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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.

### Contents

## 1.1. MPC8308-NSG Board Details

Figure 1 below displays the MPC8308-NSG board details.

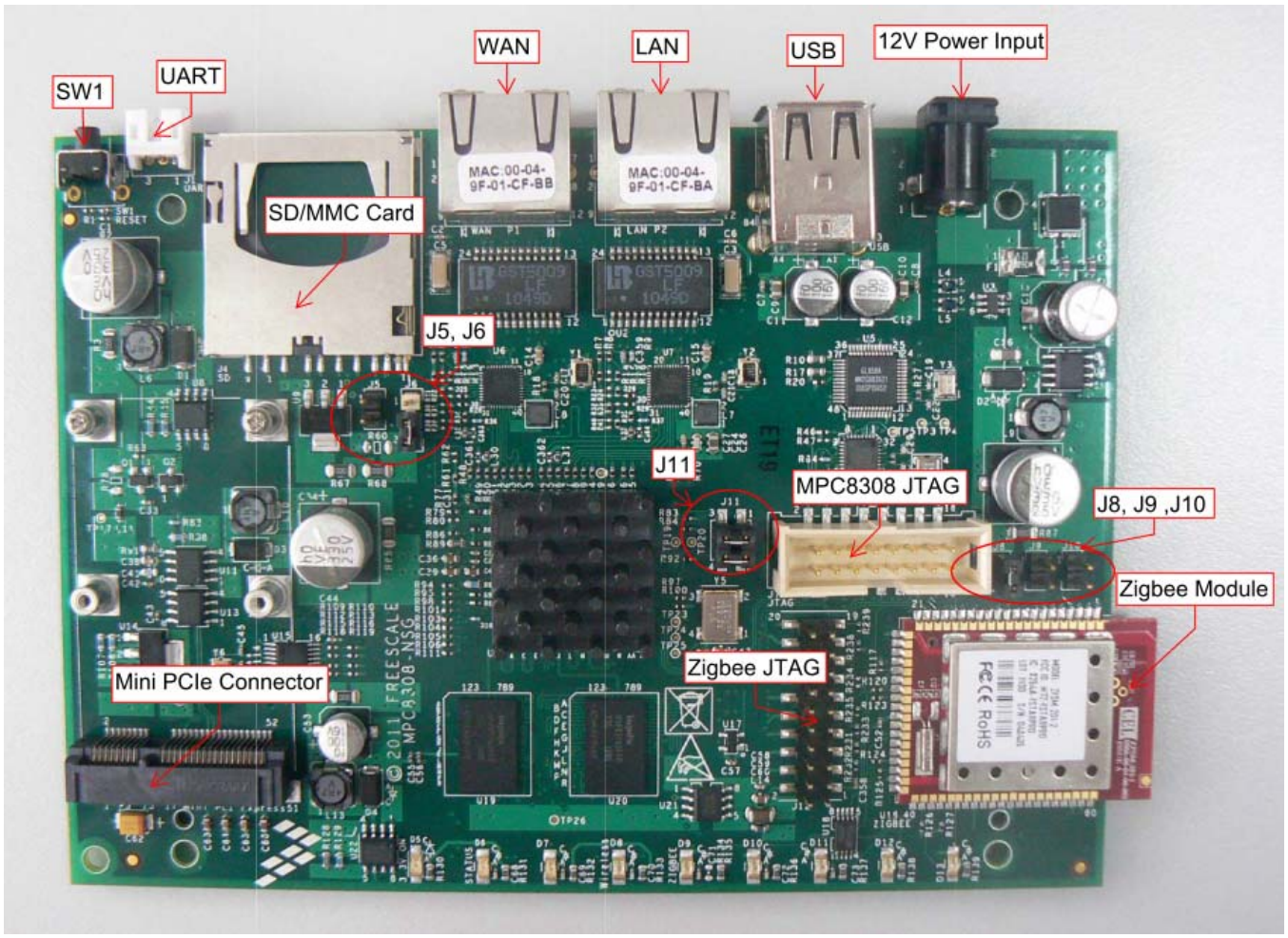


**Figure 1. MPC8308-NSG Board Details**

## 1.2. High Level Block Diagram

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

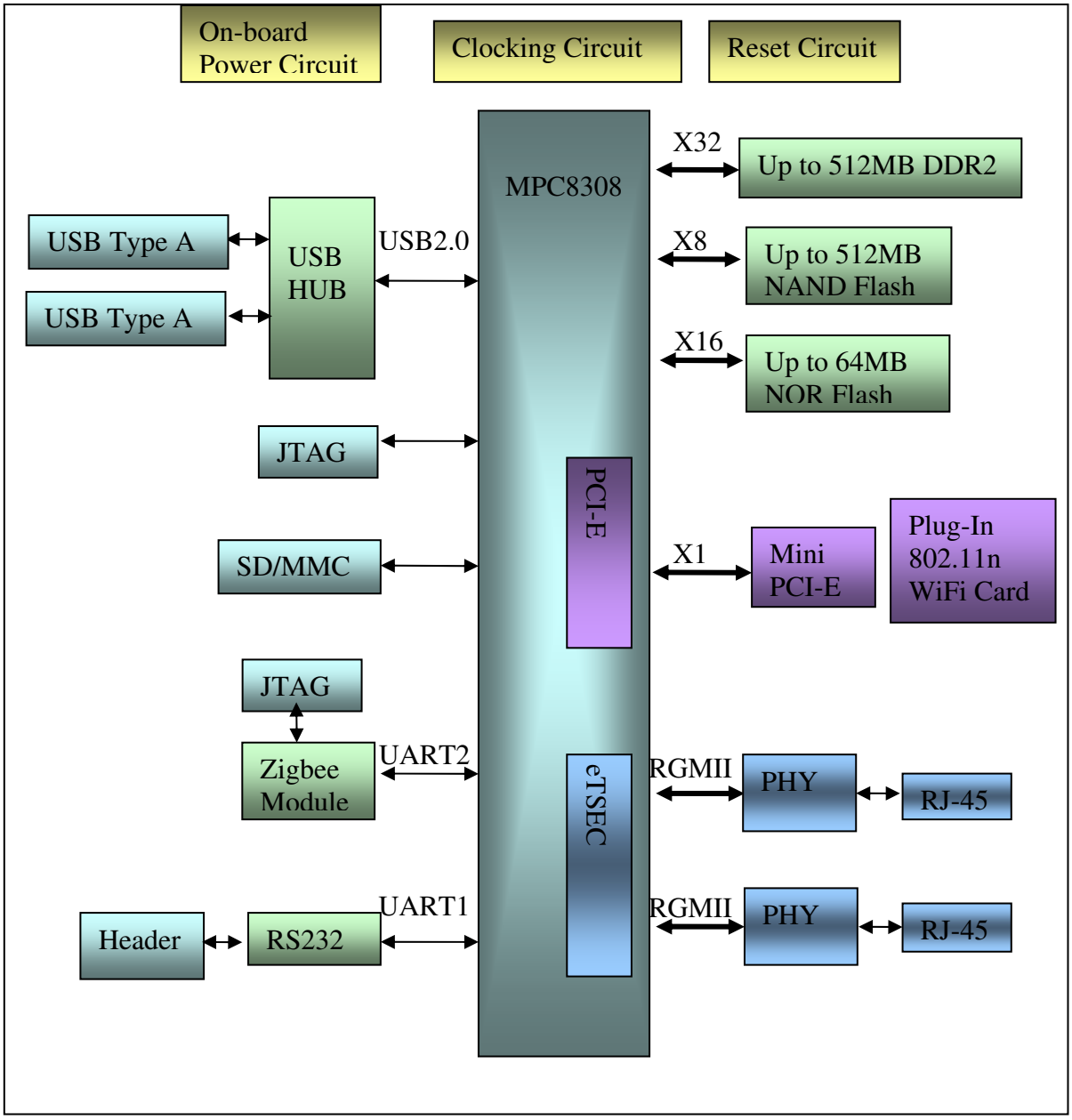


**Figure 2. MPC8308-NSG High Level Block Diagram**

## 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>uImage<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 (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 | mmcblk0 | SD/MMC 1-bit or 4-bit |

## 2.6. Zigbee Module

Zigbee module based on Freescale MC13226 is soldered on PCB directly as shown in Figure 5. The 2x10 header J12 is for Zigbee module JTAG development tools.

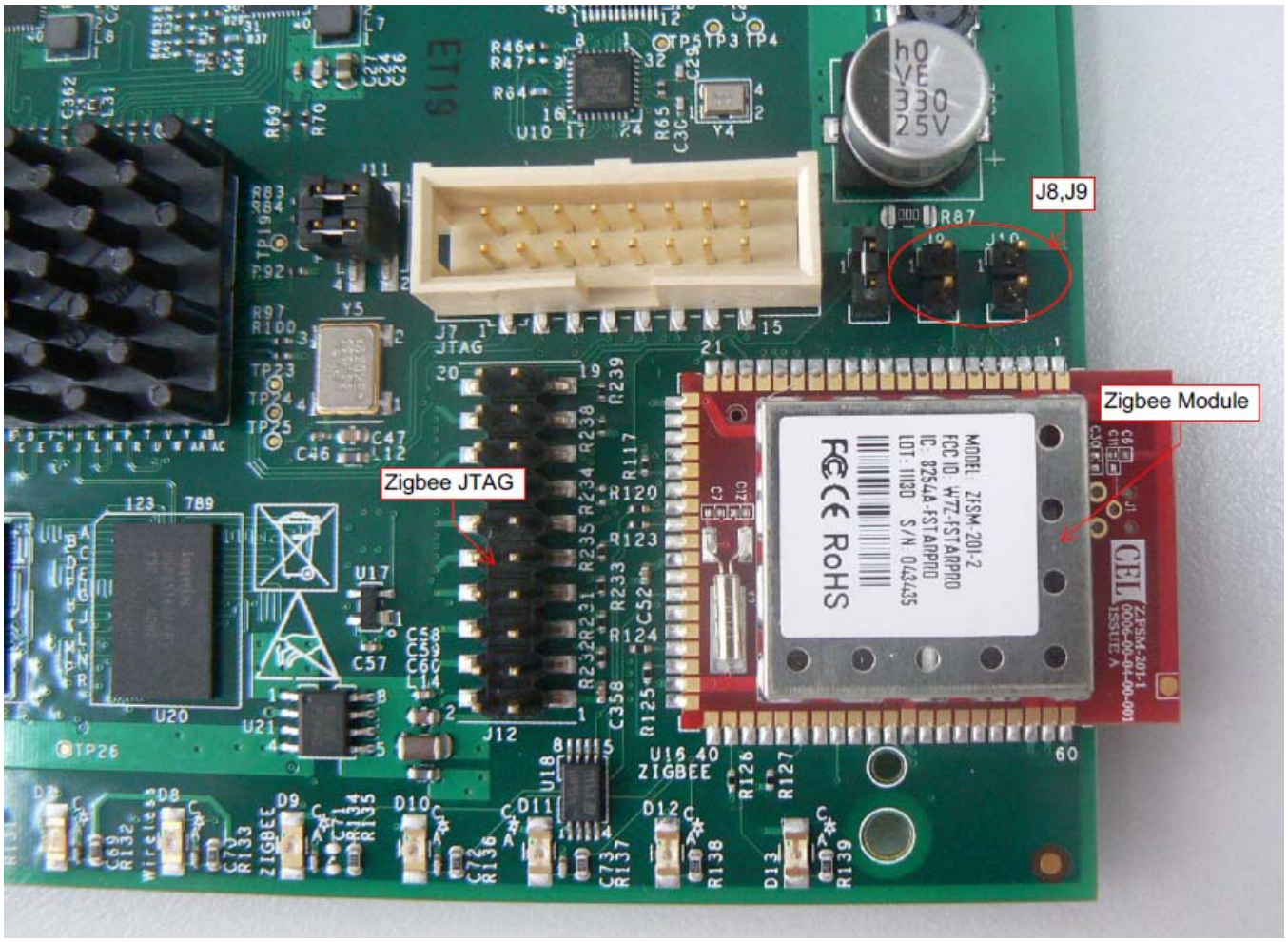


**Figure 5. Zigbee Module and Zigbee Module JTAG connector**

Table 9 shows how to configure the flash erase mode on Zigbee Module.

**Table 9. Flash Erase Mode**

| Mode | J9 | J10 | Mode of Operation |
|---|---|---|---|
| Recovery Mode | Short | Short | Erase the FLASH on Zigbee module through the boot process |
| Non-recovery Mode (default) | Open | Open | Not erase the FLASH on Zigbee module through the boot process |

## 2.7. Preparing the Board

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

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

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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