

QCS605 OPEN DEVELOPMENT KIT

USER GUIDE AND PRODUCT INTRODUCTION

Revision history

Revision	Date	Description
A	April 2021	Initial release

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Figure

Figure 2.1 - Qualcomm® QCS605 K01 Open Development Kit

Figure 4.1 - Diagram of a reference solution

1. Introduction

1.1 Purpose

Describes the overview, specifications, and operation instructions for the QCS605 K01 Open Development Kit.

1.2 Conventions

Function declarations, function names, type declarations, attributes, and code samples appear in a different font, for example, `cp armcc armcpp`.

Code variables appear in angle brackets, for example, `<number>`.

Commands to be entered appear in a different font, for example, copy `a:*. * b:`.
Button and key names appear in bold font, for example, click **Save** or press **Enter**.

1.3 Technical assistance

For assistance or clarification on information in this document, submit your inquiry by filling out a form at <https://www.excelpoint.com/>.

For assistance or clarification on information in this document, submit a case to Qualcomm Technologies, Inc. (QTI) at <https://createpoint.qti.qualcomm.com/>.

If you do not have access to the CDMATech Support website, register for access or send email to support.cdmatech@qti.qualcomm.com

2. Device overview



Figure 2.1 - Qualcomm® QCS605 K01 Open Development Kit

Powered by the Qualcomm® QCS605 SoC (System on Chip) also known as the Qualcomm® Vision Intelligence Platform, the QCS605 K01 Open Development Kit produced is the perfect reference design for the IP camera.

Coupling Qualcomm® Artificial Intelligence Engine with our industry expertise in camera and imaging, you are guaranteed to have the best in class visual quality for your product.

3. Device specifications

This section contains details of the device specifications.

3.1 Hardware specifications

Key SOM Component	Name	Details
Processor	Qualcomm QCS605 chipset	
Image sensor	Sony IMX334	8.42 M effective pixels Type 1/1.8
Memory	Samsung K4U6E3S4AM Samsung LMAG1JETD-B041	LPDDR4x 2GB eMMC 16GB
Lens	Varifocal lens	Zoom 3x F1.2 FOV 112.0° - 47.2 °
WiFi + Bluetooth/BT	WCN3990	WLAN 802.11 a/b/n/ac 2.4/5GHz 2x2 MIMO Bluetooth 5.0
Ethernet	LAN7800	1 x GbE Ethernet
Video out	DSI to HDMI bridge Lontium LT9611UCX	HDMI Type D, Resolution up to 4K/60Hz, Support with I2S audio
Audio amplifiers x2		Support 2xWSA881x connected to the board
Audio	D-MIC x4	
USB connector	USB Type C	USB Type C 3.1
Power input	DC 12V/2A power input PoE 802.3af/at	DC +12V from wall supply PoE 802.3af/at
Storage		eMMC/micro SD card
Location	GPS	GPS/GLONASS
Debug port		JTAG/UART

3.2 Software specifications

OS

- Android-based
- CC SDK - Framework QMMF for recording and playback

Audio

- PCM playback/record
- Stereo/multi-channel AAC encoder
- Fluency Pro multi-channel noise suppression

Imaging

- Basic image settings
- Joint manual control for WB, EV, shutter speed, and ISO for photo and video
- JPEG/RAW snapshot capture
- HW TNR

Video

- 4K30, 4K60
- H.264, H.265
- MPEG-4
- MPEG-H
- Overlay
- zzHDR

Connectivity

- Bluetooth
- WLAN 802.11
- USB 3.1 Gen 2

- USB video class V1.5 (driver only)
- USB audio class V2.0 (driver only)

NOTE: For a complete set of features and limitations refer to the latest release notes from QCS605 LA 2.0 platform (available in CreatePoint)

4. Operation

IP camera operation

A demo version of this software is available. Contact the QCT support team via <https://createpoint.qti.qualcomm.com> for further details.

Creating a build for the QCS605 Open Development Kit

See QCS605 Linux Android Software User Manual (SP80-PF105-4) for the steps to download and create a complete build.

Camera SDK

The reference design is built on top of a customized Android platform. OEMs can

develop applications using the connected camera SDK, an open source SDK (based

on C/C++). For further details on the connected camera framework, contact the QCT

support team via <https://createpoint.qti.qualcomm.com>.

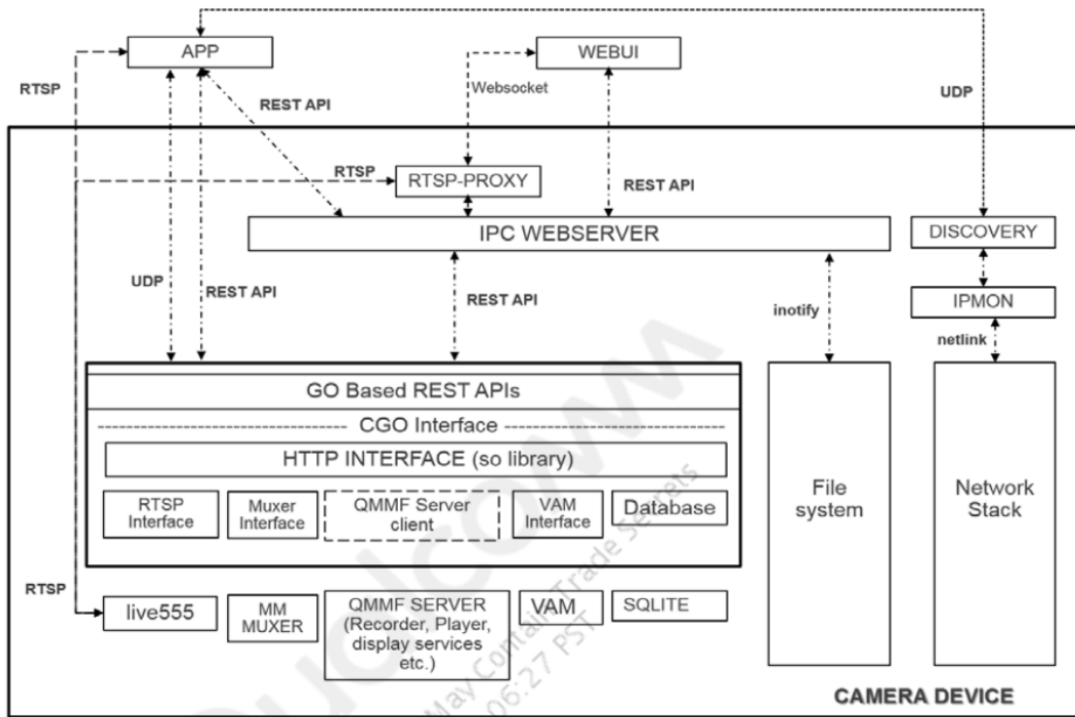


Figure 4.1 - Diagram of a reference solution

5. Software

5.1 Initial setup

- Ensure that you have the following items ready:
 - QCS605 Open Development Kit
 - USB type C cable
 - AC adaptor (12V/2A, 6.4mm, 2mm) or PoE
 - PC with the latest Qualcomm USB driver (QUD.WIN.1.1 Installer)

5.2 Powering on & turning off the device

Power on

- Insert AC adaptor to DC jack, device will boot-up automatically
- Insert USB (Type-C) into device and connect with PC check by “adb devices” to confirm if device is working
- One adb device should be detected by PC

Power off

- Remove AC adaptor from device directly to power off

5.3 Connecting to WiFi

- Ensure WLAN drivers are available
- Ensure wlan0 interface is up
- Ensure the configured network is available

```
adb root
```

```
adb remount
```

```
adb shell
```

```
iw dev wlan0 scan | grep SSID
```

(you can see the configured network details in the scan result.)

- Ensure the required network details are configured in

```
/data/misc/wifi/WifiConfigStore.xml
```

- If not available in /data/misc/wifi/WifiConfigStore.xml, follow below instructions to add a network:

```
-> Edit WifiConfigStore.xml
```

```
adb root
```

```
adb mount
```

```
adb push WifiConfigStore.xml /data/misc/wifi/WifiConfigStore.xml
```

```
adb reboot
```

5.4 Device functionality

LENS Control

- Input the following instructions 1 minute after boot-up

```
adb shell
```

```
adb root
```

```
adb remount
```

```
adb shell
```

```
driver_len
```

```
5 --> 4 --> 5 --> 4
```

Ethernet

- Input the following instructions 1 minute after boot-up
- Connect the device to one router.
- For example, router's default IP address is 192.168.0.1
- Power on device and wait for 1 minute

```
adb shell "ifconfig | grep eth0" to confirm Ethernet is listed
```

```
adb shell "ping 192.168.0.1" to check if device can get response from the  
router
```

5.5 Perform recording

Steps to test:

- Set the device in root privileges

```
adb root
```

```
adb remount
```

- Using qmmf_recorder_test Menu Options

```
adb shell
```

qmmf_recorder_test

1 : Connect

3. Start Camera

6. Create 4K AVC Session

A. Start Session <recording in progress>

To stop recording:

B --> D --> 4 --> 2 --> X

- Once completed, output files are generated in /data/misc/qmmf folder

6. Troubleshooting

6.1 Problem & Debug instructions

Problem	Debug instructions
Does not boot up	<ol style="list-style-type: none"> 1. Connect AC adaptor to DC jack 2. Connect KIT to PC using USB type C cable 3. Keep the device connected with the PC and check if device is still active by adb <ul style="list-style-type: none"> - Load command “adb devices” to check if the device can be enumerated/detected - If it is detected, flash all images by fastboot. If not, unplug/plug -in the USB cable several times until device is in fastboot mode 4. Use QFIL to flash all images using a re-worked USB cable. See QFIL (Qualcomm Flash Image Loader) User Guide (80-NN120-1)
Lost WiFi/BT function	Flash all images by fastboot. If this does not work, return the device for further analysis.
No GPS data	
No Sensor data	
No image streaming	
No USB function	<p>It means device not detected by PC via USB cable</p> <ol style="list-style-type: none"> 1. Check if the device is on 2. Use a new USB cable 3. Use QFIL to flash all images using a re-worked USB cable. See QFIL (Qualcomm Flash Image Loader) User Guide (80-NN120-1) 4. Update the software using QFIL and re-check if the USB is functioning. If this does not work, return the device for further analysis
No HDMI output	<ol style="list-style-type: none"> 1. Check if the device is on 2. Use a new HDMI cable

	<p>3. Use QFIL to flash all images using a re-worked USB cable. See QFIL (Qualcomm Flash Image Loader) User Guide (80-NN120-1).</p> <p>4. Flash all images by fastboot</p> <p>5. Change the display device. If this does not work, return the device for further analysis.</p>
Cannot access the SD card	Try another SD card (SanDisk is recommended). If this does not work, return the device for further analysis.
No Ethernet function	<p>Follow Section 5.4.1 step-by-step to enable and verify ethernet functionality</p> <p>- If no, please return the device back to us.</p>

6.2 Device restore & recover

Using fastboot to flash all images

1. Flat build SW packages are available for download. Please contact our support team for download SW packages
2. Load adb command “adb reboot bootloader”
3. Load fastboot command “fastboot devices” to confirm if the device is in fastboot mode
 - If it is in fastboot mode, run upgrade.bat to flash all images
 - If not, unplug/plug-in the USB cable several times until the device is in fastboot mode then run upgrade.bat to flash all images
 - If it still is not in fastboot mode, use QFIL to re-flash the images
4. Load fastboot command “fastboot reboot” to re-boot the device

Entering emergency download mode (EDL) by using a re-worked USB cable

1. Short the D+ (green cable) and GND (black cable) of the USB cable
2. Connect the device to a PC using this cable and then the device can enter 9008 mode

3. Swap in a normal USB cable then connect the device to a PC again to flash the images using the QFIL mode.

A. References

A.1 Related document

Title	Number
Qualcomm Technologies, Inc.	
<i>QCS605 Linux Android Software User Manual</i>	SP80-PF105-4
<i>QFIL User Guide</i>	80-NN120-1
<i>QCS605 VR360 Reference Device</i>	80-PF105-35