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Report Template Version: V04

Report Template Revision Date: 2018-07-06

RF Exposure Evaluation Report

Report No. : CQASZ20200200069E-02
Applicant: RF Networks Ltd.
Address of Applicant: 19a, Sheshet Hayamim St'. Binyamina, Israel
Equipment Under Test (EUT):
EUT Name: Gateway
Model No.: RFN-SMART915T-4NQ-xyz
Brand Name: N/A
FCC ID: 2AR6S-SMART915
Standards: 47 CFR Part 1.1307
47 CFR Part 1.1310
KDB447498D01 General RF Exposure Guidance v06
Date of Receipt: 2020-02-21
Date of Test: 2020-02-21 to 2020-03-13
Date of Issue: 2020-03-13
Test Result : PASS*

* In the configuration tested, the EUT complied with the standards specified above.

Tested By:

Tom Chen.

(Tom chen)

Reviewed By:

Aaron Ma

(Aaron Ma)

Approved By:

Jack Ai

(Jack Ai)



1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20200200069E-02	Rev.01	Initial report	2020-03-13

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3 General Information

3.1 Client Information

Applicant:	RF Networks Ltd.
Address of Applicant:	19a, Sheshet Hayamim St'. Binyamina, Israel
Manufacturer:	RF Networks Ltd.
Address of Manufacturer:	19a, Sheshet Hayamim St'. Binyamina, Israel

3.2 General Description of EUT

Product Name:	Gateway
Model No.:	RFN-SMART915T-4NQ-xyz
Trade Mark:	N/A
Hardware Version:	A
Software Version:	2.0.0
Operation Frequency:	903MHz~926MHz
Modulation Type:	GFSK
Number of Channel:	24
Product Type:	☐ Mobile ☐ Portable ☒ Fix Location
Test Software of EUT:	Radio Test Util (manufacturer declare)
Antenna Type:	External antenna
Antenna Gain:	5dBi
EUT Power Supply:	DC24V

4 SAR Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 Limits

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

TABLE 1—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)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f ²)	6
30–300	61.4	0.163	1.0	6
300–1500			f/300	6
1500–100,000			5	6
(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
1500–100,000			1.0	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d is the limit of MPE, 1 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

4.1.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

4.1.3 EUT RF Exposure

For 915

Measurement Data

GFSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	10.38	10±1	11	12.589
Middle(2440MHz)	10.17	10±1	11	12.589
Highest(2480MHz)	10.02	10±1	11	12.589

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
12.589	5	0.0079	1.0	PASS

Note: 1) Refer to report No. CQASZ20200200069E-01 for EUT test Max Conducted Peak Output Power value.

$$2) P_d = (P_{out} * G) / (4 * \pi * R^2) = (12.589 * 3.16) / (4 * 3.1416 * 20^2) = 0.0079$$