



Yofree **YFBT30M** is a Bluetooth Low Energy 5.3 module designed based on **Nordic nRF52805 solution**, which incorporates: **GPIO, SPI, UART, I2C, PWM** and **ADC** interfaces for connecting peripherals and sensors. YFBT30M module dimension is 15.7mm x 10mm x 2.3mm. It is designed for small form factor product.

1.1. Features

- Support Bluetooth Low Energy(BLE) 5.3
- 32-bit ARM Cortex –M4 processor
- 192KB flash programmed memory and 24KB RAM
- Application development independent from protocol stack
- On-air compatible with nRF51, nRF24AP and nRF24L series
- RAM mapped FIFOs using EasyDMA
- RSSI
- Flexible and configurable 10 pin GPIO
- Programmable peripheral interface –PPI
- Software stacks available as downloads
- Simple ON / OFF global power mode
- Full set of digital interface all with Easy DMA including:
 - 1 x Hardware SPI master ; 1 x Hardware SPI slave
 - 1 x two-wire master ; 1x two-wire slave
 - 1 x UART (CTS / RTS)
- PDM for digital microphone
- Quadrature demodulator
- 12-bit / 200KSPS ADC
- 128-bit AES ECB / CCM / AAR co-processor
- 4-channel pulse width modulator (PWM) unit with Easy DMA
- Low cost external crystal 32MHz ± 40 ppm for Bluetooth
- Low power 32MHz crystal and RC oscillators
- Wide supply voltage range 1.7V to 3.6V
- On-chip DC/DC buck converter
- Individual power management for all peripherals
- Timer counter:
 - 3x32-bit
 - 2x 24-bit RTC





1.2. Application

- IoT
 - Home automation
 - Sensor networks
 - Building automation
- Personal Area Networks
 - Health / fitness sensor and monitor device
 - Medical devices
 - Key-fobs and wrist watches
- Interactive entertainment devices
 - Remote control
 - Gaming controller
- Computer peripherals and I/O devices
 - Mobile HID
- Beacons

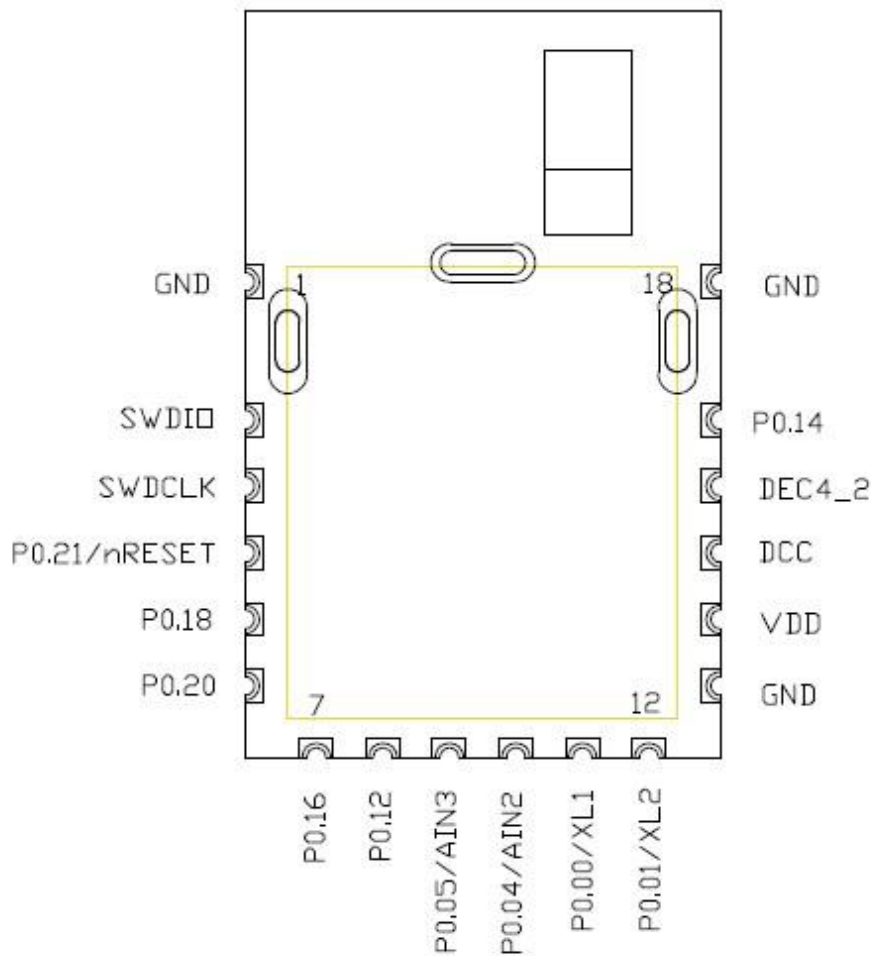


1.3. Pin Assignment

Pin No.	Name	Pin function	Description
1	GND	Ground	The pad must be connected to a solid ground plane
2	SWDIO	Digital I/O	Serial Wire debug I/O for debug and programming
3	SWDCLK	Digital input	Serial Wire debug clock input for debug and programming
4	P0.21	Digital I/O	General-purpose digital I/O Configurable as system RESET pin
	RESET		Configurable as system RESET pin
5	P0.18	Digital I/O	General-purpose digital I/O
6	P0.20	Digital I/O	General-purpose digital I/O
7	P0.16	Digital I/O	General-purpose digital I/O
8	P0.12	Digital I/O	General-purpose digital I/O
9	P0.05	Digital I/O	General-purpose digital I/O
	AIN3	Analog input	SAADC/COMP input
10	P0.04	Digital I/O	General-purpose digital I/O
	AIN2	Analog input	SAADC/COMP input
11	P0.00	Digital I/O	General-purpose digital I/O
	XL1	Analog input	Connection to 32.768khz crystal (LFXO)
12	P0.01	Digital I/O	General-purpose digital I/O
	XL2	Analog input	Connection to 32.768khz crystal (LFXO)
13	GND	Ground	The pad must be connected to a solid ground plane
14	VDD	Power	Power-supply pin
15	DCC	Power	DC/DC converter output pin
16	DEC4_2	Power	1V3 regulator supply decoupling. Input from DC/DC converter. Output from 1V3 LDO .
17	P0.14	Digital I/O	General-purpose digital I/O
18	GND	Ground	The pad must be connected to a solid ground plane



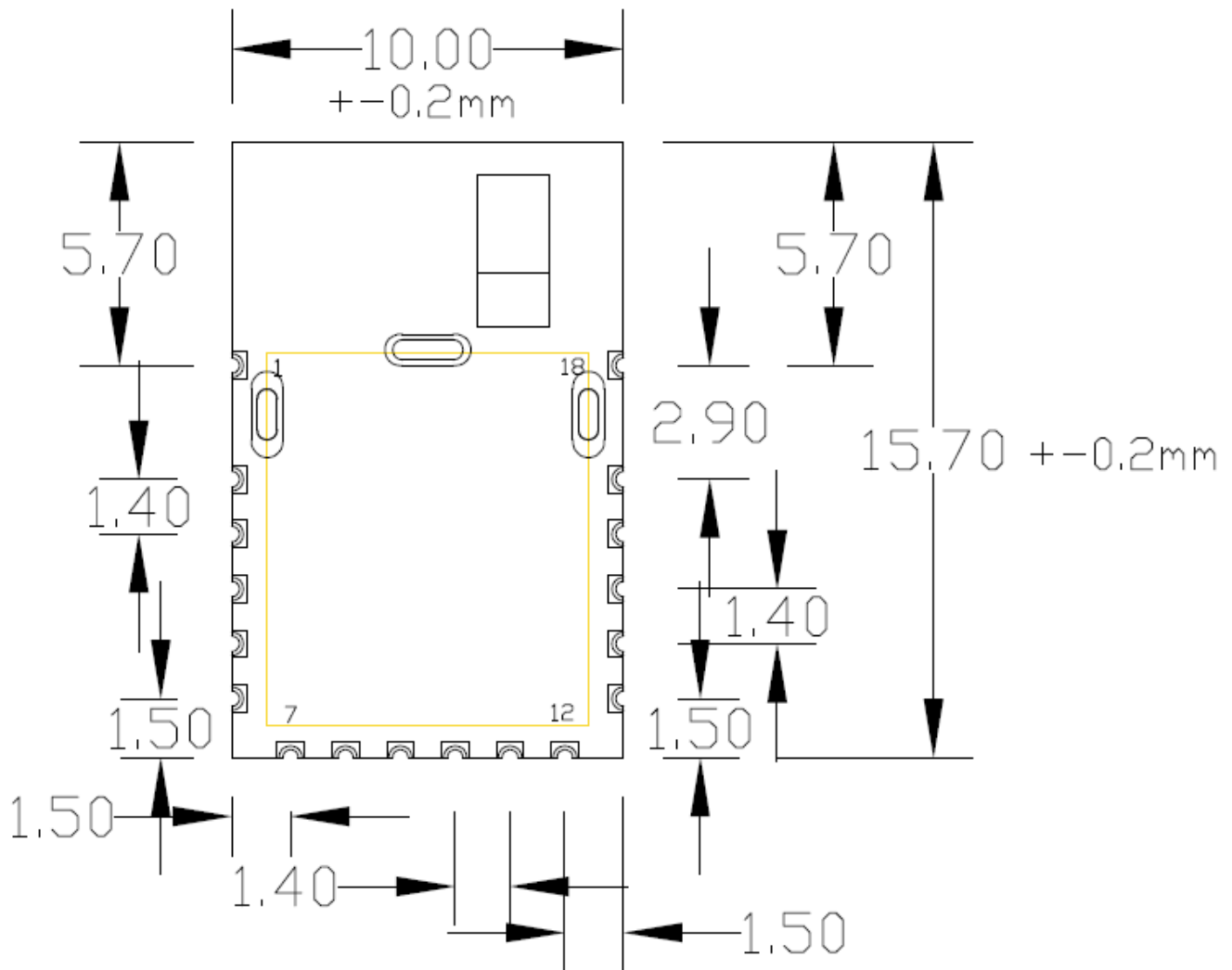
1.4. Module Pin Description:



Pin Description Top View



1.5. Module Outline And Dimension

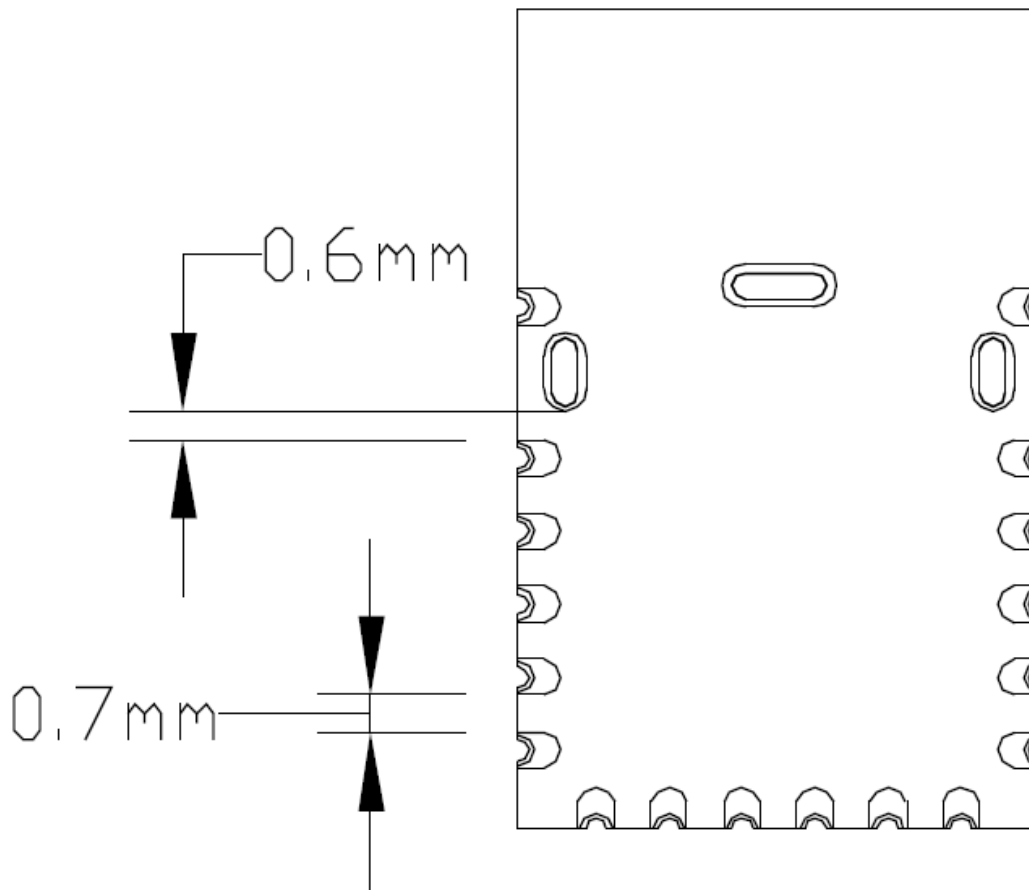


Module Outline Top View



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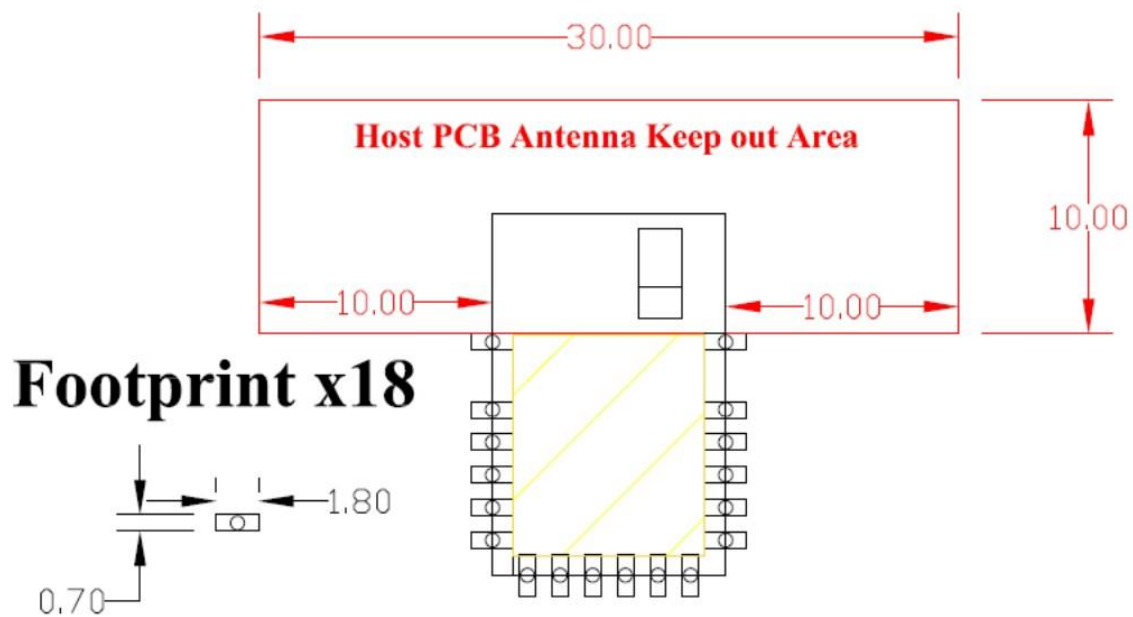
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Bottom View



1.6. Recommended Host PCB Antenna Keep Out Area and Foot Print



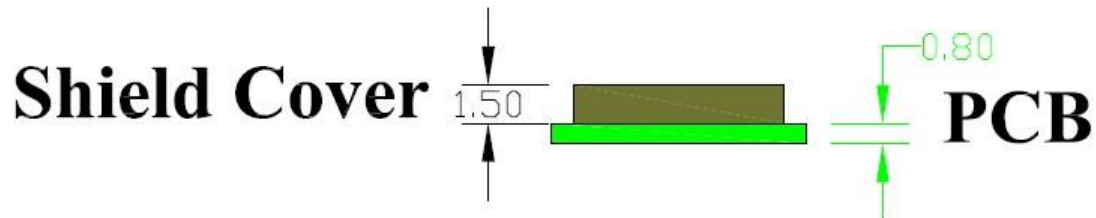
Recommended Host PCB Antenna Keep Out Area & Foot Print

Top View





1.7. Thickness



Shield Thickness = 1.5mm.

PCB Thickness = 0.8mm.

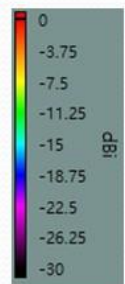
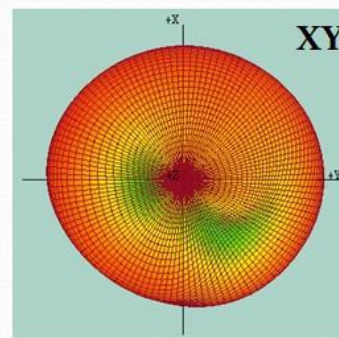
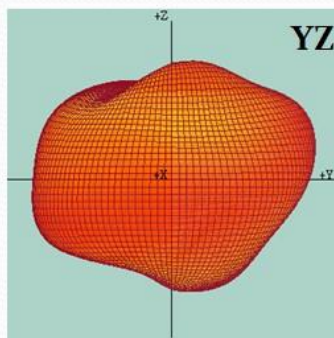
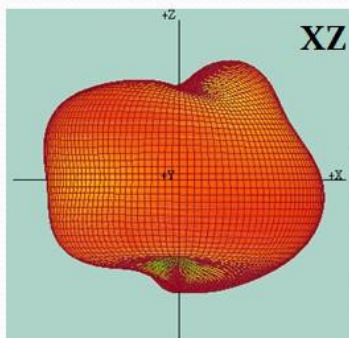
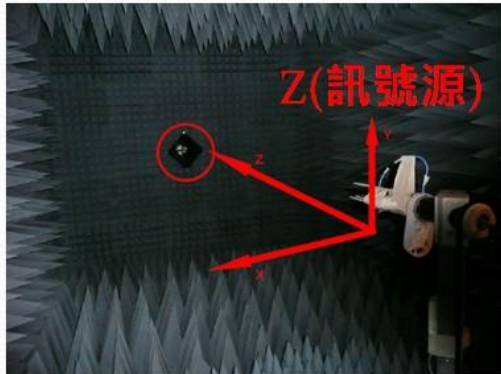
Thickness = 2.3mm

**Dimesion = 15.7mmx10mmx2.3mm
+/-0.2mm**



1.8 Antenna Radiation Pattern

Gain / Efficiency



Frequency (MHz)	2400	2410	2420	2430	2440	2450	2460	2470	2480	2490	2500
Gain (dBi)	-1.288	-1.069	-0.532	-0.209	-0.235	-0.274	-0.392	-0.66	-1.224	-1.781	-1.921

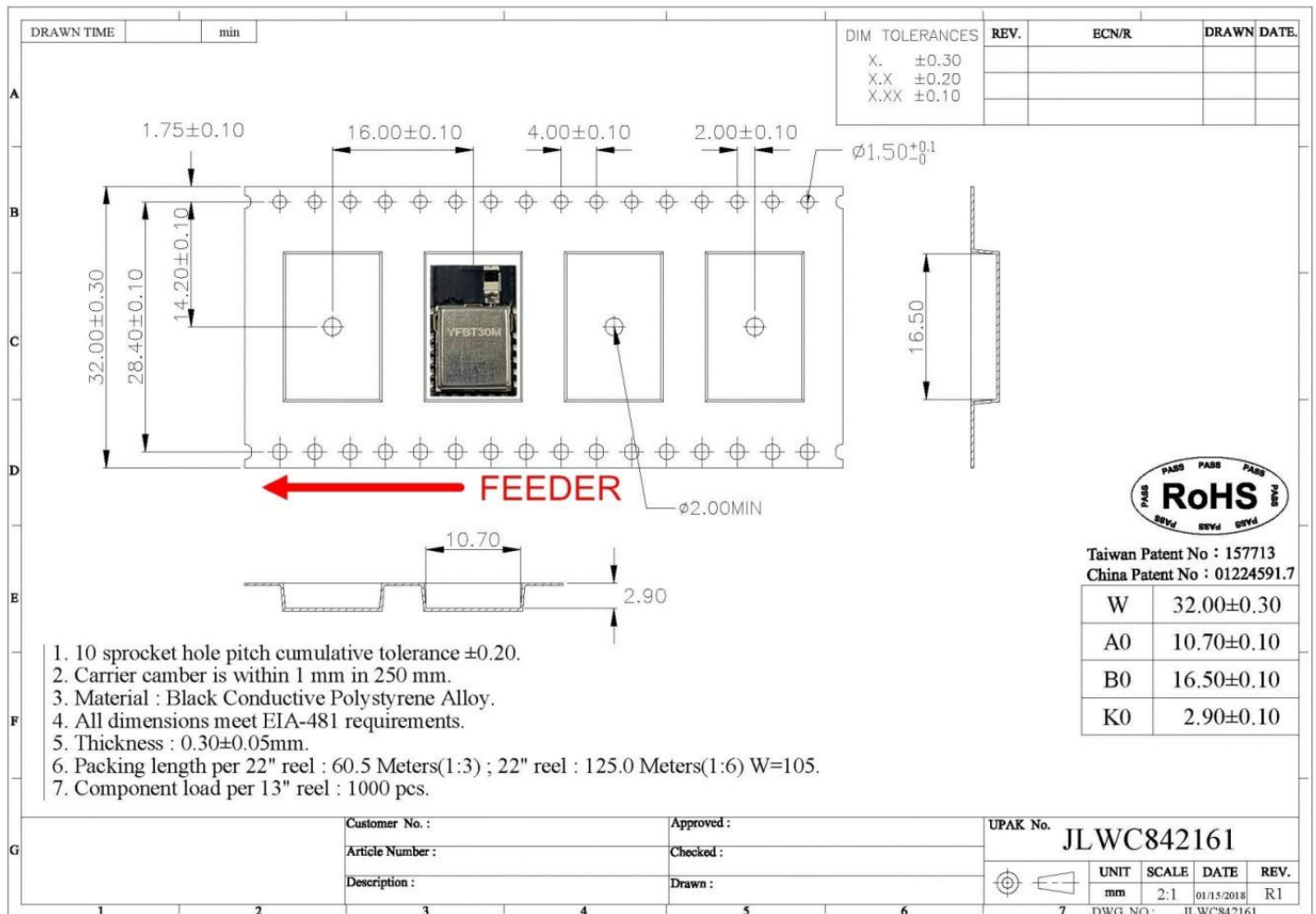


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2.0 Package Information

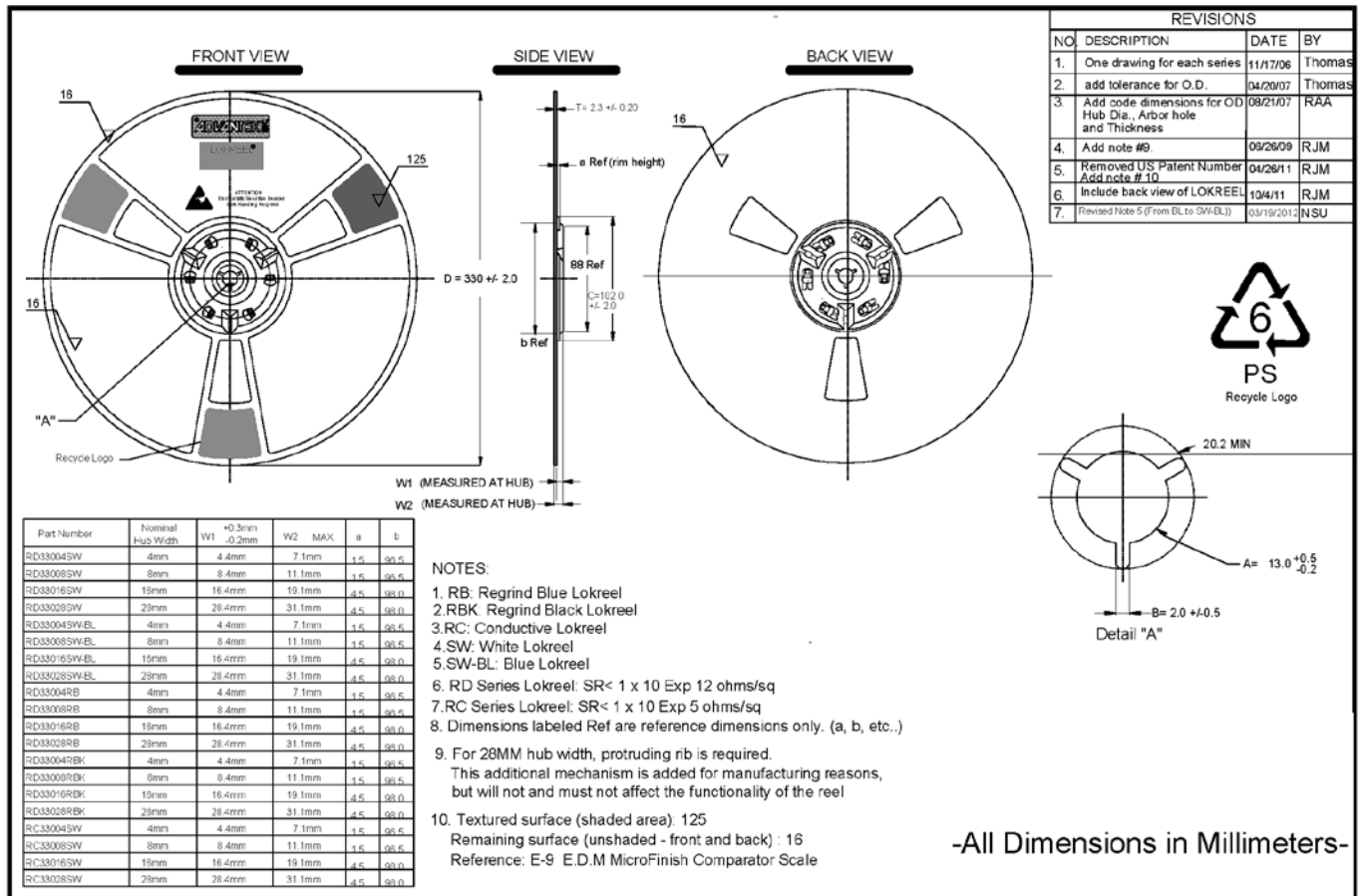
2.0.1 Tape and Reel





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3.0 CERTIFICATION NOTICES

YFBT30M is certified for a global market. This facilitates the user end-product market entry. Please note that the end-product would need to apply for the end-product certification, however the module certification listed below will facilitate that procedure. When the end user sends the end-product to those markets, the end-product may need to follow additional requirements according to the specific market regulation.

3.1 FCC (U.S.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.

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

3.1.1 RF exposure considerations

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator& your body.

This module is approved for installation into mobile or/and portable host platforms. This grant is valid only when the module is sold to OEM integrators and must be installed by the OEM or OEM integrators. This transmitter is restricted for use with the specific antenna(s) tested in this application for Certification and must not be co-located or operating in conjunction with any other antenna or transmitters within a host device, except in accordance with FCC multi-transmitter product procedures.

3.1.2 Antennas

This radio transmitter FCC ID : 2BFPDYFBT30M and has been approved by Federal Communications Commission to operate with the antenna types listed below. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Manufacture	Part Number	Description
ONEWAVE	WAN3216F245W36	Chip Antenna 3216 M-Ant 2.45G Type 36

3.1.3 Label and compliance information

The final end product must be labeled in a visible area with the following" Contains FCC ID:



2BFPDYFBT30M ”.

3.1.4 Information on test modes and additional testing requirements

Host manufacturer which install this modular with limit modular approval should perform the test of radiated emission and spurious emission according to FCC part 15 :15.212 requirement, only if the test result comply with FCC part 15.212 requirement, then the host can be sold legally. When testing host product, the host manufacture should follow FCC KDB Publication 996369 D01 Module Integration Guide for testing the host products. The host manufacturer may operate their product during the measurements.

2.4 Additional testing, Part 15 Subpart B disclaimer

Host manufacturer is responsible for compliance of the host system with module installed with all other applicable requirements for the system, such as Part 15 B.

3.2 IC (Canada)

This device complies with Industry Canada licence-exempt RSS standard(s). 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.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

RF Exposure Statement

This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator& your body.

Cet équipement est conforme aux limites d'exposition aux rayonnements d'ISDE établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec une distance minimale de 20 cm entre le radiateur et votre corps.



OEM Responsibilities to comply with IC Regulations:

OEM integrator is responsible for testing their end-product for any additional compliance requirements needed for the module installation like IC ES003 (EMC). This can be combined with the FCC Part 15B test.

3.2.1 End-product labeling

YFBT30M Module is labelled with its own certification number IC : 32421YFBT30M . If the number is not visible when the module is installed inside another device, then the outside of the end-product into which the module is installed must also display a label referring to the enclosed module. This exterior label can use the following or similar wording:

“Contains IC : 32421-YFBT30M”

3.3 NCC (Taiwan)

The YFBT30M Module has received compliance approval in accordance with the Telecommunications Act.

注意！

「取得審驗證明之低功率射頻器材，非經核准，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。低功率射頻器材之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前述合法通信，指依電信管理法規定作業之無線電通信。低功率射頻器材須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。」

3.3.1 Label

The NCC ID can be applied directly on end-product's label. Due to YFBT30M the limited module size, the NCC mark and ID are displayed in the data sheet only and cannot be displayed on the module label:



CCAP24Y10040T2



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3.4 SRRC (China)

The YFBT30M module has received certification of conformity in accordance with the China MIIT Notice 2014-01 of State Radio Regulation Committee (SRRC) certification scheme.

3.4.1 Label

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产品:蓝牙无线模块
型号:YFBT30M
CMIIT ID: 24J71YS9Y001

3.5 MIC (Japan)

The YFBT30M module has received type certification and is labeled with its own technical conformity mark and certification number as required to conform to the technical standards regulated by the Ministry of Internal Affairs and Communications (MIC) of Japan pursuant to the Radio Act of Japan.

3.5.1 Label

Due to a limited module size, the technical conformity logo and ID is displayed in the data sheet and cannot be displayed on the module label. The final product in which this module is being used must have a label referring to the type certified module inside:



3.6 KC (Korea)

The BM70/71 module has received certification of conformity in accordance with the Radio Waves Act.

3.6.1 Label

The label on the final product which contains the YFBT30M module must follow KC marking requirements. The integrator of the module should refer to the labeling requirements for Korea available on the Korea Communications Commission (KCC) website.

