

OptoBERT™ OPB-X110

10 Gbps Optical & Electrical Bit-Error-Rate Tester (BERT)



Overview

The OPTELLENT OptoBERT™ OPBX110 is a cost-effective easy-to-use 10G optical and electrical bit-error-ratio tester (BERT) for testing components and systems in R&D and manufacturing environments as well as field installations. The OPBX110 incorporates an internal reference clock, a pattern generator, clock recovery circuits, and a BER analyzer, in one compact module that provides both electrical and optical interfaces at data rates up to 11.3 Gb/s. The OPBX110 is offered with an RS-232 or USB interface and a standard 2-year warranty.

An intuitive Graphical User Interface enables easy point-and-click operation. Software drivers are available for incorporating the OptoBERT into test automation suites using programs like LabVIEW, VisualBASIC, HP VEE.

BER test data from the OptoBERT are output directly into a spreadsheet file without any programming.

Applications

- ▶ Testing of optical transceiver modules (SFP+, XFP, X2, Xenpak, XPAK), transponders, linecards, and subsystems
- ▶ Testing of opto-electronic components and devices (TOSA, ROSA, lasers, etc...)
- ▶ Testing of Gb/s ICs, PCBs, electronic modules, subsystems, and systems
- ▶ Serial bus and high-speed backplane design
- ▶ Production and compliance testing
- ▶ Installation testing and troubleshooting in optical transport networks

Key Features

- ▶ Integrated Generator and Analyzer
- ▶ Internal Reference Frequency
- ▶ Internal Clock Recovery
- ▶ Electrical and Optical Interfaces
- ▶ Data Output Amplitude Control
- ▶ Multiple Patterns: PRBS, Stress, and User-defined
- ▶ External Reference Input for Jitter Injection
- ▶ Intuitive GUI and Automated Test Report
- ▶ Easy-to-Use, Compact and Cost-Efficient
- ▶ 2-year Warranty

Preset Data Rates

SONET / SDH	
0C-192: STS-192 / STM-64	9.95328 Gbps
G.709 with FEC	10.709 Gbps
ETHERNET	
10GBASE-T	10 Gbps
10GBASE-R (LAN/PHY)	10.3125 Gbps
10GBASE-R OTU2 FEC	11.096 Gbps
FIBRE CHANNEL	
10 x FC (10GFC)	10.519 Gbps
10GFC with FEC	11.317 Gbps
INFINIBAND & HDMI	
4 x Infiniband	10 Gbps
HDMI 1.3	10.2 Gbps

Additional Preset Data Rates can be requested (See Ordering Info)

Pattern Generator

Parameter	Min	Typ	Max	Units
Data Output (Electrical)				
Output Type	Differential			
Output Format	NRZ			
Termination	AC-Coupled			
Data Patterns	<ul style="list-style-type: none"> • PRBS: 2^7-1, $2^{23}-1$, $2^{31}-1$; 101010...pattern • Pre-defined: K28.5, CJPAT, CRPAT (Optional) • User-defined: 128 bits to 2000 bits (Optional) 			
Data Rates (Using the internal clock source)	<ul style="list-style-type: none"> • Preset: OC-192/ STM-64 (9.95328 Gbps); Infiniband (10Gbps), 10GbE (10.3125 Gbps), 10GFC (10.519 Gbps); G.709 with FEC (10.709 Gbps); 10GbE with FEC (11.096Gbps), 10GFC with FEC (11.317Gbps) • Custom Preset: Special Data rates requested by customers (Optional) 			
Data Rate Range	9.95		11.3	Gbps
Frequency Accuracy			± 50	ppm
Output Amplitude (peak-to-peak)				
Fixed (Standard)	500		800	mV _{p-p}
High Output Version, Fixed (Option)	1800		1900	mV _{p-p}
Variable Output Amplitude (Option)	300		1800	mV _{p-p}
Data Rise Time, (20 – 80%) ⁽¹⁾		20		ps
Data Fall Time, (20 – 80%) ⁽¹⁾		20		ps
Data Output RMS Jitter ⁽¹⁾		1.4		ps
Error Injection	Single error; 10^{-7} , 10^{-8} , 10^{-9}			
Connector	50 Ω Nominal, 2.92mm Female			
Data Output (Optical)				
Interface	XFP housing provided as a standard feature MSA-Compliant XFP Transceiver (Optional)			
Wavelength	850nm, 1310nm, 1550nm, DWDM			
Fiber Type	Multimode and Single Mode Fiber			
Optical Connector	LC			
Clock Output				
Output Type	Differential			
Termination	AC- Coupled			
Output Amplitude (peak-to-peak)			300	mV _{p-p}
Connector	50 Ω Nominal, SMA Female			
Trigger Output				
Output Amplitude	300			mV _{p-p}
Output Type	Single-ended, AC-coupled			
Connector	50 Ω SMA Female			

(1) Measurements based on PRBS $2^{23}-1$ data at 9.95328 Gbps (OC-192)

Error Analyzer

Parameter	Min	Typ.	Max	Units
Data Input (Electrical)				
Input Type	Differential			
Termination	AC-Coupled			
Data Patterns	<ul style="list-style-type: none"> • PRBS: 2⁷-1, 2²³-1, 2³¹-1; 101010...pattern • Pre-defined: K28.5, CJPAT, CRPAT (Optional) • User-defined: 128 bits to 2000 bits (Optional) 			
Data Rates (Using the internal clock source)	<ul style="list-style-type: none"> • Preset: OC-192/ STM-64 (9.95328 Gbps); Infiniband (10Gbps), 10GbE (10.3125 Gbps), 10GFC (10.519 Gbps); G.709 with FEC (10.709 Gbps); 10GbE with FEC (11.096Gbps), 10GFC with FEC (11.317Gbps) • Custom Preset: Special Data rates requested by customers (Optional) 			
Data Rate Range	9.95		11.3	Gbps
Data Input ⁽¹⁾ Differential	100		1000	mV p-p
Clocking Mode	Built-in clock recovery			
Pattern Synchronization	Automatic			
Connector	50Ω 2.92 Female			
Data Input (Optical)				
Interface	XFP housing provided as a standard feature MSA-Compliant XFP Transceiver (Optional)			
Detector Type	p-i-n or APD (Optional)			
Optical Input ⁽¹⁾	p-i-n		0.5	dBm
	APD		-7	dBm
Wavelength	850nm, 1310nm, 1550nm, CWDM, DWDM			
Fiber Type	Multimode and Single Mode Fiber			
Optical Connector	LC			

(1) Measurements based on PRBS^{2²³}-1 data at 9.95328 Gbps (OC-192)

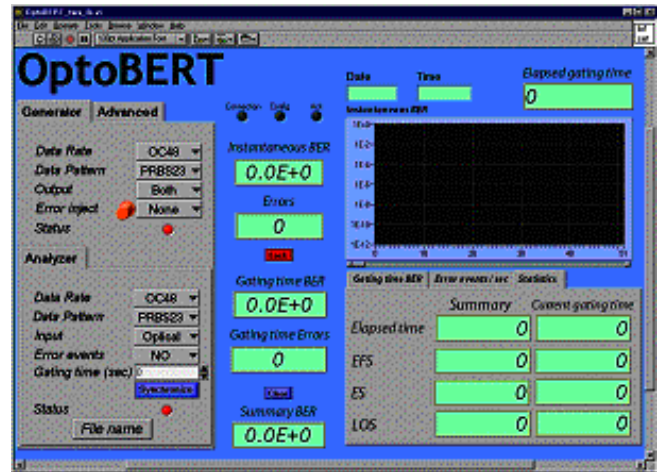
System & General Specifications

PARAMETER	MIN	MAX	UNIT
Chassis Electrical Voltage	100	240	VAC
Current Drain at Normal Voltage		2.5	A
Operating Temperature Range	5	45	°C
Storage Temperature Range	-40	70	°C
Dimensions (L x W x H)	300 x 240 x 64		mm ³
	12 x 9.5 x 2.5		inch ³
Optical Interface	Standard XFP housing		
Safety	UL, IEC-61010-1		
EMC	EN55011, EN61000-3-2, EN61000-3-3, BS EN61326		
PC Interface	RS232		
• Standard Warranty	2 years		

Software

The OptoBERT™ OPBX110 software runs on Windows 98/2000/NT/XP and VISTA over USB or RS-232 serial interface via an RJ-45 Connector provided on the front panel.

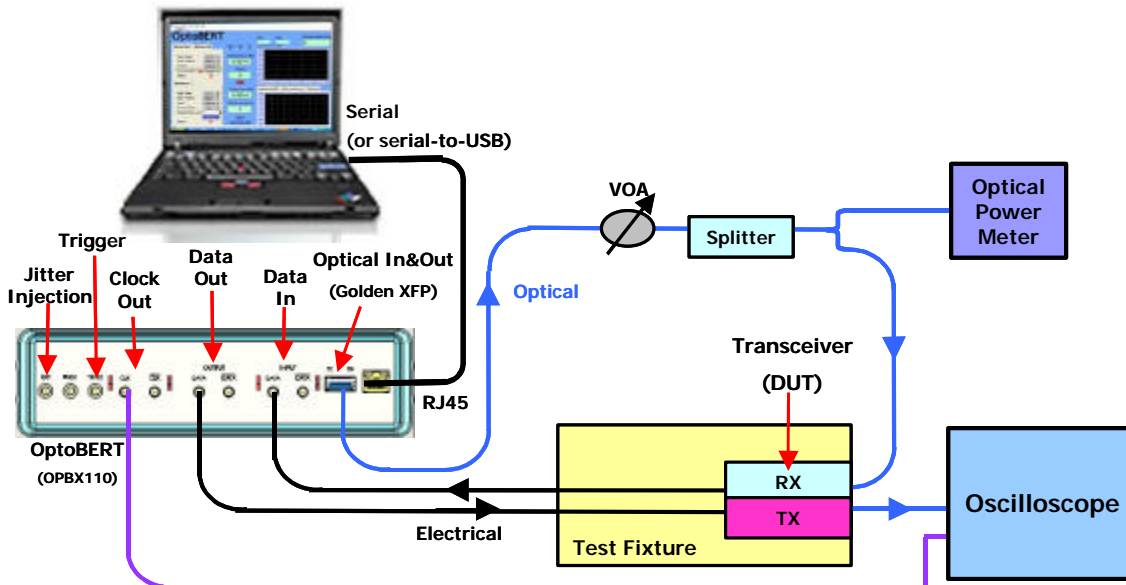
Software drivers are available for incorporating the OptoBERT into test automation suites using programs like C++, LabVIEW, VisualBASIC, and HP VEE.



Manufacturing Test of Transceiver Modules

Example: Rx: Sensitivity measurement

Tx: Output mask test with oscilloscope



Ordering Information

OPBX110-X-X- X-X

- X: other Custom Options
- 0: No Optical Transceiver;
- 1: Optical Transceiver (XFP) 850nm
- 2: Optical Transceiver (XFP) 1310nm
- 3: Optical Transceiver (XFP) 1550nm
- 4: Optical Transceiver (XFP) DWDM with High-sensitivity APD Receiver
- A: Standard (500mV Single-ended) Electrical Output Amplitude
- B: 1.8V (Single-ended) Electrical Output Amplitude, Fixed
- V: 1.8V (Single-ended) Electrical Output Amplitude, Variable
- P: Preset Standard Data Rates
- C: Custom Data Rates

Accessories Included

- User Software
- User Manual
- Power cord
- PC Interface cable

Example: OPBX110-P-A-2: 10G OptoBERT, Preset data rates, 500mV Output Amplitude, 1310nm XFP

Accessories & Services for OPBX110

Part Number	Description
OPZ1015	Serial-to-USB Converter
OPZ1201	Carrying Bracket
OPZ1202	Mounting Brackets
OPZ2015	Additional 1 year Warranty
OPZ3015	Calibration Service

Related Products

Model Number	Description
OPGX110	10G Pattern Generator (Optical & Electrical PPG)
OPB4250	4.25 Gb/s OptoBERT (Optical & Electrical BERT)
OPB3200	3.2 Gb/s OptoBERT (Optical & Electrical BERT)
OPG4250	4.25 Gb/s Data Generator (PPG)
OPG3200	3.2 Gb/s Data Generator (PPG)

Ordering Contact

For additional information or to order:

Tel: +1.408.230-1329

Fax: +1.408.228.8976

e-mail: sales@optellent.com

Website: www.optellent.com