

FCC TEST REPORT

Application No.: ZR/2020/C0047
Applicant: Sony Corporation
Address of Applicant: 1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan
Manufacturer: Sony Corporation
Address of Manufacturer: 1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan
EUT Description: GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac, GPS and NFC
Trade Mark: Sony
FCC ID: PY7-63649Q
Standards: 47 CFR Part 2
47 CFR Part 22 subpart H
47 CFR Part 24 subpart E
47 CFR Part 27 subpart C
Test Method: FCC KDB 971168 D01 Power Meas License Digital Systems V03r01 C63.26 (2015)
Date of Receipt: 2021/3/10
Date of Test: 2021/3/10 to 2021/3/31
Date of Issue: 2021/4/29

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		2021-04-07		Original
02		2021-04-29		Updated Equipment list

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



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2 Test Summary

2.1 GSM850

Test Item	FCC Rule No.	Requirements	Test Result	Remark	Test Lab*
Effective (Isotropic) Radiated Power Output Data	§2.1046, §2.913	FCC: ERP ≤ 7 W	Section 1 of Appendix B	-	A
Peak-Average Ratio	---	Limit≤13 dB	-	See Note	A
Modulation Characteristics	§2.1047	Digital modulation	-	See Note	A
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	-	See Note	A
Band Edges Compliance	§2.1051, §2.917	≤ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.	-	See Note	A
Spurious Emission at Antenna Terminals	§2.1051, §2.917	FCC: ≤ -13 dBm/100 kHz, from 9 kHz to 10th harmonics but outside authorized operating frequency ranges.	-	See Note	A
Field Strength of Spurious Radiation	§2.1053, §2.917	FCC: ≤ -13 dBm/100 kHz.	Section 2 of Appendix B	-	B
Frequency Stability	§2.1055, §2.355	≤ ±2.5ppm.	-	See Note	A
Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".					

2.2 GSM 1900

Test Item	FCC Rule No.	Requirements	Test Result	Remark	Test Lab*
Effective (Isotropic) Radiated Power Output Data	§2.1046, §24.232	EIRP ≤ 2 W	Section 1 of Appendix B	-	A
Peak-Average Ratio	§2.1046, §24.232	Limit≤13 dB	-	See Note	A
Modulation Characteristics	§2.1047	Digital modulation	-	See Note	A
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	-	See Note	A
Band Edges Compliance	§2.1051, §24.238	≤ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.	-	See Note	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.	-	See Note	A
Field Strength of	§2.1053,	≤ -13 dBm/1 MHz.	Section 2 of	-	B



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Spurious Radiation	§24.238		Appendix B		
Frequency Stability	§2.1055, §24.235	≤ ±2.5 ppm.	-	See Note	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

Test Item	FCC Rule No.	Requirements	Test Result	Remark	Test Lab*
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(d)	EIRP ≤ 1 W	Section 1 of Appendix B	-	A
Peak-Average Ratio	§2.1046, §27.50(d)	Limit≤13 dB	-	See Note	A
Modulation Characteristics	§2.1047	Digital modulation	-	See Note	A
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	-	See Note	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.	-	See Note	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.	-	See Note	A
Field Strength of Spurious Radiation	§2.1053, §27.53(h)	≤ -13 dBm/1 MHz.	Section 2 of Appendix B	-	B
Frequency Stability	§2.1055, §27.54	≤ ±2.5 ppm.	-	See Note	A
Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".					



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2.4 LTE Band 41

Test Item	FCC Rule No.	Requirements	Test Result	Remark	Test Lab*
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(h)	EIRP ≤ 2W	Section 1 of Appendix B	-	A
Peak-Average Ratio	§27.50(a)	≤13 dB	-	See Note	A
Modulation Characteristics	§2.1047	Digital modulation	-	See Note	A
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	-	See Note	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.	-	See Note	A
Spurious Emission at Antenna Terminals	§2.1051, §27.53(m)		-	See Note	A
Field Strength of Spurious Radiation	§2.1053, §27.53(m)		Section 2 of Appendix B	-	B
Frequency Stability	§2.1055, §27.54	Within authorized bands of operation/frequency block.	-	See Note	A

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



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2.5 LTE Band 12

Test Item	FCC Rule No.	Requirements	Test Result	Remark	Test Lab*
Effective (Isotropic) Radiated Power Output Data	§27.50(c)	FCC: ERP ≤ 3 W.	Section 1 of Appendix B	-	A
Peak-Average Ratio	§2.1046, §27.50(c)	Limit≤13 dB	-	See Note	A
Modulation Characteristics	§2.1047	Digital modulation	-	See Note	A
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	-	See Note	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.	-	See Note	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.	-	See Note	A
Field Strength of Spurious Radiation	§2.1053, §27.53(g)	FCC: ≤ -13 dBm/100 kHz.	Section 2 of Appendix B	-	B
Frequency Stability	§2.1055, §27.54	≤ ±2.5ppm.	-	See Note	A
Remark: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".					

Note: The RF circuit, output power level and antenna performance is the same in WWAN function across all two FCC ID PY7-76625R and PY7-63649Q, since the change, only verify RF output power and radiated spurious emission test data the worst mode was reported in this report.

Remark :

All test were performed by Lab A and B.

Parts of test items above were subcontracted to Lab 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:	Sony Corporation
Address of Applicant	1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan
Manufacturer:	Sony Corporation
Address of Manufacturer	1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan

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:	GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac, GPS and NFC
Trade Mark:	Sony
S/N:	005129ADNVM2
Sample Type:	<input checked="" type="checkbox"/> Portable Device, <input type="checkbox"/> Module
Antenna Type:	<input type="checkbox"/> External, <input checked="" type="checkbox"/> Integrated
Antenna Gain:	GSM850(824 to 849): -3.3dBi; GSM1900(1850 to 1910):1.4dBi; WCDMA Band IV(1710 to 1755):-1.4dBi; LTE Band 4(1710 to 1755):-1.4dBi; LTE Band 12(699 to 716): -5.4dBi; LTE Band 41(2496 to 2690):-9.9dBi;

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
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.

3.6 Test Environment

Operating Environment:	
Humidity:	50 % RH
Atmospheric Pressure:	101.30 KPa
Temperature	NT 25 °C
Voltage:	LV 3.4V
	NV 3.87V
	HV 4.45V

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



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3.7 Technical Specification

Characteristics	Description		
Radio System Type	<input checked="" type="checkbox"/> GSM		
	<input checked="" type="checkbox"/> UMTS		
	<input checked="" type="checkbox"/> LTE		
Supported Frequency Range	Band	TX	RX
	GSM850	824 to 849 MHz	869 to 894 MHz
	GSM1900	1850 to 1910 MHz	1930 to 1990 MHz
	UMTS Band IV	1710 to 1755 MHz	2110 to 2155 MHz
	LTE Band 4	1710 to 1755 MHz	2110 to 2155 MHz
	LTE Band 12	699 to 716 MHz	729 to 746 MHz
	LTE Band 41	2496 to 2690MHz	2496 to 2690MHz
Target TX Output Power	GSM850:33.5 dBm GSM1900: 31dBm UMTS Band IV: 24.5dBm LTE Band 4: 24.5dBm LTE Band 12: 24.5dBm LTE Band 41: 23.8dBm		
Supported Channel Bandwidth	GSM system:	<input checked="" type="checkbox"/> 0.2 MHz	
	UMTS system:	<input checked="" type="checkbox"/> 5 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 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 41	<input checked="" type="checkbox"/> 5 MHz; <input checked="" type="checkbox"/> 10 MHz; <input checked="" type="checkbox"/> 15 MHz, <input checked="" type="checkbox"/> 20 MHz	
Note1: WCDMA supports HSUPA, HSDPA, DS-HSDPA, HSPA+, but only the worst case was tested and the data displayed in this report.			



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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
	RX	Channel 128	Channel 190	Channel 251
		869.2 MHz	881.6 MHz	893.8 MHz

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



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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	Channel 20175	Channel 20393
			1710.7 MHz	1732.5 MHz	1754.3 MHz
		RX	Channel 1975	Channel 2175	Channel 2375
			2112.5 MHz	2132.5MHz	2152.5 MHz
	3MHz	TX	Channel 19965	Channel 20175	Channel 20385
			1711.5 MHz	1732.5 MHz	1753.5 MHz
		RX	Channel 2000	Channel 2175	Channel 2350
			2115 MHz	2132.5MHz	2150 MHz
	5MHz	TX	Channel 19975	Channel 20175	Channel 20375
			1712.5 MHz	1732.5 MHz	1752.5 MHz
		RX	Channel 1975	Channel 2175	Channel 2375
			2112.5 MHz	2132.5MHz	2152.5 MHz
	10MHz	TX	Channel 20000	Channel 20175	Channel 20350
			1715 MHz	1732.5 MHz	1750 MHz
		RX	Channel 2000	Channel 2175	Channel 2350
			2115 MHz	2132.5MHz	2150 MHz
	15MHz	TX	Channel 20025	Channel 20175	Channel 20325
			1717.5 MHz	1732.5 MHz	1747.5 MHz
		RX	Channel 2025	Channel 2175	Channel 2325
			2117.5 MHz	2132.5MHz	2147.5 MHz
	20MHz	TX	Channel 20050	Channel 20175	Channel 20300
			1720 MHz	1732.5 MHz	1745 MHz
		RX	Channel 2050	Channel 2175	Channel 2300
			2120 MHz	2132.5MHz	2145 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



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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



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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

4.9 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:

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



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Where:

P_d is the dipole equivalent power, P_g 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 P_g [dBm] – cable loss [dB]. The calculated P_d levels are then compared to the absolute spurious emission limit of -13dBm which is equivalent to the required minimum attenuation of $43 + 10\log_{10}(\text{Power [Watts]})$.

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:

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

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

Where:

P_g 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.

Test Settings:

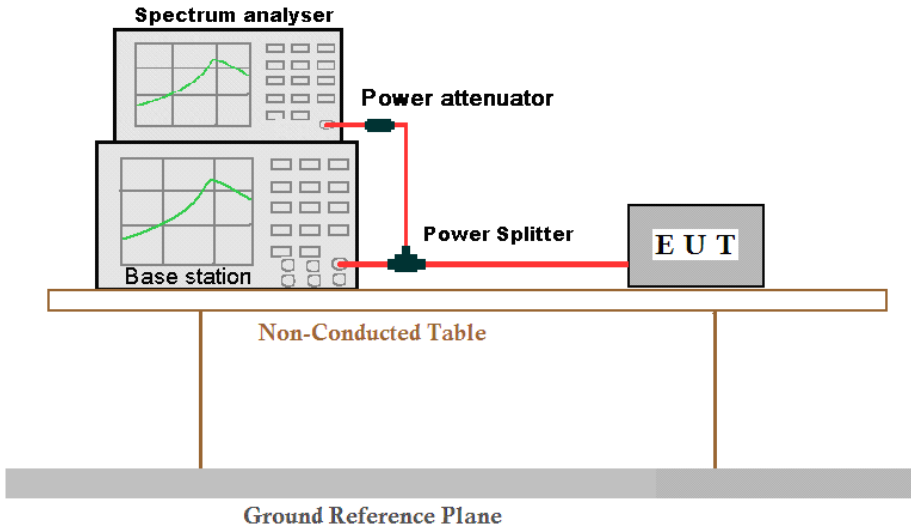
1. RBW=100kHz for emission below 1GHz and 1MHz for emission above 1GHz
2. VBW $\geq 3 \times$ RBW
3. Number of sweep point $\geq 2 \times$ span/RBW
4. Detector=RMS
5. Trace mode=Average (Max Hold for pulsed emissions)
6. The trace was allowed to stabilize



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4.10 Test Setups

4.10.1 Test Setup 1



4.10.2 Test Setup 2

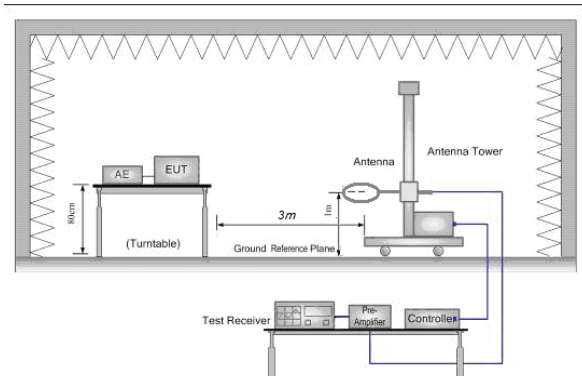


Figure 1. Below 30MHz



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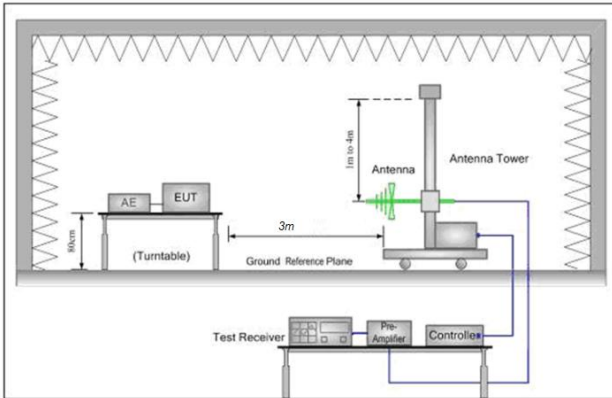


Figure 2. 30MHz to 1GHz

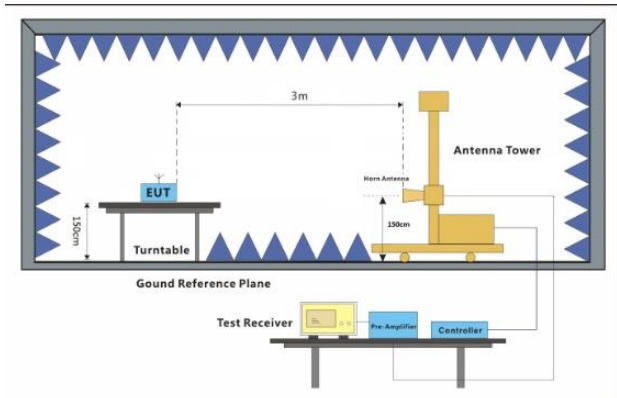


Figure 3. above 1GHz



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4.11 Test Conditions

Test Case		Test Conditions	
Transmit Output Power Data	Average Power, Total	Test Environment	Ambient Climate & Rated Voltage
		Test Setup	Test Setup 1
		RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)
		Test Mode	GSM/TM1;GSM/TM2;UMTS/TM1; LTE/TM1;LTE/TM2/TM3
	Average Power, Spectral Density (if required)	Test Environment	Ambient Climate & Rated Voltage
		Test Setup	Test Setup 1
		RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)
		Test Mode	GSM/TM1;GSM/TM2;UMTS/TM1; LTE/TM1;LTE/TM2/TM3
Field Strength of Spurious Radiation	Test Environment	Ambient Climate & Rated Voltage	
	Test Setup	Test Setup 2	
	Test Mode	GSM/TM1;GSM/TM2;UMTS/TM1; LTE/TM1;LTE/TM2/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)	



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5 Main Test Instruments

RSE&RE&CE Test System					
Equipment	Manufacturer	Model No.	Cal Date	Cal Due Date	Inventory No.
Semi-Anechoic Chamber	Brilliant-emc	966	NCR	NCR	XAW03-35-01
MXA signal analyzer	Keysight	N9020A	2020-04-02	2021-04-02	XAW01-06-01
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	2020-04-02	2021-04-02	XAW01-03-02
Test receiver	ROHDE&SCHWARZ	ESR	2020-09-11	2021-09-10	XAW01-08-01
Receiving antenna (30MHz-3GHz)	Schwarzbeck	VULB 9163	2019-10-13	2021-10-12	XAW01-09-01
Receiving antenna (1GHz~18GHz)	Schwarzbeck	BBHA 9120D	2019-10-13	2021-10-12	XAW01-09-02
Receiving antenna (15GHz~40GHz)	Schwarzbeck	BBHA 9170	2019-10-13	2021-10-12	XAW01-09-03
Directional antenna rack controller	Max-Full	MF-7802BS	NCR	NCR	XAW03-03-01
High-speed antenna rack controller	Max-Full	MF-7802	NCR	NCR	XAW03-04-01
Filter bank	Tonscend	JS0806-F	NCR	NCR	XAW03-05-01
Filter bank	Tonscend	JS0806s	NCR	NCR	XAW03-05-02
Amplifier	Tonscend	TAP00903040	2020-10-26	2021-10-25	XAW01-41-01
Amplifier	Tonscend	TAP01018048	2020-10-26	2021-10-25	XAW01-41-02
Amplifier	Tonscend	TAP18040048	2020-10-26	2021-10-25	XAW01-41-03
Amplifier	Shanghai Steed	YX28980930	2020-10-26	2021-10-25	XAW01-41-06
Artificial network	ROHDE&SCHWARZ	ENV216	2020-08-04	2021-08-03	XAW01-19-02
Temperature and humidity meter	MingGao	TH101B	2020-06-11	2021-05-11	XAW01-01-01
Measurement Software	Tonscend	TS+ RSE&RE	NCR	NCR	XAW02-05-01
Measurement Software	Tonscend	TS+ CE	NCR	NCR	XAW02-05-02



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RF conducted test					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date	Cal.Due date
				(yyyy-mm-dd)	(yyyy-mm-dd)
Dual Output Mobile Communication DC Source	Agilent Technologies Inc	66311B	W009-09	2020/10/22	2021/10/21
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	2020/10/22	2021/10/21
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	HTC-1	W006-17	2020/10/22	2021/10/21
Temperature Chamber	GIANT FORCE	ICT-150-40-CP-AR	W027-03	2020/10/22	2021/10/21
Wideband Radio Communication Tester	Anristu	MT8821C	6201462742	2020/4/16	2021/4/15
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	W005-02	2020/10/22	2021/10/21



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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]	$U = \pm 0.37$ dB
Bandwidth	Magnitude [%]	$U = \pm 0.2\%$
Band Edge Compliance	Disturbance Power [dBm]	$U = \pm 2.0$ dB
Spurious Emissions, Conducted	Disturbance Power [dBm]	$U = \pm 2.0$ dB
Field Strength of Spurious Radiation	ERP[dBm]/EIRP [dBm]	± 4.8 dB (30MHz-1GHz) ± 5.2 dB (1GHz-6GHz) ± 5.5 dB (6GHz-18GHz) ± 5.02 dB (18GHz-40GHz)
Frequency Stability	Frequency Accuracy [ppm]	$U = \pm 0.24$ ppm



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7 Appendixes

Appendix A	PCE & NII & DTS & DSS Setup Photos
Appendix B.1	GSM
Appendix B.2	WCDMA
Appendix B.3	LTE

The End



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