



TEST REPORT

Application No: XAR/2021/30009
Applicant: Xiaomi Communications Co., Ltd.
Address of Applicant: #019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085
Manufacturer: Xiaomi Communications Co., Ltd.
Address of Manufacturer: #019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085
EUT Description: Mobile Phone
Model No.: M1908C3JGG
Brand mark: Redmi
FCC ID: 2AFZZC3JGG
Standard(s) : 47 CFR Part 15, Subpart B
Date of Receipt: 2021/3/12
Date of Test: 2021/3/12 to 2021/4/7
Date of Issue: 2021/4/7

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		2021/4/7		Original

Authorized for issue by:		
Prepared By		 (Leah Chen) / Engineer
Checked By		 (Jimmy Zhu) /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

Test engineer: Leah Chen, Ken Liu, Andy Yao



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1 General Information

Product Name:	Mobile Phone		
Model No.(EUT):	M1908C3JGG		
Brand mark:	Redmi		
Hardware Version:	P1		
Software Version:	MIUI12.5		
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 CA_7C	2500~2570	2620~2690
	LTE CA_38C	2570~2620	2570~2620
	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)	1599~1610	

EUT 1 with battery1=4+128G EUT 2 with battery2= 4+64G



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1.1 Description of Support Units

Description	Manufacturer	Model No.
Laptop	Lenovo	L480
Mouse	Lenovo	3D optical Mouse
Router	NETGEAR	R6020

1.2 Test Location

All tests were performed at:

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

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: GSM 850 Idle+ BT+ 2.4G WLAN +GPS Rx+ playing MP4 +earphone1+battery1+Cable1+adapter1
- c: GSM 850 Idle+ BT+ 2.4G WLAN +GPS Rx+ playing MP4 +earphone1+battery2+Cable1+adapter1
- d: WCDMA Band V Idle+ BT+ 5G WLAN +GPS Rx+ camera (Front) +earphone1+battery(worst)+ Cable1+adapter1
- e: LTE Band 5 Idle+ BT+ 2.4G WLAN +GPS Rx+ camera (Back) + earphone1+battery(worst)+ Cable1+adapter1
- f: LTE Band 5 Idle+BT+5G WLAN +GPS Rx+ FM +earphone1+battery(worst)+ Cable1+adapter1

The worst case for final test:

- d: WCDMA Band V Idle+ BT+ 5G WLAN +GPS Rx+ camera (Front) +earphone1+battery(worst)+ Cable1+adapter1
- a: Transfer data between the EUT and the PC+USB cable1



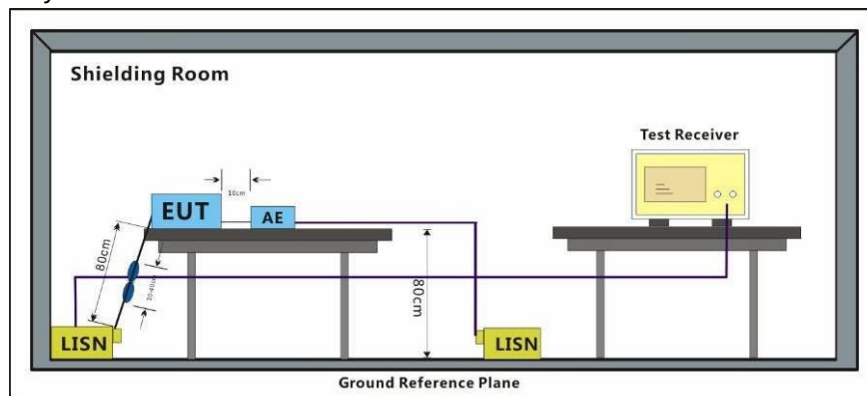
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2.1.2 Test Setup Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

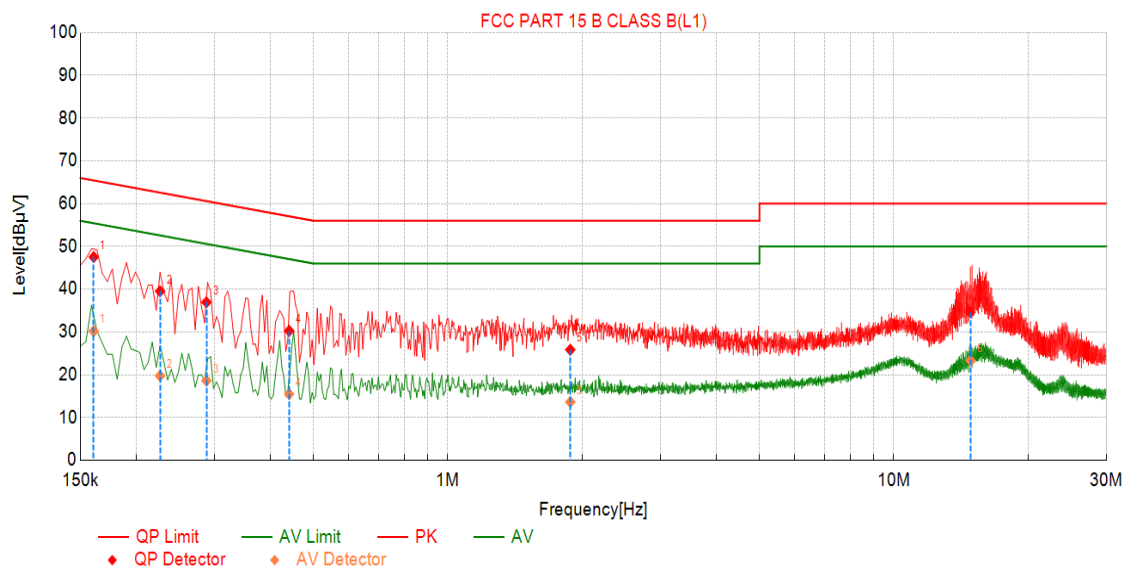


2.1.3 Measurement Data

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 d; Line:Live Line



Test Graph

Final Data List

NO.	Freq. [MHz]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Verdict
1	0.1608	47.52	65.42	17.90	30.20	55.42	25.22	PASS
2	0.2265	39.53	62.58	23.05	19.75	52.58	32.83	PASS
3	0.2877	36.94	60.59	23.65	18.63	50.59	31.96	PASS
4	0.4411	30.27	57.04	26.77	15.48	47.04	31.56	PASS
5	1.8825	25.84	56.00	30.16	13.62	46.00	32.38	PASS
6	14.8566	34.64	60.00	25.36	23.31	50.00	26.69	PASS



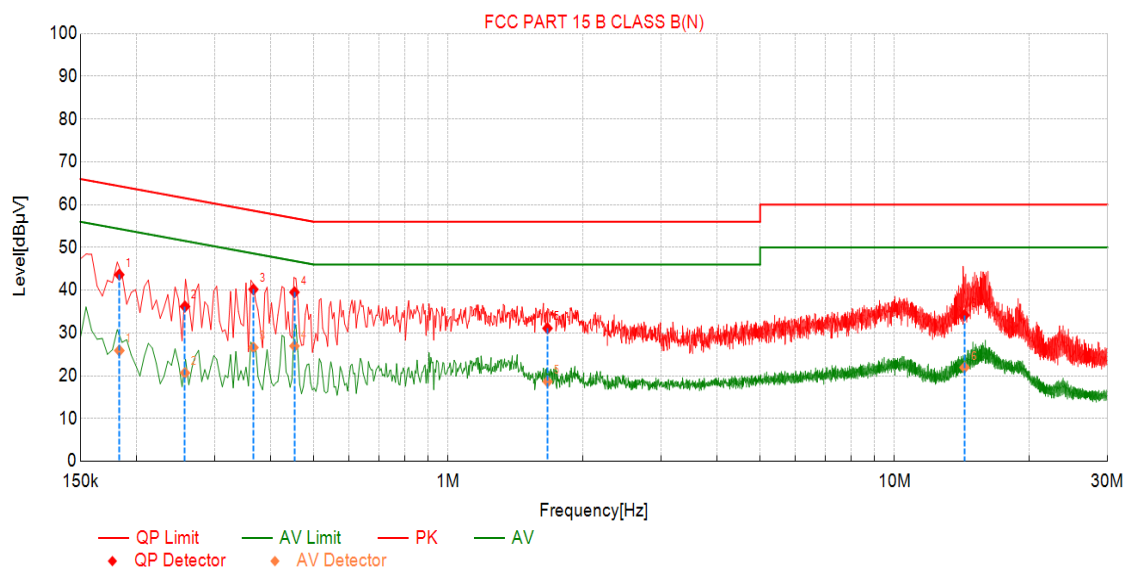
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Mode d; Line:Neutral Line



Test Graph

Final Data List

NO.	Freq. [MHz]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Verdict
1	0.1834	43.63	64.33	20.70	25.89	54.33	28.44	PASS
2	0.2573	36.20	61.52	25.32	20.66	51.52	30.86	PASS
3	0.3663	40.18	58.58	18.40	26.60	48.58	21.98	PASS
4	0.4527	39.52	56.83	17.31	26.95	46.83	19.88	PASS
5	1.6698	31.09	56.00	24.91	18.63	46.00	27.37	PASS
6	14.3418	34.13	60.00	25.87	21.92	50.00	28.08	PASS



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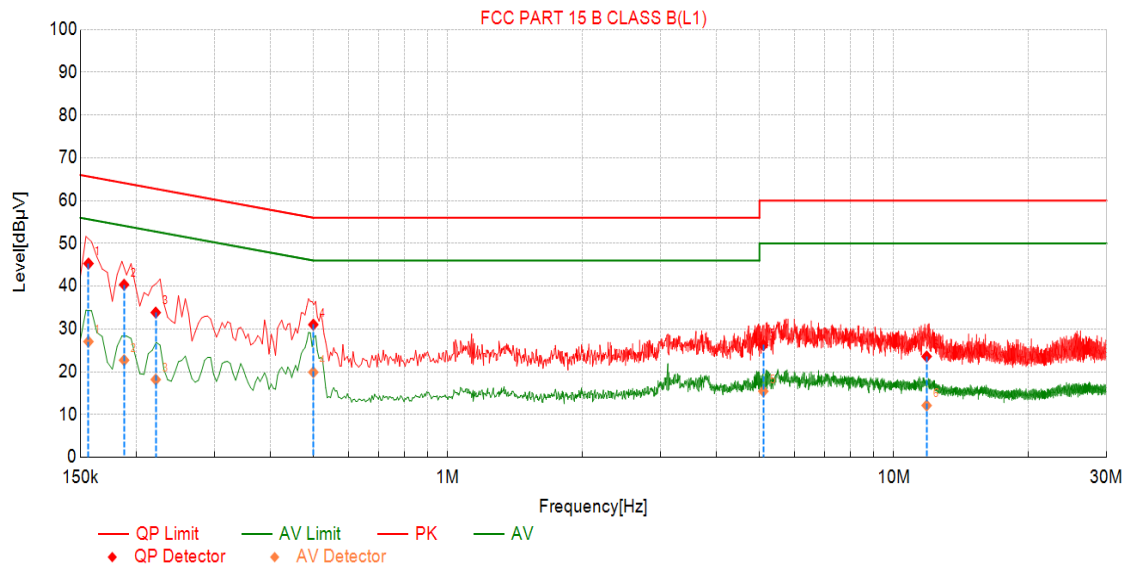
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Mode a; Line:Live Line



Test Graph

Final Data List

NO.	Freq. [MHz]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Verdict
1	0.1565	45.30	65.65	20.35	27.05	55.65	28.60	PASS
2	0.1881	40.35	64.12	23.77	22.70	54.12	31.42	PASS
3	0.2215	33.84	62.76	28.92	18.18	52.76	34.58	PASS
4	0.4996	31.03	56.01	24.98	19.89	46.01	26.12	PASS
5	5.0993	26.21	60.00	33.79	15.45	50.00	34.55	PASS
6	11.8482	23.57	60.00	36.43	12.12	50.00	37.88	PASS



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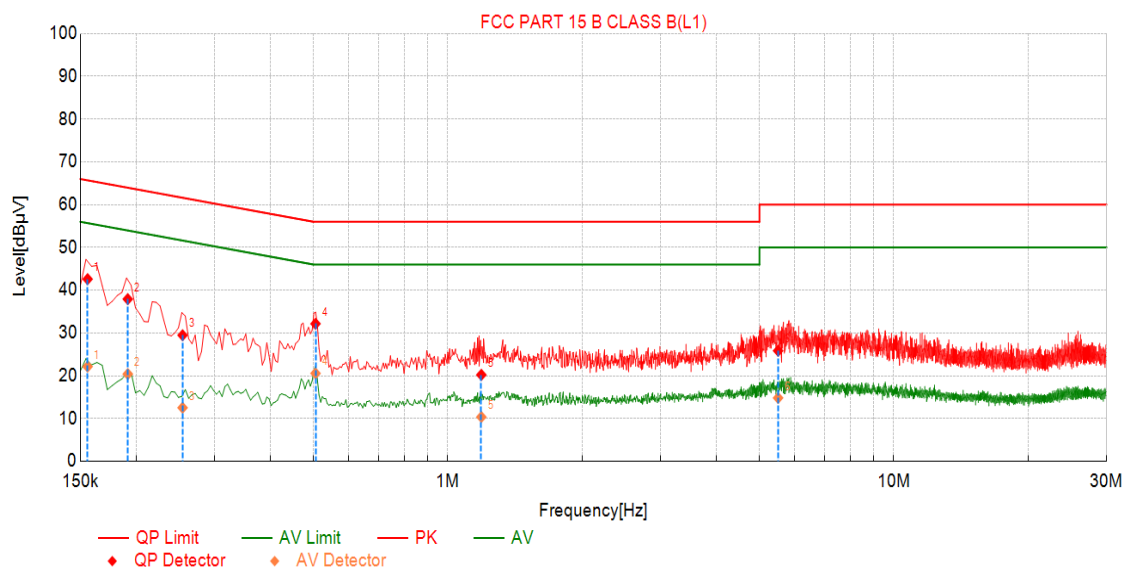
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Mode a; Line:Neutral Line



Test Graph

Final Data List

NO.	Freq. [MHz]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Verdict
1	0.1558	42.59	65.69	23.10	22.15	55.69	33.54	PASS
2	0.1917	37.92	63.96	26.04	20.40	53.96	33.56	PASS
3	0.2544	29.48	61.61	32.13	12.52	51.61	39.09	PASS
4	0.5053	32.16	56.00	23.84	20.56	46.00	25.44	PASS
5	1.1894	20.22	56.00	35.78	10.37	46.00	35.63	PASS
6	5.5030	25.84	60.00	34.16	14.82	50.00	35.18	PASS



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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:

- a: Transfer data between the EUT and the PC+USB cable1
- b: GSM 850 Idle+ BT+ 2.4G WLAN +GPS Rx+ playing MP4 +earphone1+battery1+Cable1+adapter1
- c: GSM 850 Idle+ BT+ 2.4G WLAN +GPS Rx+ playing MP4 +earphone1+battery2+Cable1+adapter1
- d: WCDMA Band V Idle+ BT+ 5G WLAN +GPS Rx+ camera (Front) +earphone1+battery(worst)+ Cable1+adapter1
- e: LTE Band 5 Idle+ BT+ 2.4G WLAN +GPS Rx+ camera (Back) + earphone1+battery(worst)+ Cable1+adapter1
- f: LTE Band 5 Idle+BT+5G WLAN +GPS Rx+ FM +earphone1+battery(worst)+ Cable1+adapter1

The worst case for final test:

- d: WCDMA Band V Idle+ BT+ 5G WLAN +GPS Rx+ camera (Front) +earphone1+battery(worst)+ Cable1+adapter1
- a: Transfer data between the EUT and the PC+USB cable1



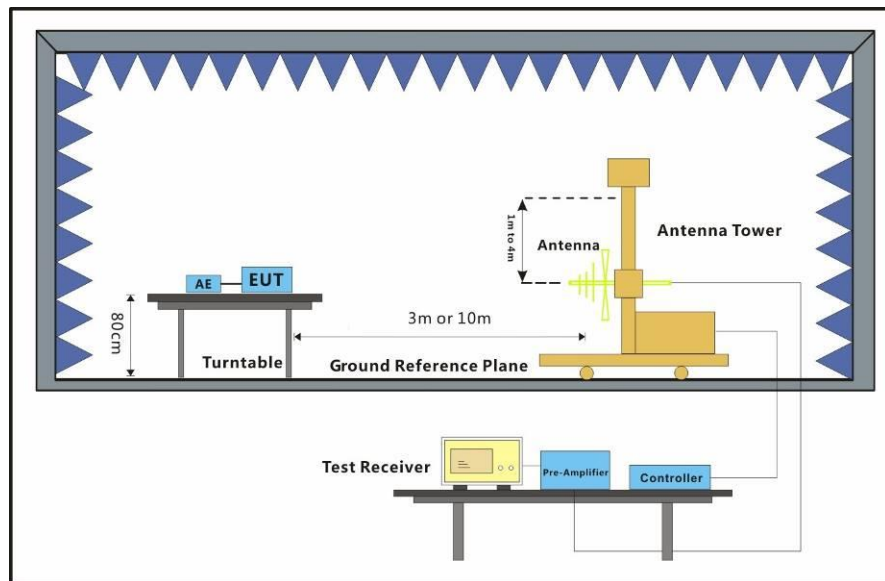
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2.2.2 Test Setup Procedures

1. The EUT was placed in a semi Anechoic Chamber as show below
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna height is adjusted between 1 to 4 meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak Detect Function with specified bandwidth with Maximum Hold Mode, and the trace was allowed to stabilize.
7. If the emission level of the EUT in peak mode was 6 dB lower than the limit specified, peak values of EUT will be reported. Otherwise, the emission will be repeated by using the quasi-peak method and reported.



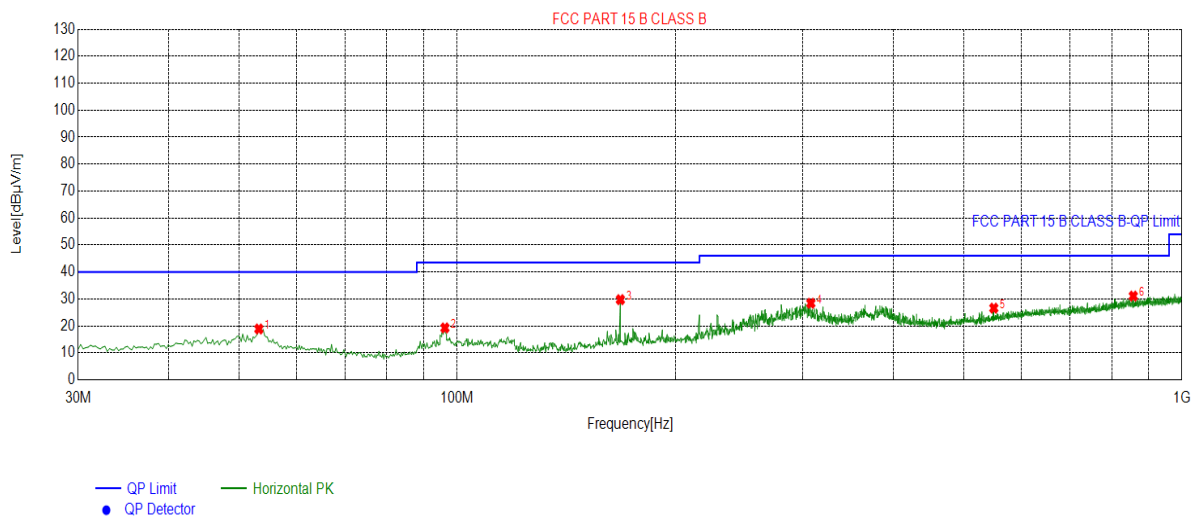
2.2.3 Measurement Data

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.

The three polarities of X,Y,Z were measured by EUT, but only the worst data had been displayed.



Mode a; Polarization:Horizontal



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	53.2800	18.88	-28.88	40.00	21.12	200	222	Horizontal
2	96.2025	19.27	-30.63	43.50	24.23	200	249	Horizontal
3	167.982	29.75	-32.13	43.50	13.75	200	48	Horizontal
4	307.662	28.40	-25.87	46.00	17.60	100	64	Horizontal
5	550.162	26.59	-20.01	46.00	19.41	200	280	Horizontal
6	856.925	31.07	-15.18	46.00	14.93	100	240	Horizontal



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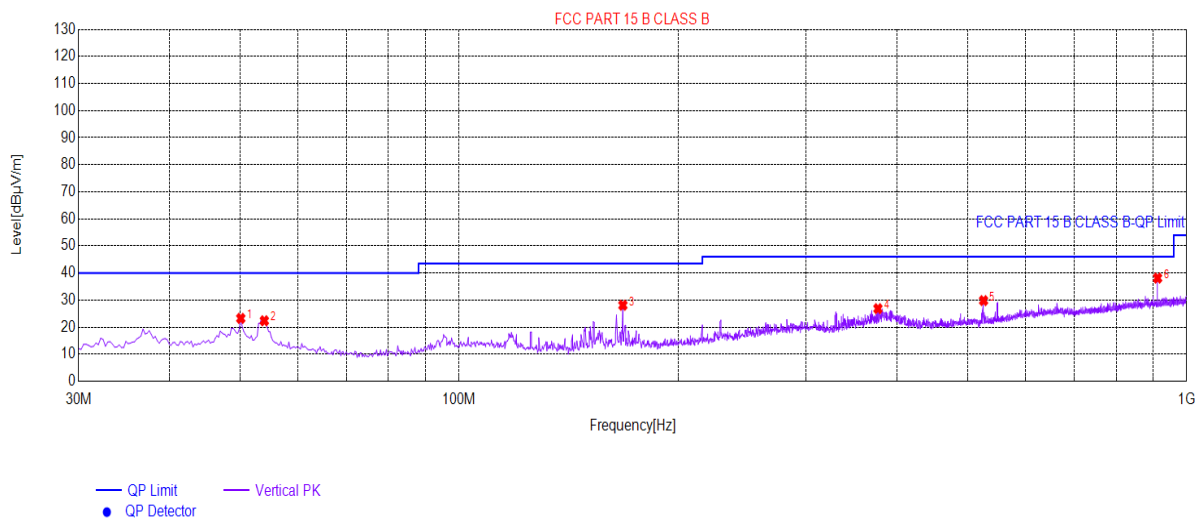
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Mode a; Polarization:Vertical



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	50.1275	23.25	-28.34	40.00	16.75	100	349	Vertical
2	54.0075	22.37	-29.01	40.00	17.63	100	6	Vertical
3	167.982	28.09	-32.13	43.50	15.41	100	112	Vertical
4	376.532	26.84	-24.31	46.00	19.16	200	355	Vertical
5	525.912	29.82	-20.84	46.00	16.18	100	338	Vertical
6	912.215	38.12	-14.16	46.00	7.88	100	201	Vertical



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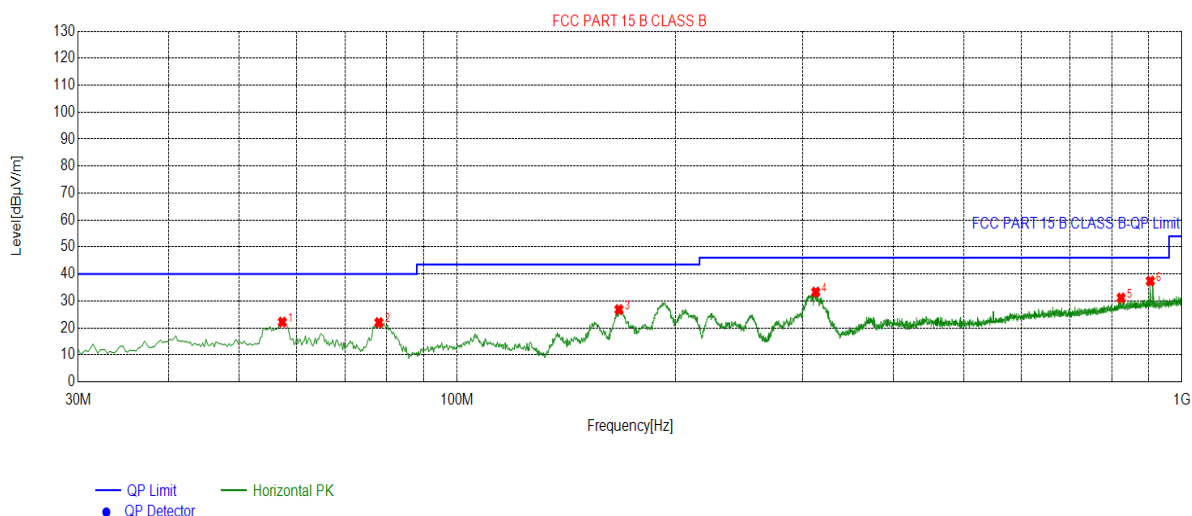
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Mode d; Polarization:Horizontal



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	57.4025	22.16	-29.59	40.00	17.84	300	170	Horizontal
2	78.0150	21.99	-34.00	40.00	18.01	200	285	Horizontal
3	167.255	26.79	-32.12	43.50	16.71	200	227	Horizontal
4	312.512	33.29	-25.80	46.00	12.71	100	75	Horizontal
5	824.430	31.11	-15.56	46.00	14.89	200	31	Horizontal
6	904.697	37.39	-14.24	46.00	8.61	200	349	Horizontal



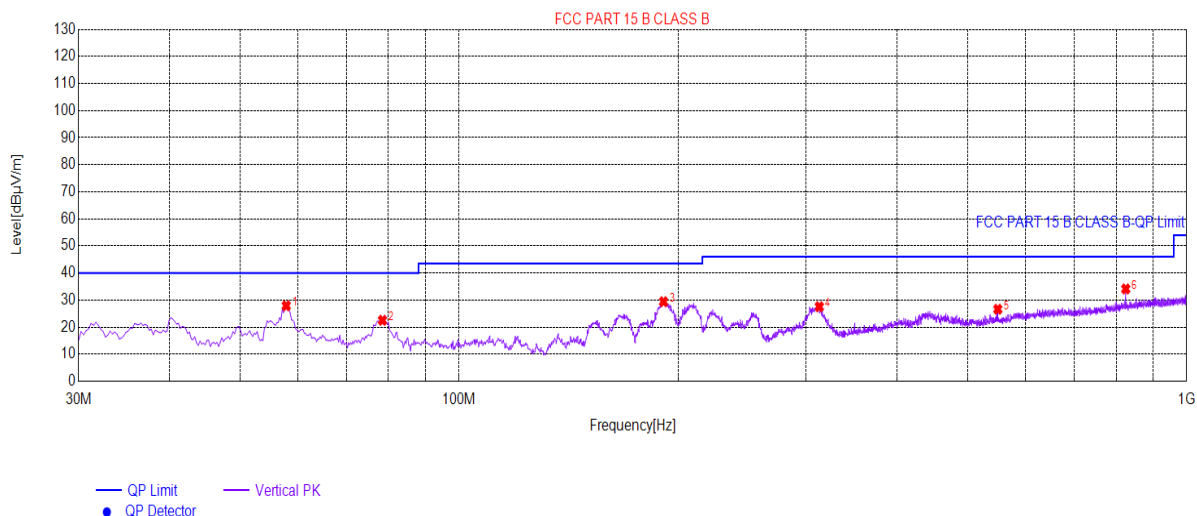
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Mode d; Polarization:Vertical



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	57.8875	27.90	-29.67	40.00	12.10	100	59	Vertical
2	78.5000	22.53	-34.09	40.00	17.47	100	232	Vertical
3	191.020	29.42	-29.66	43.50	14.08	100	21	Vertical
4	312.755	27.55	-25.80	46.00	18.45	200	212	Vertical
5	550.162	26.61	-20.01	46.00	19.39	100	349	Vertical
6	824.672	34.12	-15.56	46.00	11.88	100	358	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

2.3.1 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: GSM 850 Idle+ BT+ 2.4G WLAN +GPS Rx+ playing MP4 +earphone1+battery1+Cable1+adapter1
- c: GSM 850 Idle+ BT+ 2.4G WLAN +GPS Rx+ playing MP4 +earphone1+battery2+Cable1+adapter1
- d: WCDMA Band V Idle+ BT+ 5G WLAN +GPS Rx+ camera (Front) +earphone1+battery(worst)+ Cable1+adapter1
- e: LTE Band 5 Idle+ BT+ 2.4G WLAN +GPS Rx+ camera (Back) + earphone1+battery(worst)+ Cable1+adapter1
- f: LTE Band 5 Idle+BT+5G WLAN +GPS Rx+ FM +earphone1+battery(worst)+ Cable1+adapter1

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



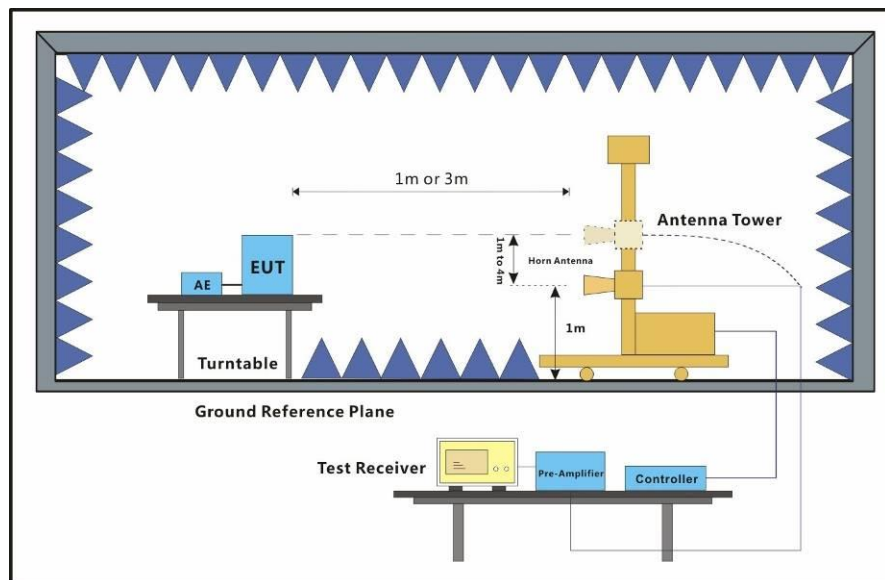
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2.3.2 Test Setup Procedures

1. The EUT was placed in a full Anechoic Chamber as show below
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna height is adjusted between 1 to 4 meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak and AV Detect Function with specified bandwidth with Maximum Hold Mode, and the trace was allowed to stabilize.



2.3.3 Measurement Data

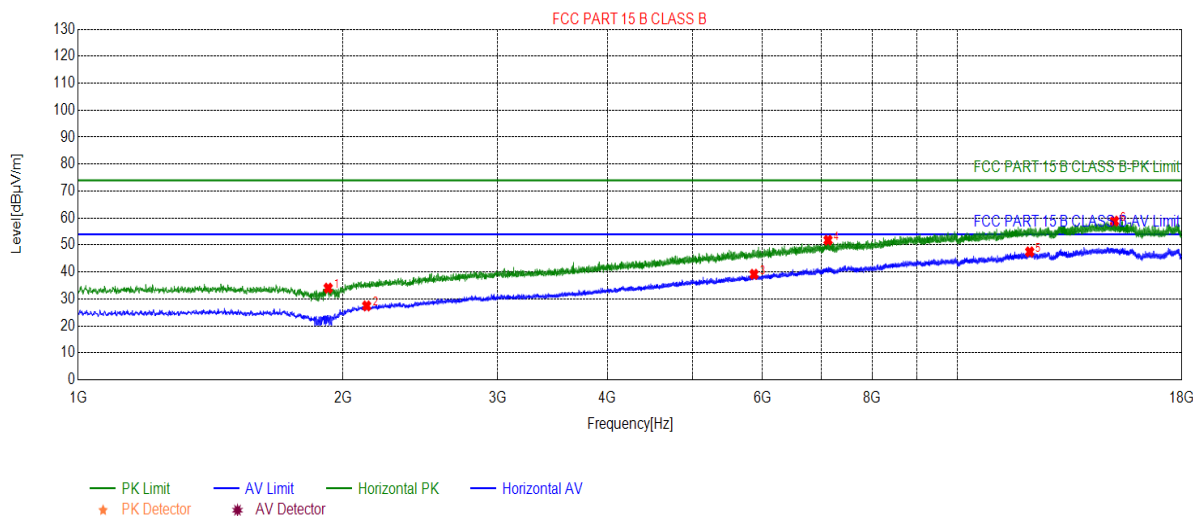
An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Average measurements were conducted based on the peak sweep graph. The EUT was measured by Horn antenna with 2 orthogonal polarities.

The three polarities of X,Y,Z were measured by EUT, but only the worst data had been displayed.

Scan from 1GHz to 30GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed.



Mode a; Polarization:Horizontal



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1924.84	34.02	-27.75	74.00	39.98	121	201	Horizontal
2	2128.85	27.42	-26.67	54.00	26.58	121	292	Horizontal
3	5870.74	39.14	-12.46	54.00	14.86	121	319	Horizontal
4	7126.25	51.80	-8.74	74.00	22.20	121	103	Horizontal
5	12084.5	47.47	0.44	54.00	6.53	121	148	Horizontal
6	15086.0	58.88	1.84	74.00	15.12	121	103	Horizontal



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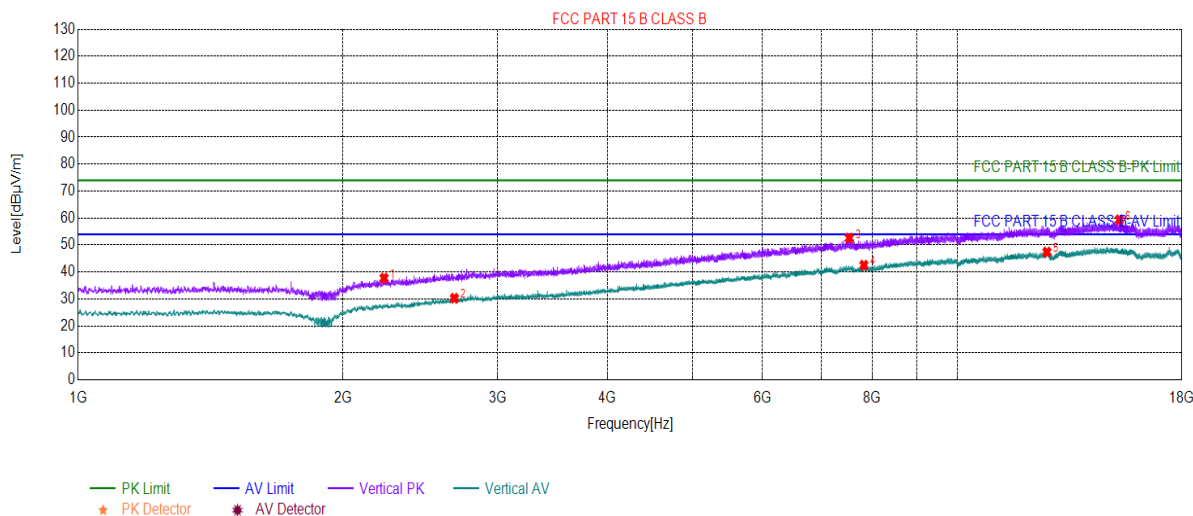
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Mode a; Polarization:Vertical



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2228.31	37.72	-26.27	74.00	36.28	213	163	Vertical
2	2678.83	30.26	-23.98	54.00	23.74	213	34	Vertical
3	7534.27	52.58	-8.10	74.00	21.42	213	280	Vertical
4	7827.54	42.53	-7.29	54.00	11.47	213	87	Vertical
5	12642.1	47.38	1.00	54.00	6.62	213	26	Vertical
6	15283.2	59.34	1.65	74.00	14.66	213	207	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	2021/4/2	2022/4/2
				2020/4/2	2021/4/2
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	2021/4/2	2022/4/2
				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	2020/11/18	2021/11/18
Amplifier	Tonscend	TAP01018048	XAW01-41-02	2020/11/18	2021/11/18
Amplifier	Tonscend	TAP18040048	XAW01-41-03	2020/12/3	2021/12/3
Amplifier	Brilliant-emc	YX28980930	XAW01-41-06	2020/11/18	2021/11/18
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 Setup Photos.

5.2 EUT Constructional Details (EUT Photos)

Refer to Photographs of EUT Constructional Details

- End of the Report -



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