

# MP131, MP132



## K-band Motion Detector

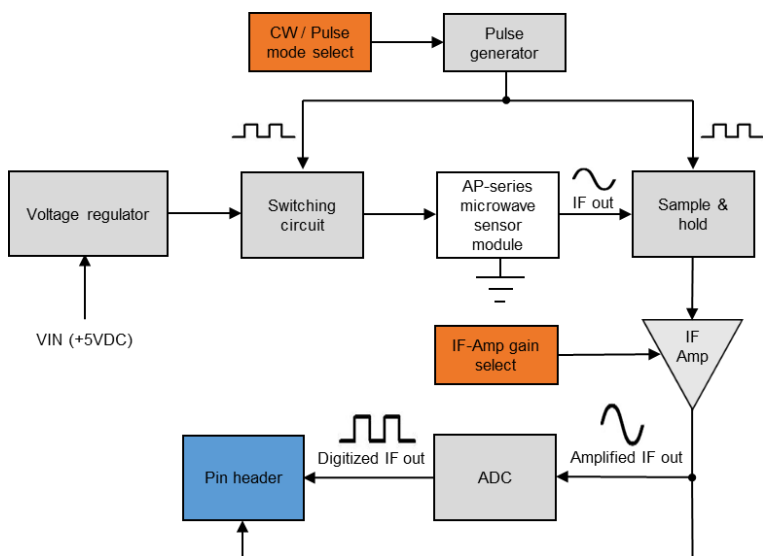
AGILSense' MP131/132<sup>1</sup> is a miniature motion detector. It's small size and compact design are ideal for applications in small spaces.

The MP131/132 performs signal processing, conditioning and digitizes the microwave sensor's analog output signal.

Onboard IF-amplifier dual-gain selector is available for users selection based on their application needs.

Aside from the standard 5V version, the 3V<sup>2</sup> and higher speed detection versions are also available to cater for 3V systems and higher speed detection applications.

### Block Diagram



### Key Applications:

- Motion detection
- Lighting control
- Security alarm
- Automatic door control
- Home automation

### Key Features:

- Small and flat profile
- Selectable CW and pulse mode operation
- Selectable IF-amplifier gain
- Low current consumption
- Digital and analog signal outputs

# Technical Specifications

PARAMETER	MODEL	REMARKS	MIN	TYPICAL	MAX	UNITS
<b>OPERATING CONDITIONS</b>						
Supply voltage, V <sub>N</sub>	MP131-3 & MP132-3 variants		2.85	3	12	V <sub>DC</sub>
	MP131 & MP132 variants		4.75	5	12	V <sub>DC</sub>
Current consumption (Includes sensor)	MP131-3, MP132-3	Pulse/CW		3.5/40		mA
	MP131-3B	Pulse/CW		8.5/40		mA
	MP131, MP132	Pulse/CW		5/40		mA
	MP131/HP, MP131-3/HP	Pulse		4		mA
Operating temperature	All variants		-20		60	°C
<b>PULSE MODE OPERATION</b>						
Pulse frequency	MP131 & MP132 variants except MP131-3B	Pulse		1		KHz
Duty cycle				4		%
Pulse frequency	MP131-3B			8		KHz
Duty cycle				14		%
<b>TRANSMITTER</b>						
Operating frequency	MP131 & MP132 variants in pulse mode			24.18		GHz
	MP131 & MP132 variants in CW mode			24.18		GHz
	MP131-3B only			24.07		GHz
<b>ANTENNA</b>						
Field of view	MP131 variants			32 × 80		°
	MP132 variants			Omni-Directional		
Antenna sidelobe rejection	MP131 variants			15		dBc
<b>IF-Amplifier</b>						
Gain	MP131-3, MP132-3, MP131-3B, MP131, MP132	Selectable		55/70		dB
	MP131/HP, MP131-3/HP	Fixed		70		dB
Bandwidth	MP131 & MP132 except MP131-3B			15-300		Hz
	MP131-3B			50-1500		Hz
Detectable speed	MP131 & MP132 except MP131-3B		0.3		7	km/hr
	MP131-3B		1		33.5	km/hr
<b>PHYSICAL PROPERTIES</b>						
Dimensions	All variants			35.0 × 28.0 × 12.2		mm
Weight	All variants			6.3		g

**Unless noted otherwise, the specifications are measured at +25°C.**

**Note 1:** MP131 and MP132 variants come with an AP96 and AP98 K-band microwave sensor module respectively. Please refer to respective datasheets for other operating specifications.

**Note 2:** MP131-3 and MP132-3 variants come with an AP96-3 and AP98-3 K-band microwave sensor module respectively. Please refer to respective datasheets for other operating specifications.

**Note 3:** MP131/HP comes with AP96-2 K-band sensor module. Please refer to respective datasheet for other operating information.

**Note 4:** Sensors used comply with EN 300 440, FCC Part 15.245 and FCC Part 15.249.

**Note 5:** **CAUTION: ELECTROSTATIC SENSITIVE DEVICE.** Observe precautions for handling and storage.

**ST Engineering Electronics Ltd.**

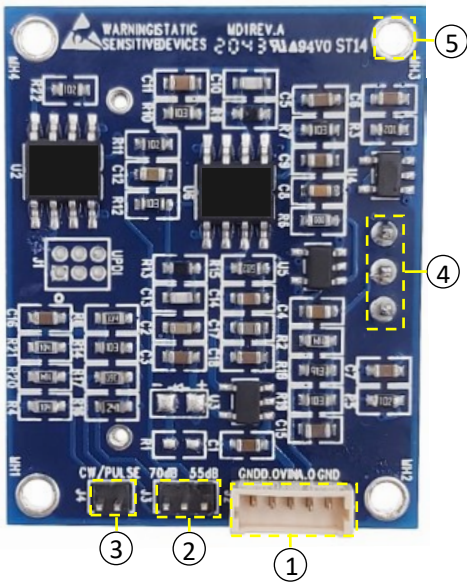
www.stengg.com


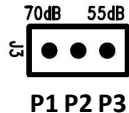
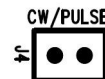
info@agilsense.com

© 2020 ST Engineering Ltd. All rights reserved.



# On-board Connectors and Controls



LABEL	DESCRIPTION	FUNCTIONS
1	Five-way pin header <sup>^</sup> 	Power supply and outputs <b>V<sub>IN</sub></b> - +3/5V <sub>DC</sub> power supply <b>A.O</b> - Analog IF Output <b>D.O</b> - Digital IF Output <b>GND</b> - Ground
2	Three-way pin header* 	IF-amplifier gain selector <sup>1</sup> <b>SHORT PIN 1 &amp; 2</b> - 70dB <b>SHORT PIN 2 &amp; 3</b> - 55dB
3	Two-way pin header# 	Operating mode selector <sup>1</sup> <b>SHORT</b> - Pulse <b>OPEN</b> - CW
4	2.54mm pitch sensor mounting holes	Microwave sensor module interface
5	Ø2mm x 4 PCB mounting holes	Mounting holes to attach PCB to an enclosure or surface

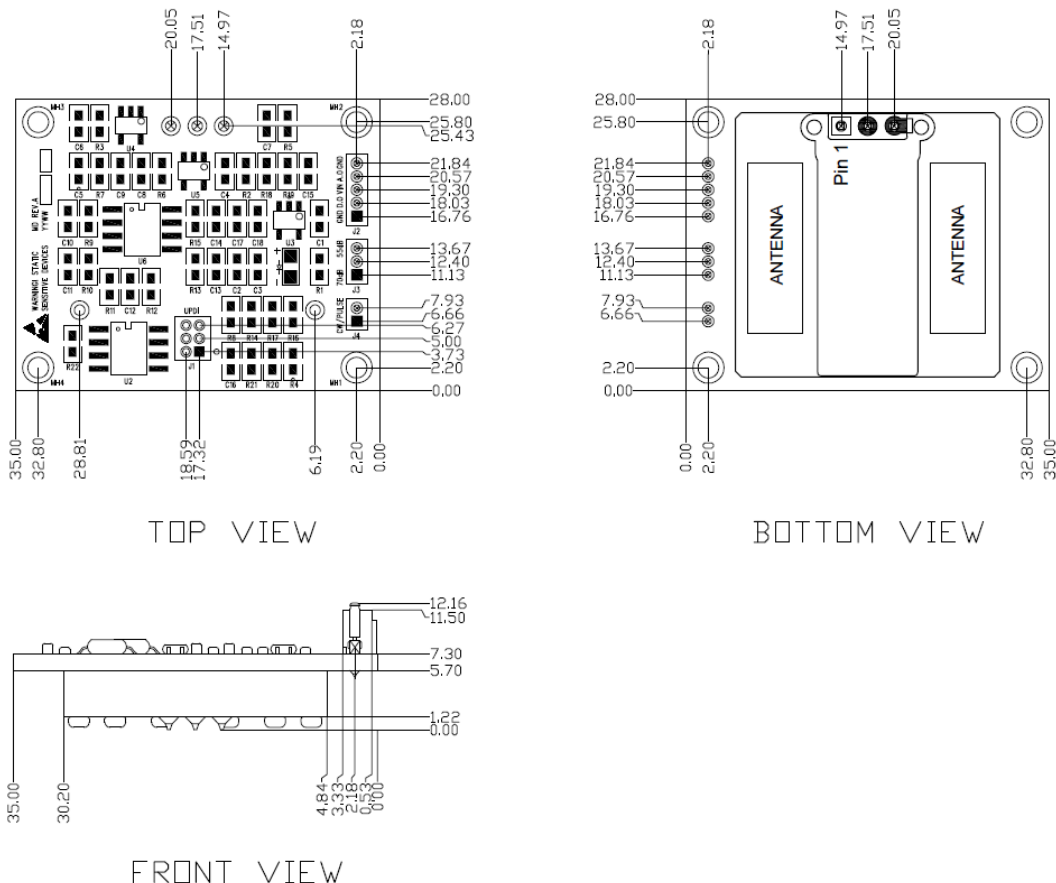
<sup>^</sup>Recommended mating cable assembly: Molex 15134-0500 - 5 contact—1.25mm Pitch 50mm Picoblade

\*Recommended mating receptacle: Harwin M50-3030342 - 3 contact—1.27mm Pitch Vertical Socket

#Recommended mating receptacle: Harwin M50-3030242 - 2 contact—1.27mm Pitch Vertical Socket

<sup>1</sup>Pin headers 2 & 3 are shorted to 70 dB and Pulse for MP131/HP and MP131-3/HP

## Outline Diagram



ST Engineering Electronics Ltd.

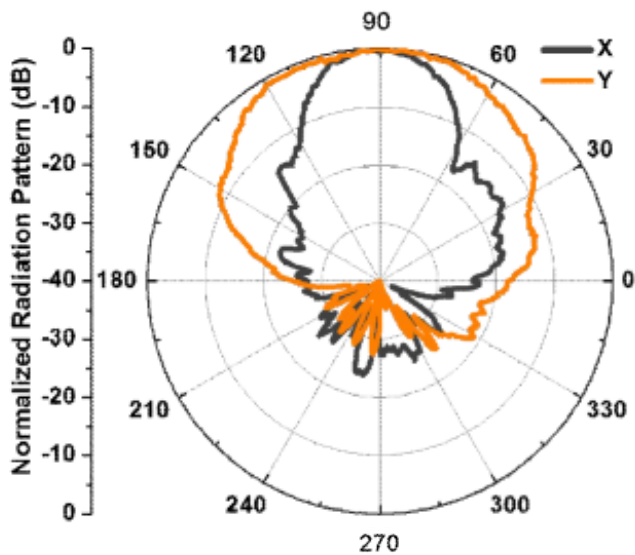
www.stengg.com

info@agilsense.com

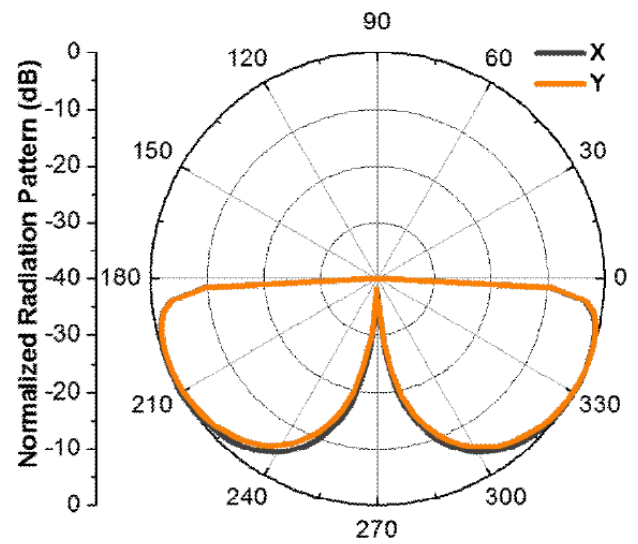
© 2020 ST Engineering Ltd. All rights reserved.



## Antenna Beam Pattern

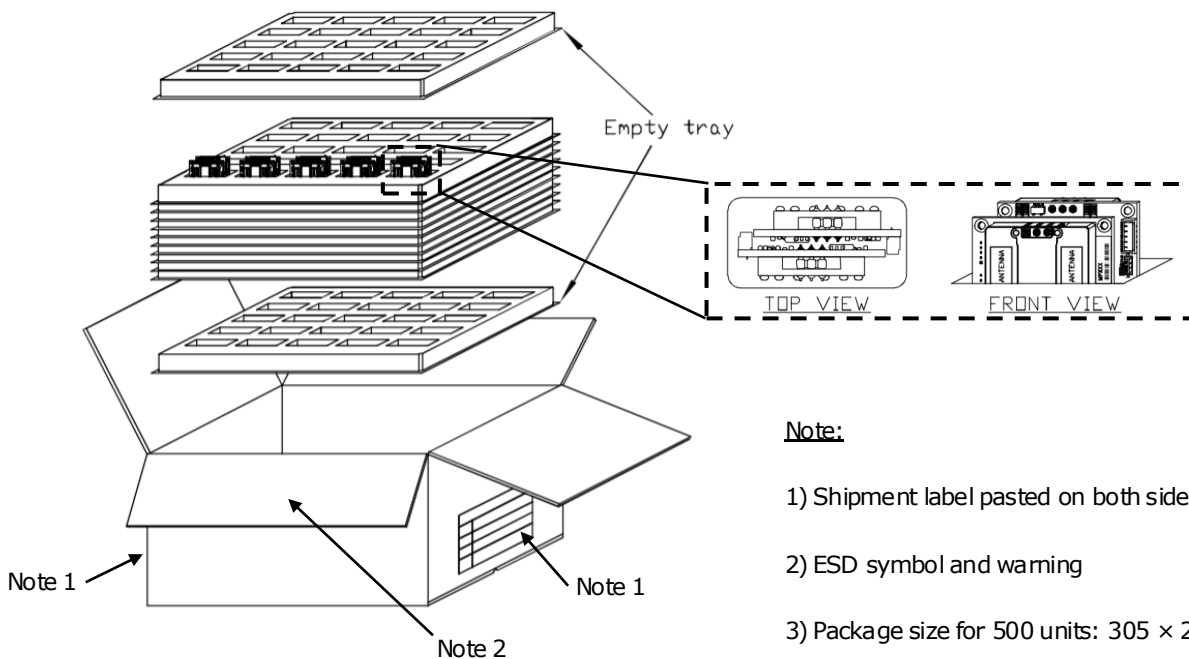


**MP131**



**MP132**

## Packing Information



**Note:**

- 1) Shipment label pasted on both sides of the box.
- 2) ESD symbol and warning
- 3) Package size for 500 units: 305 × 249 × 236 mm

## Ordering Information

Order Code	Description
MP131-3	+3V <sub>DC</sub> V <sub>IN</sub> , AP96-3 K-band sensor module
MP132-3	+3V <sub>DC</sub> V <sub>IN</sub> , AP98-3 K-band sensor module
MP131-3B	+3V <sub>DC</sub> V <sub>IN</sub> , AP96-3 K-band sensor module, wide bandwidth
MP131	+5V <sub>DC</sub> V <sub>IN</sub> , AP96 K-band sensor module
MP132	+5V <sub>DC</sub> V <sub>IN</sub> , AP98 K-band sensor module
MP131/HP	+5V <sub>DC</sub> V <sub>IN</sub> , AP96-2 K-band sensor module, fixed 70 dB gain & Pulse
MP131-3/HP	+3V <sub>DC</sub> V <sub>IN</sub> , AP96-3 K-band sensor module, fixed 70 dB gain & Pulse

**ST Engineering Electronics Ltd.**

www.stengg.com

info@agilsense.com

© 2020 ST Engineering Ltd. All rights reserved.



# Industry Canada Statement

This device complies with ISED's license-exempt RSSs. 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.

Le présent appareil est conforme aux CNR d'ISED applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

## **FOR MOBILE DEVICE USAGE (>20cm/low power)**

### **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 greater than 20cm between the radiator & your body.

### **Déclaration d'exposition aux radiations:**

Cet équipement est conforme aux limites d'exposition aux rayonnements ISED établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé à plus de 20 cm entre le radiateur et votre corps.

This device is intended only for OEM integrators under the following conditions: (For module device use)

- 1) The antenna must be installed and operated with greater than 20cm between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna.

As long as **2** 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.

Cet appareil est conçu uniquement pour les intégrateurs OEM dans les conditions suivantes: (Pour utilisation de dispositif module)

- 1) L'antenne doit être installée et exploitée avec plus de 20 cm entre l'antenne et les utilisateurs, et
- 2) Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne.

Tant que les **2** conditions ci-dessus sont remplies, des essais supplémentaires sur l'émetteur ne seront pas nécessaires. Toutefois, l'intégrateur OEM est toujours responsable des essais sur son produit final pour toutes exigences de conformité supplémentaires requises pour ce module installé.

### **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 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 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 l'ID 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.

## **End Product Labeling FOR MOBILE DEVICE USAGE (>20cm/low power)**

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:10506A-MP131".

### **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: 10506A-MP131".

### **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.

### **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.

# Federal Communication Commission Interference 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.

FOR MOBILE DEVICE USAGE (>20cm/low power)  
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 minimum distance 20cm between the radiator & your body.

**This module is intended for OEM integrators only. Per FCC KDB 996369 D03 OEM Manual v01 guidance, the following conditions must be strictly followed when using this certified module:**

KDB 996369 D03 OEM Manual v01 rule sections:

## 2.2 List of applicable FCC rules

This module has been tested for compliance to FCC Part 15.249.

## 2.3 Summarize the specific operational use conditions

The module is tested for standalone mobile RF exposure use condition. Any other usage conditions such as co-location with other transmitter(s) or being used in a portable condition will need a separate reassessment through a class II permissive change application or new certification.

## 2.4 Limited module procedures

Not applicable.

## 2.5 Trace antenna designs

Not applicable.

## 2.6 RF exposure considerations

This equipment complies with FCC mobile radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator & your body. If the module is installed in a portable host, a separate SAR evaluation is required to confirm compliance with relevant FCC portable RF exposure rules.

## 2.7 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.

Antenna Type: Patch antenna

Antenna connector: PCB trace

## 2.8 Label and compliance information

The final end product must be labelled in a visible area with the following: "Contains FCC ID: VECMP131". The grantee's FCC ID can be used only when all FCC compliance requirements are met.

## 2.9 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) or portable use will require a separate class II permissive change re-evaluation or new certification.

## 2.10 Additional testing, 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 (unintentional radiator) 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.

**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.

## **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 shown in this manual.

## **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