

CSP-2720WG / CSP-2720BWG / CSP-2720AWG

(RoHS Compliant)

10.3 Gbps / 20km / 1270 nm & 1330 nm Digital Diagnostic 2-CH CSFP+ LC SM Transceiver

FEATURES

- 2-Fiber Bi-Directional CSFP+ Optical Transceiver
- Up to 10.3 Gbps Bi-directional Data Links
- Compliant with CSFP MSA 2.0 (Option2)
- Compliant to IEEE 802.3ae 10GBASE-BX
- SFF-8472 Digital Diagnostic Function
- Duplex LC Connector
- CH1: 1270 nm DFB TX/1330nm RX
- CH2: 1330 nm DFB TX/1270nm RX
- Distance Up to 20 km
- AC/AC Coupling according to MSA
- Single +3.3 V Power Supply
- RoHS Compliant
- 0 to 70°C Operating: CSP-2720WG
- -10 to 85°C Operating: CSP-2720BWG
- -40 to 85°C Operating: CSP-2720AWG
- Class 1 Laser International Safety Standard IEC 60825 Compliant

APPLICATIONS

- 10G Ethernet Links

DESCRIPTION

The CSP-2720WG series single mode transceiver is a small form factor pluggable module for bi-directional serial optical data communications such as IEEE 802.3ae 10GBASE-BX by using 1270/1330 nm transmitter and 1330/1270 nm receiver. It is with the SFP 20-pin connector to allow hot plug capability. Digital diagnostic functions are available via an I²C series bus specified in the SFP MSA SFF-8472. The transmitter section uses a multiple quantum well 1270 nm DFB laser and is a class 1 laser compliant according to International Safety Standard IEC 60825. The receiver section uses an integrated 1330 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)	10GBASE	Distance (km)	TX (nm)	RX (nm)	Package	Temp (°C)	RoHS Compliant
CSP-2720WG	10.3	BX	20	CH1: 1270 DFB CH2: 1330 DFB	CH1: 1330 CH2: 1270	LC CSFP+ with DMI	0 to 70	Yes
CSP-2720BWG	10.3	BX	20	CH1: 1270 DFB CH2: 1330 DFB	CH1: 1330 CH2: 1270	LC CSFP+ with DMI	-10 to 85	Yes
CSP-2720AWG	10.3	BX	20	CH1: 1270 DFB CH2: 1330 DFB	CH1: 1330 CH2: 1270	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-2720WG
		-10	85		CSP-2720BWG
		-40	85		CSP-2720AWG
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-2720WG
		-10		85	°C / CSP-2720BWG
		-40		85	°C / CSP-2720AWG
Data Rate			10.3125		Gb/s

Transmitter Optical Specifications (0°C < Topr < 70°C, 3.13V < Vcc < 3.47V)						
Parameter	Symbol	Min	Typ	Max	Units	Notes
Average Launch Power	P _{O, Avg}	-2		+3	dBm	1
Extinction Ratio	ER	3.5				
Output Center Wavelength	λ _c	1260	1270	1280	nm	CH1 CH2
		1320	1330	1340		
Output Spectrum Width	σ _λ			1	nm	-20 dB width
Side Mode Suppression Ratio	SMSR	30			dB	
Relative Intensity Noise	RIN			-128	dB/Hz	
Average Launch Power of OFF Transmitter				-30	dBm	

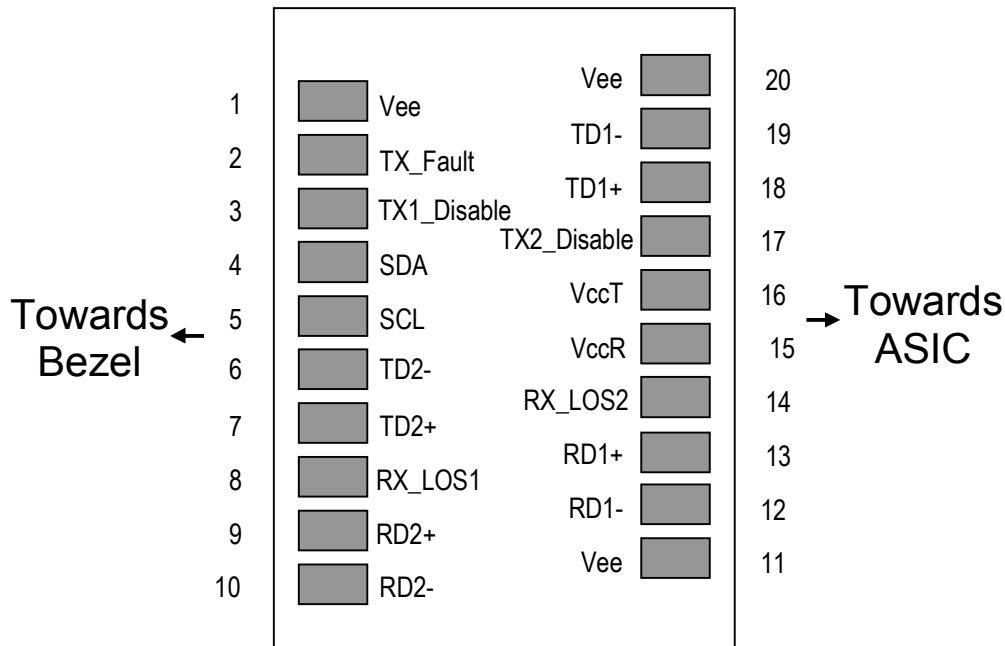
1. Output power is power coupled into a 9/125 μm single-mode fiber.

Receiver Optical Specifications (0°C < Topr < 70°C, 3.13V < Vcc < 3.47V)						
Parameter	Symbol	Min	Typ	Max	Units	Notes
Sensitivity at 10.3 Gb/s				-13	dBm	2, Average Power
Receiver Overload	P _{MAX}	0.5	---		dBm	
LOS -- Deasserted	LOS _D	---	---	-14	dBm	Transition: high to low
LOS -- Asserted	LOS _A	-35	---	---	dBm	Transition: low to high
Wavelength of Operation	λ _c	1320		1340	nm	CH1 CH2
		1260		1280		

2. Measured with average power; BER < 10⁻¹² and PRBS 2³¹-1.

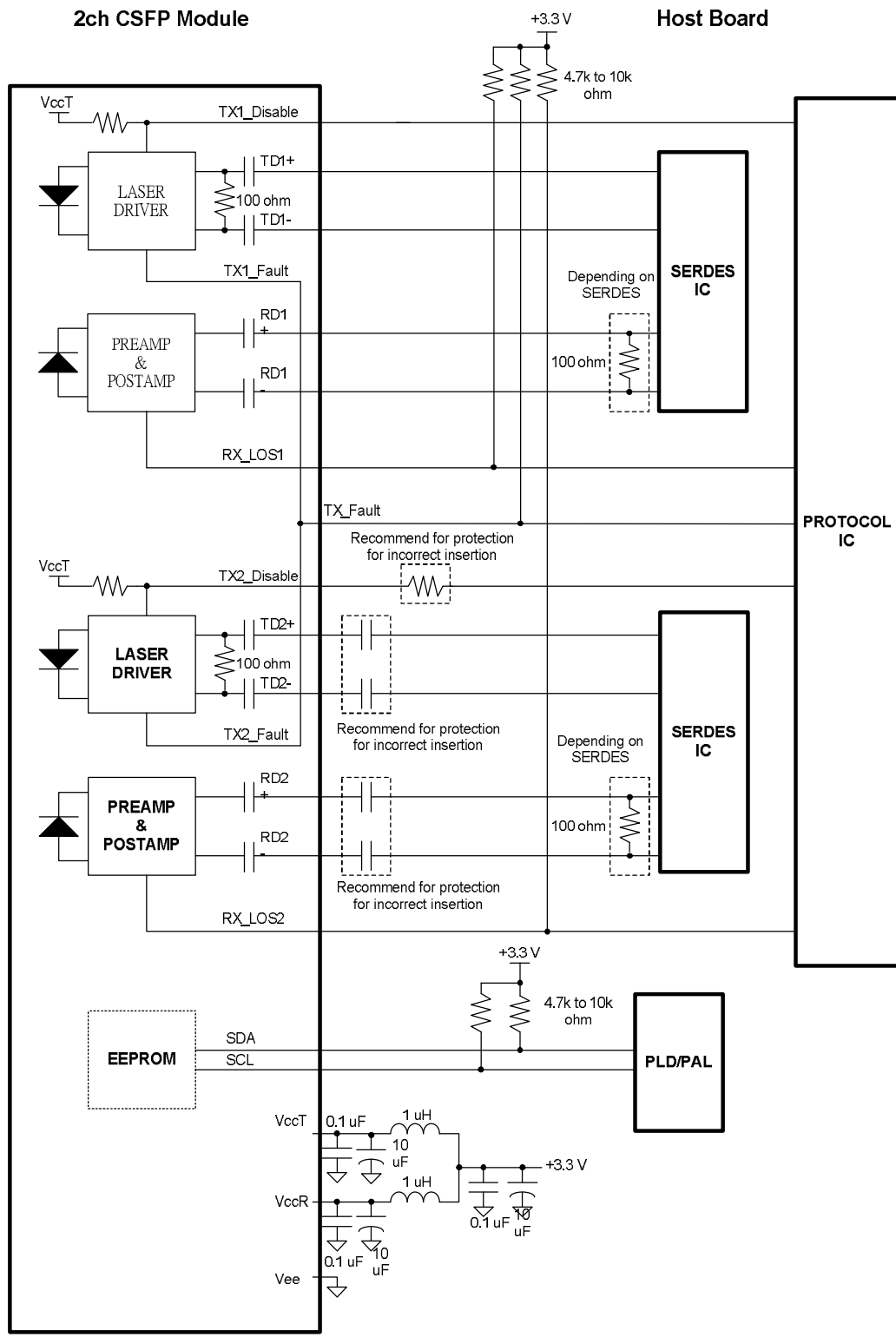
Electrical Characteristics						
Parameter	Symbol	Min	Typ	Max	Units	Notes
High-Speed Signal (CML) Interface Specification						
Input Data Rate			10.3125		Gb/s	
Differential Input Impedance	R _{in}		100		Ω	
Differential Data Input Amplitude		80		1000	mV _{pp}	Internally AC coupled
Output Data Rate			10.3125		Gb/s	
Differential Output Impedance	R _{out}		100		Ω	
Differential Data Output Amplitude		300		850	mV _{pp}	Internally AC coupled
Low-Speed Signal (LVTTTL) 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

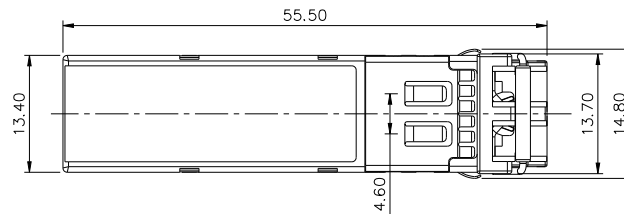
RECOMMENDED CIRCUIT SCHEMATIC



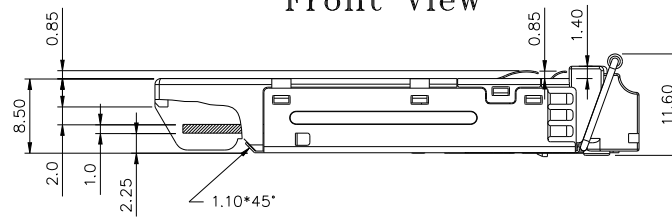
PACKAGE DIAGRAM

Units in mm

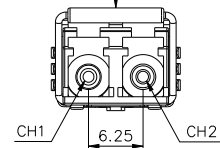
Top View



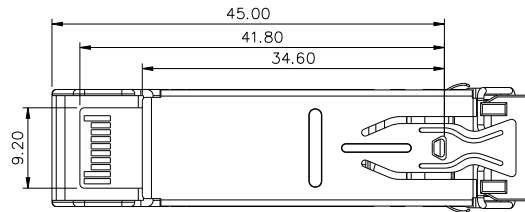
Front View



LATCH COLOR
1270nm:Ligth purple



Side View



Bottom View

Note: Specifications subject to change without notice.

REVISION HISTORY

Version	Subject	Release Date
1.0	Initial datasheet	2020/12/11