10G SFP+ to 10G SFP+ Active Optical Cables
HTOC-PP96-**01MB

Feature

- Supports 10.3125Gbps data rate
- Hot-pluggable electrical interface
- 850nm VCSEL transmitter
- PIN photo-detector receiver
- Maximum link length of 300m on OM3 MMF
- Operating case temperature range 0°C to +70°C
- Power dissipation < 1W
- RoHS compliant (lead free)

Applications

- 10G Ethernet
- InfiniBand QDR,SDR,DDR

Standards

- SFF-8431 SFF-8432 SFF-8472

Description

The Hirundo’s HTOC-PP96-**01MB are direct-attach fiber assemblies with SFP+ connectors. They are compliant with SFF-8431,SFF-8432 standard. They are suitable for short distances and offer a cost-effective solution to connect within racks and across adjacent racks. The length is up to 300 meters using OM3 MMF.

1. Ordering Information

Table 1.1 Ordering Information

Part No.	Specifications							
	Package	Date rate (Gbps)	Wavelength (nm)	Optical Power (dBm)	Bit Error Rate	Temp (℃)	Reach（m）	Other
HTOC-PP96-**01MB[1]	SFP+	10.3125	850	-6.5~-1	E-12	0~70	300	DDM
PN	HTOC-PP96-**01MB[1]							
Description	10G SFP+ to SFP+ Active Optical Cables,MMF, 300m, 0-70℃							
SAP No	-							
Customer PN	-							

Notes:

1. Refer to Chapter 9 Ordering Information.

2. Revision History

Table 2.1 Revision History

Version	Initiated	Reviewed	Revision	Date
V1.0	Leo	Virgil	LiuSJ	2020.10.15

3. Absolute Maximum Ratings and Recommended Operating Conditions

Table 3.1 Absolute Maximum Ratings

Parameter	Symbol	Unit	Min	Max
Storage Temperature Range	Ts	℃	-40	85
Relative Humidity	RH	%	5	85
Power Supply Voltage	Vcc	V	-0.5	4
Signal Input Voltage		V	-0.3	Vcc+0.3

Table 3.2 Recommended Operating Conditions

Parameter	Symbol	Unit	Min	Typ	Max
Operating Case Temperature	Tc	℃	0		70
Power Supply Voltage	Vcc	V	3.135	3.3	3.465
Bit Rate	BR	Gbps		10.3125	
Bit Error Ratio	BER				10^{-12}
Max Supported Link Length(OM3)	L	m			300

4. Specification

Table 4.1 Specifications

Parameter	Symbol	Unit	Min	Typ	Max	Notes
Transmitter						
Signaling rate per lane		Gbps		10.3125		
Center wavelength	λc	nm	840		860	
RMS Spectral Width	SW	nm			0.45	
Average launch power	P_{AVG}	dBm	-6.5		-1	
Input differential swing	Vin PP	Ω	90	100	110	
Input differential impedance	Zin	mVp-p	100		1800	
Extinction Ratio	ER	dB	3.5			
Receiver						
Signaling rate per lane		Gbps		10.3125		
Center wavelength	λ_{IN}	nm	840		860	
Bit Error Rate	BER				E-12	
Receiver Overload	Pin	dBm			-1	
Output Differential swing	Vin PP	Ω	90	100	110	
Output Differential Impedance	Zin	mVp-p	400		800	
IIC communication						
IIC Clock frequency	-	KHZ	100		400	

5. Module Memory Map

The SFP modules implement the 2-wire serial communication protocol as defined in the SFP - 8472. The serial ID information of the SFP modules and Digital Diagnostic Monitor parameters can be accessed through the I2C interface at address A0h and A2h. The memory is mapped in Figure 1.

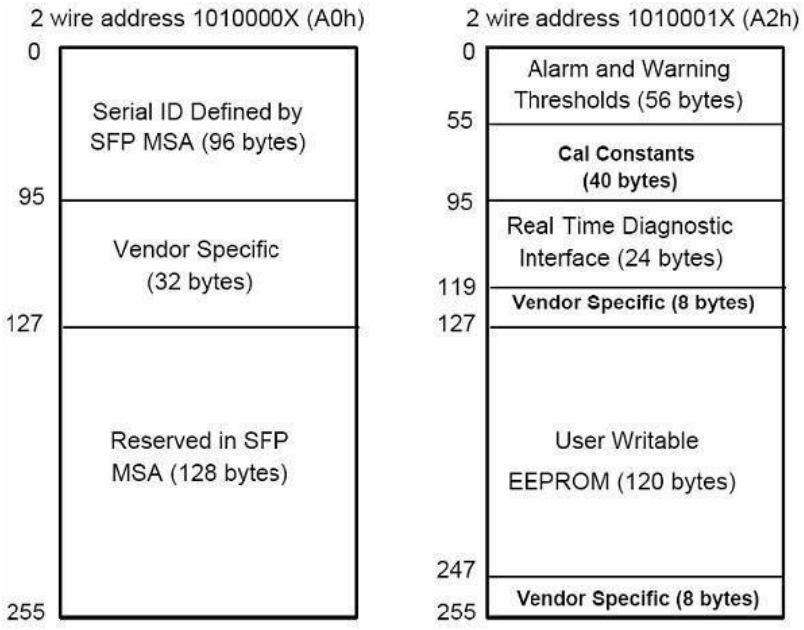

Figure 1 Digital Diagnostic Memory Map

6. Pin Assignment and Pin Description

7.1 Pin Assignment

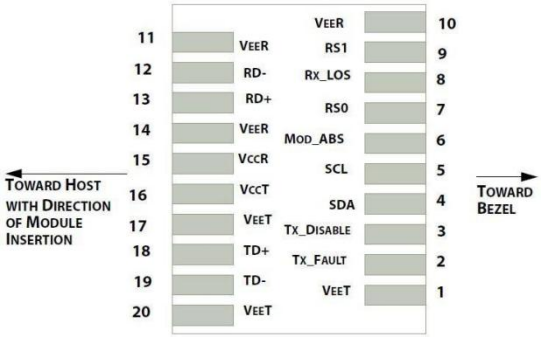

Figure 2 Electrical Pin-out Details

7.2 Pin Description

Table 7.1 Pin Description

PIN #	Name	Function	Notes
1	VeeT	Module transmitter ground	1
2	Tx Fault	Module transmitter fault	2
3	Tx Disable	Transmitter Disable; Turns off transmitter laser output	3
4	SDL	2 wire serial interface data input/output (SDA)	4
5	SCL	2 wire serial interface clock input (SCL)	4
6	MOD-ABS	Module Absent, connect to VeeR or VeeT in the module	2
7	RS0	Rate select0: module inputs and are pulled low to VeeT with > 30 kΩ resistorsin the module	
8	LOS	Receiver Loss of Signal Indication	
9	RS1	Rate select1: module inputs and are pulled low to VeeT with > 30 kΩ resistorsin the module.	
10	VeeR	Module receiver ground	1
11	VeeR	Module receiver ground	1
12	RD-	Receiver inverted data out put	
13	RD+	Receiver non-inverted data out put	
14	VeeR	Module receiver ground	1
15	VccR	Module receiver 3.3V supply	
16	VccT	Module transmitter 3.3V supply	
17	VeeT	Module transmitter ground	1
18	TD+	Transmitter non-inverted data out put	
19	TD-	Transmitter inverted data out put	
20	VeeT	Module transmitter ground	1

Notes:

1.The module ground pins shall be isolated from the module case.
2.This pin is an open collector/drain output pin and shall be pulled up with 4.7K-10Kohms to Host_Vcc on the host board.
3.This pin shall be pulled up with 4.7K-10Kohms to VccT in the module.
4.This pin is an open collector/drain output pin and shall be pulled up with 4.7K-10Kohms to Host_Vcc on the host board.

7. Typical Application Circuit

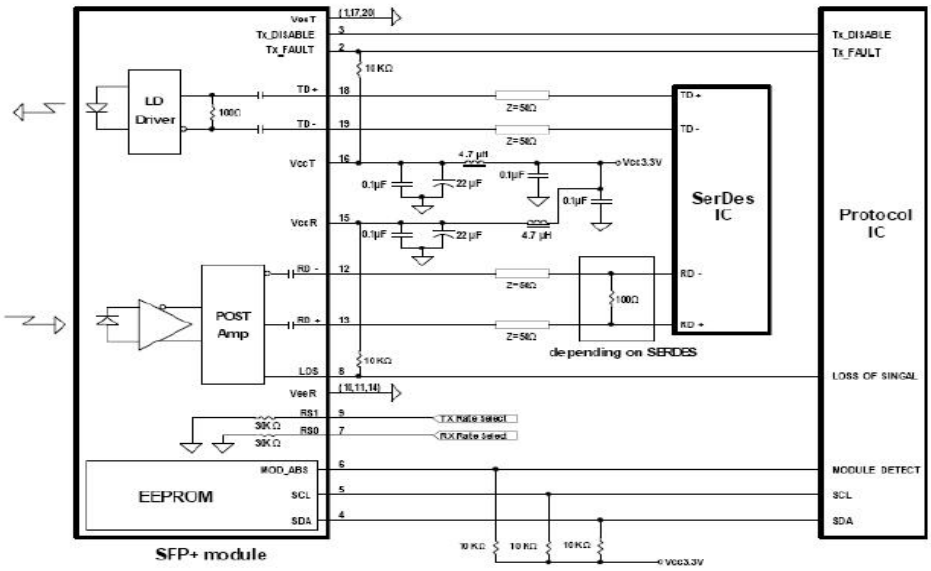

Figure 3 Typical application circuit

8. Package Dimensions

Figure 4 shows the package dimensions of the module. The module is designed to be complaint with SFP MSA specification.

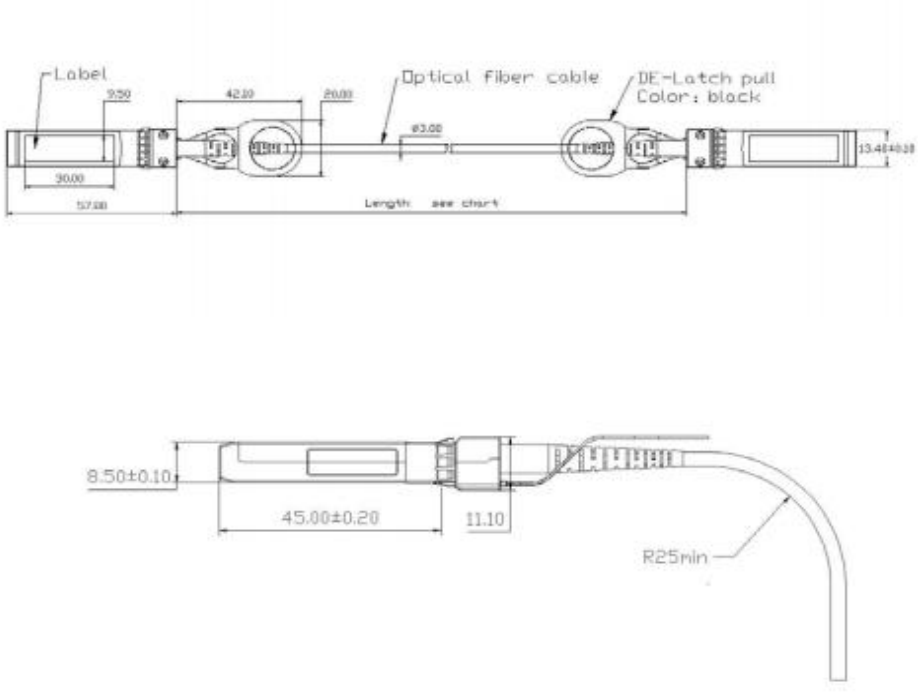

Figure 4 Package Dimensions

9. Ordering Information

Table 9.1 Ordering Information

Part Number	Description
HTOC-PP96-**01MB	10G SFP+ to SFP+ Active Optical Cables, up to 300m, 0-70℃
1~300 Length in meters. (OM3 fiber is available) **---Represents: wire type, type has: O2/O3/O4/O5=OM2/OM3/OM4/OM5	

10. For More Information

Hirundo Optics Inc

2nd floor, building-6, #16 Xinfa Road South Cable industrial park Rongli Ronggui street Shunde districtFoshan City, Guandong province，China;

Zip Code: 528300

Tel. 0757-26619220

http://www.hirundo-link.com/