



瑞維電子有限公司
S-Power Electronics Ltd

BG305

(2.4GHz RF Module)

Specification

Ver:1.0

瑞維電子有限公司

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Product Description

BG305 is a high performance and low cost 2.4GHz ISM band wireless transceiver RF Module. It integrates high sensitivity receiver(-90dBm @2Mbps), high efficiency power amplifier (up to 16dBm), frequency synthesizer and base-band modem. In typical system, BG305 is used together with MCU (microcontroller) with very few external passive components. BG305 supports both FIFO mode and direct mode that contains clock recovery circuit CKO pin to MCU.

BG305 supports very fast settling time (90 us) for frequency hopping system. For packet handling, BG305 has built-in separated 64-bytes TX/RX FIFO (could be extended to 256 bytes) for data buffering and burst transmission, CRC for error detection, FEC for 1-bit data correction per code word, RSSI for clear channel assessment, data whitening for data encryption/decryption, thermal sensor for monitoring relative temperature. Those functions are very easy to use while developing a wireless system. All features are integrated in a small size(17*23mm).

BG305 data rate is up to 2Mbps and can be easily programmed to 1Mbps or 2 Mbps via 3-wire or 4-wire SPI bus. For power saving, BG305 supports sleep mode, idle mode, standby mode. For easy-to-use, BG305 has an unique SPI command set called Strobe command that are used to control BG305 state machine. Based on Strobe commands, from power saving, TX delivery, RX receiving, channel monitoring, frequency hopping to auto calibrations, MCU only needs to define BG305 control registers and send Strobe commands via SPI bus. In addition, BG305 supports two general purpose I/O pins, GIO1 and GIO2, to inform MCU its status so that MCU could use either polling or interrupt scheme to do radio control. Therefore, it is very easy to monitor transmission between MCU and BG305 because of its digital interface.

Features

- RF Chip:A7125(AMIC)
- TX Power:16dBm
- Small size (17*23mm).
- Frequency band: 2400 ~ 2483.5MHz.
- 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 1M or 2Mbps.
- Ultra High sensitivity:
 - -92dBm at 2Mbps on-air data rate.
 - -95dBm at 1Mbps on-air data rate.
- Fast settling time (90 us) synthesizer for frequency hopping system.
- Auto FEC by (7, 4) Hamming code (1 bit error correction / code word)
- Support low cost crystal (6/8/12/16MHz).
- Support Auto Frequency Compensation.
- Separated 64 bytes RX and TX FIFO.
- Easy FIFO / Segment FIFO / FIFO Extension (up to 256 bytes).
- Low Battery Detector indication.
- Support 3-wire or 4-wire SPI.
- Unique Strobe command via SPI.
- Support direct mode with recovery clock output to MCU.



Operating Range

Parameters	Min.	Typ.	Max.	Unit
supply voltage	3.0	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		2000 1000		Kbit/s
MAX. Output power (PTX)	14	16	18	dBm
Frequency deviation				
Data Rate=2Mbps		1000		KHz
Data Rate=1Mbps		735		KHz
Spurious Emission				
2'nd spurious emission			-40	dBm
3'rd spurious emission			-50	dBm
Modulation		FSK		
Output Gain adjustable		16		dB



Receiver Part

Parameters	Min.	Typ.	Max.	Unit
Sensitivity BER $\leq 10^{-3}$ at 2MBit/s BER $\leq 10^{-3}$ at 1MBit/s		-90 -92	-86	dBm
IF frequency		4000 3000		KHz KHz
Maximum input power		-30		dBm
Spurious Emission 30MHZ~1GHz 1GHZ~12GHz		-50 -40		dBm

Crystal Frequency:16MHz

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

