32-bit M0+ BT5.2 BLE SoC Module

BM67C741-1

Revision: V1.00 Date: July 22, 2022

www.bestmodulescorp.com

Table of Contents

Features

32-bit Microcontroller

- Operating voltage: 2.0V~3.6V
- Operating frequency: Up to 40MHz
- Up to 25 GPIO pins
- 64KB on-chip Flash memory
- 8KB on-chip SRAM
- Communication interface: USART, UART, SPI, I^2C
- Timer: MCTM, GPTM, SCTM, BFTM
- 12-bit SAR A/D Converter

Bluetooth Low Energy Controller

- Operating voltage: 2.0V~3.6V
- Operating current: @ 3V
  - Power-Down mode: 2μA
  - Broadcast mode: 850μA @ 100ms
- RX sensitivity: @ 25°C
  - 1Mbps: -94dBm (Typ.)
  - 2Mbps: -91dBm (Typ.)
- Frequency range: 2402MHz~2480MHz
- TX output power: +3.5dBm @ Max. power setting
- Modulation type: GFSK
- Transmission distance: >100m @ +3.5dBm in open area

Module

- Interface: 34-pin – pitch = 1.27mm stamp hole
- Dimensions: 24mm(L) × 20mm(W)
- Temperature range: -40°C ~ +85°C

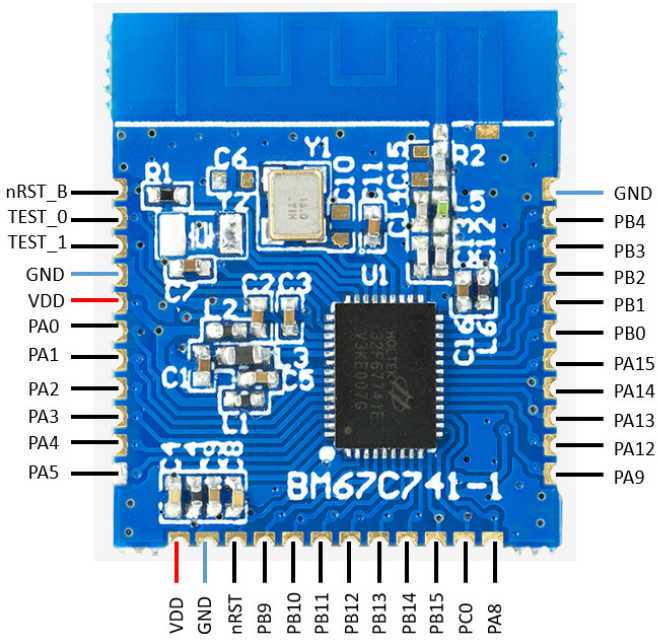
General Description

The BM67C741-1 is a 32-bit M0+ BT5.2 BLE SoC module which is a design based on the HT32F67741 BLE transparent transmission device. More detailed information is described in the HT32F67741 datasheets. This module can wirelessly control external devices and supports bidirectional data transfer suitable for lighting products, health care products and home appliances.

Selection Table

Part Number	Temperature
BM67C741-1	-40°C ~ +85°C

Pin Definition



Pin No.	Pin Name	Type	Function Description
1	nRST_B	I	BLE hardware reset, active low
2	TEST_0	I	Test pin
3	TEST_1	I	Test pin
4	GND	P	Negative power supply, ground
5	VDD	P	Positive power supply, 2.0~3.6V
6	PA0	I/O	General purpose I/O
7	PA1	I/O	General purpose I/O
8	PA2	I/O	General purpose I/O
9	PA3	I/O	General purpose I/O
10	PA4	I/O	General purpose I/O
11	PA5	I/O	General purpose I/O
12	VDD	P	Positive power supply, 2.0~3.6V
13	GND	P	Negative power supply, ground
14	nRST	I	External reset pin and external wake-up pin in the Power Down mode, active low
15	PB9	I/O	General purpose I/O
16	PB10	I/O	General purpose I/O
17	PB11	I/O	General purpose I/O
18	PB12	I/O	General purpose I/O
19	PB13	I/O	General purpose I/O
20	PB14	I/O	General purpose I/O
21	PB15	I/O	General purpose I/O
22	PC0	I/O	General purpose I/O
23	PA8	I/O	General purpose I/O
24	PA9	I/O	General purpose I/O
25	PA12	I/O	General purpose I/O
26	PA13	I/O	General purpose I/O

Pin No.	Pin Name	Type	Function Description
27	PA14	I/O	General purpose I/O
28	PA15	I/O	General purpose I/O
29	PB0	I/O	General purpose I/O
30	PB1	I/O	General purpose I/O
31	PB2	I/O	General purpose I/O
32	PB3	I/O	General purpose I/O
33	PB4	I/O	General purpose I/O
34	GND	P	Negative power supply, ground

Legend: I = Input, O = Output, A = Analog port, P = Power supply.

Absolute Maximum Ratings

The following table shows the absolute maximum ratings of the device. These are stress ratings only. Stresses beyond absolute maximum ratings may cause permanent damage to the device. Note that the device is not guaranteed to operate properly at the maximum ratings. Exposure to the absolute maximum rating conditions for extended periods may affect device reliability.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
T_A	Operating Temperature Range	—	-40	—	85	°C
V_{CC}	External Main Supply Voltage	—	2.0	—	3.6	V

Electrical Characteristics

BLE Power Consumption

T_A=25°C, V_{DD}=3.0V, f_{XTAL}=16MHz, TX Power=+3.5dBm, unless otherwise specified

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_{BPOR}	BLE Power-on-Reset Supply Current	—	—	822	—	μA
I_{BADV}	Supply Current (BLE Broadcast Mode)	AdvIntv=100ms	—	850	—	μA
I_{BCON}	Supply Current (BLE Connection Mode)	ConIntv=100ms	—	710	—	μA
I_{BPD}	Supply Current (BLE Power-Down Mode)	—	—	2	—	μA
I_{BTX}	Supply Current (BLE TX Mode)	TX Power=0dBm	—	6.9	—	mA
I_{BRX}	Supply Current (BLE RX Mode)	Data rate=1Mbps	—	8.5	—	mA

Microcontroller Power Consumption

T_A=25 °C, V_{DD}=3.0V, unless otherwise specified

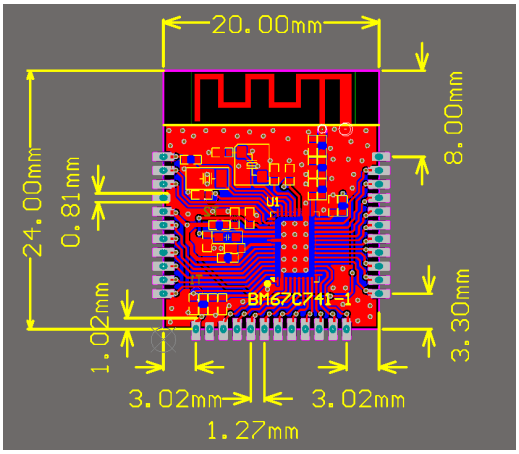
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_{DD}	Run Mode	HSI=8MHz, PLL=40MHz, f_{CPU}=40MHz, f_{BUS}=40MHz, all peripherals enabled	—	10.8	—	mA
		HSI=8MHz, PLL=40MHz, f_{CPU}=40MHz, f_{BUS}=40MHz, all peripherals disabled	—	6	—	mA
	Sleep Mode	HSI=8MHz, PLL=40MHz, f_{CPU}=0MHz, f_{BUS}=40MHz, all peripherals enable	—	6.5	—	mA
		HSI=8MHz, PLL=40MHz, f_{CPU}=0MHz, f_{BUS}=40MHz, all peripherals disabled	—	1.5	—	mA
	Deep-Sleep1 Mode	HSE/HSI/PLL/LSE clocks off, LDO in low power mode, LSI on, RTC on	—	32.4	—	μA
	Deep-Sleep2 Mode	HSE/HSI/PLL/LSE clocks off, LDO off, LSI on, RTC on	—	3.2	—	μA
	Power-Down Mode	V_{DD}=3.3V, LDO off, DMOS off, LSE off, LSI on, RTC on	—	1.4	—	μA

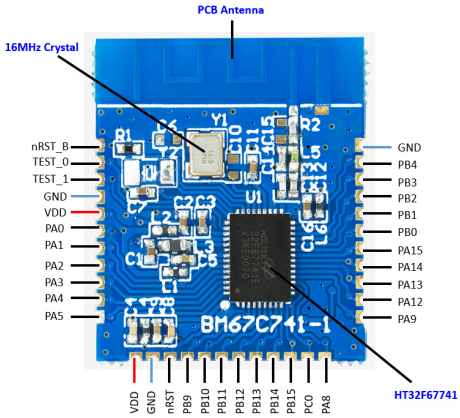
BLE Characteristics

T_A=25°C

Symbol	Parameter		Min.	Typ.	Max.	Unit
RX Characteristic						
CI0	In-band Blocking	Co-channel Interference	—	7	—	dB
CI1		Interfere at f_{OFFS}=±1MHz	-9	—	-6	dB
CI2		Interfere at f_{OFFS}=±2MHz	—	-44	—	dB
CI3		Interfere at f_{OFFS}=±3MHz	—	-50	—	dB
CI4		Interfere at f_{IMAGE}	—	-25	—	dB
CI5		Interfere at f_{IMAGE}=±1MHz	—	-35	—	dB
Intermodulation	P_{in}=-64dBm; P_{unwant}=-50dBm; f0=2×f1-f2, f2-f1=3MHz or 4MHz or 5MHz		-25	—	-22	dBm
PSENS	Sensitivity @ 1Mbps		—	-94	—	dBm
	Sensitivity @ 2Mbps		—	-91	—	dBm
TX Characteristic						
P_{TX}	Output Power		—	3.5	—	dBm
P_{BW}	Modulation 20dB Bandwidth		—	—	1	MHz
PRF1	Out of Band Emission 2MHz		—	-20	—	dB
PRF2	Out of Band Emission 3MHz		—	-58	—	dB
Dev	Transmit FM Deviation		115	250	300	kHz
Drift	Transmit Drift in any Position		—	—	400	Hz/μs

Module Dimension Drawing





Top View