OPERATIONAL DESCRIPTION

1.1. EUT description

ALPWISE Wireless Solutions

ALPW-BLEM003
Bluetooth® Smart module

Description

The ALPW-BLEM003 module is a complete ready-to-use *Bluetooth*® Smart module.

The ALPW-BLEM003 module combines ultra low power hardware components and a complete *Bluetooth*® Smart protocol stack.

Alpwise solutions benefit from best-in-class product from wireless leading semiconductor manufacturers.

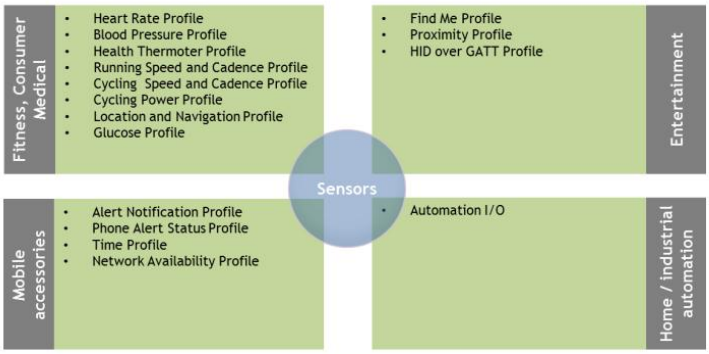
Main Features

- Small form factor
- Ultra low power consumption
- EM9301 2,4 GHz *Bluetooth*® Smart controller
- 1AA battery or button cell battery supply
- Complete connectivity
- Digital and analog comparator
- Programmable Cortex M0 processor to handle *Bluetooth*® Smart user application + *Bluetooth*® Smart stack
- Qualified *Bluetooth*® Smart protocol stack with GAP, SMP, ATT, L2CAP and GATT protocols

Bluetooth® SMART

User Applications

The ALPW-BLEM003 facilitates the integration of cost-effective and low power consumption wireless technologies for the following application segments, thanks to a continously updated and qualified list of profiles:



Contact

Alpwise Headquarter

4 avenue Doyen Louis Weil
38000 Grenoble, France
T: +33 4 76 22 22 50
F: +33 4 76 22 15 64
alpwisesales@alpwise.com
www.alpwise.com

Alpwise Worldwide

You can buy our products through our International distributors. You will find the distributors details on our website on the contact page.

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Technical Data

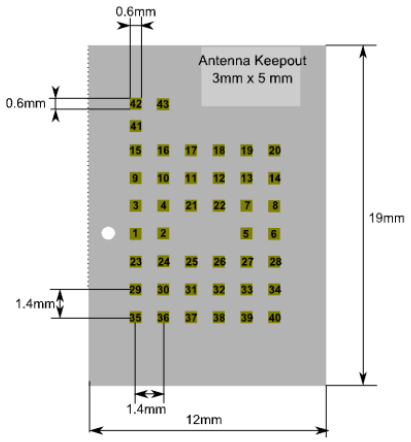
Microprocessor	**STM32 ARM Cortex M0**
Bluetooth® controller	EM9301
Module Dimensions (mm)	12 x 19 x 2.4 with shielding 12 x 19 x 1.6 without shielding
Frequency Range	2.4 GHz
TX Output Power	-18 dBm to +3 dBm
RX Sensitivity	-80 dBm
Operating Temperature	-40°C to +85°C
Power Supply	2.0 to 3.3 V

GPIOs	Up to 10
Connectivity	1 USART, 1 I2C
Analog Interfaces	4 ADC 10 bit with VREF
Certifications	CE, IC, FCC, MIC, BT Pending
Options	UFL antenna, shielding

Module Pin-Out

PAD1	GND	**PAD23**	SWD_DAT
PAD2	NC	**PAD24**	I2C_SMBA
PAD3	ADC4	**PAD25**	GND
PAD4	ADC3	**PAD26**	GND
PAD5	USART_RTS	**PAD27**	VDDA
PAD6	USART_CLK	**PAD28**	ADC1
PAD7	USART_CTS	**PAD29**	SWD_CLK
PAD8	VDD 3.3V	**PAD30**	IO2
PAD9	GND	**PAD31**	NC
PAD10	NC	**PAD32**	NC
PAD11	USART_TX	**PAD33**	I2C_SCL
PAD12	NC	**PAD34**	I2C_SDA
PAD13	NC	**PAD35**	ADC2
PAD14	GND	**PAD36**	IO1
PAD15	BOOT	**PAD37**	MCU NRST
PAD16	USART_RX	**PAD38**	NC
PAD17	NC	**PAD39**	NC
PAD18	NC	**PAD40**	GND
PAD19	NC	**PAD41**	GND
PAD20	NC	**PAD42**	RF OUTPUT
PAD21	GND	**PAD43**	GND
PAD22	GND		

Dimensions



Flexible System Configuration

The **ALPW-BLEM003** module enables wide use in different design configuration:

- **Stand Alone module** - ready-to-use *Bluetooth*® Smart co-processor, packed with GAP and GATT profile. Additional profile can be added upon the specific use.
- **Application module** - user application program can be downloaded into the internal Flash memory to take benefit of the internal MCU power and interface offer (GPIO's, ADC…). Protocol stack is provided through the ALPW-BLESDKCM0 SDK.

You may also be interested in these products

ALPW-BLEEASY
Easy Kit

ALPW-BLESDK
Protocol Stack and tools

ALPW-BLESDKiOS
Stack for iOS

Along with the ALPW-BLEM003 module, Alpwise provides all the tools facilitating the implementation of your *Bluetooth*® low energy application: development kit, SDK, SDK for iOS

Please contact us to know more about our complete offer.

1.2. Related Submittal(s) / Grant(s)

All host equipment used in the test configuration are FCC granted, when relevant.

1.3. Tested System Details

The system was configured for testing in a typical fashion (as a customer would normally use it). All configurations of EUT is considered, worst cases are presented in this test report.
BLEM003 is a Bluetooth Low Energy module.
To perform tests, manufacturer provided test board to configure module: Easykit
All I/O of module are out of test board by 10cm length of cable.

Power supply:
- Provided by test PCB, 3.0VDC nominal.
During all the tests, EUT is supplied by test board powered by 5VDC USB.

Input/output and cable:
- 1 x MicroUSB, shielded, length: 1.5m
- X x I/O, used on test PCB with 10cm length

Auxiliaries used for testing:
- Easykit, BLEMEK-1312022
- Laptop of laboratory for software (HP Pavillon, sn: 5CD244603W) and its power supply (Carrefour CPS01, sn: 1305523282)

Equipment information: (Declared by provider)

- Frequency band:	[2400.0 – 2483.5] MHz		
- Standard:	☐Wifi	☒Bluetooth	☐Zigbee
- Spectrum Modulation:	☒FHSS		☒DSSS
	Bluetooth low energy is tested like a DSSS.		
- Modulation type:	☒GFSK		
Packet type:	37, length of the payload data		
- Number of channel:	39, 3 for advertisement		
- Channel separation:	☐5MHz	☒2MHz	☐1MHz
- Channel bandwidth:	☐10MHz	☐20MHz	☒1MHz
- Channel tested:	Full test on 2404MHz, 2442MHz and 2480MHz		
- Sub-band REC7003:	Annex 3(a)		
- RF mode:	☒TX/RX	☒RX	
- Antenna type:	Ceramic 0.9dBi		
- Antenna connector:	☐Permanent external	☐Permanent internal	
	☒None	☒Temporary (only for tests)	

Firmware tested:	Application:	DataExchange 1.0 based on ALPW-BLESDE 1.0.0 for Cortex M0
	RF test:	HCIMode-M0 1.0
Revision:	RevA	

1.4. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4-2003 FCC Part 15 Subpart B and C.
Radiated testing was performed at an antenna to EUT distance of 10 meters. During testing, all equipment's and cables were moved relative to each other in order to identify the worst case set-up.

1.5. Test facility

Tests have been performed from February 11th to 14th, 2014.

This test facility has been fully described in a report and accepted by FCC as compliant with the radiated and AC line conducted test site criteria in ANSI C63.4-2003 in a letter dated March 25th, 2008 (registration number 94821). This test facility has also been accredited by COFRAC (French accreditation authority for European Union test lab accreditation organization) according to NF EN ISO/IEC 17025, accreditation number 1-1633 as compliant with test site criteria and competence in 47 CFR Part 15/ANSI C63.4 and EN55022/CISPR22 norms for 89/336/EEC European EMC Directive application. All pertinent data for this test facility remains unchanged.