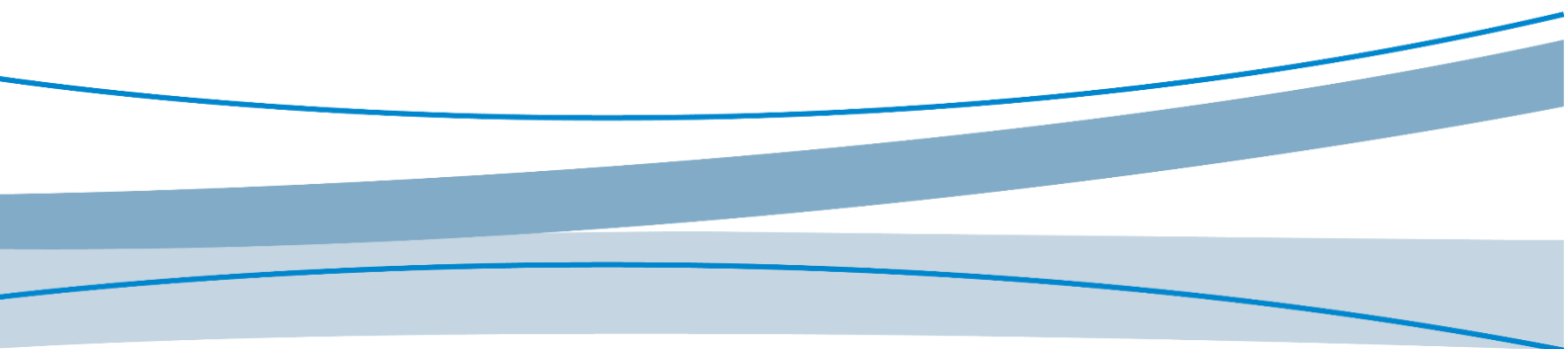




RW520-GL

Hardware Guide

V1.0



Disclaimer

Any action you take in the course of using this document is at your own risk, and Rolling Wireless shall not be liable for any damages or losses under any circumstances. Due to product version upgrade or other reasons, Rolling Wireless reserves the right to modify any information in this document at any time without prior notice and any responsibility. Unless otherwise agreed, all statements, information and suggestions in this document do not constitute any express or implied guarantee.

This document may include the third-party information covering products, services, software, data, and so on. Rolling Wireless does not control and assumes no responsibility for the third-party content, including but not limited to the accuracy, compatibility, reliability, availability, legitimacy, appropriateness, performance, non-infringement, and status update, unless otherwise specified in this document. Rolling Wireless does not provide any guarantee or authorization for the third-party content mentioned or referenced in this document. If you need a third-party license, obtain it in an authorized or legal way, unless otherwise specified in this document.

Copyright Notice

Copyright © 2024 Rolling Wireless S.a.r.l. All rights reserved.

Unless specially authorized by Rolling Wireless, the recipient of the documents shall keep the documents and information received confidential, and shall not use them for any purpose other than the implementation and development of this project. Without the written permission of Rolling Wireless, no unit or individual shall extract or copy part or all of the contents of this document without authorization, or transmit them in any form. Rolling Wireless has the right to investigate legal liabilities for any offense and tort in connection with violation of confidentiality obligations, or unauthorized use or malicious use of the said documents and information in other illegal forms.

Trademark Statement



The trademark is registered and owned by Rolling Wireless S.a.r.l.

Other trademarks, product names, service names and company names appearing in this document are owned by their respective owners.

Contact Information

Website: <https://www.rollingwireless.com>

Contents

1 Overview	2
1.1 Introduction.....	2
1.2 Specification	2
1.2.1 RF Characteristic	2
1.3 Key Features.....	3
2 Radio Frequency.....	5
2.1 RF Interface.....	5
2.1.1 RF Interface Functionality	5
2.2 Operating Band	5
3 FCC Conformance information	7
4 IC Conformance information	12

1 Overview

1.1 Introduction

RW520-GL (hereinafter referred to as RW520) is a highly integrated IOT wireless communication module which uses M.2 form factor interface. That support multi-mode such as LTE (LTE FDD Cat.M1), GSM (GSM, GPRS, EGPRS) and GNSS (GPS, GLONASS, Galileo, BEIDOU).

1.2 Specification

1.2.1 RF Characteristic

RW520 RF characteristic is shown in Table 1:

Table 1. RF characteristic

Operating Band	
FDD-LTE Cat.M1	B1/2/3/4/5/8/12/13/14/18/19/20/25/26/27/28/66/85
GSM	GSM850/GSM900/DCS1800/PCS1900
GNSS	GPS/GLONASS/Galileo/BDS
Data Throughput	
FDD-LTE Cat.M1	DL 375 Kbps/UL 1119 Kbps
GPRS/EGPRS (Multislot Class12)	GPRS: DL 107 Kbps/UL 85.6 Kbps
	EGPRS: DL 296 Kbps/UL 236.8kbps
Modulation Characteristic	
LTE Modulation	3GPP Release 14
	DL 16 QAM

UL 16 QAM

GSM Modulation

3GPP Release 12

1.3 Key Features

Table 2. Key features

Specification	
CPU	Qualcomm MDM-9205, 28nm process, ARM Cortex-A7, up to 800 MHz
Supported OS	Windows 11/Chrome /Linux
Power Supply	DC 3.135V to 3.63V, typical 3.3V
Temperature	Normal operating temperature: -30°C to +75°C
	Extended operating temperature: -35°C to +80°C ¹⁾
	Storage temperature: -40°C to +85°C
Physical Characteristics	Interface: M.2 Key-B
	Dimension: 22.0 mm × 42.0 mm × 2.3 mm
	Weight: about 4.0 g
Interface	
Antenna	WWAN Antenna × 1
Connector	GNSS Antenna × 1
Function Interface	I2C (Master Mode)
	USB 2.0 (For debug)
	eSIM(Internal)
	Device Mode Detection

W_DISABLE1# (Reserved)

W_DISABLE2# (Reserved)

WOWWAN# (Reserved)

DPR

LED

Tunable Antenna

Software

Protocol Stack IPV4/IPV6

AT Commands 3GPP TS 27.007 and 27.005

Firmware
Update USB2.0

Other Feature Multiple carrier



- 1) When temperature goes beyond normal operating temperature range of -30°C to +75°C, RF performance of module may be slightly off 3GPP specifications.

2 Radio Frequency

2.1 RF Interface

2.1.1 RF Interface Functionality

The RW520 module supports two RF connectors used for external antenna connection. As the Figure 12 shows, “M” is for Main antenna, used to receive and transmit RF signals; “G” is for GNSS antenna, used to receive the GNSS signals.

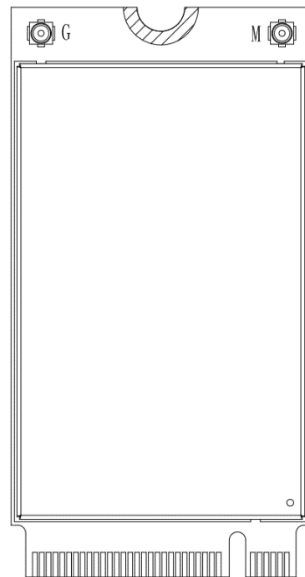


Figure 1. RF connectors

2.2 Operating Band

The operating bands of RW520 module are shown in the following table:

Operating Band	Description	Mode	Tx (MHz)	Rx (MHz)
Band 1	2100MHz	LTE FDD	1920-1980	2110-2170
Band 2	1900MHz	LTE FDD/PCS1900	1850-1910	1930-1990

Operating Band	Description	Mode	Tx (MHz)	Rx (MHz)
Band 3	1800MHz	LTE FDD/DCS1800	1710-1785	1805-1880
Band 4	1700MHz	LTE FDD	1710-1755	2110-2155
Band 5	850MHz	LTE FDD/GSM850	824-849	869-894
Band 8	900MHz	LTE FDD/GSM900	880-915	925-960
Band 12	700MHz	LTE FDD	699-716	729-746
Band 13	700MHz	LTE FDD	777-787	746-756
Band 14	700MHz	LTE FDD	788-798	758-768
Band 18	800MHz	LTE FDD	815-830	860-875
Band 19	800MHz	LTE FDD	830-845	875-890
Band 20	800MHz	LTE FDD	832-862	791-821
Band 25	1900MHz	LTE FDD	1850-1915	1930-1995
Band 26	850MHz	LTE FDD	814-849	859-894
Band 27	800MHz	LTE FDD	807-824	852-869
Band 28	700MHz	LTE FDD	703-748	758-803
Band 66	1700MHz	LTE FDD	1710-1780	2110-2180
Band 85	700MHz	LTE FDD	698-716	728-746
GPS L1	-	-	-	1575.42±1.023
GLONASS L1	-	-	-	1602.5625±4
BDS	-	-	-	1561.098±2.046
Galileo	-	-	-	1575.42±1.023

3 FCC Conformance information

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

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.

Important Notice to OEM integrators

1. This module is limited to OEM installation ONLY.

2. This module is limited to installation in mobile 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 to Rolling Wireless S.a r.l. 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 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: 2AX2URW520GL"

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) The transmitter module may not be co-located with any other transmitter or antenna.
- (3) Only antennas of the same type and 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.

In the event that these conditions cannot 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 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.

Antenna information

Band	Gain(dBi)	Type
GSM 850	3	PIFA / Monopole
GSM 1900	3	
LTE Band 2	3	
LTE Band 4	3	
LTE Band 5	3	
LTE Band 12	3	
LTE Band 13	3	
LTE Band 14	3	
LTE Band 25	3	
LTE Band 26	3	
LTE Band 66	3	
LTE Band 85	3	

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.

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.

47 CFR Part 22, 24, 27, 90

This module can be used in IOT devices, the input voltage to the module is nominally 3.3V.

This module is a single module.

The antenna is not a trace antenna.

4 IC Conformance information

Industry Canada Statement

This device complies with Industry Canada's licence-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 20 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 20 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 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 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 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:26644-RW520GL".

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:26644-RW520GL".

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