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# MPC8308-NSG

## 1. Introduction

This quick start guide applies to MPC8308-NSG board with schematic revision B or greater and PCB revision B or greater.

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## 1.1. MPC8308-NSG Board Details

Figure 1 below displays the MPC8308-NSG board details.

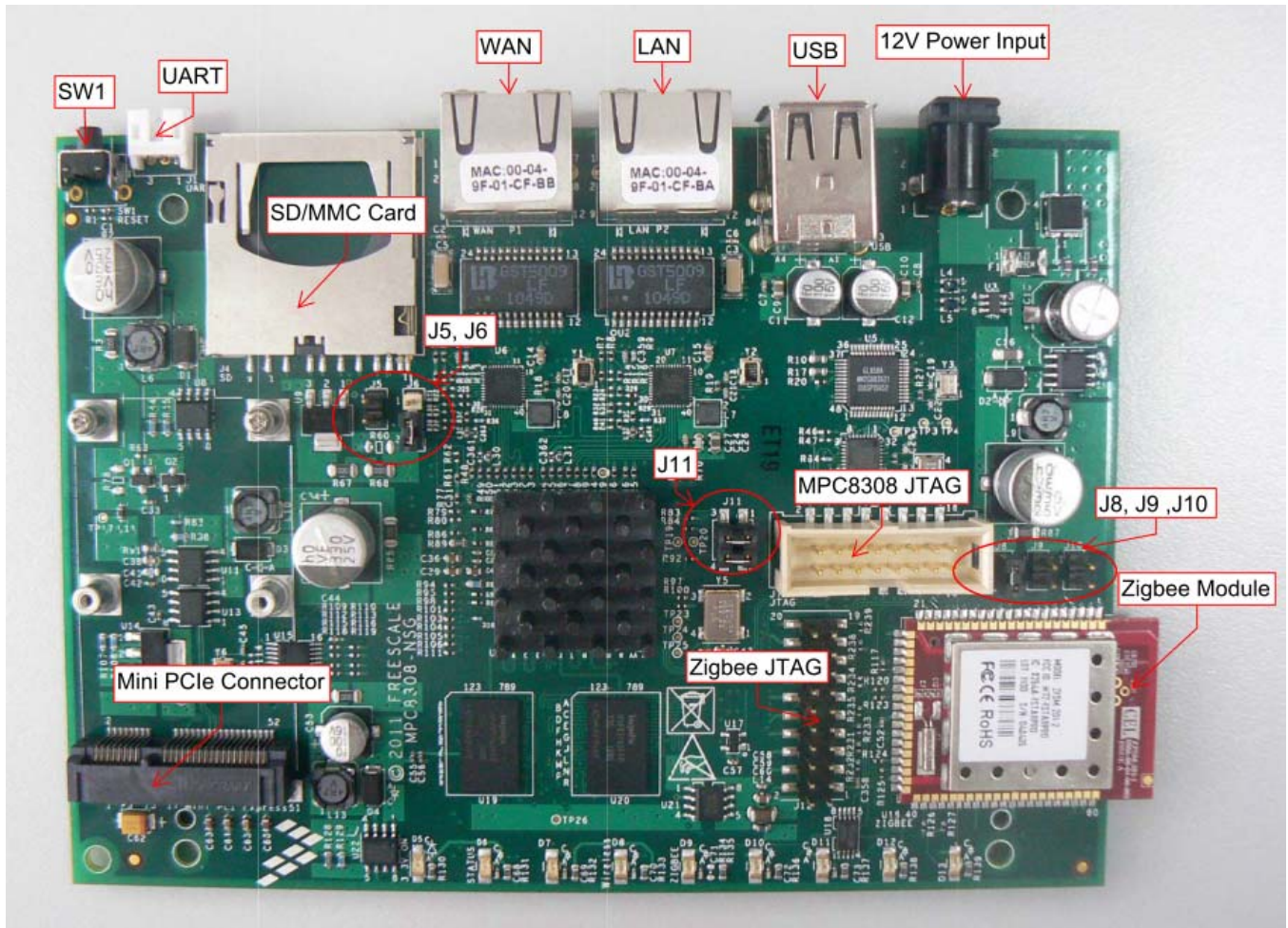


Figure 1. MPC8308-NSG Board Details

## 1.2. High Level Block Diagram

Figure 2 below displays the high level block diagram of the MPC8308-NSG board.

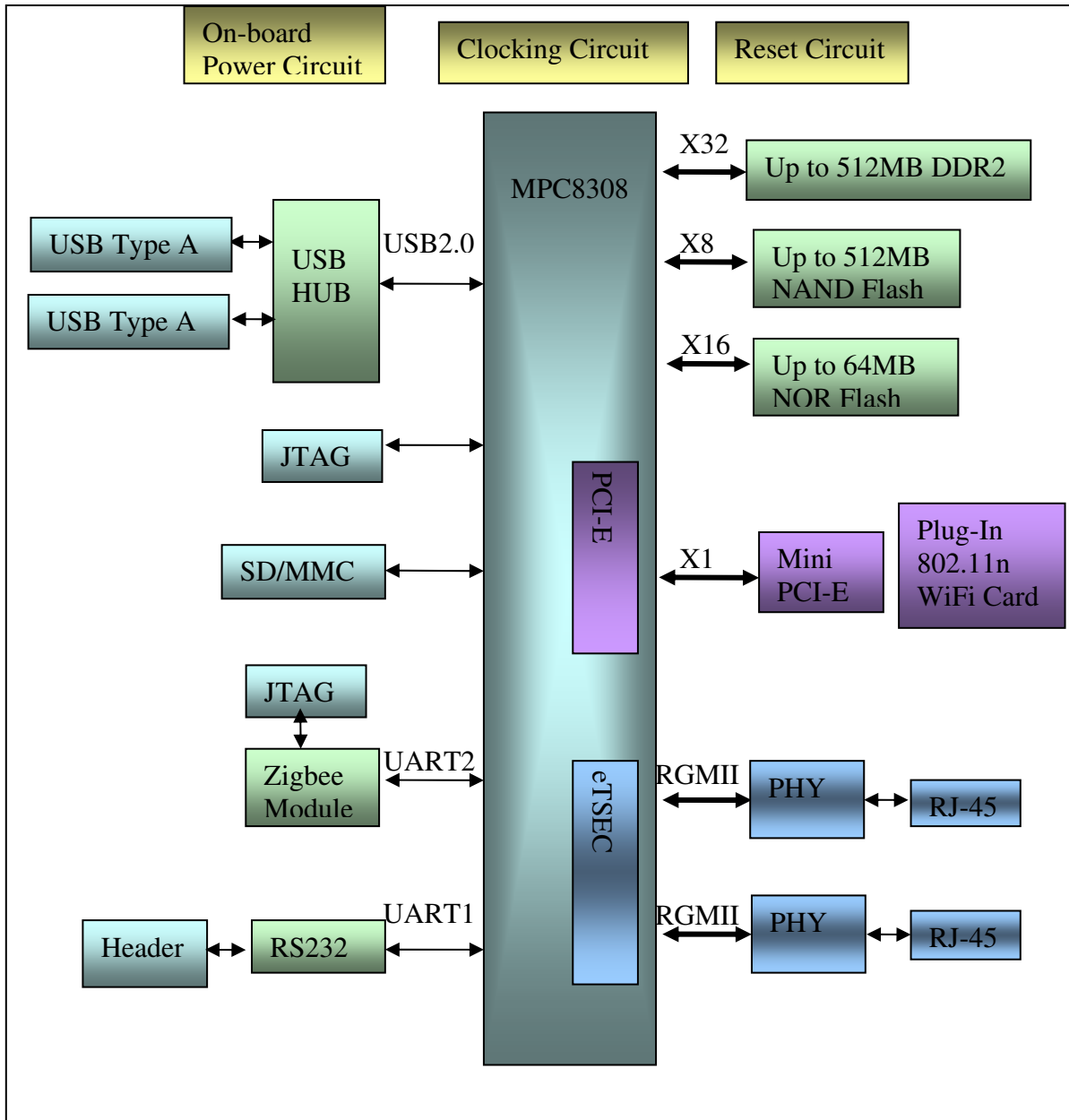


Figure 2. MPC8308-NSG High Level Block Diagram

## 1.3. Key Features

The key features of the MPC8308-NSG board are listed in Table 1:

**Table 1. Key Features of MPC8308-NSG**

| Key Feature      | Description   |
|------------------|---|
| CPU              | MPC8308 @ 400 MHz core speed, 1.0V core voltage   |
| Memory           | DDR2 on-board chips – 128MByte<br>NOR Flash – 8MByte<br>NAND Flash – 32MByte<br>I2C EEPROM – 256Kbit                  |
| PCIe             | One mini PCIe connector (x1)  |
| Zigbee module    | Zigbee/IEEE 802.15.4 module ZFSM-201-2 from CEL   |
| Ethernet         | Two 10/100/1000 ports as follows:<br>1 RGMII PHY connected to eTSEC1<br>1 RGMII PHY connected to eTSEC2               |
| I2C              | Serial EEPROM<br>Secure EEPROM  |
| SD/MMC card slot |   |
| USB              | Two Type A USB  |
| UART             | UART1: One 1x3 right angle header for serial port<br>UART2: Communication interface between MPC8308 and Zigbee module |
| Schematics       | OrCad   |
| PCB              | Allegro   |

## 2. Getting Started

### 2.1. Preloaded Binaries on the Board

Table 2 displays the MPC8308-NSG kit contents:

**Table 2. MPC8308-NSG Kit**

| Kit Contents  | Description                 |
|---|-----------------------------|
| On-board NOR Flash loaded with complete NOR flash image | u-boot.bin<br>ulmage<br>dtb |

## 2.2. Default Booting Method

By default, the boot loader executes from NOR flash. Different booting modes refer to Table 3.

**Table 3. Flash Memory Chip Select and Boot ROM**

| Mode           | J11                              | J6             | J5    | Description  |
|----------------|----------------------------------|----------------|-------|--|
| 1<br>(default) | Pin 1&3: short<br>Pin 2&4: short | Pin 2&3: short | Open  | NOR Flash CS0, NAND Flash CS1,<br>Booting from NOR Flash     |
| 2              | Pin 1&2: short<br>Pin 3&4: short | Pin 2&3: short | Short | NAND Flash CS0, NOR Flash CS1,<br>Booting from NAND Flash    |
| 3              | Pin 1&3: short<br>Pin 2&4: short | Pin 1&2: short | Open  | NOR Flash CS0, NAND Flash CS1,<br>For CodeWarrior connection |

## 2.3. Default Frequency Setting

The default frequency is configured by Reset Configuration Word (RCW) . Table 4 displays default frequency settings:

**Table 4. Default Frequency Settings**

| Core Freq (MHz) | Platform Freq (MHz) | DDR Freq (MHz) |
|-----------------|---------------------|----------------|
| 400             | 133                 | 266            |

## 2.4. Ethernet and USB Ports

Figure 3 shows the Ethernet and USB ports on MPC8308-NSG.



**Figure 3. Ethernet and USB Ports on MPC8308-NSG**

Table 5 displays Ethernet ports on MPC8308-NSG.

**Table 5. Ethernet ports on MPC8308-NSG**

| Marking on board | On SoC | In u-boot | In Linux | Mode of operation |
|------------------|--------|-----------|----------|-------------------|
| WAN              | eTSEC1 | eTSEC0    | eth0     | RGMII             |
| LAN              | eTSEC2 | eTSEC1    | eth1     | RGMII             |

Table 6 displays USB ports on MPC8308-NSG.

**Table 6. USB ports on MPC8308-NSG**

| Marking on board | On SoC | In u-boot | In Linux       | Mode of operation            |
|------------------|--------|-----------|----------------|------------------------------|
| USB-TOP          | USB    |           | usb1/1-1/1-1.4 | ULPI(external PHY) + USB HUB |
| USB-BOTTOM       | USB    |           | usb1/1-1/1-1.3 | ULPI (external PHY)+ USB HUB |

## 2.5. UART and SD/MMC

Figure 4 shows the UART port and SD/MMC slot on MPC8308-NSG.



**Figure 4. UART Port and SD/MMC Slot on MPC8308-NSG**

Table 7 displays the UART port on MPC8308-NSG.

**Table 7. UART port on MPC8308-NSG**

| Marking on board | On SoC | In u-boot | In Linux |
|------------------|--------|-----------|----------|
| UART             | UART1  |           | ttyS0    |

Table 8 displays the SD/MMC interface on MPC8308-NSG.

**Table 8. SD/MMC on MPC8308-NSG**

| Marking on board | On SoC | In u-boot | In Linux | Mode of operation     |
|------------------|--------|-----------|----------|-----------------------|
| SD/MMC           | eSDHC  | FSL_ESDHC | mmcbk0   | SD/MMC 1-bit or 4-bit |







## 2.7. Preparing the Board

1. Ensure that board is not connected to the power.

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**NOTE** It is recommended to wear the wrist strap before preparing the MPC8308-NSG board to get protection from electrical charges.

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2. Attach a 3-pin to DB9 RS-232 cable between the MPC8308-NSG (UART) and a host PC.
3. For serial you can use any serial program viz TeraTerm, Hyperterm, etc.
4. Configure the host PC's serial port with the following settings:
  - Data rate: 115200 bps
  - Number of data bits: 8
  - Parity: None
  - Number of Stop bits: 1
  - Flow Control: None
5. Plug in +12V adapter cable
6. U-boot starts followed by Linux. (see example log)

### 2.7.1. Example U-boot Log

U-Boot 2009.11-rc1-00021-gb55d5a0-dirty (Dec 22 2010 - 23:22:51) MPC83XX

Reset Status:

CPU: e300c3, MPC8308, Rev: 1.0 at 400 MHz, CSB: 133.333 MHz

Board: Freescale MPC8308WMG Rev <unknown>

I2C: ready

DRAM: 128 MB

FLASH: 8 MB

NAND: 32 MiB

PCIE0: No link

In: serial

Out: serial

Err: serial

MMC: FSL\_ESDHC: 0

Net: eTSEC0, eTSEC1

Hit any key to stop autoboot: 0

=>

## **3. References**

For more information, refer to MPC8308-NSG User's Guide.pdf.

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