

## 10G SFP+ ER 1550nm 40KM SOSP-5599-40

### ● Features :

- 1550nm EML Transmitter
- Distance up to 40km over SMF
- Single 3.3V Power supply and LVTTTL Logic Interface
- Duplex LC Connector Interface  
Hot PlugSOble
- Power Dissipation < 1.5 W
- Dispersion Tolerance 800ps/nm
- Operating Case Temperature  
Standard: 0°C~+70°C
- Compliant with SFF-8431 MSA
- Compliant with SFF-8432 MSA
- Compliant with SFF-8472 MSA

### ● Applications

- 10GBASE-ER/EW
- 8G/10G FC
- Other optical links

### ● Absolute Maximum Ratings

Table 1- Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Storage Temperature	T <sub>s</sub>	-40	-	85	°C	
Supply Voltage	V <sub>CC5</sub>	-0.5	-	4.0	V	
Operating Humidity	RH	-	-	+85	%	

### ● Recommended Operating Conditons

Table 2- Recommended operating Conditons

## 10G SFP+ ER 1550nm 40KM SOSP-5599-40

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Operating Case Temperature	TOP	0		70	°C	
Power Supply Voltage	VCC	3.14	3.3	3.46	V	
Power Supply Current	ICC	-	-	450	mA	
Power Dissipation	PD	-	-	1.5	W	
Data Rate	BR	9.95		11.3	Gbps	

### ● Electrical Characteristics

**Table 3- Electrical Characteristics**

Transmitter						
Parameter	Symbol	Unit	Min.	Typ.	Max.	Notes
Differential Data Input swing	V <sub>in,p-p</sub>	mV <sub>pp</sub>	180	-	700	
Input Differential impedance	Z <sub>in</sub>	Ω	85	100	115	
Tx_Disable,P_Down/RST	V <sub>IL</sub>	V	-0.3		0.8	
	V <sub>IH</sub>	V	2.0	-	V <sub>cc</sub> +0.3	
Receiver						
Differential Data Output	V <sub>out</sub>	mV <sub>pp</sub>	300		850	
Output Differential impedance	Z <sub>in</sub>	Ω	80	100	120	
Output Rise Time,20%-80%	T <sub>r</sub>	Ps	28			
Output Fall Time,20%-80%	T <sub>f</sub>	Ps	28			
Rx_Los,Mod_NR,Interrupt	V <sub>oL</sub>	V	0		0.4	
	V <sub>oH</sub>	V	V <sub>cc</sub> -0.5		V <sub>cc</sub> +0.3	

### ● Transmitter Performance :

**Table 4- optical TX Characteristics**

## 10G SFP+ ER 1550nm 40KM SOSP-5599-40

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Average Launch Optical Power	Pout	-4	-	+4	dBm	1
Extinction Ratio	ER	8.2	-	-	dB	2
Average Launch power of OFF TX	Poff	-	-	-30	dBm	1
Optical Wavelength	$\lambda$	1530	-	1565	nm	
Dispersion penalty@9.95/10.7Gpbs	DP1	-	-	2	dB	2
Dispersion penalty@11.1/11.3Gpbs	DP2	-	-	3	dB	3
Side Mode Suppression Ratio	SMSR	30	-	-	dB	

### ● Receiver Performance :

**Table 5- optical RX Characteristics**

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Receiver Sensitivity @9.95Gpbs/10.7Gpbs	PIN_SENS1	-	-	-16	dBm	2
Receiver Sensitivity @11.1Gpbs/11.3Gpbs	PIN_SENS2	-	-	-14	dBm	3
Overload	PIN_OL	-7.0	-		dBm	3
Optical Center Wavelength	$\lambda_C$	1260	-	1600	nm	
LOS	LOSA	-30	-	-	dBm	
	LOSD	-	-	-18	dBm	
Los hysteresis	LOSH	0.5	-		dB	
Rx_LOS	High	2.0		V <sub>cc</sub> +0.3	V	
	Low	0		0.8	V	

Note:

1. The optical power is launched into SMF.
2. Measured with a PRBS 231-1 test pattern @9.95Gpbs.
3. Measured with a PRBS 231-1 test pattern , @11.1Gpbs. BER≤10<sup>-12</sup>.

## 10G SFP+ ER 1550nm 40KM SOSP-5599-40

- **Recommended Host Board Power Supply Circuit**

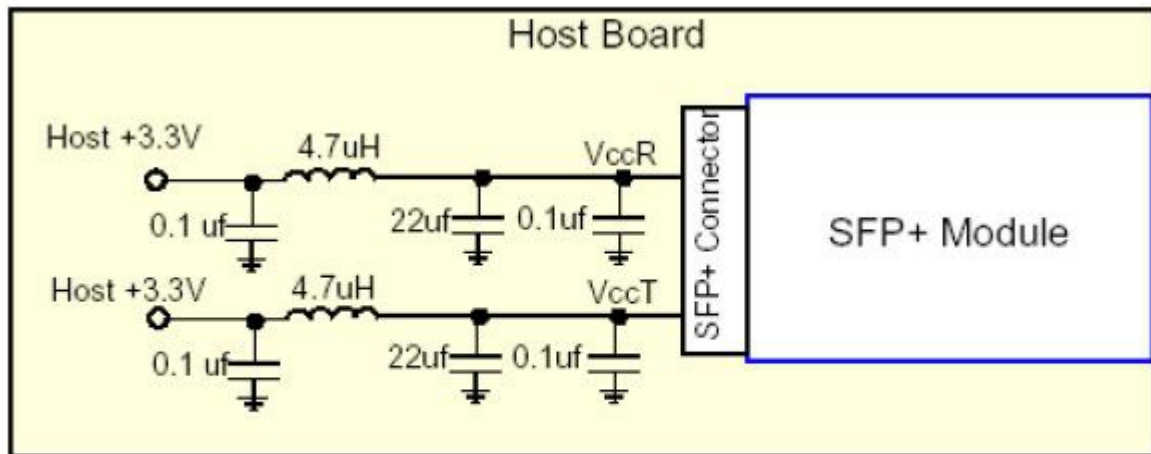


Figure 1, Recommended Host Board Power Supply Circuit

# 10G SFP+ ER 1550nm 40KM SOSP-5599-40

## ● Recommended Interface Circuit

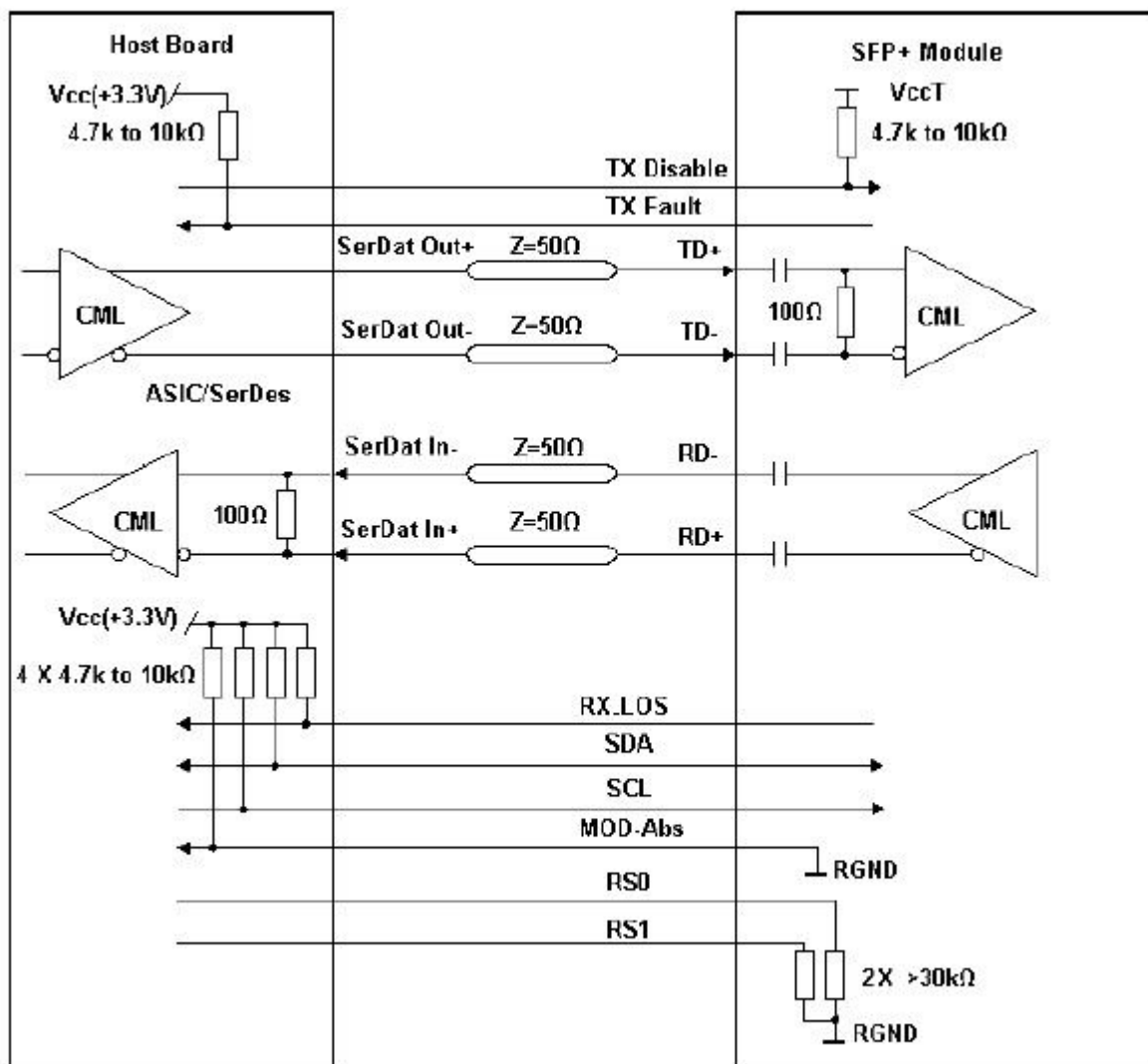


Figure 2, Recommended Interface Circuit

## 10G SFP+ ER 1550nm 40KM SOSP-5599-40

- Pin arrangement

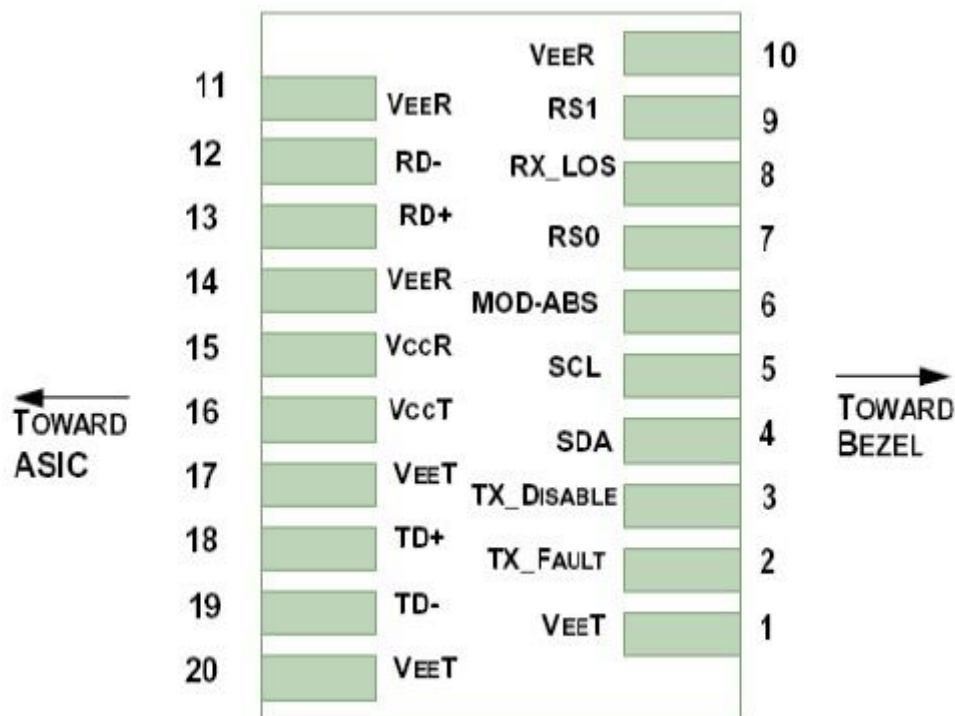


Figure 3, Pin View

Table 6-Pin Function Definitions

Pin	Name	FUNCTION	Plug Seq.	Notes
1	VeeT	Transmitter Ground	1	Note 5
2	TX Fault	Transmitter Fault Indication	3	Note 1
3	TX Disable	Transmitter Disable	3	Note 2, Module disables on high or open
4	SDA	Module Definition 2	3	2-wire Serial Interface Data Line.
5	SCL	Module Definition 1	3	2-wire Serial Interface Clock.
6	MOD_ABS	Module Definition 0	3	Note 3
7	RS0	RX Rate Select (LVTTL).	3	Rate Select 0, optionally controls SFP+ module receiver. This pin is pulled low to VeeT with a >30K resistor..

## 10G SFP+ ER 1550nm 40KM SOSP-5599-40

8	LOS	Loss of Signal	3	Note 4
9	RS1	TX Rate Select (LVTTTL).	1	Rate Select 1, optionally controls SFP+ module transmitter. This pin is pulled low to VeeT with a >30K resistor.
10	VeeR	Receiver Ground	1	Note 5
11	VeeR	Receiver Ground	1	Note 5
12	RD-	Inv. Received Data Out	3	Note 6
13	RD+	Received Data Out	3	Note 6
14	VeeR	Receiver Ground	1	Note 5
15	VccR	Receiver Power	2	3.3 ± 5%, Note 7
16	VccT	Transmitter Power	2	3.3 ± 5%, Note 7
17	VeeT	Transmitter Ground	1	Note 5
18	TD+	Transmit Data In	3	Note 8
19	TD-	Inv. Transmit Data In	3	Note 8
20	VeeT	Transmitter Ground	1	Note 5

**Note:**

- TX Fault is an open collector/drain output, which should be pulled up with a 4.7K – 10KΩ resistor on the host board. Pull up voltage between 2.0V and VccT/R+0.3V. When high, output indicates a laser fault of some kind. Low indicates normal operation. In the low state, the output will be pulled to < 0.8V.
- TX disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7K – 10 KΩ resistor. Its states are: Low (0 – 0.8V): Transmitter on (>0.8, < 2.0V): Undefined High (2.0 – 3.465V): Transmitter Disabled Open: Transmitter Disabled
- Module Absent, connected to VeeT or VeeR in the module.
- LOS (Loss of Signal) is an open collector/drain output, which should be pulled up with a 4.7K – 10KΩ resistor. Pull up voltage between 2.0V and VccT/ R+0.3V. When high, this output indicates the received optical power is below the worst-case receiver sensitivity (as defined by the standard in use). Low indicates normal operation. In the low state, the output will be pulled to < 0.8V.
- The module signal ground contacts, VeeR and VeeT, should be isolated from the module case.
- RD-/+ : These are the differential receiver outputs. They are AC coupled 100Ω differential lines which should be terminated with 100Ω (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board. The voltage swing on these lines will be between 350 and 700 mV differential (175 –350 mV single ended) when properly terminated.
- VccR and VccT are the receiver and transmitter power supplies. They are defined as 3.3V ±5% at the SFP+ connector pin. Maximum supply current is 725mA. Recommended host board power supply filtering is shown below. Inductors with DC resistance of less than 1 ohm should be used in order to maintain the required voltage at the SFP+ input pin with 3.3V supply voltage. When the recommended supply-filtering network is used, hot plugging of the SFP+ transceiver module will result in an inrush current of no more than 30mA greater than the steady state value. VccR and VccT may be internally connected within the SFP+ transceiver module.
- TD-/+ : These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module. The AC coupling is done inside the module and is thus

## 10G SFP+ ER 1550nm 40KM SOSP-5599-40

not required on the host board. The inputs will accept differential swings of 150 – 1200 mV (75 – 600mV single-ended).

### ● Mechanical Dimension :

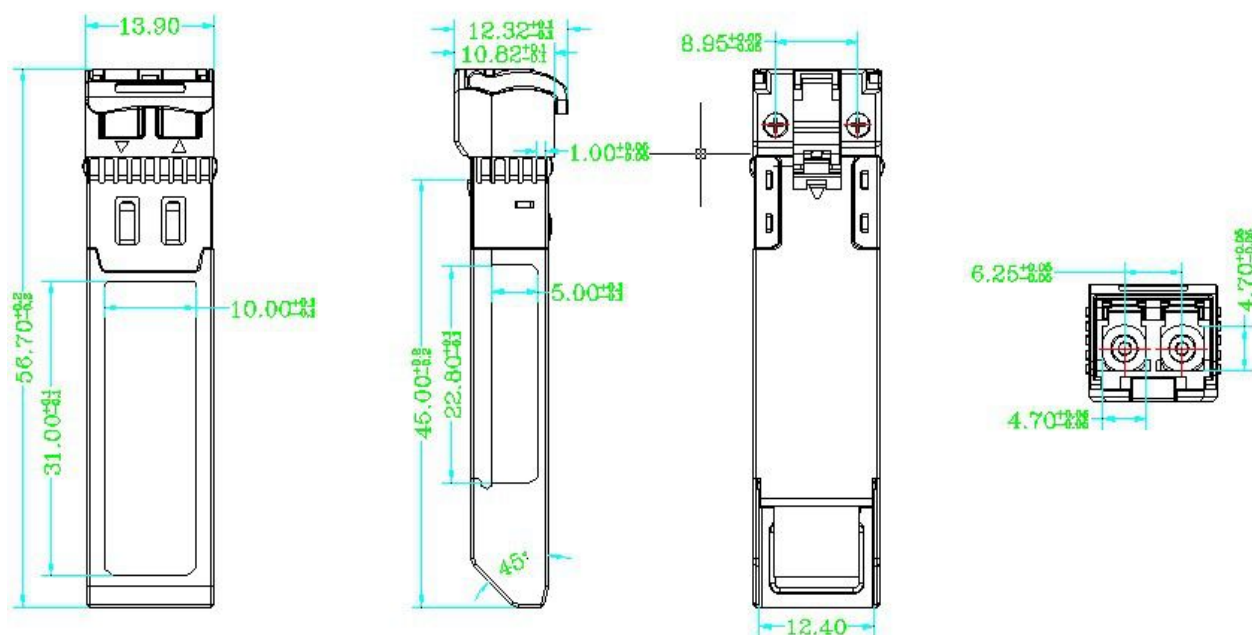


Figure 4,mechanical dimension

### ● Order Information and Related Products :

Table 7-order information

Part Number	Product Description
SOSP-5599-40	SFP+ ER 1550nm EML, 0°C ~70°C, 40Km

#### ● Notice

SINOVO reserves the right to make changes to or discontinue any optical link product or service identified in this publication, without notice, in order to improve design and/or performance. Applications that are described herein for any of the optical link products are for illustrative purposes only. SINOVO makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

#### ● Contact

Shenzhen Sinovo Telecom Co.,Ltd  
 Tel:+86(0)0755-32959919 Fax:+86(0)755 32959918  
 Email: sales@sinovocorp.com  
 Web:www.sinovocorp.com  
 Factory ADD:5/F Chuang Park,Taoyuan Street Baoan District,Shenzhen,China  
 Head Quarter:11/F, Taibang Technology Building,Gaoxin South 4<sup>th</sup>,Science and Technology Park  
 South,Nanshan,Shenzhen,China 518040