



3CW-SFP+23/32-ZR

10G XFP BI-DI TRANSCEIVER 70KM

20180625-2363

3C-LINK OPTO CO.,LIMITED

3CW-XFP-23/32-ZR

10Gbps XFP Bi-Directional Transceiver, 70km Reach

1270/1330nm TX / 1330/1270 nm RX

Features

- “ Supports 9.95Gb/s to 10.3Gb/s data rates
- “ Simplex LC Connector Bi-Directional XFP Optical Transceiver
- “ Single 3.3V Supply
- “ Up to 70km on 9/125um SMF
- “ A:1270nm DFB Laser transmitter,1330nm APD receiver
B:1330nm DFB Laser transmitter,1270nm APD receiver
- “ XFP MSA SFF-8431 Compliant
- “ Digital Diagnostic SFF-8472 Compliant
- “ RoHS compliant and Lead Free
- “ Operating case temperature:
Standard: 0 ~ 70 °C

Applications

- “ 10GBASE-ER at 10.3125Gbps
- “ 10GBASE-EW at 9.953Gbps
- “ Other Optical Links

Product description

The 3CW-XFP-23/32-ZR series single mode transceiver is small form factor pluggable module for duplex optical data communications such as 10GBASE-ER/EW defined by IEEE 802.3ae. It is with the XFP 20-pin connector to allow hot plug capability.

The 3CW-XFP-23/32-ZR module is designed for single mode fiber and operates at a nominal wavelength of 1270nm or 1330nm;.The transmitter section uses a multiple quantum well DFB, which is class 1 laser compliant according to International Safety Standard IEC-60825.The receiver section consists of a APD photodiode integrated with a TIA.

Absolute Maximum Ratings

These values represent the damage threshold of the module. Stress in excess of any of the individual Absolute Maximum Ratings can cause immediate catastrophic damage to the module even if all other parameters are within Recommended Operating Conditions.

Parameters	Symbol	Min.	Max.	Unit
Supply Voltage	V _{CC}	-0.5	+3.6	V
Storage Temperature	T _c	-40	+85	°C
Operating Case Temperature	T _c	0	+70	°C
Relative Humidity	RH	0	85	%

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max	Unit
Supply Voltage	V _{CC}	3.0	3.3	3.6	V
Supply Current	I _{CC}		200	300	mA
Operating Case Temperature	T _c	0	25	70	°C
Module Power Dissipation	P _m	-	0.7	1.1	W

Notes:

[1] Supply current is shared between VCCTX and VCCR_X.

[2] In-rush is defined as current level above steady state current requirements.

Electrical characteristics(T_{OP} = 0 to 70°C, V_{CC} = 3.0 to 3.60 Volts)

Parameter	Symbol	Min.	Typical	Max	Unit	Ref.
Supply Voltage	V _{CC}	3.00		3.60	V	1
Supply Current	I _{CC}		200	300	mA	1
Transmitter						
Input differential impedance	R _{in}		100		Ω	2
Single ended data input swing	V _{in,pp}	150		1200	mVpp	
Transmit Disable Voltage	V _D	2		V _{CC}	V	
Transmit Enable Voltage	V _{EN}	V _{EE}		V _{EE} +0.8	V	3
Receiver						
Output differential impedance	R _{out}		100		Ω	2
Single ended data output swing	V _{out,pp}	300		700	mV	4

LOS Fault	$V_{\text{LOS fault}}$	2		V_{CCHOST}	V	5
LOS Normal	$V_{\text{LOS norm}}$	Vee		Vee+0.8	V	5

Notes:

1. Module power consumption never exceeds 1W.
2. AC coupled.
3. Or open circuit.
4. Into 100 ohm differential termination.
5. LOS is LVTTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.

Optical characteristics(T_{OP} = 0 to 70°C, V_{CC} = 3.0 to 3.60 Volts)

(3CW-XFP-23-ZR, 1270 DFB & APD/TIA)

Parameter	Symbol	Min.	Typical	Max	Unit	Ref.
Transmitter						
Optical Wavelength	λ_c	1260	1270	1280	nm	
Side Mode Suppress Ratio	SMSR	30			dB	
Spectral Width(-20dB)	$\Delta\lambda$			1	nm	
Average Output Power	P_{op}	3		7	dBm	1
Extinction Ratio	ER	3.5			dB	
Eye Mask		Compliant with IEEE 802.3				
Transmitter and Dispersion Penalty	TDP			3.2	dB	
Average Power of OFF Transmitter				-30	dBm	
Relative Intensity Noise	RIN			-128	dB/Hz	
Receiver						
Average Receiver Power	RSENS			-21	dBm	1,2
Receiver Overload	P_{MAX}			-7	dBm	
Centre Wavelength	λ_c	1320		1340	nm	
LOS De-Assert	LOS _D			-25	dBm	
LOS Assert	LOS _A	-28			dBm	
LOS Hysteresis		0.5			dB	

Notes:

1. Average Receiver Power (Min) is informative and not the principal indicator of signal strength. A received power below this value cannot be compliant.
2. Measured with a PRBS²³¹-1 test pattern @10.3125Gbps, BER $\leq 10^{-12}$

(3CW-XFP-32-ZR, 1330 DFB & APD/TIA)

Parameter	Symbol	Min.	Typical	Max	Unit	Ref.
Transmitter						
Optical Wavelength	λ_c	1320	1330	1340	nm	
Side Mode Suppress Ratio	SMSR	30			dB	
Spectral Width(-20dB)	$\Delta\lambda$			2	nm	
Average Output Power	P_{op}	2		7	dBm	1,2
Extinction Ratio	ER	3.5			dB	
Eye Mask		Compliant with IEEE 802.3				
Transmitter and Dispersion Penalty	TDP			3.2	dB	
Average Power of OFF Transmitter				-30	dBm	
Relative Intensity Noise	RIN			-128	dB/Hz	
Receiver						
Average Receiver Power	RSENS			-23	dBm	2,3
Receiver Overload	P_{MAX}			-7	dBm	
Centre Wavelength	λ_c	1260		1270	nm	
LOS De-Assert	LOS_D			-25	dBm	
LOS Assert	LOS_A	-28			dBm	
LOS Hysteresis		0.5			dB	

Notes:

1. Output is coupled into a 9/125um SMF.
2. Average Receiver Power (Min) is informative and not the principal indicator of signal strength. A received power below this value cannot be compliant.
3. Measured with a PRBS231-1 test pattern @10.3125Gbps, BER $\leq 10^{-12}$

Pin Descriptions

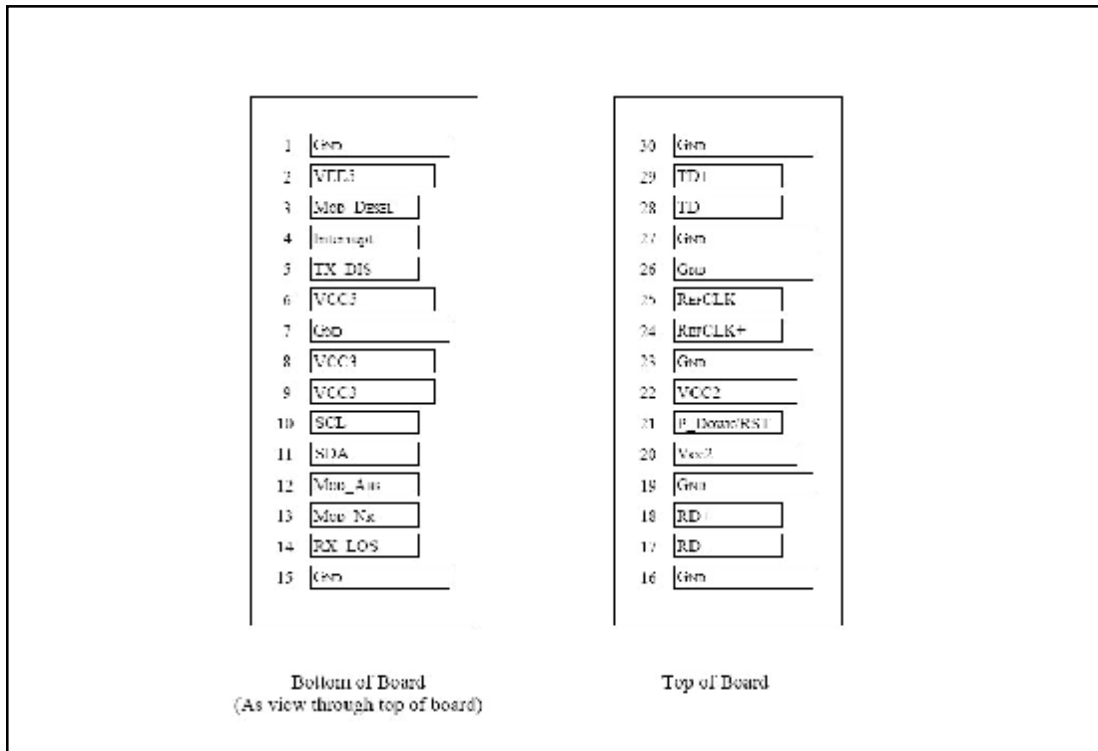


Figure1.Electrical Pin-out Details

Pin	Logic	Symbol	Name/Description	Ref.
1		GND	Module Ground	1
2		VEE5	Optional -5.2 Power Supply – Not required	
3	LVTTL-I	Mod-Desel	Module De-select; When held low allows the module to respond to 2-wire serial interface commands	
4	LVTTL-O	Interrupt	Interrupt (bar); Indicates presence of an important condition which can be read over the serial 2-wire interface	2
5	LVTTL-I	TX_DIS	Transmitter Disable; Transmitter laser source turned off	
6		VCC5	+5 Power Supply	
7		GND	Module Ground	1
8		VCC3	+3.3V Power Supply	
9		VCC3	+3.3V Power Supply	
10	LVTTL-I	SCL	Serial 2-wire interface clock	2

11	LVTTL-I/O	SDA	Serial 2-wire interface data line	2
12	LVTTL-O	Mod_Abs	Module Absent; Indicates module is not present. Grounded in the module.	2
13	LVTTL-O	Mod_NR	Module Not Ready;	2
14	LVTTL-O	RX_LOS	Receiver Loss of Signal indicator	2
15		GND	Module Ground	1
16		GND	Module Ground	1
17	CML-O	RD-	Receiver inverted data output	
18	CML-O	RD+	Receiver non-inverted data output	
19		GND	Module Ground	1
20		VCC2	+1.8V Power Supply – Not required	
21	LVTTL-I	P_Down/RST	Power Down; When high, places the module in the low power stand-by mode and on the falling edge of P_Down initiates a module reset	
			Reset; The falling edge initiates a complete reset of the module including the 2-wire serial interface, equivalent to a power cycle.	
22		VCC2	+1.8V Power Supply – Not required	
23		GND	Module Ground	1
24	PECL-I	RefCLK+	Reference Clock non-inverted input, AC coupled on the host board – Not required	3
25	PECL-I	RefCLK-	Reference Clock inverted input, AC coupled on the host board – Not required	3
26		GND	Module Ground	1
27		GND	Module Ground	1
28	CML-I	TD-	Transmitter inverted data input	
29	CML-I	TD+	Transmitter non-inverted data input	
30		GND	Module Ground	1

Note

1. Module circuit ground is isolated from module chassis ground within the module.
2. Open collector; should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15V and 3.45V.
3. A Reference Clock input is not required.

Digital Diagnostic Functions

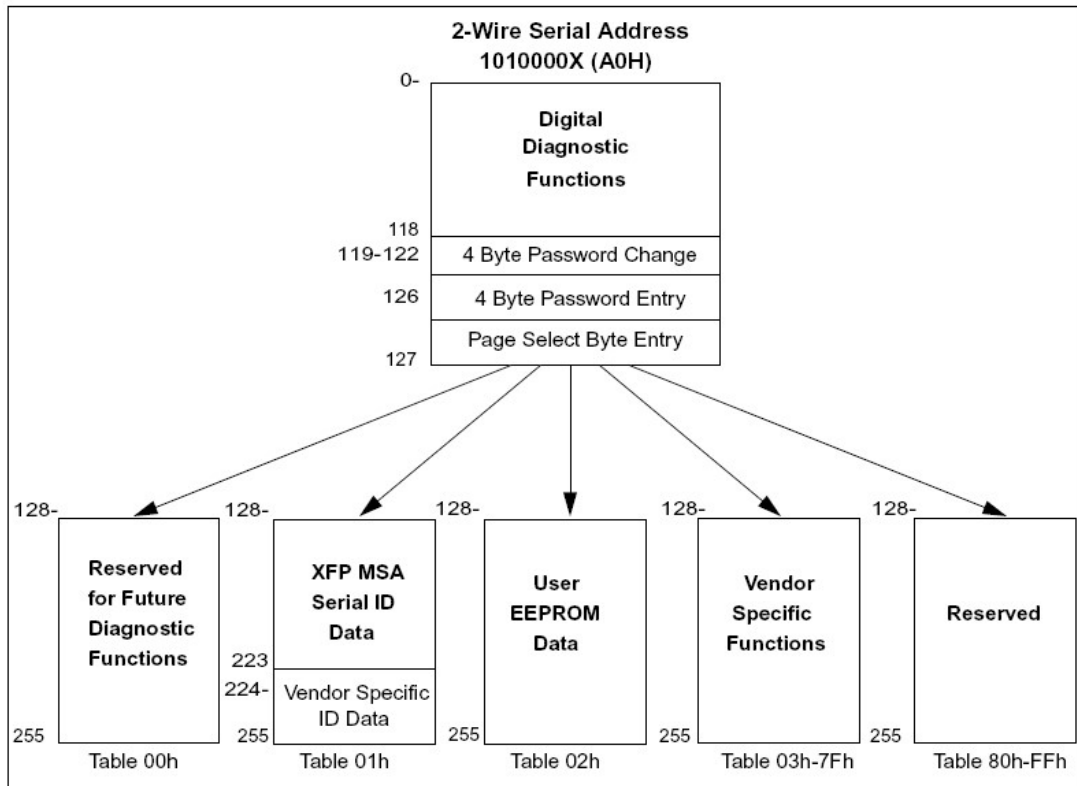
As defined by the XFP MSA 1, 3C-LINK's XFP transceivers provide digital diagnostic functions via a 2-wire serial interface, which allows real-time access to the following operating parameters:

- ✓ Transceiver temperature
- ✓ Laser bias current
- Transmitted optical power
- Received optical power
- Transceiver supply voltage

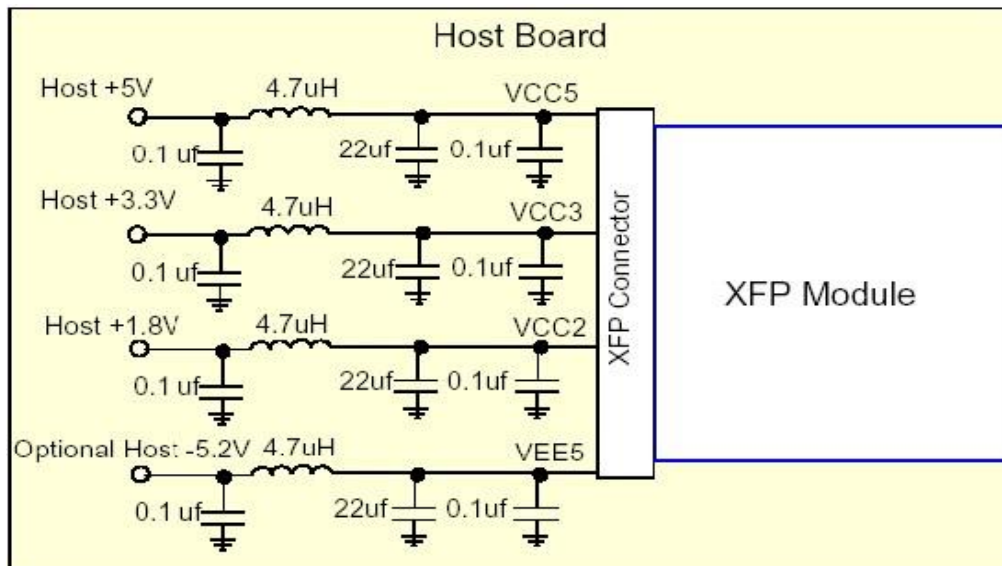
It also provides a sophisticated system of alarm and warning flags, which may be used to alert end-users when particular operating parameters are outside of a factory-set normal range.

The operating and diagnostics information is monitored and reported by a Digital Diagnostics Transceiver Controller (DDTC) inside the transceiver, which is accessed through the 2-wire serial interface. When the serial protocol is activated, the serial clock signal (SCL pin) is generated by the host. The positive edge clocks data into the XFP transceiver into those segments of its memory map that are not write-protected. The negative edge clocks data from the XFP transceiver. The serial data signal (SDA pin) is bi-directional for serial data transfer. The host uses SDA in conjunction with SCL to mark the start and end of serial protocol activation. The memories are organized as a series of 8-bit data words that can be addressed individually or sequentially. The 2-wire serial interface provides sequential or random access to the 8 bit parameters, addressed from 000h to the maximum address of the memory.

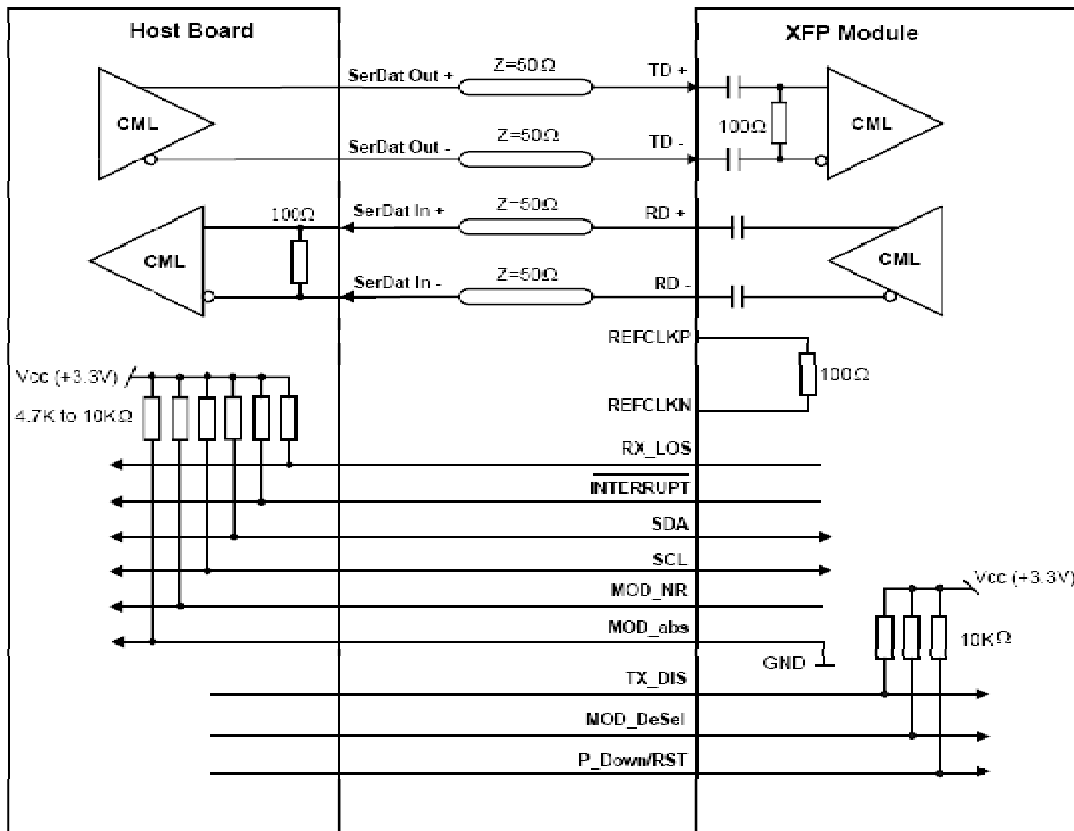
For more detailed information including memory map definitions, please see the XFP MSA Specification.



Recommended Circuit:

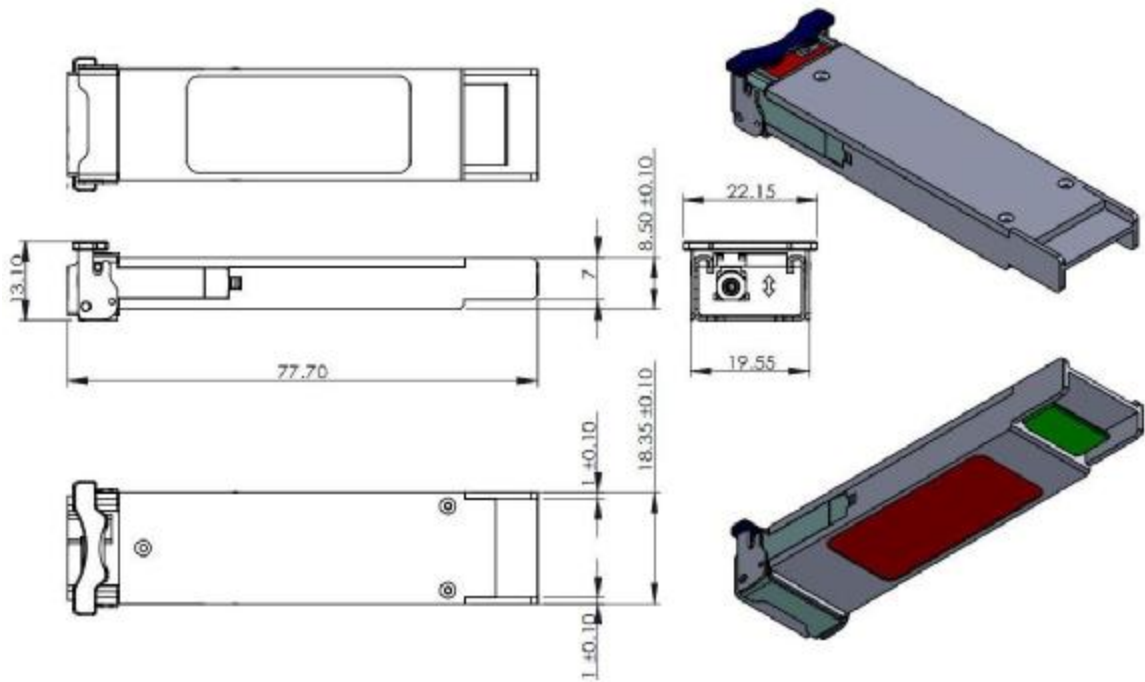


Recommended Host Board Power Supply Circuit



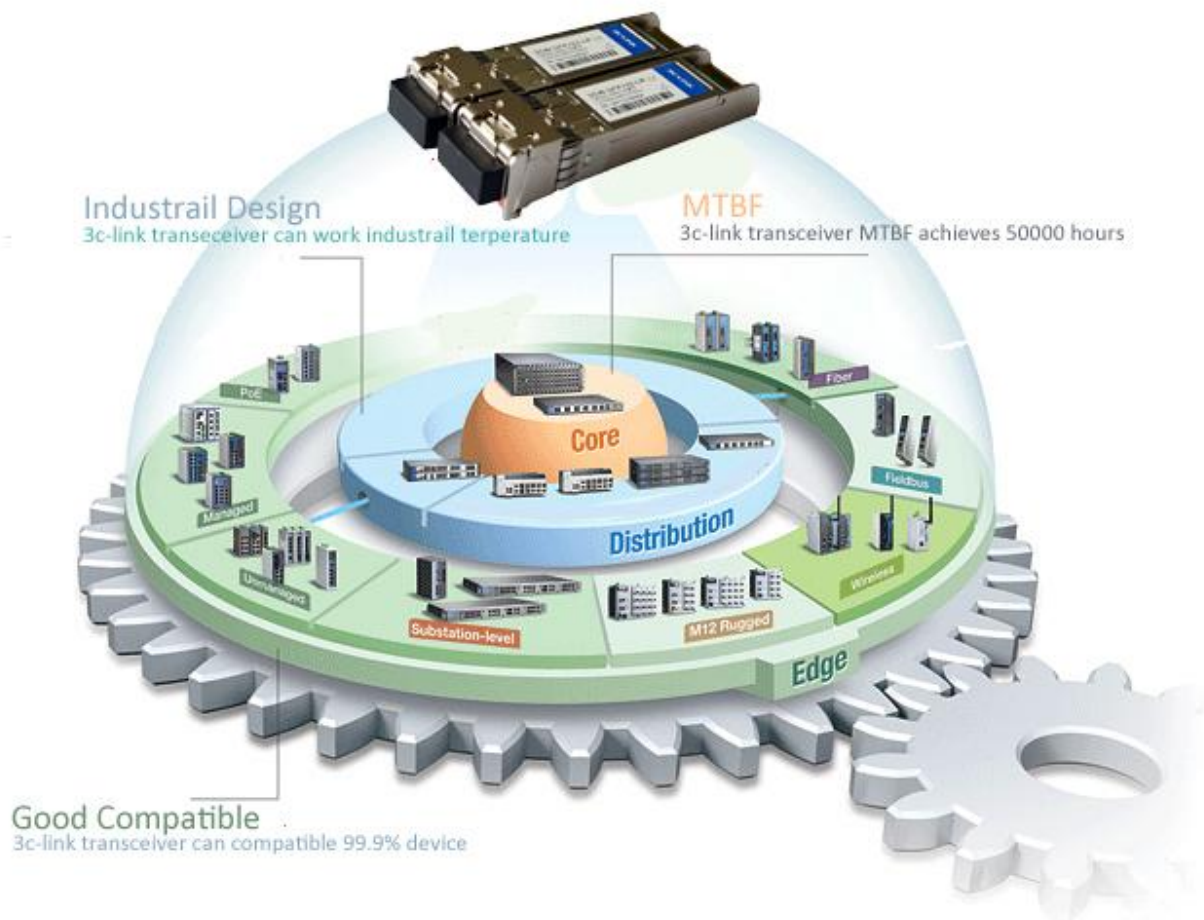
Recommended High-speed Interface Circuit

Mechanical Dimensions:



Ordering information

Part Number	Product Description
3CW-XFP-23-ZR	1270nm/1330nm, 10Gbps, 70km, 0°C ~ +70°C
3CW-XFP-32-ZR	1330nm/1270nm, 10Gbps, 70km, 0°C ~ +70°C



Specifications are subject to change without notice. It is a registered trademark of 3C-LINK Technology Co., Ltd. Other brands and product names are trademarks or registered trademarks of their respective holders. No part of the specifications can be reproduced in any form or by any means or used to make any derivative such as translation, transformation, or adaptation without permission from 3C-LINK Technology Co., Ltd.