BARROT

BC3688-s
Datasheet

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Version 1.1

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Version History

Revision	Amendment	Date	Author
1.0	Initial version	2024-05-29	Daimon
1.1	1.Updated BT version and WiFi support feature description 2.Update PIN description and remove WiFi/BT enable pin 3.Update the timing chart and three views	2024-07-03	Daimon

Contents

BC3688-s Bluetooth &Wi-Fi module

Introduction

  BC3688-s is a highly integrated, low-cost and low-power consumption module with dual band Wi-Fi6, BT5.4 for wireless application. Its WLAN function supports the USB 2.0 / SDIO 3.0 interface, and its BT function supports the UART/PCM interface.

The module provides simple legacy and 20MHz/40MHz co-existence mechanism to ensure backward and network compatibility. The units, such as power management, PA (power amplifier) and LNA (low-noise amplifier) are integrated in the main chip of the module. The wireless module complies with IEEE 802.11 a/b/g/n/ac/ax standard and the PHY rate can achieve up to 286.8Mbps. This combo module is a complete solution for a combination of Wi-Fi6 and Bluetooth V5.4 technologies.

Key Features

◆ Fully Qualified Bluetooth system and WLAN

◆ Support 2.4GHz/5GHz Wi-Fi6

◆ Integrated low power timer and watchdog

◆ Supports UART, SDIO3.0, PCM, USB2.0

◆ VBAT voltage: 3.3V

◆ VDDIO voltage: 1.8 or 3.3V

◆ Operating Temperature: -20 to +80℃

◆ Storage Temperature: -40 to +85℃

◆ 12mm*12mm*2.4mm (Tolerance: ±0.20mm)

Wi-Fi Features

◆ Support 2.4GHz/5GHz Wi-Fi6

◆ Wi-Fi supported mode: IEEE802.11a/b/g/n/ac/ax

◆ Support STA, AP, Wi-Fi Direct modes concurrently

◆ Support WEP/WPA/WPA2/WPA3-SAE Personal, MFP

BT Features

◆ Support Bluetooth 2.1+EDR/3.0/4.x/5.3/5.4

◆ Supports advanced master and slave topologies

Applications

◆ Automotive

◆ V2X
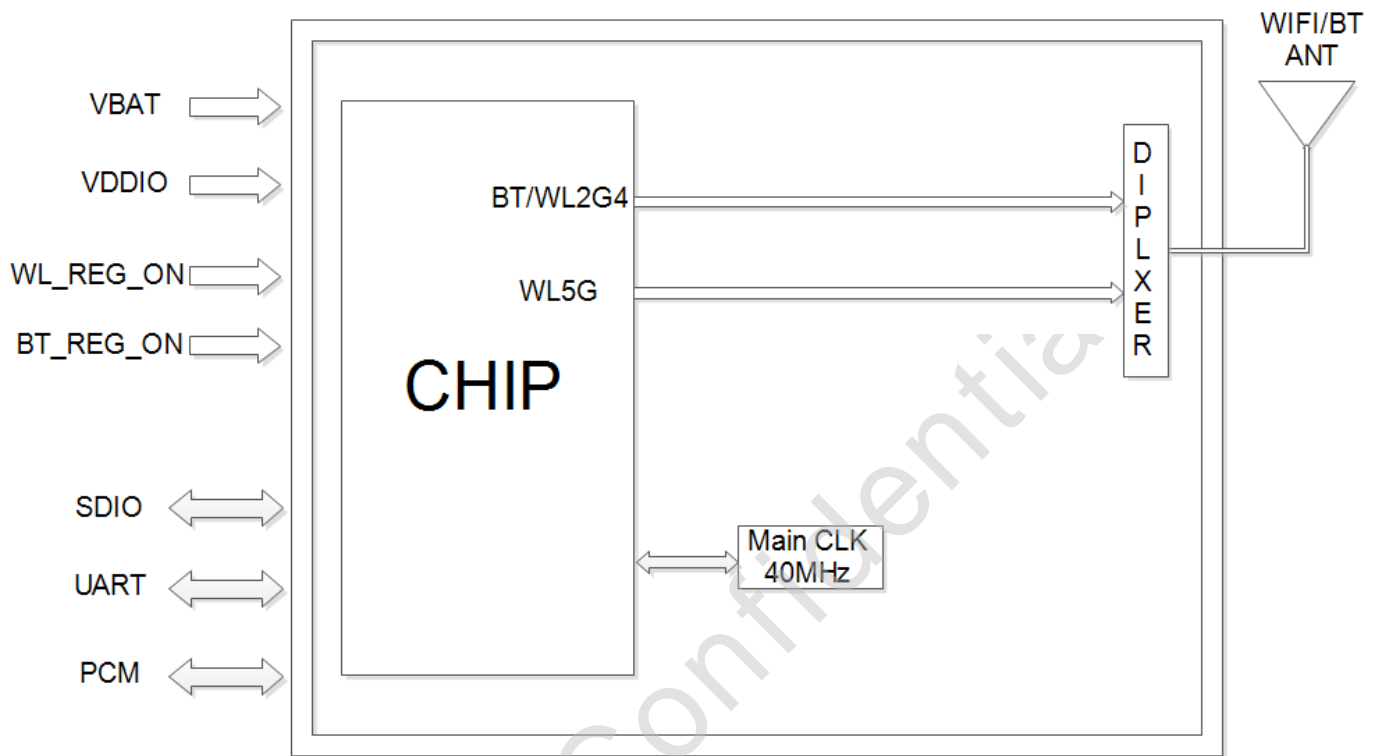
◆ LOT

1. Block Diagram and Descriptions

Figure 1 BC3688-s Block Diagram

Specification Crystal

The crystal oscillates at 40MHz

UART interface

The UART is a standard 4-wire interface (RX, TX, RTS, and CTS) with adjustable baud rates from 9600 bps to 3.0 Mbps. The interface features an automatic baud rate detection capability that returns a baud rate selection. Alternatively, the baud rate may be selected through a vendor-specific UART HCI command.

SDIO interface

The BC3688-s WLAN section provides support for SDIO 3.0.

2. Product Specifications

Table 1 Product Description

Product specification		BC3688-s
Bluetooth	Bluetooth Specification	5.4 Dual Mode
	Bluetooth Class	Class 2
	Range, line of sight	10m
	Antenna	External
	Transmit Power	4dBm
	Receiver Sensitivity	-90dBm
	Support Mode	Slave and Master
	Profiles	Support HFP, A2DP, AVRCP, PBAP, SPP, HID, HSP
WiFi	Wi-Fi Feature	2.4G: IEEE802.11 b/g/n/ac/ax 5G: IEEE802.11 a/n/ac/ax
	Range, line of sight	50m
	Frequency Band	2.4GHz and 5GHz frequency band
	Transmit Power	18dBm (Maximum) 12dBm (Minimum)
	Receiver Sensitivity	-95dBm@11Mbps

		-77.8dBm@54Mbps
		-77.1dBm@HT20 MCS7
		-74.8dBm@HT40 MCS7
	Profiles	Wi-Fi-AP (access point), Wi-Fi-Station, Wi-Fi -P2P
	Maximum Throughput	802.11b: Up to 11Mbps
		802.11g: Up to 54Mbps
		802.11n: Up to 72Mbps
		802.11ac: Up to 200Mbps
		802.11ax: Up to 286.8Mbps
	Security	WEP, WPA, WPA2, WPA3-SAE,MFP
Hardware Interface		UART, GPIO, SDIO, PCM
Operating Voltage		3.3V
Operating Temperature Range		-20 to +80℃
Size		12mm*12mm*2.4mm (Tolerance: ± 0.20mm)
Antenna		External
Ability to host applications		Yes

Shielding case	Yes
Firmware options	UART(Bluetooth)/SDIO(Wi-Fi)
BQB QDID	-

3. PIN Diagram and Description

3.1. PIN Diagram
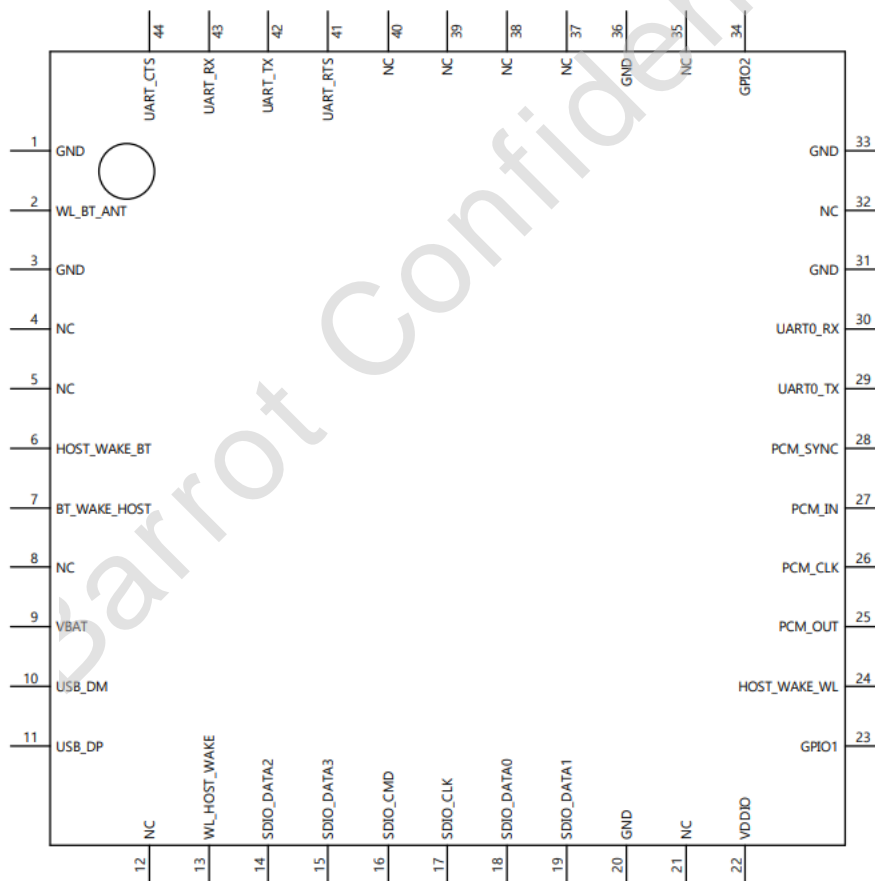
Figure 2 BC3688-s PIN diagram

3.2. PIN Description

Table 2 PIN Description

PIN No	Pin Name	Type	Description
1	GND	GND	GROUND
2	WL_BT_ANT	I/O	WLAN and BT RF I/O port
3	GND	GND	GROUND
4	NC	F	Not Connected
5	NC	F	Not Connected
6	HOST_WAKE_BT	I	HOST wake-up Bluetooth device
7	BT_WAKE_HOST	O	Bluetooth device wake-up HOST
8	NC	F	Not Connected
9	VBAT	PI	Battery Input 3.3V
10	USB_DM	I/O	default is USB_D-
11	USB_DP	I/O	default is USB_D+
12	NC	F	Not Connected
13	WL_HOST _WAKE	O	WiFi Wake Up Host
14	SDIO_DATA_2	I/O	SDIO Date Line 2
15	SDIO_DATA_3	I/O	SDIO Date Line 3
16	SDIO_CMD	I/O	SDIO Command Input

17	SDIO_CLK	I	SDIO Clock Input
18	SDIO_DATA_0	I/O	SDIO Date Line 0
19	SDIO_DATA_1	I/O	SDIO Date Line 1
20	GND	GND	GROUND
21	NC	F	Not Connected
22	VDDIO	PI	I/O Voltage supply input 1.8V or 3.3V
23	GPIO1	I/O	General Purpose Input/output Pin
24	HOST_WAKE_WL	I	HOST wake-up WL device
25	PCM_OUT	O	PCM data Out
26	PCM_CLK	I/O	PCM Clock
27	PCM_IN	I	PCM date Input
28	PCM_SYNC	I/O	PCM Synchronization control
29	UART0_TX	O	Default as the module UART port, used to burn programs and debug, baud rate 921600.
30	UART0_RX	I	
31	GND	GND	GROUND
32	NC	F	Not Connected

33	GND	GND	GROUND
34	GPIO2	I/O	General Purpose Input/output Pin
35	NC	F	Not Connected
36	GND	GND	GROUND
37	NC	F	Not Connected
38	NC	F	Not Connected
39	NC	F	Not Connected
40	NC	F	Not Connected
41	UART_RTS	O	UART request-to-send. Active-low request-to-send signal for the HCI UART Interface.
42	UART_TX	O	UART serial output. Serial data output for the HCI UART interface.
43	UART_RX	I	UART serial input. Serial data input for the HCI UART interface.
44	UART_CTS	I	UART clear-to-send. Active-low clear-to-send signal for the HCI UART interface.

PI=Power input; I/O=Bi-directional; I=Input; O=Output; RF=RF Pin;

GND=Ground; F=Floating (Not Connected)

SDIO

Pull-ups in the 10kOhm to 100kOhm range are required on the four DATA lines and the CMD line. This requirement must be met during all operating states either through the use of external pull-up resistors or through proper programming of the SDIO host's internal pull-ups. SDIO PCB layout as far as possible isometric processing, the single-end impedance of the wiring is controlled within 50Ω, SDIO_CLK wiring measurement is best covered Deal.

4. Electrical Characteristics

4.1. Absolute Maximum Ratings

Table 3 Absolute maximum ratings

Rating	Min	Max	Unit
VBAT	-0.5	3.63	V
VDDIO	-0.5	3.63	V

4.2. Recommended Operating Conditions

Table 4 Recommended Operating Conditions and DC Characteristics

Parameter	Symbol	Min	Type	Max	Unit
DC supply voltage for VBAT	VBAT	3.0	3.3	3.6	V

DC supply voltage for digital I/O	VDDIO	1.75	1.8/3.3	3.6	V
Other Digital I/O Pins					
Input high voltage	VIH	0.7 x VDDIO	-	VDDIO	V
Input Low voltage	VIL	0	-	0.3 x VDDIO	V
Threshold Voltage	VTH	-	0.5 x VDDIO	-	V

4.3. Environmental Ratings

Table 5 The environmental ratings are shown

Characteristic	Value	Unit	Note
Ambient Temperature	-20 to +80	°C	Functional operation
Storage Temperature	-40 to +85	°C	-
Relative Humidity (storage)	Less than 60	%	Storage
Relative Humidity (operation)	Less than 85	%	Operation

4.4. Current Consumption

Table 6 The Wi-Fi Current Consumption

Test Condition	Test mode	Min	Type	Max	Unit
When searching	WIFI_EN=1, BT_EN=0	-		-	mA
When connecting	WIFI_EN=1, BT_EN=0	-		-	mA
Throughput test: send and receive data	11b (2442MHz,11M)	-		-	mA
	11g (2442MHz,54M)	-		-	mA
	11N (20M)	-		-	mA
	11N (40M)	-		-	mA
	A/N (20M)	-		-	mA
	N (40M)	-		-	mA
	11AC/N/A,20M	-		-	mA
	11AC/N,40M	-		-	mA
	11AX,20M	-		-	mA
	11AX,40M	-		-	mA

Notes:

The power consumption values are preliminary information subject to change based on the device characterization results

Test Conditions VDD=3.3V, VDDIO=3.3V

4.5. Power Sequence
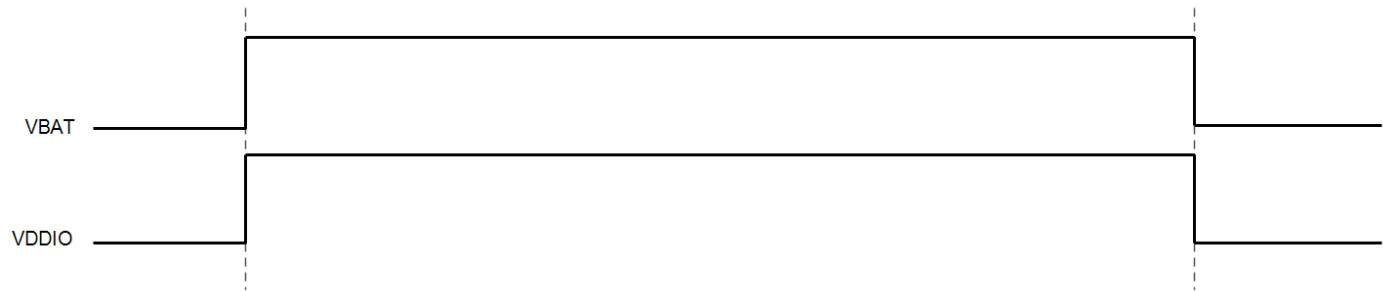
Figure 3 Power On Sequence diagram

5. Module Package Information

5.1. Package dimensions (bottom view)

Table 7 The Package dimensions (bottom view)

Module	PCB Package	Mechanical Size	Process Type	Remark
BC3688-s	-	12mm*12mm*2.4mm (Tolerance: ±0.20mm)	SMD	-
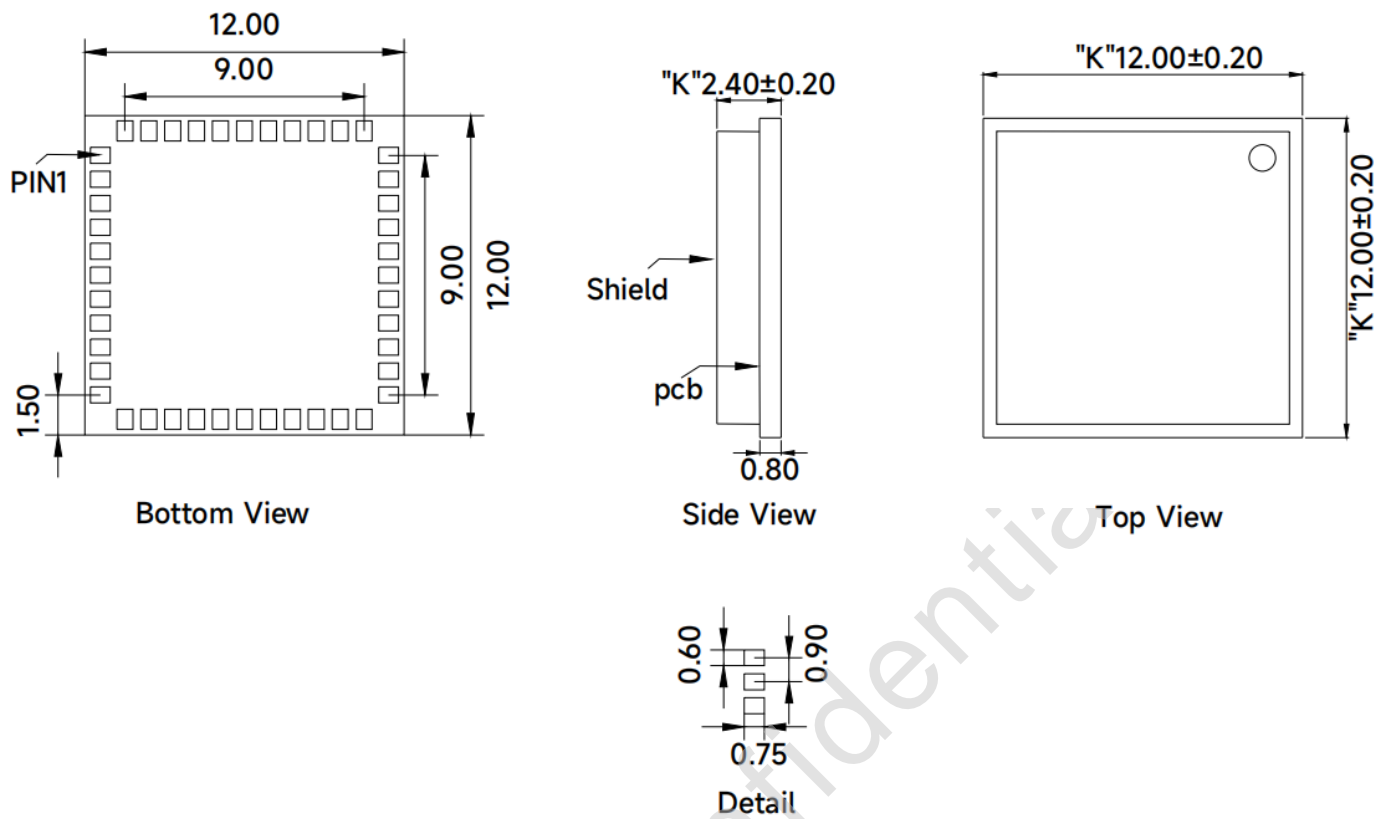
Figure 4 BC3688-s Module Package Information

5.2. Recommended PCB layout Footprint
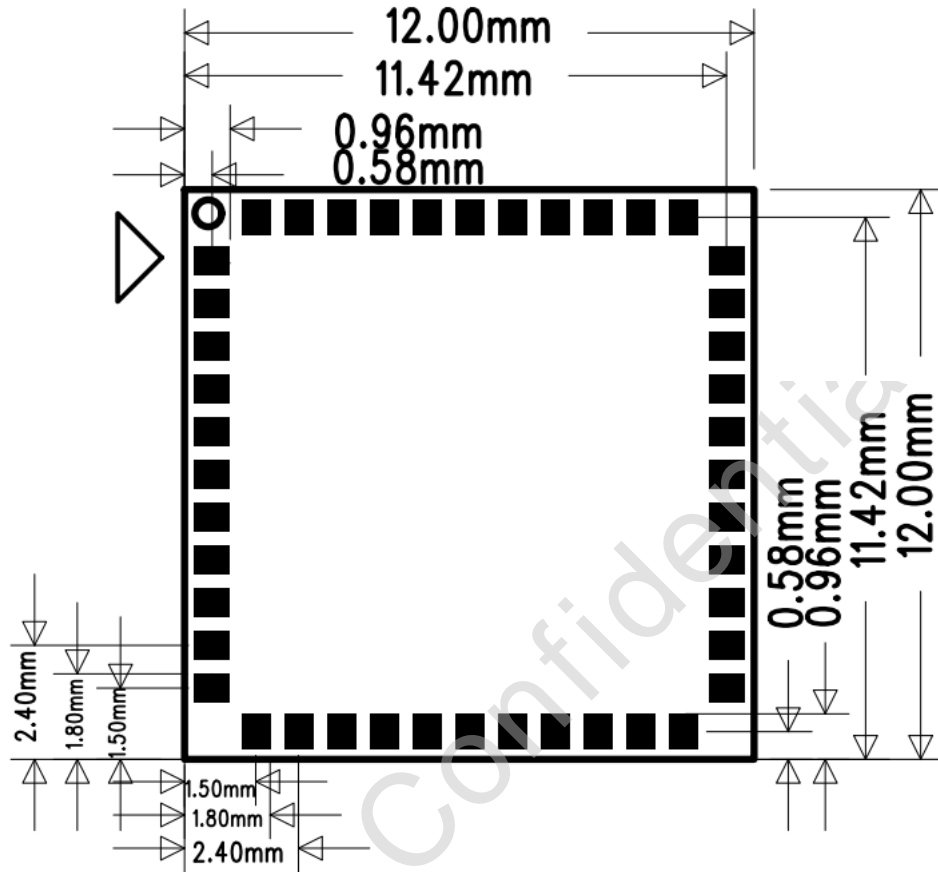
Figure 5 Recommended PCB layout footprint

RF Trace routing

The RF trace routed out of the 5G_RF/BT_RF is required to have an impedance of 50 Ohms.it is prefer to keep the RF trace on the top layer and have the trace referenced to the ground plane. The RF trace to Referencing plane allows a good trace width of 14.4mils, the 14.4 mils trace width helps minimize insertion loss of the trace compared to a thinner trace, and also minimize impedance transitions at the component pads.
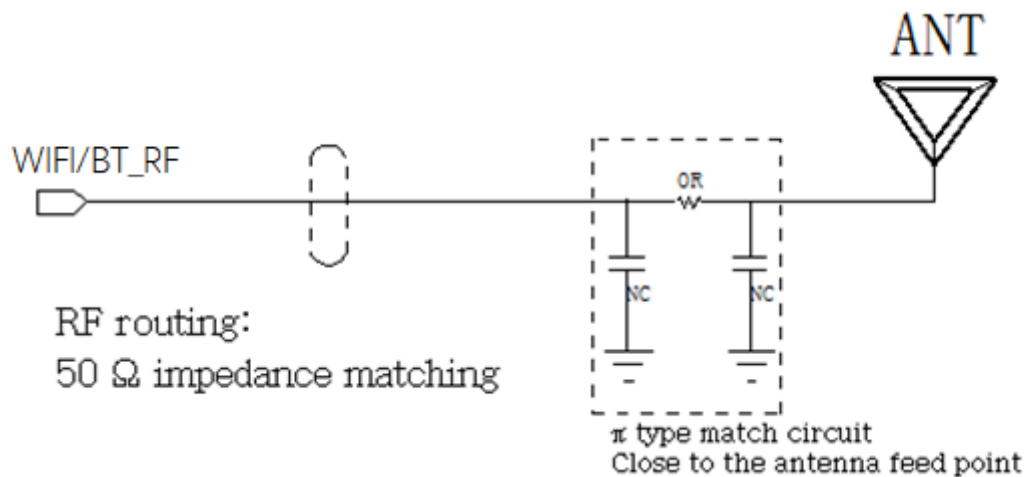
Figure 6 RF circuit
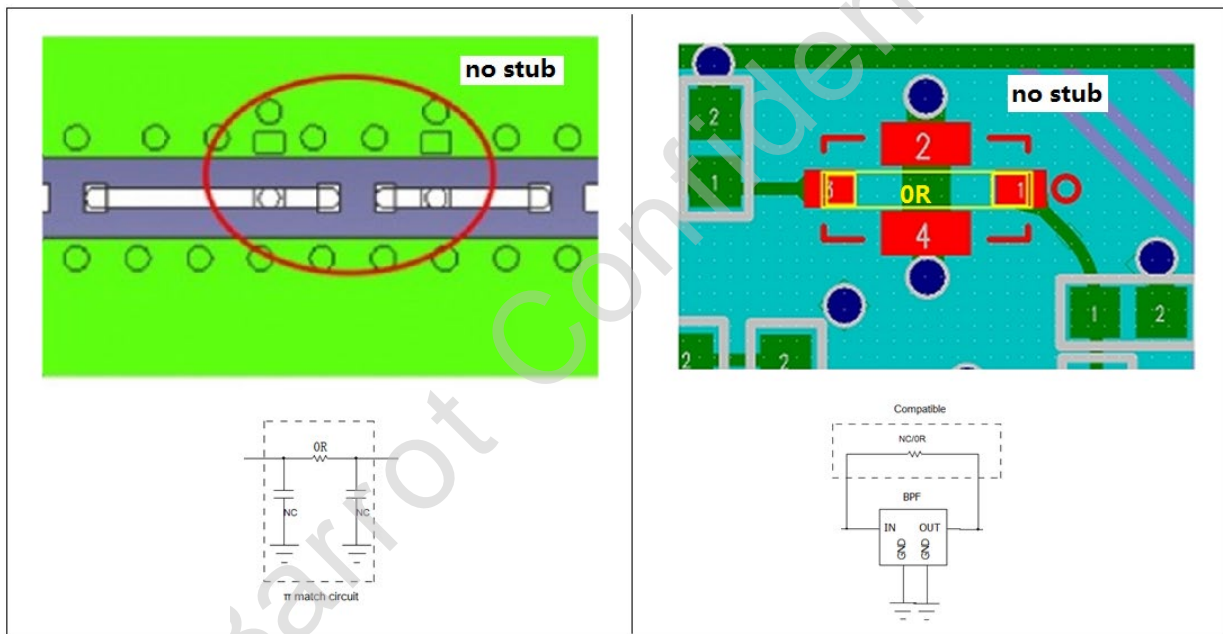
Figure 7 RF Trace routing

Critical part placement Requirements

The VBAT pin must have capacitor 10UF placed as close as possible to the pin. And the trace width minimize requirements is 50mil.

The VDDIO pin must have capacitor 10UF placed as close as possible to the pin. And the trace width minimize requirements is 15mil.

SDIO bus routing

Traces must be isolated by solid surrounded pour and have 8 mils (10 mils are better) keep-out.

For SDIO 3.0, SDIO trace should be as short as possible and keep it in the inner layer.

Keep traces have equal length with 50 ohm termination.

For SDIO 2.0, SDIO trace should be kept less than 3 inches.

Place bypass cap close to VDDIO pin. The GND on bypass cap of VDDIO should be connected to main reference through via.
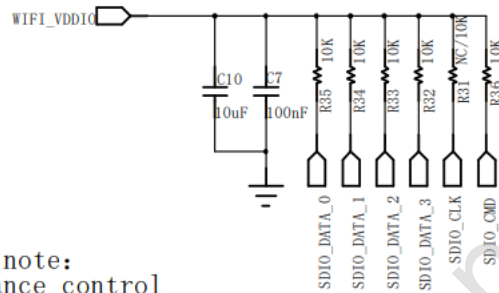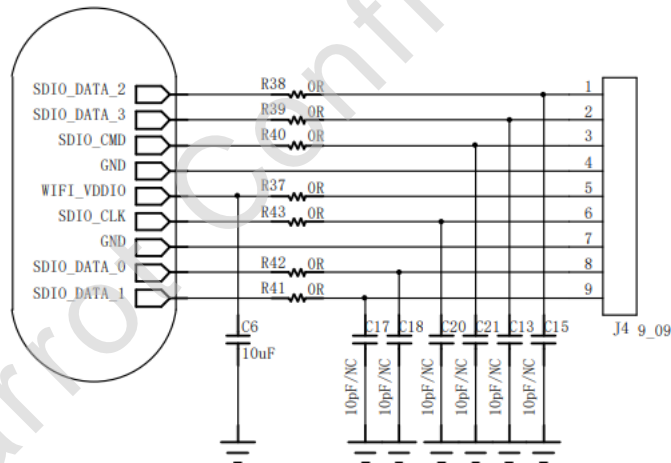
Figure 8 Critical part placement

a) The SDIO 3.0 trace should be impedance controlled to 50 ohm;

b) SDIO trace should not have any stubs. The length of the DATA traces should not be greater than the length of the CLK trace;

c) Match the lengths of the SDIO lines trace to within +/- 100 mils (keep in mind that there is a time delay of about 16.7ps for every 100 mils);

d) SDIO CLK signal:
   • Keep it away from the SDIO CMD and DATA traces(use the 2:1 rule of thumb). Routing the SDIO_CLK line too close to the command and the data lines can cause glitches on the bus, thus affecting the SDIO operation;
   • The SDIO_CLK is both the noise sensitive and noisy signal, need to be isolate well with ground when routing this trace.
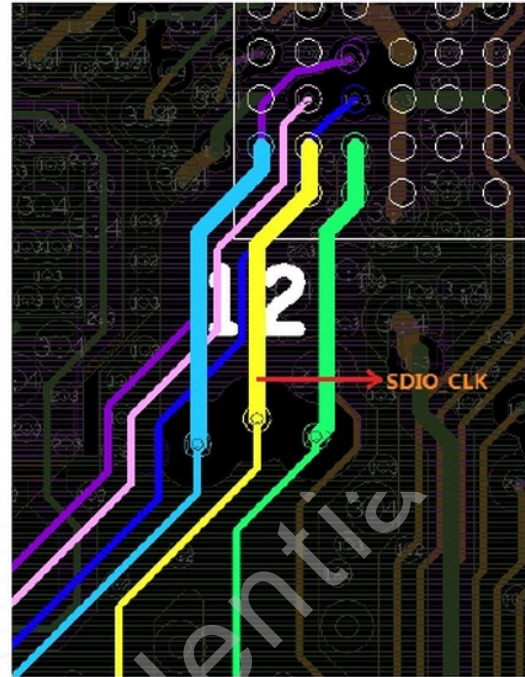
Figure 9 SDIO Trace routing

6. MOQ

Package: Reel

The minimum number of packages:

MOQ depends on the OEM factory，For details, please consult BARROT Sales.

6.1. Net weight

The module net weight: TBD

7. Company Profile

Barrot Technology Co.,Ltd. is a worldwide leading provider of wireless connectivity modules and one-stop solutions for Automotive, IoT and Audio markets. As Bluetooth core specification contributor and with multiple dimensional abilities of wireless stack (Linux\Android), audio codec, algorithms, chipset and hardware design, Barrot is committed to the development of Automotive ecosystem and wireless technologies. Barrot is serving world-leading Tier1 enterprises in China and aboard, and have successful stories in In-Vehicle Infotainment, RSE(Rear Seat Entertainment) system, HUD(head-up display), T-box, PaaK system, Electrical equipment, Printers, Healthcare devices, Portable devices, Smart lock, Mesh lighting, TWS, Soundbar, dongle and etc.

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Appendix Module storage and SMT guide

1. Introduction

This document is used for supporting customer SMT process and modules storage management. Customers should design products according to specifications and parameters provided in this document. The company does not assume any responsibility for personal injury or property damage caused by improper operations. BARROT reserves the right to update this document before declaration.

This document describes the SMT process and welding process for BARROT module products. This document applies to all BARROT wireless modules.

2. Module Information

2.1 Package

Package type：

1) LCC package，similar to IC LCC package，refer to Figure 1 below.
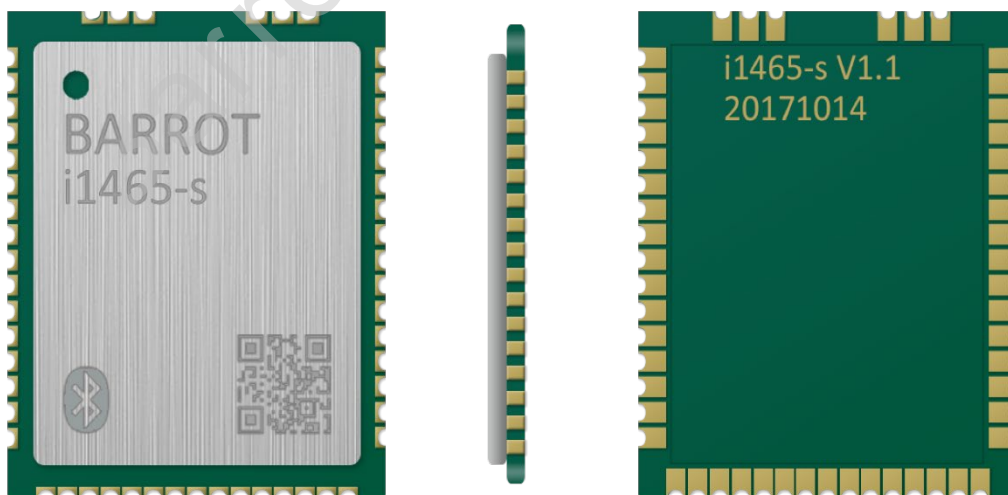
Figure 1   LCC package 3D view

2) LGA package，refer to Figure 2 below.
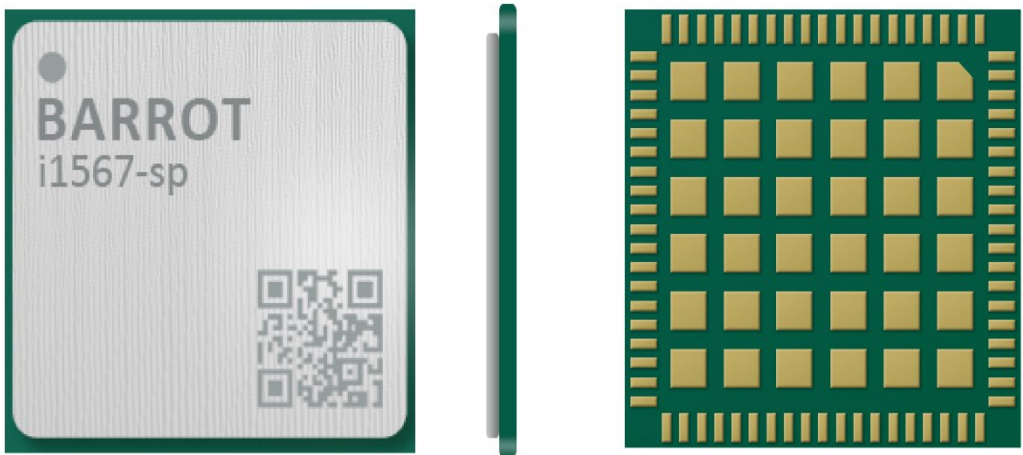
Figure 2 LGA package 3D view

2.2 Packaging Type

There are two packaging types: tape & reel and tray. The tape & reel packaging is recommended as first choice.

Table 1 . Packaging Type

Type	before sealed	After sealed (Humidity card & desiccant inside vacuum bag)
tape & reel		

tray		

3. Environment Requirements

3.1 Temperature and humidity
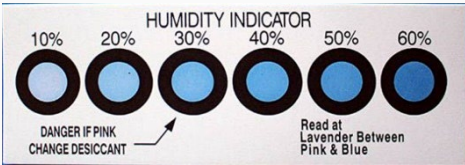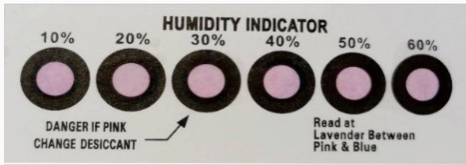
Recommended storage condition：temperature 23℃±5℃，relative humidity is 35%~60%；

Shelf life (with sealed vacuum packaging) : 12 months shelf life under recommended storage conditions

3.2 MSL

The modules provided by BARROT are humidity sensitive products. According to IPC-JEDEC standard, BARROT modules are defined as MSL3 (Moisture Sensitivity Level). Before using the module, it is necessary to confirm whether the package is in good condition; After unpacking, check the humidity card status inside the vacuum bag. If humidity card turns pink, it is necessary to bake the module before use.

Table 2 Humidity card

Item	Dry	Damp
Humidity card		
Note	Blue	Pink

After unpacking, modules should be surface mounted within 168 hours under conditions of temperature 22-28 °C and relative humidity <60% (RH).If the production line stops and modules are not used, modules should be stored in the drying oven in time, or re-vacuumed for storage; If the above conditions are not met, the module needs to be baked.

Table 3 Baking reference conditions for mounted or unmounted SMD packages

Baked under 125°C		Baked under 90°C，≤5%RH		Baked under 40°C，≤5%RH	
Beyond shop life >72hours	Beyond shop life≤72 hours	Beyond shop life >72 hours	Beyond shop life≤72 hours	Beyond shop life>72 hours	Beyond shop life≤72 hours
9 hours	7 hours	33 hours	23 hours	13 hours	9 hours

Note：

1. User baking: After baked, the shop life starts, time =0.

2.Carry, storage and SMT process must follow IPC/JEDECJ-STD-033 standard.

4. SMT

4.1 Equipment Requirements

Setup feeder：Modules are packed with either tape & reel or ESD trays. The SMT cable body should support reels and trays.

4.2 Reflow Equipment Requirements

LCC modules is recommended to use 7 or above temperature zones reflow oven.

LGA modules is recommended to use 10 or above temperature zones reflow oven.

5. Module PCB Design Instruction

5.1 PCB pad surface treatment

It suggests to use either ENIG（Chemistry Ni/Au）or OSP. ENIG（Chemistry Ni/Au）is recommended as the first choice.

5.2 PCB pad design

In order to ensure high production efficiency and high reliability of solder joints, it should follow the recommended PCB solder pad size design in the corresponding product specification.

Even if only use parts of module PINs, PCB layout is recommended to do full pad design or symmetrical pad design. If using asymmetric pad design (refer to Figure 3 below), after the solder paste on the pad melts during reflow, the module is pulled with unbalanced force, the module deflects under the action of torque. It eventually forms a short circuit between PINs.
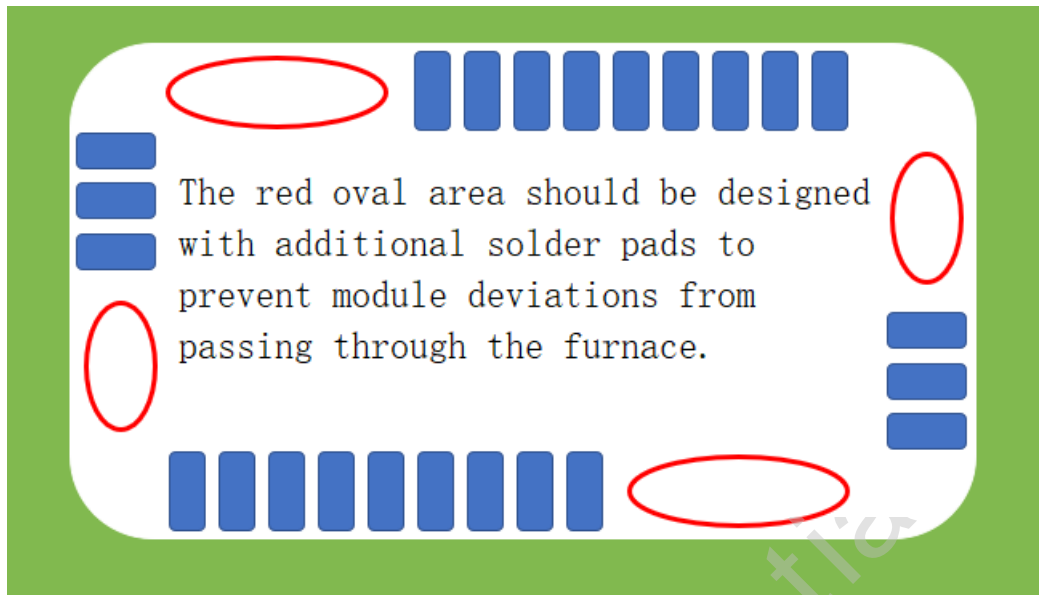
Figure 3 Asymmetric pad design

5.3   Layout Requirements

1. Module secondary reflow is now allowed. If case of special needs, it should inform BARROT in advance to avoid risks.

2. When designing PCB, the back of module should not be mounted with components in order to operate module back heating maintenance.

3. It should not have printing ink in the bottom area of the module to avoid height gap that affects the welding effect.

4. It should not mount components within the 1mm area at the very edge of the module pad. Other components should be as far away from the module body as possible. The minimum distance between the very edge of the module pad with PCB edge is 1.5mm.

5. The module should be mounted close to the edge of base PCB board in order to RF layout and reduce interference. It can also reduce the SMT impact of thermal deformation of base PCB board on module welding.

5.4   Compatibility Design

It is recommended that it should not make any pad design to be compatible with other

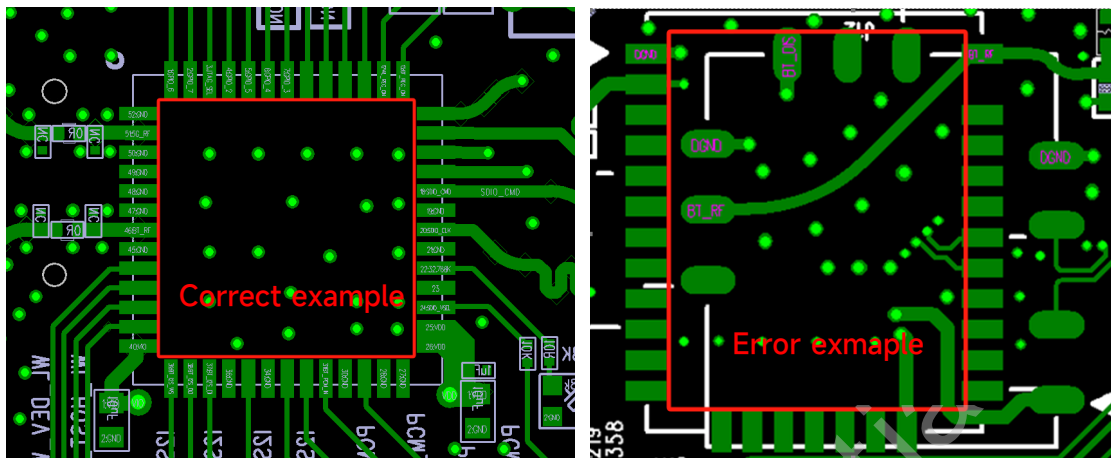components in the module SMT area (the red box shown in Figure 4) in order to prevent unforeseen risks.

Figure 4 Module SMT Area

6. SMT Notes

6.1 Lead-free Module

All BARROT modules are lead-free modules. Customers are requested to use lead-free process for secondary SMT to avoid reducing module SMT reliability due to lead process.

6.2   Stencil Design

It is recommended to use stepped stencils. Opening requirements is shown below:

1) Module PIN area is recommended to use thickened stencils. For modules with different pitches (center distance), the recommended stencil thickness is summarized in Table 4. The thickened position should be at least 1mm apart from other components.
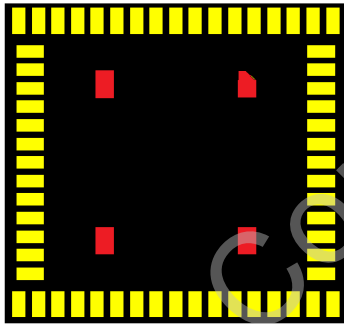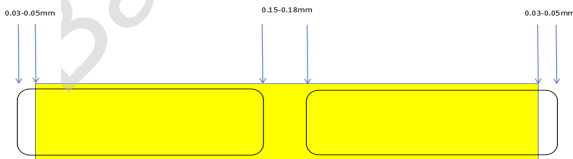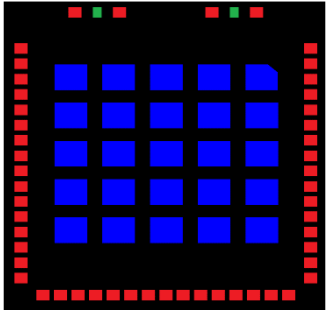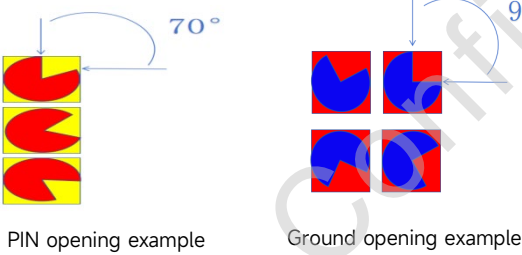
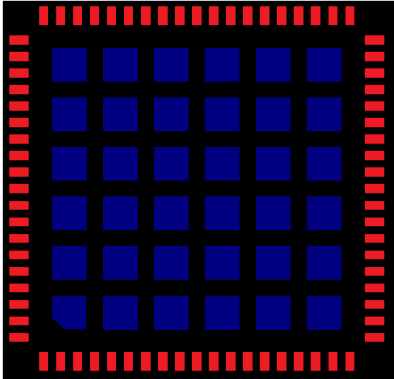Table 4 Stepped stencil recommended size

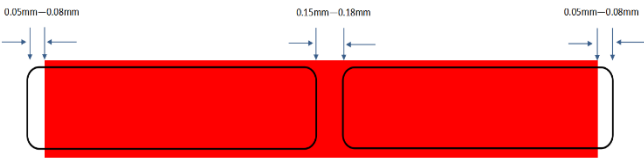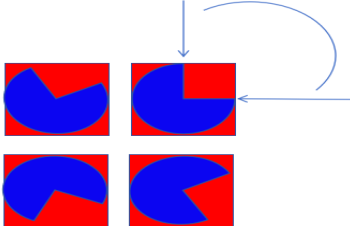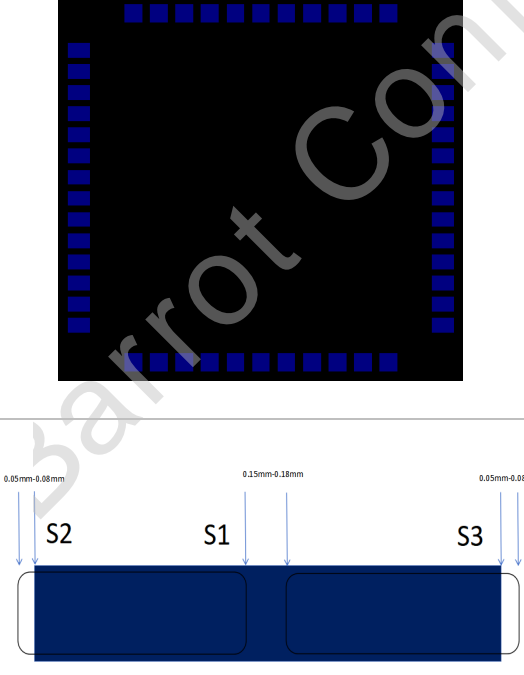| No.	Module Pitch	Stencil thickness	Note

1	0.5mm~0.9mm	0.13mm~0.15mm	If there is precision IC pad around the module, it is not recommended to exceed 0.15mm step thickness, and the square of the epitaxial stencils can be used to increase the solder paste amount.
2	1.0mm~1.5mm	0.18mm~0.20mm	

2) In real SMT process, the opening size of stencil refers to Table 5 below:

Table 6 Stencil design example

Module P/N	Example	Opening descriptions
i1552-s i1572-s i1571-s	PIN opening example	1.The recommended thickness of module stencils:0.13mm-0.15mm 2. Stencils PIN opening. The yellow part of the PIN is divided by a bridge in the middle of 0.15-0.18mm (S1), and the length of PIN extends both inside and outside with 0.03-0.05mm(S2,S3). (Refer to the PIN opening example below) 3. PIN width opening with 1:0.95, round off. 4. The ground part of the red PAD, according to a single PAD retraction center pad area 60%. (If no ground in base board, on need for opening)

i1570-sp i1465-sp	 PIN opening example Ground opening example	1.The recommended thickness of module stencils: 0.18-0.20mm 2. The red pin opening is sector with diameter of 0.8mm. All sectors bridging angle should be 70°. The directions of all sector openings should be different. There is no fixed angle requirement, but the directions cannot be the same (as shown in the figure below). 3. The green part of the pin is indented at 1:0.9, with a center opening. 4. Blue PIN ground opening is sector with diameter of 2.0mm. All sectors bridging angle should be 90°. The directions of all sector openings should be different. There is no fixed angle requirement, but the directions cannot be the same (as shown in the figure below).
i1568-sp i1569-sp i1495-sp i1496-sp i1890-sp		1. The recommended thickness of module stencils: 0.18-0.20mm 2. Red PIN middle bridging 0.15-0.18mm（S1），length extends outwards and inwards 0.05-0.08mm（S2，S3）(as shown in the figure below)． 3. PIN opening width ratio 1: 0.95, round off.

	PIN opening example	4. Blue PIN ground opening is sector with diameter of 2.0mm. All sectors bridging angle should be 90°. The directions of all sector openings should be different. There is no fixed angle requirement, but the directions cannot be the same (as shown in the figure below).
	Ground opening example	
i1852-sp	PIN opening example	1. The recommended thickness of module stencils:0.13mm-0.15mm 2. PIN opening width ratio 1: 0.95, round off. 3. Red PIN middle bridging 0.15-0.18mm（S1）, length extends outwards and inwards 0.05-0.08mm（S2，S3）(as shown in the figure below).
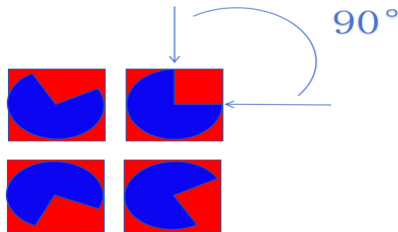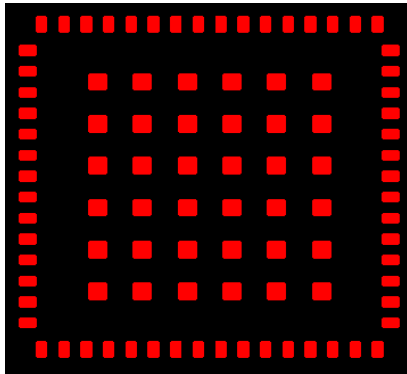
i1495-spu1	 Ground opening example PIN opening example	1. The recommended thickness of module stencils: 0.18-0.20mm 2. PIN middle bridging 0.15mm（S1），length extends outwards and inwards 0.05mm（S2，S3）（as shown in the figure below）. 3.PIN width 0.48mm，round off。 4. PIN ground opening is sector with diameter of 1.0mm. The directions of all sector openings should be different. There is no fixed angle requirement, but the directions cannot be the same (as shown in the figure below).
i1421-si i1410-si		1. The recommended thickness of module stencils: 0.18-0.20mm 2. Regarding PINs，length internally tangent 0.1mm-0.3mm（S1）extend outwards 0.3mm-0.5mm（S2), length ratio 1：0.90. all PINs round off.
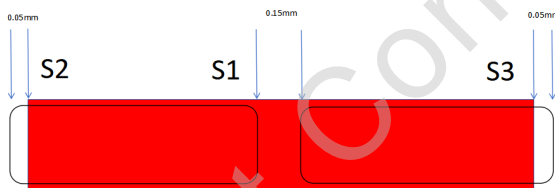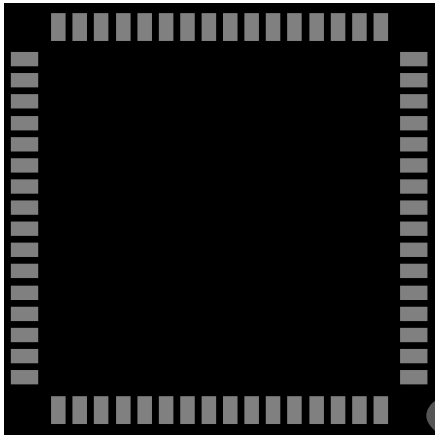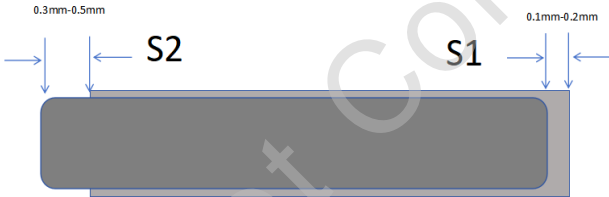
	PIN opening example	
i1433-sp		1. The recommended thickness of module stencils: 0.18-0.20mm 2.Regarding PINs，length internally tangent 0.1mm-0.3mm（S1）extend outwards 0.3mm-0.5mm（S2), length ratio 1：0.90. all PINs round off.

Note:

1. The modules in above list may have multiple hardware versions, please take module datasheet for reference.

2.Regarding to components within 1.0mm around the locally thickened area, the amount of tin increases due to stencil thickness when printing, so they should be carefully inspected during SMT processes. When it is necessary to make partially thickened stencil for the module, if there are 0201 fine components or 0.40mm and 0.50mm pin pitch ICs and components close to the module, the distance between the thicken area and those components should be kept at least 0.5mm, or in the different position parallel to module printing, in order to avoid the thickness of the solder paste for scraper printing resulting in short circuit of the nearby component pins.

3. The above suggestions are for reference only, and customers can optimize

according to the actual situation.

6.3 Feeding Notes

Single module SMT: For single module products that are unpacked and baked at high temperature, it is recommended to use special trays for SMT.

Module with tape & reel SMT: When feeding, it is necessary to set the feeding space on the feeder according to the actual modules.

6.4 Automatic SMT

Select the appropriate nozzle according to module size.

Set the appropriate speed of the SMT machine in order to prevent instability when moving. Generally, the speed is set to medium.

After SMT, it should confirm that the each PIN of the module aligns with the solder paste center. The identifier of module first PIN corresponds to PCB marking identifier.
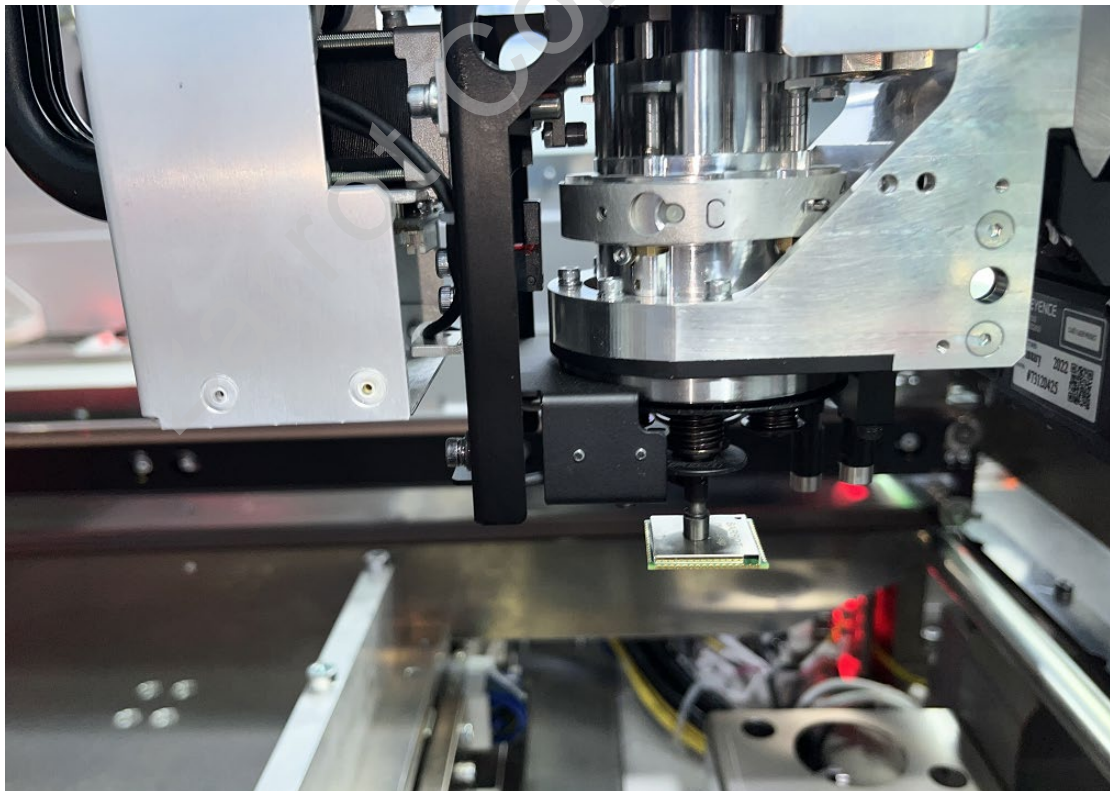
Figure 5 SMT

Figure 6 PIN1 identifier

6.5   Reflow Curve

It is recommended to use solid plate test for furnace temperature curve. When making furnace temperature plate, it is recommended to connect thermocouple temperature test points at the welding pad and pin at the bottom of the module to ensure that the pin of the module can reach the required welding temperature. The actual furnace temperature curve suggested by the production module is shown in Figure 7 below
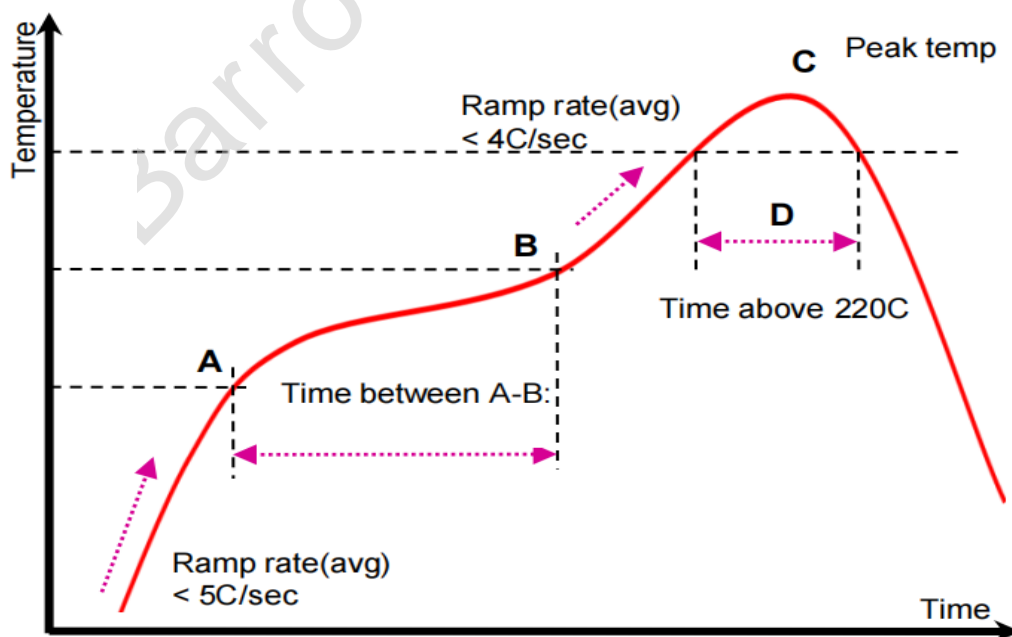
Figure 7 Reflow Curve Example

Table 6：Reflow Parameters

No.	Recommended Parameters
Pre-heating zone	Warming slope：1~4°C/s
Constant temperature zone	Time between A and B（150~200°C）：60~120s
Reflow zone	Reflow time（D:217°C above time）：30~90s
	Maximum temperature：240~250°C
Cooling zone	Cooling slope：-1.5~-4°C/s
Allowable reflow number	One time

Oven temperature：

The actual welding temperature is affected by other external factors, such as oven carriers, solder paste, the size and thickness of the base board, the heat resistance requirements of components and PCBA design.

6.6   Reflow Welding

When the PCBA mounted on the module enters oven, it should strictly pass PCBA through the oven by rail. It strictly forbids pass through by the net cover of reflow oven. Because modules have BGA components, the jitter of the net cover may lead to a high ratio of BGA tin balls.

When customers conduct secondary SMT, if it is a double-size board, it should not take the side on which the module mounts as the first side for production. It suggests to mount module when producing the second side. Note: If BGA components should face down, during secondary reflow, BGA solder joints stretch due to gravity. It may lead to weak solder joints. The solder joint may break under the influence of external forces or leading to other unknown dangers.

When designing reflow welding process (such as making fig), it should avoid

interference design that causes any device deviation on the module

Oven carrier:

For motherboards which thickness is less than 1.0mm, it is necessary to use a high Tg value PCB board or add a furnace passed carrier to support the motherboard to prevent deformation.

6.7 Wave soldering of PCBA after SMT

For PCBA mounted with modules, if wave welding is required by the process, please give special protection to the module to prevent short circuit of components mounted on the module or other unpredictable hidden dangers caused by abnormal tin splashing during wave welding.

It is not recommended to conduct wave soldering on PCBA mounted with modules. Please consider manual welding of modules after wave soldering.

6.8 Other components manual welding after module SMT

After SMT, if it needs to mount other components to the PCBA by manual welding, such as welding cables, protect the module by shielding or covering it when manual welding, especially when the manual welding part is close to the module.

Before and after manual welding, PCBA should be placed at the upper part of the manual welding operation stand, or quickly pass to the next station stand for processing. PCBA should not be placed under the welding operation stand.

7. Repair Instructions

7.1 Repair Notes

The repair process depends on repair site. The recommended repair method is not the only method. The method can be selected according to the actual hardware conditions. The method must meet the basic process requirements of repairing.

It should inspect BGA welding status by X-ray before repairing. The X-ray image should be saved in order to avoid secondary defects, such as chip tinning or component displacement, that is caused by improper secondary heating temperature or methods after

desoldering.

After-sale immediately stops if the internal components of the module body are disassembled.

7.2 Repair Process

| Repair preparation | ⇒ | Remove module | ⇒ | Welding zone treatment | ⇒ | module installation | ⇒ | Install inspection | ⇒ | functional test |

Fix base board

Remove surrounding obstacles

Select repair tools

Set temperature

Apply flux

Sheat&removal

base board cooling

Residue removal

Welding pad treatment

Apply solder paste

module inspection

Module alignment

Heat & welding

Residue removal

Solder joint inspection

Solder zone inspection

appearance inspection

Re-assemble other components

functional test

7.3 Preparation

The base PCB board needs to be fixed.

Remove components and obstacles that cannot withstand high temperatures around the module.

If the repair module exceeds the storage period, it must be repaired after baking according to Table 1 in order to prevent PCB damage caused by welding due to moisture.

7.4 Module Remove

Repair tool selection: If the number of repair module pads and the module size is too large. The ordinary soldering iron is difficult to meet the repair requirements. Therefore, it needs to use a hot air gun (large outlet) or infrared repair stand.

Temperature setting: Set the heat gun temperature to around 320 ° C to 350 ° C. Adjusting the wind speed and distance according to the actual situation.

Heat removal: The module is heated quickly and evenly by heating. To achieve simultaneous melting of all solder joints, and then remove the module.

Table 7 Repair Tools

Repair Stand	Heat Air Gun

7.5 Welding Area Treatment

Remove residues: Use the soldering iron and wire to remove existing solder and keep the pad surface flat.

Pad treatment: Clean pad and remove flux residues.

Solder paste application: It is recommended to make fixtures and tin printing small stencil for repairing and printing solder paste.

7.6 Module Installation

Module inspection: Check whether or not the module appearance is in good condition and it is working normally.

Module alignment: When installing the module, ensure that the module is correctly oriented.

Heat welding: The module is heated quickly and evenly by heating in order to achieve the simultaneous melting of all solder joints and form better IMC.

Remove residues: Clean pad and remove flux residues.

7.7 Install inspection

Welding inspection: welding spot inspection, welding area inspection, appearance inspection.

Reinstall other components: Restore the peripheral components that are removed before.

7.8Function Test

After SMT completes, it should conduct functional tests.

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its affiliated companies

Appendix A: List of Abbreviations

缩写	英文全称	中文全称
BGA	Ball Grid Array	球状栅格阵列
LCC	Leadless Chip Carriers	无针脚芯片封装
LGA	Land Grid Array	栅格阵列封装
MSL	Moisture Sensitivity Level	湿敏等级
PCB	Printed Circuit Board	印刷电路板
SMD	Surface Mount Device	表面贴装器件
SMT	Surface Mount Technology	表面贴装技术
Tg	Glass Transition Temperature	玻璃化温度

Appendix 2 Order Information

Version History

Revision[2]	Amendment	Date	Author
X.Y.0	Initial version	2024-05-29	Daimon

Table 2-1 Order Information

Order number(MPN)	Description
BC3688-s-0010-BARROTV1.0	HW Version: V1.0 WiFi Configuration: SDIO

Table 2-2 software copyright

Company name	Full name of software copyright	Abbreviation of software copyright
Barrot Technology Co.,Ltd.	BARROT 软件 V1.0	BARROTV1.0
SHENZHEN BARROT TECHNOLOGY LIMITED	BARROT 通信系统 V1.0	BARROTV1.0
CHONGQING BARROT TECHNOLOGY LIMITED	BARROT 无线系统 V1.0	BARROTV1.0