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FCC TEST REPORT

Application No:	ZR/2020/70008		
Applicant:	OnePlus Technology (shenzhen) Co., Ltd.		
Address of Applicant	18C02, 18C03, 18C04 and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen, China.		
Manufacturer:	OnePlus Technology (shenzhen) Co., Ltd.		
Address of Manufacturer:	18C02, 18C03, 18C04 and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen, China.		
EUT Description:	Smart Phone		
Model No.:	BE2011, BE2012, BE2015		
Trade Mark:	ONEPLUS		
FCC ID:	2ABZ2-EF164		
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 S		
Test Method:	FCC KDB 971168 D01 Power Meas License Digital Systems V03r01		
	C63.26 (2015)		
Date of Receipt:	2020/8/10		
Date of Test:	2020/8/10 to 2020/8/31		
Date of Issue:	2020/9/4		
Test Result:	PASS *		

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

Authorized Signature:

Derele yang

Derek Yang Wireless Laboratory Manager



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1 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2020/9/4		Original

Authorized for issue by:	
Tested By	Mike Mu
	(Mike Hu) /Project Engineer
Checked By	David Chen
	(David Chen) /Reviewer



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2 Test Summary

2.1 GSM850/UMTS Band 5 /CDMA BC0/LTE Band 5

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046, §22.913	FCC: ERP ≤ 7 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, §22.917	≤ -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	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	FCC: ≤ -13 dBm/100 kHz.	Section 7 of Appendix B	Pass
Frequency Stability	§2.1055, §22.355	≤ ±2.5ppm.	Section 8 of Appendix B	Pass
Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".				

2.2 GSM 1900/UMTS Band 2 /CDMA BC1/LTE Band 2 /25

Test Item	FCC Rule No.	Requirements	Test Result	Verdict		
Effective (Isotropic) Radiated Power Output Data	§2.1046, §24.232	EIRP ≤ 2 W	Section 1 of Appendix B	Pass		
Peak-Average Ratio	§2.1046, §24.232	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	≤ -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	 ≤ -13 dBm/1 MHz, 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, §24.238	≤ -13 dBm/1 MHz.	Section 7 of Appendix B	Pass		
Frequency Stability	§2.1055, §24.235	≤ ±2.5 ppm.	Section 8 of Appendix B	Pass		
Remark: For the verc	Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".					



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Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(d)	EIRP ≤ 1 W	Section 1 of Appendix B	Pass
Peak-Average Ratio	§2.1046, §27.50(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, §27.53(h)	≤ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.	Section 5 of Appendix B	Pass
Spurious Emission at Antenna Terminals	§2.1051, §27.53(h)	 ≤ -13 dBm/1 MHz, from 9 kHz to 10th harmonics but outside authorized operating frequency ranges. 	Section 6 of Appendix B	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(h)	≤ -13 dBm/1 MHz.	Section 7 of Appendix B	Pass
Frequency Stability	§2.1055, §27.54	≤ ±2.5 ppm.	Section 8 of Appendix B	Pass
Remark: For the verd	lict, the "N/A" denote	es "not applicable", the "N/T" denotes "not	tested".	

2.3 UMTS Band 4 /LTE Band 4 /66

2.4 LTE Band 7/38/41

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(h)	EIRP ≤ 2W	Section 1 of Appendix B	Pass
Peak-Average Ratio	§27.50(a)	≤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 5 of Appendix B	Pass



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Test Item	FCC Rule No.	Requirements	Test Result	Verdict
		section.		
Spurious Emission at Antenna Terminals	§2.1051, §27.53(m)	Channel Edge -25dBm/ 1 MHz 9 kHz \$5 MHz XMHz 10 th harmonics X=Max {6MHz, EBW}	Section 6 of Appendix B	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(m)	Channel Edge -25dBm/ 1 MHz 9 kHz 9 kHz X=Max {6MHz, EBW}	Section 7 of Appendix B	Pass
Frequency Stability	§2.1055, §27.54	Within authorized bands of operation/frequency block.	Section 8 of Appendix B	Pass
Remark: For the verd	lict, the "N/A" denot	es "not applicable", the "N/T" denotes "not	tested".	

2.5 LTE Band 12/17

Test Item	FCC Rule No	Requirements	Test Result	Verdict		
Effective (Isotropic) Radiated Power Output Data	§27.50(c)	FCC: ERP ≤ 3 W.	Section 1 of Appendix B	Pass		
Peak-Average Ratio	§2.1046, §27.50(c)	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, §27.54	≤ ±2.5ppm.	Section 8 of Appendix B	Pass		
Remark: For the vero	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
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(b)	FCC: ERP ≤ 3 W.	Section 1 of Appendix B	Pass
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Teet literee		Deminemente		Vereliet
Test Item Peak-Average Ratio	FCC Rule No. §27.50	Requirements Limit≤13 dB	Test Result Section 2 of Appendix B	Verdict N/T
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(c)	≤ -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(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. For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and –80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.	Section 6 of Appendix B	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(c) §27.53(f)	FCC: ≤ -13 dBm/100 kHz. For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.	Section 7 of Appendix B	Pass
Frequency Stability	§2.1055, §27.54	Within authorized bands of operation/frequency block.	Section 8 of Appendix B	Pass
Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".				

2.7 LTE Band 26/CDMA BC10

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Transmitter Conducted Power Output	§2.1046, §90.635	< 100 W.	Section 1 of Appendix B	PASS
Peak-Average Ratio		FCC: Limit≤13 dB	Section 2 of Appendix B	N/T
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
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	Section 5 of Appendix B	PASS



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Test Item	FCC Rule No.	Requirements	Test Result	Verdict
		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.		
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
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
Frequency Stability	§2.1055, §90.213	< ±2.5ppm.	Section 8 of Appendix B	PASS
Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".				

2.8 LTE Band 71

Test Item	FCC Rule No.	Requirements	Test Result	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(c)	EIRP ≤ 3 W	Section 1 of Appendix B	Pass
Peak-Average Ratio	§2.1046,	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 10th 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, §27.54	within the authorized bands of operation.	Section 8 of Appendix B	Pass
Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".				



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3 General Information

3.1 Client Information

Applicant:	OnePlus Technology (shenzhen) Co., Ltd.	
Address of Applicant:18C02, 18C03, 18C04 and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen, China.		
Manufacturer: OnePlus Technology (shenzhen) Co., Ltd.		
Address of Manufacturer:	18C02, 18C03, 18C04 and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen, China.	

3.2 Test Location

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	
Telephone:	+86 (0) 755 2601 2053	
Fax:	+86 (0) 755 2671 0594	
E-mail:	ee.shenzhen@sgs.com	

3.3 Test Facility

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

CNAS (No. CNAS L2929)

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

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.

Industry Canada (IC)

Two 3m Śemi-anechoić chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.



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3.4 General Description of EUT

EUT Description::	Smart Phone
Model No.:	BE2011, BE2012, BE2015
Trade Mark:	ONEPLUS
Hardware Version:	44
Software Version:	10.5.5.BE82CB
Sample Type:	Portable Device, Module
Antenna Type:	External, 🛛 Integrated
	GSM850: -4dBi;
	GSM1900:-2dBi
	WCDMA Band II:-2dBi
	WCDMA Band VI:-2dBi
	WCDMA Band V:-4dBi
	CDMA BC0: -4dBi
	CDMA BC1: -2dBi
	CDMA BC10: -4dBi
	LTE Band 2:-2dBi;
	LTE Band 4:-2dBi;
Antenna Gain:	LTE Band 5:-4dBi;
	LTE Band 7:-1dBi;
	LTE Band 12: -4.5dBi
	LTE Band 13:-4.5dBi;
	LTE Band 17:-4.5dBi;
	LTE Band 25:-4dBi;
	LTE Band 26:-2dBi;
	LTE Band 38:-1dBi;
	LTE Band 41:-1dBi;
	LTE Band 66:-2dBi;
	LTE Band 71:-5dBi;



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The mobile phone BE2012 and BE2015 and BE2011 are GSM/CDMA/WCDMA/LTE mobile phone. The differences between BE2012 and BE2015 and BE2011 are showed in the following table. They only have different model name, other parts of the mobile phone are the same, including Chipsets, the appearance, Bluetooth mode, Wi-Fi mode, Adapter, Battery, and so on.

Model name	BE2012	BE2011	BE2015
Туре	Object of reference	New model	New model
GSM bands	/	The same	The same
WCDMA bands	/	The same	The same
LTE bands	/	The same	The same
SIM card	/	The same	The same
External camera	/	The same	The same
Internal camera	/	The same	The same
FLASH	/	The same	The same
Mainboard	/	The same	The same
PCB layout	/	The same	The same
Appearance	/	The same	The same
Bluetooth mode	/	The same	The same
WLAN mode	/	The same	The same
BT/ WLAN antenna	/	The same	The same
GSM/ WCDMA /LTE antenna	/	The same	The same
Adapter	/	The same	The same
Battery	/	The same	The same
Chipset	/	The same	The same
Memory	/	The same	The same
RF Parameter	/	The same	The same
Dimension	/	The same	The same

Note:

Model No.: BE2011, BE2012, BE2015.

Only the BE2012 was tested, since they only have different model name, other parts of the mobile phone are the same, including Chipsets, the appearance, Bluetooth mode, Wi-Fi mode, Adapter, Battery, and so on.



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3.5 Test Mode

Test Mode	Test Modes Description
GSM/TM1	GSM system, GSM/GPRS, GMSK modulation
GSM/TM2	GSM system, EGPRS, 8PSK modulation
UMTS/TM1	UMTS system, WCDMA, QPSK modulation
UMTS/TM2	UMTS system, WCDMA, 16QAM modulation
CDMA/TM1	CDMA system, OQPSK modulation
LTE/TM1	LTE system, QPSK modulation
LTE/TM2	LTE system, 16QAM modulation
LTE/TM3	LTE system, 64QAM modulation

Remark: The test mode(s) are selected according to relevant radio technology specifications.



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3.6 Test Environment

Environment Parameter	Selected Values During Tests	
Relative Humidity	52%	
Atmospheric Pressure:	101.32 KPa	
Temperature	NT	25 ℃
	LV	3.4V
Voltage:	NV	3.87V
	HV	4.45V

Remark: LV= lower extreme test voltage; NV= nominal voltage

HV= upper extreme test voltage; NT= normal temperature

3.7 Technical Specification

Characteristics	Description				
	GSM				
Padia System Type					
Radio System Type	CDMA				
	LTE				
	Band	ТХ	RX		
	GSM850	824 to 849 MHz	869 to 894 MHz		
	GSM1900	1850 to 1910 MHz	1930 to 1990 MHz		
	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		
	CDMA BC0	824 to 849 MHz	869 to 894 MHz		
	CDMA BC1	1850 to 1910 MHz	1930 to 1990 MHz		
	CDMA BC10	817 to 824 MHz	862 to 869 MHz		
Supported Frequency Range	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 17	704 to 716 MHz	734 to 746 MHz		
	LTE Band 25	1850 to 1915MHz	1930 to 1995 MHz		
	LTE Band 26	814 to 824MHz	859 to 869 MHz		
	(814 to 824 MHz)				



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(824 to 849 MHz) 824 to 849 MHz 869 to 894 MHz LTE Band 38 2570 to 2620 MHz 2570 to 2620 MHz LTE Band 41 2496 to 2690MHz 2496 to 2690MHz LTE Band 66 1710 to 1780 MHz 2110 to 2200 MHz		LTE Band 26			
LTE Band 38 2570 to 2620 MHz 2570 to 2620 MHz LTE Band 41 2496 to 2690MHz 2496 to 2690MHz LTE Band 66 1710 to 1780 MHz 2110 to 2200 MI LTE Band 71 663 to 698 MHz 617 to 652 MHz GSM850:33.8dBm GSM850:33.8dBm 0MTS Band N: 24.8dBm UMTS Band V: 24.8dBm UMTS Band V: 24.8dBm 0MTS Band V: 24.8dBm UMTS Band V: 24.8dBm CDMA BC1: 24.8dBm CDMA BC1: 24.8dBm CDMA BC1: 24.8dBm CDMA BC1: 24.8dBm LTE Band 3: 24.8dBm LTE Band 12: 24.8dBm LTE Band 1: 22.4.8dBm LTE Band 1: 22.4.8dBm LTE Band 1: 24.8dBm LTE Band 1: 22.8 dBm LTE Band 1: 22.8 dBm LTE Band 1: 22.4.8dBm LTE Band 1: 22.6.3dBm LTE Band 1: 22.6.3dBm LTE Band 1: 22.6.3dBm LTE Band 1: 22.6.3dBm LTE Band 1: 22.6.3dBm LTE Band 1: 22.6.3dBm LTE Band 1: 22.6.3dBm LTE Band 1: 22.6.3dBm LTE Band 1: 22.6.3dBm LTE Band 1: 22.5.3dBm LTE Band 1: 22.5.3dBm LTE Band 2: 25.3dBm LTE Band 4: 26.8dBm LTE Band 5: 25.3dBm LTE Band 6: 24.8dBm LTE Band 6: 24.8dBm LTE Band 6: 24.8dBm			824 to 849 MHz	869 to 894 MHz	
LTE Band 41 2496 to 2690MHz 2496 to 2690MHz LTE Band 66 1710 to 1780 MHz 2110 to 2200 MI LTE Band 71 663 to 698 MHz 617 to 652 MHz GSM850:33.8dBm GSM850:33.8dBm 617 to 652 MHz GSM850:33.8dBm GSM850:33.8dBm 617 to 652 MHz GSM850:33.8dBm UMTS Band II: 24.8dBm 0107 Stand V: 24.8dBm UMTS Band V: 24.8dBm CDMA BC1: 24.8dBm 0200 ABC1: 24.8dBm CDMA BC1: 24.8dBm CDMA BC1: 24.8dBm 0200 ABC1: 24.8dBm LTE Band 2: 24.8dBm LTE Band 2: 25.3dBm LTE Band 12: 25.3dBm LTE Band 12: 25.3dBm LTE Band 13: 24.8dBm LTE Band 12: 25.3dBm LTE Band 12: 25.3dBm LTE Band 2: 25.3dBm LTE Band 3: 24.8dBm LTE Band 2: 25.3dBm LTE Band 3: 24.8dBm LTE Band 2: 25.3dBm LTE Band 3: 24.8dBm LTE Band 3: 24.8dBm LTE Band 2: 25.3dBm LTE Band 17: 25.3dBm LTE Band 2: 25.3dBm LTE Band 2: 25.3dBm LTE Band 2: 25.3dBm LTE Band 4: 24.8dBm LTE Band 4: 24.8dBm LTE Band 2: 25.3dBm LTE Band 4: 24.8dBm LTE Band 4: 24.8dBm LTE Band 4: 25.3dBm		· · · · ·			
LTE Band 66 1710 to 1780 MHz 2110 to 2200 MI LTE Band 71 663 to 698 MHz 617 to 652 MHz GSM850:33.8dBm GSM1900: 30.8dBm UMTS Band II: 24.8dBm UMTS Band II: 24.8dBm CDMA BC0: 24.8dBm CDMA BC1: 24.8dBm CDMA BC1: 24.8dBm LTE Band 2: 24.8dBm LTE Band 2: 24.8dBm LTE Band 3: 24.8dBm LTE Band 12: 24.8dBm LTE Band 12: 25.3dBm LTE Band 12: 25.3dBm LTE Band 13: 24.8dBm LTE Band 13: 24.8dBm LTE Band 17: 25.3dBm LTE Band 25: 24.8dBm LTE Band 25: 24.8dBm LTE Band 26: 25.3dBm LTE Band 26: 25.3dBm LTE Band 26: 25.3dBm LTE Band 26: 25.3dBm LTE Band 26: 24.8dBm LTE Band 26: 25.3dBm LTE Band 26: 24.8dBm LTE Band 26: 24.8dBm LTE Band 26: 25.3dBm LTE Band 26: 24.8dBm LTE Band 26: 25.3dBm LTE Band 26: 24.8dBm LTE Band 21: 23.3dBm 0.2 MHz GSM system: \Quee 0.2 MHz \Quee 0.2 MHz \Quee 0.2 MHz UMTS system: \Quee 0.2 MHz \Quee 0.2 MHz \Quee 0.2 MHz CDMA BC1 \Quee 0.2 MHz \Quee 0.2 MHz \Quee 0.2 MHz CDMA BC1 \Quee 0.2 MHz \Quee 0.2 MHz \Quee 0.2 MHz LTE Band 2 \Quee 0.1 A MHz; \Quee 0.3 MHz; \Quee 0.1 MHz; \Quee 0.1 MHz; LTE Band 2 \Quee 0.1 A MHz; \Quee 0.1 MHz; \Quee 0.1 MHz; \Quee 0.1 MHz; LTE Band 4 \Quee 0.1 MHz; \Quee 0.1 MHz; \Quee 0.1 MHz;		LTE Band 38	2570 to 2620 MHz	2570 to 2620 MHz	
ITE Band 71 663 to 698 MHz 617 to 652 MHz GSM850:33.8dBm GSM1900: 30.8dBm UMTS Band II: 24.8dBm UMTS Band IV: 24.8dBm CDMA BC0: 24.8dBm CDMA BC1: 24.8dBm CDMA BC11: 24.8dBm CDMA BC11: 24.8dBm LTE Band 2: 24.8dBm LTE Band 5: 25.3dBm LTE Band 5: 25.3dBm LTE Band 17: 25.3dBm LTE Band 17: 25.3dBm LTE Band 25: 24.8dBm LTE Band 25: 24.8dBm LTE Band 38: 24.8dBm LTE Band 25: 25.3dBm LTE Band 25: 25.3dBm		LTE Band 41	2496 to 2690MHz	2496 to 2690MHz	
GSM850:33.8dBm GSM1900: 30.8dBm UMTS Band II: 24.8dBm UMTS Band V: 24.8dBm UMTS Band V: 24.8dBm CDMA BC0: 24.8dBm CDMA BC1: 24.8dBm LTE Band 2: 24.8dBm LTE Band 4: 24.8dBm LTE Band 5: 25.3dBm LTE Band 12: 25.3dBm LTE Band 13: 24.8dBm LTE Band 13: 24.8dBm LTE Band 13: 24.8dBm LTE Band 3: 24.8dBm LTE Band 32: 24.8dBm LTE Band 32: 24.8dBm LTE Band 38: 24.8dBm LTE Band 38: 24.8dBm LTE Band 38: 24.8dBm LTE Band 38: 24.8dBm LTE Band 66: 24.8dBm CDMA BC1 1.23 MHz		LTE Band 66	1710 to 1780 MHz	2110 to 2200 MHz	
GSM1900: 30.8dBm UMTS Band II: 24.8dBm UMTS Band V: 24.8dBm CDMA BC0: 24.8dBm CDMA BC1: 24.8dBm CDMA BC1: 24.8dBm CDMA BC1: 24.8dBm CDMA BC1: 24.8dBm LTE Band 2: 24.8dBm LTE Band 12: 25.3dBm LTE Band 12: 25.3dBm LTE Band 12: 25.3dBm LTE Band 25: 24.8dBm LTE Band 26: 25.3dBm LTE Band 26: 25.3dBm LTE Band 26: 25.3dBm LTE Band 26: 25.3dBm LTE Band 26: 24.8dBm LTE Band 26: 25.3dBm LTE Band 26: 25.3dBm LTE Band 26: 25.3dBm LTE Band 26: 24.8dBm LTE Band 26: 25.3dBm LTE Band 27: 25.3dBm LTE Band 28: 24.8dBm LTE Band 20: 20.2 MHz CDMA BC0 LTE B		LTE Band 71	663 to 698 MHz	617 to 652 MHz	
UMTS system: \Bigstyle 5 MHz CDMA BC0 \Bigstyle 1.23 MHz CDMA BC1 \Bigstyle 1.23 MHz CDMA BC10 \Bigstyle 1.23 MHz LTE Band 2 \Bigstyle 1.4 MHz; \Bigstyle 3 MHz; \Bigstyle 5 MHz; \Bigstyle 10 MHz; LTE Band 4 \Bigstyle 1.4 MHz; \Bigstyle 3 MHz; \Bigstyle 5 MHz; \Bigstyle 10 MHz;		GSM1900: 30.8dBm UMTS Band II: 24.8dBm UMTS Band IV: 24.8dBm UMTS Band V: 24.8dBm CDMA BC0: 24.8dBm CDMA BC1: 24.8dBm CDMA BC10: 24.8dBm LTE Band 2: 24.8dBm LTE Band 4: 24.8dBm LTE Band 5: 25.3dBm LTE Band 12: 25.3dBm LTE Band 13: 24.8dBm LTE Band 13: 24.8dBm LTE Band 25: 24.8dBm LTE Band 25: 24.8dBm LTE Band 26: 25.3dBm LTE Band 26: 25.3dBm LTE Band 38: 24.8dBm LTE Band 38: 24.8dBm LTE Band 41: 26.8dBm LTE Band 66: 24.8dBm LTE Band 71: 25.3dBm			
CDMA BC0 1.23 MHz CDMA BC1 1.23 MHz CDMA BC10 1.23 MHz LTE Band 2 1.4 MHz; 3 MHz; 5 MHz; 10 MHz; LTE Band 4 1.4 MHz; 3 MHz; 5 MHz; 10 MHz;					
CDMA BC1 1.23 MHz CDMA BC10 1.23 MHz LTE Band 2 1.4 MHz; 3 MHz; 5 MHz; 10 MHz; LTE Band 4 1.4 MHz; 3 MHz; 5 MHz; 10 MHz;					
CDMA BC10 1.23 MHz LTE Band 2 1.4 MHz; 3 MHz; 5 MHz; 10 MHz; LTE Band 4 1.4 MHz; 3 MHz; 5 MHz; 10 MHz; LTE Band 4 1.4 MHz; 3 MHz; 5 MHz; 10 MHz;					
LTE Band 2 1.4 MHz; 3 MHz; 5 MHz; 10 MHz; LTE Band 4 15 MHz, 20 MHz LTE Band 4 1.4 MHz; 3 MHz; 5 MHz; 10 MHz;					
LTE Band 2 15 MHz, 20 MHz LTE Band 4 1.4 MHz; 3 MHz; 5 MHz; 10 MHz; 15 MHz; 10 MHz; 15 MHz, 20 MHz				5 MHz: 🖂 10 MHz:	
I I E Band 4 ⊠15 MHz, ⊠20 MHz		LIE Band 2	15 MHz, 20 MHz		
		LTE Band 4		5 MHz; 🛛 10 MHz;	
		LTE Band 5		5 MHz: 🖂 10 MHz	
LTE Band 7					
Supported Channel LTE Band 12 X1.4 MHz; X3 MHz; X5 MHz; X10 MHz	Supported Channel				
Bandwidth LTE Band 13 S MHz; 10 MHz	Bandwidth				
LTE Band 17					
		LTE Dalid T/			
LTE Band 25 $\square 1.4 \text{ MHz}, \square 3 \text{ MHz}, \square 5 \text{ MHz}, \square 10 \text{ MHz}, \square 15 \text{ MHz}, \square 20 \text{ MHz}$		LTE Band 25	⊠1.4 MHz;⊠3 MHz; ⊠5 MHz; ⊠10 MHz; ⊠15 MHz, ⊠20 MHz		
LTE Band 26(814-824)		LTE Band 26(814-824)			
LTE Band 26(824-849) $\square 1.4 \text{ MHz}; \square 3 \text{ MHz}; \square 5 \text{ MHz}; \square 10 \text{ MHz}; \square 15 \text{ MHz}$		LTE Band 26(824-849)		5 MHz; 🛛 10 MHz;	
LTE Band38		LTE Band38	$\boxtimes 5 \text{ MHz} : \boxtimes 10 \text{ MHz} \cdot \boxtimes 1$	15 MHz, 🛛 20 MHz	
LTE Band41 $\boxtimes 5 \text{ MHz}; \boxtimes 10 \text{ MHz}; \boxtimes 15 \text{ MHz}, \boxtimes 20 \text{ MHz}$					
LTE Band66			⊠15 MHz, ⊠20 MHz		



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	LTE Band71	⊠5 MHz; ⊠10 MHz; ⊠15 MHz, ⊠20 MHz
Characteristics	Description	
	GSM850	248KGXW; 246KG7W
	GSM1900	247KGXW; 245KG7W
	UMTS Band II	4M15F9W
	UMTS Band IV	4M13F9W
	UMTS Band V	4M14F9W
	CDMA BC0	1M29F9W
	CDMA BC1	1M28F9W
	CDMA BC10	1M28F9W
		1M09G7D;1M09W7D; 1M10W7D
		2M70G7D;2M69W7D; 2M69W7D
	LTE Band 2	4M48G7D;4M50W7D; 4M48W7D
		8M93G7D;8M95W7D; 8M93W7D
		13M5G7D;13M5W7D; 13M5W7D
		17M9G7D;18M0W7D; 17M9W7D
		1M09G7D;1M09W7D; 1M10W7D
		2M70G7D;2M69W7D; 2M69W7D
	LTE Band 4	4M48G7D;4M50W7D; 4M48W7D
		8M95G7D;8M93W7D; 8M93W7D
		13M5G7D;13M5W7D; 13M5W7D 17M9G7D;17M9W7D; 17M9W7D
Designation of		1M09G7D;1M09W7D; 1M10W7D
Emissions		2M70G7D;2M69W7D; 2M69W7D
(Pomork: the popport	LTE Band 5	4M49G7D;4M49W7D; 4M48W7D
(Remark: the necessary		8M93G7D;8M93W7D; 8M93W7D
bandwidth of which is	LTE Band 7	4M48G7D;4M50W7D; 4M48W7D
the worst value from		8M93G7D;8M93W7D; 8M93W7D
the measured occupied		13M5G7D;13M5W7D; 13M4W7D
bandwidths for each		17M9G7D;17M9W7D; 17M9W7D
type of channel	LTE Band 12	1M10G7D;1M09W7D; 1M10W7D
bandwidth		2M70G7D;2M69W7D; 2M69W7D
configuration.)		4M48G7D;4M49W7D; 4M48W7D
		8M93G7D;8M95W7D; 8M95W7D
	LTE Band13	4M48G7D;4M50W7D; 4M49W7D
		8M93G7D;8M93W7D; 8M91W7D
	LTE Band 17	4M48G7D;4M50W7D; 4M48W7D
		8M95G7D;8M95W7D; 8M93W7D
		1M09G7D;1M09W7D; 1M10W7D
		2M70G7D;2M69W7D; 2M69W7D 4M48G7D;4M50W7D; 4M48W7D
	LTE Band 25	8M93G7D;8M93W7D; 8M95W7D
		13M5G7D;13M5W7D; 13M5W7D
		17M9G7D;17M9W7D; 17M9W7D
		1M09G7D;1M09W7D; 1M10W7D
	LTE Band 26	2M70G7D;2M69W7D; 2M69W7D
	(814-824)	4M48G7D;4M50W7D; 4M49W7D
	· · · ·	8M93G7D;8M93W7D; 8M93W7D
		1M09G7D;1M09W7D; 1M10W7D
	LTE Band 26	2M70G7D;2M69W7D; 2M70W7D
	(824-849)	4M48G7D;4M50W7D; 4M49W7D
	(024-043)	8M95G7D;8M95W7D; 8M93W7D
		13M5G7D;13M5W7D; 13M5W7D



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LTE Band 38	4M48G7D;4M50W7D; 4M49W7D 8M91G7D;8M91W7D; 8M93W7D 13M5G7D;13M5W7D; 13M5W7D 17M9G7D;17M9W7D; 17M9W7D
LTE Band 41	4M48G7D;4M50W7D; 4M49W7D 8M93G7D;8M91W7D; 8M93W7D 13M5G7D;13M5W7D; 13M5W7D 17M9G7D;17M9W7D; 17M9W7D
LTE Band 66	1M09G7D;1M09W7D; 1M10W7D 2M70G7D;2M70W7D; 2M70W7D 4M48G7D;4M50W7D; 4M48W7D 8M95G7D;8M93W7D; 8M93W7D 13M5G7D;13M5W7D; 13M5W7D 17M9G7D;17M9W7D; 17M9W7D
LTE Band 71	4M48G7D;4M48W7D; 4M48W7D 8M93G7D;8M91W7D; 8M91W7D 13M5G7D;13M5W7D; 13M5W7D 17M9G7D;18M0W7D; 17M9W7D



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3.8 Test Frequencies

Test Mode	TX / RX	RF Channel		
		Low (L)	Middle (M)	High (H)
GSM850	TX	Channel 128	Channel 190	Channel 251
		824.2MHz	836.6 MHz	848.8 MHz
		Channel 128	Channel 190	Channel 251
	RX	869.2 MHz	881.6 MHz	893.8 MHz

Test Mode	TX / RX	RF Channel		
		Low (L)	Middle (M)	High (H)
GSM1900	ТХ	Channel 512	Channel 661	Channel 810
		1850.2MHz	1880.0 MHz	1909.8 MHz
	DV	Channel 512	Channel 661	Channel 810
	RX	1930.2 MHz	1960.0 MHz	1989.8 MHz

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

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

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



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Test Mode T	TX / BX	RF Channel		
		Low (L)	Middle (M)	High (H)
CDMA BC0	Reverse Forward	Channel 1013	Channel 384	Channel 777
		824.7 MHz	836.52 MHz	848.31 MHz
		Channel 1013	Channel 384	Channel 777
		869.7 MHz	881.52 MHz	893.31 MHz

Test Mode	TX / BX	RF Channel				
i est mode		Low (L)	Middle (M)	High (H)		
	Reverse	Channel 25	Channel 600	Channel 1175		
CDMA BC1		1851.25MHz	1880.0 MHz	1908.75 MHz		
CDIMA BOT	Forward	Channel 25	Channel 600	Channel 1175		
	Forward	1931.25 MHz	1960.0 MHz	1988.75 MHz		

Test Mode	TX / RX	RF Channel				
rest mode		Low (L)	Middle (M)	High (H)		
	Reverse	Channel 476	Channel 580	Channel 684		
CDMA BC10	TIEVEI SE	817.9MHz	820.5 MHz	823.1 MHz		
	Forward	Channel 476	Channel 580	Channel 684		
	TOIWalu	862.9MHz	865.5 MHz	868.1 MHz		

Test Mode	Bandwidth	TX / RX		RF Channel	
Test Mode	Danuwiulin		Low (L)	Middle (M)	High (H)
		ТХ	Channel 18607	Channel 18900	Channel 19193
	1.4MHz		1850.7 MHz	1880 MHz	1909.3 MHz
	1.4IVITZ	RX	Channel 607	Channel 900	Channel 1193
			1930.7 MHz	1960 MHz	1989.3 MHz
		ТХ	Channel 18615	Channel 18900	Channel 19185
	3MHz		1851.5 MHz	1880 MHz	1908.5 MHz
	SIVITIZ	RX	Channel 615	Channel 900	Channel 1185
			1931.5 MHz	1960 MHz	1988.5 MHz
		ТХ	Channel 18625	Channel 18900	Channel 19175
	5MHz		1852.5 MHz	1880 MHz	1907.5 MHz
		RX	Channel 625	Channel 900	Channel1175
LTE Band 2			1932.5 MHz	1960 MHz	1987.5 MHz
LTE Dariu Z		TX	Channel 18650	Channel 18900	Channel 19150
	10MHz		1855 MHz	1880 MHz	1905 MHz
	TOWITZ	RX	Channel 650	Channel 900	Channel 1150
		ПА	1935 MHz	1960 MHz	1985 MHz
		ТХ	Channel 18675	Channel 18900	Channel 19125
	15MHz		1857.5 MHz	1880 MHz	1902.5 MHz
	20MHz	RX	Channel 675	Channel 900	Channel 1125
		ПА	1937.5 MHz	1960 MHz	1982.5 MHz
		ТХ	Channel 18700	Channel 18900	Channel 19100
			1860 MHz	1880 MHz	1900 MHz
	2010112	RX	Channel 700	Channel 900	Channel 1100
			1940 MHz	1960 MHz	1980 MHz



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

Test Mede	Dandwidth			RF Channel	
Test Mode	Bandwidth	TX / RX	Low (L)	Middle (M)	High (H)
		ТΧ	Channel 20407	Channel 20525	Channel 20643
	1.4MHz		824.7 MHz	836.5 MHz	848.3 MHz
	1.411112	RX	Channel 2407	Channel 2525	Channel 2643
			869.7 MHz	881.5 MHz	893.3 MHz
		ТХ	Channel 20415	Channel 20525	Channel 20635
	3MHz		825.5 MHz	836.5 MHz	847.5 MHz
		RX	Channel 2415	Channel 2525	Channel 2635
LTE Band 5		HA.	870.5 MHz	881.5 MHz	892.5 MHz
LIE Dallu S		ТХ	Channel 20425	Channel 20525	Channel 20625
	5MHz		826.5 MHz	836.5 MHz	846.5 MHz
		RX	Channel 2425	Channel 2525	Channel 2625
	10MHz		871.5 MHz	881.5 MHz	891.5 MHz
		ТХ	Channel 20450	Channel 20525	Channel 20600
			829 MHz	836.5 MHz	844 MHz
			Channel 2450	Channel 2525	Channel 2600
		RX	874 MHz	881.5 MHz	889 MHz



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Test Mede	Dandwidth	TX / RX		RF Channel					
Test Mode	Bandwidth		Low (L)	Middle (M)	High (H)				
		ТХ	Channel 20775	Channel 21100	Channel 21425				
	5MHz		2502.5 MHz	2535 MHz	2567.5 MHz				
	SIVILIZ	RX	Channel 2775	Channel 3100	Channel 5825				
			2622.5 MHz	2655 MHz	2687.5 MHz				
		ТХ	Channel 20800	Channel 21100	Channel 21400				
	10MHz		2505 MHz	2535 MHz	2565 MHz				
	TOMITZ	RX	Channel 2800	Channel 3100	Channel 3400				
LTE Band 7			2625 MHz	2655 MHz	2685 MHz				
LTE Dariu /		TX	Channel 20825	Channel 21100	Channel 21375				
	15MHz		2507.5 MHz	2535 MHz	2562.5 MHz				
	20MHz					RX	Channel 2825	Channel 3100	Channel 3375
			2627.5 MHz	2655 MHz	2682.5 MHz				
		тх	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 Mede	Dondwidth	TX / RX		RF Channel				
Test Mode	Bandwidth		Low (L)	Middle (M)	High (H)			
		ТΧ	Channel 23017	Channel 23095	Channel 23173			
	1.4MHz		699.7 MHz	707.5 MHz	715.3 MHz			
	1.411112	RX	Channel 5017	Channel 5095	Channel 5173			
			729.7 MHz	737.5 MHz	745.3 MHz			
		ТΧ	Channel 23025	Channel 23095	Channel 23165			
	3MHz		700.5 MHz	707.5 MHz	714.5 MHz			
	SIVILIZ	RX	Channel 5025	Channel 5095	Channel 5165			
LTE Band12			730.5 MHz	737.5 MHz	744.5 MHz			
LTE Danutz		ТХ	Channel 23035	Channel 23095	Channel 23155			
	5MHz		701.5 MHz	707.5 MHz	713.5 MHz			
	10MHz				RX	Channel 5035	Channel 5095	Channel 5155
			731.5 MHz	737.5 MHz	743.5 MHz			
		ΤХ	Channel 23060	Channel 23095	Channel 23130			
			704 MHz	707.5 MHz	711 MHz			
			Channel 5060	Channel 5095	Channel 5130			
		ΠΛ	734 MHz	737.5 MHz	741 MHz			

Test Mode	Bandwidth	TX / RX		RF Channel	
Test Mode	Danuwiuth		Low (L)	Middle (M)	High (H)
		ТХ	Channel 23025	Channel 23230	Channel 23255
	5MHz		779.5 MHz	782 MHz	784.5 MHz
		RX	Channel 5205	Channel 5230	Channel 5255
LTE Band 13			748.5 MHz	751 MHz	753.5 MHz
LIE Daliu 13		ТХ	Channel 23230	Channel 23230	Channel 23230
	10MHz		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		
Test Mode	Danuwiuth		Low (L)	Middle (M)	High (H)
		ΤХ	Channel 23755	Channel 23790	Channel 23825
	5MHz		706.5 MHz	710 MHz	713.5 MHz
		RX	Channel 5755	Channel 5790	Channel 5825
LTE Band 17		RA.	736.5 MHz	740 MHz	743.5 MHz
LIE Dallu I/		10MHz TX RX	Channel 23780	Channel 23790	Channel 23800
	10MHz		709 MHz	710 MHz	711 MHz
			Channel 5780	Channel 5790	Channel 5800
			739 MHz	740 MHz	741 MHz

TestMede	Development			RF Channel	
Test Mode	Bandwidth	TX / RX	Low (L)	Middle (M)	High (H)
		T 1/	Channel 26047	Channel 26365	Channel 26683
	1 41411-	ТΧ	1850.7 MHz	1882.5 MHz	1914.3 MHz
	1.4MHz	RX	Channel 8047	Channel 8365	Channel 8683
		ΠΛ	1930.7 MHz	1962.5 MHz	1994.3 MHz
		ΤХ	Channel 26055	Channel 26365	Channel 26675
			1851.5 MHz	1882.5 MHz	1913.5 MHz
	3MHz	RX	Channel 8055	Channel 8365	Channel 8675
		ΠΛ	1931.5 MHz	1962.5 MHz	1993.5 MHz
		ΤХ	Channel 26065	Channel 26365	Channel 26665
	5MHz		1852.5 MHz	1882.5 MHz	1912.5 MHz
		RX	Channel 8065	Channel 8365	Channel 8665
LTE Band 25			1932.5 MHz	1962.5 MHz	1992.5 MHz
LTE Dariu 25		TX	Channel 26090	Channel 26365	Channel 26640
	10MHz		1855 MHz	1882.5 MHz	1910 MHz
	TOMITZ	RX	Channel 8090	Channel 8365	Channel 8640
			1935 MHz	1962.5 MHz	1990 MHz
		ТХ	Channel 26115	Channel 26365	Channel 26615
	15MHz		1857.5 MHz	1882.5 MHz	1907.5 MHz
	20MHz	RX	Channel 8115	Channel 8365	Channel 8615
			1937.5 MHz	1962.5 MHz	1987.5 MHz
		ТХ	Channel 26140	Channel 26365	Channel 26590
			1860 MHz	1882.5 MHz	1905 MHz
		RX	Channel 8140	Channel 8365	Channel 8590
			1940 MHz	1962.5 MHz	1985 MHz

Test Made	Dandwidth	TX / RX	RF Channel		
Test Mode	Bandwidth		Low (L)	Middle (M)	High (H)
		ТΧ	Channel 26697	Channel 26740	Channel 26783
	1.4MHz		814.7 MHz	819 MHz	823.3 MHz
	1.4IVI⊓Z	RX RX	Channel 8697	Channel 8740	Channel 8783
			859.7 MHz	864MHz	868.3 MHz
LTE Band26		ТΧ	Channel 26705	Channel 26740	Channel 26775
(814-824)	21417		815.5 MHz	819 MHz	822.5 MHz
	3MHz	RX	Channel 8705	Channel 8740	Channel 8775
			860.5 MHz	864MHz	867.5 MHz
		ТΧ	Channel 26715	Channel 26740	Channel 26765
	5MHz TX		816.5 MHz	819 MHz	821.5 MHz



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		RX	Channel 8715	Channel 8740	Channel 8755
			861.5 MHz	864MHz	866.5 MHz
		ТХ	Channel 26740	Channel 26740	Channel 26740
			819 MHz	819 MHz	819 MHz
	10MHz	RX	Channel 8740	Channel 8740	Channel 8740
			864MHz	864MHz	864MHz

Test Made	Dondwidth	TX / RX		RF Channel	
Test Mode	Bandwidth		Low (L)	Middle (M)	High (H)
		ТΧ	Channel 26797	Channel 26915	Channel 27033
	1.4MHz		824.7 MHz	836.5 MHz	848.3 MHz
	1.411172	RX	Channel 8697	Channel 8915	Channel 9033
			859.7 MHz	881.5 MHz	893.3 MHz
		ТХ	Channel 26805	Channel 26915	Channel 27025
	3MHz		825.5 MHz	836.5 MHz	847.5 MHz
	SIVITIZ	RX	Channel 8805	Channel 8915	Channel 9025
		ΠΛ	860.5 MHz	881.5 MHz	892.5 MHz
		5MHz TX RX	Channel 26815	Channel 26915	Channel 27015
LTE Band26			826.5 MHz	836.5 MHz	846.5 MHz
(824-849)			Channel 8815	Channel 8915	Channel 9015
			871.5 MHz	881.5 MHz	891.5 MHz
		ТΧ	Channel 26840	Channel 26915	Channel 26990
	10MHz		829 MHz	836.5 MHz	844 MHz
	TOWITZ	RX	Channel 8840	Channel 8915	Channel 8990
			874 MHz	881.5 MHz	889 MHz
		ТΧ	Channel 26865	Channel 26915	Channel 26965
	15MHz		831.5 MHz	836.5 MHz	841.5 MHz
		RX	Channel 8865	Channel 8915	Channel 8965
		пЛ	876.5 MHz	881.5 MHz	886.5 MHz

Test Mode	Bandwidth	TX / RX	RF Channel				
Test Mode	Danuwiuth		Low (L)	Middle (M)	High (H)		
	5MHz	TX/RX	Channel 37775	Channel38000	Channel 38225		
			2572.5 MHz	2595 MHz	2617.5 MHz		
		10MHz TX/RX	Channel 37800	Channel38000	Channel 38200		
LTE Band 38			2575 MHz	2595 MHz	2615 MHz		
LIE Danu 30		15MHz TX/BX	Channel 37825	Channel38000	Channel 38175		
	15MHz		2577.5 MHz	2595 MHz	2612.5 MHz		
	001411-	001411-	001411-	20MHz TX/RX	Channel 37850	Channel38000	Channel 38150
	20MHz TX/RX		2580 MHz	2595 MHz	2610 MHz		

Test Mode	Bandwidth	idth TX / RX			
Test Mode	Bandwidth TX/RX		Low (L)	Middle (M)	High (H)
			Channel 39675	Channel40620	Channel 41565
	5MHz	TX/RX	2498.5 MHz	2593 MHz	2687.5 MHz
	10MHz	0MHz TX/RX	Channel 39700	Channel40620	Channel 41540
LTE Band 41			2501 MHz	2593 MHz	2685 MHz
		15MHz TX/RX	Channel 39725	Channel40620	Channel 41515
	ISMHZ		2503.5 MHz	2593 MHz	2682.5 MHz
	20MHz	TX/RX	Channel 39750	Channel40620	Channel 41490



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	2506 MHz	2593 MHz	2680 MHz
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Test Mada	Bandwidth	TX / RX		RF Channel			
Test Mode	Danuwiuth		Low (L)	Middle (M)	High (H)		
		ту	Channel 131979	Channel 132322	Channel 132665		
	1.4MHz	ТХ	1710.7 MHz	1745 MHz	1779.3 MHz		
	1.4IVI⊓Z	RX	Channel 66443	Channel 66786	Channel 67329		
			2110.7 MHz	2145MHz	2199.3 MHz		
		ΤХ	Channel 131987	Channel 132322	Channel 132657		
	3MHz		1711.5 MHz	1745 MHz	1778.5MHz		
		RX	Channel 66451	Channel 66786	Channel 67121		
			2111.5 MHz	2145MHz	2198.5MHz		
		ΤХ	Channel 131997	Channel 132322	Channel 132647		
	5MHz		1712.5 MHz	1745 MHz	1777.5 MHz		
		RX	Channel 66461	Channel 66786	Channel 67311		
LTE Band 66			2112.5 MHz	2145MHz	2197.5 MHz		
LIE Dallu 00		ТХ	Channel 132022	Channel 132322	Channel 132622		
	10MHz		1715 MHz	1745 MHz	1775 MHz		
		RX	Channel 66486	Channel 66786	Channel 67286		
			2115 MHz	2145MHz	2195 MHz		
				ΤХ	Channel 132047	Channel 132322	Channel 132597
	15MHz		1717.5 MHz	1745 MHz	1772.5 MHz		
	TOIVINZ	RX	Channel 66511	Channel 66786	Channel 67261		
			2117.5 MHz	2145MHz	2192.5 MHz		
		ΤХ	Channel 132072	Channel 132322	Channel 132572		
	20MHz		1720 MHz	1745 MHz	1770 MHz		
		RX	Channel 66536	Channel 66786	Channel 67236		
		ΠΛ	2120 MHz	2145MHz	2190 MHz		

Test Made				RF Channel	
Test Mode		TX / RX	Low (L)	Middle (M)	High (H)
		тх	Channel 133147	Channel 133297	Channel 133447
	5MHz		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
		тх	Channel 133172	Channel 133297	Channel 133422
	10MHz		668 MHz	680.5 MHz	693 MHz
		RX	Channel 68636	Channel 68761	Channel 68886
LTE Band 71			622 MHz	634.5 MHz	647 MHz
LTE Ballu / T		15MHz	Channel 133197	Channel 133297	Channel 133397
	151/14-		670.5 MHz	680.5 MHz	690.5 MHz
			Channel 68661	Channel 68761	Channel 68861
		RX	624.5 MHz	634.5 MHz	644.5 MHz
		тх	Channel 133222	Channel 133297	Channel 133372
	20MHz		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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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

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:



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- 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**

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 \ge 3 × RBW.
- 5. Detector = RMS (power averaging).
- 6. Ensure that the number of measurement points in the sweep $\geq 2 \times \text{span/RBW}$.
- 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).

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





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were performed at three frequencies (low channel, middle channel and high channel). The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1 percent of the selected span as is possible without being below 1 percent. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual. The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 percent of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded. The span between the two recorded frequencies is the occupied bandwidth.

Remark: Reference test setup 1

Test Settings

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

1 - 5% of the 99% occupied bandwidth observed in Step 7

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 peak or peak hold power.

Remark: Reference test setup 1



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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. $VBW \ge 3 \times RBW$
- 5. Detector = RMS
- 6. Number of sweep points ≥ 2 x Span/RBW
- 7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
- 8. Sweep time = auto couple
- 9. The trace was allowed to stabilize

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 is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

Remark: Reference test setup 1

Test Settings

- Start frequency was set to 30MHz and stop frequency was set to at least 10 * the fundamental frequency (separated into at least two plots per channel)
- 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

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





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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

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:

ERP(dBm) = Pg(dBm) - cable loss (dB) + 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 $43 + 10\log 10$ (Power [Watts]).

Above 1GHz test procedure as below:

1) Different between above is the test site, change from Semi- Anechoic







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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 3

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

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

Time Period and Procedure:

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

Remark: Reference test setup 4



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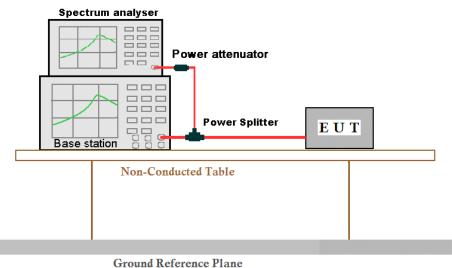
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4.10 Test Setups

4.10.1 Test Setup 1



4.10.2 Test Setup 2

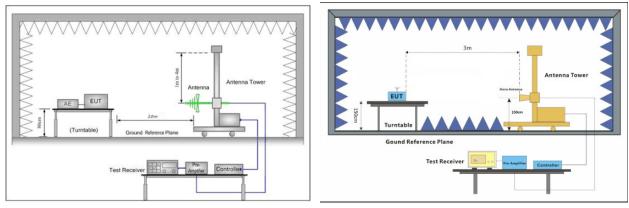


Figure 1. 30MHz to 1GHz

Figure 2. above 1GHz



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4.10.3 **Test Setup 3**

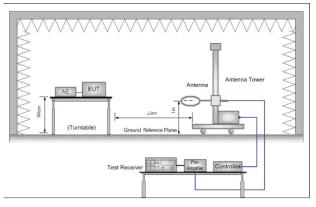


Figure 1. Below 30MHz

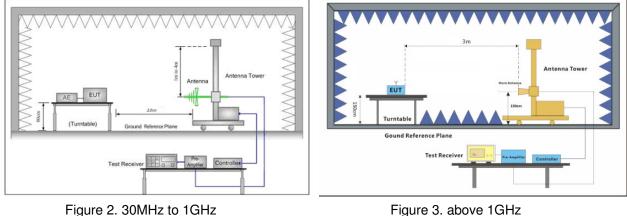
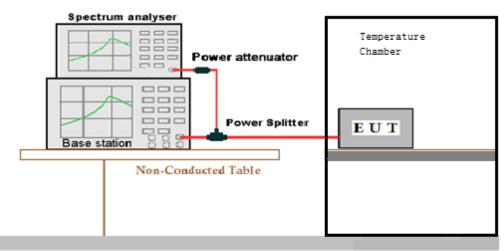


Figure 2. 30MHz to 1GHz

4.10.4 **Test Setup 4**



Ground Reference Plane



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4.11 Test Conditions

Test Case		Test Condition	S	
		Test Environment	Ambient Climate & Rated Voltage	
	Average	Test Setup	Test Setup 1	
	Power, Total	RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)	
Transmit Output		Test Mode	GSM/TM1;GSM/TM2;UMTS/TM1; UMTS/TM2;CDMA/TM1;EVDO/TM1;LTE/TM1;LTE/TM2; LTE/TM3;	
Power Data	A	Test Environment	Ambient Climate & Rated Voltage	
	Average Power,	Test Setup	Test Setup 1	
	Spectral Density (if	RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)	
	required)	Test Mode	GSM/TM1;GSM/TM2;UMTS/TM1; UMTS/TM2;CDMA/TM1;EVDO/TM1;LTE/TM1;LTE/TM2; LTE/TM3;	
		Test Environment	Ambient Climate & Rated Voltage	
		Test Setup	Test Setup 1	
Peak-to-Ave (if required)	-	RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)	
		Test Mode	GSM/TM1;GSM/TM2;UMTS/TM1; UMTS/TM2;CDMA/TM1;EVDO/TM1;LTE/TM1;LTE/TM2; LTE/TM3;	
		Test Environment	Ambient Climate & Rated Voltage	
		Test Setup	Test Setup 1	
Modulation Characteris	tics	RF Channels (TX)	M (M= middle channel)	
		Test Mode	GSM/TM1;GSM/TM2;UMTS/TM1; UMTS/TM2;CDMA/TM1;EVDO/TM1;LTE/TM1;LTE/TM2; LTE/TM3;	
			Ambient Climate & Rated Voltage	
	Occupied	Test Setup	Test Setup 1	
Bandwidth	Bandwidth	RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)	
		Test Mode	GSM/TM1;GSM/TM2;UMTS/TM1; UMTS/TM2;CDMA/TM1;EVDO/TM1;LTE/TM1;LTE/TM2;	



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			LTE/TM3;			
		Test Environment	Ambient Climate & Rated Voltage			
	Emission	Test Setup	Test Setup 1			
	Bandwidth (if	RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)			
	required)	Test Mode	GSM/TM1;GSM/TM2;UMTS/TM1; UMTS/TM2;CDMA/TM1;EVDO/TM1;LTE/TM1;LTE/TM2; LTE/TM3;			
		Test Environment	Ambient Climate & Rated Voltage			
		Test Setup	Test Setup 1			
Band Edges Compliance		RF Channels (TX)	L, H (L= low channel, H= high channel)			
		Test Mode	GSM/TM1;GSM/TM2;UMTS/TM1; UMTS/TM2;CDMA/TM1;EVDO/TM1;LTE/TM1;LTE/TM2; LTE/TM3;			
			Ambient Climate & Rated Voltage			
Spurious Er	mission at	Test Setup	Test Setup 1			
Antenna Terminals		RF Channels	L,M, H			
		(TX)	(L= low channel, M= middle channel, H= high channel)			
		Test Mode	GSM/TM1;UMTS/TM1; CDMA/TM1;EVDO/TM1;LTE/TM1			
		Test Environment	Ambient Climate & Rated Voltage			
		Test Setup	Test Setup 2			
Field Streng Spurious Ra	-	Test Mode	GSM/TM1;GSM/TM2;UMTS/TM1;UMTS/TM2; CDMA/TM1;EVDO/TM1;LTE/TM1;LTE/TM2;LTE/TM3;			
			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)			
			(1) -30 ℃ to +50 ℃ with step 10 ℃ at Rated Voltage;			
		Environment	(2) VL, VN and VH of Rated Voltage at Ambient Climate.			
		Test Setup	Test Setup 4			
Frequency	Stability	RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)			
		Test Mode	GSM/TM1;GSM/TM2;UMTS/TM1; UMTS/TM2;CDMA/TM1;EVDO/TM1;LTE/TM1;LTE/TM2; LTE/TM3;			



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5 Main Test Instruments

	RE in Chamber						
Test Equipment	Manufacturer	Model No.	Inventory	Cal. date	Cal.Due date		
Test Equipment	Manufacturer	Model No.	No.	(yyyy-mm- dd)	(yyyy-mm- dd)		
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2018/3/13	2021/3/12		
Spectrum Analyzer (20Hz-43GHz)	Rohde & Schwarz	FSU43	SEM004-08	2020/4/16	2021/4/15		
BiConiLog Antenna (26- 3000MHz)	ETS-Lindgren	3142C	SEM003-01	2020/6/27	2023/6/26		
Horn Antenna (800MHz- 18GHz)	Rohde & Schwarz	HF907	SEM003-07	2018/413	2021/412		
Horn Antenna (15-40GHz)	Schwarzbeck	BBHA 9170	SEM003-15	2017/10/17	2020/10/16		
Amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2020/7/14	2021/7/14		
Low Noise Amplifier (100MHz-18GHz)	Black Diamond Series	BDLNA- 0118- 352810	SEM005-05	2020/7/14	2021/7/14		
Pre-Amplifier (0.1- 26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	EMC2063	2019/9/20	2020/9/19		
Pre-amplifier (26-40GHz)	Compliance Directions Systems Inc.	PAP-2640- 50	SEM005-08	2020/4/16	2021/4/15		
Band filter	N/A	N/A	N/A	N/A	N/A		
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A		
Coaxial Cable	SGS	N/A	SEM026-01	2020/6/12	2021/6/11		
Wideband Radio CommunicationTeste	Anristu	MT8821C	6201462742	2020/4/16	2021/4/15		
Wideband Radio CommunicationTester	Rohde & Schwarz	CMW500	W005-02	2020/1/13	2021/1/2		



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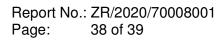


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RF conducted test						
Test Equipment	Manufacturer	Model No.	Inventory	Cal. date	Cal.Due date	
•••			No.	(yyyy-mm- dd)	(yyyy-mm- dd)	
Dual Output Mobile Communication DC Source	Agilent Technologies Inc	66311B	W009-09	2019/10/22	2020/10/21	
Signal Analyzer	Rohde & Schwarz	FSV	W005-02	2020/4/16	2021/4/15	
Coaxial Cable	SGS	N/A	SEM031-01	2020/6/12	2021/6/11	
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A	
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2019/10/22	2020/10/21	
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	HTC-1	W006-17	2019/10/22	2020/10/21	
Temperature Chamber	GIANT FORCE	ICT-150- 40-CP-AR	W027-03	2019/10/22	2020/10/21	
Wideband Radio CommunicationTeste	Anristu	MT8821C	6201462742	2020/4/16	2021/4/15	
Wideband Radio CommunicationTester	Rohde & Schwarz	CMW500	W005-02	2019/10/22	2020/10/21	



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Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (yyyy-mm- dd)	Cal. Due date (yyyy- mm-dd)
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2018/3/13	2021/3/12
Wideband Radio CommunicationTeste	Anristu	MT8821C	6201462742	2020/4/16	2021/4/15
Wideband Radio CommunicationTester	Rohde & Schwarz	CMW500	W005-02	2020/1/3	2021/1/2
EXA Signal Analyzer (10Hz- 26.5GHz)	Agilent Technologies Inc	N9010A	SEM004-09	2020/3/13	2021/3/12
Spectrum Analyzer (20Hz- 43GHz)	Rohde & Schwarz	FSU43	SEM004-08	2020/4/16	2021/4/15
BiConiLog Antenna (26- 3000MHz)	ETS-Lindgren	3142C	SEM003-01	2020/6/27	2023/6/26
Horn Antenna (800MHz-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2018/4/13	2021/4/12
Horn Antenna (15-40GHz)	Schwarzbeck	BBHA 9170	SEM003-15	2017/10/17	2020/10/16
Amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2020/7/25	2021/7/24
Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP- 0126	SEM004-11	2020/7/25	2021/7/24
Pre-amplifier (26-40GHz)	Compliance Directions Systems Inc.	PAP- 2640-50	SEM005-08	2020/4/16	2021/4/15
Band filter	N/A	N/A	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2020/6/12	2021/6/11
Tunable Notch Filter WRCD1700/2000-0.2/40-10EEK	WAINRIGHT Instruments GMBH	N/A	N/A	N/A	N/A
Tunable Notch Filter WRCD800/960-0.2/40-10EEK	WAINRIGHT Instruments GMBH	N/A	N/A	N/A	N/A
HighPass Filter WHK1.2/15G-10SS	WAINRIGHT Instruments GMBH	N/A	N/A	N/A	N/A
HighPass Filter WHKX10-2700-3000-18000-40SS	WAINRIGHT Instruments GMBH	N/A	N/A	N/A	N/A
HighPass Filter WHKX7.0/26.5G-6SS	WAINRIGHT Instruments GMBH	N/A	N/A	N/A	N/A
Band Reject Filter WRCG 824/849-814/859-40/8SS	WAINRIGHT Instruments GMBH	N/A	N/A	N/A	N/A
Band Reject Filter WRCG 1850/1910-1835/1925- 40/8SS	WAINRIGHT Instruments GMBH	N/A	N/A	N/A	N/A
Measurement Software	AUDIX	e3 V8.2014- 6-27	N/A	N/A	N/A



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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:

Test Item	Extended Uncertainty	Data	
Transmit Output Power Data	Power [dBm]	U =±0.37 dB	
Bandwidth	Magnitude [%]	U =± 0.2%	
Band Edge Compliance	Disturbance Power [dBm]	U = ±2.0 dB	
Spurious Emissions, Conducted	Disturbance Power [dBm]	U = ±2.0 dB	
		For 3 m Chamber:	
		U = ±4.5 dB (30 MHz to 1GHz)	
Field Strength of Spurious	ERP[dBm]/EIRP [dBm]	$U = \pm 3.3 \text{ dB}$ (above 1 GHz)	
Radiation	בהרנטטווון/בוהר נטטווון	For 10 m Chamber:	
		U = ±4.5 dB (30 MHz to 1GHz)	
		$U = \pm 3.2 \text{ dB}$ (above 1 GHz)	
Frequency Stability	Frequency Accuracy [ppm]	U = ±0.24 ppm	

7 Appendixes

Appendix A	Photographs of Set-Up for ZR/2020/70008	
Appendix B.1	GSM 850 & 1900	
Appendix B.2	WCDMA Band II & IV & V	
Appendix B.3	CDMA BC0/BC1/BC10	
Appendix B.4	LTE Band 2	
Appendix B.5	LTE Band 4	
Appendix B.6	LTE Band 5	
Appendix B.7	LTE Band 7	
Appendix B.8	LTE Band 12	
Appendix B.9	LTE Band 13	
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 38	
Appendix B.14	LTE Band 41	
Appendix B.15	LTE Band 66	
Appendix B.16	LTE Band 71	

The End



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