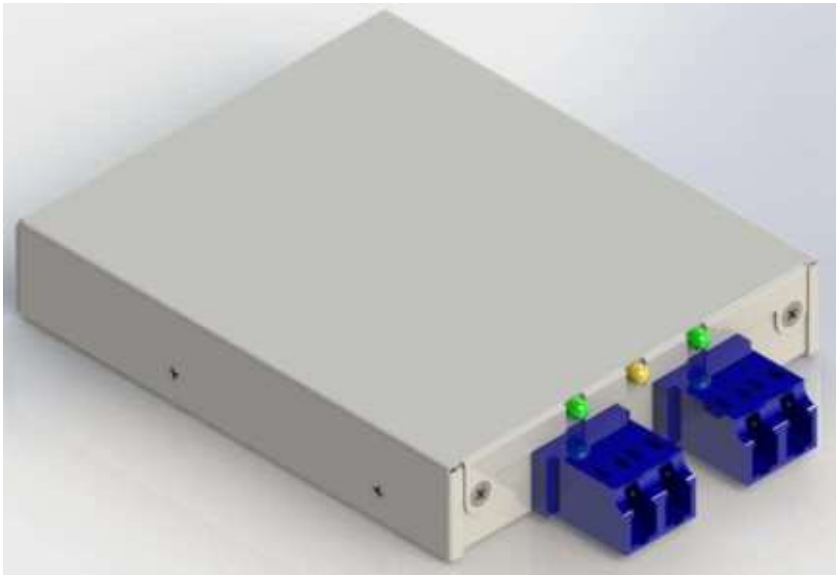
Specification

10G Ethernet Optical Bypass Module

Dual Ports 10G Base-LR



Ordering Information

O B M –A3CB2-C06_V3

(With TX disable)

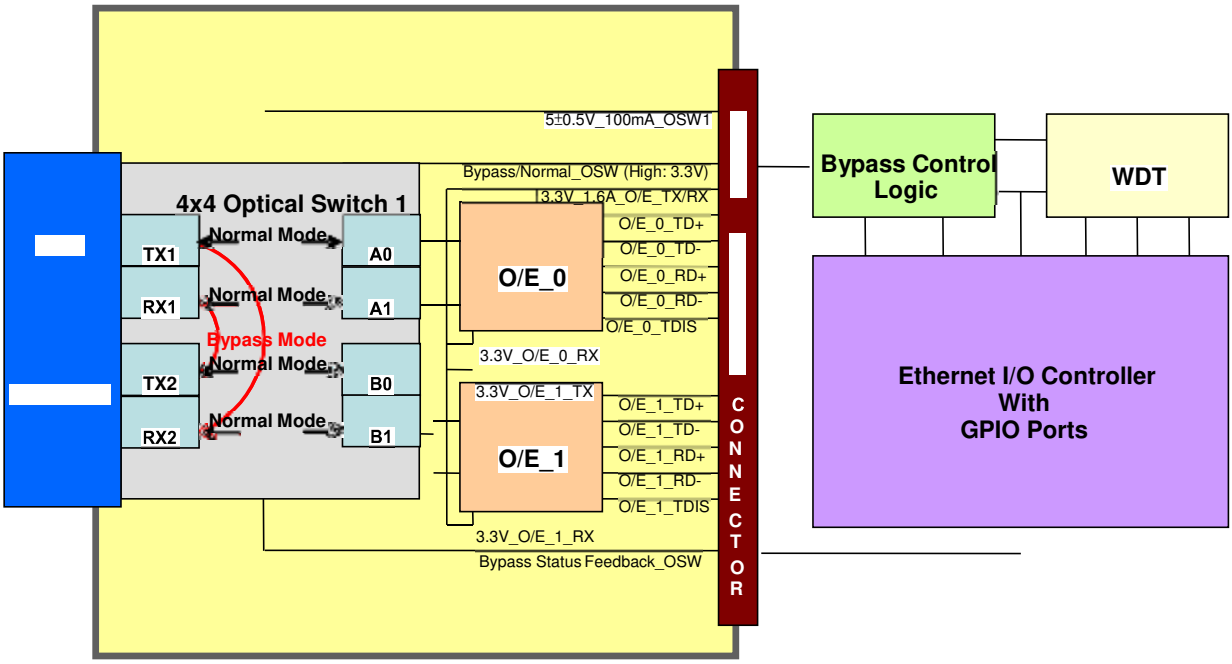
Product Overview

FormericaOE Dual Port 10 Gbit/s Optical Bypass Module is a compact box that contains two 10 G Base-LR1310nm (10KM) ports and can integrated with I/O ports controllers to be a Network Interface Card (NIC). The FormericaOE Dual Port 10 Gbit/s Optical Bypass Module is targeted to inline network system that maintains network connectivity when power failure or system fails. FormericaOE Dual Port 10 Gbit/s Optical Bypass Module supports Normal and Bypass modes, and can be controlled to perform the Block mode. In Normal mode, the ports are independent interfaces. In Bypass mode, all packets received from one port are transmitted to the adjacent port. In Block mode, the moduleblocks the route. FormericaOE Dual Port 10 Gbit/s Optical Bypass Module can Bypass or Block its I/O ports on a host system failure, power off, or uponsoftware request. FormericaOE Dual Port 10 Gbit/s Optical Bypass Modulecan be integrated withany brand's Controllers CPU. It is suitable for connecting with in-line equipment's for power failure or system maintenance. When the In-Line unit is not on or is in bypass mode, the relays within the Optical Bypass Module are set to bridge the optical signals directly through the optical switch, completely bypassing the In-Line equipment. If the In-Line equipment is on and operating normally, then it supplies power to the switch through a high speed connector PIN.Compact and competitive cost, this module provides excellent performance on your network.

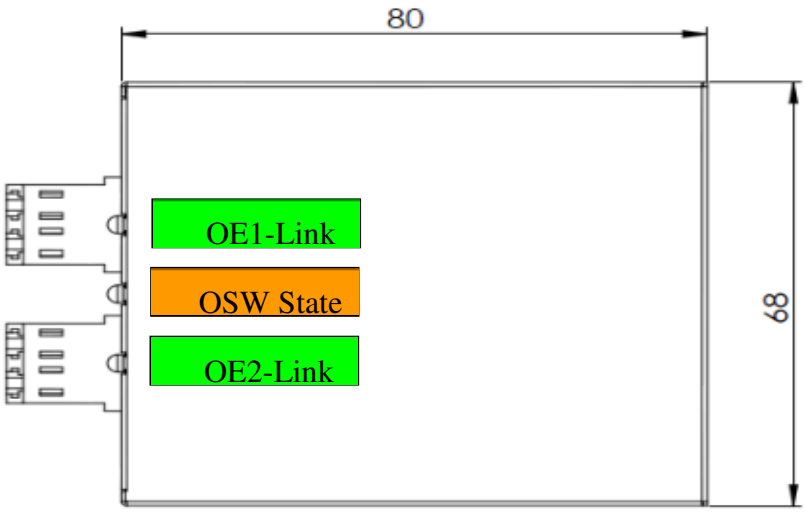
Features

- **Reliable Passive Fiber Bypass (Latching)**
- **Low Return Loss**
- **Available in 9/125µm Single mode Fiber**
- **PCB Mountable Type**
- **Fast Ethernet Standard Compliant**
- **Digital Diagnostic SFF-8472 Rev.10.2 Compliant**
- **SONET/SDH Standard Compliant**
- **Two Dual LC Adapter**
- **10G-BASE-LR are available**
- **Compliant with CE& FCC Standard**
- **Compact Format and ROHS Compliant**

Block Diagram and Optical Paths



Dual Ports Optical Bypass Module



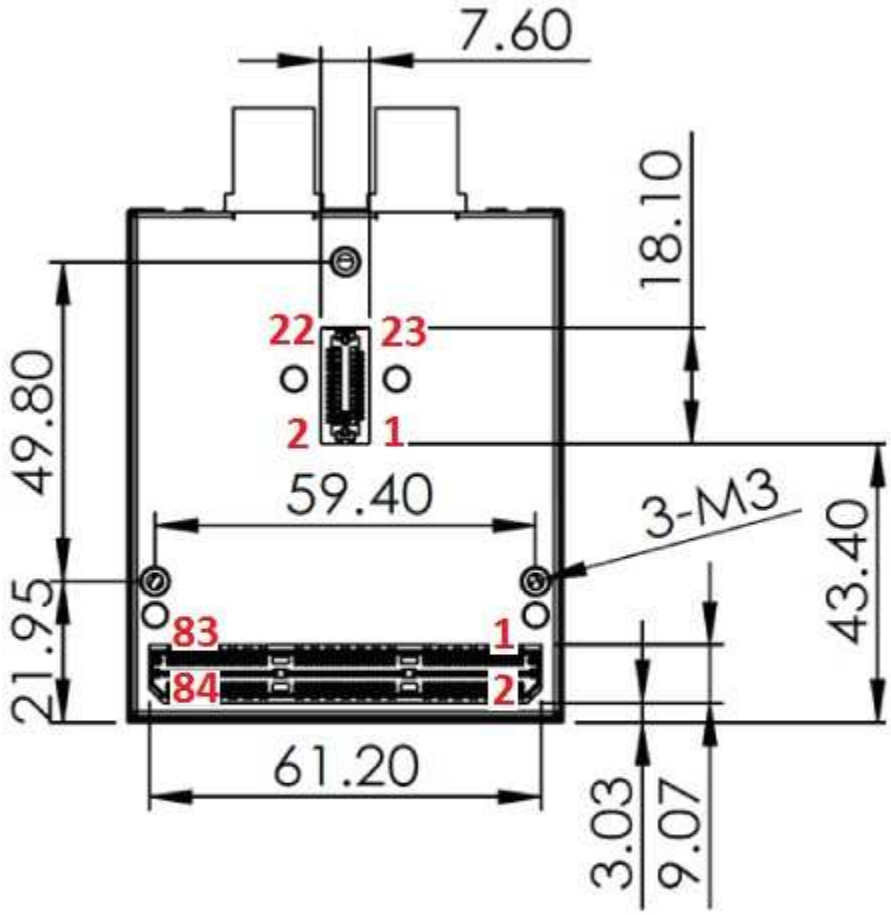
- **OE1-Link and OE2-Link indications:**

  Green: **Link**

- **OSW State indications:**

  Amber: **Optical Switch State**

Module Pin Out



84 PIN Assignments:

Pin Number	Name	I/O	Function	Note
1				
2				
3				
4	GND			
5				
6	On-Line	O	1K Ohm to Ground	
7	OE1 GND		OE1 Signal Ground	
8	GND			
9	OE1 TD-	I	OE1 Inversed Data Input	6
10	OE1 TX Disable	I	Transmitter Disable for OE-1	2
11	OE1 TD+	I	OE1 Data Input	6
12	OE1 TX Fault	O	Transmitter Fault Indication for OE-1	1
13	OE1 GND		OE1 Signal Ground	
14	OE1 MOD-DEF2	I/O	2 Wire Serial ID Interface (Data) for OE-1	3
15	OE1 GND		OE1 Signal Ground	
16	OE1 MOD-DEF1	I	2 Wire Serial ID Interface (Clock) for OE-1	3
17	OE1 RD+	O	OE1 Data Output	5
18	OE1 Vcc		3.3V for Tx1 Power Supply and Rx1 Power Supply – 300mA	
19	OE1 RD-	O	OE1 Inversed Data Output	5
20	OE1-Link	I	OE1-Link LED Indicator (Anode/ LED Green)	
21	OE1 GND		OE1 Signal Ground	
22	OSW 1 State	I	OSW 1 State LED Indicator (Anode / LED Amber)	
23	OE1 LOS	O	Loss of Signal for OE-1	4
24	OE1 Rate Select	I	High: 10 Gbps; Low: 1.25Gbps	
25				
26	GND			
27				
28				
29				
30				
31				
32				
33				

34				
35				
36				
37				
38				
39				
40				
41				
42				
43	OE2 GND		OE2 Signal Ground	
44	GND			
45	OE2 TD-	I	OE2 Inversed Data Input	
46	OE2 TX Disable	I	Transmitter Disable for OE-2	2
47	OE2 TD+	I	OE2 Data Input	6
48	OE2 TX Fault	O	Transmitter Fault Indication for OE-2	1
49	OE2 GND		OE2 Signal Ground	6
50	OE2 MOD-DEF2	I/O	2 Wire Serial ID Interface (Data) for OE-2	3
51	OE2 GND		OE2 Signal Ground	
52	OE2 MOD-DEF1	I	2 Wire Serial ID Interface (Clock) for OE-2	3
53	OE2 RD+	O	OE2 Data Output	5
54	OE2 Vcc		3.3V for Tx2 Power Supply and Rx2 Power Supply – 300mA	
55	OE2 RD-	O	OE2 Inversed Data Output	5
56	OE2-Link	I	OE2-Link LED indicator (Anode / LED Green)	
57	OE2 GND		OE2 Signal Ground	
58	LED-pair1 common	I	LED-pair1 common Cathode	
59	OE2 LOS	O	Loss of Signal for OE-2	4
60	OE2 Rate Select	I	High: 10 Gbps; Low: 1.25Gbps	
61				
62	GND			
63				
64				
65				
66				
67				
68				
69				

70				
71				
72				
73				
74				
75				
76				
77				
78				
79	OSW 1 State Output	O	High=Normal Mode, Low=Bypass Mode for OSW1	
80	GND			
81	OSW 1 B1	I	Change to Bypass mode for OSW1	7/9
82	GND			
83	OSW 1 N1	I	Change to Normal mode for OSW1	7/9
84	Vcc5_1		5.0V Power Supply (OSW 1 Power)	8

PIN Assignments of 23 pins Connector:

Pin Number	Name	I/O	Function	Note
1	Vcc5_1		5.0V Power Supper (OSW1 Power)	
2	Vcc5_1		5.0V Power Supper (OSW1 Power)	
3			No Connector	
4	OE1-Link	I	OE1-Link LED Indicator (Anode/ LED Green)	
5			No Connector	
6	OSW 1 State	I	OSW 1 State LED Indicator (Anode / LED Amber)	
7			No Connector	
8	OE2-Link	I	OE2-Link LED indicator (Anode / LED Green)	
9			No Connector	
10	LED-pair1 common	I	LED-pair1 common Cathode	
11			No Connector	
12	OSW 1 State Output	O	High=Normal Mode, Low=Bypass Mode for OSW1	
13	GND			
14	GND			
15			No Connector	
16	OSW 1 B1	I	Change to Bypass mode for OSW1	
17			No Connector	
18	OSW 1 N1	I	Change to Normal mode for OSW1	
19			No Connector	
20			No Connector	
21			No Connector	
22			No Connector	
23			No Connector	

Notes:

1. **TX Fault is an open collector/drain output, which should be pulled up with a 4.7K – 10KΩ resistor on the hostboard. Pull up voltage between 2.0V and VccT, R+0.3V. When high, output indicates a laser fault of some kind.Low indicates normal operation. In the low state, the output will be pulled to <0.5V.**

   4.7 TX disable is an input that is used to shut down the transmitter optical output. It is pulled up within the modulewith a 4.7– 10 K Ω resistor. Its states are:

   - **Low (0 – 0.8V): Transmitter on**
     - **(>0.8, < 2.0V): Undefined**
   - **High (2.0 – 3.465V): Transmitter Disabled**
   - **Open: Transmitter Disabled**

2. **Mod-Def 1,2, These are the module definition pins. They should be pulled up with a 4.7K – 10KΩ resistor on thehost board. The pull-up voltage shall be VccT or VccR (see Section IV for further details). Mod-Def 0 is groundedby the module to indicate that the module is present Mod-Def 1 is the clock line of two wire serial interface forserial ID Mod-Def 2 is the data line of two wire serial interface for serial ID**
3. **LOS (Loss of Signal) is an open collector/drain output, which should be pulled up with a 4.7K – 10KΩ resistor.Pull up voltage between 2.0V and VccT, R+0.3V. When high, this output indicates the received optical power isbelow the worst-case receiver sensitivity (as defined by the standard in use). Low indicates normal operation. Inthe low state, the output will be pulled to < 0.5V.**
4. **RD-/+: These are the differential receiver outputs. They are AC coupled 100Ω differential lines which should beterminated with 100Ω (differential) at the user SERDES. The AC coupling is done inside the module and is thusnot required on the host board. The voltage swing on these lines will be between 350 and 850 mV differential(175 – 425 mV single ended) when properly terminated.**
5. **TD-/+: These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differentialtermination inside the module. The AC coupling is done inside the module and is thus not required on the host board.The inputs will accept differential swings of 180 – 700 mV (90 – 350 mV single-ended).**
6. **Latching Type - The input is used to control the optical switchmode for OSW**
   - **Normal mode:**
     - **OSW N1/N2: > 3.75V and OSW B1/B2 < 0.5V and over 20ms.**
   - **Bypass mode:**
     - **OSW N1/N2: < 0.5V and OSW B1/B2 >3.75V and over 20ms**
7. **Non-Latching Type - High =Normal Mode, Low=Bypass Mode for OSW.**
8. **Non-Latching Type - Pin 43, 44, 82 and 83: Ground**

Absolute Maximu Ratings

Paramet	Symb	Min	Typ.	Max	Unit
Power Supply Voltage	Vcc	0		3.6	V
Storage Temperature	Ts	-40		85	℃
Supply Voltage	Vcc	0		5	V
Optical Receiver Power (Damage)	Pmax			15	dBm

Recommended Operating Conditions

Paramet	Symb	Min.	Typ.	Max.	Unit	Not
Case Operating Temperature	Top	0		70	℃	1
+5.0V Supply Voltage	Vcc5	4.75		5.25	V	Vcc
+3.3V Supply Voltage	Vcc3	3.10		3.50	V	
Relative Hunidity (non-condensation)	RH	5		85	%	
Data Rate		-	10.312	+100pp	Gbp	

Note1 : Please see order information

Electrical Characteristics

Paramet	Symb	Min.	Typ.	Max.	Unit	Not
+5.0V Supply Current	Icc5			100	mA	
+3.3V Supply Current	Icc3			1200	mA	
Data Rate		-	10.312	-	Gbps	
Transmitter						
Transmitter Differential Input	VDT	180		700	mV	1
Transmitter Disable Input-High	VDISH	2		Vcc+0.	V	
Transmitter Disable Input-Low	VDISL	0		0.8	V	
Receiver						
Receiver Differential Output	VDR	350		850	mV	3
LOS Output Voltage-High	VLOSH	2.4		Vcc	V	2
LOS Output Voltage-Low	VLOSL	0		0.5	V	2
Optical Switch						
Latching Voltage-High	VLATH	4.75	5	5.25	V	
Latching Voltage-Low	VLATL	0		0.8	V	
Latching Resistance	RLAT		125		Ω	

Notes:

1. **Internally AC coupled and terminated to 100Ohm differential load.**
2. **Pull up to Vcc on Host Board.**
3. **Internally AC coupled, but requies a 100Ohm differential termination at or internal to Serializer / Deserializer.**

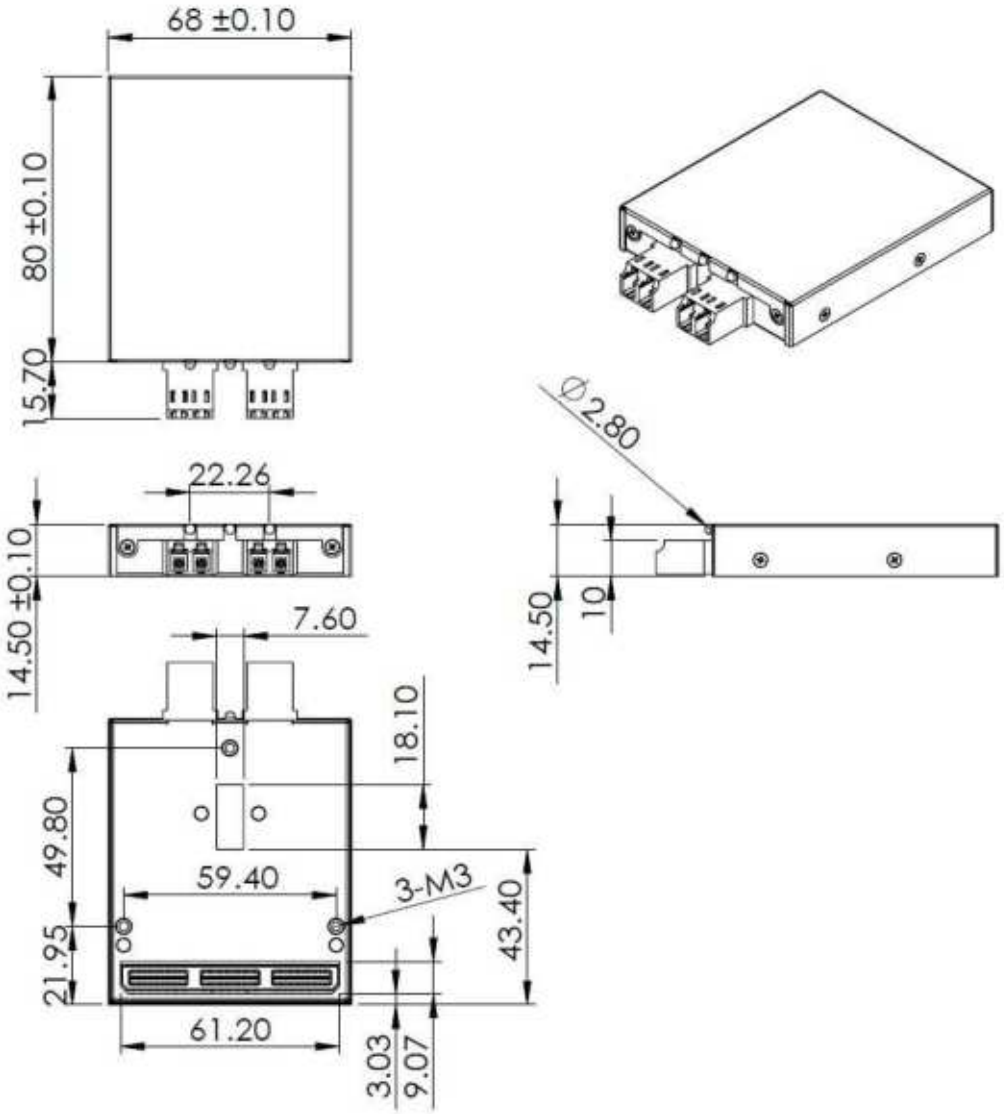
Optical Characteristics (Top = 0 ~ 70℃ , Data Rate=10.3125Gb/sec , PRBS=2^{31}-1 NRZ)

Paramet		Symb	Min	Typ.	Max.	Unit	Not
Transmitter							
Average Launch Power		Po	-8.2		0.5	dBm	
Center Wavelength		λC	1260		1355	nm	
Side Mode Suppression Ratio		SMSR	30	--	--	nm	
Extinction Ratio		ER	3.5	--	--	dB	
Transmitter and dispersion penalty(max)		TDP	--	--	3.2	dB	
Optical Power OMA		POMA	-5.2	--	--	dBm	
OMA-TDP		POMA-	-6.2	--	--	dBm	
Average launch power of OFF transmitted		Poff	--	--	-128	dB/Hz	
Optical Return Loss Tolerance			12	--	--	dB	
Output eye		Compliant with IEEE802.3ae eye mask					
Receiver							
Center Wavelength		λ	1260		1355	Nm	
Average receiver power(max)		Pmax			0.5	dBm	
Average receiver power(min)		Pmin	-14.4			dBm	
Receiver Reflectance		Rrx			-12	dB	
Receiver Sensitivity in OMA					-12.6	dBm	
Stressed Sensitivity in OMA					-10.3	dBm	1
Vertical eye closure penalty			2.2			dB	2
Stressed eye jitter			0.3			UIp-p	1
LOS	Assert	LOSA	-30			dBm	
	Deassert	LOSD			-12	dBm	
LOS Hysteresis		LOSH	0.5				
Optical Switch							
Wavelength Range		λ	1260~1360 and			nm	
Insertion Loss		OIL			2	dB	
Return Loss		ORL	50			dB	
Switch Time					8	ms	
Lifetime				≧107		times	
Latching Resistance		RLAT		125		Ω	

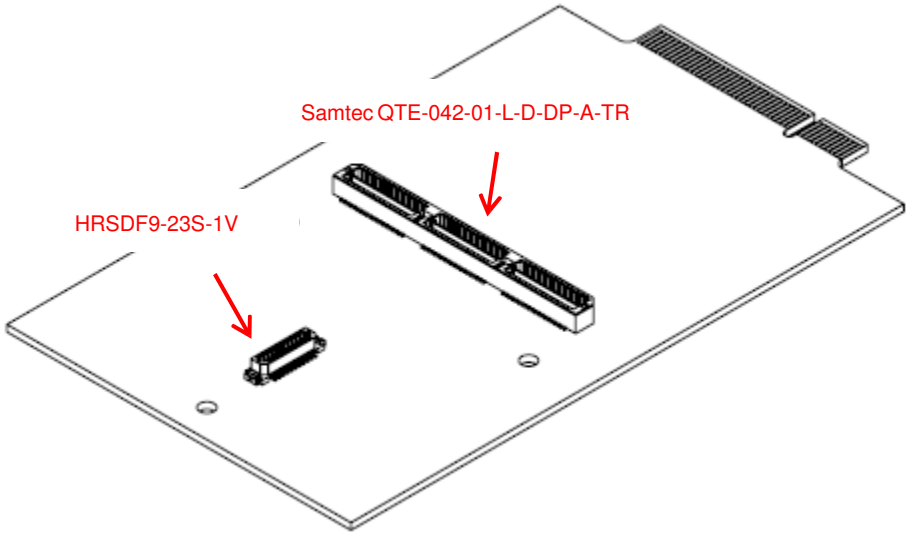
Notes:

1. **Receiver Sensitivity is informative. Stressed receiver sensitivity shall be measured with conformance test signal for BER 1×10^{-12}.**
2. **Vertical eye closure penalty and stressed eye jitter are the test conditions for measuring stressed receiver sensitivity. They are not the required characteristic of the receiver.**

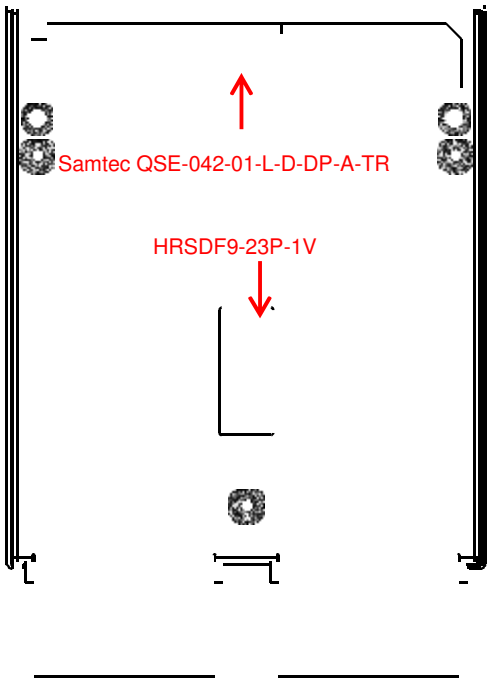
Package Outline Drawing (mm)



Host Board B2B Connector



Customer Host Board Top View



Fiber Bypass Module: Bottom View

ESD

Normal ESD precautions are required during the handling of this module. This transceiver is shipped in ESD protective packaging. It should be removed from the packaging and handled only in an ESD protected environment.

Contact Information

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