



TCL 通力电子(惠州)有限公司
惠州 TCL 音视频电子有限公司
深圳市通力科技开发有限公司

版本： V1.0
生效日期： 2018-05-31

Bluetooth Module Datasheet

蓝牙模组规格书说明书

Module No.型号 EXM1020D

版本 Version:V1.0

初版日期 Draft Data:2018-05-31

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版本变更说明 Document Revision History

Revision 版本	Date 日期	Author 作者	Description 描述
V1.0	2018-05-31	Tan Lunqiang	First Release



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1. 系统概览 System Overview

1.1 通用说明 General Descriptions

Bluetooth Low Energy Module provides a highly integrated solution for delivering low power Bluetooth v4.2 solutions. The advanced command interface offers rapid time to market.

Bluetooth Low Energy complies with Bluetooth specification version V4.2. It integrates RF, a baseband controller, command API processor, making it a complete Bluetooth Low Energy Solution.

Bluetooth Low Energy can be with either low cost microcontroller for intelligent Bluetooth low energy applications. For simple sensor applications, the Bluetooth Low Energy internal scripting capabilities enable basic functions to be implemented without the need for external host MCU or software development tools.

1.2 性能特点 Features

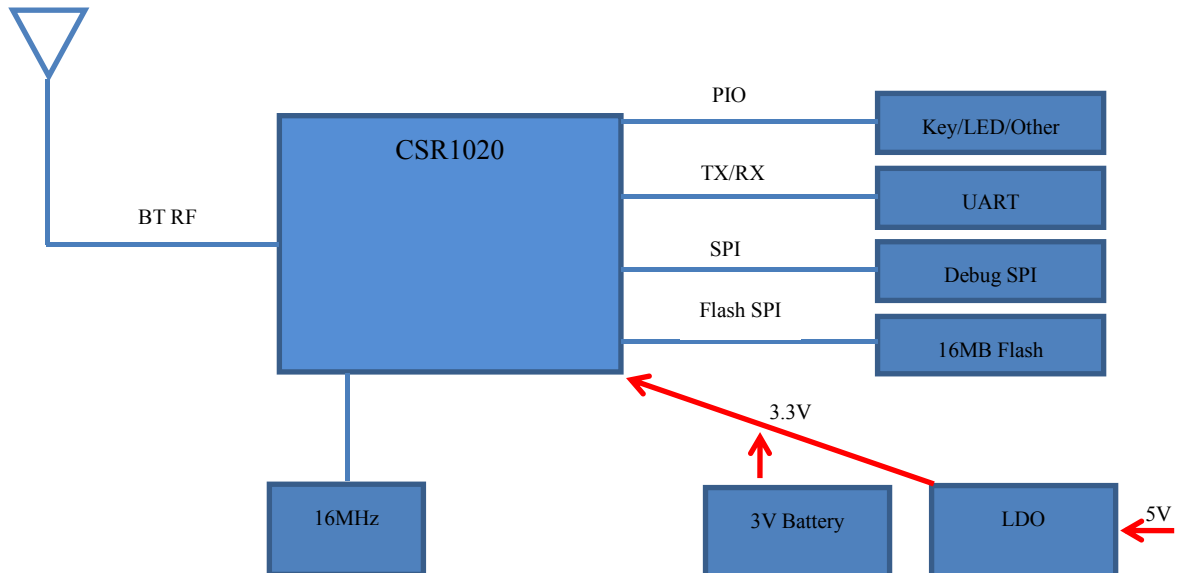
- Fully qualified Bluetooth version 4.2 low Energy Module
- Command interface API over SPI
- Device Firmware Upgrade (DFU) over SPI or Over the Air (OTA)
- Remote commands over the air
- 32KHz and 16MHz crystal or system clock
- 10-bit auxiliary ADC
- 1 analogue AIOs
- UART
- I2C/SPI for EEPROM / flash memory ICs and peripherals
- Environmentally friendly, RoHS compliant



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1.3 系统框图 Block Diagram





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2. 产品描述 Production Description

Fully qualified Bluetooth version 4.2 Low Energy Module
 ASCII command interface API over UART
 Module can be welded on PCB board
 Environmentally friendly, RoHS compliant
 Device Firmware Upgrade(DFU) over UART or Over the Air (OTA)
 Remote commands over the air
 Antenna ready

2.1. 引脚与功能说明 Pin Feature Descriptions

PIN NO.	Symbol	Description	Function
1	VDD_5V1	5V input point	Power
2	GND1	Ground	Power
3	GND2	Ground	Power
4	TM4	5V input point	Power
5	2A_BAT+1	Battery 3V input	Power
6	2A_BAT+2	Battery 3V input	Power
7	2A_BAT-1	Battery 3V Ground	Power
8	2A_BAT-2	Battery 3V Ground	Power
9	VDD_3_3V	Battery 3.3V input	Power
10	VDD_FLASH	Flash power point	Test power
11	PIO[14]1	Key test point	Test power
12	AIO1	ADC test point	Test power
13	PIO8_TX	UART TX or Programmable I/O	O
14	PIO9_RX	UART RX or Programmable I/O	I
15	PIO11	Programmable I/O	I/O
16	PIO12	Programmable I/O	I/O
17	PIO13	Programmable I/O	I/O
18	MISO	SPI data output or Programmable I/O	O
19	MOSI	SPI data input or Programmable I/O	I
20	CLK1	SPI clock or Programmable I/O	I/O
21	CS1	SPI select or Programmable I/O	I
22	PIO#1	Selects debug or programmable I/O, Pull-High: SPI debug Pull-Down: Programmable I/O line, default is	I

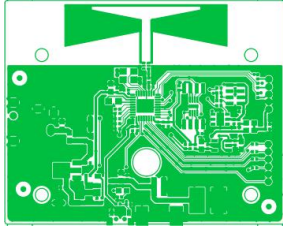


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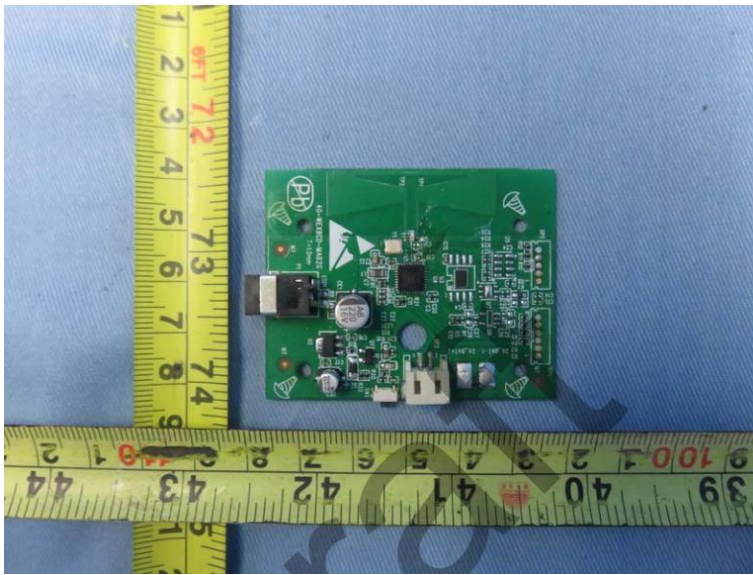
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2.2 Physical Dimensions

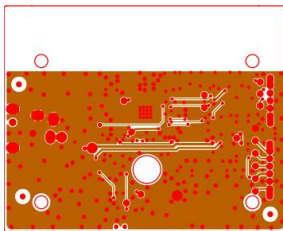
Top



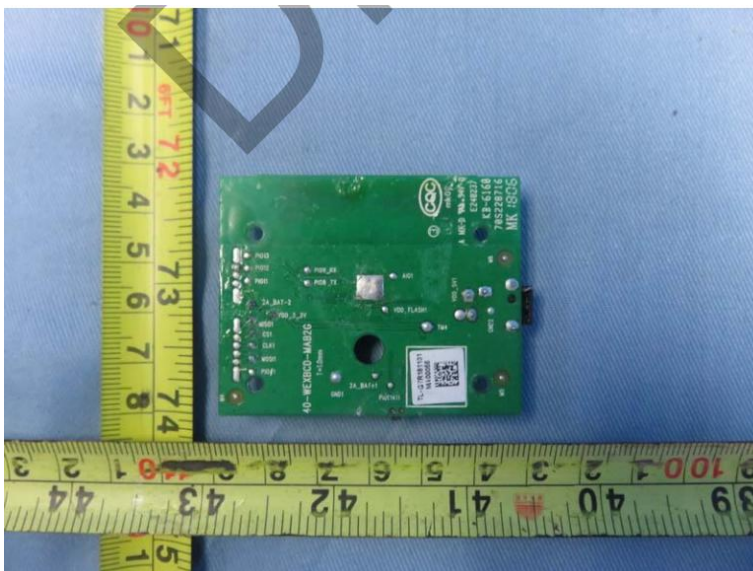
补充尺寸信息图



Bottom



补充尺寸信息图





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3.应用说明 Application Explanations

- HID: Keyboards, mice, touch pads, remote controls
- Sports and fitness sensors: heart rate, runner speed and cadence, cycle speed and cadence
- Health sensors: blood pressure, thermometer and glucose meters
- Mobile accessories: watches, proximity tags, alert tags and camera controls
- Smart home: heating control and lighting control
- Location system



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4. 电气特性 Electrical Characteristics

Electrical Characteristics	
Supply voltage	0.9 - 3.6V DC (Absolute Maximum Ratings 0-3.6V)
Working current	Depends on profiles, 3 mA (typical)
Standby current(disconnected)	3 mA
Current Consumption	
Dormant	2.0uA
Deep Sleep	13 uA
Idle	1.5 mA
Tx / Rx active	5.5 mA at 4 dBm/5.5 at -90 dBm
Weight and Dimensions (unit: mm)	
Size	56mm x 45mm x 8mm(L x W x H)
Weight	8g
Temperature	
Storage Temperature	-40° C~85° C
Operating Temperature	-30° C~85° C



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5.射频性能 RF Performance

Specification	Description	Specification	Description
RF performance			
Standard		Bluetooth 4.2	
Frequency Band		2.4 ~ 2.4835 GHz	
Modulation Method		GFSK	
Maximum Data Rate		1 Mbps	
Antenna		PCB Antenna	
Interface		UART, PIO, AIO, SPI, PCM	
Operation Range		30 meters	
Sensitivity		-85 dBm at 0.1% BER	
RF TX Power		+0 dBm (avg), +4 dBm(peak)	



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6. 认证与法规信息 Certificate & Regulation

The BQB Certification: still on-going.

R&TTE:

FCC ID:

IC ID:

SRRC:

MIC:

7. 包装信息 Package information

This module can meet ROHS&REACH compliance.XXXX

8. 环保声明 Green Policy

-----END-----

For IC:

This device complies with RSS247 of Industry Canada. Cet appareil se conforme à RSS247 de Canada d'Industrie. This device complies with Industry Canada license-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. appareils radio exempts de licence. Son fonctionnement est sujet aux deux conditions suivantes: (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

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.

The device should be installed and operated with a minimum distance of 20cm between the radiator and your body.

L'appareil doit être installé et utilisé avec une distance minimale de 20 cm entre le radiateur et votre corps.

For FCC:

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

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.
-

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

FCC RF Radiation Exposure Statement Caution: To maintain compliance with the FCC's RF exposure guidelines, place the product at least 20cm from nearby persons.

FCC Conditions

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.