

BM029 8258 Bluetooth Low Energy Module Datasheet

Version 1.0

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Revision History

Revision	Date	Description
V1.0	2021/12/20	Initial release

1. BNC BLE Module

BM029



1.1 Introduction

BM029 Bluetooth® module is a Telink's 32Bit MCU SoC Bluetooth low energy products for the Bluetooth Smart market. BM029 increases application code and data space for greater application development flexibility. It is slim and light so the designers can have better flexibilities for the product shapes.

The BM029 Bluetooth module compatible with Bluetooth standard and supports BLE specification up to version 5.0. It supports profiles for health and fitness sensors, watches, i-Beacon. It's Also support BLE Mesh protocol for Smart Lighting ,Mesh Gateway ,IoT system leave network topology application . It integrates BLE/15.4 2.4G RF Baseband controller, antenna,

1.2 Feature

Specification

Module Name	BM029
Chips ID	TL8R8258 F512ET32
Wireless Protocol	BLE up to version 4.2(mesh)&5.0
Transceiver Type	1TX x 1RX
Data Rate	1 Mbps and 2 Mbps LE Enhancement FIPD Version
Operating Frequency	2402MHz~2480MHz
Antenna	On board Chips Antenna
Transmission Range	>25M (open side)

RF Output Power	Normal +10 dBm
Power Consumption	TX: 15~22mA / RX: 12mA /Suspend :10uA /Deep Sleep:1.7uA
Interface Port	5 x PWM ,or 1 x I2C, 1 x UART,5x GPIO, total 5 GPIOs for Option Pin define
Processor	Embedded 32 Bit MCU with clock Up to 48Mhz
Memory	Build-in 512KB Program Flash ,32KB SRAM
Security	Hardware AES-128 Encryption
Firmware Upgrade	OTA (Over the Air) or SWS wire Port
Power Supply	DC 1.8V~3.6V
Operating Environment	-40 ~ +85°C(AT to +105°C) , 0~95% RH
Dimensions	18.5(L) x 8.6(W) x 2.5(H) mm(PCB 1.0mm)
Environmental standard	RoHS-compliant and 100% lead (Pb)-free.

2. Ordering Information

BM029XXX-X S S

Software Ttpe:

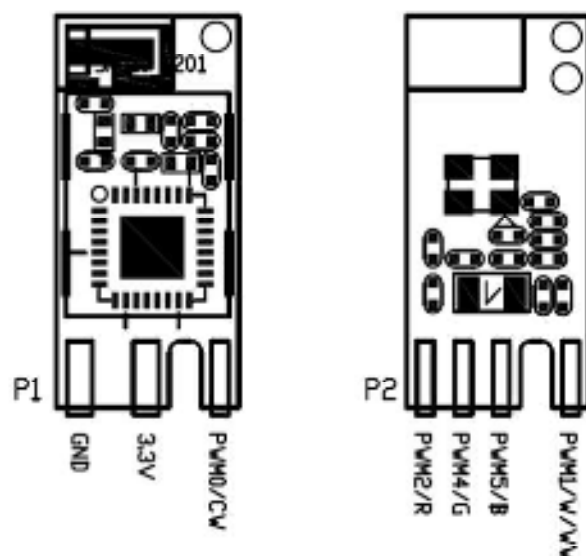
Hardware Type:
C = Chip Antenna Version

N8E = TLSR8258 Topr -40~85°C Versions

3. Pin Configurations

3.1 Pin Assignments

BM029 Pin –Out



3.2 Pin Description

P1 Pin Define

Pin No	Pin name	Type	Description
1	GND	GND	Ground
2	3.3V	Power	Power Source
3	PWM0/CW	I/O	PWM0,GPIO_PC2,UART_TX

P2 Pin Define

1	PWM2/R	I/O	PWM2,GPIO_PC4,UART_CTS
2	PWM4/G	I/O	PWM4,GPIO_PB4,
3	PWM5/B	I/O	PWM5,GPIO_PB5
4	PWM1/W/WW	I/O	PWM1,GPIO_PC3,UART_RX

Mesh Lighting Application Table

Pin	Application	LED Lighting								
	Product type	Single	CW/WW	RGB	RGBW	RGB/WW/CW				
	Type Code	01	02	03	04	05				
P1-1	GND	GND	GND	GND	GND	GND				
P1-2	3.3V	3.3V	3.3V	3.3V	3.3V	3.3V				
P1-3	PWM0/CW	On/Off Rly hi Act	CW			CW				
P2-1	PWM2/C4			R	R	R				
P2-2	PWM4/B4			G	G	G				
P2-3	PWM5/B5	On/Off DI_Lo Act		B	B	B				
P2-4	PWM1/C3	Lum	WW		WW	WW				

P3 Pin Define

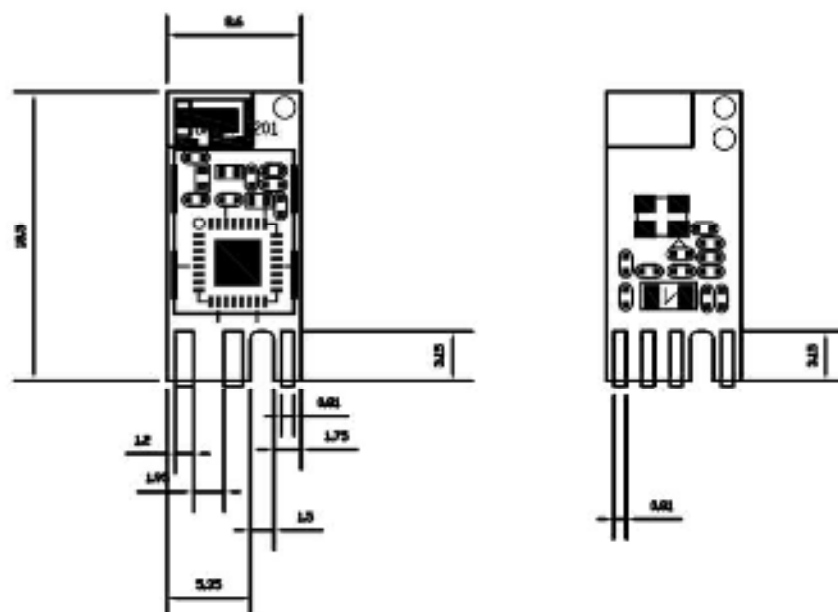
Pin No	Pin name	Type	Description
1	SWS	I/O	GPIO_PA7,UART_RTS,Single Wire Slave

P4 Pin Define

Pin No	Pin name	Type	Description
1	GND	GND	Ground
2	3.3V	Power	Power Source

4. Outline Drawing

4.1 Board Dimensions (Unit: mm)



5. Electrical Characteristics

Absolute Maximum Ratings :

Symbol	Parameters	Maximum rating	Unit
VDD	Power Supply Voltage	-0.3 to 3.6	V
Tstr	Storage Temperature	-65 to +150	°C
Tsld	Soldering Temperature	260	°C
VESD	ESD protection (HBM)	2000	V

Operating Conditions

	Min.	Typ.	Max.	Unit
Supply Voltage VDD	1.8	3.3	3.6	V
I/O Supply Voltage		3.3+/-10%		V
Temperature Range (ET Versions)	-40	-	85	°C

DC Electrical Characteristics

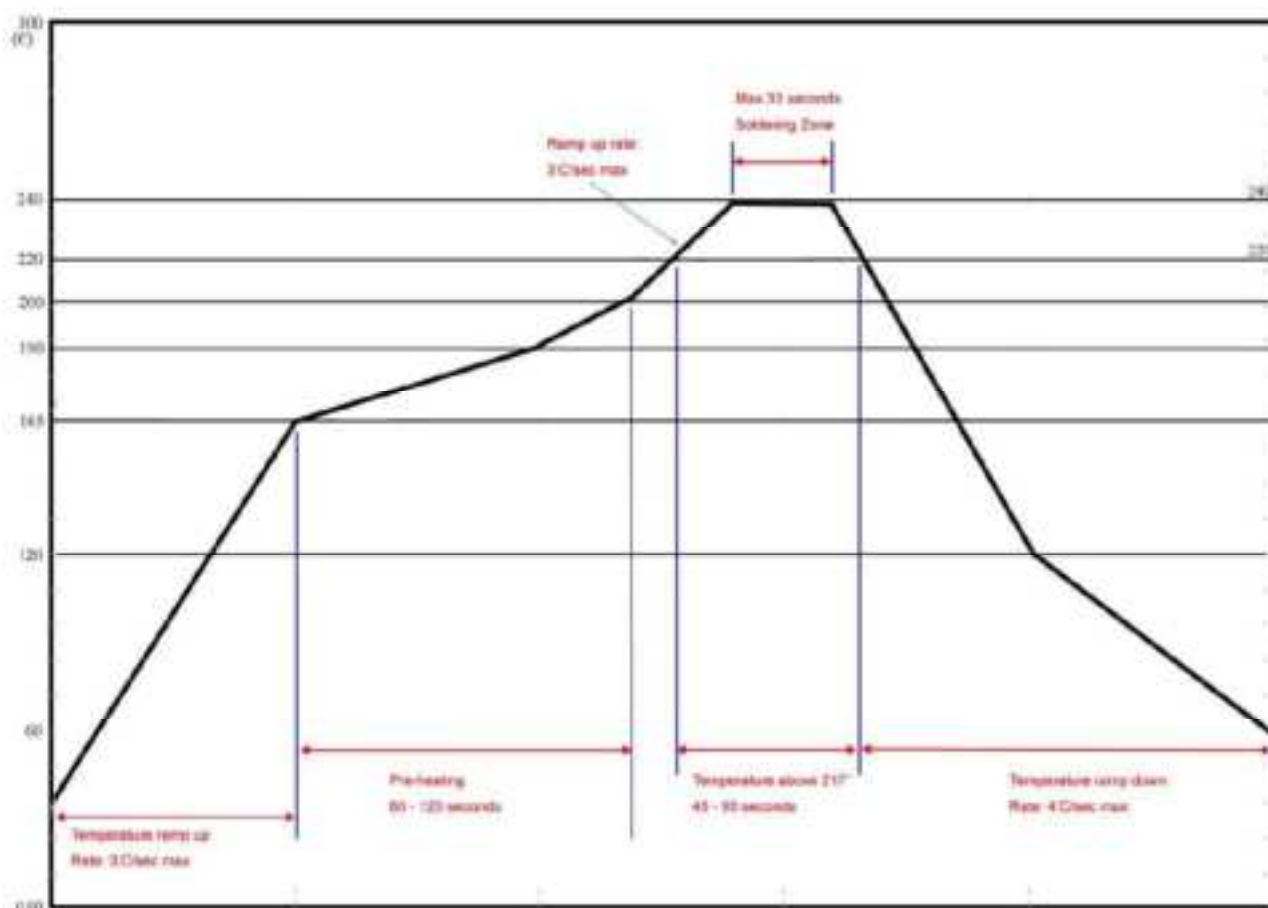
	Min.	Max.	Unit
V _{IL} Input Voltage Low	VSS	0.3VDD	V
V _{IH} Input Voltage High	0.7VDD	VDD	V
V _{OL} Output Voltage Low, (IO is 4~16mA)	VSS	0.1VDD	V
V _{OH} Output Voltage High, (IO is 4~16mA)	0.9VDD	VDD	V

Current Consumption

(VDD = 3.0V, TA = 25°C, unless otherwise specified)

	Min.	Avg.	Max.	Unit
Active Average Current	7	7.5	10	mA
Active Peak Current		25	35	mA
PWM, ON/OFF Operating Current			4	mA
Power Consumption		25		mW

6. Recommended Temperature Reflow Profile



Manual Soldering Conditions: 360°C, 5 seconds, 3 times max

Maximum number of reflow cycles: 2

Opposite side reflow is prohibited due to the module's weight. (i.e. you must not place the module on the bottom / underside of your PCB and reflow).

6.1 Hand Soldering

Hand soldering is possible. When using a soldering iron, follow IPC recommendations (reference document IPC-7711).

6.2 Rework

The module can be unsoldered from the host board. Use of a hot air rework tool should be programmable and the solder joint and module should not exceed the maximum peak reflow temperature of 250°C.

If temperature ramps exceed the reflow temperature profile, module and component damage may occur due to thermal shock. Avoid overheating. Never attempt a rework on the module itself, (e.g. replacing individual components).

6.3 Cleaning

In general, cleaning the populated modules is strongly discouraged. Residuals under the module cannot be easily removed with any cleaning process. Use of "No Clean" soldering paste is strongly recommended, as it does not require cleaning after the soldering process.

7. Application Notes

7.1 Flash Use

The BM029 Module has been calibrated by RF before leaving the factory , That has various ID and parameter information of the BM029 module need to be retained. Please don't use the "EraseF" button to erase the All Flash of the BM029 module

7.2 Mounting

BM029 has one sets of soldering pads P1 and P2, which allow it to be mounted in horizontal position. In some application, such as LED Lamp and drivers, Please purchase the corresponding module part number according to the actual application needs.

8. Compliance information

Compliance Information		
Radio	USA	FCC Part 15 Subpart C
	FCC ID (BM029):	Not Ready
	Bluetooth (BQB)	Bluetooth Product Listing
	Declaration ID (DID)	Not Ready
	TELEC	Not Ready
Environmental	RoHS	RoHS compliant
	REACH	REACH compliant

8.1 Federal Communications Commission (FCC) Statement

Compliance Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

Warning

Any Changes or modifications not expressly approved by BLTC Network Corp could void the user's authority to operate the equipment.

FCC Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to

Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

It is the host manufacturer's responsibility to ensure continued compliance with FCC requirements once the module has been installed in to the host product.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This device is intended only for OEM integrators under the following conditions:

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna.

As long as 2 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed

IMPORTANT NOTE: In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains FCC ID:OF7AT3". The grantee's FCC ID can be used only when all FCC compliance requirements are met.

Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

Integration instructions for host product manufacturers according to KDB 996369 D03 OEM

Manual v01

2.2 List of applicable FCC rules

CFR 47 FCC PART 15 SUBPART C has been investigated. It is applicable to the modular transmitter

2.3 Specific operational use conditions

This module is stand-alone modular. If the end product will involve the Multiple simultaneously transmitting condition or different operational conditions for a stand-alone modular transmitter in a host, host manufacturer have to consult with module manufacturer for the installation method in end system.

2.4 Limited module procedures

Not applicable

2.5 Trace antenna designs

Not applicable

2.6 RF exposure considerations

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

2.7 Antennas

This radio transmitter **OF7AT3** has been approved by Federal Communications Commission to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Antenna No.	Model No. of antenna:	Type of antenna:	Gain of the antenna (Max.)	Frequency range:
Bluetooth	/	Chips Antenna	-0.5dBi for 2402-2480MHz;	

2.8 Label and compliance information

The final end product must be labeled in a visible area with the following" Contains FCC ID: OF7AT3".

2.9 Information on test modes and additional testing requirements

Host manufacturer which install this modular with single modular approval should perform the test of radiated emission and spurious emission according to FCC part 15C:15.247 and 15.209 requirement, only if the test result comply with FCC part 15.247 and 15.209 requirement, then the host can be sold legally.

2.10 Additional testing, Part 15 Subpart B disclaimer

Host manufacturer is responsible for compliance of the host system with module installed with all other applicable requirements for the system such as Part 15 B.