

# Hardware Documentation

*ADP-OSM-BB*  
*for HW Revision 1.10*

Version 001  
(2024-07-03)



**Elektronik  
Systeme**

© F&S Elektronik Systeme GmbH

Untere Waldplätze 23

D-70569 Stuttgart

Phone: +49(0)711-123722-0

Fax: +49(0)711-123722-99

# About This Document

This document describes how to use the [ADP-OSM-BB](#) adapter board with mechanical and electrical information. The latest version of this document can be found at:

<http://www.fs-net.de>.

## ESD Requirements



All F&S hardware products are ESD (electrostatic sensitive devices). All products are handled and packaged according to ESD guidelines. Please do not handle or store ESD-sensitive material in ESD-unsafe environments. Negligent handling will harm the product and warranty claims become void.

## History

| Date       | V   | Platform | A,M,R | Chapter | Description     | Au |
|------------|-----|----------|-------|---------|-----------------|----|
| 03.07.2024 | 000 | All      |       | -       | Initial Version | TM |

V Version

A, M, R Added, Modified, Removed

Au Author

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# 1 Mechanical Dimensions

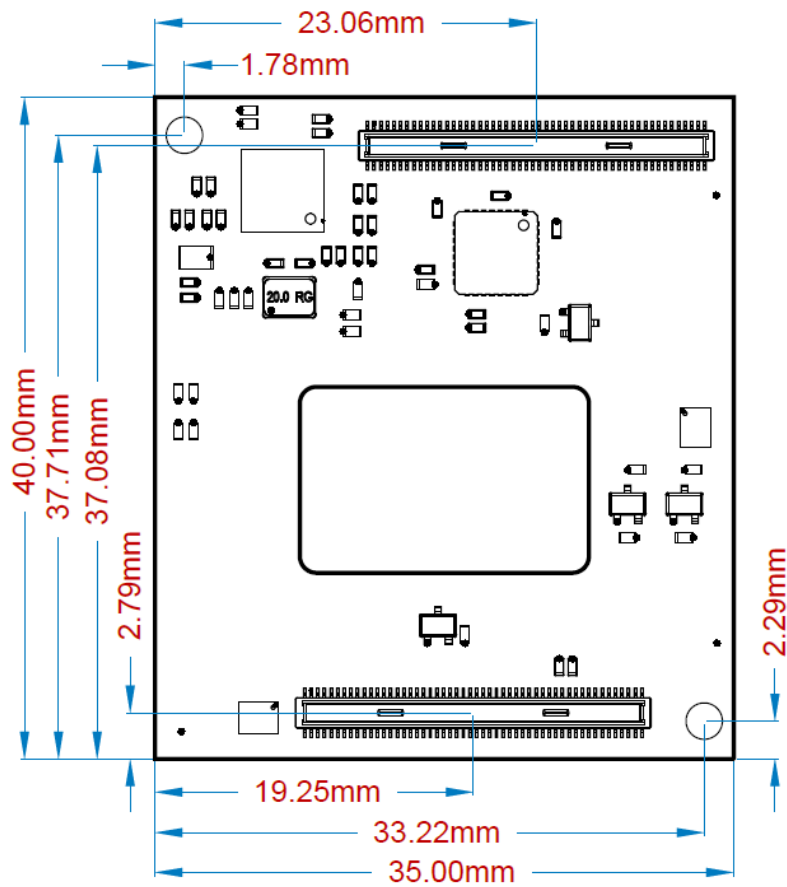


Figure 1: Mechanical Dimensions (Bottom View)

| Dimensions    | Description     |
|---------------|-----------------|
| Size          | 35mm x 40mm     |
| PCB Thickness | 1.60mm ± 0.10mm |
| Weight        | N/A             |

Table 1: Mechanical Dimensions

## 2 Connector Layout ADP-OSM-BB

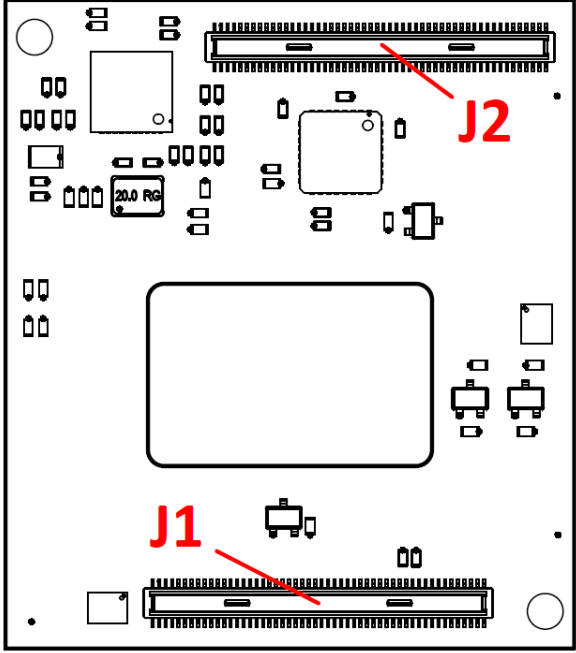


Figure 2: ADP-OSM-BB Connector Layout (Bottom View)

| Ref. | Description           | No. of Pins | Connector Type       | Counterpart          |
|------|-----------------------|-------------|----------------------|----------------------|
| J1   | PicoCore Connector J1 | 100         | DF40C-100DP-0.4V(51) | DF40C-100DS-0.4V(51) |
| J2   | PicoCore Connector J2 | 100         | DF40C-100DP-0.4V(51) | DF40C-100DS-0.4V(51) |

Table 2: Connectors List and Types

### 3 Connector Layout PicoCoreBBDSDI

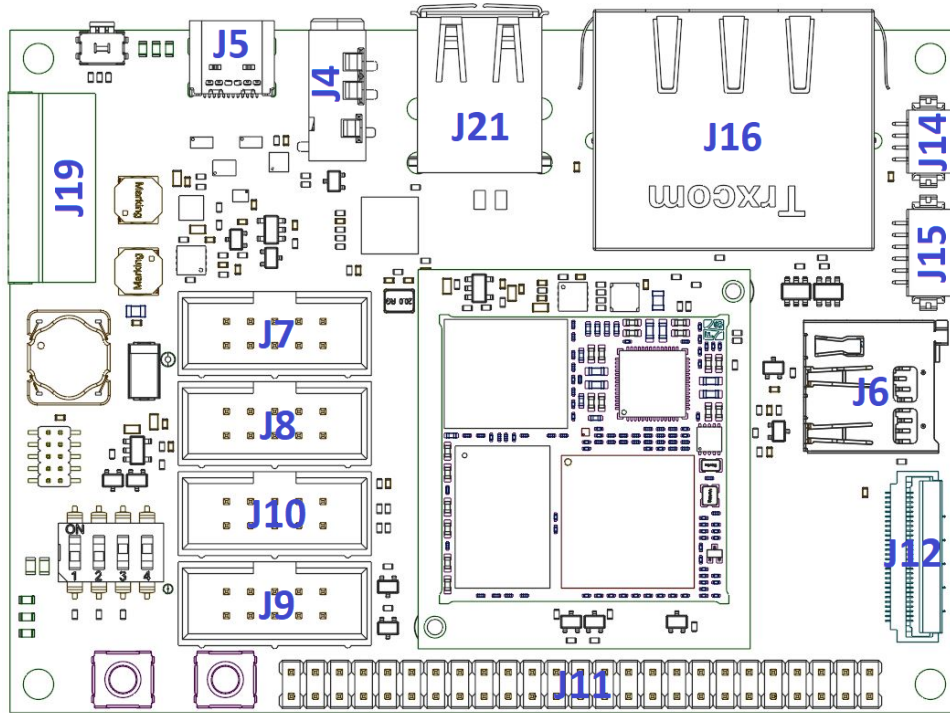


Figure 3: PicoCoreBBDSDI Connector Layout Top

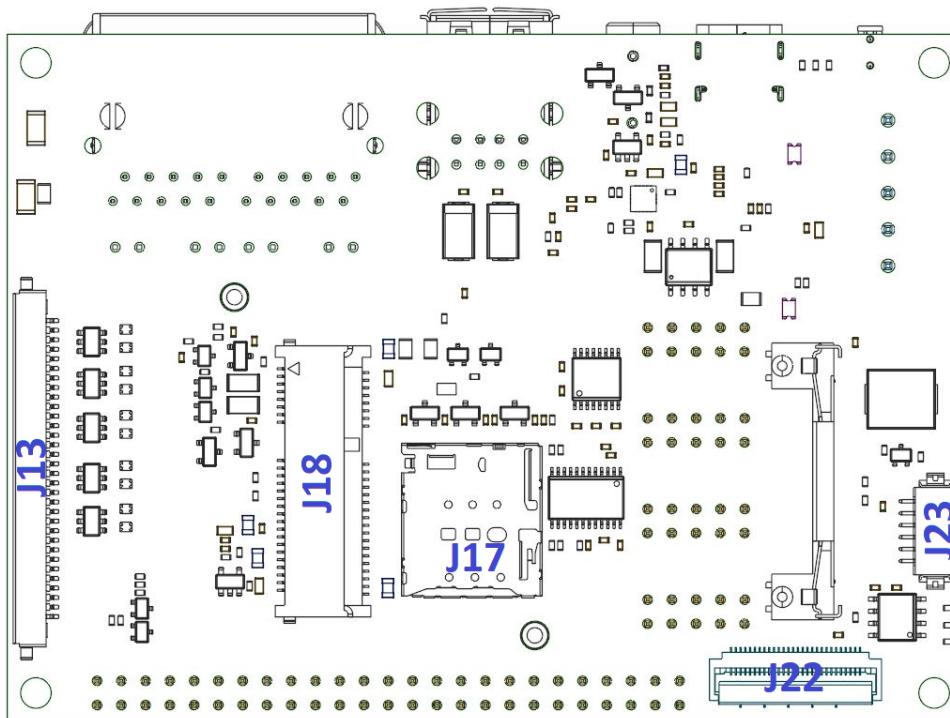


Figure 4: PicoCoreBBDSDI Connector Layout Bottom

## 4 Connector Pin Layouts

The following table shows the connection between the OSM-SF-IMX8MM REV110 and the PicoCoreBBDSI.

| Pin | Default Function   | Internal Pad   | Type | PicoCoreBBDSI Pin | Voltage |
|-----|--------------------|----------------|------|-------------------|---------|
| A2  | CSI_DATA1_N        | MIPI_CSI_D1_N  | I    | J12-12            |         |
| A3  | CSI_DATA1_P        | MIPI_CSI_D1_P  | I    | J12-11            |         |
| A4  | GND                |                | PWR  | GND               | GND     |
| A5  | CSI_DATA2_N        | MIPI_CSI_D2_N  | I    | J12-6             |         |
| A6  | CSI_DATA2_P        | MIPI_CSI_D2_P  | I    | J12-5             |         |
| A7  | GND                |                | PWR  | GND               | GND     |
| A8  | USB_C_SSTX_P       | nc             | O    | nc                |         |
| A9  | USB_C_SSTX_N       | nc             | O    | nc                |         |
| A10 | GND                |                | PWR  | GND               | GND     |
| A14 | UART_A_RX          | UART2_RXD      | I    | nc                |         |
| A15 | COM_AREA_01        | nc             |      | nc                |         |
| A16 | COM_AREA_02        | nc             |      | nc                |         |
| A17 | COM_AREA_03        | nc             |      | nc                |         |
| A18 | COM_AREA_04        | nc             |      | nc                |         |
| A19 | COM_AREA_05        | nc             |      | nc                |         |
| A20 | COM_AREA_06        | nc             |      | nc                |         |
| A21 | COM_AREA_07        | nc             |      | nc                |         |
| A22 | UART_C_RX          | UART4_RXD      | I    | J11-15            | 3.3V    |
| B1  | CSI_DATA0_P        | MIPI_CSI_D0_P  | I    | J1214             |         |
| B2  | GND                |                | PWR  | GND               | GND     |
| B3  | CSI_CLOCK_N        | MIPI_CSI_CLK_N | I    | J12-9             |         |
| B4  | CSI_CLOCK_P        | MIPI_CSI_CLK_P | I    | J12-8             |         |
| B5  | GND                |                | PWR  | GND               | GND     |
| B6  | CSI_DATA3_N        | MIPI_CSI_D3_N  | I    | J12-3             |         |
| B7  | CSI_DATA3_P        | MIPI_CSI_D3_P  | I    | J12-2             |         |
| B8  | GND                |                | PWR  | GND               | GND     |
| B9  | GND                |                | PWR  | GND               | GND     |
| B10 | USB_C_SSRX_P       | nc             | I    | nc                |         |
| B11 | USB_C_SSRX_N       | nc             | I    | nc                |         |
| B13 | UART_A_TX          | UART2_TXD      | O    | nc                |         |
| B15 | COM_AREA_08        | nc             |      | nc                |         |
| B16 | COM_AREA_09        | nc             |      | nc                |         |
| B17 | COM_AREA_10        | nc             |      | nc                |         |
| B18 | COM_AREA_11        | nc             |      | nc                |         |
| B19 | COM_AREA_12        | nc             |      | nc                |         |
| B20 | COM_AREA_13        | nc             |      | nc                |         |
| B21 | COM_AREA_14        | nc             |      | nc                |         |
| B22 | Vendor Defined_B22 | nc             |      | nc                |         |

| Pin | Default Function     | Internal Pad  | Type | PicoCoreBBD SI Pin | Voltage |
|-----|----------------------|---------------|------|--------------------|---------|
| B23 | UART_C_TX            | UART4_TXD     | O    | J11-13             | 3.3V    |
| C1  | CSI_DATA0_N          | MIPI_CSI_D0_N | I    | J12-15             |         |
| C2  | CAM_MCK              | CLKOUT1       | O    | nc                 |         |
| C3  | I2C_CAM_SDA/CSI_TX_N | I2C4_SDA      | I/O  | J13-25             | 3.3V    |
| C4  | I2C_CAM_SCL/CSI_TX_P | I2C4_SCL      | O    | J13-27             | 3.3V    |
| C5  | VCC_6_TEST           | nc            | PWR  | nc                 |         |
| C6  | Vendor Defined_C6    | nc            |      | nc                 |         |
| C7  | Vendor Defined_C7    | nc            |      | nc                 |         |
| C8  | USB_C_OC#            | nc            | I    | nc                 |         |
| C9  | USB_C_VBUS           | nc            | I    | nc                 |         |
| C10 | USB_C_EN             | nc            | O    | nc                 |         |
| C20 | SDIO_A_IOPWR         |               | PWR  | nc                 | 1       |
| C11 | GND                  |               | PWR  | GND                | GND     |
| C13 | UART_A_RTS           | SAI3_RXC      | O    | nc                 |         |
| C14 | UART_A_CTS           | SAI3_RXD      | I    | nc                 |         |
| C15 | COM_AREA_15          | nc            |      | nc                 |         |
| C16 | Vendor Defined_C16   | nc            |      | nc                 |         |
| C17 | COM_AREA_16          | nc            |      | nc                 |         |
| C18 | TEST_GENERIC         | nc            |      | nc                 |         |
| C19 | COM_AREA_17          | nc            |      | nc                 |         |
| C20 | COM_AREA_18          | nc            |      | nc                 |         |
| C22 | UART_D_RX            | nc            | I    | nc                 |         |
| C23 | UART_D_TX            | nc            | O    | nc                 |         |
| D1  | GND                  |               | PWR  | GND                | GND     |
| D2  | ETH_B_(R)(G)MII_CRS  | nc            | I    | nc                 |         |
| D3  | GPIO_C_0             | SAI1_RXD4     | I/O  | nc                 |         |
| D4  | GPIO_C_1             | SAI1_RXD3     | I/O  | nc                 |         |
| D5  | GND                  |               | PWR  | GND                | GND     |
| D6  | Vendor Defined_D6    | nc            |      | nc                 |         |
| D7  | Vendor Defined_D7    | nc            |      | nc                 |         |
| D8  | GND                  |               | PWR  | GND                | GND     |
| D9  | USB_C_ID             | nc            | I    | nc                 |         |
| D10 | USB_C_D_P            | nc            | I/O  | nc                 |         |
| D11 | USB_C_D_N            | nc            | I/O  | nc                 |         |
| D13 | UART_B_TX            | UART3_TXD     | O    | J10-5              | RS232   |
| D14 | UART_B_RX            | UART3_RXD     | I    | J10-3              | RS232   |
| D15 | UART_B_RTS           | ECSPI1_MISO   | O    | J10-4              | RS232   |
| D16 | UART_B_CTS           | ECSPI1_SS0    | I    | J10-6              | RS232   |
| D17 | GPIO_A_0             | GPIO1_IO00    | I/O  | nc                 | 3.3V    |
| D18 | GND                  |               | PWR  | GND                | GND     |
| D19 | GPIO_B_0             | GPIO1_IO08    | I/O  | nc                 |         |
| D20 | SDIO_A_WP            | SD2_WP        | I    | nc                 |         |
| D21 | SDIO_A_PWR_EN        | SD2_RESET_B   | O    | nc                 |         |



| Pin | Default Function        | Internal Pad  | Type | PicoCoreBBD SI Pin | Voltage   |
|-----|-------------------------|---------------|------|--------------------|-----------|
| D22 | UART_CON_RX             | UART1_RXD     | I    | J9-3               | RS232     |
| D23 | UART_CON_TX             | UART1_TXD     | O    | J9-5               | RS232     |
| E1  | ETH_B_(R)(G)MII_COL     | nc            | I    | nc                 |           |
| E2  | GND                     |               | PWR  | GND                | GND       |
| E3  | GPIO_C_2                | SAI1_RXD2     | I/O  | nc                 |           |
| E4  | GPIO_C_3                | SAI1_RXD1     | I/O  | nc                 |           |
| E15 | GND                     |               | PWR  | GND                | GND       |
| E16 | ETH_A_(R)(G)MII_CRS     | nc            | I    | nc                 |           |
| E17 | GPIO_A_1                | GPIO1_IO01    | I/O  | J14-2              | 3.3V      |
| E18 | PWM_0/DISP_BL_PWM       | SAI3_MCLK     | O    | J14-3              | 3.3V      |
| E19 | GPIO_B_1                | GPIO1_IO09    | I/O  | nc                 |           |
| E20 | SDIO_A_CMD              | SD2_CMD       | I/O  | J6-3               | 1.8V/3.3V |
| E21 | GND                     |               | PWR  | GND                | GND       |
| F1  | ETH_B_(S)(R)(G)MII_TXD1 | nc            | O    | nc                 |           |
| F2  | ETH_B_(S)(R)(G)MII_TXD3 | nc            | O    | nc                 |           |
| F3  | GPIO_C_4/DISP_VDD_EN    | SAI3_TXD      | I/O  | nc                 |           |
| F4  | GPIO_C_5/DISP_BL_PWM    | SAI3_TXC      | I/O  | nc                 |           |
| F15 | ETH_A_(R)(G)MII_COL     | nc            | I    | nc                 |           |
| F16 | GND                     |               | PWR  | GND                | GND       |
| F17 | GPIO_A_2                | GPIO1_IO04    | I/O  | J13-28             | 3.3V      |
| F18 | PWM_1                   | SPDIF_EXT_CLK | O    | J11-24             | 1.8V      |
| F19 | GPIO_B_2                | GPIO1_IO10    | I/O  | nc                 |           |
| F20 | GND                     |               | PWR  | GND                | GND       |
| F21 | SDIO_A_CLK              | SD2_CLK       | O    | J6-5               | 1.8V/3.3V |
| G1  | ETH_B_(S)(R)(G)MII_TXD0 | nc            | O    | nc                 |           |
| G2  | ETH_B_(S)(R)(G)MII_TXD2 | nc            | O    | nc                 |           |
| G3  | CAM_PWR/GPIO_C_6        | SAI2_TXC      | I/O  | nc                 |           |
| G4  | CAM_RST#/GPIO_C_7       | SAI2_TXD0     | I/O  | nc                 |           |
| G15 | ETH_A_(S)(R)(G)MII_TXD1 | ENET_TD1      | O    | J16 Left           |           |
| G16 | ETH_A_(S)(R)(G)MII_TXD3 | ENET_TD3      | O    | J16 Left           |           |
| G17 | GPIO_A_3                | GPIO1_IO05    | I/O  | J13-26             | 1.8V/3.3V |
| G18 | PWM_2                   | SPDIF_RX      | O    | nc                 |           |
| G19 | GPIO_B_3                | GPIO1_IO11    | I/O  | nc                 |           |
| G20 | SDIO_A_D0               | SD2_DATA0     | I/O  | J6-7               | 1.8V/3.3V |
| G21 | SDIO_A_D1               | SD2_DATA1     | I/O  | J6-8               | 1.8V/3.3V |
| H1  | ETH_B_(R)(G)MII_TX_CLK  | nc            | I/O  | nc                 |           |
| H2  | GND                     |               | PWR  | GND                | GND       |
| H3  | RGB_CS#                 | nc            | O    | nc                 |           |
| H4  | GND                     |               | PWR  | GND                | GND       |
| H15 | ETH_A_(S)(R)(G)MII_TXD0 | ENET_TD0      | O    | J16 Left           |           |
| H16 | ETH_A_(S)(R)(G)MII_TXD2 | ENET_TD2      | O    | J16 Left           |           |
| H17 | GPIO_A_4                | GPIO1_IO06    | I/O  | J2-77              | 1.8V/3.3V |
| H18 | PWM_3                   | SPDIF_TX      | O    | nc                 |           |

| Pin | Default Function           | Internal Pad | Type | PicoCoreBBD SI Pin | Voltage   |
|-----|----------------------------|--------------|------|--------------------|-----------|
| H19 | GPIO_B_4                   | ECSPI1_MOSI  | I/O  | nc                 |           |
| H20 | SDIO_A_D2                  | SD2_DATA2    | I/O  | J6-1               | 1.8V/3.3V |
| H21 | SDIO_A_D3                  | SD2_DATA3    | I/O  | J6-2               | 1.8V/3.3V |
| J1  | ETH_B_(S)(R)(G)MII_RXD0    | nc           | I    | nc                 |           |
| J2  | ETH_B_(R)(G)MII_TX_EN(_ER) | nc           | O    | nc                 |           |
| J3  | RGB_RESET#                 | nc           | O    | nc                 |           |
| J4  | RGB_DE                     | nc           | O    | nc                 |           |
| J15 | ETH_A_(R)(G)MII_TX_CLK     | ENET_TXC     | I/O  | J16 Left           |           |
| J16 | GND                        |              | PWR  | GND                | GND       |
| J17 | GPIO_A_5                   | GPIO1_IO07   | I/O  | J15-4              |           |
| J18 | PWM_4                      | nc           | O    | nc                 |           |
| J19 | GPIO_B_5                   | SAI1_RXD7    | I/O  | nc                 |           |
| J20 | GND                        |              | PWR  | GND                | GND       |
| J21 | SDIO_A_CD#                 | SD2_CD_B     | I    | nc                 |           |
| K1  | ETH_B_(S)(R)(G)MII_RXD1    | nc           | I    | nc                 |           |
| K2  | ETH_B_(R)(G)MII_RX_ER      | nc           | I    | nc                 |           |
| K3  | RGB_HSYNC                  | nc           | O    | nc                 |           |
| K4  | RGB_DISP                   | nc           | O    | nc                 |           |
| K15 | ETH_A_(S)(R)(G)MII_RXD0    | ENET_RD0     | I    | J16 Left           |           |
| K16 | ETH_A_(R)(G)MII_TX_EN(_ER) | ENET_TX_CTL  | I    | J16 Left           |           |
| K17 | GPIO_A_6/SPI_A_CS1#        | NAND_CE1_B   | I/O  | nc                 |           |
| K18 | PWM_5                      | nc           | O    | nc                 |           |
| K19 | GPIO_B_6                   | SAI1_RXD6    | I/O  | nc                 |           |
| K20 | SDIO_B_CLK                 | NAND_WE_B    | O    | nc                 |           |
| K21 | SDIO_B_CMD                 | NAND_WP_B    | I/O  | nc                 |           |
| L1  | ETH_B_(R)(G)MII_RX_DV(_ER) | nc           | I    | nc                 |           |
| L2  | GND                        |              | PWR  | GND                | GND       |
| L3  | RGB_VSYNC                  | nc           | O    | nc                 |           |
| L4  | GND                        |              | PWR  | GND                | GND       |
| L15 | ETH_A_(S)(R)(G)MII_RXD1    | ENET_RD1     | I    | J16 Left           |           |
| L17 | GPIO_A_7/SPI_B_CS1#        | ECSPI1_SCLK  | I/O  | nc                 |           |
| L18 | GND                        |              | PWR  | GND                | GND       |
| L19 | GPIO_B_7                   | SAI1_RXD5    | I/O  | nc                 |           |
| L20 | SDIO_B_D0                  | NAND_DATA04  | I/O  | nc                 |           |
| L21 | SDIO_B_D1                  | NAND_DATA05  | I/O  | nc                 |           |
| M1  | ETH_B_(R)(G)MII_RXD2       | nc           | I    | nc                 |           |
| M2  | ETH_B_SDP                  | nc           | O    | nc                 |           |
| M3  | RGB_B5                     | nc           | O    | nc                 |           |
| M4  | RGB_CLK                    | nc           | O    | nc                 |           |
| M15 | ETH_A_(R)(G)MII_RX_DV(_ER) | ENET_RX_CTL  | I    | J16 Left           |           |
| M16 | GND                        |              | PWR  | GND                | GND       |
| M17 | ETH_IOPWR                  |              | PWR  | nc                 |           |

| Pin | Default Function       | Internal Pad | Type | PicoCoreBBD SI Pin | Voltage     |
|-----|------------------------|--------------|------|--------------------|-------------|
| M18 | ADC_0                  | nc           | I    | J11-7              | 0.0V - 1.8V |
| M19 | VCC_2_TEST             |              | PWR  | nc                 |             |
| M20 | GND                    |              | PWR  | GND                | GND         |
| M21 | SDIO_B_D2              | NAND_DATA06  | I/O  | nc                 |             |
| N1  | ETH_B_(R)(G)MII_RXD3   | nc           | I    | nc                 |             |
| N2  | RESERVED_N2            | nc           |      | nc                 |             |
| N3  | RGB_B3                 | nc           | O    | nc                 |             |
| N4  | RGB_B4                 | nc           | O    | nc                 |             |
| N15 | ETH_A_(R)(G)MII_RXD2   | ENET_RD2     | I    | J16 Left           |             |
| N16 | ETH_A_SDP              | nc           | O    | nc                 |             |
| N17 | JTAG_TCK(SWCLK)        | JTAG_TCK     | I    | J20-4              | 1.8V        |
| N18 | ADC_1                  | nc           | I    | J11-9              | 0.0V - 1.8V |
| N19 | JTAG_TMS(SWDIO)        | JTAG_TMS     | I    | J20-2              | 1.8V        |
| N20 | SDIO_B_D3              | NAND_DATA07  | I/O  | nc                 |             |
| N21 | SDIO_B_D4              | NAND_RE_B    | I/O  | nc                 |             |
| P1  | ETH_B_(R)(G)MII_RX_CLK | nc           | I/O  | nc                 |             |
| P2  | GND                    |              | PWR  | GND                | GND         |
| P3  | RGB_B2                 | nc           | O    | nc                 |             |
| P4  | GND                    |              | PWR  | GND                | GND         |
| P15 | ETH_A_(R)(G)MII_RXD3   | ENET_RD3     | I    | J16 Left           |             |
| P16 | Vendor Defined_P16     | nc           |      | nc                 |             |
| P17 | JTAG_TDI               | JTAG_TDI     | I    | J20-8              | 1.8V        |
| P18 | GND                    |              | PWR  | GND                | GND         |
| P19 | JTAG_RTCK              | NC           | O    | nc                 | 1.8V        |
| P20 | SDIO_B_D5              | NAND_CE2_B   | I/O  | nc                 |             |
| P21 | SDIO_B_D6              | NAND_CE3_B   | I/O  | nc                 |             |
| R1  | GND                    |              | PWR  | GND                | GND         |
| R2  | PCIe_SM_ALERT#         | SAI3_TXFS    | I    | nc                 |             |
| R3  | RGB_B1                 | nc           | O    | nc                 |             |
| R4  | RGB_B0                 | nc           | O    | nc                 |             |
| R15 | ETH_A_(R)(G)MII_RX_CLK | ENET_RXC     | I/O  | J16 Left           |             |
| R16 | GND                    |              | PWR  | GND                | GND         |
| R17 | JTAG_TDO(SWO)          | JTAG_TDO     | O    | J20-6              | 1.8V        |
| R18 | BOOT_SEL1#             | nc           | I    | nc                 |             |
| R19 | JTAG_nTRST             | JTAG_TRST_B  | I    | nc                 |             |
| R20 | GND                    |              | PWR  | GND                | GND         |
| R21 | SDIO_B_D7              | NAND_CLE     | I/O  | nc                 |             |
| T1  | PCIe_SMCLK             | I2C4_SCL     | O    | nc                 | 1.8V        |
| T2  | PCIe_WAKE#             | SAI5_RXC     | I    | J18-1              | 1.8V        |
| T3  | RGB_G4                 | nc           | O    | nc                 |             |
| T4  | RGB_G5                 | nc           | O    | nc                 |             |

| Pin | Default Function  | Internal Pad | Type | PicoCoreBBD SI Pin | Voltage |
|-----|-------------------|--------------|------|--------------------|---------|
| T15 | ETH_MDIO          | ENET_MDIO    | I/O  | J16 Left           |         |
| T16 | ETH_MDC           | ENET_MDC     | O    | J16 Left           |         |
| T17 | FORCE_RECOVERY#   | BOOT_MODE1   | I    | nc                 |         |
| T18 | RESERVED_T18      | nc           |      | nc                 |         |
| T19 | RESERVED_T19      | nc           |      | nc                 |         |
| T20 | SDIO_B_IOPWR      |              | PWR  | nc                 |         |
| T21 | SDIO_B_CD#        | SAI2_RXC     | I    | nc                 |         |
| U1  | PCIe_SMDAT        | I2C4_SDA     | I/O  | nc                 |         |
| U2  | GND               |              | PWR  | GND                | GND     |
| U3  | RGB_G3            | nc           | O    | nc                 |         |
| U4  | GND               |              | PWR  | GND                | GND     |
| U15 | SPI_A_SDI_(IO0)   | NAND_DATA00  | I/O  | J23-4 / J23-3      | 1.8V    |
| U16 | SPI_A_SCK         | NAND_ALE     | O    | J23-2              | 1.8V    |
| U17 | SYS_RST#          |              | I    | nc                 |         |
| U18 | VCC_OUT_IO        |              | PWR  | nc                 |         |
| U19 | BOOT_SELO#        | nc           | I    | nc                 |         |
| U20 | SDIO_B_WP         | SAI2_RXD0    | I    | nc                 |         |
| U21 | SDIO_B_PWR_EN     | NAND_READY_B | O    | nc                 |         |
| V1  | GND               |              | PWR  | GND                | GND     |
| V3  | RGB_G1            | nc           | O    | nc                 |         |
| V4  | RGB_G2            | nc           | O    | nc                 |         |
| V15 | SPI_A_SDO_(IO1)   | NAND_DATA01  | I    | J23-3 / J23-4      | 1.8V    |
| V16 | GND               |              | PWR  | GND                | GND     |
| V17 | CARRIER_PWR_EN    | SAI2_MCLK    | O    | nc                 |         |
| V18 | I2S_MCLK          | SAI5_MCLK    | O    | nc                 |         |
| V2  | PCIe_A_PERST#     | SAI5_RXFS    | O    | J18-22             | 1.8V    |
| V19 | I2S_B_DATA_IN     | nc           | I    | nc                 |         |
| V20 | GND               |              | PWR  | GND                | GND     |
| V21 | I2S_A_DATA_IN     | SAI5_RXD0    | I    | nc                 |         |
| W1  | PCIe_REFCLK_P     | PCIE_CLK_P   | O    | J18-13             | 1.8V    |
| W2  | PCIe_CLKREQ#      | SAI3_RXFS    | I    | nc                 |         |
| W3  | GND               |              | PWR  | GND                | GND     |
| W4  | RGB_G0            | nc           | O    | nc                 |         |
| W15 | SPI_A_/HOLD_(IO3) | NAND_DATA03  | I/O  | nc                 |         |
| W16 | SPI_A_/WP_(IO2)   | NAND_DATA02  | I/O  | nc                 |         |
| W17 | RTC_PWR           |              | PWR  | nc                 |         |
| W18 | I2S_LRCLK         | SAI5_RXD1    | I/O  | nc                 |         |
| W19 | I2S_B_DATA_OUT    | nc           | O    | nc                 |         |
| W20 | I2S_BITCLK        | SAI5_RXD2    | I/O  | nc                 |         |
| W21 | I2S_A_DATA_OUT    | SAI5_RXD3    | O    | nc                 |         |
| Y1  | PCIe_REFCLK_N     | PCIE_CLK_N   | O    | J18-11             | 1.8V    |
| Y2  | GND               |              | PWR  | GND                | GND     |
| Y3  | VCC_5_TEST        | nc           | PWR  | nc                 |         |

| Pin  | Default Function | Internal Pad | Type | PicoCoreBBD SI |         |
|------|------------------|--------------|------|----------------|---------|
|      |                  |              |      | Pin            | Voltage |
| Y4   | RGB_R5           | nc           | O    | nc             |         |
| Y5   | RGB_R4           | nc           | O    | nc             |         |
| Y6   | RGB_R2           | nc           | O    | nc             |         |
| Y7   | RGB_R0           | nc           | O    | nc             |         |
| Y8   | VCC_IN_5V_Y8     |              | PWR  | 5.0V           | 5.0V    |
| Y9   | VCC_IN_5V_Y9     |              | PWR  | 5.0V           | 5.0V    |
| Y10  | VCC_IN_5V_Y10    |              | PWR  | 5.0V           | 5.0V    |
| Y11  | VCC_IN_5V_Y11    |              | PWR  | 5.0V           | 5.0V    |
| Y13  | RESERVED_Y13     | nc           |      | nc             |         |
| Y14  | RESERVED_Y14     | nc           |      | nc             |         |
| Y15  | SPI_A_CS0#       | NAND_CEO_B   | O    | J23-5          | 1.8V    |
| Y16  | VCC_3_TEST       | nc           | PWR  | nc             |         |
| Y17  | VCC_IN_5V_Y17    |              | PWR  | 5.0V           | 5.0V    |
| Y18  | GND              |              | PWR  | GND            | GND     |
| Y19  | VCC_IN_3V3       | nc           | PWR  | nc             |         |
| Y20  | VCC_4_TEST       | nc           | PWR  | nc             |         |
| Y21  | SPI_B_SCK        | ECSPI2_SCLK  | O    | nc             |         |
| Y22  | SPI_B_SDI        | ECSPI2_MISO  | I    | nc             |         |
| Y23  | SPI_B_SDO        | ECSPI2_MOSI  | O    | nc             |         |
| AA1  | GND              |              | PWR  | GND            | GND     |
| AA2  | RESERVED_AA2     | nc           |      | nc             |         |
| AA3  | DSI_TE           | SAI2_RXFS    | I    | nc             |         |
| AA4  | GND              |              | PWR  | GND            | GND     |
| AA5  | RGB_R3           | nc           | O    | nc             |         |
| AA6  | RGB_R1           | nc           | O    | nc             |         |
| AA7  | GND              |              | PWR  | GND            | GND     |
| AA8  | GND              |              | PWR  | GND            | GND     |
| AA9  | PWR_BTN#         | ONOFF        | I    | nc             |         |
| AA10 | GND              |              | PWR  | GND            | GND     |
| AA11 | GND              |              | PWR  | GND            | GND     |
| AA13 | RESERVED_AA13    | nc           |      | nc             |         |
| AA14 | GND              |              | PWR  | GND            | GND     |
| AA15 | I2C_A_SCL        |              | O    | J11-16         | 1.8V    |
| AA16 | I2C_A_SDA        |              | I/O  | J11-17         | 1.8V    |
| AA17 | GND              |              | PWR  | GND            | GND     |
| AA18 | V_BAT_AA18       | nc           | PWR  | nc             |         |
| AA19 | GND              |              | PWR  | GND            | GND     |
| AA20 | I2C_B_SCL        | I2C3_SCL     | O    | nc             |         |
| AA21 | I2C_B_SDA        | I2C3_SDA     | I/O  | nc             |         |
| AA22 | GND              |              | PWR  | GND            | GND     |
| AA23 | SPI_B_CS0#       | ECSPI2_SS0   | O    | nc             |         |
| AB1  | PCle_A_HSI0_P    | PCIE_RXN_P   | I    | J18-25         | 1.8V    |
| AB2  | PCle_A_HSI0_N    | PCIE_RXN_N   | I    | J18-23         | 1.8V    |

| Pin  | Default Function | Internal Pad   | Type | PicoCoreBBD SI Pin            | Voltage |
|------|------------------|----------------|------|-------------------------------|---------|
| AB3  | GND              |                | PWR  | GND                           | GND     |
| AB4  | DSI_DATA3_P      | MIPI_DSI_D3_P  | O    | J13-11                        | 1.8V    |
| AB5  | DSI_DATA3_N      | MIPI_DSI_D3_N  | O    | J13-10                        | 1.8V    |
| AB6  | GND              |                | PWR  | GND                           | GND     |
| AB7  | DSI_CLOCK_P      | MIPI_DSI_CLK_P | O    | J13-9                         | 1.8V    |
| AB8  | DSI_CLOCK_N      | MIPI_DSI_CLK_N | O    | J13-8                         | 1.8V    |
| AB9  | GND              |                | PWR  | GND                           | GND     |
| AB10 | DSI_DATA0_P      | MIPI_DSI_D0_P  | O    | J13-2                         | 1.8V    |
| AB11 | DSI_DATA0_N      | MIPI_DSI_D0_N  | O    | J13-1                         | 1.8V    |
| AB13 | USB_A_D_N        | USB1_DN        | I/O  | J5-A7 / J5-B7                 |         |
| AB14 | USB_A_ID         | USB1_ID        | I    | nc                            | 1.8V    |
| AB15 | GND              |                | PWR  | GND                           | GND     |
| AB16 | USB_A_VBUS       | USB1_VBUS      | I    | J5-A4, J5-A9,<br>J5-B4, J5-B9 | 5.0V    |
| AB17 | CAN_A_RX         | nc             | I    | J11-24                        | 3.3V    |
| AB18 | V_BAT_AB18       | nc             | PWR  | nc                            |         |
| AB19 | CAN_B_RX         | nc             | I    | nc                            |         |
| AB20 | USB_B_VBUS       | USB2_VBUS      | I    | J21                           |         |
| AB21 | GND              |                | PWR  | GND                           | GND     |
| AB22 | USB_B_ID         | USB2_ID        | I    | nc                            |         |
| AB23 | USB_B_D_N        | USB2_DN        | I/O  | J21                           |         |
| AC2  | PCIe_A_HSO0_P    | PCIE_TXN_P     | O    | J18-33                        | 1.8V    |
| AC3  | PCIe_A_HSO0_N    | PCIE_TXN_N     | O    | J18-31                        | 1.8V    |
| AC4  | GND              |                | PWR  | GND                           | GND     |
| AC5  | DSI_DATA2_P      | MIPI_DSI_D2_P  | O    | J13-6                         | 1.8V    |
| AC6  | DSI_DATA2_N      | MIPI_DSI_D2_N  | O    | J13-5                         | 1.8V    |
| AC7  | GND              |                | PWR  | GND                           | GND     |
| AC8  | DSI_DATA1_P      | MIPI_DSI_D1_P  | O    | J13-4                         | 1.8V    |
| AC9  | DSI_DATA1_N      | MIPI_DSI_D1_N  | O    | J13-3                         | 1.8V    |
| AC10 | GND              |                | PWR  | GND                           | GND     |
| AC14 | USB_A_D_P        | USB1_DP        | I/O  | J5-A6 / J5-B6                 |         |
| AC15 | USB_A_OC#        | GPIO1_IO13     | I    | nc                            | 1.8V    |
| AC16 | USB_A_EN         | GPIO1_IO12     | O    | nc                            |         |
| AC17 | CAN_A_TX         | nc             | O    | J11-26                        | 3.3V    |
| AC18 | DEBUG_EN         | nc             | I    | nc                            |         |
| AC19 | CAN_B_TX         | nc             | O    | nc                            |         |
| AC20 | USB_B_EN         | GPIO1_IO14     | O    | J21                           |         |
| AC21 | USB_B_OC#        | GPIO1_IO15     | I    | nc                            |         |
| AC22 | USB_B_D_P        | USB2_DP        | I/O  | J21                           |         |

Table 3: ADP-OSM-BB Connector Pin Layout

## 5 ESD and EMI Implementation

We highly recommend using the adapter board with wires as short as possible.

ESD Rating of the chip is  $\pm 2$  kV (HBM). The chip has limited built-in ESD protection. There is no ESD protection on the RGB and MIPI-DSI connectors.

A helpful guide is available from TI; just search for slva680 at ti.com.

## 6 Second source rules

F&S qualifies their second sources for parts autonomously, as long as this does not touch the technical characteristics of the product. This is necessary to guarantee delivery times and product life. A setup of release samples with released second sources is not possible.

F&S does not use broker components without the consent of the customer.

## 7 Storage conditions

Maximum storage on room temperature with non-condensing humidity: 6 months

Maximum storage on controlled conditions  $25 \pm 5$  °C, max. 60% humidity: 12 months

For longer storage, we recommend vacuum dry packs.

## 8 ROHS and REACH statement

All F&S designs are created from lead-free components and are completely ROHS compliant.

The products we supply do not contain any substance on the latest candidate list published by the European Chemicals Agency according to Article 59(1,10) of Regulation (EC) 1907/2006 (REACH) in a concentration above 0.1 mass %.

Consequently, the obligations in No. 1 and 2 paragraphs in Annex are not relevant here.

Please understand that F&S is not performing any chemical analysis on its products to testify REACH compliance and is therefore not able to fill out any detailed inquiry forms.

## 9 Packaging

All F&S ESD-sensitive products will shipping either in trays or in bags.

## 10 Matrix Code Sticker

All F&S hardware will ship with a matrix code sticker including the serial number. Enter your serial number here <https://www.fs-net.de/en/support/serial-number-info-and-rma/> to get information on shipping date and type of board.



*Figure 5: Matrix Code Sticker*



# 11 Appendix

## Important Notice

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