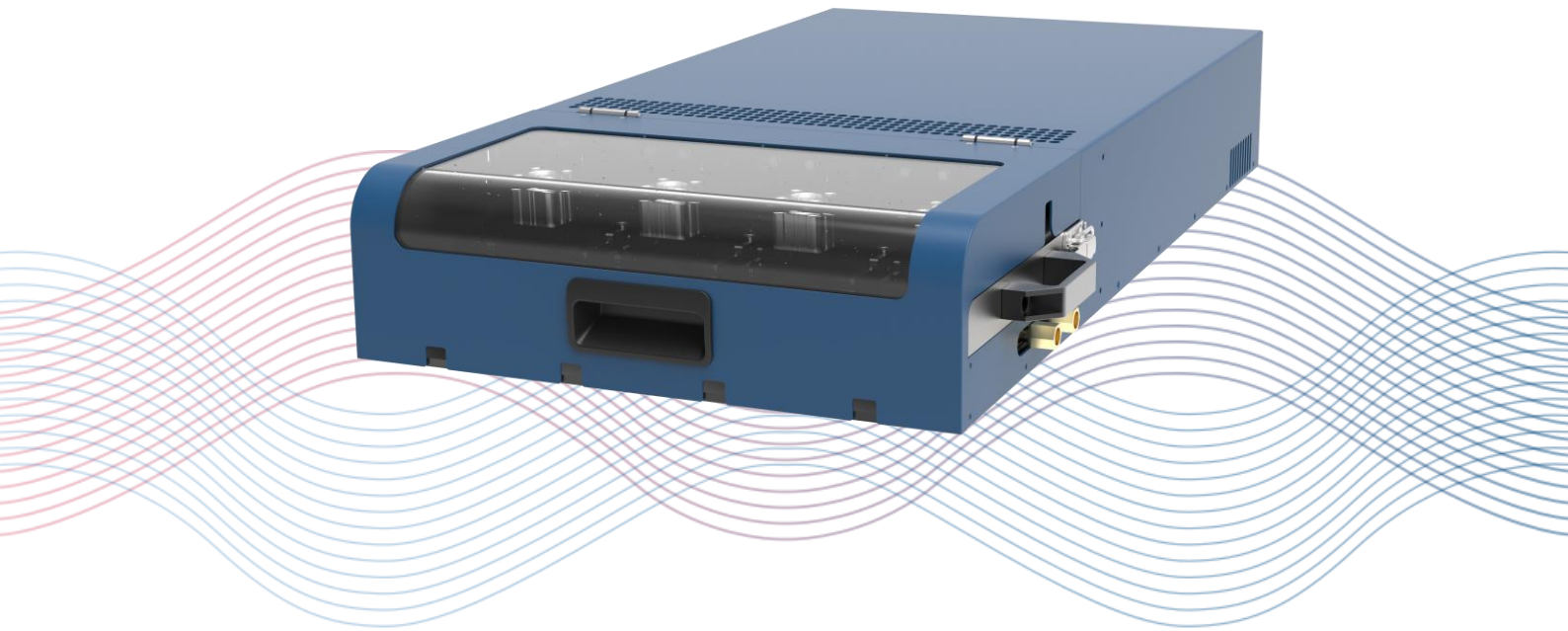




MTP4104

400G Transceiver Tester

Version 1.8





Product Description

Semight Instruments 400G Transceiver Tester is a comprehensive bit error test system with an integrated optical port bit error ratio tester (BERT) and temperature control unit. The integrated MCB test card enables flexible and fast DUT plug-in test without additional high-speed RF cables; The integrated standard light source socket further reduces the space and cost of the test rig without additional bit error tester equipment and MCB; The transceivers of different package types can be tested by replacing the MCB test card and the related corresponding test fixture, mainly including 400G/200G QSFPDD, 100G QSFP28, SFP+28G, etc.

Provide temperature cycling structure kit specially configured for MCB test card. Support TEC temperature cycle (-10 to +85 °C), and realize high efficiency temperature cycle test by configured water chiller with high cooling capacity power. Support DMI information monitoring, voltage and current measurement, voltage modulation (bias test) of transceiver; It provides strong performance and flexibility guarantee for pre-research, design and production test of high-speed serial circuit product based on its excellent signal quality (fast rise/fall time, low jitter), plenty functions (supporting FEC code simulation test analysis), flexible option configuration and ultra-high overall integration. Moreover, the programmable pattern generator (PPG) can provide 7Tap pre-emphasis to compensate the loss of the signal in the transmission process and improve the signal quality. The bit error detector (ED) is equipped with a built-in equalization circuit, not requiring an external active or passive signal conditioning circuit to ensure the signal integrity of the link. Moreover, the built-in fast locked clock recovery module ensures the stability of the link during the bit error test and the accuracy of the bit error test in the harsh and complex test environment.



Multiple bit error testers, multiple MCBS of transceivers to be measured and multiple independent temperature control units are integrated in the Semight Instruments Transceiver Tester.

Key Features

- Each channel can be independently configured as NRZ or PAM4 signal system;
- Rate support range: 20~30Gbaud;
- Support FEC simulation test analysis;
- Support PRBS 7/9/11/13/15/16/23/31, PRBS7~31Q;
- Support rich test patterns, such as SSPRQ/JP03A/JP03B/LIN/square wave/user-defined patterns, etc.;
- Trigger signal supports frequency division output (4-128 frequency division);
- Support software programmed switching TrigA/TrigB clock output
- Fast rising and falling edge, low inherent jitter;
- Support high power mode transmitter output;
- Support pre-emphasis and de-emphasis modulation at the transmitter in the 3rd/7th order mode;
- Support CTLE receiving end balanced modulation;
- Support switching input and output polarity;



- Powerful and flexible database management function, giving assistance to research and development of in-depth analysis of data;
- The product can be flexibly programmed by calling external API (LabVIEW, C #) through Ethernet port or USB control interface;

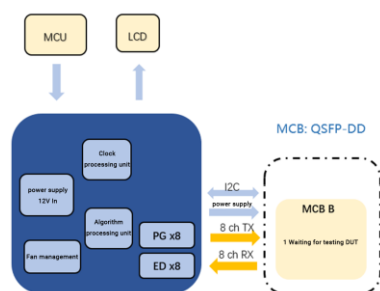


Fig. 1 Block diagram of product structure



Fig. 2 MTP4104

Applications

400G Transceiver Tester can be applied to transceiver sensitivity and Eye-Diagram testing in high and low temperature environment. Test module package form covers SFP28, QSFP28, QSFP56, QSFP_DD.

Category of 400G Transceiver Tester			
PML	PSN	Type of Modules	Qty of DUT
400G Transceiver Tester	MTP4104	SFP28	16
		100G QSFP28	8
		200G QSFP56	4
		400G QSFP_DD	4



Technical Specifications

Index of pattern generator^①	Output type	Differential/ single ended PAM4/NRZ
	Number of output channels	4 Slots x 8 Lanes
	Terminal	AC
	Output impedance	100 Ω
	Code pattern	PRBS 7/9/11/13/15/16/23/31, PRBS7~31Q; SSPRQ, JP03A, JP03B, LIN, SW, CN, etc.;
	Symbol rate (Gbaud) ^①	20.625/24.33/25/25.78125/26.5625/27.89/27.95/28.05/28.125/28.2/28.9/30;
	Frequency accuracy(typical)	± 50 ppm
	Output amplitude(differential)	750 mVp-p ^② ; 1200 mVp-p ^③
	TR(20–80%) ^④	<15 ps
TF(20–80%) ^④	<15 ps	
Random jitter ^⑤	<350 fs	

① More expansion rates can be customized according to the requirements;

② The net measurement value of the transmitting end, default pre-weighted/de-weighted parameter;

③ Transmitter net measurement, high power output mode;

④ The signal was measured at 26.5625 Gbps NRZ;

⑤ Measure random jitter after jitter separation;

Trigger output indicators	Output amplitude	>300 mVp-p
	Output type	AC coupling, single ended
	Frequency division ratio (settable)	4/8/16/32/64/128
	Trigger output	Support RF switch switching A/B, 4 groups of trigger switching for each
Bit error detector indicators	Input type	Differential PAM4/NRZ
	Termination	AC coupling
	Input impedance	100 Ω
	Receiving amplitude (differential) ^①	100-1200 mVp-p
	Receiving sensitivity	100 mVp-p



	(differential) ^①	
	Data pattern	PRBS 7/9/11/13/15/16/23/31, PRBS7~31Q;
	Symbol rate (Gbaud) ^②	20.625/24.33/25/25.78125/26.5625/27.89/27.95/28.05/28.125/28.2/28.9/30;
	Clock mode	Built-in clock recovery
	Synchronization type	Automatic synchronization (level/phase)
Temperature control indicators	Temperature-control method	Contact TEC temperature control
	Temperature range ^③	TEC set temperature (-10~85 °C) Module reported temperature (-5~85 °C) ^④
	Stability	± 1 °C
	Temperature control accuracy	±0.1 °C
	Temperature rise and fall efficiency	1) Depending on the temperature environment of the site; 2) Type of module to be tested; 3) Cooling capacity power of water cooler ^{⑤⑥}

① Net measurement value at the receiving end;

② More expansion rates can be customized according to the requirements;

③ Test conditions: ambient temperature = 25°C, module 100G QSFP28 placed in a confined space to reduce heat exchange with the outside;

④ The power consumption of different modules is different, and the efficiency of rising and cooling is also different;

⑤ It is advisable to select the chiller with appropriate cooling capacity according to the customer's on-site use needs, which can be directly recommended to customers to achieve the target temperature rise and fall efficiency;

⑥ Condensation will be produced during long-term low temperature use, so it is required to dry the test chamber with dry air, and regularly raise the temperature for drying operation;

Transceiver voltage modulation (Bias test)	Output range	3.069 ~ 3.5 V
General indicators	Environment	Use at room temperature
	Operating temperature and humidity	0 ~ +55 °C, 30% ~ 80% Relative humidity with no condensation
	Storage temperature and humidity	-30 ~ 60 °C, 10% ~ 90% Relative humidity with no condensation
	Altitude	Operation: 0m to 2,000m; Storage : 0m to 4,600m



	Power supply	【MTP4104】 : LINE:100-240 VAC,50/60 Hz,1600 W FUSE: F10AL 250 VAC
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Ordering Information

Standard accessory	USB cable, power cord, installation software USB flash drive	
Options		
MCB fixture options [Ⓢ]	QSFP_DD	External QSFP_DD MCB sub-card: Support 1 QSFP_DD module test
	QSFP	External QSFP MCB sub-card: Support 2 QSFP module test
	SFP28	External SFP28 MCB sub-card, supporting 4 SFP28 modules
Temperature control options	TEC	TEC temperature circulation kit (supporting the temperature circulation range of -10 to +85 °C)
Modulation type options	PAM	Support PAM4, 20 ~ 30 Gbaud
	NRZ	Support NRZ, 20 ~ 30 Gbps
Function options:	RFSW	Built-in RF switching trigger output
	HPO	Built-in high power output mode>1,200mVp-p pattern generator output
	FEC	FEC simulation analysis (KP4/KR4 protocol)
	EDR	Expansion rate option, adapting to more NRZ rate requirements



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*This information is subject to change without notice.