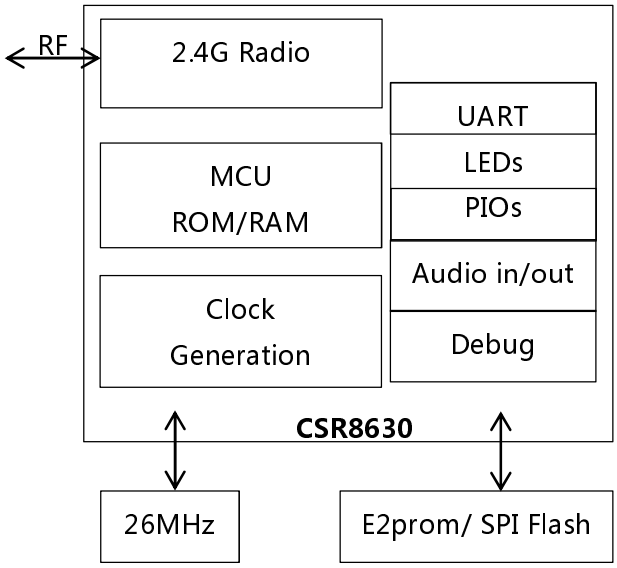
FW3817-30 Bluetooth Module

CSR8630 Audio Solution

Fully Qualified Single-chip
Bluetooth® v4.0 System
FW3817-30
V1.5

Features

- Bluetooth v4.0 specification compliant
- 80MHz RISC MCU and 80MIPS Kalimba DSP
- Support AVRCP/A2DP
- +8dBm TX power and -89dBm RX sensitivity
- AVRCP v1.4
- A2DP v1.2, multipoint A2DP support enables connection to 2 A2DP source devices for music playback
- 5-band fully configurable EQs
- Multipoint support for A2DP connection to 2 A2DP sources for music playback
- Secure simple pairing, CSR's proximity pairing and CSR's proximity connections
- Stereo line-in
- Serial interfaces: USB 2.0, UART, I²C and SPI
- SBC, MP3 and AAC decoder support
- Wired audio support
- Integrated dual switch-mode regulators, linear regulators and battery charger.
- 3 LED outputs (RGB)
- 14.7mm x 21mm SMT package



General Description

FW3817-30 is a high performance, cost effective, low power and compact solution. The Bluetooth module provides a complete 2.4GHz Bluetooth system based on the BlueCore CSR8630 chipset which is a single chip radio and baseband IC for Bluetooth 2.4GHz systems,. This module is fully compliant to Bluetooth v4.0 for audio communications.

Applications

- Bluetooth stereo speakers
- Bluetooth stereo earphone
- A2DP audio sink (including multipoint) for music streaming

FW3817-30 Details

Features

Bluetooth Profiles

- Bluetooth v4.0 specification support
- A2DP v1.2
- AVRCP v1.4
- DI v1.3

Music Enhancements

- Configurable 5-band EQ for music playback (rock, pop, classical, jazz, dance etc)
- SBC,MP3, AAC and fast stream decoder
- Volume Boost
- Wired Audio Mode supported
- USB Audio Mode supported
- Stereo Widening (S3D)

Additional Functionality

- Support for multi-language programmable audio prompts
- CSR’ s proximity pairing and CSR’ s proximity connection
- Multipoint support HFP connection to 2 handsets for voice
- Multipoint support A2DP connection to 2 A2DP source devices for music playback
- Talk-time extension
- Fast charging support up to 200mA with no external components. Higher charge currents using external pass device.
- Slim module with 21mm x 14.7mm x 2.0mm

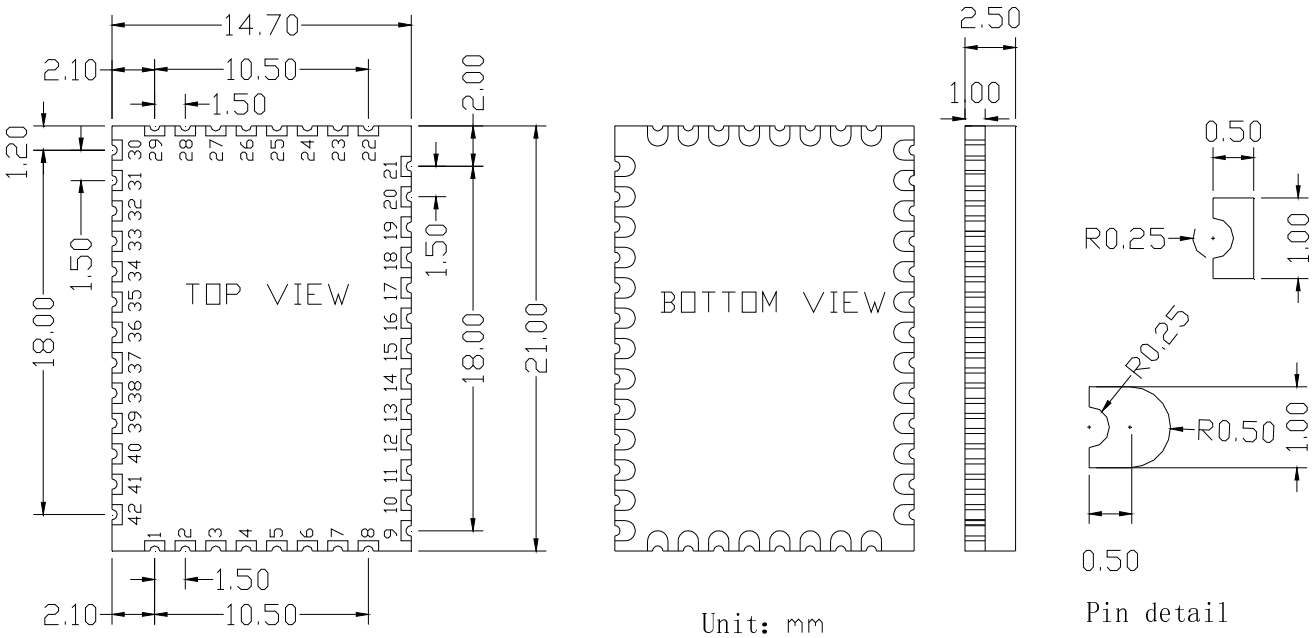
Contents

1 General specifications

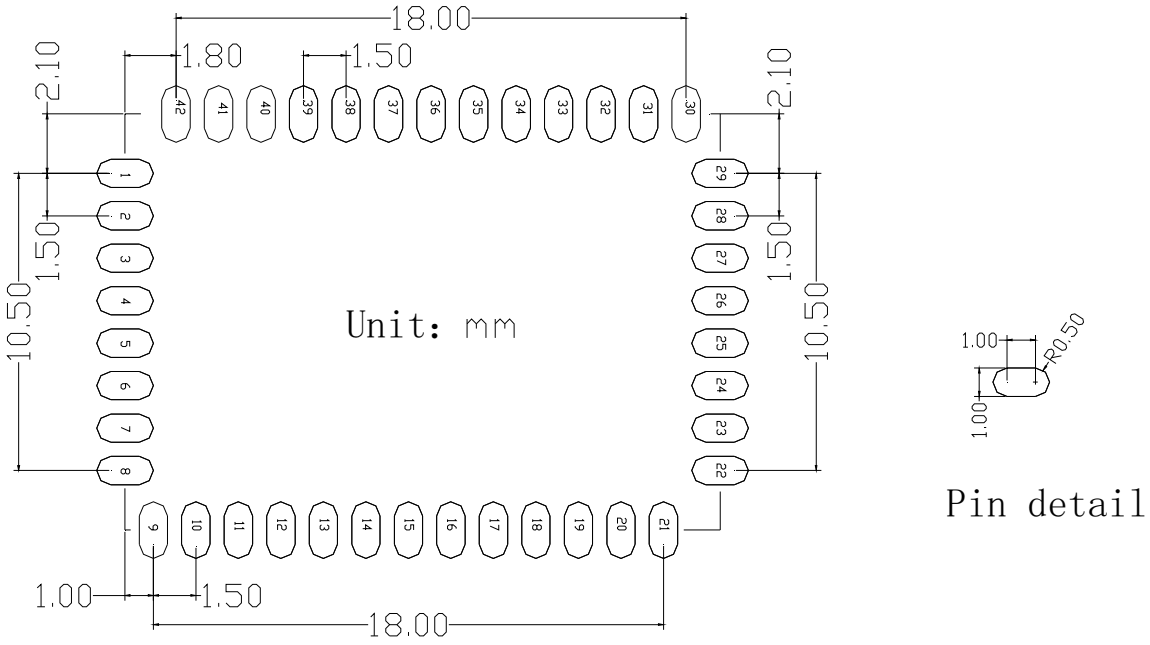
Model Name	**FW3817-30**
Product Description	**Bluetooth 4.0 Class2 Module**
Bluetooth Standard	Bluetooth 4.0
Chipset	CSR8630
Dimension	21mm x 14.7mm x 2.0mm
Temperature	
Storage Temperature	-40～+85℃
Operating Temperature	-20～+70℃
Electrical Specifications	
Supply Voltage	2.80~4.25V
Power Consumption in A2DP slave mode with no load and playing peak noise	14mA
Modulation	GFSK/π/4 DQPSK/8DPSK
Frequency Range	2402～2480MHz
Maximum RF Transmit Power	4dBm
Receive Sensitivity	-84dBm

2 Module Package Information

6.1 Pinout Diagram and package dimensions



Mechanical Dimensions



Recommended PCB layout footprint

6.2 Module Pin descriptions

Pin No.	Pin Name	Pin Type	Description
1	GND	VSS	Ground
2	USB_P	Bidirectional	USB data plus
3	USB_N	Bidirectional	USB data minus
4	PIO15	Bidirectional with strong pull-up	MFB key input
5	PIO14	Bidirectional with strong pull-up	Skip+ key input
6	PIO16	Bidirectional with strong pull-up	Volume+ key input
7	PIO9	Bidirectional with strong pull-down	External PA enable output high
8	PIO1	Bidirectional with strong pull-up	Volume- key input
9	NC	N.C	NOT CONNECTED
10	PIO17	Bidirectional with strong pull-down	Skip- key input
11	RSTn	Input with strong pull-up	Reset if low. Pull low for minimum 5ms to cause a reset.
12	SPI_MOSI	Bidirectional with weak pull-down	SPI_MOSI for debug only
13	SPI_CLK	Bidirectional with weak pull-down	SPI_CLK for debug only
14	SPI_CSB	Bidirectional with weak pull-down	SPI_CSB active low for debug only
15	SPI_MISO	Bidirectional with weak pull-down	SPI_MISO for debug only
16	LED1	Open drain output	LED driver
17	LED0	Open drain output	LED driver
18	VREG_EN	Power on/off key input	Power on/off input key indication
19	VBAT	Battery positive terminal	Power supply input for 2.8~4.2V
20	VCHG	Charger voltage input	Internal charger input for charging
21	1V8	1.8V output	1.8V output for keys
22	GND	VSS	Ground
23	VBAT_SENSE	Battery Sense	Battery charger sense input
24	PIO6	Bidirectional with strong pull-down	Programmable input/output line
25	CHG_EXT	Charger external pin	External battery charger control. External battery charger transistor base control when using external charger boost. Otherwise leave unconnected.
26	LED2	Open drain output	LED driver
27	NC	N.C	Not Connected
28	LINE_RP	Analog input	Line input, positive right
29	LINE_RN	Analog input	Line input, negative right
30	AIO0	Analog input	ADC input used only to test temperature of battery
31	LINE_LP	Analog input	Line input, positive left
32	LINE_LN	Analog input	Line input, negative left

33	SPK_RN	Analog output	Speaker output negative right
34	SPK_RP	Analog output	Speaker output positive right
35	SPK_LN	Analog output	Speaker output negative left
36	SPK_LP	Analog output	Speaker output positive left
37	GND	VSS	Ground
38	RF PORT	Analog	Bluetooth signal input/output port 50Ohm
39	GND	VSS	Ground
40	NC	N.C	Not Connected
41	NC	N.C	Not Connected
42	NC	N.C	Not Connected

3 Electrical Characteristics

7.1 Reset

FW3817-30 module is reset from several sources.We suggest to use power-on reset,that means to leave the RSTn pin floating:

- RSTn pin pulled low for minimum 5ms
- Power-on reset, leaving the RSTn pin floating. It should be that it was 0V voltage at any pin before reset.
- USB charger attach reset
- Software configured watchdog timer

7.2 Power on and power off

FW3817-30 module is power on from two sources:

- VREG_EN pin pulled high for minimum 100ms when VBAT pin is in the status of stable power.
- VREG_EN pin pulled high from low when VBAT pin is in the status of stable power.

The wrong timing sequence of VREN_EN and VBAT will lead to error of power on.

FW3817-30 module is power off from two sources:

- VREG_EN pin pulled high for minimum 100ms when VBAT pin is in the status of stable power.
- VREG_EN pin pulled low from high when VBAT pin is in the status of stable power.

The wrong timing sequence of VREN_EN and VBAT will lead to error of power off.

7.3 I/O

The driver power voltage of all the PIO port is 1.8V inside of the module.

7.4 Battery Charger

FW3817-30 module provides two kinds of battery charger controls.

The internal charger circuit can provide up to 200mA of charger circuit.

The module controls an external pass transistor which can provide 500mA of charger circuit.

7.5 USB

USB_P and USB_N can be used to updating software or USB audio.Both of them request that VCHG pin must be supplied 5V power.The two data signals do not need any resistance or capacitance.

7.6 Absolute Maximum Ratings

Rating	Minimum	Maximum	Unit
Storage Temperature	-40	85	℃
Supply Voltage			
VCHG	-0.4	5.75	V
LEDs	-0.4	4.4	V
VBAT SENSE	-0.4	4.4	V
VREG_EN	-0.4	4.4	V
VBAT	-0.4	4.4	V

7.7 Recommended Operating Conditions

Rating	Minimum	Typical	Maximum	Unit
Operating Temperature	-20	20	70	℃
Supply Voltage				
VCHG	4.75	5.00	5.75	V
LEDs	1.10	3.70	4.30	V
PIO	1.50	1.80	1.90	V
VBAT SENSE	0	3.70	4.25	V
VREN_EN	2.80	3.70	4.25	V
VBAT	2.80	3.70	4.25	V

7.8 Power consumption

Status	Current	Typical	Unit
Power off	VBAT	0.1	uA
A2DP slave mode with no load and playing peak noise	VBAT	12	mA
A2DP slave mode with two16ohm speakers and playing peak noise	VBAT	24	mA
Pause in A2DP slave mode connection	VBAT	0.5	mA

4 Main components list

NO.	Description	Manufacture	Manufacturer P/N
1	Inductor 4.7uH ±20% 0805	麦捷	MGFL2012C4R7MT-LF
	Inductor 4.7uH ±20% 0805	达方	IP20124R7MPS9
	Inductor 4.7uH ±20% 0805	顺络Sunlord	MSL2012S4R7MHT
2	IC BT BC8630 QFN68	CSR	CSR8630B04-IQQF-R
3	Filter WiFi 1608	ACX	BF1608-L2R4DAAT/LF
4	Crystal 26M 8.5PF 10PPM	HOSONIC	E3SB26.0000F8ES11M
	Crystal 26M 8.5PF 10PPM	TXC	7M26000314
	Crystal 26M 8.5PF 10PPM	EPSON	XIE000021008300
	Crystal 26M 9PF 10PPM	H.ELE	X3S026000B91H-NZ
5(ROM版)	IC EEPROM FM24C128A-TS-T-G TSSOP-8	复旦微电子	FM24C128A-TS-T-G
	IC EEPROM GT24C128A-2ZLI-TR TSSOP-8	聚辰	GT24C128A-2ZLI-TR
6（Flash版）	IC Flash Serial GD25Q41B 4M-bit SOP-8 Gigadevice	先捷	GD25Q41BTIGR
	IC Flash Serial MD25D40 4M-bit SOP-8 Gigadevice	先捷	MD25D40TIGR
	IC 1.8V 4M SPI FLASH SOP -8 150mile	MXIC	MX25U4033EM1I-12G
	IC 1.8V 4M SPI FLASH SOP -8 150mile	MXIC	KH25U4033EM1I-12G

5 Recommended reflow temperature profile

1) Follow: IPC/JEDEC J-STD-020 C
2) Condition:

Average ramp-up rate(217℃ to peak): 1～2℃/sec max.

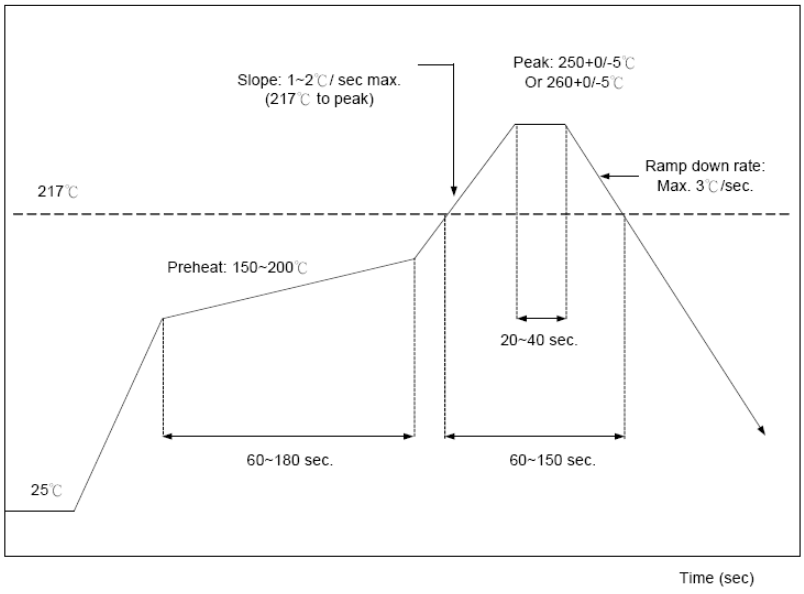
Preheat: 150～200C, 60～180 seconds

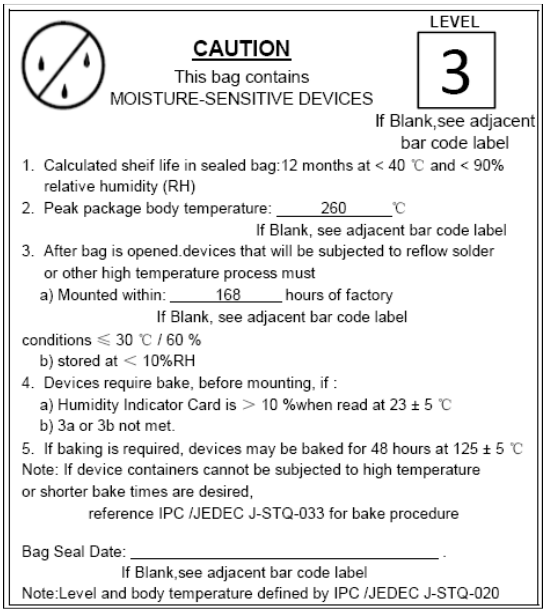
Temperature maintained above 217℃: 20～40 sec

Peak temperature: 250+0/-5℃ or 260+0/-5℃

Ramp-down rate: temperature: 8 minutes max

Cycle interval: 5 minus





The module Must go through 125℃ baking for at least 9 hours before SMT AND IR reflow process!

若拆封后未立即上线，翼动通讯建议让下次上线前务必以 125℃烘烤 9 小时以上！

6 Record of Changes

Data	Revision	Description
2015-12-14	V1.5	Upgrade the spec. format

7 Important Notice

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