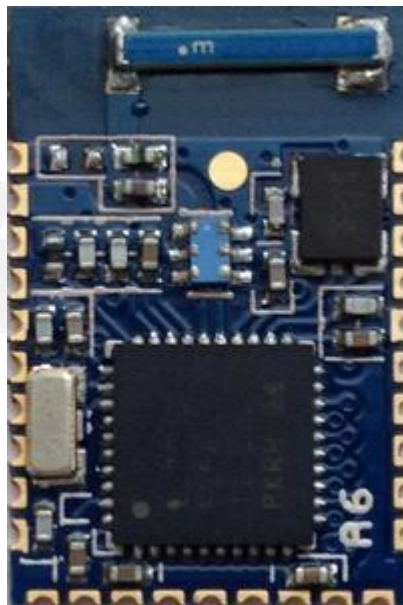


LIERDA SCIENCE & TECHNOLOGY CO., LTD.

Product Specification



Product Name: P-series BLE Module

Document version: V1.02

Contents

Chapter 1	Feature.....	1
Chapter 2	Parameters.....	2
Chapter 3	Product Specification.....	3
	3.1 boundary dimension.....	3
	3.2 Pin Definition.....	3
	3.3 real product show.....	4
Chapter 4	Typical Circuit.....	5
Chapter 5	Pakge.....	6
Appendix One	BLE Profile brief introduction.....	8
Notes to users	11



Chapter 1 Feature

Lierda P-Series Low Power Consumption High performance Bluetooth transceiver Module is designed based on TI CC2541 chip. The Module has ceramic integrate antenna, and adopts SMT attachment interface. It has a complete open port which reduces hardware design difficulties and also provide high structural and software flexibility for users. The module has low power consumption, a compact size and have high resistance to disturbance.

Based on different kinds of application firmware, Product Model offered as sheet 1-1.

Sheet 1-1 Product Model

Product Name	Model number	Remark
P-series BLE Module-hardware only	LSD4BT-P74MSTD1	No software, user development by themselves.
P-series BLE Module-unvarnished transmission master	LSD4BT-P74MMST2	Lierda BLE application in unvarnished transmission,the master device
P-series BLE Module-unvarnished transmission slave	LSD4BT-P74MLSP2	Lierda BLE application in unvarnished transmission,the slave device

Lierda P-series Module can be applicable to many occasions:

- ∅ 2.4GHz low power consumption Bluetooth system
- ∅ PC, Tablet and other BLE Handheld devices (HID device, Remote Control)
- ∅ Consumers electronics such as physical, medical and so on
- ∅ Wireless network system such as Smart meters and data collection

Chapter 2 Parameters

Sheet 2-1 Module Parameters

Item	Parameters		Remarks
Supply voltage	2.0 ~ 3.6 V (classic 3.3V)		Low power may cause failure. Over power may damage device
frequency	2402 ~ 2480 MHz		
Power consumption	Emitting	≤ 25 mA	@0dBm , MCU-32MHz
	Receiving	≤ 25 mA	@MCU-32MHz
	Sleep	≤ 1 uA	Sleep Mode
Emission power	(-23dBm ~0dBm) ±1dBm		Programmable
Operating ambient temperature range	-20℃ ~ 70 ℃		
Storage temperature range	-40℃ ~ 85 ℃		
channel	40		3 broadcast channel and 37 data transmission channel
modulation format	GFSK		Aaptive frequency hopping
Communication	BLE standrd		
I/O Control	0 ~ VCC		
Air baud rate	1Mbps		
Transmission distance	≈20m		Open and visual environment
Port type	1.27 mm Single row* 3		SMT
gain of Antenna	2 dBi (Typical)		
Application	Refer the appendix one		
Operating Humidity range	30%~70%		

All the parameters are tested at the environment of 25℃ ±3℃

Transmission distance is affected by the temperature and humidity and is only for reference

Chapter 3 Product Specification

3.1 outline dimensional drawing

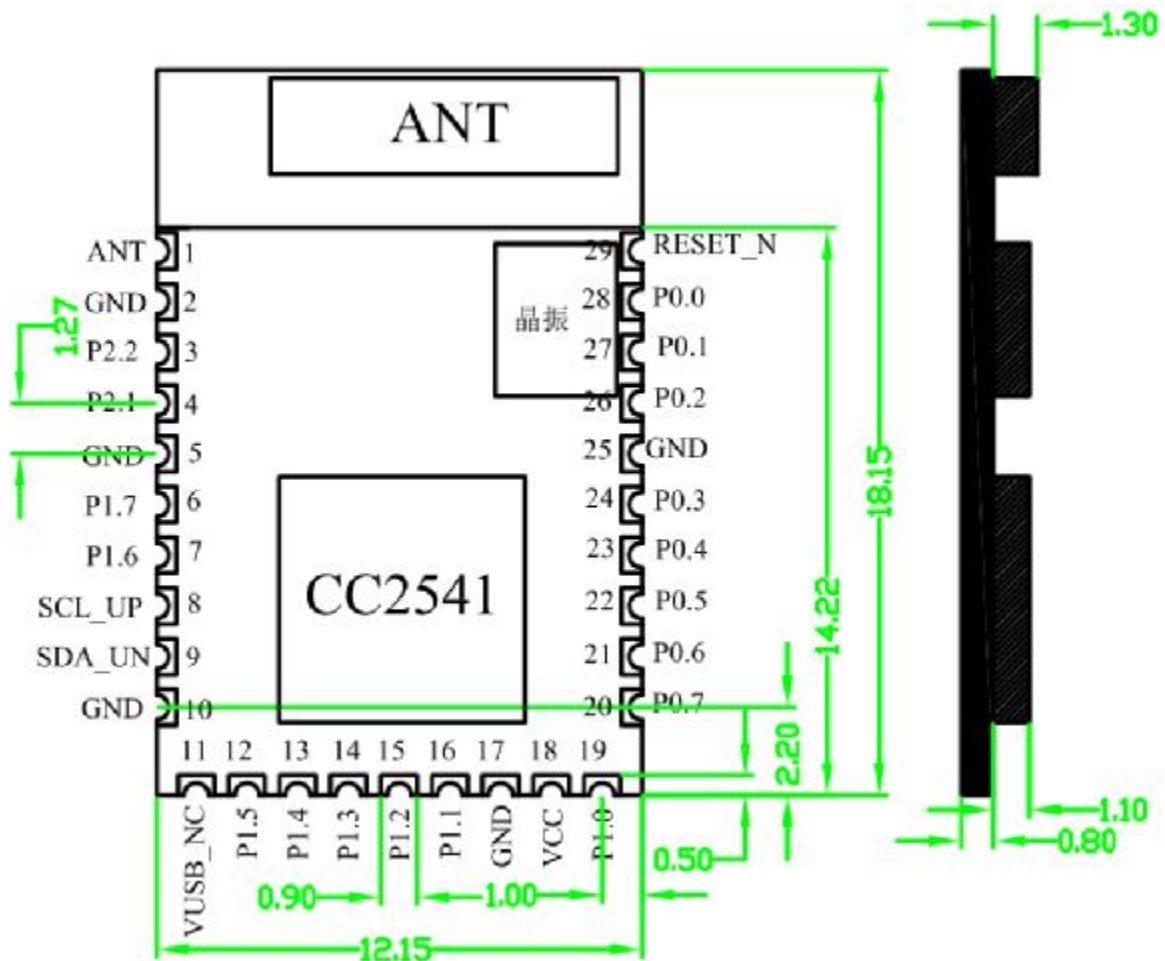


Figure 3-1 Module dimension and interface

*Size tolerance which not be marked according to GB/T1804-m standards

3.2 Pin Definition

Sheet 3-1 Pin Definition

Number	Name	功能	备注
1	ANT	Be used for the external antenna	Selected through capacitance
2	VCC	Power IN	
3	GND	Ground	All Grounding needed
4	P0.0-P0.7	I/O port	
5	P1.0-P1.7	I/O port	

Number	Name	功能	备注
6	P2.1-P2.2	I/O port	
7	SCL_UP	I2C port	SCL
8	SDA_UN	I2C port	SDA
10	REST_N	Reset	Active Low

More detail for the IO type and load capacity could be found in “CC2540/41 System-on-Chip Solution for 2.4-GHz Bluetooth® low energy Applications”, this module lead them directly.

P – Series Module did not set Reset-circuit for the REST_N pin. please refer to the chapter 4 when you design.

3.3 real product show

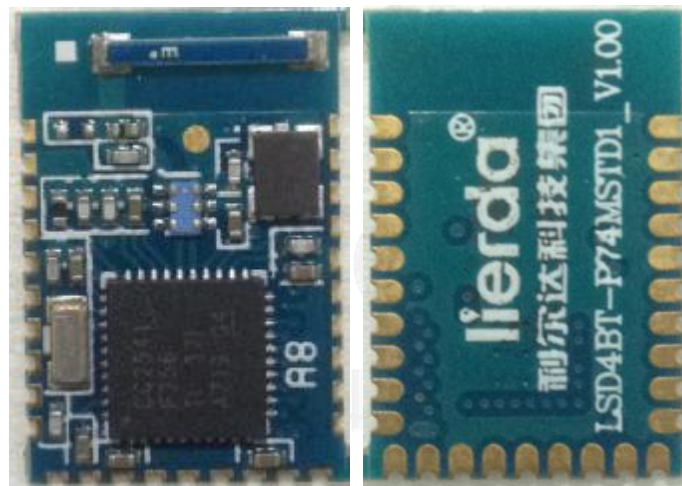


图 3-1 real product

*Pictures are for reference only, there may be differences according to different versions

Chapter 4 Typical Circuit

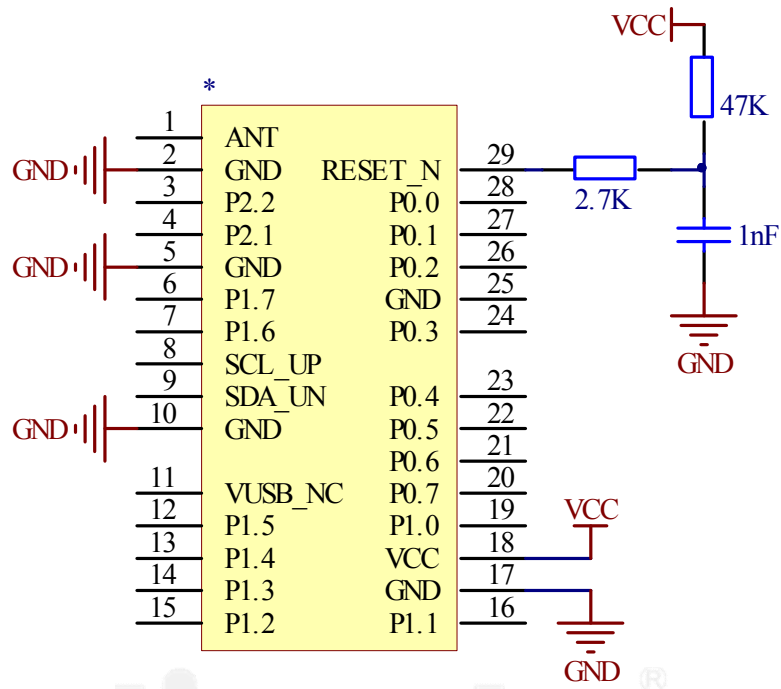


Figure 4-1 Typical application circuit

This is min-application circuit ,other circuit could be found in “<xxx> application user guide”. Module is connected to GND pin is internal, in order to ensure the current balance, suggest all connections.

Chapter 5 Pakge

1, Each one module has tape and reel packaging , and this reel transparent plastic tape attached is 32mm wide, this tape is 25.5mm waide.

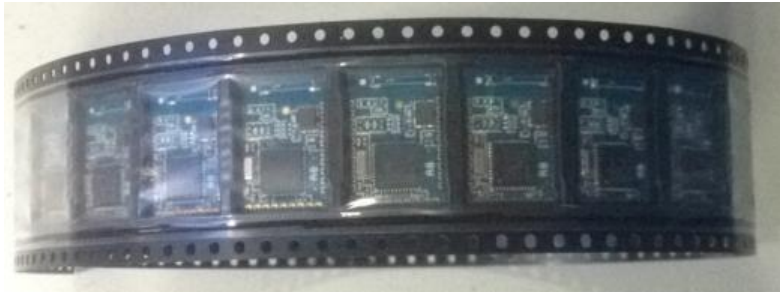


Figure 5-1 tape and reel packaging

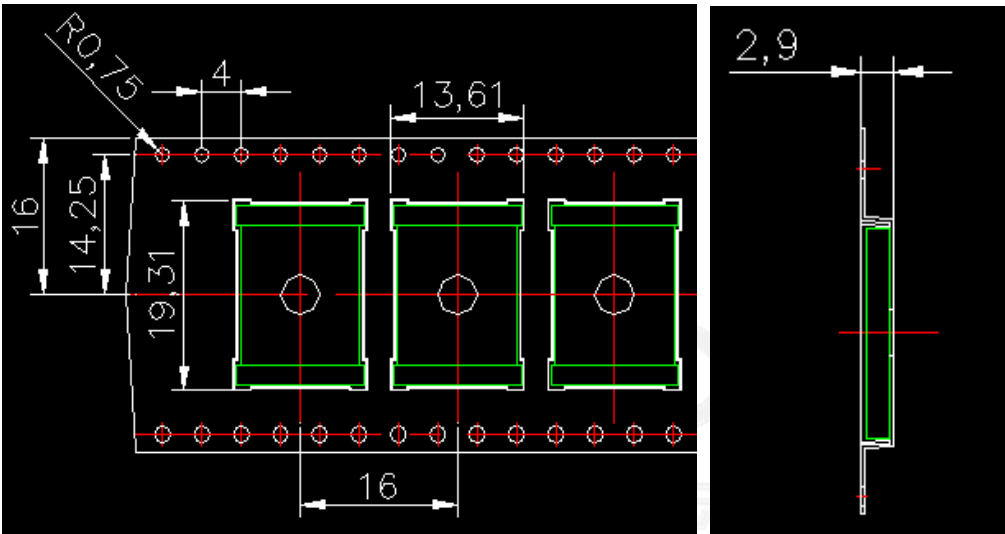


Figure 5-2 size of tape and reel

2, Each reel consists of 1600 pieces. Then put it into a antistatic bag make of PET\AL\PP material. Size of the bag are 42cm * 45cm .

3, Next put the bag into a box, size of the box are 36.5cm *36.5cm *6cm.



Figure 5-3 Whole box packaging

4, Every 5 boxes put into a case, size of the case are 37.5cm * 37.5cm * 32cm. there are total 8000 pieces in one case .



Figure 5-4 Whole case packaging

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Appendix One BLE Profile brief introduction

Bluetooth 4.0 Applications are classified into two types-The classic BR/EDR system and the BLE System. The BLE system was designed aimed to lower the power consumption and to extend the battery life of the Bluetooth system.

Those module that support both BR/EDR and BLE are called the "Dual Mode Bluetooth", whereas those that only support BLE are called the "Single Mode Bluetooth" . The L-series Bluetooth module are the Single Mode modules. For dual mode Bluetooth device, the BLE system integrates with the classic Bluetooth system to share the transceiver functions. And for the single mode Bluetooth device, they can only communicate with BLE 4.0 communication, but not with the classic Bluetooth such as 2.0, 2.1, 3.0.

The following are the Bluetooth application Profile

Sheet F-1 Classic Bluetooth Application Profile

Name	Function	Remark
A2DP	Advanced Audio Distribution Profile	
AVRCP	A/V Remote Control Profile	
BIP	Basic Imaging Profile	
BPP	Basic Printing Profile	
DI	Device ID Profile	
DUN	Dial-Up Networking Profile	
FTP	File Transfer Profile	
GAVDP	Generic A/V Distribution Profile	
GOEP	Generic Object Exchange Profile	
GNSS	Global Navigation Satellite System Profile	
HCRP	Hardcopy Cable Replacement Profile	
HDP	Health Device Profile	
HFP	Hands-Free Profile	
HSP	Headset Profile	
HID	Human Interface Device Profile	
MAP	Message Access Profile	

Name	Function	Remark
OPP	Object Push Profile	
PAN	Personal Area Networking Profile	
PBAP	Phone Book Access Profile	
SAP	SIM Access Profile	
SDAP	Service Discovery Application Profile	
SPP	Serial Port Profile	Bluetooth to Uart
SYNCH	Synchronization Profile	
VDP	Video Distribution Profile	

For the BLE ,there are new profile and specification, like sheet F-2.

Sheet F-2 BLE Application Profile

Name	Function	Remark
ANP	Alert Notification Profile	
ANS	Alert Notification Service	
BAS	Battery Service	
BLP	Blood Pressure Profile	
BLS	Blood Pressure Service	
CSCP	Cycling Speed and Cadence Profile	
CSCS	Cycling Speed and Cadence Service	
CTS	Current Time Service	
DIS	Device Information Service	
FMP	Find Me Profile	
GLP	Glucose Profile	
GLS	Glucose Service	
HIDS	HID Service	
HOGP	HID over GATT Profile	
HTP	Health Thermometer Profile	

Name	Function	Remark
HTS	Health Thermometer Service	
HRP	Heart Rate Profile	
HRS	Heart Rate Service	
IAS	Immediate Alert Service	
LLS	Link Loss Service	
NDCS	Next DST Change Service	
PASP	Phone Alert Status Profile	
PASS	Phone Alert Status Service	
PXP	Proximity Profile	
RSCP	Running Speed and Cadence Profile	
RSCS	Running Speed and Cadence Service	
RTUS	Reference Time Update Service	
ScPP	Scan Parameters Profile	
ScPS	Scan Parameters Service	
TIP	Time Profile	
TPS	Tx Power Service	

We could see that the Bluetooth SIG issue more profuse application profile for BLE. It's very suitable for low power consumption demands device.

Notes to users

1. Thanks for choosing Lierda products. Please read through this Manual before using the products. By using the products, you have understood and accept the terms and instructions in this Manual.
2. This equipment can be used in member states of the European Union once the corresponding administrative license is obtained. Lierda Science & Technology Co., LTD, as manufacturer of the product LSD4BT-P74MSTD1, declares that the said product complies with the essential requirements established in article 3 of the Council of Europe Directive 1999/5/CE, dated 9th March, 1999
3. 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. In accordance with FCC Part 15C , this module is listed as a Limited Modular Transmitter device. Therefore, the final host product must be submitted to [P-series BLE Module] for confirmation that the installation of the module into the host is in compliance with the regulations of FCC Specifically if an antenna other than the model documented in the Filing is used, a Class 2 Permissive Change must be filed with the FCC.
4. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment
5. Lierda Science & Technology Co., LTD reserves all legal rights to revise and explain the terms and information provided, without prior notices.

Lierda Science & Technology Co., LTD
Wireless Sensor Network BD
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