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TEST REPORT

SEWM2212000326RG **Application No.:** Applicant: Fibocom Wireless Inc.

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

1st Rd, Nanshan, Shenzhen, China

Manufacturer: Fibocom Wireless Inc.

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

1st Rd, Nanshan, Shenzhen, China

EUT Description: LTE Module Model No.: SC128-NA Trade Mark: **FIBOCOM**

FCC ID: ZMOSC128NA

> 47 CFR Part 2 47 CFR Part 22

Standards: 47 CFR Part 24

47 CFR Part 27 47 CFR Part 90

Date of Receipt: 2023/01/03

Date of Test: 2023/01/03 to 2023/02/07

Date of Issue: 2023/02/08

PASS * Test Result:

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

Authorized Signature:

Panta Sun Wireless Laboratory Manager



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Revision Record					
Version	Version Chapter Date Modifier Remark				
01		2023/02/08		Original	

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



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2 Test Summary

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

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046, §22.913(a)(5)	ERP≤7W	Section 1 of Appendix B.3&B.10	Pass
Peak-Average Ratio	§22.913(d)	Limit≤13 dB	Section 2 of Appendix B.3&B.10	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B.3&B.10	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B.3&B.10	Pass
Band Edges Compliance	§2.1051, §22.917(a)	≤ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.	Section 5 of Appendix B.3&B.10	Pass
Spurious Emission at Antenna Terminals	§2.1051, §22.917(a)	FCC: ≤ -13 dBm/100 kHz, from 9 kHz to 10th harmonics but outside authorized operating frequency ranges.	Section 6 of Appendix B.3&B.10	Pass
Field Strength of Spurious Radiation	§2.1053, §22.917(a)	FCC: ≤ -13 dBm/100 kHz.	Section 7 of Appendix B.3&B.10	Pass
Frequency Stability	§2.1055(a)(1)(b) §2.1055(d)(1) §22.355	≤ ±2.5ppm.	Section 8 of Appendix B.3&B.10	Pass



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[67,75]

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2.2 LTE Band 2/25

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046, §24.232(c)	EIRP ≤ 2 W	Section 1 of Appendix B.1&B.8	Pass
Peak-Average Ratio	§24.232(d)	Limit≤13 dB	Section 2 of Appendix B.1&B.8	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B.1&B.8	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B.1&B.8	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.1&B.8	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.1&B.8	Pass
Field Strength of Spurious Radiation	§2.1053, §24.238(a)	≤ -13 dBm/1 MHz.	Section 7 of Appendix B.1&B.8	Pass
Frequency Stability	§2.1055(a)(1)(b) §2.1055(d)(1) §24.235	Within authorized bands of operation/frequency block.	Section 8 of Appendix B.1&B.8	Pass



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2.3 LTE Band 4/66

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(d)(4)	EIRP ≤ 1 W	Section 1 of Appendix B.2&B.12	Pass
Peak-Average Ratio	§27.50(d)(5)	Limit≤13 dB	Section 2 of Appendix B.2&B.12	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B.2&B.12	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B.2&B.12	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.2&B.12	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.2&B.12	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(h)	≤ -13 dBm/1 MHz.	Section 7 of Appendix B.2&B.12	Pass
Frequency Stability	§2.1055(a)(1)(b) §2.1055(d)(1) §27.54	Within authorized bands of operation/frequency block.	Section 8 of Appendix B.2&B.12	Pass



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2.4 LTE Band 7/41

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(h)(2)	EIRP ≤ 2W	Section 1 of Appendix B.4&B.11	Pass
Peak-Average Ratio		≤13 dB	Section 2 of Appendix B.4&B.11	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B.4&B.11	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B.4&B.11	Pass
Band Edges Compliance	§2.1051, §27.53(m4)	For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) 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.4&B.11	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 MHz 10° harmonics X=Max {6MHz. EBW}	Section 6 of Appendix B.4&B.11	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(m)	Channel Edge -25 dBm/ 1 MHz 1 MHz 9 kHz 95 MHz XMHz 10 th harmonics X=Max {6MHz .EBW}	Section 7 of Appendix B.4&B.11	Pass
Frequency Stability	§2.1055(a)(1)(b) §2.1055(d)(1) §27.54	Within authorized bands of operation/frequency block.	Section 8 of Appendix B.4&B.11	Pass



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2.5 LTE Band 12/17

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046 §27.50(c)(10)	ERP ≤ 3 W.	Section 1 of Appendix B.5&B.7	Pass
Peak-Average Ratio		Limit≤13 dB	Section 2 of Appendix B.5&B.7	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B.5&B.7	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B.5&B.7	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.5&B.7	Pass
Spurious Emission at Antenna Terminals	§2.1051, §27.53(g)	FCC: ≤ -13 dBm/100 kHz, from 9 kHz to 10 th harmonics but outside authorized operating frequency ranges.	Section 6 of Appendix B.5&B.7	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(g)	FCC: ≤ -13 dBm/100 kHz.	Section 7 of Appendix B.5&B.7	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.5&B.7	Pass



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2.6 LTE Band 13

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(b)(10)	ERP≤3W.	Section 1 of Appendix B.6	Pass
Peak-Average Ratio		Limit≤13 dB	Section 2 of Appendix B.6	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B.6	Pass
Bandwidth	§2.1049,	OBW: No limit. EBW: No limit.	Section 4 of Appendix B.6	Pass
Band Edges Compliance	§2.1051, §27.53(c)	≤ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.	Section 5 of Appendix B.6	Pass
Spurious Emission at Antenna Terminals	§2.1051, §27.53(c) §27.53(f)	≤ -13 dBm/100 kHz, from 9 kHz to 10 th harmonics but outside authorized operating frequency ranges. On all frequencies between 763–775 MHz and 793–805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations. For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.	Section 6 of Appendix B.6	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(c) §27.53(f)	FCC: ≤ -13 dBm/100 kHz. For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.	Section 7 of Appendix B.6	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.6	Pass



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2.7 LTE Band 26(814~824 MHz)

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Transmitter Conducted Power Output	§2.1046, §90.635(b)	< 100 W.	Section 1 of Appendix B.9	Pass
Peak-Average Ratio		Limit≤13 dB	Section 2 of Appendix B.9	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B.9	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B.9	Pass
Emission Mask	§2.1051 § 90.691(a)	For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10(f/6.1) decibels or 50+10Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.	Section 5 of Appendix B.9	Pass
Spurious Emission at Antenna Terminals	§2.1051, §90.691	< 43 + 10Log10(P[Watts]) for all out-of-band emissions	Section 6 of Appendix B.9	Pass
Field Strength of Spurious Radiation	§2.1053, §90.691	< 43 + 10Log10(P[Watts]) for all out-of-band emissions	Section 7 of Appendix B.9	Pass
Frequency Stability	§2.1055(a)(1)(b) §2.1055(d)(1) §90.213	Within authorized bands of operation/frequency block.	Section 8 of Appendix B.9	Pass



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2.8 LTE Band 71

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046 §27.50(c)(10)	ERP≤3W	Section 1 of Appendix B.13	Pass
Peak-Average Ratio		Limit≤13 dB	Section 2 of Appendix B.13	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B.13	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B.13	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.13	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.13	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(g)	≤ -13 dBm/1 MHz.	Section 7 of Appendix B.13	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.13	Pass



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3 **General Information**

3.1 Details of Client

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

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

3.3 Test Facility

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

A2LA (Certificate No. 6336.01)

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

Innovation, Science and Economic Development Canada

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

CAB identifier: CN0120.

IC#: 27594.

• FCC -Designation Number: CN1312

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

accredited testing laboratory. Designation Number: CN1312.

Test Firm Registration Number: 717327



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3.4 General Description of EUT

EUT Description:	LTE Module					
Model No.:	SC128-NA					
Trade Mark:	FIBOCOM					
Hardware Version:	V1.0					
Software Version:	SC128-NA-S64.0	0.102				
INACL	RF Conducted		060001123 060001701			
IMEI:	RSE	861644060001180 861644060001768				
Antenna Type:	External Antenna					
	LTE Band 2:	4dBi		LTE Band 4:		3dBi
	LTE Band 5: 3dBi		LTE Band 7:		4dBi	
	LTE Band 12:	3dBi		LTE Band 13	3:	3dBi
	LTE Band 17:	3dBi		LTE Band 25	5:	4dBi
Antenna Gain:	LTE Band 26:	3dBi		LTE Band 41	:	4dBi
	LTE Band 66:	3dBi		LTE Band 71	:	3dBi
Note: The antenna gain are derived from the gain information report provided manufacturer.						provided by the
DE Cable	0.8dB(Below 1GF	łz)	1.0dB(1.0~2.	.4GHz)	1.2dB	(2.4~3.4GHz)
RF Cable:	1.5dB(Above 3.4GHz)					
Remark:						

Remark:

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3.5 Test Mode

Test Mode	Test Modes Description
LTE/TM1	LTE system, QPSK modulation
LTE/TM2	LTE system, 16QAM modulation
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	3.5		
LTHV		-30	4.4		
HTLV		50	3.5		
HTHV		50	4.4		
Remark:					
NV: Normal Voltage LV: Low		Extreme Test Voltage H	HV: High Extreme Test Voltage		
NT: Normal Temperature L	T: Low	Extreme Test Temperature H	HT: High Extreme Test Temperature		

3.7 Description of Support Units

Description	Manufacturer	Model No.					
Motherboard	Fibocom Wireless Inc.	EVKB-SOC_V1.3					
Adapter	Zhuzhou Dachuan Electronic Technology Co.,Ltd.	DCT36W120300CN-B0					
Remark: all above the information of ta	Remark: all above the information of table are provided by client.						



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3.8 Technical Specification

Characteristics	Description						
Radio System Type							
	Band TX				RX		
	LTE Band 2	1850 to 1910 MHz			1930 to 1990 MHz		
	LTE Band 4	1710 to 17	55 MHz		2110 to 2	2155 MHz	
	LTE Band 5	824 to 849	MHz		869 to 89	94 MHz	
	LTE Band 7	2500 to 25	70 MHz		2620 to 2690 MHz		
	LTE Band 12	699 to 716	MHz		729 to 74	16 MHz	
	LTE Band 13	777 to 787	MHz		746 to 75	66 MHz	
Supported Frequency Range	LTE Band 17	704 to 716	MHz		734 to 74	16 MHz	
Supported Frequency Trange	LTE Band 25	1850 to 19	15MHz		1930 to 1	1995 MHz	
	LTE Band 26 (814 to 824 MHz)	814 to 824	MHz		859 to 86	69 MHz	
	LTE Band 26	924 to 940	MU>		000 to 004 MHz		
	(824 to 849 MHz)	824 to 849 MHz			869 to 894 MHz		
	LTE Band 41	2496 to 2690MHz		2496 to 2690MHz			
	LTE Band 66	1710 to 1780 MHz			2110 to 2	2200 MHz	
	LTE Band 71	663 to 698 MHz			617 to 652 MHz		
	LTE Band 2		⊠3 MHz ⊠20 MHz	\triangleright	₫5 MHz	⊠10 MHz	
	LTE Band 4	⊠1.4 MHz		\triangleright	₫5 MHz	⊠10 MHz	
	LTE Band 5			<u> </u>]5 MHz	⊠10 MHz	
	LTE Band 7	⊠ 1.4 WHz	⊠3 WHZ		15 MHz	⊠20 MHz	
	LTE Band 12	⊠1.4 MHz			3 10 11112 35 MHz	⊠20 MHz	
Supported Channel Bandwidth		⊠5 MHz	⊠10 MHz		<u> </u>		
Supported Orientici Bandwidth	LTE Band 17	⊠5 MHz	⊠10 MHz				
		⊠1.4 MHz		\triangleright	5 MHz	⊠10 MHz	
	LTE Band 25	□ □15 MHz	⊠20 MHz	_	-	_	
	LTE Band 26(814-824)	⊠1.4 MHz		\triangleright	₫5 MHz	⊠10 MHz	
	2.2 23.13 25(011 021)	 ⊠1.4 MHz					
	LTE Band 26(824-849)	□ □15 MHz	· 			- -	
	LTE Band41	_ ⊠5 MHz	⊠10 MHz	$\overline{}$	15 MHz	⊠20 MHz	



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	LTE Band66	⊠1.4 MHz ⊠3 MHz ⊠5 MHz ⊠10 MHz
		⊠15MHz ⊠20MHz
	LTE Band71	⊠5MHz ⊠10MHz ⊠15MHz ⊠20MHz
Characteristics	Description	
	E-UTRA:	QPSK 16QAM
		1M11G7D 1M10W7D
		2M70G7D 2M69W7D
	LTE Band 2	4M47G7D 4M47W7D
	LIL Band 2	8M93G7D 8M91W7D
		13M4G7D 13M4W7D
	17	17M9G7D 17M9W7D
		1M09G7D 1M10W7D
	LTE Band 4 8	2M70G7D 2M69W7D
		4M47G7D 4M47W7D
		8M92G7D 8M91W7D
Designation of Emissions		13M4G7D 13M4W7D
(Remark: the necessary		17M9G7D 17M9W7D
bandwidth of which is the	21	1M09G7D 1M10W7D
worst value from the		2M70G7D 2M69W7D
measured occupied	LTE Band 5	4M47G7D 4M46W7D
bandwidths for each type of	-	8M92G7D 8M91W7D
channel bandwidth		4M46G7D 4M46W7D
configuration.)		8M92G7D 8M90W7D
,gaauc,	LTE Band 7	13M4G7D 13M4W7D
		17M9G7D 17M9W7D
		1M09G7D 1M10W7D
	TE D 140	2M70G7D 2M69W7D
	LTE Band 12	4M47G7D 4M47W7D
		8M95G7D 8M92W7D
		4M47G7D 4M47W7D
	LTE Band13	8M90G7D 8M89W7D
	LTE Band 17	4M47G7D 4M47W7D
		8M95G7D 8M92W7D
	LTE Band 25	1M09G7D 1M10W7D



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		ı ay	C. 10 01 1 1
		2M70G7D	2M69W7D
		4M47G7D	4M46W7D
		8M93G7D	8M91W7D
		13M4G7D	13M4W7D
		17M9G7D	17M9W7D
		1M09G7D	1M10W7D
	LTE Band 26	2M69G7D	2M69W7D
	(814-824)	4M47G7D	4M46W7D
		8M90G7D	8M89W7D
		1M09G7D	1M10W7D
	LTE D. 100	2M70G7D	2M69W7D
	LTE Band 26 (824-849)	4M47G7D	4M46W7D
		8M95G7D	8M92W7D
		13M4G7D	13M4W7D
	LTE Band 41	4M47G7D	4M46W7D
		8M91G7D	8M91W7D
		13M5G7D	13M4W7D
		17M9G7D	17M8W7D
		1M09G7D	1M10W7D
		2M69G7D	2M69W7D
	LTE Band 66	4M47G7D	4M46W7D
	LIE Daliu 00	8M92G7D	8M91W7D
		13M4G7D	13M4W7D
		17M9G7D	17M9W7D
		4M46G7D	4M46W7D
	LTE Band 71	8M93G7D	8M92W7D
		13M5G7D	13M5W7D
		17M9G7D	17M9W7D



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3.9 Test Frequencies

Test Mode	Bandwidth	TX / RX	RF Channel			
rest Mode		17/157	Low (L)	Middle (M)	High (H)	
			Channel 18607	Channel 18900	Channel 19193	
		TX	1850.7 MHz	1880 MHz	1909.3 MHz	
	1.4MHz	RX	Channel 607	Channel 900	Channel 1193	
		KA	1930.7 MHz	1960 MHz	1989.3 MHz	
			Channel 18615	Channel 18900	Channel 19185	
		TX	1851.5 MHz	1880 MHz	1908.5 MHz	
	3MHz	RX	Channel 615	Channel 900	Channel 1185	
		INA	1931.5 MHz	1960 MHz	1988.5 MHz	
	5MHz	TX	Channel 18625	Channel 18900	Channel 19175	
			1852.5 MHz	1880 MHz	1907.5 MHz	
		RX	Channel 625	Channel 900	Channel1175	
LTE Band 2			1932.5 MHz	1960 MHz	1987.5 MHz	
LTE Dallu Z	10MHz		Channel 18650	Channel 18900	Channel 19150	
		TX	1855 MHz	1880 MHz	1905 MHz	
		RX	Channel 650	Channel 900	Channel 1150	
			1935 MHz	1960 MHz	1985 MHz	
			Channel 18675	Channel 18900	Channel 19125	
		TX	1857.5 MHz	1880 MHz	1902.5 MHz	
	15MHz	RX	Channel 675	Channel 900	Channel 1125	
		KA	1937.5 MHz	1960 MHz	1982.5 MHz	
			Channel 18700	Channel 18900	Channel 19100	
		TX	1860 MHz	1880 MHz	1900 MHz	
	20MHz	DV	Channel 700	Channel 900	Channel 1100	
		RX	1940 MHz	1960 MHz	1980 MHz	



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T () A	Bandwidth	TV / DV	RF Channel			
Test Mode		TX / RX	Low (L)	Middle (M)	High (H)	
		TX	Channel 19957	Channel 20175	Channel 20393	
			1710.7 MHz	1732.5 MHz	1754.3 MHz	
	1.4MHz	RX	Channel 1975	Channel 2175	Channel 2375	
		KA	2112.5 MHz	2132.5MHz	2152.5 MHz	
			Channel 19965	Channel 20175	Channel 20385	
		TX	1711.5 MHz	1732.5 MHz	1753.5 MHz	
	3MHz	RX	Channel 2000	Channel 2175	Channel 2350	
		KA	2115 MHz	2132.5MHz	2150 MHz	
	5MHz	TX RX	Channel 19975	Channel 20175	Channel 20375	
			1712.5 MHz	1732.5 MHz	1752.5 MHz	
			Channel 1975	Channel 2175	Channel 2375	
LTE Band 4			2112.5 MHz	2132.5MHz	2152.5 MHz	
LTL Danu 4	10MHz	TX	Channel 20000	Channel 20175	Channel 20350	
			1715 MHz	1732.5 MHz	1750 MHz	
		RX	Channel 2000	Channel 2175	Channel 2350	
			2115 MHz	2132.5MHz	2150 MHz	
		TX	Channel 20025	Channel 20175	Channel 20325	
			1717.5 MHz	1732.5 MHz	1747.5 MHz	
	15MHz	RX	Channel 2025	Channel 2175	Channel 2325	
		IXX	2117.5 MHz	2132.5MHz	2147.5 MHz	
		TX	Channel 20050	Channel 20175	Channel 20300	
	001411		1720 MHz	1732.5 MHz	1745 MHz	
	20MHz	RX	Channel 2050	Channel 2175	Channel 2300	
	R	IVA	2120 MHz	2132.5MHz	2145 MHz	

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



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			ı age.		
Test Mode	Bandwidth	TX / RX		RF Channel	
1 est Mode	Danuwidin	IATIM	Low (L)	Middle (M)	High (H)
			Channel 20775	Channel 21100	Channel 21425
		TX	2502.5 MHz	2535 MHz	2567.5 MHz
	5MHz	RX	Channel 2775	Channel 3100	Channel 5825
		KA.	2622.5 MHz	2655 MHz	2687.5 MHz
			Channel 20800	Channel 21100	Channel 21400
	10MHz	TX	2505 MHz	2535 MHz	2565 MHz
		RX	Channel 2800	Channel 3100	Channel 3400
1.TE D 1.7			2625 MHz	2655 MHz	2685 MHz
LTE Band 7		TX	Channel 20825	Channel 21100	Channel 21375
	451411		2507.5 MHz	2535 MHz	2562.5 MHz
	15MHz	DV	Channel 2825	Channel 3100	Channel 3375
		RX	2627.5 MHz	2655 MHz	2682.5 MHz
			Channel 20850	Channel 21100	Channel 21350
		TX	2510 MHz	2535 MHz	2560 MHz
	20MHz	DV	Channel 2850	Channel 3100	Channel 3350
		RX	2630 MHz	2655 MHz	2680 MHz

Test Mode	Bandwidth	TX / RX	RF Channel		
rest wode	Danuwiuin	IA/KA	Low (L)	Middle (M)	High (H)
			Channel 23017	Channel 23095	Channel 23173
		TX	699.7 MHz	707.5 MHz	715.3 MHz
	1.4MHz	RX	Channel 5017	Channel 5095	Channel 5173
		KA	729.7 MHz	737.5 MHz	745.3 MHz
			Channel 23025	Channel 23095	Channel 23165
	3MHz	TX	700.5 MHz	707.5 MHz	714.5 MHz
		RX	Channel 5025	Channel 5095	Channel 5165
LTE Band 12			730.5 MHz	737.5 MHz	744.5 MHz
LIE Dallu 12		TX	Channel 23035	Channel 23095	Channel 23155
			701.5 MHz	707.5 MHz	713.5 MHz
	5MHz	RX	Channel 5035	Channel 5095	Channel 5155
			731.5 MHz	737.5 MHz	743.5 MHz
			Channel 23060	Channel 23095	Channel 23130
	10MHz	TX	704 MHz	707.5 MHz	711 MHz
		DV	Channel 5060	Channel 5095	Channel 5130
		RX	734 MHz	737.5 MHz	741 MHz



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

Test Mode	Bandwidth	TV / DV	RF Channel		
rest Mode	Danuwidin	TX / RX	Low (L)	Middle (M)	High (H)
			Channel 23755	Channel 23790	Channel 23825
		TX	706.5 MHz	710 MHz	713.5 MHz
	5MHz	RX	Channel 5755	Channel 5790	Channel 5825
LTE Band 17			736.5 MHz	740 MHz	743.5 MHz
LIE Dallu II		TX	Channel 23780	Channel 23790	Channel 23800
			709 MHz	710 MHz	711 MHz
	10MHz	DV	Channel 5780	Channel 5790	Channel 5800
		RX	739 MHz	740 MHz	741 MHz

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



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Toot Mode	Dondwidth	TV / DV		RF Channel	
Test Mode	Bandwidth	TX / RX	Low (L)	Middle (M)	High (H)
			Channel 26697	Channel 26740	Channel 26783
		TX	814.7 MHz	819 MHz	823.3 MHz
	1.4MHz	RX	Channel 8697	Channel 8740	Channel 8783
		KA	859.7 MHz	864MHz	868.3 MHz
			Channel 26705	Channel 26740	Channel 26775
	3MHz	TX	815.5 MHz	819 MHz	822.5 MHz
		RX	Channel 8705	Channel 8740	Channel 8775
LTE Band 26			860.5 MHz	864MHz	867.5 MHz
(814-824)		TX	Channel 26715	Channel 26740	Channel 26765
(5.1.5=1)			816.5 MHz	819 MHz	821.5 MHz
	5MHz	RX	Channel 8715	Channel 8740	Channel 8755
		KX	861.5 MHz	864MHz	866.5 MHz
			Channel 26740	Channel 26740	Channel 26740
	10MHz	TX	819 MHz	819 MHz	819 MHz
		RX	Channel 8740	Channel 8740	Channel 8740
		ΓΛ	864MHz	864MHz	864MHz

Toot Made	Dondwidth	TV / DV		RF Channel	
Test Mode	Bandwidth	TX / RX	Low (L)	Middle (M)	High (H)
			Channel 26797	Channel 26915	Channel 27033
		TX	824.7 MHz	836.5 MHz	848.3 MHz
	1.4MHz	RX	Channel 8697	Channel 8915	Channel 9033
		INA	859.7 MHz	881.5 MHz	893.3 MHz
			Channel 26805	Channel 26915	Channel 27025
		TX	825.5 MHz	836.5 MHz	847.5 MHz
	3MHz	RX	Channel 8805	Channel 8915	Channel 9025
		KA.	860.5 MHz	881.5 MHz	892.5 MHz
	5MHz	TX	Channel 26815	Channel 26915	Channel 27015
LTE Band26			826.5 MHz	836.5 MHz	846.5 MHz
(824-849)		RX	Channel 8815	Channel 8915	Channel 9015
(0=1010)			871.5 MHz	881.5 MHz	891.5 MHz
		TX	Channel 26840	Channel 26915	Channel 26990
			829 MHz	836.5 MHz	844 MHz
	10MHz	DV	Channel 8840	Channel 8915	Channel 8990
		RX	874 MHz	881.5 MHz	889 MHz
			Channel 26865	Channel 26915	Channel 26965
		TX	831.5 MHz	836.5 MHz	841.5 MHz
	15MHz	RX	Channel 8865	Channel 8915	Channel 8965
			876.5 MHz	881.5 MHz	886.5 MHz



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

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



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Toot Mode	Dondwidth	TV / DV		RF Channel	
Test Mode	Bandwidth	TX / RX	Low (L)	Middle (M)	High (H)
			Channel 133147	Channel 133297	Channel 133447
		TX	665.5 MHz	680.5 MHz	695.5 MHz
	5MHz	RX	Channel 68611	Channel 68761	Channel 68911
		KA	619.5 MHz	634.5 MHz	649.5 MHz
			Channel 133172	Channel 133297	Channel 133422
		TX	668 MHz	680.5 MHz	693 MHz
	10MHz	RX	Channel 68636	Channel 68761	Channel 68886
L TE D 174		KA.	622 MHz	634.5 MHz	647 MHz
LTE Band71		TX	Channel 133197	Channel 133297	Channel 133397
	451411		670.5 MHz	680.5 MHz	690.5 MHz
	15MHz	DV	Channel 68661	Channel 68761	Channel 68861
		RX	624.5 MHz	634.5 MHz	644.5 MHz
			Channel 133222	Channel 133297	Channel 133372
		TX	673 MHz	680.5 MHz	688 MHz
	20MHz	RX	Channel 68686	Channel 68761	Channel 68836
		11/4	627 MHz	634.5 MHz	642 MHz



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Description of Tests 4

4.1 Conducted Output Power

Measurement Procedure: FCC KDB 971168 D01 V03r01 Section 5.2.1

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

Remark: Reference test setup 1



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4.2 Effective (Isotropic) Radiated Power of Transmitter

Measurement Procedure: FCC KDB 971168 D01 V03r01 Section 5.8.4

Calculate power in dBm by the following formula:

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

EIRP=ERP+2.15dB



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4.3 Occupied Bandwidth

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

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

Remark: Reference test setup 1

Test Settings

- 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.
- RBW = 1 5% of the expected OBW
- VBW ≥ 3 x RBW
- Detector = Peak
- Trace mode = max hold
- Sweep = auto couple
- 7. The trace was allowed to stabilize
- 8. If necessary, steps 2 7 were repeated after changing the RBW such that it would be within
 - 1 5% of the 99% occupied bandwidth observed in Step 7



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4.4 Band Edge at Antenna Terminals

Measurement Procedure: FCC KDB 971168 D01 V03r01 Section 6.0

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

Remark: Reference test setup 1

Test Settings

- 1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
- 2. Span was set large enough so as to capture all out of band emissions near the band edge
- 3. RBW > 1% of the emission bandwidth
- VBW ≥ 3 x RBW
- Detector = RMS
- Number of sweep points ≥ 2 x Span/RBW
- 7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
- 8. Sweep time = auto couple
- 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
- 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
- The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power



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4.7 Field Strength of Spurious Radiation

Measurement Procedure: FCC KDB 971168 D01 V03r01 Section 5.8

Below 1GHz test procedure as below:

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

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

- 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 & AMP. The basic equation with a sample calculation is as follows:

AF = Antenna Factor(dB/m)

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

Level = Reading Level + AF + Factor -95.26

Margin = Limit – Level

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.

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



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4.8 Frequency Stability / Temperature Variation

Measurement Procedure:

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

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

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

Time Period and Procedure:

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

Remark: Reference test setup 3



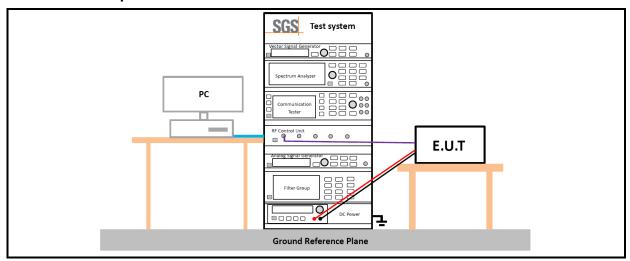


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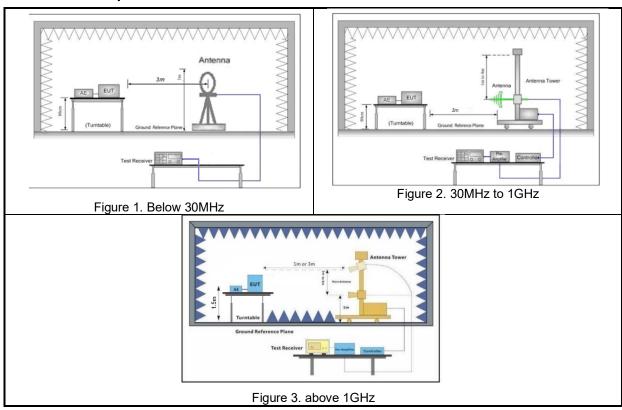
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4.9 Test Setups

4.9.1 Test Setup 1



4.9.2 Test Setup 2





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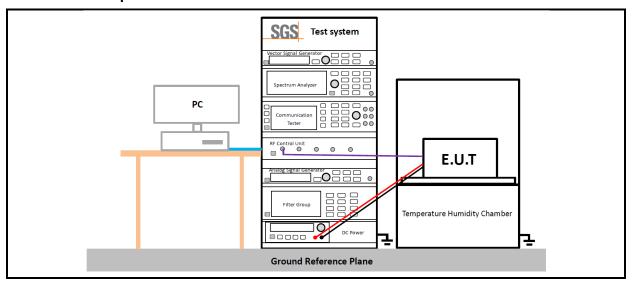
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4.9.3 Test Setup 3





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4.10Test Conditions

	Transmit Output Power Data - Average Power, Total				
Test Case	Test Conditions				
Test Environment	Ambient Climate & Rated Voltage				
Test Setup	Test Setup 1				
RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)				
Test Mode	LTE/TM1;LTE/TM2				
	Peak-to-Average Ratio				
Test Case	Test Conditions				
Test Environment	Ambient Climate & Rated Voltage				
Test Setup	Test Setup 1				
RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)				
Test Mode	LTE/TM1;LTE/TM2				
	Modulation Characteristics				
Test Case	Test Conditions				
Test Environment	Ambient Climate & Rated Voltage				
Test Setup	Test Setup 1				
RF Channels (TX)	M (M= middle channel)				
Test Mode	LTE/TM1;LTE/TM2				
	Bandwidth - Occupied Bandwidth				
Test Case	Test Conditions				
Test Environment	Ambient Climate & Rated Voltage				
Test Setup	Test Setup 1				
RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)				
Test Mode	LTE/TM1;LTE/TM2				
	Bandwidth - Emission Bandwidth				
Test Case	Test Conditions				
Test Environment	Ambient Climate & Rated Voltage				
Test Setup	Test Setup 1				
RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)				
Test Mode	LTE/TM1;LTE/TM2				
	Band Edges Compliance				
Test Case	Test Conditions				



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	Fage. 37 0141			
Test Environment	Ambient Climate & Rated Voltage			
Test Setup	Test Setup 1			
RF Channels (TX)	L, H (L= low channel, H= high channel)			
Test Mode	LTE/TM1			
	Spurious Emission at Antenna Terminals			
Test Case	Test Conditions			
Test Environment	Ambient Climate & Rated Voltage			
Test Setup	Test Setup 1			
RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)			
Test Mode	LTE/TM1			
Field Strength of Spurious Radiation				
Test Case	Test Conditions			
Test Environment	Ambient Climate & Rated Voltage			
Test Setup	Test Setup 2			
RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)			
Test Mode	LTE/TM1 Remark: If applicable, the EUT conf. that has maximum power density (based on the equivalent power level) is selected.			
Frequency Stability				
Test Case	Test Conditions			
Test Environment	(1) -30 °C to +50 °C with step 10 °C at Rated Voltage			
rest Environment	(2) VL, VN and VH of Rated Voltage at Ambient Climate.			
Test Setup	Test Setup 3			
RF Channels (TX)	M (M= middle channel)			
Test Mode	LTE/TM1			



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5 Main Test Instruments

RF conducted test					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal.Due date (yyyy/mm/dd)
Shielding Room	Brilliant-emc	N/A	SUWI-04-01-06	2021/05/08	2024/05/07
Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-07	2022/02/16	2023/02/15
Signal Analyzer	ROHDE&SCHWARZ	FSV3030	SUWI-01-02-02	2022/05/17	2023/05/16
Measurement Software	Tonscend	JS1120-3 Test System V 2.6.88.0336	SUWI-02-09-09	NCR	NCR
Radio Communication Analyzer	Anritsu	MT8821C	SUWI-01-26-03	2022/11/23	2023/11/22
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
Wideband Radio Communication Test Ststion	Anritsu	MT8000A	SUWI-01-34-02	2022/09/16	2023/09/15
Signal Analyzer	ROHDE&SCHWARZ	FSW43	SUWI-01-02-04	2022/05/28	2023/05/27



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RSE Test System					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal.Due date (yyyy/mm/dd)
Semi-Anechoic Chamber	Brilliant-emc	N/A	SUWI-04-02-02	2021/11/25	2024/11/24
Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-15	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-01-02-06	2022/11/23	2023/11/22
Test receiver	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	2022/02/19	2023/02/18
DC Power Supply	HYELEC	HY3005B	SUWI-01-18-01	2022/02/15	2023/02/14
Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	VULB 9163	SUWI-01-11-04	2021/12/05	2023/12/04
Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	BBHA 9120D	SUWI-01-11-05	2021/12/05	2023/12/04
Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	BBHA 9170	SUWI-01-11-03	2021/05/14	2023/05/13
Active Loop Antenna	SCHWRZBECK MESS- ELEKTRONIK	FMZB 1519B	SUWI-01-21-01	2021/06/10	2023/06/09
Amplifier	Tonscend	TAP9K3G32	SUWI-01-14-06	2022/11/23	2023/11/22
Amplifier	Tonscend	TAP01018050	SUWI-01-14-04	2022/11/23	2023/11/22
Amplifier	Tonscend	TAP30M7G30	SUWI-01-14-05	2022/11/23	2023/11/22
Wideband Radio Communication Tester	Anritsu	MT8820C	SUWI-01-16-08	2022/02/14	2023/02/13
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:

No.	Item Measurement Uncertainty	
1	Total RF power, conducted	±0.54dB
2	RF power density, conducted	±1.03dB
3	Spurious emissions, conducted	±0.54dB
4	Radio Frequency	±1.0 %
5	Duty Cycle	±0.37%
6	Occupied Bandwidth	±1.0 %
		± 3.13dB (9k -30MHz)
7	Dedicted Emission	± 4.88dB (30M -1GHz)
	Radiated Emission	± 4.75dB (1GHz to 18GHz)
		± 4.77dB (Above 18GHz)

Remark:

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

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

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



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7 Appendixes

Appendix A.3	WWAN Setup Photos
Appendix B.1	LTE Band 2
Appendix B.2	LTE Band 4
Appendix B.3	LTE Band 5
Appendix B.4	LTE Band 7
Appendix B.5	LTE Band 12
Appendix B.6	LTE Band 13
Appendix B.7	LTE Band 17
Appendix B.8	LTE Band 25
Appendix B.9	LTE Band 26(814-824)
Appendix B.10	LTE Band 26(824-849)
Appendix B.11	LTE Band 41
Appendix B.12	LTE Band 66
Appendix B.13	LTE Band 71

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