

Report No.: ZR/2020/9003705-01
Page: 1 of 23

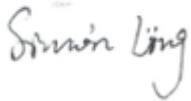
TEST REPORT

Application No: ZR/2020/90037
Applicant: HMD Global Oy
Address of Applicant: Bertel Jungin aukio 9, 02600 Espoo, Finland
Manufacturer: HMD Global Oy
Address of Manufacturer: Bertel Jungin aukio 9, 02600 Espoo, Finland
EUT Description: Mobile Phone
Model No.: TA-1333
Trade Mark: NOKIA
FCC ID: 2AJOTTA-1333
Standard(s) : 47 CFR Part 15, Subpart B
Date of Receipt: 2020/9/21
Date of Test: 2020/9/21 to 2020/10/12
Date of Issue: 2021/8/14

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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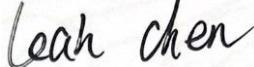
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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2020/10/20		Original
02		2021/1/6	Daniel Wang	Revising text error
03		2021/5/27	Leah Chen	1. Modify data conversion error of antenna height 2. Update equipment list
04		2021/8/14	Leah Chen	1. Update Support Units, Test facility and Test Location

*This report supersedes our previous report ZR/2020/9003705, issued on 2020/10/20, 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:	Mobile Phone		
Model No.(EUT):	TA-1333		
Trade Mark:	NOKIA		
Hardware Version:	MB_V3		
Software Version:	00WW-A01		
Frequency Bands:	Band	Tx (MHz)	Rx (MHz)
	GSM850	824~849	869~894
	GSM1900	1850~1910	1930~1990
	WCDMA Band II	1850~1910	1930~1990
	WCDMA Band IV	1710~1755	2110~2155
	WCDMA Band V	824~849	869~894
	LTE Band 2	1850~1910	1930~1990
	LTE Band 4	1710~1755	2110~2155
	LTE Band 5	824~849	869~894
	LTE Band 7	2500~2570	2620~2690
	LTE Band 12	699~716	729~746
	LTE Band 13	777~787	746~756
	LTE Band 17	704~716	734~746
	LTE Band 66	1710~1780	2110~2200
	Wi-Fi 2.4G	2412~2462	2412~2462
	Bluetooth	2402~2480	2402~2480

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Accessory:

Battery			
Battery1	Veken	HQ430	3.85V; 4000mAh
Battery2	FENGHUA	HQ430	3.85V; 4000mAh
USB Cable			
USB Cable1	Liqi	L55B-051000100	1.0m non-shielded cable without core
USB Cable2	Saibao	SHQ-A069A	1.0m non-shielded cable without core
Adapter			
Adapter1	TIANYIN	CH-21X	I/P: 100-240 Vac, 300mA ,50/60HZ O/P: 5Vdc 2000mA
Adapter2	TIANYIN	CH-21E	I/P: 100-240 Vac, 300mA ,50/60HZ O/P: 5Vdc 2000mA
Adapter3	TIANYIN	CH-21U	I/P: 100-240 Vac, 300mA ,50/60HZ O/P: 5Vdc 2000mA
Adapter4	TIANYIN	CH-21A	I/P: 100-240 Vac, 300mA ,50/60HZ O/P: 5Vdc 2000mA
Adapter5	TIANYIN	CH-21B	I/P: 100-240 Vac, 300mA ,50/60HZ O/P: 5Vdc 2000mA
earphone			
Earphone1	NEW Leader	NLD-EM300M-07SF	1.2 meter, non-shielded cable, with w/o ferrite core

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1.1 Description of Support Units

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

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(μ V)-56dB(μ V) quasi-peak, 56dB(μ V)-46dB(μ V) average

0.5M-5MHz 56dB(μV) quasi-peak, 46dB(μV) average

5M-30MHz 60dB(μ V) quasi-peak, 50dB(μ V) 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 a: Transfer data between the EUT and the PC+USB cable1

b: Transfer data between the EUT and the PC+USB cable2

the worst case: c: GSM 850 Idle+BT+WLAN +GPS Rx+playing MP4 (SD card)+earphone1+battery1+Cable(worst)+adapter1

d: WCDMA Band V Idle+BT+WLAN +GPS Rx+playing MP4 (SD card)+earphone(worst)+battery2+Cable(worst)+adapter2

e: LTE Band 5 Idle+BT+WLAN +GPS Rx+camera (Front)+earphone(worst)+battery(worst)+ Cable(worst)+adapter3

f: LTE Band 12 Idle+BT+WLAN +GPS Rx+camera (Front)+earphone(worst)+battery(worst)+ Cable(worst)+adapter4

g: LTE Band 13 Idle+BT+WLAN +GPS Rx+camera (Front)+earphone(worst)+battery(worst)+ Cable(worst)+adapter5

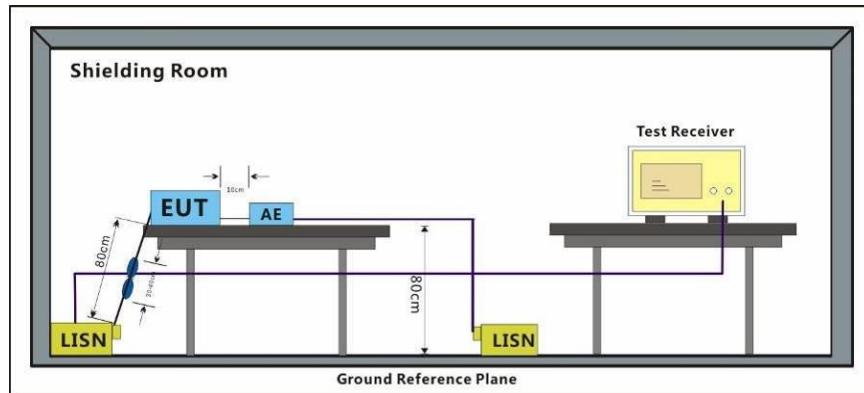
h: LTE Band 17 Idle+BT+WLAN +GPS Rx+camera (Front+earphone(worst)+battery(worst)+ Cable(worst)+adapter(

The worst case for final test: e: LTE Band 5 Idle+BT+WLAN +GPS Rx+camera (Front) +earphone(worst)+battery(worst)+ Cable(worst)+adapter3

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2.1.2 Test Setup Diagram



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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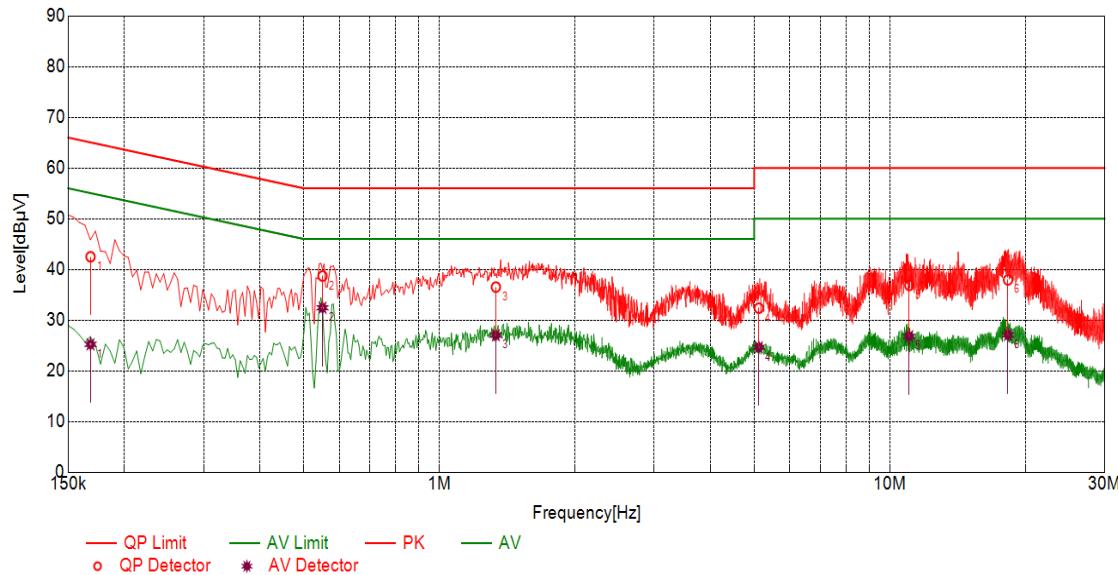


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**Test Graph**

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	0.1682	10.10	42.50	65.05	22.55	25.21	55.05	29.84	L
2	0.5506	10.10	38.70	56.00	17.30	32.44	46.00	13.56	L
3	1.3353	10.10	36.52	56.00	19.48	27.01	46.00	18.99	L
4	5.1182	10.10	32.36	60.00	27.64	24.63	50.00	25.37	L
5	11.0449	10.10	36.85	60.00	23.15	26.82	50.00	23.18	L
6	18.2896	10.11	37.95	60.00	22.05	27.08	50.00	22.92	L

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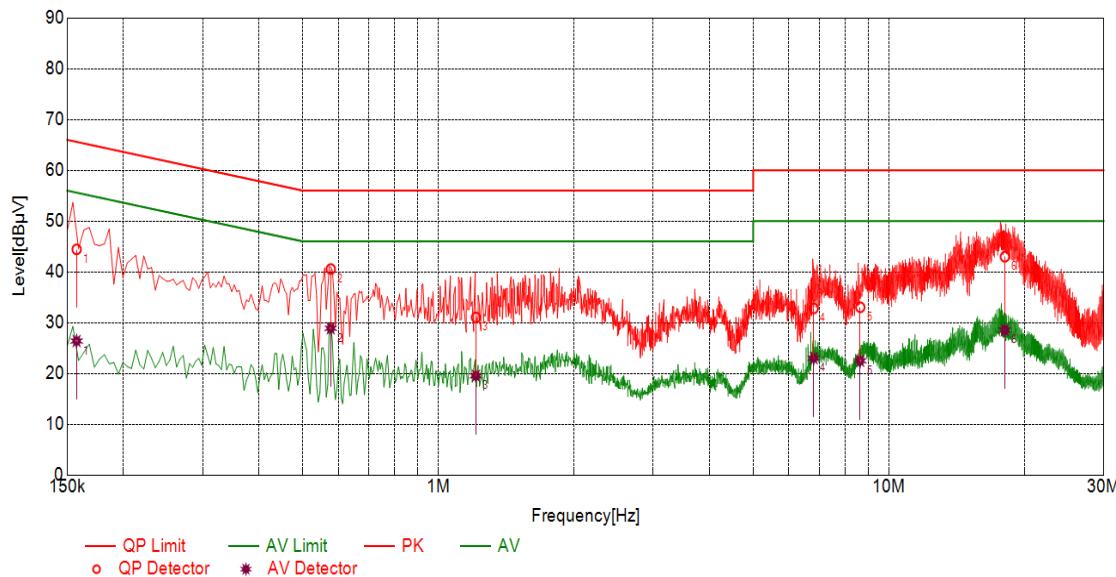
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Mode:e; Line:Neutral Line

**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	0.1575	10.10	44.43	65.59	21.16	26.39	55.59	29.20	N
2	0.5771	10.10	40.56	56.00	15.44	28.89	46.00	17.11	N
3	1.2120	10.10	31.04	56.00	24.96	19.54	46.00	26.46	N
4	6.8123	10.10	32.82	60.00	27.18	23.01	50.00	26.99	N
5	8.6398	10.10	33.03	60.00	26.97	22.49	50.00	27.51	N
6	18.0858	10.11	42.98	60.00	17.02	28.53	50.00	21.47	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(dB μ V/m) quasi-peak

88MHz-216MHz 43.5(dB μ V/m) quasi-peak

216MHz-960MHz 46.0(dB μ V/m) quasi-peak

960MHz-1000MHz 54.0(dB μ V/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:

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+WLAN +GPS Rx+playing MP4 (SD card) +earphone1+battery1+Cable(worst)+adapter1

d: WCDMA Band V Idle+BT+WLAN +GPS Rx+playing MP4 (SD card) +earphone(worst)+battery2+ Cable(worst)+adapter2

e: LTE Band 5 Idle+BT+WLAN +GPS Rx+camera (Front) +earphone(worst)+battery(worst)+ Cable(worst)+adapter3

f: LTE Band 12 Idle+BT+WLAN +GPS Rx+camera (Front) +earphone(worst)+battery(worst)+ Cable(worst)+adapter4

g: LTE Band 13 Idle+BT+WLAN +GPS Rx+camera (Front) +earphone(worst)+battery(worst)+ Cable(worst)+adapter5

h: LTE Band 17 Idle+BT+WLAN +GPS Rx+camera (Front) +earphone(worst)+battery(worst)+ Cable(worst)+adapter(worst)

The worst case for final test: b: Transfer data between the EUT and the PC+USB cable2

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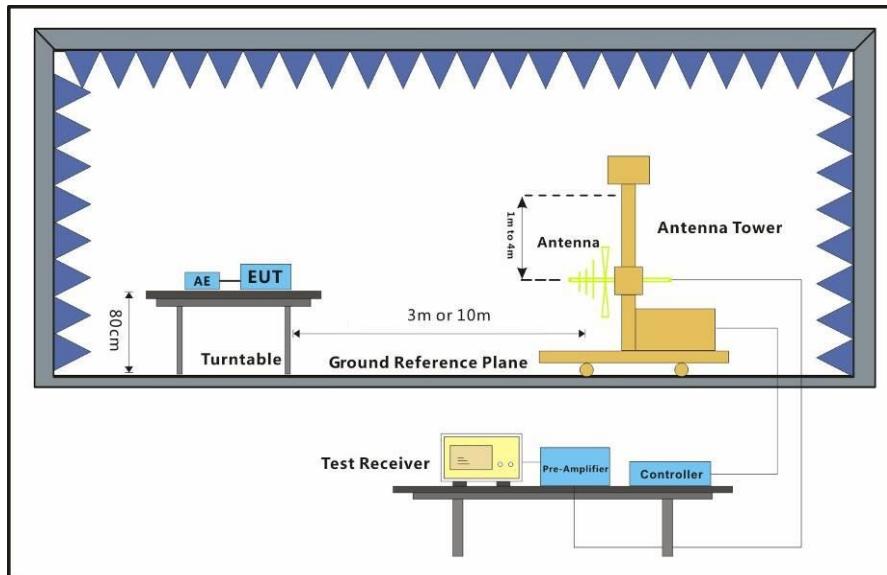


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2.2.2 Test Setup Diagram



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. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.

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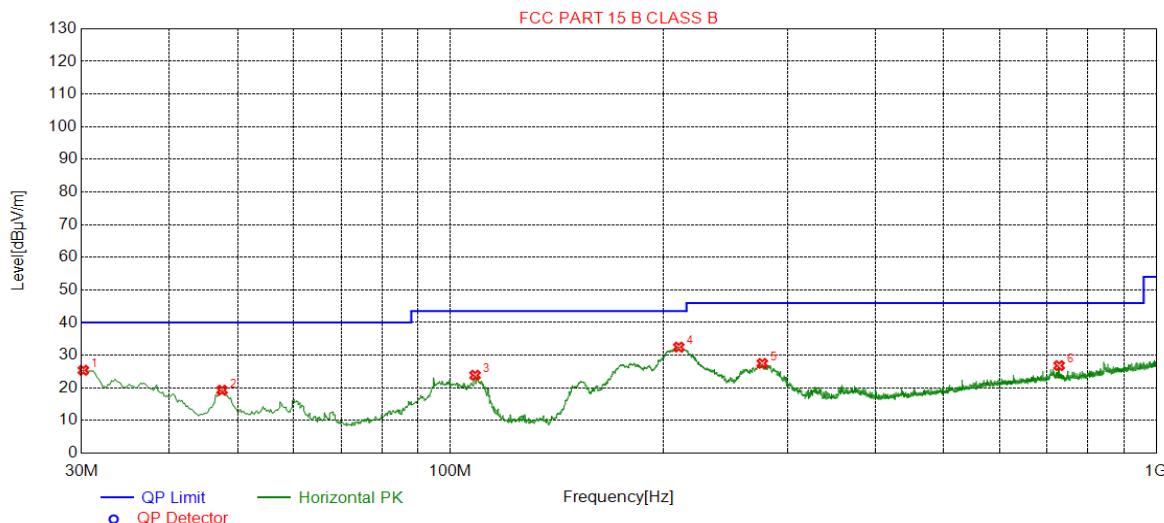


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Mode:b; Polarization:Horizontal

**Suspected List**

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	30.1940	25.40	-30.08	40.00	14.60	219	291	Horizontal
2	47.4635	19.29	-30.40	40.00	20.71	227	263	Horizontal
3	108.391	23.89	-32.00	43.50	19.61	145	257	Horizontal
4	210.650	32.51	-30.96	43.50	10.99	126	226	Horizontal
5	276.623	27.51	-29.05	46.00	18.49	243	66	Horizontal
6	728.539	26.83	-18.84	46.00	19.17	205	215	Horizontal

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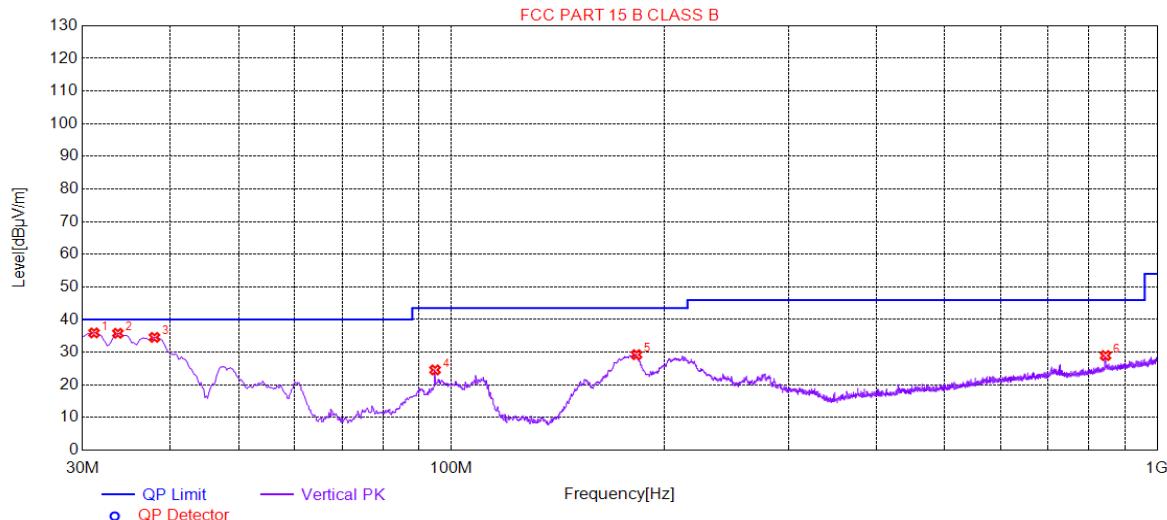
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Mode:b; Polarization:Vertical

**Suspected List**

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	31.1642	35.93	-30.05	40.00	4.07	260	14	Vertical
2	33.6867	35.81	-29.99	40.00	4.19	202	14	Vertical
3	37.9556	34.56	-29.00	40.00	5.44	169	311	Vertical
4	94.8090	24.59	-32.92	43.50	18.91	209	83	Vertical
5	182.902	29.25	-32.99	43.50	14.25	278	360	Vertical
6	844.963	28.98	-16.97	46.00	17.02	296	300	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(dB μ V/m) peak, 54(dB μ V/m) average

Detector: Peak for pre-scan (1000kHz resolution bandwidth) 1000M to 18000MHz

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+WLAN +GPS Rx+playing MP4 (SD card) +earphone1+battery1+Cable(worst)+adapter1

d: WCDMA Band V Idle+BT+WLAN +GPS Rx+playing MP4 (SD card) +earphone(worst)+battery2+Cable(worst)+adapter2

e: LTE Band 5 Idle+BT+WLAN +GPS Rx+camera (Front) +earphone(worst)+battery(worst)+Cable(worst)+adapter3

f: LTE Band 12 Idle+BT+WLAN +GPS Rx+camera (Front) +earphone(worst)+battery(worst)+Cable(worst)+adapter4

g: LTE Band 13 Idle+BT+WLAN +GPS Rx+camera (Front) +earphone(worst)+battery(worst)+Cable(worst)+adapter5

h: LTE Band 17 Idle+BT+WLAN +GPS Rx+camera (Front) +earphone(worst)+battery(worst)+Cable(worst)+adapter(worst)

The worst case for final test: f: LTE Band 12 Idle+BT+WLAN +GPS Rx+camera (Front) +earphone(worst)+battery(worst)+Cable(worst)+adapter4

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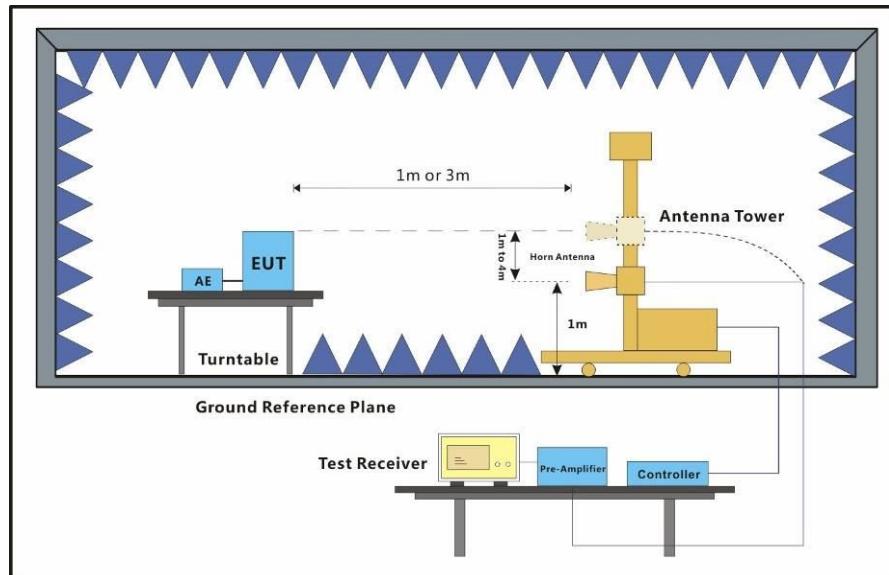


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2.3.2 Test Setup Diagram



2.3.3 Measurement Data

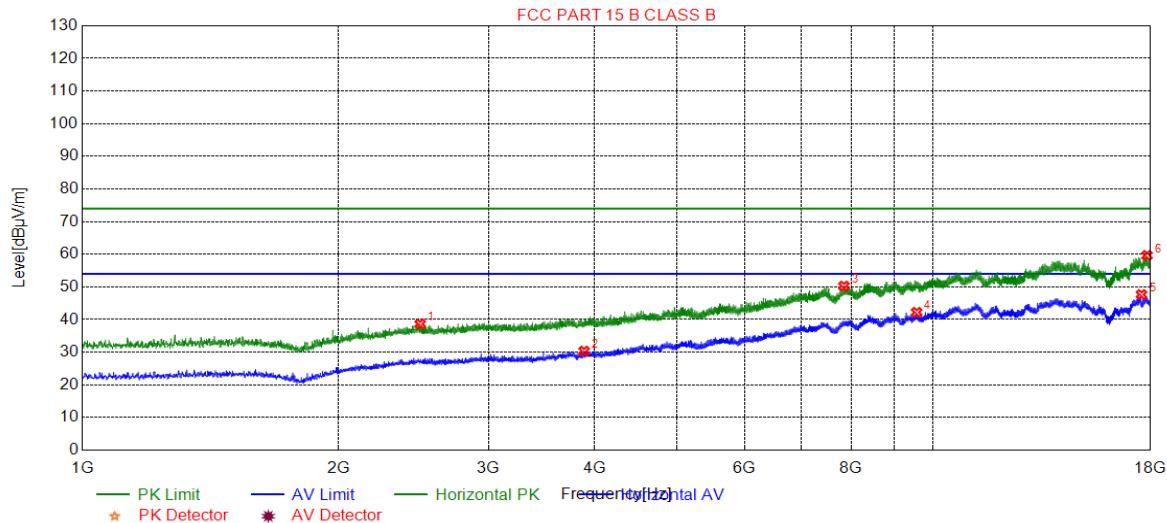
An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Average measurements were conducted based on the peak sweep graph. The EUT was measured by Horn antenna with 2 orthogonal polarities.

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Mode:f; Polarization:Horizontal

**Suspected List**

Suspected List								
NO.	Freq. [MHz]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2494.37	38.66	-25.89	74.00	35.34	121	319	Horizontal
2	3886.74	30.36	-22.00	54.00	23.64	156	4	Horizontal
3	7850.49	50.27	-8.63	74.00	23.73	101	243	Horizontal
4	9557.37	42.24	-5.56	54.00	11.76	147	193	Horizontal
5	17559.6	47.69	1.27	54.00	6.31	237	344	Horizontal
6	17825.7	59.67	0.54	74.00	14.33	156	307	Horizontal

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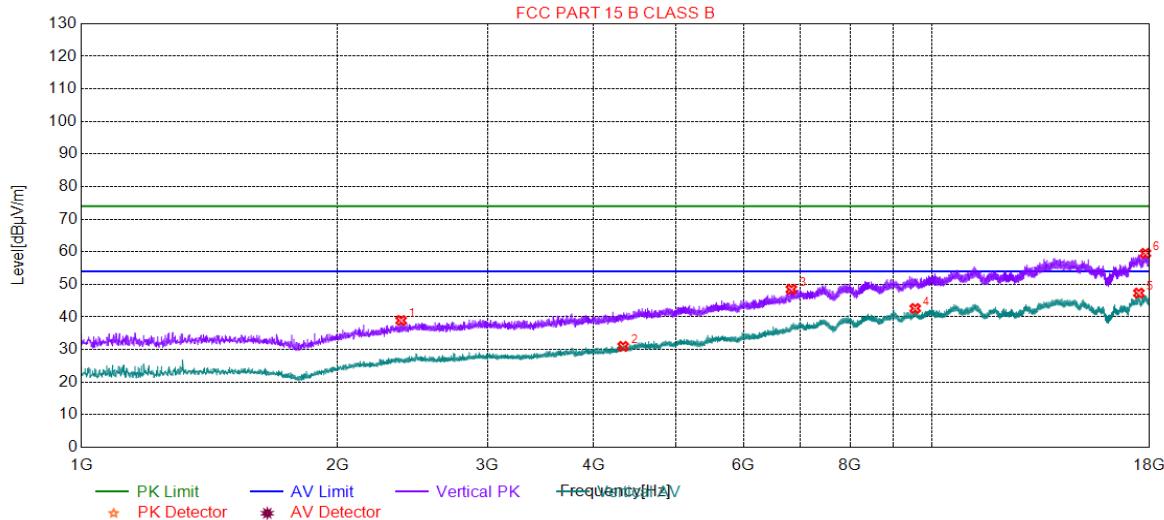
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Mode:f; Polarization:Vertical

**Suspected List**

Suspected List								
NO.	Freq. [MHz]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2375.36	38.94	-26.58	74.00	35.06	236	243	Vertical
2	4331.31	30.98	-20.16	54.00	23.02	267	344	Vertical
3	6827.89	48.50	-11.75	74.00	25.50	244	306	Vertical
4	9546.32	42.63	-5.56	54.00	11.37	159	268	Vertical
5	17482.3	47.34	1.42	54.00	6.66	154	230	Vertical
6	17798.5	59.54	0.69	74.00	14.46	247	205	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
5G UXM	Keysight	E7515B	XAW01-19-02	2020-09-11	2021-09-10
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2019-12-06	2020-12-05
Measurement Software	Tonscend	TS+ CE V2.5	XAW02-05-02	NCR	NCR

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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	2019-11-18	2020-11-17
Amplifier	Tonscend	TAP01018048	XAW01-41-02	2019-11-18	2020-11-17
Amplifier	Tonscend	TAP18040048	XAW01-41-03	2019-12-03	2020-12-02
Amplifier	Shanghai Steed	YX28980930	XAW01-41-06	2019-11-18	2020-11-17
5G UXM	Keysight	E7515B	XAW01-04-01	2020-09-11	2021-09-10
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2019-12-06	2020-12-05
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 - Photographs of Set-Up for ZR/2020/90037

5.2 EUT Constructional Details (EUT Photos)

Refer to Photographs of EUT Constructional Details

- End of the Report -

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