

# 40Gb/s Serial Bit Error Rate Tester

## 40 Gb/s-Serial / 10Gb/s-4Ch Parallel Bit Error Rate Tester

# SeBERT-400B



### Outline

SeBERT-400B is a serial bit error rate (BER) tester for 40 Gb/s serial NRZ signal or 10Gb/s 4 channel parallel NRZ signals. It consists of four 10Gb/s pulse pattern generator (PPG), four 10Gb/s error detectors (ED), a 4-1 multiplexer (MUX), a 1-4 demultiplexer (DEMUX), a frequency synthesizer and a frequency multiplier/divider circuit block.

The 10Gb/s PPGs generate pseudo-random bit sequence signal (PRBS) with pattern length of  $2^{7-1}$ ,  $2^{23-1}$  and  $2^{31-1}$ . 40 Gb/s multiplexed output is quasi- PRBS (QPRBS) data.

In addition to the 40 Gb/s serial BER test, 10Gb/s 4 channel parallel bit error rate test is also available. The four 10 Gb/s error detectors (ED) receive the four 10Gb/s data from DUT. These EDs count bit errors within a certain time period simultaneously, and output the number of errors and the error rate value, then these values are displayed on a PC screen via a USB port.

Utilizing the built-in frequency variable synthesizer, SeBERT-400B can be operated at any rate between 39.8 and 44.0 Gb/s.

### Typical features

- 1) Data rate: 39.8- 44.0 Gb/s
- 2) Functions of 40 Gb/s Serial BERT or 10Gb/s 4CH parallel BERT
- 3) 40G data output pattern: Quasi-PRBS (QPRBS)  $2^{7-1}$ ,  $2^{23-1}$  and  $2^{31-1}$ , differential output  
10G data output pattern: PRBS  $2^{7-1}$ ,  $2^{23-1}$  and  $2^{31-1}$ , single ended output
- 4) Data output amplitude: 400 mVpp (40 Gb/s serial, single ended), 500 mVpp (10Gb/s 4CH parallel)
- 5) Data output rise/fall time: 10 psec (40 Gb/s serial), 23 psec (10Gb/s 4CH parallel)
- 6) Data output jitter: 0.5 psec rms (40 Gb/s serial), 1.5 psec rms (10Gb/s 4CH parallel)
- 7) Data input sensitivity: 160 mVpp (40 Gb/s serial, single ended case), 40 mVpp (10Gb/s 4CH parallel, single ended)
- 8) Data input polarity exchange function (for both 40 Gb/s serial and 10Gb/s 4CH parallel),
- 9) Built-in 622.1- 718.8 MHz internal clock synthesizer
- 10) 20, 10, 2.5 and 0.6 GHz clock output for trigger
- 11) Small size and light weight: 450(W) x 505 mm(L) x 134(H)
- 12) AC Power supply: 85 to 264 Vac, 50/60 Hz

Functional block diagram

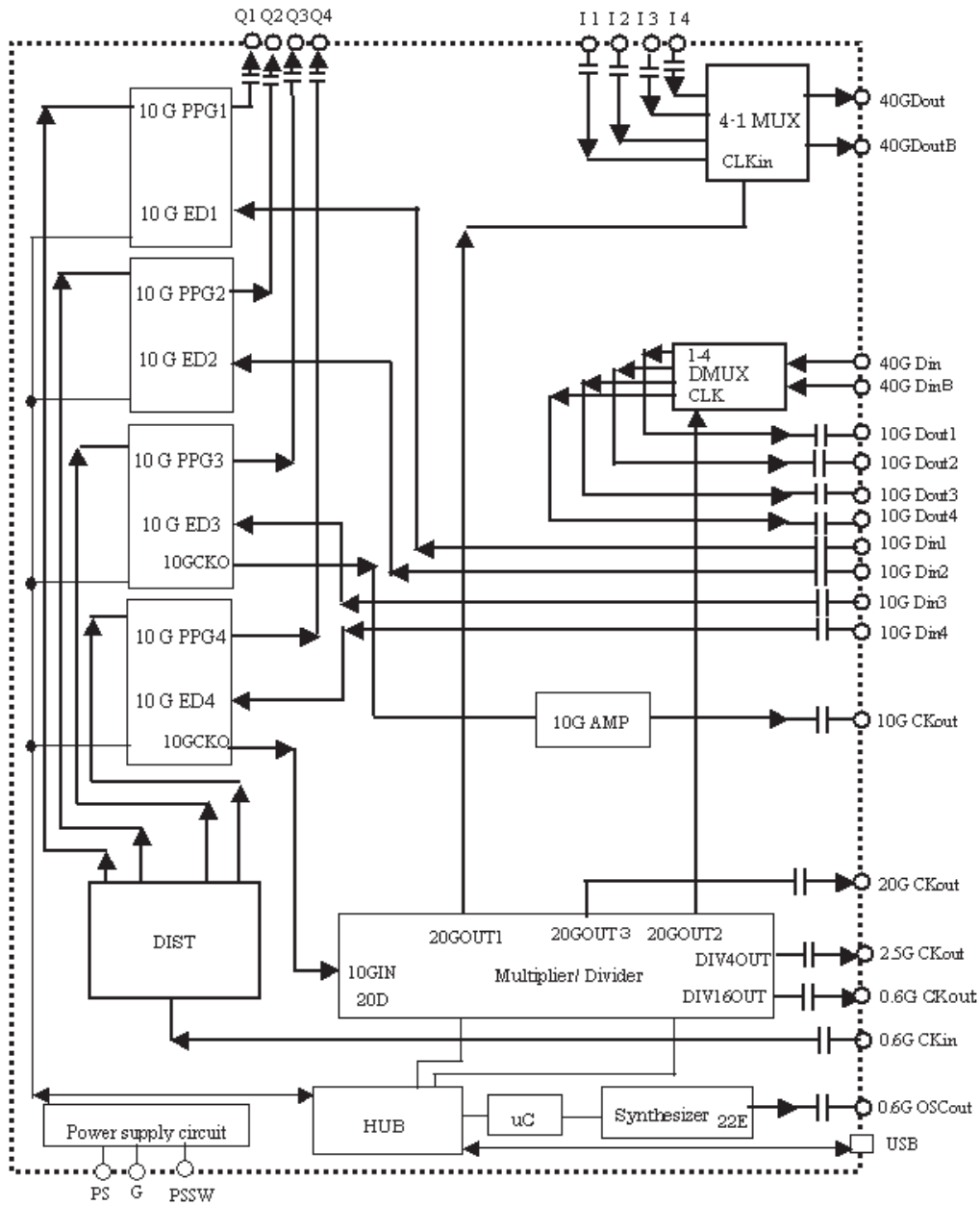


Fig. 1 Function block diagram

Typical Performance

Measured with Agilent 86116A (63GHz electrical head) and 86100B (Mainframe) using 2.5GCKout as a trigger.  
(Note) Jitter and rise/fall time is limited by inherent performance of the used oscilloscope  
If 86118A(70GHz electrical head) and 86107A(precision time base) are used, much better eye will be obtained.

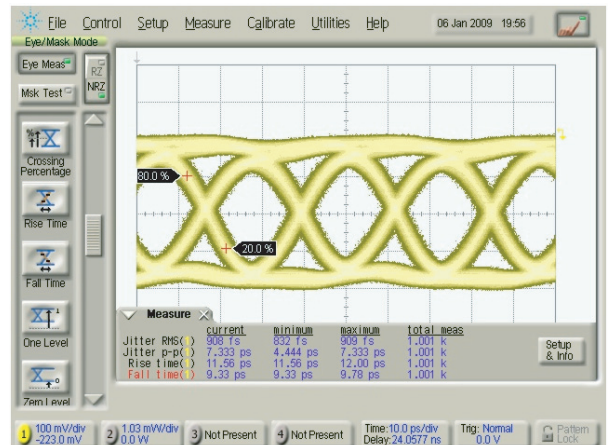


Fig. 2 Eyediagram of 40G Dout at 40.0Gb/s speed