

保密等级：机密

SPECIFICATION

产品规格书

SKI.W032.8X A25044

IEEE 802.11 b/g/n 1T1R USB WiFi+BLE 5.0 Module

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REVISION HISTORY.

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1. Introduction（简介）

The module SKI.W032.8X is developed based on ALTOBEAM WIFI chip ATBM6032-X. The chip scheme supports 2.4GHz ISM band IEEE802.11b/g/n standard, and the ATBM6032-X scheme also supports Bluetooth BLE v5.0 protocol standard. This document describes the design requirements specification for the product.

模组 SKI.W032.8X 是基于 ALTOBEAM 的 WIFI 芯片 ATBM6032-X 开发，芯片方案支持 2.4GHz ISM 频段 IEEE802.11b/g/n 标准，其中 ATBM6032-X 方案还支持蓝牙 BLE v5.0 协议标准。本文档描述了产品的设计要求规范。

2. Features（特性）

Reserving System 接收制式	IEEE Std. 802.11b
	IEEE Std. 802.11g
	IEEE Std. 802.11n
	BLE 5.0
Chip Solution 芯片方案	ATBM6032-X
Band 波段	2.4GHz*
Dimensions 尺寸	21.0mmx15.0mmx2.8mm
Antenna 天线	PCB Antenna
Installation Mode 安装方式	SMD
Remark 备注	*中国大陆：2400-2483.5MHz

本产品的型号核准代码标识在产品后标牌上。

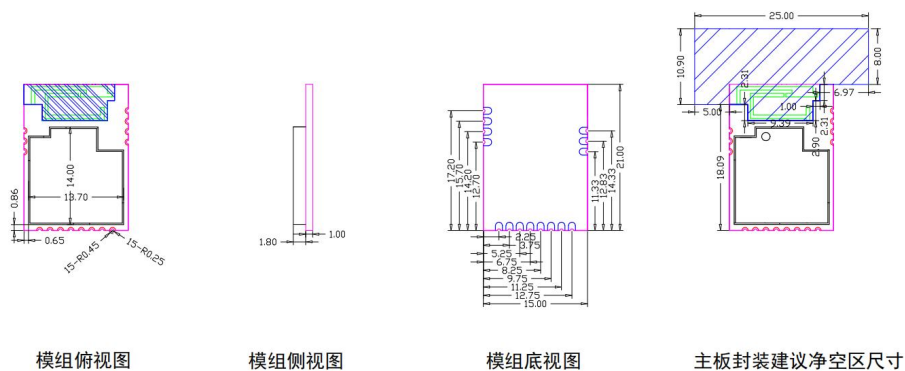
模块通过型号核准并不代表嵌入或使用该模块的最终设备符合相关无线电管理技术规定或标准，最终设备厂商须对产品的技术特性是否符合无线电管理技术规定或标准负责。

The diagram illustrates the ATBM6032 module, a large blue rectangle. It has several external connections:

- 3.3V**: A power supply connection on the top left.
- reset**: A control signal connection on the left side.
- USB 2.0**: A data connection on the left side.
- 24MHz**: A clock signal connection on the bottom left.
- WAKE**: A control signal connection on the top right.
- WF_RFIO**: A radio frequency interface connection on the bottom right, which is connected to an **Antenna** block.

Figure 1 Block Diagram

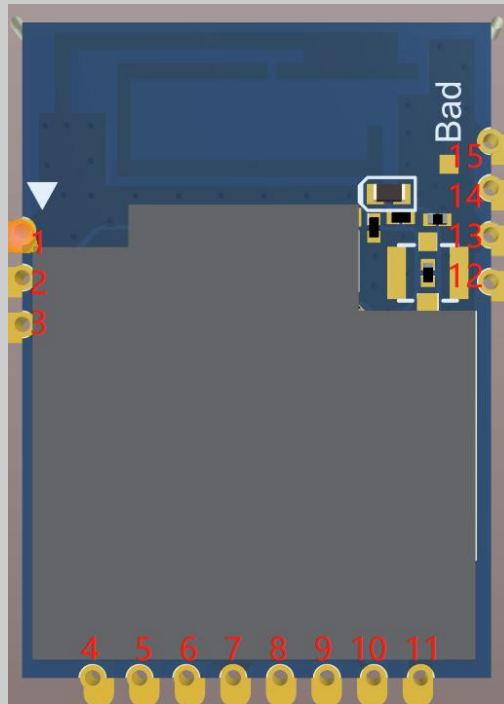
配置
Ver. A0



1. 板内顶层器件最高1.8mm, 底层无器件;
2. 模组外形尺寸公差为 $\pm 0.15\text{mm}$, 板厚以及未标注公差为 $\pm 0.1\text{mm}$;
3. 条纹区为的天线净空区

- 1.板内顶层器件最高 1.8mm,底层无器件;
- 2.模组外形尺寸公差为 $\pm 0.15\text{mm}$,板厚以及未标注公差为 $\pm 0.1\text{mm}$;
- 3.斜条纹为天线净空区。

5. Pin Definition (引脚定义)



模组正视图

PIN	SYMBOL	DESCRIPTION	Voltage
1	GND	Connected to Ground \ 接地	
2	NC	NC	
3	GND	Connected to Ground \ 接地	
4	RESET	复位引脚, 低电平有效	
5	WIFI_WAKE	WL_WAKE_HOST	
6	BT_WAKE	BT_WAKE_HOST	
7	GND	Connected to Ground \ 接地	
8	DM	USB_DM_OUT\USB 2.0 DM 引脚	
9	DP	USB_DP_OUT\USB 2.0 DP 引脚	
10	GND	Connected to Ground \ 接地	
11	VCC	3.3V 电源	
12	NC	NC	
13	GND	Connected to Ground \ 接地	
14	NC	NC	
15	GND	Connected to Ground \ 接地	

6. Product Pictures（实物图片）

正视图（top view）



背视图（bottom view）

本产品的型号核准代码标识在产品后标牌上。

丝印说明：

- （1）红色方框内的字符为产品 PCB 型号；
- （2）黄色方框内的字符为产品周期号；
- （3）其他为非关键字符，无须管控。

7. Key Materials (关键物料)

序号	关键件名称	型号	规格/材料	备注
1	集成电路	ATBM6032-X	28-QFN	
2	PCB	SKI.W032.8X	FR-4,2LAY	
3	晶体振荡器	2.3.3.240001234	24MHz	

8. General Requirements (一般要求)

No.	Feature	Description
8-1	Operation Voltage 工作电压范围	3.3V+/-0.3
8-2	Current Consumption 最大电流	400mA
8-3	Ripple 纹波*	≤120mV
8-4	Operation Temperature 工作温度范围	0°C to +40°C
8-5	Antenna Type 天线类型	PCB antenna
8-6	USB	High Speed USB 2.0 Interface
8-7	Storage Temperature 存储温度	-40°C to +85°C

*纹波：定义是主板给模组供电处的纹波要求

9. Electrical Characteristics (电气特性)

除非另有说明，电气规范试验都在下列条件下进行：

环境条件温度：25℃±5℃；

电源电压：模块输入电压 3.3V+/-0.3；

The Test for electrical specification was performed under the following condition unless otherwise specified:

Ambient condition Temperature :25℃ ± 5℃；

Power supply voltages: 3.3V+/-0.3 input power at the Module;

9.1 IEEE 802.11b Section(2.4GHz)

Items	Contents				
Specification	IEEE802.11b				
Mode	CCK				
Channel	CH1 to CH13				
Data rate	1, 2, 5.5, 11Mbps				
TX Characteristics	Min.	Typ.	Max.	Unit	Remark
1. Power Levels(Calibrated)					
1) For antenna port (CCK 11M)	15	17	19	dBm	
2. Spectrum Mask @ target power					
1) fc +/-11MHz to +/-22MHz	-	-	-30	dB	
2) fc > +/-22MHz	-	-	-50	dB	
3 Constellation Error(EVM)@ target power					
1) 1Mbps	-	-	-10	dB	
2) 2Mbps	-	-	-10	dB	
3) 5.5Mbps	-	-	-10	dB	
4) 11Mbps	-	-	-10	dB	
4. Frequency Error	-25	-	25	ppm	
RX Characteristics	Min.	Typ.	Max.	Unit	
5 Minimum Input Level Sensitivity (each chain)					
1) 1Mbps (FER ≤8%)	-	-	-83	dBm	
2) 2Mbps (FER ≤8%)	-	-	-80	dBm	
3) 5.5Mbps (FER ≤8%)	-	-	-79	dBm	
4) 11Mbps (FER ≤8%)	-	-	-76	dBm	
6 Maximum Input Level (FER ≤8%)	-10	-	-	dBm	

9.2 IEEE 802.11g Section(2.4GHz)

Items	Contents				
Specification	IEEE802.11g				
Mode	OFDM				
Channel	CH1 to CH13				
Data rate	6, 9, 12, 18, 24, 36, 48, 54Mbps				
TX Characteristics	Min.	Typ.	Max.	Unit	Remark
1. Power Levels					
1) For antenna port (54M)	13	15	17	dBm	
2. Spectrum Mask @ target power					
1) at fc +/-11MHz	-	-	-20	dB	
2) at fc +/-20MHz	-	-	-28	dB	
3) at fc > +/-30MHz	-	-	-40	dB	
3 Constellation Error(EVM)@ target power					
1) 6Mbps	-	-	-5	dB	
2) 9Mbps	-	-	-8	dB	
3) 12Mbps	-	-	-10	dB	
4) 18Mbps	-	-	-13	dB	
5) 24Mbps	-	-	-16	dB	
6) 36Mbps	-	-	-19	dB	
7) 48Mbps	-	-	-22	dB	
8) 54Mbps	-	-	-25	dB	
4 Frequency Error	-25	-	25	ppm	
RX Characteristics	Min.	Typ.	Max.	Unit	
5 Minimum Input Level Sensitivity (each chain)					
1) 6Mbps (PER ≤ 10%)	-	-	-85	dBm	
2) 9Mbps (PER ≤ 10%)	-	-	-84	dBm	
3) 12Mbps (PER ≤ 10%)	-	-	-82	dBm	
4) 18Mbps (PER ≤ 10%)	-	-	-80	dBm	
5) 24Mbps (PER ≤ 10%)	-	-	-77	dBm	
6) 36Mbps (PER ≤ 10%)	-	-	-73	dBm	
7) 48Mbps (PER ≤ 10%)	-	-	-69	dBm	
8) 54Mbps (PER ≤ 10%)	-	-	-65	dBm	
6 Maximum Input Level (PER ≤ 10%)	-20	-	-	dBm	

9.3 IEEE 802.11n HT20 Section(2.4GHz)

Items	Contents				
Specification	IEEE802.11n HT20 @ 2.4GHz				
Mode	OFDM				
Channel	CH1 to CH13				
Data rate (MCS index)	MCS0/1/2/3/4/5/6/7				
TX Characteristics	Min.	Typ.	Max.	Unit	
1. Power Levels					
1) For antenna port (MCS7)	12	14	16	dBm	
2. Spectrum Mask @ target power					
1) at fc +/-11MHz	-	-	-20	dBm	
2) at fc +/-20MHz	-	-	-28	dBm	
3) at fc > +/-30MHz	-	-	-45	dBm	
3. Constellation Error(EVM)@ target power					
1) MCS0	-	-	-5	dB	
2) MCS1	-	-	-10	dB	
3) MCS2	-	-	-13	dB	
4) MCS3	-	-	-16	dB	
5) MCS4	-	-	-19	dB	
6) MCS5	-	-	-22	dB	
7) MCS6	-	-	-25	dB	
8) MCS7	-	-	-28	dB	
4. Frequency Error	-25	-	25	ppm	
RX Characteristics	Min.	Typ.	Max.	Unit	
5. Minimum Input Level Sensitivity (each chain)					
1) MCS0 (PER ≤ 10%)	-	-	-82	dBm	
2) MCS1 (PER ≤ 10%)	-	-	-79	dBm	
3) MCS2 (PER ≤ 10%)	-	-	-77	dBm	
4) MCS3 (PER ≤ 10%)	-	-	-74	dBm	
5) MCS4 (PER ≤ 10%)	-	-	-70	dBm	
6) MCS5 (PER ≤ 10%)	-	-	-66	dBm	
7) MCS6 (PER ≤ 10%)	-	-	-65	dBm	
8) MCS7 (PER ≤ 10%)	-	-	-64	dBm	
7. Maximum Input Level (PER ≤ 10%)	-20	-	-	dBm	

9.4 IEEE 802.11n HT40 Section(2.4GHz)

Items	Contents				
Specification	IEEE802.11n HT40 @ 2.4GHz				
Mode	OFDM				
Channel	CH3 to CH11				
Data rate (MCS index)	MCS0/1/2/3/4/5/6/7				
TX Characteristics	Min.	Typ.	Max.	Unit	
1. Power Levels (Calibrated)					
1) For antenna port (MCS7)	11	13	15	dBm	
2. Spectrum Mask @target power					
1) at fc +/-22MHz	-	-	-20	dBm	
2) at fc +/-40MHz	-	-	-28	dBm	
3) at fc > +/-60MHz	-	-	-45	dBm	
3. Constellation Error(EVM)@ target power					
1) MCS0	-	-	-5	dB	
2) MCS1	-	-	-10	dB	
3) MCS2	-	-	-13	dB	
4) MCS3	-	-	-16	dB	
5) MCS4	-	-	-19	dB	
6) MCS5	-	-	-22	dB	
7) MCS6	-	-	-25	dB	
8) MCS7	-	-	-28	dB	
4. Frequency Error	-25	-	25	ppm	
RX Characteristics	Min.	Typ.	Max.	Unit	
5. Minimum Input Level Sensitivity (each chain)					
1) MCS0 (PER ≤ 10%)	-	-	-79	dBm	
2) MCS1 (PER ≤ 10%)	-	-	-76	dBm	
3) MCS2 (PER ≤ 10%)	-	-	-74	dBm	
4) MCS3 (PER ≤ 10%)	-	-	-71	dBm	
5) MCS4 (PER ≤ 10%)	-	-	-67	dBm	
6) MCS5 (PER ≤ 10%)	-	-	-63	dBm	
7) MCS6 (PER ≤ 10%)	-	-	-62	dBm	
8) MCS7 (PER ≤ 10%)	-	-	-61	dBm	
6. Maximum Input Level (PER ≤ 10%)	-20	-	-	dBm	

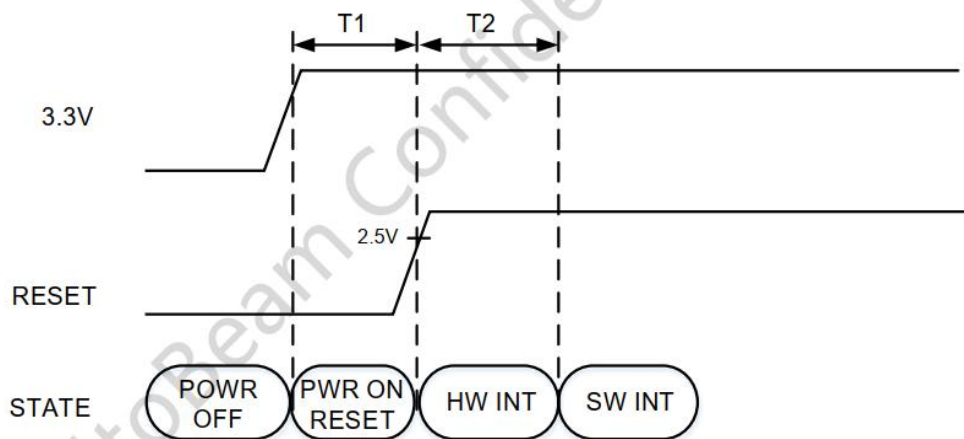
9.5 Bluetooth Section(BLE)(仅 6032-X 支持)

Items	Contents				
Specification	BLE				
Number of Channel	0~39 Channels				
Frequency Band	2400-2483.5MHz				
	Min.	Typ.	Max.	Unit	Remark
1. Output Power(1M/2M)	-	6	15	dBm	
2. Gain step	-	1.0	-	dB	
3.Receiver Sensitivity					
1).1Mbps	-	-96	-	dBm	
2).2Mbps	-	-93	-	dBm	
3).Coded-PHY, S=2	-	-98	-	dBm	
4).Coded-PHY, S=8	-	-102	-	dBm	
4.C/I Co-channel selectivity (PER<30.8%)	-	5.8	-		
5.C/I Adjacent channel selectivity					
1).C/I F0-1MHz(PER<30.8%)	-	-5.7	-	dB	
2).C/I F0+1MHz(PER<30.8%)	-	-12.6	-	dB	
3).C/I F0-2MHz(PER<30.8%)	-	-27	-	dB	
4).C/I F0+2MHz(PER<30.8%)	-	-21.5	-	dB	
5).C/I F0-3MHz(PER<30.8%)	-	-28	-	dB	
6).C/I F0+3MHz(PER<30.8%)	-	-28	-	dB	
6.C/I Image channel selectivity(PER<30.8%)	-	-30	-	dB	
7.C/I Image 1MHz adjacent to image channel selectivity (PER<30.8%)	-	-27	-	dB	
8.Carrier Frequency Offset and Drift					
1).Frequency drift	-	1.4	-	kHz	
2).Max. drift rate	-	1.3	-	kHz/50us	
9.Modulation Characteristics					
1).delta_f1avg	-	251.6	-	kHz	
2).delta_f2avg/delta_f1avg	-	0.92	-	Hz/Hz	
10.In-band Spurious Emission					
1).+-2M offset	-	-56	-	dBm	
2).>+-3M offset	-	-57	-	dBm	

10. Reference Design（参考设计）

10.1 Timing specification（时序规范）

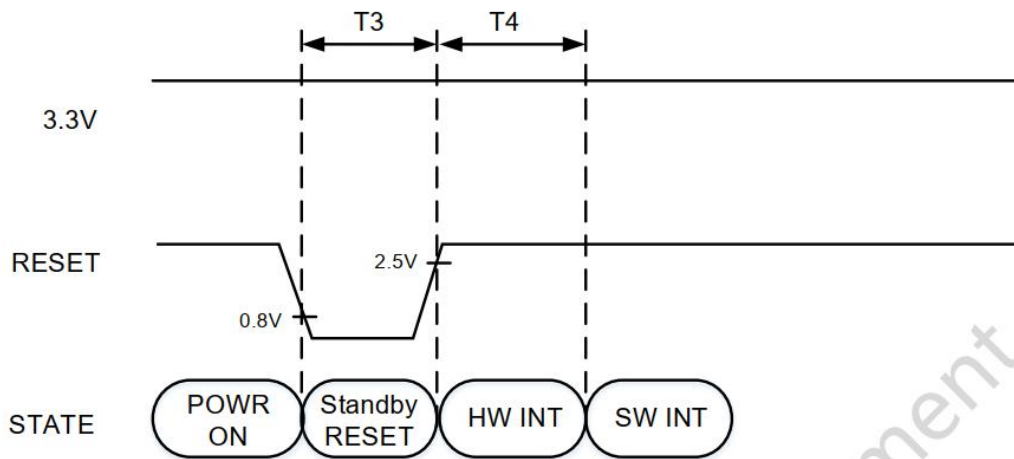
推荐的上电时序如图



上电时序要求

参数	描述	最小值	典型值	最大值	单位
T1	上电稳定时间	1			ms
T2	等待硬件唤醒时间		10		ms

推荐的待机/唤醒时序如图



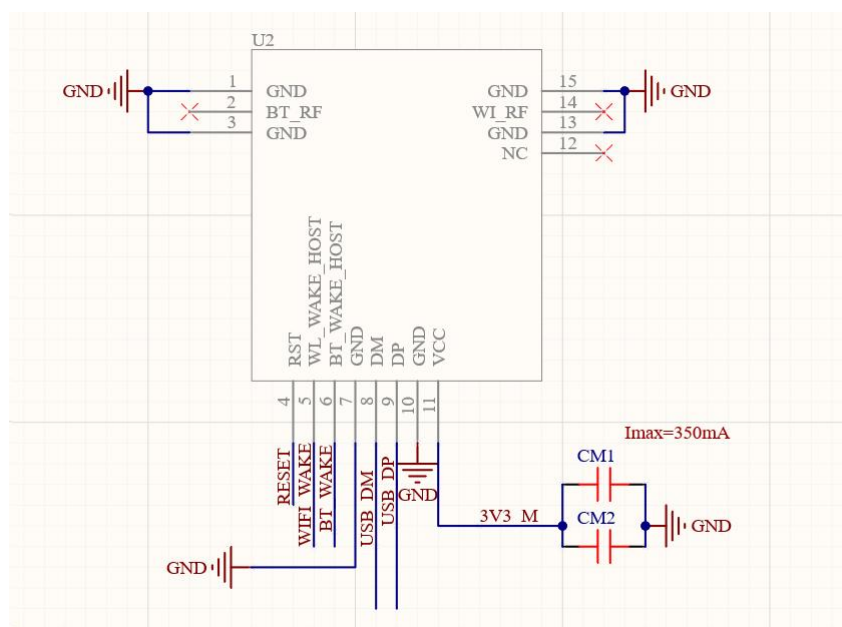
待机/唤醒时序图

参数	描述	最小值	典型值	最大值	单位
T3	硬件复位有效周期	1			ms
T4	等待硬件唤醒时间		10		ms

10.2 DC Electrical Characteristics (直流电气特性)

Symbol	Description	conditions	Min.	Typ.	Max.	Unit
VDD33	Power supplies	-	3	3.3	3.6	V
VDDIO	I/O input power supplies	-	3.0	3.3	3.6	V
I _{VDDIO}	I/O supply current	-	-	-	9.6	mA
V _{IH}	High-level input voltage	-	2.0	-	3.6	V
V _{IL}	Low-level input voltage	-	-0.3	-	0.8	V
V _{OH}	High-level output voltage	-	2.4	-	-	V
V _{OL}	Low-level output voltage	-	-	-	0.4	V

10.3 Reference schematic (参考原理图)



参考原理图

注意事项:

3.3V 网络前端建议预留滤波电容焊盘。

11. Package（包装）

- 1) 编带图纸
- 2) 编带方向
- 3) 外箱示意图
- 4) 包装数量

12. Storage and Production（存储、生产）

12.1 Storage requirements（存储要求）

本产品的湿敏特性为 4 级（MSL4），出厂时以真空密封袋包装。产品搬运、存储、加工过程必须遵循 IPC/JEDEC J-STD-033。在环境温度低于 40 摄氏度，空气湿度小于 90%的情况下，真空包装下产品可存放 12 个月。在产品存放有效期内，如发现真空包装有漏气、湿敏卡变色达到烘烤标准、开封暴露时间超过 72H，需要烘烤后使用。

12.2 Production parameters（生产参数）

炉温最高不能超过 250℃，推荐是 240℃。

推荐 SMT 焊炉温曲线如下图所示。

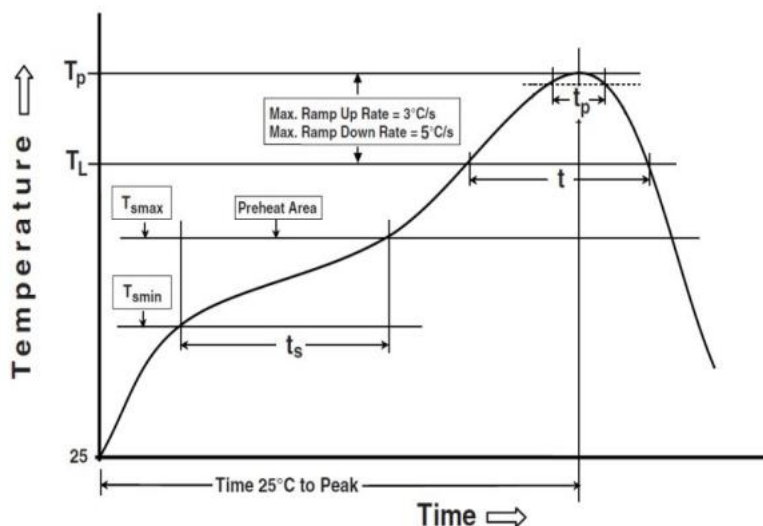


图 6-1 炉温曲线推荐图（ $T_p=245^{\circ}\text{C}$ ， $T_L=220^{\circ}\text{C}$ ）

表 16-2 炉温曲线参数

炉温参数	最小值	典型值	最大值	单位
预热区最低温度 T_{smin}	150			℃
预热区最高温度 T_{smax}			200	℃
预热上升时间 t_s	80		120	s
回流焊区升温速率(T_L 到 T_p)			3	℃/s
回流焊区低温 T_L		220		℃
回流焊区峰值温度 T_p	235	240	250	℃
回流焊峰值温度时间 t_p (T_p 波动 5℃ 范围)			30	s
回流焊区冷却降温速率（ T_p 到 T_L ）	-5	-3	-1	℃/s
回流时间 t	40		60	s

FCC Statement:

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.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

List of applicable FCC rules

This module has been tested and found to comply with [part 15, part 2, FCC part 15.247](#) requirements for Modular Approval.

Antenna Placement Within the Host Platform

The module is tested for standalone mobile RF exposure use condition.

(1) The antenna must be installed such that 20 cm is maintained between the antenna and users,

(2) The transmitter module may not be co-located with any other transmitter or antenna.

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

The module complies with FCC Part 15.247 and apply for Single module approval.

Trace antenna designs: Not applicable.

Any deviation(s) from the defined parameters of the antenna trace, as described by the instructions, require that the host product manufacturer must notify the module grantee that they wish to change the antenna trace design. In this case, a Class II permissive change application is required to be filed by the grantee, or the host manufacturer can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application.

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.

Antenna Type and Gain

The following antennas have been certified for use with this module.

Only antennas of the same type with equal or lower gain may also be used with this module. Other types of antennas and/or higher gain antennas may require the additional authorization for operation.

Antenna Specification list below:

Antenna Type	Frequency Bands	Max. Antenna Gain (dBi)	Impedance(Ω)
PCB Antenna (BT)	2.4GHz	0.23	$50 \pm 10\%$
PCB Antenna (WiFi)	2.4GHz	0.23	$50 \pm 10\%$

End Product Labeling

When the module is installed in the host device, the FCC ID label must be visible through a window on the final device or it must be visible when an access panel, door or cover is easily re-moved. If not, a second label must be placed on the outside of the final device that contains the following text: "Contains FCC ID: 2AWY6-EAT6032XCT". The FCC ID can be used only when all FCC compliance requirements are met.

The end product shall bear the following 15.19 statement: 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.

Information on test modes and additional testing requirements

This transmitter is tested in a standalone mobile RF exposure condition and any co-located or simultaneous transmission with other transmitter(s) class II permissive change re-evaluation or new certification.

Part 15 Subpart B disclaimer

This transmitter module is tested as a subsystem and its certification does not cover the FCC

Part 15 Subpart B rule requirement applicable to the final host. The final host will still need to be reassessed for compliance to this portion of rule requirements if applicable.

As long as all conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

Note EMI Considerations

Note that a host manufacture is recommended to use D04 Module Integration Guide recommending as "best practice" RF design engineering testing and evaluation in case non-linear interactions generate additional non-compliant limits due to module placement to host components or properties

For standalone mode, reference the guidance in D04 Module Integration Guide and for simultaneous mode; see D02 Module Q&A Question 12, which permits the host manufacturer to confirm compliance.

How to make changes

Since . only Grantees are permitted to make permissive changes, it is recommended that module manufactures provide contact information and some guidance to host providers in the integration instructions if they expect their module will be used differently than granted.

Important Note

In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for reevaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

Manual Information to the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The host integrator must follow the integration instructions provided in this document and ensure that the composite-system end product complies with the requirements by a technical assessment or evaluation to the rules and to KDB Publication 996369.

The host integrator installing this module into their product must ensure that the final composite product complies with the requirements by a technical assessment or evaluation to the rules, including the transmitter operation and should refer to guidance in KDB 996369.

OEM/Host manufacturer responsibilities

OEM/Host manufacturers are ultimately responsible for the compliance of the Host and Module. The final product must be reassessed against all the essential requirements of the

FCC rule such as FCC Part 15 Subpart B before it can be placed on the US market. This includes reassessing the transmitter module for compliance with the Radio and EMF essential requirements of the FCC rules. This module must not be incorporated into any other device or system without retesting for compliance as multi-radio and combined equipment

According to country code, channel 12 and 13 would be disabled in North America.

ISED Statement:

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de classe B est conforme à la norme canadienne ICES-003.

This device complies with Innovation, Science and Economic Development Canada's 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 Radiation Exposure Statement

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

Déclaration d'exposition aux radiations

Cet appareil est conforme aux limites d'exposition aux rayonnements définies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé à une distance minimale de 20 centimètres entre le radiateur et votre corps.

IMPORTANT NOTE

In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the Canada authorization is no longer considered valid and the IC can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate Canada authorization.

NOTE IMPORTANTE

Dans le cas où ces conditions ne peuvent être satisfaites (par exemple pour certaines configurations d'ordinateur portable ou de certaines co-localisation avec un autre émetteur), l'autorisation du Canada n'est plus considérée comme valide et IC ne peut pas être utilisé sur le produit final. Dans ces circonstances, l'intégrateur OEM sera chargé de réévaluer le produit

final (y compris l'émetteur) et l'obtention d'une autorisation distincte au Canada.

Required end product labeling

This transmitter module is authorized only for use in device where the antenna may be installed and operated with greater than 20cm between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains IC: [26332-EAT6032XCT](#)".

Plaque signalétique du produit final

Ce module émetteur est autorisé uniquement pour une utilisation dans un appareil où l'antenne peut être installée et utilisée à plus de 20 cm entre l'antenne et les utilisateurs. Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: "[Contient des IC: 26332-EAT6032XCT](#)".

Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

The following text, or an equivalent notice, that shall be displayed in a conspicuous location, either in the user manual or on the device, or both:

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- 1) This device may not cause interference.
- 2) This device must accept any interference, including interference that may cause undesired operation of the device.

Manuel d'information à l'utilisateur final

L'intégrateur OEM doit être conscient de ne pas fournir des informations à l'utilisateur final quant à la façon d'installer ou de supprimer ce module RF dans le manuel de l'utilisateur du produit final qui intègre ce module.

Le manuel de l'utilisateur final doit inclure toutes les informations réglementaires requises et avertissements comme indiqué dans ce manuel.

l'énoncé qui suit, ou l'équivalent, à un endroit bien en vue dans le manuel d'utilisation ou sur l'appareil, ou encore aux deux endroits :

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique 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;*
2. *L'appareil doit accepter toute interférence, y compris toute interférence pouvant*

entraîner un fonctionnement indésirable du dispositif.

Antennas

The following antennas have been certified for use with this module; antennas of the same type with equal or lower gain may also be used with this module. The antenna must be installed such that 20 cm can be maintained between the antenna and users.

This radio transmitter [[26332-EAT6032XCT](#)] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. 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.

Antenna Specification list below:

Antenna Type	Frequency Bands	Max. Antenna Gain (dBi)	Impedance(Ω)
PCB Antenna (BT)	2.4GHz	0.23	50±10%
PCB Antenna (WiFi)	2.4GHz	0.23	50±10%

ANTENNE

Les antennes suivantes ont été certifiées pour une utilisation avec ce module; des antennes du même type à gain égal ou inférieur peuvent également être utilisées avec ce module. L'antenne doit être installée de telle sorte que 20 cm puissent être maintenus entre l'antenne et les utilisateurs.

Cet émetteur radio a été approuvé par Innovation, Sciences et Développement économique Canada pour fonctionner avec les types d'antenne énumérés ci-dessous, avec le gain maximal autorisé indiqué. Les types d'antenne non inclus dans cette liste qui ont un gain supérieur au gain maximum indiqué pour tout type répertorié sont strictement interdits pour l'utilisation avec cet appareil.