

MSMP1EVK

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ABOUT THIS MANUAL

1.1 Imprint

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1.5 Care and Maintenance

- Keep the device dry. Precipitation, humidity, and all types of liquids or moisture can contain minerals that will corrode electronic circuits. If your device does get wet, allow it to dry completely.
- Do not use or store the device in dusty, dirty areas. Its moving parts and electronic components can be damaged.
- Do not store the device in hot areas. High temperatures can shorten the life of electronic devices, damage batteries, and warp or melt certain plastics.
- Do not store the device in cold areas. When the device returns to its normal temperature, moisture can form inside the device and damage electronic circuit boards.
- Do not attempt to open the device.
- Do not drop, knock, or shake the device. Rough handling can break internal circuit boards and fine mechanics.
- Do not use harsh chemicals, cleaning solvents, or strong detergents to clean the device.
- Do not paint the device. Paint can clog the moving parts and prevent proper operation.
- Unauthorized modifications or attachments could damage the device and may violate regulations governing radio devices.

1.6 Change Log

Revision	Date	Revised	Comment
1.0	10.08.2022	dk	Initial creation
2.0	28.04.2023	wa	Updating STMP1 to STM32MP1, ST Microelectronics to STMicroelectronics

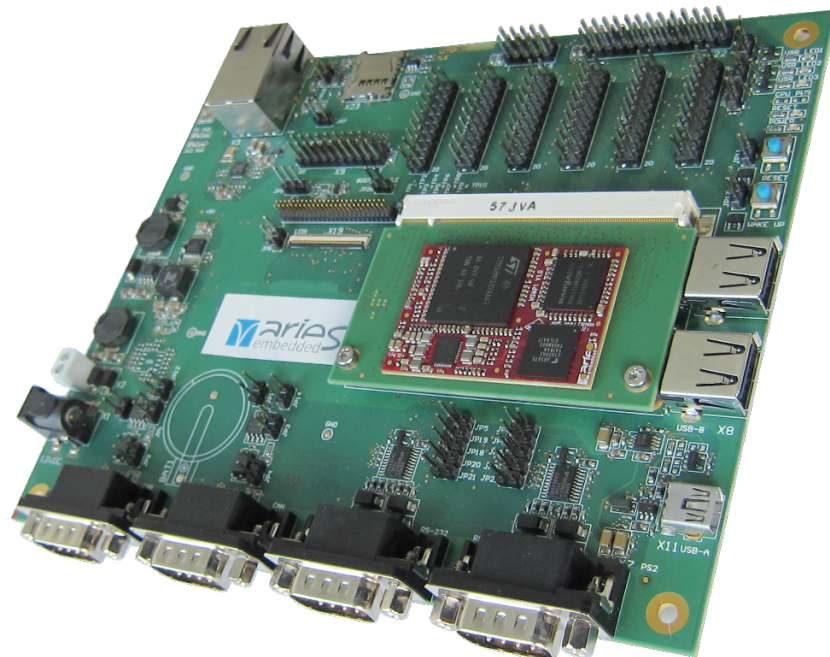
CHAPTER
TWO

OVERVIEW

2.1 MSMP1EVK

The MSMP1EVK supports a quick start-up of CPU projects and can easily be used as a fast-prototype platform.

The MSMP1EVK contains the Open Standard Module compliant System-In-Package based on STMicroelectronics STM32MP1 Family architecture offering high-performance single/dual CortexA7 cores in combination with a CortexM4 core.



2.2 Feature Set

- MSMP1 SiP
 - STM32MP157
 - Single/Dual Cortex-A7, up to 800MHz
 - Cortex-M4, up to 209MHz
 - 512MB LPDDR3 RAM
 - 4GB eMMC
 - -25...+85°C
- Ethernet 10/100MBit on RJ45
- Camera Port
- LCD Interface
- Dual UART on DSUB9
- Dual CAN on DSUB9
- USB Host
- USB Host/OTG
- microSD card slot
- JTAG
- size 165mm x 135mm

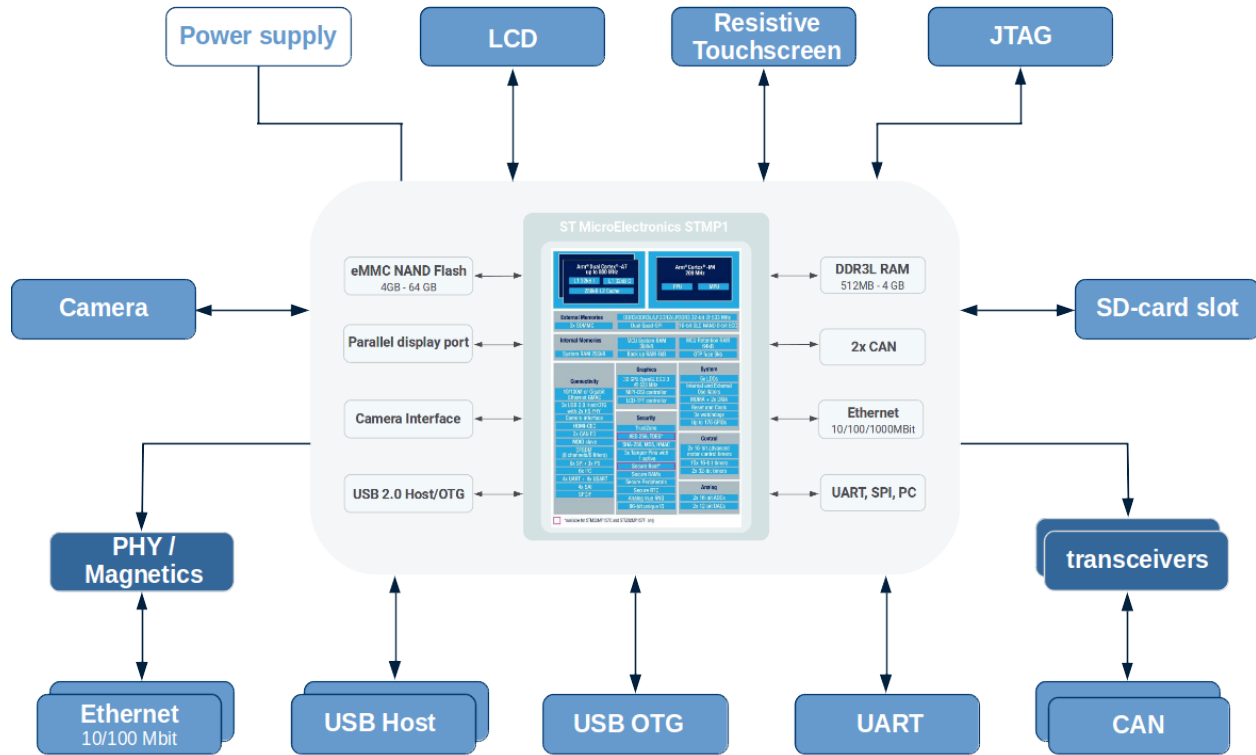
2.3 Order Codes

MSMP157EVK-AAE

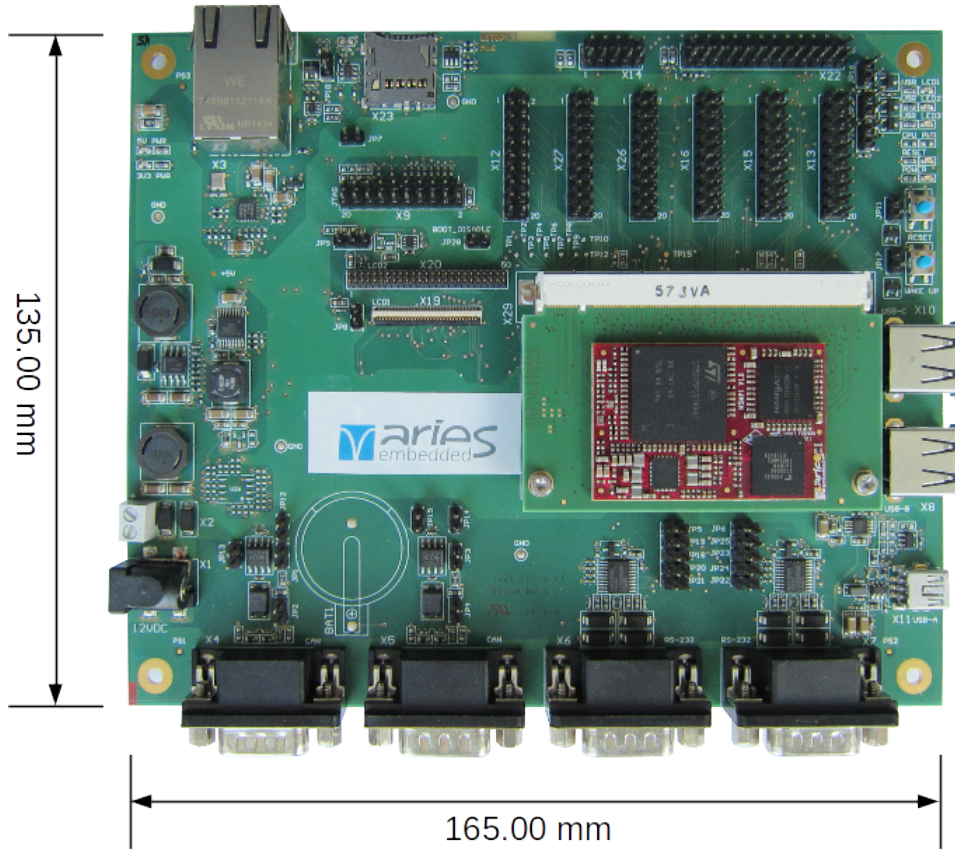
- MSMP1 SiP
 - STM32MP157
 - Cortex-M4, up to 209MHz
 - 512MB LPDDR3 RAM
 - 4GB eMMC
 - -25...+85°C

Please contact ARIES Embedded for more information about the availability of other standard products of MSMP1EVK or custom configurations.

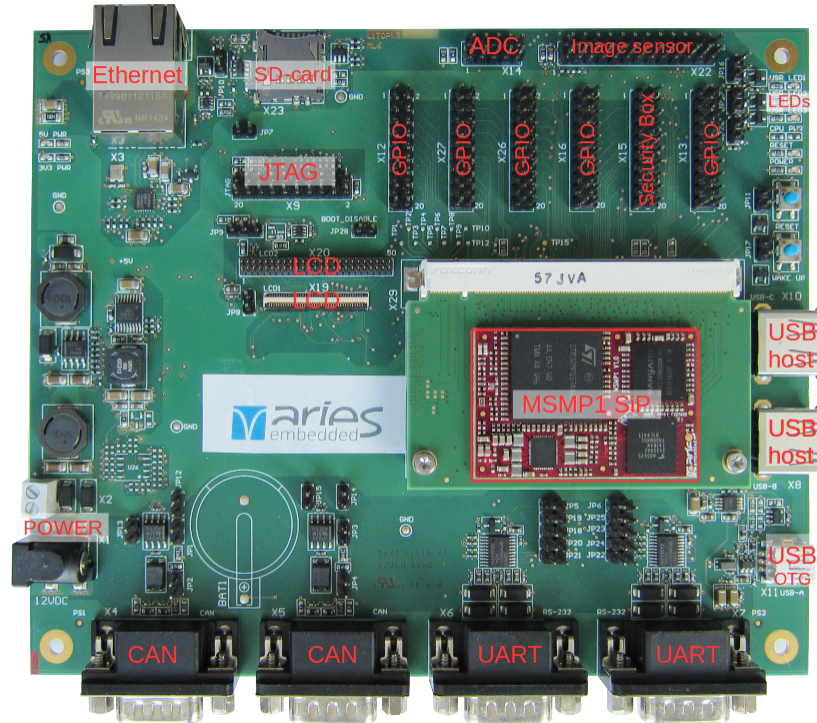
2.4 Block Diagram



2.5 Dimensions

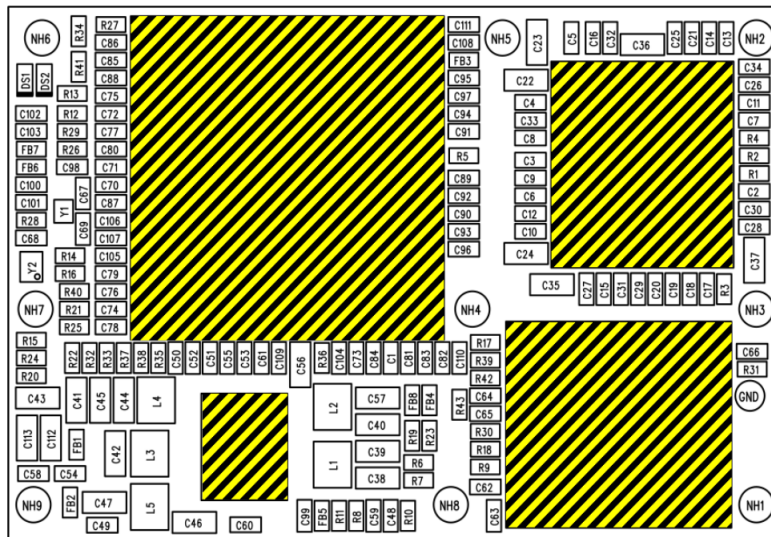


2.6 Part Overview



2.7 Handling Recommendations

To avoid mechanical damage to the components populated on MSMP1 it is strongly recommended not to apply mechanical force on the Ball Grid Array (BGA) components. The BGA components are marked as shaded in the figure below:



RESOURCES**3.1 Components****3.1.1 Ethernet**

MSMP1EVK offers 10/100 MBit Ethernet Channel on connector X3. For best flexibility the Ethernet-PHY KSZ8081 (Micrel) is populated on the MSMP1EVK baseboard.

Connector X3:

Function MSMP1EVK	Pin	MPU Pin	Function MSMP1	SiP Pads
PB17/FEC0 MDIO	174	AB2	ETH_MDIO	T15
PB16/FEC0 MDC	173	AB3	ETH_MDC	T16
PB0/FEC0 TXCK	189	V4	ETH_RGMII_RX_CLK	R15
PB8/FEC0 RX0	181	AB6	ETH_RGMII_RXD0	K15
PB9/FEC0 RX1	182	AA6	ETH_RGMII_RXD1	L15
PB6/FEC0 RXDV	183	Y9	ETH_RGMII_RX_CTL	M15
PB7/FEC0 RXER	184	W1	ETH_GMII_RX_ER	L16
PB12/FEC0 TX0	177	AA1	ETH_RGMII_TXD0	H15
PB13/FEC0 TX1	178	AA2	ETH_RGMII_TXD1	G15
PB2/FEC0 TXEN	187	Y5	ETH_RGMII_TX_CTL	K16
3.3V NRST	–	–	–	–

3.1.2 CAN

Please note that the CAN interface can only be functional in case one or two of the optional CAN interfaces on the MA5D4 System on Module are populated. The CAN interfaces 1 and 2 are available on connectors X4 and X5.

Termination

- To apply 120R termination to the interface
 - jumper JP2 has to be closed for CAN interface 1
 - jumper JP4 has to be closed for CAN interface 2

Signal enable

- To connect the CAN signals of the CAN controller to the SN65HVD320 CAN transceiver jumper have to be closed accordingly.
 - JP12, JP13 for CAN interface 1
 - JP14, JP15 for CAN interface 2

Slope control

- To enable slope control
 - jumper JP1 has to be closed for CAN interface 1
 - jumper JP3 has to be closed for CAN interface 2

Connector X4:

Function MSMP1EVK	Pin	MPU Pin	Function MSMP1	SiP Pads
ePB23/SPI1_NCS2/ CAN1_TX/EBI_D13	166	D3	FDCAN1_TX	AC17
ePB22/SPI1_NCS1/ CAN1_RX/EBI_D12	165	C2	FDCAN1_RX	AB17

Connector X5:

Function MSMP1EVK	Pin	MPU Pin	Function MSMP1	SiP Pads
ePE7/CAN2_TX/EBI_A7	52	V10	FDCAN2_TX	AC19
ePE6/CAN2_RX/EBI_A6	51	AA7	FDCAN2_RX	AB19

3.1.3 UART

The UART interfaces 0 and 1 are available on connectors X6 and X7.

- The SP3222 RS232 line driver has to be activated by closing:
 - jumper JP5 for UART0
 - jumper JP6 for UART1

- To connect the UART signals to the SP3222 RS232 line drive:
 - JP18, JP19, JP20, JP21 for UART0
 - JP22, JP23, JP24, JP25 for UART1

have to be closed accordingly

Connector X6:

Function MSMP1EVK	Pin	MPU Pin	Function MSMP1	SiP Pads
PD12/RXD0	149	AA11	UART7_RX (SPI5_NSS)	A14
PD13/TXD0	150	AA10	UART7_TX (SPI5_SCK)	B13
PD11/RTS0	152	AB10	UART7_RTS (SPI5_MISO)	C13
PD10/CTS0	151	AB11	UART7_CTS (SPI5_MOSI)	C14

Connector X7:

Function MSMP1EVK	Pin	MPU Pin	Function MSMP1	SiP Pads
PD16/RXD1	145	V13	UART4_RX	D22
PD17/TXD1	146	U11	UART4_TX	D23
PD15/RTS1	148	–	–	–
PD14/CTS1	147	–	–	–

3.1.4 RESET and WAKE UP Button

Function MSMP1EVK	Pin	MPU Pin	Function MSMP1	SiP Pads
PMIC_RESET#	24	R2	NRST	U17
PMIC_WAKE#	22	–	PMIC/PONKEYn	AA9

3.1.5 JTAG

JTAG is available on a 20 pin header X9.

Function MSMP1EVK	Pin	MPU Pin	Function MSMP1	SiP Pads
PA8/LCD_D8/JTAG_TCK	219	L4	LCD_G0	C19
PA0/LCD_D0/JTAG_TMS	229	B8	LCD_B0	C21
PB24/JTAG_TDI/EBI_D14	163	–	–	–
PB25/JTAG_TDO/EBI_D15	164	–	–	–
PA16/LCD_D16/JTAG_NTRST	209	F3	LCD_R0	C17
3.3N NRST	–	–	–	–
JTAGSEL	–	–	–	–

3.1.6 User LEDs

MSMP1EVK offers three user LEDs. They can be activated by either using a port-signal of the MPU or permanently activated by closing a jumper.

Function MSMP1EVK	Pull-down	Pin	MPU Pin	Function MSMP1	SiP Pads
PD28	R30	113	D10	PG15	E4
PD29	R142	114	–	–	–
PD30	R141	111	–	–	–

3.1.7 USB Host

MSMP1EVK offers two USB 2.0 Host-interfaces.

Connector X10:

Function MSMP1EVK	Pin	MPU Pin	Function MSMP1	SiP Pads
USBC_D_N	64	AB15	USB1_D_N	AB13
USBC_D_P	62	AA15	USB1_D_P	AC14
PE12/USBC_EN/EBI_A12	45	E6	PH9 (GPIO/USB1_EN)	G4
PE14/USB_C_OC/EBI_A14	43	J5	PI9 (GPIO/USB1_OC)	Y32

Connector X8:

Function MSMP1EVK	Pin	MPU Pin	Function MSMP1	SiP Pads
USBB_D_N	70	–	–	–
USBB_D_P	68	–	–	–
PE11/USBB_EN/EBI_A11	48	A2	PH5 (GPIO/USB2_EN)	F4
PE13/USB_B_OC/EBI_A13	46	A3	PH4 (GPIO/USB2_OC)	F3

3.1.8 USB OTG

MSMP1EVK offers one USB-OTG interface on a 6 pin header X11.

Function MSMP1EVK	Pin	MPU Pin	Function MSMP1	SiP Pads
PE10/USBA_EN/EBI_A10	47	–	–	–
PE9/unused/EBI_A9	50	–	–	–
PE31/ADTRG/USB-VBUS	26	V15	OTG_VBUS	AB20
PE8/unused/EBI_A8	49	Y17	OTG_ID	AB22
USBA_D_N	76	AA14	USB2_D_N	AB23
USBA_D_P	74	AB14	USB2_D_P	AC22

3.1.9 LCD Interface

The LCD interface of MSMP1EVK is available on connectors X19 and X20.

Connector X19:

Function MSMP1EVK	Pin	MPU Pin	Function MSMP1	SiP Pads
PA28/LCD_PCK	195	D2	LCD_CLK	M4
PA2/LCD_D2/FEC1_TXCK	227	B7	LCD_B2	R4
PA3/LCD_D3	228	C7	LCD_B3	R3
PA4/LCD_D4/FEC1_TXEN	225	B6	LCD_B4	P3
PA5/LCD_D5	226	A6	LCD_B5	N3
PA6/LCD_D6	223	C6	LCD_B6	N4
PA7/LCD_D7	224	A5	LCD_B7	M3
PA10/LCD_D10/FEC1_RXDV	217	L2	LCD_G2	W4
PA11/LCD_D11/FEC1_RXER	218	J3	LCD_G3	V3
PA12/LCD_D12/FEC1_RX0	215	K6	LCD_G4	V4
PA13/LCD_D13/FEC1_RX1	216	D8	LCD_G5	U3
PA14/LCD_D14/FEC1_TX0	213	E7	LCD_G6	T3
PA15/LCD_D15/FEC1_TX1	214	E8	LCD_G7	T4
PA18/LCD_D18	207	L6	LCD_R2	Y7
PA19/LCD_D19	208	K4	LCD_R3	AA6
PA20/LCD_D20	205	J1	LCD_R4	Y6
PA21/LCD_D21	206	K2	LCD_R5	AA5
PA22/LCD_D22/FEC1_MDC	203	K1	LCD_R6	Y5
PA23/LCD_D23/FEC1_MDIO	204	L5	LCD_R7	Y4
PA29/LCD_DEN	196	B5	LCD_DE	J4
ADC3	67	AB5	PB0/ADC2_IN9 (GPIO)	Y29
ADC2	69	W9	PA6/ADC2_IN3 (GPIO)	D6
ADC1	71	T5	ANA1/ADC2_IN1	N18
ADC0	73	R4	ANA0/ADC1_IN0	M18
PA24/LCD_PWM	199	T4	LCD_BL_CTRL	K4

Connector X20:

Function MSMP1EVK	Pin	MPU Pin	Function MSMP1	SiP Pads
PA25/LCD-DISP	200	-	-	-
PA28/LCD_PCK	195	D2	LCD_CLK	M4
PA0/LCD_D0/JTAG_TMS	229	B8	LCD_B0	C21
PA1/LCD_D1	230	A7	LCD_B1	AA31
PA2/LCD_D2/FEC1_TXCK	227	B7	LCD_B2	R4
PA3/LCD_D3	228	C7	LCD_B3	R3
PA4/LCD_D4/FEC1_TXEN	225	B6	LCD_B4	P3
PA5/LCD_D5	226	A6	LCD_B5	N3
PA6/LCD_D6	223	C6	LCD_B6	N4
PA7/LCD_D7	224	A5	LCD_B7	M3
PA8/LCD_D8/JTAG_TCK	219	L4	LCD_G0	C19
PA9/LCD_D9	220	H6	LCD_G1	AA30
PA10/LCD_D10/FEC1_RXDV	217	L2	LCD_G2	W4

continues on next page

Table 1 – continued from previous page

Function MSMP1EVK	Pin	MPU Pin	Function MSMP1	SiP Pads
PA11/LCD_D11/FEC1_RXER	218	J3	LCD_G3	V3
PA12/LCD_D12/FEC1_RX0	215	K6	LCD_G4	V4
PA13/LCD_D13/FEC1_RX1	216	D8	LCD_G5	U3
PA14/LCD_D14/FEC1_TX0	213	E7	LCD_G6	T3
PA15/LCD_D15/FEC1_TX1	214	E8	LCD_G7	T4
PA16/LCD_D16/JTAG_NTRST	209	F3	LCD_R0	C17
PA17/LCD_D17	210	J2	LCD_R1	AA29
PA18/LCD_D18	207	L6	LCD_R2	Y7
PA19/LCD_D19	208	K4	LCD_R3	AA6
PA20/LCD_D20	205	J1	LCD_R4	Y6
PA21/LCD_D21	206	K2	LCD_R5	AA5
PA22/LCD_D22/FEC1_MDC	203	K1	LCD_R6	Y5
PA23/LCD_D23/FEC1_MDIO	204	L5	LCD_R7	Y4
PB24/JTAG_TDI/EBI_D14	163	–	–	–
PA27/LCD_HSYNK	198	H2	LCD_HSYNC	K3
PA26/LCD_VSYNK	197	H1	LCD_VSYNC	L3
PB14/unused	175	U3	PC3 (GPIO)	L17
PA29/LCD_DEN	196	B5	LCD_DE	J4
PB25/JTAG_TDO/EBI_D15	164	–	–	–
ADC3	67	AB5	PB0/ADC2_IN9 (GPIO)	Y29
ADC2	69	W9	PA6/ADC2_IN3 (GPIO)	D6
ADC1	71	T5	ANA1/ADC2_IN1	N18
ADC0	73	R4	ANA0/ADC1_IN0	M18
PA24/LCD_PWM	199	T4	LCD_BL_CTRL	K4

Closing Jumper J8 will connect the LCD vbacklight to +5V.

3.1.10 SD/MMC Card

MSMP1EVK offers a microSD-card interface on connector X23. The SD-card interface can be enabled by triggering the CPU pin PE17/SD_MMC0_PWR/EBI_A17 or closing jumper KP10.

Function MSMP1EVK	Pin	MPU Pin	Function MSMP1	SiP Pads
PE17/SD_MMC0_PWR/ EBI_A17	40	W13	PB6/SD_PWR_EN	D21
PC8/EBI_D3/MMC0_DA2	99	F14	SDMMC1_D2	H20
PC9/EBI_D4/MMC0_DA3	100	D15	SDMMC1_D3	H21
PC5/EBI_D0/MMC0_CDA	104	D12	SDMMC1_CMD	E20
PC4/SPI0_NPCSI/ISI_MCK/ MMC0_CK	103	E12	SDMMC1_CK	F21
PC6/EBI_D1/MMC0_DA0	101	E14	SDMMC1_D0	G20
PC7/EBI_D2/MMC0_DA1	102	D14	SDMMC1_D1	G21
PE16/unused/EBI_A16	39	V9	PB10/SD_WP	D20
PE2/SD_MMC0_CD/EBI_A2	55	Y4	SD_CardDetect	J21

3.1.11 Image Sensor Interface

MSMP1EVK offers a Image Sensor Interface on connector X22.

Function MSMP1EVK	Pin	MPU Pin	Function MSMP1	SiP Pads
PA31/I2C0_SCL	194	B9	I2C2_SCL	AA15
PA30/I2C0_SDA	193	E10	I2C2_SDA	AA16
PB3/ISI_VSYNC	188	E16	JTAG_TDO	R17
PB4/ISI_HSYNC	185	D16	JTAG_TDI	P17
ePB1/EN_PMIC_I2C	190	D17	JTAG_TCK	N17
PD31/SPI_NPCS2	112	E17	JTAG_TMS	N19
PC26/ISI_D7	79	R3	PA14 (GPIO/DBTRGO)	F17
PC25/ISI_D6	82	E15	JTAG_NTRST	R19
PC24/ISI_D5	81	W3	PA13 (GPIO/DBTRGI)	E17
PC23/ISI_D4	84	F1	PI7 (GPIO/TIM8_CH3)	W33
PC22/ISI_D3	83	B4	SPI4_MOSI	Y23
PC21/ISI_D2	86	C12	SPI4_MISO	Y22
PC20/ISI_D1	85	D5	SPI4_NSS	AA23
PC19/ISI_D0	88	E4	SPI4_SCK	Y21
PB11/ISI_RST	180	–	–	–
PB5/ISI_PWD	186	C1	PH15 (GPIO/TIM8_CH3N)	U33
PC1/SPI0-MOSI/ISI_D9	108	AA8	SPI3_MOSI	V15
PC0/SPI0-MISO/ISI_D8	107	A8	SPI3_MISO	U15
PC3/SPI0_NPCS0	106	V6	SPI3_NSS	Y15
PC2/SPI0_SPCK/ISI_D10	105	C5	SPI3_SCK	U16

3.1.12 GPIO/EBI

The GPIO and pins of the External Bus Interface are available on the following connectors:

Connector X26:

Function MSMP1EVK	Pin	MPU Pin	Function MSMP1	SiP Pads
PC4/SPI0_NPCS1/ISI_MCK/ MMC0_CK	103	E12	SDMMC1_CK	F21
PC5/EBI_D0/MMC0_CDA	104	D12	SDMMC1_CMD	E20
PC6/EBI_D1/MMC0_DA0	101	E14	SDMMC1_D0	G20
PC7/EBI_D2/MMC0_DA1	102	D14	SDMMC1_D1	G21
PC8/EBI_D3/MMC0_DA2	99	F14	SDMMC1_D2	H20
PC9/EBI_D4/MMC0_DA3	100	D15	SDMMC1_D3	H21
PC10/EBI_D5/MMC0_DA4	97	W13	PB6 (GPIO/TIM4_CH1)	D21
PC11/EBI_D6/MMC0_DA5	98	F11	PB7 (GPIO/TIM4_CH2)	G17
PC12/EBI_D7/MMC0_DA6	95	AB8	PB8 (GPIO/TIM4_CH3)	H17
PC13/EBI_RD#/MMC0_DA7	96	F12	PB9 (GPIO/TIM4_CH4)	J17
PC14/EBI_WE#	93	D6	PH8 (GPIO/TIM5_ETR)	G3
PC15/EBI_NCS3#	94	B1	PH10 (GPIO/TIM5_CH1)	J18
PC16/EBI_RDY#	91	B3	PH11 (GPIO/TIM5_CH2)	K18
PC17/EBI_ALE	92	F5	PH12 (GPIO/TIM5_CH3)	U32
PC18/EBI_CLE	89	D1	I2S2_WS (TIM5_CH4)	W18

Connector X27:

Function MSMP1EVK	Pin	MPU Pin	Function MSMP1	SiP Pads
PE0/PMIC_IRQ/EBI_A0	57	F2	PI5 (GPIO/TIM8_CH1)	V33
PE1/FEC0_IRQ/EBI_A1	58	G5	PI6 (GPIO/TIM8_CH2)	W32
PE2/SD_MMC0_CD/EBI_A2	55	Y4	SD_CardDetect	J21
PE3/HDMI_IRQ/EBI_A3	56	–	–	–
PE4/AUDIO_IRQ/EBI_A4	53	U4	PG3 (GPIO/CAN_STBY)	D4
PE5/SD_NNC1_CD/EBI_A5	54	T3	PI11 (GPIO)	H3
ePE6/CAN2_RX/EBI_A6	51	AA7	FDCAN2_RX	AB19
ePE7/CAN2_TX/EBI_A7	52	V10	FDCAN2_TX	AC19
PE8/unused/EBI_A8	49	Y17	OTG_ID	AB22
PE9/unused/EBI_A9	50	–	–	–
PE10/USBA_EN/EBI_A10	47	–	–	–
PE11/USBB_EN/EBI_A11	48	A2	PH5 (GPIO/USB2_EN)	F4
PE12/USBC_EN/EBI_A12	45	E6	PH9 (GPIO/USB1_EN)	G4
PE13/USB_B_OC/EBI_A13	46	A3	PH4 (GPIO/USB2_EN)	F3
PE14/USB_C_OC/EBI_A14	43	J5	PI9 (GPIO/USB1_OC)	Y32
ePE15/may_DNU/EBI_A15	44	J6	PI4 (GPIO/TIM8_BKIN)	V32

Connector X12:

Function MSMP1EVK	Pin	MPU Pin	Function MSMP1	SiP Pads
PE16/unused/EBI_A16	39	V9	PB10/SD_WP	D20
PE17/SD_MMC0_PWR/ EBI_A17	40	W13	PB6/SD_PWR_EN	D21
PE18/SD_MMC1_CK/ EBI_A18	37	C10	PD0 (GPIO/FMC_AD2)	A17
PE19/SD_MMC1_CDA/ EBI_A19	38	B10	PD1 (GPIO/FMC_AD3)	A18
PE20/SD_MMC1_DA0/ EBI_A20	35	A9	PD5 (GPIO/FMC_NWE)	B19
PE21/SD_MMC1_DA1/ EBI_A21	36	L3	PD6 (GPIO/FMC_NWAIT)	B18
PE22/SD_MMC1_DA2/ EBI_A22	33	AB9	PD11 (GPIO/FMC_CLE)	B16
PE23/SD-MMC1_DA3/ EBI_A23	34	W12	PD12 (GPIO/FMC_ALE)	B17
PE24/unused/EBI_NCS0#	31	M3	PD14 (GPIO/FMC_AD0)	A15
PE25/unused/EBI_NCS1#	32	L1	PD15 (GPIO/FMC_AD1)	A16
PE26/unused/EBI_NCS2#	29	W10	PE7 (GPIO/FMC_AD4)	A19
PE27/unused/EBI_WRI-BSI#	30	W11	PE9 (GPIO/FMC_AD6)	A21
PE28/unused/EBI_WAIT#	27	W15	PG9 (GPIO/FMC_NCE)	B20
PE29/Softmodern-P	28	AB4	ETH_RGMII_GTX_CLK	J15
PE30/Softmodern-N	25	U8	ETH_RGMII_CLK125	N16
PE31/ADTRG/USB-VBUS	26	V15	OTG_VBUS	AB20

Connector X13:

Function MSMP1EVK	Pin	MPU Pin	Function MSMP1	SiP Pads
PB10/AUDIO_MCLK	179	U10	PC0 (GPIO)	K17
PB14/unused	175	U3	PC3 (GPIO)	L17
PB15/HDMI_RST	176	D13	PC7 (GPIO)	D19
PB18/SPI1_MISO/CAN_DNU/ EBI_D8	169	H5	SPI1_MISO	C29
PB19/SPI1_MOSI/CAN_DNU/ EBI_D9	170	K5	SPI1_MOSI	D30
PB20/SPI1_SPCK/CAN_DNU/ EBI_A10	167	G2	SPI1_SCK	D29
PB21/SPI1_NCS0/CAN_DEN/ EBI_D11	168	F4	SPI1_NSS	C30
ePB22/SPI1_NCS1/CAN1_RX/ EBI_D12	165	AA7	FDCAN2_RX	AB19
ePB23/SPI1_NCS2/CAN1_TX/ EBI_D13	166	D3	FDCAN1_TX	AC17
PB24/JTAG_TDI/EBI_D14	163	–	–	–
PB25/JTAG_TDO/EBI_A15	164	–	–	–
PB26/AUDIO_BCLK	161	M1	PD8 (GPIO)	E19
PB27/AUDIO_BCLK/HDMI_TK0	162	M2	PD9 (GPIO)	F19
PB28/AUDIO_DACDAT/HDMI_TD0	159	F13	PF2 (GPIO)	H19
PB29/AUDIO_ADCDAT	160	V3	PF3 (GPIO)	J19
PB30/AUDIO_LRCLK	157	V12	PF10 (GPIO/QSPI_CLK)	K19
PB31/AUDIO_LRCK/HDMI_TF0	158	W6	PF15 (GPIO)	L19

3.1.13 Security Box Module

The signals of the Security Box Module are available on a connector X15.

Function MSMP1EVK	Pin	MPU Pin	Function MSMP1	SiP Pads
PIOBU15	128	Y8	PG8 (GPIO/ETH_CLK)	E3
PIOBU14	127	–	–	–
PIOBU13	130	F10	USART2_CK (GPIO)	B21
PIOBU12	129	D9	USART2_TX (GPIO)	D13
PIOBU11	132	F9	USART2_RX (GPIO)	D14
PIOBU10	131	C9	USART2_RTS (FMC_NOE)	D15
PIOBU9	134	E9	PE6 (GPIO/TIM1_BKIN2)	G19
PIOBU8	133	C4	USART2_CTS (TIM1_BKIN)	D16
PIOBU7	136	W16	PA12 (GPIO/TIM1_ETR)	D17
PIOBU6	135	AA5	PB1 (GPIO/TIM1_CH3N)	Y33
PIOBU5	138	W14	PE10 (GPIO/X/TIM1_CH2N)	B15
PIOBU4	137	Y12	PE8 (GPIO/X/TIM1_CH1N)	A20
PIOBU3	140	Y16	PA11 (GPIO/TIM1_CH4)	H18
PIOBU2	139	A4	PE13 (GPIO/TIM1_CH3)	G18
PIOBU1	142	A11	PA9 (GPIO/TIM1_CH2)	F18
PIOBU0	141	B13	PA8 (GPIO/TIM1_CH1)	E18

3.1.14 GPIO/ANAIN2-IOs

The signals of the GPIO and ANAIN2-IOs are available on a connector X16.

Function MSMP1EVK	Pin	MPU Pin	Function MSMP1	SiP Pads
PD30	111	–	–	–
PD29	114	–	–	–
PD28	113	D10	PG15 (GPIO)	E4
PD9	154	N3	BOOT0	Y30
PD8	153	P4	BOOT2	Y31
PD27/SENSE9	116	N2	PC13 (RTC_OUT1)	C15
PD26/SENSE8	115	AB7	ETH_GMII_CRS	E16
PD25/SENSE7	118	Y6	ETH_GMII_COL	F15
PD24/SENSE6	117	W5	ETH_MDINT	M2
PD23/SENSE5	120	J4	ETH_PHYINT	R34
PD22/SENSE4	119	V7	PF14/ADC2_IN6 (GPIO)	D7
PD21/SENSE3	122	W7	PF13/ADC2_IN2 (GPIO)	C7
PD20/SENSE2	121	V8	PF12/ADC1_IN6 (GPIO)	C16
PD19/SENSE1	124	W8	PF11/ADC1_IN2 (GPIO)	B22
PD18/SENSE0	123	AA3	PA0/ADC1_IN16 (GPIO)	P16

3.1.15 ADC-Signals

The signals of the ADC are available on a connector X14.

Function MSMP1EVK	Pin	MPU Pin	Function MSMP1	SiP Pads
ADCVREF	63	–	–	–
ADC4	65	U5	PA5/ADC1_IN19 (GPIO)	C6
ADC3	67	AB5	PB0/ADC2_IN9 (GPIO)	Y29
ADC2	69	W9	PA6/ADC2_IN3 (GPIO)	D6
ADC1	71	T5	ANA1/ADC2_IN1	N18
ADC0	73	R4	ANA0/ADC1_IN0	M18

3.1.16 MxM Edge Connector

Connector X29A:

Function MSMP1EVK	Pin	MPU Pin	Function MSMP1	SiP Pads
5V	1	–	5V	–
TP1 (VDDBU_2V)	2	–	–	–
5V	3	–	5V	–
TP2 (VCC_1.8V)	4	–	–	–
5V	5	–	5V	–
TP3 (1.2V_HDMI)	6	–	–	–
5V	7	–	5V	–
TP4 (VCC_3.3V)	8	–	–	–
GND	9	–	GND	–
TP5 (FUSE_2.5V)	10	–	–	–
GND	11	–	GND	–
TP6 (VDDANA)	12	–	–	–
GND	13	–	GND	–
TP7 (VOUT6)	14	–	VBUS_SW	–
GND	15	–	GND	–
TP8 (VOUT7)	16	–	VCC_SD	–
Vbat	17	–	VBAT	–
TP9 PMIC_WKUP	18	–	–	–
NRST 3V3	19	–	NRST	–
TP10 PMIC_SHDN	20	–	–	–
TP12 NRST2V	21	–	–	–
PMIC_WAKE#	22	–	PMIC/PONKEYn	AA9
JTAGSEL	23	–	–	–
PMIC_RESET#	24	R2	NRST	U17
PE30/Softmodern-N	25	U8	ETH_RGMII_CLK125	N16
PE31/ADTRG/USB-VBUS	26	V15	OTG_VBUS	AB20
PE28/unused/EBI_WAIT#	27	W15	PG9 (GPIO/FMC_NCE)	B20
PE29/Softmodern-P	28	AB4	ETH_RGMII_GTX_CLK	J15
PE26/unused/EBI_NCS2#	29	W10	PE7 (GPIO/FMC_AD4)	A19
PE27/unused/EBI_WRI-BSI#	30	W11	PE9 (GPIO/FMC_AD6)	A21
PE24/unused/EBI_NCS0#	31	M3	PD14 (GPIO/FMC_AD0)	A15

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Table 2 – continued from previous page

Function MSMP1EVK	Pin	MPU Pin	Function MSMP1	SiP Pads
PE25/unused/EBI_NCS1#	32	L1	PD15 (GPIO/FMC_AD1)	A16
PE22/SD_MMC1_DA2/ EBI_A22	33	AB9	PD11 (GPIO/FMC_CLE)	B16
PE23/SD-MMC1_DA3/ EBI_A23	34	W12	PD12 (GPIO/FMC_ALE)	B17
PE20/SD_MMC1_DA0/ EBI_A20	35	A9	PD5 (GPIO/FMC_NWE)	B19
PE21/SD_MMC1_DA1/ EBI_A21	36	L3	PD6 (GPIO/FMC_NWAIT)	B18
PE18/SD_MMC1_CK/ EBI_A18	37	C10	PD0 (GPIO/FMC_AD2)	A17
PE19/SD_MMC1_CDA/ EBI_A19	38	B10	PD1 (GPIO/FMC_AD3)	A18
PE16/unused/EBI_A16	39	V9	PB10/SD_WP	D20
PE17/SD_MMC0_PWR/ EBI_A17	40	W13	PB6/SD_PWR_EN	D21
GND	41	–	GND	–
BOOT DIS#	42	N4	BOOT1	U19
PE14/USB_C_OC/EBI_A14	43	J5	PI9 (GPIO/USB1_OC)	Y32
ePE15/may_DNU/EBI_A15	44	J6	PI4 (GPIO/TIM8_BKIN)	V32
PE12/USBC_EN/EBI_A12	45	E6	PH9 (GPIO/USB1_EN)	G4
PE13/USB_B_OC/EBI_A13	46	A3	PH4 (GPIO/USB2_EN)	F3
PE10/USBA_EN/EBI_A10	47	–	–	–
PE11/USBB_EN/EBI_A11	48	A2	PH5 (GPIO/USB2_EN)	F4
PE8/unused/EBI_A8	49	Y17	OTG_ID	AB22
PE9/unused/EBI_A9	50	–	–	–
ePE6/CAN2_RX/EBI_A6	51	AA7	FDCAN2_RX	AB19
ePE7/CAN2_TX/EBI_A7	52	V10	FDCAN2_TX	AC19
PE4/AUDIO_IRQ/EBI_A4	53	U4	PG3 (GPIO/CAN_STBY)	D4
PE5/SD_NNC1_CD/EBI_A5	54	T3	PI11 (GPIO)	H3
PE2/SD_MMC0_CD/EBI_A2	55	Y4	SD_CardDetect	J21
PE3/HDMI_IRQ/EBI_A3	56	–	–	–
PE0/PMIC_IRQ/EBI_A0	57	F2	PI5 (GPIO/TIM8_CH1)	V33
PE1/FEC0_IRQ/EBI_A1	58	G5	PI6 (GPIO/TIM8_CH2)	W32
GND	59	–	GND	–
GND	60	–	GND	–
AGND	61	–	GND	–
USBC_D_P	62	AA15	USB1_D_P	AC14
ADCVREF	63	–	–	–
USBC_D_N	64	AB15	USB1_D_N	AB13
ADC4	65	U5	PA5/ADC1_IN19 (GPIO)	C6
GND	66	–	GND	–
ADC3	67	AB5	PB0/ADC2_IN9 (GPIO)	Y29
USBB_D_P	68	–	–	–
ADC2	69	W9	PA6/ADC2_IN3 (GPIO)	D6
USBB_D_N	70	–	–	–
ADC1	71	T5	ANA1/ADC2_IN1	N18
GND	72	–	GND	–
ADC0	73	R4	ANA0/ADC1_IN0	M18
USBA_D_P	74	AB14	USB2_D_P	AC22
AGND	75	–	GND	–
USBA_D_N	76	AA14	USB2_D_N	AB23
GND	77	–	GND	–
TP15 eVBG	78	M17	TP15 (VBUS_OTG)	M17
PC26/ISI_D7	79	R3	PA14 (GPIO/DBTRGO)	F17

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Table 2 – continued from previous page

Function MSMP1EVK	Pin	MPU Pin	Function MSMP1	SiP Pads
GND	80	–	GND	–
PC24/ISI_D5	81	W3	PA13 (GPIO/DBTRGI)	E17
PC25/ISI_D6	82	E15	JTAG_NTRST	R19
PC22/ISI_D3	83	B4	SPI4_MOSI	Y23
PC23/ISI_D4	84	F1	PI7 (GPIO/TIM8_CH3)	W33
PC20/ISI_D1	85	D5	SPI4_NSS	AA23
PC21/ISI_D2	86	C12	SPI4_MISO	Y22
GND	87	–	GND	–
PC19/ISI_D0	88	E4	SPI4_SCK	Y21
PC18/EBI_CLE	89	D1	I2S2_WS (TIM5_CH4)	W18
GND	90	–	GND	–
PC16/EBI_RDY#	91	B3	PH11 (GPIO/TIM5_CH2)	K18
PC17/EBI_ALE	92	F5	PH12 (GPIO/TIM5_CH3)	U32
PC14/EBI_WE#	93	D6	PH8 (GPIO/TIM5_ETR)	G3
PC15/EBI_NCS3#	94	B1	PH10 (GPIO/TIM5_CH1)	J18
PC12/EBI_D7/MMC0_DA6	95	AB8	PB8 (GPIO/TIM4_CH3)	H17
PC13/EBI_RD#/MMC0_DA7	96	F12	PB9 (GPIO/TIM4_CH4)	J17
PC10/EBI_D5/MMC0_DA4	97	W13	PB6 (GPIO/TIM4_CH1)	D21
PC11/EBI_D6/MMC0_DA5	98	F11	PB7 (GPIO/TIM4_CH2)	G17
PC8/EBI_D3/MMC0_DA2	99	F14	SDMMC1_D2	H20
PC9/EBI_D4/MMC0_DA3	100	D15	SDMMC1_D3	H21
PC6/EBI_D1/MMC0_DA0	101	E14	SDMMC1_D0	G20
PC7/EBI_D2/MMC0_DA1	102	D14	SDMMC1_D1	G21
PC4/SPI0_NPCS1/ISI_MCK/ MMC0_CK	103	E12	SDMMC1_CK	F21
PC5/EBI_D0/MMC0_CDA	104	D12	SDMMC1_CMD	E20
PC2/SPI0_SPCK/ISI_D10	105	C5	SPI3_SCK	U16
PC3/SPI0_NPCS0	106	V6	SPI3_NSS	Y15
PC0/SPI0-MISO/ISI_D8	107	A8	SPI3_MISO	U15
PC1/SPI0-MOSI/ISI_D9	108	AA8	SPI3_MOSI	V15
GND	109	–	GND	–
GND	110	–	GND	–
PD30	111	–	–	–
PD31/SPI_NPCS2	112	E17	JTAG_TMS	N19
PD28	113	D10	PG15 (GPIO)	E4
PD29	114	–	–	–
PD26/SENSE8	115	AB7	ETH_GMII_CRS	E16
PD27/SENSE9	116	N2	PC13 (RTC_OUT1)	C15
PD24/SENSE6	117	W5	ETH_MDINT	M2
PD25/SENSE7	118	Y6	ETH_GMII_COL	F15
PD22/SENSE4	119	V7	PF14/ADC2_IN6 (GPIO)	D7
PD23/SENSE5	120	J4	ETH_PHYINT	R34
PD20/SENSE2	121	V8	PF12/ADC1_IN6 (GPIO)	C16
PD21/SENSE3	122	W7	PF13/ADC2_IN2 (GPIO)	C7
PD18/SENSE0	123	AA3	PA0/ADC1_IN16 (GPIO)	P16
PD19/SENSE1	124	W8	PF11/ADC1_IN2 (GPIO)	B22
GND	125	–	GND	–
GND	126	–	GND	–

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Function MSMP1EVK	Pin	MPU Pin	Function MSMP1	SiP Pads
PIOBU14	127	–	–	–
PIOBU15	128	Y8	PG8 (GPIO/ETH_CLK)	E3
PIOBU12	129	D9	USART2_TX (GPIO)	D13
PIOBU13	130	F10	USART2_CK (GPIO)	B21
PIOBU10	131	C9	USART2_RTS (FMC_NOE)	D15
PIOBU11	132	F9	USART2_RX (GPIO)	D14
PIOBU8	133	C4	USART2_CTS (TIM1_BKIN)	D16
PIOBU9	134	E9	PE6 (GPIO/TIM1_BKIN2)	G19
PIOBU6	135	AA5	PB1 (GPIO/TIM1_CH3N)	Y33
PIOBU7	136	W16	PA12 (GPIO/TIM1_ETR)	D17
PIOBU4	137	Y12	PE8 (GPIO/X/TIM1_CH1N)	A20
PIOBU5	138	W14	PE10 (GPIO/X/TIM1_CH2N)	B15
PIOBU2	139	A4	PE13 (GPIO/TIM1_CH3)	G18
PIOBU3	140	Y16	PA11 (GPIO/TIM1_CH4)	H18
PIOBU0	141	B13	PA8 (GPIO/TIM1_CH1)	E18
PIOBU1	142	A11	PA9 (GPIO/TIM1_CH2)	F18
GND	143	–	GND	–
GND	144	–	GND	–
PD16/RXD1	145	V13	UART4_RX	D22
PD17/TXD1	146	U11	UART4_TX	D23
PD15/RTS1	148	–	–	–
PD14/CTS1	147	–	–	–
PD12/RXD0	149	AA11	UART7_RX (SPI5_NSS)	A14
PD13/TXD0	150	AA10	UART7_TX (SPI5_SCK)	B13
PD11/RTS0	152	AB10	UART7_RTS (SPI5_MISO)	C13
PD10/CTS0	151	AB11	UART7_CTS (SPI5_MOSI)	C14
PD8	153	P4	BOOT2	Y31
PD9	154	N3	BOOT0	Y30
GND	155	–	GND	–
GND	156	–	GND	–
PB30/AUDIO_LRCLK	157	V12	PF10 (GPIO/QSPI_CLK)	K19
PB31/AUDIO_LRCK/HDMI_TF0	158	W6	PF15 (GPIO)	L19
PB28/AUDIO_DACDAT/HDMI_TD0	159	F13	PF2 (GPIO)	H19
PB29/AUDIO_ADCDAT	160	V3	PF3 (GPIO)	J19
PB26/AUDIO_BCLK	161	M1	PD8 (GPIO)	E19
PB27/AUDIO_BCLK/HDMI_TK0	162	M2	PD9 (GPIO)	F19
PB24/JTAG_TDI/EBI_D14	163	–	–	–
PB25/JTAG_TDO/EBI_A15	164	–	–	–
ePB22/SPI1_NCS1/CAN1_RX/ EBI_D12	165	AA7	FDCAN2_RX	AB19
ePB23/SPI1_NCS2/CAN1_TX/ EBI_D13	166	D3	FDCAN1_TX	AC17
PB20/SPI1_SPCK/CAN_DNU/ EBI_A10	167	G2	SPI1_SCK	D29

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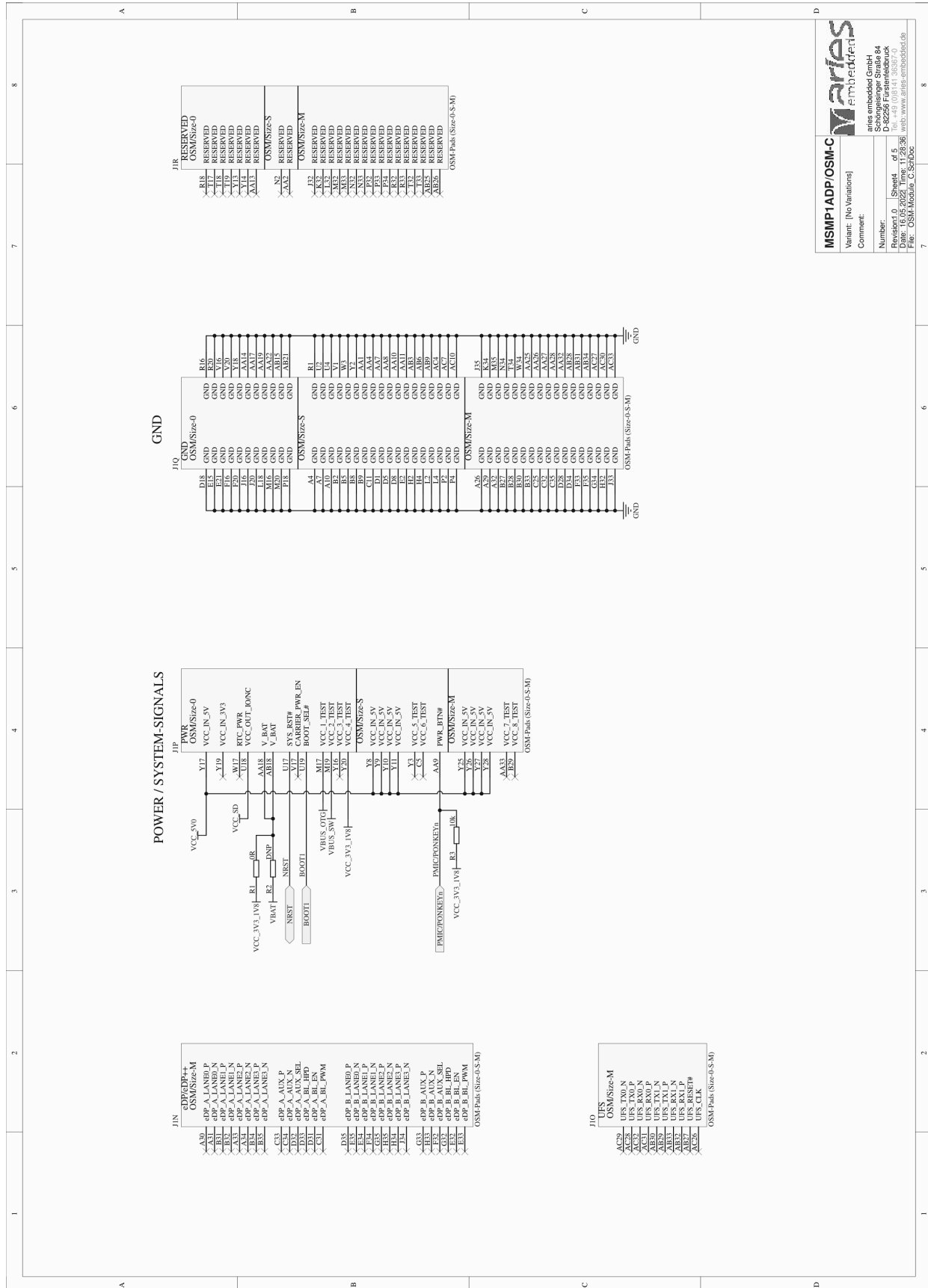
Function MSMP1EVK	Pin	MPU Pin	Function MSMP1	SiP Pads
PB21/SPI1_NCS0/CAN_DEN/ EBI_D11	168	F4	SPI1_NSS	C30
PB18/SPI1_MISO/CAN_DNU/ EBI_D8	169	H5	SPI1_MISO	C29
PB19/SPI1_MOSI/CAN_DNU/ EBI_D9	170	K5	SPI1_MOSI	D30
GND	171	–	GND	–
GND	172	–	GND	–
PB16/FEC0 MDC	173	AB3	ETH_MDC	T16
PB17/FEC0 MDIO	174	AB2	ETH_MDIO	T15
PB14/unused	175	U3	PC3 (GPIO)	L17
PB15/HDMI_RST	176	D13	PC7 (GPIO)	D19
PB12/FEC0 TX0	177	AA1	ETH_RGMII_TXD0	H15
PB13/FEC0 TX1	178	AA2	ETH_RGMII_TXD1	G15
PB10/AUDIO_MCLK	179	U10	PC0 (GPIO)	K17
PB11/ISI_RST	180	–	–	–
PB8/FEC0 RX0	181	AB6	ETH_RGMII_RXD0	K15
PB9/FEC0 RX1	182	AA6	ETH_RGMII_RXD1	L15
PB6/FEC0 RXDV	183	Y9	ETH_RGMII_RX_CTL	M15
PB7/FEC0 RXER	184	W1	ETH_GMII_RX_ER	L16
PB4/ISI_HSYNC	185	D16	JTAG_TDI	P17
PB5/ISI_PWD	186	C1	PH15 (GPIO/TIM8_CH3N)	U33
PB2/FEC0 TXEN	187	Y5	ETH_RGMII_TX_CTL	K16
PB3/ISI_VSYNC	188	E16	JTAG_TDO	R17
PB0/FEC0 TXCK	189	V4	ETH_RGMII_RX_CLK	R15
ePB1/EN_PMIC_I2C	190	D17	JTAG_TCK	N17
GND	191	–	GND	–
GND	192	–	GND	–
PA30/I2C0_SDA	193	E10	I2C2_SDA	AA16
PA31/I2C0_SCL	194	B9	I2C2_SCL	AA15
PA28/LCD_PCK	195	D2	LCD_CLK	M4
PA29/LCD_DEN	196	B5	LCD_DE	J4
PA26/LCD_VSYNK	197	H1	LCD_VSYNC	L3
PA27/LCD_HSYNK	198	H2	LCD_HSYNC	K3
PA24/LCD_PWM	199	T4	LCD_BL_CTRL	K4
PA25/LCD-DISP	200	–	–	–
GND	201	–	GND	–
GND	202	–	GND	–
PA22/LCD_D22/FEC1_MDC	203	K1	LCD_R6	Y5
PA23/LCD_D23/FEC1_MDIO	204	L5	LCD_R7	Y4
PA20/LCD_D20	205	J1	LCD_R4	Y6
PA21/LCD_D21	206	K2	LCD_R5	AA5
PA18/LCD_D18	207	L6	LCD_R2	Y7
PA19/LCD_D19	208	K4	LCD_R3	AA6
PA16/LCD_D16/JTAG_NTRST	209	F3	LCD_R0	C17
PA17/LCD_D17	210	J2	LCD_R1	AA29
GND	211	–	GND	–
GND	212	–	GND	–

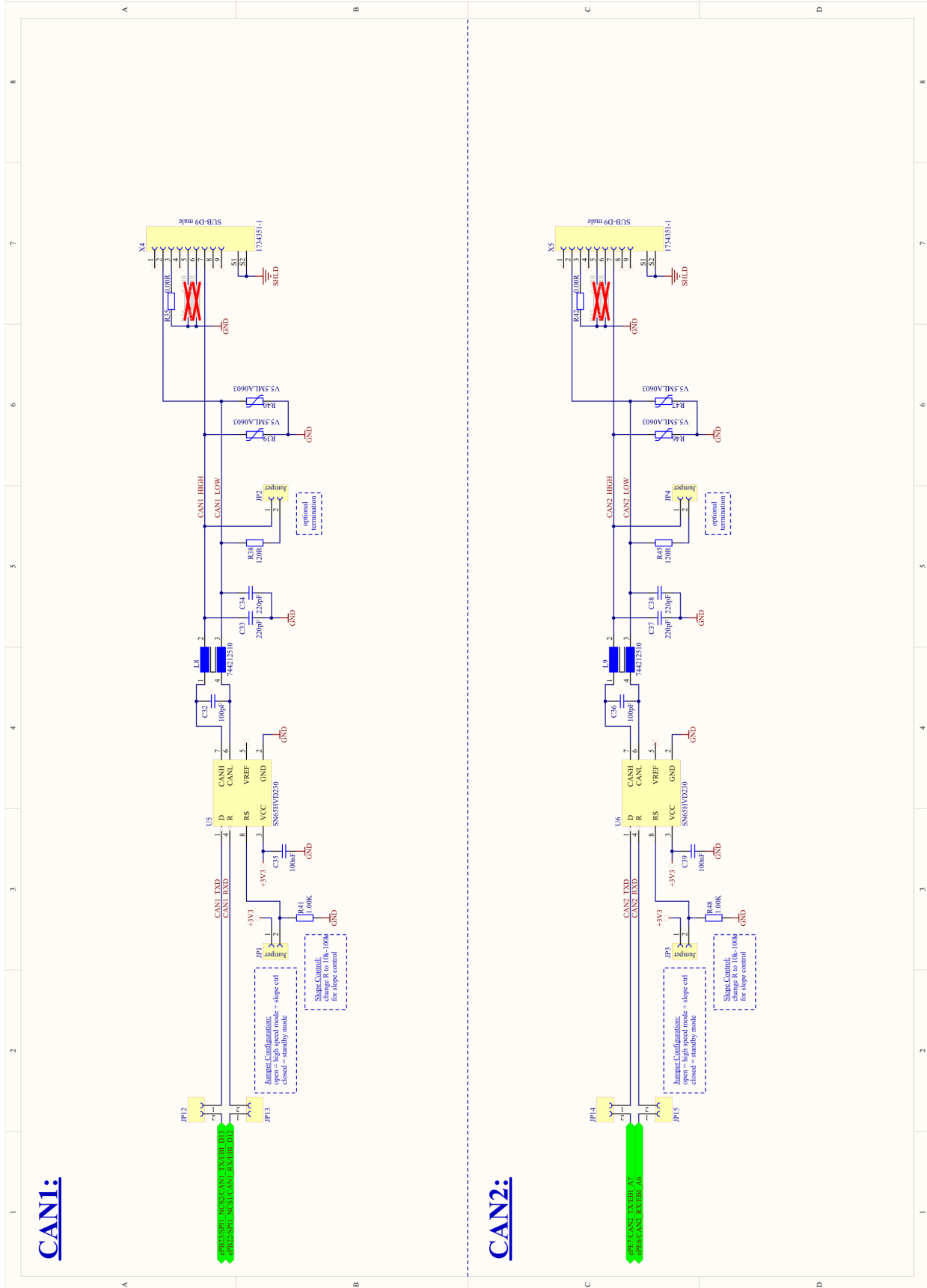
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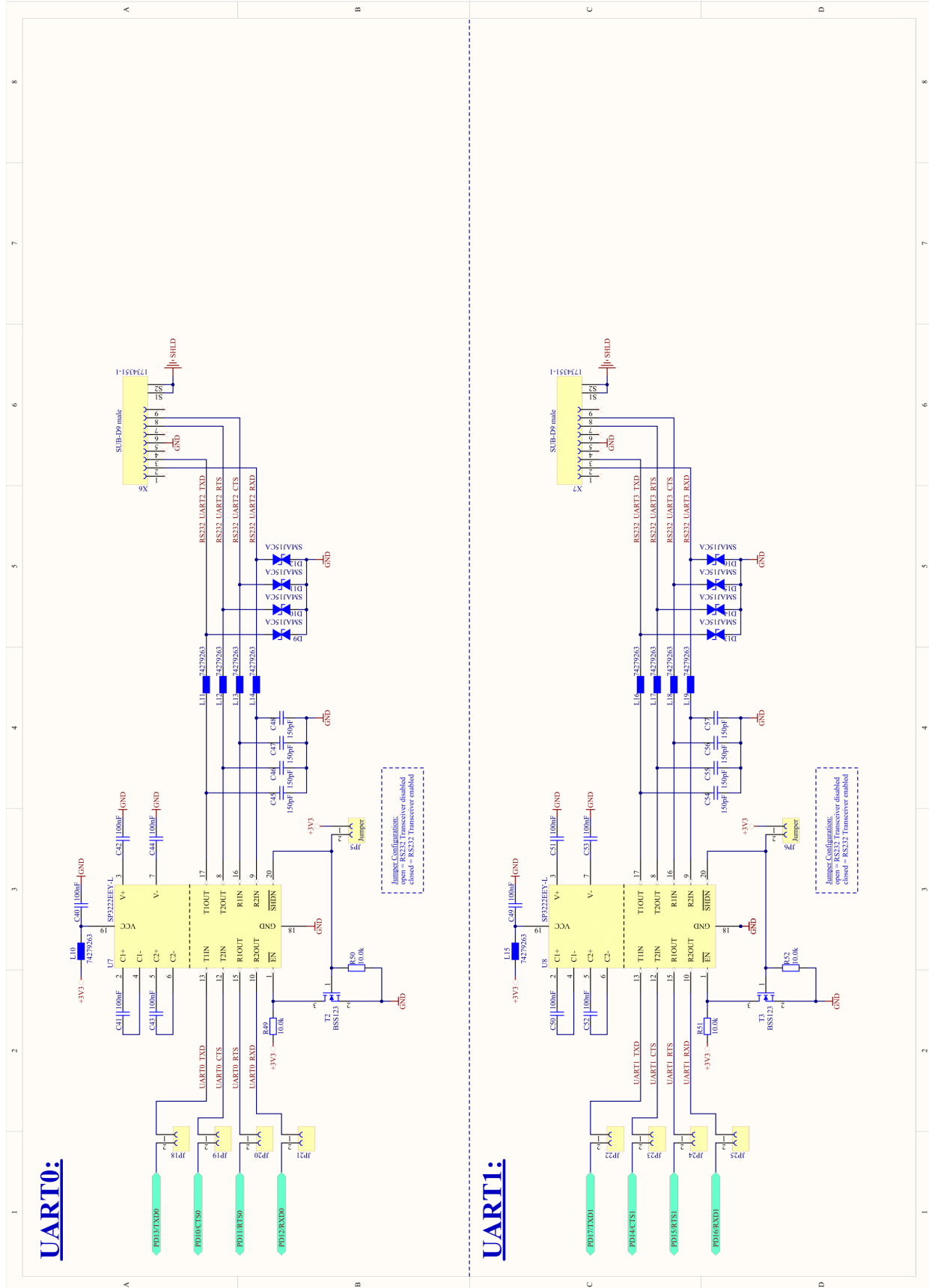
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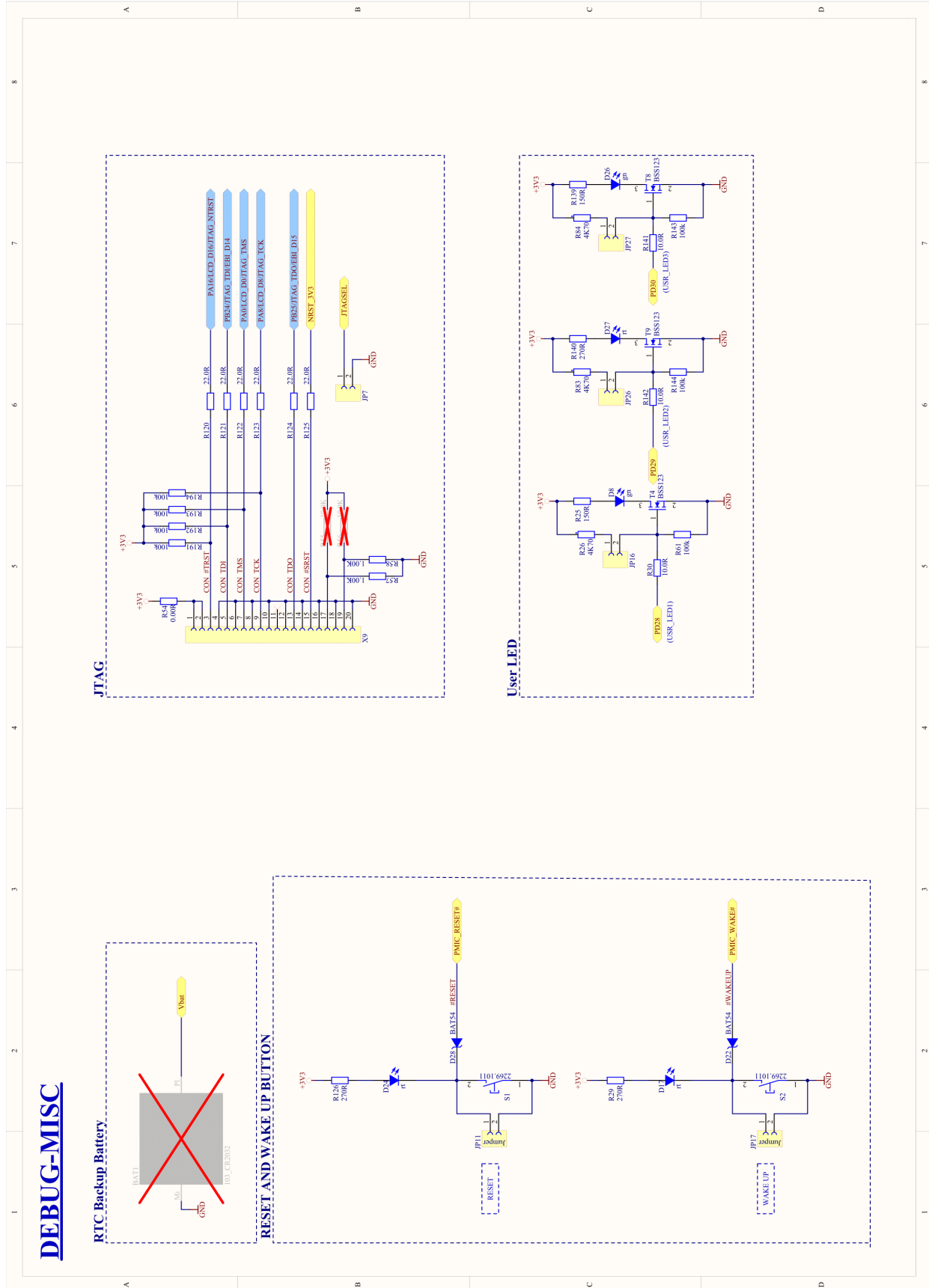
Function MSMP1EVK	Pin	MPU Pin	Function MSMP1	SiP Pads
PA14/LCD_D14/FEC1_TX0	213	E7	LCD_G6	T3
PA15/LCD_D15/FEC1_TX1	214	E8	LCD_G7	T4
PA12/LCD_D12/FEC1_RX0	215	K6	LCD_G4	V4
PA13/LCD_D13/FEC1_RX1	216	D8	LCD_G5	U3
PA10/LCD_D10/FEC1_RXDV	217	L2	LCD_G2	W4
PA11/LCD_D11/FEC1_RXER	218	J3	LCD_G3	V3
PA8/LCD_D8/JTAG_TCK	219	L4	LCD_G0	C19
PA9/LCD_D9	220	H6	LCD_G1	AA30
GND	221	–	GND	–
GND	222	–	GND	–
PA6/LCD_D6	223	C6	LCD_B6	N4
PA7/LCD_D7	224	A5	LCD_B7	M3
PA4/LCD_D4/FEC1_TXEN	225	B6	LCD_B4	P3
PA5/LCD_D5	226	A6	LCD_B5	N3
PA2/LCD_D2/FEC1_TXCK	227	B7	LCD_B2	R4
PA3/LCD_D3	228	C7	LCD_B3	R3
PA0/LCD_D0/JTAG_TMS	229	B8	LCD_B0	C21
PA1/LCD_D1	230	A7	LCD_B1	AA31

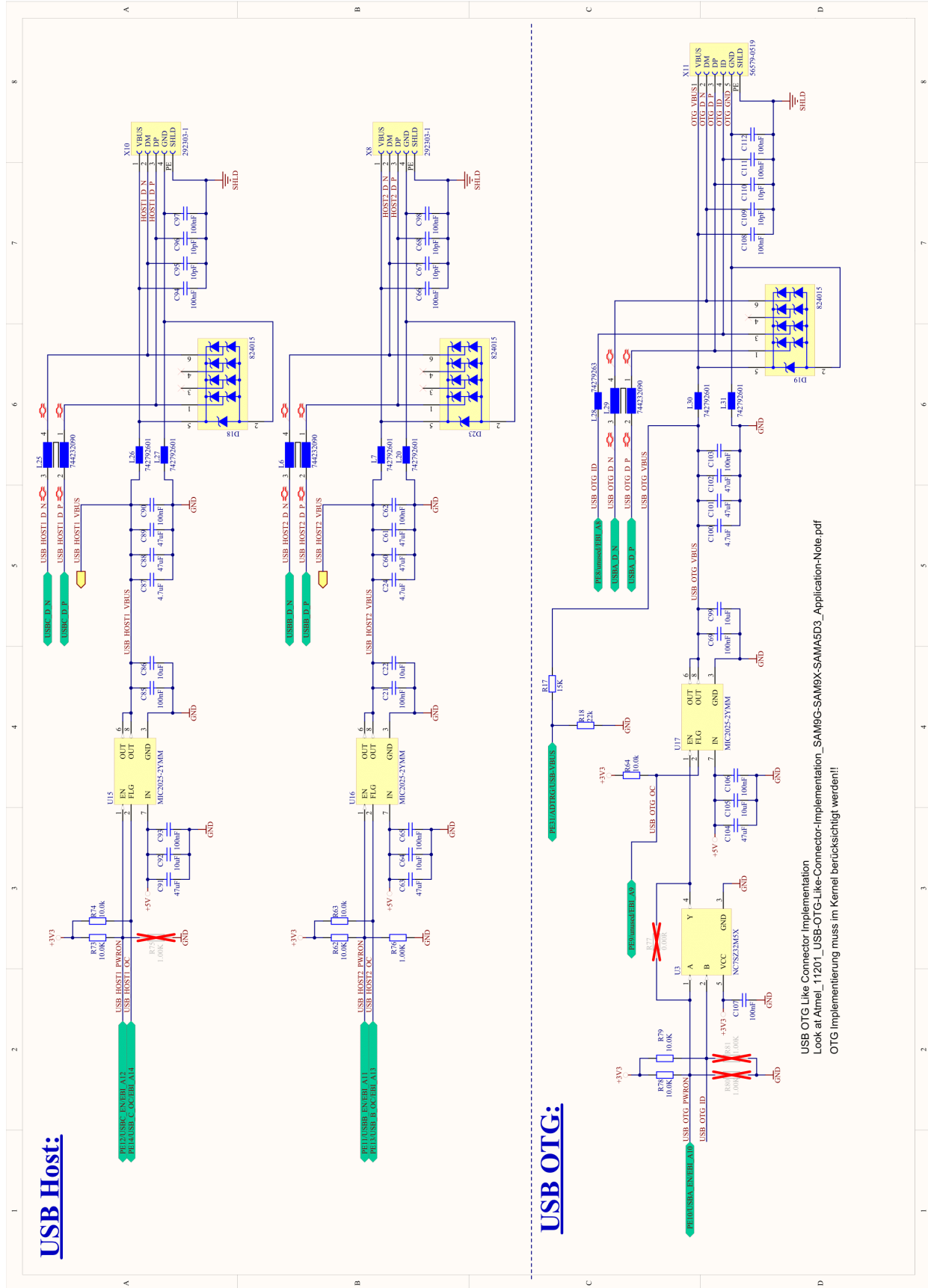
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A	ETHERNET ETH_RMII_GTX_CLK ETH_RMII_TXD0 ETH_RMII_TXD1 ETH_RMII_TXD2 ETH_RMII_TXD3 ETH_RMII_CTL ETH_RMII_RX_CLK ETH_RMII_RXD0 ETH_RMII_RXD1 ETH_RMII_RXD2 ETH_RMII_RXD3 ETH_RMII_CRS ETH_RMII_COL ETH_MPC ETH_MBO ETH_MDNT ETH_PHYINT		ETHERNET ETH_ARM_GMII_TX_CLK ETH_ASIR/GMII_TXD0 ETH_ASIR/GMII_TXD1 ETH_ASIR/GMII_TXD2 ETH_ASIR/GMII_TXD3 ETH_ARM_GMII_CTL ETH_ARM_GMII_RX_CLK ETH_ARM_GMII_RXD0 ETH_ARM_GMII_RXD1 ETH_ARM_GMII_RXD2 ETH_ARM_GMII_RXD3 ETH_ARM_GMII_CRS ETH_ARM_GMII_COL ETH_A_MPC ETH_A_MBO ETH_A_MDNT ETH_A_PHYINT		CAN/USB FPCAN1_TX CAN_A_TX FPCAN1_RX CAN_A_RX FPCAN2_TX CAN_B_TX FPCAN2_RX CAN_B_RX USB1_D_P USB1_D_N USB1_D_P USB1_D_N USB2_D_P USB2_D_N OTG_ID_GPDO OTG_VBUS		J1B AC17 CAN_A_TX CAN_A_RX CAN_B_TX CAN_B_RX USB_A_D_P USB_A_D_N USB_A_ID USB_A_RX USB_A_VBUS USB_B_D_P USB_B_D_N USB_B_ID USB_B_RX USB_B_VBUS OSMSIZE-S D11 D12 D13 D14 D15 D16 D17 D18 D19 D20 D21 D22 D23 D24 D25 D26 D27 D28 D29 D30 D31 D32 D33 D34 D35 D36 D37 D38 D39 D40 D41 D42 D43 D44 D45 D46 D47 D48 D49 D50 D51 D52 D53 D54 D55 D56 D57 D58 D59 D60 D61 D62 D63 D64 D65 D66 D67 D68 D69 D70 D71 D72 D73 D74 D75 D76 D77 D78 D79 D80 D81 D82 D83 D84 D85 D86 D87 D88 D89 D90 D91 D92 D93 D94 D95 D96 D97 D98 D99 D100 D101 D102 D103 D104 D105 D106 D107 D108 D109 D110 D111 D112 D113 D114 D115 D116 D117 D118 D119 D120 D121 D122 D123 D124 D125 D126 D127 D128 D129 D130 D131 D132 D133 D134 D135 D136 D137 D138 D139 D140 D141 D142 D143 D144 D145 D146 D147 D148 D149 D150 D151 D152 D153 D154 D155 D156 D157 D158 D159 D160 D161 D162 D163 D164 D165 D166 D167 D168 D169 D170 D171 D172 D173 D174 D175 D176 D177 D178 D179 D180 D181 D182 D183 D184 D185 D186 D187 D188 D189 D190 D191 D192 D193 D194 D195 D196 D197 D198 D199 D200 D201 D202 D203 D204 D205 D206 D207 D208 D209 D210 D211 D212 D213 D214 D215 D216 D217 D218 D219 D220 D221 D222 D223 D224 D225 D226 D227 D228 D229 D230 D231 D232 D233 D234 D235 D236 D237 D238 D239 D240 D241 D242 D243 D244 D245 D246 D247 D248 D249 D250 D251 D252 D253 D254 D255 D256 D257 D258 D259 D260 D261 D262 D263 D264 D265 D266 D267 D268 D269 D270 D271 D272 D273 D274 D275 D276 D277 D278 D279 D280 D281 D282 D283 D284 D285 D286 D287 D288 D289 D290 D291 D292 D293 D294 D295 D296 D297 D298 D299 D300 D301 D302 D303 D304 D305 D306 D307 D308 D309 D310 D311 D312 D313 D314 D315 D316 D317 D318 D319 D320 D321 D322 D323 D324 D325 D326 D327 D328 D329 D330 D331 D332 D333 D334 D335 D336 D337 D338 D339 D340 D341 D342 D343 D344 D345 D346 D347 D348 D349 D350 D351 D352 D353 D354 D355 D356 D357 D358 D359 D360 D361 D362 D363 D364 D365 D366 D367 D368 D369 D370 D371 D372 D373 D374 D375 D376 D377 D378 D379 D380 D381 D382 D383 D384 D385 D386 D387 D388 D389 D390 D391 D392 D393 D394 D395 D396 D397 D398 D399 D400 D401 D402 D403 D404 D405 D406 D407 D408 D409 D410 D411 D412 D413 D414 D415 D416 D417 D418 D419 D420 D421 D422 D423 D424 D425 D426 D427 D428 D429 D430 D431 D432 D433 D434 D435 D436 D437 D438 D439 D440 D441 D442 D443 D444 D445 D446 D447 D448 D449 D450 D451 D452 D453 D454 D455 D456 D457 D458 D459 D460 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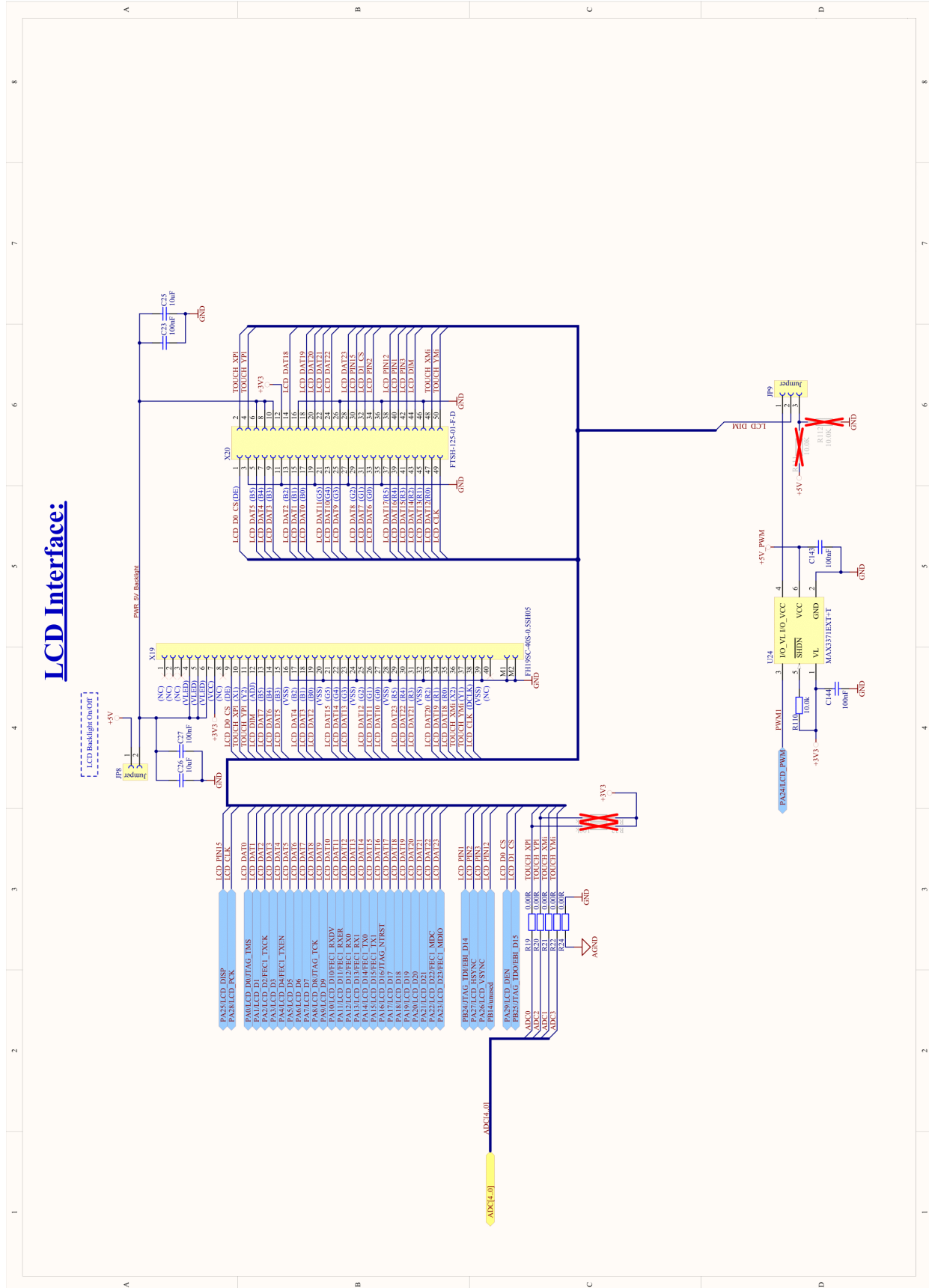


Image Sensor Interface

