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StarSOM-6ULL Datasheet and Pinout

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StarSOM-6ULL Datasheet and Pinout

General description



The StarSOM-6ULL family is a small size and low profile SoM based on the NXP i.MX6 ULL application processor, which features an advanced implementation of a single ARM Cortex-A7 core (at speeds up to 900MHz).

The StarSOM-6ULL is a low power highly integrated SoM (System on Module) featuring high computation power, on-board Ethernet PHY 10/100, 802.11b/g/n Wi-Fi and Bluetooth v5.1 connectivity. The option of integrated, fully certified Wi-Fi and Bluetooth module simplifies the carrier board design and is ideally suited for wireless application. The StarSOM-6ULL provides a variety memory configuration including flexible range of DDR3L, and eMMC Flash that meets our customers requirements.

The SoM supports connections to a variety of interfaces: two high-speed USB on-the-go with PHY, dual Ethernet (single PHY on-board), audio, display with touch panel and serial interfaces. In addition, the system supports industrial grade targeting embedded application.

SoMLabs also provides a complete hardware and software development board for the SoM in the form of a carrier board and optional TFT display and touch panel.

Applications

- Industrial embedded Linux computer
- Home Appliances
- Home Automation - Smart Home
- Human-machine Interfaces (HMI)
- Point-of-sales (POS) terminals
- Cash Register
- 2D barcode scanners and printers

- Smart grid infrastructure
- IoT gateways
- Residential gateways
- Machine vision equipment
- Robotics
- Fitness/outdoor equipment

Features

- Powered by NXP i.MX 6ULL application processor
- Core clock up to 900MHz
- Up to 1GB RAM DDR3L
- Up to 32GB eMMC
- Optional Murata 802.11b/g/n Wi-Fi and Bluetooth v5.1 module
- Power-efficient and cost-optimized solution
- Ideal for industrial IoT and embedded applications
- Integrated security features

Pictures of SOM versions

Version	Photo
eMMC	

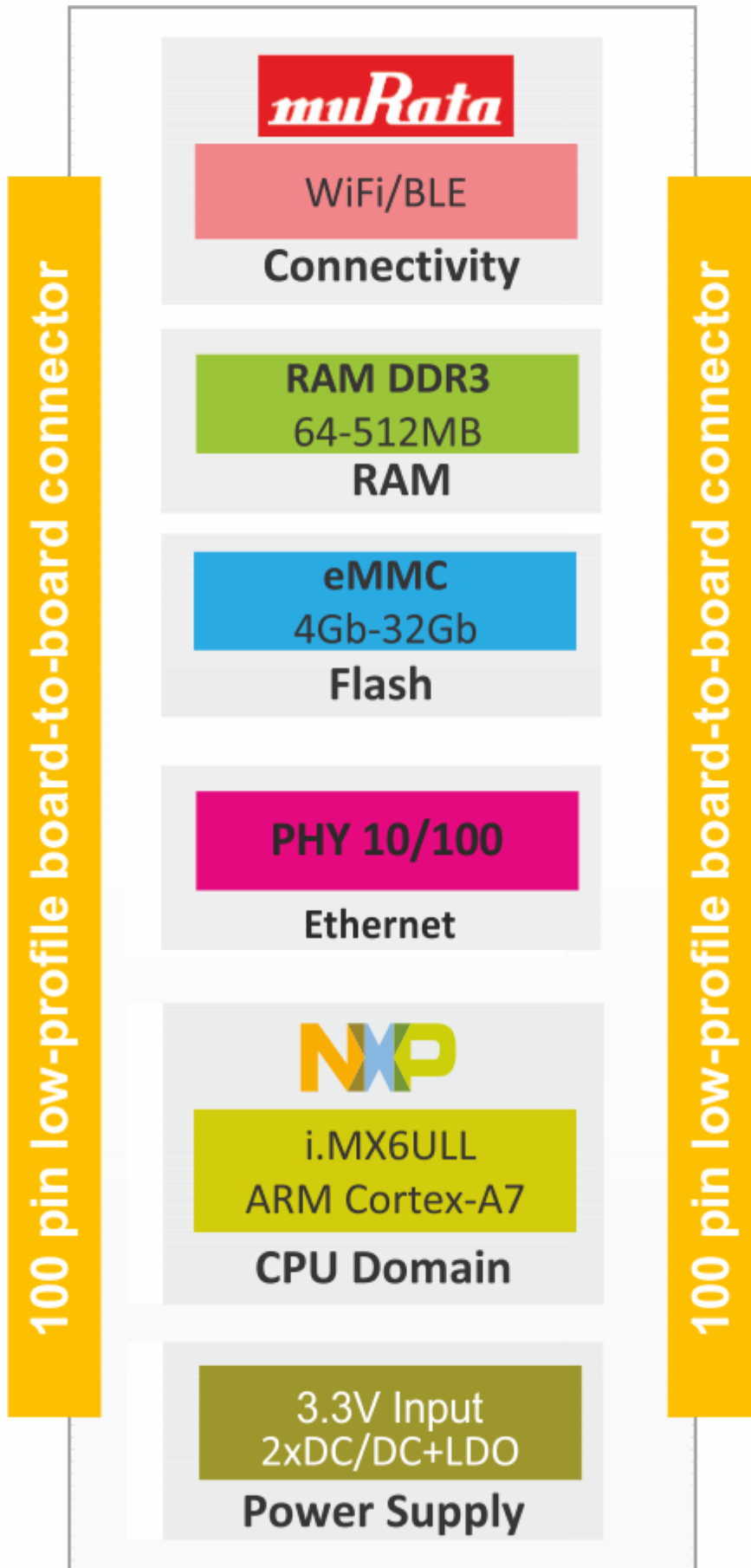
Wi-Fi and Ethernet PHY10/100 are available as an options.

Ordering info

SLS06Y2_Clock_RamSize_FlashSize_SF_TEMP

SLS	Product type SLS - System on Module
0	SOM Name 0 - StarSOM board-to-board connectors
6	CPU Family 6 - i.MX6
Y2	CPU Type Y2 - i.MX6 ULL Y2
Clock	CPU Clock Speed 528C - 528MHz 792C - 792MHz 900C - 900MHz
RamSize	DDR3 RAM Size 128R - 128MB 256R - 256MB 512R - 512MB
FlashSize	Flash Size Type and Density 04GE - 4GB eMMC 08GE - 8GB eMMC 16GE - 16GB eMMC 32GE - 32GB eMMC
SF	Special Features 0SF - No Special Features 1WB - Built-in Murata 802.11b/g/n Wi-Fi and Bluetooth v5.1 Module 2ET - Built-in Microchip 100Mb Ethernet PHY 3WE - Built-in Murata 802.11b/g/n Wi-Fi/Bluetooth v5.1 and Microchip 100Mb Ethernet PHY
TEMP	Operating Temperature C - Consumer: 0 to +70 C E - Extended with Wi-Fi: -25 to +70 C I - Industrial: -40 to +85 C

Block Diagram



Operating ranges

Parameter	Value	Unit	Comment
Power Supply	3.3	V	Connected to +3V3IN pins
Input GPIO voltage	3.3	V	-
Environment temperature ¹	-40...+85	°C	Industrial range w/o WiFi module
	-25...+70		Industrial range with WiFi module
	0...+70		Consumer range

Note:

1. Maximum MPU junction temperature is +105°C (industrial version) or +95°C (consumer version).

Electrical parameters

SOM signal name	Parameter	Value			Units
		Min.	Typ.	Max.	
+3V3IN	Supply Voltage	3.15	3.3	3.45	V
+3V3IN	Total Supply Current ¹	-	175	255	mA
VGPI0	GPIO Input Voltage	0	3.3	3.6 ²	V
+3V3SW	Output current of 3.3V power supply for peripherals	-	-	0.2	A
USB-OTGx-VBUS	USB Supply	4.40	-	5.5	V
VDD-COIN-3V	SNVS Backup Battery Supply	2.66	-	3.6	V
-	ADC Inputs Voltage	0	-	3.3	V

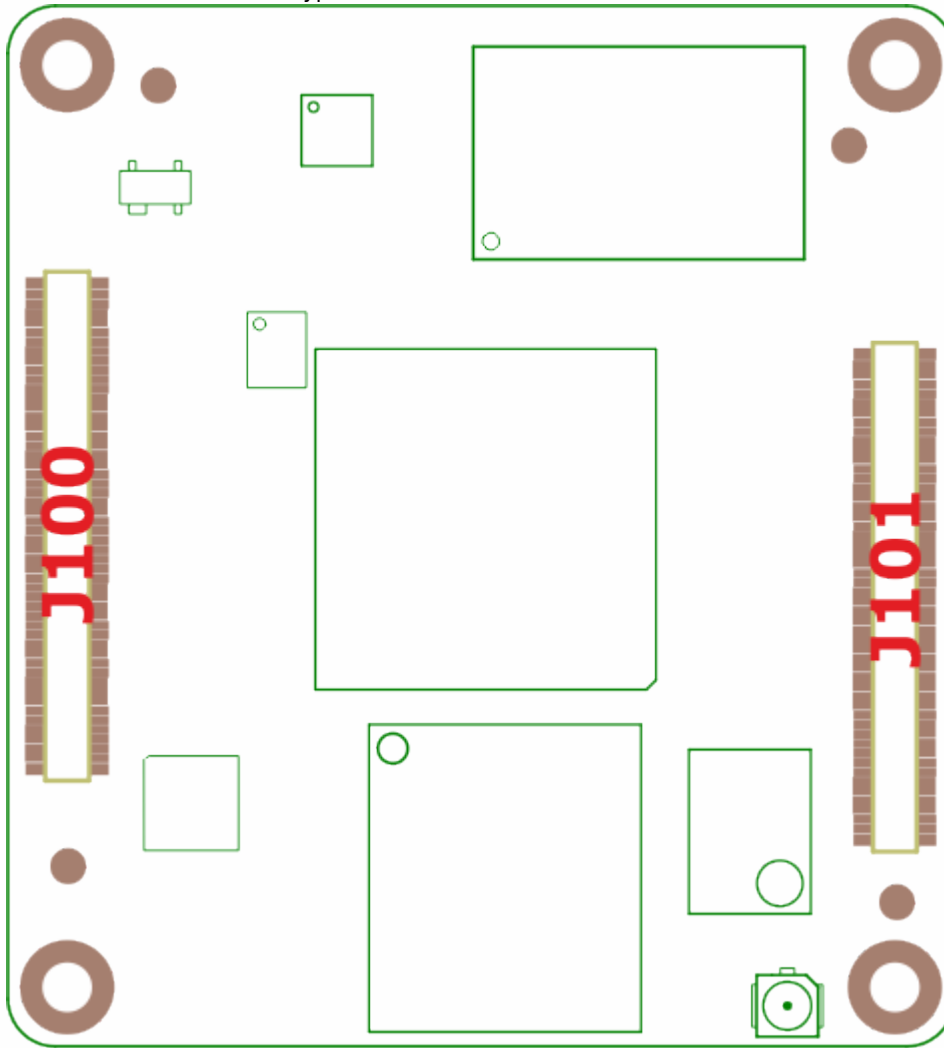
Notes:

1. Excluding external load connected to +3.3VOUT lines.
2. Applying the maximum voltage 3.6V results in shorten lifetime. Recommended value is smaller than 3.5V.

SOM pinout

StarSOM-6ULL board-to-board connectors view (top view)

StarSOM-6ULL connectors type: Hirose DF40C100DP04V51



SoM pin number	Default function	GPIO	BGA289 ball	Notes
J101				
1	GND	-	-	
2	GND	-	-	
26	LCD.RES	GPIO3.04	E9	
28	I2C2.SDA	GPIO1.31	G13	Internally pulled-up with 4.7k connected to 3.3V
30	I2C2.SCL	GPIO1.30	F17	Internally pulled-up with 4.7k connected to 3.3V
32	GPIO1.01	GPIO1.01	L15	
34	GPIO1.02	GPIO1.02	L14	
36	GPIO1.03	GPIO1.03	L17	
38	GPIO1.04	GPIO1.04	M16	
39	GND	-	-	
40	GND	-	-	

41	VDD.EMMC	-	-	Internal 1.8V LDO output as reference or power supply voltage for QSPI (SDIO) interface
42	LCD.CLK	GPIO3.00	A8	
43	QSPI.CLK	GPIO4.11	D5	Line referenced to VDD.EMMC power supply (1.8V)
44	GND	-	-	
45	QSPI.CS0	GPIO4.16	E6	Line referenced to VDD.EMMC power supply (1.8V)
46	LCD.VSYNC	GPIO3.03	C9	
47	QSPI.D0	GPIO4.12	A3	Line referenced to VDD.EMMC power supply (1.8V)
48	LCD.HSYNC	GPIO3.02	D9	
49	QSPI.D1	GPIO4.13	C5	Line referenced to VDD.EMMC power supply (1.8V)
50	LCD.ENABLE	GPIO3.01	B8	
51	QSPI.D2	GPIO4.14	B5	Line referenced to VDD.EMMC power supply (1.8V)
52	LCD.DATA23	GPIO3.28	B16	
53	QSPI.D3	GPIO4.15	A4	Line referenced to VDD.EMMC power supply (1.8V)
54	LCD.DATA22	GPIO3.27	A14	
55	QSPI.DQS	GPIO4.10	B4	Line referenced to VDD.EMMC power supply (1.8V)
56	LCD.DATA21	GPIO3.26	B14	
57	GND	-	-	
58	LCD.DATA20	GPIO3.25	C14	
59	BT.PCMCLK	GPIO4.26	D3	BT-BLE interface connection (if 1DX modules used) If 1DX modules is not used alternative pin functions (incl. GPIO) available
60	LCD.DATA19	GPIO3.24	D14	
61	BT.PCMOUT	GPIO4.27	D2	BT-BLE interface connection (if 1DX modules used) If 1DX modules is not used alternative pin functions (incl. GPIO) available
62	LCD.DATA18	GPIO3.23	A13	
63	BT.PCMIN	GPIO4.28	D1	BT-BLE interface connection (if 1DX modules used) If 1DX modules is not used alternative pin functions (incl. GPIO) available
64	LCD.DATA17	GPIO3.22	B13	
65	BT.PCMSYNC	GPIO4.25	D4	BT-BLE interface connection (if 1DX modules used) If 1DX modules is not used alternative pin functions (incl. GPIO) available
66	LCD.DATA16	GPIO3.21	C13	
67	BT.RTS	GPIO4.23	E2	BT-BLE interface connection - UART5 (if 1DX modules used) If 1DX modules is not used alternative pin functions (incl. GPIO) available
68	LCD.DATA15	GPIO3.20	D13	
69	BT.CTS	GPIO4.24	E1	BT-BLE interface connection - UART5 (if 1DX modules used) If 1DX modules is not used alternative pin functions (incl. GPIO) available
70	LCD.DATA14	GPIO3.19	A12	
71	BT.TXD	GPIO4.22	E3	BT-BLE interface connection - UART5 (if 1DX modules used) If 1DX modules is not used alternative pin functions (incl. GPIO) available
72	LCD.DATA13	GPIO3.18	B12	

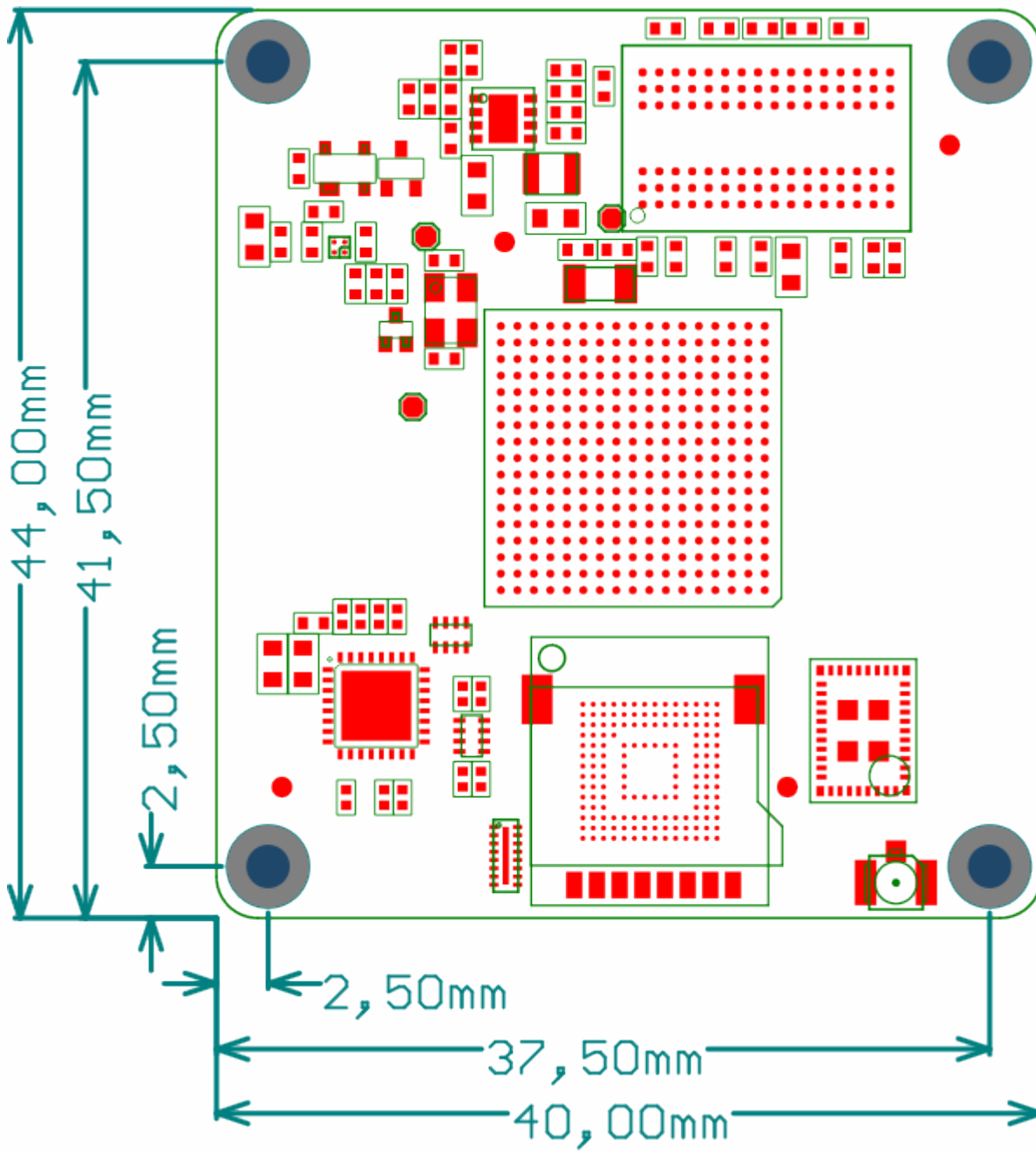
73	BT.RXD	GPIO4.21	E4	BT-BLE interface connection - UART5 (if 1DX modules used) If 1DX modules is not used alternative pin functions (incl. GPIO) available
74	LCD.DATA12	GPIO3.17	C12	
75	BT.WAKE	GPIO4.20	F3	BT-BLE interface connection (if 1DX modules used) If 1DX modules is not used alternative pin functions (incl. GPIO) available
76	LCD.DATA11	GPIO3.16	D12	
77	BT.HWAKE	GPIO4.19	F2	BT-BLE interface connection (if 1DX modules used) If 1DX modules is not used alternative pin functions (incl. GPIO) available
78	LCD.DATA10	GPIO3.15	E12	
79	BT.ENABLE	GPIO4.17	F5	BT-BLE interface connection (if 1DX modules used) If 1DX modules is not used alternative pin functions (incl. GPIO) available
80	LCD.DATA09	GPIO3.14	A11	
81	WLAN.HWAKE	GPIO4.18	E5	WiFi interface connection (if 1DX modules used) If 1DX modules is not used alternative pin functions (incl. GPIO) available
82	LCD.DATA08	GPIO3.13	B11	
83	WLAN.EN	GPIO1.08	N17	WiFi interface connection (if 1DX modules used) If 1DX modules is not used alternative pin functions (incl. GPIO) available
84	LCD.DATA07	GPIO3.12	D11	
85	GND	-	-	
86	LCD.DATA06	GPIO3.11	A10	
87	SDIO1.CLK	GPIO2.17	C1	WiFi interface connection (if 1DX modules used) If 1DX modules is not used alternative pin functions (incl. GPIO) available
88	LCD.DATA05	GPIO3.10	B10	
89	SDIO1.CMD	GPIO2.16	C2	WiFi interface connection (if 1DX modules used) If 1DX modules is not used alternative pin functions (incl. GPIO) available
90	LCD.DATA04	GPIO3.09	C10	
91	SDIO1.D2	GPIO2.20	B1	WiFi interface connection (if 1DX modules used) If 1DX modules is not used alternative pin functions (incl. GPIO) available
92	LCD.DATA03	GPIO3.08	D10	
93	SDIO1.D0	GPIO2.18	B3	WiFi interface connection (if 1DX modules used) If 1DX modules is not used alternative pin functions (incl. GPIO) available
94	LCD.DATA02	GPIO3.07	E10	
95	SDIO1.D3	GPIO2.21	A2	WiFi interface connection (if 1DX modules used) If 1DX modules is not used alternative pin functions (incl. GPIO) available
96	LCD.DATA01	GPIO3.06	A9	
97	SDIO1.D1	GPIO2.19	B2	WiFi interface connection (if 1DX modules used) If 1DX modules is not used alternative pin functions (incl. GPIO) available
98	LCD.DATA00	GPIO3.05	B9	
99	GND	-	-	
100	GND	-	-	

J100				
1	+3V3IN	-	-	External power supply 3.3V
2	+3V3IN	-	-	External power supply 3.3V
3	+3V3IN	-	-	External power supply 3.3V
4	+3V3IN	-	-	External power supply 3.3V
5	+3V3IN	-	-	External power supply 3.3V
6	+3V3IN	-	-	External power supply 3.3V
7	+3V3IN	-	-	External power supply 3.3V
8	+3V3IN	-	-	External power supply 3.3V
9	+3V3IN	-	-	External power supply 3.3V
10	+3V3IN	-	-	External power supply 3.3V
11	GND	-	-	
12	GND	-	-	
13	GND	-	-	
14	GND	-	-	
15	GND	-	-	
16	GND	-	-	
17	PMIC-ON-REQ			
18	ON-OFF	ON-OFF	R8	
19	PMIC-STBY-REQ	PMIC-STBY-REQ	U9	
20	POR	POR	P8	Power-on-reset input-output
21	VDD-3V3-SNVS	VDD-SNVS-IN	P12	SNVS domain power supply External 3.3V connection power supply is necessary
22	RECOVERY			System recovery pin: RECOVERY=0 during reset -> start recovery mode RECOVERY=1 or not connected -> normal operation mode
23	GND	-	-	
24	RESET.IN	-	-	System reset
25	UART4.RXD	GPIO1.29	G16	Default Linux console RxD line
26	GND	-	-	
27	UART4.TXD	GPIO1.28	G17	Default Linux console TxD line
28	TAMPER.0	GPIO5.00	R10	
29	+3V3SW	-	-	Reference 3.3V power supply for external peripherals, maximum load 200 mA
30	TAMPER.1	GPIO5.01	R9	
32	TAMPER.2	GPIO5.02	P11	
34	TAMPER.3	GPIO5.03	P10	
36	TAMPER.4	GPIO5.04	P9	
37	GND	-	-	
38	TAMPER.5	GPIO5.05	N8	
39	USB2.VBUS		U12	
40	TAMPER.6	GPIO5.06	N11	
41	USB2.DN	-	T13	
42	TAMPER.7	GPIO5.07	N10	
43	USB2.DP	-	U13	
44	TAMPER.8	GPIO5.08	N9	
45	GND	-	-	

46	TAMPER.9	GPIO5.09	R6	
47	GPIO1.05	GPIO1.05	M17	
48	GND	-	-	
49	USB1.VBUS	-	T12	
50	JTAG.TCK	GPIO1.14	M14	Optionally used as 32kHz clock source for 1DX radio module
51	USB1.DN	-	T15	
52	JTAG.TDI	GPIO1.13	N16	
53	USB1.DP	-	U15	
54	JTAG.TDO	GPIO1.12	N15	
55	GND	-	-	
56	JTAG.TMS	GPIO1.11	P14	
57	USB1.ID	GPIO1.00	K13	
58	JTAG.TRST	GPIO1.15	N14	
60	GND	-	-	
62	UART1.CTS	GPIO1.18	K15	
63	GND	-	-	
64	UART1.RTS	GPIO1.19	J14	
65	ENET2.TX-CLK	GPIO2.14	D17	
66	UART1.RXD	GPIO1.17	K16	
67	ENET2.TXD1	GPIO2.12	A16	
68	UART1.TXD	GPIO1.16	K14	
69	ENET2.TXD0	GPIO2.11	A15	
70	UART2.CTS	GPIO1.22	J15	
71	ENET2.TXEN	GPIO2.13	B15	
72	UART2.RTS	GPIO1.23	H14	
73	ENET2.RXER	GPIO2.15	D16	
74	UART2.RXD	GPIO1.21	J16	
75	ENET2.RXEN	GPIO2.10	B17	
76	UART2.TXD	GPIO1.20	J17	
77	ENET2.RXD0	GPIO2.08	C17	
78	UART3.CTS	GPIO1.26	H15	
79	ENET2.RXD1	GPIO2.09	C16	
80	UART3.RTS	GPIO1.27	G14	
81	ENET.MDC	GPIO1.07	L16	
82	UART3.RXD	GPIO1.25	H16	
83	ENET.MDIO	GPIO1.06	K17	
84	UART3.TXD	GPIO1.24	H17	
85	GND	-	-	
86	GND	-	-	
87	ENET1.LED0	-	-	LED0/nWAYEN - output PHY signal (LED cathode)
89	ENET1.LED1	-	-	LED0/SPEED - output PHY signal (LED cathode)
91	ENET1.RXN	-	-	Rx_n - external Ethernet trafo connector
93	ENET1.RXP	-	-	Rx_p - external Ethernet trafo connector
95	ENET1.TXN	-	-	Tx_n - external Ethernet trafo connector
97	ENET1.TXP	-	-	Tx_p - external Ethernet trafo connector

99	GND	-	-	
100	GND	-	-	
-	JTAG.MOD	GPIO1.10	P15	Used as hardware reset Ethernet of PHY with 4.7k pull-down resistor
-	BOOT.MODE1	-	U10	Permanently connected to GND

Dimensions



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