



The Bluetooth module F-3188 manual

一、 Product overview :

Intelligent wireless audio data transmission products F-3188 Bluetooth module for the independent development of the company, is a stereo radio transmission scheme of low cost and high efficiency, module uses CSR BC8 chip with high quality sound and compatibility for the module, the overall performance optimization. F-3188 Bluetooth module with free driving mode, customers only need to access the application module products, wireless transmission can quickly realize the music, enjoy wireless music.。

二、 application area :

This module is mainly used for music transmission in short distance, can be mobile phone and notebook computer, conveniently, the connection between PDA and other digital products, Bluetooth, wireless transmission of music.。

Bluetooth audio

Bluetooth stereo headset

hands-free phone

The Bluetooth wireless audio transmission

三、 The basic characteristics of :

Bluetooth Profiles

- Bluetooth v4.0 specification support
- HFP v1.6 wideband speech (HD voice ready)
- HSP v1.2
- A2DP v1.2
- AVRCP v1.4
- Support for smartphone applications (apps)

Improved Audio Quality

CSR's latest 2-mic CVC audio enhancements for narrowband and wideband connections including:

- 2-mic far-end audio enhancements
- Near-end audio enhancements (noise suppression and AEQ)
- Wind noise reduction
- Packet loss concealment
- Bit error concealment
- Automatic gain control and automatic

volume control

Frequency expansion for improved speech intelligibility
 mSBC codec support for wideband speech

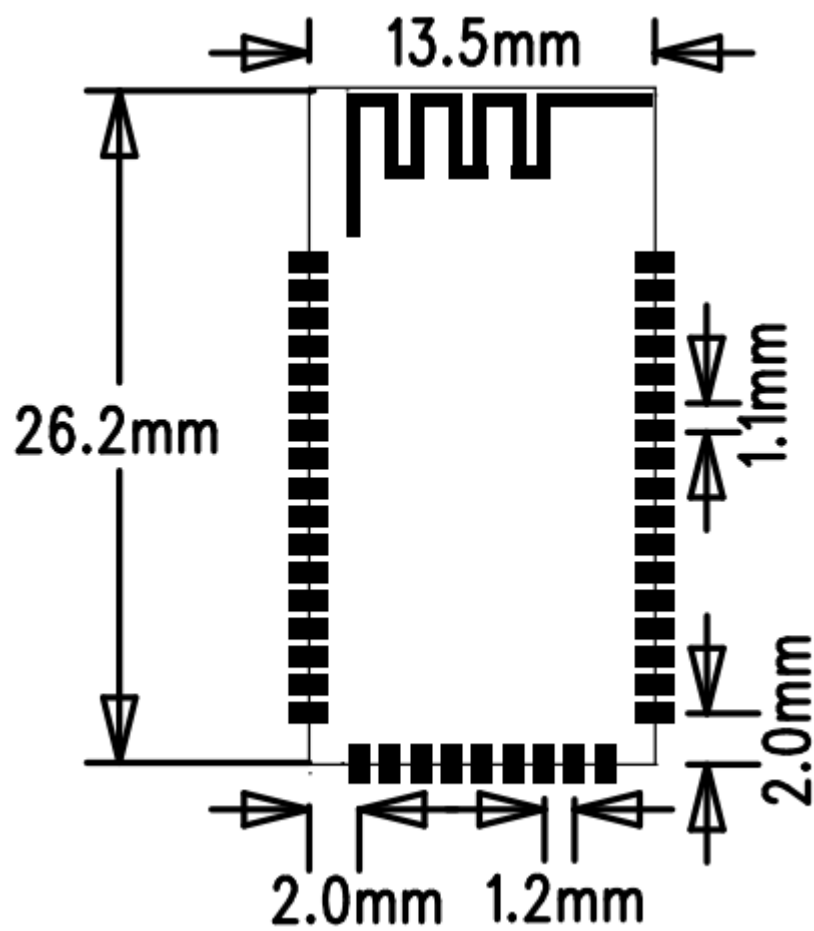
Music Enhancements

Configurable 5-band EQ for music playback (rock,pop, classical, jazz, dance etc)
 APTX, SBC, MP3, AAC and Faststream decoder
 Stereo widening (S3D)
 Volume Boost Additional Functionality Additional Functionality
 Support for voice recognition
 Support for multi-language programmable audio prompts
 CSR's proximity pairing and CSR's proximity connection
 Multipoint support for HFP connection to 2 handsets for voice
 Multipoint support for A2DP connection to 2 A2DP sources for music playback
 Talk-time extension

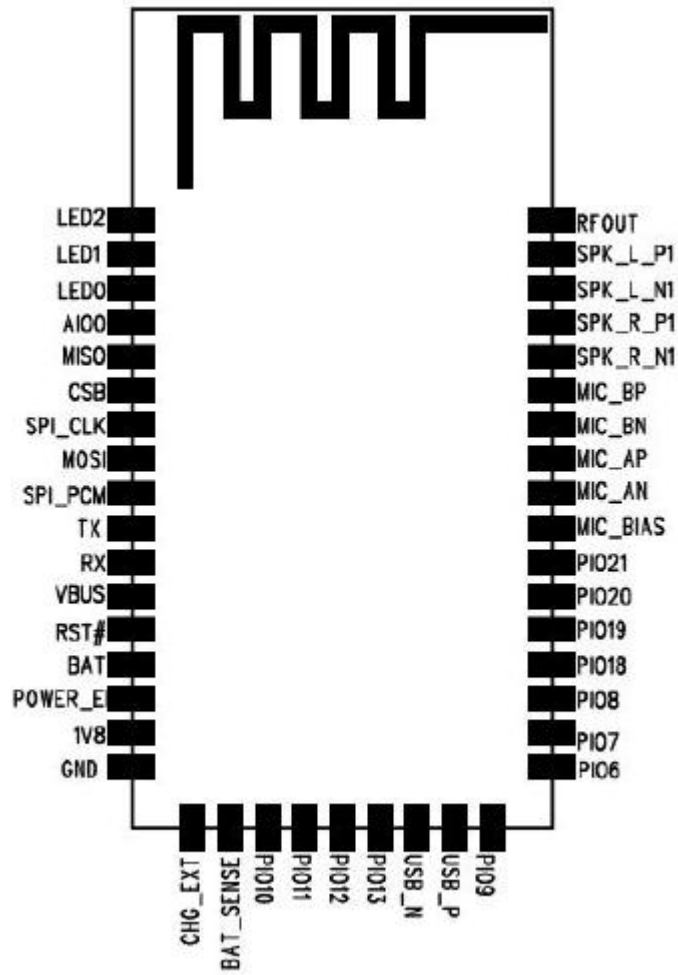
四、 performance parameter :

Model	F-3188
The Bluetooth specification	Bluetooth V4.0
Modulation	GFSK, 1/4 DQPSK, 8DPSK
Power supply voltage:	3.3-4.2V
Support Bluetooth protocol	HFPV1.6, HSPV1.2, A2DPV1.2,AVRCPV1.4
Working current	30mA
The standby current	<50uA
Temperature range	-40°C to +80°C
The wireless transmission range:	>10m
Transmission power:	support CLASS1/CLASS2/CLASS3 MAX 9dBm
Sensitivity:	-80dBm<0.1%BER
Frequency range:	2.4GHz-2.480GHz
The external interface:	PIO, SPI, I2S and PCM,USB
Audio performance	Support AAC, MP3, SBC, APTX, stereo
The audio signal to noise ratio :	75dB
Distortion	0.1%
Module size	26.2X13.5X0.8MM

五、 The size of the module graph :



六、 Module pin definition diagram



七、 Pin description

Pin	Symb	I/O	Description
1	LED2	Bi-directional	LED Driver
2	LED1	Bi-directional	LED Driver
3	LED0	Bi-directional	LED Driver
4	AIO0	Bi-directional	Programmable input/output

5	MISO	Bi-directional with weak pull-down	Programmable input/output Alternative function: SPI data Output PCM1 synchronous data Output
6	CSB	Bi-directional with weak pull-down	Programmable input/output Alternative function: SPI data Output PCM1 synchronous data sync
7	SPI_CLK	Bi-directional with weak pull-down	Programmable input/output Alternative function: SPI clock PCM1 synchronous data Clock
8	MOSI	Bi-directional with weak pull-down	Programmable input/output Alternative function: SPI data input PCM1 synchronous data output
9	SPI_PCM	Input with weak pull-down	SPI/PCM select input 0: PCM/PIO interface 1: SPI
10	TX	Bi-directional with strong pull-down	Programmable input/output Alternative function: UART data output
11	RX	Bi-directional with weak pull-down	Programmable input/output Alternative function: UART data input
12	VBUS	Charger input	
13	RST#		Reset if low,pull low minimum 5ms to case a reset
14	BAT	Battery positive terminal	3.3-4.2V
15	POWER_EN	Input with weak pull-down	Regulator enable input
16	1.8V VBUS	POWER	+1.8V Output
17	GND	Ground	Ground connect battery negative
18	CHG_EXT	External Battery charger	Charge
19	BAT_SENSE	Battery charger sense input	BAT_SENSE
20	PIO10	Bi-directional with strong pull-down	Programmable input/output
21	PIO11	Bi-directional with strong pull-down	Programmable input/output
22	PIO12	Bi-directional with strong pull-down	Programmable input/output
23	PIO13	Bi-directional with strong pull-down	Programmable input/output
24	USB_N	Bi-directional	USB data plus with selectable internal 1.5Ω resistor
25	USB_P	Bi-directional	USB data minus

26	PIO9	Bi-directional with strong pull-down	Programmable input/output
27	PIO6	Bi-directional with strong pull-down	Programmable input/output
28	PIO7	Bi-directional with strong pull-down	Programmable input/output
29	PIO8	Bi-directional with strong pull-down	Programmable input/output
30	PIO18	Bi-directional with weak pull-down	Programmable input/output
31	PIO19	Bi-directional with weak pull-down	Programmable input/output
32	PIO20	Bi-directional with weak pull-down	Programmable input/output
33	PIO21	Bi-directional with weak pull-down	Programmable input/output
34	MIC_BIAS	Analogue out	Microphone bias
35	MIC_AN	Analogue in	Microphone input negative ,channel A
36	MIC_AP	Analogue in	Microphone input positive ,channel A
37	MIC_BN	Analogue in	Microphone input negative ,channel B
38	MIC_BP	Analogue in	Microphone input positive ,channel B
39	SPK_R_N1	Analogue out	Speaker output positive, right
40	SPK_R_P1	Analogue out	Speaker output negative, right
41	SPK_L_N1	Analogue out	Speaker output positive, left
42	SPK_L_P1	Analogue out	Speaker output negative, left
43	RFOUT	radio-frequency signal	RF signal output

八、 Design notes: (module compatible with 8610862086408645 four IC, is divided into single, double channel)

BC8610 , 8620----- Mono chip

Then the audio only PIN41 , PIN42. that is SPK_L_N, SPK_L_P Audio output , but SPK_R_N,

SPK_R_P is NC

BC8640 ,8645----- Is the double channel chip ,spk_l_n ,spk_l_p ,spk_r_n ,spk_r_p

All audio output, which belongs to a stereo

2) IO note PI021 , PI020 , PI019 , PI018 , PI07 , This is the only 5 IO port can be used as the key, other port as the output

九、 Connection circuit :

When connecting a power amplifier F-3188, must be connected to the differential input amplifier, if not then the differential input amplifier, must be connected to an operational amplifier to balance two difference level, otherwise there will be "impact sound Pa Pa"

。

十、 matters needing attent :

翻译结果:

A. if a battery module antenna, next to the metal, liquid crystal screen, loudspeaker, at least from the antenna from the 3cm, or suggest the use of an external antenna.

B. layout power lines suggest using star line, and to ensure that the Bluetooth module supply linearity is better, and BT to be operational amplifier, power amplifier, separate

etc., and the underside of the BT have no other interference, suggested that the Bluetooth module on the bottom corner.

C. suggests the module antenna part floating on the floor, do not go around the antenna control line, power line, audio line, MIC interference lines; if the module should be placed in the middle, should be in the antenna around slotted, recommend the use of an external antenna.

D. if the module antenna near a row seat, shell with metallic iron net impact on signal, recommend the use of an external antenna to solve the distance problem.

The output power of this device is less than 20mW. The SAR test is not required.

This device complies with Part 15 of the FCC Rules and with RSS-210 of Industry Canada. 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.

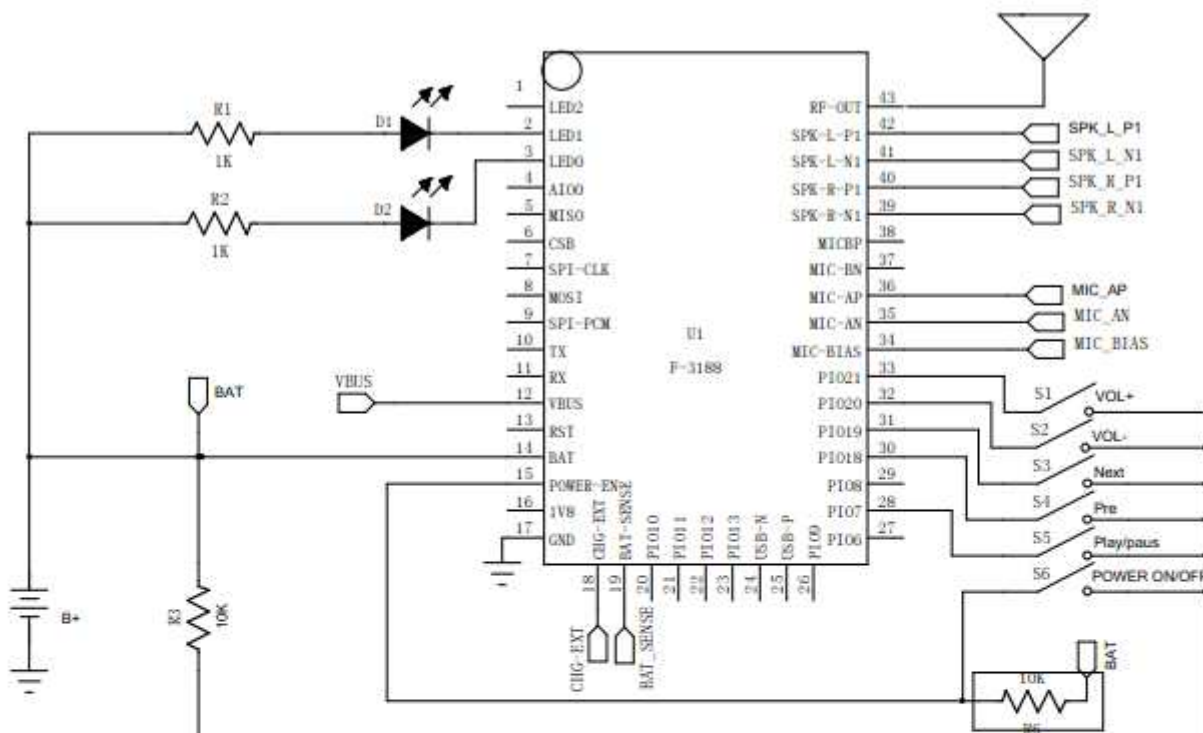
Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique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

This Class B digital apparatus complies with Canadian ICES-003.

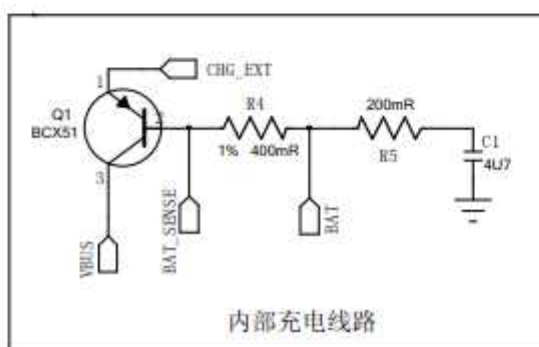
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications or changes to this equipment. Such modifications or changes could void the user's authority to operate the equipment.

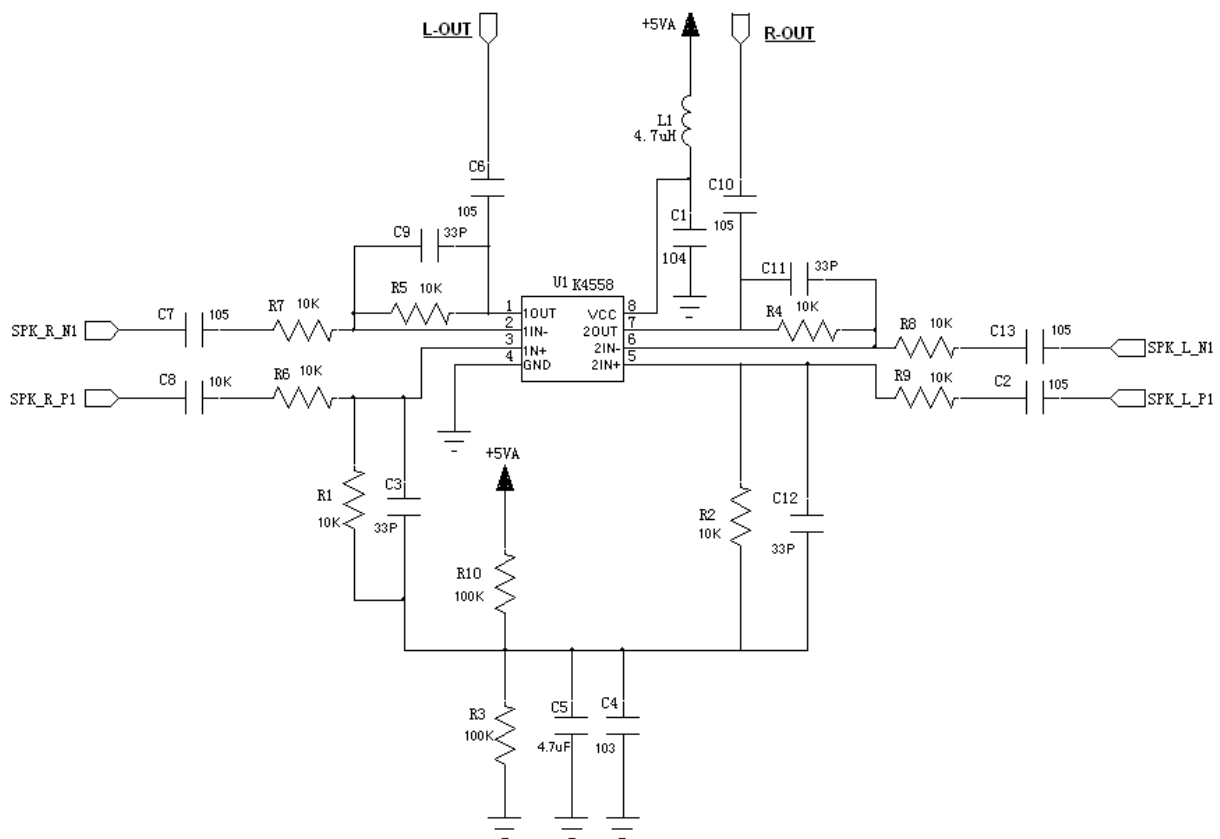
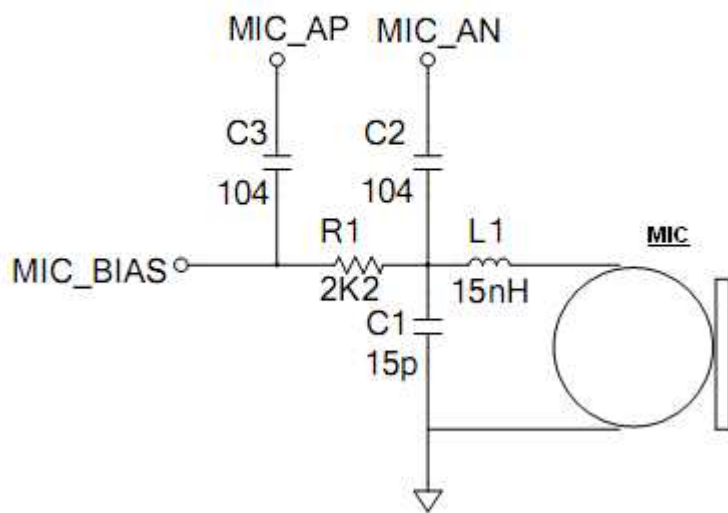
十、 The application circuit :



如若上电开机，侧用R6的10K电阻接电池正极（如方框内）替代S6开关电路

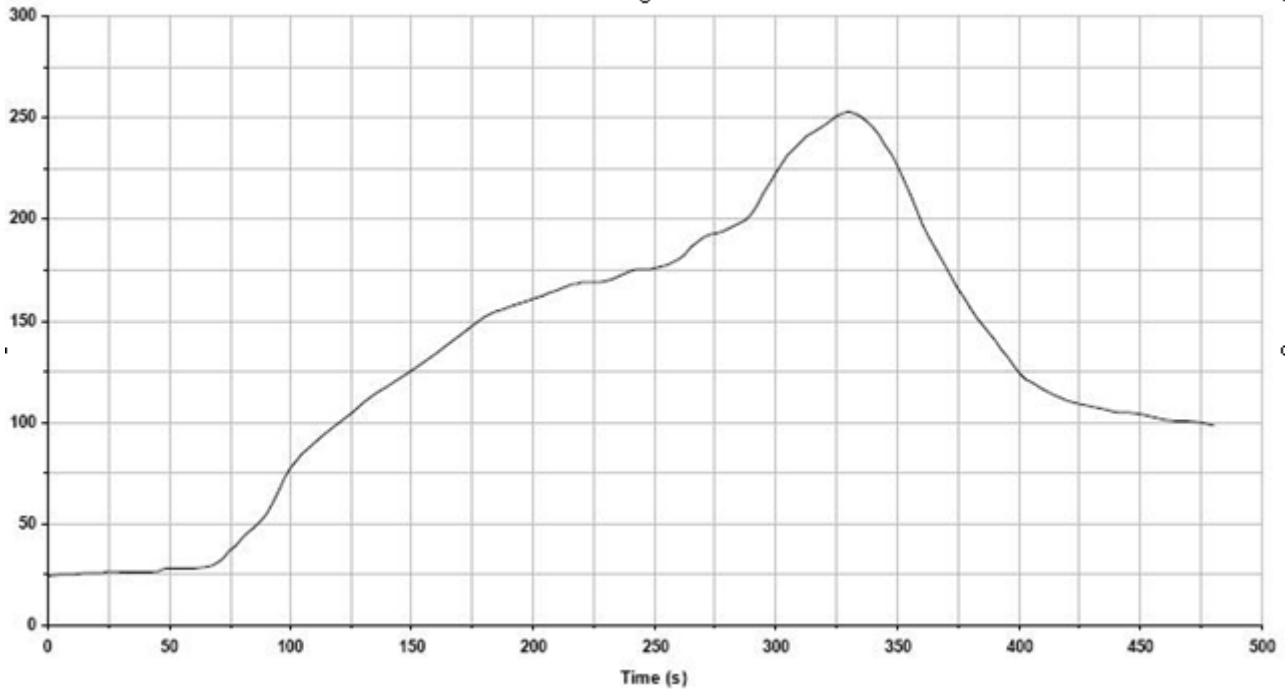


Note: the use of internal charging current up to 250mA.



十一、 Recommended reflow

temperature



Key features of the profile:

- Initial Ramp=1-2.5 /sec to 175 equilibrium
- Equilibrium time=60 to 80 seconds
- Ramp to Maximum temperature (250)=3 /sec Max
- Time above liquidus temperature(217): 45 - 90 seconds
- Device absolute maximum reflow temperature: 250