

Ericsson Enterprise Wireless Solutions, Inc.

➤ GENERAL PRODUCT DESCRIPTION

The document describes RG650V-NA RF and hardware interfaces which are connected to your applications. This document can help you quickly understand interface specifications, RF characteristics, electrical and mechanical details, as well as other information of the module.

This module is not for sale and the user manual integration instructions are internal confidential manufacturing documents.

➤ Product Overview

RG650V-NA	
Packaging type	LGA
Pin counts	519
Dimensions	(46.0 ±0.2) mm × (53.0 ±0.2) mm × (3.05 ±0.2) mm
Weight	Approx. 17.3 g
Wireless Network Type	
5G NR	n2/n5/n7/n12/n13/n14/n25/n26/n29/n30/ n38/n41/n48/n66/n70/n71/n77/n78
LTE-FDD	B2/B4/B5/B7/B12/B13/B14/B17/B25/B26/ B29/B30/B66/B71
LTE-TDD	B38/B41/B42/B43/B48
WCDMA	-
GNSS (Optional)	GPS/GLONASS/BDS/Galileo/QZSS

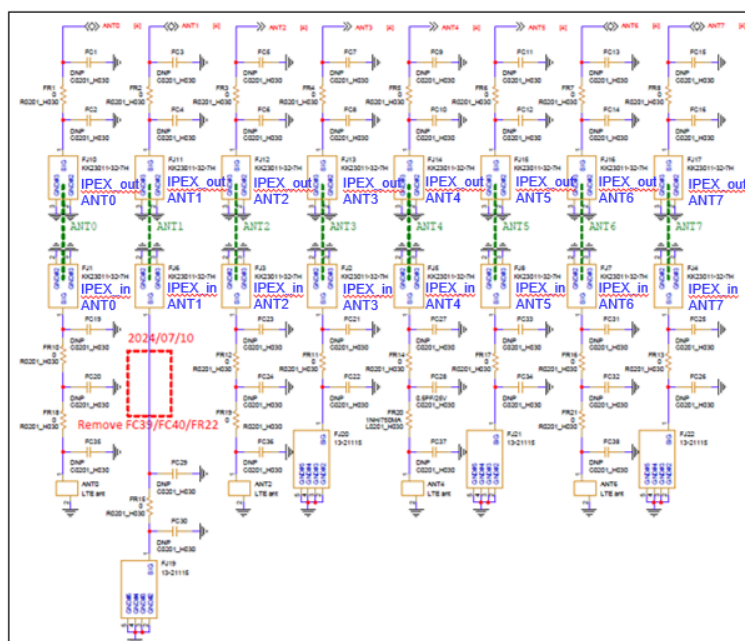
Feature	Details
Supply Voltage	3.3–4.4 V - Typ.: 3.8 V
SMS	- Text and PDU mode - Point-to-point MO and MT - SMS cell broadcast - SMS storage: ME by default
USB Interface	- Complies with USB 3.1 and 2.0 specifications - Data rates: - USB 2.0: up to 480 Mbps - USB 3.1 Gen 1: up to 5 Gbps - USB 3.1 Gen 2: up to 10 Gbps - Use: AT command communication, data transmission, GNSS NMEA sentence output, software debugging, firmware upgrade and voice over USB* - USB serial drivers for USB drivers under Windows 7/8.1/10/11, Linux 2.6–6.5 and Android 4.x–13.x - Supports OTG function*
Forced Download Interface	USB_BOOT
(U)SIM Interfaces	(U)SIM1: 1.8/3.0 V (U)SIM; (U)SIM2: 1.8 V eSIM - Dual SIM Single Standby - Complies with ETSI and IMT-2000 requirements

- Normal operating temperature ⁶: -30 °C to +75 °C
- Extended operating temperature ⁷: -40 °C to +85 °C
- Storage temperature: -40 °C to +90 °C

- Layout of trace design, parts, antenna, connectors, and isolation requirements.

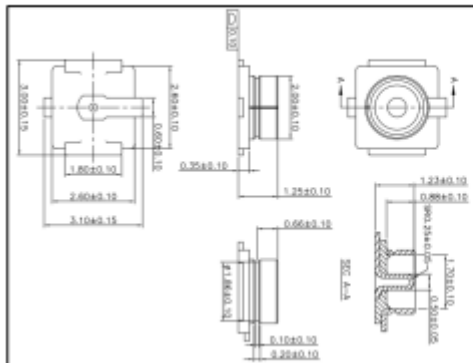
Trace

The antenna port is configured to use an SMA connector, resulting in a router trace length greater than 6.5 mm



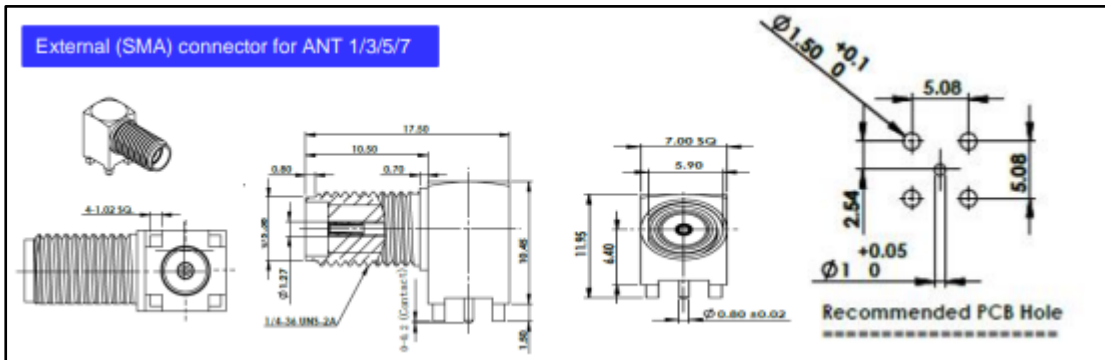
- IPEX connector with module ANT 0/1/2/3/4/5/6/7 & GNSS port

IPEX connector with Quectel RG650V-NA ANT 0/1/2/3/4/5/6/7 & GNSS



- External (SMA type) connectors with ANT 1/3/5/7

External (SMA) connector for ANT 1/3/5/7



FCC

Important Notice to OEM integrators

1. This module is limited to OEM installation ONLY.
2. This module is limited to installation in mobile or fixed applications, according to Part 2.1091(b).
3. The separate approval is required for all other operating configurations, including portable configurations with respect to Part 2.1093 and different antenna configurations.
4. For FCC Part 15.31 (h) and (k): The host manufacturer is responsible for additional testing to verify compliance as a composite system. When testing the host device for compliance with Part 15 Subpart B, the host manufacturer is required to show compliance with Part 15 Subpart B while the transmitter module(s) are installed and operating. The modules should be transmitting and the evaluation should

confirm that the module's intentional emissions are compliant (i.e. fundamental and out of band emissions). The host manufacturer must verify that there are no additional unintentional emissions other than what is permitted in Part 15 Subpart B or emissions are complaint with the transmitter(s) rule(s).

The Grantee will provide guidance to the host manufacturer for Part 15 B requirements if needed.

Important Note

Notice that any deviation(s) from the defined parameters of the antenna trace, as described by the instructions, require that the host product manufacturer must notify Ericsson that they wish to change the antenna trace design. In this case, a Class II permissive change application is required to be filed by the USI, or the host manufacturer can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application.

End Product Labeling

When the module is installed in the host device, the FCC ID label must be visible through a window on the final device or it must be visible when an access panel, door or cover is easily re-moved. If not, a second label must be placed on the outside of the final device that contains the following text: "Contains FCC ID: UXX-2024RG650VNA" The FCC ID can be used only when all FCC compliance requirements are met.

Antenna Installation

- (1) The antenna must be installed such that 20 cm is maintained between the antenna and users,
- (2) Co-location of this module with other transmitters that operate simultaneously requires evaluation using the FCC multi-transmitter procedures.
- (3) Only antennas with equal or less gains as shown below may be used with this module. Other types of antennas and/or higher gain antennas may require additional authorization for operation.

Band	max gain allowed (dBi)
Band 2/ n2	5.0
Band 4	4.0
Band 5/ n5	6.4

Band 7/ n7	5.0
Band 12/ n12	5.4
Band 13/ n13	9.1
Band 14/ n14	9.1
Band 17	5.4
Band 25/ n25	5.0
Band 26/ n26	6.4
Band 30/ n30	3.9
Band 38/ n38	5.0
Band 41/ n41	5.0
Band 42	4.0
Band 43	4.0
Band 48/ n48	4.0
Band 66/ n66	4.0
n70	4.0
n77 (3450-3550MHz)	4.0
n77 (3700-3980MHz)	4.0
n78 (3450-3550MHz)	4.0
n78 (3700-3800MHz)	4.0
Band 71/ n71	5.4

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC/IC 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/IC 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 show in this manual.

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.

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

List of applicable FCC rules

This module has been tested and found to comply with part 22, part 24, part 27, part 90 and part 96 requirements for Modular Approval.

The modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant, and that 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. If the grantee markets their product as being Part 15 Subpart B compliant (when it also contains unintentional radiator digital circuitry), then the grantee shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

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.

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 20 cm between the radiator & your body.

IC

Industry Canada Statement

This device complies with Industry Canada's license-exempt RSSs. 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

Le présent appareil est conforme aux CNR d'Industrie 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, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement."

Radiation Exposure Statement

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 26 cm 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 26 cm de distance entre la source de rayonnement 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 such that 26 cm is maintained between the antenna and users, and 2) Co-location of this module with other transmitters that operate simultaneously requires evaluation using the IC multi-transmitter procedures.

As long as the 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 26 cm est respectée entre l'antenne et les utilisateurs, et
2) La colocalisation de ce module avec d'autres émetteurs fonctionnant simultanément nécessite une évaluation à l'aide des procédures multi-émetteurs IC. 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 requis pour ce module installé.

IMPORTANT NOTE:

In the event that these conditions cannot be met (for example certain laptop configurations or colocation with another transmitter), then the Canada 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 reevaluating 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 26 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: 6921A-024RG650VNA".

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 26 cm 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: 6921A-024RG650VNA".

Manual Information to the End User

The OEM integrator must 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.

Antenna Requirements

The following antennae were approved with the prototype:

This radio transmitter [6921A-024RG650VNA] has been approved by innovation, Science and development Economic Canada to operate with the types of antennas

listed below, with the maximum allowable gain indicated. The types of antennas not included in this list that have a gain of any type listed are strictly prohibited for use with this device.

Les antennes suivantes ont été approuvées avec le prototype:

Cet émetteur radio [6921A-024RG650VNA] a été approuvé par innovation, Science et développement économique 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 qui ont un gain tout type listé sont strictement interdits pour une utilisation avec cet appareil.

Band	Gain (dBi)
Band 2/ n2	5.0
Band 4	4.0
Band 5/ n5	5.3
Band 7/ n7	5.0
Band 12/ n12	7.8
Band 13/ n13	8.2
Band 14/ n14	8.2
Band 17	7.8
Band 25/ n25	5.0
Band 26/ n26	5.3
Band 30/ n30	6.0
Band 38/ n38	5.0
Band 41/ n41	5.0
Band 42	7.6
Band 43	7.6
Band 48/ n48	7.6
Band 66/ n66	4.0
n77 (3450-3900MHz)	7.6
n77 (3900-3980MHz)	7.6
n78 (3450-3800MHz)	7.6
Band 71/ n71	4.7