

Test report No:
NIE: 60864RRF.004

Partial Test report

REFERENCE STANDARD:
USA FCC Part 22 & Part 24 & Part 27 & Part 90
CANADA RSS-130, RSS-132, RSS-133, RSS-139

(*) Identification of item tested	Wireless module
(*) Trademark	Telit
(*) Model and /or type reference	ME910C1-P1
Other identification of the product	FCC ID: RI7ME910C1P1 IC: 5131A-ME910C1P1 IMEI TAC: 35580810
(*) Features	LTE CATM/NB-IOT
Applicant	Telit Communications S.p.A Via Stazione di Prosecco 5/B, 34010 Sgonico, Trieste - ITALY
Test method requested, standard	USA FCC Part 22 10-1-18 Edition. USA FCC Part 24 10-1-18 Edition. USA FCC Part 27 10-1-18 Edition. USA FCC Part 90 10-1-18 Edition. CANADA RSS-130 Issue 2, Feb. 2019. CANADA RSS-132 Issue 3, Jan. 2013. CANADA RSS-133 Issue 6, Jan. 2013. CANADA RSS-139 Issue 3, Jul. 2015. RF Output Power ANSI C63.26 – 2015. ANSI/TIA-603-E: 2016.
Approved by (name / position & signature)	A. Llamas RF Lab. Manager  Firmado digitalmente por ALEJANDRO LLAMAS RODRIGUEZ Fecha: 2019.07.30 11:02:06 +02'00'
Date of issue	2019-07-30
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Competences and guarantees

DEKRA Testing and Certification S.A.U. is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, DEKRA Testing and Certification has a calibration and maintenance program for its measurement equipment.

DEKRA Testing and Certification guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Testing and Certification at the time of performance of the test.

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The results presented in this Test Report apply only to the particular item under test established in this document.

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Uncertainty

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

Data provided by the client

The sample consist of a LTE CAT-M1/NB1 module for IoT application.

DEKRA 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
60864/013	Wireless module	ME910C1-P1	IMEI: 355808109997921	2019-05-27
60375B/002	Cradle	---		2019-02-07

1. Sample S/01 has undergone the following test(s):

All tests indicated in appendix A, B, C and E.

Test sample description

Ports..... :	Port name and description	Cable					
		Specified max length [m]	Attached during test	Shielded	Coupled to patient ⁽³⁾		
			☐	☐	☐		
			☐	☐	☐		
			☐	☐	☐		
			☐	☐	☐		
			☐	☐	☐		
			☐	☐	☐		
Supplementary information to the ports..... :							
Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	☐	AC:	☐	☐	☐	☐	☐
	☒	DC: 3.8 Vdc.					
	☐	DC:					

Rated Power	Data not provided.		
Clock frequencies	Data not provided.		
Other parameters	Data not provided.		
Software version	M0B.900004		
Hardware version	0.0		
Dimensions in cm (W x H x D)	Data not provided.		
Mounting position	☐	Table top equipment	
	☐	Wall/Ceiling mounted equipment	
	☐	Floor standing equipment	
	☐	Hand-held equipment	
	☒	Other: Module	
Modules/parts	Module/parts of test item	Type	Manufacturer
Accessories (not part of the test item)	Description	Type	Manufacturer
Documents as provided by the applicant	Description	File name	Issue date

Identification of the client

TELIT COMMUNICATIONS
Via Stazione di Prosecco 5/B, 34010 Sgonico,
Trieste – ITALY

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2019-06-10
Date (finish)	2019-07-17

Document history

Report number	Date	Description
60864RRF.002	2019-07-30	First release

Environmental conditions

In the chamber for conducted measurements, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % Max. = 35 %

Remarks and comments

The tests have been performed by the technical personnel: José Alberto Aranda.

Used instrumentation:

Conducted Measurements

	Last Cal. date	Cal. due date
1. DC power supply R&S NGPE 40/40	2018/02	2021/02
2. Universal Radio communication Tester R&S CMW500	2019/02	2020/02

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	P	(2)
Clause 2.1047/RSS-132 Clause 5.2: Modulation characteristics	N/M	(1)
Clause 22.355/RSS-132 Clause 5.3: Frequency stability	N/M	(1)
Clause 2.1049: Occupied Bandwidth	N/M	(1)
Clause 22.917/RSS-132 Clause 5.5: Spurious emissions at antenna terminals	N/M	(1)
Clause 22.917/RSS-132 Clause 5.5: Radiated emissions	N/M	(1)
<u>Supplementary information and remarks:</u> (1): Test not requested. Only RF Output Power test was tested in the worst case. (2): Peak-to-average power ratio (PAPR) was not tested.		

FCC PART 24/ RSS-133 PARAGRAPH		
Requirement – Test case	Verdict	Remark
Clause 24.232/RSS-133 Clause 6.4: RF output power	P	(2)
Clause 2.1047/RSS-133 Clause 6.2: Modulation characteristics	N/M	(1)
Clause 24.235/RSS-133 Clause 6.3: Frequency stability	N/M	(1)
Clause 2.1049: Occupied Bandwidth	N/M	(1)
Clause 24.238/RSS-133 Clause 6.5: Spurious emissions at antenna terminals	N/M	(1)
Clause 24.238/RSS-133 Clause 6.5: Radiated emissions	N/M	(1)
<u>Supplementary information and remarks:</u> (1): Test not requested. Only RF Output Power test was tested in the worst case. (2): Peak-to-average power ratio (PAPR) was not tested.		

FCC PART 27 / RSS-139 / RSS-130 PARAGRAPH		
Requirement – Test case	Verdict	Remark
Clause 27.50 / RSS-139 Clause 6.5. / RSS-130 Clause 4.6.: RF output power	P	(2)
Clause 2.1047 / RSS-139 Clause 6.2. / RSS-130 Clause 4.2.: Modulation characteristics	N/M	(1)
Clause 27.54 / RSS-139 Clause 6.4. / RSS-130 Clause 4.5.: Frequency stability	N/M	(1)
Clause 2.1049: Occupied Bandwidth	N/M	(1)
Clause 27.53 / RSS-139 Clause 6.6. / RSS-130 Clause 4.7.: Spurious emissions at antenna terminals	N/M	(1)
Clause 27.53 / RSS-139 Clause 6.6. / RSS-130 Clause 4.7.: Radiated emissions	N/M	(1)
<u>Supplementary information and remarks:</u> (1): Test not requested. Only RF Output Power test was tested in the worst case. (2): Peak-to-average power ratio (PAPR) was not tested.		

FCC PART 90 PARAGRAPH		
Requirement – Test case	Verdict	Remark
Clause 90.635 (b): RF output power	P	(2)
Clause 2.1047: Modulation characteristics	N/M	(1)
Clause 90.213 Frequency stability	N/M	(1)
Clause 2.1049: Occupied Bandwidth	N/M	(1)
Clause 90.691 Spurious emissions at antenna terminals (Emission mask requirements for EA-based systems)	N/M	(1)
Clause 90.691: Radiated emissions	N/M	(1)
<u>Supplementary information and remarks:</u> (1): Test not requested. Only RF Output Power test was tested in the worst case. (2): Peak-to-average power ratio (PAPR) was not tested.		

Appendix A: Test results for FCC Part 22 / RSS-132. NB-IoT.

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TEST CONDITIONS

Power supply (V):

Vnominal = 3.8 Vdc

Vmax = N/A

Vmin = N/A

The subscripts nom, min and max indicate voltage test conditions (nominal, minimum and maximum respectively, as declared by the applicant).

Type of power supply = DC Voltage from external power supply

Declared Gain for antenna = +2.14 dBi

N/A: Not Applicable.

TEST FREQUENCIES:

LTE Cat NB1 (NB-IoT). Pi/2-BPSK AND Pi/4-QPSK MODULATION (BAND 5)

Channel (Frequency. MHz)		
Lowest	Middle	Highest
20401 (824.1)	20525 (836.5)	20649 (849.9)

LTE Cat NB1 (NB-IoT). Pi/2-BPSK AND Pi/4-QPSK MODULATION (BAND 26)

Channel (Frequency. MHz)		
Lowest	Middle	Highest
26791 (824.1)	26915 (836.5)	27039 (848.9)

RF Output Power

SPECIFICATION

FCC §2.1046 and §22.913. The Effective Radiated Power (E.R.P.) of mobile transmitter and auxiliary test transmitter must not exceed 7 Watts (38.45 dBm E.R.P.).

RSS-132. Clause 5.4. The equivalent isotropically radiated power (e.i.r.p.) for mobile equipment shall not exceed 11.5 watts (40.60 dBm E.I.R.P.).

In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

METHOD

The conducted RF output power measurements were made at the RF output terminals of the EUT using the power meter of the Universal Radio Communication tester R&S CMW500, selecting maximum transmission power of the EUT and different modes of modulation.

The maximum equivalent isotropically radiated power (e.i.r.p.) is calculated by adding the declared maximum antenna gain (dBi).

The maximum effective radiated power e.r.p. is calculated from the maximum equivalent isotropically radiated power (e.i.r.p.) by subtracting 2.15 dB:

$$\text{E.R.P.} = \text{E.I.R.P.} - 2.15 \text{ dB}$$

TEST SETUP

Conducted average power.



RESULTS

MAXIMUM OUTPUT POWER (CONDUCTED).

LTE Cat NB1 (NB-IoT) Band 5.

The results in the next tables shows the worst results for each modulation.

Channel	Freq. (MHz)	Modulation	BW (kHz)	Num. tone	Offset Tone	Average Power (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
20401	824.1	$\pi/2$ - BPSK	3.75	1	0	23.58	25.72	23.57
20401	824.1	$\pi/4$ - QPSK	15	3	3	23.97	26.11	23.96

ORIGINAL RESULTS ON ME910C1-WW

The results in the next tables shows the worst results for each modulation.

Channel	Freq. (MHz)	Modulation	BW (kHz)	Num. tone	Offset Tone	Average Power (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
20401	824.1	$\pi/2$ - BPSK	3.75	1	0	23.62	25.76	23.61
20401	824.1	$\pi/4$ - QPSK	15	3	3	23.96	26.10	23.95

Conclusion: The results are consistent with the original levels. The maximum difference in conducted power is $< \pm 0.5$ dB.

Verdict: PASS

LTE Cat NB1 (NB-IoT) Band 26.

The results in the next tables shows the worst results for each modulation.

Channel	Freq. (MHz)	Modulation	BW (kHz)	Num. tone	Offset Tone	Average Power (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
26791	824.1	$\pi/2$ - BPSK	3.75	1	0	23.7	25.84	23.69
26791	824.1	$\pi/4$ - QPSK	15	3	3	23.9	26.04	23.89

ORIGINAL RESULTS ON ME910C1-WW

The results in the next tables shows the worst results for each modulation.

Channel	Freq. (MHz)	Modulation	BW (kHz)	Num. tone	Offset Tone	Average Power (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
26791	824.1	$\pi/2$ - BPSK	3.75	1	0	23.68	25.82	23.67
26791	824.1	$\pi/4$ - QPSK	15	3	3	23.87	26.10	23.86

Conclusion: The results are consistent with the original levels. The maximum difference in conducted power is $< \pm 0.5$ dB.

Verdict: PASS

Appendix B: Test results for FCC Part 24 / RSS-133. NB-IoT.

TEST CONDITIONS	17
RF Output Power	18

TEST CONDITIONS

Power supply (V):

Vnominal = 3.8 Vdc

Vmax = N/A

Vmin = N/A

The subscripts nom, min and max indicate voltage test conditions (nominal, minimum and maximum respectively, as declared by the applicant).

Type of power supply = DC Voltage from external power supply

Declared Gain for antenna = +2.14 dBi

N/A: Not Applicable.

TEST FREQUENCIES:

LTE Cat NB1 (NB-IoT). Pi/2-BPSK AND Pi/4-QPSK MODULATION (BAND 2)

Channel (Frequency. MHz)		
Lowest	Middle	Highest
18601 (1850.1)	18900 (1880)	19199 (1909.9)

RF Output Power

SPECIFICATION

FCC §2.1046 and §24.232

Mobile/portable stations are limited to 2 Watts (33 dBm) Effective Isotropic Radiated Power (E.I.R.P.).
The peak-to-average ratio (PAR) of the transmission shall not exceed 13 dB.

RSS-133. Clause 6.4.

The equivalent isotropically radiated power (e.i.r.p.) for transmitters shall not exceed the limits given in SRSP-510.
Moreover, base station transmitters operating in the band 1930-1995 MHz shall not have output power exceeding 100 watts.

The peak-to-average power ratio (PAPR) shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

METHOD

The conducted RF output power measurements were made at the RF output terminals of the EUT using the power meter of the Universal Radio Communication tester R&S CMW500, selecting maximum transmission power of the EUT and different modes of modulation.

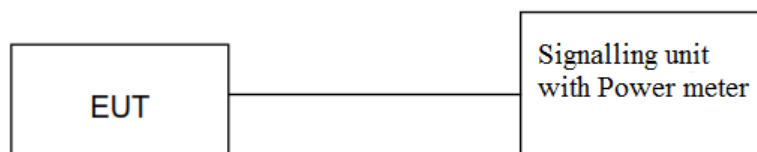
The maximum equivalent isotropically radiated power (e.i.r.p.) is calculated by adding the declared maximum antenna gain (dBi).

The maximum effective radiated power e.r.p. is calculated from the maximum equivalent isotropically radiated power (e.i.r.p.) by subtracting 2.15 dB:

$$E.R.P. = E.I.R.P. - 2.15 \text{ dB}$$

TEST SETUP

Conducted average power.



RESULTS

MAXIMUM OUTPUT POWER (CONDUCTED).

LTE Cat NB1 (NB-IoT) Band 2.

The results in the next tables shows the worst results for each modulation.

Channel	Freq. (MHz)	Modulation	BW (kHz)	Num. tone	Offset Tone	Average Power (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
18601	1850.1	$\pi/2$ - BPSK	3.75	1	0	22.87	25.01	22.86
18900	1880.0	$\pi/4$ - QPSK	15	3	3	23.70	25.84	23.69

ORIGINAL RESULTS ON ME910C1-WW

The results in the next tables shows the worst results for each modulation.

Channel	Freq. (MHz)	Modulation	BW (kHz)	Num. tone	Offset Tone	Average Power (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
18601	1850.1	$\pi/2$ - BPSK	3.75	1	0	23.36	25.50	23.35
18900	1880.0	$\pi/4$ - QPSK	15	3	3	24.04	26.18	24.03

Conclusion: The results are consistent with the original levels. The maximum difference in conducted power is $< \pm 0.5$ dB.

Verdict: PASS

Appendix C: Test results for FCC Part 27 / RSS-139 / RSS-130. NB-IoT.

TEST CONDITIONS	22
RF Output Power	23

TEST CONDITIONS

Power supply (V):

Vnominal = 3.8 Vdc

Vmax = N/A

Vmin = N/A

The subscripts nom, min and max indicate voltage test conditions (nominal, minimum and maximum respectively, as declared by the applicant).

Type of power supply = DC Voltage from external power supply

Declared Gain for antenna = +2.14 dBi

N/A: Not Applicable.

TEST FREQUENCIES:

LTE Cat NB1 (NB-IoT). Pi/2-BPSK AND Pi/4-QPSK MODULATION (BAND 4)

Channel (Frequency. MHz)		
Lowest	Middle	Highest
19951 (1710.1)	20175 (1732.5)	20399 (1754.9)

NOTE: Band 4 is completely included in band 66. so the channels of band 66 were tested to give conformity to the assigned block

LTE Cat NB1 (NB-IoT). Pi/2-BPSK AND Pi/4-QPSK MODULATION (BAND 12)

Channel (Frequency. MHz)		
Lowest	Middle	Highest
23012 (699.2)	23095 (707.5)	23178 (715.8)

LTE Cat NB1 (NB-IoT). Pi/2-BPSK AND Pi/4-QPSK MODULATION (BAND 13)

Channel (Frequency. MHz)		
Lowest	Middle	Highest
23182 (777.2)	23230 (782)	23278 (786.8)

RF Output Power

SPECIFICATION

Bands 12,13

FCC §27.50 (c) (10).

Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

RSS-130 Clause 4.6.

The e.r.p. shall not exceed 30 watts (44.77 dBm) for mobile equipment and outdoor fixed subscriber equipment. The e.r.p. shall not exceed 3 watts (34.77 dBm) for portable equipment or for indoor fixed subscriber equipment.

The peak-to-average power ratio (PAPR) of the transmission shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

Band 4

FCC §27.50 (d) (4) & (5).

Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band are limited to 1 watt EIRP (30 dBm). Fixed stations operating in the 1710-1755 MHz band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

RSS-139 Clause 6.5.

The equivalent isotropically radiated power (e.i.r.p.) for mobile and portable transmitters shall not exceed one watt. The e.i.r.p. for fixed and base stations in the band 1710-1780 MHz shall not exceed one watt.

The peak-to-average ratio (PAR) of the transmission shall not exceed 13 dB or more than 0.1% of the time, using a signal that corresponds to the highest PAPR during periods of continuous transmission.

METHOD

The conducted RF output power measurements were made at the RF output terminals of the EUT using the power meter of the Universal Radio Communication tester R&S CMW500, selecting maximum transmission power of the EUT and different modes of modulation.

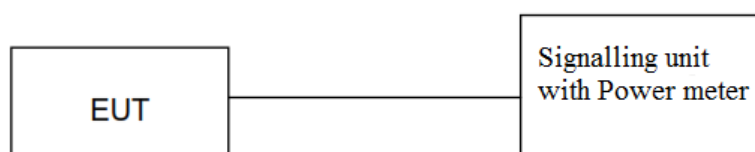
The maximum equivalent isotropically radiated power (e.i.r.p.) is calculated by adding the declared maximum antenna gain (dBi).

The maximum effective radiated power e.r.p. is calculated from the maximum equivalent isotropically radiated power (e.i.r.p.) by subtracting 2.15 dB:

$$E.R.P. = E.I.R.P. - 2.15 \text{ dB}$$

TEST SETUP

Conducted average power.



RESULTS

MAXIMUM OUTPUT POWER (CONDUCTED).

LTE Cat NB1 (NB-IoT) Band 4.

The results in the next tables shows the worst results for each modulation.

Channel	Freq. (MHz)	Modulation	BW (kHz)	Num. tone	Offset Tone	Average Power (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
19951	1710.1	$\pi/2$ - BPSK	3.75	1	47	22.66	24.80	22.65
20175	1732.5	$\pi/4$ - QPSK	15	3	3	23.05	25.19	23.04

ORIGINAL RESULTS ON ME910C1-WW

The results in the next tables shows the worst results for each modulation.

Channel	Freq. (MHz)	Modulation	BW (kHz)	Num. tone	Offset Tone	Average Power (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
19951	1710.1	$\pi/2$ - BPSK	3.75	1	47	22.40	24.54	22.39
20175	1732.5	$\pi/4$ - QPSK	15	3	3	22.58	24.72	22.57

Conclusion: The results are consistent with the original levels. The maximum difference in conducted power is $< \pm 0.5$ dB.

Verdict: PASS

LTE Cat NB1 (NB-IoT) Band 12.

The results in the next tables shows the worst results for each modulation.

Channel	Freq. (MHz)	Modulation	BW (kHz)	Num. tone	Offset Tone	Average Power (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
23012	699.2	$\pi/2$ - BPSK	15	1	11	23.10	25.24	23.09
23012	699.2	$\pi/4$ - QPSK	15	3	0	23.34	25.48	23.33

ORIGINAL RESULTS ON ME910C1-WW

The results in the next tables shows the worst results for each modulation.

Channel	Freq. (MHz)	Modulation	BW (kHz)	Num. tone	Offset Tone	Average Power (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
23012	699.2	$\pi/2$ - BPSK	15	1	11	22.71	24.85	22.70
23012	699.2	$\pi/4$ - QPSK	15	3	0	23.31	25.45	23.30

Conclusion: The results are consistent with the original levels. The maximum difference in conducted power is $< \pm 0.5$ dB.

Verdict: PASS

LTE Cat NB1 (NB-IoT) Band 13.

The results in the next tables shows the worst results for each modulation.

Channel	Freq. (MHz)	Modulation	BW (kHz)	Num. tone	Offset Tone	Average Power (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
23182	777.2	$\pi/2$ - BPSK	15	1	0	22.69	24.83	22.68
23182	777.2	$\pi/4$ - QPSK	15	3	6	23.01	25.15	23.00

ORIGINAL RESULTS ON ME910C1-WW

The results in the next tables shows the worst results for each modulation.

Channel	Freq. (MHz)	Modulation	BW (kHz)	Num. tone	Offset Tone	Average Power (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
23182	777.2	$\pi/2$ - BPSK	15	1	0	22.25	24.39	22.24
23182	777.2	$\pi/4$ - QPSK	15	3	6	22.53	24.67	22.52

Conclusion: The results are consistent with the original levels. The maximum difference in conducted power is $< \pm 0.5$ dB.

Verdict: PASS

Appendix D: Test results for FCC Part 90. NB-IoT.

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TEST CONDITIONS29

RF Output Power30

TEST CONDITIONS

Power supply (V):

Vnominal = 3.8 Vdc

Vmax = N/A

Vmin = N/A

The subscripts nom, min and max indicate voltage test conditions (nominal, minimum and maximum respectively, as declared by the applicant).

Type of power supply = DC Voltage from external power supply

Declared Gain for antenna = +2.14 dBi

N/A: Not Applicable.

TEST FREQUENCIES:

LTE Cat NB1 (NB-IoT). Pi/2-BPSK AND Pi/4-QPSK MODULATION (BAND 26)

Channel (Frequency. MHz)	
Lowest	Highest
26691 (814.1)	26789 (823.1)

RF Output Power

SPECIFICATION

FCC §90.635. The maximum output power of the transmitter for mobile stations is 100 watts (20 dBw).

METHOD

The conducted RF output power measurements were made at the RF output terminals of the EUT using the power meter of the Universal Radio Communication tester R&S CMW500, selecting maximum transmission power of the EUT and different modes of modulation.

The maximum equivalent isotropically radiated power (e.i.r.p.) is calculated by adding the declared maximum antenna gain (dBi).

The maximum effective radiated power e.r.p. is calculated from the maximum equivalent isotropically radiated power (e.i.r.p.) by subtracting 2.15 dB:

$$E.R.P. = E.I.R.P. - 2.15 \text{ dB}$$

TEST SETUP

Conducted average power.



RESULTS

MAXIMUM OUTPUT POWER (CONDUCTED).

LTE Cat NB1 (NB-IoT) Band 26.

The results in the next tables shows the worst results for each modulation.

Channel	Freq. (MHz)	Modulation	BW (kHz)	Num. tone	Offset Tone	Average Power (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
26691	814.1	$\pi/2$ - BPSK	3.75	1	0	23.58	25.72	23.57
26789	823.9	$\pi/4$ - QPSK	15	3	3	23.56	25.70	23.55

ORIGINAL RESULTS ON ME910C1-WW

The results in the next tables shows the worst results for each modulation.

Channel	Freq. (MHz)	Modulation	BW (kHz)	Num. tone	Offset Tone	Average Power (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
26691	814.1	$\pi/2$ - BPSK	3.75	1	0	23.69	25.83	23.68
26789	823.9	$\pi/4$ - QPSK	15	3	3	23.88	26.02	23.87

Conclusion: The results are consistent with the original levels. The maximum difference in conducted power is $< \pm 0.5$ dB.

Verdict: PASS

Appendix E: Test results for FCC Part 22 & 90 / RSS-132. NB-IoT.

TEST CONDITIONS	34
RF Output Power	35

TEST CONDITIONS

POWER SUPPLY (V):

Vnom: 3.8 Vdc

Vmax: N/A

Vmin: N/A

The subscripts 'nom', 'min' and 'max' indicate voltage test conditions (nominal, minimum and maximum respectively), as declared by the applicant.

Type of power supply = DC Voltage from external power supply

Declared Gain for antenna = +2.14 dBi

N/A: Not Applicable.

TEST FREQUENCIES:

Cross-Rule Channel (824MHz):

LTE Cat NB1 (NB-IoT) Band 26. Pi/2-BPSK AND Pi/4-QPSK MODULATION.

Channel (Frequency. MHz)
Cross Channel 26790 (824)

RF Output Power

SPECIFICATION

FCC §2.1046 and §22.913. The Effective Radiated Power (E.R.P.) of mobile transmitter and auxiliary test transmitter must not exceed 7 Watts (38.45 dBm E.R.P.).

RSS-132. Clause 5.4. The equivalent isotropically radiated power (e.i.r.p.) for mobile equipment shall not exceed 11.5 watts (40.60 dBm E.I.R.P.).

In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

FCC §90.635. The maximum output power of the transmitter for mobile stations is 100 watts (20 dBw).

METHOD

The conducted RF output power measurements were made at the RF output terminals of the EUT using the power meter of the Universal Radio Communication tester R&S CMU200 and CMW500, selecting maximum transmission power of the EUT and different modes of modulation.

The maximum equivalent isotropically radiated power (e.i.r.p.) is calculated by adding the declared maximum antenna gain (dBi).

The maximum effective radiated power e.r.p. is calculated from the maximum equivalent isotropically radiated power (e.i.r.p.) by subtracting 2.15 dB:

$$E.R.P. = E.I.R.P. - 2.15 \text{ dB}$$

TEST SETUP

CONDUCTED AVERAGE POWER:



RESULTS:

MAXIMUM OUTPUT POWER (CONDUCTED):

Cross-Rule Channel (824 MHz):

The following table shows the worst case AVERAGE POWER results.

LTE Cat NB1 (NB-IoT) Band 26:

Channel	Freq. (MHz)	Modulation	BW (kHz)	Num. tone	Offset Tone	Average Power (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
26790	824	$\pi/2$ - BPSK	3.75	1	0	23.27	25.41	23.26
26790	824	$\pi/4$ - QPSK	15	3	3	23.28	25.42	23.27

ORIGINAL RESULTS ON ME910C1-WW

The results in the next tables shows the worst results for each modulation.

Channel	Freq. (MHz)	Modulation	BW (kHz)	Num. tone	Offset Tone	Average Power (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
26790	824	$\pi/2$ - BPSK	3.75	1	0	23.73	25.87	23.72
26790	824	$\pi/4$ - QPSK	15	3	3	23.76	25.90	23.75

Conclusion: The results are consistent with the original levels. The maximum difference in conducted power is $< \pm 0.5$ dB.

Verdict: PASS