

TEST REPORT

Application No: ZR/2020/80074
Applicant: vivo Mobile Communication Co., Ltd.
Address of Applicant: #283,BBK Road,Wusha,Chang'An, DongGuan City, China
Manufacturer: vivo Mobile Communication Co., Ltd.
Address of Manufacturer: #283,BBK Road,Wusha,Chang'An, DongGuan City, China
EUT Description: Mobile phone
Model No.: V2028
Trade Mark: vivo
FCC ID: 2AUCY-V2027
Standard(s) : 47 CFR Part 15, Subpart B
Date of Receipt: 2020/9/3
Date of Test: 2020/9/3 to 2020/9/15
Date of Issue: 2021/8/19

Test Result:**Pass***

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

Authorized Signature:



Simon Ling

Wireless Laboratory Manager





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Wireless Laboratory

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2020/9/17		Original
02		2021/5/26	Leah Chen	1. Modify data conversion error of antenna height 2. Updated equipment list
03		2021/8/19	Leah Chen	1. Updated Support Units, Test facility and Test Location

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):	V2028		
Trade Mark:	vivo		
Hardware Version:	MP_0.1		
Software Version:	PD2042F_EX_A_3.3.8		
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 38	2570~2620	2570~2620
	LTE Band 41	2535~2655	2535~2655
	Wi-Fi 2.4G	2412~2472	2412~2472
	Bluetooth	2402~2480	2402~2480
	Wi-Fi 5G	5150~5850	5150~5850
	FM	/	88~108
	GNSS	/	1559~1610

Accessory:

Accessory Equipment	Manufacturer/trademark	Model	Specification
Adapter1	Dongguan Aohai Technology CO., LTD.	V1020D-EU	DC 5V/2A
Adapter2	Phihong Technology Co., Ltd.	V1020D-US	DC 5V/2A
Earphone	VIVO	XE160	/
Battery	Huizhou Desay Battery Co., Ltd.	B-O5	4910mAh 3.87V
USB Cable	VIVO	BK-C-19	97cm

Remark: All accessory equipment above were conduct test in this report.



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Test modes:

Pretest these modes to find the worst case:	<p>a: Transfer data between the EUT and the PC+USB cable</p> <p>b: Telecom Idle+BT+WLAN5G+GNSS +Playing MP4+USB Cable+adapter1+earphone+Battery</p> <p>c: Telecom Idle+BT+WLAN5G+GNSS +camera(Front)+USB Cable+adapter2+earphone+Battery</p> <p>d: Telecom Idle+BT+WLAN2.4G+GNSS+camera(Back)+USB Cable+adapter(worst)+earphone+Battery</p> <p>e: GSM850 Idle+BT+WLAN2.4G+GNSS+Playing MP4+USB Cable+adapter(worst)+earphone+Battery</p> <p>f: WCDMA Band V Idle+BT+WLAN2.4G+GNSS+Playing MP4+USB Cable+adapter(worst)+earphone+Battery</p> <p>g: LTE Band5 Idle+BT+WLAN2.4G+GNSS+Playing MP4+USB Cable+adapter(worst)+earphone+Battery</p> <p>h: FM mode_98MHz</p>
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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

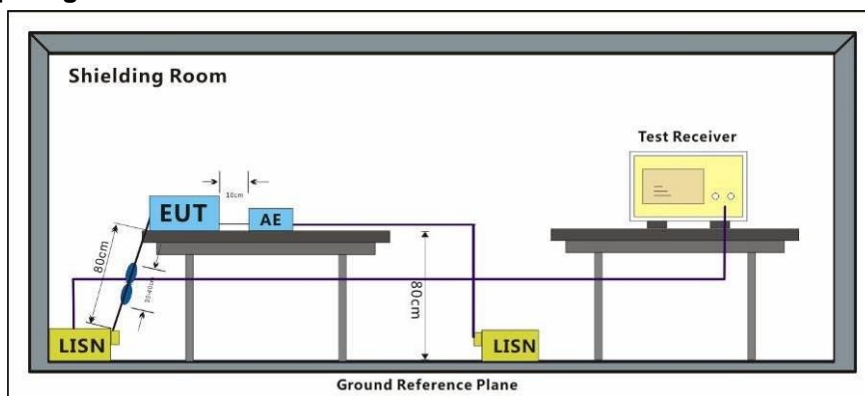
2.1 Conducted Emissions at Mains Terminals (150kHz-30MHz)

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(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: 20.5 °C Humidity: 55.3 % RH Atmospheric Pressure: 1000 mbar
 The worst case e: GSM850 Idle+BT+WLAN2.4G+GNSS+Playing MP4+USB
 for final test: Cable+adapter(worst)+earphone+Battery

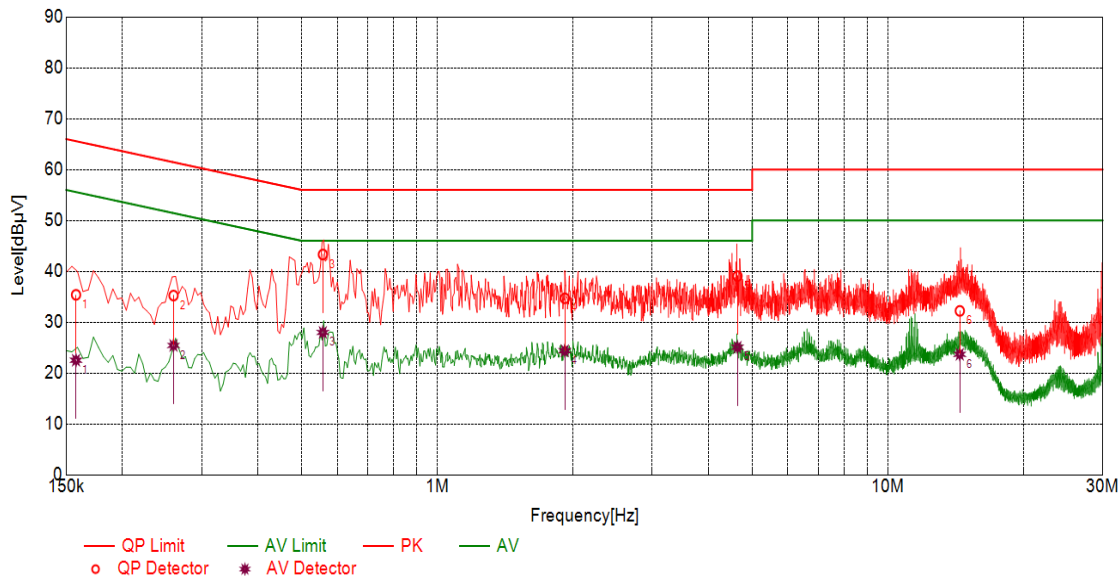
2.1.2 Test Setup Diagram



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.

Mode:e; Line:Live Line



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	0.1578	10.10	35.39	65.58	30.19	22.52	55.58	33.06	L
2	0.2597	10.10	35.24	61.44	26.20	25.43	51.44	26.01	L
3	0.5571	10.10	43.31	56.00	12.69	27.99	46.00	18.01	L
4	1.9187	10.10	34.70	56.00	21.30	24.39	46.00	21.61	L
5	4.6375	10.10	39.06	56.00	16.94	25.07	46.00	20.93	L
6	14.4437	10.11	32.22	60.00	27.78	23.69	50.00	26.31	L



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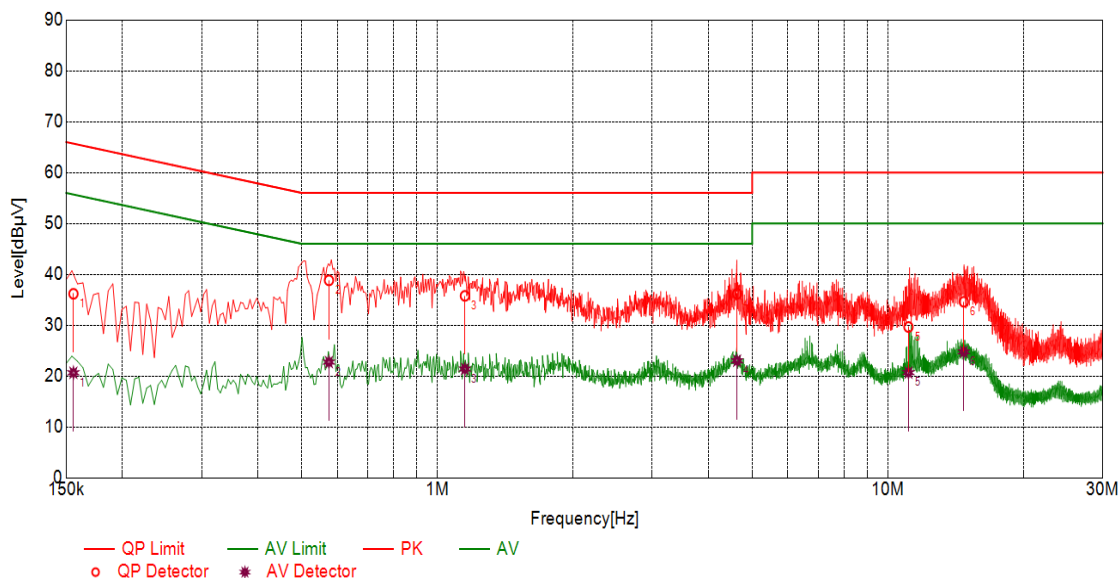
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Mode:e; Line:Neutral Line



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	0.1557	10.10	36.18	65.69	29.51	20.64	55.69	35.05	N
2	0.5748	10.10	38.82	56.00	17.18	22.75	46.00	23.25	N
3	1.1514	10.10	35.77	56.00	20.23	21.39	46.00	24.61	N
4	4.6287	10.10	36.18	56.00	19.82	23.01	46.00	22.99	N
5	11.1116	10.10	29.65	60.00	30.35	20.68	50.00	29.32	N
6	14.7459	10.11	34.60	60.00	25.40	24.76	50.00	25.24	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

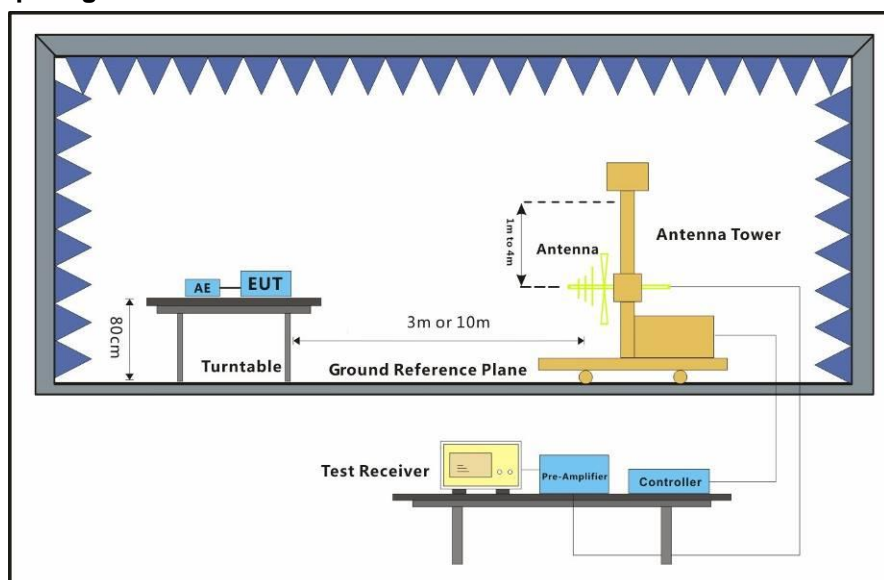
2.1.4 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 66.5 % RH Atmospheric Pressure: 1010 mbar

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

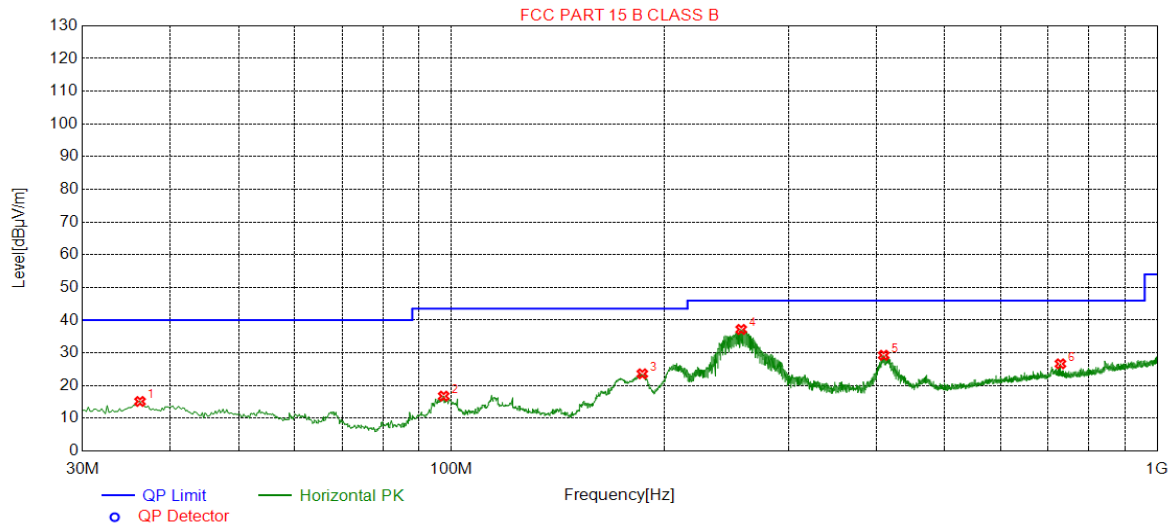
2.1.5 Test Setup Diagram



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.

Mode:a; Polarization:Horizontal



Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	36.2092	15.15	-29.57	40.00	24.85	110	257	Horizontal
2	97.5255	16.79	-32.44	43.50	26.71	160	236	Horizontal
3	186.395	23.61	-32.62	43.50	19.89	128	209	Horizontal
4	257.413	37.18	-29.45	46.00	8.82	212	111	Horizontal
5	409.733	29.28	-25.33	46.00	16.72	225	55	Horizontal
6	729.315	26.66	-18.82	46.00	19.34	223	282	Horizontal



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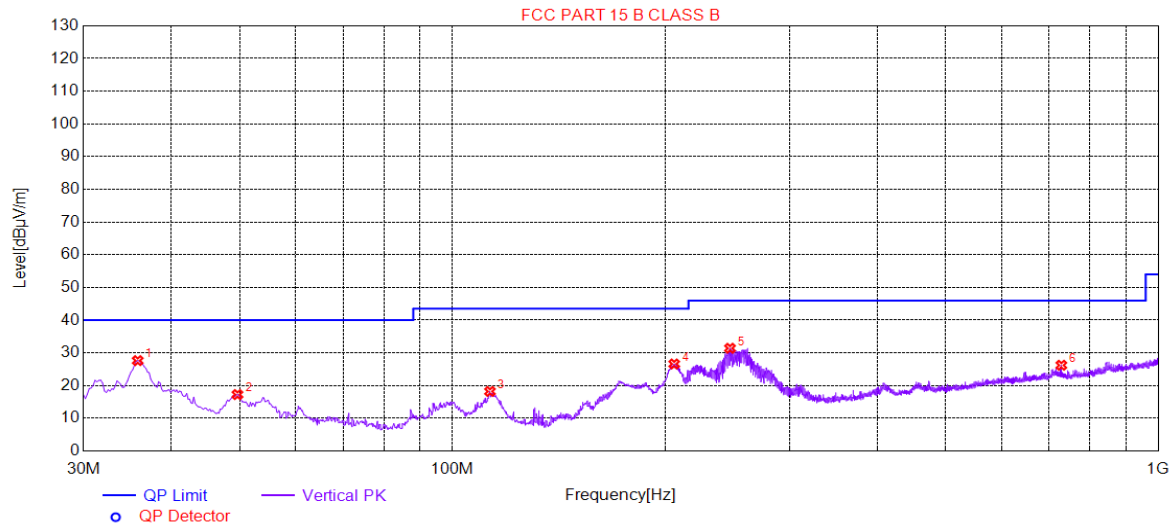
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Mode:a; Polarization:Vertical



Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	35.8212	27.64	-29.69	40.00	12.36	273	9	Vertical
2	49.5979	17.26	-30.37	40.00	22.74	207	261	Vertical
3	113.048	18.22	-32.48	43.50	25.28	212	161	Vertical
4	206.187	26.62	-31.06	43.50	16.88	217	287	Vertical
5	247.323	31.42	-29.77	46.00	14.58	226	341	Vertical
6	729.121	26.23	-18.82	46.00	19.77	270	302	Vertical



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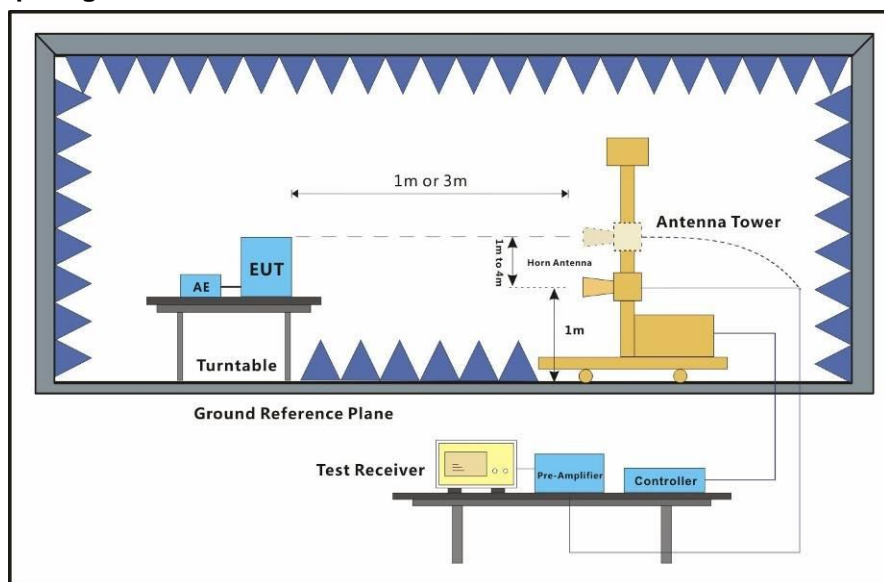
2.3 Radiated Emissions (above 1GHz)

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
The worst case	e: GSM850 Idle+BT+WLAN2.4G+GNSS+Playing MP4+USB				
for final test:	Cable+adapter(worst)+earphone+Battery				

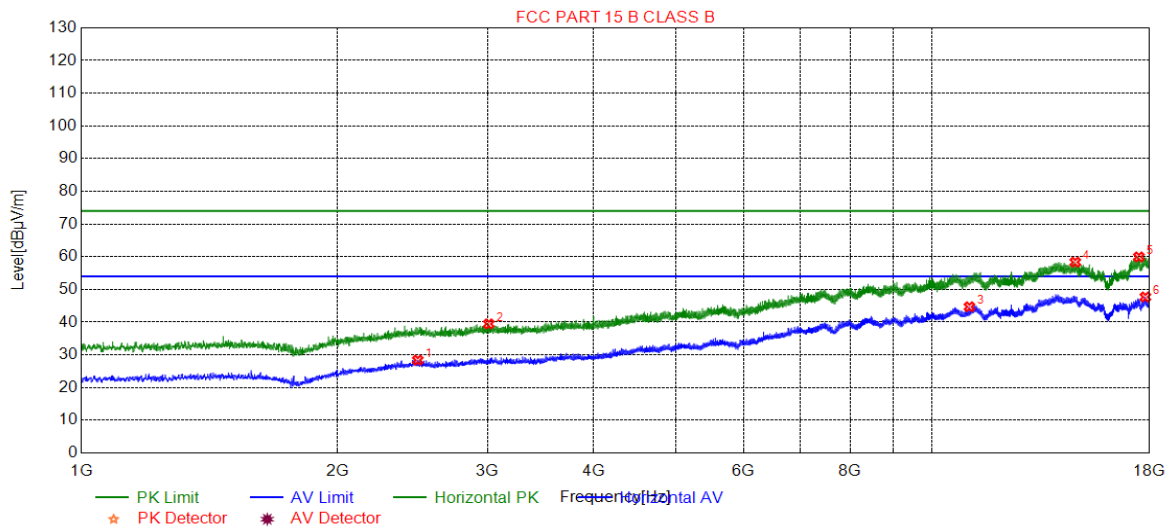
2.1.8 Test Setup Diagram



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.

Mode:e; Polarization:Horizontal



Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2485.02	28.39	-25.95	54.00	25.61	165	267	Horizontal
2	3011.20	39.48	-24.50	74.00	34.52	128	305	Horizontal
3	11054.3	44.71	-2.65	54.00	9.29	176	128	Horizontal
4	14719.6	58.35	1.69	74.00	15.65	100	241	Horizontal
5	17488.2	59.95	1.49	74.00	14.05	183	192	Horizontal
6	17795.9	47.70	0.70	54.00	6.30	224	278	Horizontal



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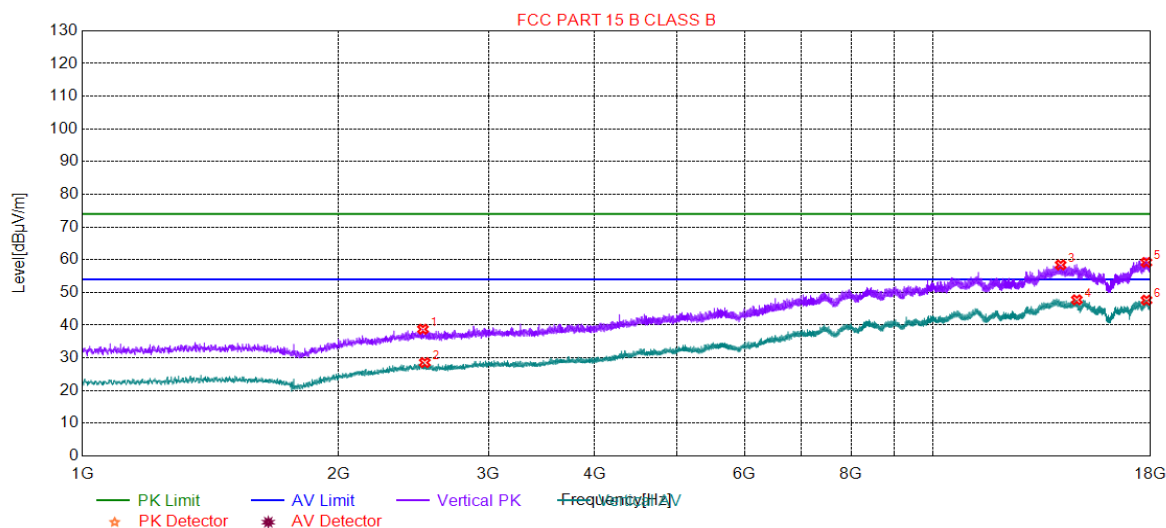
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Mode:e; Polarization:Vertical



Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2513.07	38.77	-25.86	74.00	35.23	296	91	Vertical
2	2525.82	28.56	-25.87	54.00	25.44	188	232	Vertical
3	14111.0	58.42	2.33	74.00	15.58	291	118	Vertical
4	14742.6	47.76	1.71	54.00	6.24	166	307	Vertical
5	17794.2	59.19	0.71	74.00	14.81	265	269	Vertical
6	17799.3	47.66	0.69	54.00	6.34	170	118	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	2019-09-07	2020-09-06
				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	2019-12-06	2020-12-05
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	2019-09-07	2020-09-06
				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
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2019-12-06	2020-12-05



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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	$\pm 3.0\text{dB}$ (150kHz to 30MHz)
2	Radiated Emission	$\pm 4.8\text{dB}$ (Below 1GHz)
		$\pm 4.8\text{dB}$ (1GHz to 6GHz)
		$\pm 4.5\text{dB}$ (6GHz to 18GHz)
		$\pm 5.02\text{dB}$ (Above 18GHz)



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5 Photographs

5.1 Test Setup

Refer to Appendix A - Photographs of Set-Up for ZR/2020/80074.

5.2 EUT Constructional Details (EUT Photos)

Refer to Photographs of EUT Constructional Details

- End of the Report -



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