High Flying Electronics Technology MYK2011_100 Low Power Wi-Fi Module User Manual

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MYK2011_100
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V 1.9

Overview of Characteristic

- Support IEEE802.11b/g/n Wireless Standards
- Based on Self-developed High-Cost Effective MCU
- Ultra-Low-Power for Battery Applications with Excellent Power Save Scheme
- Support UART/SPI/PWM/GPIO Data Communication Interface
- Support Work As STA/AP/AP+STA Mode
- Support Smart Link Function (APP program provide)
- Support Wireless and Remote Firmware Upgrade Function
- Support WPS Function
- Support Multi-TCP Link (5 Channel) Application
- Support External(I-PEX) Antenna Option
- Single +3.3V Power Supply
- Smallest Size: 23.1mm x 32.8mm x (3.45±0.3)mm

- FCC/CE/TELEC Certificated

Contents

PRODUCT OVERVIEW

1.1. General Description

TheMYK2011_100 is a fully self-contained small form-factor, single-stream, 802.11b/g/n Wi-Fi module, which provides a wireless interface to any equipment with a Serial/SPI interface for data transfer.MYK2011_100 integrates MAC, baseband processor, RF transceiver with a power amplifier in hardware and all Wi-Fi protocol and configuration functionality and networking stack, in embedded firmware to make a fully self-contained 802.11b/g/n Wi-Fi solution for a variety of applications.

TheMYK2011_100 employs the world's lowest power consumption embedded architecture. It has been optimized for all kinds of client applications in the home automation, smart grid, handheld device, personal medical application, and industrial control that have lower data rates, and transmit or receive data on an infrequent basis.

TheMYK2011_100 integrates all Wi-Fi functionality into a low-profile, 23.1×32.8x 2.7mm SMT module package that can be easily mounted on the main PCB with application-specific circuits. Also, the module provides built-in antenna, external antenna option.

1.1.1 Device Features

- Single stream Wi-Fi @ 2.4 GHz with support for WEP security mode as well as WPA/WPA2
- Based on Self-developed High-Cost Performance MCU
- Ultra-low-power operation with all kinds of power-save modes.
- Includes all the protocol and configuration functions for Wi-Fi connectivity.
- Support STA/AP/AP+STA Mode
- Support Smart Link Function
- Support Wireless and Remote Firmware Upgrade Function
- Support Max 8 Channel PWM/GPIO Output
- Integrated pcb antenna, antenna connector options.
- Compact surface-mount module 23.1mm x 32.8mm x (3.45±0.3)mm.
- Full IPv4 stack.
- Low power RTOS and drivers.
- CE/FCC/TELEC Certified.
- RoHS compliant.
- Single supply – 3.3V operation.

1.1.2 Device Paremeters

Table 1 MYK2011_100 Module Technical Specifications

Class	Item	Parameters
Wireless Parameters	Certification	TBD
	Wireless standard	802.11 b/g/n
	Frequency range	2.412GHz-2.462GHz
	Transmit Power	802.11b: +16 +/-2dBm (@11Mbps)
		802.11g: +14 +/-2dBm (@54Mbps)
		802.11n: +13 +/-2dBm (@HT20 , MCS7) 802.11n: +13 +/-2dBm (@HT40 , MCS7)
	Receiver Sensitivity	802.11b: -93 dBm (@11Mbps ,CCK)
		802.11g: -85 dBm (@54Mbps, OFDM)
		802.11n: -82 dBm (@HT20, MCS7) 802.11n: -82 dBm (@HT40, MCS7)
	Antenna Option	External:I-PEX Connector
	Data Interface	UART
		SPI, PWM, GPIO

Hardware Parameters	Operating Voltage	2.8~3.6V
	Operating Current	Peak [Continuous TX]: ~300mA Normal [WiFi ON/OFF, DTIM=100ms]: Average. ~12mA, Peak: 300mA
	Operating Temp.	-40℃- 85℃
	Storage Temp.	-45℃- 125℃
	Dimensions and Size	23.1mm×32.8mm×(3.45±0.3)mm
Software Parameters	Network Type	STA /AP/STA+AP
	Security Mechanisms	WEP/WPA-PSK/WPA2-PSK
	Encryption	WEP64/WEP128/TKIP/AES
	Update Firmware	Local Wireless, Remote
	Customization	Web Page Upgrade Support SDK for application develop
	Network Protocol	IPv4, TCP/UDP/HTTP
	User Configuration	AT+instruction set. Android/ iOS Smart Link APP tools

1.1.3 Key Application

- Remote equipment monitoring
- Asset tracking and telemetry
- Security
- Industrial sensors and controls
- Home automation
- Medical devices

1.2. Hardware Introduction

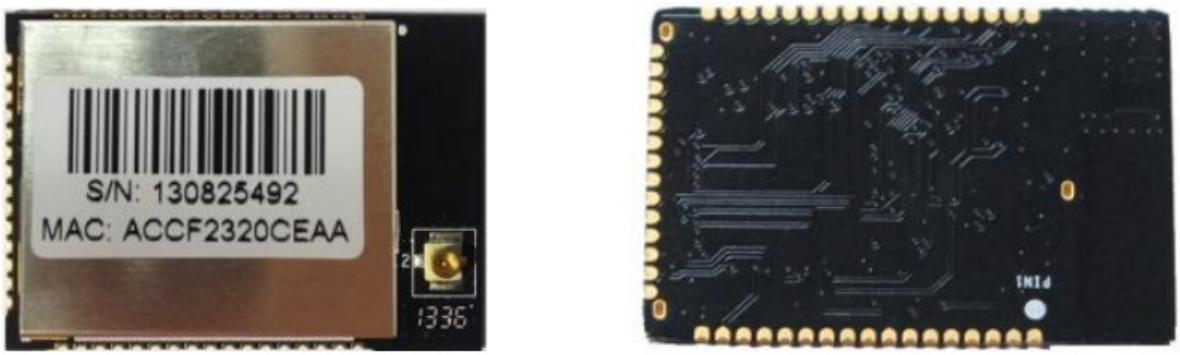

Figure 1. MYK2011_100 View

1.2.1. Pins Definition

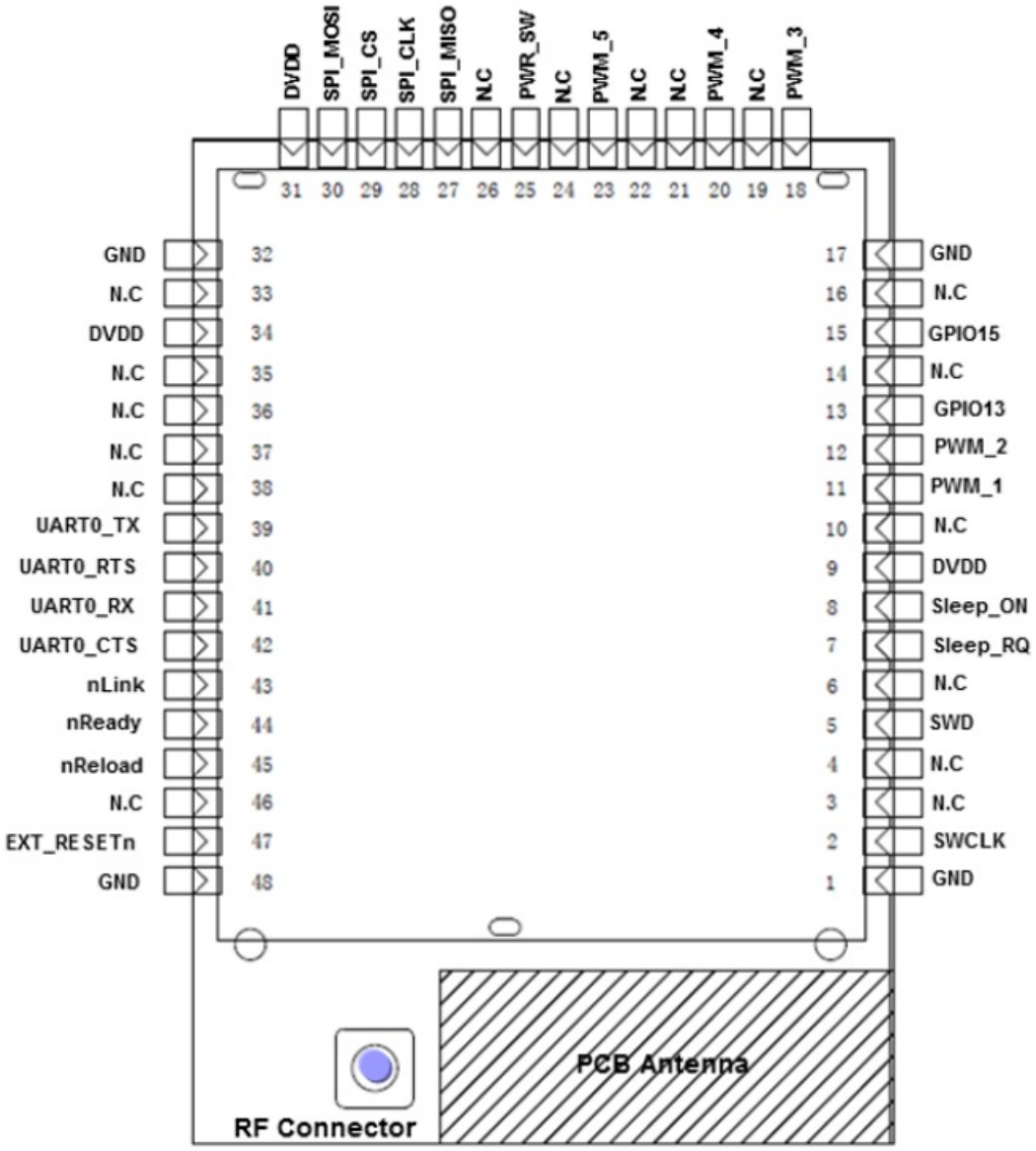

Figure 2. MYK2011_100 Pins Map

Table 2 MYK2011_100 Pins Definition

Pin	Describtion	Net Name	Signal Type	Comments
1,17,32,48	Ground	GND	Power	
2	Debug Pin	SWCLK	I, PD	Debug functional pin,

Pin	Describtion	Net Name	Signal Type	Comments
3		NC		

4		NC		No connect if not use.
5	Debug Pin	SWD	I/O,PU	
6		N.C		No connect
7	GPIO/AD	Sleep_RQ	I.PU	GPIO7, No connect if not use.
8	GPIO/AD	Sleep_ON	O	GPIO8, No connect if not use.
9	+3.3V Power	DVDD	Power	
10		N.C		No connect
11	PWM/GPIO/AD	PWM_1	I/O	GPIO11, No connect if not use.
12	PWM/GPIO/AD	PWM_2	I/O	GPIO12, No connect if not use.
13	GPIO	GPIO13	I/O	GPIO13, No connect if not use.
14		N.C		No connect
15	WPS/GPIO	GPIO15	I/O	GPIO15, WPS Function Pin.
16		N.C		No connect
18	PWM/GPIO	PWM_3	I/O	GPIO18, No connect if not use.
19		N.C		No connect
20	PWM/GPIO	PWM_4	I/O	GPIO20, No connect if not use.

21		N.C		No connect
22		N.C		No connect
23	PWM/GPIO/AD	PWM_5	I/O	GPIO23, No connect if not use.
24		N.C		No connect
25	Power Control Switch	PWR_SW	I,PU	Leave it no connect
26		N.C		No connect
27	SPI Interface/AD/PWM	SPI_MISO	I	GPIO27, No connect if not use.
28	SPI Interface/PWM	SPI_CLK	I/O	GPIO28, No connect if not use.
29	SPI Interface/AD	SPI_CS	I/O	GPIO29, No connect if not use.
30	SPI Interface/PWM	SPI_MOSI	O	GPIO30, No connect if not use.
31	+3.3V Power	DVDD	Power	
33		N.C		No connect
34	+3.3 Power	DVDD	Power	
35		N.C		No connect
36		N.C		No connect
37		N.C		No connect

38		N.C		No connect
39	UART0	UART0_TX	O	GPIO39, No connect if not use.
40	UART0	UART0_RTS	I/O	GPIO40, No connect if not use.
41	UART0	UART0_RX	I	GPIO41, No connect if not use.
42	UART0	UART0_CTS	I/O	GPIO42, No connect if not use.
43	Wi-Fi Status	nLink	O	**Detailed functions see <Notes>**
44	Module Boot Up Indicator	nReady	O	“0” – Boot-up OK; “1” – Boot-up No OK;

Pin	**Describtion**	**Net Name**	**Signal Type**	**Comments**
				No connect if not use.;
45	Multi-Function	nReload	I,PU	**Detailed functions see <Notes>**
46		N.C		No connect
47	Module Reset	EXT_RESETn	I,PU	“Low” effective reset input.

<Notes>
nReload Pin (Button) function

1. When this pin is set to “low” during module boot up, the module will enter wireless firmware and config upgrade mode. This mode is used for customer manufacture.
   (See Appendix D to download software tools for customer batch configuration and upgrade firmware during mass production)
2. After a module is powered up, short press this button (“Low” < = 2s) to make the module go into “Smart Link “ config mode, waiting for APP to set the password and other information. (See Appendix D to download SmartLink APP)
3. After a module is powered up, long press this button (“Low” >= 4s) to make the module recover to the factory setting.

High-Flying strongly suggests customers fan out this pin to connector or button for “Manufacture” and “ Smart Link” application.
nLink Pin (LED) function

1. At wireless firmware and config upgrade mode, this LED is used to indicate configure and upgrade status.
2. At “Smart Link “ config mode, this LED is used to indicate APP to finish setting.
3. At normal mode, it’s Wi-Fi link status indicator

   High-Flying strongly suggests customer fan out this pin to LED.

1.2.2. Electrical Characteristics

Absolute Maximum Ratings:

Parameter	**Condition**	**Min.**	**Typ.**	**Max.**	**Unit**
Storage temperature range		-45		125	°C
Maximum soldering temperature	IPC/JEDEC J-STD-020			260	°C
Supply voltage		0		3.8	V
Voltage on any I/O pin		0		3.3	V
ESD (Human Body Model HBM)	TAMB=25°C			2	KV
ESD (Charged Device Model, CDM)	TAMB=25°C			1	KV

Power Supply & Power Consumption:

Parameter	**Condition**	**Min.**	**Typ.**	**Max.**	**Unit**
Operating Supply voltage		2.8	3.3	3.8	V
Supply current, peak	Continuous Tx		300		mA

Supply current, IEEE PS	DTIM=100ms		12		mA
Output high voltage	Sourcing 6mA	2.8			V
Output low voltage	Sinking 6mA			0.2	V
Input high voltage		2.2			V
Input low voltage				0.8	V
GPIO Input pull-up resistor			200		kΩ
GPIO Input pull-down resistor			200		kΩ

1.2.3. Mechanical Size
MYK2011_100 modules physical size Unit: mm as follows:

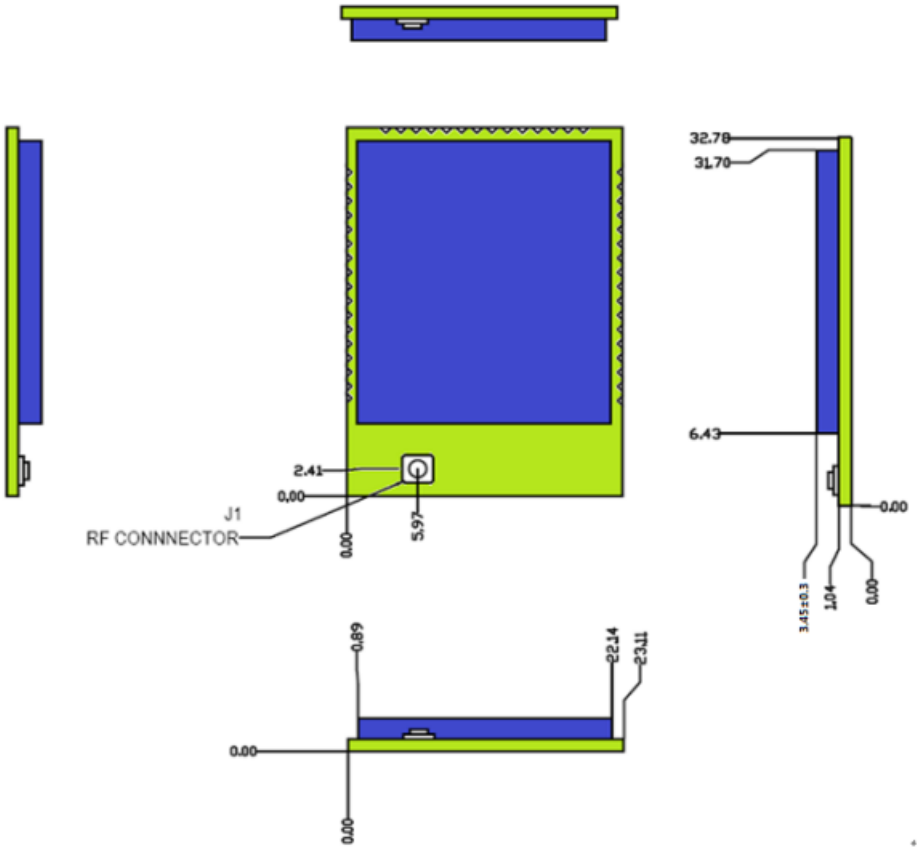

Figure 3. MYK2011_100 Mechanical Dimension

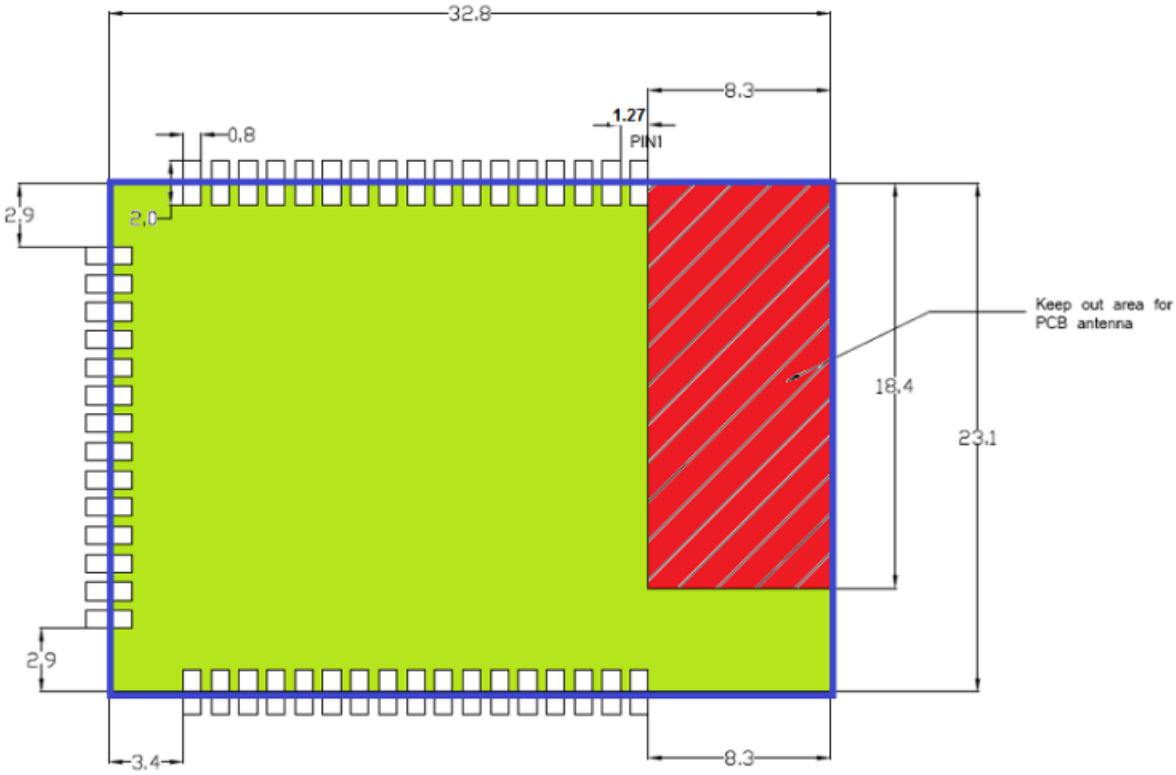

Figure 4. MYK2011_100 PCB Symbol Size

1.2.4. External Antenna

MYK2011_100 module supports external antenna(I-PEX or SMA) option for user dedicated application. If the user selects an external antenna, MYK2011_100 modules must be connected to the 2.4G antenna according to IEEE 802.11b/g/n standards.

The antenna parameters required are as follows:
Table 3 MYK2011_100 External Antenna Parameters

Item	Parameters
Frequency range	2.4~2.5GHz
Impedance	50 Ohm
VSWR	2 (Max)
Return Loss	-10dB (Max)
Connector Type	I-PEX or populate directly

PACKAGE INFORMATION

2.1. Recommended Reflow Profile

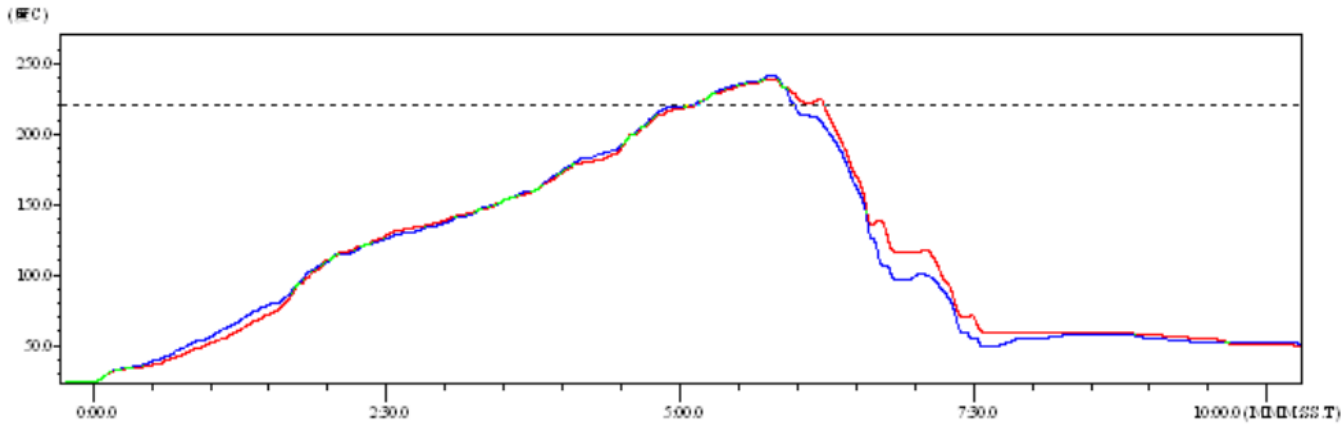

Figure 5. Reflow Soldering Profile

Table 11 Reflow Soldering Parameter
Note: 1. Recommend to supply N2 for the reflow oven.
2. N2 atmosphere during reflow (O2<300ppm)
2.2. Device Handling Instruction (Module IC SMT Preparation)

1. Shelf life in sealed bag: 12 months, at <30°C and <60% relative humidity (RH)
2. After the bag is opened, devices that will be re-baked required after last baked with window time 168 hours.
3. Recommend to oven bake with N2 supplied
4. Recommend end to reflow oven with N2 supplied
5. Baked required with 24 hours at 125+-5°C before rework process
6. Recommend to store at ≦ 10% RH with vacuum packing
7. If SMT process needs twice reflow:
   (1) Top side SMT and reflow
   (2) Bottom side SMT and reflow
   Case 1: Wifi module mounted on top side. Need to bake when bottom side process over 168 hours window time, no need to bake within 168 hours
   Case 2: Wifi module mounted on the bottom side, follow normal bake rule before the process

Note: Window time means from last bake end to next reflow start that has 168 hours space.

2.3. Shipping Information

TAPE

Size: 340*340*70 mm

BOX

Size: 340*340*350 mm (inside)

Figure 6. Shipping Information

Note:
1 tape = 500pcs
1 box = 5 tapes = 5 * 500 pcs = 2500pcs

OEM/INTEGRATORS INSTALLATION

MANUAL
Important Notice to OEM integrators

1. This module is limited to OEM installation ONLY.
2. This module is limited to installation in mobile or fixed applications, according to Part 2.1091(b).
3. The separate approval is required for all other operating configurations, including portable configurations with respect to Part 2.1093 and different antenna configurations
4. For FCC Part 15.31 (h) and (k): The host manufacturer is responsible for additional testing to verify compliance as a composite system. When testing the host device for compliance with Part 15 Subpart B, the host manufacturer is required to show compliance with Part 15 Subpart B while the transmitter module(s) are installed and operating. The modules should be transmitted and the evaluation should confirm that the module's intentional emissions are compliant (i.e. fundamental and out of band emissions). The host manufacturer must verify that there are no additional unintentional emissions other than what is permitted in Part 15 Subpart B or emissions are compliant with the transmitter(s) rule(s). The Grantee will provide guidance to the host manufacturer for Part 15 B requirements if needed.

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 re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.
End Product Labeling

The final end product must be labeled in a visible area with the following:
Contains FCC ID: 2ACSVMYK2011-100 ; IC : 12243A-MYK2011100
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.
Federal Communication Commission Interference Statement
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 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.
FCC Radiation Exposure Statement:
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance 20cm between the radiator & your body.
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
Industry Canada Statement
This device complies with Industry Canada RSS-210 and CAN ICES-3(B)/NMB-3(B). 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.
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
This device meets the exemption from the routine evaluation limits in section 2.5 of RSS102 and users can obtain Canadian information on RF exposure and compliance.
This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

Documents / Resources

	High Flying Electronics Technology MYK2011_100 Low Power Wi-Fi Module [pdf] User Manual MYK2011-100, MYK2011100, 2ACSVMYK2011-100, 2ACSVMYK2011100, MYK2011_100 Low Power Wi-Fi Module, Low Power Wi-Fi Module, Wi-Fi Module

References

- HI-FLYING.COM
- HI-FLYING.COM