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	TEST REPORT
Application No:	SEWA2212000088RG
Applicant:	Quectel Wireless Solutions Co., Ltd.
Address of Applicant:	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233
Manufacturer:	Quectel Wireless Solutions Co., Ltd.
Address of Manufacturer:	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233
EUT Description:	5G Module
Model No.:	AG550Q-NA
Trade Mark:	Quectel
FCC ID:	XMR2022AG550QNA
Standards:	47 CFR Part 2 47 CFR Part 22 47 CFR Part 24 47 CFR Part 27
Date of Receipt:	2022/06/10
Date of Test:	2022/06/10 to 2022/07/11(for original report SEWA2205000015RG02)
Date of Issue:	2022/12/05
Test Result:	PASS *

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

Authorized Signature:

anta Sun

Panta Sun Wireless Laboratory Manager



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Revision Record					
Version	Chapter	Date	Modifier	Remark	
01		2022/12/05		Original	

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



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2 Test Summary

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2.1 NR Band n5(ENDC DC_2A-n5A/ DC_66A-n5A)

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046, §22.913(a)(5)	FCC: ERP ≤ 7 W	Section 1 of Appendix B.17	Pass
Peak-Average Ratio	§22.913(d)	Limit≤13 dB	Section 2 of Appendix B.17	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B.17	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B.17	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.17	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.17	Pass
Field Strength of Spurious Radiation	§2.1053, §22.917(a)	FCC: ≤ -13 dBm/100 kHz.	Section 7 of Appendix B.17	Pass
Frequency Stability	§2.1055(a)(1)(b) §2.1055(d)(1) §22.355	≤ ±2.5ppm.	Section 8 of Appendix B.17	Pass



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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.19	Pass
Peak-Average Ratio		≤13 dB	Section 2 of Appendix B.19	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B.19	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B.19	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 5 of Appendix B.19	Pass
Spurious Emission at Antenna Terminals	§2.1051, §27.53(m)	P kHz S S MHz X MHz 10 th harmonics X=Max {6MHz, EBW}	Section 6 of Appendix B.19	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(m)	25 dBm/ 1 MHz 9 kHz 25 MHz 25 dBm/ 1 MHz 4 25 dBm/ 1 MHz 4 4 4 4 4 4 4 4 4 4 4 4 4	Section 7 of Appendix B.19	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.19	Pass

2.2 NR Band n41

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2.3 NR Band n2(ENDC DC_13A-n2A/ DC_66A-n2A)/ NR Band n25

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.16&18	Pass
Peak-Average Ratio	§24.232(d)	Limit≤13 dB	Section 2 of Appendix B.16&18	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B.16&18	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B.16&18	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 5 of Appendix B.16&18	Pass
Spurious Emission at Antenna Terminals	§2.1051, §24.238(a)	 ≤ -13 dBm/1 MHz, from 9 kHz to 10th harmonics but outside authorized operating frequency ranges. 	Section 6 of Appendix B.16&18	Pass
Field Strength of Spurious Radiation	§2.1053, §24.238(a)	≤ -13 dBm/1 MHz.	Section 7 of Appendix B.16&18	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.16&18	Pass



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2.4 NR Band n66(ENDC DC_2A-n66A/ DC_5A-n66A/ DC_12A-n66A/ DC_13A-n66A)

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.20	Pass
Peak-Average Ratio	§27.50(d)(5)	Limit≤13 dB	Section 2 of Appendix B.20	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B.20	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B.20	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 5 of Appendix B.20	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 6 of Appendix B.20	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(h)	≤ -13 dBm/1 MHz.	Section 7 of Appendix B.20	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.20	Pass



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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.21	Pass
Peak-Average Ratio		Limit≤13 dB	Section 2 of Appendix B.21	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B.21	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B.21	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 5 of Appendix B.21	Pass
Spurious Emission at Antenna Terminals	§2.1051, §27.53(g)	 ≤ -13 dBm/1 MHz, from 9 kHz to 10th harmonics but outside authorized operating frequency ranges. 	Section 6 of Appendix B.21	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(g)	≤ -13 dBm/1 MHz.	Section 7 of Appendix B.21	Pass
Frequency Stability	§2.1055(a)(1)(b) §2.1055(d)(1) §27.54	within the authorized bands of operation.	Section 8 of Appendix B.21	Pass

2.5 NR Band n71



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2.6 NR Band n77 (ENDC DC_2A-n77A/ DC_5A-n77A/ DC_7A-n77A/ DC_12A-n77A/ DC_66A-n77A)/ NR Band n78 (ENDC DC_2A-n78A/ DC_5A-n78A/ DC_7A-n78A/ DC_12A-n78A/ DC_66A-n78A)

3700-3980MHz:						
Test Item	FCC Rule No.	Requirements	Test Result	Verdict		
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(j)(3)	EIRP ≤ 1W	Section 1 of Appendix B.23&25	Pass		
Peak-Average Ratio		≤13 dB	Section 2 of Appendix B.23&25	Pass		
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B.23&25	Pass		
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B.23&25	Pass		
Band Edges Compliance	§2.1051, §27.53(I)(2)	 (2) For mobile operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz. Compliance with this paragraph (I)(2) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be either one percent of the emission bandwidth of the fundamental emission of the transmitter or 350 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz. 	Section 5 of Appendix B.23&25	Pass		
Spurious Emission at Antenna Terminals	§2.1051, §27.53(I)(2)	not exceed -13 dBm/MHz.	Section 6 of Appendix B.23&25	Pass		
Field Strength of Spurious Radiation	§2.1053, §27.53(I)(2)	not exceed -13 dBm/MHz	Section 7 of Appendix B.23&25	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.23&25	Pass		



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3450-3550MHz:

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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.22&24	Pass
Peak-Average Ratio	§27.50(k)(4)	FCC: Limit≤13 dB	Section 2 of Appendix B.22&24	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B.22&24	Pass
Band Edges Compliance	§2.1051, §27.50(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.22&24	Pass
Spurious Emission at Antenna Terminals	§2.1051, §27.50(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.22&24	Pass
Field Strength of Spurious Radiation	§2.1053, §27.50(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.22&24	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.22&24	Pass

Remark:

This test report (Report No.: SEWA2212000088RG02 issue on 2022/12/05.) is based on the original test report (Report No.: SEWA2205000015RG02 issue on 2022/07/18).

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

Therefore in this report all items do not need to retest and all test data in this report are based on the previous report with report number SEWA2205000015RG02 issue on 2022/07/18.



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3 General Information

3.1 Client Information

Applicant:	Quectel Wireless Solutions Co., Ltd.		
Address of Applicant:	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233		
Manufacturer:	Quectel Wireless Solutions Co., Ltd.		
Address of Manufacturer:	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233		

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 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 Module					
Model No.:	AG5500	AG550Q-NA				
Trade Mark:	Quectel	l				
Hardware Version:	R1.0					
Software Version:	AG5500	QNAABR03A10M8	G_OCPU			
IMEI:	860279	050015857				
Antenna Type:	Externa	I Antenna				
Support HUPE Band:	Power (Class2: n41; n77; r	178			
	n2:	0dBi(ANT0)	0dBi(ANT2)			
	n5:	n5: -0.42dBi(ANT0)				
	n25:	n25: 0.36dBi(ANT0) 0.36dBi(ANT2)				
	n41:	n41: 1.58dBi(ANT2)				
	n66: 0.39dBi(ANT0) 0.39dBi(ANT2)					
Antenna Gain:	n71: 0.24dBi(ANT0)					
	n77:	n77: -3.65dBi(ANT2)				
	n78: -3.65dBi(ANT2)					
	Note: The ant manufa		ived from the gain informa	ation report provided by the		
PE Cable:	0.2dB(E	Below 1GHz)	0.4dB(1.0~2.0GHz)	0.6dB(2.0~3.0GHz)		
RF Cable:	0.8dB(3.0~4.0GHz)					
Remark: 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			
NR/TM1	NR system, DFT-s-Pi/2-BPSK modulation			
NR/TM2	NR system, DFT-s-QPSK modulation			
NR/TM3	NR system, DFT-s-16QAM modulation			
NR/TM4	NR system, DFT-s-64QAM modulation			
NR/TM5	NR system, DFT-s-256QAM modulation			
NR/TM6	NR system, CP-QPSK modulation			
NR/TM7	NR system, CP-16QAM modulation			
NR/TM8	NR system, CP-64QAM modulation			
NR/TM9	NR system, CP-256QAM modulation			
Remark: The test mode(s) are selected according to relevant radio technology specifications.				

3.6 Test Environment

Environment Parameter	101.0 kPa Selected Values During Tests			
Relative Humidity	44-60 % RH Ambient			
Value	Temperature(°C)	Voltage(V)		
NTNV	22~23	3.8		
LTLV	-30	3.3		
LTHV	-30	4.3		
HTLV	50	3.3		
HTHV	50	4.3		
5	w Extreme Test Voltage w Extreme Test Temperature	HV: High Extreme Test Voltage HT: High Extreme Test Temperature		

3.7 Description of Support Units

Description	Manufacturer	Model No.				
Mother board	Quectel	V2X&5G-EVB				
Remark: all above the information of table are provided by client.						



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Characteristics	Description					
Radio System Type	🖂 SA 🖾 NSA					
	Band	ТХ	ТХ		RX	
	NR Band n2	1850 to 1910 MHz		1930 to 1990 MHz		
	NR Band n5	824 to 849 MHz		869 to 894 MHz		
	NR Band n25	1850 to 1915	1850 to 1915MHz		5 MHz	
	NR Band n41	2496 to 2690) MHz	2496 to 2690) MHz	
Supported Frequency Range	NR Band n66	1710 to 1780) MHz	2110 to 2180) MHz	
	NR Band n71	663 to 698 M	1Hz	617 to 652 M	1Hz	
	NR Band n77	3700 to 3980) MHz	3700 to 3980) MHz	
		3450 to 3550) MHz	3450 to 3550) MHz	
	NR Band n78	3700 to 3800) MHz	3700 to 3800) MHz	
		3450 to 3550) MHz	3450 to 3550) MHz	
	ND Bond n2	SCS 15kHz:				
	NR Band n2	⊠5 MHz	🛛 10 MHz	🛛 15 MHz	⊠20 MHz	
	NR Band n5	SCS 15kHz:				
		⊠5 MHz	⊠10 MHz	🛛 15 MHz	⊠20 MHz	
	NR Band n25	SCS 15kHz:				
		⊠5 MHz	⊠10 MHz	🛛 15 MHz	⊠20 MHz	
		⊠25 MHz	⊠30 MHz	⊠40 MHz		
		SCS 30kHz:				
	NR Band n41	⊠20 MHz	⊠30 MHz	⊠40 MHz	⊠50 MHz	
Supported Channel		⊠60 MHz	⊠80 MHz	⊠90 MHz	⊠100 MHz	
Bandwidth		SCS 15kHz:				
	NR Band n66	⊠5 MHz	⊠10 MHz	🛛 15 MHz	⊠20 MHz	
		⊠30 MHz	⊠40 MHz			
	NR Band n71	SCS 15kHz:				
		⊠5 MHz	⊠10 MHz	⊠15 MHz	⊠20 MHz	
	NR Band n77	SCS 30kHz				
		⊠20 MHz	⊠30 MHz	⊠40 MHz	⊠50 MHz	
		⊠60 MHz	⊠80 MHz	⊠90 MHz	⊠100 MHz	
	NR Band n78	SCS 30kHz				
		20 MHz	🖂 30 MHz	⊠40 MHz	⊠50 MHz	

3.8 Technical Specification



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			Report No Rev.: Page:	5.: SEWA221 01 16 of 44	12000088RG
		⊠60 MHz	70 MHz	80 MHz	⊠90 MHz
		SCS 15kHz:			
	NR Band n2	4M47G7D	4M48W7D		
		8M93G7D	9M28W7D		
		13M4G7D	14M1W7D		
		17M9G7D	18M9W7D		
		SCS 15kHz:			
		4M47G7D	4M48W7D		
	NR Band n5	8M94G7D	9M28W7D		
		13M4G7D	14M1W7D		
		17M9G7D	18M9W7D		
		SCS 15kHz:			
		4M47G7D	4M47W7D		
Designation of	NR Band n25	8M93G7D	9M28W7D		
Emissions		13M4G7D	14M1W7D		
(Remark: the necessary bandwidth of which is		17M9G7D	18M9W7D		
the worst value from		22M9G7D	23M8W7D		
the measured occupied		28M6G7D	28M6W7D		
bandwidths for each type of channel		38M5G7D	38M5W7D		
bandwidth		SCS 30kHz:			
configuration.)		17M8G7D	18M2W7D		
		26M8G7D	27M8W7D		
		35M8G7D	37M8W7D		
	NR Band n41	45M7G7D	47M4W7D		
		57M8G7D	57M8W7D		
		76M9G7D	77M5W7D		
		85M6G7D	87M2W7D		
		96M3G7D	97M2W7D		
		SCS 15kHz:			
		4M48G7D	4M46W7D		
	NR Band n66	8M93G7D	9M29W7D		
		13M5G7D	14M1W7D		
		17M9G7D	19M0W7D		



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	28M6G7D	28M5W7D	
	38M5G7D	38M6W7D	
	SCS 15kHz:		
	4M47G7D	4M48W7D	
NR Band n71	8M94G7D	9M28W7D	
	13M5G7D	14M1W7D	
	17M9G7D	18M9W7D	
	SCS 30kHz:		
	17M8G7D	18M2W7D	
	26M8G7D	27M8W7D	
	35M8G7D	37M9W7D	
NR Band n77 (3700-3980)	45M7G7D	47M5W7D	
(3700-3900)	57M8G7D	57M9W7D	
	77M1G7D	77M5W7D	
	85M7G7D	87M3W7D	
	96M3G7D	97M6W7D	
	SCS 30kHz:		
	17M8G7D	18M3W7D	
	26M9G7D	27M9W7D	
	35M8G7D	37M9W7D	
NR Band n78	45M7G7D	47M4W7D	
(3450-3550)	57M9G7D	57M9W7D	
	64M4G7D	67M6W7D	
	77M1G7D	77M5W7D	
	85M5G7D	87M3W7D	
	96M4G7D	97M5W7D	
	SCS 30kHz:		
	17M8G7D	18M2W7D	
	26M8G7D	27M8W7D	
NR Band n78	35M9G7D	37M9W7D	
(3700-3800)	45M7G7D	47M4W7D	
	57M8G7D	57M8W7D	
	64M3G7D	67M4W7D	
	77M1G7D	77M4W7D	



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	85M6G7D	87M5W7D	
	96M2G7D	97M4W7D	



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3.9 Test Frequencies

Reference test frequencies for NR operating band n2 3.9.1 3.9.1.1 Test frequencies for NR operating band n2 and SCS 15 kHz

CBW [MHz]	Range		Carrier centre [MHz]	Carrier centre [ARFCN]	SS block SCS [kHz]
		Low	1932.5	386500	
	Downlink	Mid	1960	392000	15
5		High	1987.5	397500	
5		Low	1852.5	370500	
	Uplink	Mid	1880	376000	-
		High	1907.5	381500	
		Low	1935	387000	
	Downlink	Mid	1960	392000	15
10		High	1985	397000	
10		Low	1855	371000	-
	Uplink	Mid	1880	376000	
		High	1905	381000	
		Low	1937.5	387500	
	Downlink	Mid	1960	392000	15
15		High	1982.5	396500	
15		Low	1857.5	371500	
	Uplink	Mid	1880	376000	-
		High	1902.5	380500	
		Low	1940	388000	
	Downlink	Mid	1960	392000	15
20		High	1980	396000	
20	Uplink	Low	1860	372000	
		Mid	1880	376000	-
		High	1900	380000	



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3.9.2 Reference test frequencies for NR operating band n5

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3.9.2.1 Test frequencies for NR operating band n5 and SCS 15 kHz

CBW [MHz]	Range		Carrier centre [MHz]	Carrier centre [ARFCN]	SS block SCS [kHz]
- · ·		Low	871.5	174300	
	Downlink	Mid	881.5	176300	15
5		High	891.5	178300	
5		Low	826.5	165300	
	Uplink	Mid	836.5	167300	-
		High	846.5	169300	
		Low	874	174800	
	Downlink	Mid	881.5	176300	15
10		High	889	177800	
10		Low	829	165800	-
	Uplink	Mid	836.5	167300	
		High	844	168800	
		Low	876.5	175300	
	Downlink	Mid	881.5	176300	15
15		High	886.5	177300	
15		Low	831.5	166300	
	Uplink	Mid	836.5	167300	-
		High	841.5	168300	
		Low	879	175800	
	Downlink	Mid	881.5	176300	15
20		High	884	176800	
20		Low	834	166800	
	Uplink	Mid	836.5	167300	-
		High	839	167800	



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3.9.3 Reference test frequencies for NR operating band n25

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3.9.3.1 Test frequencies for NR operating band n25 and SCS 15 kHz

<u>3.9.3.1 Test</u> CBW [MHz]	Range		Carrier centre [MHz]	Carrier centre [ARFCN]	SS block SCS [kHz]	
[]		Low	1932.5	386500	[2]	
	Downlink	Mid	1962.5	392500	15	
	Downink	High	1992.5	398500	10	
5		Low	1852.5	370500		
	Uplink	Mid	1882.5	376500		
	• F	High	1912.5	382500		
		Low	1935	387000		
	Downlink	Mid	1962.5	392500	15	
40		High	1990	398000		
10		Low	1855	371000		
	Uplink	Mid	1882.5	376500	-	
	· ·	High	1910	382000		
		Low	1937.5	387500		
	Downlink	Mid	1962.5	392500	15	
45		High	1987.5	397500		
15		Low	1857.5	371500		
	Uplink	Mid	1882.5	376500	-	
		High	1907.5	381500	1	
		Low	1940	388000		
	Downlink	Mid	1962.5	392500	15	
20		High	1985	397000		
20		Low	1860	372000		
	Uplink	Mid	1882.5	376500		
		High	1905	381000		
		Low	1942.5	388500		
	Downlink	Mid	1962.5	392500	15	
25		High	1982.5	396500		
25		Low	1862.5	372500		
	Uplink	Mid	1882.5	376500	-	
		High	1902.5	380500		
		Low	1945	389000		
	Downlink	Mid	1962.5	392500	15	
30		High	1980	396000		
50		Low	1865	373000		
	Uplink	Mid	1882.5	376500	-	
		High	1900	380000]	
		Low	1950	390000		
	Downlink	Mid	1962.5	392500	15	
10		High	1975	395000		
40		Low	1870	374000		
	Uplink	Mid	1882.5	376500	1	
		High	1895	379000	1	



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3.9.4 Reference test frequencies for NR operating band n41

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3.9.4.1 Test frequencies for NR operating band n41 and SCS 30 kHz

CBW [MHz]	Range		Carrier centre [MHz]	Carrier centre [ARFCN]	SS block SCS [kHz]	
	Downlink	Low	2506.02	501204		
20	&	Mid	2592.99	518598	30	
	Uplink	High	2670	534000		
	Downlink	Low	2511	502200		
30	&	Mid	2592.99	518598	30	
	Uplink	High	2675	535000		
	Downlink	Low	2516.01	503202		
40	&	Mid	2592.99	518598	30	
	Uplink	High	2670	534000		
	Downlink	Low	2521.02	504204		
50	&	Mid	2592.99	518598	30	
	Uplink	High	2664.99	532998		
	Downlink	Low	2526	505200		
60	&	Mid	2592.99	518598	30	
	Uplink	High	2659.98	531996		
	Downlink	Low	2536.02	507204		
80	&	Mid	2592.99	518598	30	
	Uplink	High	2649.99	529998		
	Downlink	Low	2541	508200		
90	&	Mid	2592.99	518598	30	
	Uplink	High	2644.98	528996		
	Downlink	Low	2546.01	509202		
100	&	Mid	2592.99	518598	30	
	Uplink	High	2640	528000		



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3.9.5 Reference test frequencies for NR operating band n66

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3.9.5.1 Test frequencies for NR operating band n66 and SCS 15 kHz

	t frequencies for NR	operating b				
CBW [MHz]	Range		Carrier centre [MHz]	Carrier centre [ARFCN]	SS block SCS [kHz]	
		Low	2112.5	422500		
	Downlink	Mid	2145	429000	15	
5		High	2177.5	435500		
5		Low	1712.5	342500		
	Uplink	Mid	1745	349000	-	
		High	1777.5	355500		
		Low	2115	423000		
	Downlink	Mid	2145	429000	15	
10		High	2175	435000		
10		Low	1715	343000		
	Uplink	Mid	1745	349000	-	
		High	1775	355000		
		Low	2117.5	423500		
	Downlink	Mid	2145	429000	15	
15		High	2172.5	434500		
15		Low	1717.5	343500		
	Uplink	Mid	1745	349000	-	
		High	1772.5	354500		
		Low	2120	424000		
	Downlink	Mid	2145	429000	15	
20		High	2170	434000		
20		Low	1720	344000		
	Uplink	Mid	1745	349000	-	
		High	1770	354000		
		Low	2125	425000		
	Downlink	Mid	2145	429000	15	
30		High	2165	433000		
30		Low	1725	345000		
	Uplink	Mid	1745	349000	-	
		High	1765	353000		
		Low	2130	426000		
	Downlink	Mid	2145	429000	15	
40		High	2160	432000		
40		Low	1730	346000		
	Uplink	Mid	1745	349000		
	-	High	1760	352000	1	



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3.9.6 Reference test frequencies for NR operating band n71

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3.9.6.1 Test frequencies for NR operating band n71 and SCS 15 kHz

CBW [MHz]	Range		Carrier centre [MHz]	Carrier centre [ARFCN]	SS block SCS [kHz]
		Low	619.5	123900	
	Downlink	Mid	634.5	126900	15
5		High	649.5	129900	1
5		Low	665.5	133100	
	Uplink	Mid	680.5	136100	-
		High	695.5	139100	
		Low	622	124400	
	Downlink	Mid	634.5	126900	15
10		High	647	129400	
10		Low	668	133600	
	Uplink	Mid	680.5	136100	-
		High	693	138600	
		Low	624.5	124900	
	Downlink	Mid	634.5	126900	15
15		High	644.5	128900	
15		Low	670.5	134100	
	Uplink	Mid	680.5	136100	-
	-	High	690.5	138100	
		Low	627	125400	
	Downlink	Mid	634.5	126900	15
20		High	642	128400	
20		Low	673	134600	
	Uplink	Mid	680.5	136100	- 1
		High	688	137600	



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3.9.7 Reference test frequencies for NR operating band n77

3.9.7.1 Test frequencies for NR operating band n77 and SCS 30 kHz

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CBW [MHz]	Range		Carrier centre [MHz]	Carrier centre [ARFCN]	SS block SCS [kHz]	
	Downlink	Low	3705	647000		
10	&	Mid	3840	656000	30	
	Uplink	High	3975	665000	-	
	Downlink	Low	3707.52	647168		
15	&	Mid	3840	656000	30	
	Uplink	High	3972.48	664832		
	Downlink	Low	3710.01	647334		
20	&	Mid	3840	656000	30	
	Uplink	High	3969.99	664666		
	Downlink	Low	3714.99	647666		
30	&	Mid	3840	656000	30	
	Uplink	High	3965.01	664334		
	Downlink	Low	3720	648000		
40	&	Mid	3840	656000	30	
	Uplink	High	3960	664000		
	Downlink	Low	3725.01	648334		
50	&	Mid	3840	656000	30	
	Uplink	High	3954.99	663666		
	Downlink	Low	3730.02	648668		
60	&	Mid	3840	656000	30	
	Uplink	High	3949.98	663332		
	Downlink	Low	3740.01	649334		
80	&	Mid	3840	656000	30	
	Uplink	High	3939.99	662666	1	
	Downlink	Low	3745.02	649668		
90	&	Mid	3840	656000	30	
	Uplink	High	3934.98	662332	7	
	Downlink	Low	3750	650000]	
100	&	Mid	3840	656000	30	
	Uplink	High	3930	662000	1	



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CBW [MHz]	Range		Carrier centre [MHz]	Carrier centre [ARFCN]	SS block SCS [kHz]	
	Downlink	Low	3455.01	630334		
10	&	Mid	3500.01	633334	30	
	Uplink	High	3545.01	636334		
	Downlink	Low	3457.5	630500		
15	&	Mid	3500.01	633334	30	
	Uplink	High	3542.49	636166		
	Downlink	Low	3460.02	630668		
20	&	Mid	3500.01	633334	30	
	Uplink	High	3540	636000		
	Downlink	Low	3465	631000		
30	&	Mid	3500.01	633334	30	
	Uplink	High	3534.99	635666		
	Downlink	Low	3470.01	631334		
40	&	Mid	3500.01	633334	30	
	Uplink	High	3530.01	635334		
	Downlink	Low	3475.02	631668		
50	&	Mid	3500.01	633334	30	
	Uplink	High	3525	635000		
	Downlink	Low	3480	632000		
60	&	Mid	3500.01	633334	30	
	Uplink	High	3519.99	634666		
	Downlink	Low	3490.02	632668		
80	&	Mid	3500.01	633334	30	
	Uplink	High	3510	634000		
	Downlink	Low	3495	633000		
90	&	Mid	3500.01	633334	30	
	Uplink	High	3504.99	633666		
	Downlink	Low	\	\	1	
100	&	Mid	3500.01	633334	30	
	Uplink	High	\	\	1	



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3.9.8 Reference test frequencies for NR operating band n78

3.9.8.1 Test frequencies for NR operating band n78 and SCS 30 kHz

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CBW [MHz]	Range	1	Carrier centre [MHz]	Carrier centre [ARFCN]	SS block SCS [kHz]	
	Downlink	Low	3710.01	647334		
20	&	Mid	3750	650000	30	
	Uplink	High	3789.99	652666		
	Downlink	Low	3715.02	647668		
30	&	Mid	3750	650000	30	
	Uplink	High	3785.01	652334		
	Downlink	Low	3720	648000		
40	&	Mid	3750	650000	30	
	Uplink	High	3780	652000		
	Downlink	Low	3725.01	648334		
50	&	Mid	3750	650000	30	
	Uplink	High	3774.99	651666		
	Downlink	Low	3730.02	648668		
60	&	Mid	3750	650000	30	
	Uplink	High	3769.98	651332		
	Downlink	Low	3735	649000		
70	&	Mid	3750	650000	30	
	Uplink	High	3765	651000		
	Downlink	Low	3740.01	649334		
80	&	Mid	3750	650000	30	
	Uplink	High	3759.99	650666		
	Downlink	Low	3745.02	649668	30	
90	&	Mid	3750	650000		
	Uplink	High	3754.98	650332		
	Downlink	Low		/		
100	&	Mid	3750	650000	30	
	Uplink	High		/]	



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CBW [MHz]	Range	•	Carrier centre [MHz]	Carrier centre [ARFCN]	SS block SCS [kHz]
	Downlink	Low	3460.02	630668	
20	&	Mid	3500.01	633334	30
	Uplink	High	3540	636000	
	Downlink	Low	3465	631000	
30	&	Mid	3500.01	633334	30
	Uplink	High	3534.99	635666	
	Downlink	Low	3470.01	631334	
40	&	Mid	3500.01	633334	30
	Uplink	High	3530.01	635334	
	Downlink	Low	3475.02	631668	
50	&	Mid	3500.01	633334	30
	Uplink	High	3525	635000	
	Downlink	Low	3480	632000	
60	&	Mid	3500.01	633334	30
	Uplink	High	3519.99	634666	
	Downlink	Low	3485.01	632334	
70	&	Mid	3500.01	633334	30
	Uplink	High	3515.01	634334	
	Downlink	Low	3490.02	632668	
80	&	Mid	3500.01	633334	30
	Uplink	High	3510	634000	
	Downlink	Low	3495	633000	
90	&	Mid	3500.01	633334	30
	Uplink	High	3504.99	633666	1
	Downlink	Low	/	/	
100	&	Mid	3500.01	633334	30
	Uplink	High	\	\	1



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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 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
- 3. VBW ≥ 3 x 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

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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 peak or peak hold power.

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
- 4. $VBW \ge 3 \times RBW$
- 5. Detector = RMS
- 6. 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
- 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 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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4.6 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.
- Repeat above procedures until all frequencies measured was complete.
 E (dBμV/m) = Measured amplitude level (μV/m) + (Cable Loss (dB) + Antenna Factor (dB/m) AMP(dB))
 EIRP (dBm) = E (dBμV/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 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*LOG(3/1) = 9.54 dB.

Remark: Reference test setup 2

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

Level = Reading Level(dBµV) + Factor(dB):

Factor = AF(dB/m) + Cable Factor(dB) - Preamplifier gain(dB)

AF = Antenna Factor(dB/m)

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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4.8 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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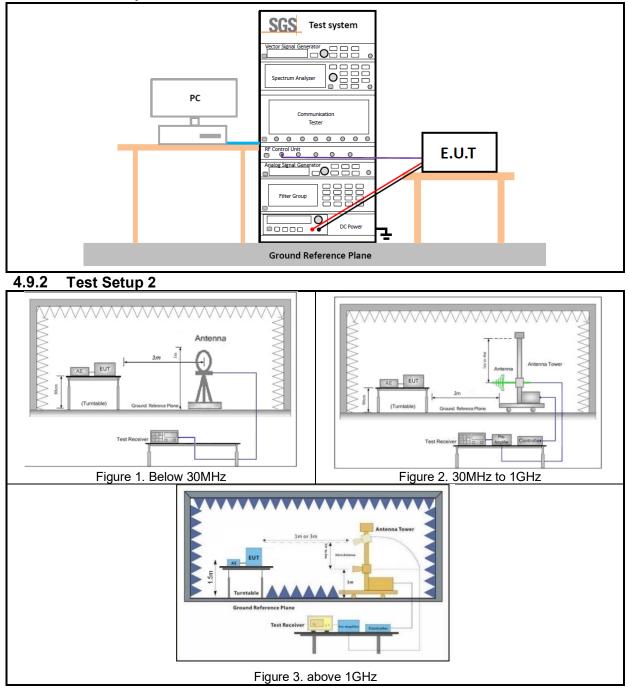
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4.9 Test Setups

4.9.1 Test Setup 1





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SGS Test system ector Signal Generato 0 Spectrum Analyzer PC Communication Tester -0 0 0 0 0 0 0 0 RF Control Unit E.U.T 0 0 0 Ö Analog Signal Generator 0 Filter Group **Temperature Humidity Chamber** С DC Power 0000 **~ Ground Reference Plane**

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	NR/TM1; NR/TM2; NR/TM3; NR/TM4; NR/TM5; NR/TM6; NR/TM7; NR/TM8; NR/TM9			
	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	NR/TM1; NR/TM6			
	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	NR/TM1; NR/TM2; NR/TM3; NR/TM4; NR/TM5; NR/TM6; NR/TM7; NR/TM8; NR/TM9			
	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	NR/TM1; NR/TM2; NR/TM3; NR/TM4; NR/TM5; NR/TM6; NR/TM7; NR/TM8; NR/TM9			
	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	NR/TM1; NR/TM2; NR/TM3; NR/TM4; NR/TM5; NR/TM6; NR/TM7; NR/TM8; NR/TM9			



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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	NR/TM1; NR/TM6			
	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	NR/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	NR/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	NR/TM1; NR/TM6			



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RF Test Equipment					
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	2024/05/08
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	StarPoint	SP9500E	SUWI-01-28-01	2021/08/11	2022/08/10
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

Main Test Instruments 5

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		RSE Test Equi	pment		
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
Active Loop Antenna	SCHWRZBECK MESS-ELEKTRONIK	FMZB 1519B	SUWI-01-21-01	2021/06/10	2023/06/09
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
UXM 5G Wireless Test Platform	KEYSIGHT	E7515B	SUWI-01-04-01	2022/02/14	2023/02/13
Measurement Software	Tonscend	JS32-RE 4.0.0.0	SUWI-02-09-04	NCR	NCR



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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	±0.54dB
2	RF power density, conducted	±1.03dB
3	Spurious emissions, conducted	±0.54dB
4	Radio Frequency	±1.0%
5	Duty Cycle	±0.37%
6	Occupied Bandwidth	±1.0%
7 R		± 3.13dB (9kHz - 30MHz)
		± 4.8dB (30MHz - 1GHz)
	Radiated Emission	± 4.8dB (1GHz to 18GHz)
		± 4.8dB (Above 18GHz)
Remark:		

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The U_{lab} (lab Uncertainty) is less than U_{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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Appendixes 7

Appendix A.2	WWAN Setup Photos
Appendix B.16	NR Band n2
Appendix B.17	NR Band n5
Appendix B.18	NR Band n25
Appendix B.19	NR Band n41
Appendix B.20	NR Band n66
Appendix B.21	NR Band n71
Appendix B.22	NR Band n77(3450-3550)
Appendix B.23	NR Band n77(3700-3980)
Appendix B.24	NR Band n78(3450-3550)
Appendix B.25	NR Band n78(3700-3800)

---End of Report---



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