Qualcomm Technologies, Inc.

Qualcomm IQ-X Series Evaluation Kit - Linux

Bringup Guide

80-80022-297 Rev. AB

May 19, 2026

About Qualcomm

Qualcomm relentlessly innovates to deliver intelligent computing everywhere, helping the world tackle some of its most important challenges. Building on our 40 years of technology leadership in creating era-defining breakthroughs, we deliver a broad portfolio of solutions built with our leading-edge AI, high-performance, low-power computing, and unrivaled connectivity. Our Snapdragon® platforms power extraordinary consumer experiences, and our Qualcomm Dragonwing™ products empower businesses and industries to scale to new heights. Together with our ecosystem partners, we enable next-generation digital transformation to enrich lives, improve businesses, and advance societies. At Qualcomm, we are engineering human progress.

Revision history

Revision	Date	Description
AA	May 18, 2026	Initial release
AB	May 19, 2026	Updated the CCI level to white

Contents

Figures

Tables

1 Introduction

The IQ-X series evaluation kit (EVK) includes a carrier board and a module. This bring-up guide explains how to set up the IQ-X series EVK, understand the peripheral interfaces, and perform software flashing.

NOTE: This document is a preview (beta) version. The production version will be released later. Features such as Wi-Fi, Bluetooth, Ethernet, audio, display, video, and camera are not included in this guide and will be added in future revisions.

For information about the IQ-X series module, see the documents listed in Related documents.

1.1 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**.

1.2 Technical assistance

For assistance or clarification on information in this document, go to www.qualcomm.com/support

2 IQ-X series carrier board–peripheral interface connectors

The following figure shows the location of various peripheral interface connectors from the top view of the IQ-X series carrier board.

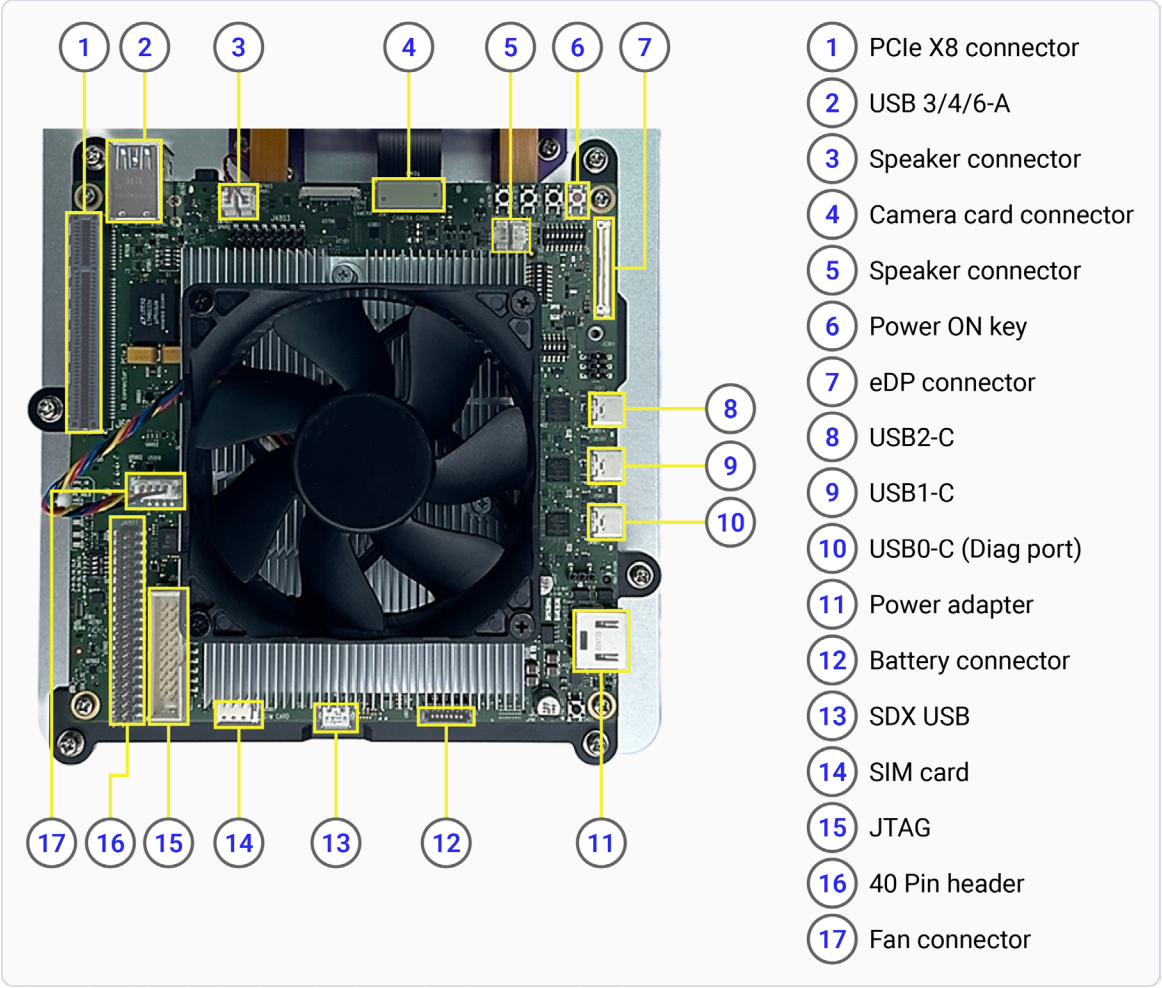

Figure 2-1 Top view of IQ-X series carrier board

The following figure shows the location of various peripheral interface connectors from the bottom view of the IQ-X series carrier board.

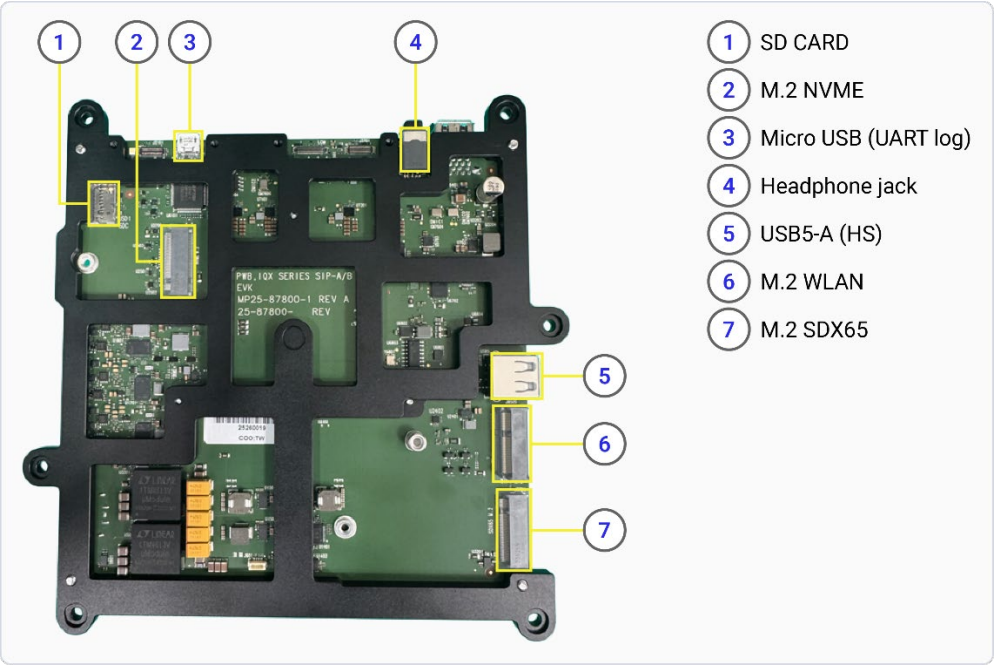

Figure 2-2 Bottom view of IQ-X series carrier board

3 Configure DIP switch settings

The following figure shows the dual in-line package (DIP) switch settings to set up the default SPINOR and universal flash storage (UFS) mode on the IQ-X series carrier board.

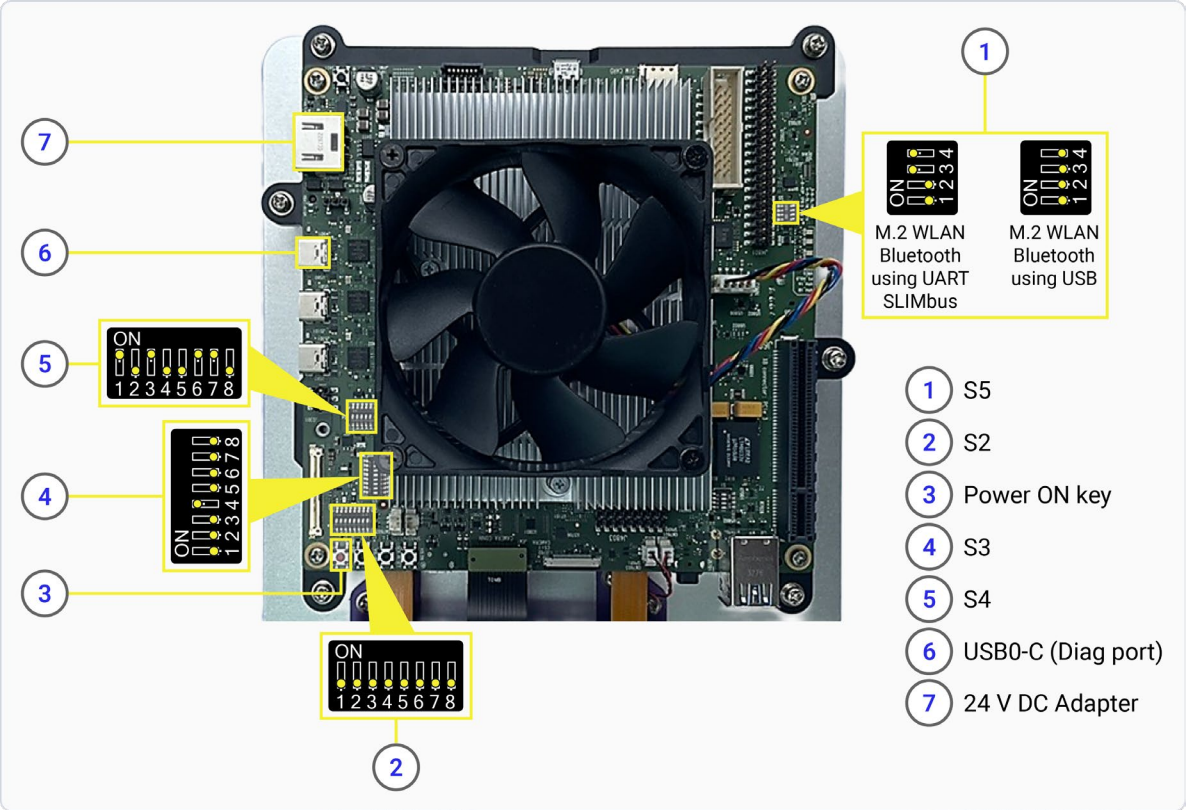

Figure 3-1 DIP switch settings for default SPINOR + UFS and Bluetooth setup

The following table describes the ON and OFF positions of the DIP switches for the SPINOR and UFS mode.

Table 3-1 DIP switch settings

Switch	Description	
	ON	OFF
S2-4	Emergency Download (EDL) mode	Normal mode
S3-4	FAST BOOT [0] → 1	FAST BOOT [0] → 0
S4-1	FAST BOOT [2] → 1	FAST BOOT [2] → 0
S4-3	FAST BOOT [1] → 1	FAST BOOT [1] → 0

Switch	Description	
	ON	OFF
S4-2	FAST BOOT [3] → 1	FAST BOOT [3] → 0
S4-5	Enables BAT_THERM resistor on board	Uses BAT_THERM resistor in battery
S4-6	Enables BAT_ID resistor on board	Uses BAT_ID resistor in battery
S4-7		
S5-3	Bluetooth using UART and SLIMbus	Bluetooth using USB
S5-4	Bluetooth using UART and SLIMbus	Bluetooth using USB

The following table lists the description of the S2, S3, and S4 DIP switches:

Table 3-2 S2, S3, and S4 DIP switches

Pins	Function
DIP switch S2	
8-9	VXT2_3P3_DIS
7-10	EUD_ENABLE
6-11	ELDO_3P3_EN
5-12	BOOT_SPEED1
4-13	FORCE USB BOOT
3-14	BOOT_SPEED0
2-15	SYSTEM_THROTTLE
1-16	SDX_FORCE_USB
DIP switch S3	
8-9	DDR3_CH_SEL
7-10	SDX_PCIE_INIT
6-11	SDX_FB2
5-12	WDOG_DISABLE
4-13	FBO
3-14	FORCE_PS_HOLD
2-15	VBATT_HIGH
1-16	AUTO_PWR_EN
DIP switch S4	
8-9	UART_SEL
7-10	BATT_ID
6-11	BATT_ID
5-12	BATT_THERM
4-13	DEAD_BATT_CHG
3-14	FB1
2-15	FB3
1-16	FB2

4 Download and flash software

This chapter describes how to download and flash the software on the IQ-X series carrier board.

4.1 Power up and power cycle

The IQ-X series carrier board is preloaded with software to set up the device. If no image is loaded, the device enters into EDL mode when powered on. The following figure shows the location of the interfaces used to power up the device:

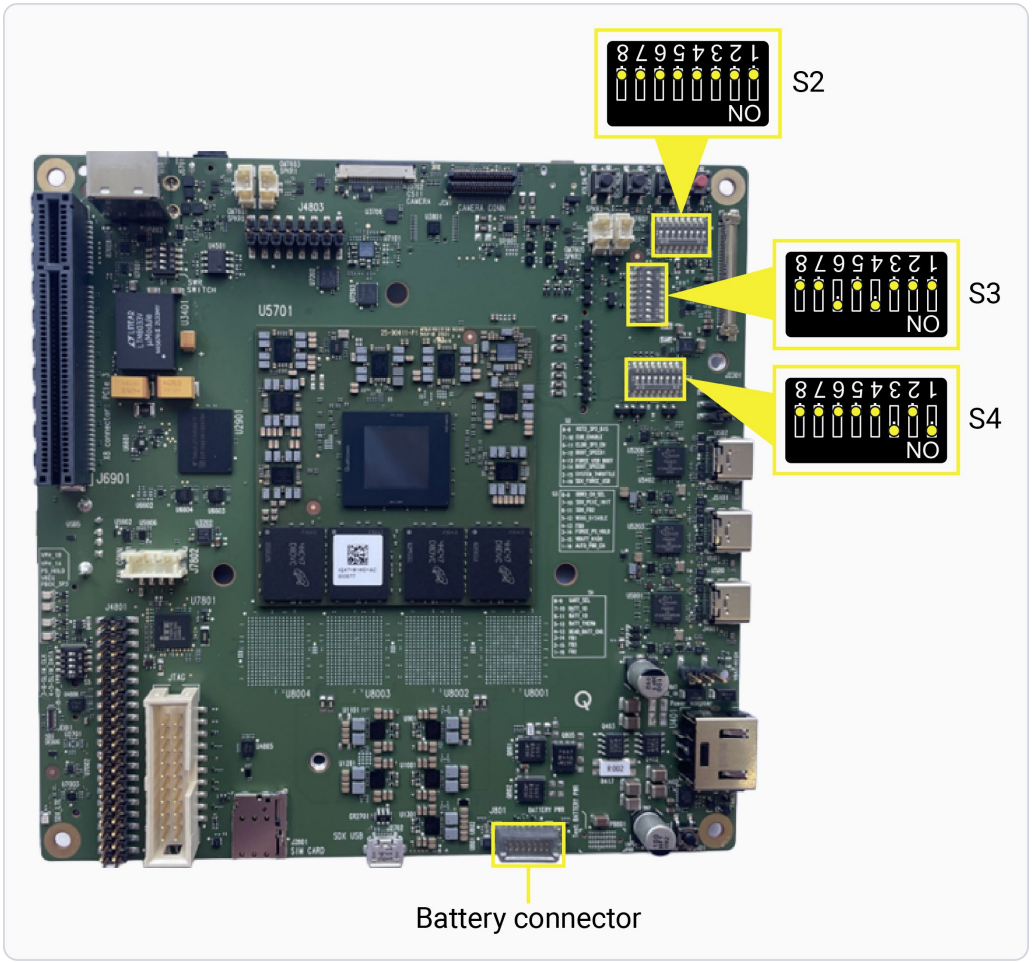

Figure 4-1 Power up options on IQ-X series carrier board

Table 4-1 DIP switch settings

Switch	Description	
	ON	OFF
S2-4	EDL mode	Normal mode
S3-4	FAST BOOT [0] → 1	FAST BOOT [0] → 0
S4-1	FAST BOOT [2] → 1	FAST BOOT [2] → 0
S4-3	FAST BOOT [1] → 1	FAST BOOT [1] → 0
S4-2	FAST BOOT [3] → 1	FAST BOOT [3] → 0
S4-6	Enables BAT_ID resistor on board	Uses BAT_ID resistor in battery
S4-7		

4.1.1 Configure boot mode

Boot mode configuration of the S2-4 DIP switch: For the EDL mode, turn ON S2-4 and for Normal mode, turn OFF S2-4.

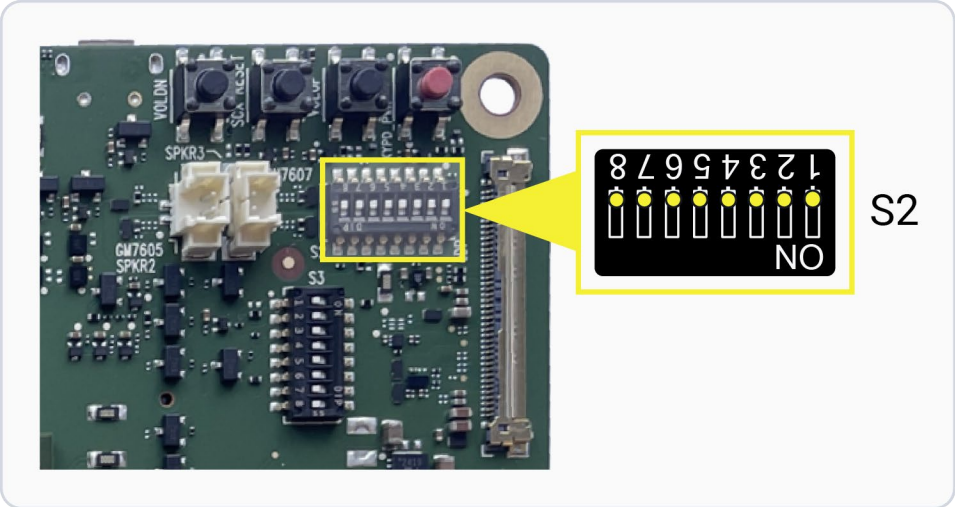

Table 4-2 DIP switch setting for Boot mode configuration

Switch	Description	
	ON	OFF
S2-4	EDL mode	Normal mode

4.1.2 Power cycle the EVK

To power cycle the EVK, do the following:

1. Disconnect the power source (DC adapter, battery, Type C PD).
2. Disconnect the USB Type-C cable (USB0-C, USB1-C, USB2-C) (if connected).
3. Reconnect the power source.

4.2 Flash the software images to the Dragonwing IQ-X EVK

Download and integrate the software images, and flash them onto the Dragonwing IQ-X EVK.

4.2.1 Prerequisites

Ensure that you have the following required hardware and peripherals ready:

Requirement	Description
Host computer OS	Ubuntu OS
Development kit	Dragonwing IQ-X EVK
USB cable	One USB Type-C to USB Type-A cable for flashing the image to the Dragonwing IQ-X EVK
Serial Cable	One Micro-USB to USB Type-A cable for the UART debug port

Follow the setup steps based on your host computer's operating system (OS).

4.2.2 Set up the Ubuntu host

To set up the environment in the Ubuntu OS, set up the debug UART.

1. Connect one end of a Micro-USB cable to the Micro-USB port on the Dragonwing IQ-X EVK.

Figure 4-2 Connecting the IQ-X board to the host computer

2. Connect the other end of the Micro-USB cable to the host computer.
3. Install the `Screen` application on the Linux host computer:
```
$ sudo apt update
$ sudo apt install screen
```
4. Verify the USB port:
```
$ ls /dev/ttyUSB*
```

   Sample output
```
$ /dev/ttyUSB0
```
5. Open the debug UART:
   $ sudo screen <serial_port> <baud_rate>

Example command:
$ sudo screen /dev/ttyUSB0 115200

4.2.3 Download flashable binaries

To download the no-login binaries for the Dragonwing IQ-X EVK, and to set up the recommended directory structure and extraction process, do the following:

1. Create a workspace and then go to that directory.
   ```
   $ mkdir iqx_workspace
   $ cd iqx_workspace
   ```
2. Download and unzip the binaries.
   ```
   $ wget https://artifacts.codelinaro.org/artifactory/qli-ci/flashable-binaries/meta-qcom/iq-x7181-evk/qli-2.0-rc3+20260513-qcom-multimedia-proprietary-image.zip
   $ unzip qli-2.0-rc3+20260513-qcom-multimedia-proprietary-image.zip
   ```

4.2.3.1 Flash the Dragonwing IQ-X EVK integrated image on Ubuntu host

To flash the Dragonwing IQ-X EVK integrated image using Ubutnu host, do the following:

1. Move the Dragonwing IQ-X EVK into the Emergency Download (EDL) mode.
   a. Connect the Dragonwing IQ-X EVK to a 12 V wall power supply.
   b. Connect the Dragonwing IQ-X EVK to the host computer through the USB Type-C connector.
   c. Verify whether the Dragonwing IQ-X EVK has entered the EDL mode by running the following command on the host computer:
      ```
      $ lsusb
      ```

      Sample output
      ```
      Bus 002 Device 014: ID 05c6:9008 Qualcomm, Inc. Gobi Wireless Modem (QDL mode).
      ```
2. Update the udev rules.
   a. Go to the udev configuration directory:
      ```
      $ cd /etc/udev/rules.d
      ```
   b. List the contents of the directory:
      ```
      $ ls
      ```
      i If the `51-qcom-usb.rules` file isn't present, run the following command to create it.
      ```
      $ sudo vi 51-qcom-usb.rules
      ```
      ii Add the following content to the file 51-qcom-usb.rules:
      SUBSYSTEMS=="usb", ATTRS{idVendor}=="05c6", ATTRS{idProduct}=="9008", MODE="0664", GROUP="plugdev"
      iii If the file exists, check for the earlier content. Run the following command to view the content:
      ```
      $ cat 51-qcom-usb.rules
      ```
   c. Restart udev:
      $ sudo systemctl restart udev

If the USB cable is already connected to the host computer, disconnect and reconnect it to apply the updated rules.

3. Use the **QDL** tool to flash the software onto the Dragonwing IQ-X EVK:

NOTE: Use QDL version 2.4.0 or later to flash the Dragonwing IQ-X EVK.

a. Download the QDL tool and unzip the contents of the downloaded folder.

b. Provide executable permission:
```
$ chmod +x ./qdl
```

NOTE: For more information about QDL tool usage, see the **QDL_User_Guide** in your unzipped `qdl` directory.

NOTE: To perform UFS flashing, switch on SW4-1.

c. Perform configuration data table (CDT) flashing

d. Perform universal flash storage (UFS) provisioning

e. Flash the boot binaries to spinor.

   i Go to the IQ-X workspace iqx_workspace/images/iq-x7181-evk/qcom-multimedia-proprietary-image-iq-x7181-evk/spinor

   ii Flash Spinor using the command: <qdl_tool_path>/qdl --storage spinor xbl_s_devprg_ns.melf rawprogram0.xml patch0.xml

f. Flash the RC3 firmware

   i Go to the IQ-X workspace iqx_workspace/images/iq-x7181-evk/qcom-multimedia-proprietary-image-iq-x7181-evk

   ii Flash the RC3 firmware using the command: <qdl_tool_path>/qdl --storage ufs xbl_s_devprg_ns.melf rawprogram0.xml

NOTE: Turn off the SW2-4 DIP switch after flashing the software

5 FAQs

5.1 How do you perform configuration data table (CDT) flashing?

CDT is a set of platform-specific configuration files used during flashing to configure hardware parameters on the Dragonwing IQ-X EVK.

To perform CDT flashing, do the following:

1. Download the IQ-X.1.4-EVK-CDT.tar.gz files from JFrog.
2. Unzip the boot binaries.
3. Put the device in EDL mode.
4. Verify whether the Dragonwing IQ-X EVK has entered the EDL mode by running the following command on the host computer:
   ```
   $ lsusb
   ```
   Sample output
   ```
   Bus 002 Device 014: ID 05c6:9008 Qualcomm, Inc. Gobi Wireless Modem (QDL mode)
   ```
5. Navigate to CDTworkspace.
   ```
   $ cd IQ-X.1.4-EVK-CDT
   ```
6. Run QDL:
   $ <qdl_tool_path>/qdl xbl_s_devprg_ns.melf rawprogram0.xml patch0.xml

5.2 How do you provision universal flash storage (UFS)?

UFS provisioning helps divide the storage into several logical unit numbers (LUNs), allowing you to store different types of data separately. This improves access efficiency and system organization.

To provision the UFS, do the following:

1. Download the provisioning.zip file from JFrog and unzip it.
2. Put the device in EDL mode.
3. Navigate to the provisioning directory.
   ```
   $ cd provisioning
   ```
4. Provision UFS:
   $ <qdl_tool_path>/qdl --storage ufs xbl_s_devprg_ns.melf provision.xml

5.3 Further support

Post your questions on the Qualcomm support forum.

A References

A.1 Related documents

Title	Number
Qualcomm Technologies, Inc.	
IQ-X Series Module Data Sheet	80-77181-1
IQ-X Series Module Pin Assignment and GPIO Configuration Specification Spreadsheet	80-77181-1A
IQ-X Series Module Technical Reference Manual	80-77181-5

A.2 Acronyms and terms

Acronym or term	Definition
CDT	Configuration data table
DIP	Dual in-line package
EDL	Emergency Download
EVK	Evaluation kit
NVMe	Non-Volatile Memory Express
QDL	Qualcomm Downloader
UART	Universal asynchronous receiver/transmitter
UEFI	Unified extensible firmware interface
UFS	Universal flash storage

LEGAL INFORMATION

Your access to and use of this material, along with any documents, software, specifications, reference board files, drawings, diagnostics and other information contained herein (collectively this "Material"), is subject to your (including the corporation or other legal entity you represent, collectively "You" or "Your") acceptance of the terms and conditions ("Terms of Use") set forth below. If You do not agree to these Terms of Use, you may not use this Material and shall immediately destroy any copy thereof.

1) Legal Notice.

This Material is being made available to You solely for Your internal use with those products and service offerings of Qualcomm Technologies, Inc. ("**Qualcomm Technologies**"), its affiliates and/or licensors described in this Material, and shall not be used for any other purposes. If this Material is marked as "**Qualcomm Internal Use Only**", no license is granted to You herein, and You must immediately (a) destroy or return this Material to Qualcomm Technologies, and (b) report Your receipt of this Material to qualcomm.support@qti.qualcomm.com. This Material may not be altered, edited, or modified in any way without Qualcomm Technologies' prior written approval, nor may it be used for any machine learning or artificial intelligence development purpose which results, whether directly or indirectly, in the creation or development of an automated device, program, tool, algorithm, process, methodology, product and/or other output. Unauthorized use or disclosure of this Material or the information contained herein is strictly prohibited, and You agree to indemnify Qualcomm Technologies, its affiliates and licensors for any damages or losses suffered by Qualcomm Technologies, its affiliates and/or licensors for any such unauthorized uses or disclosures of this Material, in whole or part.

Qualcomm Technologies, its affiliates and/or licensors retain all rights and ownership in and to this Material. No license to any trademark, patent, copyright, mask work protection right or any other intellectual property right is either granted or implied by this Material or any information disclosed herein, including, but not limited to, any license to make, use, import or sell any product, service or technology offering embodying any of the information in this Material.

THIS MATERIAL IS BEING PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, WHETHER EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE. TO THE MAXIMUM EXTENT PERMITTED BY LAW, QUALCOMM TECHNOLOGIES, ITS AFFILIATES AND/OR LICENSORS SPECIFICALLY DISCLAIM ALL WARRANTIES OF TITLE, MERCHANTABILITY, NON-INFRINGEMENT, FITNESS FOR A PARTICULAR PURPOSE, SATISFACTORY QUALITY, COMPLETENESS OR ACCURACY, AND ALL WARRANTIES ARISING OUT OF TRADE USAGE OR OUT OF A COURSE OF DEALING OR COURSE OF PERFORMANCE. MOREOVER, NEITHER QUALCOMM TECHNOLOGIES, NOR ANY OF ITS AFFILIATES AND/OR LICENSORS, SHALL BE LIABLE TO YOU OR ANY THIRD PARTY FOR ANY EXPENSES, LOSSES, USE, OR ACTIONS HOWSOEVER INCURRED OR UNDERTAKEN BY YOU IN RELIANCE ON THIS MATERIAL.

Certain product kits, tools and other items referenced in this Material may require You to accept additional terms and conditions before accessing or using those items.

Technical data specified in this Material may be subject to U.S. and other applicable export control laws. Transmission contrary to U.S. and any other applicable law is strictly prohibited.

Nothing in this Material is an offer to sell any of the components or devices referenced herein.

This Material is subject to change without further notification.

In the event of a conflict between these Terms of Use and the Website Terms of Use on www.qualcomm.com, the *Qualcomm Privacy Policy* referenced on www.qualcomm.com, or other legal statements or notices found on prior pages of the Material, these Terms of Use will control. In the event of a conflict between these Terms of Use and any other agreement (written or click-through, including, without limitation any non-disclosure agreement) executed by You and Qualcomm Technologies or a Qualcomm Technologies affiliate and/or licensor with respect to Your access to and use of this Material, the other agreement will control.

These Terms of Use shall be governed by and construed and enforced in accordance with the laws of the State of California, excluding the U.N. Convention on International Sale of Goods, without regard to conflict of laws principles. Any dispute, claim or controversy arising out of or relating to these Terms of Use, or the breach or validity hereof, shall be adjudicated only by a court of competent jurisdiction in the county of San Diego, State of California, and You hereby consent to the personal jurisdiction of such courts for that purpose.

2) Trademark and Product Attribution Statements.

Qualcomm is a trademark or registered trademark of Qualcomm Incorporated. Arm is a registered trademark of Arm Limited (or its subsidiaries) in the U.S. and/or elsewhere. The Bluetooth® word mark is a registered trademark owned by Bluetooth SIG, Inc. Other product and brand names referenced in this Material may be trademarks or registered trademarks of their respective owners.

Snapdragon and Qualcomm branded products referenced in this Material are products of Qualcomm Technologies, Inc. and/or its subsidiaries. Qualcomm patented technologies are licensed by Qualcomm Incorporated.

THE DOCUMENTATION ACCOMPANYING THE MATERIALS AND/OR RELEVANT PRODUCTS AND SERVICE OFFERINGS MAY INCLUDE IMPORTANT USE LIMITATIONS. ANY DEVIATIONS FROM APPLICABLE USE LIMITATIONS MAY ADVERSELY IMPACT PERFORMANCE, DURABILITY, QUALITY OR SAFETY. YOU ASSUME ALL RISKS AND LIABILITIES ASSOCIATED WITH ANY DEVIATIONS.