CSP-7940WG / CSP-7940BWG / CSP-7940AWG (RoHS Compliant)

1.25 Gbps / 40km / 1490 nm TX & 1310 nm RX Digital Diagnostic 2-CH CSFP LC SM Transceiver

FEATURES

- 2-Fiber Bi-Directional CSFP Optical Transceiver
- Up to 1.25 Gbps Bi-directional Data Links
- Compliant with CSFP MSA 2.0 (Option2)
- IEEE802.3ah 100BASE-BX, 1000BASE-BX, SONET OC-3 / SDH STM-1, Compliant
- SFF-8472 Digital Diagnostic Function
- Duplex LC Connector
- 1490 nm DFB TX/1310nm RX
- Distance Up to 40 km
- AC/AC Coupling according to MSA
- Single +3.3 V Power Supply
- RoHS Compliant
- 0 to 70°C Operating: CSP-7940WG
- -10 to 85°C Operating: CSP-7940BWG
- -40 to 85°C Operating: CSP-7940AWG
- Class 1 Laser International Safety Standard IEC 60825 Compliant

APPLICATIONS

- WDM Gigabit Ethernet Links
- SONET/SDH Equipment Interconnect
- Fibre Channel Links

DESCRIPTION

The CSP-7940WG series single mode transceiver is a small form factor pluggable module for bi-directional serial optical data communications such as IEEE 802.3ah 1000BASE-BX by using 1490 nm DFB transmitter and 1310 nm receiver. It is with the SFP 20-pin connector to allow hot plug capability. Digital diagnostic functions are available via an I^2C series bus specified in the SFP MSA SFF-8472. The transmitter section uses a multiple quantum well 1490 nm DFB laser and is a class 1 laser compliant according to International Safety Standard IEC 60825. The receiver section uses an integrated 1310 nm detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC.

LASER SAFETY

This single mode transceiver is a Class 1 laser product. It complies with IEC 60825 and FDA 21 CFR 1040.10 and 1040.11. The transceiver must be operated within the specified temperature and voltage limits. The optical ports of the module shall be terminated with an optical connector or with a dust plug.

ORDER INFORMATION

P/No.	Bit Rate (Gb/s)	1000BASE	Distance (km)	TX (nm)	RX (nm)	Package	Temp (°C)	RoHS Compliant
CSP-7940WG	1.25	BX	40	1490 DFB	1310	LC CSFP with DMI	0 to 70	Yes
CSP-7940BWG	1.25	BX	40	1490 DFB	1310	LC CSFP with DMI	-10 to 85	Yes
CSP-7940AWG	1.25	BX	40	1490 DFB	1310	LC CSFP with DMI	-40 to 85	Yes

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Units	Notes
Storage Temperature	Tstg	-40	85	°C	
Operating Case Temperature	Topr	0	70	°C	CSP-7940WG
		-10	85		CSP-7940BWG
		-40	85		CSP-7940AWG
Relative Humidity	RH	0	85	%	Non condensing
Power Supply Voltage	Vcc	0	3.6	V	
Input Voltage	---	GND	Vcc	V	
Output Current	Iout	0	30	mA	

Recommended Operating Conditions					
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Units / Notes**
Power Supply Voltage	Vcc	3.13	3.3	3.47	V
Power Supply Current	$I_{CC\ (TX+RX)}$			600	mA / 2 Channels
Operating Case Temperature	Topr	0		70	°C / CSP-7940WG
		-10		85	°C / CSP-7940BWG
		-40		85	°C / CSP-7940AWG
Data Rate			1.25		Gb/s

Transmitter Optical Specifications (3.13V < Vcc < 3.47V)						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Units**	**Notes**
Average Launch Power	$Po_{,\ Avg}$	-6		+2	dBm	1
Extinction Ratio	ER	9				
Output Center Wavelength	λc	1480	1490	1500	nm	
Output Spectrum Width	σ_λ			1	nm	-20 dB width
Average Launch Power of OFF Transmitter				-45	dBm	

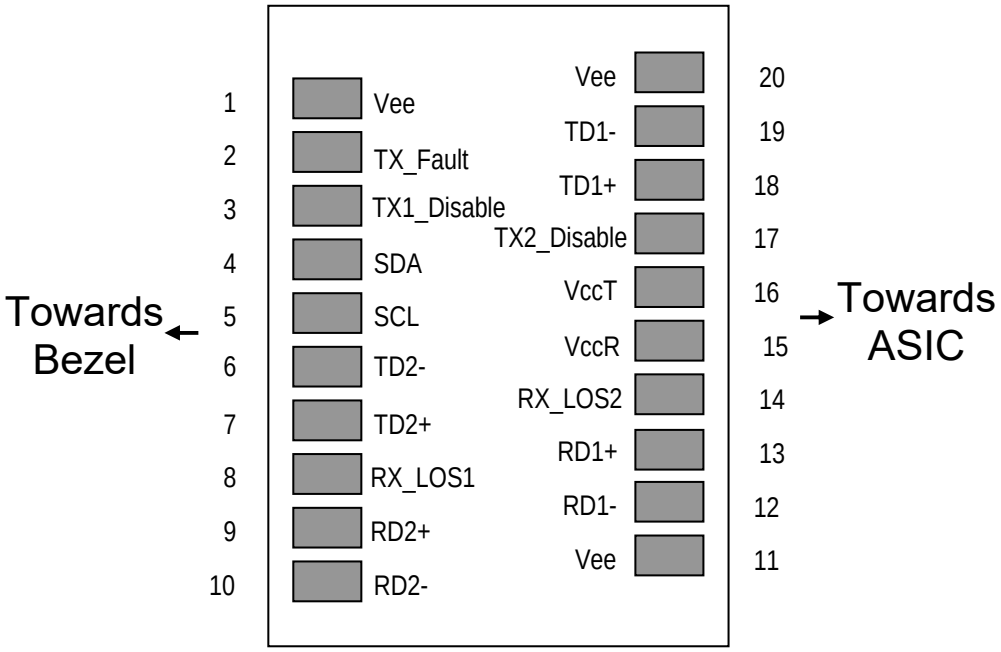
1. Output power is power coupled into a 9/125 μm single-mode fiber.

Receiver Optical Specifications (3.13V < Vcc < 3.47V)						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Units**	**Notes**
Sensitivity	Sen			-25	dBm	2, Average Power
Receiver Overload	P_{MAX}	-3	---		dBm	
LOS -- Deasserted	LOS_D	---	---	-25	dBm	Transition: high to low
LOS -- Asserted	LOS_A	-45	---	---	dBm	Transition: low to high
LOS Hysteresis	LOS_H	0.5	2	6	dB	
Wavelength of Operation	λc	1260		1360	nm	

2. Measured with average power; BER < 10^{-12} and PRBS 2^{31}-1 @ 1.25Gbps.

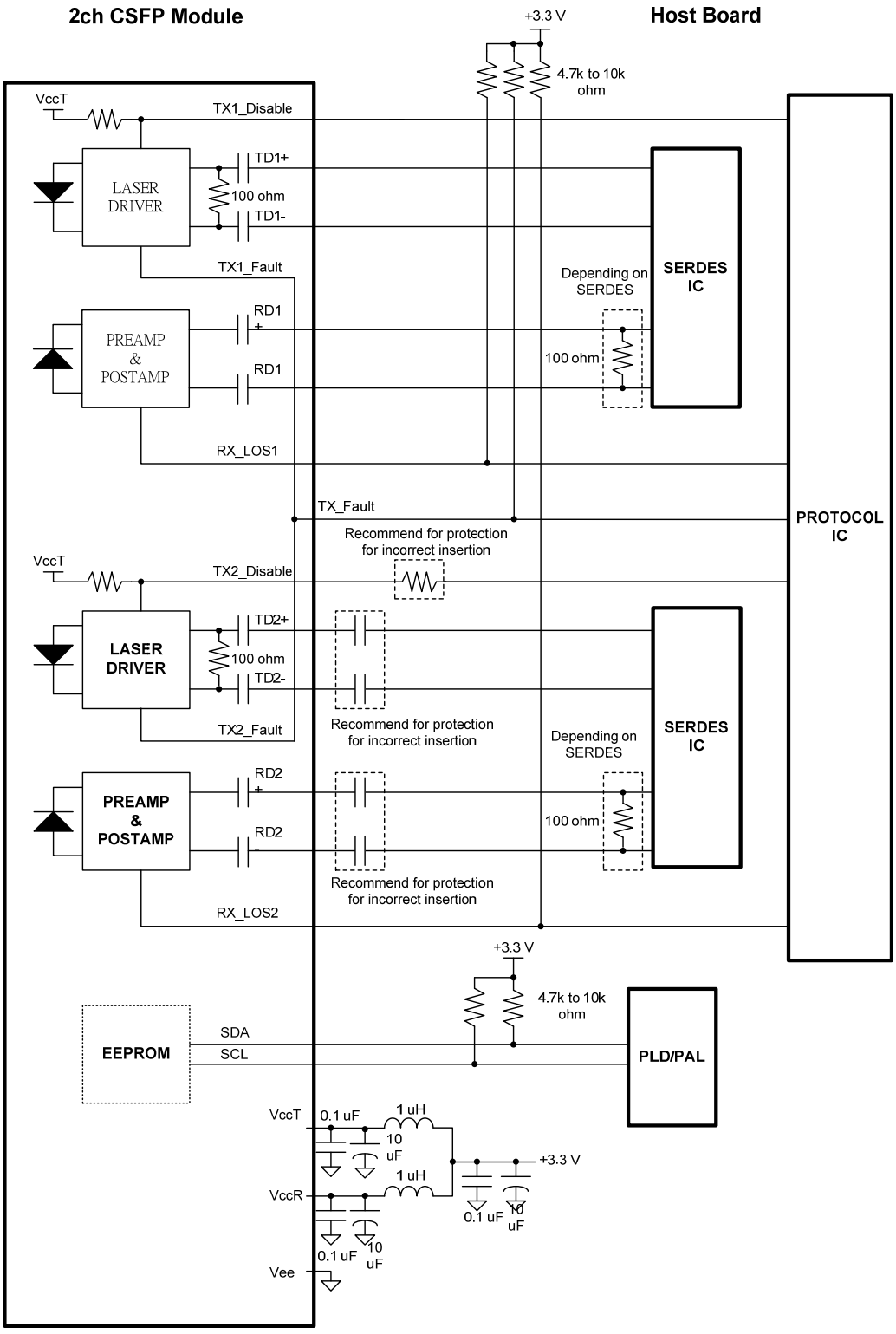
Electrical Characteristics						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Units**	**Notes**
High-Speed Signal (CML) Interface Specification						
Input Data Rate			1.25		Gb/s	
Differential Data Input Amplitude		500		2400	mVpp	Internally AC coupled
Output Data Rate			1.25		Gb/s	
Low-Speed Signal (LVTTL) Interface Specification						
Input High Voltage		2.0		Vcc	V	
Input Low Voltage		GND		0.8	V	
Output High Voltage		2.0		Vcc	V	
Output Low Voltage		GND		0.8	V	

CONNECTION DIAGRAM



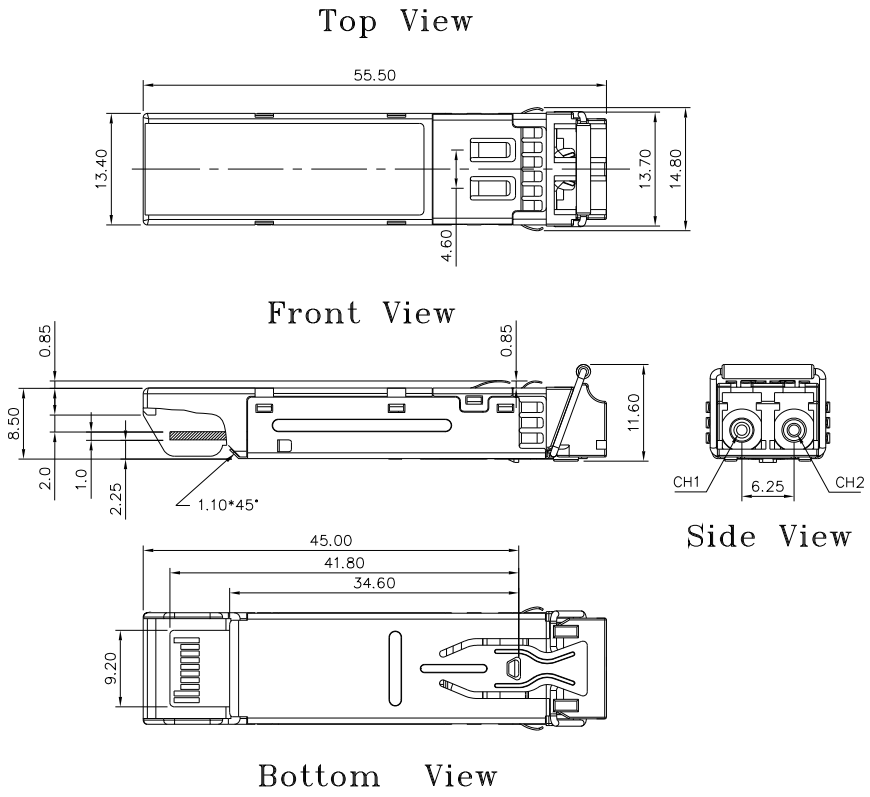
PIN	Signal Name	Description	PIN	Signal Name	Description
1	V_{EE}	Transmitter Signal Ground	11	V_{EE}	Receiver Signal Ground
2	TX_Fault	Transmitter Fault Indication. Logic “1” Output = Laser Fault. Logic “0” Output = Normal Operation	12	RD1-	Inverse Receiver Data Out Ch1
3	TX1_Disable	Logic “1” Input (or no connection) = Laser off, Logic “0” = Laser on.	13	RD1+	Receiver Data Out Ch1
4	SDA	Modulation Definition 2 – Two wires serial ID Interface	14	RX_LOS2	Loss of Signal Out Ch 2(OC).
5	SCL	Modulation Definition 1 – Two wires serial ID Interface	15	$V_{CC}R$	Receiver Power – 3.3V±5%
6	TD2-	Transmitter Data In Ch2	16	$V_{CC}T$	Transmitter Power – 3.3V±5%
7	TD2+	Inverse Transmitter Data In Ch2	17	TX2_Disable	Logic “1” Input (or no connection) = Laser off, Logic “0” = Laser on.
8	RX_LOS1	Loss of Signal Out Ch1(OC).	18	TD1+	Transmitter Data In Ch1
9	RD2+	Receiver Data Out Ch2	19	TD1-	Inverse Transmitter Data In Ch1
10	RD2-	Inverse Receiver Data Out Ch2	20	V_{EE}	Transmitter Signal Ground

RECOMMENDED CIRCUIT SCHEMATIC



PACKAGE DIAGRAM

Units in mm



Note: Specifications subject to change without notice.

REVISION HISTORY

Version	Subject	Release Date
1.0	Initial datasheet	2021/4/8