

Burst Mode

Bit Error Ratio Tester

rBT1250 [Datasheet](#) V2.9

10G Burst Mode Bit Error Ratio Tester

Professional PON module system simulation testing instrument

Supports burst mode bit error testing and analysis for 1.25G EPON, GPON, 2.5G XGPON, Combo-PON, 10G EPON and 10G XGSPON



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1 Product Description

The Semight rBT1250 is a burst mode bit error ratio tester (BERT) specifically designed for optical line terminal (OLT) testing in 1.25G / 2.5G / 10G passive optical network (PON) applications. It supports performance evaluation of 1.25G, 2.5G and 10G ONU and OLT modules under burst-mode operation. The product's overall design greatly simplifies test setup and system configuration, while significantly reducing overall test costs.

The rBT1250 features three independent burst pattern generators and error detectors. It supports bit error ratio analysis in both continuous and burst-mode operation, and is capable of generating and analyzing two burst time-division pattern sequences. Burst frame timing is fully flexible and adjustable. To meet device test requirements, the instrument provides synchronous laser enable and reset control signals for the corresponding test channels.

The error detector integrates a BCDR capable of fast clock recovery from upstream burst signals, accurately characterizing module performance in PON test systems. The instrument also supports automatic ranging, making it well-suited for long-fiber testing.

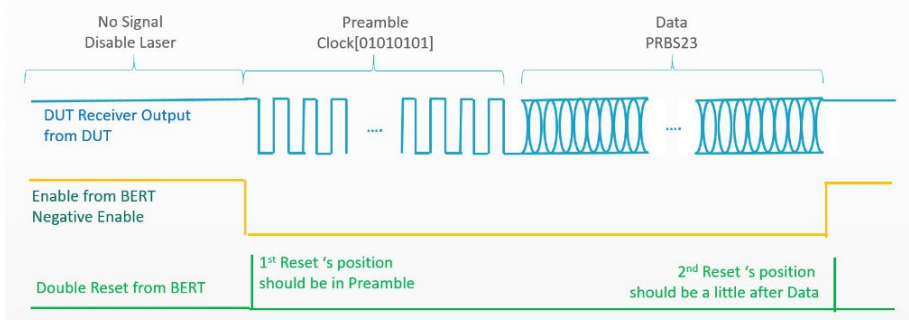
2 Key Features and Advantages

Flexible Application

- Supports burst data rates: 1.25 / 2.5 / 9.953 / 10.3125 GBaud;
- Supports data output and bit error rate testing in both burst and continuous modes;
- Supports Combo-PON; Industry's first burst-mode BERT for CPON;
- Burst sequence (Period, Preamble, Payload, Guard Time) is flexibly configurable;
- Excellent Signal Quality: Fast rise and fall times and low intrinsic jitter;

Synchronous Control Signal

- Provides 3 channels of synchronized ONU laser enable control signals: LVTTL 3.3 V, with configurable active level;
- Provides 3 channels of dual reset control signals: LVTTL 3.3 V, configurable logic level, with adjustable reset position and pulse width;



Diverse Auxiliary Test Functions

- Supports 1 RSSI trigger: adjustable trigger mode, period, position and pulse width;
- Supports 1 trigger with adjustable position, providing trigger signals for real-time oscilloscope monitoring of burst timing;
- Supports LOS/SD signal measurement: Each burst channel is equipped with independent LOS/SD signal detection function, capable of detecting the edge position and level of LOS/SD signals;

High Efficiency, Easy-to-Use Operation, One-Stop Solution

- Simple burst timing configuration, fast hardware response;
- Built-in BCDR: Performs clock recovery on each burst data reception, ideal for mass-production testing. Enables long-fiber testing and supports automatic reset signal positioning;

Fully Match ATE Application Scenarios

- Features robust and flexible database management for in-depth R&D data analysis;
- Supports remote control via USB port using external APIs (LabVIEW, C#);

3 Technical Specifications

TX Specifications

Type	Item	Description
Pattern Generator Specifications	Output	Differential/Single-End NRZ
	Terminal	AC Coupling
	Output Impedance	100 Ω $\pm$ 10%
	Pattern	PRBS7, 23, 31, Custom Defined Pattern and CID (64 to 88 bits)
	Burst Signal Rate (GBaud) ^[1]	1.25 / 2.5 / 9.953 / 10.3125
	Pre-Emphasis	3 taps
	Output Amplitude (Differential)	100 to 600 mVpp (typical) ^[2]
	Rise Time ^[3] (20% to 80%)	< 40 ps (typical)
	Fall Time ^[3] (20% to 80%)	< 40 ps (typical)
	Random Jitter ^[3]	< 1.5 ps (typical)
	Laser Enable (TXEN)	LVTTL 3.3 V, Adjustable level
	Reset Signal	LVTTL 3.3 V Adjustable level, trigger position, and width

Type	Item	Description
	Connector	SMA
Trigger and Clock	Output Amplitude	> 250 mVp-p
	Output Type	AC Coupled, Single-Ended
	Div Ratio	64

[1] Covers EPON and GPON test data rates.

[2] Net measurement value at the transmitter end, default pre-emphasis/de-emphasis parameters.

[3] Measured with 10.3125 Gbps NRZ signal.

RX Specifications

Type	Item	Description
Error Detector Specifications	Input	Differential NRZ
	Terminal	AC Coupled
	Input Impedance	100 Ω $\pm$ 10%
	Input Range (Differential) ^[1]	100 to 800 mVp-p (typical)
	RSSI (Differential) ^[1]	100 mVp-p (typical)
	Pattern	PRBS7, 23, 31, CID (64 to 88 bits)
	Symbol Rate (GBaud) ^[2]	1.25 / 2.5 / 9.953 / 10.3125
	Clock Mode	Built-in Clock Recovery
	Connector	SMA

[1] Excessive input voltage may damage the receiver.

[2] Covers EPON and GPON test data rates.

Environmental Specifications

Item	Description
Environment	Indoor
Operating	Temperature: 0°C to +50°C Humidity: 30% to 80% RH, non-condensing
Storage	Temperature: -30°C to 60°C Humidity: 10% to 90% RH, non-condensing
Power Supply	Voltage Range: 100 to 240 VAC Frequency Range: 50/60 Hz Maximum Power: 75 W
Warm-Up	10-minute warm-up; ambient temperature change less than $\pm 3^{\circ}\text{C}$
Dimensions (mm)	415 (± 0.8) x 265 (± 0.5) x 105 (± 0.3) (with foot pads/handles)
Weight	Net Weight 5.7 kg

4 Ordering Information

Option List

Option Type	Option ID	Remarks
Rate Option (Choose one)	200	Supports baud rates: 1.25 / 2.5 GBaud; supports CPON testing
	300	Supports baud rates: 1.25 / 2.5 / 9.953 / 10.3125 GBaud; full-rate, full-featured
Service (Choose one)	R3C	Extended warranty and service plan – 36 months
	R5C	Extended warranty and service plan – 60 months

Option Configuration Guide

Option Code	Option ID	Remarks
CPON	200	Supports double burst or single burst test Upstream 1.25 / 2.5 GBaud, downstream 10 GBaud Supports CPON testing
10G full-rates	300	Supports double burst or single burst test Upstream 1.25 / 2.5 / 10 GBaud, downstream 10 GBaud Supports GPON, EPON, CPON, 10G GPON, 10G EPON testing

5 Warranty Terms

Number	Item	Description	Period
1	Mainframe Warranty Period	Free of Charge during the warranty period (excluding static electricity or human damage)	12 months
2	Calibration Period	Return to the factory for calibration or bring the calibration system for on-site calibration	24 months



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* This information is subject to change without notice.