

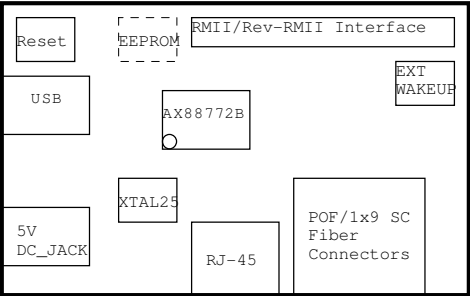
AX88772B USB to 100Base-TX/FX Ethernet with RMII Demo Boards Reference Schematic System Block

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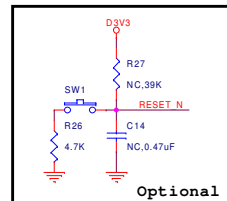
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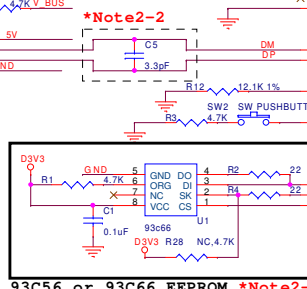
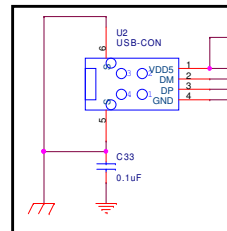
Note:  
1.Please refer to AX88772B USB-to-LAN Application Design Note for more AX88772B PCB layout design notes.  
  
2.Please deliver us your AX88772B schematic and PCB layout file for further review.

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## Reset Circuit \*Note2-1

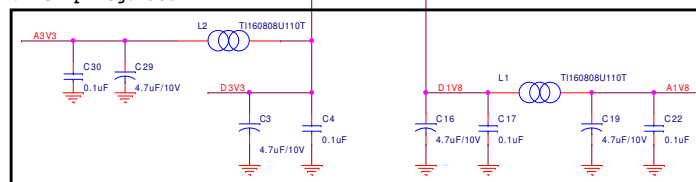


## USB Connector

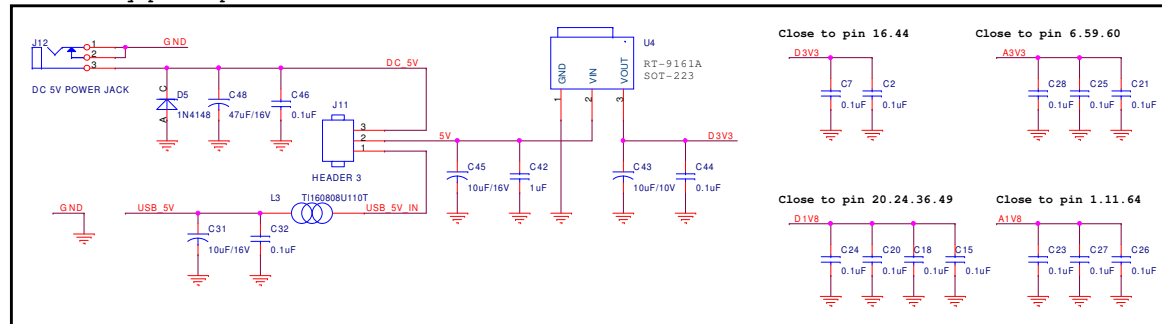


93C56 or 93C66 EEPROM \*Note2-3

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



## Power and by-pass capacitors \*Note2-9

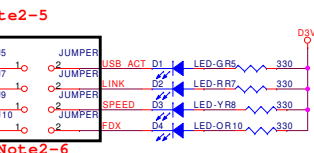
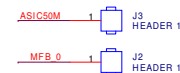
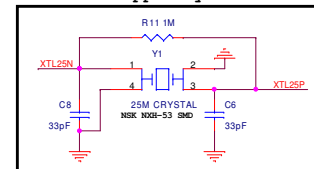


\*Note2-1:  
The RC reset circuit is optional for AX88772B applications. You can reserve the RC reset circuit on your AX88772B schematic to fine tune the reset timing if necessary.

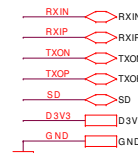
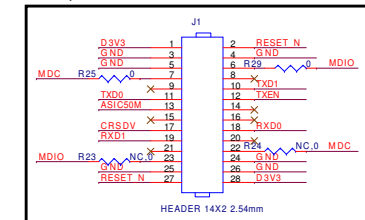
\*Note2-2:  
The C5 cap between the DP and DM pins is used to filter the common-mode noise and should be placed as close as pin #57 and #56.

\*Note2-3:  
The AX88772B supports 16-bit mode 93C56/93C66 EEPROM. The R1 resistor is mounted to set the ATME1 AT93C66A EEPROM to 16-bit mode.  
You can pull high the EECK signal to force AX88772B at USB Full Speed mode if necessary.

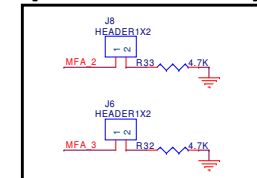
## 25MHz +- 30ppm Crystal \*Note2-7



## RMII/Rev-RMII Interface \*Note2-8



## Operation Modes Setting



## Operation Modes Selection Table

Operation Modes	J8/MFA2 Pin #19	J6/MFA3 Pin #20
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

\*Note2-4:  
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.

\*Note2-5:  
The SD signal should be connected to GND directly or through a 4.7K resistor at copper mode.  
The SD signal should be connected to the fiber transceiver signal detect output pin at fiber mode.

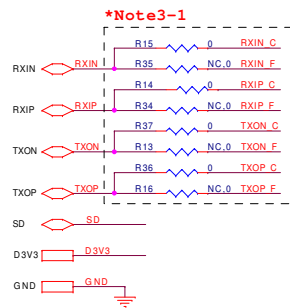
\*Note2-6:  
For internal PHY mode, the J5,J7,J9,J10 jumpers should be short.  
For RMII/Rev-RMI modes, the J5,J7,J9,J10 jumpers should be open.

\*Note2-7:  
The 1M feedback resistor is necessary for 25MHz crystal circuit. The reference 25MHz crystal is the NSK NXH-53 SMD 25MHz crystal with CL 20pF and ESR max. 70 Ohm.  
The 25MHz clock signals should be within 25MHz +- 50ppm.

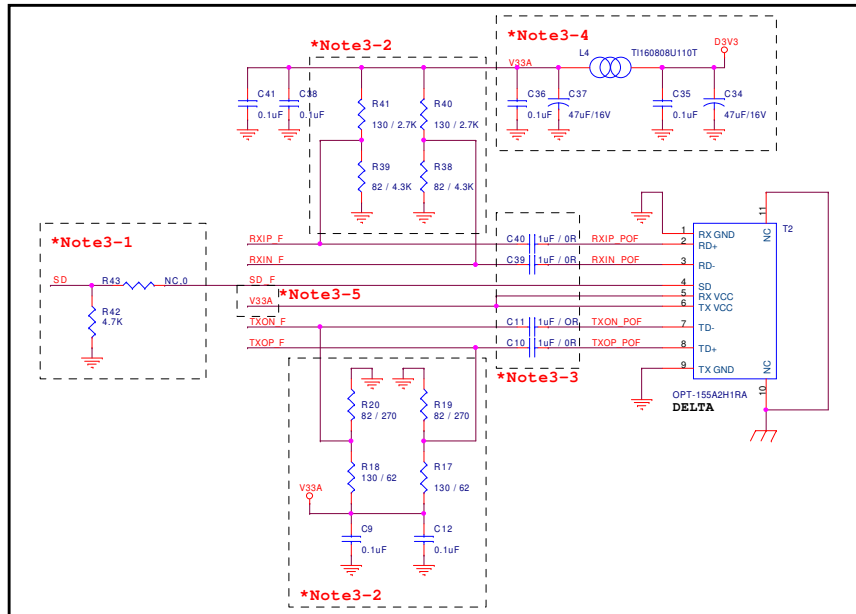
\*Note2-8:  
Please set the MFA2 and MFA3 signals to enable the RMII or Rev-RMII interface. Please refer to above "Operation Modes Selection Table" for details.

\*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 C31/C45 capacitors and C42 capacitor should be 10uF and 1uF respectively for USB-IF compliant test.  
The J12 DC 5V Power Jack is optional to provide the 5V power source to AX88772B and external devices on AX88772B Self-power application. You can use J11 to select a proper power source of AX88772B application.

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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
DELTA 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

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

**\*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.

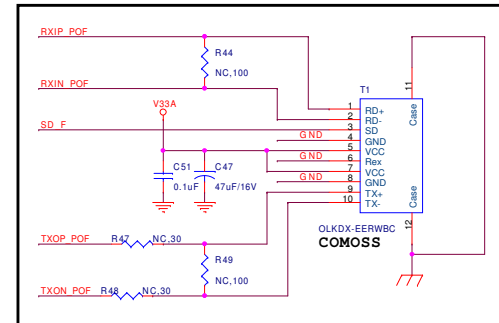
**\*Note3-2:**

The R17~R20, R38~R41, R44, R47~R49 resistors should be set different values for DELTA 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.

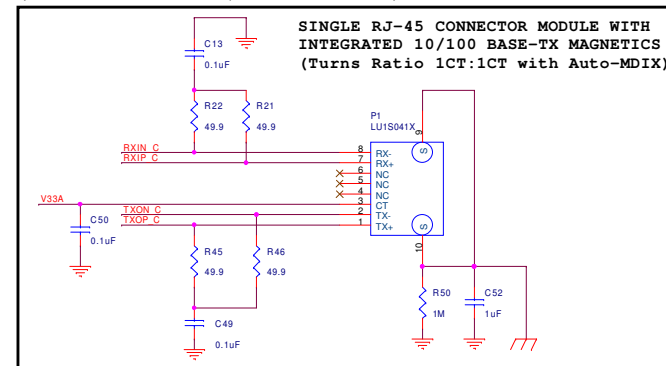
**\*Note3-3:**

The C10, C11, C39, C40 will be mounted 0 Ohm resistors for DELTA 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.

100Base-FX POF Fiber Transceiver Module



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



**\*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 OPT-155A2H1RA 1x9 SC Fiber transceiver is near to L4 so it can share the C36 and C37 capacitors with L4.

## 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 T1160808U110T.

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