TBS-PCIE-FANET
Hardware User Manual

Rev.1.00

Revision History

Version	Date	Description	Publisher
Rev.1.00	2014/12/5	Initial Release	Li

Table of Contents

List of Figures

List of Tables

Introduction

Thank you for purchasing the **TBS-PCIE-FANET** board. Before using the product, be sure to carefully read this User Manual and fully understand how to correctly use the product.
Read through this manual and always keep it handy.

Safety Precautions | Be sure to observe these precautions

Observe the precautions listed below to prevent injuries to you or other personnel or damage to property.

- **Before using the product, read these safety precautions carefully to assure correct use.**
- **These precautions contain serious safety instructions that must be observed.**
- **After reading through this manual, be sure to always keep it handy.**

The following conventions are used to indicate and classify precautions in this manual.   Failure to observe precautions can result in injury to people or damage to property.

⚠ **Danger**	Indicates the high possibility of serious injury or death if the product is handled incorrectly.
⚠ **Warning**	Indicates the possibility of serious injury or death if the product is handled incorrectly.
⚠ **Caution**	Indicates the possibility of injury or physical damage in connection with houses or household goods if the product is handled incorrectly.

The following graphical symbols are used to indicate and classify precautions in this manual.
(Examples)

	Be sure to turn off the power switch
	Do not disassemble the product.
	Do not attempt this.

	⚠ **Warning**
🔌	**In the event of a failure, disconnect the power supply.** If the product is used as is, a fire or electric shock may occur.　Disconnect the power supply immediately and contact our sales personnel for repair.
🔌	**If an unpleasant smell or smoking occurs, disconnect the power supply.** If the product is used as is, a fire or electric shock may occur.　Disconnect the power supply immediately.　After verifying that no smoking is observed, contact our sales personnel for repair.
🛠	**Do not disassemble, repair or modify the product.** Otherwise, a fire or electric shock may occur due to a short circuit or heat generation.　For inspection, modification or repair, contact our sales personnel.
🚫	**Do not touch a cooling fan (when installing it).** As a cooling fan rotates in high speed, do not put your hand close to it.　Otherwise, it may cause injury to persons.　Never touch a rotating cooling fan.
🚫	**Do not place the product on unstable locations.** Otherwise, it may drop or fall, resulting in injury to persons or failure.
🚫	**If the product is dropped or damaged, do not use it as is.** Otherwise, a fire or electric shock may occur.
🚫	**Do not touch the product with a metallic object.** Otherwise, a fire or electric shock may occur.
🚫	**Do not place the product in dusty or humid locations or where water may splash.** Otherwise, a fire or electric shock may occur.
🚫	**Do not get the product wet or touch it with a wet hand.** Otherwise, the product may break down or it may cause a fire, smoking or electric shock.
🚫	**Do not touch a connector (gold-plated portion) on the product.** Otherwise, the surface of a connector may be contaminated with sweat or skin oil, resulting in contact failure of a connector or it may cause a malfunction, fire or electric shock due to static electricity.

	⚠ Caution
🚫	**Do not use or place the product in the following locations.** • Humid and dusty locations • Airless locations such as closet or bookshelf • Locations which receive oily smoke or steam • Locations exposed to direct sunlight • Locations close to heating equipment • Closed inside of a car where the temperature becomes high • Staticky locations • Locations close to water or chemicals Otherwise, a fire, electric shock, accident or deformation may occur due to a short circuit or heat generation.
🚫	**Do not place heavy things on the product.** Otherwise, the product may be damaged.

■ Disclaimer

This product is i.MX6 CPU for Freescale evaluation boards. Tokyo Electron Device Limited assumes no responsibility for any damages resulting from the use of this product for purposes other than those stated.

Even if the product is used properly, Tokyo Electron Device Limited assumes no responsibility for any damages caused by:
- Earthquake, thunder, natural disaster or fire resulting from the use beyond our responsibility, acts by a third party or other accidents, the customer's willful or accidental misuse or use under other abnormal conditions,
- Secondary impact arising from use of this product or its unusable state (business interruption or others),
- Use of this product against the instructions given in this manual or
- Malfunctions due to connection to other devices.

Tokyo Electron Device Limited assumes no responsibility or liability for:
- Erasure or corruption of data arising from use of this product
- Any consequences or other abnormalities arising from use of this product, or
- Damage of this product not due to our responsibility or failure due to modification

This product has been developed by assuming its use for research, testing or evaluation. It is not authorized for use in any system or application that requires high reliability.

Repair of this product is carried out by replacing it on a chargeable basis, not repairing the faulty devices.

However, non-chargeable replacement is offered for initial failure if such notification is received within two weeks after delivery of the product.

The specification of this product is subject to change without prior notice.

The product is subject to discontinuation without prior notice.

1. Related Documents and Board Accessories

【Related Documents】

・All documents relating to this board can be downloaded from our website.

・MECHATROLINK-Ⅲ Protocol document: http://www.mechatrolink.org/en/index.html

【Board Fixtures】

　・PCI Express X1 Slot

【Accessories】

　・None

2. Block Diagram

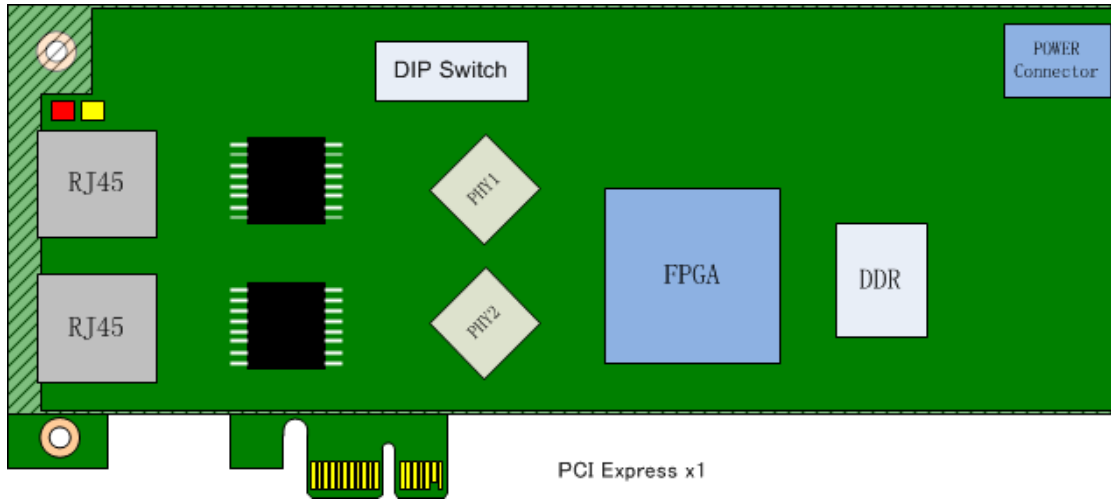Figure 2-1 shows the block diagram of the board

Figure 2-1 Block Diagram

3. External View of the Board
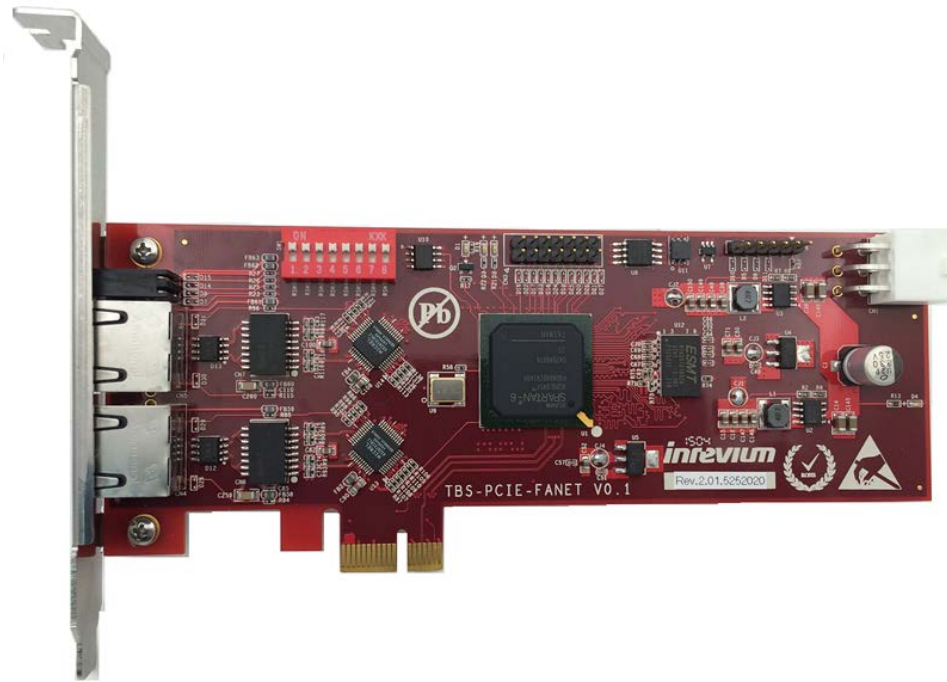
Figures 3-1 show the external view of the board.

Figure 3-1 Component Side

4. Board Specifications

4.1. On Board Function

Table 4-1 On Board Function Table

Function	Details	Quantity
FPGA	XILINX Spartan-6	1Pcs
Memory	ESMT DDR2 SDRAM 64MByte	1Pcs
Fast Ethernet	10/100M Ethernet LAN-PHY & RJ45 Connector	2port
SPI Flash	Winbond W25Q32BV	1port
I2C	1port : I2C Connected to EEPROM	1Pcs
Power	1Port:Power Connected to Slide Connector	1Pcs
Switch	8bit DIP Switch	1Pin
OSC	Clock 25MHz	1Pcs

4.2. Extended Connector

Table 4-2 Extended Connector Function Table

Function	Details	Quantity
GPIO	General Purpose input output 3.3V(2.54mm Pin Header)	12Line

5. Description of Components

5.1. Power Supply Structure

The Board has two power connectors for input power. One is AC adapter connector other one is expansion connector.
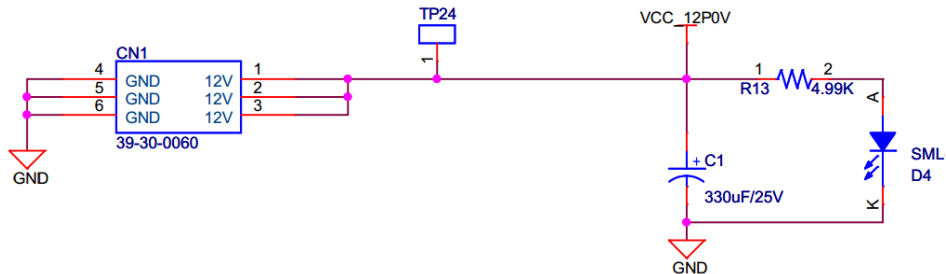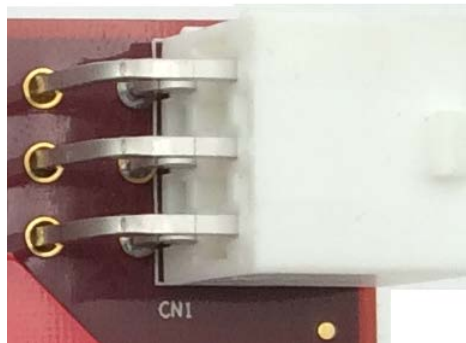

Figure 5-1 Power Input

Figure 5-2 Power Supply DC-Jack

5.2. Power Supply Status Checking

The current status of power supply can be verified on the power status LED(D4).

Figure 5-3 Power LED(D4)

5.3. LED

The board is equipped with two LEDs.
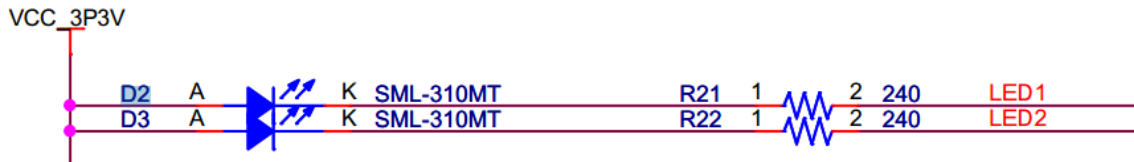Each LED will light up when the corresponding FPGA output pin is driven "Low".
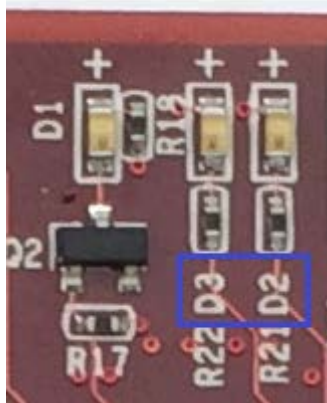
Figure 5-4 LED Structure

Figure 5-5 LED

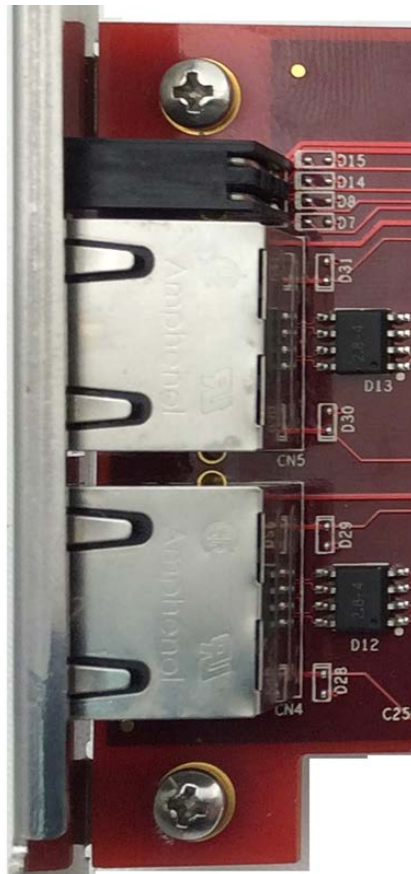## 5.4. LAN

The board is equipped with two Fast Ethernet interface.

5.5. DIP Switch

The board is equipped with a DIP Switch interface.

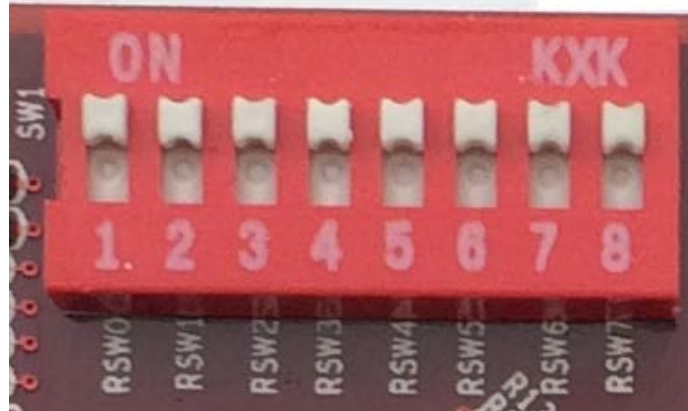This interface can be used for Node ID assignment.

Figure 5-7 DIP Switch

5.6. JTAG Interface
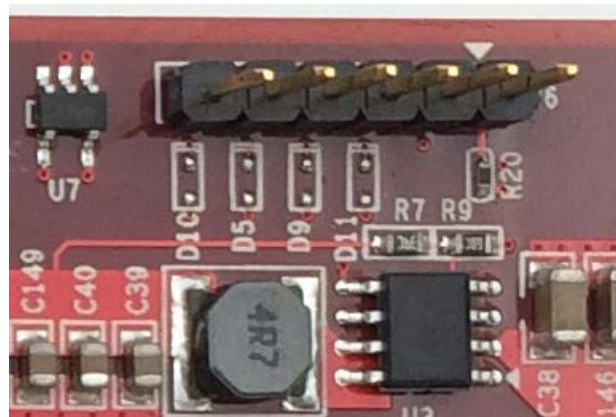
The board is equipped with a JTAG Debug interface (J6).

Figure 5-8 JTAG Interface

Table 5-1 JTAG Interface Pin Assignment

J6 Pin No.	Signal Name	I/O	Description
1	VCC_3P3V	—	3.3V Power
2	GND	—	GND
3	TCK	—	TCK
4	TDO	—	TDO
5	TDI	—	TDI
6	TMS	—	TMS

5.7. Expansion Interface

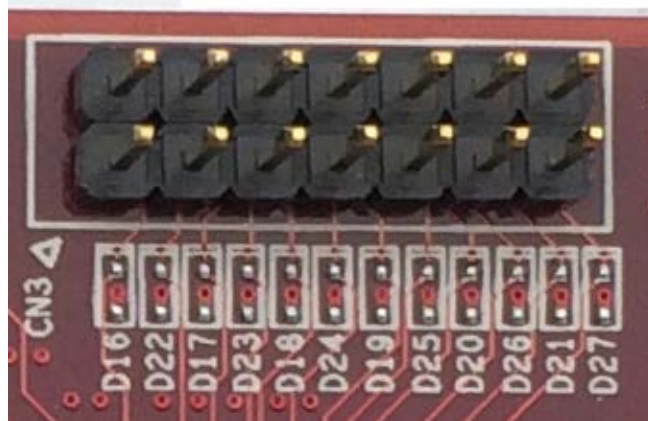The board is equipped with one expansion connector (CN3).

Figure 5-9 Expansion Connector

Table 5-2 Expansion Connector (CN3) Pin Assignment

CN3 Pin No.	Signal Name	FPGA Pin Name	I/O	Description
1	GND	—	Power	GND
2	VCC_3P3V	—	Power	3.3V Output(150mA)
3	IO7	—	IO	General Input Output
4	IO1	—	IO	General Input Output
5	IO8	—	IO	General Input Output
6	IO2	—	IO	General Input Output
7	IO9	—	IO	General Input Output
8	IO3	—	IO	General Input Output
9	IO10	—	IO	General Input Output
10	IO4	—	IO	General Input Output
11	IO11	—	IO	General Input Output
12	IO5	—	IO	General Input Output
13	IO12	—	IO	General Input Output
14	IO6	—	IO	General Input Output