



FCC REPORT (LTE)

Applicant: Baicells Technologies Co., Ltd.

Address of Applicant: 9-10F, 1stBldg., No.81BeijingRoad, Haidian District, Beijing, China

Equipment Under Test (EUT)

Product Name: LTE Base Station

Model No.: sBS71010

Trade mark: Baicells

FCC ID: 2AG32SBS71010

Applicable standards: FCC CFR Title 47 Part 2
FCC CFR Title 47 Part 96

Date of sample receipt: 17 Jun., 2021

Date of Test: 05 Jul., to 13 Sep., 2021

Date of report issued: 30 Sep., 2021

Test Result: PASS*

*In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Bruce Zhang

Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the JYT product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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2. Version

Version No.	Date	Description
00	30 Sep., 2021	Original

Tested by:

Mike.Ou
Test Engineer

Date: 30 Sep., 2021

Reviewed by:

Winner Zhang
Project Engineer

Date: 30 Sep., 2021

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4. Test Summary

Test Item	Section in CFR 47	Result
	FCC	
Effective Isotropic Radiated Power (EIRP) Power Spectral Density (PSD)	Part 2.1046 Part 96.41(b)	Pass
Peak-to-average power ratio (PAPR)	Part 96.41(g)	Pass
99% Occupied Bandwidth -26 dB Occupied Bandwidth	Part 2.1049 Part 96.41(e)(3)	Pass
Spurious Emissions at Antenna Terminal	Part 2.1051 Part 96.41(e)(1)(2)	Pass
Field Strength of Spurious Radiation	Part 2.1053 Part 96.41(e)(1)(2)	Pass
Frequency stability vs. temperature	Part 2.1055(a)(b)	Pass
Frequency stability vs. voltage	Part 2.1055(d)	Pass

Test Method:

- ANSI C63.26-2015
- ANSI/TIA-603-E-2016
- ANSI C63.4-2014
- KDB 971168 D01 Power Meas License Digital Systems v03r01
- KDB 940660 D01 Part 96 CBRS Eqpt v03
- KDB 662911 D01 Multiple Transmitter Output v02r01

Note:

- Offset Ext Gain = ATT loss + Cable loss + Duty cycle correction

Pass: The EUT complies with the essential requirements in the standard.

5. General Information

5.1 Client Information

Applicant:	Baicells Technologies Co., Ltd.
Address:	9-10F, 1stBldg., No.81BeiqingRoad, Haidian District, Beijing, China
Manufacturer:	Baicells Technologies Co., Ltd.
Address:	9-10F, 1stBldg., No.81BeiqingRoad, Haidian District, Beijing, China

5.2 General Description of E.U.T.

Product Name:	LTE Base Station
Model No.:	sBS71010
Operation Frequency range:	Band48: 3550MHz~3700MHz
Modulation type:	QPSK, 16QAM, 64QAM, 256QAM
Antenna type:	External antenna
Antenna gain:	LTE Band 48: 15.0dBi
Antenna supports:	Single carrier 0-3 and 4-7 antenna 4x4MIMO, or single carrier 0-1 and 4-5 antenna 2x2MIMO
Category device:	Category B device
AC adapter:	Model: HEP-480-54 Input: AC100-240V 50/60Hz 5.5~2.2A Output: DC 54.0V---8.9A
Test Sample Condition:	The test samples were provided in good working order with no visible defects.

Test Channel:

10MHz		20MHz	
Channel:	Frequency (MHz)	Channel:	Frequency (MHz)
Lowest	3555.0	Lowest	3560.0
Middle	3625.0	Middle	3625.0
Highest	3695.0	Highest	3690.0

5.3 Test environment and mode

Operating Environment:	
Temperature:	Normal: 15°C ~ 35°C, Extreme: -30°C ~ +50°C
Humidity:	20 % ~ 75 % RH
Atmospheric Pressure:	1008 mbar
Voltage:	Nominal: 120Vac, Extreme: Low 102Vac, High 138Vac
Test mode:	
LTE QPSK mode	Keep the EUT communication with simulated station in QPSK mode
LTE 16-QAM mode	Keep the EUT communication with simulated station in 16-QAM mode
LTE 64-QAM mode	Keep the EUT communication with simulated station in 64-QAM mode
LTE 256-QAM mode	Keep the EUT communication with simulated station in 256-QAM mode
Remark:	
1. The EUT has been tested under continuous transmitting mode. Channel Low, Mid and High for each type band with rated data rate were chosen for full testing. The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for these modes. Just the worst case position (H mode) shown in report.	
2. Pre-scan all modulation type (QPSK, 16-QAM, 64-QAM, 256-QAM), and found the QPKS and 256-QAM was the worst case.)	

5.4 Description of Support Units

Test Equipment	Manufacturer	Model No.	Serial No.
LENOVO	Laptop	SL510	DoC

5.5 Measurement Uncertainty

Parameters	Expanded Uncertainty (Confidence of 95%)
Radiated Emission (9kHz ~ 30MHz) for 3m SAC	3.13 dB
Radiated Emission (30MHz ~ 1GHz) for 3m SAC	4.45 dB
Radiated Emission (1GHz ~ 18GHz) for 3m SAC	5.34 dB
Radiated Emission (18GHz ~ 40GHz) for 3m SAC	5.34 dB

Note: The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.26-2015. All the measurement uncertainty value were shown with a coverage k=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

5.6 Related Submittal(s) / Grant (s)

This is an original grant, no related submittals and grants.

5.7 Additions to, deviations, or exclusions from the method

No

5.8 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

● **FCC - Designation No.: CN1211**

JianYan Testing Group Shenzhen Co., Ltd. has been accredited as a testing laboratory by FCC (Federal Communications Commission). The test firm Registration No. is 727551.

● **ISED – CAB identifier.: CN0021**

The 3m Semi-anechoic chamber of JianYan Testing Group Shenzhen Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

● **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: <https://portal.a2la.org/scopepdf/4346-01.pdf>

5.9 Laboratory Location

JianYan Testing Group Shenzhen Co., Ltd.

Address: No.101, Building 8, Innovation Wisdom Port, No.155 Hongtian Road, Huangpu Community, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, People's Republic of China.

Tel: +86-755-23118282, Fax: +86-755-23116366

Email: info@ccis-cb.com, Website: <http://www.ccis-cb.com>

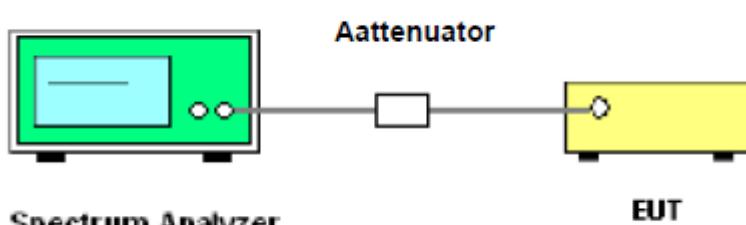
5.10 Test Instruments list

Radiated Emission:					
Test Equipment	Manufacturer	Model No.	Management Number	Cal.Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
3m SAC	ETS	9m*6m*6m	WXJ001-1	01-19-2021	01-18-2024
BiConiLog Antenna	SCHWARZBECK	VULB9163	WXJ002	03-03-2021	03-02-2022
Biconical Antenna	SCHWARZBECK	VUBA9117	WXJ002-1	06-20-2021	06-19-2022
Horn Antenna	SCHWARZBECK	BBHA9120D	WXJ002-2	03-03-2021	03-02-2022
Horn Antenna	SCHWARZBECK	BBHA9120D	WXJ002-3	06-18-2021	06-17-2022
Pre-amplifier	HP	8447D	WXG001-2	03-07-2021	03-06-2022
Pre-amplifier	SKET	LNPA_0118G-50	WXG001-3	03-07-2021	03-06-2022
EMI Test Receiver	Rohde & Schwarz	ESRP7	WXJ003-1	03-03-2021	03-02-2022
Spectrum analyzer	Rohde & Schwarz	FSP30	WXJ004	03-03-2021	03-02-2022
Signal Generator	Agilent	N5173B	WXJ006-7	03-25-2021	03-24-2022
RF Switch Unit	Tonscend	JS0806-F	WXJ089		N/A
Test Software	Tonscend	TS+		Version: 3.0.0.1	

Conducted method:					
Test Equipment	Manufacturer	Model No.	Management Number	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
Spectrum Analyzer	Keysight	N9020B	WXJ081-1	07-02-2021	07-01-2022
RF Control Unit	Tonscend	JS0806-1	WXG010-2	N/A	N/A
RF Control Unit	Tonscend	JS0806-1	WXG010-3	N/A	N/A
Band Reject Filter Group	Tonscend	JS0806-F	WXG010-4	N/A	N/A
Test Software	Tonscend	TS+		Version: 2.6.9.0526	

6. Test results

6.1 Effective Isotropic Radiated (EIRP) and Power Spectral Density (PSD)

Test Requirement:	FCC part 96.41(b), FCC part2.1046												
Limit:	<table border="1"> <thead> <tr> <th>Device</th> <th>Maximum EIRP (dBm/10 megahertz)</th> <th>Maximum PSD (dBm/MHz)</th> </tr> </thead> <tbody> <tr> <td>End User Device</td> <td>23</td> <td>n/a</td> </tr> <tr> <td>Category A CBSD</td> <td>30</td> <td>20</td> </tr> <tr> <td>Category B CBSD¹</td> <td>47</td> <td>37</td> </tr> </tbody> </table>	Device	Maximum EIRP (dBm/10 megahertz)	Maximum PSD (dBm/MHz)	End User Device	23	n/a	Category A CBSD	30	20	Category B CBSD ¹	47	37
Device	Maximum EIRP (dBm/10 megahertz)	Maximum PSD (dBm/MHz)											
End User Device	23	n/a											
Category A CBSD	30	20											
Category B CBSD ¹	47	37											
Test Setup:	 <p style="text-align: center;">Spectrum Analyzer Attenuator EUT</p>												
Test Procedure:	<p>For Maximum EIRP</p> <ol style="list-style-type: none"> 1. Connect the transmitter to the spectrum analyzer via coaxial cable while ensuring proper impedance matching. 2. Set span to $2 \times$ to $3 \times$ the OBW. 3. Set RBW = 1% to 5% of the OBW. 4. Set VBW $\geq 3 \times$ RBW. 5. Set number of measurement points in sweep $\geq 2 \times$ span / RBW. 6. Sweep time: <ol style="list-style-type: none"> 1) Set = auto-couple, or 2) Set $\geq [10 \times (\text{number of points in sweep}) \times (\text{transmission symbol period})]$ for single sweep (automation-compatible) measurement. 7. Detector = power averaging (rms). 8. Set sweep trigger to "free run." 9. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. To accurately determine the average power over the on and off time of the transmitter, it can be necessary to increase the number of traces to be averaged above 100, or if using a manually configured sweep time, increase the sweep time. 10. Compute power by integrating the spectrum across the OBW(10MHz) of the signal using the instrument's band or channel power measurement function with band/channel limits set equal to the OBW(10MHz) band edges. 11. Add $10 \log (1/\text{duty cycle})$ to the measured power level to compute the average power during continuous transmission. 12. $\text{EIRP} = \text{PM}_{\text{Meas}} + \text{GT}$. <p>$\text{P}_{\text{Meas}}$ measured transmitter output power. G_T gain of the transmitting antenna.</p> <p>For Maximum PSD</p> <p>The PSD is measured following the same procedures described for measuring the maximum EIRP but with the RBW set to the reference bandwidth specified(eg.1MHz) by the applicable regulatory requirement, and by using the marker function to identify the maximum PSD instead of summing the power across the OBW.</p>												
Test Instruments:	Refer to section 5.10 for details												
Test mode:	Refer to section 5.3 for details												
Test results:	Passed												

Measurement Data(EIRP):

Band width	Modulation	Channel	ANT 0 Output Power (dBm/ 10MHz)	ANT 1 Output Power (dBm/ 10MHz)	ANT 2 Output Power (dBm/ 10MHz)	ANT 3 Output Power (dBm/ 10MHz)	Total Power (dBm/ 10MHz)	Gain (dBi)	Eirp	Limit (dBm/ 10MHz)	Verdict
10MHz	256QAM	55290	25.43	25.73	25.32	25.62	31.55	15	46.55	47	PASS
10MHz	256QAM	55990	24.36	25.14	25.13	24.99	30.94	15	45.94	47	PASS
10MHz	256QAM	56690	24.40	25.42	25.04	24.96	30.99	15	45.99	47	PASS
10MHz	QPSK	55290	26.05	24.95	25.44	25.91	31.63	15	46.63	47	PASS
10MHz	QPSK	55990	25.01	25.39	25.06	25.23	31.20	15	46.20	47	PASS
10MHz	QPSK	56690	25.20	25.04	24.85	25.11	31.07	15	46.07	47	PASS
20MHz	256QAM	55340	23.18	23.25	23.11	23.52	29.29	15	44.29	47	PASS
20MHz	256QAM	55990	22.80	22.77	23.46	23.38	29.13	15	44.13	47	PASS
20MHz	256QAM	56640	22.66	23.20	23.17	23.14	29.07	15	44.07	47	PASS
20MHz	QPSK	55340	22.99	22.82	22.51	22.78	28.80	15	43.80	47	PASS
20MHz	QPSK	55990	22.89	23.12	22.41	23.04	28.89	15	43.89	47	PASS
20MHz	QPSK	56640	22.51	22.77	22.58	22.47	28.60	15	43.60	47	PASS

Remark:

1. ANT 0, ANT 1, ANT 2, ANT 3: 4*4MIMO
2. All transmit signals are completely uncorrelated with each other, Directional gain = GANT =15dBi

Band width	Modulation	Channel	ANT 4 Output Power (dBm/ 10MHz)	ANT 5 Output Power (dBm/ 10MHz)	ANT 6 Output Power (dBm/ 10MHz)	ANT 7 Output Power (dBm/ 10MHz)	Total Power (dBm/ 10MHz)	Gain (dBi)	Eirp	Limit (dBm/ 10MHz)	Verdict
10MHz	256QAM	55290	25.30	25.85	25.59	25.67	31.63	15	46.63	47	PASS
10MHz	256QAM	55990	24.67	25.05	25.09	24.51	30.86	15	45.86	47	PASS
10MHz	256QAM	56690	25.02	24.77	24.88	25.23	31.00	15	46.00	47	PASS
10MHz	QPSK	55290	25.52	25.82	25.94	25.68	31.76	15	46.76	47	PASS
10MHz	QPSK	55990	24.86	25.08	25.15	25.20	31.10	15	46.10	47	PASS
10MHz	QPSK	56690	24.95	24.93	24.80	25.16	30.98	15	45.98	47	PASS
20MHz	256QAM	55340	23.40	23.52	23.36	22.90	29.32	15	44.32	47	PASS
20MHz	256QAM	55990	23.11	22.61	22.98	22.84	28.91	15	43.91	47	PASS
20MHz	256QAM	56640	22.99	23.02	23.16	22.90	29.04	15	44.04	47	PASS
20MHz	QPSK	55340	22.83	22.85	23.22	23.50	29.13	15	44.13	47	PASS
20MHz	QPSK	55990	22.76	22.96	23.09	22.59	28.87	15	43.87	47	PASS
20MHz	QPSK	56640	22.92	22.97	23.21	23.28	29.12	15	44.12	47	PASS

Remark:

1. ANT 4, ANT 5, ANT 6, ANT 7: 4*4MIMO
2. All transmit signals are completely uncorrelated with each other, Directional gain = GANT =15dBi

Band width	Modulation	Channel	ANT 0 Output Power (dBm/ 20MHz)	ANT 1 Output Power (dBm/ 20MHz)	ANT 2 Output Power (dBm/ 20MHz)	ANT 3 Output Power (dBm/ 20MHz)	Total Power (dBm/ 20MHz)	Gain (dBi)	Eirp	Limit	Verdict
20MHz	256QAM	55340	25.80	25.75	25.35	26.03	31.76	15	46.76	/	PASS
20MHz	256QAM	55990	25.30	25.37	25.82	25.95	31.64	15	46.64		PASS
20MHz	256QAM	56640	25.47	25.73	25.68	25.63	31.65	15	46.65		PASS
20MHz	QPSK	55340	25.54	25.17	25.07	25.13	31.25	15	46.25		PASS
20MHz	QPSK	55990	25.71	25.52	25.23	25.62	31.54	15	46.54		PASS
20MHz	QPSK	56640	25.18	25.31	25.29	25.18	31.26	15	46.26		PASS

Remark:

1. ANT 0, ANT 1, ANT 2, ANT 3: 4*4MIMO
2. All transmit signals are completely uncorrelated with each other, Directional gain = GANT =15dBi

Band width	Modulation	Channel	ANT 4 Output Power (dBm/ 20MHz)	ANT 5 Output Power (dBm/ 20MHz)	ANT 6 Output Power (dBm/ 20MHz)	ANT 7 Output Power (dBm/ 20MHz)	Total Power (dBm/ 20MHz)	Gain (dBi)	Eirp	Limit	Verdict
20MHz	256QAM	55340	25.78	26.10	25.81	25.36	31.79	15	46.79	/	PASS
20MHz	256QAM	55990	25.33	25.26	25.52	25.52	31.43	15	46.43		PASS
20MHz	256QAM	56640	25.34	25.58	25.81	25.61	31.61	15	46.61		PASS
20MHz	QPSK	55340	25.35	25.28	25.71	26.10	31.64	15	46.64		PASS
20MHz	QPSK	55990	25.48	25.35	25.76	25.26	31.49	15	46.49		PASS
20MHz	QPSK	56640	25.57	25.31	25.79	25.86	31.66	15	46.66		PASS

Remark:

1. ANT 4, ANT 5, ANT 6, ANT 7: 4*4MIMO
2. All transmit signals are completely uncorrelated with each other, Directional gain = GANT =15dBi

Band width	Modulation	Channel	ANT 0 Output Power (dBm/ 10MHz)	ANT 1 Output Power (dBm/ 10MHz)	Total Power (dBm/ 10MHz)	Gain (dBi)	Eirp	Limit (dBm/ 10MHz)	Verdict
10MHz	256QAM	55290	28.93	28.76	31.86	15	46.86	47	PASS
10MHz	256QAM	55990	27.78	28.33	31.07	15	46.07	47	PASS
10MHz	256QAM	56690	28.17	27.98	31.09	15	46.09	47	PASS
10MHz	QPSK	55290	28.83	28.79	31.82	15	46.82	47	PASS
10MHz	QPSK	55990	28.13	28.29	31.22	15	46.22	47	PASS
10MHz	QPSK	56690	27.89	28.15	31.03	15	46.03	47	PASS
20MHz	256QAM	55340	26.46	26.45	29.47	15	44.47	47	PASS
20MHz	256QAM	55990	26.21	26.17	29.20	15	44.20	47	PASS
20MHz	256QAM	56640	26.06	26.59	29.34	15	44.34	47	PASS
20MHz	QPSK	55340	26.21	26.31	29.27	15	44.27	47	PASS
20MHz	QPSK	55990	25.34	26.09	28.74	15	43.74	47	PASS
20MHz	QPSK	56640	25.52	26.24	28.91	15	43.91	47	PASS

Remark:

1. ANT 0, ANT 1: 2*2MIMO
2. All transmit signals are completely uncorrelated with each other, Directional gain = GANT =15dBi

Band width	Modulation	Channel	ANT 4 Output Power (dBm/ 10MHz)	ANT 5 Output Power (dBm/ 10MHz)	Total Power (dBm/ 10MHz)	Gain (dBi)	Eirp	Limit (dBm/ 10MHz)	Verdict
10MHz	256QAM	55290	28.69	28.55	31.63	15	46.63	47	PASS
10MHz	256QAM	55990	27.67	28.32	31.02	15	46.02	47	PASS
10MHz	256QAM	56690	27.90	28.05	30.99	15	45.99	47	PASS
10MHz	QPSK	55290	28.85	28.83	31.85	15	46.85	47	PASS
10MHz	QPSK	55990	28.30	28.28	31.30	15	46.30	47	PASS
10MHz	QPSK	56690	28.39	28.11	31.26	15	46.26	47	PASS
20MHz	256QAM	55340	26.56	26.37	29.48	15	44.48	47	PASS
20MHz	256QAM	55990	26.17	26.40	29.30	15	44.30	47	PASS
20MHz	256QAM	56640	25.99	26.02	29.02	15	44.02	47	PASS
20MHz	QPSK	55340	26.29	26.03	29.17	15	44.17	47	PASS
20MHz	QPSK	55990	26.17	26.32	29.26	15	44.26	47	PASS
20MHz	QPSK	56640	26.17	26.20	29.20	15	44.20	47	PASS

Remark:

1. ANT 4, ANT 5: 2*2MIMO
2. All transmit signals are completely uncorrelated with each other, Directional gain = GANT =15dBi

Band width	Modulation	Channel	ANT 0 Output Power (dBm/ 20MHz)	ANT 1 Output Power (dBm/ 20MHz)	Total Power (dBm/ 20MHz)	Gain (dBi)	Eirp	Limit	Verdict
20MHz	256QAM	55340	28.80	28.73	31.78	15	46.78	/	PASS
20MHz	256QAM	55990	28.93	28.76	31.86	15	46.86		PASS
20MHz	256QAM	56640	28.63	29.10	31.88	15	46.88		PASS
20MHz	QPSK	55340	28.75	28.75	31.76	15	46.76		PASS
20MHz	QPSK	55990	28.12	28.33	31.24	15	46.24		PASS
20MHz	QPSK	56640	28.16	28.46	31.32	15	46.32		PASS

Remark:
1. ANT 0, ANT 1: 2*2MIMO
2. All transmit signals are completely uncorrelated with each other, Directional gain = GANT =15dBi

Band width	Modulation	Channel	ANT 4 Output Power (dBm/ 20MHz)	ANT 5 Output Power (dBm/ 20MHz)	Total Power (dBm/ 20MHz)	Gain (dBi)	Eirp	Limit	Verdict
20MHz	256QAM	55340	29.16	28.94	32.06	15	47.06	/	PASS
20MHz	256QAM	55990	28.53	29.17	31.87	15	46.87		PASS
20MHz	256QAM	56640	28.53	28.52	31.54	15	46.54		PASS
20MHz	QPSK	55340	28.95	28.91	31.94	15	46.94		PASS
20MHz	QPSK	55990	29.00	29.04	32.03	15	47.03		PASS
20MHz	QPSK	56640	28.72	28.85	31.80	15	46.80		PASS

Remark:
1. ANT 4, ANT 5: 2*2MIMO
2. All transmit signals are completely uncorrelated with each other, Directional gain = GANT =15dBi

Measurement Data(PSD):

Band width	Modulation	Channel	ANT 0 Output Power (dBm/ MHz)	ANT 1 Output Power (dBm/ MHz)	ANT 2 Output Power (dBm/ MHz)	ANT 3 Output Power (dBm/ MHz)	Total Power (dBm/ MHz)	Gain (dBi)	Eirp. PSD	Limit (dBm/ MHz)	Verdict
10MHz	256QAM	55290	15.82	16.03	15.79	15.34	21.77	15	36.77	37	PASS
10MHz	256QAM	55990	15.16	15.81	15.44	15.58	21.52	15	36.52	37	PASS
10MHz	256QAM	56690	15.36	15.11	15.28	15.89	21.44	15	36.44	37	PASS
10MHz	QPSK	55290	15.72	15.80	15.99	15.67	21.82	15	36.82	37	PASS
10MHz	QPSK	55990	15.14	15.47	15.13	15.49	21.33	15	36.33	37	PASS
10MHz	QPSK	56690	15.11	15.18	15.26	15.24	21.22	15	36.22	37	PASS
20MHz	256QAM	55340	12.80	12.83	13.03	13.18	18.98	15	33.98	37	PASS
20MHz	256QAM	55990	12.42	12.95	13.06	12.75	18.82	15	33.82	37	PASS
20MHz	256QAM	56640	13.08	12.83	12.98	13.15	19.03	15	34.03	37	PASS
20MHz	QPSK	55340	13.00	12.78	13.08	13.00	18.99	15	33.99	37	PASS
20MHz	QPSK	55990	12.67	12.84	12.99	12.97	18.89	15	33.89	37	PASS
20MHz	QPSK	56640	12.70	12.61	12.62	13.13	18.79	15	33.79	37	PASS

Remark:

1. ANT 0, ANT 1, ANT 2, ANT 3: 4*4MIMO
2. All transmit signals are completely uncorrelated with each other, Directional gain = GANT =15dBi

Band width	Modulation	Channel	ANT 4 Output Power (dBm/ MHz)	ANT 5 Output Power (dBm/ MHz)	ANT 6 Output Power (dBm/ MHz)	ANT 7 Output Power (dBm/ MHz)	Total Power (dBm/ MHz)	Gain (dBi)	Eirp. PSD	Limit (dBm/ MHz)	Verdict
10MHz	256QAM	55290	15.71	15.97	16.01	15.80	21.89	15	36.89	37	PASS
10MHz	256QAM	55990	15.52	15.55	15.68	15.93	21.69	15	36.69	37	PASS
10MHz	256QAM	56690	15.22	15.24	15.67	15.58	21.45	15	36.45	37	PASS
10MHz	QPSK	55290	15.83	15.84	15.73	16.05	21.88	15	36.88	37	PASS
10MHz	QPSK	55990	15.25	15.33	15.23	15.28	21.29	15	36.29	37	PASS
10MHz	QPSK	56690	15.45	15.15	15.11	15.56	21.34	15	36.34	37	PASS
20MHz	256QAM	55340	12.92	13.32	12.90	13.08	19.08	15	34.08	37	PASS
20MHz	256QAM	55990	12.75	13.12	12.48	13.26	18.93	15	33.93	37	PASS
20MHz	256QAM	56640	12.96	12.84	13.25	13.33	19.12	15	34.12	37	PASS
20MHz	QPSK	55340	12.98	12.98	12.96	12.51	18.88	15	33.88	37	PASS
20MHz	QPSK	55990	13.23	13.22	13.29	12.67	19.13	15	34.13	37	PASS
20MHz	QPSK	56640	13.17	12.88	12.70	12.43	18.82	15	33.82	37	PASS

Remark:

1. ANT 4, ANT 5, ANT 6, ANT 7: 4*4MIMO
2. All transmit signals are completely uncorrelated with each other, Directional gain = GANT =15dBi

Band width	Modulation	Channel	ANT 0 Output Power (dBm/ MHz)	ANT 1 Output Power (dBm/ MHz)	Total Power (dBm/ MHz)	Gain (dBi)	Eirp. PSD	Limit (dBm/ MHz)	Verdict
10MHz	256QAM	55290	18.84	18.55	21.71	15	36.71	37	PASS
10MHz	256QAM	55990	18.15	18.66	21.42	15	36.42	37	PASS
10MHz	256QAM	56690	18.50	18.65	21.59	15	36.59	37	PASS
10MHz	QPSK	55290	18.69	18.89	21.80	15	36.80	37	PASS
10MHz	QPSK	55990	18.18	18.38	21.29	15	36.29	37	PASS
10MHz	QPSK	56690	18.37	18.45	21.42	15	36.42	37	PASS
20MHz	256QAM	55340	16.25	16.26	19.27	15	34.27	37	PASS
20MHz	256QAM	55990	15.95	16.12	19.05	15	34.05	37	PASS
20MHz	256QAM	56640	16.20	16.10	19.16	15	34.16	37	PASS
20MHz	QPSK	55340	16.15	15.97	19.07	15	34.07	37	PASS
20MHz	QPSK	55990	15.66	15.57	18.63	15	33.63	37	PASS
20MHz	QPSK	56640	15.95	15.80	18.89	15	33.89	37	PASS

Remark:

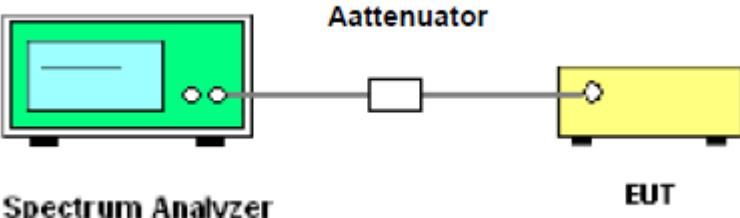
1. ANT 0, ANT 1: 2*2MIMO
2. All transmit signals are completely uncorrelated with each other, Directional gain = GANT =15dBi

Band width	Modulation	Channel	ANT 4 Output Power (dBm/ MHz)	ANT 5 Output Power (dBm/ MHz)	Total Power (dBm/ MHz)	Gain (dBi)	Eirp. PSD	Limit (dBm/ MHz)	Verdict
10MHz	256QAM	55290	18.97	18.79	21.89	15	36.89	37	PASS
10MHz	256QAM	55990	18.40	18.77	21.60	15	36.60	37	PASS
10MHz	256QAM	56690	17.98	18.68	21.35	15	36.35	37	PASS
10MHz	QPSK	55290	18.78	18.80	21.80	15	36.80	37	PASS
10MHz	QPSK	55990	18.88	18.68	21.79	15	36.79	37	PASS
10MHz	QPSK	56690	18.49	18.43	21.47	15	36.47	37	PASS
20MHz	256QAM	55340	16.20	15.94	19.08	15	34.08	37	PASS
20MHz	256QAM	55990	16.26	16.18	19.23	15	34.23	37	PASS
20MHz	256QAM	56640	16.25	15.62	18.96	15	33.96	37	PASS
20MHz	QPSK	55340	16.04	15.88	18.97	15	33.97	37	PASS
20MHz	QPSK	55990	16.06	15.70	18.89	15	33.89	37	PASS
20MHz	QPSK	56640	16.35	16.20	19.29	15	34.29	37	PASS

Remark:

1. ANT 4, ANT 5: 2*2MIMO
2. All transmit signals are completely uncorrelated with each other, Directional gain = GANT =15dBi

6.2 Peak-to-Average Ratio

Test Requirement:	FCC part 96.41(g)
Limit:	The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.
Test Setup:	 <p>The diagram illustrates the test setup. A green 'Spectrum Analyzer' unit is connected via a cable to a yellow 'EUT' (Equipment Under Test) unit. Between them is a small white rectangular component labeled 'Attenuator'. The word 'Spectrum Analyzer' is written below the green unit, and 'EUT' is written below the yellow unit. The word 'Attenuator' is written above the middle section of the connection.</p>
Test Procedure:	<ol style="list-style-type: none">1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.2 Set the CCDF option in spectrum analyzer, $RBW \geq OBW$,3 Set the EUT working in highest power level, measured and recorded the 0.1% as PAPR level.4 Repeat step 1~3 at other frequency and modulations.
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

Refer to Appendix E

6.3 Occupy Bandwidth

Test Requirement:	FCC part 96.41(E)(3)
Test Setup:	<p>The diagram shows a horizontal line representing a signal path. On the left, there is a green rectangular box labeled "Spectrum Analyzer". A small black rectangle representing an attenuator is placed between the spectrum analyzer and the EUT. On the right, there is a yellow rectangular box labeled "EUT". Two small circles on the line represent the points where a -26dBc display line intersects the signal trace.</p>
Test Procedure:	<ol style="list-style-type: none">1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer2. RBW was set to about 1% ~ 5% of emission BW, VBW= 3 times RBW.3. -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

Refer to Appendix C

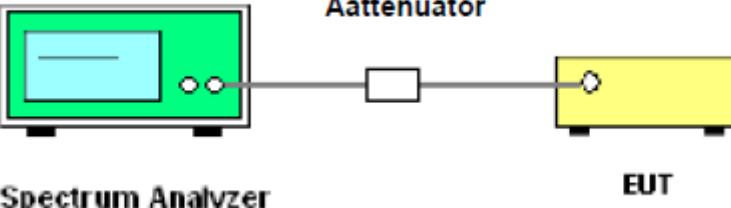
6.4 Emission Mask

Test Requirement:	FCC part 96.41(e)(1)(2)
Limit:	-13 dBm/Mhz at frequencies within 0-10MHz of channel edge -25 dBm/MHz at frequencies greater than 10MHz above and below channel edge -40 dBm/MHz at frequencies below 3530 MHz and above 3720 MHz
Test setup:	<p style="text-align: center;">Spectrum Analyzer EUT</p>
Test Procedure:	<ol style="list-style-type: none"> 1. The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. Measurements must be performed for low, mid, and high channels. 2. RBW=1% of fundamental for measurements within 1 MHz immediately outside the authorized channel; and 1 MHz for beyond 1 MHz outside the authorized channel. (eg. For 5MHz, RBW=51KHz within 1 MHz immediately outside the authorized channel) 3. Trace average at least 100 traces
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	PASS

Measurement Data:

Refer to Appendix F

6.5 Out of band emission at antenna terminals

Test Requirement:	FCC part 96.41(e)(1)(2)
Limit:	below 3530 MHz and above 3720 MHz \leq -40dBm
Test Setup:	 <p style="text-align: center;">Spectrum Analyzer EUT</p> <p style="text-align: center;">Attenuator</p>
Test Procedure:	<ol style="list-style-type: none"> 1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. 2 For the out of band: for Band 48 set the RBW=1 MHz, VBW=3 MHz Start=30MHz, Stop= 10th harmonic. 3 Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed
Remark:	Pre-scan all modulation type (QPSK, 16-QAM, 64-QAM, 256-QAM), and found the QPKS was the worst case. so only the worst case test data.)

Measurement Data:

Refer to Appendix G

6.6 Field strength of spurious radiation measurement

Test Requirement:	FCC part 96.41(e)(1)(2)
Limit:	-40dBm/MHz
Test setup:	<p>Below 1GHz</p> <p>Above 1GHz</p>
Test Procedure:	<ol style="list-style-type: none"> The EUT was placed on the top of a rotating table 0.8m(below 1GHz)/1.5m(above 1GHz) above the ground at a 3 meter camber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations. The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method. The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency. $\text{ERP / EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain(dB/dBi)} - \text{Cable Loss (dB)}$
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details.
Test results:	Passed
Remark:	Pre-scan all modulation type (QPSK, 16-QAM, 64-QAM, 256-QAM), and found the QPKS was the worst case. Pre-scan 2*2MIMO and 4*4MIMO found the 2*2MIMO was the worst case. The report only reflects the worst mode)

Measurement Data:
LTE Band 48 part:

Band 48 (10MHz)						
Lowest channel						
Frequency (MHz)	Spurious Emission level (dBm)	Factor (dB)	Level at antenna terminals (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
7110.00	-56.87	12.01	-44.86	-40.00	4.86	Vertical
10665.00	-50.39	6.07	-44.32	-40.00	4.32	Vertical
14220.00	-47.01	3.64	-43.37	-40.00	3.37	Vertical
7110.00	-56.55	12.01	-44.54	-40.00	4.54	Horizontal
10665.00	-49.94	6.07	-43.87	-40.00	3.87	Horizontal
14220.00	-46.90	3.64	-43.26	-40.00	3.26	Horizontal
Middle channel						
Frequency (MHz)	Spurious Emission level (dBm)	Factor (dB)	Level at antenna terminals (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
7250.00	-56.32	11.86	-44.46	-40.00	4.46	Vertical
10875.00	-49.99	5.98	-44.01	-40.00	4.01	Vertical
14500.00	-46.69	3.56	-43.13	-40.00	3.13	Vertical
7250.00	-56.75	11.86	-44.89	-40.00	4.89	Horizontal
10875.00	-49.39	5.98	-43.41	-40.00	3.41	Horizontal
14500.00	-46.54	3.56	-42.98	-40.00	2.98	Horizontal
Highest channel						
Frequency (MHz)	Spurious Emission level (dBm)	Factor (dB)	Level at antenna terminals (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
7390.00	-55.83	11.73	-44.1	-40.00	4.10	Vertical
11085.00	-50.12	5.67	-44.45	-40.00	4.45	Vertical
14780.00	-46.42	3.51	-42.91	-40.00	2.91	Vertical
7390.00	-56.54	11.73	-44.81	-40.00	4.81	Horizontal
11085.00	-49.23	5.67	-43.56	-40.00	3.56	Horizontal
14780.00	-46.90	3.51	-43.39	-40.00	3.39	Horizontal

Remark:

The emission levels of below 1 GHz are lower than the limit 20dB and not show in test report.

Band 48 (20MHz)						
Lowest channel						
Frequency (MHz)	Spurious Emission level (dBm)	Factor (dB)	Level at antenna terminals (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
7120.00	-57.20	12.01	-45.19	-40.00	5.19	Vertical
10680.00	-50.28	6.07	-44.21	-40.00	4.21	Vertical
14240.00	-46.65	3.64	-43.01	-40.00	3.01	Vertical
7120.00	-56.93	12.01	-44.92	-40.00	4.92	Horizontal
10680.00	-49.67	6.07	-43.6	-40.00	3.60	Horizontal
14240.00	-46.42	3.64	-42.78	-40.00	2.78	Horizontal
Middle channel						
Frequency (MHz)	Spurious Emission level (dBm)	Factor (dB)	Level at antenna terminals (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
7250.00	-57.28	11.86	-45.42	-40.00	5.42	Vertical
10875.00	-50.33	5.98	-44.35	-40.00	4.35	Vertical
14500.00	-46.21	3.56	-42.65	-40.00	2.65	Vertical
7250.00	-56.65	11.86	-44.79	-40.00	4.79	Horizontal
10875.00	-49.23	5.98	-43.25	-40.00	3.25	Horizontal
14500.00	-46.36	3.56	-42.8	-40.00	2.80	Horizontal
Highest channel						
Frequency (MHz)	Spurious Emission level (dBm)	Factor (dB)	Level at antenna terminals (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
7380.00	-56.79	11.73	-45.06	-40.00	5.06	Vertical
11070.00	-50.45	5.67	-44.78	-40.00	4.78	Vertical
14760.00	-46.14	3.51	-42.63	-40.00	2.63	Vertical
7380.00	-56.07	11.73	-44.34	-40.00	4.34	Horizontal
11070.00	-49.01	5.67	-43.34	-40.00	3.34	Horizontal
14760.00	-46.28	3.51	-42.77	-40.00	2.77	Horizontal

Remark:
The emission levels of below 1 GHz are lower than the limit 20dB and not show in test report.

6.7 Frequency stability V.S. Temperature measurement

Test Requirement:	FCC Part 2.1055(a)(b)																																																																														
Limit:	<p>FCC:</p> <table border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th> <th rowspan="2">Fixed and base stations (\pmppm)</th> <th colspan="2">Mobile stations (\pmppm)</th> </tr> <tr> <th>Over 2 watts output power</th> <th>2 watts or less output power</th> </tr> </thead> <tbody> <tr> <td>Below 25</td><td>100</td><td>100</td><td>200</td></tr> <tr> <td>25–50</td><td>20</td><td>20</td><td>50</td></tr> <tr> <td>72–76</td><td>5</td><td></td><td>50</td></tr> <tr> <td>150–174</td><td>5</td><td>5</td><td>50</td></tr> <tr> <td>216–220</td><td>1.0</td><td></td><td>1.0</td></tr> <tr> <td>220–222</td><td>0.1</td><td>1.5</td><td>1.5</td></tr> <tr> <td>421–512</td><td>2.5</td><td>5</td><td>5</td></tr> <tr> <td>806–809</td><td>1.0</td><td>1.5</td><td>1.5</td></tr> <tr> <td>809–824</td><td>1.5</td><td>2.5</td><td>2.5</td></tr> <tr> <td>851–854</td><td>1.0</td><td>1.5</td><td>1.5</td></tr> <tr> <td>854–869</td><td>1.5</td><td>2.5</td><td>2.5</td></tr> <tr> <td>896–901</td><td>0.1</td><td>1.5</td><td>1.5</td></tr> <tr> <td>902–928</td><td>2.5</td><td>2.5</td><td>2.5</td></tr> <tr> <td>902–928</td><td>2.5</td><td>2.5</td><td>2.5</td></tr> <tr> <td>929–930</td><td>1.5</td><td></td><td></td></tr> <tr> <td>935–940</td><td>0.1</td><td>1.5</td><td>1.5</td></tr> <tr> <td>1427–1435</td><td>300</td><td>300</td><td>300</td></tr> <tr> <td>Above 2450</td><td></td><td></td><td></td></tr> </tbody> </table>	Frequency range (MHz)	Fixed and base stations (\pm ppm)	Mobile stations (\pm ppm)		Over 2 watts output power	2 watts or less output power	Below 25	100	100	200	25–50	20	20	50	72–76	5		50	150–174	5	5	50	216–220	1.0		1.0	220–222	0.1	1.5	1.5	421–512	2.5	5	5	806–809	1.0	1.5	1.5	809–824	1.5	2.5	2.5	851–854	1.0	1.5	1.5	854–869	1.5	2.5	2.5	896–901	0.1	1.5	1.5	902–928	2.5	2.5	2.5	902–928	2.5	2.5	2.5	929–930	1.5			935–940	0.1	1.5	1.5	1427–1435	300	300	300	Above 2450			
Frequency range (MHz)	Fixed and base stations (\pm ppm)			Mobile stations (\pm ppm)																																																																											
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809–824	1.5	2.5	2.5																																																																												
851–854	1.0	1.5	1.5																																																																												
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902–928	2.5	2.5	2.5																																																																												
902–928	2.5	2.5	2.5																																																																												
929–930	1.5																																																																														
935–940	0.1	1.5	1.5																																																																												
1427–1435	300	300	300																																																																												
Above 2450																																																																															
Test setup:	<p>Temperature Chamber</p> <p>Spectrum analyzer</p> <p>Att.</p> <p>EUT</p> <p>Variable Power Supply</p>																																																																														
Note :	Measurement setup for testing on Antenna connector																																																																														
Test procedure:	<ol style="list-style-type: none"> The equipment under test was connected to an external DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached 																																																																														
Test Instruments:	Refer to section 5.10 for details																																																																														
Test mode:	Refer to section 5.3 for details																																																																														
Test results:	Passed																																																																														

Measurement Data:

Refer to Appendix D

6.8 Frequency stability V.S. Voltage measurement

Test Requirement:	FCC Part 2.1055(a)(b)																																																																																																			
Limit:	<p>FCC:</p> <table border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th> <th colspan="2">Fixed and base stations (\pmppm)</th> <th colspan="2">Mobile stations (\pmppm)</th> </tr> <tr> <th>Over 2 watts output power</th> <th>2 watts or less output power</th> <th>Over 2 watts output power</th> <th>2 watts or less output power</th> </tr> </thead> <tbody> <tr> <td>Below 25</td><td>100</td><td>100</td><td>200</td><td>200</td></tr> <tr> <td>25-50</td><td>20</td><td>20</td><td>50</td><td>50</td></tr> <tr> <td>72-76</td><td>5</td><td>5</td><td>50</td><td>50</td></tr> <tr> <td>150-174</td><td>5</td><td>5</td><td>50</td><td>50</td></tr> <tr> <td>216-220</td><td>1.0</td><td>1.0</td><td>1.0</td><td>1.0</td></tr> <tr> <td>220-222</td><td>0.1</td><td>1.5</td><td>1.5</td><td>1.5</td></tr> <tr> <td>421-512</td><td>2.5</td><td>5</td><td>5</td><td>5</td></tr> <tr> <td>806-809</td><td>1.0</td><td>1.5</td><td>1.5</td><td>1.5</td></tr> <tr> <td>809-824</td><td>1.5</td><td>2.5</td><td>2.5</td><td>2.5</td></tr> <tr> <td>851-854</td><td>1.0</td><td>1.5</td><td>1.5</td><td>1.5</td></tr> <tr> <td>854-869</td><td>1.5</td><td>2.5</td><td>2.5</td><td>2.5</td></tr> <tr> <td>896-901</td><td>0.1</td><td>1.5</td><td>1.5</td><td>1.5</td></tr> <tr> <td>902-928</td><td>2.5</td><td>2.5</td><td>2.5</td><td>2.5</td></tr> <tr> <td>902-928</td><td>2.5</td><td>2.5</td><td>2.5</td><td>2.5</td></tr> <tr> <td>929-930</td><td>1.5</td><td></td><td></td><td></td></tr> <tr> <td>935-940</td><td>0.1</td><td>1.5</td><td>1.5</td><td>1.5</td></tr> <tr> <td>1427-1435</td><td>300</td><td>300</td><td>300</td><td>300</td></tr> <tr> <td>Above 2450</td><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Frequency range (MHz)	Fixed and base stations (\pm ppm)		Mobile stations (\pm ppm)		Over 2 watts output power	2 watts or less output power	Over 2 watts output power	2 watts or less output power	Below 25	100	100	200	200	25-50	20	20	50	50	72-76	5	5	50	50	150-174	5	5	50	50	216-220	1.0	1.0	1.0	1.0	220-222	0.1	1.5	1.5	1.5	421-512	2.5	5	5	5	806-809	1.0	1.5	1.5	1.5	809-824	1.5	2.5	2.5	2.5	851-854	1.0	1.5	1.5	1.5	854-869	1.5	2.5	2.5	2.5	896-901	0.1	1.5	1.5	1.5	902-928	2.5	2.5	2.5	2.5	902-928	2.5	2.5	2.5	2.5	929-930	1.5				935-940	0.1	1.5	1.5	1.5	1427-1435	300	300	300	300	Above 2450				
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Test setup:	<p>Temperature Chamber</p> <p>Note : Measurement setup for testing on Antenna connector</p>																																																																																																			
Test procedure:	<ol style="list-style-type: none"> Set chamber temperature to 25°C. Use a variable AC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency. Reduce the input voltage to specify extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change. 																																																																																																			
Test Instruments:	Refer to section 5.10 for details																																																																																																			
Test mode:	Refer to section 5.3 for details																																																																																																			
Test results:	Passed																																																																																																			

Measurement Data:

Refer to Appendix D