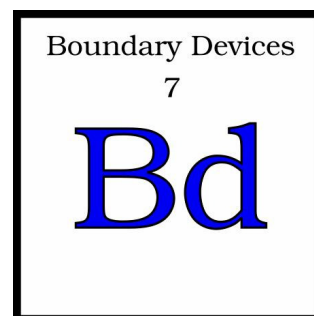


# SABRE Lite Hardware User Manual

## Revision History

| Date       | Revision | Description                        |
|------------|----------|------------------------------------|
| 10-27-2011 | 1.0      | First Draft                        |
| 11-07-2011 | 1.1      | Updated Section 2/Modified Picture |



# 1 Contents

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## 2 Overview

Freestyle and Boundary Devices are excited to announce the availability of the i.MX6x SABRE Lite Board, a low-cost development platform featuring the powerful i.MX 6Quad Application Processor. The hardware specifications for the Sabre Lite board are the following:

- Quad-Core ARM® Cortex A9 processor at 1GHz per core
- 1GByte of 64-bit wide DDR3 @ 532MHz
- Three display ports (RGB, LVDS, and HDMI 1.4a)
- 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) at 3Gbps
- Dual SD 3.0/SDXC card slots
- PCIe port (1 lane)
- Analog (headphone/mic) and Digital (HDMI) audio
- 10/100/Gb Ethernet
- 10-pin JTAG interface
- 3 High speed USB ports (2xHost, 1xOTG)
- 1xCAN2 port
- I2C
- General Purpose I/O for Device Control

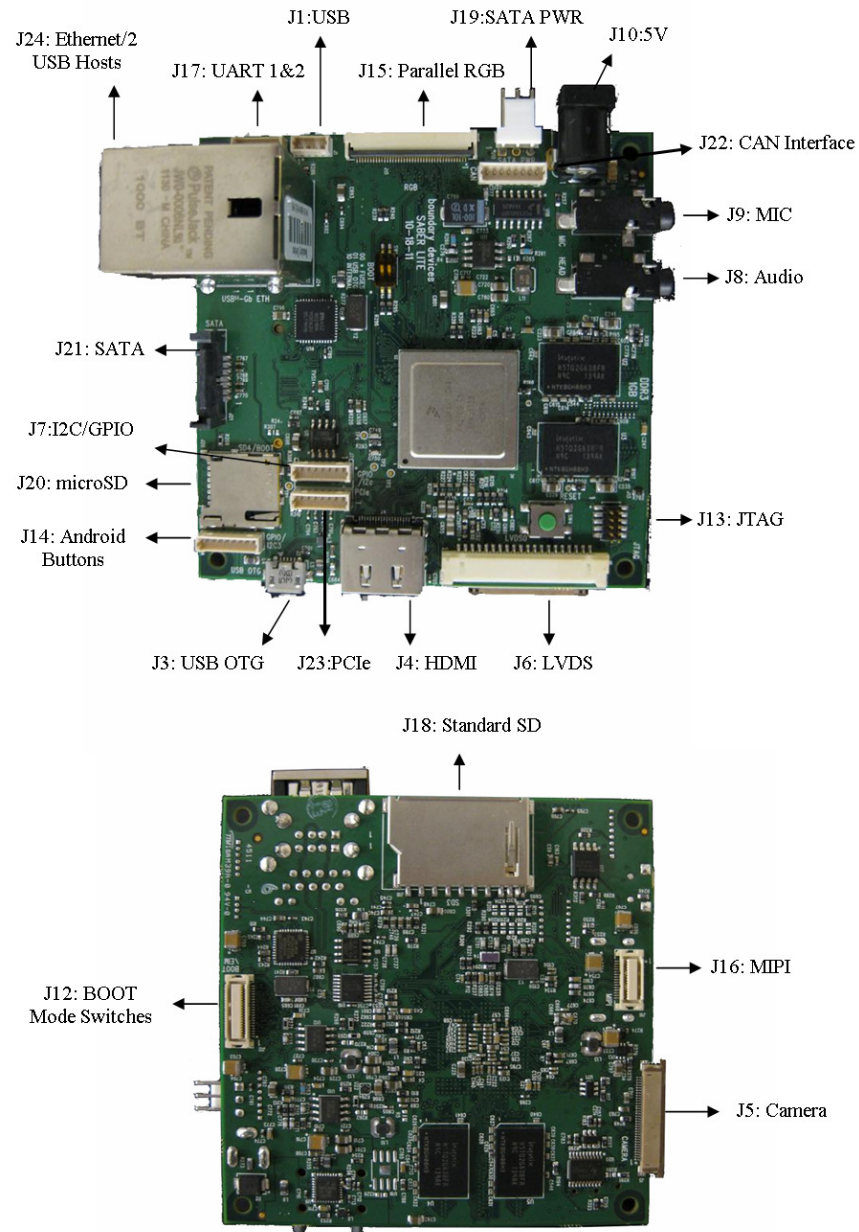
## 3 Electrical Characteristics

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

Figure 1 shows the details of each connector.



## 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 (DVI Signals)         |
| J8             | Headphone Jack             |
| J9             | Mic IN                     |
| J10            | DC Power Jack              |
| J18            | Standard SD Slot           |
| J20            | microSD Slot               |
| J21            | SATA                       |
| J24            | 10/100 Ethernet/2xUSB Host |

## 4.2 Custom Connectors

The SABRE Lite 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    | TX0_N          |
| 6    | TX0_P          |
| 7    | GND            |
| 8    | TX1_N          |
| 9    | TX1_P          |
| 10   | GND            |
| 11   | TX2_N          |
| 12   | TX2_P          |
| 13   | GND            |
| 14   | CLK_N          |
| 15   | CLK_P          |
| 16   | GND            |
| 17   | TX3_N          |
| 18   | TX3_P          |
| 19   | DISP0_CONTRAST |
| 20   | PWM4           |

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

| Pin# | Function |
|------|----------|
| 1    | +5V      |

|   |          |
|---|----------|
| 2 | +5V      |
| 3 | +5V      |
| 4 | GPIO9    |
| 5 | I2C3_SDA |
| 6 | I2C3_SCL |
| 7 | GND      |

#### **J12: Boot Mode Switches (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   | DSI_D1M  |
| 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 (FCI 20021121-00010T4LF)**

| 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    | DISP0_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 52991-0408)**

| 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   | NANDE_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)**

| 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      |

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

| Pin# | Function |
|------|----------|
| 1    | CANH     |
| 2    | GND      |
| 3    | CANL     |

**J23: PCIe (Molex 53047-0710)**

| Pin# | Function |
|------|----------|
| 1    | +3.3V    |
| 2    | PCIE_RXM |
| 3    | PCIE_RXP |
| 4    | PCIE_TXM |
| 5    | PCIE_TXP |
| 6    | GND      |
| 7    | GND      |

## 5 Mounting

The overall dimensions of the SABRE Lite board are 3.25"x3.25"

