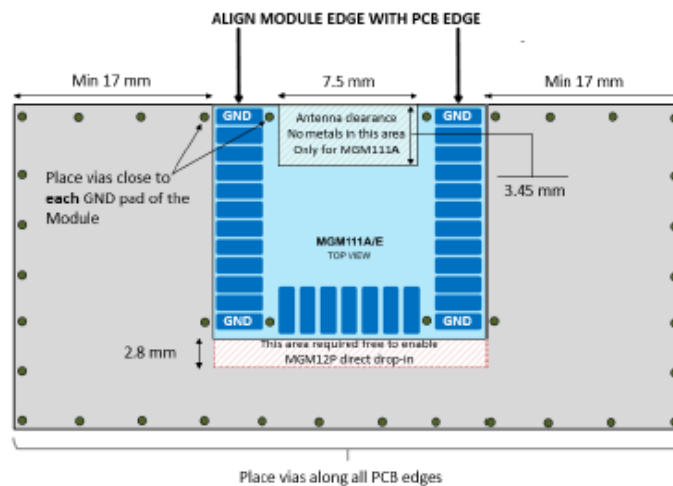


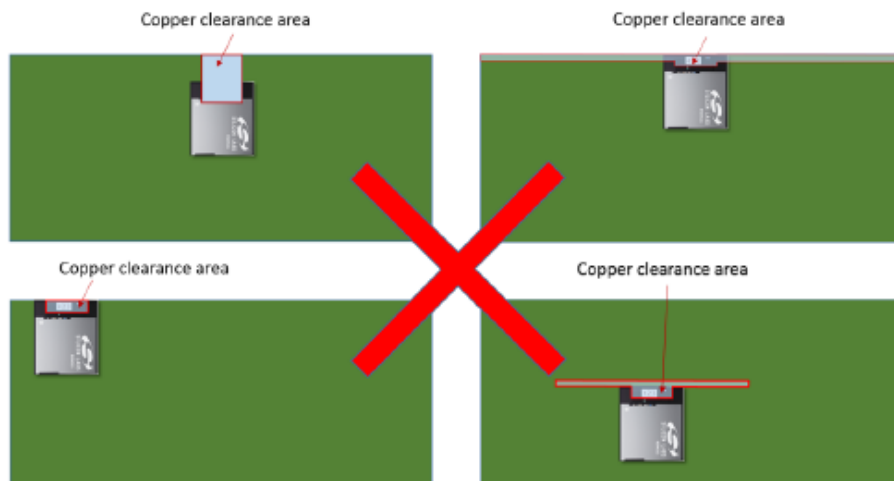
# INSTALLATION GUIDE

- Place the module at the edge of the PCB, as shown in the figure below.
- Do not place any metal (traces, components, battery, etc.) within the clearance area of the antenna (shown in the figure below).
- Connect all ground pads directly to a solid ground plane.
- Place the ground vias as close to the ground pads as possible.
- Do not place plastic or any other dielectric material in touch with the antenna.



**Figure 6.1. Recommended Application PCB Layout for MGM12P with Integrated Antenna**

The layouts in the next figure will result in severely degraded RF-performance.



**Figure 6.2. Non-optimal Module Placements for MGM12P**

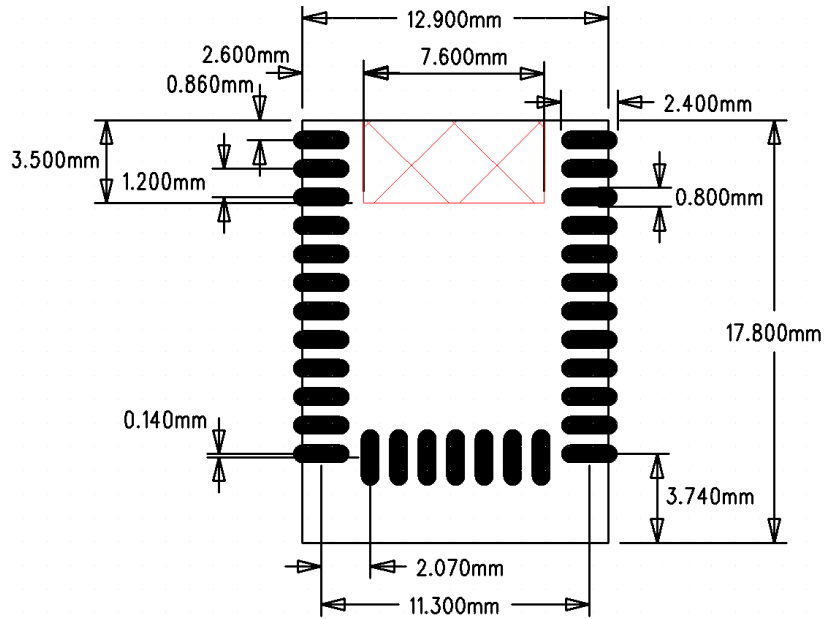


Figure 9.4: Recommended PCB Land Pattern

## Qualified Antenna Types

This device has been designed to operate with a standard 2.14 dBi dipole antenna. Any antenna of a different type or with a gain higher than 2.14 dBi is strictly prohibited for use with this device. Using an antenna of a different type or gain more than 2.14 dBi will require additional testing for FCC, CE and IC. The required antenna impedance is 50 Ω.

Antenna type	Maximum gain
Dipole	2.14 dBi

Table 1: Qualified antennas for MGM12Px

## CE

The MGM13P02 modules are in conformity with the essential requirements and other relevant requirements of the Radio Equipment Directive(RED). Please note that every application using the MGM12P will need to perform the radio EMC tests on the end product according to EN 301 489-17. Separate RF testing is not required provided that the customer follows the module manufacturer's recommendations and instructions and does not make modifications e.g. to the provided antenna solutions or requirements. A formal DoC is available via [www.silabs.com](http://www.silabs.com)

MGM13P12 module is in conformity with the essential requirements and other relevant requirements of the Radio Equipment Directive(RED) at nominal 10 dBm transmit power. The transmit power of the module is not limited and when an end product is using MGM13P12, the end product manufacturer is responsible that the end product is in conformity of all relevant requirements of the RED.

# 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.

Any changes or modifications not expressly approved by Silicon Labs could void the user's authority to operate the equipment.

## **FCC RF Radiation Exposure Statement:**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter meets both portable and mobile limits as demonstrated in the RF Exposure Analysis. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures.

## **OEM Responsibilities to comply with FCC Regulations**

OEM integrator is responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

- With MGM13P12 the antenna(s) must be installed such that a minimum separation distance of 38 mm is maintained between the radiator (antenna) and all persons at all times.
- With MGM13P02 the antenna(s) must be installed such that a minimum separation distance of 7.7 mm is maintained between the radiator (antenna) and all persons at all times.
- The transmitter module must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures.

**IMPORTANT NOTE:** In the event that the above conditions cannot be met (for certain 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.

## **End Product Labeling**

The variants of MGM13P Modules are labeled with their own FCC ID. If the FCC ID is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. In that case, the final product must be labeled in a visible area with the following:

**“Contains Transmitter Module FCC ID: QOQMGM13P”**

or

**“Contains FCC ID: QOQMGM13P”**

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module or change RF related parameters in the user manual of the end product.

## ISED Canada

This radio transmitter (IC: 5123A-MGM13P) has been approved by Industry Canada to operate with the antenna types listed above with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device

This device complies with Industry Canada’s license-exempt RSS standards. 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

### **RF Exposure Statement**

Exception from routine SAR evaluation limits are given in RSS-102 Issue 5.

The models MGM13P12E and MGM13P12A meet the given requirements when the minimum separation distance to human body is 35 mm.

The models MGM13P02A and MGM13P02E meet the given requirements when the minimum separation distance to human body is 20 mm.

RF exposure or SAR evaluation is not required when the separation distance is same or more than stated above. If the separation distance is less than stated above the OEM integrator is responsible for evaluating the SAR.

### **OEM Responsibilities to comply with IC Regulations**

The MGM13P modules has been certified for integration into products only by OEM integrators under the following conditions:

- The antenna(s) must be installed such that a minimum separation distance as stated above is maintained between the radiator (antenna) and all persons at all times.
- The transmitter module must not be co-located or operating in conjunction with any other antenna or transmitter.

As long as the two conditions above are met, further transmitter testing 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 (for example, digital device emissions, PC peripheral requirements, etc.).

**IMPORTANT NOTE:** In the event that these conditions cannot be met (for certain configurations or co-location with another transmitter), then the ISED authorization is no longer considered valid and the IC 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 ISED authorization.

### **End Product Labeling**

The MGM13P modules are labeled with their own IC ID. If the IC ID is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. In that case, the final end product must be labeled in a visible area with the following:

**“Contains Transmitter Module IC: 5123A-MGM13P”**

or

**“Contains IC: 5123A-MGM13P”**

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module or change RF related parameters in the user manual of the end product

### **ISED (Français)**

Industrie Canada a approuvé l'utilisation de cet émetteur radio (IC: 5123A-MGM13P) en conjonction avec des antennes de type dipolaire à 2.14dBi ou des antennes embarquées, intégrée au produit. L'utilisation de tout autre type d'antenne avec ce composant est proscrite. Ce composant est conforme aux normes RSS, exonérées de licence d'Industrie Canada. Son mode de fonctionnement est soumis aux deux conditions suivantes :

1. Ce composant ne doit pas générer d'interférences
2. Ce composant doit pouvoir est soumis à tout type de perturbation y compris celle pouvant nuire à son bon fonctionnement.

### **Déclaration d'exposition RF**

L'exception tirée des limites courantes d'évaluation SAR est donnée dans le document RSS-102 Issue 5. Les modules MGM13P12GA et MGM13P12GE répondent aux exigences requises lorsque la distance minimale de séparation avec le corps humain est de 35 mm. Les modules MGM13P02GA et MGM13P02GA répondent aux exigences requises lorsque la distance minimale de séparation avec le corps humain est de 20 mm.

La déclaration d'exposition RF ou l'évaluation SAR n'est pas nécessaire lorsque la distance de séparation est identique ou supérieure à celle indiquée ci-dessus. Si la distance de séparation est inférieure à celle mentionnées plus haut, il incombe à l'intégrateur OEM de procéder à une évaluation SAR.

### **Responsabilités des OEM pour une mise en conformité avec le Règlement du Circuit Intégré**

Le module MGM13P a été approuvé pour l'intégration dans des produits finaux exclusivement réalisés par des OEM sous les conditions suivantes:

- L'antenne (s) doit être installée de sorte qu'une distance de séparation minimale indiquée ci-dessus soit maintenue entre le radiateur (antenne) et toutes les personnes avoisinante, ce à tout moment.
- Le module émetteur ne doit pas être localisé ou fonctionner avec une autre antenne ou un autre transmetteur que celle indiquée plus haut.

Tant que les deux conditions ci-dessus sont respectées, il n'est pas nécessaire de tester ce transmetteur de façon plus poussée. Cependant, il incombe à l'intégrateur OEM de s'assurer de la bonne conformité du produit fini avec les autres normes auxquelles il pourrait être soumis de fait de l'utilisation de ce module (par exemple, les émissions des périphériques numériques, les exigences de périphériques PC, etc.).

**REMARQUE IMPORTANTE:** dans le cas où ces conditions ne peuvent être satisfaites (pour certaines configurations ou co-implantation avec un autre émetteur), l'autorisation ISEDC n'est plus considérée comme valide et le numéro d'identification ID IC ne peut pas être apposé sur le produit final. Dans ces circonstances, l'intégrateur OEM sera responsable de la réévaluation du produit final (y compris le transmetteur) et de l'obtention d'une autorisation ISEDC distincte.

### **Étiquetage des produits finis**

Les modules MGM12P sont étiquetés avec leur propre ID IC. Si l'ID IC n'est pas visible lorsque le module est intégré au sein d'un autre produit, cet autre produit dans lequel le module est installé devra porter une étiquette faisant apparaître les référence du module intégré. Dans un tel cas, sur le produit final doit se trouver une étiquette aisément lisible sur laquelle figurent les informations suivantes :

**"Contient le module transmetteur : 5123A-MGM13P"**

ou

**"Contient le circuit: 5123A-MGM13P"**

L'intégrateur OEM doit être conscient qu'il ne doit pas fournir, dans le manuel d'utilisation, d'informations relatives à la façon d'installer ou de d'enlever ce module RF ainsi que sur la procédure à suivre pour modifier les paramètres liés à la radio.