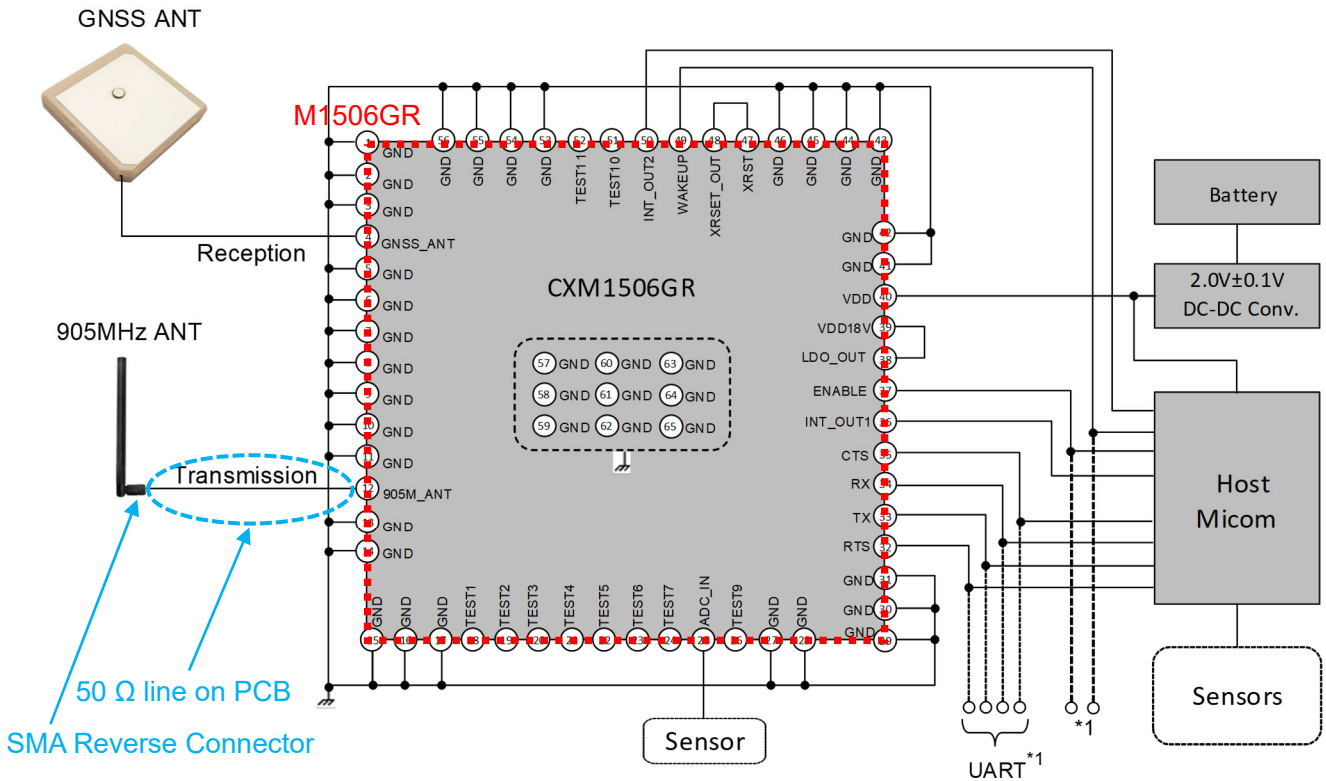


M1506GR User Manual



Application Block Diagram

M1506GR is installed into the printed circuit board (PCB) of the application by reflow soldering process. LPWA output (“905M_ANT” pin) is connected to the antenna (SMA Reverse Connector) with 50 Ω line on PCB.

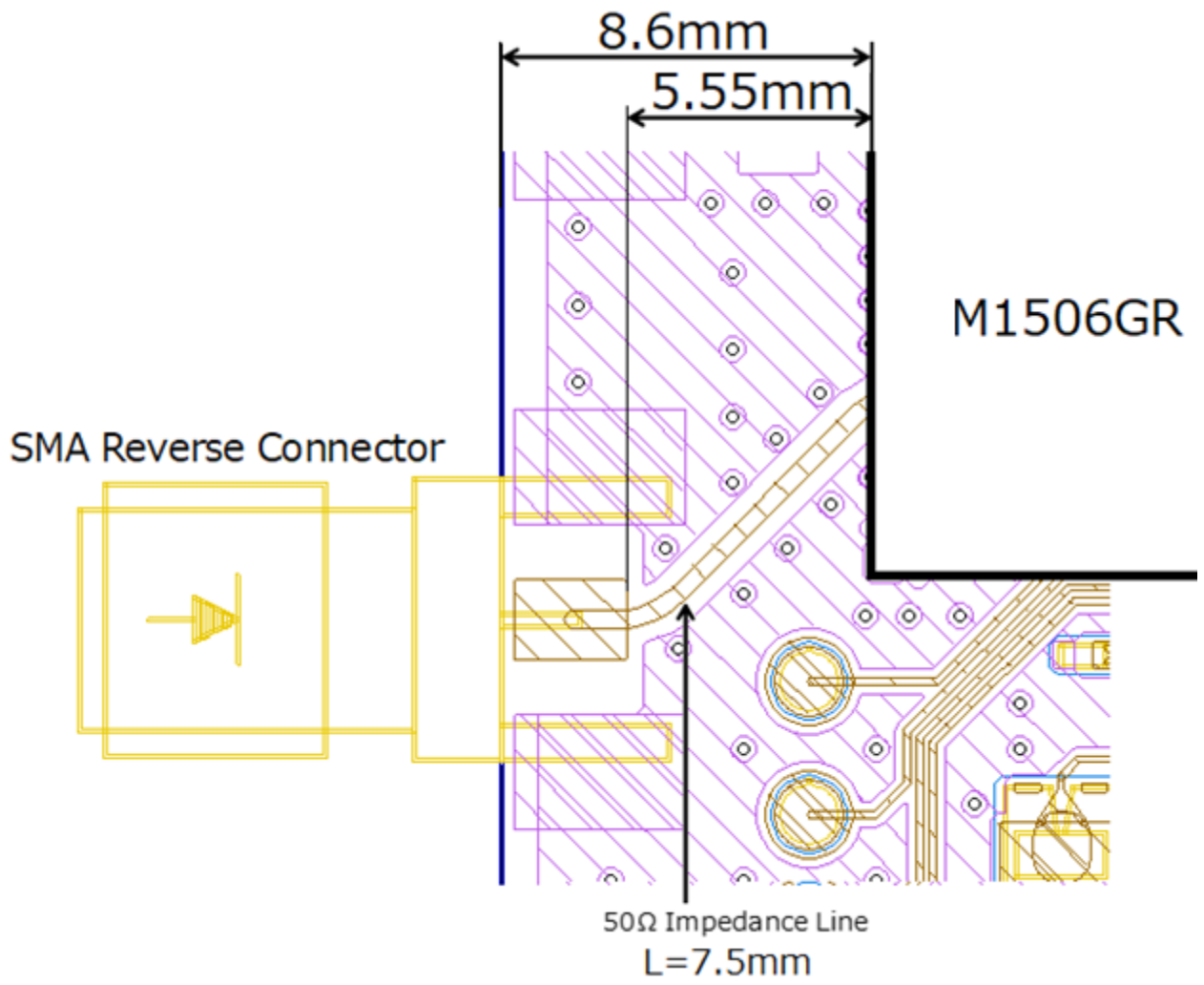
Antenna Information

- Frequency: 860~928 (MHz)
- Antenna type: monopole antenna ($\lambda/2$)
- Maximum absolute gain: 3 dBi or less
- Impedance: 50 Ω
- Connector type: SMA-P (REVERSE)

PCB Information

- Thickness: 1.6 mm (4-Layers)
- Dielectric constant: 4.3

PCB Layout (from "905M ANT" pin to antenna connector)



FCC and IC Regulatory Statements

FCC ID and IC Number

US / FCC	CANADA / IC
AK8M1506GR	409B-M1506GR

The following information must be indicated on the host device of this module;

[for FCC]

Contains Transmitter Module FCC ID: AK8M1506GR

or

Contains FCC ID: AK8M1506GR

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.

*If it is difficult to describe this statement on the host product due to the size, please describe in the User's manual.

[for ISED]

Contains IC: 409B-M1506GR

The following statements must be described on the user manual of the host device of this module;

[for 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.

FCC CAUTION

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines.

This equipment should be installed and operated keeping the radiator at least 20cm or more away from person's body.

[for ISED]

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada'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.

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.

This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment and meets RSS-102 of the ISED radio frequency (RF) Exposure rules.
This equipment should be installed and operated keeping the radiator at least 20cm or more away from person's body.

Cet équipement est conforme aux limites d'exposition aux rayonnements énoncées pour un environnement non contrôlé et respecte les règles d'exposition aux fréquences radioélectriques (RF) CNR-102 de l'ISDE. Cet équipement doit être installé et utilisé en gardant une distance de 20 cm ou plus entre le radiateur et le corps humain.

This radio transmitter (409B-M1506GR) 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.

Antenna type	Gain	Impedance
$\lambda/2$ monopole antenna	3 dBi	50 ohm

Le présent émetteur radio (409B-M1506GR) a été approuvé par Innovation, Sciences et Développement économique Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué pour tout type figurant sur la liste, sont strictement interdits pour l'exploitation de l'émetteur.

Type d'antenne	Gain	l'impédance
$\lambda/2$ antenne monopôle	3 dBi	50 ohm

FCC KDB 996369 D03 OEM Manual v01 rule sections

2.1 「General」 : Applicable

This user manual describes the integration procedure per Sec. 2.2 to 2.12 of KDB 996369 D03.

2.2 「List of applicable FCC rules」 : Applicable

This device complies with below part 15 of the FCC Rules.

Part 15 Subpart C

2.3 「Summarize the specific operational use conditions」 : Not applicable

2.4 「Limited module procedures」 : Not applicable

2.5 「Trace antenna designs」 : Applicable

M1506GR is installed into the printed circuit board (PCB) of the application by reflow soldering process.

LPWA output ("905M_ANT" pin) is connected to the antenna (SMA Reverse Connector) with 50 Ω line on PCB.

Antenna Information

Frequency: 860~928 (MHz)

Antenna type: monopole antenna ($\lambda/2$)

Maximum absolute gain: 3 dBi or less

Impedance: 50 Ω

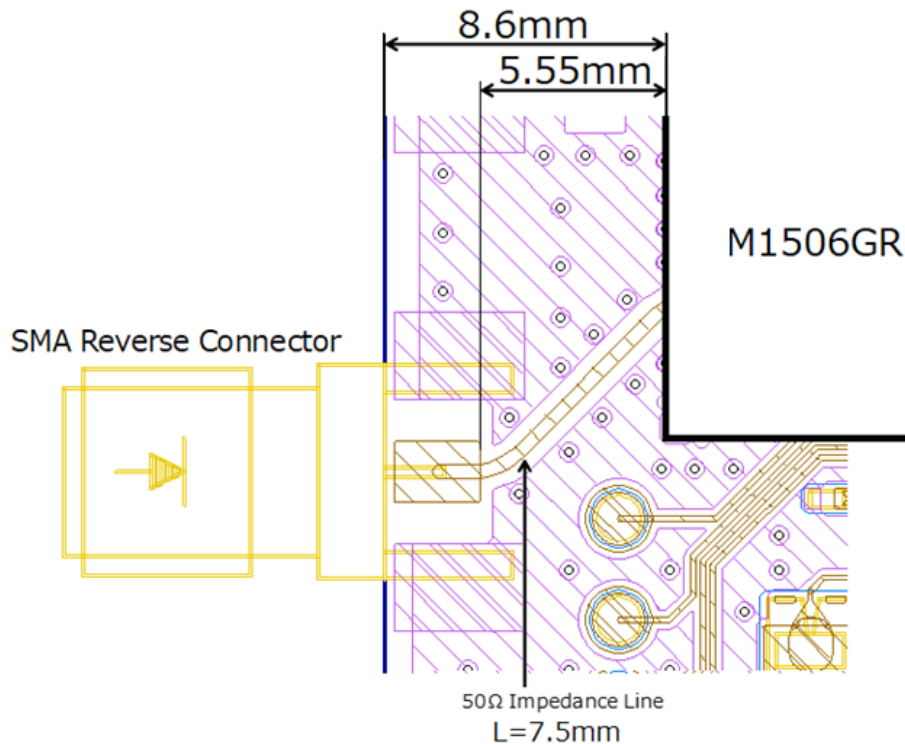
Connector type: SMA-P (REVERSE)

PCB Information

Thickness: 1.6 mm (4-Layers)

Dielectric constant: 4.3

PCB Layout (from "905M ANT" pin to antenna connector)



Fine tuning of return loss etc. can be performed using a matching network. However, it is required to check "Class1 change" and "Class2 change" which the authorities define then.

2.6 「RF exposure considerations」 : Applicable

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines. This equipment should be installed and operated keeping the radiator at least 20cm or more away from person's body.

2.7 「Antennas」 : Applicable

The device is designed to use the antennas listed below. Do not modify the antenna or any other part of the module. Any modifications will invalidate the modular certifications and require new approvals for the host system.

Model No.	Antenna Type	Antenna Gain
T13-047-1039	$\lambda/2$ monopole antenna	3 dBi

2.8 「Label and compliance information」 : Applicable

Following information must be indicated on the host device of this module.

Contains Transmitter Module FCC ID: AK8M1506GR

or

Contains FCC ID: AK8M1506GR

2.9 「Information on test modes and additional testing requirements」 : Applicable

Test modes should take into consideration different operational conditions for a stand-alone modular transmitter in a host, as well as for multiple simultaneously transmitting modules or other transmitters in a host product.

2.10 「Additional testing, Part 15 Subpart B disclaimer」 : Applicable

The modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant (Part 15 Subpart C), and 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.

The final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

2.11 「Note EMI Considerations」 : Applicable

We recommend to use "best practice" RF design engineering testing and evaluation in case non-linear interactions generate additional non-compliant limits due to module placement to host components or properties. The host manufacturer is responsible for ensuring compliance with the applicable FCC rules for the transmitters operating individually and simultaneously. This includes compliance for the summation of all emissions from all outputs occupying the same or overlapping frequency ranges, as defined by the applicable rules.

2.12 「How to make changes」 : Applicable

Only the grantee is permitted to make permissive changes. Please contact us at the address below.

<https://www.sony-semicon.com/en/contact/index.html>