

# MYC-LD25X

## Hardware Design Guide



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**MYIR Electronics Limited**

# History

Version	Author	Participants	Date	Description
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# 1. Overview

This document is designed to help hardware engineers design circuits based on the MYC-LD25X core module. Please fully understand the content of the document before starting your design. This document contains common information, such as reference design description, Layout suggestions, and design check items, to assist hardware engineers in designing.

The references cited in this document are from the official website of MYIR Electronics and are included in the hardware data collection for the MYC-LD25X product, which can be downloaded at any time at the following address.

In addition, the following resources are available to speed up your design:

- SOM and Evaluation Board product manual;
- evaluation board schematic source file;
- Related device manuals.

## 1.1. Supported products

This document applies to all models of MYC-L25X series SOMs.

## 1.2. Disclaimer

- Some of the reference circuits in the documentation are based on MYIR Electronics evaluation boards and cannot be guaranteed to be suitable for all applications. If your product has special requirements for application scenarios or technical indicators, adjust the design according to the actual situation.
- The reference circuit and Layout in the document are for reference only and do not necessarily contain all precautions. Please adjust them according to the actual situation.
- MYIR Electronics accepts no technical and joint liability of any kind for the recommendations in any document.

## 2. Supply circuit design

The design of the power supply system is very important in the design of embedded products, engineers not only need to consider the basic electrical parameters of the power supply itself, but also consider the stability of the power supply design, such as electromagnetic compatibility, temperature range, safety design, three-proof design and other factors, any one of the negligent factors may lead to the entire system can not work properly. Before starting to design a power supply system for a new product, the engineer should thoroughly understand the actual needs of the entire system, and comprehensively demonstrate the feasible design scheme combining cost and efficiency, and choose a suitable power supply method for the system.

### 2.1. Reference circuit

The normal operation of the SOM needs to provide 5V voltage, full load power consumption of 1.89W. Considering that the instantaneous current of the product is relatively large, and the performance of the circuit itself will be derated under high temperature conditions, if the power supply is insufficient, the system can not start normally, so the power supply must leave a certain margin to ensure the stable and reliable operation of the system, it is recommended to use a power adapter above 5V/3A to supply power to the board alone.

The power interface of the Evaluation board is USB Type-C interface. Please select an adapter with +5V voltage and 3A current for power supply, and ensure that the output capacity of the power supply can meet the power consumption of the evaluation board. At present, most of the adapter output on the market is 5V/9V/12V, etc. We evaluate that the board power supply circuit adopts the fast charge protocol power chip CH224, which has been configured as 5V voltage output by default. For details, refer to the following circuit design.

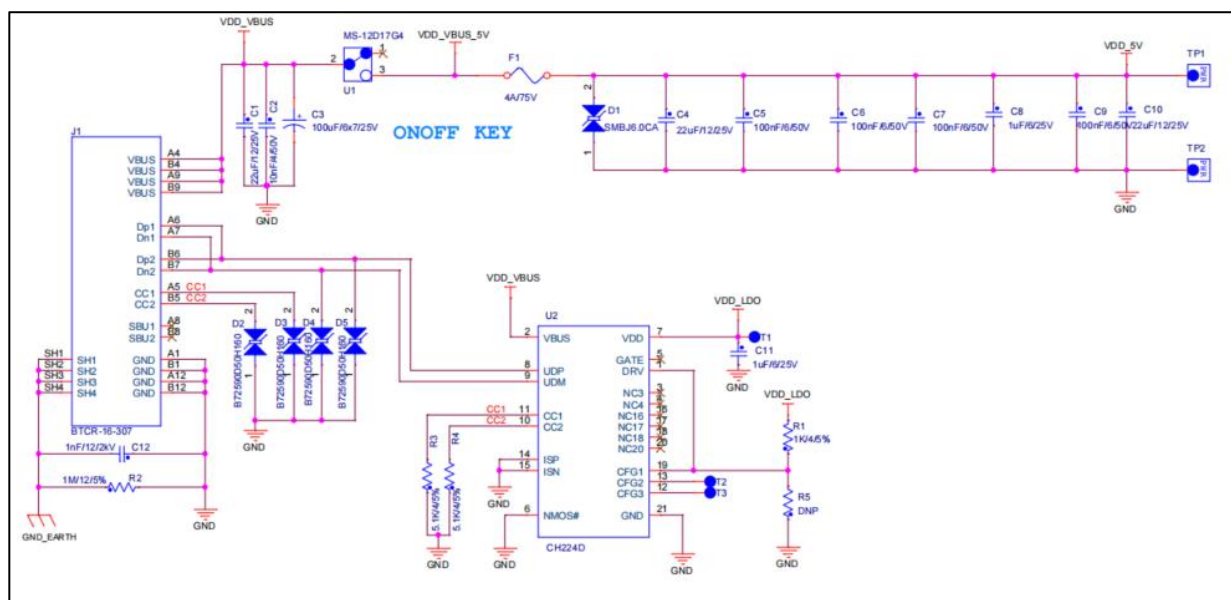


Figure 2-1 Usually power input circuit

## 2.2. Power supply protection

To ensure the reliability of the power supply system, it is not recommended to directly supply the external input voltage that is not processed directly to the load terminal of the rear stage. You can refer to the protection circuit in the following figure to process the power supply before using it to improve the reliability and safety of the input power supply and reduce electromagnetic interference.

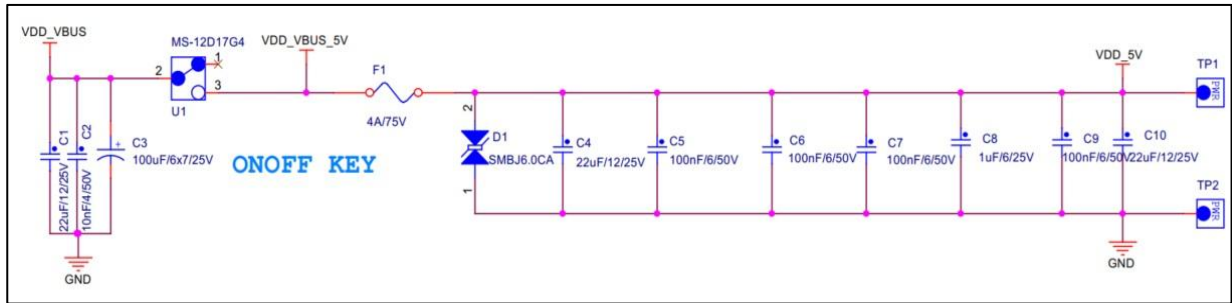


Figure 2-2 Power input circuit

## 2.3. Power-on sequence

The design of the power system must follow a certain power-on time sequence and corresponding steady state regulations, only in this way can ensure the reliable operation of the chip. In the design, it is recommended that the SOM be powered on first, and then the baseboard peripheral I/O equipment be powered on. If the power-on time sequence cannot be met, the following situations may occur:

- The mainboard peripheral I/O current is poured to the processor, causing the processor to fail to start.
- The mainboard peripheral I/O current is poured into the processor, causing irreversible damage to the processor in the worst case.



## 2.4. Layout suggestion

- a) The distance between different power planes is at least 20mil.
- b) Try to widen the width of the power cord and ground wire, to meet the required rated current value, the width of the feedback signal should not be too narrow, it is recommended that more than 10mil.
- c) If DC-DC is used, it is not recommended to use signal lines in the area below the inductance.
- d) If DC-DC is used, the path of the current loop should be as short as possible, and the inductor and capacitor should be placed as close to the chip as possible, that is, the red and green paths in the following figure.

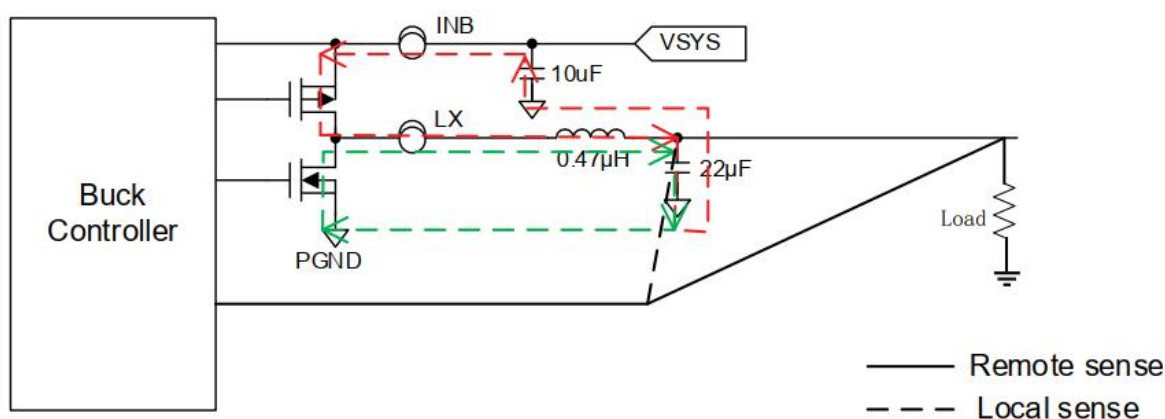


Figure 2-3 DC-DC current reflux path

- e) If you use LDO, pay attention to the thermal resistance of the LDO chip, because the heat loss of the LDO chip is relatively high, it is recommended to add a grounding pad and make more grounding holes on the pad.
- f) Try to select the capacitance of small ESR at the output end.
- g) The power chip with digital ground and analog ground should be separated from each other and only connected at a single point at the total power input, and the analog ground cannot be connected to the grounding pad.

## 3. The system must design the circuit

### 3.1. Boot configuration circuit

MYC-LD25X SOM supports two boot media: EMMC boot, SD card boot; With the MYC-LD25X SOM, dip switch or jumper cap can be considered when designing the base board. The processor can be started according to the corresponding Boot item (EMMC, SD card). The pull-up power supply designed by dip switch in baseboard adopts 3V3 output of the SOM, and the output of boot 3-Boot 0 of the SOM is low by default. Users can design according to their needs.

BOOT_MODE[3:2:1:0]	Boot Device	Remarks
0000	Serial/USB Downloader	Default USB download mode
0001	SD card boot	
0010	emmc boot	

**Table 3-1 Boot boot mode Settings**

The MYC-LD25X SOM has a default configuration level, and BOOT3, BOOT2, BOOT1, and BOOT0 are set to low levels by default. When we get the evaluation board, we only need to pull the dip switch to the corresponding configuration according to the silk screen information, and then we can start or download.

signal name	voltage	BOOT Downloading	BOOT eMMC	BOOT SD
BOOT3	0	0	0	0
BOOT2	0	0	0	0
BOOT1	0	0	1	0
BOOT0	0	0	0	1

**Table 3-2 Description of board startup configuration pins**

## 3.2. Boot reference circuit

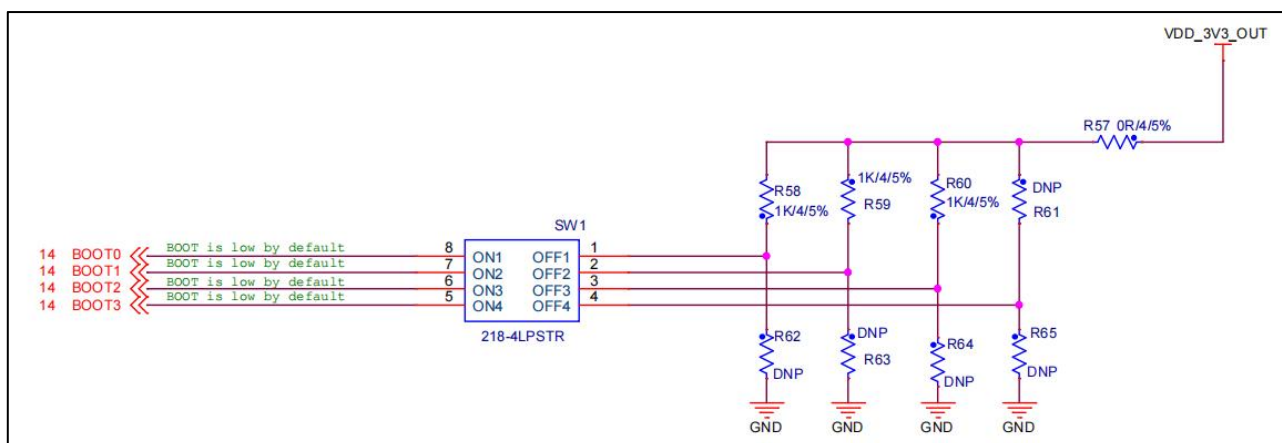


Figure 3-1 Startup setting reference circuit

## 3.3. Burn firmware circuit

It is recommended to use MicroSD card circuit for MYC-LD25X SOM to burn and update the firmware, and it is recommended to use SDMMC1 for signal interface. When burning firmware, you need to set the boot item to start from SD card, and the factory default is that the image has been burned, please refer to Section 5.1 for details.

## 3.4. Debug circuit

MYC-LD25X debugging serial port of the core board uses the interface circuit of UART2 and UART5 to debug the software program of the SOM. UART2 and UART5 are debugging serial ports by default and cannot be replaced with other debugging serial ports. For details, please refer to Section 5.2.

## 3.5. Reset circuit

With the MYC-LD25X SOM, the RESET signal is led out by the PIN D11 pin of the SOM, which is used for the hard ware system of the SOM to reset the input signal, 3.3V level logic, and the baseboard design is best with logical isolation to prevent external interference.

## 4. Key circuit design

The MYC-LD25X SOM provides function pins, namely RST\_N, PONKEY, which are usually used for external keys, and PB15 for user-defined function keys, Table 4-1 describes the functions.

Because the key signal is more sensitive, a simple RC filter can usually be composed of resistors and capacitors, which on the one hand can filter out the jitter interference when the key is pressed, and at the same time filter out the interference introduced by the outside world to affect the reset signal. In the harsh electromagnetic environment, in order to eliminate the electrostatic interference from the key and ensure the more reliable operation of the system, an ESD device can be connected in parallel. If there are more stringent requirements for buffering, you can consider using a logic circuit such as RS flip-flop to build a reset circuit.

Special function pins	explain
RST_N	3.3V level logic. The chip is internally connected to a permanent pull-up resistor. Hardware reset input.
PONKEY	3.3V level logic, wake up button
PB15	User-defined function buttons

Table 4-1 Special function pin description

## 4.1. Reference circuit

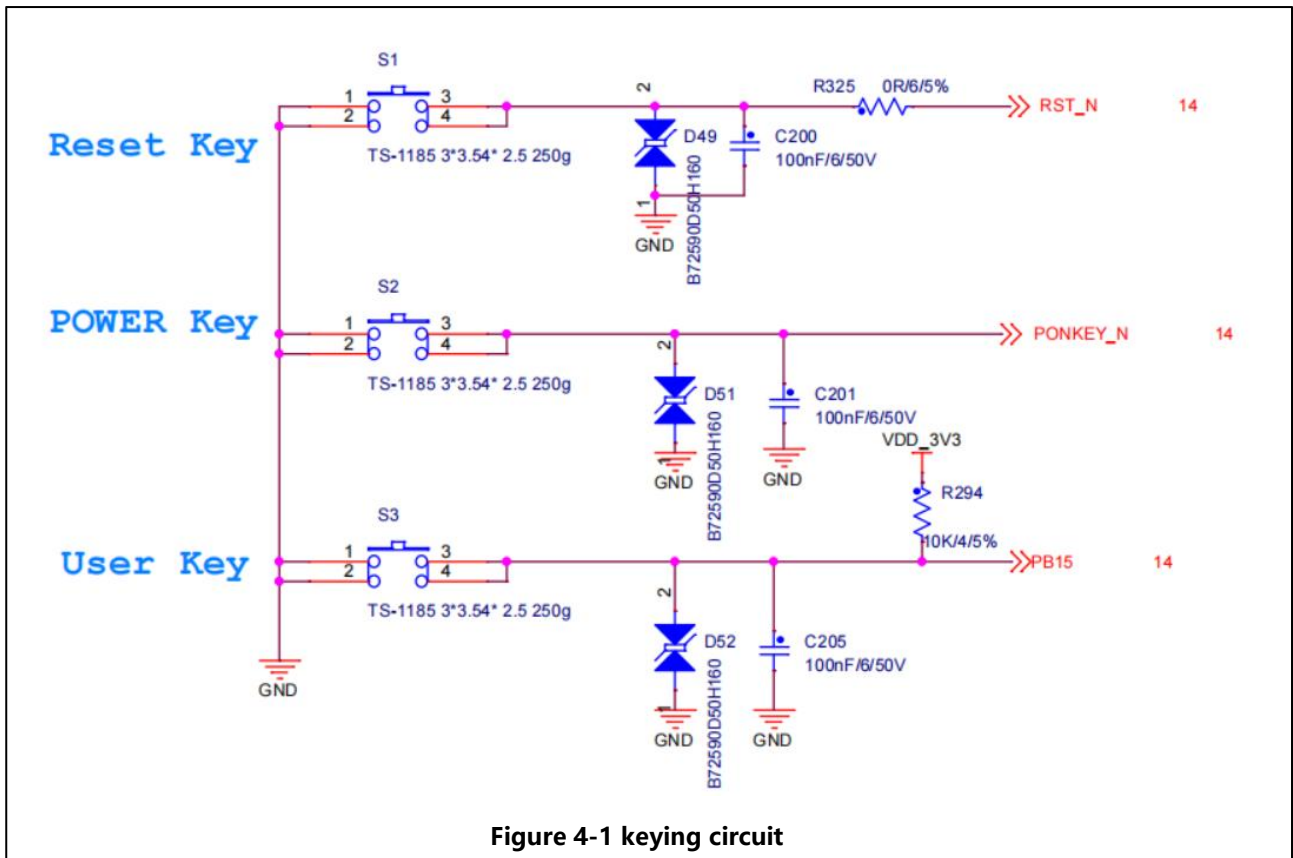


Figure 4-1 keying circuit

## 4.2. Layout suggestion

- The key reset signal line width should not be too narrow, it is recommended not less than 8mil.
- The reset signal is a sensitive signal, it is recommended to package processing.
- TVS tube should be placed as close to the button as possible.

## 5. Interface circuit design

### 5.1. SD/MMC interface

The MYC-LD25X SOM is equipped with three SD/MMC interfaces, namely SDMMC1, SDMMC2 and SDMMC3. SDMMC1 is usually used to design MicroSD card signals; SDMMC2 has been used to connect EMMC signals in the SOM. SDMMC3 has a 3.3V level and can be used to design a communication interface between modules with an SDIO interface. The specific application depends on the design requirements.

#### 5.1.1. Reference circuit

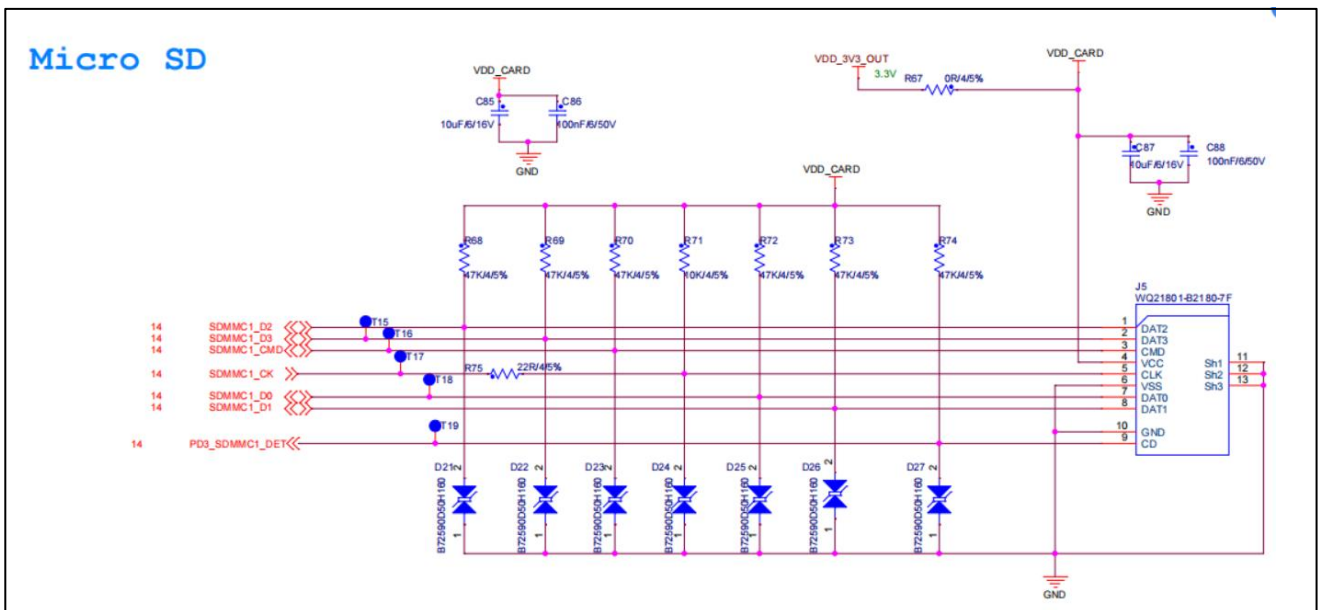


Figure 5-1 Micro SD card reference circuit

#### 5.1.2. Layout suggestion

- The interface signal needs to be impedance control, using a single-end impedance of 50Ω;
- Data, cmd & clk should be equal length matched, error is less than  $\pm 100\text{mil}$ .
- If the wiring space is sufficient, the CLK signal is processed as extensively as possible. If this is not possible, distance the clock signal from the other signals and follow the 3W rule.
- The power supply of the SD card is provided by the VDD 3V3 OUT output of the SOM.

## 5.2. UART interface

MYC-LD25X SOM processor has up to 9 serial ports, the SOM will lead out all these pins, the SOM is configured with 5 serial ports by default, USART6 with flow control (RTS and CTS signal) function, USART6 for WIFI module communication, In addition, USART1 and UART9 are connected to a 2\*20 Pin double-row pin with a 2.54mm spacing, which can be used to connect the external Raspberry PI module. USART2 and UART5 are Debug serial ports by default.

When the UART2 is used as a debugging serial port, it is connected to the PC with a UART-to-USB conversion cable. Common USB-to-UART TTL modules are shown in the following figure. You can also convert the UART to USB and use it as a debugging serial port.

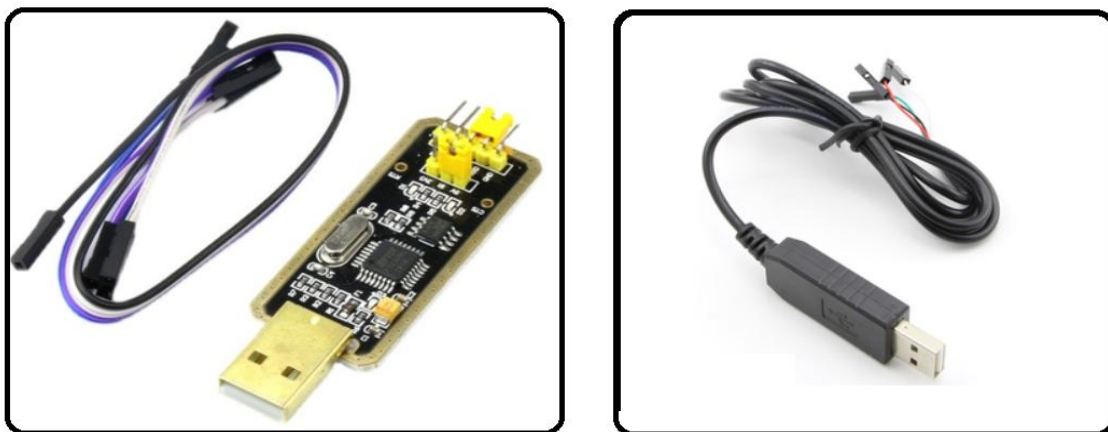


Figure 5-2-1 USB to UART TTL module

### 5.2.1. Reference circuit

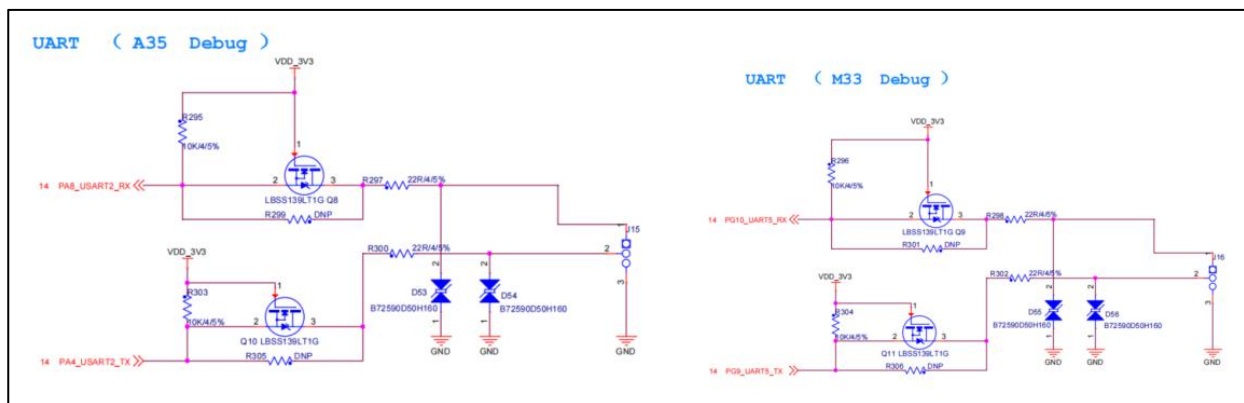


Figure 5-2-2 UART debug reference circuit

### 5.2.2. Layout suggestion

- The signal and power plane before and after isolation should be kept sufficiently spaced.
- TVS is placed next to connector.



### 5.3. USB interface

The MYC-LD25X SOM provides one USB2.0 HOST and one USB3.0/USB2.0 OTG (currently Linx does not support USB3.0). USB3DR Supports HOST and Device modes, adopts STUSB1600 chip to realize switching between OTG and HOST functions, and is equipped with Type-C interface, the interface is J3; The USBH supports only HOST mode, and uses the USB2.0 HUB chip to expand two USB HOST ports. The expanded two ports are directly led out through the double-layer USB Type-A connector, and the interface is J4.

#### 5.3.1. Reference circuit

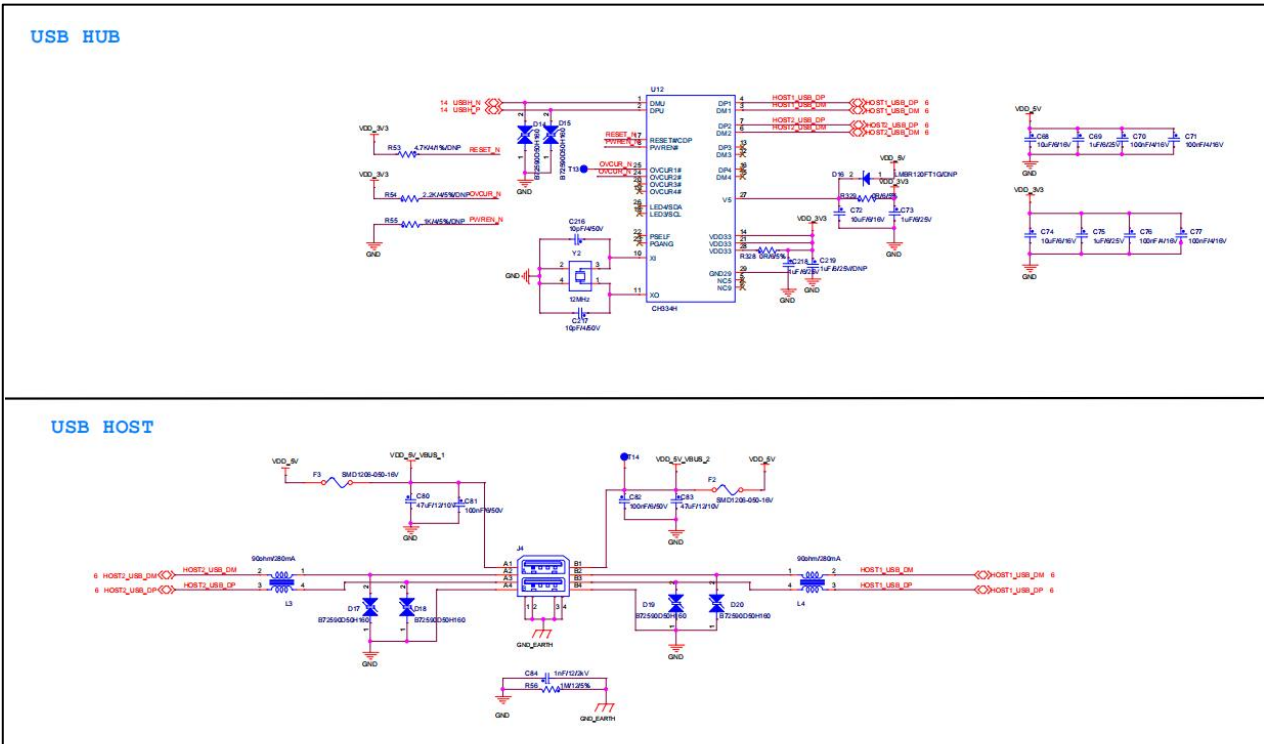


Figure 5-3-1 Reference circuit of the USB HUB and HOST port

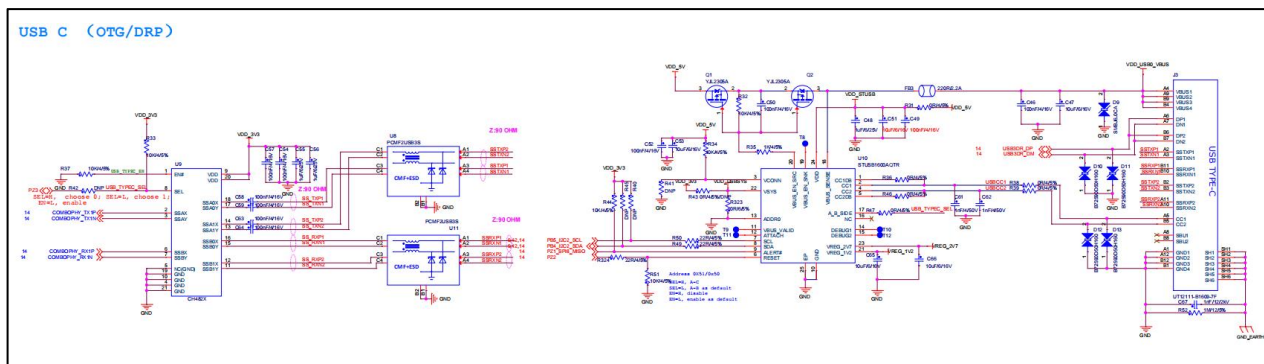


Figure 5-3-2 Reference circuit of the USB DRP port



### 5.3.2. Layout suggestion

- a) Make the difference lines as short as possible and shorten the distance of the difference lines.
- b) A pair of differential lines should not exceed two pairs of holes, and should be placed symmetrically to reduce the parasitic inductance and signal interference of the line.
- c) Symmetrical parallel route, avoid 90° route, arc or 45° route is a better choice.
- d) For high-speed USB signals (such as USB 2.0 and USB 3.0), the impedance of the differential signal line should be controlled at 90 ohms and processed uniformly to avoid signal reflection and ensure signal quality.
- e) The total length is best not to exceed 1800mil, shorten the line length as much as possible, reduce the layer through the hole, so as to better control the impedance.
- f) The hole will cause the discontinuity of the line impedance, and a pair of return through holes should be added to the place of each hole for signal return layer change.
- g) The distance between the ground cover and the difference line should be greater than 20mil to avoid mutual interference.
- h) Due to the pin distribution, through the hole, and the route space and other factors may cause the difference line length mismatch, the difference should be compensated for the mismatch, the length difference is usually controlled within 5mil.
- i) ESD and common mode inductor devices should be placed close to the USB interface, pay attention to the distance between ESD and USB, leave a certain distance, and consider the situation of post-welding.

## 5.4. Raspberry PI interface

MYC-LD25X SOM was used to design a 2\*20 Pin double row pin with 2.54MM spacing on the evaluation board, and the interface J13 on the board was developed to connect the Raspberry PI module. MY-WIREDCOM module is the Raspberry PI peripheral interface form launched by Mill Electronics, which supports RS232 interface, isolated RS485 interface and isolated CAN interface.

Users can choose the Raspberry PI interface MY-WIREDCOM module launched by MYIR Electronics.

### 5.4.1. Reference circuit

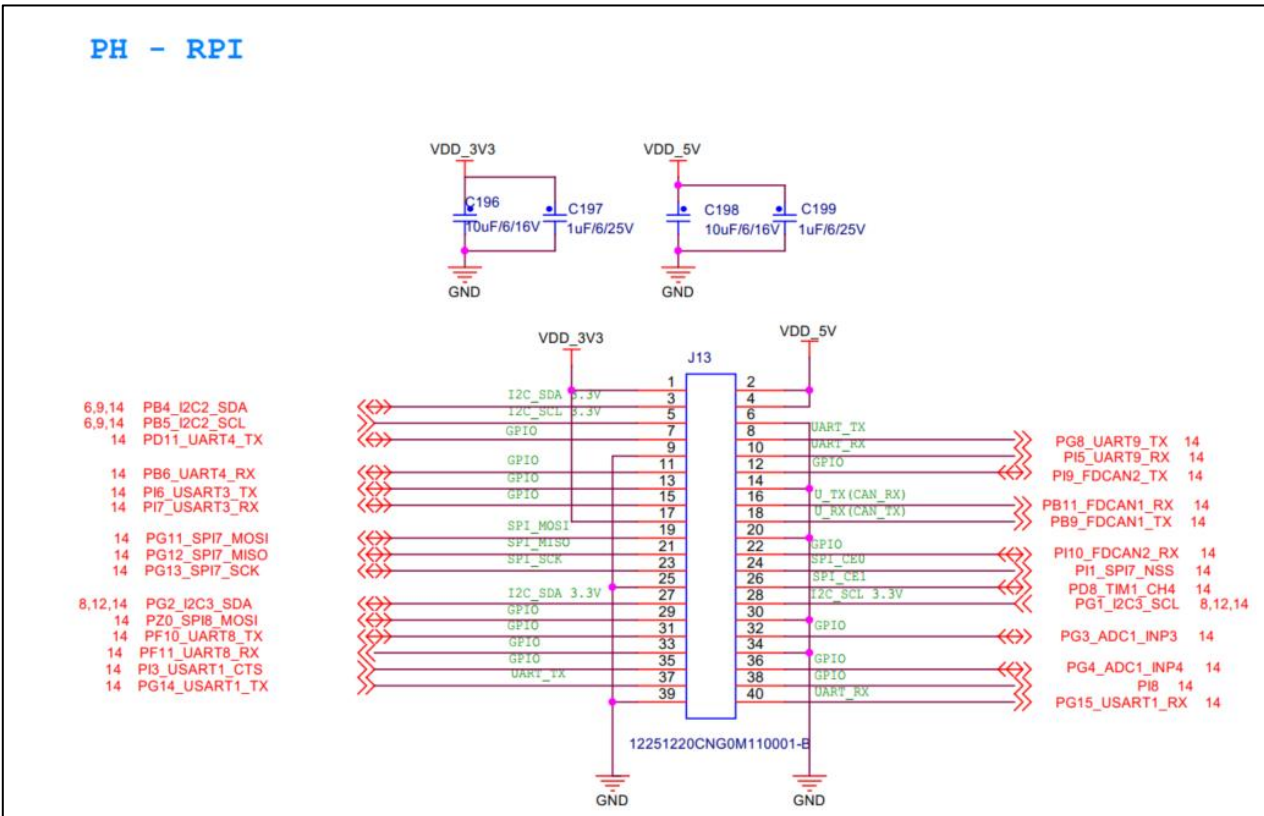


Figure 5-4 Reference circuit of the Raspberry PI port

### 5.4.2. Layout suggestion

- Pay attention to the definition sequence of the Raspberry PI interface, 1 pin screen mark clearly, pay attention to avoid dull.
- Raspberry PI interface CAN signal single-end impedance control 50Ω, CAN signal routing isometric control, error range  $\pm 25\text{mil}$ .
- Ensure that the reference layer of the signal is continuous.





- RGMII single-ended signal needs to control 50 Ohm impedance, within the group isometric error  $\pm 15\text{mil}$ . CLK signals need to be processed in a packet (or at a distance of 3W from other signals).
- The differential signal of the network port needs to control 100 Ohm differential impedance, and the internal error is  $\pm 5\text{mil}$  and the intra-group error is  $\pm 25\text{mil}$ .
- PHY chip is placed near the Core plate and far away from the network transformer.
- The power pin decoupling capacitor of the PHY chip is placed near the PHY chip.
- It is recommended that the copper cover under the network port seat (behind the differential signal pin) be emptied.

## 5.6. I2C interface

The MYC-LD25X SOM processor supports a maximum of 8 I2C buses, of which I2C2 is used for E2PROM chip in the SOM (I2C2 is extracted from SOM for use), I2C7 is used for PMIC chip in the SOM (I2C7 SOM didn't come out), I2C7 can not be used, the other 7 I2C are lead from the SOM, available for use.

If you want to use more I2C bus interfaces, consult the chip manual or Pin List and modify the pin configuration in the driver. Several devices can be mounted under the same I2C main line, and the following points should be noted when designing the schematic diagram:

- Check whether device addresses under the same general line conflict.
- Ensure that each I2C bus has a pair of pull-up resistors, resistance value is recommended 2.2K~10K, but do not add repeatedly.
- Check whether the I2C interface level of the device is 3.3V. If not, add a level switching circuit.
- The number of devices under the same total line should not be too much, otherwise it may exceed the Load Capacitance limit of 400pF required by the I2C specification, affecting the signal waveform.

### 5.6.1. Reference circuit

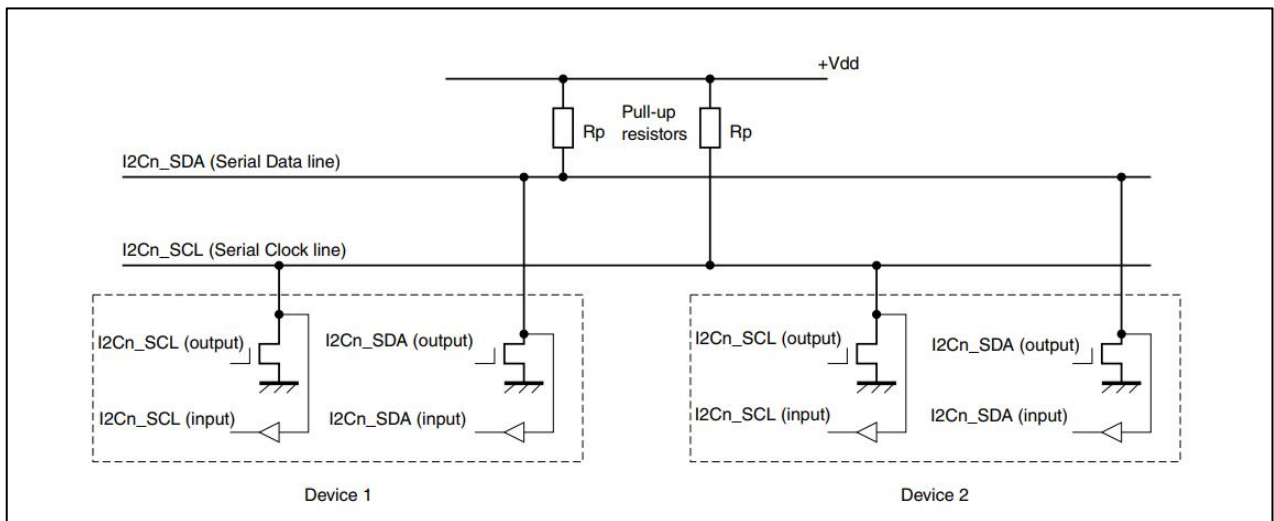


Figure 5-6 I2C reference circuit

### 5.6.2. Layout suggestion

- The width of the I2C signal line should not be too narrow, it is recommended to be 6mil and above.
- The location of each device should be planned before I2C wiring, the line should not be too winding, I2C wiring is too long, it will also increase the Load Capacitance of the bus.
- Avoid interference source wiring, adjacent lines spacing more than 10mil.





## 5.8. MIPI DSI interface

The MYC-LD25X SOM supports 1 \*MIPI DSI interface, can be designed as 1\* MIPI DSI, 4 channels of data, used as DSI output signal, does not support HDMI interface, in order to facilitate customer use, We used LT9611 conversion chip in the evaluation board to convert MIPI DSI signal to HDMI signal to support HDMI interface display output.

### 5.8.1. Reference circuit

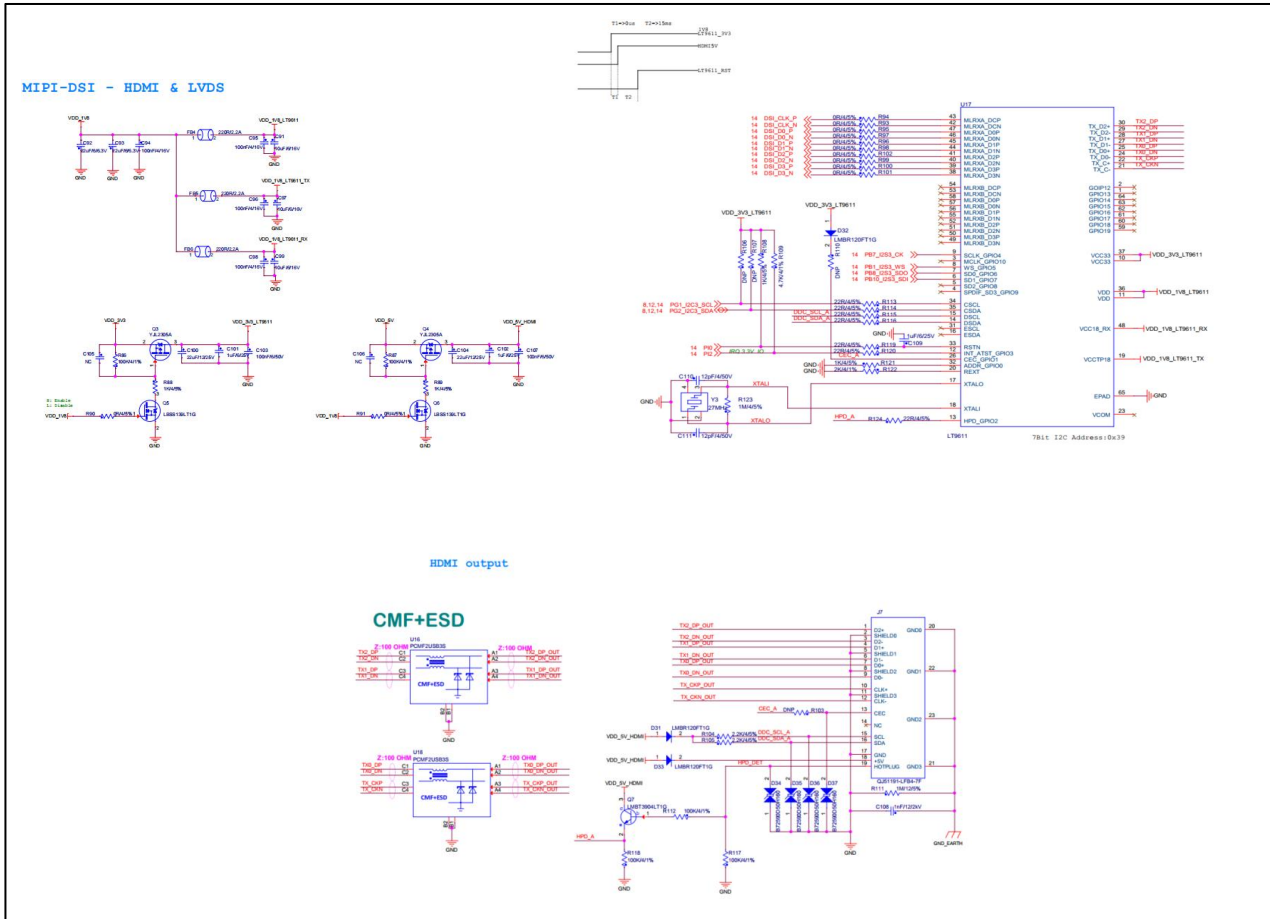


Figure 5-8 MIPI DSI to HDMI reference circuit

## 5.8.2. Layout Guidelines

- a) DSI differential signal needs to control 100 Ohm impedance, internal isometric control within  $\pm 5\text{mil}$ , group isometric control within  $\pm 25\text{mil}$ .
- b) If layers need to be changed, the accompanying ground holes should be placed 10mil away from the p/n layer change through the holes, and the accompanying ground holes of p/n should be placed symmetrically.
- c) DSI differential signals should be in the same group and at the same layer, and should have a complete power reference plane, and should not be divided across.
- d) HDMI signal routing isometric control, error range  $\pm 5\text{mil}$ . The TVS should be close to the HDMI seat.
- e) The distance between adjacent difference pairs of HDMI signal routes is more than 3W.
- f) The HDMI signal should not be changed as far as possible. If the layer is changed, the GND return through hole should be placed within 50mil from the layer through hole.
- g) The HDMI ground pin is recommended to be connected directly to the ground of the housing.
- h) HDMI signal line as short as possible; The power pin ripple is less than 50mV.





## 5.9.2. Layout Guidelines

- a) MIPI CSI differential signal needs to control 100 Ohm impedance, internal isometric control within  $\pm 5\text{mil}$ , group isometric control within  $\pm 25\text{mil}$ .
- b) MIPI CSI differential signals should be in the same group and at the same layer, and should have a complete power reference plane, and should not be divided across.
- c) Data and clock difference pairs require complete reference ground planes.
- d) Isolate the area under the power supply, including the inner layer, and do not wire it.

## 5.10. Audio Out interface

The I2S1 signal of MYC-LD25X SOM is used to realize the audio communication function on the evaluation board. In the circuit design, the interface signal of I2S1 is connected to the audio codec chip, and the external headset and microphone are used. The reference design uses the ES8388 chip for audio CODEC, a low-power, high-performance CODEC chip that is particularly suitable for audio applications in stereo portable devices.

### 5.10.1. Reference circuit

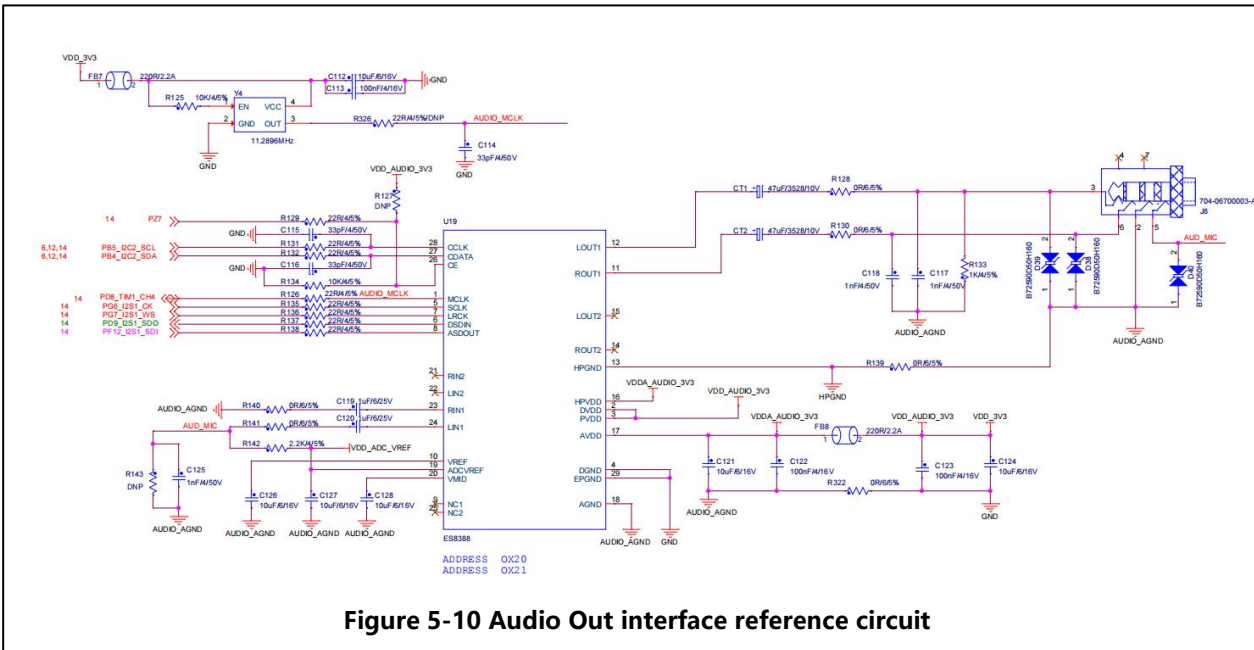


Figure 5-10 Audio Out interface reference circuit

### 5.10.2. Layout suggestion

- The isolation points of digital and analog ground shall be grounded as close as possible to the power input end of the base plate.
- The layout position of the audio circuit is away from the interference source, and it is recommended to place the analog circuit in a separate area of the PCB planning.
- Audio Out is an analog audio signal, 10mil and above are recommended.
- Pay attention to the distinction between analog and digital land.

## 5.11. WIFI/BT module

MYC-LD25X SOM is used to realize the WIFI function on our evaluation board. The AP6256 module is used. Through the SOM, one SDIO signal and UART signal are generated to communicate with the WIFI module, so as to realize the WIFI and Bluetooth functions, which is convenient for users to develop and use.

### 5.11.1. Reference circuit

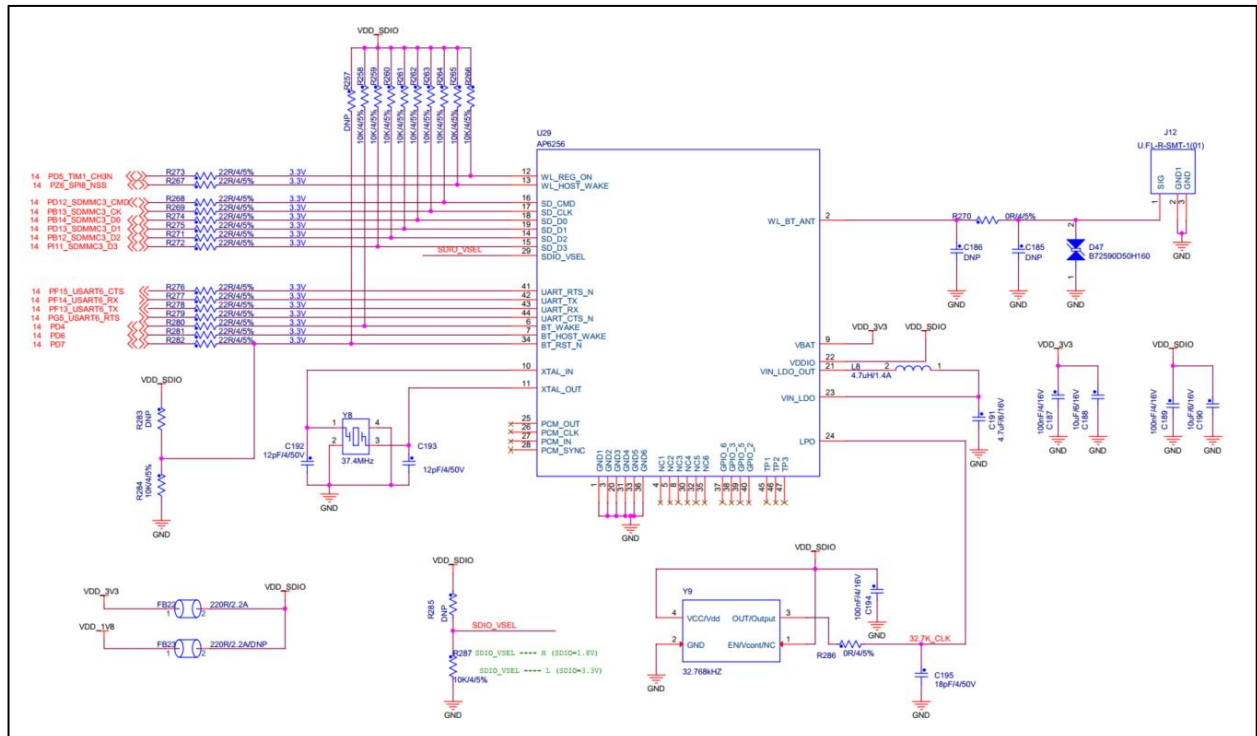


Figure 5-15 Reference circuit of the WIFI/BT module

### 5.11.2. Layout suggestion

- The interface signal needs to be impedance control, using a single-end impedance of 50Ω;
- The data line and the control line are as long as possible, and the error is less than ±100mil;
- If the wiring space is sufficient, SDMMC3\_CK as far as possible package processing, if not, then open the distance between the clock signal and other signals, follow the 3W rule.
- The filter capacitor needs to be close to the power supply pin.
- The device layout of the WL\_BT\_ANT pin is  $\pi$ -type structure, and the line is straight, and the line width is 15-25mil.

## 5.12. Standby battery interface

The RTC standby interface circuit is designed on the evaluation board using the MYC-LD 25X SOM. The clock chip LK8563T is used, and the 3.0V button battery needs to be connected to the J14 seat son (1.25mm-2pin connector). It can be used to maintain the operation of the RTC circuit when the system is powered down.

### 5.12.1. Reference circuit

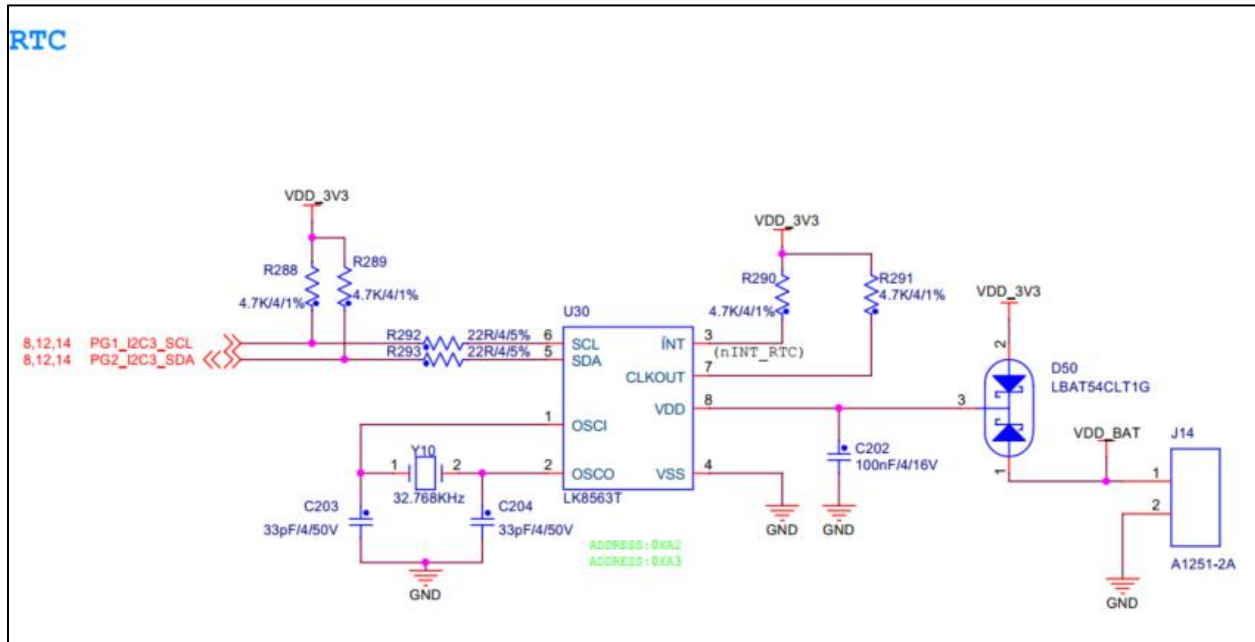


Figure 5-12 Standby battery interface reference circuit

### 5.12.2. Layout suggestion

- C202 is placed near J4.
- The width of the I2C signal line should not be too narrow, it is recommended to be 6mil and above.
- The position of each device should be planned before I2C wiring, and the wiring should not be too winding.

## 6. Design check item

### 6.1. Power supply design check items

check the entry	proposed projects
SOM supply voltage	The recommended value is 4.5V- 5V
SOM supply decoupling capacitor	Use capacitors with 47uF and above value for core module power supply
IO level of baseboard peripherals	The IO level of the peripheral should match the corresponding interface level of the SOM
SOM power timing	It is recommended that the core module power start before the peripheral power
The temperature rise of the power chip	Confirm the thermal resistance of the power chip, and calculate the maximum temperature rise of the power chip based on the power consumption of the core module to ensure that the final temperature is within the specified range of the power chip

Table 6-1 Power supply design checklist

## 6.2. Check system startup items

check the entry	proposed projects
BOOT pin configuration	Select an appropriate BOOT MODE based on product requirements
reset circuit	You are advised to connect the KEY-RESET pin
Micro SD circuit	SD card is convenient for burning procedure, it is recommended to keep

**Table 6-2 System startup checklist**

### 6.3. Some peripheral circuit design check matters

classify	check the entry	proposed projects
USB	USB D+/D- Signal Capacitance value of ESD device	It is recommended that the capacitance of ESD devices be less than 2pF
	Whether the capacitor of the supply pin is series resistance	The interface 5V capacitor requires a 1-ohm resistance in series to limit the voltage surge at the USB port
Ethernet (RGMII/RMII)	PHY chip layout	<ul style="list-style-type: none"> <li>Layout as close to the SOM as possible. Keep the RGMII track as short as possible.</li> <li>RGMII send signal and receive signal are grouped separately, and the Layout is equal to +25mil in the wiring group. No inter-group requirement.</li> </ul>
	PHY chip power supply	PHY chip power supply is isolated with magnetic beads
	PHY chip clock signal source	Use an external active or passive crystal oscillator.
	Connection of center tap on PHY side of network transformer	Depending on the type of PHY chip, it can generally be found in the chip manual; If the PHY is current driven, the tap needs to be pulled up to the PHY supply voltage, if the PHY is voltage driven, the tap does not need to be pulled up; If not found in the manual, use a reference circuit or reserve a pull-up resistor
I2C	I2C How many pull-up resistors to take	The more bus load devices, the smaller the resistance value should be, and the larger the resistance value is. Recommended resistance value 1.5K/2.2K/4.7K;
	How many pull-up resistors are connected to each I2C signal line	One or more can be used.
	What is the pull-up voltage	The pull-up resistor must be connected to a voltage that matches the I/O level
SDIO	Whether the DATA and CMD signals are pulled up	It needs to be pulled up. The recommended resistance is 47K or 10K and pulled up to 3.3V
HDMI	The I2C of the processor	Can be directly connected to the HDMI connector, without level conversion, need to pull up 2.2K resistor.

Table 6-3 Peripheral circuit check list



## 7. Common hardware problems

### 7.1. SOM connection mode

If the board-to-board connector scheme is used, the advantage is that the plug and pull scheme, but there will also be the following disadvantages:

- 1) Poor seismic performance.
- 2) Can not be used for thin and light products.
- 3) Insertion and removal can easily cause internal injury of PCBA.
- 4) The yield of mass-produced patches is not high.
- 5) At least one pair of male and female connectors is required, and the increase cost is the highest.

If the Goldfinger scheme is used, it will be more convenient to insert and remove, but it also has the following disadvantages:

- 1) A high-quality base needs to be placed on the bottom plate to increase the cost.
- 2) Goldfinger production process cost is high.
- 3) Can not be used for thin and light products.
- 4) The number of leading pins relative to the stamp hole plate is more.

The connection method of the stamp hole is somewhat good in shock resistance, and the need for additional connectors is conducive to reducing costs, but there are also some disadvantages.

- 1) The size is not suitable for large, the number of leading pins is limited.
- 2) The overall weight of the SOM as a module should not be too heavy, otherwise the placement machine suction nozzle capacity limits can not be placed or poor placement.
- 3) The baseboard PCB may need to be slotted for the case of devices on the back of the stamp hole SOM.

The connection method of LGA is somewhat good in shock resistance, the need for additional connectors is conducive to reducing costs, the number of pins and other advantages, but there are also some disadvantages.

- 1) The process requirements are high, easy to weld and tin, and the maintenance is troublesome.
- 2) The overall weight of the SOM as a module should not be too heavy, otherwise the limit of the nozzle capacity of the placement machine will lead to no placement or poor placement.
- 3) LGA can only be single-sided layout, the board size needs to be larger.

To sum up MYC-LD25X is more suitable for LGA connection due to the relatively large number of pins and small size.

# Appendix A

## Warranty & Technical Support Services

MYIR Electronics Limited is a global provider of ARM hardware and software tools, design solutions for embedded applications. We support our customers in a wide range of services to accelerate your time to market.

MYIR is an ARM Connected Community Member and work closely with ARM and many semiconductor vendors. We sell products ranging from board level products such as development boards, single board computers and CPU modules to help with your evaluation, prototype, and system integration or creating your own applications. Our products are used widely in industrial control, medical devices, consumer electronic, telecommunication systems, Human Machine Interface (HMI) and more other embedded applications. MYIR has an experienced team and provides custom design services based on ARM processors to help customers make your idea a reality.

The contents below introduce to customers the warranty and technical support services provided by MYIR as well as the matters needing attention in using MYIR's products.

### Service Guarantee

MYIR regards the product quality as the life of an enterprise. We strictly check and control the Core plate design, the procurement of components, production control, product testing, packaging, shipping and other aspects and strive to provide products with best quality to customers. We believe that only quality products and excellent services can ensure the long-term cooperation and mutual benefit.

### Price

MYIR insists on providing customers with the most valuable products. We do not pursue excess profits which we think only for short-time cooperation. Instead, we hope to establish long-term cooperation and win-win business with customers. So we will offer reasonable prices in the hope of making the business greater with the customers together hand in hand.

### Delivery Time

MYIR will always keep a certain stock for its regular products. If your order quantity is less than the amount of inventory, the delivery time would be within three days; if your order quantity is greater than the number of inventory, the delivery time would be always four to six weeks. If for any urgent delivery, we can negotiate with customer and try to supply the goods in advance.

### Technical Support

MYIR has a professional technical support team. Customer can contact us by email (support@myirtech.com), we will try to reply you within 48 hours. For mass production and customized products, we will specify person to follow the case and ensure the smooth production.

## After-sale Service

MYiR offers one year free technical support and after-sales maintenance service from the purchase date. The service covers:

### Technical support service

MYiR offers technical support for the hardware and software materials which have provided to customers;

- To help customers compile and run the source code we offer.
- To help customers solve problems occurred during operations if users follow the user manual documents.
- To judge whether the failure exists.
- To provide free software upgrading service.
- However, the following situations are not included in the scope of our free technical support service.
- Hardware or software problems occurred during customers' own development.
- Problems occurred when customers compile or run the OS which is tailored by themselves.
- Problems occurred during customers' own applications development.
- Problems occurred during the modification of MYiR's software source code.

### After-sales maintenance service

The products except LCD, which are not used properly, will take the twelve months free maintenance service since the purchase date. But following situations are not included in the scope of our free maintenance service:

- The warranty period is expired.
- The customer cannot provide proof-of-purchase or the product has no serial number.
- The customer has not followed the instruction of the manual which has caused the damage the product.
- Due to the natural disasters (unexpected matters), or natural attrition of the components, or unexpected matters leads the defects of appearance/function.
- Due to the power supply, bump, leaking of the roof, pets, moist, impurities into the boards, all those reasons which have caused the damage of the products or defects of appearance.
- Due to unauthorized weld or dismantle parts or repair the products which has caused the damage of the products or defects of appearance.
- Due to unauthorized installation of the software, system or incorrect configuration or computer virus which has caused the damage of products.

### Warm tips:

- MYIR does not supply maintenance service to LCD. We suggest the customer first check the LCD when receiving the goods. In case the LCD cannot run or no display, customer should contact MYIR within 7 business days from the moment get the goods.
- Please do not use finger nails or hard sharp object to touch the surface of the LCD.
- MYIR suggests user purchasing a piece of special wiper to wipe the LCD after long time use, please avoid clean the surface with fingers or hands to leave fingerprint.
- Do not clean the surface of the screen with chemicals.
- Please read through the product user manual before you using MYIR's products.
- For any maintenance service, customers should communicate with MYIR to confirm the issue first. MYIR's support team will judge the failure to see if the goods need to be returned for repair service, we will issue you RMA number for return maintenance service after confirmation.

### Maintenance period and charges

MYIR will test the products within three days after receipt of the returned goods and inform customer the testing result. Then we will arrange shipment within one week for the repaired goods to the customer. For any special failure, we will negotiate with customers to confirm the maintenance period.

For products within warranty period and caused by quality problem, MYIR offers free maintenance service; for products within warranty period but out of free maintenance service scope, MYIR provides maintenance service but shall charge some basic material cost; for products out of warranty period, MYIR provides maintenance service but shall charge some basic material cost and handling fee.

### Shipping cost

During the warranty period, the shipping cost which delivered to MYIR should be responsible by user; MYIR will pay for the return shipping cost to users when the product is repaired. If the warranty period is expired, all the shipping cost will be responsible by users.

### Products Life Cycle

MYIR will always select mainstream chips for our design, thus to ensure at least ten years continuous supply; if meeting some main chip stopping production, we will inform customers in time and assist customers with products updating and upgrading.

### Value-added Services

- MYIR provides services of driver development base on MYIR's products, like serial port, USB, Ethernet, LCD, etc.
- MYIR provides the services of OS porting, BSP drivers' development, API software development, etc.
- MYIR provides other products supporting services like power adapter, LCD panel, etc.
- ODM/OEM services.

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