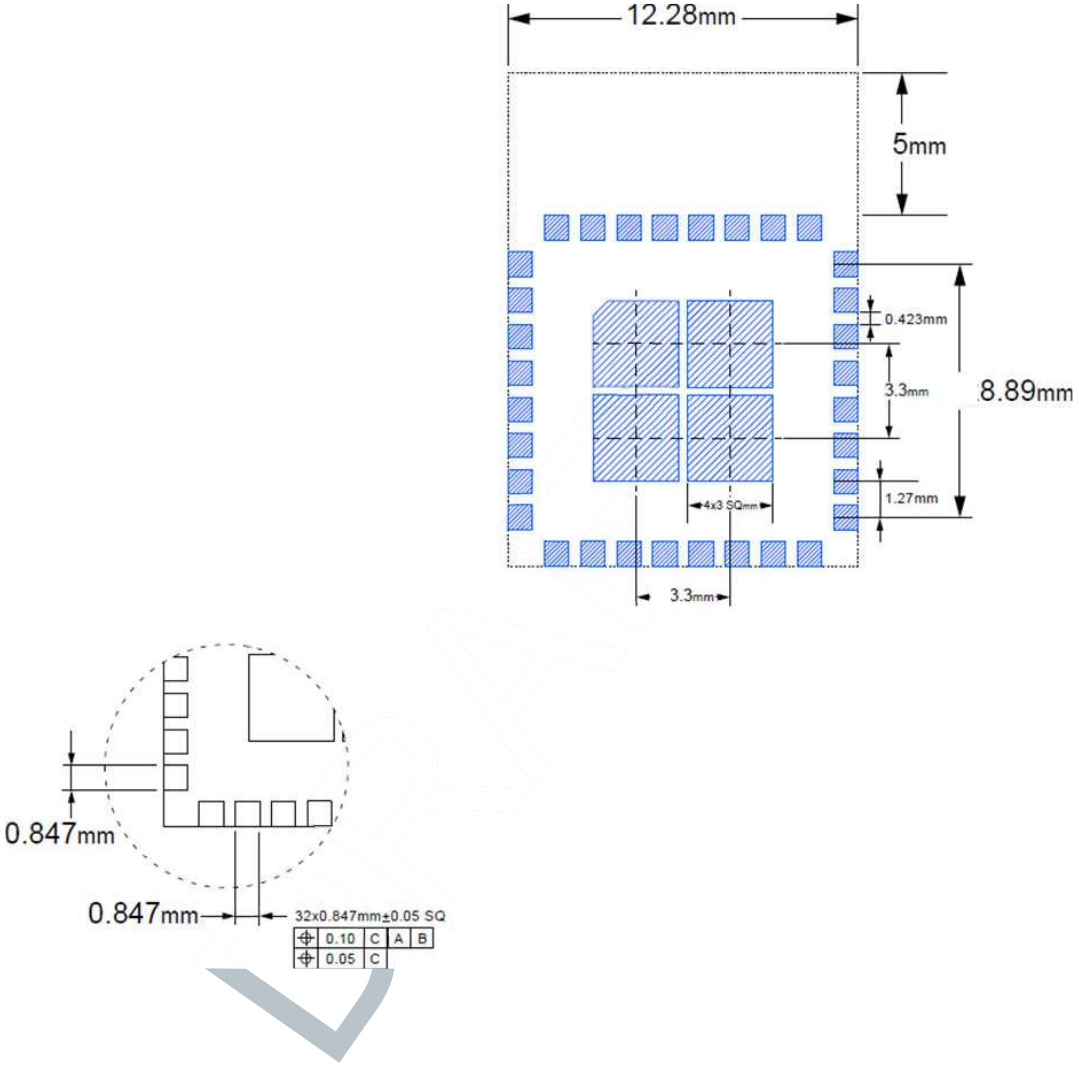
Figure 8. **ST67W611M1 LGA module PCB antenna landing pad**



5.1.2 ST67W611M1 LGA module antenna connector

Figure 9. ST67W611M1 LGA module antenna connector dimension

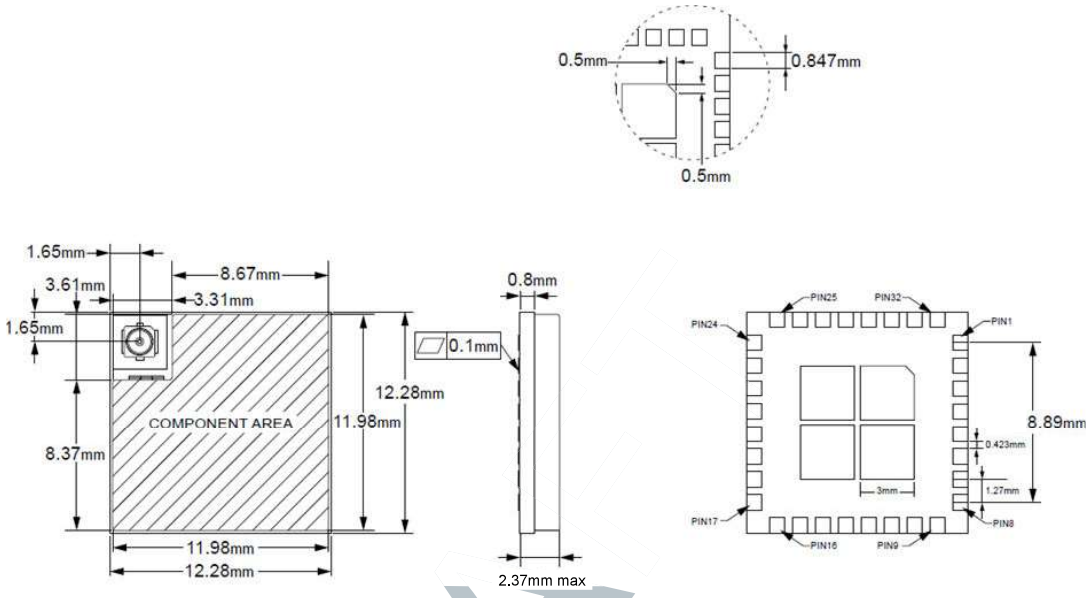
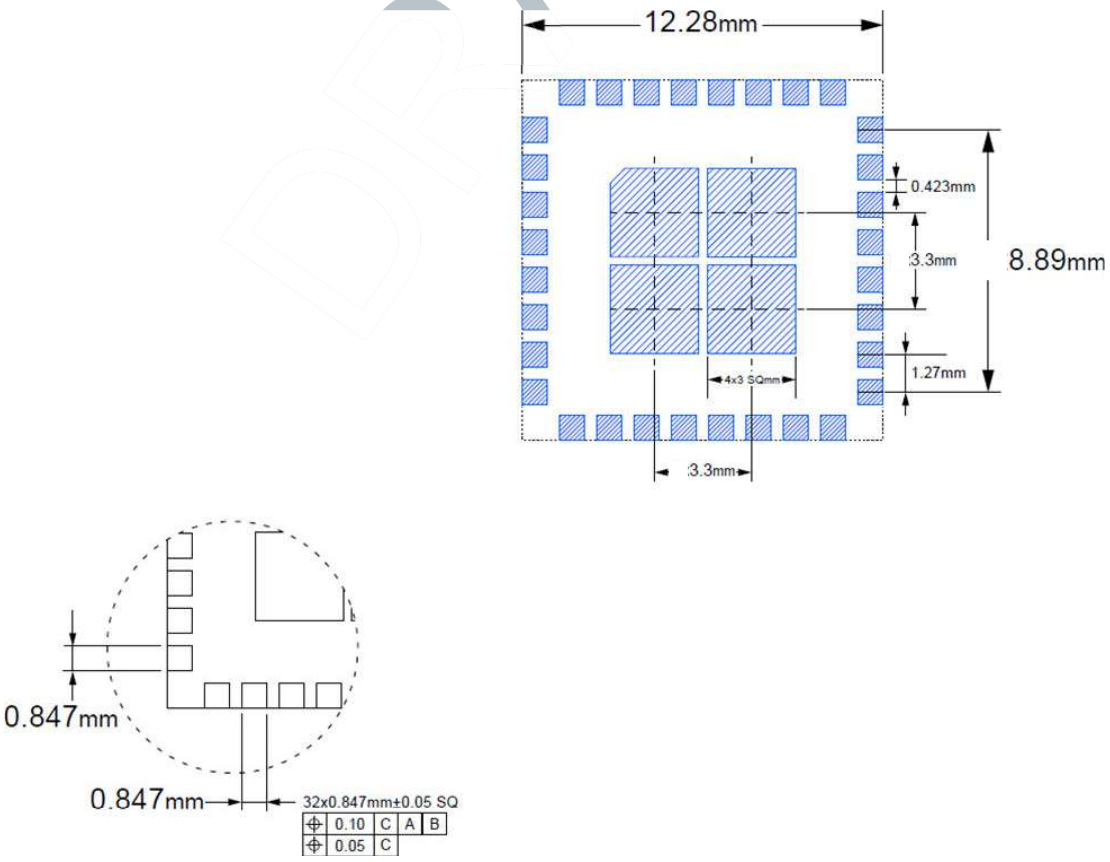


Figure 10. ST67W611M1 LGA module antenna connector landing pad



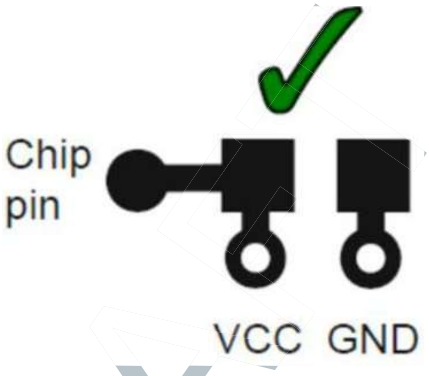
6 Manufacturing guidelines

6.1 Power layout guideline

The ST67W611M1 can be powered by either a 3 V battery or a DC 3.3 V power supply. To ensure proper operation, follow these guidelines for power pin connections and decoupling:

1. Place the capacitor as close as possible to the chip and the power pin.
2. Use a capacitor to decouple the power supply from the chip.
3. Use capacitors to prevent noise from coupling back to the power plane.

Figure 11. Power layout guideline



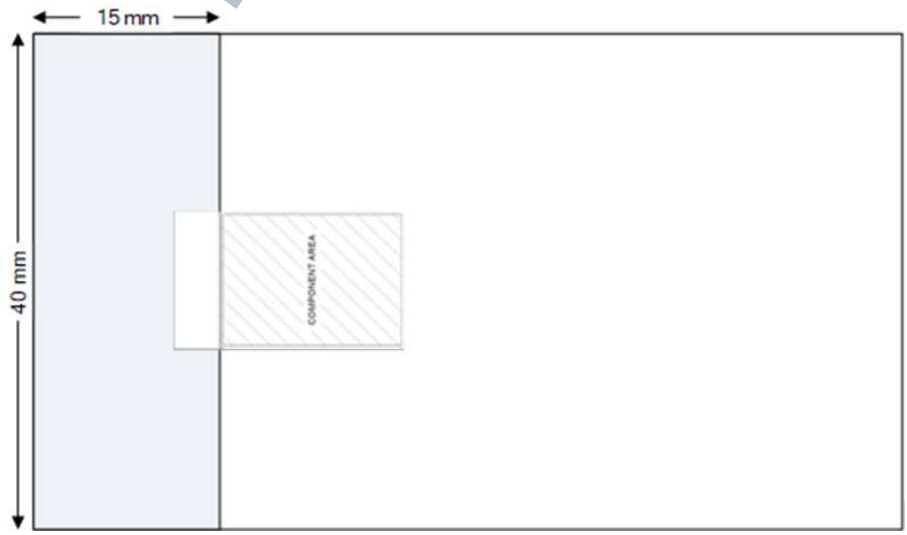
DT75615V1

6.2 RF layout guideline

To optimize antenna performance, follow these guidelines for placing ST67W611M1 on the PCB:

1. Place ST67W611M1 in the corner of the PCB as shown in Figure 12.
2. Do not cover the antenna clearance area with copper or traces.
3. Keep the antenna area as far away as possible from the power supply and metal components.
4. Connect all GND pins directly to a solid GND plane.
5. Place GND vias as close as possible to the GND pin.
6. Use a good layout method to avoid excessive noise coupling with signal lines or supply voltage lines.

Figure 12. RF layout guideline



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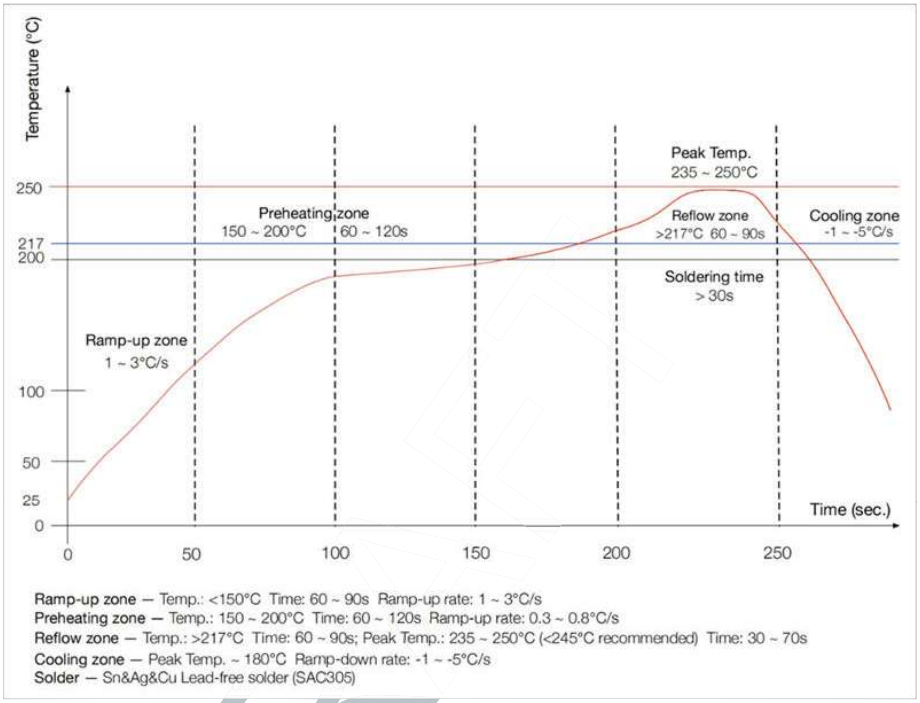
6.3 Soldering guideline

ST67W611M1 can be SMT on the board following the temperature curve graph.

Figure 13. Soldering guideline



DT75617V1

7 Tape and reel information

All tape carrier systems conform to EIA-481 standards.

The following figure shows the simplified sketch of the ST67W611M1 tape carrier including the part orientation, maximum number of devices per reel, and key dimensions

Figure 14. Carrier tape drawing with part orientation

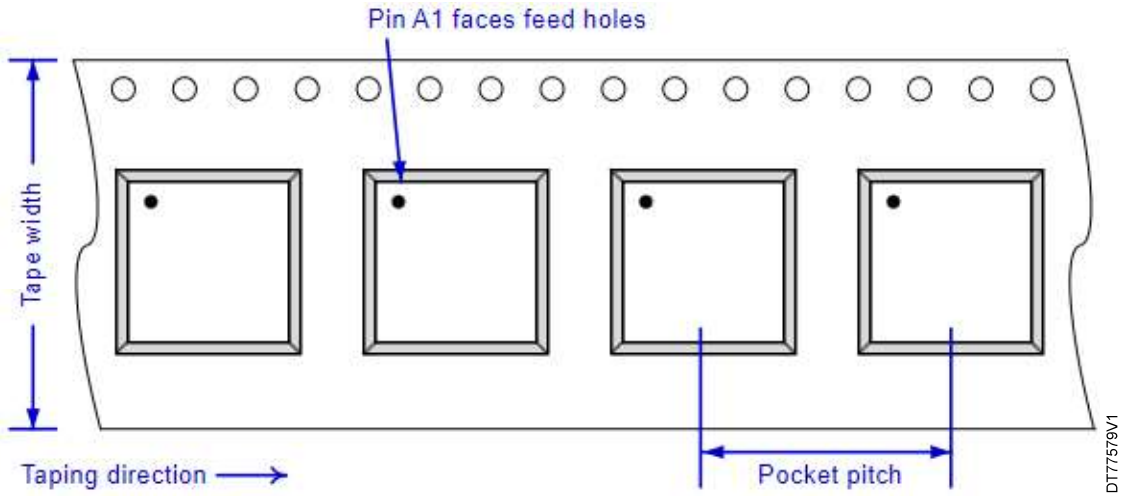


Table 17. ST67W611M1A6B

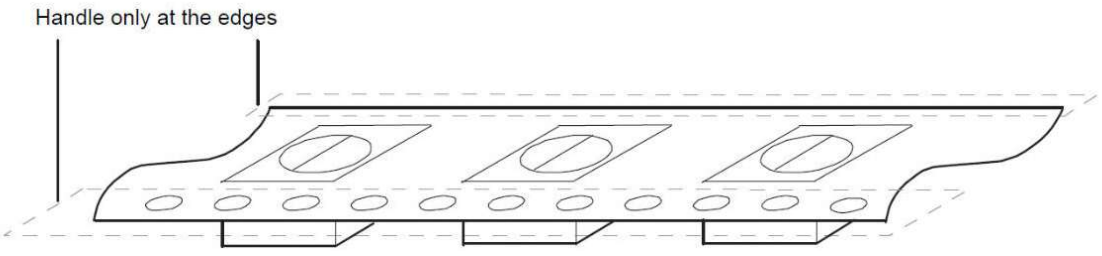
Tape feed: Single	Reel diameter: 330 mm	Tape width: 32 mm
Units per reel: 800	Hub diameter: 178 mm	Pocket pitch: 20 mm

Table 18. ST67W611M1A6U / ST67W611M1A6P

Tape feed: Single	Reel diameter: 330 mm	Tape width: 24 mm
Units per reel: 800	Hub diameter: 178 mm	Pocket pitch: 20 mm

The following figure shows the tape-handling recommendation.

Figure 15. Tape handling



8 Device moisture sensitivity level

A package's moisture sensitivity level (MSL) indicates its ability to withstand exposure after it is removed from its shipment bag, while it is on the factory floor awaiting PCB installation. A low MSL rating is better than a high rating; a low MSL device can be exposed on the factory floor longer than a high MSL device. All pertinent MSL ratings are summarized in Table 19.

Table 19. MSL ratings summary

MSL	Out-of-bag floor life	Comments
1	Unlimited	≤ 30°C/85% RH
2	1 year	≤ 30°C/60% RH
2a	4 weeks	≤ 30°C/60% RH
3	168 hours	≤ 30°C/60% RH; ST67W611M1
4	72 hours	≤ 30°C/60% RH
5	48 hours	≤ 30°C/60% RH
5a	24 hours	≤ 30°C/60% RH
6	Mandatory bake before use. After baking, it must be reflowed within the time limit specified on the label.	≤ 30°C/60% RH

ST follows the latest IPC/JEDEC J-STD-020 standard revision for moisture-sensitivity qualification. The ST67W611M1 devices are targeted as MSL3.

9 Bagged storage conditions

ST67W611M1 devices delivered in tape and reel carriers must be stored in sealed, moisture barrier, antistatic bags.

10 Handling

Tape handling is described in Tape and reel information. For other (IC-specific) handling guidelines, see the following topics.

10.1 Baking

It is not necessary to bake the ST67W611M1 if the conditions specified in Bagged storage conditions and Out-of-bag duration have not **been exceeded**.

It is necessary to bake the ST67W611M1 if any condition specified in Bagged storage conditions or Out-of-bag duration has **been exceeded**. The baking conditions are specified on the moisture-sensitive caution label attached to each bag.

Caution: *If baking is required, the devices must be transferred into trays that can be baked to at least 125°C. Do not bake devices in tape and reel carriers at any temperature.*

10.2 Electrostatic discharge

Electrostatic discharge (ESD) occurs naturally in laboratory and factory environments. An established high-voltage potential is always at risk of discharging to a lower potential. If this discharge path is through a semiconductor device, destructive damage may result. ESD countermeasures and handling methods must be developed and used to control the factory environment at each manufacturing site.

11 Ordering information

Table 20. Ordering information

Order code	Package	Delivery mode
ST67W611M1A6BTR	32 pin LGA	Tape and reel, 800 units per reel
ST67W611M1A6UTR		

12 FCC- ISED compliance statement

FCC Part 15 compliance statement

Changes or modifications not expressly approved by STMicroelectronics could void the user's authority to operate the 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.

FCCID: YCP-67W611M1A01

Product Marketing Name: ST67W611M1A

Models Name: ST67W611M1A

- Applicable FCC rules: Thismodule has been approved under FCC part 15C 15.247 in the frequency range 2400-2483.5MHz. This modular transmitter is only FCC authorized for this specific rule part.
- Specific operational use conditions:
  - The module is limited to OEM installation ONLY.
  - Only the module grantee is permitted to make permissive changes.
  - The OEM integrator is responsible for ensuring that the end-user has no manual instruction to remove or install module.
- Limited module procedures are not applicable to this application.
- Trace antenna: Not applicable
- Radio Frequency (RF) Exposure Compliance of Radio communication: To satisfy FCC RF Exposure requirements, a separation distance of 20cm or more should be maintained between the antenna of this device and persons during operation. To ensure compliance, operation at a closer distance than this is not recommended. This transmitter must not be co- located or operating in conjunction with any other antenna or transmitter.
- List of antenna type approved for ST67W611M1A6U :
  - External PIFA, max antenna gain: 3.19dBi
  - External dipole, max antenna gain: 3.37dBi
  - External monopole, max antenna gain: 3.12dBi
    If other antenna with higher gain or other antennas type, other than the type documented in the filing, a class 2 permissive change must be filed with FCC
- End Product Labeling: The final end product must be labeled in a visible area with the following: *"Contains Transmitter Module FCC ID: YCP-67W611M1A01"*
- End Product User's Manual: The user manual for end users must include the following information in a prominent location: *To satisfy FCC RF Exposure requirements, a separation distance of 20cm or more should be maintained between the antenna of this device and persons during operation. To ensure compliance, operation at a closer distance than this is not recommended. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.*
- Additional testing requirements:
  If testing of the host product with this transmitter installed and operating is necessary (to verify that the host product meets all the applicable FCC rules), a test mode for this specific module is available upon request to STMicroelectronics.
- The host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. (For example, Part 15 Subpart B)

ISED- Industry Canada Licence-Exempt Radio Apparatus

IC: 8976A-67W611M1A01

Product Marketing Name: ST67W611M1A

HVIN: ST67W611M1A6B & ST67W611M1A6U & ST67W611M1A6P

Note: ST67W611M1A6B & ST67W611M1A6U & ST67W611M1A6P models share this same user's manual because these two models belong to the same hardware family of the ST67W611M1A module.

This device contains licence-exempt transmitter(s)/receivers(s) that comply with Innovation, Science and EconomicDevelopment Canda's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference
2. This device must accept any interference, including interference that may cause undesired operation of the device.

- Applicable ISED-CANADA rules: Thismodule has been approved under RSS-247 in the frequency range 2400-2483.5MHz. This modular transmitter is only ISED authorized for this specific rule part.
- Specific operational use conditions:
  - The module is limited to OEM installation ONLY.
  - Only the module grantee is permitted to make permissive changes.
  - The OEM integrator is responsible for ensuring that the end-user has no manual instruction to remove or install module.
- Limited module procedures are not applicable to this application.
- Trace antenna: Not applicable.
- Radio Frequency (RF) Exposure Compliance of Radio communication: To satisfy ISED-Canada RF Exposure requirements, a separation distance of 20cm or more should be maintained between the antenna of this device and persons during operation. To ensure compliance, operation at a closer distance than this is not recommended. This transmitter must not be co- located or operating in conjunction with any other antenna or transmitter.
- This radio transmitter IC: 8976A-67W611M1A01 has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.
  List of antenna type approved for ST67W611M1A6U:
  - External PIFA, max antenna gain: 3.19dBi
  - External dipole, max antenna gain: 3.37dBi
  - External monopole, max antenna gain: 3.12dBi

  If other antenna with higher gain or other antennas type, other than the type documented in the filing, a class 2 permissive change must be filed with ISED-Canada.
- End Product Labeling: The final end product must be labeled in a visible area with the following: *Contains Transmitter Module IC: 8976A-67W611M1A01"*
- End Product User's Manual: The user manual for end users must include the following information in a prominent location: *To satisfy ISED-Canada RF Exposure requirements, a separation distance of 20cm or more should be maintained between the antenna of this device and persons during operation. To ensure compliance, operation at a closer distance than this is not recommended. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter*.
- Additional testing requirements:
  If testing of the host product with this transmitter installed and operating is necessary (to verify that the host product meets all the applicable ISED-Canada rules), a test mode for this specific module is available upon request to STMicroelectronics.
- The host product manufacturer is responsible for compliance to any other ISED-Canada rules that apply to the host not covered by the modular transmitter grant of certification. (For example, ICES-003)

ISED- Industry Canada Licence-Exempt Radio Apparatus

IC: 8976A-67W611M1A01

Nom de marque du produit: ST67W611M1A

NIVM: ST67W611M1A6B & ST67W611M1A6U & ST67W611M1A6P

Remarque : les modèles ST67W611M1A6B & ST67W611M1A6U & ST67W611M1A6P partagent ce même manuel d'utilisation car ces deux modèles appartiennent à la même famille matérielle du module ST67W611M1A.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence.
L'exploitation est autorisée aux deux conditions suivantes :

1. L'appareil ne doit pas produire de brouillage;
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

- Règles ISED-CANADA applicables : Ce module a été approuvé suivant la norme RSS-247 dans la gamme de fréquences 2400-2483.5MHz. Cet émetteur modulaire est uniquement autorisé par ISDE pour cette partie de règle spécifique.
- Conditions opérationnelles spécifiques d'utilisation :
  - Le module est limité à l'installation OEM uniquement.
  - Seul le titulaire de la certification du module est autorisé à apporter des modifications permissives.
  - L'intégrateur OEM est responsable de s'assurer que l'utilisateur final ne dispose d'aucune instruction pour retirer ou installer le module.
- Les procédures de module limité ne sont pas applicables à cette application.
- Conception de la piste d'antenne : Non applicable
- Conformité des communications radio en matière d'exposition aux radiofréquences (RF) : Pour satisfaire aux exigences d'ISDE-Canada en matière d'exposition aux radiofréquences, une distance de séparation de 20 cm ou plus doit être maintenue entre l'antenne de cet appareil et les personnes pendant le fonctionnement. Pour assurer la conformité, il est déconseillé d'utiliser cet équipement à une distance inférieure. Cet émetteur ne doit pas être co-situé ou fonctionner conjointement avec une autre antenne ou un autre émetteur.
- Cet émetteur radio 8976A-67W611M1A01 a été approuvé par Innovation, Sciences et Développement Economique Canada pour fonctionner avec les types d'antennes énumérés ci-dessous, avec le gain maximal autorisé indiqué. Les types d'antennes non inclus dans cette liste, ou qui ont un gain supérieur au gain maximal indiqué pour tout type répertorié sont strictement interdits pour une utilisation avec cet appareil.
  Liste des types d'antennes approuvés :
  - Antenna PIFA, gain maximal : 3.19dBi
  - Antenne dipole, gain maximal : 3.37dBi
  - Antenna monopole, gain maximal : 3.12dBi

  Si d'autres antennes avec un gain plus élevé ou d'un autre type d'antenne, autre que le type documenté dans le dossier, un changement permissif de classe 2 doit être déposé auprès d'ISDE-Canada.
- Étiquetage du produit final : Le produit final doit être étiqueté dans une zone visible avec les éléments suivants : « Contient IC : 8976A-67W611M1A01 »
- Manuel de l'utilisateur du produit final : le manuel de l'utilisateur destiné aux utilisateurs finaux doit inclure les informations suivantes dans un endroit bien en vue :
  Pour satisfaire aux exigences d'ISDE-Canada en matière d'exposition aux RF, une distance de séparation de 20 cm ou plus doit être maintenue entre l'antenne de cet appareil et les personnes pendant le fonctionnement. Pour garantir la conformité, il n'est pas recommandé d'opérer à une distance plus courte que celle-ci. Cet émetteur ne doit pas être colocalisé ou fonctionner en conjonction avec une autre antenne ou émetteur.
- Exigences de tests supplémentaires :
  Si un test du produit hôte avec cet émetteur installé et opérationnel est nécessaire (pour vérifier que le produit hôte répond à toutes les règles applicables d'ISDE-Canada), un mode de test pour ce module spécifique est disponible sur demande à STMicroelectronics.
- Le fabricant du produit hôte est responsable du respect de toutes les autres règles ISDE applicables à l'hôte non couvertes par l'octroi de certification de l'émetteur modulaire. (Par exemple, ICES-003)

13 RED Compliance Statement

Déclaration de conformité CE simplifiée

STMicroelectronics déclare que l'équipement radioélectrique du type "ST67W611M1A6B & ST67W611M1A6U & ST67W611M1A6P" est conforme à la directive 2014/53/UE.

Bande de fréquence utilisée en transmission et puissance maximale rayonnée dans cette bande :

- Bande de fréquence : 2400-2483.5 MHz
- Puissance maximale : 100mW p.i.r.e

Simplified EC compliance statement

Hereby, STMicroelectronics declares that the radio equipment type "ST67W611M1A6B & ST67W611M1A6U & ST67W611M1A6P " is in compliance with Directive 2014/53/EU.

Frequency range used in transmission and maximal radiated power in this range:

- Frequency range: 2400-2483.5 MHz (Bluetooth®)
- Maximal power: 100mW e.i.r.p

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Revision history

Table 21. **Document revision history**

Date	Revision	Changes
19-Mar-2025	1	Initial release.
03-Jun-2025	2	First public release. Updated: • Cover page and product status table • Section Features • Section 2: Description • Section 1: Introduction • Section 3.1: Pinout schematics • Section 3.2: Pin description • Section 4.4: Power-on sequence • Section 4.5: Shutdown sequence • Section 4.7: WLAN RF characteristics • Section 4.8: Power consumption • Section 5.1.1: ST67W611M1 LGA module PCB antenna (-B version) • Section 5.1.2: ST67W611M1 LGA module antenna connector • Section 6.1: Power layout guideline Added Section 2.1: UART interface and Section 2.2: SPI interface. Removed "Bluetooth® LE RF performance" section.
16-Jun-2025	3	Updated Section Features and Section 2: Description. Added: • Section 4.2: Electrical sensitivity characteristics • Section 7: Tape and reel information • Section 8: Device moisture sensitivity level • Section 9: Bagged storage conditions • Section 10: Handling • Section 10.1: Baking • Section 10.2: Electrostatic discharge
30-Jul-2025	4	Updated: • Section 3.1: Pinout schematics • Section 3.2: Pin description • Section 4.7: WLAN RF characteristics • Section 12: FCC- ISED compliance statement and Section 13: RED Compliance Statement to add ST67W611M1A6P

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