

Bluetooth[®] 4.2 Low Energy Module

EYAGJN

Data Sheet

In case you adopt this module and design some appliance,
Please ask for the latest specifications from the local sales office.

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Control name	General Items
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Scope

This specification ("Specification") applies to the hybrid IC "EYSGJN Series", a **Bluetooth**® 4.2 Low Energy module ("Product") manufactured by TAIYO YUDEN Co., Ltd. ("TAIYO YUDEN")

1. Part number: EYAGJN
2. Function:
Radio frequency module. **Bluetooth**® standard Ver. 4.2 Low Energy conformity
3. Application: Health & Fitness Equipment, Sensor, Toys
4. Structure:
Hybrid IC loaded with silicon monolithic semiconductor
Compatible with industrial standard reflow profile for Pb-free solders
Can meet with RoHS compliance (Pb, Cd, Hg, Cr⁺⁶, PBB, PBDE)
5. Outline: 11.3x 5.1 x 1.3(MAX) mm (TBD)
28-pin Land Grid Array
6. Marking: Part number, Lot number, Japan ID, FCC ID, IC ID
7. Features:
 - Small outline by PCB substrate
 - Low power consumption
 - Integrated antenna
 - Integrated system clock
 - **Bluetooth**® 4.2 Low Energy conformity
8. Packaging:
Packaging method: Tape & reel + aluminum moisture barrier bag
Packaging unit: 2000
*It might be provided as tray at sample stage.

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9. Note:

- a. Any question arising from this Specification shall be solved through mutual discussion by the parties hereof.
- b. This Product is not designed to be radiation durable and should not be used under the circumstance of radiation.
- c. The operating conditions of this Product are as shown in this Specification. Please note that TAIYO YUDEN shall not be liable for a failure and/or abnormality which is caused by use under the conditions other than the operating conditions hereof.
- d. The Product mentioned in this Specification is manufactured for use in Health & Fitness Equipment, Sensor and Toys. Before using this Product in any special equipment (such as medical equipment, space equipment, air craft, disaster prevention equipment), where higher safety and reliability are duly required, the applicability and suitability of this Product must be fully evaluated by the customer at its sole risk to ensure correct and safe operation of these special equipments. Also, evaluation of the safety function of this Product even for use in general electronics equipment shall be thoroughly made and when necessary, a protective circuit shall be added during the design stage, all at the customer's sole risk.
- e. i) You are requested to fully check and confirm by the start of mass production of this Product that (1) no bug, defect or other failure is included in firmware incorporated in this Product ("Incorporated Software"), (2) no bug defect or other failure arising from installation of this Product in which is contained Incorporated Software into your products is included in Incorporated Software, and that Incorporated Software fully meets your intended use, although TAIYO YUDEN sufficiently inspects or verifies quality of Incorporated Software.
ii) Please note that TAIYO YUDEN is not responsible for any failure arising out of bugs or defects in Incorporated Software.
- f. TAIYO YUDEN warrants only that this Product is in conformity with this Specification for one year after purchase and shall in no event give any other warranty.
- g. Communication between this Product and others might not be established nor maintained depending on radio environment or operating conditions of this Product and other *Bluetooth*[®] products.
- h. In order to test for Radio Law certification with a device incorporating this module, the Host Software must be able to put the module into test mode. Please contact TAIYO YUDEN for further details.
- i. This Product operates in the unlicensed ISM band at 2.4GHz. In case this Product is used around the other wireless devices which operate in same frequency band of this Product, there is a possibility that interference may occur between this Product and such other devices. If such interference occurs, please stop the operation of other devices or relocate this Product before using this Product or do not use this Product around the other wireless devices.
- j. Please thoroughly evaluate our module with your products before going mass production.
- k. User Code Modification Notice.

User Code for sample modules or part numbers in this Specification are TAIYO YUDEN standard part numbers. When any modification is made to a module to meet requested specifications, the part number will be changed. Please contact TAIYO YUDEN to confirm whether your part number needs to be modified.

Please see the following examples for cases when part numbers are modified:

- For specific firmware version (our standard item firmware will be upgraded occasionally)
- For other relevant cases (specific or different setting, form, sizes, or display etc..)

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- l. Alternative components may used to this module. The intended components is used within the warranty written in this document (characteristics, size, operating condition, reliability, public regulation such as radio type approval) and Taiyo Yuden confirmed there are not any problems with the replacement. The traceability of the components is secured each production lot.

m. Caution for Export Control

This Product may be subject to governmental approvals, consents, licenses, authorizations, declarations, filings, and registrations for export or re-export of the Product, required by Japanese Foreign Exchange and Foreign Trade Law (including related laws and regulations) and/or any other country's applicable laws or regulations related to export control.

If you plan to export or re-export this Product, it is strongly recommended that you check and confirm, the necessary procedures to export or re-export of this Product as required by applicable laws and regulations, and if necessary, you have to obtain necessary and appropriate approvals or licenses from governmental authority at your own risk and expense.

n. Japan Regulatory Information

This module is approved with the specific antenna on this module.

Please ensure that the sentence below is clearly stated on your product or product manual.

This product has a radio system which was approved as a radio station in a low power data communication system based on the Radio Law.

Name of the radio system: 001-A06159



001-A06159

o. Canada Regulatory Information

- a) This device complies with Industry Canada license-exempt RSS standards.

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

L'utilisation de ce dispositif est autorisée seulement aux conditions suivantes: (1) il ne doit pas produire de brouillage et (2) l'utilisateur du dispositif doit être prêt à accepter tout brouillage radioélectrique reçu, même si ce brouillage est susceptible de compromettre le fonctionnement du dispositif.

- b) This product is certified as type of the portable device with Industry Canada Rules.

To maintain compliance with RF Exposure requirement, please use within specification of this product.

- IC: 4389B-EYAGJN
- FVIN: F1

Ce produit est certifié comme type de l'appareil portable avec Industrie Règles de Canada. Pour maintenir l'acquiescement avec exigence Exposition de RF, veuillez utiliser dans spécification de ce produit.

- IC: 4389B-EYAGJN
- FVIN: F1

- c) Please notify certified ID by either one of the following method on your product.

Specifiez ID certifiée dans votre produit par une de méthode suivante.

- Contains Transmitter module IC : 4389B-EYAGJN
- Contains IC : 4389B-EYAGJN

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p. FCC Regulatory Information

a) 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.

b) Please notify certified ID by either one of the following method on your product.

-Contains Transmitter Module FCC ID: RYHEYAGJN

-Contains FCC ID: RYHEYAGJN

c) CAUTION: changes or modifications not expressly approved by the party responsible for compliance could void the use's authority to operate the equipment

d) This product is certified as type of the portable device with FCC Rules.

To maintain compliance with RF Exposure requirement, please use within specification of this product.

- FCC ID: RYHEYAGJN

e) The antenna used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

q. This Product is designed for use in products which comply with *Bluetooth*[®] Specifications (Ver. 4.2 LE) ("Bluetooth Specifications"). TAIYO YUDEN disclaims and is not responsible for any liability concerning infringement by this Product under any intellectual property right owned by third party in case the customer uses this Product in any product which does not comply with Bluetooth Specifications (the "non-complying products"). Furthermore, TAIYO YUDEN warrants only that this Product complies with this Specification and does not grant any other warranty including warranty for application of the non-complying products.

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Control name	Electrical characteristics
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Absolute maximum ratings

Symbol	Parameter	Min.	Typ.	Max.	Units
VCC_NRF		-0.3		+3.6	V
GND				0	V
Storage temperature		-40		+125	Deg-C

Recommendation operating range

Symbol	Parameter	Min.	Typ.	Max.	Units
VCC_NRF	Supply voltage, normal mode	1.8	3.0	3.6	V

DC Specifications

The Specification applies for Topr. = 25 degrees C, VCC_NRF = 3.0V

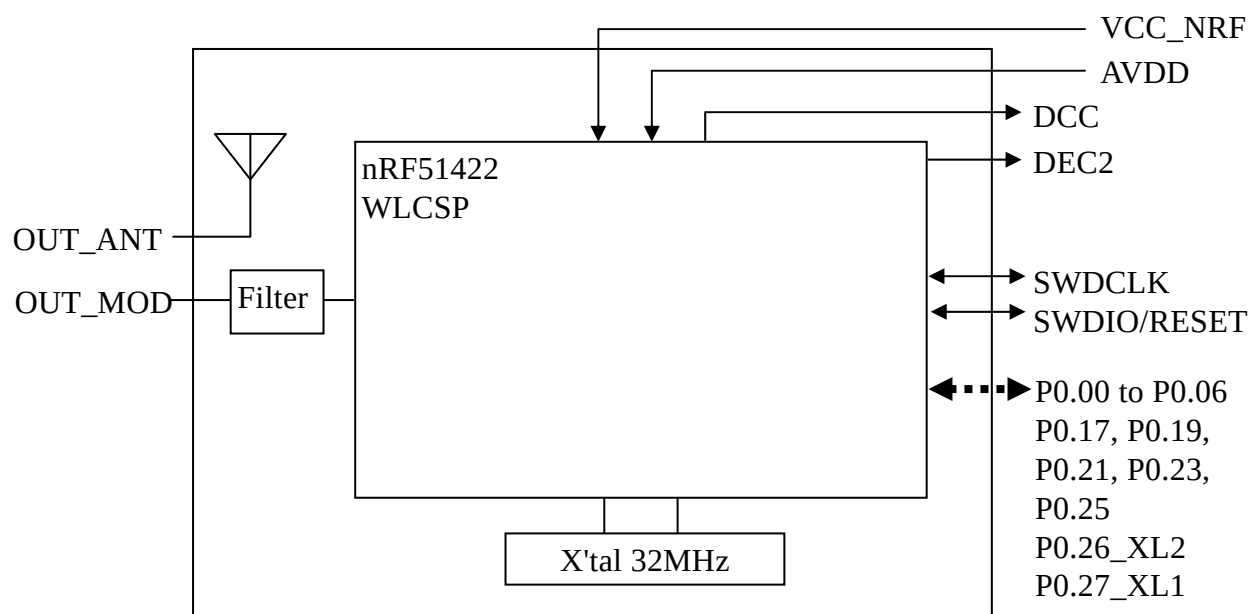
Symbol	Parameter (condition)	Min.	Typ.	Max.	Units
VIH	Input high voltage	0.7 VCC_NRF		VCC_NRF	V
VIL	Input low voltage	GND		0.3 VCC_NRF	V
VOH	Output high voltage	VCC_NRF-0.3		VCC_NRF	V
VOL	Output low voltage	GND		0.3	V

RF Specifications

Symbol	Description	Min.	Typ.	Max.	Units
Fop	Operating frequencies	2402		2480	MHz
PRF	Maximum output power		4		dBm
PSENS IT	Receiver sensitivity (0.1% BER) Ideal transmitter		-93		dBm

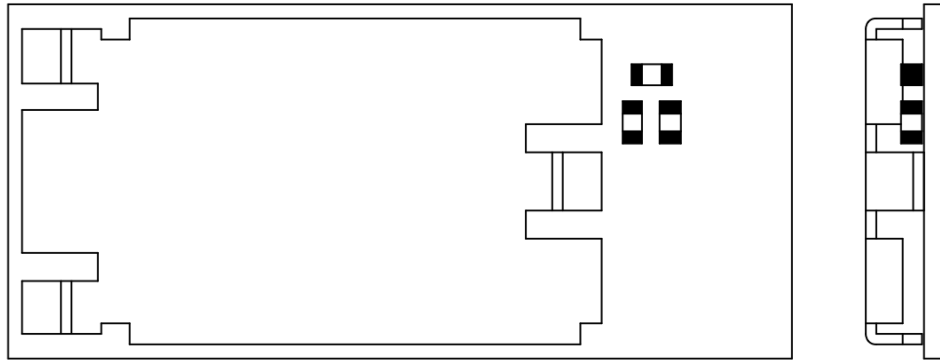
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Control name	Block Diagram
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Block Diagram

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Control name	Outline
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OutlineTolerance: $\pm 0.2\text{mm}$ 