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OP-S25XX-40

25G SFP28 LAN-WDM 40km LC DDM

Features

- Compatible with CPRI option10 24.33Gbps and 25GBASE 25.78Gbps
- Up to 40km transmission on SMF
- EML laser and APD receiver
- SFP28 MSA compliant
- Built-in digital diagnostic functions
- Single +3.3V power supply
- Operating case temperature: -40 to +85 °C or 0 to +70 °C
- RoHS 6 Compliant

Application

- 25GBASE CWDM
- 24.33Gbps CPRI

Overview

OP-S25GXX-40 25G SFP28 transceivers are designed for 24.33Gbps and 25.78Gbps data rate over SMF and support up to 40km link length. They are compliant to IEEE802.3ba, SFF-8402, SFF-8432. Digital diagnostic monitoring interface compliant to SFF-8472 is available via an I2C interface.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Storage Temperature	T_S	-40	-	+85	°C	1
Supply Voltage	V_{CC}	-0.5	-	+4.0	V	
Operating Relative Humidity	RH	-	-	+95	%	

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	T_C	-40	-	+85	°C	**1**
Operating Case Temperature	T_C	0	-	+70	°C	**2**
Power Supply Voltage	V_{CC}	3.135	3.3	3.465	V	
Power Supply Current	I_{CC}	-	-	360	mA	
Maximum Power Dissipation	P_D	-	-	1.2	W	
Bit Rate	BR	24.3	25.78	26.5	Gb/s	
Transmission Distance	TD		-	10	km	Over SMF

Note1,2: See order information

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.Optical Characteristics

Transmitter						
Parameter	**Symbol**	**Min.**	**Typical**	**Max.**	**Unit**	**Notes**
Center Wavelength	λ	1285.65	1286.66	1287.69	nm	
		1290.09	1291.10	1292.13	nm	
		1294.53	1295.56	1296.59	nm	
		1299.02	1300.05	1301.09	nm	
		1303.54	1304.58	1305.63	nm	
		1308.09	1309.14	1310.19	nm	
Average Optical Power, 25GE	P_{avg}	-1.6	-	6	dBm	
Optical Modulation Amplitude, 25GE	OMA	-2	-	-	dBm	
OMA–TDP, 25GE	OMA_TDP	-3	-	-	dBm	
Average Output Power (Laser Turn off)	P_{OFF}	-	-	-30	dBm	
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Extinction Ratio	ER	4	-	-	dB	
Transmitter and Dispersion Penalty	TDP	-	-	2.7	dB	1
Optical Return Loss Tolerance	ORLT	-	-	11	dB	
Receiver						
Center Wavelength	λr	1260		1610	nm	
Stressed OMA Sensitivity, 25GE		-	-	-8.3	dBm	
OMA Sensitivity, 25GE@1E-12	P_{SEN_OMA}	-	-	-9.6	dBm	
Average Rx Sensitivity, 25GE@1E-12	P_{SEN}	-	-	-19	dBm	
Receiver Overload	P_{IN-OL}	5	-	-	dBm	
Reflectance	Ref	-	-	-26	dB	
LOS Assert	LOS_A	-38	-	-17	dBm	
LOS De-assert	LOS_D	-	-	-17	dBm	
LOS Hysteresis	LOS_H	0.5	-	-	dB	

Notes:

1. Measured with a PRBS 2^{31}-1 test pattern @25.78125 Gb/s.

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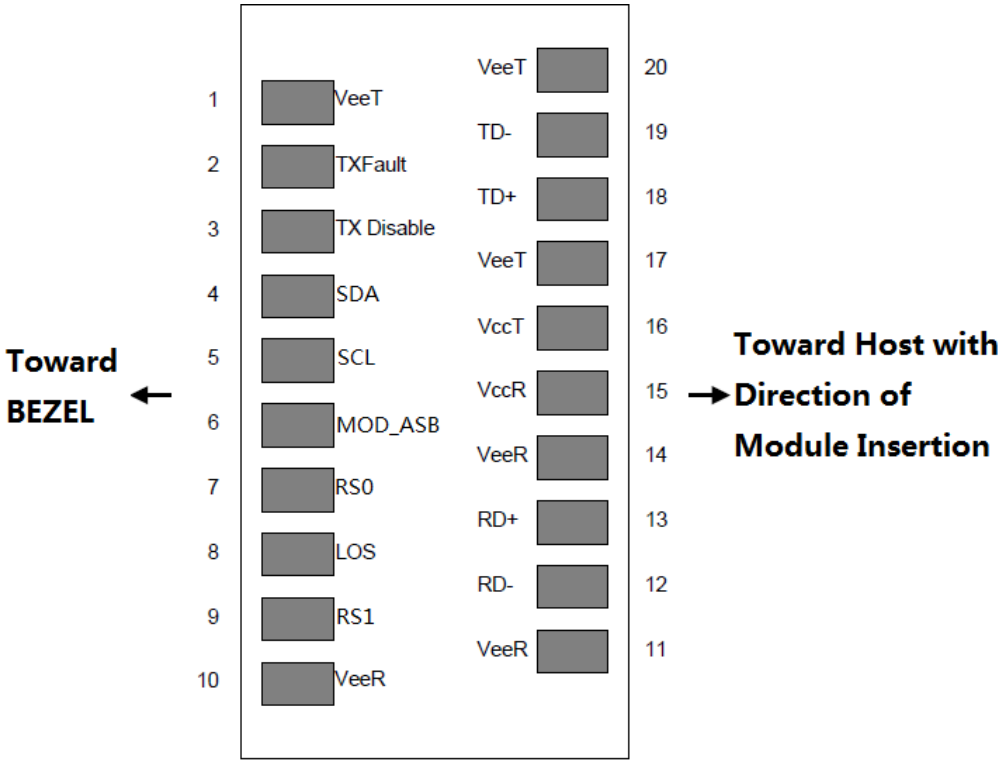
Electrical Characteristics

Transmitter (Module Input)							
Parameter		Symbol	Min.	Typical	Max.	Unit	Note
Differential Data Input Amplitude		$V_{IN,P-P}$	200	-	900	mVpp	
Differential Input Impedance		Rin	-	100	-	Ω	
Tx_Fault	Normal Operation	V_{IL}	-0.3	-	0.4	V	
	Tx Fault	V_{IH}	2.4	-	V_{CC}+0.3	V	
Tx_Disable	Normal Operation	V_{IL}	-0.3	-	0.8	V	
	Laser Disable	V_{IH}	2.0	-	V_{CC}+0.3	V	
Receiver (Module Output)							
Differential Data Output Amplitude		$V_{OUT,P-P}$	300	-	900	mVpp	
Differential Output Impedance		Rout	-	100	-	Ω	
Differential Termination Mismatch			-	-	±5	%	
Output Rise/Fall Time, 20%~80%		T_R	9.5	-	-	ps	
Rx_LOS	Normal Operation	V_{OL}	-0.3	-	0.4	V	
	Lose Signal	V_{OH}	2.4	-	V_{CC}+0.3	V	

Pin Definition



Pin	Symbol	Name/Description	Notes
1	VeeT	Transmitter Ground	1
2	Tx_Fault	Transmitter Fault - High indicates a fault condition	2
3	Tx_Disable	Transmitter Disable – High or open disables the transmitter	
4	SDA	2-wire Serial Interface Data Line (MOD-DEF2)	3

5	SCL	2-wire Serial Interface Clock (MOD-DEF1)	3
6	MOD_ABS	Module Absent, connected to VeeT or VeeR in the module	
7	RS0	Rate Select 0 – Not used, Presents high input impedance	5
8	RX_LOS	Receiver Loss of Signal(LVTTL-O). Logic 0 indicates normal operation	4
9	RS1	Rate Select 1 – Not used, Presents high input impedance	5
10	VeeR	Receiver Ground	1
11	VeeR	Receiver Ground	1
12	RD-	Inverse Received Data out (CML-O), AC Coupled	
13	RD+	Receiver Non-inverted DATA out. AC Coupled	
14	VeeR	Receiver Ground	1
15	VccR	Receiver Power Supply	
16	VccT	Transmitter Power Supply	
17	VeeT	Transmitter Ground	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	VeeT	Transmitter Ground	1

Notes:

1. Module ground pins GND are isolated from the module case.
2. Tx_Fault is an open collector/drain output, which should be pulled up with a 4.7k – 10k Ohms resistor on Host board.
3. Should be pulled up with 4.7k – 10kohms on host board to a voltage between 2.0V and 3.6V.
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.
5. RS0 and RS1 pins are pulled low to GND with a resistor > 30KΩ in module.

Digital Diagnostics

Parameter	Range	Accuracy	Unit	Calibration
Temperature	−40 to 85	±3	ºC	Internal
Voltage	0 to V_{CC}	±5%	V	Internal
Tx Bias Current Per Lane	0 to 100	±10%	mA	Internal
Tx Output Power Per Lane	-5 to +3	±3	dBm	Internal
Rx Power (Each Lane)	-12 to +2.5	±3	dBm	Internal

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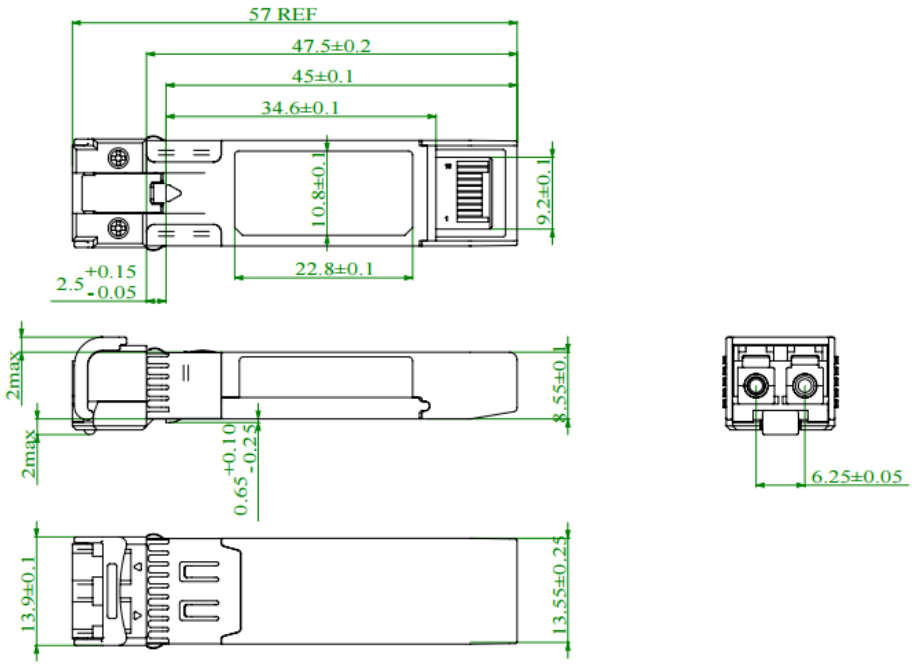
Mechanical Dimension



Order Information

Part No.	Data Rate	Laser	Fiber Type	Distance	Optical Interface	Temp	DDMI
OP-S25GXX-40	24.33Gbps 25.78Gbps	CWDM DFB	SMF	10km	LC	0~70C	Y
OP-S25GXX-40I	24.33Gbps 25.78Gbps	CWDM DFB	SMF	10km	LC	40~85C	Y

Warnings

Handling Precautions: This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

Laser Safety: Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.