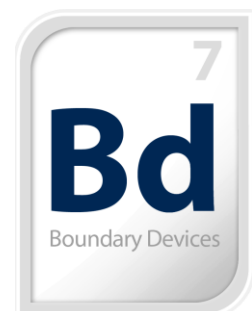


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# Nitrogen6\_MAX Hardware User Manual

## Revision History

Date	Revision	Description
07-20-2014	1.0	First Draft
11-04-2015	1.1	Added Quad Plus Capability



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## 2 Overview

The Nitrogen6\_MAX is a turbo-charged version of our popular Nitrogen6X platform. The Nitrogen6\_MAX features the same Quad-Core i.MX6 processor from Freescale, but has some other notable upgrades to allow for high-end performance. The Nitrogen6\_MAX Rev 3 boards, support the i.MX6 Quad PLUS processor. The hardware specifications for the Nitrogen6\_MAX board are the following:

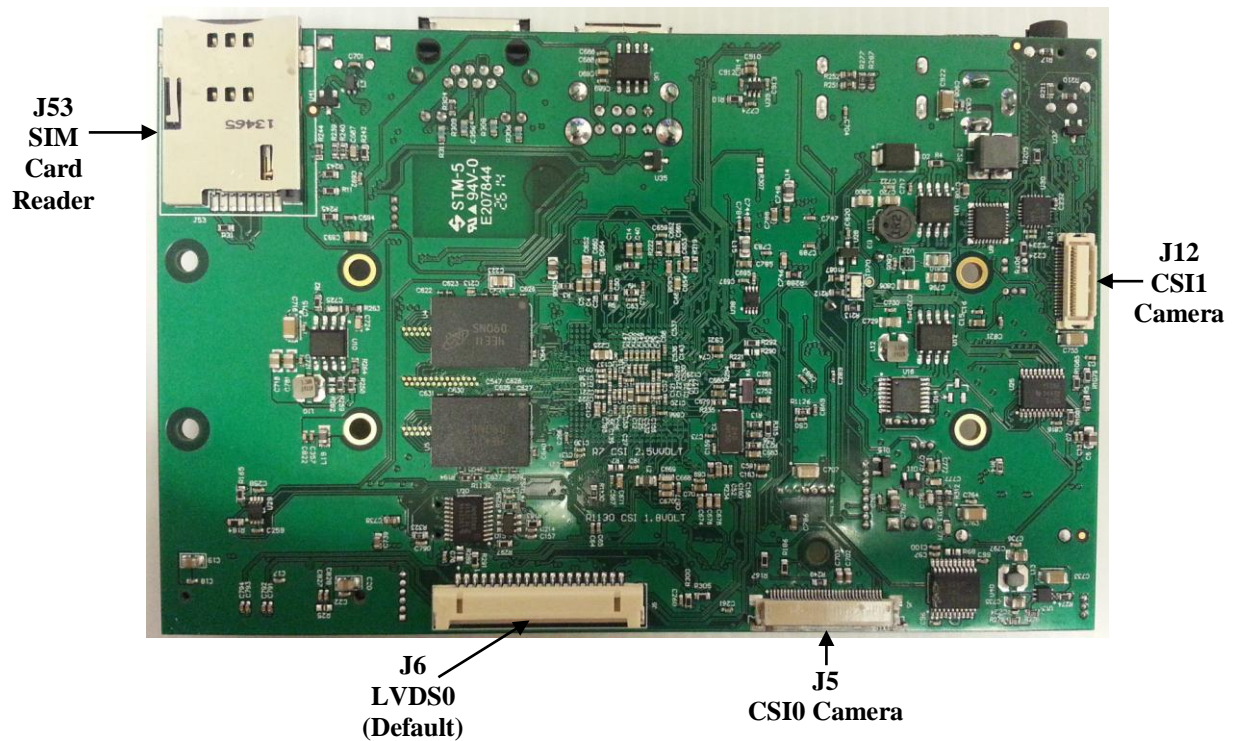
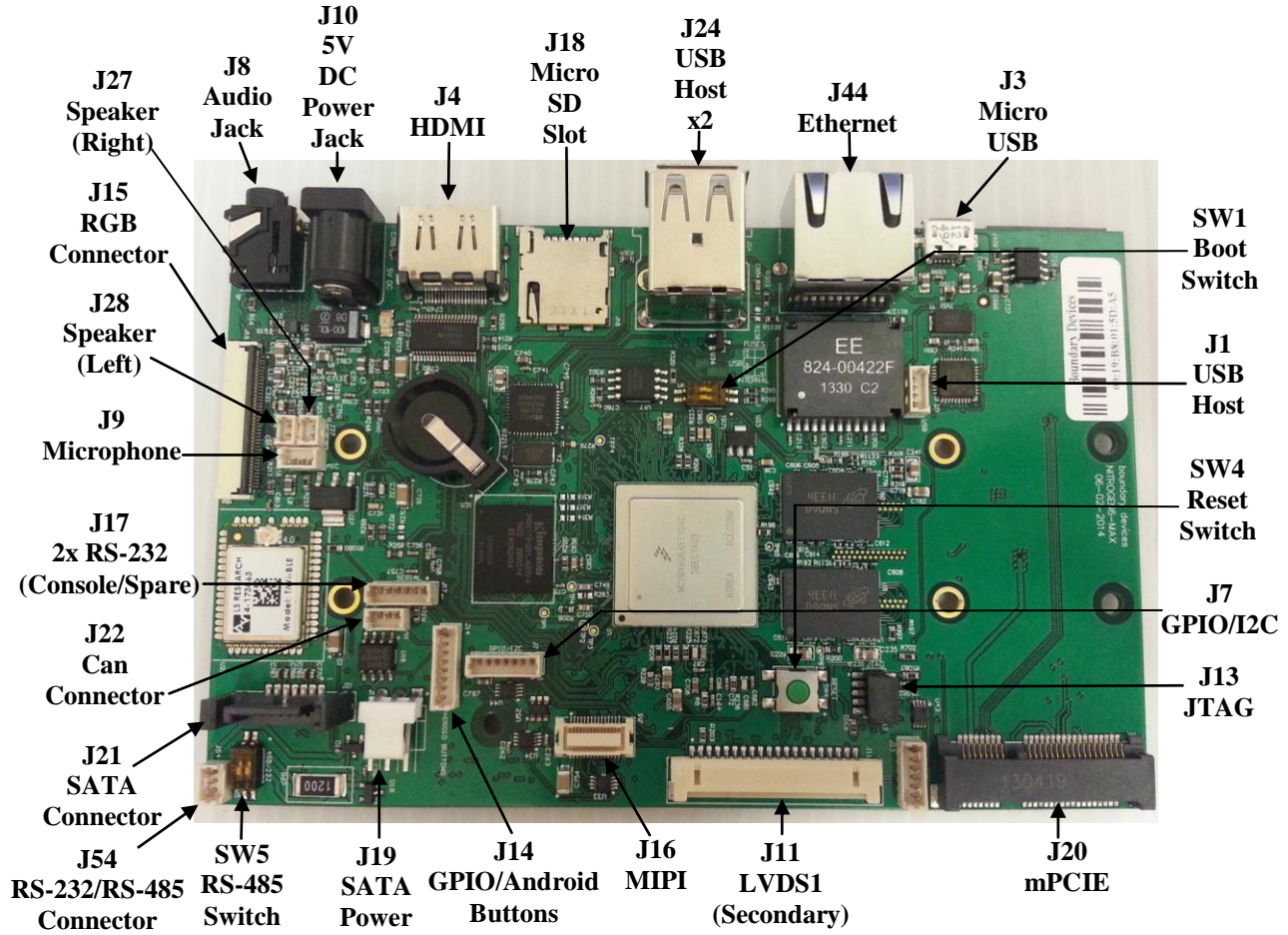
- Quad-Core (or Quad PLUS) ARM® Cortex A9 processor at 1GHz per core
- 4GByte of 64-bit wide DDR3L @ 532MHz
- 2 LVDS Outputs for Dual-Display or Dual-Channel 1080p displays
- RGB and HDMI 1.4a
- 4GB eMMC
- Three camera ports (2xParallel, 1x MIPI CSI-2)
- On-Board mPCIE connector with both PCIe and USB interfaces
- 2W Audio Amplifier to directly drive speakers
- 3 RS-232 serial ports, (1 software-selectable as RS-485)
- 802.11b/g/n WiFi/Bluetooth (LSR TiWi BLE) comes standard
- Serial ATA 2.5 (SATA) at 3Gbps
- 1 microSD 3.0/SDXC card slot
- Analog (headphone/mic) and Digital (HDMI) audio
- 10/100/Gb Ethernet
- 10-pin JTAG interface
- 3 High speed USB ports (2xHost, 1xOTG)
- 1xCAN port
- I2C
- Real-Time Clock with battery backup
- SIM Card Holder
- General Purpose I/O for Device Control

## 3 Electrical Characteristics

Parameter	Min	Typ	Max	Unit
Main Input Voltage	4.75	5	5.25	V
Power Consumption*	-	1.5	TBD	W
CPU Clock	-	1.0	1.0	GHz

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

### 4 Connector Details



Revision 1.1

## 4.1 Standard Connectors

The list of industry standard connectors with known pin outs is the following:

Ref Designator	Function
J3	USB OTG
J4	HDMI
J8	Headphone Jack
J10	DC Power Jack
J18	microSD Slot 1
J21	SATA
J24	2xUSB Host
J44	10/100/1G Ethernet
J53	SIM Card Holder

## 4.2 Custom Connectors

The Nitrogen6\_MAX board has a wide variety of peripheral interfaces available via custom connectors.

### J1: USB (Molex 53047-0410)

Pin#	Function
1	+5V
2	USBDN_DM3
3	USBDN_DP3
4	GND

### J5: Camera (AVX 086210033340800)

Pin#	Function
1	GND
2	D19
3	D18
4	D17
5	D16
6	D15
7	D14
8	D13
9	D12
10	D11
11	D10
12	D9
13	D8
14	SCL
15	SDA

16	GND
17	GPIO_3_CLKO2
18	GND
19	2.5V
20	2.5V
21	2.5V
22	2.5V
23	GND
24	CSI0_DATA_EN
25	GND
26	CSI0_RST
27	CSI0_VSYNC
28	CSI0_HSYNC
29	GND
30	CSI0_PIXCLK
31	GPIO_6
32	GND
33	GPIO1_16

**J6: LVDS (Hirose DF14-20P-1.25H)**

Pin#	Function
1	3.3V
2	3.3V
3	GND
4	GND
5	LVDS0_TX0_N
6	LVDS0_TX0_P
7	GND
8	LVDS0_TX1_N
9	LVDS0_TX1_P
10	GND
11	LVDS0_TX2_N
12	LVDS0_TX2_P
13	GND
14	LVDS0_CLK_N
15	LVDS0_CLK_P
16	GND
17	LVDS0_TX3_N
18	LVDS0_TX3_P
19	DISP0_CONTRAST (NANDF_D0)
20	PWM4

**J7: I2C/GPIO (Molex 53047-0710)**

Pin#	Function
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1	+5V
2	+5V
3	+5V
4	GPIO9
5	I2C3_SDA
6	I2C3_SCL
7	GND

**J9: MIC In (Molex 53047-0310)**

Pin#	Function
1	GND_Analog
2	MIC In
3	MIC Det

**J11: LVDS (Hirose DF14-20P-1.25H)**

Pin#	Function
1	3.3V
2	3.3V
3	GND
4	GND
5	LVDS1_TX0_N
6	LVDS1_TX0_P
7	GND
8	LVDS1_TX1_N
9	LVDS1_TX1_P
10	GND
11	LVDS1_TX2_N
12	LVDS1_TX2_P
13	GND
14	LVDS1_CLK_N
15	LVDS1_CLK_P
16	GND
17	LVDS1_TX3_N
18	LVDS1_TX3_P
19	LVDS1_GPIO (EIM_CS0)
20	PWM2

**J12: CSI1 (Molex 52991-0408)**

Pin#	Function
1	EIM_A23
2	EIM_DA0
3	EIM_A22
4	EIM_DA1
5	EIM_A21

6	EIM_DA2
7	EIM_A20
8	EIM_DA3
9	EIM_A19
10	EIM_DA4
11	EIM_A18
12	EIM_DA5
13	EIM_A17
14	EIM_DA6
15	EIM_A16
16	EIM_DA7
17	EIM_EB3
18	EIM_DA8
19	EIM_EB2
20	EIM_DA9
21	EIM_RW
22	EIM_DA10
23	EIM_EB1
24	EIM_DA11
25	EIM_EB0
26	GND
27	EIM_LBA
28	EIM_DA12
29	GND
30	GND
31	EIM_WAIT
32	EIM_DA13
33	GND
34	GND
35	EIM_A24
36	EIM_DA14
37	+3.3V
38	GND
39	+3.3V
40	EIM_DA15

**J13: JTAG (20021121-00010T4LF FCI)**

Pin#	Function
1	+3.3V
2	JTAG_TMS
3	GND
4	JTAG_TCK
5	GND
6	JTAG_TDO
7	JTAG_MOD



8	JTAG_TDI
9	JTAG_nTRST
10	BRESET_N

**J14: Android Buttons (Molex 53047-0810)**

Pin#	Function	IMX6 Pad Name
1	ON/OFF	
2	KEY_VOL_UP	GPIO_18
3	HOME	NANDF_D4
4	SEARCH	NANDF_D3
5	BACK	NANDF_D2
6	MENU	NANDF_D1
7	KEY_VOL_DN	GPIO_19
8	GND	

**J15: Parallel RGB (Omron XF2M-4015-1A)**

Pin#	Function
1	GND
2	GND
3	GND
4	DISPO_CNTRST
5	R0
6	R1
7	R2
8	R3
9	R4
10	R5
11	R6
12	R7
13	G0
14	G1
15	G2
16	G3
17	G4
18	G5
19	G6
20	G7
21	B0
22	B1
23	B2
24	B3
25	B4
26	B5
27	B6
28	B7

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

**J16: MIPI (Molex 52991-0308)**

Pin#	Function
1	CSI_D0M
2	+5V
3	CSI_D0P
4	+5V
5	GND
6	I2C2_SDA
7	CSI_D1M
8	I2C2_SCL
9	CSI_D1P
10	PWM3
11	GND
12	MIPI_BAKLGT_ON
13	CSI_D2M
14	NANDF_D5
15	CSI_D2P
16	DSI_D0P
17	GND
18	DSI_D0M
19	CSI_D3M
20	GND
21	CSI_D3P
22	DSI_CLK0P
23	GND
24	DSI_CLK0M
25	CSI_CLK0M
26	GND
27	CSI_CLK0P
28	DSI_D1P
29	GND
30	DSI_D1M

**J17: COM1 & COM2 (Molex 53047-0610)**

UART2 is used as the U-Boot and O/S console, so UART1 or UART5 on J54 should normally be used for external connections.

UART1/2 are mapped to /dev/ttyxc0 and /dev/ttyxc1 under Linux and COM1/2 under Windows Embedded.

Pin#	Function
1	UART1 TX
2	+5V
3	GND
4	UART2 TX
5	UART2 RX
6	UART1 RX

**J19: SATA Power (Tyco 640457-3)**

Pin#	Function
1	+3.3V
2	GND
3	+5V

**J20: PCIe (Molex 679100002)**

Pin#	Function
2	+3.3V
4	GND
6	+1.5V
8	To SIM Card C1
9	GND
10	To SIM Card C7
11	CLK1_N
12	To SIM Card C3
13	CLK1_P
14	To SIM Card C2
15	GND
18	GND
21	GND
22	PCIE_Reset (EIM_BCLK)
23	PCIE_RXM
24	+3.3V
25	PCIE_RXP
26	GND
27	GND

28	+1.5V
29	GND
30	I2C3_SCL
31	PCIE_TXM
32	I2C3_SDA
33	PCIE_TXP
34	GND
35	GND
36	USBDN_DM3
38	USBDN_DP3
40	GND
48	+1.5V
50	GND
52	+3.3V

**J22: CAN Interface (Molex 53047-0310)**

Pin#	Function
1	CANH
2	GND
3	CANL

**J27: 2W Amplified Audio – Right Channel (Molex 53047-0210)**

Pin#	Function
1	OUTRP
2	OUTRM

**J28: 2W Amplified Audio – Left Channel (Molex 53047-0210)**

Pin#	Function
1	OUTLP
2	OUTLM

**J54: Selectable RS232/RS485 (Molex 53047-0310)**

UART5 is mapped to /dev/ttymx4 under Linux. SW5 needs to be set to either RS232 or RS485.

Pin#	Function
1	GND
2	UART5 RXD/RS-485-
3	UART5 TXD/RS-485+

## 5 Mounting

The overall dimensions of the Nitrogen6\_MAX board are 5.4" x 3.43"

