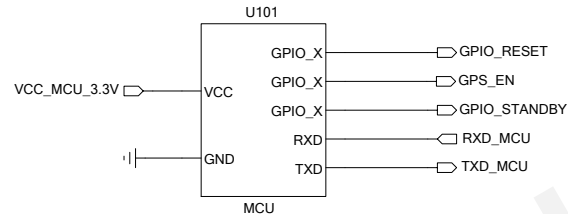
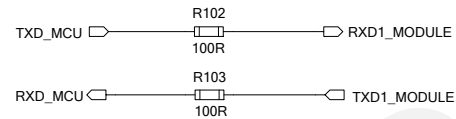


3.3V Power Supply and UART Circuit

Customer's MCU

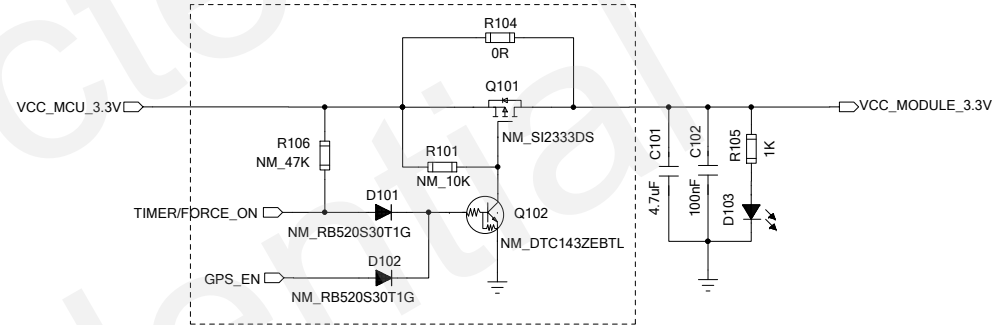


UART Circuit



R102,R103 are resrved for debugging the waveform of UART, and they are also beneficial to ESD protection.
Generally,100R for R102 and R103 is recommended,but 0R also works well.

Power Management Circuit(Optional)



	R101	R104	R106	D101	D102	Q101	Q102
L70	10K	NM	47K	RB520S30T1G	RB520S30T1G	Si2333DS	DTC143ZEBTL
L76	NM	0R	NM	0R	0R	NM	NM

(NM:Not Mounted)

FORCE_ON in L76 module: Logic high will force the GNSS module to be waked up from backup mode.

TIMER in L70 module: An open drain output signal can be used to control the GPS module

main power on/off. Note that when TIMER function is used in L70 module, please ensure V_BCKP is supplied with power all the time.

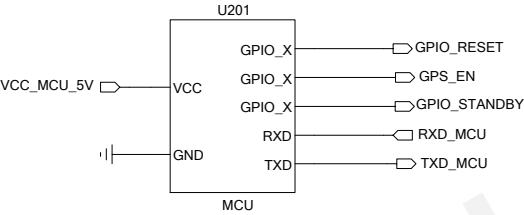
For more details about TIMER & FORCE_ON, please refer to L70/L76 Hardware Design.

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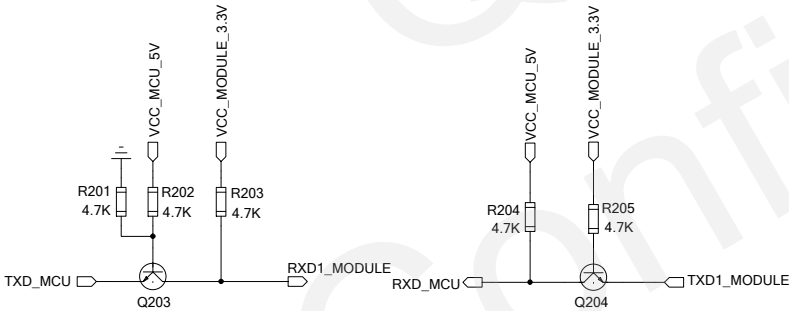
DRAWN BY <King HAO & Rain ZHOU>	PROJECT <L70/L76>	TITLE <L70/L76_Reference_Design>
CHECKED BY <Ray XU>	SIZE A2	VER <1.03>
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5V Power Supply and UART Circuit

Customer's MCU

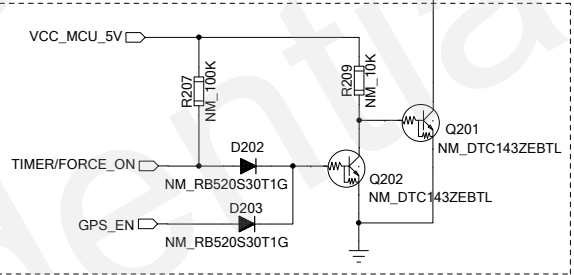
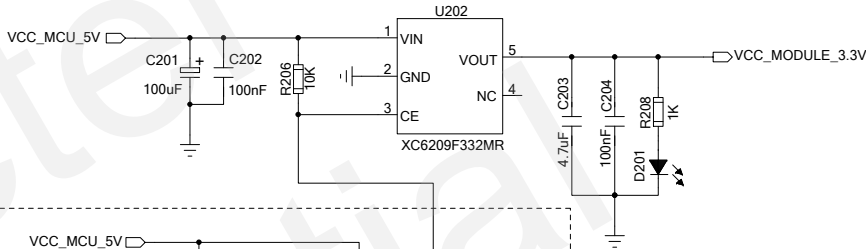


Level Shifting for UART



The transistor circuit will realize the voltage level shifting between VCC_MCU_5V and VCC_MODULE_3.3V, and block the leakage current from one power-on device to another power-off device.

LDO Circuit



Power Management Circuit(optional)

	R207	R209	D202	D203	Q201	Q202
L70	100K	10K	RB520S30T1G	RB520S30T1G	DTC143ZEBTL	DTC143ZEBTL
L76	NM	NM	0R	0R	NM	NM

(NM:Not Mounted)

FORCE_ON in L76 module: Logic high will force the GNSS module to be waked up from backup mode.

TIMER in L70 module: An open drain output signal can be used to control the GPS module main power on/off. Note that when TIMER function is used in L70 module, please ensure V_BCKP is supplied with power all the time.

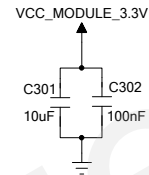
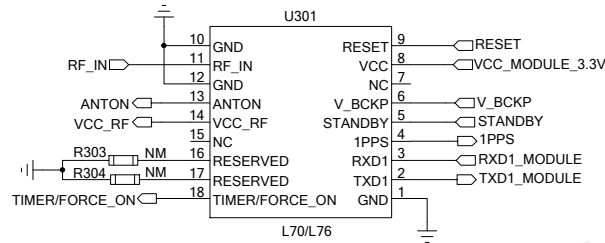
For more details about TIMER & FORCE_ON, please refer to L70/L76 Hardware Design.

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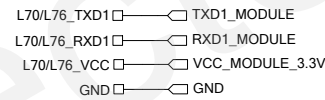
DRAWN BY <King HAO & Rain ZHOU>	PROJECT <L70/L76>	TITLE <L70/L76_Reference_Design>
CHECKED BY <Ray XU>	SIZE A2	VER 1.03
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Module Interface

Module Interface

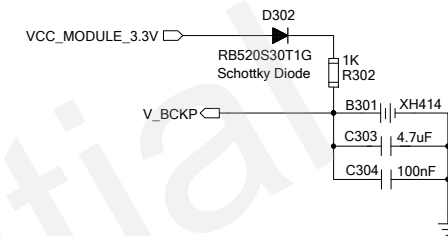


Test Points



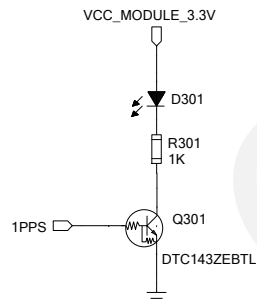
1. UART1 can be used to output NMEA message as well as to upgrade firmware.
2. R303,R304 are reserved to modify baud rate for future.
Keep R303,R304 unmounted in L70/L76 module.
3. The definition of pin 18: L76 called FORCE_ON,L70 called TIMER.
4. The test points are reserved for debugging the GPS module.

Charge Circuit for RTC logic



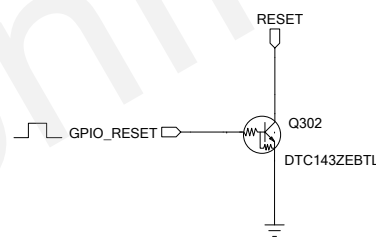
V_BCKP is designed to supply power for L70/L76 RTC logic circuit when VCC_MODULE_3.3V is powered off.

Indicating Circuit



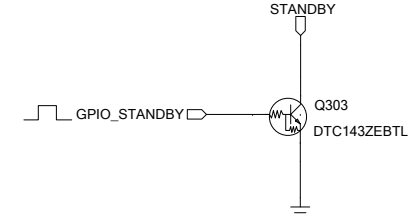
The 1PPS indicator will blink at 1Hz frequency after fixing the position.

Reset Circuit



1. If the reset function is unused,the RESET pin can be connected to the VCC directly.
2. RESET has been pulled up internally.

Standby Circuit



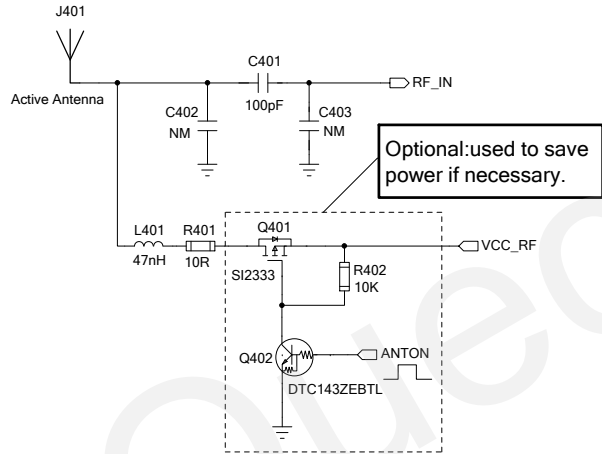
1. STANDBY has been pulled up internally.
 2. Enter standby mode: change the STANDBY pin from high to low level.
 3. Exit from standby mode: change the STANDBY pin from low to high level.
- For more details,please refer to L70/L76 Hardware Design.

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Antenna Interface

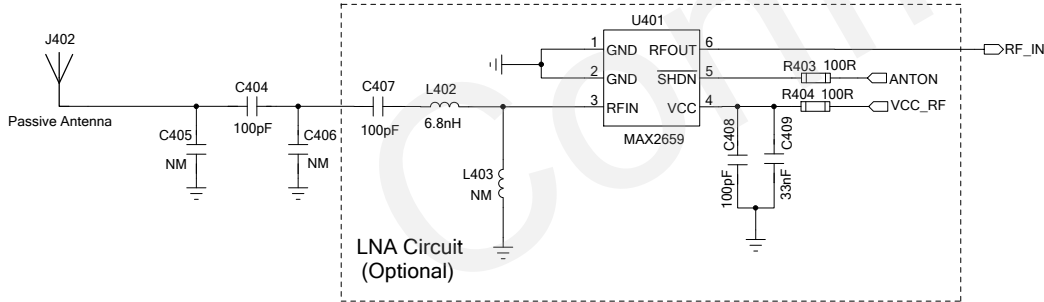
Active Antenna



1. Pi circuit (C401,C402,C403) is reserved for impedance matching for antenna. By default, C402 and C403 are not mounted, C401 is 100pF.
2. VCC_RF can be used as power supply for active antenna, its typical value is 3.3V, the voltage range is 2.8V-4.3V. If it does not meet the requirement of the active antenna, an external LDO could be used.
3. The voltage level of ANTON will be pulled down in standby mode.
4. If the L70/L76 module never enter the standby mode in the design, the ANTON pin can be kept unused.
5. Impedance of RF trace should be controlled by 50 ohm and the length should be kept as short as possible.

For more details, please refer to L70/L76 Hardware Design.

Passive Antenna



1. Pi circuit (C404,C405,C406) is reserved for impedance matching for antenna. By default, C405 and C406 are not mounted, C404 is 100pF.
2. If an external LNA is added between passive antenna and L70/L76 module, the total sensitivity will be improved about 3dB, which is beneficial for improving TTFF.
3. One typical reference circuit with MAX2659 is given as the left figure. Here, C407,L402,L403 form a reserved matching circuit for the LNA MAX2659. By default, C407 is 100pF, L402 is 6.8nH, L403 is not mounted.
4. VCC_RF can be used as power supply for LNA, its typical value is 3.3V, the voltage range is 2.8V-4.3V.
5. ANTON is an optional pin which can be used to control the enable pin of an external LNA. If "ANTON" function is not used, please connect the pin "LNA ENABLE" to VCC to keep LNA always on.
6. Impedance of RF trace should be controlled by 50 ohm and the length should be kept as short as possible.

For more details, please refer to L70/L76 Hardware Design.

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