

25G SFP28 AOC Checker

Features

- 10Gbps, 25Gbps, 28Gbps BERT
- SFP status checker
- Friendly graphic user interface (GUI)
- 2 SFP28 ports
- Working independently without PC
- ◆ 5V~12V DC power supply
- Small form & full metal case
- Mini-USB connection



Applications

- Bit error rate test
- SFP+, SFP28 module, SFP+ AOC/DAC, SFP28 AOC /DAC test
- Module power measurement
- GUI Operating environment: Win XP, Win 7, Win8 and Win10

Description

The SFP28 Checker is an instrument which can help you to test SFP+, SFP28 module ,SFP + AOC/DAC, SFP28 AOC/DAC

It can help you to read the internal memory EEPROM of the modules and display details of the EEPROM (such as the Part Number, Vendor Name, description and range.), monitor all DDM information. You can change the EEPROM if you know the module passwords . In addition it can measure the power of the module.

The SFP28 Checker combines the Serial Pattern Generator, Bit Error Rate Analyzer. It provides common transmission rate for 10G, 25G and 28G,

The friendly graphic user interface (GUI) provides clear monitoring for bit error rate, bit error counter, time, status, power of the module, selection of data rate and PRBS pattern.

Working mode



1. SFP+ 10G

In this mode, SFP+ module, SFP+ AOC/DAC can be tested. Two modules at the same time, one by one, single channel by single channel, all are supported.

In addition, you can use two "SFP28 Checker" if the AOC or DAC can't be inserted into one SFP28 Checker. But in this mode, two SFP28 Checkers connected to one PC is not supported.

2. SFP28_25G or SFP28_28G

In these two modes, SFP28 module, SFP28 AOC/DAC can be tested. Two modules at the same time, one by one, single channel by single channel, all are supported.

In addition, you can use two "SFP28 Checker" if the AOC or DAC can't be inserted into one SFP28 Checker. But in these two modes, two SFP28 Checkers connected to one PC is not supported.

3. Without PC

The SFP28 Checker can working independently .You can choose the work mode from the GUI and save it to the SFP28 Checker (Factory setting is 10G), then the Checker can work as you wanted. The SFP28 Checker will not change its working mode even if it is power down, you can get the main message from the four LED, such as working mode, Bit Error test is OK or NG.



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Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply Voltage	Vcc	-0.5	16	V
Storage Temperature	Ts	-10	+70	°C

Technical Specifications

Parameter		Symbol	Min	Typical	Max	Unit
Operating Case Temperature	Standard	Тс	-10		+50	°C
Operating Humidity	,	-	5		85 non-condensing	%
Power Supply Voltag	le	Vcc	5	12	16	V
Physical Dimension	S		1	60(W)x110(D)) x24(H)	mm

Optical and Electrical Characteristics

	Main Frame
SFP ports	Standard SFP 20pin with Cage
Transmission rate	10.3Gbps, 25.78125Gbps 27.9525Gbps
Pattern Generator	PRBS7, PRBS9, PRBS21, PRBS23, PRBS31
	Module Power measured
supply current	0~3000mA
Accuracy	±15%



Hardware Configuration

1. MINI USB and DC Power



2. SFP28 PORTS and work status



SFP1,SFP2: support 10G,25G,28G KEY: Restart testing

LED:

- ERR1: Indicates test result of SFP1, if any one of the four channels BER (bit error of rate) is not zero, it will be red
- ERR2: Indicates test result of QSFP2, if any one of the four channels BER (bit error of rate) is not zero, it will be red

Power: two functions: one is power indicator, the other is working mode When the working mode is SFP28_28G, it will blink

10/25/28G:

10G: OFF 25G: ON 28G: ON¹ In 112G mode, the power led blink

ERR1, ERR2 is no function when the "Checker" is connected to PC



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Mechanical Dimensions









Ordering information

Part Number	Product Description
25G SFP28 AOC CHECKER	25G SFP28 AOC CHECKER is an test instrument which combines 10Gbps,25Gbps,28Gbps Bit error rate test, DDM Checking, EEPROM coding function, etc.

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Light

Off

On

Flash

Mode

10G

25G

28G

User Guide

Hardware Configuration

Front panel



Note:

- (1) Both ports support three data rates;
- (2) Press Start to begin bit error test.

Rear panel



Device Connection

One Checker for AOC & DAC Test





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Two Checkers for AOC & DAC Test



Note: One end module of AOC & DAC connected to one port of one checker, another end module connected to one port of another checker.

Bit Error Test

Software Function Introduction

Start						Bit Error	Code Other		
Туре	10G SFP+				•	Option Patter	n PRBS31 +		
DDM1			DDM2			SFP1	0		
тх	FAILT		тх	FAIILT		EC	U	Mode	
RX	LOS O		RX	LOS 🔘		ER	0.0000e+000		
тх	DIS 🗖		TX	DIS 🔲		Time		Start	
BGU	 h		per			SFP2			
RS1	, v		RS	1		EC	0	Mode	
Temp	30.39	- 	Temp	31.01	'n	ER	0.0000e+000	Free	
rentb	00.00	_	Tauth	0.101		Time		Start	
VCC	3.30	V	VCC	3.27	A				
Bias1	3.63	mA	Biasl	3.79	mA	AOC Mode		Stop	
TXP₩1	8.16	dBm	TXP₩1	8.16	dBn				
RXPW1	-40.00	dBm	RXPW1	-40.00	dBm				



The software interface as shown above, separately introduced as follow:

2.1.1. Data Rate Selection:

Start		
Туре	Please select	*
	Please select	
DDW1	25G SFP28 28G SFP28	

2.1.2 Test Time Mode Selection

	с.	_
Fre	е	•
Fre	e	
Tim	er	

Free -- Increasing timing Timer -- decreasing timing

2.1.3 PRBS Type Selection

Option		
Patten	PRBS31	-

PRBS types have three options: PRBS7, PRBS15 and PRBS31, default to PRBS31.

2.1.4 DDM Display Section

It read and display the real-time data of the transceiver internal memory, Checker and GUI do not process.



DDM includes the real-time data, as well as the transceiver mode control and the pin indicated.



2.1.5 Bit Error Rate Test on AOC & DAC

For example, 10G AOC test,

(1) when there is no bit error, ER value on SFP1 and SFP2 section are highlighted in green as below,



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Start						Bit Error	Code Other	
Туре	10G SFP+				•	Option Patte	n PRBS31 -	
DDM1			DDM2			SFP1		_
TU			TU			EC	0	Mode
IX_			RX			ER	0.0000e+000	Free -
TX	DIS 🕅		TX	DIS 🕅		Time		Start
PCI	- <u> </u>		29	- <u> </u>		SFP2		
RSI	1 🔽		RS	1		EC	0	Mode
Temp	30.39	°C	Temp	31.01	°C	ER	0.0000e+000	Free
romp		_	romp			Time		Start
VCC	3.30	۷	VCC	3.27	A			
Bias1	3.63	mA	Biasl	3.79	mA	AOC Mode F.		Stop
TXP₩1	8.16	dBm	TXPW1	8.16	dBn			
RXPW1	-40.00	dBm	RXPW1	-40.00	dBm			

(2) When there is bit error, ER and EC value on SFP1 section are highlighted in red as below:

Start		Bit Error Code Other	
Type 10G SFP+	•	Option Patten PRBS31 +	
DDM1	DDM2	SFP1	
TX_FAULT	TX_FAULT	EC 9	Mode
PW LOS	PV LOC	ER 1.2857e-011	
		Time	Start
TX_DIS	TX_DIS	SEP2	
RSO 🔽	RSO 🔽	EC O	Mode
RS1 🗹	RS1 💟	0.0000-1000	Free -
Temp 46.19 °C	Temp 49.06 °C	ER 0.0000e+000	Start
vcc 3.34 v	vcc 3.38 v		
Biasl 18.36 mA	Bias1 20.59 mA	AOC Mode Free Time 00.04.40	Stop
TXPW1 -3.83 dBm	TXPW1 -3.15 dBm	00:01:10	

(3) When the transceiver in AOC receiving end is abnormal, it will show alarm as below:



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Start						Bit Error	Code Other		
Туре	e 10G SFP+				•	Patte	n PRBS31 -		
DDM1			DDM2			SFP1	Unlooked		
TX	FAULT 🔘		тх	FAULT		EC	Uniockeu:	Mode	
RX	_LOS		RX_	_LOS 🔘		ER		Start	
						Time		Start	
TX_	_DIS		TX_	_DIS		5000			
RSI	0 🔽		RS	0 🔽		SFF2	0	W- 1	
RS	1		RS	1		EC	v	Rree T	
-	46 57	***		40.64	10	ER	0.0000e+000		
Temp	40.57	C	Temp	49.04	C	Tine		Start	
VCC	3.34	V	VCC	3.38	v	The			
Bigg1	18 36		Biast	20.59	mů	AOC			
51451	10.00	11167	51451	20.00		Mode F1	.ee - Time 00:00:03	Stop	
TXPW1	-3.87	dBm	TXP₩1	-3.17	dBm				
RXPW1	-40.00	dBn	RXPW1	-6.21	dBm				



Transceiver Code Reading/Writing

2.2.1 Code Reading

						BIT EFFOR Code	other		
Type [10G SFP+				•	Information Vendor Name Part Number	OEM	Length(SMF, km)	10
DDM1			DDM2			Serial Number	SFP-IUG-LK	Length (50um OM2 10m)	0
TX_FA	ULT 🔘		TX_	FAULT 🔘		Vender Revision	1.0	Length(62.5um OM1 10m)	0
RX LO	s 🔘		RX	LOS 🔘		Date Code	090109	Length(50um OM4 10m/copper m)	0
						Wavelength	7685	Length(50um OM3 10m)	0
IX_DI	s 🗆		TX_			Local			Display
RSO			RSO)		File_A0			Module
RS1			RSI			© File_A2		Import	🔘 Local
Temp		°C	Temp	48.68	°C	Module			
vcc		V	VCC	3.38	v	🔿 SFP1 💿 SFP2	File_A2	Read Type SFP -	Vrite
Bias1		mA	Biasl	20.59	πA				
TXPW1		dBn	TXPW1	-3.13	dBm			1	
RXPW1		dBm	RXPW1	-2.94	dBm				

For example of 10G optical module code reading to introduce the operating steps:

- 1) Type chooses 10G SFP+, wait for initialization completed;
- 2) Click Code to enter Code function page (Module \rightarrow Type default to SFP);

3) If the module inserted in SFP2 port, then choose Module \rightarrow SFP2 \rightarrow Read; If the module in SFP1 port, then Module \rightarrow QSFP1 \rightarrow Read;

4) Status bar shows Succeed to read code, and the purple box showing the module information;

For 25G/28G module, choose SFP+ on Module \rightarrow Type, then do similar operation.



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2.2.2 Code Writing

Start						Bit Error Code	Other		
Type 10G	SFP+				•	Information Vendor Name Part Number	Gigalight	Length(SMF,km) Length(SMF 100m)	10
DDM1 DDM2						Serial Number	588888888	Length(50um OM2 10m)	0
TX_FAULT 🔘		TX_FAULT 🔘			Vender Revision	1.0	Length(62.5um OM1 10m)	0	
RX LOS 🔘		RX LOS			Date Code	33333	Length(50um OM4 10m/copper m)	0	
	-					Wavelength	22222	Length(50um OM3 10m)	0
TX_DIS RSO RS1			TX_DIS 🗖 RSO 🔽 RS1 🔽		Local File_A0	Local File_A0	Import Export		
Temp		°C	Temp	49.45	ŕ	Module			C Local
VCC		v	VCC	3.37	v	🔘 SFP1 💿 SFP2	File_A2	Read Type SFP -	Write
Bias1		mA	Biasl	20.59	mA				
TXPW1		dBm	TXPW1	-3.15	dBm				
RXPW1		dBm	RXPW1	-3.07	dBm				

For example of 10G SFP+ code writing, the operation as follow:

1) the current module in SFP2 port, Module \rightarrow SFP2, Display \rightarrow Module;

2) Default to Module \rightarrow A0_2, modify in the text box, input the character with correct format and number;

- 3) Click Write, status bar shows Succeed to write code;
- 4) Click Read, to check if the modified character have been input to module information.



2.2.3 Local Import/Export Code File

otart						Bit Error Code Other				
Type 10G	SFP+				•	Information Vendor Name Length(SMF,km)	0			
						Part Number Length(SMF 100m)	0			
DDM1			DDM2			Serial Number Length(50um OM2 10m)	0			
TX_FAULT	۲		TX_	FAULT 🔘		Vender Revision Length (62.5um OM1 10m)	0			
RX_LOS	۲		RX_	LOS 🔘		Date Code Length(50um OM4 10m/copy	perm) O			
TX DIS			τx	DIS 🗖		Wavelength 0 Length (50um OM3 10m)	0			
850			800			Local				
RS1			RSI			◎ File_A0 Import Exp	ort 🔍 Modul			
nor			1.01			© File_A2	C Local			
lemp		°C	Temp	48.11	°C	Module				
<i>i</i> cc		V	VCC	3.30	V	SFP1	▼ Vrite			
Bias1		mА	Biasl	18.36	mA					
TXPW1		dBm	TXPW1	-3.96	dBn					
RXPW1		dBm	RXPW1	-8.63	dBm					

Choose Local if you want to import code file from the local computer to GUI, click Import button, then choose the local code file through the bounced window. After import, it will show directly in Information, then click Write to encode the module.

Export: to export the code file from the module.

A0_0 and A0_2 in Local refer to the page 0 and page 2 of the module A0 register, check details on the protocol. Generally speaking, password is necessary for code reading and writing, default to A0_0 register information; A0_2 is customized by manufacturer, if user wants to read and write, then choose A0_2 in Module (little purple box).



Other Function Page

Here to set up offline working rate, power dissipation display, and close Tx end on any channel of the module .

Start				Bit Error Code Other
Type 10G SFP+			-	Offline SFF1_Power Rate 10G • 0 w
DDM1	DDM2			SFP2_Power
TX_FAULT 🔘	1	X_FAULT		Read Save 0.81
RX_LOS 🔘	F	x_los 🔘		
TX_DIS 🗌	1	X_DIS 📃		
RSO 🗌	F	:SO 🔽		
RS1	F	S1		
Iemp	°C Temp	49.45	°C	
VCC	V VCC	3.37	V	
Biasl	mA Bias	1 20.59	mA	
TXPW1	dBm TXPV	- 3.15	dBm	
RXPW1	dBm RXPW	- 3.07	dBm	

1) Type choose 10G SFP+, wait for initialization completed; click Other to enter its function page;

2) The purple box Offline -- offline mode save (data rate is saved optionally, code type all is code PRBS31);

The green box -- show power consumption of SFP1 and SFP2 (2% - 5% error);

3) click Offline \rightarrow Rate, read the mode of offline rate (default rate is 10G);

4) Power consumption display: as the module inserted to the port, the value will be automatically showed (generally the value is monitoring value for reference).

Offline Working

The Checker has offline working mode.

1) In GUI you can choose the working rate of offline mode;

2) The other rate mode is set up in GUI after connecting to PC;

3) After choosing different rate mode, please click Save (note: all is code PRBS31);

4) Set up different rate and check other connect mode of optical module, users must strictly follow the guide to operate the product.