96Boards TV Platform

Version 1.0, August 2016

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For further information contact: 96Boards@linaro.org

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For further information contact: yangz@linaro.org

Background

The 96Boards TV Platform is a hardware specification addressing the requirements from the Linaro Digital Home Group (LHG), based on the common baseline for multiple segment groups known as the 96Boards Enterprise Edition (EE) Specification.
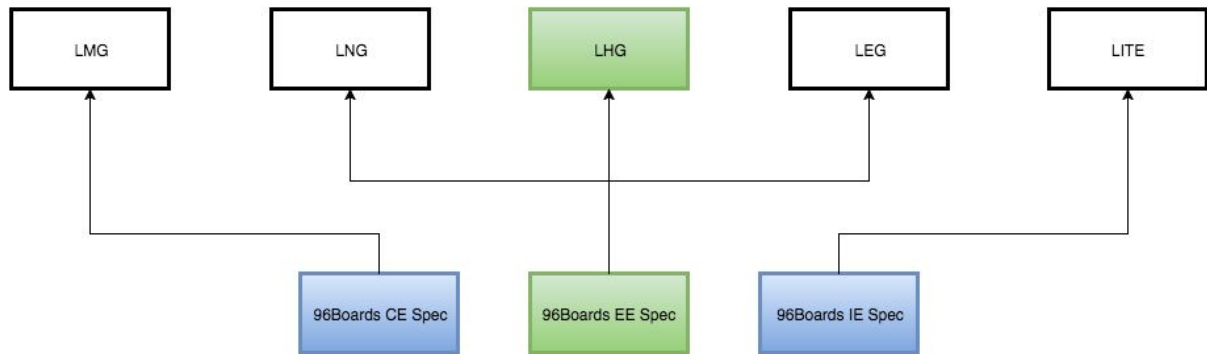
The specification describes requirements and recommendations for a 96Boards Compliant hardware to be used for Digital Home applications including Digital TV and Set Top Boxes.

96Boards TV Platform

Hardware

The TV Platform version **shall** implement the Standard EE footprint version (160 x 120mm)

DRAM

It is **recommended** that a minimum of 2GB of DRAM is provided for boards that support UHD video. SO-DIMM sockets **may** be implemented but are not recommended.

Flash Storage

A minimum of 8GB of flash storage **shall** be provided on the TV version. It is expected that this will be implemented as eMMC memory.

It is **recommended** that this storage is separate from the 96Boards EE Boot ROM requirement. However, the designer **may** use the eMMC for boot ROM and flash storage subject to SoC support.

WiFi/Bluetooth LE

WiFi **shall** be provided on the TV version. The minimum implementation **shall** be 802.11 g/n at 2.4GHz. It is **recommended** that 802.11ac is also supported.
Bluetooth **may** be provided. If provided, Bluetooth 4.0 Low Energy **shall** be the minimum supported version.

Display

Output

A minimum of one HDMI output interface **shall** be provided on a full size (Type A) connector at the location specified in this specification.

The minimum support **shall** be HDMI 1.4 with HDCP 2.0. For high end 4K/UHD implementations HDMI 2.0 and HDCP 2.2 or higher is **recommended**.

Audio shall be provided in at least the minimum format required for the HDMI version used.

Input

One or more HDMI input interfaces **may** be provided. If HDMI inputs are provided the same specifications apply as for Output HDMI above.

Other

Additional video connectivity **may** be offered (composite/CVBS, S-Video, YCbCr, Component, VGA etc.)

Ethernet

The on-board RJ45 port **shall** be implemented as a system Ethernet port.
It is **recommended** that this port shall operate at a minimum speed of 100Mbit/sec.

Audio

HDMI audio **shall** be supported as specified above.
Additional audio facilities such as stereo I/O jack and S/PDIF **may** be provided at the designer's option.

LEDs

A WiFi activity LED **shall** be placed at the location specified in this specification.
The LED **shall** be 0603 SMD Yellow.

If Bluetooth is supported then a Bluetooth activity LED **shall** be placed at the location specified in this specification. The LED **shall** be 0603 SMD Blue.

Low Speed Expansion Connector

A 96Boards low speed expansion connector **shall** be implemented in the specified location on the Standard EE version. A 40 pin low profile female 2mm receptacle (20x2) 4.5mm height is specified. The mating connector will provide a board to board separation of at least 7mm.

We re-use the CE LS connector with the benefits: compatibility with CE, EE and other specification mezzanines.

Additional Functionality

Boards that comply to the 96Boards TV Platform specification may provide additional functions provided that all mandatory functionality is available. For instance, User Input and Security Interface are two example optional features that can be added by the designer.

User Input

An Infrared (IR) detector **may** be provided. If implemented the detector **shall** be placed at the location specified in this specification.

Security Interface

A SmartCard interface that is ISO/IEC 7816 compliant **may** be provided on the board. If it is provided it is **recommended** that it be placed in the location specified on the drawing below. Alternatively, SmartCard feature **may** be implemented as an off-board module via an onboard 12 pin connector (2.0mm pitch). If present, this **shall** be implemented at the same location as the on-board SmartCard.

Tuner Interface

A Tuner interface may be **provided** as optional feature. If present, one of the below two

options for connectors are **recommended** at the **specified** location of the board:

- 24-pin (12x2) for Single Parallel or Dual Serial Transport Stream (TS)

OR

- 42-pin (21x2) for Dual Parallel TS or four Serial Transport Stream (TS)

Variances from 96Boards Enterprise Edition Specification

Given the specific requirements of the TV Platform version of the 96Boards community board the following variances to the 96Boards EE specification are permitted for a TV platform version:

Power Connection

The EE specification provides for a low cost external 12V 8A power supply using a standard barrel jack for boards that consume up to 90W of power. It also requires a high power standard 4 pin DIN connector to supply up to 180W of power for enterprise SoCs. Board designers who implement the PCIe interface should be aware that a PCIe card can draw up to 25W of power.

At the board designer's discretion a TV platform version **may** omit the high power 4 pin DIN connector if the board design is such that a maximum of 90W will be drawn from the barrel jack connector. The barrel jack connector **shall** always be implemented.

Boot ROM

The EE specification requires a minimum of 64MB of bootable flash memory to be implemented. The TV Platform specification requires a minimum of 8GB of flash storage. If this storage is bootable then the EE specification is met.
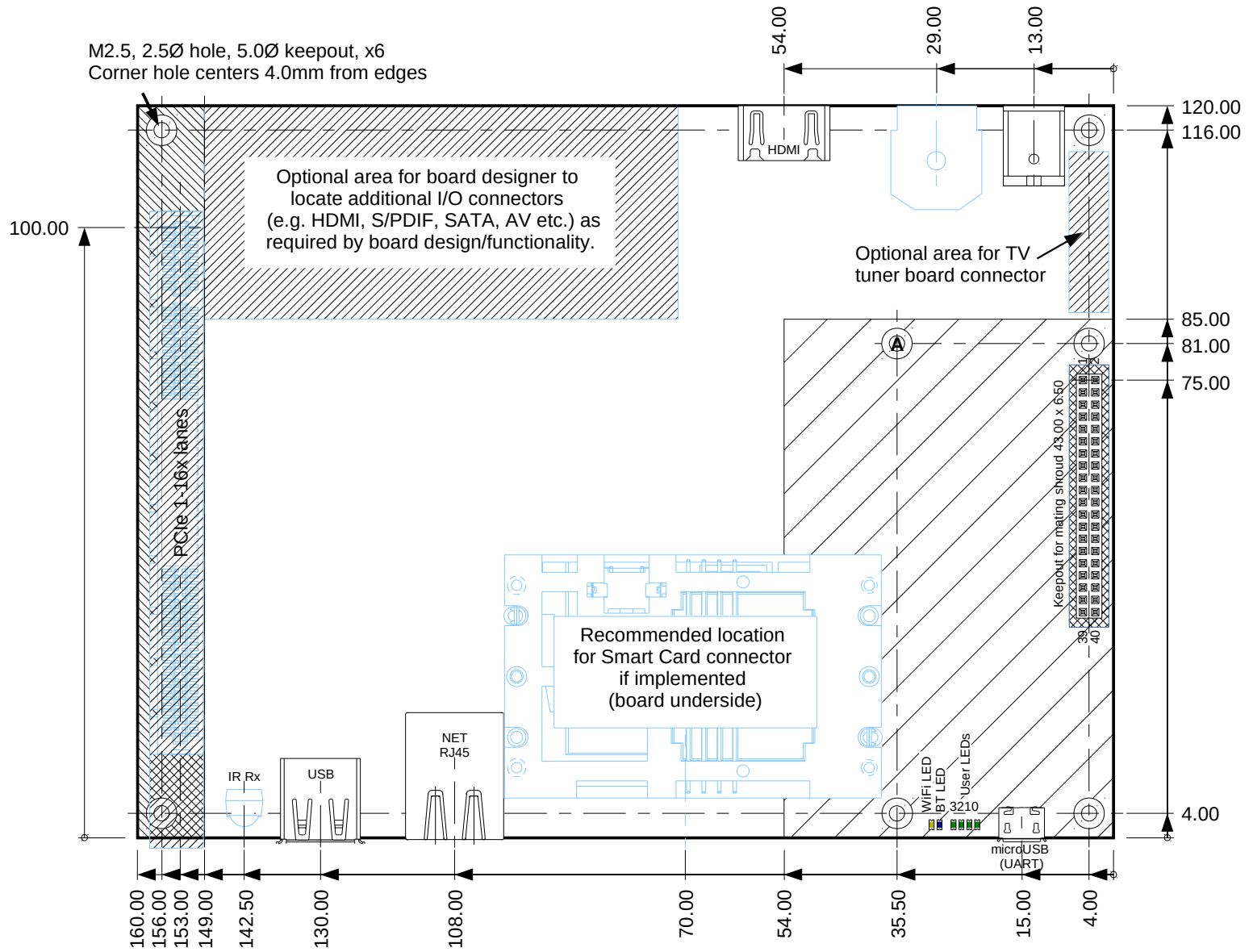
If the TV platform board designer wishes to implement a separate boot ROM then the size is at the discretion of the designer, and **may** be less than 64MB whether or not the flash storage is bootable. In considering the boot ROM size requirements, designers should note that a separate boot ROM may be used for SoC-dependent binary code blobs as well as the boot software itself.

Ethernet Connector

The EE specification requires that the Ethernet RJ45 connector be to located in the specified location on the front.

For TV platform, this connector is still **recommended** to be in the specified location on the front. However, at the board designer's discretion, the Ethernet RJ45 connector **may** be located within the Optional area instead (so all connections are accessible on the back panel).

M2.5, 2.5Ø hole, 5.0Ø keepout, x6
Corner hole centers 4.0mm from edges

Optional area for board designer to
locate additional I/O connectors
(e.g. HDMI, S/PDIF, SATA, AV etc.) as
required by board design/functionality.

Optional area for TV
tuner board connector

PCIe 1-16x lanes

Keepout for mating shroud 43.00 x 650

Recommended location
for Smart Card connector
if implemented
(board underside)

NET
RJ45

IR Rx

USB

WiFi LED
BT LED
3210
User LEDs

microUSB
(UART)

HDMI

54.00
29.00
13.00

120.00
116.00

100.00

85.00
81.00
75.00

4.00

160.00
156.00
153.00
149.00
142.50
130.00
108.00
70.00
54.00
35.50
15.00
4.00

General Top
component area

Top component
keep out area

Top component max
height = 6.5mm

Optional Components

96 Boards
Enterprise

TITLE
96Boards Enterprise Edition (TV)

VERSION
1.0

SCALE
1:1

DATE
30 Aug 2016

ALL DIMENSIONS IN MM

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Change History

v0.9   Nov 2015   Final Draft

V1.0   Dec 2015   First Version

V1.0   Aug 2016   Release version