

## Содержание

|                                         |    |
|-----------------------------------------|----|
| <b>NMS-uQ7-BKLT v1 ds-en</b>            | 3  |
| <b>Technical Specifications</b>         | 4  |
| <b>Block Diagram</b>                    | 5  |
| <b>Power tree</b>                       | 6  |
| <b>Mechanical Specifications</b>        | 7  |
| <b>Main Hardware Components</b>         | 8  |
| Component Location                      | 8  |
| Top view                                | 8  |
| Bottom View                             | 9  |
| Processor                               | 10 |
| <b>External connectors</b>              | 11 |
| I2C                                     | 11 |
| <b>Debugging/development interfaces</b> | 12 |
| I2C                                     | 12 |
| RESET                                   | 13 |
| <b>External connectors</b>              | 14 |
| Top view                                | 14 |
| Bottom view                             | 15 |
| <b>Appendix 1</b>                       | 16 |



# NMS-uQ7-BKLT v1 ds-en

System on Module Q7\_BFK is based on the Baikal-T1 (BE-T1000) applications processor. BE-T1000 is a russian system on a chip based on the MIPS Warrior P-class P5600 architecture by the «Baikal Electronics»

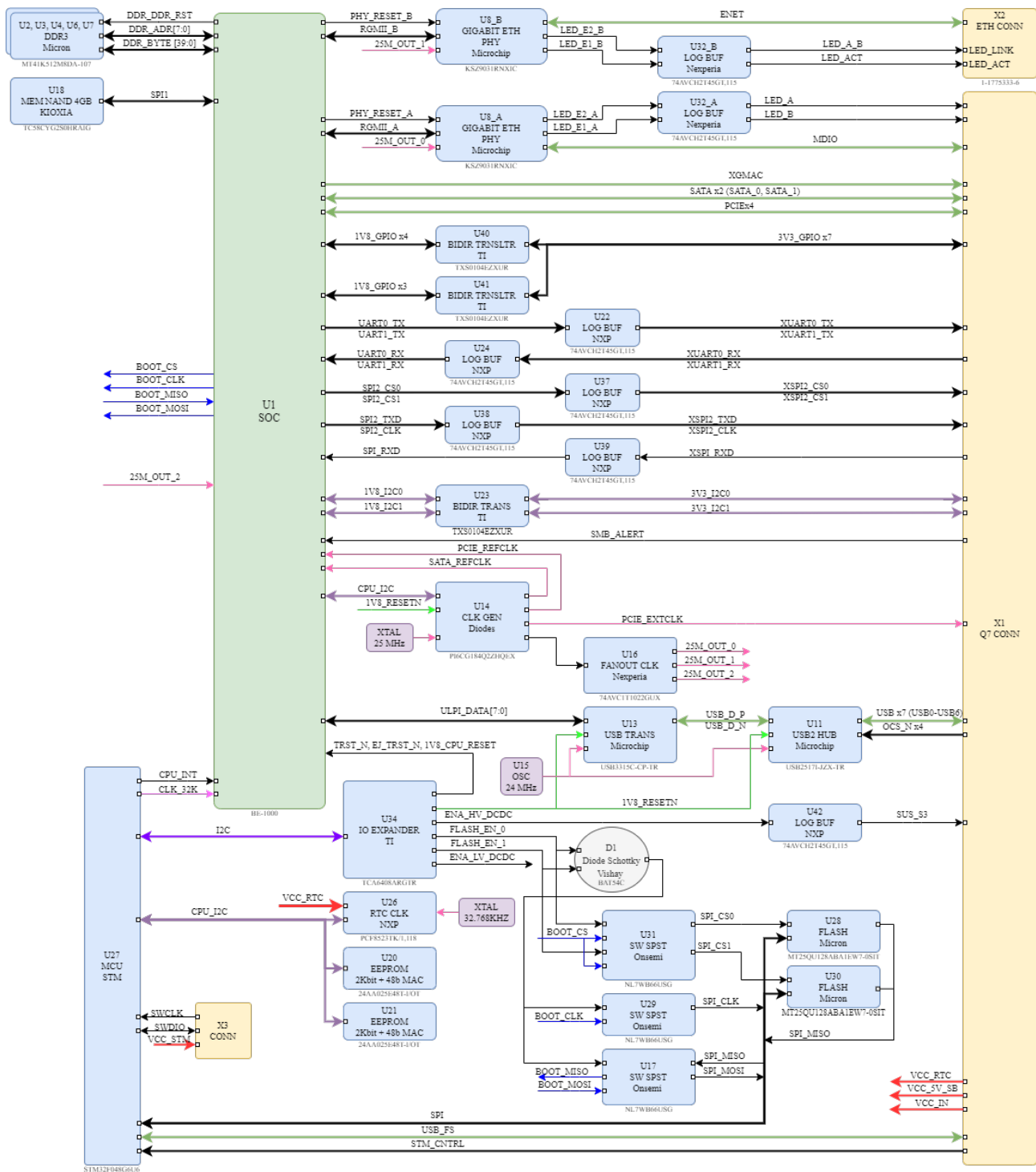


## Technical Specifications

Main technical specifications

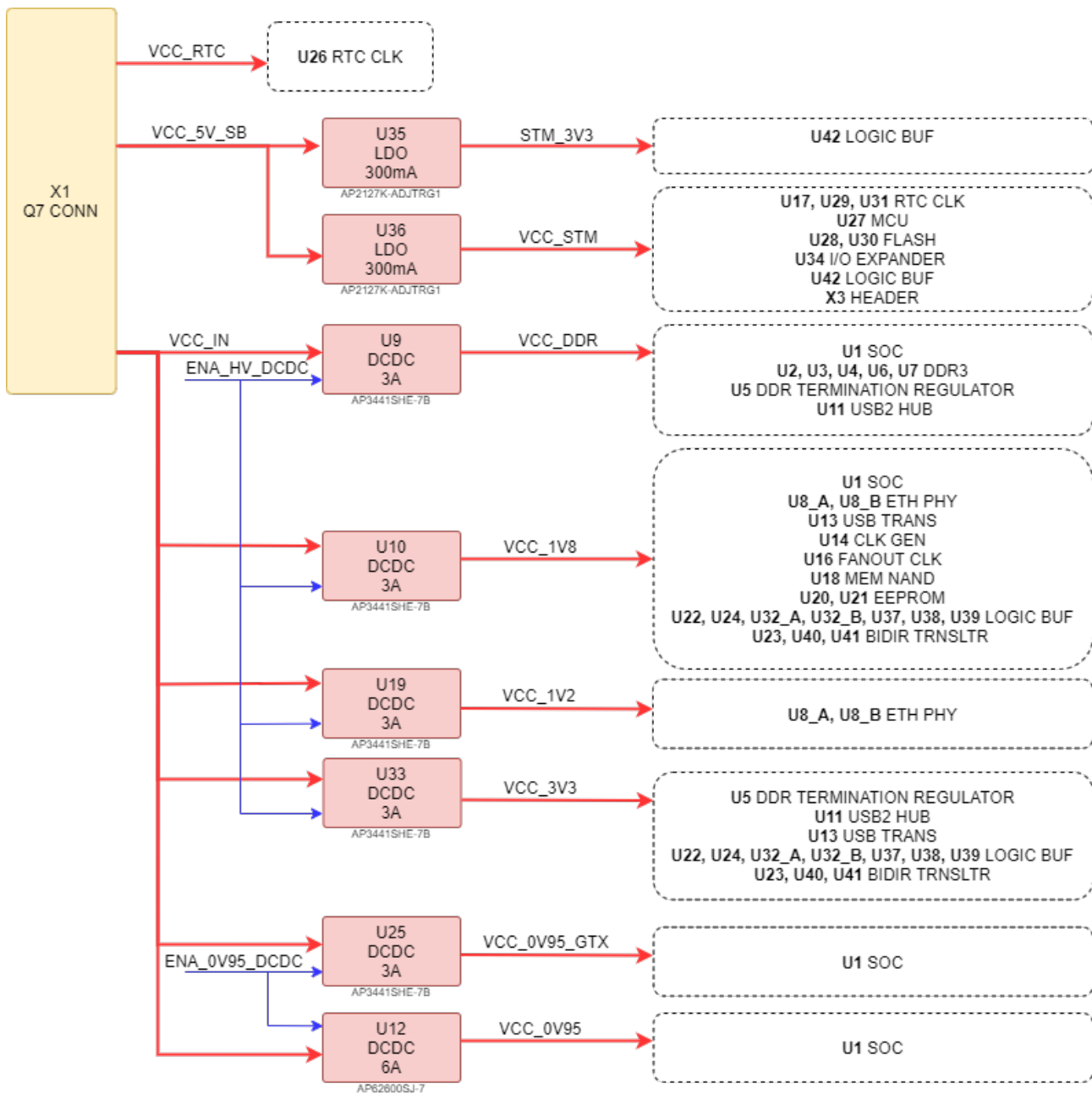
|                             |                                                                   |
|-----------------------------|-------------------------------------------------------------------|
| <b>Form factor</b>          | Qseven                                                            |
| <b>CPU</b>                  | Baikal-T1 ((BE-T1000))                                            |
|                             | Cores: 2 x P5600 MIPS 32 r5 1,2 GHz                               |
|                             | L2 Cache: 1 MB                                                    |
|                             | Operating Frequency [Max]: 1.2 GHz                                |
| <b>RAM</b>                  | ECC DDR3 4 Gb, interface 40-bit, 5 x 512 M x 8 (MT41K512M8DA-107) |
|                             | NAND FLASH 4 Mb, SPI interface (TC58CYG2S0HRAIG)                  |
|                             | NOR FLASH 128 Mb, SPI interface (MT25QU128ABA1EW7)                |
| <b>EEPROM</b>               | 2 Kb, I2C interface, Unique ID 48-bit (24AA025)                   |
| <b>Power management IC</b>  | RTC (PCF8523TK)                                                   |
|                             | Ethernet PHY (KSZ9031)                                            |
|                             | DDR Termination Regulator (TPS51200)                              |
|                             | PCIe Gen 4 Clock Generator (PI6CG184Q2)                           |
|                             | USB 2.0 7-Port High Speed Hub Controller (USB2517I)               |
|                             | Hi-Speed USB Transceiver (USB3315C)                               |
|                             | ARM-based Cortex-M0 32-bit MCU (STM32F048G6U6)                    |
| <b>Interfaces</b>           | 4x PCIe                                                           |
|                             | 2x UART                                                           |
|                             | 2x SPI + BOOTSPI                                                  |
|                             | 2x SATA                                                           |
|                             | 7x USB 2.0                                                        |
|                             | 2x Gigabit Ethernet (PHY)                                         |
|                             | 1x 10 Gigabit Ethernet                                            |
|                             | 2x I2C                                                            |
|                             | 7x GPIO                                                           |
| <b>Power supply voltage</b> | +5V                                                               |
| <b>Power consumption</b>    | TBD                                                               |
| <b>Dimensions</b>           | 70 x 40 mm                                                        |

# Block Diagram



Block Diagram

## Power tree

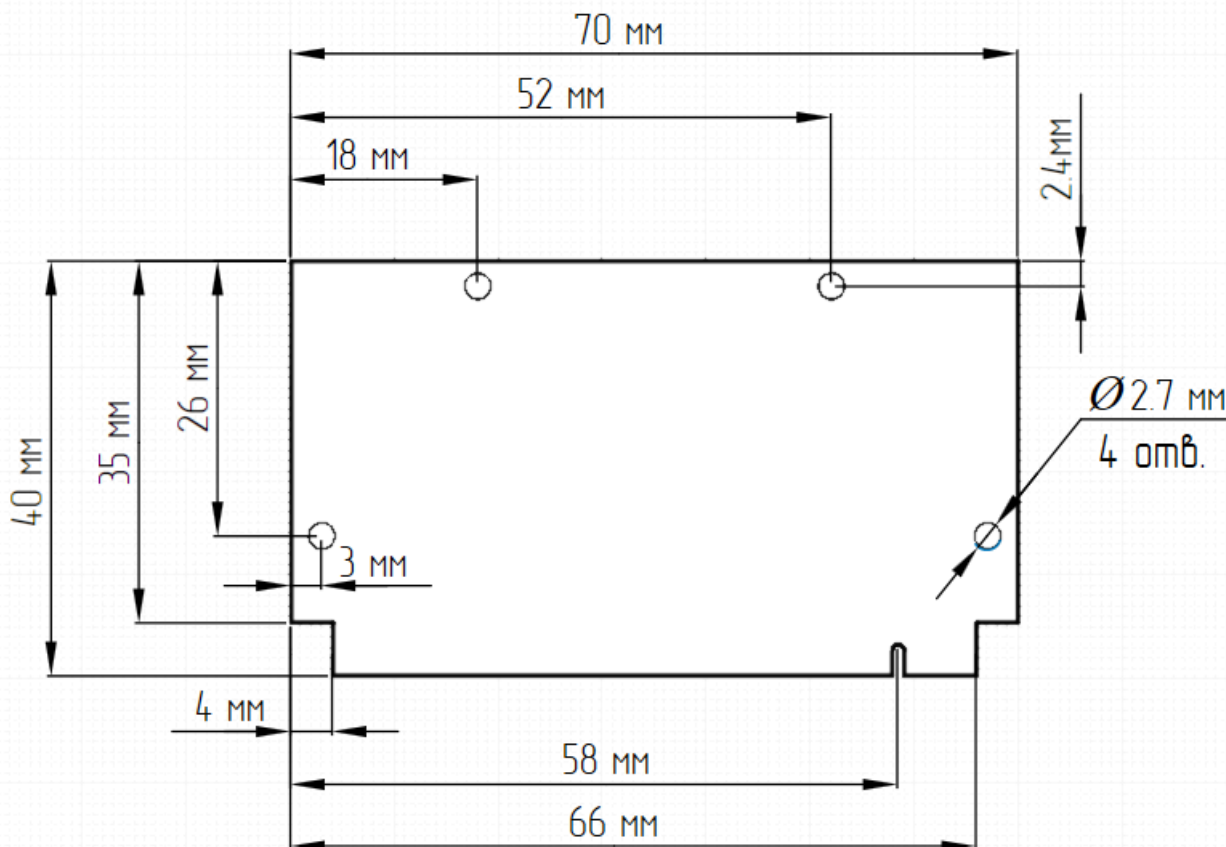


Power tree

## Mechanical Specifications

Board dimensions are: 70 x 40 mm.

Printed circuit of the board is made of 10 layers, some of them are ground planes, for disturbance rejection.

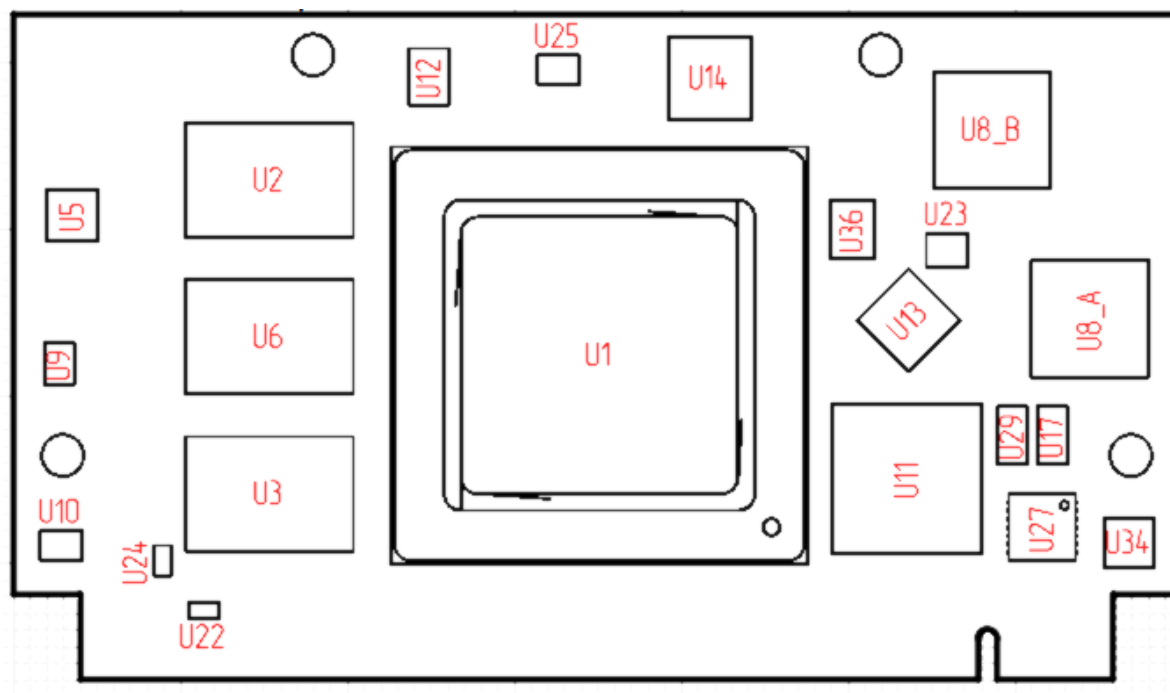


Module mechanical dimensions

# Main Hardware Components

## Component Location

### Top view



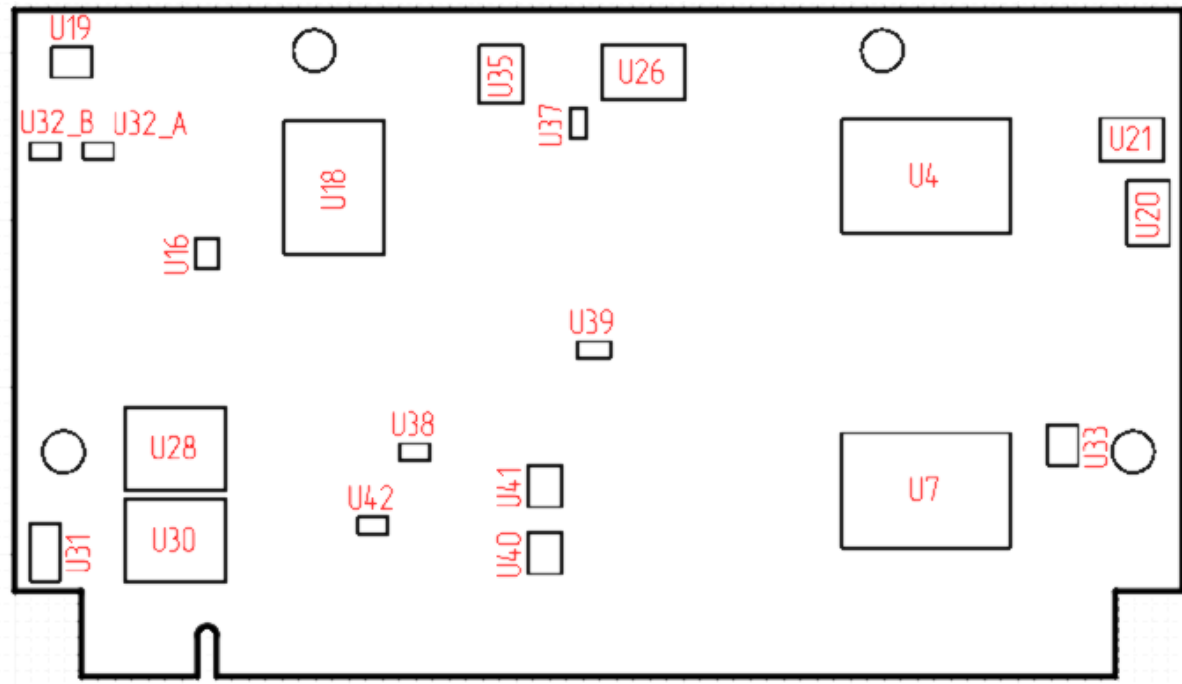
Component Location. Top View

Component description on the board (Top side)

| Designator   | P/N              | Description                                                |
|--------------|------------------|------------------------------------------------------------|
| U1           | BAIKAL-T1        | CPU                                                        |
| U2, U3, U6   | MT41K512M8DA-107 | DDR3 RAM                                                   |
| U5           | TPS51200DRCT     | DDR Termination Regulator                                  |
| U8_A, U8_B   | KSZ9031RN        | Ethernet PHY                                               |
| U9, U10, U25 | AP3441SHE-7B     | Step-down DC-DC Converters 3A                              |
| U11          | USB2517I-JZX-TR  | 7-Port USB 2.0 Hub Controller                              |
| U12          | AP62600SJ-7      | 6A DC-DC Switching Synchronous Buck Regulator              |
| U13          | USB3315C-CP-TR   | USB-Transceiver                                            |
| U14          | PI6CG184Q2ZHQEX  | PCIe Gen 4 Clock Generator                                 |
| U17, U29     | NL7WB66USG       | SPST Analogue Switch                                       |
| U22, U24     | 74AVCH2T45GT,115 | Dual-bit, dual-supply voltage level translator/transceiver |
| U23          | TXS0104EZXUR     | 4Bit Bidirectional Voltage-Level Shifter                   |
| U27          | STM32F048G6U6    | MCU                                                        |
| U34          | TCA6408ARGTR     | 8-Bit I2C and SMBus I/O Expander                           |
| U36          | AP2127K-ADJTRG1  | CMOS LDO REGULATOR                                         |



## Bottom View



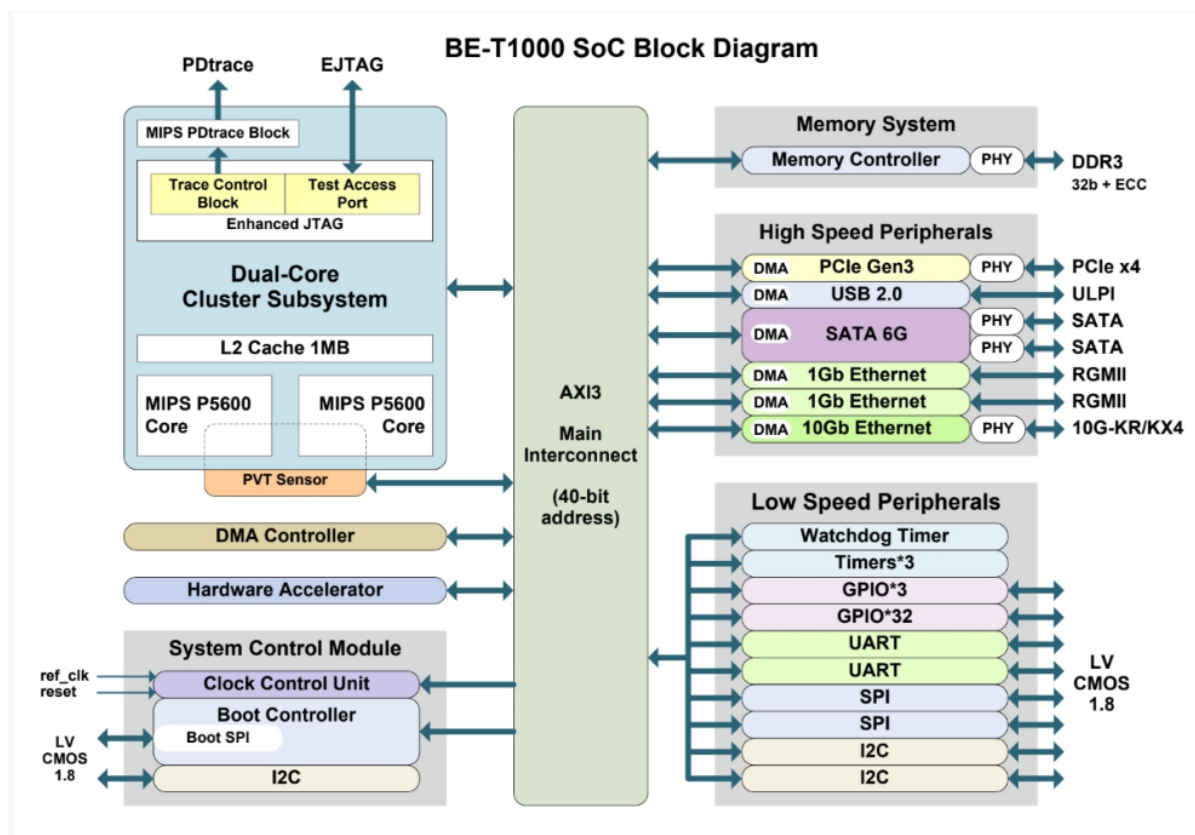
Component Location. Bottom View

Component description on the board (Bottom side)

| Designator                       | P/N                   | Description                                                |
|----------------------------------|-----------------------|------------------------------------------------------------|
| U4, U7                           | MT41K512M8DA-107      | DDR3 RAM                                                   |
| U16                              | 74AVC1T1022GUX        | 1-to-4 fan-out buffer                                      |
| U18                              | TC58CYG2S0HRAIG       | NAND Flash memory                                          |
| U19, U33                         | AP3441SHE-7B          | Step-down DC-DC Converters 3A                              |
| U20, U21                         | 24AA025E48T-I/OT      | EEPROM                                                     |
| U26                              | PCF8523TK/1,118       | RTC                                                        |
| U28, U30                         | MT25QU128ABA1EW7-0SIT | FLASH memory with SPI interface                            |
| U31                              | NL7WB66USG            | SPST Analogue Switch                                       |
| U32_A, U32_B, U37, U38, U39, U42 | 74AVCH2T45GT,115      | Dual-bit, dual-supply voltage level translator/transceiver |
| U35                              | AP2127K-ADJTRG1       | CMOS LDO REGULATOR                                         |
| U40, U41                         | TXS0104EZXR           | 4Bit Bidirectional Voltage-Level Shifter                   |

## Processor

Figure 6 shows the functional modules in the Baikal-T1 processor system.

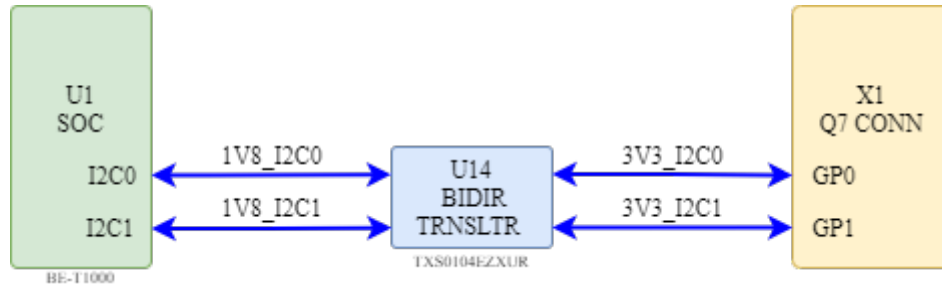


Baikal-T1 function modules

## External connectors

### I2C

Two I2C interfaces are available on Q7\_BFK.



I2C interfaces

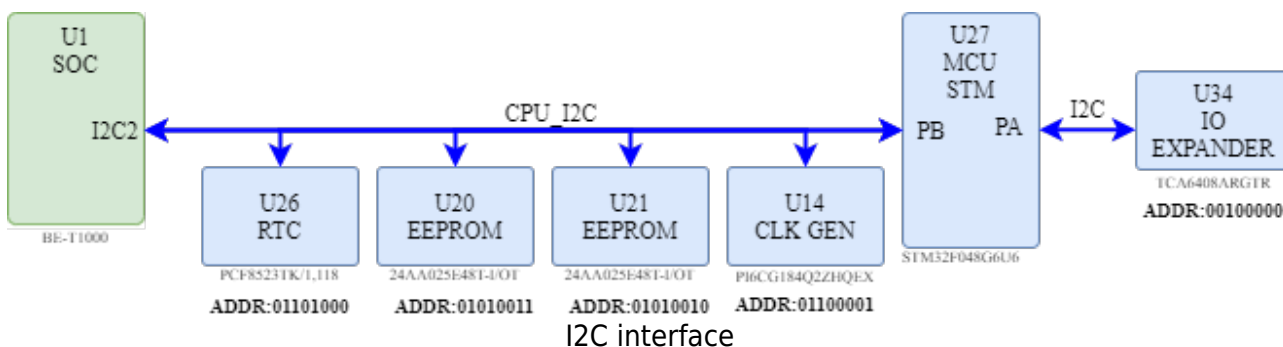
Q7 I2C signals

| Signal Name | Pin(s) | Direction | Voltage standard | Description                         |        |
|-------------|--------|-----------|------------------|-------------------------------------|--------|
| I2C0_SCL    | 66     | in/out    | 3.3<br>1.8       | General purpose I2C Bus clock line. | U1.AD5 |
| I2C0_SDA    | 68     | in/out    | 3.3<br>1.8       | General purpose I2C Bus data line.  | U1.AD4 |
| I2C1_SCL    | 60     | in/out    | 3.3<br>1.8       | General purpose I2C Bus clock line. | U1.K7  |
| I2C1_SDA    | 62     | in/out    | 3.3<br>1.8       | General purpose I2C Bus data line.  | U1.K6  |

## Debugging/development interfaces

### I2C

One I2C interface (for communication between processor and peripherals) is available on Q7\_BFK.



#### I2C Address Mapping

| Device                           | Address   |
|----------------------------------|-----------|
| RTC                              | 0x1101000 |
| EEPROM1                          | 0x1010011 |
| EEPROM2                          | 0x1010010 |
| 8-Bit I2C and SMBus I/O Expander | 0x0100000 |
| PCIe Gen 4 Clock Generator       | 0x1100001 |

#### BE-T1000 I2C signals

| Signal Name | Pin(s) | Direction | Voltage standard | Description        | Comments |
|-------------|--------|-----------|------------------|--------------------|----------|
| I2C2_SDA    | K1     | in/out    | 1.8<br>PU 2.2 kΩ | I2C Bus data line  |          |
| I2C2_SCL    | J1     | in/out    | 1.8<br>PU 2.2 kΩ | I2C Bus clock line |          |

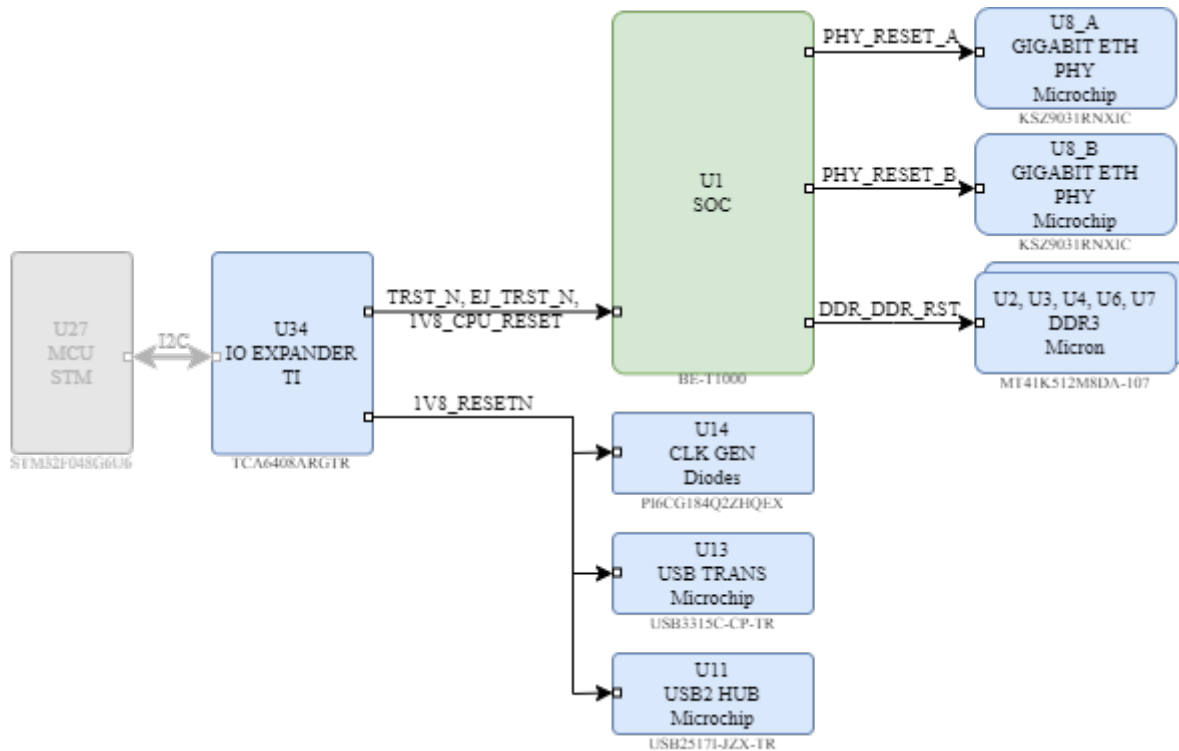
where PU - pull-up resistor, PD -pull-down resistor.

#### STM32 I2C signals

| Signal Name | Pin(s) | Direction | Voltage standard | Description         | Comments |
|-------------|--------|-----------|------------------|---------------------|----------|
| I2C_SDA     | 6      | in/out    | 3.3              | I2C Bus data line.  |          |
| I2C_SCL     | 7      | in/out    | 3.3              | I2C Bus clock line. |          |
| CPU_I2C_SCL | 27     | in/out    | 3.3              | I2C Bus data line.  |          |
| CPU_I2C_SDA | 28     | in/out    | 3.3              | I2C Bus clock line  |          |

where PU - pull-up resistor, PD -pull-down resistor.

## RESET



Reset signals

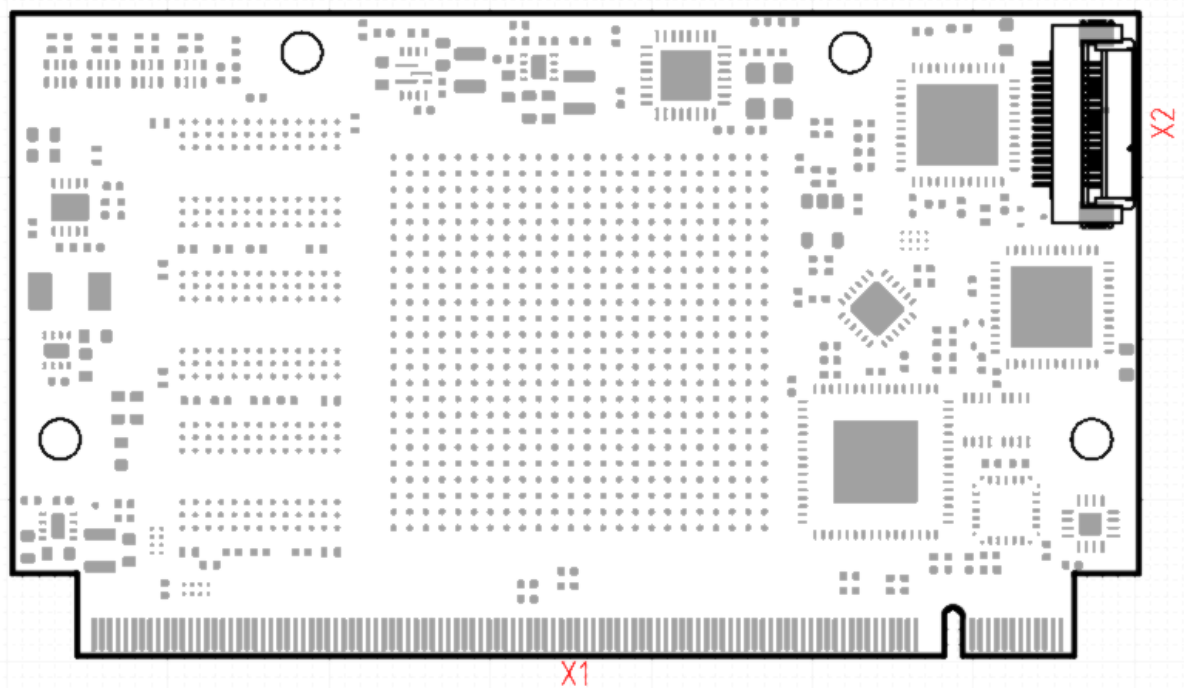
Reset signals

| Signal Name | Pin(s) | Voltage standard | Description | Connection                            | Comments |
|-------------|--------|------------------|-------------|---------------------------------------|----------|
| G0_GP_OUT   | N7     | 1.8<br>PU 10 kΩ  | PHY_RESET_A | U8_A.42                               |          |
| G1_GP_OUT   | Y2     | 1.8<br>PU 10 kΩ  | PHY_RESET_B | U8_B.42                               |          |
| GPIO[8]     | A5     | 1.8              | CPU_INT     | U27.9                                 |          |
| DDR_RAM_RST | T19    | 1.5<br>PD 10 kΩ  | DDR_DDR_RST | U2.N2, U3.N2, U4.N2,<br>U6.N2, U7.N2, |          |

where PU - pull-up resistor, PD -pull-down resistor.

## External connectors

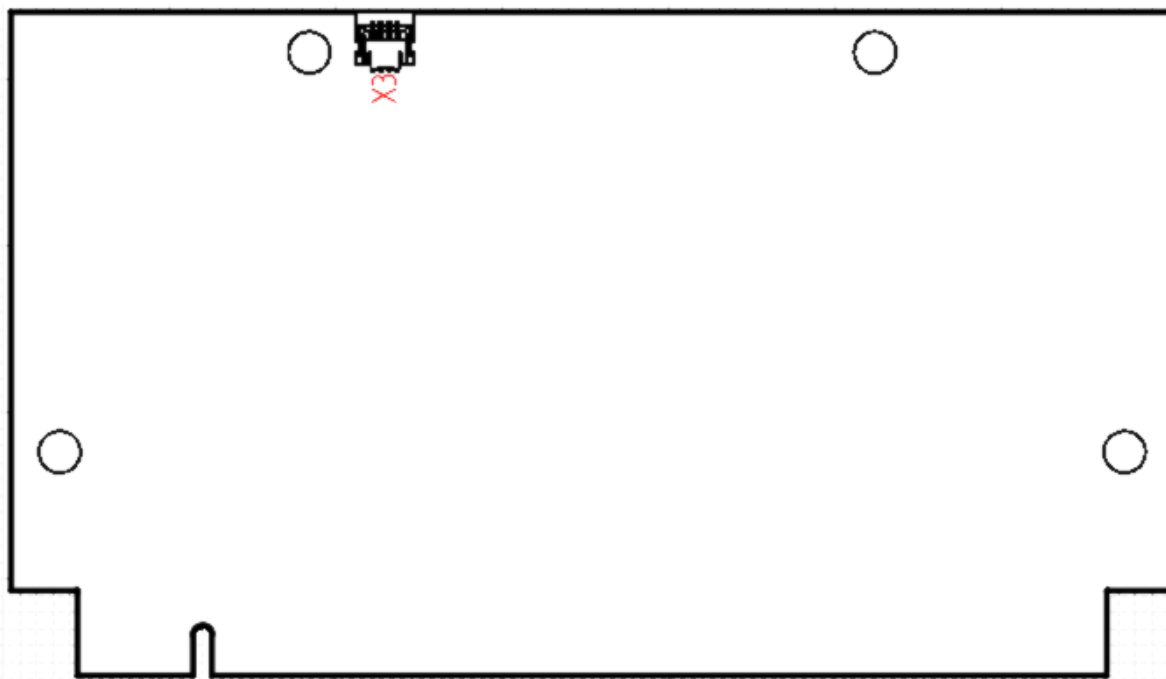
### Top view



Connectors Location. Top View

| Designator | P/N           | Description                                            |
|------------|---------------|--------------------------------------------------------|
| X1         | CONN-uQ7-EDGE | uQ7 format connector for connecting to the motherboard |
| X2         | 1-1775333-6   | Gigabit Ethernet connector ZIF FFC/FPC                 |

## Bottom view



Connectors Location. Bottom View

| Designator | P/N              | Description                                     |
|------------|------------------|-------------------------------------------------|
| X3         | 59453-041110EHLF | ZIF FFC/FPC connector for debugging/development |

# Appendix 1

## X1 Q7\_BFK connectors

| Pin | Signal name(Top view) | Signal group | Type   | Comments | Pin | Signal name(Bottom view) | Signal group | Type   | Comments |
|-----|-----------------------|--------------|--------|----------|-----|--------------------------|--------------|--------|----------|
| 1   | GND                   |              | Power  |          | 2   | GND                      |              | Power  |          |
| 3   | GBE_MDI3-             | GBE          | in/out |          | 4   | GBE_MDI2-                | GBE          | in/out |          |
| 5   | GBE_MDI3+             | GBE          | in/out |          | 6   | GBE_MDI2+                | GBE          | in/out |          |
| 7   | GBE_LINK100#          | GBE          | out    | Unused   | 8   | GBE_LINK1000#            | GBE          | out    | Unused   |
| 9   | GBE_MDI1-             | GBE          | in/out |          | 10  | GBE_MDI0-                | GBE          | in/out |          |
| 11  | GBE_MDI1+             | GBE          | in/out |          | 12  | GBE_MDI0+                | GBE          | in/out |          |
| 13  | GBE_LINK#             | GBE          | out    |          | 14  | GBE_ACT#                 | GBE          | out    |          |
| 15  | GBE_CTREF             | GBE          | out    | Unused   | 16  | SUS_S5#                  | PWR_MGMT     | out    | Unused   |
| 17  | WAKE#                 | PWR_MGMT     | in     | Unused   | 18  | SUS_S3#                  | PWR_MGMT     | out    |          |
| 19  | GPO0(SUS_STAT#)       | PWR_MGMT     | out    | Unused   | 20  | PWRBTN#                  | PWR_MGMT     | in     |          |
| 21  | SLP_BTN#/GPII1        | PWR_MGMT     | in     | Unused   | 22  | LID_BTN#/GPII0           | PWR_MGMT     | in     | Unused   |
| 23  | GND                   |              | Power  |          | 24  | GND                      |              | Power  |          |
| 25  | GND                   |              | Power  |          | 26  | PWGIN                    | PWR_MGMT     | in     |          |
| 27  | BATLOW#/GPII2         | PWR_MGMT     | in     | Unused   | 28  | RSTBTN#                  | PWR_MGMT     | in     |          |
| 29  | SATA0_TX+             | SATA         | out    |          | 30  | SATA1_TX+                | SATA         | out    |          |
| 31  | SATA0_TX-             | SATA         | out    |          | 32  | SATA1_TX-                | SATA         | out    |          |
| 33  | SATA_ACT#             | SATA         | out    | Unused   | 34  | GND                      |              | Power  |          |
| 35  | SATA0_RX+             | SATA         | in     |          | 36  | SATA1_RX+                | SATA         | in     |          |
| 37  | SATA0_RX-             | SATA         | in     |          | 38  | SATA1_RX-                | SATA         | in     |          |
| 39  | GND                   |              | Power  |          | 40  | GND                      |              | Power  |          |
| 41  | BIOS_DIS#/BOOT_ALT#   | BOOT         | in     |          | 42  | SDIO_CLK#                | SDIO         | out    | Unused   |
| 43  | SDIO_CD#              | SDIO         | in/out | Unused   | 44  | reserved (SDIO_LED)      |              |        | Unused   |
| 45  | SDIO_CMD              | SDIO         | in/out | Unused   | 46  | SDIO_WP                  | SDIO         | in/out | Unused   |
| 47  | SDIO_PWR#             | SDIO         | out    | Unused   | 48  | SDIO_DAT1                | SDIO         | in/out | Unused   |
| 49  | SDIO_DAT0             | SDIO         | in/out | Unused   | 50  | SDIO_DAT3                | SDIO         | in/out | Unused   |
| 51  | SDIO_DAT2             | SDIO         | in/out | Unused   | 52  | reserved (SDIO_DAT5)     |              |        | Unused   |
| 53  | reserved (SDIO_DAT4)  |              |        |          | 54  | reserved (SDIO_DAT7)     |              |        | Unused   |
| 55  | reserved (SDIO_DAT6)  |              |        |          | 56  | USB_OTG_PEN (RSVD)       | USB          | out    | Unused   |
| 57  | GND                   |              | Power  |          | 58  | GND                      |              | Power  |          |
| 59  | HDA_SYNC/I2S_WS       | AUDIO        | out    | Unused   | 60  | SMB_CLK/GP1_I2C_CLK      | MISC         | in/out |          |
| 61  | HDA_RST#/I2S_RST#     | AUDIO        | out    | Unused   | 62  | SMB_DAT/GP1_I2C_DAT      | MISC         | in/out |          |
| 63  | HDA_BITCLK/I2S_CLK    | AUDIO        | out    | Unused   | 64  | SMB_ALERT#               | MISC         | in/out |          |
| 65  | HDA_SDI/I2S_SDI       | AUDIO        | in     | Unused   | 66  | GP0_I2C_CLK (I2C_CLK)    | MISC         | in/out |          |
| 67  | HDA_SDO/I2S_SDO       | AUDIO        | out    | Unused   | 68  | GP0_I2C_DAT (I2C_DAT)    | MISC         | in/out |          |
| 69  | THRM#                 | MISC         | in     | Unused   | 70  | WDTRIG#                  | MISC         | in     | Unused   |
| 71  | THRMTRIP#             | MISC         | out    | Unused   | 72  | WDOUT                    | MISC         | out    | Unused   |
| 73  | GND                   |              | Power  |          | 74  | GND                      |              | Power  |          |
| 75  | USB_P7-/USB_SSTX0-    | USB          | in/out |          | 76  | USB_P6-/USB_SSRX0-       | USB          | in/out |          |
| 77  | USB_P7+/USB_SSTX0+    | USB          | in/out |          | 78  | USB_P6+/USB_SSRX0+       | USB          | in/out |          |
| 79  | USB_6_7_OC#           | USB          | in     |          | 80  | USB_4_5_OC#              | USB          | in     |          |
| 81  | USB_P5-/USB_SSTX2-    | USB          | in/out |          | 82  | USB_P4-/USB_SSRX2-       | USB          | in/out |          |
| 83  | USB_P5+/USB_SSTX2+    | USB          | in/out |          | 84  | USB_P4+/USB_SSRX2+       | USB          | in/out |          |
| 85  | USB_2_3_OC#           | USB          | in     |          | 86  | USB_0_1_OC#              | USB          | in     |          |
| 87  | USB_P3-               | USB          | in/out |          | 88  | USB_P2-                  | USB          | in/out |          |
| 89  | USB_P3+               | USB          | in/out |          | 90  | USB_P2+                  | USB          | in/out |          |
| 91  | USB_VBUS (USB_CC)     | USB          | in     |          | 92  | USB_ID                   | USB          | out    | Unused   |
| 93  | USB_P1-               | USB          | in/out |          | 94  | USB_P0-                  | USB          | in/out |          |
| 95  | USB_P1+               | USB          | in/out |          | 96  | USB_P0+                  | USB          | in/out |          |
| 97  | GND                   |              | Power  |          | 98  | GND                      |              | Power  |          |
| 99  | eDP0_TX0+/LVDS_A0+    | LVDS/eDP     | out    | Unused   | 100 | eDP1_TX0+/LVDS_B0+       | LVDS/eDP     | out    |          |
| 101 | eDP0_TX0-/LVDS_A0-    | LVDS/eDP     | out    | Unused   | 102 | eDP1_TX0-/LVDS_B0-       | LVDS/eDP     | out    |          |
| 103 | eDP0_TX1+/LVDS_A1+    | LVDS/eDP     | out    | Unused   | 104 | eDP1_TX1+/LVDS_B1+       | LVDS/eDP     | out    |          |
| 105 | eDP0_TX1-/LVDS_A1-    | LVDS/eDP     | out    | Unused   | 106 | eDP1_TX1-/LVDS_B1-       | LVDS/eDP     | out    |          |
| 107 | eDP0_TX2+/LVDS_A2+    | LVDS/eDP     | out    | Unused   | 108 | eDP1_TX2+/LVDS_B2+       | LVDS/eDP     | out    |          |
| 109 | eDP0_TX2-/LVDS_A2-    | LVDS/eDP     | out    | Unused   | 110 | eDP1_TX2-/LVDS_B2-       | LVDS/eDP     | out    |          |
| 111 | LVDS_PPEN             | LVDS/eDP     | out    | Unused   | 112 | LVDS_BLEN                | LVDS/eDP     | out    | Unused   |



| Pin | Signal name(Top view)               | Signal group | Type   | Comments | Pin | Signal name(Bottom view)      | Signal group | Type   | Comments |
|-----|-------------------------------------|--------------|--------|----------|-----|-------------------------------|--------------|--------|----------|
| 113 | eDP0_TX3+/LVDS_A3+                  | LVDS/eDP     | out    | Unused   | 114 | eDP1_TX3+/LVDS_B3+            | LVDS/eDP     | out    | Unused   |
| 115 | eDP0_TX3-/LVDS_A3-                  | LVDS/eDP     | out    | Unused   | 116 | eDP1_TX3-/LVDS_B3-            | LVDS/eDP     | out    | Unused   |
| 117 | GND                                 |              | Power  |          | 118 | GND                           |              | Power  |          |
| 119 | eDP0_AUX+/LVDS_A_CLK+               | LVDS/eDP     | out    | Unused   | 120 | eDP1_AUX+/LVDS_B_CLK+         | LVDS/eDP     | in/out | Unused   |
| 121 | eDP0_AUX-/LVDS_A_CLK-               | LVDS/eDP     | out    | Unused   | 122 | eDP1_AUX-/LVDS_B_CLK-         | LVDS/eDP     | in/out | Unused   |
| 123 | LVDS_BLT_CTRL/GP_PWM_OUT0           | LVDS/GP      | out    | Unused   | 124 | GP_1-Wire_Bus/HDMI_CEC (RSVD) | HDMI/DP      | in/out | Unused   |
| 125 | LVDS_DID_DAT/GP_I2C_DAT             | LVDS/GP      | in/out | Unused   | 126 | eDP0_HPD#/LVDS_BLC_DAT        | LVDS/eDP     | in/out | Unused   |
| 127 | LVDS_DID_CLK/GP_I2C_CLK             | LVDS/GP      | in/out | Unused   | 128 | eDP1_HPD#/LVDS_BLC_CLK        | LVDS/eDP     | in/out | Unused   |
| 129 | CAN0_TX                             | CAN          | out    | Unused   | 130 | CAN0_RX                       | CAN          | in     | Unused   |
| 131 | DP_LANE3+/TMDS_CLK+ (SDVO_BCLK+)    | HDMI/DP      | out    | Unused   | 132 | USB_SSTX1- (SDVO_INT+)        | USB          | out    | Unused   |
| 133 | DP_LANE3-/TMDS_CLK- (SDVO_BCLK-)    | HDMI/DP      | out    | Unused   | 134 | USB_SSTX1+ (SDVO_INT-)        | USB          | out    | Unused   |
| 135 | GND                                 |              | Power  |          | 136 | GND                           |              | Power  |          |
| 137 | DP_LANE1+/TMDS_LANE1+ (SDVO_GREEN+) | HDMI/DP      | out    | Unused   | 138 | DP_AUX+ (SDVO_FLDSTALL+)      | DP           | in/out | Unused   |
| 139 | DP_LANE1-/TMDS_LANE1- (SDVO_GREEN-) | HDMI/DP      | out    | Unused   | 140 | DP_AUX- (SDVO_FLDSTALL-)      | DP           | in/out | Unused   |
| 141 | GND                                 |              | Power  |          | 142 | GND                           |              | Power  |          |
| 143 | DP_LANE2+/TMDS_LANE0+ (SDVO_BLUE+)  | HDMI/DP      | out    | Unused   | 144 | USB_SSRX1- (SDVO_TVCLKIN+)    | USB          | in     | Unused   |
| 145 | DP_LANE2-/TMDS_LANE0- (SDVO_BLUE-)  | HDMI/DP      | out    | Unused   | 146 | USB_SSRX1+ (SDVO_TVCLKIN-)    | USB          | in     | Unused   |
| 147 | GND                                 |              | Power  |          | 148 | GND                           |              | Power  |          |
| 149 | DP_LANE0+/TMDS_LANE2+ (SDVO_RED+)   | HDMI/DP      | out    | Unused   | 150 | HDMI_CTRL_DAT (SDVO_CTRL_DAT) | HDMI/DP      | in/out | Unused   |
| 151 | DP_LANE0-/TMDS_LANE2- (SDVO_RED-)   | HDMI/DP      | out    | Unused   | 152 | HDMI_CTRL_CLK (SDVO_CTRL_CLK) | HDMI/DP      | in/out | Unused   |
| 153 | HDMI_HPD#                           | HDMI/DP      | in     | Unused   | 154 | DP_HPD#                       | DP           | in     | Unused   |
| 155 | PCIE_CLK_REF+                       | PCIE         | out    |          | 156 | PCIE_WAKE#                    | PCIE         | in     | Unused   |
| 157 | PCIE_CLK_REF-                       | PCIE         | out    |          | 158 | PCIE_RST#                     | PCIE         | out    | Unused   |
| 159 | GND                                 |              | Power  |          | 160 | GND                           |              | Power  |          |
| 161 | PCIE3_TX+                           | PCIE         | out    |          | 162 | PCIE3_RX+                     | PCIE         | in     |          |
| 163 | PCIE3_TX-                           | PCIE         | out    |          | 164 | PCIE3_RX-                     | PCIE         | in     |          |
| 165 | GND                                 |              | Power  |          | 166 | GND                           |              | Power  |          |
| 167 | PCIE2_TX+                           | PCIE         | out    |          | 168 | PCIE2_RX+                     | PCIE         | in     |          |
| 169 | PCIE2_TX-                           | PCIE         | out    |          | 170 | PCIE2_RX-                     | PCIE         | in     |          |
| 171 | UART0_TX (EXCD0_PERST#)             | UART         | out    |          | 172 | UART0_RTS# (EXCD1_PERST#)     | UART         | out    | Unused   |
| 173 | PCIE1_TX+                           | PCIE         | out    |          | 174 | PCIE1_RX+                     | PCIE         | in     |          |
| 175 | PCIE1_TX-                           | PCIE         | out    |          | 176 | PCIE1_RX-                     | PCIE         | in     |          |
| 177 | UART0_RX (EXCD0_CPPE#)              | UART         | in     |          | 178 | UART0_CTS# (EXCD1_CPPE#)      | UART         | in     | Unused   |
| 179 | PCIE0_TX+                           | PCIE         | out    |          | 180 | PCIE0_RX+                     | PCIE         | in     |          |
| 181 | PCIE0_TX-                           | PCIE         | out    |          | 182 | PCIE0_RX-                     | PCIE         | in     |          |
| 183 | GND                                 |              | Power  |          | 184 | GND                           |              | Power  |          |
| 185 | LPC_AD0/GPIO0                       | GPIO         | in/out |          | 186 | LPC_AD1/GPIO1                 | LPC          | in/out |          |
| 187 | LPC_AD2/GPIO2                       | GPIO         | in/out |          | 188 | LPC_AD3/GPIO3                 | LPC          | in/out |          |
| 189 | LPC_CLK/GPIO4                       | GPIO         | in/out |          | 190 | LPC_FRAME#/GPIO5              | LPC          | in/out |          |
| 191 | SERIRQ/GPIO6                        | GPIO         | in/out |          | 192 | LPC_LDRQ#/GPIO7               | LPC          | in/out |          |
| 193 | VCC_RTC                             |              | in     |          | 194 | SPKR/GP_PWM_OUT2              | MISC         | out    | Unused   |
| 195 | FAN_T_IN/GP_TIMER_IN                | MISC         | in     | Unused   | 196 | FAN_OUT/GP_PWM_OUT1           | MISC         | out    | Unused   |
| 197 | GND                                 |              | Power  |          | 198 | GND                           |              | Power  |          |
| 199 | SPI_MOSI                            | SPI          | out    |          | 200 | SPI_CS0#                      | SPI          | out    |          |
| 201 | SPI_MISO                            | SPI          | in     |          | 202 | SPI_CS1#                      | SPI          | out    |          |
| 203 | SPI_SCK                             | SPI          | out    |          | 204 | MFG_NC4                       | MFG          | in     | Unused   |
| 205 | VCC_5V_SB                           |              | in     |          | 206 | VCC_5V_SB                     |              | in     |          |
| 207 | MFG_NC0                             | MFG          | in     | Unused   | 208 | MFG_NC2                       | MFG          | in     |          |
| 209 | MFG_NC1                             | MFG          | out    |          | 210 | MFG_NC3                       | MFG          | in     |          |
| 211 | NC (VCC)                            |              |        | Unused   | 212 | NC (VCC)                      |              |        | Unused   |
| 213 | NC (VCC)                            |              |        | Unused   | 214 | NC (VCC)                      |              |        | Unused   |

| Pin | Signal name(Top view) | Signal group | Type  | Comments | Pin | Signal name(Bottom view) | Signal group | Type  | Comments |
|-----|-----------------------|--------------|-------|----------|-----|--------------------------|--------------|-------|----------|
| 215 | NC (VCC)              |              |       | Unused   | 216 | NC (VCC)                 |              |       | Unused   |
| 217 | NC (VCC)              |              |       | Unused   | 218 | NC (VCC)                 |              |       | Unused   |
| 219 | VCC                   |              | Power |          | 220 | VCC                      |              | Power |          |
| 221 | VCC                   |              | Power |          | 222 | VCC                      |              | Power |          |
| 223 | VCC                   |              | Power |          | 224 | VCC                      |              | Power |          |
| 225 | VCC                   |              | Power |          | 226 | VCC                      |              | Power |          |
| 227 | VCC                   |              | Power |          | 228 | VCC                      |              | Power |          |
| 229 | VCC                   |              | Power |          | 230 | VCC                      |              | Power |          |