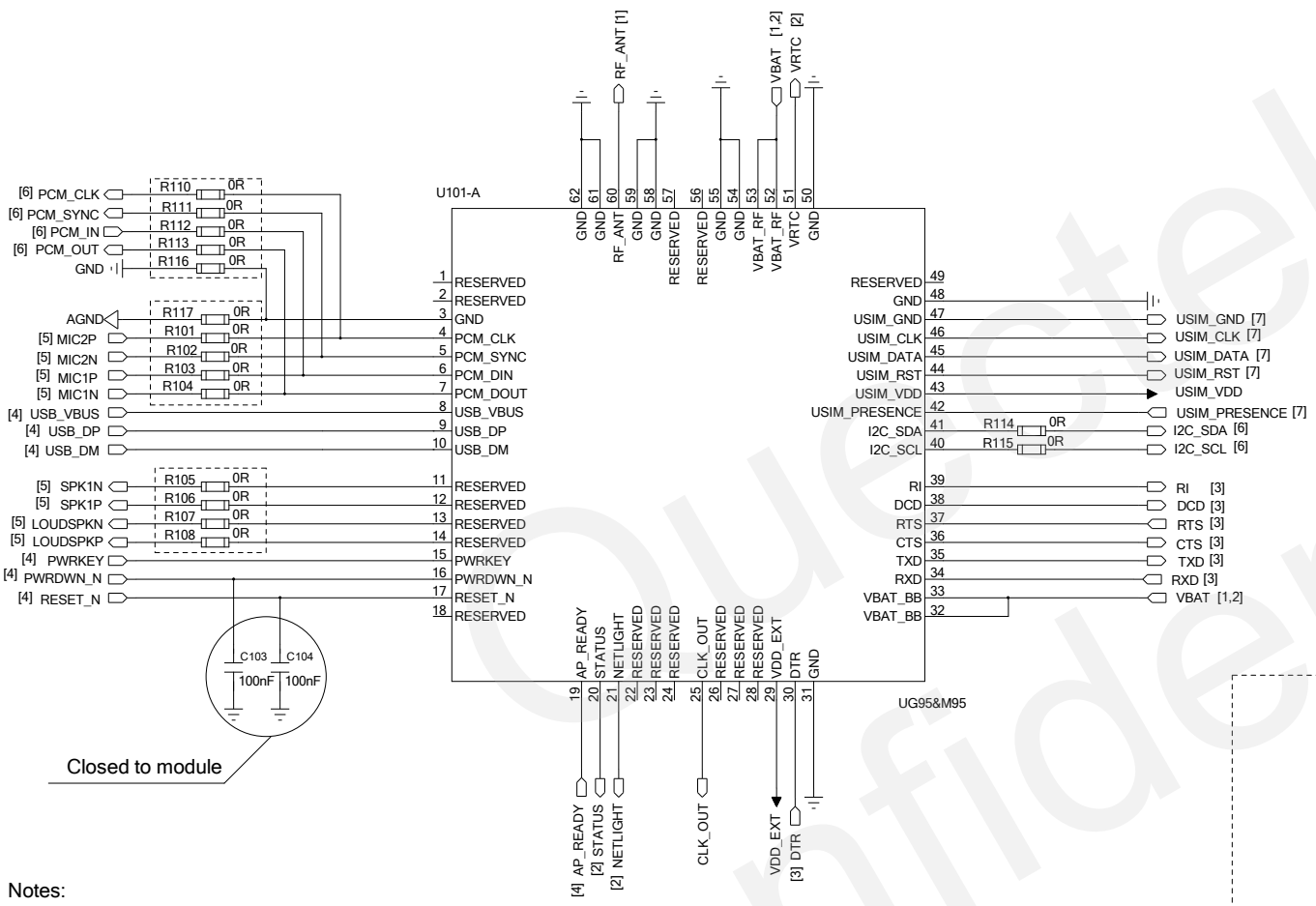
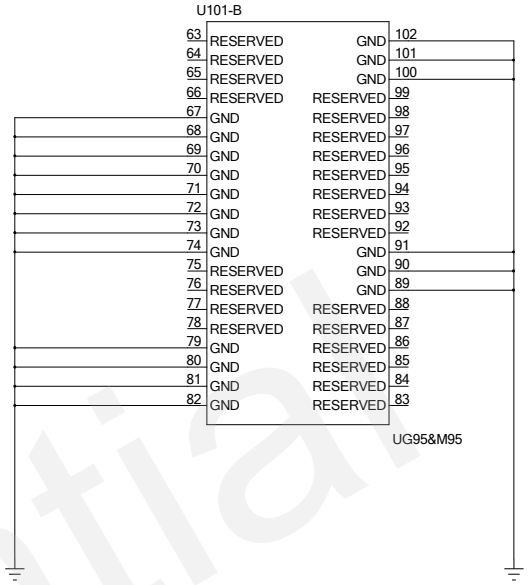
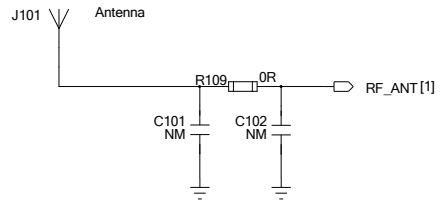
Module Interface





Antenna Interface



C101 and C102 are reserved for impedance matching.

Notes:

1. SMD difference between UG95 and M95 is shown as below:

Intended audience	Installed	Not installed
M95	R101~R108, R117	R110~R116
UG95	R110~R116	R101~R108, R117

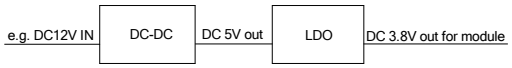
2. Please refer to M95 and UG95 Hardware Design respectively for further details about the difference between them.
3. Keep all RESERVED and unused pins unconnected. All GND pins should be connected to ground.
4. AP_READY is under development
5. The CLK_OUT is a digital clock output signal for an external audio codec, please refer to UG95 Hardware Design for more details.

Quectel Wireless Solutions		
DRAWN BY <Yeoman CHEN>	PROJECT <UG95&M95 Ref.Design>	TITLE <Module Interface>
CHECKED BY <Huik LI>	SIZE A2	VER 1.3
	SHEET 1 of 7	<2015.11>

Power Design

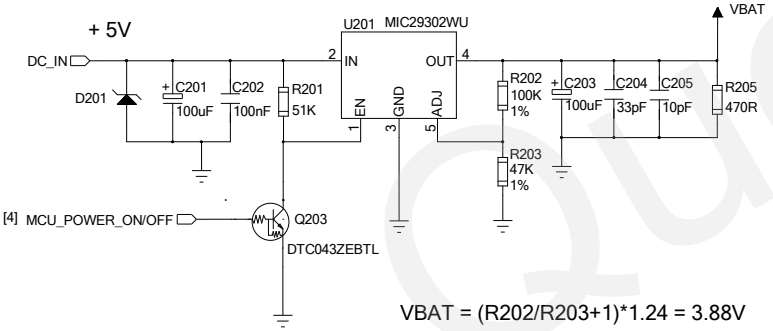
DC-DC Application

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.



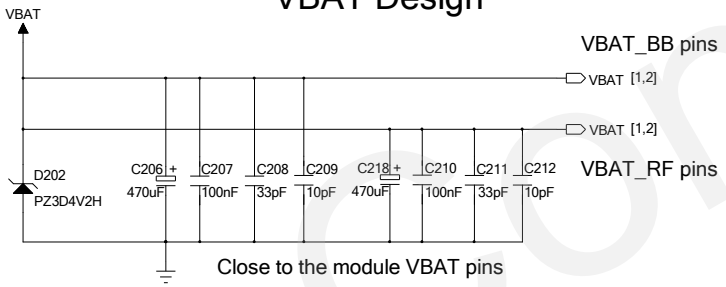
LDO Application

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



VBAT = (R202/R203+1)*1.24 = 3.88V

VBAT Design

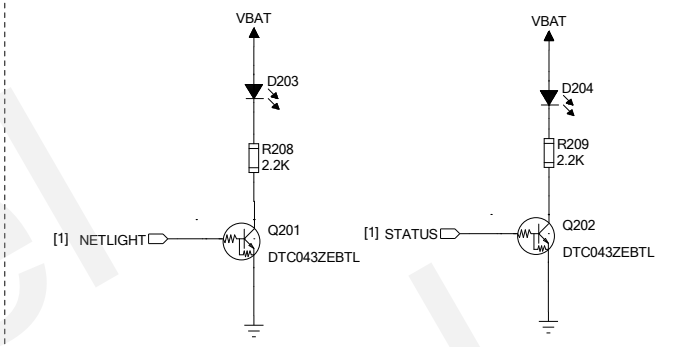


Note:

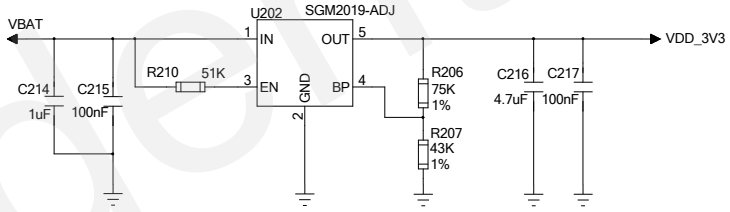
VBAT should be routed in star mode to VBAT_BB and VBAT_RF pins.

VRTC Design

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



Supply Power to PCM Codec Circuit

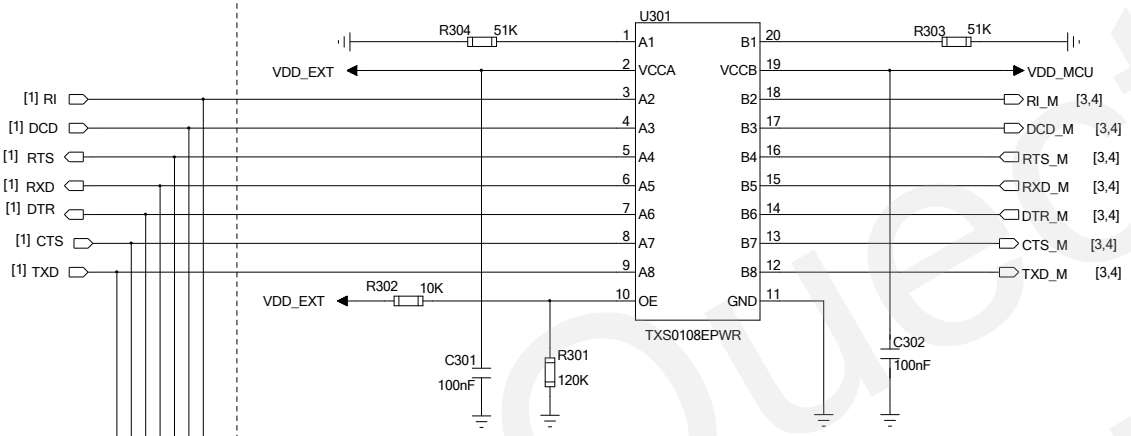


VDD_3V3 = (R206/R207+1)*1.207 = 3.3V

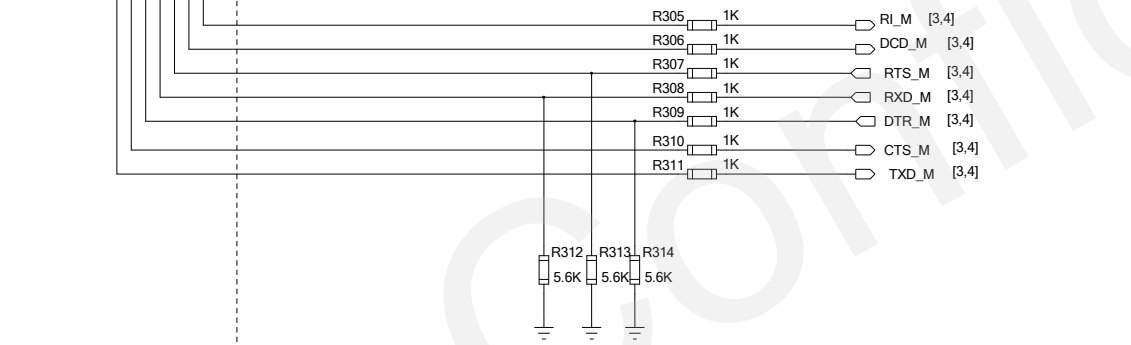
Quectel Wireless Solutions		
DRAWN BY <Yeoman CHEN>	PORJECT <UG95&M95 Ref.Design>	TITLE <Power Design>
CHECKED BY <Huik LI>	SIZE A2	VER 1.3
	SHEET 2 of 7	<2015.11>

UART Design

UART Design-Option 1



UART Design-Option 2



Notes 1:

1. TXS0108EPWR is to realize the voltage level translation between UG95/M95 and MCU.
2. This circuit is available for both UG95 and M95 UART voltage level translation design.
3. VCCA should not exceed VCCB.
4. DTR is pulled up by software. Driving DTR to low level wakes up the module.

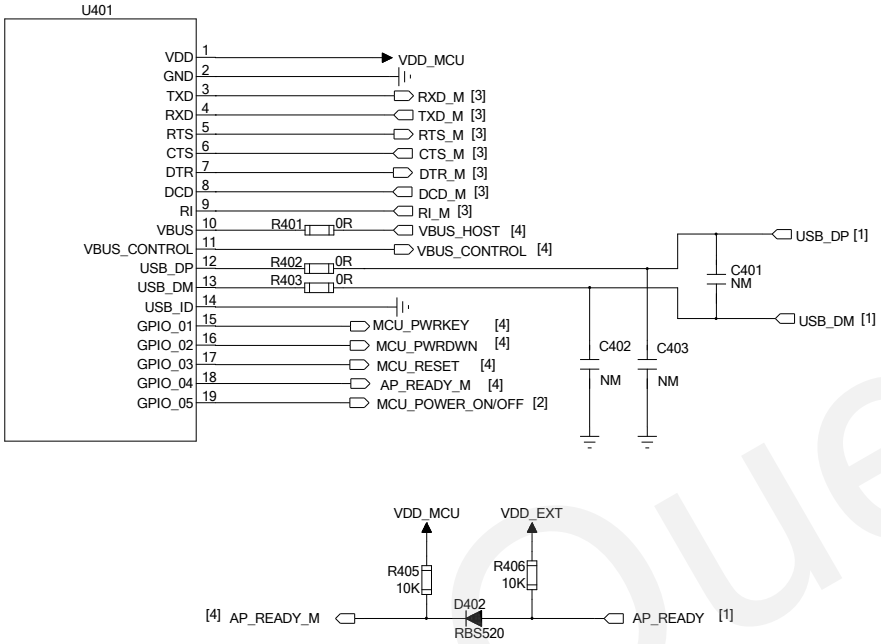
For more information about TXS0108EPWR, please refer to the datasheet from TI website.

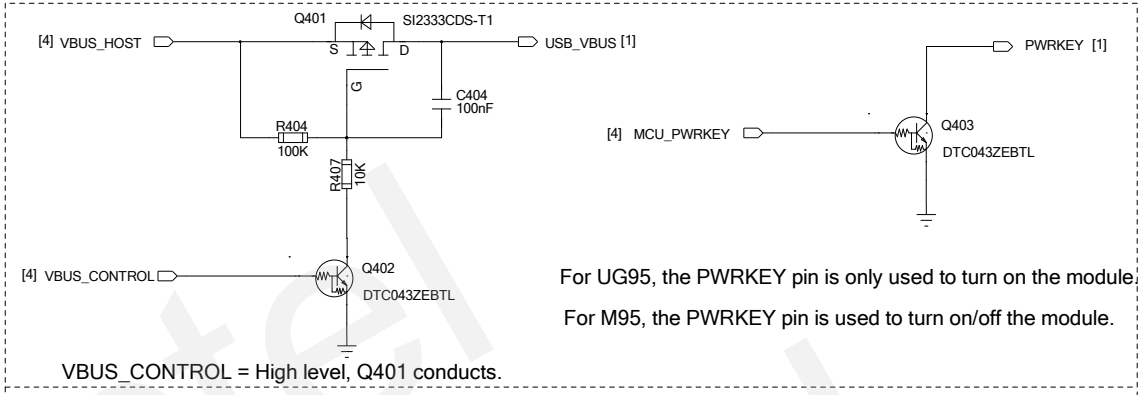
Notes 2:

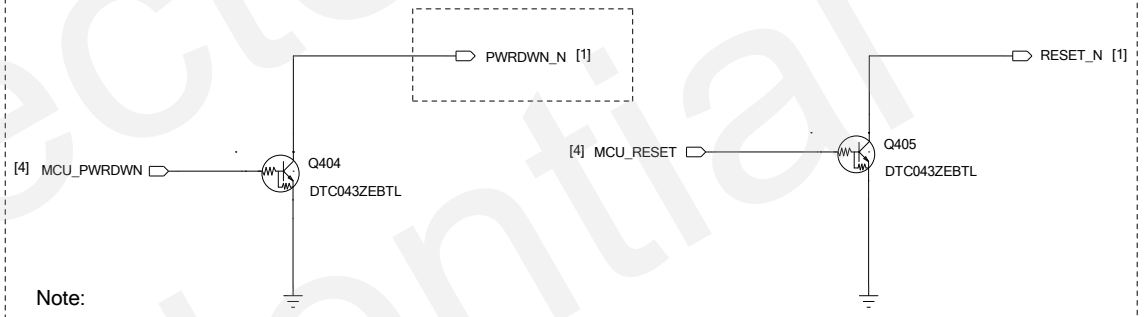
1. When UG95 only uses USB port to communicate and M95 uses UART port, it is recommended to use the UART design-option 2 for M95.
2. The resistance of R312~R314 is used on 3.3V IO level system. While on 3V IO level system, the resistance of R312~R314 should change to 15K ohm, and make sure the max input level voltage to module is 2.8V.
3. If both UG95 and M95 module use UART port, it is recommended to use UART design-option 1 for UART compatible design.

Quectel Wireless Solutions		
DRAWN BY <Yeoman CHEN>	PORJECT <UG95&M95 Ref.Design>	TITLE <UART Design>
CHECKED BY <Huik LI>	SIZE A2	VER 1.3
	SHEET 3 of 7	<2015.11>

MCU Interface







Notes:

1. U401 represents customer's MCU.
2. Pay attention to the UART connection of RTS/CTS.
3. UG95 can only work as a USB device and supports FS/HS mode. To communicate with USB interface, MCU needs to support USB host or OTG function.

   The USB interface is primarily used for AT command, data transmission, software debug and firmware upgrade.

   The USB_VBUS pin of UG95 is used for USB detection, and VBUS_CONTROL powers on and off VBUS.
4. Customers can determine to use USB or UART communication according to their needs.

Module	Application	Installed	Not installed
UG95	USB	R401~R404, Q401,Q402	U301 circuit
UG95&M95	UART design-option 1	U301 circuit	R401~R404, Q401,Q402
M95	UART design-option 2	R305~R314	U301 circuit

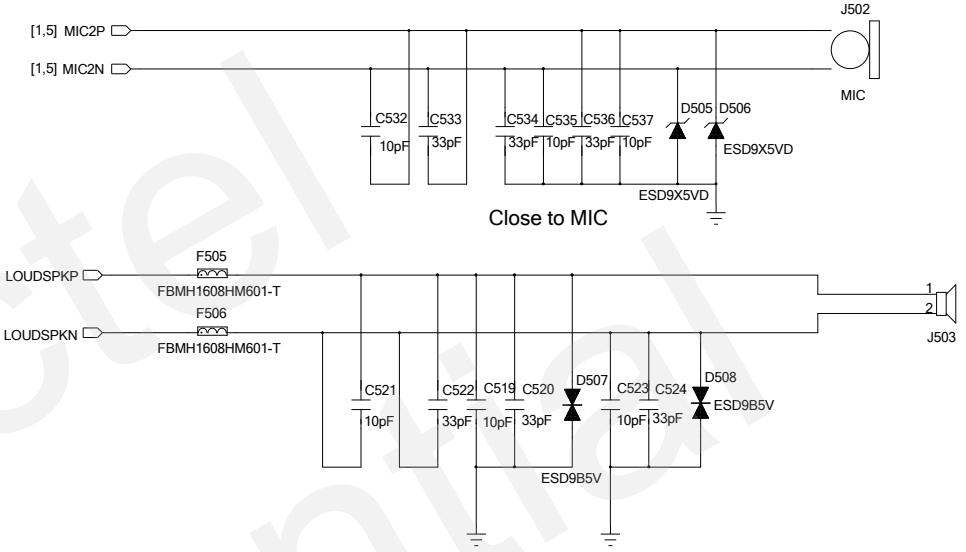
Quectel Wireless Solutions		
DRAWN BY <Yeoman CHEN>	PORJECT <UG95&M95 Ref.Design>	TITLE <MCU Interface>
CHECKED BY <Huik LI>	SIZE A2	VER 1.3
	SHEET 4 of 7	<2015.11>

Audio Interface

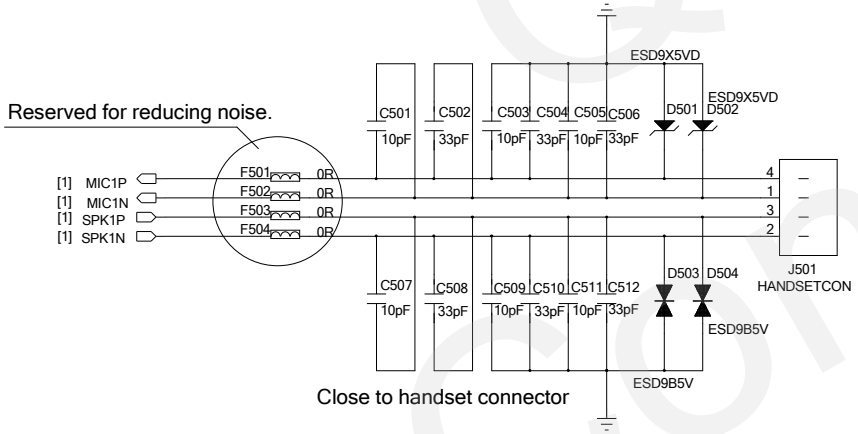
Notes:

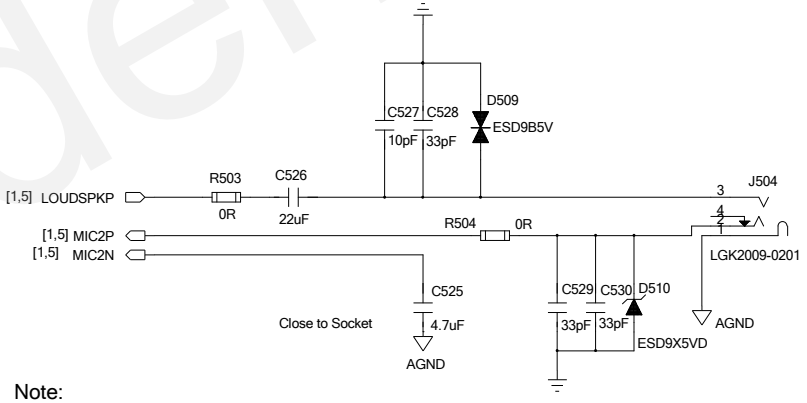
1. Audio interface is for M95 only.
2. This is the typical audio application. For more details, please refer to the GSM Module Audio Design Guide.
3. 10P&33P capacitors are used for filtering TDD noise.
4. Both AIN1 and AIN2 have bias voltage of micphone inside module.
5. AOUT1 is capable of driving 32ohm load.
6. AOUT2 is capable of driving 8ohm load and Earphone.

Hands-free Application of AIN2/AOUT2



Handsets Application of AIN1/AOUT1





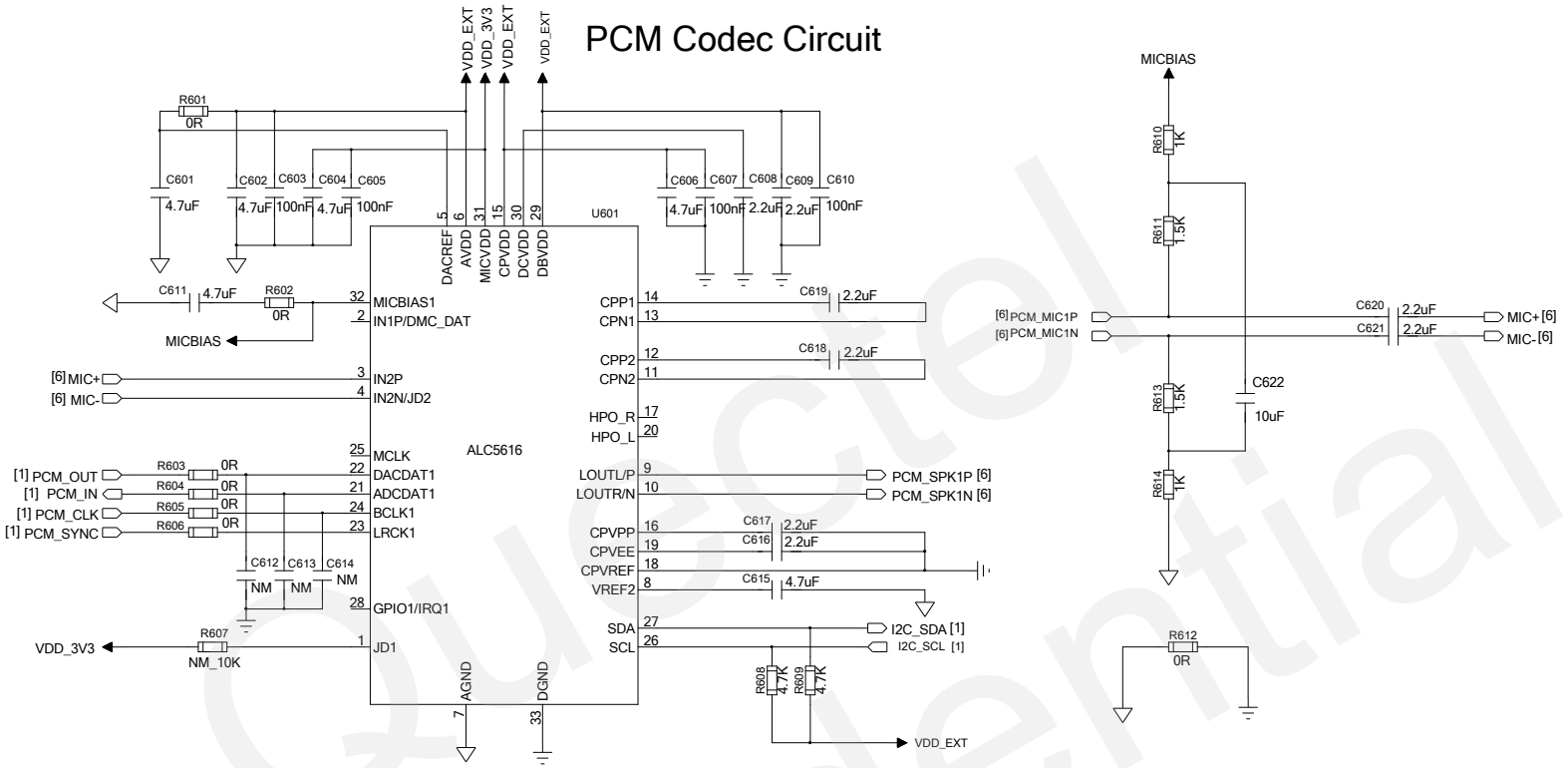
Note:

Ringing function for incoming call is only supported by AOUT2 channal.

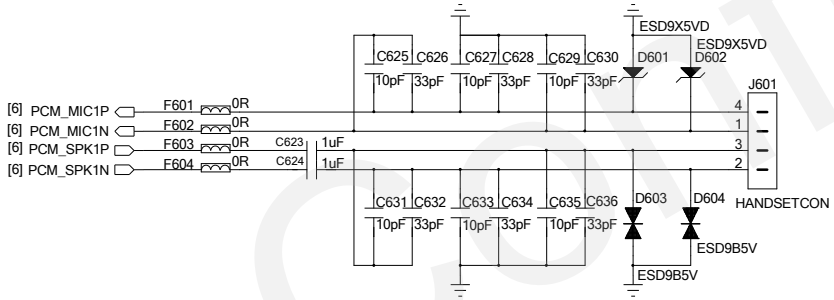
Quectel Wireless Solutions		
DRAWN BY <Yeoman CHEN>	PORJECT <UG95&M95 Ref.Design>	TITLE <Audio Interface>
CHECKED BY <Huik LI>	SIZE A2	VER 1.3
	SHEET 5 of 7	<2015.11>

PCM Design

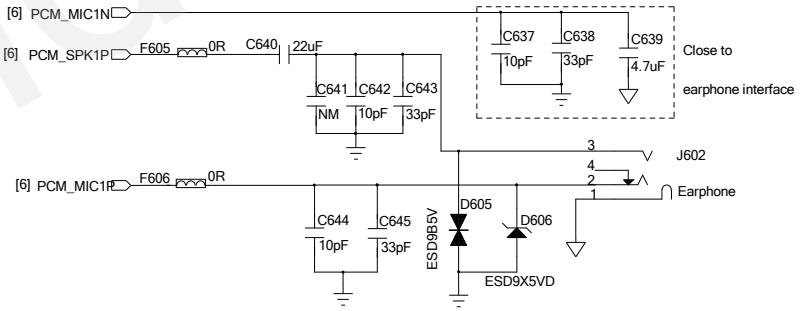
PCM Codec Circuit



Audio Channel-Handset



Audio Channel-Earphone

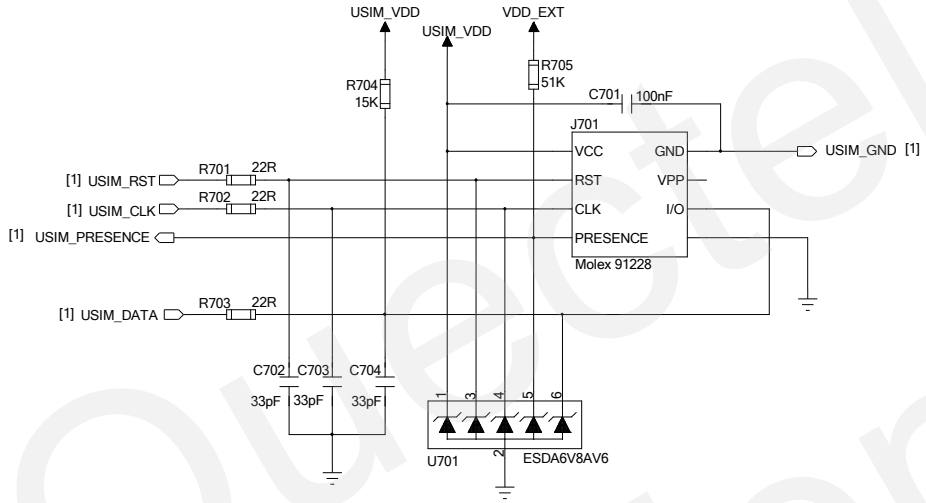


Note:

PCM_SPK1P&PCM_SPK1N are capable of driving 32ohm load.

Quectel Wireless Solutions		
DRAWN BY <Yeoman CHEN>	PORJECT <UG95&M95 Ref.Design>	TITLE <PCM Design>
CHECKED BY <Huik LI>	SIZE A2	VER 1.3
	SHEET 6 of 7	<2015.11>

USIM Interface



Notes:

1. R701~R703 are applied to suppress the EMI spurious transmission and enhance the ESD protection.
2. R704 can improve anti-jamming capability of the USIM circuit.
3. UG95 supports USIM card hot-plugging, which can be implemented through USIM_PRESENCE pin.The circuit above is designed for low-level detection.
4. The value of C701 should be less than 1uF.

Quectel Wireless Solutions		
DRAWN BY <Yeoman CHEN>	PORJECT <UG95&M95 Ref.Design>	TITLE <USIM Interface>
CHECKED BY <Huik LI>	SIZE A2	VER 1.3
	SHEET 7 of 7	<2015.11>