

Report No.: XEWM2309000447RG01

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TEST REPORT

Application No.: XEWM2309000447RG

Applicant: Lenovo (Shanghai) Electronics Technology Co., Ltd.

Address of Applicant: Section 304-305, Building No. 4, # 222, Meiyue Road, China (Shanghai) Pilot

Free Trade Zone

Manufacturer: Lenovo PC HK Limited

Address of Manufacturer: 23/F, Lincoln House, Taikoo Place 979 King's Road, Quarry Bay, Hong Kong,

China

EUT Description: Portable Tablet Computer

Model No.: TB330XU

Trade Mark: Lenovo

FCC ID: O57TB330XU

47 CFR Part 2 47 CFR Part 22

Standards: 47 CFR Part 24

47 CFR Part 27 47 CFR Part 90

Date of Receipt: 2023/09/02

Date of Test: 2023/09/05 to 2023/09/28

Date of Issue: 2023/09/28

Test Result : PASS *

Authorized Signature:

Peter Tan Regulatory Technical Manager



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^{*} In the configuration tested, the EUT detailed in this report complied with the standards specified above.



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1 Version

Revision Record				
Version Chapter Date Modifier Remark				
01		2023/09/28		Original

Prepared By	(Leah Chen) / Test Engineer
Checked By	Andy Yao) /Reviewer



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2 Test Summary

2.1 GSM850/UMTS Band 5/LTE Band 5/26(824~849 MHz)

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046, §22.913(a)(5)	ERP ≤ 7 W	Section 1 of Appendix B.1&B.2&B.5B.13	Pass
Peak-Average Ratio	§22.913(d)	Limit≤13 dB	Section 2 of Appendix B.1&B.2&B.5B.13	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 3 of Appendix B.1&B.2&B.5B.13	Pass
Band Edges Compliance	§2.1051, §22.917(a)	≤ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.	Section 4 of Appendix B.1&B.2&B.5B.13	Pass
Spurious Emission at Antenna Terminals	§2.1051, §22.917(a)	FCC: ≤ -13 dBm/100 kHz, from 9 kHz to 10th harmonics but outside authorized operating frequency ranges.	Section 5 of Appendix B.1&B.2&B.5B.13	Pass
Field Strength of Spurious Radiation	§2.1053, §22.917(a)	FCC: ≤ -13 dBm/100 kHz.	Section 6 of Appendix B.1&B.2&B.5B.13	Pass
Frequency Stability	§2.1055(a)(1)(b) §2.1055(d)(2) §22.355	±2.5ppm.	Section 7 of Appendix B.1&B.2&B.5B.13	Pass



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2.2 GSM 1900/UMTS Band 2 /LTE Band 2 /25

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046, §24.232(c)	EIRP ≤ 2 W	Section 1 of Appendix B.1&B.2&B.3&B.11	Pass
Peak- Average Ratio	§24.232(d)	Limit≤13 dB	Section 2 of Appendix B.1&B.2&B.3&B.11	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 3 of Appendix B.1&B.2&B.3&B.11	Pass
Band Edges Compliance	§2.1051, §24.238(a)	≤ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.	Section 4 of Appendix B.1&B.2&B.3&B.11	Pass
Spurious Emission at Antenna Terminals	§2.1051, §24.238(a)	≤ -13 dBm/1 MHz, from 9 kHz to 10 th harmonics but outside authorized operating frequency ranges.	Section 5 of Appendix B.1&B.2&B.3&B.11	Pass
Field Strength of Spurious Radiation	§2.1053, §24.238(a)	≤ -13 dBm/1 MHz.	Section 6 of Appendix B.1&B.2&B.3&B.11	Pass
Frequency Stability	§2.1055(a)(1)(b) §2.1055(d)(2) §24.235	Within authorized bands of operation/frequency block.	Section 7 of Appendix B.1&B.2&B.3&B.11	Pass



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2.3 UMTS Band 4 /LTE Band 4 /66

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(d)(4)	EIRP ≤ 1 W	Section 1 of Appendix B.2&B.4&B.17	Pass
Peak-Average Ratio	§27.50(d)(5)	Limit≤13 dB	Section 2 of Appendix B.2&B.4&B.17	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 3 of Appendix B.2&B.4&B.17	Pass
Band Edges Compliance	§2.1051, §27.53(h)	≤ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.	Section 4 of Appendix B.2&B.4&B.17	Pass
Spurious Emission at Antenna Terminals	§2.1051, §27.53(h)	≤ -13 dBm/1 MHz, from 9 kHz to 10 th harmonics but outside authorized operating frequency ranges.	Section 5 of Appendix B.2&B.4&B.17	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(h)	≤ -13 dBm/1 MHz.	Section 6 of Appendix B.2&B.4&B.17	Pass
Frequency Stability	§2.1055(a)(1)(b) §2.1055(d)(2) §27.54	Within authorized bands of operation/frequency block.	Section 7 of Appendix B.2&B.4&B.17	Pass



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2.4 LTE Band 7/38/41

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(h)(2)	EIRP ≤ 2W	Section 1 of Appendix B.6&B.15&.B.16	Pass
Peak- Average Ratio		≤13 dB	Section 2 of Appendix B.6&B.15&.B.16	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 3 of Appendix B.6&B.15&.B.16	Pass
Band Edges Compliance	§2.1051, §27.53(m4)	For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as de ned in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz.	Section 4 of Appendix B.6&B.15&.B.16	Pass
Spurious Emission at Antenna Terminals	§2.1051, §27.53(m)	Channel Edge -25dBm/ 1 MHz 1 MHz 9 kHz 95 MHz × MHz 10th harmonics X=Max {6MHz, EBW}	Section 5 of Appendix B.6&B.15&.B.16	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(m)	Channel Edge -25dBm/ 1 MHz 1 MHz 1 MHz 9 kHz 95 MHz XMHz 10th harmonics X=Max {6MHz, EBW}	Section 6 of Appendix B.6&B.15&.B.16	Pass
Frequency Stability	§2.1055(a)(1)(b) §2.1055(d)(2) §27.54	Within authorized bands of operation/frequency block.	Section 7 of Appendix B.6&B.15&.B.16	Pass



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2.5 LTE Band 12/17

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046 §27.50(c)(10)	ERP ≤ 3 W.	Section 1 of Appendix B.7&B.10	Pass
Peak-Average Ratio		Limit≤13 dB	Section 2 of Appendix B.7&B.10	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 3 of Appendix B.7&B.10	Pass
Band Edges Compliance	§2.1051, §27.53(g)	≤ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.	Section 4 of Appendix B.7&B.10	Pass
Spurious Emission at Antenna Terminals	§2.1051, §27.53(g)	FCC: ≤ -13 dBm/100 kHz, from 9 kHz to 10 th harmonics but outside authorized operating frequency ranges.	Section 5 of Appendix B.7&B.10	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(g)	FCC: ≤ -13 dBm/100 kHz.	Section 6 of Appendix B.7&B.10	Pass
Frequency Stability	§2.1055(a)(1)(b) §2.1055(d)(2) §27.54	Within authorized bands of operation/frequency block.	Section 7 of Appendix B.7&B.10	Pass



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2.6 LTE Band 13

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(b)(10)	ERP ≤ 3 W.	Section 1 of Appendix B.8	Pass
Peak-Average Ratio		Limit≤13 dB	Section 2 of Appendix B.8	Pass
Bandwidth	§2.1049,	OBW: No limit. EBW: No limit.	Section 3 of Appendix B.8	Pass
Band Edges Compliance	§2.1051, §27.53(c)	≤ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.	Section 4 of Appendix B.8	Pass
Spurious Emission at Antenna Terminals	§2.1051, §27.53(c) §27.53(f)	≤ -13 dBm/100 kHz, from 9 kHz to 10 th harmonics but outside authorized operating frequency ranges. On all frequencies between 763–775 MHz and 793–805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations. 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 5 of Appendix B.8	Pass
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 6 of Appendix B.8	Pass
Frequency Stability	§2.1055(a)(1)(b) §2.1055(d)(2) §27.54	Within authorized bands of operation/frequency block.	Section 7 of Appendix B.8	Pass



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2.7 LTE Band 14

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046 §90.542(a)	ERP ≤ 3 W.	Section 1 of Appendix B.9	Pass
Peak-Average Ratio		Limit≤13 dB	Section 2 of Appendix B.9	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 3 of Appendix B.9	Pass
Emission Mask	§2.1051 §90.210(b)	Transmitters designed for operation under this part on frequencies other than listed in this section must meet the emission mask requirements of Emission Mask B. Equipment operating under this part on frequencies allocated to but shared with the Federal Government, must meet the applicable Federal Government technical standards (b) Emission Mask B. For transmitters that are equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as follows: (1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB.(2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB(3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 + 10 log (P) dB.	Section 4 of Appendix B.9	Pass
Band Edges Compliance	§2.1051 §90.543(e)(2)(3)	(1) On all frequencies between 769- 775 MHz and 799-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations.(2) On all	Section 5 of Appendix B.9	Pass



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		frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.(3) On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB.		
Spurious Emission at Antenna Terminals	§2.1051, §90.543(c) §90.543(f)	FCC: ≤ -13 dBm/100 kHz, from 9 kHz to 10th harmonics but outside authorized operating frequency ranges. 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 6 of Appendix B.9	Pass
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 7 of Appendix B.9	Pass
Frequency Stability	§2.1055(a)(1)(b) §2.1055(d)(2) §90.213	Within authorized bands of operation/frequency block.	Section 8 of Appendix B.9	Pass



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2.8 LTE Band 26(814~824 MHz)

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Transmitter Conducted Power Output	§2.1046, §90.635(b)	< 100 W.	Section 1 of Appendix B.12	Pass
Peak-Average Ratio		Limit≤13 dB	Section 2 of Appendix B.12	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 3 of Appendix B.12	Pass
Emission Mask	§2.1051 § 90.691(a)	For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10(f/6.1) decibels or 50+10Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.	Section 4 of Appendix B.12	Pass
Spurious Emission at Antenna Terminals	§2.1051, §90.691	< 43 + 10Log10(P[Watts]) for all out-of-band emissions	Section 5 of Appendix B.12	Pass
Field Strength of Spurious Radiation	§2.1053, §90.691	< 43 + 10Log10(P[Watts]) for all out-of-band emissions	Section 6 of Appendix B.12	Pass
Frequency Stability	§2.1055(a)(1)(b) §2.1055(d)(2) §90.213	Within authorized bands of operation/frequency block.	Section 7 of Appendix B.12	Pass



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2.9 LTE Band 30

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(a)(3)	EIRP ≤ 250mW/5MHz	Section 1 of Appendix B.14	Pass
Peak-Average Ratio		FCC: Limit≤13 dB	Section 2 of Appendix B.14	Pass
Bandwidth	§2.1049,	OBW: No limit. EBW: No limit.	Section 3 of Appendix B.14	Pass
Band Edges Compliance	§2.1051, §27.53(a)(4)	≤ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.	Section 4 of Appendix B.14	Pass
Spurious Emission at Antenna Terminals	§2.1051, §27.53(a)(4)	For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands: (i) By a factor of not less than: 43 + 10 log (P) dB on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than 55 + 10 log (P) dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2345 and 2345 MHz, not less than 61 + 10 log (P) dB on all frequencies between 2345 and 2345 MHz, not less than 61 + 10 log (P) dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2345 mHz, not less than 61 + 10 log (P) dB on all frequencies between 2328 mHz and on all frequencies between 2328 mHz and on all frequencies between 2328 and 2337 MHz; (ii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305 MHz, 55	Section 5 of Appendix B.14	Pass



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		+ 10 log (P) dB on all frequencies between 2296 and 2300 MHz, 61 + 10 log (P) dB on all frequencies between 2292 and 2296 MHz, 67 + 10 log (P) dB on all frequencies between 2288 and 2292 MHz, and 70 + 10 log (P) dB below 2288 MHz;(iii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365 MHz, and not less than 70 + 10 log (P) dB above 2365 MHz.		
Field Strength of Spurious Radiation	§2.1053, §27.53(a)(4)	≤ -40Bm/1MHz.	Section 6 of Appendix B.14	Pass
Frequency Stability	§2.1055(a)(1)(b) §2.1055(d)(2) §27.54	within the range of the operating frequency blocks	Section 7 of Appendix B.14	Pass



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2.10 LTE Band 71

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046 §27.50(c)(10)	ERP≤3W	Section 1 of Appendix B.18	Pass
Peak-Average Ratio		Limit≤13 dB	Section 2 of Appendix B.18	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 3 of Appendix B	Pass
Band Edges Compliance	§2.1051, §27.53(g)	≤ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.	Section 4 of Appendix B.18	Pass
Spurious Emission at Antenna Terminals	§2.1051, §27.53(g)	≤ -13 dBm/1 MHz, from 9 kHz to 10 th harmonics but outside authorized operating frequency ranges.	Section 5 of Appendix B.18	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(g)	≤ -13 dBm/1 MHz.	Section 6 of Appendix B.18	Pass
Frequency Stability	§2.1055(a)(1)(b) §2.1055(d)(2) §27.54	within the authorized bands of operation.	Section 7 of Appendix B.18	Pass



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3 General Information

3.1 Details of Client

Applicant:	Lenovo (Shanghai) Electronics Technology Co., Ltd.
Address of Applicant:	Section 304-305, Building No. 4, # 222, Meiyue Road, China (Shanghai) Pilot Free Trade Zone
Manufacturer:	Lenovo PC HK Limited
Address of Manufacturer:	23/F, Lincoln House, Taikoo Place 979 King's Road, Quarry Bay, Hong Kong, China

3.2 Test Location

Company:	SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd.
Address:	1/F, Unit D, Building 1, Kanghong Orange Science Park, No.137, Keyuan 3rd Road, Fengdong New Town, Xi' an, Shaanxi China
Post code:	710086
Test engineer:	Bo Feng, Jacky Xue

3.3 Test Facility

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

•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.

• Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0095.

IC#: 25613.

• FCC –Designation Number: CN1337

SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd. has been recognized as an accredited testing

laboratory.

Designation Number: CN1337.

Test Firm Registration Number: 917410



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3.4 General Description of EUT

EUT Description:	Portable Tablet Computer						
Model No.:	TB330XU						
Trade Mark:	Lenovo						
Hardware Version:	TB330XU						
Software Version:	Lenovo ZUI 15.1.0)27					
Power Supply:	3.91V						
INACI	RF Conducted	865823	060003570				
IMEI:	RSE	865823	060002457				
Antenna Type:	PIFA Antenna						
	GSM850:	-1.880	dBi	GSM1900:	-1.1dBi		
	WCDMA Band II:	-1.1dE	3i	WCDMA Bar	nd IV: -0.32dBi		
	WCDMA Band V:	-1.880	lBi				
	LTE Band 2: -1.1dBi			LTE Band 4: -0.32dBi			
	LTE Band 5: -1.88dBi			LTE Band 7: -0.9dBi			
	LTE Band 12:	-4.970	lBi	LTE Band 13: -3.18dBi			
Antenna Gain:	LTE Band 14:	-3.230	lBi	LTE Band 17	': -4.97dBi		
	LTE Band 25:	-0.9dE	3i	LTE Band 26: -1.97dBi			
	LTE Band 30:	-1.640	lBi	LTE Band 38: -0.9dBi			
	LTE Band 41:	-0.9dE	3i	LTE Band 66: -0.32dBi			
	LTE Band 71:	-2.920	lBi				
	Note: The antenna gain are derived from the gain information report provided by the manufacturer.						
	9kHz ~ 30Mł (0.3dB)	Ηz		1000MHz 6dB)	1000MHz ~ 2000MHz (0.8dB)		
RF Cable:	2000MHz ~ 4000MHz ~ 4000MHz ~ (1.2dB) (1.8d			6000MHz ~ 12750MHz (2.6dB)			
	Above 12750MHz	(3.5dB)					
Remark:							

Remark:

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3.5 Test Mode

Test Mode	Test Modes Description				
GSM/TM1	GSM system, GSM/GPRS, GMSK modulation				
GSM/TM2	GSM system, EGPRS, 8PSK modulation				
UMTS/TM1	UMTS system, WCDMA, QPSK modulation				
LTE/TM1	LTE system, QPSK modulation				
LTE/TM2	LTE system, 16QAM modulation				
LTE/TM3	LTE system, 64QAM modulation				
Remark: The test mode(s	Remark: The test mode(s) are selected according to relevant radio technology specifications.				

3.6 Test Environment

NT: Normal Temperature

Environment Parameter	96~98 kPa Selected Values During Tests				
Relative Humidity	40-60 % RH Ambient				
Value	Temperature(°C)	Voltage(V)			
NTNV	22~25	3.91			
LTLV	-30	3.6			
LTHV	-30	4.4			
HTLV	50	3.6			
HTHV	50	4.4			
Remark:					
NV: Normal Voltage LV: Low	v Extreme Test Voltage	HV: High Extreme Test Voltage			

LT: Low Extreme Test Temperature

3.7 Description of Support Units

The EUT has been tested as an independent unit.



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HT: High Extreme Test Temperature



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3.8 Technical Specification

Characteristics	Description							
Radio System Type	⊠ GSM	⊠ UMTS		⊠ LTE				
	Band		TX	TX		RX		
	GSM850		824	to 849	MHz	869 to	894 MHz	
	GSM1900		1850	0 to 19	10 MHz	1930 t	o 1990 MHz	
	UMTS Band II		1850	0 to 19	10 MHz	1930 t	o 1990 MHz	
	UMTS Band I\	/	1710	0 to 17	55 MHz	2110 t	o 2155 MHz	
	UMTS Band V	1	824	to 849	MHz	869 to	894 MHz	
	LTE Band 2		1850	0 to 19	10 MHz	1930 t	o 1990 MHz	
	LTE Band 4		1710	0 to 17	55 MHz	2110 t	o 2155 MHz	
	LTE Band 5		824	to 849	MHz	869 to	894 MHz	
	LTE Band 7		2500	0 to 25	70 MHz	2620 t	o 2690 MHz	
	LTE Band 12		699 to 716 MHz			729 to	729 to 746 MHz	
Supported Frequency Range	LTE Band 13		777 to 787 MHz			746 to	746 to 756 MHz	
cupported Frequency Range	LTE Band 14		788 to 798 MHz		758 to	768 MHz		
	LTE Band 17		704	to 716	MHz	734 to	746 MHz	
	LTE Band 25		1850 to 1915MHz			1930 t	o 1995 MHz	
	LTE Band 26 (814 to 824 MHz)		814 to 824MHz			859 to	869 MHz	
	LTE Band 26 (824 to 849 MHz)		824 to 849 MHz		869 to	869 to 894 MHz		
	LTE Band 30		2305 to 2315 MHz			2350 t	2350 to 2360 MHz	
	LTE Band 38		2570 to 2620 MHz			2570 t	2570 to 2620 MHz	
	LTE Band 41		2496 to 2690MHz		2496 t	2496 to 2690MHz		
	LTE Band 66		1710 to 1780 MHz		2110 t	o 2200 MHz		
	LTE Band 71		663 to 698 MHz			617 to	652 MHz	
	GSM system:		⊠0.2 MHz					
	UMTS system	:	⊠5 I	MHz				
Supported Channel Bandwidth	LTE Band 2		⊠1.4	4 MHz	⊠3 MHz	⊠5 MHz	ː ⊠10 MHz	
	LIE Dallu Z		⊠15	MHz	⊠20 MHz			
	LTE Band 4		⊠1.4	4 MHz	⊠3 MHz	⊠5 MHz	ː ⊠10 MHz	



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			⊠15 MH	J-7	⊠20 MHz		
	LTE Band 5						∑40 MU-
					⊠3 MHz	⊠5 MHz	⊠10 MHz
	LTE Band 7		⊠5 MHz		⊠10 MHz		⊠20 MHz
	LTE Band 12		⊠1.4 M ⊠5 MHz		⊠3 MHz	⊠5 MHz	⊠10 MHz
	LTE Band 13				⊠10 MHz		
	LTE Band 14		⊠5 MHz	<u>z</u>	⊠10 MHz		
	LTE Band 25		⊠5 MHz	<u>z</u>	⊠10 MHz		
			⊠1.4 M	Hz	⊠3 MHz	⊠5 MHz	⊠10 MHz
			⊠15 MF	łz	⊠20 MHz		
	LTE Band 26(814-824)	⊠1.4 M	Hz	⊠3 MHz	⊠5 MHz	⊠10 MHz
	LTE Band 26/024 040	`	⊠1.4 M	Hz	⊠3 MHz	⊠5 MHz	⊠10 MHz
	LTE Band 26(824-849)	⊠15 MF	łz			
	LTE Band30		⊠5 MHz	<u> </u>	⊠10 MHz		
			⊠5 MHz	<u>z</u>	⊠10 MHz	⊠15 MHz	⊠20 MHz
			⊠5 MHz	z ⊠10 MHz		⊠15 MHz	⊠20 MHz
			⊠1.4 M	MHz ⊠3 MHz		⊠5 MHz	⊠10 MHz
	LTE Band66			Z	⊠20MHz		
	LTE Band71		⊠5MHz		⊠10MHz	⊠15MHz	⊠20MHz
	Note: WCDMA suppor	ts H	SUPA, HSDPA, DC-HSDPA,HSPA+, but only the				
	worst case was tested	and	the data	disp	olayed in thi	s report.	-
Characteristics	Description						
	GSM:	GM	ISK	8F	PSK		
	GSM850	248	BKGXW	25	2KG7W		
	GSM1900	245	KGXW	26	7KG7W		
Designation of Emissions	UMTS:	QP	SK				
(Remark: the necessary	Band II	4M:	20F9W				
bandwidth of which is the worst value from the	Band IV	4M:	20F9W				
measured occupied bandwidths for each type of channel bandwidth	Band V	4M:	20F9W				
	E-UTRA:	QP	SK	16	6QAM	64QAM	
configuration.)		1M	09G7D	11	/10W7D	1M10W7D	
		2M	69G7D	21	л68W7D	2M68W7D	
	LTE Band 2	4M	47G7D	41	//48W7D	4M47W7D	
		8M ²	95G7D		//93W7D	8M94W7D	
			· -		-		



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		13M5G7D	13M5W7D	13M5W7D
		18M0G7D	17M9W7D	17M9W7D
		1M09G7D	1M10W7D	1M10W7D
		2M69G7D	2M68W7D	2M68W7D
	LTE Dand 4	4M47G7D	4M47W7D	4M48W7D
	LTE Band 4	8M94G7D	8M92W7D	8M94W7D
		13M5G7D	13M5W7D	13M4W7D
		17M9G7D	17M9W7D	17M9W7D
		1M09G7D	1M10W7D	1M10W7D
	LTE Day 15	2M69G7D	2M68W7D	2M69W7D
	LTE Band 5	4M47G7D	4M47W7D	4M49W7D
		8M94G7D	8M92W7D	8M94W7D
		4M48G7D	4M48W7D	4M48W7D
	LTE Band 7	8M95G7D	8M94W7D	8M94W7D
		13M5G7D	13M5W7D	13M4W7D
		18M0G7D	18M0W7D	17M9W7D
	LTE Band 12	1M09G7D	1M10W7D	1M10W7D
		2M69G7D	2M68W7D	2M68W7D
		4M49G7D	4M48W7D	4M49W7D
		8M96G7D	8M94W7D	8M96W7D
		4M47G7D	4M48W7D	4M49W7D
	LTE Band13	8M93G7D	8M92W7D	8M93W7D
	LTE Dand 44	4M48G7D	4M47W7D	4M49W7D
	LTE Band 14	8M95G7D	8M93W7D	8M95W7D
	LTC Dand 17	4M47G7D	4M47W7D	4M49W7D
	LTE Band 17	8M96G7D	8M94W7D	8M93W7D
		1M09G7D	1M10W7D	1M10W7D
		2M69G7D	2M68W7D	2M68W7D
	LTE Band 25	4M48G7D	4M47W7D	4M50W7D
	LTE Band 25	8M94G7D	8M93W7D	8M94W7D
		13M5G7D	13M5W7D	13M5W7D
		18M0G7D	17M9W7D	18M0W7D
		•		



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LTE Band 26 (814-824) LTE Band 26 (814-824) EXECUTE Band 26 (814-824) LTE Band 26 (814-824) EXECUTE Band 26 (814-824) EXECUTE Band 26 (824-849) EXECUTE Band 30 LTE Band 30 LTE Band 30 LTE Band 38 LTE Band 38 EXECUTE Band 38 LTE Band 41 LTE Band 41 EXECUTE Band 41 LTE Band 46 EXECUTE BAND AND AND AND AND AND AND AND AND AND						
(814-824) 4M47G7D 4M47W7D 4M48W7D 8M92G7D 8M92W7D 8M93W7D 1M09G7D 1M10W7D 1M10W7D 2M69G7D 2M68W7D 2M69W7D 4M47G7D 4M47W7D 4M47W7D 8M96G7D 8M94W7D 8M93W7D 13M5G7D 13M5W7D 13M5W7D 4M50G7D 4M50W7D 4M51W7D 8M98G7D 8M97W7D 8M98W7D 4M47G7D 4M47W7D 4M48W7D 8M93G7D 8M93W7D 8M94W7D 13M5G7D 13M5W7D 13M5W7D 13M5G7D 13M5W7D 13M5W7D 13M5G7D 13M5W7D 13M5W7D 17M9G7D 17M9W7D 17M9W7D 4M47G7D 4M47W7D 4M47W7D 8M93G7D 8M93W7D 8M93W7D 17M9G7D 17M9W7D 17M9W7D 13M5G7D 13M5W7D 13M5W7D 1M09G7D 1M10W7D 1M10W7D 2M69G7D 2M68W7D 2M68W7D 4M48G7D 4M45W7D 4M49W7D 8M95G7D 8M93W7D 8M95W7D 8M95G7D 8M93W7D 8M95W7D			1M09G7D	1M10W7D	1M10W7D	
BM92G7D 8M92W7D 8M93W7D 1M09G7D 1M10W7D 1M10W7D 2M69G7D 2M68W7D 2M69W7D 2M69W7D 4M47W7D 4M47W7D 8M96G7D 8M94W7D 8M93W7D 13M5G7D 13M5W7D 13M5W7D 4M51W7D 8M98G7D 8M97W7D 8M98W7D 8M98W7D 4M47G7D 4M47W7D 8M98G7D 8M93W7D 8M98W7D 4M47G7D 4M47W7D 4M48W7D 8M93G7D 8M93W7D 13M5W7D 13M5W7D 13M5G7D 13M5W7D 17M9W7D 17M9G7D 17M9W7D 4M47W7D 4M47W7D 8M93G7D 8M92W7D 8M93W7D 8M93W7D 13M5G7D 13M5W7D 13M5W7D 13M5W7D 13M5G7D 13M5W7D 13M5W7D 13M5G7D 13M5W7D 13M5W7D 13M5G7D 13M5W7D 2M69G7D 2M68W7D 2M68W7D 4M48G7D 4M49W7D 8M95G7D 8M93W7D 8M95W7D 8M95G7D 8M93W7D 8M95W7D		LTE Band 26	2M69G7D	2M68W7D	2M68W7D	
LTE Band 26 (824-849) LTE Band 26 (824-849) LTE Band 30 LTE Band 38 LTE Band 38 LTE Band 41 LTE Band 41 LTE Band 41 LTE Band 66 LTE Band 66 LTE Band 66 LTE Band 66 LTE Band 26 (824-849) LTE Band 26 (824-849) LTE Band 26 (824-849) LTE Band 30 LTE Band 38 LTE Band 41 LTE Band 66		(814-824)	4M47G7D	4M47W7D	4M48W7D	
LTE Band 26 (824-849) 2M69G7D 2M68W7D 2M69W7D 4M47G7D 4M47W7D 4M47W7D 8M96G7D 8M94W7D 8M93W7D 13M5G7D 13M5W7D 13M5W7D 4M50G7D 4M50W7D 4M51W7D 8M98G7D 8M97W7D 8M98W7D 4M47G7D 4M47W7D 4M48W7D 8M93G7D 8M93W7D 8M94W7D 13M5G7D 13M5W7D 13M5W7D 13M5G7D 13M5W7D 13M5W7D 17M9G7D 17M9W7D 17M9W7D 17M9G7D 17M9W7D 17M9W7D 4M47G7D 4M47W7D 4M47W7D 8M93G7D 8M92W7D 8M93W7D 13M5G7D 13M5W7D 13M5W7D 18M0G7D 18M0W7D 17M9W7D 2M69G7D 2M68W7D 2M68W7D 4M48G7D 4M50W7D 4M49W7D 8M95G7D 8M93W7D 8M95W7D			8M92G7D	8M92W7D	8M93W7D	
LTE Band 26 (824-849) 4M47G7D 4M47W7D 4M47W7D 8M96G7D 8M94W7D 13M5W7D 13M5G7D 13M5W7D 13M5W7D 4M50G7D 4M50W7D 4M51W7D 8M98G7D 8M97W7D 8M98W7D 4M47G7D 4M47W7D 4M48W7D 8M93G7D 8M93W7D 13M5W7D 13M5G7D 13M5W7D 13M5W7D 13M5G7D 13M5W7D 13M5W7D 17M9G7D 17M9W7D 17M9W7D 4M47G7D 4M47W7D 4M47W7D 8M93G7D 8M93W7D 8M93W7D 17M9G7D 17M9W7D 17M9W7D 13M5G7D 13M5W7D 13M5W7D 13M5G7D 13M5W7D 17M9W7D 18M0G7D 18M0W7D 17M9W7D 2M69G7D 2M68W7D 2M68W7D 4M48G7D 4M50W7D 4M49W7D 8M95G7D 8M93W7D 8M95W7D			1M09G7D	1M10W7D	1M10W7D	
(824-849)		1.TE D. 100	2M69G7D	2M68W7D	2M69W7D	
BM96G7D 8M94W7D 8M93W7D 13M5W7D 13M5W7D 13M5W7D 13M5W7D 13M5W7D 13M5W7D 4M51W7D 8M98G7D 8M98W7D 8M98W7D 4M47G7D 4M47W7D 4M48W7D 8M93G7D 8M93W7D 8M94W7D 13M5G7D 13M5W7D 13M5W7D 17M9W7D 17M9W7D 17M9W7D 17M9W7D 17M9W7D 13M5W7D 13M9W7D 14M10W7D 2M69G7D 2M68W7D 2M68W7D 2M68W7D 2M68W7D 4M49W7D 8M95G7D 8M95W7D 8M9			4M47G7D	4M47W7D	4M47W7D	
LTE Band 30 4M50G7D 4M50W7D 4M51W7D 8M98G7D 8M97W7D 8M98W7D 4M47G7D 4M47W7D 4M48W7D 8M93G7D 8M93W7D 8M94W7D 13M5G7D 13M5W7D 13M5W7D 17M9G7D 17M9W7D 17M9W7D 4M47G7D 4M47W7D 4M47W7D 8M93G7D 8M92W7D 8M93W7D 8M93G7D 8M92W7D 8M93W7D 13M5G7D 13M5W7D 13M5W7D 13M5G7D 13M5W7D 13M5W7D 13M5G7D 13M5W7D 13M5W7D 13M5G7D 13M5W7D 17M9W7D 18M0G7D 18M0W7D 17M9W7D 1M09G7D 1M10W7D 1M10W7D 2M69G7D 2M68W7D 2M68W7D 4M48G7D 4M50W7D 4M49W7D 8M95G7D 8M93W7D 8M95W7D		(024-049)	8M96G7D	8M94W7D	8M93W7D	
LTE Band 30 8M98G7D 8M97W7D 8M98W7D 4M47G7D 4M47W7D 4M48W7D 8M93G7D 8M93W7D 8M94W7D 13M5G7D 13M5W7D 13M5W7D 17M9G7D 17M9W7D 17M9W7D 4M47G7D 4M47W7D 4M47W7D 8M93G7D 8M92W7D 8M93W7D 13M5G7D 13M5W7D 13M5W7D 13M5G7D 13M5W7D 13M5W7D 13M5G7D 13M5W7D 13M5W7D 13M5G7D 13M5W7D 17M9W7D 18M0G7D 18M0W7D 17M9W7D 1M09G7D 1M10W7D 1M10W7D 2M69G7D 2M68W7D 2M68W7D 4M48G7D 4M50W7D 4M49W7D 8M95G7D 8M93W7D 8M95W7D			13M5G7D	13M5W7D	13M5W7D	
BM98G7D 8M97W7D 8M98W7D		LTE Bond 20	4M50G7D	4M50W7D	4M51W7D	
LTE Band 38 8M93G7D 8M93W7D 8M94W7D 13M5G7D 13M5W7D 13M5W7D 17M9G7D 17M9W7D 17M9W7D 4M47G7D 4M47W7D 4M47W7D 8M93G7D 8M92W7D 8M93W7D 13M5G7D 13M5W7D 13M5W7D 18M0G7D 18M0W7D 17M9W7D 1M09G7D 1M10W7D 1M10W7D 2M69G7D 2M68W7D 2M68W7D 4M48G7D 4M50W7D 4M49W7D 8M95G7D 8M93W7D 8M95W7D		LIE Band 30	8M98G7D	8M97W7D	8M98W7D	
LTE Band 38 13M5G7D 13M5W7D 13M5W7D 17M9G7D 17M9W7D 17M9W7D 4M47G7D 4M47W7D 4M47W7D 8M93G7D 8M92W7D 8M93W7D 13M5G7D 13M5W7D 13M5W7D 18M0G7D 18M0W7D 17M9W7D 1M09G7D 1M10W7D 1M10W7D 2M69G7D 2M68W7D 2M68W7D 4M48G7D 4M50W7D 4M49W7D 8M95G7D 8M93W7D 8M95W7D			4M47G7D	4M47W7D	4M48W7D	
13M5G7D 13M5W7D 13M5W7D 17M9W7D 17M9W7D 17M9W7D 17M9W7D 17M9W7D 4M47W7D 4M47W7D 8M93G7D 8M92W7D 8M93W7D 13M5W7D 13M5W7D 13M5W7D 18M0G7D 18M0W7D 17M9W7D 1M09G7D 1M10W7D 2M69G7D 2M68W7D 2M68W7D 4M49W7D 8M95G7D 8M93W7D 8M95W7D 8M95		LTE Band 38	8M93G7D	8M93W7D	8M94W7D	
LTE Band 41 4M47G7D 4M47W7D 4M47W7D 8M93G7D 8M92W7D 8M93W7D 13M5G7D 13M5W7D 13M5W7D 18M0G7D 18M0W7D 17M9W7D 1M09G7D 1M10W7D 1M10W7D 2M69G7D 2M68W7D 2M68W7D 4M48G7D 4M50W7D 4M49W7D 8M95G7D 8M93W7D 8M95W7D			13M5G7D	13M5W7D	13M5W7D	
LTE Band 41 8M93G7D 8M92W7D 8M93W7D 13M5G7D 13M5W7D 13M5W7D 18M0G7D 18M0W7D 17M9W7D 1M09G7D 1M10W7D 1M10W7D 2M69G7D 2M68W7D 2M68W7D 4M48G7D 4M50W7D 4M49W7D 8M95G7D 8M93W7D 8M95W7D			17M9G7D	17M9W7D	17M9W7D	
LTE Band 41 13M5G7D 13M5W7D 13M5W7D 18M0G7D 18M0W7D 17M9W7D 1M09G7D 1M10W7D 1M10W7D 2M69G7D 2M68W7D 2M68W7D 4M48G7D 4M50W7D 4M49W7D 8M95G7D 8M93W7D 8M95W7D		LTE Band 41	4M47G7D	4M47W7D	4M47W7D	
13M5G7D 13M5W7D 13M5W7D 18M0W7D 17M9W7D 1M09G7D 1M10W7D 1M10W7D 2M69G7D 2M68W7D 2M68W7D 4M49W7D 4M49W7D 8M95G7D 8M93W7D 8M95W7D			8M93G7D	8M92W7D	8M93W7D	
1M09G7D 1M10W7D 1M10W7D 2M68W7D 2M68W7D 4M48G7D 4M50W7D 4M49W7D 8M95G7D 8M93W7D 8M95W7D			13M5G7D	13M5W7D	13M5W7D	
2M69G7D 2M68W7D 2M68W7D 4M49W7D 4M48G7D 8M95G7D 8M93W7D 8M95W7D			18M0G7D	18M0W7D	17M9W7D	
LTE Band 66 4M48G7D 4M50W7D 4M49W7D 8M95G7D 8M93W7D 8M95W7D			1M09G7D	1M10W7D	1M10W7D	
LTE Band 66 8M95G7D 8M93W7D 8M95W7D			2M69G7D	2M68W7D	2M68W7D	
8M95G7D 8M93W7D 8M95W7D		LTE Dand 66	4M48G7D	4M50W7D	4M49W7D	
TOMESTE TOMESMEET TOMESMEET		LIE Ballu 00	8M95G7D	8M93W7D	8M95W7D	
13M5G7D 13M5W7D 13M5W7D			13M5G7D	13M5W7D	13M5W7D	
18M0G7D 17M9W7D 17M9W7D			18M0G7D	17M9W7D	17M9W7D	
4M48G7D 4M47W7D 4M49W7D			4M48G7D	4M47W7D	4M49W7D	
LTE Band 71 8M94W7D 8M94W7D		LTE Rand 71	8M95G7D	8M94W7D	8M94W7D	
13M5G7D 13M5W7D 13M5W7D		LIE Dallu / I	13M5G7D	13M5W7D	13M5W7D	
18M0G7D 17M9W7D 17M9W7D			18M0G7D	17M9W7D	17M9W7D	



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3.9 Test Frequencies

Test Mode	TX / RX	RF Channel				
1 est Mode	IA/IX	Low (L)	Middle (M)	High (H)		
	TX	Channel 128	Channel 190	Channel 251		
GSM850	IA	824.2MHz	836.6 MHz	848.8 MHz		
	DV	Channel 128	Channel 190	Channel 251		
	RX	869.2 MHz	881.6 MHz	893.8 MHz		

Test Mode	TX / RX	TY / PY RF Channel				
i est ivioue	IX/IX	Low (L)	Middle (M)	High (H)		
GSM1900 -	TX	Channel 512	Channel 661	Channel 810		
		1850.2MHz	1880.0 MHz	1909.8 MHz		
	DV	Channel 512	Channel 661	Channel 810		
	RX	1930.2 MHz	1960.0 MHz	1989.8 MHz		

Test Mode	TX / RX	TY / PY RF Channel				
rest wode	IX/IX	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		
	ľΛ	1932.4 MHz	1960.0 MHz	1987.6 MHz		

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

Test Mode	TX / RX	TY / RY RF Channel				
i est iviode	IX/IX	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		
	ľΛ	871.4 MHz	881.4 MHz	891.6 MHz		



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T. A. M. A.	D de dalla	TV / DV		RF Channel	
Test Mode	Bandwidth	TX / RX	Low (L)	Middle (M)	High (H)
			Channel 18607	Channel 18900	Channel 19193
		TX	1850.7 MHz	1880 MHz	1909.3 MHz
	1.4MHz	RX	Channel 607	Channel 900	Channel 1193
		KA	1930.7 MHz	1960 MHz	1989.3 MHz
			Channel 18615	Channel 18900	Channel 19185
		TX	1851.5 MHz	1880 MHz	1908.5 MHz
	3MHz	RX	Channel 615	Channel 900	Channel 1185
		KA	1931.5 MHz	1960 MHz	1988.5 MHz
		TX	Channel 18625	Channel 18900	Channel 19175
			1852.5 MHz	1880 MHz	1907.5 MHz
	5MHz	RX	Channel 625	Channel 900	Channel1175
LTE Band 2			1932.5 MHz	1960 MHz	1987.5 MHz
LIE Danu Z	10MHz		Channel 18650	Channel 18900	Channel 19150
		TX	1855 MHz	1880 MHz	1905 MHz
		RX	Channel 650	Channel 900	Channel 1150
			1935 MHz	1960 MHz	1985 MHz
			Channel 18675	Channel 18900	Channel 19125
		TX	1857.5 MHz	1880 MHz	1902.5 MHz
	15MHz	DV	Channel 675	Channel 900	Channel 1125
_		RX	1937.5 MHz	1960 MHz	1982.5 MHz
			Channel 18700	Channel 18900	Channel 19100
		TX	1860 MHz	1880 MHz	1900 MHz
	20MHz	DV	Channel 700	Channel 900	Channel 1100
		RX	1940 MHz	1960 MHz	1980 MHz



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T (14)	D 1 : 10	TV / DV		RF Channel	
Test Mode	Bandwidth	TX / RX	Low (L)	Middle (M)	High (H)
			Channel 19957	Channel 20175	Channel 20393
		TX	1710.7 MHz	1732.5 MHz	1754.3 MHz
	1.4MHz	RX	Channel 1975	Channel 2175	Channel 2375
		KA	2112.5 MHz	2132.5MHz	2152.5 MHz
			Channel 19965	Channel 20175	Channel 20385
		TX	1711.5 MHz	1732.5 MHz	1753.5 MHz
	3MHz	RX	Channel 2000	Channel 2175	Channel 2350
		IX	2115 MHz	2132.5MHz	2150 MHz
LTE Danid 4	5MHz		Channel 19975	Channel 20175	Channel 20375
		TX	1712.5 MHz	1732.5 MHz	1752.5 MHz
		RX	Channel 1975	Channel 2175	Channel 2375
			2112.5 MHz	2132.5MHz	2152.5 MHz
LTE Band 4	10MHz	TX	Channel 20000	Channel 20175	Channel 20350
			1715 MHz	1732.5 MHz	1750 MHz
		RX	Channel 2000	Channel 2175	Channel 2350
			2115 MHz	2132.5MHz	2150 MHz
		- >.	Channel 20025	Channel 20175	Channel 20325
		TX	1717.5 MHz	1732.5 MHz	1747.5 MHz
	15MHz	RX	Channel 2025	Channel 2175	Channel 2325
		100	2117.5 MHz	2132.5MHz	2147.5 MHz
			Channel 20050	Channel 20175	Channel 20300
		TX	1720 MHz	1732.5 MHz	1745 MHz
	20MHz	RX	Channel 2050	Channel 2175	Channel 2300
		Γ.Λ	2120 MHz	2132.5MHz	2145 MHz

Toot Mode	Dandwidth	TV / DV		RF Channel	
Test Mode	Bandwidth	TX / RX	Low (L)	Middle (M)	High (H)
			Channel 20407	Channel 20525	Channel 20643
		TX	824.7 MHz	836.5 MHz	848.3 MHz
	1.4MHz	RX	Channel 2407	Channel 2525	Channel 2643
		IXX	869.7 MHz	881.5 MHz	893.3 MHz
			Channel 20415	Channel 20525	Channel 20635
	3MHz	TX	825.5 MHz	836.5 MHz	847.5 MHz
		/IHZ RX	Channel 2415	Channel 2525	Channel 2635
1.TE D 1.5			870.5 MHz	881.5 MHz	892.5 MHz
LTE Band 5		TX	Channel 20425	Channel 20525	Channel 20625
			826.5 MHz	836.5 MHz	846.5 MHz
	5MHz	RX	Channel 2425	Channel 2525	Channel 2625
			871.5 MHz	881.5 MHz	891.5 MHz
			Channel 20450	Channel 20525	Channel 20600
		TX	829 MHz	836.5 MHz	844 MHz
	10MHz	RX	Channel 2450	Channel 2525	Channel 2600
		IXX	874 MHz	881.5 MHz	889 MHz



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Took Mode	Danduidth	TV / DV		RF Channel	
Test Mode	Bandwidth	TX / RX	Low (L)	Middle (M)	High (H)
			Channel 20775	Channel 21100	Channel 21425
		TX	2502.5 MHz	2535 MHz	2567.5 MHz
	5MHz	RX	Channel 2775	Channel 3100	Channel 5825
		KA.	2622.5 MHz	2655 MHz	2687.5 MHz
			Channel 20800	Channel 21100	Channel 21400
		TX	2505 MHz	2535 MHz	2565 MHz
	10MHz	RX	Channel 2800	Channel 3100	Channel 3400
			2625 MHz	2655 MHz	2685 MHz
LTE Band 7		TX	Channel 20825	Channel 21100	Channel 21375
			2507.5 MHz	2535 MHz	2562.5 MHz
	15MHz	RX	Channel 2825	Channel 3100	Channel 3375
		KA.	2627.5 MHz	2655 MHz	2682.5 MHz
			Channel 20850	Channel 21100	Channel 21350
		TX	2510 MHz	2535 MHz	2560 MHz
	20MHz	RX	Channel 2850	Channel 3100	Channel 3350
		IXX	2630 MHz	2655 MHz	2680 MHz

T. A. N.A. ala	Daniel de Calde	TV / DV		RF Channel	
Test Mode	Bandwidth	TX / RX	Low (L)	Middle (M)	High (H)
			Channel 23017	Channel 23095	Channel 23173
	1.4MHz	TX	699.7 MHz	707.5 MHz	715.3 MHz
		RX	Channel 5017	Channel 5095	Channel 5173
		KA.	729.7 MHz	737.5 MHz	745.3 MHz
			Channel 23025	Channel 23095	Channel 23165
		TX	700.5 MHz	707.5 MHz	714.5 MHz
	3MHz	RX	Channel 5025	Channel 5095	Channel 5165
			730.5 MHz	737.5 MHz	744.5 MHz
LTE Band 12		TX	Channel 23035	Channel 23095	Channel 23155
			701.5 MHz	707.5 MHz	713.5 MHz
	5MHz	RX	Channel 5035	Channel 5095	Channel 5155
		KA.	731.5 MHz	737.5 MHz	743.5 MHz
			Channel 23060	Channel 23095	Channel 23130
	10MHz	TX	704 MHz	707.5 MHz	711 MHz
		RX	Channel 5060	Channel 5095	Channel 5130
		Γ.Λ	734 MHz	737.5 MHz	741 MHz



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Test Mode	Bandwidth	TX / RX		RF Channel	
rest Mode	Dariuwiutii	IA/KA	Low (L)	Middle (M)	High (H)
			Channel 23025	Channel 23230	Channel 23255
		TX	779.5 MHz	782 MHz	784.5 MHz
	5MHz	RX	Channel 5205	Channel 5230	Channel 5255
LTE Band 13		KA.	748.5 MHz	751 MHz	753.5 MHz
LIE Danu 13			Channel 23230	Channel 23230	Channel 23230
		TX	782 MHz	782 MHz	782 MHz
	10MHz	DV	Channel 5230	Channel 5230	Channel 5230
		RX	751 MHz	751 MHz	751 MHz

Test Mode Bandwidth		TX / RX	RF Channel		
i est iviode	Test wode Bandwidth	IA/KA	Low (L)	Middle (M)	High (H)
			Channel 23305	Channel 23330	Channel 23355
		TX	790.5 MHz	793 MHz	795.5 MHz
	5MHz	DV	Channel 5305	Channel 5330	Channel 5355
LTE Band 14		RX	760.5 MHz	763 MHz	765.5 MHz
LIE Danu 14			Channel 23330	Channel 23330	Channel 23330
		TX	793MHz	793 MHz	793 MHz
	10MHz	RX	Channel 5330	Channel 5330	Channel 5330
		Γ.Λ	763MHz	763 MHz	763 MHz

Toot Made	Dandwidth	Bandwidth TX / RX	RF Channel		
Test Mode	rest wode Bandwidth		Low (L)	Middle (M)	High (H)
			Channel 23755	Channel 23790	Channel 23825
		TX	706.5 MHz	710 MHz	713.5 MHz
	5MHz	RX	Channel 5755	Channel 5790	Channel 5825
LTE Band 17			736.5 MHz	740 MHz	743.5 MHz
LIE Dallu I <i>I</i>			Channel 23780	Channel 23790	Channel 23800
		TX	709 MHz	710 MHz	711 MHz
	10MHz	RX	Channel 5780	Channel 5790	Channel 5800
		INA.	739 MHz	740 MHz	741 MHz



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Toot Made	Donaluialth	TV / DV		RF Channel	
Test Mode	Bandwidth	TX / RX	Low (L)	Middle (M)	High (H)
			Channel 26047	Channel 26365	Channel 26683
		TX	1850.7 MHz	1882.5 MHz	1914.3 MHz
	1.4MHz	RX	Channel 8047	Channel 8365	Channel 8683
		KA	1930.7 MHz	1962.5 MHz	1994.3 MHz
			Channel 26055	Channel 26365	Channel 26675
		TX	1851.5 MHz	1882.5 MHz	1913.5 MHz
	3MHz	RX	Channel 8055	Channel 8365	Channel 8675
		KΛ	1931.5 MHz	1962.5 MHz	1993.5 MHz
	5MHz		Channel 26065	Channel 26365	Channel 26665
		TX	1852.5 MHz	1882.5 MHz	1912.5 MHz
		RX	Channel 8065	Channel 8365	Channel 8665
LTE Dand OF			1932.5 MHz	1962.5 MHz	1992.5 MHz
LTE Band 25	10MHz	TX	Channel 26090	Channel 26365	Channel 26640
			1855 MHz	1882.5 MHz	1910 MHz
		RX	Channel 8090	Channel 8365	Channel 8640
		KA	1935 MHz	1962.5 MHz	1990 MHz
		TX	Channel 26115	Channel 26365	Channel 26615
			1857.5 MHz	1882.5 MHz	1907.5 MHz
_	15MHz	RX	Channel 8115	Channel 8365	Channel 8615
		100	1937.5 MHz	1962.5 MHz	1987.5 MHz
			Channel 26140	Channel 26365	Channel 26590
		TX	1860 MHz	1882.5 MHz	1905 MHz
	20MHz	DV	Channel 8140	Channel 8365	Channel 8590
		RX	1940 MHz	1962.5 MHz	1985 MHz



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Test Mode	Bandwidth	TV / DV	TX / RX RF Channel		
rest Mode	Test wode Bandwidth	IA/KA	Low (L)	Middle (M)	High (H)
			Channel 26697	Channel 26740	Channel 26783
		TX	814.7 MHz	819 MHz	823.3 MHz
	1.4MHz	RX	Channel 8697	Channel 8740	Channel 8783
		KA	859.7 MHz	864MHz	868.3 MHz
			Channel 26705	Channel 26740	Channel 26775
	3MHz	TX	815.5 MHz	819 MHz	822.5 MHz
		RX	Channel 8705	Channel 8740	Channel 8775
LTE Band 26			860.5 MHz	864MHz	867.5 MHz
(814-824)	5MHz	TX	Channel 26715	Channel 26740	Channel 26765
(0.1.02.)			816.5 MHz	819 MHz	821.5 MHz
		RX	Channel 8715	Channel 8740	Channel 8755
			861.5 MHz	864MHz	866.5 MHz
			Channel 26740	Channel 26740	Channel 26740
		TX	819 MHz	819 MHz	819 MHz
	10MHz	RX	Channel 8740	Channel 8740	Channel 8740
		INA	864MHz	864MHz	864MHz

Toot Mode	Bandwidth	TV / DV		RF Channel	
Test Mode	Dandwidth	TX / RX	Low (L)	Middle (M)	High (H)
		TX	Channel 26797	Channel 26915	Channel 27033
			824.7 MHz	836.5 MHz	848.3 MHz
	1.4MHz	RX	Channel 8697	Channel 8915	Channel 9033
		ĽΛ	859.7 MHz	881.5 MHz	893.3 MHz
			Channel 26805	Channel 26915	Channel 27025
		TX	825.5 MHz	836.5 MHz	847.5 MHz
	3MHz	RX	Channel 8805	Channel 8915	Channel 9025
		ĽΛ	860.5 MHz	881.5 MHz	892.5 MHz
	5MHz	TX	Channel 26815	Channel 26915	Channel 27015
LTE Band26			826.5 MHz	836.5 MHz	846.5 MHz
(824-849)		RX	Channel 8815	Channel 8915	Channel 9015
(02:0:0)			871.5 MHz	881.5 MHz	891.5 MHz
	10MHz		Channel 26840	Channel 26915	Channel 26990
		TX	829 MHz	836.5 MHz	844 MHz
		RX	Channel 8840	Channel 8915	Channel 8990
			874 MHz	881.5 MHz	889 MHz
			Channel 26865	Channel 26915	Channel 26965
		TX	831.5 MHz	836.5 MHz	841.5 MHz
	15MHz	RX	Channel 8865	Channel 8915	Channel 8965
		KA	876.5 MHz	881.5 MHz	886.5 MHz



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Toot Mode	Test Mode Bandwidth TX / RX	RF Channel			
rest Mode		IA/KA	Low (L)	Middle (M)	High (H)
		TX	Channel 27685	Channel27710	Channel 27735
			2307.5 MHz	2310MHz	2312.5 MHz
	5MHz	RX	Channel 9795	Channel 9820	Channel 9845
LTE Band 30			2352.5MHz	2355 MHz	2357.5MHz
LIE Danu 30		TX	Channel 27710	Channel27710	Channel27710
	10MHz RX		2310 MHz	2310MHz	2310MHz
		DV	Channel 9820	Channel 9820	Channel 9820
		KX.	2355 MHz	2355 MHz	2355 MHz

Test Mode	Bandwidth	TX / RX	RF Channel		
rest Mode	Dariuwiuiri	IA/KA	Low (L)	Middle (M)	High (H)
	5MHz	TX/RX	Channel 37775	Channel38000	Channel 38225
	SIVITZ	17/17/	2572.5 MHz	2595 MHz	2617.5 MHz
	10MHz	TX/RX	Channel 37800	Channel38000	Channel 38200
LTE Band 38		17/100	2575 MHz	2595 MHz	2615 MHz
LIE Danu 30	15MHz TX/RX	TV/DV	Channel 37825	Channel38000	Channel 38175
		17/100	2577.5 MHz	2595 MHz	2612.5 MHz
	20MHz	TX/RX	Channel 37850	Channel38000	Channel 38150
	ΖυίνιπΖ	17/100	2580 MHz	2595 MHz	2610 MHz

Test Mode Bandwidth		TV / DV	RF Channel		
Test Mode	Test wode Bandwidth	TX / RX	Low (L)	Middle (M)	High (H)
			Channel 39675	Channel40620	Channel 41565
	5MHz	TX / RX	2498.5 MHz	2593 MHz	2687.5 MHz
LTE Band 41			Channel 39700	Channel40620	Channel 41540
	10MHz	TX / RX	2501 MHz	2593 MHz	2685 MHz
(2496-2690)			Channel 39725	Channel40620	Channel 41515
,	15MHz	TX / RX	2503.5 MHz	2593 MHz	2682.5 MHz
			Channel 39750	Channel40620	Channel 41490
	20MHz	TX / RX	2506 MHz	2593 MHz	2680 MHz



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T (N)	5 1 1111	TV / DV		RF Channel	
Test Mode	est Mode Bandwidth	TX / RX	Low (L)	Middle (M)	High (H)
			Channel 131979	Channel 132322	Channel 132665
		TX	1710.7 MHz	1745 MHz	1779.3 MHz
	1.4MHz	RX	Channel 66443	Channel 66786	Channel 67329
		RA.	2110.7 MHz	2145MHz	2199.3 MHz
			Channel 131987	Channel 132322	Channel 132657
		TX	1711.5 MHz	1745 MHz	1778.5MHz
	3MHz	RX	Channel 66451	Channel 66786	Channel 67321
		KA.	2111.5 MHz	2145MHz	2198.5MHz
	5MHz	TX	Channel 131997	Channel 132322	Channel 132647
			1712.5 MHz	1745 MHz	1777.5 MHz
		RX	Channel 66461	Channel 66786	Channel 67311
LTE Band66			2112.5 MHz	2145MHz	2197.5 MHz
LIE Bandoo	10MHz	TX	Channel 132022	Channel 132322	Channel 132622
			1715 MHz	1745 MHz	1775 MHz
		RX	Channel 66486	Channel 66786	Channel 67286
			2115 MHz	2145MHz	2195 MHz
			Channel 132047	Channel 132322	Channel 132597
		TX	1717.5 MHz	1745 MHz	1772.5 MHz
	15MHz	RX	Channel 66511	Channel 66786	Channel 67261
		100	2117.5 MHz	2145MHz	2192.5 MHz
			Channel 132072	Channel 132322	Channel 132572
		TX	1720 MHz	1745 MHz	1770 MHz
	20MHz	DV	Channel 66536	Channel 66786	Channel 67236
	RX	2120 MHz	2145MHz	2190 MHz	

Toot Made	Donduidth	TV / DV		RF Channel	
Test Mode	Test Mode Bandwidth	TX / RX	Low (L)	Middle (M)	High (H)
			Channel 133147	Channel 133297	Channel 133447
		TX	665.5 MHz	680.5 MHz	695.5 MHz
	5MHz	RX	Channel 68611	Channel 68761	Channel 68911
		KA	619.5 MHz	634.5 MHz	649.5 MHz
			Channel 133172	Channel 133297	Channel 133422
		TX	668 MHz	680.5 MHz	693 MHz
	10MHz	RX	Channel 68636	Channel 68761	Channel 68886
1.TE D 174			622 MHz	634.5 MHz	647 MHz
LTE Band71		TX RX	Channel 133197	Channel 133297	Channel 133397
			670.5 MHz	680.5 MHz	690.5 MHz
	15MHz		Channel 68661	Channel 68761	Channel 68861
			624.5 MHz	634.5 MHz	644.5 MHz
			Channel 133222	Channel 133297	Channel 133372
		TX	673 MHz	680.5 MHz	688 MHz
	20MHz	DV	Channel 68686	Channel 68761	Channel 68836
		RX	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 Section 5.2.1

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



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4.2 Effective (Isotropic) Radiated Power of Transmitter

Measurement Procedure: FCC KDB 971168 D01 V03r01 Section 5.8.4

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



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4.3 EIRP Power Density

Measurement Procedure: FCC KDB 971168 D01 V03r01 Section 5.3

Test Settings

- 1. Set instrument center frequency to OBW center frequency.
- 2. Set span to at least 1.5 times the OBW.
- 3. Set the RBW to the specified reference bandwidth (often 1 MHz).
- 4. Set VBW ≥ 3 × RBW.
- 5. Detector = RMS (power averaging).
- 6. Ensure that the number of measurement points in the sweep ≥ 2 × span/RBW.
- 7. Sweep time = auto couple.
- 8. Employ trace averaging (RMS) mode over a minimum of 100 traces.
- 9. Use the peak marker function to determine the maximum amplitude level within the reference bandwidth (PSD).



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4.4 Occupied Bandwidth

Measurement Procedure: FCC KDB 971168 D01 V03r01 Section 4.2 & 4.3

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. The transmitter output was connected to a calibrated coaxial cable, attenuator and Spectrum analyser, 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 tests were performed at three frequencies (low channel, middle channel and high channel). The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1 percent of the selected span as is possible without being below 1 percent. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual. The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 percent of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded. The span between the two recorded frequencies is the occupied bandwidth.

Remark: Reference test setup 1

Test Settings

- The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
- 2. RBW = 1 5% of the expected OBW
- VBW ≥ 3 x RBW
- Detector = Peak
- Trace mode = max hold
- 6. Sweep = auto couple
- 7. The trace was allowed to stabilize
- 8. If necessary, steps 2 7 were repeated after changing the RBW such that it would be within
 - 1 5% of the 99% occupied bandwidth observed in Step 7



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4.5 Band Edge at Antenna Terminals

Measurement Procedure: FCC KDB 971168 D01 V03r01 Section 6.0

The transmitter output was connected to a calibrated coaxial cable, attenuator and Spectrum analyser, 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 tests were performed at two frequencies (low channel and high channel).in the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of 100kHz or 1% of the emission bandwidth of the fundamental emission of the transmitter may be employed. The EUT emission bandwidth is measured as the width of the signal between two points, outside of which all emission are attenuated at least 26dB below the transmitter power. The video bandwidth of the spectrum analyzer was set at thrice the resolution bandwidth. Detector Mode was set to rms.

Remark: Reference test setup 1

Test Settings

- 1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
- 2. Span was set large enough so as to capture all out of band emissions near the band edge
- 3. RBW > 1% of the emission bandwidth
- VBW > 3 x RBW
- 5. Detector = RMS
- Number of sweep points ≥ 2 x Span/RBW
- 7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
- 8. Sweep time = auto couple
- The trace was allowed to stabilize



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4.6 Spurious And Harmonic Emissions at Antenna Terminal

Measurement Procedure: FCC KDB 971168 D01 V03r01 Section 6.0

The transmitter output was connected to a calibrated coaxial cable, attenuator and Spectrum analyzer, 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 tests were performed at three frequencies (low channel and high channel). The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log(P) dB. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

Remark: Reference test setup 1

Test Settings

- 1. Start frequency was set to 9kHz and stop frequency was set to at least 10* the fundamental frequency(Separated into at least two plots per channel)
- 2. Detector = RMS
- 3. Trace mode = trace average for continuous emissinos, max hold for pulse emissions
- 4. Sweep time = auto couple
- 5. The trace was allowed to stabilize
- 6. Please see test notes below for RBW and VBW settings



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4.7 Peak-Average Ratio

Measurement Procedure: FCC KDB 971168 D01 V03r01 Section 5.7.2

A peak to average ratio measurement is performed at the conducted port of the EUT. For WCDMA signals, the spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level. For GSM signals, an average and a peak trace are used on a spectrum analyzer to determine the largest deviation between the average and the peak power of the EUT in a bandwidth greater than the emission bandwidth. The traces are generated with the spectrum analyzer set to zero span mode.

Remark: Reference test setup 1

Test Settings

- 1. The signal analyzer's CCDF measurement profile is enabled
- 2. Frequency = carrier center frequency
- Measurement BW > Emission bandwidth of signal
- 4. The signal analyzer was set to collect one million samples to generate the CCDF curve
- 5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power



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4.8 Field Strength of Spurious Radiation

Measurement Procedure: FCC KDB 971168 D01 V03r01 Section 5.8

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). Test the EUT in the lowest channel, the middle channel ,the Highest channel.
- 5). 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.
- 6). Repeat above procedures until all frequencies measured was complete.

E (dB μ V/m) = Measured amplitude level (dB μ V) + (Cable Loss (dB) + Antenna Factor (dB/m) – AMP(dB)) EIRP (dBm) = E (dB μ V/m) + 20 log D – 104.8; where D is the measurement distance in meters

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:

E (dB μ V/m) = Measured amplitude level (dB μ V) + (Cable Loss (dB) + Antenna Factor (dB/m) – AMP(dB)) EIRP (dBm) = E (dB μ V/m) + 20 log D – 104.8; where D is the measurement distance in meters

- 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 Z 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

Remark1: Reference test setup 2

Remark2: The emission below 18G were measured at a 3m test distance, while emissions above 18GHz were measured at a 1m test distance. At a measurement distance of 1 meter the limit line was increased by 20*LOG(3/1) = 9.54 dB.

Remark: Reference test setup 2

Remark

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier gain. The basic equation with a sample calculation is as follows:

Level = Reading Level + AF(dB/m) + Factor(dB)-95.26

AF = Antenna Factor(dB/m)

Factor = Cable Factor(dB) - Preamplifier gain (dB)

Margin = Limit(dBm) - Level(dBm)

2) Scan from 9kHz to 40GHz, The disturbance between 9KHz to 30MHz and 18GHz to 40GHz was very low, and the harmonics were the highest point could be found when testing, so only the harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

3) All modes have been tested, but only the worst case data displayed in this report.



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4.9 Frequency Stability / Temperature Variation

Measurement Procedure:

Frequency stability testing is performed in accordance with the guidelines of FCC KDB 971168 D01 V03r01; Section 9

- . The frequency stability of the transmitter is measured by:
- a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

Specification – The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency.

Time Period and Procedure:

- 1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
- 2. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
- 3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

Remark: Reference test setup 3



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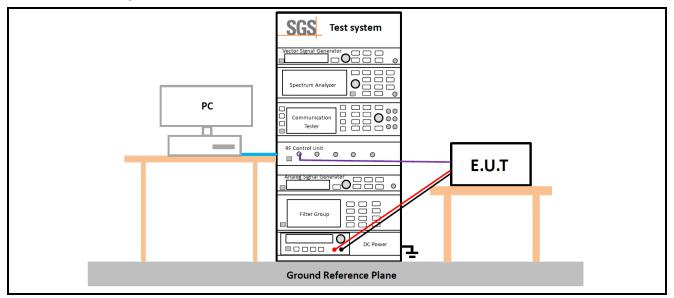
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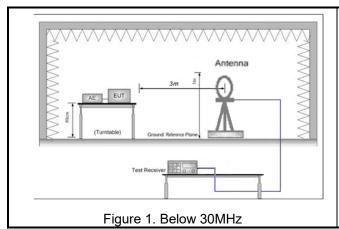
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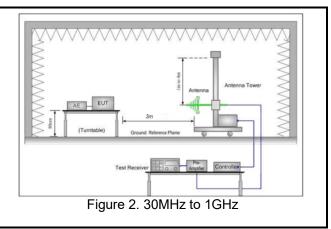
4.10Test Setups

4.10.1 Test Setup 1



4.10.2 Test Setup 2







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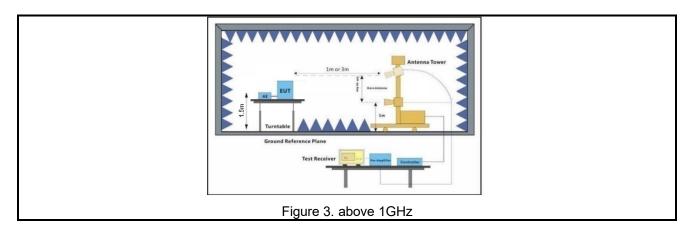
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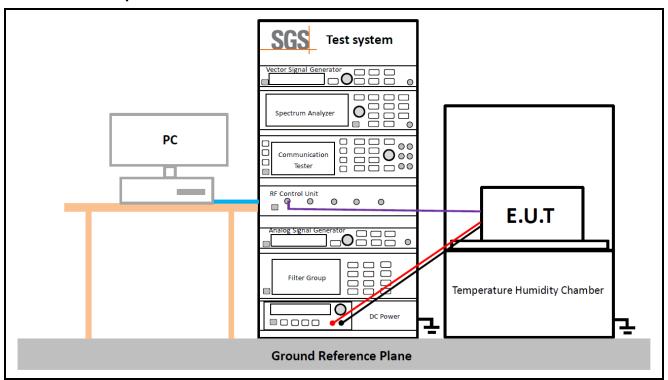
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4.10.3 Test Setup 3





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4.11Test Conditions

4.111est conditions				
Transmit Output Power Data - Average Power, Spectral Density				
Test Case	Test Conditions			
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	GSM/TM1;GSM/TM2;UMTS/TM1; LTE/TM1;LTE/TM2; LTE/TM3			
	Peak-to-Average Ratio			
Test Case	Test Conditions			
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	GSM/TM1;GSM/TM2;UMTS/TM1; LTE/TM1;LTE/TM2; LTE/TM3			
Bandwidth - Occupied Bandwidth				
Test Case	Test Conditions			
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	GSM/TM1;GSM/TM2;UMTS/TM1; LTE/TM1;LTE/TM2; LTE/TM3			
	Bandwidth - Emission Bandwidth			
Test Case	Test Conditions			
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	GSM/TM1;GSM/TM2;UMTS/TM1; LTE/TM1;LTE/TM2; LTE/TM3			
Band Edges Compliance				
Test Case	Test Conditions			
Test Environment	Ambient Climate & Rated Voltage			
Test Setup	Test Setup 1			
RF Channels (TX)	L, H (L= low channel, H= high channel)			



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Test Mode	GSM/TM1;GSM/TM2;UMTS/TM1; LTE/TM1		
	Spurious Emission at Antenna Terminals		
Test Case	Test Conditions		
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	GSM/TM1;GSM/TM2;UMTS/TM1; LTE/TM1		
Field Strength of Spurious Radiation			
Test Case	Test Conditions		
Test Environment	Ambient Climate & Rated Voltage		
Test Setup	Test Setup 2		
RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)		
Test Mode	GSM/TM1; UMTS/TM1; LTE/TM1 Remark: All bandwidth and modulation of GSM/ UMTS/LTE have been pre tested, and only the worst results are reflected in the report.		
Frequency Stability			
Test Case	Test Conditions		
Test Environment	(1) -30 °C to +50 °C with step 10 °C at Rated Voltage (2) VL, VN and VH of Rated Voltage at Ambient Climate.		
Test Setup	Test Setup 3		
RF Channels (TX)	M (M= middle channel)		
Test Mode	GSM/TM1; UMTS/TM1; LTE/TM1 The report only show the bandwidth with the worst case.		



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5 Main Test Instruments

	RF Test System				
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal.Due date (yyyy/mm/dd)
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-07	2023/08/30	2024/08/29
Radio communication analyzer	Anritsu	MT8821C	XAW01-03-24	2022/11/18	2023/11/17
Spectrum Analyzer	ROHDE&SCHWARZ	FSV3044	XAW01-13-05	2023/05/15	2024/05/14
power supply	Angilent	66311B	XAW01-17-01	2023/02/16	2024/02/15
temperature chamber	Votsch	VT4002	XAW01-18-01	2023/02/16	2024/02/15
RF Control Unit	Tonscend	JS0806-1	XAW03-37-02	NCR	NCR
Temperature and humidity meter	MingGao	T809	XAW01-01-04	2023/09/04	2024/09/03
Measurement Software	Tonscend	JS1120 (3.1.46)	XAW02-15-01	NCR	NCR



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RSE Test System					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal.Due date (yyyy/mm/dd)
Semi-Anechoic Chamber	Brilliant-emc	N/A	XAW03-35-01	2021/09/09	2024/09/08
MXA signal analyzer	Keysight	N9020A	XAW01-06-01	2023/02/16	2024/02/15
Spectrum Analyzer	ROHDE &SCHWARZ	FSV3044	XAW01-13-05	2023/05/15	2024/05/14
Test receiver	ROHDE &SCHWARZ	ESR	XAW01-08-01	2023/08/30	2024/08/29
Receiving antenna (30MHz-3GHz)	Schwarzbeck	VULB 9163	XAW01-09-01	2022/07/28	2024/07/27
Receiving antenna (1GHz~18GHz)	Schwarzbeck	BBHA 9120D	XAW01-09-02	2022/07/28	2024/07/27
Receiving antenna (15GHz~40GHz)	Schwarzbeck	BBHA 9170	XAW01-09-03	2022/07/23	2024/07/22
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	TAP9K3G32	XAW01-41-01	2023/05/15	2024/05/14
Amplifier	Tonscend	TAP01018048	XAW01-41-02	2023/08/30	2024/08/29
Amplifier	Tonscend	TAP18040048	XAW01-41-03	2023/08/30	2024/08/29
Amplifier	Shanghai Steed	YX28980930	XAW01-41-06	2023/08/30	2024/08/29
Temperature and humidity meter	MingGao	TH101B	XAW01-01-02	2023/09/04	2024/09/03
Radio communication analyzer	ROHDE &SCHWARZ	CMW 500	XAW01-03-02	2023/02/16	2024/02/15
Measurement Software	Tonscend	TS+ V4.0.0.0	XAW02-05-01	NCR	NCR
Loop Antenna	Schwarzbeck	FMZB 1519B	XAW01-48-02	2022/05/26	2024/05/25



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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:

No.	Item	Measurement Uncertainty	
1	Total RF power, conducted	±0.65dB	
2	RF power density, conducted	±1.25dB	
3	Spurious emissions, conducted	±0.65dB	
4	Radio Frequency	±9.01 x 10 ⁻⁸ GHz	
5	Duty Cycle	±0.30%	
6	Occupied Bandwidth	±9.01 x 10 ⁻⁸ GHz	
		± 4.6dB (9kHz to 30MHz)	
		± 4.9dB (30MHz to 1GHz)	
7	Radiated Emission	± 4.9dB (1GHz to 6GHz)	
		± 4.7dB (6GHz to 18GHz)	
		± 5.26dB (Above 18GHz)	

Remark:

The U_{lab} (lab Uncertainty) is less than U_{cisprieTSI} (CISPR/ETSI Uncertainty), so the test results

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;

- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.



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7 Appendixes

Appendix A.1	WWAN Setup Photos
Appendix B.1	GSM 850 & 1900
Appendix B.2	WCDMA Band II & IV & V
Appendix B.3	LTE Band 2
Appendix B.4	LTE Band 4
Appendix B.5	LTE Band 5
Appendix B.6	LTE Band 7
Appendix B.7	LTE Band 12
Appendix B.8	LTE Band 13
Appendix B.9	LTE Band 14
Appendix B.10	LTE Band 17
Appendix B.11	LTE Band 25
Appendix B.12	LTE Band 26(814-824)
Appendix B.13	LTE Band 26(824-849)
Appendix B.14	LTE Band 30
Appendix B.15	LTE Band 38
Appendix B.16	LTE Band 41
Appendix B.17	LTE Band 66
Appendix B.18	LTE Band 71

---End of Report---



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