Product Specification 10.3125Gb/s CWDM SFP+

CLSFP10GCW10-xx

Product Features

- 10.3125Gbps data links
- Maximum link length 10km on Single mode Fiber
- DFB laser for 18 CWDM waves
- Duplex LC connector, The metal casing ensures low EMI interference standards
- Hot-pluggable SFP+ footprint
- Single 3. 3V power supply
- Operating temperature: 0℃ to 70℃
- RoHS
- Digital Diagnostic Monitor (DDM) SFF-8472
- Compliant to SFP+: SFF-8431 and SFF-8432, IEEE 802.3ae.
- Power Consumption: ≤1.5W

Applications

√ CWDM 10GBase SFP+

√ 10G FC

1. Product Description

The **CLSFP10GCW10-XX** is a 10Gbps enhanced small form factor pluggable SFP+ transceiver compatible with 10GBASE- CWDM /10G FC. It is suitable for single-mode fiber (SMF) communications in 10Gbps Ethernet.

2. Regulatory Compliance

C-light transceivers are Class 1 Laser Products comply with FDA regulations. Meet Class 1 eye safety requirements of EN 60825 and the electrical safety requirements of EN 60950.

3. Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Supply Voltage	VCC	-0.5	4	V
Storage Temperature	TS	-40	85	°C
Operating Case Temperature	TC	0	70	°C

4. Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature	TC	0		70	°C
Power Supply Voltage	VCC	3.135	3.3	3.465	V
Power Supply Current	ICC			350	mA
Data Rate		9.95	10.3125	11.3	Gbps
Max Link Length on 9/125μm SMF	Lmax		10		km

5. Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit
Transmitter					
CLSFP10GCW10-XX Centre Wavelength 1271nm~1611nm	λc	1XX1-6	1XX1	1XX1+6	nm
Centre Wavelength Spacing			20		nm
Spectral Width (-20dB)	σ			1	nm
Average Output Power	Pout	-1		6	dBm
Extinction Ratio	ER	3			dB
Average Launch Power of Off Transmitter	Poff			-30	dBm
Relative Intensity Noise	RIN			-130	dB/Hz
Output Eye Mask	Compliant with IEEE 802.3ae				
Receiver					
Centre Wavelength	λc	1260		1620	nm
Receiver Sensitivity @BER ≤10^-12 at 10.3125Gbps	PIN			-14.4	dBm
Overload	Pmax	3			dBm
LOS De-Assert	LOSD			-15	dBm
LOS Assert	LOSA	-30			dBm

Note：

1. Launched power (avg.) is power coupled into a single-mode fiber with master connector.（Before of Life）

2. Measured with conformance test signal for BER ≤ 10^{-12}.@10.3125Gbps, PRBS=2^31-1, NRZ

6. Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit
Transmitter					
Input Differential Impedance	Zin	90	100	110	Ω
Data Input Swing Differential	Vin	250		1200	mV
Tx-Dis Disable	Vd	2.0		Vcc	V
Tx-Dis Enable	Ven	0		0.8	V
Receiver					
Data Output Swing Differential	Vout	250		800	mV
Rx-Los Fault	Vlf	2.0		VccHOST	V
Rx-Los Normal	Vln	0		0+0.8	V
Output rise and fall time	Tr, Tf	30			ps

7. Pin Descriptions

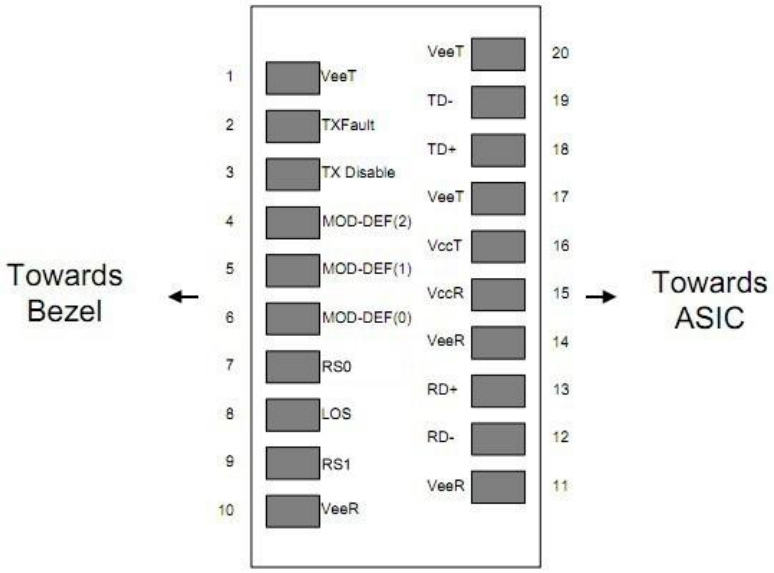


Diagram of Host Board Connector Block Pin Numbers and Names

Pin	Symbol	Description	Ref.
1	VEET	Transmitter Ground (Common with Receiver Ground)	7.1
2	TFAULT	Transmitter Fault.	
3	TDIS	Transmitter Disable. Laser output disabled on high or open.	7.2
4	MOD_DEF(2)	Module Definition 2. Data line for Serial ID.	7.3
5	MOD_DEF(1)	Module Definition 1. Clock line for Serial ID.	7.3
6	MOD_DEF(0)	Module Definition 0. Grounded within the module.	7.3
7	RS0	Rate Select0, optionally controls SFP+ module receiver. When high	

		input signaling rate>4.25 GBd and when low input signaling rate<4.25GBd	
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	7.4
9	RS1	Rate Select1, optionally controls SFP+ module receiver. When high input signaling rate>4.25 GBd and when low input signaling rate<4.25GBd	
10	VEER	Receiver Ground (Common with Transmitter Ground)	7.1
11	VEER	Receiver Ground (Common with Transmitter Ground)	7.1
12	RD-	Receiver Inverted DATA out. AC Coupled.	
13	RD+	Receiver Non-inverted DATA out. AC Coupled.	
14	VEER	Receiver Ground (Common with Transmitter Ground)	7.1
15	VCCR	Receiver Power Supply	
16	VCCT	Transmitter Power Supply	
17	VEET	Transmitter Ground (Common with Receiver Ground)	7.1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	VEET	Transmitter Ground (Common with Receiver Ground)	7.1

Notes:

7.1 Circuit ground is internally isolated from chassis ground.

7.2 Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.

7.3 Should be pulled up with 4.7k - 10kohms on host board to a voltage between 2.0V and 3.6V.

MOD_DEF(0) pulls line low to indicate module is plugged in.

7.4 LOS is open collector output. Should be pulled up with 4.7k -10kohms on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

8. SFP Module EEPROM Information and Management

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 Table 1. Detailed ID information (A0h) is listed in Table 2. And the DDM specification at address A2h. For more details of the memory map and byte definitions, please refer to the SFF-8472, “Digital Diagnostic Monitoring Interface for Optical Transceivers”. The DDM parameters have been internally calibrated.

Table 1. Digital Diagnostic Memory Map (Specific Data Field Descriptions)

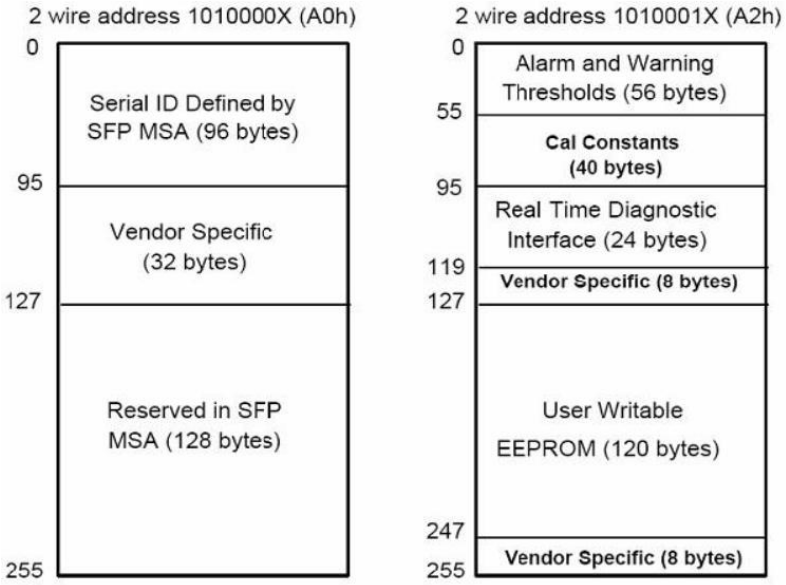


Table 2 - EEPROM Serial ID Memory Contents (**A0h**)

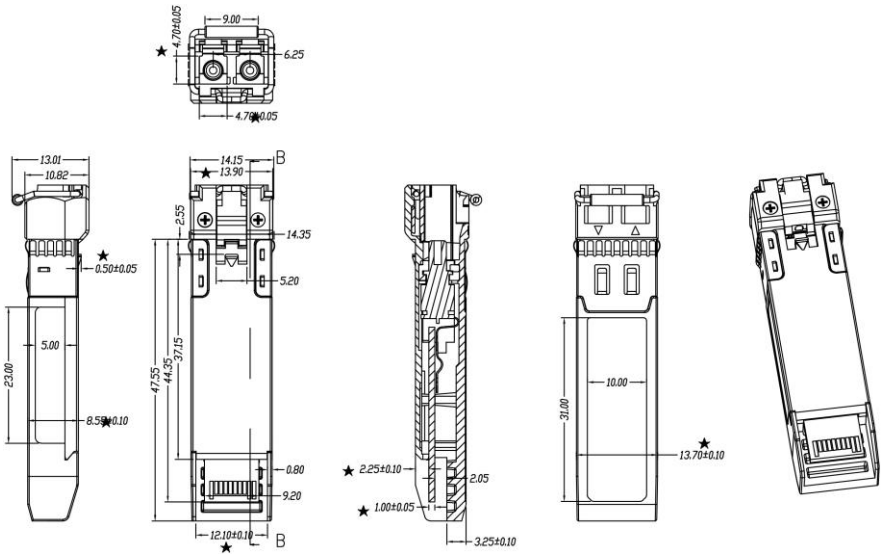
Data Address	Length (Byte)	Name of Length	Description and Contents
Base ID Fields			
0	1	Identifier	Type of Serial transceiver (03h=SFP)
1	1	Reserved	Extended identifier of type serial transceiver (04h)
2	1	Connector	Code of optical connector type (07=LC)
10-Mar	8	Transceiver	
11	1	Encoding	NRZ(03h)
12	1	BR, Nominal	Nominal baud rate, unit of 100Mbps
13-14	2	Reserved	(0000h)
15	1	Length(9um)	Link length supported for 9/125um fiber, units of 100m
16	1	Length(50um)	Link length supported for 50/125um fiber, units of 10m
17	1	Length(62.5um)	Link length supported for 62.5/125um fiber, units of 10m
18	1	Length(Copper)	Link length supported for copper, units of meters
19	1	Reserved	
20-35	16	Vendor Name	SFP vendor name: C-light
36	1	Reserved	
37-39	3	Vendor OUI	SFP transceiver vendor OUI ID
40-55	16	Vendor PN	Part Number (ASCII)

56-59	4	Vendor rev	Revision level for part number
60-62	3	Reserved	
63	1	CCID	Least significant byte of the sum of data in address 0-62
Extended ID Fields			
64-65	2	Option	Indicates which optical SFP signals are implemented (001Ah = LOS, TX_FAULT, TX_DISABLE all supported)
66	1	BR, max	Upper bit rate margin, units of %
67	1	BR, min	Lower bit rate margin, units of %
68-83	16	Vendor SN	Serial number (ASCII)
84-91	8	Date code	Manufacturing date code
92-94	3	Reserved	
95	1	CCEX	Check code for the extended ID Fields (addresses 64 to 94)
Vendor Specific ID Fields			
96-127	32	Readable	C-Light specific date, read only
128-255	128	Reserved	Reserved for SFF-8079

Digital Diagnostic Monitor Characteristics

Data Address	Parameter	Accuracy	Unit
96-97	Transceiver Internal Temperature	±3.0	°C
98-99	VCC3 Internal Supply Voltage	±3.0	%
100-101	Laser Bias Current	±10	%
102-103	Tx Output Power	±3.0	dBm
104-105	Rx Input Power	±3.0	dBm

9. Mechanical Specifications



Ordering Information

Part No.	Data Rate	DDM	Wave	Fiber Type	Reach	Temp.	Optical Interface
CLSFP10GCW10-XX	11.3Gbps	yes	*	SMF	10km	0℃~70℃	Dual LC

* Wave=1271nm,1291nm,1311nm,……..,1571nm,1591nm,1611nm

XX Wavelength Guide											
Code	**λC**	**Unit**	**Code**	**λC**	**Unit**	**Code**	**λC**	**Unit**	**Code**	**λC**	**Unit**
39	1391	nm	43	1431	nm	47	1471	nm	51	1511	nm
41	1411	nm	45	1451	nm	49	1491	nm	53	1531	nm
55	1551	nm	59	1591	nm						
57	1571	nm	61	1611	nm						