



FCC TEST REPORT

Application No: HR/2020/90016
Applicant: A Beep, LLC
Address of Applicant 710 W Jefferson St, Joliet Illinois 60435, USA
Manufacturer: Quanzhou Tesunho Electronics Co., Ltd
Address of Manufacturer: 2#, 5F E-19# Phase 2 Xunmei, Quanzhou, Fujian, China
EUT Description: Nationwide Radio
Model No.: DTP9751
Trade Mark:

FCC ID: 2APPUDTP9751
FCC ID (module): XMR201808EC25AF
Standards:
47 CFR Part 2
47 CFR Part 22 subpart H
47 CFR Part 24 subpart E
47 CFR Part 27 subpart C
47 CFR Part 90 subpart R
Test Method: FCC KDB 971168 D01 Power Meas License Digital Systems V03r01
C63.26 (2015)
Date of Receipt: 2020/10/20
Date of Test: 2020/10/20 to 2020/11/10
Date of Issue: 2021/8/13

Test Result:	PASS *
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* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Authorized Signature:

Derek Yang

Wireless Laboratory Manager



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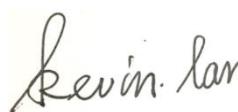
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1 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2020/11/10		Original
02		2021/5/29	Kevin.Lan	1. Add test site Information 2. Update equipment list
03		2021/8/13	Kevin.Lan	1. Add antenna height and angle for 'Field Strength of Spurious Radiation'

*This test report supersedes the original report (report No.: HR/2020/9001602, issue date: 2020/11/10), original report shall be invalid.

Authorized for issue by:	
Prepared By	 (Kevin.Lan) /Engineer
Checked By	 (Jim Huang) /Reviewer



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2 Test Summary

2.1 GSM850/UMTS Band 5 & LTE Band 5

Test Item	FCC Rule No.	Requirements	Test Result	Verdict	Test Lab*
Effective (Isotropic) Radiated Power Output Data	§2.1046, §22.913	FCC: ERP \leq 7 W	Section 1 of Appendix B	Pass	A
Field Strength of Spurious Radiation	§2.1053, §22.917	FCC: \leq -13 dBm/100 kHz.	Section 7 of Appendix B	Pass	B
Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".					

2.2 GSM 1900/UMTS Band 2 /LTE Band 2

Test Item	FCC Rule No.	Requirements	Test Result	Verdict	Test Lab*
Effective (Isotropic) Radiated Power Output Data	§2.1046, §24.232	EIRP \leq 2 W	Section 1 of Appendix B	Pass	A
Field Strength of Spurious Radiation	§2.1053, §24.238	\leq -13 dBm/1 MHz.	Section 7 of Appendix B	Pass	B
Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".					

2.3 UMTS Band 4 /LTE Band 4 /66

Test Item	FCC Rule No.	Requirements	Test Result	Verdict	Test Lab*
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(d)	EIRP \leq 1 W	Section 1 of Appendix B	Pass	A
Field Strength of Spurious Radiation	§2.1053, §27.53(h)	\leq -13 dBm/1 MHz.	Section 7 of Appendix B	Pass	B
Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".					

2.4 LTE Band 12

Test Item	FCC Rule No.	Requirements	Test Result	Verdict	Test Lab*
Effective (Isotropic) Radiated Power Output Data	§27.50(c)	FCC: ERP \leq 3 W.	Section 1 of Appendix B	Pass	A
Field Strength of Spurious Radiation	§2.1053, §27.53(g)	FCC: \leq -13 dBm/100 kHz.	Section 7 of Appendix B	Pass	B
Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".					

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2.5 LTE Band 13

Test Item	FCC Rule No.	Requirements	Test Result	Verdict	Test Lab*
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(b)	FCC: ERP ≤ 3 W.	Section 1 of Appendix B	Pass	A
Field Strength of Spurious Radiation	§2.1053, §27.53(c) §27.53(f)	FCC: ≤ -13 dBm/100 kHz. For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.	Section 7 of Appendix B	Pass	B

Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".

2.6 LTE Band 14

Test Item	FCC Rule No	Requirements	Test Result	Verdict	Test Lab*
Effective (Isotropic) Radiated Power Output Data	§90.365	FCC: ERP ≤ 3 W.	Section 1 of Appendix B	Pass	A
Field Strength of Spurious Radiation	§2.1053, §90.543(c) §90.543(f)	FCC: ≤ -13 dBm/100 kHz. For operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559-1610 MHz shall be limited to -70 dBW/ MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.	Section 8 of Appendix B	Pass	A

Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".

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2.7 LTE Band 71

Test Item	FCC Rule No.	Requirements	Test Result	Verdict	Test Lab*
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(c)	EIRP ≤ 3 W	Section 1 of Appendix B	Pass	A
Field Strength of Spurious Radiation	§2.1053, §27.53(g)	≤ -13 dBm/1 MHz.	Section 7 of Appendix B	Pass	B
Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".					

Remark:

All test were performed by Lab A and B.

Parts of test items above were subcontracted to Lab B.

Lab A SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Lab B SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD.

This test report (Report No.: HR/2020/9001602-01) is base on the original test report (Report No.: R1806A0301-R1V1/ R1806A0301-R2V1/ R1806A0301-R3V1/ R1806A0301-R4V1).

Review this report and original report, this report just changing the parts according to the declaration letter from client.

Considering to the difference, pre-scan were performed on the sample in this report to find the items which can be influential to the result in the original test report for fully retest.

Therefore in this report only Radiated Power Output and radiated spurious emissions were retested and other test data in this report are base on the previous report with report number R1806A0301-R1V1/ R1806A0301-R2V1/ R1806A0301-R3V1/ R1806A0301-R4V1.

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3 General Information

3.1 Client Information

Applicant:	A Beep, LLC
Address of Applicant:	710 W Jefferson St, Joliet Illinois 60435, USA
Manufacturer:	Quanzhou Tesunho Electronics Co., Ltd
Address of Manufacturer:	2#, 5F E-19# Phase 2 Xunmei, Quanzhou, Fujian, China

3.2 Test Location

Lab A:

Company:	SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch
Address:	No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China
Post code:	518057
Test engineer:	Dee Zheng, Mike Hu

Lab B:

Company:	SGS-CSTC STANDARDS TECHNICAL SERVICES (XI'AN) CO., LTD.
Address:	1/F, Unit D, Building 1, Kanghong Orange Technology Park, No.137, Keyuan 3rd Road, Fengdong New City, Xi'an, Shaanxi China
Post code:	710086
Test engineer:	Ben Huang, Leah Chen

3.3 Test Facility

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

Lab A:

• A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• VCCI

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• FCC –Designation Number: CN1178

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Designation Number: CN1178. Test Firm Registration Number: 406779.

• **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

Lab B:

• **A2LA (Certificate No. 4854.01)**

SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4854.01.

• **FCC –Designation Number: CN1271.**



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3.4 General Description of EUT

EUT Description::	Nationwide Radio
Model No.:	DTP9751
Trade Mark:	
Hardware Version:	A02L6000g0
Software Version:	SZE05
Sample Type:	<input checked="" type="checkbox"/> Portable Device, <input type="checkbox"/> Module
Antenna Type:	<input checked="" type="checkbox"/> External, <input type="checkbox"/> Integrated
Antenna Gain:	WCDMA Band II:2dBi WCDMA Band IV:2dBi WCDMA Band V:2dBi LTE Band 2: 2dBi LTE Band 4: 2dBi LTE Band 5:2dBi; LTE Band 12: 2dBi LTE Band 13: 2dBi LTE Band 14: 2dBi LTE Band 66: 2dBi LTE Band 71: 2dBi

3.5 Test Mode

Test Mode	Test Modes Description
UMTS/TM1	UMTS system, WCDMA, QPSK modulation
LTE/TM1	LTE system, QPSK modulation
LTE/TM2	LTE system, 16QAM modulation

Remark: The test mode(s) are selected according to relevant radio technology specifications.

3.6 Test Environment

Environment Parameter	Selected Values During Tests	
Relative Humidity	52%	
Atmospheric Pressure:	101.32 KPa	
Temperature	NT	25 °C
Voltage:	LV	3.3V
	NV	3.8V
	HV	4.2V

Remark: LV= lower extreme test voltage; NV= nominal voltage

HV= upper extreme test voltage; NT= normal temperature

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3.7 Technical Specification

Characteristics	Description		
Radio System Type	<input checked="" type="checkbox"/> UMTS		
	<input checked="" type="checkbox"/> LTE		
Supported Frequency Range	Band	TX	RX
	UMTS Band II	1850 to 1910 MHz	1930 to 1990 MHz
	UMTS Band IV	1710 to 1755 MHz	2110 to 2155 MHz
	UMTS Band V	824 to 849 MHz	869 to 894 MHz
	LTE Band 2	1850 to 1910 MHz	1930 to 1990 MHz
	LTE Band 4	1710 to 1755 MHz	2110 to 2155 MHz
	LTE Band 5	824 to 849 MHz	869 to 894 MHz
	LTE Band 12	699 to 716 MHz	729 to 746 MHz
	LTE Band 13	777 to 787 MHz	746 to 756 MHz
	LTE Band 14	788 to 798 MHz	758 to 768 MHz
	LTE Band 66	1710 to 1780 MHz	2110 to 2200 MHz
	LTE Band 71	663 to 698 MHz	617 to 652 MHz
Target TX Output Power	UMTS Band II: 25dBm UMTS Band IV: 25dBm UMTS Band V: 25dBm LTE Band 2: 25dBm LTE Band 4: 25dBm LTE Band 5: 25dBm LTE Band 12: 25dBm LTE Band 13: 25dBm LTE Band 14: 25dBm LTE Band 66: 25dBm LTE Band 71: 25dBm		
Supported Channel Bandwidth	UMTS system:	<input checked="" type="checkbox"/> 5 MHz	
	LTE Band 2	<input checked="" type="checkbox"/> 1.4 MHz; <input checked="" type="checkbox"/> 3 MHz; <input checked="" type="checkbox"/> 5 MHz; <input checked="" type="checkbox"/> 10 MHz; <input checked="" type="checkbox"/> 15 MHz, <input checked="" type="checkbox"/> 20 MHz	
	LTE Band 4	<input checked="" type="checkbox"/> 1.4 MHz; <input checked="" type="checkbox"/> 3 MHz; <input checked="" type="checkbox"/> 5 MHz; <input checked="" type="checkbox"/> 10 MHz; <input checked="" type="checkbox"/> 15 MHz, <input checked="" type="checkbox"/> 20 MHz	
	LTE Band 5	<input checked="" type="checkbox"/> 1.4 MHz; <input checked="" type="checkbox"/> 3 MHz; <input checked="" type="checkbox"/> 5 MHz; <input checked="" type="checkbox"/> 10 MHz	
	LTE Band 12	<input checked="" type="checkbox"/> 1.4 MHz; <input checked="" type="checkbox"/> 3 MHz; <input checked="" type="checkbox"/> 5 MHz; <input checked="" type="checkbox"/> 10 MHz	
	LTE Band 13	<input checked="" type="checkbox"/> 5 MHz; <input checked="" type="checkbox"/> 10 MHz	
	LTE Band 14	<input checked="" type="checkbox"/> 5 MHz; <input checked="" type="checkbox"/> 10 MHz	
	LTE Band 66	<input checked="" type="checkbox"/> 1.4 MHz; <input checked="" type="checkbox"/> 3 MHz; <input checked="" type="checkbox"/> 5 MHz; <input checked="" type="checkbox"/> 10 MHz; <input checked="" type="checkbox"/> 15 MHz, <input checked="" type="checkbox"/> 20 MHz	
	LTE Band 71	<input checked="" type="checkbox"/> 5 MHz; <input checked="" type="checkbox"/> 10 MHz; <input checked="" type="checkbox"/> 15 MHz, <input checked="" type="checkbox"/> 20 MHz	

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3.8 Test Frequencies

Test Mode	TX / RX	RF Channel		
		Low (L)	Middle (M)	High (H)
WCDMA Band II	TX	Channel 9262	Channel 9400	Channel 9538
		1852.4 MHz	1880.0 MHz	1907.6 MHz
	RX	Channel 9662	Channel 9800	Channel 9938
		1932.4 MHz	1960.0 MHz	1987.6 MHz

Test Mode	TX / RX	RF Channel		
		Low (L)	Middle (M)	High (H)
WCDMA Band IV	TX	Channel 1312	Channel 1413	Channel 1513
		1712.4MHz	1732.6 MHz	1752.6 MHz
	RX	Channel 1537	Channel 1638	Channel 1738
		2112.4 MHz	2132.6 MHz	2152.6 MHz

Test Mode	TX / RX	RF Channel		
		Low (L)	Middle (M)	High (H)
WCDMA Band V	TX	Channel 4132	Channel 4182	Channel 4233
		826.4MHz	836.4 MHz	846.6 MHz
	RX	Channel 4357	Channel 4407	Channel 4458
		871.4 MHz	881.4 MHz	891.6 MHz

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Test Mode	Bandwidth	TX / RX	RF Channel		
			Low (L)	Middle (M)	High (H)
LTE Band 2	1.4MHz	TX	Channel 18607	Channel 18900	Channel 19193
			1850.7 MHz	1880 MHz	1909.3 MHz
	3MHz	RX	Channel 607	Channel 900	Channel 1193
			1930.7 MHz	1960 MHz	1989.3 MHz
	5MHz	TX	Channel 18615	Channel 18900	Channel 19185
			1851.5 MHz	1880 MHz	1908.5 MHz
	10MHz	RX	Channel 615	Channel 900	Channel 1185
			1931.5 MHz	1960 MHz	1988.5 MHz
	15MHz	TX	Channel 18625	Channel 18900	Channel 19175
			1852.5 MHz	1880 MHz	1907.5 MHz
	20MHz	RX	Channel 625	Channel 900	Channel 1175
			1932.5 MHz	1960 MHz	1987.5 MHz
	TX	TX	Channel 18650	Channel 18900	Channel 19150
			1855 MHz	1880 MHz	1905 MHz
	RX	RX	Channel 650	Channel 900	Channel 1150
			1935 MHz	1960 MHz	1985 MHz
	TX	TX	Channel 18675	Channel 18900	Channel 19125
			1857.5 MHz	1880 MHz	1902.5 MHz
	RX	RX	Channel 675	Channel 900	Channel 1125
			1937.5 MHz	1960 MHz	1982.5 MHz
	TX	TX	Channel 18700	Channel 18900	Channel 19100
			1860 MHz	1880 MHz	1900 MHz
	RX	RX	Channel 700	Channel 900	Channel 1100
			1940 MHz	1960 MHz	1980 MHz

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Test Mode	Bandwidth	TX / RX	RF Channel		
			Low (L)	Middle (M)	High (H)
LTE Band 4	1.4MHz	TX	Channel 19957	Channel 20175	Channel 20393
			1710.7 MHz	1732.5 MHz	1754.3 MHz
	3MHz	RX	Channel 1975	Channel 2175	Channel 2375
			2112.5 MHz	2132.5MHz	2152.5 MHz
	5MHz	TX	Channel 19965	Channel 20175	Channel 20385
			1711.5 MHz	1732.5 MHz	1753.5 MHz
	10MHz	RX	Channel 2000	Channel 2175	Channel 2350
			2115 MHz	2132.5MHz	2150 MHz
LTE Band 4	15MHz	TX	Channel 19975	Channel 20175	Channel 20375
			1712.5 MHz	1732.5 MHz	1752.5 MHz
	20MHz	RX	Channel 1975	Channel 2175	Channel 2375
			2112.5 MHz	2132.5MHz	2152.5 MHz
	10MHz	TX	Channel 20000	Channel 20175	Channel 20350
			1715 MHz	1732.5 MHz	1750 MHz
	15MHz	RX	Channel 2000	Channel 2175	Channel 2350
			2115 MHz	2132.5MHz	2150 MHz
LTE Band 5	1.4MHz	TX	Channel 20025	Channel 20175	Channel 20325
			1717.5 MHz	1732.5 MHz	1747.5 MHz
	3MHz	RX	Channel 2025	Channel 2175	Channel 2325
			2117.5 MHz	2132.5MHz	2147.5 MHz
	5MHz	TX	Channel 20050	Channel 20175	Channel 20300
			1720 MHz	1732.5 MHz	1745 MHz
	10MHz	RX	Channel 2050	Channel 2175	Channel 2300
			2120 MHz	2132.5MHz	2145 MHz

Test Mode	Bandwidth	TX / RX	RF Channel		
			Low (L)	Middle (M)	High (H)
LTE Band 5	1.4MHz	TX	Channel 20407	Channel 20525	Channel 20643
			824.7 MHz	836.5 MHz	848.3 MHz
	3MHz	RX	Channel 2407	Channel 2525	Channel 2643
			869.7 MHz	881.5 MHz	893.3 MHz
	5MHz	TX	Channel 20415	Channel 20525	Channel 20635
			825.5 MHz	836.5 MHz	847.5 MHz
	10MHz	RX	Channel 2415	Channel 2525	Channel 2635
			870.5 MHz	881.5 MHz	892.5 MHz
LTE Band 5	1.4MHz	TX	Channel 20425	Channel 20525	Channel 20625
			826.5 MHz	836.5 MHz	846.5 MHz
	3MHz	RX	Channel 2425	Channel 2525	Channel 2625
			871.5 MHz	881.5 MHz	891.5 MHz
	5MHz	TX	Channel 20450	Channel 20525	Channel 20600
			829 MHz	836.5 MHz	844 MHz
	10MHz	RX	Channel 2450	Channel 2525	Channel 2600
			874 MHz	881.5 MHz	889 MHz

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Test Mode	Bandwidth	TX / RX	RF Channel		
			Low (L)	Middle (M)	High (H)
LTE Band12	1.4MHz	TX	Channel 23017	Channel 23095	Channel 23173
			699.7 MHz	707.5 MHz	715.3 MHz
	3MHz	RX	Channel 5017	Channel 5095	Channel 5173
			729.7 MHz	737.5 MHz	745.3 MHz
	5MHz	TX	Channel 23025	Channel 23095	Channel 23165
			700.5 MHz	707.5 MHz	714.5 MHz
	10MHz	RX	Channel 5025	Channel 5095	Channel 5165
			730.5 MHz	737.5 MHz	744.5 MHz
LTE Band 13	5MHz	TX	Channel 23035	Channel 23095	Channel 23155
			701.5 MHz	707.5 MHz	713.5 MHz
	10MHz	RX	Channel 5035	Channel 5095	Channel 5155
			731.5 MHz	737.5 MHz	743.5 MHz
	TX	TX	Channel 23060	Channel 23095	Channel 23130
			704 MHz	707.5 MHz	711 MHz
	RX	RX	Channel 5060	Channel 5095	Channel 5130
			734 MHz	737.5 MHz	741 MHz

Test Mode	Bandwidth	TX / RX	RF Channel		
			Low (L)	Middle (M)	High (H)
LTE Band 13	5MHz	TX	Channel 23025	Channel 23230	Channel 23255
			779.5 MHz	782 MHz	784.5 MHz
	10MHz	RX	Channel 5205	Channel 5230	Channel 5255
			748.5 MHz	751 MHz	753.5 MHz
LTE Band 14	10MHz	TX	Channel 23230	Channel 23230	Channel 23230
			782 MHz	782 MHz	782 MHz
	RX	RX	Channel 5230	Channel 5230	Channel 5230
			751 MHz	751 MHz	751 MHz

Test Mode	Bandwidth	TX / RX	RF Channel		
			Low (L)	Middle (M)	High (H)
LTE Band 14	5MHz	TX	Channel 23305	Channel 23330	Channel 23355
			790.5 MHz	793 MHz	795.5 MHz
	10MHz	RX	Channel 5305	Channel 5330	Channel 5355
			760.5 MHz	763 MHz	765.5 MHz
LTE Band 14	10MHz	TX	Channel 23330	Channel 23330	Channel 23330
			793MHz	793 MHz	793 MHz
	RX	RX	Channel 5330	Channel 5330	Channel 5330
			763MHz	763 MHz	763 MHz

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Test Mode	Bandwidth	TX / RX	RF Channel		
			Low (L)	Middle (M)	High (H)
LTE Band 66	1.4MHz	TX	Channel 131979	Channel 132322	Channel 132665
			1710.7 MHz	1745 MHz	1779.3 MHz
	3MHz	RX	Channel 66443	Channel 66786	Channel 67329
			2110.7 MHz	2145MHz	2199.3 MHz
	5MHz	TX	Channel 131987	Channel 132322	Channel 132657
			1711.5 MHz	1745 MHz	1778.5MHz
	10MHz	RX	Channel 66451	Channel 66786	Channel 67121
			2111.5 MHz	2145MHz	2198.5MHz
	15MHz	TX	Channel 131997	Channel 132322	Channel 132647
			1712.5 MHz	1745 MHz	1777.5 MHz
	20MHz	RX	Channel 66461	Channel 66786	Channel 67311
			2112.5 MHz	2145MHz	2197.5 MHz
	TX	TX	Channel 132022	Channel 132322	Channel 132622
			1715 MHz	1745 MHz	1775 MHz
	RX	RX	Channel 66486	Channel 66786	Channel 67286
			2115 MHz	2145MHz	2195 MHz
	TX	TX	Channel 132047	Channel 132322	Channel 132597
			1717.5 MHz	1745 MHz	1772.5 MHz
	RX	RX	Channel 66511	Channel 66786	Channel 67261
			2117.5 MHz	2145MHz	2192.5 MHz
	TX	TX	Channel 132072	Channel 132322	Channel 132572
			1720 MHz	1745 MHz	1770 MHz
	RX	RX	Channel 66536	Channel 66786	Channel 67236
			2120 MHz	2145MHz	2190 MHz

Test Mode		TX / RX	RF Channel		
			Low (L)	Middle (M)	High (H)
LTE Band 71	5MHz	TX	Channel 133147	Channel 133297	Channel 133447
			665.5 MHz	680.5 MHz	695.5 MHz
	10MHz	RX	Channel 68611	Channel 68761	Channel 68911
			619.5 MHz	634.5 MHz	649.5 MHz
	15MHz	TX	Channel 133172	Channel 133297	Channel 133422
			668 MHz	680.5 MHz	693 MHz
	20MHz	RX	Channel 68636	Channel 68761	Channel 68886
			622 MHz	634.5 MHz	647 MHz
	TX	TX	Channel 133197	Channel 133297	Channel 133397
			670.5 MHz	680.5 MHz	690.5 MHz
	RX	RX	Channel 68661	Channel 68761	Channel 68861
			624.5 MHz	634.5 MHz	644.5 MHz
	TX	TX	Channel 133222	Channel 133297	Channel 133372
			673 MHz	680.5 MHz	688 MHz
	RX	RX	Channel 68686	Channel 68761	Channel 68836
			627 MHz	634.5 MHz	642 MHz

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4 Description of Tests

4.1 Conducted Output Power

Measurement Procedure: FCC KDB 971168 D01 V03r01

The transmitter output was connected to a calibrated coaxial cable, attenuator and power meter, the other end of which was connected to a Base Station Simulator. The Base Station Simulator was set to force the EUT to its maximum power setting. The power output at the transmitter antenna port was determined by adding the value of the cable insertion loss to the power reading. The tests were performed at three frequencies (low channel, middle channel and high channel) and on the highest power levels, which can be setup on the transmitters.

Remark: Reference test setup 1

4.2 Effective (Isotropic) Radiated Power of Transmitter

Measurement Procedure: FCC KDB 971168 D01 V03r01 ; C63.26 (2015)

Calculate power in dBm by the following formula:

ERP (dBm) = Conducted Power (dBm) + antenna gain (dBd)

EIRP(dBm) = Conducted Power (dBm) + antenna gain (dBi)

EIRP=ERP+2.15dB

4.3 Field Strength of Spurious Radiation

Measurement Procedure: FCC KDB 971168 D01 V03r01

Below 1GHz test procedure as below:

- 1). The EUT was powered ON and placed on a 80cm high table in the chamber. The antenna of the transmitter was extended to its maximum length.
- 2). The disturbance of the transmitter was maximized on the test receiver display by raising and lowering from 1m to 4m (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) the receive antenna and by rotating through 360° the turntable. After the fundamental emission was maximized, a field strength measurement was made.
- 3). Steps 1) and 2) were performed with the EUT and the receive antenna in both vertical and horizontal polarization.
- 4). The transmitter was then removed and replaced with another antenna. The center of the antenna was approximately at the same location as the center of the transmitter.
- 5). A signal at the disturbance was fed to the substitution antenna by means of a non-radiating cable. With both the substitution and the receive antennas horizontally polarized, the receive antenna was raised and lowered to obtain a maximum reading at the test receiver. The level of the signal generator was adjusted until the measured field strength level in step 2) is obtained for this set of conditions.
- 6). The output power into the substitution antenna was then measured.
- 7). Steps 5) and 6) were repeated with both antennas polarized.
- 8) Calculate power in dBm by the following formula:

ERP(dBm) = Pg(dBm) – cable loss (dB) + antenna gain (dBd)

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Where:

P_d is the dipole equivalent power, P_g is the generator output into the substitution antenna, and the antenna gain is the gain of the substitute antenna used relative to either a half-wave dipole (dB_d) or an isotropic source (dB_i). The substitute level is equal to P_g [dBm] – cable loss [dB]. The calculated P_d levels are then compared to the absolute spurious emission limit of -13dBm which is equivalent to the required minimum attenuation of $43 + 10\log_{10}(\text{Power [Watts]})$.

Above 1GHz test procedure as below:

- 1) Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber
- 2) Calculate power in dBm by the following formula:

$$\text{EIRP(dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dB)}$$

$$\text{EIRP} = \text{ERP} + 2.15 \text{dB}$$

Where:

P_g is the generator output power into the substitution antenna.

3. Test the EUT in the lowest channel, the middle channel the Highest channel
4. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, Only the test worst case mode is recorded in the report.
5. Repeat above procedures until all frequencies measured was complete

Remark: Reference test setup 3

4.3.1 Test Setup 2

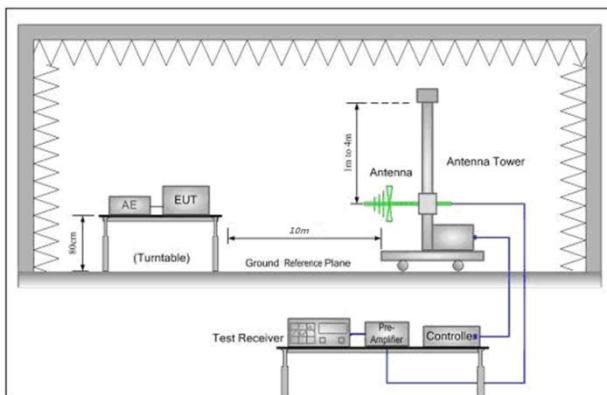


Figure 1. 30MHz to 1GHz

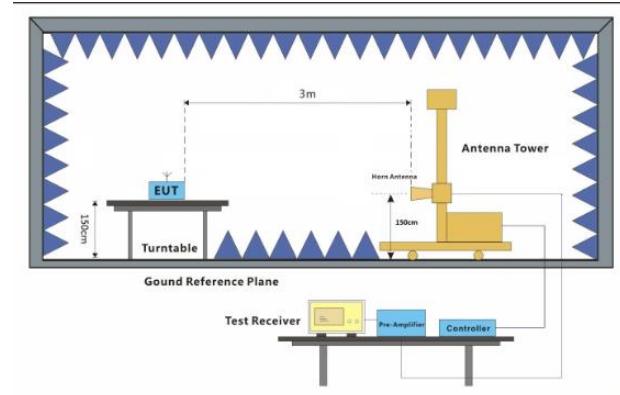


Figure 2. above 1GHz

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4.3.2 Test Setup 3

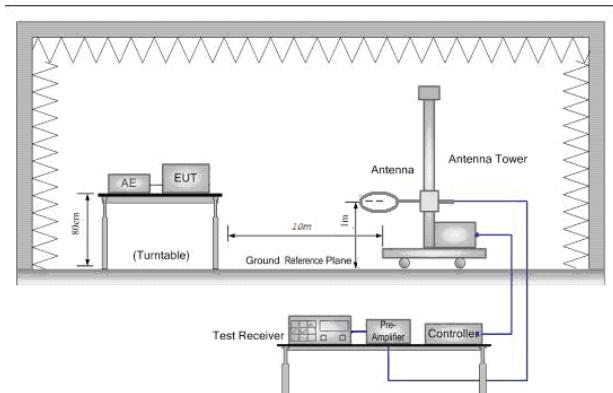


Figure 1. Below 30MHz

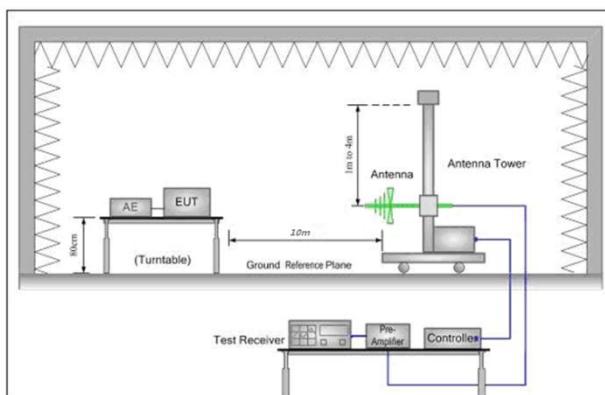


Figure 2. 30MHz to 1GHz

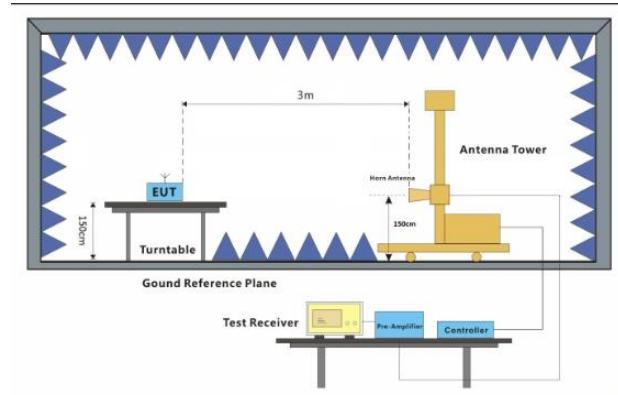


Figure 3. above 1GHz

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4.4 Test Conditions

Test Case		Test Conditions		
Transmit Output Power Data	Average Power, Total	Test Environment	Ambient Climate & Rated Voltage	
		Test Setup	Test Setup 1	
		RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)	
		Test Mode	UMTS/TM1; LTE/TM1;LTE/TM2	
	Average Power, Spectral Density (if required)	Test Environment	Ambient Climate & Rated Voltage	
		Test Setup	Test Setup 1	
		RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)	
		Test Mode	UMTS/TM1; LTE/TM1;LTE/TM2	
Field Strength of Spurious Radiation		Test Environment	Ambient Climate & Rated Voltage	
		Test Setup	Test Setup 2	
		Test Mode	UMTS/TM1;LTE/TM1;LTE/TM2; Remark: If applicable, the EUT conf. that has maximum power density (based on the equivalent power level) is selected.	
		RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)	

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5 Main Test Instruments

RF conducted test					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date	Cal.Due date
				(yyyy-mm-dd)	(yyyy-mm-dd)
Signal Analyzer	Rohde & Schwarz	FSV	W005-02	2020/4/16	2021/4/15
Coaxial Cable	SGS	N/A	SEM031-01	2020/6/12	2021/6/11
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2020/9/23	2021/9/22
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	HTC-1	W006-17	2020/4/21	2021/4/20
Temperature Chamber	GIANT FORCE	ICT-150-40-CP-AR	W027-03	2019/11/21	2020/11/20
Wideband Radio Communication Teste	Anristu	MT8821C	W061-05	2020/4/16	2021/4/15
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	W005-02	2020/4/16	2021/4/15



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RSE Test System					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Semi-Anechoic Chamber	Brilliant-emc	N/A	XAW03-35-01	2019-09-11	2022-09-10
MXA signal analyzer	Keysight	N9020A	XAW01-06-01	2020-04-02	2021-04-01
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2020-09-11	2021-09-10
Receiving antenna (30MHz-3GHz)	Schwarzbeck	VULB 9163	XAW01-09-01	2019-10-13	2021-10-12
Receiving antenna (1GHz~18GHz)	Schwarzbeck	BBHA 9120D	XAW01-09-02	2019-10-13	2021-10-12
Receiving antenna (15GHz~40GHz)	Schwarzbeck	BBHA 9170	XAW01-09-03	2019-10-13	2021-10-12
Directional antenna rack controller	Max-Full	MF-7802BS	XAW03-03-01	NCR	NCR
High-speed antenna rack controller	Max-Full	MF-7802	XAW03-04-01	NCR	NCR
Filter bank	Tonscend	JS0806-F	XAW03-05-01	NCR	NCR
Filter bank	Tonscend	JS0806s	XAW03-05-02	NCR	NCR
Amplifier	Tonscend	TAP00903040	XAW01-41-01	2019-11-18	2020-11-17
Amplifier	Tonscend	TAP01018048	XAW01-41-02	2019-11-18	2020-11-17
Amplifier	Tonscend	TAP18040048	XAW01-41-03	2019-12-03	2020-12-02
Amplifier	Shanghai Steed	YX28980930	XAW01-41-06	2019-11-18	2020-11-17
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2019-12-06	2020-12-05
Measurement Software	Tonscend	TS+ RSE V3.0.0.2	XAW02-05-01	NCR	NCR
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	2020-04-02	2021-04-01

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6 Measurement Uncertainty

For a 95% confidence level ($k = 2$), the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 as following:

Lab A:

Test Item	Extended Uncertainty	Data
Transmit Output Power Data	Power [dBm]	$U = \pm 0.37 \text{ dB}$
Bandwidth	Magnitude [%]	$U = \pm 0.2\%$
Band Edge Compliance	Disturbance Power [dBm]	$U = \pm 2.0 \text{ dB}$
Spurious Emissions, Conducted	Disturbance Power [dBm]	$U = \pm 2.0 \text{ dB}$
Frequency Stability	Frequency Accuracy [ppm]	$U = \pm 0.24 \text{ ppm}$

Lab B:

No.	Item	Measurement Uncertainty
1	Radiated Emission	$\pm 4.8 \text{ dB}$ (Below 1GHz)
		$\pm 4.8 \text{ dB}$ (1GHz to 6GHz)
		$\pm 4.5 \text{ dB}$ (6GHz to 18GHz)
		$\pm 5.02 \text{ dB}$ (Above 18GHz)

7 Appendixes

Appendix A	Photographs of Set-Up for HR202090016
Appendix B.1	WCDMA Band II & IV & V
Appendix B.2	LTE Band 2
Appendix B.3	LTE Band 4
Appendix B.4	LTE Band 5
Appendix B.5	LTE Band 12
Appendix B.6	LTE Band 13
Appendix B.7	LTE Band 14
Appendix B.8	LTE Band 66
Appendix B.9	LTE Band 71

The End

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