The Embedded I/O Company

TEWS
T E C H N O L O G I E S

TXMC897

2 Channel 10GBASE-T and 2 Channel SFP+ 10 Gigabit Ethernet

Version 1.0

User Manual

Issue 1.0.1

May 2024

TXMC897-10R

2 Channel 10GBASE-T Ethernet; RJ45 Front I/O

(RoHS compliant)

TXMC897-20R

2 Channel 10GBASE-T and 2 Channel SFP+ 10 Gigabit Ethernet; RJ45 and SFP+ Front I/O

(RoHS compliant)

Issue	Description	Date
1.0.0	Initial issue	January 2024
1.0.1	Description of Status LEDs revised	May 2024

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1 Product Description

The TXMC897 is a Switched Mezzanine Card (XMC) compatible module providing a two channel 100Base-TX / 1000Base-T / 2.5GBase-T / 5GBase-T / 10GBase-T Ethernet and a two channel Enhanced Small Form Factor Pluggable (SFP+) 10 Gigabit Ethernet interface.

The XMC-Connector P15 provides access to the Intel X710-TM4/AT2 quad/dual port 10GbE controller via an x8/x4 PCIe link. Two Ethernet interfaces support 100, 1000 Mbit/s and 2.5, 5, 10 Gbit/s transmission rates and the two SFP+ Cages accept various SFP and SFP+ transceiver modules. These two SFP+ hosts are connected to the Ethernet Controller's SFI Interfaces.

The following transceiver modules have been successfully tested with the TXMC897-20R:

- Intel XDACBL1M
  (SFP+ Direct Attach Twinaxial Cable)

- Finisar FCBG110SD1C01
  (SFP+ SFPwire Active Optical Cable)

- Intel E10GSFPSR
  (SFP+ 10GBase-SR/SW or 1000Base-SX)

- Finisar FTLX8571D3BCV
  (SFP+ 10GBase-SR/SW or 1000Base-SX)

- Intel E10GSFPLR
  (SFP+ 10GBase-LR/LW or 1000Base-LX)

- Finisar FTLX1471D3BCV
  (SFP+ 10GBase-LR/LW or 1000Base-LX)

- 10Gtek ASF-10G-T
  (SFP+ 10GBase-T)

- Finisar FCLF8522P2BTL
  (SFP 1000Base-T)

All compatible transceiver modules and replacements of the tested modules will also work properly with the TXMC897. For preconfigured variants of the hardware module containing transceiver modules, please contact TEWS.

The controller is equipped with a 64 Mbit Serial Flash to support PXE and iSCSI boot and LEDs indicate the different network activities.

The four/two Ethernet interfaces of the TXMC897 are capable of performing an auto negotiation algorithm which allows both link-partners to determine the best link-parameters. The TXMC897 supports IEEE 1588/802.1AS Precision Time Protocol (PTP).

The TXMC897-10R provides two 10GBase-T Ethernet interfaces via front panel RJ45 connectors.

The TXMC897-20R provides two 10GBase-T Ethernet interfaces via front panel RJ45 connectors and two 10 Gigabit Ethernet interfaces via front panel SFP+ connectors.

Software Support:

- Software support for Intel X710-TM4/AT2 at www.intel.com

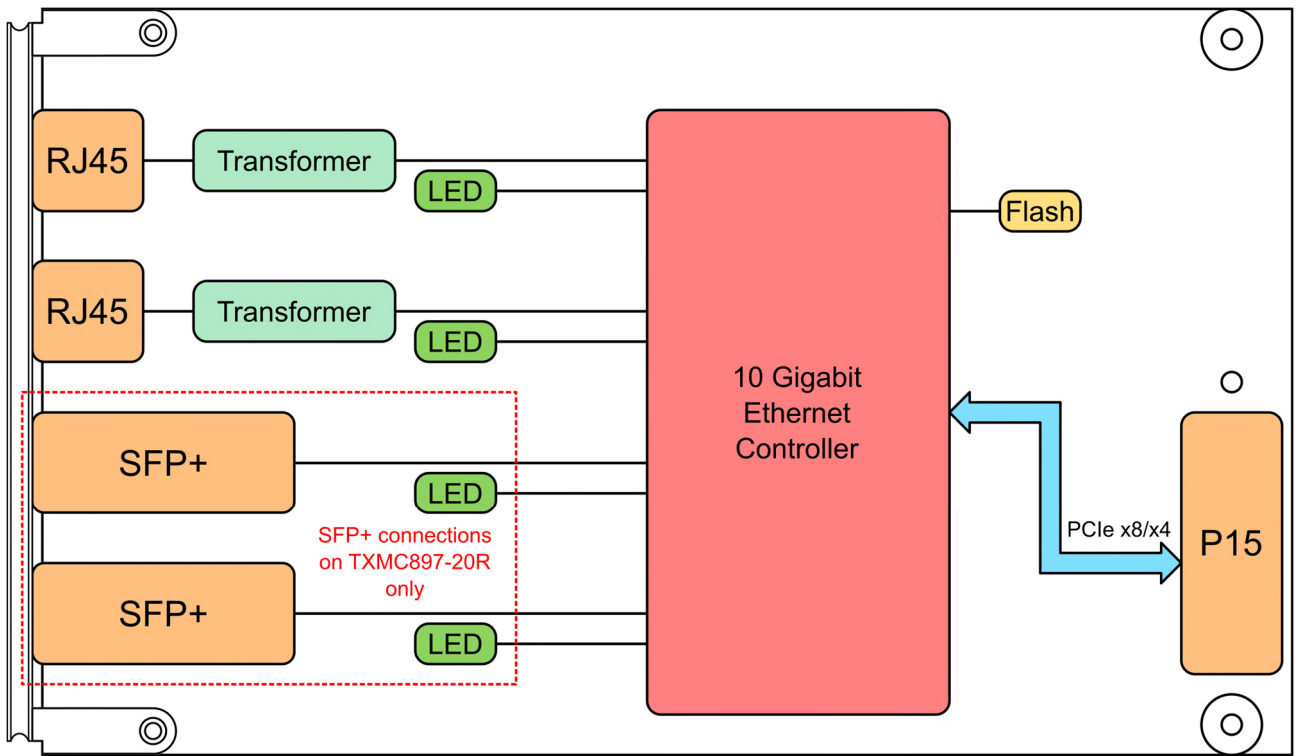- For operating systems not supported by Intel, please contact TEWS.

Figure 1-1 : Block Diagram

2 Technical Specification

XMC Interface	
Mechanical Interface	Switched Mezzanine Card (XMC) Interface conforming to ANSI/VITA 42.0 Short single-width (124 mm x 74 mm)
Electrical Interface	x8/x4 PCI Express (Specification 3.0) compliant interface conforming to ANSI/VITA 42.3

On Board Devices	
10 Gigabit Ethernet Controller	X710-TM4 or X710-AT2 (Intel)
64 Mbit Serial Flash for Boot ROM	W25Q64JV (Winbond)

I/O Interface		
Number of Channels	4/2	
I/O Standards	RJ45: 10GBase-T NBase-T 1000Base-T 100Base-TX SFP+: 10GBase-CU (SFP+ Direct Attach, twinax) SFPwire SFP+ Active Optical Cable 10GBase-SR/SW / 1000Base-SX 10GBase-LR/LW / 1000Base-LX 10GBase-T 1000Base-T	
I/O Connector	RJ45 (TE Connectivity 406732 or compatible) SFP+ (Molex 74754-0103 and 74441-0001 or compatible)	

Physical Data		
Power Requirements	580mA typical @ VPWR = +5V (four channel, no link) app. additional 45mA to 520mA per link 280mA typical @ VPWR = +12V (four channel, no link) app. additional 15mA to 230mA per link	
Temperature Range	Operating Storage	0°C to +55°C (constant airflow of 2m/s is required) -40°C to +85°C
MTBF	TXMC897-10R: 404000 h TXMC897-20R: 293000 h MTBF values shown are based on calculation according to MIL-HDBK-217F and MIL-HDBK-217F Notice 2; Environment: G_B 20°C. The MTBF calculation is based on component FIT rates provided by the component suppliers. If FIT rates are not available, MIL-HDBK-217F and MIL-HDBK-217F Notice 2 formulas are used for FIT rate calculation.	
Humidity	5 – 95 % non-condensing	

Weight	TXMC897-10R: 101 g TXMC897-20R: 110 g

<p align="center">Table 2-1 : Technical Specification</p>

3 Handling and Operation Instructions

3.1 ESD Protection

	This XMC module is sensitive to static electricity. Packing, unpacking and all other module handling has to be done with appropriate care.

3.2 Power Dissipation

	This XMC module requires adequate forced air cooling!

4 PCI Express Interface

4.1 X710 PCI Express Identifiers

Vendor-ID	0x8086 (Intel)
Device-ID	0x15FF (RJ45) 0x104E (SFP+)
Class Code	0x020000 (Ethernet Controller)
Subsystem Vendor-ID	0x8086 (Intel)
Subsystem Device-ID	0x0000

Table 4-1 : X710 PCI Express Identifiers

5 Ethernet Interface Status LEDs

The TXMC897 provides an individual LINK/ACT-LED and two individual SPEED-LEDs for every Ethernet Interface. Due to the fact that XMCs are mounted upside-down on the carrier card the Status LEDs are visible on the back side of the TXMC897. A marking is placed close to the three Status LEDs to indicate the Ethernet Port they correspond to.

See table below for more details:

LINK/ACT LED (green)	Description
OFF	No cable is connected or no link is established
ON	A link is established
BLINKING	Activity (the Ethernet Port transmits or receives data)

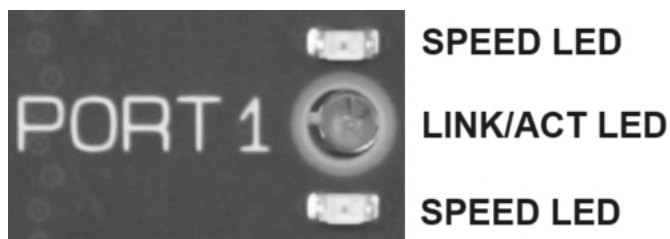| SPEED LEDs	Description
GREEN	Indicates 10Gbit/s link
ORANGE	Indicates 5Gbit/s, 2.5Gbit/s or 1000Mbit/s link
OFF	Indicates 100Mbit/s link

Table 5-1 : Status LEDs

Figure 5-1 : Status LEDs

6 Pin Assignment – I/O Connectors

6.1 RJ45 Connector

Pin	Signal (10GBase-T/NBase-T/1000Base-T)	Signal (100Base-TX)
1	TX0/RX0+	TX+
2	TX0/RX0-	TX-
3	TX1/RX1+	RX+
4	TX2/RX2+	not used
5	TX2/RX2-	not used
6	TX1/RX1-	RX-
7	TX3/RX3+	not used
8	TX3/RX3-	not used

Table 6-1 : RJ45 Connector

6.2 SFP+ Connector

Pin	Signal
1	VeeT
2	Tx_Fault
3	Tx_Disable
4	SDA
5	SCL
6	Mod-ABS
7	RS0
8	Rx_LOS
9	RS1
10	VeeR
11	VeeR
12	RD-
13	RD+
14	VeeR
15	VccR
16	VccT
17	VeeT
18	TD+
19	TD-
20	VeeT

Table 6-2 : SFP+ Connector