

SC200R Reference Design

Smart Module Series

Rev. SC200R_Reference_Design_V1.1

Date: 2019-12-25

Status: Released



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Quectel Wireless Solutions Co., Ltd.

Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233

Tel: +86 21 5108 6236

Email: info@quectel.com

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About the Document

History

Revision	Date	Author	Description
1.0	2019-12-04	Anthony SUN	Initial
1.1	2019-12-25	Arsene TONG	<ol style="list-style-type: none">Updated the pin name of Pin 156 from LDO10_2P85 to LDO10_2V85.Updated the pin names of camera interface pins from MCAM_XXX, SCAM_XXX and DCAM_XXX to CAM0_XXX, CAM1_XXX and CAM2_XXX respectively.Updated the power supply pin of sensors U301, U302 and U304 from LDO10_2V85 to LDO17_2V85.Added the reference design of USB OTG function.Added the voltage tolerance (10V) for C103, C104, C711 and C712.

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1 Reference Design

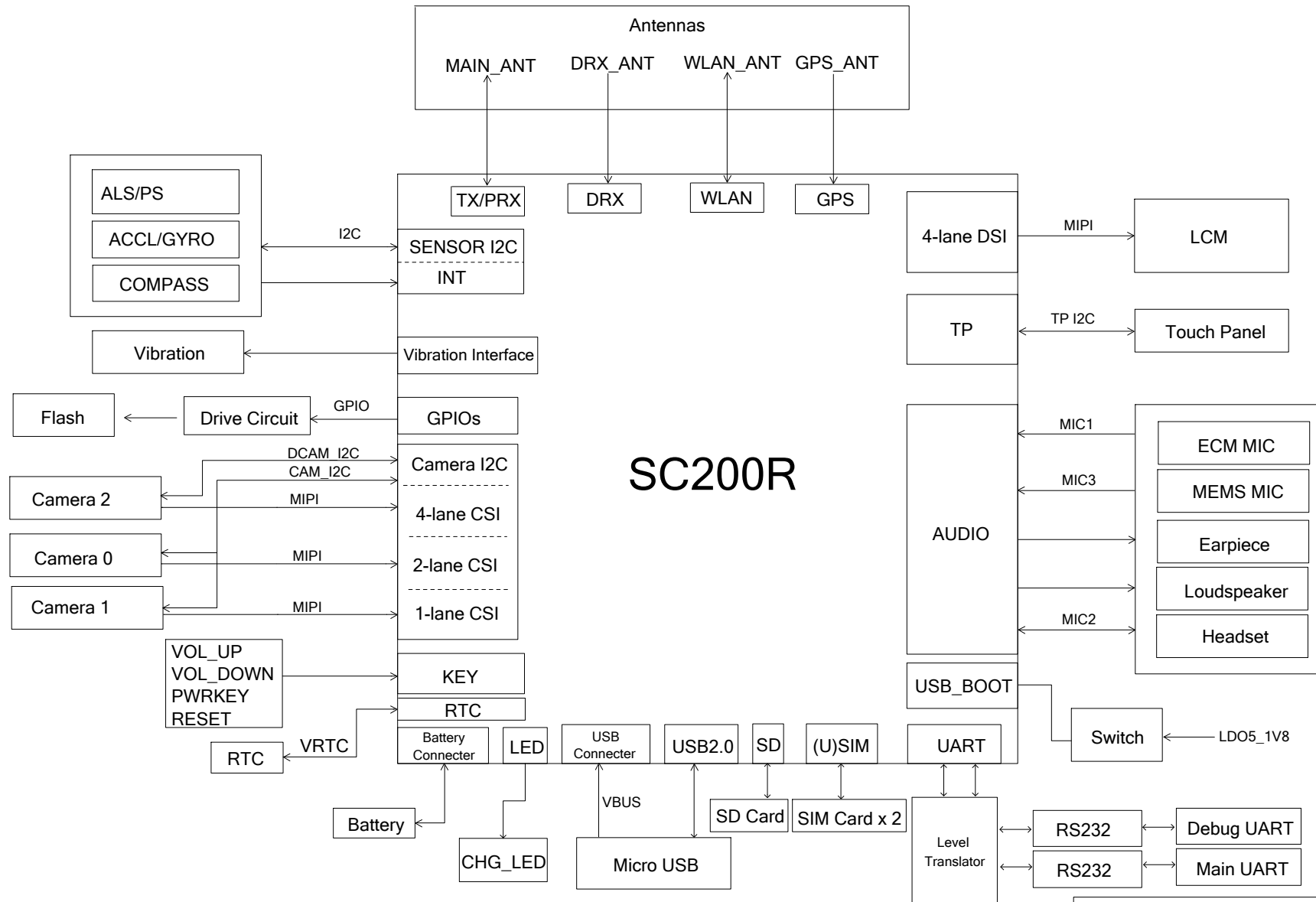
1.1. Introduction

This document provides a reference design for Quectel SC200R module.

1.2. Schematics

The schematics illustrated in the following pages are provided for your reference only.

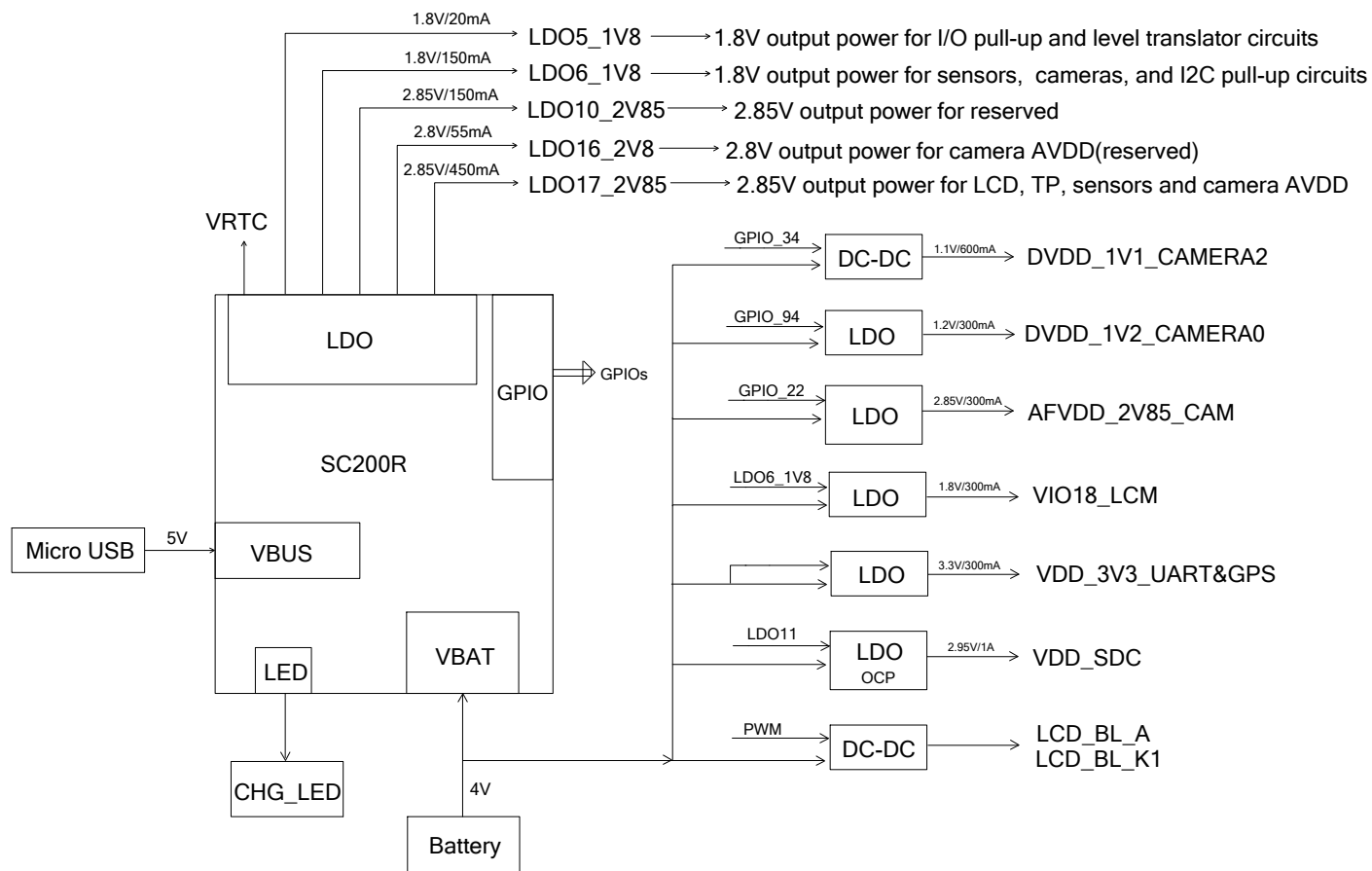
System Diagram



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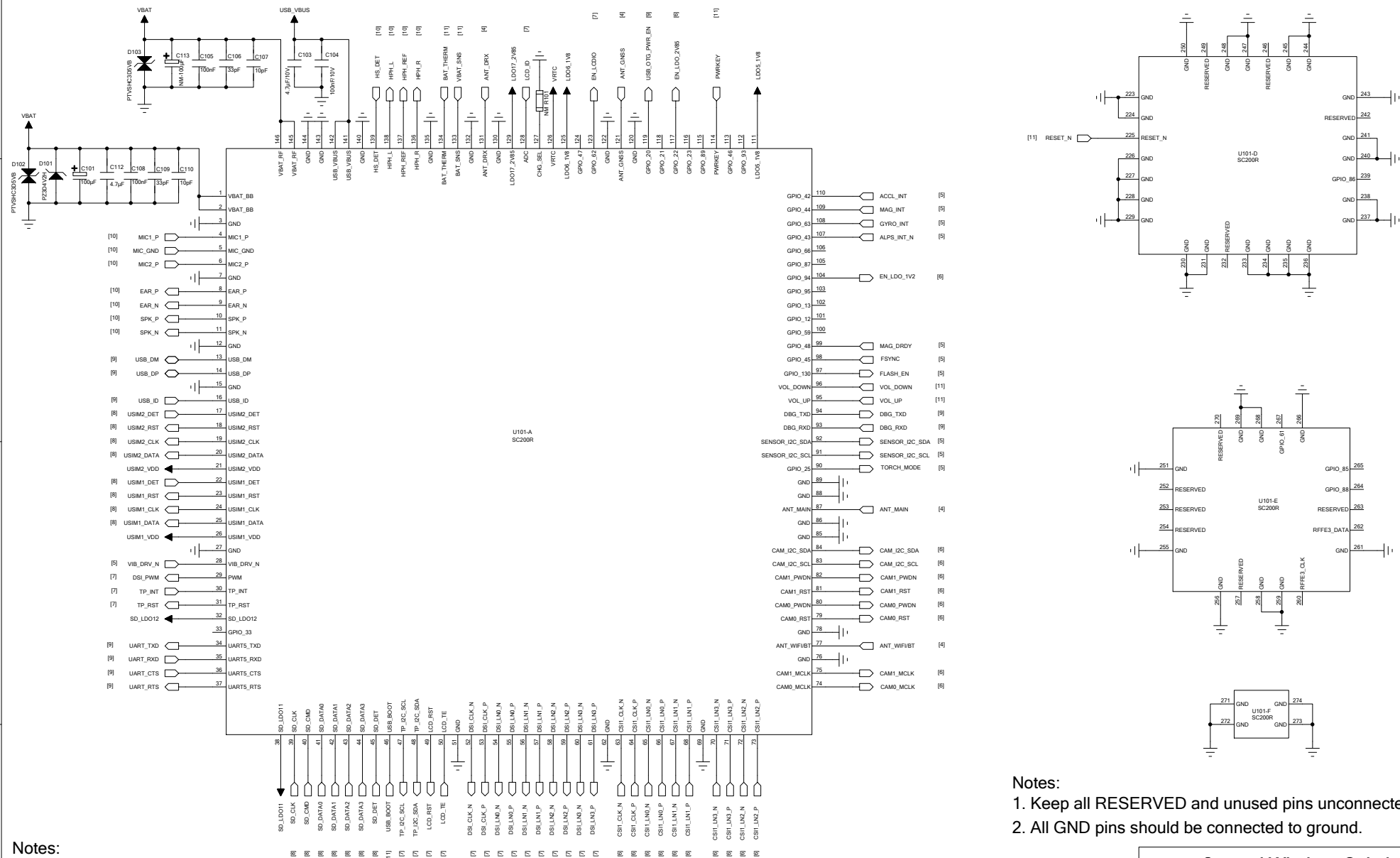
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Power Diagram



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Module Interface 1

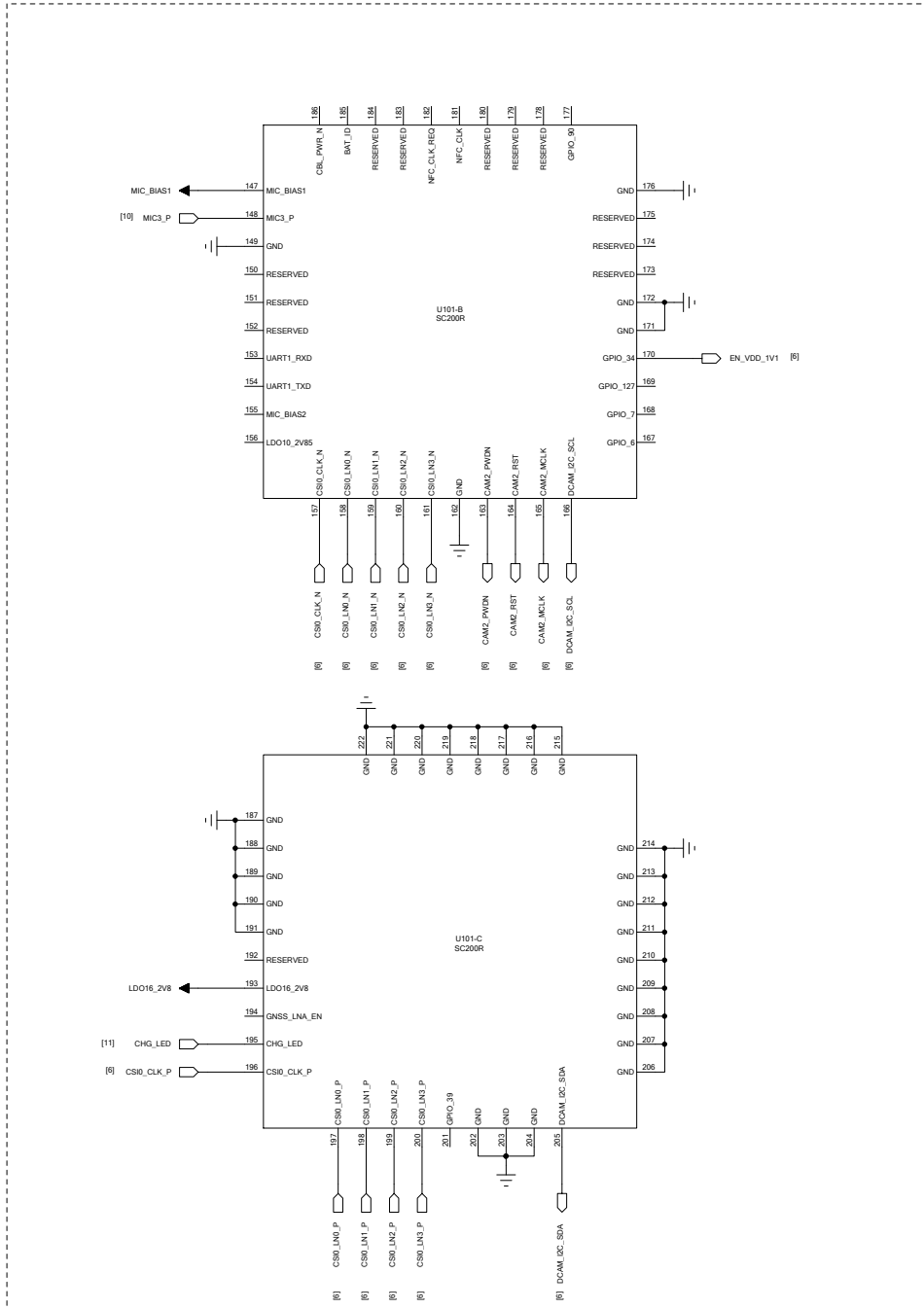


- Notes:**
- Capacitors should be placed close to VBAT_BB and VBAT_RF pins.
 - If an external charger IC is used, pin CHG_SEL should be connected to GND by a 0R resistor.
 - If an internal charger IC is used, pin CHG_SEL should be left floating.
 - Pin 70 and 71 are used as the clock signal of camera 1.
 - Pin 70 and 71 are used as the data signal of camera 1.

- Notes:**
- Keep all RESERVED and unused pins unconnected.
 - All GND pins should be connected to ground.

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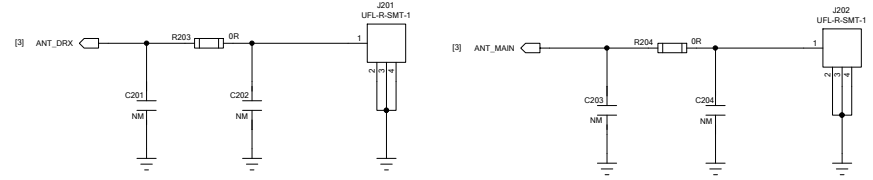
Module Interface 2 and Antenna Interfaces



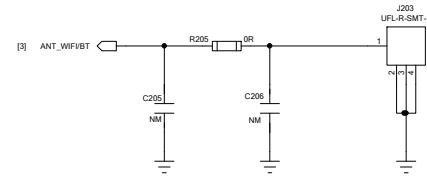
UMTS/LTE Antennas

MIMO Antenna

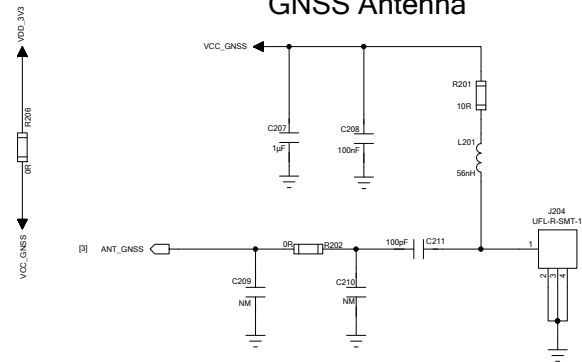
Main Antenna



Wi-Fi/BT Antenna



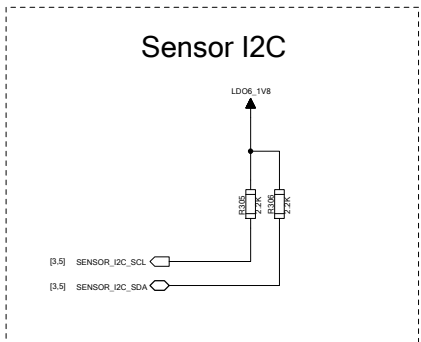
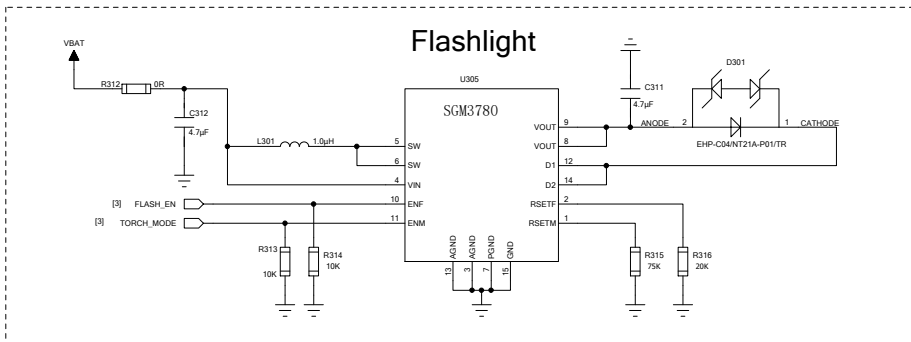
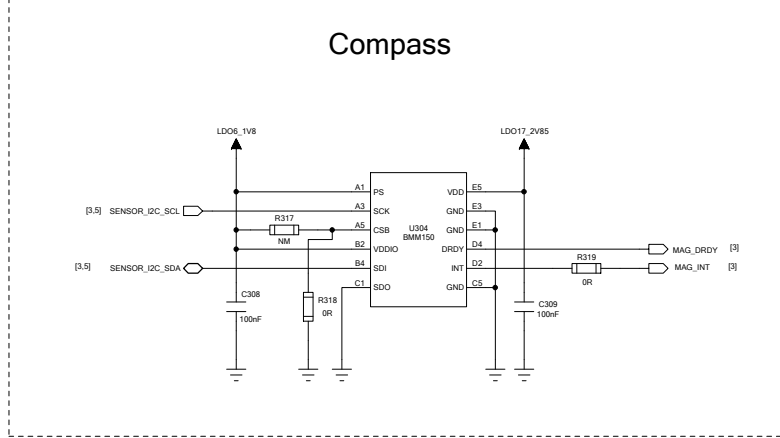
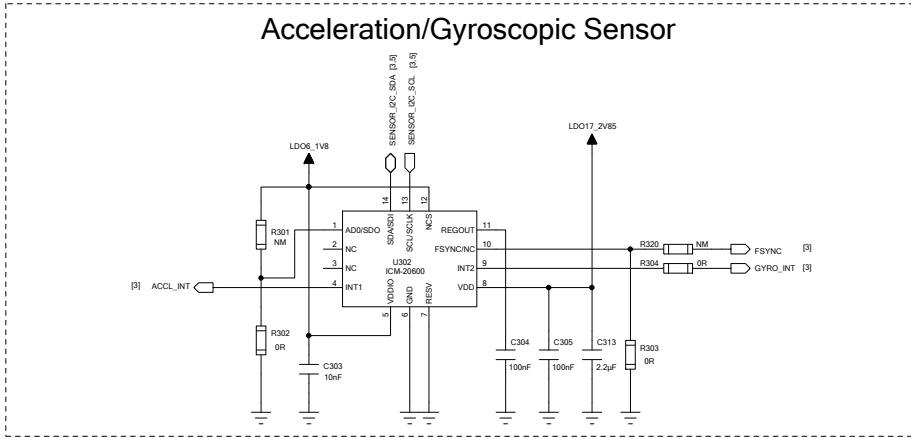
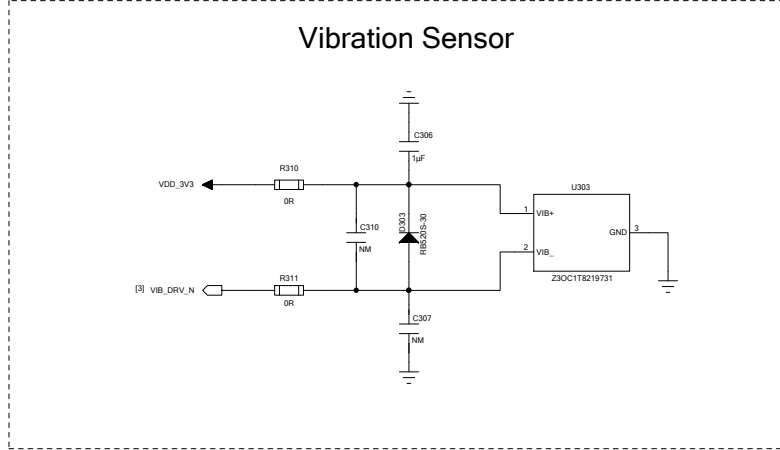
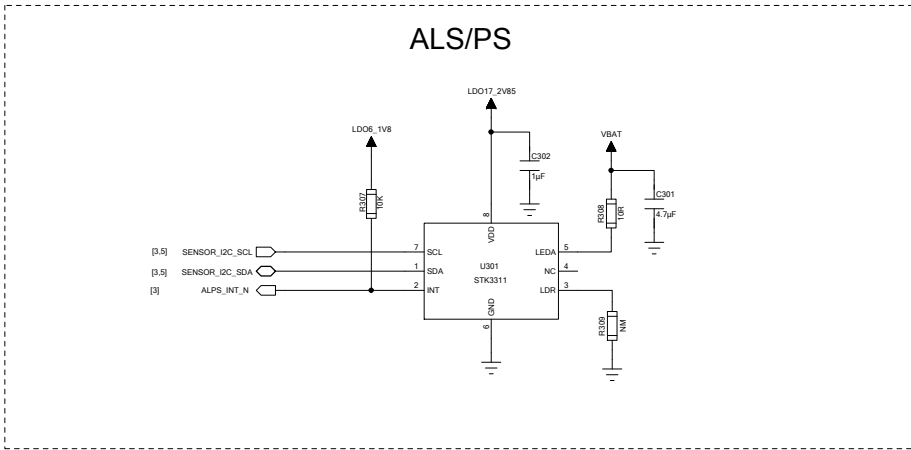
GNSS Antenna



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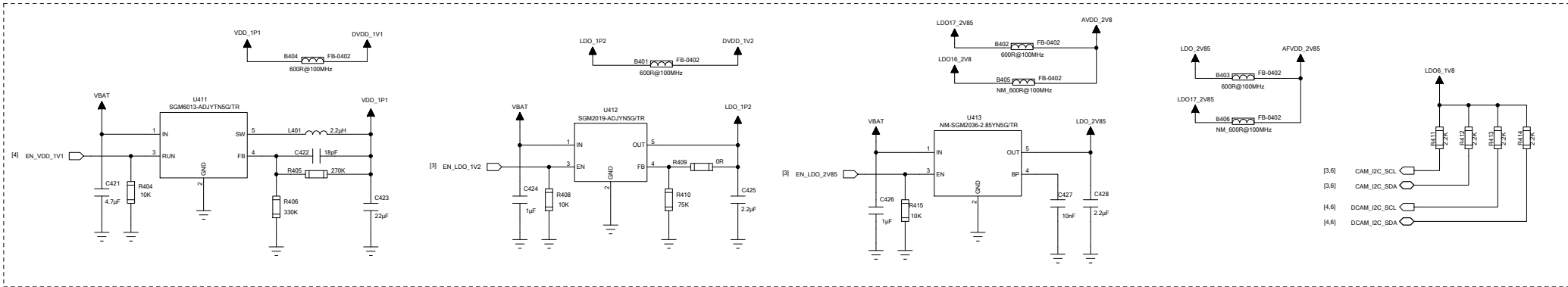
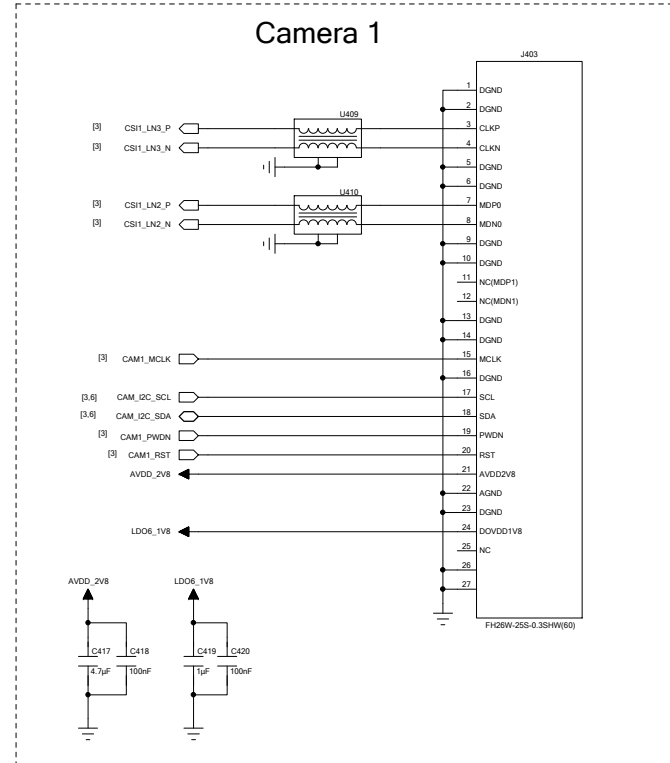
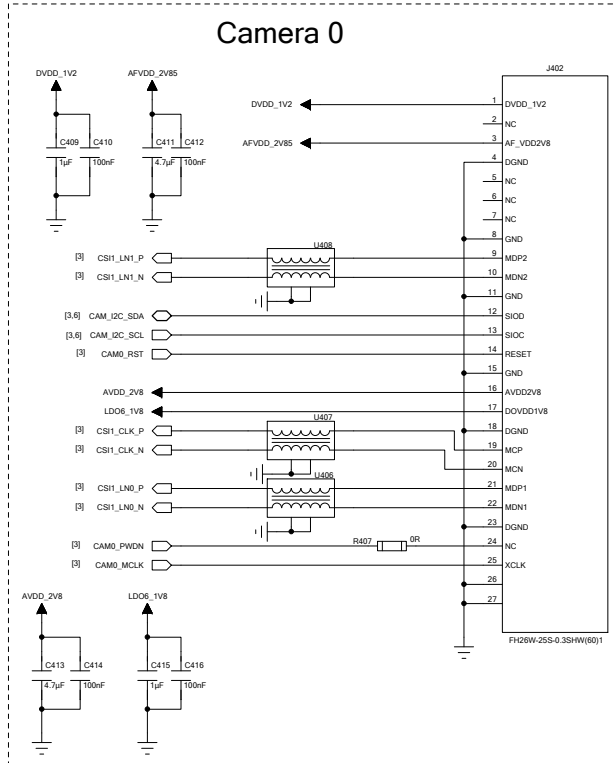
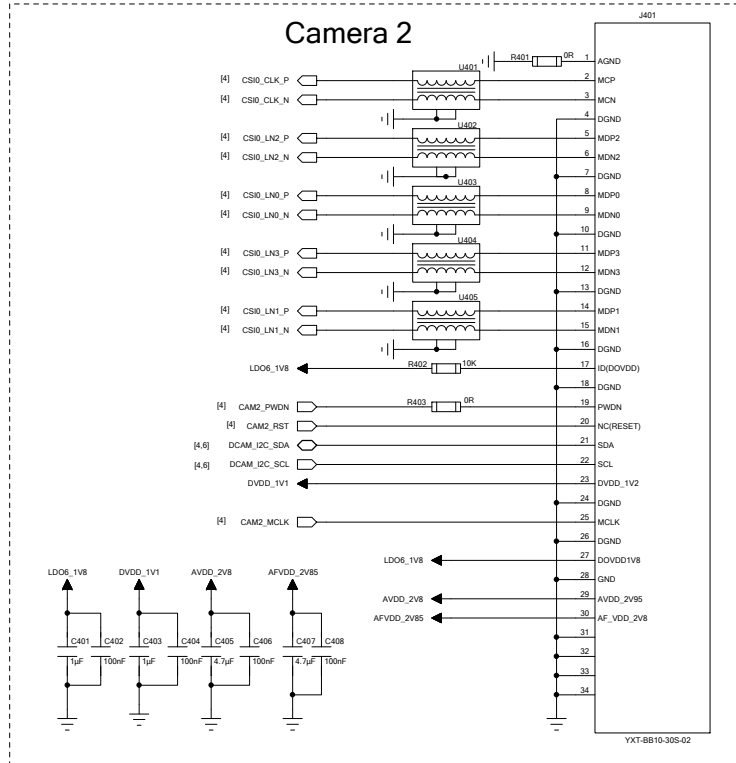
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Sensor Interfaces



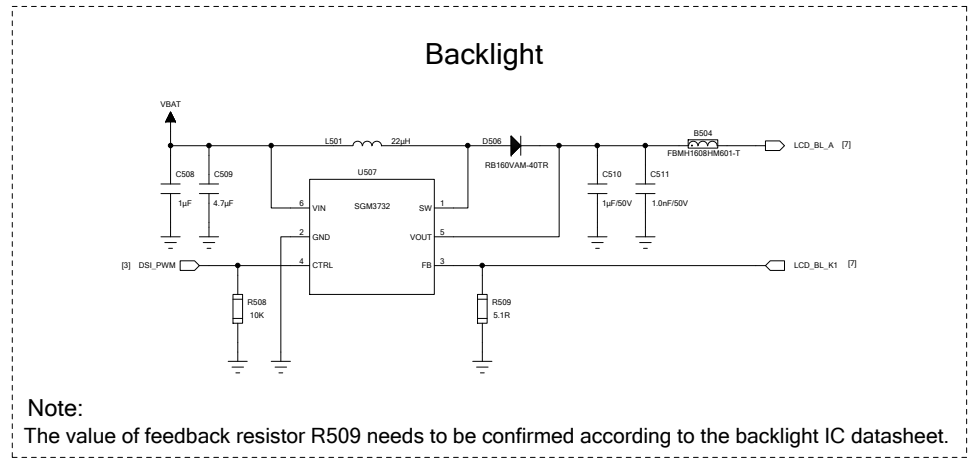
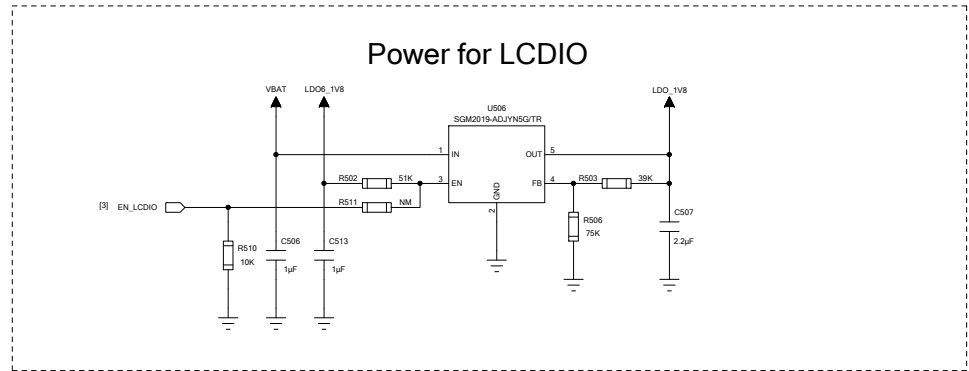
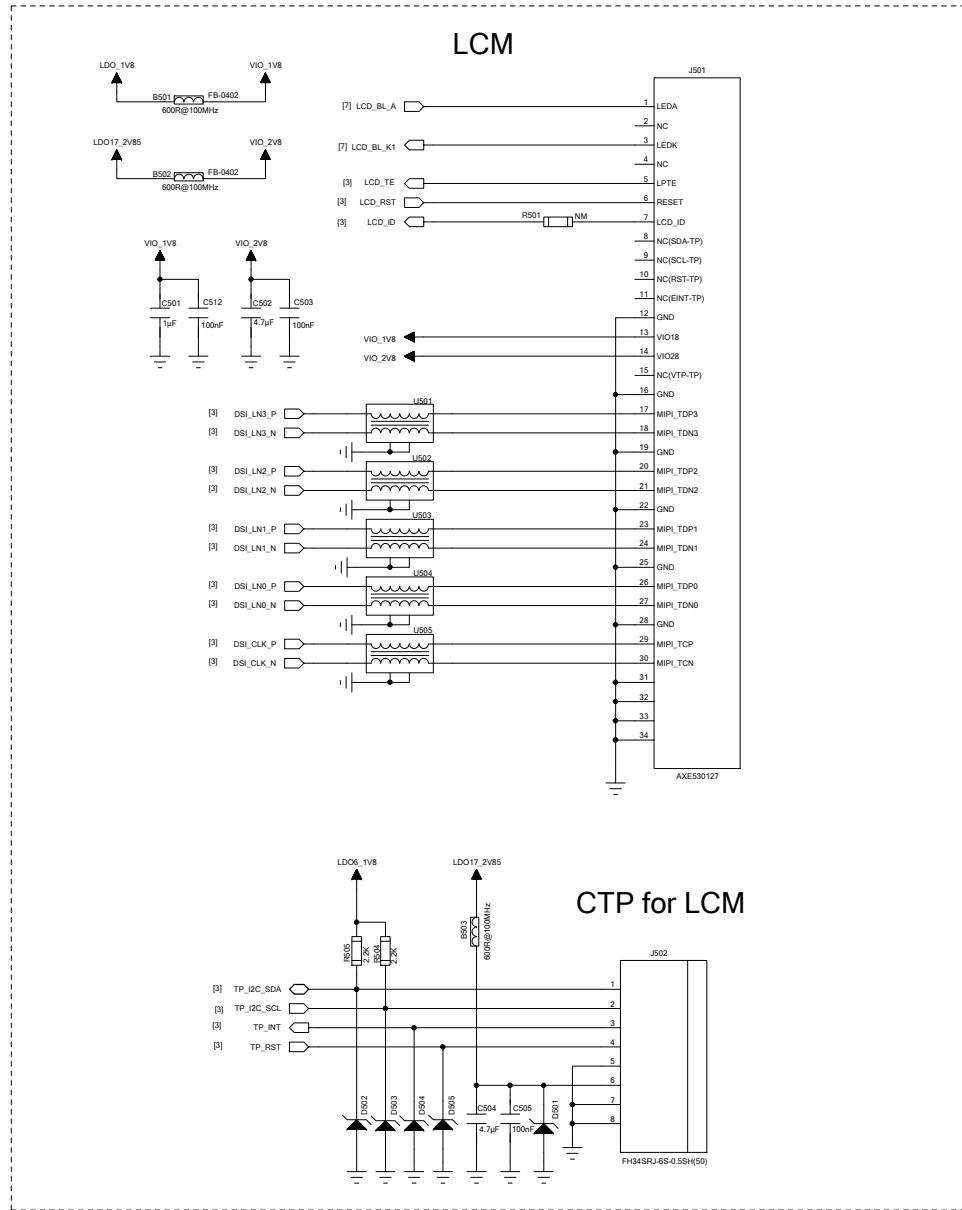
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Camera Interfaces



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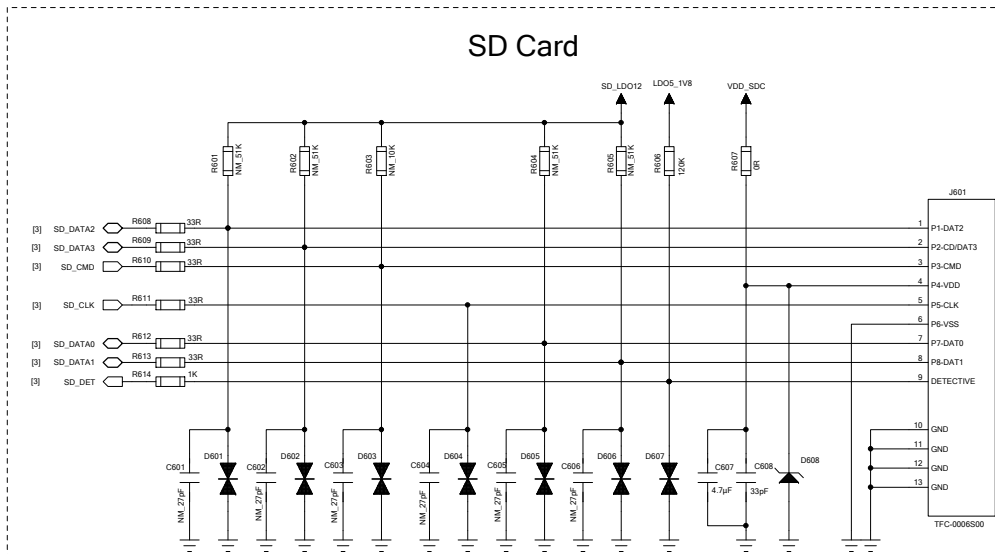
LCM and CTP Interfaces



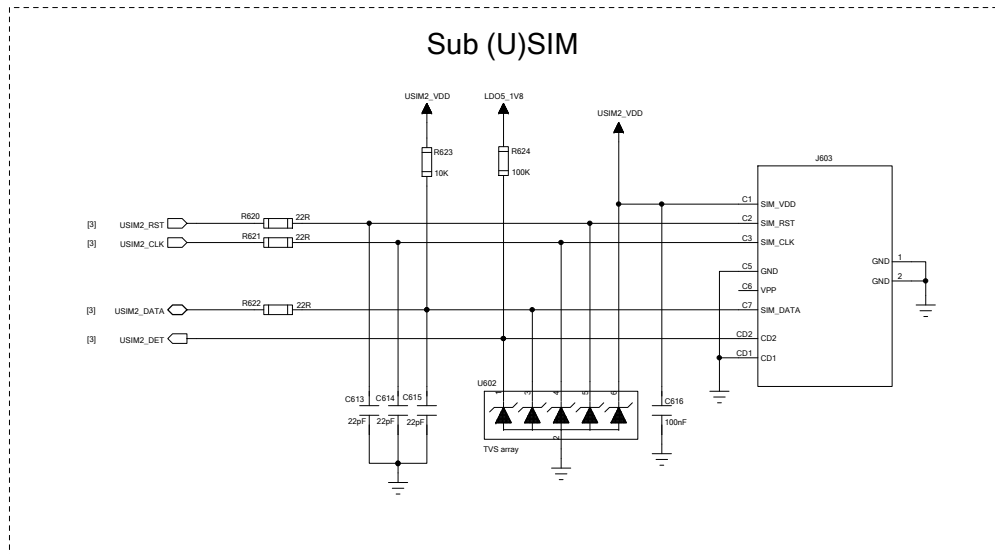
Note:
The value of feedback resistor R509 needs to be confirmed according to the backlight IC datasheet.

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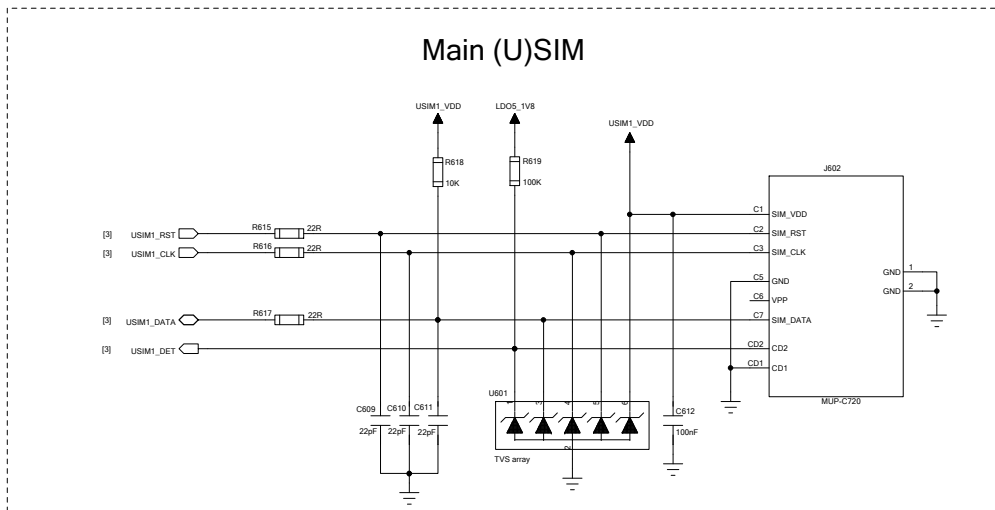
(U)SIM and SD Card Interfaces



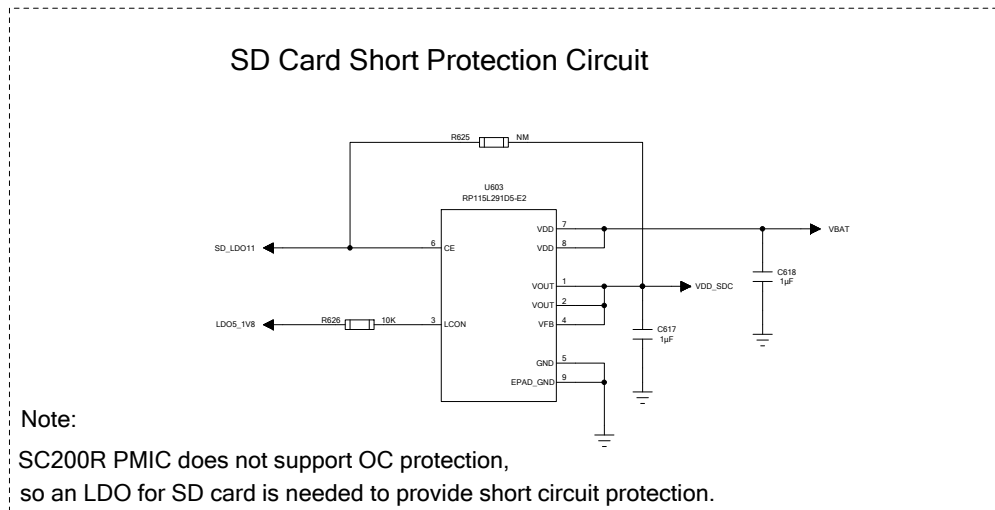
Note:
R608~R613 are applied to suppress the EMI spurious transmission and enhance the ESD protection.



Note:
R620~R622 are applied to suppress the EMI spurious transmission and enhance the ESD protection.



Note:
R615~R617 are applied to suppress the EMI spurious transmission and enhance the ESD protection.

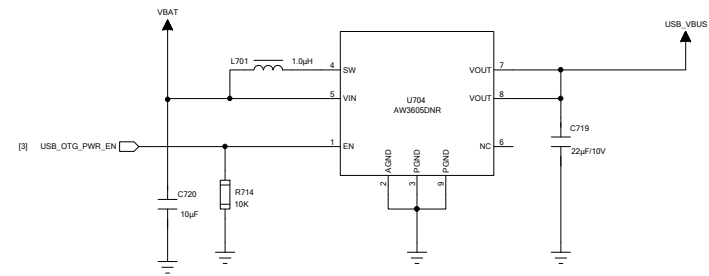
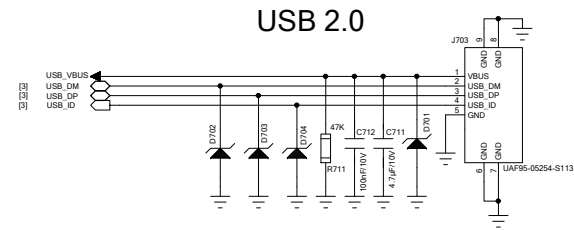
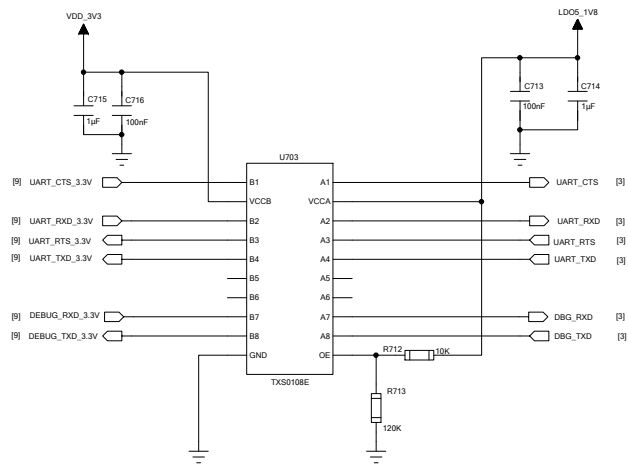
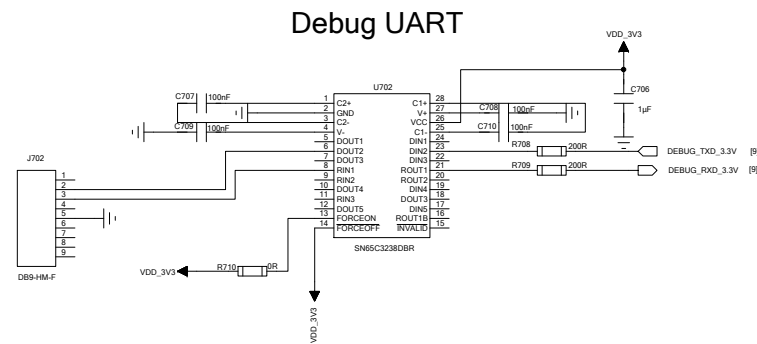
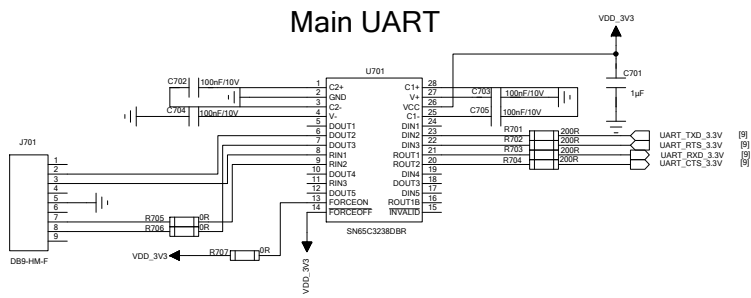


Note:
SC200R PMIC does not support OC protection, so an LDO for SD card is needed to provide short circuit protection.

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USB and UART Interfaces



Notes:

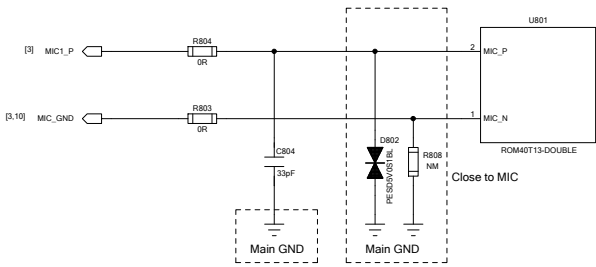
1. It is recommended to add TVS components close to the USB interface.
2. The junction capacitance value of TVS on USB_DP/DM lines should be less than 2pF.

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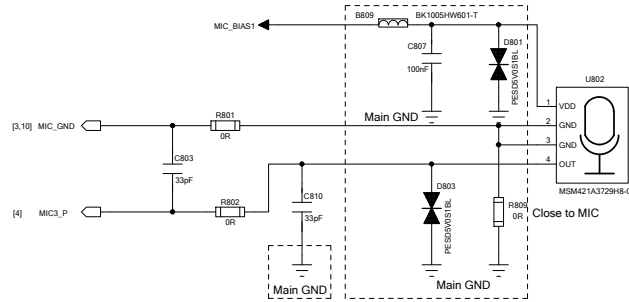
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Audio Interfaces

ECM-type Microphone



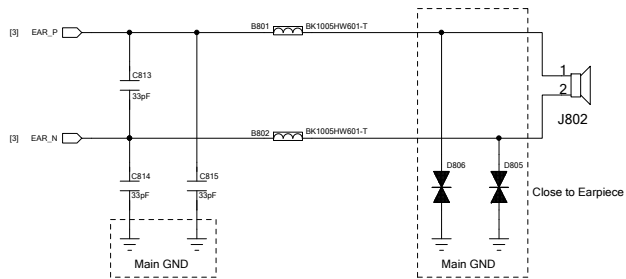
MEMS-type Microphone



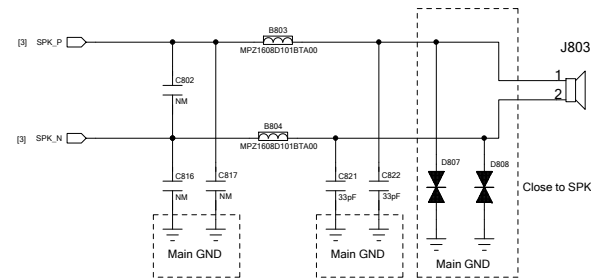
Notes:

1. SC200R supports ECM-type and MEMS-type microphones, for ensuring better interference immunity, the latter one is highly recommended.
2. For more details, please refer to *Quectel_SC200R_Hardware_Design*.

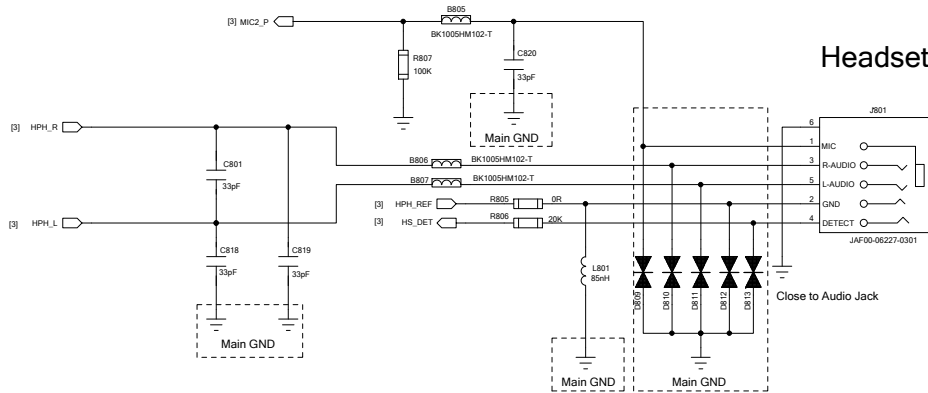
Earpiece



Loudspeaker



Headset



Notes:

- TVS diodes for speaker and earpiece interface pins:
1. The clamping voltage range should be from 10V to 12.5V.

TVS diodes for microphones and Headset interface pins:

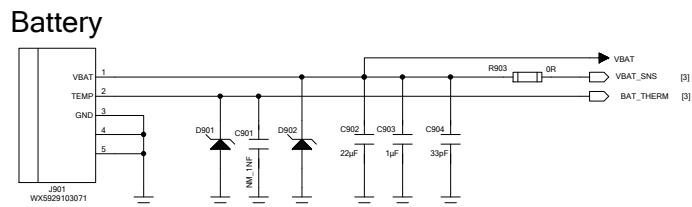
1. The clamping voltage range should be from 5V to 6V.
2. Headset interface has a negative swing and requires a bidirectional TVS.

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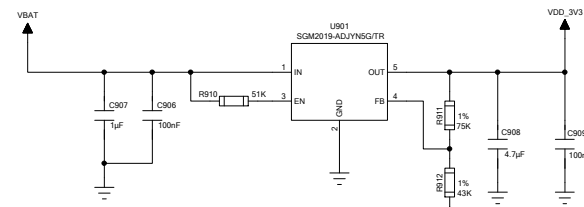
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Power Supply

Battery Application



Power for 3V3



$$V_{out} = [(R911 + R912) / R912] * 1.207 = 3.3V$$

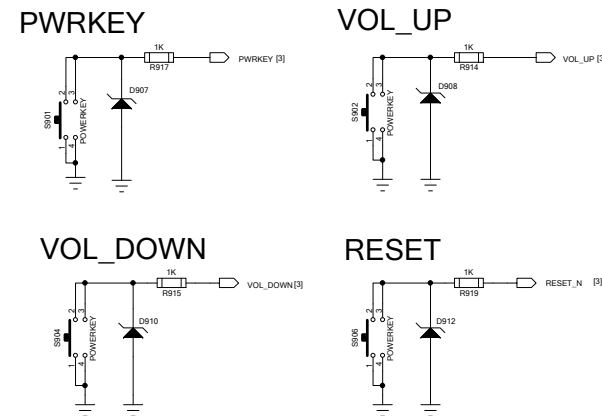
Indicator Lights



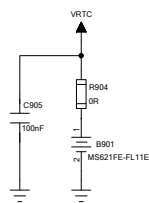
Notes:

1. If an internal charger IC is used, during the charging process, pin CHG-LED will drive the LED.
2. If an external charger IC is used, pin CHG_SEL should be grounded and pin CHG_LED can not drive LED.

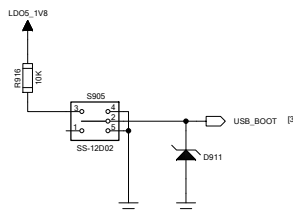
Keypad



Backup Battery



FORCE_USB_BOOT



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