

## ENC28J60-H development board

### User's manual



All boards produced by Olimex are ROHS compliant

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## **INTRODUCTION**

ENC28J60-H is world's smallest Ethernet controller development board with it's size of only 30×24mm. It provides easy connection to any microcontroller with only few ports via SPI which makes it perfect for adding Ethernet connectivity to embedded applications.

## **BOARD FEATURES**

- ENC28J60 10 Mbit Ethernet controller
- on-board RJ45 connector with build in Ethernet transformer and two status LEDs
- easy interface to any microcontroller via SPI
- compact size in DIL 10 pin format, the distance between pin rows is 0.8"
- PCB: FR-4, 1.5 mm (0,062"), soldermask, white silkscreen component print
- Dimensions: 30×24 mm (1.18×0.95")

## **ELECTROSTATIC WARNING**

The ENC28J60-H board is shipped in protective anti-static packaging. The board must not be subject to high electrostatic potentials. General practice for working with static sensitive devices should be applied when working with this board.

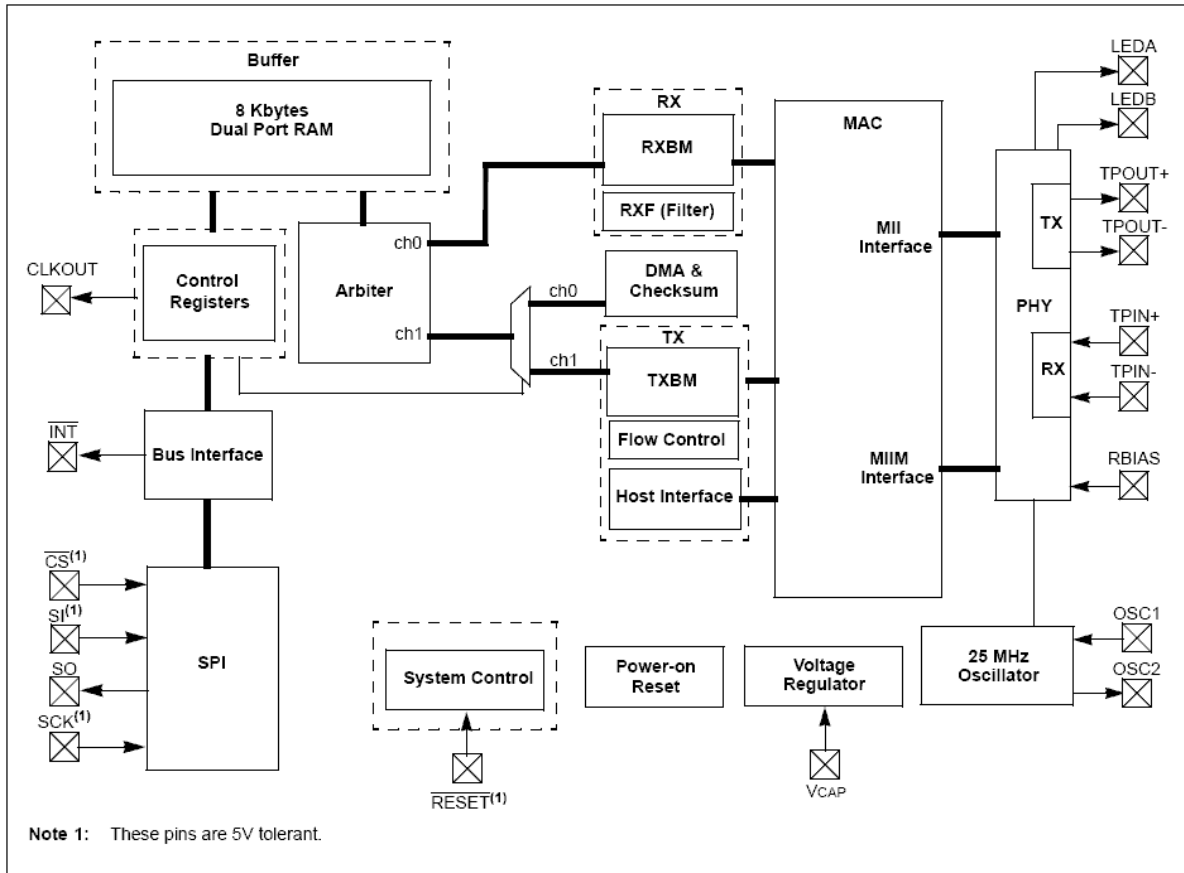
## **Ethernet Controller Features**

ENC28J60-H board use ENC28J60 stand-alone Ethernet controller with these features:

- IEEE 802.3. Compatible Ethernet Controller
- Fully Compatible with 10/100/1000Base-T Networks
- Integrated MAC and 10Base-T PHY
- Supports One 10Base-T Port with Automatic Polarity Detection and Correction
- Supports Full and Half-Duplex modes
- Programmable Automatic Retransmit on Collision
- Programmable Padding and CRC Generation
- Programmable Automatic Rejection of Erroneous Packets
- SPI Interface with Clock Speeds Up to 20 MHz

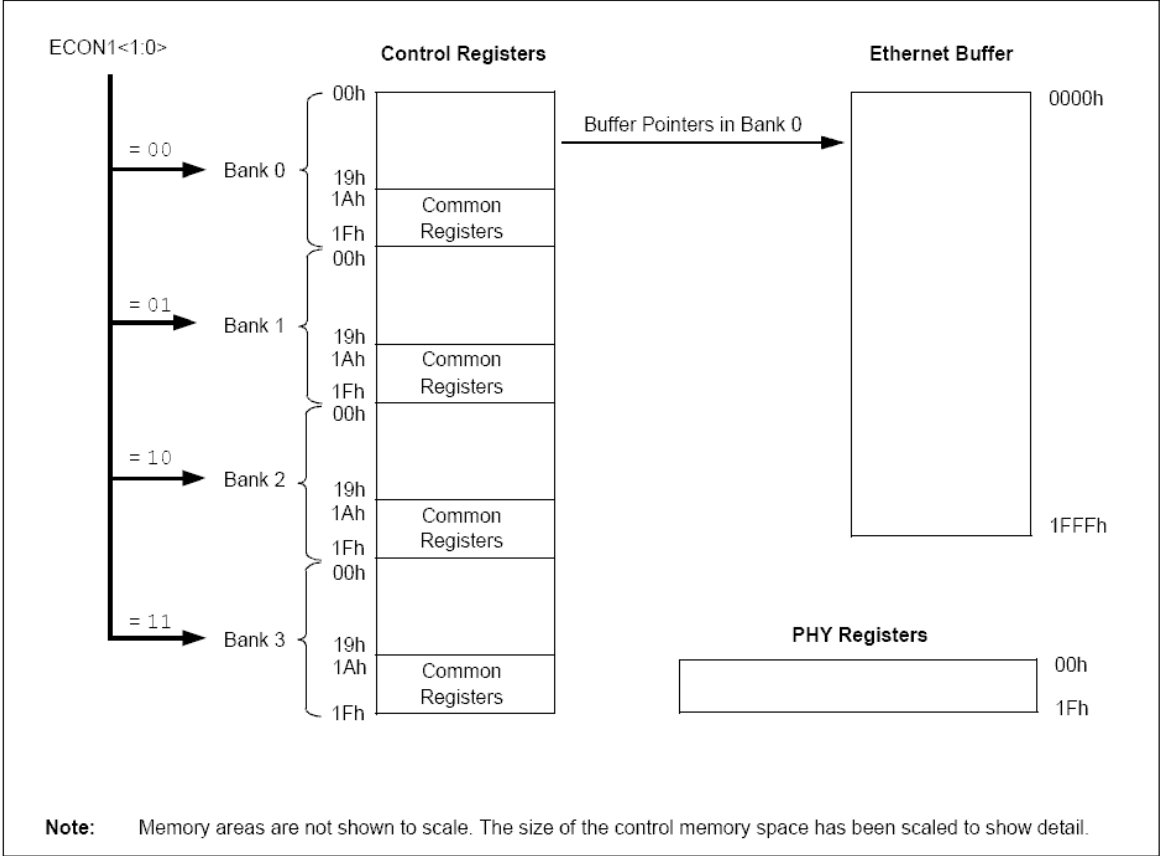
# BLOCK DIAGRAM

ENC28J60 BLOCK DIAGRAM

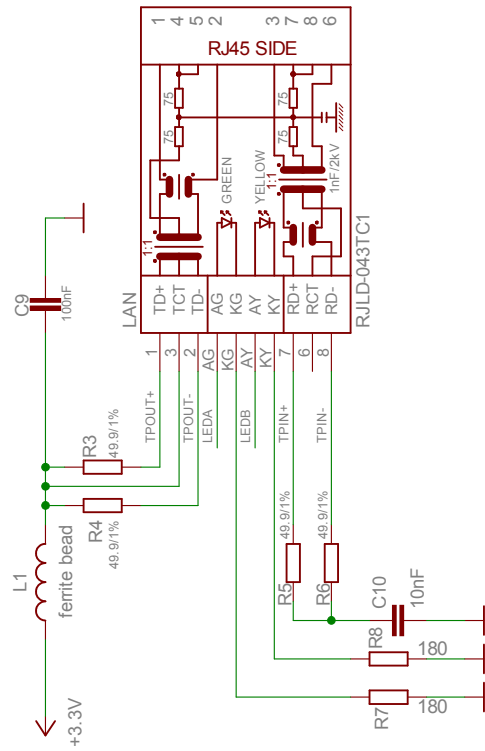


# MEMORY MAP

## ENC28J60 MEMORY ORGANIZATION



# SCHEMATIC

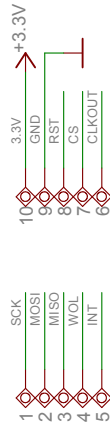
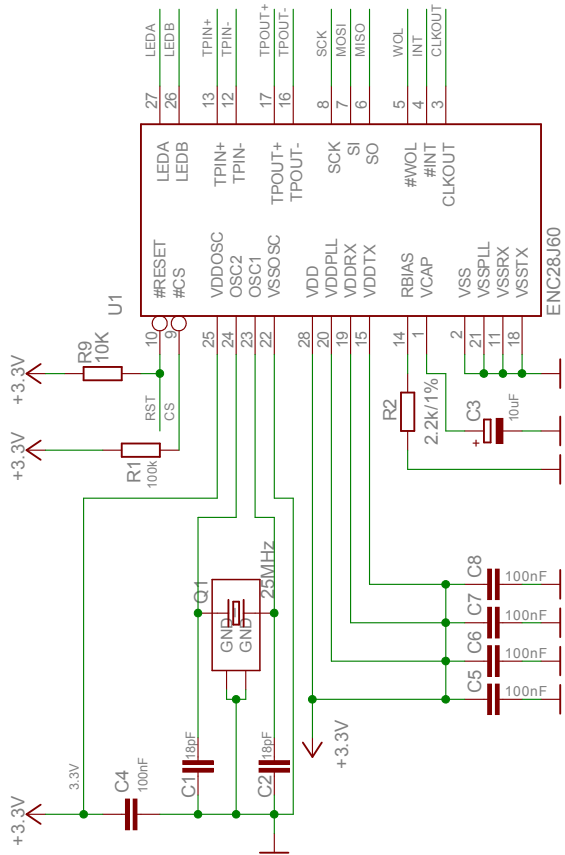


**ENC28J60-H**

Rev. B

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## POWER SUPPLY CIRCUIT

ENC28J60-H is typically power supplied by EXT pin 10 and pin 9.

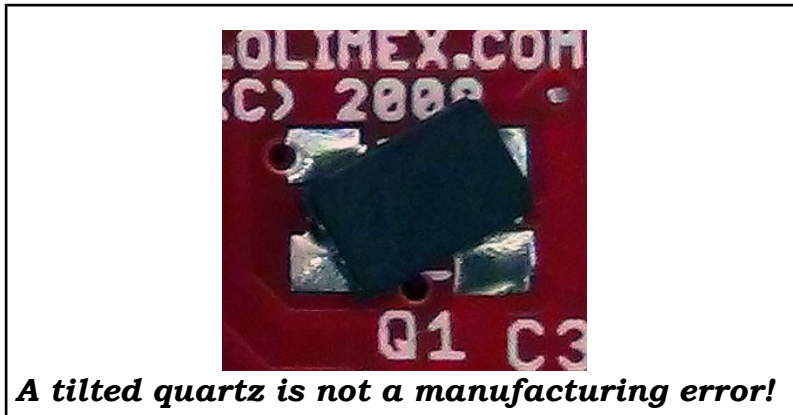
## RESET CIRCUIT

ENC28J60-H reset circuit includes EXT connector pin 8, U1 pin 10 and R9 (10k).

## CLOCK CIRCUIT

Quartz crystal 25 MHz is connected to ENC28J60 pin 23 (OSC1) and pin 24 (OSC2).

**IMPORTANT: If the board has a quartz crystal rotated at 45 degrees relative to the pads provided do not panic. This is normal. We have two types of such crystals - one of them requires 4 pads, the other only 2 pads. That is why we have provided 4 pads to be able to fit both crystals. All boards Olimex manufactures pass automatized optical inspection after assembly and obvious misplacement like this is impossible to occur.**

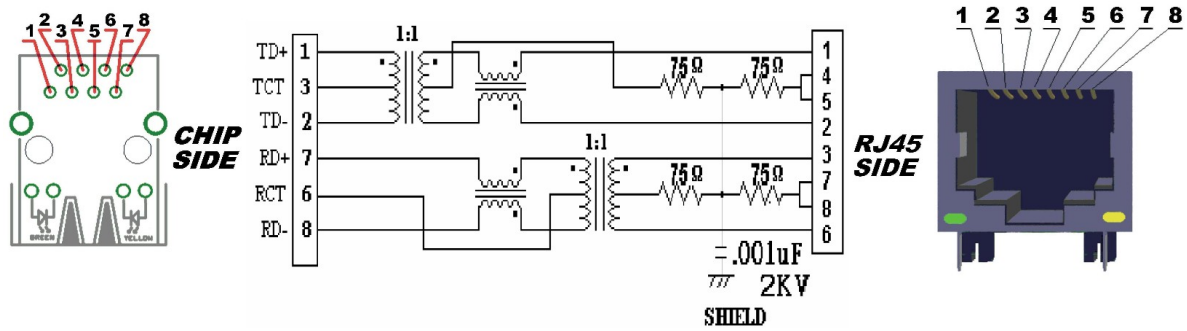


## JUMPER DESCRIPTION

There are no configurable jumpers on the board.

# CONNECTOR DESCRIPTIONS

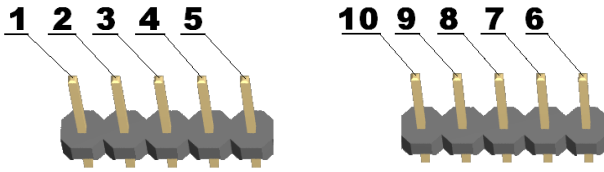
## LAN



Pin #	Signal Name Chip Side	Pin #	Signal Name Chip Side
1	TX+	5	Not Connected (NC)
2	TX-	6	VDD
3	VDD	7	RX+
4	Not Connected (NC)	8	RX-

LED	Color	Usage
Right	Green	Link status
Left	Yellow	Activity status

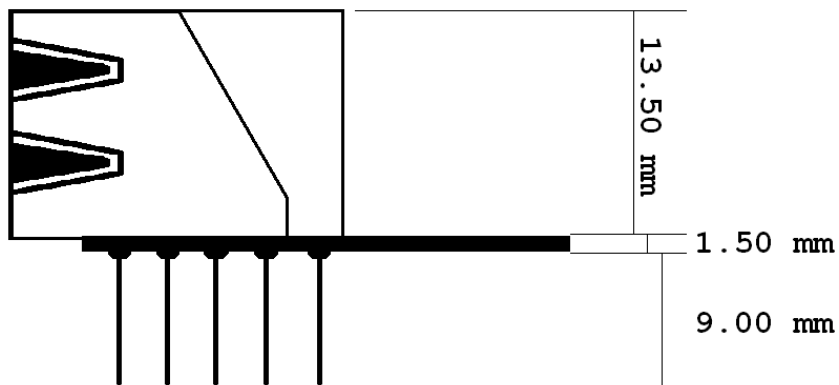
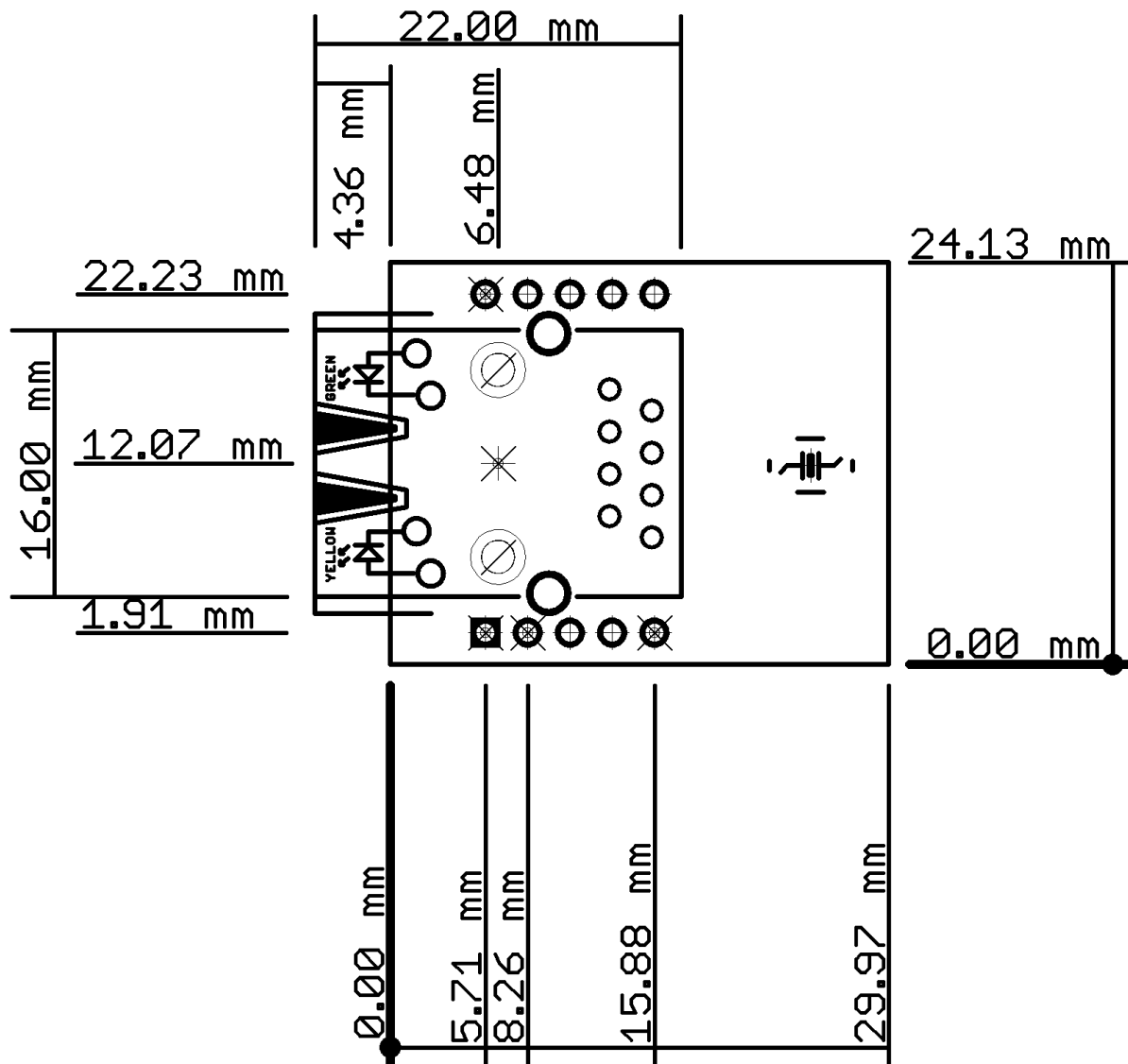
## EXT



Pin#	Signal Name	Pin#	Signal Name
1	SCK	6	CLKOUT
2	MOSI	7	CS
3	MISO	8	RST
4	WOL	9	GND
5	INT	10	3.3V



# MECHANICAL DIMENSIONS



## **AVAILABLE DEMO SOFTWARE**

Please check the SOFTWARE section of the product page for a number of examples with different boards. The web page for ENC28J60-H is:

<https://www.olimex.com/Products/Modules/Ethernet/ENC28J60-H/>

## **ORDER CODE**

ENC28J60-H - completely assembled and tested, includes ENC28J60 Ethernet controller

How to order?

You can purchase directly from our online shop or from any of our distributors. Note that usually it might be faster and cheaper to purchase Olimex products from our distributors. List of confirmed Olimex LTD distributors and resellers: <https://www.olimex.com/Distributors>

Please visit our web site [www.olimex.com](http://www.olimex.com) for more information.

## **REVISION HISTORY:**

Board revision:

Board revision	Notable changes
B	Initial release of the board

Manual revision:

Document revision	Notable changes	Modified page
A	- Initial manual release	All
B, 23.01.15	- Cleared duplicate information - Added clarification about the rotated quartz crystal - Formatting improvements	All

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It is possible that the pictures in this manual differ from the latest revision of the board.

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