Product Specification

25Gbps SFP28 CWDM 1271nm~1371nm 10km Transceiver

CLSFP25GCW10-XX

Product Features

- Supports 25GBASE
- Lane bit rate up to 25,78125 Gb/s
- Up to 10km transmission on Single mode Fiber
- 6ch CWDM 1271nm~1371nm laser and PIN receiver
- High speed I/O electrical interface (25GAUI)
- I2C interface with integrated Digital Diagnostic monitoring
- SFP28 MSA package with duplex LC connector, The metal casing ensures low EMI interference standards
- Single +3.3V power supply
- Maximum power consumption 1.5 W .
- Compliant to IEEE 802.3cc, SFF-8472, SFF-8431 and SFF-8432;
- Operate case temperature 0℃~70℃

Applications

√ 25GBase-CWDM 10km commercial grade

1. Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.
Storage Temperature ℃	TS	-40	-	+85
Operate Temperature ℃	TC	0	-	+70
Supply Voltage V	VCC	-0.5	-	+4.0
Operating Relative Humidity	RH	-	-	+85

2. Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature	TC	0	-	+70	℃

Power Supply Voltage	VCC	3.135	3.3	3.465	V
Power Supply Current	ICC	-	-	350	mA
Maximum Power Dissipation	PD	-	-	1.5	W
Lane Bit Rate	BRLANE	24.33	25.78125	26.5	Gb/s
Transmission Distance	TD			10	km

3. Optical Characteristics

Transmitter						
Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Center Wavelength 1271nm~1371nm	λ0	-6.5	1XX1	+6.5	nm	
Average Launch Power	Pout	-1	-	6	dBm	1,2
Spectral Width (-20dB)	σ	-	-	1	dBm	3
Average Output Power (Laser Turn off)	Pout-OFF	-	-	-30	dBm	
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Extinction Ratio	ER	4.5	-	-	dB	
Transmitter and dispersion penalty (TDP)	TDP	-	-	2.7	dB	
Optical Return Loss Tolerance	ORLT	-	-	20	dB	
Receiver						
Center Wavelength	λ0	1260	-	1610	nm	
Receiver sensitivity (OMA) @BER ≤10^-5 at 25,78125Gbps		-	-	-14.4	dBm	5
Receiver Overload	PIN-OL	2	-	-	dBm	
LOS Assert	LOSA	-30	-	-	dBm	
LOS De-assert	LOSD	-	-	-15	dBm	

Notes:

1. Class 1 Laser Safety per FDA/CDRH and EN (IEC) 60825 regulations.
2. High Bandwidth Mode. Class 1 Laser Safety per FDA/CDRH and EN (IEC) 60825 regulations.
3. 20dB spectral width.
4. Equivalent extinction ratio specification for Fibre Channel. Allows smaller ER at higher average power.
5. Measured with a PRBS 231-1 test pattern @25.78125Gbps, BER ≤5×10^{-5}

4. Electrical Characteristics

Transmitter (Module Input)						
Parameter		Symbol	Min.	Typical	Max.	Unit	Notes
Differential Data Input Amplitude		VIN,P-P	90	-	800	mVpp	
Differential Termination Mismatch			-	-	5	%	
Tx_Disable	Normal Operation	VIL	-0.3	-	0.8	V	
	Laser Disable	VIH	2.0	-	VCC+0.3	V	
Receiver (Module Output)							
Differential Data Output Amplitude		VOUT,P-P	185	-	425	mVpp	
Differential Termination Mismatch			-	-	5	%	

Output Rise/Fall Time, 20%~80%		TR	12	-	-	ps	
Rx_LOS	Normal Operation	VOL	-	-	0.2	V	
	Lose Signal	VOH	VCC-0.2	-	-	V	

5. Pin Descriptions

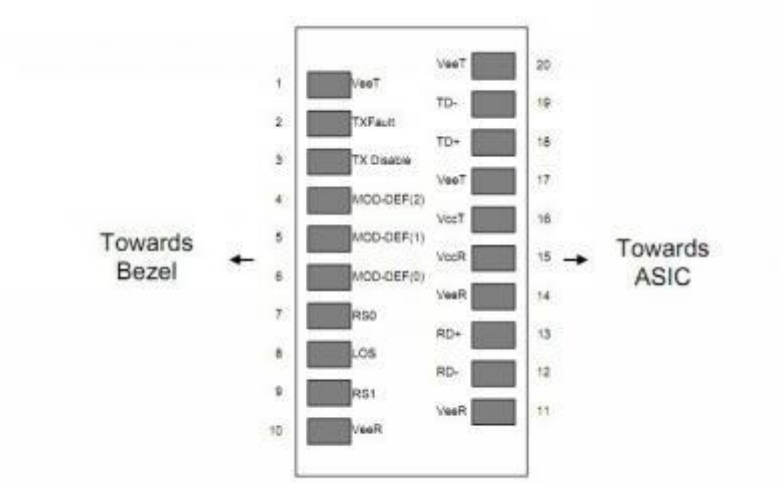


Diagram of Host Board Connector Block Pin Numbers and Names

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.

6. 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)

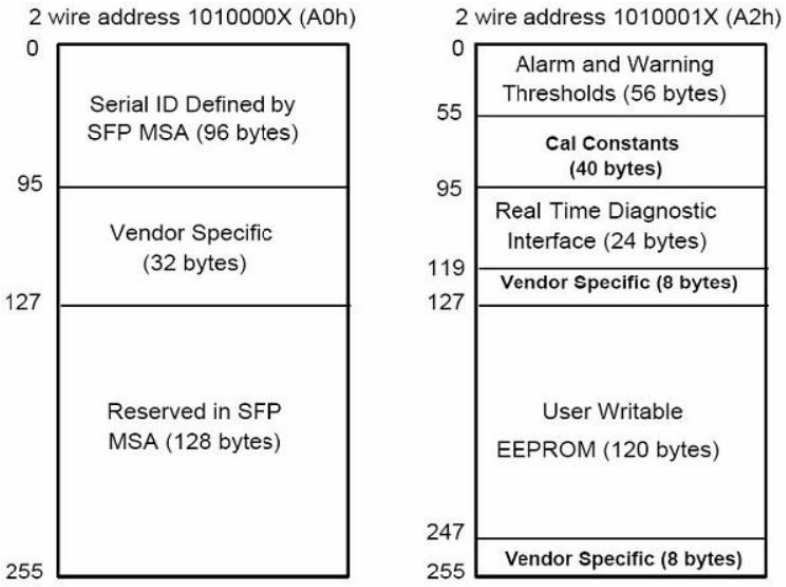


Table 2 - EEPROM Serial ID Memory Contents (**A0h**)

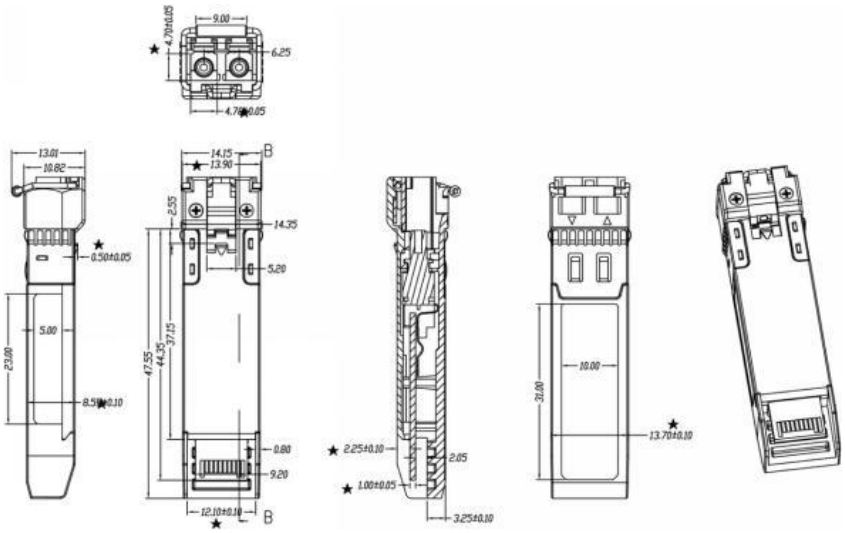
Data Address	Length (Byte)	Name of Length	Description and Contents
Base ID Fields			
0	1	Identifier	Type of Serial transceiver (03h=SFP)
1	1	Reserved	Extended identifier of type serial transceiver (04h)
2	1	Connector	Code of optical connector type (07=LC)
10-Mar	8	Transceiver	
11	1	Encoding	NRZ(03h)
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

7. Mechanical Specifications



Ordering Information

Part No.	Data Rate
CLSFP25GCW10-XX	25.78Gbps, 6ch CWDM 1271nm~1371nm, 10km, LC Dulplex, 0°C~+70°C, with DDM

XX Wavelength Guide											
Code	λC	Unit	Code	λC	Unit	Code	λC	Unit	Code	λC	Unit
27	1271	nm	29	1291	nm	31	1311	nm	33	1331	nm
35	1351	nm	37	1371	nm						