TOPTECH TPL3936 Dual BLE 5.0 Mode Bluetooth Module Owner's Manual

Contents

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TOPTECH TPL3936 Dual BLE 5.0 Mode Bluetooth Module

Introduction

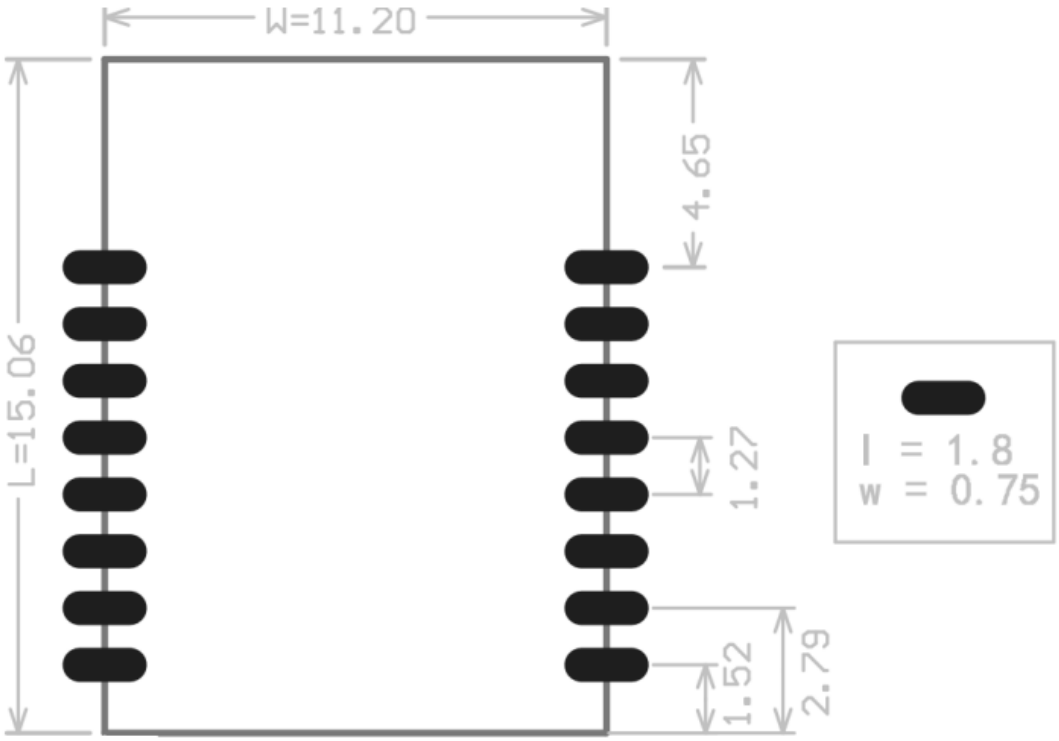
TPL3936 is a BLE 5.0 dual mode Bluetooth module with a built-in Bluetooth protocol stack, which can be used for short distance music transmission and can be easily connected to Bluetooth devices such as mobile phones to achieve wireless music transmission. And synchronization can support data transmission function, which can be widely used in various application scenarios that require both audio transmission and data transmission
The other main features of the module are as follows:

- 32KB SRAM Built in 4Mbit flash, 48KB SRAM
- Support various profiles such as A2DP, BLE, AVRCP, HFP, SPP, HID, etc
- Support low power Bluetooth data transparent transmission
- Support AT command control
- Ultra small package

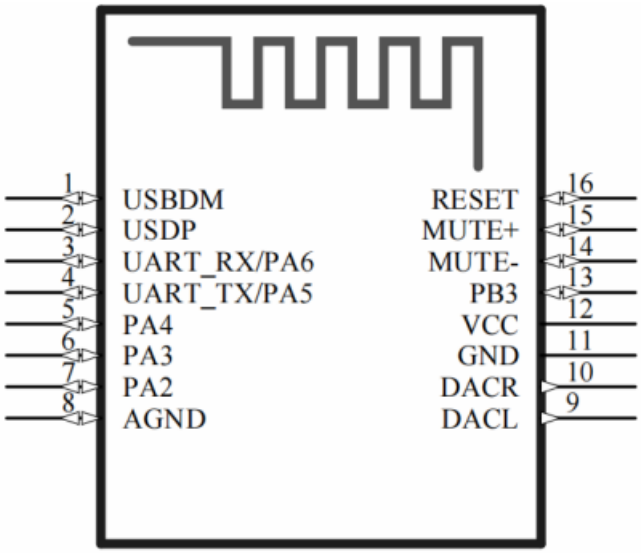
Module Parameters

Item	Parameters
Module Name	TPL3936
Package	SMT Stamp Hole
Size	11.20×15.06 (±0.2)MM
Voltage Range	3.5V~5.5V Recommend 5V
Wireless Standard	Bluetooth 5.0
Frequency Range	2400~2483.5MHz
Output Power	5dBm
Sensitivity	-92dBm
Default Communication interface	UART
FLASH Size	4Mbit
RAM Size	32KB
GPIO Number	10
Work Temperature	-20℃~+75℃
Storage Temperature	-20℃~+75℃

Module Size



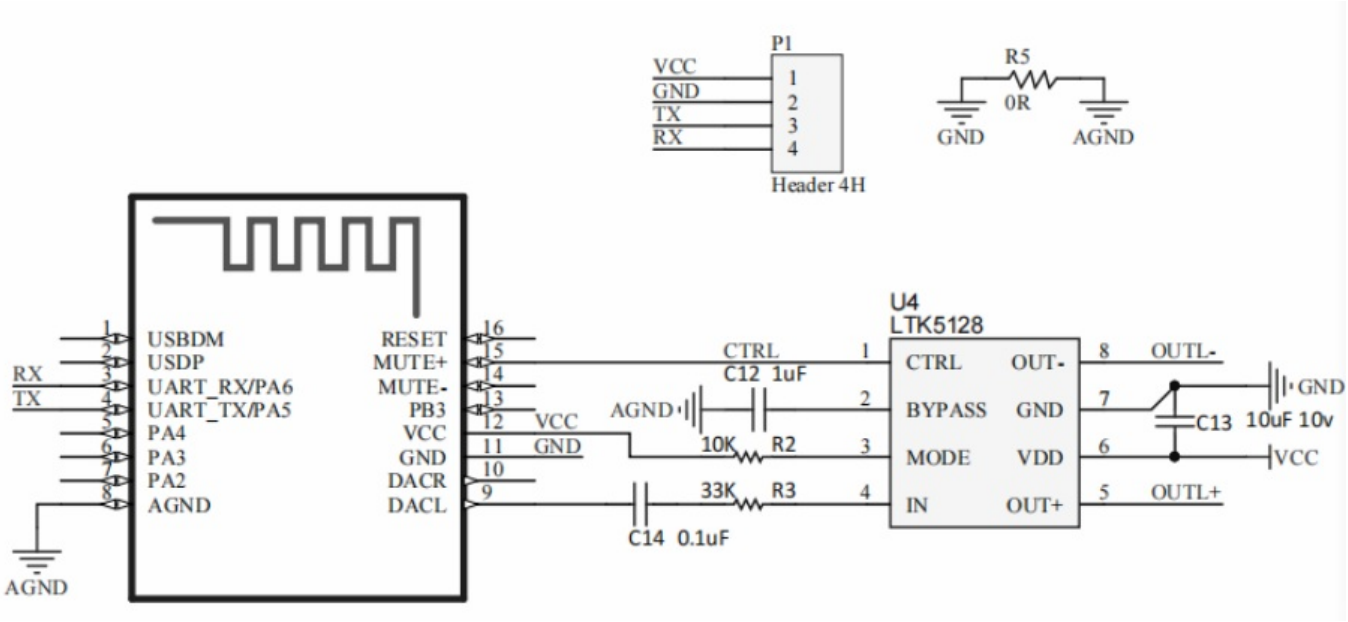
Pin Definition



serial number	name	pin	Function	Remark
1	USBDM	USB Data Minus	USB_D-	Debug Port
2	USBDP	USB Data Positive	USB_D+	Debug Port
3	UART_RX	Digital I/O	Communication serial port RXD	
4	UART_TX	Digital I/O	Communication serial port TXD	
5	PA4	Digital I/O	Multiplexing LineIn Right Channel	Input DC isolation capacitor

6	PA3	Digital I/O	Multiplexing LineIn left channel	Input DC isolation capacitor
7	PA2	Digital I/O	LineIn input control	Low level enable LineIn mode
8	AGND	AGND	Analog ground	Connect to the power amplifier BYPASS and t hen connect to GND
9	DACL	Audio output	Left channel output	Audio output port
10	DACR	Audio output	Right channel output	Audio output port
11	GND	GND		
12	VCC	Power	3.5V~5.5V Recommend 5V	5V power supply, capable of connecting a 10 R resistor in series with the power supply
13	PB3	Digital I/O		
14	MUTE-	Digital I/O	Power amplifier off control low effective	Pull down the amplifier to mute
15	MUTE+	Digital I/O	Power amplifier shutdown control highly effective	Raise the power amplifier to mute
16	RESET	reset	reset	

Reference Design

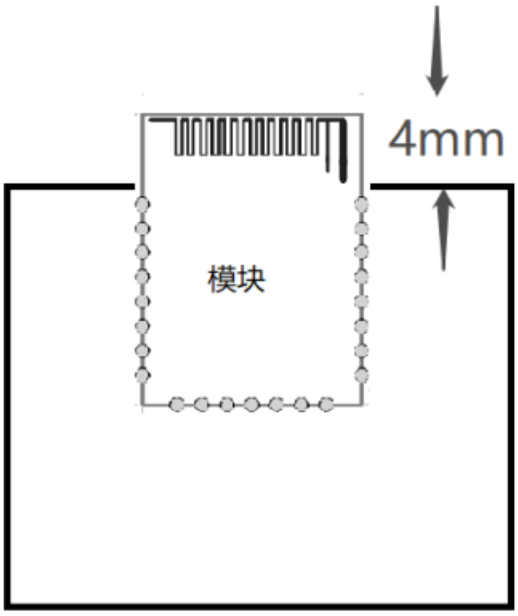


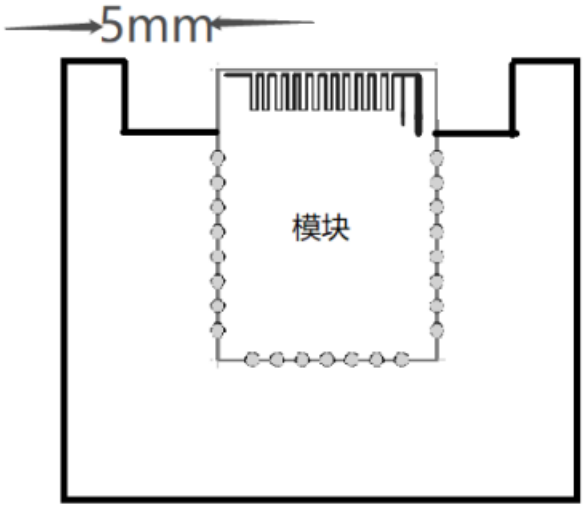
Hardware Design Considerations

Module placement requirements on the bottom plate

1. In order to meet the performance of the antenna on board, it is forbidden to place metal parts around the antenna, away from high frequency devices.Avoid using metal in the product housing and keep metal screw inside away from the RF part of the module.
2. Pay attention to the layout of the module on the soleplate, and minimize the impact of the soleplate on the performance of the module PCB antenna.

The following are suggested: Option 1: Place the module at the edge of the motherboard and the antenna area extends beyond the edge of the motherboard. Option 2: Place the module at the edge of the motherboard, which empties an area at the antenna position. Option 3: If the above scheme is limited and cannot be implemented, make sure that the area of the module PCB antenna and the area of 5 mm extension need to be cleared (copper, wiring and placement of components are strictly prohibited).



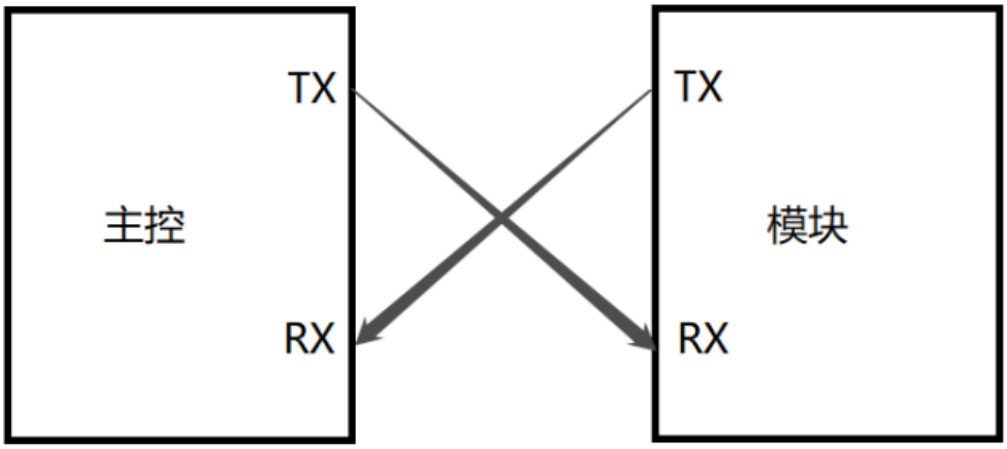


power supply requirements

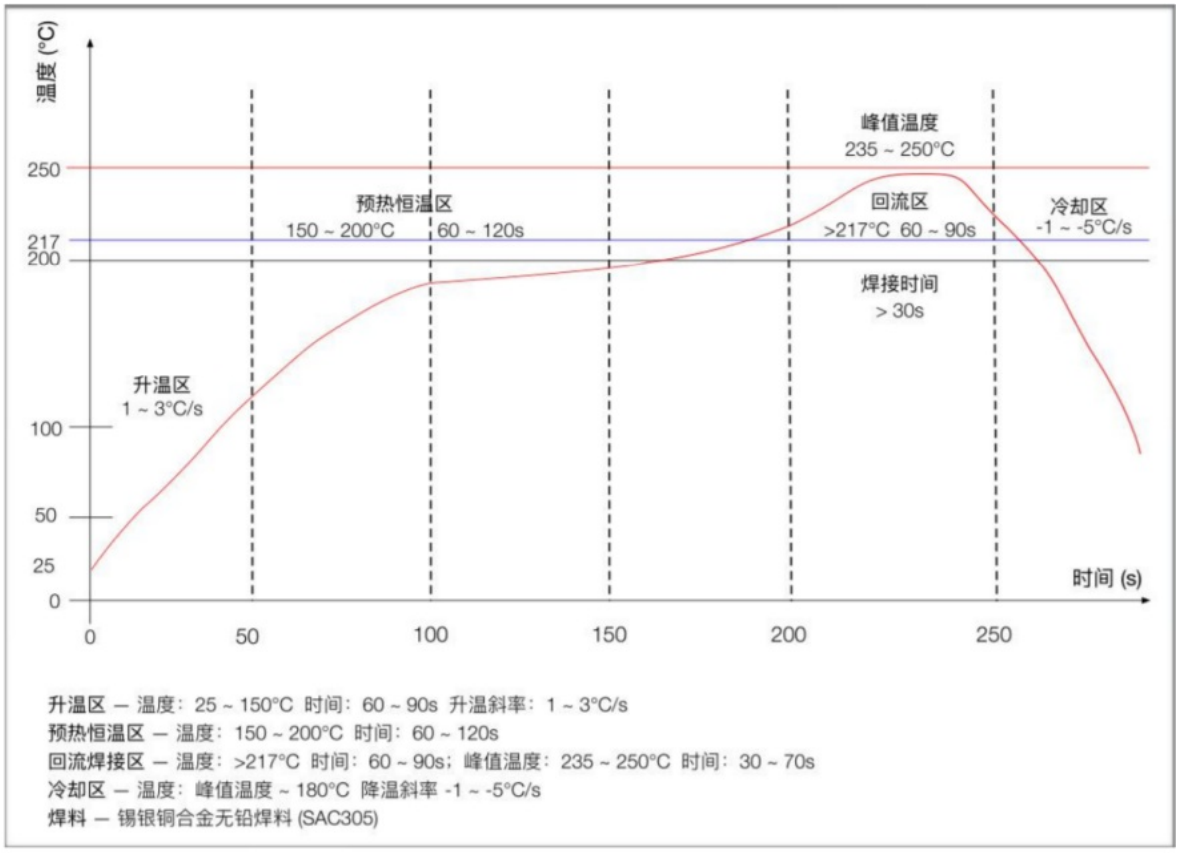
(1) It is recommended to use DC regulator power supply to supply power to the module. The power ripple factor is as small as possible and the module needs to be grounded reliably. Please note that the correct connection between the positive and negative poles of the power supply, such as reverse connection may cause permanent damage to the module. (2) Check the power supply to ensure that between the recommended supply voltage, if the maximum value is exceeded, the module will be permanently damaged; check the power supply stability, the voltage should not fluctuate significantly and frequently; (3) Recommend 3.3V voltage, LDO power supply is recommended; if using DC-DC, ripple control is recommended within 30mV.The DC-DC power supply circuit suggests reserving the position of the dynamic response capacitance to optimize the output ripple when the load varies greatly.

UART Communication

UART communication between module and master MCU through serial port supports full duplex transmission and reception of TX and RX.



Reflow Profile



FCC Statement

FCC standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247
Integral antenna with antenna gain 3 dBi

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.
Any 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.

FCC Radiation Exposure Statement
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: 2AZYO-TPL3936 Or Contains FCC ID: 2AZYO-TPL3936"
When the module is installed inside another device, the user manual of the host must contain below warning statements;

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.

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:

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- 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.

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.
Any company of the host device which install this modular with modular approval should perform the test of radiated & conducted emission and spurious emission,etc. according to FCC part 15C : 15.247 and 15.209 &

15.207 ,15B Class B requirement, Only if the test result comply with FCC part 15C : 15.247 and 15.209 & 15.207 ,15B Class B requirement then the host can be sold legally.

Documents / Resources

	TOPTECH TPL3936 Dual BLE 5.0 Mode Bluetooth Module [pdf] Owner's Manual 2AZYO-TPL3936, 2AZYOTPL3936, TPL3936 Dual BLE 5.0 Mode Bluetooth Module, Dual BLE 5.0 Mode Bluetooth Module, BLE 5.0 Mode Bluetooth Module, Bluetooth Module