



**Universal Global Scientific Industrial Co., Ltd.**  
No. 141, Lane 351, Taiping Road, Sec. 1, Tsaotuen,  
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# **WM-SG-SM-42 LoRa Module User Manual**



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The WM-SG-SM-42 module complies with the following features and standards:

(Typical spec is defined @3.3V 25°C )

Features	Description	
RF Standards	LoRa® Technology modulation	
Frequency Band	860 MHz – 1020 MHz	
RF TX Power	Adjustable up to max. +18.5 dBm	
Sensitivity at 1% BER	SF=7,BW=125KHz	Max. To -123dBm*
	SF=10,BW=125KHz	Max. To -130dBm*
	SF=12,BW=125KHz	Max. To -135dBm*

\*Follow Semtech test spec

Power supply for the WM-SG-SM-42 module will be provided by the host via the power pins

Symbol	Parameter	Min	Typ	Max	Unit
VDD_3V3	power supply for MCU	2.0	3.3	3.5	V
VDDA	power supply for MCU	2.0	3.3	3.5	V
VREF+	power supply for MCU	2.0	3.3	3.5	V
VDD_RFS	power supply for RFS	2.0	3.3	3.5	V

The WM-SG-SM-42 module has to withstand the operational requirements as listed in the table below.

Operating Temperature	-40° to 85° Celsius	
Humidity range	Max 95%	Non condensing, relative humidity

The maximum operating ambient temperature range can up to 85degC, but exposure to absolute-maximum-rated conditions may cause performance degradation and affect device reliability.

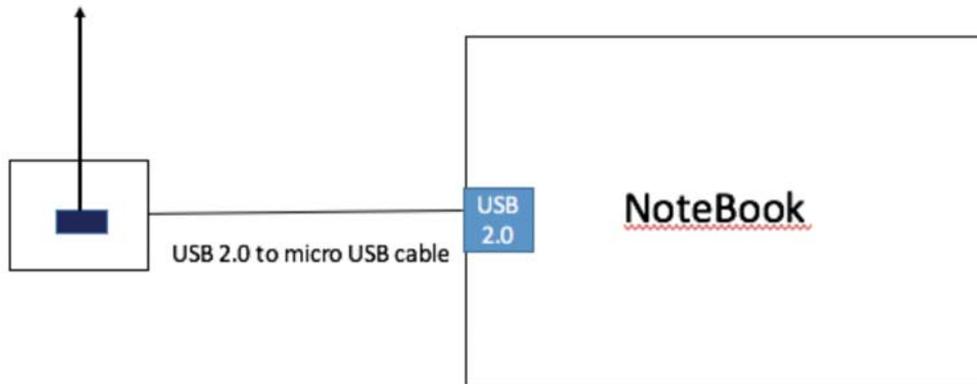


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# User Guide

1. Setup and connection diagram as below:

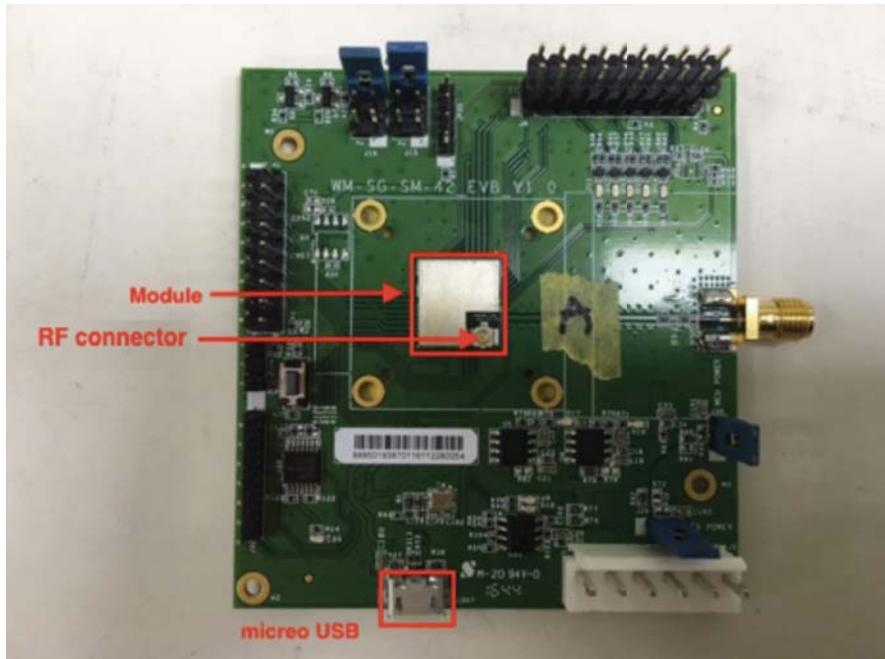
## EUT : LoRa Module



- 1) Notebook\*1 or PC \*1
- 2) USB2.0 to micro USB 2.0 \*1

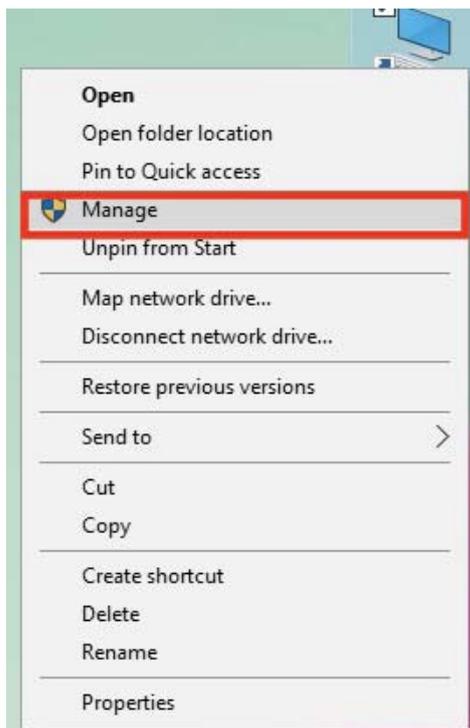


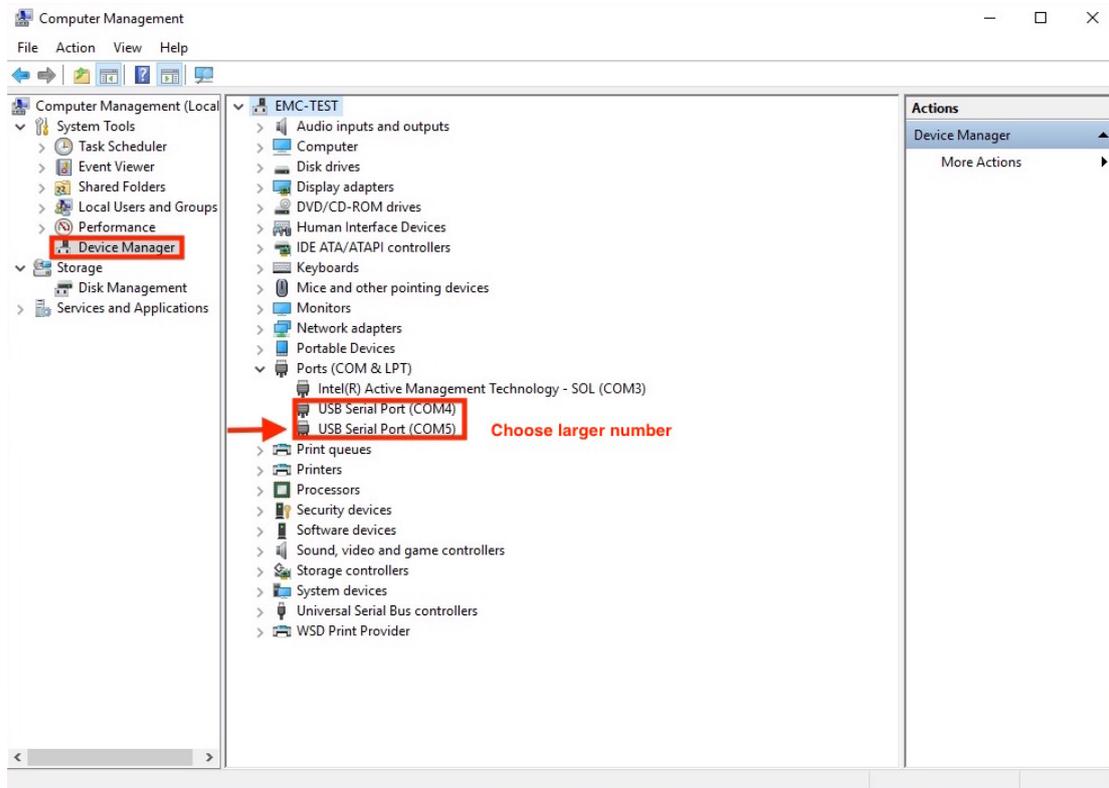
2. WM-SG-SM-42 photo as below:



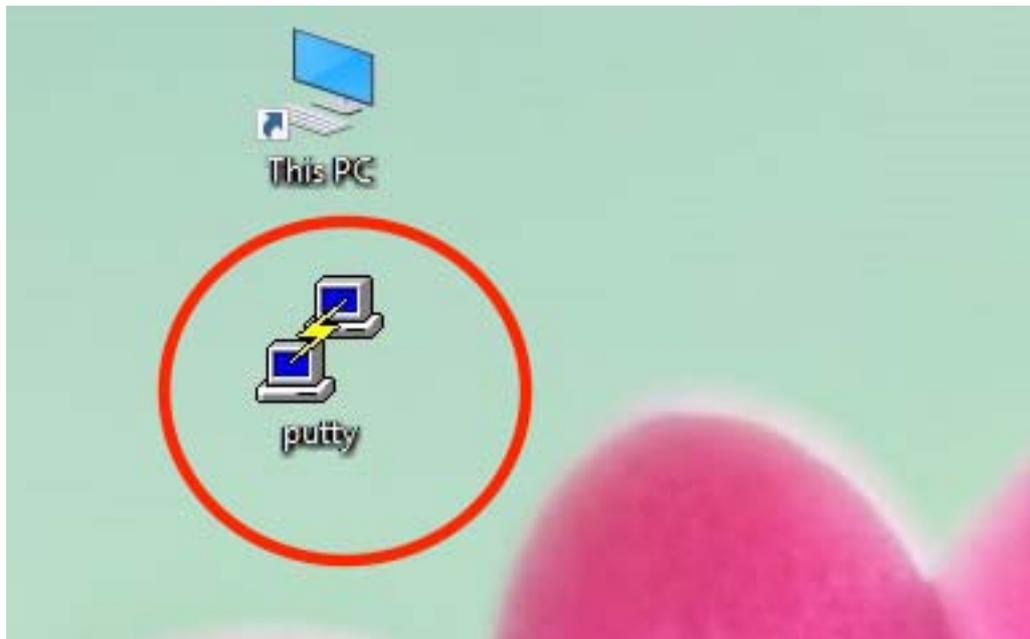
3. Setup step:

- 1) Insert USB2.0 to micro USB cable to NB
- 2) This PC → Manage → Device manager :  
To make sure the device is recognized

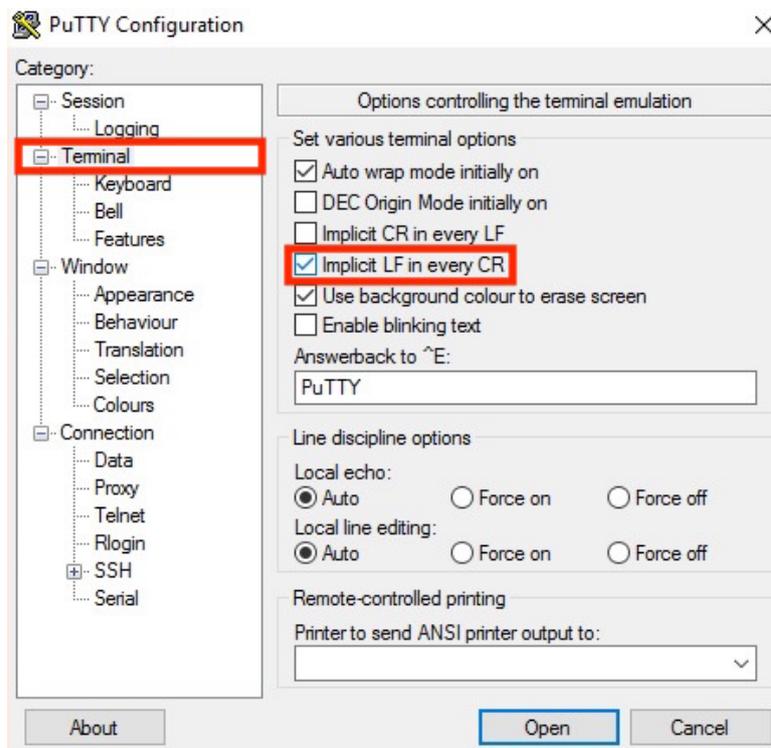
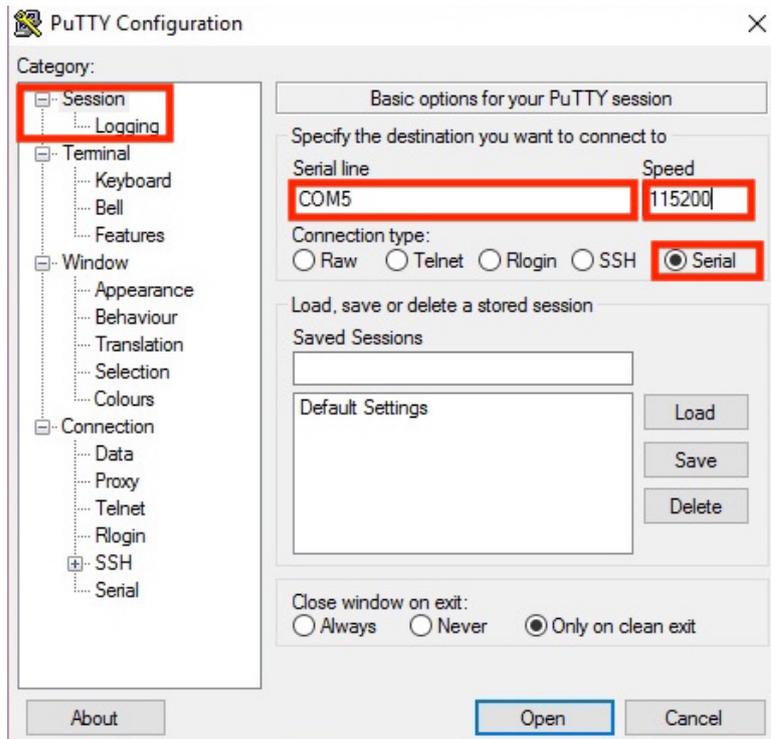


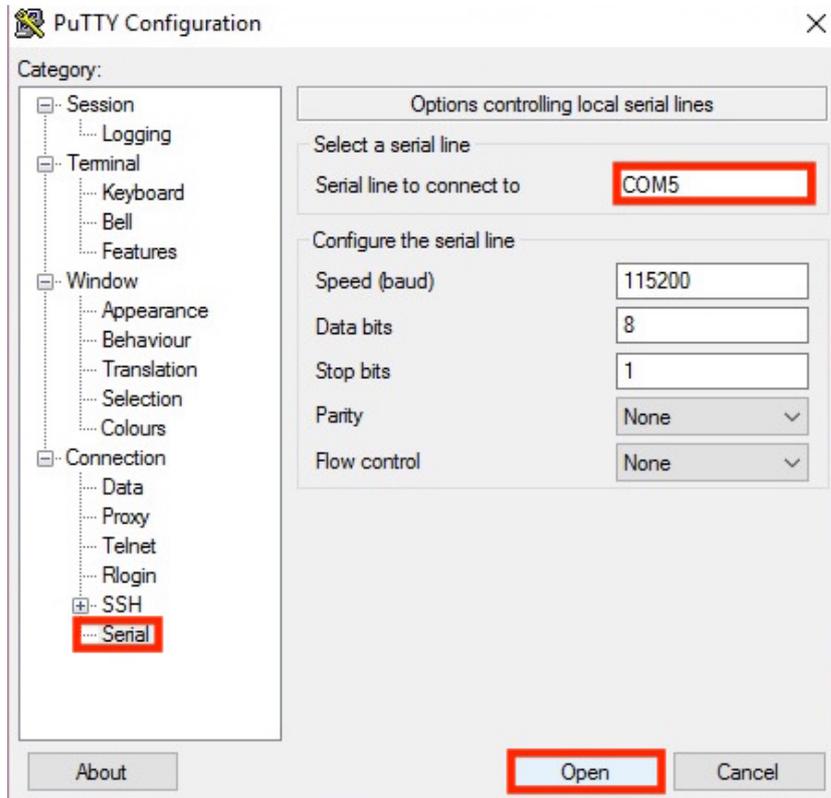


### 3) Open putty (or hyper terminal)



- 4) Enter serial line and speed: It depends on your port, it could be COM1, 2, 3...etc





5) You can type command if your set up is successful





## 6) Command list:

Start Continue TX

```
# ATZ /*SYSTEM RESET*/  
# AT+FRE=902300000 /*SET FREQUENCY AT 902.3MHz*/  
# AT+BW=0 /* SET BW=125K*/  
# AT+SF=10 /*SET SF=10*/  
# AT+TXON /*START CONTINUE TX*/  
#AT+TXP=20 /*SET RF OUTPUT POWER=20dBm*/
```

Note:

**FCC Data Rate** parameter set up as blow:

DataRate	Configuration	Indicative physical bit rate [bit/s]
0	LoRa: SF12 / 125 kHz	250
1	LoRa: SF11 / 125 kHz	440
2	LoRa: SF10 / 125 kHz	980
3	LoRa: SF9 / 125 kHz	1760
4	LoRa: SF8 / 125 kHz	3125
5	LoRa: SF7 / 125 kHz	5470
6	LoRa: SF7 / 250 kHz	11000
7	FSK: 50 kbps	50000
8..15	RFU	

**CE Data Rate** parameter set up as below:

DataRate	Configuration	Indicative physical bit rate [bit/s]
0	LoRa: SF12 / 125 kHz	250
1	LoRa: SF11 / 125 kHz	440
2	LoRa: SF10 / 125 kHz	980
3	LoRa: SF9 / 125 kHz	1760
4	LoRa: SF8 / 125 kHz	3125
5	LoRa: SF7 / 125 kHz	5470
6	LoRa: SF7 / 250 kHz	11000
7	FSK: 50 kbps	50000
8..15	RFU	

**BW=0 (BW=125k); BW=1 (BW=250k);BW=2 (BW=500k)**



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Stop Continue TX

# ATZ                                   /\*SYSTEM RESET\*/  
OR  
# AT+STOP                           /\*ENTER LISTENING MODE\*/  
OR  
# AT+TXON=0                       /\*STOP CONTINUE TX\*/

Start Continue RX

# ATZ                                   /\*SYSTEM RESET\*/  
# AT+FRE=902300000               /\*SET FREQUENCY AT 902.3MHz\*/  
# AT+BW=0                           /\* SET BW=125K\*/  
# AT+SF=10                          /\*SET SF=10\*/  
# AT+RXON                           /\*START CONTINUE RX\*/

Stop Continue RX

# ATZ                                   /\*SYSTEM RESET\*/  
OR  
# AT+STOP                           /\*ENTER LISTENING MODE\*/  
OR  
# AT+TXON=0                       /\*STOP CONTINUE TX\*/



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### **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.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.



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**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.



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**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, 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

**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**

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: COFWMSGSM42". The grantee's FCC ID can be used only when all FCC compliance requirements are met.

#### **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.

**Antenna type : Dipole**

**Antenna gain : 2.3 dBi**



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### **Industry Canada statement:**

This device complies with ISED's licence-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.

### **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 minimum distance 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 avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.



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

- 1) The antenna must be installed such that 20 cm is maintained 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 de telle sorte qu'une distance de 20 cm est respectée 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.



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#### **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 considéré 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**

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 IC:10293A-WMSGSM42".

#### **Plaque signalétique du produit final**

Ce module émetteur est autorisé uniquement pour une utilisation dans un dispositif où l'antenne peut être installée de telle sorte qu'une distance de 20cm peut être maintenue entre l'antenne et les utilisateurs. Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: "Contient des IC: 10293A-WMSGSM42".

#### **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



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intègre ce module.

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

**Antenna Type : Dipole**

**Antenna Gain : 2.3 dBi**