

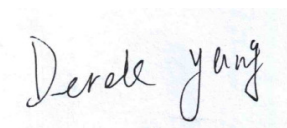
## **TEST REPORT**

**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:** 2020/10/20

<b>Test Result:</b>	<b>Pass*</b>
---------------------	--------------

\* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Derek Yang

Wireless Laboratory Manager

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

Report No.: ZR/2020/9003705  
Page: 2 of 22

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2020/10/20		Original

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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

Checked By

*David Chen*

David Chen  
Reviewer

Test By

*Daniel Wang*

Daniel Wang  
Project Engineer

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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	2412~2472	2412~2472
	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	L55B-051000100	1.0m non-shielded cable without core
Adapter			
Adapter1	TIANYIN	CH-51N	I/P: 100-240 Vac, 200mA ,50/60HZ O/P: 5Vdc 1000mA
Adapter2	TIANYIN	CH-51E	I/P: 100-240 Vac, 200mA ,50/60HZ O/P: 5Vdc 1000mA
Adapter3	TIANYIN	CH-51A	I/P: 100-240 Vac, 200mA ,50/60HZ O/P: 5Vdc 1000mA
Adapter4	TIANYIN	CH-51U	I/P: 100-240 Vac, 200mA ,50/60HZ O/P: 5Vdc 1000mA
Adapter5	TIANYIN	CH-51X	I/P: 100-240 Vac, 200mA ,50/60HZ O/P: 5Vdc 1000mA
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.
Laptop	Lenovo	T430u	REF. No.SEA1800
Mouse	Lenovo	M-U0025-O	REF. No.:SEA2400
Router	NETGEAR	DGN2200	REF. No.SEA2200

## 1.2 Test Location

All tests were performed at:

Company:	SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD.
Address:	Single floor D, building 1, Kanghong orange square science and technology park, No.137 keyuan 3rd road, fengdong new town, Xi 'an city, Shaanxi China
Post code:	710000
Telephone:	+86 (0) 29 6282 7885
Fax:	+86 (0) 29 6282 7885
E-mail:	ee.xian@sgs.com

No tests were sub-contracted.

## 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.

Test Site No.:	SGS Xian Site No.		FCC Designation No.
	CO01-XA	03CH01-XA	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+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:

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

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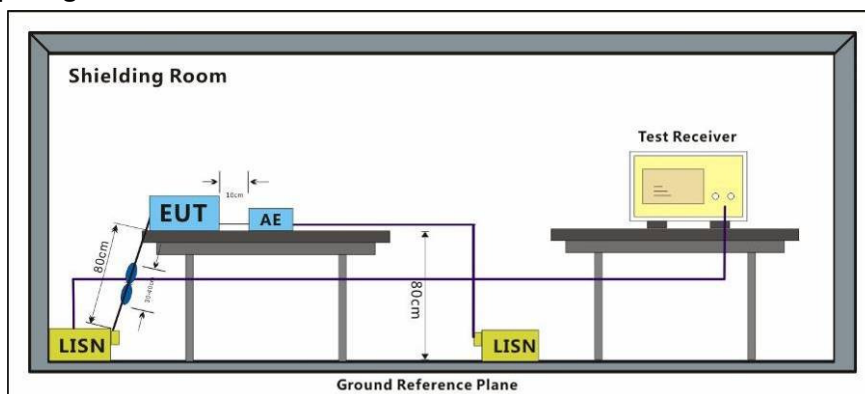
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## 2.1.2 Test Setup Diagram



## 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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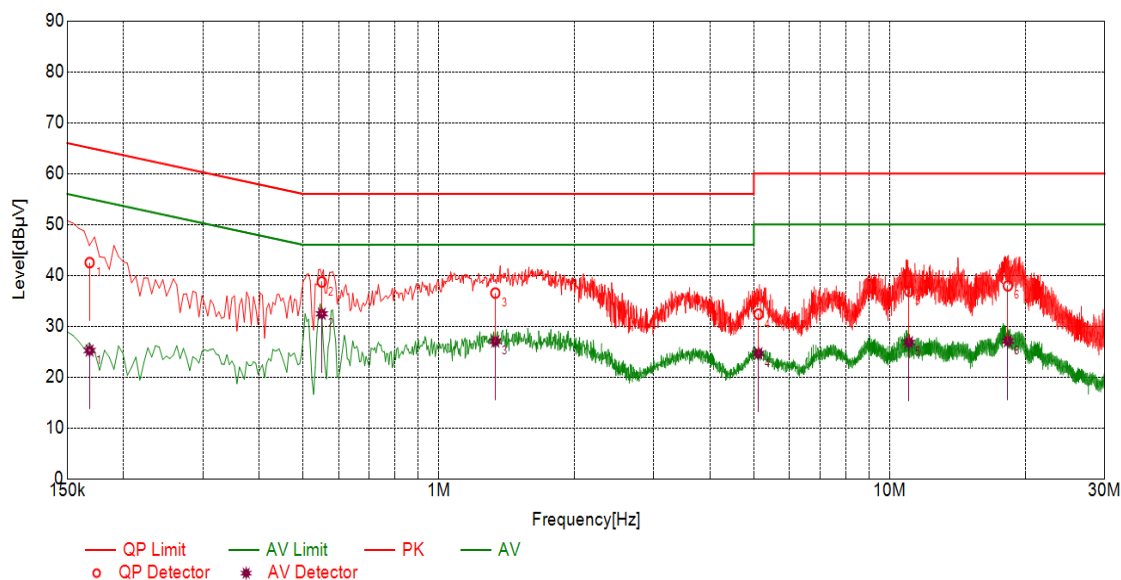
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Mode:e; Line:Live Line



## Test Graph

## Final Data List

NO.	Freq. [MHz]	Factor [dB]	QP Value [dB-μV]	QP Limit [dB-μV]	QP Margin [dB]	AV Value [dB-μV]	AV Limit [dB-μV]	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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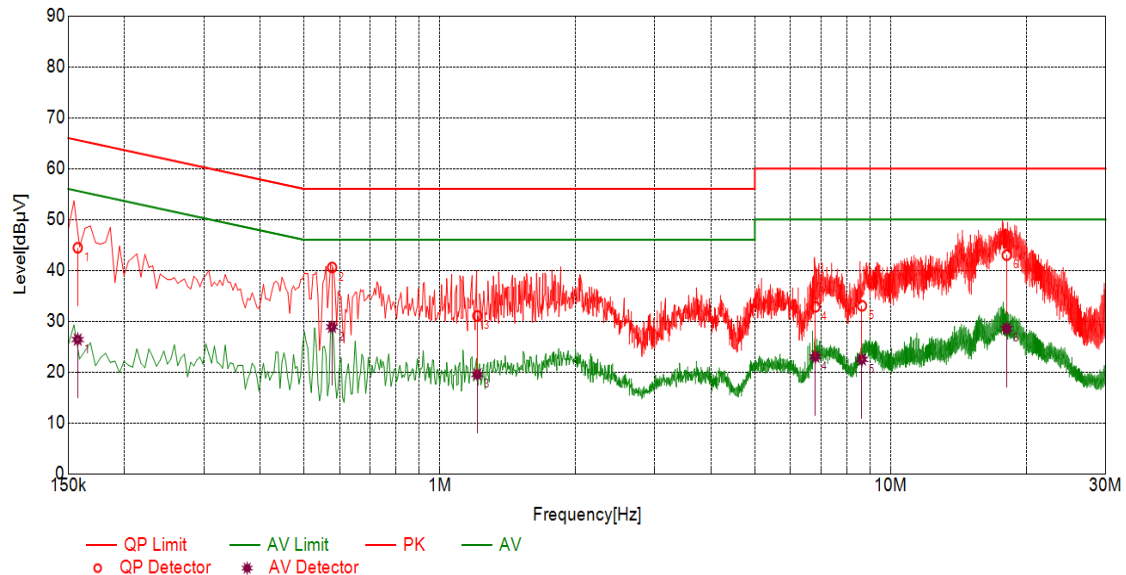
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Mode:e; Line:Neutral Line



## 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(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

### 2.1.4 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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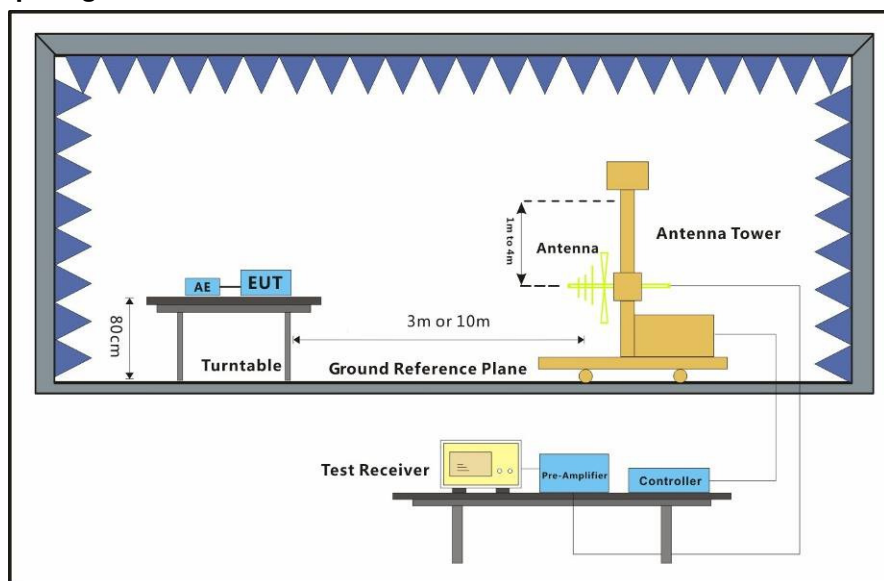
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### 2.1.5 Test Setup Diagram



### 2.1.6 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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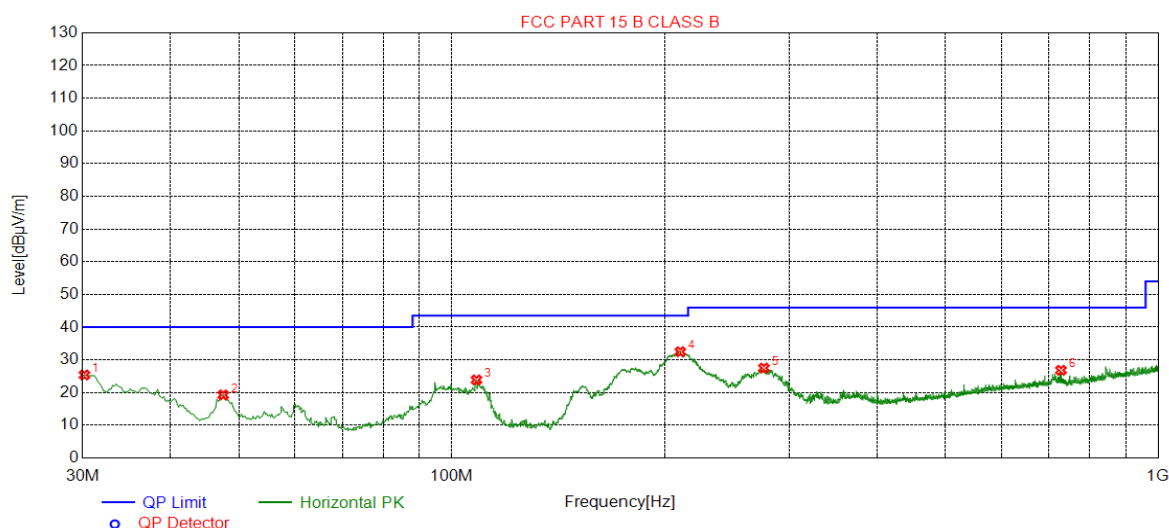
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Mode:b; Polarization:Horizontal

**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	200	291	Horizontal
2	47.4635	19.29	-30.40	40.00	20.71	200	263	Horizontal
3	108.391	23.89	-32.00	43.50	19.61	200	257	Horizontal
4	210.650	32.51	-30.96	43.50	10.99	100	226	Horizontal
5	276.623	27.51	-29.05	46.00	18.49	100	66	Horizontal
6	728.539	26.83	-18.84	46.00	19.17	200	215	Horizontal

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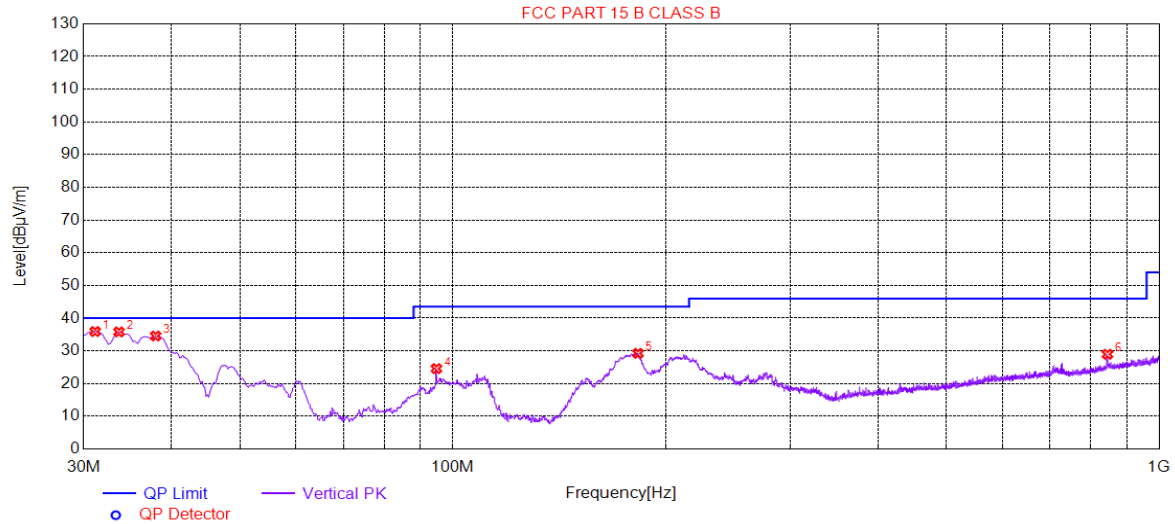
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Mode:b; Polarization:Vertical



## 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	100	14	Vertical
2	33.6867	35.81	-29.99	40.00	4.19	100	14	Vertical
3	37.9556	34.56	-29.00	40.00	5.44	100	311	Vertical
4	94.8090	24.59	-32.92	43.50	18.91	100	83	Vertical
5	182.902	29.25	-32.99	43.50	14.25	100	360	Vertical
6	844.963	28.98	-16.97	46.00	17.02	200	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(dBμV/m) peak, 54(dBμV/m) average  
Detector: Peak for pre-scan (1000kHz resolution bandwidth) 1000M to 18000MHz

### 2.1.7 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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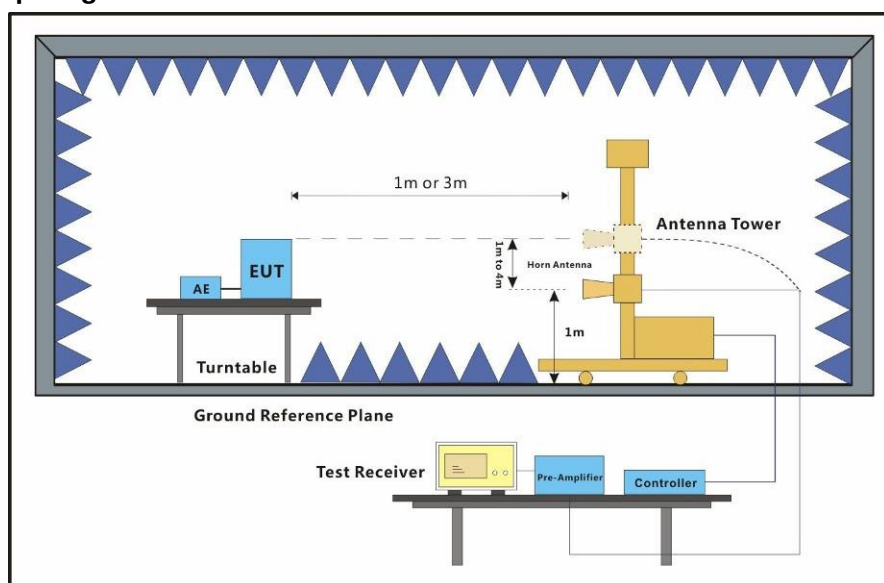
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### 2.1.8 Test Setup Diagram



### 2.1.9 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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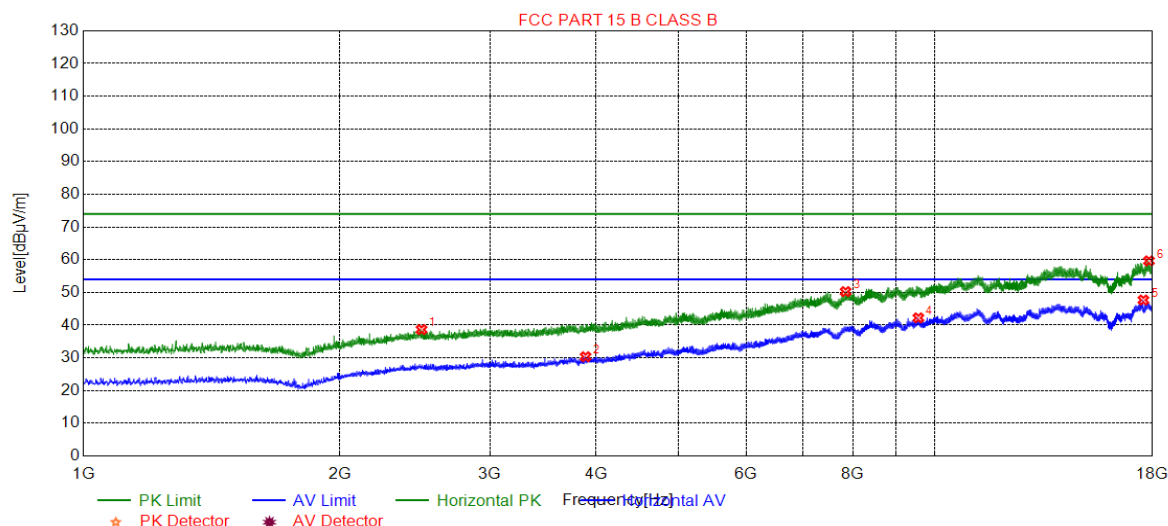
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Mode:f; Polarization:Horizontal



## Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2494.37	38.66	-25.89	74.00	35.34	100	319	Horizontal
2	3886.74	30.36	-22.00	54.00	23.64	200	4	Horizontal
3	7850.49	50.27	-8.63	74.00	23.73	100	243	Horizontal
4	9557.37	42.24	-5.56	54.00	11.76	200	193	Horizontal
5	17559.6	47.69	1.27	54.00	6.31	200	344	Horizontal
6	17825.7	59.67	0.54	74.00	14.33	200	307	Horizontal

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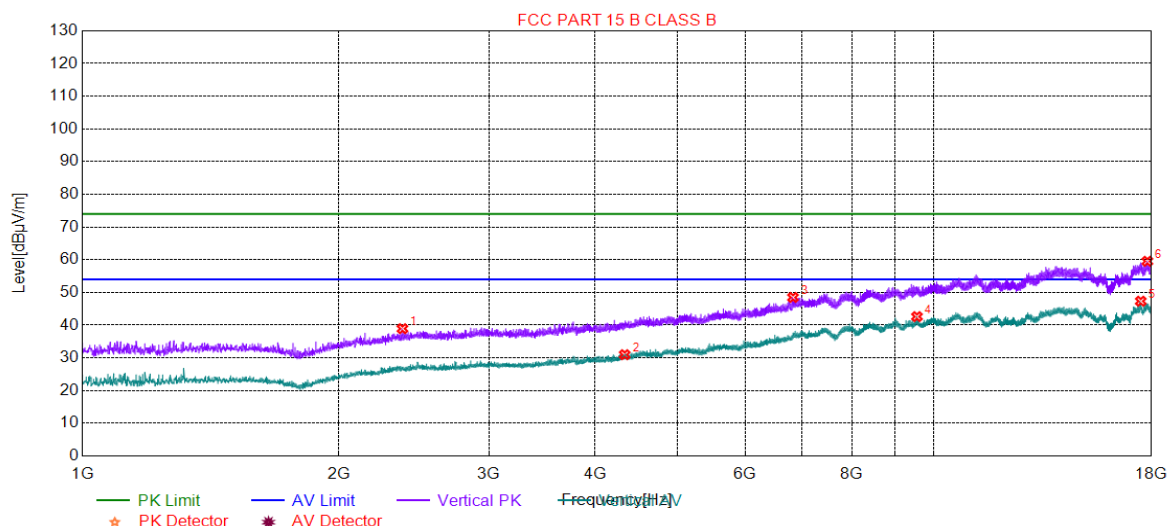
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Mode:f; Polarization:Vertical



## Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2375.36	38.94	-26.58	74.00	35.06	100	243	Vertical
2	4331.31	30.98	-20.16	54.00	23.02	200	344	Vertical
3	6827.89	48.50	-11.75	74.00	25.50	200	306	Vertical
4	9546.32	42.63	-5.56	54.00	11.37	200	268	Vertical
5	17482.3	47.34	1.42	54.00	6.66	200	230	Vertical
6	17798.5	59.54	0.69	74.00	14.46	100	205	Vertical

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### 3 Equipment List

Chamber					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date	Cal.Due date
				(yyyy-mm-dd)	(yyyy-mm-dd)
Semi-Anechoic Chamber	Brilliant-emc	966	XAW03-35-01	NCR	NCR
MXA signal analyzer	Keysight	N9020A	XAW01-06-01	2020/4/2	2021/4/2
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	2020/4/2	2021/4/2
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2020/9/7	2021/9/6
Receiving antenna	Rosenberger	VULB 9163	XAW01-09-01	2019/10/13	2021/10/12
Receiving antenna	Rosenberger	BBHA 9120D	XAW01-09-02	2019/10/13	2021/10/12
Receiving antenna	Rosenberger	BBHA 9170	XAW01-09-03	2019/10/13	2021/10/12
Directional antenna rack controller	Max-Full	MF-7802BS	XAW03-03-01	NCR	NCR
High-speed antenna rack controller	Max-Full	MF-7802	XAW03-04-01	NCR	NCR
Filter bank	Tonscend	JS0806-F	XAW03-05-01	NCR	NCR
Filter bank	Tonscend	JS0806s	XAW03-05-02	NCR	NCR
Amplifier	Tonscend	TAP00903040	XAW01-41-01	2019/11/18	2020/11/18
Amplifier	Tonscend	TAP01018048	XAW01-41-02	2019/11/18	2020/11/18
Amplifier	Tonscend	TAP18040048	XAW01-41-03	2019/12/3	2020/12/3
Amplifier	Brilliant-emc	YX28980930	XAW01-41-06	2019/11/18	2020/11/18
Artificial network	ROHDE&SCHWARZ	ENV216	XAW01-19-02	2020/9/16	2021/9/15

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## 4 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Conduction Emission	$\pm 3.4\text{dB}$ (150kHz to 30MHz)
2	Radiated Emission	$\pm 4.8\text{dB}$ (30MHz-1GHz)
		$\pm 5.2\text{dB}$ (1GHz-6GHz)
		$\pm 5.5\text{dB}$ (6GHz-18GHz)
		$\pm 5.02\text{dB}$ (18GHz-40GHz)

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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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