

QFN Style Solder-Down Computer On Module

- 27mm square
- 2.6mm total height
- QS family pin-compatible
- Solder-down version
- QFN type lead style
 - 1mm pitch
 - 100 pads
 - Thermal pad
- Visual solder joint inspection possible after soldering
- Single-sided assembly
- 3.3V power supply



Key Features

- STM32MP235 Dual ARM® Cortex®-A35, 1.2 GHz
ARM® Cortex®-M33, 400 MHz
Vivante® NPU, 0.6 TOPS
- RAM 1GB LPDDR4
- ROM 4 GB eMMC
- Grade Industrial
- Temperature -40°C to 85°C
- Display support
 - LVDS Display Interface
 - 3D GPU: OpenGL® ES 3.1 - Vulkan 1.1, OpenCL™ 1.2, OpenVX™ 1.1, Up to 66 Mtriangle/s, 400 Mpixel/s
 - VPU: H264/VP8 up to FHD (1920×1080)@60 fps
- Connectivity
 - 2x USB 2.0
 - 2x Gb Ethernet, RGMII
 - 1x eMMC/SD
 - 2x CAN-FD
 - 3x UART, 3x I²C, 1x SPI, PWM, SAI
 - Up to 60x 3.3V General Purpose I/O
 - MIPI-CSI (2-lane)

OS Support

- Linux

**Dual
Cortex®-A35
STM32MP2**



STM32MP235



QS93 | QSMP-23 | QSMP-25 | Differentiating Features

	QS93 i.MX 9352	QSMP-23 STM32MP235	QSMP-25 STM32MP255
Primary Arm® Core	2x Cortex®-A55 1.5 GHz	2x Cortex®-A35 1.2 GHz	2x Cortex®-A35 1.5 GHz
Secondary Arm® Core	Cortex-M33 250 MHz	Cortex-M33 400 MHz	Cortex-M33 400 MHz
RAM	1GB LPDDR4	1GB LPDDR4	1GB LPDDR4
ROM	4 GB eMMC	4 GB eMMC	4 GB eMMC
GPU	2D GFX	66 MTrg/s 400 MPix/s 12.8 GFlops	133 MTrg/s 800 MPix/s 25.6 GFlops
AI/ML/DSP	0.5 TOPS	0.6 TOPS	1.2 TOPS
VPU	-	Decode	De-/Encode
Connectivity	USB 2.0	USB 2.0	USB 2.0, USB 3.0 or PCIe
QS Size	100 pins 27mm square	100 pins 27mm square	108 pins 29mm square
Grade / Temperature	Industrial -40°C to 85°C	Industrial -40°C to 85°C	Industrial -40°C to 85°C

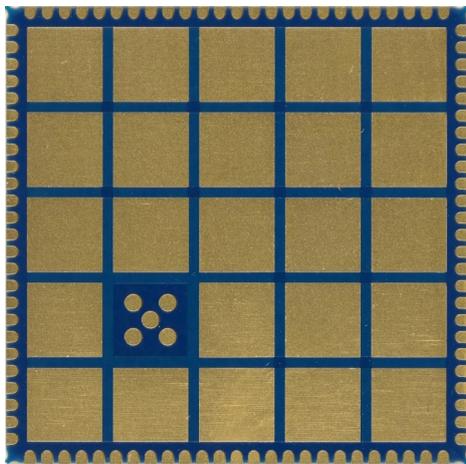
QFN Style Computer On Module Advantages

Defined Return Path

The reason PCB layout becomes more and more important is because of the trend to faster, higher integrated, smaller formfactors, and lower power electronic circuits. The higher the switching frequencies are, the more radiation may occur on a PCB. With good layout, many EMI problems can be minimized to meet the required specifications.

When a module or component is used in a design, the supplier specifies the basis for such a layout. It's not only the pinout which should lead to an easy wiring without the need for crossings. He also has to provide a proper solution for the signal path back to the module. If this return path, mostly the ground plane, cannot be connected near the signal pin, the return current has to take another way and this may result in a loop area. The larger the area, the more radiation and EMI problems may occur.

Ka-Ro QSCOM modules uses a large ground pad on the bottom side. With this a defined ground plane connection is available for all signals. In addition to have a good return path for all signals this large ground pad can be used for cooling.



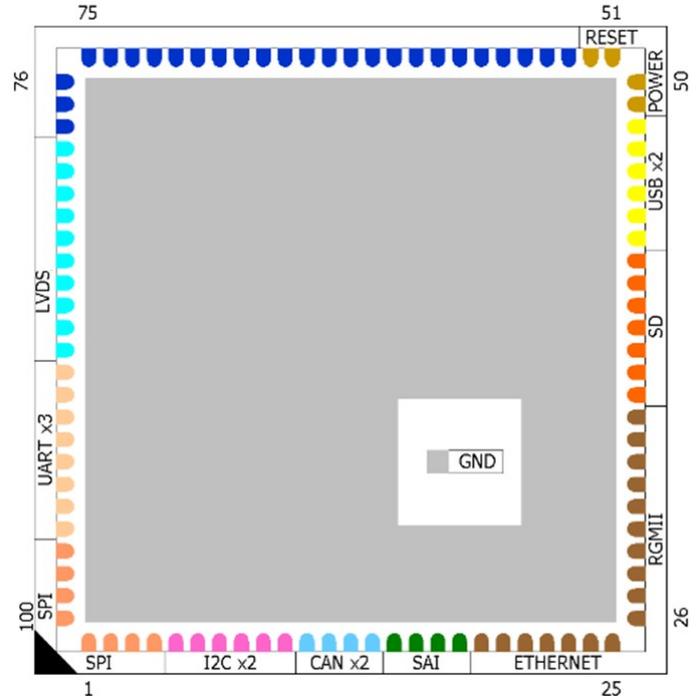
Easy Wiring - Even 2-layer printed circuit boards can be used.

With a solid ground plane on the bottom layer, high speed signals can be routed on the top layer at a defined impedance. However, this is only possible if a peripheral or plug can be connected directly without crossing other routes.

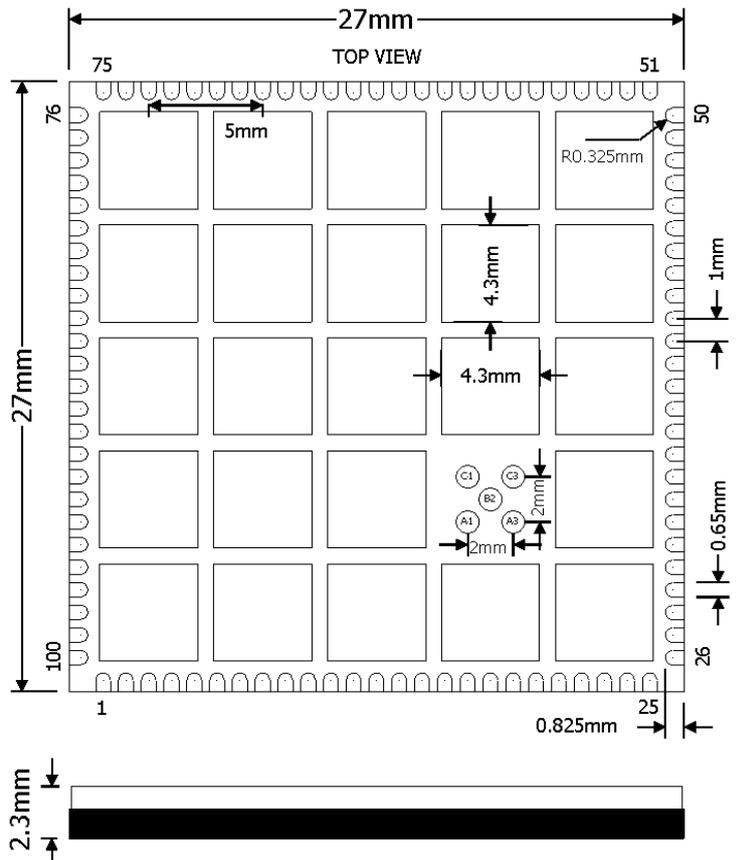
Advanced Soldering

Using a large solder pad underneath the component has not only electrical and thermal advantages. It is also used to hold the component at a defined height during soldering, without the solder being compressed by the weight of the components, which could result in short circuits.

Standard Contact Assignments



Package Information

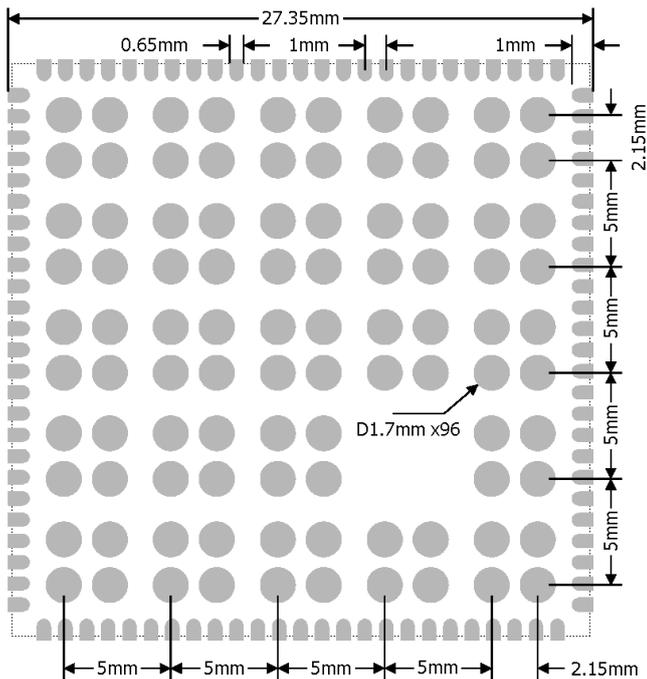


Soldering Recommendations

Ka-Ro QSCOM modules are compatible with industrial standard reflow profile for Pb-free solders. Ka-Ro will give following recommendations for soldering the module to ensure reliable solder joint and operation of the module after soldering. Since the profile used is process and layout dependent, the optimum profile should be studied case by case. Thus following recommendations should be taken as a starting point guide.

- Refer to technical documentations of particular solder paste for reflow profile configurations
- Avoid using more than one flow.
- A 150µm stencil thickness is recommended.
- Aperture size of the stencil should be 1:1 with the pad size.
- A low residue, "no clean" solder paste should be used due to low mounted height of the component.

Recommended stencil design

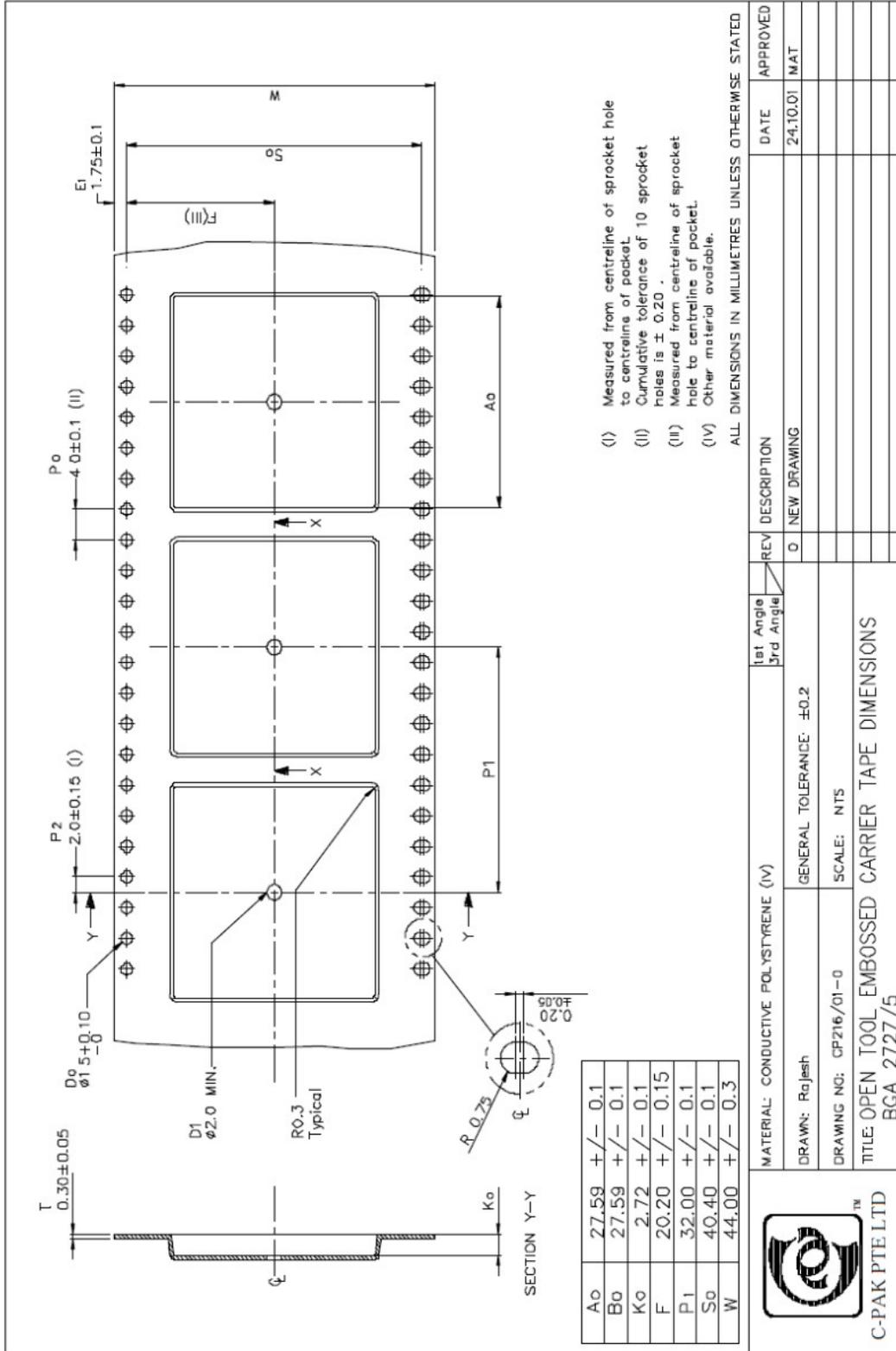


Aperture size of the stencil is 1:1 with the pad size. Four 1.7mm diameter bumps are used for each of the 4.3mm square GND pads sections giving a 50% solder paste padding. The lower component settling with this ensures that the pads at the edge are always soldered even at vertical misalignment by distortion or warping.

Thermal Considerations

A low residue, "no clean" solder paste should be used due to low mounted height of the component. The QSCOM module consume more than 1 W of DC power. In any application where high ambient temperatures for more than a few seconds can occur, it is important that a sufficient cooling surface is provided to dissipate the heat. The thermal pad at the bottom of the module must be connected to the application board ground planes by soldering. The application board should provide a number of vias under and around the pad to conduct the produced heat to the board ground planes, and preferably to a copper surface on the other side of the board in order to conduct and spread the heat. The module internal thermal resistance should in most cases be negligible compared to the thermal resistance from the module into air, and common equations for surface area required for cooling can be used to estimate the temperature rise of the module. Only copper planes on the circuit board surfaces with a solid thermal connection to the module ground pad will dissipate heat. For an application with high load the maximum allowed ambient temperature should be reduced due to inherent heating of the module, especially with small fully plastic enclosed applications where heat transfer to ambient air is low due to low thermal conductivity of plastic. The module measured on the evaluation board exhibits a temperature rise of about 20°C above ambient temperature. An insufficiently cooled module will rapidly heat beyond operating range in ambient room temperature.

Packaging



- (I) Measured from centreline of sprocket hole to centreline of pocket.
- (II) Cumulative tolerance of 10 sprocket holes is ± 0.20 .
- (III) Measured from centreline of sprocket hole to centreline of pocket.
- (IV) Other material available.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED

	MATERIAL: CONDUCTIVE POLYSTYRENE (IV)		1st Angle	REV	DESCRIPTION	DATE	APPROVED
	DRAWN: Rqjesh		3rd Angle	0	NEW DRAWING	24.10.01	MAT
DRAWING NO: CP216/01-0		GENERAL TOLERANCE: ± 0.2		SCALE: NTS			
TITLE: OPEN TOOL EMBOSSED CARRIER TAPE DIMENSIONS BCA 2727/5							
C-PAK PTE LTD							

THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO C-PAK PTE.LTD.

PINOUT (STM32MP2 pads named PA, PB, etc. can be used as GPIO ports)							
PIN	QSCOM STANDARD	MP2 PAD	Alternate Function 0-3	Alternate Function 4-7	Alternate Function 8-11	Alternate Function 12-15	Remarks / Length [µm] Additional functions
1st SPI							
1	SPIA_NSS	PD5	TRACED1 SPI4_NSS HDP_HDP4 SAI1_D4	SAI1_FS_B - - -	TIM1_CH3N TIM4_CH2 OCTOSPIM_P1_IO1 -	- DCMIPP_D13 - -	32890
2	SPIA_MISO	PD4	TRACED0 SPI4_MISO HDP_HDP3 SAI1_D3	SAI1_SD_B - - -	TIM1_CH4N TIM4_CH1 OCTOSPIM_P1_IO0 -	- DCMIPP_D14 - -	32856
3	SPIA_MOSI	PD6	TRACED2 SPI4_MOSI HDP_HDP5 -	SAI1_SCK_B MDF1_SDI2 - -	TIM1_CH2N TIM4_CH3 OCTOSPIM_P1_IO2 -	- DCMIPP_D12 - -	30667
4	SPIA_SCK	PD7	DEBUG_TRACED3 SPI4_SCK SPI1_RDY -	SAI1_MCLK_B MDF1_CKI2 - -	TIM1_CH1N TIM4_CH4 OCTOSPIM_P1_IO3 -	- DCMIPP_D11 - -	32201
I2C							
5	I2CA_SCL	PB5	- I2S2_MCK UART4_DE/UART4_RTS	SAI4_SD_B - - -	- I2C2_SCL OCTOSPIM_P2_IO5 -	FMC_D8/FMC_DA8 I3C2_SCL SDMMC3_D123DIR -	35735
6	I2CA_SDA	PB4	- SPI2_RDY UART4_CTS	SAI4_FS_B - TIM14_CH1 -	- I2C2_SDA OCTOSPIM_P2_IO4 -	I3C2_SDA - -	37252
7	INTA	PD15	- SPI1_RDY -	DSIHOST_TE - FDCAN1_TX	TIM1_BKIN2 TIM5_ETR I2C7_SCL FMC_D3/FMC_DA3	SDMMC3_CKIN DCMIPP_D0 - -	32849
8	I2CB_SCL	PG6	DEBUG_TRACED4 HDP_HDP4 SPI5_SCK I2S1_CK/SPI1_SCK	- - - TIM2_CH4	- - - -	LTDC_R6 DCMIPP_HSYNC -	GPIO I2C bit-banging 44474
9	I2CB_SDA	PG5	DEBUG_TRACED3 HDP_HDP3 USART6_DE/USART6_RTS	- - - TIM2_CH3	- - - -	LTDC_R5 DCMIPP_PIXCLK -	GPIO I2C bit-banging 43876
10	INTB	PD14	- I2S1_MCK -	- - FDCAN1_RX	TIM11_CH1 - I2C7_SDA FMC_D4/FMC_DA4	SDMMC3_D3 DCMIPP_D1 - -	30087
CAN							
11	CANA_RX	PB11	- I2S3_MCK -	- USART1_CTS/USART1_NSS FDCAN1_RX	TIM12_CH2 OCTOSPIM_P2_NCLK OCTOSPIM_P2_NCS2	FMC_D14/FMC_DA14 OCTOSPIM_P1_NCS2 -	35440
12	CANA_TX	PB9	SPI3_RDY -	- USART1_DE/USART1_RTS FDCAN1_TX	TIM10_CH1 OCTOSPIM_P2_DQS OCTOSPIM_P2_NCS2	FMC_D13/FMC_DA13 - -	34416
13	CANB_RX	PI10	SAI1_SCK_A I2S1_CK/SPI1_SCK SPDIFRX_IN0	FDCAN2_RX MDF1_CCK0 -	TIM4_CH1 -	FMC_D12/FMC_DA12 DSIHOST_TE -	30852
14	CANB_TX	PI9	- I2S2_SDO/SPI2_MOSI -	FDCAN2_TX - -	TIM16_BKIN - FMC_NWAIT	DSIHOST_TE LTDC_B0 -	30359
SAI							
15	SAI_TX	PD1	- HDP_HDP1 I2S1_SDI/SPI1_MISO SAI1_CK2	- SAI4_SD_A UART7_DE/UART7_RTS TIM15_CH1	TIM1_BKIN - OCTOSPIM_P1_NCLK OCTOSPIM_P1_NCS2	OCTOSPIM_P2_NCS2 DCMIPP_HSYNC -	32698
16	SAI_RX	PI3	- - LPTIM1_IN2	- SAI4_SD_B - USART1_CTS/USART1_NSS	TIM8_CH2 - -	- LTDC_B6 DCMIPP_D14	40667
17	SAI_SCK	PD2	HDP_HDP2 I2S1_WS/SPI1_NSS SAI1_CK1	SAI4_SCK_A UART7_CTS TIM15_BKIN	TIM1_ETR - OCTOSPIM_P1_DQS OCTOSPIM_P1_NCS2	- DCMIPP_VSYNC -	25321

PIN	QSCOM STANDARD	MP2 PAD	Alternate Function 0-3	Alternate Function 4-7	Alternate Function 8-11	Alternate Function 12-15	Remarks / Length [µm] Additional functions
18	SAI_FS	PD0	DEBUG_TRACECLK HDP_HDP0 - SAI1_D2	- SAI4_FS_A UART7_RX TIM15_CH2	- - OCTOSPIM_P1_CLK -	- DCMIPP_PIXCLK -	29451
ETHERNET 1							
19	ENET_RST	PB2	- I2S2_SDO/SPI2_MOSI	- MDF1_CK13 TIM17_BKIN TIM16_BKIN	- - OCTOSPIM_P2_IO2 -	- -	29575
20	ENET_CK125	PH9	- -	SAI3_MCLK_A - USART6_RX TIM15_CH1N	- - ETH1_RGMII_CLK125 ETH1_MII_RX_ER	- -	ADC3_INP4 35645
21	ENET_INT	PF5	- -	SAI3_MCLK_A - USART6_TX TIM4_CH3	- ETH1_MDIO ETH1_CLK ETH2_PHY_INTN ETH1_PHY_INTN	- LTDC_B6 -	37284
22	ENET_MDIO	PA10	- SPI4_MISO	SAI2_SD_B - USART2_RX LPTIM5_IN1	- TIM2_CH2 ETH1_MDIO -	LTDC_R6 DCMIPP_D15/PSSI_D15 -	31546
23	ENET_MDC	PF4	RTC_OUT2 -	SAI3_SCK_A - USART6_RX TIM4_CH4	- ETH1_MDC ETH2_CLK ETH2_PPS_OUT ETH1_PPS_OUT	LTDC_B7 -	39508
24	ENET_RXC	PA14	- SPI8_NSS LPTIM2_CH2	SAI4_FS_B MDF1_CCK1 -	- - ETH1_RXC/REF_CLK -	- -	41128
25	ENET_RX_CTL	PA11	- SPI8_SCK LPTIM2_CH1	SAI4_SD_B -	- - ETH1_RX_CTL/CRS_DV -	- -	41192
26	ENET_RXD0	PF1	SPI8_MISO LPTIM2_IN2	SAI4_SCK_B - USART2_CK	- - ETH1_RXD0 -	- -	41123
27	ENET_RXD1	PC2	SPI8_MOSI LPTIM2_IN1	SAI4_MCLK_B MDF1_SD13 USART2_DE/USART2_RTS	- - ETH1_RXD1 -	- -	40434
28	ENET_RXD2	PH12	- I2S3_WS/SPI3_NSS	- -	TIM10_CH1 - ETH1_RXD2 -	- -	41103
29	ENET_RXD3	PH13	- I2S3_CK/SPI3_SCK	- -	TIM11_CH1 - ETH1_RXD3 -	- -	41126
30	ENET_TX_CTL	PA13	- SPI8_RDY I2S3_MCK LPTIM2_ETR	MDF1_CK13 USART2_CTS/USART2_NSS	- I2C7_SMBA ETH1_TX_CTL/TX_EN -	- -	37346
31	ENET_TXC	PC0	- LPTIM1_CH1	SAI3_MCLK_B USART6_TX -	- DCMIPP_D0 ETH2_RMII_REF_CLK ETH1_MII_TX_CLK	ETH1_RGMII GTX_CLK LTDC_G7 -	37307
32	ENET_TXD3	PH11	- -	SAI3_FS_A - TIM15_CH2	- ETH2_MDIO ETH1_TXD3 -	- -	37300
33	ENET_TXD2	PH10	- I2S1_CK/SPI1_SCK	SAI3_SCK_A - TIM15_CH1	- ETH2_MDC ETH1_TXD2 -	- -	ADC3_INP8, ADC3_INN4 37378
34	ENET_TXD1	PC1	- I2S3_SDO/SPI3_MOSI	- USART2_TX	- I2C7_SCL ETH1_TXD1 -	- -	37212
35	ENET_TXD0	PA15	- I2S3_SDI/SPI3_MISO	- USART2_RX	- I2C7_SDA ETH1_TXD0 -	- -	37156
SD							
36	SD_CD	PA4	- -	- USART2_TX FDCAN2_TX	TIM2_CH1 - LTDC_R1	ETH1_PTP_AUX_TS -	26807

PIN	QSCOM STANDARD	MP2 PAD	Alternate Function 0-3	Alternate Function 4-7	Alternate Function 8-11	Alternate Function 12-15	Remarks / Length [µm] Additional functions
37	SD_D1	PE5	DEBUG_TRACED1 LPTIM2_IN2 I2S1_WS/SPI1_NSS I2S3_WS/SPI3_NSS	SAI1_FS_B - USART3_DE/USART3_RTS FDCAN1_RX	- - SDMMC1_D1 -	- - - -	18840
38	SD_D0	PE4	DEBUG_TRACED0 LPTIM2_IN1 I2S1_SDO/SPI1_MOSI I2S3_SDI/SPI3_MISO	SAI1_SD_B - USART3_CTS/USART3_NSS FDCAN1_TX	- - SDMMC1_D0 -	- - - -	18837
39	SD_CLK	PE3	DEBUG_TRACECLK - SPI1_RDY I2S3_CK/SPI3_SCK	SAI1_MCLK_B - USART3_TX -	TIM11_CH1 - SDMMC1_CK -	- - - -	18847
40	SD_CMD	PE2	- LPTIM2_ETR I2S1_SDI/SPI1_MISO I2S3_SDO/SPI3_MOSI	SAI1_SCK_B - - -	TIM10_CH1 - SDMMC1_CMD -	- - - -	18817
41	SD_D3	PE1	DEBUG_TRACED3 LPTIM2_CH2 I2S1_MCK I2S3_MCK	- - USART3_RX -	- - SDMMC1_D3 -	- - - -	18849
42	SD_D2	PE0	DEBUG_TRACED2 LPTIM2_CH1 I2S1_CK/SPI1_SCK SPI3_RDY	- - USART3_CK -	- - SDMMC1_D2 -	- - - -	18721

USB

43	USBA_VBUS	UCPD1_CC2					25191
44	USBA_DN	USBH_HS_DM					33675
45	USBA_DP	USBH_HS_DP					34067
46	USBB_VBUS	UCPD1_CC1					39269
47	USBB_DN	USB3DR_DM					34964
48	USBB_DP	USB3DR_DP					35069

POWER SUPPLY & RESET

49	VIN	3.3V power supply input					
50							
51	NRST	Open drain reset to reset of external devices, or to reset the device. Connected to STM32MP2 NRST and PCA9450 POR_B, 10K-PU					
52	BOOT_MODE	Connected to STM32MP2 BOOT1, 10K-PU. BOOT[0,2,3]=L					H: Boot from eMMC L: Boot from USB

MISC

53		PB15	- LPTIM1_IN2 SPI5_SCK -	SAI2_SD_B UART5_RX - TIM3_CH2	TIM5_CH1 - ETH1_PPS_OUT -	FMC_A18 LTDC_R4 DCMIPP_D8 -	ADC1_INP15, ADC3_INP5 30653
54		PF3	- - - -	SAI2_SCK_B MDF1_CCK0 - TIM3_CH4	TIM8_BKIN2 ETH1_CLK ETH2_PPS_OUT -	FMC_A20 LTDC_R6 DCMIPP_HSYNC -	ADC1_INP16, ADC1_INN15 27246
55		PG3	- LPTIM1_ETR SPI5_MOSI -	SAI2_FS_B - - TIM3_CH3	TIM8_ETR ETH2_CLK ETH2_PHY_INTN -	FMC_A19 LTDC_R5 DCMIPP_PIXCLK -	WKUP6, TAMP_IN7, ADC1/2/3_INP3 34344
56		PG2	- RTC_REFIN I2S3_MCK -	SAI2_FS_A - USART3_CK -	TIM5_CH3 - ETH2_MII_TX_CLK ETH2_RGMII_CLK125	FMC_CLK LTDC_HSYNC - -	WKUP5, ADC1_INP2, ADC2_INP2 19039

MIPI-CSI

57	CSI1_D1_P	CSI_D1P					11904
58	CSI1_D1_N	CSI_D1N					11895
59	CSI1_D0_P	CSI_D0P					11825
60	CSI1_D0_N	CSI_D0N					11819
61	CSI1_CLK_P	CSI_CKP					11896
62	CSI1_CLK_N	CSI_CKN					11814

ETHERNET 2

PIN	QSCOM STANDARD	MP2 PAD	Alternate Function 0-3	Alternate Function 4-7	Alternate Function 8-11	Alternate Function 12-15	Remarks / Length [µm] Additional functions
63	ENET2_TXC	PF7	- SPDIFRX_IN1 -	SAI3_SD_A - - TIM2_ETR	- - ETH2_GTX_CLK ETH2_MII_TX_CLK	- LTDC_R1 -	19894
64	ENET2_TD3	PC10	- I2S3_SDO/SPI3_MOSI -	- - LPTIM4_ETR SAI2_SCK_A	TIM8_CH4 USBH_HS_VBUSEN ETH2_TXD3 USB3DR_VBUSEN	FMC_A23 LTDC_G3 DCMIPP_D6	ADC1_INP5, ADC2_INP5 19813
65	ENET2_TD2	PC9	RCC_MCO_1 I2S3_SDI/SPI3_MISO -	- - TIM13_CH1 SAI3_SCK_B	TIM8_CH4N USBH_HS_OVRCUR ETH2_TXD2 USB3DR_OVRCUR	FMC_A22 LTDC_G2 DCMIPP_D7	ADC1/2_INP8, ADC1/2_INN4 19826
66	ENET2_TD1	PC8	LPTIM1_ETR -	USART6_CTS/USART6_NSS	TIM8_CH2 ETH2_TXD1 ETH1_MII_TXD3	- LTDC_B3 DCMIPP_D2	19756
67	ENET2_TD0	PC7	- -	SAI3_SD_B -	TIM8_CH2N - ETH2_TXD0 ETH1_MII_TXD2	- LTDC_B4 DCMIPP_D1	19858
68	ENET2_TX_CTL	PC4	- -	SAI3_FS_B -	- ETH2_TX_CTL/TX_EN	ETH1_RGMII_CLK125 LTDC_R0	TAMP_IN1 19852
69	ENET2_RX_CTL	PC3	LPTIM1_IN2 I2S3_WS/SPI3_NSS -	USART6_DE/USART6_RTS FDCAN2_TX	- ETH2_RX_CTL/CRS_DV ETH1_MII_RX_ER	- LTDC_G6 DCMIPP_D3	ADC1/2/3_INP12, ADC1/2/3_INN10, TAMP_IN3 11277
70	ENET2_RXC	PF6	RTC_OUT2 - SAI3_MCLK_B	USART6_CK TIM12_CH1	- ETH2_RX_CLK/REF_CLK	LTDC_B0 -	TAMP_IN5 11293
71	ENET2_RD3	PC11	LPTIM1_CH1 SPI5_NSS -	SAI2_MCLK_A UART5_DE/UART5_RTS USART3_DE/USART3_RTS TIM3_CH1	TIM5_ETR - ETH2_RXD3	FMC_NBL1 LTDC_R2 DCMIPP_D10	ADC1/2/3_INP7, ADC1/2/3_INN3 11101
72	ENET2_RD2	PF9	- SAI3_SD_B	SAI2_SD_A - TIM2_CH2	- ETH2_RXD2 ETH2_MDIO		11134
73	ENET2_RD1	PC12	LPTIM1_CH2 -	MDF1_CK12	TIM8_CH3 - ETH2_RXD1 ETH1_MII_RXD3	- LTDC_G1 DCMIPP_D5/DCMI_D5/PSS I_D5	ADC1_INP17 11113
74	ENET2_RD0	PG0	LPTIM1_IN1 -	MDF1_SDI2	TIM8_CH3N - ETH2_RXD0 ETH1_MII_RXD2	LTDC_G5 DCMIPP_D4/DCMI_D4/PSS I_D4	ADC1_INP18, ADC1_INN17 11140
75	ENET2_MDIO	PC5	- SPDIFRX_IN1 -	MDF1_SDI1	TIM8_CH1N - ETH2_MDIO ETH1_MII_COL	FMC_A25 ETH1_PPS_OUT LTDC_DE	ADC1/2/3_INP10, TAMP_IN6 10855
76	ENET2_MDC	PG4	- SPI5_MISO SAI3_FS_B	- - LPTIM4_IN1	TIM8_BKIN - ETH2_PPS_OUT ETH2_MDC	FMC_A21 LTDC_R7 DCMIPP_VSYNC/DCMI_VSYN NC/PSSI_RDY	PVD_IN, ADC1_INP4, ADC2_INP4 12869
Display Control							
77	LCD_EN	PH5	- -	SAI2_FS_A - - TIM2_CH1	UART7_RX - LTDC_G1 USB3DR_VBUSEN	USBH_HS_VBUSEN ETH2_PTP_AUX_TS -	WKUP2 13253
78	LCD_BL	PF13	DEBUG_TRACED0 HDP_HDP0 AUDIOCLK USART6_TX	I2S2_WS/SPI2_NSS - USART3_CTS/USART3_NSS	- TIM3_CH3 -	- LTDC_R2 -	13965
LVDS DISPLAY							
79	CSI_CKP LVDS_TX3P	LVDS_D3P					17609
80	DSI_DP3 LVDS_TX3N	LVDS_D3N					17696
81	DSI_DN3 LVDS_TX2P	LVDS_D2P					17361
82	DSI_DN3 LVDS_TX2N	LVDS_D2N					17356

PIN	QSCOM STANDARD	MP2 PAD	Alternate Function 0-3	Alternate Function 4-7	Alternate Function 8-11	Alternate Function 12-15	Remarks / Length [µm] Additional functions
83	DSI_DP1 LVDS_TX1P	LVDS_D1P					17473
84	DSI_DN1 LVDS_TX1N	LVDS_D1N					17476
85	DSI_DP0 LVDS_TX0P	LVDS_D0P					17579
86	DSI_DN0 LVDS_TX0N	LVDS_D0N					17454
87	DSI_CKP LVDS_CLKP	LVDS_D4P					17612
88	DSI_CKN LVDS_CLKN	LVDS_D4N					17398

UART

89	UARTA_RXD	PB6	- I2S2_SDI/SPI2_MISO UART4_RX	SAI4_SCK_B - -	- - OCTOSPIM_P2_IO6	FMC_D9/FMC_DA9 - SDMMC3_D0DIR	18591
90	UARTA_TXD	PB7	- I2S3_CK/SPI3_SCK UART4_TX	SAI4_MCLK_B - -	- - TIM12_CH1 OCTOSPIM_P2_IO7	FMC_D10/FMC_DA10 - SDMMC3_CDIRE	16284
91	UARTB_RXD	PI7	- - -	- USART3_RX TIM2_CH1	- - TIM3_CH2	- - LTDC_HSYNC	23722
92	UARTB_TXD	PI6	- RCC_MCO_1 -	- USART3_TX TIM2_ETR	- - TIM3_CH1	- LTDC_VSYNC -	WKUP4 28641
93	UARTC_RXD	PG10	- DEBUG_TRACED8 HDP_HDP0 -	- UART5_RX -	- - TIM8_CH4N	- LTDC_G4 DCMIPP_D4/DCMI_D4/PSS I_D4	32520
94	UARTC_TXD	PG9	- DEBUG_TRACED7 -	- UART5_TX -	- - TIM5_CH4	- LTDC_G3 DCMIPP_D3/DCMI_D3/PSS I_D3	57848
95	UARTC_CTS	PG1	- LPTIM1_IN1 I2S3_MCK -	SAI2_SD_A UART5_CTS USART3_CTS/USART3_NSS	TIM5_CH4 - ETH2_MII_RX_ER ETH2_MII_RXD3	FMC_NBL0 LTDC_VSYNC DCMIPP_D11/DCMI_D11/P SSI_D11	CTS/RTS input signal WKUP3, TAMP_IN4 ADC1/2_INP6/INN2, 19676
96	UARTC_RTS	PG8	- DEBUG_TRACED6 HDP_HDP6 SPI5_RDY SPI1_RDY	USART6_CK UART5_DE/UART5_RTS -	TIM5_CH3 - -	- LTDC_G2 DCMIPP_D2/DCMI_D2/PSS I_D2	RTS/CTS output signal 51192

2nd SPI

97	SPIB_NSS	PA8	- LPTIM2_CH2 -	SAI1_FS_B - USART1_CK	USART2_RX - -	LTDC_B2 DCMIPP_D4	GPIO SPI bit-banging 23395
98	SPIB_MISO	PD12	- I2S2_SDI/SPI2_MISO SPDIFRX_IN2	- -	- - TIM4_ETR SDMMC3_CMD FMC_D6/FMC_DA6	FMC_D1/FMC_DA1 -	GPIO SPI bit-banging 17262
99	SPIB_MOSI	PG11	- DEBUG_TRACED9 HDP_HDP1 -	- - FDCAN1_TX	- - -	LTDC_G5 DCMIPP_D5	GPIO SPI bit-banging 46106
100	SPIB_SCK	PB13	- -	SAI1_SD_B -	- - SDMMC3_CK FMC_D5/FMC_DA5	FMC_D0/FMC_DA0 -	GPIO SPI bit-banging 31477

Pins used for manufacturing and debugging – leave unconnected

PIN	(SPM32MP2 PAD NAME)	PIN	(SPM32MP2 PAD NAME)	PIN	(SPM32MP2 PAD NAME)
C1	JTAG_TDI (JTDI)			C3	JTAG_TCK (JTCK_SWCLK)
		B2	JTAG_TDO (JTDO_TRACESWO)		
A1	JTAG_TRST_B (NJTRST)			A3	JTAG_TMS (JTMS_SWDIO)

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	- - - SAI1_SCK_A	TIM1_CH1N - - TIM15_CH1N	SDMMC2_CMD - - FMC_NOE	10K-PU	
	CLK	PE14	- - - SAI1_MCLK_A	TIM1_BKIN - - TIM15_BKIN	SDMMC2_CLK - - FMC_NWE	10K-PU	
	DAT0	PE13	- - - SAI1_SD_A	TIM1_CH2N - - TIM15_CH1	SDMMC2_D0 - - FMC_RNB	10K-PU	
	DAT1	PE11	- - - 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_CK10 - -	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 PCA9450A	SDA	PI1	DEBUG_TRACED15 HDP_HDP7 - -	- - - -	TIM8_CH3N I2C1_SDA I3C1_SDA -	1K-PU	
	SCL	PG13	DEBUG_TRACED11 HDP_HDP3 SPI7_SCK -	MDF1_CK16 - - -	TIM8_CH2N I2C1_SCL I3C1_SCL -	10K-PU	
	IRQ_B	PD11	DEBUG_TRACED7 I2S1_CK/SPI1_SCK SAI1_MCLK_A	UART4_TX MDF1_CK10 - -	TIM1_CH1 - OCTOSPIM_P1_IO7 SDMMC1_D4	SDMMC1_CKIN DCMIPP_D7/DCMI_D7/PSSI_D7 -	10K-PU
	POR_B	NRST					10K-PU
	PMIC_ON_REQ	PWR_ON					
	PMIC_STBY_REQ	PWR_LP					
	WDOG_B	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 -	10K-PU