VisionSOM-8Mmini Datasheet and Pinout

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VisionSOM-8Mmini Datasheet and Pinout

General description

The VisionSOM-8Mmini family is a SODIMM-sized SoM based on the NXP quad core i.MX8M mini application processor which features an advanced implementation of a single or four ARM Cortex-A53 cores (at speed up to 1,8GHz) and ARM Cortex-M4 core (at speed up to 400MHz) as well as a 2D (HD1080p60) and 3D Graphics Processing Unit (GPU) Open GL 2.0 ES compatible and Video Processing Unit (VPU) with D1080p60 H.264 and HD1080p60 H.265 capabilities.

The VisionSOM-8Mmini is a multimedia and video oriented, highly integrated SoM (System on Module) featuring high computation power and 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 VisionSOM-8Mmini provides a variety memory configuration including flexible range of LPDDR4, eMMC and SD memory card that meets our customers requirements.

The SoM supports connections to a variety of interfaces: two high-speed USB on-the-go with PHY, single Ethernet 1Gbit, audio, display with touch panel and MIPI-DSI interface and serial communication interfaces. In addition, the system supports industrial grade embedded applications.

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

- Human-machine Interfaces (HMI)
- IP Cameras

- Video Stream Servers
- Home Appliances
- Home Automation – Smart Home
- Machine vision equipment
- Robotics
- IoT gateways
- Residential gateways
- Industrial embedded Linux computer
- Smart grid infrastructure
- Point-of-sales (POS) terminals
- Cash Register
- Fitness/outdoor equipment

Features

- Powered by quad core NXP i.MX8Mmini application processor
- Quad ARM Cortex-A53 core at speed up to 1,8GHz
- ARM Cortex-M4 core at speed up to 400MHz
- Up to 4GB DRAM LPDDR4
- Up to 32GB eMMC memory or uSD memory card
- Optional Murata 802.11b/g/n Wi-Fi and Bluetooth v5.1
- Power-efficient and cost-optimized solution
- Ideal for industrial IoT and embedded applications
- Integrated security features

Pictures of SOM versions

Version	Photo
eMMC	
micro-SD	

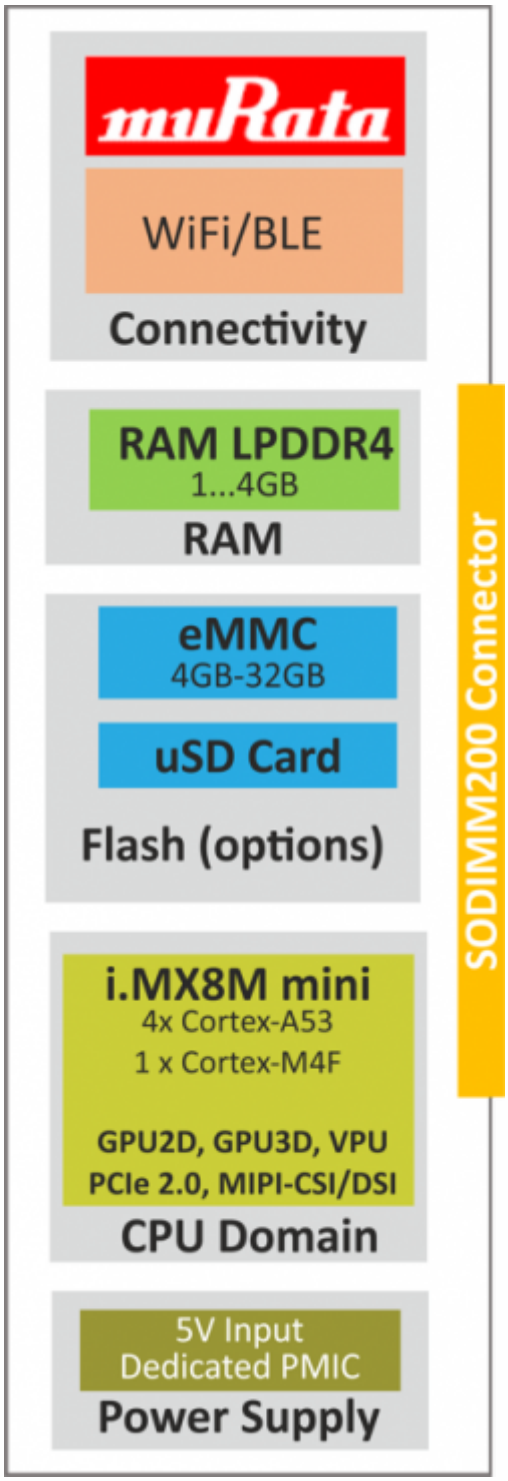
WiFi/BT module is available for all memory variants configurations.

Ordering info

SLSNNCpuType_Clock_RamSize_FlashSize_SF_TEMP

SLS	Product type SLS - System on Module
N	SOM Name 2 - High Performance VisionSOM SODIMM200 module
N	CPU Family 3 - i.MX 8M mini
CpuType	CPU Type X8MMQC - i.MX 8M mini Quad Core
Clock	CPU Clock Speed 1600C - 1.6GHz (Industrial temperature range) 1800C - 1.8GHz (Commercial temperature range)
RamSize	LPDDR4 RAM Size 01GR - 1024MB 02GR - 2048MB 04GR - 4096MB
FlashSize	eMMC Memory Size 04GE - 4GB eMMC 08GE - 8GB eMMC 16GE - 16GB eMMC 32GE - 32GB eMMC
SF	Special Features 0SF - No Special Features 1WB - Built-in 802.11b/g/n Wi-Fi and Bluetooth v5.1+EDR Module
TEMP	Operating Temperature C - Consumer: 0 to +70 C E - Industrial with Wi-Fi: -25 to +70 C I - Industrial: -40 to +85 C

Block Diagram



Operating ranges

Parameter	Value	Unit	Comment
Power Supply	5.0	V	Connected to VDD 5V SODIMM pins
Max. input GPIO voltage	1.8/3.3	V	-
Environment temperature[1]	-40...+85	°C	Industrial range w/o WiFi module
	-30...+70		Industrial range with WiFi module
	0...+70		Consumer range

Note:
1. Maximum MPU junction temperature is +105°C.
2. Junction temperature determines MPU lifetime. Details: NXP Application Note i.MX8MMINI Product Lifetime Usage, Rev. 0, June 2019 or newer.

Electrical parameters

SOM signal name	Parameter	Value			Unit
		Min.	Typ.	Max.	
VDD-5V	Supply Voltage (Input)	4.5	5.0	5.5	V
VDD-1V8	Output power supply for external 1.8V accesories	-	-	0.5	A
VDD-3V3	Output power supply for external 3.3V accesories	-	-	0.5	A
VDD-3V3-SW	Switched power supply output voltage	-	3.3	-	V
$I_{VDD\text{-}3V3\text{-}SW}$	Switched power supply output current	-	-	0.25	A
VGPIO @1V8	GPIO Input Voltage	0	-	2.15	V
VGPIO @3V3	GPIO Input Voltage	0	-	3.6	V
V_{USB_VBUS}	USB VBUS Input Voltage	0	-	5.25[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 3.45V.
3. 5.25 V is the maximum value for modules in hardware version starting from 1.1. For version 1.0 the maximum value is 3.6 V.

SoM pinout

Important notes

1. Detail pin configurations description you can find, edit and arrange in dedicated MEX file (with free "iMX PinTool" configurational tool).

SOM pin number	Default function	GPIO	Ball number FCBGA486	Notes
1	GND	-	-	-
2	GND	-	-	-
3	SD1-DQS	GPIO2_IO11	R24	1.8/3.3V IO voltage standard (controlled by SDIO-VSELECT)
4	JTAG-TRST	-	C27	JTAG interface 3.3V IO voltage standard
5	SD1-WP	GPIO2_IO10	R23	1.8/3.3V IO voltage standard (controlled by SDIO-VSELECT)
6	JTAG-TDO	-	E26	JTAG interface 3.3V IO voltage standard
7	SD1-DATA7	GPIO2_IO09	W26	1.8/3.3V IO voltage standard (controlled by SDIO-VSELECT)
8	JTAG-TDI	-	E27	JTAG interface 3.3V IO voltage standard
9	SD1-DATA6	GPIO2_IO08	W27	1.8/3.3V IO voltage standard (controlled by SDIO-VSELECT)
10	JTAG-TMS	-	F27	JTAG interface 3.3V IO voltage standard
11	SD1-DATA5	GPIO2_IO07	U26	1.8/3.3V IO voltage standard (controlled by SDIO-VSELECT)
12	JTAG-TCK	-	F26	JTAG interface, by default pulled down with 10kOhm 3.3V IO voltage standard
13	SD1-DATA4	GPIO2_IO06	U27	1.8/3.3V IO voltage standard (controlled by SDIO-VSELECT)
14	BOOT-RECOVERY	-		System, single line for setting BOOT0/BOOT1 to 1/0 3.3V IO voltage standard
15	SD1-DATA1	GPIO2_IO03	Y26	1.8/3.3V IO voltage standard (controlled by SDIO-VSELECT)
16	POR-B	-	B24	System 3.3V IO voltage standard
17	SD1-DATA0	GPIO2_IO02	Y27	1.8/3.3V IO voltage standard (controlled by SDIO-VSELECT)
18	PWR-ON	-	A25	System 3.3V IO voltage standard
19	GND	-	-	-
20	RESET-IN	-	-	System, connected to PMIC reset circuit 3.3V IO voltage standard
21	SD1-CLK	GPIO2_IO00	V26	Internal Flash/SD 1.8/3.3 IO voltage standard (controlled by SDIO-VSELECT)
22	GND	-	-	-
23	SD1-CMD	GPIO2_IO01	V27	Internal Flash/SD 1.8/3.3 IO voltage standard (controlled by SDIO-VSELECT)

24	NVCC-SNVS-1V8	-	-	-
25	SD1-DATA3	GPIO2_IO05	T26	Internal Flash/SD 1.8/3.3 IO voltage standard (controlled by SDIO-VSELECT)
26	GND	-	-	-
27	SD1-DATA2	GPIO2_IO04	T27	Internal Flash/SD 1.8/3.3 IO voltage standard (controlled by SDIO-VSELECT)
28	-	-	-	-
29	NVCC-SDIO	-	V20	Power supply of SDIO interface 1.8/3.3V (controlled by SDIO-VSELECT)
30	-	-	-	-
31	-	-	-	-
32	-	-	-	-
33	VDD-1V8	-	-	1.8V Output for external accesories
34	VDD-1V8	-	-	1.8V Output for external accesories
35	VDD-1V8	-	-	1.8V Output for external accesories
36	VDD-1V8	-	-	1.8V Output for external accesories
37	VDD-1V8	-	-	1.8V Output for external accesories
38	VDD-1V8	-	-	1.8V Output for external accesories
39	VDD-1V8	-	-	1.8V Output for external accesories
40	VDD-1V8	-	-	1.8V Output for external accesories
41	VDD-5V	-	-	External 5V input
42	VDD-5V	-	-	External 5V input
43	VDD-5V	-	-	External 5V input
44	VDD-5V	-	-	External 5V input
45	VDD-5V	-	-	External 5V input
46	VDD-5V	-	-	External 5V input
47	VDD-5V	-	-	External 5V input
48	VDD-5V	-	-	External 5V input
49	VDD-5V	-	-	External 5V input
50	VDD-5V	-	-	External 5V input
51	-	-	-	-
52	-	-	-	-
53	VDD-3V3	-	-	3.3V Output for external accesories
54	VDD-3V3	-	-	3.3V Output for external accesories
55	VDD-3V3	-	-	3.3V Output for external accesories
56	VDD-3V3	-	-	3.3V Output for external accesories
57	VDD-3V3	-	-	3.3V Output for external accesories
58	VDD-3V3	-	-	3.3V Output for external accesories
59	VDD-3V3	-	-	3.3V Output for external accesories
60	VDD-3V3	-	-	3.3V Output for external accesories
61	-	-	-	-
62	-	-	-	-
63	UART4-TXD	GPIO5_IO29	F18	3.3V IO voltage standard
64	VDD-3V3-SW	-	-	Switched power supply output for external accesories Internally controlled by GPIO1_IO05
65	UART4-RXD	GPIO5_IO28	F19	3.3V IO voltage standard
66	-	-	-	-

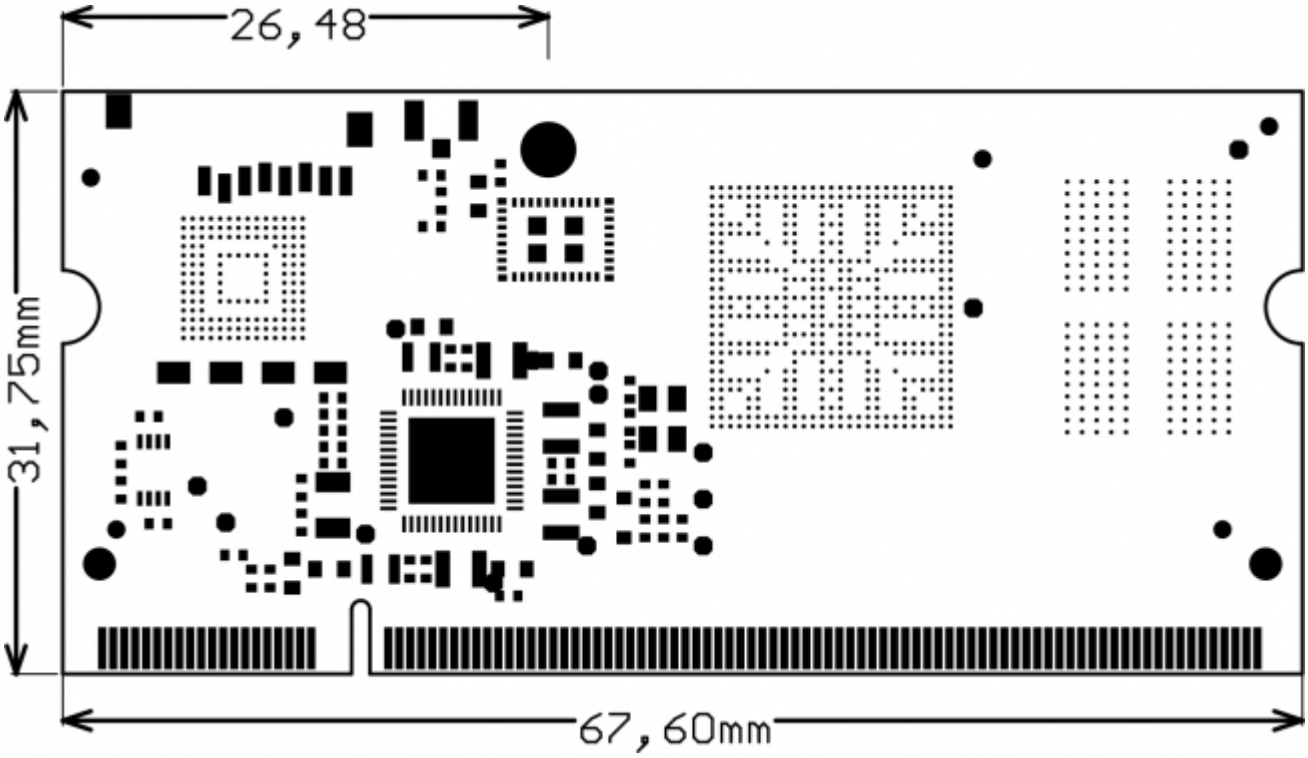
67	GND	-	-	-
68	SYS-LED	GPIO1_IO04	AG12	3.3V IO voltage standard
69	ENET-CLK-25MHz	GPIO1_IO00	AG14	1.8V IO voltage standard
70	GND	-	-	-
71	ENET-INT	GPIO1_IO08	AG10	1.8V IO voltage standard
72	GPIO4-IO04	GPIO4_IO04	AG17	3.3V IO voltage standard
73	GND	-	-	-
74	GPIO4-IO05	GPIO4_IO05	AF17	3.3V IO voltage standard
75	ENET1-MDIO	GPIO1_IO17	AB27	1.8V IO voltage standard
76	GPIO4-IO00	GPIO4_IO00	AG16	3.3V IO voltage standard
77	ENET1-MDC	GPIO1_IO16	AC27	1.8V IO voltage standard
78	GPIO4-IO01	GPIO4_IO01	AF16	3.3V IO voltage standard
79	GND	-	-	-
80	GPIO4-IO02	GPIO4_IO02	AG15	3.3V IO voltage standard
81	ENET1-RXC	GPIO1_IO25	AE26	1.8V IO voltage standard
82	GPIO4-IO03	GPIO4_IO03	AF15	3.3V IO voltage standard
83	ENET1-RX-CTL	GPIO1_IO24	AF27	1.8V IO voltage standard
84	GPIO4-IO07	GPIO4_IO07	AF18	3.3V IO voltage standard
85	ENET1-RXD0	GPIO1_IO26	AE27	1.8V IO voltage standard
86	GPIO4-IO06	GPIO4_IO06	AG18	3.3V IO voltage standard
87	ENET1-RXD1	GPIO1_IO27	AD27	1.8V IO voltage standard
88	GPIO4-IO09	GPIO4_IO09	AF19	3.3V IO voltage standard
89	ENET1-RXD2	GPIO1_IO28	AD26	1.8V IO voltage standard
90	GPIO4-IO08	GPIO4_IO08	AG19	3.3V IO voltage standard
91	ENET1-RXD3	GPIO1_IO29	AC26	1.8V IO voltage standard
92	GPIO4-IO15	GPIO4_IO15	AF21	3.3V IO voltage standard
93	GND	-	-	-
94	GPIO4-IO16	GPIO4_IO16	AG22	3.3V IO voltage standard
95	ENET1-TX-CTL	GPIO1_IO22	AF24	1.8V IO voltage standard
96	GPIO4-IO18	GPIO4_IO18	AG23	3.3V IO voltage standard
97	ENET1-TXC	GPIO1_IO23	AG24	1.8V IO voltage standard
98	GPIO4-IO19	GPIO4_IO19	AF23	3.3V IO voltage standard
99	ENET1-TXD3	GPIO1_IO18	AF25	1.8V IO voltage standard
100	GPIO4-IO17	GPIO4_IO17	AF22	3.3V IO voltage standard
101	ENET1-TXD2	GPIO1_IO19	AG25	1.8V IO voltage standard
102	GPIO4-IO14	GPIO4_IO14	AG21	3.3V IO voltage standard
103	ENET1-TXD1	GPIO1_IO20	AF26	1.8V IO voltage standard
104	GPIO4-IO13	GPIO4_IO13	AF20	3.3V IO voltage standard
105	ENET1-TXD0	GPIO1_IO21	AG26	1.8V IO voltage standard
106	GPIO4-IO12	GPIO4_IO12	AG20	3.3V IO voltage standard
107	GND	-	-	-
108	GPIO4-IO11	GPIO4_IO11	AC18	3.3V IO voltage standard
109	USB2-ID	-	D23	-
110	GPIO4-IO20	GPIO4_IO20	AB18	3.3V IO voltage standard
111	USB2-Dp	-	B23	Analog USB interface line
112	GPIO4-IO10	GPIO4_IO10	AB19	3.3V IO voltage standard

113	USB2-Dn	-	A23	Analog USB interface line
114	GND	-	-	-
115	USB2-VBUS	-	F23	Analog USB interface line
116	GPIO5-IO22	GPIO5_IO22	E14	-
117	USB2-OC	GPIO1_IO15	AB9	1.8V IO voltage standard
118	GPIO5-IO23	GPIO5_IO23	F13	-
119	USB2-EN	GPIO1_IO14	AC9	1.8V IO voltage standard
120	I2C3-SDA	GPIO5_IO19	F10	-
121	GND	-	-	-
122	I2C3-SCL	GPIO5_IO18	E10	-
123	USB1-OC	GPIO1_IO13	AD9	1.8V IO voltage standard
124	I2C2-SDA	GPIO5_IO17	D9	-
125	USB1-EN	GPIO1_IO12	AB10	1.8V IO voltage standard
126	I2C2-SCL	GPIO5_IO16	D10	-
127	USB1-ID	-	D22	-
128	I2C1-SDA	GPIO5_IO15	F9	-
129	USB1-Dp	-	B22	Analog USB interface line
130	I2C1-SCL	GPIO5_IO14	E9	-
131	USB1-Dn	-	A22	Analog USB interface line
132	GND	-	-	-
133	USB1-VBUS	-	F22	Analog USB interface line
134	SPI2_SS0	GPIO5_IO13	A6	-
135	GND	-	-	-
136	SPI2_MOSI	GPIO5_IO11	B8	-
137	SPDIF-CLK	GPIO5_IO05	AF8	-
138	SPI2_MISO	GPIO5_IO12	A8	-
139	SPDIF-RX	GPIO5_IO04	AG9	-
140	SPI2_CLK	GPIO5_IO10	E6	-
141	SPDIF-TX	GPIO5_IO03	AF9	-
142	SPI1_SS0	GPIO5_IO09	B6	-
143	SAI3-MCLK	GPIO5_IO02	AD6	-
144	SPI1_MOSI	GPIO5_IO07	B7	-
145	SAI3-RXFS	GPIO4_IO28	AG8	-
146	SPI1_MISO	GPIO5_IO08	A7	-
147	SAI3-TXD	GPIO5_IO01	AF6	-
148	SPI1_CLK	GPIO5_IO06	D6	-
149	GND	-	-	-
150	GND	-	-	-
151	UART3-TXD	GPIO5_IO27	D18	-
152	PCIE-CLK_N	-	A21	100nF separation capacitor integrated on board
153	UART3-RXD	GPIO5_IO26	E18	-
154	PCIE-CLK_P	-	B21	100nF separation capacitor integrated on board
155	SAI3-TXC	GPIO5_IO00	AG6	-
156	GND	-	-	-
157	SAI3-TXFS	GPIO4_IO31	AC6	-
158	PCIE-TXN_N	-	A20	100nF separation capacitor integrated on board

159	GND	-	-	-
160	PCIE-TXN_P	-	B20	100nF separation capacitor integrated on board
161	UART2-TXD	GPIO5_IO25	E15	-
162	GND	-	-	-
163	UART2-RXD	GPIO5_IO24	F15	-
164	PCIE-RXN_N	-	A19	External 100nF capacitor required in series
165	UART2-RTS	GPIO4_IO30	AF7	-
166	PCIE-RXN_P	-	B19	External 100nF capacitor required in series
167	UART2-CTS	GPIO4_IO29	AG7	-
168	GND	-	-	-
169	GND	-	-	-
170	GND	-	-	-
171	DSI-DATA3_P	-	B13	Dedicated MIPI-DSI line
172	CSI-DATA3_N	-	A18	Dedicated MIPI-CSI line
173	DSI-DATA3_N	-	A13	Dedicated MIPI-DSI line
174	CSI-DATA3_P	-	B18	Dedicated MIPI-CSI line
175	GND	-	-	-
176	GND	-	-	-
177	DSI-DATA2_P	-	B12	Dedicated MIPI-DSI line
178	CSI-DATA2_N	-	A17	Dedicated MIPI-CSI line
179	DSI-DATA2_N	-	A12	Dedicated MIPI-DSI line
180	CSI-DATA2_P	-	B17	Dedicated MIPI-CSI line
181	GND	-	-	-
182	GND	-	-	-
183	DSI-CLK_P	-	B11	Dedicated MIPI-DSI line
184	CSI-CLK_N	-	A16	Dedicated MIPI-CSI line
185	DSI-CLK_N	-	A11	Dedicated MIPI-DSI line
186	CSI-CLK_P	-	B16	Dedicated MIPI-CSI line
187	GND	-	-	-
188	GND	-	-	-
189	DSI-DATA1_P	-	B10	Dedicated MIPI-DSI line
190	CSI-DATA1_N	-	A15	Dedicated MIPI-CSI line
191	DSI-DATA1_N	-	A10	Dedicated MIPI-DSI line
192	CSI-DATA1_P	-	B15	Dedicated MIPI-CSI line
193	GND	-	-	-
194	GND	-	-	-
195	DSI-DATA0_P	-	B9	Dedicated MIPI-DSI line
196	CSI-DATA0_N	-	A14	Dedicated MIPI-CSI line
197	DSI-DATA0_N	-	A9	Dedicated MIPI-DSI line
198	CSI-DATA0_P	-	B14	Dedicated MIPI-CSI line
199	GND	-	-	-
200	GND	-	-	-
-	I2C4-SCL	GPIO5_IO20	D13	Used to internal PMIC configuration
-	I2C4-SDA	GPIO5_IO21	E13	Used to internal PMIC configuration
-	PMIC-INT	GPIO1_IO01	AF14	Interrupt input from internal PMIC
-	WDOG-B	GPIO1_IO02	AG13	Watchdog input in internal PMIC

-	SDIO-VSELECT	GPIO1_IO03	AF13	GPIO1_IO03/NVCC-SDIO voltage selection ("1"=1.8/"0"=3.3V)
	VDD-3V3-EN	GPIO1_IO05	AF12	GPIO1_IO05/On and off of VDD-3V3-SW
	SD3-DATA0	GPIO3_IO10	M26	Internal SD card/eMMC Flash data line (NAND_DATA04)
	SD3-DATA1	GPIO3_IO11	L26	Internal SD card/eMMC Flash data line (NAND_DATA05)
	SD3-DATA2	GPIO3_IO12	K26	Internal SD card/eMMC Flash data line (NAND_DATA06)
	SD3-DATA3	GPIO3_IO13	N26	Internal SD card/eMMC Flash data line (NAND_DATA07)
	SD3-DATA4	GPIO3_IO15	N27	Internal eMMC Flash data line (NAND_RE_B)
	SD3-DATA5	GPIO3_IO03	M27	Internal eMMC Flash data line (NAND_CE2_B)
	SD3-DATA6	GPIO3_IO04	L27	Internal eMMC Flash data line (NAND_CE3_B)
	SD3-DATA7	GPIO3_IO05	K27	Internal eMMC Flash data line (NAND_CLE)
	SD3-CLK	GPIO3_IO17	R26	Internal SD card/eMMC Flash data line (NAND_WE_B)
	SD3-CMD	GPIO3_IO18	R27	Internal SD card/eMMC Flash data line (NAND_WP_B)
	SD3-DQS	GPIO3_IO02	P27	Internal eMMC Flash data line (NAND_CE1_B)
	WLAN-ENABLE	GPIO2_IO20	AA27	1DX WiFi module line (GPIO2-IO20)
	WLAN-H-WAKE	GPIO2_IO12	AA26	1DX WiFi module line (GPIO2-IO12)
	SD2-CLK	GPIO2_IO13	W23	1DX WiFi module line
	SD2-CMD	GPIO2_IO14	W24	1DX WiFi module line
	SD2-DATA0	GPIO2_IO15	AB23	1DX WiFi module line
	SD2-DATA1	GPIO2_IO16	AB24	1DX WiFi module line
	SD2-DATA2	GPIO2_IO17	V24	1DX WiFi module line
	SD2-DATA3	GPIO2_IO18	V23	1DX WiFi module line
	BT-RTS	GPIO4_IO24	AD23	1DX Bluetooth module line
	BT-TXD	GPIO4_IO21	AC19	1DX Bluetooth module line
	BT-RXD	GPIO4_IO22	AB22	1DX Bluetooth module line
	BT-CTS	GPIO4_IO23	AC24	1DX Bluetooth module line
	BT-DEV-WAKE	GPIO4_IO27	AD19	1DX Bluetooth module line
	BT-HOST-WAKE	GPIO4_IO25	AD22	1DX Bluetooth module line
	BT-REG-ON	GPIO4_IO26	AC22	1DX Bluetooth module line
	BT-PCM-OUT	GPIO3_IO21	AD18	1DX Bluetooth module line
	BT-PCM-CLK	GPIO3_IO20	AC15	1DX Bluetooth module line
	BT-PCM-IN	GPIO3_IO24	AC13	1DX Bluetooth module line
	BT-PCM-SYNC	GPIO3_IO19	AB15	1DX Bluetooth module line

Dimensions



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