ENC28J60-H development board

Users 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 30x24 mm. 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: 30x24 mm (1.18x0.95")

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.
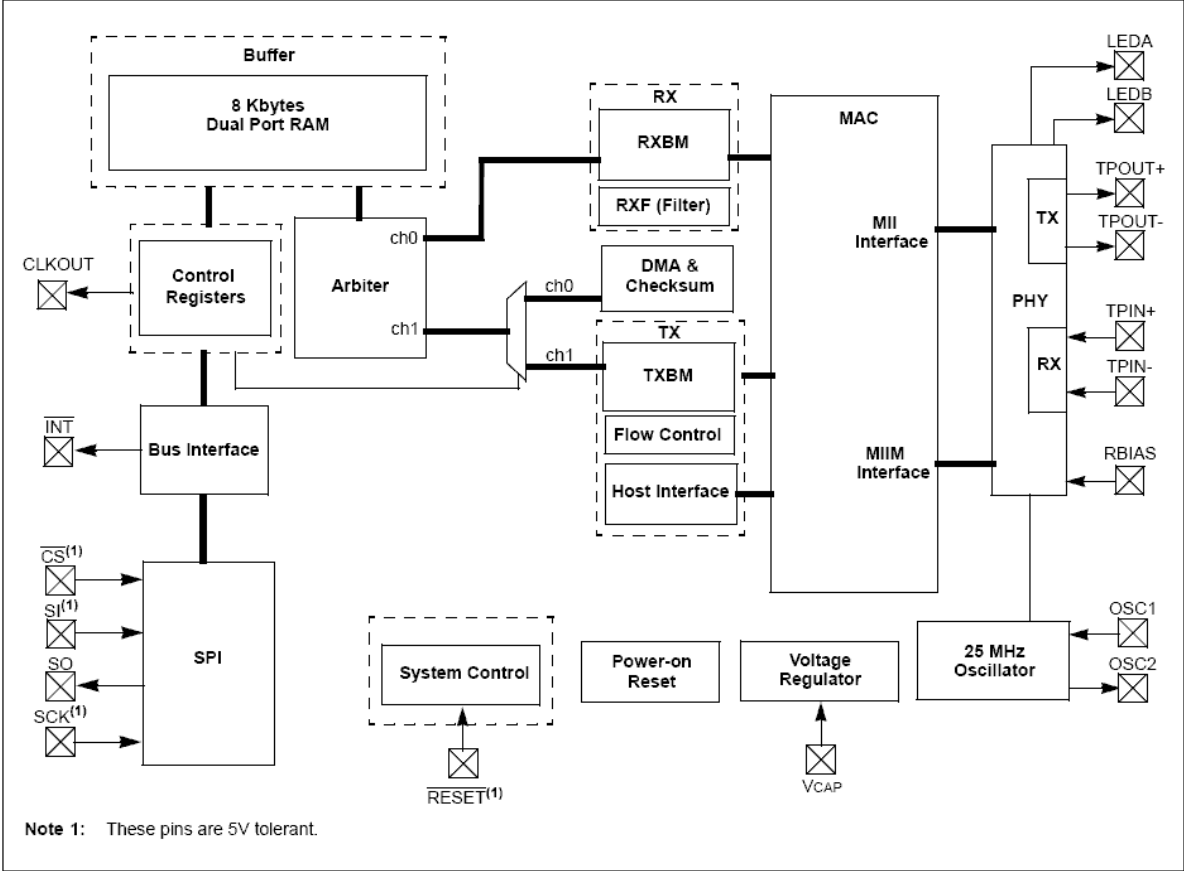
Ethernet Controller Features

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
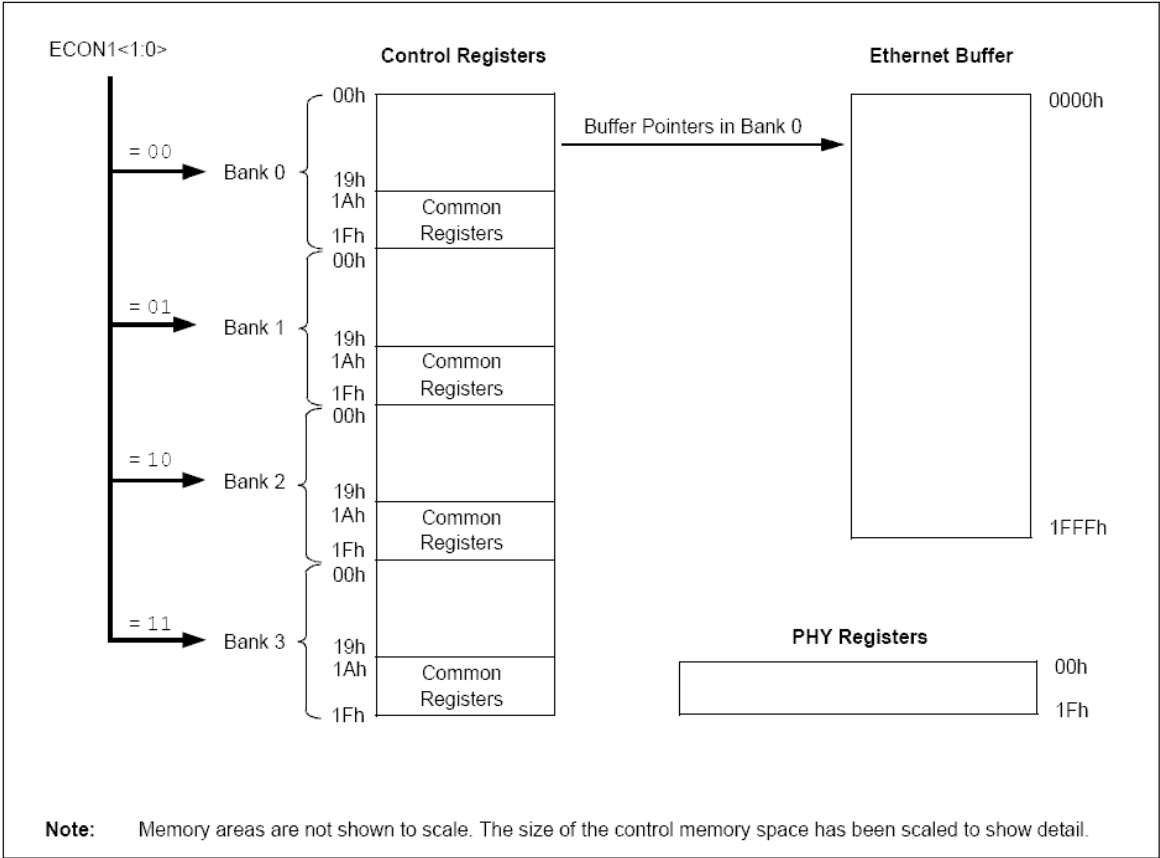
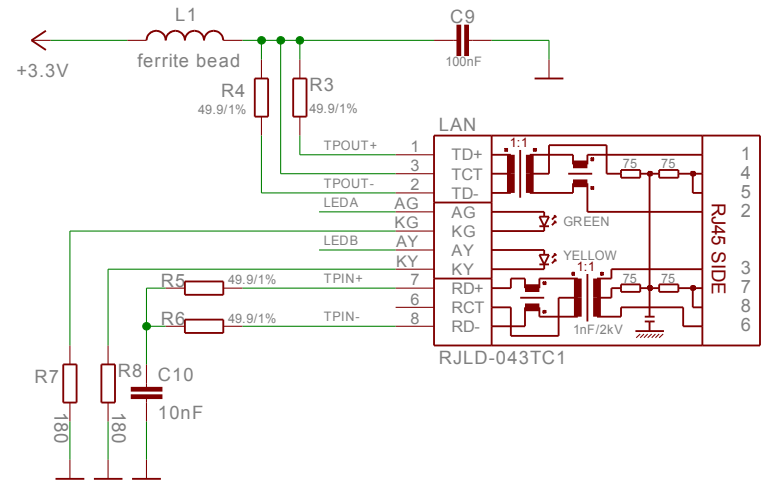– SPI Interface with Clock Speeds Up to 20 MHz
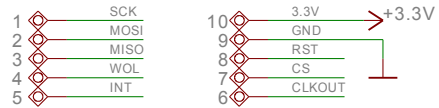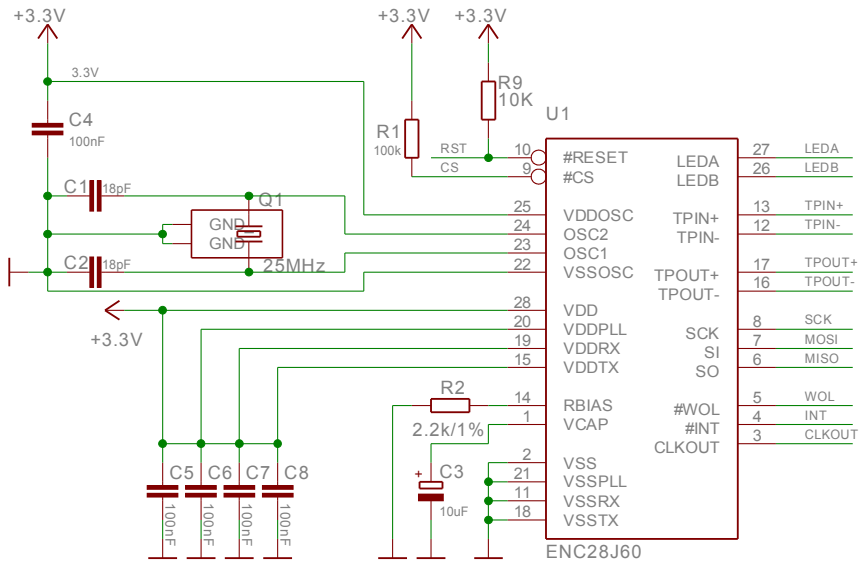
BLOCK DIAGRAM

ENC28J60 BLOCK DIAGRAM

Note 1: These pins are 5V tolerant.

MEMORY MAP

ENC28J60 MEMORY ORGANIZATION

Note: Memory areas are not shown to scale. The size of the control memory space has been scaled to show detail.

+3.3V

3.3V

C4
100nF

C1 18pF

Q1
GND
GND
25MHz

C2 18pF

+3.3V

C5 C6 C7 C8
100nF 100nF 100nF 100nF

R2
2.2k/1%

+ C3
10uF

+3.3V +3.3V

R1
100k

R9
10K

U1

RST   10   #RESET   LEDA   27   LEDA
CS   9   #CS   LEDB   26   LEDB

25   VDDOSC   TPIN+   13   TPIN+
24   OSC2   TPIN-   12   TPIN-
23   OSC1
22   VSSOSC   TPOUT+ 17   TPOUT+
                TPOUT- 16   TPOUT-
28   VDD
20   VDDPLL   SCK   8   SCK
19   VDDRX   SI   7   MOSI
15   VDDTX   SO   6   MISO

14   RBIAS   #WOL   5   WOL
1   VCAP   #INT   4   INT
                CLKOUT 3   CLKOUT
2   VSS
21   VSSPLL
11   VSSRX
18   VSSTX

ENC28J60

L1
ferrite bead

+3.3V

C9
100nF

R4
49.9/1%

R3
49.9/1%

LAN

TPOUT+   1   TD+   1:1
         3   TCT
TPOUT-   2   TD-
LEDA   AG
             KG   GREEN
LEDB   AY
             KY   YELLOW   1:1
R5 49.9/1% TPIN+ 7   RD+
             6   RCT
R6 49.9/1% TPIN- 8   RD-

RJLD-043TC1

1:1
75   75

75   75
1nF/2kV

RJ45 SIDE
1
4
5
2

3
7
8
6

R7   R8   C10
180   180   10nF

ENC28J60-H

Rev. B

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1   SCK
2   MOSI
3   MISO
4   WOL
5   INT

10 3.3V   +3.3V
9   GND
8   RST
7   CS
6   CLKOUT

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).
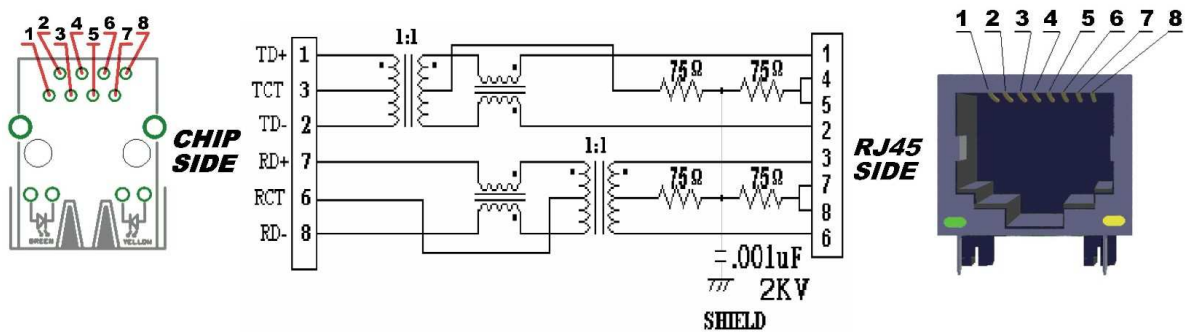
CLOCK CIRCUIT

Quartz crystal 25 MHz is connected to **ENC28J60** pin 23 (OSC1) and pin24 (OSC2).

JUMPER DESCRIPTION

There are no jumpers on this board.
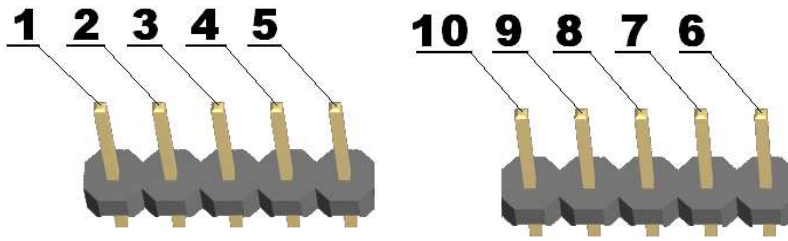
CONNECTOR DESCRIPTIONS

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

22.00 mm

4.36 mm

6.48 mm

24.13 mm

22.23 mm

16.00 mm

12.07 mm

GREEN

YELLOW

1.91 mm

0.00 mm

0.00 mm

5.71 mm

8.26 mm

15.88 mm

29.97 mm

13.50 mm

1.50 mm

9.00 mm
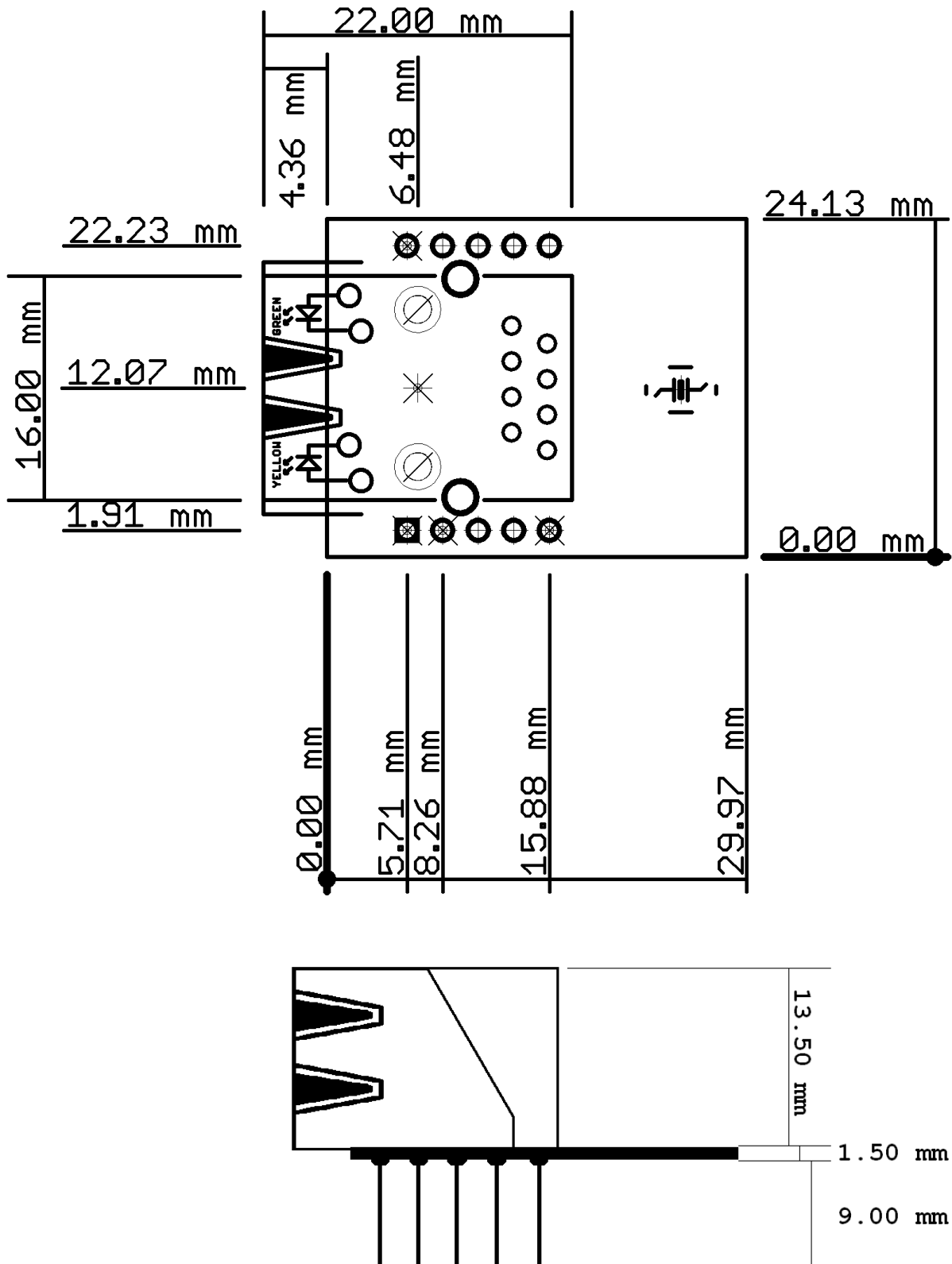
AVAILABLE DEMO SOFTWARE

– Microchip's TCP-IP stack full featured TCP-IP stack, very easy to configure and use with PIC microcontrollers.
– AVR fans now have also demo code for driving ENC28J60 with Bascom thanks to Ben Zijlstra from Netherlands
– Our development boards PIC-WEB and PIC-MINI-WEB use ENC28J60
– uIP1.0 demo code with LPC-P2106 and ENC28J60-H for CrossWorks written by Iain Derrington

ORDER CODE

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

How to order?
You can order to us directly or by any of our distributors.
Check our web www.olimex.com/dev for more info.

Revision history:

Board's revision: Rev. B   - create November 2008

Manual's revision: Rev. A – added more detailed mechanical dimensions