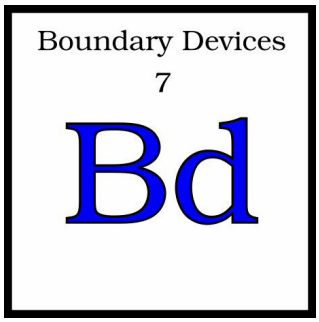
Nitrogen6X_SOM Hardware User Manual

Revision History

Date	Revision	Description
08-01-2012	1.0	First Draft
03-04-2013	2.0	Modified Signals



1 Contents

2 Overview

The Nitrogen6X-SOM is a low cost, highly integrated System-on-Module based on the Freescale i.mx6 Single/Dual/Quad-Core CPU. The SOM is ideal for customers looking for rapid product development while maintaining the flexibility of a custom design. The Nitrogen6X-SOM has a wide variety of peripheral options including Gigabit Ethernet, multiple display channels, and PCIe. Highlights of the SOM:

- Single/Dual/Quad-Core ARM® Cortex A9 processor at 1GHz
- 1GByte of 64-bit wide DDR3 @ 532MHz - Expandable
- Three display ports (PRGB, LVDS, and HDMI)
- Two camera ports (1xParallel, 1x MIPI CSI-2)
- Multi-stream-capable HD video engine delivering H.264 1080p60 decode,1080p30 encode and 3-D video playback in HD
- Triple Play Graphics system consisting of a Quad-shader 3D unit, and a separate 2-D and separate OpenVG Vertex acceleration engine for superior 3D, 2D and user interface acceleration
- Serial ATA 2.5 (SATA)
- SDIO Interface
- PCIe
- 10/100/Gb Ethernet
- 2 High speed USB ports (1xHost, 1xOTG)
- 1xCAN2 port
- I2C
- General Purpose I/O for Device Control
- Industrial Temperature versions available
- Small Size (2.25” x 2.5”)

3 SOM Pin Out

Changes from Rev 1:
1. Pin 158 is now coming from SD1_CLK
2. Added configurable RNET option (RN1 and RN2):

Pin #	RN1	RN2
Pin 119	PCIE_CLK1_P	JTAG_TMS
Pin 121	PCIE_CLK1_N	JTAG_TRST
Pin 123	MIPI Reset (GPIO)	JTAG_MOD
Pin 125	Expansion GPIO	JTAG_TDO

The SOM utilizes a 200pin SODIMM edge connector to interface to the carrier board. The part number is TE 1473005-1. SODIMM pin information:

Pin #	Pin Description	Pad Name
1	RGMII_REF_CLK	ENET_REF_CLK

2	I2C1_SCL	EIM_D21
3	RGMII_INT	ENET_TX_EN
4	UART3_RXD	EIM_D25
5	UART1_TXD	SD3_DAT7
6	EIM_D29	EIM_D29
7	EIM_DA2	EIM_DA2
8	I2C1_SDA	EIM_D28
9	SD3_DATA1	SD3_DAT1
10	EIM_DA0	EIM_DA0
11	UART1_RXD	SD3_DAT6
12	RGMII_TXD1	RGMII_TD1
13	CSI0_RST	NANDF_CS0
14	EIM_DA4	EIM_DA4
15	BACK	NANDF_D2
16	UART3_RTS	EIM_D31
17	EIM_RW	EIM_RW
18	SD4_DATA2	SD4_DAT2
19	PWM1	SD1_DAT3
20	RGMII_MDIO	ENET_MDIO
21	UART3_TXD	EIM_D24
22	SD4_CLK	SD4_CLK
23	SD4_CD	NANDF_D6
24	USB_H1_OC	EIM_D30
25	SEARCH	NANDF_D3
26	SD4_WP	NANDF_D7
27	MENU	NANDF_D1
28	SD2_CMD	SD2_CMD
29	HOME	NANDF_D4
30	BT_EN	NANDF_CS3
31	RGMII_TXD3	RGMII_TD3
32	SD2_DAT1	SD2_DAT1
33	SD2_DAT2	SD2_DAT2
34	RGMII_RXD1	RGMII_RD1
35	SD2_DAT0	SD2_DAT0
36	SD4_DATA0	SD4_DAT0
37	EIM_D20	EIM_D20
38	SD4_DATA3	SD4_DAT3
39	EIM_DA5	EIM_DA5
40	SD4_DATA1	SD4_DAT1
41	EIM_DA3	EIM_DA3
42	WL_EN	NANDF_CS2
43	EIM_DA1	EIM_DA1
44	WL_IRQ	NANDF_CS1
45	EIM_OE	EIM_OE
46	MIPI_BAKLGT_ON	NANDF_WP_B

47	EIM_CS0	EIM_CS0
48	SD3_DATA0	SD3_DAT0
49	RGMII_TXD2	RGMII_TD2
50	SD3_CLK	SD3_CLK
51	UART2_RXD	EIM_D27
52	SD3_WP	D3_DAT4
53	UART2_TXD	EIM_D26
54	SD3_CMD	SD3_CMD
55	UART3_CTS	EIM_D23
56	SD3_CD	SD3_DAT5
57	RGMII_RXD0	RGMII_RD0
58	USB_OTG_PWR_EN	EIM_D22
59	PCIE_TXM	PCIE_TXM
60	RGMII_RXDV	RGMII_RX_CTL
61	PCIE_TXP	PCIE_TXP
62	RESET_N	
63	GND	
64	RGMII_RXD3	RGMII_RD3
65	PCIE_RXM	PCIE_RXM
66	RGMII_TXCLK	RGMII_TXC
67	PCIE_RXP	PCIE_RXP
68	VCC_RTC	
69	GND	
70	RGMII_TXEN	RGMII_TX_CTL
71	CSI_D1M	CSI_D1M
72	RGMII_RXCLK	RGMII_RXC
73	CSI_D1P	CSI_D1P
74	RGMII_TXD0	RGMII_TD0
75	GND	
76	RGMII_RXD2	RGMII_RD2
77	CSI_D2M	CSI_D2M
78	SD2_CLK	SD2_CLK
79	CSI_D2P	CSI_D2P
80	PWM3	SD1_DAT1
81	GND	
82	SD2_DAT3	SD2_DAT3
83	CSI_D3P	CSI_D3P
84	GPIO1_16	SD1_DAT0
85	CSI_D3M	CSI_D3M
86	GND	
87	GND	
88	PWM4	SD1_CMD
89	CSI_D0M	CSI_D0M
90	SD4_CMD	SD4_CMD
91	CSI_D0P	CSI_D0P

92	SD3_DATA3	SD3_DAT3
93	GND	
94	SD3_DATA2	SD3_DAT2
95	CSI_CLK0M	CSI_CLK0M
96	ON_OFF	ONOFF
97	CSI_CLK0P	CSI_CLK0P
98	RGMII_nRST	ENET_RXD0
99	GND	
100	MIC_DET	ENET_RX_ER
101	DSI_CLK0M	DSI_CLK0M
102	RGMII_MDC	ENET_MDC
103	DSI_CLK0P	DSI_CLK0P
104	GND	
105	GND	
106	SATA_RXN	SATA_RXM
107	DSI_D0P	DSI_D0P
108	SATA_RXP	SATA_RXP
109	DSI_D0M	DSI_D0M
110	GND	
111	GND	
112	SATA_TXP	SATA_TXP
113	DSI_D1P	DSI_D1P
114	SATA_TXN	SATA_TXM
115	DSI_D1M	DSI_D1M
116	GND	
117	GND	
118	USB_OTG_DN	USB_OTG_DN
119	JTAG_TMS/PCIE_CLKP	JTAG_TMS/PCIE_CLKP
120	USB_OTG_DP	USB_OTG_DP
121	JTAG_nTRST/PCIE_CLKN	JTAG_TRSTB/PCIE_CLKN
122	GND	
123	JTAG_MOD/MIPI_RESET	JTAG_MOD/NandF_D5
124	USB_OTG_VBUS	USB_OTG_VBUS
125	JTAG_TDO	JTAG_TDO
126	GND	
127	JTAG_TDI	JTAG_TDI
128	USB_HOST_DP	USB_H1_DP
129	JTAG_TCK	JTAG_TCK
130	USB_HOST_DN	USB_H1_DN
131	GND	
132	GND	
133	HDMI_CLKP	HDMI_CLKP
134	HDMI_HPD	HDMI_HPD
135	HDMI_CLKM	HDMI_CLKM
136	CSI0_DAT13	CSI0_DAT13

137	HDMI_D0P	HDMI_D0P
138	CSI0_DAT10	CSI0_DAT10
139	HDMI_D0M	HDMI_D0M
140	CSI0_DAT12	CSI0_DAT12
141	HDMI_D1M	HDMI_D1M
142	AUD3_TXC	CSI0_DAT4
143	HDMI_D1P	HDMI_D1P
144	CSI0_VSYNC	CSI0_VSYNC
145	HDMI_D2M	HDMI_D2M
146	CSI0_PIXCLK	CSI0_PIXCLK
147	HDMI_D2P	HDMI_D2P
148	CSI0_DAT15	CSI0_DAT15
149	GND	
150	CSI0_DAT9	CSI0_DAT9
151	AUD3_TXD	CSI0_DAT5
152	CSI0_DAT8	CSI0_DAT8
153	USB_HUB_RESET_B	GPIO_17
154	KEY_VOL_DN	GPIO_19
155	CAN1_STBY	GPIO_2
156	I2C3_SCL	GPIO_5
157	GPIO9	GPIO9
158	SLOW_CLK	SD1_CLK
159	GND	
160	KEY_VOL_UP	GPIO_18
161	LVDS0_TX1_P	LVDS0_TX1_P
162	GPIO_3_CLKO2	GPIO_3
163	LVDS0_TX1_N	LVDS0_TX1_N
164	I2C2_SDA	KEY_ROW3
165	GND	
166	I2C3_SDA	GPIO_16
167	LVDS0_CLK_P	LVDS0_CLK_P
168	CSI0_DAT18	CSI0_DAT18
169	LVDS0_CLK_N	LVDS0_CLK_N
170	CSI0_DAT19	CSI0_DAT19
171	GND	
172	CSI0_DAT17	CSI0_DAT17
173	LVDS0_TX0_P	LVDS0_TX0_P
174	CSI0_DAT16	CSI0_DAT16
175	LVDS0_TX0_N	LVDS0_TX0_N
176	CSI0_DAT11	CSI0_DAT11
177	GND	
178	CSI0_DAT14	CSI0_DAT14
179	LVDS0_TX2_P	LVDS0_TX2_P
180	AUD3_RXD	CSI0_DAT7
181	LVDS0_TX2_N	LVDS0_TX2_N

182	AUD3_TXFS	CSI0_DAT6
183	GND	
184	USB_OTG_ID	GPIO_1
185	LVDS0_TX3_P	LVDS0_TX3_P
186	GPIO6	GPIO6
187	LVDS0_TX3_N	LVDS0_TX3_N
188	I2C2_SCL	KEY_COL3
189	GPIO_0_CLKO	GPIO_0
190	KEY_ROW2	KEY_ROW2
191	CSI0_HSYNC	CSI0_MCLK
192	USB_OTG_OC	KEY_COL4
193	CSI0_DATA_EN	CSI0_DATA_EN
194	KEY_COL2	KEY_COL2
195	+5V	
196	+5V	
197	+5V	
198	+5V	
199	+5V	
200	+5V	

40 pin XF2M-4015-1 Connector

Pin #	Description
1	GND
2	GND
3	GND
4	DISP0_CONTRAST
5	DISP0_DAT16
6	DISP0_DAT17
7	DISP0_DAT18
8	DISP0_DAT19
9	DISP0_DAT20
10	DISP0_DAT21
11	DISP0_DAT22
12	DISP0_DAT23
13	DISP0_DAT8
14	DISP0_DAT9
15	DISP0_DAT10
16	DISP0_DAT11
17	DISP0_DAT12
18	DISP0_DAT13
19	DISP0_DAT14
20	DISP0_DAT15
21	DISP0_DAT0
22	DISP0_DAT1

23	DISP0_DAT2
24	DISP0_DAT3
25	DISP0_DAT4
26	DISP0_DAT5
27	DISP0_DAT6
28	DISP0_DAT7
29	GND
30	DISP0_CLK
31	GND
32	DISP0_HSYNC
33	DISP0_VSYNC
34	DISP0_DRDY
35	I2C3_SCL
36	I2C3_SDA
37	PWM1
38	+5V
39	+5V
40	+5V

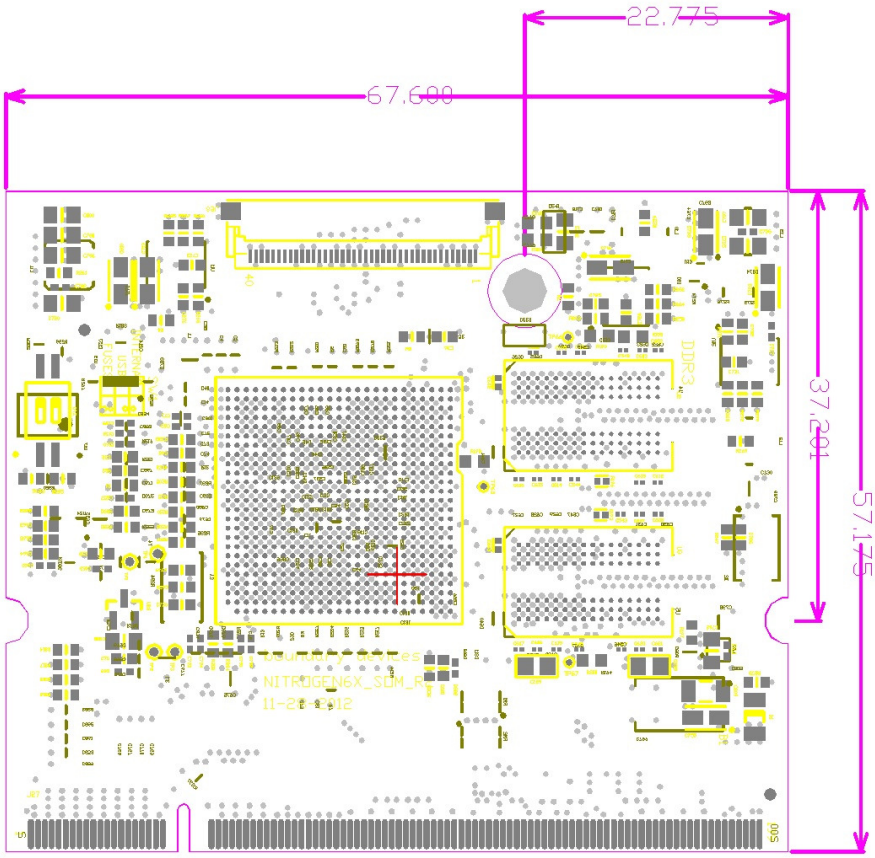
4 Electrical Characteristics

Nitrogen6X_SOM requires a single +5V rail.

Parameter	Min	Typ	Max	Unit
Main Input Voltage	4.75	5	5.25	V
Current Consumption		400		mA
Power Consumption*	-	2	TBD	W
CPU Clock	-	1.0	1.0	GHz

*The Power Consumption refers to a single board with no other peripherals plugged in.

5 Mounting



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