COLOR LEGEND:

**DONE / IMPORTANT COMMENT**

**SHOULD BE DONE AND/OR IMPROVED**

**OK - PRELIMINARY**

**OK - SHOULD BE DONE BUT WASN'T CHECKED**

**OK - CHECKED AND SHOULD BE DEFINITE**

# CONNECTOR 1:

* Ethernet (after phy) 12 (+1)pins:
  + 4x TRX differential pairs
  + 3x LED
  + **OPTIONAL** 1x supply
* HDMI 12pins:
  + 3x DATA differential pairs
  + 1x CLK differential pairs
  + ----
  + HDMI\_HPD
  + HDMI\_CEC\_IN
    - on the module there won't be located voltage translator (NLSV1T34 on sheet 3 of reference board). On connector it was named DISP0\_CONTRAST.
  + HDMI\_DDC\_CLK\_IN
    - multiplexed I2C2\_SCL
  + HDMI\_DDC\_DAT\_IN
    - multiplexed I2C2\_SDA
* SD card 8pin:
  + - **SD2** with software \_CD and \_WP
    - possibility to hardware pins \_CD and \_WP but for software compatibility we won't use them
    - just half bus for data
  + SD2\_DATA0
  + SD2\_DATA1
  + SD2\_DATA2
  + SD2\_DATA3
  + SD2\_CLK
  + SD2\_CMD
  + SD2\_CD\_B
    - software used pin NANDF\_D2
  + SD2\_WP
    - software used pin NANDF\_D3
* SPI 2 4pin:
  + - **CSPI2**
    - **maybe lead out more chip select**
  + ECSPI2\_MOSI
    - multiplexed DISP0\_DAT16 (pin T21)
    - could be used pad EIM\_CS1 (pin J23)
  + ECSPI2\_MISO
    - multiplexed DISP0\_DAT17 (pin U24)
    - could be used pad EIM\_OE (pin J24)
  + ECSPI2\_SCLK
    - multiplexed DISP0\_DAT19 (pin U23)
    - could be used EIM\_CS0 (pin H24)
  + ECSPI2\_SS0
    - multiplexed DISP0\_DAT18 (pin V25)
    - could be used EIM\_RW (pin K20)
* USB OTG 4(+1)pins:
  + - usb on-the-go - the fifth pin for ID will be routed on connector, so costumers, that build their own baseboard can decide if they us OTG
    - supply for USB requires +5V it won't be on card, should be supplied with baseboard - won't be on connector
    - ESD protection and EMI filters on baseboard
  + differential pair USB\_OTG\_D
  + USB\_OTG\_OC
    - multiplexed EIM\_D21 (pin H20)
  + USB\_OTG\_PWR\_EN
    - multiplexed EIM\_D22 (pin E23)
  + USB\_OTG\_ID
* UART1 8pins:
  + UART1\_CTS\_B
    - used EIM\_D19 (pin G21)
  + UART1\_DCD\_B
    - used EIM\_D23 (pin D25)
  + UART1\_DSR\_B
    - used EIM\_D25 (pin G22)
  + UART1\_DTR\_B
    - used EIM\_D24 (pin F22)
  + UART1\_RI\_B
    - used EIM\_EB3 (pin F23)
  + UART1\_RTS\_B
    - used EIM\_D20 (pin G20)
  + UART1\_RX\_DATA
    - used CSI0\_DAT11 (pin M3)
  + UART1\_TX\_DATA
    - used CSI0\_DAT10 (pin M1)
* I2C4 2pins:
  + I2C4\_SCL
    - used NANDF\_WP\_B (pin E15)
    - also possible to use GPIO\_7 (pin R3)
  + I2C4\_SDA
    - used NANDF\_CS3 (pin D16)
    - also possible to use GPIO\_8 (pin R5)

# SUM OF USED PINS ON CONNECTOR 1:

* Ethernet (after phy) 12 (+1)
* HDMI 12
* SD card 8
* SPI 4
* USB OTG 4(+1)
* UART1 8
* I2C4 2
* reset input 1
* reset output 1
  + sum **54 (min 50)**

# CONNECTOR 2:

* LVDS0 12pins
  + 3x TX differential pairs
    - not multiplexed with something else
  + 1x CLK differential pairs
    - not multiplexed with something else
  + CABC\_EN0 (pin A17)
    - used as GPIO6\_IO15
  + DISP0\_PWM (pin F18)
    - used as GPIO1\_IO21
    - on the module there won't be located voltage translator (NLSV1T34 on sheet 3 of reference board). On connector it was named DISP0\_CONTRAST.
  + LVDS0\_EDID\_SCL
    - multiplexed **changed** I2C3\_SCL
  + LVDS0\_EDID\_SDA
    - multiplexed **changed** I2C3\_SDA
* MMC card 12pins:
  + - **SD3** with software \_CD and \_WP
    - full data bus
  + SD3\_DATA0 - SD3\_DATA7
  + SD3\_CMD
  + SD3\_CLK
  + SD3\_WP
    - software used pin NANDF\_D0
  + SD3\_CD\_B
    - software used pin NANDF\_D1
* SATA 4pin:
  + supported only by iMX6 dual and quad processors
  + differential pair SATA\_RX
    - negative SATA\_PHY\_RX\_N
      * used SATA\_RXM (pin A14)
    - positive SATA\_PHY\_RX\_P
      * used SATA\_RXP (pin B14)
  + differential pair SATA\_TX
    - negative SATA\_PHY\_TX\_N
      * used SATA\_TXM (pin B12)
    - positive SATA\_PHY\_TX\_P
      * used SATA\_TXP (pin A12)
  + pin SATA\_DEVSLP won't be on connector
* PCIE 7pin:
  + added also differential clock and PCIE wake, so costumers on base board can build mini PCIe
  + differential pair PCIE\_RX
    - negative PCIE\_RX\_N
      * used PCIE\_RXM (pin B1)
    - positive PCIE\_RX\_P
      * used PCIE\_RXP (pin B2)
  + differential pair PCIE\_TX
    - negative PCIE\_TX\_N
      * used PCIE\_TXM (pin A3)
    - positive PCIE\_TX\_P
      * used PCIE\_TXP (pin B3)
  + differential clock
    - negative CLK1\_N
      * used XTALOSC\_CLK1\_N (pin C7)
    - positive CLK1\_P
      * used XTALOSC\_CLK1\_P (pin D7)
  + PCIE\_WAKE\_B
    - used CSI0\_DATA\_EN (pin P3)
  + **doesn’t need to also pin PCIE\_RST\_B ?**
* USB HOST 4pins:
  + - supply for USB requires +5V it won't be on card, should be supplied with baseboard - won't be on connector
    - ESD protection and EMI filters on baseboard
  + differential pair USB\_HOST\_D
  + USB\_H1\_OC
    - multiplexed EIM\_D30 (pin J20)
  + USB\_H1\_PWR\_EN
    - multiplexed ENET\_TXD1 (pin W20)
    - there is possibility to use hardware PWR\_EM (EIM\_D31 (pin H21) ), on reference design they us ENET\_TXD1 and for software compatibility we will use ENET\_TXD1
* UART2 4pin:
  + UART2\_CTS\_B
    - used SD4\_DAT6 (pin B20)
  + UART2\_RTS\_B
    - used SD4\_DAT5 (pin C19)
  + UART2\_RX\_DATA
    - used SD4\_DAT4 (pin E18)
  + UART2\_TX\_DATA
    - used SD4\_DAT7 (pin D19)x
* AUDIO 7pin:
  + AUD3\_TXC
    - used CSI0\_DAT4 (pin N1)
  + AUD3\_TXD
    - used CSI0\_DAT5 (pin P2)
  + AUD3\_TXFS
    - used CSI0\_DAT6 (pin N4)
  + AUD3\_RXD
    - used CSI0\_DAT7 (pin N3)
  + I2C1\_SDA
    - used CSI0\_DAT8 (pin N6)
    - **added pullup**
  + I2C1\_SCL
    - used CSI0\_DAT9 (pin N5)
    - **added pullup**
  + GPIO\_0\_CLKO
    - used GPIO\_0\_CLKO (pin T5)
    - pin for codec AUD\_MCLK which need to be translated from 3V3 down to 1V8
    - level translator needs to be placed on base board NLSV1T34
* JTAG 6pin:
  + JTAG\_TDO
    - not multiplexed
  + JTAG\_TCK
    - not multiplexed
  + JTAG\_TMS
    - not multiplexed
  + JTAG\_TDI
    - not multiplexed
  + JTAG\_nTRST
    - not multiplexed
  + **not** JTAG\_MOD
    - not multiplexed
    - resistors will be populated on board, don't need to be lead out from connector

# SUM OF USED PINS ON CONNECTOR 2:

* LVDS0 12
* MMC card 12
* SATA 4
* PCIE 7
* USB HOST 4
* UART2 4
* I2C3 0 (counted in LVDS)
* audio 7
* JTAG 6
  + sum **56 (min X)**

# PERIPHERALS PINS FROM CPU:

* Ethernet: **OK**
  + 4x RXD
    - RGMII\_RD0
      * used RGMII\_RD0 (pin C22)
    - RGMII\_RD1
      * used RGMII\_RD1 (pin F20)
    - RGMII\_RD2
      * used RGMII\_RD2 (pin E21)
    - RGMII\_RD3
      * used RGMII\_RD3 (pin A24)
  + 4x TXD
    - RGMII\_TD0
      * used RGMII\_TD0 (pin C24)
    - RGMII\_TD1
      * used RGMII\_TD1 (pin B23)
    - RGMII\_TD2
      * used RGMII\_TD2 (pin B24)
    - RGMII\_TD3
      * used RGMII\_TD3 (pin D23)
  + 1x RXCLK
    - RGMII\_RXC
      * used RGMII\_RXC (pin B25)
  + 1x TXCLK
    - RGMII\_TXC
      * used RGMII\_TXC (pin D21)
  + 1x RXDV
    - RGMII\_RX\_CTL
      * used RGMII\_RX\_CTL ( pin D22)
  + 1x TXEN
    - ENET\_REF\_CLK
    - used RGMII\_TX\_CTL (pin C23)
  + RGMII\_MDC
    - used ENET\_MDC (pin V20)
  + RGMII\_MDIO
    - used ENET\_MDIO (pin V23)
  + RGMII\_Nrst
    - used ENET\_CRS\_DV (pin U21)
  + ENET\_REF\_CLK
    - used RGMII\_TX\_CTL (pin V22)
  + ETH\_WOL\_INT
    - used ENET\_TX\_EN (pin V21)
  + RGMII\_INT
    - used ENET\_RXD1 (pin W22)
* HDMI: **OK**
  + connection same like on connector
  + **I2C2** **USED FOR LVDS0**
  + **find out if audio on HDMI will work (will be drivers for it)**
* LVDS0: **OK**
  + connection same like on connector
  + **I2C3** **USED FOR LVDS0**
  + **priority port**
* LVDS1: not used
  + but LVDS1\_DATA3\_N and LVDS1\_DATA3\_P will used for test points
* SD card: **OK**
  + connection same like on connector
* MMC card: **OK**
  + connection same like on connector
* SPI2: **OK**
  + connection same like on connector
* SPI FLASH 4pin:
  + - **CSPI1**
  + SPINOR\_MISO
    - multiplexed CSPI1\_MISO
  + SPINOR\_MOSI
    - multiplexed CSPI1\_MOSI
  + SPINOR\_CLK
    - multiplexed CSPI1\_CLK
  + SPINOR\_CS0
  + multiplexed CSPI1\_CS0
* SATA: **OK**
  + connection same like on connector
  + **added to card capacitor** - on base board placed only connector
* PCIE: **OK**
  + connection same like on connector
  + **added to card capacitor** - on base board placed only connector
* USB HOST: **OK**
  + connection same like on connector
* USB OTG: **OK**
  + connection same like on connector
* UART1: **OK**
  + connection same like on connector
  + **doesn't need to add pullups** (if there is a need place it on baseboard or enable one of three internal pullups in mcu)
* UART2: **OK**
  + connection same like on connector
  + **doesn't need to add pullups** (if there is a need place it on baseboard or enable one of three internal pullups in mcu)
* I2C4: **OK**
  + connection same like on connector
  + **added pullups**
* AUDIO: **OK**
  + connection same like on connector
* JTAG: **OK**
  + connection same like on connector
  + **added pullups**

# BOOT

* used boot mode: BOOT FROM FUSES
  + configuration:
    - BOOT\_MODE\_0 : value 0
    - BOOT\_MODE\_1 : value 0
  + we aren't going to change boot mode, so there will be no opportunity to change boot mode
    - we won't place any switch that could change boot mode
  + will be placed only two pull down resistors
* only possible to boot from eFuse
  + also won't be located configuration resistors and switch
  + pins connected to those will be free of use
* default boot from **SPI flash** (according to SABRE Lite)

# I2C USE

* I2C1 used for communication with audio codec
* I2C2 used by HDMI
* I2C3 used by LVDS - can be used for general I2C
* I2C4 on Connector 1