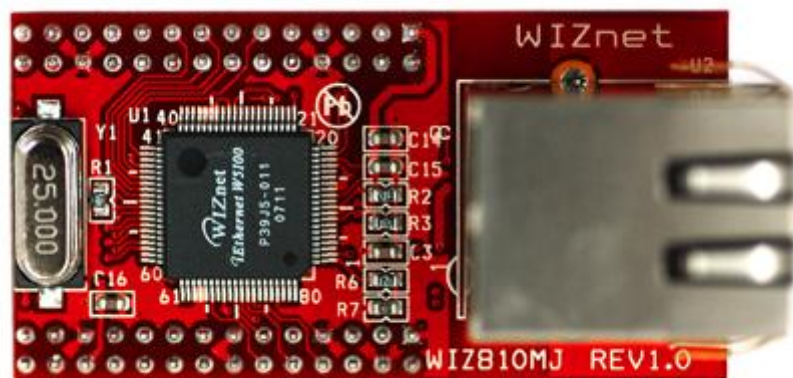


WIZ810MJ Datasheet

(Ver. 1.3)



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Document History Information

| Revision | Date | Description |
|----------|------------------|--|
| Ver. 1.0 | September , 2007 | Release with WIZ810MJ Launching |
| Ver. 1.1 | February, 2008 | Hardware revision(ver.1.1). Modified the SPI_EN signal description (P.8) Modified the Schematic & Partlist : R10 is mounted as SPI_EN pull-down resistor. (P.15~16) |
| Ver. 1.2 | January, 2009 | Added temperature specification |
| Ver. 1.3 | January, 2013 | Hardware revision(ver.1.2) Changed operation temperature range(P.5) Changed Partlist and schematic |

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1. Introduction

WIZ810MJ is the network module that includes W5100 (TCP/IP hardwired chip, include PHY), MAG-JACK (RJ45 with X'FMR) with other glue logics. It can be used as a component and no effort is required to interface W5100 and Transformer. The WIZ810MJ is an ideal option for users who want to develop their Internet enabling systems rapidly.

For the detailed information on implementation of Hardware TCP/IP, refer to the W5100 Datasheet.

WIZ810MJ consists of W5100 and MAG-JACK.

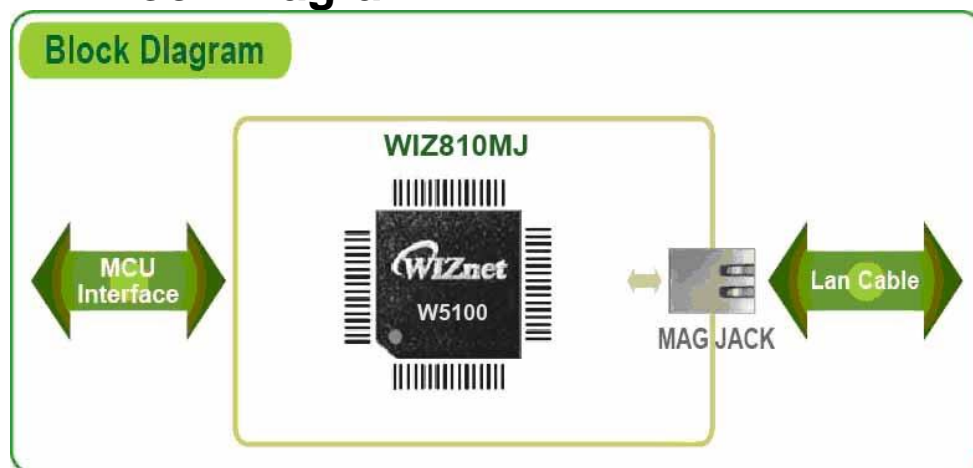
- TCP/IP, MAC protocol layer: W5100
- Physical layer: Included in W5100
- Connector: MAG-JACK(RJ45 with Transformer)

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1.1. Features

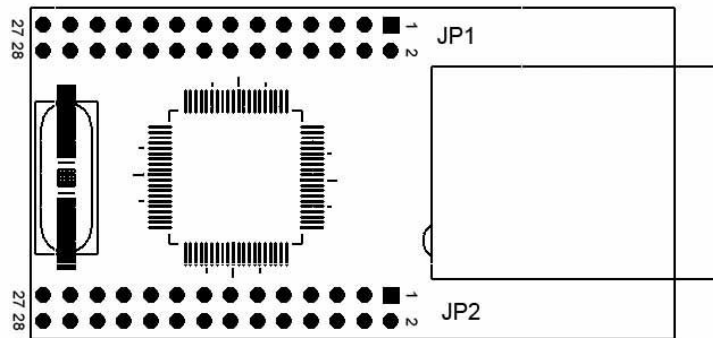
- Supports 10/100 Base TX
- Supports half/full duplex operation
- Supports auto-negotiation and auto crossover detection
- IEEE 802.3/802.3u Complaints
- Operates 3.3V with 5V I/O signal tolerance
- Supports network status indicator LEDs
- Includes Hardware Internet protocols: TCP, IP Ver.4, UDP, ICMP, ARP, PPPoE, IGMP
- Includes Hardware Ethernet protocols: DLC, MAC
- Supports 4 independent connections simultaneously
- Supports MCU bus Interface and SPI Interface
- Supports Direct/Indirect mode bus access
- Supports Socket API for easy application programming
- Interfaces with Two 2.0mm pitch 2 * 14 header pin
- Temperature :
 - [PCB rev1.0] : 0 ~ 70°C (Operation), -40 ~ 85°C (Storage)
 - [PCB rev1.1] : 0 ~ 70°C (Operation), -40 ~ 85°C (Storage)
 - [PCB rev1.2] : -40 ~ 85°C (Operation), -40 ~ 85°C (Storage)

1.2. Block Diagram

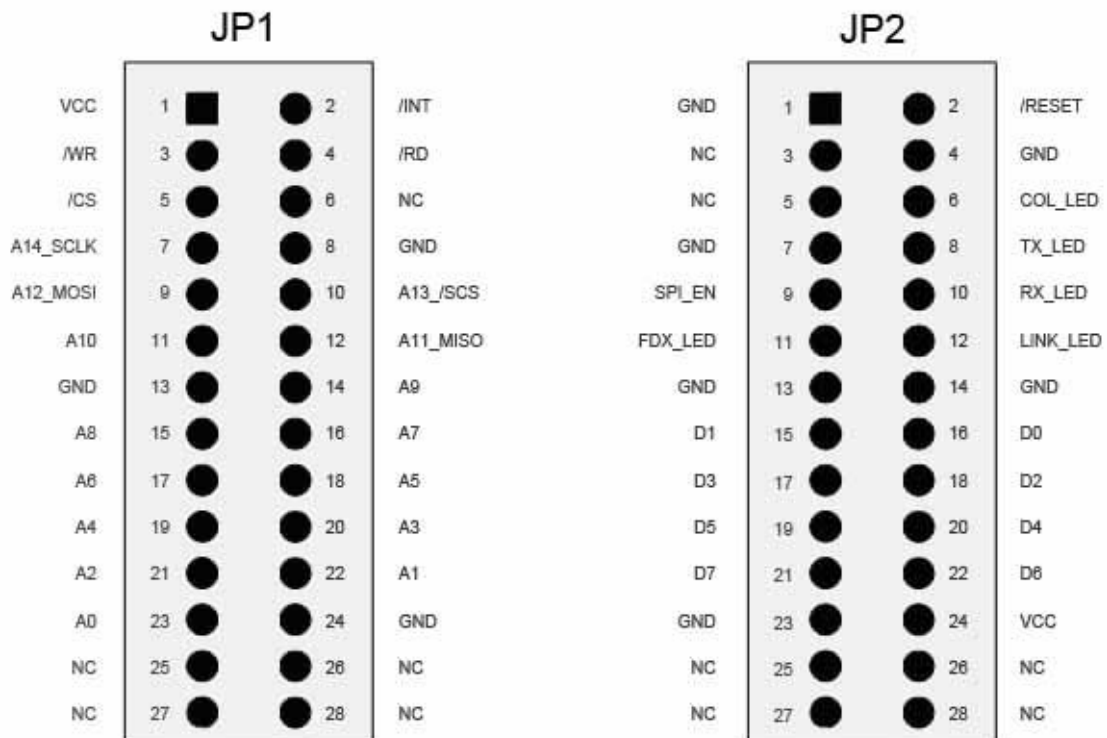


2. Pin Assignments & descriptions

2.1. Pin Assignments



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I : Input
I/O : Bi-directional Input and output

O : Output
P : Power

2.2. Power & Ground

| Symbol | Type | Pin No. | Description |
|--------|------|---|----------------------------|
| VCC | P | JP1:1 , JP2:24 | Power : 3.3 V power supply |
| GND | P | JP1:8, JP1:13, JP1:24, JP2:1, JP2:4, JP2:7 JP2:13, JP2:14, JP2:23 | Ground |

2.3. MCU Interfaces

| Symbol | Type | Pin No. | Description |
|----------|------|--|--|
| A14_SCLK | I | JP1:7 | ADDRESS PIN OR SCLK(Serial Clock) This pin is used to select a register or memory. When asserting SPI_EN pin high, this pin is used to SPI Clock signal Pin. |
| A13_/SCS | I | JP1:10 | ADDRESS PIN or /SCS (Slave Select) * This pin is used to select a register or memory. When asserting SPI_EN pin high, this pin is used to SPI Slave Select signal Pin. In only SPI Mode, this pin is active low |
| A12_MOSI | I | JP1:9 | ADDRESS PIN or MOSI (Master Out Slave In) * This pin is used to select a register or memory. When asserting SPI_EN pin high, this pin is used to SPI MOSI signal pin. |
| A11_MISO | I/O | JP1:12 | ADDRESS PIN or MISO (Master In Slave Out) * This pin is used to select a register or memory. When asserting SPI_EN pin high, this pin is used to SPI MISO signal pin. |
| A10~A8 | I | JP1:11, JP1:14 JP1:15 | Address Used as Address[10-8] pin |
| A7~A0 | I | JP1:16 ~ JP1:23 | Address Used as Address[7-0] pin |
| D7~D0 | I/O | JP2:21, JP2:22 JP2:19, JP2:20 JP2:17, JP2:18 JP2:15, JP2:16 | Data 8 bit-wide data bus |
| /CS | I | JP1:5 | Module Select : Active low. /CS of W5100 |
| /RD | I | JP1:4 | Read Enable : Active low. /RD of W5100 |
| /WR | I | JP1:3 | Write Enable : Active low /WR of W5100 |

| | | | |
|------|---|-------|--|
| /INT | O | JP1:2 | Interrupt : Active low After reception or transmission it indicates that the W5100 requires MCU attention. By writing values to the Interrupt Status Register of W5100 the interrupt will be cleared. All interrupts can be masked by writing values to the IMR of W5100 (Interrupt Mask Register). For more details refer to the W5100 Datasheet |
|------|---|-------|--|

2.4. Network status & LEDs

You can observe the network status using MAG-JACK LEDs. LED interface can be extended to the LED of the main board.

| Symbol | Type | Pin No. | Description |
|----------|------|---------|---|
| COL_LED | O | JP2:6 | Collision LED : Active low when collisions occur. |
| TX_LED | O | JP2:8 | Transmit activity LED : Active low indicates the presence of transmitting activity. |
| RX_LED | O | JP2:10 | Receive activity LED : Active low indicates the presence of receiving activity. |
| FDX_LED | O | JP2:11 | Full Duplex LED : Active low when in full duplex operation. Active high when in half duplex operation. |
| LINK_LED | O | JP2:12 | Link LED : Active low in link state indicates a good status for 10/100M. It is always ON when the link is OK and it flashes while in a TX or RX state. |

2.5. Miscellaneous Signals

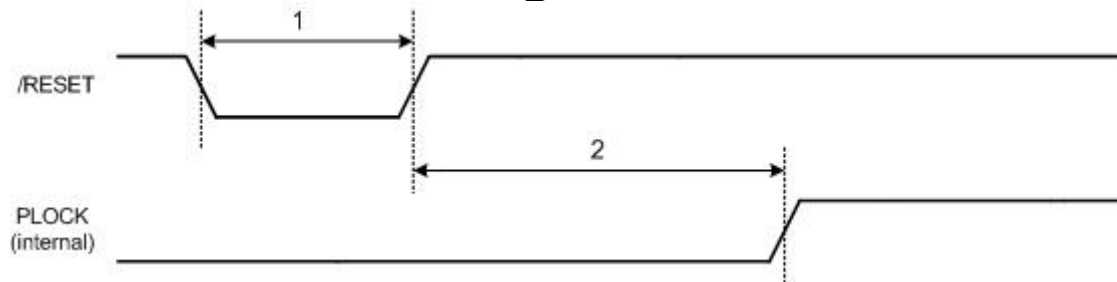
| Symbol | Type | Pin No. | Description |
|--------|------|---|--|
| /RESET | I | JP2:2 | Reset : This pin is active low input to initialize or re-initialize W5100. By asserting this pin low for at least 2us, all internal registers will be re-initialized to their default states. |
| SPI_EN | I | JP2:9 | SPI Enable : This pin selects Enable/Disable W5100 SPI Mode. Low = SPI Mode Disable High = SPI Mode Enable A pull-down resistor(R10) sets to the default of SPI Mode Disable. H/W ver.1.0 : R10 is not mounted H/W ver.1.1 : R10 is mounted |
| NC | - | JP1 : 6, 25, 26, 27, 28 JP2 : 3, 5, 25, 26, 27, 28 | Not Connect |

3. Timing Diagrams

WIZ810MJ provides following interfaces of W5100.

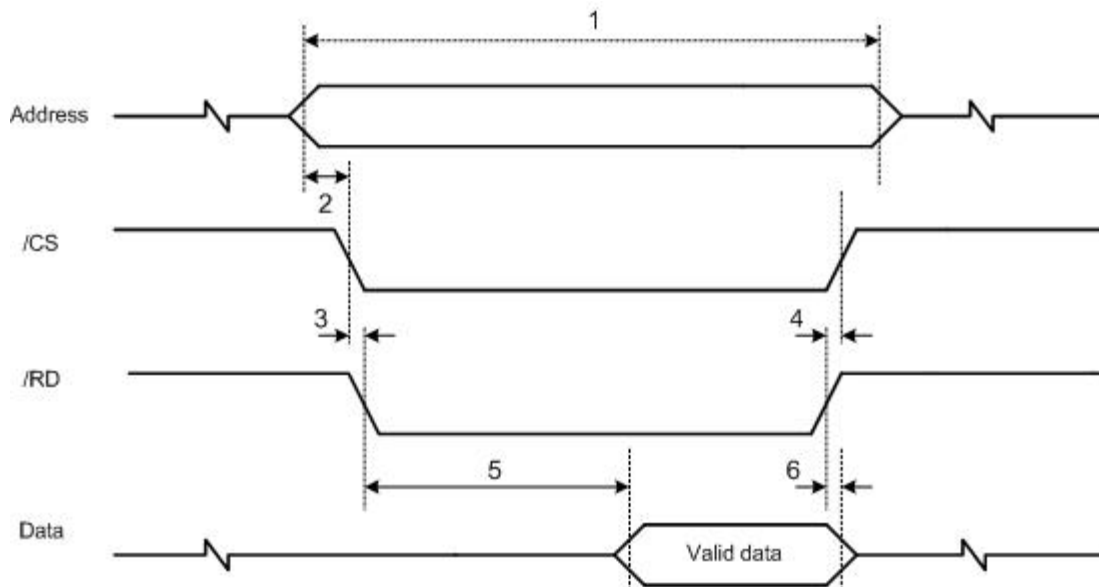
- . Direct/Indirect mode bus access
- . SPI access

3.1. Reset Timing



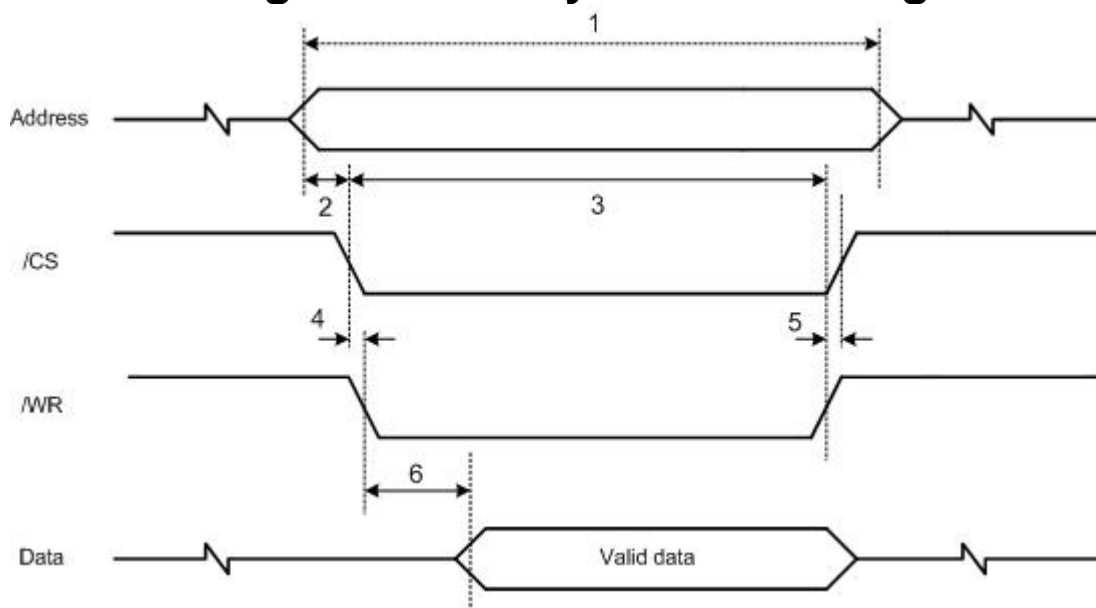
| Description | | Min | Max |
|-------------|--------------------------|------|-------|
| 1 | Reset Cycle Time | 2 us | - |
| 2 | /RESET to internal PLOCK | - | 10 ms |

3.2. Register/Memory READ Timing



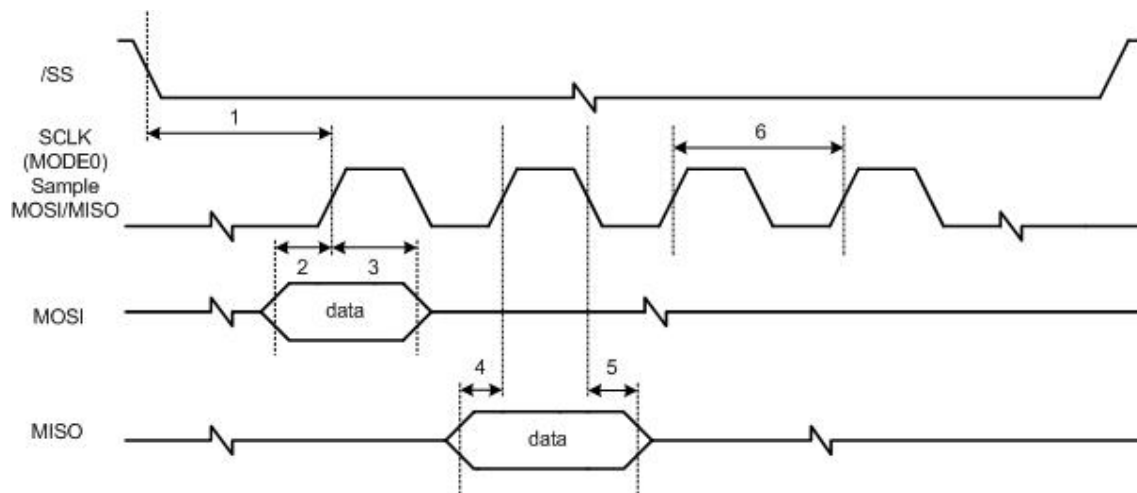
| Description | | Min | Max |
|-------------|-------------------------------------|-------|-------|
| 1 | Read Cycle Time | 80 ns | - |
| 2 | Valid Address to /CS low time | 8 ns | - |
| 3 | /CS low to /RD low time | - | 1 ns |
| 4 | /RD high to /CS high time | - | 1 ns |
| 5 | /RD low to Valid Data Output time | - | 80 ns |
| 6 | /RD high to Data High-Z Output time | - | 1 ns |

3.3. Register/Memory WRITE Timing



| | Description | Min | Max |
|---|-------------------------------|-------|-------|
| 1 | Write Cycle Time | 70 ns | - |
| 2 | Valid Address to /CS low time | 7 ns | - |
| 3 | /CS low to /WR high time | 70 ns | - |
| 4 | /CS low to /WR low time | - | 1 ns |
| 5 | /WR high to /CS high time | - | 1 ns |
| 6 | /WR low to Valid Data time | - | 14 ns |

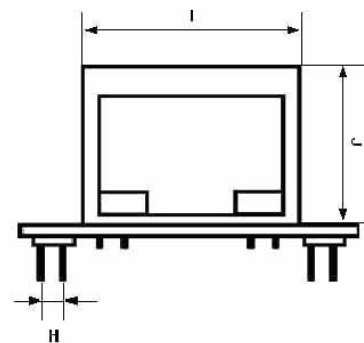
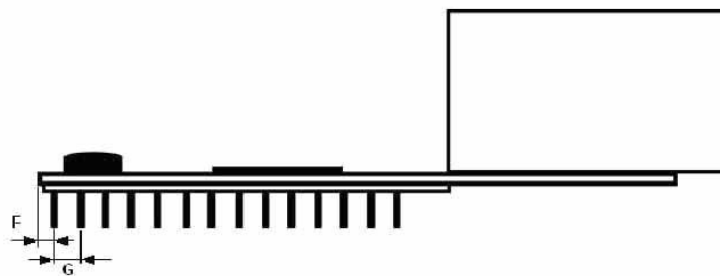
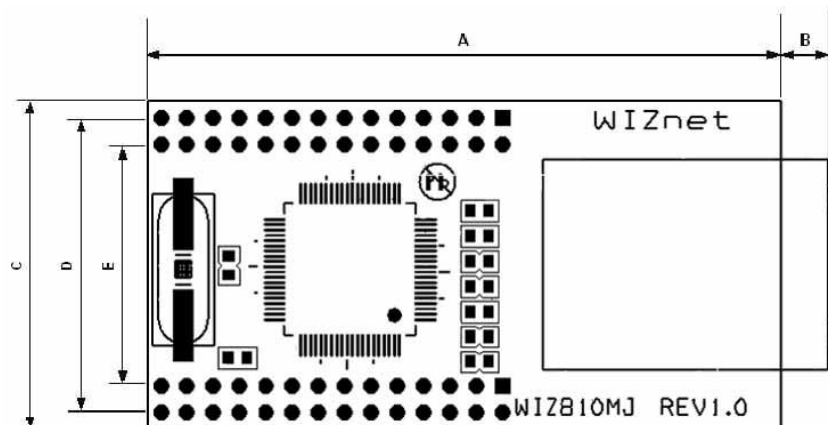
3.4. SPI Timing



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| Description | Mode | Min | Max |
|---------------------|-------|-------|-------|
| 1 /SS low to SCLK | Slave | 21 ns | - |
| 2 Input setup time | Slave | 7 ns | - |
| 3 Input hold time | Slave | 28 ns | - |
| 4 Output setup time | Slave | 7 ns | 14 ns |
| 5 Output hold time | Slave | 21 ns | - |
| 6 SCLK time | Slave | 70 ns | |

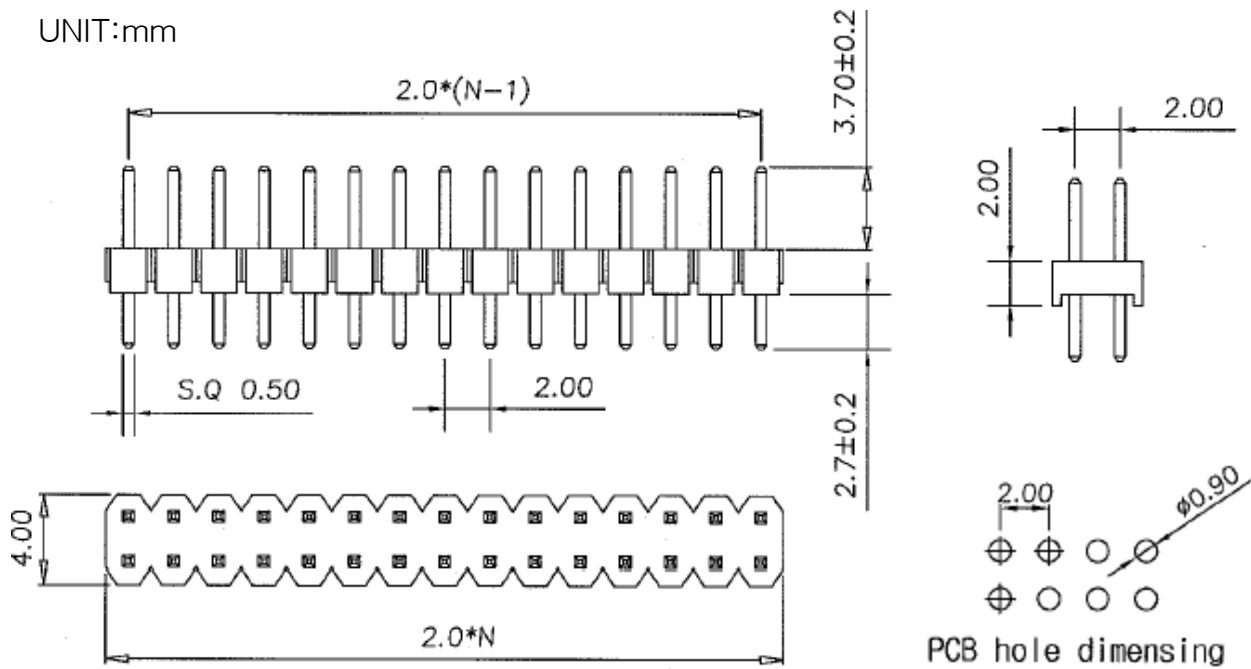
4. Dimensions



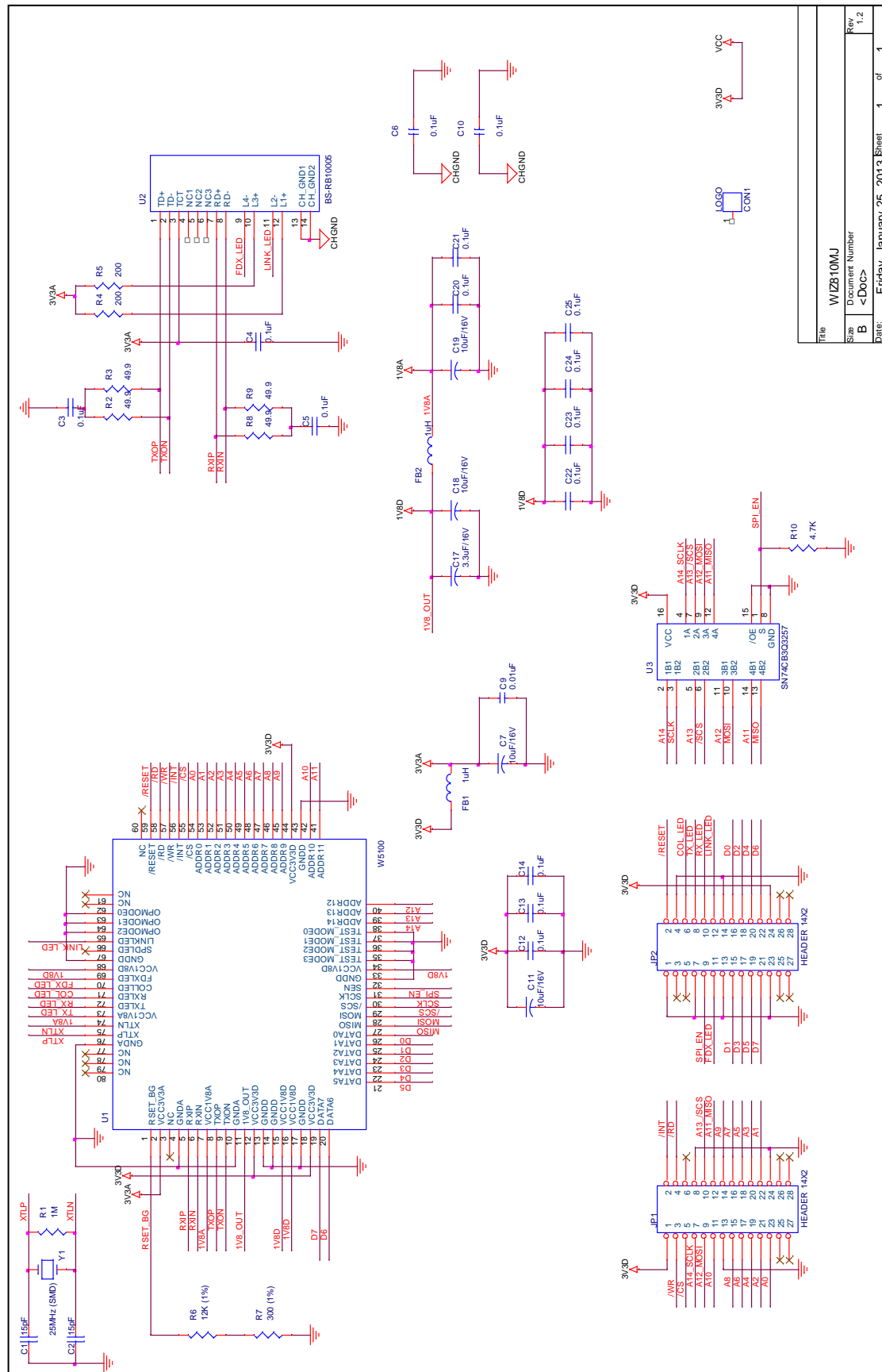
| Symbols | Dimensions (mm) |
|---------|-----------------|
| A | 48.0 |
| B | 3.5 |
| C | 25.0 |
| D | 22.4 |
| E | 18.4 |
| F | 1.0 |
| G | 2.0 |
| H | 2.0 |
| I | 16.0 |
| J | 13.5 |

5. Connector Specification

UNIT:mm



6. Schematic



7. Partlists

| Item | Q.ty | Reference | Part | Tech. Characteristics | Package |
|------|------|---|---------------------------------------|-----------------------------------|---------------|
| 1 | 2 | C1,C2 | 15pF | 50V-20% Ceramic | CASE 0603 |
| 2 | 14 | C3,C4,C5,C6,C10, C12,C13,C14,C20, C21,C22,C23,C24,C25 | 0.1uF | 50V-20% Ceramic | CASE 0603 |
| 3 | 4 | C7,C11,C18,C19 | 10uF/16V | 16Vmin 10% | EIA/IECQ 3216 |
| 4 | 1 | C9 | 0.01uF | 50V-20% Ceramic | CASE 0603 |
| 5 | 2 | FB1,FB2 | 1uH Chip Ferrite Inductor | | CASE 0805 |
| 6 | 2 | JP1,JP2 | 2X14 28PIN 2mm DIP STRAIGHT Header | 2 X 14 2mm pitch | |
| 7 | 1 | R1 | 1M | 1/10W-5% SMD | CASE 0603 |
| 8 | 4 | R2,R3,R8,R9 | 49.9 | 1/10W-1% SMD | CASE 0603 |
| 9 | 2 | R5,R4 | 200 | 1/10W-5% SMD | CASE 0603 |
| 10 | 1 | R6 | 12K | 1/10W-1% SMD | CASE 0603 |
| 11 | 1 | R7 | 300 | 1/10W-1% SMD | CASE 0603 |
| 12 | 1 | R10 | 4.7K | 1/10W-5% SMD | CASE 0603 |
| 13 | 1 | U1 | W5100 | WIZnet Hardware TCP/IP | LQFP80 |
| 14 | 1 | U2 | BS-RB10005 | Transformer + RJ45 | |
| 15 | 1 | U3 | SN74CB3Q3257 | Bus Switch(vendor : TI) | TSSOP |
| 16 | 1 | Y1 | 25MHz (SMD) | SMD Type, CL=18pF, Industrial. | SX-1 |
| 17 | 1 | PCB | WIZ810MJ REV1.2 1.6T 4LAYER | FR4, OSP | |