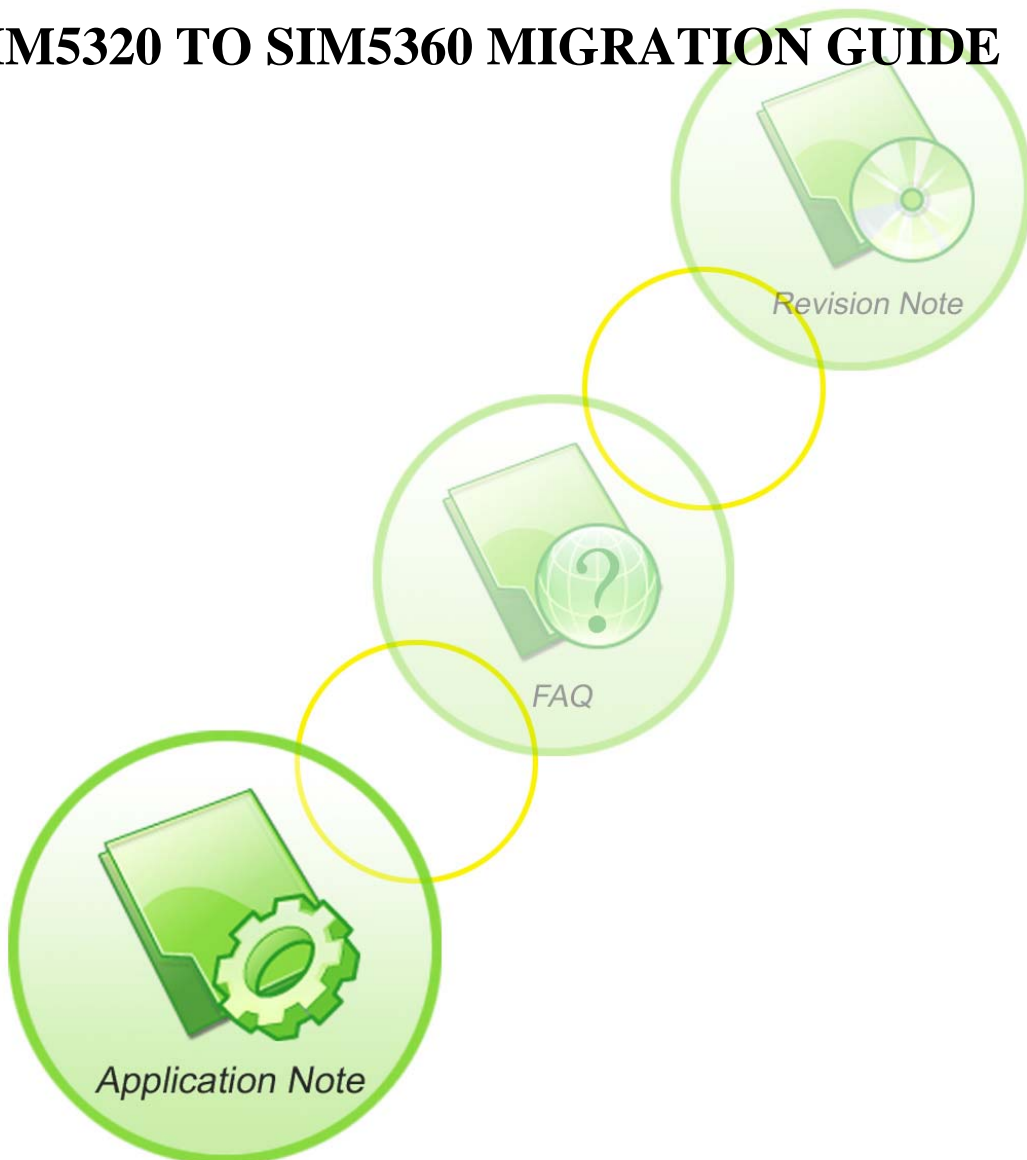




Application Note

SIM5320 TO SIM5360 MIGRATION GUIDE



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Revision History

Data	Version	Description of change	Author
2014-07-03	1.01	Original	Libing

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1 Introduction

This document is targeted for customers to understand the differences between the SIM5360 and SIM5320. Users can use SIM5360 or SIM5320 module to design and develop applications quickly.

2 Pin Configuration

The following figure shows the pin assignment of SIM5360 and SIM5320.

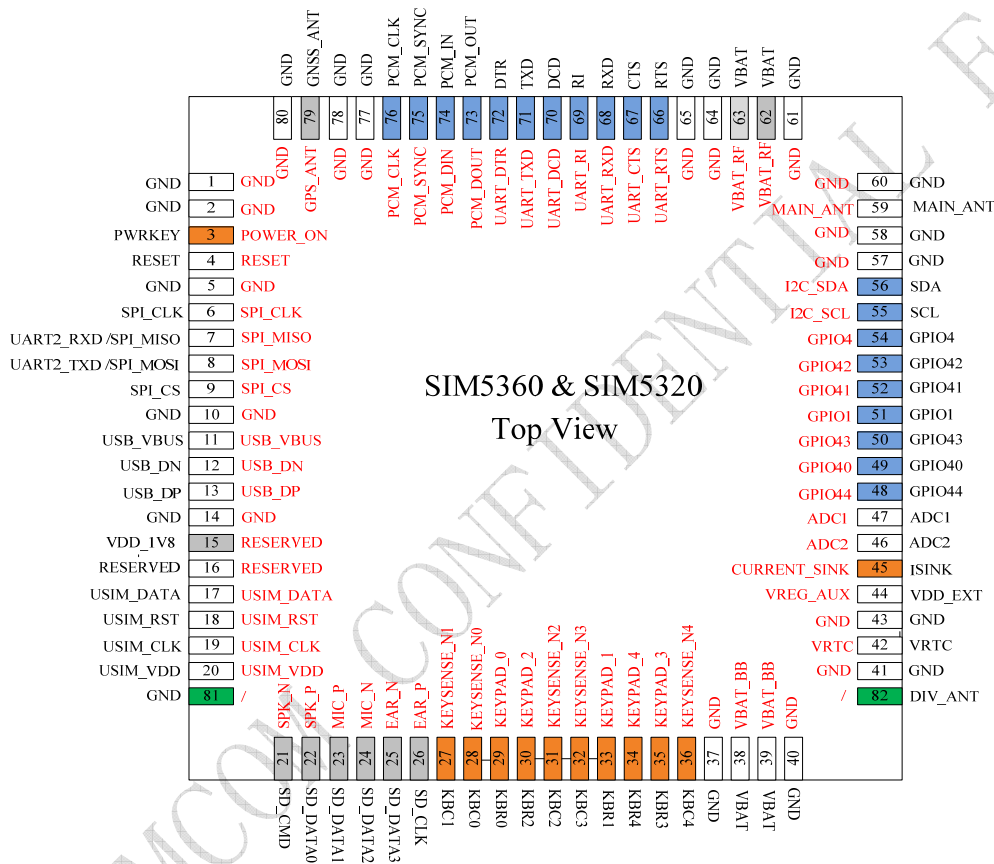


Figure 1: SIM5360 and SIM5320 Pin Assignment

NOTE:

- The pin names marked in red in the inside area are SIM5320.
- The green pins of SIM5360 are the additional pins compared with SIM5320.
- The pin names marked in blue in the inside area are different of voltage levels between SIM5360 and SIM5320.
- The pin names marked in gray in the inside area are different function interfaces between SIM5360 and SIM5320.
- The different pin names in orange between SIM5360 and SIM5320 has the same functions in the above figure, except the following table.

Table 1: The Difference of Pins in SIM5360 and SIM5320

Pin	SIM5360 Pin name	SIM5320 Pin name	I/O	Description
7	UART2_RXD /SPI_MISO	SPI_MISO_DATA	I	SIM5360: UART2 function (default) SIM5320: SPI function
8	UART2_TXD /SPI_MOSI	SPI_MOSI_DATA	I	
15	VDD_1V8	RESERVED	O	VDD_1V8 is 1.8V SMPS output for external circuit, such as level shift circuit. Rated Current is 50mA.
21	SD_CMD	SPK_M	I/O	SIM5360: SD function SIM5320: Analog Audio function
22	SD_DATA0	SPK_P	I/O	
23	SD_DATA1	MIC1P	I/O	
24	SD_DATA2	MIC1N	I/O	
25	SD_DATA3	EAR1N	I/O	
26	SD_CLK	EAR1P	O	
38	VBAT	VBAT_BB	I	SIM5360: Baseband and RF circuit power supply SIM5320: Baseband circuit power supply
39	VBAT	VBAT_BB	I	
44	VDD_EXT	VREG_AUX	O	SIM5360: VDD_EXT is 1.8V LDO output. SIM5320: VREG_AUX is default 2.6V LDO output for external circuit power supply.
62	VBAT	VBAT_RF	I	SIM5360: Baseband and RF circuit power supply SIM5320: RF circuit power supply
63	VBAT	VBAT_RF	I	
79	GNSS_ANT	GPS_ANT	I	SIM5360: GPS and GLONASS Antenna. SIM5320: GPS Antenna.
81	GND	/		
82	DIV_ANT	/	I	Diversity Antenna interface

Table 2: The Difference of Logic level in SIM5360 and SIM5320

Function	SIM5360	SIM5320
PCM interface	1.8V	2.6V
I2C interface	1.8V	2.6V
UART interface	1.8V	2.6V
SD interface	2.85V	None
GPIO1/GPIO4/GPIO40/GPIO41/GPIO42/GPIO43/GPIO44	1.8V	2.6V

3 Recommended Footprint

The following figure shows the recommended compatible footprint of SIM5360 and SIM5320.

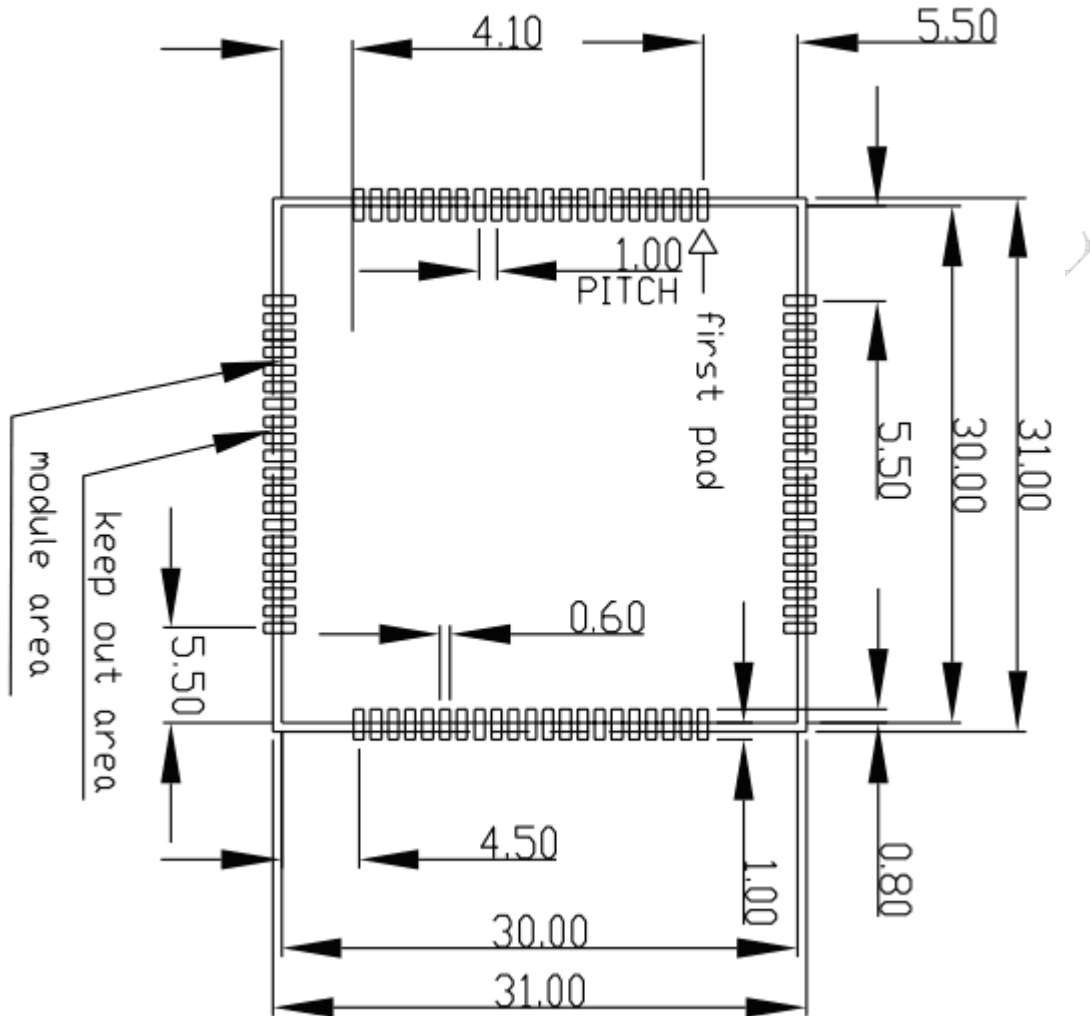


Figure 2: Footprint recommendation (Unit: mm)

4 Hardware Reference Design

The following chapters describe compatible design of SIM5360 and SIM5320 on main functionalities.

4.1 Power Supply

The power supply pins of SIM5360 include four VBAT pins (pin 62&63, pin 38&39). VBAT directly supplies the power to RF circuit and baseband circuit. All four VBAT pins of SIM5360 must be used together. The figure 4 is the reference design of SIM5360 VBAT power supply.

The power supply pins of SIM5320 include VBAT_RF and VBAT_BB. VBAT_RF directly supplies the power to RF circuit; VBAT_BB supplies the power to the baseband circuit.

The following figure is the reference design of +5V input power supply. The designed output for the power supply is 4.1V; here a linear regulator can be used.

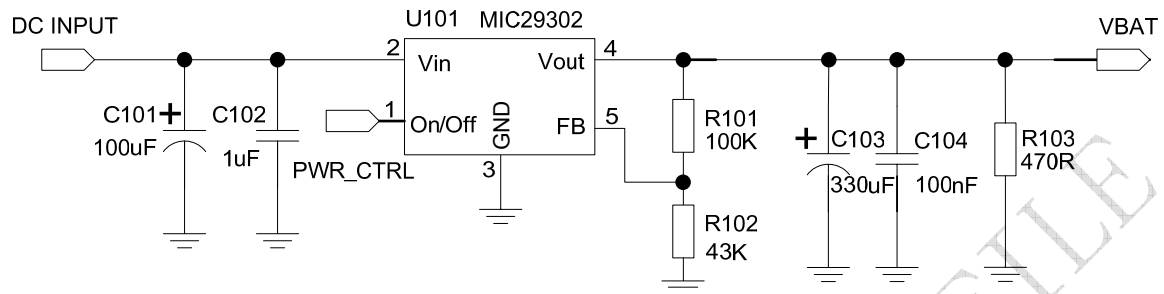


Figure 3: Reference circuit of the LDO power supply

In addition, in order to get a stable power source, it is suggested to use a zener diode of which reverse zener voltage is 5.1V and dissipation power is more than 500mW.

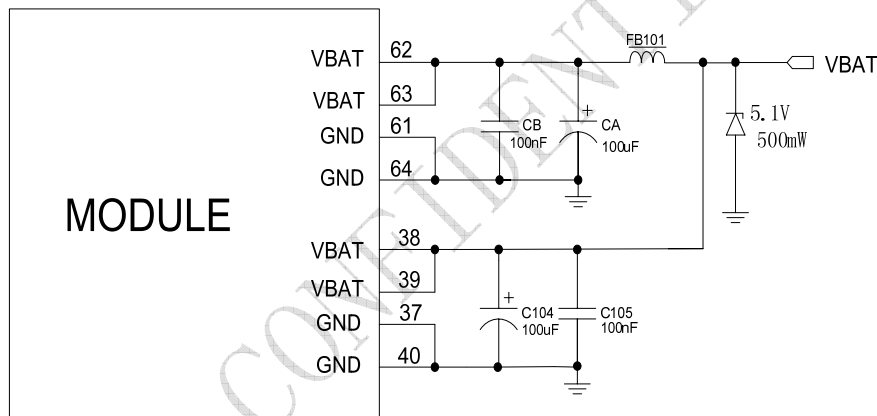


Figure 4: Reference Circuit of SIM5360

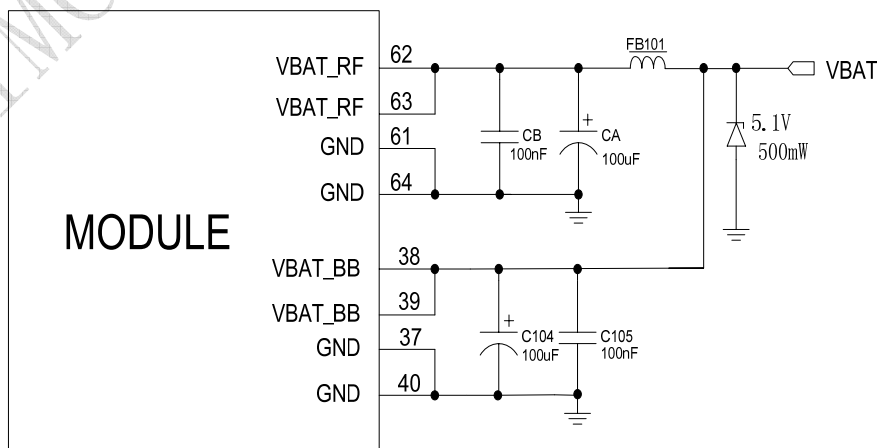


Figure 5: Reference Circuit of SIM5320

4.2 USB Interface

SIM5360 and SIM5320 module contains a USB interface. This interface is compliant with the USB2.0 specification. The following circuit is the reference design of USB interface.

It is recommended to use an ESD protection component such as ON SEMI (www.onsemi.com) ESD9M5.0ST5G or ESD9L5.0ST5G.

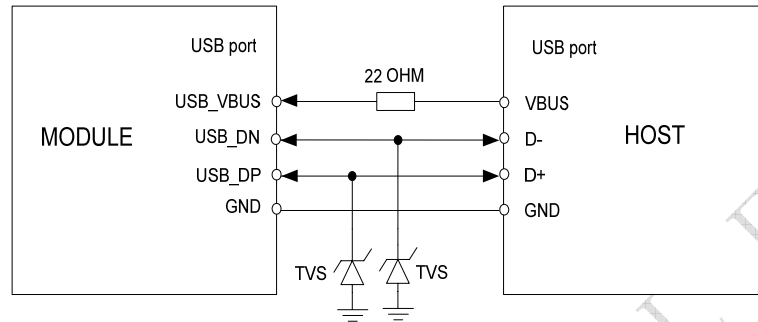


Figure 6: USB interface

4.3 Network Status Indication

The GPIO1 pin can be used to drive a network status indicator LED. The following circuit is the reference design.

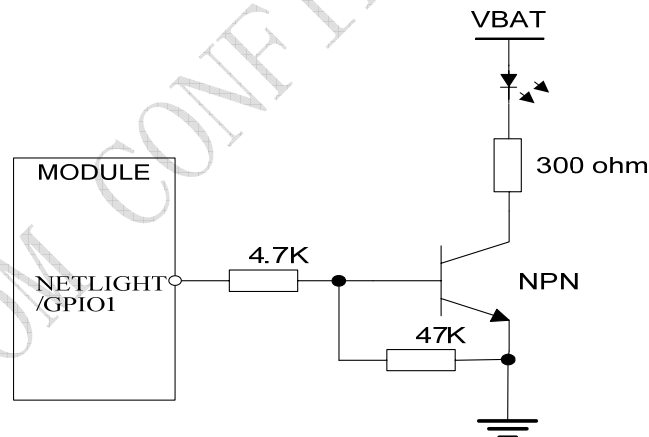


Figure 7: Application circuit

4.4 Power on/off circuit

The following circuit is a reference design for SIM5360 and SIM5320 power-on/off circuit.

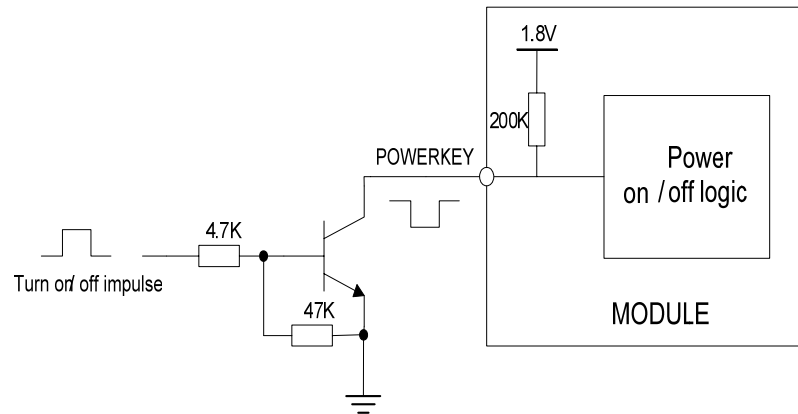


Figure 8: Power on/off circuit

4.5 USIM Interface

The USIM provides the required subscription verification information to allow the mobile equipment to attach to a GSM or UMTS network. Both 1.8V and 3.0V SIM Cards are supported.

It is recommended to use an ESD protection component such as ST (www.st.com) ESDA6V1W5. The following circuit is a reference design for SIM5360 and SIM5320 USIM circuit.

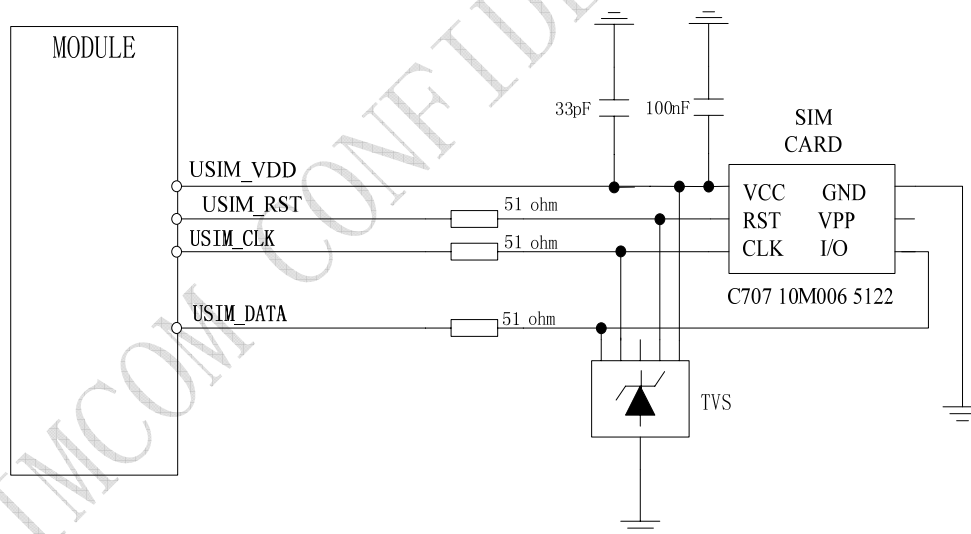


Figure 9: USIM interface reference circuit

4.6 UART Interface

The SIM5360 UART is 1.8V interface. The SIM5320 UART is 2.6V interface. A level shifter should be used if user's application is equipped with a 3.3V UART interface. The level shifter TXB0108RGYR provided by Texas Instruments is recommended. The reference design of the TXB0108RGYR is in the following figures.

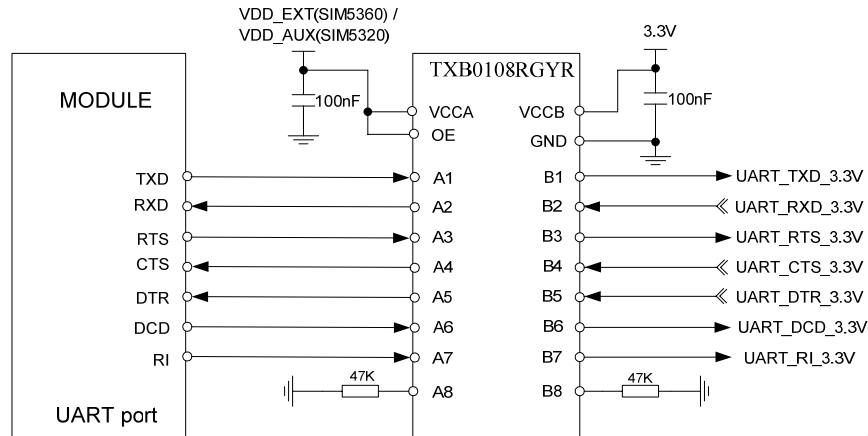


Figure 10: Reference circuit of level shift

4.7 RF Interface

SIM5360 and SIM5320 provides RF antenna interface. Customer's antenna should be located in the host board and connected to module's antenna pad through micro-strip line or other types of RF trace and the trace impedance must be controlled in 50Ω .

The following circuit is a reference design for SIM5360 and SIM5320 RF antenna circuit.

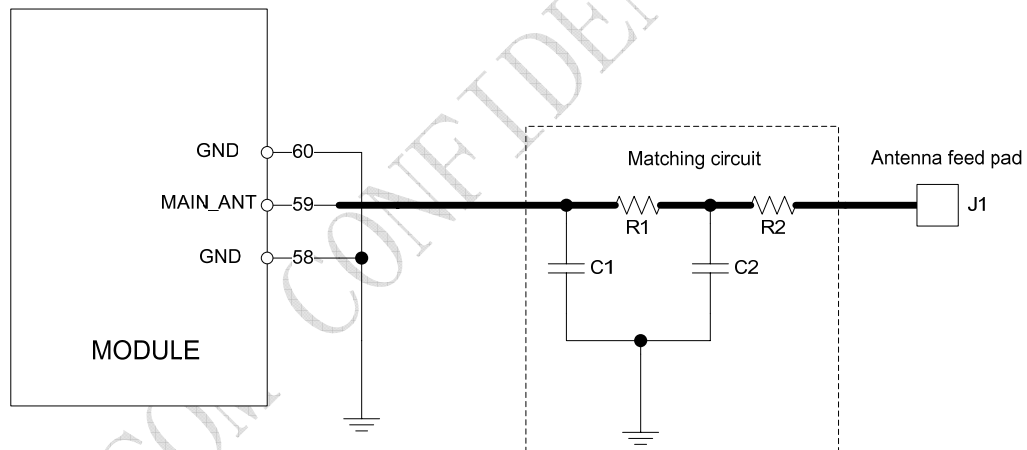


Figure 11: Main Antenna matching circuit

SIM5360 provides RF diversity antenna interface. Customer's antenna should be located in the host board and connected to module's antenna pad through micro-strip line or other types of RF trace and the trace impedance must be controlled in 50Ω .

The following circuit is a reference design for SIM5360 RF diversity antenna circuit.

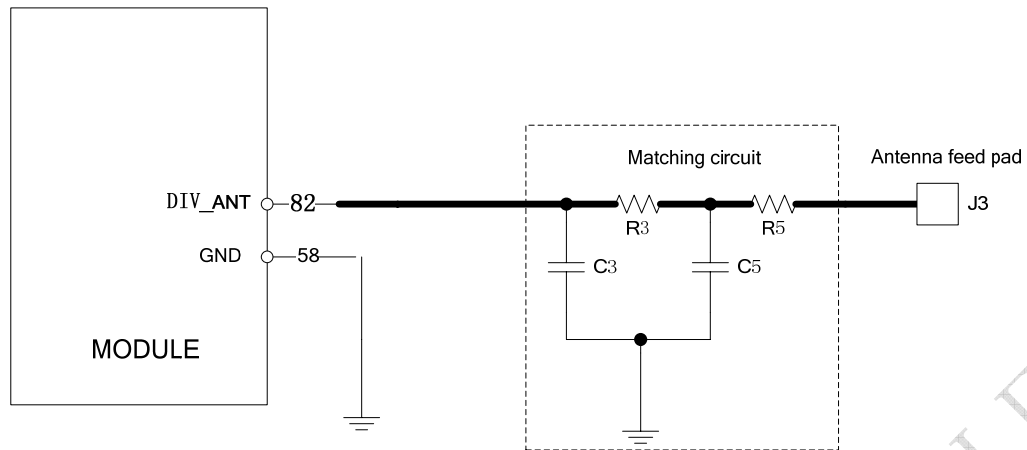
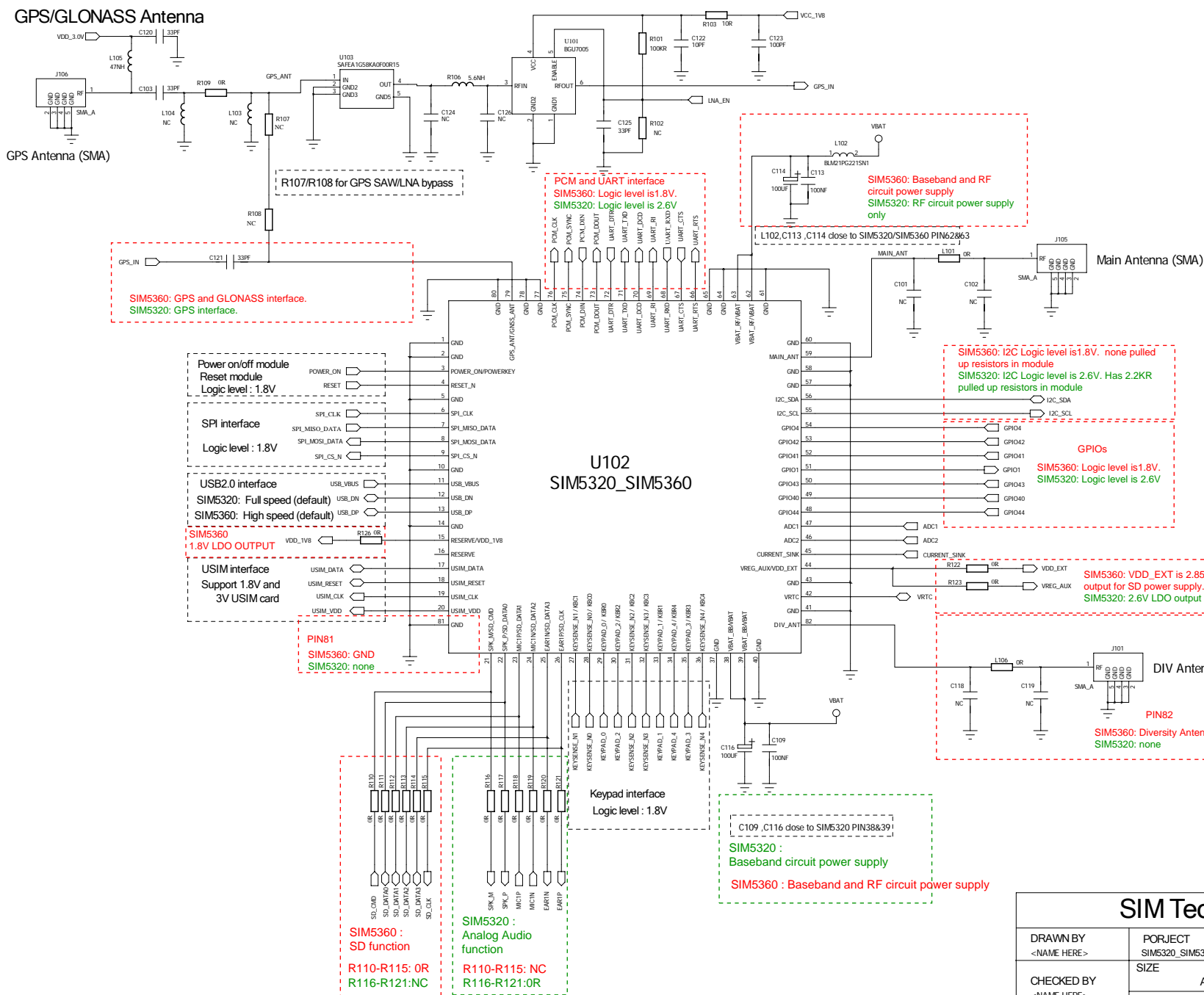


Figure 12: DiversityAntenna matching circuit of SIM5360

In figure 11 and figure 12, the components R1/R3, C1/C3, C2/C5 and R2/R5 is used for antenna matching, the value of components can only be got after the antenna tuning, usually, they are provided by antenna vendor. By default, the R1/R3, R2/R5 are 0 ohm resistors, and the C1/C3, C2/C5 are reserved for tuning

4.8 Comparison of the Schematic

The following table shows schematic differences between SIM5360 module and SIM5320 module.



SIM Technology		
DRAWN BY <NAME HERE>	PORJECT SIM5320_SIM5360-EVB	TITLE P1_SIM5320_SIM5360_IF
CHECKED BY <NAME HERE>	SIZE A2	VER V1.01
	SHEET 1 of 5 2014-1-23	

DRAWN BY <NAME HERE>	PROJECT SIM5320_SIM5360-EVB	TITLE P1_SIM5320_SIM5360_IF
CHECKED BY <NAME HERE>	SIZE A2	VER V1.01
	SHEET 1 of 5 2014-1-23	

Figure 13: Comparison of the Schematic**NOTE:**

1. The pins marked in **green** are SIM5320.
2. The pins marked in **red** are SIM5360.
3. The 81/82 pins are dedicated pins of SIM5360.

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5 Appendix

5.1 Related documents

Table 3: Related documents

SN	Document name	Remark
[1]	SIM5360_Hardware_Design	SIM5360 Hardware Design Document
[2]	SIM5320_Hardware_Design	SIM5320 Hardware Design Document

5.2 Terms and Abbreviation

Table 4: Terms and Abbreviations

Abbreviation	Description
ESD	Electrostatic Discharge
GSM	Global Standard for Mobile Communications
I2C	Inter-Integrated Circuit
PCB	Printed Circuit Board
PCS	Personal Communication System, also referred to as GSM 1900
RF	Radio Frequency
RTC	Real Time Clock
Rx	Receive Direction
SIM	Subscriber Identification Module
SPI	serial peripheral interface
UART	Universal Asynchronous Receiver & Transmitter
VSWR	Voltage Standing Wave Ratio
NC	Not connect
EDGE	Enhanced data rates for GSM evolution
HSDPA	High Speed Downlink Packet Access
HSUPA	High Speed Uplink Packet Access
WCDMA	Wideband Code Division Multiple Access
USIM	Universal subscriber identity module
UMTS	Universal mobile telecommunications system
SMPS	Switch Mode Power Supply
KBC	Keypad Button Column
KBR	Keypad Button Row

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