



FCC LISTED, REGISTRATION
NUMBER: 2764.01

ISED LISTED REGISTRATION
NUMBER: 23595-1

Test report No:
2524ERM.004A1

Partial Test report

REFERENCE STANDARD:
USA FCC Part 27
CANADA ISED RSS-139 / RSS-130

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 Werinherstr. 81, 81541 Munich, Germany.
Test method requested, standard	USA FCC Part 27 10-1-18 Edition CANADA IC RSS-139 Issue 3, July. 2015. CANADA IC RSS-130 Issue 2, Feb 2019. 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
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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.

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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.004	06-15-2019	First release
2524ERM.004A1	08-13-2019	Second release

Modification to the reference test report

It was introduced the following modifications in respect to the test report number 2456ERM.004 related with the samples, in the next clauses and sub-clauses:

Clauses/ Sub-Clauses	Modification	Justification
Page 1/ Standards	Corrected Canada RSS Standards	Typo

This modification test report cancels and replaces the test report 2524ERM.004

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 27 /IC RSS-139/RSS-130 PARAGRAPH					
Report Section	FCC Spec Clause	RSS Spec Clause	Test Description	Verdict	Remark
A.1	§2.1046 and §27.50	RSS-139 Clause 6.5/ RSS-130 Clause 4.6	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	2018/10	2020/10
1149	Wideband Radio Communication Tester Rohde & Schwarz CMW 500	2018/07	2020/07
1041	EMI Test Receiver Rohde & Schwarz ESR 7	2017/04	2019/08
101	Climatic chamber Espec	2019/10	2020/10

Appendix A: Test Results for FCC Part 27/ IC RSS-139/ RSS-130

Appendix A Content

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TEST A.1: RF OUTPUT POWER 17

PRODUCT INFORMATION

The following information is provided by the client

Information	Description
Modulation	LTE: QPSK, QAM 3G: WCDMA
Maximum RF Output Power	LTE: 25 dBm 3G: 25 dBm
Operation mode:	
- Operating Frequency Range	LTE Band 4: 1710 – 1755 MHz LTE Band 12: 699 – 716 MHz LTE Band 17: 704 – 716 MHz LTE Band 66: 1710 – 1780 MHz 3G Band 4: 1710 – 1755 MHz
- Nominal Channel Bandwidth	LTE Band 4: 1.4 / 3 / 5 / 10 / 15 / 20 MHz LTE Band 12: 1.4 / 3 / 5 / 10 MHz LTE Band 17: 5 / 10 MHz LTE Band 66: 1.4 / 3 / 5 / 10 / 15 / 20 MHz 3G Band 4: 5 MHz
Extreme operating conditions	
- Temperature range	T _{nom} = +15 to + 35 T _{min} = -30 T _{max} = +50
Antenna type	External attachable Antenna.
Antenna gain	698-960 MHz: 3 dBi 1710-2170 MHz: 4 dBi 2170-2700 MHz: 5 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 LTE Band 4	<u>Power supply (V):</u> $V_{\text{nominal}} = 3.8 \text{ Vdc}$ <u>Test Frequencies for Conducted tests:</u> <u>1.4 MHz Bandwidth:</u> -Lowest Channel: 19957(1710.7 MHz) -Middle Channel: 20175(1732.5 MHz) -Highest Channel: 20393(1754.3 MHz) <u>3 MHz Bandwidth:</u> -Lowest Channel: 19965(1711.5 MHz) -Middle Channel: 20175(1732.5 MHz) -Highest Channel: 20375(1752.5 MHz) <u>5 MHz Bandwidth:</u> -Lowest Channel: 19975(1712.5 MHz) -Middle Channel: 20175(1732.5 MHz) -Highest Channel: 19175(1907.5 MHz) <u>10 MHz Bandwidth:</u> -Lowest Channel: 20000(1715 MHz) -Middle Channel: 20175(1732.5 MHz) -Highest Channel: 20350(1750 MHz) <u>15 MHz Bandwidth:</u> -Lowest Channel: 20025(1717.5 MHz) -Middle Channel: 20175(1732.5 MHz) -Highest Channel: 20325(1747.5 MHz) <u>20 MHz Bandwidth:</u> -Lowest Channel: 20050(1720 MHz) -Middle Channel: 20175(1732.5 MHz) -Highest Channel: 20300(1745 MHz)

TEST CONDITIONS	DESCRIPTION
TC#02 LTE Band 12	<u>Power supply (V):</u> $V_{\text{nominal}} = 3.8 \text{ Vdc}$ <u>Test Frequencies for Conducted tests:</u> <u>1.4 MHz Bandwidth:</u> -Lowest Channel: 23017(699.7 MHz) -Middle Channel: 23095(707.5 MHz) -Highest Channel: 23173(715.3 MHz) <u>3 MHz Bandwidth:</u> -Lowest Channel: 23025(700.5 MHz) -Middle Channel: 23095(707.5 MHz) -Highest Channel: 23165(714.5 MHz) <u>5 MHz Bandwidth:</u> -Lowest Channel: 23035(701.5 MHz) -Middle Channel: 23095(707.5 MHz) -Highest Channel: 23155(713.5 MHz) <u>10 MHz Bandwidth:</u> -Lowest Channel: 23060(704 MHz) -Middle Channel: 23095(707.5 MHz) -Highest Channel: 23130(711 MHz) Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case found in QPSK modulation.
TC#03 LTE Band 17	<u>Power supply (V):</u> $V_{\text{nominal}} = 3.8 \text{ Vdc}$ <u>Test Frequencies for Conducted tests:</u> <u>5 MHz Bandwidth:</u> -Lowest Channel: 23755 (706.5 MHz) -Middle Channel: 23790 (710.0 MHz) -Highest Channel: 23825 (713.5 MHz) <u>10 MHz Bandwidth:</u> -Lowest Channel: 23780 (709 MHz) -Middle Channel: 23790 (710 MHz) -Highest Channel: 23800 (711 MHz) Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case found in QPSK modulation.

TEST CONDITIONS	DESCRIPTION
TC#04 LTE Band 66	<u>Power supply (V):</u> $V_{\text{nominal}} = 3.8 \text{ Vdc}$ <u>Test Frequencies for Conducted tests:</u> <u>1.4 MHz Bandwidth:</u> -Lowest Channel: 131979(1710.7 MHz) -Middle Channel: 132422(1755 MHz) -Highest Channel: 132665(1779.3 MHz) <u>3 MHz Bandwidth:</u> -Lowest Channel: 131987(1711.5 MHz) -Middle Channel: 132422(1755 MHz) -Highest Channel: 132657(1778.5 MHz) <u>5 MHz Bandwidth:</u> -Lowest Channel: 131997(1712.5 MHz) -Middle Channel: 132422(1755 MHz) -Highest Channel: 132647(1777.5 MHz) <u>10 MHz Bandwidth:</u> -Lowest Channel: 132022(1715 MHz) -Middle Channel: 132422(1755 MHz) -Highest Channel: 132622(1775 MHz) <u>15 MHz Bandwidth:</u> -Lowest Channel: 132047(1717.5 MHz) -Middle Channel: 132422(1755 MHz) -Highest Channel: 132597(1772.5 MHz) <u>20 MHz Bandwidth:</u> -Lowest Channel: 132072(1720 MHz) -Middle Channel: 132422(1755 MHz) -Highest Channel: 132572(1770 MHz)

TEST CONDITIONS	DESCRIPTION										
TC#05 3G Band 4	<u>Power supply (V):</u> V _{nominal} = 3.8 Vdc										
	<u>Test Frequencies for Conducted tests:</u> -Lowest Channel: 1313 (1712.6 MHz) -Middle Channel: 1450 (1740 MHz) -Highest Channel: 1512 (1752.4 MHz)										
	<u>Test Frequencies for Radiated tests:</u>										
	<table><tr><th>Available Frequencies</th><th>Tested Frequency</th><th>Channel Bandwidth</th><th>Modulation</th></tr><tr><td rowspan="3">1710 to 1755 MHz</td><td>1712.6 MHz</td><td rowspan="3">5 MHz</td><td rowspan="3">WCDMA</td></tr><tr><td>1740 MHz</td></tr><tr><td>1752.4 MHz</td></tr></table>	Available Frequencies	Tested Frequency	Channel Bandwidth	Modulation	1710 to 1755 MHz	1712.6 MHz	5 MHz	WCDMA	1740 MHz	1752.4 MHz
	Available Frequencies	Tested Frequency	Channel Bandwidth	Modulation							
1710 to 1755 MHz	1712.6 MHz	5 MHz	WCDMA								
	1740 MHz										
	1752.4 MHz										
Note: This device was tested under all channels and modulations. The worst case found in WCDMA modulation.											

TEST A.1: RF OUTPUT POWER

LIMITS:	Product standard:	FCC Part 27 / IC RSS-139/ RSS-130
	Test standard:	FCC §2.1046 and §27.50 / RSS-139 Clause 6.5/ RSS-130 Clause 4.6

LIMITS

Fixed, mobile, and portable (hand-held) stations operating in the band are limited to 1-watt EIRP (30 dBm). Fixed stations operating in the 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.

The peak-to-average ratio (PAR) of the transmission shall not exceed 13 dB.

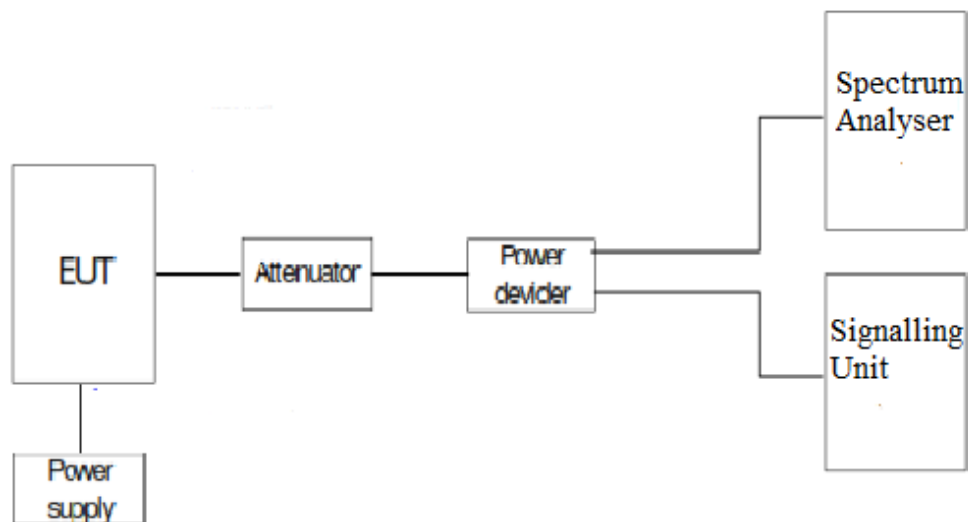
RSS-139 Clause 6.5

The equivalent isotropically radiated power (e.i.r.p.) for mobile and portable transmitters shall not exceed one watt. In addition, the peak to average power ratio (PAPR) of the equipment shall not exceed 13 dB for more than 0.1% of the time, using a signal that corresponds to the highest PAPR during periods of continuous transmission.

RSS-130 Clause 4.6

The e.r.p. shall not exceed 30 watts for mobile equipment. 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 and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

TEST SETUP



TESTED SAMPLES:	S/01		
TESTED CONDITIONS MODES:	TC#01 (Band 4)		
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	23.07	4.0	27.07
Middle	22.95	4.0	26.95
Highest	22.96	4.0	26.96

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	23.08	4.0	27.08
Middle	22.94	4.0	26.94
Highest	22.96	4.0	26.96

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	23.14	4.0	27.14
Middle	23.02	4.0	27.02
Highest	23.00	4.0	27.00

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	23.11	4.0	27.11
Middle	23.06	4.0	27.06
Highest	22.98	4.0	26.98

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	23.20	4.0	27.20
Middle	23.05	4.0	27.05
Highest	23.07	4.0	27.07

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	23.21	4.0	27.21
Middle	23.14	4.0	27.14
Highest	23.06	4.0	27.06
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 (19957 (1710.7 MHz))	QPSK	1	0	22.97
			1	5	22.97
			3	0	23.04
			3	2	23.07
			6	0	22.02
		16-QAM	1	0	21.90
			1	5	21.90
			3	0	21.91
			3	2	21.97
			6	0	21.05
	Middle (20175 (1732.5 MHz))	QPSK	1	0	22.85
			1	5	22.89
			3	0	22.92
			3	2	22.95
			6	0	21.89
		16-QAM	1	0	22.08
			1	5	22.10
			3	0	21.87
			3	2	21.92
			6	0	20.91
	Highest (20393 (1754.3 MHz))	QPSK	1	0	22.85
			1	5	22.83
			3	0	22.89
			3	2	22.96
			6	0	22.86
		16-QAM	1	0	22.12
			1	5	22.11
			3	0	21.89
			3	2	21.88
			6	0	20.93

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 (19965 (1711.5 MHz))	QPSK	1	0	23.08
			1	14	23.03
			8	0	22.09
			8	7	22.04
			15	0	22.05
		16-QAM	1	0	22.25
			1	14	22.24
			8	0	21.26
			8	7	21.24
			15	0	21.13
	Middle (20175 (1732.5 MHz))	QPSK	1	0	22.94
			1	14	22.93
			8	0	21.94
			8	7	21.95
			15	0	21.96
		16-QAM	1	0	22.16
			1	14	22.15
			8	0	21.10
			8	7	21.11
			15	0	20.99
	Highest (20385 (1753.5 MHz))	QPSK	1	0	22.96
			1	14	22.92
			8	0	21.93
			8	7	21.90
			15	0	21.97
		16-QAM	1	0	22.22
			1	14	22.18
			8	0	21.01
			8	7	21.06
			15	0	20.96

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 (19975 (1712.5 MHz))	QPSK	1	0	23.11
			1	24	23.14
			12	0	22.13
			12	11	22.08
			25	0	22.07
		16-QAM	1	0	22.24
			1	24	22.27
			12	0	21.13
			12	11	21.16
			25	0	21.09
	Middle (20175 (1732.5 MHz))	QPSK	1	0	23.02
			1	24	22.98
			12	0	21.96
			12	11	21.93
			25	0	21.97
		16-QAM	1	0	22.08
			1	24	22.03
			12	0	21.06
			12	11	21.05
			25	0	20.96
	Highest (20375 (1752.5 MHz))	QPSK	1	0	23.00
			1	24	23.00
			12	0	21.95
			12	11	21.95
			25	0	21.99
		16-QAM	1	0	22.40
			1	24	22.42
			12	0	20.90
			12	11	20.83
			25	0	20.97

TEST RESULTS (Cont):

BANDWIDTH (MHz)	CHANNEL FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)
10	Low est (20000 (1715 MHz))	QPSK	1	0	23.11
			1	24	23.03
			1	49	23.05
			25	0	22.09
			25	24	22.14
			50	0	22.08
		16-QAM	1	0	22.32
			1	24	22.14
			1	49	22.24
			25	0	21.18
			25	24	21.17
			50	0	21.09
	Middle (20175 (1732.5 MHz))	QPSK	1	0	23.06
			1	24	22.90
			1	49	22.95
			25	0	21.97
			25	24	22.00
			50	0	21.96
		16-QAM	1	0	22.27
			1	24	22.15
			1	49	22.21
			25	0	21.05
			25	24	21.00
			50	0	20.97
	Highest (20350 (1750 MHz))	QPSK	1	0	22.98
			1	24	22.91
			1	49	22.91
			25	0	21.94
			25	24	21.96
			50	0	21.94
		16-QAM	1	0	22.22
			1	24	22.16
			1	49	22.18
			25	0	21.05
			25	24	21.07
			50	0	20.98

TEST RESULTS (Cont):

BANDWIDTH (MHz)	CHANNEL FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)
15	Lowest (20025 (1717.5 MHz))	QPSK	1	0	23.20
			1	37	23.03
			1	74	22.96
			36	0	22.13
			36	37	22.14
			75	0	22.12
		16-QAM	1	0	22.39
			1	37	22.20
			1	74	22.16
			36	0	21.18
			36	37	21.18
			75	0	21.06
	Middle (20175 (1732.5 MHz))	QPSK	1	0	23.05
			1	37	22.91
			1	74	23.00
			36	0	22.04
			36	37	22.03
			75	0	21.99
		16-QAM	1	0	22.31
			1	37	22.14
			1	74	22.24
			36	0	21.03
			36	37	20.97
			75	0	20.99
	Highest (20325 (1747.5 MHz))	QPSK	1	0	23.07
			1	37	22.93
			1	74	22.98
			36	0	22.00
			36	37	21.97
			75	0	21.98
		16-QAM	1	0	22.06
			1	37	21.94
			1	74	22.01
			36	0	21.04
			36	37	21.00
			75	0	20.97

TEST RESULTS (Cont):

BANDWIDTH (MHz)	CHANNEL FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)
20	Lowest (20050 (1720 MHz))	QPSK	1	0	23.21
			1	49	23.06
			1	99	23.01
			50	0	22.18
			50	49	21.95
			100	0	22.10
		16-QAM	1	0	22.31
			1	49	22.16
			1	99	22.12
			50	0	21.21
			50	49	21.00
			100	0	21.13
	Middle (20175 (1732.5 MHz))	QPSK	1	0	23.14
			1	49	22.98
			1	99	23.08
			50	0	22.05
			50	49	22.00
			100	0	22.01
		16-QAM	1	0	22.50
			1	49	22.36
			1	99	22.43
			50	0	21.02
			50	49	20.98
			100	0	21.06
	Highest (20300 (1745 MHz))	QPSK	1	0	23.06
			1	49	22.95
			1	99	22.99
			50	0	22.06
			50	49	21.98
			100	0	22.02
		16-QAM	1	0	22.62
			1	49	22.45
			1	99	22.54
			50	0	20.98
			50	49	20.95
			100	0	21.08

TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (Band 12)
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	23.08	3.0	26.08
Middle	23.29	3.0	26.29
Highest	23.61	3.0	26.61

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	23.19	3.0	26.19
Middle	23.33	3.0	26.33
Highest	23.69	3.0	26.69

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	23.27	3.0	26.27
Middle	23.45	3.0	26.45
Highest	23.57	3.0	26.57

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	23.27	3.0	26.27
Middle	23.46	3.0	26.46
Highest	23.47	3.0	26.47

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 (23017 (699.7 MHz))	QPSK	1	0	23.01
			1	5	23.00
			3	0	23.06
			3	2	23.08
			6	0	22.07
		16-QAM	1	0	21.94
			1	5	21.94
			3	0	21.96
			3	2	22.03
			6	0	21.16
	Middle (23095 (707.5 MHz))	QPSK	1	0	23.23
			1	5	23.25
			3	0	23.29
			3	2	23.28
			6	0	22.24
		16-QAM	1	0	22.46
			1	5	22.48
			3	0	22.32
			3	2	22.28
			6	0	21.35
	Highest (23173 (715.3 MHz))	QPSK	1	0	23.50
			1	5	23.50
			3	0	23.56
			3	2	23.61
			6	0	22.51
		16-QAM	1	0	22.75
			1	5	22.71
			3	0	22.55
			3	2	22.54
			6	0	21.66

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 (23025 (700.5 MHz))	QPSK	1	0	23.09
			1	14	23.19
			8	0	22.14
			8	7	22.25
			15	0	22.25
		16-QAM	1	0	22.31
			1	14	22.45
			8	0	21.35
			8	7	21.40
			15	0	21.27
	Middle (23095 (707.5 MHz))	QPSK	1	0	23.33
			1	14	23.29
			8	0	22.35
			8	7	22.31
			15	0	22.35
		16-QAM	1	0	22.61
			1	14	22.55
			8	0	21.50
			8	7	21.51
			15	0	21.38
	Highest (23165 (714.5 MHz))	QPSK	1	0	23.51
			1	14	23.51
			8	0	23.69
			8	7	22.62
			15	0	22.65
		16-QAM	1	0	22.70
			1	14	22.79
			8	0	21.65
			8	7	21.78
			15	0	21.72

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 (23035 (701.5 MHz))	QPSK	1	0	23.10
			1	24	23.27
			12	0	22.16
			12	11	22.25
			25	0	22.23
		16-QAM	1	0	22.25
			1	24	22.43
			12	0	21.16
			12	11	21.31
			25	0	21.23
	Middle (23095 (707.5 MHz))	QPSK	1	0	23.32
			1	24	23.45
			12	0	22.33
			12	11	22.31
			25	0	22.34
		16-QAM	1	0	22.39
			1	24	22.50
			12	0	21.50
			12	11	21.46
			25	0	21.38
	Highest (23155 (713.5 MHz))	QPSK	1	0	23.44
			1	24	23.57
			12	0	22.60
			12	11	22.62
			25	0	22.56
		16-QAM	1	0	22.90
			1	24	23.03
			12	0	21.50
			12	11	21.45
			25	0	21.58

TEST RESULTS (Cont):

BANDWIDTH (MHz)	CHANNEL FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)
10	Low est (23060 (704 MHz))	QPSK	1	0	23.09
			1	24	23.27
			1	49	23.27
			25	0	22.20
			25	24	22.27
			50	0	22.29
		16-QAM	1	0	22.34
			1	24	22.52
			1	49	22.51
			25	0	21.35
			25	24	21.33
			50	0	21.28
	Middle (23095 (707.5 MHz))	QPSK	1	0	23.22
			1	24	23.29
			1	49	23.46
			25	0	22.29
			25	24	22.41
			50	0	22.36
		16-QAM	1	0	22.44
			1	24	22.59
			1	49	22.72
			25	0	21.31
			25	24	21.50
			50	0	21.36
	Highest (23130 (711 MHz))	QPSK	1	0	23.35
			1	24	23.39
			1	49	23.47
			25	0	22.30
			25	24	22.49
			50	0	22.43
		16-QAM	1	0	22.51
			1	24	22.56
			1	49	22.64
			25	0	21.48
			25	24	21.57
			50	0	21.40

TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#03 (Band 17)
TEST RESULTS:	PASS

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	23.38	3.0	26.38
Middle	23.40	3.0	26.40
Highest	23.48	3.0	26.48

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	23.41	3.0	26.41
Middle	23.45	3.0	26.45
Highest	23.38	3.0	26.38

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 (23755 (706.5 MHz))	QPSK	1	0	23.27
			1	24	23.38
			12	0	22.31
			12	11	22.34
			25	0	22.33
		16-QAM	1	0	22.40
			1	24	22.55
			12	0	21.36
			12	11	21.38
			25	0	21.35
	Middle (23790 (710 MHz))	QPSK	1	0	23.40
			1	24	23.39
			12	0	22.41
			12	11	22.41
			25	0	22.44
		16-QAM	1	0	22.48
			1	24	22.42
			12	0	21.56
			12	11	21.53
			25	0	21.47
	Highest (23825 (713.5 MHz))	QPSK	1	0	23.45
			1	24	23.48
			12	0	22.61
			12	11	22.61
			25	0	22.59
		16-QAM	1	0	22.86
			1	24	22.95
			12	0	21.50
			12	11	21.45
			25	0	21.59

TEST RESULTS (Cont):

BANDWIDTH (MHz)	CHANNEL FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)
10	Low est (23780 (709 MHz))	QPSK	1	0	23.27
			1	24	23.37
			1	49	23.41
			25	0	22.41
			25	24	22.43
			50	0	22.48
		16-QAM	1	0	22.52
			1	24	22.65
			1	49	22.71
			25	0	21.48
			25	24	21.53
			50	0	21.46
	Middle (23790 (710 MHz))	QPSK	1	0	23.37
			1	24	23.38
			1	49	23.45
			25	0	22.45
			25	24	22.44
			50	0	22.48
		16-QAM	1	0	22.60
			1	24	22.66
			1	49	22.70
			25	0	21.52
			25	24	21.45
			50	0	21.42
	Highest (23800 (711 MHz))	QPSK	1	0	23.35
			1	24	23.38
			1	49	23.38
			25	0	22.43
			25	24	22.52
			50	0	22.43
		16-QAM	1	0	22.51
			1	24	22.55
			1	49	22.57
			25	0	21.57
			25	24	21.58
			50	0	21.57

TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#04 (Band 66)
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	23.11	4.0	27.11
Middle	22.96	4.0	26.96
Highest	23.06	4.0	27.06

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	23.14	4.0	27.14
Middle	23.02	4.0	27.02
Highest	23.14	4.0	27.14

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	23.17	4.0	27.17
Middle	23.10	4.0	27.10
Highest	23.06	4.0	27.06

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	23.17	4.0	27.17
Middle	23.08	4.0	27.08
Highest	23.12	4.0	27.12

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	23.23	4.0	27.23
Middle	23.16	4.0	27.16
Highest	23.21	4.0	27.21

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	23.32	4.0	27.32
Middle	23.23	4.0	27.23
Highest	23.13	4.0	27.13
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 (131979 (1710.7 MHz))	QPSK	1	0	23.03
			1	5	23.04
			3	0	23.10
			3	2	23.11
			6	0	22.07
		16-QAM	1	0	21.98
			1	5	21.97
			3	0	22.02
			3	2	22.05
			6	0	21.12
	Middle (132422 (1755 MHz))	QPSK	1	0	22.92
			1	5	22.93
			3	0	22.90
			3	2	22.96
			6	0	21.92
		16-QAM	1	0	22.12
			1	5	22.14
			3	0	21.94
			3	2	22.01
			6	0	21.01
	Highest (132665 (1779.3 MHz))	QPSK	1	0	22.92
			1	5	23.00
			3	0	23.00
			3	2	23.06
			6	0	21.93
		16-QAM	1	0	22.21
			1	5	22.15
			3	0	21.95
			3	2	21.98
			6	0	21.10

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 (131987 (1711.5 MHz))	QPSK	1	0	23.14
			1	14	23.10
			8	0	22.16
			8	7	22.16
			15	0	22.12
		16-QAM	1	0	22.32
			1	14	22.30
			8	0	21.34
			8	7	21.33
			15	0	21.19
	Middle (132422 (1755 MHz))	QPSK	1	0	23.02
			1	14	23.01
			8	0	22.02
			8	7	22.00
			15	0	22.04
		16-QAM	1	0	22.28
			1	14	22.20
			8	0	21.15
			8	7	21.14
			15	0	21.03
	Highest (132657 (1778.5 MHz))	QPSK	1	0	23.01
			1	14	23.14
			8	0	22.01
			8	7	22.02
			15	0	22.06
		16-QAM	1	0	22.27
			1	14	22.24
			8	0	21.15
			8	7	21.15
			15	0	21.10

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 (131997 (1712.5 MHz))	QPSK	1	0	23.16
			1	24	23.17
			12	0	22.19
			12	11	22.16
			25	0	22.15
		16-QAM	1	0	22.28
			1	24	22.29
			12	0	21.20
			12	11	21.19
			25	0	21.14
	Middle (132422 (1755 MHz))	QPSK	1	0	23.10
			1	24	23.07
			12	0	22.02
			12	11	22.02
			25	0	22.00
		16-QAM	1	0	22.16
			1	24	22.13
			12	0	21.13
			12	11	21.16
			25	0	21.08
	Highest (132647 (1777.5 MHz))	QPSK	1	0	23.06
			1	24	23.03
			12	0	22.04
			12	11	22.08
			25	0	22.03
		16-QAM	1	0	22.48
			1	24	22.48
			12	0	21.00
			12	11	21.00
			25	0	21.11

TEST RESULTS (Cont):

BANDWIDTH (MHz)	CHANNEL FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)
10	Lowest (132022 (1715 MHz))	QPSK	1	0	23.17
			1	24	23.12
			1	49	23.13
			25	0	22.17
			25	24	22.18
			50	0	22.16
		16-QAM	1	0	22.37
			1	24	22.28
			1	49	22.27
			25	0	21.27
			25	24	21.24
			50	0	21.18
	Middle (132422 (1755 MHz))	QPSK	1	0	23.08
			1	24	23.00
			1	49	23.00
			25	0	22.06
			25	24	22.03
			50	0	22.05
		16-QAM	1	0	22.29
			1	24	22.23
			1	49	22.25
			25	0	21.10
			25	24	21.05
			50	0	21.03
	Highest (132622 (1775 MHz))	QPSK	1	0	23.12
			1	24	23.04
			1	49	23.07
			25	0	22.08
			25	24	22.08
			50	0	22.12
		16-QAM	1	0	22.26
			1	24	22.23
			1	49	22.24
			25	0	21.17
			25	24	21.17
			50	0	21.06

TEST RESULTS (Cont):

BANDWIDTH (MHz)	CHANNEL FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)
15	Lowest (132047 (1717.5 MHz))	QPSK	1	0	23.23
			1	37	23.07
			1	74	23.14
			36	0	22.22
			36	37	22.21
			75	0	22.22
		16-QAM	1	0	22.49
			1	37	22.24
			1	74	22.35
			36	0	21.27
			36	37	21.21
			75	0	21.19
	Middle (132422 (1755 MHz))	QPSK	1	0	23.16
			1	37	23.00
			1	74	23.09
			36	0	22.08
			36	37	22.03
			75	0	22.04
		16-QAM	1	0	22.43
			1	37	22.21
			1	74	22.31
			36	0	21.14
			36	37	21.10
			75	0	21.13
	Highest (132597 (1772.5 MHz))	QPSK	1	0	23.21
			1	37	23.02
			1	74	23.09
			36	0	22.12
			36	37	22.05
			75	0	22.10
		16-QAM	1	0	22.14
			1	37	22.01
			1	74	22.03
			36	0	21.11
			36	37	21.15
			75	0	21.04

TEST RESULTS (Cont):

BANDWIDTH (MHz)	CHANNEL FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)
20	Lowest (132072 (1720 MHz))	QPSK	1	0	23.32
			1	49	23.13
			1	99	23.09
			50	0	22.27
			50	49	22.22
			100	0	22.23
	16-QAM	16-QAM	1	0	22.35
			1	49	22.21
			1	99	22.17
			50	0	21.25
			50	49	21.19
			100	0	21.24
	Middle (132422 (1755 MHz))	QPSK	1	0	23.23
			1	49	23.07
			1	99	23.15
			50	0	22.11
			50	49	22.07
			100	0	22.07
	16-QAM	16-QAM	1	0	22.55
			1	49	22.42
			1	99	22.51
			50	0	21.09
			50	49	21.07
			100	0	21.11
	Highest (132572 (1770 MHz))	QPSK	1	0	23.13
			1	49	22.99
			1	99	23.05
			50	0	22.14
			50	49	22.10
			100	0	22.08
	16-QAM	16-QAM	1	0	22.67
			1	49	22.52
			1	99	22.65
			50	0	21.07
			50	49	21.05
			100	0	21.14

TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#05(3G Band 4)
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	24.47	4.0	28.47
Middle	24.35	4.0	28.35
Highest	24.30	4.0	28.30
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	21.5	4.0	25.5
Middle	22.14	4.0	26.14
Highest	22.2	4.0	26.2
Measurement uncertainty (dB)			<±0.95