
Nit6X_SOM_V2 Hardware User Manual

Revision History

Date	Revision	Description
10-27-2015	1.0	First Draft



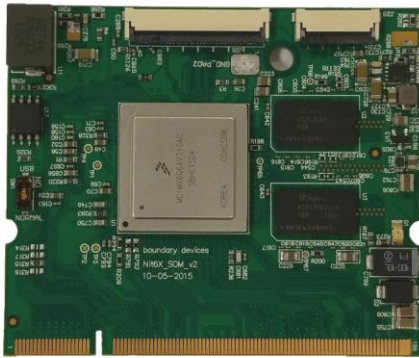
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2 Overview

The Nit6X-SOM_v2 is Boundary Devices' next generation System-on-Module based on the Freescale i.MX6 Single/Dual/Quad-Core CPU. The V2 SOM has added multiple new features that enhance the original SOM capabilities. The list of new features:

- 4GB on-board eMMC (expandable to 128GB)
- Up to 4GB DDR3 (previous SOM had a maximum of 2GB)
- Modified Power supplies to support Quad PLUS processor
- Added 2nd LVDS Channel



The SOM is ideal for customers looking for rapid product development while maintaining the flexibility of a custom design. The Nit6X-SOM_v2 is fully compatible with the previous version of the SOM allowing customers an upgrade path to add higher performance. Highlights of the SOM:

- Single/Dual/Quad/QuadPLUS-Core ARM® Cortex A9 processor at 1GHz
- 1GByte of 64-bit wide DDR3 @ 532MHz – Expandable to 4GB DDR3
- 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
- 4GB eMMC
- 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

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. Pin differences between V2 SOM and regular SOM (18, 22, 23, 26, 36, 38, 40, 68, 90, 186). 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	EIM_DA11	EIM_DA11
19	PWM1	SD1_DAT3
20	RGMII_MDIO	ENET_MDIO
21	UART3_TXD	EIM_D24
22	EIM_DA10	EIM_DA10
23	NANDF_D6	NANDF_D6
24	USB_H1_OC	EIM_D30
25	SEARCH	NANDF_D3
26	NANDF_D7	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	EIM_DA9	EIM_DA9
37	EIM_D20	EIM_D20
38	EIM_DA8	EIM_DA8
39	EIM_DA5	EIM_DA5
40	EIM_DA7	EIM_DA7
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	RTC_INTR	NANDF_CLE
69	GND	
70	RGMII_TXEN	RGMII_TX_CTL
71	CSI_DIM	CSI_DIM
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	EIM_DA6	EIM_DA6
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	EIM_DA12	EIM_DA12
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

20 pin OMRON XF2M-2015-1A:

Pin #	Pin Description
1	+3.3V
2	+3.3V
3	GND
4	GND
5	LVDS1_TX0M
6	LVDS1_TX0P

7	GND
8	LVDS1_TX1M
9	LVDS1_TX1P
10	GND
11	LVDS1_TX2M
12	LVDS1_TX2P
13	GND
14	LVDS1_CLKM
15	LVDS1_CLKP
16	GND
17	LVDS1_TX3M
18	LVDS1_TX3P
19	EIM_EB2
20	EIM_EB3

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

