MA-4000 Module Analyzer

ALL-IN-ONE BER TESTER—MCB FOR 100G/400G

SPEC SHEET

The all-in-one solution for transceiver qualification on the production floor, including a bit-error-rate tester, module compliance board (MCB) and power supply.

KEY FEATURES

- 8 channels, 10 - 28 GBd supporting PAM4 and NRZ
- Integrated MCB (no RF cable required)
- High flexibility supporting the most popular transceivers.
  Daughter cards available: QSFP-DD, OSFP, QSFP28, SFP28, SFP-DD
- Future-proof design with replaceable MCB
- Built-in power supply for four-corner testing
- I^2C control function supported
- Pre-FEC and post-FEC BER
- Featuring FEC distribution (codewords vs symbol errors)

SMART MCB DESIGN

Superior SI performance and long insertion life

- Uses daughter board system (no external MCB required)
- Supports QSFP-DD, OSFP, QSFP28, SFP-DD, SFP28 (direct connection)
- Easy to replace after connector insertion life cycle to ensure reliability
- No RF connector on MCB to minimize thermal chamber size
- One-fifth thermal cycling time compared to external MCB

Easy-to-replace MCB in direct contact with BERT

FEC SIMULATION SOFTWARE

Powerful function for Burst Error Analysis

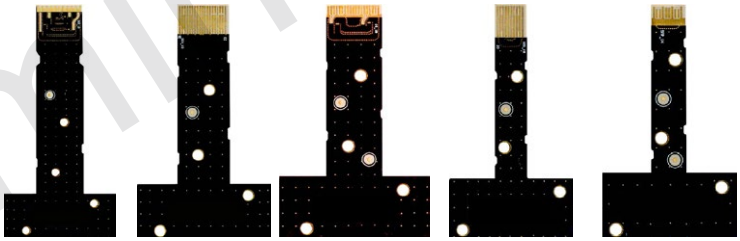
- PRBS error check and correction
- Pre-FEC and post-FEC BER
- KP4/KR4 and low latency FEC protocols
- FEC lane striping function
- FEC symbol error distribution plot: codewords vs. symbol errors
- FEC margin auto-calculation

Minimized thermal chamber for industry's fastest thermal cycling

LOOPBACK BOARD

Excellent signal integrity (SI)

- Supports most of MSA
- High-performance signal integrity
- Smart design that requires no housing
- Easy plug and unplug



OSFP *QSFP-DD* *QSFP28* *SFP-DD* *SFP28*

SPECIFICATIONS

Module Analyzer	
Number of channels	8
Data rate per lane (GBd)	25.78125, 26.5625, 27.95, 28.05, 28.125, 28.9 (PAM4/NRZ) 9.95328, 10, 10.3125, 10.709, 11.3176, 12.5, 14.025, 21, 24.33024, 25 (NRZ only)
Data rate adjustment (ppm)	0 to ±300
Modulation	NRZ/PAM4
Pattern	PRBS 7/9/11/13/15/23/31, PRBS7Q-31Q (PPG and ED) PRBS16, SSPRQ, user-defined pattern (PPG only)
Maximum amplitude (mV_{ppd})	1500 (typical)
High power mode amp. (mV_{ppd})	1.5 V (as an option)
Rise time / Fall time (ps)	15/15 (20% to 80%, typical)
PAM4 eye width (ps)	17 (zero hit, typical)
Jitter rms (fs)	500 (typical)
Sensitivity (mV_{ppd})	200 to 800 (PAM4 26.5625 GBd, typical) 150 to 1000 (NRZ 25.78125 GBd, typical)
Clock out	
Clock output amplitude (mV_{ppd})	400
Clock output ratio	/8, /16, /32, /64
Power supply	
Output voltage (V)	3.13 to 3.465
Adjustable step (mV)	25
Max power (W)	10
Current monitoring	Supported
Daughter card (MCB)	
Built-in I^2C and I/O control	

GENERAL SPECIFICATIONS

Size (H x W x D)		114 mm x 220 mm x 517 mm (4.5 in x 8.7 in x 20.4 in)
Weight		≤10 kg (22 lb)
Temperature	Operating Storage	5 °C to 40 °C (41 °F to 104 °F) –20 °C to 70 °C (–4 °F to 158 °F)
Relative humidity		20% to 80%
Power [a]		100/120 Vac (50/60/400 Hz) 220/240 Vac (50/60 Hz) 60 W typical/80 W max.
Access interface		Gigabit Ethernet (RJ45 port)

ACCESSORIES

LB-QSDD	QSFP-DD loopback board
LB-OSFP	OSFP loopback board
LB-QS28	QSFP28 loopback board
LB-SFDD	SFP-DD loopback board
LB-SF28	SFP28 loopback board
MA-9000-ESD	Electrical screwdriver

a. Operate with supply voltage fluctuations up to ±10 % of the nominal voltage.

ORDERING INFORMATION

MA-4000-XX-XX

Model
8-28-PAM = 8x28 GBd PAM4 module analyzer (10G - 28G)

Daughter card (MCB)[a]
MA-QSFPDD = QSFP-DD module test board
MA-OSFP = OSFP module test board
MA-QSFP28 = QSFP28 module test board
MA-SFPDD = SFP-DD module test board
MA-SFP28 = SFP28 module test board

Options
FEC = 26G PAM4 FEC simulator software

Example: MA-4000-8-28-PAM-MA-QSFP28-FEC

a. Loopback board included

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