

Product Approval Datasheet

Customer	
Part Number	
Module ID.	CW88

Customer Confirmation :

Approved By	
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Issued by :

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Revision History

Date	Version	Description	Author
2015.12.14	V1.0	■ First release	Jason

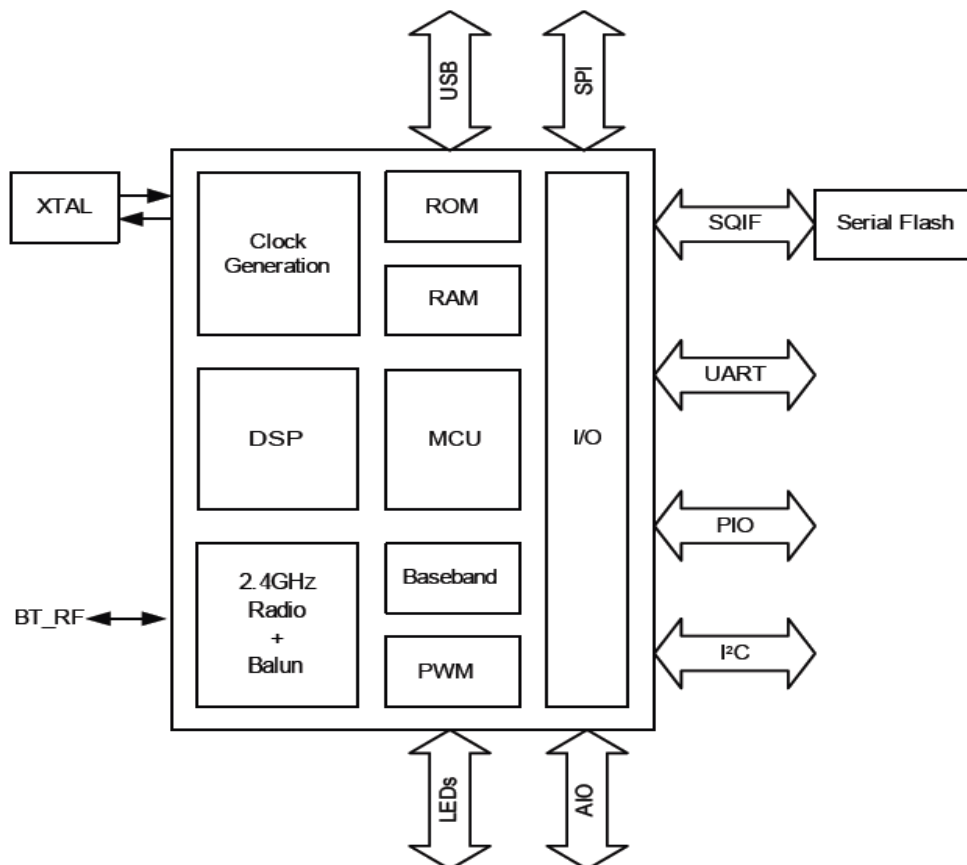
1. Introduction

The CW88 Bluetooth module build in a CSRB5348 Bluetooth chip, is a perfect solution for wireless HCI and wireless HID applications.

The CW88 Bluetooth module complies with Bluetooth specification version 4.1. It supports SPP, AVRCP, profiles. It integrates RF, Baseband controller, etc. And it also provides UART interface, USB interface and I²C interface, etc.

The detail information of CW88 Bluetooth module is presented in this document below.

Block Diagram



2. Feature

- ✓ Small overall dimension(20mm x 15 mm x 2mm)
- ✓ Bluetooth Specification V4.1
- ✓ BlueCore HCI Stack
- ✓ Class 2 and Class 3 support
- ✓ Integrated switch-mode regulator
- ✓ Physical connection as SMD type
- ✓ Serial interfaces: UART, USB 2.0 full-speed, I²C and SPI
- ✓ 5 independent PWM generators
- ✓ 21 analogue I/Os
- ✓ 12 programmable digital I/Os
- ✧ *Some features are optional for customization on demand.*

3. General Specification

Module ID	CW88
Chip Set	CSRB 5348
Bluetooth® Standard	Bluetooth® V4.1 Specification
Output Power	Class II (1mW, 0dBm)
Frequency Band	2.4GHz~2.4835GHz ISM Band
Sensitivity	-90dBm@0.1% BER
Power Consumption (Avg.)	78uA(Deep sleep);
	<8mA(Operation)
Major Interface	<ul style="list-style-type: none">• I²C• UART : Tx/Rx• USB : DP/DN• PIOs• SPI
Humidity	10% ~ 90%
Storage Temperature	-40 ~ 105°C
Operating Temperature	-40 ~ 85°C

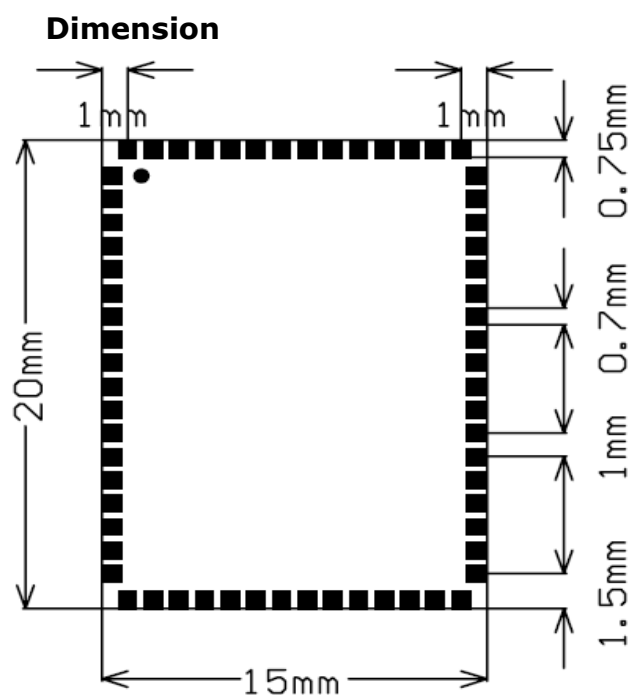
4. Firmware Specification

Firmware version	(Customizable)
Local Name	(Customizable)
Pin Code	(Customizable)
Function Table	(Customizable)
UART Specification	(Customizable)

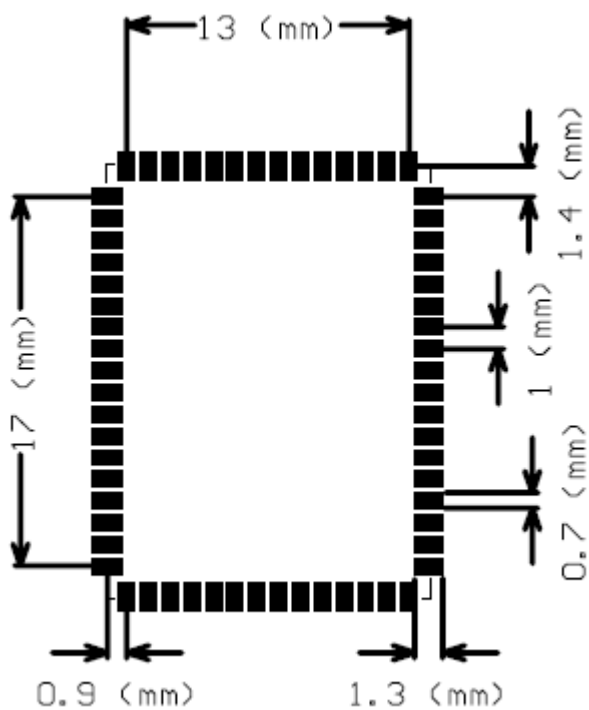
5. Hardware Specification

PCB Version	CW88_V01B
Crystal	26MHz
Serial flash	32Mb
ROM	8Mb

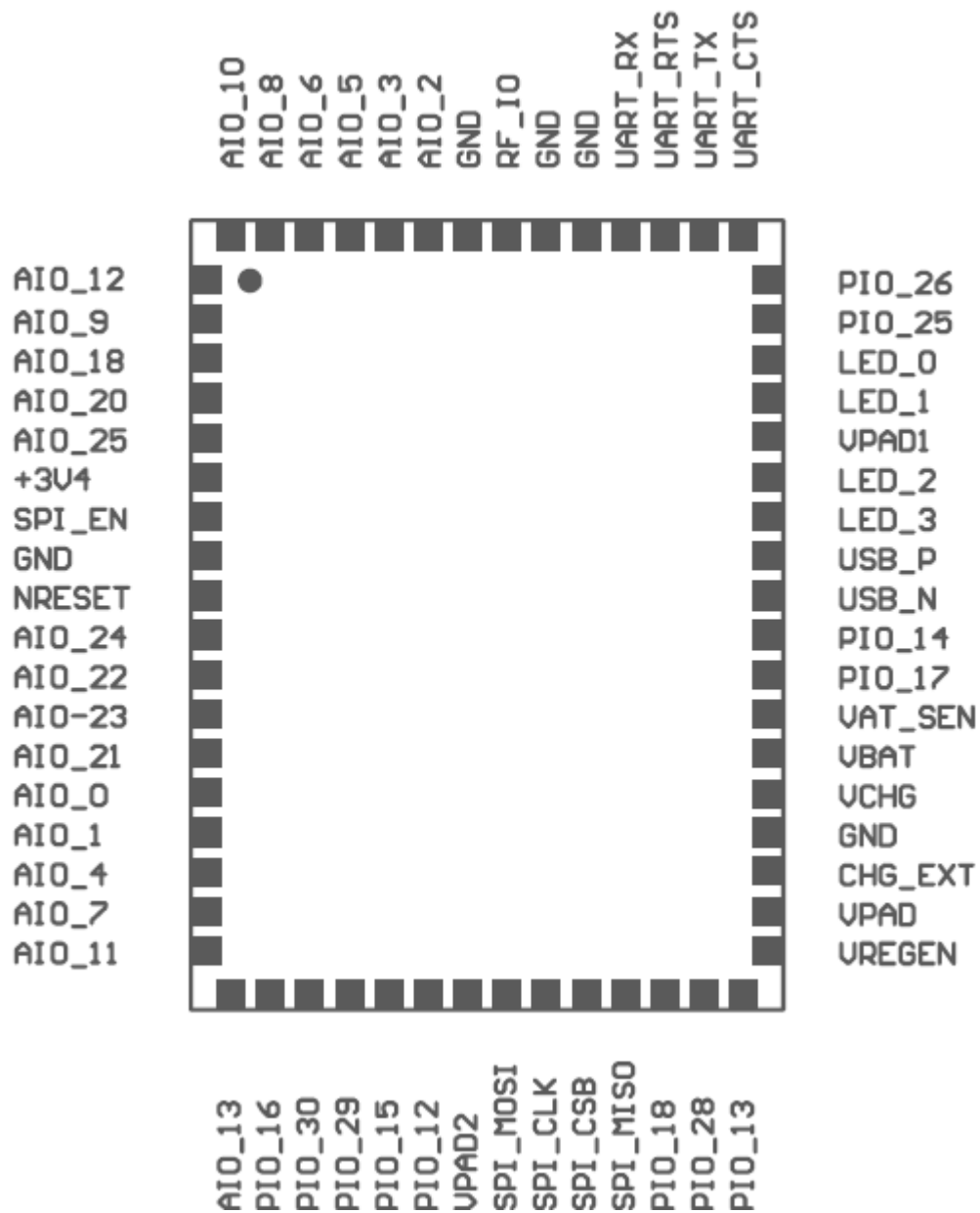
6. Package Information



Recommended land pattern



Pin-Out Diagram



Pin Definition

Pin#	Name	Pad Type	Description
1	AIO_12	Analogue programmable input / output line	Analogue programmable input
2	AIO_9	Analogue programmable input / output line	Analogue programmable input
3	AIO_18	Analogue programmable input / output line	Analogue programmable input
4	AIO_20	Analogue programmable input / output line	Analogue programmable input
5	AIO_25	Analogue programmable input / output line	Analogue programmable input
6	+3V4	VDD	VOUT3.4V
7	SPI_EN		SPI Enable
8	GND	VSS	Ground connections
9	NRESET		RST
10	AIO_24	Analogue programmable input / output line	Analogue programmable input
11	AIO_22	Analogue programmable input / output line	Analogue programmable input
12	AIO_23	Analogue programmable input / output line	Analogue programmable input
13	AIO_21	Analogue programmable input / output line	Analogue programmable input
14	AIO_0	Analogue programmable input / output line	Analogue programmable input
15	AIO_1	Analogue programmable input / output line	Analogue programmable input
16	AIO_4	Analogue programmable input / output line	Analogue programmable input
17	AIO_7	Analogue programmable input / output line	Analogue programmable input
18	AIO_11	Analogue programmable input / output line	Analogue programmable input
19	AIO_13	Analogue programmable input / output line	Analogue programmable input
20	PIO_16	Bi-directional with programmable strength internal pull-up/down	Analogue programmable input
21	PIO_30	Bi-directional with programmable strength internal pull-up/down / I2C_WP	Analogue programmable input
22	PIO_29	Bi-directional with programmable strength internal pull-up/down / I2C_SDA	Analogue programmable input
23	PIO_15	Bi-directional with	Analogue programmable input

		programmable strength internal pull-up/down	
24	PIO_12	Bi-directional with programmable strength internal pull-up/down / PWM 6	Programmable input/output
25	VPAD2		Positive supply for PIOs
26	SPI_MOSI	CMOS input with weak internal pull-down	Programming interface
27	SPI_CLK	CMOS input with weak internal pull-down	Programming interface
28	SPI_CSB	CMOS input with weak internal pull-up	Programming interface
29	SPI_MISO	CMOS output	Programming interface
30	PIO_18	Bi-directional with programmable strength internal pull-up/down	Programmable input/output
31	PIO_28	Bi-directional with programmable strength internal pull-up/down / I2C_SCL	Programmable input/output
32	PIO_13	Bi-directional with programmable strength internal pull-up/down / PWM 4	Programmable input/output
33	VREGEN		Regulator enable input
34	VPAD		LD0 regulator output
35	CHG_EXT		External battery charger control
36	GND	VSS	Ground connections
37	VCHG		Battery charger input
38	VBAT	Battery terminal. Do not use a battery change it into DC 3.3V.	Lithium ion/polymer battery positive terminal. Battery charger output and input to switch-mode regulator.
39	VBAT_SEN		Battery charger sense input
40	PIO_17	Bi-directional with programmable strength internal pull-up/down	Programmable input/output
41	PIO_14	Bi-directional with programmable strength internal pull-up/down / PWM 5	Programmable input/output
42	USB_N	Bidirectional	USB data minus
43	USB_P	Bidirectional	USB data plus with selectable internal 1.5k R pull-up resistor
44	LED_3	Open drain	LED output
45	LED_2	Open drain	LED output
46	VPAD1		Positive supply for SPI, LEDs, reset and PIOs
47	LED_1	Open drain	LED output
48	LED_0	Open drain	LED output

49	PIO_25	Bi-directional with programmable strength internal pull-up/down	Programmable input/output
50	PIO_26	Bi-directional with programmable strength internal pull-up/down	Programmable input/output
51	UART_CTS	CMOS input /PIO_5 /PWM 5	UART clear to send active low
52	UART_Tx	CMOS output /PIO_3 /PWM 3	UART data output
53	UART_RTS	CMOS output /PIO_4 /PWM 4	UART request to send active low
54	UART_Rx	CMOS input /PIO_2 /PWM 2	UART data input
55	GND	VSS	Ground connections
56	GND	VSS	Ground connections
57	RF_IO		For 2.45G Hz 50 ohm antenna
58	GND	VSS	Ground connections
59	AIO_2	Analogue programmable input / output line	Analogue programmable input
60	AIO_3	Analogue programmable input / output line	Analogue programmable input
61	AIO_5	Analogue programmable input / output line	Analogue programmable input
62	AIO_6	Analogue programmable input / output line	Analogue programmable input
63	AIO_8	Analogue programmable input / output line	Analogue programmable input
64	AIO_10	Analogue programmable input / output line	Analogue programmable input

7. Electrical Characteristics

Recommended Operating Conditions

Operating Condition	Min	Max
Operating temperature	-20°C	+85°C
VDD_3V4	3.00V	3.60V
VDD_USB	3.10V	3.40V
VPAD1	1.70V	3.60V
VPAD2	1.70V	3.60V
VCHG	3.00V	6.50V
VBAT	2.70V	4.30V

Regulator Enable

Vregenable, switching threshold	Min	Typ	Max	Unit
Rising threshold	1.0	–	–	V

USB

	Min	Typ	Max	Unit
VDD_USB for correct USB operation	3.10	3.40	3.60	V
VIL input logic level low			0.30 x VDD_USB	V
VIH input logic level high	0.70 x VDD_USB			V
VOL output logic level low	0		0.2	V
VOH output logic level high	2.80		VDD_USB	V

12-bit ADC

	Min	Typ	Max	Unit
Input voltage range	0	–	VDD_ADC	V
Accuracy(a) (VDD_ADC = 2.8 V/3.2 V only) (Guaranteed monotonic)	–	–	±1.5	LSB
Offset(a)	–		±1.5	LSB
Gain error(a)	0.75xVDD		±1.5	LSB
Conversion time	14	14	–	μs
External source impedance	–	–	50	kΩ
Sample and hold capacitance	–	12	–	pF
Resolution (VDD_ADC = 2.8 V/3.2 V)	–	–	12	Bits

Digital Terminals

Digital Terminals	Min	Typ	Max	Unit
VIL input logic level low	-0.4	-	0.25 x VDD	V
VIH input logic level high	0.7xVDD	-	VDD +0.4	V
Input Tr/Tf	0	-	25	ns
VOL output logic level low, 10L = drive strength specified in Table	-	-	0.4	V
VOH output logic level high, 10H = drive strength specified in Table	0.75 X VDD	-	-	V
Output Tr/Tf	-	-	5	ns
Strong pull-up	-150	-40	-10	μ A
Strong pull-down	10	40	150	μ A
Weak pull-up	-5	-1.0	-0.33	μ A
Weak pull-down	0.33	1.0	5.0	μ A
CI Input Capacitance	1.0		5.0	pF
High impedance state (no pulls)	-0.1	0	0.1	μ A

Power Consumption

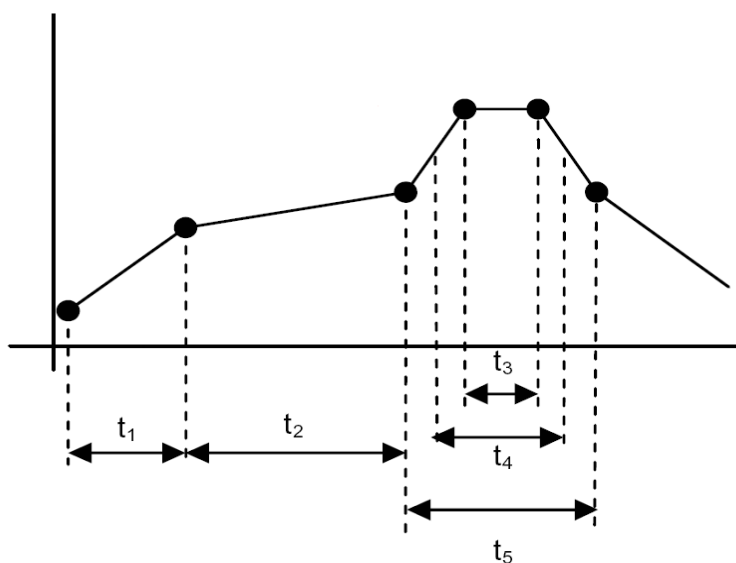
DUT Role	Connection		Packet type	Average Current	Unit
N/A	Deep sleep	With host connection	-	78	μ A
N/A	Page scan	Page = 1280ms interval	-	234	μ A
N/A	Inquiry and page scan	Inquiry = 1280ms interval, page = 1280 ms interval, window = 11.25 ms	-	374	μ A
N/A	Inquiry and page scan	Inquiry = 1280 ms interval, page = 1280 ms interval, window = 11.25 ms	-	313	μ A
Master	ACL	No traffic	DH1	3.0	mA
Master	ACL	Transmit	DH1	5.6	mA
Master	ACL	Sniff = 40 ms	DH1	1.0	mA
Master	ACL	Sniff = 1280 ms	DH1	130	μ A
Master	ACL	Sniff = 15 ms	DH1	3.6	mA
Master	ACL	Sniff = 11.25 ms	DH1	3.9	mA
Slave	ACL	No traffic	DH1	5.2	mA
Slave	ACL	Receive	DH1	6.1	mA
Slave	ACL	Sniff = 40 ms	DH1	1.0	mA
Slave	ACL	Sniff = 1280 ms	DH1	150	μ A
Slave	ACL	Sniff = 15 ms	DH1	3.3	mA
Slave	ACL	Sniff = 11.25 ms	DH1	3.5	mA

Note :

Current consumption values are taken with:

- HCI only
- VBAT pin = 3.7 V
- RF TX power set to 0dBm
- LEDs disconnected
- AFH off

8. Recommended Temperature Reflow Profile

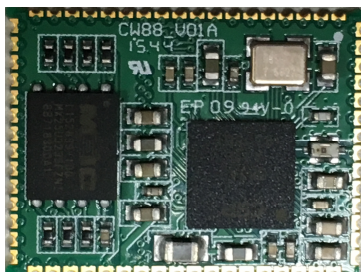


Recommended Reflow Profiles

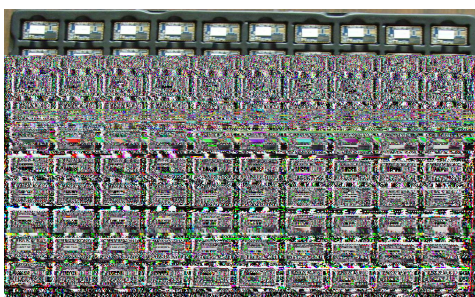
	End Temperature	Heating/Cooling Speed	Time
t1	150 °C	1 to 3 °C/sec	80~120 sec
t2	180 °C	1 to 3 °C/sec	100~140 sec
t3	250 °C	–	5~10 sec
t4	217 °C	–	30~90 sec
t5	180 °C	1 to 3 °C/sec(ramp-up) < 2 °C/sec(ramp-down)	90~120 sec

9. Product Packing

CW88 Photo (With Serial flash)



100 modules per pack



Vacuum package

