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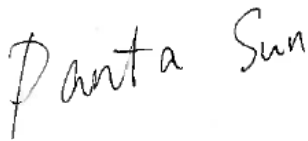
TEST REPORT

Application No.: ZR/2021/C0014
Applicant: Fibocom Wireless Inc.
Address of Applicant: 1101, Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan, Shenzhen, China
Manufacturer: Fibocom Wireless Inc.
Address of Manufacturer: 1101, Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan, Shenzhen, China
EUT Description: 5G module
Model No.: FG360-NA
Trade Mark: Fibocom
FCC ID: ZMOFG360NA05
Standards: 47 CFR Part 2
47 CFR Part 22 subpart H
47 CFR Part 24 subpart E
47 CFR Part 27 subpart H
47 CFR Part 27 subpart L
47 CFR Part 27 subpart M
47 CFR Part 27 subpart N
Date of Receipt: 2021/12/16
Date of Test: 2021/12/17 to 2022/3/3
Date of Issue: 2022/3/3

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

Authorized Signature:



Pantu Sun
Wireless Laboratory Manager



SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd.
Wireless Laboratory

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1 Version

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

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



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2 Test Summary

2.1 LTE Band 5

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



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2.2 LTE Band 2

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



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



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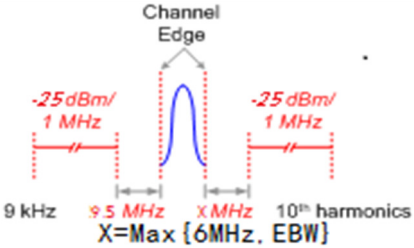
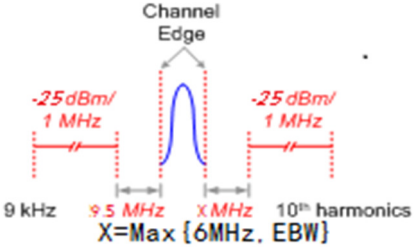
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2.4 LTE Band 41

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	Pass
Peak-Average Ratio	---	≤13 dB	Section 2 of Appendix B	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B	Pass
Band Edges Compliance	§2.1051, §27.53(m4)	For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz.	Section 5 of Appendix B	Pass
Spurious Emission at Antenna Terminals	§2.1051, §27.53(m)		Section 6 of Appendix B	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(m)		Section 7 of Appendix B	Pass
Frequency Stability	§2.1055(a)(1)(b) §2.1055(d)(1) §27.54	Within authorized bands of operation/frequency block.	Section 8 of Appendix B	Pass



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2.5 LTE Band 12

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	Pass
Peak-Average Ratio	---	Limit≤13 dB	Section 2 of Appendix B	Pass
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B	Pass
Band Edges Compliance	§2.1051, §27.53(g)	≤ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.	Section 5 of Appendix B	Pass
Spurious Emission at Antenna Terminals	§2.1051, §27.53(g)	FCC: ≤ -13 dBm/100 kHz, from 9 kHz to 10 th harmonics but outside authorized operating frequency ranges.	Section 6 of Appendix B	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(g)	FCC: ≤ -13 dBm/100 kHz.	Section 7 of Appendix B	Pass
Frequency Stability	§2.1055(a)(1)(b) §2.1055(d)(1) §27.54	Within authorized bands of operation/frequency block.	Section 8 of Appendix B	Pass



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2.6 LTE Band 71

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



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3 General Information

3.1 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, King-p Li, Nature Shen, Tizzy Song

3.3 Test Facility

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

• **A2LA (Certificate No. 6336.01)**

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

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

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

CAB identifier: CN0120.

IC#: 27594.

• **FCC –Designation Number: CN1312**

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

Designation Number: CN1312.

Test Firm Registration Number:717327



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3.4 General Description of EUT

EUT Description:	5G module			
Model No.:	FG360-NA			
Trade Mark:	Fibocom			
Hardware Version:	V1.0			
Software Version:	81105.7000.00.08.01.08			
Sample Type:	☐ Portable Device, ☒ Module			
Antenna Type:	☒ External, ☐ Integrated			
Antenna Gain*:	☒ Provided by client			
	LTE Band 2:	2.63dBi	LTE Band 4:	2.86dBi
	LTE Band 5:	1.32dBi	LTE Band 12:	1.61dBi
	LTE Band 41:	1.52dBi	LTE Band 66:	2.76dBi
	LTE Band 71:	1.39dBi		
	LTE CA_2C:	2.63dBi	LTE CA_41C:	1.52dBi
HPUE(only Band 41 and LTE CA_41C):	☒ Support ☐ Not Support			
RF Cable*:	☒ Provided by client			
	10.5dB(below 1GHz)	11dB(1~2GHz)	11.5dB(above 2GHz)	
Remark: *Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information , SGS is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.				



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3.5 Test Mode

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

3.6 Test Environment

Environment Parameter	101.0 kPa Selected Values During Tests	
Relative Humidity	44-46 % RH Ambient	
Value	Temperature(°C)	Voltage(V)
NTNV	22~23	3.8
LTLV	-30	3.3
LTHV	-30	4.4
HTLV	50	3.3
HTHV	50	4.4
Remark: NV: Normal Voltage NT: Normal Temperature LT: Low Extreme Test Temperature HT: High Extreme Test Temperature LV: Low Extreme Test Voltage HV: High Extreme Test Voltage		



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3.7 Technical Specification

Characteristics	Description		
Radio System Type	☒ LTE		
Supported Frequency Range	Band	TX	RX
	LTE Band 2	1850 to 1910 MHz	1930 to 1990 MHz
	LTE Band 4	1710 to 1755 MHz	2110 to 2155 MHz
	LTE Band 5	824 to 849 MHz	869 to 894 MHz
	LTE Band 12	699 to 716 MHz	729 to 746 MHz
	LTE Band 41	2496 to 2690MHz	2496 to 2690MHz
	LTE Band 66	1710 to 1780 MHz	2110 to 2200 MHz
	LTE Band 71	663 to 698 MHz	617 to 652 MHz
	LTE CA_2C	1850 to 1910 MHz	1930 to 1990 MHz
	LTE CA_41C	2496 to 2690MHz	2496 to 2690MHz
	LTE UL CA_2A-4A	1850 to 1910 MHz 1710 to 1755 MHz	1930 to 1990 MHz 2110 to 2155 MHz
	LTE UL CA_2A-12A	1850 to 1910 MHz 699 to 716 MHz	1930 to 1990 MHz 729 to 746 MHz
	LTE UL CA_2A-66A	1850 to 1910 MHz 1710 to 1780 MHz	1930 to 1990 MHz 2110 to 2200 MHz
	LTE UL CA_12A-66A	699 to 716 MHz 1710 to 1780 MHz	729 to 746 MHz 2110 to 2200 MHz
Supported Channel Bandwidth	LTE Band 2	☒ 1.4 MHz ☒ 3 MHz ☒ 5 MHz ☒ 10 MHz ☒ 15 MHz ☒ 20 MHz	
	LTE Band 4	☒ 1.4 MHz ☒ 3 MHz ☒ 5 MHz ☒ 10 MHz ☒ 15 MHz ☒ 20 MHz	
	LTE Band 5	☒ 1.4 MHz ☒ 3 MHz ☒ 5 MHz ☒ 10 MHz	
	LTE Band 12	☒ 1.4 MHz ☒ 3 MHz ☒ 5 MHz ☒ 10 MHz	
	LTE Band 41	☒ 5 MHz ☒ 10 MHz ☒ 15 MHz ☒ 20 MHz	
	LTE Band 66	☒ 1.4 MHz ☒ 3 MHz ☒ 5 MHz ☒ 10 MHz ☒ 15MHz ☒ 20MHz	
	LTE Band 71	☒ 5MHz ☒ 10MHz ☒ 15MHz ☒ 20MHz	
	LTE UL CA_2C	☒ 5MHz+20MHz ☒ 10MHz+20MHz ☒ 15MHz+20MHz	☒ 10MHz+15MHz ☒ 15MHz+15MHz ☒ 20MHz+20MHz



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	LTE UL CA_41C	☒ 5MHz+20MHz		☒ 10MHz+15MHz	
		☒ 10MHz+20MHz		☒ 15MHz+15MHz	
		☒ 15MHz+20MHz		☒ 20MHz+20MHz	
	LTE UL CA_2A-4A	☒ 20MHz +20MHz			
	LTE UL CA_2A-12A	☒ 20MHz +10MHz			
	LTE UL CA_2A-66A	☒ 20MHz +20MHz			
	LTE UL CA_12A-66A	☒ 10MHz +20MHz			
Characteristics	Description				
Designation of Emissions (Remark: the necessary bandwidth of which is the worst value from the measured occupied bandwidths for each type of channel bandwidth configuration.)	E-UTRA:	QPSK	16QAM	64QAM	256QAM
	LTE Band 2	1M09G7D	1M09W7D	1M10W7D	1M09W7D
		2M70G7D	2M69W7D	2M69W7D	2M69W7D
		4M47G7D	4M47W7D	4M47W7D	4M47W7D
		8M94G7D	8M93W7D	8M94W7D	8M94W7D
		13M5G7D	13M5W7D	13M5W7D	13M4W7D
		17M9G7D	17M9W7D	17M9W7D	17M9W7D
	LTE Band 4	1M10G7D	1M09W7D	1M10W7D	1M09W7D
		2M70G7D	2M70W7D	2M69W7D	2M69W7D
		4M47G7D	4M47W7D	4M47W7D	4M47W7D
		8M93G7D	8M92W7D	8M93W7D	8M93W7D
		13M5G7D	13M5W7D	13M5W7D	13M5W7D
		17M9G7D	17M9W7D	17M9W7D	17M9W7D
	LTE Band 5	1M09G7D	1M09W7D	1M10W7D	1M09W7D
		2M70G7D	2M69W7D	2M69W7D	2M69W7D
		4M47G7D	4M47W7D	4M47W7D	4M47W7D
		8M95G7D	8M94W7D	8M94W7D	8M93W7D
	LTE Band 12	1M10G7D	1M10W7D	1M10W7D	1M09W7D
		2M70G7D	2M69W7D	2M69W7D	2M69W7D
		4M47G7D	4M47W7D	4M47W7D	4M47W7D
		8M93G7D	8M93W7D	8M95W7D	8M94W7D
	LTE Band 41	4M48G7D	4M47W7D	4M48W7D	4M45W7D
		8M92G7D	8M93W7D	8M93W7D	8M93W7D
		13M5G7D	13M5W7D	13M5W7D	13M5W7D
		17M9G7D	17M9W7D	17M9W7D	17M9W7D
	LTE Band 66	1M10G7D	1M09W7D	1M10W7D	1M09W7D



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		2M70G7D	2M69W7D	2M69W7D	2M69W7D
		4M47G7D	4M47W7D	4M47W7D	4M47W7D
		8M95G7D	8M92W7D	8M95W7D	8M93W7D
		13M5G7D	13M5W7D	13M5W7D	13M5W7D
		18M1G7D	17M9W7D	17M9W7D	17M9W7D
	LTE Band 71	4M47G7D	4M46W7D	4M47W7D	4M47W7D
		8M94G7D	8M92W7D	8M94W7D	8M93W7D
		13M5G7D	13M5W7D	13M4W7D	13M4W7D
		17M9G7D	17M9W7D	17M9W7D	17M9W7D
	LTE UL CA_2C	50RB+75RB:			
		23M2G7D	23M1W7D	23M2W7D	23M1W7D
		50RB+100RB:			
		27M7G7D	27M7W7D	27M7W7D	27M7W7D
		75RB+50RB:			
		23M2G7D	23M2W7D	23M2W7D	23M2W7D
		75RB+75RB:			
		28M4G7D	28M3W7D	28M4W7D	28M3W7D
		75RB+100RB:			
		32M6G7D	32M6W7D	32M6W7D	32M6W7D
		100RB+75RB:			
		32M7G7D	32M6W7D	32M6W7D	32M6W7D
		100RB+100RB:			
		37M7G7D	37M7W7D	37M7W7D	37M7W7D
		100RB+25RB:			
		23M1G7D	23M0W7D	23M0W7D	23M0W7D
		25RB+100RB:			
		22M8G7D	22M9W7D	22M9W7D	22M8W7D
	LTE UL CA_41C	50RB+75RB:			
		23M2G7D	23M1W7D	23M2W7D	23M1W7D
		50RB+100RB:			
		27M7G7D	27M7W7D	27M7W7D	27M7W7D
		75RB+50RB:			
		23M1G7D	23M2W7D	23M2W7D	23M1W7D
		75RB+50RB:			



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		28M5G7D	28M3W7D	28M3W7D	28M3W7D
		75RB+100RB:			
		32M6G7D	32M6W7D	32M6W7D	32M6W7D
		100RB+75RB:			
		32M6G7D	32M6W9D	32M6W7D	32M6W7D
		100RB+100RB:			
		37M7G7D	37M8W7D	37M7W7D	37M7W7D
		100RB+25RB:			
		23M1G7D	22M9W7D	22M9W7D	22M9W7D
		25RB+100RB:			
		22M9G7D	22M9W7D	22M8W7D	22M9W7D



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3.8 Test Frequencies

Test Mode	Bandwidth	TX / RX	RF Channel		
			Low (L)	Middle (M)	High (H)
LTE Band 2	1.4MHz	TX	Channel 18607	Channel 18900	Channel 19193
			1850.7 MHz	1880 MHz	1909.3 MHz
		RX	Channel 607	Channel 900	Channel 1193
			1930.7 MHz	1960 MHz	1989.3 MHz
	3MHz	TX	Channel 18615	Channel 18900	Channel 19185
			1851.5 MHz	1880 MHz	1908.5 MHz
		RX	Channel 615	Channel 900	Channel 1185
			1931.5 MHz	1960 MHz	1988.5 MHz
	5MHz	TX	Channel 18625	Channel 18900	Channel 19175
			1852.5 MHz	1880 MHz	1907.5 MHz
		RX	Channel 625	Channel 900	Channel 1175
			1932.5 MHz	1960 MHz	1987.5 MHz
	10MHz	TX	Channel 18650	Channel 18900	Channel 19150
			1855 MHz	1880 MHz	1905 MHz
		RX	Channel 650	Channel 900	Channel 1150
			1935 MHz	1960 MHz	1985 MHz
	15MHz	TX	Channel 18675	Channel 18900	Channel 19125
			1857.5 MHz	1880 MHz	1902.5 MHz
		RX	Channel 675	Channel 900	Channel 1125
			1937.5 MHz	1960 MHz	1982.5 MHz
	20MHz	TX	Channel 18700	Channel 18900	Channel 19100
			1860 MHz	1880 MHz	1900 MHz
		RX	Channel 700	Channel 900	Channel 1100
			1940 MHz	1960 MHz	1980 MHz



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

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



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

Test Mode	Bandwidth	TX / RX	RF Channel		
			Low (L)	Middle (M)	High (H)
LTE Band 41 (2496-2690)	5MHz	TX / RX	Channel 39675	Channel 40620	Channel 41565
			2498.5 MHz	2593 MHz	2687.5 MHz
	10MHz	TX / RX	Channel 39700	Channel 40620	Channel 41540
			2501 MHz	2593 MHz	2685 MHz
	15MHz	TX / RX	Channel 39725	Channel 40620	Channel 41515
			2503.5 MHz	2593 MHz	2682.5 MHz
	20MHz	TX / RX	Channel 39750	Channel 40620	Channel 41490
			2506 MHz	2593 MHz	2680 MHz



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Test Mode	Bandwidth	TX / RX	RF Channel		
			Low (L)	Middle (M)	High (H)
LTE Band66	1.4MHz	TX	Channel 131979	Channel 132322	Channel 132665
			1710.7 MHz	1745 MHz	1779.3 MHz
		RX	Channel 66443	Channel 66786	Channel 67329
			2110.7 MHz	2145MHz	2199.3 MHz
	3MHz	TX	Channel 131987	Channel 132322	Channel 132657
			1711.5 MHz	1745 MHz	1778.5MHz
		RX	Channel 66451	Channel 66786	Channel 67321
			2111.5 MHz	2145MHz	2198.5MHz
	5MHz	TX	Channel 131997	Channel 132322	Channel 132647
			1712.5 MHz	1745 MHz	1777.5 MHz
		RX	Channel 66461	Channel 66786	Channel 67311
			2112.5 MHz	2145MHz	2197.5 MHz
	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
	15MHz	TX	Channel 132047	Channel 132322	Channel 132597
			1717.5 MHz	1745 MHz	1772.5 MHz
		RX	Channel 66511	Channel 66786	Channel 67261
			2117.5 MHz	2145MHz	2192.5 MHz
	20MHz	TX	Channel 132072	Channel 132322	Channel 132572
			1720 MHz	1745 MHz	1770 MHz
		RX	Channel 66536	Channel 66786	Channel 67236
			2120 MHz	2145MHz	2190 MHz

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



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Table 4.3.1.1.2A-2: Test frequencies for CA_2C

Range	CC-Combo / N _{RB,agg} [RB]	CC1 Note1					CC2 Note1				
		BW [RB]	N _{UL}	f _{UL} [MHz]	N _{DL}	f _{DL} [MHz]	BW [RB]	N _{UL}	f _{UL} [MHz]	N _{DL}	f _{DL} [MHz]
Low	25+100	25	18633	1853.3	633	1933.3	100	18750	1865	750	1945
		100	18700	1860	700	1940	25	18817	1871.7	817	1951.7
	50+75	50	18653	1855.3	653	1935.3	75	18773	1867.3	773	1947.3
		75	18675	1857.5	675	1937.5	50	18795	1869.5	795	1949.5
	50+100	50	18655	1855.5	655	1935.5	100	18799	1869.9	799	1949.9
		100	18700	1860	700	1940	50	18844	1874.4	844	1954.4
	75+75	75	18675	1857.5	675	1937.5	75	18825	1872.5	825	1952.5
		75	18678	1857.8	678	1937.8	100	18849	1874.9	849	1954.9
	75+100	100	18700	1860	700	1940	75	18871	1877.1	871	1957.1
		100	18700	1860	700	1940	100	18898	1879.8	898	1959.8
Mid	25+100	25	18808	1870.8	808	1950.8	100	18925	1882.5	925	1962.5
		100	18875	1877.5	875	1957.5	25	18992	1889.2	992	1969.2
	50+75	50	18829	1872.9	829	1952.9	75	18949	1884.9	949	1964.9
		75	18851	1875.1	851	1955.1	50	18971	1887.1	971	1967.1
	50+100	50	18806	1870.6	806	1950.6	100	18950	1885	950	1965
		100	18851	1875.1	851	1955.1	50	18995	1889.5	995	1969.5
	75+75	75	18825	1872.5	825	1952.5	75	18975	1887.5	975	1967.5
		75	18803	1870.3	803	1950.3	100	18974	1887.4	974	1967.4
	75+100	100	18826	1872.6	826	1952.6	75	18997	1889.7	997	1969.7
		100	18801	1870.1	801	1950.1	100	18999	1889.9	999	1969.9
High	25+100	25	18983	1888.3	983	1968.3	100	19100	1900	1100	1980
		100	19050	1895	1050	1975	25	19167	1906.7	1167	1986.7
	50+75	50	19005	1890.5	1005	1970.5	75	19125	1902.5	1125	1982.5
		75	19027	1892.7	1027	1972.7	50	19147	1904.7	1147	1984.7
	50+100	50	18956	1885.6	956	1965.6	100	19100	1900	1100	1980
		100	19001	1890.1	1001	1970.1	50	19145	1904.5	1145	1984.5
	75+75	75	18975	1887.5	975	1967.5	75	19125	1902.5	1125	1982.5
		75	18929	1882.9	929	1962.9	100	19100	1900	1100	1980
	75+100	100	18951	1885.1	951	1965.1	75	19122	1902.2	1122	1982.2
		100	18902	1880.2	902	1960.2	100	19100	1900	1100	1980

Note 1: Carriers in increasing frequency order.



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Table 4.3.1.2.9A-1: Test frequencies for CA_41C

Range	CC-Combo / N _{RB_agg} [RB]	CC1 Note1			CC2 Note1		
		BW [RB]	N _{UL/DL}	f _{UL/DL} [MHz]	BW [RB]	N _{UL/DL}	f _{UL/DL} [MHz]
Low	25+100	25	39683	2499.3	100	39800	2511
		100	39750	2506	25	39867	2517.7
	50+75	50	39703	2501.3	75	39823	2513.3
		75	39725	2503.5	50	39845	2515.5
	50+100	50	39705	2501.5	100	39849	2515.9
		100	39750	2506	50	39894	2520.4
	75+75	75	39725	2503.5	75	39875	2518.5
	75+100	75	39728	2503.8	100	39899	2520.9
		100	39750	2506	75	39921	2523.1
	100+100	100	39750	2506	100	39948	2525.8
Mid	25+100	25	40528	2583.8	100	40645	2595.5
		100	40595	2590.5	25	40712	2602.2
	50+75	50	40549	2585.9	75	40669	2597.9
		75	40571	2588.1	50	40691	2600.1
	50+100	50	40526	2583.6	100	40670	2598.0
		100	40571	2588.1	50	40715	2602.5
	75+75	75	40545	2585.5	75	40695	2600.5
	75+100	75	40523	2583.3	100	40694	2600.4
		100	40546	2585.6	75	40717	2602.7
	100+100	100	40521	2583.1	100	40719	2602.9
High	25+100	25	41373	2668.3	100	41490	2680
		100	41440	2675	25	41557	2686.7
	50+75	50	41395	2670.5	75	41515	2682.5
		75	41417	2672.7	50	41537	2684.7
	50+100	50	41346	2665.6	100	41490	2680
		100	41391	2670.1	50	41535	2684.5
	75+75	75	41365	2667.5	75	41515	2682.5
	75+100	75	41319	2662.9	100	41490	2680
		100	41341	2665.1	75	41512	2682.2
	100+100	100	41292	2660.2	100	41490	2680
Note 1: Carriers in increasing frequency order.							



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4 Description of Tests

4.1 Conducted Output Power

Measurement Procedure: FCC KDB 971168 D01 V03r01

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

Remark: Reference test setup 1

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4.2 Effective (Isotropic) Radiated Power of Transmitter

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

Calculate power in dBm by the following formula:

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

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

EIRP=ERP+2.15dB

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

Below 1GHz test procedure as below:

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

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

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

$\text{ERP} = \text{EIRP} - 2.15 \text{ (dB)}$; where ERP and EIRP are expressed in consistent units.

Above 1GHz test procedure as below:

- 1) Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber
- 2) Calculate power in dBm by the following formula:
 $E \text{ (dB}\mu\text{V/m)} = \text{Measured amplitude level (dBm)} + 107 + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$
 $\text{EIRP (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20 \log D - 104.8$; where D is the measurement distance in meters
- 3). Test the EUT in the lowest channel, the middle channel the Highest channel
- 4). The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, Only the test worst case mode is recorded in the report.
- 5). Repeat above procedures until all frequencies measured was complete

Remark: Reference test setup 2



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4.3 Occupied Bandwidth

Measurement Procedure: FCC KDB 971168 D01 V03r01 Section 4.2

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

Remark: Reference test setup 1

Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW $\geq 3 \times$ RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5% of the 99% occupied bandwidth observed in Step 7



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4.4 Band Edge at Antenna Terminals

Measurement Procedure: FCC KDB 971168 D01 V03r01 Section 6.0

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

Remark: Reference test setup 1

Test Settings

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. $RBW \geq 1\%$ of the emission bandwidth
4. $VBW \geq 3 \times RBW$
5. Detector = RMS
6. Number of sweep points $\geq 2 \times \text{Span}/RBW$
7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
8. Sweep time = auto couple
9. The trace was allowed to stabilize



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4.5 Spurious And Harmonic Emissions at Antenna Terminal

Measurement Procedure: FCC KDB 971168 D01 V03r01

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 30MHz and stop frequency was set to at least $10 \times$ the fundamental frequency (separated into at least two plots per channel)
2. Detector = RMS
3. Trace mode = trace average for continuous emissions, max hold for pulse emissions
4. Sweep time = auto couple
5. The trace was allowed to stabilize
6. Please see test notes below for RBW and VBW settings



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4.6 Peak-Average Ratio

Measurement Procedure: FCC KDB 971168 D01 V03r01 Section 5.7.1

A peak to average ratio measurement is performed at the conducted port of the EUT. For WCDMA signals, the spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level. For GSM signals, an average and a peak trace are used on a spectrum analyzer to determine the largest deviation between the average and the peak power of the EUT in a bandwidth greater than the emission bandwidth. The traces are generated with the spectrum analyzer set to zero span mode.

Remark: Reference test setup 1

Test Settings

1. The signal analyzer's CCDF measurement profile is enabled
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

Below 1GHz test procedure as below:

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

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

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

Above 1GHz test procedure as below:

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

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

$$\text{EIRP (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20 \log D - 104.8; \text{ where D is the measurement distance in meters}$$
- 3). Test the EUT in the lowest channel, the middle channel the Highest channel
- 4). The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, Only the test worst case mode is recorded in the report.
- 5). Repeat above procedures until all frequencies measured was complete

Remark1: Reference test setup 2

Remark2: The emission below 18G were measured at a 3m test distance, while emissions above 18GHz were measured at a 1m test distance.

Remark: Reference test setup 2

- 1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
 Final Test Level = Receiver Reading + Factor(Antenna Factor + Cable Factor – Preamplifier Factor)
- 2) Scan from 9kHz to 40GHz, The disturbance between 9KHz to 30MHz and 18GHz to 40GHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
- 3) All modes have been tested, but only the worst case data displayed in this report.



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4.8 Frequency Stability / Temperature Variation

Measurement Procedure:

Frequency stability testing is performed in accordance with the guidelines of FCC KDB 971168 D01 V03r01; ANSI/C63.26 (2015)

. The frequency stability of the transmitter is measured by:

- a.) **Temperature:** The temperature is varied from -30 °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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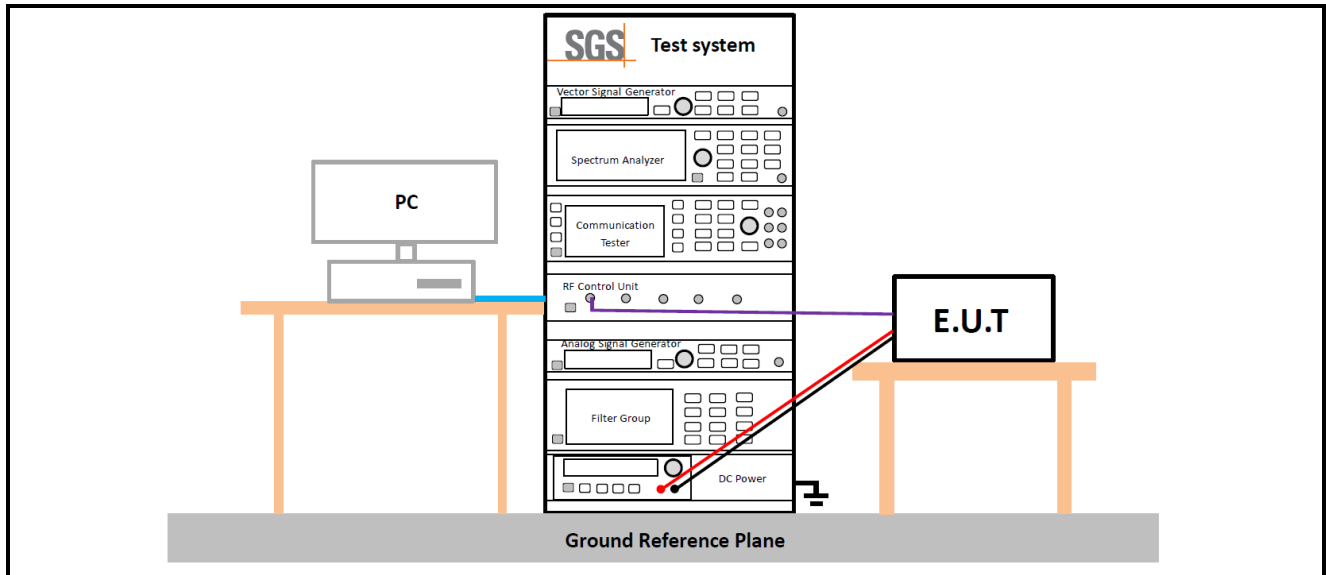
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4.9 Test Setups

4.9.1 Test Setup 1



4.9.2 Test Setup 2

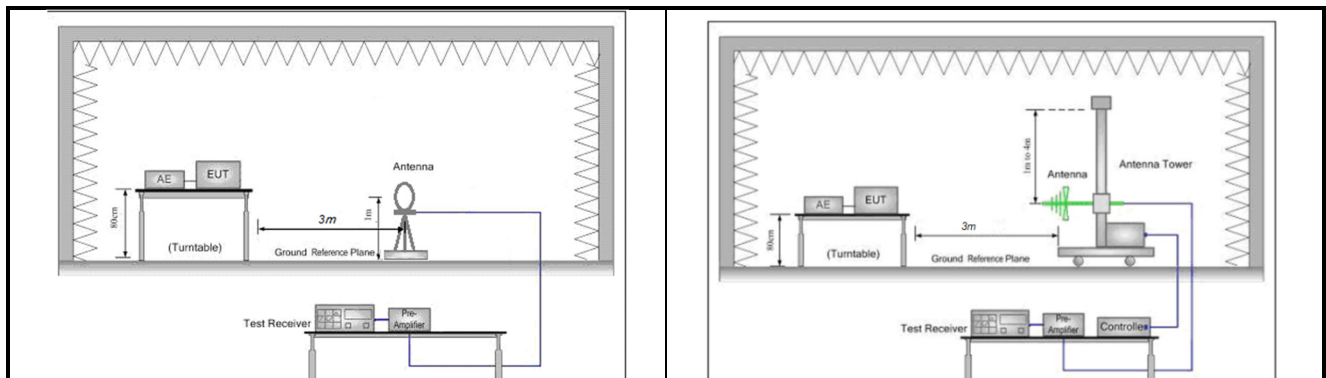


Figure 1. Below 30MHz

Figure 2. 30MHz to 1GHz

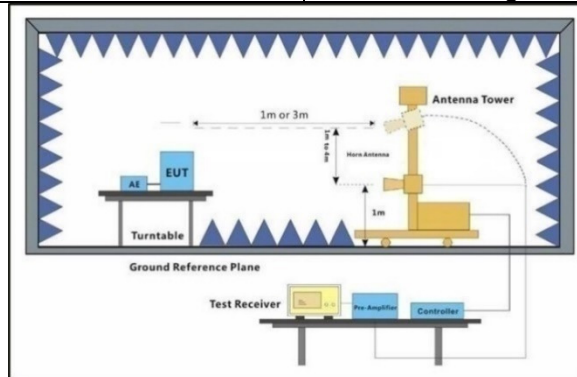


Figure 3. above 1GHz



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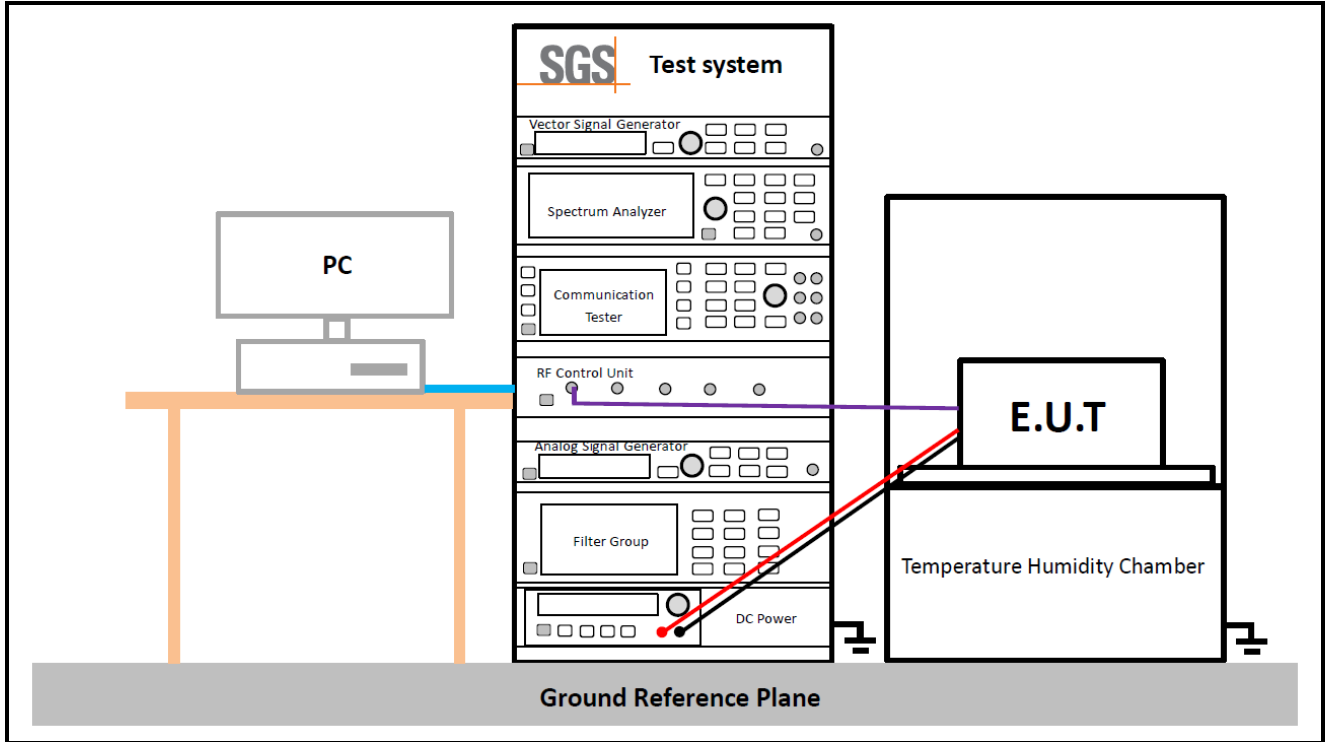
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4.9.3 Test Setup 3



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4.10 Test Conditions

Test Case		Test Conditions	
Transmit Output Power Data	Average Power, Total	Test Environm ent	Ambient Climate & Rated Voltage
		Test Setup	Test Setup 1
		RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)
		Test Mode	LTE/TM1;LTE/TM2;LTE/TM3;LTE/TM4
	Average Power, Spectral Density (if required)	Test Environm ent	Ambient Climate & Rated Voltage
		Test Setup	Test Setup 1
		RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)
		Test Mode	LTE/TM1;LTE/TM2;LTE/TM3;LTE/TM4
Peak-to-Average Ratio (if required)		Test Environm ent	Ambient Climate & Rated Voltage
		Test Setup	Test Setup 1
		RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)
		Test Mode	LTE/TM1;LTE/TM2;LTE/TM3;LTE/TM4
Modulation Characteristics		Test Environm ent	Ambient Climate & Rated Voltage
		Test Setup	Test Setup 1
		RF Channels (TX)	M (M= middle channel)
		Test Mode	LTE/TM1;LTE/TM2;LTE/TM3;LTE/TM4
Bandwid	Occupie	Test	Ambient Climate & Rated Voltage



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th	d Bandwidth	Environm ent	
		Test Setup	Test Setup 1
		RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)
		Test Mode	LTE/TM1;LTE/TM2;LTE/TM3;LTE/TM4
	Emissio n Bandwidth (if required)	Test Environm ent	Ambient Climate & Rated Voltage
		Test Setup	Test Setup 1
		RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)
		Test Mode	LTE/TM1;LTE/TM2;LTE/TM3;LTE/TM4
Band Edges Compliance		Test Environm ent	Ambient Climate & Rated Voltage
		Test Setup	Test Setup 1
		RF Channels (TX)	L, H (L= low channel, H= high channel)
		Test Mode	LTE/TM1;LTE/TM2;LTE/TM3;LTE/TM4
Spurious Emission at Antenna Terminals		Test Environm ent	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 Environm ent	Ambient Climate & Rated Voltage
		Test Setup	Test Setup 2



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	Test Mode	LTE/TM1;LTE/TM2;LTE/TM3;LTE/TM4 Remark: If applicable, the EUT conf. that has maximum power density (based on the equivalent power level) is selected.
	RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)
Frequency Stability	Test Environment	(1) -30 °C to +50 °C with step 10 °C at Rated Voltage; (2) VL, VN and VH of Rated Voltage at Ambient Climate.
	Test Setup	Test Setup 3
	RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)
	Test Mode	LTE/TM1;LTE/TM2;LTE/TM3;LTE/TM4



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5 Main Test Instruments

RF Test Equipment					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Shielding Room	Brilliant-emc	N/A	SUWI-04-01-06	2021/5/8	2024/5/7
Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-07	2021/2/20	2022/2/19
				2022/2/19	2023/2/18
Signal Analyzer	ROHDE&SCHWARZ	FSV3030	SUWI-01-02-02	2021/5/28	2022/5/27
DC Power Supply	HYELEC	HY3005B	SUWI-01-18-01	2021/2/20	2022/2/19
				2022/2/19	2023/2/18
Measurement Software	Tonscend	JS1120-3 Test System V 2.6.88.0336	SUWI-02-09-09	NCR	NCR
Radio Communication Analyzer	Anritsu	MT8821C	SUWI-01-26-03	2021/9/29	2022/9/28
Wideband Radio Communication Tester	ROHDE&SCHWARZ	CMW500	SUWI-01-27-01	2021/9/28	2022/9/27
Temperature Chamber	ESPEC	SU-242	SUWI-01-13-01	2021/2/20	2022/2/19
				2022/2/19	2023/2/18



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



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6 Measurement Uncertainty

For a 95% confidence level ($k = 2$), the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 as following:

No.	Item	Measurement Uncertainty
1	Total RF power, conducted	$\pm 0.54\text{dB}$
2	RF power density, conducted	$\pm 1.03\text{dB}$
3	Spurious emissions, conducted	$\pm 0.54\text{dB}$
4	Radio Frequency	$\pm 7.25 \times 10^{-8}$
5	Duty Cycle	$\pm 0.37\%$
6	Occupied Bandwidth	$\pm 7.25 \times 10^{-8}$
7	Radiated Emission	$\pm 3.13\text{dB}$ (9kHz - 30MHz)
		$\pm 4.8\text{dB}$ (30MHz - 1GHz)
		$\pm 4.8\text{dB}$ (1GHz to 18GHz)
		$\pm 4.8\text{dB}$ (Above 18GHz)



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7 Appendixes

Appendix A.2	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 12
Appendix B.5	LTE Band 41
Appendix B.6	LTE Band 66
Appendix B.7	LTE Band 71
Appendix B.8	LTE CA_2C
Appendix B.9	LTE CA_41C
Appendix B.10	LTE UL Inter band CA

The End



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