Guangzhou HC Information Technology Co., Ltd.

Product Data Sheet

Module Data Sheet

Rev 1

1．0	**1.01**						
2010/5/15	2011/4/6						

DRAWN BY :	Ling Xin		**MODEL :** HC-05	
CHECKED BY :	Eric Huang		**Description:** BC04 has external 8M Flash and EDR mode HC-03 is industrial, and compatible with civil HC-05	
APPD. BY：	Simon Mok		**REV : 2.0**	**PAGES:**
Former version introduction	Linvaor is the former of Wavesen.			

www.wavesen.com Phone: 020-84083341 Fax: 020-84332079 QQ:1043073574
Address: Room 527, No.13, Jiangong Road, Tianhe software park, Tianhe district, Guangzhou Post: 510660
Technology consultant: support@wavesen.com Business consultant:sales@wavesen.com
Complaint and suggestion: sunbirdit@hotmail.com

Contents

1.Product's picture

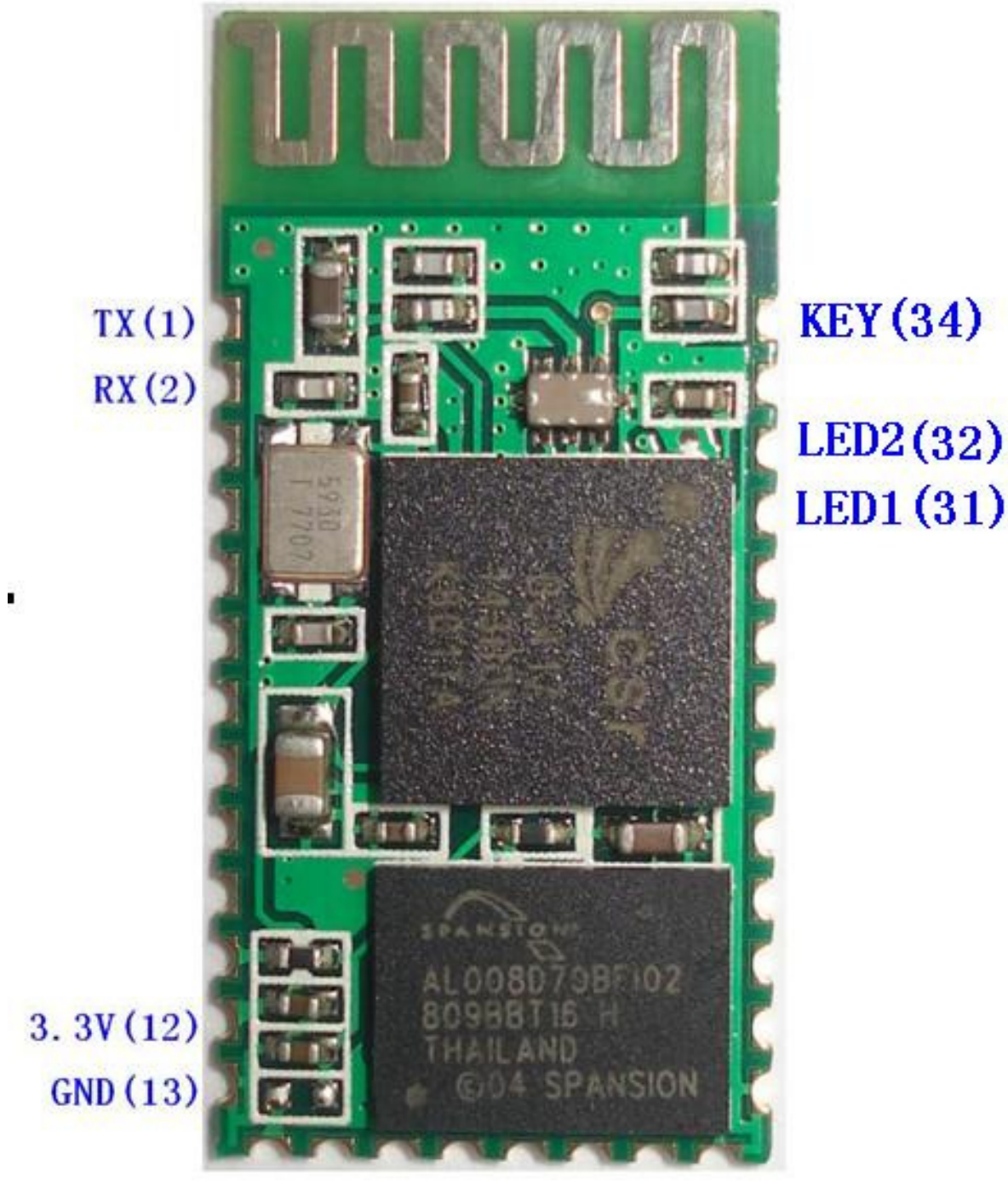

Figure 1. A Bluetooth module

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Figure 2 50 pieces chips in an anti-static blister package

2. Feature

- Wireless transceiver
  - Sensitivity (Bit error rate) can reach -80dBm.
  - The change range of output's power: -4 - +6dBm.
- Function description (perfect Bluetooth solution)
  - Has an EDR module; and the change range of modulation depth: 2Mbps - 3Mbps.
  - Has a build-in 2.4GHz antenna; user needn't test antenna.

- Has the external 8Mbit FLASH
- Can work at the low voltage (3.1V~4.2V). The current in pairing is in the range of 30～40mA. The current in communication is 8mA.
- PIO control can be switched.
- Has the standard HCI Port (UART or USB)
- The USB protocol is Full Speed USB1.1, and compliant with 2.0.
- This module can be used in the SMD.
- It's made through RoHS process.
- The board PIN is half hole size.
- Has a 2.4GHz digital wireless transceiver.
- Bases at CSR BC04 Bluetooth technology.
- Has the function of adaptive frequency hopping.
- Small (27mm×13mm×2mm).
- Peripheral circuit is simple.
- It's at the Bluetooth class 2 power level.
- Storage temperature range: -40 ℃- 85℃, operating temperature range: -25 ℃ - +75℃
- Any wave inter Interference: 2.4MHz，the power of emitting: 3 dBm.
- Bit error rate: 0. Only the signal decays at the transmission link, bit error may be produced. For example, when RS232 or TTL is being processed, some signals may decay.

- Low power consumption
- Has high-performance wireless transceiver system
- Low Cost
- Application fields:
  - Bluetooth Car Handsfree Device
  - Bluetooth GPS
  - Bluetooth PCMCIA , USB Dongle
  - Bluetooth Data Transfer
- Software
  - CSR

3. PINs description

Figure 3 PIN configuration

The PINs at this block diagram is same as the physical one.

PIN Name	PIN #	Pad type	Description	Note
GND	13 21 22	VSS	Ground pot	
1V8	14	VDD	Integrated 1.8V (+) supply with On-chip linear regulator output within 1.7-1.9V	
VCC	12	3.3V		
AIO0	9	Bi-Directional	Programmable input/output line	
AIO1	10	Bi-Directional	Programmable input/output line	
PIO0	23	Bi-Directional RX EN	Programmable input/output line, control output for LNA(if fitted)	
PIO1	24	Bi-Directional TX EN	Programmable input/output line, control output for PA(if fitted)	
PIO2	25	Bi-Directional	Programmable input/output line	
PIO3	26	Bi-Directional	Programmable input/output line	
PIO4	27	Bi-Directional	Programmable input/output line	
PIO5	28	Bi-Directional	Programmable input/output line	
PIO6	29	Bi-Directional	Programmable input/output line	CLK_REQ
PIO7	30	Bi-Directional	Programmable input/output line	CLK_OUT
PIO8	31	Bi-Directional	Programmable	

			input/output line	
PIO9	32	Bi-Directional	Programmable input/output line	
PIO10	33	Bi-Directional	Programmable input/output line	
PIO11	34	Bi-Directional	Programmable input/output line	
RESETB	11	CMOS Input with weak intemal pull-down		
UART_RTS	4	CMOS output, tri-stable with weak internal pull-up	UART request to send, active low	
UART_CTS	3	CMOS input with weak internal pull-down	UART clear to send, active low	
UART_RX	2	CMOS input with weak internal pull-down	UART Data input	
UART_TX	1	CMOS output, Tri-stable with weak internal pull-up	UART Data output	
SPI_MOSI	17	CMOS input with weak internal pull-down	Serial peripheral interface data input	
SPI_CSB	16	CMOS input with weak internal pull-up	Chip select for serial peripheral interface, active low	
SPI_CLK	19	CMOS input with weak internal pull-down	Serial peripheral interface clock	
SPI_MISO	18	CMOS input with weak internal pull-down	Serial peripheral interface data Output	
USB_-	15	Bi-Directional		
USB_+	20	Bi-Directional		
1.8V	14		1.8V external power supply input	Default : 1.8V internal power supply.

PCM_CLK	5	Bi-Directional		
PCM_OUT	6	CMOS output		
PCM_IN	7	CMOS Input		
PCM_SYNC	8	Bi-Directional		

4. The parameters and mode of product

LINVOR BLUE T

www.linvor.com

Bluetooth Module

Bluetooth

CSR,BC417143B

V 2.0

2006/09/6

蓝牙 **RF** 模块

1. 采用 CSR BC4 +8M FLASH 方案
2. 具有 PIO0-PIO11、AIO0、AIO1、USB、PCM、UART 及 SPI 接口，模块内置 8MFLASH，功能强大，用户可定制软件,适用于各种蓝牙设备，内置 RF 天线,便于调试。

蓝牙协议版本	Bluetooth Specifcation V2.0 With EDR
USB 协议 USB Protocol	Full Speed USB V1.1 Compliant With USB V2.0
频率	2.4Ghz ISM band
调制方式	GFSK(Gaussian Frequency Shift Keying)
发射功率	-4 ->4 dBm, Class 2
灵敏度	≤-80dBm at 0.1% BER
通讯速率	Asynchronous:2Mbps(Max)
供电电源	3.3V
工作温度	-20~+55 Centigrade
封装尺寸	27mmX13mmX2mm

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LINVOR BLUE T

LV-BC-2.0

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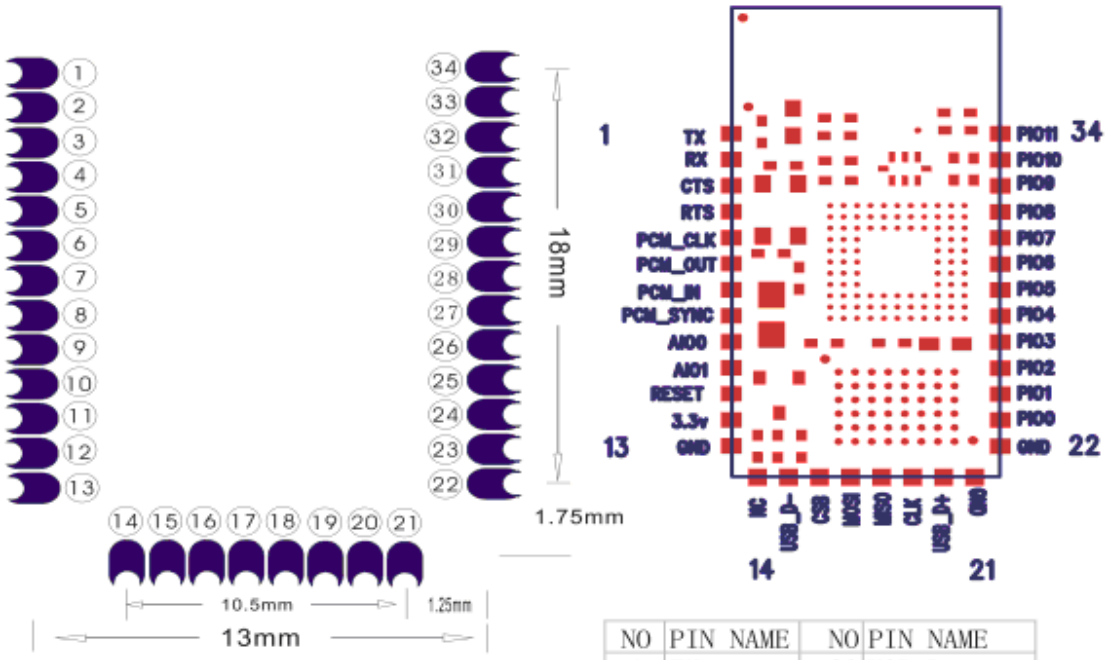
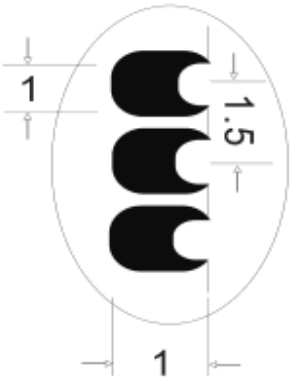
单位： mm





PCB Layout 请参考实物

NO	PIN NAME	NO	PIN NAME
1	TX	20	USB D+
2	RX	21	GND
3	CTS	22	GND
4	RTS	23	PIO0
5	PCM CLK	24	PIO1
6	PCM OUT	25	PIO2
7	PCM IN	26	PIO3
8	PCM SYNC	27	PIO4
9	AIO0	28	PIO5
10	AIO1	29	PIO6
11	RESET	30	PIO7
12	3.3V	31	PIO8
13	GND	32	PIO9
14	NC	33	PIO10
15	USB D-	34	PIO11
16	CSB		
17	MOSI		
18	MISO		
19	CLK		

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5. Block diagram

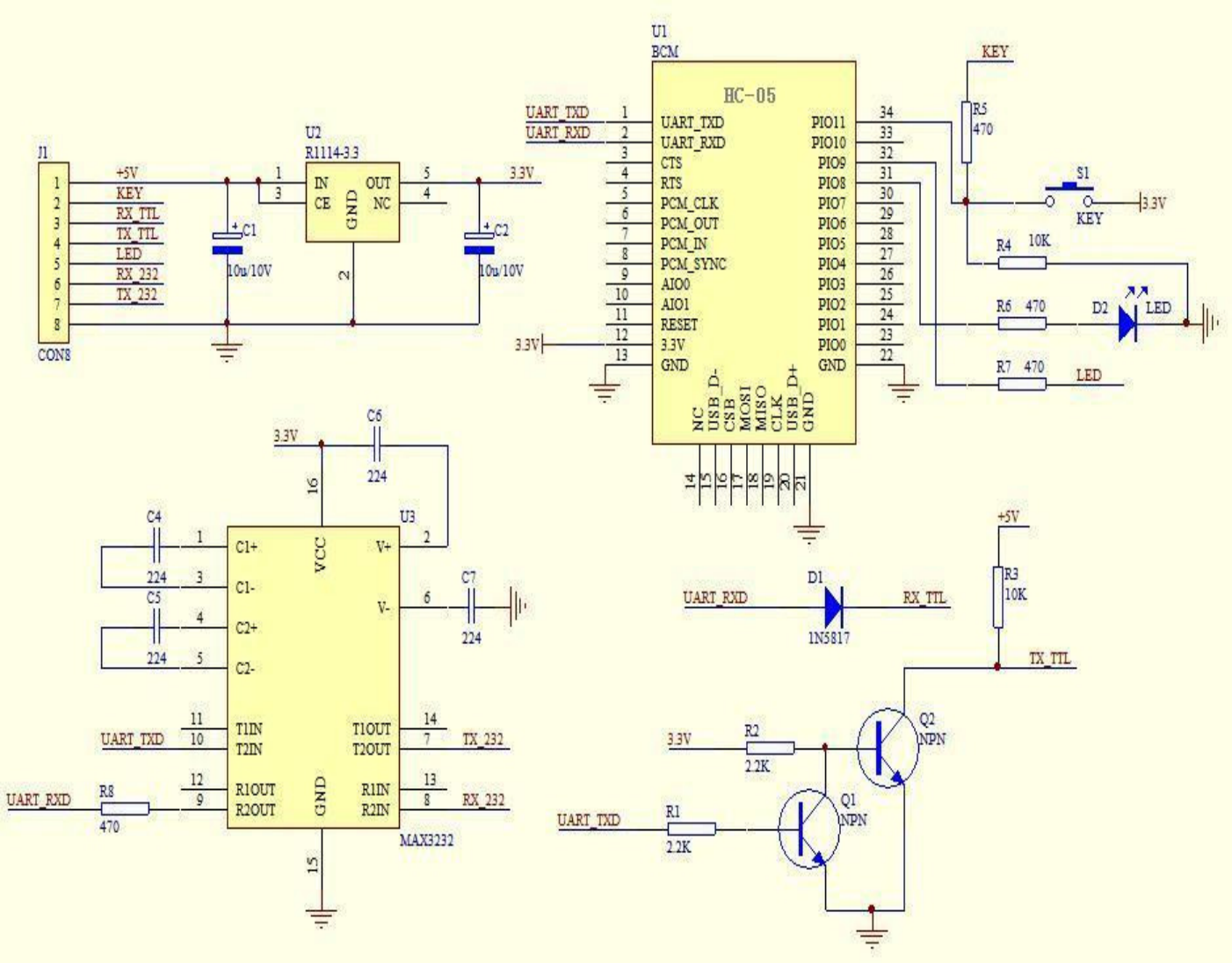

Figure 5 Block diagram

6. Debugging device

6.1 Device

PC, hardware, 3G，3G Frequency Counter (SP3386), 3.15V DC power supply, Shielding，Bluetooth Test box.

6.2 Software

7. Characteristic of test

Test Condition 25℃ RH 65%

	Min	Typ	Max	Unit
1. Carrier Freq. (*ISM Band*)	2.4		2.4835	MHz
2. RF O/P Power	-6	2	4	dBm
3. Step size of Power control	2		8	dB
4. Freq. Offset (*Typical Carrier freq.*)	-75		75	KHz
5. Carrier Freq. drift (*Hopping on, drift rate/50uS*)	-20		20	KHz
1 slot packet	-25		25	KHz
3 slot packet	-40		-40	KHz
6. Average Freq. Deviations (*Hopping off, modulation*)	140		175	KHz
Freq. Deviation	115			KHz
Ratio of Freq. Deviation	0.8			
7 . Receive Sensitivity @< 0.1% BER*(Bit error rate)*	-83			dBm

8. Test diagram

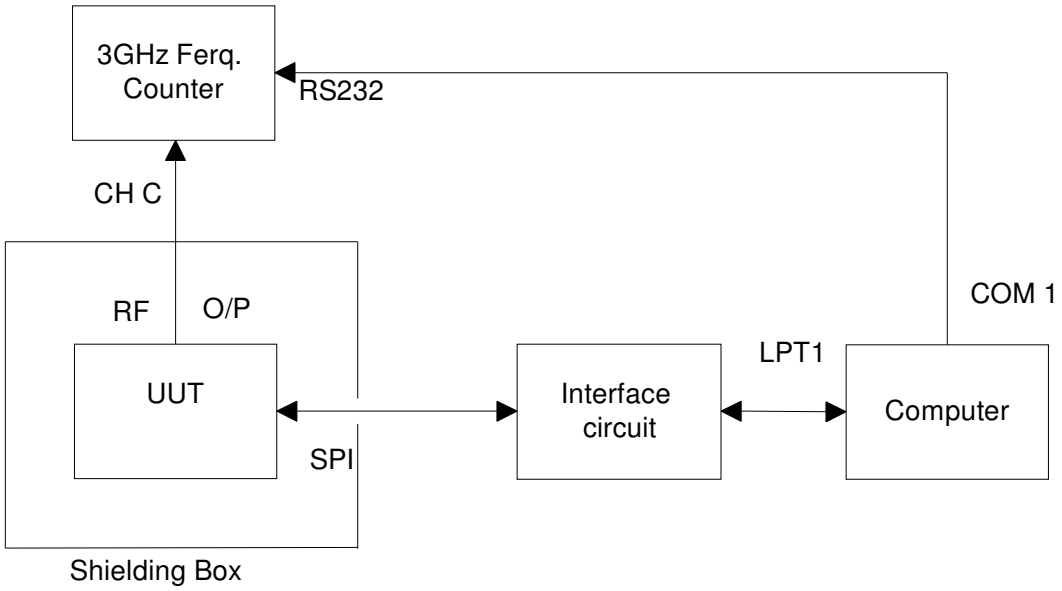

Fig 1. Programming and Freq. Alignment

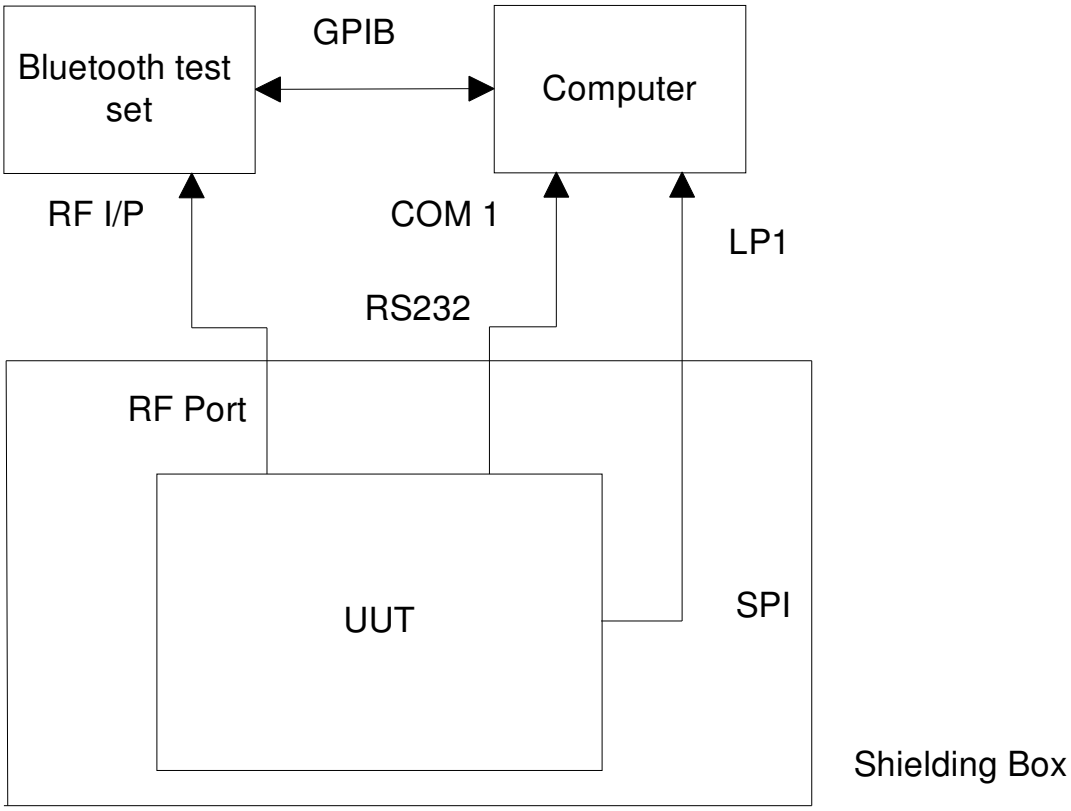

Fig 2 RF parameter Test Procedure

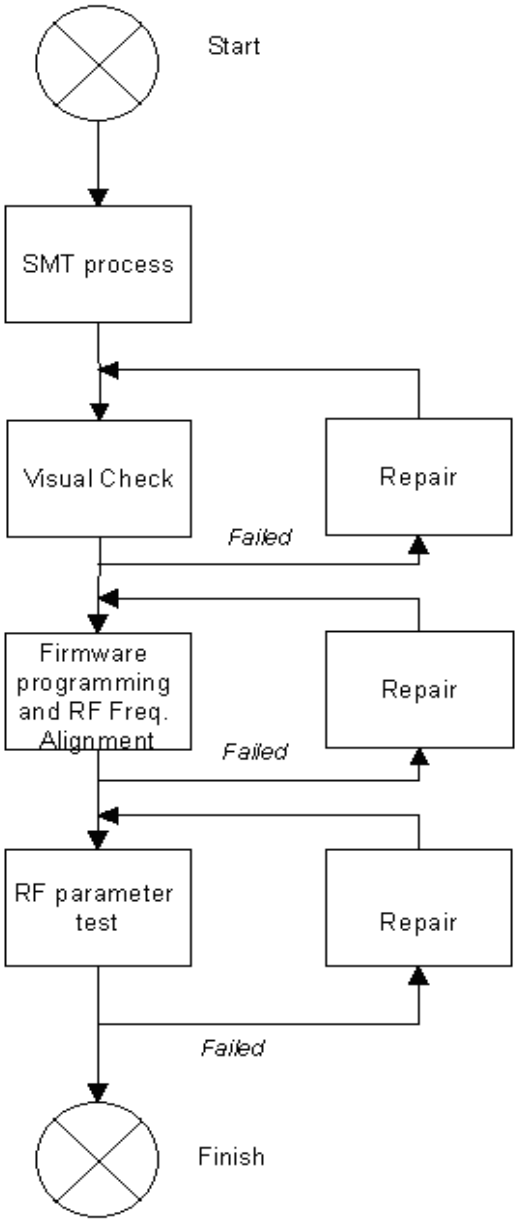

Fig 3 Assemble/Alignment/Testing Flow Chart

9. AT command set

More information about command set is provided at HC-05 master-salve bluetooth serial module command set.pdf. Please download it from our company website www.wavesen.com.