BT-MC88-1X 产品说明书

1. 介绍 Introduction

1.1 简要 Overview

★ BT-MC88-1X是一款基于CSR8811芯片设计的HCI模组.
BT-MC88-1X is a HCI module based on CSR8811 chip.

★ BT-MC88-1X是由一单射频和基带IC组成并应用于蓝牙2.4GHz系统的模组.
The BT-MC88-1X is a module that Integrate a single-chip radio and baseband IC for Bluetooth 2.4GHz systems.

1.2 特征 Features

★ 蓝牙双模/蓝牙低功耗
Dual-mode Bluetooth/Bluetooth low energy

★ 高品质蓝牙4.0
High quality Bluetooth v4.0

★ Class2蓝牙功率等级
Bluetooth power level：Class 2

★ 高速串行通讯接口（最高到4Mbps）
High-speed UART port (up to 4Mbps)

★ PCM/I2S兼容数字音频接口
PCM/I2S digital audio interfaces.

★ 支持IEEE 802.11协议
Support for IEEE 802.11

★ 模组尺寸23*16*3.2mm，邮票孔，24个脚位（带屏蔽罩）
Module size 23*16*3.2mm, Stamp-24(with shield case)

★ 模组内置PCB天线
Built-in pattern antenna on the module

★ 标准的HCI通讯接口
Standard HCI support

★ 宽电源供电，电压范围：2.7-3.6V
Flexible voltage supply, supply range: 2.7-3.6V

★ 环保RoHS
Environmental care: RoHS

1.3 应用 Applications

★ 车载免提
Hands-Free Car Kits

★ 低端手机、功能手机、智能手机
Low-cost phones, Feature phones, Smart-phones

★ 便携式媒体播放器
Portable media players

2. 规格 参数

1	产品或项目名称 Product/ Project Name	车载蓝牙模组 Car kit Bluetooth Module
2	芯片类型 Chip set	BlueCore CSR8811 A08 0.5mm WLCSP
3	产品射频功率等级 Power class level	Class 2 (-6dBm < P_{AV} < 4dBm)
4	波特率 Baud Rate	9600bps～4Mbps
5	额定电压 Rated Voltage	3.3V
6	工作电压范围 Operation Voltage range	2.7V～3.6V
7	工作范围 Operation Range	10 meters (33 feet)
8	尺寸 Dimension	23*16*3.2mm （L*W*H）
9	核心规格版本 Core Specification Version	☐1.2 ☐2.0 ☐2.0+EDR ☐2.1 ☐2.1+EDR ■3.0 ☐3.0+HS ■4.0
10	认证 Test of certification	FCC\CE\IC\MIC\BQB
11	工作温度范围 Operation Temperature range	-30～85℃
12	储存温度范围 Storage Temperature range	-40～85℃

3 射频规格 RF Spe

规格 Specification	条件 Condition	最小 Min.	典型 Type	最大 Max.	单位 Unit
输出功率 Output transmit power	Normal	-6	0	4	dBm
调制特性 Modulation characteristics	f1 avg	140		175	kHz
	f2 max	115			kHz
	f2avg/f1a	80			%
初始载波频率容限 Initial carrier-frequency tolerance	Normal	-20		20	kHz
载波频率漂移 Carrier frequency drift	DH1	-25		25	kHz
	DH3	-40		40	kHz
	DH5	-40		40	kHz
	Draft rate/50us	-20		20	kHz

备注：常温下是25±5℃
Remark: Normal Test Condition is 25±5℃

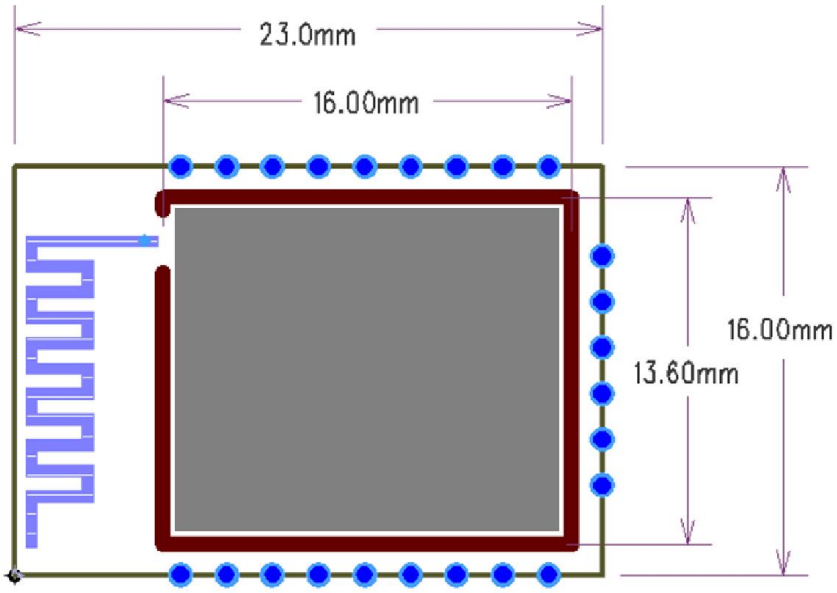
4 管脚配置

No.	名称 Pin Name	I/O	接口类型 Pad Type	描述 Pin Description
1	GND	-	VSS	Ground of supply voltage
2	SPI_CS#/PCM_SYNC	I/O	Bi-directional, Tristate, with weak internal pull-down	SPI chip select(active low) or PCM synchronous data sync
3	SPI_MISO/PCM_OUT	O	Output, Tristate, with weak internal pull-down	SPI data output or PCM synchronous data output
4	SPI_CLK/PCM_CLK	I/O	Bi-directional, Tristate, with weak internal pull-down	SPI clock or PCM synchronous data-clock
5	SPI_MOSI/PCM_IN	I	Input, Tristate, with weak internal pull-down	SPI data input or PCM synchronous data input
6	SPI_PCM#_SEL	I	Input with weak internal pull-down	Control line to select SPI or PCM interface, H=SPI, L=PCM
7	RESET#	I	Input with strong internal pull-down	Active low reset, to ensure a full reset the reset sigma should be asserted for period greater than 5ms.
8	VDD_3V3	I	VDD	Positive supply for module, -Supply voltage: Typical 3.3V
9	VDD_PADS	I	VDD	Positive supply for module, -Supply voltage: Typical 3.3V
10	GND	-	VSS	Ground of supply voltage
11	I2C_SDA	I/O	Bi-directional, Tristate	EEPROM data pin, Internal 4.7K pull-up resistor
12	I2C_SCL	I	Input clock	EEPROM clock pin, Internal 4.7K pull-up resistor
13	I2C_WP	I	Write protect input	EEPROM write protect pin, Internal 4.7K pull-up resistor
14	VDD_1V8	I	VDD	Output from internal high-voltage regulator
15	GND	-	VSS	Ground of supply voltage
16	UART_CTS	I	Bi-directional, Tristate, with weak internal pull-up	UART clear to send, active low
17	UART_RTS	O	Bi-directional, Tristate, with weak internal pull-up	UART request to send, active low.
18	UART_RX	I	Bi-directional, Tristate, with weak internal pull-up	UART data input, active high -Recommended external 10K pull-up resistor.
19	UART_TX	O	Bi-directional, Tristate, with weak internal pull-up	UART data output, active high -Recommended external 10K pull-up resistor.
20	GND	-	VSS	Ground of supply voltage
21	NC	-	NC	NC
22	NC	-	NC	NC
23	NC	-	NC	NC
24	GND	-	VSS	Ground of supply voltage

备注：建议PCM,I2C以及 UART都串联一个10Ω-1K的外置电阻

Remark: Recommended external 10Ω-1K serial resistor for all the PCM, I2C and UART transfer ports.

5 模组尺寸 Module Dimension



模块尺寸 23*16*3.2mm(长*宽*高)　公差：±0.1mm

Module Size：23*16*3.2mm (L*W*H)　tolerance: ±0.1mm

6 试验规格 Routine Test Specification

序号 No.	测试项目 Test Item	测试条件 Conditions
1	高温存储 High Temperature (Storage)	在+85℃环境下放置 48 小时，在标准测试条件下三小时内进行测试，模块应满足可靠性测试标准 +85℃, 48hrs, In standard test condition take measurements within 3 hours.
2	低温存储 Low Temperature (Storage)	在-40±3℃环境下放置 48 小时，在标准测试条件下三小时内进行测试，模块应满足可靠性测试标准 -40±3℃,48hrs, In standard test condition, take measurements within 3 hours
3	高湿存储 High Humidity (Storage)	在 40±3℃,90±5%RH 环境中放置 48 小时，在标准测试条件下三小时内进行测试，模块应满足可靠性测试标准 40±3℃,90±5%RH, 48hrs, In standard test condition, take measurements within 3 hours
4	高低温循环 High and low temperature cycling test	在+85℃环境下放置 30 分钟，然后温度降低到到-40℃（温度转换时间为 2 个小时）放置 30 分钟；然后温度升高到 85℃放置 30 分钟（温度转换时间为 2 个小时），如此重复循环 5 次。实验完成后，在标准测试条件下，模块应满足可靠性测试标准 Tstg Max 85℃ 30 min s, Temperature shift time: within 2hrs. Tstg Min -40℃ 30 min s. 5 cycles
5	热冲击 Thermal Shock	在+85℃环境下放置 20 分钟后，温度切换到-40℃（在 5 分钟之内）放置 20 分钟，然后温度切换到 85℃（在 5 分钟之内）放置 20 分钟，如此重复循环 5 次，实验完成后，在标准测试条件下，模块应满足基本功能

		Tstg Max 85℃ 20 mins, Temperature shift time: within 5 mins. Tstg Min -40℃ 20 mins. 50 cycles
6	静电测试 Electrostatic Resistance	人体接触放电 ±2KV，3 次，静电测试后，在标准测条件下，模块应满足基本功能 human body model ±2KV, 3 times
7	振动测试 Vibration Resistance	振动频率：10～55Hz，扫频速率：0.1 oct/min，最大加速度：4G。X ，Y，Z 三个方向各两个小时，振动完成后，在标准测试条件下三个小时内测试，满足基本功能 Freq: 10~55Hz, 0.1 oct/min, max acceleration: 4Grms- Test time: X,Y, Z axis for 6 hours. After 1 hour vibration test, do the test in each direction. In standard test condition, take measurements within 3 hours.
8	冲击测试 Impact Resistance	**冲击测试**：冲击加速度：50G(m/sec2)；冲击时间：11 毫秒；冲击频率和方向：6 个方向每个方向 10 次。在标准测试条件下三个小时内测试，模块应满足可靠性测试标准 **跌落测试：**将模块从 100 厘米的高度跌落到一块 10 毫米厚的胶合板上，重复 5 次，实验完成后在标准测试条件下，模块应满足基本功能 **Shock Test**: Impact acceleration: 50G(m/sec2), impact time: 11msec, impact frequency and direction: 10 times each in 6 directions. In standard test condition, take measurements within 3hr. **Drop Test**: Test height: 100cm. Frequency: 5 times. Drop the module onto 10mm thickness plywood. In standard test condition, take measurements within 3 hours
9	蒸压测试 Pressurizing Vapour	在-30℃环境下放置 1 个小时，在 1 分钟之内切换至 25℃,90%RH 环境下，放置 1 个小时，开启 15 分钟，然后关闭 15 分钟。在标准测试条件下进行 3 个循环，实验完成后在常温下放置 2 个小时后测试，模块应满足基本功能 -30℃ 1 hour, shift to 25℃,90%RH within 1 min, stay 25℃,90%RH 1 hour, On:15min then Off: 15min. 3 cycle In Standard test condition, take measurements 2 hours after

9. 附录 Appendix

9.1 FCC&IC 提示 FCC&IC Caution

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This modular complies with FCC RF radiation exposure limits set forth for an uncontrolled environment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

If the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following : "Contains Transmitter Module FCC ID: ZWY8350X"or"Contains FCC ID: ZWY8350X."

When the module is installed inside another device,the user manual of this device must contain below warning statements ;

1.This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference .

(2) this device must accept any interference received, including interference that may cause undesired operation.

2. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.

If the IC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains transmitter module IC : 12033A-8811X" or "Contains IC : 12033A-8811X"

When the module is installed inside another device, the user manual of this device must contain below warning statements ;

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the

following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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