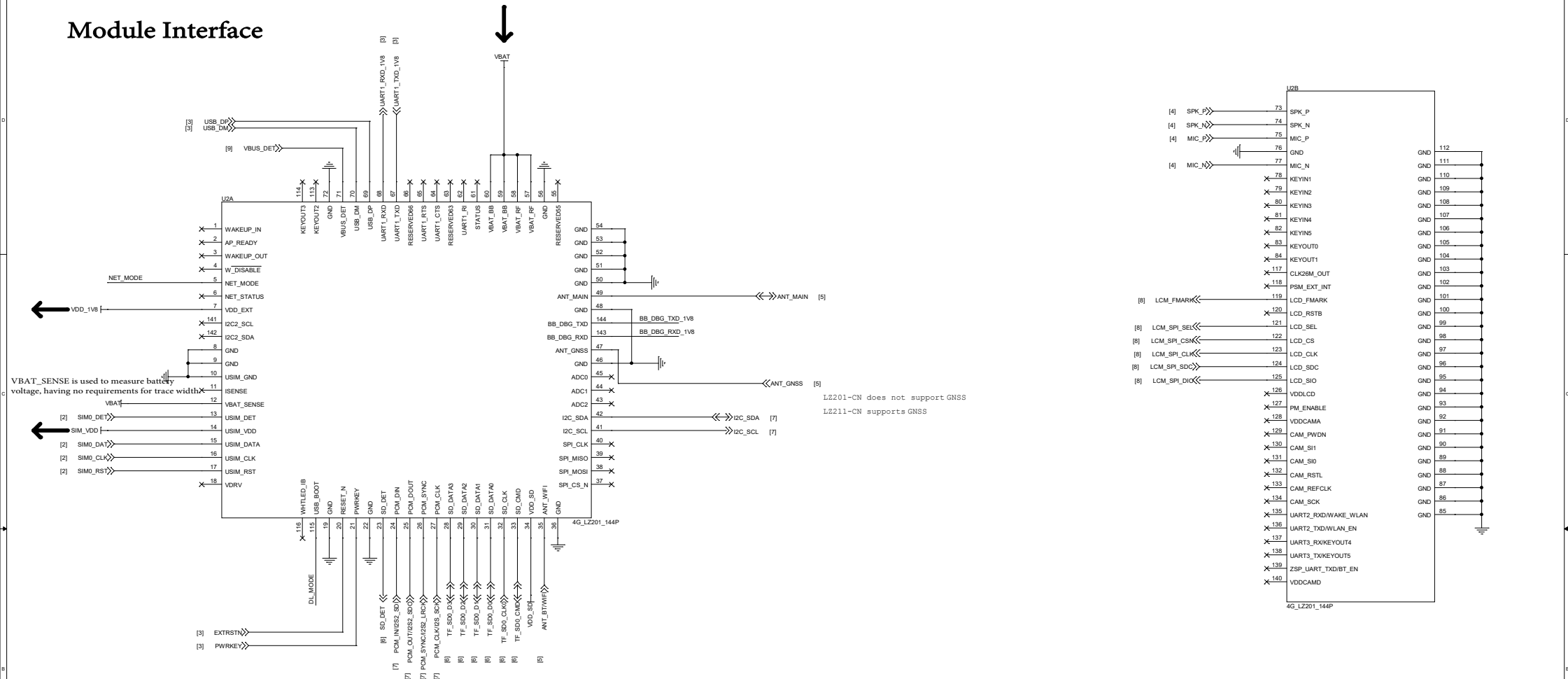
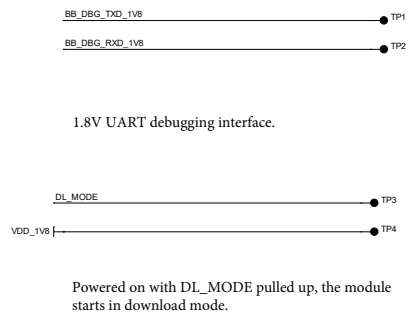


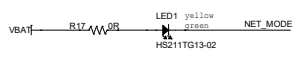
Module Interface



Test Point

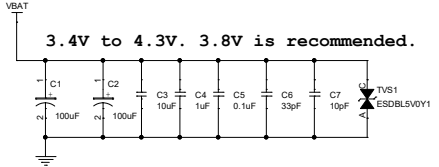


Status Indicator



Status 1: Quick blink indicates the device is connecting to the network.
 Status 2: Slow blink indicates the device is connected to the cloud.

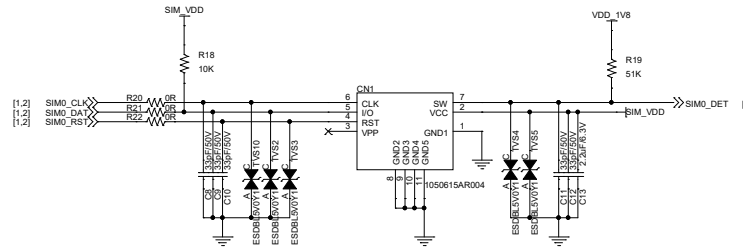
VBAT



VBAT requires a rated output current of 2A. The maximum current of the module is 2A.
 When VBAT is at full load, the ripple should be less than 300 mV.
 VBAT requires a star routing topology.
 Place the capacitor near the VBAT pin on the module.
 Keep the VBAT trace wider than 2.5 mm or directly fill the area with copper.

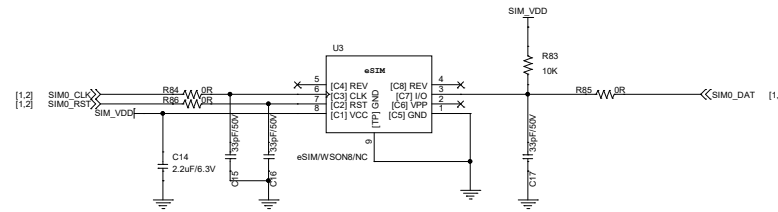
SIM Card Connector or eSIM

2FF/3FF SIM card connector



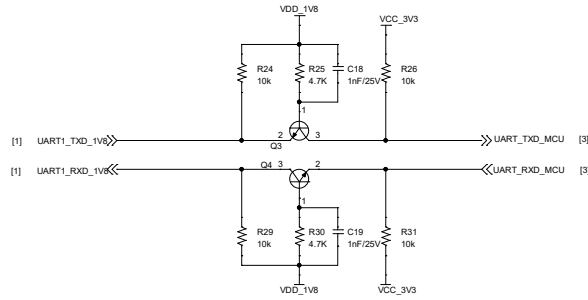
On the signal trace, place the 22Ω near the module.
 SW pin on the SIM card connector
 Leave it floating when a card is inserted. Short it to the ground when no card is inserted.
 If you use built-in SIM card connectors, the TVS can be normally closed (NC).

ESIM MFF2 1.8V WSON 5x6:



Interface with MCU via Serial Port

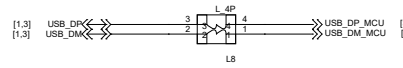
With Tuya serial protocol, you can send serial data to wake up the module.



The serial port level of the module is 1.8V. Use a level shifter if your MCU is not compatible with the voltage requirement.

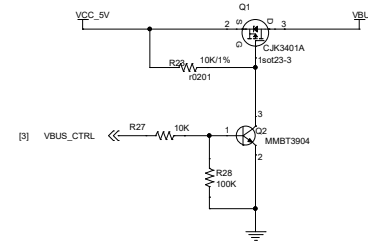
Interface with MCU via USB

You can use cloud mode or ECM mode to control the sleep and wakeup states through USB suspend or VBUS.



Connect a common mode choke L8 between the MCU and module in series. To reduce EMI noise, place the inductor near the module. If no EMI is present, you can use two zero-ohm resistors alternatively.

5V power supply from motherboard



VBUS is used to detect the presence of the USB bus. VBUS_CTRL is used to control the power on and off of VBUS. Control sleep mode:

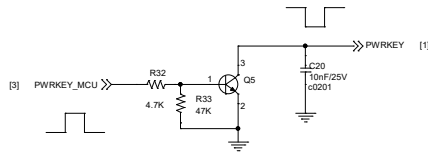
1. If the host's USB supports suspend, you can use the USB suspend feature to make the module enter sleep mode.
2. If the host's USB does not support suspend, you can power off VBUS to make the module enter sleep mode.

D

C

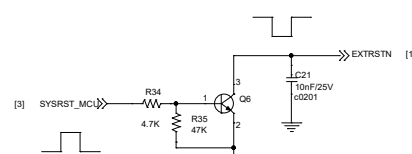
Module Control

Module power on/off control



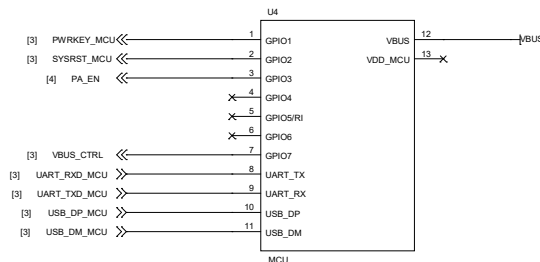
You can control PWRKEY using the MCU, or connect a zero-ohm resistor in series to enable auto power-on by pulling down PWRKEY.

Module reset control



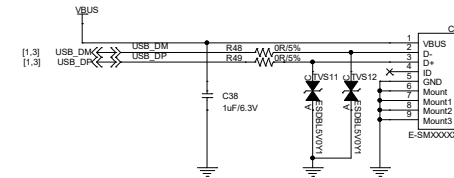
B

Microcontroller unit



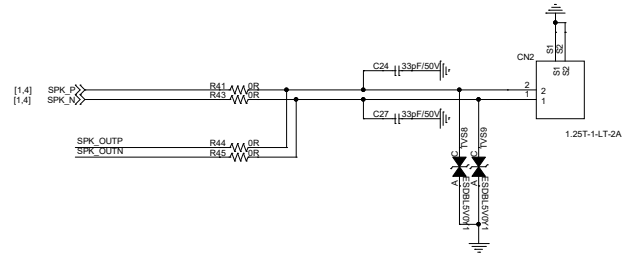
A

Micro-USB



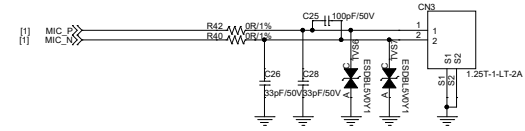
You can reserve the USB port for firmware download and debugging.

SPK

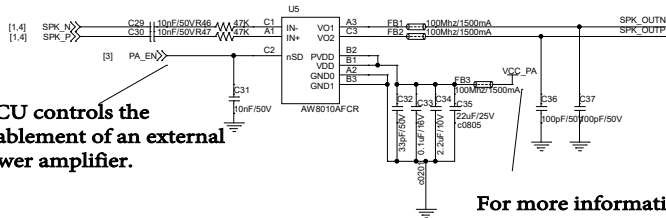


The module has an internal class AB amplifier that features an output power of 600 mW and an 8Ω speaker.

MIC



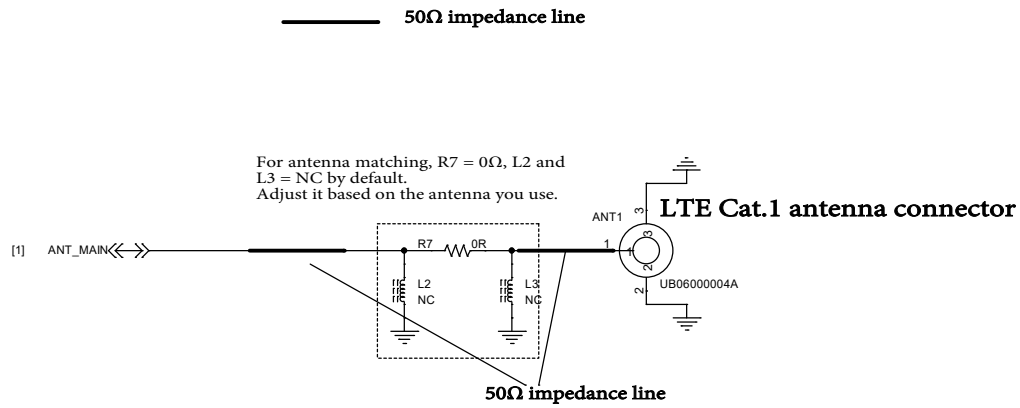
External power amplifier



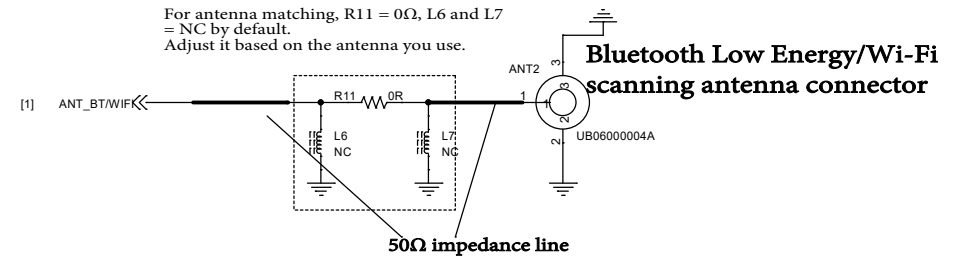
MCU controls the enablement of an external power amplifier.

For more information about the voltage of the audio power amplifier, see the datasheet of the chip you use.

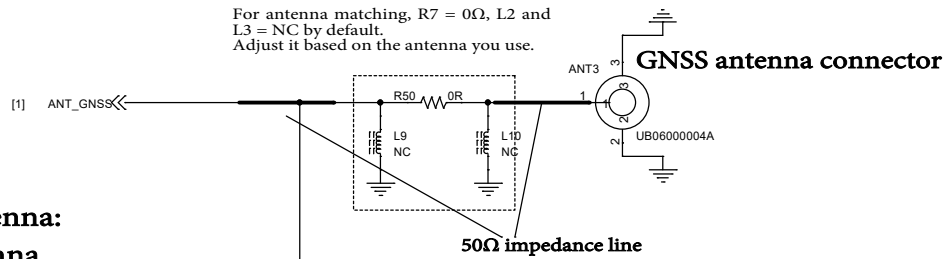
LTE Antenna



Bluetooth/Wi-Fi Antenna

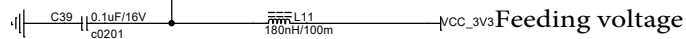


GNSS Antenna



Options for GNSS antenna:

1. SMT ceramic antenna
2. External passive antenna connected to SMA interface
3. External active antenna connected to SMA interface

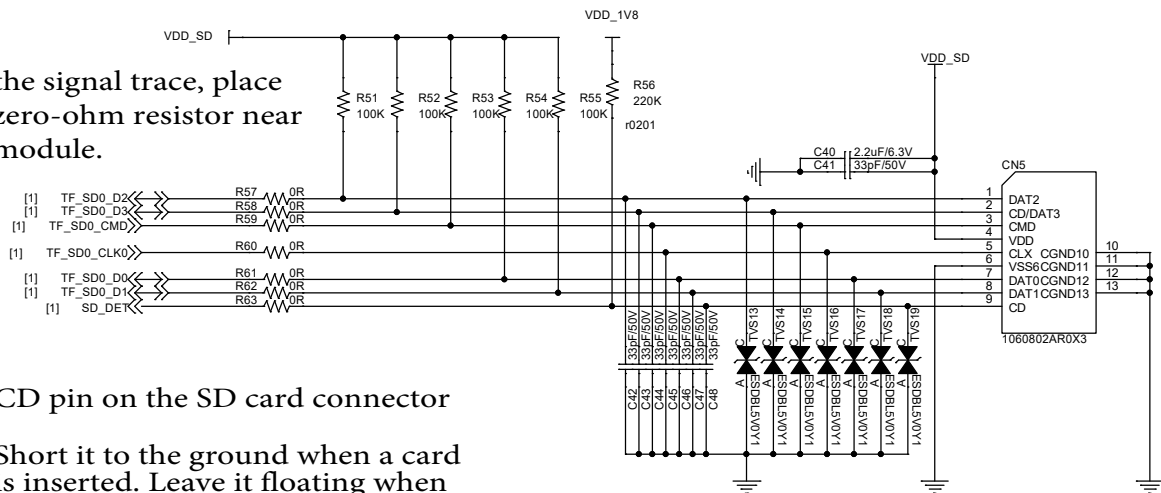


If you use an external active antenna, choose an appropriate feeding voltage.

tuya Tuya Inc.			
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File:	05.Ant		
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SD/TF Card

On the signal trace, place the zero-ohm resistor near the module.



CD pin on the SD card connector

Short it to the ground when a card is inserted. Leave it floating when no card is inserted.

SD_DET does not have pull-up resistors in LZ201 modules.

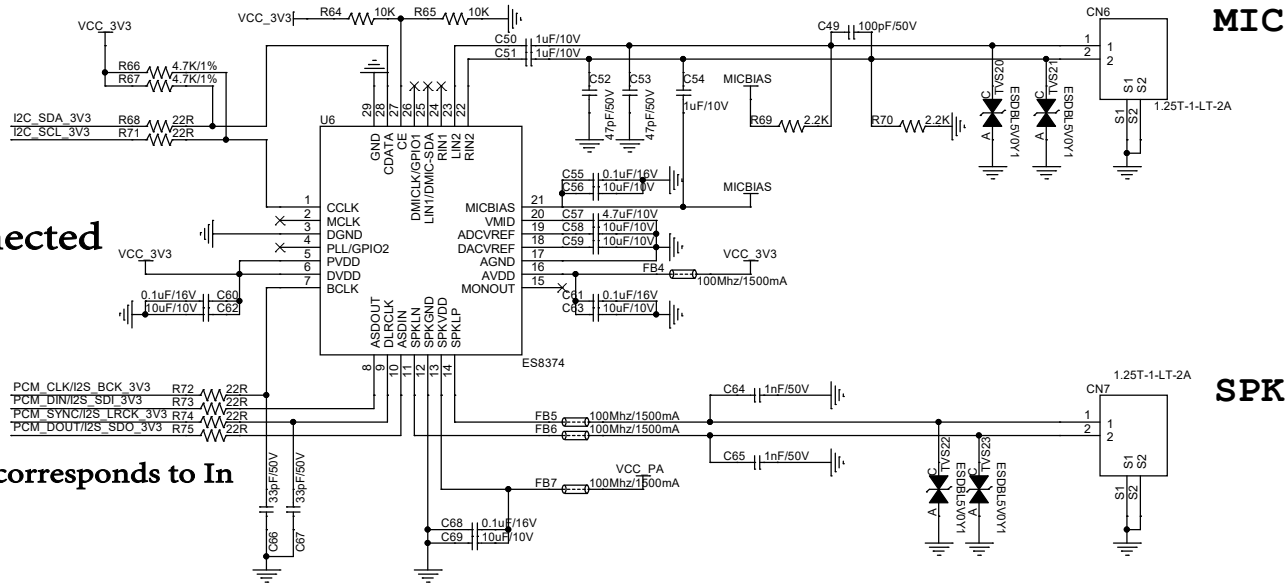
The maximum output current of VDD_SDIO is 150 mA. If the SD card current consumption exceeds 150 mA, an external power supply is needed.

External Codec

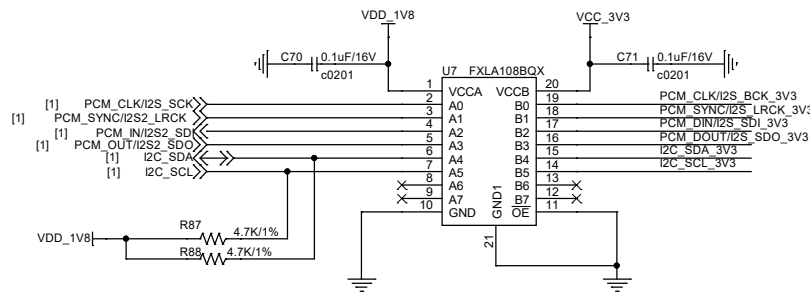
If you do not use the module's built-in power amplifier, you can adopt an external codec chip through PCM signals.

MCLK not connected
Use PCM bus

Out corresponds to In



External Codec Level Shifter

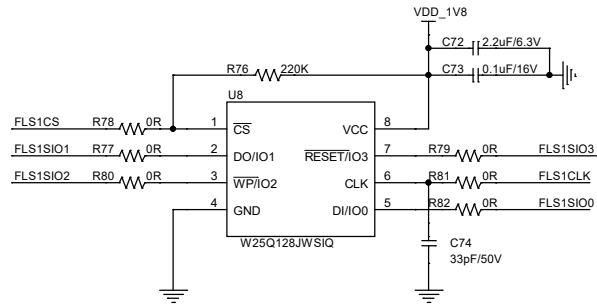


PCM/I2S and I2C level shifter

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Designed by:	<Tuya>	Sheet:	7 of 10

SPI_FLASH

- [1] LCM_FMARK<<<----- FLS1SIO3
- [1] LCM_SPI_SEL<<<----- FLS1SIO2
- [1] LCM_SPI_CS<<<----- FLS1SIO1
- [1] LCM_SPI_CLK<<<----- FLS1SIO0
- [1] LCM_SPI_SDC>>>----- FLS1CS
- [1] LCM_SPI_DIC<<<----- FLS1CLK

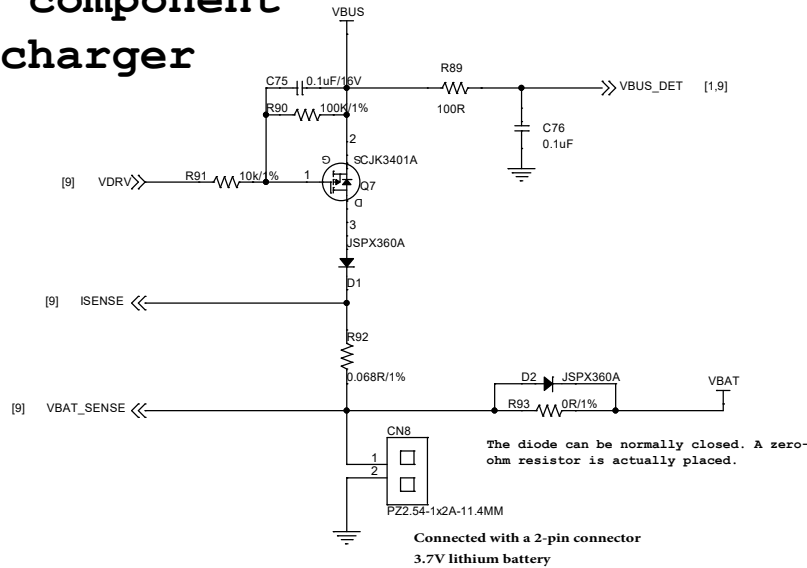


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File:	08.SPIFLASH		
Date:	Nov 22, 2021	Rev:	<V104>
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Battery Power Supply

Linear charger circuit

Discrete component battery charger

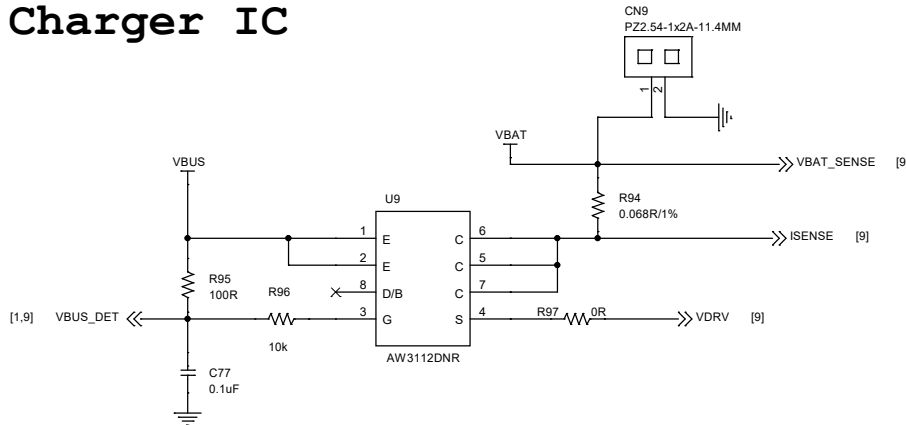


The maximum charging current for a linear charger should be less than 700 mA.

To get an accurate charging current, ISENSE and VBAT_SENSE can be routed as a pseudo-differential mode (0.075 mm/0.075 mm/0.075 mm).

If the module is powered by a battery, it will trigger the power-off program when the voltage drops below 3.38V. In this case, take care of the power of other components to avoid battery over-discharge.

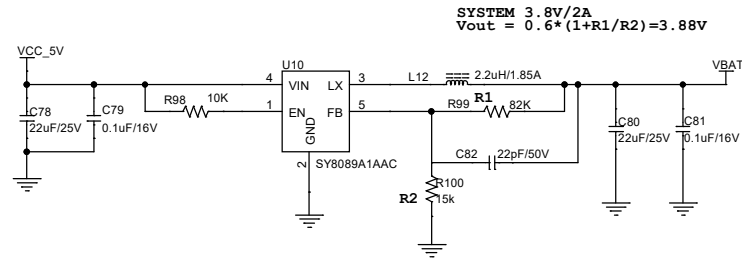
Battery Charger IC



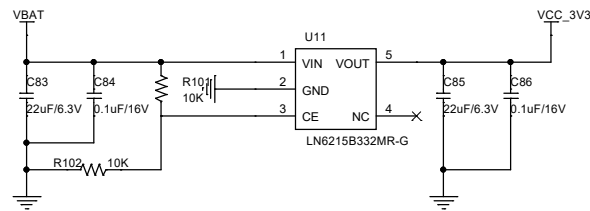
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File:	09.Charge		
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5V DC Power Supply

POWER_VBAT



POWER_VDD_3V3



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Project:	L22x1 reference design		
File:	10.Power		
Date:	Nov 22, 2021	Rev:	<V104>
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