MTrionEVK

Release 20.11.2024

Felix Netsch

Feb 21, 2025

CONTENTS:

CHAPTER

ONE

ABOUT THIS MANUAL

1.1 Imprint

Adress:

ARIES Embedded GmbH

Schöngeisinger Str. 84

D-82256 Fürstenfedbruck

Germany

Phone:

+49 (0) 8141/36 367-0

Fax:

+49 (0) 8141/36 367-67

1.2 Disclaimer

ARIES Embedded does not guarantee that the information in this document is up-to-date, correct, complete or of good quality. Liability claims against ARIES Embedded, referring to material or non-material related damages caused, due to usage or non-usage of the information given in this document, or due to usage of erroneous or incomplete information, are exempted, as long as there is no proven intentional or negligent fault of ARIES Embedded. ARIES Embedded explicitly reserves the rights to change or add to the contents of this Preliminary User's Manual or parts of it without notification.

1.3 Copyright

1.4 Registered Trademarks

The contents of this document may be subject of intellectual property rights (including but not limited to copyright, trademark, or patent rights). Any such rights that are not expressly licensed or already owned by a third party are reserved by ARIES Embedded GmbH.

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	20.11.2024	fn	Initial creation

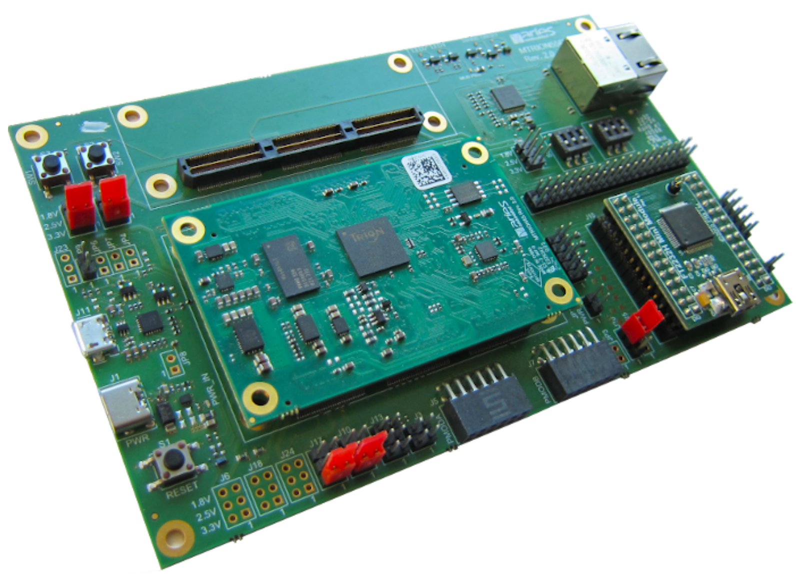
CHAPTER

TWO

OVERVIEW

2.1 MTrionEVK - Evaluation Kit for all MTrion SoMs

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



2.2 Feature Set

- suitable for all MTrion SoMs
- Ethernet 10/100MBit
- expansion connector for MIPI and LVDS signals
- pin header for GPIO signals
- pin header for JTAG
- user LED
- user switch
- **connector for FT2232H mini module**
  - SPI2 accessible via USB
  - JTAG accessible via USB
- CP2102 USB2UART bridge for softcore CPU console

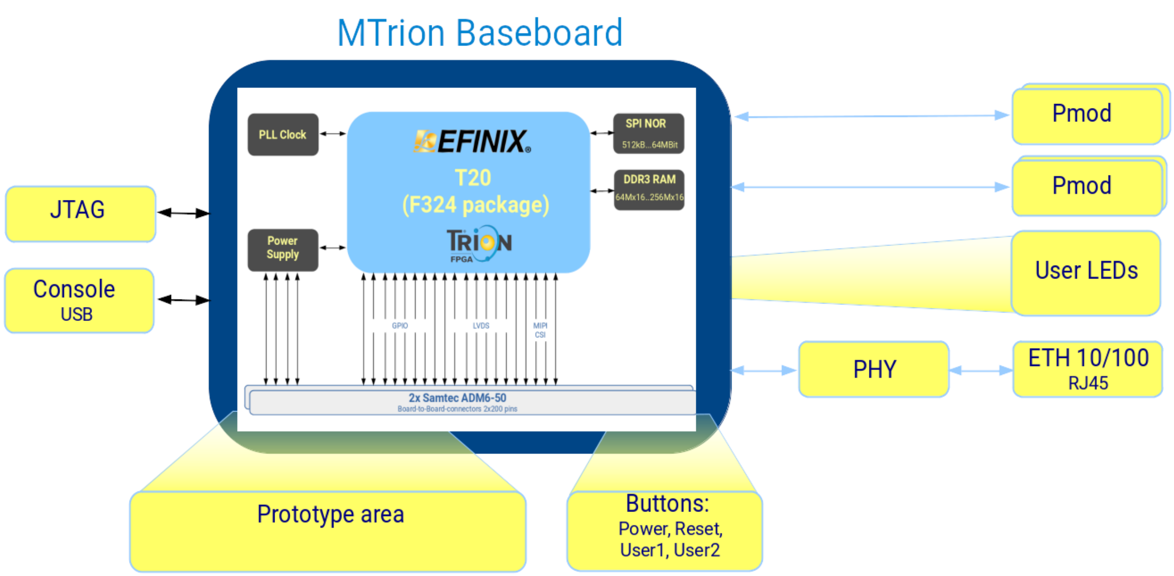
2.3 Order Codes

The MTrionEVK is available in the following standard configurations:

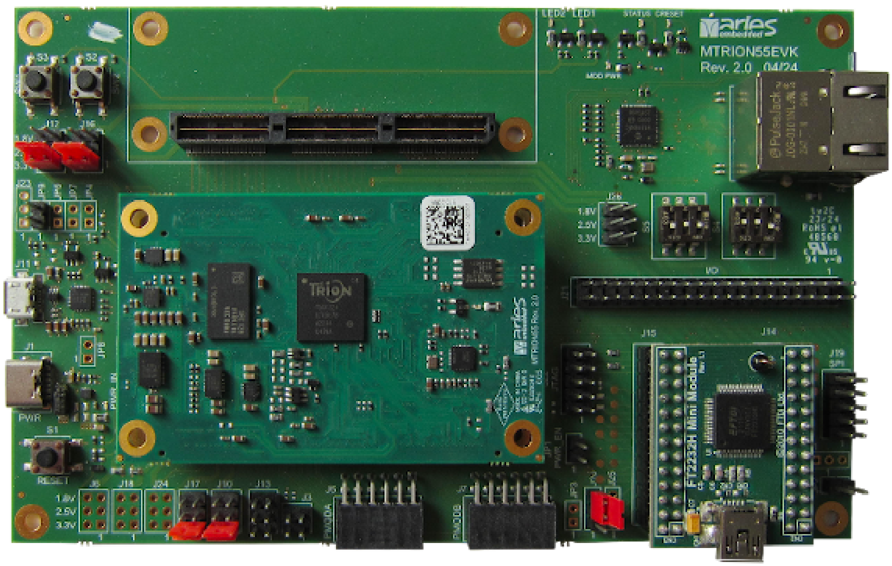
- MTrionEVK-55

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

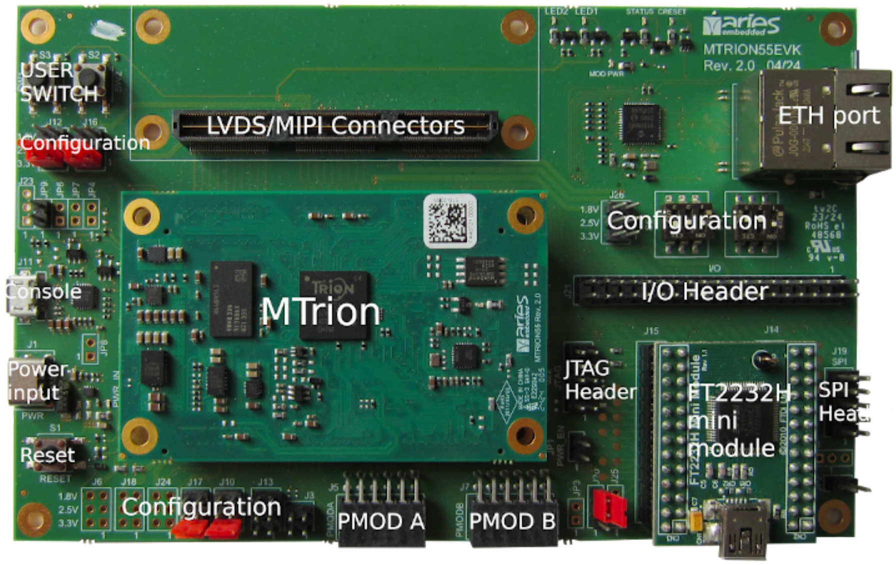
2.4 Block Diagram



2.5 Dimensions

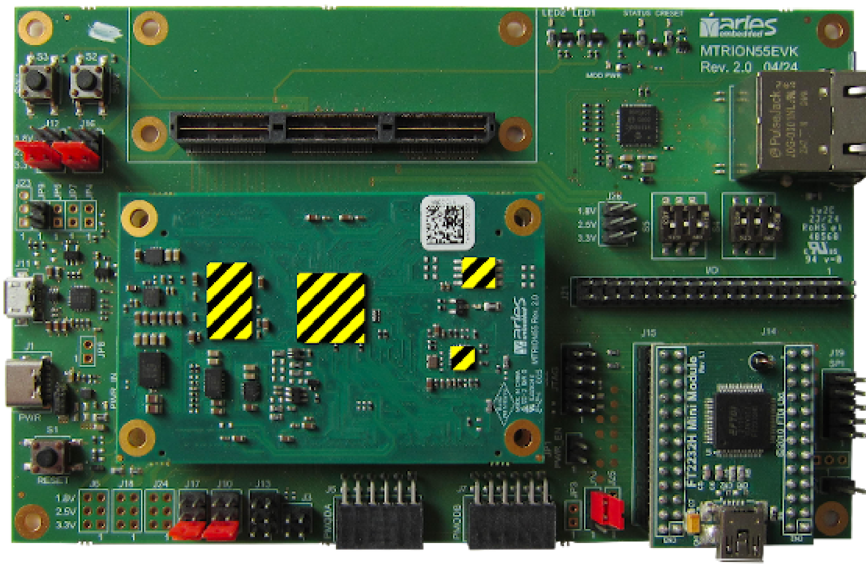


2.6 Part Overview



2.7 Handling Recommendations

To avoid mechanical damage to the components populated on MTrion 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:



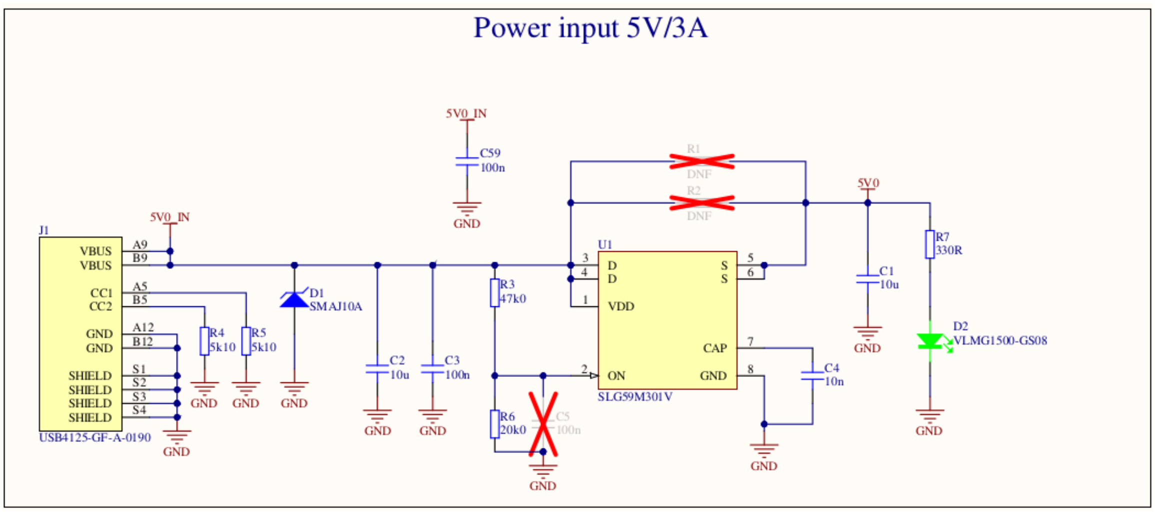
CHAPTER THREE

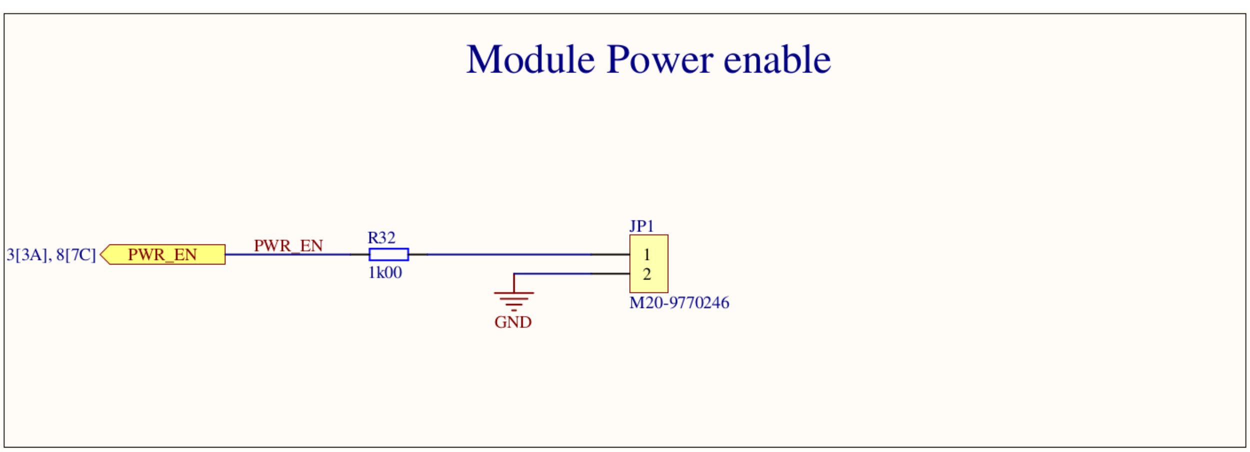
RESOURCES

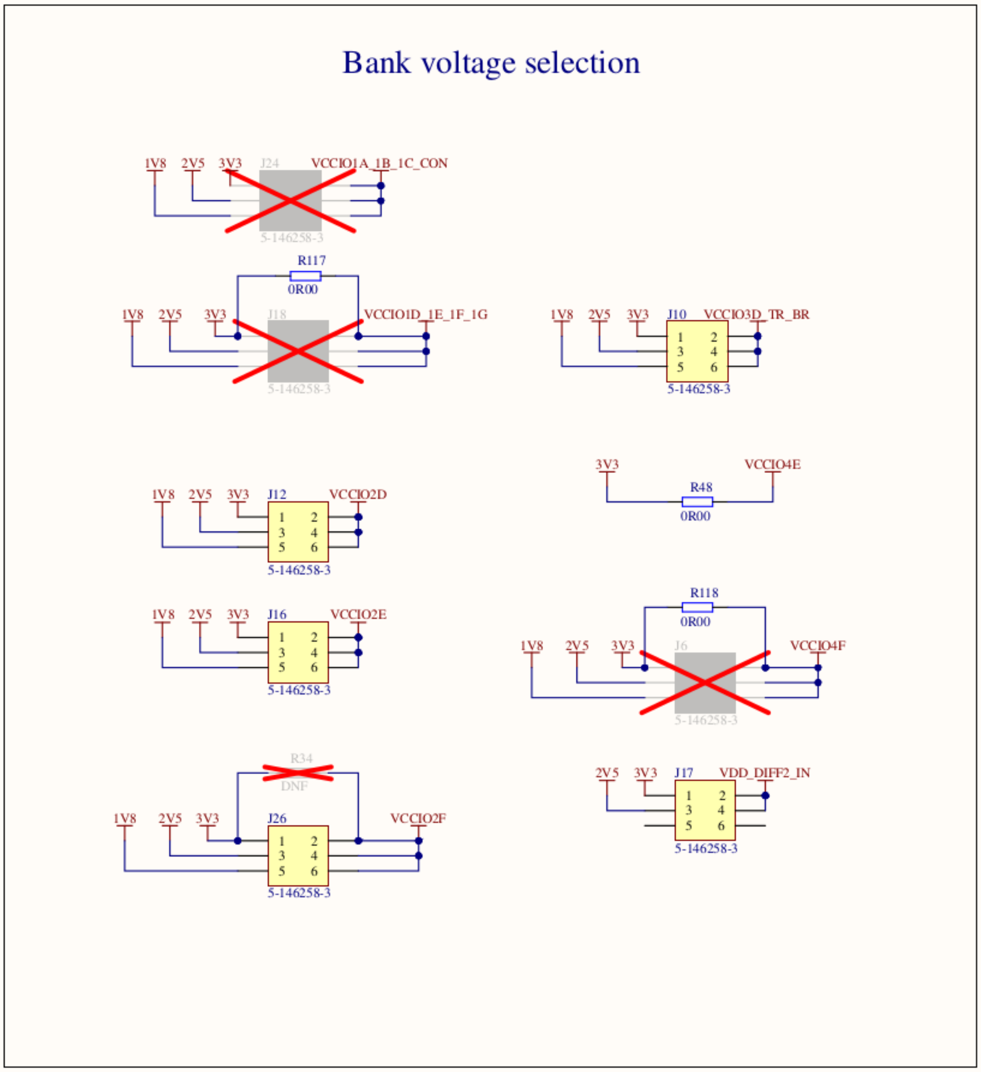
3.1 POWER SUPPLY

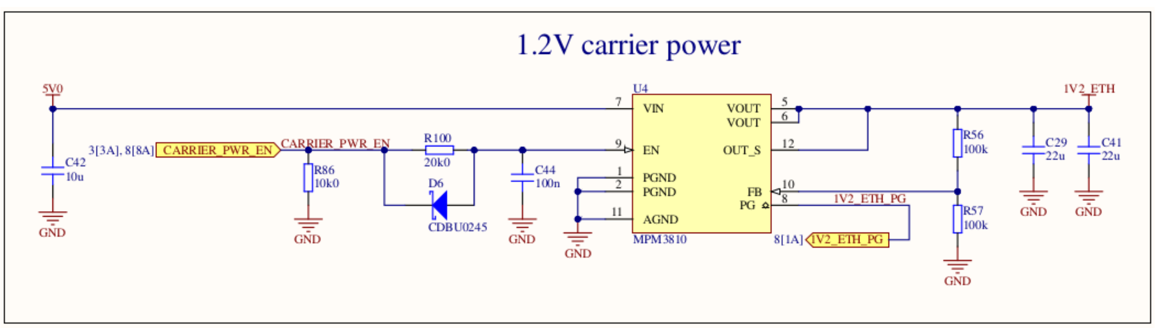
The baseboard must be supplied with the following voltage:

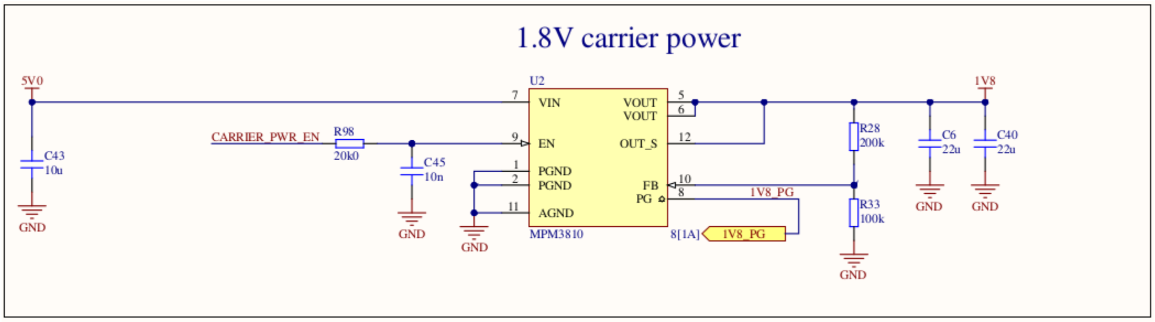
min. voltage	max. voltage
4.25 V	5.5 V






Bank voltage selection
1V8
2V5
3V3
J24
VCCIO1A_1B_1C_CON
5-146258-3
R117
0R00
J18
VCCIO1D_1E_1F_1G
J10
VCCIO3D_TR_BR
J12
VCCIO2D
VCCIO4E
R48
J16
VCCIO2E
R118
J6
VCCIO4F
R34
DNF
J26
VCCIO2F
J17
VDD_DIFF2_IN

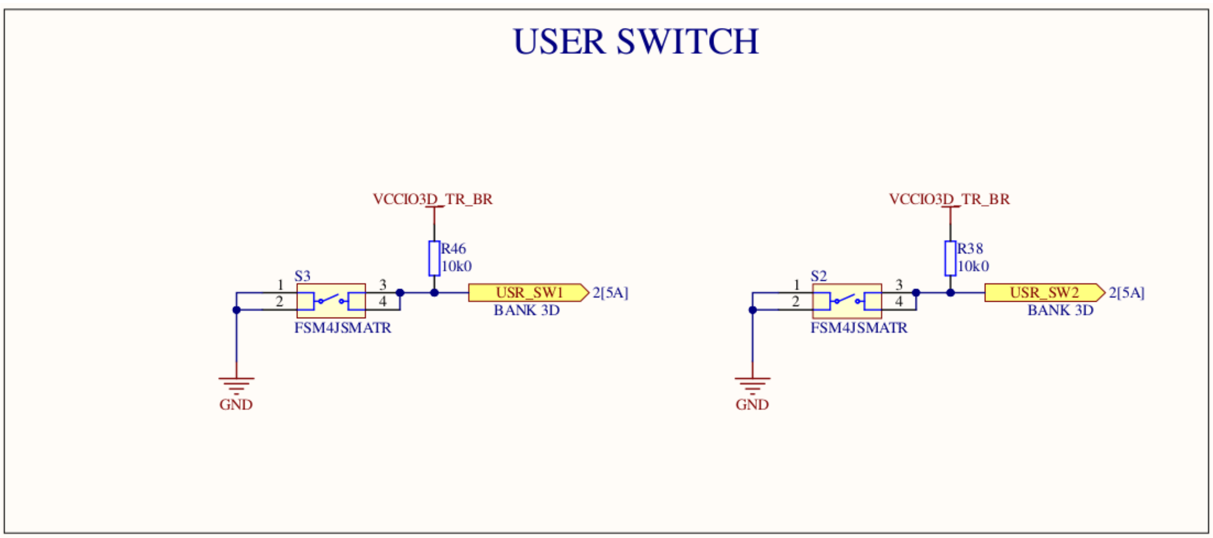

1.2V carrier power
5V0
C42
10u
GND
3[3A], 8[8A]
CARRIER_PWR_EN
R86
10k0
R100
20k0
D6
CDBU0245
C44
100n
U4
VIN
EN
PGND
AGND
MPM3810
VOUT
OUT_S
FB
PG
1V2_ETH_PG
8[1A]
R56
100k
R57
100k
C29
22u
C41
22u
1V2_ETH



3.2 USER SWITCH

MTrionEVK Function	S3 Pin	J8B Connector Pin	MTrion Pin
USR_SW1	3, 4	70	G5

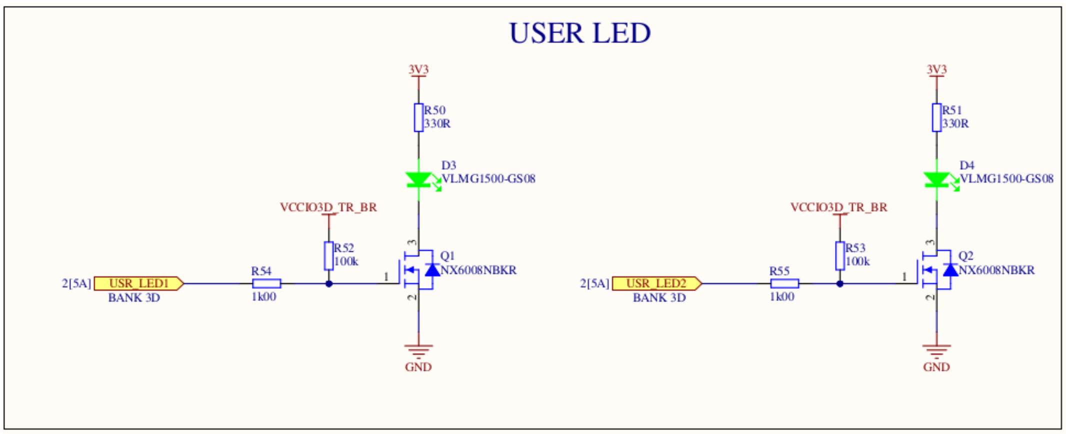
MTrionEVK Function	S2 Pin	J8B Connector Pin	MTrion Pin
USR_SW2	3, 4	76	K6



3.3 USER LED

MTrionEVK Function	J8B Connector Pin	MTrion Pin
USR_LED1	74	H6

MTrionEVK Function	J8B Connector Pin	MTrion Pin
USR_LED2	72	G6



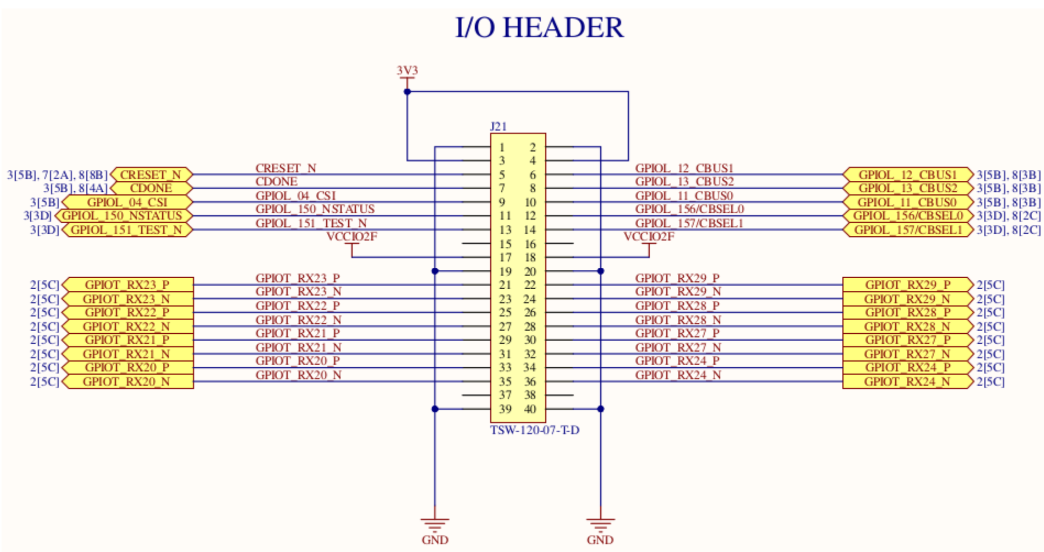
3.4 I/O HEADER

MTrionEVK Function	J21 Pin	Connector Pin	MTrion Pin
GND	1	–	–
3V3	3	–	–
CRESET_N	5	159 (J9C)	N17
CDONE	7	157 (J9C)	N18
GPIOL_04_CSI	9	169 (J9C)	N15
GPIOL_150_NSTATUS	11	119 (J9B)	J14
GPIOL_151_TEST_N	13	117 (J9B)	J15
–	15	–	–
VCCIO2F	17	–	–
GND	19	–	–
GPIOT_RX23_P	21	157 (J8C)	B13
GPIOT_RX23_N	23	159 (J8C)	A13
GPIOT_RX22_P	25	163 (J8C)	B14
GPIOT_RX22_N	27	165 (J8C)	A14
GPIOT_RX21_P	29	169 (J8C)	B15
GPIOT_RX21_N	31	171 (J8C)	A15
GPIOT_RX20_P	33	175 (J8C)	B16
GPIOT_RX20_N	35	177 (J8C)	A16
–	37	–	–
GND	39	–	–

continues on next page

Table 1 – continued from previous page

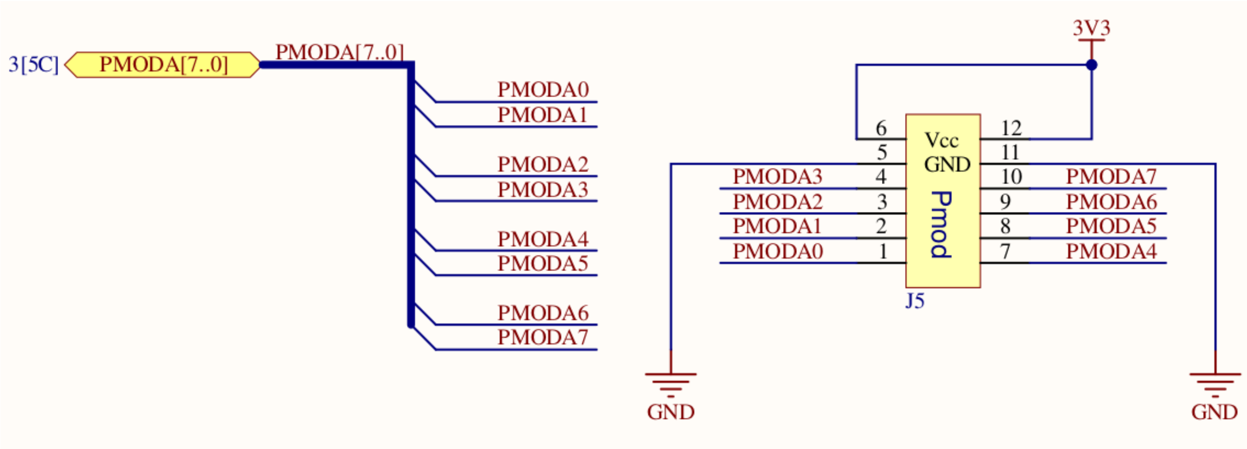
MTrionEVK Function	J21 Pin	Connector Pin	MTrion Pin
GND	2	–	–
3V3	4	–	–
GPIOL_12_CBUS1	6	175 (J9C)	M16
GPIOL_13_CBUS2	8	177 (J9C)	M17
GPIOL_11_CBUS0	10	173 (J9C)	M14
GPIOL_156/CBSEL0	12	113 (J9B)	J17
GPIOL_157/CBSEL1	14	115 (J9B)	J18
–	16	–	–
VCCIO2F	18	–	–
GND	20	–	–
GPIOT_RX29_P	22	133 (J8C)	B9
GPIOT_RX29_N	24	135 (J8C)	A9
GPIOT_RX28_P	26	139 (J8C)	A10
GPIOT_RX28_N	28	141 (J8C)	B10
GPIOT_RX27_P	30	145 (J8C)	A11
GPIOT_RX27_N	32	147 (J8C)	B11
GPIOT_RX24_P	34	151 (J8C)	A12
GPIOT_RX24_N	36	153 (J8C)	B12
–	38	–	–
GND	40	–	–



3.5 PMOD

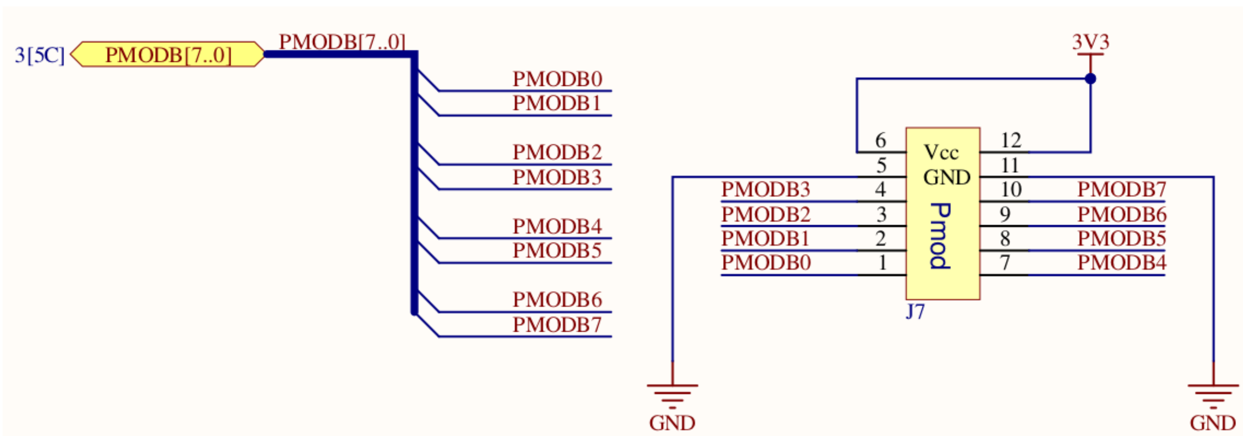
3.5.1 PMODA

MTrionEVK Function	J5 Pin	J9B Connector Pin	MTrion Pin
PMODA0	1	62	T9
PMODA1	2	64	R9
PMODA2	3	68	U11
PMODA3	4	70	T11
PMODA4	7	74	V9
PMODA5	8	76	U9
PMODA6	9	80	N9
PMODA7	10	82	P9



3.5.2 PMODB

MTrionEVK Function	J7 Pin	J9B Connector Pin	MTrion Pin
PMODB0	1	86	U10
PMODB1	2	88	V10
PMODB2	3	92	N10
PMODB3	4	94	P10
PMODB4	7	98	N11
PMODB5	8	100	P11
PMODB6	9	104	P12
PMODB7	10	106	N12



3.6 LVDS/MIPI

The interfaces of MIPI and LVDS can be reached via the connectors of J4.

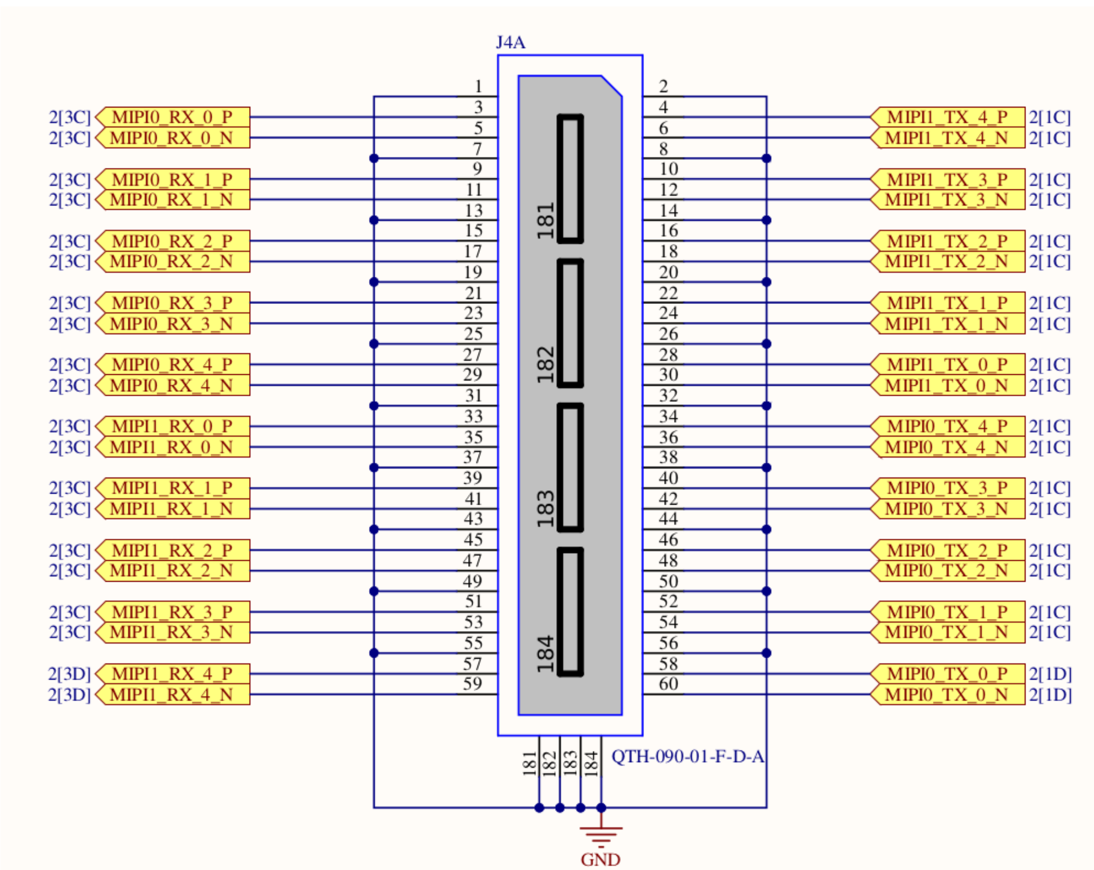
MIPI - Connector J4A

MTrion Pin	MTrion Function	Connector Pin J8A	MTrionEVK Function	J4A Pin
–	–	–	GND	1
E5	MIPI0_RX_0_P	4	MIPI0_RX_0_P	3
D5	MIPI0_RX_0_N	6	MIPI0_RX_0_N	5
–	–	–	GND	7
E8	MIPI0_RX_1_P	10	MIPI0_RX_1_P	9
D8	MIPI0_RX_1_N	12	MIPI0_RX_1_N	11
–	–	–	GND	13
F6	MIPI0_RX_2_P	16	MIPI0_RX_2_P	15
F5	MIPI0_RX_2_N	18	MIPI0_RX_2_N	17
–	–	–	GND	19
E6	MIPI0_RX_3_P	22	MIPI0_RX_3_P	21
D6	MIPI0_RX_3_N	24	MIPI0_RX_3_N	23
–	–	–	GND	25
E7	MIPI0_RX_4_P	28	MIPI0_RX_4_P	27
F7	MIPI0_RX_4_N	30	MIPI0_RX_4_N	29
–	–	–	GND	31
D4	MIPI1_RX_0_P	34	MIPI1_RX_0_P	33
E4	MIPI1_RX_0_N	36	MIPI1_RX_0_N	35
–	–	–	GND	37
F3	MIPI1_RX_1_P	40	MIPI1_RX_1_P	39
G3	MIPI1_RX_1_N	42	MIPI1_RX_1_N	41
–	–	–	GND	43
G1	MIPI1_RX_2_P	46	MIPI1_RX_2_P	45
F1	MIPI1_RX_2_N	48	MIPI1_RX_2_N	47
–	–	–	GND	49
H2	MIPI1_RX_3_P	52	MIPI1_RX_3_P	51
G2	MIPI1_RX_3_N	54	MIPI1_RX_3_N	53
–	–	–	GND	55
D3	MIPI1_RX_4_P	58	MIPI1_RX_4_P	57
E3	MIPI1_RX_4_P	60	MIPI1_RX_4_P	59
–	–	–	GND	2
E1	MIPI1_TX_4_P	3	MIPI1_TX_4_P	4
D1	MIPI1_TX_4_N	5	MIPI1_TX_4_N	6
–	–	–	GND	8
D2	MIPI1_TX_3_P	9	MIPI1_TX_3_P	10
E2	MIPI1_TX_3_N	11	MIPI1_TX_3_N	12
–	–	–	GND	14
C1	MIPI1_TX_2_P	15	MIPI1_TX_2_P	16
B1	MIPI1_TX_2_N	17	MIPI1_TX_2_N	18
–	–	–	GND	20
B2	MIPI1_TX_1_P	21	MIPI1_TX_1_P	22
A2	MIPI1_TX_1_N	23	MIPI1_TX_1_N	24
–	–	–	GND	26
B3	MIPI1_TX_0_P	27	MIPI1_TX_0_P	28

continues on next page

Table 2 – continued from previous page

MTrion Pin	MTrion Function	Connector Pin J8A	MTrionEVK Function	J4A Pin
A3	MIPI1_TX_0_N	29	MIPI1_TX_0_N	30
–	–	–	GND	32
A4	MIPI0_TX_4_P	33	MIPI0_TX_4_P	34
B4	MIPI0_TX_4_N	35	MIPI0_TX_4_N	36
–	–	–	GND	38
A5	MIPI0_TX_3_P	39	MIPI0_TX_3_P	40
B5	MIPI0_TX_3_N	41	MIPI0_TX_3_N	42
–	–	–	GND	44
B8	MIPI0_TX_2_P	45	MIPI0_TX_2_P	46
A8	MIPI0_TX_2_N	47	MIPI0_TX_2_N	48
–	–	–	GND	50
A7	MIPI0_TX_1_P	51	MIPI0_TX_1_P	52
B7	MIPI0_TX_1_N	53	MIPI0_TX_1_N	54
–	–	–	GND	56
B6	MIPI0_TX_0_P	57	MIPI0_TX_0_P	58
A6	MIPI0_TX_0_N	59	MIPI0_TX_0_N	60
–	–	–	GND	181
–	–	–	GND	182
–	–	–	GND	183
–	–	–	GND	184



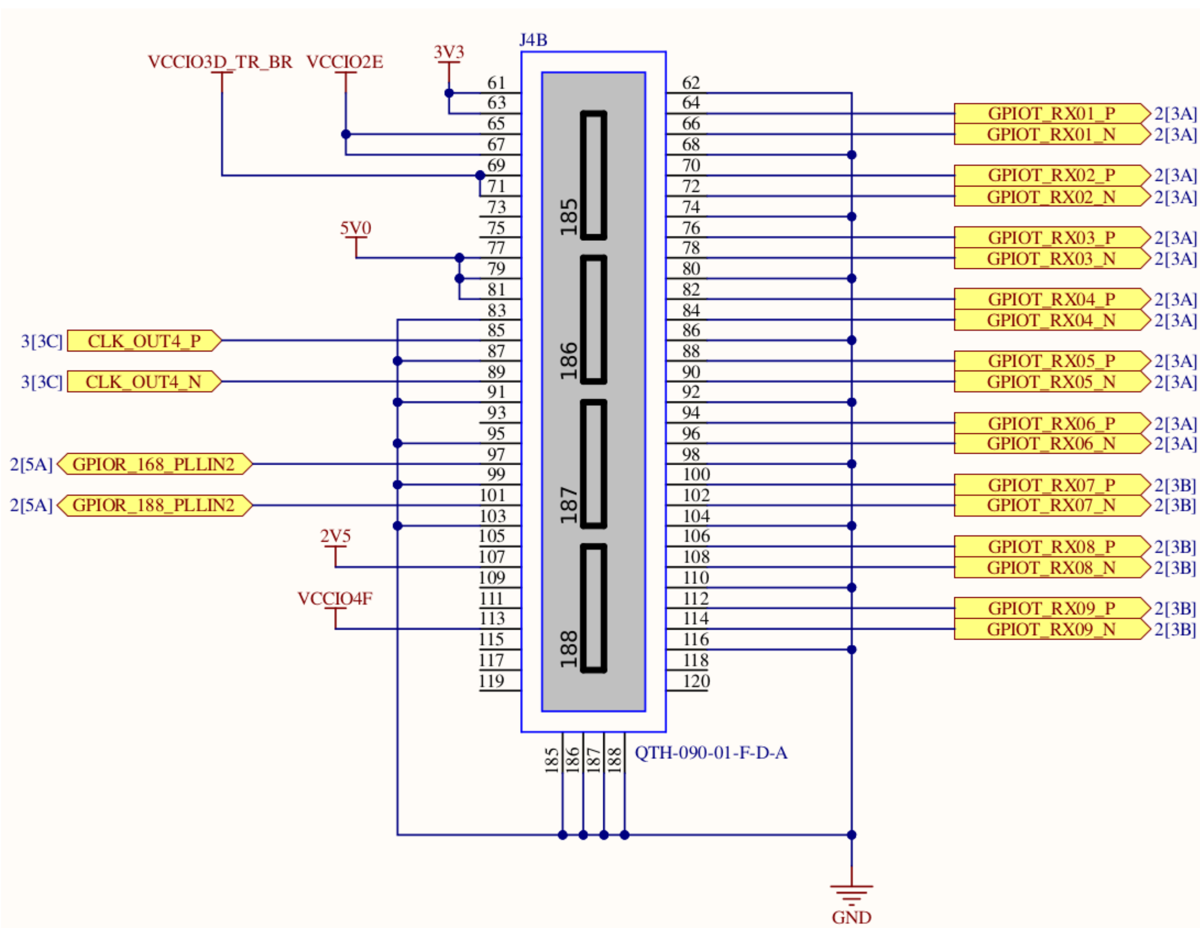
LVDS - Connector J4B

MTrion Pin	MTrion Function	Connector Pin J8B	MTrionEVK Function	J4B Pin
–	–	–	3V3	61
–	–	–	3V3	63
–	–	–	VCCIO2E	65
–	–	–	VCCIO2E	67
–	–	–	VCCIO3D_TR_BR	69
–	–	–	VCCIO3D_TR_BR	71
–	–	–	–	73
–	–	–	–	75
–	–	–	5V0	77
–	–	–	5V0	79
–	–	–	5V0	81
–	–	–	GND	83
24 (CG)	CLK_OUT4_P	101 (J9B)	CLK_OUT4_P	85
–	–	–	GND	87
23 (CG)	CLK_OUT4_N	99 (J9B)	CLK_OUT4_N	89
–	–	–	GND	91
–	–	–	–	93
–	–	–	GND	95
E9	GPIOR_168_PLLIN2	64	GPIOR_168_PLLIN2	97
–	–	–	GND	99
R8	GPIOR_188_PLLIN2	66	GPIOR_188_PLLIN2	101
–	–	–	GND	103
–	–	–	–	105
–	–	–	2V5	107
–	–	–	–	109
–	–	–	–	111
–	–	–	VCCIO4F	113
–	–	–	–	115
–	–	–	–	117
–	–	–	–	119
–	–	–	GND	62
D13	GPIOT_RX01_P	67	GPIOT_RX01_P	64
C13	GPIOT_RX01_N	69	GPIOT_RX01_N	66
–	–	–	GND	68
C16	GPIOT_RX02_P	73	GPIOT_RX02_P	70
D16	GPIOT_RX02_N	75	GPIOT_RX02_N	72
–	–	–	GND	74
D11	GPIOT_RX03_P	79	GPIOT_RX03_P	76
C11	GPIOT_RX03_N	81	GPIOT_RX03_N	78
–	–	–	GND	80
D15	GPIOT_RX04_P	85	GPIOT_RX04_P	82
E15	GPIOT_RX04_N	87	GPIOT_RX04_N	84
–	–	–	GND	86
D14	GPIOT_RX05_P	91	GPIOT_RX05_P	88
E14	GPIOT_RX05_N	93	GPIOT_RX05_N	90
–	–	–	GND	92
E12	GPIOT_RX06_P	97	GPIOT_RX06_P	94
D12	GPIOT_RX06_N	99	GPIOT_RX06_N	96

continues on next page

Table 3 – continued from previous page

MTrion Pin	MTrion Function	Connector Pin J8B	MTrionEVK Function	J4B Pin
–	–	–	GND	98
E13	GPIOT_RX07_P	103	GPIOT_RX07_P	100
F14	GPIOT_RX07_N	105	GPIOT_RX07_N	102
–	–	–	GND	104
E11	GPIOT_RX08_P	109	GPIOT_RX08_P	106
F11	GPIOT_RX08_N	111	GPIOT_RX08_N	108
–	–	–	GND	110
E16	GPIOT_RX09_P	115	GPIOT_RX09_P	112
F16	GPIOT_RX09_N	117	GPIOT_RX09_N	114
–	–	–	GND	116
–	–	–	–	118
–	–	–	–	120
–	–	–	GND	185
–	–	–	GND	186
–	–	–	GND	187
–	–	–	GND	188



LVDS - Connector J4C

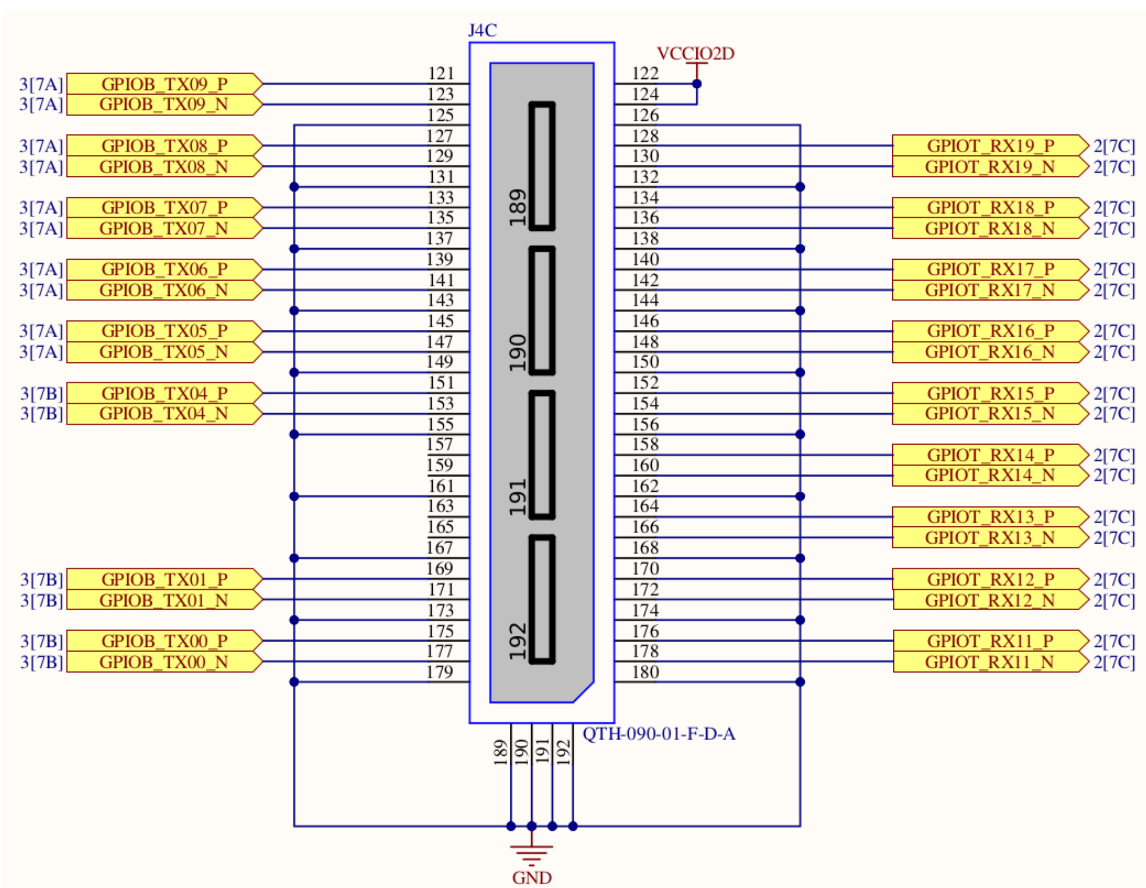
MTrion Pin	MTrion Function	Connector Pin J9C	MTrionEVK Function	J4C Pin
P13	GPIOB_TX09_P	122	GPIOB_TX09_P	121
R13	GPIOB_TX09_N	124	GPIOB_TX09_N	123
–	–	–	GND	125
V13	GPIOB_TX08_P	128	GPIOB_TX08_P	127
U13	GPIOB_TX08_N	130	GPIOB_TX08_N	129
–	–	–	GND	131
P14	GPIOB_TX07_P	134	GPIOB_TX07_P	133
R14	GPIOB_TX07_N	136	GPIOB_TX07_N	135
–	–	–	GND	137
V14	GPIOB_TX06_P	140	GPIOB_TX06_P	139
U14	GPIOB_TX06_N	142	GPIOB_TX06_N	141
–	–	–	GND	143
T15	GPIOB_TX05_P	146	GPIOB_TX05_P	145
R15	GPIOB_TX05_N	148	GPIOB_TX05_N	147
–	–	–	GND	149
U15	GPIOB_TX04_P	152	GPIOB_TX04_P	151
V15	GPIOB_TX04_N	154	GPIOB_TX04_N	153
–	–	–	GND	155
–	–	–	–	157
–	–	–	–	159
–	–	–	GND	161
–	–	–	–	163
–	–	–	–	165
–	–	–	GND	167
U18	GPIOB_TX01_P	170	GPIOB_TX01_P	169
T18	GPIOB_TX01_N	172	GPIOB_TX01_N	171
–	–	–	GND	173
T17	GPIOB_TX00_P	176	GPIOB_TX00_P	175
R17	GPIOB_TX00_N	178	GPIOB_TX00_N	177
–	–	–	GND	179

MTrion Pin	MTrion Function	Connector Pin J8C	MTrionEVK Function	J4C Pin
–	–	–	VCCIO2D	122
–	–	–	VCCIO2D	124
–	–	–	GND	126
A17	GPIOT_RX19_P	128	GPIOT_RX19_P	128
B17	GPIOT_RX19_N	130	GPIOT_RX19_N	130
–	–	–	GND	132
B18	GPIOT_RX18_P	134	GPIOT_RX18_P	134
C18	GPIOT_RX18_N	136	GPIOT_RX18_N	136
–	–	–	GND	138
H18	GPIOT_RX17_P	140	GPIOT_RX17_P	140
G18	GPIOT_RX17_N	142	GPIOT_RX17_N	142
–	–	–	GND	144
D18	GPIOT_RX16_P	146	GPIOT_RX16_P	146

continues on next page

Table 5 – continued from previous page

MTrion Pin	MTrion Function	Connector Pin J8C	MTrionEVK Function	J4C Pin
E18	GPIOT_RX16_N	148	GPIOT_RX16_N	148
–	–	–	GND	150
D17	GPIOT_RX15_P	152	GPIOT_RX15_P	152
E17	GPIOT_RX15_N	154	GPIOT_RX15_N	154
–	–	–	GND	156
G14	GPIOT_RX14_P	158	GPIOT_RX14_P	158
F14	GPIOT_RX14_N	160	GPIOT_RX14_N	160
–	–	–	GND	162
G15	GPIOT_RX13_P	164	GPIOT_RX13_P	164
H15	GPIOT_RX13_N	166	GPIOT_RX13_N	166
–	–	–	GND	168
G16	GPIOT_RX12_P	170	GPIOT_RX12_P	170
H16	GPIOT_RX12_N	172	GPIOT_RX12_N	172
–	–	–	GND	174
G17	GPIOT_RX11_P	176	GPIOT_RX11_P	176
H17	GPIOT_RX11_N	178	GPIOT_RX11_N	178
–	–	–	GND	180
–	–	–	GND	189
–	–	–	GND	190
–	–	–	GND	191
–	–	–	GND	192



3.7 Ethernet

MTrionEVK offers one ethernet port. The ethernet port can be accessed via the RJ45 connector J2 supported by microchip KSZ9131RNXC ethernet physical-layer transceivers.

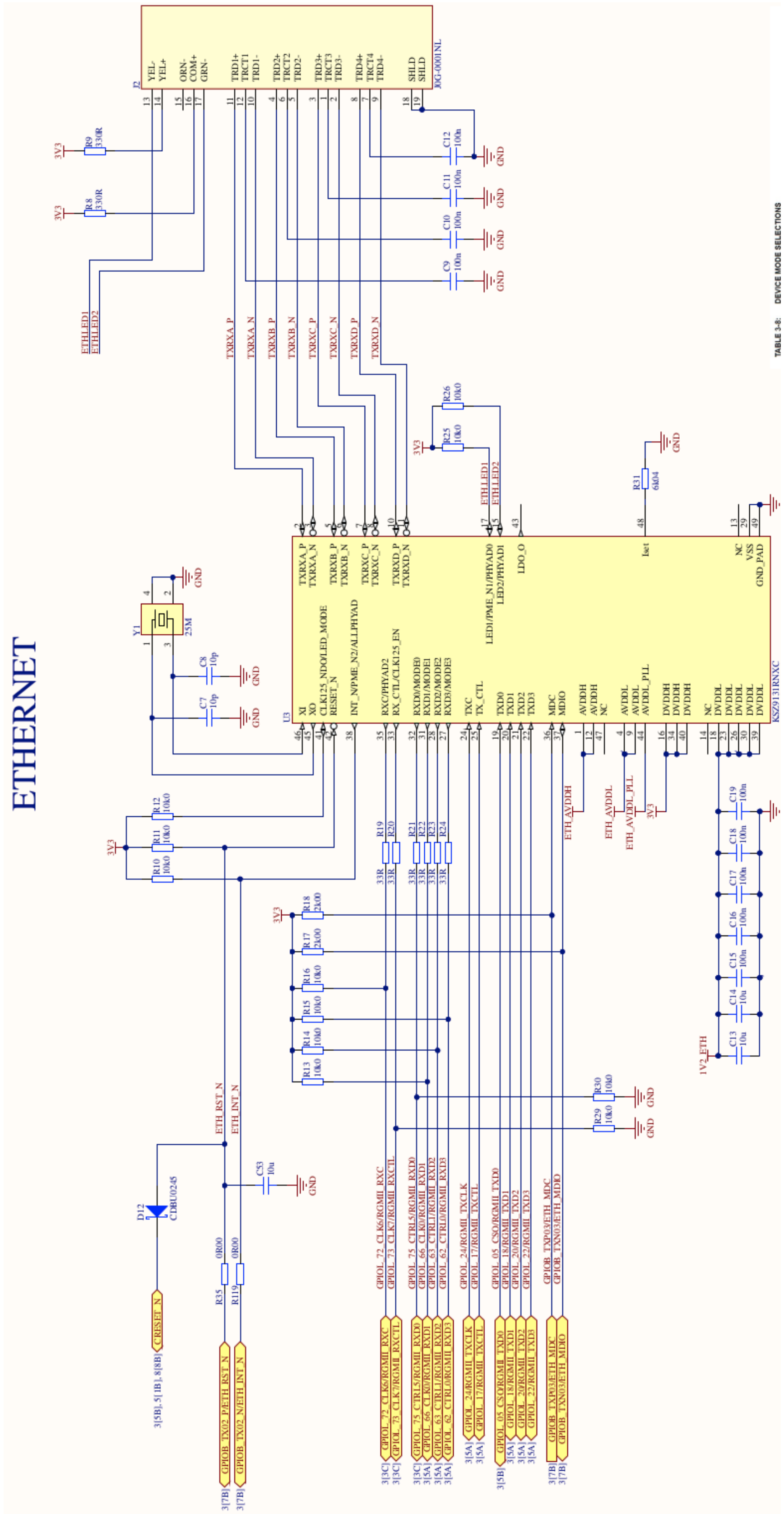
MTrionEVK Function	U3 Pin	J9C Connector Pin	MTrion Pin
CRESET_N	**Remark**	159	N17
GPIOB_TX02_P/ETH_RST_N	42	164	R18
GPIOB_TX02_N/ETH_INT_N	38	166	P18
GPIOL_66_CLK0/RGMII_RXD1	31	125	K17
GPIOL_63_CTRL1/RGMII_RXD2	28	127	K15
GPIOL_62_CTRL0/RGMII_RXD3	27	129	K16
GPIOL_24/RGMII_TXCLK	24	135	L17
GPIOL_17/RGMII_TXCTL	25	133	L15
GPIOL_05_CSO/RGMII_TXD0	19	171	M15
GPIOL_18/RGMII_TXD1	20	141	M18
GPIOL_20/RGMII_TXD2	21	139	L18
GPIOL_22/RGMII_TXD3	22	137	L16
GPIOB_TXP03/ETH_MDC	36	158	U16
GPIOB_TXN03/ETH_MDIO	37	160	V16

MTrionEVK Function	U3 Pin	J9B Connector Pin	MTrion Pin
GPIOL_72_CLK6/RGMII_RXC	35	105	H14
GPIOL_73_CLK7/RGMII_RXCTL	33	107	H13
GPIOL_75_CTRL5/RGMII_RXD0	32	109	G13

3.7.1 Device mode selections

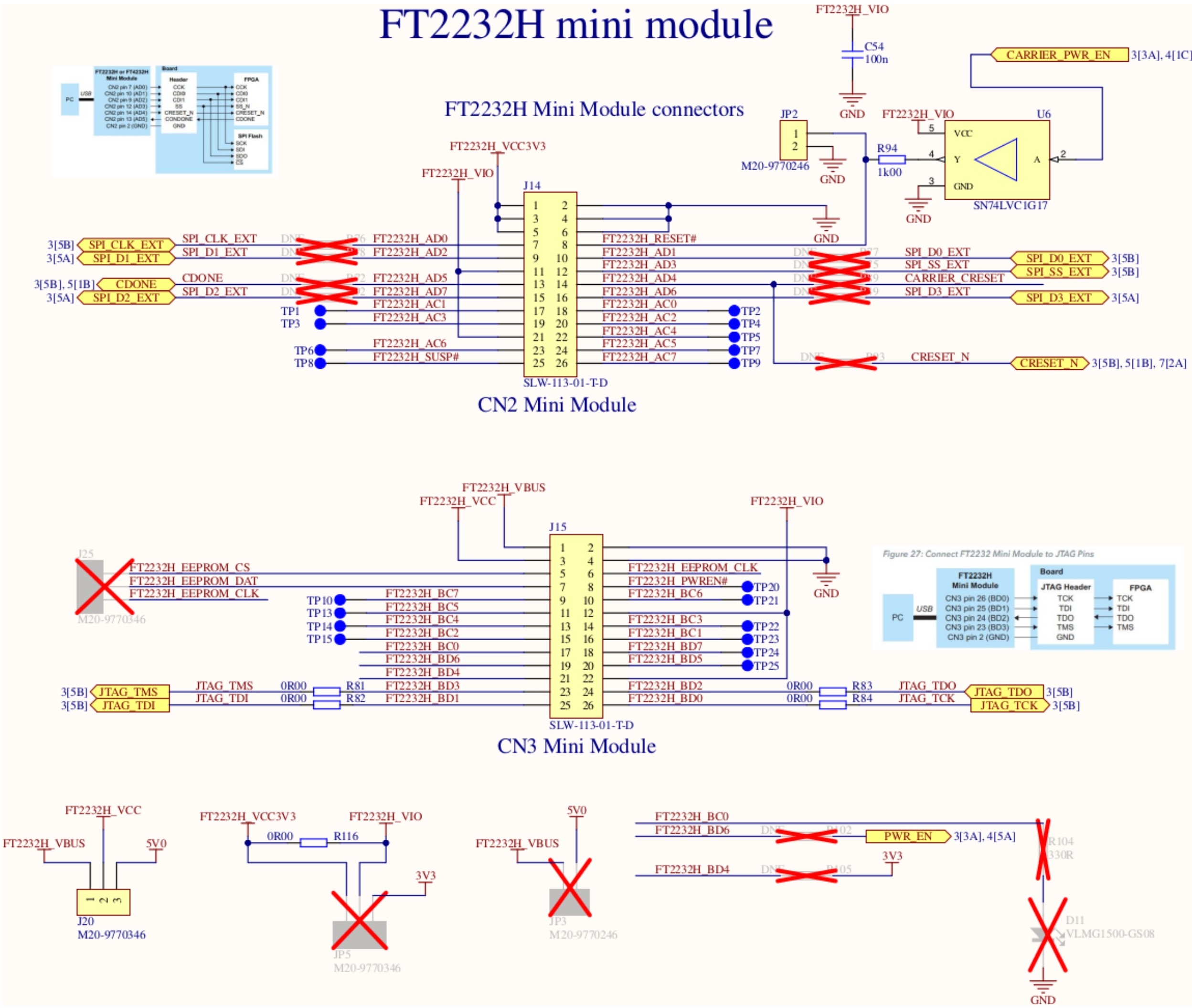
TABLE 3-8: DEVICE MODE SELECTIONS

Functional Modes							
MODE[3:0]	Mode	Pin 17 Function	Pin 38 Function	Auto-negotiation Advertisement			
				1000BT Full Duplex	1000BT Half Duplex	10/100BT Full Duplex	10/100BT Half Duplex
0000	RESERVED			-	-	-	-
0001	RESERVED			-	-	-	-
1000	RGMII	LED1 (PME_N1)		no	no	yes	yes
1001	RESERVED			-	-	-	-
1010	RGMII		INT_N (PME_N2)	no	no	yes	yes
1011	RESERVED			-	-	-	-
1100	RGMII			yes	no	no	no
1101	RESERVED			-	-	-	-
1110	RGMII			yes	no	yes	yes
1111	RESERVED			-	-	-	-

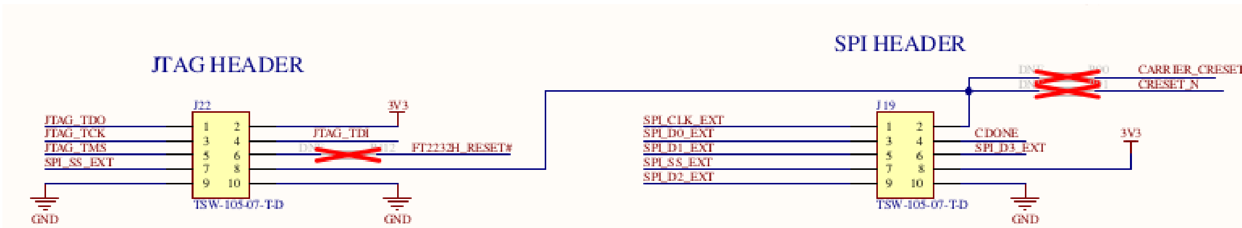

ETHERNET

3.8 FT2232H mini module

The FT2232H mini module can be added additionally and enables access to the JTAG-Interface via USB 2.0. More Information about the component is available on MouserElectronics and DigiKey.



3.9 JTAG Header & SPI Header



3.9.1 JTAG Header

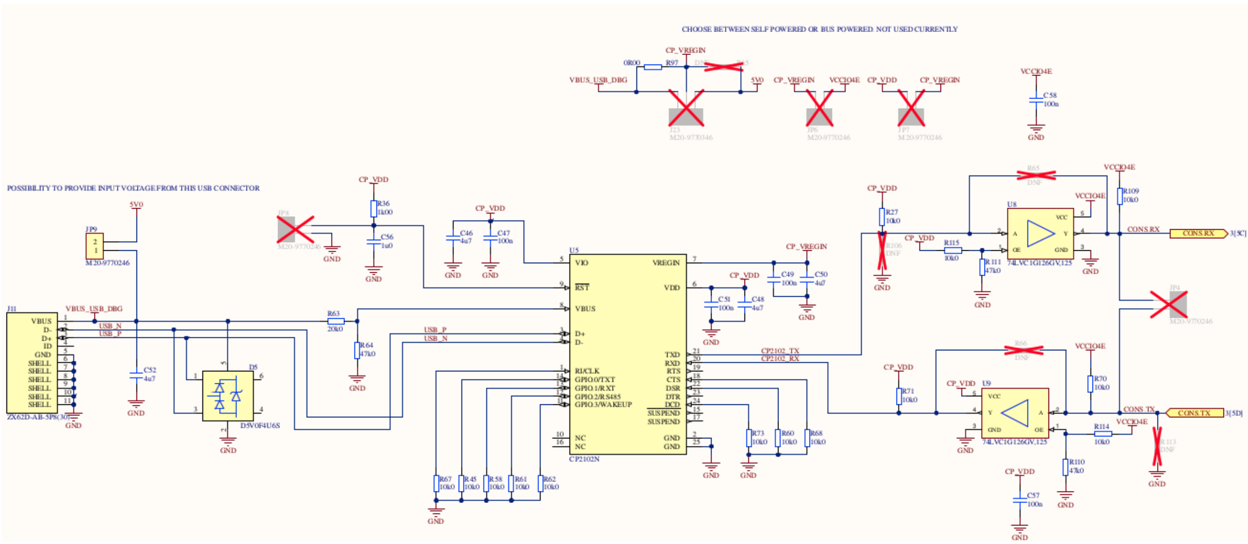
MTrionEVK Function	J22 Pin	J9C Connector Pin	MTrion Pin
JTAG_TDO	1	163	P17
JTAG_TCK	3	167	T16
JTAG_TMS	5	161	P16
SPI_SS_EXT	7	153	–
GND	9	–	–
3V3	2	–	–
JTAG_TDI	4	165	R16
–	6	–	–
–	8	–	–
GND	10	–	–

3.9.2 SPI Header

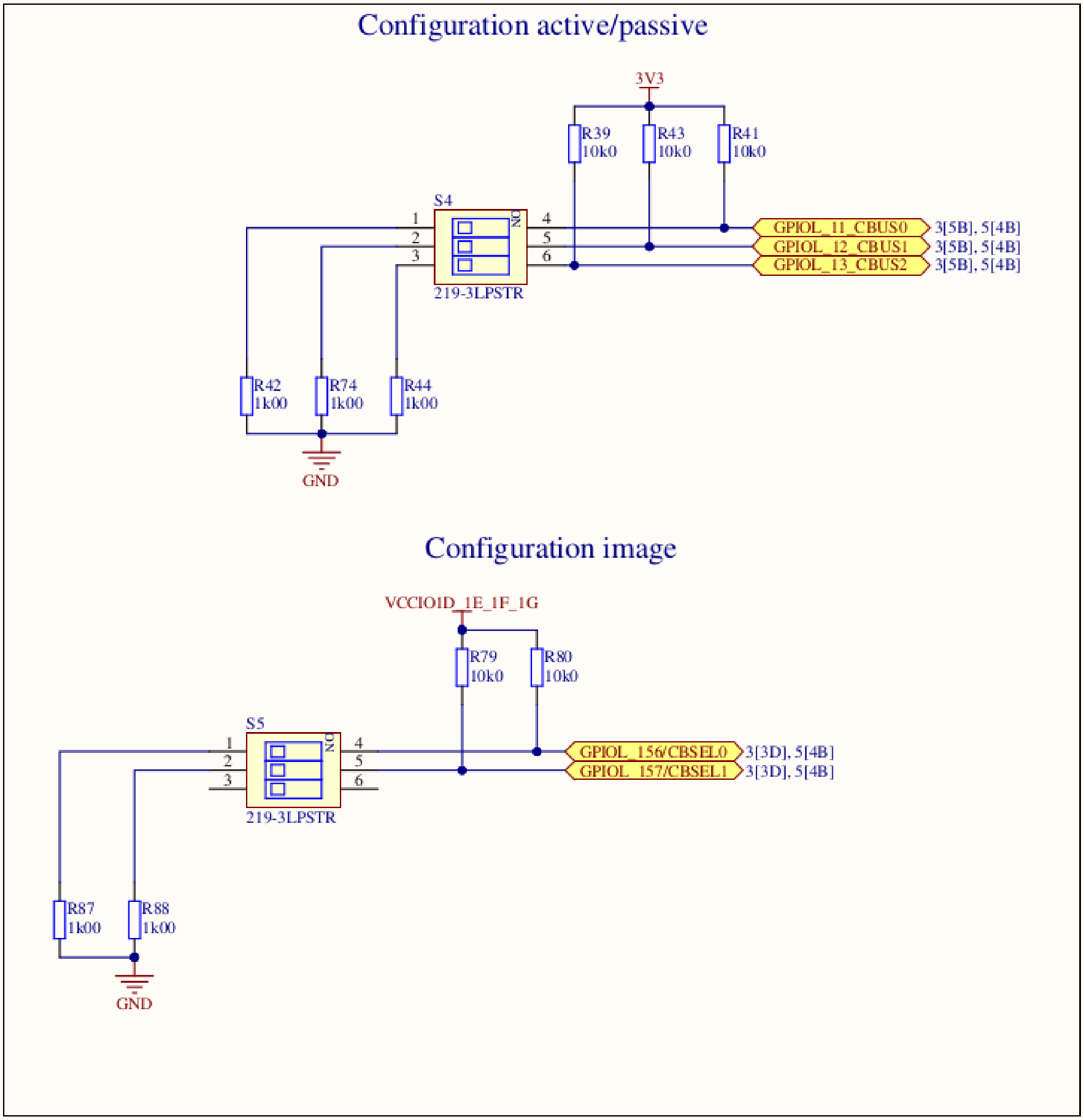
MTrionEVK Function	J19 Pin	J9C Connector Pin	MTrion Pin
SPI_CLK_EXT	1	155	–
SPI_D0_EXT	3	151	–
SPI_D1_EXT	5	149	–
SPI_SS_EXT	7	153	–
SPI_D2_EXT	9	145	–
–	2	–	–
CDONE	4	157	N18
SPI_D3_EXT	6	143	–
3V3	8	–	–
GND	10	–	–

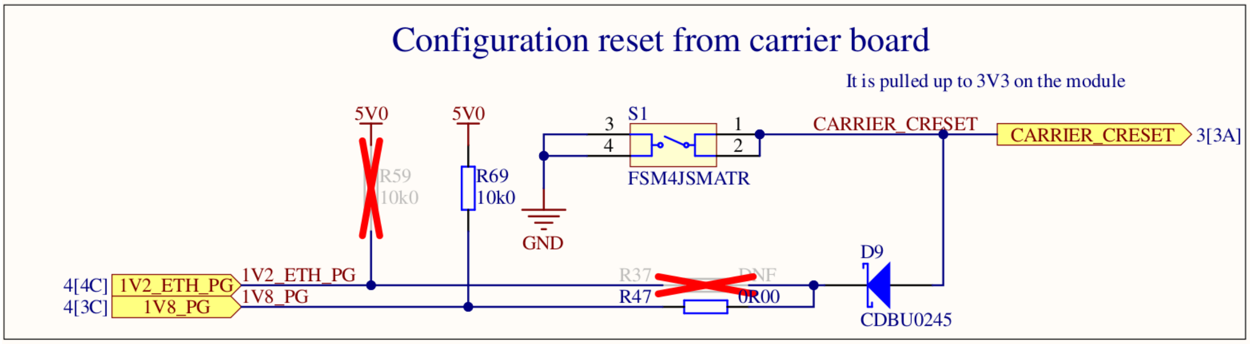
3.10 Console

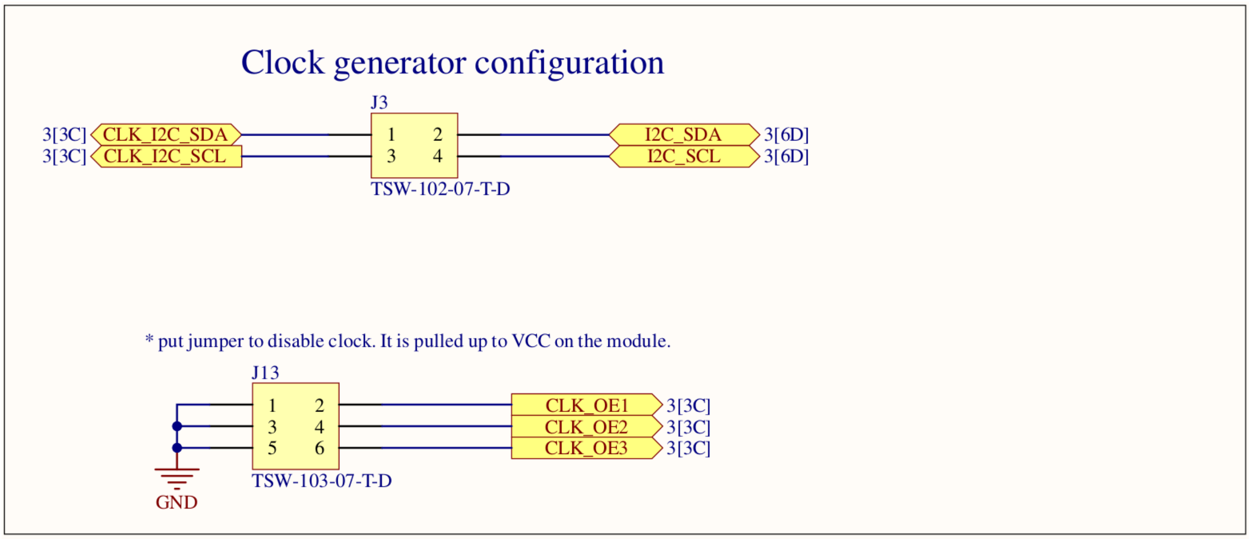
MTrionEVK Function	U5 Pin	J9B Connector Pin	MTrion Pin
CONS.RX	21	110	R12
CONS.TX	20	112	T12



3.11 Configuration




Configuration reset from carrier board
It is pulled up to 3V3 on the module
5V0
5V0
R59
10k0
R69
10k0
S1
FSM4JSMATR
GND
CARRIER_CRESET
CARRIER_CRESET
3[3A]
4[4C]
1V2_ETH_PG
4[3C]
1V8_PG
1V2_ETH_PG
1V8_PG
R37
DNF
R47
0R00
D9
CDBU0245


Clock generator configuration
J3
3[3C]
CLK_I2C_SDA
3[3C]
CLK_I2C_SCL
TSW-102-07-T-D
I2C_SDA
3[6D]
I2C_SCL
3[6D]
* put jumper to disable clock. It is pulled up to VCC on the module.
J13
TSW-103-07-T-D
GND
CLK_OE1
3[3C]
CLK_OE2
3[3C]
CLK_OE3
3[3C]

3.12 MTrion FPGA

Connector Bottom J9

Contact Overview

MTrion Pin	MTrion Function	Connector Pin	MTrionEVK Function
J9A			
–	5V0	1	5V0
–	5V0	3	5V0
–	5V0	5	5V0
–	5V0	7	5V0
–	5V0	9	5V0
–	5V0	11	5V0
–	5V0	13	5V0
–	5V0	15	5V0
–	5V0	17	5V0
–	5V0	19	5V0
–	–	21	–
–	3V3	23	3V3
–	3V3	25	3V3
–	3V3	27	3V3
–	–	29	–
–	VCCIO1A_1B_1C_CON	31	VCCIO1A_1B_1C_CON
–	VCCIO1A_1B_1C_CON	33	VCCIO1A_1B_1C_CON
–	VCCIO1A_1B_1C_CON	35	VCCIO1A_1B_1C_CON
–	–	37	–
–	2V5	39	2V5
–	2V5	41	2V5
–	2V5	43	2V5
–	–	45	–
–	VCCIO1D_1E_1F_1G	47	VCCIO1D_1E_1F_1G
–	VCCIO1D_1E_1F_1G	49	VCCIO1D_1E_1F_1G
–	VCCIO1D_1E_1F_1G	51	VCCIO1D_1E_1F_1G
–	–	53	–
–	3V3	55	3V3
–	3V3	57	3V3
–	3V3	59	3V3
–	–	2	–
–	–	4	–
–	–	6	–
–	CARRIER_PWR_EN	8	CARRIER_PWR_EN
–	–	10	–
–	PWR_EN	12	PWR_EN
–	–	14	–
–	CARRIER_CRESET	16	CARRIER_CRESET
–	–	18	–
–	3V3	20	3V3
–	3V3	22	3V3
–	–	24	–
–	VDD_DIFF2_IN	26	VDD_DIFF2_IN

continues on next page

Table 6 – continued from previous page

MTrion Pin	MTrion Function	Connector Pin	MTrionEVK Function
–	–	28	–
–	2V5	30	2V5
–	2V5	32	2V5
–	–	34	–
–	VCCIO3D_TR_BR	36	VCCIO3D_TR_BR
–	VCCIO3D_TR_BR	38	VCCIO3D_TR_BR
–	–	40	–
–	3V3	42	3V3
–	3V3	44	3V3
–	–	46	–
–	–	48	–
–	–	50	–
–	–	52	–
–	–	54	–
–	–	56	
–	–	58	–
–	–	60	–
–	GND	181	GND
–	GND	182	GND
–	GND	183	GND
–	GND	184	GND
J9B			
–	VCCIO4E	61	VCCIO4E
–	VCCIO4E	63	VCCIO4E
–	–	65	–
–	2V5	67	2V5
–	2V5	69	2V5
–	2V5	71	2V5
–	–	73	–
–	VCCIO4F	75	VCCIO4F
–	VCCIO4F	77	VCCIO4F
–	–	79	–
–	3V3	81	3V3
–	3V3	83	3V3
–	–	85	–
–	CLK_OE1	87	CLK_OE1
–	CLK_OE2	89	CLK_OE2
–	CLK_OE3	91	CLK_OE3
–	CLK_I2C_SDA	93	CLK_I2C_SDA
–	CLK_I2C_SCL	95	CLK_I2C_SCL
–	–	97	–
–	CLK_OUT4_N	99	CLK_OUT4_N
–	CLK_OUT4_P	101	CLK_OUT4_P
–	–	103	–
H14	GPIOL_72_CLK6/RGMII_RXC	105	GPIOL_72_CLK6/RGMII_RXC
H13	GPIOL_73_CLK7/RGMII_RXCTL	107	GPIOL_73_CLK7/RGMII_RXCTL
G13	GPIOL_75_CTRL5/RGMII_RXD0	109	GPIOL_75_CTRL5/RGMII_RXD0
–	–	111	–
J17	GPIOL_156/CBSEL0	113	GPIOL_156/CBSEL0

continues on next page

Table 6 – continued from previous page

MTrion Pin	MTrion Function	Connector Pin	MTrionEVK Function
J18	GPIOL_157/CBSEL1	115	GPIOL_157/CBSEL1
J15	GPIOL_151_TEST_N	117	GPIOL_151_TEST_N
J14	GPIOL_150_NSTATUS	119	GPIOL_150_NSTATUS
T9	GPIOB_TX19_P	62	PMODA0
R9	GPIOB_TX19_N	64	PMODA1
–	GND	66	GND
U11	GPIOB_TX18_P	68	PMODA2
T11	GPIOB_TX18_N	70	PMODA3
–	GND	72	GND
V9	GPIOB_TX17_P	74	PMODA4
U9	GPIOB_TX17_N	76	PMODA5
–	GND	78	GND
N9	GPIOB_TX16_P	80	PMODA6
P9	GPIOB_TX16_N	82	PMODA7
–	GND	84	GND
U10	GPIOB_TX15_P	86	PMODB0
V10	GPIOB_TX15_N	88	PMODB1
–	GND	90	GND
N10	GPIOB_TX14_P	92	PMODB2
P10	GPIOB_TX14_N	94	PMODB3
–	GND	96	GND
N11	GPIOB_TX13_P	98	PMODB4
P11	GPIOB_TX13_N	100	PMODB5
–	GND	102	GND
P12	GPIOB_TX12_P	104	PMODB6
N12	GPIOB_TX12_N	106	PMODB7
–	GND	108	GND
R12	GPIOB_TX11_P	110	CONS.RX
T12	GPIOB_TX11_N	112	CONS.TX
–	GND	114	GND
V12	GPIOB_TX10_P	116	I2C_SDA
U12	GPIOB_TX10_N	118	I2C_SCL
–	GND	120	GND
–	GND	185	GND
–	GND	186	GND
–	GND	187	GND
–	GND	188	GND
J9C			
–	–	121	–
–	–	123	–
K17	GPIOL_66_CLK0/RGMII_RXD1	125	GPIOL_66_CLK0/RGMII_RXD1
K15	GPIOL_63_CTRL1/RGMII_RXD2	127	GPIOL_63_CTRL1/RGMII_RXD2
K16	GPIOL_62_CTRL0/RGMII_RXD3	129	GPIOL_62_CTRL0/RGMII_RXD3
–	–	131	–
L15	GPIOL_17/RGMII_TXCTL	133	GPIOL_17/RGMII_TXCTL
L17	GPIOL_24/RGMII_TXCLK	135	GPIOL_24/RGMII_TXCLK
L16	GPIOL_22/RGMII_TXD3	137	GPIOL_22/RGMII_TXD3
L18	GPIOL_20/RGMII_TXD2	139	GPIOL_20/RGMII_TXD2
M18	GPIOL_18/RGMII_TXD1	141	GPIOL_18/RGMII_TXD1

continues on next page

Table 6 – continued from previous page

MTrion Pin	MTrion Function	Connector Pin	MTrionEVK Function
–	SPI_D3_EXT	143	SPI_D3_EXT
–	SPI_D2_EXT	145	SPI_D2_EXT
–	–	147	–
–	SPI_D1_EXT	149	SPI_D1_EXT
–	SPI_D0_EXT	151	SPI_D0_EXT
–	SPI_SS_EXT	153	SPI_SS_EXT
–	SPI_CLK_EXT	155	SPI_CLK_EXT
N18	CDONE	157	CDONE
N17	CRESET_N	159	CRESET_N
P16	JTAG_TMS	161	JTAG_TMS
P17	JTAG_TDO	163	JTAG_TDO
R16	JTAG_TDI	165	JTAG_TDI
T16	JTAG_TCK	167	JTAG_TCK
N15	GPIOL_04_CSI	169	GPIOL_04_CSI
M15	GPIOL_05_CSO/RGMII_TXD0	171	GPIOL_05_CSO/RGMII_TXD0
M14	GPIOL_11_CBUS0	173	GPIOL_11_CBUS0
M16	GPIOL_12_CBUS1	175	GPIOL_12_CBUS1
M17	GPIOL_13_CBUS2	177	GPIOL_13_CBUS2
–	–	179	–
P13	GPIOB_TX09_P	122	GPIOB_TX09_P
R13	GPIOB_TX09_N	124	GPIOB_TX09_N
–	GND	126	GND
V13	GPIOB_TX08_P	128	GPIOB_TX08_P
U13	GPIOB_TX08_N	130	GPIOB_TX08_N
–	GND	132	GND
P14	GPIOB_TX07_P	134	GPIOB_TX07_P
R14	GPIOB_TX07_N	136	GPIOB_TX07_N
–	GND	138	GND
V14	GPIOB_TX06_P	140	GPIOB_TX06_P
U14	GPIOB_TX06_N	142	GPIOB_TX06_N
–	GND	144	GND
T15	GPIOB_TX05_P	146	GPIOB_TX05_P
R15	GPIOB_TX05_N	148	GPIOB_TX05_N
–	GND	150	GND
U15	GPIOB_TX04_P	152	GPIOB_TX04_P
V15	GPIOB_TX04_N	154	GPIOB_TX04_N
–	GND	156	GND
U16	GPIOB_TX03_P	158	GPIOB_TXP03/ETH_MDC
V16	GPIOB_TX03_N	160	GPIOB_TXN03/ETH_MDIO
–	GND	162	GND
R18	GPIOB_TX02_P	164	GPIOB_TX02_P/ETH_RST_N
P18	GPIOB_TX02_N	166	GPIOB_TX02_N/ETH_INT_N
–	GND	168	GND
U18	GPIOB_TX01_P	170	GPIOB_TX01_P
T18	GPIOB_TX01_N	172	GPIOB_TX01_N
–	GND	174	GND
T17	GPIOB_TX00_P	176	GPIOB_TX00_P
R17	GPIOB_TX00_N	178	GPIOB_TX00_N
–	GND	180	GND

continues on next page

Table 6 – continued from previous page

MTrion Pin	MTrion Function	Connector Pin	MTrionEVK Function
–	GND	189	GND
–	GND	190	GND
–	GND	191	GND
–	GND	192	GND

Connector Top J8

Contact Overview

MTrion Pin	MTrion Function	Connector Pin	MTrionEVK Function
J8A			
–	GND	1	GND
E1	MIPI1_TX_4_P	3	MIPI1_TX_4_P
D1	MIPI1_TX_4_N	5	MIPI1_TX_4_N
–	GND	7	GND
D2	MIPI1_TX_3_P	9	MIPI1_TX_3_P
E2	MIPI1_TX_3_N	11	MIPI1_TX_3_N
–	GND	13	GND
C1	MIPI1_TX_2_P	15	MIPI1_TX_2_P
B1	MIPI1_TX_2_N	17	MIPI1_TX_2_N
–	GND	19	GND
B2	MIPI1_TX_1_P	21	MIPI1_TX_1_P
A2	MIPI1_TX_1_N	23	MIPI1_TX_1_N
–	GND	25	GND
B3	MIPI1_TX_0_P	27	MIPI1_TX_0_P
A3	MIPI1_TX_0_N	29	MIPI1_TX_0_N
–	GND	31	GND
A4	MIPI0_TX_4_P	33	MIPI0_TX_4_P
B4	MIPI0_TX_4_N	35	MIPI0_TX_4_N
–	GND	37	GND
A5	MIPI0_TX_3_P	39	MIPI0_TX_3_P
B5	MIPI0_TX_3_N	41	MIPI0_TX_3_N
–	GND	43	GND
B8	MIPI0_TX_2_P	45	MIPI0_TX_2_P
A8	MIPI0_TX_2_N	47	MIPI0_TX_2_N
–	GND	49	GND
A7	MIPI0_TX_1_P	51	MIPI0_TX_1_P
B7	MIPI0_TX_1_N	53	MIPI0_TX_1_N
–	GND	55	GND
B6	MIPI0_TX_0_P	57	MIPI0_TX_0_P
A6	MIPI0_TX_0_N	59	MIPI0_TX_0_N
–	GND	2	GND
E5	MIPI0_RX_0_P	4	MIPI0_RX_0_P
D5	MIPI0_RX_0_N	6	MIPI0_RX_0_N
–	GND	8	GND
E8	MIPI0_RX_1_P	10	MIPI0_RX_1_P
D8	MIPI0_RX_1_N	12	MIPI0_RX_1_N
–	GND	14	GND

continues on next page

Table 7 – continued from previous page

MTrion Pin	MTrion Function	Connector Pin	MTrionEVK Function
F6	MIPI0_RX_2_P	16	MIPI0_RX_2_P
F5	MIPI0_RX_2_N	18	MIPI0_RX_2_N
–	GND	20	GND
E6	MIPI0_RX_3_P	22	MIPI0_RX_3_P
D6	MIPI0_RX_3_N	24	MIPI0_RX_3_N
–	GND	26	GND
E7	MIPI0_RX_4_P	28	MIPI0_RX_4_P
F7	MIPI0_RX_4_N	30	MIPI0_RX_4_N
–	GND	32	GND
D4	MIPI1_RX_0_P	34	MIPI1_RX_0_P
E4	MIPI1_RX_0_N	36	MIPI1_RX_0_N
–	GND	38	GND
F3	MIPI1_RX_1_P	40	MIPI1_RX_1_P
G3	MIPI1_RX_1_N	42	MIPI1_RX_1_N
–	GND	44	GND
G1	MIPI1_RX_2_P	46	MIPI1_RX_2_P
F1	MIPI1_RX_2_N	48	MIPI1_RX_2_N
–	GND	50	GND
H2	MIPI1_RX_3_P	52	MIPI1_RX_3_P
G2	MIPI1_RX_3_N	54	MIPI1_RX_3_N
–	GND	56	GND
D3	MIPI1_RX_4_P	58	MIPI1_RX_4_P
E3	MIPI1_RX_4_N	60	MIPI1_RX_4_N
–	GND	181	GND
–	GND	182	GND
–	GND	183	GND
–	GND	184	GND
J8B			
–	–	61	–
–	–	63	–
–	GND	65	GND
D13	GPIOT_RX01_P	67	GPIOT_RX01_P
C13	GPIOT_RX01_N	69	GPIOT_RX01_N
–	GND	71	GND
C16	GPIOT_RX02_P	73	GPIOT_RX02_P
D16	GPIOT_RX02_N	75	GPIOT_RX02_N
–	GND	77	GND
D11	GPIOT_RX03_P	79	GPIOT_RX03_P
C11	GPIOT_RX03_N	81	GPIOT_RX03_N
–	GND	83	GND
D15	GPIOT_RX04_P	85	GPIOT_RX04_P
E15	GPIOT_RX04_N	87	GPIOT_RX04_N
–	GND	89	GND
D14	GPIOT_RX05_P	91	GPIOT_RX05_P
E14	GPIOT_RX05_N	93	GPIOT_RX05_N
–	GND	95	GND
E12	GPIOT_RX06_P	97	GPIOT_RX06_P
D12	GPIOT_RX06_N	99	GPIOT_RX06_N
–	GND	101	GND

continues on next page

Table 7 – continued from previous page

MTrion Pin	MTrion Function	Connector Pin	MTrionEVK Function
E13	GPIOT_RX07_P	103	GPIOT_RX07_P
F13	GPIOT_RX07_N	105	GPIOT_RX07_N
–	GND	107	GND
E11	GPIOT_RX08_P	109	GPIOT_RX08_P
F11	GPIOT_RX08_N	111	GPIOT_RX08_N
–	GND	113	GND
E16	GPIOT_RX09_P	115	GPIOT_RX09_P
F16	GPIOT_RX09_N	117	GPIOT_RX09_N
–	GND	119	GND
–	–	62	–
E9	GPIOR_168_PLLIN2	64	GPIOR_168_PLLIN2
R8	GPIOR_188_PLLIN2	66	GPIOR_188_PLLIN2
–	–	68	–
G5	GPIOR_173_CTRL12	70	USR_SW1
G6	GPIOR_174_CLK15	72	USR_LED2
H6	GPIOR_178_CLK11	74	USR_LED1
K6	GPIOR_183_CTRL10	76	USR_SW2
–	–	78	–
N9	3V3	80	3V3
P9	3V3	82	3V3
–	–	84	–
U10	VCCIO2D	86	VCCIO2D
V10	VCCIO2D	88	VCCIO2D
–	–	90	–
N10	2V5	92	2V5
P10	2V5	94	2V5
–	–	96	–
N11	VCCIO2E	98	VCCIO2E
P11	VCCIO2E	100	VCCIO2E
–	–	102	–
P12	3V3	104	3V3
N12	3V3	106	3V3
–	–	108	–
R12	VCCIO2F	110	VCCIO2F
T12	VCCIO2F	112	VCCIO2F
–	–	114	–
V12	2V5	116	2V5
U12	2V5	118	2V5
–	–	120	–
–	GND	185	GND
–	GND	186	GND
–	GND	187	GND
–	GND	188	GND
J8C			
–	3V3	121	3V3
–	3V3	123	3V3
–	3V3	125	3V3
–	–	127	–
–	–	129	–

continues on next page

Table 7 – continued from previous page

MTrion Pin	MTrion Function	Connector Pin	MTrionEVK Function
–	GND	131	GND
B9	GPIOT_RX29_P	133	GPIOT_RX29_P
A9	GPIOT_RX29_N	135	GPIOT_RX29_N
–	GND	137	GND
A10	GPIOT_RX28_P	139	GPIOT_RX28_P
B10	GPIOT_RX28_N	141	GPIOT_RX28_N
–	GND	143	GND
A11	GPIOT_RX27_P	145	GPIOT_RX27_P
B11	GPIOT_RX27_N	147	GPIOT_RX27_N
–	GND	149	GND
A12	GPIOT_RX24_P	151	GPIOT_RX24_P
B12	GPIOT_RX24_N	153	GPIOT_RX24_N
–	GND	155	GND
B13	GPIOT_RX23_P	157	GPIOT_RX23_P
A13	GPIOT_RX23_N	159	GPIOT_RX23_N
–	GND	161	GND
B14	GPIOT_RX22_P	163	GPIOT_RX22_P
A14	GPIOT_RX22_N	165	GPIOT_RX22_N
–	GND	167	GND
B15	GPIOT_RX21_P	169	GPIOT_RX21_P
A15	GPIOT_RX21_N	171	GPIOT_RX21_N
–	GND	173	GND
B16	GPIOT_RX20_P	175	GPIOT_RX20_P
A16	GPIOT_RX20_N	177	GPIOT_RX20_N
–	GND	179	GND
–	2V5	122	2V5
–	–	124	–
–	GND	126	GND
A17	GPIOT_RX19_P	128	GPIOT_RX19_P
B17	GPIOT_RX19_N	130	GPIOT_RX19_N
–	GND	132	GND
B18	GPIOT_RX18_P	134	GPIOT_RX18_P
C18	GPIOT_RX18_N	136	GPIOT_RX18_N
–	GND	138	GND
H18	GPIOT_RX17_P	140	GPIOT_RX17_P
G18	GPIOT_RX17_N	142	GPIOT_RX17_N
–	GND	144	GND
D18	GPIOT_RX16_P	146	GPIOT_RX16_P
E18	GPIOT_RX16_N	148	GPIOT_RX16_N
–	GND	150	GND
D17	GPIOT_RX15_P	152	GPIOT_RX15_P
E17	GPIOT_RX15_N	154	GPIOT_RX15_N
–	GND	156	GND
G14	GPIOT_RX14_P	158	GPIOT_RX14_P
F14	GPIOT_RX14_N	160	GPIOT_RX14_N
–	GND	162	GND
G15	GPIOT_RX13_P	164	GPIOT_RX13_P
H15	GPIOT_RX13_N	166	GPIOT_RX13_N
–	GND	168	GND

continues on next page

Table 7 – continued from previous page

MTrion Pin	MTrion Function	Connector Pin	MTrionEVK Function
G16	GPIOT_RX12_P	170	GPIOT_RX12_P
H16	GPIOT_RX12_N	172	GPIOT_RX12_N
–	GND	174	GND
G17	GPIOT_RX11_P	176	GPIOT_RX11_P
H17	GPIOT_RX11_N	178	GPIOT_RX11_N
–	GND	180	GND
–	GND	189	GND
–	GND	190	GND
–	GND	191	GND
–	GND	192	GND

3.13 Schematics

Schematics for the MTrionEVK SiP may be obtained on request. Please contact sales@aries-embedded.de.

Below the schematics of the connectors J8 and J9 are shown: