6. How to avoid interference

As work in the 2.4G ISM band BK24x1, this band has a lot of other equipment in common, so there are many interfering signals, can be divided into two categories: continuous interference (WLAN signal) and burst interference (Bluetooth signal). Most of the time, BK24x1 continued to work in a frequency without interference, but the power on the device or detect disturbance, PTX and PRX need to search the frequency to find a frequency without interference to communications. Frequency interference for the search and avoid, to implement more flexible, the user can according to the actual application, their own definition of algorithms and rules.

6.1. Frequency search

(1). NOACK packet transmission

Common method is to: PRX and PTX pre-defined sequence of frequency, the frequency at different speeds, switching between send and receive data packets, due to the frequency of PTX PRX and switching speed, so that, at some point, a frequency If PRX receive data packets, while PTX PRX made software also received reply packet, it shows that there is no frequency interference, which PTX PRX and stop frequency switching, fixed at the frequency to communicate. Frequency point in the search, you can use the command REUSE_TX_PL to send packets to speed up the search. In the communication process, if communication can not be either a period of time or a response packet received the packet, then re-entering the search frequency phase or dormant.

(2) ACK packet transmission

ACK packet transmission for the model, PTX can MAX_RT or TX_DS interrupt to determine whether the packet sent successfully, if the sending fails, PTX for retransmission, if several retransmissions still fails to start switching to the next frequency to send; PRX If time does not receive packets to switch to the next frequency receiver. As the frequency of PTX and PRX switching speed is not the same, so, in a moment, if the two sides succeeded in sending and receiving a frequency, then the frequency is available.

6.2. Interference Detection

The presence of Bluetooth interference burst, because Bluetooth is usually the presence of a frequency less than 625 us, will be re-issued delay is set to 700us can not guarantee two launches are subject to interference. For the continuous interference signals such as WLAN signal, the PRX mode, the user to detect by CD, CD detection methods in comparative table see "CD detection" item. However, in PTX mode, through the CD to detect continuous interference, not a good way. This is because:

υ need to switch to RX mode detection CD, will consume a large current, waste more time.

υ many devices transmit packets in the air for about 100-300us, there may be no interference detection, a few us, another case of interference.

υ Bluetooth frequency-hopping devices may interfere with the BK2421 of a package, but BK24x1 the next retransmission is likely to be successful.

υ directional antenna and multipath fading will affect the detection of CD.

7. Other FAQ

7.6. How to make Power down mode current consumption is the lowest?

BK2421 CSN need to set high, CE is set low, if the line, there are pull-up resistor, CLK and MOSI to be set high, if the line does not pull, CLK and MOSI to be set low. Please also note that pin MCU idle processing.

7.7. How to control the output power?

Note Bank1_REG4 default setting for "0xD99E860B"; control the output power of the composition by the three bit RF_PWR [2:0], with the highest bit RF_PWR [2] in Bank1_Reg4 [20]; the other two RF_PWR [1:0] in Bank0_Reg6 [2:1], output power values as follows:
RF_PWR [2] = Bank1_Reg4 [20]
RF_PWR [1:0] = Bank0_Reg6 [2:1]

RF_PWR[2]＝ Bank1_Reg4[20]	RF_PWR[1:0]＝ Bank0_Reg6[2:1]	输出功率(dBm)	电流（mA）
1	11	5	23
1	10	0(默认值)	17
1	01	-5	15
1	00	-10	13
0	11	-25	12
0	10	-30	11
0	01	-30	11
0	00	-40	11

Figure 13 Output power control table

7.8. How to make the receiver sensitivity becomes even worse, to control communication within a shorter distance?

In order to communicate only within a shorter distance (such as on the original code), in addition to control output power to a minimum, you can also control the receiver sensitivity, the need for Bank0_REG6 [0] = 0, sensitivity of 20dB or so will be worse.

7.9. How FEATURE register Bank0_REG29 and Bank0_REG7 [7] = RBANK?

In the read and write these registers, you need to pass ACTIVATE (0x73 or 0x53) command to activate. The user should activate the register read the register before, only read out to 0 under the circumstances that activate the command. Activated, again written to the register value should be written. If itself is activated, the next command will become inactive after; in non-activated state, the return value is 0.

7.10. Multiple consecutive Plug Power, why communication sometimes fails?

After a short power-down because the register, the existence of large capacitor on the power supply charge will not be entirely off the power, so the registers may not be lost after power off, re-power the power will not return to the default value, so in writing ACTIVATE command (0x73 or 0x53) must be read when FEATURE (0x1D) or Bank0_REG7 [7] = RBANK value, if the relevant register has been activated, the initialization would not write ACTIVATE command, otherwise would have been activated into a non-active register.

7.11. Why do I set the number of automatic retransmission for non-ARC 0, the system did not automatically re-issued?

If you want to resend error BK2421, send and receive both parties must be Bank0_REG1 = EN_AA Pipe corresponding enable registers. Both send and receive communications such as the use of Pipe0, you will need Bank0_REG1 [0] = 1.

7.12. EN_DPL and EN_AA the difference between the working conditions?

EN_DPL and DPL_Px	EN_AA	Help
0	0	Compatible with the old Nordic chips, using the old format, and no Enhanced ShockBurst mode.
0	1	RX_PW_Px register by the static load to determine the length, the length of the transmitter and receiver the same load. To work in the NOACK mode, to be REG1D [0] = EN_DYN_ACK = 1, issued W_TX_PAYLOAD_NOACK command.
1	0	Dynamic load length, with the command W_TX_PAYLOAD send NOACK package.
1	1	To work in the NOACK mode, to be REG1D [0] = EN_DYN_ACK = 1, issued W_TX_PAYLOAD_NOACK command.

Chart 14 EN_DPL and EN_AA different working conditions

7.13. How to MAX_RT status bit is cleared?

Chip sends a ACK packet, if the retransmission number exceeds ARC, will cause MAX_RT interrupt. TX FIFO is not only the data packets in order to completely remove MAX_RT interrupt. If the TX FIFO has data packets, in the Qing MAX_RT interrupted, the system began in the first retransmission FIFO push of a packet until the transmission is successful or the number of retransmission over again ARC. If you want to discard the TX FIFO in the packet, you can do FLUSH TX FIFO order, the TX FIFO empty. Clear MAX_RT need to turn it performs the following steps:

- the TX FIFO empty (FLUSH TXFIFO);
- clear MAX_RT flag;

RX_DR and TX_DS interrupt their writing as long as 1, respectively, can be cleared.