DEKRA Testing and Certification, S.A.U.
Parque Tecnológico de Andalucía,
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C.I.F. A29 507 456

Test report No:

NIE: 60864RRF.003

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 10:57:05 +02'00'
Date of issue	2019-07-30
Report template No	FDT08_22 (*) "Data provided by the client"

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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.

DEKRA Testing and Certification is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

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

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General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
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4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Testing and Certification and the Accreditation Bodies.

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 Nº	Description	Model	Serial Nº	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 appendixes A, B, C, D, 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.					

Rated Power .....:	Data not provided.		
Clock frequencies.....:	Data not provided.		
Other parameters .....:	Data not provided.		
Software version .....:	M0B.900004		
Hardware version .....:	HW 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

(3) Only for Medical Equipment

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.001	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 ºC Max. = 35 ºC
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)
Supplementary information and remarks: (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)
Supplementary information and remarks: (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)
Supplementary information and remarks: (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)
Supplementary information and remarks: (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. CAT M.

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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. QPSK AND 16QAM MODULATION (BAND 5)

	Channel (Frequency, MHz)			
	BW = 1.4 MHz	BW = 3 MHz	BW = 5 MHz	BW = 10 MHz
Lowest	20407 (824.70)	20415 (825.50)	20425 (826.50)	20450 (829.00)
Middle	20525 (836.50)	20525 (836.50)	20525 (836.50)	20525 (836.50)
Highest	20643 (848.30)	20635 (847.50)	20625 (846.50)	20600 (844.00)

LTE. QPSK AND 16QAM MODULATION (BAND 26)

	Channel (Frequency, MHz)				
	BW = 1.4 MHz	BW = 3 MHz	BW = 5 MHz	BW = 10 MHz	BW = 15 MHz
Lowest	26797 (824.70)	26805 (825.50)	26815 (826.50)	26840 (829.00)	26865 (831.50)
Middle	26915 (836.50)	26915 (836.50)	26915 (836.50)	26915 (836.50)	26915 (836.50)
Highest	27033 (848.30)	27025 (847.50)	27015 (846.50)	26990 (844.00)	26965 (841.50)

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:

$$E.R.P. = E.I.R.P. - 2.15\ dB$$

TEST SETUP

Conducted average power.

RESULTS

MAXIMUM OUTPUT POWER (CONDUCTED).

LTE. BAND 5.

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

Narrow band = 1

BANDWIDTH (MHz)	CHANNEL	FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
1.4 MHz	20425	824.7	QPSK	1	0	23.34	25.48	23.33
	20525	836.5	16-QAM	1	0	23.10	25.24	23.09
3 MHz	20415	825.5	QPSK	1	0	23.60	25.74	23.59
	20415	825.5	16-QAM	1	0	23.17	25.31	23.16
5 MHz	20425	826.5	QPSK	1	0	23.47	25.61	23.46
	20425	826.5	16-QAM	1	0	23.55	25.69	23.54
10 MHz	20525	836.5	QPSK	1	0	23.99	26.13	23.98
	20525	836.5	16-QAM	1	0	23.98	26.12	23.97

ORIGINAL RESULTS ON ME910C1-WW

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

Narrow band = 1

BANDWIDTH (MHz)	CHANNEL	FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
1.4 MHz	20425	824.7	QPSK	1	0	23.71	25.85	23.70
	20525	836.5	16-QAM	1	0	23.34	25.48	23.33
3 MHz	20415	825.5	QPSK	1	0	23.71	25.85	23.70
	20415	825.5	16-QAM	1	0	23.64	25.78	23.63
5 MHz	20425	826.5	QPSK	1	0	23.78	25.92	23.77
	20425	826.5	16-QAM	1	0	23.71	25.85	23.70
10 MHz	20525	836.5	QPSK	1	0	23.54	25.68	23.53
	20525	836.5	16-QAM	1	0	23.51	25.65	23.50

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

LTE. BAND 26.

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

Narrow band = 1

BANDWIDTH (MHz)	CHANNEL	FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
1.4 MHz	26915	836.5	QPSK	1	0	23.57	25.71	23.56
	26797	824.7	16-QAM	1	0	23.03	25.17	23.02
3 MHz	26805	825.5	QPSK	1	0	23.62	25.76	23.61
	26915	836.5	16-QAM	1	0	23.12	25.26	23.11
5 MHz	26815	826.5	QPSK	1	0	23.74	25.88	23.73
	26815	826.5	16-QAM	1	0	23.75	25.89	23.74
10 MHz	26840	829	QPSK	1	0	23.65	25.79	23.64
	26840	829	16-QAM	1	0	23.68	25.82	23.67
15 MHz	26865	831.5	QPSK	1	0	23.82	25.96	23.81
	26865	831.5	16-QAM	1	0	23.80	25.94	23.79

ORIGINAL RESULTS ON ME910C1-WW

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

Narrow band = 1

BANDWIDTH (MHz)	CHANNEL	FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
1.4 MHz	26915	836.5	QPSK	1	0	23.48	25.62	23.47
	26797	824.7	16-QAM	1	0	23.31	25.45	23.30
3 MHz	26805	825.5	QPSK	1	0	23.47	25.61	23.46
	26915	836.5	16-QAM	1	0	23.41	25.55	23.40
5 MHz	26815	826.5	QPSK	1	0	23.48	25.62	23.47
	26815	826.5	16-QAM	1	0	23.43	25.57	23.42
10 MHz	26840	829	QPSK	1	0	23.38	25.52	23.37
	26840	829	16-QAM	1	0	23.33	25.47	23.32
15 MHz	26865	831.5	QPSK	1	0	23.55	25.69	23.54
	26865	831.5	16-QAM	1	0	23.51	25.65	23.50

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

Verdict: PASS

Appendix B: Test results for FCC Part 24 / RSS-133. CAT M.

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TEST CONDITIONS.....19
RF Output Power 20

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. QPSK AND 16QAM MODULATION (BAND 2)

	Channel (Frequency. MHz)					
	BW = 1.4 MHz	BW = 3 MHz	BW = 5 MHz	BW = 10 MHz	BW = 15 MHz	BW = 20 MHz
Lowest	18607 (1850.7)	18615 (1851.5)	18625 (1852.5)	18650 (1855.0)	18675 (1857.5)	18700 (1860.0)
Middle	18900 (1880.0)	18900 (1880.0)	18900 (1880.0)	18900 (1880.0)	18900 (1880.0)	18900 (1880.0)
Highest	19193 (1909.3)	19185 (1908.5)	19175 (1907.5)	19150 (1905.0)	19125 (1902.5)	19100 (1900.0)

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 dB

TEST SETUP

Conducted average power.

RESULTS

MAXIMUM OUTPUT POWER (CONDUCTED).

LTE. BAND 2.

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

Narrow band = 1

BANDWIDTH (MHz)	CHANNEL	FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
1.4 MHz	18900	1880	QPSK	1	0	23.48	25.62	23.47
	18900	1880	16-QAM	1	0	22.95	25.09	22.94
3 MHz	18900	1880	QPSK	1	0	23.42	25.56	23.41
	18900	1880	16-QAM	1	0	23.03	25.17	23.02
5 MHz	18900	1880	QPSK	1	0	23.58	25.72	23.57
	18900	1880	16-QAM	1	0	23.44	25.58	23.43
10 MHz	18900	1880	QPSK	1	0	23.36	25.50	23.35
	18900	1880	16-QAM	1	0	23.31	25.45	23.30
15 MHz	18900	1880	QPSK	1	0	23.48	25.62	23.47
	18900	1880	16-QAM	1	0	23.41	25.55	23.40
20 MHz	18900	1880	QPSK	1	0	23.34	25.48	23.33
	18900	1880	16-QAM	1	0	23.35	25.49	23.34

ORIGINAL RESULTS ON ME910C1-WW

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

Narrow band = 1

BANDWIDTH (MHz)	CHANNEL	FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
1.4 MHz	18900	1880	QPSK	1	0	23.72	25.86	23.71
	18900	1880	16-QAM	1	0	23.25	25.39	23.24
3 MHz	18900	1880	QPSK	1	0	23.69	25.83	23.68
	18900	1880	16-QAM	1	0	23.51	25.65	23.5
5 MHz	18900	1880	QPSK	1	0	23.64	25.78	23.63
	18900	1880	16-QAM	1	0	23.62	25.76	23.61
10 MHz	18900	1880	QPSK	1	0	23.62	25.76	23.61
	18900	1880	16-QAM	1	0	23.59	25.73	23.58
15 MHz	18900	1880	QPSK	1	0	23.74	25.88	23.73
	18900	1880	16-QAM	1	0	23.65	25.79	23.64
20 MHz	18900	1880	QPSK	1	0	23.59	25.73	23.58
	18900	1880	16-QAM	1	0	23.48	25.62	23.47

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

Verdict: PASS

Appendix C: Test results for FCC Part 27 / RSS-139 / RSS-130. CAT M.

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TEST CONDITIONS.....25
RF Output Power 27

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. QPSK AND 16QAM MODULATION (BAND 4)

	Channel (Frequency. MHz)					
	BW = 1.4 MHz	BW = 3 MHz	BW = 5 MHz	BW = 10 MHz	BW = 15 MHz	BW = 20 MHz
Lowest	19957 (1710.7)	19965 (1711.5)	19975 (1712.5)	20000 (1715.0)	20025 (1717.5)	20050 (1720.0)
Middle	20175 (1732.5)	20175 (1732.5)	20175 (1732.5)	20175 (1732.5)	20175 (1732.5)	20175 (1732.5)
Highest	20393 (1754.3)	20385 (1753.5)	20375 (1752.5)	20350 (1750.0)	20325 (1747.5)	20300 (1745.0)

LTE. QPSK AND 16QAM MODULATION (BAND 12)

	Channel (Frequency. MHz)			
	BW = 1.4 MHz	BW = 3 MHz	BW = 5 MHz	BW = 10 MHz
Lowest	23017 (699.7)	23025 (700.5)	23035 (701.5)	23060 (704.0)
Middle	23095 (707.5)	23095 (707.5)	23095 (707.5)	23095 (707.5)
Highest	23173 (715.3)	23165 (714.5)	23155 (713.5)	23130 (711.0)

LTE. QPSK AND 16QAM MODULATION (BAND 13)

	Channel (Frequency, MHz)	
	BW = 5 MHz	BW = 10 MHz
Lowest	23205 (779.5)	N/A
Middle	23230 (782.0)	23230 (782.0)
Highest	23255 (784.5)	N/A

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:

$$E.R.P. = E.I.R.P. - 2.15\ dB$$

TEST SETUP

Conducted average power.

RESULTS

MAXIMUM OUTPUT POWER (CONDUCTED).

LTE. BAND 4.

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

Narrow band = 1

BANDWIDTH (MHz)	CHANNEL	FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
1.4 MHz	19957	1710.7	QPSK	1	0	22.80	24.94	22.79
	19957	1710.7	16-QAM	1	0	22.36	24.50	22.35
3 MHz	19965	1711.5	QPSK	1	0	22.71	24.85	22.70
	20385	1753.2	16-QAM	1	0	22.66	24.80	22.65
5 MHz	19975	1712.5	QPSK	1	0	22.73	24.87	22.72
	19975	1712.5	16-QAM	1	0	22.82	24.96	22.81
10 MHz	20350	1750	QPSK	1	0	23.02	25.16	23.01
	20350	1750	16-QAM	1	0	23.02	25.16	23.01
15 MHz	20325	1747.5	QPSK	1	0	23.04	25.18	23.03
	20025	1717.5	16-QAM	1	0	22.90	25.04	22.89
20 MHz	20050	1720	QPSK	1	0	22.88	25.02	22.87
	20050	1720	16-QAM	1	0	22.79	24.93	22.78

ORIGINAL RESULTS ON ME910C1-WW

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

Narrow band = 1

BANDWIDTH (MHz)	CHANNEL	FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
1.4 MHz	19957	1710.7	QPSK	1	0	23.01	25.15	23.00
	19957	1710.7	16-QAM	1	0	22.50	24.64	22.49
3 MHz	19965	1711.5	QPSK	1	0	22.71	24.85	22.70
	20385	1753.2	16-QAM	1	0	22.50	24.64	22.49
5 MHz	19975	1712.5	QPSK	1	0	22.76	24.90	22.75
	19975	1712.5	16-QAM	1	0	22.74	24.88	22.73
10 MHz	20350	1750	QPSK	1	0	22.60	24.74	22.59
	20350	1750	16-QAM	1	0	22.55	24.69	22.54
15 MHz	20325	1747.5	QPSK	1	0	22.63	24.77	22.62
	20025	1717.5	16-QAM	1	0	22.58	24.72	22.57
20 MHz	20050	1720	QPSK	1	0	22.81	24.95	22.80
	20050	1720	16-QAM	1	0	22.67	24.81	22.66

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

Verdict: PASS

LTE. BAND 12.

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

Narrow band = 1

BANDWIDTH (MHz)	CHANNEL	FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
1.4 MHz	23173	715.3	QPSK	1	0	23.05	25.19	23.04
	23095	707.5	16-QAM	1	0	22.80	24.94	22.79

ORIGINAL RESULTS ON ME910C1-WW

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

Narrow band = 1

BANDWIDTH (MHz)	CHANNEL	FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
1.4 MHz	23173	715.3	QPSK	1	0	22.86	25.00	22.85
	23095	707.5	16-QAM	1	0	22.32	24.46	22.31

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

Verdict: PASS

LTE. BAND 13.

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

Narrow band = 1

BANDWIDTH (MHz)	CHANNEL	FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
5 MHz	23230	782	QPSK	1	0	23.45	25.59	23.44
	23230	782	16-QAM	1	0	23.37	25.51	23.36

ORIGINAL RESULTS ON ME910C1-WW

Narrow band = 1

BANDWIDTH (MHz)	CHANNEL	FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
5 MHz	23230	782	QPSK	1	0	22.96	25.10	22.95
	23230	782	16-QAM	1	0	22.95	25.09	22.94

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

Verdict: PASS

Appendix D: Test results for FCC Part 90. CAT M.

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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. QPSK AND 16QAM MODULATION (BAND 26)

	Channel (Frequency, MHz)				
	BW = 1.4 MHz	BW = 3 MHz	BW = 5 MHz	BW = 10 MHz	BW = 15 MHz
Lowest	26697 (814.70)	26705 (815.5)	26715 (816.5)	---	---
Middle	26740 (819)	26740 (819)	26740 (819)	26740 (819)	---
Highest	26783 (823.30)	26775 (822.50)	26765 (821.50)	---	---

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 dB

TEST SETUP

Conducted average power.

RESULTS

MAXIMUM OUTPUT POWER (CONDUCTED).

LTE. BAND 26.

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

Narrow band = 1

BANDWIDTH (MHz)	CHANNEL	FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
1.4 MHz	26697	814.7	QPSK	1	0	23.41	25.55	23.40
	26783	823.3	16-QAM	1	0	23.05	25.19	23.04
3 MHz	26705	815.5	QPSK	1	0	23.59	25.73	23.58
	26705	815.5	16-QAM	1	0	23.10	25.24	23.09
5 MHz	27015	846.5	QPSK	1	0	23.55	25.69	23.54
	26815	826.5	16-QAM	1	0	23.57	25.71	23.56
10 MHz	26740	819	QPSK	1	0	23.48	25.62	23.47
	26740	819	16-QAM	1	0	23.59	25.73	23.58

ORIGINAL RESULTS ON ME910C1-WW

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

Narrow band = 1

BANDWIDTH (MHz)	CHANNEL	FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
1.4 MHz	26697	814.7	QPSK	1	0	23.44	25.58	23.43
	26783	823.3	16-QAM	1	0	23.35	25.49	23.34
3 MHz	26705	815.5	QPSK	1	0	23.44	25.58	23.43
	26705	815.5	16-QAM	1	0	23.35	25.49	23.34
5 MHz	27015	846.5	QPSK	1	0	23.42	25.56	23.41
	26815	826.5	16-QAM	1	0	23.35	25.49	23.34
10 MHz	26740	819	QPSK	1	0	23.40	25.54	23.39
	26740	819	16-QAM	1	0	23.37	25.51	23.36

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

Verdict: PASS

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

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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 M1 Band 26. QPSK AND 16QAM MODULATION:

Channel (Frequency, MHz)			
BW = 1.4 MHz	BW = 3 MHz	BW = 5 MHz	BW = 10 MHz
26790 (824)	26790 (824)	26790 (824)	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:

$$E.R.P. = E.I.R.P. – 2.15\ dB$$

TEST SETUP

CONDUCTED AVERAGE POWER:

RESULTS:

MAXIMUM OUTPUT POWER (CONDUCTED):

Cross-Rule Channel (824 MHz):

The following tables shows the worst case AVERAGE POWER results per channel bandwidth.

LTE Cat M1 Band 26. QPSK AND 16QAM MODULATION.

Narrow band = 1

BANDWIDTH (MHz)	CHANNEL	FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
1.4 MHz	26790	824	QPSK	1	0	23.11	25.25	23.10
	26790	824	16-QAM	1	0	22.98	25.12	22.97
3 MHz	26790	824	QPSK	1	0	22.97	25.11	22.96
	26790	824	16-QAM	1	0	23.31	25.45	23.30
5 MHz	26790	824	QPSK	1	0	23.17	25.31	23.16
	26790	824	16-QAM	1	0	23.18	25.32	23.17
10 MHz	26790	824	QPSK	1	0	23.16	25.3	23.15
	26790	824	16-QAM	1	0	23.01	25.15	23.00

ORIGINAL RESULTS ON ME910C1-WW

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

Narrow band = 1

BANDWIDTH (MHz)	CHANNEL	FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)	Maximum effective radiated power E.I.R.P. (dBm)	Maximum effective radiated power E.R.P. (dBm)
1.4 MHz	26790	824	QPSK	1	0	23.48	25.62	23.47
	26790	824	16-QAM	1	0	23.38	25.52	23.37
3 MHz	26790	824	QPSK	1	0	23.45	25.59	23.44
	26790	824	16-QAM	1	0	23.37	25.51	23.36
5 MHz	26790	824	QPSK	1	0	23.40	25.54	23.39
	26790	824	16-QAM	1	0	23.34	25.48	23.33
10 MHz	26790	824	QPSK	1	0	23.46	25.60	23.45
	26790	824	16-QAM	1	0	23.40	25.54	23.39

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

Verdict: PASS