

AX88772C Product Introduction

Revision 1.10
May 15th, 2013

Revision History

Revision	Date	Description
V0.10	2013/03/27	Preliminary release
V1.00	2013/05/08	1. Modified some descriptions in Section 1, 3, 8.
V1.10	2013/05/15	1. Modified some descriptions in Section 3, 4.

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1. Introduction

The AX88772C USB 2.0 to 10/100M Fast Ethernet controller with Microsoft AOAC(Always On Always Connected) support is a high performance and highly integrated ASIC which enables a low cost, small form factor, and simple plug-and-play Fast Ethernet network connection capability for desktops, notebook PCs, Ultrabooks, cradles/port replicators/docking stations, game consoles, digital-home appliances, and any embedded system using a standard USB port.

The AX88772C can be used in any embedded system with a USB host microcontroller requiring a twisted pair physical network connection. Featuring a USB interface (compliant with USB specification V2.0 and V1.1) to communicate with a USB Host Controller, the AX88772C also integrates on-chip Ethernet MAC and PHY (IEEE802.3 and IEEE802.3u compatible) and embedded memory. Additionally, the AX88772C needs only a single 25MHz crystal to drive both the USB and Ethernet PHYs.

The AX88772C offers a wide array of features including IPv4/IPv6 checksum offload engine, Protocol Offload(ARP & NS), HP Auto-MDIX, and IEEE 802.3x and back-pressure flow control. The AX88772C also offers multiple power management Wake-on-LAN features, including Magic Packet, Microsoft Wakeup Frame, Link Status Change, 32 Microsoft Wakeup Patterns and Wakeup Packet Indication that allows the AOAC platform to enter a low-power “Connected Standby” state and wake on a desired network pattern.

The AX88772C provides an optional Multi-Function-Bus portion A and B (MFA and MFB) for external PHY or external MAC for different application purposes. The MFA/MFB can be a reduce-media-independent interface (RMII) for implementing HomePlug, HomePNA, etc. functions. The MFA/MFB can also be a Reverse Reduced-MII (Reverse-RMII) for glueless MAC-to-MAC connections to any MCU with Ethernet MAC RMII interface. In addition, the MFA/MFB can be configured as general purpose I/O.

The following URL provides detailed online resources of ASIX Electronics high-speed USB-to-LAN solutions:

(Refer to <http://www.asix.com.tw/products.php?op=ProductList&PLine=71>)

USB 2.0 to 10/100M Fast Ethernet Controller with Microsoft AOAC Support

AX88772C -- USB 2.0 to 10/100M Fast Ethernet Controller with Microsoft AOAC Support

This document provides an overview of AX88772C USB 2.0 to 10/100M Fast Ethernet Controller with Microsoft AOAC Support product.

2. Block Diagram

The following is AX88772C block diagram,

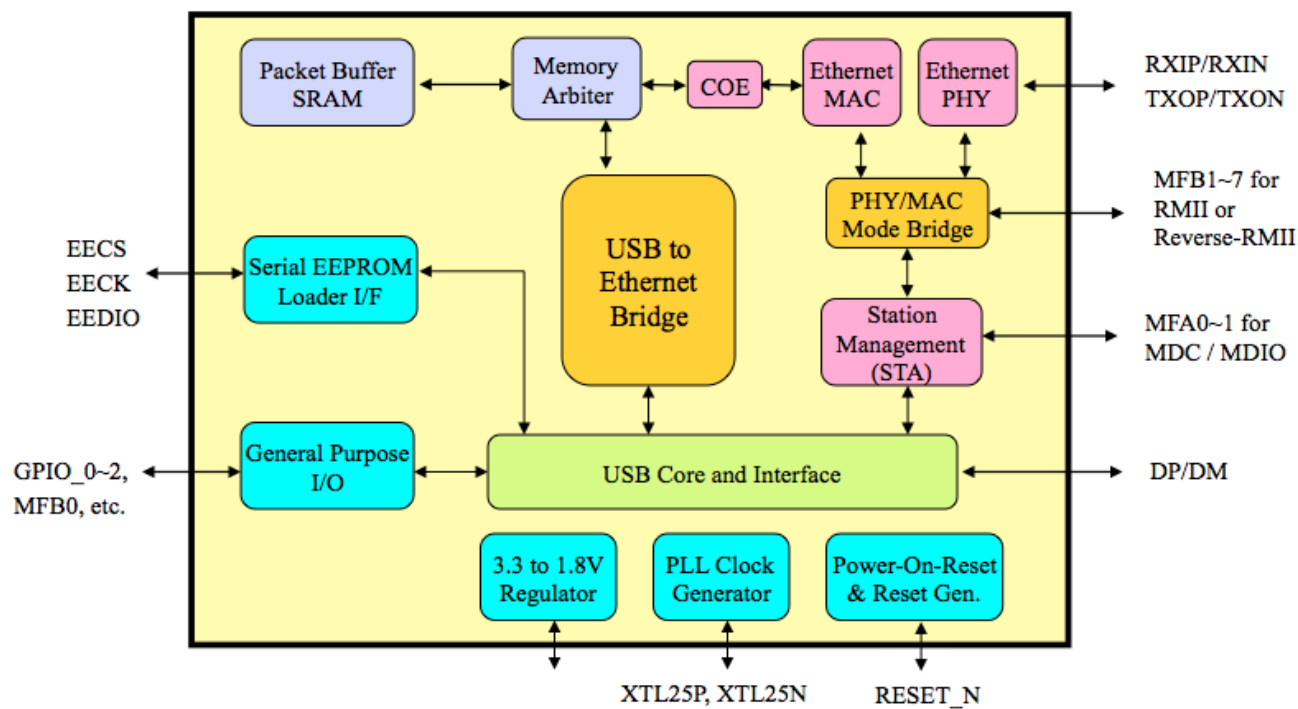


Figure 1. Block Diagram

2-1. Typical System Block Diagrams

- Hosted by USB to operate with internal Ethernet PHY only

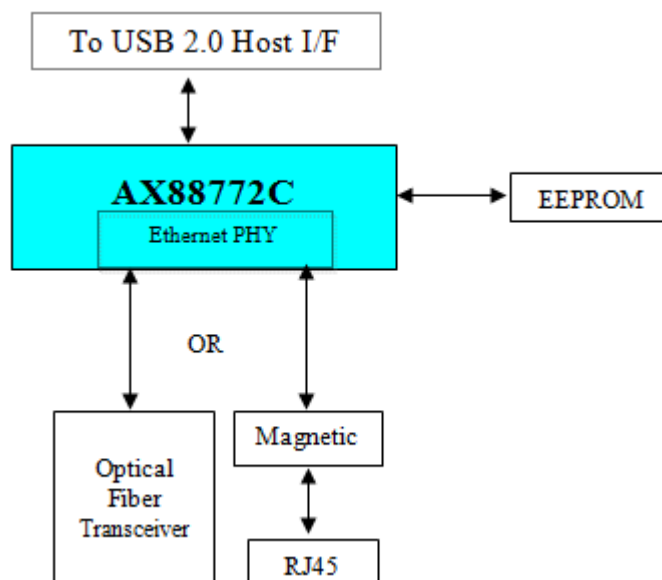


Figure 2 : USB 2.0 to LAN Adaptor (MAC mode)

- Hosted by USB to operate with either internal Ethernet PHY or RMII (in MAC mode)

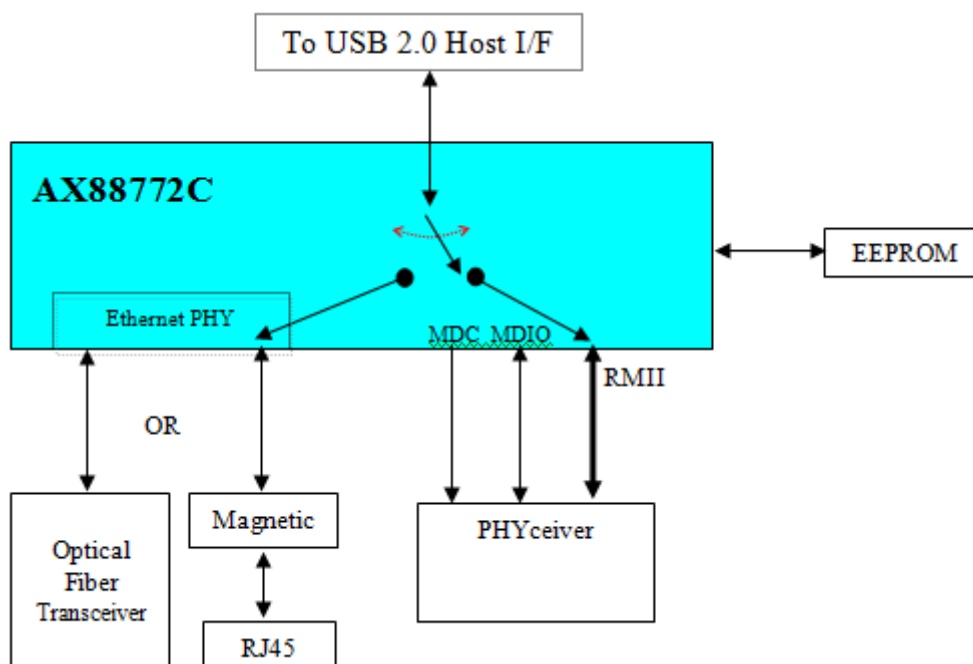
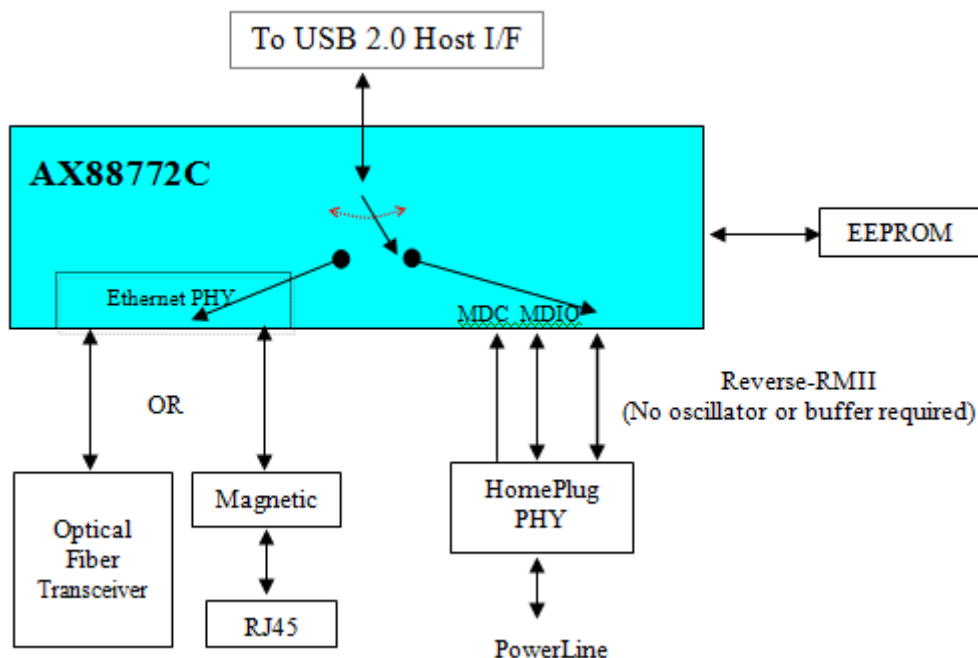
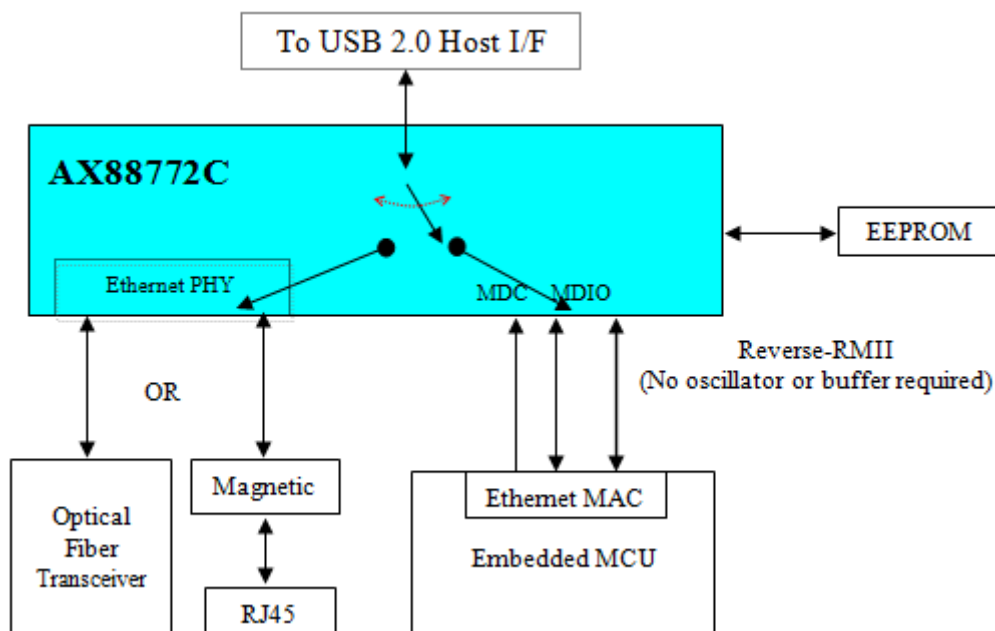


Figure 3 : USB 2.0 to Fast Ethernet and external PHYceiver Combo (MAC mode)

- Hosted by USB to operate with either internal Ethernet PHY (in MAC mode) or Reverse-RMII (in PHY mode)



3. Selection Guide

The following is the selection guide of ASIX Electronics USB to Ethernet family for different requirement applications. Please visit ASIX Electronics' High-Speed USB-to-LAN product web page (<http://www.asix.com.tw/products.php?PLine=71>) and contact ASIX's Sales (sales@asix.com.tw) for details.

Part No.	USB Speed	USB Hub	Ethernet MAC/PHY (Mbps)	Microsoft AOAC	MAC Interface	Crossover Detection and Auto-correction
AX88179	Super (3.0)	-	10/100/1000	-	-	v
AX88178A	High (2.0)	-	10/100/1000	-	-	v
AX88178	High (2.0)	-	10/100/1000 (MAC only)	-	MII/GMII/RGMII	-
AX88772C	High (2.0)	-	10/100	v	RMII/Rev-RMII(Optional)	v
AX88772B	High (2.0)	-	10/100	-	RMII/Rev-RMII(Optional)	v
AX88772A	High (2.0)	-	10/100	-	-	v
AX88172A	High (2.0)	-	10/100	-	(Rev-)MII/Rev-RMII	v
AX88772	High (2.0)	-	10/100	-	MII	-
AX88760	High (2.0)	3-Port	10/100	-	-	v

Part No.	IP/TCP/UDP Checksum	Wake-on-LAN	Serial Interface	Temperature Range (°C)	Package
AX88179	v	v	-	0 ~ +70	QFN-68
AX88178A	v	v	-	0 ~ +70	QFN-68
AX88178	-	v	-	0 ~ +70	LQFP-128
AX88772C	v	v	-	0 ~ +70	LQFP-64
AX88772B	v	v	-	0 ~ +70/ -45 ~ +85	LQFP-64
AX88772A	-	v	I ² C, SPI UART	0 ~ +70	LQFP-64
AX88172A	-	v	I ² C, SPI UART	0 ~ +70	TQFP-80
AX88772	-	v	-	0 ~ +70	LQFP-128
AX88760	-	v	-	0 ~ +70	LQFP-100

Figure 2. Selection Guide

4. Ordering Information

The following are the ordering information of AX88772C silicon and AX88772C demo boards. Please contact ASIX's Sales (sales@asix.com.tw) for more details.

Part Number	Description
AX88772CLF	64 PIN, LQFP Package, Commercial grade 0°C to +70 °C (Green, Lead-Free)

AX88772C Demo Boards	Description
AX88772C USB to 100Base-TX Ethernet Demo Board	This is a USB dongle for AX88772C USB to 100Base-TX Ethernet application
AX88772C USB to 100Base-TX Ethernet (with RMII) Demo Board	This is a general-purpose demo board for AX88772C USB to 100Base-TX Ethernet (with optional RMII/Rev-RMII interface) application
AX88772C USB to 100Base-FX 1x9 SC Ethernet Demo Board	This is a general-purpose demo board for AX88772C USB to 100Base-FX 1x9 SC Fiber Ethernet (with optional RMII/Rev-RMII interface) application
AX88772C USB to 100Base-FX POF Ethernet Demo Board	This is a general-purpose demo board for AX88772C USB to 100Base-FX POF (Plastic Optical Fiber) Fiber Ethernet (with optional RMII/Rev-RMII interface) application

Figure 3. Ordering Information

5. Target Applications

The following are some PC/Internet and consumer electronics target applications for your reference.

PC/Internet



Consumer Electronics



Figure 4. Target Applications

6. Mass Production Solutions

To support the mass production for those products using AX88772C chip, ASIX provides the Windows SROM Programming Tool and Windows Production Test Tool solutions for AX88772C customers. This chapter provides a brief introduction for both solutions. Please refer to “AX88772C EEPROM User Guide” for details.

6-1. Windows SROM Programming Tool

ASIX Electronics provides a Windows SROM Programming tool for users to easily program the Serial EEPROM of AX88772C on a typical Windows PC. This AX88772C Windows SROM Programming Tool supports to customize the MAC address, Serial Number, Vendor ID and Product ID, etc. for AX88772C based application systems in mass production.

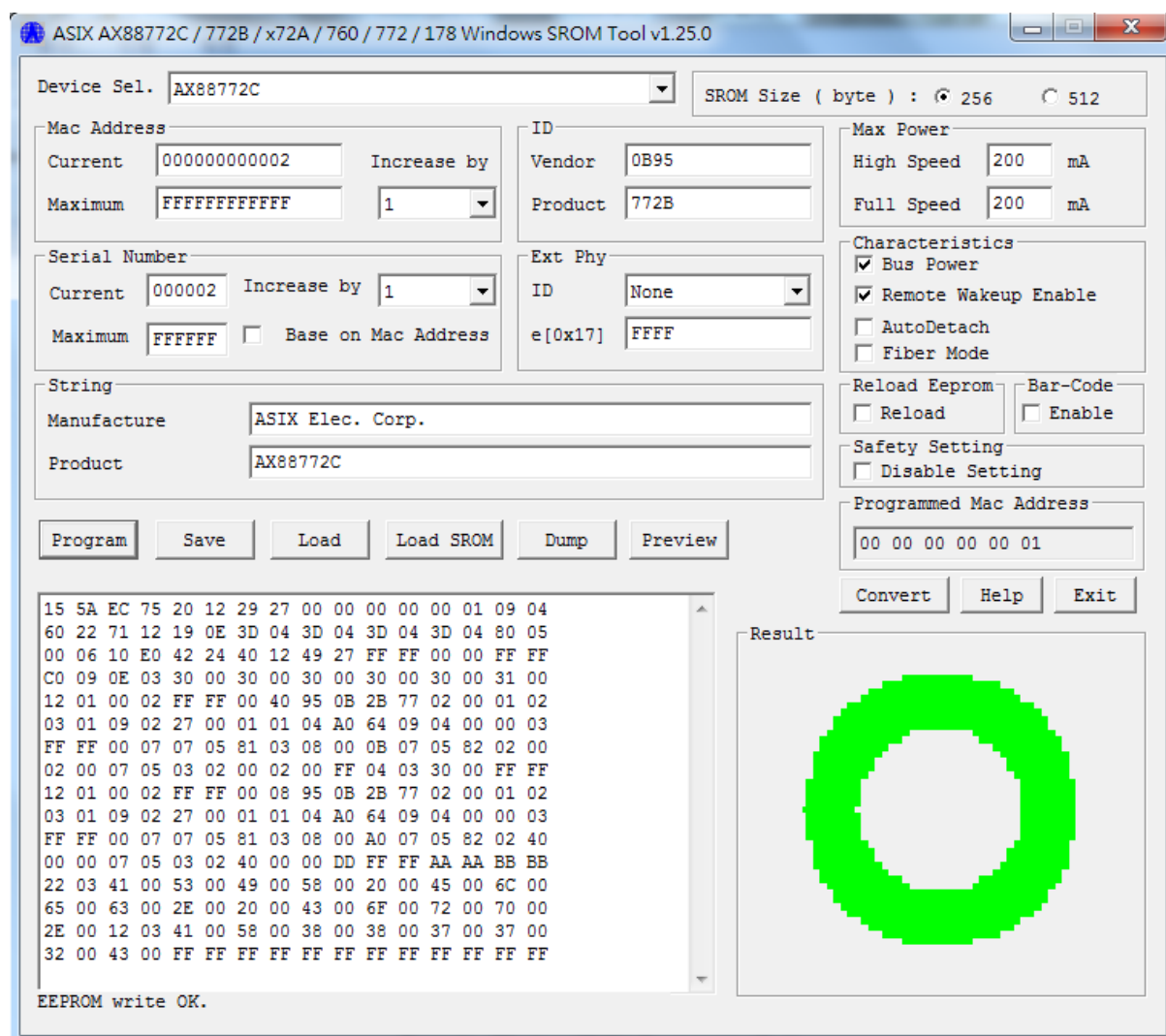


Figure 5. Windows SROM Programming Tool

6-2. Windows Production Test Tool

ASIX Electronics provides a Windows Production Test tool for users to run some basic network function tests and program the EEPROM of their AX88772C based application systems during production. This tool is used for testing the USB to Ethernet Network Adapter product that uses ASIX AX88772C chip.

This tool supports to send/receive packets in different Ethernet speed modes, and program EEPROM. This tool can be run on a Windows PC, which installs the special AX88772C Windows test driver. This tool also needs a separate server PC to run the test server tool. The test server tool on server PC can receive packets from the “device under test” product, and then reply back.

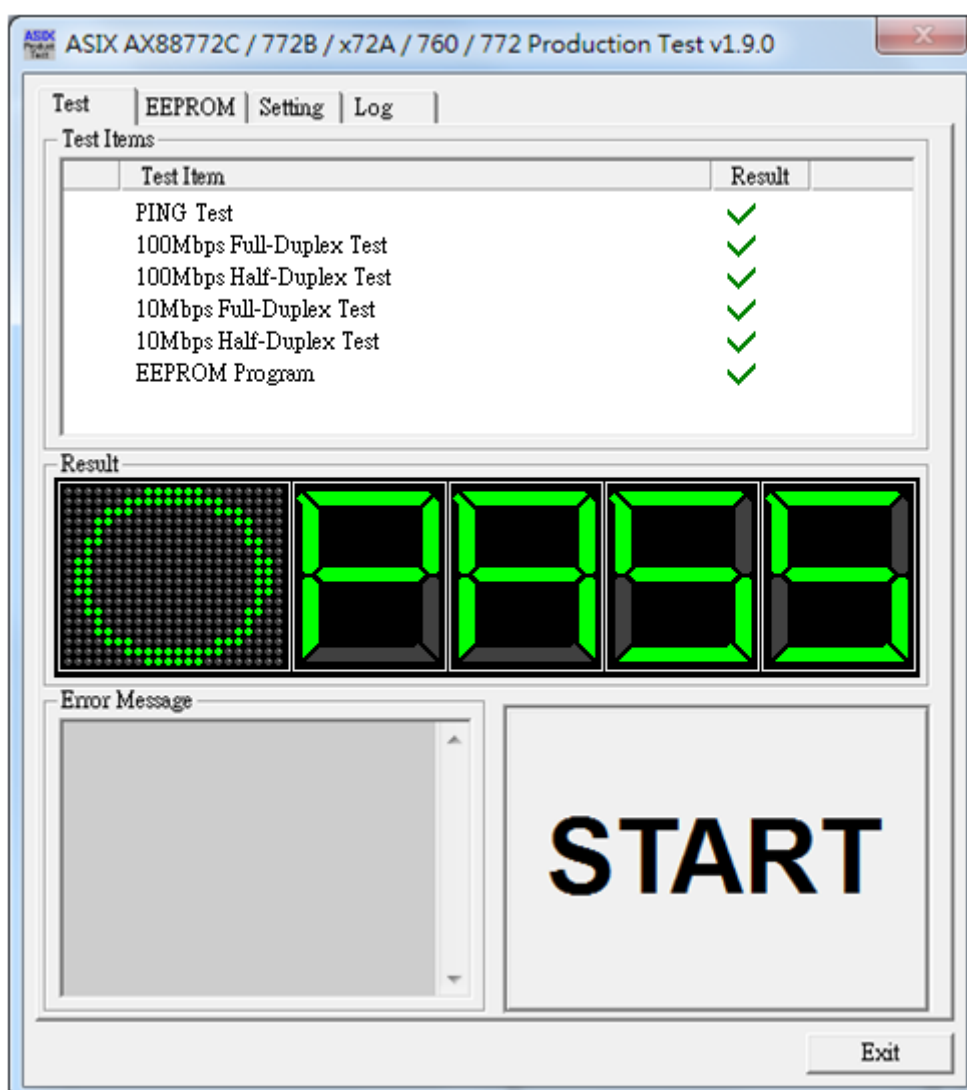


Figure 6. Windows Production Test Tool

7. AX88772C Demo Boards

ASIX Electronics provides several AX88772C demo boards for users to evaluate the basic functions of AX88772C on different target applications. If you need to purchase the AX88772C demo boards, please contact ASIX's Sales (sales@asix.com.tw) for more details.

7-1. AX88772C USB to 100Base-TX Ethernet Demo Board

The following is the picture of AX88772C USB to 100Base-TX Ethernet demo board for your reference.

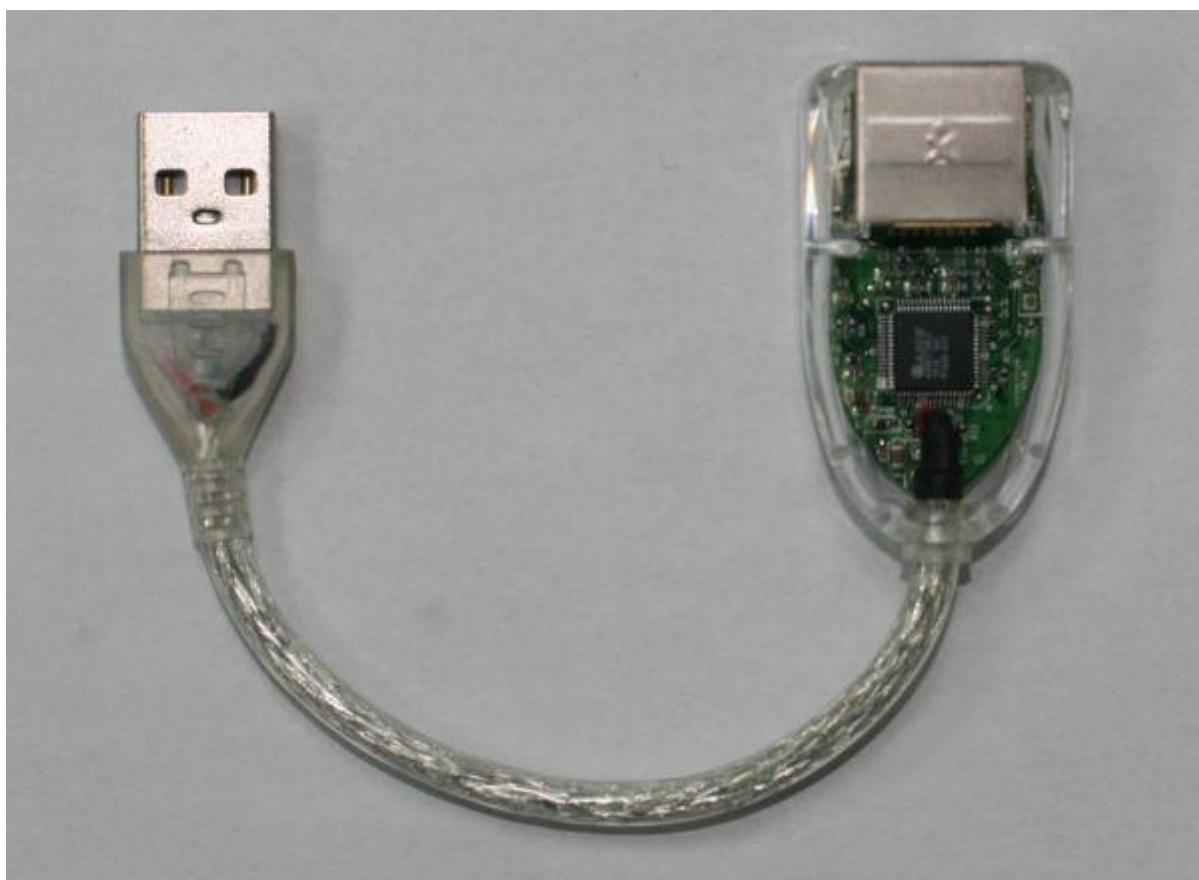


Figure 7. AX88772C USB to 100Base-TX Ethernet Demo Board

7-2. AX88772C USB to 100Base-TX Ethernet (with RMII) Demo Board

The following is the picture of AX88772C USB to 100Base-TX Ethernet (with RMII) demo board for your reference.

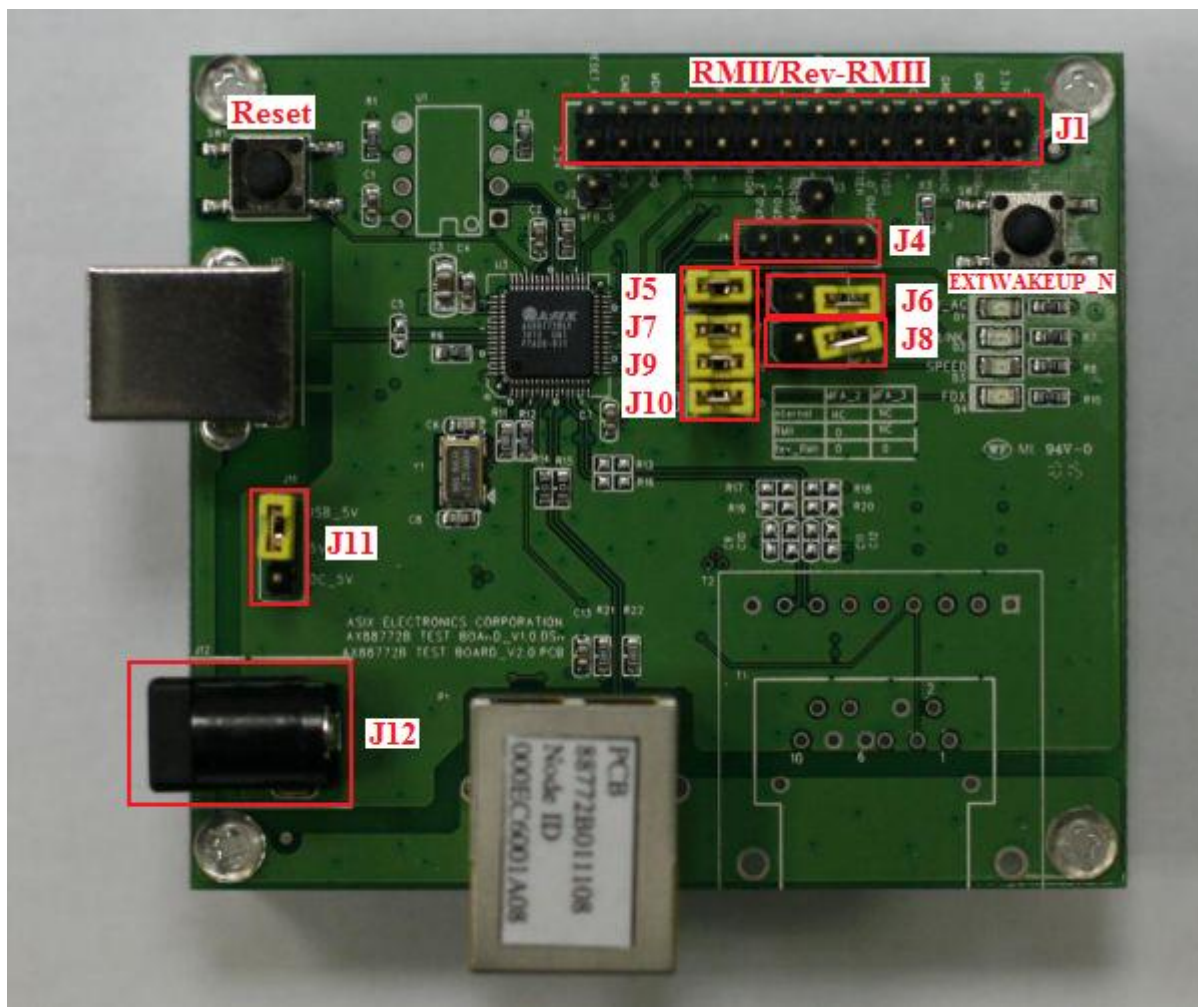


Figure 8. AX88772C USB to 100Base-TX Ethernet (with RMII) Demo Board

7-3. AX88772C USB to 100Base-FX 1x9 SC Ethernet Demo Board

The following is the picture of AX88772C USB to 100Base-FX 1x9 SC Ethernet demo board for your reference.

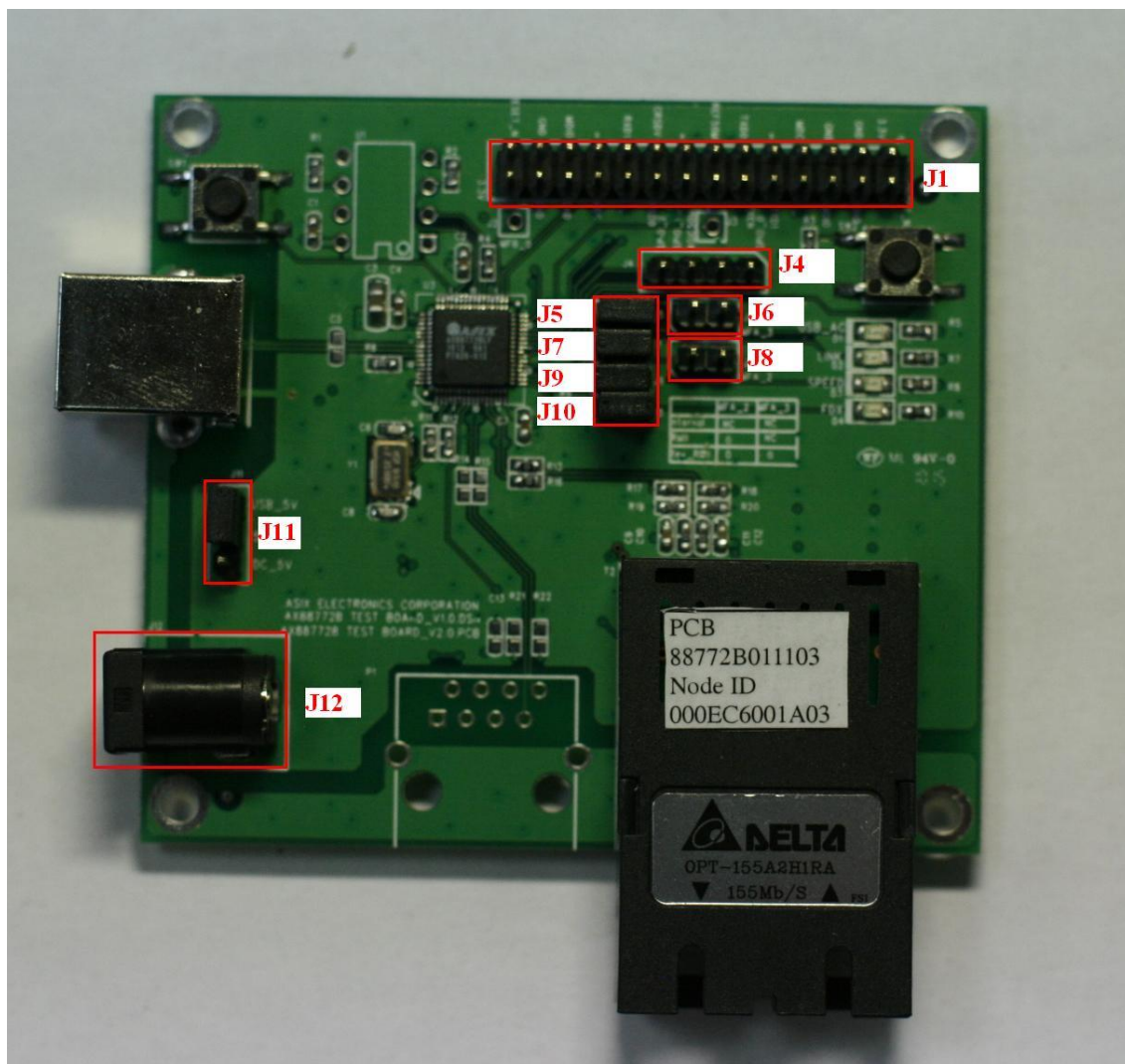


Figure 9. AX88772C USB to 100Base-FX 1x9 SC Ethernet Demo Board

7-4. AX88772C USB to 100Base-FX POF Ethernet Demo Board

The following is the picture of AX88772C USB to 100Base-FX POF Ethernet demo board for your reference.

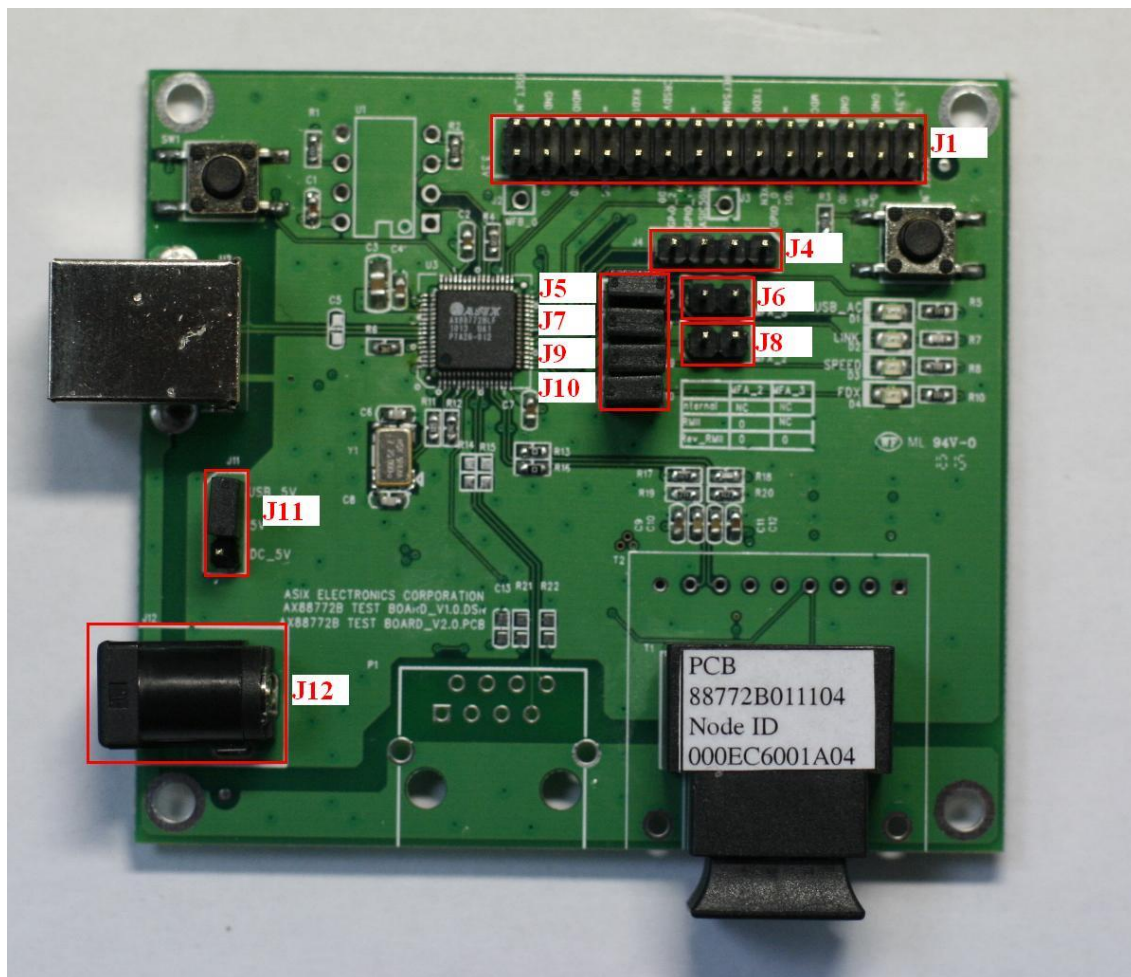


Figure 10. AX88772C USB to 100Base-FX POF Ethernet Demo Board

The following is the jumper configuration table of the AX88772C USB to 100Base-TX/FX Ethernet (with RMII) demo boards.

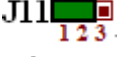
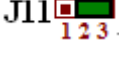
Jumper	Setting	Description
J1		The J1 is the RMII/Reverse-RMII interface headers. Please refer to AX88772C USB to 100Base-TX/FX Ethernet (with RMII) Demo Boards Reference Schematic for details.
J4	J4  Pole #1: GPIO2 Pole #2: VCC 3.3V Pole #3: GPIO1 Pole #4:GPIO0/PME	AX88772C GPIO Pins
J6/J8	J6  J8  (Default)	Set AX88772C to Internal Ethernet PHY
	J6  J8 	Set AX88772C to RMII mode
	J6  J8 	Reserved
	J6  J8 	Set AX88772C to Reverse-RMII mode
J5/J7/J9/J10	J5  J7  J9  J10  J5 : PHY_N J7 : RMII_N J9 : MDIO J10 : MDC	The multi-function pins (PHY_N, RMII_N, MDIO, MDC) for RMII/Reverse-RMII pins.
	J5  J7  J9  J10  (Default) J5 : MFA3 J7 : MFA2 J9 : MFA1 J10 : MFA0	The multi-function pins (MFA0 ~ MFA3) for LED display purpose. Please refer to PIN configuration of MFA in section 2.2 of AX88772C datasheet for details.
J11/J12	J11  (Default) Pole #1: USB_5V Pole #2: 5V Pole #3: DC_5V	Set AX88772C USB to 100Base-TX/FX Ethernet (with RMII) demo boards to Bus-power mode. The J12 connector doesn't need to be connected.
	J11 	Set AX88772C USB to 100Base-TX/FX Ethernet (with RMII) demo boards to Self-power mode. The J12 connector should be connected to a 5V power adapter.

Figure 11. AX88772C USB to 100Base-TX/FX Ethernet with RMII Demo Boards Jumper Setting Table

8. Related Technical Archives

The following is the AX88772C technical archives table.

AX88772C Technical Archives	Type	Availability
AX88772C Product Introduction	Document	This document
AX88772C Product Brief	Document	Public Release
AX88772C USB to 100Base-TX Ethernet Demo Board Reference Schematic	Schematic	Public Release
AX88772C USB to 100Base-TX/FX Ethernet with RMII Demo Boards Reference Schematic	Schematic	Public Release
AX88772C Windows 8 64-bit Driver (Note1)	Driver	Public Release
AX88772C Windows 8 32-bit Driver (Note1)	Driver	Public Release
AX88772C Windows 7 64-bit Driver	Driver	Public Release
AX88772C Windows 7 32-bit Driver	Driver	Public Release
AX88772C Windows XP/Vista 64-bit Driver	Driver	Public Release
AX88772C Windows XP/Vista 32-bit Driver	Driver	Public Release
AX88772C Apple Mac OSX 10.5 to 10.8 Drivers	Driver	Public Release
AX88772C Android/Linux Driver	Driver	Public Release
AX88772C WinCE 7.0 Driver	Driver	Public Release
AX88772C WinCE 6.0 Driver	Driver	Public Release
AX88772C WinCE 5.0/Mobile 5/Mobile 6 Driver	Driver	Public Release
AX88772C Datasheet	Document	MyASIX Membership
AX88772C USB-to-LAN Application Design Guide	Document	MyASIX Membership
AX88772C USB to 100Base-TX Ethernet Demo Board PCB file	PCB	MyASIX Membership
AX88772C USB to 100Base-TX/FX Ethernet with RMII Demo Boards PCB file	PCB	MyASIX Membership
AX88772C USB to 100Base-TX Ethernet Demo Board Gerber files	Gerber	MyASIX Membership
AX88772C USB to 100Base-TX/FX Ethernet with RMII Demo Boards Gerber files	Gerber	MyASIX Membership
AX88772C USB to 100Base-TX Ethernet Demo Board BOM File	BOM	MyASIX Membership
AX88772C USB to 100Base-TX Ethernet with RMII Demo Board BOM file	BOM	MyASIX Membership
AX88772C USB to 100Base-FX 1x9 SC Ethernet Demo Board BOM file	BOM	MyASIX Membership
AX88772C USB to 100Base-FX POF Ethernet Demo Board BOM file	BOM	MyASIX Membership
AX88772C IBIS Model	IBIS	MyASIX Membership
AX88772C EEPROM/Manufacture User Guide	Document	Contact ASIX Sales
AX88772C Windows SROM Programming Tool	Utility	Contact ASIX Sales
AX88772C Windows Production Test Tool	Utility	Contact ASIX Sales
AX88772C Linux SROM Programming Tool	Utility	Contact ASIX Sales
AX88772C Windows IEEE 802.3 Compliant Test	Utility	Contact ASIX Sales

Tool		
AX88772C Performance Test Report	Report	Contact ASIX Sales
AX88772C RoHS Report	Report	Contact ASIX Sales
AX88772C Reliability Report	Report	Contact ASIX Sales
AX88772C USB-IF Compliant Test Report	Report	Contact ASIX Sales
AX88772C IEEE 802.3 Compliant Test Reports	Report	Contact ASIX Sales

*Note 1: The Windows 8 32-bit/64-bit systems already support AX88772C/AX88772B/AX88772A/AX88760/AX88772 inbox drivers.

Figure 12. Related Technical Archives

Availability Type	Description
Public Release	Please download the technical archives from AX88772C product web page directly.
MyASIX Membership	Please register MyASIX membership from MyASIX register web page (http://www.asix.com.tw/RegLogin.php?mod=thisis) first and then download the technical archives from AX88772C product web page .
Contact ASIX Sales	Please contact ASIX's Sales (sales@asix.com.tw) for more details.

Figure 13. Technical Archives Availability Type



**4F, No.8, Hsin Ann Rd., Hsinchu Science Park,
Hsinchu, Taiwan, R.O.C.**

TEL: +886-3-5799500

FAX: +886-3-5799558

Email: support@asix.com.tw

Web: <http://www.asix.com.tw>

Features

- Single chip USB 2.0 to 10/100M Fast Ethernet controller
- Single chip USB 2.0 to RMII, support HomePNA and HomePlug PHY
- Single chip USB 2.0 to Reverse-RMII, supports glueless MAC-to-MAC connections
- **USB Device Interface**
 - Integrates on-chip USB 2.0 transceiver and SIE compliant to USB Spec 1.1 and 2.0
 - Supports USB Full and High Speed modes with Bus-Power or Self-Power capability
 - Supports 4 endpoints on USB interface
 - Supports AutoDetach power saving, Detach from USB host when Ethernet cable is unplugged
 - High performance packet transfer rate over USB bus using proprietary burst transfer mechanism (US Patent Approval)
- **Fast Ethernet Controller**
 - Integrates 10/100Mbps Fast Ethernet MAC/PHY
 - IEEE 802.3 10Base-T/100Base-TX compatible
 - IEEE 802.3 100BASE-FX compatible
 - Supports twisted pair crossover detection and auto-correction (Auto-MDIX)
 - Embeds SRAM for packet buffering
 - Supports IPv4/ IPv6 packet Checksum Offload Engine to reduce CPU loading, including IPv4 IP/TCP/UDP/ICMP/IGMP & IPv6 TCP/UDP/ICMPv6 checksum check & generation
 - Supports full duplex operation with IEEE 802.3x flow control and half duplex operation with back-pressure flow control
 - Supports 2 VLAN ID filtering, received VLAN Tag (4 bytes) can be stripped off or preserved
 - PHY loop-back diagnostic capability
 - Supports Multiple unicast MAC destination address filter

Product Description

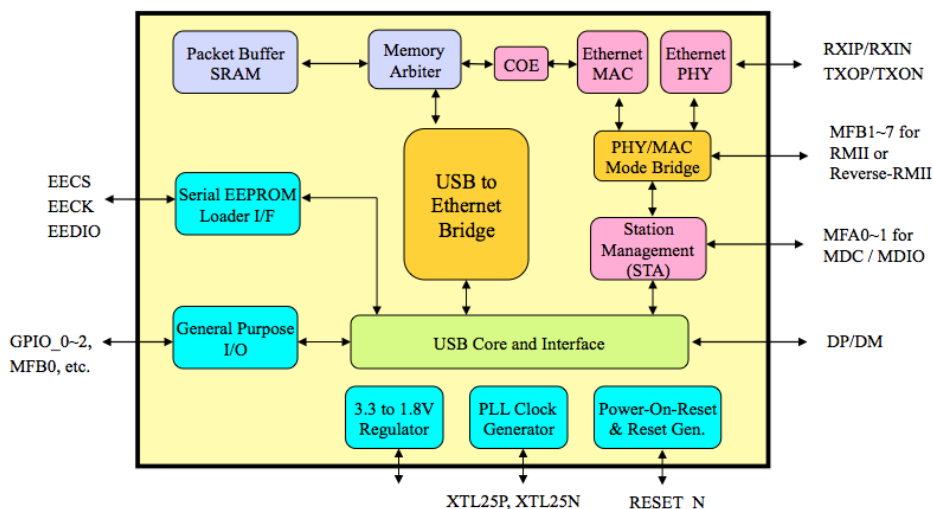
The AX88772C USB 2.0 to 10/100M Fast Ethernet controller with Microsoft AOAC(Always On Always Connected) support is a high performance and highly integrated ASIC which enables a low cost, small form factor, and simple plug-and-play Fast Ethernet network connection capability for desktops, notebook PCs, Ultrabooks, cradles/port replicators/docking stations, game consoles, digital-home appliances, and any embedded system using a standard USB port. The AX88772C can be used in any embedded system with a USB host microcontroller requiring a twisted pair physical network connection. Featuring a USB interface (compliant with USB specification V2.0 and V1.1) to communicate with a USB Host Controller, the AX88772C also integrates on-chip Ethernet MAC and PHY (IEEE802.3 and IEEE802.3u compatible) and embedded memory. Additionally, the AX88772C needs only a single 25MHz crystal to drive both the USB and Ethernet PHYs.

The AX88772C offers a wide array of features including IPv4/IPv6 checksum offload engine, Protocol Offload(ARP & NS), Auto-MDIX, and IEEE 802.3x and back-pressure flow control. The AX88772C also offers multiple power management Wake-on-LAN features, including Magic Packet, Microsoft Wakeup Frame, Link Status Change, 32 bitmap Wake on LAN Patterns and Wake Packet Indication that allows the AOAC platform to enter a low-power "Connected Standby" state and wake on a desired network pattern.

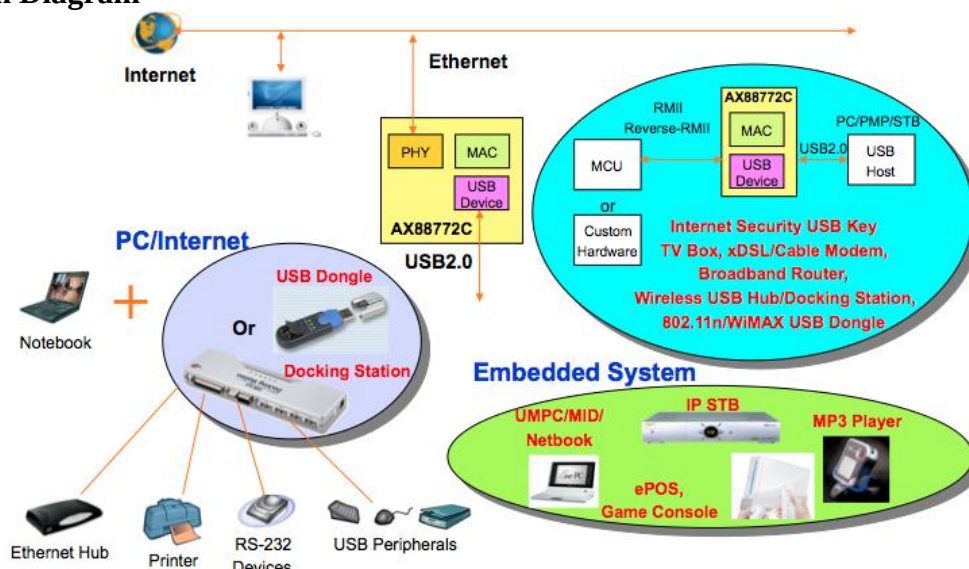
Product Brief

- **Support Wake-on-LAN Function**
 - Supports Suspend Mode and Remote Wakeup via Link-change, Magic packet, MS wakeup frame and external wakeup pin
 - Supports Protocol Offloads (ARP & NS) for Windows 8 and 7 Networking Power Management
 - Optional PHY power down during Suspend mode
 - Supports 32 bitmap Wake on LAN Patterns
 - Supports Wake Packet Indication
 - Supports Receive Filter Wakeup
- **Versatile External Media Interface**
 - Optional RMII interface in MAC mode allows AX88772C to work with HomePNA and HomePlug PHY
 - Optional Reverse-RMII interface in PHY mode allows AX88772C to support glueless MAC-to-MAC connections
- **Advanced Power Management Features**
 - Supports dynamic power management to reduce power dissipation during idle or light traffic period
 - Supports very low power Wake-on-LAN (WOL) mode when the system enters suspend mode and waits for network event to wake it up
- Supports 256/512 bytes (93c56/93c66) of serial EEPROM (for storing USB Descriptors)
- Supports automatic loading of Ethernet ID, USB Descriptors and Adapter Configuration from EEPROM after power-on initialization
- Integrates on-chip voltage regulator and only requires a single 3.3V power supply
- Single 25MHz clock input from either crystal or oscillator source
- Integrates on-chip power-on reset circuit
- Small form factor with 64-pin LQFP RoHS compliant package
- Operating commercial temperature range 0°C to 70°C

Block Diagram



Application Diagram



High-speed USB-to-LAN Applications



How to identify authentic ASIX USB to LAN Products

Revision 1.00
July 16th, 2013

Revision History

Revision	Date	Description
1.00	2013/07/16	Initial release.

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1. Introduction

This document indicates how to identify authentic ASIX USB to LAN products and only adapts to AX88772C/AX88772B/AX88772A/AX88760/AX88772 products.

Recently some USB to LAN devices with Non-authentic ASIX USB to LAN solution inside illegally use ASIX default VID/PID. The illegal USB to LAN devices might cause some abnormal network functionalities failure issues on your target platforms. Please refer to below sections to identify if your tested USB to LAN device is the authentic ASIX USB to LAN products or not.

NOTE:

ASIX DOES NOT GUARANTEE AND PROVIDE ANY SUPPORT FOR THOSE ILLEGAL NON-AUTHENTIC ASIX USB TO LAN PRODUCTS. PLEASE PURCHASE AUTHENTIC ASIX USB TO LAN PRODUCTS INSTEAD IF YOU ARE USING THE ILLEGAL NON-AUTHENTIC ASIX USB TO LAN PRODUCTS NOW.

ASIX authentic products should have the following ASIX mark on the top side of IC.



Of course, you might not be able to open the case of your tested USB to LAN device to check ASIX mark on the top side of IC. You can still refer to below sections to identify if your USB to LAN device is ASIX solution inside or not.

2. How to check the VID/PID of your USB to LAN device

Before installing ASIX's standard USB to LAN drivers, please refer to this section to check if the VID/PID of your tested USB to LAN device is supported in the following ASIX's default VID/PID table or not? If no, please contact the manufacturer of your USB to LAN device to get proper drivers.

ASIX Product	ASIX Vendor ID	Product ID
AX88772C	0B95h	772Bh
AX88772B	0B95h	772Bh/7E2Bh
AX88760	0B95h	772Ah
AX88772A	0B95h	772Ah
AX88772	0B95h	7720h

Figure 1. ASIX USB to LAN Products Default VID/PID

Note:

1. ASIX USB to LAN standard drivers might support some known customer's VID/PID. Please check ASIX USB to LAN standard drivers for details.
2. Some ASIX customers' USB to LAN products have their own VID/PID. In this case, you should contact the manufacturer of your USB to LAN device to get proper customized drivers.

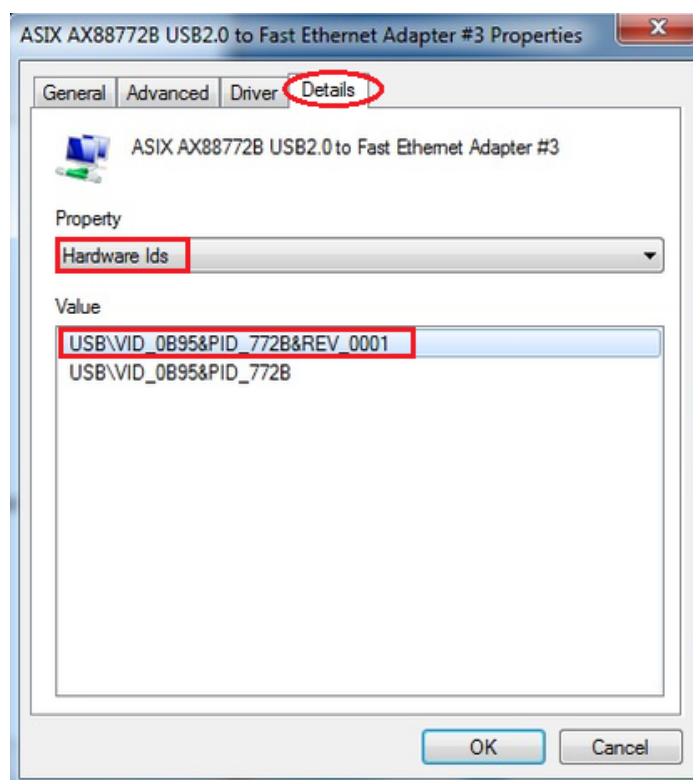


Figure 2. How to check VID/PID on Windows system

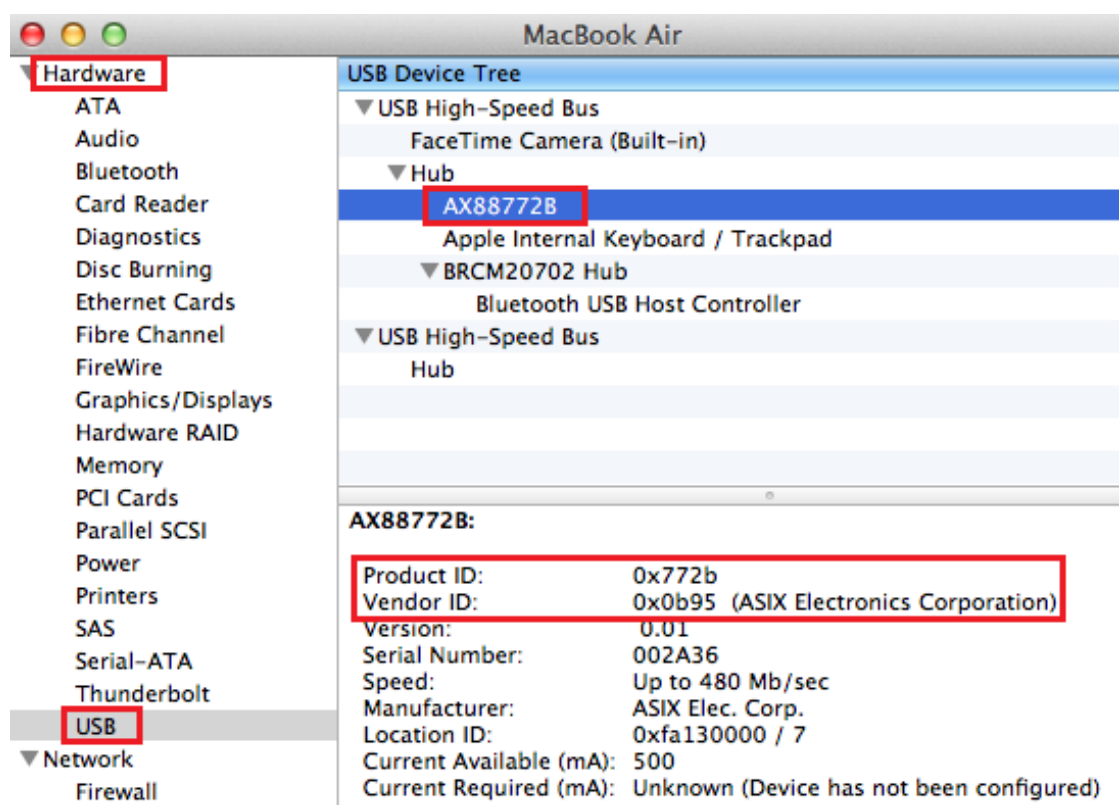


Figure 3. How to check VID/PID on Mac OSX system

lsusb

```
Bus 002 Device 005: ID 0b27:0165 Ritek Corp.
Bus 002 Device 008: ID 0b95:772b ASIX Electronics Corp.
Bus 003 Device 002: ID 0461:4d16 Primax Electronics, Ltd
Bus 004 Device 002: ID 0461:0010 Primax Electronics, Ltd HP Keyboard
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
Bus 002 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
Bus 003 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub
Bus 004 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub
Bus 005 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub
Bus 006 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub
Bus 007 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub
```

Figure 4. How to check VID/PID on Linux system

3. Download the latest ASIX USB to LAN Drivers

In order to identify the illegal Non-authentic ASIX USB to LAN products, please download the latest ASIX USB to LAN drivers from ASIX web site

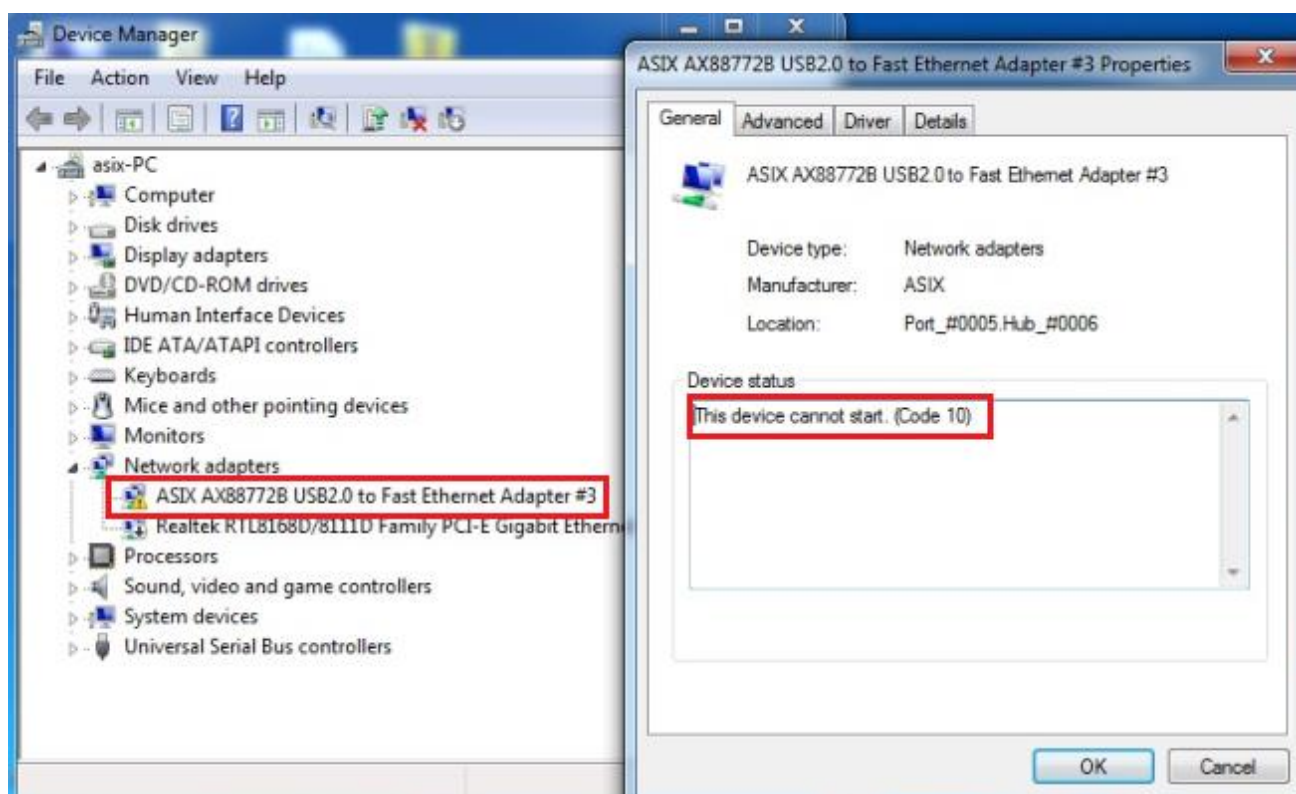
(<http://www.asix.com.tw/products.php?op=ProductList&PLine=71>).

You can refer to [Section 2](#) to get the VID/PID of your USB to LAN device and then refer to [Figure 1](#) to identify which ASIX product drivers should be downloaded.

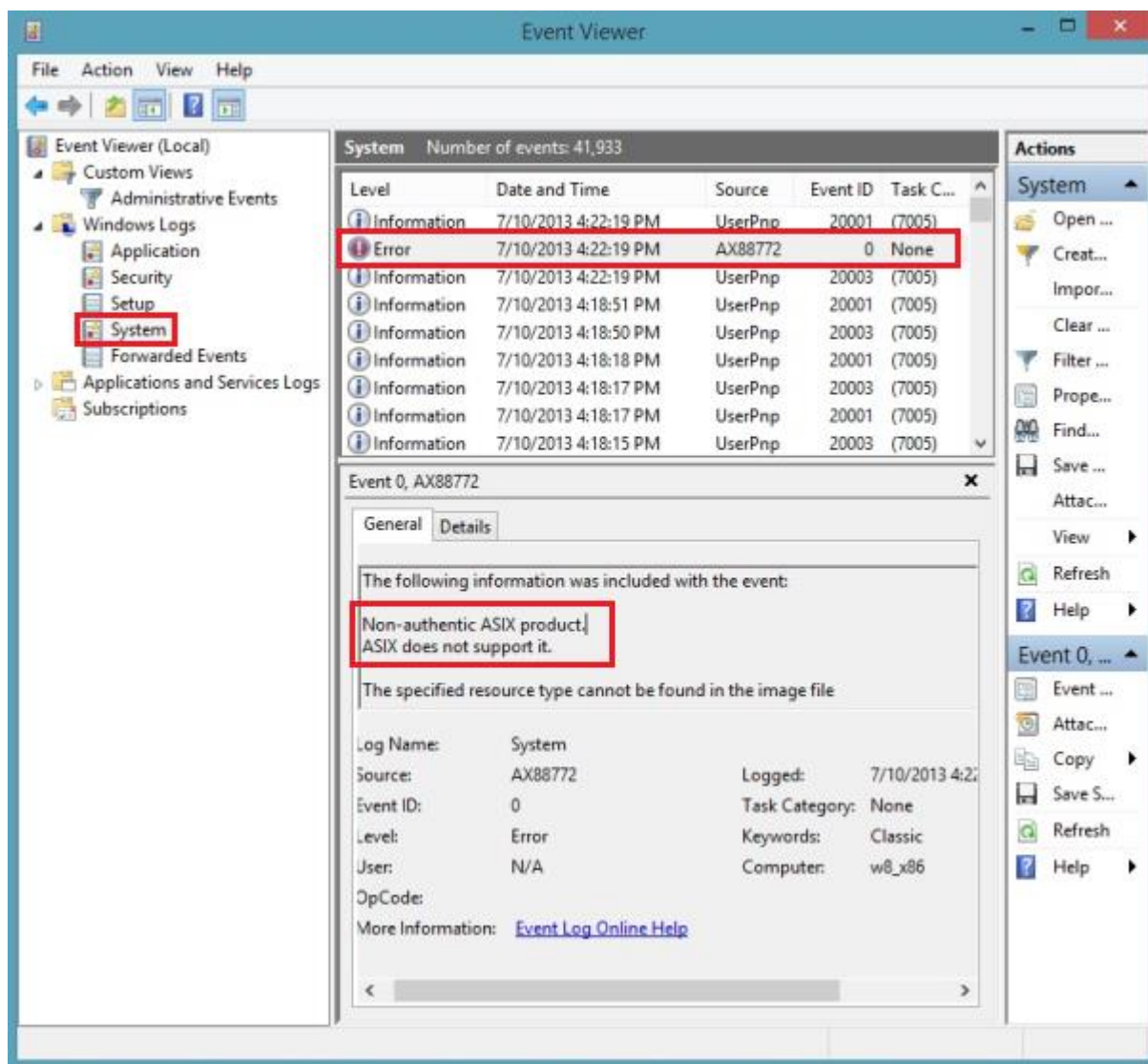
4. How to identify authentic ASIX USB to LAN Product on Windows

1. Refer to [Section 3](#) to download the latest ASIX USB to LAN Windows driver.
2. Install the ASIX USB to LAN Windows driver on your Windows platform and make sure if the driver can be installed successfully or not?

If your USB to LAN device is Non-authentic ASIX product inside, you should see below Yellow Exclamation mark on AX88772B Windows driver with Error Code 10 error message on the Device Manager console as below figure.



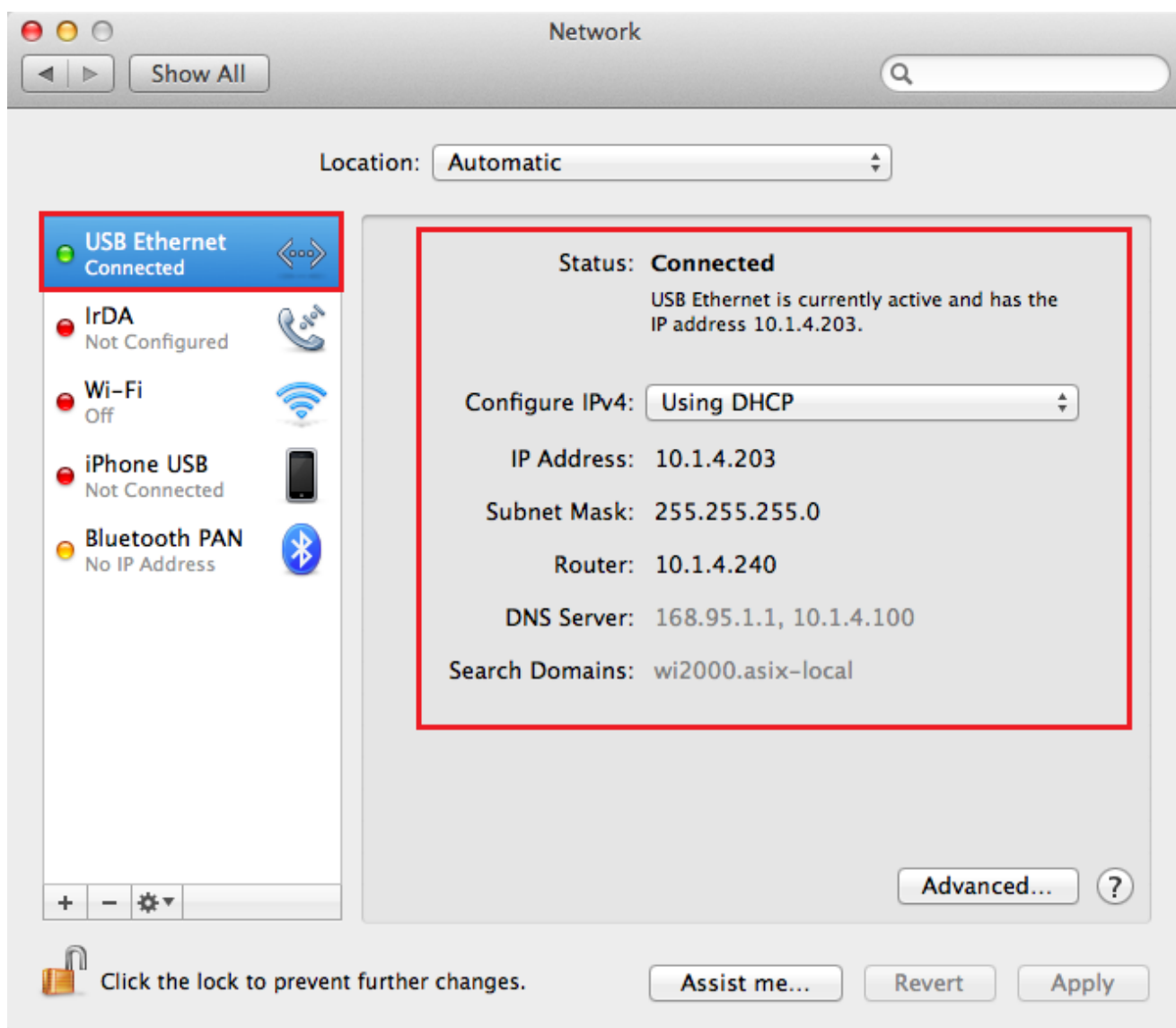
3. You can refer to below figure to double check if your USB to LAN device is ASIX product inside or not? If your USB to LAN device is Non-authentic ASIX product inside, you should see below Error Message “**Non-authentic ASIX product. ASIX does not support it.**” on the Windows Event Viewer console.



5. How to identify authentic ASIX USB to LAN Product on Mac OSX

1. Refer to [Section 3](#) to download the latest ASIX USB to LAN Mac OSX driver.
2. Refer to the MAC OSX Driver Installation Guide to install the ASIX USB to LAN Mac OSX driver on your Mac OSX platform and make sure if the driver can be installed successfully or not?

If your USB to LAN device is ASIX product inside, you should install ASIX USB to LAN Mac OSX driver successfully as below figure.



3. If you can't install ASIX USB to LAN driver successfully, you can refer to below figure to double check if your USB to LAN device is ASIX's product inside or not? If your USB to LAN device is Non-authentic ASIX product inside, you should see below "**Non-authentic ASIX product, ASIX does not support it.**" error message by running the "**sudo dmesg**" command on the Mac OSX Terminal console.

```
allan$ sudo dmesg
```

```
Password:
```

```
.....
```

```
DSMOS has arrived
```

```
macx_swapon SUCCESS
```

```
AppleUSBMultitouchDriver::handleReport - not in path binary mode, received 0x74 data packet of length 58  
virtual bool IOHIDEventSystemUserClient::initWithTask(task_t, void *, UInt32): Client task not privileged  
to open IOHIDSystem for mapping memory (e00002c1)
```

Authentic ASIX product normal messages

```
AppleUSBEthernet: start - Version number 3.9.0
```

```
AppleUSBEthernet: Input buffers 64, Output buffers 64
```

```
AppleUSBEthernet: Ethernet address 00:0e:c6:00:2a:36
```

```
AppleUSBEthernet::monitorLinkStatus - Link up at 100 Mbps - Full Duplex (PHY regs 5,6:0xc1e1,0x000b)
```

```
Sandbox: sandboxd(344) deny mach-lookup com.apple.coresymbolicationd
```

```
AppleUSBEthernet::disable - Link down.
```

Non-authentic ASIX product error messages

```
AppleUSBEthernet: start - Version number 3.9.0
```

```
AppleUSBEthernet: Non-authentic ASIX product, ASIX does not support it.
```

```
.....
```

```
.....
```

6. How to identify authentic ASIX USB to LAN Product on Linux

1. Refer to [Section 3](#) to download the latest ASIX USB to LAN Linux driver.
2. Change to the ASIX USB to LAN Linux driver source folder and then refer to below commands to build and install the compiled ASIX USB to LAN Linux driver on your Android/Linux platform. Run “**ifconfig -a**” and “**dmesg**” commands to make sure if the ASIX USB to LAN Linux driver was installed successfully or not?

```
# make
make -C /lib/modules/3.5.7/build
SUBDIRS=/home/allan/AX88772C_772B_772A_760_772_178_LINUX_Driver_v4.9.0_Source modules
make[1]: Entering directory `/usr/src/linux-3.5.0'
  CC [M] /home/allan/AX88772C_772B_772A_760_772_178_LINUX_Driver_v4.9.0_Source/asix.o
/home/allan/AX88772C_772B_772A_760_772_178_LINUX_Driver_v4.9.0_Source/asix.c: In function
'ax88772b_suspend':
/home/allan/AX88772C_772B_772A_760_772_178_LINUX_Driver_v4.9.0_Source/asix.c:812:6:
warning: unused variable 'tmp32'
  Building modules, stage 2.
  MODPOST 1 modules
  CC /home/allan/AX88772C_772B_772A_760_772_178_LINUX_Driver_v4.9.0_Source/asix.mod.o
  LD [M] /home/allan/AX88772C_772B_772A_760_772_178_LINUX_Driver_v4.9.0_Source/asix.ko
make[1]: Leaving directory `/usr/src/linux-3.5.0'
# make install
su -c "cp -v asix.ko /lib/modules/3.5.7/kernel/drivers/net/usb && /sbin/depmod -a"
`asix.ko' -> `/lib/modules/3.5.7/kernel/drivers/net/usb/asix.ko'
# insmod asix.ko
# ifconfig -a
eth0    Link encap:Ethernet HWaddr 90:e6:ba:d8:94:84
        UP BROADCAST MULTICAST MTU:1500 Metric:1
        RX packets:0 errors:0 dropped:0 overruns:0 frame:0
        TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:1000
        RX bytes:0 (0.0 B) TX bytes:0 (0.0 B)

eth28   Link encap:Ethernet HWaddr 00:0e:c6:00:2a:36
        inet addr:192.168.20.144 Bcast:192.168.20.255 Mask:255.255.255.0
        inet6 addr: fe80::20e:c6ff:fe00:2a36/64 Scope:Link
        UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
        RX packets:59 errors:0 dropped:0 overruns:0 frame:0
        TX packets:67 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:1000
        RX bytes:16945 (16.9 KB) TX bytes:9426 (9.4 KB)

lo      Link encap:Local Loopback
        inet addr:127.0.0.1 Mask:255.0.0.0
        inet6 addr: ::1/128 Scope:Host
        UP LOOPBACK RUNNING MTU:16436 Metric:1
        RX packets:1558 errors:0 dropped:0 overruns:0 frame:0
        TX packets:1558 errors:0 dropped:0 overruns:0 carrier:0
```



```
collisions:0 txqueuelen:0
RX bytes:126300 (126.3 KB) TX bytes:126300 (126.3 KB)
```

dmesg

```
[ 620.345602] usb 2-6: new high-speed USB device number 15 using ehci_hcd
[ 620.490014] usb 2-6: New USB device found, idVendor=0b95, idProduct=772b
[ 620.490025] usb 2-6: New USB device strings: Mfr=1, Product=2, SerialNumber=3
[ 620.490033] usb 2-6: Product: AX88772B
[ 620.490038] usb 2-6: Manufacturer: ASIX Elec. Corp.
[ 620.490043] usb 2-6: SerialNumber: 002A36
[ 620.518127] ASIX USB Ethernet Adapter:v4.9.0 23:06:44 Jul 11 2013
[ 620.518127] http://www.asix.com.tw
[ 621.151696] eth%d: status ep1in, 8 bytes period 11
[ 621.152152] eth1: register 'asix' at usb-0000:00:13.2-6, ASIX AX88772B USB 2.0 Ethernet, 00:0e:c6:00:2a:36
[ 621.152209] usbcore: registered new interface driver asix
[ 621.189489] eth28: rxqlen 0 --> 5
[ 621.189489]
[ 621.190067] eth28: ax88772b - Link status is: 0
[ 621.208486] IPv6: ADDRCONF(NETDEV_UP): eth28: link is not ready
[ 621.208606] IPv6: ADDRCONF(NETDEV_UP): eth28: link is not ready
[ 622.978626] eth28: ax88772b - Link status is: 1
[ 622.979022] IPv6: ADDRCONF(NETDEV_CHANGE): eth28: link becomes ready
```

- You can refer to below figure to double check if your USB to LAN device is ASIX's product inside or not? If your USB to LAN device is Non-authentic ASIX product inside, you should see below “**Non-authentic ASIX product, ASIX does not support it**” error message by running the “**dmesg**” command on the Linux Terminal console.

```
root@fae-CM1525:/home/allan/AX88772C_772B_772A_760_772_178_LINUX_Driver_v4.9.0_Source# dmesg
[ 1055.808206] usb 2-6: new high-speed USB device number 17 using ehci_hcd
[ 1055.952627] usb 2-6: New USB device found, idVendor=0b95, idProduct=772b
[ 1055.952638] usb 2-6: New USB device strings: Mfr=1, Product=2, SerialNumber=3
[ 1055.952645] usb 2-6: Product: AX88772B
[ 1055.952651] usb 2-6: Manufacturer: ASIX Elec. Corp.
[ 1055.952656] usb 2-6: SerialNumber: 002A36
[ 1055.954958] ASIX USB Ethernet Adapter:v4.9.0 23:06:44 Jul 11 2013
[ 1055.954958] http://www.asix.com.tw
[ 1056.586364] eth%d: status ep1in, 8 bytes period 11
[ 1056.586820] eth1: register 'asix' at usb-0000:00:13.2-6, ASIX AX88772B USB 2.0 Ethernet, 00:0e:c6:00:2a:36
[ 1056.641899] eth28: rxqlen 0 --> 5
[ 1056.641899]
[ 1056.729412] eth28: ax88772b - Link status is: 0
[ 1058.390136] eth28: ax88772b - Link status is: 1
[ 1067.704738] usb 2-6: USB disconnect, device number 17
[ 1067.705079] eth28: unregister 'asix' usb-0000:00:13.2-6, ASIX AX88772B USB 2.0 Ethernet
[ 1079.778711] usb 2-6: new high-speed USB device number 18 using ehci_hcd
[ 1079.912143] usb 2-6: New USB device found, idVendor=0b95, idProduct=772b
[ 1079.912154] usb 2-6: New USB device strings: Mfr=1, Product=2, SerialNumber=3
[ 1079.912161] usb 2-6: Product: AX88772B
[ 1079.912167] usb 2-6: Manufacturer: ASIX Elec. Corp.
[ 1079.912172] usb 2-6: SerialNumber: 0004FC
[ 1079.918333] ASIX USB Ethernet Adapter:v4.9.0 23:06:44 Jul 11 2013
[ 1079.918333] http://www.asix.com.tw
[ 1080.585034] Non-authentic ASIX product
[ 1080.585034] ASIX does not support it
[ 1080.585105] eth%d: Binding device failed: -19
[ 1088.837492] usb 2-6: USB disconnect, device number 18
```

Authentic ASIX product normal message

Non-authentic ASIX product error message



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AX88772C/AX88772B USB Type-C Plug Connector Reference Schematic System Block

Page 1

System Block (This page)

Page 2

AX88772C_AX88772B

EEPROM

25MHz Crystal

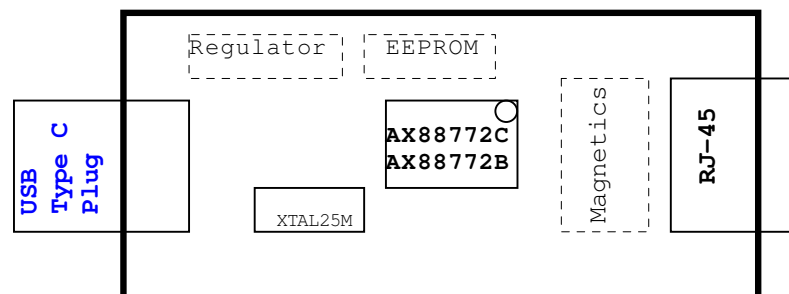
USB Type-C Plug Connector

RJ-45 Transformer Connector

Power/Reset Circuit

Page 3

Revision History



Note:

1.Please refer to AX88772C/AX88772B USB to LAN Application Design Note for more AX88772C/AX88772B PCB layout design notes.

2.Please deliver us your AX88772C/AX88772B schematic and PCB layout file for further review.

ASIX ELECTRONICS CORPORATION

Title

System Block

Size
A

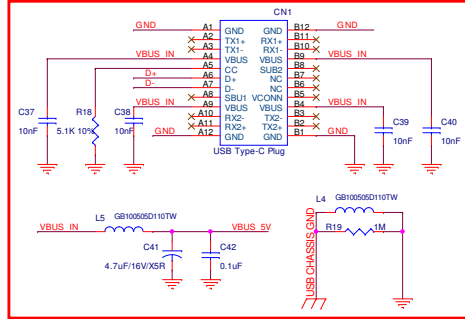
Document Number

AX88772C/AX88772B USB Type-C Plug

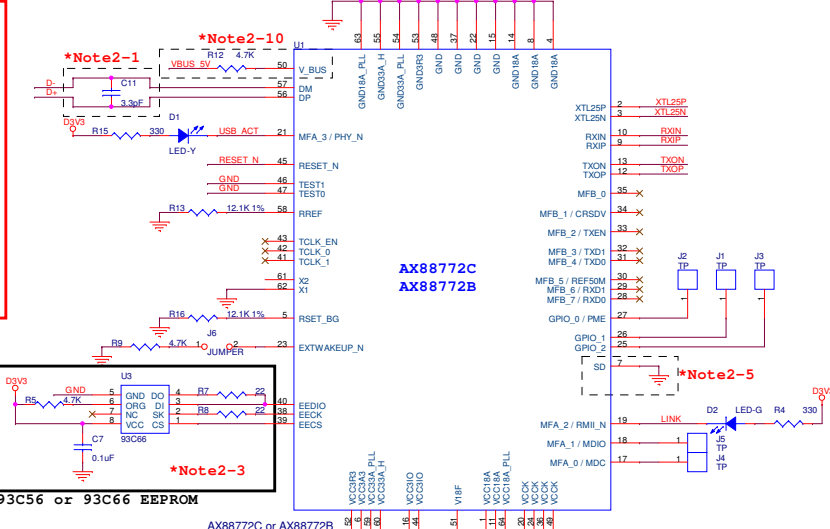
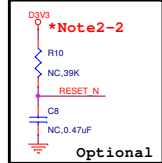
Rev
1.00

Date: Wednesday, December 23, 2015 Sheet 1 of 3

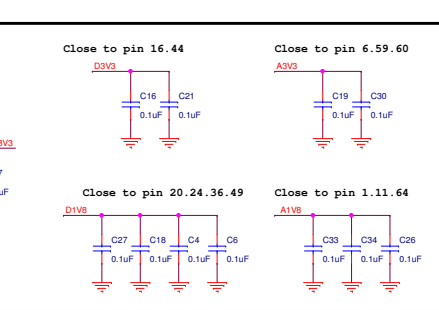
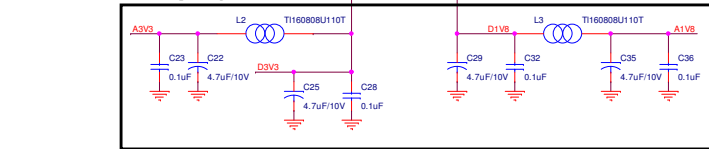
USB Type-C Plug Connector *Note2-11



Reset Circuit

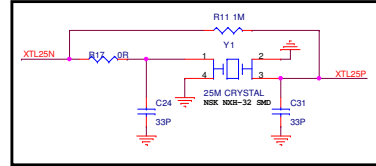


3.3V to 1.8V *Note2-4 On-chip Regulator

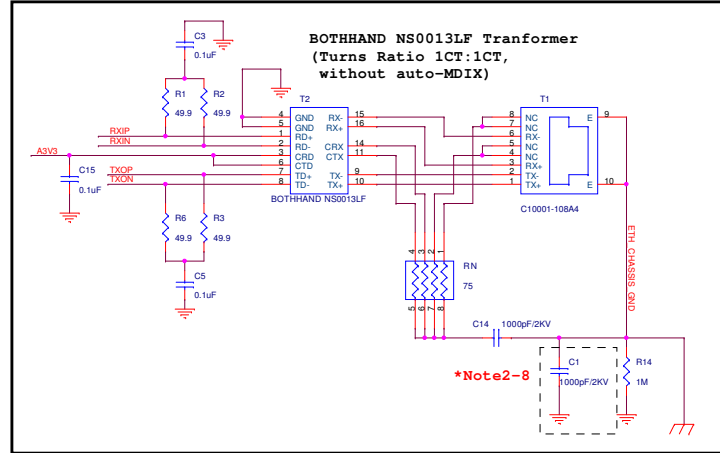


- *Note2-1:**
The C11 cap between the DP and DM pins is used to filter the common-mode noise and should be placed as close as pin #57 and #56.
- *Note2-2:**
The RC reset circuit is optional for AX88772C/AX88772B applications. You can reserve the RC reset circuit on your AX88772C/AX88772B schematic to fine tune the reset timing if necessary.
- *Note2-3:**
The AX88772C/AX88772B supports 16-bit mode 93C56/93C66 EEPROM. The R5 resistor is mounted to set the ATMEL AT93C66A EEPROM to 16-bit mode.
- *Note2-4:**
AX88772C/AX88772B on-chip 3.3V to 1.8V regulator is a low dropout regulator (LDO), which requires some large external compensating capacitors on its input (pin #52) and output (pin #51) pins. The C25, C28, C29 and C32 capacitors are the compensating capacitors for the on-chip regulator.
The analog powers and digital powers should be isolated with a Ferrite Bead (L2, L3). The VCC3R3 trace should be wider than 40mil for good power regulation.
The V18F trace should be wider than 20mil for good power regulation.

25MHz +/- 30ppm Crystal *Note2-6



RJ-45 Connector + Transformer *Note2-7



- *Note2-5:**
The SD signal should be connected to GND directly or through a 4.7K resistor at copper mode.
- *Note2-6:**
The 1M feedback resistor is necessary for 25MHz crystal circuit. The reference 25MHz crystal is the NSK NXH-32 SMD 25MHz crystal with CL 20pF and ESR max. 70 Ohm. The 25MHz clock signals should be within 25MHz +/- 50ppm. Please reserve the R17 0 Ohm resistor on 25MHz crystal circuit for fine tuning the 25MHz crystal circuit if necessary.
- *Note2-7:**
Please refer to Section 4 of AX88772C/AX88772B USB to LAN Application Design Note for more details of the Ethernet magnetics reference circuits.
- *Note2-8:**
The C1 capacitor can be 1uF or 1000pF/2KV(for a better ESD protection).

- *Note2-9:**
All power pins should be implemented with a by-pass capacitor, and the by-pass capacitors should be as close as the power pins.
The C9/C13 capacitors and C10 capacitor should be 10uF and 1uF respectively for USB-IF compliant test.
- *Note2-10:**
For self-power applications, please refer to below suggestions to design the V_BUS signal circuit,
(1)While the USB interface was connected to USB host/hub controller, the V_BUS signal MUST be pulled high to set AX88772C/AX88772B at normal operation stage.
(2)While the USB interface was disconnected from USB host/hub controller, the V_BUS signal MUST be pulled down to set AX88772C/AX88772B at reset stage.

- *Note2-11:**
Please double check the pin definition of the preferred USB Type-C Plug Connector datasheet to design the USB Type-C Plug Connector circuit.
The pins naming of USB Type-C Plug Connector are defined based on USB host controller pins naming.

ASIX ELECTRONICS CORPORATION			
Title AX88772C_AX88772B			
Size Custom	Document Number AX88772C/AX88772B USB Type-C Plug	Rev 1.00	
Date Wednesday, December 23, 2015	Sheet 2	of 3	

Revision History

Revision	Date	Comment
V0.10	2015/05/28	Preliminary release.
V1.00	2015/12/23	Init release.

ASIX ELECTRONICS CORPORATION		
Revision History		
Size A	Document Number AX88772C/AX88772B USB Type-C Plug	Rev 1.00
Date:	Wednesday, December 23, 2015	Sheet 3 of 3

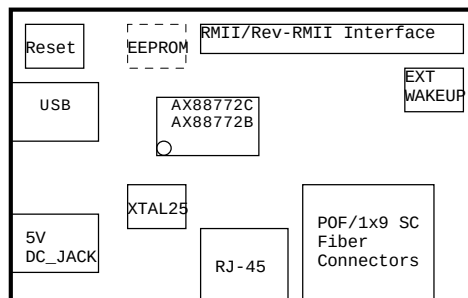
AX88772C/AX88772B USB to 100Base-TX/FX Ethernet with RMIi Demo Boards Reference Schematic System Block

Page 1
System Block (this Page)

Page 3
RJ-45 + Ethernet Magnetics (copper mode)
100Base-FX POF Fiber Transceiver Module
100Base-FX 1x9 SC Fiber Transceiver Module

Page 2
AX88772C/AX88772B
25MHz Crystal
EEPROM(93C66)
RMII/Rev-RMII Interface
Power/Reset Circuit
USB Connector

Page 4
Revision History



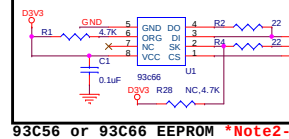
Note:

1.Please refer to AX88772C/AX88772B USB-to-LAN Application Design Note for more AX88772C/AX88772B PCB layout design notes.

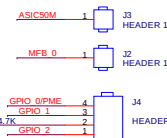
2.Please deliver us your AX88772C/AX88772B schematic and PCB layout file for further review.

ASIX ELECTRONICS CORPORATION		
Title		
System Block		
Size B	Document Number	
	AX88772C/AX88772B USB to 100Base-TX/FX with RMII	
Date:	Wednesday, June 13, 2018	Sheet 1 of 4
		Rev 2.12

Optional



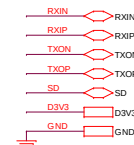
*Note2-4:
AX88772C/AX88772B on-chip 3.3V to 1.8V regulator is a low dropout regulator (LDO), which requires some large external compensating capacitors on its input (pin #52) and output (pin #51) pins. The C3, C4, C16 and C17 capacitors are the compensating capacitors for the on-chip regulator and should be as close as pin #51 and #52. The analog powers and digital powers should be isolated with a Ferrite Bead (L1, L2).
The VCC3R3 trace should be wider than 40mil for good power regulation.
The V18F trace should be wider than 20mil for good power regulation.



A close-up photograph of the USB module's pin headers. A black box highlights the first four pins, which are labeled J5, J7, J9, and J10. Each pin has a small white jumper cap. To the right of the pins, a wiring diagram shows the connections: J5 to J7 (USB_ACT D1), J7 to J9 (LINK D2), J9 to J10 (SPEED D3), and J10 to J10 (FDX D4). The diagram also shows the corresponding LED labels (LED-G R5, LED-R R7, LED-Y R8, LED-O R10) and their connection to a common ground (330).

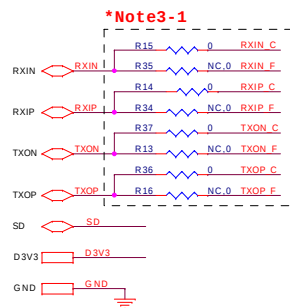
*Note2-10:
For self-power applications, please refer to below suggestions to design the V_BUS signal circuit,
(1)While the USB interface was connected to USB host/hub controller,
the V_BUS signal MUST be pulled high to set AX88772C/AX88772B at normal operation stage.
(2)While the USB interface was disconnected from USB host/hub controller,
the V_BUS signal MUST be pulled down to set AX88772C/AX88772B at reset stage.

Pin 1 to 27 connections for the J1 header. The diagram shows a 27-pin header with pins numbered 1 to 27. Pins 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, and 27 are labeled on the left. Pins 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, and 28 are labeled on the right. The connections are: Pin 1 to D3V3, Pin 2 to RESET N, Pin 3 to GND, Pin 4 to GND, Pin 5 to GND, Pin 6 to R25, Pin 7 to TXD0, Pin 8 to TXEN, Pin 9 to TXD0, Pin 10 to TXEN, Pin 11 to ASIC50M, Pin 12 to TXD0, Pin 13 to TXEN, Pin 14 to TXD0, Pin 15 to TXEN, Pin 16 to TXD0, Pin 17 to TXEN, Pin 18 to TXD0, Pin 19 to TXEN, Pin 20 to TXD0, Pin 21 to TXEN, Pin 22 to TXD0, Pin 23 to TXEN, Pin 24 to TXD0, Pin 25 to TXEN, Pin 26 to TXD0, Pin 27 to TXEN. The diagram also shows a 14x2.54mm header.

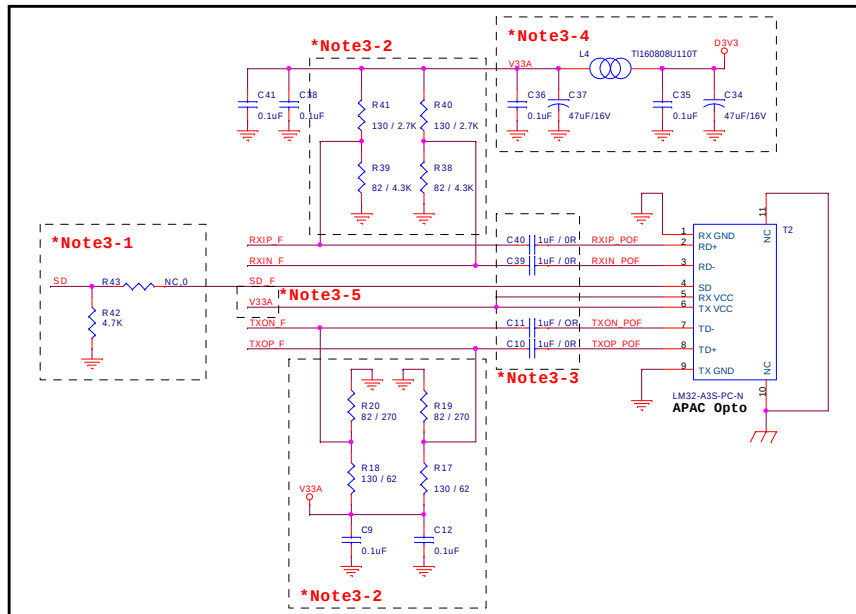


Operation Modes	J8/MFA2 Pin #19	J6/MFA3 Pin #23
Internal PHY MAC Mode	Open	Open
RMII MAC Mode	Short	Open
Reverse-RMII PHY Mode	Short	Short

*The MFA2/MFA3 are pulled high by hardware default



100Base-FX 1x9 SC Fiber Transceiver Module



Copper and Fiber Mode Setting Table ***Note3-1**

Mode	R15	R35	R14	R34	R37	R13	R36	R16	R42	R43
Copper	0	NC	0	NC	0	NC	0	NC	4.7K	NC
Fiber	NC	0	NC	0	NC	0	NC	0	NC	0

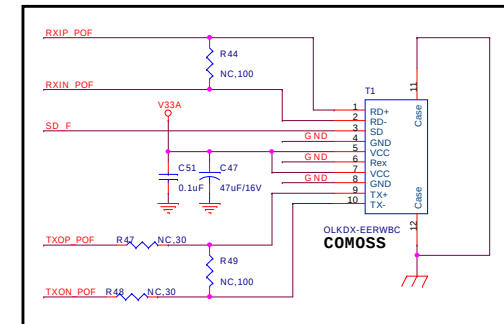
Fiber Mode Component Table ***Note3-2**

Component	R17	R18	R19	R20	R40	R41	R38	R39	R44	R49	R47	R48
APAC Opto 1x9 SC	130	130	82	82	130	130	82	82	NC	NC	NC	NC
COMOSS POF	62	62	270	270	2.7K	2.7K	4.3K	4.3K	100	100	30	30

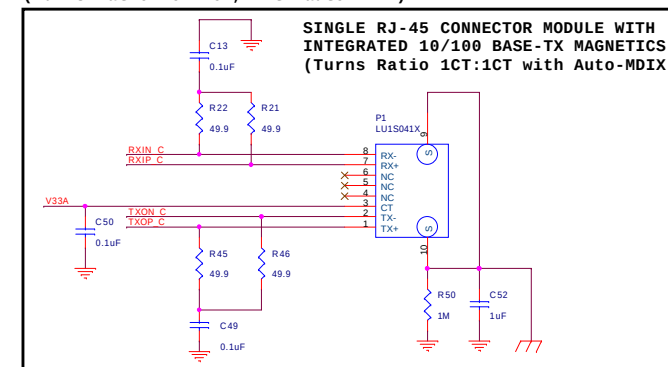
***Note3-3**

Component	C10	C11	C39	C40
APAC Opto 1x9 SC	0R	0R	0R	0R
COMOSS POF	1uF	1uF	1uF	1uF

100Base-FX POF Fiber Transceiver Module



RJ-45 Connector + Tranformer (Copper) (Default Mode)
(Turns Ratio 1CT:1CT, with auto-MDIX)



*Note3-1:

The AX88772B supports both copper mode and fiber mode. Please refer to above "Copper and Fiber Mode Setting Table" to implement your AX88772B application for copper mode or fiber mode.

*Note3-2:

The R17~R20, R38~R41, R44, R47~R49 resistors should be set different values for APAC Opto 1x9 SC Fiber transceiver module and COMOSS POF Fiber transceiver module. Please refer to above "Fiber Mode Component Table" and contact the Fiber transceiver vendor support guys for detailed Fiber transceiver related circuit.

*Note3-3:

The C10, C11, C39, C40 will be mounted 0 Ohm resistors for APAC Opto 1x9 SC Fiber transceiver module.
The C10, C11, C39, C40 will be mounted 1uF capacitors for COMOSS POF Fiber transceiver module.
Please refer to above "Fiber Mode Component Table" and contact the Fiber transceiver vendor support guys for detailed Fiber transceiver related circuit.

*Note3-4:

You can implement a separate V33A power plane to provide a pure 3.3V analog power source for the copper/fiber connectors.

*Note3-5:

The V33A power source of APAC Opto 1x9 SC Fiber transceiver is near to L4 so it can share the C36 and C37 capacitors with L4.

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Title	RJ45/POF Fiber/1x9 SC Fiber Connectors		
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Revision History

Revision	Date	Comment
V1.00	2010/06/21	Initial release.
V1.01	2010/06/24	1.Changed D5 to 1N4148. 2.Changed C47 to 47uF/16V.
V1.02	2011/08/10	1.Updated F.B. L1/L2/L3/L4 to Tl160808U110T.
V2.00	2013/04/09	1.Modified to support AX88772C. 2.Modified 25MHz crystal circuit. 3.Added Note2-10 for the VBUS circuit design note.
V2.10	2015/06/01	1.Changed T2 part to APAC Opto LM32-A3S-PC-N.
V2.11	2017/06/26	1.Corrected some notes descriptions in Page 3.
V2.12	2018/06/13	1.Corrected some notes descriptions in Page 2.

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AX88772C/AX88772B USB to 100Base-TX Ethernet Demo Board Reference Schematic System Block

Page 1

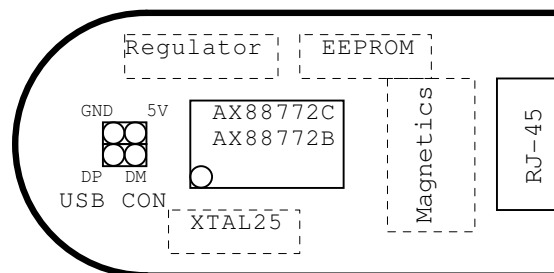
System Block (This page)

Page 2

AX88772C AX88772B
(25MHz Crystal, EEPROM, RJ-45 Transformer,
USB Connector, Power/Reset Circuit)

Page 3

Revision History



Note:

1. Please refer to AX88772C/AX88772B USB to LAN Application Design Note for more AX88772C/AX88772B PCB layout design notes.

2. Please deliver us your AX88772C/AX88772B schematic and PCB layout file for further review.

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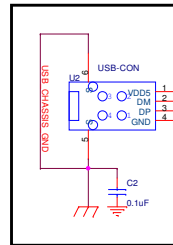
Sheet

1

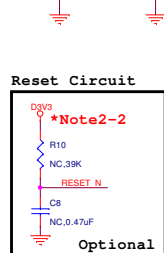
of

3

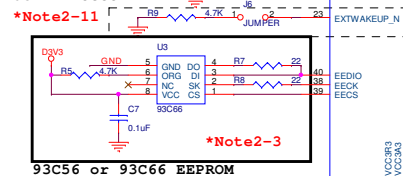
USB Connector



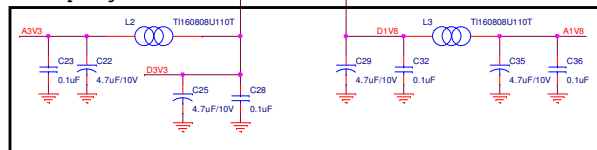
Reset Circuit



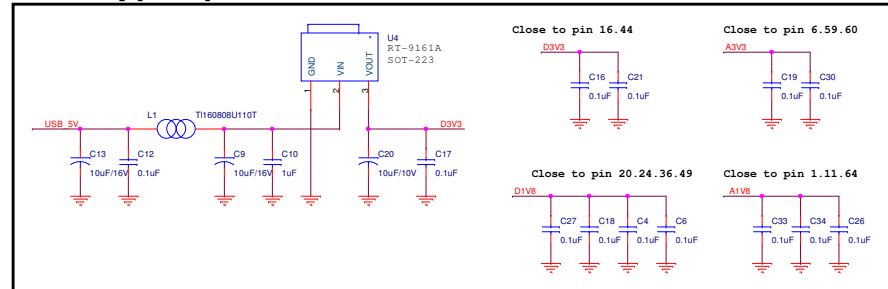
Optional for USB-IF test



3.3V to 1.8V *Note2-4 On-chip Regulator



Power and by-pass capacitors *Note2-9



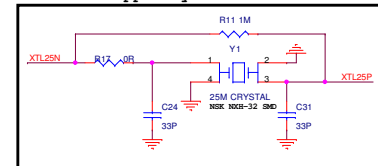
***Note2-1:**
The C11 cap between the DP and DM pins is used to filter the differential-mode noise and should be placed as close as pin #57 and #56.

***Note2-2:**
The RC reset circuit is optional for AX88772C/AX88772B applications. You can reserve the RC reset circuit on your AX88772C/AX88772B schematic to fine tune the reset timing if necessary.

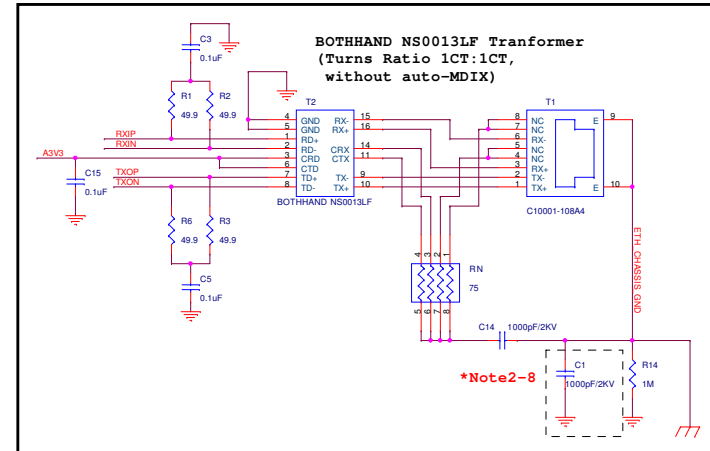
***Note2-3:**
The AX88772C/AX88772B supports 16-bit mode 93C56/93C66 EEPROM. The R5 resistor is mounted to set the ATMEL AT93C66A EEPROM to 16-bit mode.

***Note2-4:**
AX88772C/AX88772B on-chip 3.3V to 1.8V regulator is a low dropout regulator (LDO), which requires some large external compensating capacitors on its input (pin #52) and output (pin #51) pins. The C25, C28, C29 and C32 capacitors are the compensating capacitors for the on-chip regulator.
The analog powers and digital powers should be isolated with a Ferrite Bead (L2, L3). The VCC3R3 trace should be wider than 40mil for good power regulation.
The V18F trace should be wider than 20mil for good power regulation.

25MHz +- 30ppm Crystal *Note2-6



RJ-45 Connector + Transformer *Note2-7



***Note2-5:**
The SD signal should be connected to GND directly or through a 4.7K resistor at copper mode.

***Note2-6:**
The 1M feedback resistor is necessary for 25MHz crystal circuit. The reference 25MHz crystal is the NSK NXH-32 SMD 25MHz crystal with CL 20pF and ESR max. 70 Ohm. The 25MHz clock signals should be within 25MHz +- 50ppm. Please reserve the R17 0 Ohm resistor on 25MHz crystal circuit for fine tuning the 25MHz crystal circuit if necessary.

***Note2-7:**
Please refer to Section 4 of AX88772C/AX88772B USB to LAN Application Design Note for more details of the Ethernet magnetics reference circuits.

***Note2-8:**
The C1 capacitor can be 1uF or 1000pF/2KV(for a better ESD protection).

***Note2-9:**
All power pins should be implemented with a by-pass capacitor, and the by-pass capacitors should be as close as the power pins.
The C9/C13 capacitors and C10 capacitor should be 10uF and 1uF respectively for USB-IF compliant test.

***Note2-10:**
For self-power applications, please refer to below suggestions to design the V_BUS signal circuit,
(1) While the USB interface was connected to USB host/hub controller, the V_BUS signal MUST be pulled high to set AX88772C/AX88772B at normal operation stage.
(2) While the USB interface was disconnected from USB host/hub controller, the V_BUS signal MUST be pulled down to set AX88772C/AX88772B at reset stage.

***Note2-11:**
Please reserve the EXTWAKEUP_N circuit location if you need to run the USB-IF compliant test (mount R9 4.7K resistor and J6 jumper). Don't need mount R9, J6 in production.

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Revision History

Revision	Date	Comment
V1.00	2010/06/21	Initial release.
V1.01	2011/08/10	1.Updated F.B. L1/L2/L3 to T1160808U110T.
V2.00	2013/03/19	1.Modified to support AX88772C. 2.Modified 25MHz crystal circuit. 3.Modified the RJ-45 Connector + Transform circuit. 4.Added Note2-10 for the VBUS circuit design note.
V2.01	2013/04/10	1.Modified some descriptions in Note2-10.
V2.02	2014/05/20	1.Corrected a typo on NS0013LF pin #15 & #16 naming.
V2.03	2016/09/20	1.Added Note2-11 in page 2. 2.Modified some descriptions in Note2-1.

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