Bit Error Rate Tester

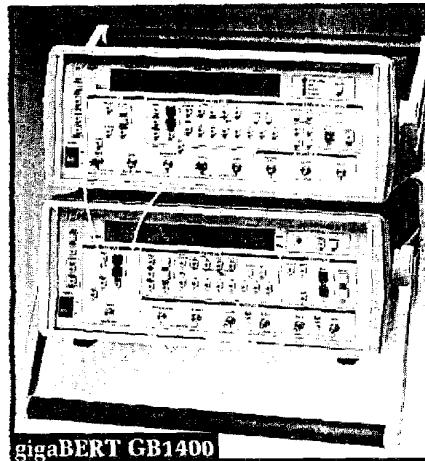## gigaBERT® GB1400

Features

gigaBERT GB1400
- Operating Frequency Range 1400 MHz
- Internal PLL Synthesized Clock Source
- PRBS 2^n-1 n: 7, 15, 17, 20, 23
- 1 Mbit Programmable Pattern Memory (Optional)
- Auto-synchronization
- Clock/Data Delay 4 ns, 5 ps Resolution
- Automatic Eye-width Measurements
- Reference Data Input for Proprietary Framed Data
- Phase Synchronous Clock and Data Edge Tracking
- Optional BURST Mode Operation

Applications
- Gigabit LAN Testing
- Satellite System Testing
- High-speed Circuits and System Design
- Full Rate HDDV Simulation/Testing
- Manufacturing Test in TE Environment
- GaAs, ECL, and Optical Component Testing
- Test Clock Recovery Circuit
- Parallel-to-Serial Analysis with MB100

gigaBERT GB1400

gigaBERT GB1400 Pattern Generator and Error Detector

The GB1400 operates at bit rates up to 1400 Mb/s. This instrument is cost-effective for lower-speed applications today and will accommodate your future high-speed requirements as well.

SYMMETRICAL, LOW-JITTER OUTPUT WAVEFORMS
The GB1400 generates low-jitter, symmetrical waveforms over its entire operating frequency range. The clock and data ports provide both true and inverted output signals. The instrument can drive single-ended or differential ECL inputs.

PRBS OR USER-DEFINED TEST PATTERNS
The GB1400 can generate pseudo-random bit sequences (PRBS) up to $2^{23}-1$ bits and others optional in length, user-programmable patterns. Patterns can be created locally using setup menus or externally by using a workstation or PC. A PC Windows-based Pattern Editor software package comes with the 1M Memory Option. Externally created patterns can be downloaded via the GPIB or RS-232 port. All user patterns are saved in battery-backed RAM.

ADJUSTABLE INPUTS FOR MAXIMUM FLEXIBILITY
The clock and data ports on the GB1400 Error Detector accept both true and inverted inputs. Single-ended or differential signals can be internally terminated. Input data delay is adjustable to accommodate different clock and data signal path delays.

AUTO SEARCH FOR EASY SETUP
Auto search greatly simplifies the Error Detector setup. The GB1400 Error Detector automatically synchronizes to the incoming signal by 1) Setting the input data decision voltage to its optimum value; 2) Adjusting input data delay for an optimum clock/data phase relationship; 3) Selecting the correct PRBS test pattern; and 4) selecting the correct pattern polarity (normal or inverted).

It synchronizes with any pattern sourced by a gigaBERT Pattern Generator. It can perform a bit-by-bit comparison of an arbitrary signal with an external Reference input. Thus the GB1400 can perform bit error analysis on any data pattern with a known good reference pattern.

POWERFUL ANALYSIS AND REPORTING FUNCTIONS
Not only will the GB1400 Error Detector synchronize with any pattern sourced by a gigaBERT Pattern Generator, it can perform a bit-by-bit comparison and bit error analysis on an arbitrary signal if provided with a known good external Reference data stream.

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Moreover, the GB1400 calculates errored seconds (ES), percentage error-free seconds (%EFS), severely-errored seconds (SES), degraded minutes (DM), unavailable seconds (US), and loss of signal (LOS) seconds. All bit error results – including the three BER measures – are calculated simultaneously and may be displayed during a test or after a test has been completed. A hard copy of all test results can be generated locally by connecting a printer to the parallel printer port or GPIB or RS-232 port. Reports may be printed when an error is detected, at the end of test intervals, or both.

FRONT PANEL OR AUTOMATED OPERATION
The GB1400 provides easy operation augmented by set-up store and recall. Clear, concise LCD displays of setup and results make it easy to use.

The 1 MB memory option for both the Pattern Generator and the Error Detector is sufficient for storing and outputting complex data such as SONET frames, ATM cells, MPEG digital video, etc, allowing designers to simulate "live" traffic. The GB1400 Pattern Generator and Error Detector can be controlled via the GPIB or RS-232 interface ports. The gigaBERT remote command set includes commands for all setup menus and front panel selections. The status of front panel indicators and test results can be remotely accessed.

BURST MODE
BURST mode allows for operation with non-continuous external clocks. Use of BURST mode requires ECL-level signals with a minimum rate during the burst of 150 kHz. This is an option on the GB1400.

Characteristics

PATTERN GENERATOR
Frequency Range –
Internal Clock Source: 1 Mb/s to 1400 Mb/s.
External Clock with BURST Mode: 150 Kb/s to 1400 Mb/s.

Freq. Resolution (Internal Clock) – 10 kHz.

Clock Output Amplitude –
500 mV to 2.0 Vp-p in 50 mV steps.
500 mV to 2.8 V with PECL opt.

Clock Output Offset –
–2.0 V to 1.0 V in 50 mV steps.
–2.0 V to 1.8 V with PECL opt.

Data Output Amplitude –
500 mV to 2.0 V in 50 mV steps.
500 mV to 2.8 V with PECL opt.

Data Output Offset –
–2.0 V to 1.0 V in 50 mV steps.
–2.0 V to 1.8 V with PECL opt.

Data delay range – ±4 ns.

Data Delay Increments – 5 ps.

Clock Delay – ±4 ns.

Clock Delay Increments – 5 ps.

Std. Programmable Memory – 16-Bits.

Optional Memory – 1 Mbit.

PRBS Patterns (2^n-1) – 7,15,17,20,23.

Burst Mode (ECL levels only) – Optional.

ERROR DETECTOR
Frequency Range – 1 Mb/s to 1400 Mb/s.
150 Kb/s to 1400 Mb/s (with BURST Mode)

Clock Input Levels (max) –
500 mV to 1.5 Vp-p.

Clock Input Terminations – GND, AC, –2 Vp-p.

Clock Input Threshold – Fixed threshold levels.

Data Input Level (max) – 500 mV to 1.5 Vp-p (does not support PECL).

Data Input Threshold – –1.5 V to 1.0 V in 50 mV steps

Data Input Terminations – GND, AC, –2 V.

Single-ended or differential operation for clock and data inputs.

PHYSICAL CHARACTERISTICS

Dimensions	mm	in.	mm	in.
Height	152	6.0	152	6.0
Width	366	14.4	366	14.4
Depth	340	1304	419	16.5
Weight	**kg.**	**lbs.**	**kg**	**lbs.**
Net	10	22	10	22