2.4G High Power Special RF Module for Aeromodelling Use

SPECIFICATION

Model No.: DL-297LPA

Version: V1.0

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Before using this module, please pay attention to the following important matters:

This module is an electrostatic sensitive product. Please operate it on an anti-static workbench during installation and testing.

This module defaults to using an external antenna, you can choose wire antenna or standard UHF antenna, according to the using condition, if there is metal case of the final product, please make sure install the antenna on the metal shell, otherwise it will lead to serious attenuation of radio frequency signals, which will affect the effective use of distance.

Metal objects and wires should be kept away from the antenna as much as possible.

When installing the module, nearby objects should be kept at a sufficient safety distance from the module to prevent short circuit damage.

This module should be used in a dry environment. Please do not make any liquid substance come into this module.

Please use an independent voltage regulator circuit to supply power to this module, and avoid sharing with other circuits. The tolerance of the power supply should not be less than 5%.

Limitations:

This module is intended to be embedded in the customer's terminal product application, and does not provide a casing itself. It is not recommended that the customer directly resell this module as a final product without permission.

This series of modules are in accordance with commonly used international standards. If there is any special certification needed, we can adjust certain indicators according to your needs.

This module cannot be applied to life rescue, life-support systems, or any occasion where personal injury or life threatening may cause by equipment failure. Any organization or individual carrying out the above-mentioned applications shall bear all risks at their own.

1. Brief Introduction

DL-297LPA is a single-chip wireless transceiver module which works in ISM band of 2.400 ~ 2.483ghz. The module integrates RF transceiver, frequency generator, crystal oscillator, modem and other functional modules, which supports "one to many" networking and communication mode of ACK. Transmission output power, working channel and communication data rate can be configured.

The module is a low cost 2.4G module with low power consumption, 2μ sleep current, and very few components, it has a compact size but excellent performance, easy to use. Its transmitting power is up to 20dbm, with strong anti-interference performance, high near channel rejection of the receiving filter, and good receiver selectivity.

The module adopts single chip architecture, high-precision crystal, high Q-value Murata inductor and small volume high-capacity filter capacitor. SMD components are used in the whole system, and the interface adopts stamp edge packaging form with standard spacing, which is conducive to the development of compact system and the application of SMD mass production.

2. Typical application:

- Aero-model ● RFID (Active Tag) ● Wireless mouse and keyboard
- Remote control toy ● Remote control of TV / Set-top box
- Wireless game handle ● Smart home & Security system

3. Features

- GFSK communication mode;
- Low power consumption, sleep current @ 2μA;
- Working frequency: 2400-2483Mhz;
- Working voltage: 2.3V-3.3V;
- SPI interface communication, the maximum interface speed is 4Mbps;
- Maximum transmitting power can reach 20dbm, and the receiving sensitivity can reach - 103dbm;
- Support the maximum data length of 32 bytes (two-level FIFO) or 64 bytes (single level FIFO);
- Support RSSI detection function;
- Support automatic response and automatic retransmission;
- With automatic scrambling code and CRC verification function.

4. Pins Definition
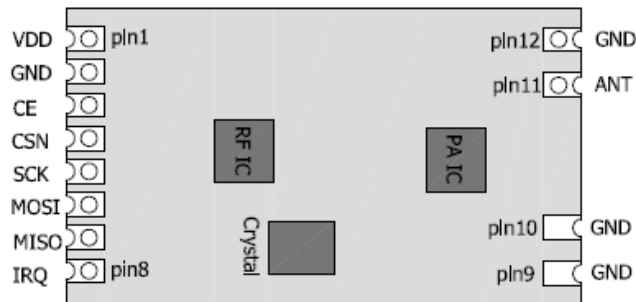
Pin	Definition	Function	Remark
1	VDD	Power Supply: 3V	RF VDD
2	GND	Grounding, common ground with the system	
3	CE	Mode chip selection signal	
4	CSN	SPI chip select signals	
5	SCK	SPI Clock signals	
6	MOSI	SPI data input, MOSI	
7	MISO	SPI data output, MISO	
8	IRQ	Interrupt signal	

Table 1: Pin Definition of DL-297LPA

5. Product Size
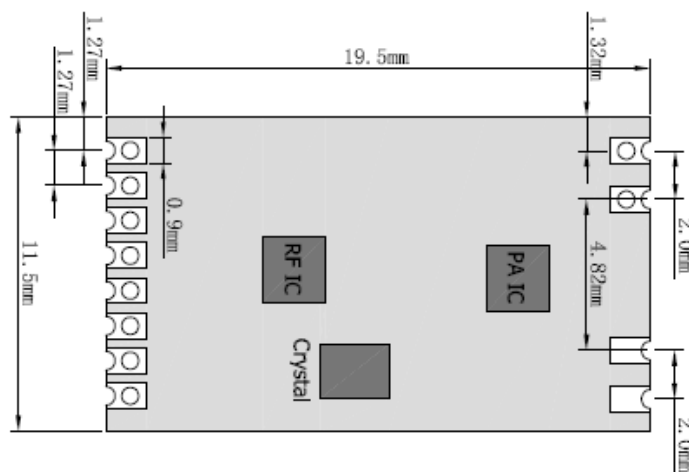
Figure 1: Product Size

6. Technical Parameters:

DC Features:

Description	Min.	Max.	Unit
Power supply voltage	2.2	3.3	V
Working current	RX < 20mA	TX < 120mA@22dbm	mA
Stand-by current		< 2uA	mA
Working temperature	-40	85	℃
Storage temperature	-40	125	℃

Table 2: DC Features of the module

*Note 1: Set more than one value into maximum ratings in use will cause permanent damage to the device.
*Note 2: It is an electrostatic sensitive device, please comply with the protection rules during operation.

RF Features (unless otherwise stated, Temperature is 25℃, VCC = 3V±5%)

No	Description	Parameter Range			Unit
		Min.	Type.	Max.	
1	Applied Frequency Range	2400		2483	MHz
2	Frequency Interval		100K		Hz
3	Transmit Power	-30		22	dBm
4	Reception sensitivity		-103		dBm
5	Modulation mode	GFSK	2-FSK	OOK	MSK
6	Transmission speed	250		2000	Kbps
7	Communication Distance	500	600	650	M
8	Standby Power Consumption			0.9	uA
9	Crystal Precision		10		PPM

Table 3: High Frequency Characteristic of the module

*Note 1: the receiving sensitivity of channels with integral multiples of 16MHz crystal oscillator (such as 2416, 2432MHz, etc.) and adjacent channels with plus or minus 1MHz is degraded by 2dB; the transmitting signal modulation accuracy (EVM) is degraded by 10%.

*Note 2: the transmission data length in 250kbps mode is Max.16 bytes.
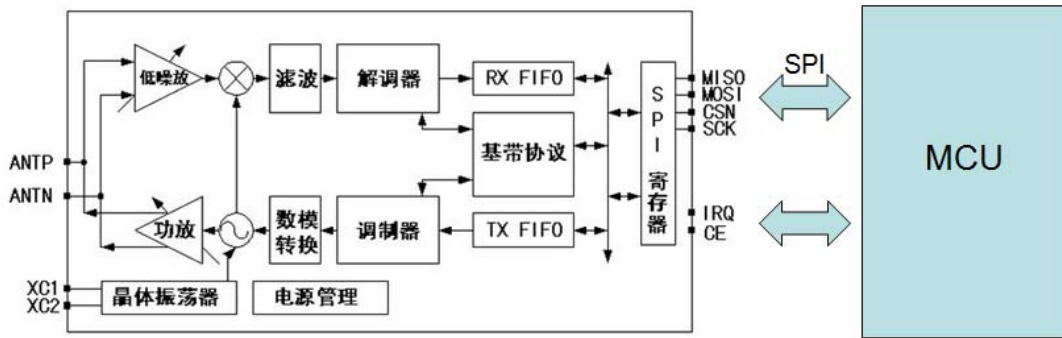
7. Module Connection Diagram (TTL Level):

Figure 2: Module connection diagram

8. Applications

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9. Notice in Module Application

Considering the complexity of data transmission, radio frequency modulation mode of data and some inherent characteristics of electromagnetic waves, the following aspects should be considered in the application process.

1. The electromagnetic interference of the application environment will affect the actual distance of the remote control. Electromagnetic wave interference can be divided into power transformer, main board power supply interference, TFT screen data layout interference, Flash/DDR/SDRAM data exchange interference, as well as carrier co-frequency interference, noise interference, interference from high-power signal source in the air, and so on.

2. The dimensions of the products, the internal space, the coating of the housing and other factors will cause the attenuation of the wireless signal, which will affect the remote-control distance. Usually the narrow space inside the product is not conducive to the extension of the antenna. The outer shell should avoid metal or metal coating as much as possible. The antenna should be wounded along the inner wall of the outer shell.

3. Selection of antenna is very important. Antenna is an important part of the communication system; its performance directly affects the indicators of the communication system. Users must pay attention to its performance (antenna type, antenna electrical performance) when choosing the antenna. Therefore, when choosing the antenna, you can contact us for advice or recommendation...

10. Contact us

Shenzhen DreamLnk Technology Co., Ltd
★ Data collection, Smart home, Internet of Things applications, Wireless remote-control technology, Remote active RFID, Antennas ★

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