USERS GUIDE

PCIe/104 Dual 10GbE
Users Guide

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Preface

Disclaimer

The information contained within this user's guide, including but not limited to any product specification, is subject to change without notice.

Connect Tech assumes no liability for any damages incurred directly or indirectly from any technical or typographical errors or omissions contained herein or for discrepancies between the product and the user's guide.

Customer Support Overview

If you experience difficulties after reading the manual and/or using the product, contact the Connect Tech reseller from which you purchased the product. In most cases the reseller can help you with product installation and difficulties.

In the event that the reseller is unable to resolve your problem, our highly qualified support staff can assist you. Our support section is available 24 hours a day, 7 days a week on our website at: www.connecttech.com/sub/support/support.asp. See the contact information section below for more information on how to contact us directly. Our technical support is always free.

Contact Information

Mail/Courier
Connect Tech Inc.
Technical Support
42 Arrow Road
Guelph, Ontario
Canada N1K 1S6

Email/Internet

sales@connecttech.com
support@connecttech.com
www.connecttech.com

> **Note:**
> Please go to the **Download Zone** or the **Knowledge Database** in the **Support Center** on the Connect Tech website for product manuals, installation guides, device driver software and technical tips.
> Submit your technical support questions to our customer support engineers via the **Support Center** on the Connect Tech website.

Telephone/Facsimile
Technical Support representatives are ready to answer your call Monday through Friday, from 8:30 a.m. to 5:00 p.m. Eastern Standard Time. Our numbers for calls are:

Toll Free: 800-426-8979 (North America only)
Telephone: 519-836-1291 (Live assistance available 8:30 a.m. to 5:00 p.m. EST, Monday to Friday)
Facsimile: 519-836-4878 (on-line 24 hours)

Limited Product Warranty

Connect Tech Inc. provides a two year Warranty for the PCIe/104 Dual 10GbE. Should this product, in Connect Tech Inc.'s opinion, fail to be in good working order during the warranty period, Connect Tech Inc. will, at its option, repair or replace this product at no charge, provided that the product has not been subjected to abuse, misuse, accident, disaster or non-Connect Tech Inc. authorized modification or repair.

You may obtain warranty service by delivering this product to an authorized Connect Tech Inc. business partner or to Connect Tech Inc. along with proof of purchase. Product returned to Connect Tech Inc. must be pre-authorized by Connect Tech Inc. with an RMA (Return Material Authorization) number marked on the outside of the package and sent prepaid, insured and packaged for safe shipment. Connect Tech Inc. will return this product by prepaid ground shipment service.

The Connect Tech Inc. Limited Warranty is only valid over the serviceable life of the product. This is defined as the period during which all components are available. Should the product prove to be irreparable, Connect Tech Inc. reserves the right to substitute an equivalent product if available or to retract the Warranty if no replacement is available.

The above warranty is the only warranty authorized by Connect Tech Inc. Under no circumstances will Connect Tech Inc. be liable in any way for any damages, including any lost profits, lost savings or other incidental or consequential damages arising out of the use of, or inability to use, such product.

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ESD Warning

Electronic components and circuits are sensitive to ElectroStatic Discharge (ESD). When handling any circuit board assemblies including Connect Tech COM Express Carrier assemblies, it is recommended that ESD safety precautions be observed. ESD safe best practices include, but are not limited to:

- Leaving circuit boards in their antistatic packaging until they are ready to be installed.
- Using a grounded wrist strap when handling circuit boards, at a minimum you should touch a grounded metal object to dissipate any static charge that may be present on you.
- Only handling circuit boards in ESD safe areas, which may include ESD floor and table mats, wrist strap stations and ESD safe lab coats.
- Avoiding handling circuit boards in carpeted areas.
- Try to handle the board by the edges, avoiding contact with components.

Revision History

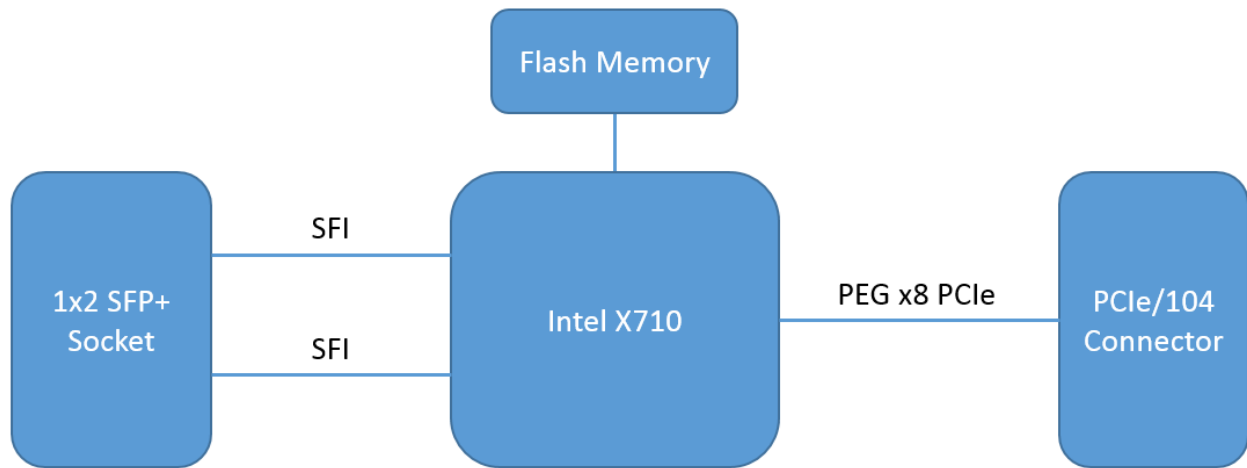| Revision	Date	Changes
0.00	2016/07/04	Initial Release

Introduction

Connect Tech's PCIe/104 Dual 10G board is a dual-port 10 Gigabit Ethernet controller for PCIe/104 platforms. Powered by Intel's X710 Ethernet Controller the PCIe/104 Dual 10G provides support for network and server virtualization as well as LAN and SAN flexibility while maintaining reliable performance. This product is ideal for adding high speed 10G connectivity to embedded systems.

Product Features and Specifications

Feature	PCIe/104 Dual 10GbE
Form Factor	PCIe/104 compliant: 3.775" x 3.550" (95.885mm x 90.17mm) 3D STEP Model: **download here**
PCIe Host Interface	Single x8 Lane PCIe Configurations (PCIe 3.0 capable)
Ethernet	Two SFP+ pluggable interfaces (using SFF 8431 protocol)
Memory	32 Mb Serial Flash for firmware and configuration
Power Source	PCIe/104 Bus
Operating Temperature	0ºC to +55ºC (32ºF to 131ºF)
Weight	74 grams (with heatsink, no stand-offs)
Warranty and Support	2 Years

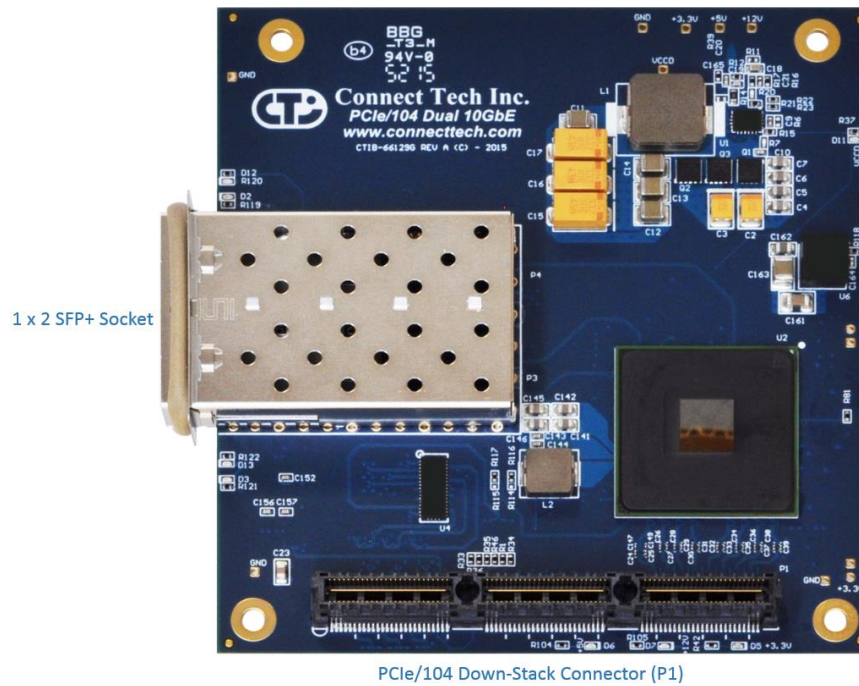# Product Overview

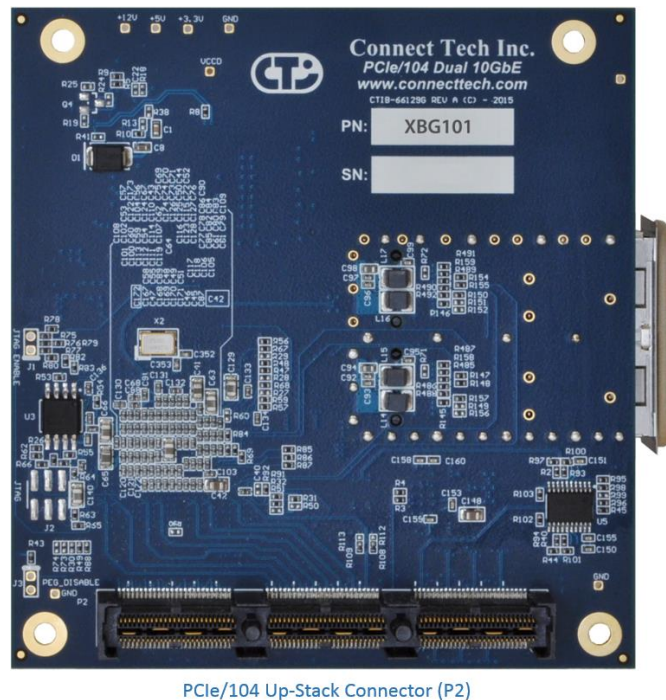## Block Diagram

Ordering Part Numbers

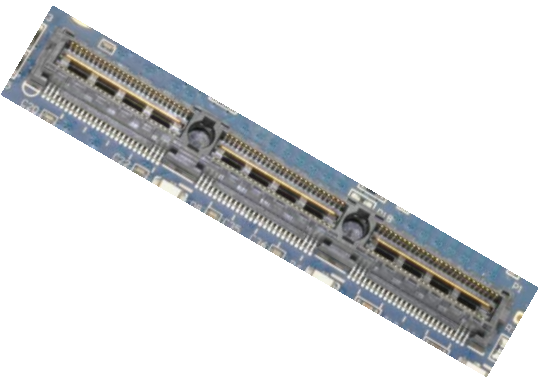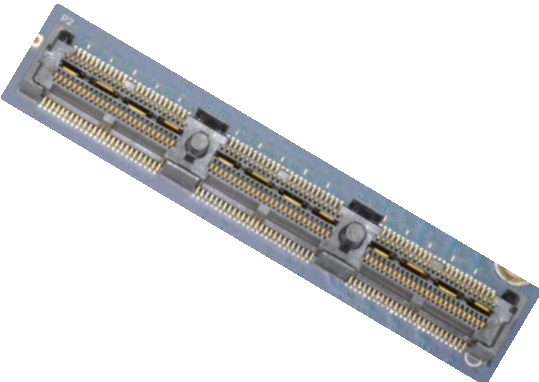| Part Number	Description
XDG101	PCIe/104 Dual 10GbE Up-Stacking with support for an additional x16 PCIe/104 product to be placed above the XDG101 within the stack

Connector Locations

Top Side

1 x 2 SFP+ Socket

PCIe/104 Down-Stack Connector (P1)

Secondary Side

PN: XBG101

SN:

PCIe/104 Up-Stack Connector (P2)

Connector Summary

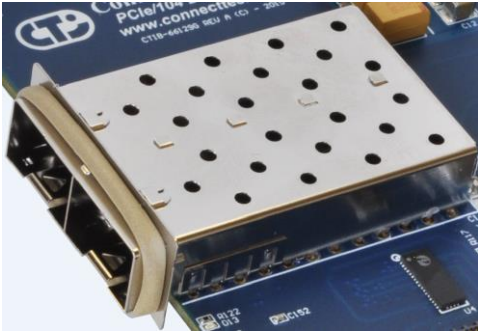| Designator	Connector	Description
P1	PCIe/104 Down-Stack Connector	PCIe/104 Type 1 Down-Stack Connector
P2	PCIe/104 Up-Stack Connector	PCIe/104 Type 1 Up-Stack Connector
P3	SFP+ Port 0 (within SFP+ Cage)	SFP+ Pluggable Socket using SFF 8431 protocol
P4	SFP+ Port 1 (within SFP+ Cage)	SFP+ Pluggable Socket using SFF 8431 protocol

Detailed Feature Description

PCIe/104 Top Connector (Down Stacking)

Function	PCIe/104 Stack Interface	
Location	P1	
Type	Samtec fine pitch stacking connector, part number: ASP-129637-03 PCIe/104 Top Side Connector (Connects in Stack Down Configurations) 15mm stack height.	
Pinout	Refer to PCI/104-Express & PCIe/104 Specification, Rev 3.0 NOTE: Depending on the variant you are using the PEG lanes used by the PCIe/104 Dual 10GbE will be different. Please contact support@connecttech.com for more information.	

PCIe/104 Bottom Connector (Up Stacking)

Function	PCIe/104 Stack Interface	
Location	P2	
Type	Samtec fine pitch stacking connector, part number: ASP-129646-03 PCIe/104 Bottom Side Connector (Connects in Stack Up Configurations) 15mm stack height.	
Pinout	Refer to PCI/104-Express & PCIe/104 Specification, Rev 3.0 NOTE: Depending on the variant you are using the PEG lanes used by the PCIe/104 Dual 10GbE will be different. Please contact support@connecttech.com for more information.	

SFP+ Pluggable Socket

Function	SFP+ Pluggable Socket
Location	P3, P4
Type	Samtec SFP+ Transceiver Interface: MECT-110-01-M-D-RA1-TR (socket connector only) SFP+ Cage: SFPC-2SL-02-S
Pinout	Refer to the following specifications for detailed pin-out and interface descriptions: - SFF-8418; Specification for SFP+ 10Gb/s Electrical Interface - SFF-8419; Specification for SFP+ Low Speed Electrical Interface This interface uses SFF 8431 protocol

Typical Installation

1. Ensure all external system power supplies are off.

2. Install the PCIe/104 Dual 10GbE into the PCIe/104 stack.

3. Switch on the Power Supply to the PCIe/104 Stack. DO NOT power up your system by plugging in live power. DO NOT connect the PCIe/104 Dual 10GbE into a live PCIe/104 stack.

On-Board Indicator LED's

The PCIe/104 Dual 10GbE has 2 on-board indicator LEDs.

LED	Description
D2	Link activity LED for Port 1
D12	Link speed (1G/10G) LED for Port 1
D3	Link activity LED for Port 0
D13	Link speed (1G/10G) LED for Port 0

Software

All software and software documentation for the PCIe/104 Dual 10GbE is provided directly by Intel.

To download drivers and software for the X710 chip family please follow the link below:

https://downloadcenter.intel.com/product/83950/Intel-Ethernet-Converged-Network-Adapter-XL710-Series
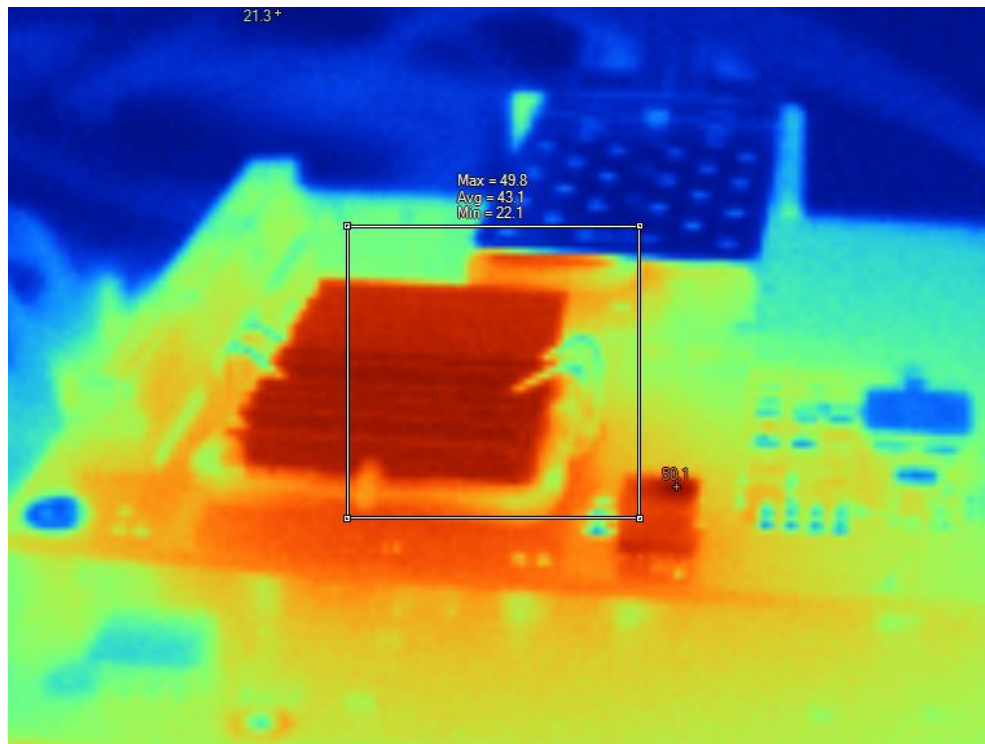
Current Consumption Details

Below are the maximum ratings of the PCIe/104 Dual 10GbE. This product requires that both +12V and +5V both be present on the PCIe/104 bus.

Maximums	Watts
Theoretical absolute maximum total draw of all functionality on the PCIe/104 Dual 10GbE Board not including pluggable SFP modules/cables	6

Thermal Details

The PCIe/104 Dual 10GbE Board's operating temperature range is limited to the Intel X710 chip which is 0ºC to +55ºC (32ºF to 131ºF).

See the image below showing the thermal signature of the PCIe/104 Dual 10GbE. The following heat signature is in a lab setting with an ambient temperature of +21.3ºC with no air-flow. The unit is running a 10Gb/s loopback stress test between the two SFP+ ports using an Intel Ethernet SFP Twinaxial passive cable.
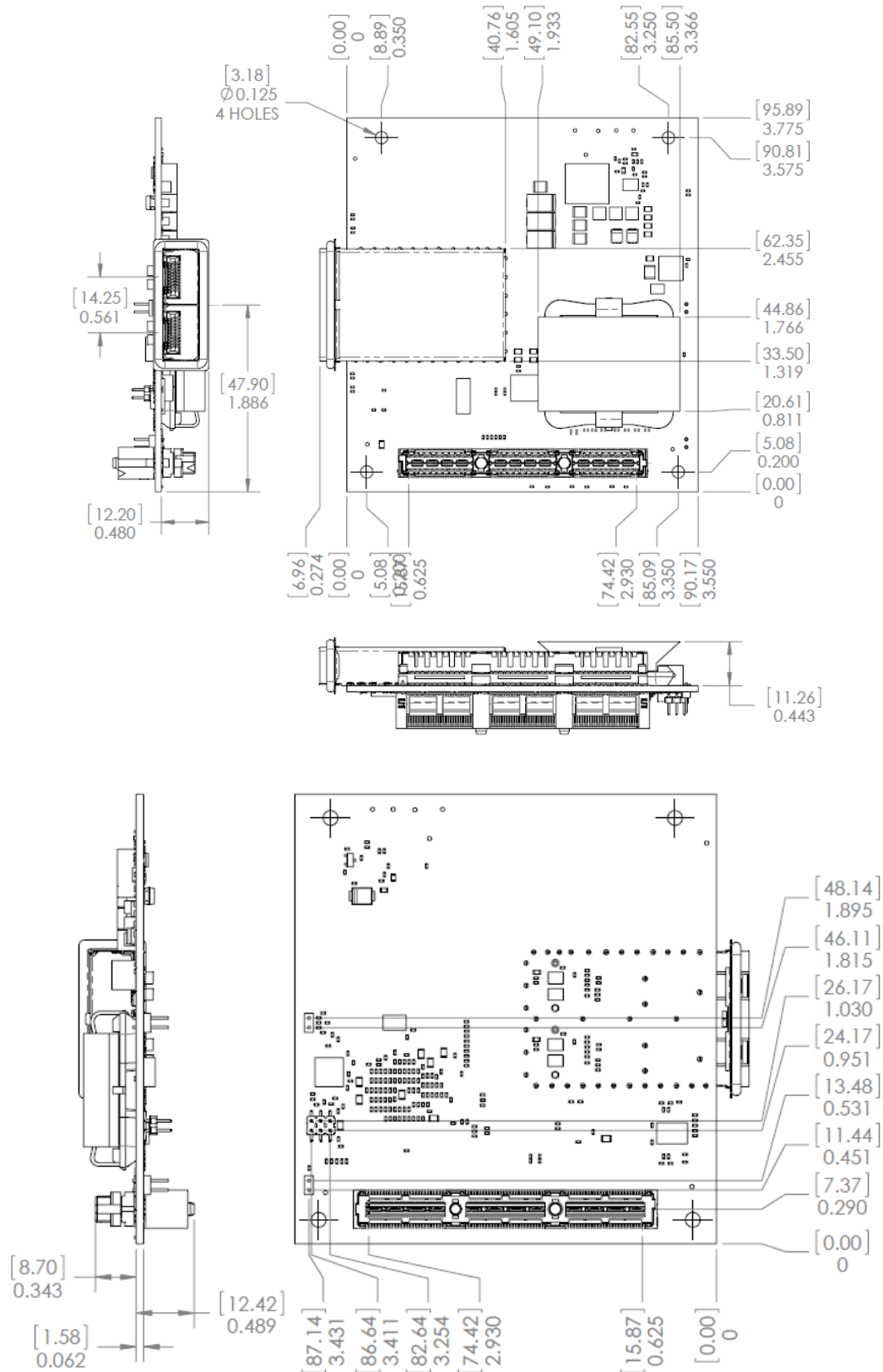

Mechanical Details

3D Model Download

A complete **3D STEP Model** file of the PCIe/104 Dual 10GbE can be downloaded here:

http://www.connecttech.com/ftp/3d_models/XDG101_3D_MODEL.zip

Weight

The XDG101 (PCIe/104 Dual 10GbE) has a weight of 72 grams with the default heatsink (ATS-50250B-C1-R0) installed, without any stand-offs installed.

PCIe/104 Dual 10GbE Outline and Dimensions

Cables

The following table summarizes tested cables that work with the PCIe/104 Dual 10GbE.

Name	Product Code	Description
Intel Ethernet SFP Twinaxial Cable	XDACBL1M	1 meter passive copper SFP+ cable
Intel Ethernet SFP Twinaxial Cable	XDACBL3M	3 meter passive copper SFP+ cable
Intel Ethernet SFP Twinaxial Cable	XDACBL5M	5 meter passive copper SFP+ cable

For more information regarding SFP/SFP+ cables and pluggable modules please see the link below or contact **support@connecttech.com**.

Intel X710 supported SFP/SFP+ modules and information:
http://www.intel.com/content/www/us/en/support/network-and-i-o/ethernet-products/000007045.html?wapkw=ethernet+sfp+sr+optics