



**CIONLABS**

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# MODULE Datasheet

**DS-BC301HZ-01-24P V1.0**

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# Features

## 1.1 Overview

The BC301HZ-01-24P module is based on the Beken BK7236M chip. The BK7236M is a highly integrated 1x1 single-band 2.4 GHz Wi-Fi 6 (802.11b/g/n/ax) and Bluetooth Low Energy (LE) 5.4 combo solution designed for applications that require high security and abundant resources. The integration of a 32-bit Armv8-M STAR-MC1 MCU and a comprehensive set of peripherals makes the BK7236M ideal for advanced Internet of Things (IoT) applications.

The BK7236M provides state-of-the-art security based on a powerful security architecture. The BK7236M integrates an IoT Platform Security Suite (IPSS) for cryptography and system security control. The IPSS embeds all-round and robust security features to set up a top-secret execution environment for IoT devices.

Using advanced design techniques and ultra-low power process technology, the BK7236M delivers high integration, efficient security, and minimal power consumption for a wide range of advanced IoT applications.

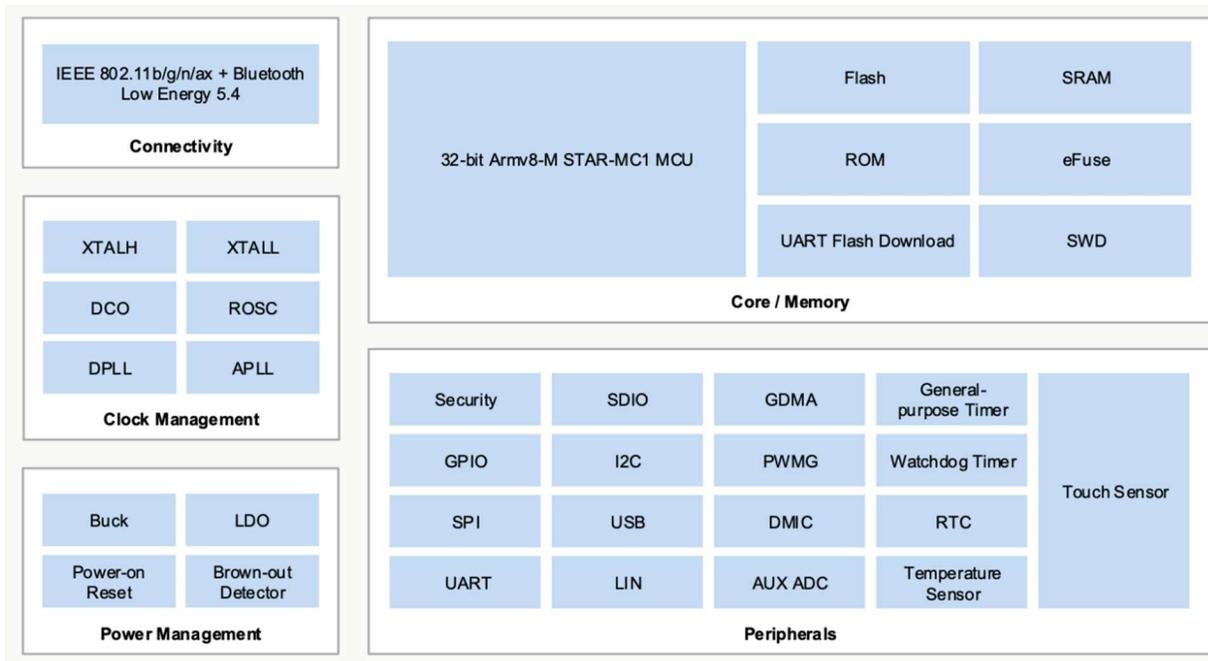


Figure 1 BK7236M Block Diagram

## 1.2 Features

- Bluetooth 5.4 Dual Mode and proprietary 2.4 GHz protocol
- Around 5 mA full operation current
- Around 1  $\mu$ A deep sleep current with a low-power running timer

- Bluetooth Angle of Arrival (AoA) and Angle of Departure (AoD)
- Antenna array with a maximum of 16 antennas for precise indoor positioning
- Bluetooth Low Energy (LE) 125 kbps, 500 kbps, 1 Mbps and 2 Mbps
- Classic Bluetooth 1 Mbps
- Proprietary 2.4 GHz 250 kbps, 1 Mbps and 2 Mbps
- High output power up to 10 dBm and Bluetooth LE Power Control
- 32-bit RISC core with 80 KB data memory at up to 64 MHz speed
- SiP Flash: 512 KB or 1 MB
- 32-byte eFUSE
- Operating voltage: 0.9–1.5 V (boost), 2.0–3.6 V (buck)
- Clock
  - 16 MHz crystal reference clock with internal tuning load capacitance
  - 64 MHz digital PLL clock
  - 32 kHz ring oscillator
  - External 32 kHz crystal oscillator
  - MCU can run with any clock source with an internal frequency divider
  - Dedicated audio PLL clock for I2S master clock
- Interface and peripheral units
  - Quad IO flash programming

# Electrical Specifications

## 2.1 Absolute Maximum Ratings

Stresses beyond those listed under *Absolute Maximum Ratings* may cause permanent damage to the device. Exposure to absolute-maximum-rated conditions for prolonged periods may affect the reliability of the device.

Parameter	Description	Min.	Max.	Unit
VBAT	Chip power supply voltage	-0.3	4.5	V
VIO	IO LDO output voltage	-0.3	4.0	V
VCCPA	Supply voltage for PA	-0.3	4.0	V
VCCPAD	Supply voltage for PA driver	-0.3	4.0	V
VCCIF	Supply voltage for IF	-0.3	1.8	V
VCCRxFE	Supply voltage for RX	-0.3	1.8	V
VCCPLL	Supply voltage for RF PLL	-0.3	1.8	V
VCCA	Supply voltage for analog	-0.3	1.8	V
VDDA	Analog buck/LDO output voltage	-0.3	1.8	V
VDDD	Digital buck/LDO output voltage	-0.3	1.2	V
VDDDIG	Digital core LDO output voltage	-0.3	1.1	V
VDDRAM	EXMEM LDO output voltage	-0.3	2.1	V
SWA	Analog buck switch output voltage	-0.3	4.5	V
SWD	Digital buck switch output voltage	-0.3	4.5	V
PRX	RX input power	-	10	dBm
TSTR	Storage temperature range	-55	150	°C

## 2.2 ESD Ratings

Parameter	Description	Test Condition	Value	Unit
ESD HBM	Electrostatic discharge voltage (human body model), per ANSI/ESDA/JEDEC JS-001	-	±2000	V

Parameter	Description	Test Condition	Value	Unit
ESD CDM	Electrostatic discharge voltage (charge device model), per ANSI/ESDA/JEDEC JS-002	-	±500	V

## 2.3 Recommended Operating Conditions

Parameter	Description	Min. <sup>(1)</sup>	Typ.	Max.	Unit
VBAT <sup>(2)</sup>	Chip power supply voltage	2.0	3.3	4.35	V
VBAT slew rate	-	300	-	-	mV/ms
VIO	IO LDO output voltage	2.0	-	3.6	V
VCCPA <sup>(2)</sup>	Supply voltage for PA	2.0	-	3.6	V
VCCPAD <sup>(2)</sup>	Supply voltage for PA driver	2.0	-	3.6	V
VCCIF	Supply voltage for IF	-	1.45	-	V
VCCRXFE	Supply voltage for RX	-	1.45	-	V
VCCPLL	Supply voltage for RF PLL	-	1.45	-	V
VCCA	Supply voltage for analog	-	1.45	-	V
VDDA	Analog LDO output voltage	-	1.45	-	V
	Analog buck output voltage	-	1.5	-	V
VDDD	Digital LDO output voltage	-	1.0	-	V
	Digital buck output voltage	-	1.05	-	V
VDDDIG	Digital core LDO output voltage	-	0.875	-	V
VDDRAM	EXMEM LDO output voltage	1.8	-	1.95	V
TOPR	Operating temperature range	-40	-	105	°C

(1) The minimum voltage specified includes the ripple on the supply voltage and all other transient dips. Care must be taken when operating at the minimum specified voltage.

(2) To ensure WLAN performance, the ripple on the supply must be less than  $V_{pp} = 100$  mV.

## 2.4 Digital I/O Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
VIH	High-level input voltage	-	0.7 V <sub>IO</sub>	-	V <sub>IO</sub> + 0.3	V
VIL	Low-level input voltage	-	-0.3	-	0.3 V <sub>IO</sub>	V
VOH	High-level output voltage	-	0.9 V <sub>IO</sub>	-	-	V
VOL	Low-level output voltage	-	-	-	0.1 V <sub>IO</sub>	V
IDRV	I/O output drive strength	-	5	-	20	mA
RPU	Weak pull-up resistor	-	-	40	-	kΩ
RPD	Weak pull-down resistor	-	-	44	-	kΩ

## 2.5 IO LDO

Parameter	Description	Min.	Typ.	Max.	Unit
V <sub>IO</sub>	IO LDO output voltage	2.0	3.3	3.6	V
Load current	-	-	-	500	mA

## 2.6 Analog LDO

Parameter	Description	Min.	Typ.	Max.	Unit
V <sub>DDA</sub>	Analog LDO output voltage	-	1.45	-	V
Load current	-	-	-	150	mA

## 2.7 Digital LDO

Parameter	Description	Min.	Typ.	Max.	Unit
V <sub>DDD</sub>	Digital LDO output voltage	-	1.0	-	V
Load current	-	-	-	100	mA

## 2.8 Core LDO

Parameter	Description	Min.	Typ.	Max.	Unit
VDDDIG	Digital core LDO output voltage	-	0.875	-	V
Load current	-	-	-	100	mA

## 2.9 Analog Buck

Parameter	Description	Min.	Typ.	Max.	Unit
VDDA	Analog buck output voltage	-	1.5	-	V
Load current	-	-	-	150	mA
Switching frequency	Buck modulation frequency	0.5	1	2	MHz
Output filter capacitor capacitance	-	-	4.7	-	μF
Inductor inductance	-	-	4.7	-	μH
Inductor DC resistance	-	-	-	500	mΩ
Inductor saturation current	-	200	-	-	mA

## 2.10 Digital Buck

Parameter	Description	Min.	Typ.	Max.	Unit
VDDD	Digital buck output voltage	-	1.05	-	V
Load current	-	-	-	100	mA
Switching frequency	Buck modulation frequency	0.5	1	2	MHz
Output filter capacitor capacitance	-	-	4.7	-	μF
Inductor inductance	-	-	4.7	-	μH
Inductor DC resistance	-	-	-	500	mΩ
Inductor saturation current	-	200	-	-	mA

## 2.11 26 MHz Crystal Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
F0	Nominal frequency	-	-	26	-	MHz
$\Delta F/F0$	Frequency tolerance	25 °C	-10	-	+10	ppm
TC	Frequency stability over operating temperature	-40 to 105 °C crystal	-20	-	+20	ppm
		-30 to 85 °C crystal	-10	-	+10	ppm
CL	Load capacitance	-	7	7.3	12	pF
TS	Trim sensitivity	-40 to 105 °C crystal	-	32	-	ppm/pF
		-30 to 85 °C crystal	-	17	-	ppm/pF

## 2.12 Current Consumption

Measured with T = 25 °C, VBAT = 3.3 V unless otherwise stated.

Parameter	Condition	Min.	Typ.	Max.	Unit
<b>Active Mode</b>					
RX current	11b: 11 Mbps DSSS	-	17.5	-	mA
	11g: 54 Mbps OFDM	-	17.5	-	mA
	11n: MCS7, HT20	-	17.5	-	mA
	11n: MCS7, HT40	-	18.5	-	mA
	11ax: MCS7, HE20	-	17.5	-	mA
TX current	11b: 11 Mbps DSSS @ 19 dBm	-	235	-	mA
	11g: 54 Mbps OFDM @ 17 dBm	-	200	-	mA
	11n: MCS7, HT20 @ 16 dBm	-	189	-	mA
	11n: MCS7, HT40 @15 dBm	-	182	-	mA
	11ax: MCS7, HE20 @ 16 dBm	-	188	-	mA
<b>Sleep Mode</b>					
Sleep	-	-	43	-	μA

Deep sleep	-	-	16	-	μA
<b>Shutdown Mode</b>					
Shutdown	-	-	2.5	-	μA

## 2.13 WLAN RF Receiver Characteristics

Measured with T = 25 °C, VBAT = 3.3 V unless otherwise stated.

Parameter	Condition	Min.	Typ.	Max.	Unit
<b>General</b>					
Frequency range	-	2412	-	2484	MHz
<b>Sensitivity</b>					
Sensitivity - IEEE 802.11b (8% PER for 1024 octet PSDU)	1 Mbps DSSS	-	-98	-	dBm
	2 Mbps DSSS	-	-94.5	-	dBm
	5.5 Mbps DSSS	-	-92	-	dBm
	11 Mbps DSSS	-	-89	-	dBm
Sensitivity - IEEE 802.11g (10% PER for 1000 octet PSDU)	6 Mbps OFDM	-	-92	-	dBm
	9 Mbps OFDM	-	-91.5	-	dBm
	12 Mbps OFDM	-	-90.5	-	dBm
	18 Mbps OFDM	-	-88	-	dBm
	24 Mbps OFDM	-	-85	-	dBm
	36 Mbps OFDM	-	-82	-	dBm
	48 Mbps OFDM	-	-77.5	-	dBm
	54 Mbps OFDM	-	-76.5	-	dBm
Sensitivity - IEEE 802.11n, 20 MHz (10% PER for 4096 octet PSDU, LDPC)	HT20, MCS0	-	-92	-	dBm
	HT20, MCS1	-	-91	-	dBm
	HT20, MCS2	-	-88	-	dBm
	HT20, MCS3	-	-86	-	dBm
	HT20, MCS4	-	-82	-	dBm
	HT20, MCS5	-	-78	-	dBm

	HT20, MCS6	-	-76.5	-	dBm
	HT20, MCS7	-	-75	-	dBm
Sensitivity - IEEE 802.11n, 40 MHz (10% PER for 4096 octet PSDU,	HT40, MCS0	-	-87.5	-	dBm
	HT40, MCS1	-	-87	-	dBm
LDPC)	HT40, MCS2	-	-85	-	dBm
	HT40, MCS3	-	-82.5	-	dBm
	HT40, MCS4	-	-79	-	dBm
	HT40, MCS5	-	-75	-	dBm
	HT40, MCS6	-	-74	-	dBm
	HT40, MCS7	-	-71.5	-	dBm
Sensitivity - IEEE 802.11 ax, 20 MHz (10% PER for 4096 octet PSDU, LDPC)	HE20, MCS0	-	-92	-	dBm
	HE20, MCS1	-	-90.5	-	dBm
	HE20, MCS2	-	-87.5	-	dBm
	HE20, MCS3	-	-85	-	dBm
	HE20, MCS4	-	-81	-	dBm
	HE20, MCS5	-	-77.5	-	dBm
	HE20, MCS6	-	-75.5	-	dBm
	HE20, MCS7	-	-74	-	dBm
Sensitivity - IEEE 802.11 ax, 40 MHz (10% PER for 4096 octet PSDU, LDPC)	HE40, MCS0	-	-88.5	-	dBm
	HE40, MCS1	-	-87.5	-	dBm
	HE40, MCS2	-	-85.5	-	dBm
	HE40, MCS3	-	-82	-	dBm
	HE40, MCS4	-	-77	-	dBm
	HE40, MCS5	-	-75	-	dBm
	HE40, MCS6	-	-74	-	dBm
	HE40, MCS7	-	-72	-	dBm
<b>Maximum Receive Level</b>					
	11b: 1, 2 Mbps (8% PER, 1024 octets)	-	10	-	dBm

Maximum receive level @ 2.4 GHz	11b: 5.5, 11 Mbps (8% PER, 1024 octets)	-	10	-	dBm
	11g: 6–54 Mbps (10% PER, 1000 octets)	-	0	-	dBm
	11n: MCS0–7 (10% PER, 4096 octets)	-	0	-	dBm
	11ax: MCS0–7 (10% PER, 4096 octets)	-	0	-	dBm
<b>Adjacent Channel Rejection</b>					
Adjacent channel ( $\pm 30$ MHz) rejection - IEEE 802.11b (8% PER for 1024 octet PSDU with desired signal level as specified in Condition)	1 Mbps DSSS	-74 dBm	-	50	- dB
	2 Mbps DSSS	-74 dBm	-	45	- dB
Adjacent channel ( $\pm 25$ MHz) rejection - IEEE 802.11b (8% PER for 1024 octet PSDU with desired signal level as specified in Condition)	5.5 Mbps DSSS	-70 dBm	-	43	- dB
	11 Mbps DSSS	-70 dBm	-	40	- dB
Adjacent channel ( $\pm 25$ MHz) rejection - IEEE 802.11g (10% PER for 1000 octet PSDU with desired signal level as specified in Condition)	6 Mbps OFDM	-79 dBm	-	43	- dB
	54 Mbps OFDM	-62 dBm	-	27	- dB
Adjacent channel ( $\pm 25$ MHz) rejection - IEEE 802.11n (10% PER for 4096 octet PSDU with desired signal level as specified in Condition)	HT20, MCS0	-79 dBm	-	43	- dB
	HT20, MCS7	-61 dBm	-	21	- dB
Adjacent channel ( $\pm 40$ MHz) rejection - IEEE 802.11n (10% PER for 4096 octet PSDU with desired signal level as specified in Condition)	HT40, MCS0	-76 dBm	-	TBD	- dB
	HT40, MCS7	-58 dBm	-	TBD	- dB
Adjacent channel ( $\pm 20$ MHz) rejection - IEEE 802.11ax (10% PER for 4096 octet PSDU with desired signal level as specified in Condition)	HE20, MCS0	-79 dBm	-	43	- dB
	HE20, MCS7	-61 dBm	-	26	- dB

Adjacent channel ( $\pm 40$ MHz) rejection - IEEE 802.11ax (10% PER for 4096 octet PSDU with desired signal level as specified in Condition)	HE40, MCS0	-76 dBm	-	TBD	-	dB
	HE40, MCS7	-58 dBm	-	TBD	-	dB
<b>Spurious Emissions</b>						
Spurious emissions	< 1 GHz	-	-60	-	-	dBm
	> 1 GHz	-	-50	-	-	dBm

## 2.14 WLAN RF Transmitter Characteristics

Measured with T = 25 °C, VBAT = 3.3 V unless otherwise stated.

Parameter	Condition	Min.	Typ.	Max.	Unit
<b>General</b>					
Frequency range	-	2412	-	2484	MHz
<b>TX Power</b>					
TX power - IEEE 802.11b (SEM compliant)	1 Mbps DSSS	-	21	-	dBm
	11 Mbps DSSS	-	21	-	dBm
TX power - IEEE 802.11g (EVM compliant)	6 Mbps OFDM	-	18	-	dBm
	54 Mbps OFDM	-	18	-	dBm
TX power - IEEE 802.11n (EVM compliant)	HT20, MCS0	-	17	-	dBm
	HT20, MCS7	-	17	-	dBm
	HT40, MCS0	-	17	-	dBm
	HT40, MCS7	-	16	-	dBm
TX power - IEEE 802.11ax (EVM compliant)	HE20, MCS0	-	17	-	dBm
	HE20, MCS7	-	17	-	dBm
	HE40, MCS0	-	17	-	dBm
	HE40, MCS7	-	16	-	dBm
<b>Spurious Emissions</b>					
Spurious emissions (at maximum output power)	< 1 GHz	-	-50	-	dBm
	> 1 GHz	-	-45	-	dBm

## 2.15 Bluetooth LE RF Receiver Characteristics

Measured with T = 25 °C, VBAT = 3.3 V unless otherwise stated.

Parameter	Condition	Min.	Typ.	Max.	Unit
<b>General</b>					
Frequency range	-	2402	-	2480	MHz
<b>Bluetooth LE 1 Mbps</b>					
Sensitivity	30.8% PER	-	-97	-	dBm
Maximum input level	30.8% PER	-	0	-	dBm
C/I co-channel	-	-	8	-	dB
C/I 1 MHz adjacent channel	-	-	0	-	dB
C/I -1 MHz adjacent channel	-	-	0	-	dB
C/I 2 MHz adjacent channel	-	-	-26	-	dB
C/I -2 MHz adjacent channel	-	-	-27	-	dB
C/I 3 MHz adjacent channel	-	-	-28	-	dB
C/I -3 MHz adjacent channel	-	-	-29	-	dB
C/I > 3 MHz adjacent channel	-	-	-50	-	dB
C/I < -3 MHz adjacent channel	-	-	-50	-	dB
Out-of-band blocking	30–2000 MHz	-10	-	-	dBm
	2003–2399 MHz	-12	-	-	dBm
	2484–2997 MHz	-12	-	-	dBm
	3000 MHz–12.75 GHz	-2	-	-	dBm
Intermodulation	-	-	TBD	-	dBm
<b>Bluetooth LE 2 Mbps</b>					
Sensitivity	30.8% PER	-	-94	-	dBm
Maximum input level	30.8% PER	-	0	-	dBm
C/I co-channel	-	-	7	-	dB
C/I 2 MHz adjacent channel	-	-	0	-	dB
C/I -2 MHz adjacent channel	-	-	3	-	dB

Parameter	Condition	Min.	Typ.	Max.	Unit
C/I 4 MHz adjacent channel	-	-	-26	-	dB
C/I -4 MHz adjacent channel	-	-	-30	-	dB
C/I 6 MHz adjacent channel	-	-	-30	-	dB
C/I -6 MHz adjacent channel	-	-	-39	-	dB
C/I > 6 MHz adjacent channel	-	-	-22	-	dB
C/I < -6 MHz adjacent channel	-	-	-22	-	dB
Out-of-band blocking	30–2000 MHz	-	-30	-	dBm
	2003–2399 MHz	-	-35	-	dBm
	2484–2997 MHz	-	-35	-	dBm
	3000 MHz–12.75 GHz	-	-17	-	dBm
Intermodulation	-	-	TBD	-	dBm
<b>Bluetooth LE 125 kbps</b>					
Sensitivity	30.8% PER	-	-102	-	dBm
Maximum input level	30.8% PER	-	0	-	dBm
C/I co-channel	-	-	3	-	dB
C/I 1 MHz adjacent channel	-	-	-15	-	dB
C/I -1 MHz adjacent channel	-	-	-16	-	dB
C/I 2 MHz adjacent channel	-	-	-34	-	dB
C/I -2 MHz adjacent channel	-	-	-40	-	dB
C/I 3 MHz adjacent channel	-	-	-42	-	dB
C/I -3 MHz adjacent channel	-	-	-43	-	dB
C/I > 3 MHz adjacent channel	-	-	-41	-	dB
C/I < -3 MHz adjacent channel	-	-	-42	-	dB
<b>Bluetooth LE 500 kbps</b>					
Sensitivity	30.8% PER	-	-99	-	dBm
Maximum input level	30.8% PER	-	0	-	dBm

C/I co-channel	-	-	5	-	dB
C/I 1 MHz adjacent channel	-	-	-2	-	dB
C/I -1 MHz adjacent channel	-	-	-3	-	dB
C/I 2 MHz adjacent channel	-	-	-30	-	dB
C/I -2 MHz adjacent channel	-	-	-31	-	dB
C/I 3 MHz adjacent channel	-	-	-31	-	dB
C/I -3 MHz adjacent channel	-	-	-40	-	dB
C/I > 3 MHz adjacent channel	-	-	-36	-	dB
C/I < -3 MHz adjacent channel	-	-	-36	-	dB

## 2.16 Bluetooth LE RF Transmitter Characteristics

Measured with T = 25 °C, VBAT = 3.3 V unless otherwise stated.

Parameter		Condition	Min.	Typ.	Max.	Unit
<b>General</b>						
Frequency range		-	2402	-	2480	MHz
TX power		-	-20	6	15	dBm
<b>Bluetooth LE 1 Mbps</b>						
In-band emissions	±2 MHz offset	-	-	-47	-	dBm
	±3 MHz offset	-	-	-49	-	dBm
	>±3 MHz offset	-	-	-50	-	dBm
Modulation characteristics	$\Delta f_{1avg}$	-	225	245	275	kHz
	$\Delta f_{2max}$	-	185	235	-	kHz
	$\Delta f_{2avg}/\Delta f_{1avg}$	-	0.8	0.93	-	-
Carrier frequency offset and drift	Max $ f_n $ n = 0, 1, 2, 3...k	-	-	3	150	kHz
	Max $ f_0 - f_n $ n = 2, 3, 4...k	-	-	2.5	50	kHz
	$ f_1 - f_0 $	-	-	2	23	kHz
	Max $ f_n - f_{n-5} $ n = 6, 7, 8...k	-	-	2.5	20	kHz/50 $\mu$ s
<b>Bluetooth LE 2 Mbps</b>						

Parameter		Condition	Min.	Typ.	Max.	Unit
In-band emissions	±4 MHz offset	-	-	-50	-	dBm
	±5 MHz offset	-	-	-51	-	dBm
	>±5 MHz offset	-	-	-52	-	dBm
Modulation characteristics	Δf1avg	-	-	488	-	kHz
	Δf2max	-	-	469	-	kHz
	Δf2avg/Δf1avg	-	-	0.93	-	-
Carrier frequency offset and drift	Max  fn  n = 0, 1, 2, 3...k	-	-	3	150	kHz
	Max  f0 – fn  n = 2, 3, 4...k	-	-	2.5	50	kHz
	f1 – f0	-	-	1.5	23	kHz
	Max  fn – fn-5  n = 6, 7, 8...k	-	-	2.5	20	kHz/50 μs
<b>Bluetooth LE 125 kbps</b>						
In-band emissions	±2 MHz offset	-	-	-47	-	dBm
	±3 MHz offset	-	-	-49	-	dBm
	>±3 MHz offset	-	-	-50	-	dBm
Modulation characteristics	Δf1avg	-	225	245	275	kHz
	Δf1max	-	185	246	-	kHz
Carrier frequency offset and drift	Max  fn  n = 0, 1, 2, 3...k	-	-	1.5	150	kHz
	Max  f0 – fn  n = 1, 2, 3...k	-	-	1.5	50	kHz
	f0 – f3	-	-	1.5	19.2	kHz
	fn – fn-3  n = 7, 8, 9...k	-	-	1.5	19.2	kHz/48 μs
<b>Bluetooth LE 500 kbps</b>						
In-band emissions	±2 MHz offset	-	-	-47	-	dBm
	±3 MHz offset	-	-	-49	-	dBm
	>±3 MHz offset	-	-	-50	-	dBm

## 2.17 AUX ADC Characteristics

Parameter	Condition	Min.	Typ.	Max.	Unit
Conversion clock	-	0.2	-	13	MHz
Conversion time	-	-	16	-	Cycle
VREF	Internal	-	1.1	-	V
	External	-	VIO/3	-	V
Input voltage range	-	0	-	VREF*N <sup>(1)</sup>	V
Input impedance	-	10	-	-	MΩ
Input capacitance (Cs)	-	-	1	-	pF
DNL	-	-1	-	3	LSB
INL	-	-5	-	5	LSB
ENOB	-	-	10	-	Bit
SNDR	-	-	62	-	dB
SFDR	-	-	77	-	dB
TSTARTUP	-	-	5	-	μs
Current consumption	-	-	200	-	μA

(1) N is the input voltage division factor. N=1, 2, 3, or 4.

# Pin Configuration

The pin configuration of the module are as below:

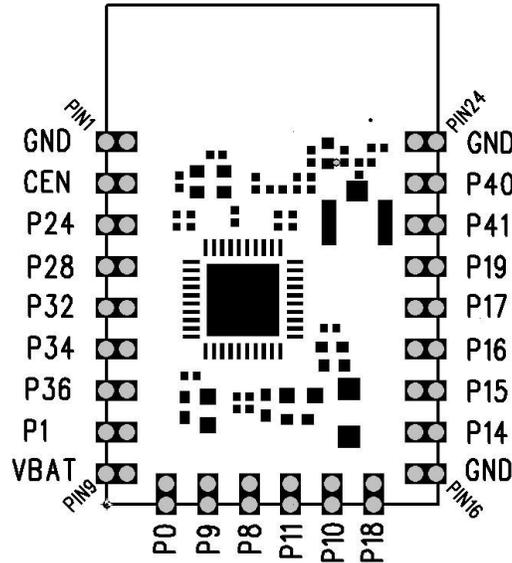


Figure 2 Pin Configuration

Pins	Name	I/O	Description
1	GND	G	Ground
2	PRICES	P	Chip enable, active high
3	P24	I/O	GPIO24/PWMG0_PWM4/ADC2
4	P28	I/O	GPIO28/I2S_MCLK/ADC4/TOUCH2/CLK_AUXS_CIS
5	P32	I/O	GPIO32/PWMG1_PWM0/TOUCH6
6	P34	I/O	GPIO34/PWMG1_PWM2/TOUCH8/SPI0_CSN
7	P36	I/O	GPIO36/PWMG1_PWM4/TOUCH10/SPI0_MISO
8	P1	I/O	GPIO01/UART1_RX/I2C1_SDA/SWDIO/ADC13/LIN_RX D
9	VBAT	P	Chip power supply (DC2.8V~4.35V)
10	P0	I/O	GPIO0/UART1_TX/I2C1_SCL/SWCLK/ADC12/LIN_TXD
11	P9	I/O	GPIO09/PWMG0_PWM3/DMIC_DAT/32K_XI
12	P8	I/O	GPIO8/PWMG0_PWM2/DMIC_CLK/ADC10/32K_XO
13	P11	I/O	GPIO11/DL_UART0_TX/SDIO_DATA3
14	P10	I/O	GPIO10/DL_UART0_RX/SDIO_DATA2/CLK_AUXS_CIS
15	P18	I/O	GPIO18/SDIO_DATA2/PWMG0_PWM0
16	GND	G	Ground
17	P14	I/O	GPIO14/SDIO_CLK/SPI0_SCK/BT_ANT0/I2C1_SCL

18	P15	I/O	GPIO15/SDIO_CMD/SPI0_CSN/BT_ANT1/I2C1_SDA
19	P16	I/O	GPIO16/SDIO_DATA0/SPI0_MOSI/BT_ANT2
20	P17	I/O	GPIO17/SDIO_DATA1/SPI0_MISO/BT_ANT3
21	P19	I/O	GPIO19/SDIO_DATA3/PWMG0_PWM1
22	P41	I/O	GPIO41/UART2_TX/LIN_TXD
23	P40	I/O	GPIO40/UART2_RX/LIN_RXD
24	GND	G	Ground

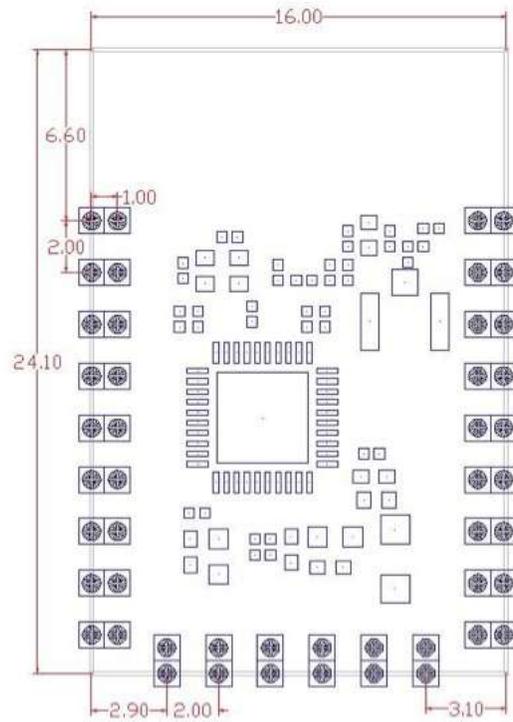
## Appearance size

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The dimensions of the module are as below:

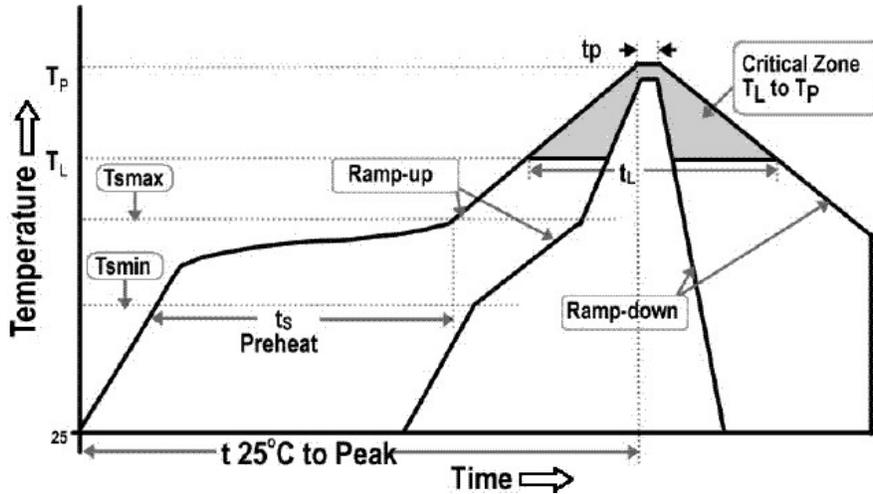
Module dimensions: 24.10mm  $\pm$  0.2mm(L) x 16.00  $\pm$  0.2mm(W) x 2.4  $\pm$  0.2mm (H)

PCB Thickness: 0.8mm ( $\pm$  0.1mm)



*Figure 3 Module Dimensions*

# Solder Reflow Profile



Profile Feature		Specification
Average Ramp-Up Rate ( $t_{smax}$ to $t_p$ )		3 °C/second max.
Pre_heat	Temperature Min ( $T_{smin}$ )	150 °C
	Temperature Max ( $T_{smax}$ )	200 °C
	Time ( $t_s$ )	60-180 seconds
Time Maintained above	Temperature ( $T_L$ )	217 °C
	Time ( $t_L$ )	60-150 seconds
Peak/Classification Temperature ( $T_p$ )		260 °C
Time within 5 °C of Actual Peak Temperature ( $t_p$ )		20-40 seconds
Ramp-Down Rate		6 °C/second max.
Time 25 °C to Peak Temperature		8 minutes max.

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