



RF TEST REPORT

Report No.: SET2020-06347

Product Name: LTE OBD dongle

FCC ID: PJ7-N2110-AM

Model No.: N2110-AM

Applicant: Shenzhen Neoway Technology Co., Ltd.

4F-2#, Lianjian Science&Industry Park, Huarong Road, Dalang,

Address: Longhua District, Shenzhen City, Guangdong Province,
P.R.China.

Dates of Testing: 07/06/2020 —07/13/2020

Issued by: CCIC Southern Testing Co., Ltd

Lab Location: Electronic Testing Building, No. 43 Shahe Road Xili Street,
Nanshan District Shenzhen, Guangdong 518055, China.

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Test Report

Product: LTE OBD dongle

Brand Name.....: neoway

Trade Name: neoway

Applicant: Shenzhen Neoway Technology Co., Ltd.

Applicant Address: 4F-2#, Lianjian Science&Industry Park, Huarong Road,
Dalang, Longhua District, Shenzhen City, Guangdong
Province, P.R.China.

Manufacturer: Shenzhen Neoway Technology Co., Ltd.

Manufacturer Address.....: 4F-2#, Lianjian Science&Industry Park, Huarong Road,
Dalang, Longhua District, Shenzhen City, Guangdong
Province, P.R.China.

Test Standards: 47 CFR Part 2/22/24/27/90

Test Result.....: PASS

Tested by:

Vincent

2020.07.13

Vincent, Test Engineer

Reviewed by.....:

Chris You

2020.07.13

Chris You, Senior Engineer

Approved by.....:

Shuangwen Zhang

2020.07.13

Shuangwen Zhang, Manager



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Change History		
Issue	Date	Reason for change
1.0	2020.07.13	First edition



1. GENERAL INFORMATION

1.1 EUT Description

EUT Type	LTE OBD dongle
Hardware Version	V1.1
Software Version	N27-Q02-STDBZ_N2110-02D
EUT supports Radios application	GSM850/1900 LTE Band 2/4/5/12/13/14/25/26/66/85
Frequency Range(TX)	GSM850:824.2MHz~848.8MHz GSM1900:1850.2MHz~1909.8MHz LTE Band 2: 1850.7MHz~1909.3MHz LTE Band 4: 1710.7MHz~1754.3MHz LTE Band 5: 824.7MHz~848.3MHz LTE Band 12: 699.7MHz~715.3MHz LTE Band 13: 779.5MHz~784.5MHz LTE Band 14: 790.5MHz~795.5MHz LTE Band 25: 1850.7MHz~1914.3MHz LTE Band 26: 824.7MHz~848.3MHz LTE Band 66: 1710.7MHz~1719.3MHz LTE Band 85: 700.5MHz~713.5MHz
LTE Bandwidth	LTE Band 2: 1.4MHz/3MHz/5MHz/10MHz/15MHz/20MHz LTE Band 4: 1.4MHz/3MHz/5MHz/10MHz/15MHz/20MHz LTE Band 5: 1.4MHz/3MHz/5MHz/10MHz LTE Band 12: 1.4MHz/3MHz/5MHz/10MHz LTE Band 13: 5MHz/10MHz LTE Band 14: 5MHz/10MHz LTE Band 25: 1.4MHz/3MHz/5MHz/10MHz/15MHz/20MHz LTE Band 26: 1.4MHz/3MHz/5MHz/10MHz/15MHz LTE Band 66: 1.4MHz/3MHz/5MHz/10MHz/15MHz/20MHz LTE Band 85: 5MHz/10MHz
Modulation Type	GSM/GPRS/EGPRS:GMSK/8PSK LTE:QPSK/16QAM
Antenna Type	Internal Antenna

Note: The test data except radiated spurious emissions and ERP/EIRP of this report refers to FCC ID:PJ7-N27-W3

1.2 Maximum ERP/EIRP Power and Emission Designator

Band	Type of Modulation	BW (MHz)	Maximum ERP/EIRP(W)
LTE Band 2	QPSK	1.4	0.13
LTE Band 2	16QAM	1.4	0.092
LTE Band 2	QPSK	3	0.129
LTE Band 2	16QAM	3	0.095
LTE Band 2	QPSK	5	0.129
LTE Band 2	16QAM	5	0.093
LTE Band 2	QPSK	10	0.115
LTE Band 2	16QAM	10	0.103
LTE Band 2	QPSK	15	0.144
LTE Band 2	16QAM	15	0.089
LTE Band 2	QPSK	20	0.134
LTE Band 2	16QAM	20	0.111
LTE Band 4	QPSK	1.4	0.157
LTE Band 4	16QAM	1.4	0.127
LTE Band 4	QPSK	3	0.160
LTE Band 4	16QAM	3	0.133
LTE Band 4	QPSK	5	0.164
LTE Band 4	16QAM	5	0.183
LTE Band 4	QPSK	10	0.169
LTE Band 4	16QAM	10	0.146
LTE Band 4	QPSK	15	0.132
LTE Band 4	16QAM	15	0.108
LTE Band 4	QPSK	20	0.177
LTE Band 4	16QAM	20	0.138
LTE Band 5	QPSK	1.4	0.178
LTE Band 5	16QAM	1.4	0.120



LTE Band 5	QPSK	3	0.173
LTE Band 5	16QAM	3	0.119
LTE Band 5	QPSK	5	0.178
LTE Band 5	16QAM	5	0.116
LTE Band 5	QPSK	10	0.129
LTE Band 5	16QAM	10	0.104
LTE Band 12	QPSK	1.4	0.144
LTE Band 12	16QAM	1.4	0.111
LTE Band 12	QPSK	3	0.141
LTE Band 12	16QAM	3	0.126
LTE Band 12	QPSK	5	0.142
LTE Band 12	16QAM	5	0.112
LTE Band 12	QPSK	10	0.166
LTE Band 12	16QAM	10	0.127
LTE Band 13	QPSK	5	0.102
LTE Band 13	16QAM	5	0.065
LTE Band 13	QPSK	10	0.101
LTE Band 13	16QAM	10	0.069
LTE Band 14	QPSK	5	0.178
LTE Band 14	16QAM	5	0.122
LTE Band 14	QPSK	10	0.178
LTE Band 14	16QAM	10	0.121
LTE Band 25	QPSK	1.4	0.122
LTE Band 25	16QAM	1.4	0.102
LTE Band 25	QPSK	3	0.124
LTE Band 25	16QAM	3	0.11
LTE Band 25	QPSK	5	0.133
LTE Band 25	16QAM	5	0.106
LTE Band 25	QPSK	10	0.151



LTE Band 25	16QAM	10	0.121
LTE Band 25	QPSK	15	0.153
LTE Band 25	16QAM	15	0.123
LTE Band 25	QPSK	20	0.156
LTE Band 25	16QAM	20	0.125
LTE Band 26	QPSK	1.4	0.136
LTE Band 26	16QAM	1.4	0.117
LTE Band 26	QPSK	3	0.150
LTE Band 26	16QAM	3	0.115
LTE Band 26	QPSK	5	0.150
LTE Band 26	16QAM	5	0.121
LTE Band 26	QPSK	10	0.137
LTE Band 26	16QAM	10	0.110
LTE Band 26	QPSK	15	0.143
LTE Band 26	16QAM	15	0.114
LTE Band 66	QPSK	1.4	0.123
LTE Band 66	16QAM	1.4	0.095
LTE Band 66	QPSK	3	0.127
LTE Band 66	16QAM	3	0.102
LTE Band 66	QPSK	5	0.126
LTE Band 66	16QAM	5	0.104
LTE Band 66	QPSK	10	0.126
LTE Band 66	16QAM	10	0.086
LTE Band 66	QPSK	15	0.124
LTE Band 66	16QAM	15	0.100
LTE Band 66	QPSK	20	0.129
LTE Band 66	16QAM	20	0.103
LTE Band 85	QPSK	5	0.170
LTE Band 85	16QAM	5	0.147



LTE Band 85	QPSK	10	0.184
LTE Band 85	16QAM	10	0.161

2. TRANSMITTER RADIATED POWER (EIRP/ERP)

2.1.1 Requirement

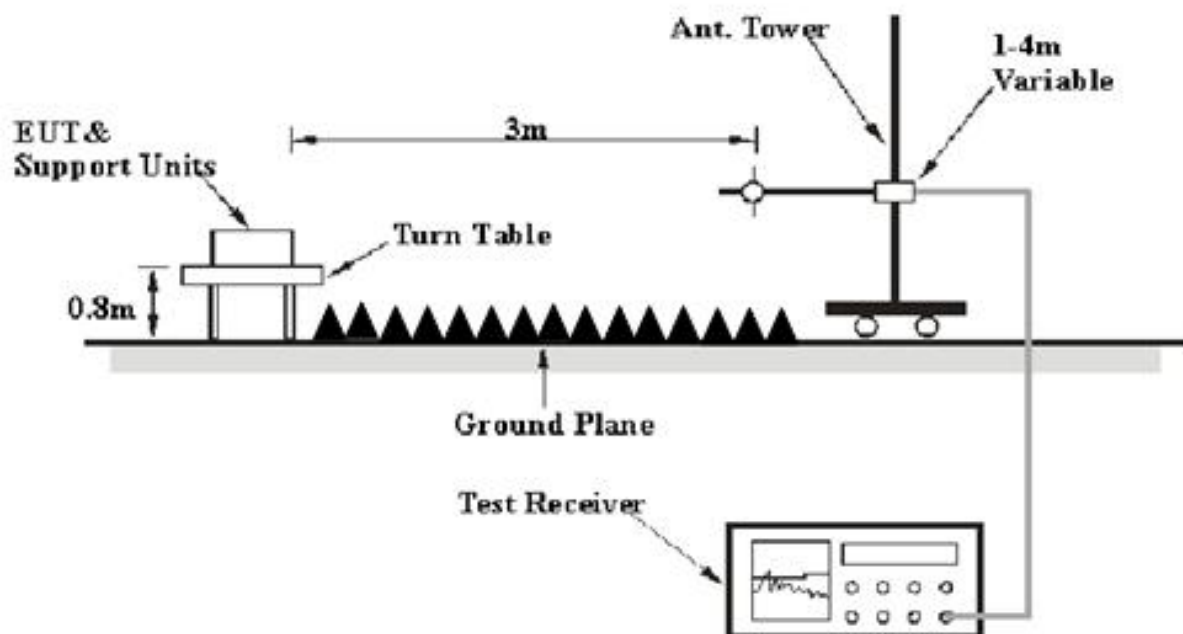
Effective radiated power output measurements by substitution method according to ANSI / TIA / EIA-603-D-2010, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v03r01. Mobile and portable (hand-held) stations operating are limited to average ERP of 7 watts with LTE band 5/26 and 3 watts with LTE band 12 / 13.

Equivalent isotropic radiated power output measurements by substitution method according to ANSI / TIA / EIA-603-D-2010, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v03r01. Mobile and portable (hand-held) stations operating are limited to average EIRP of 2 watts with LTE band 2 / 25 / 41/7 and 1 watt with LTE band 4 and 66.

2.1.2 Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.1.3 Test Setup



2.1.4 Test Procedures

1. The EUT was placed on a turntable with 1.5 meter height in a fully anechoic chamber.
2. The EUT was set at 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer which used a channel power option across EUT's signal bandwidth per section 4.0 of KDB 971168 D01v03r01.
4. The table was rotated 360 degrees to determine the position of the highest radiated power.
5. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
6. Taking the record of maximum ERP/EIRP.
7. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
8. The conducted power at the terminal of the dipole antenna is measured.
9. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
10. $ERP/EIRP = P_s + E_t - E_s + G_s = P_s + R_t - R_s + G_s$

P_s (dBm): Input power to substitution antenna.

G_s (dBi or dBd): Substitution antenna Gain.

$E_t = R_t + AF$

$E_s = R_s + AF$

AF (dB/m): Receive antenna factor

R_t : The highest received signal in spectrum analyzer for EUT.

R_s : The highest received signal in spectrum analyzer for substitution antenna.



2.1.5 Test Result of ERP/EIRP

1. LTE Band 2 Test Verdict:

LTE Band	BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	Verdict
			RB Size	RB Offset			
2	1.4	QPSK	1	3	1850.7	21.14	PASS
2	1.4	QPSK	1	3	1880	21.12	PASS
2	1.4	QPSK	1	3	1909.3	21.15	PASS
2	1.4	16QAM	1	0	1850.7	19.55	PASS
2	1.4	16QAM	1	0	1880	19.56	PASS
2	1.4	16QAM	1	0	1909.3	19.64	PASS
2	3	QPSK	1	8	1851.5	21.10	PASS
2	3	QPSK	1	8	1880	21.08	PASS
2	3	QPSK	1	8	1908.5	21.11	PASS
2	3	16QAM	1	0	1851.5	19.70	PASS
2	3	16QAM	1	0	1880	19.74	PASS
2	3	16QAM	1	0	1908.5	19.77	PASS
2	5	QPSK	1	0	1852.5	21.09	PASS
2	5	QPSK	1	0	1880	21.03	PASS
2	5	QPSK	1	0	1907.5	21.10	PASS
2	5	16QAM	1	24	1852.5	19.68	PASS
2	5	16QAM	1	24	1880	19.61	PASS
2	5	16QAM	1	24	1907.5	19.69	PASS
2	10	QPSK	1	49	1855	20.62	PASS
2	10	QPSK	1	49	1880	20.51	PASS
2	10	QPSK	1	49	1905	20.60	PASS
2	10	16QAM	1	0	1855	20.11	PASS
2	10	16QAM	1	0	1880	20.09	PASS
2	10	16QAM	1	0	1905	20.12	PASS
2	15	QPSK	1	74	1857.5	21.48	PASS
2	15	QPSK	1	74	1880	21.58	PASS
2	15	QPSK	1	74	1902.5	21.52	PASS
2	15	16QAM	1	0	1857.5	19.36	PASS
2	15	16QAM	1	0	1880	19.39	PASS
2	15	16QAM	1	0	1902.5	19.47	PASS
2	20	QPSK	1	0	1860	21.27	PASS
2	20	QPSK	1	0	1880	21.21	PASS
2	20	QPSK	1	0	1900	21.20	PASS
2	20	16QAM	1	0	1860	20.45	PASS
2	20	16QAM	1	0	1880	20.40	PASS
2	20	16QAM	1	0	1900	20.47	PASS



2. LTE Band 4 Test Verdict:

LTE Band	BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	Verdict
			RB Size	RB Offset			
4	1.4	QPSK	1	0	1710.7	21.92	PASS
4	1.4	QPSK	1	0	1732.5	21.54	PASS
4	1.4	QPSK	1	0	1754.3	21.95	PASS
4	1.4	16QAM	1	3	1710.7	21.02	PASS
4	1.4	16QAM	1	3	1732.5	21.05	PASS
4	1.4	16QAM	1	3	1754.3	21.02	PASS
4	3	QPSK	1	0	1711.5	22.03	PASS
4	3	QPSK	1	0	1732.5	22.04	PASS
4	3	QPSK	1	0	1753.5	22.02	PASS
4	3	16QAM	1	14	1711.5	21.25	PASS
4	3	16QAM	1	14	1732.5	21.24	PASS
4	3	16QAM	1	14	1753.5	21.15	PASS
4	5	QPSK	1	0	1712.5	22.02	PASS
4	5	QPSK	1	0	1732.5	22.12	PASS
4	5	QPSK	1	0	1752.5	22.14	PASS
4	5	16QAM	1	0	1712.5	22.08	PASS
4	5	16QAM	1	0	1732.5	22.01	PASS
4	5	16QAM	1	0	1752.5	22.63	PASS
4	10	QPSK	1	0	1715	22.28	PASS
4	10	QPSK	1	0	1732.5	22.26	PASS
4	10	QPSK	1	0	1750	22.25	PASS
4	10	16QAM	1	24	1715	21.62	PASS
4	10	16QAM	1	24	1732.5	21.64	PASS
4	10	16QAM	1	24	1750	21.61	PASS
4	15	QPSK	1	74	1717.5	21.18	PASS
4	15	QPSK	1	74	1732.5	21.21	PASS
4	15	QPSK	1	74	1747.5	21.19	PASS
4	15	16QAM	1	74	1717.5	20.32	PASS
4	15	16QAM	1	74	1732.5	20.27	PASS
4	15	16QAM	1	74	1747.5	20.29	PASS
4	20	QPSK	1	0	1720	22.32	PASS
4	20	QPSK	1	0	1732.5	22.15	PASS
4	20	QPSK	1	0	1745	22.47	PASS
4	20	16QAM	1	0	1720	21.41	PASS
4	20	16QAM	1	0	1732.5	21.25	PASS
4	20	16QAM	1	0	1745	21.35	PASS



3. LTE Band 5 Test Verdict:

LTE Band	BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	ERP (dBm)	Verdict
			RB Size	RB Offset			
5	1.4	QPSK	1	3	824.7	22.47	PASS
5	1.4	QPSK	1	3	836.5	22.51	PASS
5	1.4	QPSK	1	3	848.3	22.50	PASS
5	1.4	16QAM	1	3	824.7	20.73	PASS
5	1.4	16QAM	1	3	836.5	20.66	PASS
5	1.4	16QAM	1	3	848.3	20.80	PASS
5	3	QPSK	1	0	825.5	22.38	PASS
5	3	QPSK	1	0	836.5	22.29	PASS
5	3	QPSK	1	0	847.5	22.34	PASS
5	3	16QAM	1	0	825.5	20.73	PASS
5	3	16QAM	1	0	836.5	20.66	PASS
5	3	16QAM	1	0	847.5	20.74	PASS
5	5	QPSK	1	0	826.5	22.47	PASS
5	5	QPSK	1	0	836.5	22.51	PASS
5	5	QPSK	1	0	846.5	22.46	PASS
5	5	16QAM	1	0	826.5	20.53	PASS
5	5	16QAM	1	0	836.5	20.66	PASS
5	5	16QAM	1	0	846.5	20.60	PASS
5	10	QPSK	1	49	829.0	21.10	PASS
5	10	QPSK	1	49	836.5	21.05	PASS
5	10	QPSK	1	49	844.0	20.96	PASS
5	10	16QAM	1	0	829.0	20.03	PASS
5	10	16QAM	1	0	836.5	20.05	PASS
5	10	16QAM	1	0	844.0	20.17	PASS



4.LTE Band 12 Test Verdict:

LTE Band	BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	Verdict
			RB Size	RB Offset			
12	1.4	QPSK	1	0	699.7	21.50	PASS
12	1.4	QPSK	1	0	707.5	21.58	PASS
12	1.4	QPSK	1	0	715.3	21.51	PASS
12	1.4	16QAM	1	0	699.7	20.41	PASS
12	1.4	16QAM	1	0	707.5	20.45	PASS
12	1.4	16QAM	1	0	715.3	20.46	PASS
12	3	QPSK	1	0	700.5	21.44	PASS
12	3	QPSK	1	0	707.5	21.48	PASS
12	3	QPSK	1	0	714.5	21.45	PASS
12	3	16QAM	1	8	700.5	20.96	PASS
12	3	16QAM	1	8	707.5	20.88	PASS
12	3	16QAM	1	8	714.5	20.99	PASS
12	5	QPSK	1	24	701.5	21.50	PASS
12	5	QPSK	1	24	707.5	21.44	PASS
12	5	QPSK	1	24	713.5	21.52	PASS
12	5	16QAM	1	0	701.5	20.36	PASS
12	5	16QAM	1	0	707.5	20.49	PASS
12	5	16QAM	1	0	713.5	20.42	PASS
12	10	QPSK	1	49	704	22.11	PASS
12	10	QPSK	1	49	707.5	22.19	PASS
12	10	QPSK	1	49	711	22.08	PASS
12	10	16QAM	1	0	704	21.02	PASS
12	10	16QAM	1	0	707.5	21.05	PASS
12	10	16QAM	1	0	711	21.01	PASS



5. LTE Band 13 Test Verdict:

LTE Band	BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	ERP (dBm)	Verdict
			RB Size	RB Offset			
13	5	QPSK	1	0	779.5	22.99	PASS
13	5	QPSK	1	0	782	22.03	PASS
13	5	QPSK	1	0	784.5	22.09	PASS
13	5	16QAM	1	24	779.5	21.15	PASS
13	5	16QAM	1	24	782	21.08	PASS
13	5	16QAM	1	24	784.5	21.13	PASS
13	10	QPSK	1	49	782	22.06	PASS
13	10	16QAM	1	0	782	21.37	PASS



6. LTE Band 14 Test Verdict:

LTE Band	BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	Verdict
			RB Size	RB Offset			
14	5	QPSK	1	0	790.5	22.49	PASS
14	5	QPSK	1	0	793	22.48	PASS
14	5	QPSK	1	0	795.5	22.51	PASS
14	5	16QAM	1	0	790.5	20.87	PASS
14	5	16QAM	1	0	793	20.83	PASS
14	5	16QAM	1	0	795.5	20.85	PASS
14	10	QPSK	1	0	793	22.50	PASS
14	10	16QAM	1	24	793	20.84	PASS



7.LTE Band 25 Test Verdict:

LTE Band	BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	Verdict
			RB Size	RB Offset			
25	1.4	QPSK	1	0	1850.7	20.83	PASS
25	1.4	QPSK	1	0	1882.5	20.86	PASS
25	1.4	QPSK	1	0	1914.3	20.85	PASS
25	1.4	16QAM	1	3	1850.7	20.10	PASS
25	1.4	16QAM	1	3	1882.5	20.08	PASS
25	1.4	16QAM	1	3	1914.3	20.07	PASS
25	3	QPSK	1	0	1851.5	20.90	PASS
25	3	QPSK	1	0	1882.5	20.94	PASS
25	3	QPSK	1	0	1913.5	20.92	PASS
25	3	16QAM	1	0	1851.5	20.40	PASS
25	3	16QAM	1	0	1882.5	20.37	PASS
25	3	16QAM	1	0	1913.5	20.38	PASS
25	5	QPSK	1	0	1852.5	21.24	PASS
25	5	QPSK	1	0	1882.5	21.21	PASS
25	5	QPSK	1	0	1912.5	21.23	PASS
25	5	16QAM	1	24	1852.5	20.27	PASS
25	5	16QAM	1	24	1882.5	20.26	PASS
25	5	16QAM	1	24	1912.5	20.24	PASS
25	10	QPSK	1	0	1855.0	21.77	PASS
25	10	QPSK	1	0	1882.5	21.79	PASS
25	10	QPSK	1	0	1910.0	21.76	PASS
25	10	16QAM	1	0	1855.0	20.80	PASS
25	10	16QAM	1	0	1882.5	20.78	PASS
25	10	16QAM	1	0	1910.0	20.81	PASS
25	15	QPSK	1	74	1857.5	21.84	PASS
25	15	QPSK	1	74	1882.5	21.81	PASS
25	15	QPSK	1	74	1907.5	21.86	PASS
25	15	16QAM	1	0	1857.5	20.88	PASS
25	15	16QAM	1	0	1882.5	20.86	PASS
25	15	16QAM	1	0	1907.5	20.89	PASS
25	20	QPSK	1	0	1860.0	21.91	PASS
25	20	QPSK	1	0	1882.5	21.93	PASS
25	20	QPSK	1	0	1905.0	21.92	PASS
25	20	16QAM	1	0	1860.0	20.96	PASS
25	20	16QAM	1	0	1882.5	20.93	PASS
25	20	16QAM	1	0	1905.0	20.94	PASS



8.LTE Band 26 Test Verdict:

LTE Band (For part 90)	BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	ERP (dBm)	Verdict
			RB Size	RB Offset			
26	1.4	QPSK	1	0	814.7	21.23	PASS
26	1.4	QPSK	1	0	819.0	21.32	PASS
26	1.4	QPSK	1	0	823.3	21.27	PASS
26	1.4	16QAM	1	0	814.7	20.55	PASS
26	1.4	16QAM	1	0	819.0	20.68	PASS
26	1.4	16QAM	1	0	823.3	20.67	PASS
26	3	QPSK	1	8	815.5	21.43	PASS
26	3	QPSK	1	8	819.0	21.75	PASS
26	3	QPSK	1	8	822.5	21.35	PASS
26	3	16QAM	1	0	815.5	20.48	PASS
26	3	16QAM	1	0	819.0	20.55	PASS
26	3	16QAM	1	0	822.5	20.62	PASS
26	5	QPSK	1	24	816.5	21.58	PASS
26	5	QPSK	1	24	819.0	21.35	PASS
26	5	QPSK	1	24	821.5	21.75	PASS
26	5	16QAM	1	0	816.5	20.58	PASS
26	5	16QAM	1	0	819.0	20.82	PASS
26	5	16QAM	1	0	821.5	20.83	PASS
26	10	QPSK	1	0	819.0	21.34	PASS
26	10	16QAM	1	49	819.0	20.38	PASS
26	15	QPSK	1	74	821.5	21.54	PASS
26	15	16QAM	1	0	821.5	20.33	PASS
LTE Band (For part 22)	BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	ERP (dBm)	Verdict
			RB Size	RB Offset			
26	10	QPSK	1	0	831.5	21.28	PASS
26	10	QPSK	1	0	844.0	21.37	PASS
26	10	16QAM	1	49	831.5	20.28	PASS
26	10	16QAM	1	49	844.0	20.41	PASS
26	15	QPSK	1	74	831.5	21.52	PASS
26	15	QPSK	1	74	841.5	21.47	PASS
26	15	16QAM	1	0	831.5	20.58	PASS
26	15	16QAM	1	0	841.5	20.43	PASS



9.LTE Band 66 Test Verdict:

LTE Band	BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	Verdict
			RB Size	RB Offset			
66	1.4	QPSK	1	0	1710.7	20.91	PASS
66	1.4	QPSK	1	0	1732.5	20.71	PASS
66	1.4	QPSK	1	0	1754.3	20.66	PASS
66	1.4	16QAM	1	3	1710.7	19.73	PASS
66	1.4	16QAM	1	3	1732.5	19.76	PASS
66	1.4	16QAM	1	3	1754.3	19.73	PASS
66	3	QPSK	1	0	1711.5	21.04	PASS
66	3	QPSK	1	0	1732.5	21.05	PASS
66	3	QPSK	1	0	1753.5	20.73	PASS
66	3	16QAM	1	14	1711.5	20.09	PASS
66	3	16QAM	1	14	1732.5	20.07	PASS
66	3	16QAM	1	14	1753.5	20.05	PASS
66	5	QPSK	1	0	1712.5	20.98	PASS
66	5	QPSK	1	0	1732.5	20.97	PASS
66	5	QPSK	1	0	1752.5	21.00	PASS
66	5	16QAM	1	0	1712.5	20.16	PASS
66	5	16QAM	1	0	1732.5	20.02	PASS
66	5	16QAM	1	0	1752.5	20.04	PASS
66	10	QPSK	1	0	1715	20.99	PASS
66	10	QPSK	1	0	1732.5	20.97	PASS
66	10	QPSK	1	0	1750	20.96	PASS
66	10	16QAM	1	24	1715	19.33	PASS
66	10	16QAM	1	24	1732.5	19.35	PASS
66	10	16QAM	1	24	1750	19.32	PASS
66	15	QPSK	1	74	1717.5	20.89	PASS
66	15	QPSK	1	74	1732.5	20.92	PASS
66	15	QPSK	1	74	1747.5	20.90	PASS
66	15	16QAM	1	74	1717.5	19.93	PASS
66	15	16QAM	1	74	1732.5	19.98	PASS
66	15	16QAM	1	74	1747.5	20.00	PASS
66	20	QPSK	1	0	1720	21.06	PASS
66	20	QPSK	1	0	1732.5	21.09	PASS
66	20	QPSK	1	0	1745	21.01	PASS
66	20	16QAM	1	0	1720	20.00	PASS
66	20	16QAM	1	0	1732.5	20.13	PASS
66	20	16QAM	1	0	1745	20.12	PASS



10.LTE Band 85 Test Verdict:

LTE Band	BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	Verdict
			RB Size	RB Offset			
85	5	QPSK	1	0	700.5	22.12	PASS
85	5	QPSK	1	0	707	22.31	PASS
85	5	QPSK	1	0	713.5	22.09	PASS
85	5	16QAM	1	0	700.5	21.58	PASS
85	5	16QAM	1	0	707	21.67	PASS
85	5	16QAM	1	0	713.5	21.48	PASS
85	10	QPSK	1	0	703	22.57	PASS
85	10	QPSK	1	0	707	22.65	PASS
85	10	QPSK	1	0	711	22.18	PASS
85	10	16QAM	1	24	703	22.03	PASS
85	10	16QAM	1	24	707	22.07	PASS
85	10	16QAM	1	24	711	21.97	PASS

2.2 Radiated Out of Band Emissions

2.2.1 Requirement

The radiated spurious emission was measured by substitution method according to ANSI / TIA /EIA-603-C-2004. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

For Band 7

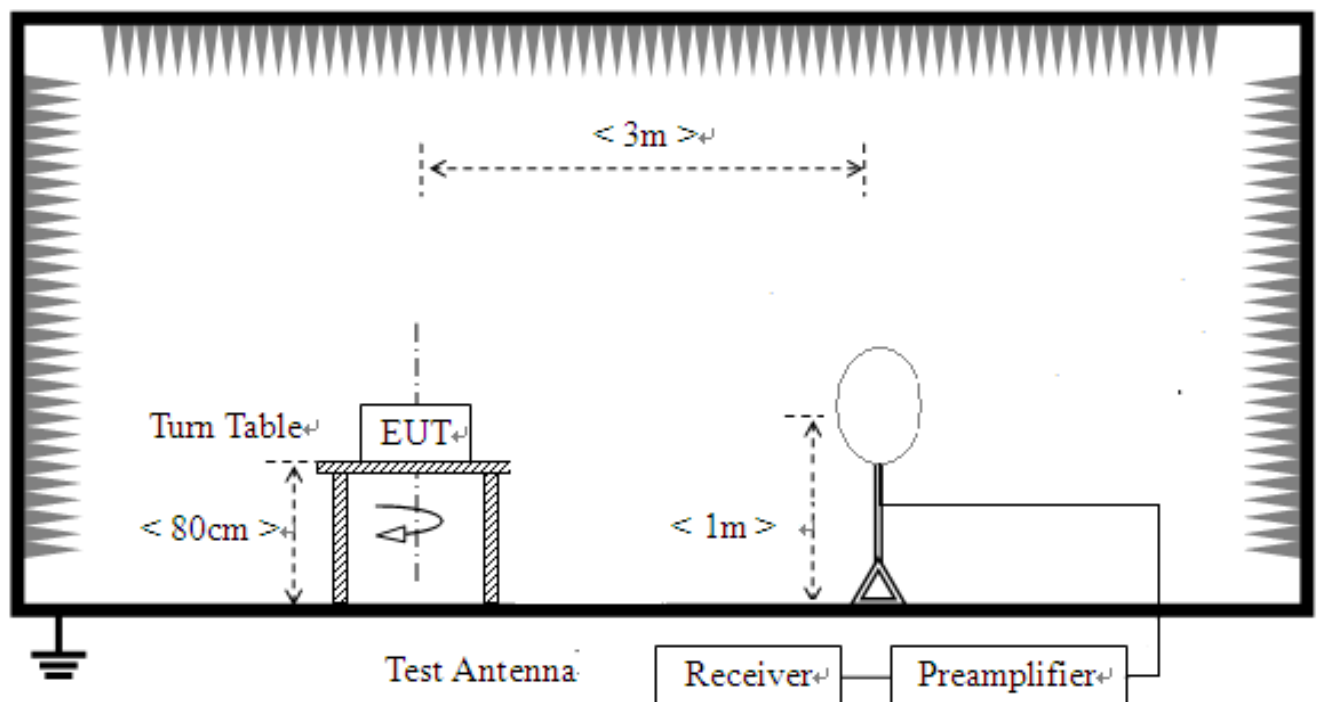
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $55 + 10 \log (P)$ dB.

2.2.2 Measuring Instruments

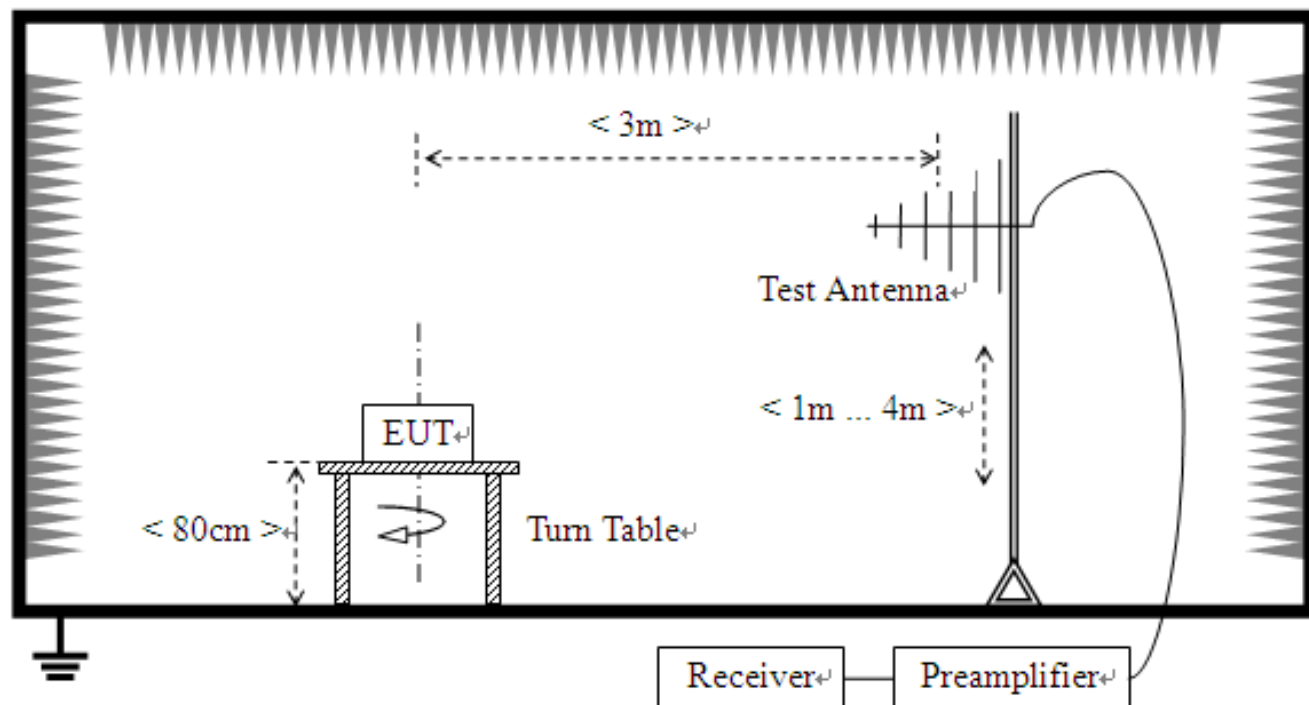
The measuring equipment is listed in the section 3 of this test report.

2.2.3 Test Setup

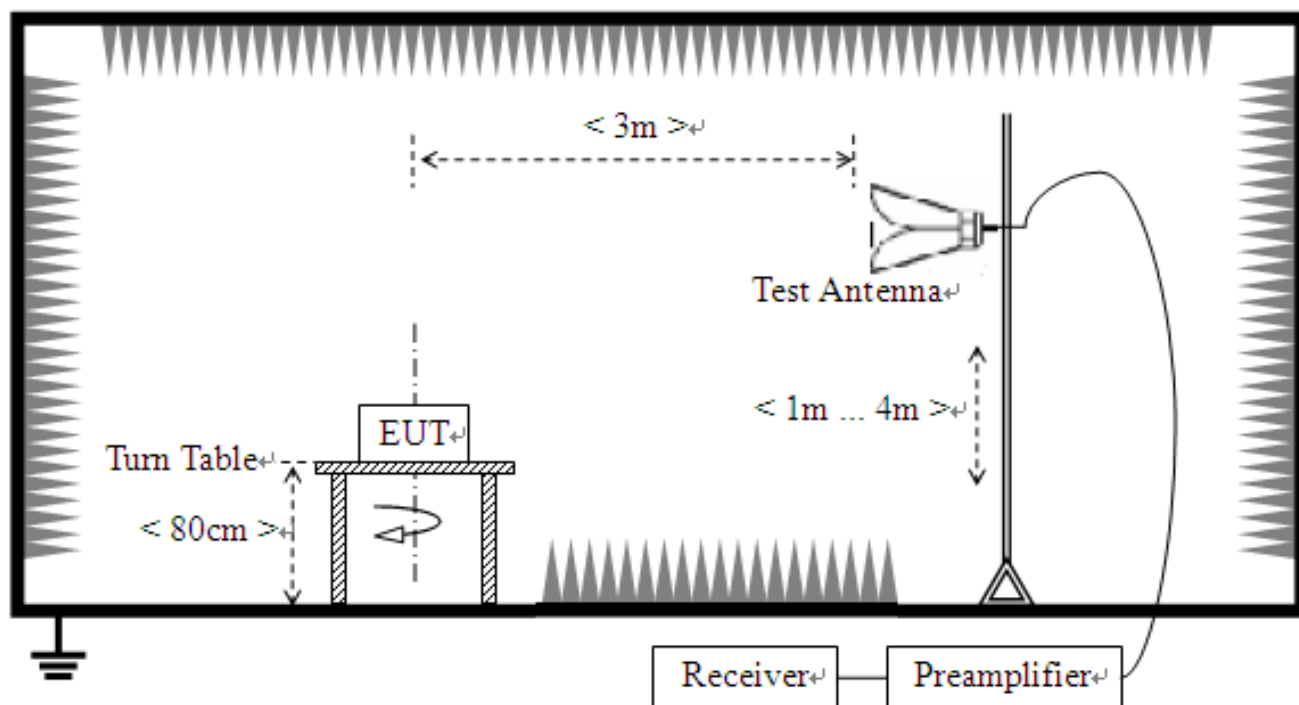
For radiated emissions from 9kHz to 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



2.2.4 Test Procedures

1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10\log(P)]$ (dB)
 $= [30 + 10\log(P)]$ (dBm) - $[43 + 10\log(P)]$ (dB)
 $= -13$ dBm.
11. All Spurious Emission tests were performed in X, Y, Z axis direction and low, middle, high channel. And only the worst axis test condition was recorded in this test report.
12. The spectrum is measured from 9 KHz to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. The worst case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
13. The maximum RB configurations of the Radiated Spurious Emissions as RB Size 1, RB Offset 0

2.2.5 Test Result (Plots) of Radiated Spurious Emission

Note: 1. within 30MHz-1GHz were found more than 20dB below limit line

Note: 2. Absolute Level=Reading Level + Factor

LTE Band 2 QPSK 20MHz BW Middle Channel

NO.	Freq. [MHz]	Reading Level [dBm]	Absolute Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	34.8549	-98.20	-75.93	-13.00	62.93	22.27	Horizontal
2	61.0711	-92.78	-74.16	-13.00	61.16	18.62	Horizontal
3	3216.10	-54.82	-46.09	-13.00	33.09	8.73	Horizontal
4	3967.98	-53.90	-45.19	-13.00	32.19	8.71	Horizontal
5	6510.25	-55.68	-40.73	-13.00	27.73	14.95	Horizontal
6	12711.3	-56.83	-35.79	-13.00	22.79	21.04	Horizontal
NO.	Freq. [MHz]	Reading Level [dBm]	Absolute Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	38.7387	-97.66	-77.88	-13.00	64.88	19.78	Vertical
2	61.0711	-94.40	-74.93	-13.00	61.93	19.47	Vertical
3	3168.08	-54.29	-45.90	-13.00	32.90	8.39	Vertical
4	3871.93	-54.24	-45.96	-13.00	32.96	8.28	Vertical
5	6348.17	-55.66	-41.51	-13.00	28.51	14.15	Vertical
6	11738.8	-57.31	-38.83	-13.00	25.83	18.48	Vertical

LTE Band 4 QPSK 20MHz BW Middle Channel

NO.	Freq. [MHz]	Reading Level [dBm]	Absolute Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	34.8549	-97.94	-75.67	-13.00	62.67	22.27	Horizontal
2	62.0420	-94.54	-75.92	-13.00	62.92	18.62	Horizontal
3	3174.08	-54.27	-45.81	-13.00	32.81	8.46	Horizontal
4	3786.39	-53.59	-44.92	-13.00	31.92	8.67	Horizontal
5	6504.25	-54.88	-39.91	-13.00	26.91	14.97	Horizontal
6	13023.5	-57.37	-35.61	-13.00	22.61	21.76	Horizontal
NO.	Freq. [MHz]	Reading Level [dBm]	Absolute Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	64.9550	-93.15	-73.27	-13.00	60.27	19.88	Vertical
2	79.5195	-96.34	-74.88	-13.00	61.88	21.46	Vertical
3	3205.60	-55.13	-46.09	-13.00	33.09	9.04	Vertical
4	4005.50	-54.41	-45.72	-13.00	32.72	8.69	Vertical
5	6306.15	-54.12	-40.10	-13.00	27.10	14.02	Vertical
6	9655.82	-54.13	-38.61	-13.00	25.61	15.52	Vertical

LTE Band 5 QPSK 10MHz BW Middle Channel

NO.	Freq. [MHz]	Reading Level [dBm]	Absolute Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	65.9259	-92.72	-74.13	-13.00	61.13	18.59	Horizontal
2	498.008	-105.01	-74.43	-13.00	61.43	30.58	Horizontal
3	3210.10	-54.82	-45.97	-13.00	32.97	8.85	Horizontal
4	4014.50	-53.65	-44.80	-13.00	31.80	8.85	Horizontal
5	6510.25	-55.22	-40.27	-13.00	27.27	14.95	Horizontal
6	13995.9	-59.72	-35.89	-13.00	22.89	23.83	Horizontal
NO.	Freq. [MHz]	Reading Level [dBm]	Absolute Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	62.0420	-94.51	-74.94	-13.00	61.94	19.57	Vertical
2	2389.69	-54.19	-49.85	-13.00	36.85	4.34	Vertical
3	3217.60	-53.56	-44.81	-13.00	31.81	8.75	Vertical
4	4013.00	-54.44	-45.83	-13.00	32.83	8.61	Vertical
5	6720.36	-55.01	-41.21	-13.00	28.21	13.80	Vertical
6	12813.4	-56.98	-37.27	-13.00	24.27	19.71	Vertical

LTE Band 12 QPSK 10MHz BW Middle Channel

NO.	Freq. [MHz]	Reading Level [dBm]	Absolute Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	1418.3837	-44.98	-55.48	-13.00	42.48	-10.50	Horizontal
2	1825.0150	-52.76	-61.85	-13.00	48.85	-9.09	Horizontal
3	2414.9830	-53.22	-61.23	-13.00	48.23	-8.01	Horizontal
4	3000.2501	-53.72	-57.28	-13.00	44.28	-3.56	Horizontal
NO.	Freq. [MHz]	Reading Level [dBm]	Absolute Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	1688.6877	-53.01	-62.22	-13.00	49.22	-9.21	Vertical
2	3108.3717	-55.12	-57.06	-13.00	44.06	-1.94	Vertical
3	3994.4989	-55.43	-58.79	-13.00	45.79	-3.36	Vertical
4	5785.5571	-55.77	-55.41	-13.00	42.41	0.36	Vertical

LTE Band 13 QPSK 10MHz BW Middle Channel

NO.	Freq. [MHz]	Reading Level [dBm]	Absolute Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	1258.5517	-52.29	-62.50	-13.00	49.50	-10.21	Horizontal
2	1608.7453	-52.08	-61.86	-40.00	21.86	-9.78	Horizontal
3	1900.2300	-52.17	-61.38	-13.00	48.38	-9.21	Horizontal
4	3075.4651	-54.19	-57.21	-13.00	44.21	-3.02	Horizontal
5	3829.9660	-54.38	-58.54	-13.00	45.54	-4.16	Horizontal

NO.	Freq. [MHz]	Reading Level [dBm]	Absolute Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	1305.5611	-53.11	-63.27	-13.00	50.27	-10.16	Vertical
2	1607.8325	-52.27	-62.04	-40.00	22.04	-9.77	Vertical
3	1839.1178	-54.11	-63.22	-13.00	50.22	-9.11	Vertical
4	2443.1886	-53.09	-61.03	-13.00	48.03	-7.94	Vertical
5	3084.8670	-54.53	-57.49	-13.00	44.49	-2.96	Vertical

LTE Band 14 QPSK 10MHz BW Middle Channel

NO.	Freq. [MHz]	Reading Level [dBm]	Absolute Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	506.7467	-102.69	-72.00	-13.00	59.00	30.69	Horizontal
2	687.3473	-102.80	-70.41	-13.00	57.41	32.39	Horizontal
3	3768.3842	-50.00	-41.54	-13.00	28.54	8.46	Horizontal
4	5159.5798	-55.07	-44.54	-13.00	31.54	10.53	Horizontal
5	6636.3182	-54.84	-40.31	-13.00	27.31	14.53	Horizontal
6	11990.995	-56.92	-37.69	-13.00	24.69	19.23	Horizontal
NO.	Freq. [MHz]	Reading Level [dBm]	Absolute Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	36.7968	-103.41	-83.32	-13.00	70.32	20.09	Vertical
2	55.2452	-101.33	-82.39	-13.00	69.39	18.94	Vertical
3	90.2002	-103.63	-80.84	-13.00	67.84	22.79	Vertical
4	3754.8774	-52.93	-44.62	-13.00	31.62	8.31	Vertical
5	6636.3182	-55.38	-41.41	-13.00	28.41	13.97	Vertical
6	13983.992	-58.47	-35.28	-13.00	22.28	23.19	Vertical

LTE Band 25 QPSK 20MHz BW Middle Channel

NO.	Freq. [MHz]	Reading Level [dBm]	Absolute Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	2241.6208	-53.70	-62.27	-13.00	49.27	-8.57	Horizont
2	3044.8590	-53.87	-56.16	-13.00	43.16	-2.29	Horizont
3	3823.0646	-45.56	-50.19	-13.00	37.19	-4.63	Horizont
4	5787.1074	-56.58	-57.69	-13.00	44.69	-1.11	Horizont
5	7240.1480	-58.32	-56.33	-13.00	43.33	1.99	Horizont
6	8829.7159	-59.60	-57.72	-13.00	44.72	1.88	Horizont
NO.	Freq. [MHz]	Reading Level [dBm]	Absolute Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	1912.4562	-7.39	-16.61	-13.00	3.61	-9.22	Vertical
2	3095.5691	-54.44	-55.48	-13.00	42.48	-1.04	Vertical
3	3823.0646	-45.05	-48.84	-13.00	35.84	-3.79	Vertical
4	5822.2144	-56.71	-57.53	-13.00	44.53	-0.82	Vertical
5	7335.7171	-58.25	-56.44	-13.00	43.44	1.81	Vertical
6	8800.4601	-59.59	-57.47	-13.00	44.47	2.12	Vertical

LTE Band 26 QPSK 15MHz BW Middle Channel

NO.	Freq. [MHz]	Reading Level [dBm]	Absolute Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	1317.3135	-52.61	-62.80	-13.00	49.80	-10.19	Horizontal
2	1820.3141	-53.14	-62.22	-13.00	49.22	-9.08	Horizontal
3	2471.3943	-54.30	-62.18	-13.00	49.18	-7.88	Horizontal
4	3108.3717	-55.04	-57.93	-13.00	44.93	-2.89	Horizontal
5	4626.7754	-54.27	-59.54	-13.00	46.54	-5.27	Horizontal
6	7278.1056	-58.35	-55.40	-13.00	42.40	2.95	Horizontal

NO.	Freq. [MHz]	Reading Level [dBm]	Absolute Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	1881.4263	-53.24	-62.42	-13.00	49.42	-9.18	Vertical
2	3054.3109	-54.12	-57.29	-13.00	44.29	-3.17	Vertical
3	3935.7371	-54.52	-58.72	-13.00	45.72	-4.20	Vertical
4	5806.7113	-55.90	-55.82	-13.00	42.82	0.08	Vertical
5	7233.4467	-57.98	-55.53	-13.00	42.53	2.45	Vertical
6	9189.0378	-59.40	-57.35	-13.00	44.35	2.05	Vertical

LTE Band 66 QPSK 20MHz BW Middle Channel

NO.	Freq. [MHz]	Reading Level [dBm]	Absolute Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	533.933	-103.07	-72.83	-13.00	59.83	30.24	Horizontal
2	1020.01	-61.99	-66.78	-13.00	53.78	-4.79	Horizontal
3	3472.73	-52.20	-45.00	-13.00	32.00	7.20	Horizontal
4	5356.17	-54.70	-43.93	-13.00	30.93	10.77	Horizontal
5	6618.30	-55.18	-40.59	-13.00	27.59	14.59	Horizontal
6	13011.5	-57.36	-35.49	-13.00	22.49	21.87	Horizontal
NO.	Freq. [MHz]	Reading Level [dBm]	Absolute Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	55.2452	-100.81	-81.87	-13.00	68.87	18.94	Vertical
2	624.234	-104.41	-73.38	-13.00	60.38	31.03	Vertical
3	4038.51	-54.30	-45.97	-13.00	32.97	8.33	Vertical
4	6432.21	-55.82	-41.61	-13.00	28.61	14.21	Vertical
5	10736.3	-56.52	-38.86	-13.00	25.86	17.66	Vertical
6	14296.1	-58.09	-35.65	-13.00	22.65	22.44	Vertical

LTE Band 85 QPSK 10MHz BW Middle Channel

Suspected List							
NO.	Freq. [MHz]	Reading Level [dBm]	Absolute Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	33.8839	-104.13	-81.62	-13.00	68.62	22.51	Horizontal
2	1290.14	-53.85	-57.11	-13.00	44.11	-3.26	Horizontal
3	3199.59	-54.43	-45.39	-13.00	32.39	9.04	Horizontal
4	5866.43	-54.74	-41.68	-13.00	28.68	13.06	Horizontal
5	12681.3	-57.44	-36.40	-13.00	23.40	21.04	Horizontal
6	17411.7	-58.85	-32.12	-13.00	19.12	26.73	Horizontal

Suspected List							
NO.	Freq. [MHz]	Reading Level [dBm]	Absolute Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	97.9680	-105.42	-82.00	-13.00	69.00	23.42	Vertical
2	1314.15	-54.29	-57.44	-13.00	44.44	-3.15	Vertical
3	3808.90	-54.37	-45.70	-13.00	32.70	8.67	Vertical
4	6576.28	-55.57	-41.53	-13.00	28.53	14.04	Vertical
5	14296.1	-57.85	-35.41	-13.00	22.41	22.44	Vertical
6	17501.7	-59.58	-31.02	-13.00	18.02	28.56	Vertical



3. LIST OF MEASURING EQUIPMENT

Description	Manufacturer	Model	Serial No.	Cal. Date	Due Date	Remark
EMI Test Receiver	R&S	ESU8	A0805559	2020.04.03	2021.04.02	Radiation
Loop Antenna	Schwarz beck	HFH2-Z2	100047	2019.04.26	2022.04.25	Radiation
Broadband antenna (30MHz~1GHz)	Schwarbeck	BBHA 9120 J	A190503537	2019.01.07	2021.01.06	Radiation
Broadband antenna (30MHz~1GHz)	R&S	HK116	A130701424	2018.01.19	2021.01.18	Radiation
Double ridge horn antenna (1GHz~18GHz)	R&S	HF906	100150	2019.04.27	2022.04.26	Radiation
Double ridge horn antenna (1GHz~18GHz)	R&S	HF906	100149	2019.04.17	2022.04.16	Radiation
Horn antenna (18GHz~26.5GHz)	AR	AT4002A	305753	2017.11.10	2020.11.09	Radiation
Horn antenna (18GHz~26.5GHz)	AR	AT4003A	0329293	2018.09.17	2020.09.16	Radiation
Amplifier 1GHz-18GHz	AR	25S1G4AM1	22018	2018.09.17	2020.09.16	Radiation
Amplifier 20M~3GHz	MILMEGA	80RF1000-250	1064573	2017.10.09	2020.10.08	Radiation
Spectrum Analyzer	KEYSIGHT	N9030A	A160702554	2020.05.18	2021.05.17	Conducted
Test Receiver	R&S	ESIB26	A0304218	2020.04.29	2021.04.28	Conducted
Temperature chamber	Tomilo	TOD-B165FXS-4 K	A181003256	2019.11.21	2020.11.20	Conducted
Wideband Radio Communication tester	R&S	CMW500	A130101034	2019.07.30	2021.07.29	Conducted
Power Supply	R&S	NGMO1	101037	2019.08.03	2020.08.02	Conducted



4. UNCERTAINTY OF EVALUATION

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013. 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.

Uncertainty of Conducted Emission Measurement (150KHz~30MHz)

Measuring Uncertainty for a level of confidence of 95%($U=2U_c(y)$)	2.6dB
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Uncertainty of Radiated Emission Measurement (30MHz~1GHz)

Measuring Uncertainty for a level of confidence of 95%($U=2U_c(y)$)	2.4dB
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Uncertainty of Radiated Emission Measurement (1GHz~40GHz)

Measuring Uncertainty for a level of confidence of 95%($U=2U_c(y)$)	2.8dB
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****END OF REPORT ****