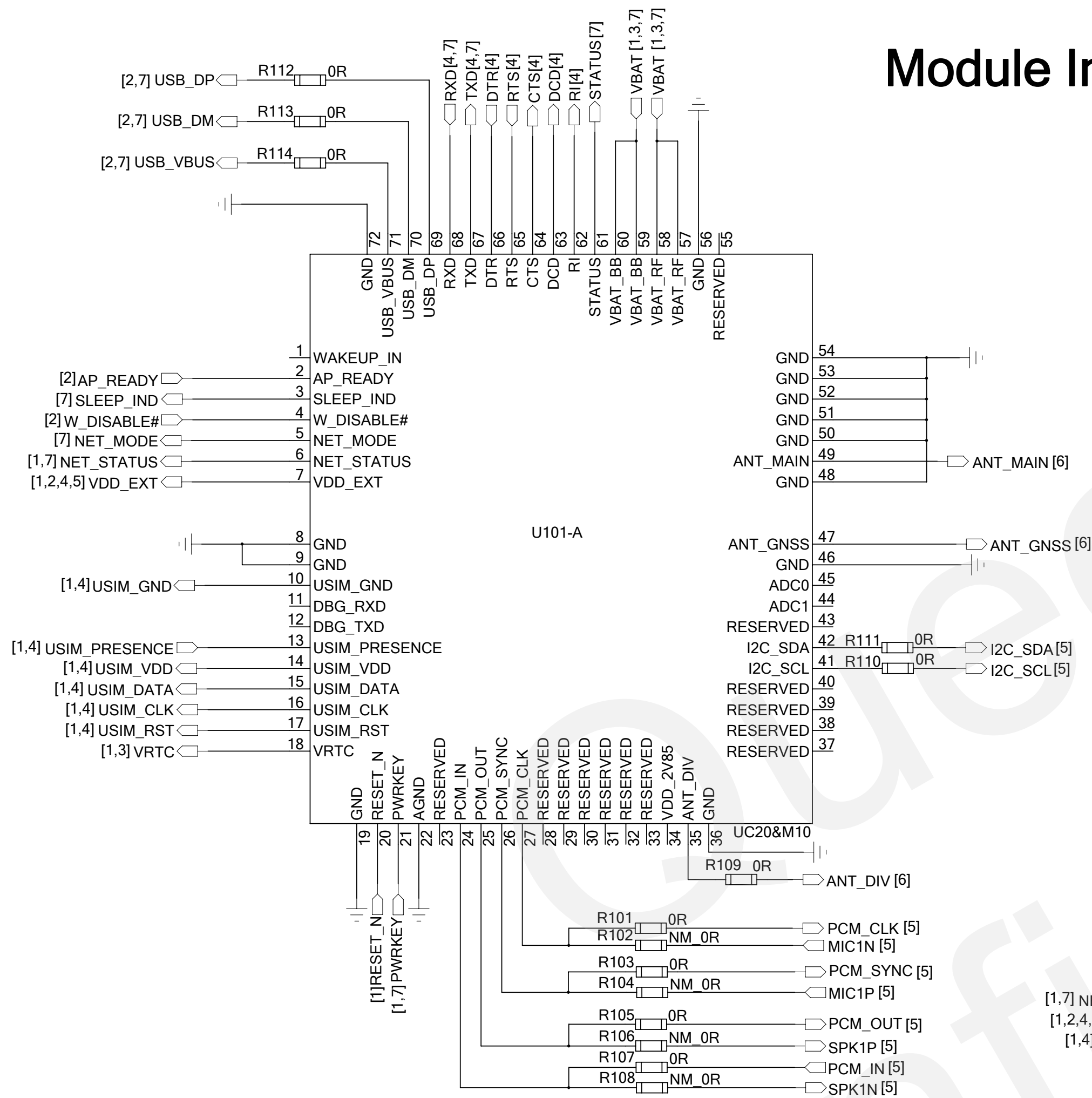
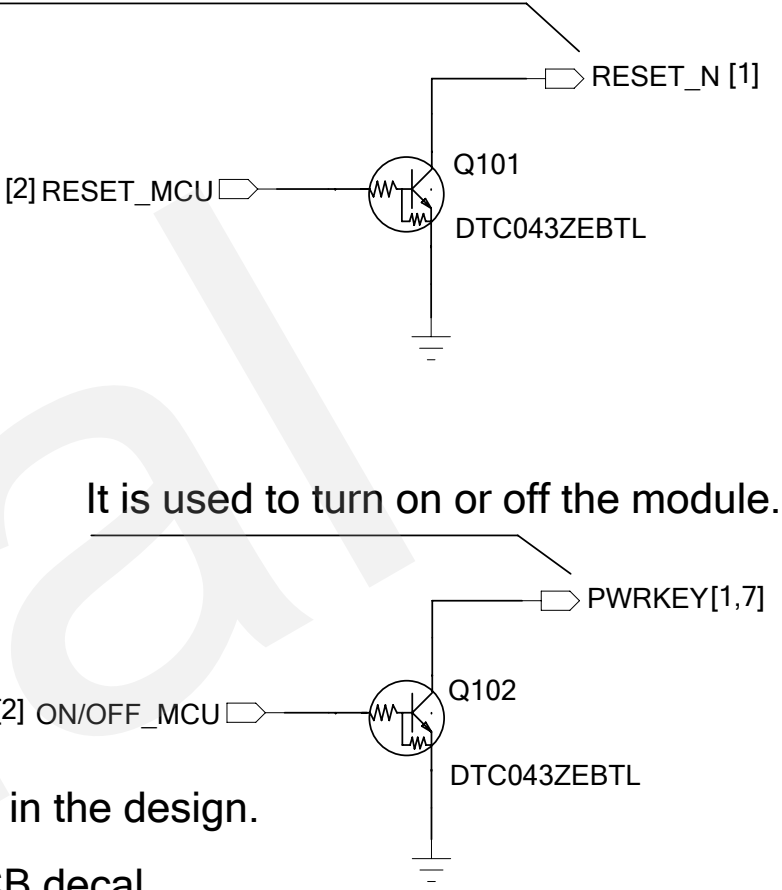


Module Interface



For UC20, RESET_N is used to reset the module.
For M10, EMERG_OFF is used to turn off the module.



Note:
Pin73~84 of UC20 are used for factory test, and they are unused in the design.
You can ignore them and don't design them in schematic and PCB decal.

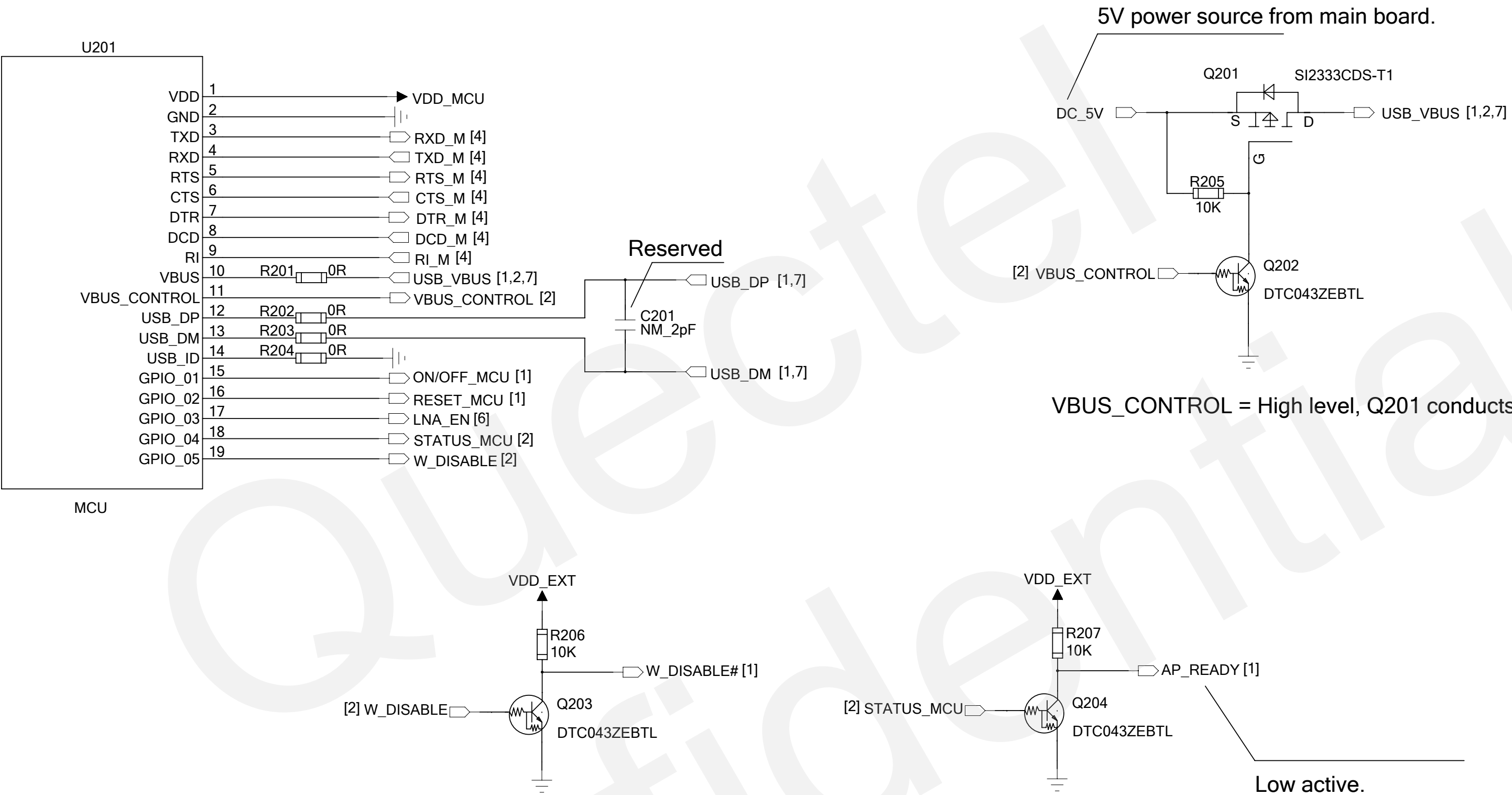
Notes:
1. SMD difference between UC20 and M10 is shown as below:

Intended audience	Installed	Not installed
M10	R102, R104, R106, R108	R101, R103, R105, R107, R109~R114
UC20	R101, R103, R105, R107, R109~R114	R102, R104, R106, R108

2. Please refer to M10 and UC20 Hardware Design respectively for further details about the difference between them.
3. Keep all RESERVED and unused pins unconnected.
4. AP_READY should be designed in your circuit. Refer to the document <UC20_Hardware_Design> for more details.

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DRAWN BY <Mountain.ZHOU>	PROJECT <UC20&M10 Reference Design>	TITLE <Module Interface>
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MCU Interface



Notes:

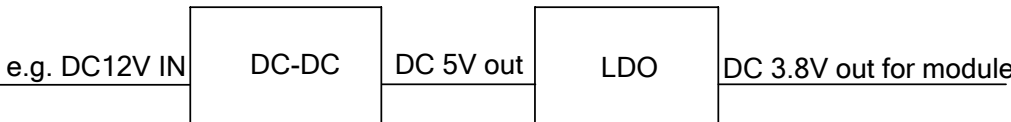
1. U201 represents customer's MCU.
2. Pay attention to the UART connection of RTS/CTS.
3. UC20 can only work as a USB device and support FS/HS mode. To communicate with USB interface, MCU needs to support USB host or OTG function.
The VBUS pins of MCU and UC20 need to be provided by 5V power for USB detection, and VBUS_CONTROL turns on and off VBUS power supply.
4. Please pay attention to LNA_EN voltage level translation for LNA, if the voltage domain of MCU is 5V.

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CHECKED BY <Bruce.YU>	SIZE A2	VER 1.05
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Power Supply Design

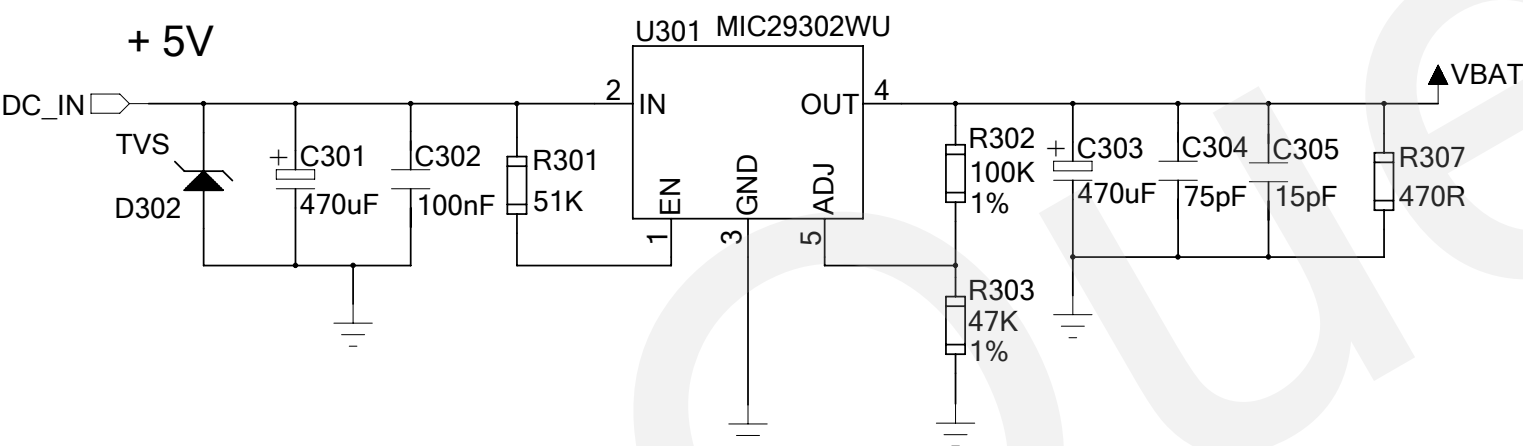
DC-DC Application

It is used when the input voltage is above 7V. Use DC-DC to convert high input voltage to 5V, and LDO will generate 3.8V typical voltage for the module.



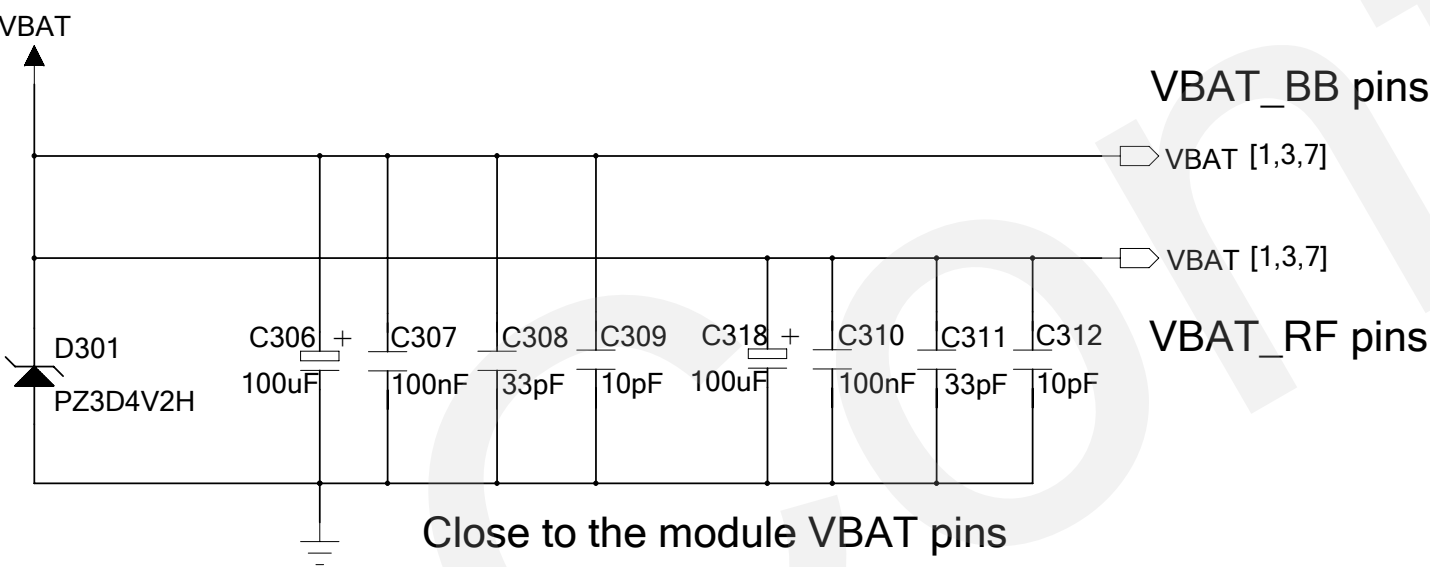
LDO Application

It is used when the input voltage is below 7V.



$$VBAT = (R302/R303+1)*1.24 = 3.88V$$

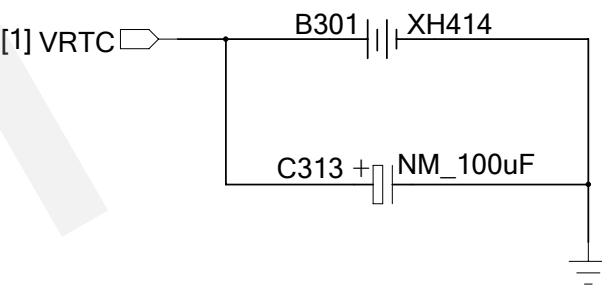
VBAT Design



Note:

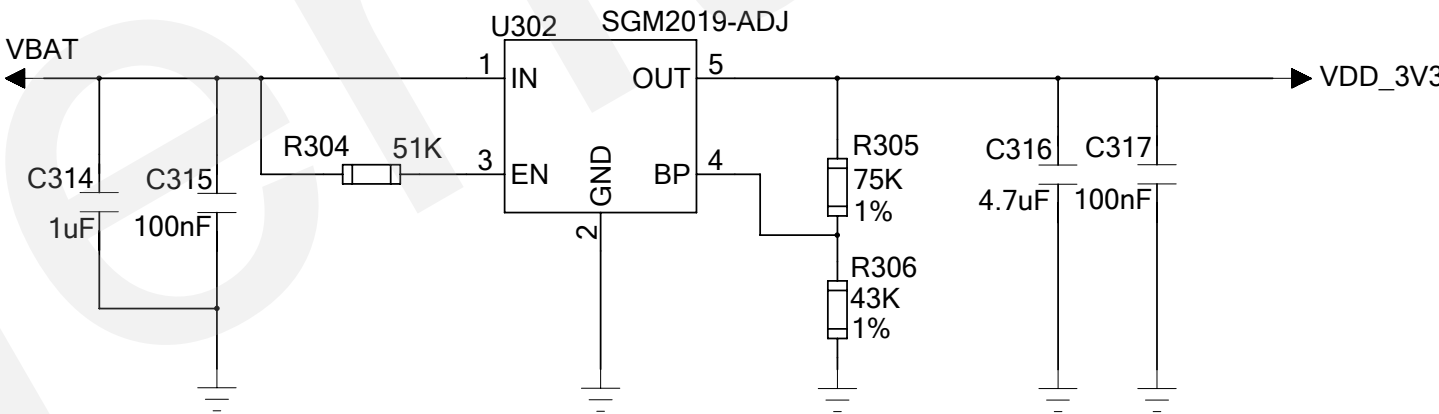
VBAT should be routed in star mode to VBAT_BB and VBAT_RF pins.

VRTC Design



If VRTC function is not used, keep VRTC pin open.

Supply Power to UC20 PCM Codec Circuit



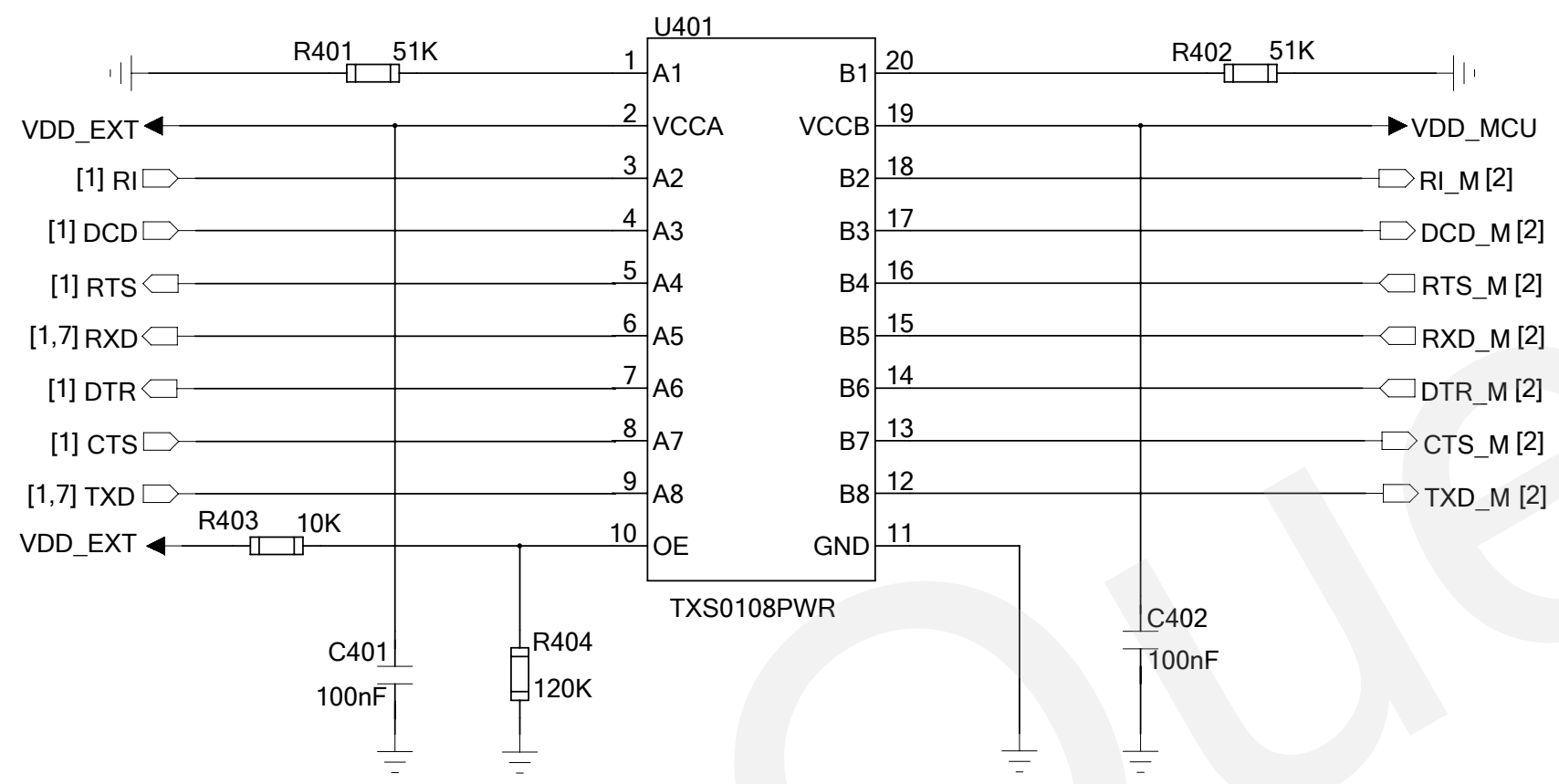
$$Vout = (R305/R306+1)*1.207 = 3.3V$$

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DRAWN BY <Mountain.ZHOU>	PROJECT <UC20&M10 Reference Design>	TITLE <Power Supply Design>
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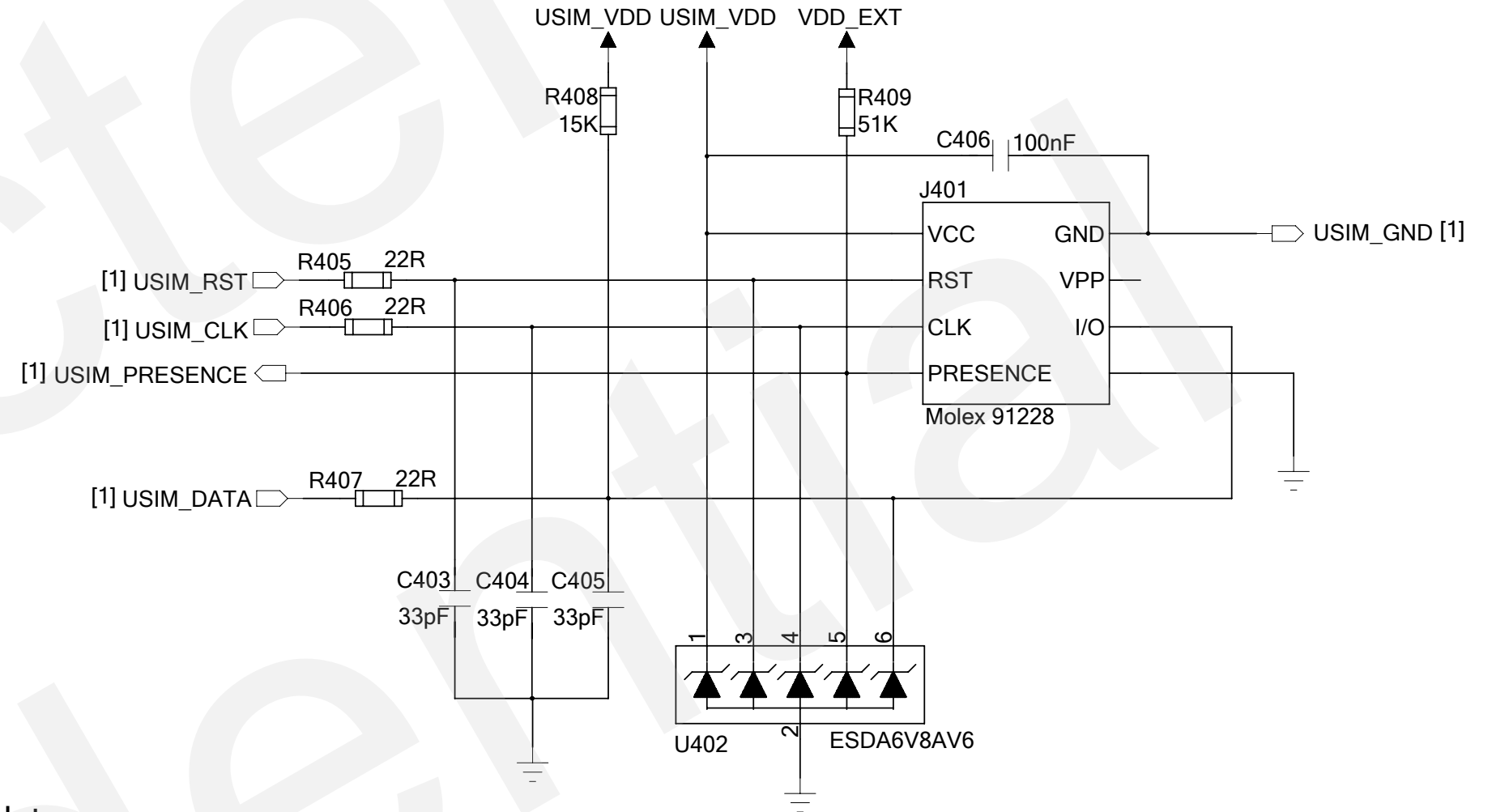
UART and USIM Design

UART Level Translator



- Notes:
- 1. TXS0108 is to realize the voltage level translation between UC20/M10 and MCU.
 - 2. This circuit is available for both UC20 and M10 UART voltage level translation design.
 - 3. VCCA should not exceed VCCB.
For more information about TXS0108, please refer to the datasheet from TI website.
 - 4. DTR is pulled up by software. Driving DTR to low level wakes up the module.
 - 5. TXS0108 is compatible with TXB0108, and can be used to replace TXB0108 directly.

USIM Design

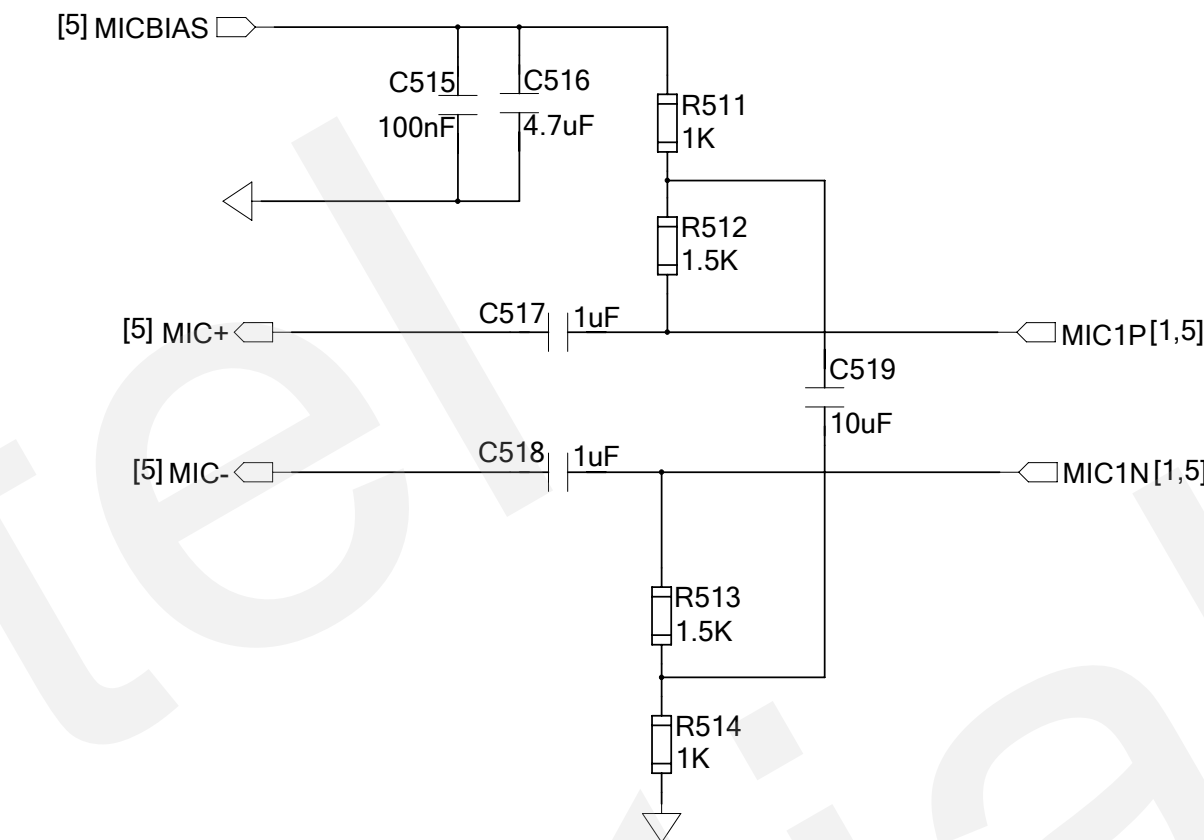
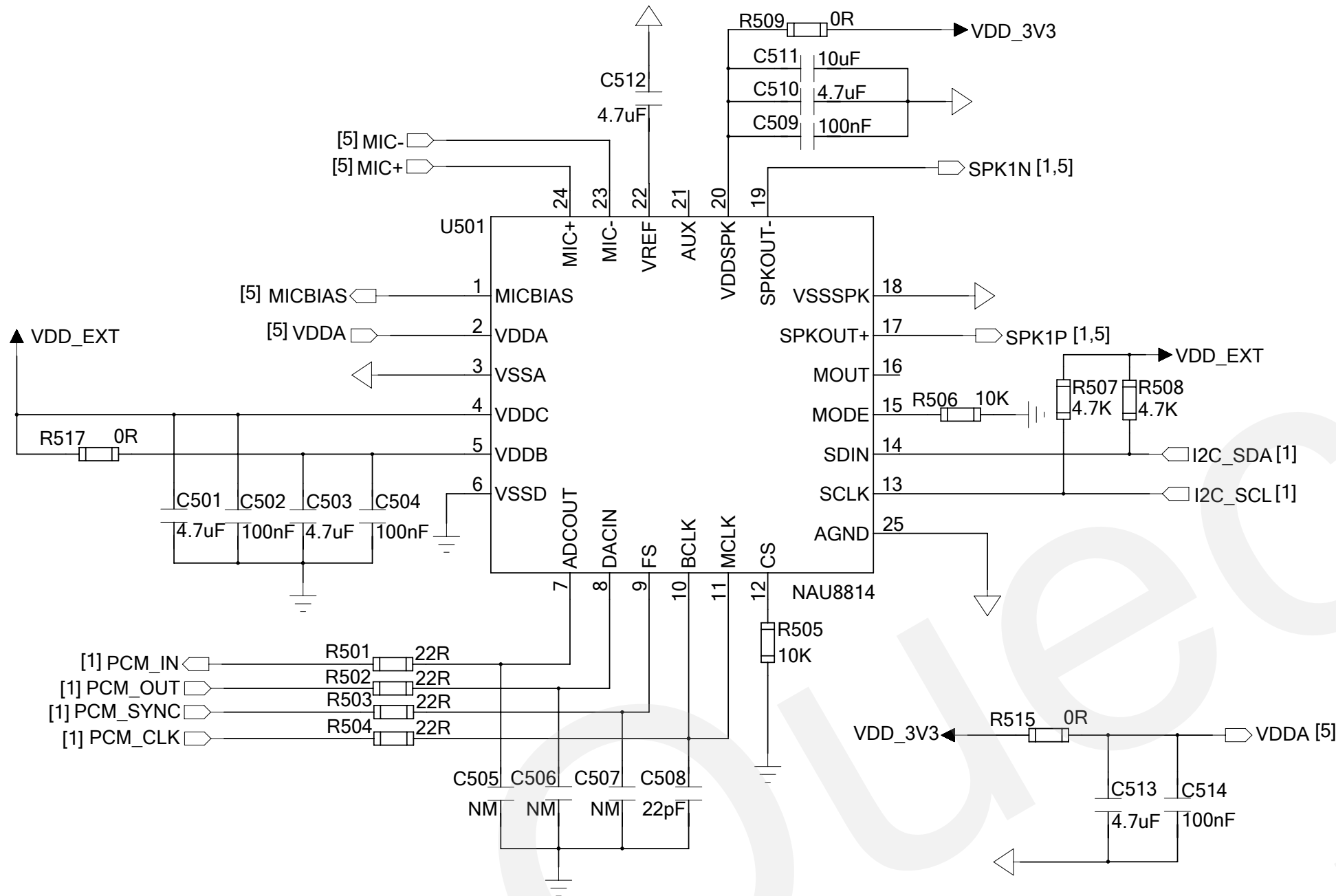


- Notes:
- 1. R405~R407 are applied to suppress the EMI spurious transmission and enhance the ESD protection.
 - 2. R408 can improve anti-jamming capability of the USIM circuit.
 - 3. UC20 supports USIM card hot-plugging, which can be implemented through USIM_PRESENCE and configured to high-level active or low-level active through command "AT+QSIMDET".
The circuit above is designed for low-level detection.
 - 4. The value of C406 should be less than 1uF.

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DRAWN BY <Mountain.ZHOU>	PROJECT <UC20&M10 Reference Design>	TITLE <UART and USIM Design>
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	SHEET 4 of 7	<2014.10>

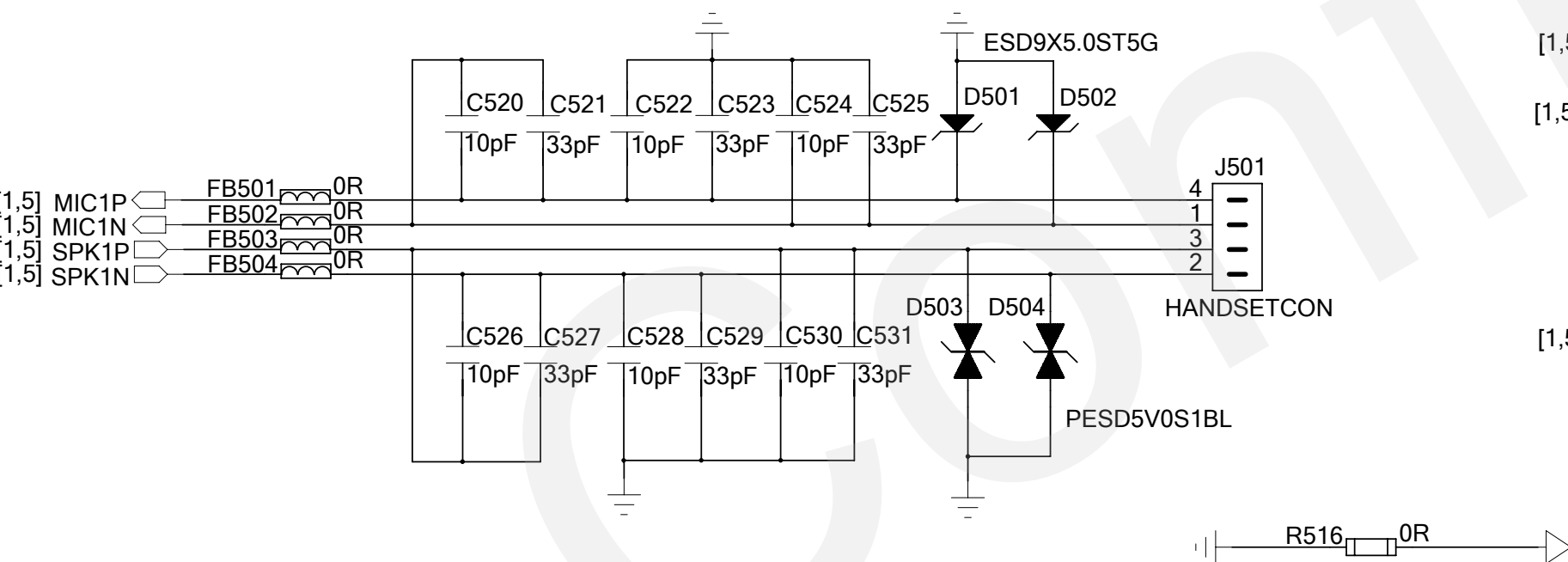
Audio Design

PCM Codec Circuit

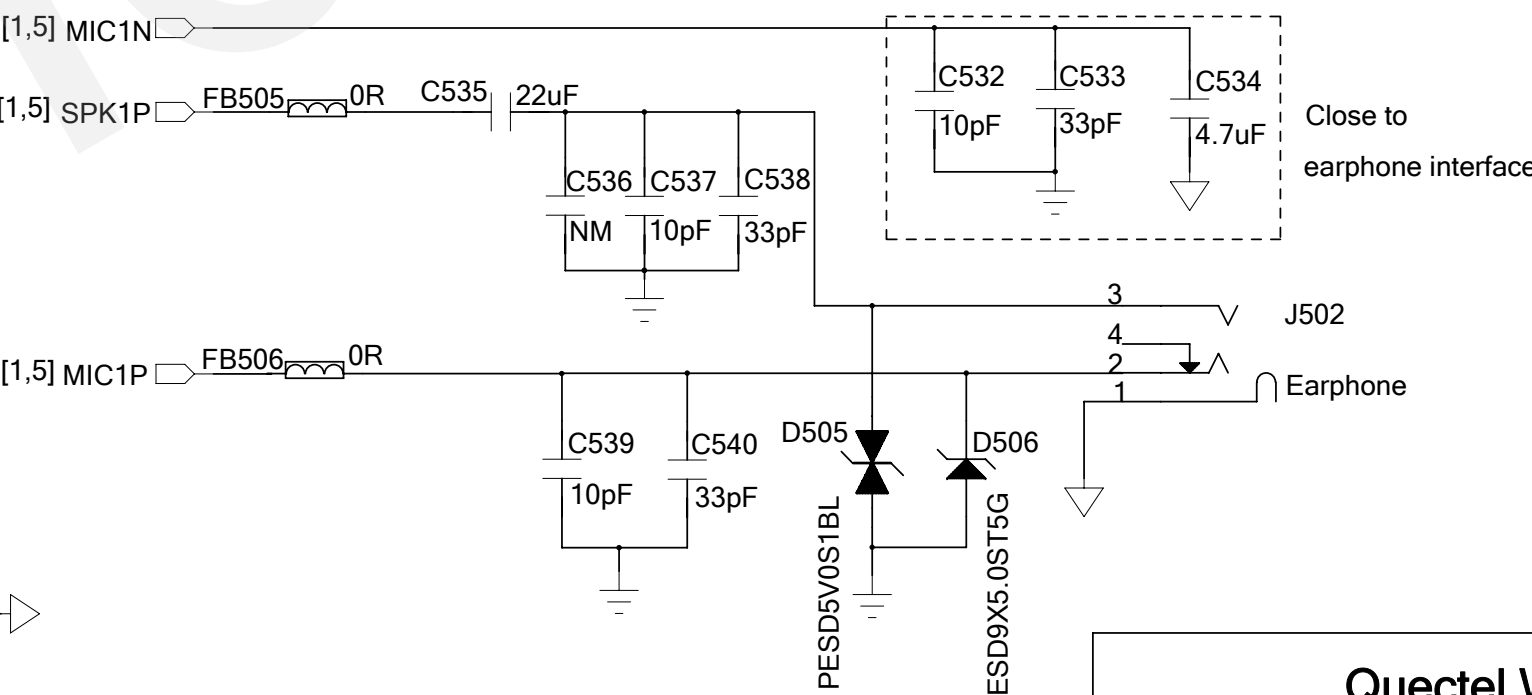


- Notes:
1. This circuit is available for UC20 audio applicaion only.
 2. The UC20 firmware supports NAU8814 and ALC5616 codec's application without additional software configuration. Refer to the document <UC20_AT_Commands_Manual> for command "AT+QDAI".
 3. The circuit about ALC5616 is not designed here, you can refer to datasheet for details.

Audio Channel - Handset



Audio Channel - Earphone

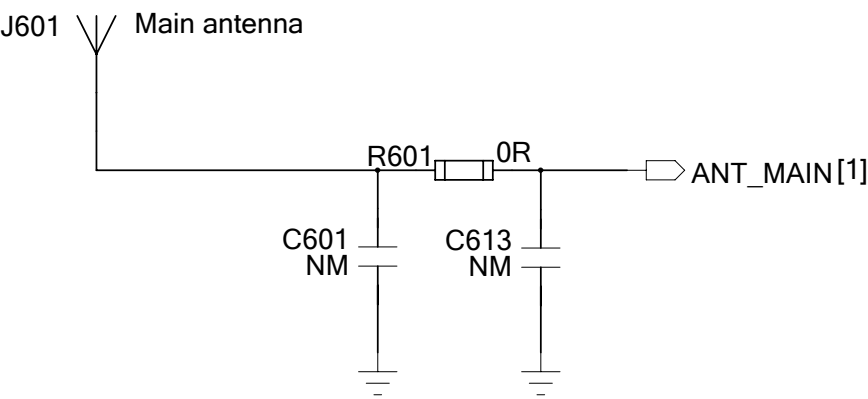


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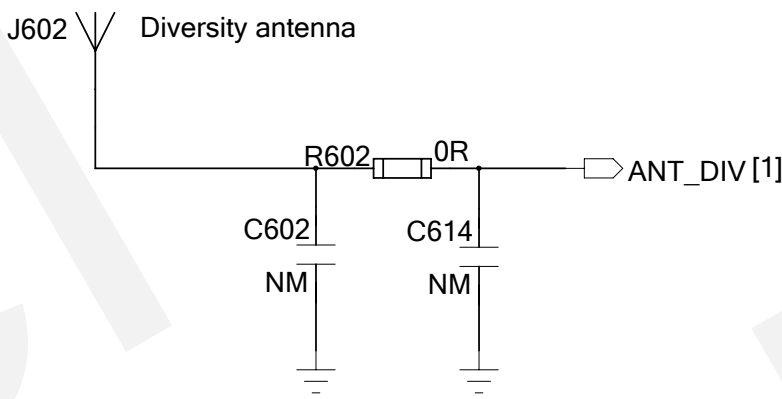
RF and GNSS Design

Main Antenna Interface



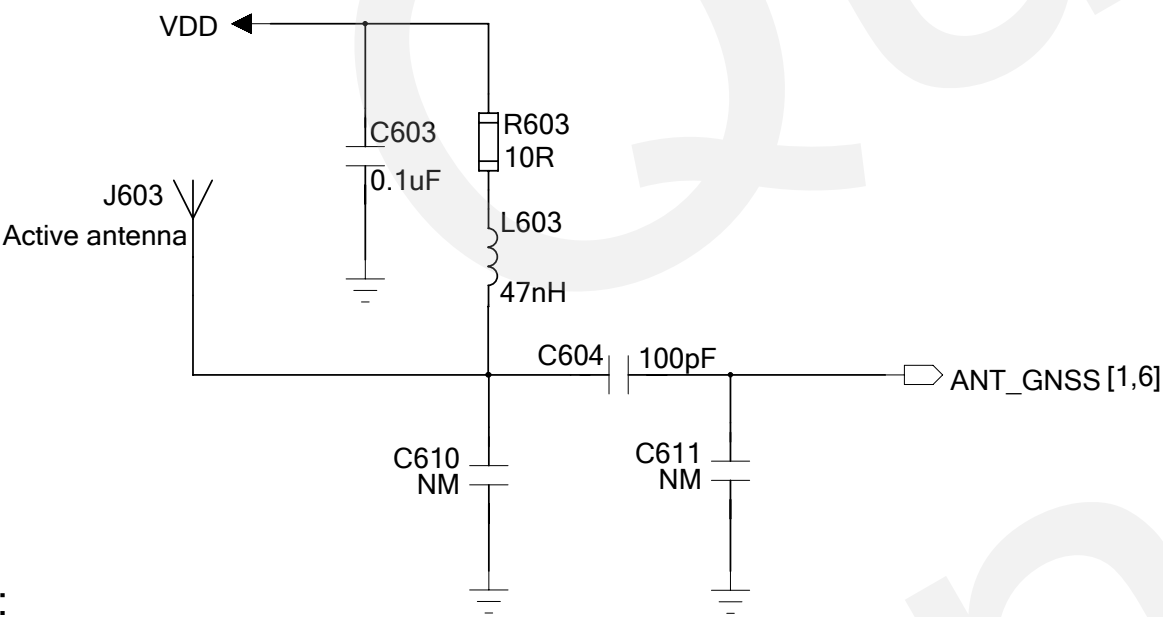
C601 and C613 are reserved for impedance matching.

Diversity Antenna Interface



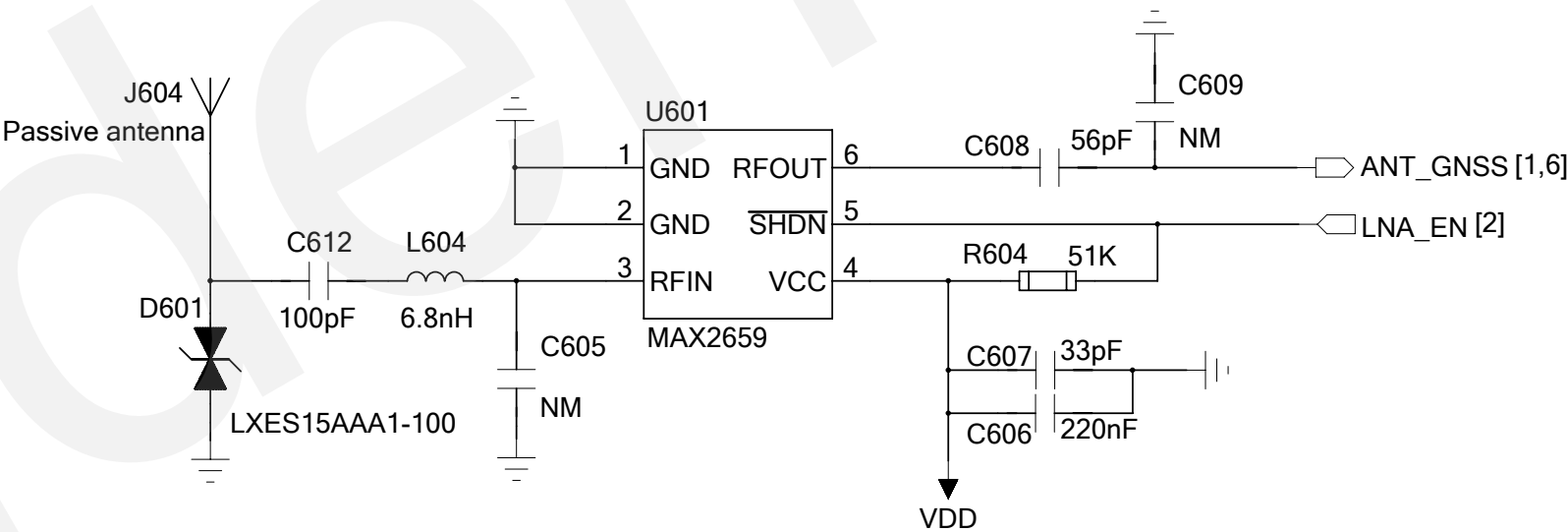
ANT_DIV is used to improve UMTS receiving performance.

GNSS Active Antenna Circuit



- Notes:
- 1. If you design antenna circuit with passive antenna, the R603 and L603 are not needed.
 - 2. You can choose an external LDO to supply power (VDD above) to the active antenna and LNA circuit.

GNSS Passive Antenna Circuit



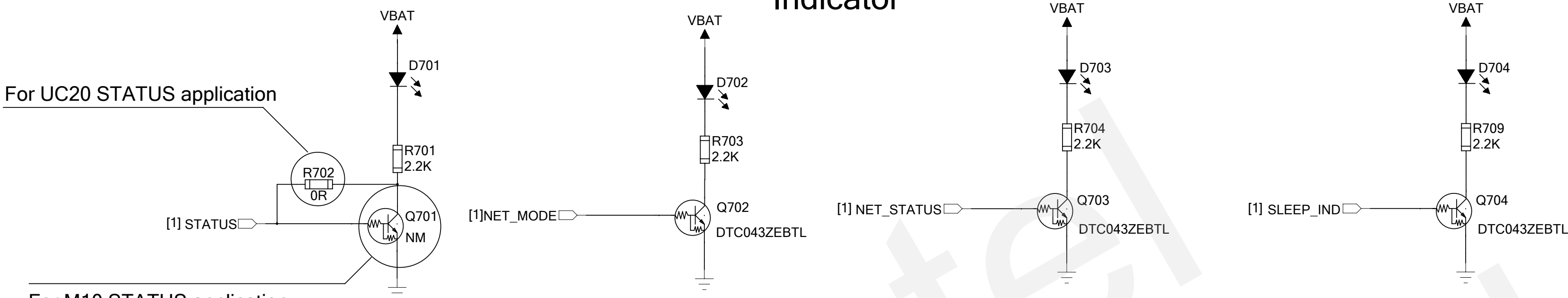
- Notes:
- 1. One typical reference circuit based on MAX2659 is shown above.
 - 2. You can use one GPIO to turn on or off the LNA U601.
 - 3. The junction capacitance of D601 should be less than 1pF.

Quectel Wireless Solutions

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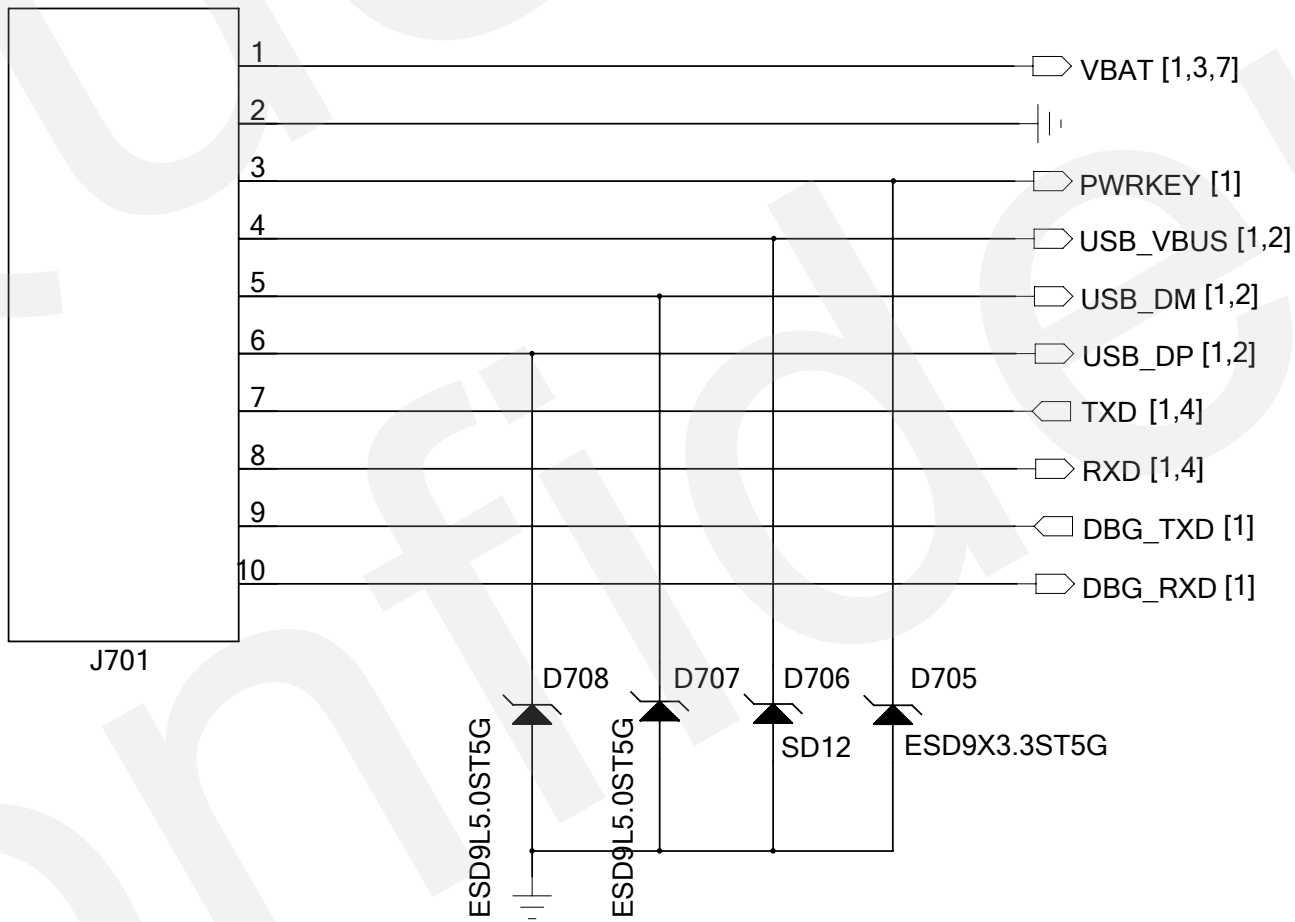
Other Designs

Indicator



Note:
Refer to the document <UC20_Hardware_Design> for more details about NET_MODE, NET_STATUS and SLEEP_IND.

Reserved Test Points



- Notes:
- 1. USB of UC20 and UART of M10 are reserved for firmware upgrade.
 - 2. Keep USB test points as close to USB pins as possible.
 - 3. Debug UART interface of M10 is used to catch log.

Quectel Wireless Solutions

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CHECKED BY <Bruce.YU>	SIZE A2	VER 1.05
SHEET	7 of 7	<2014.10>