TEST REPORT

Application No:	ZR/2020/90041
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-1337
Trade Mark:	NOKIA
FCC ID:	2AJOTTA-1337
Standard(s) :	47 CFR Part 15, Subpart B
Date of Receipt:	2020/9/21
Date of Test:	2020/9/21 to 2020/10/15
Date of Issue:	2020/10/15
Test Result:	**Pass***

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

Authorized Signature:

Derek Yang

Derek Yang
Wireless Laboratory Manager

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Revision Record				
Version	***Chapter***	***Date***	***Modifier***	***Remark***
01		2020/10/15		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
Project Engineer

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1 General Information

Product Name:	Mobile Phone		
Model No.(EUT):	TA-1337		
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 V	824~849	869~894
	LTE Band 5	824~849	869~894
	LTE Band 7	2500~2570	2620~2690
	LTE Band 38	2570~2620	2570~2620
	LTE Band 41	2535~2655	2535~2655
	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	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
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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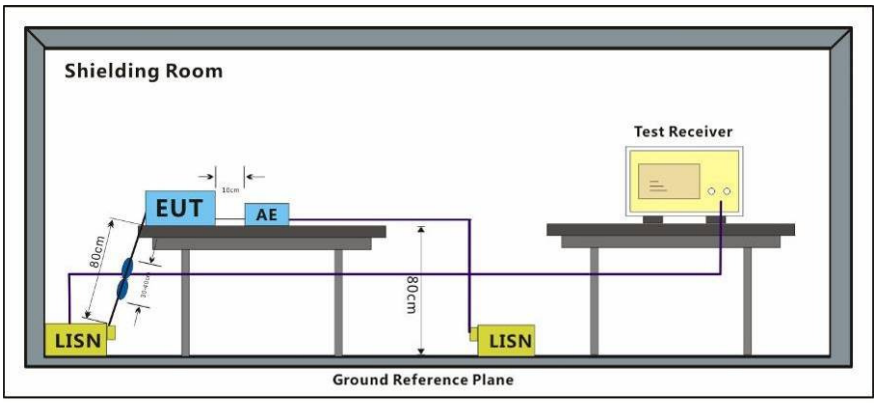
2.1.2 Test Setup Diagram



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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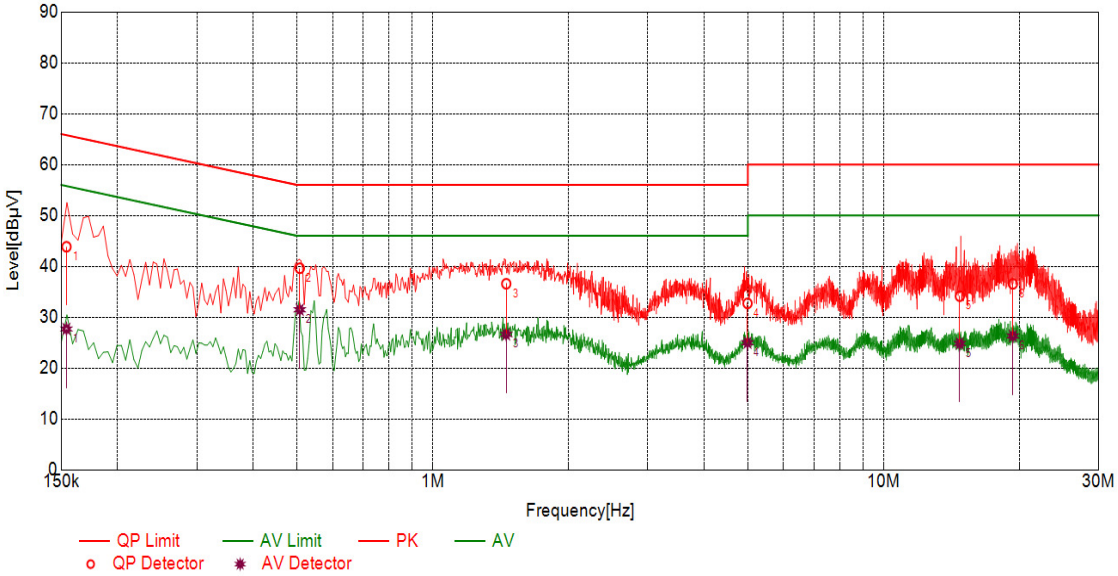

Final Data List

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	0.1541	10.10	43.85	65.78	21.93	27.69	55.78	28.09	L
2	0.5072	10.10	39.63	56.00	16.37	31.46	46.00	14.54	L
3	1.4556	10.10	36.58	56.00	19.42	26.62	46.00	19.38	L
4	4.9914	10.10	32.72	56.00	23.28	24.98	46.00	21.02	L
5	14.7550	10.11	34.14	60.00	25.86	24.83	50.00	25.17	L
6	19.3493	10.11	36.56	60.00	23.44	26.31	50.00	23.69	L

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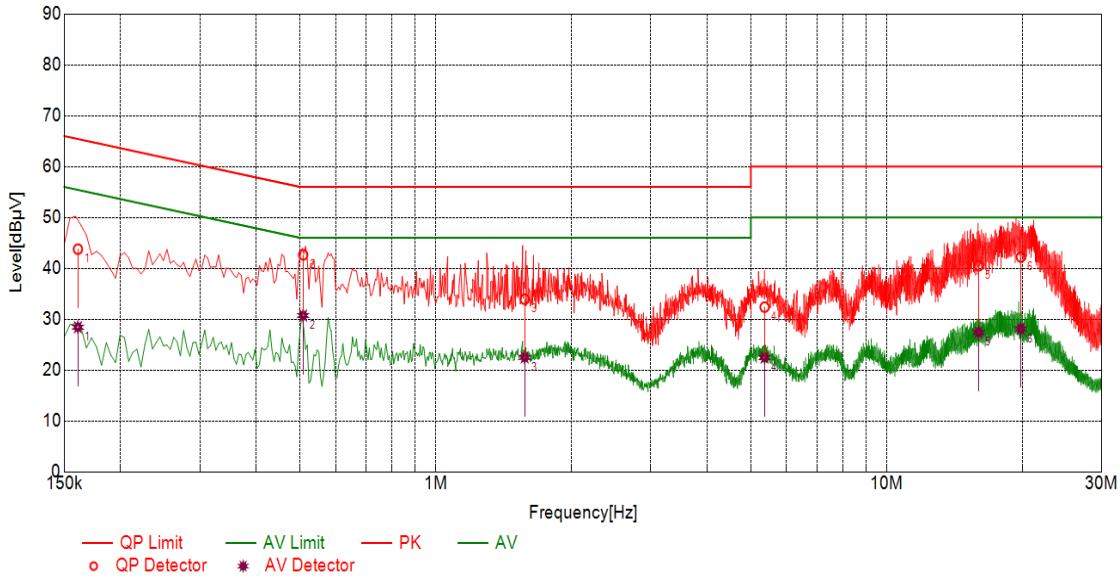

Final Data List

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	0.1609	10.10	43.77	65.42	21.65	28.42	55.42	27.00	N
2	0.5082	10.10	42.65	56.00	13.35	30.72	46.00	15.28	N
3	1.5752	10.10	33.93	56.00	22.07	22.49	46.00	23.51	N
4	5.3632	10.10	32.38	60.00	27.62	22.46	50.00	27.54	N
5	16.0032	10.11	40.50	60.00	19.50	27.41	50.00	22.59	N
6	19.8428	10.11	42.22	60.00	17.78	28.10	50.00	21.90	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

The worst case for final test: a: Transfer data between the EUT and the PC+USB cable1

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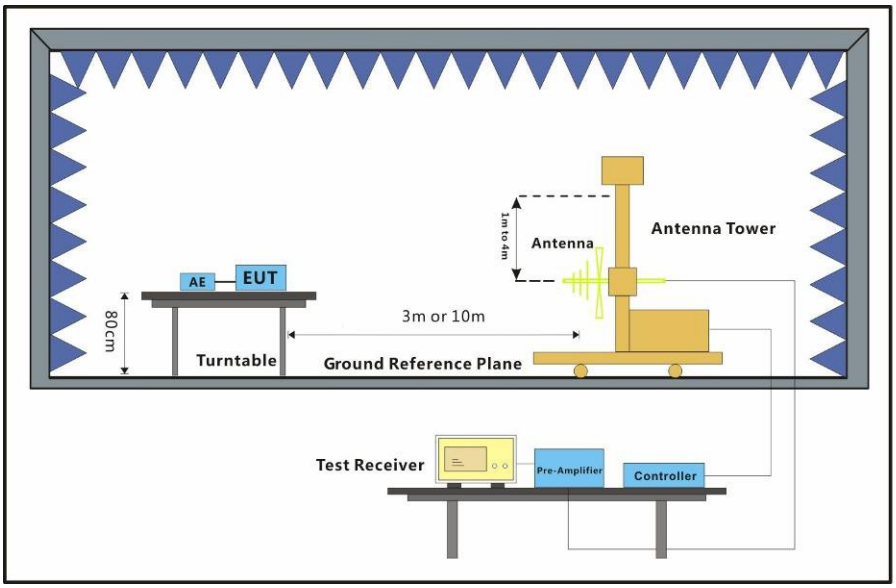
2.1.5 Test Setup Diagram



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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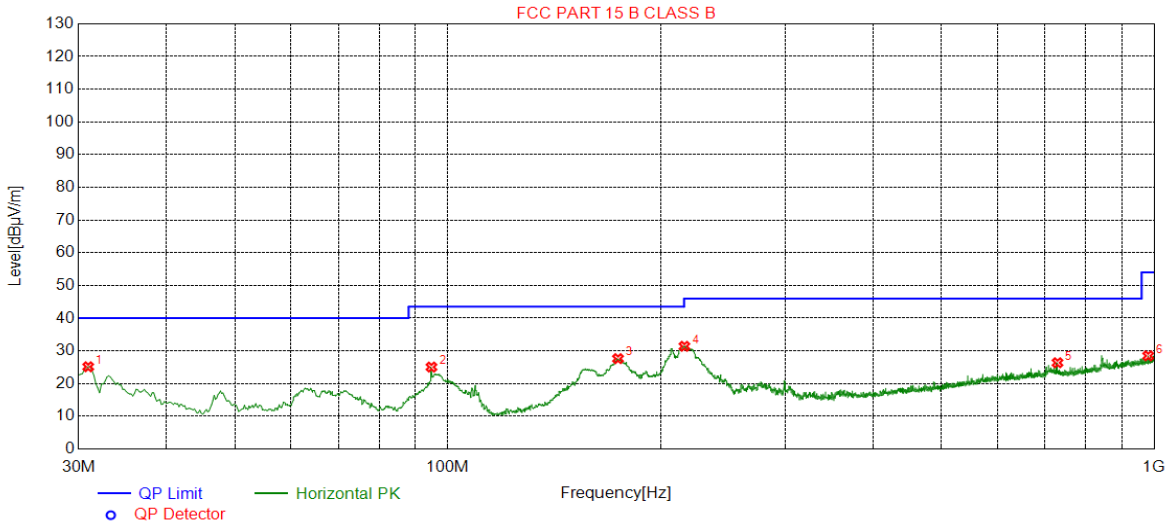
Mode:a; Polarization:Horizontal



Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	30.9702	25.15	-30.06	40.00	14.85	200	298	Horizontal
2	94.8090	25.06	-32.92	43.50	18.44	200	234	Horizontal
3	174.170	27.64	-33.73	43.50	15.86	200	208	Horizontal
4	216.277	31.41	-30.81	46.00	14.59	100	326	Horizontal
5	729.703	26.38	-18.81	46.00	19.62	100	300	Horizontal
6	980.790	28.49	-15.06	54.00	25.51	100	314	Horizontal

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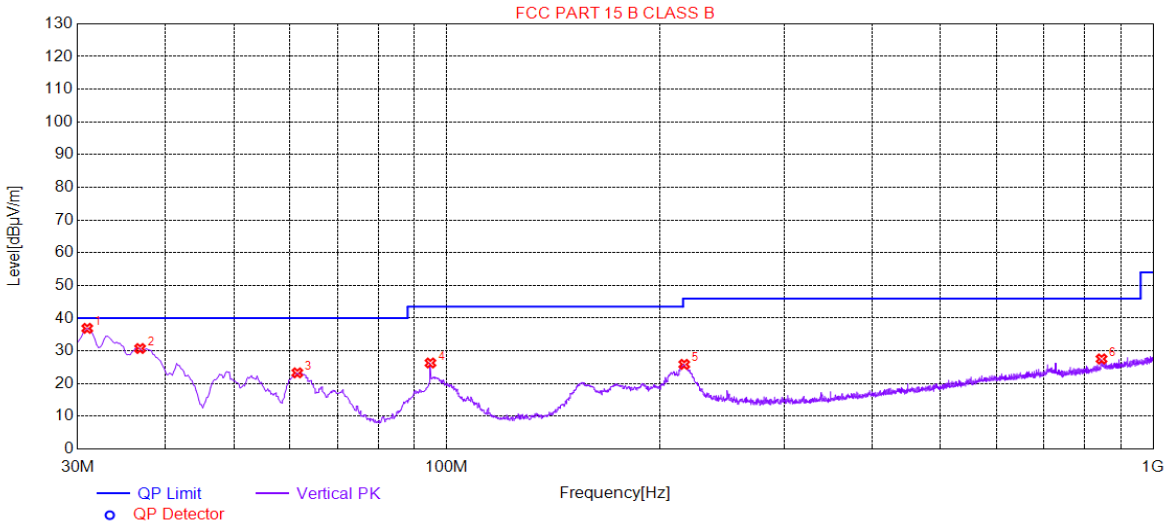
Mode:a; Polarization:Vertical



Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	30.9702	36.90	-30.06	40.00	3.10	100	346	Vertical
2	36.7914	30.74	-29.38	40.00	9.26	100	346	Vertical
3	61.4343	23.30	-32.23	40.00	16.70	100	250	Vertical
4	94.8090	26.31	-32.92	43.50	17.19	100	85	Vertical
5	216.859	25.89	-30.79	46.00	20.11	100	99	Vertical
6	845.157	27.54	-16.97	46.00	18.46	100	85	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 to18000MHz

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

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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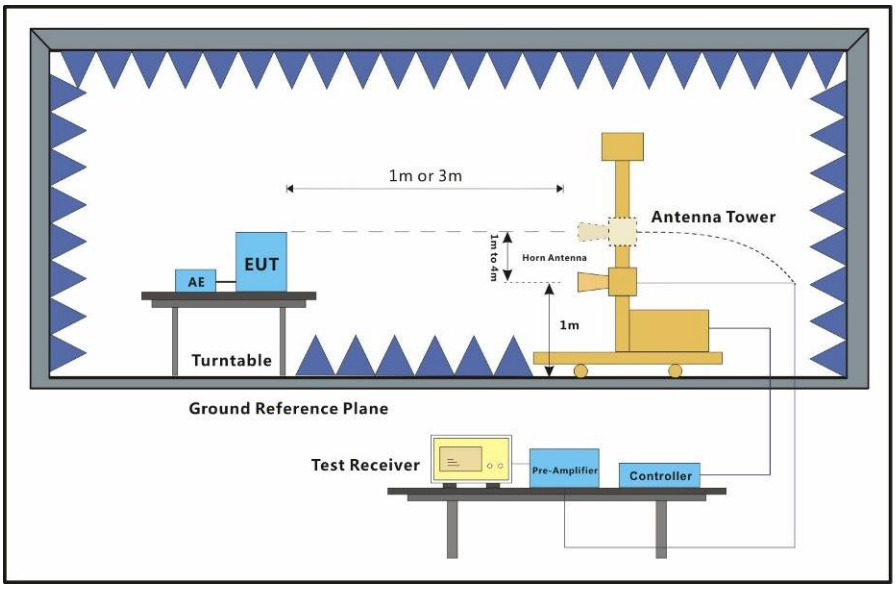
2.1.8 Test Setup Diagram



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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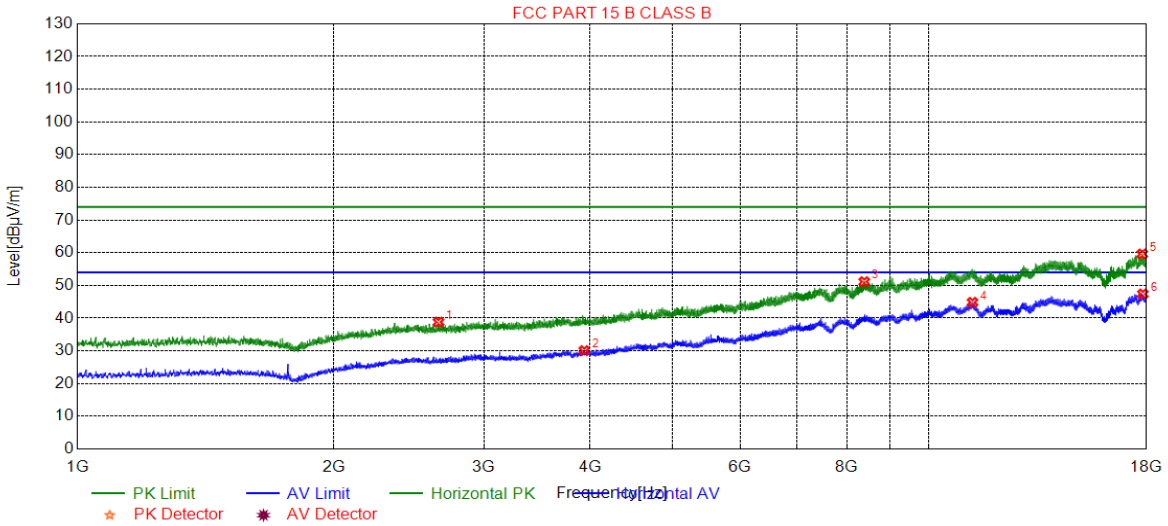
Mode:e; Polarization:Horizontal



Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2654.18	38.80	-25.73	74.00	35.20	100	91	Horizontal
2	3936.04	30.08	-21.93	54.00	23.92	100	15	Horizontal
3	8391.11	51.15	-7.79	74.00	22.85	100	166	Horizontal
4	11243.0	44.85	-2.79	54.00	9.15	100	129	Horizontal
5	17793.4	59.63	0.71	74.00	14.37	100	317	Horizontal
6	17824.0	47.40	0.55	54.00	6.60	100	280	Horizontal

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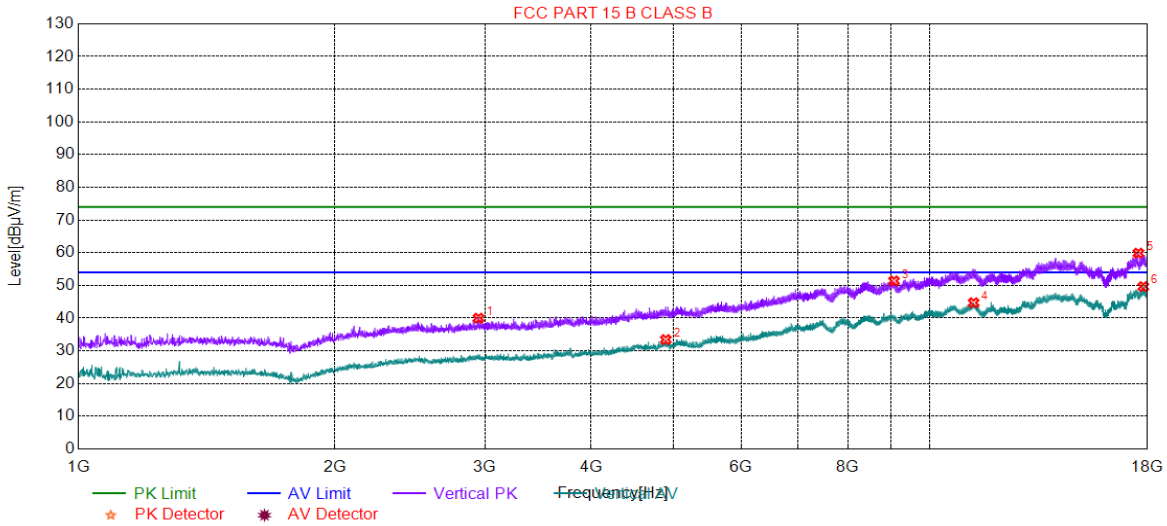
Mode:e; Polarization:Vertical



Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2949.99	40.01	-24.64	74.00	33.99	100	243	Vertical
2	4893.19	33.45	-17.81	54.00	20.55	100	53	Vertical
3	9069.45	51.39	-6.57	74.00	22.61	100	92	Vertical
4	11247.2	44.72	-2.79	54.00	9.28	200	193	Vertical
5	17558.8	59.89	1.28	74.00	14.11	200	231	Vertical
6	17794.2	49.65	0.71	54.00	4.35	100	356	Vertical

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3 Equipment List

Chamber					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy-mm-dd)	Cal.Due date (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	± 3.4dB (150kHz to 30MHz)
2	Radiated Emission	± 4.8dB (30MHz-1GHz)
		± 5.2dB (1GHz-6GHz)
		± 5.5dB (6GHz-18GHz)
		± 5.02dB (18GHz-40GHz)

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5 Photographs

5.1 Test Setup

Refer to Appendix A - Photographs of Set-Up for ZR/2020/90041

5.2 EUT Constructional Details (EUT Photos)

Refer to Photographs of EUT Constructional Details

- End of the Report -

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