


TEST REPORT

Application No: ZR/2020/B0030
Applicant: Sony Mobile Communications, Inc.
Address of Applicant: 4-12-3 Higashi-shinagawa, Shinagawa-ku, Tokyo, 140-0002, Japan
Manufacturer: Sony Mobile Communications, Inc.
Address of Manufacturer: 4-12-3 Higashi-shinagawa, Shinagawa-ku, Tokyo, 140-0002, Japan
EUT Description: GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac, GPS and NFC
Trade Mark: Sony
FCC ID: PY7-10933K
Standard(s) : 47 CFR Part 15, Subpart B
Date of Receipt: 2020/11/19
Date of Test: 2020/11/19 to 2020/12/18
Date of Issue: 2021/7/4

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Simon Ling



Wireless Laboratory Manager



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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2020/12/20		Original
02		2021/1/29		Update test mode; Add test data remark
03		2021/1/30		Update contents and individual sections
04		2021/2/4		Update RE test data description
05		2021/7/4	Leah Chen	1. Modify data conversion error of antenna height 2. Updated equipment list

*This report supersedes our previous report ZR/2020/B0003006, issued on 2021-02-04, which is hereby deemed null and void.

Authorized for issue by:	
Prepared By	 _____ (Leah Chen) / Engineer
Checked By	 _____ (Daniel Wang) /Reviewer



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Test Summary

Emission Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at Mains Terminals (150kHz-30MHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass
Radiated Emissions (30MHz-1GHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass
Radiated Emissions (above 1GHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass

Internal Source	Upper Frequency
Below 1.705MHz	30MHz
1.705MHz to 108MHz	1GHz
108MHz to 500MHz	2GHz
500MHz to 1GHz	5GHz
Above 1GHz	5th harmonic of the highest frequency or 40GHz, whichever is lower



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1 General Information

Product Name:	GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac, GPS and NFC		
Trade Mark:	Sony		
S/N:	001265ADNVM2		
Frequency Bands:	Band	Tx (MHz)	Rx (MHz)
	GSM850	824~849	869~894
	GSM1900	1850~1910	1930~1990
	WCDMA Band V	824~849	869~894
	LTE Band 5	824~849	869~894
	LTE Band 12	699~716	729~746
	Wi-Fi 2.4G	2400~2483.5	2400~2483.5
	Bluetooth	2400~2483.5	2400~2483.5
	Wi-Fi 5G	5150~5850	5150~5850
	FM	87-108	
	GNSS(GPS/Glonass/Beidou/Galileo/SBAS)	1559~1610	
NFC	13.56		

Accessory:

Accessory Name.	Model no.
Earphone1	SBH82D
USB Cable1	UCB24
USB Cable2	UCB20
Adapter1	UCH-32



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1.1 Description of Support Units

Description	Manufacturer	Model No.	Serial No.	Certificate Type
Router	NETGEAR	R6020	No.XA1401	Router
Computer	Lenovo	L480	No.XA1402	Computer
Mouse	A4TECH	OP-520NU USB	No.XA1403	Mouse

1.2 Test Location

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:	Ben Huang, Leah Chen

1.3 Test Facility

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

- **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.**

1.4 Deviation from Standards

None

1.5 Abnormalities from Standard Conditions

None



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2 Emission Test Results

2.1 Conducted Emissions at Mains Terminals (150kHz-30MHz)

Test Requirement:	47 CFR Part 15, Subpart B
Test Method:	ANSI C63.4:2014
Frequency Range:	150kHz to 30MHz
Limit:	
0.15M-0.5MHz	66dB(μV)-56dB(μV) quasi-peak, 56dB(μV)-46dB(μV) average
0.5M-5MHz	56dB(μV) quasi-peak, 46dB(μV) average
5M-30MHz	60dB(μV) quasi-peak, 50dB(μV) average
Detector:	Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

2.1.1 E.U.T. Operation

Operating Environment:

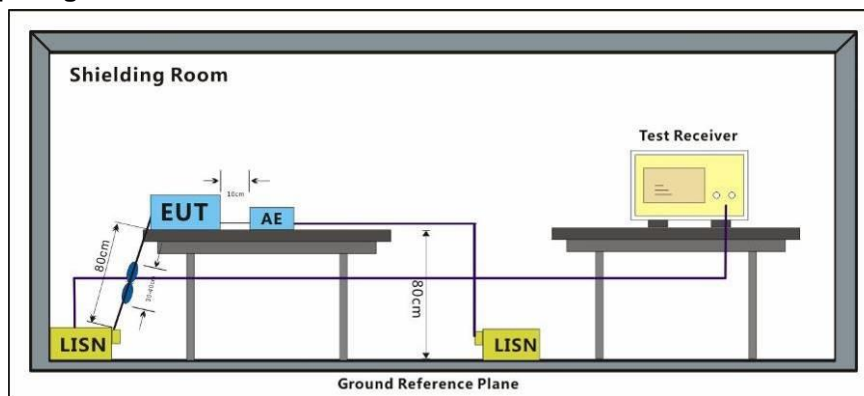
Temperature: 18.9 °C Humidity: 55.1 % RH Atmospheric Pressure: 1000 mbar

Pretest these modes to find the worst case:

- a: Transfer data between the EUT and the PC+USB cable1
- b: Transfer data between the EUT and the PC+USB cable2
- c: GSM 850 Idle+BT+2.4G WLAN +NFC +GPS Rx+playing MP4 (SD card) +earphone1 + battery1+Cable(worst)+adapter1
- d: WCDMA Band V Idle+BT+5G WLAN +NFC +GPS Rx+ camera (Back) +earphone1+ battery1+Cable(worst)+adapter1
- e: LTE Band 5 Idle+BT+2.4G WLAN +NFC +GPS Rx+camera (Front) +earphone1+battery1+ Cable(worst)+adapter1
- f: LTE Band 12 Idle+BT+5G WLAN +NFC +GPS Rx +FM +earphone1+battery1+ Cable(worst)+adapter1
- f: LTE Band 12 Idle+BT+5G WLAN +NFC +GPS Rx +FM +earphone1+battery1+ Cable(worst)+adapter1

The worst case for final test:

2.1.2 Test Setup Diagram



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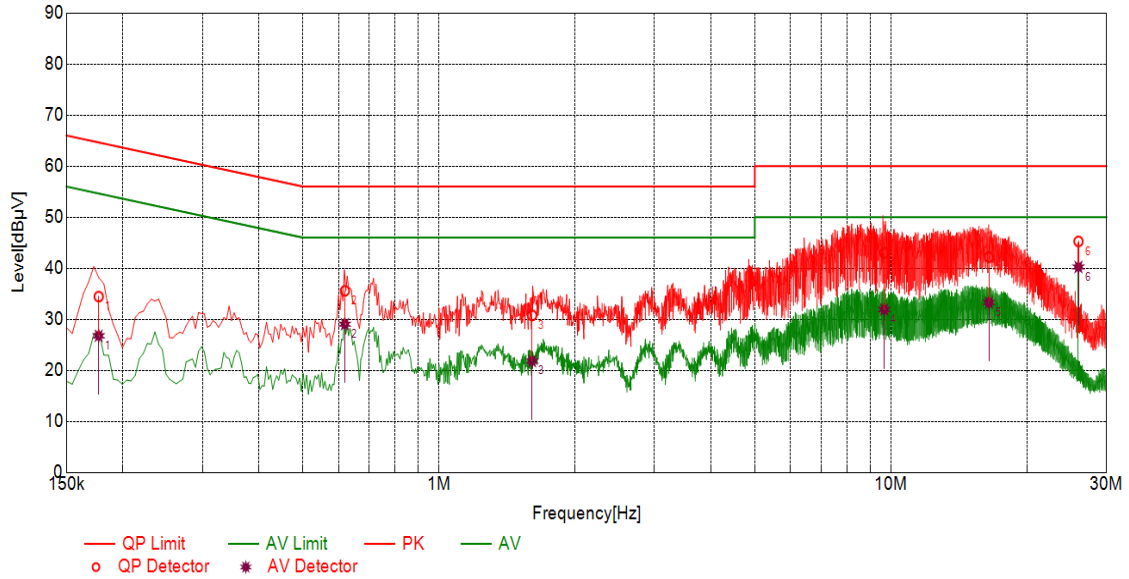
2.1.3 Measurement Data

An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.



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Mode:f; Line:Live Line



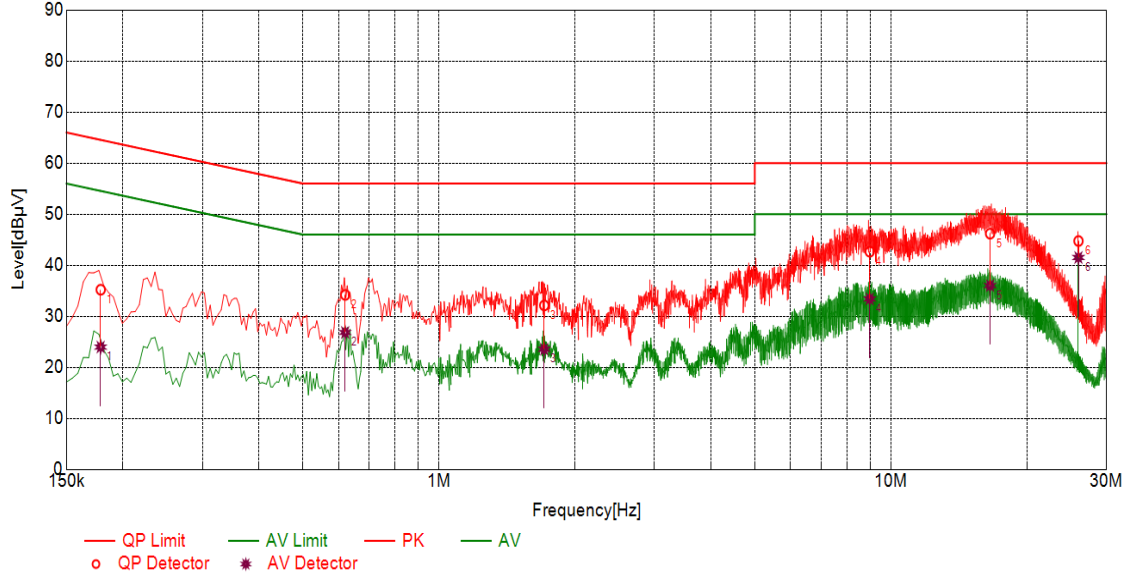
Test Graph

Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Type
1	0.1768	10.10	34.45	64.63	30.18	26.76	54.63	27.87	L
2	0.6197	10.10	35.58	56.00	20.42	29.04	46.00	16.96	L
3	1.6083	10.10	30.76	56.00	25.24	21.80	46.00	24.20	L
4	9.6670	10.10	43.02	60.00	16.98	31.92	50.00	18.08	L
5	16.4702	10.11	42.20	60.00	17.80	33.29	50.00	16.71	L
6	26.0006	10.11	45.25	60.00	14.75	40.24	50.00	9.76	L



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Mode:f; Line:Neutral Line



Test Graph

Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Type
1	0.1786	10.10	35.21	64.55	29.34	23.97	54.55	30.58	N
2	0.6206	10.10	34.20	56.00	21.80	26.83	46.00	19.17	N
3	1.7103	10.10	32.13	56.00	23.87	23.54	46.00	22.46	N
4	8.9779	10.10	42.66	60.00	17.34	33.39	50.00	16.61	N
5	16.5727	10.11	46.19	60.00	13.81	36.02	50.00	13.98	N
6	25.9987	10.11	44.75	60.00	15.25	41.51	50.00	8.49	N



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2.2 Radiated Emissions (30MHz-1GHz)

Test Requirement:	47 CFR Part 15, Subpart B
Test Method:	ANSI C63.4:2014
Frequency Range:	30MHz to 1GHz
Measurement Distance:	3m
Limit:	
30MHz -88MHz	40.0(dBμV/m) quasi-peak
88MHz-216MHz	43.5(dBμV/m) quasi-peak
216MHz-960MHz	46.0(dBμV/m) quasi-peak
960MHz-1000MHz	54.0(dBμV/m) quasi-peak
Detector:	Peak for pre-scan (120kHz resolution bandwidth) 30M to1000MHz

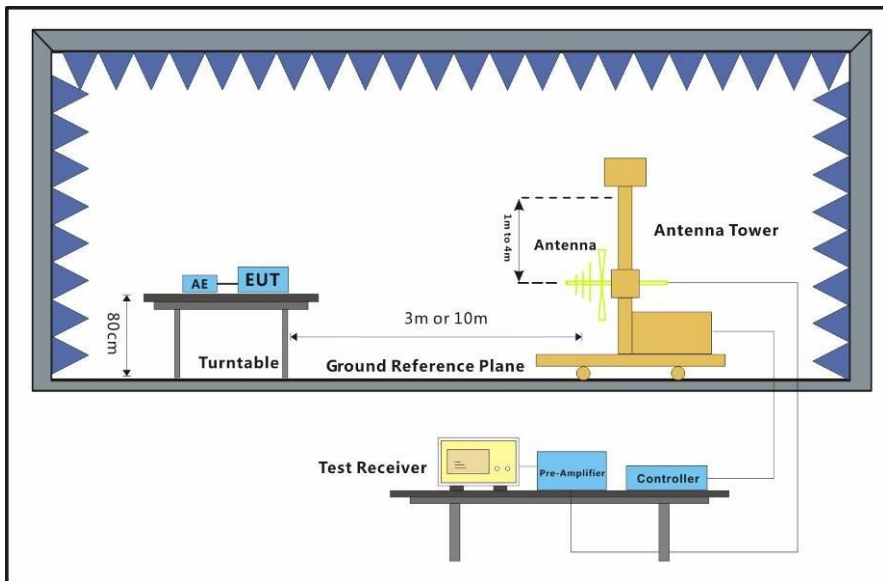
2.2.1 E.U.T. Operation

Operating Environment:	
Temperature:	25 °C Humidity: 66.5 % RH Atmospheric Pressure: 1010 mbar
Pretest these modes to find the worst case:	<ul style="list-style-type: none"> a: Transfer data between the EUT and the PC+USB cable1 b: Transfer data between the EUT and the PC+USB cable2 c: GSM 850 Idle+BT+2.4G WLAN +NFC +GPS Rx+playing MP4 (SD card) +earphone1 + battery1+Cable(worst)+adapter1 d: WCDMA Band V Idle+BT+5G WLAN +NFC +GPS Rx+ camera (Back) +earphone1+ battery1+Cable(worst)+adapter1 e: LTE Band 5 Idle+BT+2.4 WLAN +NFC +GPS Rx+camera (Front) +earphone1+battery1+ Cable(worst)+adapter1 f: LTE Band 12 Idle+BT+5G WLAN +NFC +GPS Rx +FM +earphone1+battery1+ Cable(worst)+adapter1
The worst case for final test:	f: LTE Band 12 Idle+BT+5G WLAN +NFC +GPS Rx +FM +earphone1+battery1+ Cable(worst)+adapter1



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2.2.2 Test Setup Diagram



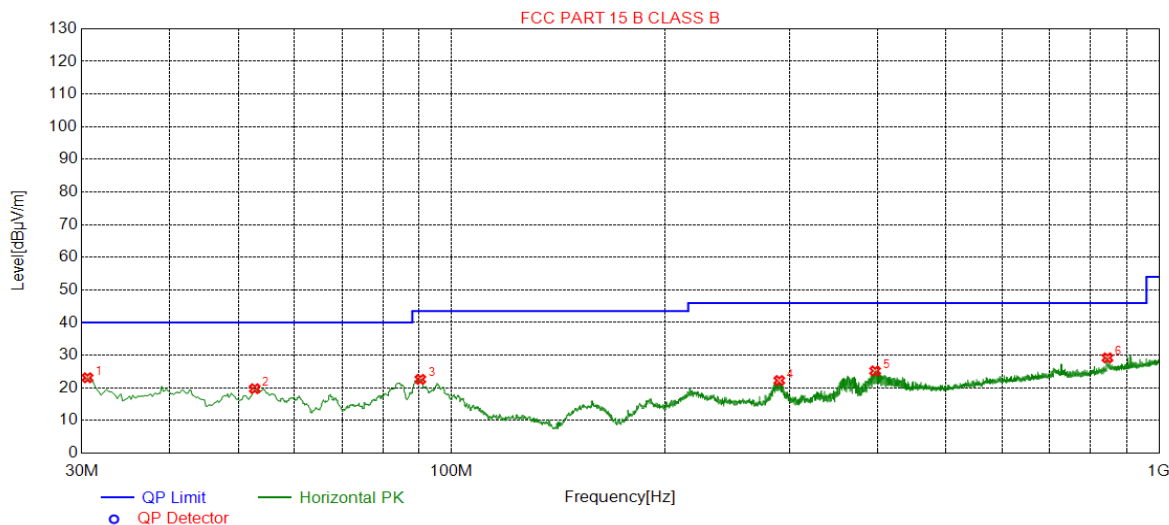
2.2.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. Three orthogonal axes of X,Y,Z are tested by EUT using BiConiLog antenna with 2 orthogonal polarities, but only the worst data had been displayed



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Mode:f; Polarization:Horizontal



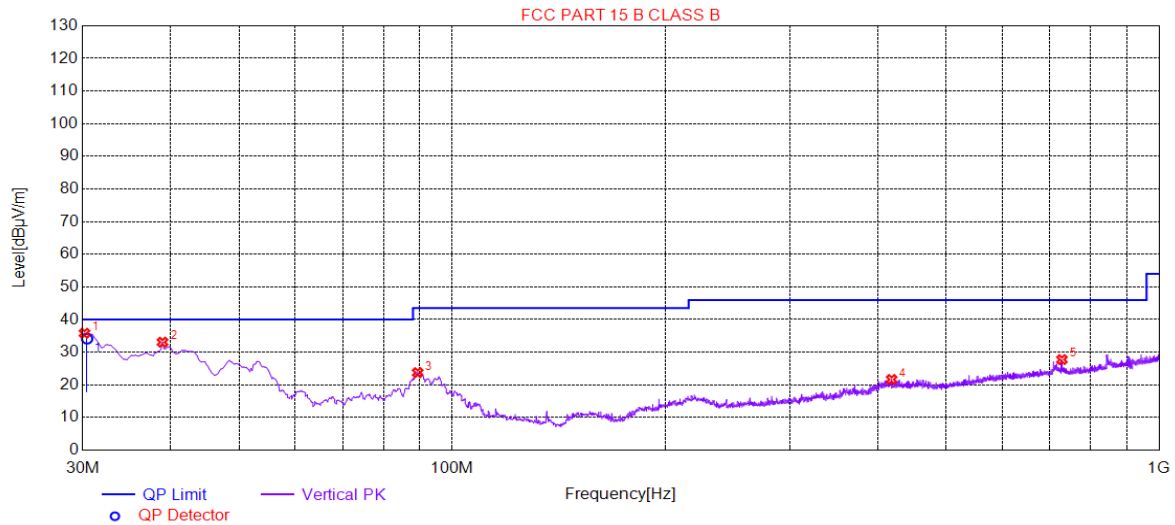
Suspected List

Suspected List							
NO.	Freq. [MHz]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	30.5821	23.10	40.00	16.90	152	286	Horizontal
2	52.7025	19.76	40.00	20.24	174	241	Horizontal
3	90.3461	22.62	43.50	20.88	225	259	Horizontal
4	290.5941	22.26	46.00	23.74	184	121	Horizontal
5	396.9274	25.20	46.00	20.80	275	194	Horizontal
6	845.5451	29.20	46.00	16.80	192	338	Horizontal



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Mode:f; Polarization:Vertical



Suspected List

Suspected List							
NO.	Freq. [MHz]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	30.1940	35.82	40.00	4.18	119	335	Vertical
2	38.9258	33.09	40.00	6.91	273	312	Vertical
3	89.3759	23.75	43.50	19.75	382	95	Vertical
4	418.4657	21.66	46.00	24.34	189	306	Vertical
5	728.7337	27.76	46.00	18.24	254	285	Vertical

Final Data List

Final Data List								
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	30.4410	-30.07	33.96	40.00	6.04	101	340.8	Vertical



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2.3 Radiated Emissions (above 1GHz)

Test Requirement: 47 CFR Part 15, Subpart B
 Test Method: ANSI C63.4:2014
 Frequency Range: Above 1GHz
 Measurement Distance: 3m
 Limit:
 Above 1GHz 74(dBμV/m) peak, 54(dBμV/m) average
 Detector: Peak for pre-scan (1000kHz resolution bandwidth) 100M to 40000MHz

2.3.1 E.U.T. Operation

Operating Environment:

Temperature: 21.7 °C Humidity: 56.4 % RH Atmospheric Pressure: 1010 mbar

Pretest these modes to find the worst case:

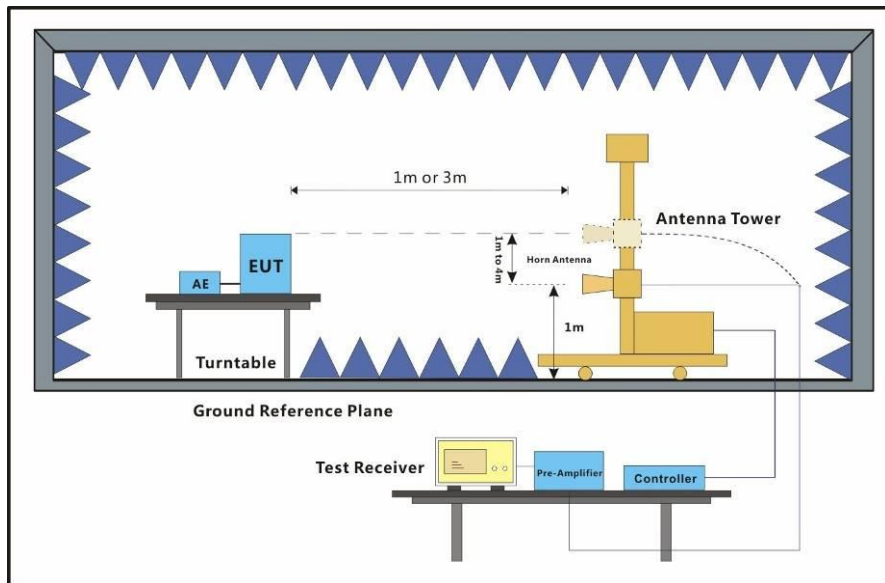
- a: Transfer data between the EUT and the PC+USB cable1
- b: Transfer data between the EUT and the PC+USB cable2
- c: GSM 850 Idle+BT+2.4G WLAN +NFC +GPS Rx+playing MP4 (SD card) +earphone1 + battery1+Cable(worst)+adapter1
- d: WCDMA Band V Idle+BT+5G WLAN +NFC +GPS Rx+ camera (Back) +earphone1+ battery1+Cable(worst)+adapter1
- e: LTE Band 5 Idle+BT+2.4G WLAN +NFC +GPS Rx+camera (Front) +earphone1+battery1+ Cable(worst)+adapter1
- f: LTE Band 12 Idle+BT+5G WLAN +NFC +GPS Rx +FM +earphone1+battery1+ Cable(worst)+adapter1

The worst case for final test: f: LTE Band 12 Idle+BT+5G WLAN +NFC +GPS Rx +FM +earphone1+battery1+ Cable(worst)+adapter1



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2.3.2 Test Setup Diagram



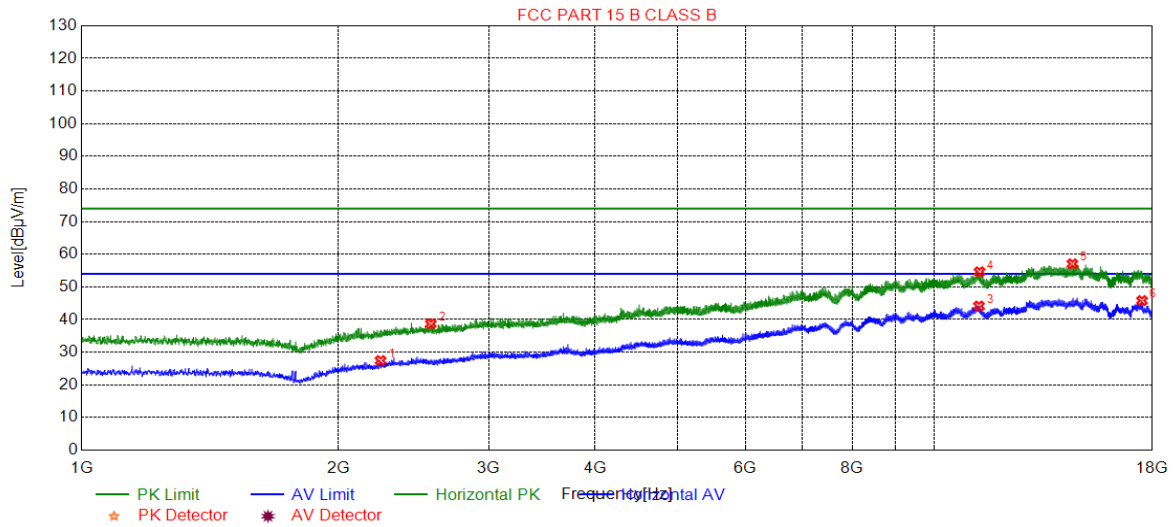
2.3.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Average measurements were conducted based on the peak sweep graph. Three orthogonal axes of X,Y,Z are tested by EUT using Horn antenna with 2 orthogonal polarities, but only the worst data had been displayed.



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Mode:f; Polarization:Horizontal



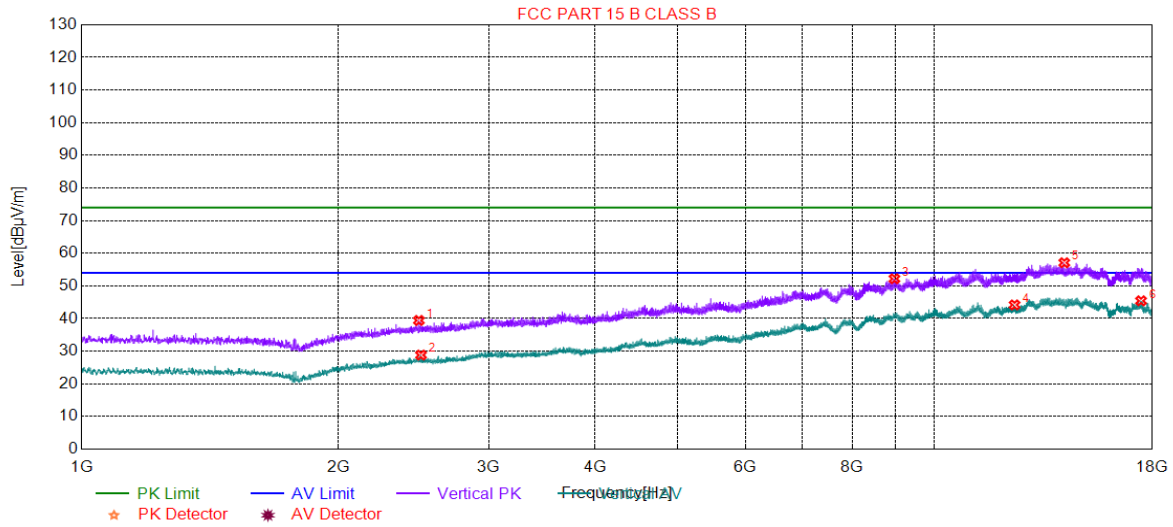
Suspected List

Suspected List							
NO.	Freq. [MHz]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2241.062	27.45	54.00	26.55	242	258	Horizontal
2	2566.628	38.70	74.00	35.30	239	190	Horizontal
3	11270.21	44.16	54.00	9.84	169	59	Horizontal
4	11287.21	54.63	74.00	19.37	154	124	Horizontal
5	14502.92	57.08	74.00	16.92	137	258	Horizontal
6	17501.02	45.82	54.00	8.18	122	344	Horizontal



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Mode:f; Polarization:Vertical



Suspected List

Suspected List							
NO.	Freq. [MHz]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2485.024	39.44	74.00	34.56	276	84	Vertical
2	2499.475	28.83	54.00	25.17	268	106	Vertical
3	8969.998	52.20	74.00	21.80	160	214	Vertical
4	12405.87	44.20	54.00	9.80	256	257	Vertical
5	14188.40	57.11	74.00	16.89	153	16	Vertical
6	17454.27	45.44	54.00	8.56	240	214	Vertical



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3 Equipment List

CE Test System					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Shielding Room	Brilliant-emc	N/A	XAW03-35-01	2019-09-11	2022-09-10
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	2020-04-02	2021-04-01
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2020-09-11	2021-09-10
Artificial network	ROHDE&SCHWARZ	ENV216	XAW01-04-01	2020-08-04	2021-08-03
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2020-11-06	2021-11-05
Measurement Software	Tonscend	TS+ CE V2.5	XAW02-05-02	NCR	NCR

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



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4 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Conduction Emission	± 3.0dB (150kHz to 30MHz)
2	Radiated Emission	± 4.8dB (Below 1GHz)
		± 4.8dB (1GHz to 6GHz)
		± 4.5dB (6GHz to 18GHz)
		± 5.02dB (Above 18GHz)



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5 Photographs

5.1 Test Setup

Refer to Appendix A JBP Setup Photos for ZR/2020/B0030

5.2 EUT Constructional Details (EUT Photos)

Refer to Photographs of EUT Constructional Details

- End of the Report -

