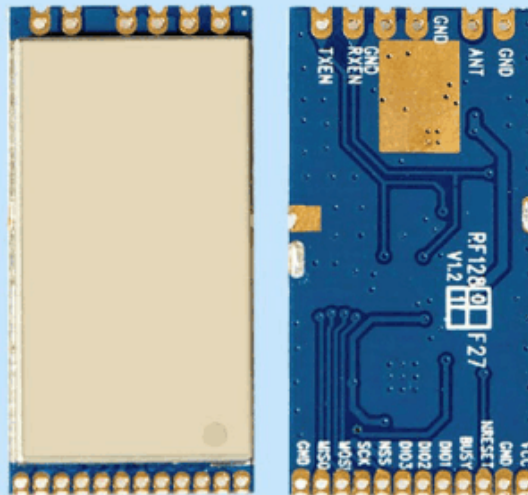


2.4GHz

LoRa spread spectrum remote distance transceiver module

Product Specification



Catalogue

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Note: Revision History

Revision	Date	Comment
V1.0	2018-11	First release
V1.1	2019-12	Update picture

1. Overview

LoRa1280/1F27 is 2.4G wireless transceiver module. This module use SX1280 from Semtech. And we add RF amplifier to get higher output power and longer range. It is LoRa modulation with maximum 24.34dBm output power. This wireless module has good sensitivity and good ant-interference. Also LoRa1280/1F27 can measure the range between the transmitter and receiver.

FCC ID: 2AD66-LORA128XF27

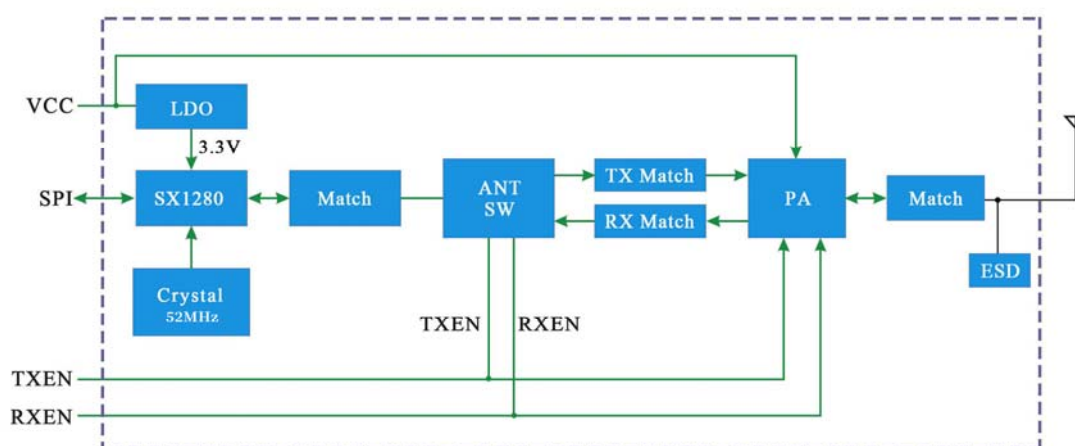
2. Features

- Operating frequency range: 2404-2480MHZ
- Maximum output power: 24.34dBm
- Sensitivity up to -132dBm@LoRa
- Data transfer rate: @LoRa=0.476-202kPbs
- LoRa modulation
- Packet communication mode (receiving FIFO 256 bytes)
- Operating voltage range: 2.0-5.5V
- Operating temperature range: -40~+85° C

3. Applications

- Wireless remote
- Smart home
- Toy control
- Tire pressure monitoring
- Health monitoring
- Tag reader

4. Internal block diagram



5. Performance parameter

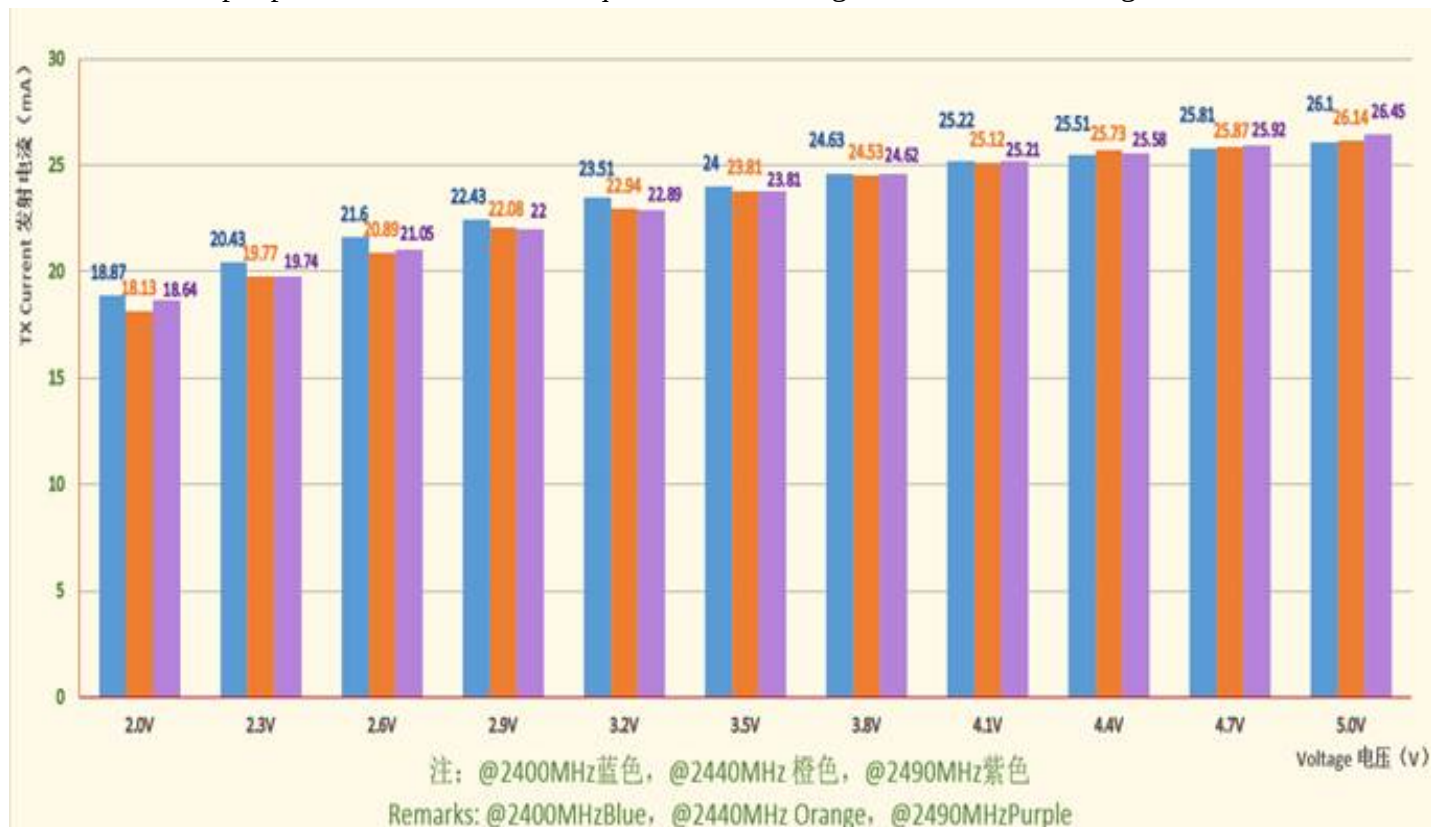
★ The following parameters are obtained by connecting the instrument with a 50 ohm copper axis. @VCC=3.3V

Parameter	Min	Typ.	Max.	Unit	Condition
Operation condition					
Working voltage	2	5	5.5	V	
Temperature range	-40		85	°C	
Current consumption					
RX current		<17		mA	
TX current		<600		mA	@Vcc=5V, 27dBm
Sleep current		<6		uA	
RF parameter					
Frequency range	2404		2480	MHZ	
Modulation rate	0.476		202	kpbs	@LoRa
	260		1300	kpbs	@FLRC
	125		2000	Kbps	@FSK
Output power range		24.34		dBm	
Receiving sensitivity	26	26.5	27	dBm	@VCC=5V
Frequency range		-132		dBm	LoRa@0.476kPbs

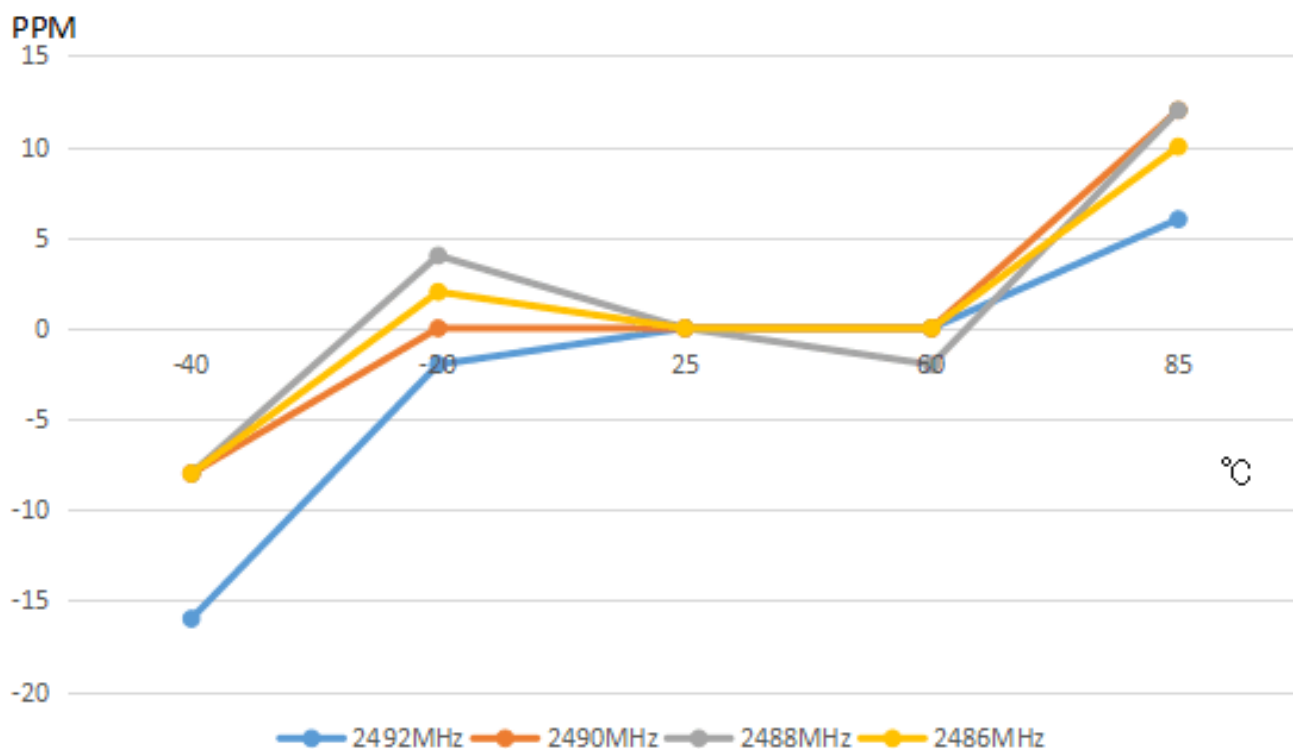
★ The following data is tested with DEMO board and tested at 2440MHZ working frequency.

Power level	Output Power (dBm)	Tx current (mA)	Register value
9	26.4	520	13
8	25.5	426	10
7	23.4	343	7
6	20.85	268	4
5	18.26	229	1
4	15.2	182	-2
3	12.3	155	-5
2	9.3	138	-8
1	6.0	130	-12
0	3.0	125	-15

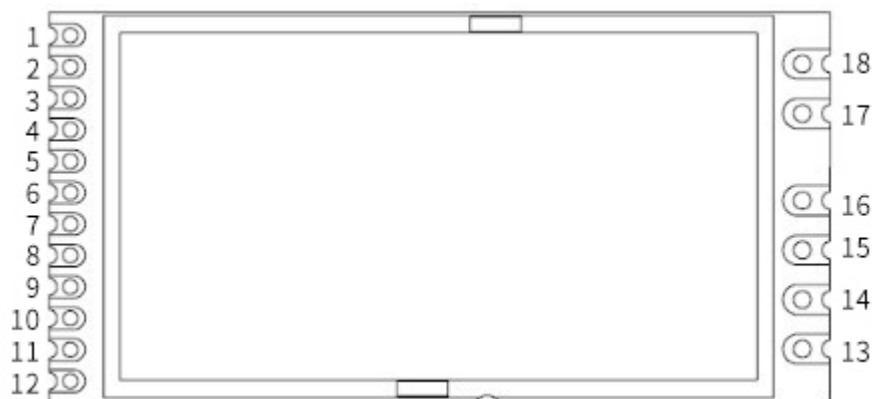
- The output power under different frequencies and voltages are shown in the figure below:



- The corresponding crystal frequency offset at different temperatures and frequencies are shown in the figure below:



6. Pin definition

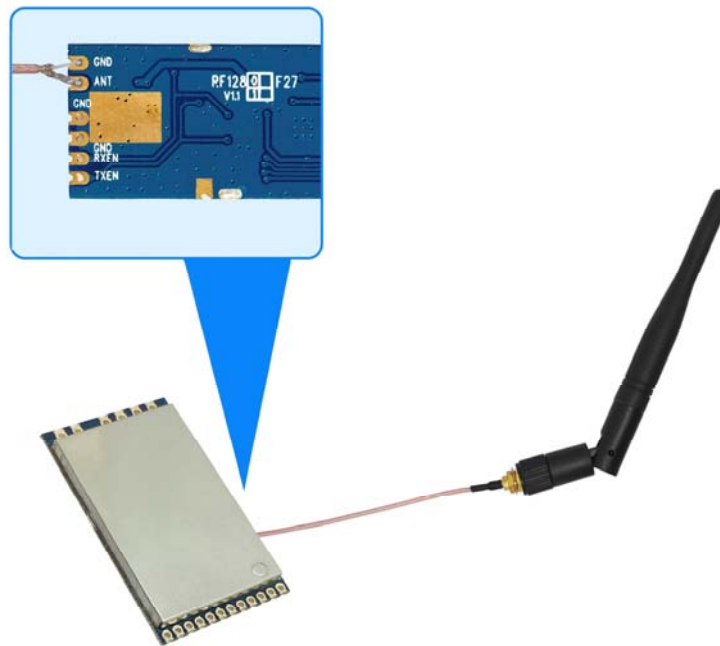


Note: All IO high level is 3.3V when powered by 5V

Pin NO.	Pin name	Description
1	VCC	Positive power supply
2	GND	Power ground
3	NRESET	Chip reset trigger pin, active low
4	BUSY	Status indicator foot (see SX1280/1281 specification for details)
5	DIO1	Directly connected to the chip pin, configurable general-purpose IO (see the chip SX1280/1281 specification for details)
6	DIO2	Directly connected to the chip pin, configurable general-purpose IO (see the chip SX1280/1281 specification for details)
7	DIO3	Directly connected to the chip pin, configurable general-purpose IO (see the chip SX1280/1281 specification for details)
8	NSS	Module chip select pin
9	SCK	SPI clock input pin
10	MOSI	SPI data input pin
11	MISO	SPI data output pin
12,15,16	GND	Connected to the negative pole
13	TXEN	Transmit control pin (high level when transmitting, low level when receiving)
14	RXEN	Receive control pin (high level when receiving, low level when transmitting)
17	ANT	50 ohm coaxial antenna
18	GND	Can be connected to an ANT negative or left floating

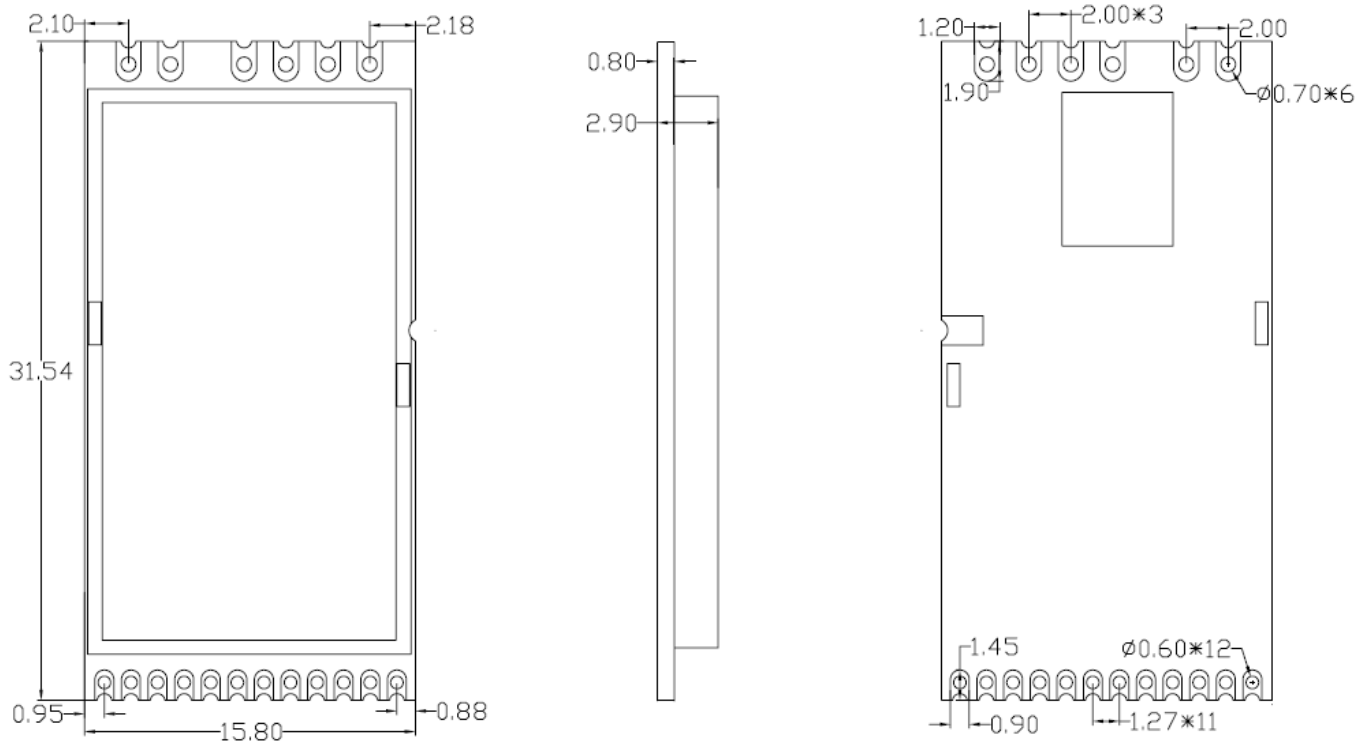
7. Antenna and LAYOUT considerations

The antenna is an important part of the communication system. Its performance directly affects the parameters of the communication system. The antenna impedance required by the module is 50 ohms. The universal antenna has wires, and can also be used for SMA adapter straight/elbow/folding rods, small suction cups, etc. Users can purchase antennas according to their own application environment. In order to make the module work optimally, it is recommended to use the company. Antenna provided.



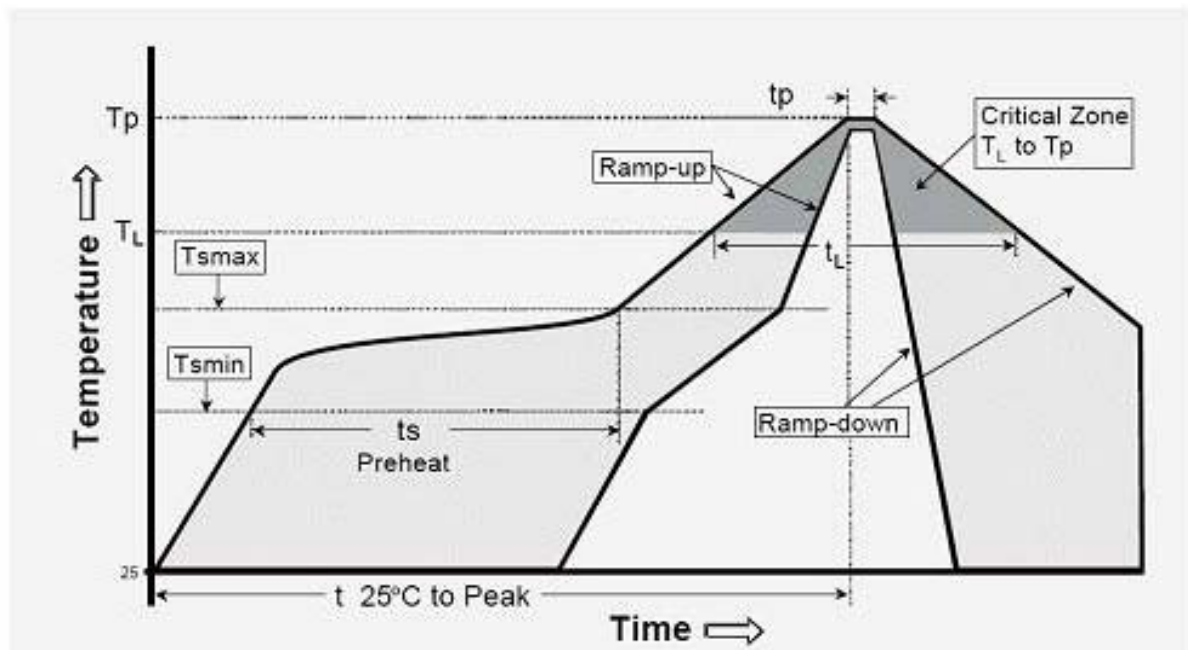
★ The following principles should be followed during antenna use to ensure the best communication distance of the module:

- The antenna should not be close to the ground surface, and the surrounding area should be kept away from obstacles;
- If the suction cup antenna is purchased, the lead wire should be straightened as much as possible, and the suction cup base should be attached to the metal object;

8. Mechanical Dimensions (Unit:mm)

Appendix 2: SMD Reflow Chart

We recommend you should obey the IPC related standards in setting the reflow profile:



IPC/JEDEC J-STD-020B the condition for lead-free reflow soldering	big size components (thickness $\geq 2.5\text{mm}$)
The ramp-up rate (T _L to T _p)	3°C/s (max.)
preheat temperature	
- Temperature minimum (T _{smin})	150°C
- Temperature maximum (T _{smax})	200°C
- preheat time (t _s)	60~180s
Average ramp-up rate(T _{smax} to T _p)	3°C/s (Max.)
- Liquidous temperature(T _L)	217°C
- Time at liquidous(t _L)	60~150 second
peak temperature(T _p)	245+/-5°C

9. Statements

FCC:

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.

NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications or changes to this equipment. Such modifications or changes could

void the user's authority to operate the equipment.

RF exposure information: To maintain compliance with FCC RF exposure requirements, use the product that maintain a 20cm separation distance between the user's body and the host. MPE limit for RF exposure at prediction frequency is 1mW/cm² for 2.4GHz. The MPE for 2.4GHz is 0.126mW/cm². It satisfy RF exposure compliance.

CE:

This product can be used across EU member states.

EU Regulatory Conformance

Hereby, NiceRF Wireless Technology LTD. Corporation declares that this device is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU.

For the declaration of conformity, visit the Web site <http://www.nicerf.com> certification.



This device is intended only for OEM integrators under the following conditions:

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

Important Note:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the Federal Communications Commission of the U.S. Government (FCC) and the Canadian Government authorizations are no longer considered valid and the FCC ID and IC ID cannot be used on the final product. In these circumstances, the OEM integrator shall be responsible for re-evaluating the end-product (including the transmitter) and obtaining a separate FCC and IC authorization in the U.S. and Canada.

OEM Integrators - End Product Labeling Considerations:

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains, FCC ID: 2AD66-LORA128XF27. The grantee's FCC ID can be used only when all FCC compliance requirements are met.

OEM Integrators - End Product Manual Provided to the End User:

The OEM integrator shall not provide information to the end user regarding how to install or remove this RF module in end product user manual. The end user manual must include all required regulatory information and warnings as outlined in this document.