



FCC LISTED, REGISTRATION
NUMBER: 2764.01

ISED LISTED REGISTRATION
NUMBER: 23595-1

Test report No:

2524ERM.003

Partial Test report

REFERENCE STANDARD:
USA FCC Part 24
CANADA ISED RSS-133

Identification of item tested	Wireless Module
Trademark	Cinterion ALAS5V-US
Model and /or type reference	ALAS5V-US
Other identification of the product	FCC ID: QIPALAS5V-US IC: 7830A-ALAS5VUS
Features	Wireless Module supporting 2G, 3G and 4G Cellular Technologies
Manufacturer	Gemalto M2M GmbH a Thales Company Werinherstr. 81, 81541 Munich, Germany.
Test method requested, standard	USA FCC Part 24 10-1-18 Edition CANADA IC RSS-133 Issue 6, Jan. 2013 (Amendment January 2018); Measurement Guidance 971168 D01 v02r02 for certification of Licensed Digital Transmitters. ANSI C63.26 – 2015.
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Domingo Galvez EMC&RF Lab Manager
Date of issue	07-29-2019
Report template No	FDT08_21

Index

Competences and guarantees..... 3

General conditions 3

Uncertainty 3

Data provided by the client 4

Usage of samples 4

Test sample description..... 5

Identification of the client..... 6

Testing period and place 6

Document history 6

Environmental conditions 7

Remarks and comments..... 8

Testing verdicts..... 8

Summary 8

List of equipment used during the test..... 9

Appendix A: Test Results for FCC Part 24/ IC RSS-133..... 10

Competences and guarantees

DEKRA Certification Inc. is a testing laboratory accredited by A2LA (The American Association for Laboratory Accreditation), to perform the tests indicated in the Certificate 2764.01.

DEKRA Certification Inc. 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 Certification Inc. has a calibration and maintenance program for its measurement equipment.

DEKRA Certification Inc. 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 Certification at the time of performance of the test.

DEKRA Certification Inc. 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 item under test established in this document.

IMPORTANT: No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA Certification Inc.

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.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA Certification Inc.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Certification Inc. and the Accreditation Bodies.

Uncertainty

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

Frequency (MHz)	U(k=2)	Units
30-180	3.82	dB
180-1000	2.61	dB
1000-18000	2.92	dB
18000-40000	2.15	dB

Data provided by the client

Wireless Module supporting 2G,3G and 4G Cellular Technologies.

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
2524.02	Gemalto ALAS5V-US	ALAS5V-US	004401083226668	6/5/2019

1. Sample S/01 was used for the following test(s):

All conducted tests indicated in appendix A.

Test sample description

Ports..... :	Port name and description		Cable				
			Specified length [m]	Attached during test	Shielded		
	No Data Provided			☐	☐		
				☐	☐		
				☐	☐		
				☐	☐		
				☐	☐		
Supplementary information to the ports..... :	No Data Provided						
Rated power supply..... :	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	☐	AC: 230Vac / 50Hz.	☐	☐	☐	☐	☐
	☐	AC:	☐	☐	☐	☐	☐
	☐	DC: 3.3 to 4.2V					
	☒	DC: 3.8V					
Rated Power..... :	No Data Provided						
Clock frequencies..... :	No Data Provided						
Other parameters..... :	No Data Provided						
Software version..... :	Rev. 1.1.4b						
Hardware version..... :	Rev 00.056						
Dimensions in cm (L x W x D) ... :	No Data Provided						
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		
	No Data provided						

Accessories (not part of the test item)..... :	Description	Type	Manufacturer
Documents as provided by the applicant..... :	Description	File name	Issue date
	Equipment declaration data	FDT30_15_Declaration_Equipment_Data_Gemalto_ALAS5V-US_signed	2019-05-24
Copy of marking plate:			
			

Identification of the client

Gemalto M2M GmbH
Werinherstr. 81, 81541 Munich, Germany

Testing period and place

Test Location	DEKRA Certification, Inc.
Date (start)	06-06-2019
Date (finish)	06-08-2019

Document history

Report number	Date	Description
2524ERM.003	06-15-2019	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. = 30 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

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

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

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. = 30 % Max. = 60 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

Remarks and comments

The tests have been performed by the technical personnel: Diya Adusumalli

Testing verdicts

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

Summary

FCC PART 24 /IC RSS-133 PARAGRAPH					
Report Section	FCC 24 Spec Clause	RSS Spec Clause	Test Description	Verdict	Remark
A.1	§2.1046 and §24.232	RSS-133 Clause 6.4	RF Output power	P	N/A
<u>Supplementary information and remarks:</u> N/A					

List of equipment used during the test

Conducted Measurements

CONTROL NUMBER	DESCRIPTION	LAST CALIBRATION	NEXT CALIBRATION
1039	Signal analyzer Rohde & Schwarz FSV40	2018/03	2020/03
1149	Wideband Radio Communication Tester Rohde & Schwarz CMW 500	2018/07	2020/07
1041	EMI Test Receiver Rohde & Schwarz ESR 7	2017/04	2019/03
101	Climatic chamber Espec	2019/10	2020/10

Appendix A: Test Results for FCC Part 24/ IC RSS-133

Appendix A Content

PRODUCT INFORMATION 12

DESCRIPTION OF TEST CONDITIONS 13

TEST A.1: RF OUTPUT POWER 15

PRODUCT INFORMATION

The following information is provided by the client

Information	Description
Modulation	LTE: QPSK, QAM 2G: GPRS, EDGE 3G: WCDMA
Maximum RF Output Power	LTE: 25 dBm 2G: 30 dBm 3G: 25 dBm
Operation mode:	
- Operating Frequency Range	Band 1900: 1850-1910 MHz Band 2: 1850-1910 MHz
- Nominal Channel Bandwidth	Band 1900: 200-300 KHz 3G Band 2: 5 MHz LTE Band 2: 1.4 / 3 / 5 / 10 / 15 / 20 MHz
Extreme operating conditions	
- Temperature range	$T_{nom} = +15$ to $+35$ $T_{min} = -30$ $T_{max} = +50$
Antenna type	External attachable Antenna.
Antenna gain	4 dBi
Nominal Voltage	
- Supply Voltage	3.8 Vdc
- Type of power source	DC voltage from power supply.

DESCRIPTION OF TEST CONDITIONS

The worst case was found when positioned as the table below. Following channel(s) was (were) selected for the final test as listed below:

TEST CONDITIONS	DESCRIPTION
TC#01 2G Band 1900	<u>Power supply (V):</u> $V_{\text{nominal}} = 3.8 \text{ Vdc}$ <u>Test Frequencies for Conducted tests:</u> -Lowest Channel: 512 (1850.2 MHz) -Middle Channel: 662 (1880.2 MHz) -Highest Channel: 810 (1909.8 MHz) Note: This device was tested under all channels and modulations. The worst case found in GPRS modulation.
TC#02 3G Band 2	<u>Power supply (V):</u> $V_{\text{nominal}} = 3.8 \text{ Vdc}$ <u>Test Frequencies for Conducted tests:</u> -Lowest Channel: 9263 (1852.6 MHz) -Middle Channel: 9400 (1880 MHz) -Highest Channel: 9537 (1907.4 MHz) Note: This device was tested under all channels and modulations. The worst case found in WCDMA modulation.

TEST CONDITIONS	DESCRIPTION
TC#03 LTE Band 2	<u>Power supply (V):</u> $V_{\text{nominal}} = 5 \text{ Vdc}$ <u>Test Frequencies for Conducted tests:</u> <u>1.4 MHz Bandwidth:</u> -Lowest Channel: 18607(1850.7 MHz) -Middle Channel: 18900(1880 MHz) -Highest Channel: 19193(1909.3 MHz) <u>3 MHz Bandwidth:</u> -Lowest Channel: 18615(1851.5 MHz) -Middle Channel: 18900(1880 MHz) -Highest Channel: 19185(1908.5 MHz) <u>5 MHz Bandwidth:</u> -Lowest Channel: 18625(1852.5 MHz) -Middle Channel: 18900(1880 MHz) -Highest Channel: 19175(1907.5 MHz) <u>10 MHz Bandwidth:</u> -Lowest Channel: 18650(1855 MHz) -Middle Channel: 18900(1880 MHz) -Highest Channel: 19150(1905 MHz) <u>15 MHz Bandwidth:</u> -Lowest Channel: 18675(1857.5 MHz) -Middle Channel: 18900(1880 MHz) -Highest Channel: 19125(1902.5 MHz) <u>20 MHz Bandwidth:</u> -Lowest Channel: 18700(1860 MHz) -Middle Channel: 18900(1880 MHz) -Highest Channel: 19100(1900 MHz) Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case found in QPSK modulation.

TEST A.1: RF OUTPUT POWER

LIMITS:	Product standard:	FCC Part 24 / IC RSS-133
	Test standard:	FCC §2.1046 and §24.232 / RSS-133 Clause 6.4

LIMITS

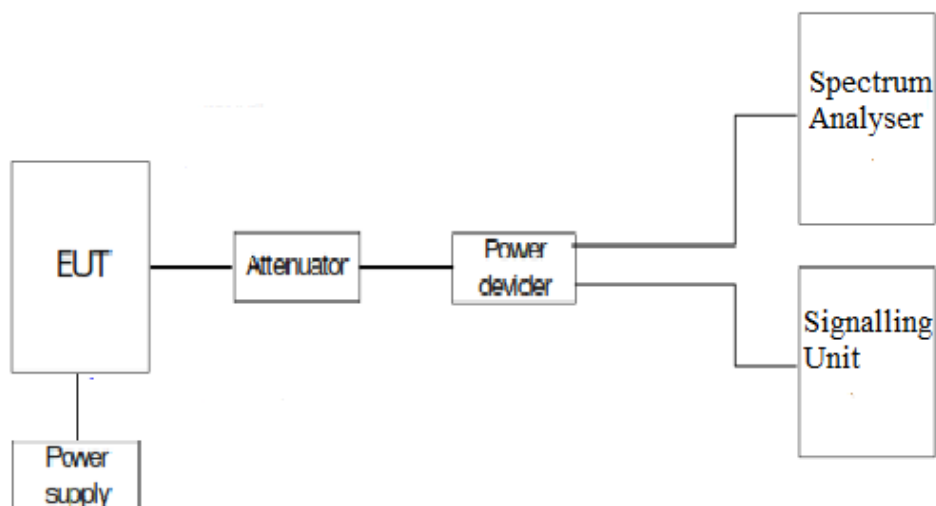
Fixed, mobile, and portable (hand-held) stations are limited to 2-watt EIRP (30 dBm). Fixed stations are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications. 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.

In addition, the transmitter's 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.

TEST SETUP



TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01
TEST RESULTS:	PASS

GPRS Modulation:

Channel	Average power at antenna port (dBm)	Maximum declared antenna gain (dBi)	Maximum E.I.R.P. average power (dBm)
Lowest	29.29	4.0	33.29
Middle	29.34	4.0	33.34
Highest	29.24	4.0	33.24
Measurement uncertainty (dB)			<±0.95

Edge Modulation:

Channel	Average power at antenna port (dBm)	Maximum declared antenna gain (dBi)	Maximum E.I.R.P. average power (dBm)
Lowest	25.44	4.0	29.44
Middle	25.31	4.0	29.31
Highest	25.35	4.0	29.35
Measurement uncertainty (dB)			<±0.95

TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02
TEST RESULTS:	PASS

WCDMA Modulation:

Channel	Average power at antenna port (dBm)	Maximum declared antenna gain (dBi)	Maximum E.I.R.P. average power (dBm)
Lowest	24.61	4.0	28.61
Middle	24.73	4.0	28.73
Highest	24.50	4.0	28.50
Measurement uncertainty (dB)			<±0.95

HSPA Modulation:

Channel	Average power at antenna port (dBm)	Maximum declared antenna gain (dBi)	Maximum E.I.R.P. average power (dBm)
Lowest	22.2	4.0	26.2
Middle	23.1	4.0	27.1
Highest	22.69	4.0	26.69
Measurement uncertainty (dB)			<±0.95

TESTED SAMPLES:	S/01		
TESTED CONDITIONS MODES:	TC#03		
TEST RESULTS:	PASS		

LTE QPSK AND 16QAM MODULATION. Bandwidth = 1.4 MHz

Channel	Average power at antenna port (dBm)	Maximum declared antenna gain (dBi)	Maximum E.I.R.P. average power (dBm)
Lowest	22.9	4.0	26.9
Middle	22.9	4.0	26.9
Highest	23.13	4.0	27.13

LTE QPSK AND 16QAM MODULATION. Bandwidth = 3 MHz

Channel	Average power at antenna port (dBm)	Maximum declared antenna gain (dBi)	Maximum E.I.R.P. average power (dBm)
Lowest	22.89	4.0	26.89
Middle	22.93	4.0	26.93
Highest	23.10	4.0	27.10

LTE QPSK AND 16QAM MODULATION. Bandwidth = 5 MHz

Channel	Average power at antenna port (dBm)	Maximum declared antenna gain (dBi)	Maximum E.I.R.P. average power (dBm)
Lowest	22.84	4.0	26.84
Middle	22.99	4.0	26.99
Highest	23.12	4.0	27.12

LTE QPSK AND 16QAM MODULATION. Bandwidth = 10 MHz

Channel	Average power at antenna port (dBm)	Maximum declared antenna gain (dBi)	Maximum E.I.R.P. average power (dBm)
Lowest	23.16	4.0	27.16
Middle	23.19	4.0	27.19
Highest	23.19	4.0	27.19

LTE QPSK AND 16QAM MODULATION. Bandwidth = 15 MHz

Channel	Average power at antenna port (dBm)	Maximum declared antenna gain (dBi)	Maximum E.I.R.P. average power (dBm)
Lowest	22.99	4.0	26.99
Middle	23.04	4.0	27.04
Highest	23.28	4.0	27.28

LTE QPSK AND 16QAM MODULATION. Bandwidth = 20 MHz

Channel	Average power at antenna port (dBm)	Maximum declared antenna gain (dBi)	Maximum E.I.R.P. average power (dBm)
Lowest	23.20	4.0	27.20
Middle	23.26	4.0	27.26
Highest	23.21	4.0	27.21
Measurement uncertainty (dB)			<±0.95

TEST RESULTS (Cont):

Bandwidth (MHz)	Channel Location Frequency (MHz) Channel Number	Modulation	Resource Block Size	Resource Block Offset	Average power at antenna port (dBm)
1.4	Lowest (18607 (1850.7 MHz))	QPSK	1	0	22.86
			1	5	22.90
			3	0	22.84
			3	2	22.87
			6	0	21.85
		16-QAM	1	0	22.03
			1	5	21.98
			3	0	21.84
			3	2	21.94
			6	0	20.95
	Middle (18900 (1880 MHz))	QPSK	1	0	22.81
			1	5	22.80
			3	0	22.87
			3	2	22.90
			6	0	21.82
		16-QAM	1	0	22.07
			1	5	22.02
			3	0	21.82
			3	2	21.90
			6	0	20.95
	Highest (19193 (1909.3 MHz))	QPSK	1	0	23.02
			1	5	23.05
			3	0	23.13
			3	2	23.12
			6	0	22.04
		16-QAM	1	0	22.07
			1	5	22.02
			3	0	22.01
			3	2	22.05
			6	0	21.17

TEST RESULTS (Cont):

Bandwidth (MHz)	Channel Location Frequency (MHz) Channel Number	Modulation	Resource Block Size	Resource Block Offset	Average power at antenna port (dBm)
3	Lowest (18650 (1855 MHz))	QPSK	1	0	22.89
			1	14	22.84
			8	0	21.95
			8	7	21.92
			15	0	21.91
		16-QAM	1	0	22.13
			1	14	22.05
			8	0	21.12
			8	7	21.13
			15	0	20.96
	Middle (18900 (1880 MHz))	QPSK	1	0	22.93
			1	14	22.90
			8	0	21.95
			8	7	21.94
			15	0	21.95
		16-QAM	1	0	22.13
			1	14	22.08
			8	0	21.10
			8	7	21.11
			15	0	20.99
	Highest (19185 (1908.5 MHz))	QPSK	1	0	23.10
			1	14	23.03
			8	0	22.11
			8	7	22.15
			15	0	22.11
		16-QAM	1	0	22.24
			1	14	22.28
			8	0	21.24
			8	7	21.22
			15	0	21.20

TEST RESULTS (Cont):

Bandwidth (MHz)	Channel Location Frequency (MHz) Channel Number	Modulation	Resource Block Size	Resource Block Offset	Average power at antenna port (dBm)
5	Lowest (18625 (1852.5 MHz))	QPSK	1	0	22.84
			1	24	22.81
			12	0	21.95
			12	11	21.89
			25	0	21.90
		16-QAM	1	0	22.02
			1	24	21.98
			12	0	20.97
			12	11	20.97
			25	0	20.94
	Middle (18900 (1880 MHz))	QPSK	1	0	22.99
			1	24	22.93
			12	0	21.92
			12	11	21.92
			25	0	21.95
		16-QAM	1	0	22.01
			1	24	21.95
			12	0	21.07
			12	11	21.09
			25	0	20.98
	Highest (19175 (1907.5 MHz))	QPSK	1	0	23.12
			1	24	23.05
			12	0	22.15
			12	11	22.15
			25	0	22.13
		16-QAM	1	0	22.48
			1	24	22.52
			12	0	21.05
			12	11	21.03
			25	0	21.18

TEST RESULTS (Cont):

BANDWIDTH (MHz)	CHANNEL FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)
10	Lowest (18650 (1855 MHz))	QPSK	1	0	23.16
			1	24	22.83
			1	49	23.11
			25	0	21.97
			25	24	21.98
			50	0	21.98
		16-QAM	1	0	22.43
			1	24	22.07
			1	49	22.34
			25	0	21.08
			25	24	21.03
			50	0	21.00
	Middle (18900 (1880 MHz))	QPSK	1	0	23.19
			1	24	22.92
			1	49	23.13
			25	0	21.98
			25	24	21.98
			50	0	22.04
		16-QAM	1	0	22.36
			1	24	22.06
			1	49	22.25
			25	0	21.06
			25	24	20.98
			50	0	20.98
	Highest (19150 (1905 MHz))	QPSK	1	0	23.19
			1	24	23.07
			1	49	23.15
			25	0	22.22
			25	24	22.21
			50	0	22.20
		16-QAM	1	0	22.37
			1	24	22.24
			1	49	22.27
			25	0	21.32
			25	24	21.27
			50	0	21.17

TEST RESULTS (Cont):

BANDWIDTH (MHz)	CHANNEL FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)
15	Lowest (18675 (1857.5 MHz))	QPSK	1	0	22.99
			1	37	22.86
			1	74	22.93
			36	0	22.00
			36	37	21.91
			75	0	21.95
		16-QAM	1	0	22.33
			1	37	22.16
			1	74	22.22
			36	0	21.06
			36	37	21.02
			75	0	20.96
	Middle (18900 (1880 MHz))	QPSK	1	0	23.04
			1	37	22.89
			1	74	22.94
			36	0	22.02
			36	37	21.98
			75	0	21.95
		16-QAM	1	0	22.28
			1	37	22.11
			1	74	22.20
			36	0	21.09
			36	37	20.97
			75	0	21.03
	Highest (19125 (1902.5 MHz))	QPSK	1	0	23.28
			1	37	23.15
			1	74	23.15
			36	0	22.24
			36	37	22.16
			75	0	22.21
		16-QAM	1	0	22.20
			1	37	22.06
			1	74	22.11
			36	0	21.25
			36	37	21.23
			75	0	21.17

TEST RESULTS (Cont):

BANDWIDTH (MHz)	CHANNEL FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)
20	Lowest (18700 (1860 MHz))	QPSK	1	0	23.20
			1	49	22.89
			1	99	23.09
			50	0	22.02
			50	49	21.95
			100	0	22.02
		16-QAM	1	0	22.26
			1	49	21.92
			1	99	22.15
			50	0	21.09
			50	49	21.02
			100	0	20.99
	Middle (18900 (1880 MHz))	QPSK	1	0	23.26
			1	49	22.95
			1	99	23.15
			50	0	22.03
			50	49	21.97
			100	0	22.01
		16-QAM	1	0	22.64
			1	49	22.43
			1	99	22.58
			50	0	21.07
			50	49	21.00
			100	0	21.02
	Highest (19100 (1900 MHz))	QPSK	1	0	23.21
			1	49	23.03
			1	99	23.10
			50	0	22.29
			50	49	22.23
			100	0	22.28
		16-QAM	1	0	22.85
			1	49	22.70
			1	99	22.86
			50	0	21.26
			50	49	21.19
			100	0	21.30