BQ 410:

Installation Guide

Version:	V2.0.0	
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REVISION HISTORY

Version	Date	Change Description
V0.0.0	yyyy-mm-dd	Description

Contents

1 Introduction

The BQ410 is a board developed by BQ based on Qualcomm® Snapdragon™410 processor, providing a powerful and flexible platform that can meet most of market needs.

The board can be used over expansion shields that can provide the peripheral interface needed in each application.

2 Technical Characteristics

Qualcomm® Snapdragon™ APQ8016

Quad ARM Cortex® A53 @ 1.2GHz

Qualcomm® Adreno™ A306 @ 400MHz

eMMC v4.5 8 GB / 16 GB

LPDDR2 (1600) 8Gb / 16Gb

Micro SD Connector

Bluetooth® 4.1

Wi-Fi 802.11b/g/n 2.4GHz

Type of modulation:

- CCK, DQPSK, DBPSK for DSSS
- 64QAM, 16QAM, QPSK, BPSK for OFDM

Transfer Rate:

- 802.11b @ 11Mbps
- 802.11a/g @ 54Mbps
- 802.11n @ 65Mbps

Integral PCB Printed Antenna.

Display Support with 4-line MIPI-DSI

Up to 720p@60fps or 1080p@30fps

Camera Support with 2 MIPI-CSI

- 4-lane MIPI-CSI up to 13MPx
- 2-lane MIPI-CSI up to 8MPx

High Speed Expansion Connector with:

- MIPI-CSI and MIPI-DSI signals.
- 2 x I^2C buses
- Display and camera control signals.

Low Speed Expansion Connector including:

- Input Voltage
- 1 x USB 2.0 Host

- 40 x GPIOs
- Programmable Output Voltage
- Power-ON and reset pins

Audio connector available including:

- Analog Microphone
- Stereo Headphone
- Mono Speaker
- FM Radio

Input voltage 3.7V or Li-Po battery.

83.51 x 49.50 mm

Android Marshmallow 6.0.1

OpenEmbedded

Windows 10 IoT

3 Circuit Block Diagram

The major internal and external block diagrams of BQ410 can be found on Figure 1.

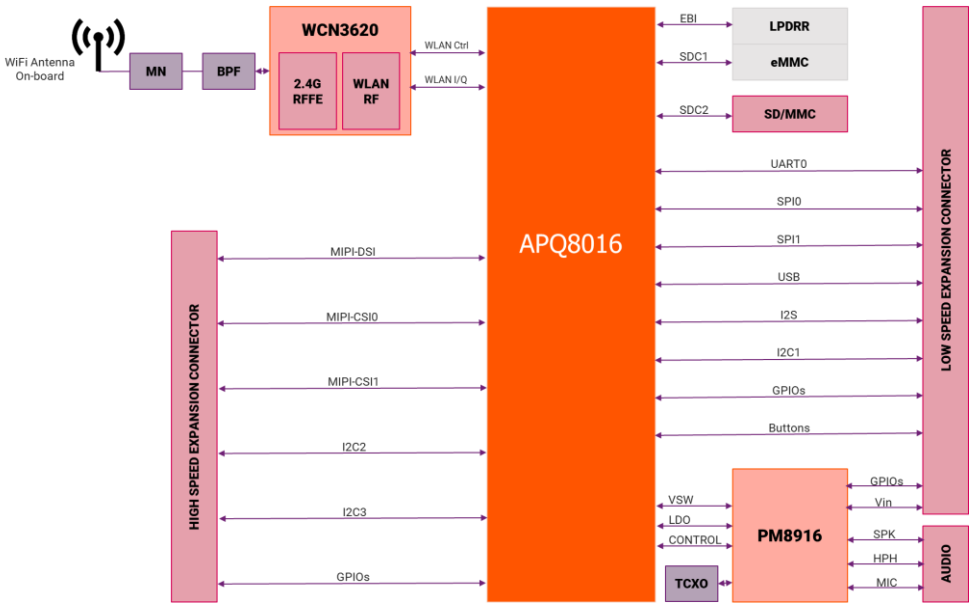

Figure 1. Block Diagram

4 Mechanical Description

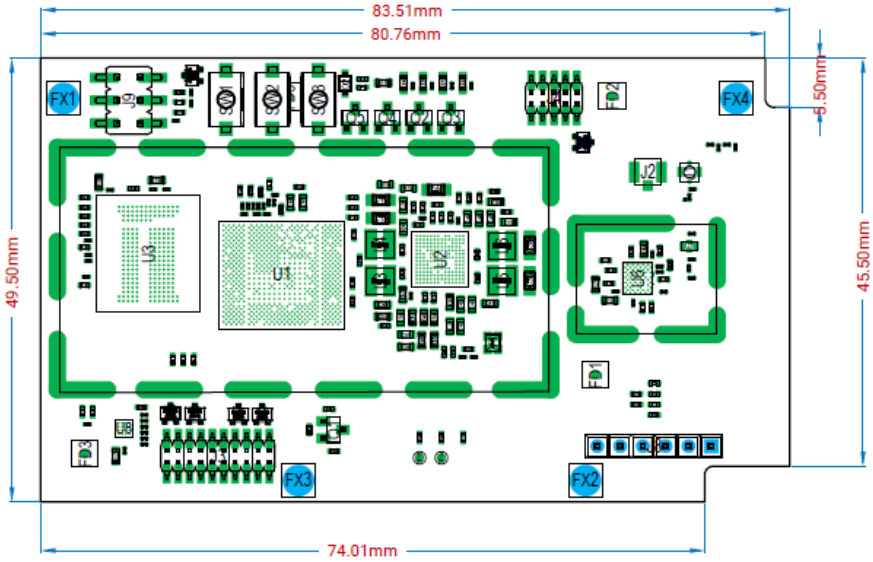

Figure 2. Mechanical Description.

5 Connectors

5.1 Low speed expansion connector

The connectors used for the low speed expansion connector are:

- SAMTEC – FTSH-130-02-F-DV-P-TR
- SAMTEC -- FTS-130-01-F-DV

We recommend using SAMTEC -- CLP-130-02-F-D-K-TR to connect BQ410.

Low Speed Expansion Connector includes the signals DC_IN, which must provide the power to the board. The recommended power source is 3.7V and 2A.

bq410	bq410-Pin Function	bq410	bq410-Pin Function
J7-1	GPIO_8	J7-2	GPIO_0
J7-3	GPIO_9	J7-4	GPIO_1
J7-5	GPIO_10	J7-6	GPIO_2
J7-7	GPIO_11	J7-8	GPIO_3
J7-9	USB_VBUS_IN	J7-10	GND
J7-11	USB_P	J7-12	GPIO_7
J7-13	USB_N	J7-14	GPIO_6
J7-15	USB_GND	J7-16	GPIO_58
J7-17	PM_RESIN	J7-18	GPIO_104
J7-19	KEY_VOLP	J7-20	PMIC_GPIO_4
J7-21	PHONE_ON	J7-22	GND
J7-23	GPIO_110	J7-24	GPIO_21
J7-25	GPIO_111	J7-26	GPIO_117

J7-27	GPIO_112	J7-28	GND
J7-29	GPIO_113	J7-30	GPIO_36
J7-31	GPIO_114	J7-32	GPIO_69
J7-33	GPIO_115	J7-34	GPIO_79
J7-35	PMIC_GPIO_1	J7-36	GPIO_20
J7-37	PMIC_GPIO_2	J7-38	GND
J7-39	PMIC_GPIO_3	J7-40	GPIO_74
J7-41	GPIO_100	J7-42	GPIO_75
J7-43	GPIO_88	J7-44	GPIO_78
J7-45	GPIO_102	J7-46	GPIO_22
J7-47	GPIO_90	J7-48	GPIO_23
J7-49	GPIO_12	J7-50	GND
J7-51	GPIO_13	J7-52	V_LDO
J7-53	GPIO_14	J7-54	GND
J7-55	GPIO_15	J7-56	1V8_CONN
J7-57	DC_IN	J7-58	GND
J7-59	DC_IN	J7-60	GND

5.2 High speed expansion connector

The connector used on BQ410 is SAMTEC -- BSH-030-01-F-D-A-TR.

We recommend using SAMTEC -- BTH-030-01-F-D-A-K-TR to connect BQ410.

bq410	bq410-Pin Function	bq410	bq410-Pin Function
J6-1	GND	J6-2	GND
J6-3	MIPI_DSI_C_P	J6-4	MIPI_CSI0_C_P
J6-5	MIPI_DSI_C_N	J6-6	MIPI_CSI0_C_N
J6-7	GND	J6-8	GND
J6-9	MIPI_DSI_D0_P	J6-10	MIPI_CSI0_D0_P
J6-11	MIPI_DSI_D0_N	J6-12	MIPI_CSI0_D0_N
J6-13	GND	J6-14	GND
J6-15	MIPI_DSI_D1_P	J6-16	MIPI_CSI0_D1_P
J6-17	MIPI_DSI_D1_N	J6-18	MIPI_CSI0_D1_N
J6-19	GND	J6-20	GND
J6-21	MIPI_DSI_D2_P	J6-22	MIPI_CSI0_D2_P
J6-23	MIPI_DSI_D2_N	J6-24	MIPI_CSI0_D2_N
J6-25	GND	J6-26	GND
J6-27	MIPI_DSI_D3_P	J6-28	MIPI_CSI0_D3_P
J6-29	MIPI_DSI_D3_N	J6-30	MIPI_CSI0_D3_N
J6-31	GND	J6-32	GND
J6-33	GPIO_19	J6-34	GPIO_30
J6-35	GPIO_18	J6-36	GPIO_29
J6-37	GPIO_32	J6-38	GPIO_35
J6-39	GPIO_25	J6-40	GPIO_26

J6-41	PMIC_MPP_4	J6-42	GPIO_34
J6-43	GPIO_24	J6-44	GND
J6-45	GPIO_28	J6-46	MIPI_CSI1_D0_P
J6-47	GPIO_27	J6-48	MIPI_CSI1_D0_N
J6-49	GND	J6-50	GND
J6-51	MIPI_CSI1_C_P	J6-52	MIPI_CSI1_D1_P
J6-53	MIPI_CSI1_C_N	J6-54	MIPI_CSI1_D1_N
J6-55	GND	J6-56	GND
J6-57	GPIO_33	J6-58	VREG_L4_2P8
J6-59	GPIO_31	J6-60	1V8_CONN

6 Getting Started

The BQ410 is ready to use "out of the box" with a preinstalled version of Android. There is no need to configure to any hardware on the board to start using it.

When starting the board for the first time, it could take more time to boot as the system is booting for the first time.

7 Installing Android

The only supported method to install Android Operating-system-image on the BQ410is by using fastboot available from Android SDK Platform Tools for Windows, Linux and Mac.

This guide describes the process both for Windows and Linux Host systems.

7.1 Installation prerequisites

This method requires the Fastboot tool to be installed on the HostPC. Fastboot is a tool that communicates with the bootloader of the BQ410 and allows you to flash images onto the board. See below for instruction on how to install Fastboot on your Host PC.

- On Windows Host:

  Get the latest tools from https://developer.android.com/studio/releases/platform-tools.html

- On Linux Host (Ubuntu/Debian):

  You can get the tool from Android Developer website or execute the following command:

  sudo apt-get install android-tools-fastboot

7.2 Installation overview

In order to install Android from a Host PC just follow these simple steps:

- Download the Android images from the BQ Website
- Bring the board into fastboot-mode.
- In FW folder, open 8016_fastboot_all_images.bat or 8016_fastboot_all_images.sh and wait until flash process ends

8 FCC Notification

The BQ410 board complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- this device may not cause harmful interference, and
- this device must accept any interference received, including interference that may cause undesired operations.

This device must not be collocated or operated in conjunction with any antenna or transmitter.

The FCC ID (2AKDW-BQ410) is detailed on the silkscreen of the board. If when integrating this module into an end piece of equipment, this label cannot be seen externally, then the FCC ID must be clearly shown on the outside of the equipment.
The label must contain the following text: "Contains FCC ID: 2AKDW-BQ410"
Changes of modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment

CAUTION: Radio Frequency Exposure

This device complies with applicable FCC radio frequency exposure requirement s, and must be adjusted with a distance of at least 20cm (7.9 inches) between the RF aperture of device and the body of any person at all times during adjustment.