



RF - TEST REPORT

- Human Exposure -

Type / Model Name : Wireless Gateway GW900-4G-US

Product Description : Open Thread Gateway

Applicant : I-care SRL

Address : Rue Descartes 18

Mons, Province de Hainaut 7000, Belgium

Manufacturer : I-care SRL

Address : Rue Descartes 18

Mons, Province de Hainaut 7000, Belgium

Test Result according to the standards
listed in clause 1 test standards:

POSITIVE

Test Report No. : **80218491-06 Rev_1**

16. April 2025

Date of issue



Deutsche
Akkreditierungsstelle
D-PL-12030-01-00

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ATTACHMENT A as separate supplement

1 TEST STANDARDS

The tests were performed according to following standards:

FCC Rules and Regulations

Part 1, Subpart I, Section 1.1310	Radiofrequency radiation exposure limits
Part 2, Subpart J, Section 2.1091	Radiofrequency radiation exposure evaluation: mobile devices.
KDB 447498 D01 V06	General RF Exposure Guidance

ISED Canada Rules and Regulations

RSS-102, Issue 6	Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)
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2 EQUIPMENT UNDER TEST

2.1 Information provided by the Client

Please note, we do not take any responsibility for information provided by the client or his representative which may have an influence on the validity of the test results.

2.2 Sampling

The customer is responsible for the choice of sample. Sample configuration, start-up and operation is carried out by the customer or according to his/her instructions.

2.3 Photo documentation of the EUT – see Attachment A

2.4 Equipment type, category

Thread device mobile equipment
Cellular device

2.5 Short description of the equipment under test (EUT)

The Wireless Gateway GW900-4G-US is networking hardware for fixed installations designed to receive data via the OpenThread wireless protocol from compatible measurement devices and transmit it over a cellular network.

Number of tested samples:	1
Serial number:	WGBE24xxT7
Modell number:	WG150161-02

2.6 Variants of the EUT

There are three variants of the EUT:

- WG150161-02 (tested)
- WG150161H-02 (not tested)
- WG150161L-02 (not tested)

According to the manufacturer the WG150161-02 is the worst case variant.

PC24_BBA_AG02_001

Document ID

Overview of differences Wireless Gateway GW900-4G-xx

Title

Mod#	4G cellular module		Fuse		Overtemperature protection (not active in normal operation)		
	EG915UEUAB (U4)	EG91NAXDGA (U4)	240V DC side (F1)	240V AC side (F2)	(P1)	(P2)	(P4)
WG150161-02	-	x	SIBA 160000.3,15 (3.15 A), 160000.0.8 (0.8 A) OR Littelfuse 0453.800MR (0.8 A)	SCHURTER 3403.0279.23 (3.15 A) OR 3403.0273.23 (0.8 A)	-	-	-
WG150161H-02	-	x	SIBA 160000.0.8 OR Littelfuse 0453.800MR (0.8 A)	SCHURTER 3403.0273.23 (0.8 A)	2 resettable thermal switches in series [Note 5]	2 resettable thermal switches in series [Note 5]	Non-resettable with 72 °C rating max. [Note 6]
WG150161L-02	-	x	SIBA 160000.0.8 OR Littelfuse 0453.800MR (0.8 A)	SCHURTER 3403.0273.23 (0.8 A)	2 resettable thermal switches in series [Note 5]	2 resettable thermal switches in series [Note 5]	Non-resettable with 72 °C rating max. [Note 6]

2025-03-14

Date

I-care SRL

Manufacturer

Ex protection (EN/IEC/UL 60079-0 /-11 /-18)								Mechanical / IP			
Heat management			Power cable applied to AC (encapsulated)	Power cable applied to DC (encapsulated)	Power cable HazLoc applied to AC (encapsulated)	Power cable HazLoc applied to DC (encapsulated)	Encapsulation / Coating	Cable Gland			
Thermal pad below PCBA	Clamping of P1 between P4 and AC power supply	Glue connection of P2 on PCB at P3	RZ1-K2X1,5-CCAB 1000 OR H07RN-F LS0H		LAPP ÖLFLEX® POWER MULTI 611603		Bectron SK 75V2-35 / SH 79V5-35 1:1	PROTEC EPN 250 M 20 N	Lapp SKINTOP ST-M 20x1,5	SKINTOP® K-M / KR-MATEX plus 54115225 or 54115220	PFLITSCH Lex 220ms HTS + strain relief and grounding
-	-	-	-	-	-	-	-	-	x [Note 1]	-	-
x	x	x	-	-	x	-	x	-	-	-	x [Note 8]
x	x	x	-	-	-	x	x	-	-	-	x [Note 8]

2.7 Operation frequency and channel plan

Operating range 1: 2400 MHz to 2483.5 MHz.(Thread)
 Operation range 2: 824 MHz to 1909.9 MHz (LTE B2 and B5)

Channel plan Thread:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
11	2405	19	2445
12	2410	20	2450
13	2415	21	2455
14	2420	22	2460
15	2425	23	2465
16	2430	24	2470
17	2435	25	2475
18	2440	26	2480

Note: The marked frequencies are used for testing.

2.8 Transmit operating modes

The EUT use DSSS (Thread) or SC-FDMA (LTE) modulation and provides following data rates with auto-fall-back:

- 802.15.4 250kbps (kbps = *kilobits per second*)
 - LTE B2 1RB (RB = *resource block*)

2.9 Antennas

The following integrated antennas are used with the EUT:

Technology	Characteristic	Model number	Plug	Frequency range (GHz)	Gain (dBi)
Thread	integrated	PCB antenna	-	2.4-2.5	-4.04
Cellular	integrated	Quectel YC0002AA	-	0.88-1.9799	3.00

2.10 Power supply system utilised

Power supply voltage, V_{nom} : 120V AC 60Hz
 Power supply voltage, $V_{alt.}$: 24V DC

3 TEST RESULT SUMMARY

FCC Rule Part	RSS Rule Part	Description	Result
KDB 447498, 7.1	RSS-102, 6.6	MPE	passed
KDB 447498, 4.3.1	RSS-102, 6.3	SAR exclusion consideration	not applicable ¹
KDB 447498, 7.2	RSS-102, 7.1.5	Co-location, Co-transmission	passed

Note: ¹ Not applicable, because the EUT is not portable.

3.1 Revision history of test report

Test report No	Rev.	Issue Date	Changes
80218491-06	0	18 March 2025	Initial test report
80218491-06	1	16 April 2025	Co-transmission for RSS added

The test report with the highest revision number replaces the previous test reports.

3.2 Final assessment

The equipment under test fulfils the requirements cited in clause 1 test standards.

Date of receipt of test sample : acc. to storage records

Testing commenced on : 20 February 2025

Testing concluded on : 21 February 2025

Checked by:

Tested by:

Klaus Gegenfurtner
Teamleader Radio

Laurin Roth
Radio Team

4 TEST ENVIRONMENT

4.1 Address of the test laboratory

**CSA Group Bayern GmbH
Straubinger Strasse 100
94447 PLATTILING
GERMANY**

4.2 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature: 15 - 35 °C

Humidity: 30 - 60 %

Atmospheric pressure: 86 - 106 kPa

4.3 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. It is noted that the expanded measurement uncertainty corresponds to the measurement results from the standard measurement uncertainty multiplied by the coverage factor $k = 2$. The true value is located in the corresponding interval with a probability of 95 %. The measurement uncertainty was calculated for all measurements listed in this test report on basis of the ETSI Technical Report TR 100 028 Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1 and Part 2. The results are documented in the quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

4.4 Conformity Decision Rule

The applied conformity decision rule is based on ILAC G8:09/2019 clause 4.2.1 Binary Statement for Simple Acceptance Rule ($w = 0$).

Details can be found in the procedure CSA_B_V50_29.

5 HUMAN EXPOSURE

5.1 Maximum permissible exposure (MPE)

5.1.1 Applicable standard

This test report shows the compliance with the limits for Maximum Permissible Exposure (MPE) specified in FCC Part 1, Section 1.1310 and the criteria to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in FCC Part 1, Section 1.1307(b).

5.1.2 Description of Determination

The maximum rated output power conducted included the tune up tolerance is used to calculate the EIRP. Through the Friis transmission formula, the known maximum gain of the antenna and the maximum power, can be calculated the MPE in a defined distance away from the product.

Friis transmission formula:

$$P_d = \frac{P_{out} * G}{4 * \pi * r^2}$$

Where:

P_d = power density (mW/cm²)

P_{out} = output power to antenna (mW)

G = gain of antenna (linear scale)

r = distance between antenna and observation point (cm)

According to FCC Rules 47CFR 2.1093(b) the EUT is not a portable device. The EUT is designed to be used that radiating structures are 20 cm outside of the body of the user. ($r = 20$ cm)

5.1.3 Determination of MPE according to FCC

Thread

Rated output power:	12,6 dBm	18,0 mW
Tune-up tolerance:	2,00 dB	
Maximum output power:	14,6 dBm	28,5 mW
Antenna gain max:	-4,04 dBi	
Maximum EIRP:	10,5 dBm	11,3 mW
Minimum distance r:	20,0 cm	

Channel	Antgain	EIRP	EIRP	G	EIRP	S	Limit S_{eq}	Margin	Exposure ratio
No.	(dBi)	(dBm)	(mW)	linear	(W)	(mW/cm ²)	(mW/cm ²)	(mW/cm ²)	(%)
11	-4,0	10,5	11,25	0,39	0,0113	0,0022	1,0	-0,9978	0,22
18	-4,0	10,5	11,25	0,39	0,0113	0,0022	1,0	-0,9978	0,22
25	-4,0	10,5	11,25	0,39	0,0113	0,0022	1,0	-0,9978	0,22

LTE B8

Rated output power:	23,8 dBm	240,0 mW
Tune-up tolerance:	2,00 dB	
Maximum output power:	25,8 dBm	380,4 mW
Antenna gain max:	3,00 dBi	
Maximum EIRP:	28,8 dBm	758,9 mW
Minimum distance r:	20,0 cm	

Channel	EIRP	Antgain	Time division correction	EIRP _{AV}	EIRP _{AV}	S	Limit S_{eq}	Margin	Exposure ratio
No.	(dBm)	(dBi)	(dB)	(dBm)	(mW)	(mW/cm ²)	(mW/cm ²)	(mW/cm ²)	(%)
20525	28,8	3,0	-6,02	22,8	189,74	0,0377	1,0	-0,9623	3,77

Limits for maximum permissible exposure (MPE):

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(B) Limits for General Population / Uncontrolled Exposure				
0.3 – 1.34	614	1.63	100	30
1.34 – 30	824/f	2.19/f	180/f ²	30
30 - 300	27.5	0.073	0.2	30
300-1500	---	---	f/1500	30
1500-100000	---	---	1.0	30

f = Frequency in MHz

5.1.4 Determination of MPE according to ISED:

Thread:

Frequency	Antgain	EIRP	Factor	$f^{0.6834}$	Limit	Margin
MHz	(dBi)	(W)		(W)	(W)	(W)
2405	-4,0	0,0113	0,0131	204,4815	2,679	-2,6675
2440	-4,0	0,0113	0,0131	206,5105	2,705	-2,6940
2475	-4,0	0,0113	0,0131	208,5304	2,732	-2,7205

LTE B8:

Frequency	EIRP	Antgain	Factor	$f^{0.6834}$	Limit	Margin
MHz	(mW)	(dBi)		(W)	(W)	(W/m ²)
836,5	758,9	3,0	0,0131	99,3604	1,3016	-0,5427

Exemption limits for routine Evaluation – RF exposure evaluation according to RSS-102, 6.6:

At or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834} \text{ W}$ (adjusted for tune-up tolerance), where f is in MHz.

The requirements are **FULFILLED**.

Remarks: None.

5.2 Co-location and Co-transmission

Applicable standard:

OET Bulletin 65, Edition 97-01, Section 2: Multiple-transmitter sites and Complex Environments:

The FCC's MPE limits vary with frequency. Therefore, in mixed or broadband RF fields where several sources and frequencies are involved, the fraction of the recommended limit (in terms of power density or square of the electric or magnetic field strength) incurred within each frequency interval should be determined, and the sum of all fractional contributions should not exceed 1.0, or 100 % in terms of percentage.

According to RSS-102, 7.1.5: Devices with multiple transmitters:

Devices with multiple transmitters may be subject to evaluation by a combination of the evaluation methods specified in RSS-102, as applicable to each transmitter in the device.

In addition, all transmitters that transmit simultaneously shall be accounted for in the overall declaration of compliance of the device.

Maximum power density ratio Thread (%)	Maximum power density ratio LTE (%)	Sum of exposure ratios (%)
0,2239	3,77	3,999

The requirements are **FULFILLED**.

Remarks:

None.

- End of test report -