Re-imagining Cellular IoT Solutions

Cavli CQS290 EVK

User Manual

External Release Version 1.1

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VERSION HISTORY

Version	Edit	Date
1.0	Initial Version	10-01-2024
1.1	Updated Layout	23-01-2024

1 Introduction

1.1 Overview

This document aims to familiarize the reader on the different functionalities and interfaces of CQS290 Evaluation board.
It also helps the customer in getting started with the CQS290 EVK.

The EVK is a tool designed for engineers, programmers and developers who are looking to:

- Debug and/or improve applications based on Cavli CQS290 modules.
- Develop a first-pass proof-of-concept device for new application.

1.2 References

The present document is based on the following document:

Cavli CQS290 Hardware Manual.

2 Interfaces

2.1 Chapter Overview

Description:

This chapter contains all the necessary information on CQS290 EVK Interfaces and Pin-outs.

2.2 EVK Layout

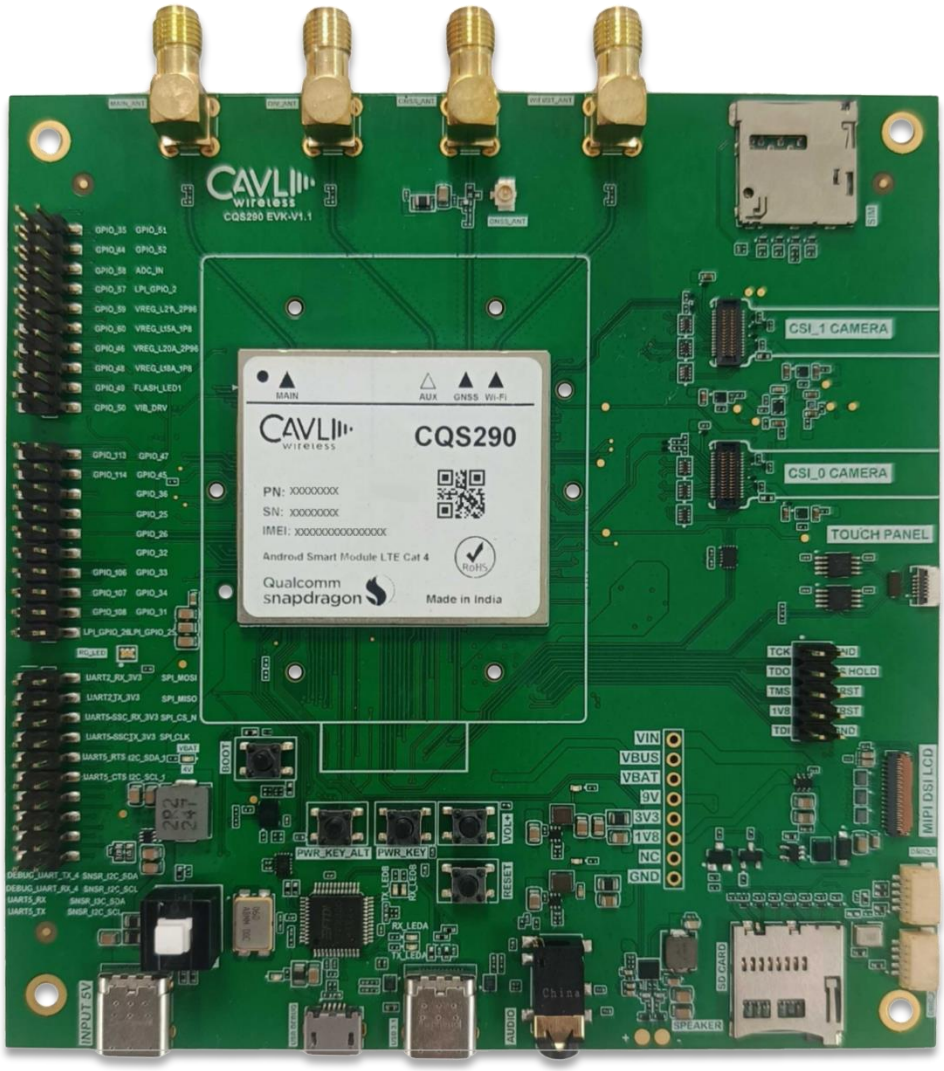


Figure 1: CQS290 EVK Layout

2.3 Pin Layout

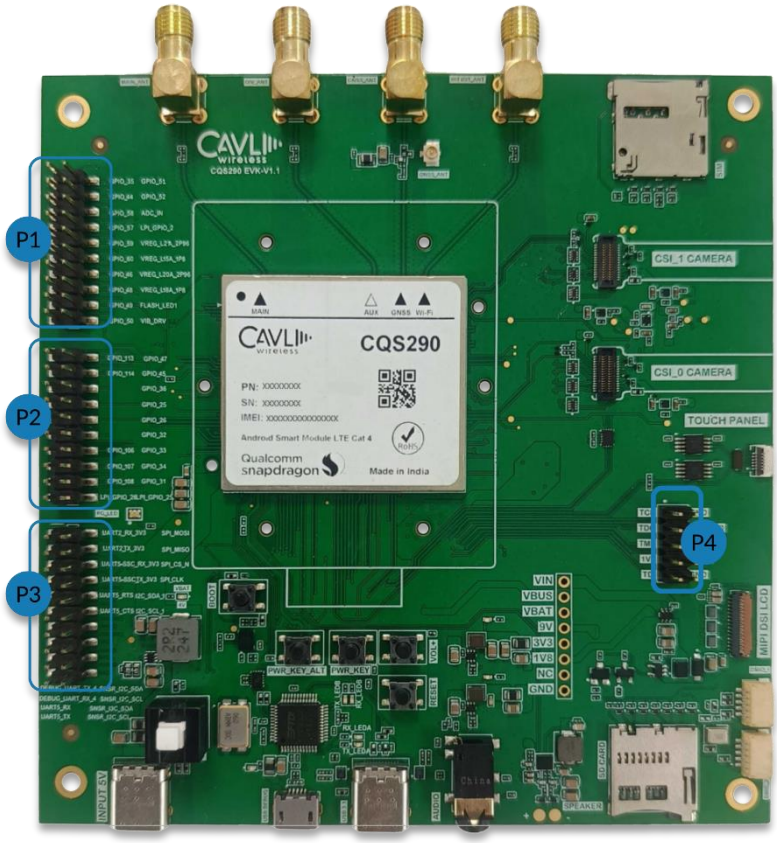


Figure 2: CQS290 EVK Pinout

2.3.1 P1 Pinout

Pin No	Pin name	Pin No.	Pin name
1	GPIO_35	2	GPIO_51
3	GPIO_44	4	GPIO_52
5	GPIO_58	6	ADC_IN
7	GPIO_57	8	LPI_GPIO_2
9	GPIO_59	10	VREG_L2A_2P96
11	GPIO_60	12	VREG_L15A_1P8
13	GPIO_46	14	VREG_L20A_2P96

15	GPIO_48	**16**	VREG_L18A_1P8
17	GPIO_49	**18**	FLASH_LED1
19	GPIO_50	**20**	VIB_DRV

2.3.2 P2 Pinout

Pin No	Pin name	Pin No.	Pin name
1	GPIO_113	**2**	GPIO_47
3	GPIO_114	**4**	GPIO_45
5	GPIO_104	**6**	GPIO_36
7	GPIO_103	**8**	GPIO_25
9	GPIO_102	**10**	GPIO_26
11	GPIO_105	**12**	GPIO_32
13	GPIO_106	**14**	GPIO_33
15	GPIO_107	**16**	GPIO_34
17	GPIO_108	**18**	GPIO_31
19	LPI_GPIO_26	**20**	LPI_GPIO_25

2.3.2 P3 Pinout

Pin No	Pin name	Pin No.	Pin name
1	UART2_RX_3V3	**2**	SPI_MOSI
3	UAT2_TX_3V3	**4**	SPI_MISO
5	UART5_SSC_RX_3V3	**6**	SPI_CS_N
7	UART5_SSC_TX_3V3	**8**	SPI_CLK

9	UART5_RTS	**10**	I2C_SDA
11	UART5_CTS	**12**	I2C_SDA
13	DEBUG_UART_TX_4	**14**	SNSR_I2C_SDA
15	DEBUG_UART_RX_4	**16**	SNSR_I2C_SCL
17	UART5_RX	**18**	SNSR_I3C_SDA
19	UART5_TX	**20**	SNSR_I2C_SCL

2.3.3 P4 Pinout – JTAG Pin

Pin No	Pin name	Pin No.	Pin name
1	TCK	**2**	GND
3	TDO	**4**	PS HOLD
5	TMS	**6**	SRST
7	1V8	**8**	TRST
9	TDI	**10**	GND

3 Component Description

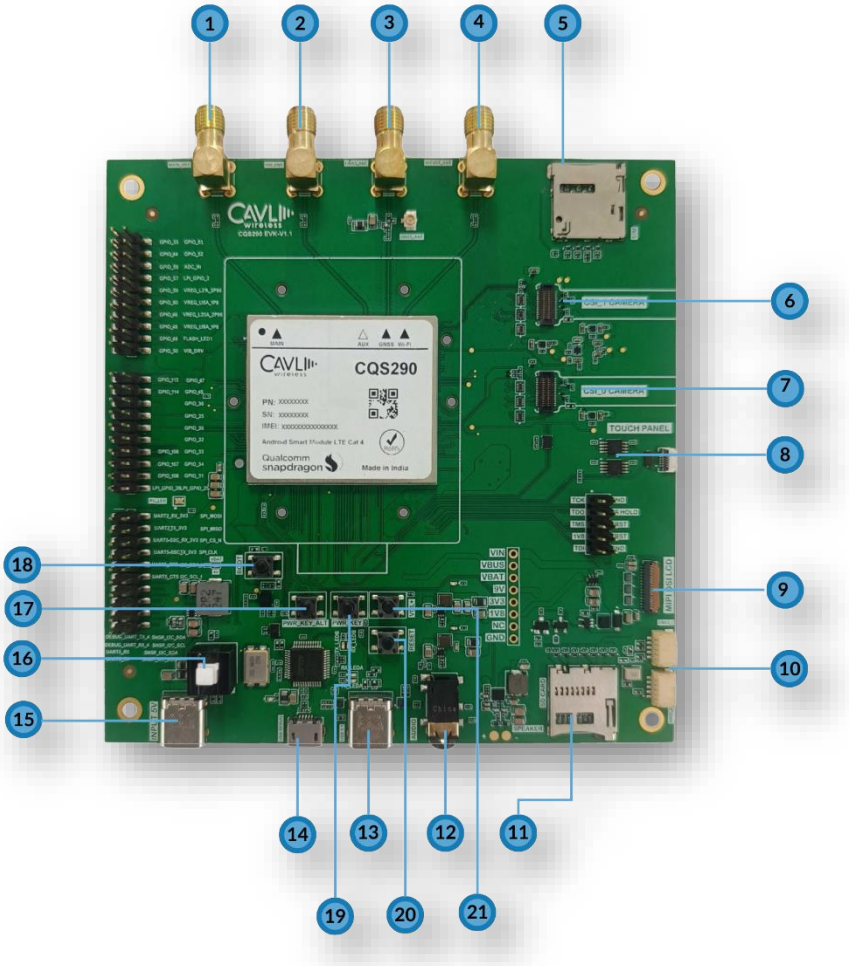


Figure 3: CQS290 EVK Components

1. LTE main antenna
2. Diversity antenna
3. GNSS antenna
4. WiFi-Bluetooth antenna
5. SIM card socket
6. Camera interface 0
7. Camera Interface 1
8. Touch Panel Interface
9. LCD Interface
10. Digital Mic Pins
11. SD card socket
12. Analog Mic Pins
13. USB 3.1 and USB 2.0
14. Debug UART port
15. Power Input Port (Type C)
16. Input Power switch
17. Power Key_ALT button
18. USB Boot button
19. Power key
20. Reset or VOL- Button
21. VOL+ Button

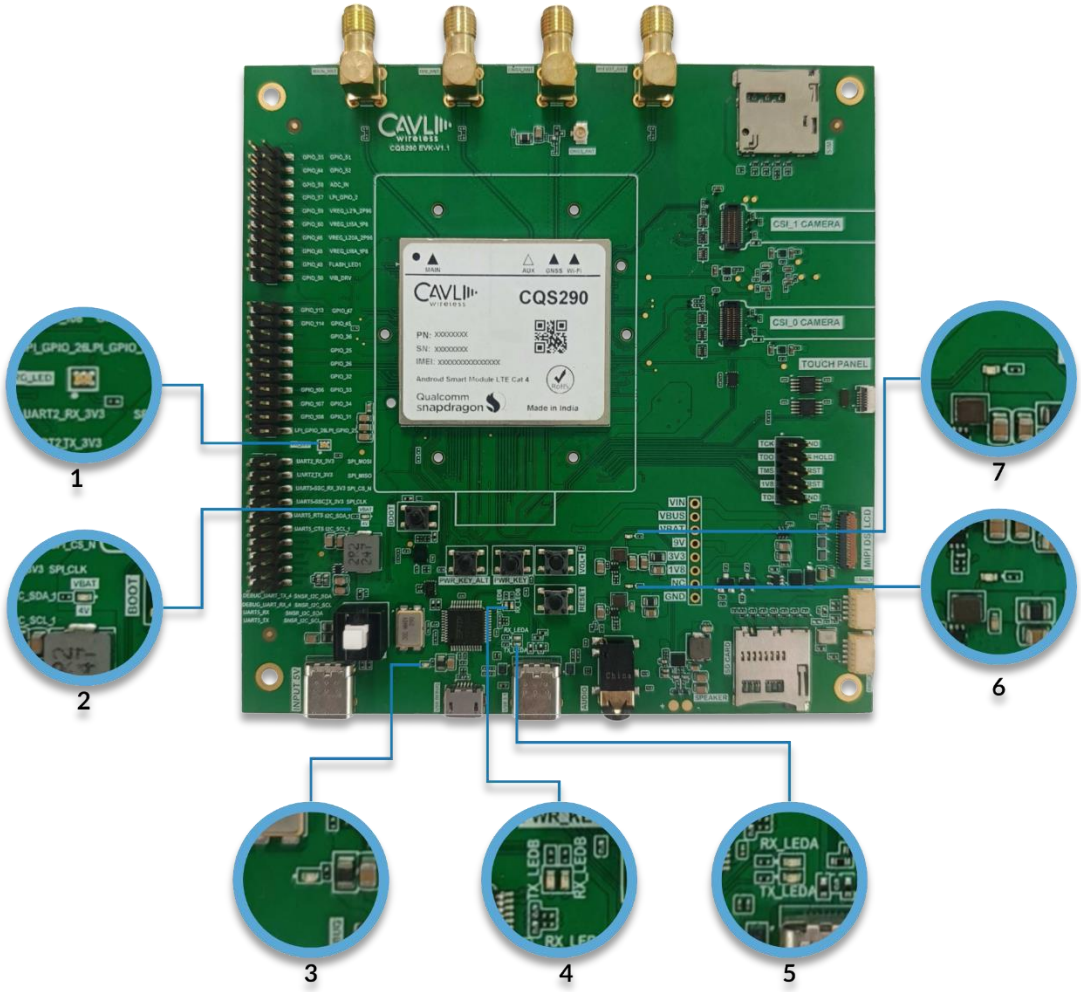
Pin No.	Pin name	Description
1	LTE Main antenna	This is an SMA Antenna connector for interfacing an external LTE Antenna.
2	Diversity antenna	This is an SMA Antenna connector for interfacing a LTE diversity Antenna.
3	GNSS antenna	This is an SMA Antenna connector along with active antenna of voltage 3.3V for interfacing external GNSS Antenna.
4	Wi-Fi – Bluetooth Antenna	This is an SMA Antenna connector for interfacing Wi-Fi or Bluetooth and reception of FM signal is also done through this Antenna port.
5	SIM card socket	You can insert your external SIM card to the micro-SIM card push-push socket.
6	Camera interface 0	First of the MIPI-CSI interface.
7	Camera interface 1	Second of the MIPI-CSI interface.
8	Touch-panel interface	This EVK has a Touch panel interface based on I2C.
9	LCD Interface	This is a MIPI DSI interface used for LCD interfacing.
10	Digital Mic pins	Interfaced to connect MEMS Mic.
11	SD card socket	This interface is used to access the files from SD card using the module.
12	Analog Mic Pins	3.5 mm Audio Jack
13	USB 3.1 & USB 2.0	USB 3.1 and USB 2.0 can be accessed through this port.
14	Debug UART Port	Debug UART of CQS290 is connected to FTDI converter(UART-USB converter) to access the debug log.
15	Power input port (Type C)	It is recommended to power using PD charger. The user can also use PC USB port to power the module.
16	Input power switch	It is used to enable the input power source.
17	Power Key_Alt button	This is the alternate trigger for power key.
18	USB boot button	This button is used to enter into EDL

19	Power key	This is a Power ON trigger for CQS290.
20	Reset / VOL- button	This button is used to reset the module or decrease the volume. • Single Press for volume decreasing • Long press for Reset
21	VOL+ Button	Used to increase the volume.

NOTE

- The CQS290 have two set of MIPI CSI interface which will support up to 13+13 camera sensors with ZSL.
- Support for active GNSS antenna is solely available in the CQS290 Evaluation Kit version 1.1. Prior iterations do not possess this functionality.

3.1 LED Indicators



Led Indicators of CQS290 EVK are:

1. RG LED
2. VBAT power indicator
3. FTDI IC power status Indicator
4. FTDI Channel-1 Rx-Tx indicator
5. FTDI Channel-2 Rx-Tx indicator
6. 1.8V power Indicator
7. 3.3V power indicator

4 Setup Guide

4.1 Setting up the LCD (MIPI DSI) Interface:

1. Consider the MIPI DSI LCD socket on the EVK
2. Open the flap of MIPI DSI LCD Socket by pushing it back
3. Insert the DSI FPC (Flexible Printed Cable), in the proper orientation, into the socket from the front
4. Push the flap to its initial position to hold the FPC in place
5. You have connected the LCD screen.

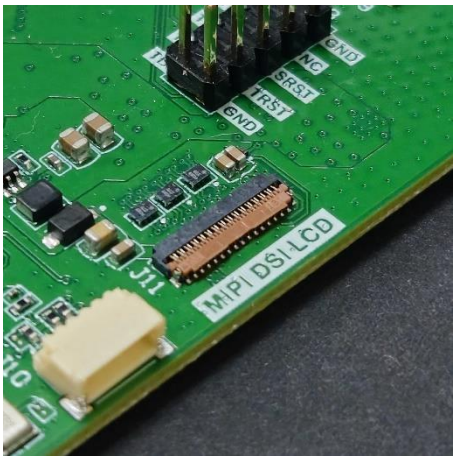


Figure 4 Flap Closed

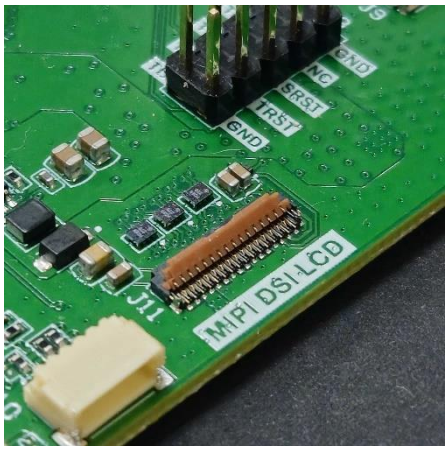


Figure 5 Flap open

4.1.1 Setting up the Touch Panel for the LCD:

1. Consider the Touch Panel Socket on the EVK
2. Open the flap of the socket from the back (by pushing it up)
3. Insert the CSI FPC into the socket, in the proper orientation, from the front
4. Close the flap of the socket, pushing it back to its initial position, to hold the FPC in place.

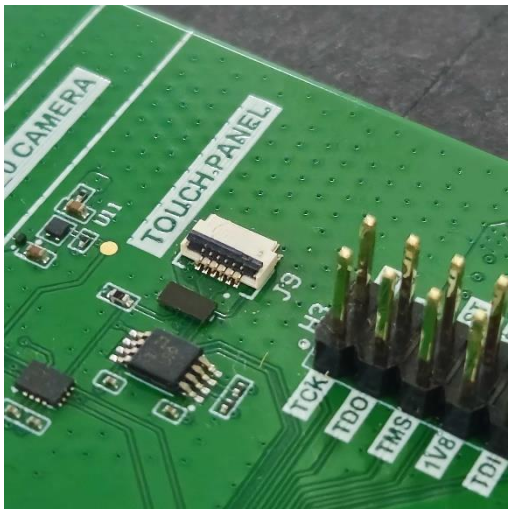


Figure 6 Flap open

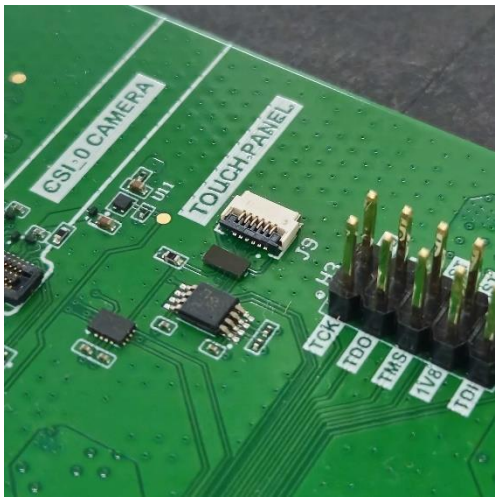


Figure 7 Flap closed

4.2 Setting up the Camera (CSI) Interface:

4.2.1 CSI_0 CAMERA:

1. Consider the socket for CSI_0 CAMERA
2. Insert the board-to-board connector, connected to the camera of choice, into the socket directly
3. Ensure it locks into the socket properly and is held in place.

4.2.2 CSI_1 CAMERA

1. Consider the socket for CSI_1 CAMERA
2. Insert the board-to-board connector, connected to the camera of choice, into the socket directly
3. Ensure it locks into the socket properly and is held in place

4.3 Basic Start-up Steps

Given below are the various steps involved in powering on the CQS290 Module.

1. Place the EVK on an insulated platform.
2. Connect all four antennas provided.
3. Power the EVK by connecting to the INPUT_5V Type-C port (using a Type-C). Please note this is only a power input port and does not have data channels.
4. Connect the Type C to USB 3.1 to access the ADB.
5. Press the Input Power Switch to enable the power supply.
6. After toggling the Input Power Switch, 4 LED's glows up. (VBAT LED, USB UART IC power LED,3.3V LDU LED and 1.8V LDU LED)
7. Long press the Power Key for 2000ms to power on the module.

NOTE

- USB 2.0 and USB 3.0 socket has to be connected in EVK v1
- Recommended to use PD charger as input power source (INPUT_5V)