

Technical Description

The brief circuit description is listed as below:

- 1) U2 acts as 2.4GHz RF Module (RDA5850).**
- 2) U3 acts as Decoder (HT9172).**
- 3) U4 acts as MCU (AT8EB156x).**
- 4) Y1 acts as Crystal for U2.**
- 5) Y2 acts as Crystal for U3.**
- 6) U5 and U6 act as Motor Driver IC (NY9M008A).**

Antenna Type: Internal antenna

Antenna Gain: 0dBi

Nominal rated field strength: 100.8 dB μ V/m at 3m

Maximum allowed field strength of production tolerance: +/- 2dB

UP5850

Bluetooth Module

JUN, 5, 2013

Version: 6.0

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Bluetooth Module

1. General Description

SU5850 is a kind of Bluetooth module elaborately made by Shenzhen UPAI LINK Electronics Co., Ltd. It is compliant with the Bluetooth 2.1 + EDR specification and fully shows the technical achievements in the fields of high frequency PCB design, anti-EMI and RF microchip antenna impedance control. It features high receiving sensitivity, low cost, small size, low power consumption and high integrity. If there are no occludes, the point-to-point transmission distance can be up to 10m between the same-power modules. This module is designed to an SMD module that can be used for various applications.

1.1. Application Fields

- Bluetooth speakers, Bluetooth earphones, Bluetooth microphones
- Bluetooth keyboards, Bluetooth mouse
- Bluetooth game handles, Bluetooth joysticks
- Bluetooth car hand free systems
- Bluetooth radio instruments and meters
- Bluetooth printers
- Bluetooth remote control toys and handsets

1.2. Customer Support

TEL: 86-0755-33118533

E-mail: upai_btfae@szupai.com

Web: www.szupai.com

2. FEATURES

2.1. Multi-Media Features

- 8M-bit SPI Flash on Board
- Multi-Media Support
 - SBC
 - MP3
 - WMA
 - WAV
- Stereo Audio line Input
- Supports Serial LCD Interfaces/LEDs
- Power Management
- Power On Reset Control
- Integrated Batter Charger
- Integrated All Internal Voltage Supply From VBAT
- Audio
 - Integrated 1W Audio Speaker Driver
 - MIC, Earphone
- User Interfaces

- Supports 3*3 Keypad Matrix Detection
- I2C
- FM Receiver Integrated
- MMC/SD Support
- IR Decode
- ECHO Cancel For Hand Free
- Voice record
- Bluetooth Profiles
 - HFP/HSP
 - OPP
 - A2DP
 - AVRCP

2.2. Bluetooth Features

- CMOS single-chip fully-integrated radio and baseband
- Compliant with Bluetooth 2.1+EDR specification
- Bluetooth Piconet and Scatternet support
- Meets class2 and class3 transmitting power requirements
- Provides +7dbm transmitting power
- NZIF receiver with -80dbm sensitivity
- Supports DCXO with internal oscillator circuit
- Low power consumption

3. Multi-Media Section

3.1. Analog Module

- Differential 13 bit Audio ADC and 16 bit stereo DAC
- 1W stereo loudspeaker amplifier
- Audio line in
- Full speed USB PHY 1.1

3.2. PMU

- Complete integrated power management system
- Integrated LDO voltage regulators
- Implement LCD back light drivers

3.3. FM Tuner

- Supports worldwide frequency band 65-108MHz
- Digital low-IF tuner
- Fully integrated digital frequency synthesizer
- Autonomous search tuning
- Digital auto gain control (AGC)
- Digital adaptive noise cancellation
- Programmable de-emphasis (50/75 ms)
- Receive signal strength indicator (RSSI)
- Bass boost
- Volume Control

3.4. System CPU (XPU)

- RDA RISC Core
- 4kByte Instruction Cache
- 4kByte Data Cache

3.5. Keypad

- 3*3 matrix support with de-bouncing and interrupt generation
- Key On input with de-bouncing and interrupt generation

3.6. SD/MMC Card Controller

- SD Card specification Version 2.0
- SDIO Version 1.10
- MMC specification Version 3.1

3.7. IR Controller

- Supports NEC protocol
- User code and key code programmable

3.8. LCD Controller

- SPI interface for LCM
- Max size 128X64

4. Bluetooth Section

4.1. Radio

- Built-in TX/RX switch
- Fully integrated synthesizer without any external components
- Class2 and class3 transmit output power supported and over 30dB dynamic control range
- Supports $\pi/4$ DQPSK and 8DPSK modulation
- High performance in receiver sensitivity and over 80dB dynamic range
- Integrated channel filter
- Supports eSCO and AFH
- Supports up to Bluetooth v2.1 + EDR

4.2. Bluetooth Stack

- Compliant with Bluetooth 2.1 + EDR specification
- Profile included AVRCP, A2DP, OPP, HSP/HF

5. Technical Parameters

CATEGORIES	FEATURE	IMPLEMENTAIONT
Wireless specification	Bluetooth	V2.1+EDR
	Frequency	2.402G-----2.480GHz
	MAX Transmit Power	Class2 and Class3
	Receive Sensitivity	-85dBm (typical)
	Tx Power	+3.61dBm (typical)
	Transmission distance	10 meters (typical)
FM specification	Receive Sensitivity	-107dBm
Supply Voltage	Supply	3.2---4.2V
DC Specification	V_PAD\ V_LCD\ V_MMC	2.9V (typical)
	CMOS Low Level Input Voltage	0~0.3*V_PAD
	CMOS High Level Input Voltage	0.7*V_PAD~V_PAD
Consumption	Operational	<29mA (active)
	Idle	<2.7mA (open the Bluetooth)
Temperature	Open	0 ~ +60℃
	Storage	-10 ~ +70℃

Pin Definitions

The BT module has 60 pins; Fig.7.1 shows its pin order. Fig. 7.2 shows its package.

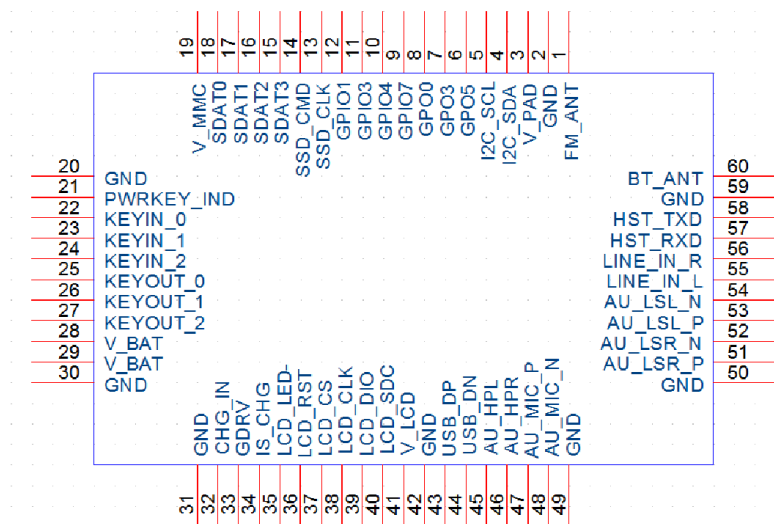


Fig. 7.1 Pin-order

The table below describes the definitions of these 60 pins:

PIN#	PIN Name	I/O	Type	Description	Remarks
1	FM_IP	I	A	FM RF differential input	
2	GND		POWER	GND	
3	V_PAD	O	A	Supplies Standard PADs I/O ring. Out for decoupling / debug / backup	
4	I2C_SDA	I/O	D	I2C Data	
5	I2C_SCL	I/O	D	I2C Clock	
6	GPO5	O	D	GPO 5	
7	GPO3	O	D	GPO 3	
8	GPO0	O	D	GPO 0	
9	GPIO7	I/O	D	GPIO 7	
10	GPIO4	I/O	D	GPIO 4	
11	GPIO3	I/O	D	GPIO 3	
12	GPIO1	I/O	D	GPIO 1	
13	SSD_CLK	O	D	SD Clock	
14	SSD_CMD	I/O	D	SD Command	
15	SDAT3	I/O	D	SD data bit 3	
16	SDAT2	I/O	D	SD data bit 2	
17	SDAT1	I/O	D	SD data bit 1	
18	SDAT0	I/O	D	SD data bit 0	
19	V_MMC	O	A	Supplies MMC PADs I/O ring and V_MEM output PAD	
20	GND		POWER	GND	
21	PWRKEY_INT	I	D	Power-on switch enable signal. Active High	
22	KEYIN_0	I	D	Key matrix input line 0	

PIN#	PIN Name	I/O	Type	Description	Remarks
23	KEYIN_1	I	D	Key matrix input line 1	
24	KEYIN_2	I	D	Key matrix input line 2	
25	KEYOUT_0	O	D	Key matrix output line 0	
26	KEYOUT_1	O	D	Key matrix output line 1	
27	KEYOUT_2	O	D	Key matrix output line 2	
28	V_BAT		POWER	Connect to battery	
29	V_BAT		POWER	Connect to battery	
30	GND		POWER	GND	
31	GND		POWER	GND	
32	CHG_IN	I	A	Input from the AC charger or USB inlet	
33	GDRV	O	A	Charger drive	
34	IS_CHG	I	A	Current Sensor for Charger Control	
35	LCD_LED-	I	A	LED driver current sink	
36	SPI_LCD_RST	O	D	SPI_LCD Reset	
37	SPI_LCD_CS	O	D	SPI_LCD Chip select	
38	SPI_LCD_CLK	O	D	SPI_LCD Clock	
39	SPI_LCD_DIO	I/O	D	SPI_LCD data bus	
40	SPI_LCD_SDC	I/O	D	SPI_LCD data bus	
41	V_LCD	O	A	Supplies LCD PADs I/O ring and V_MEM output PAD	
42	GND		POWER	GND	
43	USB_DP	I/O	A	USB D+	
44	USB_DN	I/O	A	USB D-	
45	AU_HPL	O	A	Headset output L	
46	AU_HPR	O	A	Headset output R	
47	AU_MIC_P	I	A	MIC Input+	
48	AU_MIC_N	I	A	MIC Input-	
49	GND		POWER	GND	
50	GND		POWER	GND	
51	AU_LSR_P	O	A	Loudspeaker Right Out +	
52	AU_LSR_N	O	A	Loudspeaker Right Out -	
53	AU_LSL_P	O	A	Loudspeaker Left Out +	
54	AU_LSL_N	O	A	Loudspeaker Left Out -	
55	LINE_IN_L	I	A	Stereo Line input Left	
56	LINE_IN_R	I	A	Stereo Line input Right	
57	HST_RXD	I	D	Host data receive	
58	HST_TXD	O	D	Host data transmit	
59	GND		POWER	GND	
60	ANT	I	A	RF ANT	

6. Package Dimensions

BT module dimension: 17.0mm x 25.0 mm

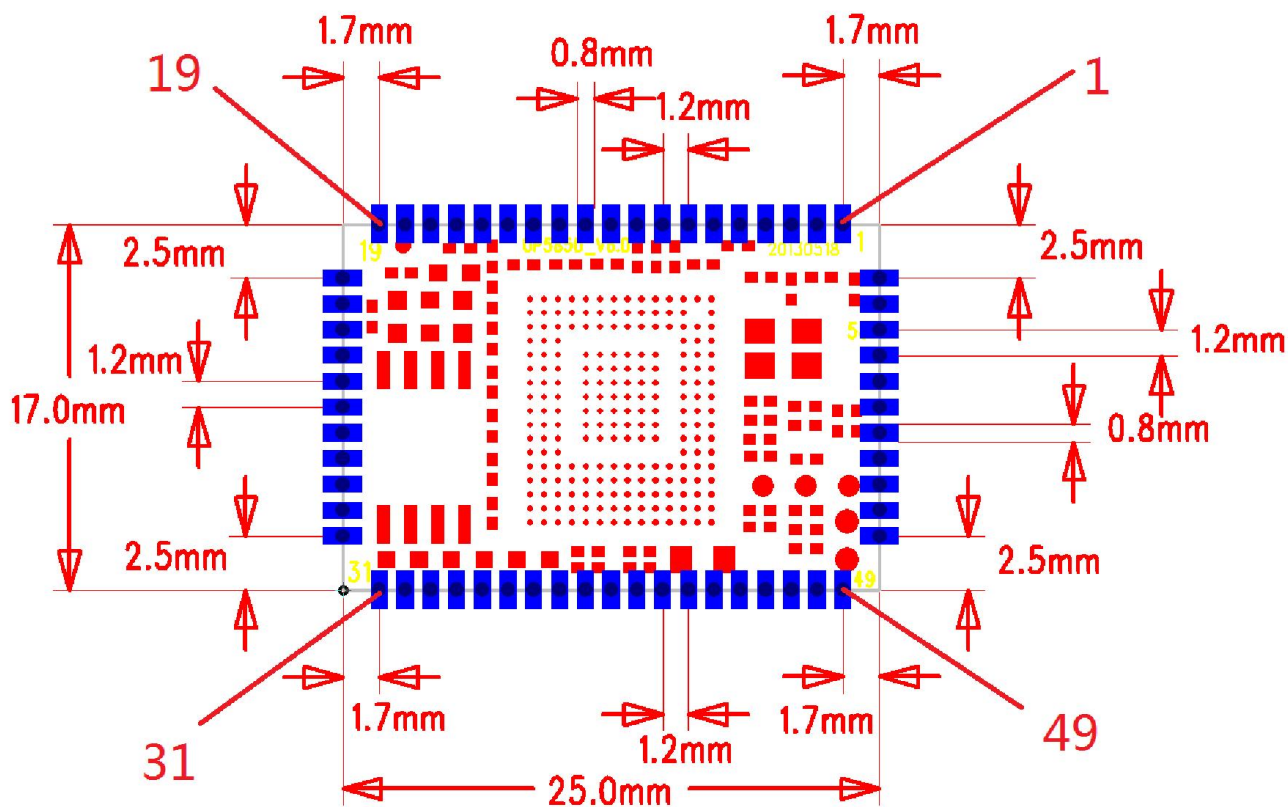


Fig. 7.2 Package Dimensions

Note: the PAD is 0.8*1.8mm.

7. DISCLAIMER

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8. REVISION HISTORY

Date	Revision #	Description	Page
Dec. 29, 2012	1.0	Original	
JUN.5,2013	6.0	1\Modify PIN order 2\Add PIN LCD_LED-	