M25GSA-10

SFP28 25Gb/s 1310nm 10KM Transceiver

1. Feature

- Compatible with CPRI option10 24.33Gbps and 25GBASE 25.78Gbps
- Up to 10km transmission on SMF
- 1310nm DML laser transmitter
- 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



2.Application

- 25GBASE-LR
- 24.33Gbps CPRI

3.Overview

SFP28-25GB-LR 25G SFP28 transceivers are designed for 24.33Gbps and 25.78Gbps data rate over SMF and support up to 10km 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.

4.Order Information

Part No.	Data Rate	Laser	Fiber Type	Distance	Optical Interface	Temp	DDMI
SFP28-LRI	24.33Gbps 25.78Gbps	1310nm-DFB	SMF	10km	LC	-40~85C	Y

SFP28-LR	24.33Gbps 25.78Gbps	1310nm-DFB	SMF	10km	LC	0~70C	Y

5.Absolute Maximum Ratings

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

6.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}	-	-	450	mA	
Maximum Power Dissipation	P_D	-	-	1.5	W	
Bit Rate	BR	24.3	25.78	26.5	Gb/s	
Transmission Distance	TD		-	10	km	Over SMF

Note1,2: See order information

7. Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter						
Center Wavelength	λ_t	1295	1310	1325	nm	
Average Optical Power, 25GE	P_{avg}	-4.5	-	2.5	dBm	
Optical ModulationAmplitude,25GE	OMA	-2	-	-	dBm	

OMA–TDP, 25GE	OMA_TDP	-5	-	-	dBm	
Average OutputPower(LaserTurnoff)	P_{OFF}	-	-	-30	dBm	
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Extinction Ratio, 25GE	ER	3.5	-	-	dB	
Transmitter and Dispersion Penalty	TDP	-	-	2.7	dB	
Optical Return Loss Tolerance	ORLT	-	-	11	dB	
Receiver						
Center Wavelength	λr	1260		1610	nm	
Stressed OMA Sensitivity, 25GE@5E-5		-	-	-9.6	dBm	1
OMA Sensitivity, 25GE@5E-5	P_{SEN_OMA}	-	-	-13	dBm	1
Average Rx Sensitivity, 25GE@5E-5	P_{SEN}	-	-	-12	dBm	1
Receiver Overload	P_{IN-OL}	2.5	-	-	dBm	
Reflectance	Ref	-	-	-26	dB	
LOS Assert	LOS_A	-30	-		dBm	
LOS De-assert	LOS_D	-	-	-14	dBm	
LOS Hysteresis	LOS_H	0.5	-	-	dB	

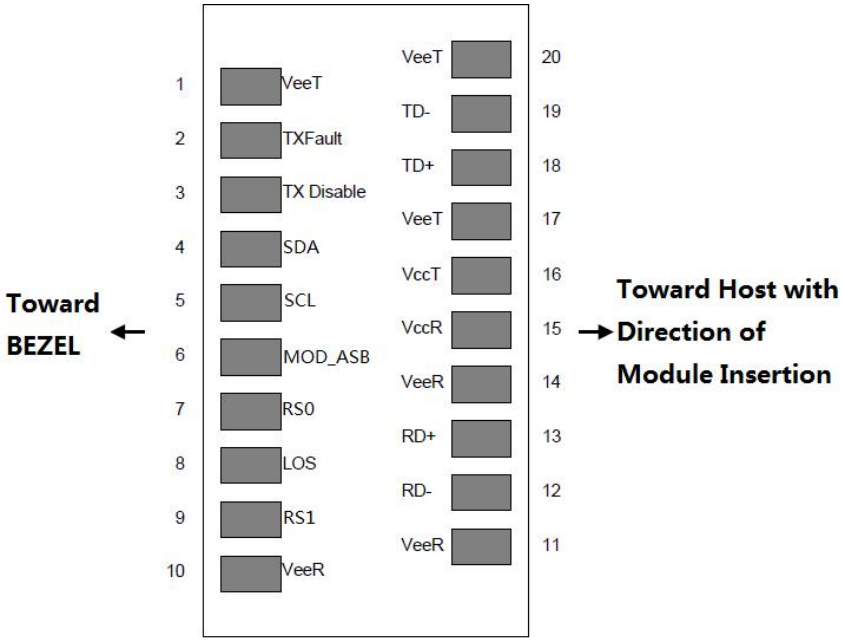
Notes: Measured with a PRBS 2^{31}-1 test pattern @25.78125 Gb/s.

8.Electrical Characteristics

Parameter		Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter (Module Input)							
Differential Data Input Amplitude		$V_{IN,P-P}$	200	-	900	mVpp	
Differential Input Impedance		Rin	-	100	-	Ω	
Tx_Fault	NormalOperation	V_{IL}	-0.3	-	0.4	V	
	Tx Fault	V_{IH}	2.4	-	V_{CC}+0.3	V	
Tx_Disable	NormalOperation	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	

9.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.

10.Digital Diagnostics

Parameter	Range	Accuracy	Unit	Calibration
Temperature	-40 to 85	±5	ºC	Internal
Voltage	3.15 to 3.45	±5%	V	Internal
Tx Bias Current Per Lane	10 to 100	±10%	mA	Internal
Tx Output Power Per Lane	-5 to +3	±3	dBm	Internal
Rx Power (Each Lane)	-12 to 0	±3	dBm	Internal

11. Outline Dimensions (mm)

