

Report No.: SUZR/2021/C001402

Rev.: 01

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TEST REPORT

Application No: ZR/2021/C0014

Applicant: Fibocom Wireless Inc.

Address of Applicant: 1101, Tower A, Building 6, Shenzhen International Innovation Valley,

Dashi 1st Rd, Nanshan, Shenzhen, China

Manufacturer: Fibocom Wireless Inc.

Address of Manufacturer: 1101, Tower A, Building 6, Shenzhen International Innovation Valley,

Dashi 1st Rd, Nanshan, Shenzhen, China

EUT Description: 5G module

Model No.: FG360-NA

Trade Mark: Fibocom

FCC ID: ZMOFG360NA05 Standards: 47 CFR Part 2

> 47 CFR Part 24 subpart E 47 CFR Part 27 subpart L 47 CFR Part 27 subpart M 47 CFR Part 27 subpart N

Date of Receipt: 2021/12/16

Date of Test: 2021/12/17 to 2022/3/1

Date of Issue: 2022/3/2

Test Result: PASS *

Authorized Signature:

Panta Sun

Panta Sun Wireless Laboratory Manager



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



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Version 1

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2022/3/2		Original

Prepared By	weller lin		
	(Weller Liu) / Engineer		
Checked By	well wei'		
	(Well Wei) / Reviewer		



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2 **Test Summary**

2.1 NR Band n25(ENDC DC_12A-n25A/ DC_66A-n25A)

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



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2.2 NR Band n41(ENDC DC_2A_n41A/ DC_41A_n41A/ DC_66A_n41A)

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	Pass
Peak-Average Ratio		≤13 dB	Section 2 of Appendix B	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B	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	Pass
Spurious Emission at Antenna Terminals	§2.1051, §27.53(m)	Channel Edge -25dBm/ 1 MHz 1 MHz 1 MHz 9 kHz 95 MHz X=Max {6MHz, EBW}	Section 6 of Appendix B	Pass
Field Strength of Spurious Radiation §2.1053, §27.53(m)		Channel Edge -25dBm/ 1 MHz 1 MHz 1 MHz 9 kHz 95 MHz X MHz 10th harmonics X=Max {6MHz, EBW}	Section 7 of Appendix B	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	Pass



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2.3 NR Band n66(ENDC DC_2A-n66A/ DC_12A-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	Pass
Peak-Average Ratio	§27.50(d)(5)	Limit≤13 dB	Section 2 of Appendix B	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B	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	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	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(h)	≤ -13 dBm/1 MHz.	Section 7 of Appendix B	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	Pass



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2.4 NR Band n71(ENDC DC_2A-n71A/ DC_66A-n71A)

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



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3 General Information

3.1 Client Information

Applicant:	Fibocom Wireless Inc.	
Address of Applicant:	1101, Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan,Shenzhen, China	
Manufacturer:	Fibocom Wireless Inc.	
Address of Manufacturer:	1101, Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan,Shenzhen, China	

3.2 Test Location

- 1			
	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: Test engineer:		215000	
		Weller Liu, King-p Li, Nature Shen, 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.:	FG360-l	FG360-NA				
Trade Mark:	Fibocom	า				
Hardware Version:	V1.0					
Software Version:	81105.7	000.00.08.01.08				
Sample Type:	□Porta	ble Device, 🖂 Mo	dul	е		
Antenna Type:	⊠Exter	nal, 🗌 Integrated				
	⊠Provided by client					
	n25:	5: 2.63dBi (ANT0);				
Antenna Gain*:	n41:	n41: 1.52dBi (ANT0);				
	n66:	n66: 2.76dBi (ANT0);				
	n71:	1.39dBi (ANT0);				
Power Class 2(only for n41 UL MIMO):	r ⊠Support □Not Support					
DE Cable*	⊠Provi	ded by client				
RF Cable*:	10.5dB	(below 1GHz)	1	1dB (1~2GHz)	11.5dB (above 2GHz)	
Remark:	Remark:					

*Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information, SGS is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.



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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	44-46 % RH Ambient					
Value	Temperature(°C) Voltage(V)					
NTNV	22~23	3.8				
LTLV	-30	3.3				
LTHV	-30	4.4				
HTLV	50	3.3				
HTHV	50	4.4				

Remark:

NV: Normal Voltage
NT: Normal Temperature

LT: Low Extreme Test Temperature
HT: High Extreme Test Temperature
LV: Low Extreme Test Voltage
HV: High Extreme Test Voltage



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3.7 Technical Specification

Characteristics	Description						
Radio System Type	⊠ SA ⊠ NSA						
	Band	TX		RX			
	NR Band n25	1850 to 1915	MHz	1930 to 1995	5 MHz		
	NR Band n41	2496 to 2690	MHz	2496 to 2690) MHz		
	NR Band n66	1710 to 1780	MHz	2110 to 2180) MHz		
	NR Band n71	663 to 698 M	Hz	617 to 652 M	1Hz		
	ND CA posa pata	1850 to 1915	MHz	1930 to 1995	5 MHz		
	NR CA_n25A-n41A	2496 to 2690	MHz	2496 to 2690) MHz		
Supported Frequency	NR CA_n25A-n66A	1850 to 1915	MHz	1930 to 1995	5 MHz		
Range	NIT OA_IIZSA-IIOOA	1710 to 1780	MHz	2110 to 2180) MHz		
	NR CA_n25A-n71A	1850 to 1915		1930 to 1995			
	1411 671_112671117171	663 to 698 M		617 to 652 M			
	NR CA n41A-n66A	2496 to 2690		2496 to 2690			
		1710 to 1780 MHz		2110 to 2180 MHz			
	NR CA_n41A-n71A	2496 to 2690 MHz		2496 to 2690 MHz			
	_	663 to 698 MHz		617 to 652 MHz			
	NR CA_n66A-n71A	1710 to 1780 MHz 663 to 698 MHz		2110 to 2180			
				617 to 652 MHz			
		SCS 15kHz:			—————————————————————————————————————		
		⊠5 MHz	⊠10 MHz	⊠15 MHz	⊠20 MHz		
	NR Band n25	⊠25 MHz	⊠30 MHz	⊠40 MHz			
		SCS 30kHz:		Maa	M		
		⊠10 MHz	⊠15 MHz	⊠20 MHz	⊠25 MHz		
		⊠30 MHz	⊠40 MHz				
Supported Channel		SCS 15kHz:					
Bandwidth		⊠10 MHz	⊠15 MHz	⊠20 MHz	⊠30 MHz		
		⊠40 MHz	⊠50 MHz				
	NR Band n41	SCS 30kHz:					
		⊠10 MHz	□ 15 MHz	⊠20 MHz	⊠30 MHz		
		⊠40 MHz	⊠50 MHz	⊠60 MHz	⊠70 MHz		
		⊠80 MHz	⊠90 MHz	⊠100 MHz			
	NR Band n66	SCS 15kHz:					



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MR Band n25 SMHz S10 MHz S15 MHz S20 MHz SCS 30kHz: S10 MHz S15 MHz S25 MHz SCS 30kHz: S10 MHz S15 MHz S25 MHz SCS 30kHz: S10 MHz S15 MHz S20 MHz SCS 15kHz: S10 MHz S15 MHz S20 MHz SCS 30kHz: S10 MHz S15 MHz S20 MHz DFT-s-Pi/2-BPSK CP-16QAM SCS 15kHz: M46G7D 4M47W7D 8M92G7D 9M29W7D 13M4G7D 14M1W7D 17M9G7D 19M0W7D 22M9G7D 23M7W7D 22M9G7D 28M6W7D 38M9G7D 39M0W7D 22M9G7D 28M6W7D 38M9G7D 39M0W7D 28M6G7D 38M9W7D 12M9G7D 13M6W7D 12M9G7D 13M6W7D 12M9G7D 13M6W7D 12M9G7D 13M6W7D 12M9G7D 13M6W7D 17M9G7D 37M9W7D 26M8G7D 27M9W7D 35M7G7D 37M9W7D 45M7G7D 57M8W7D 64M2G7D 67M5W7D 77M0G7D 77M6W7D 85M6G7D 97M3W7D 86M3G7D 97M3W7D 8CS 15kHz: M48W3G7D 9M29W7D 13M4G7D 14M1W7D 14M1W7D 14M1W7D 14M1W7D 14M1W7D 14M1W7D 14M1W7D 13M4G7D 14M1W7D 14M1W7D 14M1W7D 14M1W7D 14M1W7D 14M1W7D				Page:	13 of 50	
SCS 30kHz:			⊠5 MHz	⊠10 MHz	⊠15 MHz	⊠20 MHz
MR Band n71 S15 MHz			⊠25 MHz	⊠30 MHz	⊠40 MHz	
NR Band n71 SCS 15kHz: SCS 15kHz SCS 30kHz: SCS 15kHz: SCS 30kHz: SCS 15kHz: SCS 30kHz: SCS 15kHz: SCS 30kHz: SC			SCS 30kHz:			
NR Band n71 SCS 15kHz:			⊠10 MHz	⊠15 MHz	⊠20 MHz	⊠25 MHz
NR Band n71 S MHz			⊠30 MHz	⊠40 MHz		
NR Band n71 SCS 30kHz:			SCS 15kHz:			
SCS 30kHz:		ND Daniel 1774	⊠5 MHz	⊠10 MHz	⊠15 MHz	⊠20 MHz
DFT-s-Pi/2-BPSK		NR Band n/1	SCS 30kHz:			
NR Band n25 SCS 15kHz: 4M46G7D			⊠10 MHz	⊠15 MHz	⊠20 MHz	
NR Band n25 13M4G7D			DFT-s-Pi/2-BF	PSK	CP-16QAM	
NR Band n25 NR Band n25 13M4G7D			SCS 15kHz:			
NR Band n25 13M4G7D			4M46G7D		4M47W7D	
17M9G7D		NR Band n25	8M92G7D		9M29W7D	
22M9G7D			13M4G7D		14M1W7D	
Designation of Emissions SCS 30kHz: 8M59G7D			17M9G7D		19M0W7D	
Designation of Emissions SCS 30kHz:			22M9G7D		23M7W7D	
Designation of Emissions SCS 30kHz: 8M59G7D			28M6G7D		28M6W7D	
SCS 30kHz: SCS 30kHz: SCS 30kHz: SCS 30kHz: SCS 30kHz: SM59G7D SM59W7D SM7G7D SM6W7D SM9W7D SM9W7	Designations		38M9G7D		39M0W7D	
Remark: the necessary bandwidth of which is the worst value from the measured occupied bandwidths for each type of channel bandwidth configuration.) NR Band n41 Remarks Remarks	_		SCS 30kHz:			
the worst value from the measured occupied bandwidths for each type of channel bandwidth configuration.) NR Band n41 NR Band n41 NR Band n66 17M9G7D			8M59G7D		8M59W7D	
the measured occupied bandwidths for each type of channel bandwidth configuration.) NR Band n41 NR Band n41 NR Band n41 NR Band n66 17M9G7D			12M9G7D		13M6W7D	
bandwidths for each type of channel bandwidth configuration.) NR Band n41 NR Band n41 NR Band n41 NR Band n41 26M8G7D 27M9W7D 35M7G7D 37M9W7D 45M7G7D 47M5W7D 57M7G7D 57M8W7D 64M2G7D 67M5W7D 77M0G7D 77M6W7D 85M6G7D 87M4W7D 96M3G7D 97M3W7D SCS 15kHz: 4M48G7D 4M47W7D 8M93G7D 9M29W7D			17M9G7D		18M2W7D	
bandwidth configuration.) NR Band n41 45M7G7D 47M5W7D 57M7G7D 57M8W7D 64M2G7D 67M5W7D 77M0G7D 77M6W7D 85M6G7D 87M4W7D 96M3G7D 97M3W7D SCS 15kHz: 4M48G7D 4M47W7D 8M93G7D 9M29W7D			26M8G7D		27M9W7D	
45M7G7D		ND Donal and d	35M7G7D		37M9W7D	
57M7G7D		NR Band n41	45M7G7D		47M5W7D	
77M0G7D 77M6W7D 85M6G7D 87M4W7D 96M3G7D 97M3W7D SCS 15kHz: 4M48G7D 4M47W7D 8M93G7D 9M29W7D	Corniguration.)		57M7G7D		57M8W7D	
85M6G7D 87M4W7D 96M3G7D 97M3W7D SCS 15kHz: 4M48G7D 4M47W7D 8M93G7D 9M29W7D			64M2G7D		67M5W7D	
96M3G7D 97M3W7D SCS 15kHz: 4M48G7D 4M47W7D 8M93G7D 9M29W7D			77M0G7D		77M6W7D	
SCS 15kHz: 4M48G7D 4M47W7D 8M93G7D 9M29W7D			85M6G7D		87M4W7D	
NR Band n66 4M48G7D 4M47W7D 8M93G7D 9M29W7D			96M3G7D		97M3W7D	
NR Band n66 8M93G7D 9M29W7D			SCS 15kHz:			
8M93G7D 9M29W7D		ND Daniel 200	4M48G7D		4M47W7D	
13M4G7D 14M1W7D		NK Band N66	8M93G7D		9M29W7D	
			13M4G7D		14M1W7D	



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			. age: e. ee
		17M9G7D	18M9W7D
		22M8G7D	23M7W7D
		28M6G7D	28M6W7D
		38M6G7D	38M7W7D
		SCS 15kHz:	
		4M47G7D	4M47W7D
N	NR Band n71	8M89G7D	9M26W7D
		13M4G7D	14M1W7D
		17M8G7D	18M9W7D



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3.8 Test Frequencies

3.8.1 Reference test frequencies for NR operating band n25

3.8.1.1 Test frequencies for NR operating hand n25 and SCS 15 kHz

3.8.1.1 Test frequencies for NR operating band n25 and SCS 15 kHz								
CBW [MHz]	Range		Carrier centre [MHz]	Carrier centre [ARFCN]	SS block SCS [kHz]			
		Low	1932.5	386500				
	Downlink	Mid	1962.5	392500	15			
5		High	1992.5	398500				
5		Low	1852.5	370500				
	Uplink	Mid	1882.5	376500	-			
		High	1912.5	382500]			
		Low	1935	387000				
	Downlink	Mid	1962.5	392500	15			
10		High	1990	398000				
10		Low	1855	371000				
	Uplink	Mid	1882.5	376500	-			
		High	1910	382000	1			
		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				
		Low	1940	388000				
	Downlink	Mid	1962.5	392500	15			
00		High	1985	397000	1			
20		Low	1860	372000				
	Uplink	Mid	1882.5	376500	_			
	'	High	1905	381000				
		Low	1942.5	388500				
	Downlink	Mid	1962.5	392500	15			
0.5		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			
00		High	1980	396000]			
30		Low	1865	373000				
	Uplink	Mid	1882.5	376500	1 - 1			
	, i	High	1900	380000	1			
		Low	1950	390000				
	Downlink	Mid	1962.5	392500	15			
40		High	1975	395000]			
40		Low	1870	374000				
	Uplink	Mid	1882.5	376500	1 - 1			
	l'	High	1895	379000	1			



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3.8.1.2 Test frequencies for NR operating band n25 and SCS 30 kHz

CBW [MHz]	Range		Carrier centre [MHz]	Carrier centre [ARFCN]	SS block SCS [kHz]
		Low	1935	387000	
	Downlink	Mid	1962.5	392500	15
10		High	1990	398000	1
10		Low	1855	371000	
	Uplink	Mid	1882.5	376500	-
		High	1910	382000	
		Low	1937.5	387500	
	Downlink	Mid	1962.5	392500	15
15		High	1987.5	397500	
15		Low	1857.5	371500	
	Uplink	Mid	1882.5	376500	- 1
	·	High	1907.5	381500	
		Low	1940	388000	
	Downlink	Mid	1962.5	392500	15
00		High	1985	397000	1
20		Low	1860	372000	
	Uplink	Mid	1882.5	376500	-
		High	1905	381000	1
		Low	1942.5	388500	
	Downlink	Mid	1962.5	392500	15
05		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
20		High	1980	396000	
30		Low	1865	373000	
	Uplink	Mid	1882.5	376500	-
	·	High	1900	380000	
		Low	1950	390000	
40	Downlink	Mid	1962.5	392500	15
		High	1975	395000	
40		Low	1870	374000	
	Uplink	Mid	1882.5	376500	-
	•	High	1895	379000]



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3.8.2 Reference test frequencies for NR operating band n41 3.8.2.1 Test frequencies for NR operating band n41 and SCS 15 kHz

CBW [MHz]	Range		Carrier centre [MHz]	Carrier centre [ARFCN]	SS block SCS [kHz]
	Downlink	Low	2501.01	500202	
10	&	Mid	2593.005	518601	15
	Uplink	High	2685	537000	
	Downlink	Low	2503.5	500700	
15	&	Mid	2593.005	518601	15
	Uplink	High	2682.495	536499	
	Downlink	Low	2506.005	501201	
20	&	Mid	2593.005	518601	15
	Uplink	High	2679.99	535998	
	Downlink	Low	2511	502200	
30	&	Mid	2593.005	518601	15
	Uplink	High	2674.995	534999	
	Downlink	Low	2516.01	503202	
40	&	Mid	2593.005	518601	15
	Uplink	High	2670	534000	
	Downlink	Low	2521.005	504201	
50	&	Mid	2593.005	518601	15
	Uplink	High	2664.99	532998	



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3.8.2.2 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	2501.01	500202	
10	&	Mid	2592.99	518598	30
	Uplink	High	2685	537000	
	Downlink	Low	2503.5	500700	
15	&	Mid	2592.99	518598	30
	Uplink	High	2682.48	536496	
	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	1
	Downlink	Low	2521.02	504204	
50	&	Mid	2592.99	518598	30
	Uplink	High	2664.99	532998	1
	Downlink	Low	2526	505200	
60	&	Mid	2592.99	518598	30
	Uplink	High	2659.98	531996	1
	Downlink	Low	2536.02	507204	
70	&	Mid	2592.99	518598	30
	Uplink	High	2649.99	529998	1
	Downlink	Low	2536.02	507204	
80	&	Mid	2592.99	518598	30
	Uplink	High	2649.99	529998	1
	Downlink	Low	2541	508200	30
90	&	Mid	2592.99	518598	
	Uplink	High	2644.98	528996	
	Downlink	Low	2546.01	509202	
100	&	Mid	2592.99	518598	30
	Uplink	High	2640	528000	1



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3.8.3 Reference test frequencies for NR operating band n66

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

3.8.3.1 Test frequencies for NR operating band nob and SCS 15 KHZ							
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	2122.5	424500			
	Downlink	Mid	2145	429000	15		
25		High	2167.5	433500			
20		Low	1722.5	344500			
	Uplink	Mid	1745	349000	-		
		High	1767.5	353500			
		Low	2125	425000			
	Downlink	Mid	2145	429000	15		
30		High	2165	433000			
30		Low	1725	345000			
	Uplink	Mid	1745	349000			
		High	1765	353000	7		
		Low	2130	426000			
	Downlink	Mid	2145	429000	15		
40	40	High	2160	432000			
40		Low	1730	346000			
	Uplink	Mid	1745	349000	-		
		High	1760	352000			



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3.8.3.2 Test frequencies for NR operating band n66 and SCS 30 kHz

	requencies for NF				00 klask 000
CBW [MHz]	Range		Carrier centre [MHz]	Carrier centre [ARFCN]	SS block SCS [kHz]
		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	2122.5	424500	
	Downlink	Mid	2145	429000	15
25		High	2167.5	433500	
25		Low	1722.5	344500	
	Uplink	Mid	1745	349000] -
	·	High	1767.5	353500	
		Low	2125	425000	
	Downlink	Mid	2145	429000	15
00		High	2165	433000	1
30		Low	1725	345000	
	Uplink	Mid	1745	349000] -
	·	High	1765	353000	1
		Low	2130	426000	
40 D	Downlink	Mid	2145	429000	15
		High	2160	432000	
		Low	1730	346000	
	Uplink	Mid	1745	349000	-
	'	High	1760	352000	1



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3.8.4 Reference test frequencies for NR operating band n71 3.8.4.1 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	
3		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	
13		Low	670.5	134100	
	Uplink	Mid	680.5	136100	-
		High	690.5	138100	
		Low	627	125400	
Downlink 20	Downlink	Mid	634.5	126900	15
		High	642	128400	
20		Low	673	134600	
	Uplink	Mid	680.5	136100	-
		High	688	137600	



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3.8.4.2 Test frequencies for NR operating band n71 and SCS 30 kHz

CBW [MHz]	Range		Carrier centre [MHz]	Carrier centre [ARFCN]	SS block SCS [kHz]
		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	
		Low	673	134600	
	Uplink	Mid	680.5	136100	1 - 1
		High	688	137600	



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3.8.5 Reference test frequencies for NR operating band n25A-n41A

		Panga			Carrior	SS block	
INN DAILU		narige				SCS	
	[IVITIZ]					[kHz]	
			Low			[KI IZ]	
		Downlink				15	
		DOWNIII				- 13	
	5						
		Linlink				_	
		Оршик					
		Downlink				15	
		Bownin				10	
	10						
		Linlink				† <u> </u>	
		Оршик					
		Downlink				15	
		DOWNIII				1 13	
	15						
		Linlink				_	
		Оршик					
						 	
		Downlink				15	
n25 25A-		Bownin					
	20						
		Linlink				_	
		Оршик					
		Downlink				15	
	25	DOWNIII				10	
		25	25				
		Linlink				_	
		Opinik				-	
						15	
		Downlink					
	30						
		Uplink				_	
		ορ					
		Downlink				15	
		Downing					
	40						
		Uplink				_	
		- Pillin,				1	
		Downlink					
	10					30	
	10					""	
						+	
n41	15 & Uplink	n41 15					30
15							
						+	
	20					30	
		[MHz] 5 10 15 15 20 25 30 40 10	MHz Downlink	MHz Downlink Mid High Low Uplink Mid High High Low Uplink Mid High High Low Uplink Mid High High Low Uplink High High Uplink High Uplink	MHz Low	Centre CAPPECN CAPPE	



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	Uplink	High	2670	534000	
	Downlink	Low	2511	502200	
00					00
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	30
70	&	Mid	2592.99	518598	
	Uplink	High	2649.99	529998	
	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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3.8.6 Reference test frequencies for NR operating band n25A-n66A

NR CA	NR Band	CBW	Range		Carrier	Carrier	SS block	
Band	INIT Dallu	[MHz]	nanye	,	centre	centre	SCS	
Daria		[1411 12]			[MHz]	[ARFCN]	[kHz]	
				Low	1932.5	386500	[]	
			Downlink	Mid	1962.5	392500	15	
			Downmix	High	1992.5	398500	-	
		5		Low	1852.5	370500		
			Uplink	Mid	1882.5	376500	-	
			- p	High	1912.5	382500		
				Low	1935	387000		
			Downlink	Mid	1962.5	392500	15	
		40		High	1990	398000	1	
		10		Low	1855	371000		
			Uplink	Mid	1882.5	376500	1 -	
			·	High	1910	382000	1	
				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	1 -	
			·	High	1907.5	381500	1	
				Low	1940	388000		
			Downlink	Mid	1962.5	392500	15	
	n25 20	00		High	1985	397000		
	n25	n25 20		Low	1860	372000		
			Uplink	Mid	1882.5	376500	1 -	
			·	High	1905	381000		
n25A-					Low	1942.5	388500	
n66A			Downlink	Mid	1962.5	392500	15	
				High	1982.5	396500		
		25		Low	1862.5	372500	_	
			Uplink	Mid	1882.5	376500	-	
				High	1902.5	380500	<u> </u>	
				Low	1945	389000	15	
			Downlink	Mid	1962.5	392500		
		30		High	1980	396000		
		30		Low	1865	373000		
			Uplink	Mid	1882.5	376500	_	
				High	1900	380000		
				Low	1950	390000		
			Downlink	Mid	1962.5	392500	15	
		40		High	1975	395000		
		40		Low	1870	374000		
			Uplink	Mid	1882.5	376500	-	
				High	1895	379000		
			_	Low	2112.5	422500	_	
			Downlink	Mid	2145	429000	15	
		5		High	2177.5	435500		
	n66			Low	1712.5	342500	-	
		6	Uplink	Mid	1745	349000		
			High	1777.5	355500	ļ		
		10	Downlink	Low	2115	423000	15	
		. 0	20.271111111	Mid	2145	429000		



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				Page:	26 01 50	
			High	2175	435000	
			Low	1715	343000	
		Uplink	Mid	1745	349000	-
		·	High	1775	355000	
		Downlink	Low	2117.5	423500	
			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	Uplink	Low	1720	344000	
			Mid	1745	349000	-
			High	1770	354000	
			Low	2122.5	424500	
		Downlink	Mid	2145	429000	15
	25		High	2167.5	433500	
	23	Uplink	Low	1722.5	344500	-
			Mid	1745	349000	
		·	High	1767.5	353500	
			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	<u>-</u>
			High	1760	352000	



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3.8.7 Reference test frequencies for NR operating band n25A-n71A

NR CA	NR Band	CBW	Pongo			Consider	CC blook			
	NK Band		Range		Carrier	Carrier	SS block			
Band		[MHz]			centre	centre	SCS			
				Laur	[MHz]	[ARFCN]	[kHz]			
			D. P.I	Low	1932.5	386500	45			
			Downlink	Mid	1962.5	392500	15			
		5		High	1992.5	398500				
				Low	1852.5	370500				
			Uplink	Mid	1882.5	376500	-			
				High	1912.5	382500				
				Low	1935	387000				
			Downlink	Mid	1962.5	392500	15			
		10		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	-			
			- 1-	High	1907.5	381500				
				Low	1940	388000				
			Downlink	Mid	1962.5	392500	15			
			2011111111	High	1985	397000				
		20		Low	1860	372000				
			Uplink	Mid	1882.5	376500	_			
			Орших	High	1905	381000	-			
n25A-				Low	1942.5	388500				
n71A			Downlink	Mid	1962.5	392500	15			
117 173		25	DOWININ	High	1982.5	396500	- 13			
			25 Uplink	25	25		Low	1862.5	372500	
				Mid	1882.5	376500	1			
			Oplink		1902.5	380500	-			
				High	1902.5	389000	+			
			Danneliale	Low			4.5			
			Downlink	Mid	1962.5	392500	15			
		30		High	1980	396000				
			l la Cal.	Low	1865	373000	-			
			Uplink	Mid	1882.5	376500	-			
				High	1900	380000				
			D. "1	Low	1950	390000				
			Downlink	Mid	1962.5	392500	15			
		40		High	1975	395000				
				Low	1870	374000]			
			Uplink	Mid	1882.5	376500	-			
<u> </u>				High	1895	379000				
				Low	619.5	123900				
		5	Downlink	Mid	634.5	126900	15			
				High	649.5	129900				
	n71]		Low	665.5	133100				
	117 1		Uplink	Mid	680.5	136100				
	10		Opilitik	High	695.5	139100				
		Downlink	Low	622	124400	15				
		10	Downlink	Mid	634.5	126900	15			



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		High	647	129400	
		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	Uplink	Low	670.5	134100	-
		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	-
	,	High	688	137600	-



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3.8.8 Reference test frequencies for NR operating band n41A-n66A

3.8.8 Reference test frequencies for NR operating band n41A-n66A NR CA NR Band CBW Range Carrier Carrier SS block										
NR CA Band	[MHz]		Range		Carrier centre [MHz]	Carrier centre [ARFCN]	SS block SCS [kHz]			
			Downlink	Low	2501.01	500202	1			
		10	&	Mid	2592.99	518598	30			
			Uplink	High	2685	537000				
			Downlink	Low	2503.5	500700				
		15	&	Mid	2592.99	518598	30			
			Uplink	High	2682.48	536496	1			
			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	1			
			Downlink	Low	2516.01	503202				
		40	&	Mid	2592.99	518598	30			
			Uplink	High	2670	534000				
			Downlink	Low	2521.02	504204				
	n41	50	&	Mid	2592.99	518598	30			
			Uplink	High	2664.99	532998				
			Downlink	Low	2526	505200				
		60	&	Mid	2592.99	518598				
	70		Uplink	High	2659.98	531996	1			
			Downlink	Low	2536.02	507204				
		70	&	Mid	2592.99	518598	30			
			Uplink	High	2649.99	529998	1			
n41A-			Downlink	Low	2536.02	507204				
n66A		80	&	Mid	2592.99	518598	30			
			Uplink	High	2649.99	529998	1			
			Downlink	Low	2541	508200				
		90	&	Mid	2592.99	518598	30			
			Uplink	High	2644.98	528996	1			
			Downlink	Low	2546.01	509202				
		100	&	Mid	2592.99	518598	30			
			Uplink	High	2640	528000	1			
				Low	2112.5	422500				
			Downlink	Mid	2145	429000	15			
		_		High	2177.5	435500	1			
		5		Low	1712.5	342500				
			Uplink	Mid	1745	349000	-			
			•	High	1777.5	355500	1			
				Low	2115	423000				
			Downlink	Mid	2145	429000	15			
	n66 10	40		High	2175	435000	1			
		10		Low	1715	343000				
			Uplink	Mid	1745	349000	1 -			
			•	High	1775	355000	1			
				Low	2117.5	423500				
			Downlink	Mid	2145	429000	15			
		15		High	2172.5	434500				
	15	11.2.1	Low	1717.5	343500	1				
			Uplink	Mid	1745	349000	-			



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			ı age.	30 01 30	
		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	2122.5	424500	
	Downlink	Mid	2145	429000	15
25		High	2167.5	433500	
	Uplink	Low	1722.5	344500	
		Mid	1745	349000	-
		High	1767.5	353500	
	Downlink	Low	2125	425000	15
		Mid	2145	429000	
20		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	
	20 25 30 40	20 Uplink Downlink 25 Uplink Downlink 30 Uplink Downlink Downlink	20	Downlink	High 1772.5 354500 Low 2120



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3.8.9 Reference test frequencies for NR operating band n41A-n71A

Band	3.8.9 Reference test frequencies for NR operating band n41A-n71A										
10	NR CA Band	NR Band	CBW [MHz]	Range	•						
10				Downlink	Low			[KI IZ]			
Public High 2685 537000			10					30			
15			10					- 30			
15											
Uplink			15					30			
Downlink			10					1 00			
Part											
Uplink			20					30			
Downlink								1 00			
Note											
Uplink			30					30			
Note			30					1 00			
NATE				•							
NATE Part			40					30			
NATE Name			.5					1 5			
NATE SO				•							
Uplink		n41	50					30			
Note		-						1 00			
Record Part											
Uplink			60					30			
National Process National Process National Process		70									
Nation											
NATIA- NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA NATIA			70					30			
Note								1 33			
Note	n41A-				•						
Uplink			80					30			
Downlink Low 2541 508200 30								1			
Po											
Uplink			90					30			
100 Downlink Low 2546.01 509202 30			00					1			
100											
Downlink			100					30			
Downlink								1			
Downlink Mid 634.5 126900 15											
10 High 649.5 129900				Downlink				15			
Note			_					1			
Note			5								
High 695.5 139100 Low 622 124400 15				Uplink				1 -			
Downlink				- I				1			
n71 10 Downlink Mid 634.5 126900 15 High 647 129400 Low 668 133600 Mid 680.5 136100 - High 693 138600 Low 624.5 124900 Downlink Mid 634.5 126900 15 High 644.5 128900 Low 670.5 134100											
10				Downlink				15			
Low 668 133600		n71	10					1			
Uplink Mid 680.5 136100 - High 693 138600 - Low 624.5 124900 - Mid 634.5 126900 15 High 644.5 128900 Low 670.5 134100		""	10								
High 693 138600 Low 624.5 124900 Townlink Mid 634.5 126900 15 High 644.5 128900 Low 670.5 134100 Townlink Low 670.5 134100 Townlink Low 670.5 134100 Townlink Low 670.5 134100 Townlink Low 670.5 Townl				Uplink] -			
Downlink Low 624.5 124900 15 15 15 15 15				'				1			
Downlink Mid 634.5 126900 15 High 644.5 128900 Low 670.5 134100											
15 High 644.5 128900 Low 670.5 134100				Downlink				15			
Low 670.5 134100			15	DOWNIINK							
		15	15	I In Part							
				Uplink	Mid	680.5	136100	1 -			



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		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	-
		High	688	137600	



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3.8.10 Reference test frequencies for NR operating band n66A-n71A

NR CA	NR Band	CBW	Range			Carrier	SS block		
Band	INK Dallu	[MHz]	hange	3	Carrier		SCS		
Danu		[IVITZ]			centre [MHz]	centre [ARFCN]	[kHz]		
				Low	2112.5	422500	[KIIZ]		
			Downlink	Low Mid		429000	15		
			Downlink	High	2145 2177.5	435500	15		
		5			1712.5	342500			
			Uplink	Low Mid	1712.5	349000	-		
			Opilitik	High	1777.5	355500	-		
					2115	423000			
			Downlink	Low Mid	2145	429000	15		
			DOWITHIN		2175	435000	- 13		
		10		High	1715	343000			
			Holiple	Low Mid	1715	349000	4		
			Uplink		1745	355000	-		
				High	2117.5				
			Downlink	Low Mid	2145	423500 429000	15		
			DOWIIIIIK		2172.5	434500	15		
		15		High Low	1717.5	343500			
			Uplink	Mid	1717.5	349000	_		
			Оршік	High	1772.5	354500	-		
				Low	2120	424000			
			Downlink	Mid	2145	429000	15		
I	n66			High	2170	434000			
		20		Low	1720	344000			
			Uplink	Mid	1745	349000			
			Оршк	High	1770	354000	_		
n66A-				Low	2122.5	424500			
n71A		Downlink 25 Uplink	Mid	2145	429000	15			
117 173			DOWITHIN	High	2167.5	433500	- '5		
			25	25		Low	1722.5	344500	
			Mid	1745	349000	_			
			Орших	High	1767.5	353500	-		
				Low	2125	425000	15		
			Downlink	Mid	2145	429000			
			DOWINIK	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	i -		
			·	High	1760	352000			
				Low	619.5	123900			
			Downlink	Mid	634.5	126900	15		
		_		High	649.5	129900			
	n74	5		Low	665.5	133100			
	11/1	n71	Uplink	Mid	680.5	136100	-		
	10		Opilitik	High	695.5	139100			
ı		Downlink	Low	622	124400	15			
		10	Downlink	Mid	634.5	126900	15		



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				. 490.		
			High	647	129400	
			Low	668	133600	
		Uplink	Mid	680.5	136100	-
		·	High	693	138600	
			Low	624.5	124900	
	Downlink	Downlink	Mid	634.5	126900	15
			High	644.5	128900	
		Uplink	Low	670.5	134100	- -
			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	-
		'	High	688	137600	



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4 Description of Tests

4.1 Conducted Output Power

Measurement Procedure: FCC KDB 971168 D01 V03r01

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

Remark: Reference test setup 1



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4.2 Effective (Isotropic) Radiated Power of Transmitter

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

Calculate power in dBm by the following formula:

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

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

EIRP=ERP+2.15dB

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

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 (dBμV/m) = Measured amplitude level (dBm) + 107 + Cable Loss (dB) + Antenna Factor (dB/m)

EIRP (dBm) = E (dB μ V/m) + 20 log D - 104.8; where D is the measurement distance in meters

ERP = EIRP - 2.15 (dB); where ERP and EIRP are expressed in consistent units.

Above 1GHz test procedure as below:

- 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:

 $E (dB\mu V/m) = Measured amplitude level (dBm) + 107 + Cable Loss (dB) + Antenna Factor (dB/m)$

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

Remark: Reference test setup 2



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4.3 Occupied Bandwidth

Measurement Procedure: FCC KDB 971168 D01 V03r01 Section 4.2

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

Remark: Reference test setup 1

Test Settings

- The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
- 2. RBW = 1 5% of the expected OBW
- VBW ≥ 3 x RBW
- Detector = Peak
- 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 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 > 3 x RBW
- 5. Detector = RMS
- Number of sweep points ≥ 2 x Span/RBW
- 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

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

- Start frequency was set to 30MHz and stop frequency was set to at least 10 * the fundamental frequency (separated into at least two plots per channel)
- Detector = RMS
- 3. Trace mode = trace average for continuous emissions, max hold for pulse emissions
- 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 5.7.1

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



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4.7 Field Strength of Spurious Radiation

Measurement Procedure: FCC KDB 971168 D01 V03r01

Below 1GHz test procedure as below:

- 1). The EUT was powered ON and placed on a 80cm high table in the chamber. The antenna of the transmitter was extended to its maximum length.
- 2). The disturbance of the transmitter was maximized on the test receiver display by raising and lowering from 1m to 4m (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) the receive antenna and by rotating through 360° the turntable. After the fundamental emission was maximized, a field strength measurement was made.
- 3). Steps 1) and 2) were performed with the EUT and the receive antenna in both vertical and horizontal polarization.
- 4). Test the EUT in the lowest channel, the middle channel, the Highest channel.
- 5). The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, Only the test worst case mode is recorded in the report.
- 6). Repeat above procedures until all frequencies measured was complete.

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

Above 1GHz test procedure as below:

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

E (dBμV/m) = Measured amplitude level (dBμV) + (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.

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:

Final Test Level = Receiver Reading + Factor (Antenna Factor + Cable Factor - Preamplifier Factor)

- 2) Scan from 9kHz to 40GHz, The disturbance between 9KHz to 30MHz and 18GHz to 40GHz was very low, and the above harmonics were the highest point could be found when testing, so only the above 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; ANSI/C63.26 (2015)

- . The frequency stability of the transmitter is measured by:
- a.) **Temperature:** The temperature is varied from -30 $^{\circ}$ C to +50 $^{\circ}$ C in 10 $^{\circ}$ 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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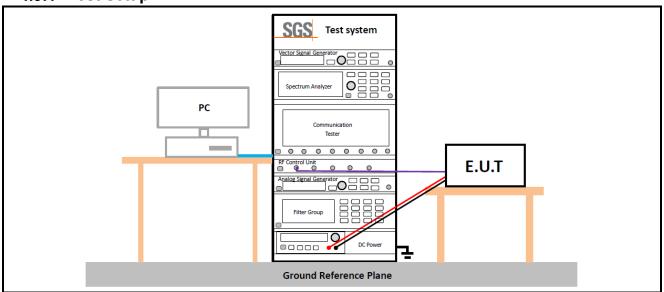
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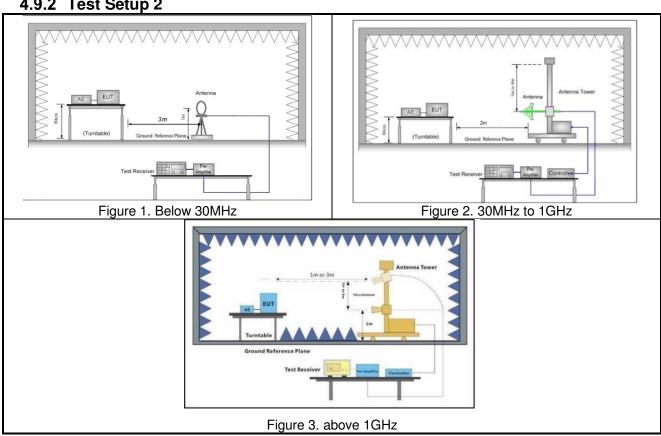
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4.9 Test Setups

4.9.1 Test Setup 1



4.9.2 Test Setup 2





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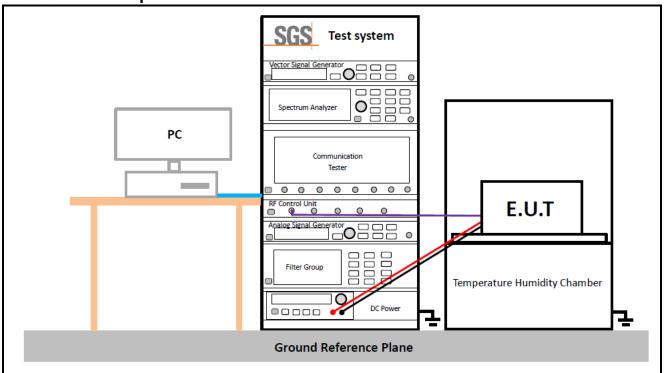


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4.9.3 Test Setup 3





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4.10Test Conditions

Test Case		Test Conditions			
Transmit Output		Test Environment	Ambient Climate & Rated Voltage		
	Average	Test Setup	Test Setup 1		
	Power, Total	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;		
Power Data	Avorago	Test Environment	Ambient Climate & Rated Voltage		
Dala	Average Power,	Test Setup	Test Setup 1		
	Spectral Density (if required)	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;		
		Test Environment	Ambient Climate & Rated Voltage		
Peak-to-Ave	erage Ratio	Test Setup	Test Setup 1		
(if required)		RF Channels (TX)	M (M= middle channel)		
		Test Mode	NR/TM1;NR/TM6		
		Test Environment	Ambient Climate & Rated Voltage		
Modulation		Test Setup	Test Setup 1		
Characteris	tics	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;		
		Test Environment	Ambient Climate & Rated Voltage		
	Occupied Bandwidth	Test Setup	Test Setup 1		
		RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)		
Bandwidth		Test Mode	NR/TM1;NR/TM2;NR/TM3;NR/TM4;NR/TM5;NR/TM6; NR/TM7;NR/TM8; NR/TM9;		
Dandwidth		Test Environment	Ambient Climate & Rated Voltage		
	Emission Bandwidth (if required)	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;		
Band Edges		Test Environment	Ambient Climate & Rated Voltage		
Compliance		Test Setup	Test Setup 1		



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	1	rage. +0 or 50		
	RF Channels (TX)	L, H (L= low channel, H= high channel)		
Test Mode		NR/TM1;NR/TM2;NR/TM3;NR/TM4;NR/TM5;NR/TM6; NR/TM7;NR/TM8; NR/TM9;		
	Test Environment	Ambient Climate & Rated Voltage		
	Test Setup	Test Setup 1		
Spurious Emission at Antenna Terminals	RF Channels (TX)	L,M, H (L= low channel, M= middle channel, H= high channel)		
	Test Mode	NR/TM1		
	Test Environment	Ambient Climate & Rated Voltage		
	Test Setup	Test Setup 2		
Field Strength of Spurious Radiation	Test Mode	NR/TM1 Remark: If applicable, the EUT conf. that has maximum power density (based on the equivalent power level) is selected.		
	RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)		
	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.		
Frequency Stability	Test Setup	Test Setup 4		
	RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= h channel)		
	Test Mode	NR/TM1;NR/TM6		



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5 Main Test Instruments

RF Test Equipment					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Shielding Room	Brilliant-emc	N/A	SUWI-04-01-06	2021/5/8	2024/5/7
Temperature and	MingGao	TH101B	SUWI-01-01-07	2021/2/20	2022/2/19
humidity meter				2022/2/19	2023/2/18
Signal Analyzer	ROHDE&SCHWARZ	FSV3030	SUWI-01-02-02	2021/5/28	2022/5/27
DC Power Supply	HYELEC	HY3005B	SUWI-01-18-01	2021/2/20	2022/2/19
DO Fower Supply				2022/2/19	2023/2/18
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	2021/9/29	2022/9/28
Wideband Radio Communication Tester	ROHDE&SCHWARZ	CMW500	SUWI-01-27-01	2021/9/28	2022/9/27
Temperature	ESPEC	SU-242	SUWI-01-13-01	2021/2/20	2022/2/19
Chamber				2022/2/19	2023/2/18



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RSE Test Equipment					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Semi-Anechoic Chamber	Brilliant-emc	N/A	SUWI-04-02-02	2021/11/25	2022/11/24
Temperature and	MingGao	TH101B	SUWI-01-01-11	2021/2/20	2022/2/19
humidity meter				2022/2/19	2023/2/18
Signal Analyzer	Keysight	N9020A	SUWI-01-02-05	2021/12/4	2022/12/3
To at we ask you	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	2021/2/20	2022/2/19
Test receiver				2022/2/19	2023/2/18
	HYELEC	HY3005B	SUWI-01-18-01	2021/2/20	2022/2/19
DC Power Supply				2022/2/19	2023/2/18
Receiving antenna	SCHWRZBECK MESS-ELEKTRONIK	VULB 9163	SUWI-01-11-04	2021/12/5	2022/12/4
Receiving antenna	SCHWRZBECK MESS-ELEKTRONIK	BBHA 9120D	SUWI-01-11-05	2021/12/5	2022/12/4
Receiving antenna	SCHWRZBECK MESS-ELEKTRONIK	BBHA 9170	SUWI-01-11-03	2021/5/14	2022/5/13
Amplifier	Tonscend	TAP9K3G40	SUWI-01-14-06	2021/12/4	2022/12/3
Amplifier	Tonscend	TAP01018050	SUWI-01-14-04	2021/12/4	2022/12/3
Amplifier	Tonscend	TAP18040048	SUWI-01-14-05	2021/12/4	2022/12/3
Measurement Software	Tonscend	JS32-RE V4.0.0.0	SUWI-02-12-01	NCR	NCR
Measurement Software	Tonscend	JS32-RSE V4.0.0.1	SUWI-02-12-02	NCR	NCR
Wideband Radio	Anritsu	MT8820C	SUWI-01-16-08	2021/2/20	2022/2/19
Communication Tester				2022/2/19	2023/2/18
Wideband Radio Communication Tester	Anritsu	MT8821C	SUWI-01-26-03	2021/12/4	2022/12/3



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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	±7.25 x 10 ⁻⁸
5	Duty Cycle	±0.37%
6	Occupied Bandwidth	±7.25 x 10 ⁻⁸
		± 3.13dB (9kHz - 30MHz)
7	Radiated Emission	± 4.8dB (30MHz - 1GHz)
		± 4.8dB (1GHz to 18GHz)
		± 4.8dB (Above 18GHz)



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Appendixes

Appendix A.2	WWAN Setup Photos
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Appendix B.14	n71
Appendix B.15	NR UL Inter band CA

The End



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