

Report No.: SEWM2208000155RG01

Rev.: 01

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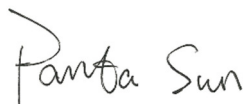
TEST REPORT

Application No.: SEWM2208000155RG
Applicant: NCXX Inc.
Address of Applicant: 2-32-1, Kunuginome, Hanamaki, Iwate-Pref 025-0323, Japan
Manufacturer: NCXX Inc.
Address of Manufacturer: 2-32-1, Kunuginome, Hanamaki, Iwate-Pref 025-0323, Japan
EUT Description: 5G Portable Modem
Model No.: UNX-05G
Trade Mark: NCXX
FCC ID: SLKUNX-05G
Standards: 47 CFR Part 2
47 CFR Part 22
47 CFR Part 24
47 CFR Part 27
47 CFR Part 90
Date of Receipt: 2022/08/30
Date of Test: 2022/09/03 to 2022/10/12
Date of Issue: 2022/10/27

Test Result :**PASS ***

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

Authorized Signature:



Panta Sun
Wireless Laboratory Manager



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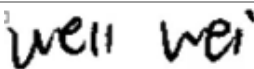
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1 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2022/10/27		Original

Prepared By		
		(Weller Liu) / Test Engineer
Checked By		
		(Well Wei) / Reviewer



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2 Test Summary

2.1 LTE Band 5/26(824~849 MHz)/LTE CA_5B

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.3&B.6&B.9	Pass
Peak-Average Ratio	§22.913(d)	Limit≤13 dB	Section 2 of Appendix B.3&B.6&B.9	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B.3&B.6&B.9	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B.3&B.6&B.9	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 5 of Appendix B.3&B.6&B.9	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 6 of Appendix B.3&B.6&B.9	Pass
Field Strength of Spurious Radiation	§2.1053, §22.917(a)	FCC: ≤ -13 dBm/100 kHz.	Section 7 of Appendix B.3&B.6&B.9	Pass
Frequency Stability	§2.1055(a)(1)(b) §2.1055(d)(1)§22.355	≤ ±2.5ppm.	Section 8 of Appendix B.3&B.6&B.9	Pass



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2.2 LTE Band 2

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046, §24.232(c)	$EIRP \leq 2\text{ W}$	Section 1 of Appendix B.1	Pass
Peak-Average Ratio	§24.232(d)	$Limit \leq 13\text{ dB}$	Section 2 of Appendix B.1	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B.1	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B.1	Pass
Band Edges Compliance	§2.1051, §24.238(a)	$\leq -13\text{ dBm}/1\% \cdot EBW$, in 1 MHz bands immediately outside and adjacent to the frequency block.	Section 5 of Appendix B.1	Pass
Spurious Emission at Antenna Terminals	§2.1051, §24.238(a)	$\leq -13\text{ dBm}/1\text{ MHz}$, from 9 kHz to 10 th harmonics but outside authorized operating frequency ranges.	Section 6 of Appendix B.1	Pass
Field Strength of Spurious Radiation	§2.1053, §24.238(a)	$\leq -13\text{ dBm}/1\text{ MHz}$.	Section 7 of Appendix B.1	Pass
Frequency Stability	§2.1055(a)(1)(b) §2.1055(d)(1)§24.235	Within authorized bands of operation/frequency block.	Section 8 of Appendix B.1	Pass



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2.3 LTE Band 4

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(d)(4)	$EIRP \leq 1\text{ W}$	Section 1 of Appendix B.2	Pass
Peak-Average Ratio	§27.50(d)(5)	Limit $\leq 13\text{ dB}$	Section 2 of Appendix B.2	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B.2	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B.2	Pass
Band Edges Compliance	§2.1051, §27.53(h)	$\leq -13\text{ dBm}/1\% \cdot \text{EBW}$, in 1 MHz bands immediately outside and adjacent to the frequency block.	Section 5 of Appendix B.2	Pass
Spurious Emission at Antenna Terminals	§2.1051, §27.53(h)	$\leq -13\text{ dBm}/1\text{ MHz}$, from 9 kHz to 10 th harmonics but outside authorized operating frequency ranges.	Section 6 of Appendix B.2	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(h)	$\leq -13\text{ dBm}/1\text{ MHz}$.	Section 7 of Appendix B.2	Pass
Frequency Stability	§2.1055(a)(1)(b) §2.1055(d)(1)§27.54	Within authorized bands of operation/frequency block.	Section 8 of Appendix B.2	Pass



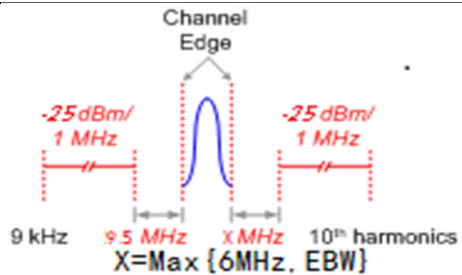
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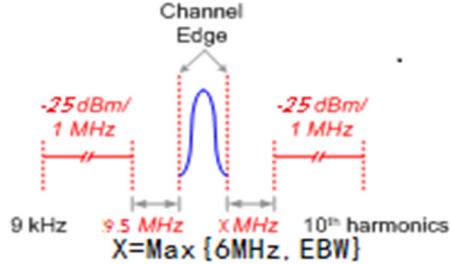
2.4 LTE Band 7/41/CA_7C/ CA_41C

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(h)(2)	$EIRP \leq 2W$	Section 1 of Appendix B.4&B.7&B.10 &B.11	Pass
Peak-Average Ratio	---	$\leq 13 \text{ dB}$	Section 2 of Appendix B.4&B.7&B.10 &B.11	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B.4&B.7&B.10 &B.11	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B.4&B.7&B.10 &B.11	Pass
Band Edges Compliance	§2.1051, §27.53(m4)	For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P) \text{ dB}$ on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P) \text{ dB}$ on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P) \text{ dB}$ 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 defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log (P) \text{ dB}$ on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P) \text{ dB}$ at or below 2490.5 MHz.	Section 5 of Appendix B.4&B.7&B.10 &B.11	Pass
Spurious Emission at Antenna Terminals	§2.1051, §27.53(m)		Section 6 of Appendix B.4&B.7&B.10 &B.11	Pass

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Field Strength of Spurious Radiation	§2.1053, §27.53(m)		Section 7 of Appendix B.4&B.7&B.10 &B.11	Pass
Frequency Stability	§2.1055(a)(1)(b) §2.1055(d)(1)§27.54	Within authorized bands of operation/frequency block.	Section 8 of Appendix B.4&B.7&B.10 &B.11	Pass



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2.5 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.5	Pass
Peak-Average Ratio	---	Limit≤13 dB	Section 2 of Appendix B.5	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B.5	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B.5	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 5 of Appendix B.5	Pass
Spurious Emission at Antenna Terminals	§2.1051, §90.691	< 43 + 10Log10(P[Watts]) for all out-of-band emissions	Section 6 of Appendix B.5	Pass
Field Strength of Spurious Radiation	§2.1053, §90.691	< 43 + 10Log10(P[Watts]) for all out-of-band emissions	Section 7 of Appendix B.5	Pass
Frequency Stability	§2.1055(a)(1)(b) §2.1055(d)(1)§90.213	Within authorized bands of operation/frequency block.	Section 8 of Appendix B.5	Pass



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2.6 LTE Band 42/CA_42

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(k)(3)	EIRP ≤ 30dBm	Section 1 of Appendix B.8&B.12	Pass
Peak-Average Ratio	§27.50(k)(4)	Limit≤13 dB	Section 2 of Appendix B.8&B.12	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B.8&B.12	Pass
Band Edges Compliance	§2.1051, §27.53(n)(2)	For mobile operations in the 3450-3550 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz.	Section 5 of Appendix B.8&B.12	Pass
Spurious Emission at Antenna Terminals	§2.1051, §27.53(n)(2)	For mobile operations in the 3450-3550 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz.	Section 6 of Appendix B.8&B.12	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(n)(2)	For mobile operations in the 3450-3550 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz.	Section 7 of Appendix B.8&B.12	Pass
Frequency Stability	§2.1055(a)(1)(b) §2.1055(d)(1) §27.54	Within authorized bands of operation/ frequency block.	Section 8 of Appendix B.8&B.12	Pass



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3 General Information

3.1 Details of Client

Applicant:	NCXX Inc.
Address of Applicant:	2-32-1, Kunuginome, Hanamaki, Iwate-Pref 025-0323, Japan
Manufacturer:	NCXX Inc.
Address of Manufacturer:	2-32-1, Kunuginome, Hanamaki, Iwate-Pref 025-0323, Japan

3.2 Test Location

Company:	SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd.
Address:	South of No. 6 Plant, No. 1, Runsheng Road, Suzhou Industrial Park, Suzhou Area, China (Jiangsu) Pilot Free Trade Zone
Post code:	215000
Test engineer:	Weller Liu, Tizzy Song

3.3 Test Facility

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

- **A2LA (Certificate No. 6336.01)**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6336.01.

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

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0120.

IC#: 27594.

- **FCC –Designation Number: CN1312**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized as an accredited testing laboratory.

Designation Number: CN1312.

Test Firm Registration Number: 717327



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3.4 General Description of EUT

EUT Description:	5G Portable Modem		
Model No.:	UNX-05G		
Trade Mark:	NCXX		
Hardware Version:	SRT851N_V1.02		
Software Version:	UNX-05G_8.0.7_EQ100		
IMEI:	RF Conducted	354942230001013	
	RSE	354942230001435	
Antenna Type:	<input type="checkbox"/> External, <input checked="" type="checkbox"/> Integrated		
Antenna Gain:	LTE Band 2:	2.50dBi (Ant0)	2.1dBi (Ant1)
	LTE Band 4:	2.2dBi (Ant1)	
	LTE Band 5:	0.81dBi (Ant0)	
	LTE Band 7:	2.0dBi(Ant0)	2.4dBi (Ant1)
	LTE Band 26:	0.81dBi(Ant0)	
	LTE Band 41:	2.4dBi(Ant1)	
	LTE Band 42:	2.1dBi (Ant4)	2.3dBi(Ant6)
	LTE CA_5B:	0.81dBi (Ant0)	
	LTE CA_7C:	2.0dBi(Ant0)	2.4dBi (Ant1)
	LTE CA_41C:	2.4dBi(Ant1)	
	LTE CA_42C:	2.1dBi (Ant4)	2.3dBi(Ant6)
	Note: The antenna gain are derived from the gain information report provided by the manufacturer.		
RF Cable:	0.8dB(Below 1GHz)	1.0dB(1.0~2.4GHz)	1.2dB(2.4~3.4GHz)
	1.5dB(Above 3.4GHz)		
Remark: 1.This report all antennas are tested, and only the worst data is presented. 2.As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.			



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3.5 Test Mode

Test Mode	Test Modes Description
LTE/TM1	LTE system, QPSK modulation
LTE/TM2	LTE system, 16QAM modulation
LTE/TM3	LTE system, 64QAM modulation
LTE/TM4	LTE system, 256QAM modulation
Remark: The test mode(s) are selected according to relevant radio technology specifications.	

3.6 Test Environment

Environment Parameter	101 kPa Selected Values During Tests	
Relative Humidity	44-46 % RH Ambient	
Value	Temperature(°C)	Voltage(V)
NTNV	22~23	5
LTLV	-30	4.5
LTHV	-30	13.2
HTLV	50	4.5
HTHV	50	13.2
Remark: NV: Normal Voltage LV: Low Extreme Test Voltage HV: High Extreme Test Voltage NT: Normal Temperature LT: Low Extreme Test Temperature HT: High Extreme Test Temperature		

3.7 Description of Support Units

The EUT has been tested as an independent unit.



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3.8 Technical Specification

Characteristics	Description		
Radio System Type	<input checked="" type="checkbox"/> LTE		
Supported Frequency Range Supported Channel Bandwidth	Band	TX	RX
	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 7	2500 to 2570 MHz	2620 to 2690 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 894 MHz
	LTE Band 41	2496 to 2690MHz	2496 to 2690MHz
	LTE Band 42	3450 to 3550 MHz	3450 to 3550 MHz
	LTE CA_5B	824 to 849 MHz	869 to 894 MHz
	LTE CA_7C	2500 to 2570 MHz	2620 to 2690 MHz
	LTE CA_41C	2496 to 2690MHz	2496 to 2690MHz
	LTE CA_42C	3450 to 3550 MHz	3450 to 3550 MHz
	LTE UL CA_2A-4A	1850 to 1910 MHz 1710 to 1755 MHz	1930 to 1990 MHz 2110 to 2155 MHz
	LTE UL CA_2A-5A	1850 to 1910 MHz 824 to 849 MHz	1930 to 1990 MHz 869 to 894 MHz
	LTE UL CA_2A-7A	1850 to 1910 MHz 2500 to 2570 MHz	1930 to 1990 MHz 2620 to 2690 MHz
	LTE UL CA_4A-5A	1710 to 1755 MHz 824 to 849 MHz	2110 to 2155 MHz 869 to 894 MHz
	LTE UL CA_4A-7A	1710 to 1755 MHz 2500 to 2570 MHz	2110 to 2155 MHz 2620 to 2690 MHz
	LTE UL CA_5A-7A	824 to 849 MHz 2500 to 2570 MHz	869 to 894 MHz 2620 to 2690 MHz
	LTE UL CA_41A-42A	2496 to 2690MHz 3450 to 3550 MHz	2496 to 2690MHz 3450 to 3550 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	



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	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 7	<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 26(814-824)	<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 26(824-849)	<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			
	LTE Band41	<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 Band42	<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 CA_5B	<input checked="" type="checkbox"/> 10MHz+10MHz		<input checked="" type="checkbox"/> 10MHz+5MHz	
		<input checked="" type="checkbox"/> 3MHz+5MHz		<input checked="" type="checkbox"/> 5MHz+10MHz	
		<input checked="" type="checkbox"/> 5MHz+3MHz			
	LTE Band CA_7C	<input checked="" type="checkbox"/> 10MHz+15MHz		<input checked="" type="checkbox"/> 10MHz+20MHz	
		<input checked="" type="checkbox"/> 15MHz+15MHz		<input checked="" type="checkbox"/> 15MHz+20MHz	
		<input checked="" type="checkbox"/> 20MHz+20MHz			
	LTE Band CA_41C	<input checked="" type="checkbox"/> 5MHz+20MHz		<input checked="" type="checkbox"/> 10MHz+15MHz	
		<input checked="" type="checkbox"/> 10MHz+20MHz		<input checked="" type="checkbox"/> 15MHz+15MHz	
		<input checked="" type="checkbox"/> 15MHz+20MHz		<input checked="" type="checkbox"/> 20MHz+20MHz	
	LTE Band CA_42C	<input checked="" type="checkbox"/> 5MHz+20MHz		<input checked="" type="checkbox"/> 10MHz+20MHz	
		<input checked="" type="checkbox"/> 15MHz+20MHz		<input checked="" type="checkbox"/> 20MHz+20MHz	
	LTE UL CA_2A-4A	<input checked="" type="checkbox"/> 1.4MHz +5MHz		<input checked="" type="checkbox"/> 20MHz+20MHz	
	LTE UL CA_2A-5A	<input checked="" type="checkbox"/> 5MHz +5MHz		<input checked="" type="checkbox"/> 10MHz +20MHz	
	LTE UL CA_2A-7A	<input checked="" type="checkbox"/> 5MHz +5MHz		<input checked="" type="checkbox"/> 20MHz+20MHz	
	LTE UL CA_4A-5A	<input checked="" type="checkbox"/> 5MHz +5MHz		<input checked="" type="checkbox"/> 10MHz +20MHz	
	LTE UL CA_4A-7A	<input checked="" type="checkbox"/> 5MHz +5MHz		<input checked="" type="checkbox"/> 10MHz +20MHz	
	LTE UL CA_5A-7A	<input checked="" type="checkbox"/> 1.4MHz +10MHz		<input checked="" type="checkbox"/> 10MHz +20MHz	
	LTE UL CA_41A-42A	<input checked="" type="checkbox"/> 10MHz +20MHz			
	CA: LTE UL CA_2A-4A;LTE UL CA_2A-5A;LTE UL CA_2A-7A;LTE UL CA_4A-5A; LTE UL CA_4A-7A;LTE UL CA_5A-7A;LTE UL CA_41A-42A ULCA intra-band Only test RSE, report only show worst mode				
Designation of Emissions (Remark: the necessary bandwidth of which is the worst value from the measured occupied bandwidths for each type of channel bandwidth	E-UTRA:	QPSK	16QAM	64QAM	256QAM
	LTE Band 2	1M11G7D	1M11W7D	1M11W7D	1M11W7D
		2M70G7D	2M70W7D	2M70W7D	2M70W7D
		4M48G7D	4M48W7D	4M48W7D	4M48W7D
		8M96G7D	8M97W7D	8M95W7D	8M95W7D



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configuration.)		13M5G7D	13M5W7D	13M5W7D	13M5W7D
		17M9G7D	18M0W7D	17M9W7D	17M9W7D
	LTE Band 4	1M11G7D	1M11W7D	1M11W7D	1M11W7D
		2M70G7D	2M70W7D	2M70W7D	2M70W7D
		4M47G7D	4M48W7D	4M48W7D	4M48W7D
		8M95G7D	8M94W7D	8M95W7D	8M95W7D
		13M5G7D	13M5W7D	13M5W7D	13M5W7D
		17M9G7D	18M0W7D	17M9W7D	17M9W7D
	LTE Band 5	1M11G7D	1M11W7D	1M11W7D	1M11W7D
		2M70G7D	2M70W7D	2M70W7D	2M70W7D
		4M49G7D	4M48W7D	4M48W7D	4M48W7D
		8M95G7D	8M95W7D	8M94W7D	8M95W7D
	LTE Band 7	4M48G7D	4M48W7D	4M48W7D	4M48W7D
		8M96G7D	8M96W7D	8M95W7D	8M95W7D
		13M5G7D	13M5W7D	13M5W7D	13M5W7D
		17M9G7D	17M9W7D	17M9W7D	17M9W7D
	LTE Band 26 (814-824)	1M10G7D	1M11W7D	1M11W7D	1M11W7D
		2M70G7D	2M70W7D	2M70W7D	2M70W7D
		4M49G7D	4M48W7D	4M48W7D	4M48W7D
		8M94G7D	8M93W7D	8M94W7D	8M95W7D
	LTE Band 26 (824-849)	1M11G7D	1M11W7D	1M11W7D	1M11W7D
		2M70G7D	2M70W7D	2M70W7D	2M70W7D
		4M48G7D	4M48W7D	4M48W7D	4M48W7D
		8M95G7D	8M96W7D	8M96W7D	8M95W7D
		13M6G7D	13M5W7D	13M5W7D	13M5W7D
	LTE Band 41	4M48G7D	4M48W7D	4M48W7D	4M49W7D
		8M95G7D	8M95W7D	8M95W7D	8M96W7D
		13M5G7D	13M5W7D	13M5W7D	13M5W7D
		18M0G7D	18M0W7D	17M9W7D	17M9W7D
	LTE Band 42	4M52G7D	4M52W7D	4M53W7D	4M52W7D
		9M01G7D	9M03W7D	9M03W7D	9M01W7D
		13M5G7D	13M5W7D	13M5W7D	13M5W7D
		18M1G7D	18M1W7D	18M0W7D	18M0W7D
	LTE Band CA_5B	50RB+50RB:			



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		18M9G7D	18M8W7D	18M8W7D	18M9W7D
		50RB+25RB:			
		13M9G7D	13M9W7D	13M9W7D	13M9W7D
		25RB+50RB:			
		13M9G7D	13M9W7D	13M9W7D	13M9W7D
	LTE Band CA_7C	50RB+100RB:			
		27M7G7D	27M7W7D	27M7W7D	27M7W7D
		75RB+50RB:			
		23M2G7D	23M2W7D	23M1W7D	23M2W7D
		75RB+75RB:			
		28M3G7D	28M3W7D	28M3W7D	28M3W7D
		75RB+100RB:			
		32M5G7D	32M6W7D	32M6W7D	32M6W7D
		100RB+50RB:			
		27M8G7D	27M8W7D	27M7W7D	27M7W7D
		100RB+75RB:			
		32M7G7D	32M6W7D	32M6W7D	32M7W7D
		100RB+100RB:			
		37M8G7D	37M7W7D	37M7W7D	37M7W7D
	LTE Band CA_41C	25RB+100RB:			
		23M0G7D	23M0W7D	23M0W7D	23M0W7D
		50RB+75RB:			
		23M3G7D	23M2W7D	23M2W7D	23M2W7D
		50RB+100RB:			
		27M8G7D	27M8W7D	27M8W7D	27M8W7D
		75RB+50RB:			
		23M2G7D	23M2W7D	23M2W7D	23M2W7D
		75RB+75RB:			
		28M4G7D	28M4W7D	28M4W7D	28M4W7D
		75RB+100RB:			
		32M7G7D	32M7W9D	32M6W7D	32M7W7D
		100RB+25RB:			
		23M0G7D	23M0W7D	22M9W7D	22M9W7D
		100RB+75RB:			



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		32M7G7D	32M7W7D	32M7W7D	32M7W7D
		100RB+100RB:			
LTE Band CA_42C		37M9G7D	37M8W7D	37M9W7D	37M9W7D
		25RB+100RB:			
		23M0G7D	22M9W7D	22M9W7D	22M9W7D
		50RB+100RB:			
		28M3G7D	28M2W7D	28M1W7D	28M1W7D
		75RB+100RB:			
		33M0G7D	33M0W7D	33M0W7D	33M0W7D
		100RB+25RB:			
		23M0G7D	23M0W7D	23M0W7D	22M9W7D
		100RB+50RB:			
		28M3G7D	28M3W7D	28M2W7D	28M2W7D
		100RB+75RB:			
		33M1G7D	33M0W7D	33M0W7D	33M0W7D
		100RB+100RB:			
		37M8G7D	37M8W7D	37M9W7D	37M8W7D



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3.9 Test Frequencies

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
		RX	Channel 607	Channel 900	Channel 1193
			1930.7 MHz	1960 MHz	1989.3 MHz
	3MHz	TX	Channel 18615	Channel 18900	Channel 19185
			1851.5 MHz	1880 MHz	1908.5 MHz
		RX	Channel 615	Channel 900	Channel 1185
			1931.5 MHz	1960 MHz	1988.5 MHz
	5MHz	TX	Channel 18625	Channel 18900	Channel 19175
			1852.5 MHz	1880 MHz	1907.5 MHz
		RX	Channel 625	Channel 900	Channel 1175
			1932.5 MHz	1960 MHz	1987.5 MHz
	10MHz	TX	Channel 18650	Channel 18900	Channel 19150
			1855 MHz	1880 MHz	1905 MHz
		RX	Channel 650	Channel 900	Channel 1150
			1935 MHz	1960 MHz	1985 MHz
	15MHz	TX	Channel 18675	Channel 18900	Channel 19125
			1857.5 MHz	1880 MHz	1902.5 MHz
		RX	Channel 675	Channel 900	Channel 1125
			1937.5 MHz	1960 MHz	1982.5 MHz
	20MHz	TX	Channel 18700	Channel 18900	Channel 19100
			1860 MHz	1880 MHz	1900 MHz
		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 1710.7 MHz	Channel 20175 1732.5 MHz	Channel 20393 1754.3 MHz
		RX	Channel 1975 2112.5 MHz	Channel 2175 2132.5MHz	Channel 2375 2152.5 MHz
	3MHz	TX	Channel 19965 1711.5 MHz	Channel 20175 1732.5 MHz	Channel 20385 1753.5 MHz
		RX	Channel 2000 2115 MHz	Channel 2175 2132.5MHz	Channel 2350 2150 MHz
	5MHz	TX	Channel 19975 1712.5 MHz	Channel 20175 1732.5 MHz	Channel 20375 1752.5 MHz
		RX	Channel 1975 2112.5 MHz	Channel 2175 2132.5MHz	Channel 2375 2152.5 MHz
	10MHz	TX	Channel 20000 1715 MHz	Channel 20175 1732.5 MHz	Channel 20350 1750 MHz
		RX	Channel 2000 2115 MHz	Channel 2175 2132.5MHz	Channel 2350 2150 MHz
	15MHz	TX	Channel 20025 1717.5 MHz	Channel 20175 1732.5 MHz	Channel 20325 1747.5 MHz
		RX	Channel 2025 2117.5 MHz	Channel 2175 2132.5MHz	Channel 2325 2147.5 MHz
	20MHz	TX	Channel 20050 1720 MHz	Channel 20175 1732.5 MHz	Channel 20300 1745 MHz
		RX	Channel 2050 2120 MHz	Channel 2175 2132.5MHz	Channel 2300 2145 MHz

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



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

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



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

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



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Test Mode	Bandwidth	TX / RX	RF Channel		
			Low (L)	Middle (M)	High (H)
LTE Band 42 (3450-3550)	5MHz	TX	Channel 42115	Channel 42590	Channel 43065
			3452.5 MHz	3500 MHz	3547.5 MHz
		RX	Channel 42115	Channel 42590	Channel 43065
			3452.5 MHz	3500 MHz	3547.5 MHz
	10MHz	TX	Channel 42140	Channel 42590	Channel 43040
			3455 MHz	3500 MHz	3545 MHz
		RX	Channel 42140	Channel 42590	Channel 43040
			3455 MHz	3500 MHz	3545 MHz
	15MHz	TX	Channel 42165	Channel 42590	Channel 43015
			3457.5 MHz	3500 MHz	3542.5 MHz
		RX	Channel 42165	Channel 42590	Channel 43015
			3457.5 MHz	3500 MHz	3542.5 MHz
	20MHz	TX	Channel 42190	Channel 42590	Channel 42990
			3460 MHz	3500 MHz	3540 MHz
		RX	Channel 42190	Channel 42590	Channel 42990
			3460 MHz	3500 MHz	3540 MHz



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Table 4.3.1.1.5A-1: Test frequencies for CA_5B

Range	CC-Combo / N _{RB_agg} [RB]	CC1 Note1					CC2 Note1				
		BW [RB]	N _{UL}	f _{UL} [MHz]	N _{DL}	f _{DL} [MHz]	BW [RB]	N _{UL}	f _{UL} [MHz]	N _{DL}	f _{DL} [MHz]
Low	15+25	15	20416	825.6	2416	870.6	25	20455	829.5	2455	874.5
		25	20425	826.5	2425	871.5	15	20464	830.4	2464	875.4
	25+50	25	20428	826.8	2428	871.8	50	20500	834	2500	879
	50+25	50	20450	829	2450	874	25	20522	836.2	2522	881.2
	50+50	50	20450	829	2450	874	50	20549	838.9	2549	883.9
Mid	15+25	15	20501	834.1	2501	879.1	25	20540	838.0	2540	883.0
		25	20510	835.0	2510	880.0	15	20549	838.9	2549	883.9
	25+50	25	20478	831.8	2478	876.8	50	20550	839	2550	884
	50+25	50	20500	834	2500	879	25	20572	841.2	2572	886.2
	50+50	50	20476	831.6	2476	876.6	50	20575	841.5	2575	886.5
High	15+25	15	20586	842.6	2586	887.6	25	20625	846.5	2625	891.5
		25	20595	843.5	2595	888.5	15	20634	847.4	2634	892.4
	25+50	25	20528	836.8	2528	881.8	50	20600	844	2600	889
	50+25	50	20550	839	2550	884	25	20622	846.2	2622	891.2
	50+50	50	20501	834.1	2501	879.1	50	20600	844	2600	889

Note 1: Carriers in increasing frequency order.

Table 4.3.1.1.7A-1: Test frequencies for CA_7C

Range	CC-Combo / N _{RB_agg} [RB]	CC1 Note1					CC2 Note1				
		BW [RB]	N _{UL}	f _{UL} [MHz]	N _{DL}	f _{DL} [MHz]	BW [RB]	N _{UL}	f _{UL} [MHz]	N _{DL}	f _{DL} [MHz]
Low	50+100	50	20805	2505.5	2805	2625.5	100	20949	2519.9	2949	2639.9
		100	20850	2510	2850	2630	50	20994	2524.4	2994	2644.4
	75+50	75	20825	2507.5	2825	2627.5	50	20945	2519.5	2945	2639.5
	75+75	75	20825	2507.5	2825	2627.5	75	20975	2522.5	2975	2642.5
	75+100	75	20828	2507.8	2828	2627.8	100	20999	2524.9	2999	2644.9
		100	20850	2510	2850	2630	75	21021	2527.1	3021	2647.1
Mid	100+100	100	20850	2510	2850	2630	100	21048	2529.8	3048	2649.8
		50	21006	2525.6	3006	2645.6	100	21150	2540	3150	2660
	50+100	100	21051	2530.1	3051	2650.1	50	21195	2544.5	3195	2664.5
		75	21051	2530.1	3051	2650.1	50	21171	2542.1	3171	2662.1
	75+50	75	21025	2527.5	3025	2647.5	75	21175	2542.5	3175	2662.5
	75+75	75	21003	2525.3	3003	2645.3	100	21174	2542.4	3174	2662.4
High	75+100	100	21026	2527.6	3026	2647.6	75	21197	2544.7	3197	2664.7
		100	21001	2525.1	3001	2645.1	100	21199	2544.9	3199	2664.9
	100+100	100	21001	2525.1	3001	2645.1	100	21199	2544.9	3199	2664.9
		50	21206	2545.6	3206	2665.6	100	21350	2560	3350	2680
	50+100	100	21251	2550.1	3251	2670.1	50	21395	2564.5	3395	2684.5
		75	21277	2552.7	3277	2672.7	50	21397	2564.7	3397	2684.7
	75+50	75	21225	2547.5	3225	2667.5	75	21375	2562.5	3375	2682.5
		75	21179	2542.9	3179	2662.9	100	21350	2560	3350	2680
	75+75	100	21201	2545.1	3201	2665.1	75	21372	2562.2	3372	2682.2
		100	21152	2540.2	3152	2660.2	100	21350	2560	3350	2680
	100+100	100	21152	2540.2	3152	2660.2	100	21350	2560	3350	2680
		100	21152	2540.2	3152	2660.2	100	21350	2560	3350	2680

Note 1: Carriers in increasing frequency order.



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t (86-512) 62992980 sgs.china@sgs.com

Table 4.3.1.2.9A-1: Test frequencies for CA_41C

Range	CC-Combo / N _{RB_agg} [RB]	CC1 Note1			CC2 Note1		
		BW [RB]	N _{UL/DL}	f _{UL/DL} [MHz]	BW [RB]	N _{UL/DL}	f _{UL/DL} [MHz]
Low	25+100	25	39683	2499.3	100	39800	2511
		100	39750	2506	25	39867	2517.7
	50+75	50	39703	2501.3	75	39823	2513.3
		75	39725	2503.5	50	39845	2515.5
	50+100	50	39705	2501.5	100	39849	2515.9
		100	39750	2506	50	39894	2520.4
	75+75	75	39725	2503.5	75	39875	2518.5
		75	39728	2503.8	100	39899	2520.9
	75+100	100	39750	2506	75	39921	2523.1
		100	39750	2506	100	39948	2525.8
Mid	25+100	25	40528	2583.8	100	40645	2595.5
		100	40595	2590.5	25	40712	2602.2
	50+75	50	40549	2585.9	75	40669	2597.9
		75	40571	2588.1	50	40691	2600.1
	50+100	50	40526	2583.6	100	40670	2598.0
		100	40571	2588.1	50	40715	2602.5
	75+75	75	40545	2585.5	75	40695	2600.5
		75	40523	2583.3	100	40694	2600.4
	75+100	100	40546	2585.6	75	40717	2602.7
		100	40521	2583.1	100	40719	2602.9
High	25+100	25	41373	2668.3	100	41490	2680
		100	41440	2675	25	41557	2686.7
	50+75	50	41395	2670.5	75	41515	2682.5
		75	41417	2672.7	50	41537	2684.7
	50+100	50	41346	2665.6	100	41490	2680
		100	41391	2670.1	50	41535	2684.5
	75+75	75	41365	2667.5	75	41515	2682.5
		75	41319	2662.9	100	41490	2680
	75+100	100	41341	2665.1	75	41512	2682.2
		100	41292	2660.2	100	41490	2680

Note 1: Carriers in increasing frequency order.



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LTE CA_42C(3450-3550):

Range	CC- Combo / NRB_agg [RB]	CC1 Note1			CC2 Note1		
		BW [RB]	N _{UL/DL}	f _{UL/DL} [MHz]	BW [RB]	N _{UL/DL}	f _{UL/DL} [MHz]
Low	25+100	25	42123	3453.3	100	42240	3465
		100	42190	3460	25	42307	3471.7
	50+100	50	42145	3455.5	100	42289	3469.9
		100	42190	3460	50	42334	3474.4
	75+100	75	42168	3457.8	100	42339	3474.9
		100	42190	3460	75	42361	3477.1
	100+100	100	42190	3460	100	42388	3479.8
	Mid	25+100	25	42498	3490.8	100	42615
100			42565	3497.5	25	42682	3509.2
50+100		50	42496	3490.6	100	42640	3505
		100	42541	3495.1	50	42685	3509.5
75+100		75	42493	3490.3	100	42664	3507.4
		100	42516	3492.6	75	42687	3509.7
100+100		100	42491	3490.1	100	42689	3509.9
High		25+100	25	42873	3528.3	100	42990
	100		42940	3535	25	43057	3546.7
	50+100	50	42846	3525.6	100	42990	3540
		100	42891	3530.1	50	43035	3544.5
	75+100	75	42819	3522.9	100	42990	3540
		100	42841	3525.1	75	43012	3542.2
	100+100	100	42792	3520.2	100	42990	3540
	Note 1: Carriers in increasing frequency order.						



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Table 6.2.3.2-2: Test frequencies for E-UTRA PCell and SCell for CA Inter-band operation and E-UTRA PCell and PSCell for DC Inter-band operation (two bands)

E-UTRA CA Configuration	Width of Operating bands [MHz+MHz]	CC Combination / NRB_agg	Test Frequency	CC NRB	N _{UL}	Frequency of Uplink [MHz]	N _{DL}	Frequency of Downlink [MHz]
CA_2A-4A, DC_2A-4A	60 + 45	50 + 50	f1	CC 50	18900	1880	900	1960
			f2	CC 50	19150	1905	1150	1985
			f5	CC 50	20175	1732.5	2175	2132.5
			f6	CC 50	20350	1750	2350	2150
CA_2A-5A	60+25	50 + 50	f1	CC 50	18900	1880	900	1960
			f2	CC 50	19150	1905	1150	1985
			f5	CC 50	20450	829	2450	874
			f6	CC 50	20600	844	2600	889
CA_2A-7A, DC_2A-7A	60 + 70	50 + 50	f1	CC 50	18900	1880	900	1960
			f2	CC 50	19150	1905	1150	1985
			f5	CC 50	21100	2535	3100	2655
			f6	CC 50	21400	2565	3400	2685
CA_4A-5A	45+25	50 + 50	f1	CC 50	20175	1732.5	2175	2132.5
			f2	CC 50	20350	1750	2350	2150
			f5	CC 50	20450	829	2450	874
			f6	CC 50	20600	844	2600	889
CA_4A-7A, DC_4A-7A	45+70	50+50	f1	CC 50	20175	1732.5	2175	2132.5
			f2	CC 50	20350	1750	2350	2150
			f5	CC 50	21100	2535	3100	2655
			f6	CC 50	21400	2565	3400	2685
CA_5A-7A, DC_5A-7A	25+70	50 + 50	f1	CC 50	20450	829	2450	874
			f2	CC 50	20600	844	2600	889
			f5	CC 50	21100	2535	3100	2655
			f6	CC 50	21400	2565	3400	2685
CA_41A-42A, DC_41A-42A	194+200	100 + 100	f1	CC 100	40620	2593	40620	2593
			f2	CC 100	41490	2680	41490	2680
			f5	CC 100	42590	3500	42590	3500
			f6	CC 100	43490	3590	43490	3590



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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 (dBi)

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

EIRP=ERP+2.15dB



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4.3 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

1. 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
3. VBW $\geq 3 \times$ RBW
4. Detector = Peak
5. 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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4.4 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. $RBW \geq 1\%$ of the emission bandwidth
4. $VBW \geq 3 \times RBW$
5. Detector = RMS
6. Number of sweep points $\geq 2 \times \text{Span}/RBW$
7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
8. Sweep time = auto couple
9. The trace was allowed to stabilize



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4.5 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 emissions, 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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4.6 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
3. 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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4.7 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.

$$E \text{ (dB}\mu\text{V/m)} = \text{Measured amplitude level (dB}\mu\text{V)} + (\text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)} - \text{AMP(dB)})$$

$$\text{EIRP (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20 \log D - 104.8; \text{ where D is the measurement distance in meters}$$

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:

$$E \text{ (dB}\mu\text{V/m)} = \text{Measured amplitude level (dB}\mu\text{V)} + (\text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)} - \text{AMP(dB)})$$

$$\text{EIRP (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20 \log D - 104.8; \text{ where D is the measurement distance in meters}$$
- 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 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

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 $20 \cdot \log(3/1) = 9.54 \text{ dB}$.

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:

$$\text{Level} = \text{Reading Level} + \text{AF(dB/m)} + \text{Factor(dB)}$$

$$\text{AF} = \text{Antenna Factor(dB/m)}$$

$$\text{Factor} = \text{Cable Factor(dB)} - \text{Preamplifier gain (dB)}$$

$$\text{Margin} = \text{Limit(dBm)} - \text{Level(dBm)}$$

- 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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4.8 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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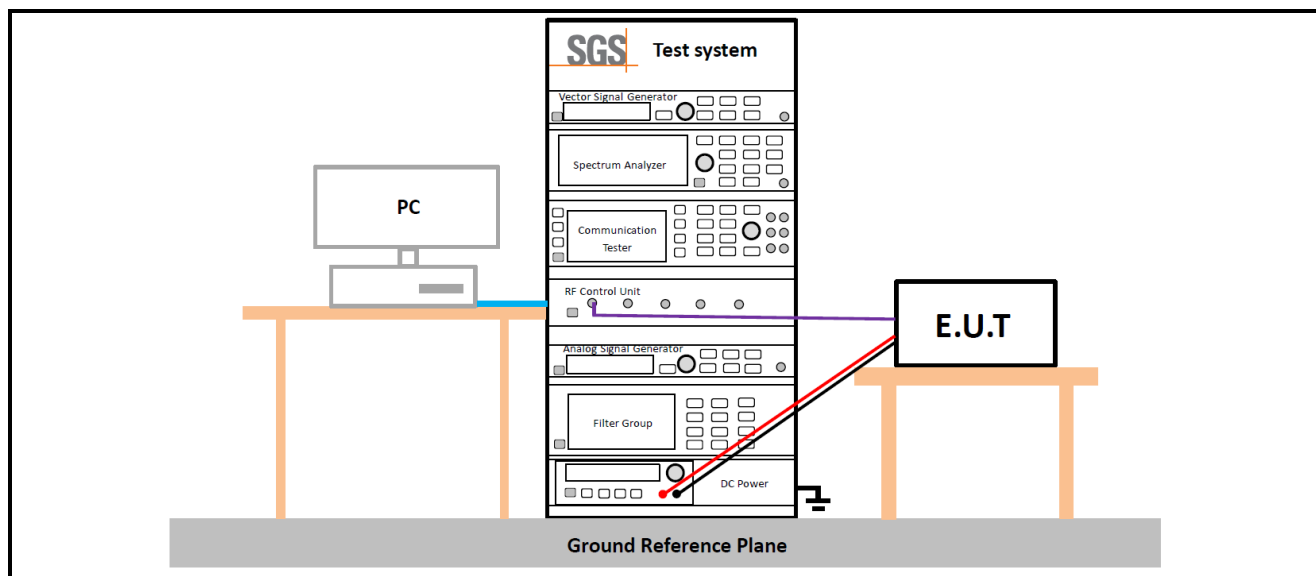
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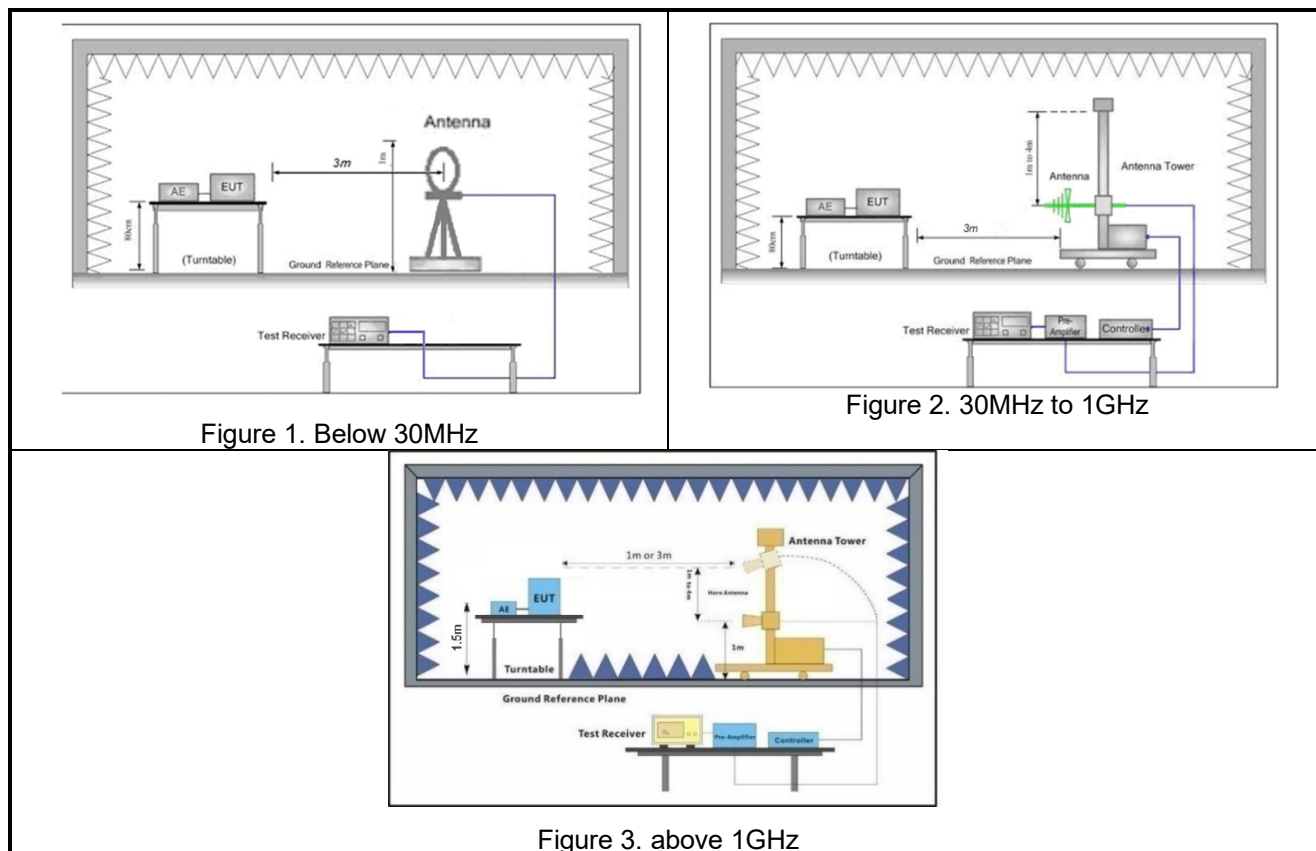
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4.9 Test Setups

4.9.1 Test Setup 1



4.9.2 Test Setup 2

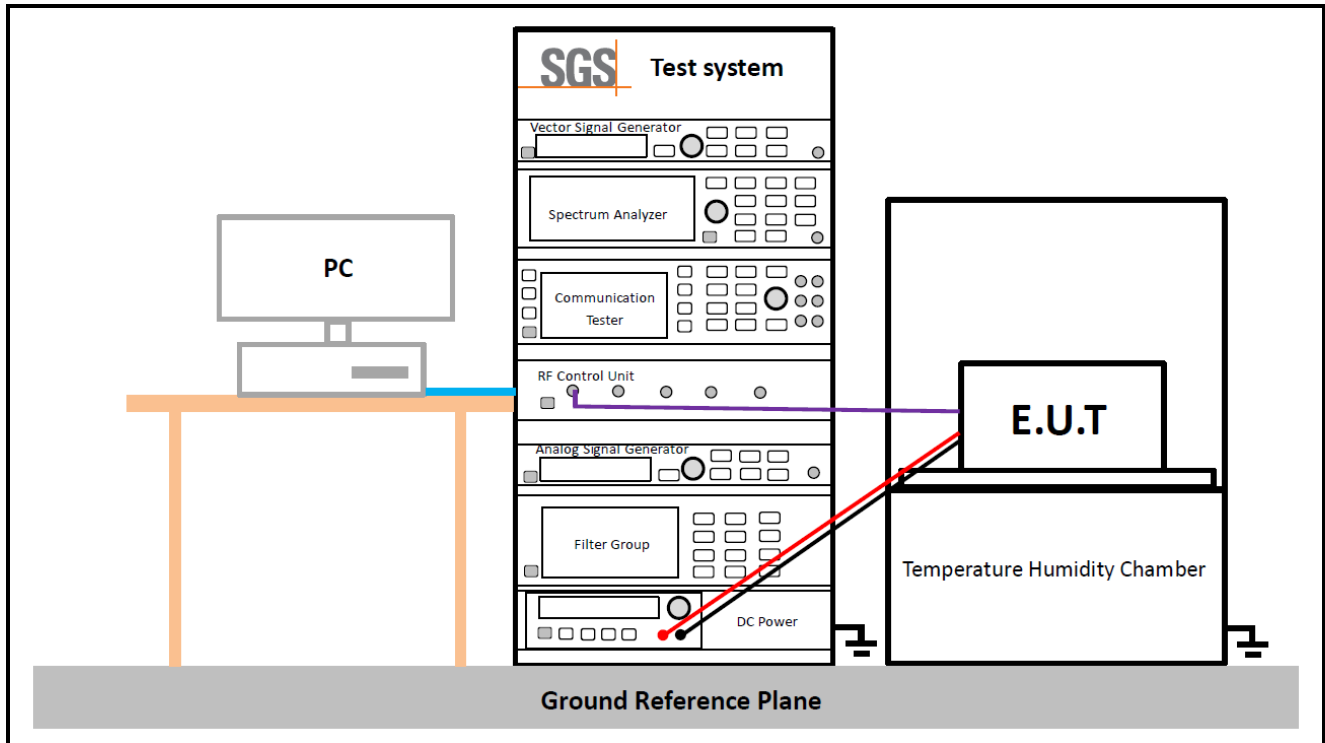


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4.9.3 Test Setup 3



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4.10 Test Conditions

Transmit Output Power Data - Average Power, Total	
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	LTE/TM1;LTE/TM2; LTE/TM3; LTE/TM4
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	LTE/TM1;LTE/TM2; LTE/TM3; LTE/TM4
Modulation Characteristics	
Test Case	Test Conditions
Test Environment	Ambient Climate & Rated Voltage
Test Setup	Test Setup 1
RF Channels (TX)	M (M= middle channel)
Test Mode	LTE/TM1;LTE/TM2; LTE/TM3; LTE/TM4
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	LTE/TM1;LTE/TM2; LTE/TM3; LTE/TM4
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	LTE/TM1;LTE/TM2; LTE/TM3; LTE/TM4



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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)
Test Mode	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	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	LTE/TM1; Remark: If applicable, the EUT conf. that has maximum power density (based on the equivalent power level) is selected.
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	LTE/TM1



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5 Main Test Instruments

RF conducted test					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal.Due date (yyyy/mm/dd)
Shielding Room	Brilliant-emc	N/A	SUWI-04-01-06	2021/05/08	2024/05/07
Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-07	2022/02/16	2023/02/15
Signal Analyzer	ROHDE&SCHWARZ	FSV3030	SUWI-01-02-02	2022/05/17	2023/05/16
Measurement Software	Tonscend	JS1120-3 Test System V 2.6.88.0336	SUWI-02-09-09	NCR	NCR
Radio Communication Analyzer	Anritsu	MT8821C	SUWI-01-26-03	2021/12/04	2022/12/03
Wideband Radio Communication Tester	ROHDE&SCHWARZ	CMW500	SUWI-01-16-05	2022/02/14	2023/02/13
DC Power Supply	HYELEC	HY3005B	SUWI-01-18-01	2022/02/15	2023/02/14
Temperature Chamber	ESPEC	SU-242	SUWI-01-13-01	2022/02/15	2023/02/14
Signal Analyzer	ROHDE&SCHWARZ	FSW43	SUWI-01-02-04	2022/05/28	2023/05/27



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RSE Test System					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date (yyyy/mm/dd)	Cal Due Date (yyyy/mm/dd)
Semi-Anechoic Chamber	Brilliant-emc	N/A	SUWI-04-02-01	2021/05/08	2024/05/07
Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-05	2022/02/16	2023/02/15
Signal Analyzer	ROHDE&SCHWARZ	FSW43	SUWI-01-02-04	2022/05/28	2023/05/27
Signal Analyzer	KEYSIGHT	N9020A	SUWI-01-02-05	2021/12/04	2022/12/03
Test receiver	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	2022/02/19	2023/02/18
Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	VULB 9163	SUWI-01-11-01	2021/05/16	2023/05/15
Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	BBHA 9120D	SUWI-01-11-02	2021/05/16	2023/05/15
Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	BBHA 9170	SUWI-01-11-03	2021/05/14	2023/05/13
Amplifier	Tonscend	TAP9K3G40	SUWI-01-14-01	2022/02/14	2023/02/13
Amplifier	Tonscend	TAP01018050	SUWI-01-14-02	2022/02/14	2023/02/13
Amplifier	Tonscend	TAP18040048	SUWI-01-14-03	2022/02/19	2023/02/18
Active Loop Antenna	SCHWRZBECK MESS- ELEKTRONIK	FMZB 1519B	SUWI-01-21-01	2021/06/10	2023/06/09
Wideband Radio Communication Tester	Anritsu	MT8820C	SUWI-01-16-08	2022/02/14	2023/02/13
Wideband Radio Communication Tester	Anritsu	MT8821C	SUWI-01-26-03	2021/12/04	2022/12/03
Measurement Software	Tonscend	JS32-RSE V4.0.0.1	SUWI-02-09-06	NCR	NCR



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South of No. 6 Plant, No. 1, Runsheng Road, Suzhou Industrial Park, Suzhou Area, China (Jiangsu) Pilot Free Trade Zone 215000
中国·苏州·中国（江苏）自由贸易试验区苏州片区苏州工业园区润胜路1号的6号厂房南面 邮编：215000

t (86-512) 62992980 www.sgs.com.cn
t (86-512) 62992980 sgs.china@sgs.com

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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	$\pm 0.54\text{dB}$
2	RF power density, conducted	$\pm 1.03\text{dB}$
3	Spurious emissions, conducted	$\pm 0.54\text{dB}$
4	Radio Frequency	$\pm 1.0 \%$
5	Duty Cycle	$\pm 0.37\%$
6	Occupied Bandwidth	$\pm 1.0 \%$
7	Radiated Emission	$\pm 3.13\text{dB}$ (9k -30MHz)
		$\pm 4.8\text{dB}$ (30M -1GHz)
		$\pm 4.8\text{dB}$ (1GHz to 18 GHz)
		$\pm 4.8\text{dB}$ (Above 18GHz)

Remark:
 The U_{lab} (lab Uncertainty) is less than $U_{\text{CISPR/ETSI}}$ (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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 中国·苏州·中国(江苏)自由贸易试验区苏州片区苏州工业园区润胜路1号的6号厂房南部 邮编: 215000

t (86-512) 62992980 www.sgsgroup.com.cn
 t (86-512) 62992980 sgs.china@sgs.com

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7 Appendixes

Appendix A.3	WWAN Setup Photos
Appendix B.1	LTE Band 2
Appendix B.2	LTE Band 4
Appendix B.3	LTE Band 5
Appendix B.4	LTE Band 7
Appendix B.5	LTE Band 26(814-824)
Appendix B.6	LTE Band 26(824-849)
Appendix B.7	LTE Band 41
Appendix B.8	LTE Band 42
Appendix B.9	LTE CA_5B
Appendix B.10	LTE CA_7C
Appendix B.11	LTE CA_41C
Appendix B.12	LTE CA_42C

---End of Report---



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t (86-512) 62992980 www.sgs.com.cn
t (86-512) 62992980 sgs.china@sgs.com