

## TX Family Computer On Module

- Processor 1.2GHz Dual ARM® Cortex®-A35 based STM32MP255
- RAM 1GB LPDDR4
- ROM 4GB eMMC
- Power supply 3.3V to 5V
- Size 26mm SO-DIMM
- Grade Industrial
- Temperature -40°C to 85°C

## Key Features

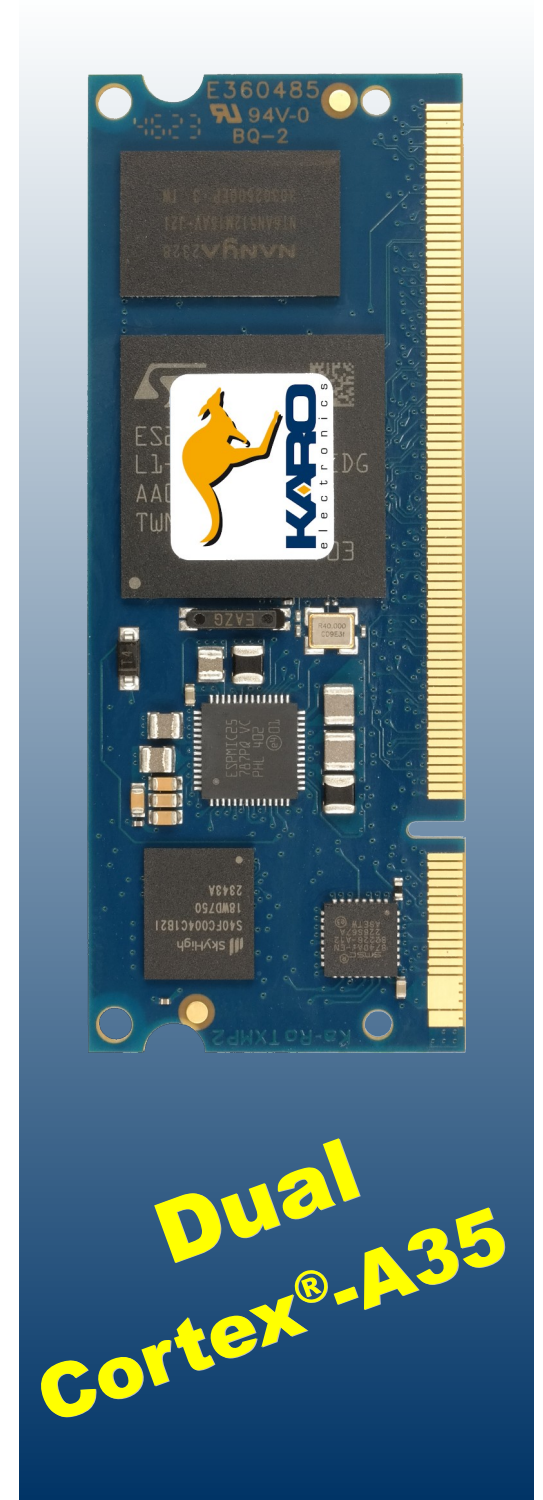
- Dual ARM® Cortex®-A35  
ARM® Cortex®-M33, 400 MHz  
Vivante® NPU, 1.35 TOPS
- Display support:
  - RGB Display Interface
  - 3D GPU: OpenGL® ES 3.1 - Vulkan 1.1, OpenCL™ 1.2, OpenVX™ 1.1, Up to 149 Mtriangle/s, 900 Mpixel/s
  - 1080p60 video de-/encode

## Connectivity

- 2x Ethernet
  - 10/100 Ethernet with PHY
  - Gb Ethernet, RGMII
- 2x USB 2.0, 1x PCIe or  
1x USB 2.0, 1x USB 3.0
- 3x UART, 4x I²C, 3x SPI, 2x FlexCAN, 1x eMMC/SD
- MIPI-CSI (2-lane)
- 3.3V I/O

## OS Support

- Linux



## STM32MP2

The STM32MP2 series is an industrial-grade 64-bit solution for secure Industry 4.0 and advanced edge computing applications that require high-end multimedia capabilities.

The STM32MP25 lines are the first of the STM32MP2 series.

Reaching up to 6,000 DMIPS, they support the growth of smart, connected applications thanks to robust features and a significant performance upgrade compared to previous generations.

### Robustness

- 100% operating time for 10 years
- Extended temperature up to +125°C
- 10-year longevity program

### Neural processing unit accelerator

- 1.35 TOPS (tera operations per second)

### Strong security

- SESIP Level 3 certification
- TrustZone® on Cortex®-A and Cortex®-M
- Robust hardware encryption

## TX Computer on Module

- STM32MP255
- 1GB LPDDR4 SDRAM
- 4GB eMMC
- DIMM200-module (67,6mm x 26 mm x 4mm)

### Standard TXCOM pinout:

Highly scalable design options allow a single platform to cover multiple products. Pin-compatible TX modules allow a single PCB as a platform for different features as product needs dictate.

- 4-wire UARTs (x3)
- I2C / PWM
- Serial Audio Interface
- 4-wire SD-Card/SDIO

High-Speed communication interfaces incl. onboard Ethernet PHY / on-chip USB PHY allows direct use of connectors/magnetics on the baseboard without the need for additional logic:

- 10/100 Mbps Ethernet
- USB 2.0 OTG (Host or Device)
- USB 3.0 Host

### Read more in our TX-Guide:

[www.karo-electronics.com/tx-guide](http://www.karo-electronics.com/tx-guide)

## STM32MP257C / STM32MP257F

<h3>System</h3> <ul style="list-style-type: none"> <li>Power Supply Regulators</li> <li>Crystal &amp; Internal oscillators</li> <li>Cyclic Redundancy Check (CRC)</li> <li>Watchdogs (I &amp; W)</li> <li>96-bit unique ID</li> <li>Up to 176 GPIOs</li> </ul>	<h3>Dual Cortex-A35 @ 1.2GHz / up to 1.5GHz</h3> <ul style="list-style-type: none"> <li>Core 1 @ 1.5GHz L1 32kB I / 32kB D</li> <li>Core 2 @ 1.5GHz L1 32kB I / 32kB D</li> <li>NEON SIMD MPE</li> <li>NEON SIMD MPE</li> <li>512kB L2 cache</li> <li>TrustZone</li> </ul>	<h3>Multimedia / AI</h3> <ul style="list-style-type: none"> <li>3D GPU: OpenGL ES3.1 / Vulkan 1.1 / OpenCL 1.2</li> <li>AI / NN HW Acceleration: up to 1.35 TOPS</li> <li>1080p60 H.264, VP8 Video Decoder / Encoder</li> <li>24b RGB Disp. 1080p @ 60fps</li> <li>LVDS Display 8 lanes with PHY</li> <li>DSI Display 4 lanes with PHY</li> <li>Camera I/F MIPI CSI-2, 2 lanes</li> <li>Lite-ISP (Camera Pipeline)</li> <li>Camera I/F 16-bit Parallel</li> </ul>	
<h3>Security</h3> <ul style="list-style-type: none"> <li>RIF: Isolation and safe sharing of system resources</li> <li>Octal SPI OTF Decryption</li> <li>DRAM OTF Encryption/Dec.</li> <li>DES, TDES, AES-256 with SCA</li> <li>SHA-256/512, SHA-3, HMAC</li> <li>PKA ECC/RSA with SCA</li> <li>16x Tamper pins</li> <li>T<sup>o</sup>, V, F and 32KHz detection</li> <li>Secure RTC</li> <li>Analog true RNG</li> </ul>	<h3>Cortex-M33 @ 400MHz</h3> <ul style="list-style-type: none"> <li>16 kB I-Cache</li> <li>16 kB D-Cache</li> <li>FPU / MPU / NVIC</li> <li>TrustZone</li> </ul>	<h3>Connectivity</h3> <ul style="list-style-type: none"> <li>2x 1Gbps ETH/TSN w/ switch</li> <li>1Gbps ETH/TSN port</li> <li>3x CAN-FD / TTCAN</li> <li>PCIe Gen2, 1 lane + USB2.0 Host/Device HS or USB3.0 DRD</li> <li>3x SDIO3.0 / SD 3 / eMMC 5.1</li> <li>USB2.0 Host HS + HS PHY</li> <li>16-bit SLC NAND, 8-bit-ECC</li> <li>USB Type-C connector support</li> <li>2x Octal SPI, 8x SPI</li> <li>5x UART, 4x USART</li> <li>4x I<sup>2</sup>C, 4x I<sup>3</sup>C, 3x I<sup>S</sup></li> </ul>	
	<h3>DDR4/LPDDR4 32b @ 1.2GHz</h3> <h3>DDR3(L) 32b @ 1066MHz</h3> <ul style="list-style-type: none"> <li>Shared RAM 640kB including 128kB Retention RAM</li> <li>Backup RAM 8kB / Boot ROM 128kB / OTP fuse 12kb</li> </ul>	<h3>Audio</h3> <ul style="list-style-type: none"> <li>SPDIF Rx 4 inputs</li> <li>4x SAI</li> <li>MDF 8 channels / 8 filters</li> </ul>	<h3>Analog</h3> <ul style="list-style-type: none"> <li>3x 12-bit ADC 5 MSPS</li> <li>Temperature sensor</li> </ul>
	<h3>Control</h3> <ul style="list-style-type: none"> <li>3x 16-bit motor control PWM synchronized AC timer</li> <li>10x 16-bit timer</li> <li>5x 16-bit LP timer</li> <li>4x 32-bit timer</li> </ul>		

### Ordering Information

Order Number	CPU	SDRAM	Flash
TXMP2/255C/1GS/4GF/I	1.2 GHz STM32MP255C	1 GB	4 GB

**PINOUT**

PIN	TXCOM STANDARD	MP2 PAD	Alternate Function 0-3	Alternate Function 4-7	Alternate Function 8-11	Alternate Function 12-14	Remarks Additional functions
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**POWER SUPPLY & RESET**

1-4	VIN						
5-7, 9-12	VOOUT						
8	BOOTMODE	BOOT1					
13	VBACKUP	VBAT					
14							STPMIC25 PONKEYn
15	#RESET_OUT	NRSTC1MS					
16	#POR	NRST					
17	#RESET_IN	Not connected					
18	GND						

**Ethernet**

19	ETN_TXN		Transmit Data Negative: 100Base-TX or 10Base-T differential transmit output to magnetics.				
20	#ETN_LED2		Active low - output is driven active when the operating speed is 100Mbps. This LED will go inactive when the operating speed is 10Mbps or during line isolation.				
21	ETN_TXP		Transmit Data Positive: 100Base-TX or 10Base-T differential transmit output to magnetics.				
22	ETN_3V3		+3.3V analog power supply output to magnetics				
23	ETN_RXN		Receive Data Negative: 100Base-TX or 10Base-T differential receive input from magnetics.				
24	#ETN_LED1		Active low - output is driven active whenever the device detects a valid link, and blinks indicating activity.				
25	ETN_RXP		Receive Data Positive: 100Base-TX or 10Base-T differential receive input from magnetics.				
26	GND						

**USB-HOST**

27	USBH_VBUSEN	PC10	- - I2S3_SDO/SPI3_MOSI -	- - LPTIM4_ETR SAI2_SCK_A	TIM8_CH4 <b>USBH_HS_VBUSEN</b> ETH2_TXD3 USB3DR_VBUSEN	FMC_A23 LTDC_G3 DCMIPP_D6/DCMI_D6/PSSI_D6	
28	#USBH_OC	PC9	- RCC_MCO_1 I2S3_SDI/SPI3_MISO -	- - - TIM13_CH1	TIM8_CH4N <b>USBH_HS_OVRCUR</b> ETH2_TXD2 USB3DR_OVRCUR	FMC_A22 LTDC_G2 DCMIPP_D7/DCMI_D7/PSSI_D7	
29	USBH_DM	USBH_HS_DM					
30	USBH_VBUS						
31	USBH_DP	USBH_HS_DP					
32	GND						

**USB-OTG**

33	USBOTG_ID	<b>PZ9</b>	- RCC_MCO_2 - SPI8_RDY	MDF1_CK15 - LPUART1_TX LPTIM4_ETR	I2C8_SDA - LPTIM3_CH2 I3C4_SDA	- - -	
34	USBOTG_VBUSEN	<b>PD2</b>	- HDP_HDP2 I2S1_WS/SPI1_NSS SAI1_CK1	SAI4_SCK_A UART7_CTS TIM15_BKIN	TIM1_ETR FDCAN3_TX OCTOSPIM_P1_DQS OCTOSPIM_P1_NCS2	- DCMIPP_VSYNC/PSSI_RDY -	
35	USBOTG_DM	USB3DR_DM					
36	USBOTG_OC	<b>PD1</b>	- HDP_HDP1 I2S1_SDI/SPI1_MISO SAI1_CK2	- SAI4_SD_A UART7_DE/UART7_RTS TIM15_CH1	TIM1_BKIN FDCAN3_RX OCTOSPIM_P1_NCLK OCTOSPIM_P1_NCS2	OCTOSPIM_P2_NCS2 DCMIPP_HSYNC/PSSI_DE -	
37	USBOTG_DP	USB3DR_DP					
38	USBOTG_VBUS	USB3DR_VBUS					
39	GND						

**I2C**

PIN	TXCOM STANDARD	MP2 PAD	Alternate Function 0-3	Alternate Function 4-7	Alternate Function 8-11	Alternate Function 12-14	Remarks Additional functions
40	I2C_DATA	PH2	- LPTIM2_CH1 SPI7_RDY SPDIFRX_IN3	SAI1_SCK_B I3C3_SDA - TIM16_CH1	I2C5_SDA <b>I2C3_SDA</b> - -	- - ETH3_RGMII_GTX_CLK	
41	I2C_CLK	PH6	LPTIM2_IN2 - -	SAI1_MCLK_B I3C3_SCL - TIM16_CH1N	I2C5_SCL <b>I2C3_SCL</b> I2C1_SMBA -	- - ETH3_RGMII_TXD2	
<b>PWM</b>							
42	PWM	PD10	DEBUG_TRACED6 HDP_HDP7 - SAI1_SCK_A	UART4_RX MDF1_SDI0 I2C4_SDA -	<b>TIM1_CH2</b> TIM14_CH1 OCTOSPIM_P1_IO6 SDMMC1_D5	SDMMC1_CDIR DCMIIP_D8/PSSI_D8 -	
<b>1-WIRE</b>							
43	Not connected						
<b>SPI – Serial Peripheral Interface</b>							
44	CSPI_SS	PB3	- I2S2_WS/ <b>SPI2_NSS</b> -	- MDF1_SDI3 -	TIM20_CH3 - OCTOSPIM_P2_IO3 -	FMC_NCE3 - -	
45	CSPI_SS	<b>PB1</b>	I2S3_WS/SPI3_NSS - -	- - -	TIM16_CH1N TIM20_CH3N - OCTOSPIM_P2_IO1	- FMC_NCE4 -	
46	CSPI_MOSI	PB2	I2S2_SDO/ <b>SPI2_MOSI</b> -	MDF1_CK13 TIM17_BKIN TIM16_BKIN	TIM20_CH2N - OCTOSPIM_P2_IO2	- - -	
47	CSPI_MISO	PB6	I2S2_SDI/ <b>SPI2_MISO</b> UART4_RX	SAI4_SCK_B - -	TIM20_CH1N - OCTOSPIM_P2_IO6	FMC_D9/FMC_DA9 SDMMC3_D0DIR	
48	CSPI_SCLK	PB0	I2S2_CK/ <b>SPI2_SCK</b> -	- USART1_CK TIM16_CH1	TIM20_CH4N - OCTOSPIM_P2_IO0	- - -	
49	CSPI_RDY	PB4	- <b>SPI2_RDY</b> UART4_CTS	SAI4_FS_B MDF1_SDI4 TIM14_CH1 -	TIM20_CH2 I2C2_SDA OCTOSPIM_P2_IO4 -	- I3C2_SDA -	
50	GND						
<b>SD – Secure Digital Interface 1</b>							
51	SD1_CD	<b>PB5</b>	- I2S2_MCK UART4_DE/UART4_RTS	SAI4_SD_B MDF1_CK14 -	TIM20_CH1 I2C2_SCL OCTOSPIM_P2_IO5 -	FMC_D8/FMC_DA8 I3C2_SCL SDMMC3_D123DIR	
52	SD1_D[0]	PE4	DEBUG_TRACED0 LPTIM2_IN1 I2S1_SDO/SPI1_MOSI I2S3_SDI/SPI3_MISO	SAI1_SD_B - USART3_CTS FDCAN1_TX	- - <b>SDMMC1_D0</b> -	- - - -	
53	SD1_D[1]	PE5	DEBUG_TRACED1 LPTIM2_IN2 I2S1_WS/SPI1_NSS I2S3_WS/SPI3_NSS	SAI1_FS_B - USART3_RTS FDCAN1_RX	- - <b>SDMMC1_D1</b> -	- - - -	
54	SD1_D[2]	PE0	DEBUG_TRACED2 LPTIM2_CH1 I2S1_CK/SPI1_SCK SPI3_RDY	- USART3_CK -	- - <b>SDMMC1_D2</b> -	- - - -	
55	SD1_D[3]	PE1	DEBUG_TRACED3 LPTIM2_CH2 I2S1_MCK I2S3_MCK	- USART3_RX -	- - <b>SDMMC1_D3</b> -	- - - -	
56	SD1_CMD	PE2	LPTIM2_ETR I2S1_SDI/SPI1_MISO I2S3_SDO/SPI3_MOSI	SAI1_SCK_B - -	TIM10_CH1 - <b>SDMMC1_CMD</b>	- - -	
57	SD1_CLK	PE3	DEBUG_TRACECLK - SPI1_RDY I2S3_CK/SPI3_SCK	SAI1_MCLK_B - USART3_TX -	TIM11_CH1 - <b>SDMMC1_CK</b> -	- - -	
58	GND						
<b>1<sup>st</sup> UART (Debug)</b>							

PIN	TXCOM STANDARD	MP2 PAD	Alternate Function 0-3	Alternate Function 4-7	Alternate Function 8-11	Alternate Function 12-14	Remarks Additional functions	
59	TXD	PA4	- - -	- - - <b>USART2_TX</b> FDCAN2_TX	TIM2_CH1 - LTDC_R1 -	- ETH1_PTP_AUX_TS ETH3_PPS_OUT		
60	RXD	PA8	- LPTIM2_CH2 SPI7_NSS -	- SAI1_FS_B - USART1_CK -	<b>USART2_RX</b> I2C5_SCL - -	LTDC_B2 DCMIPP_D4/DCMI_D4/PSSI_D4 -		
61	RTS/CTS IN	PA9	- - - SPI4_NSS	- SAI2_SCK_B - <b>USART2_CTS</b> LPTIM5_ETR	TIM2_CH3 - ETH1_MDC -	LTDC_G7 DCMIPP_D14/PSSI_D14 ETH3_RXD0		
62	CTS/RTS OUT	PA5	- - - SPI4_MOSI	- SAI2_MCLK_B SAI2_SD_B <b>USART2_RTS</b> FDCAN2_RX	TIM2_CH4 - LTDC_G0 -	FMC_A0 DCMIPP_D13/PSSI_D13 ETH3_RX_CLK/ETH3_REF_CLK		
<b>2<sup>nd</sup> UART</b>								
63	TXD	PB8	- I2S3_SDO/SPI3_MOSI - -	PCIE_CLKREQN - <b>USART1_TX</b> TIM17_CH1	TIM20_CH4 - OCTOSPIM_P2_NCS1 -	FMC_D12/FMC_DA12 - -		
64	RXD	PB10	- I2S3_SDI/SPI3_MISO - -	- - <b>USART1_RX</b> TIM17_CH1N	- - OCTOSPIM_P2_CLK -	FMC_D15/FMC_DA15 - -		
65	RTS/CTS IN	PI3	- - - LPTIM1_IN2	- SAI4_SD_B - <b>USART1_CTS</b> -	TIM8_CH2 - - -	- LTDC_B6 DCMIPP_D14/PSSI_D14		
66	CTS/RTS OUT	PB9	- SPI3_RDY - -	- - <b>USART1_RTS</b> FDCAN1_TX	TIM20_BKIN TIM10_CH1 OCTOSPIM_P2_DQS OCTOSPIM_P2_NCS2	FMC_D13/FMC_DA13 - -		
<b>3<sup>rd</sup> UART</b>								
67	TXD	PD3	- SAI1_MCLK_A I2S2_CK/SPI2_SCK SAI1_D1	- SAI4_MCLK_A <b>UART7_TX</b> TIM15_CH1N	TIM1_BKIN2 - OCTOSPIM_P1_NCS1 -	- DCMIPP_D15/PSSI_D15 -		
68	RXD	PD0	- DEBUG_TRACECLK HDP_HDP0 SPI7_RDY SAI1_D2	- SAI4_FS_A <b>UART7_RX</b> TIM15_CH2	- - OCTOSPIM_P1_CLK -	- DCMIPP_PIXCLK/PSSI_PDCK -		
69	RTS/CTS IN	PH8	- I2S1_SDI/SPI1_MISO SPDIFRX_IN3	- UART4_RX - <b>UART7_CTS</b> -	- - TIM5_CH1 I2C3_SMBA I2C5_SMBA	- - ETH3_RGMII_RXD3		
70	CTS/RTS OUT	PH7	- I2S1_SDO/SPI1_MOSI -	UART4_TX - <b>UART7_DE/UART7_RTS</b> TIM17_CH1	TIM5_CH4 I2C7_SDA -	- ETH3_RGMII_RXD2		
71	GND							
<b>KEYPAD / CAN</b>								
72	KP_COL[0]	<b>PC12</b>	- LPTIM1_CH2 - I3C3_SCL	- MDF1_CK12 - -	TIM8_CH3 I2C3_SCL ETH2_RXD1 ETH1_RXD3	- LTDC_G1 DCMIPP_D5/DCMI_D5/PSSI_D5		
73	KP_COL[1]	<b>PC7</b>	- - SPI6_MOSI	- SAI3_SD_B - -	TIM8_CH2N - ETH2_TXD0 ETH1_TXD2	- LTDC_B4 DCMIPP_D1/DCMI_D1/PSSI_D1		
74	KP_COL[2]	<b>PC4</b>	- - SPI6_MISO	- SAI3_FS_B - -	- - ETH2_TX_EN/ETH2_TX_CTL -	ETH1_RGMII_CLK125 LTDC_R0 -		
75	KP_COL[3]	<b>PZ8</b>	- LPTIM3_IN1 SPI8_MISO	- MDF1_SDI5 ADF1_SDI0 LPUART1_RX LPTIM4_CH1	I2C8_SMBA LPTIM5_ETR - -	- - -		
76	TXCAN	PD15	- SPI1_RDY - -	- DSIHOST_TE I2C5_SDA <b>FDCAN1_TX</b> -	TIM1_BKIN2 TIM5_ETR I2C7_SCL FMC_D3/FMC_DA3	SDMMC3_CKIN DCMIPP_D0/DCMI_D0/PSSI_D0 _D0		
77	KP_ROW[0]	<b>PG0</b>	- LPTIM1_IN1 - I3C3_SDA	- MDF1_SDI2 - -	TIM8_CH3N I2C3_SDA ETH2_RXD0 ETH1_RXD2	LTDC_G5 DCMIPP_D4/DCMI_D4/PSSI_D4		

PIN	TXCOM STANDARD	MP2 PAD	Alternate Function 0-3	Alternate Function 4-7	Alternate Function 8-11	Alternate Function 12-14	Remarks Additional functions
78	KP_ROW[1]	PC3	- LPTIM1_IN2 I2S3_WS/SPI3_NSS SPI6_RDY	- USART6_RTS FDCAN2_TX SAI3_SCK_B	- ETH2_RX_CTL/ETH2_CRD_DV ETH1_MII_RX_ER	- LTDC_G6 DCMIPP_D3/DCMI_D3/PSSI_D3	
79	KP_ROW[2]	PC8	- LPTIM1_ETR - SPI6_NSS	- USART6_CTS - SAI3_SCK_A	- TIM8_CH2 - ETH2_TXD1 ETH1_TXD3	- LTDC_B3 DCMIPP_D2/DCMI_D2/PSSI_D2	
80	KP_ROW[3]	PF4	- RTC_OUT2 SPI6_NSS - -	- USART6_RX TIM4_CH4 - -	- ETH1_MDC ETH2_CLK ETH2_PPS_OUT ETH1_PPS_OUT	- LTDC_B7 - -	
81	RXCAN	PB11	- I2S3_MCK - -	- USART1_CTS FDCAN1_RX - -	- TIM20_BKIN2 TIM12_CH2 OCTOSPIM_P2_NCLK OCTOSPIM_P2_NCS2	- FMC_D14/FMC_DA14 OCTOSPIM_P1_NCS2 -	
82	GND						

### SSI 1 - Serial Audio Port 1

83	SSI1_INT	PD11	- DEBUG_TRACED7 - I2S1_CK/SPI1_SCK SAI1_MCLK_A	- UART4_TX MDF1_CK10 I2C4_SCL -	- TIM1_CH1 - OCTOSPIM_P1_IO7 SDMMC1_D4	- SDMMC1_CKIN DCMIPP_D7/DCMI_D7/PSSI_D7 -	
84	SSI1_RXD	PD4	- DEBUG_TRACED0 SPI4_MISO HDP_HDP3 SAI1_D3	- SAI1_SD_B - - -	- TIM1_CH4N TIM4_CH1 OCTOSPIM_P1_IO0 -	- DCMIPP_D14/PSSI_D14 -	
85	SSI1_TXD	PD9	- DEBUG_TRACED5 HDP_HDP6 I2S1_SDO/SPI1_MOSI SAI1_SD_A	- UART4_DE/UART4_RTS MDF1_CK11 - -	- TIM1_CH3 - OCTOSPIM_P1_IO5 SDMMC1_D6	- SDMMC1_D0DIR DCMIPP_D9/DCMI_D9/PSSI_D9 -	
86	SSI1_CLK	PI10	- SAI1_SCK_A I2S1_CK/SPI1_SCK SPDIFRX_IN0	- FDCAN2_RX MDF1_CCK0 - -	- TIM4_CH1 - - -	- FMC_D12/FMC_DA12 DSIHOST_TE -	
87	SSI1_FS	PD8	- DEBUG_TRACED4 SPI4_RDY I2S1_MCK SAI1_FS_A	- UART4_CTS MDF1_SDI1 - -	- TIM1_CH4 TIM4_ETR OCTOSPIM_P1_IO4 SDMMC1_D7	- SDMMC1_D123DIR DCMIPP_D10/PSSI_D10 -	
88	GND						

### SSI 2 - Serial Audio Port 2

89	SSI2_INT	PF10	- RCC_MCO_2 SPI3_RDY -	- SAI2_MCLK_A MDF1_CK16 UART8_TX TIM2_CH3	- ETH2_MII_TXD2/ETH2_RG MII_TXD2 -	- -	
90	SSI2_RXD	PB15	- LPTIM1_IN2 SPI5_SCK UART8_DE/UART8_RTS	- SAI2_SD_B UART5_RX - TIM3_CH2	- TIM5_CH1 - ETH1_PPS_OUT -	- FMC_A18 LTDC_R4 DCMIPP_D8/PSSI_D8	
91	SSI2_TXD	PG1	- LPTIM1_IN1 I2S3_MCK I3C3_SCL	- SAI2_SD_A UART5_CTS USART3_CTS -	- TIM5_CH4 I2C3_SCL ETH2_MII_RX_ER ETH2_RXD3	- FMC_NBL0 LTDC_VSYNC DCMIPP_D11/PSSI_D11	
92	SSI2_CLK	PF11	- RCC_MCO_1 SPDIFRX_IN0 SPI6_RDY	- SAI2_SCK_A MDF1_SDI6 UART8_RX TIM2_CH4	- ETH2_TXD3 -	- -	
93	SSI2_FS	PG2	- RTC_REFIN I2S3_MCK I3C3_SDA	- SAI2_FS_A USART3_CK -	- TIM5_CH3 I2C3_SDA ETH2_MII_TX_CLK ETH2_RGMII_CLK125	- FMC_CLK LTDC_HSYNC -	
94	GND						

### Secure Digital Interface 2

95	SD2_CD	PB7	- I2S3_CK/SPI3_SCK - UART4_TX	- SAI4_MCLK_B - -	- TIM20_ETR TIM12_CH1 OCTOSPIM_P2_IO7 -	- FMC_D10/FMC_DA10 - SDMMC3_CDIN	
96	SD2_D[0]	PB14	- I2S2_CK/SPI2_SCK - -	- MDF1_CK17 UART9_RX -	- TIM4_CH2 SDMMC3_D0 FMC_D7/FMC_DA7	- FMC_D2/FMC_DA2 -	
97	SD2_D[1]	PD13	- I2S2_WS/SPI2_NSS -	- MDF1_SDI7 UART9_TX -	- TIM4_CH4 SDMMC3_D1 FMC_D11/FMC_DA11	- FMC_NWE -	

PIN	TXCOM STANDARD	MP2 PAD	Alternate Function 0-3	Alternate Function 4-7	Alternate Function 8-11	Alternate Function 12-14	Remarks Additional functions
98	SD2_D[2]	PB12	- - -	- UART8_CTS - TIM13_CH1	- DSIHOST_TE <b>SDMMC3_D2</b> FMC_NWAIT	- - DCMIPP_D12/PSSI_D12	
99	SD2_D[3]	PI11	- I2S2_MCK -	- UART8_TX UART9_DE/UART9_RTS -	- TIM4_CH3 <b>SDMMC3_D3</b> FMC_D15/FMC_DA15	- - -	
100	SD2_CMD	PD12	- SPI7_MISO I2S2_SDI/SPI2_MISO SPDIFRX_IN2	- UART8_DE/UART8_RTS -	- TIM4_ETR <b>SDMMC3_CMD</b> FMC_D6/FMC_DA6	- FMC_D1/FMC_DA1 -	
101	SD2_CLK	PB13	- SPI7_SCK -	- SAI1_SD_B UART8_RX -	- - <b>SDMMC3_CK</b> FMC_D5/FMC_DA5	- FMC_D0/FMC_DA0 -	
102	GND						
<b>CMOS Sensor Interface</b>							
103	CSI0_DAT12	PF12	- DEBUG_TRACECLK - SPI5_MISO I2S1_SDI/SPI1_MISO	- - UART9_DE/UART9_RTS -	- TIM5_CH1 - -	- LTDC_CLK <b>DCMIPP_D0/PSSI_D0</b>	
104	CSI0_DAT13	PI5	- SPI5_MOSI I2S1_SDO/SPI1_MOSI	- UART5_CTS UART9_RX -	- TIM5_CH2 - -	- LTDC_DE <b>DCMIPP_D1/PSSI_D1</b>	
105	CSI0_DAT14	PA3	- LPTIM2_ETR SPI7_MOSI -	- MDF1_CK17 USART1_TX -	- I3C1_SCL I2C7_SMBA I2C1_SCL LTDC_B1	- <b>DCMIPP_D2/PSSI_D2</b> ETH3_TX_CTL/ETH3_TX_EN	
106	CSI0_DAT15	PA2	- LPTIM2_IN1 SPI7_MISO	- MDF1_SDI7 USART1_RX -	- I3C1_SDA -	- <b>DCMIPP_D3/PSSI_D3</b> ETH3_RX_CTL/ETH3_CRS_DV	
107	CSI0_DAT16	PG10	- DEBUG_TRACED8 HDP_HDP0 -	- UART5_RX -	- TIM8_CH4N -	- LTDC_G4 <b>DCMIPP_D4/PSSI_D4</b>	
108	CSI0_DAT17	PA1	- - SPI6_MISO	- SAI3_SD_A USART1_RTS USART6_CK TIM4_CH2	- I2C4_SDA I2C6_SDA -	- <b>DCMIPP_D5/PSSI_D5</b> ETH3_PHY_INTN	
109	CSI0_DAT18	PA7	- - AUDIOCLK SPI6_RDY	- PCIE_CLKREQN MDF1_CCK0 USART1_CTS TIM4_ETR	- I2C2_SMBA I2C6_SMBA LTDC_B5 I2C3_SMBA	- I2C4_SMBA <b>DCMIPP_D6/PSSI_D6</b> ETH3_TXD1	
110	CSI0_DAT19	PG13	- DEBUG_TRACED11 HDP_HDP3 SPI7_SCK -	- MDF1_CK16 -	- TIM8_CH2N I2C1_SCL I3C1_SCL -	- LTDC_G7 <b>DCMIPP_D7/PSSI_D7</b>	
111	GND						
112	CSI0_HSYNC	PG6	- DEBUG_TRACED4 HDP_HDP4 SPI5_SCK I2S1_CK/SPI1_SCK	- - TIM2_CH4 -	- I2C6_SCL -	- LTDC_R6 <b>DCMIPP_HSYNC/PSSI_DE</b>	
113	CSI0_VSYNC	PG4	- - SPI5_MISO SAI3_FS_B	- - LPTIM4_IN1 -	- TIM8_BKIN ETH2_PPS_OUT ETH2_MDC	- FMC_A21 LTDC_R7 <b>DCMIPP_VSYNC/PSSI_RDY</b>	
114	CSI0_PIXCLK	PG5	- DEBUG_TRACED3 HDP_HDP3 -	- - TIM2_CH3 -	- I2C6_SDA -	- LTDC_R5 <b>DCMIPP_PIXCLK/PSSI_PDCK</b>	
115	CSI0_MCLK	PZ5	- <b>RCC_MCO_1</b> LPTIM3_ETR SPI8_SCK	- ADF1_CCK0 LPUART1_DE/LPUART1_RTS LPTIM5_IN1	- - LPTIM4_CH2 -	- -	
116	GND						
<b>LCD Controller</b>							
117	LD0	PF6	- RTC_OUT2 -	- - USART6_CK TIM12_CH1	- I2C3_SMBA ETH2_RX_CLK/ETH2_REF_CLK -	- <b>LTDC_B0</b> -	
118	LD1	PG14	- DEBUG_TRACED12 HDP_HDP4 SPI7_RDY -	- MDF1_CK15 USART1_TX -	- TIM8_BKIN2 -	- <b>LTDC_B1</b> DCMIPP_D9/PSSI_D9	

PIN	TXCOM STANDARD	MP2 PAD	Alternate Function 0-3	Alternate Function 4-7	Alternate Function 8-11	Alternate Function 12-14	Remarks Additional functions
119	LD2	PG15	DEBUG_TRACED13 HDP_HDP5 - LPTIM1_CH2	- MDF1_SDI5 USART1_RX -	TIM8_ETR - -	- <b>LTDC_B2</b> DCMIPP_D10/PSSI_D10	
120	LD3	PI0	DEBUG_TRACED14 HDP_HDP6 - LPTIM1_IN1	SAI4_MCLK_B - USART1_CK -	TIM8_BKIN - -	- <b>LTDC_B3</b> DCMIPP_D11/PSSI_D11	
121	LD4	PI1	DEBUG_TRACED15 HDP_HDP7 SPI7_NSS -	MDF1_SDI6 - -	TIM8_CH3N I2C1_SDA I3C1_SDA -	- <b>LTDC_B4</b> DCMIPP_D8/PSSI_D8	
122	LD5	PI2	- - LPTIM1_ETR	SAI4_SCK_B - USART1_RTS -	TIM8_CH1 - -	- <b>LTDC_B5</b> DCMIPP_D13/PSSI_D13	
123	LD6	PF5	- SPI6_SCK -	SAI3_MCLK_A - USART6_TX TIM4_CH3 SAI4_FS_B	ETH1_MDIO ETH1_CLK ETH2_PHY_INTN ETH1_PHY_INTN	- <b>LTDC_B6</b> -	
124	LD7	PI4	- - LPTIM1_CH1	- -	TIM8_CH3 - -	- <b>LTDC_B7</b> DCMIPP_D15/PSSI_D15	
125	LD8	PF8	RTC_REFIN - SAI3_SCK_B	- USART3_RX TIM12_CH2	ETH1_CLK ETH2_RGMII_CLK125 ETH2_MII_RX_ER	ETH2_RX_CTL/ETH2_CRIS_DV - <b>LTDC_G0</b> -	
126	LD9	PH5	- - -	SAI2_FS_A - UART8_CTS TIM2_CH1	UART7_RX - <b>LTDC_G1</b> USB3DR_VBUSEN	USBH_HS_VBUSEN ETH2_PTP_AUX_TS -	
127	LD10	PG8	DEBUG_TRACED6 HDP_HDP6 SPI5_RDY SPI1_RDY	USART6_CK UART5_DE/UART5_RTS UART9_TX -	TIM5_CH3 - -	- <b>LTDC_G2</b> DCMIPP_D2/PSSI_D2	
128	LD11	PG9	DEBUG_TRACED7 - -	- UART5_TX -	TIM5_CH4 - -	- <b>LTDC_G3</b> DCMIPP_D3/PSSI_D3	
129	GND						
130	LD12	PA6	- - SPI4_SCK	SAI2_FS_B MDF1_SDI6 USART2_CK TIM13_CH1	TIM2_ETR - <b>LTDC_G4</b> -	FMC_NE1 DCMIPP_D12/PSSI_D12 ETH3_TXD0	
131	LD13	PG11	DEBUG_TRACED9 HDP_HDP1 SPI7_MOSI -	- - FDCAN1_TX	TIM8_CH4 - -	- <b>LTDC_G5</b> DCMIPP_D5/PSSI_D5	
132	LD14	PG12	DEBUG_TRACED10 HDP_HDP2 SPI7_MISO -	- FDCAN1_RX	TIM8_CH1N - -	- <b>LTDC_G6</b> DCMIPP_D6/PSSI_D6	
133	LD15	PC0	LPTIM1_CH1 - SPI6_SCK	SAI3_MCLK_B USART6_TX -	- DCMIPP_D0/PSSI_D0 ETH2_RX_CLK/ETH2_REF_CLK ETH1_MII_TX_CLK	ETH1_RGMII_GTX_CLK - <b>LTDC_G7</b> -	
134	LD16	PH4	- - -	UART7_TX TIM17_BKIN SAI3_SD_A	TIM5_CH2 <b>LTDC_R0</b> USB3DR_OVRCUR	USBH_HS_OVRCUR ETH1_PTP_AUX_TS ETH3_PPS_OUT	
135	LD17	PF7	- SPDIFRX_IN1 SPI6_SCK	- TIM2_ETR	ETH2_RGMII_GTX_CLK ETH2_MII_TX_CLK	- <b>LTDC_R1</b> -	
136	LD18	PF13	DEBUG_TRACED0 HDP_HDP0 AUDIOCLK USART6_TX	I2S2_WS/SPI2_NSS MDF1_CK17 USART3_CTS FDCAN3_TX	TIM3_CH3 - -	- <b>LTDC_R2</b> -	
137	LD19	PF14	DEBUG_TRACED1 HDP_HDP1 - USART6_RX	MDF1_SDI7 USART3_RTS FDCAN3_RX	TIM3_CH4 - -	- <b>LTDC_R3</b> -	
138	LD20	PF15	DEBUG_TRACED2 HDP_HDP2 SPI2_RDY USART6_CTS	I2S2_CK/SPI2_SCK - USART3_CK TIM2_CH2	TIM3_ETR I2C6_SMBA -	- <b>LTDC_R4</b> -	
139	LD21	PG3	- LPTIM1_ETR SPI5_MOSI UART8_TX	SAI2_FS_B - TIM3_CH3	TIM8_ETR ETH2_CLK ETH2_PHY_INTN	FMC_A19 <b>LTDC_R5</b> DCMIPP_PIXCLK/PSSI_PDCK	



PIN	TXCOM STANDARD	MP2 PAD	Alternate Function 0-3	Alternate Function 4-7	Alternate Function 8-11	Alternate Function 12-14	Remarks Additional functions
140	LD22	PA10	- - - SPI4_MISO	SAI2_SD_B - USART2_RX LPTIM5_IN1	TIM2_CH2 - ETH1_MDIO -	<b>LTDC_R6</b> DCMIPP_D15/PSSI_D15 ETH3_RXD1	
141	LD23	PG7	DEBUG_TRACED5 HDP_HDP5 SPI5_NSS I2S1_WS/SPI1_NSS	- - UART9_CTS -	- - - -	- <b>LTDC_R7</b> DCMIPP_VSYNC/PSSI_RDY	
142	GND						
143	HSYNC	PI7	- - -	- USART3_RX TIM2_CH1	TIM3_CH2 - - -	<b>LTDC_HSYNC</b> -	
144	VSYSN	PI6	RCC_MCO_1 - -	- USART3_TX TIM2_ETR	TIM3_CH1 - -	<b>LTDC_VSYN</b> -	
145	OE_ACD	PC5	- SPDIFRX_IN1	- MDF1_SDI1	TIM8_CH1N I2C4_SDA ETH2_MDIO ETH1_MII_COL	FMC_A25 ETH1_PPS_OUT <b>LTDC_DE</b>	
146	LSCLK	PC6	- RTC_REFIN SPDIFRX_IN0 -	MDF1_CK11 - -	TIM8_CH1 I2C4_SCL ETH2_MDC ETH1_MII_CRS	FMC_A24 ETH1_PHY_INTN <b>LTDC_CLK</b>	
147	GND						
<b>General Purpose IOs / Module Specific Signals</b>							
148		PH9	- - SPI6_NSS	SAI3_MCLK_A - USART6_RX TIM15_CH1N	- - ETH1_RGMII_CLK125 ETH1_MII_RX_ER	- -	
149		PH13	- I2S3_CK/SPI3_SCK SPI6_MOSI	- - TIM15_BKIN	TIM11_CH1 - ETH1_RXD3 -	- -	
150		PH12	- I2S3_WS/SPI3_NSS SPI6_MISO	- - -	TIM10_CH1 - ETH1_RXD2 -	- -	
151		PZ0	- LPTIM3_IN1 SPI8_MOSI	TIM8_CH1 LPUART1_TX LPTIM5_OUT	I2C8_SDA - LPTIM3_CH2 I3C4_SDA	- -	TXMP2 v1: PK7
152		PZ1	- LPTIM3_CH1 SPI8_MISO	TIM8_CH2 LPUART1_RX LPTIM5_ETR	I2C8_SCL I2C8_SMBA - I3C4_SCL	- -	TXMP2 v1: PK5
153		PZ2	- LPTIM3_CH1 SPI8_SCK	- ADF1_CCK0 LPUART1_DE/LPUART1_RTS LPTIM4_ETR	I2C8_SCL - - I3C4_SCL	- -	TXMP2 v1: PK3
154		PZ3	DEBUG_DBTRGI DEBUG_DBTRGO LPTIM3_ETR SPI8_NSS	MDF1_SDI5 ADF1_SDI0 LPUART1_CTS LPTIM4_IN1	I2C8_SDA - LPTIM4_CH2 I3C4_SDA	- -	TXMP2 v1: PI14
155		PZ4	DEBUG_DBTRGI DEBUG_DBTRGO RCC_MCO_2 SPI8_RDY	MDF1_CCK1 ADF1_CCK1 LPUART1_RX LPTIM4_CH1	I2C8_SCL - - I3C4_SCL	- -	TXMP2 v1: PI15
156		PZ6	DEBUG_DBTRGI DEBUG_DBTRGO - SPI8_NSS	TIM8_CH3 ADF1_SDI0 LPUART1_CTS LPTIM5_OUT	- - LPTIM4_CH2 -	- -	
157		PH10	- I2S1_CK/SPI1_SCK SPI6_MOSI	SAI3_SCK_A - -	- ETH2_MDC ETH1_TXD2 -	- -	
158		PI9	- SPI7_MOSI I2S2_SDO/SPI2_MOSI	FDCAN2_TX - UART9_CTS	TIM16_BKIN - FMC_NWAIT	DSIHOST_TE LTDC_B0 -	
159		PD7	DEBUG_TRACED3 SPI4_SCK SPI1_RDY -	SAI1_MCLK_B MDF1_CK12 -	TIM1_CH1N TIM4_CH4 OCTOSPIM_P1_IO3 -	- DCMIPP_D11/PSSI_D11 -	
160	GND						

PIN	TXCOM STANDARD	MP2 PAD	Alternate Function 0-3	Alternate Function 4-7	Alternate Function 8-11	Alternate Function 12-14	Remarks Additional functions
161		PZ7	- - - SPI8_MOSI	MDF1_CCK1 ADF1_CCK1 LPUART1_TX LPTIM5_IN1	- - LPTIM3_CH2 -	- - -	TXMP2 v1: PK6
162		PI8	- - -	- - -	- - -	- - -	TXMP2 v1: PK2
163		PD5	DEBUG_TRACED1 SPI4_NSS HDP_HDP4 SAI1_D4	SAI1_FS_B - -	TIM1_CH3N TIM4_CH2 OCTOSPIM_P1_IO1	DCMIPP_D13/PSSI_D13 -	
164		PD6	DEBUG_TRACED2 SPI4_MOSI HDP_HDP5 -	SAI1_SCK_B MDF1_SDI2 -	TIM1_CH2N TIM4_CH3 OCTOSPIM_P1_IO2	DCMIPP_D12/PSSI_D12 -	
165		PC11	- LPTIM1_CH1 SPI5_NSS -	SAI2_MCLK_A UART5_DE/UART5_RTS USART3_RTS TIM3_CH1	TIM5_ETR - ETH2_MII_RXD3/ETH2_RG MII_RXD3 -	FMC_NBL1 LTDC_R2 DCMIPP_D10/PSSI_D10	TXMP2 v1: PK1
<b>MIPI-DSI</b>							
166		PCIE_CLKINP					
167		COMBOPHY_RX1N					
168		PCIE_CLKINN					
169		COMBOPHY_RX1P					
170		COMBOPHY_TX1N					
171	GND						
172		COMBOPHY_TX1P					
<b>Module Specific Signals</b>							
173					Not connected		
174					Not connected		
175					Not connected		
176					Not connected		
177					Not connected		
178					Not connected		
179					Not connected		
180					Not connected		
181					Not connected		
182					Not connected		
183	GND						
184					Not connected		
185		CSI_CKP					
186					Not connected		
187		CSI_CKN					
188					Not connected		
189		CSI_D1P					
190					Not connected		
191		CSI_D1N					
192					Not connected		
193		CSI_D0P					
194					Not connected		
195		CSI_D0N					
196					Not connected		
197					Not connected		
198		PH11	- - - SPI6_MISO	SAI3_FS_A - - TIM15_CH2	- ETH2_MDIO ETH1_TXD3 -	- - -	
199		PF9	- - - SAI3_SD_B	SAI2_SD_A MDF1_SDI5 UART8_DE/UART8_RTS TIM2_CH2	- - ETH2_RXD2 ETH2_MDIO	- - -	
200	GND						

## Onboard peripherals wiring

USED FOR	MP2 PAD	Alternate Function 0-3	Alternate Function 4-7	Alternate Function 8-11	Alternate Function 12-14	Remarks	
eMMC	CMD	PE15	- SPI7_MOSI -	SAI1_SCK_A MDF1_SDI6 - TIM15_CH1N	TIM1_CH1N - FMC_NOE	SDMMC2_CMD - -	10K-PU
	CLK	PE14	- SPI7_NSS -	SAI1_MCLK_A MDF1_CKI6 - TIM15_BKIN	TIM1_BKIN - FMC_NWE	SDMMC2_CK - -	10K-PU
	DAT0	PE13	- SPI7_MISO -	SAI1_SD_A - TIM15_CH1	TIM1_CH2N - FMC_RNB	SDMMC2_D0 - -	10K-PU
	DAT1	PE11	- SPI7_SCK SAI4_D3	SAI1_FS_A - TIM15_CH2	TIM1_CH3N - FMC_A16/FMC_CLE	SDMMC2_D1 - -	
	DAT2	PE8	- SPI4_MOSI SAI4_CK1	SAI4_MCLK_A MDF1_CKIO - -	TIM1_CH1 - FMC_A17/FMC_ALE	SDMMC2_D2 - -	
	DAT3	PE12	- SPI4_NSS SAI4_CK2	SAI4_SCK_A MDF1_SDI0 USART1_RTS -	TIM1_CH2 - FMC_NE2 FMC_NCE1	SDMMC2_D3 - -	
	DAT4	PE10	- SPI4_SCK SAI4_D1	SAI4_SD_A - USART1_CTS -	TIM1_CH3 - FMC_NE3 FMC_NCE2	SDMMC2_D4 SDMMC2_CKIN -	
	DAT5	PE9	- SPI4_MISO SAI4_D2	SAI4_FS_A - USART1_CK -	TIM1_CH4 - FMC_D0/FMC_DA0	SDMMC2_D5 SDMMC2_CDIR -	
	DAT6	PE6	- SPI4_RDY -	SPDIFRX_IN2 - USART1_TX -	TIM1_ETR - FMC_D1/FMC_DA1	SDMMC2_D6 SDMMC2_D0DIR -	
	DAT7	PE7	- SAI4_D4	SPDIFRX_IN3 - USART1_RX -	TIM1_CH4N - TIM14_CH1 FMC_D2/FMC_DA2	SDMMC2_D7 SDMMC2_D123DIR -	
PMIC	SDA	PD14	- I2S1_MCK -	- FDCAN1_RX -	TIM11_CH1 - I2C7_SDA FMC_D4/FMC_DA4	SDMMC3_D3 DCMIPP_D1/PSSI_D1 -	1K-PU
	SCL	PH3	I2S1_WS/SPI1_NSS	- UART7_RX TIM17_CH1N	TIM5_CH3 I2C7_SCL -	ETH3_RGMII_TXD3	10K-PU
	INTn	PA0	LPTIM1_CH2 SPI5_RDY UART8_CTS	SAI2_MCLK_B UART5_TX USART3_TX TIM3_ETR	TIM5_CH2 - ETH2_RXD2 -	FMC_NL DCMIPP_D9/PSSI_D9	
	RSTn	NRST					
	PWRCTRL1	PWR_ON					
	PWRCTRL2	PWR_CPU_ON					
	PWRCTRL3	NRSTC1MS					
WAKEUPn	PC13	- -	- -	- -	- -	- -	
ETHERNET LAN8710 RMII	CLKIN	PF3	- UART8_RX	SAI2_SCK_B MDF1_CCK0 - TIM3_CH4	TIM8_BKIN2 ETH1_CLK ETH2_PPS_OUT -	FMC_A20 LTDC_R6 DCMIPP_HSYNC/PSSI_DE	
	MDC	PF0	- I2S3_CK/SPI3_SCK	- FDCAN2_RX	TIM12_CH2 I2C2_SDA ETH1_MDC ETH2_MII_CRS	I3C2_SDA -	
	MDIO	PF2	- SPI3_RDY	- I2C4_SMBA	TIM12_CH1 I2C2_SCL ETH1_MDIO ETH2_MII_COL	FMC_NE4 I3C2_SCL -	1K-PU
	RXD0	PF1	- SPI8_MISO LPTIM2_IN2	SAI4_SCK_B MDF1_CK14 USART2_CK -	- ETH1_RXD0 -	- -	

Onboard peripherals wiring						
USED FOR	MP2 PAD	Alternate Function 0-3	Alternate Function 4-7	Alternate Function 8-11	Alternate Function 12-14	Remarks
RXD1	PC2	- SPI8_MOSI LPTIM2_IN1 -	SAI4_MCLK_B MDF1_SDI3 USART2_RTS -	- - ETH1_RXD1 -	- - -	
COL/CRS_DV	PA11	- SPI8_SCK LPTIM2_CH1 -	SAI4_SD_B MDF1_SDI4 - -	- - ETH1_RX_DV/RX_CTL/CRS_DV -	- - -	10K-PU
TXEN	PA13	- SPI8_RDY I2S3_MCK LPTIM2_ETR -	- MDF1_CK13 USART2_CTS -	- I2C7_SMBA ETH1_TX_EN/TX_CTL/TX_EN -	- - -	
TXD0	PA15	- I2S3_SDI/SPI3_MISO -	- - USART2_RX -	- I2C7_SDA ETH1_TXD0 -	- - -	
TXD1	PC1	- I2S3_SDO/SPI3_MOSI -	- - USART2_TX -	- I2C7_SCL ETH1_TXD1 -	- - -	
nINT	PA12	- SPI6_MOSI -	SAI3_FS_A - TIM4_CH1 SAI4_FS_B MDF1_CCK1 -	I2C4_SCL I2C6_SCL ETH1_PHY_INTN -	- - -	10K-PU
nRST	PA14	- SPI8_NSS LPTIM2_CH2 -	SAI4_FS_B MDF1_CCK1 -	- - ETH1_RX_CLK/REF_CLK -	- - -	10K-PU

PIN's	UART	PIN's	I2C	PIN's	SPI		
161, 163	LPUART1_CTS	110, 105	I2C1_SCL	36, 56, 69, 103	SPI1_MISO		
115, 159	LPUART1_DE/ LPUART1_RTS	121, 106	I2C1_SDA	52, 70, 85, 104	SPI1_MOSI		
75, 158, 162	LPUART1_RX	41	I2C1_SMBA	34, 53, 141	SPI1_NSS		
33, 157, 164	LPUART1_TX	51	I2C2_SCL	76, 57, 151, 127	SPI1_RDY		
49, 87	UART4_CTS	49	I2C2_SDA	54, 83, 86, 153, 112	SPI1_SCK		
51, 85	UART4_DE/ UART4_RTS	109	I2C2_SMBA	47, 100	SPI2_MISO		
47, 42, 69	UART4_RX	91, 41, 72	I2C3_SCL	46, 165	SPI2_MOSI		
95, 70, 83	UART4_TX	40, 93, 77	I2C3_SDA	44, 97, 136	SPI2_NSS		
91, 104	UART5_CTS	117, 69, 109	I2C3_SMBA	49, 138	SPI2_RDY		
127, 148	UART5_DE/ UART5_RTS	146, 83	I2C4_SCL	48, 67, 96, 138	SPI2_SCK		
90, 107	UART5_RX	145, 108, 42	I2C4_SDA	64, 28, 52	SPI3_MISO		
128	UART5_TX	109	I2C4_SMBA	63, 27, 56	SPI3_MOSI		
34, 69	UART7_CTS	41, 60	I2C5_SCL	45, 78, 154, 53	SPI3_NSS		
36, 70	UART7_DE/ UART7_RTS	76, 40	I2C5_SDA	66, 89, 54	SPI3_RDY		
68, 126	UART7_RX	69	I2C5_SMBA	95, 155, 57	SPI3_SCK		
67, 134	UART7_TX	112	I2C6_SCL	84, 140	SPI4_MISO		
98, 126	UART8_CTS	108, 114	I2C6_SDA	150, 62	SPI4_MOSI		
90, 100, 199	UART8_DE/ UART8_RTS	109, 138	I2C6_SMBA	149, 61	SPI4_NSS		
101, 92	UART8_RX	76	I2C7_SCL	87	SPI4_RDY		
139, 99, 89	UART8_TX	70	I2C7_SDA	151, 130	SPI4_SCK		
141, 165	UART9_CTS	105	I2C7_SMBA	103, 113	SPI5_MISO		
99, 103	UART9_DE/ UART9_RTS	159, 162, 158	I2C8_SCL	104, 139	SPI5_MOSI		
96, 104	UART9_RX	157, 33, 161	I2C8_SDA	141, 148	SPI5_NSS		
97, 127	UART9_TX	75, 158	I2C8_SMBA	127	SPI5_RDY		
48, 60, 120	USART1_CK			90, 112	SPI5_SCK		
65, 81, 109	USART1_CTS			108, 74, 154, 198	SPI6_MISO		
108, 66, 122	USART1_RTS			73, 153, 155	SPI6_MOSI		
64, 106, 119	USART1_RX			80, 79, 152	SPI6_NSS		
63, 105, 118	USART1_TX			78, 92, 109	SPI6_RDY		
130	USART2_CK			123, 133, 135	SPI6_SCK		
61	USART2_CTS			100, 106, 132	SPI7_MISO		
62	USART2_RTS			165, 105, 131	SPI7_MOSI		
140, 60	USART2_RX			60, 121	SPI7_NSS		
59	USART2_TX			40, 68, 118	SPI7_RDY		
54, 93, 138	USART3_CK			101, 110	SPI7_SCK		
52, 91, 136	USART3_CTS			75, 158	SPI8_MISO		
53, 137, 148	USART3_RTS			157, 164	SPI8_MOSI		
55, 125, 143	USART3_RX			161, 163	SPI8_NSS		
57, 144	USART3_TX			33, 162	SPI8_RDY		
127, 108, 117	USART6_CK			115, 159	SPI8_SCK		
138, 79	USART6_CTS						
114, 78	USART6_RTS						
137, 80, 152	USART6_RX						
136, 133, 123	USART6_TX						