



瑞維電子有限公司
S-Power Electronics Ltd

BG311

(Wireless Audio Module)

Specification

Ver:1.0

瑞維電子有限公司

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DESCRIPTION

The 2.4GHz Wireless platform is a cost-effective and low-power solution optimized for wireless transmission of high-quality digital audio.

The BG311 Module includes a robust built-in wireless audio transmission protocol and Built-in audio ADC/DAC. Utilizing numerous coexistence mechanisms allows the BG311 to avoid interfering with, or being interfered by other 2.4 GHz radio systems.

APPLICATIONS

- Wireless high-quality digital audio
- Wireless point-to-point audio link
- Wireless (USB) headphones / headsets
- Wireless (USB) loudspeakers
- Wireless speaker systems

Features

- Built-in audio ADC/DAC
- CD-quality uncompressed audio
- Audio latency down to 16 ms
- Stereo Audio DAC with 100dB SNR
- 4.1mW Stereo 48ksps DAC Playback
- Stereo Audio ADC with 93dB SNR
- 6.1mW Stereo 48ksps ADC Record
- Stereo Headphone Outputs
- Stereo Analog Microphone Inputs
- Very Low-Noise
- Microphone Power Output
- Adaptive Frequency Hopping
- Forward Error Correction
- Buffering and Retransmission
- Error Concealment
- Optional high quality audio compression
- No software development needed when used in autonomous mode

RF section

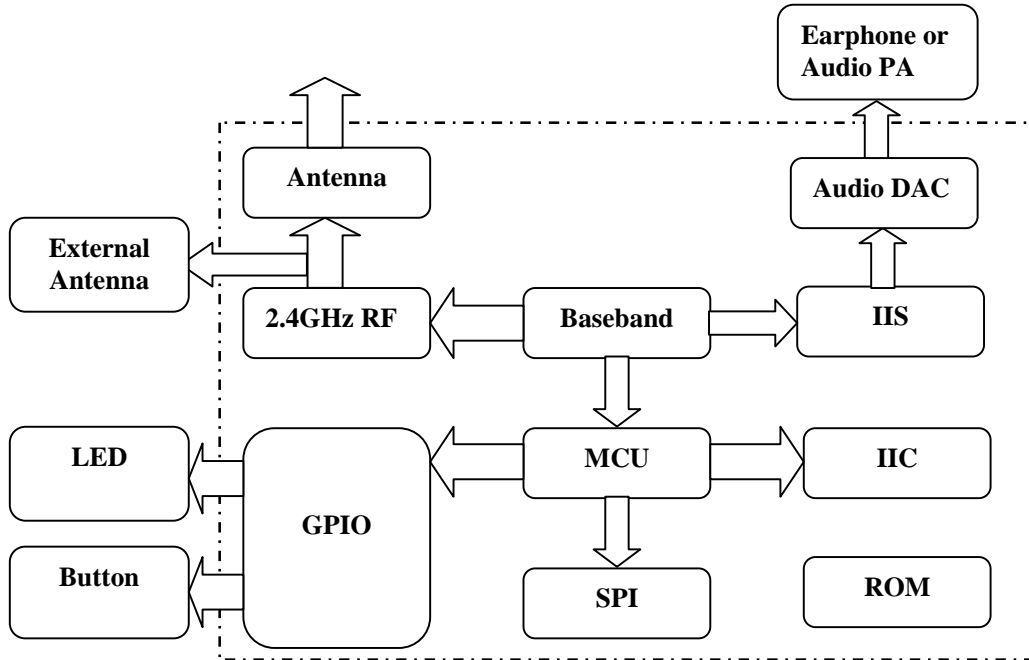
- 5 Mbps over-the-air data rate
- Bandwidth-efficient modulation format
- -87dBm sensitivity
- +4dBm output power
- Suited for systems targeting compliance with worldwide radio frequency regulations: ETSI EN 300 328 and EN300 440 class 2 (Europe), FCC CFR47 Part 15 (US) and ARIB STD-T66 (Japan)

Digital audio support

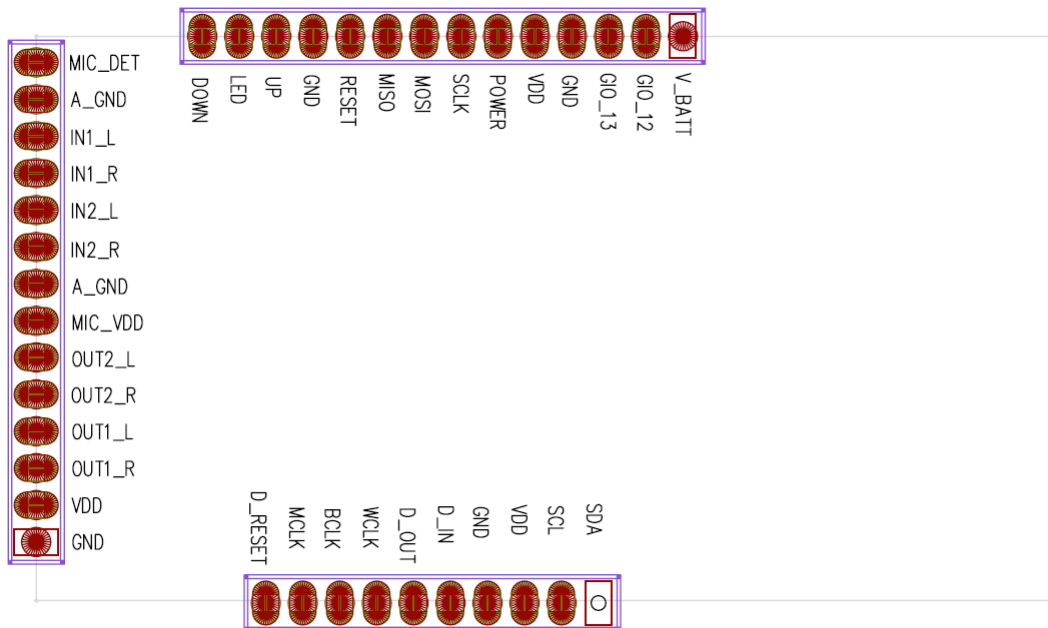
- Digital I2S audio interface supports 1 or 2 audio channels for the BG311_A and 1 to 4 audio channels for the BG311_B at sample rates of 32, 40.275, 44.1 and 48 kHz, and supports 16 bit word-widths
- USB(Master For BG310) audio support for 32, 44.1 and 48 kHz, and supports 16 bit word-widths.
- Data side-channel allows data to be sent alongside the audio between external host controllers



Module Block Diagram



PIN Define





Analog Audio Connect PIN

PIN	PIN NAME	PIN TYPE	DESCRIPTION
1	GND	Ground	The exposed die attach pad must be connected to a solid ground plane underneath the chip
2	VDD	Power	Power supply for the linear voltage regulator.
3	OUT1_R	Output	Right high power output driver
4	OUT1_L	Output	Left high power output driver
5	OUT2_R	Output	Right line output
6	OUT2_L	Output	Left line output
7	MIC_VDD	Output	Microphone bias voltage output
8/13	A_GND	Ground	Analog ground supply
9	IN2_R	Input	Multifunction Analog Input, or Single-ended configuration: MIC 2 or Line 2 right or Differential configuration: MIC or Line left, negative
10	IN2_L	Input	Multifunction Analog Input, or Single-ended configuration: MIC 2 or Line 2 right or Differential configuration: MIC or Line left, positive
11	IN1_R	Input	Multifunction Analog Input, or Single-ended configuration: MIC 1 or Line 1 right or Differential configuration: MIC or Line right, positive
12	IN1_L	Input	Multifunction Analog Input, or Single-ended configuration: MIC 1 or Line 1 left or Differential configuration: MIC or Line right, negative
14	MIC_DET	Input	MIC Detect Input

Digital Audio Connect PIN

PIN	PIN NAME	PIN TYPE	DESCRIPTION
1	SDA	Input/Output	I2C master data line. Must be connected to external pull-up
2	SCL	Output	I2C master clock line. Must be connected to external pull-up
3	VDD	Power	Power supply for the linear voltage regulator.
4	GND	Ground	The exposed die attach pad must be connected to a solid ground plane underneath the chip
5	D_IN	Output	I2S/DSP audio interface data in
6	D_OUT	Output	I2S/DSP audio interface data out
7	WCLK	Input/Output	I2S/DSP audio interface word clock (in/out)
8	BCLK	Input/Output	I2S/DSP audio interface bit clock (in/out)
9	MCLK	Output	Master clock output for external audio devices
10	D_Reset	Output	Active-low codec reset

Functional Interface Connect PIN

PIN	PIN NAME	PIN TYPE	DESCRIPTION
1	V_BATT	Analog input	Battery voltage supervisor (threshold level programmable by external resistor to positive battery terminal)
2	GIO_12	Digital I/O	General-purpose digital I/O pin 12
3	GIO_13	Digital I/O	General-purpose digital I/O pin 13
4/11	GND	Ground	The exposed die attach pad must be connected to a solid ground plane underneath the chip
5	VDD	Power	Power supply for the linear voltage regulator.
6	POWER	Input	Power Key and Code Key
7	SCLK	Input/Output	Serial SPI configuration interface, clock input/output
8	MOSI	Input	Serial SPI configuration interface, master data output, slave data input
9	MISO	Output	Serial SPI configuration interface, master data input, slave data output.
10	RESET	Input	Active-low device reset
12	UP	Input	Up Key
13	LED	Output	Status LED
14	DOWN	Input	Down Key



RECOMMENDED OPERATING CONDITIONS

PARAMETER	TEST CONDITIONS	Min	Max	Unit
Operating ambient temperature range, TA		-40	+85	°C
Operating supply voltage		2.0	3.6	V

ELECTRICAL CHARACTERISTICS,

TA = 25°C and VDD = 3.3 V, unless otherwise noted.

PARAMETER	TEST CONDITION	MIN	TYP	MAX	UNIT
Current consumption, power down state	Voltage regulator / crystal oscillator off – status lost (POWERED_DOWN state)		1		µA
Current consumption, headphone master(1)	Average current for a PurePath Wireless master with I2S interface active, sourcing two PCM16 channels with maximum output power.		120		mA
Current consumption, headphone slave(1)	Average current for a PurePath Wireless slave with I2S interface active, sinking two PCM16 channels with maximum output power		100		mA

(1) Measured on Texas Instruments CC85xx EM reference designs and CC85XXDK. Sample rate 48 kHz, MCLK disabled.

GENERAL CHARACTERISTICS

TA = 25°C and VDD = 3.3 V, unless otherwise noted

PARAMETER	TEST CONDITION	MIN	TYP	MAX	UNIT
RF frequency range		2400		2483.5	MHz
Data rate	Shaped 8FSK		5		Mbps
Audio latency	Latency between I2S interface on audio source and I2S interface on audio sink. Uncompressed 16 bit. Audio latency is programmable using the PurePath Wireless Configurator [1].	768		2048	Samples
Audio sample rate	Audio sample rate is programmable using the PurePath Wireless Configurator [1]		48 44.1 40.275 32		kHz

(1) ±2000ppm tolerance

(2) Not supported in USB mode. For USB Headset, dynamic sample rate change is not allowed.

RF CHARACTERISTICS,

TA = 25°C and VDD = 3.3 V, unless otherwise noted

PARAMETER	TEST CONDITION	MIN	TYP	MAX	UNIT
Output power	Maximum output power setting		4		dBm
Receiver sensitivity	5 Mbps, 0.1 % BER		-89		dBm
Saturation (maximum input level)	5 Mbps, 0.1 % BER		-2		dBm
Selectivity	Adjacent channel, ±4MHz, wanted 3dB above sensitivity		8		dB
	Alternate channel, ±8MHz, wanted 3dB above sensitivity		35		dB
Occupied bandwidth	99% energy bandwidth		3.8		MHz
Optimum load impedance	Differential impedance seen from the RF port (RF_P and RF_N) towards the antenna		70 + j30		Ω
Spurious emission	Suitable for systems targeting compliance with EN 300 328, EN 300 440(2), FCC CFR47 Part 15 and ARIB STD-T-66				



AUDIO ELECTRICAL CHARACTERISTICS

At 25°C, AVdd, DVdd, IOVDD = +1.8V, VDD = 3.3V, fs (Audio) = 48kHz,

AUDIO ADC

PARAMETER		TEST CONDITIONS	TYP	UNIT
Input signal level (0dB)		Single-ended, CM=0.75V, AVdd = 1.5V	0.375	VRMS
SNR	Signal-to-noise ratio, A-weighted (1) (2)	Inputs ac-short to ground	91	dB
DR	Dynamic range A-weighted(1) (2)	-60dB full-scale, 1-kHz input signal	90	dB
THD+N	Total Harmonic Distortion plus Noise	-3dB full-scale, 1-kHz input signal	-80	dB

(1) Ratio of output level with 1-kHz full-scale sine wave input, to the output level with the inputs short circuited, measured A-weighted over a 20-Hz to 20-kHz bandwidth using an audio analyzer.

(2) All performance measurements done with 20-kHz low-pass filter and, where noted, A-weighted filter. Failure to use such a filter may result in higher THD+N and lower SNR and dynamic range readings than shown in the Electrical Characteristics. The low-pass filter removes out-of-band noise, which, although not audible, may affect dynamic specification values

AUDIO DAC

PARAMETER		TEST CONDITIONS	TYP	UNIT
Full scale output voltage (0dB)			0.375	VRMS
SNR	Signal-to-noise ratio, A-weighted (1) (2)	All zeros fed to DAC input	99	dB
DR	Dynamic range, A-weighted (1) (2)	-60dB 1 kHz input full-scale signal	97	dB
THD+N	Total Harmonic Distortion plus Noise	-1 dB full-scale, 1-kHz input signal	-85	dB

(1) Ratio of output level with 1-kHz full-scale sine wave input, to the output level with the inputs short circuited, measured A-weighted over a 20-Hz to 20-kHz bandwidth using an audio analyzer.

(2) All performance measurements done with 20-kHz low-pass filter and, where noted, A-weighted filter. Failure to use such a filter may result in higher THD+N and lower SNR and dynamic range readings than shown in the Electrical Characteristics. The low-pass filter removes out-of-band noise, which, although not audible, may affect dynamic specification values

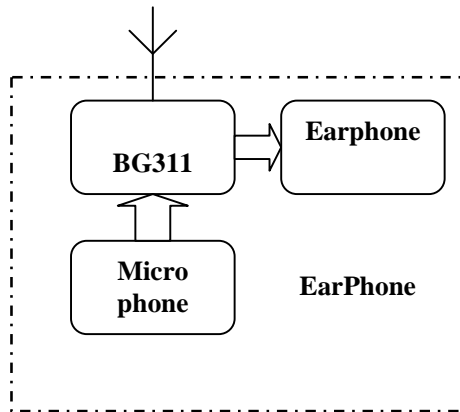
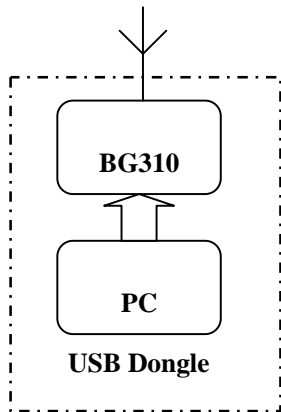
LED Status:

	ON (ms)	OFF (ms)	Remark
No Link Mode	20	1980	Master/Slave
Standby Mode	20	980	Master/Slave
Pairing Mode	20	480	Master/Slave
Working Mode	20+20+20+20+20	100+100+100+100+1500	Master/Slave

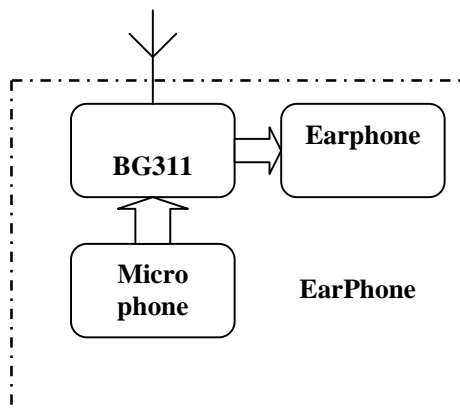
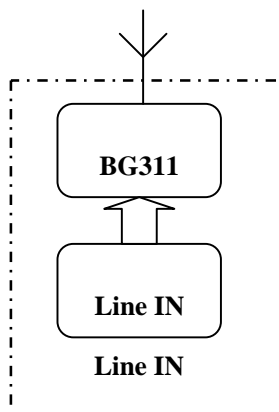


Application Block Diagram

USB EarPhone



Line EarPhone





Package Outline

