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## General

AP9945

## Specifications

PORTABLE BERT

GS 734010-01E

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### ■ Outline

The AP9945 PORTABLE BERT is a compact and lightweight 10 Gbit/s portable BERT (Bit Error Rate Tester). The combination of high quality features such as an internal Signal Generator (SG)(option), Clock Data Recovery (CDR) and several variable signal output functions along with its smaller size, make this BERT useful in both a lab and field environment.

### ■ Features

- 1) Compact & lightweight
- 2) Multi-bit rate: 9.95 Gbit/s to 11.32 Gbit/s
- 3) 1/N pattern generation
  - 1/N pattern (N=2,4 and 8) generation of PPG internal clock rate
  - Test example: 5 Gbit/s, 2.5 Gbit/s and 1.25 Gbit/s
- 4) Variable signal output functions
  - Amplitude: 0.5 Vp-p to 2.0 Vp-p
  - Offset: -2.0V to +3.0V
  - Cross-Point: 30% to 70%
- 5) Built-in Clock Data Recovery (CDR)

## ■ Specifications 1

PPG/ED Common				
Clock Mode	Modes	Internal, External sync, External Clock in		
	Internal clock	Internal Fixed Clock	specify 2 clocks from 9.95328 GHz, 10.3125 GHz, 10.664 GHz and 10.709 GHz	
Internal Variable Clock		Frequency Range :	from 9.95 to 11.32GHz	
		Frequency Step :	1KHz	
REFERENCE CLOCK IN	Frequency	1/16 or 1/64 clock of bit rate		
	Input level	0.4 Vp-p to 1.0 Vp-p		
	Duty	50% (Typ) Square clock		
	Connector	SMA-Female		
	Coupling	50 Ω (AC coupling)		
10G CLOCK IN for PPG	Frequency	1/1 clock of bit rate		
	Input level	0.4 Vp-p to 1.0 Vp-p		
	Duty	50% (Typ)		
	Connector	SMA-Female		
	Coupling	50 Ω (AC coupling)		
PPG				
Interface				
DATA OUT & DATA OUT	Bit rate	9.95 Gbit/s to 11.32 Gbit/s		
	Data Format	NRZ		
	Output Level	0.50 Vp-p to 2.0 Vp-p (10 mV step)		
	TR/TF(20-80 %)	< 25ps		
	Offset	-2 V to +3 V (10 mV step)		
	Cross Point	30 % to 70 % (1% step)		
	Number of ports	2 (invert, non-invert)		
	Connector	3.5mm-Female		
	Coupling	50 Ω (AC/ DC)		
	Invert control	Invert / non-invert function		
	Output control	ON/OFF function		
CLOCK OUT & CLOCK OUT	Output Level	0.6Vp-p (AC Coupling) (Typ.)		
	Duty	50 % ± 10 %		
	TR/TF (20-80%)	< 25ps		
	Offset	-2 V to +3 V (10 mV step)		
	Number of ports	2 (invert, non-invert)		
	Connector	SMA-Female		
TRIGGER OUT	Clock Trigger	Frequency	1/16 or 1/64 of Clock Frequency	
		PRBS	Outputs 128 bits positive pulse every 128 times of PRBS pattern	
	Pattern Trigger	PROGRAM	Outputs 1024bits positive pulse and same width negative pulse every times	
	1/N bit rate	Frequency	Same Frequency as 1/N bit rate	
	Output Level	0.6Vp-p +/- 0.3V		
	Connector	SMA-Female		
	Coupling	50 Ω (AC)		
Data				
Output Pattern	PRBS	$2^7-1, 2^{15}-1, 2^{23}-1, 2^{31}-1$		
	PROGRAM	2 / 4 / 8 / 16 / 32 / 64 / 128 byte		
	1/N bit rate	1/2 , 1/4 and 1/8 bit rate of PPG clock (9.95 Gbit/s to 11.1 Gbit/s)		
Error Add	SINGLE	1 bit when user specifies		
	RATE	10-n (n= 3 to 12 by 1 step )		

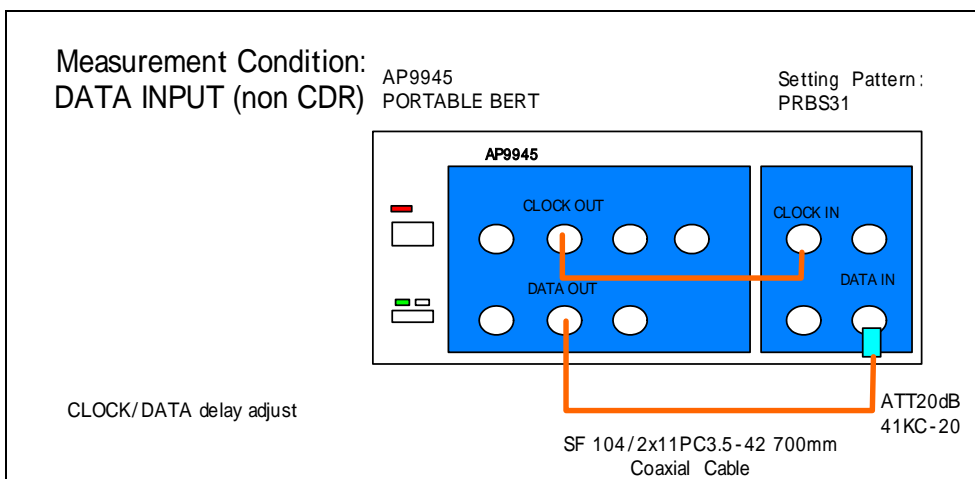
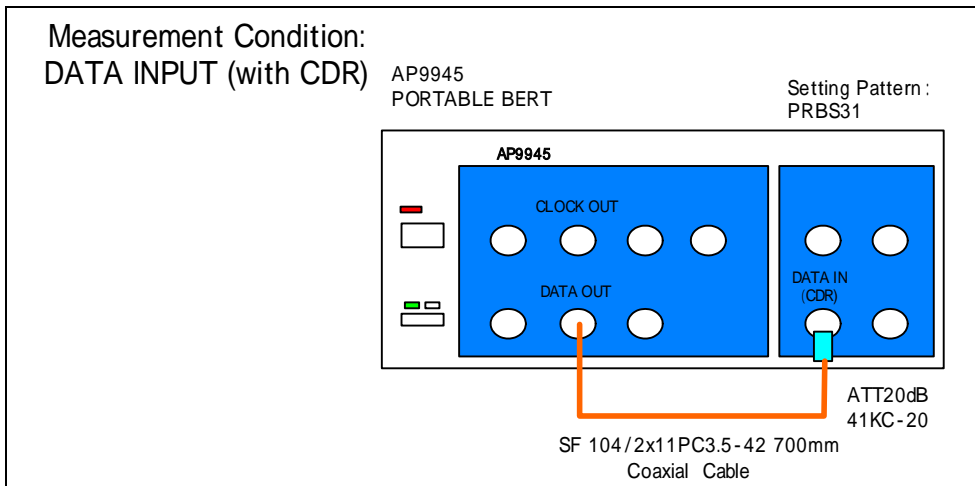
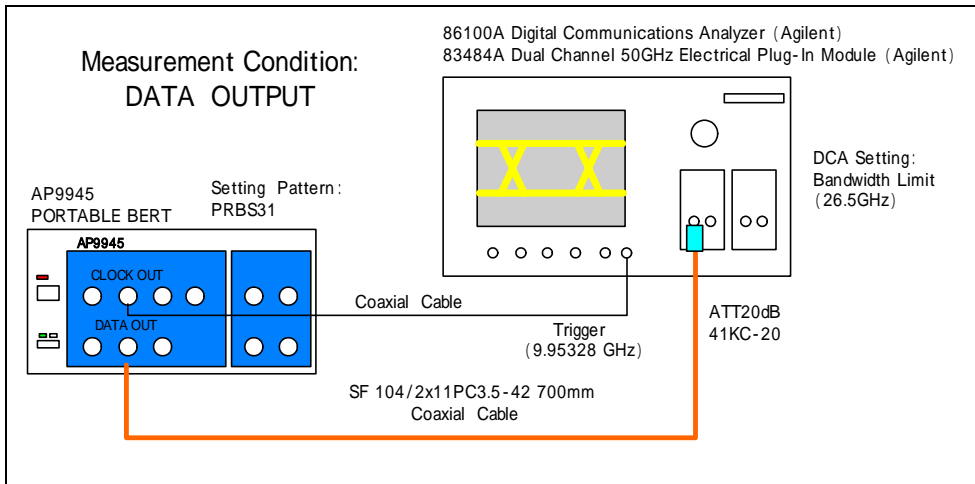
## ■ Specifications 2

ED			
<b>Interface</b>			
DATA IN with CDR	Bit rate	9.95 Gbit/s to 11.32 Gbit/s	
	Synchronization range	± 100 ppm of PPG clock	
	Input level	Minimum: 0.1Vp-p, Maximum: 0.7 Vp-p	
	Minimum Input Sensitivity	100 mVp-p or less	
	Threshold level adjustment	± 0.35 V (1 mV step)	
	Data Format	NRZ	
	Invert control	Invert / non-invert function	
DATA IN without CDR	Bit rate	9.95 Gbit/s to 10.71 Gbit/s	
	Input level	Minimum: 0.1Vp-p, Maximum: 0.6 Vp-p	
	Minimum Input Sensitivity	100 mVp-p or less	
	Threshold level adjustment	± 0.3 V (1 mV step)	
	Invert control	Invert / non-invert function	
	Connector	3.5mm-Female	
	Coupling	50 Ω (AC)	
10G CLOCK IN for ED	Frequency	The synchronized and same bit rate of frequency with DATA INPUT	
	Input level	from 0.2 to 0.6Vp-p	
	Connector	SMA-Female	
	Coupling	50 Ω (AC)	
TRIGGER OUT	Clock Trigger	Frequency	1/16 or 1/64 of Clock out Frequency
	Pattern Trigger	PRBS	Outputs 128 bits positive pulse every 128 times of PRBS pattern
		PROGRAM	Outputs 1024bits positive pulse and same width negative pulse every times
	Output level	0.6Vp-p +/- 0.3V	
	Connector	SMA-Female	
Coupling	50 Ω (AC)		
<b>Data</b>			
Pattern	PRBS	$2^7-1, 2^{15}-1, 2^{23}-1, 2^{31}-1$	
	PROGRAM	2 / 4 / 8 / 16 / 32 / 64 / 128 byte	
Measurement functions	Manual	from START function to STOP function	
	Single	One time measurement in setting period	
	Period	Maximum 99 Hour	
	Results	CURRENT, TIMED / BIT ERROR COUNT, ERROR RATE, SYNC LOSS	
Error Log	Available		

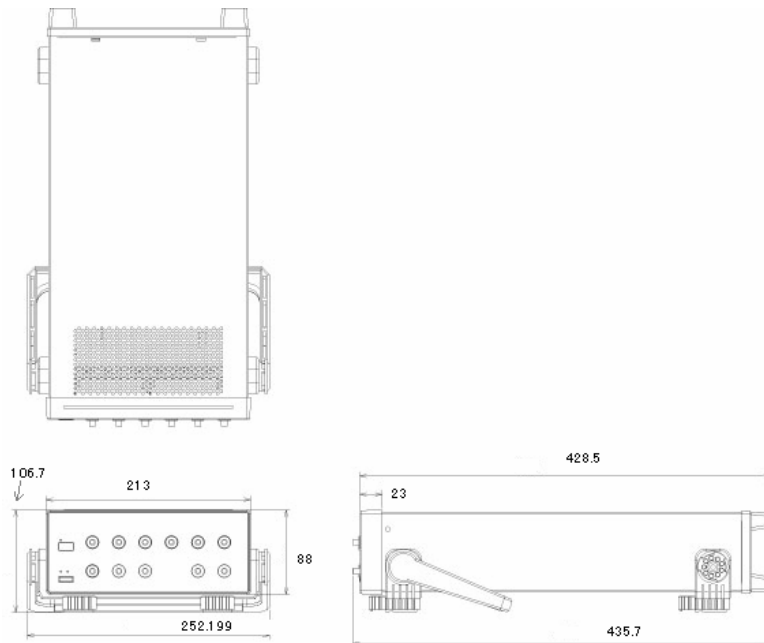
## ■ Specifications 3

Common		
Controller Interface	USB	9600bps/ Bit length 8/ Parity None/ Stop bit 1bit/ Flow control None
	Inline command control	Not Available
Environmental conditions	Operating temperature	+5 to +40 °C
	Operating humidity	20 to 80 %RH
	Power requirements	AC100 V to 120V, AC200 V to 240 V, 50 Hz/60 Hz, 100VA or less
Dimensions and mass	Dimensions	213 (W) × 88 (H) × 429 (D) mm
	Mass	5 kg or less
Accessories		Instruction Manual (1), Application software (1), USB cable (1), Power cable (1), Terminator (6)

■ Measurement Conditions



## ■ Dimensions



## ■ Order Code

Model	Order Code
AP9945 PORTABLE BERT	734001 - - - -
	-SG0 : Non SG -SG1 : SG
	-F10 :Non Oscillator 1 -F11 :Oscillator 1 (9.95328GHz) -F12 :Oscillator 1(10.3125GHz) -F13 :Oscillator 1(10.6642GHz) -F14 :Oscillator 1(10.709GHz) -F15 :Oscillator 1(11.905GHz)
	-F20 :Non Oscillator 2 -F22 :Oscillator 2(10.3125GHz) -F23 :Oscillator 2(10.6642GHz) -F24 :Oscillator 2(10.709GHz) -F25 :Oscillator 2(11.095GHz)
	-E VDE AC250V straight -G AS AC250V straight -J BS AC250V straight -U UL/CSA AC125V straight