

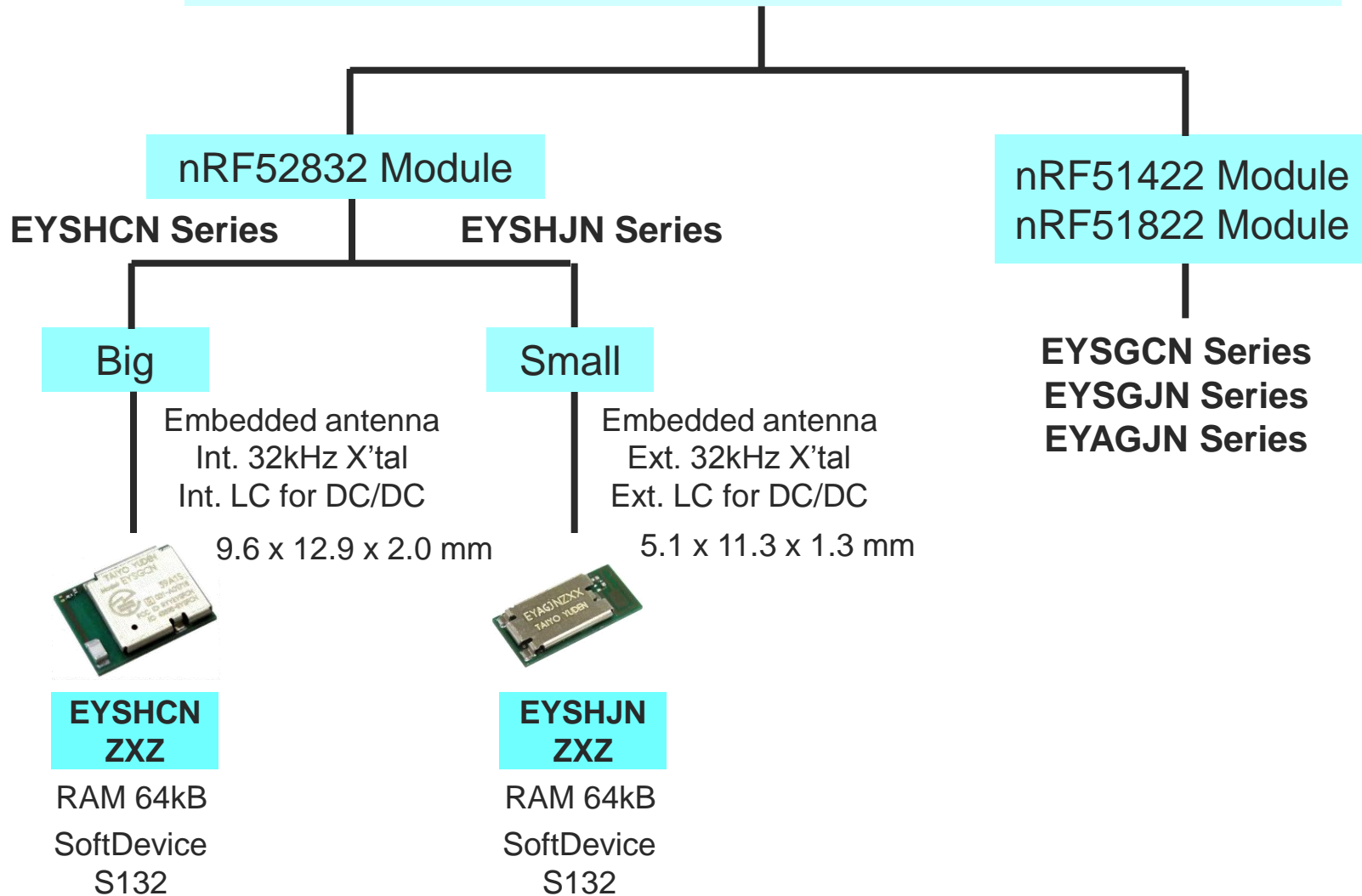
# Wireless Module *Bluetooth<sup>®</sup> low energy* Module Overview

---

Dec. 9, 2016 Version 1.4

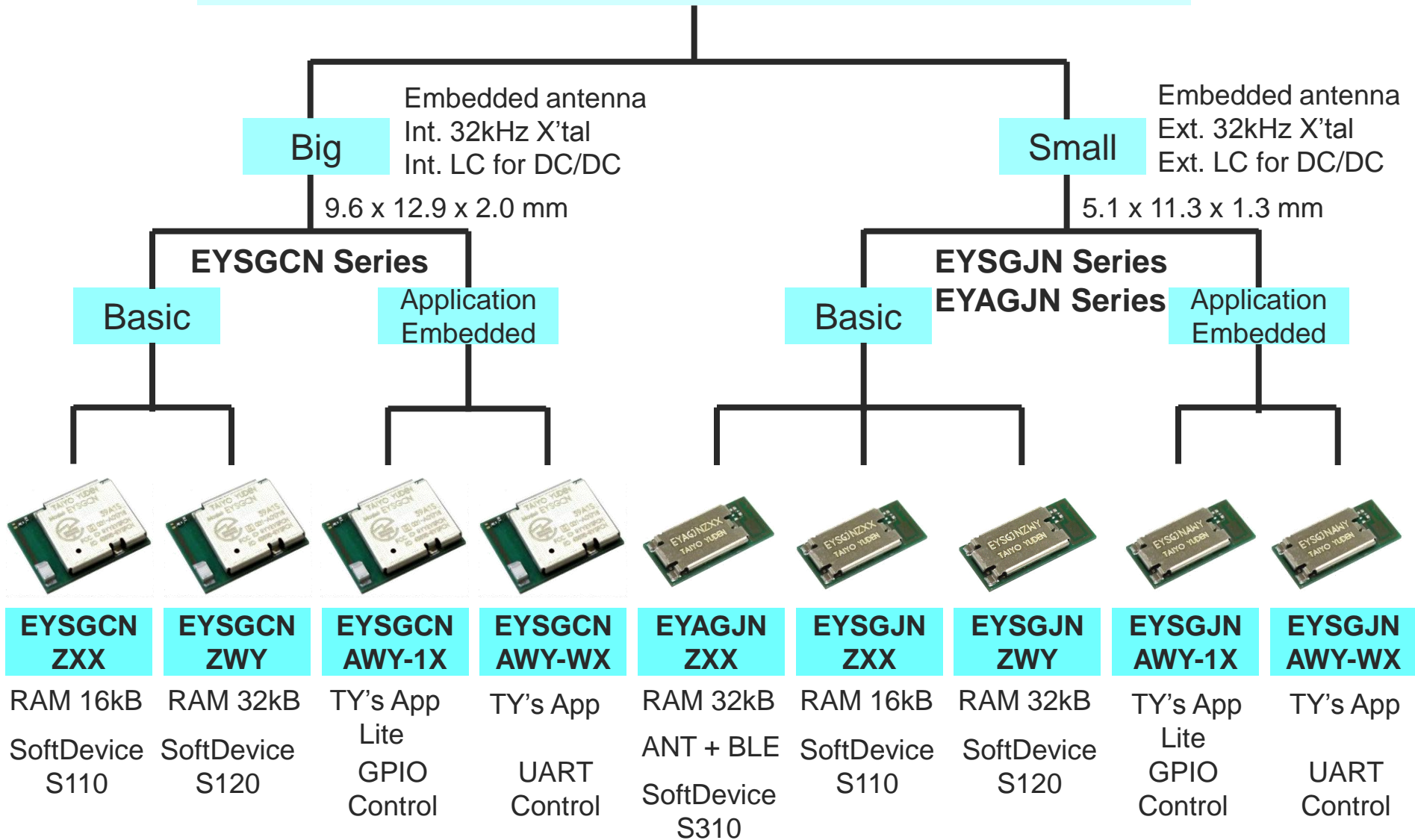
# Taiyo Yuden Bluetooth® low energy Module Line-Up

## Taiyo Yuden Bluetooth® low energy Module



# Taiyo Yuden Bluetooth® low energy Module Line-Up

## nRF51x22 Bluetooth® low energy Module



# Latest Documents for Bluetooth® low energy Module

EYSHCNZXX	<a href="http://www.yuden.co.jp/or/product/category/module/EYSHCNZXX.html">http://www.yuden.co.jp/or/product/category/module/EYSHCNZXX.html</a>
EYSHJNZXX	<a href="http://www.yuden.co.jp/or/product/category/module/EYSHJNZXX.html">http://www.yuden.co.jp/or/product/category/module/EYSHJNZXX.html</a>
EYSGCNZXX	<a href="http://www.yuden.co.jp/or/product/category/module/EYSGCNZXX.html">http://www.yuden.co.jp/or/product/category/module/EYSGCNZXX.html</a>
EYSGCNZWY	<a href="http://www.yuden.co.jp/or/product/category/module/EYSGCNZWY.html">http://www.yuden.co.jp/or/product/category/module/EYSGCNZWY.html</a>
EYSGJNZXX	<a href="http://www.yuden.co.jp/or/product/category/module/EYSGJNZXX.html">http://www.yuden.co.jp/or/product/category/module/EYSGJNZXX.html</a>
EYSGJNZWY	<a href="http://www.yuden.co.jp/or/product/category/module/EYSGJNZWY.html">http://www.yuden.co.jp/or/product/category/module/EYSGJNZWY.html</a>
EYAGJNZXX	<a href="http://www.yuden.co.jp/or/product/category/module/EYAGJNZXX.html">http://www.yuden.co.jp/or/product/category/module/EYAGJNZXX.html</a>
EYSGCNAWY-1X	<a href="http://www.yuden.co.jp/or/product/category/module/EYSGCNAWY-1X.html">http://www.yuden.co.jp/or/product/category/module/EYSGCNAWY-1X.html</a>
EYSGJNAWY-1X	<a href="http://www.yuden.co.jp/or/product/category/module/EYSGJNAWY-1X.html">http://www.yuden.co.jp/or/product/category/module/EYSGJNAWY-1X.html</a>
EYSGCNAWY-WX	<a href="http://www.yuden.co.jp/or/product/category/module/EYSGJNAWY-WX.html">http://www.yuden.co.jp/or/product/category/module/EYSGJNAWY-WX.html</a>
EYSGJNAWY-WX	<a href="http://www.yuden.co.jp/or/product/category/module/EYSGJNAWY-WX.html">http://www.yuden.co.jp/or/product/category/module/EYSGJNAWY-WX.html</a>
EYSFCNZXX	<a href="http://www.yuden.co.jp/or/product/category/module/EYSFCNZXX.html">http://www.yuden.co.jp/or/product/category/module/EYSFCNZXX.html</a>

-The documents for the evaluation board and evaluation kit are also available on the above page.

- The Japanese documents are available on the following page.

<http://www.yuden.co.jp/jp/product/category/module/lineup.html#Bluetooth>

# Bluetooth® low energy Module: **EYSHCNZXZ**

## Features

- Frequency: 2402 to 2480 MHz with +4dBm Output power
- Single power supply: 1.7 – 3.6V
- Single Mode Bluetooth low energy Slave/Master (ANT™ Available)
- Chip: **nRF52832** (Nordic)
- Integrated System/**Sleep Clock, LC for DC/DC**
- Integrated high performance ceramic chip antenna
- ARM Cortex M4F** 32bit processor
- 512kB Flash** and **64kB RAM**
- Interface: SPI, UART, I2C, I2S, PDM and 12bit ADC
- Support **NFC-A Type-2** for Touch-to-Pair
- Outline: **9.6 x 12.9 x 2.0** mm with **1mm** pad pitch
- Operating Temperature range: -40 to 85 deg-C
- Bluetooth and Japan, FCC, IC qualified
- CE Conducted Test Report Available
- RoHS compliant / Complete Lead Free

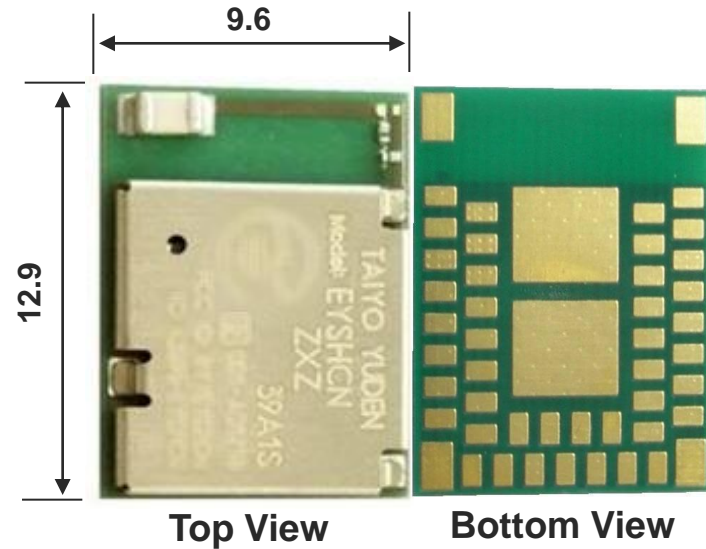
## Applications

- Cycle computer
- Heart rate monitor
- Blood pressure monitor
- Blood glucose meter
- Weighing machine
- Thermometer
- Mobile accessories
- Sports and fitness sensors
- Remote controllers / Toys

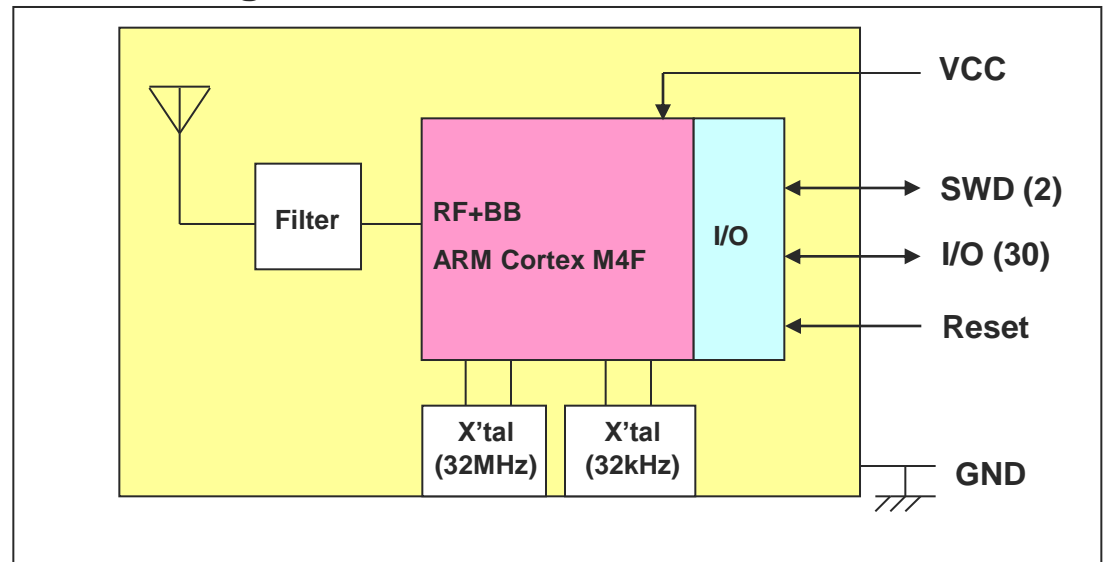
All specifications are subject to change without notice.

The *Bluetooth*® word mark and logos are owned by the *Bluetooth* SIG, Inc. and any use of such marks by TAIYO YUDEN CO., LTD. is under license.

## Outline



## Block Diagram

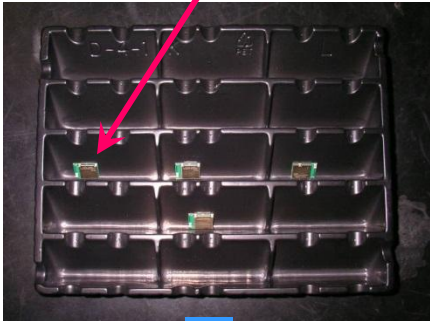
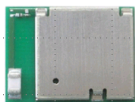


**TAIYO YUDEN**

# Bluetooth® low energy Module Sample, Evaluation Board / Kit

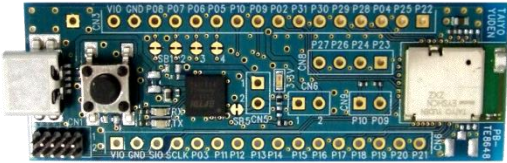
## EYSHCNZZX (Module)

### Module samples



## EBSHCNZZX (EV-B)

### Evaluation board



## EKSHCNZZX (EV-K)

### Evaluation kit



**SEGGER  
J-Link LITE  
Attached**



# Bluetooth® low energy Module: **EYSHJNZXZ**

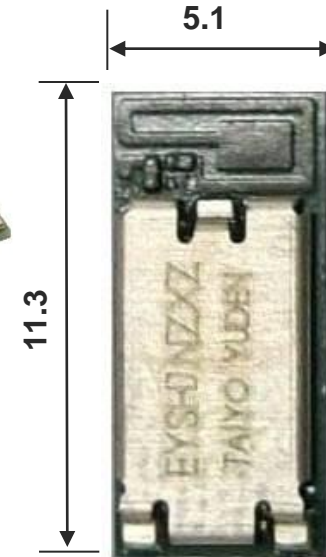
## Features

- Frequency: 2402 to 2480 MHz with +4dBm Output power
- Single power supply: 1.7– 3.6V
- Single Mode Bluetooth low energy Slave (ANT™ Available)
- Chip: **nRF52832** (Nordic)
- Integrated System Clock
- ARM Cortex M4F** 32bit processor
- 512kB Flash and 64kB RAM**
- Interface: SPI, UART, I2C, I2S, PDM and 12bit ADC
- Support **NFC-A Type-2** for Touch-to-Pair
- Integrated high performance pattern antenna
- Outline: **5.1 x 11.3 x 1.3**mm MAX
- Operating Temperature range: -40 to 85 deg-C
- Bluetooth and Japan, FCC, IC qualified
- CE Conducted Test Report Available
- RoHS compliant / Complete Lead Free

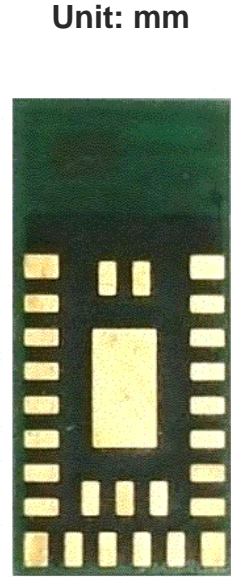
## Applications

- Cycle computer
- Heart rate monitor
- Blood pressure monitor
- Blood glucose meter
- Weighing machine
- Thermometer
- Mobile accessories
- Sports and fitness sensors
- Remote controllers / Toys

## Outline



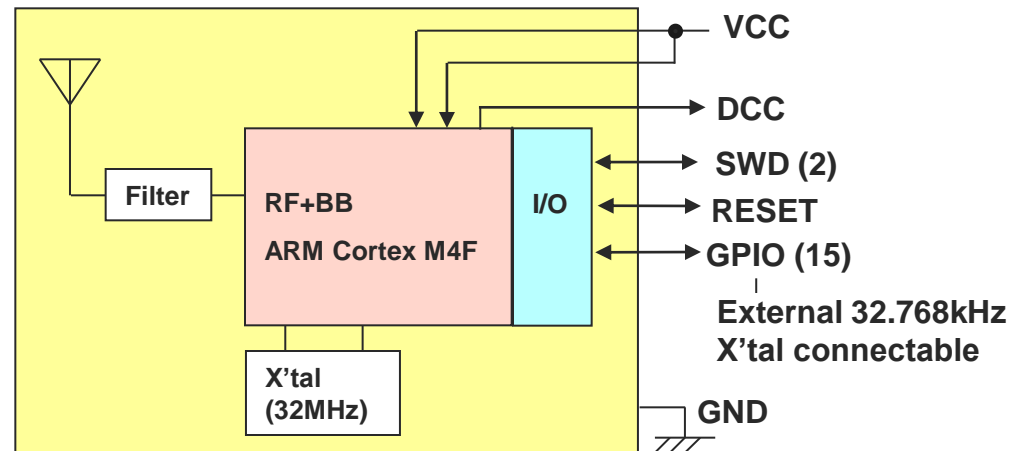
Top View



Bottom View

Unit: mm

## Block Diagram



All specifications are subject to change without notice.

The *Bluetooth*® word mark and logos are owned by the *Bluetooth* SIG, Inc. and any use of such marks by TAIYO YUDEN CO., LTD. is under license.

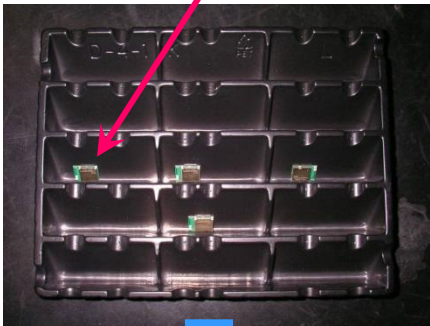
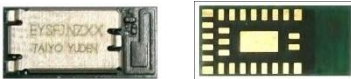
**TAIYO YUDEN**



# Bluetooth® low energy Module Sample, Evaluation Board / Kit

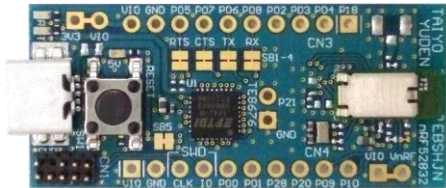
## EYSHJNZXZ (Module)

### Module samples



## EBSHJNZXZ (EV-B)

### Evaluation board



## EKSHJNZXZ (EV-K)

### Evaluation kit





# Bluetooth® low energy Module: **EYSGCNZXX**

## Features

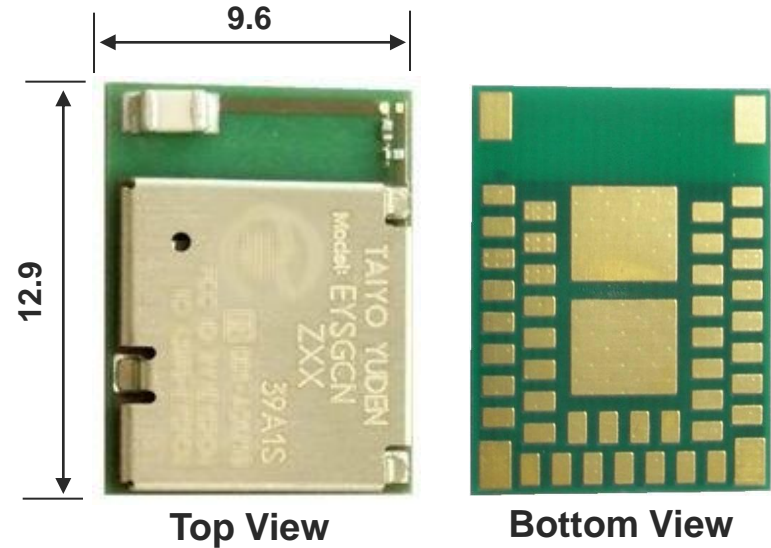
- Frequency: 2402 to 2480 MHz
- Output power: +4dBm typ.
- Single power supply: 1.8 – 3.6V
- Single Mode Bluetooth low energy Slave
- Chip: nRF51822 **Rev.3** (Nordic)
- Integrated System/Sleep Clock
- Integrated high performance ceramic chip antenna
- ARM Cortex M0** 32bit processor
- 256kB Flash** and **16kB RAM**
- Interface: SPI, UART, I2C and 8/9/10bit ADC
- Outline: **9.6 x 12.9 x 2.0** mm with **1mm** pad pitch
- Operating Temperature range: -25 to 75 deg-C
- Bluetooth and Japan, FCC, IC qualified
- CE Conducted Test Report Available
- RoHS compliant / Complete Lead Free

## Applications

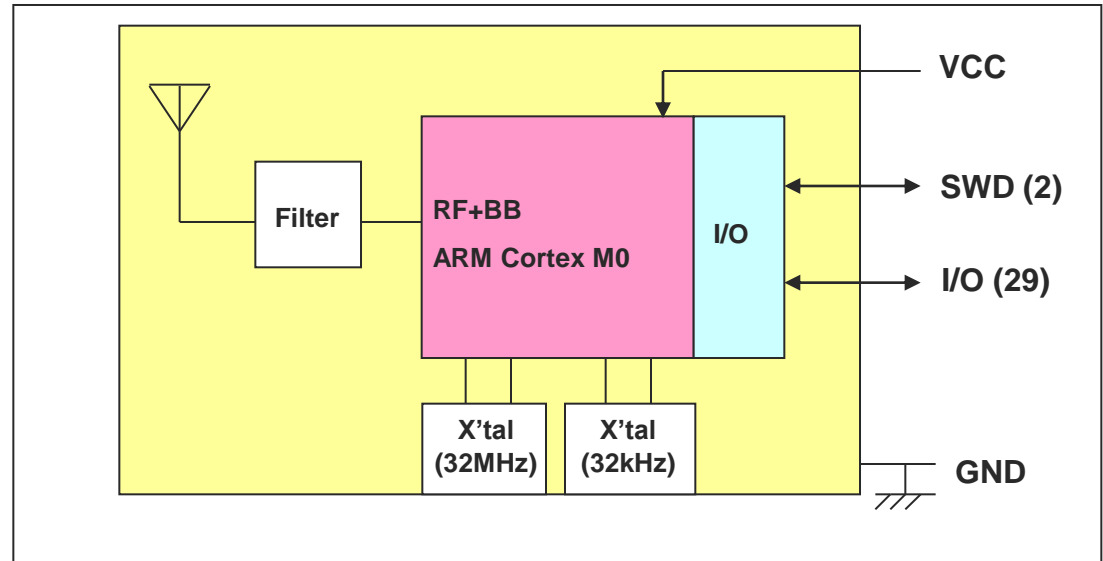
- Cycle computer
- Heart rate monitor
- Blood pressure monitor
- Blood glucose meter
- Weighing machine
- Thermometer
- Mobile accessories
- Sports and fitness sensors
- Remote controllers / Toys

## Outline

Unit: mm



## Block Diagram



All specifications are subject to change without notice.

The *Bluetooth*® word mark and logos are owned by the *Bluetooth* SIG, Inc. and any use of such marks by TAIYO YUDEN CO., LTD. is under license.

**TAIYO YUDEN**

# Bluetooth® low energy Module: **EYSGCNZWY**

## Features

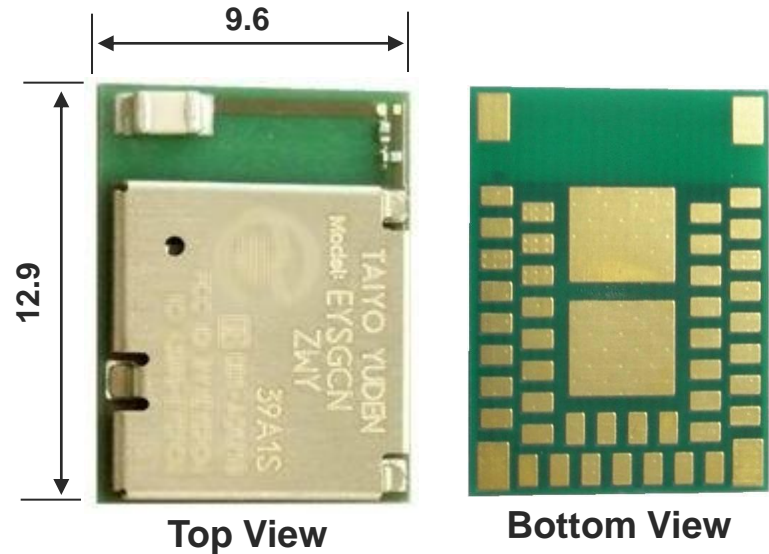
- Frequency: 2402 to 2480 MHz
- Output power: +4dBm typ.
- Single power supply: 1.8 – 3.6V
- Single Mode Bluetooth low energy **Slave / Master**
- Chip: nRF51822 **Rev.3** (Nordic)
- Integrated System/**Sleep Clock**
- Integrated high performance ceramic chip antenna
- ARM Cortex M0** 32bit processor
- 256kB Flash** and **32kB RAM**
- Interface: SPI, UART, I2C and 8/9/10bit ADC
- Outline: **9.6 x 12.9 x 2.0** mm with **1mm** pad pitch
- Operating Temperature range: -25 to 75 deg-C
- Bluetooth and Japan, FCC, IC qualified
- CE Conducted Test Report Available
- RoHS compliant / Complete Lead Free

## Applications

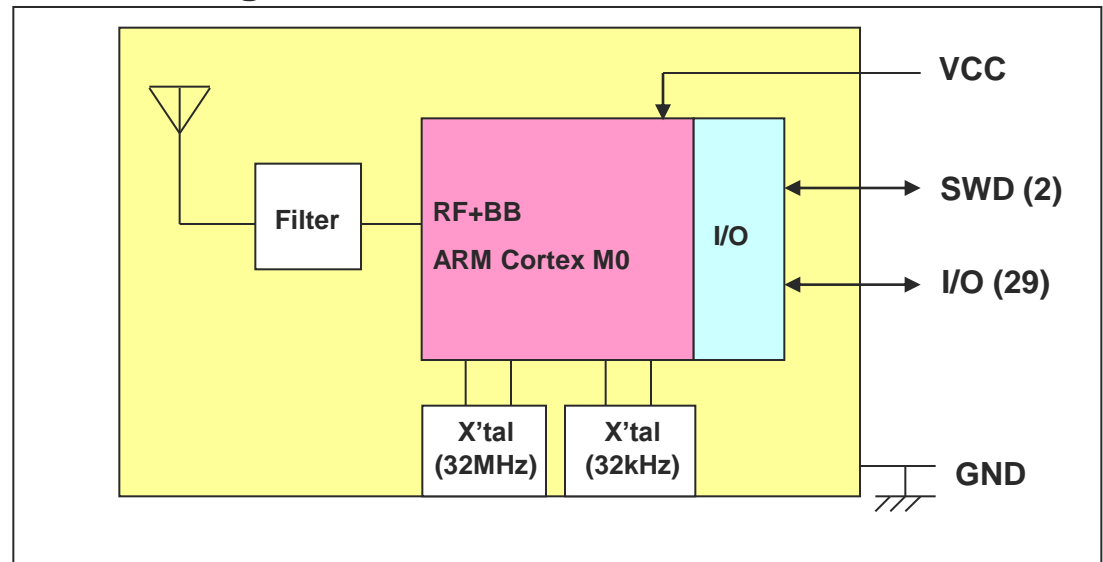
- Cycle computer
- Heart rate monitor
- Blood pressure monitor
- Blood glucose meter
- Weighing machine
- Thermometer
- Mobile accessories
- Sports and fitness sensors
- Remote controllers / Toys

## Outline

Unit: mm



## Block Diagram



All specifications are subject to change without notice.

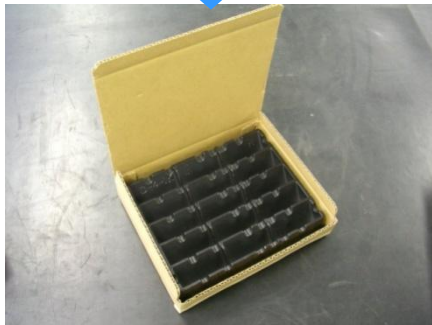
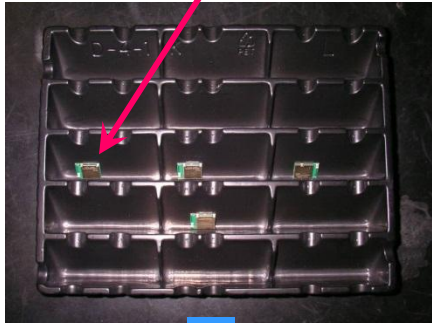
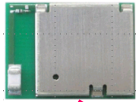
The *Bluetooth*® word mark and logos are owned by the *Bluetooth* SIG, Inc. and any use of such marks by TAIYO YUDEN CO., LTD. is under license.

**TAIYO YUDEN**

# Bluetooth® low energy Module Sample, Evaluation Board / Kit

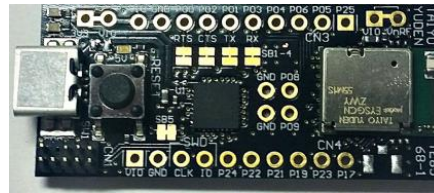
## EYSGCNZXX, EYSGCNZWY (Module)

### Module samples



## EBSGCMZWY (EV-B)

### Evaluation board



## EKSGCMZWY (EV-K)

### Evaluation kit



**SEGGER  
J-Link LITE  
Attached**



# Bluetooth® low energy Module **EYSGJNZXX**

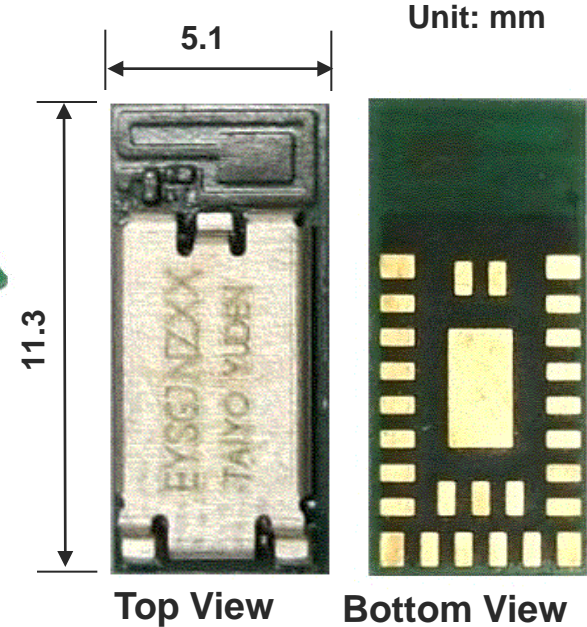
## Features

- Frequency: 2402 to 2480 MHz
- Output power: +4dBm typ.
- Single power supply: 1.8 – 3.6V
- Single Mode Bluetooth low energy Slave
- Chip: nRF51822 **Rev.3** (Nordic)
- Integrated System Clock
- ARM Cortex M0** 32bit processor
- 256kB Flash** and **16kB RAM**
- Interface: SPI, UART, I2C and 8/9/10bit ADC
- Integrated high performance pattern antenna
- Outline: **5.1 x 11.3 x 1.3**mm MAX
- Operating Temperature range: -25 to 75 deg-C
- Bluetooth and Japan, FCC, IC qualified
- CE Conducted Test Report Available
- RoHS compliant / Complete Lead Free

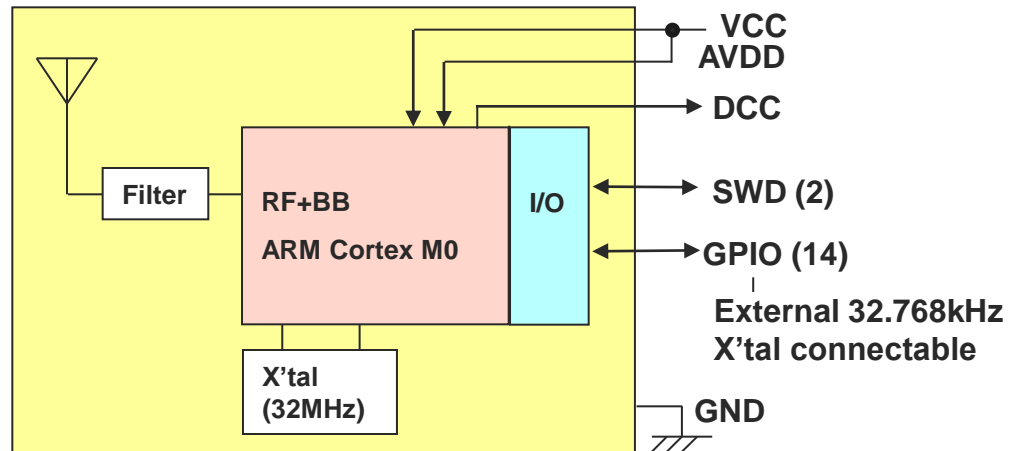
## Applications

- Cycle computer
- Heart rate monitor
- Blood pressure monitor
- Blood glucose meter
- Weighing machine
- Thermometer
- Mobile accessories
- Sports and fitness sensors
- Remote controllers / Toys

## Outline



## Block Diagram



All specifications are subject to change without notice.

The Bluetooth® word mark and logos are owned by the Bluetooth SIG, Inc. and any use of such marks by TAIYO YUDEN CO., LTD. is under license.

**TAIYO YUDEN**

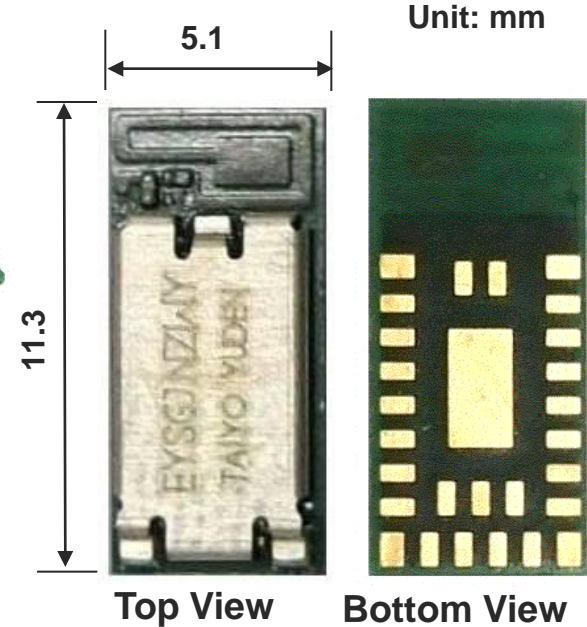


# Bluetooth® low energy Module **EYSGJNZWY**

## Features

- Frequency: 2402 to 2480 MHz
- Output power: +4dBm typ.
- Single power supply: 1.8 – 3.6V
- Single Mode Bluetooth low energy **Slave / Master**
- Chip: nRF51822 **Rev.3** (Nordic)
- Integrated System Clock
- ARM Cortex M0** 32bit processor
- 256kB Flash** and **32kB RAM**
- Interface: SPI, UART, I2C and 8/9/10bit ADC
- Integrated high performance pattern antenna
- Outline: **5.1 x 11.3 x 1.3**mm MAX
- Operating Temperature range: -25 to 75 deg-C
- Bluetooth and Japan, FCC, IC qualified
- CE Conducted Test Report Available
- RoHS compliant / Complete Lead Free

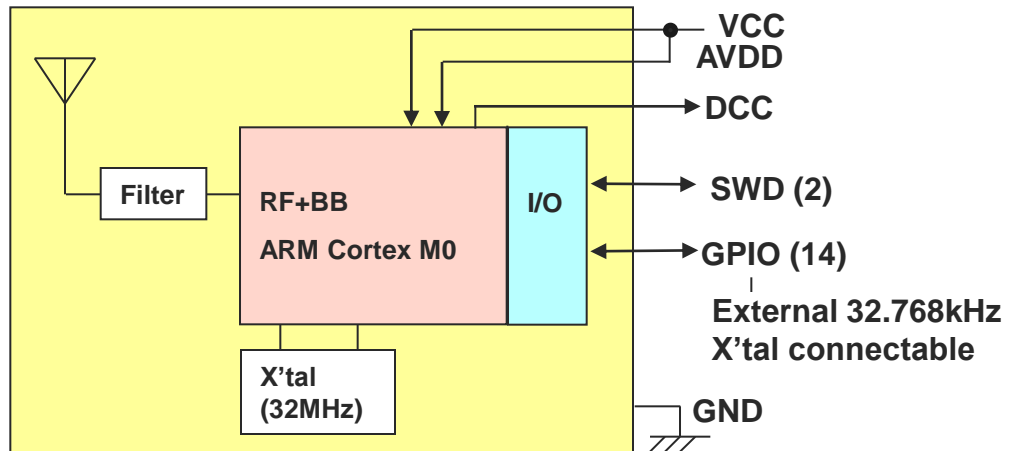
## Outline



## Applications

- Cycle computer
- Heart rate monitor
- Blood pressure monitor
- Blood glucose meter
- Weighing machine
- Thermometer
- Mobile accessories
- Sports and fitness sensors
- Remote controllers / Toys

## Block Diagram



All specifications are subject to change without notice.

The *Bluetooth*® word mark and logos are owned by the *Bluetooth* SIG, Inc. and any use of such marks by TAIYO YUDEN CO., LTD. is under license.

**TAIYO YUDEN**

# ANT + Bluetooth® low energy Module **EYAGJNZXX**

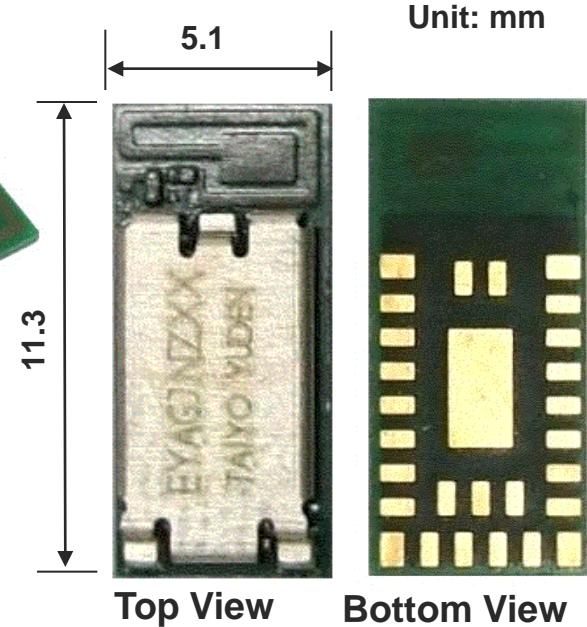
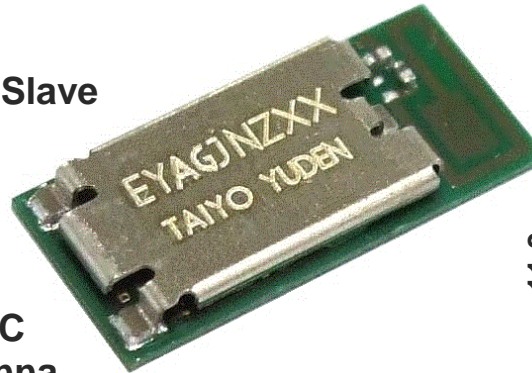
## Features

- Frequency: 2402 to 2480 MHz
- Output power: +4dBm typ.
- Single power supply: 1.8 – 3.6V
- ANT** + Single Mode Bluetooth low energy Slave
- Chip: **nRF51422 Rev 3** (Nordic)
- Integrated System Clock
- ARM Cortex M0** 32bit processor
- 256kB Flash and 32kB RAM**
- Interface: SPI, UART, I2C and 8/9/10bit ADC
- Integrated high performance pattern antenna
- Outline: **5.1 x 11.3 x 1.3**mm MAX
- Operating Temperature range: -25 to 75 deg-C
- Bluetooth and Japan, FCC, IC qualified
- CE Conducted Test Report Available
- RoHS compliant / Complete Lead Free

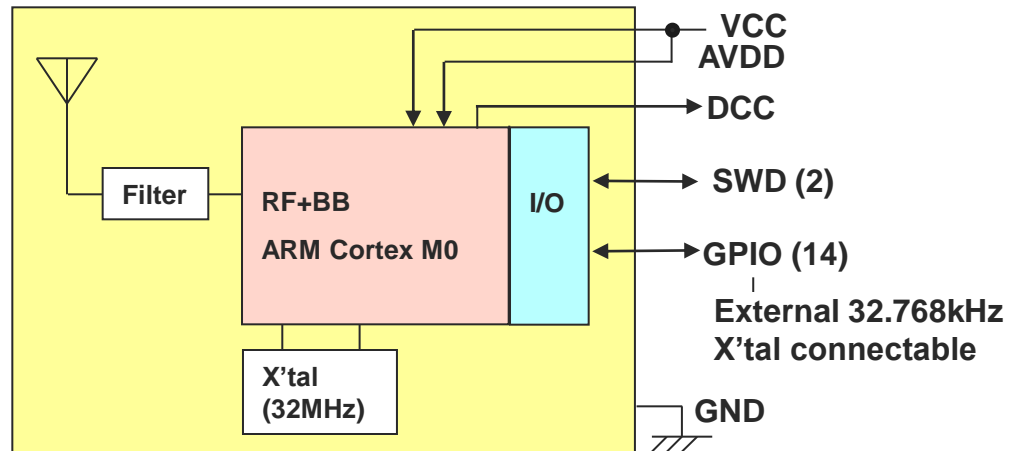
## Applications

- Cycle computer
- Heart rate monitor
- Blood pressure monitor
- Blood glucose meter
- Weighing machine
- Thermometer
- Mobile accessories
- Sports and fitness sensors
- Remote controllers / Toys

## Outline



## Block Diagram



All specifications are subject to change without notice.

The Bluetooth® word mark and logos are owned by the Bluetooth SIG, Inc. and any use of such marks by TAIYO YUDEN CO., LTD. is under license.

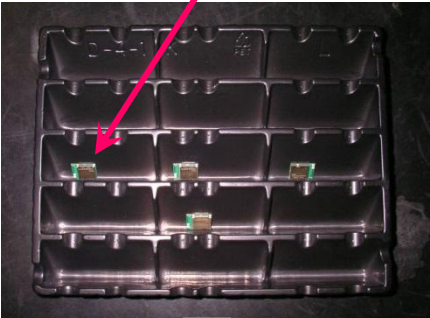
**TAIYO YUDEN**



# Bluetooth® low energy Module Sample, Evaluation Board / Kit

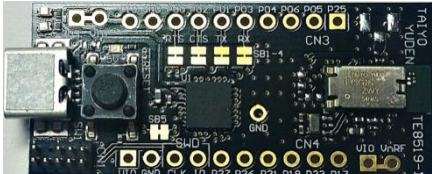
**EYSGJNZXX, EYSGJNZWY, EYAGJNZXX** (Module)

## Module samples



**EBSGJNZWY, EBAGJNZXX** (EV-B)

## Evaluation board

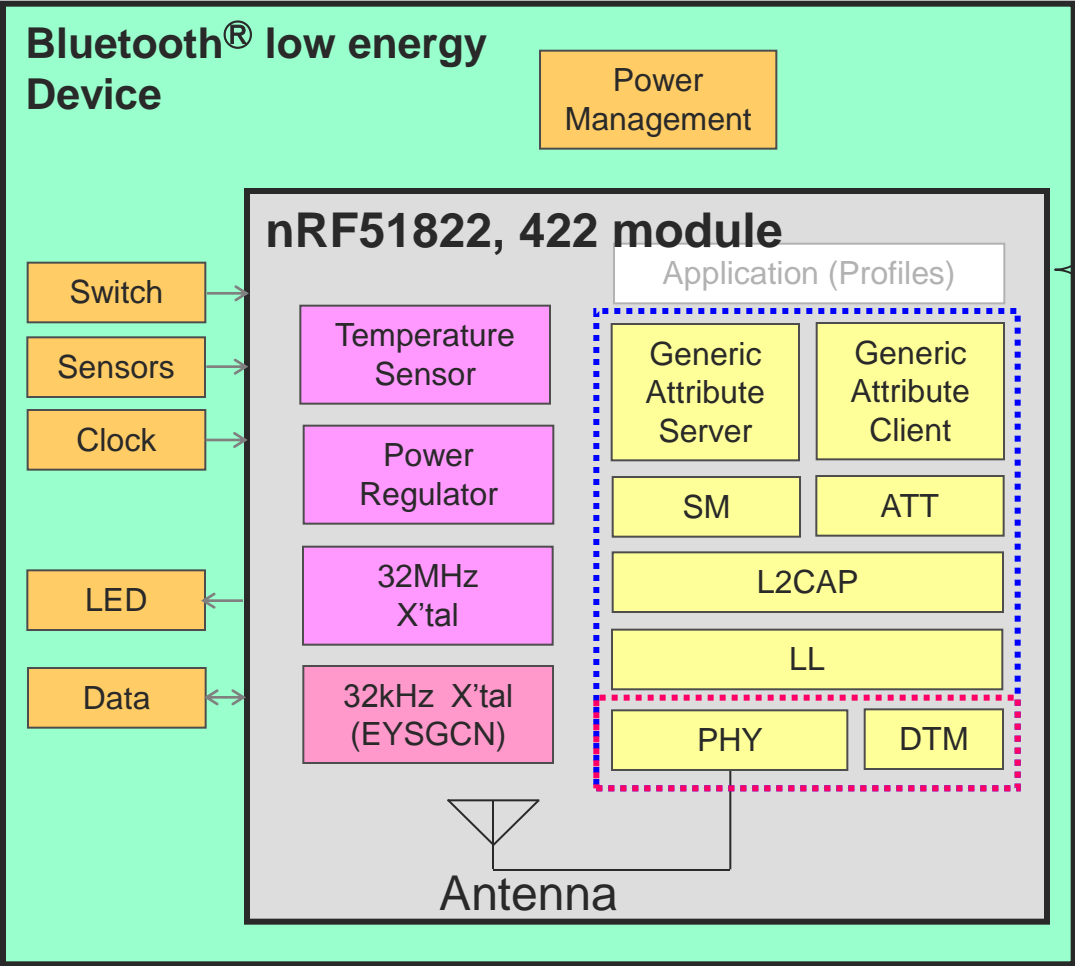


**EKSGJNZWY, EKAGJNZXX** (EV-K)

## Evaluation kit



# Application Layer image for Basic Module



- Alert Notification **Nordic SDK**
- Blood Pressure
- Cycling Speed and Cadence
- Glucose
- HID Mouse
- Heart Rate
- Phone Alert Status
- Proximity
- Running Speed and Cadence
- Time

Basic module will be written under GATT.

**Softdevice** 

- GAP:** Generic Access Profile
- SM:** Security Manager
- ATT:** Attribute Protocol
- L2CAP:** Logical Link Control and Adaptation Protocol
- LL:** Link Layer
- PHY:** Physical Layer
- DTM:** Direct Test Mode

**EYSGCN, EYSGJN, EYAGJN**  
**Basic Module**

# Bluetooth® low energy Module: **EYSGCNAWY-1X**

## Features

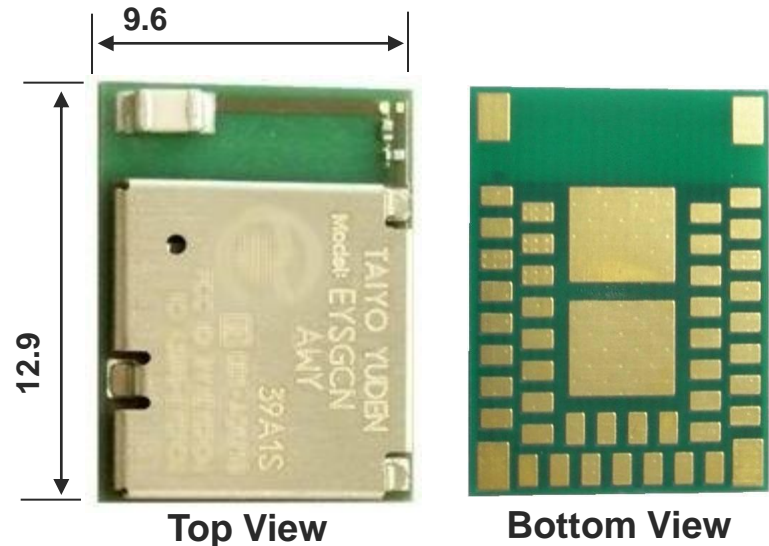
- Frequency: 2402 to 2480 MHz
- Output power: +4dBm typ.
- Single power supply: 1.8 – 3.6V
- Single Mode Bluetooth low energy **Slave / Master**
- Chip: nRF51822 (Nordic)
- Integrated System/Sleep Clock
- Integrated high performance ceramic chip antenna
- ARM Cortex M0** 32bit processor
- Application Embedded by Taiyo Yuden**
- (TY's App Lite Generic Data transfer, Battery Service)**
- Interface: UART
- Outline: **9.6 x 12.9 x 2.0** mm with **1mm** pad pitch
- Operating Temperature range: -25 to 75 deg-C
- Bluetooth and Japan, FCC, IC qualified
- CE Conducted Test Report Available
- RoHS compliant / Complete Lead Free

## Applications

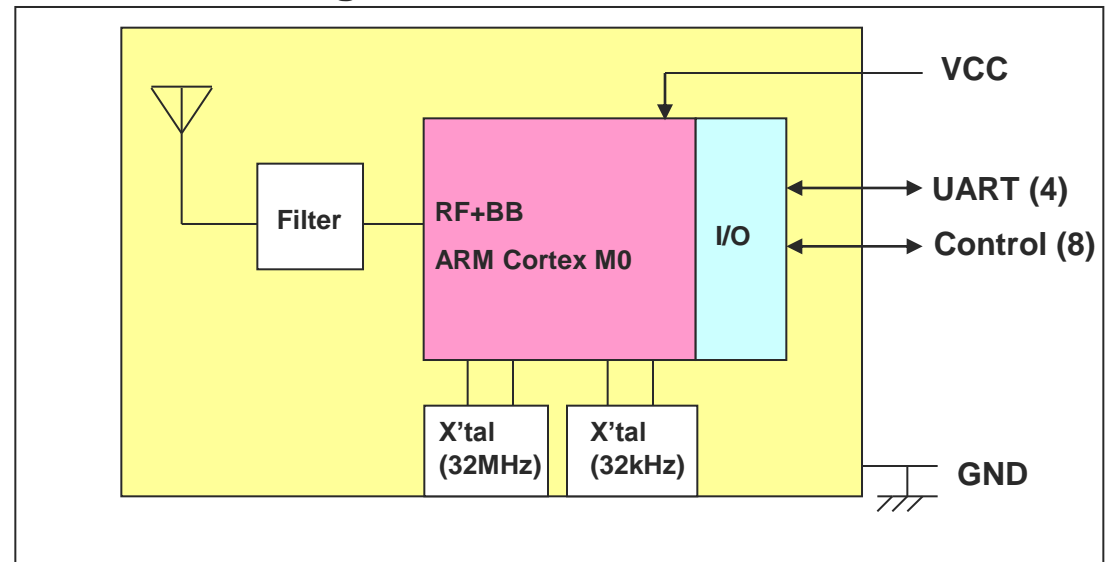
- Cycle computer
- Heart rate monitor
- Blood pressure monitor
- Blood glucose meter
- Weighing machine
- Thermometer
- Mobile accessories
- Sports and fitness sensors
- Remote controllers / Toys

## Outline

Unit: mm



## Block Diagram



All specifications are subject to change without notice.

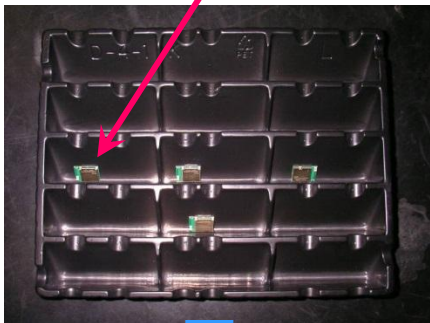
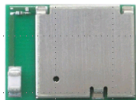
The *Bluetooth*® word mark and logos are owned by the *Bluetooth* SIG, Inc. and any use of such marks by TAIYO YUDEN CO., LTD. is under license.

**TAIYO YUDEN**

# Bluetooth® low energy Module Sample, Evaluation Board

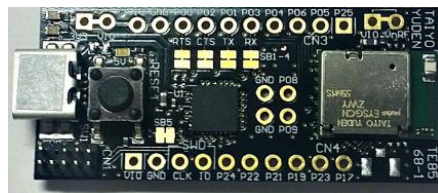
## EYSGCNAWY-1X (Module)

### Module samples



## EBSGCNAWY-1X (EV-B)

### Evaluation board



# Bluetooth® low energy Module **EYSGJNAWY-1X**

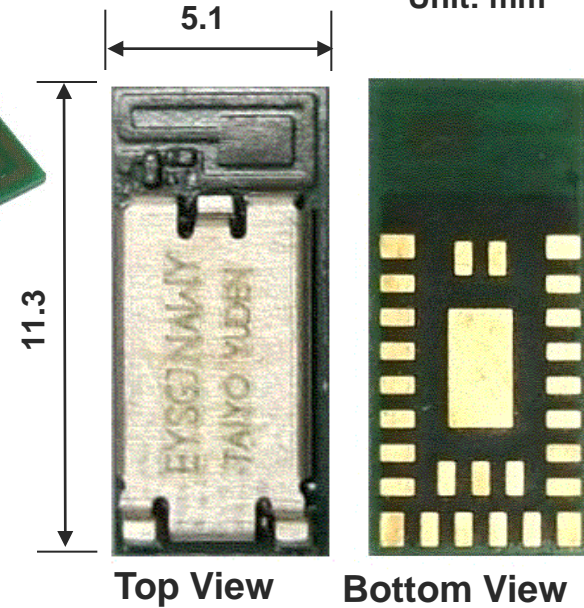
## Features

- Frequency: 2402 to 2480 MHz
- Output power: +4dBm typ.
- Single power supply: 1.8 – 3.6V
- Single Mode Bluetooth low energy **Slave / Master**
- Chip: nRF51822 Rev3 (Nordic)
- Integrated System Clock
- ARM Cortex M0** 32bit processor
- Application Embedded by Taiyo Yuden**
- (TY's App : Generic Data transfer, Battery Service)**
- Interface: UART
- Integrated high performance pattern antenna
- Outline: **5.1 x 11.3 x 1.3**mm MAX
- Operating Temperature range: -25 to 75 deg-C
- Bluetooth and Japan, FCC, IC qualified
- CE Conducted Test Report Available
- RoHS compliant / Complete Lead Free

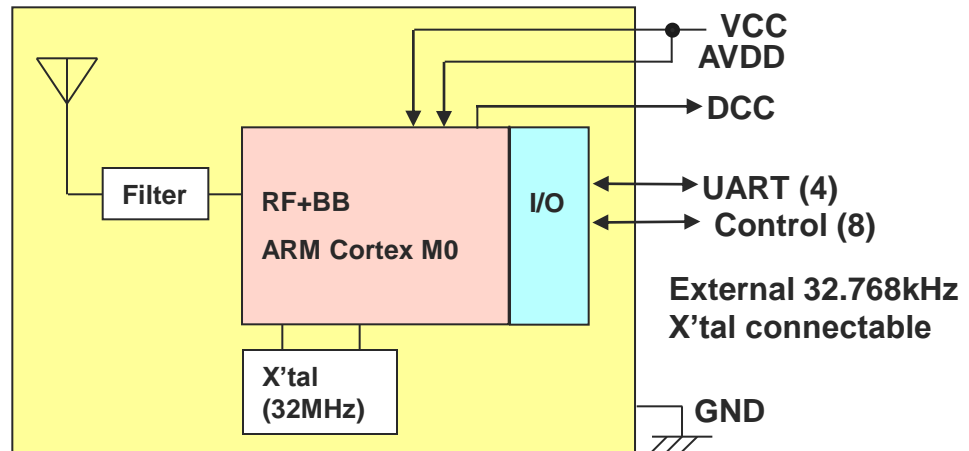
## Applications

- Cycle computer
- Heart rate monitor
- Blood pressure monitor
- Blood glucose meter
- Weighing machine
- Thermometer
- Mobile accessories
- Sports and fitness sensors
- Remote controllers / Toys

## Outline



## Block Diagram



All specifications are subject to change without notice.

The *Bluetooth*® word mark and logos are owned by the *Bluetooth* SIG, Inc. and any use of such marks by TAIYO YUDEN CO., LTD. is under license.

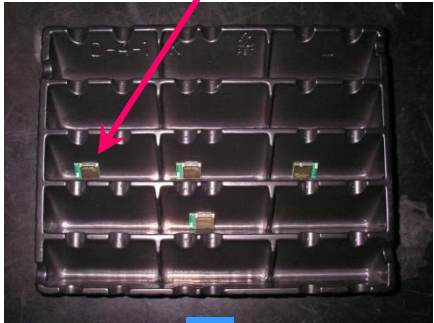
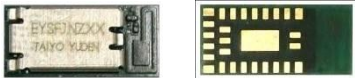
**TAIYO YUDEN**



# Bluetooth® low energy Module Sample, Evaluation Board

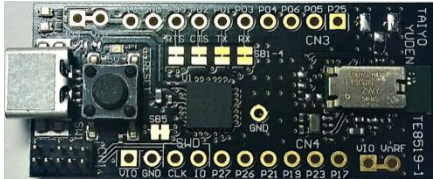
## EYSGJNAWY-1X (Module)

### ■ Module samples



## EBSGJNAWY-1X (EV-B)

### ■ Evaluation board





# Bluetooth® low energy Module: **EYSGCNAWY-WX**

## Features

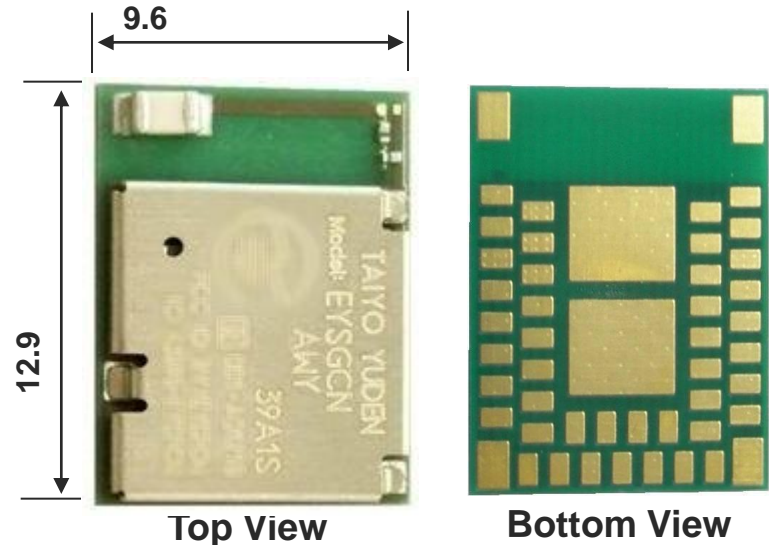
- Frequency: 2402 to 2480 MHz
- Output power: +4dBm typ.
- Single power supply: 1.8 – 3.6V
- Single Mode Bluetooth low energy **Slave / Master**
- Chip: nRF51822 (Nordic)
- Integrated System/Sleep Clock
- Integrated high performance ceramic chip antenna
- ARM Cortex M0** 32bit processor
- Application Embedded by Taiyo Yuden**
- (TY's App : Generic Data transfer, Battery Service)**
- Interface: UART
- Outline: **9.6 x 12.9 x 2.0** mm with **1mm** pad pitch
- Operating Temperature range: -25 to 75 deg-C
- Bluetooth and Japan, FCC, IC qualified
- CE Conducted Test Report Available
- RoHS compliant / Complete Lead Free

## Applications

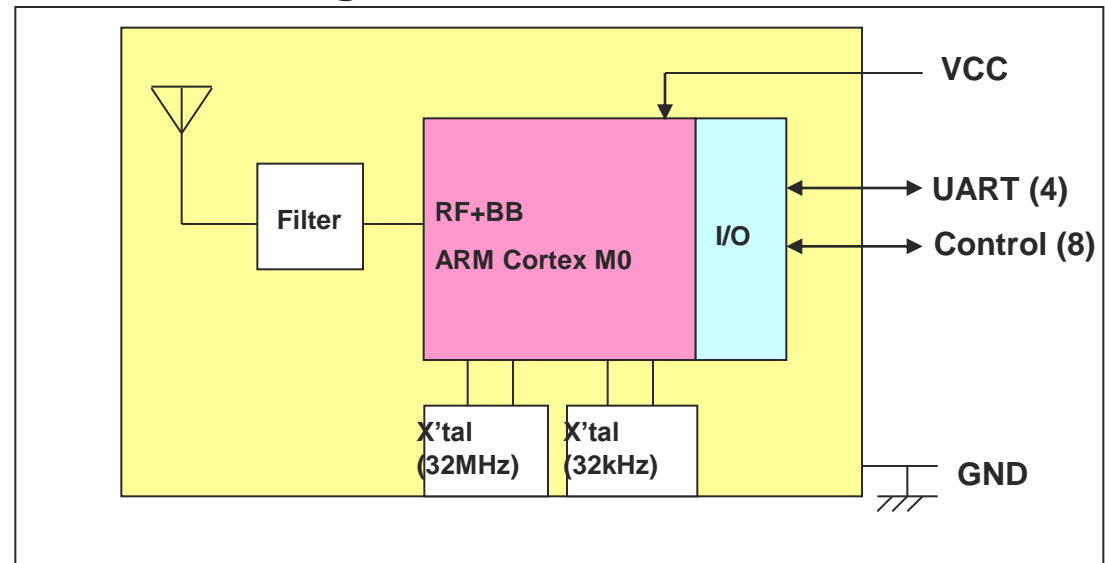
- Cycle computer
- Heart rate monitor
- Blood pressure monitor
- Blood glucose meter
- Weighing machine
- Thermometer
- Mobile accessories
- Sports and fitness sensors
- Remote controllers / Toys

## Outline

Unit: mm



## Block Diagram



All specifications are subject to change without notice.

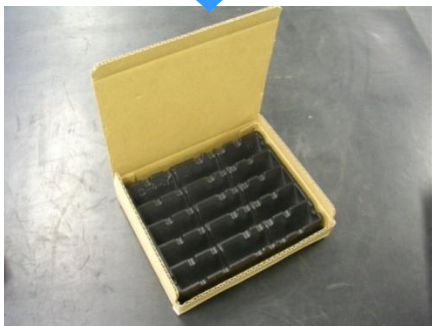
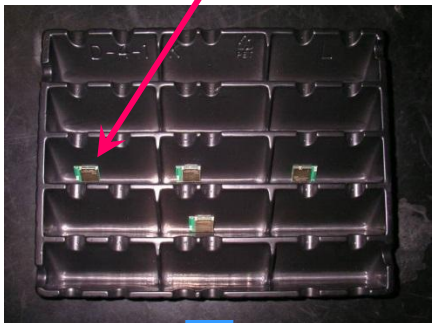
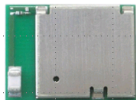
The *Bluetooth*® word mark and logos are owned by the *Bluetooth* SIG, Inc. and any use of such marks by TAIYO YUDEN CO., LTD. is under license.

**TAIYO YUDEN**

# Bluetooth® low energy Module Sample, Evaluation Board

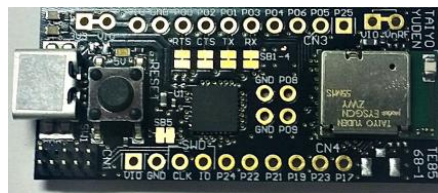
## EYSGCNAWY-WX (Module)

### ■ Module samples



## EBSGCNAWY-WX (EV-B)

### ■ Evaluation board



# Bluetooth® low energy Module **EYSGJNAWY-WX**

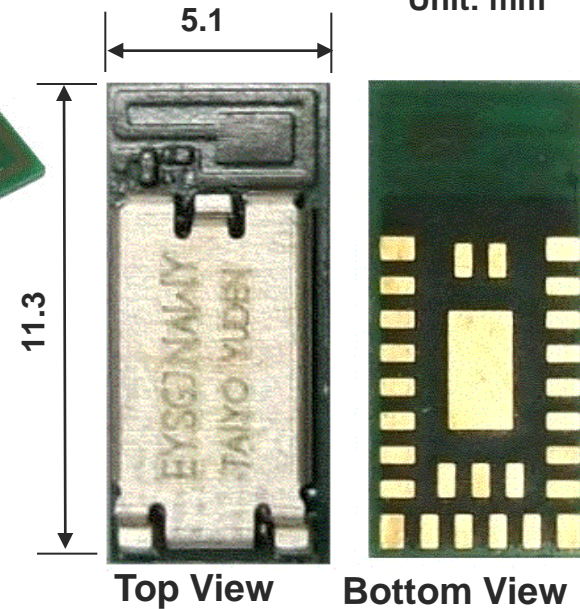
## Features

- Frequency: 2402 to 2480 MHz
- Output power: +4dBm typ.
- Single power supply: 1.8 – 3.6V
- Single Mode Bluetooth low energy **Slave / Master**
- Chip: nRF51822 Rev3 (Nordic)
- Integrated System Clock
- ARM Cortex M0** 32bit processor
- Application Embedded by Taiyo Yuden**
- (TY's App : Generic Data transfer, Battery Service)**
- Interface: UART
- Integrated high performance pattern antenna
- Outline: **5.1 x 11.3 x 1.3**mm MAX
- Operating Temperature range: -25 to 75 deg-C
- Bluetooth and Japan, FCC, IC qualified
- CE Conducted Test Report Available
- RoHS compliant / Complete Lead Free

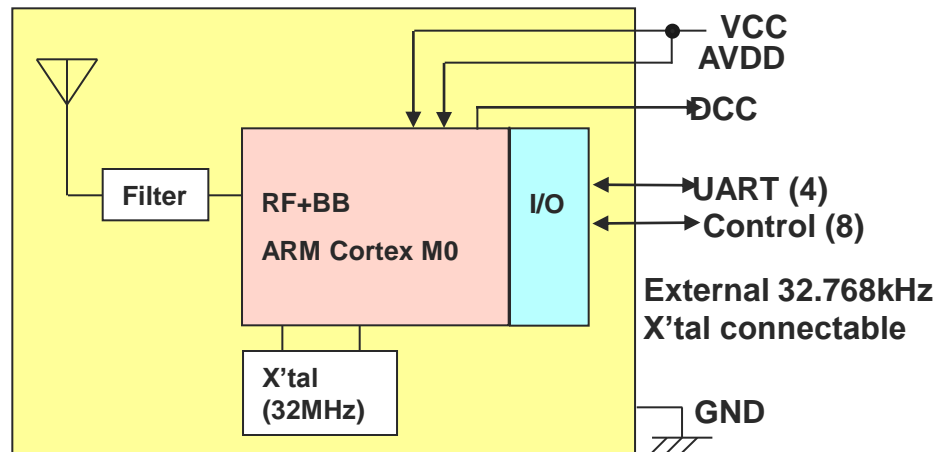
## Applications

- Cycle computer
- Heart rate monitor
- Blood pressure monitor
- Blood glucose meter
- Weighing machine
- Thermometer
- Mobile accessories
- Sports and fitness sensors
- Remote controllers / Toys

## Outline



## Block Diagram



All specifications are subject to change without notice.

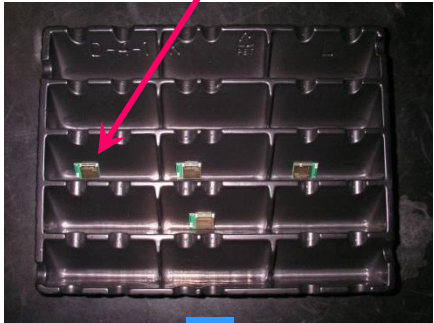
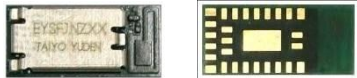
The Bluetooth® word mark and logos are owned by the Bluetooth SIG, Inc. and any use of such marks by TAIYO YUDEN CO., LTD. is under license.

**TAIYO YUDEN**

# Bluetooth® low energy Module Sample, Evaluation Board

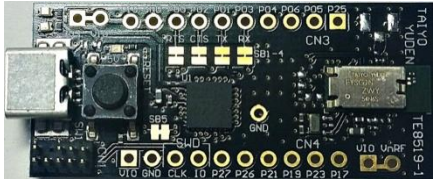
## EYSGJNAWY-WX (Module)

### ■ Module samples

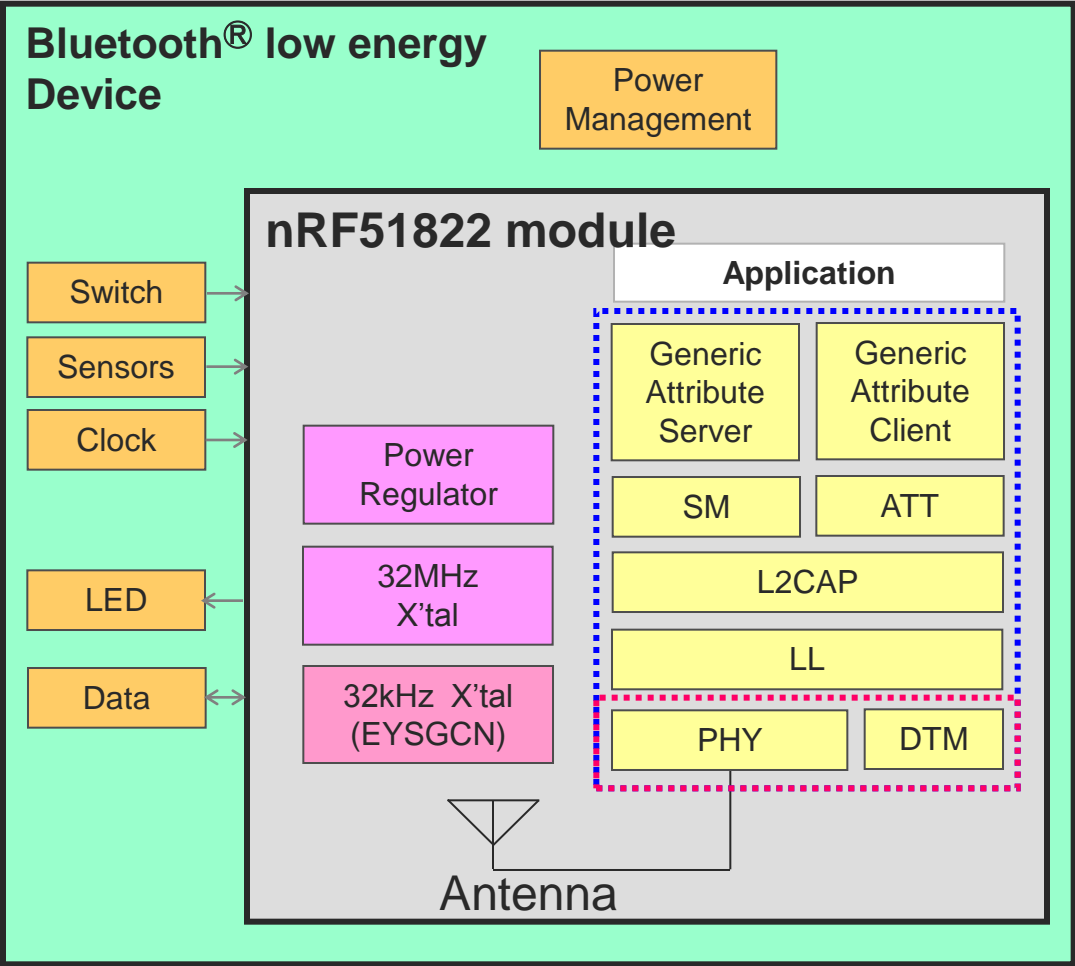


## EBSGJNAWY-WX (EV-B)

### ■ Evaluation board



# Application Layer image for Application Embedded Module



**Connection option**

**-1X module for Module - Module only**

**-WX module for Module - Module Module - Smart phone**

Softdevice 

- GAP:** Generic Access Profile
- SM:** Security Manager
- ATT:** Attribute Protocol
- L2CAP:** Logical Link Control and Adaptation Protocol
- LL:** Link Layer
- PHY:** Physical Layer
- DTM:** Direct Test Mode

**EYSGCN, EYSGJN**  
**Application Embedded Module**

# Bluetooth® low energy standard module

Type	Part No.	Size (LxWxH)	Specification	ANT™ Support	I/F	RAM	Certification	Temperature	
High Performance Basic	EYSHCNZXZ	9.6x12.9 X2.0mm	Bluetooth V4.2 BLE Single Slave/Master	✓	UART SPI I2C	64kB	Japan FCC IC (CE)*	-40~+85 deg-C	
	EYSHJNZXZ	5.1x11.3 X1.3mm		✓		64kB			
Basic (Software Support : Nordic)	EYSGCNZXX	9.6x12.9 x2.0mm		✓		UART SPI I2C			16kB
	EYSGCNZWY								32kB
	EYSGJNZXX	5.1x11.3 x1.3mm							16kB
	EYSGJNZWY				32kB				
	EYAGJNZXX				32kB				
Application Embedded Module – Module (Software Support : Taiyo Yuden)	EYSGCNAWY-1X	9.6x12.9 x2.0mm		UART	N/A				-25~+75 deg-C
	EYSGJNAWY-1X	5.1x11.3 x1.3mm							
Application Embedded Module – Smart phone (Software Support : Taiyo Yuden)	EYSGCNAWY-WX	9.6x12.9 x2.0mm							
	EYSGJNAWY-WX	5.1x11.3 x1.3mm							



**TAIYO YUDEN**