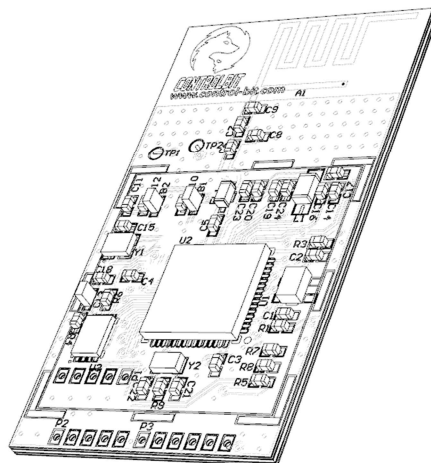


CONTROLBIT

# Bluetooth Dual Module

---

## AGM19v1



**ControlBit**

**2019-04-01**

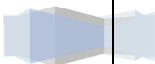
AGM19v1 is Bluetooth 5.0-compliant for lot applications and including Bluetooth Classic for SPP service. AGM19v1 is the optimal solution for applications in wireless input devices(Remote controllers, Home Automations and etc.)

# BLUETOOTH Dual Module - AGM19v1

---

## Table of Contents

1	General Description.....	2
2	Block Diagram.....	3
3	Pin Description.....	4
4	Electrical Characteristics .....	5
5	RF Characteristics.....	6
6	Physical Dimension .....	7
7	Power Supply.....	9
8	Example Application .....	9



# BLUETOOTH Dual Module - AGM19v1

---

## 1 General Description

### Features

#### Bluetooth Subsystem

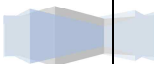
- Complies with Bluetooth core specification version 5.0 with LE 2-Mbps support
- Supports Basic Rate (BR) and Bluetooth Low Energy (BLE)
- Supports Adaptive Frequency Hopping (AFH)
- Programmable TX power up to 12 dBm
- Rx sensitivity -94.5 dBm (BLE)
- Ultra-low-power radio
  - RX current 8 mA
  - TX current 18 mA @ 12 dBm
- 32 kHz crystal oscillator
- 24 MHz crystal oscillator

#### Communication

- 1x peripheral UART, 1x UART for programming and HCI

### Applications

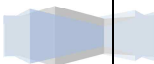
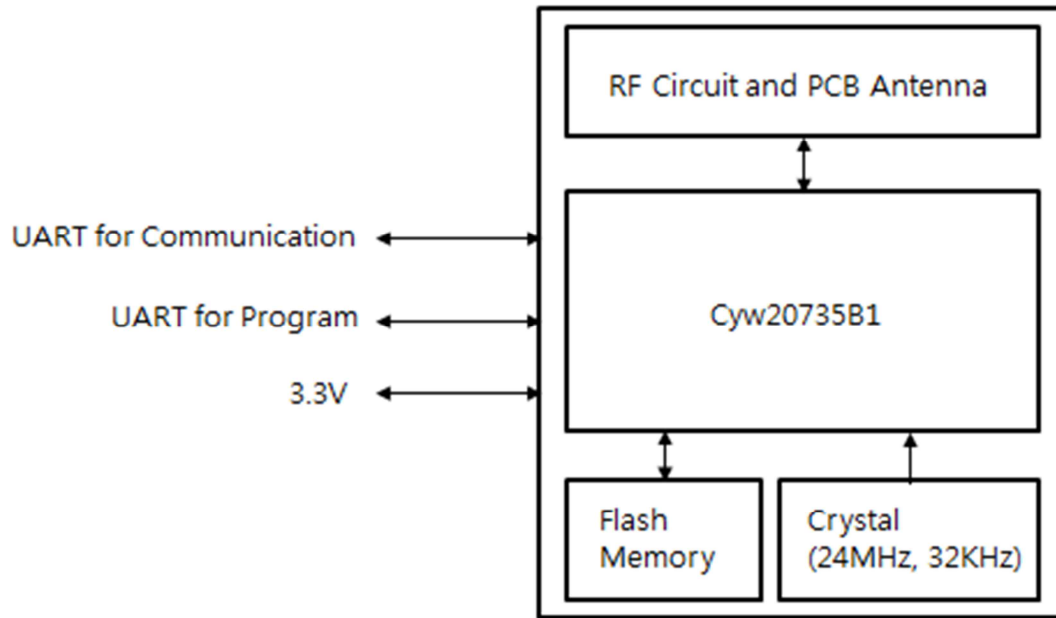
- Alexa Garget Device.(Voice control with Alexa Echo Speaker)
- Remote controls
- Home Automation
- Coding Education Kit
- Lighting Control
- Find-me devices
- Blood pressure monitors



# BLUETOOTH Dual Module - AGM19v1

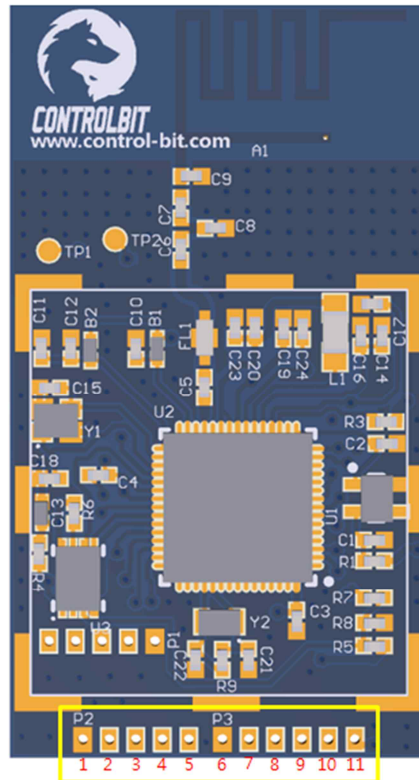
---

## 2 Block Diagram



# BLUETOOTH Dual Module - AGM19v1

## 3 Pin Description



Pin	Pin Name	Direction	Description
1	GND	I	Ground
2	RTS	O	UART request to send
3	CTS	I	UART clear to send
4	TX	O	UART data output
5	RX	I	UART data input
6	GND	I	Ground
7	P1	I/O	General I/O Port
8	P0	I/O	General I/O Port
9	VPA_BT	I	Power supply 3.3V, PA LDO input
10	VBAT	I	Power supply 3.3V, Core buck input
11	VDDIO	I	Power supply 3.3V

# BLUETOOTH Dual Module - AGM19v1

## 4 Electrical Characteristics

### 4.1 Absolute Maximum Ratings

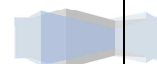
Parameter	Min	Typ	Max	Unit
VDDIO	-0.5	-	3.795	V
VPA_BT	-0.5	-	3.795	V
VBAT	-0.5	-	3.795	V
Maximum Junction Temperature			125	°C

### 4.2 Recommended Operating Conditions

Parameter	Min	Typ	Max	Unit
VDDIO	1.62	3.0	3.63	V
VPA_BT	2.5	3.3	3.63	V
VBAT	1.62	3.0	3.63	V

### 4.3 BLE Power Consumption

Operational Mode	Conditions	Typical	Unit
Receiving	Receiver and baseband are both operating, 100% ON.	8	mA
Transmitting@12 dBm	Transmitter and baseband are both operating, 100% ON.	18	mA
Advertising	1.28s direct advertising in low power idle mode	30	µA
Scanning	TBD	TBD	mA
Connecting	1-second connection interval in low power idle mode	25	µA
HIDOFF (Deep Sleep)	-	1	µA



# BLUETOOTH Dual Module - AGM19v1

## 5 RF Characteristics

### 5.1 Receiver RF Specifications

Parameter	Conditions	Min	Typ	Max	Unit
<b>General</b>					
Frequency range	-	2402	-	2480	MHz
RX sensitivity	-	-	-91.5	-	-
Maximum input	GFSK, 1 Mbps	-	-	-20	dBm
<b>Out-of-Band Blocking Performance (CW)</b>					
30 MHz-2000 MHz	0.1% BER	-	-10.0	-	dBm
2000-2399 MHz	0.1% BER	-	-27	-	dBm
2498-3000 MHz	0.1% BER	-	-27	-	dBm
3000 MHz-12.75 GHz	0.1% BER	-	-10.0	-	dBm
<b>Intermodulation Performance</b>					
BT, Df = 4 MHz	-	-39.0	-	-	dBm
<b>Spurious Emissions</b>					
30 MHz to 1 GHz				-62	dBm
1 GHz to 12.75 GHz				-47	dBm
65 MHz to 108 MHz	FM RX		-147		dBm/Hz
746 MHz to 764 MHz	CDMA		-147		dBm/Hz
851-894 MHz	CDMA		-147		dBm/Hz
925-960 MHz	EDGE/GSM		-147		dBm/Hz
1805-1880 MHz	EDGE/GSM		-147		dBm/Hz
1930-1990 MHz	PCS		-147		dBm/Hz
2110-2170 MHz	WCDMA		-147		dBm/Hz

### 5.2 Transmitter RF Specifications (TBD)

Parameter	Conditions	Min	Typ	Max	Unit
<b>General</b>					
Frequency range	-	2402	-	2480	MHz
Class 1: GFSK TX power	-		10		dBm
Power control step	-	2	4	8	dB
<b>Out-of-Band Spurious Emissions</b>					
30 MHz to 1 GHz				-36.0	dBm
1 GHz to 12.75 GHz				-30.0	dBm
1.8 GHz to 1.9 GHz				-47.0	dBm
5.15 GHz to 5.3 GHz				-47.0	dBm

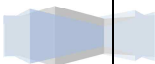
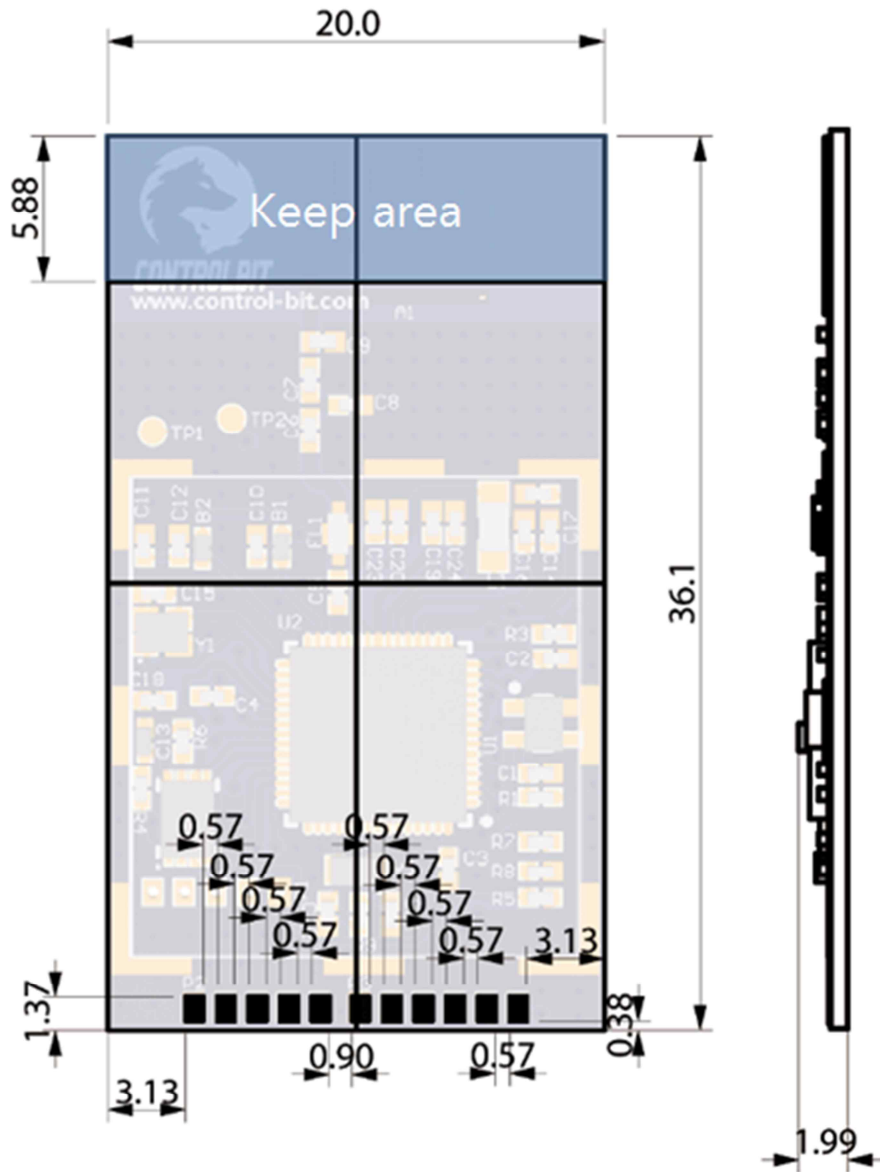
### 5.3 BLE RF Specifications

Parameter	Conditions	Min	Typ	Max	Unit
Frequency range	-	2402	-	2480	MHz
RX sense	GFSK, 0.1% BER, 1 Mbps	-	-94.5	-	dBm
TX power	-	-	12	-	dB dBm

# BLUETOOTH Dual Module - AGM19v1

## 6 Physical Dimension

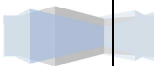
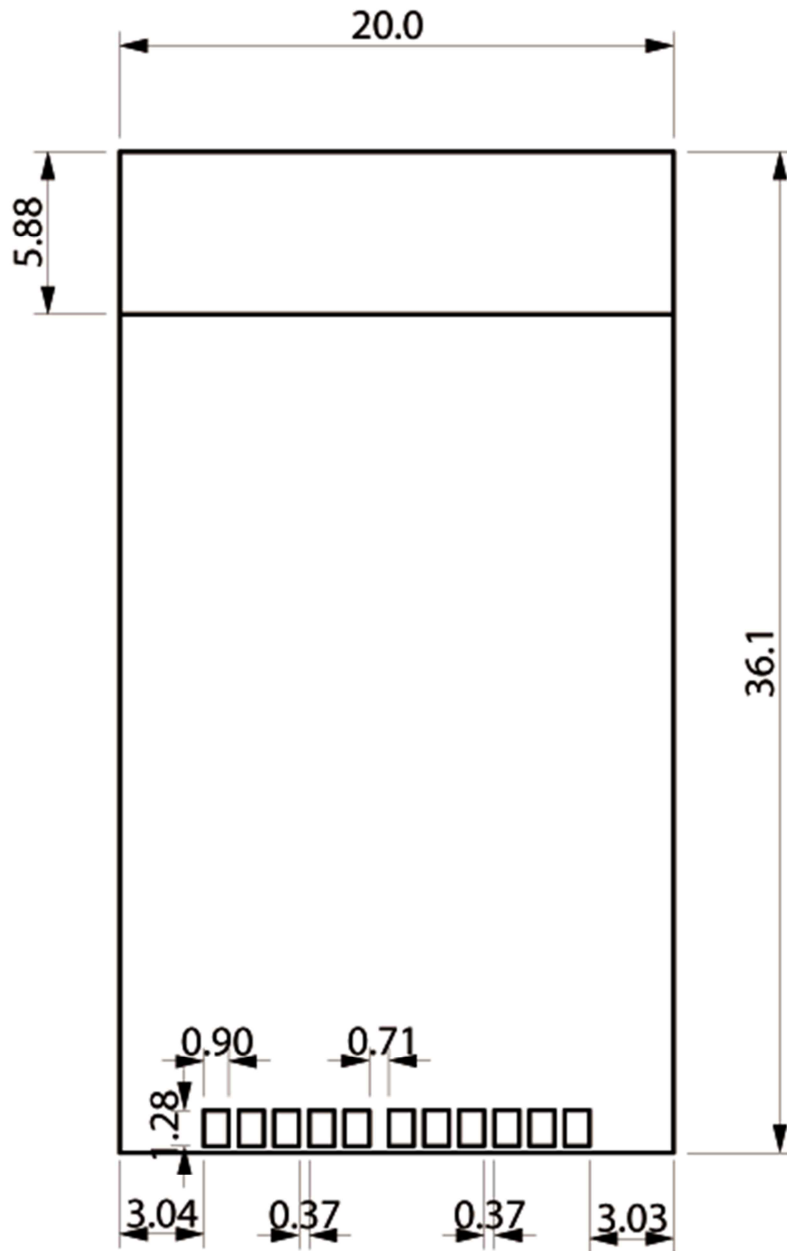
### 6.1 Dimension





# BLUETOOTH Dual Module - AGM19v1

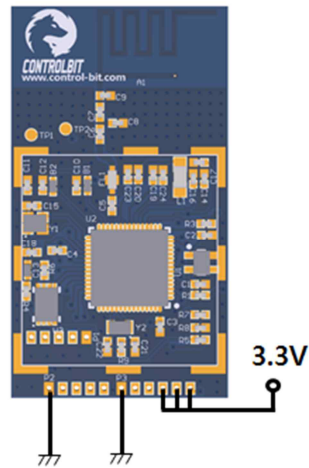
## 6.2 Recommended Footprint



# BLUETOOTH Dual Module - AGM19v1

## 7 Power Supply

### 7.1 3.3V for Bluetooth Module



## 8 Example Application

### 8.1 UART Interface

