10G SFP10 LR Optical Transceiver

Part Number: VS-10040CS-EA

VS-10040CS-EA is a high performance SFP+ transceiver module for 10 Gigabit Ethernet data links over single-mode fiber.

Features

- Supports from 9.83Gb/s to 11.3 Gb/s bit rates
- Compliant with IEEE 802.3ae 10GBASE-LR/LW
- Compliant with 10GFC
- Compliant with SFF-8431
- Hot-pluggable SFP+ footprint
- 1310nm DFB laser transmitter and PIN receiver
- Duplex LC connector
- Built-in digital diagnostic functions
- Up to 40km on SMF
- Single power supply 3.3V
- RoHS Compliant
- Class 1 laser product complies with EN 60825-1
- Operating temperature range: 0°C to 70°C

Applications

- 10GBASE-LR/LW Ethernet
- 10G Fiber Channel

Ordering Information

Part Number	Data Rate	Link Length	Laser	Detector	Fiber Type	Temperature
VS-10040CS-EA	10G	Up to 40km	1310nm DFB	1310nm PIN ROSA	SMF	0 – 70°C

Product Overview

Vitex **VS-10040CS-EA** (10GE SFP+) is a 10Gb/s transceiver module designed for optical communication applications compliant to Ethernet 10GBASE-LR/LW standard.

The product is based on 10G Ethernet IEEE 802.3ae standard and SFF-8431 standard, providing a fast and reliable interface for 10G Ethernet applications. The product implements digital diagnostics via a 2-wire serial bus, compliant with the SFF-8472 standard.

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Storage Temperature	T_S	-40	85	°C
Power Supply Voltage	V_{CC}	-0.5	4	V

Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature	T_C	0		70	°C
Power Supply Voltage	V_{CC}	3.14	3.3	3.46	V
Supply Current	I_{CC}		250	270	mA
Data Rate	DR	9.83	10.3125	11.3	Gb/s
Bit Error Rate	BER			10^{-12}	

Electrical Specifications

Parameter	Symbol	Min	Typical	Max	Unit
Electrical Transmitter Characteristics					
Input differential impedance	R_{IN}		100		Ω
Differential data input swing	$V_{IN\ PP}$	180		700	mV
Transmit disable voltage	V_D	2		V_{CC}	V
Transmit enable voltage	V_{EN}	V_{EE}		V_{EE}+0.8	V
Electrical Receiver Characteristics					
Differential data output swing	$V_{OUT\ PP}$	300		850	mV
Data output rise/fall time (20%-80%)	t_r/t_f	28			ps
LOS Assert	$V_{LOS\ A}$	2		$V_{CC\ HOST}$	V
LOS De-Assert	$V_{LOS\ D}$	V_{EE}		V_{EE}+0.5	V

Optical – Transmitter

Parameter	Symbol	Min	Typical	Max	Unit
Output Optical Power [1]	P_{TX}	2		5	dBm
Optical Center Wavelength	λ_C	1290	1310	1330	nm
Extinction Ratio	ER	3.5	5.5		dB
Spectral Width (RMS) (-20dB)	$\Delta\lambda$			0.6	nm
Side Mode Suppression Ratio	SMSR	30			dB
Relative Intensity Noise	RIN			-128	dB/Hz
Transmitter Dispersion Penalty	TDP			3.2	dB
Transmitter Jitter [2]					
Launch Power of OFF Transmitter [1]	P_{OUT_OFF}			-30	dBm

Note:

1) Average
2) According to IEEE 802.3ae requirement

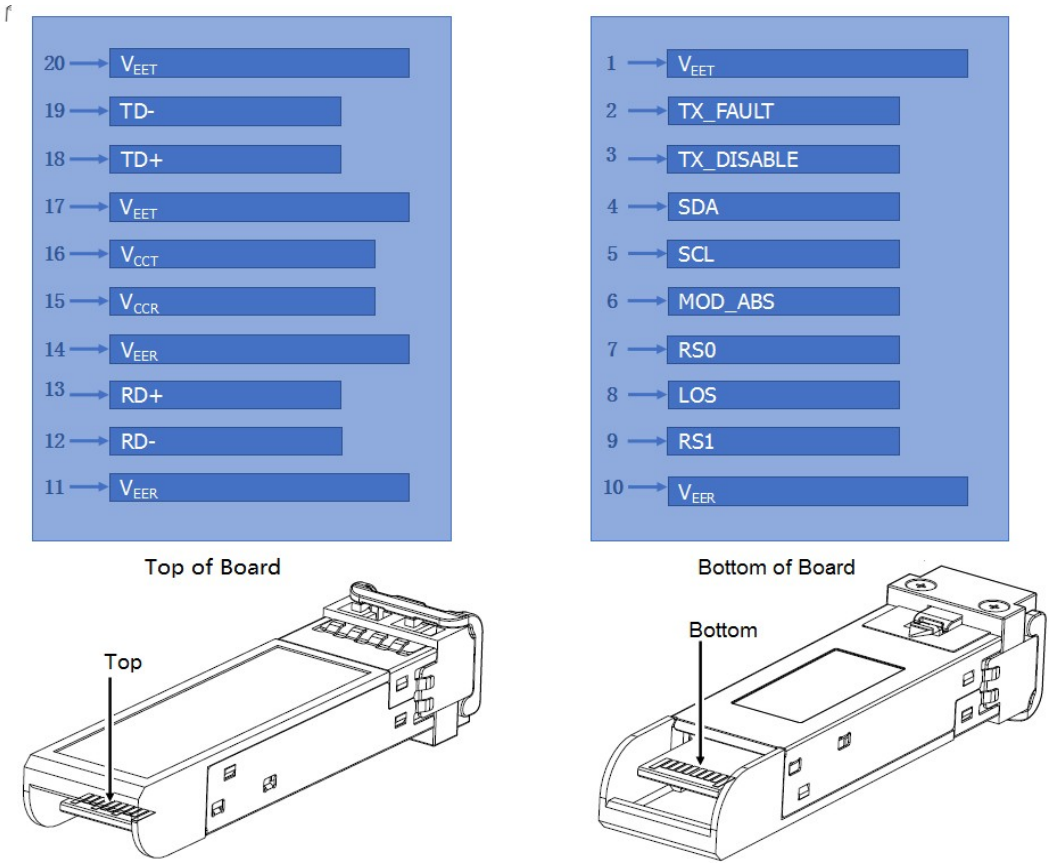
Optical – Receiver

Parameter	Symbol	Min	Typical	Max	Unit
Optical Center Wavelength	λ_C	1260		1600	nm
Receiver Overload	P_{OL}	0.5			dBm
Receiver Sensitivity @ 10.3Gb/s [1]	R_{X_SEN}			-14.4	dBm
Receiver Reflectance	TR_{RX}			-12	dB
LOS Assert	LOS_A	-30			dBm
LOS De-Assert	LOS_D			-16	dBm
LOS Hysteresis	LOS_H	0.5			dB

Note:

1) Measured with the PRBS 2^{31}-1 test mode, BER<10^{-12}

Electrical Connector Layout



Electrical Pin Definition

Pin	Symbol	Name/Description
1	V_{EET}	Transmitter ground (common with receiver ground) [1]
2	TX_FAULT	Transmitter Fault
3	TX DISABLE	Transmitter Disable. Laser output disabled on high or open [2]
4	SDA	2-wire Serial Interface Data Line [3]
5	SCL	2-wire Serial Interface Clock Line [3]
6	MOD ABS	Module Absent. Grounded within the module [3]
7	RS0	No connection required
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation [4]
9	RS1	No connection required [1]
10	V_{EER}	Receiver ground (common with transmitter ground) [1]
11	V_{EER}	Receiver ground (common with transmitter ground) [1]
12	RD–	Receiver Inverted DATA out. AC coupled
13	RD+	Receiver Non-inverted DATA out. AC coupled

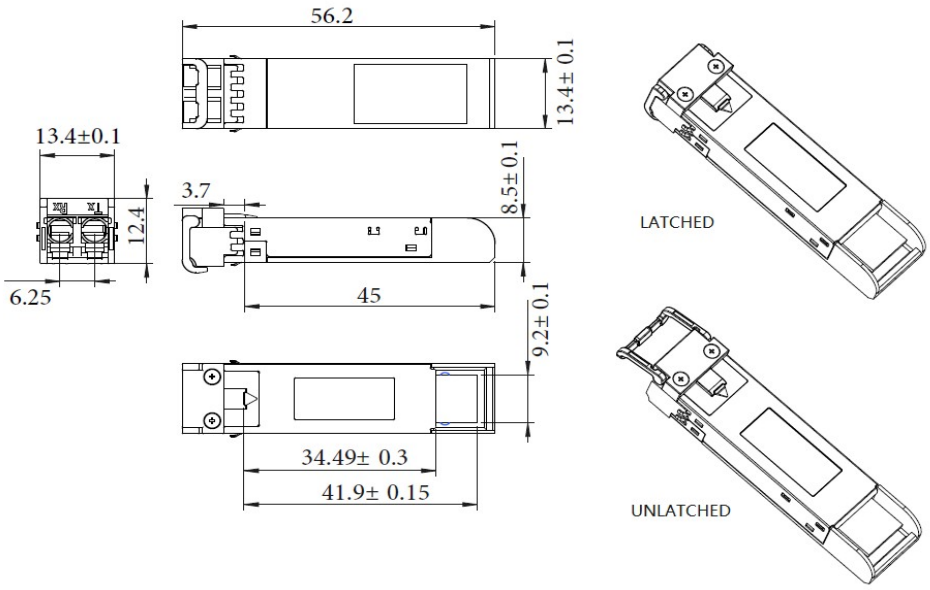
14	V_{EER}	Receiver ground (common with transmitter ground) [1]
15	V_{CCR}	Receiver power supply
16	V_{CCT}	Transmitter power supply
17	V_{EET}	Transmitter ground (common with receiver ground) [1]
18	TD+	Transmitter Non-Inverted DATA in. AC coupled
19	TD–	Transmitter Inverted DATA in. AC coupled
20	V_{EET}	Transmitter ground (common with receiver ground) [1]

Note:

1) Circuit ground is isolated from chassis ground
2) Disabled: T_{DIS}>2V or open, Enabled: T_{DIS}<0.8V
3) Should Be pulled up with 4.7k –10k ohm on host board to a voltage between 2V and 3.6V
4) LOS is open collector output

Mechanical Dimensions

Note: All units are in mm



ALL DIMENSIONS ARE ±0.2mm UNLESS OTHERWISE SPECIFIED

Contact Information

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