



瑞維電子有限公司
S-Power Electronics Ltd

BG306

(2.4GHz RF Module)

Specification

Ver:1.2

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Product Description

BG306 is a high performance and low cost 2.4GHz ISM band RF Module. This device integrates both high sensitivity receiver (-90dBm @ 3Mbps, -89dBm @4Mbps) and programmable high efficiency power amplifier (-20 ~ 5dBm). Based on Data Rate Register (0x0E), user can configure on-air data rates to either 3Mbps or 4Mbps.

BG306 supports fast settling time (100 us) for frequency hopping system. For packet handling, BG306 has built-in separated 64-bytes TX/RX FIFO (could be logically extended to 4K bytes) for data buffering and burst transmission, auto-ack and auto-resend, CRC for error packet filtering, FEC for 1-bit data correction per code word, RSSI for clear channel assessment, thermal sensor for monitoring relative temperature, WOR (Wake on RX) function to support periodically wake up from sleep mode to RX mode and listen for incoming packets without MCU interaction, data whitening for data encryption / decryption. In addition, BG306 has built-in AES128 co-processor (Advanced Encryption Standard) for advanced data encryption or decryption which consists of the transformation of a 128-bit block into an encrypted 128-bit block. Those functions are very easy to use while developing a wireless system. All features are integrated in a small size(17*23mm).

BG306 control registers are accessed via 3-wire or 4-wire SPI interface such as TX/RX FIFO, ID register, RSSI value, frequency hopping to chip calibration procedures. Another one, via SPI as well, is the unique Strobe command, BG306 can be controlled from power saving mode (deep sleep, sleep, idle, standby), TX mode, RX mode. In addition to the SPI, other connections between BG306 and MCU are GIO1 and GIO2, multi-function GPIO, to output BG306 status so that MCU could use either polling or interrupt scheme for radio control. Overall, it is very easy to develop a wireless application by a MCU and BG306 because of its rich and easy-to-use features.

Features

- RF Chip:A7130(AMIC)
- TX Power:16dBm
- Small size (17*23mm).
- Frequency band: 2400 ~ 2483.5MHz.
- FSK or GFSK modulation
- Low current consumption: RX 40mA, TX 180mA (at 16dBm output power).
- Deep sleep current (2uA).
- Sleep current (5 uA).
- support input voltage 2.9 ~ 3.6 V.
- Programmable data rate 3M or 4Mbps.
- Ultra High sensitivity:
 - -89dBm at 4Mbps on-air data rate.
 - -90dBm at 3Mbps on-air data rate.
- Fast settling time (100 us) synthesizer for frequency hopping system.
- On chip low power RC oscillator for WOR (Wake on RX) function.
- AGC (Auto Gain Control) for wide RSSI dynamic range.
- AFC (Auto Frequency Compensation) for frequency drift due to temperature.
- Support low cost crystal (16 / 18 MHz).
- Low Battery Detector indication.
- Support 3-wire or 4-wire SPI.
- Unique Strobe command via SPI.



- ONE register setting for new channel frequency.
- CRC Error Packet Filtering.
- Auto acknowledgement and auto Resend.
- Dynamic FIFO length.
- 8-bits RSSI measurement for clear channel indication.
- Auto Calibrations.
- Auto IF function.
- Auto FEC by (7, 4) Hamming code (1 bit error correction / code word).
- Separated 64 bytes RX and TX FIFO.
- Easy FIFO / Segment FIFO / FIFO Extension (up to 4K bytes).
- Support FIFO mode frame sync to MCU.
- Support direct mode with recovery clock output to MCU.

Operating Range

Parameters	Min.	Typ.	Max.	Unit
supply voltage	3.2	3.3	3.4	V
Temperature ambient	0		50	°C
Input frequency range	2400		2483	MHz
RX supply current , CW-mode (peak current)			40	mA
TX supply current, CW-mode (peak current)			180	mA
Supply current in standby mode			20	uA



Transmitter Part

Parameters	Min.	Typ.	Max.	Unit
TX data rate		3000 4000		Kbit/s
MAX. Output power (PTX)	14	16	18	dBm
Frequency deviation				
Data Rate=4Mbps		1000		KHz
Data Rate=3Mbps		735		KHz
Spurious Emission				
2'nd spurious emission			-40	dBm
3'rd spurious emission			-50	dBm
Modulation		FSK GFSK		
Output Gain adjustable		16		dB

Receiver Part

Parameters	Min.	Typ.	Max.	Unit
Sensitivity BER ≤ 10 ⁻³ at 4MBit/s BER ≤ 10 ⁻³ at 3MBit/s		-89 -90	-86	dBm
IF frequency		4000 3000		KHz KHz
Maximum input power		-30		dBm
Spurious Emission 30MHZ~1GHz 1GHZ~12GHz		-50 -40		dBm

Crystal Frequency:

Data Rate 4MHz:16MHz

Data Rate 3MHz:18MHz

PA&LNA Control State:

Control Function	RX ON	TX ON	TX/RX OFF	Inhibition
TX SW	1	0	1	0
RX SW	0	1	1	0



Dimension and Pad Define

