



RF TEST REPORT

Report No.: SET2021-09174

Product: Dash Cam

FCC ID: NCI-M360-D700-1

Model No.: Mobile360 D700

Dates of Testing: 08/01/2020 —07/19/2021

Applicant: VIA Technologies, Inc

Address: 8F, 535 Zhongzheng Rd. Xindian Dist. New Taipei City, Taiwan

Issued by: CCIC Southern Testing Co., Ltd.

Lab Location: Electronic Testing Building, No. 43 Shahe Road, Xili Street,
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Test Report

Product : Dash Cam

Brand Name..... : VIA

Trade Name : VIA

Applicant : VIA Technologies,Inc

Applicant Address : 8F, 535 Zhongzheng Rd. Xindian Dist. New Taipei City,
Taiwan

Manufacturer : VIA Technologies,Inc

Manufacturer Address : 8F, 535 Zhongzheng Rd. Xindian Dist. New Taipei City,
Taiwan

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

Test Result..... : PASS

Tested by :

Vincent

2021.07.19

Vincent, Test Engineer

Reviewed by..... :

Chris You

2021.07.19

Chris You, Senior Engineer

Approved by..... :

Shuangwen Zhang

2021.07.19

Shuangwen Zhang, Manager



Table of Contents

1.	GENERAL INFORMATION	4
1.1	EUT Description.....	4
1.2	Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator	5
1.3	Test Standards and Results	8
1.4	Test Configuration of Equipment Under Test	9
1.5	Measurement Results Explanation Example.....	10
1.6	Facilities and Accreditations	10
2.	TEST REQUIREMENTS	12
2.1	Transmitter Radiated Power (EIRP/ERP)	12
2.2	Radiated Out of Band Emissions	21
3.	LIST OF MEASURING EQUIPMENT	29
4.	UNCERTAINTY OF EVALUATION	30

Change History		
Issue	Date	Reason for change
1.0	2021.07.19	First edition



1. GENERAL INFORMATION

1.1 EUT Description

EUT Type	Dash Cam
Hardware Version	RA
Software Version	V2.1.0
EUT supports Radios application	LTE Band 2/4/5/12/13/14/66
Frequency Range(Tx)	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 66: 1710.7MHz~1779.3MHz
Maximum Output Power to Antenna	LTE Band 2: 22.99dBm LTE Band 4: 22.87dBm LTE Band 5: 23.30dBm LTE Band 12: 23.18dBm LTE Band 13: 23.06dBm LTE Band 14: 23.20dBm LTE Band 66: 23.09dBm
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 66: 1.4MHz/3MHz/5MHz/10MHz/15MHz/20MHz
Modulation Type	QPSK/16QAM/64QAM(downlink only)
Antenna Type	Internal Antenna(3.54dBi)
Power supply	DC 12V



1.2 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator

Band	Type of Modulation	BW (MHz)	Emission Designator	Frequency Tolerance (ppm)	Maximum ERP/EIRP(W)
LTE Band 2	QPSK	1.4	1M09G7D	—	0.166
LTE Band 2	16QAM	1.4	1M09W7D	—	0.133
LTE Band 2	QPSK	3	2M68G7D	—	0.167
LTE Band 2	16QAM	3	2M68W7D	—	0.140
LTE Band 2	QPSK	5	4M48G7D	—	0.169
LTE Band 2	16QAM	5	4M49W7D	—	0.136
LTE Band 2	QPSK	10	8M91G7D	0.005	0.182
LTE Band 2	16QAM	10	8M91W7D	—	0.142
LTE Band 2	QPSK	15	13M4G7D	—	0.199
LTE Band 2	16QAM	15	13M4W7D	—	0.139
LTE Band 2	QPSK	20	17M8G7D	—	0.162
LTE Band 2	16QAM	20	17M8W7D	—	0.133
LTE Band 4	QPSK	1.4	1M09G7D	—	0.166
LTE Band 4	16QAM	1.4	1M09W7D	—	0.133
LTE Band 4	QPSK	3	2M69G7D	—	0.167
LTE Band 4	16QAM	3	2M68W7D	—	0.189
LTE Band 4	QPSK	5	4M49G7D	—	0.177
LTE Band 4	16QAM	5	4M49W7D	—	0.192
LTE Band 4	QPSK	10	8M92G7D	0.004	0.177
LTE Band 4	16QAM	10	8M91W7D	—	0.152
LTE Band 4	QPSK	15	13M4G7D	—	0.138
LTE Band 4	16QAM	15	13M4W7D	—	0.112
LTE Band 4	QPSK	20	17M9G7D	—	0.141
LTE Band 4	16QAM	20	17M9W7D	—	0.117



LTE Band 5	QPSK	1.4	1M09G7D	—	0.235
LTE Band 5	16QAM	1.4	1M09W7D	—	0.196
LTE Band 5	QPSK	3	2M68G7D	—	0.239
LTE Band 5	16QAM	3	2M68W7D	—	0.162
LTE Band 5	QPSK	5	4M48G7D	—	0.233
LTE Band 5	16QAM	5	4M49W7D	—	0.192
LTE Band 5	QPSK	10	8M91G7D	0.006	0.194
LTE Band 5	16QAM	10	8M90W7D	—	0.187
LTE Band 12	QPSK	1.4	1M09G7D	—	0.139
LTE Band 12	16QAM	1.4	1M09W7D	—	0.114
LTE Band 12	QPSK	3	2M68G7D	—	0.198
LTE Band 12	16QAM	3	2M68W7D	—	0.116
LTE Band 12	QPSK	5	4M49G7D	—	0.144
LTE Band 12	16QAM	5	4M49W7D	—	0.118
LTE Band 12	QPSK	10	8M91G7D	0.006	0.160
LTE Band 12	16QAM	10	8M90W7D	—	0.131
LTE Band 13	QPSK	5	4M48G7D	—	0.165
LTE Band 13	16QAM	5	4M49W7D	—	0.117
LTE Band 13	QPSK	10	8M91G7D	0.005	0.163
LTE Band 13	16QAM	10	8M90W7D	—	0.159
LTE Band 14	QPSK	5	4M48G7D	—	0.181
LTE Band 14	16QAM	5	4M49W7D	—	0.163
LTE Band 14	QPSK	10	8M91G7D	0.004	0.178
LTE Band 14	16QAM	10	8M90W7D	—	0.14
LTE Band 66	QPSK	1.4	1M09G7D	—	0.170
LTE Band 66	16QAM	1.4	1M09W7D	—	0.131
LTE Band 66	QPSK	3	2M68G7D	—	0.176
LTE Band 66	16QAM	3	2M68W7D	—	0.141
LTE Band 66	QPSK	5	4M48G7D	—	0.174



LTE Band 66	16QAM	5	4M49W7D	—	0.143
LTE Band 66	QPSK	10	8M91G7D	0.005	0.173
LTE Band 66	16QAM	10	8M90W7D	—	0.119
LTE Band 66	QPSK	15	13M4G7D	—	0.171
LTE Band 66	16QAM	15	13M4W7D	—	0.138
LTE Band 66	QPSK	20	17M8G7D	—	0.177
LTE Band 66	16QAM	20	17M8W7D	—	0.142



1.3 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 2/22/24/27/90 and for the EUT FCC ID Certification:

1. ANSI/TIA/EIA-603-D-2010
2. FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01

This C2PC Report was based on original FCC ID: NCI-M360-D700-1, The device was change the ANT, and open LTE Band 71 via the software. Below are the test items:

No.	FCC Rule	Description	Limit	Result
1	§22.913(a)(2)	Effective Radiated Power (Band 5)	FCC:ERP< 7Watt IC: ERP< 11.5Watt	PASS
	§24.232(c)	Equivalent Isotropic Radiated Power (Band 2)	EIRP < 2Watt	PASS
	§27.50(b)(10) §27.50(c)(10) §90.541	Effective Radiated Power (Band 12/13/14)	FCC:ERP< 3Watt IC:ERP< 5Watt for band 12/13 3Watt for band 14	PASS
	§27.50(d)(4)	Equivalent Isotropic Radiated Power (Band 4) (Band 66)	EIRP < 1Watt	PASS
2	2.1053 §22.917(a) 24.238(a) 27.53(c) 27.53(g) 27.53(h) 90.543(c)	Radiated Spurious Emission (Band 2/4/5/12/13/13/66)	FCC:< 43+10log10(P[watt]) IC:for Band13 refer to RSS-130,4.6	PASS

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test



1.4 Test Configuration of Equipment Under Test

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power.

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes to find the maximum emission.

Test Items	Band	Bandwidth(MHz)						Modulation		RB#			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	M	H
ERP/EIRP	2	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
	4	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
	5	✓	✓	✓	✓			✓	✓	✓			✓	✓	✓
	12	✓	✓	✓	✓			✓	✓	✓			✓	✓	✓
	13			✓	✓			✓	✓	✓			✓	✓	✓
	14			✓	✓			✓	✓	✓			✓	✓	✓
	66	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
Radiated Spurious Emission	2	Worst case												✓	
	4	Worst case												✓	
	5	Worst case												✓	
	12	Worst case												✓	
	13	Worst case												✓	
	14	Worst case												✓	
	66	Worst case												✓	

Note:1. The mark “ ✓ ” means that this configuration is chosen for testing.



1.5 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 7dB and 10dB attenuator.

Example:

$$\begin{aligned}\text{Offset (dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 7 + 10 = 17 \text{ (dB)}\end{aligned}$$

1.6 Facilities and Accreditations

1.6.1 Test Facilities

CNAS-Lab Code: L1659

CCIC-SET is a third party testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L1659.

FCC-Registration No.: CN1283

CCIC Southern Testing Co., Ltd EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Designation Number: CN1283, valid time is until April 19th, 2023.

ISED Registration: 11185A-1

CAB identifier: CN0064

CCIC Southern Testing Co., Ltd. EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11185A-1 on Aug. 04, 2016, valid time is until April 19th, 2023.

A2LA Code: 5721.01

CCIC-SET is a third party testing organization accredited by A2LA according to ISO/IEC 17025. The accreditation certificate number is 5721.01.



1.6.2 Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15°C - 35°C
Relative Humidity (%):	30% -60%
Atmospheric Pressure (kPa):	86KPa-106KPa

2. TEST REQUIREMENTS

2.1 Transmitter Radiated Power (EIRP/ERP)

2.1.1 Requirement

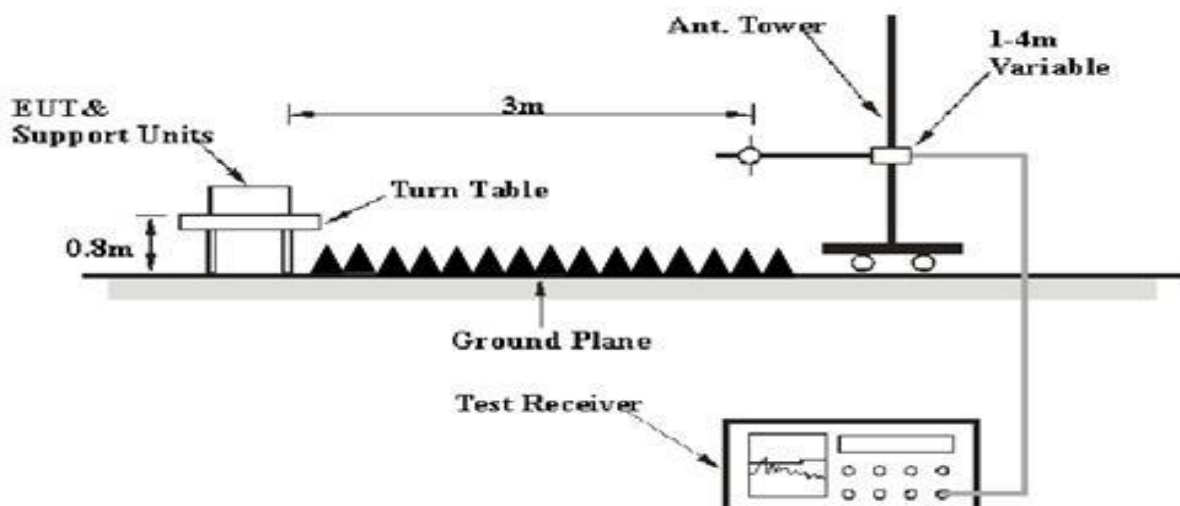
Effective radiated power output measurements by substitution method according to ANSI / TIA / EIA-603-D-2010, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v03r01. Mobile and portable (hand-held) stations operating are limited to average ERP of 7 watts (FCC)/11.5 watts (IC) with LTE band 5 and 3 watts with LTE band 12/13/71. For IC :5 watts with LTE Band 12/13/71.

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 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	22.18	PASS
2	1.4	QPSK	1	3	1880	22.20	PASS
2	1.4	QPSK	1	3	1909.3	22.07	PASS
2	1.4	16QAM	1	0	1850.7	21.12	PASS
2	1.4	16QAM	1	0	1880	21.24	PASS
2	1.4	16QAM	1	0	1909.3	21.08	PASS
2	3	QPSK	1	8	1851.5	22.10	PASS
2	3	QPSK	1	8	1880	22.12	PASS
2	3	QPSK	1	8	1908.5	22.24	PASS
2	3	16QAM	1	0	1851.5	21.20	PASS
2	3	16QAM	1	0	1880	21.36	PASS
2	3	16QAM	1	0	1908.5	21.45	PASS
2	5	QPSK	1	0	1852.5	22.17	PASS
2	5	QPSK	1	0	1880	22.27	PASS
2	5	QPSK	1	0	1907.5	22.13	PASS
2	5	16QAM	1	24	1852.5	21.32	PASS
2	5	16QAM	1	24	1880	21.28	PASS
2	5	16QAM	1	24	1907.5	21.27	PASS
2	10	QPSK	1	49	1855	22.17	PASS
2	10	QPSK	1	49	1880	22.61	PASS
2	10	QPSK	1	49	1905	22.27	PASS
2	10	16QAM	1	0	1855	21.24	PASS
2	10	16QAM	1	0	1880	21.52	PASS
2	10	16QAM	1	0	1905	21.17	PASS
2	15	QPSK	1	74	1857.5	22.20	PASS
2	15	QPSK	1	74	1880	22.25	PASS
2	15	QPSK	1	74	1902.5	22.99	PASS
2	15	16QAM	1	0	1857.5	21.35	PASS
2	15	16QAM	1	0	1880	21.42	PASS
2	15	16QAM	1	0	1902.5	21.28	PASS
2	20	QPSK	1	0	1860	22.10	PASS
2	20	QPSK	1	0	1880	22.07	PASS
2	20	QPSK	1	0	1900	22.09	PASS
2	20	16QAM	1	0	1860	21.11	PASS
2	20	16QAM	1	0	1880	21.12	PASS
2	20	16QAM	1	0	1900	21.24	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	22.11	PASS
4	1.4	QPSK	1	0	1732.5	22.19	PASS
4	1.4	QPSK	1	0	1754.3	22.14	PASS
4	1.4	16QAM	1	3	1710.7	21.21	PASS
4	1.4	16QAM	1	3	1732.5	21.24	PASS
4	1.4	16QAM	1	3	1754.3	21.21	PASS
4	3	QPSK	1	0	1711.5	22.22	PASS
4	3	QPSK	1	0	1732.5	22.23	PASS
4	3	QPSK	1	0	1753.5	22.21	PASS
4	3	16QAM	1	14	1711.5	22.77	PASS
4	3	16QAM	1	14	1732.5	22.75	PASS
4	3	16QAM	1	14	1753.5	22.73	PASS
4	5	QPSK	1	0	1712.5	22.46	PASS
4	5	QPSK	1	0	1732.5	22.45	PASS
4	5	QPSK	1	0	1752.5	22.48	PASS
4	5	16QAM	1	0	1712.5	22.84	PASS
4	5	16QAM	1	0	1732.5	22.8	PASS
4	5	16QAM	1	0	1752.5	22.82	PASS
4	10	QPSK	1	0	1715	22.47	PASS
4	10	QPSK	1	0	1732.5	22.45	PASS
4	10	QPSK	1	0	1750	22.44	PASS
4	10	16QAM	1	24	1715	21.81	PASS
4	10	16QAM	1	24	1732.5	21.83	PASS
4	10	16QAM	1	24	1750	21.8	PASS
4	15	QPSK	1	74	1717.5	21.37	PASS
4	15	QPSK	1	74	1732.5	21.4	PASS
4	15	QPSK	1	74	1747.5	21.38	PASS
4	15	16QAM	1	74	1717.5	20.51	PASS
4	15	16QAM	1	74	1732.5	20.46	PASS
4	15	16QAM	1	74	1747.5	20.48	PASS
4	20	QPSK	1	0	1720	21.44	PASS
4	20	QPSK	1	0	1732.5	21.47	PASS
4	20	QPSK	1	0	1745	21.49	PASS
4	20	16QAM	1	0	1720	20.58	PASS
4	20	16QAM	1	0	1732.5	20.61	PASS
4	20	16QAM	1	0	1745	20.68	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	23.68	PASS
5	1.4	QPSK	1	3	836.5	23.71	PASS
5	1.4	QPSK	1	3	848.3	23.70	PASS
5	1.4	16QAM	1	3	824.7	22.75	PASS
5	1.4	16QAM	1	3	836.5	22.73	PASS
5	1.4	16QAM	1	3	848.3	22.92	PASS
5	3	QPSK	1	0	825.5	23.75	PASS
5	3	QPSK	1	0	836.5	23.79	PASS
5	3	QPSK	1	0	847.5	23.77	PASS
5	3	16QAM	1	0	825.5	22.03	PASS
5	3	16QAM	1	0	836.5	22.10	PASS
5	3	16QAM	1	0	847.5	22.01	PASS
5	5	QPSK	1	0	826.5	23.68	PASS
5	5	QPSK	1	0	836.5	23.65	PASS
5	5	QPSK	1	0	846.5	23.66	PASS
5	5	16QAM	1	0	826.5	22.83	PASS
5	5	16QAM	1	0	836.5	22.80	PASS
5	5	16QAM	1	0	846.5	22.81	PASS
5	10	QPSK	1	49	829.0	22.53	PASS
5	10	QPSK	1	49	836.5	22.54	PASS
5	10	QPSK	1	49	844.0	22.87	PASS
5	10	16QAM	1	0	829.0	22.13	PASS
5	10	16QAM	1	0	836.5	22.72	PASS
5	10	16QAM	1	0	844.0	22.59	PASS



4.LTE Band 12 Test Verdict:

LTE Band	BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	ERP (dBm)	Verdict
			RB Size	RB Offset			
12	1.4	QPSK	1	0	699.7	21.42	PASS
12	1.4	QPSK	1	0	707.5	21.4	PASS
12	1.4	QPSK	1	0	715.3	21.43	PASS
12	1.4	16QAM	1	0	699.7	20.58	PASS
12	1.4	16QAM	1	0	707.5	20.57	PASS
12	1.4	16QAM	1	0	715.3	20.55	PASS
12	3	QPSK	1	0	700.5	21.98	PASS
12	3	QPSK	1	0	707.5	22.97	PASS
12	3	QPSK	1	0	714.5	22.95	PASS
12	3	16QAM	1	8	700.5	20.63	PASS
12	3	16QAM	1	8	707.5	20.65	PASS
12	3	16QAM	1	8	714.5	20.66	PASS
12	5	QPSK	1	24	701.5	21.58	PASS
12	5	QPSK	1	24	707.5	21.56	PASS
12	5	QPSK	1	24	713.5	21.54	PASS
12	5	16QAM	1	0	701.5	20.68	PASS
12	5	16QAM	1	0	707.5	20.71	PASS
12	5	16QAM	1	0	713.5	20.7	PASS
12	10	QPSK	1	49	704	21.99	PASS
12	10	QPSK	1	49	707.5	22.01	PASS
12	10	QPSK	1	49	711	22.03	PASS
12	10	16QAM	1	0	704	21.16	PASS
12	10	16QAM	1	0	707.5	21.15	PASS
12	10	16QAM	1	0	711	21.12	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	21.95	PASS
13	5	QPSK	1	0	782	21.87	PASS
13	5	QPSK	1	0	784.5	22.18	PASS
13	5	16QAM	1	24	779.5	20.68	PASS
13	5	16QAM	1	24	782	20.57	PASS
13	5	16QAM	1	24	784.5	20.55	PASS
13	10	QPSK	1	49	782	22.12	PASS
13	10	16QAM	1	0	782	22.01	PASS



6.LTE Band 14 Test Verdict:

LTE Band	BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	ERP (dBm)	Verdict
			RB Size	RB Offset			
14	5	QPSK	1	0	790.5	22.18	PASS
14	5	QPSK	1	0	793	22.13	PASS
14	5	QPSK	1	0	795.5	22.57	PASS
14	5	16QAM	1	24	790.5	22.00	PASS
14	5	16QAM	1	24	793	21.94	PASS
14	5	16QAM	1	24	795.5	22.13	PASS
14	10	QPSK	1	49	793	22.50	PASS
14	10	16QAM	1	0	793	21.45	PASS



6. 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	22.31	PASS
66	1.4	QPSK	1	0	1732.5	22.11	PASS
66	1.4	QPSK	1	0	1754.3	22.06	PASS
66	1.4	16QAM	1	3	1710.7	21.13	PASS
66	1.4	16QAM	1	3	1732.5	21.16	PASS
66	1.4	16QAM	1	3	1754.3	21.13	PASS
66	3	QPSK	1	0	1711.5	22.44	PASS
66	3	QPSK	1	0	1732.5	22.45	PASS
66	3	QPSK	1	0	1753.5	22.13	PASS
66	3	16QAM	1	14	1711.5	21.49	PASS
66	3	16QAM	1	14	1732.5	21.47	PASS
66	3	16QAM	1	14	1753.5	21.45	PASS
66	5	QPSK	1	0	1712.5	22.38	PASS
66	5	QPSK	1	0	1732.5	22.37	PASS
66	5	QPSK	1	0	1752.5	22.4	PASS
66	5	16QAM	1	0	1712.5	21.56	PASS
66	5	16QAM	1	0	1732.5	21.42	PASS
66	5	16QAM	1	0	1752.5	21.44	PASS
66	10	QPSK	1	0	1715	22.39	PASS
66	10	QPSK	1	0	1732.5	22.37	PASS
66	10	QPSK	1	0	1750	22.36	PASS
66	10	16QAM	1	24	1715	20.73	PASS
66	10	16QAM	1	24	1732.5	20.75	PASS
66	10	16QAM	1	24	1750	20.72	PASS
66	15	QPSK	1	74	1717.5	22.29	PASS
66	15	QPSK	1	74	1732.5	22.32	PASS
66	15	QPSK	1	74	1747.5	22.3	PASS
66	15	16QAM	1	74	1717.5	21.33	PASS
66	15	16QAM	1	74	1732.5	21.38	PASS
66	15	16QAM	1	74	1747.5	21.4	PASS
66	20	QPSK	1	0	1720	22.46	PASS
66	20	QPSK	1	0	1732.5	22.49	PASS
66	20	QPSK	1	0	1745	22.41	PASS
66	20	16QAM	1	0	1720	21.4	PASS
66	20	16QAM	1	0	1732.5	21.53	PASS
66	20	16QAM	1	0	1745	21.52	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.

Additional requirement for IC Rule: RSS130, 4.6

equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

(a) The power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least:

- (i) $76 + 10 \log_{10} P$ (watts), dB, for base and fixed equipment, and
- (ii) $65 + 10 \log_{10} P$ (watts), dB, for mobile and portable equipment.

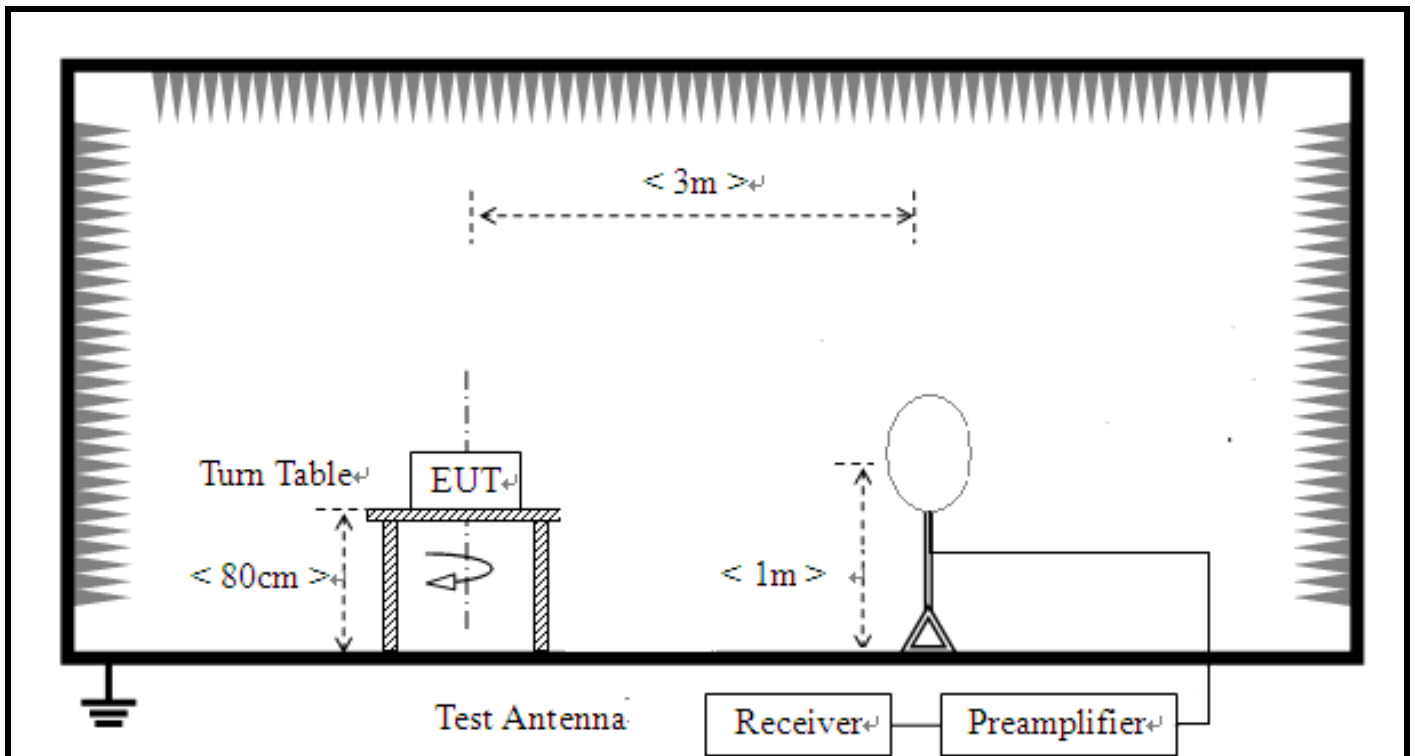
(b) The e.i.r.p. in the band 1559-1610 MHz shall not exceed -70 dBW/MHz for wideband signal and -80 dBW for discrete emission with bandwidth less than 700 Hz.

2.2.2 Measuring Instruments

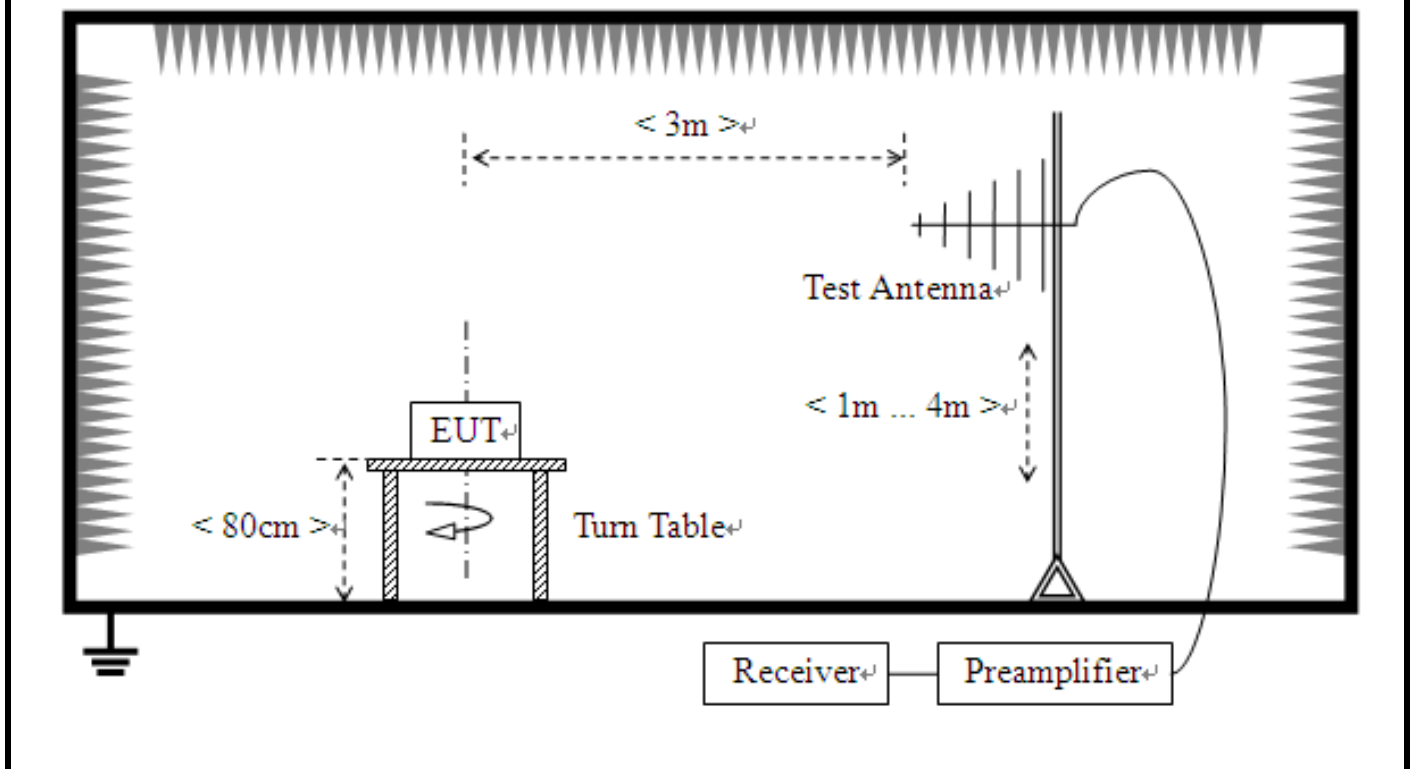
The measuring equipment is listed in the section 3 of this test report.

2.2.3 Test Setup

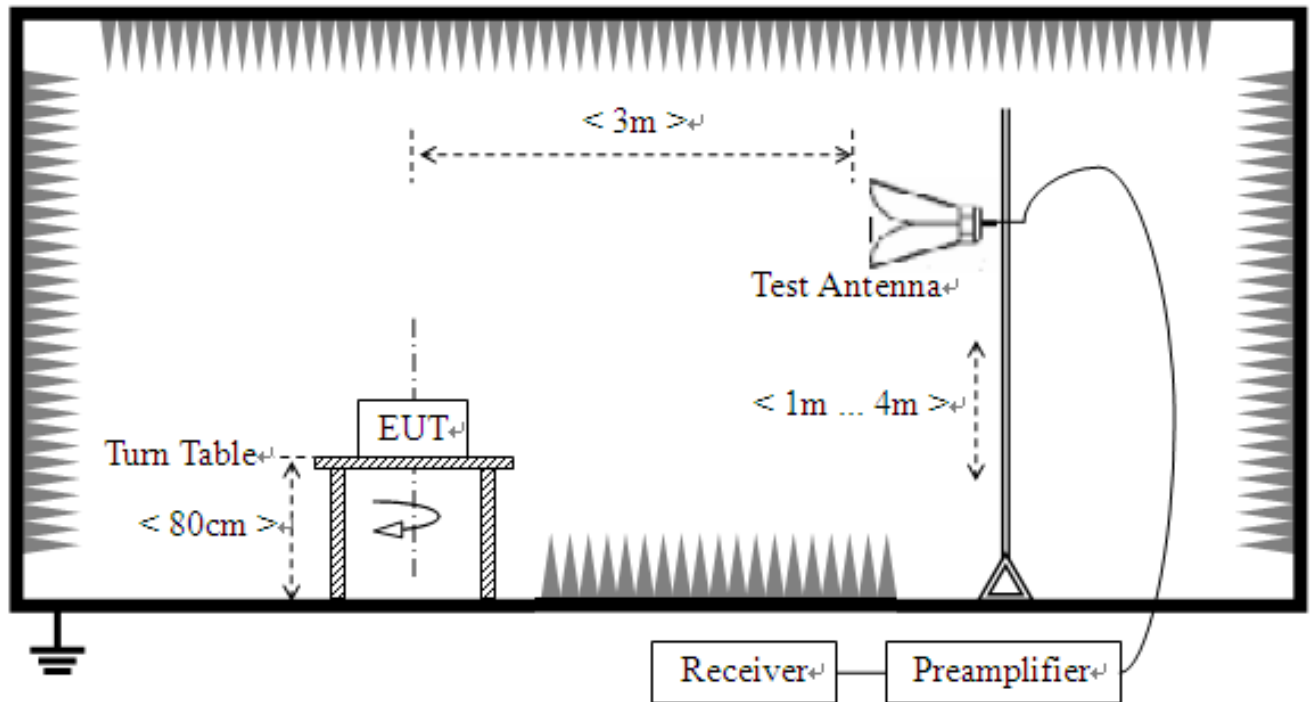
For radiated emissions from 9kHz to 30MHz



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)

$$= P(W) - [43 + 10\log(P)] \text{ (dB)}$$

$$= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$$

$$= -13\text{dBm.}$$

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

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	499.768	-104.94	-72.31	-13	59.31	32.63	Horizontal
2	650.536	-103.95	-69.12	-13	56.12	34.83	Horizontal
3	790.438	-104.05	-67.65	-13	54.65	36.40	Horizontal
4	3768.45	-58.67	-48.19	-13	35.19	10.48	Horizontal
5	5861.22	-59.02	-42.75	-13	29.75	16.27	Horizontal
6	7983.24	-60.20	-36.59	-13	23.59	23.61	Horizontal

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	67.8376	-92.12	-71.16	-13	58.16	20.96	Vertical
2	755.123	-104.06	-68.17	-13	55.17	35.89	Vertical
3	899.099	-103.39	-66.23	-13	53.23	37.16	Vertical
4	3046.80	-58.31	-49.65	-13	36.65	8.66	Vertical
5	3748.94	-59.08	-48.72	-13	35.72	10.36	Vertical
6	4987.44	-59.64	-45.45	-13	32.45	14.19	Vertical



LTE Band 4 QPSK 20MHz BW Middle Channel

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	501.891	-105.54	-72.9	-13	59.9	32.64	Horizontal
2	665.015	-104.69	-69.93	-13	56.93	34.76	Horizontal
3	854.354	-104.48	-67.37	-13	54.37	37.11	Horizontal
4	3219.48	-57.91	-48.55	-13	35.55	9.36	Horizontal
5	3882.81	-57.87	-48.24	-13	35.24	9.63	Horizontal
6	5770.38	-58.83	-42.84	-13	29.84	15.99	Horizontal

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	57.1872	-91.02	-71.31	-13	58.31	19.71	Vertical
2	601.901	-104.49	-71.54	-13	58.54	32.95	Vertical
3	795.125	-103.95	-67.86	-13	54.86	36.09	Vertical
4	2971.98	-57.67	-50.03	-13	37.03	7.64	Vertical
5	3765.75	-59.16	-48.81	-13	35.81	10.35	Vertical
6	4970.48	-59.74	-45.68	-13	32.68	14.06	Vertical

LTE Band 5 QPSK 10MHz BW Middle Channel

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	40.6807	-97.11	-75.51	-13	62.51	21.60	Horizontal
2	509.659	-104.62	-71.56	-13	58.56	33.06	Horizontal
3	661.131	-104.51	-68.93	-13	55.93	35.58	Horizontal
4	2099.17	-58.82	-55.37	-13	42.37	3.45	Horizontal
5	2951.47	-57.56	-50.18	-13	37.18	7.38	Horizontal
6	3744.99	-59.27	-50.21	-13	37.21	9.06	Horizontal

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	48.4484	-91.62	-72.33	-13	59.33	19.29	Vertical
2	65.9259	-93.65	-72.73	-13	59.73	20.92	Vertical
3	601.901	-104.53	-70.83	-13	57.83	33.70	Vertical
4	1229.23	-57.40	-59.22	-13	46.22	-1.82	Vertical
5	2616.43	-57.60	-52.73	-13	39.73	4.87	Vertical
6	3968.35	-58.21	-49.81	-13	36.81	8.40	Vertical



LTE Band 12 QPSK 10MHz BW Middle Channel

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	36.7968	-82.30	-59.95	-13.00	46.95	22.35	Horizontal
2	53.3033	-79.37	-60.11	-13.00	47.11	19.26	Horizontal
3	61.0711	-88.94	-69.61	-13.00	56.61	19.33	Horizontal
4	1476.23	-57.30	-58.96	-13.00	45.96	-1.66	Horizontal
5	2080.54	-57.34	-53.18	-13.00	40.18	4.16	Horizontal
6	3029.26	-58.37	-49.15	-13.00	36.15	9.22	Horizontal
Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	36.7968	-84.11	-63.52	-13.00	50.52	20.59	Vertical
2	53.3033	-80.10	-60.87	-13.00	47.87	19.23	Vertical
3	62.0420	-88.13	-67.84	-13.00	54.84	20.29	Vertical
4	1213.10	-57.92	-59.52	-13.00	46.52	-1.60	Vertical
5	1728.36	-57.62	-57.92	-13.00	44.92	-0.30	Vertical
6	2371.68	-56.81	-52.37	-13.00	39.37	4.44	Vertical

LTE Band 13 QPSK 10MHz BW Middle Channel

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	36.7968	-83.78	-61.43	-13.00	48.43	22.35	Horizontal
2	773.745	-94.74	-58.14	-35.00	23.14	36.60	Horizontal
3	801.993	-93.65	-56.8	-35.00	21.8	36.85	Horizontal
4	1170.08	-58.23	-61.03	-13.00	48.03	-2.80	Horizontal
5	1601.73	-57.05	-58.67	-40.00	18.67	-1.62	Horizontal
6	2706.85	-57.87	-51.91	-13.00	38.91	5.96	Horizontal
Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	36.7968	-82.14	-61.55	-13.00	48.55	20.59	Vertical
2	773.745	-93.23	-56.63	-35.00	21.63	36.60	Vertical
3	801.954	-89.74	-52.89	-35.00	17.89	36.85	Vertical
4	1297.14	-56.31	-58.85	-13.00	45.85	-2.54	Vertical
5	1601.84	-57.75	-59.37	-40.00	19.37	-1.62	Vertical
6	2582.79	-57.86	-52.10	-13.00	39.10	5.76	Vertical



LTE Band 14 QPSK 10MHz BW Middle Channel`

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	36.7968	-80.32	-57.97	-13.00	44.97	22.35	Horizontal
2	52.3323	-79.06	-59.81	-13.00	46.81	19.25	Horizontal
3	773.854	-93.54	-72.24	-35.00	-37.24	21.30	Horizontal
4	805.698	-57.73	-49.02	-35.00	14.02	8.71	Horizontal
5	1607.28	-58.42	-48.14	-40.00	8.14	10.28	Horizontal
6	5297.27	-59.42	-44.55	-13.00	31.55	14.87	Horizontal

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	36.7968	-80.08	-59.49	-13.00	46.49	20.59	Vertical
2	53.3033	-79.96	-60.73	-13.00	47.73	19.23	Vertical
3	773.854	-89.32	-68.80	-35.00	33.8	20.52	Vertical
4	805.698	-57.42	-50.98	-35.00	15.98	6.44	Vertical
5	1607.59	-59.13	-48.85	-40.00	8.85	10.28	Vertical
6	4994.87	-59.85	-45.60	-13.00	32.60	14.25	Vertical

LTE Band 66 QPSK 20MHz BW Middle Channel

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	501.891	-105.54	-72.90	-36.00	36.90	32.64	Horizontal
2	665.015	-104.69	-69.93	-36.00	33.93	34.76	Horizontal
3	854.354	-104.48	-67.37	-36.00	31.37	37.11	Horizontal
4	3219.48	-57.91	-48.55	-30.00	18.55	9.36	Horizontal
5	3882.81	-57.87	-48.24	-30.00	18.24	9.63	Horizontal
6	5770.38	-58.83	-42.84	-30.00	12.84	15.99	Horizontal

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	57.1872	-91.02	-71.31	-36.00	35.31	19.71	Vertical
2	601.901	-104.49	-71.54	-36.00	35.54	32.95	Vertical
3	795.125	-103.95	-67.86	-36.00	31.86	36.09	Vertical
4	2971.98	-57.67	-50.03	-30.00	20.03	7.64	Vertical
5	3765.75	-59.16	-48.81	-30.00	18.81	10.35	Vertical
6	4970.48	-59.74	-45.68	-30.00	15.68	14.06	Vertical



3. LIST OF MEASURING EQUIPMENT

Description	Manufacturer	Model	Serial No.	Cal. Date	Due Date	Remark
EMI Test Receiver	R&S	ESW26	A180502935	2020.08.13	2021.08.12	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	2022.01.06	Radiation
Broadband antenna (30MHz~1GHz)	R&S	VULB9160	A0805560	2019.05.24	2022.05.23	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	AT4510	A0804450	2020.06.19	2023.06.18	Radiation
Horn antenna (18GHz~26.5GHz)	AR	AT4003A	0329293	2020.09.17	2021.09.16	Radiation
Amplifier 30M~1GHz	MILMEGA	80RF1000-10004	A140101634	2020.09.22	2023.09.21	Radiation
Amplifier 1G~18GHz	MILMEGA	AS0104R-800/40 0	A160302517	2021.01.26	2022.01.25	Radiation
Spectrum Analyzer	KEYSIGHT	N9030A	A160702554	2021.04.26	2022.04.25	Conducted
Test Receiver	R&S	ESIB7	A0501375	2020.06.24	2021.06.23	Conducted
Temperature chamber	TABAI	PS-232	A8708054	2020.10.30	2021.10.29	Conducted
Wideband Radio Communication tester	R&S	CMW500	A130101034	2019.07.30	2021.07.29	Conducted
Power Supply	R&S	WYJ-60100	A141102031	2020.01.16	2023.01.15	Conducted
Test software	ECIT	Eagle	V2.0	N/A	N/A	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% ($U=2U_c(y)$)	2.8dB
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Uncertainty of Radiated Emission Measurement (30MHz~1GHz)

Measuring Uncertainty for a level of confidence of 95% ($U=2U_c(y)$)	3.91dB
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Uncertainty of Radiated Emission Measurement (1GHz~18GHz)

Measuring Uncertainty for a level of confidence of 95% ($U=2U_c(y)$)	4.5dB
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Uncertainty of Radiated Emission Measurement (18GHz~40GHz)

Measuring Uncertainty for a level of confidence of 95% ($U=2U_c(y)$)	4.9dB
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** END OF REPORT **