BC65&BC66&BC68&M66
Compatible Design

NB-IoT/GSM/GPRS Module Series

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Quectel Wireless Solutions Co., Ltd.
Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai 200233, China
Tel: +86 21 5108 6236
Email: info@quectel.com

Or our local office. For more information, please visit:
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About the Document

Revision History

Version	Date	Author	Description
-	2019-05-07	Speed SUN/ Power JIN/ King MA	Creation of the document
1.0	2019-05-07	Speed SUN/ Power JIN/ King MA	Initial
1.1	2019-05-08	Speed SUN	Updated the description of BC66's auxiliary UART port in Table 2.
1.2	2021-02-09	Jerry WANG/ Clifton HE	1. Added BC65 module to the compatible design; 2. Updated BC66 function and parameter information; 3. Updated the reference module images.

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1 Introduction

Quectel BC65, BC66 and BC68 are high-performance NB-IoT modules compatible with Quectel GSM/GPRS M66 module. This document briefly describes the compatible design among BC65, BC66, BC68 and M66 modules.

1.1. Special Mark

Table 1: Special Mark

Mark	Definition
*	When an asterisk (*) is used after a function, feature, interface, pin name, AT command, or argument, it indicates that the function, feature, interface, pin name, AT command, or argument is under development and currently not supported, unless otherwise specified.

2 General Descriptions

2.1. Product Description

M66 is a quad-band GSM/GPRS module supporting GSM850/EGSM900/DCS1800/PCS1900. BC65, BC66 and BC68 are high-performance, low-power, multi-band NB-IoT modules. BC65, BC66, BC68 and M66 are designed as compatible products, and you can choose a suitable product according to application requirements. The compatible design guideline ensures a smooth migration from M66 to BC65, BC66 and BC68 modules.

Table 2: Module General Information

Module	Appearance	Packaging	Dimensions	Description
BC65		44 LCC pins + 14 LGA pins	17.7 mm × 15.8 mm × 2.2 mm	Multi-band NB-IoT module
BC66		44 LCC pins + 14 LGA pins	17.7 mm × 15.8 mm × 2.0 mm	Multi-band NB-IoT module
BC68		44 LCC pins + 14 LGA pins	17.7 mm × 15.8 mm × 2.0 mm	Multi-band NB-IoT module

M66		44 LCC pins	17.7 mm × 15.8 mm × 2.3 mm	Quad-band GSM/GPRS module

NOTE

Images above are for illustration purpose only and may differ from the actual module. For authentic appearance and label, please refer to the module received from Quectel.

2.2. Features Overview

The following table compares general properties and features of BC65, BC66, BC68 and M66 modules.

Table 3: Features Overview

Feature	BC65	BC66	BC68	M66
Power Supply	3.2–4.2 V Typ. 3.8 V	2.1–3.63 V Typ. 3.3 V	3.1–4.2 V Typ. 3.6 V	3.3–4.6 V Typ. 4.0 V
Peak Current	VBAT: Max 0.8 A	VBAT: Max 0.5 A	VBAT: Max 0.8 A	VBAT: Max 1.6 A
Sleep Current	Typ. 4 μA @ Deep Sleep	Typ. 3.5 μA @ Deep Sleep	Typ. 3 μA @ PSM	1.3 mA @ DRX=5 1.2 mA @ DRX=9
Frequency Bands	H-FDD: B1*/B3/B5/B8/B20/B28	H-FDD: B1/B2/B3/B5/B8/B12/B13/B17/B18/B19/B20/B25/B26*/B28/B66	H-FDD: B1/B3/B5/B8/B20/B28	Quad-band: GSM850/EGSM900/ DCS1800/PCS1900
Temperature Range	Operating temperature range: -25 °C to +75 °C [1)] Extended temperature range: -40 °C to +85 °C [2)] Storage temperature range: -40 °C to +90 °C	Operating temperature range: -35 °C to +75 °C [1)] Extended temperature range: -40 °C to +85 °C [2)] Storage temperature range: -40 °C to +90 °C	Operating temperature range: -35 °C to +75 °C [1)] Extended temperature range: -40 °C to +85 °C [2)] Storage temperature range: -40 °C to +90 °C	Operating temperature range: -35 °C to +75 °C [1)] Extended temperature range: -40 °C to +85 °C [2)] Storage temperature range: -40 °C to +90 °C
Main UART	● Used for AT command communication and data transmission. ● When used for AT	● Used for AT command communication and data transmission. ● By default, the module is in	● When used for AT command communication and data transmission, supported baud rates are	● Seven-wire main port ● Used for AT command communication, GPRS data transmission, etc.

	command communication and data transmission, baud rates 4800 bps, 9600 bps (default), 57600 bps are supported.	auto-baud mode, and it supports automatic baud rates not exceeding 115200 bps. When powering on the module, the MCU has to send AT command consecutively to synchronize baud rate with the module. When **OK** is returned, it indicates the baud rate has been synchronized successfully. When the module is woken up from Deep Sleep, the baud rate synchronized during start-up will be used directly. ● Can be used for firmware upgrade, the baud rate is 921600 bps by default.	4800 bps, 9600 bps (default), 115200 bps, 230400 bps and 460800 bps. ● When used for firmware upgrading, supported baud rates are 115200 bps and 921600 bps (default).	● Support multiplexing function ● Support autobauding from 4800 bps to 115200 bps
Debug UART	● Used for debugging supports 921600 bps baud rate. ● Used for upgrading supports 921600 bps baud rate.	● Used for debugging supports 921600 bps baud rate. ● Used for upgrading supports 921600 bps baud rate.	● Used for debugging. ● Only supports 921600 bps baud rate.	● Two-wire debug port ● Only used for debugging and the baud rate is 460800 bps.
Auxiliary UART [3)]	Used for AT command communication and data transmission. When used for AT command communication and	● Used for AT command communication and data transmission. ● Used for debugging	Not supported	● Used for AT command communication. ● The default baud rate is 115200bps, and does not

	data transmission, baud rates 4800 bps, 9600 bps (default), 57600 bps are supported.	● The baud rate is 115200 bps by default.		support autobauding.
Signal level	1.8 V	1.8 V	3.0 V	2.8 V
(U)SIM	1.8/3.0 V USIM	1.8 V USIM	1.8/3.0 V USIM	1.8/3.0 V (U)SIM
Analog Audio	Not supported	Not supported	Not supported	One analog input channel Two analog output channels
ADC	ADC	ADC0	ADC*	ADC0
BT	Not supported	Not supported	Not supported	BT 3.0
RTC Backup	Not supported	Not supported	Not supported	Vnorm = 2.8 V VI = 1.5–3.3 V
PCM Interface	Not supported	Not supported	Not supported	Supported
Firmware Upgrade	● Debug UART ● DFOTA	● Main UART ● DFOTA ● USB	● Main UART ● DFOTA	Main UART

NOTES

1. [1] Within operation temperature range, the module is 3GPP compliant.
2. [2] Within extended temperature range, the module remains the ability to establish and maintain a voice, SMS, data transmission, etc. There is no unrecoverable malfunction. There are also no effects on radio spectrum and no harm to radio network. Only one or more parameters like Pout might reduce in their value and exceed the specified tolerances. When the temperature returns to normal operating temperature levels, the module will meet 3GPP specifications again.
3. [3] The auxiliary serial port of BC65 is currently under development.

2.3. Pin Assignment

The following figure shows the pin assignment of BC65, BC66, BC68 and M66.

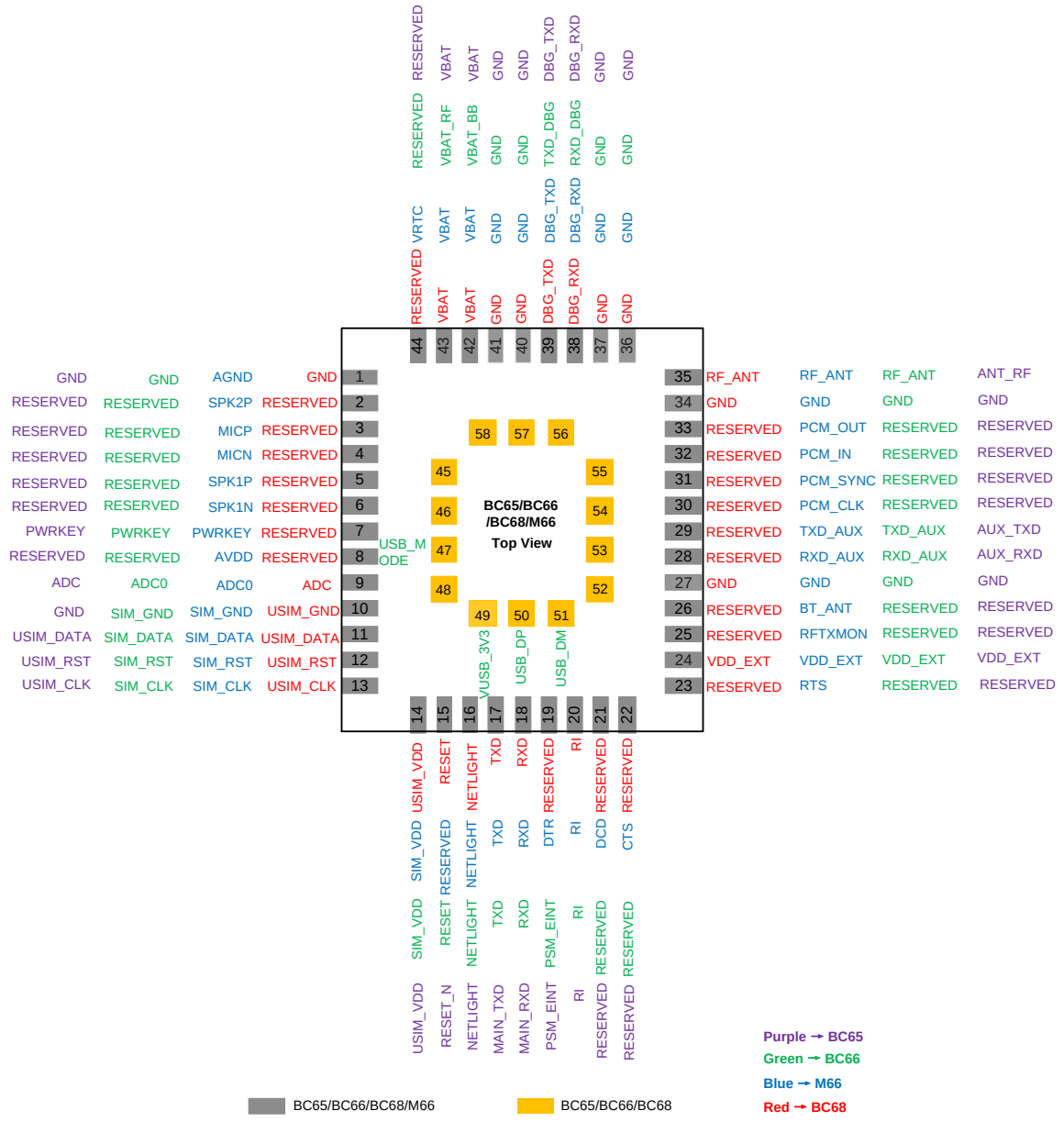

Figure 1: BC65&BC66&BC68&M66 Pin Assignment

NOTE

The pins marked in orange are the additional pins of BC65, BC66 and BC68 as compared with M66.

3 Pin Description

This chapter describes the pin definition of BC65, BC66, BC68 and M66, as well as the pin comparison among them.

Table 4: I/O Parameters Definition

Symbol	Description
IO	Bidirectional
DI	Digital Input
DO	Digital Output
PI	Power Input
PO	Power Output
AI	Analog Input
AO	Analog Output
OD	Open Drain

Table 5: Pin Comparison among BC65, BC66, BC68 and M66

Pin No.	BC65			BC66			BC68			M66		
	Pin Name	I/O	Description	Pin Name	I/O	Description	Pin Name	I/O	Description	Pin Name	I/O	Description
1	GND			GND			GND			AGND		Analog ground. Specific ground for external audio circuits
2	RESERVED	/	/	RESERVED	/	/	RESERVED	/	/	SPK2P	AO	Channel 2 voice output (positive)
3	RESERVED	/	/	RESERVED	/	/	RESERVED	/	/	MICP	AI	Positive voice input
4	RESERVED	/	/	RESERVED	/	/	RESERVED	/	/	MICN	AI	Negative voice input signal
5	RESERVED	/	/	RESERVED	/	/	RESERVED	/	/	SPK1P	AO	Channel 1 positive voice output
6	RESERVED	/	/	RESERVED	/	/	RESERVED	/	/	SPK1N	AO	Channel 1 negative voice output
7	PWRKEY	DI	Turn on the module	PWRKEY	DI	Turn on/off the module	RESERVED	/		PWRKEY	DI	Used to power on/off the module
8	RESERVED	/	/	RESERVED	/	/	RESERVED	/	/	AVDD	PO	Reference voltage of ADC circuit. If unused, keep this pin open.
9	ADC	AI	General-purpose ADC interface	ADC0	AI	General-purpose ADC interface	ADC*	AI	General-purpose ADC interface	ADC0	AI	General-purpose ADC interface
10	GND		GND	SIM_GND		Specified ground for USIM card	USIM_GND		Specified ground for USIM card	SIM_GND		Specified ground for (U)SIM card
11	USIM_DATA	IO	USIM card data	SIM_DATA	IO	USIM card data	USIM_DATA	IO	USIM card data	SIM_DATA	IO	(U)SIM card data

			signal									
12	USIM_RST	DO	USIM card reset signal	SIM_RST	DO	USIM card reset	USIM_RST	DO	USIM card reset	SIM_RST	DO	(U)SIM card reset
13	USIM_CLK	DO	USIM card clock signal	SIM_CLK	DO	USIM card clock	USIM_CLK	DO	USIM card clock	SIM_CLK	DO	(U)SIM card clock
14	USIM_VDD	PO	Power supply for USIM card	SIM_VDD	PO	USIM card power supply	USIM_VDD	PO	USIM card power supply	SIM_VDD	PO	(U)SIM card power supply
15	RESET_N	DI	Reset the module	RESET	DI	Reset the module	RESET	DI	Reset the module	RESERVED	/	/
16	NETLIGHT	DO	Network status indication	NETLIGHT*	DO	Network status indication	NETLIGHT	DO	Network status indication	NETLIGHT	DO	Network status indication
17	MAIN_TXD	DO	Main UART transmit	TXD	DO	Main UART transmit	TXD	DO	Main UART transmit	TXD	DO	Main UART transmit
18	MAIN_RXD	DI	Main UART receive	RXD	DI	Main UART receive	RXD	DI	Main UART receive	RXD	DI	Main UART receive
19	PSM_EINT	DI	Dedicated external interrupt pin used to wake up the module from Deep Sleep mode.	PSM_EINT	DI	Dedicated external interrupt pin used to wake up the module from Deep Sleep mode.	DTR	DI	Data terminal ready	DTR	DI	Data terminal ready
20	RI	DO	Ring indication	RI	DO	Ring indication	RI	DO	Ring indication	RI	DO	Ring indication
21	RESERVED	/	/	RESERVED	/	/	RESERVED	/	/	DCD	DO	Data carrier detection
22	RESERVED	/	/	RESERVED	/	/	RESERVED	/	/	CTS	DO	Clear to send
23	RESERVED	/	/	RESERVED	/	/	RESERVED	/	/	RTS	DI	Request to send
24	VDD_EXT	PO	1.8 V output power supply for external circuits.	VDD_EXT	PO	1.8 V output power supply for external circuits.	VDD_EXT	PO	3.0 V output power supply for external circuits.	VDD_EXT	PO	2.8V output power supply for an external circuit.

			It cannot be used to supply power for external circuits when in Deep Sleep.			It cannot be used to supply power for external circuits when in Deep Sleep.			It cannot be used to supply power for external circuits when in PSM.			
25	RESERVED	/	/	RESERVED	/	/	RESERVED	/	/	RFTXMON	DO	Transmission signal indication
26	RESERVED	/	/	RESERVED	/	/	RESERVED	/	/	BT_ANT	IO	BT antenna pad
28	AUX _RXD	DI	Auxiliary UART receive	RXD_AUX	DI	Auxiliary UART receive	RESERVED	/	/	RXD_AUX	DI	Auxiliary UART receive
29	AUX _TXD	DO	Auxiliary UART transmit	TXD_AUX	DO	Auxiliary UART transmit	RESERVED	/	/	TXD_AUX	DO	Auxiliary UART transmit
30	RESERVED	/	/	RESERVED	/	/	RESERVED	/	/	PCM_CLK	DO	PCM clock
31	RESERVED	/	/	RESERVED	/	/	RESERVED	/	/	PCM_SYNC	DO	PCM frame synchronization
32	RESERVED	/	/	RESERVED	/	/	RESERVED	/	/	PCM_IN	DI	PCM data input
33	RESERVED	/	/	RESERVED	/	/	RESERVED	/	/	PCM_OUT	DO	PCM data output
35	ANT_RF	IO	Antenna interface	RF_ANT	IO	Antenna interface	RF_ANT	IO	Antenna interface	RF_ANT	IO	Antenna interface
38	DBG_RXD	DI	Debug UART receive	RXD_DBG	DI	Debug UART receive	DBG_RXD	DI	Debug UART receive	DBG_RXD	DI	Debug UART receive
39	DBG_TXD	DO	Debug UART transmit	TXD_DBG	DO	Debug UART transmit	DBG_TXD	DO	Debug UART transmit	DBG_TXD	DO	Debug UART transmit
42	VBAT	PI	Main power supply of the module: VBAT = 3.2–4.2 V	VBAT_BB	PI	Main power supply of the module: VBAT_BB = 2.1–3.63 V	VBAT	PI	Main power supply of the module: VBAT = 3.1–4.2 V	VBAT	PI	Main power supply of the module: VBAT = 3.3–4.6 V

43	VBAT	PI	Main power supply of the module: VBAT = 3.2–4.2 V	VBAT_RF	PI	Main power supply of the module: VBAT_RF = 2.1–3.63 V	VBAT	PI	Main power supply of the module: VBAT = 3.1–4.2 V	VBAT	PI	Main power supply of the module: VBAT = 3.3–4.6 V
44	RESERVED	/	/	RESERVED	/	/	RESERVED	/	/	VRTC	IO	RTC power supply when the module is not powered by VBAT.
27, 34, 36, 37, 40, 41,	GND	/	Ground	GND	/	Ground	GND	/	Ground	GND	/	Ground
47	RESERVED	/	/	USB_MODE	DI	Pull down the pin to achieve USB download function	RESERVED	/	/	RESERVED	/	/
49	RESERVED	/	/	VUSB_3V3	PI	USB power supply	RESERVED	/	/	RESERVED	/	/
50	RESERVED	/	/	USB_DP	IO	USB differential data (+)	RESERVED	/	/	RESERVED	/	/
51	RESERVED	/	/	USB_DM	IO	USB differential data (-)	RESERVED	/	/	RESERVED	/	/
45, 46, 48, 52–58	RESERVED	/	/	RESERVED	/	/	RESERVED	/	/	/	/	/

NOTES

1. The pins not marked in any color are compatible pins with the same function.
2. The pins marked in red are compatible pins with different functions.
3. The pins marked in orange are the additional pins of BC65, BC66 and BC68 as compared with M66.
4. Keep all reserved and unused pins unconnected.

4 Hardware Reference Design

The following chapters describe the compatible design among BC65, BC66, BC68 and M66 on main functions.

4.1. Power Supply

4.1.1. Operation Voltage

Power supply ranges of BC65, BC66, BC68 and M66 are listed below:

Table 6: Module Operating Voltage Range

Module	Power Supply Pins	Conditions	Min	Typical	Max	Unit
BC65	VBAT	The actual input voltages must stay between the minimum and maximum values.	3.2	3.8	4.2	V
BC66	VBAT_BB & VBAT_RF		2.1	3.3	3.63	V
BC68	VBAT		3.1	3.6	4.2	V
M66	VBAT		3.3	4.0	4.6	V

When considering the compatibility design among modules, please make sure the input voltage is between 3.3 V and 3.63 V. During operation, please make sure the module's input voltage will never drop below 3.3 V.

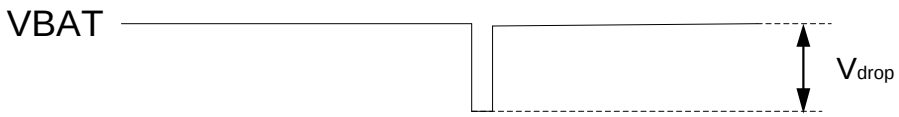

Figure 2: VBAT Voltage Waveform Diagram

4.1.2. Power Supply Reference Design

Power design for a module is critical to its performance. The power supply of BC65, BC66, BC68 and M66 should be able to provide sufficient current up to 2.0 A.

In order to ensure better power supply performance and compatibility, the recommended input voltage is 3.6 V. Also, it is recommended to add 47 µF, 100 nF, 33 pF and 10 pF capacitors near the VBAT pins of BC65, BC66 and BC68, while 100 µF, 100 nF, 33 pF and 10 pF capacitors near the VBAT pins of M66. Additionally, it is recommended to add a TVS diode on the VBAT trace (near VBAT pins) to improve surge voltage withstand capability.

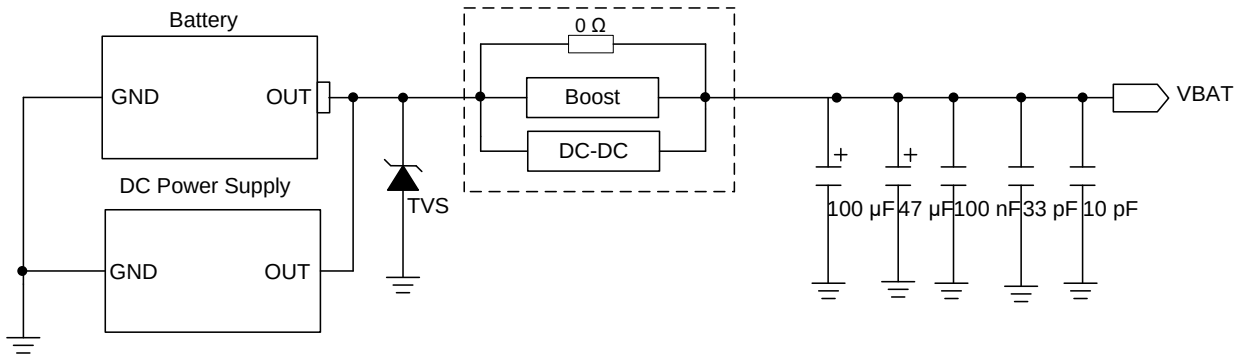

Figure 3: Reference Circuit of Power Supply

According to power supply type (battery or DC power), the reference design for power switching circuit in the above dashed box will be different. The details are illustrated in the table below.

Table 7: Power Supply Type and Power Switching Circuit Relationship

Power Supply Type	Power Switching Circuit			
	BC65 (VBAT = 3.2–4.2 V)	BC66 (VBAT = 2.1–3.63 V)	BC68 (VBAT = 3.1–4.2 V)	M66 (VBAT = 3.3–4.6 V)
Li-SOCl2 Battery	0 Ω	0 Ω	0 Ω	Boost
Li-MnO2 Battery	Boost	0 Ω	Boost	Boost
DC Power Supply	DC-DC	DC-DC	DC-DC	DC-DC

4.2. Turn on

BC65, BC66, BC68 and M66 have different turn on methods:

- BC68 can be automatically turned on by supplying power to VBAT pins.
- BC65, BC66 and M66 can be turned on by driving PWRKEY LOW for a certain time T1 (BC65 ≥ 1 s, BC66 ≥ 500 ms, M66 > 1 s). It is recommended use an open drain/collector driver to control the PWRKEY. A reference circuit is shown below.

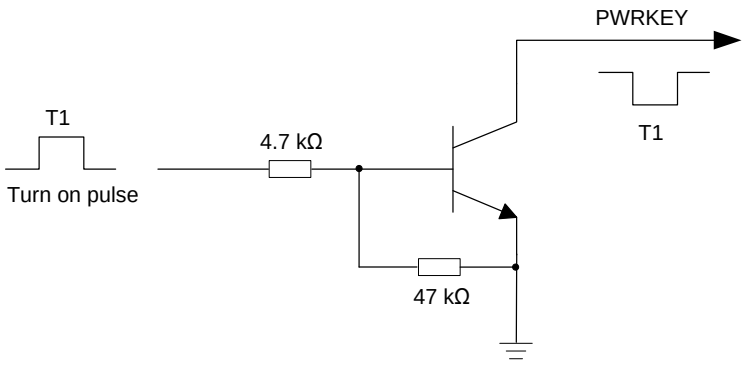

Figure 4: PWRKEY Driving Circuit for Module Turn-on (BC65&BC66&M66)

The timing of turn-on scenario of BC65, BC66, BC68 and M66 are illustrated below.

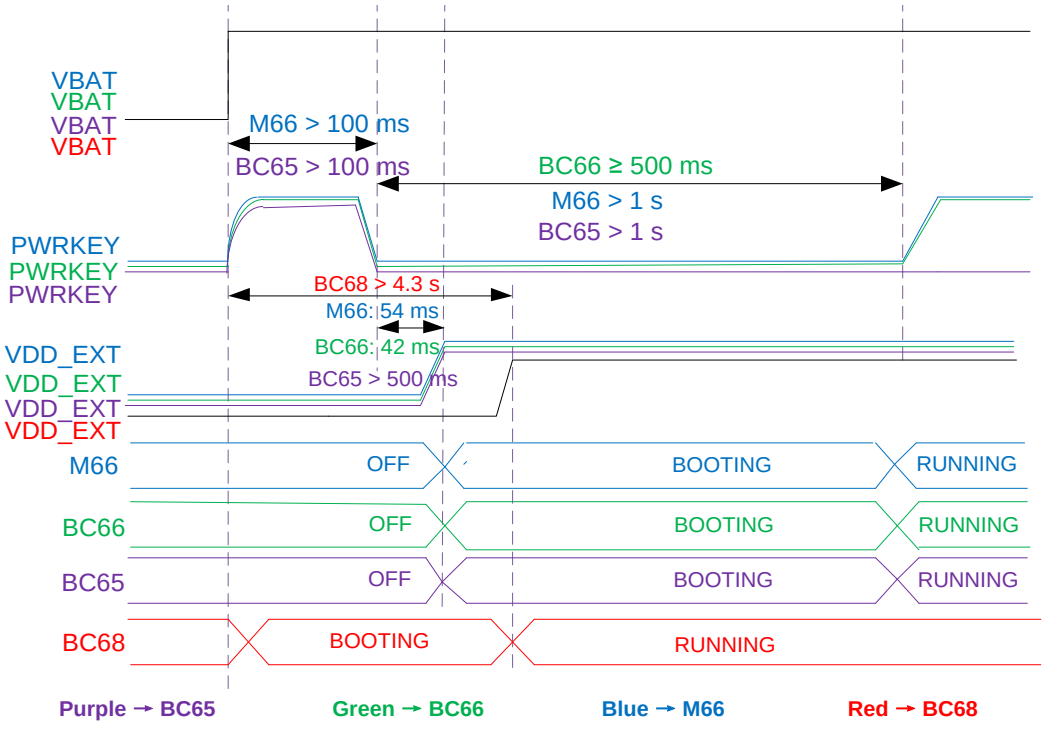

Figure 5: BC65&BC66&BC68&M66 Turn-on Timing

NOTES

1. When BC65, BC66, or M66 is turned on through driving PWRKEY LOW, please make sure that VBAT is stable before pulling down PWRKEY pin. The recommended minimum timings are: 1s for BC65, 500 ms for BC66, and 100 ms for M66. PWRKEY cannot be pulled down all the time.
2. After successful power-up of BC68, it is recommended to wait for 3.8 s before module operation.

4.3. Turn off

BC65, BC66, BC68 and M66 modules can be turned off through methods listed in the following table:

Table 8: BC65&BC66&BC68&M66 Turn-off Methods

Modules	Turn-off Methods
BC65	● Through AT command **AT+QPOWD** ● VBAT drops below 3.2 V ● In emergency conditions, through disconnecting VBAT power supply
BC66	● Through AT command **AT+QPOWD** ● VBAT drops below 2.1 V ● In emergency conditions, through disconnecting VBAT power supply
BC68	Through disconnecting power supply to VBAT
M66	● Through AT command **AT+QPOWD** ● Through pulling down PWRKEY pin for 0.7–1 s ● In emergency conditions, through disconnecting VBAT power supply

The turn-off scenario is illustrated in the figure below.

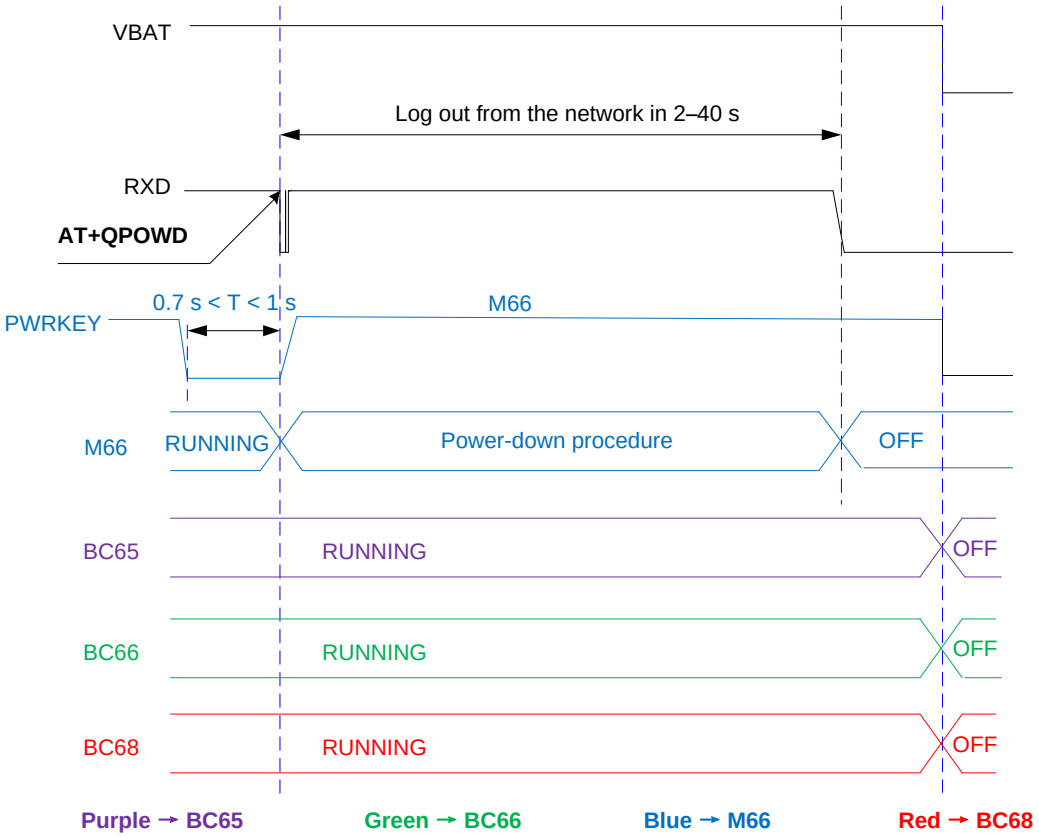

Figure 6:Timing of Power-down

NOTES

1. When AT command is used to turn off M66, please make sure PWRKEY remains in high level.
2. When PWRKEY is used to turn off M66, please make sure PWRKEY is pulled down for a period of time between 0.7 s and 1 s.
3. Network logout time is related to local network signal strength.

4.4. Reset

M66 has no reset function. BC65, BC66 and BC68 can be reset by hardware and software methods as illustrated below.

4.4.1. Reset BC65&BC66&BC68 by Hardware Method

Driving the RESET pin LOW for a certain period of time (BC66 ≥ 50 ms, BC68 ≥ 100 ms, BC65 ≥ 1 s) will reset BC65, BC66, or BC68 module. The recommended circuit of resetting the module is shown below.

An open drain/collector driver or button can be used to control the RESET pin.

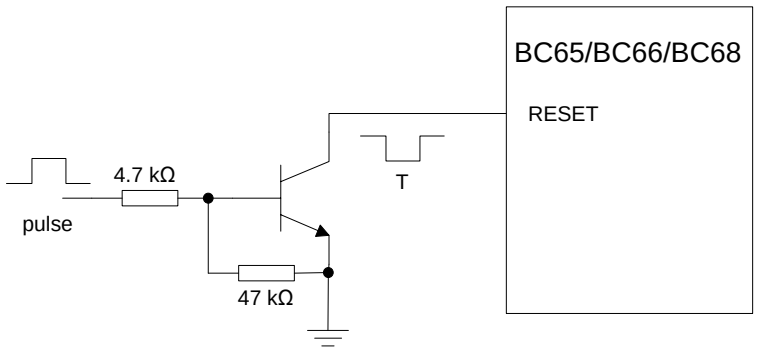

Figure 7: Reference Circuit of RESET by Using Driving Circuit

The timings of reset scenario of BC65, BC66 and BC68 are illustrated in the figure below.

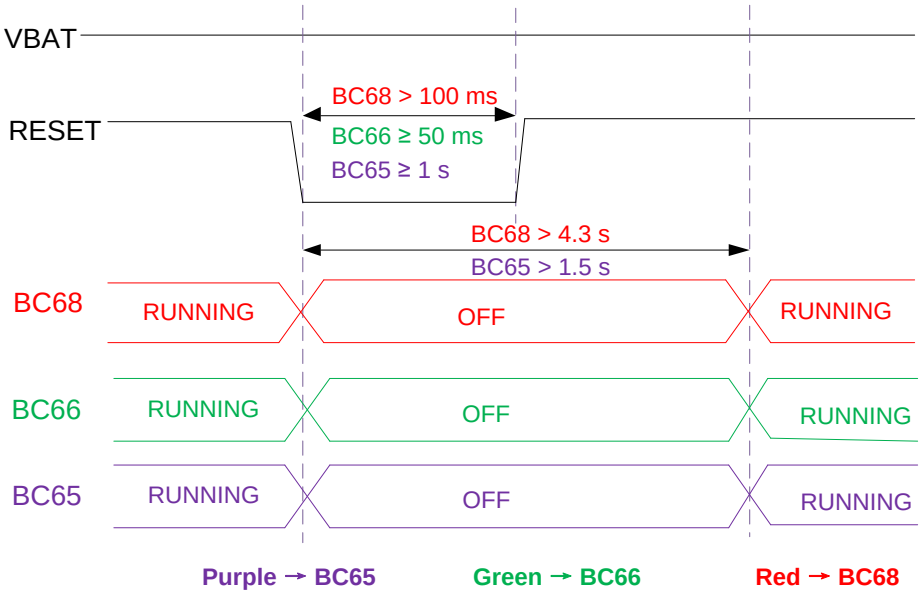

Figure 8: Timing of Resetting Module

4.4.2. Reset BC65&BC66&BC68 by Software Method

- **AT+NRB** command can be used to reset BC68. For more details about the command, see ***document [1]***.
- **AT+QRST=1** command can be used to reset BC66 and BC65. For more details about the command, see ***document [2]*** and ***document [3]***.

4.5. Network Status Indication

The NETLIGHT signal can be used to drive a network status indicator LED, so as to indicate the network status of BC65, BC66, BC68 and M66. A reference circuit is shown as below.

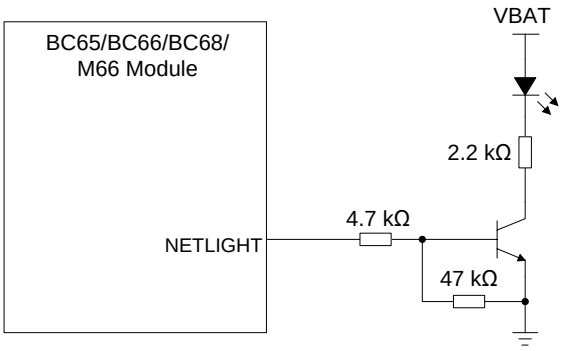

Figure 9: Reference Circuit of NETLIGHT

4.6. (U)SIM Interface

- BC66 supports 1.8 V USIM cards.
- BC68 supports 1.8/3.0 V USIM cards.
- BC65 supports 1.8/3.0 V USIM cards.
- M66 supports 1.8/3.0 V (U)SIM cards.

The pin assignment of BC65, BC66 and BC68's USIM interface and M66's (U)SIM interface are compatible with each other. A compatible design for 6-pin (U)SIM interface is shown in the figure below:

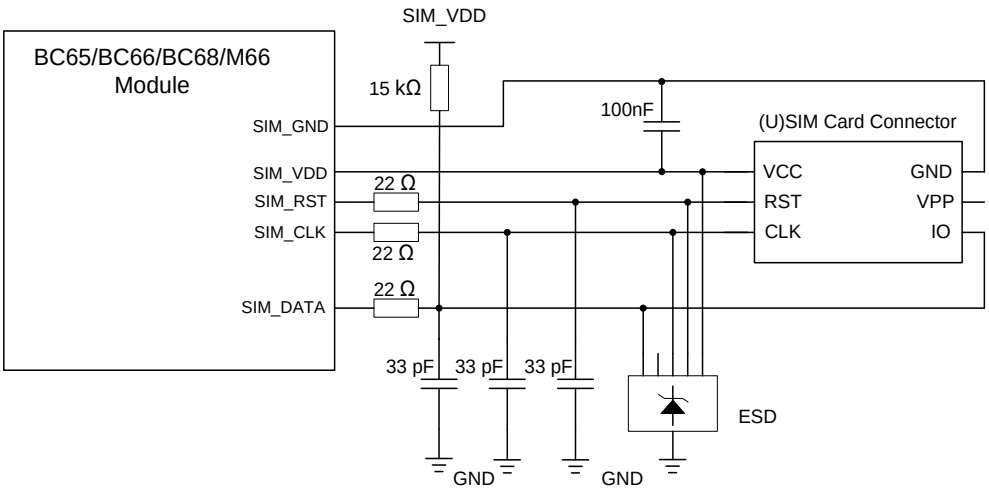

Figure 10: Reference Compatible Design for 6-Pin (U)SIM Interface

4.7. UART Interfaces

UART interfaces of BC65, BC66, BC68 and M66 have different voltage domains, as listed below.

Table 9: UART Interface Voltage Domain

Module	UART Interface	Voltage Domain	Description
BC65	Main UART	1.8 V	/
	Debug UART		/
	AUX UART		/
BC66	Main UART	1.8 V	/
	Debug UART		/
	AUX UART		/
BC68	Main UART	3.0 V	/
	Debug UART		/
M66	Main UART	2.8 V	Support RTS/CTS
	Debug UART		/
	AUX UART		/

A compatible voltage level translation reference design for BC65's, BC66's, BC68's and M66's UART interfaces is shown below. For the design of circuits shown in dotted lines, see that shown in solid lines, but pay attention to the direction of connection.

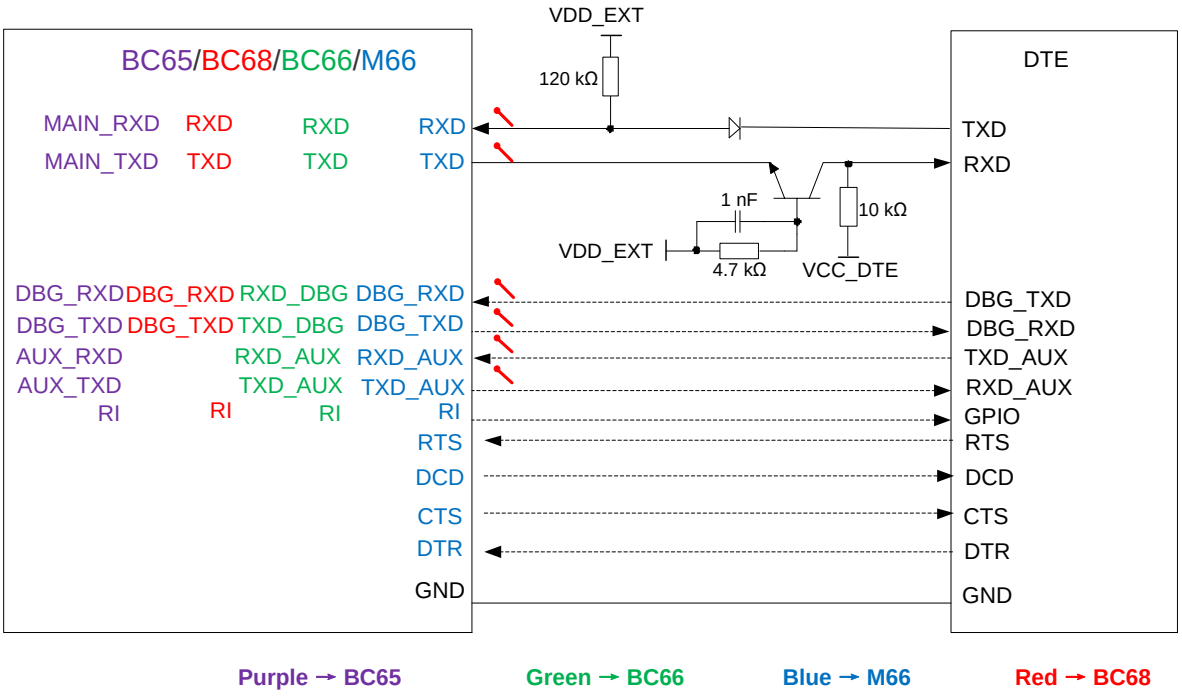

Figure 11: Compatible Reference Circuit with Transistor Circuit

NOTES

1. Transistor circuit solution as shown above is not suitable for applications with high baud rates exceeding 460 kbps.
2. "\" represents the test point of UART interfaces. It is also recommended to reserve the test points of VBAT and PWRKEY, for convenient firmware upgrade and debugging when necessary.
3. RXD, TXD, RI and DBG_TXD need to be designed for BC68 only. And for the BC68, R1 is recommended to be 20 kΩ.

4.8. ADC Interface

BC65, BC66, BC68 and M66 modules provide a 10-bit ADC input channel to read the voltage value.

- The maximum voltage value applied on BC65's ADC pin is 1.8 V.
- The maximum voltage value applied on BC66's ADC0 pin is 1.4 V.
- The maximum voltage value applied on BC68's ADC* pin is 4.0 V, but the value must be lower than VBAT supply voltage.
- The maximum voltage value applied on M66's ADC0 pin is 2.8 V

Table 10: Module ADC Interface Information

Module	Pin Name	Pin No.	Description
BC65	ADC	9	Analog to digital converter interface
BC66	ADC0*	9	Analog to digital converter interface
BC68	ADC*	9	Analog to digital converter interface
M66	ADC0	9	Analog to digital converter interface

4.9. RF Antenna Interface

M66's ANT_MAIN and BT_ANT, BC65's ANT_RF, and BC66's and BC68's RF_ANT antenna interfaces are compatible with each other. The antenna ports have an impedance of 50 Ω.

In order to achieve better RF performance, it is recommended to reserve a π-type matching circuit (R1/C1/C2) and place it close to the antenna. The capacitors (C1/C2) are not mounted and a 0 Ω resistor is mounted on R1 by default. A reference design for RF antenna interface is shown as below.

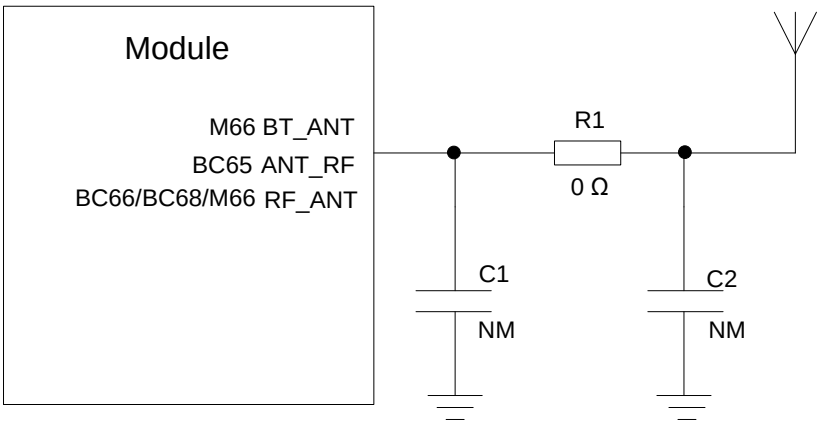

Figure 12: Reference Circuit of RF Antenna Interface

5 Recommended Footprint and Stencil Design

This chapter mainly introduces the recommended compatible footprint and stencil design of BC65, BC66, BC68 and M66. All dimensions are measured in millimeter (mm), and the tolerances for dimensions without tolerance values are ±0.05 mm.

5.1. Recommended Compatible Footprint

The following figure shows the bottom view of BC65, BC66, BC68 and M66.

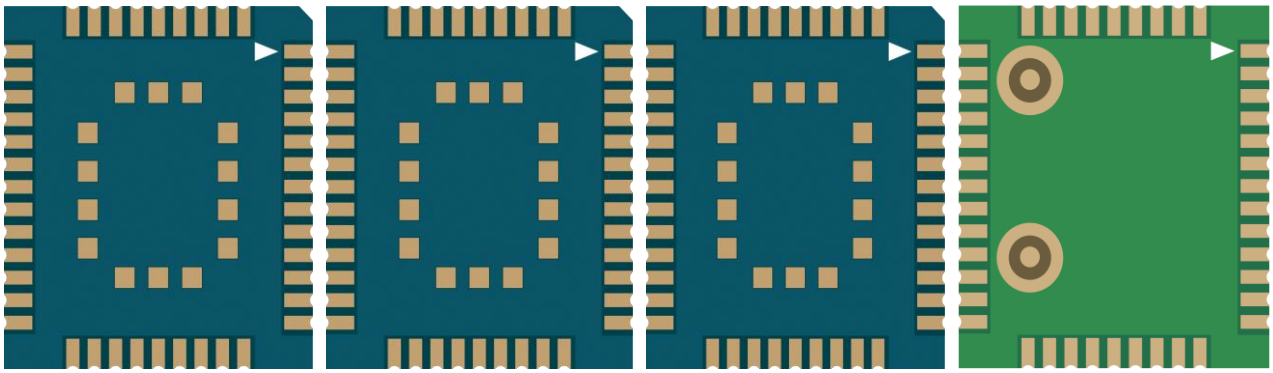

Figure 13: Bottom View of BC65&BC66&BC68&M66

The following figure shows the recommended compatible footprint of BC65, BC66, BC68 and M66.

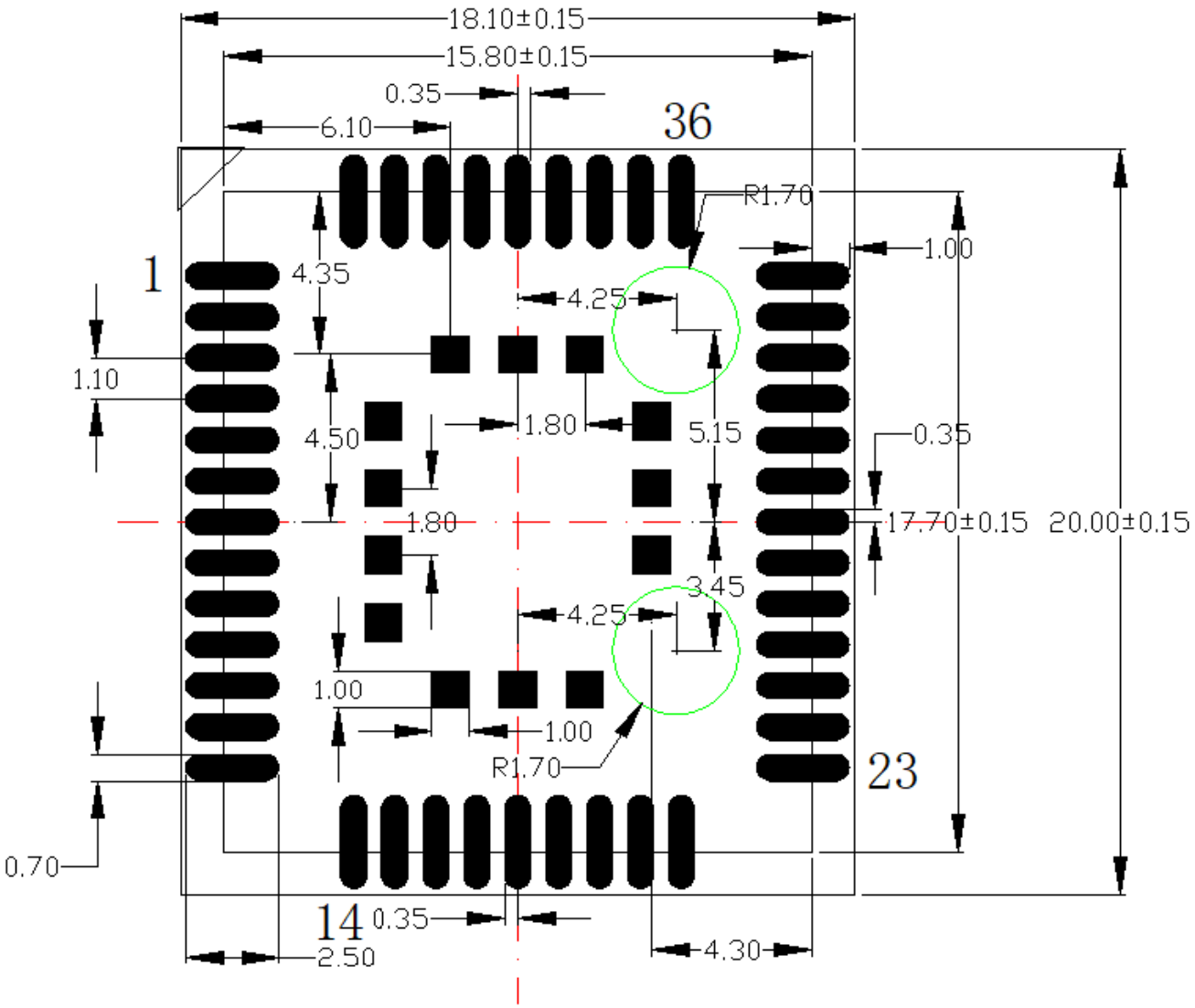

Figure 14: Recommended Footprint of BC65&BC66&BC68&M66 (Unit: mm)

NOTES

1. The modules should be kept about 3 mm away from other components on the host PCB.
2. The circular test points with a radius of 1.7 mm in the above recommended footprint should not be designed in schematic and PCB decal, and these test points should be served as a keepout area.
3. The pin 52 of BC65, BC66 and BC68 should not be designed in the recommended footprint for the compatibility with M66 module.

5.2. Recommended Stencil Design

BC65, BC66, BC68 and M66 have different PCB thicknesses. In order to ensure the module soldering quality, the thickness of stencil is recommended to be 2.0 mm for M66 and 0.15 mm for BC65, BC66 and BC68. For more details, see ***document [4]***.

The recommended stencil design for BC65, BC66 and BC68 is shown as below.

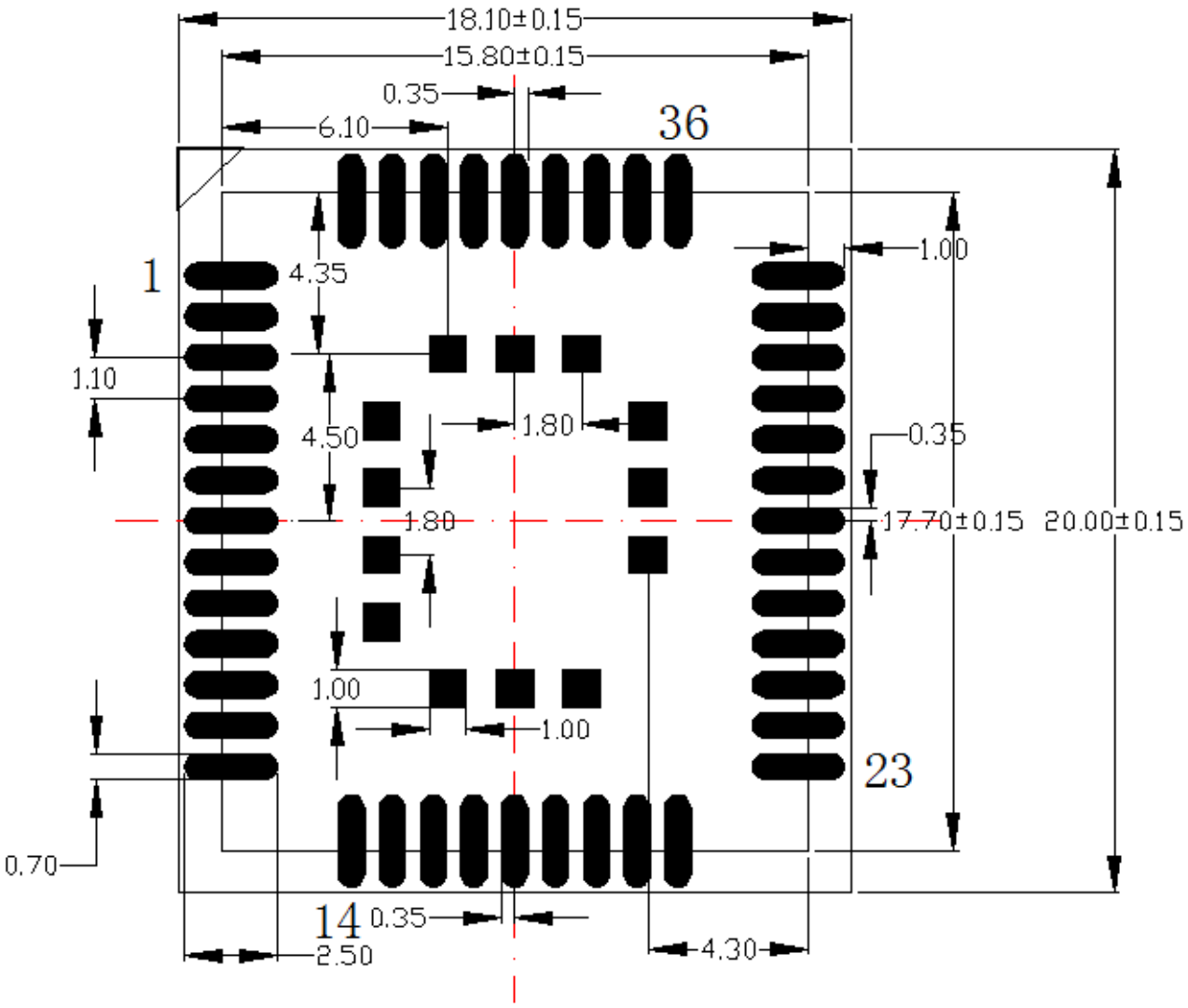

Figure 15: Recommended Stencil Design for BC65&BC66&BC68 (Unit: mm)

The recommended stencil design for M66 is shown as below.

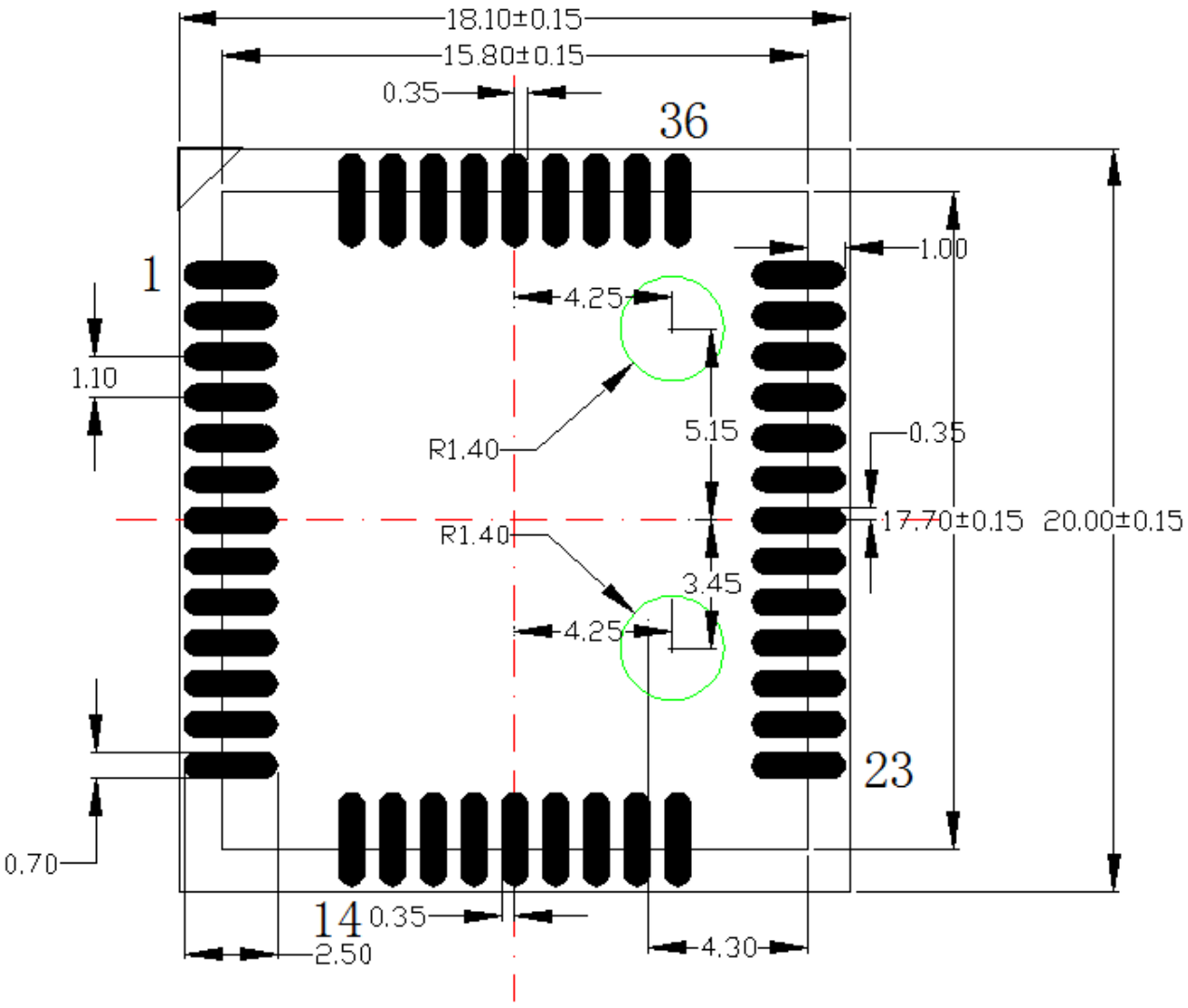

Figure 16: Recommended Stencil Design for M66 (Unit: mm)

5.3. Installation Reference Diagram

The following figure is a reference diagram of installation for BC65, BC68, BC66 and M66.

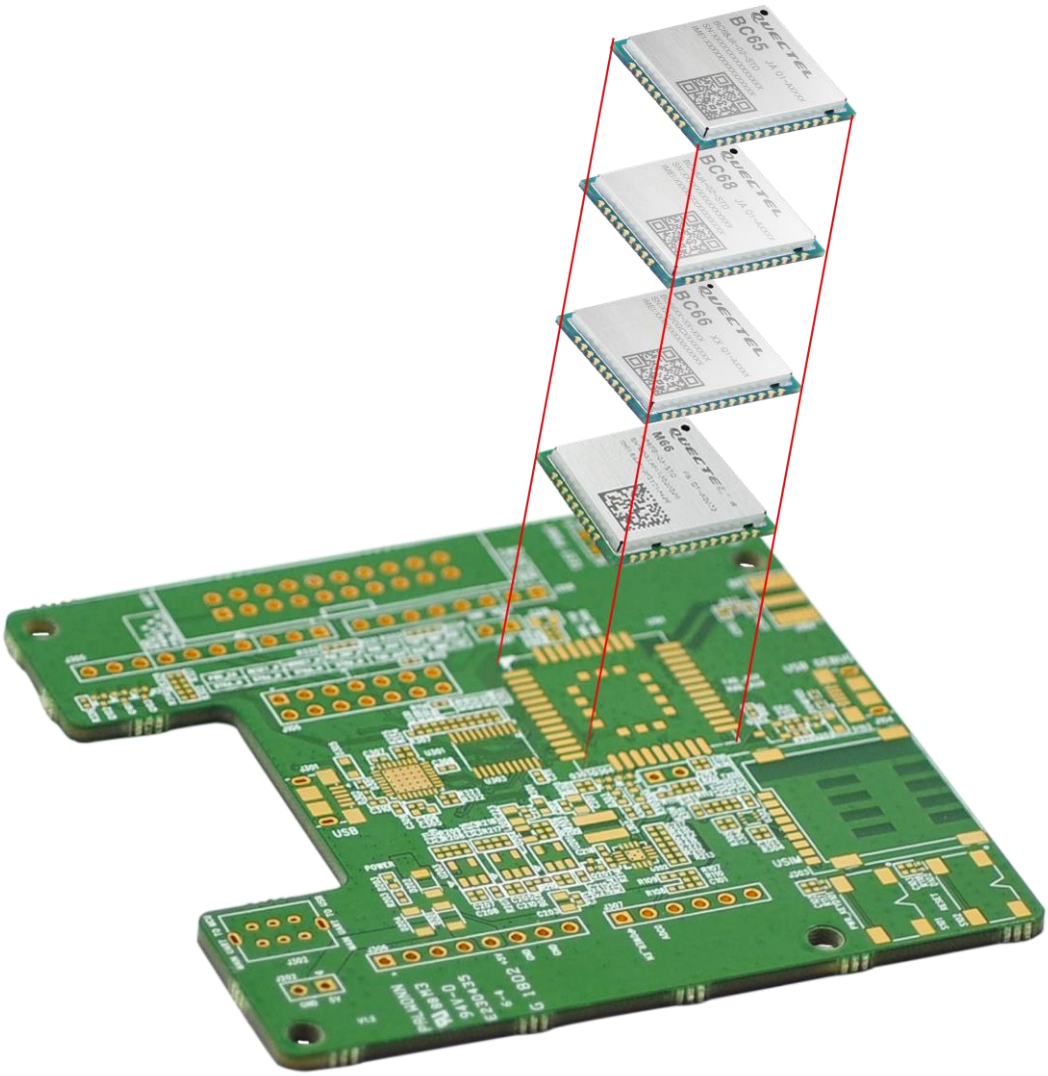

Figure 17: Installation Reference Diagram for BC65&BC68&BC66&M66

6 Appendix A References

Table 11: Related Documents

SN	Document Name	Remark
[1]	Quectel_BC95-G&BC68_AT_Commands_Manual	AT Commands Manual of BC95-G and BC68
[2]	Quectel_BC66_AT_Commands_Manual	BC66 AT Commands Manual
[3]	Quectel_BC65_AT_Commands_Manual	BC65 AT Commands Manual
[4]	Quectel_M66_AT_Commands_Manual	M66 AT Commands Manual
[5]	Quectel_Module_Secondary_SMT_User_Guide	Quectel Module Secondary SMT User Guide
[6]	Quectel_M66_Hardware_Design	M66 Hardware Design
[7]	Quectel_BC68_Hardware_Design	BC68 Hardware Design
[8]	Quectel_BC66_Hardware_Design	BC66 Hardware Design
[9]	Quectel_BC65_Hardware_Design	BC65 Hardware Design

Table 12: Terms and Abbreviations

Abbreviation	Description
ADC	Analog-to-Digital Converter
BT	Bluetooth
CTS	Clear To Send
DCD	Data Carrier Detect
DCS	Digital Communication System
DFOTA	Delta Firmware Upgrade Over the Air
DRX	Discontinuous Reception

DTR	Date Terminal Ready
EGSM	Extended Global System for Mobile
ESD	Electrostatic Discharge
GSM	Global System for Mobile Communications
GPRS	General Packet Radio Service
LCC	Leadless Chip Carriers
LDO	Low Dropout Regulator
LED	Light Emitting Diode
LGA	Land Grid Array
Li-MnO2	Lithium Manganese Dioxide
Li-SOCl2	Lithium Thionyl Chloride
LTE	Long Term Evolution
NB-IoT	Narrow Band Internet of Things
PCB	Printed Circuit Board
PCM	Pulse Code Modulation
PCS	Personal Communication System
PSM	Power Saving Mode
RF	Radio Frequency
RI	Ring Indicator
RTC	Real Time Clock
RTS	Require To Send
RXD	Receive Direction
SMT	Surface Mount Technology
SWD	Serial Wire Debug
TXD	Transmitting Direction

UART	Universal Asynchronous Receiver & Transmitter
(U)SIM	(Universal) Subscriber Identity Module