



FCC LISTED, REGISTRATION
NUMBER: 2764.01

ISED LISTED REGISTRATION
NUMBER: 23595-1

Test report No:
2456ERM.013A1

Test report

REFERENCE STANDARD:
USA FCC Part 27

CANADA ISED RSS-199/ RSS-130/ RSS-139

Identification of item tested	Wireless Module
Trademark	Cinterion ALAS5-AM
Model and /or type reference	ALAS5-AM
Other identification of the product	FCC ID: QIPALAS5-AM IC: 7830A-ALAS5AM
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-199 Issue 3, Dec. 2016. CANADA IC RSS-130 Issue 2, Feb 2019. CANADA IC RSS-139 Issue 3, July 2015. 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	08-13-2019
Report template No	FDT08_21

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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.

DEKRA Certification Inc. is a testing laboratory competent to carry out the tests described in this report.

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.

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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 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
2456.08	Cinterion® ALAS5	ALAS5-AM	004401083051280	3/25/2019
2456.10	Cinterion® ALAS5	ALAS5-AM	004401083051652	3/25/2019
2456.05	Antenna	Panorama_LPBEM-7-27	-	2/7/2019
2456.06	Antenna	Panorama_LPBEM-7-27	-	2/7/2019

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

All conducted and radiated 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 00.052						
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_ALAS5-AM_signed	2019-05-16
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)	04-04-2019
Date (finish)	05-06-2019

Document history

Report number	Date	Description
2456ERM.013	05-21-2019	First release
2456ERM.013A1	08-13-2019	Second release

Modifications to the reference test report

It was introduced the following modifications in respect to the test report number 2456ERM.013 related with the samples, in the next clauses and sub-clauses:

Clauses/Sub-Clauses	Modification	Justification
Page 1: Canadian Standards	Added Correct Canadian RSS Standards	Typo

This modification test report cancels and replaces the test reports 2456ERM.013.

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: Sravani Gollamudi, Koji Nishimoto, and Poojita Bhattu.

Testing verdicts

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

Summary

FCC PART 27 /IC RSS-199/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-199 Clause 4.4 /RSS-130 Clause 4.6/ RSS-139 Clause 6.5	RF Output power	P	N/A
A.2	§2.1047 and §27.50	RSS-199 Clause 4.1 /RSS-130 Clause 4.2/ RSS-Clause 6.2	Modulation characteristics	P	N/A
A.3	§2.1055 and § 27.54	RSS-199 Clause 4.3 /RSS-130 Clause 4.5 / RSS-Clause 6.4	Frequency stability	P	N/A
A.4	§ 2.1049	RSS-199 Clause 4.2	Occupied Bandwidth	P	N/A
A.5	§2.1051 and §27.53	RSS-199 Clause 4.5 /RSS-130 Clause 4.7/ RSS-Clause 6.6	Spurious emissions at antenna terminals	P	N/A
A.6	§27.53	RSS-199 Clause 4.5 /RSS-130 Clause 4.7/ RSS-Clause 6.6	Spurious emissions at antenna terminals at Block edges	P	N/A
A.7	§2.1053 and §27.53	RSS-199 Clause 4.5 /RSS-130 Clause 4.7/ RSS-Clause 6.6	Radiated emissions	P	N/A
Supplementary information and remarks:					
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

Radiated Measurements

CONTROL NUMBER	DESCRIPTION	LAST CALIBRATION	NEXT CALIBRATION
1179	Semi anechoic Absorber Lined Chamber Frankonia SAC 3 plus "L"	N/A	N/A
1064	Biconical Log antenna ETS LINDGREN 3142E	2017/03	2020/03
1057	Double-ridge Waveguide Horn antenna 1-18 GHz	2017/03	2020/03
1056	Double-ridge Waveguide Horn antenna 18-40 GHz	2016/12	2019/12
1012	Spectrum analyzer Rohde & Schwarz ESR26	2018/09	2020/09
1039	Spectrum analyzer Rohde & Schwarz FSV40	2018/10	2020/10
1015, 1017, 1019, 1020	Rohde & Schwarz EMC32 software	N/A	N/A

Appendix A: Test Results for LTE

FCC Part 27/ IC RSS-199/ RSS-130/ RSS-139

Appendix A Content

PRODUCT INFORMATION**Error! Bookmark not defined.**

DESCRIPTION OF TEST CONDITIONS**Error! Bookmark not defined.**

TEST A.1: RF OUTPUT POWER**Error! Bookmark not defined.**

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PRODUCT INFORMATION

The following information is provided by the client

Information	Description
Modulation	QPSK, QAM
Maximum RF Output Power	25 dBm
Operation mode:	
- Operating Frequency Range	LTE Band 4: 1710 – 1755MHz LTE Band 7: 2500 – 2570MHz LTE Band 12: 699 – 716MHz LTE Band 13: 777 – 787MHz LTE Band 66: 1710 – 1780MHz
- Nominal Channel Bandwidth	LTE Band 4: 1.4 / 3 / 5/ 10/ 15/ 20 MHz LTE Band 7: 5 / 10 / 15 / 20 MHz LTE Band 12: 1.4 / 3 / 5 / 10 MHz LTE Band 13: 5 / 10 MHz LTE Band 66: 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	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 _{nominal} = 3.8 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)													
	<u>Test Frequencies for Radiated tests:</u>													
	<table><tr><td>Available Frequencies</td><td>Tested Frequency</td><td>Channel Bandwidth</td><td>Modulation</td><td>Mode</td></tr><tr><td>1710 to 1755 MHz</td><td>1720 MHz 1732.5 MHz 1745 MHz</td><td>20 MHz</td><td>QPSK</td><td>1 RB</td></tr></table>					Available Frequencies	Tested Frequency	Channel Bandwidth	Modulation	Mode	1710 to 1755 MHz	1720 MHz 1732.5 MHz 1745 MHz	20 MHz	QPSK
Available Frequencies	Tested Frequency	Channel Bandwidth	Modulation	Mode										
1710 to 1755 MHz	1720 MHz 1732.5 MHz 1745 MHz	20 MHz	QPSK	1 RB										

TEST CONDITIONS	DESCRIPTION												
TC#02 LTE Band 7	<u>Power supply (V):</u> V _{nominal} = 3.8 Vdc												
	<u>Test Frequencies for Conducted tests:</u>												
	<u>5 MHz Bandwidth:</u>												
	-Lowest Channel: 20775 (2502.5 MHz)												
	-Middle Channel: 21100 (2535.0 MHz)												
	-Highest Channel: 21425 (2567.5 MHz)												
	<u>10 MHz Bandwidth:</u>												
	-Lowest Channel: 20800 (2505.0 MHz)												
	-Middle Channel: 21100 (2535.0 MHz)												
	-Highest Channel: 21400 (2565.0 MHz)												
<u>15 MHz Bandwidth:</u>													
-Lowest Channel: 20825 (2507.5 MHz)													
-Middle Channel: 21100 (2535.0 MHz)													
-Highest Channel: 21375 (2562.5 MHz)													
<u>20 MHz Bandwidth:</u>													
-Lowest Channel: 20850 (2510.0 MHz)													
-Middle Channel: 21100 (2535.0 MHz)													
-Highest Channel:21350 (2560.0 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><th>Mode</th></tr><tr><td rowspan="3">2570 to 2610 MHz</td><td>2507.5 MHz</td><td rowspan="3">15 MHz</td><td rowspan="3">QPSK</td><td rowspan="3">1 RB</td></tr><tr><td>2535.0 MHz</td></tr><tr><td>2562.5 MHz</td></tr></table>	Available Frequencies	Tested Frequency	Channel Bandwidth	Modulation	Mode	2570 to 2610 MHz	2507.5 MHz	15 MHz	QPSK	1 RB	2535.0 MHz	2562.5 MHz
Available Frequencies	Tested Frequency	Channel Bandwidth	Modulation	Mode									
2570 to 2610 MHz	2507.5 MHz	15 MHz	QPSK	1 RB									
	2535.0 MHz												
	2562.5 MHz												
	Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case found in QPSK modulation.												

TEST CONDITIONS	DESCRIPTION													
TC#03 LTE Band 12	<u>Power supply (V):</u> V _{nominal} = 3.8 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)														
<u>Test Frequencies for Radiated tests:</u>														
<table><tr><td>Available Frequencies</td><td>Tested Frequency</td><td>Channel Bandwidth</td><td>Modulation</td><td>Mode</td></tr><tr><td>699 to 710 MHz</td><td>700.5 MHz 707.5 MHz 714.5 MHz</td><td>3 MHz</td><td>QPSK</td><td>1 RB</td></tr></table>					Available Frequencies	Tested Frequency	Channel Bandwidth	Modulation	Mode	699 to 710 MHz	700.5 MHz 707.5 MHz 714.5 MHz	3 MHz	QPSK	1 RB
Available Frequencies	Tested Frequency	Channel Bandwidth	Modulation	Mode										
699 to 710 MHz	700.5 MHz 707.5 MHz 714.5 MHz	3 MHz	QPSK	1 RB										
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 13	<u>Power supply (V):</u> V _{nominal} = 3.8 Vdc															
	<u>Test Frequencies for Conducted tests:</u>															
	<u>5 MHz Bandwidth:</u>															
	-Lowest Channel: 23205 (779.5 MHz)															
	-Middle Channel: 23230 (782.0 MHz)															
	-Highest Channel: 23255 (784.5 MHz)															
	<u>10 MHz Bandwidth:</u>															
	-Middle Channel: 23230 (782.0 MHz)															
	<u>Test Frequencies for Radiated tests:</u>															
	<table><tr><td>Available Frequencies</td><td>Tested Frequency</td><td>Channel Bandwidth</td><td>Modulation</td><td>Mode</td></tr><tr><td rowspan="3">2570 to 2610 MHz</td><td>779.5 MHz</td><td rowspan="3">5 MHz</td><td rowspan="3">QPSK</td><td rowspan="3">1 RB</td></tr><tr><td>782 MHz</td></tr><tr><td>784.5 MHz</td></tr></table>					Available Frequencies	Tested Frequency	Channel Bandwidth	Modulation	Mode	2570 to 2610 MHz	779.5 MHz	5 MHz	QPSK	1 RB	782 MHz
Available Frequencies	Tested Frequency	Channel Bandwidth	Modulation	Mode												
2570 to 2610 MHz	779.5 MHz	5 MHz	QPSK	1 RB												
	782 MHz															
	784.5 MHz															
Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case found in QPSK modulation.																

TEST CONDITIONS	DESCRIPTION													
TC#05 LTE Band 66	<u>Power supply (V):</u> V _{nominal} = 3.8 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)													
	<u>Test Frequencies for Radiated tests:</u>													
	<table><tr><td>Available Frequencies</td><td>Tested Frequency</td><td>Channel Bandwidth</td><td>Modulation</td><td>Mode</td></tr><tr><td>1850 to 1915 MHz</td><td>1720 MHz 1755 MHz 1770 MHz</td><td>20 MHz</td><td>QPSK</td><td>1 RB</td></tr></table>					Available Frequencies	Tested Frequency	Channel Bandwidth	Modulation	Mode	1850 to 1915 MHz	1720 MHz 1755 MHz 1770 MHz	20 MHz	QPSK
Available Frequencies	Tested Frequency	Channel Bandwidth	Modulation	Mode										
1850 to 1915 MHz	1720 MHz 1755 MHz 1770 MHz	20 MHz	QPSK	1 RB										

TEST A.1: RF OUTPUT POWER

LIMITS:	Product standard:	FCC Part 27 / IC RSS-199/ RSS-130/ RSS-139
	Test standard:	FCC §2.1046 and §27.50 / RSS-199 Clause 4.4 / RSS-130 Clause 4.6/ RSS 139-Clause 6.5

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 (PAPR) of the transmission shall not exceed 13 dB.

RSS-199 Clause 4.4

The equivalent isotropically radiated power (e.i.r.p.) for mobile and portable transmitters shall not exceed two watts.

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

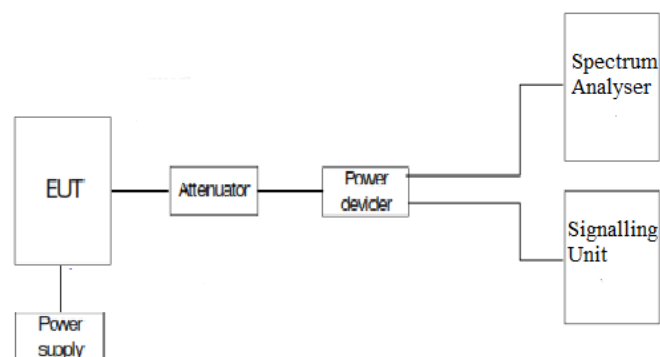
RSS-130 Clause 4.4

The transmitter output power shall be measured in terms of average power. 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. The e.i.r.p. shall not exceed 30 watts for mobile equipment and outdoor fixed subscriber equipment

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.

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)	PAPR (dB)
Lowest	22.9	4.0	26.9	5.28
Middle	22.86	4.0	26.86	5.80
Highest	22.86	4.0	26.86	5.77

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)	PAPR (dB)
Lowest	22.89	4.0	26.89	5.57
Middle	22.87	4.0	26.87	5.74
Highest	22.79	4.0	26.79	5.65

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)	PAPR (dB)
Lowest	22.98	4.0	26.98	5.10
Middle	22.96	4.0	26.96	5.51
Highest	22.86	4.0	26.86	5.74

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)	PAPR (dB)
Lowest	22.99	4.0	26.99	5.48
Middle	22.92	4.0	26.92	5.68
Highest	22.84	4.0	26.84	5.62

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)	PAPR (dB)
Lowest	23.03	4.0	27.03	5.48
Middle	22.98	4.0	26.98	5.51
Highest	23.02	4.0	27.02	5.71

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)	PAPR (dB)
Lowest	23.06	4.0	27.06	4.84
Middle	23.07	4.0	27.07	5.36
Highest	23.02	4.0	27.02	6.12
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)	PAPR (dB)
1.4	Lowest (19957 (1710.7 MHz))	QPSK	1	0	22.84	4.26
			1	5	22.84	
			3	0	22.88	
			3	2	22.9	
			6	0	21.84	
		16-QAM	1	0	21.78	5.28
			1	5	21.79	
			3	0	21.78	
			3	2	21.85	
			6	0	20.95	
	Middle (20175 (1732.5 MHz))	QPSK	1	0	22.78	4.84
			1	5	22.79	
			3	0	22.78	
			3	2	22.86	
			6	0	21.82	
		16-QAM	1	0	22.01	5.80
			1	5	22.03	
			3	0	21.77	
			3	2	21.86	
			6	0	20.8	
	Highest (20393 (1754.3 MHz))	QPSK	1	0	22.71	4.78
			1	5	22.7	
			3	0	22.8	
			3	2	22.86	
			6	0	21.76	
		16-QAM	1	0	21.97	5.77
			1	5	21.96	
			3	0	21.73	
			3	2	21.77	
			6	0	20.81	

TEST RESULTS (Cont):						
Bandwidth (MHz)	Channel Location Frequency (MHz) Channel Number	Modulation	Resource Block Size	Resource Block Offset	Average power at antenna port (dBm)	PAPR (dB)
3	Lowest (19965 (1711.5 MHz))	QPSK	1	0	22.89	4.52
			1	14	22.89	
			8	0	21.94	
			8	7	21.99	
			15	0	21.94	
		16-QAM	1	0	22.13	5.57
			1	14	22.12	
			8	0	21.13	
			8	7	21.12	
			15	0	20.97	
	Middle (20175 (1732.5 MHz))	QPSK	1	0	22.87	4.75
			1	14	22.87	
			8	0	21.84	
			8	7	21.86	
			15	0	21.87	
		16-QAM	1	0	22.14	5.74
			1	14	22.1	
			8	0	21.02	
			8	7	21.02	
			15	0	20.89	
	Highest (20385 (1753.5 MHz))	QPSK	1	0	22.77	4.87
			1	14	22.79	
			8	0	21.78	
			8	7	21.82	
			15	0	21.79	
		16-QAM	1	0	22.03	5.65
			1	14	22.05	
			8	0	20.9	
			8	7	20.9	
			15	0	20.86	

TEST RESULTS (Cont):						
Bandwidth (MHz)	Channel Location Frequency (MHz) Channel Number	Modulation	Resource Block Size	Resource Block Offset	Average power at antenna port (dBm)	PAPR (dB)
5	Lowest (19975 (1712.5 MHz))	QPSK	1	0	22.95	4.12
			1	24	22.98	
			12	0	21.92	
			12	11	21.93	
			25	0	21.96	
		16-QAM	1	0	22.09	5.10
			1	24	22.12	
			12	0	20.99	
			12	11	21	
			25	0	20.96	
	Middle (20175 (1732.5 MHz))	QPSK	1	0	22.96	4.67
			1	24	22.94	
			12	0	21.86	
			12	11	21.9	
			25	0	21.86	
		16-QAM	1	0	22	5.51
			1	24	22.01	
			12	0	21	
			12	11	21	
			25	0	20.89	
	Highest (20375 (1752.5 MHz))	QPSK	1	0	22.86	4.87
			1	24	22.86	
			12	0	21.84	
			12	11	21.83	
			25	0	21.83	
		16-QAM	1	0	22.23	5.74
			1	24	22.27	
			12	0	20.78	
			12	11	20.75	
			25	0	20.88	