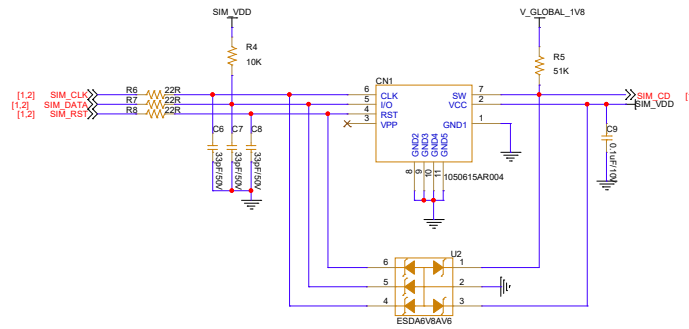


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|---------------------|-----------------------------|---------------|----------|
| Project: | TSC600U-CN reference design | | |
| File: | 00.BLOCK | | |
| Date: | Sep 20, 2022 | Rev: | <V101> |
| Designed by: | <Tuya> | Sheet: | 11 of 11 |

SIM Card Connector or eSIM

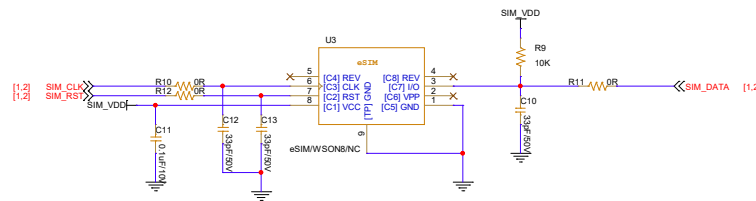
2FF/3FF SIM card connector



On the signal trace, place the 22 Ω 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 do not need the hot-plug feature, keep SIM_CD floating.
 If you use built-in SIM card connectors, the TVS can be normally closed (NC).

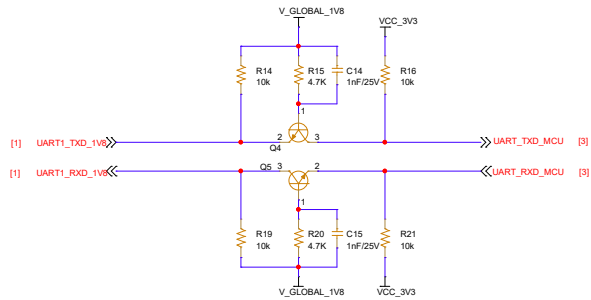
ESIM MFF2

1.8V WSON 5x6:



Interface with MCU via Serial Port

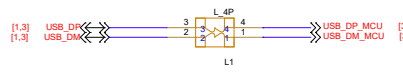
With Tuya serial protocol, you can send serial data to wake up the module.



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

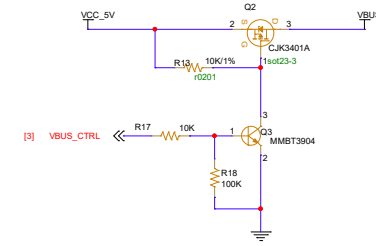
Interface with MCU via USB

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



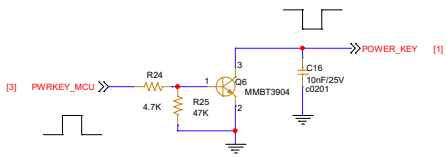
VBUS is used to detect the presence of the USB bus. VBUS_CTRL is used to control the power on and off of VBUS.

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.

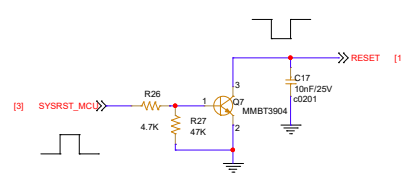
Module Control

Module power on/off control

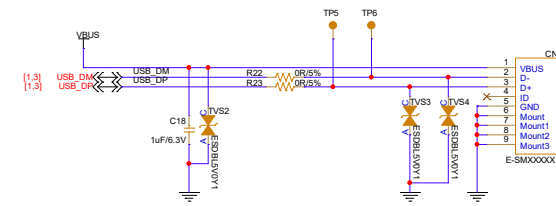


1. Pull down PWRKEY for 1.5s to power on the module, and release PWRKEY after startup.
2. You can detect the voltage on V_GLOBAL_1V8 to determine whether startup is completed.
3. You can control PWRKEY with a button, or connect a 1 k Ω resistor in series to pull down PWRKEY for auto power-on.

Module reset control

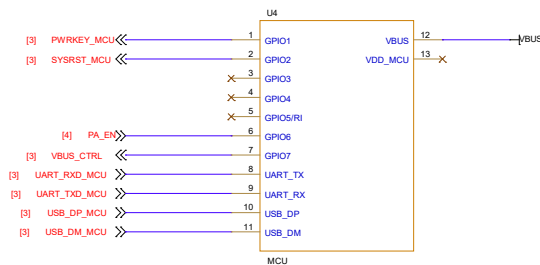


MICRO USB

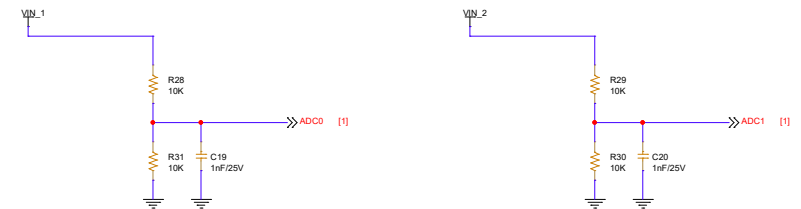


You can reserve the USB port for firmware download and debugging.

Microcontroller Unit



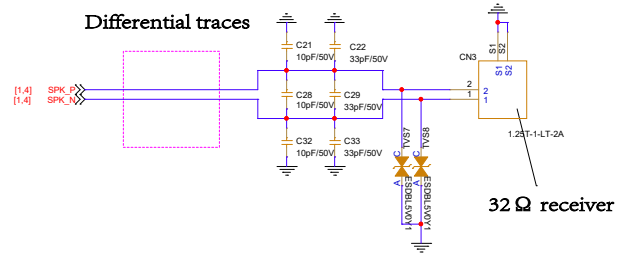
ADC Input



1. ADC's voltage input range: 0 to VBAT. Resolution: 11 Bits
2. It is recommended to use a 1% tolerance divider resistor. The resistance should be at least 10 k Ω for less current consumption and reverse current protection.

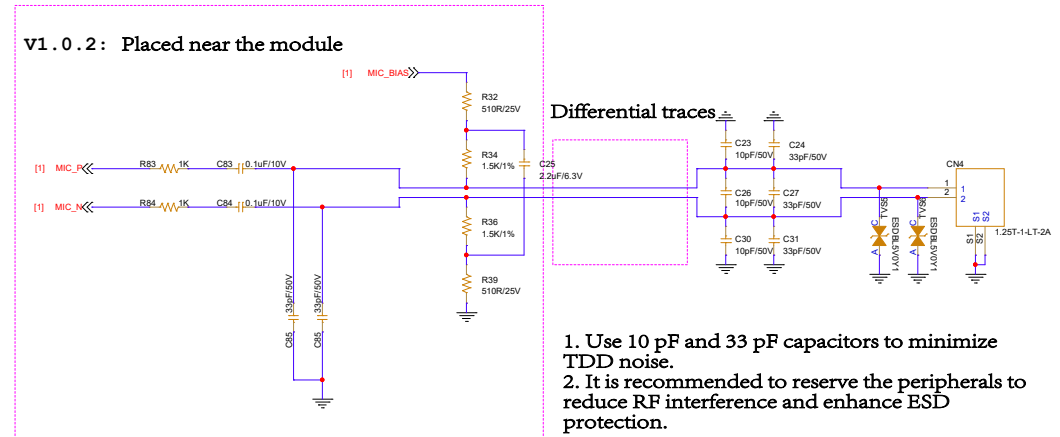
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|-----------------------|-----------------------------|
| tuya Tuya Inc. | |
| Project: | TIC6000UCH reference design |
| File: | 03.MCU |
| Date: | Sep 20, 2022 |
| Designed by: | <Type> |
| Rev: | <V10> |
| Sheet: | 3 of 10 |

Receiver Output

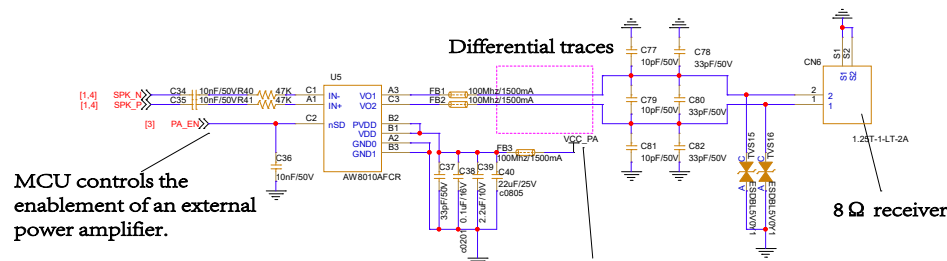


The module does not come with a power amplifier, so it drives the 32 Ω receiver. An external power amplifier is required to connect to an 8 Ω external speaker.

Microphone



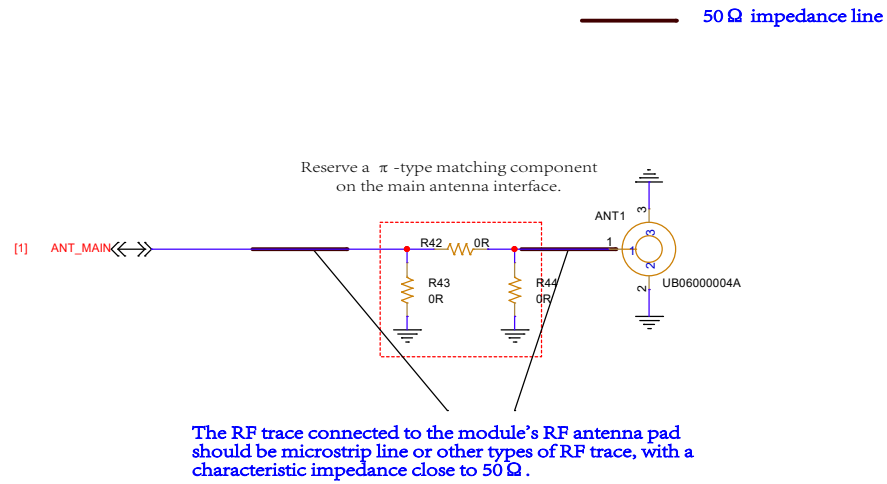
External Power Amplifier



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

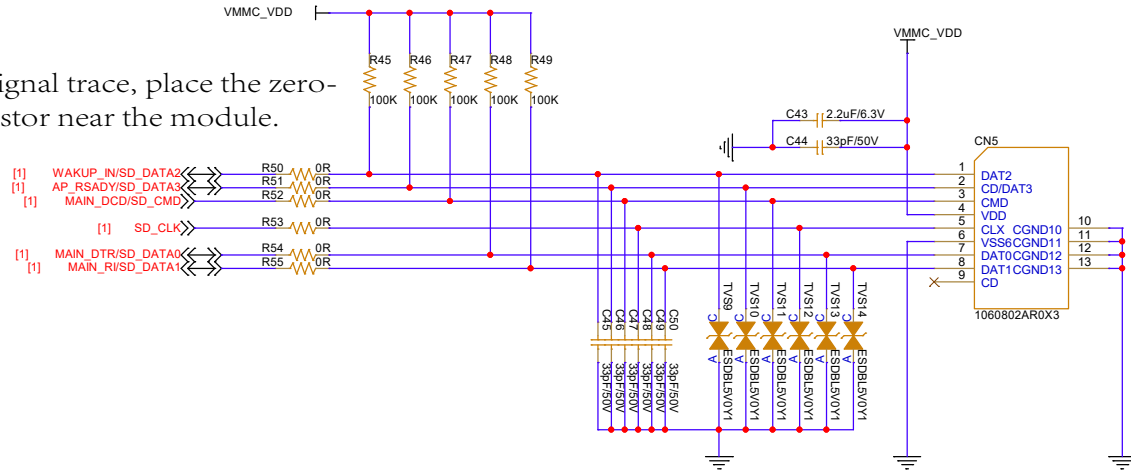


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| Project: | TSC600U-CN reference design | | |
| File: | 05_Ant | | |
| Date: | Sep 20, 2022 | Rev: | <V101> |
| Designed by: | <Tuya> | Sheet: | 5 of 10 |

SD/TF Card

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



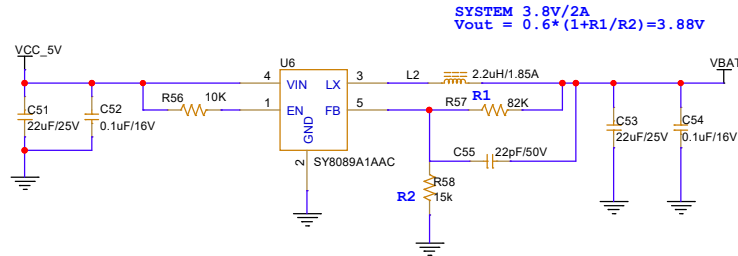
The maximum output current of VDD_SDIO is 150 mA. If the current consumption of the SD card exceeds 150 mA, an external power supply is needed.



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| Project: | TSC600U-CN reference design | | |
| File: | 06.Micro SD | | |
| Date: | Sep 20, 2022 | Rev: | <V101> |
| Designed by: | <Tuya> | Sheet: | 6 of 10 |

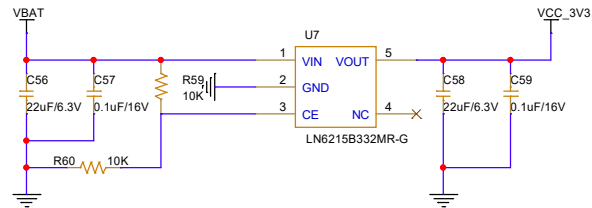
5V DC Power Supply

POWER_VBAT



The DC-to-DC solution adopts Silergy SY8089A1 that features 2.5V to 5.5V input voltage range and 2A output current. If you choose another voltage input, be sure to change to the matched DC-to-DC chip, with an output current higher than 2A.

POWER_VDD_3V3

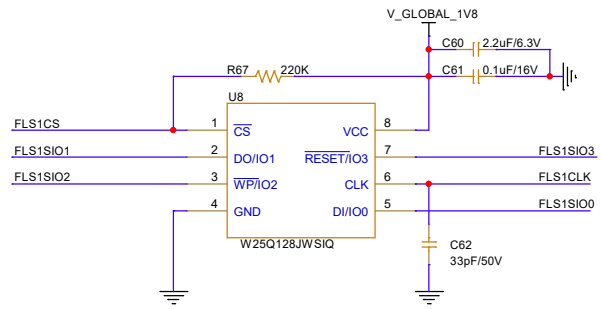


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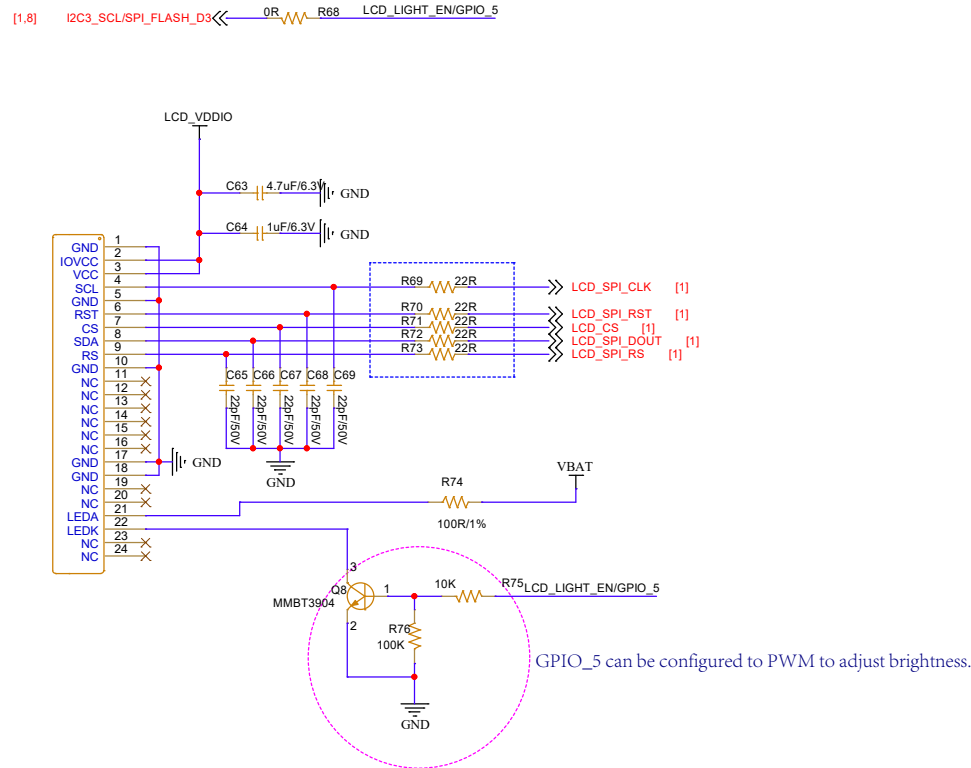
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|---------------------|-----------------------------|---------------|---------|
| Project: | TSC600U-CN reference design | | |
| File: | 07.Power | | |
| Date: | Sep 20, 2022 | Rev: | <V101> |
| Designed by: | <Tuya> | Sheet: | 7 of 10 |

SPI_FLASH

- [1,9] I2C3_SCL/SPI_FLASH_D3 <<< R61 0R FLS1SIO3
- [1] I2C3_SDA/SPI_FLASH_D2 <<< R62 0R FLS1SIO2
- [1] PCM_DOUT/SPI_FLASH_D <<< R63 0R FLS1SIO1
- [1] PCM_DIN/SPI_FLASH_D0 <<< R64 0R FLS1SIO0
- [1] PCM_SYNC/SPI_FLASH_CS <<< R65 0R FLS1CS
- [1] PCM_CLK/SPI_FLASH_CLK <<< R66 0R FLS1CLK



LCD Interface

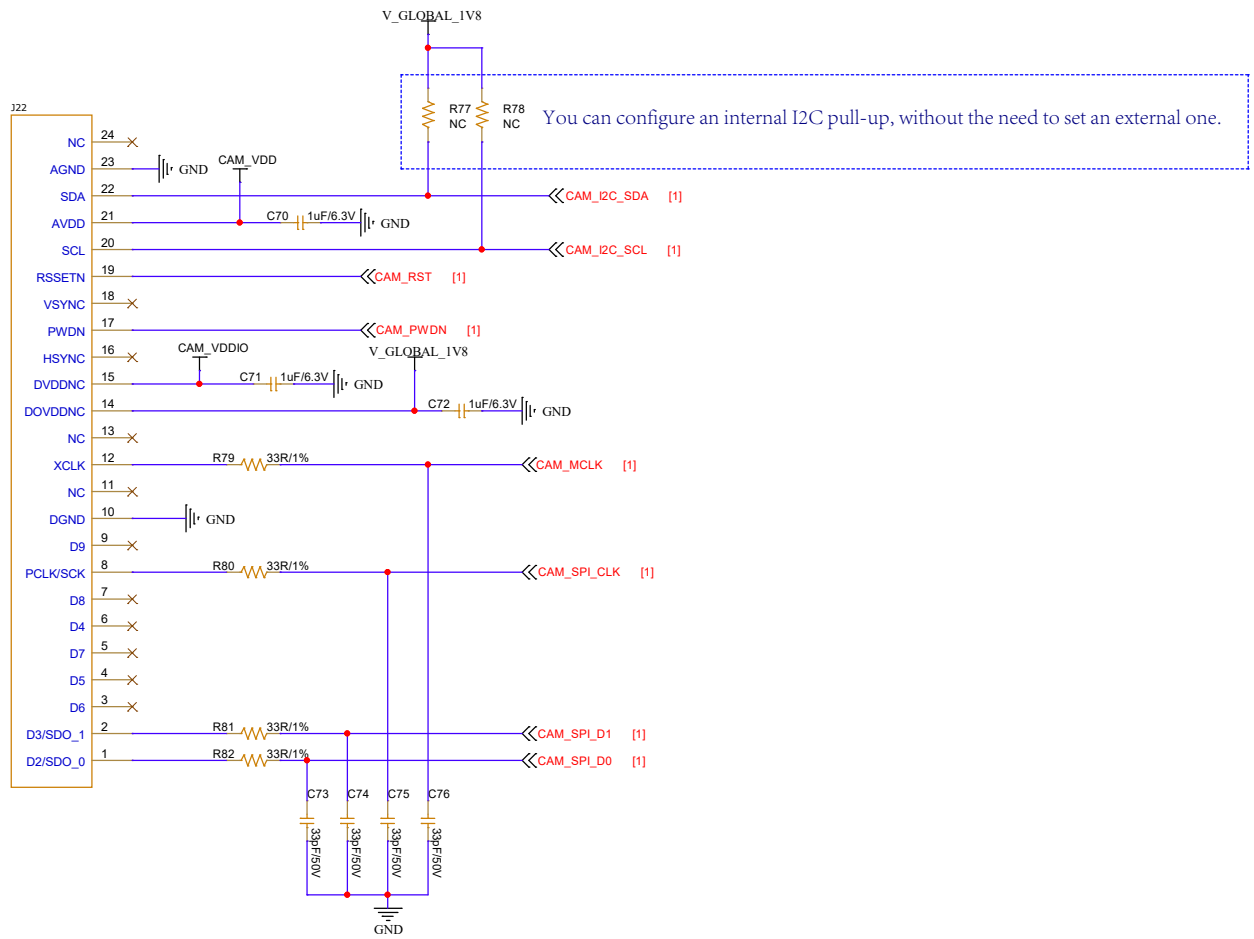


1. Reserve a resistor-capacitor circuit to reduce RF interference.
2. VBAT is the positive power supply of the LCD backlight. Power design is based on the requirements of the LCD.
3. The brightness of the backlight is adjusted by PWM duty cycle.
4. The R92 resistor is adjusted based on the turn-on current flowing through the LCD backlight.

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|---------------------|-----------------------------|---------------|---------|
| Project: | TSC600U-CN reference design | | |
| File: | 09_SPI_LCD | | |
| Date: | Sep 20, 2022 | Rev: | <V101> |
| Designed by: | <Organization Name> | Sheet: | 9 of 10 |

Camera Interface



1. Connect a 33 Ω resistor and a 33 pF capacitor in series on the CAM signal trace to reduce RF interference.
2. Place the filter capacitor on AVDD, DVDD, and DOVDD close to the connector.
3. Keep camera signal traces away from RF and VBAT traces. This is especially crucial for clock and signal traces.
4. Surround the clock and signal traces with ground to reduce RF interference.
5. Surround the analog power supply CAM_VDD with ground. CAM_VDD powers the analog signals of the camera.

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| tuya Tuya Inc. | | | |
| Project: | TSC600U-CN reference design | | |
| File: | 10_CAMERA | | |
| Date: | Sep 20, 2022 | Rev: | <V101> |
| Designed by: | <Organization Name> | Sheet: | 10 of 10 |