

# **Bluetooth® Module**

## **Product By TAIYO YUDEN**

No matter how far apart— several devices can be operated at the same time. The module is available worldwide, since the use of the 2.4 GHz band is license free in every country of the world.

Global standard that guarantees compatibility with products of all brands. TAIYO YUDEN CO., LTD. with customer with a reliable & small-sized module of low power consumption in the best harmony of core technologies: Multi-layer technology, High frequency designing technology & Mounting technology.

- EYSF2CAXX ; RF+B.B, UART, Ver.1.2\*<sup>1</sup>
- EYSF2CAXX-XX ; RF+B.B, UART, Embedded SPP
- EYSF2CSXX ; RF+B.B, USB, Ver.1.2\*<sup>1</sup>
- EYMF2CAMM ; ANT+RF+B.B, UART, Ver.1.2\*<sup>1</sup>
- EYMF2CAMM-XX ; ANT+RF+B.B, UART, Embedded SPP
- EYMF2CSMM ; ANT+RF+B.B, USB, Ver.1.2\*<sup>1</sup>
- New!!** •EYTF3CSTT ; RF+B.B, USB, Connector Type, Ver.2.0 +EDR
- Up!!** •EYSFCCSXX ; RF+B.B, USB, Connector Type, Ver.2.0+EDR
- Up!!** •EYSFDCSXX ; ANT+RF+B.B, USB, Connector Type, Ver.2.0+EDR
- New!!** •EYSNDYAXX ; RF+B.B, UART, Use of 1chip Mask ROM, Ver.1.2
- EWSCBBQXX ; RF,CDMA I/F,5.0x4.0mm
- Evaluation Kit, Evaluation Board

\*All modules mentioned above are Class 2 unless stated.

\*Ver. 1.2\*<sup>1</sup> ; Ver. 1.2 Mandatory Available (include Faster Connection, AFH)

**\*All modules conform to RoHS**

(RoHS ; Restriction of the use of certain hazardous substances in electrical and electronic equipment.)

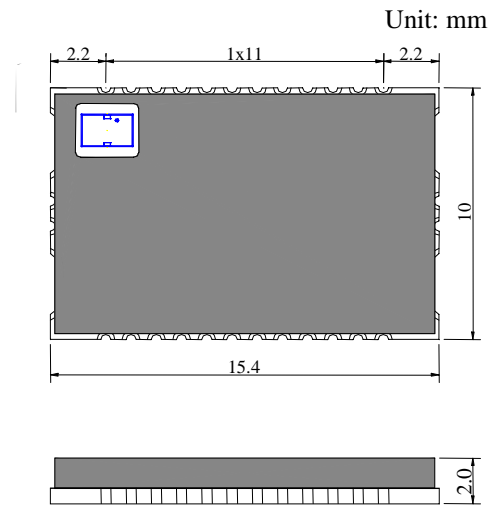
[www.DataSheet.in](http://www.DataSheet.in)

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**TAIYO YUDEN**

**Features**

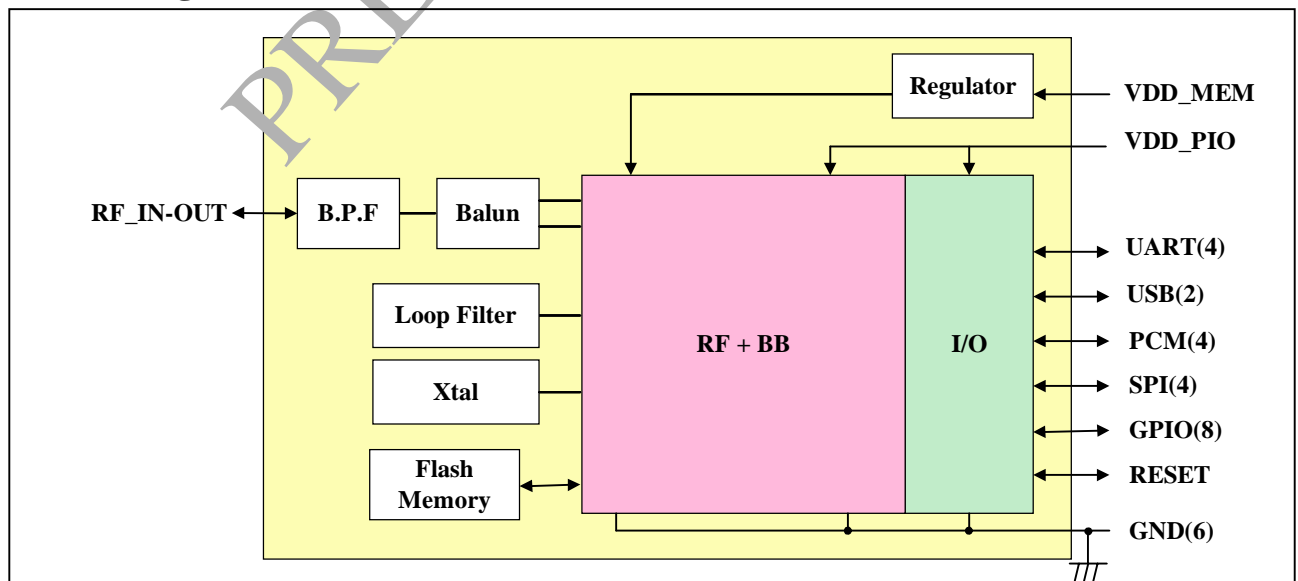
- The module is a Max.4dBm( Class2 ) module.
- Bluetooth® standard Ver. 1.2 conformity.
- Internal baseband clock oscillator.
- Internal 1.8V regulator
- Low current consumption
- Support functions  
SCO links,ACL links,Piconet<7>,Hold,Sniff,Park, AFH, Faster connection
- Interface:EYSF2CAXX:UART&PCM(for voice CODEC)
- Protocol stack:Under HCI firmware
- Small outline. **15.4 x 10 x 2.0 mm**

**Outline****Applications**

- Notebook PC
- PDA
- Cellular Phone

**General Electrical Specification**

Parameter	Description	Min.	Typ.	Max.	Units
Carrier Frequency		2.402		2.480	GHz
Operating Voltage (VDD_MEM)		3.00	3.30	3.60	V
Operating Voltage (VDD_PIO)		3.00	3.30	3.60	V
RF Output Power	measured in 50 ohm	-6	0	4	dBm
RX Sensitivity			-83	-70	dBm
Load Impedance	No abnormal Oscillation			5:1	-
Input Low Voltage	RESET, UART, GPIO, PCM	-0.30	-	0.80	V
Input High Voltage	RESET, UART, GPIO, PCM	0.70VDD_PIO	-	VDD_PIO+0.3 0	V
Output Low Voltage	UART, GPIO, PCM	-	-	0.40	V
Output High Voltage	UART, GPIO, PCM	VDD_PIO-0.40	-	-	V
Average Current Consumption	Receive DM1		46	-	mA

**Block Diagram**

Note: The above PRELIMINARY data are not guaranteed and are subject to change without notice.

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## Simple Cable Replacement

## EYSF2CA\*\*.\*

### Features

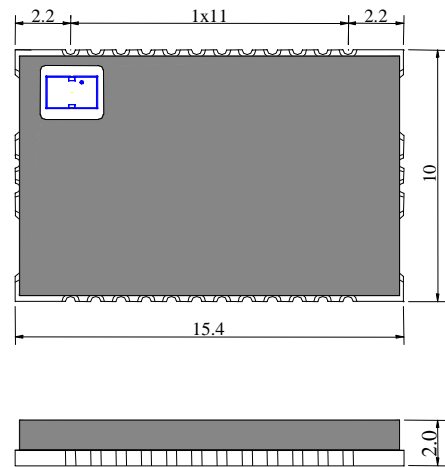
- The module is a Max.4dBm( Class2 ) module.
  - Bluetooth® standard Ver1.1 conformity.
  - Internal baseband clock oscillator.
  - Internal 1.8V regulator
  - Low current consumption
  - Support functions
- Serial Port Emulation (Point-To-Point)
- Interface: UART
  - Protocol Stack/Profile (L2CAP,RFCOMM,SDP,GAP,SPP)
  - Small outline. 15.4 x 10 x 2.0 mm

### Applications

- POS,Barcode Reader,FA equipments

### Outline

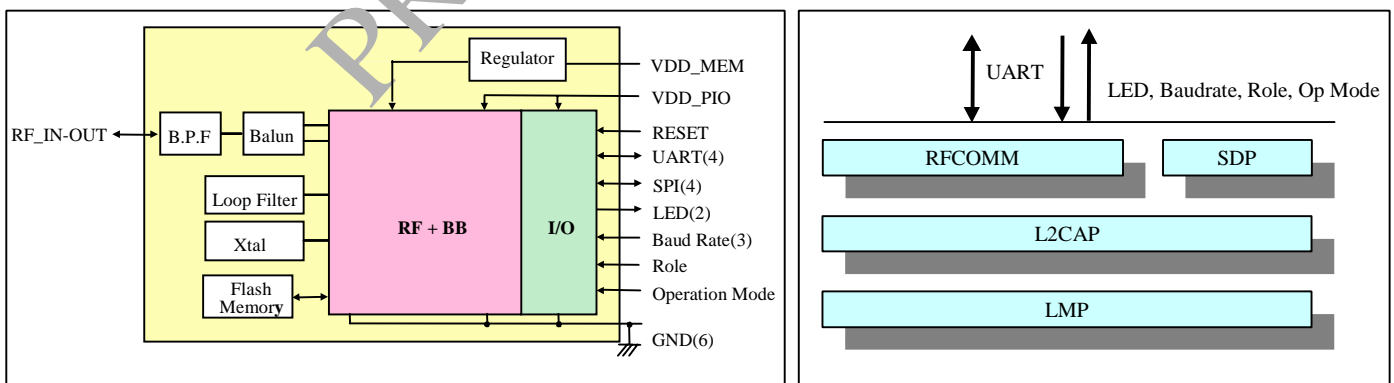
Unit: mm



### General Electrical Specification

Parameter	Description	Min.	Typ.	Max.	Units
Carrier Frequency		2.402		2.480	GHz
Operating Voltage (VDD_MEM)		3.00	3.30	3.60	V
Operating Voltage (VDD_PIO)		3.00	3.30	3.60	V
RF Output Power	measured in 50 ohm	-6	0	4	dBm
RX Sensitivity			-83	-70	dBm
Load Impedance	No abnormal Oscillation			5:1	-
Input Low Voltage	RESET, UART, GPIO	-0.30	-	0.80	V
Input High Voltage	RESET, UART, GPIO	0.70VDD_PIO	-	VDD_PIO+0.30	V
Output Low Voltage	UART, GPIO	-	-	0.40	V
Output High Voltage	UART, GPIO	VDD_PIO-0.40	-	-	V
Average Current Consumption	Receive DMI Packet		TBD	-	mA

### Block Diagram



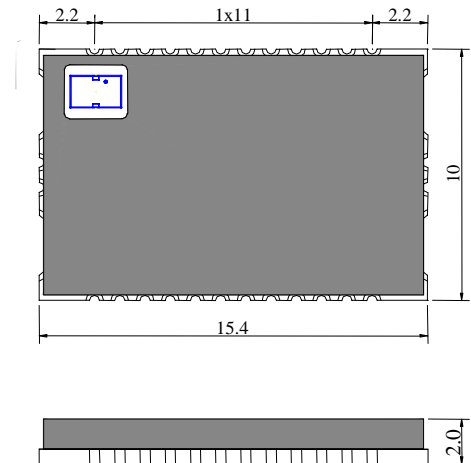
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## Features

- The module is a Max.4dBm( Class2 ) module.
- Bluetooth® standard Ver. 1.2 conformity.
- Internal baseband clock oscillator.
- Internal 1.8V regulator
- Low current consumption
- Support functions  
SCO links,ACL links,Piconet<7>,Hold,Sniff,Park, AFH, Faster connection
- Interface:EYSF2CSXX: USB(for data and voice)
- Protocol stack:Under HCI firmware
- Small outline. **15.4 x 10 x 2.0 mm**

## Outline

Unit: mm



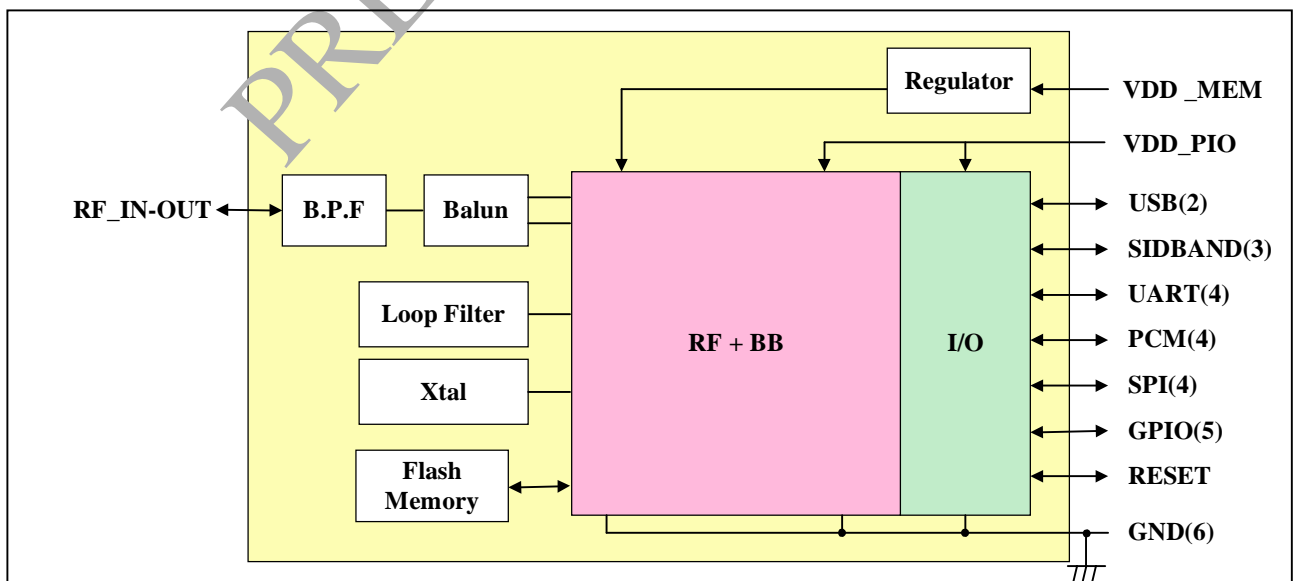
## Applications

- Notebook PC
- PDA

## General Electrical Specification

Parameter	Description	Min.	Typ.	Max.	Units
Carrier Frequency		2.402		2.480	GHz
Operating Voltage (VDD_MEM)		3.10	3.30	3.45	V
Operating Voltage (VDD_PIO)		3.10	3.30	3.45	V
RF Output Power	measured in 50 ohm	-6	0	4	dBm
RX Sensitivity			-83	-70	dBm
Load Impedance	No abnormal Oscillation			5:1	-
Input Low Voltage	RESET, SIDBAND, GPIO	-0.30	-	0.80	V
Input Low Voltage	D+, D-	-	-	0.80	V
Input High Voltage	RESET, SIDBAND, GPIO	0.70VDD_PIO	-	VDD_PIO+0.30	V
Input High Voltage	D+, D-	2.00	-	-	V
Output Low Voltage	SIDBAND, GPIO	-	-	0.40	V
Output Low Voltage	D+, D-	-	-	0.30	V
Output High Voltage	SIDBAND, GPIO	VDD_PIO-0.40	-	-	V
Output High Voltage	D+, D-	2.80	-	-	V
Average Current Consumption	Receive DM1		48	-	mA

## Block Diagram

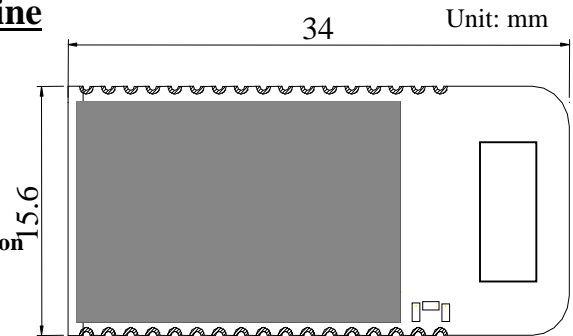


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**TAIYO YUDEN****Bluetooth® Module****Class 2 UART All In One(ANT+RF+BB) EYMF2Camm****Features**

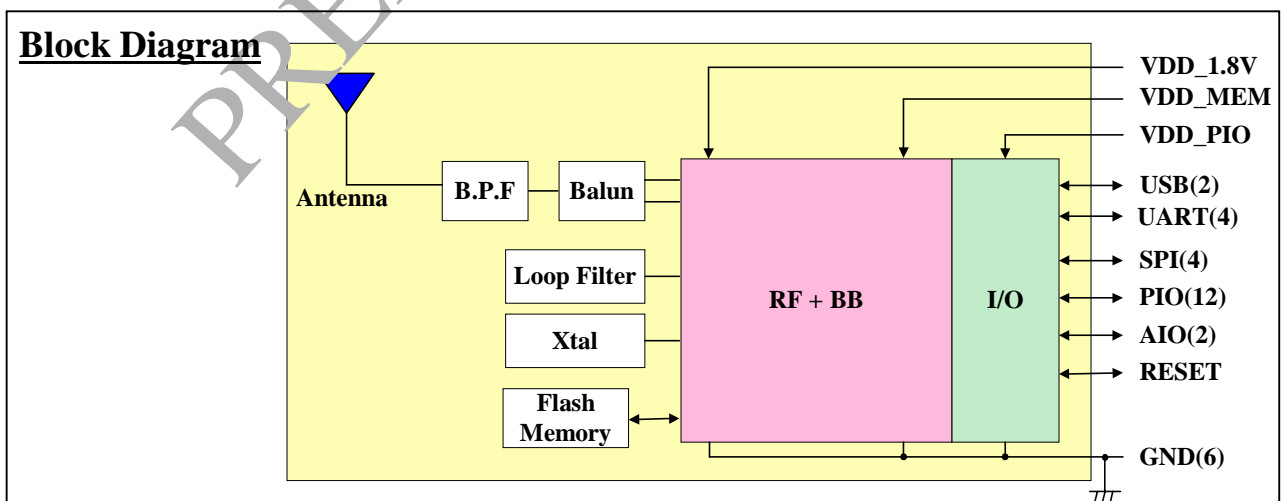
- Antenna is provided on board
- The module is Max.4 dBm( Class2 )module
- Bluetooth® standard Ver. 1.2 conformity
- Internal baseband clock oscillator
- Low current consumption
- Support functions  
ACL links, Piconet<7>, Hold, Sniff, Park, AFH, Faster connection
- Interface: UART
- HCI module
- Outline: 34.0 x 15.6 x 3.7 mm

**Outline****Applications**

- PC & peripheral

**General Electrical Specification**

Parameter	Description	Min.	Typ.	Max.	Units
Carrier Frequency		2.402		2.480	GHz
Operating Voltage(VDD_MEM)	VDD_MEM = VDD_PIO	3.0	3.3	3.6	V
Operating Voltage(VDD_PIO)	VDD_MEM = VDD_PIO	3.0	3.3	3.6	V
Operating Voltage(VDD_1.8)		1.75	1.8	1.9	V
RF Output Power	Measured in 50 ohm	-6	0	4	dBm
RX Sensitivity		-	-83	-70	dBm
Load Impedance	No abnormal Oscillation	-		5:1	-
Operation temperature range		0	25	70	Degree C
Input Low Voltage	PIO, AIO, SPI	-0.3		0.8	V
Input Low Voltage	UART_RX, UART_CTS	-0.3		0.8	V
Input Low Voltage	RESET	-0.3		0.8	V
Input High Voltage	PIO, AIO, SPI	0.7VDD_PIO		VDD +0.3	V
Input High Voltage	UART_RX, UART_CTS	0.7VDD_PIO		VDD +0.3	V
Input High Voltage	RESET	0.7VDD_PIO		VDD +0.3	V
Output Low Voltage	PIO, AIO, SPI	-		0.4	V
Output Low Voltage	UART_TX, UART_RTS	-		0.4	V
Output High Voltage	PIO, AIO, SPI	VDD -0.4		-	V
Output High Voltage	UART_TX, UART_RTS	VDD -0.4		-	V
Average Current Consumption	Receive DM1(VDD_MEM,VDD_PIO)		14	-	mA
	Receive DM1(VDD_1.8)		35	-	

**Block Diagram**

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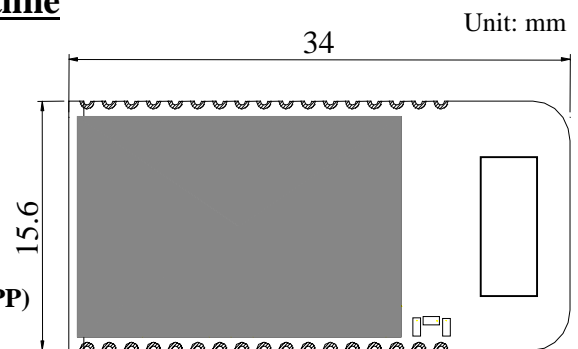
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## Simple Cable Replacement

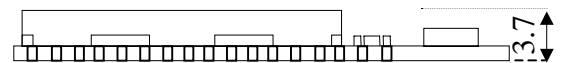
EYMF2CA\*\*-\*\*

Features

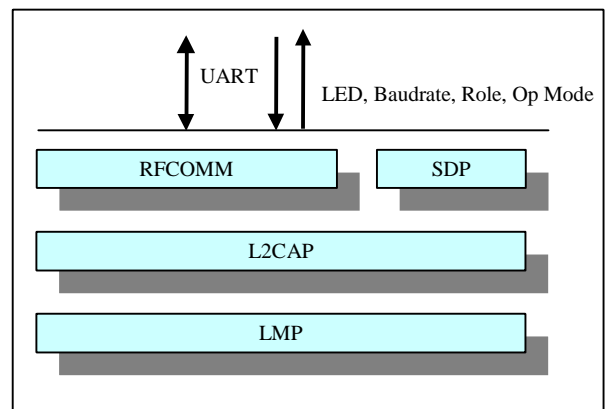
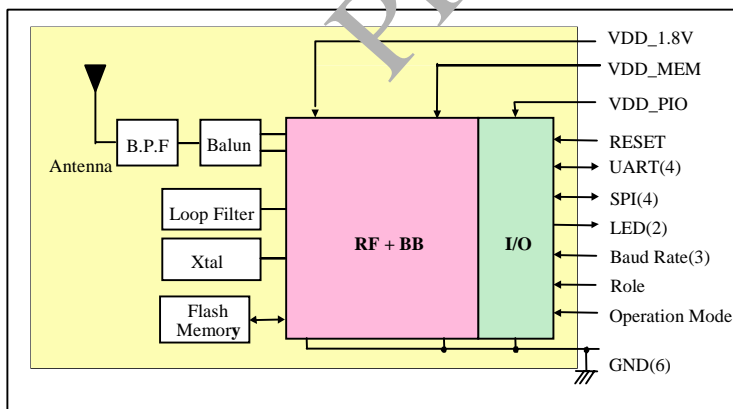
- Antenna is provided on board
- The module is Max.4 dBm( Class2 )module
- Bluetooth® standard Ver.1.1 conformity
- Internal baseband clock oscillator
- Low current consumption
- Support functions  
Serial Port Emulation (Point-To-Point)
- Interface: UART
- Protocol Stack/Profile (L2CAP,RFCOMM,SDP,GAP,SPP)
- Outline: 34.0 x 15.6 x 3.7 mm

OutlineApplications

- POS,Barcode Reader,FA equipments

General Electrical Specification

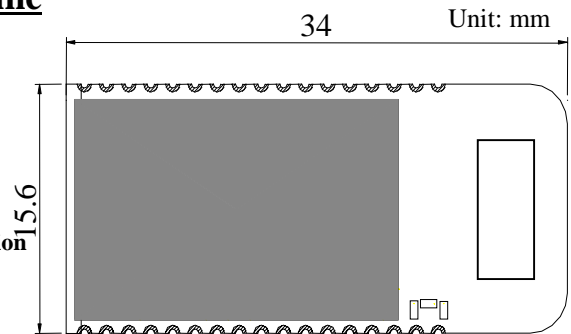
Parameter	Description	Min.	Typ.	Max.	Units
Carrier Frequency		2.402		2.480	GHz
Operating Voltage(VDD_MEM)		3.0	3.3	3.6	V
Operating Voltage(VDD_PIO)		3.0	3.3	3.6	V
Operating Voltage(VDD_1.8V)		1.7	1.8	1.9	V
RF Output Power	Measured in 50 ohm	-6	0	4	dBm
RX Sensitivity		-	-83	-70	dBm
Load Impedance	No abnormal Oscillation	-		5:1	-
Operation temperature range		0	25	70	Degree C
Input Low Voltage	PIO, AIO, SPI	-0.3		0.8	V
Input Low Voltage	UART_RX, UART_CTS	-0.3		0.8	V
Input Low Voltage	RESET	-0.3		0.8	V
Input High Voltage	PIO, AIO, SPI	0.7VDD_PIO		VDD +0.3	V
Input High Voltage	UART_RX, UART_CTS	0.7VDD_PIO		VDD +0.3	V
Input High Voltage	RESET	0.7VDD_PIO		VDD +0.3	V
Output Low Voltage	PIO, AIO, SPI	-		0.4	V
Output Low Voltage	UART_TX, UART_RTS	-		0.4	V
Output High Voltage	PIO, AIO, SPI	VDD -0.4		-	V
Output High Voltage	UART_TX, UART_RTS	VDD -0.4		-	V
Average Current Consumption 1	Receive DM1 Packet		TBD	-	mA

Block Diagram

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**TAIYO YUDEN****Bluetooth® Module****Class 2 USB All In One(ANT+RF+BB)****EYMF2CSMM****Features**

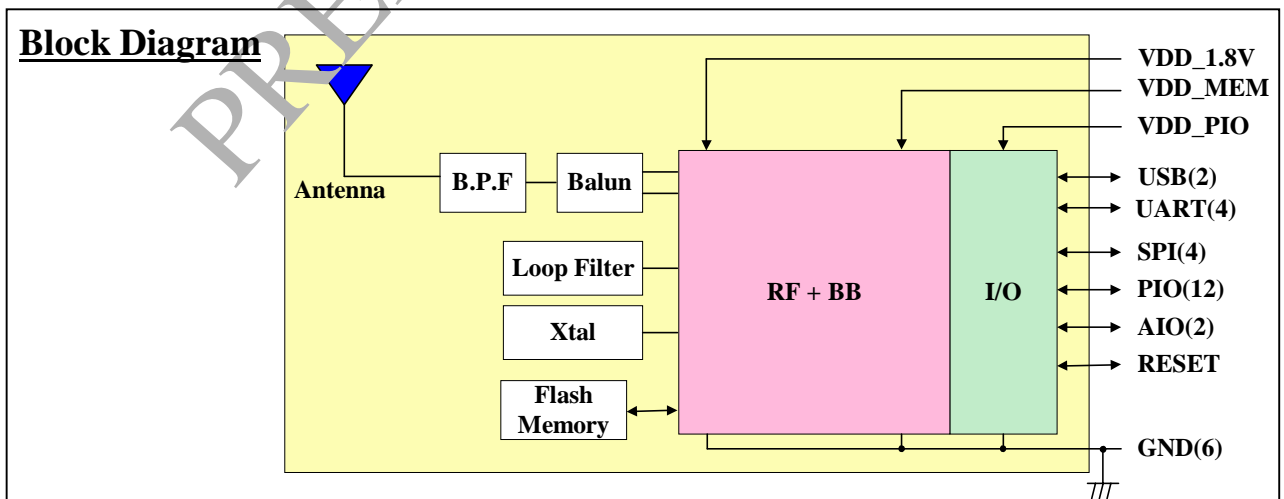
- Antenna is provided on board
- The module is Max.4 dBm( Class2 )module
- Bluetooth® standard Ver. 1.2 conformity
- Internal baseband clock oscillator
- Low current consumption
- Support functions  
ACL links, Piconet<7>, Hold, Sniff, Park, AFH, Faster connection
- Interface: USB
- HCI module
- Outline: 34.0 x 15.6 x 3.7 mm

**Outline****Applications**

- PC & peripheral

**General Electrical Specification**

Parameter	Description	Min.	Typ.	Max.	Units
Carrier Frequency		2.402		2.480	GHz
Operating Voltage(VDD_MEM)		3.1	3.3	3.45	V
Operating Voltage(VDD_PIO)		3.1	3.3	3.45	V
Operating Voltage(VDD_1.8V)		1.7	1.8	1.9	V
RF Output Power	Measured in 50 ohm	-6	0	4	dBm
RX Sensitivity		-	-83	-70	dBm
Load Impedance	No abnormal Oscillation	-		5:1	-
Operation temperature range		0	25	70	Degree C
Input Low Voltage	PIO, AIO, SPI	-0.3		0.8	V
Input Low Voltage	D+, D-	-		0.8	V
Input Low Voltage	RESET	-0.3		0.8	V
Input High Voltage	PIO, AIO, SPI	0.7VDD_PIO		VDD +0.3	V
Input High Voltage	D+, D-	2.0		-	V
Input High Voltage	RESET	0.7VDD_PIO		VDD +0.3	V
Output Low Voltage	PIO,AIO,SPI	-		0.4	V
Output Low Voltage	D+, D-	-		0.3	V
Output High Voltage	PIO, AIO, SPI	VDD_PIO-0.4		-	V
Output High Voltage	D+, D-	2.8		-	V
Average Current Consumption	Receive DM1(VDD_MEM,VDD_PIO)		14	-	mA
	Receive DM1(VDD_1.8)		37	-	

**Block Diagram**

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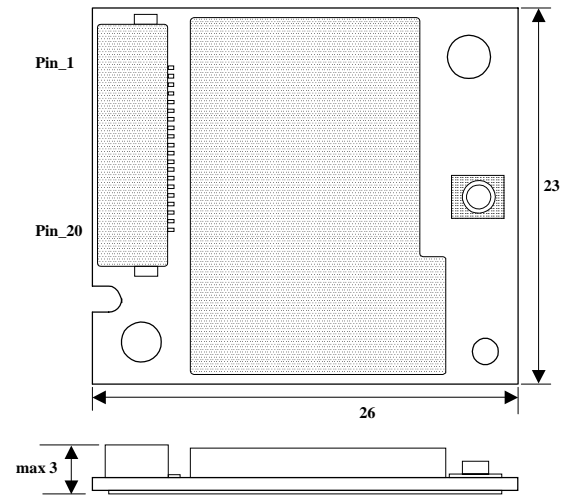
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**TAIYO YUDEN****Bluetooth® Module****Class 2 USB Full Module (Connector Type) EYTF3CSTT****Features**

- The module is a Max.4dBm (Class2) module.
- Bluetooth® standard Ver. 2.0+EDR conformity.
- Internal baseband clock oscillator.
- Support functions
  - Bluetooth
    - ACL links, Piconet<7>, Scatternet<2.5>, Hold, Sniff, Park, AFH & Coexistence, Faster connection, EDR
  - Others
    - Selective Suspend, Dual Boot
- USB Interface
- Protocol stack: Under HCI firmware.
- Outline: 26 x 23 x 3 mm.
- Complete Lead Free
- RoHS Available

**Outline**

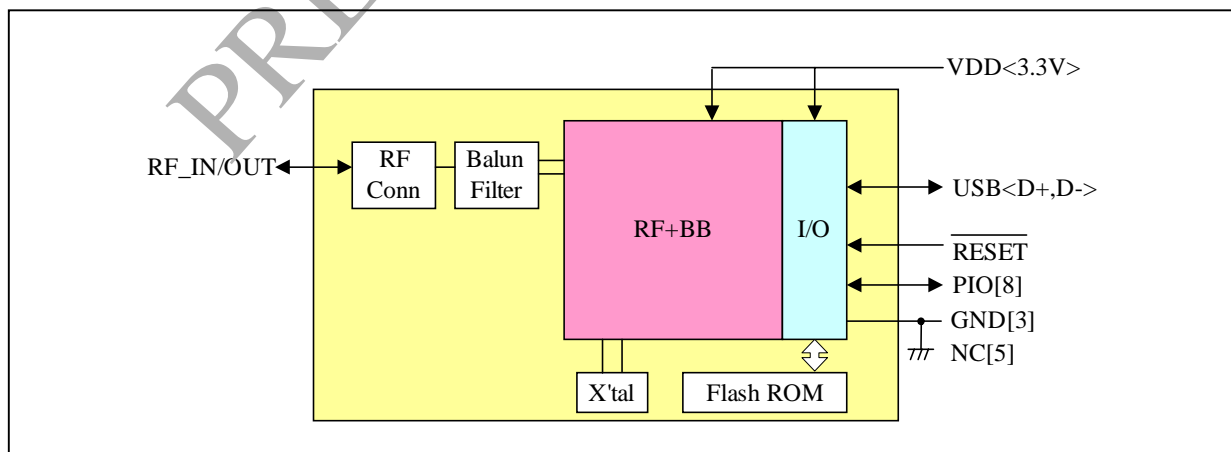
Unit: mm

**FPC/FFC Connector****Applications**

- Notebook PC

**General Electrical Specification**

Parameter	Description	Min.	Typ.	Max.	Units
Carrier Frequency		2.402		2.480	GHz
Operating Voltage(VDD)		3.15	3.3	3.45	V
RF Output Power	Measured in 50 ohm	-6	0	4	dBm
RX Sensitivity		-	-83	-70	dBm
Load Impedance	No abnormal Oscillation	-		5:1	-
Input Low Voltage	/RESET, PIO	-0.3		0.8	V
Input Low Voltage	D+,D-	-		0.8	V
Input High Voltage	/RESET, PIO	0.7 x VDD		VDD +0.3	V
Input High Voltage	D+, D-	2.0		-	V
Output Low Voltage	PIO	-		0.4	V
Output Low Voltage	D+, D-	-		0.3	V
Output High Voltage	PIO	0.8 x VDD		-	V
Output High Voltage	D+, D-	2.8		-	V
Average Current Consumption	Receive DM1	-	43	-	mA

**Block Diagram**

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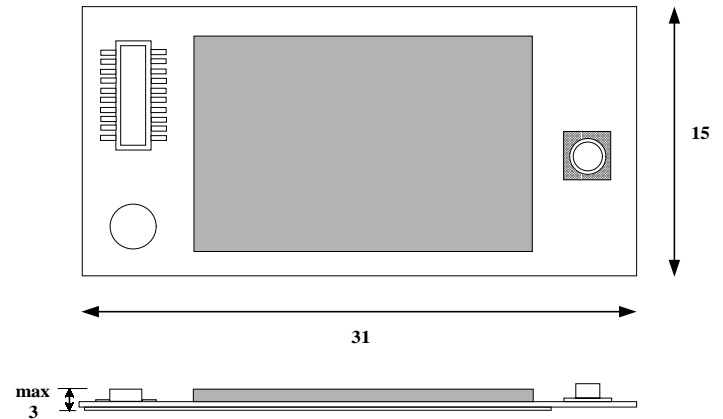


**TAIYO YUDEN****Bluetooth® Module****Class 2 Full Module (RF Connector Type)****EYSFCCSXX****Features**

- The module is a Max.4dBm( Class2 ) module.
- Bluetooth® standard Ver. 2.0+EDR conformity.
- Internal baseband clock oscillator.
- Support functions
  - Bluetooth
    - ACL links, Piconet<7>, Scatternet <2.5>, Hold, Sniff, Park, AFH & Coexistence, Faster connection , EDR
  - Others
    - Selective Suspend, Dual Boot.
- USB Interface
- Protocol stack: Under HCI firmware.
- Outline: 31x 15 x 3 mm.
- Complete Lead Free
- RoHS Available

**Outline**

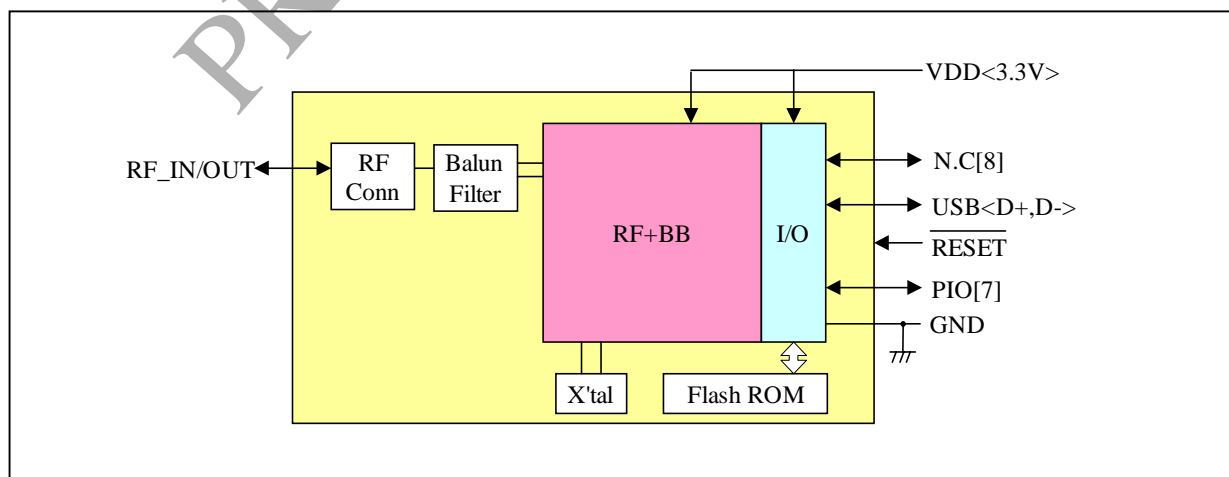
Unit: mm

**Board to Board Connector****Applications**

- Notebook PC

**General Electrical Specification**

Parameter	Description	Min.	Typ.	Max.	Units
Carrier Frequency		2.402		2.480	GHz
Operating Voltage (VDD)	USB Interface	3.15	3.3	3.45	V
RF Output Power	Measured in 50 ohm	-6	0	4	dBm
RX Sensitivity		-	-83	-70	dBm
Load Impedance	No abnormal Oscillation	-		5:1	-
Input Low Voltage	/RESET, PIO	-0.3		0.8	V
Input Low Voltage	D+,D-	-		0.8	V
Input High Voltage	/RESET, PIO	0.7 x VDD		VDD +0.3	V
Input High Voltage	D+, D-	2.0		-	V
Output Low Voltage	PIO	-		0.4	V
Output Low Voltage	D+, D-	-		0.3	V
Output High Voltage	PIO	0.8 x VDD		-	V
Output High Voltage	D+, D-	2.8		-	V
Average Current Consumption	Receive DM1	-	43	-	mA

**Block Diagram**

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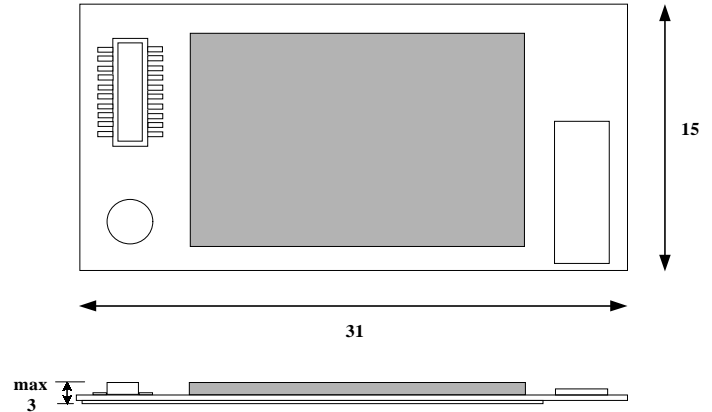
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**TAIYO YUDEN****Bluetooth® Module****Class 2 Full Module (Antenna Type)****EYSFDCSXX****Features**

- The module is a Max.4dBm( Class2 ) module.
- Bluetooth® standard Ver. 2.0+EDR conformity.
- Internal baseband clock oscillator.
- Support functions
  - Bluetooth
    - ACL links, Piconet<7>, Scatternet <2.5>, Hold, Sniff, Park, AFH & Coexistence, Faster connection , EDR
  - Others
    - Selective Suspend, Dual Boot.
- USB Interface
- Protocol stack: Under HCI firmware.
- Outline: 31x 15 x 3 mm.
- Complete Lead Free
- RoHS Available

**Outline**

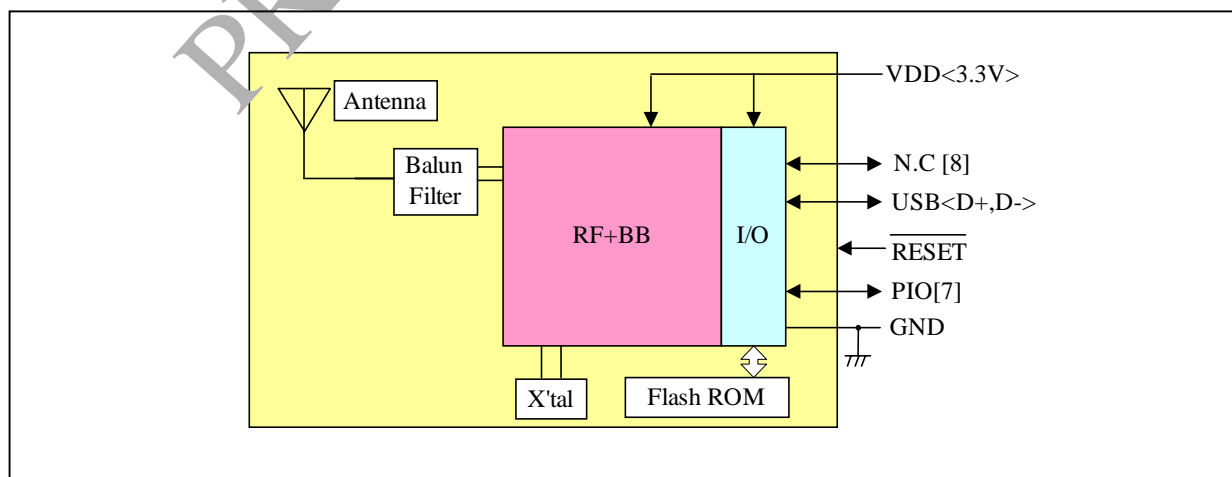
Unit: mm

**Board to Board Connector****Applications**

- Notebook PC

**General Electrical Specification**

Parameter	Description	Min.	Typ.	Max.	Units
Carrier Frequency		2.402		2.480	GHz
Operating Voltage (VDD)	USB Interface	3.15	3.3	3.45	V
RF Output Power	Measured in 50 ohm	-6	0	4	dBm
RX Sensitivity		-	-83	-70	dBm
Load Impedance	No abnormal Oscillation	-		5:1	-
Input Low Voltage	/RESET, PIO	-0.3		0.8	V
Input Low Voltage	D+,D-	-		0.8	V
Input High Voltage	/RESET, PIO	0.7 x VDD		VDD +0.3	V
Input High Voltage	D+, D-	2.0		-	V
Output Low Voltage	PIO	-		0.4	V
Output Low Voltage	D+, D-	-		0.3	V
Output High Voltage	PIO	0.8 x VDD		-	V
Output High Voltage	D+, D-	2.8		-	V
Average Current Consumption	Receive DM1	-	43	-	mA

**Block Diagram**

Note: The above PRELIMINARY data are not guaranteed and are subject to change without notice.

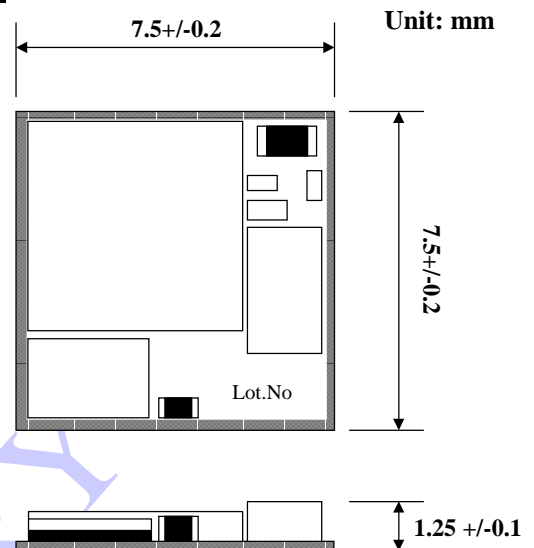
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**TAIYO YUDEN****Bluetooth® Module****HCI Module for Cellular Phone and PDA EYSNDYAXX****Features**

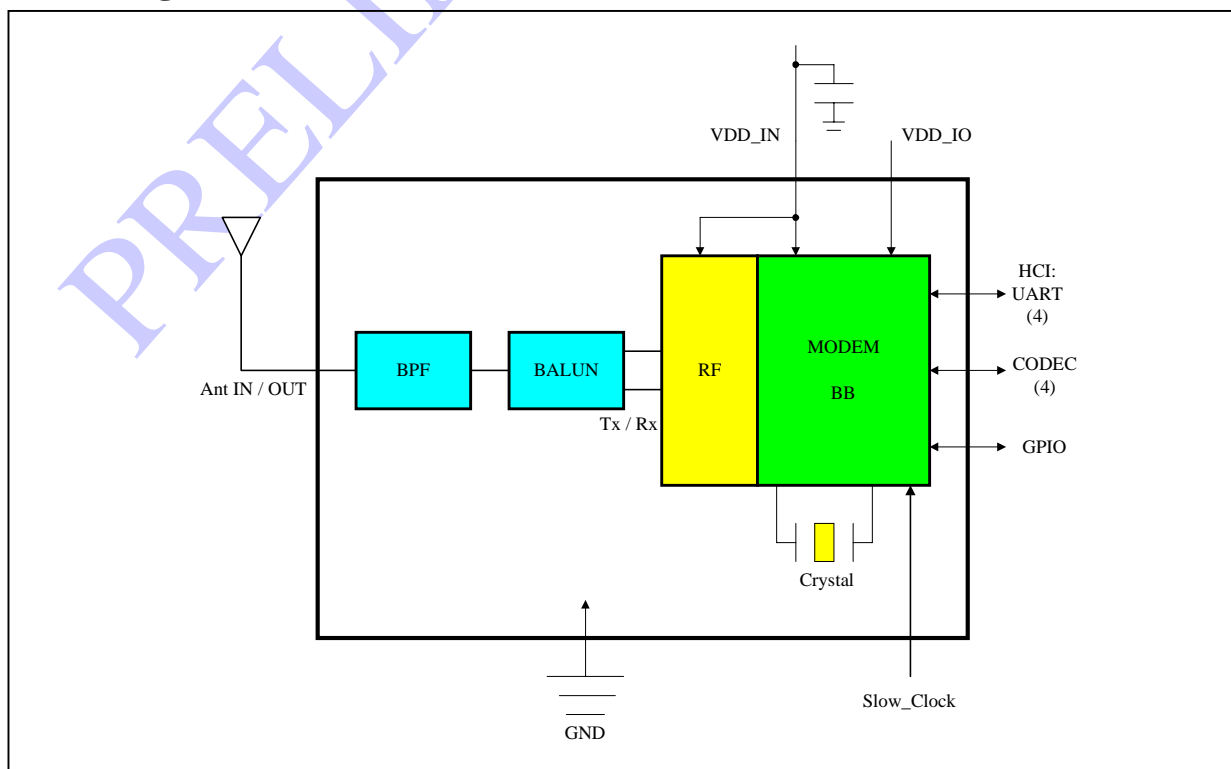
- The module is a Max.4dBm ( Class2 ) module.
- Low current consumption.
- *Bluetooth*® standard Ver1.2 conformity
- HCI module
- Interface:UART
- Supports multiple host reference clock inputs
- Small outline
- Outline : 7.5x7.5x1.25mm
- Without Shieldcase
- RoHS Conformity
- Halogen Free (Substrate)

**Applications**

- PDA
- Cellular Phone
- Mobile system

**Outline****General Electrical Specification**

Parameter	Description	Min.	Typ.	Max.	Units
Carrier Frequency		2.402		2.480	GHz
Operating Voltage		2.7		3.6	V
RF Output Power	Measured in 50 ohm	-6		4	dBm
RX Sensitivity			-83		dBm
TX Peak Current Consumption	Continuous Transmit Mode		31		mA
RX Peak Current Consumption	Continuous Receive Mode		48		mA
Deep Sleep Current Consumption	Standby Mode		83		uA
General Operating Temperature condition		-30		85	deg-C

**Block Diagram**

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# TAIYO YUDEN

## Bluetooth® Module

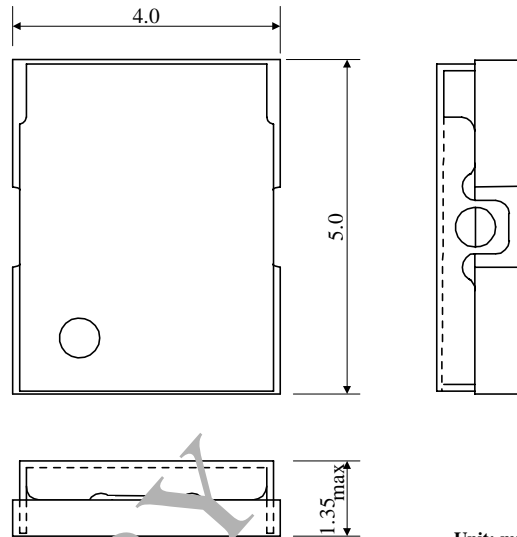
### Class2 Bluetooth® RF Module

### EWSCBBQXX

#### Features

- The module is a Max.4dBm ( Class2 ) module.
- Bluetooth® standard Ver1.1, 1.2 conformity.
- Compatible with CDMA Interface.
- Support the 19.2MHz host reference clock input.
- Shield case type.
- Small outline by LTCC substrate built-in RF function.
- Outline : 5.0 x 4.0 x 1.35max mm Pin pitch 0.75mm (Min)
- 16 pin LGA package.
- Lead Free
- RoHS Available

#### Outline



Unit: mm

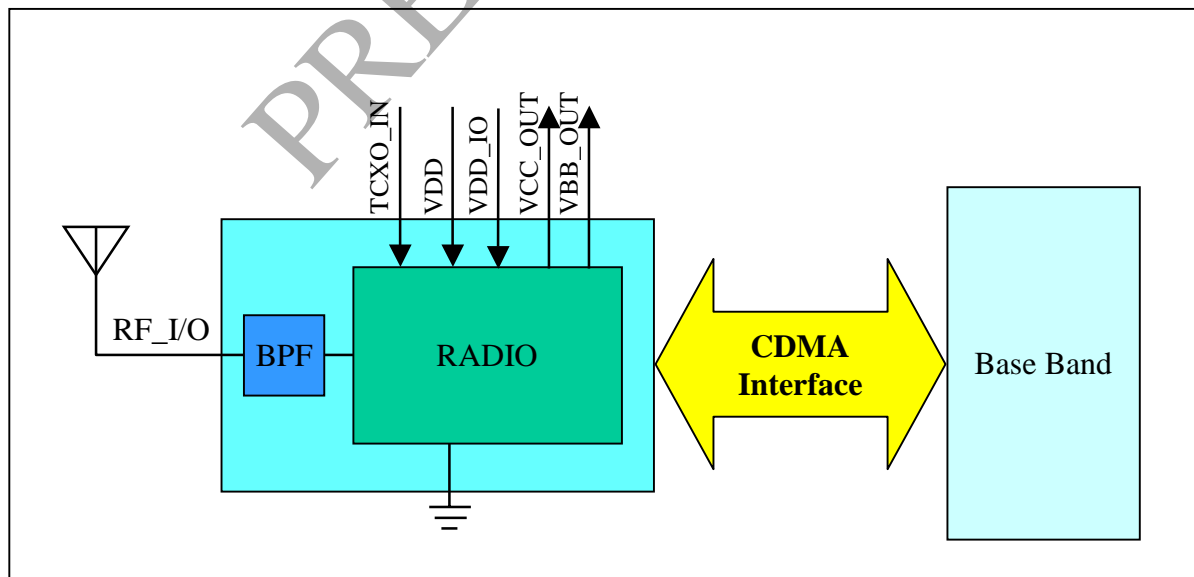
#### Applications

- Cellular Phone

#### General Electrical Specification

Parameter	Description	Min.	Typ.	Max.	Units
Carrier Frequency		2.402		2.480	GHz
Supply Voltage	VDD	1.9		3.6	V
Supply Voltage	VDD_IO	1.62		2.92	V
RF Output Power	Measured in 50 ohm	-6		4	dBm
RX Sensitivity			-86	-70	dBm
TX Peak Current Consumption	Worst Case Transmit Mode		37		mA
RX Peak Current Consumption	Worst Case Receive Mode		38		mA
General Operating Temperature condition		-30	25	80	deg-C

#### Block Diagram



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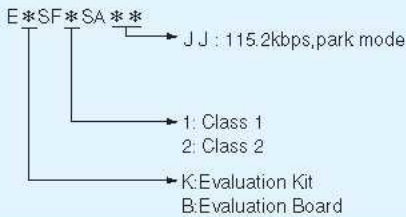


**Introduction**

'Bluetooth™ Module Evaluation Kit' includes two evaluation boards which function as hardware and software tools enabling you to control the module directly from your PC by HCI commands. By connecting the board to your PC either through UART or by a USB port, you will have the necessary environment to evaluate the performance of the module.

**Ordering Codes**

**1. Evaluation for UART Full Module**



**2. Evaluation for Class1 USB Full Module**



**3. Evaluation for Class2 USB Full Module**



**4. Evaluation Board for RM Module**

EBSR2SXXX  
(Note : This board can be connected to Silicon Wave WDS)

**Accessories**

- 1. Evaluation Kit
  - Evaluation Board 2pcs
  - CD-ROM disc 1pc  
(containing software, software users' manual, Module specification report, and evaluation board users' manual).
  - Antenna 2pcs
  - DC power cable (UART Evaluation Kit only) 2pcs
  - Stand 2set
- 2. Evaluation Board
  - Evaluation Board 1pc
  - Antenna 1pcs
  - DC power cable (UART Evaluation Board only) 1pc
  - Stand 1set

**Recommended Operating Environment**

- Operating System : \*Windows 98 or Windows Me
- CPU : \*\*Pentium III 300MHz and Celeron™ 400MHz or higher
- RAM : 64MB or more
- Interface : RS-232C

\*Microsoft Windows 98 and Windows Me are trademarks of Microsoft Corporation.  
\*\*Intel Celeron™ and Pentium III are trademarks of Intel Corporation.

**Notes**

1. /RESET signal must be driven by open drain output. Pull-up resistor inside the module is 1MΩ(Typ.)
2. To be compliant with Full-Speed of USB 2.0 specification. Pull-up resistor of D+is 1.5kΩ(Typ.)
3. 100kΩ Pull-up resistors to 3.0V are used on the module.