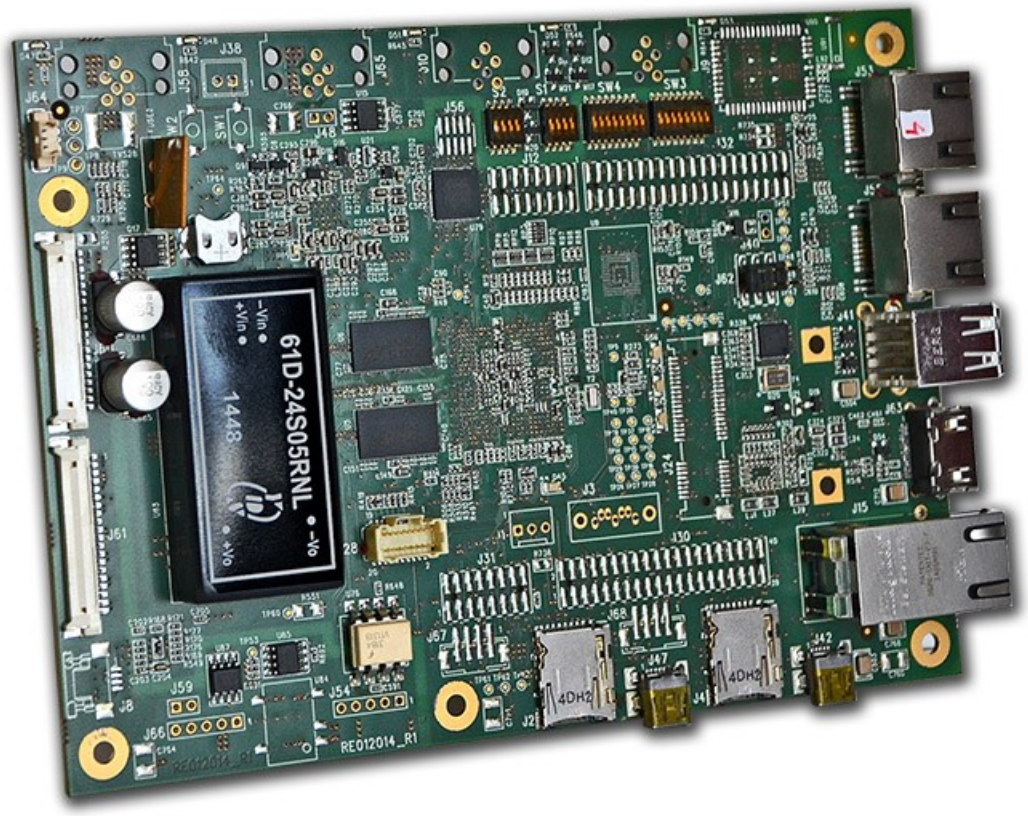
STELLA-SBC
i.MX6
Hardware Manual



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1

INTRODUCTION

STELLA in an SBC (Single Board Computer) supporting the Freescale's **i.MX6 Quad/ Dual/ DualLite/ Single core ARM Cortex-A9**. The CPU frequency peaks up to1.2GHz. The board delivers high CPU and graphical performance with minimum power consumption.
It processes data and communicates very effectively thanks to its multi-core processing and connects to the Cloud and Internet of Things (IOT) through the MQTT protocol. Robustness and reliability, especially in environmental conditions of high stress, versatile solutions -40 to 85 °C temperature range and Dual CAN support is ideal for industrial and medical applications, while 1080p video and graphics accelerations make it equally suitable for intensive multimedia applications.

Supporting Markets:
Stella targets a wide range of applications, including: Digital Signage, Medical Devices,Navigation, Industrial Automation, HMIs, Avionics, Entertainment system, POS, Data Acquisition,
Robotics, Gaming and much more

Operating systems support:

- Linux Kernel 3.1.x Yocto
- Android Lollipop 5.02
- Ubuntu 12.04 LTS

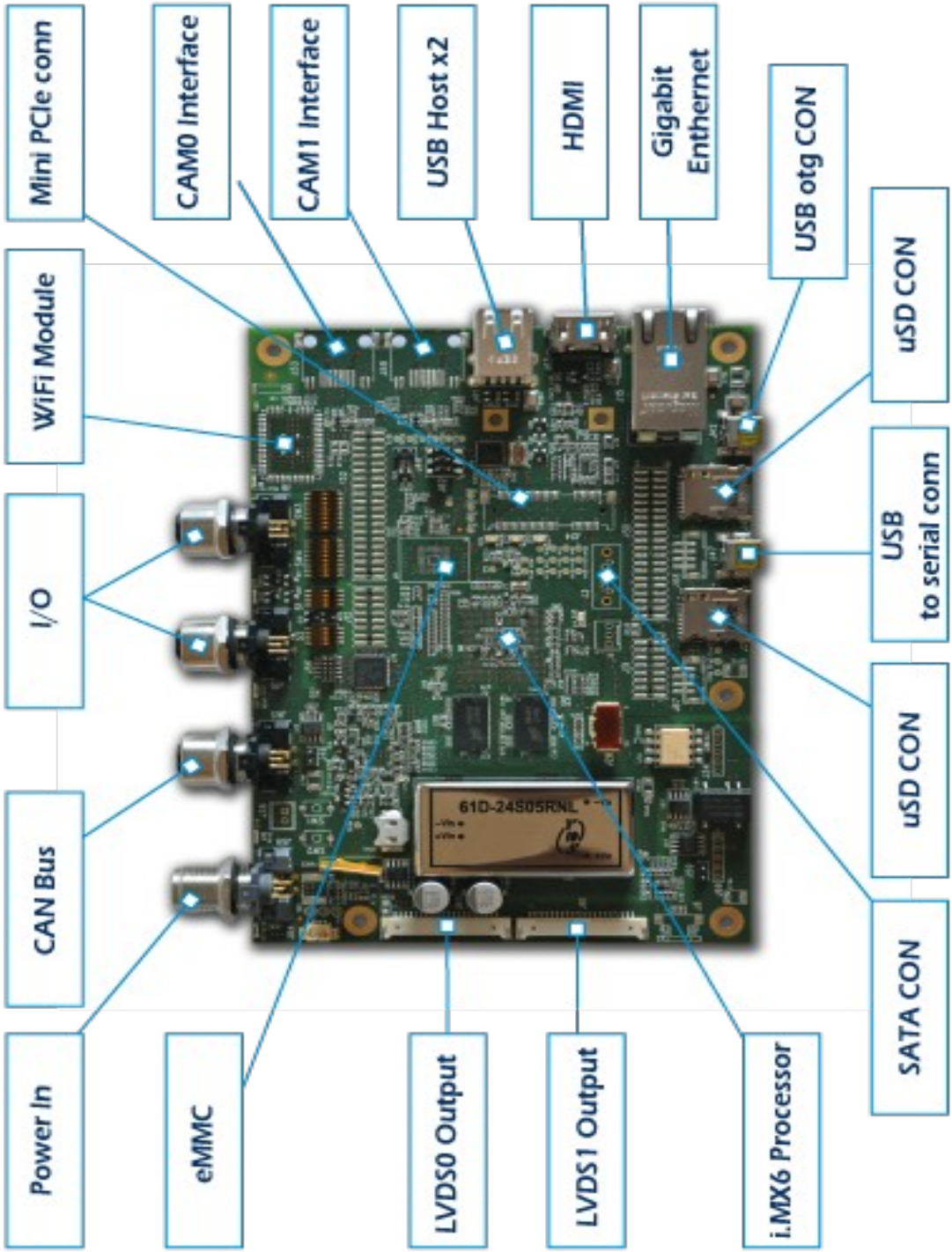
Contact support for further information mailto:info@maselettronica.com

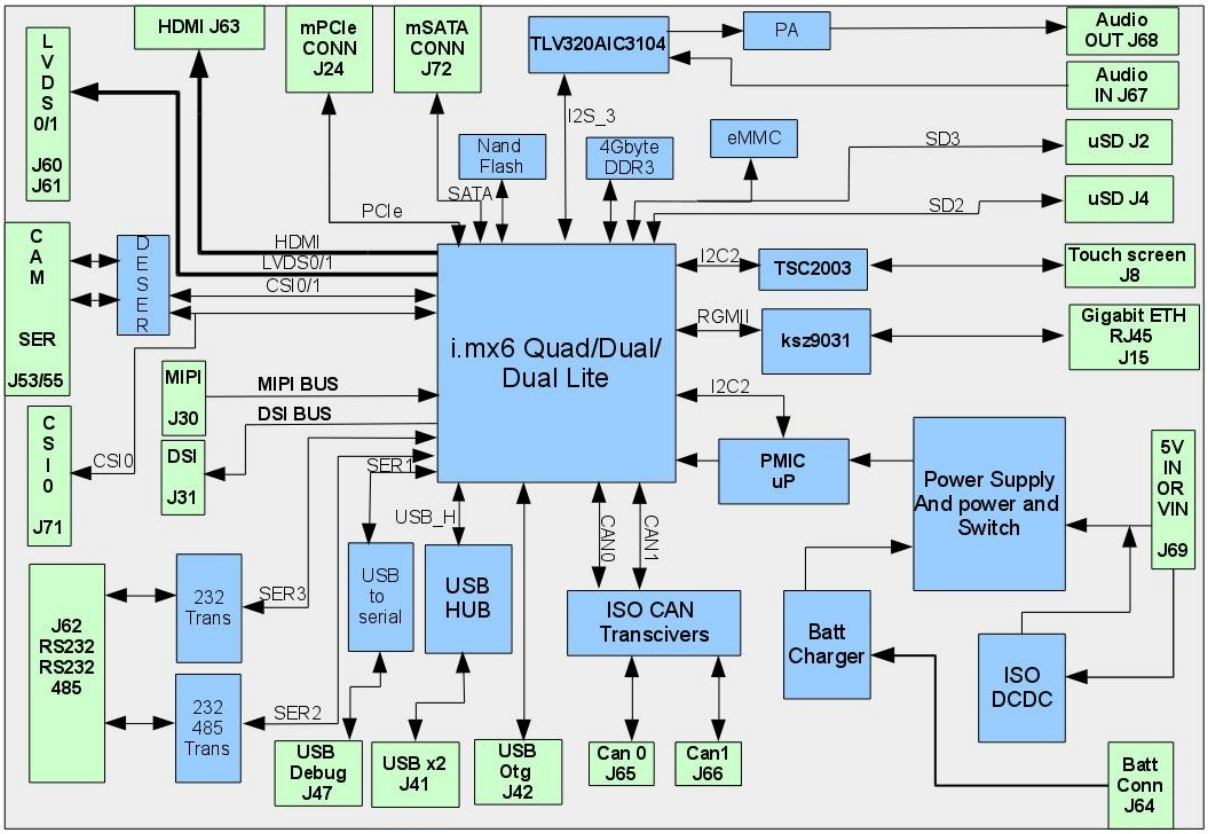
FEATURES

The features of the i.MX6 are:

- CPU i.MX6 Freescale
- CPU Type Cortex-A9 MPCore up to Single/Dual and Quad core
- CPU clock (Max) up to 1.2GHz
- RAM DDR3 up to 4Gbyte
- Nand Flash up to 8Gbyte
- eMMC up to 64Gbyte
- Camera Interface 1 x CSI, 2 x CPI
- Video Encore /Decore 1080p60 H.264 Decore / 1080p30 H.264 Encore
- 3D Graphic Acceleration GPU 3D Vivante
- Integrated Audio Codec
- HDMI v.1.4 1920x1080
- LVDS Dual 1920x1200 24-bit
- TTL 24Bit
- SD/MMC x 2
- USB Host/Device USB 2.0: 1 x Host, 1 x OTG
- Uart x4 up to 3,6 Mbps
- I2C x2
- SPI x2
- M-Sata Interface, 3.0Gbps
- RTC on board
- PCI-Express(mini) Gen 2.0
- Wi-Fi 802.11 b/g/n
- Bluetooth 4.0 BLE
- GPIO Variable, shared whit other peripherals
- Power 5 V or 18-36V Isolated

SYSTEM DESCRIPTION





Stella Block Diagram

2

CPU

The Stella supports i.MX6 SOC supports of ARM Cortex ™ A9 Solo/Dual/Dual Lite and Quad processors, commercial and Industrial temperature range. The table below summarizes the feature of the processors supported by Stella:

	iMX6Quad	iMX6Dual	i.MX6 Dual Lite	iMX6Solo
Freescale SoC	MCIMX6Q5EYM10AC	MCIMX6D5EYM10AC	MCIMX6U5DVM10AC	MCIMX6S5DVM10AC
CPU Cores	4	2	2	1
L1 Instruction Cache (each core)	32KByte	32KByte	32KByte	32KByte
L1 Data Cache (each core)	32KByte	32KByte	32KByte	32KByte
L2 Cache (shared by cores)	1MByte	1MByte	512KB	512KB
NEON MPE	√	√	√	√
Maximum CPU frequency	1,2GHz	1,2GHz	1GHz	1GHz
ARM TrustZone	√	√	√	√
Advanced High Assurance Boot	√	√	√	√
Cryptographic Acceleration and Assurance Module	√	√	√	√
Secure Real-Time Clock	√	√	√	√
Secure JTAG Controller	√	√	√	√

2.1 MEMORIES

The table below summarizes the main features of the memory support for Stella:

	IMX6 Quad	IMX6 Dual	i.MX6 Dual Lite	IMX6 Solo
DDR3 RAM Size Max	4GByte	4GByte	4GByte	512Mbyte
DDR3 RAM Speed	1066MT/s	1066MT/s	1066MT/s	800MT/s
DDR3 RAM Memory Width	64bit	64bit	64bit	32bit
NAND Flash (8bit) Max	4GByte	4GByte	4GByte	4Gbyte
eMMC	64Gbyte	64Gbyte	64Gbyte	64Gbyte

DDR3 Memory

The Stella supports up to 4Gbyte of DDR3 SDRAM, depending on the SOC it can be from 256Mbytes to 4Gbytes and 32/64 bits.
For more information about the DDR3 memory devices see the following link.

http://www.micron.com/products/dram/ddr3-sdram

Nand Flash

The i.MX6 is available with 512Mbyte (up to 4Gbyte) of NAND FLASH memory.
The NAND flash is used for flash disk purposes, O.S. run-time-image and the bootloader (boot from NAND).
First block (block address 00h) of the memory device is guaranteed to be valid without ECC (up to 1,000 PROGRAM/ERASE cycles).

For more information about the Nand Flash devices see the following link.

http://www.micron.com/products/nand-flash/slc-nand

eMMC

The i.MX6 is avaiable with eMMC Memory an optional, up to 64GB.

http://www.micron.com/products/managed-nand/emmc

2.2 Connectivity

uSD CON

Stella contains two on board uSD connector supporting micro SD cards up to 192Mbit/sec (24MByte/sec) in High-Speed SD mode 4-bit data transfer. The CPU can boot from this devices.

Extremely small size: Small external dimensions and the above-the-board height make the connectors the smallest on the market.

Card detection switch: The card detection switch is Normally Open

LAN

The core implements a triple speed 10/100/1000 Mbit/s Ethernet MAC compliant with the IEEE802.3-2002 standard. The MAC layer provides compatibility with half- or full-duplex 10/100 Mbit/s Ethernet LANs and full-duplex gigabit Ethernet LANs.

RGMII Gigabit Ethernet Phy

The KSZ9031RNX is a completely integrated triple-speed (10Base-T/100Base-TX/1000Base-T) Ethernet physical-layer transceiver for transmission and reception of data on standard CAT-5 unshielded twisted pair (UTP) cable.

The KSZ9031RNX provides the reduced gigabit media independent interface (RGMII) for direct connection to RGMII MACs in gigabit Ethernet processors and switches for data transfer at 10/100/1000Mbps.

The KSZ9031RNX reduces board cost and simplifies board layout by using on-chip termination resistors for the four differential pairs and by integrating an LDO controller to drive a low-cost MOSFET to supply the 1.2V core.

The KSZ9031RNX offers diagnostic features to facilitate system bring-up and debugging in production testing and in product deployment. Parametric NAND tree support enables fault detection between KSZ9031 I/Os and the board. The LinkMD® TDR-based cable diagnostic identifies faulty copper cabling. Remote and local loopback functions verify analog and digital data paths.

For more information about the Gigabit Ethernet devices see the following link

http://www.micrel.com/index.php/products/lan-solutions/phys/article/2.html

http://www.micrel.com/index.php/products/lan-solutions/phys/article/2-ksz9031rnx.html

Wifi

The TiWi-BLE integrated in Stella is a Bluetooth® and Wi-Fi module incorpoprating a high performance 2.4 GHz IEEE 802.11 b/g/n and Bluetooth® 2.1+EDR and Bluetooth® 4.0 (BLE) radio in a cost effective, pre-certified footprint.

The module realizes the necessary PHY/MAC layers to support WLAN applications in conjunction with a host processor over a SDIO interface.

The module also provides a Bluetooth® platform through the HCI transport layer. Both WLAN and Bluetooth® share the same antenna port.

For more information about this WiFi module see the following link

http://www.lsr.com/embedded-wireless-modules/wifi-plus-bluetooth-module/tiwi-ble

2.3 MULTIMEDIA

3D Graphic Acceleration

i.MX6 incorporates a graphics acceleration GPU 3D Vivante GC2000

- Core Clock in 28HPM (WC-125) 800MHz
- Shader Clock in 28HPM (WC-125) 1000MHz
- Shader Cores 4 (VEC-4) / 16 (Vec-1)
- Pixel Rate 1600(MPixel/sec, no overdraw)
- Shader GFLOPS High/Medium Precision 32
- GPGPU Option 1.1/1.2 Embedded Full

Features for the Quad and Dual Processors:

	iMX6Quad	iMX6Dual
Independent Image Processing Units	2	2
OpenGL® ES 2.0 (88M triangles/s, 1.066G pixel/s)	√	√
Number of OpenGL® Shaders	4	4
Dedicated OpenVG 1.1 accelerator	√	√
OpenVG 1.1	√	√
Windows Direct3D	√	√

16x Line Anti-aliasing	√	√
8K x 8K texture and 8K x 8K rendering target	√	√
Ultra-threaded, unified vertex and fragment shaders	√	√

Features for the Dual Lite and Solo Processors:

	i.MX 6 Dual Lite	iMX6Solo
Independent Image Processing Units	1	1
OpenGL® ES 2.0 (532 M pixel/s)	√	√
Number of OpenGL® Shaders	1	1
Dedicated OpenVG 1.1 accelerator		
OpenVG 1.1	√	√
Windows Direct3D	√	√
OpenCL EP		
16x Line Anti-aliasing	√	√
8K x 8K texture and 8K x 8K rendering target	√	√
Ultra-threaded, unified vertex and fragment shaders	√	√

Video Encore/Decore

HD Video Decode

Features for the Quad and Dual Processors:

MPEG-2 (Main, High Profile) – 1080p30, 720p60, (50Mbps)
MPEG4/XviD (Simple, Advanced Simple Profile) – 1080p30 (40Mbps)
H.263 (P0/P3) – 16CIF(1408x1152) 30fps (20Mbps)
H.264 (Constrained Baseline, Baseline, Main, High Profile) – 1080p30, 720p60, (50Mbps)
H.264-MVC (Baseline, Main, High Profile) – 720p60
VC1 (Simple, Main, Advanced Profile) – 1080p30 (45Mbps)
RV (8/9/10) – 1080p30 (40Mbps)
DivX (3/4/5/6) – 1080p30 (40Mbps)
On2 VP6/VP8 – 720p30 (20Mbps)
AVS Jizhun – 1080p30 (40Mbps)
MJPEG (Baseline) – 8192x8192 (120MPixel/s)

Features for the Dual Lite and Solo Processors:

MPEG-2 (Main, High Profile) – 1080p30, 720p60, (50Mbps)
MPEG4/XviD (Simple, Advanced Simple Profile) – 1080p30 (40Mbps)
H.263 (P0/P3) – 16CIF(1408x1152) 30fps (20Mbps)
H.264 (Constrained Baseline, Baseline, Main, High Profile) – 1080p30, 720p60, (50Mbps)
H.264-MVC (Baseline, Main, High Profile) – 720p60
VC1 (Simple, Main, Advanced Profile) – 1080p30 (45Mbps)
RV (8/9/10) – 1080p30 (40Mbps)
DivX (3/4/5/6) – 1080p30 (40Mbps)
On2 VP6/VP8 – 720p30 (20Mbps)
AVS Jizhun – 1080p30 (40Mbps)
MJPEG (Baseline) – 8192x8192 (120MPixel/s)

HD Video Encode

Features for the Quad and Dual Processors:
MPEG4 (Simple Profile) – 720p30 (12Mbps)
H.263 (P0/P3) – 4CIF(704x576) 30fps (8Mbps)
H.264 (Constrained Baseline, Baseline Profile) – 1080p30, (14Mbps)
MJPEG (Baseline) – 8192x8192 (160MPixel/s)

Features for the Dual Lite and Solo Processors:
MPEG4 (Simple Profile) – 720p30 (12Mbps)
H.263 (P0/P3) – 4CIF(704x576) 30fps (8Mbps)
H.264 (Constrained Baseline, Baseline Profile) – 1080p30, (14Mbps)
MJPEG (Baseline) – 8192x8192 (160MPixel/s)v

Type of interface	iMX6Quad	iMX6Dual	i.MX 6 Dual Lite	iMX6Solo
LCD RGB (24bit, 225 Mpixel/s)	1	1	1	1
LVDS (2x single channel 85 Mpxiel/s or 1x dual channel 165 Mpixel/s)	1	1	1	1
HDMI 1.4a (266Mpixel/s)	1	1	1	1
MIPI DSI	1x 2 Data Lanes*	1x 2 Data Lanes*		
Resistive Touch Screen	4 Wire	4 Wire	1	1
Analogue Audio Headphone out	1 (Stereo)	1 (Stereo)	1	1
Analogue Audio Line in	1 (Stereo)	1 (Stereo)	1	1
Analogue Audio Mic in	1 (Mono)	1 (Mono)	1	1
AC97/I2S/SSI	1+2*	1+2*	1	1
ESAI	1*	1*	1	1
S/PDIF	1 in / 1 out	1 in / 1 out	1	1
Parallel Camera Interface (through serdes)	1+1	1+1	1+1	1+1
MIPI CSI-2	1x 4 Data Lanes*	1x 4 Data Lanes*		

Type of interface	iMX6Quad	iMX6Dual	i.MX 6 Dual Lite	iMX6Solo
I2C	3	3	3	3
SPI	2+1*	2+1*	2+1*	2+1*
UART	4+1*	4+1*	4+1*	4+1*
SD/SDIO/MMC	2+1*	2+1*	2+1*	2+1*
GPIO	TBD	TBD	TBD	TBD
USB 2.0 OTG (host/device)	1	1	1	1
USB 2.0 host	2	2	2	2
PCIe (Gen 2.0)	1 Lane	1 Lane		
Serial ATA II (3Gbit/s)	1	1		
10/100/1000 MBit/s Ethernet	1 (IEEE 1588)	1 (IEEE 1588)	1 (IEEE 1588)	1 (IEEE 1588)
PWM	4	4	4	4
CAN	2	2	2	2
MLB	2*	2*	1	1

2.4 POWER SUPPLY

The board must be powered through the power connector, the supply must be 5V +/- 5% or 18-36V.

Absolute Maximum Rating

Power Supply	Min	Max	Unit
DC IN (5V power supply)	4.75	5.25	V
Main Power Supply, DC IN (when DCDC is present).	16	38	
Digital IOs: UARTs, LCD, MMC2, ISP, SPI, McBSP,I2C,GPMC, JTAG	-0.3	3.6	V
Analog IOs: AIN0-7	-0.3	3.6	V
RTC Power Supply	-0.3	3.6	

Table 1 Absolute Maximum Characteristics

Operational Characteristics

Power supplies

Power Supply	Min	Typical	Max	Unit
DC IN (5V power supply)	-5 %	5.0	+5%	V
Main Power Supply, DC IN (when DCDC is present).	18	24	36	V

Table 2 Power Supplies Operational Characteristics

Power Consumption

Power Supply	Min	Typical	Max	Unit
Main Power Supply, DC IN				
RTC backup battery current draw				

Table 3 Power Consumption

DC Electrical Characteristics

Parameter	Min	Typical	Max	Unit
Digital IOs: UARTs, LCD, MMC2, ISP, SPI, McBSP,I2C,GPMC,JTAG				
Analog IOs: AIN0-7				

Table 4 DC Electrical Characteristics

Environmental Specifications

	Min	Max
Commercial Operating Temperature Range	0	70° C
Extended Operating Temperature Range		
Industrial Operating Temperature Range	-40° C	+85° C

Table 5 Environmental specifications

I2C mapping

Information on I2C address assignments are provided below.

i.MX6 Function	i.MX6 I2C Port	Address
i.MX6 PMIC Control	BUS 2	0x08h
MIPI Control	BUS 2	TDB
HDMI DDC	BUS 2	TDB
Touch screen	BUS 2	0x4Bh
CSI2	BUS 2	TDB
RTC	BUS 1	0x51h
Audio Codec	BUS 1	0x18
Serdes	BUS 1	0x60 and 0x61
PCIe SMBus	BUS 3	TBD

Table 6 :I2C Bus Addresses

CONNECTORS PINOUT

Connector J1 Power SATA

- Part Number: Molex 0022272031 3 pins male

PIN	NAME	DESCRIPTION
1	+5V	5V power supply
2	+5V	5V power supply
3	GND	Board Ground

Connector J2 SD Channel

- Part Number: Hirose DM3AT 9 pins socket

PIN	NAME	DESCRIPTION
1	SD3_DATA2	SD DATA2
2	SD3_DATA3	SD DATA3
3	SD3_CMD	SD COMMAND
4	3V3	3,3V power supply
5	SD3_CLK	SD CLOCK
6	GND	Board Ground
7	SD3_DATA0	SD DATA0
8	SD3_DATA1	SD DATA1
9	SD3_CD_B	SD CARD DETECT

Connector J3 SATA Connector

- Part Number: Molex WM4059-ND 7 pins socket

PIN	NAME	DESCRIPTION
1	GND	Board Ground
2	SATA_TXP	SATA TX POSITIVE SIGNAL
3	SATA_TXN	SATA TX NEGATIVE SIGNAL
4	GND	Board Ground
5	SATA_RXP	SATA RX POSITIVE SIGNAL
6	SATA_RXN	SATA RX NEGATIVE SIGNAL
7	GND	Board Ground

Connector J4 SD Channel 2

- Part Number: Hirose DM3AT 9 pins socket

PIN	NAME	DESCRIPTION
1	SD2_2DATA2	SD DATA2
2	SD2_DATA3	SD DATA3
3	SD2_CMD	SD COMMAND
4	3V3	3,3V power supply
5	SD2_CLK	SD CLOK
6	GND	Board Ground
7	SD2_DATA0	SD DATA0
8	SD2_DATA1	SD DATA1
9	SD2_CD_B	SD CARD DETECT

Connector J8 RESISTIVE TOUCH CONNECTOR

- Part Number: MOLEX 52207-0485 4 pins socket

PIN	NAME	DESCRIPTION
1	Top	TOP SIGNAL
2	RIGHT	RIGHT SIGNAL
3	BOTTOM	BOTTOM SIGNAL
4	LEFT	LEFT SIGNAL

Connector J9 PROXIMITY SENSOR

- Part Number: Conec 43-01203 5 pins female

PIN	NAME	DESCRIPTION
1	NC	NOT CONNECTED
2	+24V_PROX	24V POWER
3	0V_PROX	0V PROX SIGNAL
4	PROX_AN	PROXIMITY ANODE
5	PROX_CAT	PROXIMITY CATHODE

- Part Number: Conec 43-01203 5 pins female

PIN	NAME	DESCRIPTION
1	ENC_2	ENCODER 2 SIGNAL
2	+24V_PROX	RIGHT SIGNAL
3	0V_PROX	0V PROX SIGNAL
4	PROX_AN	PROXIMITY ANODE
5	PROX_CAT	PROXIMITY CATHODE

Connector J12 OPTIONAL EXTENTION

- NOT USED

Connector J15 GIGABIT ETHERNET

- CONN MAGJACK RJ45 1PORT 1000 BASE-T GL, YL
- LED GREEN ACTIVITY
- LED YELLOW LINK

Connector J24 Mini-Pcle

- Mini-Pcle 2X26 MINI PCI EXPRESSE
- Part Number: Molex 679100002 52 pins SOCKET

PIN	NAME	DESCRIPTION
1	PCIE_WAKE_B	PCIE WAKE SIGNAL
2	3V3	3,3V POWER SUPPY
3	NC	NOT CONNECTED
4	GND	GROUND SIGNAL
5	NC	NOT CONNECTED
6	1V5	1,5V POWER SUPPLY
7	NC	NOT CONNECTED
8	NC	NOT CONNECTED
9	GND	GROUND SIGNAL
10	PCIE_WAKE_B	PCIE WAKE SIGNAL
11	PCIe_CREFCLKM	PCIE NEGATIVE REFERENCE CLOCK
12	NC	NOT CONNECTED
13	PCIe_CREFCLKP	PCIE NEGATIVE REFERENCE CLOCK
14	NC	NOT CONNECTED

16	NC	NOT CONNECTED
17	NC	NOT CONNECTED
18	GND	GROUND SIGNAL
19	NC	NOT CONNECTED
20	PCIE_DIS_B	PCIE DISABLE SIGNAL
21	GND	GROUND SIGNAL
22	PCIE_RST_B	PCIE RESET SIGNAL
23	PCIe_CRXM	PCIE NEGATIVE RECEIVE SIGNAL
24	3V3	3,3V POWER SUPPLY
25	PCIe_CRXP	PCIE POSITIVE RECEIVE SIGNAL
26	GND	GROUND SIGNAL
27	GND	GROUND SIGNAL
28	1V5	1,5V POWER SUPPLY
29	GND	GROUND SIGNAL
30	PCIe_SMB_CLK	PCIE SM BUS CLOCK
31	PCIe_CTXM	PCIE NEGATIVE TRASMIT SIGNAL
32	PCIe_SMB_DATA	PCIE SM BUS DATA
33	PCIe_CTXP	PCIE POSITIVE TRASMIT SIGNAL
34	GND	GROUND SIGNAL
35	GND	GROUND SIGNAL
36	PCIE_USB_DM	PCIE USB NEGATIVE DATA
37	GND	GROUND SIGNAL
38	PCIE_USB_DP	PCIE POSITIVE DATA
39	3V3	3,3V POWER SUPPLY
40	GND	GROUND SIGNAL
41	3V3	3,3VPOWER SUPPLY
42	LED_WWAN_B	WIRELESS WIDE AREA NETWORK LED
43	GND	GROUND SIGNAL
44	LED_WLAN_B	WIRWLESS LAN NETWORK LED
45	NC	NOT CONNECTED
46	LED_WPAN_B	BLUETOOTH LED
47	NC	NOT CONNECTED
48	1V5	1,5V POWERSUPPLY
49	NC	NOT CONNECTED
50	GND	GROUND SIGNAL
51	NC	NOT CONNECTED
52	3V3	3,3V POWER SUPPLY

- Part Number: Molex 501190-2017 20 pins SOCKET

PIN	NAME	DESCRIPTION
1	NC	NOT CONNECTED
2	3V3	3,3V POWER SUPPLY
3	NC	NOT CONNECTED
4	3V3	3,3V POWER SUPPLY
5	NC	NOT CONNECTED
6	5V	5V POWER SUPPLY
7	JTAG_nSRST	SISTEM RESET
8	5V	5V POWER SUPPLY
9	JTAG_TDI	JTAG DATA IN
10	PCIE_WAKE_B	PCIE WAKE SIGNAL
11	JTAG_TDO	JTAG DATA OUT
12	NC	NOT CONNECTED
13	JTAG_RTCK	JTAG RTCK
14	NC	NOT CONNECTED
15	JTAG_TCK	JTAG CLOCK
16	JTAG_nTRST	JTAG RESET
17	JTAG_DE	JTAG DATA ENABLE
18	JTAG_TMS	JTAG TEST MODE
19	JTAG_DACK	JTAG DATA ACKNOWLEDGE
20	GND	GROUND SIGNAL

Connector J30 Camera Link and MIPI Input

- STRIP_20x2 PICH 2mm
- Part Number: SAMTEC ST-MV-SMD-P2-20X2-TMMH STRIP_20x2 MALE

PIN	NAME	DESCRIPTION
1	3V3	3,3V POWER SUPPLY
2	1V8	1,8V POWER SUPPLY
3	3V3	3,3V POWER SUPPLY
4	1V8	1,8V POWER SUPPLY
5	GND	GROUND SIGNAL
6	GND	GROUND SIGNAL
7	2V8	2,8V POWER SUPPLY
8	GND	GROUND SIGNAL
9	2V5	2,5V POWER SUPPLY
10	CSI_D1P	CSI POSITIVE SERIAL DATA 1
11	1V5	1,5V POWER SUPPLY
12	CSI_D1M	CSI NEGATIVE SERIAL DATA 1
13	GPIO_0_CLKO	CMOS 3V3 CLOCK SIGNAL FROM PROCESSOR
14	GND	GROUND SIGNAL
15	CSI_GPIO7_11	CPU GPIO7_11
16	CSI_CLK0P	CSI POSITIVE SERIAL CLOCK
17	CSI_MCLK	CMOS 1V8 CLOCK SIGNAL FROM PROCESSOR
18	CSI_CLK0M	CSI NEGATIVE SERIAL CLOCK
19	GND	GROUND SIGNAL
20	GND	GROUND SIGNAL
21	CSI_RST_B	CSI RESET SIGNAL
22	CSI_D0P	CSI POSITIVE SERIAL DATA 0
23	CSI_GPIO3_28	PROCESSOR GPIO3_28
24	CSI_D0M	CSI NEGATIVE SERIAL DATA 0
25	GND	GROUND SIGNAL
26	GND	GROUND SIGNAL
27	NC	NOT CONNECTED
28	CSI_D2M	CSI NEGATIVE SERIAL DATA 2
29	NC	NOT CONNECTED
30	CSI_D2P	CSI POSITIVE SERIAL DATA 2
31	GND	GROUND SIGNAL

33	CSI2_SDA	CSI I2C DATA (BUS 2)
34	CSI_D3M	CSI NEGATIVE SERIAL DATA 3
35	SCI2_SCL	CSI I2C CLOCK (BUS 2)
36	CSI_D3P	CSI POSITIVE SERIAL DATA 3
37	GND	GROUND SIGNAL
38	GND	GROUND SIGNAL
39	GND	GROUND SIGNAL
40	GND	GROUND SIGNAL

Connector J31 MIPI Display Output

- STRIP_8x2 PITCH 2mm
- Part Number: SAMTEC TMMH-108-01-L-DV STRIP_08x2 MALE

PIN	NAME	DESCRIPTION
1	MIPI_I2C_SCL	MIPI I2C CLOCK (BUS 2)
2	DSI_D0M	DSI NEGATIVE DATA 0
3	MIPI_I2C_SDA	MIPI I2C CLOCK (BUS 2)
4	DSI_D0P	DSI POSITIVE DATA 0
5	GND	GROUND SIGNAL
6	GND	GROUND SIGNAL
7	DISP_RST_B	DISPLAY RESET SIGNAL
8	DSI_D1M	DSI NEGATIVE DATA 1
9	DISP_PWR_EN	DISPLAY POWER SUPPLY ENABLE
10	DSI_D1P	DSI POSITIVE DATA 1
11	GPIO_0_CLKO	AUX CLOCK SIGNAL
12	GND	GROUND SIGNAL
13	GND	GROUND SIGNAL
14	DSI_CLK0M	DSI NEGATIVE CLOCK
15	3V3	3,3V POWER SUPPLY
16	DSI_CLK0P	DSI NEGATIVE CLOCK

Connector J32 Spare GPIOs

- STRIP_20x2 PITCH 2mm
- Part Number: SAMTEC ST-MV-SMD-P2-20X2-TMMH STRIP_20x2 MALE

PIN	NAME	DESCRIPTION
1	1V8	1,8V POWER SUPPLY
2	CSPI2_MISO	1,8V POWER SUPPLY
3	1V8	1,8V POWER SUPPLY
4	CSPI2_CLK	1,8V POWER SUPPLY
5	GPIO4_IO16	GROUND SIGNAL
6	CSPI2_MOSI	GROUND SIGNAL
7	GPIO6_IO15	2,8V POWER SUPPLY
8	CSPI2_MOSI	GROUND SIGNAL
9	GPIO6_IO16	2,5V POWER SUPPLY
10	GPIO6_IO16	CSI POSITIVE SERIAL DATA 1
11	GPIO2_IO08	1,5V POWER SUPPLY
12	3V3	3,3V POWER SUPPLY
13	GPIO2_IO11	CMOS 3V3 CLOCK SIGNAL FROM PROCESSOR
14	GPIO2_IO10	GROUND SIGNAL
15	GPIO2_IO14	CPU GPIO7_11
16	GPIO2_IO13	CSI POSITIVE SERIAL CLOCK
17	GPIO2_IO28	CMOS 1V8 CLOCK SIGNAL FROM PROCESSOR
18	GPIO2_IO22	CSI NEGATIVE SERIAL CLOCK
19	GPIO2_IO29	GROUND SIGNAL
20	GPIO2_IO30	GROUND SIGNAL
21	GPIO3_IO00	CSI RESET SIGNAL
22	GPIO3_IO01	CSI POSITIVE SERIAL DATA 0
23	GPIO3_IO02	PROCESSOR GPIO3_28
24	GPIO3_IO04	CSI NEGATIVE SERIAL DATA 0
25	GPIO3_IO05	GROUND SIGNAL
26	GPIO3_IO06	GROUND SIGNAL
27	GPIO3_IO07	CPU GPIO3_IO20
28	GPIO3_IO08	CPU GPIO3_IO20
29	GPIO3_IO09	CPU GPIO3_IO09
30	GPIO3_IO10	CPU GPIO3_IO10
31	GPIO3_IO11	CPU GPIO3_IO11

33	GPIO3_IO20	CPU GPIO3_IO20
34	GPIO3_IO27	CPU GPIO3_IO27
35	GPIO5_IO00	CPU GPIO5_IO00
36	GPIO6_IO31	CPU GPIO6_IO31
37	EXTERNAL_SDA	EXTERNAL I2C DATA (BUS 1)
38	EXTERNAL_SCL	EXTERNAL I2C CLOCK (BUS 1)
39	GND	GROUND SIGNAL
40	GND	GROUND SIGNAL

Connector J38 on/off board

- Part Number: JST B2B-XH-A (LF)(SN)(P) 2 pins male

PIN	NAME	DESCRIPTION
1	GND	BOARD GROUND
2	ON/OFF	ON/OFF SIGNAL

Connector J41 USB CONNECTOR

- Part Number: MOLEX 72309-8034BLF USB STANDARD

Connector J42 USB OTG

- *Part Number: MOLEX 67803-8020 MINI USB OTG STANDARD*

Connector J47 USB SERIAL

- *Part Number: MOLEX 67803-8020 MINI USB OTG STANDARD*
- *LINUX SERIAL CONSOLE*

Connector J48 SELECT CAN1 TERMINATION

- *Part Number: SAMTEC TLW-102-06-T-S 2 pins male*

PIN	NAME	DESCRIPTION
1	GND	BOARD GROUND
2	SELECT	ON TERMINATION ENABLE

Connector J53 CAMERA DESERIALIZER B

- *Part Number: WURTH 634008137521 RJ45 WLEDS*

PIN	NAME	DESCRIPTION
1	24V	24V TO SENSOR
2	24V	24V TO SENSOR
3	RIN1+A	SERIAL CHANNEL A
4	RIN1-A	SERIALCHANNEL A
5	RIN1+B	SERIAL CHANNEL B
6	RIN1-B	SERIAL CHANNEL B
7	GND	BOARD GROUND
8	GND	ON/OFF SIGNAL
	LED YELLOW	LOCK SERDES
	LED GREEN	LINK SERDES

Connector J54 FLASH

- *Part Number: SAMTEC TSW-105-24-T-S 5 pins male*

PIN	NAME	DESCRIPTION
1	FLASH_EXT	ON TERMINATION ENABLE
2	24V	ON TERMINATION ENABLE
3	GND	Board Ground
4	NC	NOT CONNECTED
5	NC	NOT CONNECTED

Connector J55 CAMERA DESERIALIZER A

- *Part Number: WURTH 634008137521 RJ45 WLEDS*

PIN	NAME	DESCRIPTION
1	24V	24V TO SENSOR
2	24V	24V TO SENSOR
3	RIN1+A	SERIAL CHANNEL A
4	RIN1-A	SERIAL CHANNEL A
5	RIN1+B	SERIAL CHANNEL B
6	RIN1-B	SERIAL CHANNEL B
7	GND	Board Ground
8	GND	ON/OFF SIGNAL
	LED YELLOW	LOCK SERDES
	LED GRREN	LINK SERDES

J58 POWER INPUT

- *Part Number: CONEC 43-01211 5 M12 PIN MALE*

PIN	NAME	DESCRIPTION
1	GND_EMI	EARTH
2	VIN	18 - 36 INPUT VOLTAGE
3	VIN	18 - 36 INPUT VOLTAGE
4	GND_NF	GROUND NOT FILTERED
5	GND_NF	GROUND NOT FILTERED

J59 SELECT CAN2 TERMINATION

- *Part Number: SAMTEC TLW-102-06-T-S 2 pins male*

PIN	NAME	DESCRIPTION
1	GND	Board Ground
2	SELECT	ON TERMINATION ENABLE

Connector J60 LVDS0

- *Part Number: MOLEX 53780-2070 20 PIN PASSO 1.25mm*

PIN	NAME	DESCRIPTION
1	5V	5V POWER SUPPLY
2	5V	5V POWER SUPPLY
3	GND	Board Ground
4	GND	Board Ground
5	PWM0	BACKLIGHT PWM0 DIMMING
6	3V3	3,3V POWER SUPPLY
7	LVDS0_TX3_P	LVDS0 POSITIVE CH3
8	LVDS0_TX3_N	LVDS0 NEGATIVE CH3
9	GND	Board Ground
10	LVDS0_CLK_P	LVDS1 POSITIVE CLOCK
11	LVDS0_CLK_N	LVDS0 NEGATIVE CLOCK
12	GND	Board Ground
13	LVDS0_TX2_P	LVDS0 POSITIVE CH2
14	LVDS0_TX2_N	LVDS0 NEGATIVE CH2
15	GND	Board Ground
16	LVDS0_TX1_P	LVDS0 POSITIVE CH1
17	LVDS0_TX1_N	LVDS0 POSITIVE CH1
18	GND	Board Ground
19	LVDS0_TX0_P	LVDS0 POSITIVE CH0
20	LVDS0_TX0_N	LVDS0 NEGATIVE CH0

Connector J61 LVDS1

- *Part Number: MOLEX 53780-2070 20 PIN PASSO 1.25mm*

PIN	NAME	DESCRIPTION
1	5V	5V POWER SUPPLY
2	5V	5V POWER SUPPLY
3	GND	Board Ground
4	GND	Board Ground
5	PWM0	BACKLIGHT PWM0 DIMMING
6	3V3	3,3V POWER SUPPLY
7	LVDS0_TX3_P	LVDS0 POSITIVE CH3
8	LVDS0_TX3_N	LVDS0 NEGATIVE CH3
9	GND	Board Ground
10	LVDS0_CLK_P	LVDS1 POSITIVE CLOCK
11	LVDS0_CLK_N	LVDS0 NEGATIVE CLOCK
12	GND	Board Ground
13	LVDS0_TX2_P	LVDS0 POSITIVE CH2
14	LVDS0_TX2_N	LVDS0 NEGATIVE CH2
15	GND	Board Ground
16	LVDS0_TX1_P	LVDS0 POSITIVE CH1
17	LVDS0_TX1_N	LVDS0 POSITIVE CH1
18	GND	Board Ground
19	LVDS0_TX0_P	LVDS0 POSITIVE CH0
20	LVDS0_TX0_N	LVDS0 NEGATIVE CH0

J62 RS232 Serial port

- Uart 2,3
- *Part Number: STRIP MASC.2x3P MSD.p=2,54mm*

PIN	NAME	DESCRIPTION
1	UART2_TX	EARTH
2	UART3_TX	18 - 36 INPUT VOLTAGE
3	UART2_RX	18 - 36 INPUT VOLTAGE
4	UART3_RX	GROUND NOT FILTERED
5	GND	BOARD GROUND
6	GND	BOARD GROUND

Connector J63 USB

- *Part Number: FCI 10029449-111RLF HDMI STANDARD*

Connector J64 LiPol Battery

- LINTIUM POLIMER BATTERY CONNECTOR.
- *Part Number: MOLEX 53398-0371*

PIN	NAME	DESCRIPTION
1	BATT +	BATT POSITIVE VOLTAGE
2	NTC	NTC INPUT
3	GND	BOARD GND

J65 Isolated CAN Bus Port 1

- *Part Number: CONEC 43-01203 5-PIN FEMALE CIRCULAR CONN*

PIN	NAME	DESCRIPTION
1	SHIELD	SHIELD CONNECTION
2	24V	24V POWER OUTPUT
3	GND	BOARD GND
4	CANH_1	CANH CHANNEL 1 SIGNAL
5	CANL_1	CANL CHANNEL 1 SIGNAL

J66 Isolated CAN Bus Port 2

- *Part Number: SAMTEC TSW-105-24-T-S 5-PIN MALE 1X5 P=2,54mm*

PIN	NAME	DESCRIPTION
1	SHIELD	SHIELD CONNECTION
2	24V	24V POWER OUTPUT
3	GND	BOARD GND
4	CANH_1	CANH CHANNEL 1 SIGNAL
5	CANL_1	CANL CHANNEL 1 SIGNAL

Connector J67 AUDIO IN

- *Part Number: JST B4B-PH-SM4-TB(LF)(SN) 4 PIN SMD*

PIN	NAME	DESCRIPTION
1	MIC_MAINP_IN	MICROPHONE IN POSITIVE SIGNAL
2	MIC_MAINM_IN	MICROPHONE IN POSITIVE SIGNAL
3	LINE1_RP	LINE IN SIGNAL
4	GND	BOARD GND

- *Part Number: JST B4B-PH-SM4-TB(LF)(SN) 4 PIN SMD*

PIN	NAME	DESCRIPTION
1	LEFT_OUT_P	SPEAKER OUT LEFT POSITIVE
2	LEFT_OUT_N	SPEAKER OUT LEFT NEGATIVE
3	RIGHT_OUT_P	SPEAKER OUT RIGHT POSITIVE
4	RIGHT_OUT_N	SPEAKER OUT RIGHT NEGATIVE

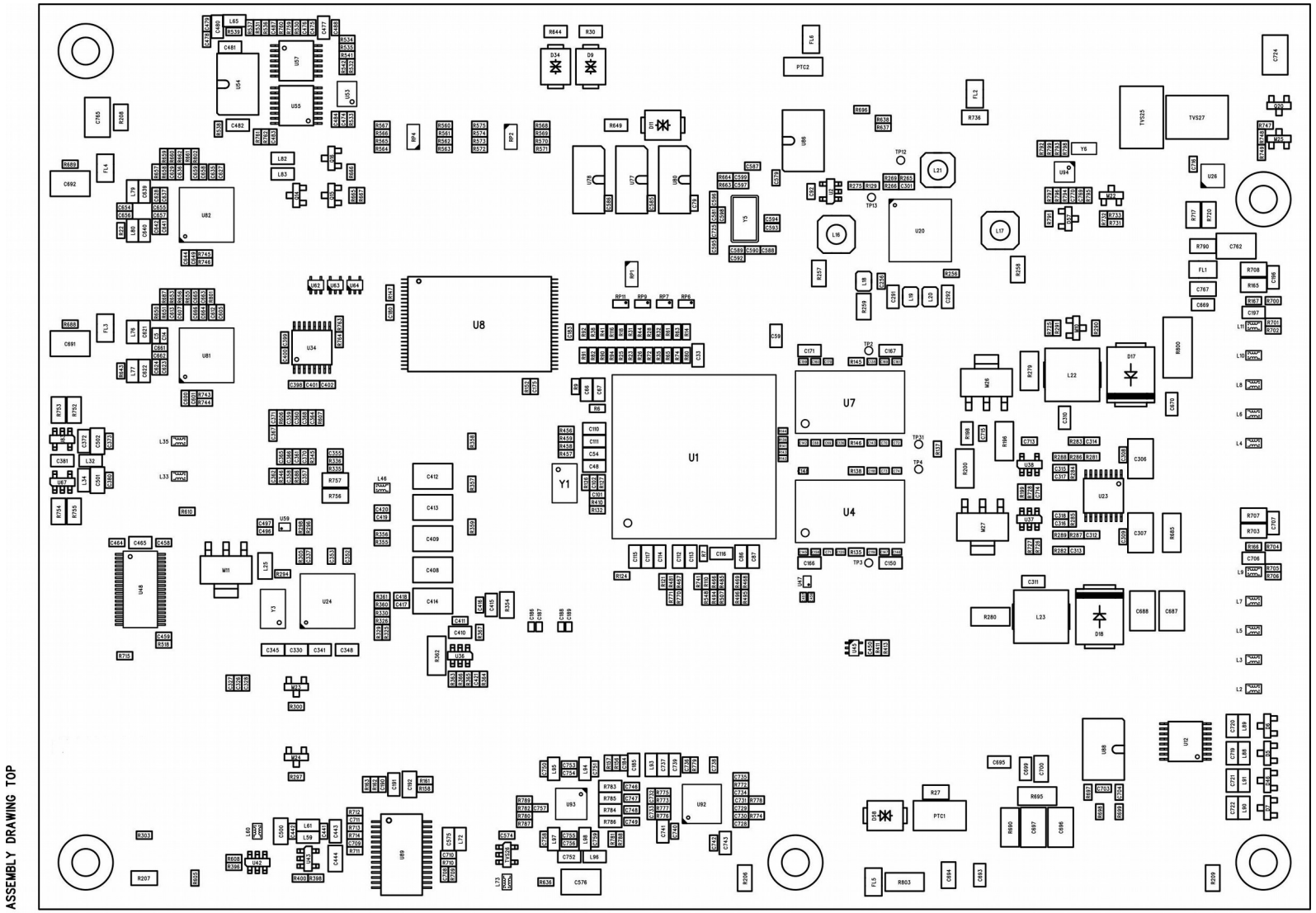
Boot modes

The boot mode for the stella Board can be chosen configuring the SW3 and SW4 dip switches. The Main peripherals where stella can boot are:

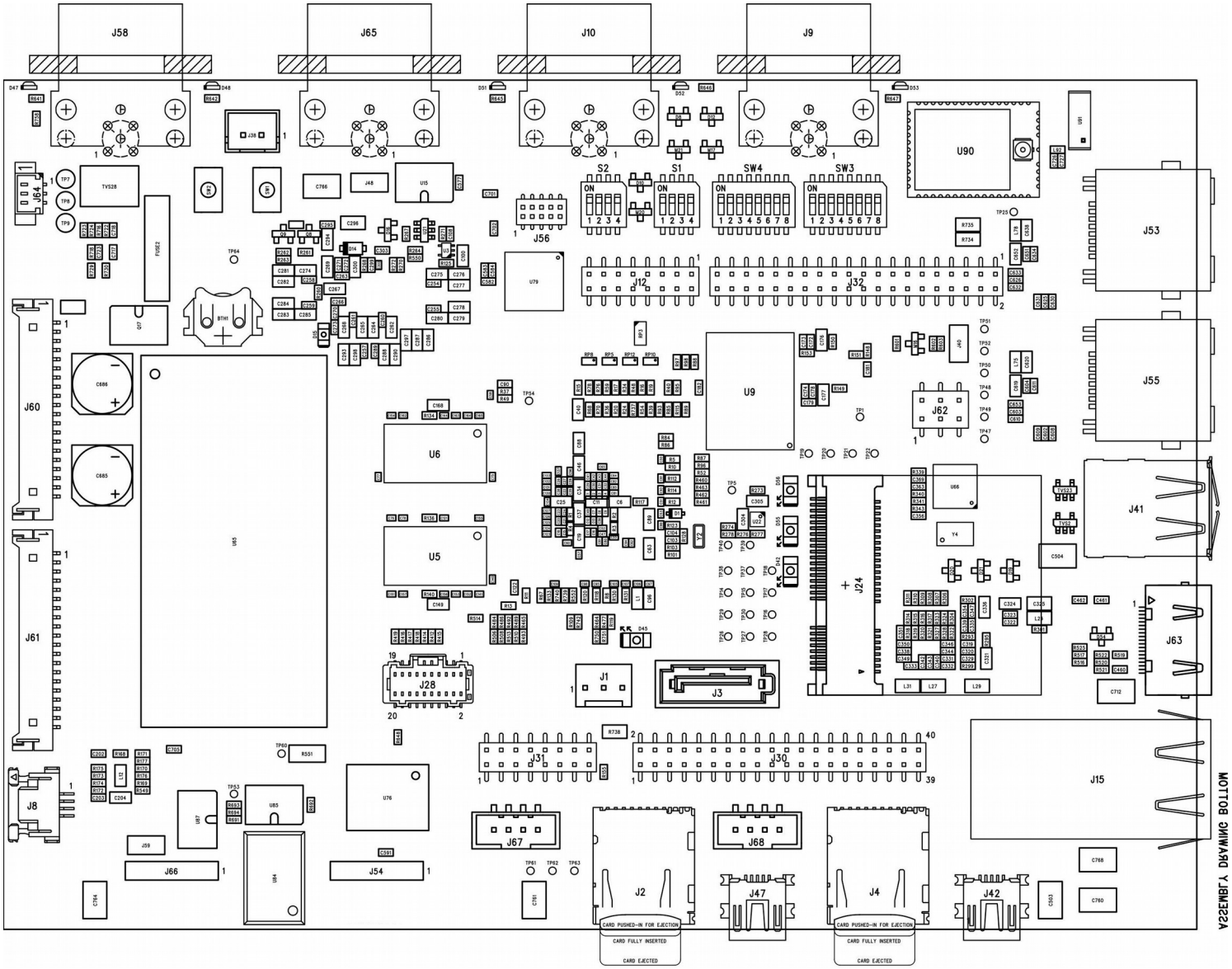
1. SD2 channel J4 connector
2. SD3 channel J2 connector
3. eMMC 8 bit
4. Nand Flash.
5. SATA

BOOT PER	SW3 1	SW3 2	SW3 3	SW3 4	SW3 5	SW3 6	SW3 7	SW3 8	SW4 1	SW4 2	SW4 3	SW4 4	SW4 5	SW4 6	SW4 7	SW4 8
SD2	OFF	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
SD3	OFF	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
eMMC 8Bit	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
Nand	ON	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF
SATA	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

BOARD LAYOUT TOP SIDE



BOARD LAYOUT BOTTOM SIDE



Rohs compliance

The Stella Board comply with the European Union’s Directive 2002/95/EC: "Restrictions of Hazardous Substances".

Warranty Terms

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