



Test report No:
NIE: 64587RRF.002

Partial Test report

REFERENCE STANDARD:
USA FCC Part 22
CANADA RSS-132

(*) Identification of item tested	Treon Gateway inside IP protected enclosure
(*) Trademark	TREON
(*) Model and /or type reference	Treon Gateway in protective enclosure, Model 1131
Other identification of the product	HW Version: 0001 SW Version: 5.8.0 FCC ID: 2AR86GW11 IC: 24716-GW11
(*) Features	GSM/NB-IOT/Cat M1, WLAN 2.4GHz b/g/n, Wirepas Mesh (BLE)
Applicant	TREON OY Visiokatu 3, 33720 Tampere, Finland
Test method requested, standard	USA FCC Part 22 (10-1-19 Edition). CANADA RSS-132 Issue 3, Jan. 2013. ANSI C63.26-2015. KDB 971168 D01 Power Meas License Digital Systems v03r01, April. 2018.
Approved by (name / position & signature)	José Carlos Luque RF Lab. Supervisor
Date of issue	2020-08-12
Report template No	FDT08_22 (*) "Data provided by the client"

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Competences and guarantees

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Uncertainty

Uncertainty (factor $k=2$) was calculated according to the DEKRA Testing and Certification S.A.U. internal document PODT000.

Data provided by the client

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested").
2. The sample of the model Treon Gateway in protective enclosure, Model 1131 includes a Treon Gateway (Model 1111) which is placed inside a plastic IP67 enclosure to protect the gateway in challenging installation environments. Treon Gateway is a certified wireless gateway for Wirepas Mesh sensor networks. Through the Treon Gateway sensor data can be routed to backend systems via ethernet, WiFi or cellular data connection.

DEKRA Testing and Certification S.A.U. declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Usage of samples

Samples undergoing test have been selected by: The client.

- Sample S/01 is composed of the following elements:

Control N°	Description	Model	Serial N°	Date of reception
64587/002	Treon Gateway inside IP protected enclosure	Treon Gateway in protective enclosure, Model 1131	3019d076	2020/05/19

Sample S/01 has undergone the following test(s): All radiated tests indicated in Appendix A.

Test sample description

Ports.....:	<table> <tr> <th rowspan="2">Port name and description</th><th colspan="4">Cable</th></tr> <tr> <th>Specified max length [m]</th><th>Attached during test</th><th>Shielded</th><th>Coupled to patient⁽³⁾</th></tr> <tr> <td>RJ45</td><td><100</td><td>☐</td><td>☐</td><td>☐</td></tr> <tr> <td></td><td></td><td>☐</td><td>☐</td><td>☐</td></tr> </table>	Port name and description	Cable				Specified max length [m]	Attached during test	Shielded	Coupled to patient ⁽³⁾	RJ45	<100	☐	☐	☐			☐	☐	☐							
Port name and description	Cable																										
	Specified max length [m]	Attached during test	Shielded	Coupled to patient ⁽³⁾																							
RJ45	<100	☐	☐	☐																							
		☐	☐	☐																							
Supplementary information to the	--																										
Rated power supply	<table> <tr> <th colspan="2" rowspan="2">Voltage and Frequency</th><th colspan="5">Reference poles</th></tr> <tr> <th>L1</th><th>L2</th><th>L3</th><th>N</th><th>PE</th></tr> <tr> <td>☒</td><td>AC: 100-240V 50/60Hz</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td><td>☐</td></tr> <tr> <td>☐</td><td>DC:</td><td></td><td></td><td></td><td></td><td></td></tr> </table>	Voltage and Frequency		Reference poles					L1	L2	L3	N	PE	☒	AC: 100-240V 50/60Hz	☐	☐	☐	☐	☐	☐	DC:					
Voltage and Frequency				Reference poles																							
		L1	L2	L3	N	PE																					
☒	AC: 100-240V 50/60Hz	☐	☐	☐	☐	☐																					
☐	DC:																										
Rated Power	--																										
Clock frequencies.....:	1000MHz																										
Other parameters	--																										
Software version	5.8.0																										
Hardware version	0001																										
Dimensions in cm (W x H x D)	18 x 13 x 8,1																										
Mounting position	☐ Table top equipment ☒ Wall/Ceiling mounted equipment ☐ Floor standing equipment ☐ Hand-held equipment ☐ Other:																										

Modules/parts.....:	Module/parts of test item	Type	Manufacturer
	IRM-30-5ST	AC-DC Single output Encapsulated power supply	Mean Well
Accessories (not part of the test item)	Description	Type	Manufacturer
	--		
Documents as provided by the applicant.....:	Description	File name	Issue date
	--		

⁽³⁾ Only for Medical Equipment

Identification of the client

TREON OY
VISIOKATU 3, 33720 TAMPERE, FINLAND

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2019-06-24
Date (finish)	2019-06-25

Document history

Report number	Date	Description
64587RRF.002	2020-08-12	First release.

Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

In the semianechoic chamber, the following limits were not exceeded during the test.

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

Remarks and comments

The tests have been performed by the technical personnel: José Gabriel Pendón and Miguel Angel Torres.

Used instrumentation:

Radiated Measurements

	Last Calibration	Due Calibration
1. Semianechoic Absorber Lined Chamber ETS LINDGREN FACT 3 200 STP	N.A.	N.A.
2. Shielded room ETS LINDGREN S101	N.A.	N.A.
3. Biconical/Log Antenna ETS LINDGREN 3142E	2020/04	2023/04
4. EMI Test Receiver ROHDE AND SCHWARZ ESR7	2019/10	2021/10
5. Broadband Horn antenna 1-18 GHz SCHWARZBECK MESS-ELEKTRONIK BBHA 9120 D	2019/11	2022/11
6. RF pre-amplifier 1-18 GHz Bonn Elektronik BLMA 0118-1M	2020/05	2021/05
7. Signal and Spectrum Analyzer ROHDE AND SCHWARZ FSV 40	2019/09	2021/09
8. Wideband Radio Communication tester ROHDE & SCHWARZ CMW500	2020/04	2021/04
9. AC power supply ELGAR CS-AC35(351SL)	2019/09	2022/09
10. Digital Multimeter FLUKE 175	2020/06	2021/06

Testing verdicts

Not applicable:	N/A
Pass:	P
Fail:	F
Not measured:	N/M

Summary

FCC PART 22 / RSS-132 PARAGRAPH		
Requirement – Test case	Verdict	Remark
Clause 22.913/RSS-132 Clause 5.4: RF output power	N/M	
Clause 2.1047/RSS-132 Clause 5.2: Modulation characteristics	N/M	
Clause 22.355/RSS-132 Clause 5.3: Frequency stability	N/M	
Clause 2.1049: Occupied Bandwidth	N/M	
Clause 22.917/RSS-132 Clause 5.5: Spurious emissions at antenna terminals	N/M	
Clause 22.917/RSS-132 Clause 5.5: Radiated emissions	P	(1)
<u>Supplementary information and remarks:</u>		
(1) Only test requested.		

Appendix A: Test results for FCC PART 22 / RSS-132

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TEST CONDITIONS

POWER SUPPLY (V):

V nominal: 110 Vac.
 Type of Power Supply: AC voltage.

ANTENNA:

Type of Antenna: Integral.
 Maximum Declared Antenna Gain: -5.4 dBi. Pulse W3544B

TEST FREQUENCIES:

LTE Band 5. QPSK AND 16QAM MODULATIONS:

	Channel (Frequency in MHz)			
	BW = 1.4 MHz	BW = 3 MHz	BW = 5 MHz	BW = 10 MHz
Low	20407 (824.70)	20415 (825.50)	20425 (826.50)	20450 (829)
Middle	20525 (836.50)	20525 (836.50)	20525 (836.50)	20525 (836.50)
High	20643 (848.30)	20635 (847.50)	20625 (846.50)	20600 (844)

All radiated test have been performed in the worst case of band, modulation, resource block and channel combination.

A preliminary scan determined the Low channel Band 5, QPSK modulation, BW=1.4 MHz, RB=1, Offset=0 as the worst case.

Radiated emissions

SPECIFICATION:

FCC §22.917:

RSS-132. Clause 5.5:

The power of emissions shall be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB. P in watts.

METHOD:

The measurement was performed with the EUT inside an anechoic chamber. The spectrum was scanned from 30 MHz to at least the 10th harmonic of the High frequency generated within the equipment.

The EUT was placed on a non-conductive stand at a 3 meter distance from the measuring antenna.

Detected emissions were maximized at each frequency by rotating the EUT and adjusting the measuring antenna height and polarization. The maximum meter reading was recorded.

The maximum field strength (dBμV/m) of each detected emission at less than 20 dB respect to the limit is converted to an equivalent EIRP level (dBm) according to ANSI C63.26 with the formula:

$$\text{EIRP (dBm)} = E(\text{dB}\mu\text{V/m}) + 20 \log (D) - 104.8$$

Where D is the measurement distance (in the far field region) in m. $D = 3 \text{ m}$.

Measurement Limit:

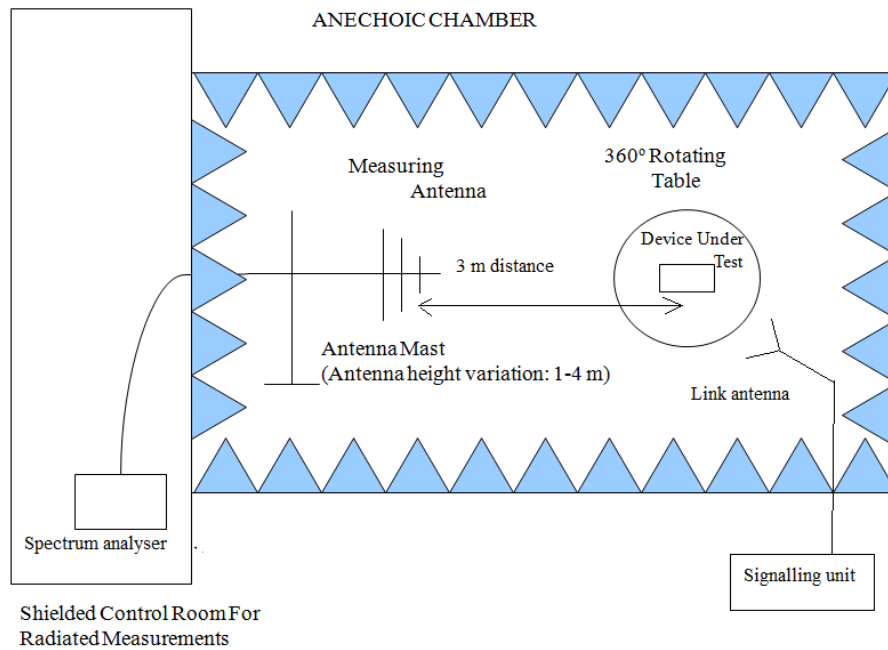
According to specification, the power of emissions shall be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB. P in watts.

At P_o transmitting, power the specified minimum attenuation becomes $43+10\log (P_o)$ and the level in dBm relative P_o becomes:

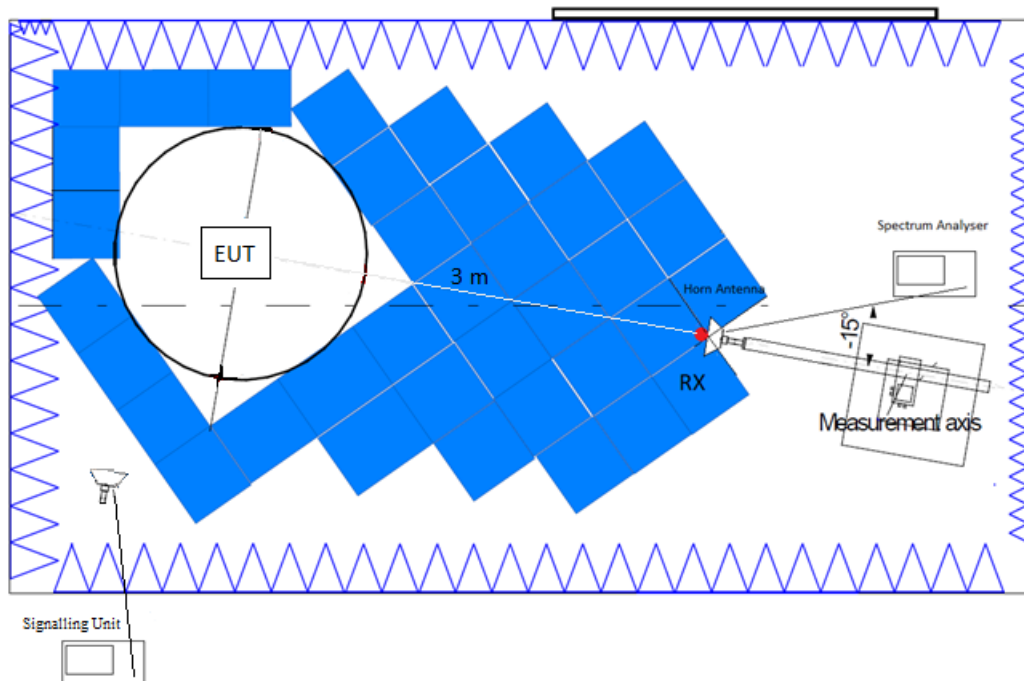
$$P_o (\text{dBm}) - [43 + 10 \log (P_o \text{ in mwatts}) - 30] = - 13 \text{ dBm}$$

TEST SETUP:

Radiated measurements below 1 GHz:



Radiated measurements above 1 GHz:



RESULTS:

A preliminary scan determined the Low channel Band 5, QPSK modulation, BW=1.4 MHz, RB=1, Offset=0 as the worst case.

Only results for worst case are shown below.

LTE Band 5:

- LOW CHANNEL:

Frequency range 30 MHz - 1 GHz

No spurious frequencies detected at less than 20 dB below the limit.

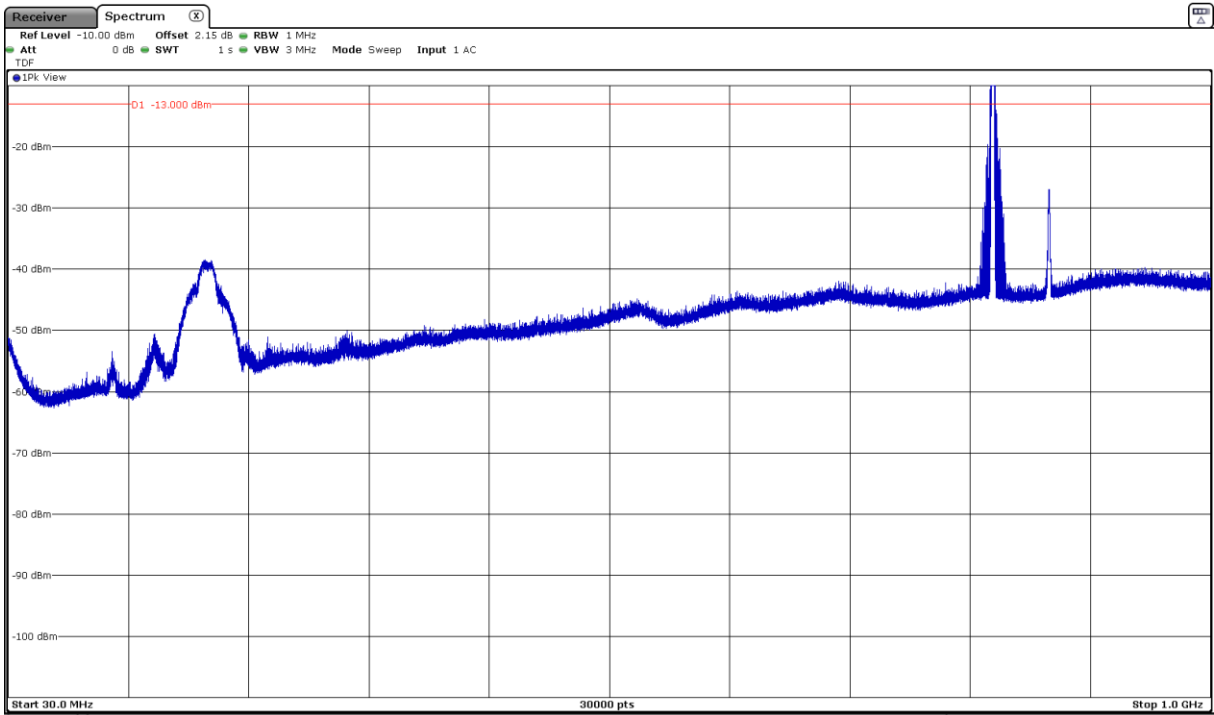
Frequency range 1 - 10 GHz

No spurious frequencies detected at less than 20 dB below the limit.

Measurement uncertainty (dB)	<± 4,65 for f < 1GHz <± 4.98 for f ≥ 1 GHz up to 10 GHz
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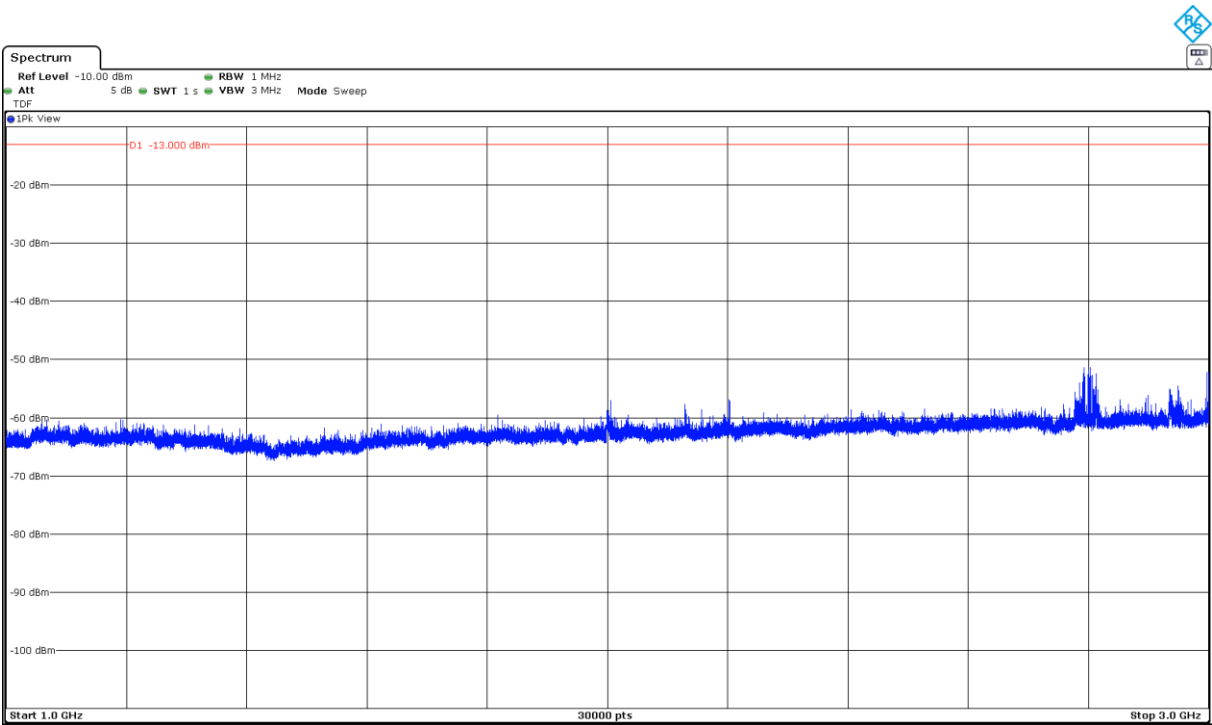
Verdict: PASS

FREQUENCY RANGE 30 MHz - 1 GHz



The peak above the limit is the carrier frequency.
The peak at 869 MHz corresponds to the downlink signal.

FREQUENCY RANGE 1 - 3 GHz



FREQUENCY RANGE 3 - 10 GHz

