Amazon Alexa with Colibri iMX7
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One Stop Design-to-Order
Simply place displays, sensors, processors, and Geppetto connects it all.
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Board Description

Board for Alexa Voice Service (AVS) compatible with the Alexa Voice Service Functional Design Guide.

Board Dimensions

11cm x 8.2cm
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1 Modules on Board

1.1 COM Connectors

1.1.1 Colibri iMX7 (Toradex) Connector (v6) (1)

The Colibri i.MX7D (Toradex) SODIMM connector breaks out the GPIOs, signals and buses from the Toradex Colibri i.MX7D COM for use on Geppetto boards. The datasheet is available from the link below:

docs.toradex.com/103125-colibri-arm-som-imx7-datasheet.pdf

The module is connected to the following inputs:

- 5.0V from Barrel Connector (5V 3A) (22)

The Colibri connector provides the following outputs:

- LINEIN to Line In Jack (5)
- USB_CLIENT to Micro-B Jack (6)
- SYS_EN to 1.8V/0.15A LDO (7)
- SD1 to microSD slot (9)
- VLOGIC to:
  - microSD slot (9)
  - TI WiLink8 (2)
  - Real Time Clock (10)
  - USB-UART (4)
  - Tactile Switch (19)
  - Tactile Switch (18)
  - Tactile Switch (16)
  - Tactile Switch (11)
  - Tactile Switch (15)
  - Tactile Switch (23)
- SD2 to TI WiLink8 (2)
- I2C3 to Real Time Clock (10)
- ETH_MAG to Ethernet Connector (20)
- UART1 to USB-UART (4)
- GPIO38 to TI WiLink8 (2)
- UART2.4W to TI WiLink8 (2)
- AVCC to Microphone (21)
- AGND to Microphone (21)
- MIC to Microphone (21)
- GPIO39 to TI WiLink8 (2)
- GPIO54 to TI WiLink8 (2)
- GPIO55 to Tactile Switch (19)
- GPIO63 to Tactile Switch (18)
- GPIO36 to Tactile Switch (16)
- GPIO35 to Tactile Switch (11)
- GPIO49 to Top-side LED (17)
- GPIO37 to Tactile Switch (15)
- GPIO34 to Top-side LED (14)
- GPIO33 to Top-side LED (12)
- GPIO48 to Top-side LED (13)
- RESET to Tactile Switch (23)
- USB_HOST to Standard-A Jack (25)
- HSO to Stereo Headphone Jack (26)
- GPIO100 to 2.5W Speaker Driver (24)
1.2 Network and Wireless

1.2.1 TI WiLink8 (v19) (2)

The TI WiLink8 module includes BT4.1 and 802.11(a/b/g/n). TI’s WL183xMOD, a fully contained integrated WiFi/Bluetooth controller, provides SISO 802.11a/b/g/n and Bluetooth wireless communications via 2 external u.FL antennas. WLAN data is delivered to the host by way of an SDIO interface, while BT uses a UART bus. The module includes a dedicated oscillator, providing a 32.768kHz clock for the SDIO bus.

The datasheet for the WL18xx series is available from TI at:

The module connects to the following buses:
- SDIO to SD2 on Colibri iMX7 (Toradex) Connector (1)
- VLOGIC to VLOGIC on Colibri iMX7 (Toradex) Connector (1)
- BT_ENABLE to GPIO38 on Colibri iMX7 (Toradex) Connector (1)
- UART_4W to UART2_4W on Colibri iMX7 (Toradex) Connector (1)
- WLAN_ENABLE to GPIO39 on Colibri iMX7 (Toradex) Connector (1)
- WLAN_IRQ to GPIO54 on Colibri iMX7 (Toradex) Connector (1)

1.2.2 Ethernet Connector (v3) (20)

This design offers a 10/100 Base-T Ethernet connection.

The 10/100BASE-T module provides ethernet to ETH_MAG on Colibri iMX7 (Toradex) Connector (1).

1.3 USB

1.3.1 Micro-B Jack (v13) (3)

The USB micro-B port module allows your design to connect as a USB device to a USB host.
This module is connected to USB_DEVICE on USB-UART (4).
This module does not supply power.

1.3.2 Micro-B Jack (v13) (6)

The USB micro-B port module allows your design to connect as a USB device to a USB host.
This module is connected to USB_CLIENT on Colibri iMX7 (Toradex) Connector (1).
This module does not supply power.
1.3.3 Standard-A Jack (v13) (25)

A standard A USB host port that allows you to connect USB devices to the board. This port is connected to USB_HOST on Colibri iMX7 (Toradex) Connector (1).

1.4 Converters

1.4.1 USB-UART (v19) (4)

Also known as an FTDI, this USB to UART converter allows a USB connection to the board to behave as a virtual RS232 serial connection. It offers direct and complete access to the system from a development machine by way of the FTDI FT232RQ USB – UART IC.

Technical documentation for the FT232RQ is available at:


This USB to UART converter connects a host machine from Micro-B Jack (3) to UART1 on Colibri iMX7 (Toradex) Connector (1).

1.5 Audio

1.5.1 Line In Jack (v6) (5)

This standard 3.5mm line-in jack accepts line-level stereo audio input from Colibri iMX7 (Toradex) Connector (1).

1.5.2 Microphone (v7) (21)

This compact omnidirectional electret condenser microphone offers mono microphone input for MIC on Colibri iMX7 (Toradex) Connector (1).

1.5.3 2.5W Speaker Driver (v4) (24)

This PAM8302A audio power amplifier has an average output of 2.5W driving loudspeaker output for NC (27).

1.5.4 Stereo Headphone Jack (v7) (26)

A standard 3.5mm headset jack stereo audio connected to Colibri iMX7 (Toradex) Connector (1).
1.6  Power

1.6.1  1.8V/0.15A LDO (v5) (7)

This efficient and precise low-voltage CMOS regulator is optimized for ultra-low noise applications, with an initial accuracy better than 1% and 85A constant ground current over load. The Micrel MIC5247-1.8YM5 linear regulator provides power to noise-sensitive modules that need a 1.8V input.

The datasheet for MIC5247 regulators is available at:


It recieves:

- SYS_EN from Colibri iMX7 (Toradex) Connector (1)
- 3.3V from 3.3V/1.5A Regulator (8)

The following modules receive 1.8V DC from this regulator:

- TI WiLink8 (2)

1.6.2  3.3V/1.5A Regulator (v15) (8)

This DC to DC step down regulator provides a 3.3V DC output at 1.5A needed by certain components on this board. It is capable of accepting an input voltage between 3.1 to 16V DC and output is controlled by the TI TPS6211 buck regulator.

It recieves 5.0V from Barrel Connector (5V 3A) (22).

The datasheet for the TPS6211 regulator is available at:


This regulator provides 3.3V to:

- TI WiLink8 (2)
- 1.8V/0.15A LDO (7)
- microSD slot (9)
- Top-side LED (12)
- Top-side LED (13)
- Top-side LED (14)
- Top-side LED (17)
- Standard-A Jack (25)
- Ethernet Connector (20)
- 2.5W Speaker Driver (24)
1.6.3 Real Time Clock (v11) (10)

This real-time clock backup is powered by a 6mm coin cell battery. The MI DS1340 RTC is programmed over I2C and is connected to a crystal oscillator at 32.8 kHz.

**NOTE:** The RTC IC used in this module is trickle-charge capable. Only NiCd cells should be used if this feature is enabled.

Technical documentation for the MI DS1340 is available at:


This module is connected to I2C3 on Colibri iMX7 (Toradex) Connector (1).

1.7 Memory

1.7.1 microSD slot (v11) (9)

The Micro SD card slot module provides removable non-volatile memory to Geppetto designs.

The SD card reader is connected to SD1 on Colibri iMX7 (Toradex) Connector (1).

1.8 Lights and Switches

1.8.1 Tactile Switch (v19) (11)

This 4.9 sq. mm pull-down touch switch provides a user input for the signal GPIO35 on Colibri iMX7 (Toradex) Connector (1).

1.8.2 Top-side LED (v5) (12)

The top-side LED module contains a 1608 standard size LED of a user-selected color, mounted on the top side of a Geppetto board.

The LED is active-high on GPIO33 from Colibri iMX7 (Toradex) Connector (1).

1.8.3 Top-side LED (v5) (13)

The top-side LED module contains a 1608 standard size LED of a user-selected color, mounted on the top side of a Geppetto board.

The LED is active-high on GPIO48 from Colibri iMX7 (Toradex) Connector (1).

1.8.4 Top-side LED (v5) (14)

The top-side LED module contains a 1608 standard size LED of a user-selected color, mounted on the top side of a Geppetto board.

The LED is active-high on GPIO34 from Colibri iMX7 (Toradex) Connector (1).
1.8.5 Tactile Switch (v19) (15)

This 4.9 sq. mm pull-down touch switch provides a user input for the signal GPIO37 on Colibri iMX7 (Toradex) Connector (1).

1.8.6 Tactile Switch (v19) (16)

This 4.9 sq. mm pull-down touch switch provides a user input for the signal GPIO36 on Colibri iMX7 (Toradex) Connector (1).

1.8.7 Top-side LED (v5) (17)

The top-side LED module contains a 1608 standard size LED of a user-selected color, mounted on the top side of a Geppetto board.

The LED is active-high on GPIO49 from Colibri iMX7 (Toradex) Connector (1).

1.8.8 Tactile Switch (v19) (18)

This 4.9 sq. mm pull-down touch switch provides a user input for the signal GPIO63 on Colibri iMX7 (Toradex) Connector (1).

1.8.9 Tactile Switch (v19) (19)

This 4.9 sq. mm pull-down touch switch provides a user input for the signal GPIO55 on Colibri iMX7 (Toradex) Connector (1).

1.8.10 Tactile Switch (v19) (23)

This 4.9 sq. mm pull-down touch switch provides a user input for the signal RESET on Colibri iMX7 (Toradex) Connector (1).

1.9 Power Connectors

1.9.1 Barrel Connector (5V 3A) (v10) (22)

This power jack is compatible with Gumstix 5V/3.5A DC power adapter using a 4.0mm x 1.7mm barrel connector. It provides more current than a standard 5V DC power supply, suitable for use with multi-processor designs.

This power jack provides 5V to the following modules:

- Colibri iMX7 (Toradex) Connector (1)
- 3.3V/1.5A Regulator (8)
- Standard-A Jack (25)
1.10 Headers

1.10.1 NC (v17) (27)

No connection
2 Module Connections Graph

Figure 1: excludes power modules
3 Module Power Graph