Wireless Module

*Bluetooth® low energy* Module Overview

May 30, 2018 Version 1.8
TAIYO YUDEN Bluetooth® low energy Module Line-Up

Taiyo Yuden Bluetooth® low energy Module

- nRF52832 Module
- nRF51822 Module
- nRF51422 Module

EYSHCN Series
EYSLCN Series

Big
Embedded antenna
Int. 32kHz X’tal
Int. LC for DC/DC
9.6 x 12.9 x 2.0 mm

Small
Embedded antenna
Ext. 32kHz X’tal
Ext. LC for DC/DC
5.1 x 11.3 x 1.3 mm

Ultra-small
Embedded antenna
Ext. 32kHz X’tal
Ext. LC for DC/DC
3.25 x 8.55 x 0.85 mm

EYSHCN Series
RAM 64kB
SoftDevice S132

EYSLCN Series
RAM 24kB
SoftDevice S112

EYSHJN Series
RAM 64kB
SoftDevice S132

EYSHSN Series
RAM 64kB
SoftDevice S132
TAIYO YUDEN Bluetooth® low energy Module Line-Up

nRF51x22 Bluetooth® low energy Module

Big

EYSGCN Series

Basic

Embedded antenna
Int. 32kHz X’tal
Int. LC for DC/DC

9.6 x 12.9 x 2.0 mm

Application
Embedded

EYSGJN Series

Basic

Embedded antenna
Ext. 32kHz X’tal
Ext. LC for DC/DC

5.1 x 11.3 x 1.3 mm

Application
Embedded

EYAGJN Series

TY’s App
Lite
GPIO
Control

RAM 16kB
SoftDevice
S110

TY’s App
UART
Control

RAM 32kB
SoftDevice
S120

ANT + BLE
SoftDevice
S310

Embedded antenna
Int. 32kHz X’tal
Int. LC for DC/DC

TY’s App
Lite
GPIO
Control

RAM 16kB
SoftDevice
S110

TY’s App
UART
Control

RAM 32kB
SoftDevice
S120

TY’s App
Lite
GPIO
Control

RAM 32kB
SoftDevice
S120

TY’s App
UART
Control

RAM 32kB
SoftDevice
S120

TY’s App
Lite
GPIO
Control

RAM 32kB
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S120

TY’s App
UART
Control

RAM 32kB
SoftDevice
S120

TY’s App
Lite
GPIO
Control

RAM 32kB
SoftDevice
S120

TY’s App
UART
Control

RAM 32kB
SoftDevice
S120

TY’s App
Lite
GPIO
Control

RAM 32kB
SoftDevice
S120

TY’s App
UART
Control

RAM 32kB
SoftDevice
S120

TY’s App
Lite
GPIO
Control

RAM 32kB
SoftDevice
S120
## Latest Documents for Bluetooth® low energy Module

<table>
<thead>
<tr>
<th>Model</th>
<th>URL</th>
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<tbody>
<tr>
<td>EYSHSNZWZ</td>
<td><a href="http://www.yuden.co.jp/or/product/category/module/EYSHSNZWZ.html">http://www.yuden.co.jp/or/product/category/module/EYSHSNZWZ.html</a></td>
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<td><a href="http://www.yuden.co.jp/or/product/category/module/EYSLCNZWW.html">http://www.yuden.co.jp/or/product/category/module/EYSLCNZWW.html</a></td>
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<td>EYSGCNZXX</td>
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<td>EYSFCNZXX</td>
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</tr>
</tbody>
</table>

- 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](http://www.yuden.co.jp/jp/product/category/module/lineup.html#Bluetooth)
2Mbps Bluetooth® 5.0 low energy Module: EYSWNSNZWZ

Features
- Frequency: 2402 to 2480 MHz with +4dBm Output power
- Single power supply: 1.7–3.6V
- Single Mode Bluetooth low energy (ANT™ Available)
- Chip: nRF52832 (Nordic) with Bluetooth low energy 2Mbps mode
- 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 PCB antenna
- Outline: 3.25 x 8.55 x 0.85mm MAX
- Operating Temperature range: -40 to 85 deg-C
- Bluetooth and Japan, FCC, IC qualified
- ETSI EN 300 328 v2.1.1 Conducted Test Report Available
- RoHS compliant / Complete Lead Free

Applications
- Smart wristband
- Smart glasses
- Remote control ring
- Smart pen
- Heart rate monitor
- Pressure monitor
- Blood glucose meter
- Thermometer
- Mobile accessories

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

<table>
<thead>
<tr>
<th>EYSNSNZWZ (Module)</th>
<th>EBSNSNZWZ (EV-B)</th>
<th>EKSNSNZWZ (EV-K)</th>
</tr>
</thead>
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<tr>
<td><strong>Module samples</strong></td>
<td><strong>Evaluation board</strong></td>
<td><strong>Evaluation kit</strong></td>
</tr>
<tr>
<td><img src="image1" alt="Module samples" /></td>
<td><img src="image2" alt="Evaluation board" /></td>
<td><img src="image3" alt="Evaluation kit" /></td>
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<tr>
<td><strong>Tray</strong></td>
<td><strong>Tape</strong></td>
<td><strong>SEGGER J-Link LITE Attached</strong></td>
</tr>
</tbody>
</table>

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**TAIYO YUDEN**
**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) with Bluetooth low energy 2Mbps mode
- 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
- ETSI EN 300 328 v2.1.1 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

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

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*TAIYO YUDEN*
**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) with Bluetooth low energy 2Mbps mode
- 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 1.3mm MAX
- Operating Temperature range: -40 to 85 deg-C
- Bluetooth and Japan, FCC, IC qualified
- ETSI EN 300 328 v2.1.1 Conducted Test Report Available
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**Applications**

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

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### EYSHJNZWZ (Module)
- **Module samples**
  - Tray
  - Tape

### EBSHJNZWZ (EV-B)
- **Evaluation board**

### EKSHJNZWZ (EV-K)
- **Evaluation kit**
  - SEGGER J-Link LITE Attached
**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: nRF52810 (Nordic) with Bluetooth low energy 2Mbps mode
- Integrated System/Sleep Clock, LC for DC/DC
- Integrated high performance ceramic chip antenna
- ARM Cortex M4 32bit processor
- 192kB Flash and 24kB RAM
- Interface: SPI, UART, I2C, PDM and 12bit ADC
- 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
- ETSI EN 300 328 v2.1.1 Conducted Test Report Available
- RoHS compliant / Complete Lead Free

**Applications**

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

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**2Mbps Bluetooth® 5.0 low energy Module:** EYSLCNZWW
# Bluetooth® low energy Module Sample, Evaluation Board / Kit

<table>
<thead>
<tr>
<th><strong>EYSLCNZWW (Module)</strong></th>
<th><strong>EBSLCNZWW (EV-B)</strong></th>
<th><strong>EKSLCNZW (EV-K)</strong></th>
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<td>SEGGER J-Link LITE Attached</td>
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</tbody>
</table>

*SENGER J-Link LITE Attached*
Bluetooth® low energy Module: EYSGNCNZXX

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
• Operating Temperature range: -40 to 85 deg-C
• Bluetooth and Japan, FCC, IC qualified
• ETSI EN 300 328 v2.1.1 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

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**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
- Operating Temperature range: -25 to 85 deg-C
- Bluetooth and Japan, FCC, IC qualified
- ETSI EN 300 328 v2.1.1 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

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Bluetooth® low energy Module Sample, Evaluation Board / Kit

EYSGCNZXX, EYSGCNZWY (Module)

- Module samples
  - Tray
  - Tape

EBSGCNZWY (EV-B)

- Evaluation board

EKSJCNZWY (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 1.3mm MAX
- Operating Temperature range: -40 to 85 deg-C
- Bluetooth and Japan, FCC, IC qualified
- ETSI EN 300 328 v2.1.1 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

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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 Rev3 (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 1.3mm MAX
- Operating Temperature range: -25 to 85 deg-C
- Bluetooth and Japan, FCC, IC qualified
- ETSI EN 300 328 v2.1.1 Conducted Test Report Available
- RoHS compliant / Complete Lead Free

**Applications**
- Cycle computer
- Heart rate monitor
- Blood pressure monitor
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- Mobile accessories
- Sports and fitness sensors
- Remote controllers / Toys

**Outline**

**Block Diagram**

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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 1.3mm MAX
- Operating Temperature range: -25 to 85 deg-C
- Bluetooth and Japan, FCC, IC qualified
- ETSI EN 300 328 v2.1.1 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
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Outline

Block Diagram

Applications
- Cycle computer
- Heart rate monitor
- Blood pressure monitor
- Blood glucose meter
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# Bluetooth® low energy Module Sample, Evaluation Board / Kit

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<td>EBSJGNZWX, EBAGJNZXX (EV-B)</td>
<td>EKSGJNZWX, EKAGJNZXX (EV-K)</td>
</tr>
<tr>
<td>Tray or Tape</td>
<td>SEGGER J-Link LITE Attached</td>
<td></td>
</tr>
</tbody>
</table>

![Module samples images](image1)

![Evaluation board images](image2)

![Evaluation kit images](image3)
Application Layer image for Basic Module

BlindTech® low energy Device

nRF51822, 422 module

Temperature Sensor
Power Regulator
32MHz X’tal
32kHz X’tal (EYSGCN)

Application (Profiles)
Generic Attribute Server
Generic Attribute Client
SM
ATT
L2CAP
LL
PHY
DTM

Antenna

Switch
Sensors
Clock
LED
Data

Nordic SDK
• Alert Notification
• 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, EYSJN, 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 85 deg-C
- Bluetooth and Japan, FCC, IC qualified
- ETSI EN 300 328 v2.1.1 Conducted Test Report Available
- RoHS compliant / Complete Lead Free

Applications
- Cycle computer
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TAIYO YUDEN
Bluetooth low energy Module Sample, Evaluation Board

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[Image of module samples and 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)
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- Application Embedded by Taiyo Yuden
  - (TY’s App Lite : Generic Data transfer, Battery Service)
- Interface: UART
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TAIYO YUDEN
### Bluetooth low energy Module Sample, Evaluation Board

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<tr>
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<th>EBSGJNAWY-1X (EV-B)</th>
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- Tray
- Tape

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**Image:** Bluetooth low energy Module Sample, 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 85 deg-C
- Bluetooth and Japan, FCC, IC qualified
- ETSI EN 300 328 v2.1.1 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.
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Bluetooth low energy Module Sample, Evaluation Board

<table>
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<tr>
<th>EYSGCNAWY-WX (Module)</th>
<th>EBSGCNAWY-WX (EV-B)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Module samples</strong></td>
<td><strong>Evaluation board</strong></td>
</tr>
<tr>
<td>Tray</td>
<td>Tape</td>
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</table>

Taiyo Yuden
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 1.3mm MAX
• Operating Temperature range: -25 to 85 deg-C
• Bluetooth and Japan, FCC, IC qualified
• ETSI EN 300 328 v2.1.1 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

Top View

Bottom View

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Bluetooth low energy Module Sample, Evaluation Board

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</table>

- Tray
- Tape
Application Layer image for Application Embedded Module

Bluetooth® low energy Device

nRF51822 module

Application

- Power Regulator
- 32MHz X'tal
- 32kHz X'tal (EYSGCN)
- Antenna

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

Softdevice

Connection option

- **1X** module for Module - Module only
- **WX** module for Module – Module Module – Smart phone

EYSGCN, EYSGJN
Application Embedded Module
# Bluetooth® low energy standard module

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<th>Specification</th>
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<th>RAM</th>
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※1 Supported by S130 SoftDevice, ※2 ETSI EN 300 328 v2.1.1 conducted test report available
TAIYO YUDEN