LSD4BT-T55ASTD001

Product Specification

Product Name：T55 BLE MESH MODULE

Product Model：LSD4BT-T55ASTD001

File Version：Rev04

文件修订历史

序号	修改日志	修改人	审核人	文件版本	修改日期
1	Initial Version	gq	sxt	Rev01	2020-6-9
2	1，Add flash operation instructions；2，Typical circuit description;	gq	sxt	Rev02	2020-8-11
3	1. Correct the repeated pin description; 2. Add distance description	gq	sxt	Rev03	2020-10-10
4	Correct writing errors	gq	sxt	Rev04	2021-01-29

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Chapter 1 Overview

T55 series low-power Bluetooth module is a high-performance Bluetooth module developed based on telink low-power Bluetooth SOC tlsr8250 chip. The module adopts stamp type and side plug-in interface, which is exquisite, compact, full port led out and easy to use. It helps users bypass the cumbersome rf hardware design, development and production. Users can easily realize the development of Bluetooth applications on this basis, Shorten the R & D cycle and help you seize the market opportunity.

Table 1-1 Model Description

Model	Description
LSD4BT-T55ASTD001	PCB antenna,not include software. If it is a product with software, please communicate the specific model and MPQ with the sales department

1.1 Module Function Characteristics

- Operation Voltage：1.8 to 3.6 V
- Operation Freq：2400MHz to 2483.5MHz
- TX Power：Max 10dBm（@3.3V）
- Rx Sensitivity：-95dBm （@1Mbps）

1.2 Application occasion

- Smartphone and tablet peripheral products
- Wireless sensor networks such as data collection
- Wireless wearable Bluetooth device
- Smart home, Smart city

Chapter 2 Specifications

Table 2-1 Absolute Maximum Ratings

			Unit
	MIN	MAX	
Supply Voltage(VDD)	-0.3	3.6	V
Supply Voltage(IO)	-0.3	VDD+0.3	V
Storage Temperature（℃）	-40	150	℃

Table 2-2 General Characteristics @Ta=25℃，VDD=3.3V

Parameter		Characteristics			Remarks
		MIN	TYP	MAX	
Operating Voltage（V）		1.8	3.3	3.6	
Operating Temperaturt（℃）		-40	/	85	
Freq (MHz)		2400	/	2483.5	
Channels		/	40	/	
Power	Tx Current(mA)	/	6.3	/	@0dBm
		/	18	/	@10dBm
	Rx Current(mA)	/	6	/	
	休眠电流(uA)	/	0.4	/	
TX(dBm)		/	10	/	
RX(dBm)		/	-95	/	BLE @1Mbps，PER≤30.8%@1500packets
Protocol		BLE 5.0			
Interface Type		3 sides stamp hole			
Communication Distance[1]		150m			Private agreement,Free environment

1."Communication distance" is affected by the surrounding environment, air humidity and other factors. The distance is measured through the communication between the mobile phone and the module for reference only.

Chapter 3 Hardware Layout and Interface Description

3.1 Overall Dimension Drawing

LSD4BT-T55 Module physical drawing is shown in the figure 3-1：

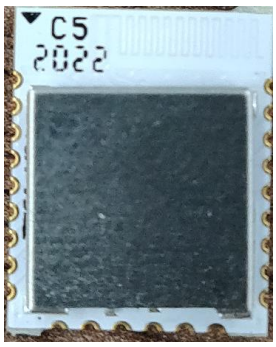


Fig. 3-1 LSD4BT-T55 Module Picture

LSD4BT-T55 Module physical Dimensions are shown in the figure 3-2：

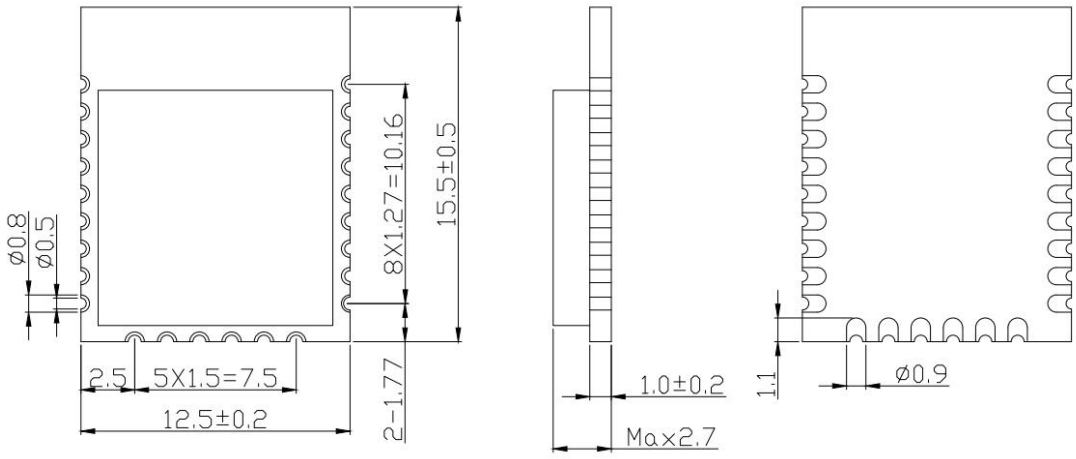


Fig.3-2 LSD4BT-T55 模块外形尺寸图

A. All linear dimensions are in millimeters.

B. Dimensioning and tolerancing per GB/T1804-m

3.2 Pin Diagram

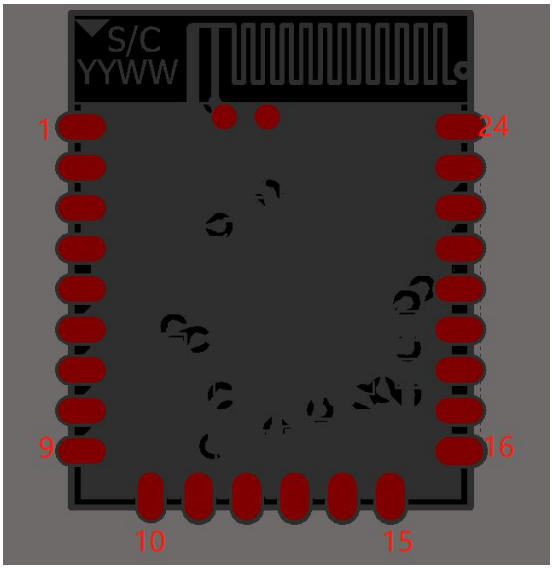


Fig.3-3 Package 24-Pin SMD

Table 3-1 LSD4BT-T55 Pin Description

Module Pin	IC Pin	Name	Fuction	Remarks
1	/	ANT	External Antenna Interface	
2	0	GND	GND	All GND shuld be connected
3	0	GND	GND	All GND shuld be connected
4	31	PWM3/PD2	General IO/PWM	
5	32	PWM1_N/PD3	General IO/PWM	
6	1	PWM2_N/PD4	General IO/PWM	
7	2	PD7	General IO	
8	3	UART_RX/PA0	General IO/UART RX	
9	4	PA1	General IO	
10	5	SWS/PA7	Debug/General IO	
11	6	UART_TX/PB1	General IO/UART TX	
12	14	PWM4/PB4	General IO/PWM	
13	15	PWM5/PB5	General IO/PWM	
14	18	VCC	Power	
15	0	GND	GND	All GND shuld be connected
16	16	ADC/PB6	General IO/ADC	
17	17	ADC/PB7	General IO	
18	20	PWM4_N/PC0	General IO/PWM	
19	21	PWM_1/PC1	General IO/PWM	
20	22	PWM0/PC2	General IO/PWM	
21	23	PWM1/PC3	General IO/PWM	
22	24	PWM2/PC4	General IO/PWM	
23	25	RST	Reset	Active low
24	0	GND	GND	All GND shuld be connected

3.3 Typical Circuit

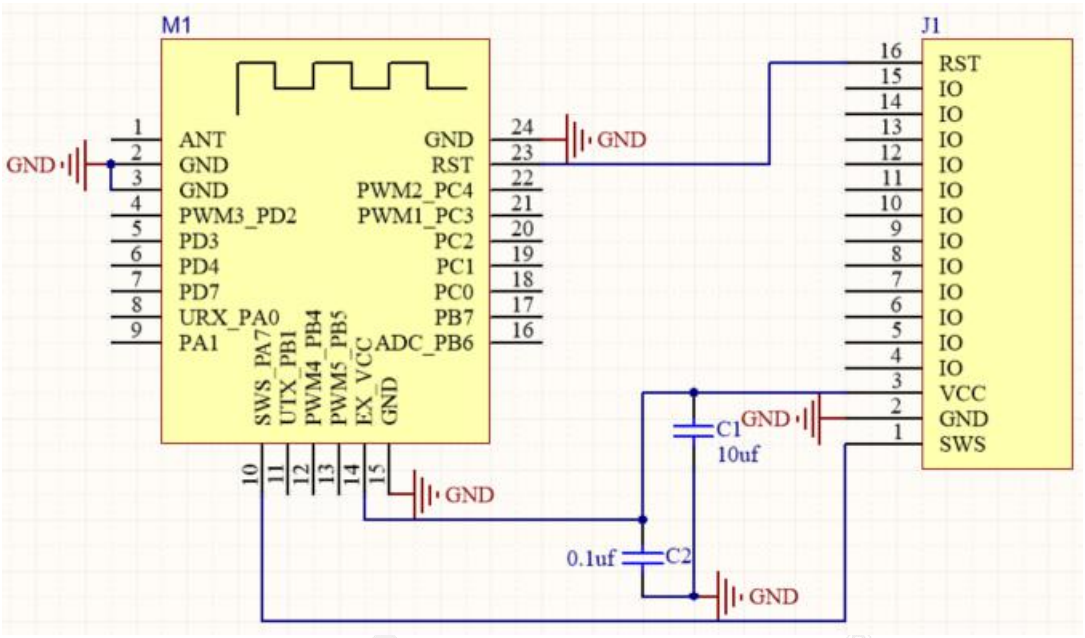


Fig.3-4 Typical Circuit(PCB antenna)

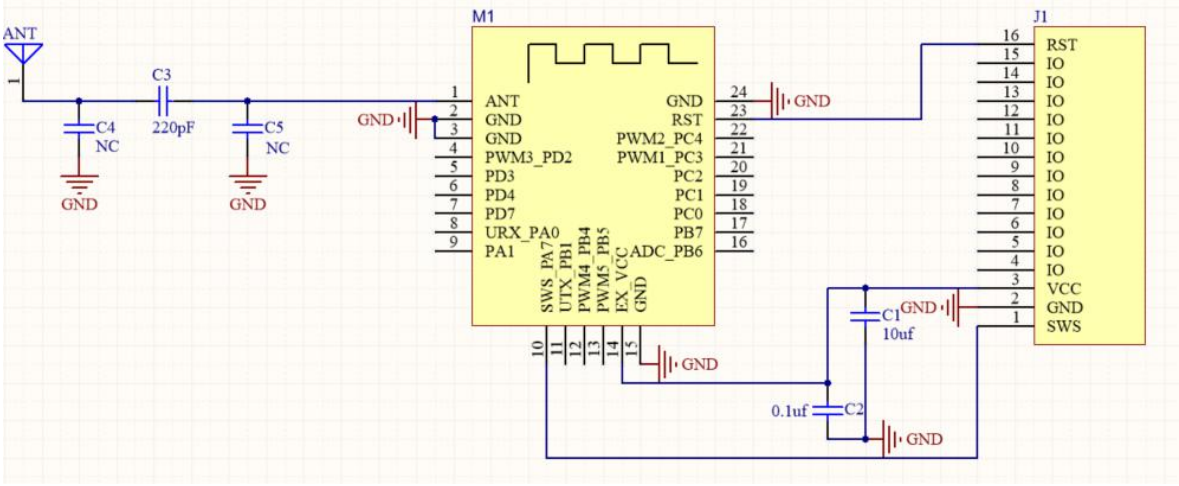


Fig.3-5 Typical Circuit(External antenna)

Chapter 4 Production Guidance

4.1 Production Guide

It is suggested the stamp hole packaging module mounted by an SMT machine, and the mounting shall be finished within 24 hours after unpacking. Otherwise, its need to repackage by vacuumizing, so as to prevent poor mounting effect due to damp.

If the package includes a humidity indicator card, it is suggested judging if the module needs to be baked according to the indication of the humidity indicator card. The baking conditions are as follows:

Baking temperature: 125℃±5℃;

The alarm temperature is set to be 130℃ ;

SMT mounting can be carried out after the temperature cools down to be <36℃ under natural conditions;

If the product is unpacked for over 3 months, please pay special attention if the product is affected with damp, because the PCB gold immersion process may lead to the oxidation of the land after more than 3 months, and may lead to such problems as false welding and missing welding during the mounting process.

In order to ensure the pass rate of reflow, it is suggested picking 10% of products for visual inspection

and AOI detection in the first time of mounting, so as to ensure the reasonableness of the furnace temperature, device absorption method and placement method;

Operators at all stations must wear the anti-electrostatic gloves during the whole production process;

4.2 Requirements on Positions of Module on Backplane

It is suggested the green oil thickness at the module position of the backplane be less than 0.02mm, so as to prevent the phenomenon that the green oil is too thick, the module is blocked up and cannot be effectively contacted with solder paste, and the welding quality is affected.

In addition, it is necessary to consider that other devices cannot be arranged within 2mm around the interface board module to ensure the maintenance of the module.

4.3 Opening Design of Steel Mesh

The thickness of the steel mesh on the backplane shall be selected by comprehensively considering the packaging type of the devices in the board, and special attention shall be paid to the following requirement ：

The land position of the module can be locally thickened to 0.15~0.20mm, so as to prevent void solder;

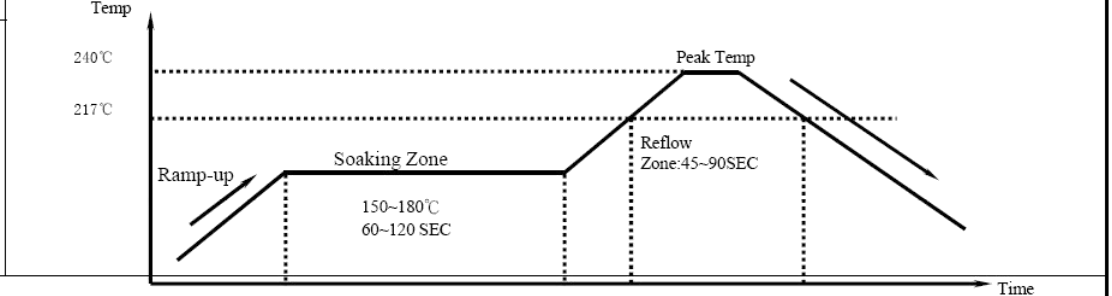
4.4 SOP for Reflow

Note: This SOP is only applicable to lead-free operation, and only for reference.

利尔达 物联网嵌入式解决方案领导者	作业指导书 Standard Operation Procedure (SOP)				批准	审核	作成	作成日
生产工段 Station	SMT		工序名 Station	回流焊				
文件编号 Doc No.	MSOP-FL-RX1060N-G01	版本 Rev A0	程序名 Program	003-RR-T-S606-S3				

作业项目

曲线图



温区参数

Zone	1	2	3	4	5	6	7	8	9	10
Top	150	150	180	180	180	195	210	240	250	240
Bottom	150	150	180	180	180	195	210	240	250	240
Conveyor speed	900	mm/min								

曲线参

	峰值温度	浸温	熔锡温度	上升斜率	回焊斜率	降温斜率
Temp Range	240±5	150--180	217	25-150		183
Time ,		60--120S	45—90S	1--3 ℃/s	1—3 ℃/s	≤4℃/s

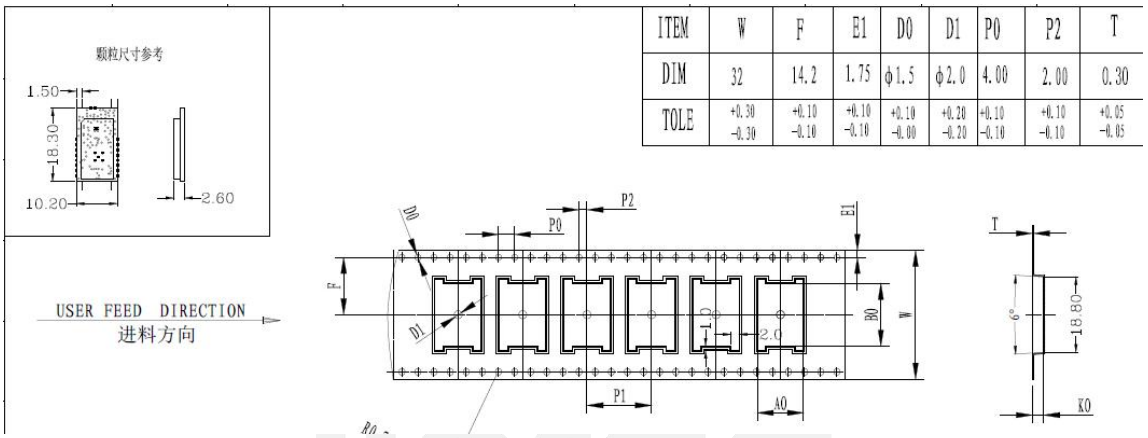
	物料名称 Description	规格	料号 P/N	位号 Location	用量（PCS	工具/设备	用量（PCS	编号	日期	修改内容
1						测温仪	1			
2						测温板	1			
3						耐高温手套	1			

Chaper 5 Product Package

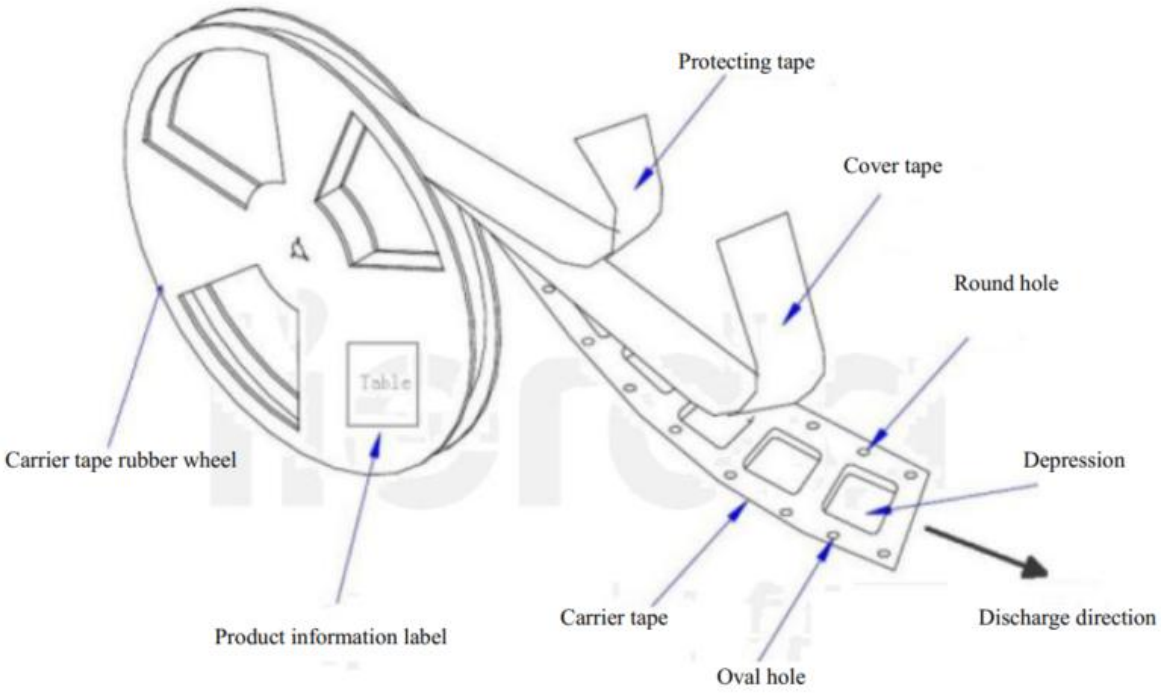
5.1 Packaging Method

■ Tape ☐ Foam ☐ Electrostatic bag

5.2 Strip Size



ITEM	W	F	E1	D0	D1	P0	P2	T
DIM	32	14.2	1.75	φ1.5	φ2.0	4.00	2.00	0.30
TOLE	+0.30 −0.30	+0.10 −0.10	+0.10 −0.10	+0.10 −0.00	+0.20 −0.20	+0.10 −0.10	+0.10 −0.10	+0.05 −0.05



Conformity

FCC regulatory conformance：
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.
Warning: Changes or modifications 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

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

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

ORIGINAL EQUIPMENT MANUFACTURER (OEM) NOTES

The OEM must certify the final end product to comply with unintentional radiators (FCC Sections 15.107 and 15.109) before declaring compliance of the final product to Part 15 of the FCC rules and regulations. Integration into devices that are directly or indirectly connected to AC lines must add with Class II Permissive Change.

The OEM must comply with the FCC labeling requirements. If the module's label is not visible when installed, then an additional permanent label must be applied on the outside of the finished product which states: "Contains transmitter module FCC ID: **N8NLSD4BT-T55**". Additionally, the following statement should be included on the label and in the final product's user manual: "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 interferences, and
(2) this device must accept any interference received, including interference that may cause undesired operation."

The module is limited to installation in mobile or fixed applications. Separate approval is required for all other operating configurations, including portable configuration with respect to Part 2.1093 and different antenna configurations.

A module or modules can only be used without additional authorizations if they have been tested and granted under the same intended end‐use operational conditions, including simultaneous transmission operations. When they have not been tested and granted in this manner, additional testing and/or FCC application filing may be required. The most straightforward approach to address additional testing conditions is to have the grantee responsible for the certification of at least one of the modules submit a permissive change application. When having a module grantee file a permissive change is not practical or feasible, the following guidance provides some additional options for host manufacturers. Integrations using modules where additional testing and/or FCC application filing(s) may be required are: (A) a module used in devices requiring additional RF exposure compliance information (e.g., MPE evaluation or SAR testing); (B) limited and/or split modules not meeting all of the module requirements; and (C) simultaneous transmissions for independent collocated transmitters not previously granted together.

This Module is full modular approval, it is limited to OEM installation ONLY.
Integration into devices that are directly or indirectly connected to AC lines must add with Class II Permissive Change. (OEM) Integrator has to assure compliance of the entire end product include the integrated Module. Additional measurements (15B) and/or equipment authorizations (e.g. Verification) may need to be addressed depending on co-location or simultaneous transmission issues if applicable. (OEM) Integrator is reminded to assure that these installation instructions will not be made available to the end user