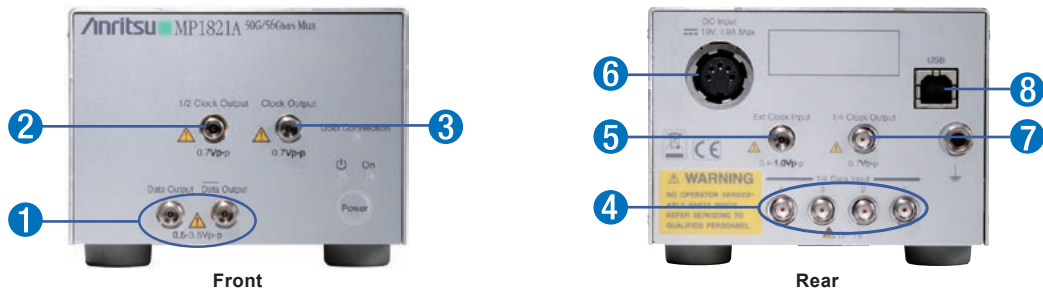


Anritsu Solution

- Compact Remote Head: Direct on-wafer device evaluation.
- Sophisticated Waveform: High-speed Tr/Tf & low-jitter waveforms for electronic device evaluation.
- Automatic Measurement Function: Full line of versatile analysis functions, such as Bathtub, cut design verification times.

Outline

MP1821A 50G/56Gbit/s MUX



| | | |
|---|-----------------------|--|
| 1 | Data/Data Output | Output differential data signals |
| 2 | 1/2 Clock Output | Output half-rate clock signals |
| 3 | Clock Output | Output same frequency clock signal as Ext. Clock Input |
| 4 | 1/4 Data Input 1 to 4 | Input data signals to multiplex by 4 to 1 |
| 5 | Ext. Clock Input | Input system clock signals |
| 6 | DC Input | AC adapter connector |
| 7 | 1/4 Clock Output | Output reference clock for MU181040A/B |
| 8 | USB | Connect to MP1800A or control PC |

MP1822A 50G/56Gbit/s DEMUX



| | | |
|---|------------------------|---------------------------------------|
| 1 | Data/Data Input | Input differential data signals |
| 2 | Ext. Clock Input | Input system clock signals |
| 3 | 1/4 Data Output 1 to 4 | Output 1/4 data signals |
| 4 | DC Input | AC adapter connector |
| 5 | 1/4 Clock Output | Output reference clock to MU181040A/B |
| 6 | USB | Connect to MP1800A or control PC |

Selection Guide

| Category | 50 Gbit/s Configuration | | 56 Gbit/s Configuration | |
|-------------|--|---|--|---|
| MUX | 1 × MP1821A 1 × MP1821A-011*1 | 50G/56Gbit/s MUX Variable Data Output (0.5 to 2.5 Vp-p) | 1 × MP1821A 1 × MP1821A-001 1 × MP1821A-011*1 | 50G/56Gbit/s MUX 56 Gbit/s Extension Variable Data Output (0.5 to 2.5 Vp-p) |
| DEMUX | 1 × MP1822A 1 × MP1822A-030*2 | 50G/56Gbit/s DEMUX Variable Clock Delay | 1 × MP1822A 1 × MP1822A-001 1 × MP1822A-030*2 | 50G/56Gbit/s DEMUX 56 Gbit/s Extension Variable Clock Delay |
| 4ch PPG | 1 × MP1800A 1 × MP1800A-015 4 × MU181020A 4 × MU181020A-002 4 × MU181020A-030 1 × MU181800A | Signal Quality Analyzer 4-slot for PPG and/or ED 12.5 Gbit/s PPG 0.1 to 12.5 Gbit/s Variable Data Delay 12.5 GHz Clock Distributor | 1 × MP1800A 1 × MP1800A-015 4 × MU181020B 4 × MU181020B-002 4 × MU181020B-030 1 × MU181800B | Signal Quality Analyzer 4-slot for PPG and/or ED 14 Gbit/s PPG 0.1 to 14 Gbit/s Variable Data Delay 14 GHz Clock Distributor |
| 4ch ED | 1 × MP1800A 1 × MP1800A-015 4 × MU181040A 4 × MU181040A-002 4 × MU181040A-030 1 × MU181800A | Signal Quality Analyzer 4-slot for PPG and/or ED 12.5 Gbit/s ED 0.1 to 12.5 Gbit/s Variable Clock Delay 12.5 GHz Clock Distributor | 1 × MP1800A 1 × MP1800A-015 4 × MU181040B 4 × MU181040B-002 4 × MU181040B-030 1 × MU181800B | Signal Quality Analyzer 4-slot for PPG and/or ED 14 Gbit/s ED 0.1 to 14 Gbit/s Variable Clock Delay 14 GHz Clock Distributor |
| Synthesizer | MG3693C | RF/Microwave Signal Generator (2 to 30 GHz) | MG3693C | RF/Microwave Signal Generator (2 to 30 GHz) |

This is the recommended configuration. Check according to your application and purpose.
See the MP1821A/22A product introduction for details of each option.

*1: One of MP1821A-010, 011 or 013 required

*2: MP1822A-030 required

Specifications

MP1821A 50G/56Gbit/s MUX

| Item | Specification | | |
|--|--|--|-----------------------------|
| Operation Frequency | 8 Gbit/s to 50 Gbit/s 8 Gbit/s to 56 Gbit/s (option-001 installed) | | |
| External Clock Input | | | |
| Number of Input | 1 | | |
| Input Frequency | 4 GHz to 25 GHz 4 GHz to 28 GHz (option-001 installed) 4 GHz to 25 GHz, 8 GHz to 50 GHz (option-002 installed) 4 GHz to 28 GHz, 8 GHz to 56 GHz (option-001, 002 installed) | | |
| Input Amplitude | 0.4 to 1.0 Vp-p | | |
| Termination | 50Ω/AC Coupling | | |
| Connector | K (f.) V (f.) (option-002 installed) | | |
| Data Output | MP1821A-010 | MP1821A-011 | MP1821A-013 |
| Number of Output | 2 (Data/xData) | | |
| Amplitude*1 | H: 0 V, L: -0.4 V | 0.5 to 2.5 Vp-p, step: 2 mV | 0.5 to 3.5 Vp-p, step: 2 mV |
| Offset*1 | - | -2 to +3.3 Voh, step: 1 mV | |
| Current Limiting | - | Source 50 mA, Sink 80 mA | |
| Fixed Interface | - | NECL, SCFL, NCML, PCML, LVPECL | |
| Crosspoint*1 | 50% ±15% (at 50 Gbit/s) | 30 to 70%, step: 0.1% (±5%: 50 Gbit/s, 2.0 Vp-p or more) | |
| Tf/Tf*1, *2 | 10 ps (typ.), ≤12 ps, (20 to 80%) | 8 ps (typ.), ≤10 ps, (20 to 80%) | |
| Total Jitter*1, *2 | 4 psp-p (typ.), ≤5 psp-p | 4 psp-p (typ.), ≤5 psp-p | |
| Waveform Distortion (0 peak)*1 | ±25 mV ±15% (typ.) | ±25 mV ±10% (typ.) | |
| Termination | 50Ω/GND | AC, DC switching DC: 50Ω/GND, -2 V, +1.3 V | |
| Output ON/OFF Function | No | Yes | |
| Connector | V (f.) | | |
| Clock Output | | | |
| Number of Output | 1 | | |
| Frequency | Output clock frequency is same of input clock frequency | | |
| Amplitude | 0.4 Vp-p min., 1.0 Vp-p max. (Fixed) | | |
| Termination | 50Ω/AC Coupling | | |
| Connector | K (f.) V (f.) (option-002 installed) | | |
| 1/2 Clock Output | | | |
| Number of Output | 1 | | |
| Frequency | 4 GHz to 25 GHz 4 GHz to 28 GHz (option-001 installed) | | |
| Amplitude | 0.4 Vp-p min., 1.0 Vp-p max. (Fixed) | | |
| Termination | 50Ω/AC Coupling | | |
| Connector | K (f.) | | |
| 1/4 Clock Output | | | |
| Number of Output | 1 | | |
| Frequency | 2 GHz to 12.5 GHz 2 GHz to 14 GHz (option-001 installed) | | |
| Amplitude | 0.4 Vp-p min., 1.2 Vp-p max. (Fixed) | | |
| Termination | 50Ω/AC Coupling | | |
| Connector | SMA (f.) | | |
| 1/4 Data Input | | | |
| Number of Input | 4 (Data1, Data2, Data3, Data4) | | |
| Input level | 0/-1 V | | |
| Termination | 50Ω/GND | | |
| Connector | SMA (f.) | | |
| Variable Data Delay (option-030 installed) | | | |
| Phase Shift Range | -1000 to +1000 mUI, step: 4 mUI | | |
| Setting Error | ±50 mUIp-p (typ.) | | |
| General Specifications | | | |
| USB Interface | USB 2.0 or 1.1 Type B × 1 | | |
| Power Supply | AC Adapter, DC 19 V, 4A | | |
| Dimension | 100 (W) × 70 (H) × 140 (D) mm 100 (W) × 90.9 (H) × 140 (D) mm (option-030 installed) | | |
| Mass | <5kg | | |
| Operation Temperature | 15° to 35°C | | |
| EMC | EN61326-1, EN61000-3-2 | | |
| LVD | EN61010-1 | | |

*1: Values when using oscilloscope with residual jitter <200 fs (RMS) and sampling bandwidth >70 GHz

*2: Bit rate: 50 Gbit/s, Maximum amplitude: 2.5 Vp-p (MP1821A-011), 3.5Vp-p (MP1821A-013)

MP1822A 50G/56Gbit/s DEMUX

| Item | Specification |
|--|--|
| Operation Frequency | 8 Gbit/s to 50 Gbit/s 8 Gbit/s to 56 Gbit/s (option-001 installed) |
| External Clock Input | |
| Number of Input | 1 |
| Input Frequency | 4 GHz to 25 GHz 4 GHz to 28 GHz (option-001 installed) 4 GHz to 25 GHz, 8 GHz to 50 GHz (option-002 installed) 4 GHz to 28 GHz, 8 GHz to 56 GHz (option-001, 002 installed) |
| Input Amplitude | 0.4 to 1.0 Vp-p |
| Termination | 50 Ω/AC Coupling |
| Connector | K (f.) V (f.) (option-002 installed) |
| Data Input | |
| Number of Input | 2 (Data, xData) |
| Input Format | NRZ |
| Input Amplitude | 0.2 to 0.5 Vp-p (single-ended) |
| Threshold Voltage | -0.5 to +0.5 V (single-ended) |
| Input Sensitivity | 50 mVp-p (typ., 40 Gbit/s), 70 mVp-p (typ., 50 Gbit/s) |
| Phase Margin | 200 deg. (typ., 50 Gbit/s, 56 Gbit/s) |
| Termination | 50 Ω/GND |
| Connector | V (f.) |
| 1/4 Clock Output | |
| Number of Output | 1 |
| Frequency | 2 GHz to 12.5 GHz 2 GHz to 14 GHz (option-001 installed) |
| Amplitude | 0.4 Vp-p min., 1.2 Vp-p max. (Fixed) |
| Termination | 50Ω/AC Coupling |
| Connector | SMA (f.) |
| 1/4 Data Input | |
| Number of Input | 4 (Data1, Data2, Data3, Data4) |
| Output Level | 0/-0.4 V |
| Termination | 50Ω/GND |
| Connector | SMA (f.) |
| Variable Clock Delay (option-030 installed) | |
| Phase Shift Range | -1000 to +1000 mUI, step: 4 mUI |
| Setting Error | ±50 mUIp-p (typ.) |
| General Specifications | |
| USB Interface | USB 2.0 or 1.1 Type B × 1 |
| Power Supply | AC Adapter, DC 19 V, 4A |
| Dimension | 100 (W) × 70 (H) × 140 (D) mm 100 (W) × 90.9 (H) × 140 (D) mm (option-030 installed) |
| Mass | <5 kg |
| Operation Temperature | 15° to 35°C |
| EMC | EN61326-1, EN61000-3-2 |
| LVD | EN61010-1 |

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.

MP1821A 50G/56Gbit/s MUX

| Model/Order No. | Name |
|-----------------|---|
| MP1821A | -Main Frame- 50G/56Gbit/s MUX |
| J1343A | -Standard Accessories- Coaxial Cable 1.0 m 5 pcs |
| J1145 | Terminator <V Connector> 2 pcs |
| J1137 | Terminator <SMA Connector> 1 pc |
| J1341A | Open <SMA Connector> 7 pcs |
| J1475A | USB Cable 1 pc |
| Z1312A | AC Adaptor 1 pc |
| | Power Cord 1 pc |
| Z1307A | MP1821A/22A Manual CD 1 pc |
| Z0918A | MX180000A Software CD 1 pc |
| MP1821A-001 | -Options- 56 Gbit/s Extension |
| MP1821A-002 | Clock Input Band Switch |
| MP1821A-010 | Data Output (0.4 Vp-p Fixed) |
| MP1821A-011 | Variable Data Output (0.5 to 2.5 Vp-p) |
| MP1821A-013 | Variable Data Output (0.5 to 3.5 Vp-p) |
| MP1821A-030 | Variable Data Delay |
| MP1821A-101 | 56 Gbit/s Extension Retrofit |
| MP1821A-102 | Clock Input Band Switch Retrofit |
| MP1821A-110 | Data Output (0.4 Vp-p Fixed) Retrofit |
| MP1821A-111 | Variable Data Output (0.5 to 2.5 Vp-p) Retrofit |
| MP1821A-113 | Variable Data Output (0.5 to 3.5 Vp-p) Retrofit |
| MP1821A-130 | Variable Data Delay Retrofit |
| J1363A | -MP1821A-002/102 Standard Accessories- Protection Cap <V Connector> 2 pcs |
| J1090 | -Optional Accessories- Coaxial Cable <V120MM-30CM> |
| J1108 | Coaxial Cable <V120MM-50CM> |
| J1379A | Coaxial Attenuator <41V-3> |
| J1144 | Coaxial Attenuator <41V-6> |
| J1380A | Coaxial Attenuator <41V-10> |
| J1381A | Coaxial Attenuator <41V-20> |
| J1477A | Coaxial Adaptor <V (m.) -V (f.)> |
| J1359A | Coaxial Adaptor (K-P.K-J, SMA) |
| J1486A | V (m.) -K (f.) Adaptor |
| J1439A | Coaxial Cable (0.8 m, K Connector) |
| J1474A | Cable Kit for 4ch PPG |
| J1476A | Cable Kit for 4ch ED |
| W3207AE | MP1821A/22A Operation Manual (Booklet) |

MP1822A 50G/56Gbit/s DEMUX

| Model/Order No. | Name |
|-----------------|---|
| MP1822A | -Main Frame- 50G/56Gbit/s DEMUX |
| J1343A | -Standard Accessories- Coaxial Cable 1.0m 5 pcs |
| J1363A | Protection Cap <V Connector> 2 pcs |
| J1137 | Terminator <SMA Connector> 4 pcs |
| J1341A | Open <SMA Connector> 2 pcs |
| J1475A | USB Cable 1 pc |
| Z1312A | AC Adaptor 1 pc |
| | Power Cord 1 pc |
| Z1307A | MP1821A/22A Manual CD 1 pc |
| Z0918A | MX180000A Software CD 1 pc |
| MP1822A-001 | -Options- 56 Gbit/s Extension |
| MP1822A-002 | Clock Input Band Switch |
| MP1822A-030 | Variable Clock Delay |
| MP1822A-101 | 56 Gbit/s Extension Retrofit |
| MP1822A-102 | Clock Input Band Switch Retrofit |
| MP1822A-130 | Variable Clock Delay Retrofit |
| J1486A | -MP1822A-002/102 Standard Accessories- V (m.) -K (f.) Adaptor |
| J1090 | -Optional Accessories- Coaxial Cable <V120MM-30CM> |
| J1108 | Coaxial Cable <V120MM-50CM> |
| J1379A | Coaxial Attenuator <41V-3> |
| J1144 | Coaxial Attenuator <41V-6> |
| J1380A | Coaxial Attenuator <41V-10> |
| J1381A | Coaxial Attenuator <41V-20> |
| J1477A | Coaxial Adaptor <V (m.) -V (f.)> |
| J1359A | Coaxial Adaptor (K-P.K-J, SMA) |
| J1486A | V (m.) -K (f.) Adaptor |
| J1439A | Coaxial Cable (0.8 m, K Connector) |
| J1474A | Cable Kit for 4ch PPG |
| J1476A | Cable Kit for 4ch ED |
| W3207AE | MP1821A/22A Operation Manual (Booklet) |



Specifications are subject to change without notice.

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