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CW32W031 Smart Search Reference

Application note

Rev 1.0

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1 Introduction and Notes

The CW32W031 chip provides an smart search function for the implementation of lightweight gateway devices. It enables intelligent identification of SF parameters in the channel during reception for the purpose of receiving data from different SF signals.

The current version of the chip only supports searching SF7-11, not SF12 Smart Search at the moment.

2 Software design reference

To use this function, the transmitter and receiver need to be configured accordingly.

SDK interface functions:

uint32_t rf_set_all_sf_preamble(uint32_t sf)

SF parameter configuration: SF_7/SF_8/SF_9/SF_10/SF_11

uint32_t rf_set_all_sf_search(void)

uint32_t rf_set_all_sf_search_off(void)

2.1 Receiver configuration

Configure rf_set_all_sf_search() on the receiver side before reception to turn on the smart search function. At this point, the chip will be able to receive data from different SF signals on the same channel and then just follow the normal process.

When this function needs to be switched off, the receiver side is configured with rf_set_all_sf_search_off(). In this case, the chip can only receive data from the specified SF signal on the same channel, and then just follow the normal process.

As the smart search mode modifies the reception threshold, users are advised to call the rf_set_all_sf_search_off() function after using the smart search function, which turns off the smart search function and restores the reception threshold.

2.2 Transmitter configuration

The transmitter needs to configure different preamble lengths for different SF values before sending. When in use, the rf_set_all_sf_preamble(uint32_t sf) interface function can be configured according to the SF value used for transmitting.

In smart search mode, the preamble length at the transmitter is increased appropriately, i.e. it increases the transmitting duration of the chip. In non-smart search mode, the default preamble value for the transmitter is 8.

2.3 Smart search range configuration

The smart search function supports the configuration of different SF search ranges according to actual requirements. The default configuration in the SDK is to support all SF searches (SF7~11 are currently supported, SF12 is not supported).

If you need to modify the SF search range, you need to modify the PAN3028_write_spec_page_reg(PAGE1_SEL,0x2d,0x3f) register value in the rf_set_all_sf_search() function. This register corresponds to the configuration of SF7~12 by setting bit0~bit5, where bit0 corresponds to SF7 and the default value is 0x07, i.e. SF7~9 search is supported.

Users can configure the SF search range according to their needs, it is recommended to select consecutive SF values for smart search. It is recommended to limit the search range to less than 3, e.g. SF7~9. It is not recommended to use the full range of SF7~12 for smart search, which is prone to packet loss.

3 Revision history

Table 3-1 Document revision history

Date	Revision	Changes
May 18, 2023	Rev 1.0	Initial release.