

Nitrogen7

User Manual



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1 Revision History

Date	Revision	Description
6-01-2016	1.0	First Draft

2 Overview

The Nitrogen7 is a multi-purpose i.MX7 single board computer based on the i.MX7 processor from NXP/Freescale. The i.MX7 processor from NXP/Freescale has ARM Cortex™-A7 and ARM Cortex™-M4 cores which provide unique features to the i.MX family. The i.MX 7 series is the first device in the market utilizing both the ARM® Cortex®-A7 and Cortex-M4 cores for general purpose programmable processing. The Nitrogen7 was designed take advantage of the key features of the i.MX7 processor including power efficiency with a PFUSE PMIC and the M4 core.

- NXP/Freescale i.MX7 Dual Core Cortex A7 + ARM Cortex M4 at 1GHz
- 1GB DDR3L
- Board dimensions: 135mm x 79mm
- 2MB Serial Flash
- 4GB eMMC
- 1 x MIPI Camera Port
- 24-bit RGB Display Interface
- 10/100/1GB Ethernet
- 802.11 ac + BT4.1 (Silex/QCA9377)
- Analog (Headphone/MIC) Audio + 2W Amplified Audio
- 1 Full Size SD Card Slot
- 1 USB Host + 1 USB OTG
- I2C/GPIO/SPI
- CAN
- 2 RS-232
- PCIE + SIM Card
- RTC + Battery
- Yocto + Buildroot Linux Operating Systems
- Industrial Temperature Versions Available

3 Electrical Characteristics

Parameter	Min	Typ	Max	Unit
Main Input Voltage	TBD	5	TBD	V
Power Consumption*	-	-	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

Figure 1 & 2 show the details of each connector.

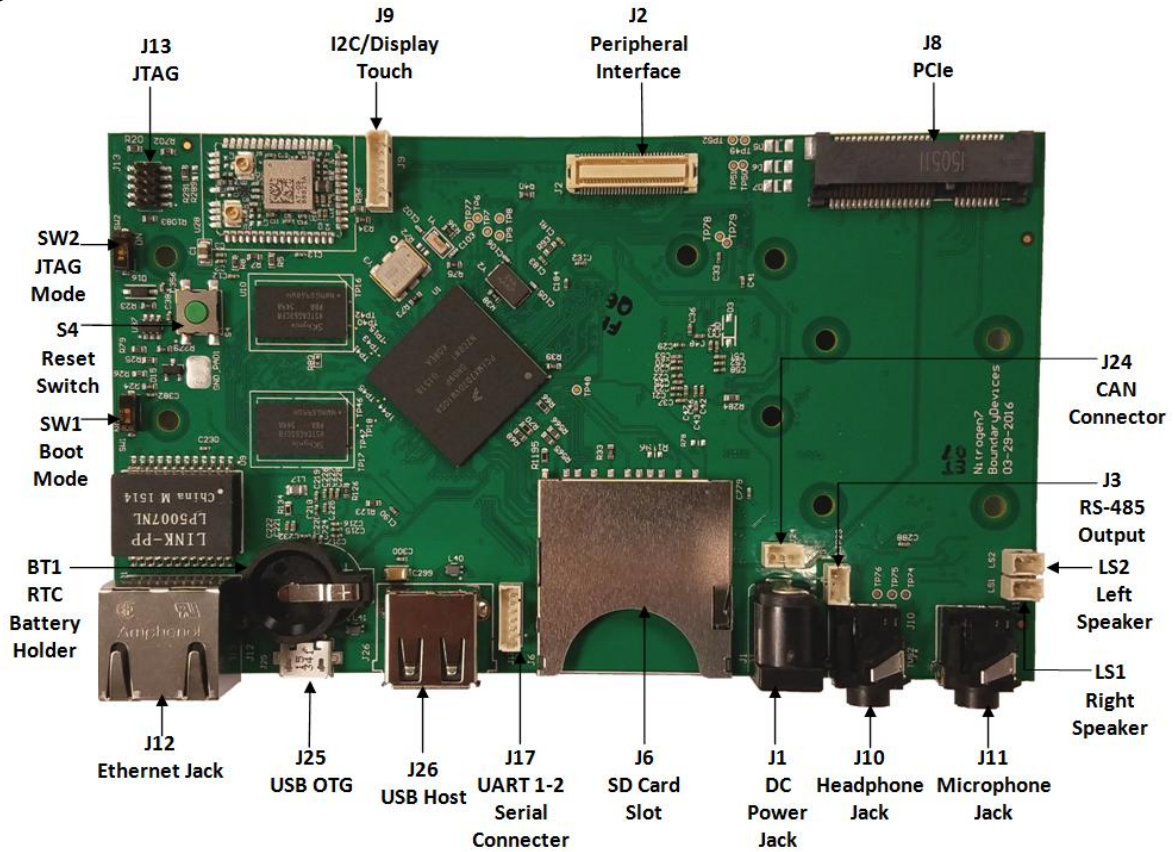


Figure 1

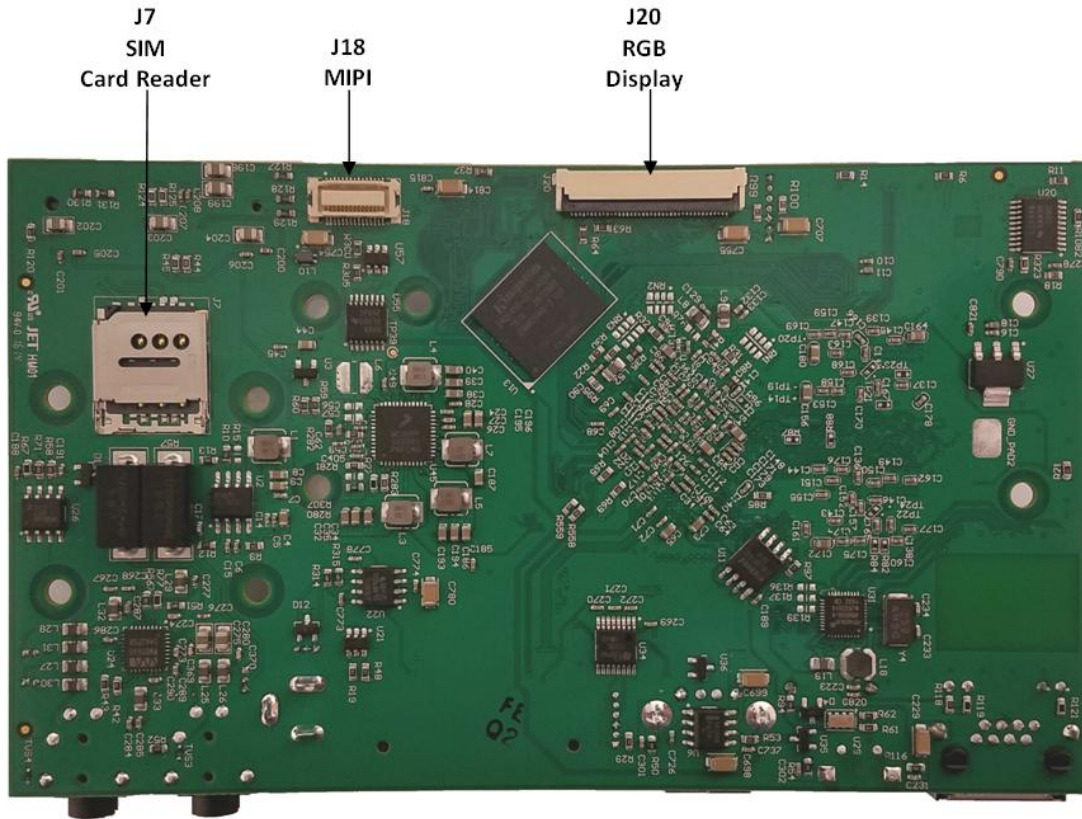


Figure 2

4.1 Standard Connectors

Industry standard connectors with known pin outs:

Ref Designator	Function
J1	DC Power Jack
J6	Full size SD Card Slot
J7	SIM Card Reader
J8	PCIE Connector
J10	Headphone Jack
J11	Microphone Jack
J12	10/100/1000 Ethernet Jack
J25	USB OTG
J26	USB Host

4.2 Custom Connectors

The Nitrogen7 board has a wide variety of peripheral interfaces available via custom connectors:

J2: (Molex 54167-0608)

Pin#	Function	41	GPIO_EPDC_SDCE1
1	GPIO_SAI1_TXD	42	GPIO_SAI2_TXFS
2	GPIO_EPDC_BDR0	43	GPIO_EPDC_SDCE2
3	GPIO_SAI1_RXD	44	GND
4	GPIO_EPDC_BDR1	45	GPIO_EPDC_SDCE3
5	GND	46	GND
6	GPIO_EPDC_SDSHR	47	GPIO_EPDC_GDSP
7	SD1_RESET_B	48	I2C3_SDA
8	GND	49	ADC1_IN0
9	ADC2_IN1	50	I2C3_SCL
10	GP_SD2_RESET	51	GPIO_EPDC_SDCLK
11	ADC2_IN0	52	GND
12	ADC1_IN1	53	GPIO_EPDC_SDLE
13	GND	54	GND
14	ADC1_IN2	55	GPIO_EPDC_SDOE
15	GPIO_EPDC_D7	56	5VIN
16	USB_H_DATA	57	EPDC_PWRCTRL0
17	GPIO_EPDC_D8	58	5VIN
18	USB_H_STROBE	59	GND
19	GPIO_EPDC_D9	60	5VIN
20	GND	58	5VIN
21	GPIO_EPDC_D10	59	GND
22	TOUCH_INTR	60	5VIN
23	GPIO_EPDC_D11		
24	GND		
25	GPIO_EPDC_D12		
26	GPIO_SAI1_TXFS		
27	GPIO_EPDC_D13		
28	GPIO_SAI1_TXC		
29	ADC2_IN2		
30	GP_SD2_CD		
31	ADC1_IN3		
32	GND		
33	GPIO_EPDC_GDCLK		
34	GPIO_SAI2_RXD		
35	GPIO_EPDC_GDOE		
36	GND		
37	GPIO_EPDC_GDRL		
38	GPIO_SAI2_TXD		
39	GPIO_EPDC_SDCE0		
40	GPIO_SAI2_TXC		

J3: RS-485 Output (Molex 53047-0310)

Pin#	Function
1	A
2	B
3	GND

J9: I2C/Display Touch (MOLEX 53047-0710)

Pin#	Function
1	+5V
2	+5V
3	GPIO1_IO7
4	TOUCH_INTR
5	I2C3_SDA
6	I2C3_SCL
7	GND

J13: JTAG (FCI 20021121-00010T4LF)

Pin#	Function
1	VDD_SNV5
2	JTAG_TMS
3	GND
4	JTAG_TCK
5	GND
6	JTAG_TDO
7	JTAG_MOD
8	JTAG_TDI
9	JTAG_TRST_E
10	BRESET_N

J17: UART 1-2 SERIAL CONNECTOR (MOLEX 53047-0610)

Pin#	Function
1	UART1 TXD
2	+5V
3	GND
4	UART 2 TXD
5	UART2_RXD
6	UART1_RXD

J18: 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	BPWM2
11	GND
12	BMIPI_BAKLGT_ON
13	TP49
14	BMIPI_GPIO
15	TP50
16	DSI_D0P
17	GND
18	DSI_D0M
19	TP51
20	GND
21	TP52
22	DSI_CLK0P
23	GND
24	DSI_CLK0M
25	CSI_CLK0M
26	GND
27	CSI_CLK0P
28	DSI_D1P
29	GND
30	DSI_D1M

J20: RGB Display (OMRON XF2M-4015-1A)

Pin#	Function
1	GND
2	GND
3	GND
4	LCD1_RESET
5	LCD1_DATA16
6	LCD1_DATA17
7	LCD1_DATA18
8	LCD1_DATA19
9	LCD1_DATA20
10	LCD1_DATA21
11	LCD1_DATA22
12	LCD1_DATA23
13	LCD1_DATA8
14	LCD1_DATA9
15	LCD1_DATA10
16	LCD1_DATA11

17	LCD1_DATA12
18	LCD1_DATA13
19	LCD1_DATA14
20	LCD1_DATA15
21	LCD1_DATA0
22	LCD1_DATA1
23	LCD1_DATA2
24	LCD1_DATA3
25	LCD1_DATA4
26	LCD1_DATA5
27	LCD1_DATA6
28	LCD1_DATA7
29	GND
30	LCD1_CLK
31	GND
32	LCD1_HSYNC
33	LCD1_VSYNC
34	LCD1_ENABLE
35	I2C3_SCL
36	I2C3_SDA
37	PWM1
38	+5V
39	+5V
40	+5V

J24: CAN Connector (Molex 53047-0310)

Pin#	Function
1	CANH
2	GND
3	CANL

LS1: Right Speaker (Molex 53047-0210)

Pin#	Function
1	Speaker Right Plus
2	Speaker Right

LS2: Left Speaker (Molex 53047-0210)

Pin#	Function
1	Speaker Left
2	Speaker Left Plus

5 Physical Dimensions

