

# Boardcon CM3576 System on Module User Manual

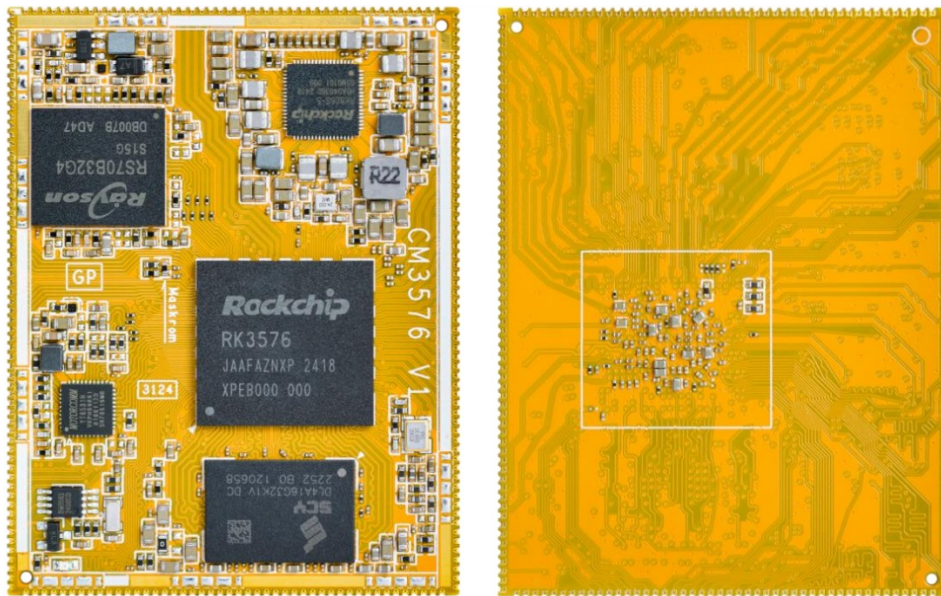
[Home](#) » [Boardcon](#) » Boardcon CM3576 System on Module User Manual 

## Contents

- [1 Boardcon CM3576 System on Module](#)
- [2 Product Usage Instructions](#)
- [3 Introduction](#)
- [4 CM3576 Introduction](#)
- [5 CM3576 Block Diagram](#)
- [6 CM3576 specifications](#)
- [7 Hardware Design Guide](#)
- [8 Product Electrical Characteristics](#)
- [9 Documents / Resources](#)
  - [9.1 References](#)
- [10 Related Posts](#)



**Boardcon CM3576 System on Module**



## Specifications

- **Feature:** CM3576
- **CPU:** Quad-core Cortex-A72 and quad-core Cortex-A53
- **DDR:** 2GB LPDDR4/x (up to 8GB)
- **eMMC:** 32GB (up to 128GB option)
- **FLASH UFS:** FLASH Power EDP/MIPI DSI I2S MIPI CSI SATA HDMI output DP output RGB output EBC output Flex Bus
- **Specifications:** 1-CH EDP, 1-CH MIPI DSI, 5-CH, 3-CH, 4-Lane or 4-CH, 2-Lane + 1-CH, 4-Lane CSI (up to 5 CSI Cameras), 2-CH, 1-CH (EDP option), 1-CH, 1-CH, 24bit, 1-CH (option) option
- **CAN:** 2-CH
- **USB:** 1-CH Type-C and 1-CH USB Host3.0
- **Ethernet:** 1-ch 1GB PHY
- **Board Dimension:** 57.5 x 44mm

## Product Usage Instructions

### Setup Procedures

1. Connect the necessary power input according to the Pin Definitions.
2. Ensure the system voltage is within the specified range (3.4V-5.5V).
3. If using peripherals like cameras or displays, connect them to the appropriate ports on the board.

### Safety Information

Always use the specified power input voltage range to avoid damaging the board or components.

### Troubleshooting

If you encounter any issues during setup or operation, refer to the troubleshooting section of the manual for guidance.

### FAQ

- **Q: What should I do if the board does not power on?**

A: Check the power connections and ensure the voltage is within the specified range. If the issue persists, refer to the troubleshooting section of the manual.

- **Q: Can I upgrade the DDR capacity?**

A: Yes, the DDR capacity can be upgraded up to 8GB as per the specifications mentioned.

## **CM3576 Reference User Manual**

V1.20240628

### **Boardcon Embedded Design**

[www.armdesigner.com](http://www.armdesigner.com)

## **Introduction**

### **About this Manual**

This manual is intended to provide the user with an overview of the board and benefits, complete features specifications, and set up procedures. It contains important safety information as well.

### **Feedback and Update to this Manual**

To help our customers make the most of our products, we are continually making additional and updated resources available on the Boardcon website ([www.boardcon.com](http://www.boardcon.com), [www.armdesigner.com](http://www.armdesigner.com)).

These include manuals, application notes, programming examples, and updated software and hardware. Check in periodically to see what's new!

When we are prioritizing work on these updated resources, feedback from customers is the number one influence. If you have questions, comments, or concerns about your product or project, please do not hesitate to contact us at [support@armdesigner.com](mailto:support@armdesigner.com).

### **Limited Warranty**

Boardcon warrants this product to be free of defects in material and workmanship for a period of one year from date of buy. During this warranty period Boardcon will repair or replace the defective unit in accordance with the following process:

A copy of the original invoice must be included when returning the defective unit to Boardcon. This limited warranty does not cover damages resulting from lightning or other power surges, misuse, abuse, abnormal conditions of operation, or attempts to alter or modify the function of the product.

This warranty is limited to the repair or replacement of the defective unit. In no event shall Boardcon be liable or responsible for any loss or damages, including but not limited to any lost profits, incidental or consequential damages, loss of business, or anticipatory profits arising from the use or inability to use this product.

Repairs made after the expiration of the warranty period are subject to a repair charge and the cost of return shipping. Please contact Boardcon to arrange for any repair service and to obtain repair charge information.

## **CM3576 Introduction**

### **Summary**

The CM3576 system-on-module is equipped with Rockchip's RK3566. It has a quad-core Cortex-A72 and a quad-core Cortex-A53 processor, Embedded Mali-G52 MC3 GPU and 6.0 TOPs NPU.

It is designed specifically for the high-performance devices such as 4K video surveillance system, AI Edge calculation devices, intelligent interactive devices, personal computers and robots. The high-performance multimedia processing and acceleration engine solution can help customers to introduce new technologies more quickly and enhance the overall solution efficiency.

### **Features**

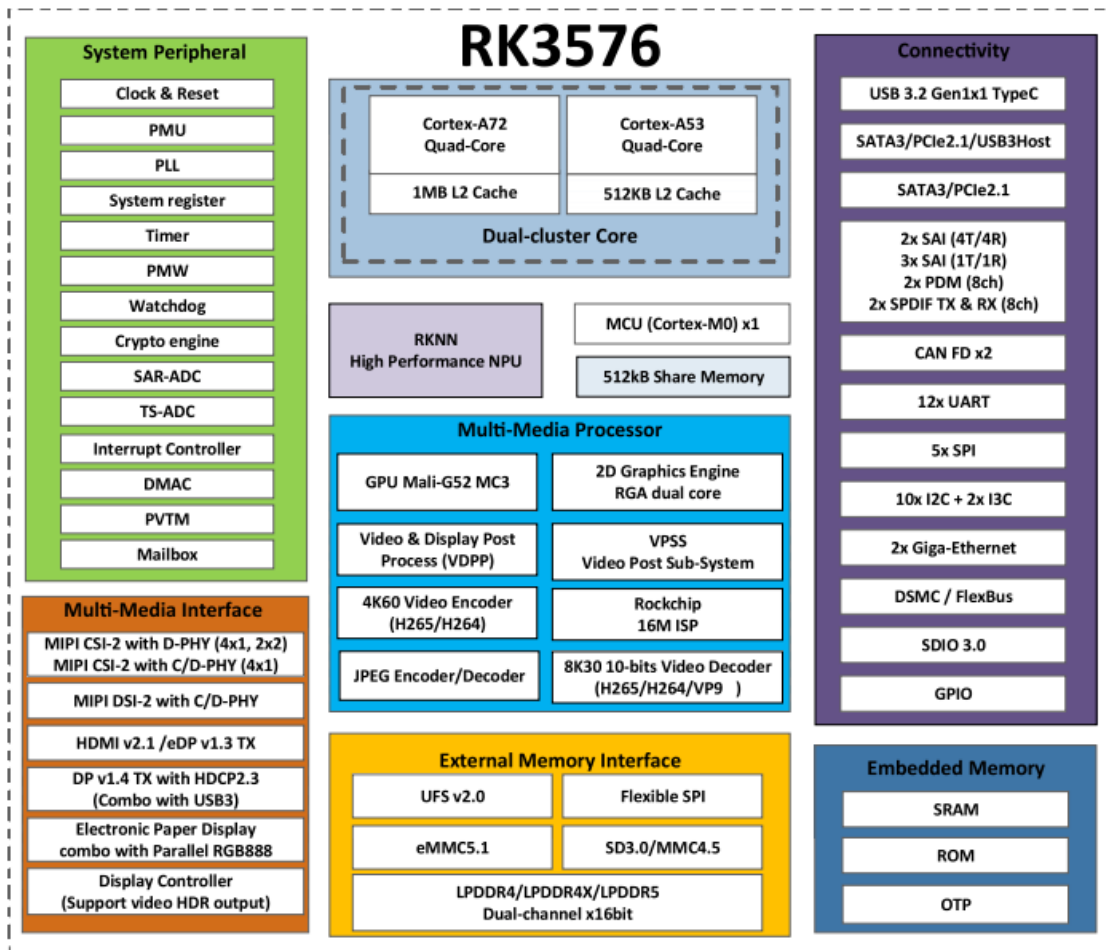
- Microprocessor

- Quad-core Cortex-A72 up to 2.2GHz
- Quad-core Cortex-A53 up to 1.8GHz
- 48KB I-cache 32KB D-cache and 1MB L2 for A72 each core, 32KB I-cache 32KB D-cache and 512KB L2 for A53 each core
- 6.0 TOPS Neural Process Unit
- Mali-G52 MC3 up to 1.0GHz
- Quad-core Cortex-M0 for user application
- Memory Organization
  - LPDDR4 or LPDDR4X RAM up to 16GB
  - EMMC up to 128GB
  - Support UFS up to 128GB
  - Support FSPI Flash
- Boot ROM
  - Supports system code download through USB OTG
- Secure system
  - Embedded two cipher engine
  - Support key ladder to guarantee key secure
  - Support secure OS and data scrambling
  - Support OTP
- Video Decoder/Encoder
  - Supports video decoding up to 8K@30fps
  - Supports H.265 encode up to 8K@30fps or 4K@120fps
  - H.264 HP encoding up to 4K@60fps
  - Picture size up to 65520 x 65520
- Display Subsystem
  - Video Output
    - Supports HDMI 2.1 TX with ARC, up to 4K@120fps Or EDP TX interface up to 4K@60Hz
    - HDMI 2.1 support FRL mode
    - Supports 4 lanes MIPI DSI up to 4K@60Hz
    - Supports PD1.4a interface up to 4K@60fps
    - Supports RGB 24bit output
    - Supports E-ink screen interface
  - Video/Image Input
    - Supports 3-CH MIPI 4lanes CSI interfaces or 4-CH MIPI 2lanes + 1-CH 4lanes CSI interfaces
    - Supports DVP 8-bit input
- Audio
  - Five I2S/PCM interfaces
  - Support 8-ch TX/RX on I2S0/1
  - Support Mic array Up to 8ch PDM/TDM interface
  - Support 2-ch SPDIF output
  - Support 2-ch SPDIF input
  - Support voice activity detection
- USB / PCIE/SATA3

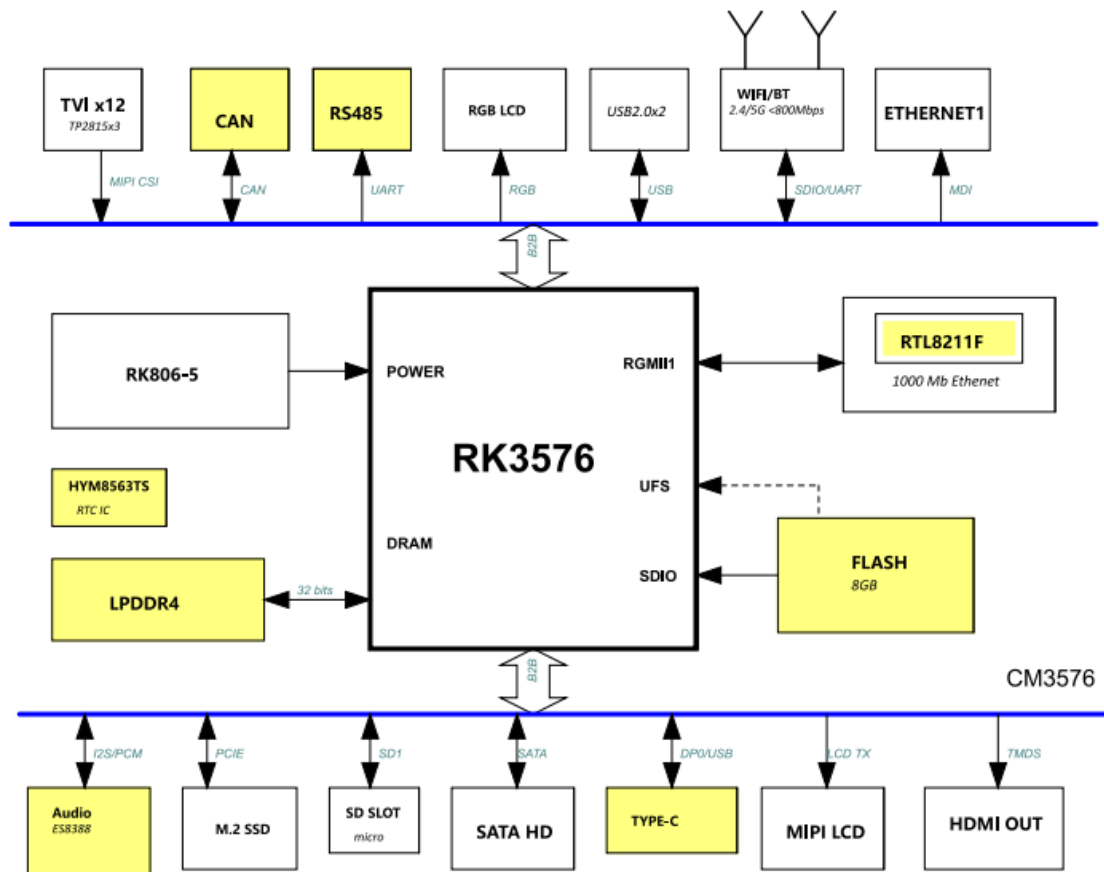
- Two USB2.0 OTG interfaces
- One Type-C or DP interfaces
- One USB3.0 Host or PCIE2.1×1 or SATA3 interface.
- One PCIE2.1×1 or SATA3 interface.
- SATA3 support five device each port via PM switch
- Ethernet
  - On board RTL8211F/ YT8531
- I2C
  - Up to 9-CH I2C
  - Support standard mode and fast mode(up to 400kbit/s)
- I3C
  - Up to 2-CH I3C
  - Support HDR mode(up to 30Mbps)
  - I2C compatible
- SDIO / SDMMC
  - Support SDIO 3.0 protocol
  - Support SD3.0 card
- SPI
  - Up to 5-ch SPI controllers,
  - Full-duplex synchronous serial interface
- UART
  - Support up to 12 UARTs
  - UART2 with 2 wires for debug
  - Embedded two 64byte FIFO
- CAN
  - Support up to two CAN controller
  - Support CAN FD protocol
- ADC
  - Up to Two ADC channels
  - 12-bit resolution up to 1MS/s sampling rate
  - Voltage input range between 0V to 1.8V
- PWM
  - Up to 4 PWMs with interrupt-based operation
  - Support 32bit time/counter facility
- Power unit
  - PMU RK806 on board
  - 3.4 ~ 5.5V main power input
  - 1.8V and 3.3V max 500mA output
  - Very low RTC consume current, less 5uA at 3V button Cell.

## **CM3576 Block Diagram**

## **RK3576 Block Diagram**



Development board (EM3576) Block Diagram

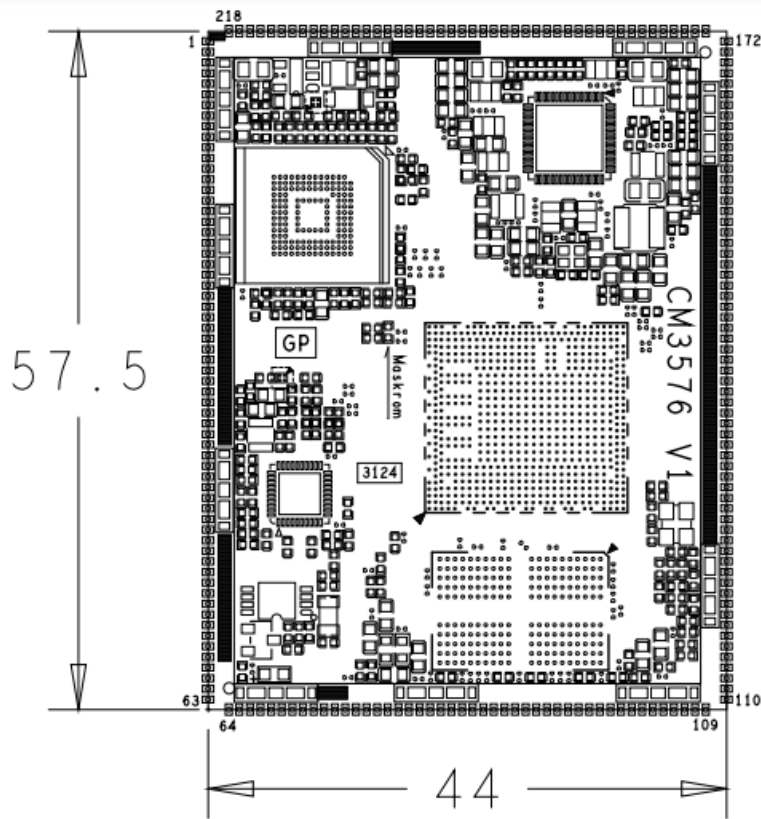


## CM3576 specifications

| Feature      | Specifications                                                    |
|--------------|-------------------------------------------------------------------|
| CPU          | Quad-core Cortex-A72 and quad-core Cortex-A53                     |
| DDR          | 2GB LPDDR4/x (up to 8GB)                                          |
| eMMC FLASH   | 32GB (up to 128GB)                                                |
| UFS FLASH    | option                                                            |
| Power        | DC 3.4 ~ 5.5V                                                     |
| EDP/MIPI DSI | 1-CH EDP, 1-CH MIPI DSI                                           |
| I2S          | 5-CH                                                              |
| MIPI CSI     | 3-CH 4-Lane or 4-CH 2-Lane + 1-CH 4-Lan CSI (up to 5 CSI Cameras) |
| SATA         | 2-CH                                                              |
| HDMI output  | 1-CH (EDP option)                                                 |
| DP output    | 1-CH                                                              |
| RGB output   | 1-CH 24bit                                                        |
| EBC output   | 1-CH (option)                                                     |
| Flex Bus     | option                                                            |

| Feature         | Specifications                   |
|-----------------|----------------------------------|
| CAN             | 2-CH                             |
| USB             | 1-CH Type-C and 1-CH USB Host3.0 |
| Ethernet        | 1-ch 1GB PHY                     |
| SDMMC           | 2-CH                             |
| SPDIF TX        | 2-CH                             |
| SPDIF RX        | 2-CH                             |
| I2C             | 9-CH                             |
| I3C             | 2-CH                             |
| SPI             | 5-CH                             |
| CAN             | 2-CH                             |
| UART            | 11-CH, 1-CH(DEBUG)               |
| PWM             | 4-CH                             |
| ADC IN          | 2-CH                             |
| Board Dimension | 57.5 x 44mm                      |

## CM3576 PCB Dimension



## CM3576 Pin Definition

| Pin | Signal     | Description or functions | GPIO serial | IO Voltage |
|-----|------------|--------------------------|-------------|------------|
| 1   | VCC_SYS    | System Power Input       |             | 3.4V-5.5V  |
| 2   | VCC_SYS    | System Power Input       |             | 3.4V-5.5V  |
| 3   | VCC_SYS    | System Power Input       |             | 3.4V-5.5V  |
| 4   | PWRON_L    | Power Key input          |             | 3.4V-5.5V  |
| 5   | VCC_3V3_S3 | 3.3V GPIO Power output   | Max 500mA   | 3.3V       |

| Pin | Signal               | Description or functions | GPIO serial | IO Voltage |
|-----|----------------------|--------------------------|-------------|------------|
| 6   | UART0_TX_M0          | For debug default        | GPIO0_D4_u  | 3.3V       |
| 7   | UART0_RX_M0          | For debug default        | GPIO0_D5_u  | 3.3V       |
| 8   | GND                  | Ground                   |             | 0V         |
| 9   | RESET_L              | GPIO0_A1_z connected(PU) |             | 1.8V       |
| 10  | SDMMC0_DET_L_1V8     | (PU100K)                 | GPIO0_A7_u  | 1.8V       |
| 11  | WIFI_WAKE_HOST_H_1V8 | I2C0_SCL_M0              | GPIO0_B0_z  | 1.8V       |

|    |                         |                                                                         |            |      |
|----|-------------------------|-------------------------------------------------------------------------|------------|------|
| 12 | BT_WAKE_HOST_H_1<br>V8  | I2C0_SDA_M0                                                             | GPIO0_B1_z | 1.8V |
| 13 | HOST_WAKE_BT_H_1 V<br>8 | SPDIF_TX1_M2/SPI2_CLK_M1<br>/PDM0_CLK1_M2/CLK1_<br>32K_OUT/SATA_MPSWIT  | GPIO1_D5_d | 1.8V |
| 14 | SAI2_SCLK_M0_1V8        | I3C0_SDA_PU_M1/UART10<br>_RX_M1                                         | GPIO1_D1_d | 1.8V |
| 15 | SAI2_SDO_M0_1V8         | UART10_TX_M1                                                            | GPIO1_D0_d | 1.8V |
| 16 | SAI2_SDI_M0_1V8         | I3C0_SDA_M1/PWM1_CH4_<br>M1                                             | GPIO1_D3_d | 1.8V |
| 17 | SAI2_LRCK_M0_1V8        | I3C0_SCL_M1/PWM1_CH3_<br>M1                                             | GPIO1_D2_d | 1.8V |
| 18 | WIFI_REG_ON_H_1V8       | I2C8_SCL_M1/UART2_TX_M0/<br>PDM0_SDI0_M2/SATA_<br>CPPOD                 | GPIO1_C6_d | 1.8V |
| 19 | BT_REG_ON_H_1V8         | I2C8_SDA_M1/UART2_RX_<br>M0/PDM0_SDI1_M2/SATA_CP<br>DET                 | GPIO1_C7_d | 1.8V |
| 20 | UART4_CTSN_M1_1V<br>8   | SDMMC1_DET_M0/I2C6_S<br>DA_M1/SPI2_CSN0_M1                              | GPIO1_C3_u | 1.8V |
| 21 | UART4_RTSN_M1_1V 8      | SDMMC1_PWEN_M0/I2C6_SC<br>L_M1/SPI2_CSN1_M1/P<br>WM1_CH2_M1             | GPIO1_C2_u | 1.8V |
| 22 | UART4_TX_M1_1V8         | SPI2_MOSI_M1/UART2_RT<br>S_M0/PCIE0_BUTTONRST                           | GPIO1_C4_d | 1.8V |
| 23 | UART4_RX_M1_1V8         | SPI2_MISO_M1/UART2_CT<br>S_M0/PCIE1_BUTTONRST                           | GPIO1_C5_d | 1.8V |
| 24 | SDMMC1_D1_M0_1V8        | I2C9_SCL_M1/SPI1_MOSI_<br>M0/PCIE1_WAKE_M1/SAI3_L<br>RCK_M1/PWM1_CH1_M1 | GPIO1_B5_d | 1.8V |

|    |                  |                                                                          |            |      |
|----|------------------|--------------------------------------------------------------------------|------------|------|
| 25 | SDMMC1_D0_M0_1V8 | I2C9_SDA_M1/SPI1_CLK_M0/<br>PCIE1_CLKREQ_M1/SAI3<br>_SCLK_M1/PWM1_CH0_M1 | GPIO1_B4_d | 1.8V |
|----|------------------|--------------------------------------------------------------------------|------------|------|

| Pin | Signal                   | Description or functions                                                                        | GPIO serial                              | IO Voltage |
|-----|--------------------------|-------------------------------------------------------------------------------------------------|------------------------------------------|------------|
| 26  | SDMMC1_D2_M0_1V8         | UART3_CTS_M2/SPI1_MISO_<br>M0/PCIE0_CLKREQ_M1/<br>SAI3_SDO_M1                                   | GPIO1_B6_d                               | 1.8V       |
| 27  | SDMMC1_D3_M0_1V8         | UART3_RTS_M2/SPI1_CSN0_<br>M0/PCIE0_WAKE_M1/SAI<br>3_SDI_M1                                     | GPIO1_B7_d                               | 1.8V       |
| 28  | SDMMC1_CMD_M0_1V8        | UART3_TX_M2/SPI1_CSN1<br>_M0/PDM0_SDI2_M2/PWM0<br>_CH0_M1                                       | GPIO1_C0_d                               | 1.8V       |
| 29  | SDMMC1_CLK_M0_1V8        | UART3_RX_M2/PDM0_CLK<br>0_M2/SAI3_MCLK_M1                                                       | GPIO1_C1_d                               | 1.8V       |
| 30  | GND                      | Ground                                                                                          |                                          | 0V         |
| 31  | RECOVERY_SARADC<br>_VIN1 | RECOVERY<br>MODE/ADC_IN1(PU10K)                                                                 |                                          | 1.8V       |
| 32  | SARADC_VIN2              | ADC_IN2                                                                                         |                                          | 1.8V       |
| 33  | GND                      | Ground                                                                                          |                                          | 0V         |
| 34  | SDMMC0_CLK               | I3C1_SDA_PU_M1/I2C5_SCL<br>_M0/UART5_TX_M2/SPI0_CL<br>K_M1/SAI3_SCLK_M3                         | GPIO2_A5_d/ FSPI1_C<br>LK_M0             | 3.3V       |
| 35  | SDMMC0_D1                | DSM_ALN_M0/I2C8_SDA_M0/<br>UART0_TX_M1/UART7_TX_M<br>2/SPI0_MISO_M1/CAN0<br>_TX_M0/SAI3_MCLK_M3 | GPIO2_A1_d/ PWM2_C<br>H3_M0/ FSPI1_D1_M0 | 3.3V       |
| 36  | SDMMC0_D0                | DSM_ALP_M0/I2C8_SCL_M0/<br>UART0_RX_M1/UART7_RX_M<br>2/SPI0_MOSI_M1/CAN0<br>_RX_M0              | GPIO2_A0_d/ PWM2_C<br>H2_M0/ FSPI1_D0_M0 | 3.3V       |

|    |                                     |                                                                          |                                               |      |
|----|-------------------------------------|--------------------------------------------------------------------------|-----------------------------------------------|------|
| 37 | SDMMC0_CMD                          | I2C5_SDA_M0/UART5_RX_M2<br>/SPI0_CSN0_M1/SAI3_S<br>DO_M3                 | GPIO2_A4_d/ PWM2_C<br>H4_M0/<br>FSPI1_CSN0_M0 | 3.3V |
| 38 | SDMMC0_D3                           | I3C1_SDA_M1/DSM_ARN_M0/<br>UART5_CTSN_M2/SAI3<br>_SDI_M3/CAN1_TX_M0      | GPIO2_A3_d/<br>FSPI1_D3_M0/ JTAG_T<br>MS_M0   | 3.3V |
| 39 | SDMMC0_D2                           | I3C1_SCL_M1/DSM_ARP_M<br>0/UART5_RTSN_M2/SAI3_L R<br>CK_M3/CAN1_RX_M0    | GPIO2_A2_d/<br>FSPI1_D2_M0/ JTAG_T<br>CK_M0   | 3.3V |
| 40 | LCDC_DEN/EBC_SDL E/<br>DSMC_DATA0   | I2C3_SCL_M2/UART5_RX_M0<br>/SPI3_CLK_M1/SAI1_SDI<br>1_M1/FLEXBUS1_D1     | GPIO3_D4_d                                    | 3.3V |
| 41 | LCDC_VSYNC/EBC_S D<br>CLK/DSMC_CLKN | UART5_CTS_M0/SPI3_MOS<br>I_M1/SAI1_SDI3_M1/FLEXB U<br>S1_CLK/PWM2_CH6_M3 | GPIO3_D6_d                                    | 3.3V |

| Pin | Signal                              | Description or functions                                                                                                                             | GPIO serial                              | IO Voltage |
|-----|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|------------|
| 42  | LCDC_HSYNC/EBC_G D<br>CLK/DSMC_CLKP | I2C3_SDA_M2/UART5_TX_M0<br>/SPI3_MISO_M1/SAI1_S<br>DI2_M1/FLEXBUS1_D0                                                                                | GPIO3_D5_d                               | 3.3V       |
| 43  | LCDC_CLK/EBC_SDO E/<br>DSMC_RESETN  | UART5_RTS_M0/SPI3_CSN 1_<br>M1/SAI4_SCLK_M1/FLEX BUS<br>1_D12_M0/FLEXBUS0_ D15_M<br>0/FLEXBUS1_CS <sub>n</sub> _M<br>1/CAM_CLK0_OUT_M0               | GPIO3_D7_d/<br>PWM2_CH7_M3               | 3.3V       |
| 44  | DSMC_INT0/GPIO4_A<br>0_d            | I2C7_SCL_M2/UART3_TX_M0/<br>SPI1_CSN1_M2/SAI4_L RCK_<br>M1/FLEXBUS1_D14_ M0/FLEX<br>BUS0_D13_M0/FL<br>EXBUS1_CS <sub>n</sub> _M3/CAM_CL<br>K1_OUT_M0 | GPIO4_A0_d/ MIPI_TE<br>_M2/ SPDIF_RX0_M1 | 3.3V       |

|    |                             |                                                                                                            |                                         |          |
|----|-----------------------------|------------------------------------------------------------------------------------------------------------|-----------------------------------------|----------|
| 45 | DSMC_INT2/GPIO4_A1_d        | I2C7_SDA_M2/UART3_RX_M0<br>/SAI4_SDO_M1/FLEXBUS1_D13_M0/FLEXBUS0_D14_M0/FLEXBUS0_CS_M1/<br>CAM_CLK2_OUT_M0 | GPIO4_A1_d/ VO_POST_EMPTY/ SPDIF_TX0_M1 | 3.3V     |
| 46 | PHY1_LED1/CFG_LD00          | Speed LED(PD4.7K)                                                                                          |                                         | 3.3V     |
| 47 | PHY1_LED2/CFG_LD01          | Link LED(PD4.7K)                                                                                           |                                         | 3.3V     |
| 48 | PHY1_MDI0+                  |                                                                                                            |                                         | 0.5V     |
| 49 | PHY1_MDI0-                  |                                                                                                            |                                         | 0.5V     |
| 50 | PHY1_MDI1+                  |                                                                                                            |                                         | 0.5V     |
| 51 | PHY1_MDI1-                  |                                                                                                            |                                         | 0.5V     |
| 52 | PHY1_MDI2+                  |                                                                                                            |                                         | 0.5V     |
| 53 | PHY1_MDI2-                  |                                                                                                            |                                         | 0.5V     |
| 54 | PHY1_MDI3+                  |                                                                                                            |                                         | 0.5V     |
| 55 | PHY1_MDI3-                  |                                                                                                            |                                         | 0.5V     |
| 56 | 32KOUT_RTC_1V8              | RTC_CLK 32.768KHz output                                                                                   | GPIO0_A2_d                              | 1.8V     |
| 57 | VCC_RTC                     | RTC Power input                                                                                            |                                         | 1.8~3.3V |
| 58 | LCDC_D0/EBC_SDDO0/DSMC_CSN0 | I3C1_SCL_M2/UART2_CTS_M2/SAI2_SDO_M2/FLEXBUS1_D2                                                           | GPIO3_D3_d/<br>PWM2_CH5_M3              | 3.3V     |
| 59 | LCDC_D1/EBC_SDDO1/DSMC_CSN3 | I3C1_SDA_M2/UART2_RTS_M2/SPI4_CSN1_M1/SAI2_SDI_M2/FLEXBUS0_D12/FLEXBUS0_CS_M3/FLEXBUS1_D15_M0              | GPIO3_D2_d/<br>PWM2_CH4_M3              | 3.3V     |

| Pin | Signal                      | Description or functions                                            | GPIO serial | IO Voltage |
|-----|-----------------------------|---------------------------------------------------------------------|-------------|------------|
| 60  | LCDC_D2/EBC_SDDO2/DSMC_CSN2 | I3C1_SDA_PU_M2/SPI4_CLK_M1/SAI2_MCLK_M2/FLEXBUS0_D11/FLEXBUS1_CS_M2 | GPIO3_D1_d  | 3.3V       |

|    |                                     |                                                                                                |                            |      |
|----|-------------------------------------|------------------------------------------------------------------------------------------------|----------------------------|------|
| 61 | LCDC_D3/EBC_SDDO 3/<br>DSMC_DATA1   | UART8_CTS_M0/SPI1_CSN 0_<br>M2/SAI1_MCLK_M1/FLEX<br>BUS1_D3                                    | GPIO3_D0_d/<br>PWM2_CH3_M3 | 3.3V |
| 62 | LCDC_D4/EBC_SDDO 4/<br>DSMC_DATA2   | UART8_RTS_M0/SPI1_CLK<br>_M2/SAI1_SCLK_M1/FLEXB U<br>S1_D4                                     | GPIO3_C7_d                 | 3.3V |
| 63 | LCDC_D5/EBC_SDDO 5/<br>DSMC_DATA3   | UART8_TX_M0/SPI1_MOSI<br>_M2/SAI1_LRCK_M1/FLEXB U<br>S1_D5                                     | GPIO3_C6_d                 | 3.3V |
| 64 | LCDC_D6/EBC_SDDO 6/<br>DSMC_DATA4   | UART8_RX_M0/SPI1_MISO<br>_M2/SAI1_SDO0_M1/FLEXB U<br>S1_D6                                     | GPIO3_C5_d/<br>PWM2_CH2_M3 | 3.3V |
| 65 | LCDC_D7/EBC_SDDO 7/<br>DSMC_DATA5   | I2C5_SCL_M3/UART11_TX_ M<br>0/SPI2_CSN0_M2/SAI1_ S DO0<br>_M1/FLEXBUS1_D7/CA<br>N0_TX_M3       | GPIO3_C4_d                 | 3.3V |
| 66 | LCDC_D8/EBC_SDDO 8/<br>DSMC_INT3    | I2C9_SDA_M3/UART11_CT S_<br>M0/SPI4_MOSI_M1/SAI2_ LRC<br>K_M2/FLEXBUS0_D10/<br>FLEXBUS0_CSN_M2 | GPIO3_C3_d/<br>PWM2_CH1_M3 | 3.3V |
| 67 | LCDC_D9/EBC_SDDO 9/<br>DSMC_INT1    | I2C9_SCL_M3/UART11_RTS<br>_M0/SPI4_MISO_M1/SAI2_ S C<br>LK_M2/FLEXBUS0_D9                      | GPIO3_C2_d/<br>PWM2_CH0_M3 | 3.3V |
| 68 | LCDC_D10/EBC_SDD O1<br>0/DSMC_DATA6 | I2C5_SCL_M3/UART11_RX_ M<br>0/SPI2_MISO_M2/SAI1_ S DO2<br>_M1/FLEXBUS1_D8/CA<br>N0_RX_M3       | GPIO3_C1_d                 | 3.3V |
| 69 | LCDC_D11/EBC_SDD O1<br>1/DSMC_DATA7 | I2C4_SCL_M3/UART2_TX_ M2/<br>UART3_RTS_M1/SAI1_ S<br>DO3_M1/FLEXBUS1_D9                        | GPIO3_C0_d                 | 3.3V |
| 70 | LCDC_D12/EBC_SDD O1<br>2/DSMC_DQS0  | I2C4_SDA_M3/UART2_RX_ M2<br>/UART3_CTS_M1/SAI1_ S DO0<br>_M1/FLEXBUS1_D10/F<br>LEXBUS1_CSN_M0  | GPIO3_B7_d                 | 3.3V |

|    |                                     |                                                            |                             |      |
|----|-------------------------------------|------------------------------------------------------------|-----------------------------|------|
| 71 | LCDC_D13/EBC_SDD<br>O13/DSMC_DQS1   | SPI3_CSN0_M1/ETH0_TXC<br>LK_M0/FLEXBUS0_CLK                | GPIO3_B6_d/<br>PWM0_CH1_M3  | 3.3V |
| 72 | LCDC_D14/EBC_SDD O1<br>4/DSMC_DATA8 | UART9_CTS_M1/ETH0_TX<br>D0_M0/SPDIF_TX1_M0/FLE<br>XBUS0_D0 | GPIO3_B5_d/ PWM1_C<br>H5_M3 | 3.3V |

| Pin | Signal                              | Description or functions                                                  | GPIO serial                 | IO Voltage |
|-----|-------------------------------------|---------------------------------------------------------------------------|-----------------------------|------------|
| 73  | LCDC_D15/EBC_SDD O1<br>5/DSMC_DATA9 | UART9_RTS_M1/ETH0_TX D1<br>_M0/SPDIF_RX1_M0/FLE<br>XBUS0_D1               | GPIO3_B4_d/ PWM1_C<br>H4_M3 | 3.3V       |
| 74  | LCDC_D16/EBC_SDC E0<br>/DSMC_DATA10 | I2C8_SCL_M3/UART9_TX_ M1/<br>ETH0_TXCTL_M0/PDM1<br>_SDI0_M2/FLEXBUS0_D2   | GPIO3_B3_d                  | 3.3V       |
| 75  | LCDC_D17/EBC_SDC E1<br>/DSMC_DATA11 | I2C8_SDA_M3/UART9_RX_ M1<br>/ETH0_RXD0_M0/PDM1_<br>SDI1_M2/FLEXBUS0_D3    | GPIO3_B2_d                  | 3.3V       |
| 76  | LCDC_D18/EBC_SDC E2<br>/DSMC_DATA12 | UART10_TX_M0/SPI4_CSN 0_<br>M1/ETH0_RXD1_M0/PDM<br>1_CLK0_M2/FLEXBUS0_D4  | GPIO3_B1_d/ PWM1_C<br>H3_M3 | 3.3V       |
| 77  | LCDC_D19/EBC_SDC E3<br>/DSMC_CSN1   | UART10_RX_M0/SPI2_MOS I_<br>M2/ETH0_MCLK_M0/SAI4<br>_MCLK_M1/FLEXBUS0_D8  | GPIO3_B0_d/ PWM0_C<br>H0_M3 | 3.3V       |
| 78  | LCDC_D20/EBC_VCO M/<br>DSMC_DATA13  | UART10_RTS_M0/UART1_T X_<br>M2/ETH0_RXCTL_M0/PD<br>M1_CLK1_M2/FlexBUS0_D5 | GPIO3_A7_d                  | 3.3V       |
| 79  | LCDC_D21/EBC_GDO E/<br>DSMC_DATA14  | UART10_CTS_M0/UART1_RX<br>_M2/ETH0_MDC_M0/PD<br>M1_SDI2_M2/FlexBUS0_D6    | GPIO3_A6_d/ PWM1_C<br>H2_M3 | 3.3V       |
| 80  | LCDC_D22/EBC_GDS P/<br>DSMC_DATA15  | SPI2_CSn1_M2/UART1_RT S_<br>M2/ETH0_MDIO_M0/PDM<br>1_SDI3_M2/FlexBUS0_D7  | GPIO3_A5_d/ PWM1_C<br>H1_M3 | 3.3V       |

|    |                                   |                                                                                                            |                             |      |
|----|-----------------------------------|------------------------------------------------------------------------------------------------------------|-----------------------------|------|
| 81 | LCDC_D23/EBC_SDS_H<br>R/DSMC_RDYN | SPI2_CLK_M2/UART1_CTS<br>_M2/ETH0_CLKOUT_25M_<br>M0/SAI4_SDI_M1/FlexBUS1<br>_D11/FlexBUS0_CSn_M0           | GPIO3_A4_d/ PWM1_C<br>H0_M3 | 3.3V |
| 82 | TYPEC_DPTX_AUX_P<br>UPDCTL1       | AUPLL_CLKIN_M2/SAI1/4_<br>MCLK_M0                                                                          | GPIO4_A2_d<br>/PWM2_CH5_M0  | 3.3V |
| 83 | PCIE1_CLKREQn_M2                  | I2C2_SDA_M2/UART5_CTS<br>_M1/SPI4_CS1_M2/SAI1_LR<br>CK_M0/FlexBUS1_D12_M1                                  | GPIO4_A5_d                  | 3.3V |
| 84 | PCIE1_PWREN_H                     | I2C2_SCL_M2/UART5_RTS<br>_M1/SPI3_CS0_M2/SAI1_S<br>CLK_M0/FlexBUS1_CS_M4                                   | GPIO4_A3_d/ PWM2_C<br>H4_M1 | 3.3V |
| 85 | HDMI_TX_ON_H                      | I2C4_SDA_M1/UART6_RX_M0<br>/SPI3_MISO_M2/SAI4_L_RCK_<br>M0/PDM1_CLK0_M1/F<br>lexBUS1_D14_M1/CAN0_RX<br>_M2 | GPIO4_A6_d                  | 3.3V |

| Pin | Signal                       | Description or functions                                                                                   | GPIO serial                | IO Voltage |
|-----|------------------------------|------------------------------------------------------------------------------------------------------------|----------------------------|------------|
| 86  | TYPEC_DPTX_AUX_P U<br>PDCTL2 | I2C4_SCL_M1/UART6_TX_M0/<br>SPI3_MOSI_M2/SAI4_S_CLK_M<br>0/PDM1_SDI3_M1/FlexBUS1_<br>D13_M1/CAN0_TX<br>_M2 | GPIO4_A4_d                 | 3.3V       |
| 87  | HP_CTL_H                     | SPI3_CLK_M2/SAI4_SDI_M<br>0/SAI1_SDO0_M0                                                                   | GPIO4_A7_d/<br>PWM2_CH6_M0 | 3.3V       |
| 88  | I2C3_SCL_M0_Sensor           | PCIE0_CLKREQ_M2/IUART<br>2_TX_M1/SPDIF_TX0_M0/Flex<br>BUS0_D15_M1/CAN1_TX<br>_M2                           | GPIO4_B5_d (PU2.2K)        | 3.3V       |

|    |                    |                                                                                                           |                                                           |      |
|----|--------------------|-----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|------|
| 89 | I2C3_SDA_M0_Sensor | PCIE0_WAKE_M2/IUART2_RX_M1/SPDIF_RX0_M0/FlexBUS0_CSN_M4/CAN1_RX_M2                                        | GPIO4_B4_d (PU2.2K)                                       | 3.3V |
| 90 | SPK_CTL_H          | SPI3_CS1_M2/SPI4_CS0_M2/PDM1_SDI0_M1/SAI1_SDI0_M0/SAI4_SDO_M0                                             | GPIO4_B3_d/ PWM2_CH7_M0                                   | 3.3V |
| 91 | PCIE1_PERSTn       | SPI4_MISO_M2/PDM1_SDI1_M1/SAI1_SDI1_M0/SAI1_SDO3_M0/FlexBUS1_D15_M1                                       | GPIO4_B2_d/ MIPI_TE_M0                                    | 3.3V |
| 92 | IRC_BIN            | UART2_CTS_M1/UART6_CTS_M0/UART5_RX_M1/SPI4_MOSI_M2/PDM1_SDI2_M1/SAI1_SDI2_M0/SAI1_SDO2_M0/FlexBUS1_D14_M1 | GPIO4_B1_d                                                | 3.3V |
| 93 | IRC_AIN            | UART2_RTS_M1/UART6_RTS_M0/UART5_TX_M1/SPI4_CLK_M2/PDM1_CLK1_M1/SAI1_SDI3_M0/SAI1_SDO1_M0/FlexBUS1_D13_M1  | GPIO4_B1_d                                                | 3.3V |
| 94 | PCIE0_CLKREQn_M3   | I2C6_SCL_M3/SPI4_MISO_M0/SAI4_SDI_M2/VP1_SYNC_OUT/CAN1_TX_M1                                              | GPIO4_C6_d/ PWM2_CH2_M1/ SATA0_ACTLED_M1                  | 3.3V |
| 95 | PCIE0_PERSTn       | I2C6_SDA_M3/SPI4_CLK_M0/SAI4_SCLK_M2/VP2_SYNC_OUT/CAN1_RX_M1                                              | GPIO4_C7_d/ PWM2_CH3_M1                                   | 3.3V |
| 96 | PWM2_CH5_M1_FAN    | I2C3_SDA_M3/UART6_RX_M3/SPI4_MOSI_M0/SAI4_SDO_M2/VP0_SYNC_OUT/ISP_FLASH_TRIGOUT_M1                        | GPIO4_C5_d/ PWM2_CH5_M1/ SATA1_ACTLED_M1<br>PCIE0_WAKE_M3 | 3.3V |

| Pin | Signal | Description or functions | GPIO serial | IO Voltage |
|-----|--------|--------------------------|-------------|------------|
|-----|--------|--------------------------|-------------|------------|

|     |                             |                                                                     |                                      |      |
|-----|-----------------------------|---------------------------------------------------------------------|--------------------------------------|------|
| 97  | HDMI_TX_HPDI0_M0            | I2C7_SDA_M3/UART11_RX_M2/EDP_HPDI0_M0/PCIE1_CLKREQ_M3/DSM_ALN_M1    | GPIO4_C1_d/PWM0_CH1_M1               | 3.3V |
| 98  | HDMI_TX_SDA                 | I2C2_SDA_M3/UART9_RX_M2/CAN0_RX_M1/DSM_ARM_M1                       | GPIO4_C3_d/PWM2_CH1_M1               | 3.3V |
| 99  | HDMI_TX_SCL                 | I2C2_SCL_M3/UART9_TX_M2/CAN0_TX_M1/DSM_ARM_M1                       | GPIO4_C2_d/PWM2_CH0_M1               | 3.3V |
| 100 | DP_HPDI0_M0                 | I2C3_SCL_M3/UART6_TX_M3/SPI4_CS0_M0/SAI4_LCK_M2/ISP_PRLIGHT_TRIG_M1 | GPIO4_C4_d/PWM2_CH6_M1               | 3.3V |
| 101 | HDMI_TX_CEC_M0              | I2C7_SCL_M3/UART11_TX_M2/SPI4_CS1_M0/SAI_MCLK_M2/DSM_ALP_M1         | GPIO4_C0_d/PWM1_CH5_M1/PCIE1_WAKE_M3 | 3.3V |
| 102 | GND                         | Ground                                                              |                                      | 0V   |
| 103 | MIPI_DPHY_CSI0_PWR_EN_H_1V8 | UART3_RTS_M0/SPI3_CS0_M0/SAI3_SDI_M2/ETH0_RXD1_M1/CAN_RX_M3         | GPIO3_A3_d/VI_CIF_CLKI/SPDIF_TX1_M1  | 1.8V |
| 104 | SAI0_SDI0_M0_1V8            | UART1_TX_M1/PDM0_SDI3_M3/ETH0_TXD1_M1                               | GPIO2_B0_d/VI_CIF_D13                | 1.8V |
| 105 | SAI0_SDI1_M0_1V8            | UART1_RX_M1/PDM0_SDI2_M3/ETH0_TXD0_M1                               | GPIO2_B1_d/VI_CIF_D12                | 1.8V |
| 106 | SAI0_SDI2_M0_1V8            | UART1_CTS_M1/SPI4_CS0_M3/PDM0_SDI1_M3/PCIE0_CLKREQ_M0               | GPIO2_B2_d/VI_CIF_D11                | 1.8V |
| 107 | SAI0_SDI3_M0_1V8            | UART7_CTS_M1/SPI4_MOSI_M3/PDM0_SDI0_M3/SATA0_ACTLED_M0              | GPIO2_B4_d/VI_CIF_D9                 | 1.8V |
| 108 | SAI0_SCLK_M0_1V8            | I2C8_SCL_M2/UART8_CTS_M1/UART7_RX_M0                                | GPIO2_B6_d                           | 1.8V |

|     |                  |                                                        |                        |      |
|-----|------------------|--------------------------------------------------------|------------------------|------|
| 109 | SAI0_LRCK_M0_1V8 | I2C8_SDA_M2/UART8_RTS_M1/UART7_TX_M0                   | GPIO2_B7_d             | 1.8V |
| 110 | SAI0_MCLK_M0_1V8 | UART7_RTS_M0/SPI4_MISO_M3/PDM0_CLK0_M3/SATA1_ACTLED_M0 | GPIO2_B5_d/ VI_CIF_D8  | 1.8V |
| 111 | SAI0_SDO0_M0_1V8 | I2C4_SCL_M2/UART8_TX_M1/SPI4_CS_n1_M3/ETH0_RX_D0_M1    | GPIO2_A6_d/ VI_CIF_D15 | 1.8V |
| 112 | SAI0_SDO1_M0_1V8 | I2C4_SDA_M2/UART8_RX_M1/ETH0_TXCTL_M1                  | GPIO2_A7_d/ VI_CIF_D14 | 1.8V |

| Pin | Signal           | Description or functions                                      | GPIO serial                         | IO Voltage |
|-----|------------------|---------------------------------------------------------------|-------------------------------------|------------|
| 113 | SAI0_SDO2_M0_1V8 | UART1_RTS_M1/SPI4_CLK_M3/PDM0_CLK1_M3/PCIE1_CLKREQ_M0         | GPIO2_B3_d/ VI_CIF_D10              | 1.8V       |
| 114 | SPDIF_RX1_M1_1V8 | UART3_RTS_M0/SPI3_MISO_M0/SAI3_SDO_M2/ETH0_RXCTL_M1/CAN_TX_M3 | GPIO3_A2_d/ VI_CIF_CLKO/ MIPI_TE_M1 | 1.8V       |
| 115 | I2C7_SDA_M1_1V8  | UART3_RX_M0/SPI3_MOSI_M0/SAI3_LRCK_M2/ETH0_MDC_M1(PU2.2K)     | GPIO3_A1_d/ VI_CIF_VSYNC            | 1.8V       |
| 116 | I2C7_SCL_M1_1V8  | UART3_TX_M0/SPI3_CLK_M0/SAI3_SCLK_M2/ETH0_MDIO_M1(PU2.2K)     | GPIO3_A0_d/ VI_CIF_HREF             | 1.8V       |
| 117 | GND              | Ground                                                        |                                     | 0V         |
| 118 | DP_TX_AUXP       |                                                               |                                     | 0.5V       |
| 119 | DP_TX_AUXN       |                                                               |                                     | 0.5V       |
| 120 | USB2_OTG1_DP     |                                                               |                                     | 0.5V       |
| 121 | USB2_OTG1_DM     |                                                               |                                     | 0.5V       |
| 122 | USB2_OTG0_DP     |                                                               |                                     | 0.5V       |
| 123 | USB2_OTG0_DM     |                                                               |                                     | 0.5V       |

|     |                                |                             |  |      |
|-----|--------------------------------|-----------------------------|--|------|
| 124 | USB3_OTG0_SSRX1N<br>/DP_TX_D0N |                             |  | 0.5V |
| 125 | USB3_OTG0_SSRX1P<br>/DP_TX_D0P |                             |  | 0.5V |
| 126 | USB3_OTG0_SSTX1P/<br>DP_TX_D1P |                             |  | 0.5V |
| 127 | USB3_OTG0_SSTX1N/<br>DP_TX_D1N |                             |  | 0.5V |
| 128 | USB3_OTG0_SSRX2N<br>/DP_TX_D2N |                             |  | 0.5V |
| 129 | USB3_OTG0_SSRX2P<br>/DP_TX_D2P |                             |  | 0.5V |
| 130 | USB3_OTG0_SSTX2P/<br>DP_TX_D3P |                             |  | 0.5V |
| 131 | USB3_OTG0_SSTX2N/<br>DP_TX_D3N |                             |  | 0.5V |
| 132 | GND                            | Ground                      |  | 0V   |
| 133 | MIPI_DPHY_DSI_TX_<br>D0N       | MIPI_CPHY_DSI_TX_TRIO0<br>A |  | 0.5V |
| 134 | MIPI_DPHY_DSI_TX_<br>D0P       | MIPI_CPHY_DSI_TX_TRIO0<br>B |  | 0.5V |
| 135 | MIPI_DPHY_DSI_TX_<br>D1N       | MIPI_CPHY_DSI_TX_TRIO0<br>C |  | 0.5V |

| Pin | Signal                   | Description or functions    | GPIO serial | IO Voltage |
|-----|--------------------------|-----------------------------|-------------|------------|
| 136 | MIPI_DPHY_DSI_TX_<br>D1P | MIPI_CPHY_DSI_TX_TRIO1<br>A |             | 0.5V       |

|     |                            |                             |  |      |
|-----|----------------------------|-----------------------------|--|------|
| 137 | MIPI_DPHY_DSI_TX_<br>CLKN  | MIPI_CPHY_DSI_TX_TRIO1<br>B |  | 0.5V |
| 138 | MIPI_DPHY_DSI_TX_<br>CLKP  | MIPI_CPHY_DSI_TX_TRIO1<br>C |  | 0.5V |
| 139 | MIPI_DPHY_DSI_TX_<br>D2N   | MIPI_CPHY_DSI_TX_TRIO2<br>A |  | 0.5V |
| 140 | MIPI_DPHY_DSI_TX_<br>D2P   | MIPI_CPHY_DSI_TX_TRIO2<br>B |  | 0.5V |
| 141 | MIPI_DPHY_DSI_TX_<br>D3N   | MIPI_CPHY_DSI_TX_TRIO2<br>C |  | 0.5V |
| 142 | MIPI_DPHY_DSI_TX_<br>D3P   |                             |  | 0.5V |
| 143 | MIPI_DPHY_CSI0_RX<br>_D0P  | MIPI_CPHY_CSI_TX_TRIO0<br>B |  | 0.5V |
| 144 | MIPI_DPHY_CSI0_RX<br>_D0N  | MIPI_CPHY_CSI_TX_TRIO0<br>A |  | 0.5V |
| 145 | MIPI_DPHY_CSI0_RX<br>_D1P  | MIPI_CPHY_CSI_TX_TRIO1<br>A |  | 0.5V |
| 146 | MIPI_DPHY_CSI0_RX<br>_D1N  | MIPI_CPHY_CSI_TX_TRIO0<br>C |  | 0.5V |
| 147 | MIPI_DPHY_CSI0_RX<br>_CLKP | MIPI_CPHY_CSI_TX_TRIO1<br>C |  | 0.5V |
| 148 | MIPI_DPHY_CSI0_RX<br>_CLKN | MIPI_CPHY_CSI_TX_TRIO1<br>B |  | 0.5V |
| 149 | MIPI_DPHY_CSI0_RX<br>_D2P  | MIPI_CPHY_CSI_TX_TRIO2<br>B |  | 0.5V |

|     |                           |                             |  |      |
|-----|---------------------------|-----------------------------|--|------|
| 150 | MIPI_DPHY_CSI0_RX<br>_D2N | MIPI_CPHY_CSI_TX_TRIO2<br>A |  | 0.5V |
| 151 | MIPI_DPHY_CSI0_RX<br>_D3P |                             |  | 0.5V |
| 152 | MIPI_DPHY_CSI0_RX<br>_D3N | MIPI_CPHY_CSI_TX_TRIO2<br>C |  | 0.5V |
| 153 | GND                       | Ground                      |  | 0V   |
| 154 | HDMI_TX_D3N               | EDP_TX3N                    |  | 0.5V |
| 155 | HDMI_TX_D3P               | EDP_TX3P                    |  | 0.5V |
| 156 | HDMI_TX_D0P               | EDP_TX0P                    |  | 0.5V |
| 157 | HDMI_TX_D0N               | EDP_TX0N                    |  | 0.5V |
| 158 | HDMI_TX_D1P               | EDP_TX1P                    |  | 0.5V |
| 159 | HDMI_TX_D1N               | EDP_TX1N                    |  | 0.5V |
| 160 | HDMI_TX_D2P               | EDP_TX2P                    |  | 0.5V |

| Pin | Signal                     | Description or functions | GPIO serial | IO Voltage |
|-----|----------------------------|--------------------------|-------------|------------|
| 161 | HDMI_TX_D2N                | EDP_TX2N                 |             | 0.5V       |
| 162 | HDMI_TX_SBDN               | EDP_AUXN                 |             | 0.5V       |
| 163 | HDMI_TX_SBDP               | EDP_AUXP                 |             | 0.5V       |
| 164 | GND                        | Ground                   |             | 0V         |
| 165 | MIPI_DPHY_CSI2_RX<br>_CLKP |                          |             | 0.5V       |
| 166 | MIPI_DPHY_CSI2_RX<br>_CLKN |                          |             | 0.5V       |
| 167 | MIPI_DPHY_CSI1_RX<br>_CLKN |                          |             | 0.5V       |
| 168 | MIPI_DPHY_CSI1_RX<br>_CLKP |                          |             | 0.5V       |
| 169 | MIPI_DPHY_CSI1_RX<br>_D3N  | MIPI_DPHY_CSI2_RX_D1N    |             | 0.5V       |

|     |                           |                                                                 |                            |      |
|-----|---------------------------|-----------------------------------------------------------------|----------------------------|------|
| 170 | MIPI_DPHY_CSI1_RX<br>_D3P | MIPI_DPHY_CSI2_RX_D1P                                           |                            | 0.5V |
| 171 | MIPI_DPHY_CSI1_RX<br>_D2N | MIPI_DPHY_CSI2_RX_D0N                                           |                            | 0.5V |
| 172 | MIPI_DPHY_CSI1_RX<br>_D2P | MIPI_DPHY_CSI2_RX_D0P                                           |                            | 0.5V |
| 173 | MIPI_DPHY_CSI1_RX<br>_D1N |                                                                 |                            | 0.5V |
| 174 | MIPI_DPHY_CSI1_RX<br>_D1P |                                                                 |                            | 0.5V |
| 175 | MIPI_DPHY_CSI1_RX<br>_D0N |                                                                 |                            | 0.5V |
| 176 | MIPI_DPHY_CSI1_RX<br>_D0P |                                                                 |                            | 0.5V |
| 177 | VCC_1V8_S3                | 1.8V GPIO Power output                                          | Max 500mA                  | 1.8V |
| 178 | USB2_OTG1_VBUSDE<br>T     | USB2 VBUS Input                                                 |                            | 3.3V |
| 179 | TP_INT_L                  | I3C0_SDA_PU_M0/UART10<br>_RX_M2/SAI0_SDO0_M1/D P_<br>HPD_M1     | GPIO0_C5_d                 | 3.3V |
| 180 | LCD_BL_PWM1_CH1_<br>M0    | I2C1_SDA_M1/UART4_RX_<br>M2/REFCLK2_OUT                         | GPIO0_B5_d/<br>PWM1_CH1_M0 | 3.3V |
| 181 | PCIE1_WAKEn_M0            | I2C4_SDA_M0/UART1_RTS<br>_M0/PDM0_SDI3_M0/SAI0_SD<br>O1/SDI3_M1 | GPIO0_D3_d/<br>PWM2_CH0_M0 | 3.3V |
| 182 | GPIO0_B4_d                | I2C1_SCL_M1/UART4_TX_<br>M2/REFCLK1_OUT                         | PWM1_CH0_M0                | 3.3V |

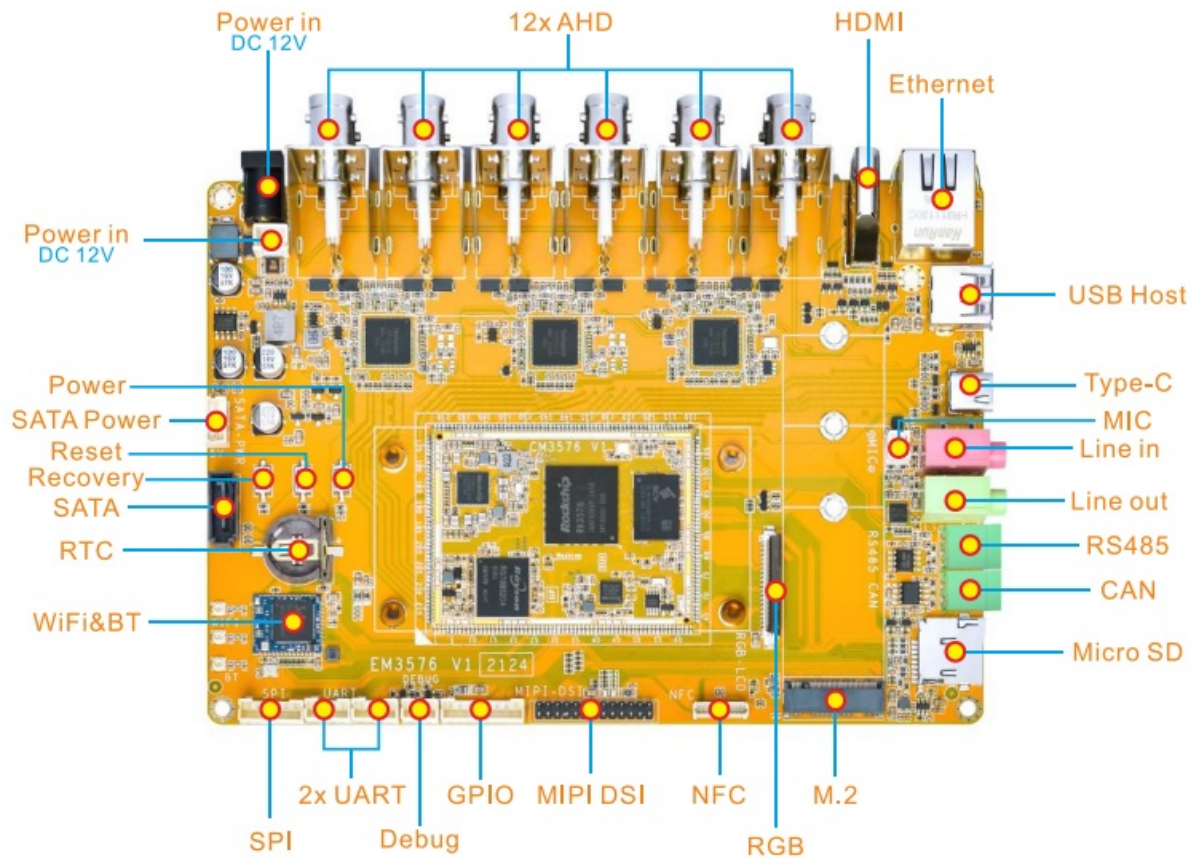
| Pin | Signal | Description or functions | GPIO serial | IO Voltage |
|-----|--------|--------------------------|-------------|------------|
|-----|--------|--------------------------|-------------|------------|

|     |                        |                                                         |                        |      |
|-----|------------------------|---------------------------------------------------------|------------------------|------|
| 183 | USBCC_INT_L            | SPI0_MISO_M0/PDM0_SDI1_M0/SAI0_SDO3/SDI1_M1             | GPIO0_D1_d             | 3.3V |
| 184 | PCIE0_PWREN_H          | I2C3_SDA_M1/SPI0_CLK_M0/SAI0_LRCK_M1                    | GPIO0_C7_d             | 3.3V |
| 185 | PCIE0_WAKEn_M0         | I2C4_SCL_M0/UART1_CTS_M0/PDM0_SDI2_M0/SAI0_SDO2/SDI2_M1 | GPIO0_D2_d/PWM1_CH5_M0 | 3.3V |
| 186 | LCD_PWREN_H            | I2C3_SCL_M1/SPI0_CSn0_M0/SAI0_SCLK_M1                   | GPIO0_C6_d             | 3.3V |
| 187 | I2C2_SCL_M0_CC_RT<br>C | UART1_TX_M0/PWM1_CH4_M0(PU2.2K)                         | GPIO0_B7_d             | 3.3V |
| 188 | I2C2_SDA_M0_CC_RT<br>C | UART1_RX_M0/PWM1_CH3_M0(PU2.2K)                         | GPIO0_C0_d             | 3.3V |
| 189 | GPIO0_C4_d             | UART10_TX_M2/PDM0_CLK0_M0/SAI0_MCLK_M1                  | PWM0_CH0_M0            | 3.3V |
| 190 | I2C0_SCL_M1_TP         | I3C0_SCL_M0/UART8_TX_M2(PU2.2K)                         | GPIO0_C1_d             | 3.3V |
| 191 | I2C0_SDA_M1_TP         | I3C0_SDA_M0/UART8_RX_M2(PU2.2K)                         | GPIO0_C2_d             | 3.3V |
| 192 | TP_RST_L               | SPI0_MOSI_M0/PDM0_SDI0_M0/SAI0_SDI0_M1                  | GPIO0_D0_d             | 3.3V |
| 193 | GND                    | Ground                                                  |                        | 0V   |
| 194 | PCIE0_RXP              | SATA0_RXP                                               |                        | 0.5V |
| 195 | PCIE0_RXN              | SATA0_RXN                                               |                        | 0.5V |
| 196 | PCIE0_TXN              | SATA0_TXN                                               |                        | 0.5V |
| 197 | PCIE0_TXP              | SATA0_TXP                                               |                        | 0.5V |
| 198 | PCIE0_REFCLKP          |                                                         |                        | 0.5V |
| 199 | PCIE0_REFCLKN          |                                                         |                        | 0.5V |

|     |                            |                               |  |      |
|-----|----------------------------|-------------------------------|--|------|
| 200 | PCIE1_TXP                  | SATA1_TXP/USB3_OTG1_S<br>STXP |  | 0.5V |
| 201 | PCIE1_TXN                  | SATA1_TXN/USB3_OTG1_S<br>STXN |  | 0.5V |
| 202 | PCIE1_RXP                  | SATA1_RXP/USB3_OTG1_S<br>SRXP |  | 0.5V |
| 203 | PCIE1_RXN                  | SATA1_RXN/USB3_OTG1_S<br>SRXN |  | 0.5V |
| 204 | PCIE1_REFCLKP              |                               |  | 0.5V |
| 205 | PCIE1_REFCLKN              |                               |  | 0.5V |
| 206 | GND                        | Ground                        |  | 0V   |
| 207 | MIPI_DPHY_CSI4_RX<br>_CLKP |                               |  | 0.5V |

| Pin | Signal                     | Description or functions | GPIO serial | IO Voltage |
|-----|----------------------------|--------------------------|-------------|------------|
| 208 | MIPI_DPHY_CSI4_RX<br>_CLKN |                          |             | 0.5V       |
| 209 | MIPI_DPHY_CSI3_RX<br>_D3N  | MIPI_DPHY_CSI4_RX_D1N    |             | 0.5V       |
| 210 | MIPI_DPHY_CSI3_RX<br>_D3P  | MIPI_DPHY_CSI4_RX_D1P    |             | 0.5V       |
| 211 | MIPI_DPHY_CSI3_RX<br>_D2N  | MIPI_DPHY_CSI4_RX_D0N    |             | 0.5V       |
| 212 | MIPI_DPHY_CSI3_RX<br>_D2P  | MIPI_DPHY_CSI4_RX_D0P    |             | 0.5V       |
| 213 | MIPI_DPHY_CSI3_RX<br>_CLKN |                          |             | 0.5V       |
| 214 | MIPI_DPHY_CSI3_RX<br>_CLKP |                          |             | 0.5V       |
| 215 | MIPI_DPHY_CSI3_RX<br>_D1N  |                          |             | 0.5V       |
| 216 | MIPI_DPHY_CSI3_RX<br>_D1P  |                          |             | 0.5V       |
| 217 | MIPI_DPHY_CSI3_RX<br>_D0N  |                          |             | 0.5V       |
| 218 | MIPI_DPHY_CSI3_RX<br>_D0P  |                          |             | 0.5V       |

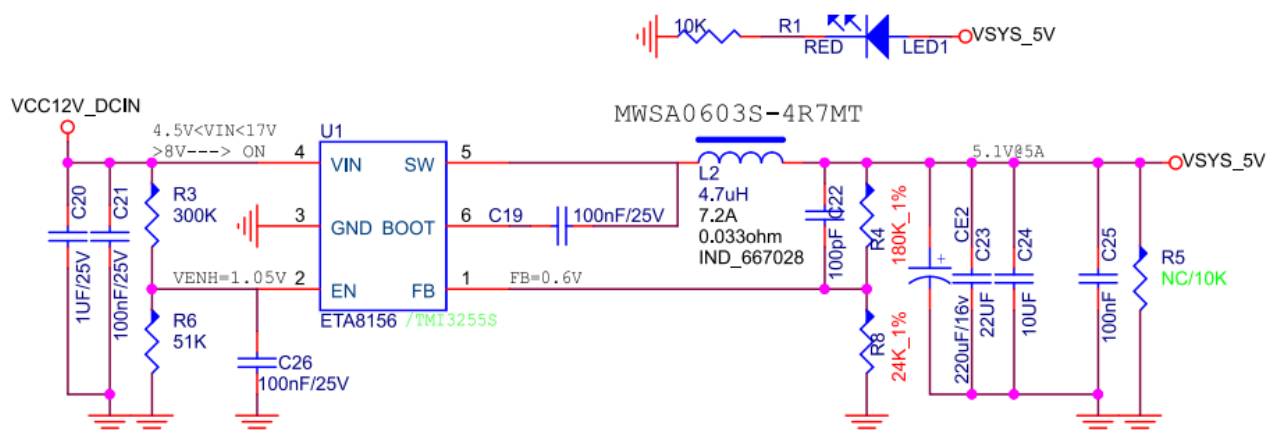
**Development Kit (EM3576)**



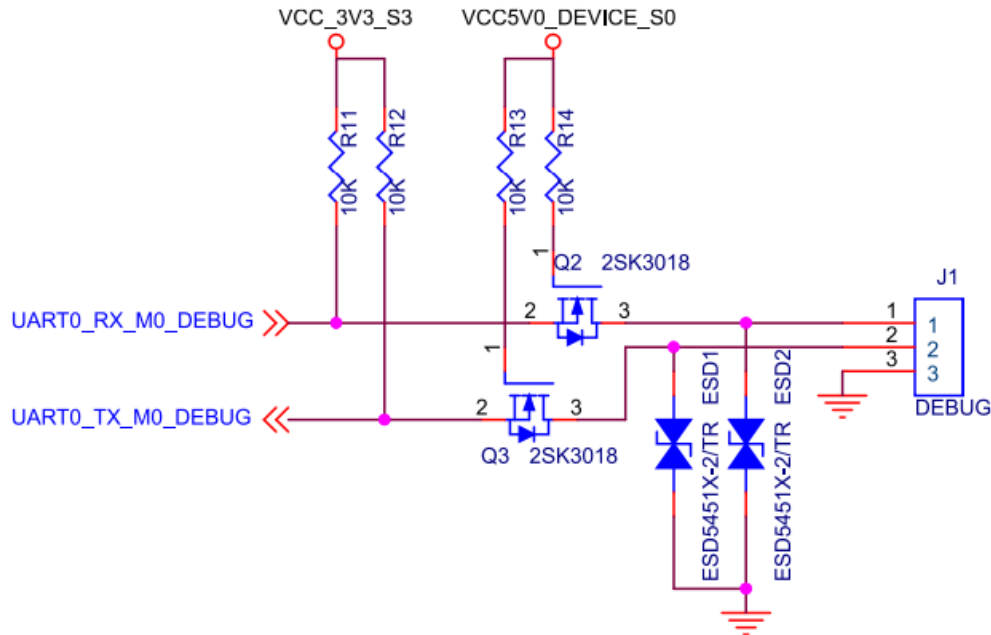
## Hardware Design Guide

## Peripheral Circuit Reference

### External Power

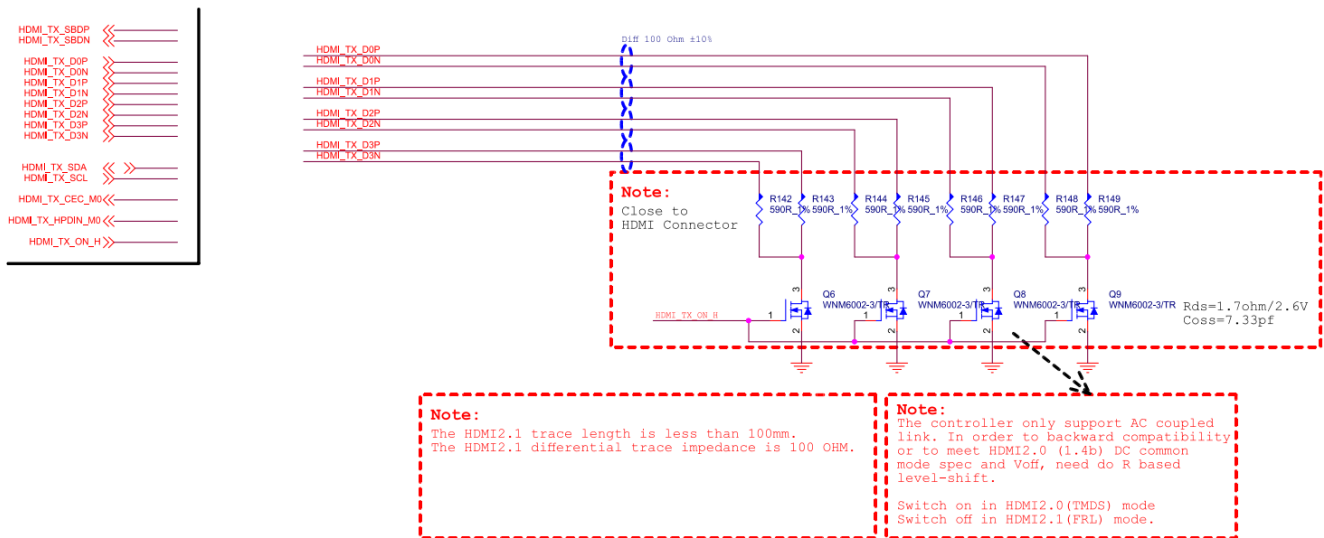


### Debug Circuit

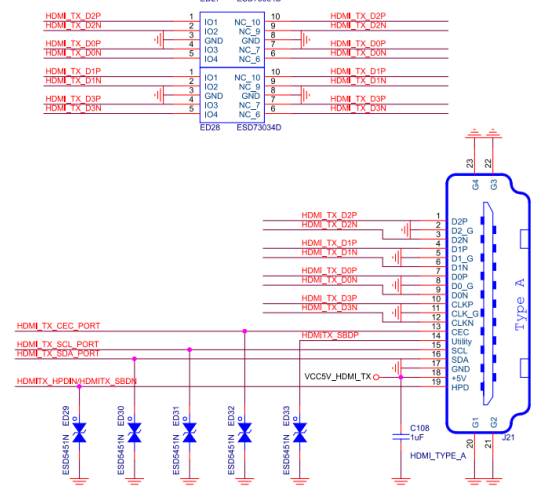
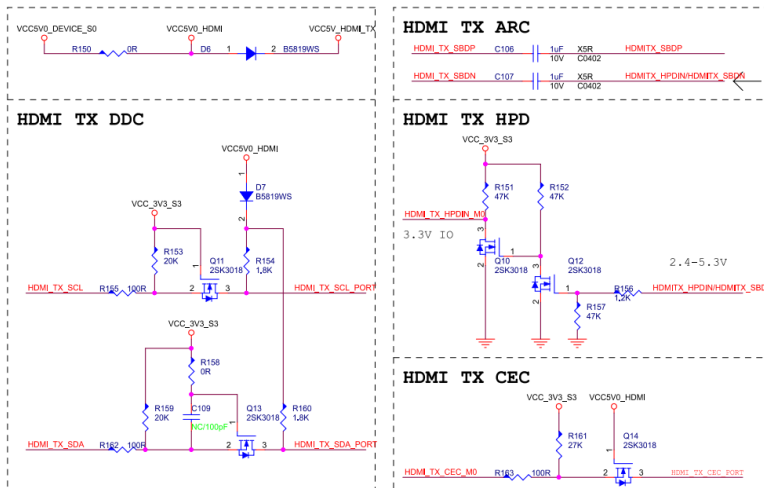


## HDMI TX Circuit

### HDMI 2.1 Support video output up to 4Kx2K@120Hz



Cj<=0.2pF

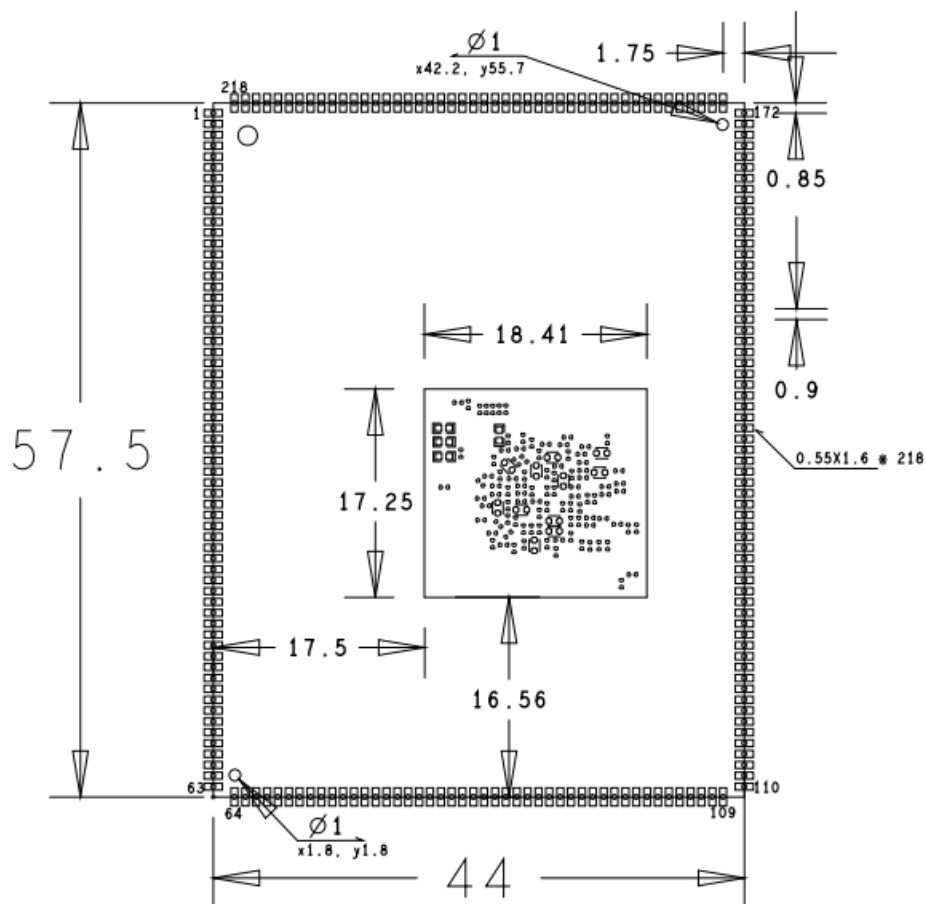


### Mother Board length offset

| MIPI CSI0 4-Lane Interface length offset |                   |           |       |
|------------------------------------------|-------------------|-----------|-------|
| MIPI_CSI0_RX0_CLKP                       | MIPI_CSI0_RX0_D0P | (53.5)    | (+40) |
|                                          | MIPI_CSI0_RX0_D1P | (35.046)  | (+30) |
|                                          | MIPI_CSI0_RX0_D2P |           |       |
|                                          | MIPI_CSI0_RX0_D3P | (-25.758) | (-30) |

Yellow block is CM3576 CSI0 group length difference.

## PCB Footprint



## Product Electrical Characteristics

## Dissipation and Temperature

| Symbol               | Parameter                 | Min  | Typ  | Max | Unit |
|----------------------|---------------------------|------|------|-----|------|
| VCC_SYS              | System Voltage            | 3.4V | 4    | 5.5 | V    |
| I <sub>sys_in</sub>  | VCC_SYS<br>input Current  |      | 1750 |     | mA   |
| VCC_RTC              | RTC Voltage               | 1.8  | 3    | 3.4 | V    |
| I <sub>rtc</sub>     | RTC input<br>Current      |      | 5    | 8   | uA   |
| I <sub>3v3_out</sub> | VCC_3V3<br>output Current |      |      | 500 | mA   |
| I <sub>1v8_out</sub> | VCC_1V8<br>output Current |      |      | 500 | mA   |
| T <sub>a</sub>       | Operating Tempera<br>ture | 0    |      | 70  | °C   |
| T <sub>stg</sub>     | Storage Temperatu<br>re   | -40  |      | 85  | °C   |

## Reliability of Test

| High Temperature Operating Test |                                  |          |
|---------------------------------|----------------------------------|----------|
| Contents                        | Operating 8h in high temperature | 55°C±2°C |
| Result                          | TBD                              |          |

| Operating Life Test |                   |      |
|---------------------|-------------------|------|
| Contents            | Operating in room | 120h |
| Result              | TBD               |      |

## Documents / Resources

|                                                                                   |                                                                                                                                            |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p><a href="#">Boardcon CM3576 System on Module</a> [pdf] User Manual</p> <p>CM3576 System on Module, CM3576, System on Module, Module</p> |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|

References

- [User Manual](#)

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