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## **TEST REPORT**

Test Result:	PASS *
Date of Issue:	2023/02/15
Date of Test:	2022/12/08 to 2023/02/13
Date of Receipt:	2022/12/08
	47 CFR Part 90
	47 CFR Part 27
	47 CFR Part 24
	47 CFR Part 22
Standards:	47 CFR Part 2
FCC ID:	2APJ4-SRM825NNA
Trade Mark:	MEIGLink
Model No.:	SRM825N-NA
EUT Description:	SRM825
Address of Manufacturer:	2nd Floor,Office Building,No.5 Lingxia Road,Fenghuang,Fuyong Street,Bao'an District,Shenzhen
Manufacturer:	MeiG Smart Technology Co., Ltd
Address of Applicant:	2nd Floor,Office Building,No.5 Lingxia Road,Fenghuang,Fuyong Street,Bao'an District,Shenzhen
Applicant:	MeiG Smart Technology Co., Ltd
Application No:	SEWM2212000297RG

\* 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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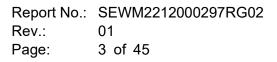
Revision Record					
Version	Chapter	Modifier	Remark		
01		2023/02/15		Original	

Prepared By	weller liu
Checked By	(Weller Liu) / Test Engineer



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## 2 Test Summary

### 2.1 NR Band n5

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.21	Pass
Peak-Average Ratio	§22.913(d)	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, §22.917(a)	≤ -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, §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.21	Pass
Field Strength of Spurious Radiation	§2.1053, §22.917(a)	FCC: ≤ -13 dBm/100 kHz.	Section 7 of Appendix B.21	Pass
Frequency Stability	§2.1055(a)(1)(b) §2.1055(d)(1) §22.355	≤ ±2.5ppm.	Section 8 of Appendix B.21	Pass



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#### Test Item FCC Rule No. **Test Result** Verdict Requirements Effective (Isotropic) §2.1046, Section 1 of EIRP ≤ 2W Pass Radiated Power §27.50(h)(2) Appendix B.22&B.25 Output Data Section 2 of Peak-Average ≤13 dB \_\_\_ Pass Appendix B.22&B.25 Ratio Modulation Section 3 of Digital modulation §2.1047 Pass Appendix B.22&B.25 Characteristics OBW: No limit. Section 4 of Bandwidth §2.1049 Pass EBW: No limit. Appendix B.22&B.25 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 Band Edges §2.1051, (P) dB on all frequencies more than Section 5 of Pass X megahertz from the channel Compliance §27.53(m4) Appendix B.22&B.25 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. Channel Edge Spurious -25 dBm -25dBm/ Emission at §2.1051, Section 6 of 1 MHz 1 MHz Pass Antenna §27.53(m) Appendix B.22&B.25 Terminals 9 kHz MHz 10th harmonics X=Max {6MHz, EBW} Channel Edge Field Strength -25dBm/ -25 dBm/ §2.1053, Section 7 of of Spurious 1 MHz 1 MHz Pass §27.53(m) Appendix B.22&B.25 Radiation 10th harmonics 9 kHz MH<sub>2</sub> MHZ X=Max {6MHz, EBW} §2.1055(a)(1)(b) Frequency Section 8 of Within authorized bands of §2.1055(d)(1) Pass Stability operation/frequency block. Appendix B.22&B.25 §27.54

## 2.2 NR Band n7 / NR Band n41



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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.20&B.24	Pass
Peak-Average Ratio	§24.232(d)	Limit≤13 dB	Section 2 of Appendix B.20&B.24	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B.20&B.24	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B.20&B.24	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.20&B.24	Pass
Spurious Emission at Antenna Terminals	§2.1051, §24.238(a)	<ul> <li>≤ -13 dBm/1 MHz, from 9 kHz to 10<sup>th</sup> harmonics but outside authorized operating frequency ranges.</li> </ul>	Section 6 of Appendix B.20&B.24	Pass
Field Strength of Spurious Radiation	§2.1053, §24.238(a)	≤ -13 dBm/1 MHz.	Section 7 of Appendix B.20&B.24	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.20&B.24	Pass

### 2.3 NR Band n2/ NR Band n25

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### 2.4 NR Band n12

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.23	Pass
Peak-Average Ratio		Limit≤13 dB	Section 2 of Appendix B.23	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B.23	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B.23	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.23	Pass
Spurious Emission at Antenna Terminals	§2.1051, §27.53(g)	FCC: ≤ -13 dBm/100 kHz, from 9 kHz to 10 <sup>th</sup> harmonics but outside authorized operating frequency ranges.	Section 6 of Appendix B.23	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(g)	FCC: ≤ -13 dBm/100 kHz.	Section 7 of Appendix B.23	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	Pass



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### 2.5 NR Band n66

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.26	Pass
Peak-Average Ratio	§27.50(d)(5)	Limit≤13 dB	Section 2 of Appendix B.26	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B.26	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B.26	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.26	Pass
Spurious Emission at Antenna Terminals	§2.1051, §27.53(h)	≤ -13 dBm/1 MHz, from 9 kHz to 10 <sup>th</sup> harmonics but outside authorized operating frequency ranges.	Section 6 of Appendix B.26	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(h)	≤ -13 dBm/1 MHz.	Section 7 of Appendix B.26	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.26	Pass



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Effective (Isotropic) Radiated Power Output Data	§2.1046 §27.50(c)(10)	ERP ≤ 3 W	Section 1 of Appendix B.27	Pass
Peak-Average Ratio		Limit≤13 dB	Section 2 of Appendix B.27	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B.27	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B.27	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.27	Pass
Spurious Emission at Antenna Terminals	§2.1051, §27.53(g)	≤ -13 dBm/1 MHz, from 9 kHz to 10 <sup>th</sup> harmonics but outside authorized operating frequency ranges.	Section 6 of Appendix B.27	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(g)	≤ -13 dBm/1 MHz.	Section 7 of Appendix B.27	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.27	Pass

## 2.6 NR Band n71



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### 2.7 NR Band n77

#### 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.29	Pass
Peak-Average Ratio		≤13 dB	Section 2 of Appendix B329	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B329	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B329	Pass
Band Edges Compliance	§2.1051, §27.53(I)(2)	<ul> <li>(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.</li> </ul>	Section 5 of Appendix B.29	Pass
Spurious Emission at Antenna Terminals	§2.1051, §27.53(I)(2)	not exceed -13 dBm/MHz.	Section 6 of Appendix B.29	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(I)(2)	not exceed -13 dBm/MHz	Section 7 of Appendix B.29	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.29	Pass



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#### 3450-3550MHz:

Test Item	FCC Rule No.	Requirements	Test Result	Verdict	
Effective (Isotropic) Radiated Power Output	§2.1046, §27.50(k)(3)	EIRP ≤ 30dBm	Section 1 of Appendix	Pass	
Data			B.28		
Peak-Average Ratio	§27.50(k)(4)	FCC: Limit≤13 dB	Section 2 of Appendix B.28	Pass	
			Section 4 of		
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Appendix	Pass	
			B.28		
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.28	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.28	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.28	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.28	Pass	



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## **3** General Information

## 3.1 Client Information

Applicant:	MeiG Smart Technology Co., Ltd
Address of Applicant:	2nd Floor,Office Building,No.5 Lingxia Road,Fenghuang,Fuyong Street,Bao'an District,Shenzhen
Manufacturer:	MeiG Smart Technology Co., Ltd
Address of Manufacturer:	2nd Floor,Office Building,No.5 Lingxia Road,Fenghuang,Fuyong Street,Bao'an District,Shenzhen

## 3.2 Test Location

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

## 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:	SRM82	SRM825					
Model No.:	SRM82	SRM825N-NA					
Trade Mark:	MEIGLi	nk					
Hardware Version:	SRM82	5WN_X62_V1.01					
Software Version:	SRM82	5N_6.0.3_EQ101					
	RF Con	ducted	86161006003	37434			
IMEI:	RSE		86061006003	37343			
Feature:	UL 2*2 I	MIMO: n41; n77					
HPUE Power Class:	Class 2	Class 2: n41; n77					
Antenna Type:	🖾 Exte	External, 🗌 Integrated					
	n2:	-1.1dBi(Ant0)		n5:	-1.10	dBi(Ant2)	
	n7:	1.9dBi(Ant0)		n12:	1.3d	Bi(Ant2)	
	n25:	-1.1dBi(Ant0)		n41:	1.9d	Bi(Ant0); 1.9dBi(Ant2)	
Antenna Gain:	n66:	-1.4dBi(Ant0)		n71:	1.1d	Bi(Ant1)	
	n77:	n77: 3.1dBi(Ant1); 3.1dBi(Ant3)					
	Note: The antenna gain are derived from the gain information report provided by the manufacturer.					n report provided by the	
	0.8dB(Below 1GHz) 1.0dB(1.0~2.4GHz) 1.2dB(2.4~3.4GHz)			I.2dB(2.4~3.4GHz)			
RF Cable:	1.5dB(Above 3.4GHz)						
As above information is pro suitability, reliability or/and			applicant. SG	S is not li	able to	o the accuracy,	



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#### MIMO Model:

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

If all antennas have the same gain,  $G_{ANT}$ , Directional gain =  $G_{ANT}$  + Array Gain, where Array Gain is as follows.

 For power measurements on IEEE 802.11 devices: Array Gain = 0 dB (i.e., no array gain) for N<sub>ANT</sub> ≤ 4; Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N<sub>ANT</sub>; Array Gain = 5 log(N<sub>ANT</sub>/N<sub>SS</sub>=1) dB or 3 dB, whichever is less, for 20-MHz channel widths with N<sub>ANT</sub> ≥ 5.

Unequal antenna gains, with equal transmit powers. For antenna gains given by G1, G2, …, GN dBi ● If transmit signals are correlated, then

Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2 /N_{ANT}] dBi [Note the "20"s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]$ 

#### If all transmit signals are completely uncorrelated, then Directional gain = 10 log[(10<sup>G1/10</sup> + 10<sup>G2/10</sup> + ... + 10<sup>GN/10</sup>)/N<sub>ANT</sub>] dBi

Band	ANT Gain1 (dBi)	ANT Gain2 (dBi)	Power DG (dBi)
NR Band n41:	1.9	1.9	1.9
NR Band n77:	3.1	3.1	3.1



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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 kPa Selected Values During Tests			
Relative Humidity		44-46 % RH Ambient			
Value		Temperature(°C)	Voltage(V)		
NTNV		22~23	3.8		
LTLV		-40	3.3		
LTHV		-40	4.4		
HTLV		75	3.3		
HTHV		75	4.4		
		/ Extreme Test Voltage / Extreme Test Temperature	HV: High Extreme Test Voltage HT: High Extreme Test Temperatur		

## 3.7 Description of Support Units

The EUT has been tested as an independent unit.



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### 3.8 Technical Specification

SG

Characteristics	Description	Description							
Radio System Type	🛛 🖾 SA 🖾 NSA								
	Band	ТХ	ТХ						
	NR Band n2	1850 to 1910	MHz	1930 to 1990	) MHz				
	NR Band n5	824 to 849 M	ИHz	869 to 894 N	1Hz				
	NR Band n7	2500 to 2570	MHz	2620 to 2690	) MHz				
	NR Band n12	699 to 716 M	Hz	729 to 746 N	1Hz				
	NR Band n25	1850 to 1915	MHz	1930 to 1998	5 MHz				
	NR Band n41	2496 to 2690	MHz	2496 to 2690	) MHz				
	NR Band n66	1710 to 1780	MHz	2110 to 2180	) MHz				
Supported Frequency	NR Band n71	663 to 698 M	Hz	617 to 652 N	1Hz				
Range	ND Dand n77	3700 to 3980	MHz	3700 to 3980	) MHz				
	NR Band n77	3450 to 3550	MHz	3450 to 3550	) MHz				
	ENDC: DC_5A-n2A, DC_1 DC_2A-n5A, DC_6 DC_12A-n25A;DC DC_13A-n66A, DC DC_5A-n77A, DC_ Remark:ENDC Bar	6A-n5A, DC_7/ _2A-n41A, DC_ _71A-n66A;DC 12A-n77A, DC_	A-n5A;DC_2A- 12A-n41A;DC _2A-n71A, DC _13A-n77A, DC	n12A, DC_66A _5A-n66A, DC_ 5_66A-n71A; D0 C_66A-n77A,D0	_12A-n66A, C_2A-n77A, C_71A-n77A				
		SCS 15kHz:							
	NR Band n2	⊠5 MHz	⊠10 MHz	⊠15 MHz	20 MHz				
		SCS 15kHz:							
	NR Band n5	⊠5 MHz	⊠10 MHz	⊠15 MHz	20 MHz				
		SCS 15kHz:							
Supported Channel	NR Band n7	⊠5 MHz	⊠10 MHz	⊠15 MHz	20 MHz				
Bandwidth		25 MHz	⊠30 MHz	⊠40 MHz					
	NR Band n12	SCS 15kHz:							
		⊠5 MHz	⊠10 MHz	⊠15 MHz					
	NR Band n25	SCS 15kHz:							
		⊠5 MHz	⊠10 MHz	⊠15 MHz	⊠20 MHz				
	NR Band n41	SCS 30kHz:							



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		⊠20 MHz	Page: ⊠30 MHz	18 of 4 ⊠40 MHz	+5 ⊠50 MHz
			⊠30 MHZ	⊠40 MHZ	⊠30 MHz ⊠90 MHz
		SCS 15kHz:			
	NR Band n66	⊠5 MHz	⊠10 MHz	⊠15 MHz	⊠20 MHz
		30 MHz	⊠40 MHz		
	NR Band n71	SCS 15kHz:	10 MHz	⊠15 MHz	⊠20 MHz
		SCS 30kHz			
		10 MHz	15 MHz	⊠20 MHz	⊠30 MHz
	NR Band n77	⊠ 40 MHz	⊠ 13 MHz	⊠20 MHz	⊠30 MHz
		80 MHz	⊠90 MHz	⊠100 MHz	
		DFT-s-Pi/2- BPSK	CP-16QAM		
	NR Band n2	SCS 15kHz:			
		4M48G7D	4M53W7D		
		8M95G7D	9M32W7D		
		13M4G7D	14M2W7D		
		17M9G7D	19M0W7D		
		SCS 15kHz:			
Designation of		4M48G7D	4M51W7D		
Emissions	NR Band n5	8M92G7D	9M28W7D		
(Remark: the necessary bandwidth of which is		13M5G7D	14M2W7D		
the worst value from		17M9G7D	18M9W7D		
the measured occupied		SCS 15kHz:			
bandwidths for each type of channel		4M47G7D	4M52W7D		
bandwidth		8M92G7D	9M30W7D		
configuration.)		13M4G7D	14M2W7D		
	NR Band n7	17M9G7D	19M0W7D		
		22M9G7D	23M8W7D		
		28M6G7D	28M7W7D		
		38M5G7D	38M6W7D		
		4M49G7D	4M50W7D		
	NR Band n12	8M92G7D	9M28W7D		
		13M4G7D	14M2W7D		



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	SCS 15kHz:		
	4M49G7D	4M52W7D	
NR Band n25	8M92G7D	9M30W7D	
	13M5G7D	14M2W7D	
	17M9G7D	19M0W7D	
	SCS 30kHz:		
	17M9G7D	18M3W7D	
	26M8G7D	27M9W7D	
	35M8G7D	37M9W7D	
NR Band n41	45M8G7D	47M5W7D	
	58M0G7D	57M8W7D	
	64M4G7D	67M4W7D	
	77M1G7D	77M5W7D	
	85M7G7D	87M5W7D	
	96M5G7D	97M6W7D	
	SCS 15kHz:		
	4M48G7D	4M50W7D	
	8M91G7D	9M30W7D	
NR Band n66	13M4G7D	14M1W7D	
	17M9G7D	19M0W7D	
	28M6G7D	28M6W7D	
	38M6G7D	38M6W7D	
	SCS 15kHz:		
	4M47G7D	4M49W7D	
NR Band n71	8M91G7D	9M27W7D	
	13M4G7D	14M1W7D	
	17M9G7D	18M9W7D	
	SCS 30kHz:		
	8M58G7D	8M60W7D	
	12M9G7D	13M6W7D	
NR Band n77	17M9G7D	18M2W7D	
(3450-3550)	26M8G7D	27M8W7D	
	35M7G7D	37M9W7D	
	45M8G7D	47M6W7D	
	57M9G7D	57M9W7D	
	571010710		



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			Report Rev.: Page:	No.:	SEWM2 01 20 of 4	2212000297RG02
		64M5G7D	67M5W7D			
		77M1G7D	77M4W7D			
		85M6G7D	87M3W7D			
		96M4G7D	97M4W7D			
		SCS 30kHz:				
		8M62G7D	8M59W7D			
		12M9G7D	13M6W7D			
		17M9G7D	18M2W7D			
		26M7G7D	27M9W7D			
	NR Band n77	35M8G7D	37M9W7D			
	(3700-3980)	45M7G7D	47M5W7D			
		58M0G7D	57M9W7D			
		64M5G7D	67M3W7D			
		77M2G7D	77M5W7D			
		85M5G7D	87M4W7D			
		96M3G7D	97M3W7D			



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### 3.9 Test Frequencies

## 3.9.1 Reference test frequencies for NR operating band n2 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	15
	Downlink	Mid	1960	392000	
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		Low	1860	372000	
	Uplink	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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CBW	t frequencies for NR operating ba Range		Carrier centre	Carrier centre	SS block SCS
[MHz]			[MHz]	[ARFCN]	[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	1 -
		High	844	168800	
	Downlink	Low	876.5	175300	
		Mid	881.5	176300	15
45		High	886.5	177300	
15		Low	831.5	166300	
	Uplink	Mid	836.5	167300	- 1
		High	841.5	168300	
		Low	879	175800	
	Downlink	Mid	881.5	176300	15
00		High	884	176800	1
20		Low	834	166800	
	Uplink	Mid	836.5	167300	1 -
		High	839	167800	1



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3.9.3				perating band n	7
B.9.3.1 Test Bandwidth	Trequencies for Range		band n7 and SC	Carrier centre	SS block SCS
[MHz]	Kang	6	[MHz]	[ARFCN]	[kHz]
		Low	2622.5	524500	
	Downlink	Mid	2655	531000	15
5		High	2687.5	537500	
5		Low	2502.5	500500	
	Uplink	Mid	2535	507000	
		High	2567.5	513500	
Г		Low	2625	525000	
	Downlink	Mid	2655	531000	15
10		High	2685	537000	
10		Low	2505	501000	
	Uplink	Mid	2535	507000	
		High	2565	513000	
	Downlink	Low	2627.5	525500	
		Mid	2655	531000	15
15		High	2682.5	536500	
10		Low	2507.5	501500	
	Uplink	Mid	2535	507000	
		High	2562.5	512500	
		Low	2630	526000	
	Downlink	Mid	2655	531000	15
20		High	2680	536000	
		Low	2510	502000	4
	Uplink	Mid	2535	507000	
		High	2560	512000	
	<b>D</b> " '	Low	2632.5	526500	
	Downlink	Mid	2655	531000	15
25		High	2677.5	535500	
		Low	2512.5	502500	_
	Uplink	Mid	2535	507000	
		High	2557.5	511500	
	Davin II. I	Low	2635	52700	45
	Downlink	Mid	2655	531000	15
30		High	2675	535000	
	L Incline In	Low	2515	503000	-
	Uplink	Mid	2535	507000	
		High	2555	511000	
		Low	2640	528000	4



40

Downlink

Uplink

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2655

2670

2520

2535

2550

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Mid

High

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531000

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507000

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#### 3.9.4 Reference test frequencies for NR operating band n12 3.9.4.1 Test frequencies for NR operating band n12 and SCS 15 kHz

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Bandwidth [MHz]	Rang	e	Carrier centre [MHz]	Carrier centre [ARFCN]	SS block SCS [kHz]
		Low	731.5	146300	
	Downlink	Mid	737.5	147500	15
5		High	743.5	148700	
5		Low	701.5	140300	
	Uplink	Mid	707.5	141500	
		High	713.5	142700	
		Low	734	146800	
	Downlink	Mid	737.5	147500	15
10		High	741	148200	
10		Low	704	140800	
	Uplink	Mid	707.5	141500	
		High	711	142200	
		Low	736.5	147300	
15	Downlink	Mid	737.5	147500	15
		High	738.5	147700	
		Low	706.5	141300	
	Uplink	Mid	707.5	141500	
		High	708.5	141700	

#### 3.9.5 Reference test frequencies for NR operating band n25 3.9.5.1 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	- 1
		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	-
	·	High	1907.5	381500	
		Low	1940	388000	
	Downlink	Mid	1962.5	392500	15
20		High	1985	397000	1
20		Low	1860	372000	
	Uplink	Mid	1882.5	376500	1 -
	•	High	1905	381000	1



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## 3.9.6 Reference test frequencies for NR operating band n41

S

3.9.6.1 Test frequencies for NR operating band n41 and SCS 30 kHz         CBW       Range       Carrier centre       Carrier centre       SS block S						
[MHz]			[MHz]	[ARFCN]	[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		
70	&	Mid	2592.99	518598	30	
	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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## 3.9.7 Reference test frequencies for NR operating band n66

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CBW [MHz]	Range	•	Carrier centre [MHz]	Carrier centre [ARFCN]	SS block SCS [kHz]
		Low	2112.5	422500	
	Downlink	Mid	2145	429000	15
F		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	1 -
		High	1775	355000	
		Low	2117.5	423500	
	Downlink	Mid	2145	429000	15
45		High	2172.5	434500	_
15		Low	1717.5	343500	
	Uplink	Mid	1745	349000	1 -
		High	1772.5	354500	
		Low	2120	424000	
	Downlink	Mid	2145	429000	15
		High	2170	434000	
20		Low	1720	344000	-
	Uplink	Mid	1745	349000	
		High	1770	354000	
		Low	2125	425000	
	Downlink	Mid	2145	429000	15
20		High	2165	433000	1
30		Low	1725	345000	
	Uplink	Mid	1745	349000	1 -
		High	1765	353000	1
		Low	2130	426000	
	Downlink	Mid	2145	429000	15
		High	2160	432000	1
40		Low	1730	346000	
	Uplink	Mid	1745	349000	1 -
	- 1	High	1760	352000	1



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## 3.9.8 Reference test frequencies for NR operating band n71

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	frequencies for N				-
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	
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	
	Downlink	Low	624.5	124900	
		Mid	634.5	126900	15
15		High	644.5	128900	
15		Low	670.5	134100	
	Uplink	Mid	680.5	136100	1 -
		High	690.5	138100	
		Low	627	125400	
	Downlink	Mid	634.5	126900	15
20		High	642	128400	7
20		Low	673	134600	
	Uplink	Mid	680.5	136100	] -
	-	High	688	137600	7



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#### 3.9.9 Reference test frequencies for NR operating band n77

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

3700-3980:

S

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	3735	649000	
70	&	Mid	3840	656000	30
	Uplink	High	3945	663000	
	Downlink	Low	3740.01	649334	
80	&	Mid	3840	656000	30
	Uplink	High	3939.99	662666	
	Downlink	Low	3745.02	649668	
90	&	Mid	3840	656000	30
	Uplink	High	3934.98	662332	
	Downlink	Low	3750	650000	
100	&	Mid	3840	656000	30
	Uplink	High	3930	662000	



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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	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	
90	Downlink	Low	3495	633000	
	&	Mid	3500.01	633334	30
	Uplink	High	3504.99	633666	
	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
  - 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
- VBW ≥ 3 x 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 of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

#### Remark: Reference test setup 1

#### Test Settings

1. Start frequency was set to 9kHz and stop frequency was set to at least 10\* the fundamental frequency(Separated into at least two plots per channel)

- 2. Detector = RMS
- 3. Trace mode = trace average for continuous emissinos, max hold for pulse emissions
- 4. Sweep time = auto couple
- 5. The trace was allowed to stabilize
- 6. Please see test notes below for RBW and VBW settings



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

Remark:

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

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

AF = Antenna Factor(dB/m)

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

Margin = Limit(dBm) - Level(dBm)

2) Scan from 9kHz to 40GHz, The disturbance between 9KHz to 30MHz and 18GHz to 40GHz was very low, and the harmonics were the highest point could be found when testing, so only the harmonics

had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

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

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## 4.8 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  $\pm 0.00025\%$  ( $\pm 2.5$  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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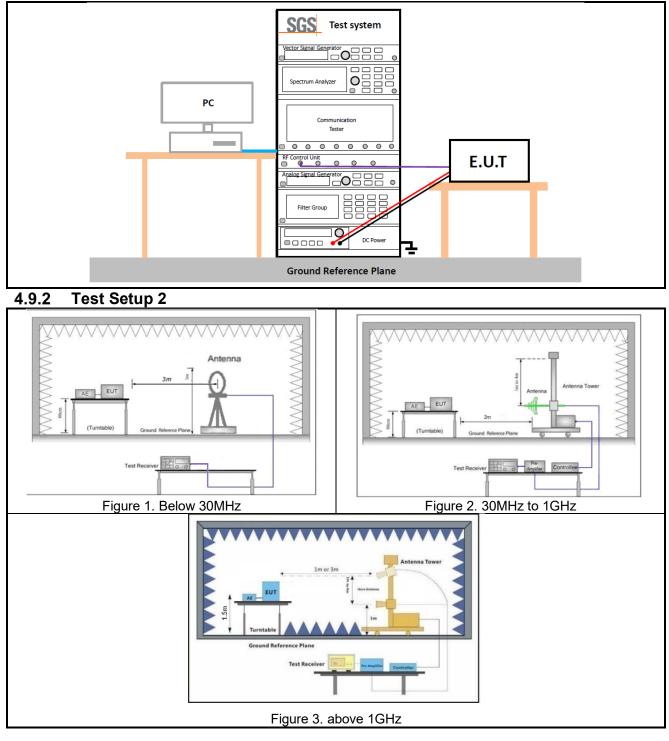
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### 4.9 Test Setups

### 4.9.1 Test Setup 1



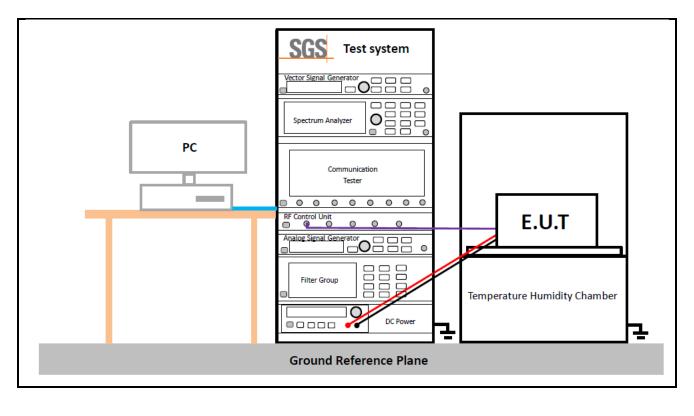


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### 4.9.3 Test Setup 3





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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			
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/TM5; NR/TM9			
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	<ul> <li>(1) -40 °C to +75 °C with step 10 °C at Rated Voltage</li> <li>(2) VL, VN and VH of Rated Voltage at Ambient Climate.</li> </ul>			
Test Setup	Test Setup 3			
RF Channels (TX)	M (M= middle channel)			
( )				



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## 5 Main Test Instruments

RF conducted test					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal.Due date (yyyy/mm/dd)
Shielding Room	Brilliant-emc	N/A	SUWI-04-01-06	2021/05/08	2024/05/07
Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-07	2022/02/16	2023/02/15
Signal Analyzer	ROHDE&SCHWARZ	FSV3030	SUWI-01-02-02	2022/05/17	2023/05/16
Measurement Software	Tonscend	JS1120-3 Test System V 2.6.88.0336	SUWI-02-09-09	NCR	NCR
Wideband Radio Communication Tester	ROHDE&SCHWARZ	CMW500	SUWI-01-16-05	2022/02/14	2023/02/13
DC Power Supply	HYELEC	HY3005B	SUWI-01-18-01	2022/02/15	2023/02/14
Temperature Chamber	ESPEC	SU-242	SUWI-01-13-01	2022/02/15	2023/02/14
Signal Analyzer	ROHDE&SCHWARZ	FSW43	SUWI-01-02-04	2022/05/28	2023/05/27
Wideband Radio Communication Tester station	Anritsu	MT8000A	SUWI-01-34-02	2022/09/16	2023/09/15



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RSE Test System					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date (yyyy/mm/dd)	Cal Due Date (yyyy/mm/dd)
Semi-Anechoic Chamber	Brilliant-emc	N/A	SUWI-04-02-01	2021/05/08	2024/05/07
Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-05	2022/02/16	2023/02/15
Signal Analyzer	ROHDE&SCHWARZ	FSW43	SUWI-01-02-04	2022/05/28	2023/05/27
Signal Analyzer	KEYSIGHT	N9020A	SUWI-01-02-05	2022/11/23	2023/11/22
Test receiver	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	2022/02/19	2023/02/18
Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	VULB 9163	SUWI-01-11-01	2021/05/16	2023/05/15
Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	BBHA 9120D	SUWI-01-11-02	2021/05/16	2023/05/15
Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	BBHA 9170	SUWI-01-11-03	2021/05/14	2023/05/13
Amplifier	Tonscend	TAP9K3G40	SUWI-01-14-01	2022/02/14	2023/02/13
Amplifier	Tonscend	TAP01018050	SUWI-01-14-02	2022/02/14	2023/02/13
Amplifier	Tonscend	TAP18040048	SUWI-01-14-03	2022/02/19	2023/02/18
Active Loop Antenna	SCHWRZBECK MESS- ELEKTRONIK	FMZB 1519B	SUWI-01-21-01	2021/06/10	2023/06/09
UXM 5G Wireless Test Platform	KEYSIGHT	E7515B	SUWI-01-04-01	2022/02/20	2023/02/19
Measurement Software	Tonscend	JS32-RE V4.0.0.0	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:

Total RF power, conducted RF power density, conducted	±0.54dB
PE power density, conducted	
RE power density, conducted	±1.03dB
Spurious emissions, conducted	±0.54dB
Radio Frequency	±1.0 %
Duty Cycle	±0.37%
Occupied Bandwidth	±1.0 %
	± 3.13dB (9k -30MHz)
Dedicted Emission	± 4.8dB (30M -1GHz)
Radiated Emission	± 4.8dB (1GHz to 18 GHz)
	± 4.8dB (Above 18GHz)
	Radio Frequency Duty Cycle

Remark:

S

The Ulab (lab Uncertainty) is less than Ucispr/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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## 7 Appendixes

Appendix A.2	WWAN Setup Photos
Appendix B.20	NR Band n2
Appendix B.21	NR Band n5
Appendix B.22	NR Band n7
Appendix B.23	NR Band n12
Appendix B.24	NR Band n25
Appendix B.25	NR Band n41
Appendix B.26	NR Band n66
Appendix B.27	NR Band n71
Appendix B.28	NR Band n77(3450-3550)
Appendix B.29	NR Band n77(3700-3980)

---End of Report---



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