

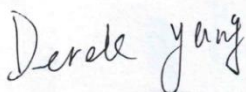
FCC TEST REPORT

Application No.: AR/2021/40009
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: ZMOFG360NA
Standards: 47 CFR Part 2
47 CFR Part 22 subpart H
47 CFR Part 24 subpart E
47 CFR Part 27 subpart C
47 CFR Part 90 subpart R
47 CFR Part 90 subpart S
47 CFR Part 96 subpart E
Date of Receipt: 2021/5/7
Date of Test: 2021/5/7 to 2021/6/14
Date of Issue: 2021/6/14

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:



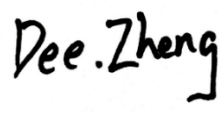
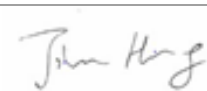
Derek Yang
Wireless Laboratory Manager



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1 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2021-06-14		Original

Authorized for issue by:		
Prepared By		 (Dee Zheng) / Engineer
Checked By		 (Jim Huang) / Reviewer



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2 Test Summary

2.1 GSM850/UMTS Band 5 & LTE Band 5 / 26(824~849 MHz)

Test Item	FCC Rule No.	Requirements	Test Result	Verdict	Test Lab*
Effective (Isotropic) Radiated Power Output Data	§2.1046, §22.913	FCC: ERP ≤ 7 W	Section 1 of Appendix B	Pass	A
Peak-Average Ratio	---	Limit≤13 dB	Section 2 of Appendix B	Pass	A
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B	Pass	A
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B	Pass	A
Band Edges Compliance	§2.1051, §22.917	≤ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.	Section 5 of Appendix B	Pass	A
Spurious Emission at Antenna Terminals	§2.1051, §22.917	FCC: ≤ -13 dBm/100 kHz, from 9 kHz to 10th harmonics but outside authorized operating frequency ranges.	Section 6 of Appendix B	Pass	A
Field Strength of Spurious Radiation	§2.1053, §22.917	FCC: ≤ -13 dBm/100 kHz.	Section 7 of Appendix B	Pass	B
Frequency Stability	§2.1055, §22.355	≤ ±2.5ppm.	Section 8 of Appendix B	Pass	A
Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".					

2.2 GSM 1900/UMTS Band 2 /LTE Band 2 /25

Test Item	FCC Rule No.	Requirements	Test Result	Verdict	Test Lab*
Effective (Isotropic) Radiated Power Output Data	§2.1046, §24.232	EIRP ≤ 2 W	Section 1 of Appendix B	Pass	A
Peak-Average Ratio	§2.1046, §24.232	Limit≤13 dB	Section 2 of Appendix B	Pass	A
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B	Pass	A
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B	Pass	A



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Band Edges Compliance	§2.1051, §24.238	≤ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.	Section 5 of Appendix B	Pass	A
Spurious Emission at Antenna Terminals	§2.1051, §24.238	≤ -13 dBm/1 MHz, from 9 kHz to 10 th harmonics but outside authorized operating frequency ranges.	Section 6 of Appendix B	Pass	A
Field Strength of Spurious Radiation	§2.1053, §24.238	≤ -13 dBm/1 MHz.	Section 7 of Appendix B	Pass	B
Frequency Stability	§2.1055, §24.235	$\leq \pm 2.5$ ppm.	Section 8 of Appendix B	Pass	A
Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".					

2.3 UMTS Band 4 /LTE Band 4 /66

Test Item	FCC Rule No.	Requirements	Test Result	Verdict	Test Lab*
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(d)	EIRP ≤ 1 W	Section 1 of Appendix B	Pass	A
Peak-Average Ratio	§2.1046, §27.50(d)	Limit ≤ 13 dB	Section 2 of Appendix B	Pass	A
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B	Pass	A
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B	Pass	A
Band Edges Compliance	§2.1051, §27.53(h)	≤ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.	Section 5 of Appendix B	Pass	A
Spurious Emission at Antenna Terminals	§2.1051, §27.53(h)	≤ -13 dBm/1 MHz, from 9 kHz to 10 th harmonics but outside authorized operating frequency ranges.	Section 6 of Appendix B	Pass	A
Field Strength of Spurious Radiation	§2.1053, §27.53(h)	≤ -13 dBm/1 MHz.	Section 7 of Appendix B	Pass	B
Frequency Stability	§2.1055, §27.54	$\leq \pm 2.5$ ppm.	Section 8 of Appendix B	Pass	A
Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".					

2.4 LTE Band 7/41/ CA_41C

Test Item	FCC Rule No.	Requirements	Test Result	Verdict	Test Lab*
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(h)	EIRP ≤ 2 W	Section 1 of Appendix B	Pass	A



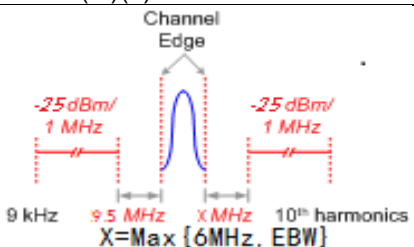
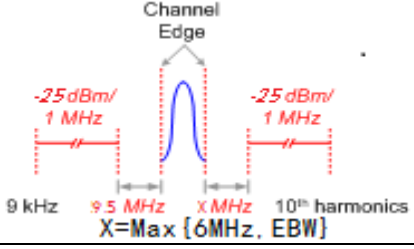
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Peak-Average Ratio	§27.50(a)	≤13 dB	Section 2 of Appendix B	Pass	A
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B	Pass	A
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B	Pass	A
Band Edges Compliance	§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.	Section 5 of Appendix B	Pass	A
Spurious Emission at Antenna Terminals	§2.1051, §27.53(m)		Section 6 of Appendix B	Pass	A
Field Strength of Spurious Radiation	§2.1053, §27.53(m)		Section 7 of Appendix B	Pass	B
Frequency Stability	§2.1055, §27.54	Within authorized bands of operation/frequency block.	Section 8 of Appendix B	Pass	A

Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".

2.5 LTE Band 12/17

Test Item	FCC Rule No.	Requirements	Test Result	Verdict	Test Lab*
Effective (Isotropic) Radiated Power Output Data	§27.50(c)	FCC: ERP ≤ 3 W.	Section 1 of Appendix B	Pass	A



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Peak-Average Ratio	§2.1046, §27.50(c)	Limit≤13 dB	Section 2 of Appendix B	Pass	A
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B	Pass	A
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B	Pass	A
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	A
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	A
Field Strength of Spurious Radiation	§2.1053, §27.53(g)	FCC: ≤ -13 dBm/100 kHz.	Section 7 of Appendix B	Pass	B
Frequency Stability	§2.1055, §27.54	≤ ±2.5ppm.	Section 8 of Appendix B	Pass	A

Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".

2.6 LTE Band 13

Test Item	FCC Rule No.	Requirements	Test Result	Verdict	Test Lab*
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(b)	FCC: ERP ≤ 3 W.	Section 1 of Appendix B	Pass	A
Peak-Average Ratio	§27.50	Limit≤13 dB	Section 2 of Appendix B	Pass	A
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B	Pass	A
Bandwidth	§2.1049,	OBW: No limit. EBW: No limit.	Section 4 of Appendix B	Pass	A
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	Pass	A
Spurious Emission at Antenna Terminals	§2.1051, §27.53(c) §27.53(f)	FCC: ≤ -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.	Section 6 of Appendix B	Pass	A



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		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.			
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	Pass	B
Frequency Stability	§2.1055, §27.54	Within authorized bands of operation/frequency block.	Section 8 of Appendix B	Pass	A
Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".					



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2.7 LTE Band 14

Test Item	FCC Rule No.	Requirements	Test Result	Verdict	Test Lab*
Effective (Isotropic) Radiated Power Output Data	§2.1046 §90.542	FCC: ERP ≤ 3 W.	Section 1 of Appendix B	Pass	A
Peak-Average Ratio	---	Limits ≤ 13 dB	Section 2 of Appendix B	Pass	A
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B	Pass	A
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B	Pass	A
Emission Mask	§2.1051 §90.210(n)	Transmitters designed for operation under this part on frequencies other than listed in this section must meet the emission mask requirements of Emission Mask B. Equipment operating under this part on frequencies allocated to but shared with the Federal Government, must meet the applicable Federal Government technical standards (b) Emission Mask B. For transmitters that are equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as follows: (1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB. (2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB. (3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 + 10 log (P) dB.	Section 5 of Appendix B	Pass	A
Band Edges Compliance	§2.1051 §90.543(e)(2)(3)	(1) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 76 + 10 log (P)	Section 6 of Appendix B	Pass	A



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		dB in a 6.25 kHz band segment, for base and fixed stations.(2) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than $65 + 10 \log (P)$ dB in a 6.25 kHz band segment, for mobile and portable stations.(3) On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least $43 + 10 \log (P)$ dB.			
Spurious Emission at Antenna Terminals	§2.1051, §90.543(c) §90.543(f)	FCC: ≤ -13 dBm/100 kHz, from 9 kHz to 10th harmonics but outside authorized operating frequency ranges. For operations in the 758–775 MHz and 788–805 MHz bands, all emissions including harmonics 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		A
Field Strength of Spurious Radiation	§2.1053, §90.543(c) §90.543(f)	FCC: ≤ -13 dBm/100 kHz. For operations in the 758–775 MHz and 788–805 MHz bands, all emissions including harmonics 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 8 of Appendix B	Pass	A
Frequency Stability	§2.1055, §90.213	$\leq \pm 2.5$ ppm.	Section 9 of Appendix B	Pass	A

Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".



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2.8 LTE Band 26(814~824 MHz)

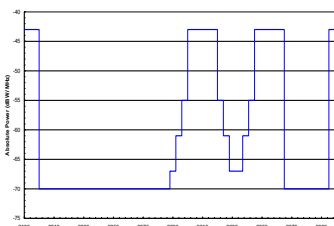
Test Item	FCC Rule No.	Requirements	Test Result	Verdict	Test Lab*
Transmitter Conducted Power Output	§2.1046, §90.635	< 100 W.	Section 1 of Appendix B	Pass	A
Peak-Average Ratio	---	FCC: Limit≤13 dB	Section 2 of Appendix B	Pass	A
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B	Pass	A
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B	Pass	A
Emission Mask	§2.1051 § 90.691	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	Pass	A
Spurious Emission at Antenna Terminals	§2.1051, §90.691	< 43 + 10Log10(P[Watts]) for all out-of-band emissions	Section 6 of Appendix B	Pass	A
Field Strength of Spurious Radiation	§2.1053, §90.691	< 43 + 10Log10(P[Watts]) for all out-of-band emissions	Section 7 of Appendix B	Pass	A
Frequency Stability	§2.1055, §90.213	< ±2.5ppm.	Section 8 of Appendix B	Pass	A

Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".



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2.9 LTE Band 30

Test Item	FCC Rule No.	Requirements	Test Result	Verdict	Test Lab*
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.53(a)	$EIRP \leq 250\text{mW}/5\text{MHz}$	Section 1 of Appendix B	Pass	A
Peak-Average Ratio	§27.50(a),	FCC: Limit $\leq 13\text{ dB}$	Section 2 of Appendix B	Pass	A
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B	Pass	A
Bandwidth	§2.1049, §27.53(a)	OBW: No limit. EBW: No limit.	Section 4 of Appendix B	Pass	A
Band Edges Compliance	§2.1051, §27.53(a)	$\leq -13\text{ dBm}/1\% \cdot \text{EBW}$, in 1 MHz bands immediately outside and adjacent to the frequency block.	Section 5 of Appendix B	Pass	A
Spurious Emission at Antenna Terminals	§2.1051, §27.53(a)	<p>Figure 1: Unwanted Emissions for Mobile, Portable, and Low Power Fixed Subscriber Equipment</p>  <p>For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands:</p> <p>(i) By a factor of not less than: $43 + 10 \log (P)$ dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than $55 + 10 \log (P)$ dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than $61 + 10 \log (P)$ dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than $67 + 10 \log (P)$ dB on all frequencies between 2328 and 2337 MHz;</p> <p>(ii) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2300 and 2305 MHz, $55 + 10 \log (P)$ dB on all frequencies</p>	Section 6 of Appendix B	Pass	A



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		between 2296 and 2300 MHz, 61 + 10 log (P) dB on all frequencies between 2292 and 2296 MHz, 67 + 10 log (P) dB on all frequencies between 2288 and 2292 MHz, and 70 + 10 log (P) dB below 2288 MHz; (iii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365 MHz, and not less than 70 + 10 log (P) dB above 2365 MHz.			
Field Strength of Spurious Radiation	§2.1053, §27.53(a)	≤ -13 dBm/1 MHz.	Section 7 of Appendix B	Pass	B
Frequency Stability	§2.1055, §27.54	within the range of the operating frequency blocks	Section 8 of Appendix B	Pass	A
Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".					



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2.1 LTE Band 48

Test Item	FCC Rule No.	Requirements	Test Result	Verdict	Test Lab*
Effective (Isotropic) Radiated Power Output Data	§2.1046, §96.41	Reporting only	Section 1 of Appendix B	Pass	A
Peak-Average Ratio	§96.41	FCC: Limit≤13 dB	Section 2 of Appendix B	Pass	A
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B	Pass	A
Band Edges Compliance	§2.1051, §96.41	for channel and frequency assignments made by the SAS to CBSDs, the conducted power of any emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed -13 dBm/MHz within 0-10 megahertz above the upper SAS-assigned channel edge and within 0-10 megahertz below the lower SAS-assigned channel edge.	Section 5 of Appendix B	Pass	A
Spurious Emission at Antenna Terminals	§2.1051, §96.41	for channel and frequency assignments made by the SAS to CBSDs, the conducted power of any emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed -13 dBm/MHz within 0-10 megahertz above the upper SAS-assigned channel edge and within 0-10 megahertz below the lower SAS-assigned channel edge. At all frequencies greater than 10 megahertz above the upper SAS assigned channel edge and less than 10 MHz below the lower SAS assigned channel edge, the conducted power of any emission shall not exceed -25 dBm/MHz. (2) Additional protection levels. Notwithstanding paragraph (d)(1) of this section, the conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed -40dBm/MHz.	Section 6 of Appendix B	Pass	A
Field Strength of Spurious	§2.1053, §96.41	for channel and frequency assignments made by the SAS to CBSDs, the conducted power of any emission outside	Section 7 of	Pass	B



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Test Item	FCC Rule No.	Requirements	Test Result	Verdict	Test Lab*
Radiation		the fundamental emission (whether in or outside of the authorized band) shall not exceed -13 dBm/MHz within 0-10 megahertz above the upper SAS-assigned channel edge and within 0-10 megahertz below the lower SAS-assigned channel edge. At all frequencies greater than 10 megahertz above the upper SAS assigned channel edge and less than 10 MHz below the lower SAS assigned channel edge, the conducted power of any emission shall not exceed -25 dBm/MHz. (2) Additional protection levels. Notwithstanding paragraph (d)(1) of this section, the conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed -40dBm/MHz.	Appendix B		
Frequency Stability	\$2.1055, \$96.41	Within authorized bands of operation/ frequency block.	Section 8 of Appendix B	Pass	A

Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".



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2.2 LTE Band 71

Test Item	FCC Rule No.	Requirements	Test Result	Verdict	Test Lab*
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(c)	EIRP ≤ 3 W	Section 1 of Appendix B	Pass	A
Peak-Average Ratio	§2.1046,	Limit≤13 dB	Section 2 of Appendix B	Pass	A
Modulation Characteristics	§2.1047	Digital modulation	Section 3 of Appendix B	Pass	A
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Section 4 of Appendix B	Pass	A
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	A
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	A
Field Strength of Spurious Radiation	§2.1053, §27.53(g)	≤ -13 dBm/1 MHz.	Section 7 of Appendix B	Pass	B
Frequency Stability	§2.1055, §27.54	within the authorized bands of operation.	Section 8 of Appendix B	Pass	A
Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".					

Remark : All test were performed by Lab A and B.

Lab A SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Lab B SGS-CSTC STANDARDS TECHNICAL SERVICES (XI'AN) CO., LTD.



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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

Lab A:

Company:	SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch
Address:	No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China
Post code:	518057
Test engineer:	Dee Zheng,Swing Hu,Habit Zeng

Lab B:

Company:	SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD.
Address:	1/F, Unit D, Building 1, Kanghong Orange Technology Park, No.137, Keyuan 3rd Road, Fengdong New City, Xi'an, Shaanxi China
Post code:	710086
Test engineer:	Leah Chen,Ken Liu,Andy Yao



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3.3 Test Facility

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

Lab A:

• **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• **VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

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

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

Lab B:

A2LA (Certificate No. 4854.01)

SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4854.01.

FCC-Designation Number: CN1271.



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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:	81103.7000.30.02.01.09
Sample Type:	<input type="checkbox"/> Portable Device, <input checked="" type="checkbox"/> Module
Antenna Type:	<input checked="" type="checkbox"/> External, <input type="checkbox"/> Integrated
Antenna Gain:	WCDMA Band II:2.63dBi; WCDMA Band IV:2.86dB; WCDMA Band V:1.32dBi; LTE Band 2:2.63dBi; LTE Band 4:2.86dBi; LTE Band 5:1.32dBi; LTE Band 7: 1.52dBi; LTE Band 12:1.61dBi; LTE Band 13:1.94dBi; LTE Band 14:2.19dBi; LTE Band 17:1.58dBi; LTE Band 25:1.93dBi; LTE Band 26:1.32dBi; LTE Band 30:0.22dBi; LTE Band 41:1.52dBi; LTE Band 48:-0.13dBi; LTE Band 66:3.76dBi; LTE Band 71:1.39dBi; LTE CA_41C:1.52dBi;

3.5 Test Mode

Test Mode	Test Modes Description
UMTS/TM1	UMTS system, WCDMA, QPSK modulation
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.



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3.6 Test Environment

Operating Environment:			
Humidity:	50 % RH		
Atmospheric Pressure:	101.30 KPa		
Temperature	NT	25 °C	
Voltage:	LV	3.3V	
	NV	3.8V	
	HV	4.4V	

Remark: LV= lower extreme test voltage; NV= nominal voltage
HV= upper extreme test voltage; NT= normal temperature

3.7 Technical Specification

Characteristics	Description		
Radio System Type	<input checked="" type="checkbox"/> UMTS		
	<input checked="" type="checkbox"/> LTE		
Supported Frequency Range	Band	TX	RX
	UMTS Band II	1850 to 1910 MHz	1930 to 1990 MHz
	UMTS Band IV	1710 to 1755 MHz	2110 to 2155 MHz
	UMTS Band V	824 to 849 MHz	869 to 894 MHz
	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 7	2500 to 2570 MHz	2620 to 2690 MHz
	LTE Band 12	699 to 716 MHz	729 to 746 MHz
	LTE Band 13	777 to 787 MHz	746 to 756 MHz
	LTE Band 14	788 to 798 MHz	758 to 768 MHz
	LTE Band 17	704 to 716 MHz	734 to 746 MHz
	LTE Band 25	1850 to 1915MHz	1930 to 1995 MHz
	LTE Band 26 (814 to 824 MHz)	814 to 824MHz	859 to 869 MHz
	LTE Band 26 (824 to 849 MHz)	824 to 849 MHz	869 to 894 MHz
	LTE Band 30	2305 to 2315 MHz	2350 to 2360 MHz
	LTE Band 41	2496 to 2690MHz	2496 to 2690MHz
	LTE Band 48	3550 to 3700 MHz	3550 to 3700 MHz



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	LTE Band 66	1710 to 1780 MHz	2110 to 2200 MHz
	LTE Band 71	663 to 698 MHz	617 to 652 MHz
	LTE CA_41C	2496 to 2690MHz	2496 to 2690MHz
Supported Channel Bandwidth	UMTS system:		<input checked="" type="checkbox"/> 5 MHz
	LTE Band 2	<input checked="" type="checkbox"/> 1.4 MHz; <input checked="" type="checkbox"/> 3 MHz; <input checked="" type="checkbox"/> 5 MHz; <input checked="" type="checkbox"/> 10 MHz; <input checked="" type="checkbox"/> 15 MHz, <input checked="" type="checkbox"/> 20 MHz	
	LTE Band 4	<input checked="" type="checkbox"/> 1.4 MHz; <input checked="" type="checkbox"/> 3 MHz; <input checked="" type="checkbox"/> 5 MHz; <input checked="" type="checkbox"/> 10 MHz; <input checked="" type="checkbox"/> 15 MHz, <input checked="" type="checkbox"/> 20 MHz	
	LTE Band 5	<input checked="" type="checkbox"/> 1.4 MHz; <input checked="" type="checkbox"/> 3 MHz; <input checked="" type="checkbox"/> 5 MHz; <input checked="" type="checkbox"/> 10 MHz	
	LTE Band 7	<input checked="" type="checkbox"/> 5 MHz; <input checked="" type="checkbox"/> 10 MHz; <input checked="" type="checkbox"/> 15 MHz, <input checked="" type="checkbox"/> 20 MHz	
	LTE Band 12	<input checked="" type="checkbox"/> 1.4 MHz; <input checked="" type="checkbox"/> 3 MHz; <input checked="" type="checkbox"/> 5 MHz; <input checked="" type="checkbox"/> 10 MHz	
	LTE Band 13	<input checked="" type="checkbox"/> 5 MHz; <input checked="" type="checkbox"/> 10 MHz	
	LTE Band 14	<input checked="" type="checkbox"/> 5 MHz; <input checked="" type="checkbox"/> 10 MHz	
	LTE Band 17	<input checked="" type="checkbox"/> 5 MHz; <input checked="" type="checkbox"/> 10 MHz	
	LTE Band 25	<input checked="" type="checkbox"/> 1.4 MHz; <input checked="" type="checkbox"/> 3 MHz; <input checked="" type="checkbox"/> 5 MHz; <input checked="" type="checkbox"/> 10 MHz; <input checked="" type="checkbox"/> 15 MHz, <input checked="" type="checkbox"/> 20 MHz	
	LTE Band 26(814-824)	<input checked="" type="checkbox"/> 1.4 MHz; <input checked="" type="checkbox"/> 3 MHz; <input checked="" type="checkbox"/> 5 MHz; <input checked="" type="checkbox"/> 10 MHz;	
	LTE Band 26(824-849)	<input checked="" type="checkbox"/> 1.4 MHz; <input checked="" type="checkbox"/> 3 MHz; <input checked="" type="checkbox"/> 5 MHz; <input checked="" type="checkbox"/> 10 MHz; <input checked="" type="checkbox"/> 15 MHz	
	LTE Band30	<input checked="" type="checkbox"/> 5 MHz; <input checked="" type="checkbox"/> 10 MHz;	
	LTE Band41	<input checked="" type="checkbox"/> 5 MHz; <input checked="" type="checkbox"/> 10 MHz; <input checked="" type="checkbox"/> 15 MHz, <input checked="" type="checkbox"/> 20 MHz	
	LTE Band48	<input checked="" type="checkbox"/> 5 MHz; <input checked="" type="checkbox"/> 10 MHz; <input checked="" type="checkbox"/> 15 MHz, <input checked="" type="checkbox"/> 20 MHz	
	LTE Band66	<input checked="" type="checkbox"/> 1.4 MHz; <input checked="" type="checkbox"/> 3 MHz; <input checked="" type="checkbox"/> 5 MHz; <input checked="" type="checkbox"/> 10 MHz; <input checked="" type="checkbox"/> 15 MHz, <input checked="" type="checkbox"/> 20 MHz	
	LTE Band71	<input checked="" type="checkbox"/> 5 MHz; <input checked="" type="checkbox"/> 10 MHz; <input checked="" type="checkbox"/> 15 MHz, <input checked="" type="checkbox"/> 20 MHz	
	LTE Band CA_41C	<input checked="" type="checkbox"/> 5MHz+20MHz <input checked="" type="checkbox"/> 10MHz+15MHz <input checked="" type="checkbox"/> 10MHz+20MHz <input checked="" type="checkbox"/> 15MHz+15MHz <input checked="" type="checkbox"/> 15MHz+20MHz <input checked="" type="checkbox"/> 20MHz+20MHz	
	Note1: WCDMA supports HSUPA, HSDPA, DS-HSDPA,HSPA+, but only the worst case was tested and the data displayed in this report.		
Characteristics	Description		
Designation of Emissions (Remark: the necessary bandwidth of which is the worst value from the	UMTS Band II	4M17F9W;	
	UMTS Band IV	4M17F9W;	
	UMTS Band V	4M19F9W;	
	LTE Band 2	1M09G7D;1M09W7D; 1M09W7D; 1M09W7D 2M70G7D;2M68W7D; 2M69W7D; 2M69W7D	



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measured occupied bandwidths for each type of channel bandwidth configuration.)		4M48G7D;4M49W7D; 4M48W7D; 4M49W7D 8M95G7D;8M95W7D; 8M95W7D; 8M95W7D 13M5G7D;13M5W7D; 13M5W7D; 13M5W7D 17M9G7D;17M9W7D; 17M9W7D; 17M9W7D
	LTE Band 4	1M09G7D;1M09W7D; 1M09W7D; 1M09W7D 2M69G7D;2M68W7D; 2M69W7D; 2M69W7D 4M48G7D;4M49W7D; 4M48W7D;4M49W7D 8M93G7D;8M95W7D; 8M93W7D;8M95W7D 13M5G7D;13M5W7D; 13M5W7D;13M5W7D 17M9G7D;17M9W7D; 17M9W7D; 17M9W7D
	LTE Band 5	1M09G7D;1M09W7D; 1M09W7D; 1M09W7D 2M70G7D;2M68W7D; 2M69W7D; 2M69W7D 4M48G7D;4M48W7D; 4M48W7D; 4M49W7D 8M93G7D;8M95W7D; 8M93W7D;8M95W7D
	LTE Band 7	4M48G7D;4M49W7D; 4M48W7D; 4M48W7D 8M93G7D;8M95W7D; 8M93W7D;8M95W7D 13M5G7D;13M5W7D; 13M5W7D;13M5W7D 17M9G7D;17M9W7D; 17M9W7D; 17M9W7D
	LTE Band 12	1M09G7D;1M09W7D; 1M09W7D; 1M09W7D 2M69G7D;2M69W7D; 2M69W7D; 2M69W7D 4M48G7D;4M49W7D; 4M48W7D;4M49W7D 8M93G7D;8M93W7D; 8M95W7D; 8M95W7D
	LTE Band13	4M48G7D;4M49W7D; 4M48W7D;4M49W7D 8M91G7D;8M91W7D; 8M91W7D; 8M93W7D
	LTE Band 14	4M48G7D;4M49W7D; 4M48W7D; 4M50W7D 8M93G7D;8M91W7D; 8M91W7D; 8M93W7D
	LTE Band 17	4M48G7D;4M49W7D; 4M48W7D; 4M48W7D 8M93G7D;8M91W7D; 8M91W7D; 8M93W7D
	LTE Band 25	1M10G7D;1M10W7D; 1M09W7D; 1M09W7D 2M70G7D;2M68W7D; 2M69W7D; 2M69W7D 4M48G7D;4M49W7D; 4M48W7D; 4M48W7D 8M95G7D;8M95W7D; 8M95W7D; 8M95W7D 13M5G7D;13M5W7D; 13M5W7D; 13M5W7D 17M9G7D;17M9W7D; 17M9W7D; 17M9W7D
	LTE Band 26 (814-824)	1M09G7D;1M09W7D; 1M09W7D; 1M09W7D 2M69G7D;2M68W7D; 2M69W7D; 2M69W7D 4M48G7D;4M49W7D; 4M48W7D; 4M48W7D 8M95G7D;8M95W7D; 8M95W7D; 8M95W7D
	LTE Band 26 (824-849)	1M09G7D;1M09W7D; 1M09W7D; 1M09W7D 2M69G7D;2M69W7D; 2M69W7D; 2M69W7D 4M48G7D;4M50W7D; 4M48W7D; 4M48W7D 8M95G7D;8M95W7D; 8M93W7D;8M95W7D 13M5G7D;13M5W7D; 13M5W7D; 13M5W7D
	LTE Band 30	4M49G7D;4M50W7D; 4M48W7D; 4M48W7D 8M97G7D;8M95W7D; 8M93W7D; 8M95W7D
	LTE Band 41	4M48G7D;4M50W7D; 4M49W7D; 4M47W7D 8M91G7D;8M93W7D; 8M95W7D; 8M95W7D 13M5G7D;13M5W7D; 13M5W7D; 13M5W7D 17M9G7D;17M9W7D; 17M9W7D; 17M9W7D
	LTE Band 48	4M49G7D;4M47W7D; 4M49W7D; 4M46W7D 8M94G7D;8M94W7D; 8M94W7D; 8M99W7D 13M5G7D;13M5W7D; 13M5W7D; 13M4W7D 17M9G7D;18M0W7D; 17M9W7D; 17M9W7D



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	LTE Band 66	1M09G7D;1M09W7D; 1M09W7D; 1M09W7D 2M69G7D;2M69W7D; 2M69W7D; 2M69W7D 4M48G7D;4M49W7D; 4M48W7D; 4M48W7D 8M93G7D;8M93W7D; 8M95W7D; 8M95W7D 13M5G7D;13M5W7D; 13M5W7D; 13M5W7D 17M9G7D;17M9W7D; 17M9W7D; 17M9W7D
	LTE Band 71	4M48G7D;4M49W7D; 4M48W7D; 4M50W7D 8M93G7D;8M95W7D; 8M95W7D; 8M95W7D 13M5G7D;13M5W7D; 13M5W7D; 13M5W7D 17M9G7D;17M9W7D; 17M9W7D; 18M0W7D
	LTE Band CA_41C	25RB+100RB:22M7G7D;22M7W7D; 22M7W7D; 22M8W7D 50RB+75RB:23M0G7D;23M0W7D; 23M0W7D; 23M1W7D 50RB+100RB:27M6G7D;27M6W7D; 27M6W7D; 27M6W7D 75RB+50RB:23M1G7D;23M1W7D; 23M1W7D; 23M1W7D 75RB+75RB:28M2G7D;28M2W7D; 28M2W7D; 28M3W7D 75RB+100RB:32M6G7D;32M6W9D; 32M6W7D; 32M6W7D 100RB+25RB:22M9G7D;22M9W7D; 22M9W7D; 32M8W7D 100RB+50RB:27M7G7D;27M7W7D; 27M7W7D; 27M7W7D 100RB+75RB:32M6G7D;32M6W7D; 32M6W7D; 32M6W7D 100RB+100RB:37M4G7D;37M4W7D; 37M4W7D; 37M4W7D



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3.8 Test Frequencies

Test Mode	TX / RX	RF Channel		
		Low (L)	Middle (M)	High (H)
WCDMA Band II	TX	Channel 9262	Channel 9400	Channel 9538
		1852.4 MHz	1880.0 MHz	1907.6 MHz
	RX	Channel 9662	Channel 9800	Channel 9938
		1932.4 MHz	1960.0 MHz	1987.6 MHz

Test Mode	TX / RX	RF Channel		
		Low (L)	Middle (M)	High (H)
WCDMA Band IV	TX	Channel 1312	Channel 1413	Channel 1513
		1712.4MHz	1732.6 MHz	1752.6 MHz
	RX	Channel 1537	Channel 1638	Channel 1738
		2112.4 MHz	2132.6 MHz	2152.6 MHz

Test Mode	TX / RX	RF Channel		
		Low (L)	Middle (M)	High (H)
WCDMA Band V	TX	Channel 4132	Channel 4182	Channel 4233
		826.4MHz	836.4 MHz	846.6 MHz
	RX	Channel 4357	Channel 4407	Channel 4458
		871.4 MHz	881.4 MHz	891.6 MHz



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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 7	5MHz	TX	Channel 20775	Channel 21100	Channel 21425
			2502.5 MHz	2535 MHz	2567.5 MHz
		RX	Channel 2775	Channel 3100	Channel 5825
			2622.5 MHz	2655 MHz	2687.5 MHz
	10MHz	TX	Channel 20800	Channel 21100	Channel 21400
			2505 MHz	2535 MHz	2565 MHz
		RX	Channel 2800	Channel 3100	Channel 3400
			2625 MHz	2655 MHz	2685 MHz
	15MHz	TX	Channel 20825	Channel 21100	Channel 21375
			2507.5 MHz	2535 MHz	2562.5 MHz
		RX	Channel 2825	Channel 3100	Channel 3375
			2627.5 MHz	2655 MHz	2682.5 MHz
	20MHz	TX	Channel 20850	Channel 21100	Channel 21350
			2510 MHz	2535 MHz	2560 MHz
		RX	Channel 2850	Channel 3100	Channel 3350
			2630 MHz	2655 MHz	2680 MHz

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 13	5MHz	TX	Channel 23025	Channel 23230	Channel 23255
			779.5 MHz	782 MHz	784.5 MHz
		RX	Channel 5205	Channel 5230	Channel 5255
			748.5 MHz	751 MHz	753.5 MHz
	10MHz	TX	Channel 23230	Channel 23230	Channel 23230
			782 MHz	782 MHz	782 MHz
		RX	Channel 5230	Channel 5230	Channel 5230
			751 MHz	751 MHz	751 MHz



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Test Mode	Bandwidth	TX / RX	RF Channel		
			Low (L)	Middle (M)	High (H)
LTE Band 14	5MHz	TX	Channel 23305 790.5 MHz	Channel 23330 793 MHz	Channel 23355 795.5 MHz
		RX	Channel 5305 760.5 MHz	Channel 5330 763 MHz	Channel 5355 765.5 MHz
	10MHz	TX	Channel 23330 793MHz	Channel 23330 793 MHz	Channel 23330 793 MHz
		RX	Channel 5330 763MHz	Channel 5330 763 MHz	Channel 5330 763 MHz

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

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



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

Test Mode	Bandwidth	TX / RX	RF Channel		
			Low (L)	Middle (M)	High (H)
LTE Band26 (824-849)	1.4MHz	TX	Channel 26797	Channel 26915	Channel 27033
			824.7 MHz	836.5 MHz	848.3 MHz
		RX	Channel 8697	Channel 8915	Channel 9033
			859.7 MHz	881.5 MHz	893.3 MHz
	3MHz	TX	Channel 26805	Channel 26915	Channel 27025
			825.5 MHz	836.5 MHz	847.5 MHz
		RX	Channel 8805	Channel 8915	Channel 9025
			860.5 MHz	881.5 MHz	892.5 MHz
	5MHz	TX	Channel 26815	Channel 26915	Channel 27015
			826.5 MHz	836.5 MHz	846.5 MHz
		RX	Channel 8815	Channel 8915	Channel 9015
			871.5 MHz	881.5 MHz	891.5 MHz
	10MHz	TX	Channel 26840	Channel 26915	Channel 26990
			829 MHz	836.5 MHz	844 MHz
		RX	Channel 8840	Channel 8915	Channel 8990
			874 MHz	881.5 MHz	889 MHz
	15MHz	TX	Channel 26865	Channel 26915	Channel 26965
			831.5 MHz	836.5 MHz	841.5 MHz
		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		
			Low (L)	Middle (M)	High (H)
LTE Band 30	5MHz	TX	Channel 27685	Channel27710	Channel 27735
			2307.5 MHz	2310MHz	2312.5 MHz
	10MHz	RX	Channel 9795	Channel 9820	Channel 9845
			2352.5MHz	2355 MHz	2357.5MHz
		TX	Channel 27710	Channel27710	Channel27710
			2310 MHz	2310MHz	2310MHz
		RX	Channel 9820	Channel 9820	Channel 9820
			2355 MHz	2355 MHz	2355 MHz

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

Test Mode	Bandwidth	TX / RX	RF Channel		
			Low (L)	Middle (M)	High (H)
LTE Band 48	5MHz	TX/RX	Channel 55265	Channel55990	Channel 56715
			3552.5 MHz	3625.0 MHz	3697.5 MHz
	10MHz	TX/RX	Channel 55290	Channel55990	Channel 56690
			3555.0 MHz	3625.0 MHz	3695.0 MHz
	15MHz	TX/RX	Channel 55315	Channel55990	Channel 56665
			3557.5 MHz	3625.0 MHz	3692.5 MHz
	20MHz	TX/RX	Channel 55340	Channel55990	Channel 56640
			3560.0 MHz	3625.0 MHz	3690.0 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 1710.7 MHz	Channel 132322 1745 MHz	Channel 132665 1779.3 MHz
		RX	Channel 66443 2110.7 MHz	Channel 66786 2145MHz	Channel 67329 2199.3 MHz
	3MHz	TX	Channel 131987 1711.5 MHz	Channel 132322 1745 MHz	Channel 132657 1778.5MHz
		RX	Channel 66451 2111.5 MHz	Channel 66786 2145MHz	Channel 67121 2198.5MHz
	5MHz	TX	Channel 131997 1712.5 MHz	Channel 132322 1745 MHz	Channel 132647 1777.5 MHz
		RX	Channel 66461 2112.5 MHz	Channel 66786 2145MHz	Channel 67311 2197.5 MHz
	10MHz	TX	Channel 132022 1715 MHz	Channel 132322 1745 MHz	Channel 132622 1775 MHz
		RX	Channel 66486 2115 MHz	Channel 66786 2145MHz	Channel 67286 2195 MHz
	15MHz	TX	Channel 132047 1717.5 MHz	Channel 132322 1745 MHz	Channel 132597 1772.5 MHz
		RX	Channel 66511 2117.5 MHz	Channel 66786 2145MHz	Channel 67261 2192.5 MHz
	20MHz	TX	Channel 132072 1720 MHz	Channel 132322 1745 MHz	Channel 132572 1770 MHz
		RX	Channel 66536 2120 MHz	Channel 66786 2145MHz	Channel 67236 2190 MHz



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Test Mode	Bandwidth	TX / RX	RF Channel		
			Low (L)	Middle (M)	High (H)
LTE Band71	1.4MHz	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
	3MHz	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
	5MHz	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
	10MHz	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
	15MHz	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
	20MHz	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



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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.



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 ; 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 0.8m 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 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). The transmitter was then removed and replaced with another antenna. The center of the antenna was approximately at the same location as the center of the transmitter.
- 5). A signal at the disturbance was fed to the substitution antenna by means of a non-radiating cable. With both the substitution and the receive antennas horizontally polarized, the receive antenna was raised and lowered to obtain a maximum reading at the test receiver. The level of the signal generator was adjusted until the measured field strength level in step 2) is obtained for this set of conditions.
- 6). The output power into the substitution antenna was then measured.
- 7). Steps 5) and 6) were repeated with both antennas polarized.
- 8). Calculate power in dBm by the following formula:

ERP (dBm) = Pg(dBm) – cable loss (dB) + antenna gain (dBd)

Where:

Pg is the generator output power into the substitution antenna.

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:
EIRP(dBm) = Pg(dBm) – cable loss (dB) + antenna gain (dBi)
EIRP=ERP+2.15dB
Where:
Pg is the generator output power into the substitution antenna.
- 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 EIRP Power Density

For mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, *except that* for mobile and portable stations compliant with 3GPP LTE standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth. For mobile and portable stations using time division duplexing (TDD) technology, the duty cycle must not exceed 38 percent in the 2305-2315 MHz and 2350-2360 MHz bands. Mobile and portable stations using FDD technology are restricted to transmitting in the 2305-2315 MHz band. Power averaging shall not include intervals in which the transmitter is off.

Test Settings

1. Set instrument center frequency to OBW center frequency.
2. Set span to at least 1.5 times the OBW.
3. Set the RBW to the specified reference bandwidth (often 1 MHz).
4. Set VBW $\geq 3 \times$ RBW.
5. Detector = RMS (power averaging).
6. Ensure that the number of measurement points in the sweep $\geq 2 \times$ span/RBW.
7. Sweep time = auto couple.
8. Employ trace averaging (RMS) mode over a minimum of 100 traces.
9. Use the peak marker function to determine the maximum amplitude level within the reference bandwidth (PSD).



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4.4 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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4.5 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 x RBW
5. Detector = RMS
6. Number of sweep points \geq 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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4.6 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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4.7 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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4.8 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). The transmitter was then removed and replaced with another antenna. The center of the antenna was approximately at the same location as the center of the transmitter.
- 5). A signal at the disturbance was fed to the substitution antenna by means of a non-radiating cable. With both the substitution and the receive antennas horizontally polarized, the receive antenna was raised and lowered to obtain a maximum reading at the test receiver. The level of the signal generator was adjusted until the measured field strength level in step 2) is obtained for this set of conditions.
- 6). The output power into the substitution antenna was then measured.
- 7). Steps 5) and 6) were repeated with both antennas polarized.
- 8) Calculate power in dBm by the following formula:

$$\text{ERP(dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dBd)}$$

Where:

Pd is the dipole equivalent power, Pg is the generator output into the substitution antenna, and the antenna gain is the gain of the substitute antenna used relative to either a half-wave dipole (dBd) or an isotropic source (dBi). The substitute level is equal to Pg [dBm] – cable loss [dB]. The calculated Pd levels are then compared to the absolute spurious emission limit of -13dBm which is equivalent to the required minimum attenuation of 43 + 10log10(Power [Watts]).

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:

$$\text{EIRP(dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dBi)}$$

$$\text{EIRP} = \text{ERP} + 2.15\text{dB}$$

Where:

Pg is the generator output power into the substitution antenna.

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.



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Test Settings:

1. RBW=100kHz for emission below 1GHz and 1MHz for emission above 1GHz
2. VBW \geq 3*RBW
3. Number of sweep point \geq 2*span/RBW
4. Detector=RMS
5. Trace mode=Average (Max Hold for pulsed emissions)
6. The trace was allowed to stabilize



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4.9 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

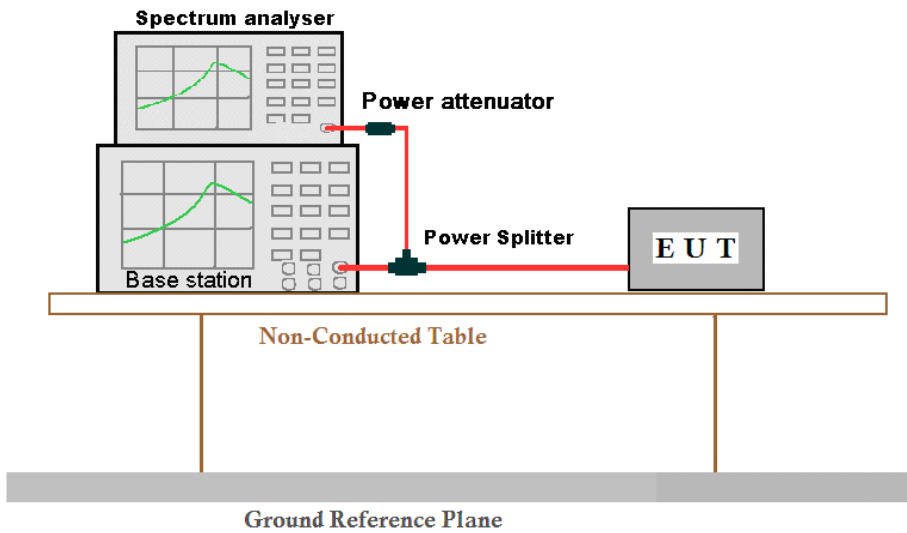


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4.10 Test Setups

4.10.1 Test Setup 1



4.10.2 Test Setup 2

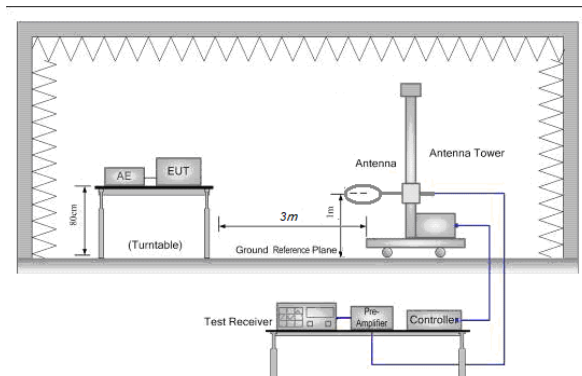


Figure 1. Below 30MHz



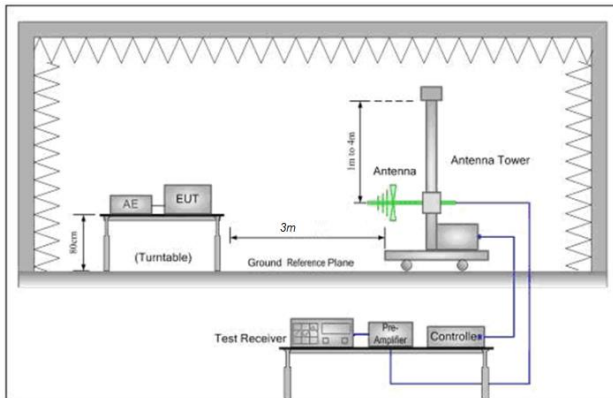


Figure 2. 30MHz to 1GHz

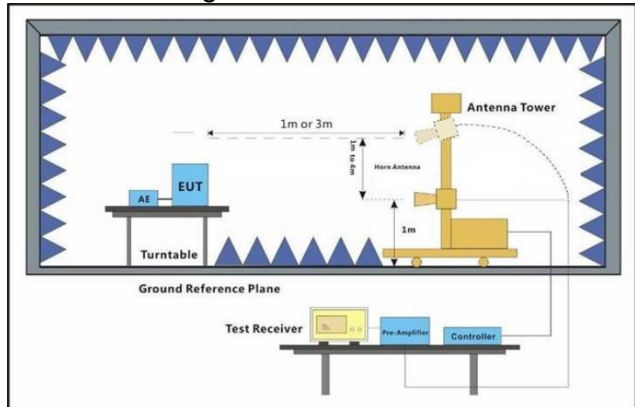
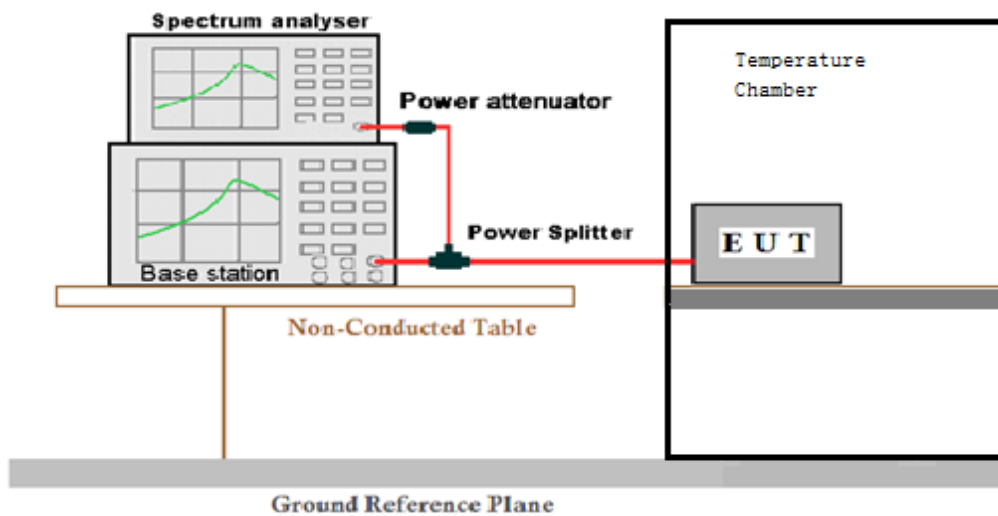


Figure 3. above 1GHz

4.10.3 Test Setup 3



Ground Reference Plane

4.11 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	UMTS/TM1; 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	UMTS/TM1; 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	UMTS/TM1; 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	UMTS/TM1; LTE/TM1;LTE/TM2; LTE/TM3; LTE/TM4;
Bandwid	Occupie	Test	Ambient Climate & Rated Voltage



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th	d Bandwid th	Environm ent	
		Test Setup	Test Setup 1
		RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)
		Test Mode	UMTS/TM1; LTE/TM1;LTE/TM2; LTE/TM3; LTE/TM4;
	Emissio n Bandwid th (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	UMTS/TM1; 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	UMTS/TM1; 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	UMTS/TM1; 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	UMTS/TM1; 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	UMTS/TM1; LTE/TM1;LTE/TM2; LTE/TM3; LTE/TM4;



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5 Main Test Instruments

RF conducted test					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date	Cal.Due date
				(yyyy-mm-dd)	(yyyy-mm-dd)
Signal Analyzer	Rohde & Schwarz	FSV	W025-05	2021/4/14	2022/4/13
DC Power Supply	Rohde & Schwarz	HMP2020	W009-08	2020/7/15	2021/7/15
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	HTC-1	W006-17	2021/4/20	2022/4/19
Temperature Chamber	GIANT FORCE	ICT-150-40-CP-AR	W027-03	2020/11/20	2021/11/19
Wideband Radio Communication Tester	Anristu	MT8821C	W061-05	2021/4/14	2022/4/13
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	W005-22	2020/10/22	2021/10/21

Field strength of spurious radiation					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2021-03-26	2024-03-25
EXA Signal Analyzer (10Hz-44GHz)	Agilent Technologies Inc	N9010A	SEM004-12	2021-02-01	2022-01-31
Horn Antenna (800MHz-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2021-04-14	2024-04-13
Horn Antenna (15-40GHz)	Schwarzbeck	BBHA 9170	SEM003-15	2020-11-14	2023-11-13
Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEM004-11	2020-09-23	2021-09-22
Pre-amplifier (26-40GHz)	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2021-03-24	2022-03-23
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2020-07-10	2021-07-09

Field strength of spurious radiation (below 1GHz)					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date	Cal. Due date
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2020-07-19	2023-07-18
MXE EMI Receiver (20Hz-8.4GHz)	Agilent Technologies	N9038A	SEM004-05	2020-09-23	2021-09-22
BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEM003-01	2019-05-24	2022-05-23
Substitution Antenna	Schwarzbeck	VULB9168	SEM003-18	2019-08-08	2022-08-07
Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEM005-01	2021-03-24	2022-03-23
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2020-07-10	2021-07-09
Universal Radio Communication Tester	Rohde & Schwarz	CMW 500	SEM010-03	2021-03-30	2022-03-29
Signal Generator	R&S	SMA100A	102174	2020-07-10	2021-07-09



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RSE Test System					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Semi-Anechoic Chamber	Brilliant-emc	N/A	XAW03-35-01	2019-09-11	2022-09-10
MXA signal analyzer	Keysight	N9020A	XAW01-06-01	2021-04-01	2022-03-31
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	2021-04-01	2022-03-31
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2020-09-11	2021-09-10
Receiving antenna (30MHz-3GHz)	Schwarzbeck	VULB 9163	XAW01-09-01	2019-10-13	2021-10-12
Receiving antenna (1GHz~18GHz)	Schwarzbeck	BBHA 9120D	XAW01-09-02	2019-10-13	2021-10-12
Receiving antenna (15GHz~40GHz)	Schwarzbeck	BBHA 9170	XAW01-09-03	2019-10-13	2021-10-12
Directional antenna rack controller	Max-Full	MF-7802BS	XAW03-03-01	NCR	NCR
High-speed antenna rack controller	Max-Full	MF-7802	XAW03-04-01	NCR	NCR
Filter bank	Tonscend	JS0806-F	XAW03-05-01	NCR	NCR
Filter bank	Tonscend	JS0806s	XAW03-05-02	NCR	NCR
Amplifier	Tonscend	TAP00903040	XAW01-41-01	2020-10-26	2021-10-25
Amplifier	Tonscend	TAP01018048	XAW01-41-02	2020-10-26	2021-10-25
Amplifier	Tonscend	TAP18040048	XAW01-41-03	2020-10-27	2021-10-26
Amplifier	Shanghai Steed	YX28980930	XAW01-41-06	2020-10-26	2021-10-25
5G UXM	Keysight	E7515B	XAW01-04-01	2020-09-11	2021-09-10
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2020-11-06	2021-11-05
Measurement Software	Tonscend	TS+ RSE V3.0.0.2	XAW02-05-01	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:

Lab A:

No.	Item	Measurement Uncertainty
1	Total RF power, conducted	$\pm 0.41\text{dB}$
2	RF power density, conducted	$\pm 1.96\text{dB}$
3	Spurious emissions, conducted	$\pm 0.41\text{dB}$
4	Radio Frequency	$\pm 7.10 \times 10^{-8}$
5	Duty Cycle	$\pm 0.49\%$
6	Occupied Bandwidth	$\pm 0.2\%$
7	Radiated Emission	4.5dB below 1GHz; 4.8dB above 1GHz

Lab B:

No.	Item	Measurement Uncertainty
1	Radiated Emission	$\pm 4.8\text{dB}$ (Below 1GHz)
		$\pm 4.8\text{dB}$ (1GHz to 6GHz)
		$\pm 4.5\text{dB}$ (6GHz to 18GHz)
		$\pm 5.02\text{dB}$ (Above 18GHz)



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7 Appendixes

Appendix A	Setup Photos
Appendix B.1	WCDMA Band II & IV & V
Appendix B.2	LTE Band 2
Appendix B.3	LTE Band 4
Appendix B.4	LTE Band 5
Appendix B.5	LTE Band 7
Appendix B.6	LTE Band 12
Appendix B.7	LTE Band 13
Appendix B.8	LTE Band 14
Appendix B.9	LTE Band 17
Appendix B.10	LTE Band 25
Appendix B.11	LTE Band 26 (814-824)
Appendix B.12	LTE Band 26 (824-849)
Appendix B.13	LTE Band 30
Appendix B.14	LTE Band 41
Appendix B.15	LTE Band 48
Appendix B.16	LTE Band 66
Appendix B.17	LTE Band 71
Appendix B.18	LTE CA_41C
Appendix B.19	LTE CA_2A-12A
Appendix B.20	LTE CA_12A-66A

The End



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