

Users' Guide of BM57SPP02 EVB

ISSC Technologies Corp.

Revision History

Date	Revision Content	Version
2011/05/30	Correct the	0.3

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1. Overview

This EVB is for Apple MFi solutions development and verification. It's made of ISSC BM57 SPP module. The main power supply of this EVB is USB 5V, Li-BAT or 2 alkaline batteries. The main power source gets into BM57 module, and the power management unit of this module will generate 3V3 and 1V8 out to provide the power of the IC. The micro USB connector only provides the 5V power from PC, it doesn't provide the charger function to charge battery.

There is another daughter board provides a DB-9 interface connecting to PC for helping the development. The main power source of this daughter board is also 5V from the main board.

The CP of apple communication interface is fixed in I2C interface and connecting to ISSC IS1657 SCL and SDA signals. The write and read addresses of the CP are 0x22 and 0x23.

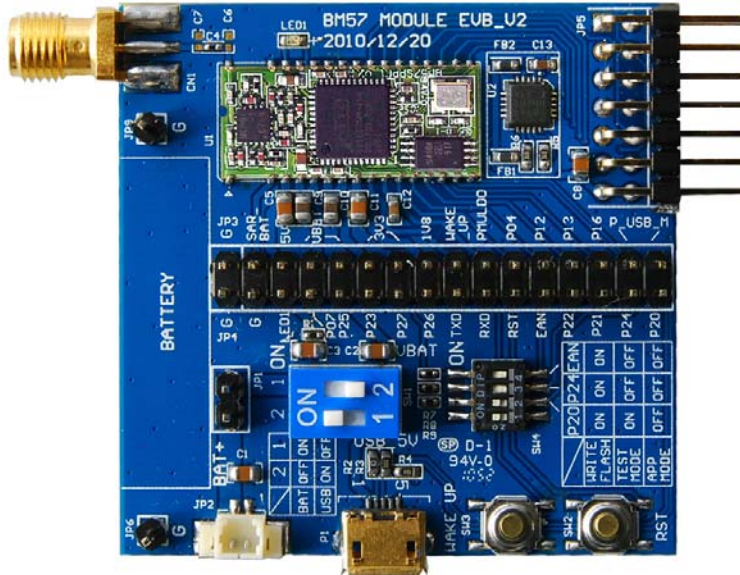
The two push buttons of this EVB are the "Reset" and "Wake-Up". When the module is in idle mode for a long time, it will get into sleep mode automatically for saving power. Press the Wake-Up button when you want to leave the sleep mode.

The BM57 development kits are including:

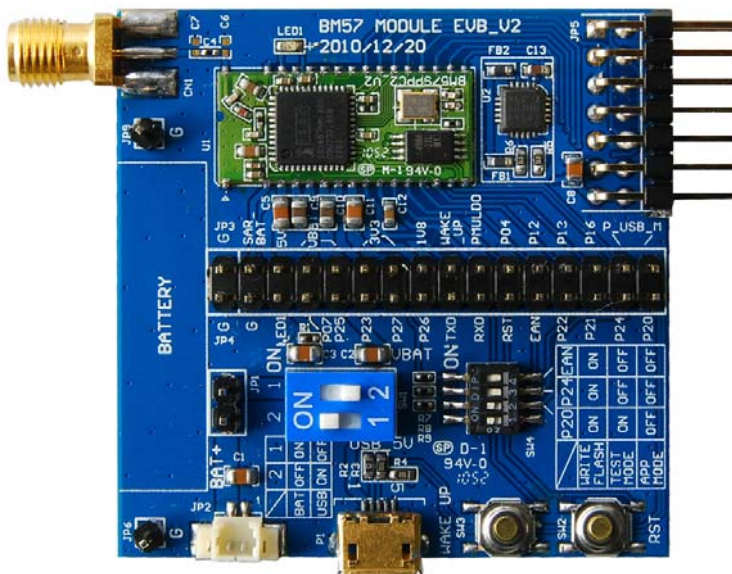
1. BM57 EVB (Class1, Class2)
2. UART-RS232 Convert Board
3. Dipole Antenna
4. Jumper
5. RS-232 Null Modem Cable
6. Mirco USB Cable

1.1. Outlook

1. BM57 EVB with BM57SPP Module (Class1, Range 100m)



2. BM57 EVB with BM57SPP Module (Class2, Range 10m)



3. UART-RS232 Convert Board



4. Dipole Antenna



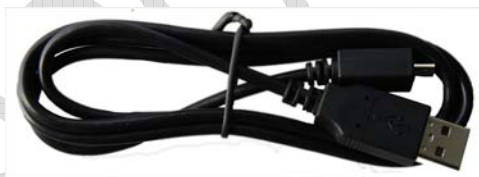
5. Jumper



6. RS-232 Null Modem Cable



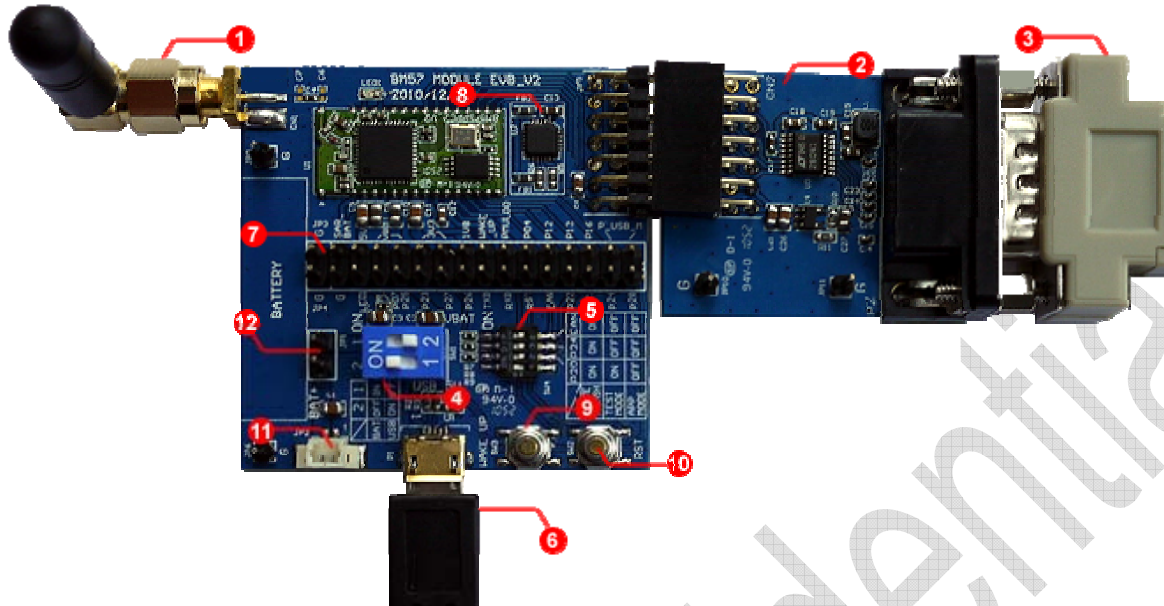
7. Micro USB Cable



1.2. Features


- Easy connect module with MUC or PC without welding
- Easy change EEPROM settings and update firmware code
- Switch for different modes settings (Flash write, EEPROM modified, Application)
- Jumper for 32- pin out
- Connector for UART-RS232 Convert Board (DB-9, RS-232)
- RF connector for external Antenna


3. Hardware Configuration



- ① Dipole Antenna
- ② UART-RS232 Convert Board
- ③ DB-9 RS-232 Null Modem cable
- ④ Power Switch (see 3.1 Power Switch Settings)
- ⑤ Mode Switch (see 3.2 Mode Definition, 3.3 Mode Settings)
- ⑥ Micro USB B-type cable
- ⑦ Module 32-PIN out- for easy connect the Bluetooth module PIN out to MCU
- ⑧ Apple Core Processor (MFI341S2164)
- ⑨ Wake up button- to wake up Bluetooth from Shutdown State
- ⑩ Reset button- to rest Bluetooth module
- ⑪ Battery connector
- ⑫ Jumper for choosing battery power option


3.1. Power Switch Settings

Mode	Switch	PIN Settings
USB 5V	<div style="text-align: center;"> 2 1  </div>	1. OFF 2. ON




BAT 4.2V~3.3V		1. ON 2. OFF
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* Notice: For choosing the **BAT** 4.2V~3.3V power, the **JP1** have to be short.

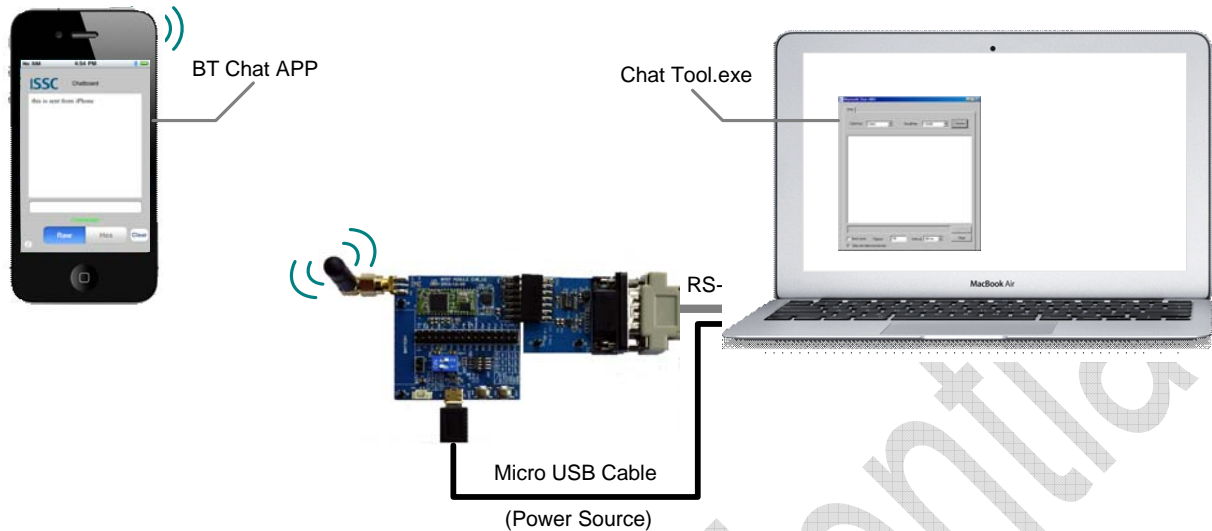
3.2. Mode Definitions

	Switch Number	1	2	3	4
	Pin	No Use	P20	P24	EAN
	ON	---	Low	Low	High
	Function	---	Test Mode High=Disable/ Application Low=Enable/ Test Mode	Flash Write High=Disable Low=Enable	Boot by Flash or ROM High=ROM Low=Flash

3.3. Mode Switch Settings

Mode	Switch	PIN Definition
Write Flash		2. P20: Low 3. P24: Low 4. EAN: High
Test Mode (Write EEPROM)		2. P20: Low 3. P24: High 4. EAN: Low
SPP Application		2. P20: High 3. P24: High 4. EAN: Low

4. Getting Started



Step 1. Check the Power Tree.

Default is using **USB** as the main power supply.

Step 2. Check the Setting of Switch.

Make sure the **SW4** is under the **SPP Application Mode**. 2: OFF, 3: OFF, 4: OFF

Step 3. Connect the **UART-RS232 Convert Board** and **dipole antenna** to EVB.

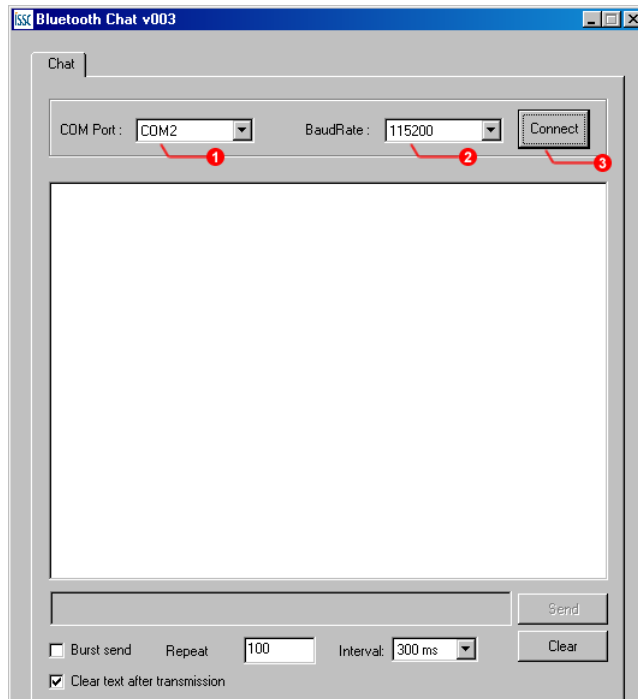
Step 4. Connect the power supply. The default LED behavior:

Stand-by State- the **LED1** of EVB will blink **once** at a time. (Blue)

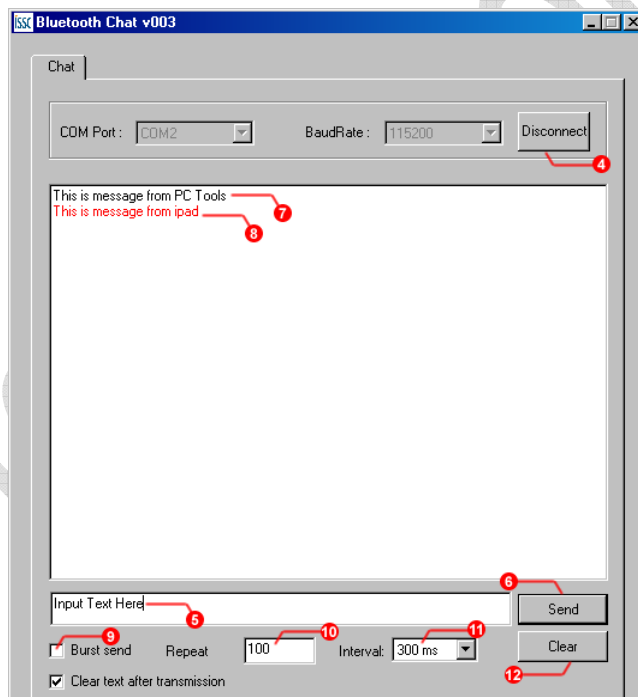
Pairing, Connected State- the **LED01** of EVB will blink **twice** at a time. (Blue)

Step 5. Connect the RS-232 cable (**Null** cable) to **UART-RS232 Convert Board DB-9**.

Step 6. Run the **Chat Tool vXXX.exe** on your PC and make sure the COM Port is connected.



- ① Select the specific **COM Port** by your PC
- ② Default **BaudRate** is 115200
- ③ Click **Connect** button.



- ④ The **Connect** button will turn into **Disconnect** after connected.
- ⑤ **Input the Texts or dialogue in this box.**

- ⑥ Click **Send** to transmit texts from Bluetooth EVB to iPhone, iPod or iPad.
- ⑦ The **Black** texts are sent from PC tool (Bluetooth EVB)
- ⑧ The **Red** texts are sent from iOS APP (iPhone, iPod or iPad)
- ⑨ Click the check box of **Burst Send** will be continuous to send text from this tool.
- ⑩ **Repeat** column means the how many times these texts will be resend.
- ⑪ **Interval** means the interval between two records.
- ⑫ **Clear** button will clear up the texts on the screen.

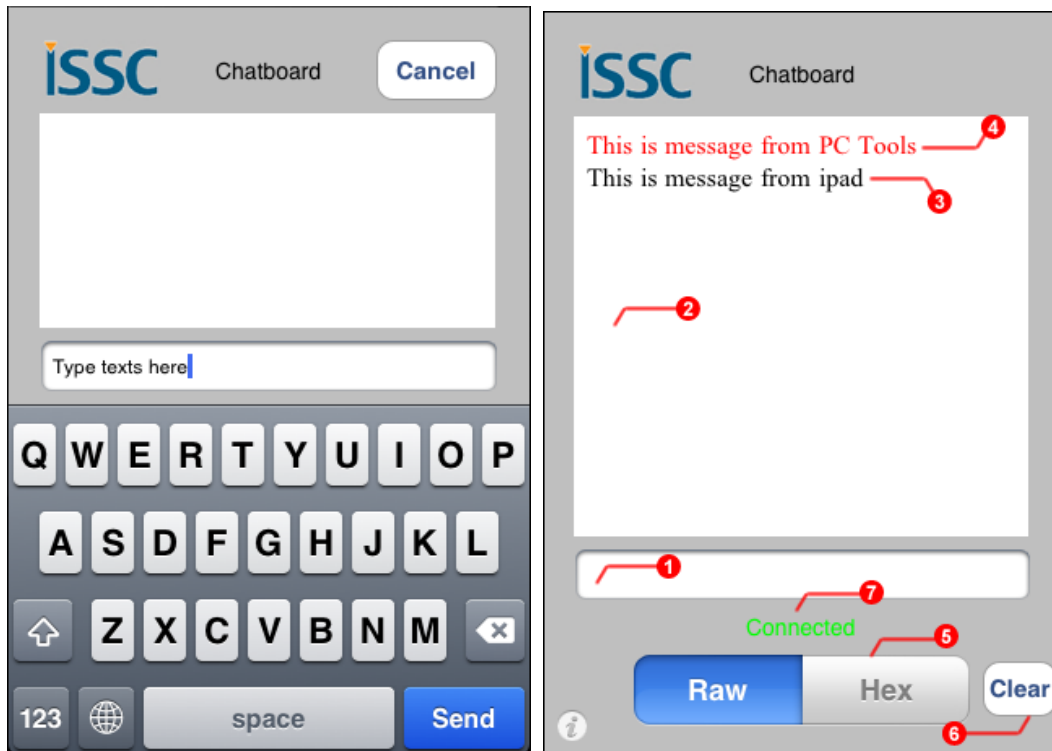
Step 7. Get your iPhone, iPod or iPad device ready and Download “**ISSC BT Chat Board**” APP from **APP Store**.

Step 8. Set up the iPhone, iPod or iPad **Bluetooth connection** by following operations.



- ① Go to **Settings/ General/ Bluetooth** Page.
- ② Turn **ON** the Bluetooth, and it will scan the Devices automatically. Find the **ISSC_MFi** device and press **NOT Connected** to start connecting Bluetooth device.
- ③ After Connected, RUN the **ISSC BT Chat APP** on iPhone, iPod or iPad.

Step 9. Type some texts or messages on the input column and press **Send**.



- ① The column for text input.
- ② The display window for dialogue.
- ③ The transmit contents will display on the above window in **Black** color.
- ④ In **Red** if received from remote site (PC Tool).
- ⑤ The transmit contents could be also displayed and inputted in **Hex** format.(ex: A1 B2 FF)
- ⑥ The **Clear** button will clean the texts displayed on the window.
- ⑦ The **Connected** indicates the Bluetooth connection status.

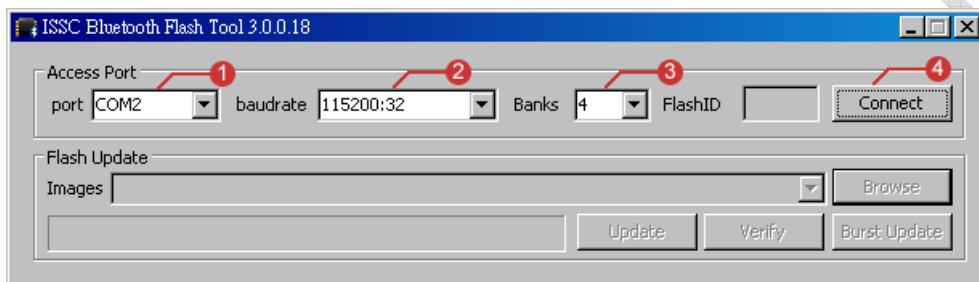
5. Procedure to Update Firmware

The firmware code of BM57 could be updated by following procedures. Make sure you got the correct and official released code from ISSC before starting the procedure.

Step 1. Switch the SW4 to **Write Flash** mode (2:ON, 3:ON, 4:ON), and connect the RS232 cable and Power supply (Default USB 5V) and then turn on the SW1 to **2:ON, 1:OFF** (the number was marked on PCB).

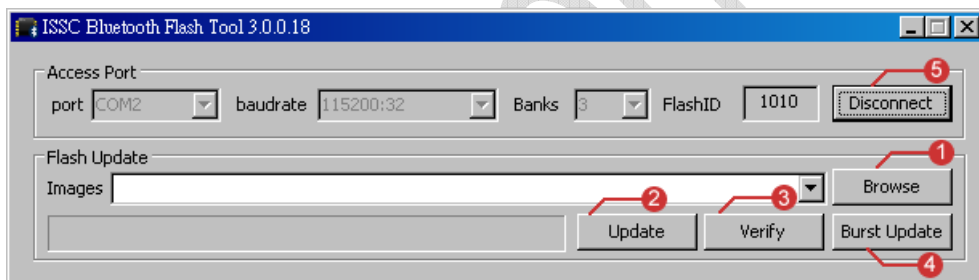
* LED1 will blink very quickly (around 20 msec)

Step 2. Run the **isbtfllash.exe** program on WinXP PC, and the window as below:



- ① Select the **Com Port** by your PC environment
- ② Set the baud rate (default is **115200**)
- ③ Select the banks as **4**
- ④ Click the **connect**

Step 3. Select the Flash code files and update the flash on chip.



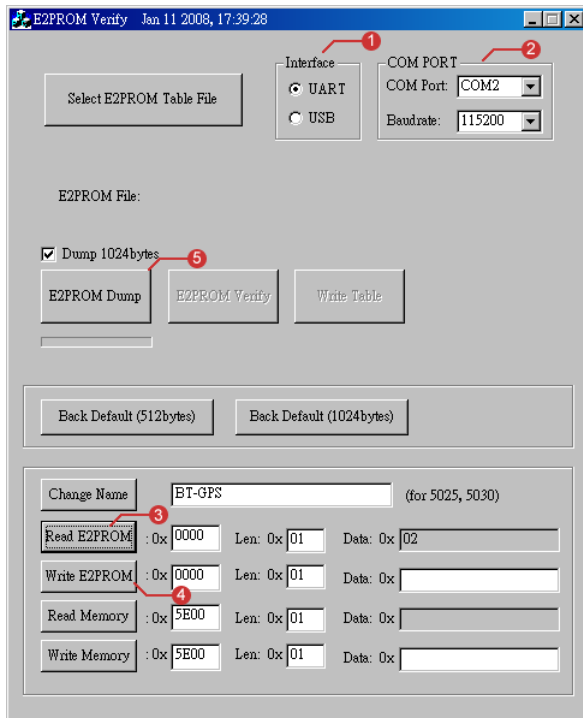
- ① Click **Browse** to select the new flash code files (**4 files have to be selected**)
- ② Click **Update** to start update
- ③ **Verify** is used for comparing the on chip flash code and selected files.
- ④ **Burst Update** is force updating
- ⑤ Click **Disconnect** after the update procedure is finished

6. Procedure to Change EEPROM Parameter

Step 1. Switch the SW4 to **Test Mode** (2:ON, 3:OFF, 4:OFF), and connect the RS232 cable and Power supply (Default USB 5V) and then turn on the SW1 to **2:ON, 1:OFF** (the number was marked on PCB).

* LED1 will keep lighting.

Step 2. Run the **E2PROM_Tool.exe** program and a window will show up as below



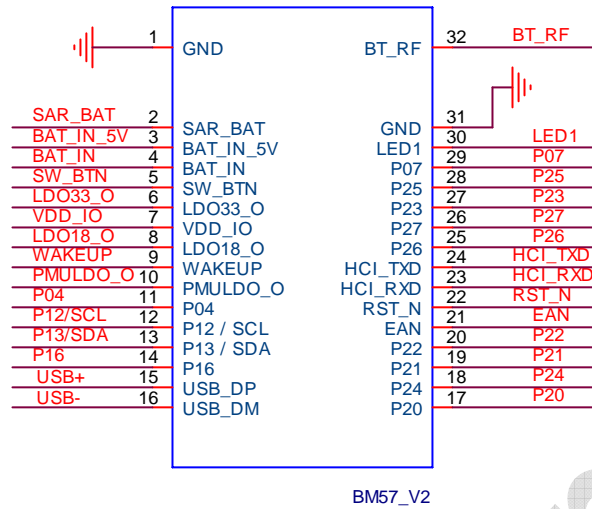
Step 3.

- ① Select the Interface as **UART**.
- ② Specify the COM Port and baud rate (default is **115200**).
- ③ Fill in the address that you are going to read and the length of the parameter, and then click the **Read E2PROM** button to read the value.
- ④ Fill in the address that you are going to change and the length of the parameter, and then click the **Write E2PROM** button to change the parameter.
- ⑤ **E2PROM Dump** can dump the EEPROM table from chip and save into text format.

Notice: Do **NOT** press the **Back Default (512bytes)** or **Back Default (1024bytes)** buttons; otherwise all the **calibration parameters** will be lost.

* Calibration parameters- for example: RF Frequency, Transmit Power and LDO Power

Appendix A: PIN Assignment



BM57_V2

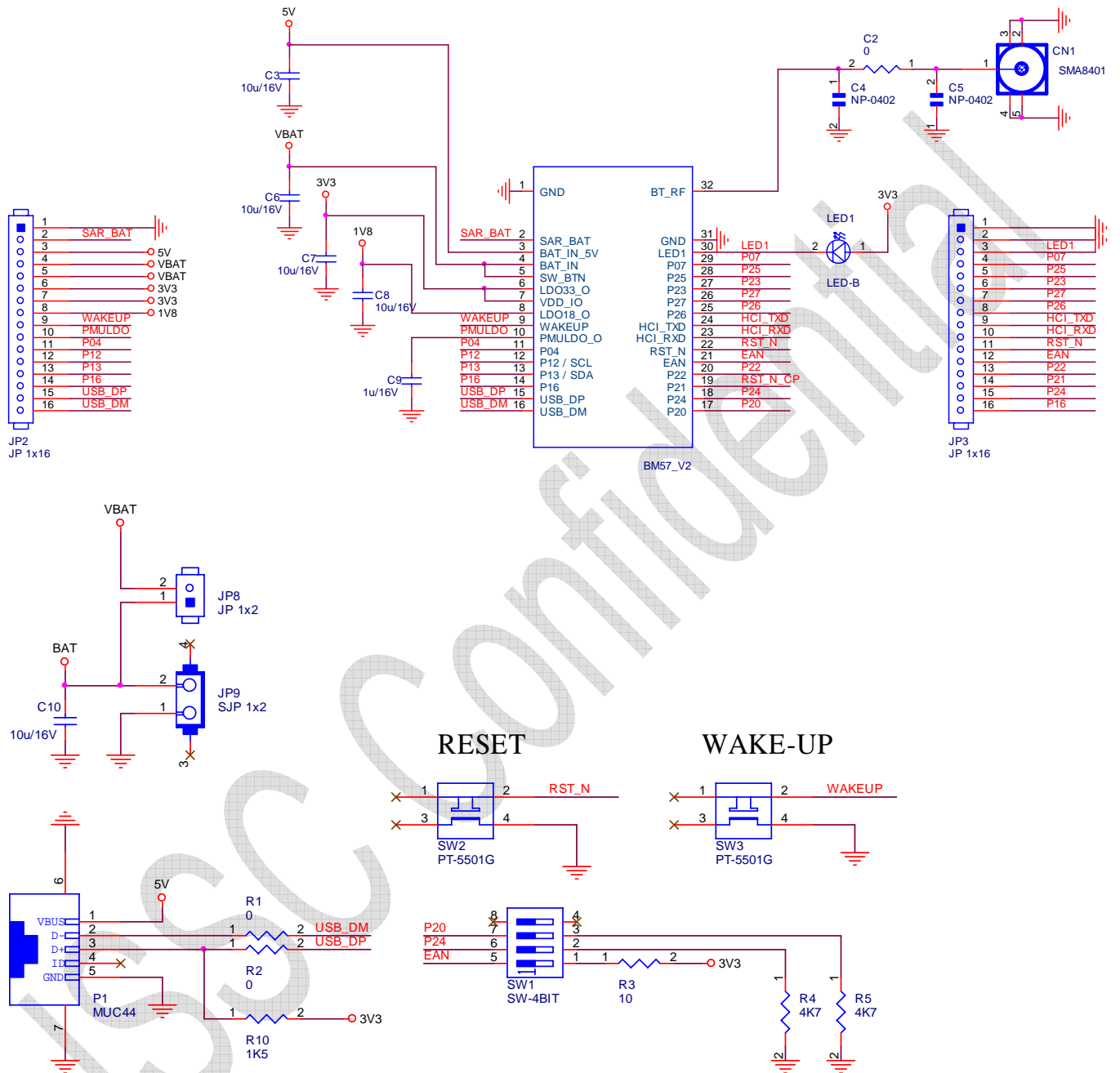
BM57 Module PIN Define

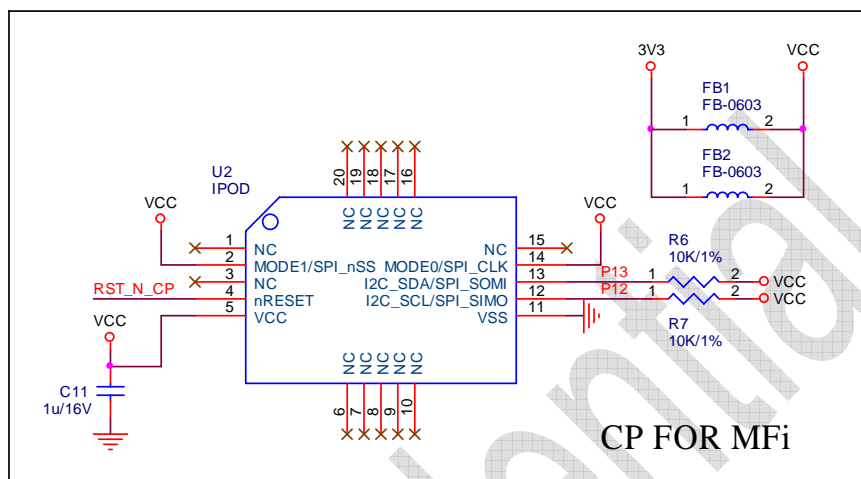
Pin No.	I/O	Name	Description
1	P	GND	Ground
2	I	SAR_BAT	Reserved
3	I	BAT_IN_5V	5V power input
4	I	BAT_IN	3.3V power input
5	I	SW_BTN	Reserved
6	P	LDO33_O	3V3 LDO output
7	P	VDD_IO	Main power supply
8	P	LDO18_O	LDO18 output
9	I	WAKEUP	Wakeup BM57 from Shutdown State. (Low Active) It is only valid while BM57 into Shutdown State.
10	P	PMULDO_O	Output of PMULDO
11	O	P04	UART_TX_IND: H: BM57 indicate UART data will be transmitted out after a certain timing (setting by EEPROM, default 5 ms) L: Otherwise. STATUS_IND_2: BM57 State indication , refer to P22
12	I/O	P12/ SCL	I2C_SCL, for Authentication Coprocessor 2.0B
13	I/O	P13/ SDA	I2C_SDA, for Authentication Coprocessor 2.0B
14	I/O	P16	EEPROM WP
15	I/O	USB_DP	Reserved
16	I/O	USB_DM	Reserved
17	I	P20	System configuration, refer to P2_4.

Pin No.	I/O	Name	Description
18	I	P24	Boot mode selection P2_0/ P2_4: HH → Application LL → Boot mode LH → HCI UART mode for testing and system configuration.
19	O	P21	CP_RST: Reset Authentication Coprocessor 2.0B
20	O	P22	STATUS_IND: Bluetooth link status indication P22/P04: HH → Power default value and Shutdown State. P22/P04: HL → Access State. P22/P04: LL → Link State w/o UART_TXD. P22/P04: LH → Link State with UART_TXD.
21	I	EAN	ROM/Flash selection. H: ROM code; L: Flash code
22	I	RST_N	External reset input (Low Active), clock period 62.5n at least.
23	I	HCI_RXD	UART_RXD
24	O	HCI_TXD	UART_TXD
25	I	P26	UART_CTS: UART Flow Control, if set HIGH, disables TX transmitter.
26	O	P27	UART_RTS: UART Flow Control, goes HIGH to disable host transmitter.
27	I	P23	LINK_DROP: Host_MCU ask to drop SPP link under Link State; One low pulse with 10 ms duration low signal to trigger SPP disconnection. Otherwise it will be set as high always.
28	O	P25	Reserved
29	I	P07	UART_RX_IND: L: Inform BM57 that UART data will be transmitted out after 1 ms H: Otherwise.
30	O	LED1	LED1 driver
31	P	GND	Ground
32	RI/O	BT_RF	RF Port

Appendix B: Schematic

Evaluation Board





The PCB layout includes the following components and connections:

- Connectors:**
 - P2 DB9_ML:** DCD, DSR, RXD, RTS, TXD, CTS, DTR, RI, GND. Connections include FCB, RXDB, RTSB, TXDB, CTSB, and FCB.
 - CN2 CONN 2x7-R:** HC1_RXD_B, HC1_CTS_B, HC1_RTS_B, HC1_TXD_B.
- Resistors:**
 - R8 18K/1%:** Connected to VCC_HC1.
 - R9 10K/1%:** Connected to GND.
- Capacitors:**
 - C12 10p/50V:** Connected to DCD.
 - C13 1u/16V:** Connected to VCC_HC1.
 - C14 1u/16V:** Connected to VCC_HC1.
 - C15 0.22u/16V:** Connected to VCC_HC1.
 - C16 10u/16V:** Connected to 5V.
 - C17 1u/16V:** Connected to GND.
 - C18 0.22u/16V:** Connected to GND.
 - C19 10p/50V:** Connected to GND.
 - C20 10p/50V:** Connected to CTSB.
 - C21 10p/50V:** Connected to TXDB.
 - C22 10p/50V:** Connected to RTSB.
 - C23 10p/50V:** Connected to RXDB.
- Inductors:**
 - L1 L10uH:** Connected to VCC_HC1.
- ICs:**
 - U3 LTC2804-1:** A precision centration and scaling IC with pins for R1IN, R2IN, T1OUT, T2OUT, VCC, VDD, SW, GND, R1OUT, R2OUT, T1IN, T2IN, VL, ON/OFF, CAP, and VEE.
 - U4 RT9179:** A voltage regulator with pins for VIN, GND, EN, VOUT, and ADJ.
- Other Components:**
 - JP11 and JP12:** 1x1 pin headers.

Appendix C: Q & A

1. What is the maximum current which LDO33_O and LDO18_O can offer?

Ans:

Output Source	Min	Typ	Max	Unit
LDO18_O Output Current		60	100	mA
LDO33_O Output Current		100	150	mA

The output current has to contain the RF, GPIO, Flash so the maximum current for others usage would be:

Output Source	Max
LDO18_O	20mA
LDO33_O	70mA

For Class 1 module, there will be extra 70mA necessary for Power Amplifier.

2. Maximum baudrate of 16MHz?

Ans: 11520

Clock	Support Baudrate
16 MHz	2400
	4800
	9600
	14400
	19200
	28800
	38400
	57600
	115200
48 MHz	230400
	460800
	921600

3. Can **EEPROM** be read/ wrote from UART port using "E2PROM_Tool"?

Ans: Yes, just adjust the switch to **Test Mode (Write EEPROM)** (see 3.3 Mode Switch Settings). And set baudrate as 115200. For more detail please see chapter 6.

4. How to flash the **new code** (Firmware) into the module?

Ans: Please see the Chapter 5 for more detail.

5. Is the resistance divider for SAR_BAT need to be changed for different battery application?

Ans: SAR_BAT Function was reserved.

Appendix D: Reversion History

Version	Date	History
0.2	2011/03/30	1. Modified some typo
0.3	2011/05/30	1. Correct Q&A LDO_18, LDO_33 description