



REPORT No.: SZ21100132E01

TEST REPORT

APPLICANT : Reliance Communications LLC

PRODUCT NAME : Orbic Tab10R 5G

MODEL NAME : R10L5TR

BRAND NAME : Orbic

FCC ID : 2ABGH-R10L5TR

STANDARD(S) : 47 CFR Part 15 Subpart B

RECEIPT DATE : 2021-12-03

TEST DATE : 2022-01-11 to 2022-01-18

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MORLAB

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Change History		
Version	Date	Reason for Change
1.0	2022-01-29	First edition



1. Technical Information

Note: Provide by applicant

1.1. Applicant and Manufacturer Information

Applicant:	Reliance Communications LLC
Applicant Address:	91 Colin Drive, Unit 1, HOLBROOK, New York 11741, United States
Manufacturer:	ZJY RIGHT SOURCE INDIA PRIVATE LIMITED
Manufacturer Address:	MIDC industrial Area, Shiravane, Nerul, India

1.2. Equipment Under Test (EUT) Description

Product Name:	Orbic Tab10R 5G
EUT No.:	5#
Hardware Version:	V1.1
Software Version:	ORB10L5TR_v1.0.5_BVZ
Tx Frequency:	WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band IV: 1710 MHz ~ 1755 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 746 MHz ~ 756 MHz LTE Band 48: 3550MHz~3700MHz LTE Band 66: 1710 MHz ~ 1780 MHz 5G NR n2:1850 MHz ~ 1910 MHz 5G NR n5:824 MHz ~ 849 MHz 5G NR n66:1710 MHz ~ 1780 MHz 5G NR n77:3300 MHz ~ 4200 MHz 5G NR n260:37000 MHz ~ 40000 MHz 5G NR n261:27500 MHz ~ 28350MHz Bluetooth: 2402 MHz ~ 2480 MHz 802.11b/g/n: 2412 MHz ~ 2462 MHz 802.11a/ac/n: 5150 MHz ~ 5250 MHz; 5250 MHz ~ 5350 MHz; 5470 MHz ~ 5725 MHz; 5745MHz ~ 5825 MHz
Rx Frequency:	WCDMA Band II: 1930 MHz ~ 1990 MHz WCDMA Band IV: 2110 MHz ~ 2155 MHz

	WCDMA Band V: 869 MHz ~ 894 MHz LTE Band 2: 1930 MHz ~ 1990 MHz LTE Band 4: 2110 MHz ~ 2155 MHz LTE Band 5: 869 MHz ~ 894 MHz LTE Band 12: 729 MHz ~ 746 MHz LTE Band 13: 746 MHz ~ 756 MHz LTE Band 48: 3550 MHz ~ 3700 MHz LTE Band 66: 2110 MHz ~ 2200 MHz 5G NR n2: 1930 MHz ~ 1990 MHz 5G NR n5: 869 MHz ~ 894 MHz 5G NR n66: 2110 MHz ~ 2200 MHz 5G NR n77: 3300 MHz ~ 4200 MHz 5G NR n260: 37000 MHz ~ 40000 MHz 5G NR n261: 27500 MHz ~ 28350 MHz Bluetooth: 2402 MHz ~ 2480 MHz 802.11b/g/n: 2412 MHz ~ 2462 MHz 802.11a/ac/n: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz; 5500 MHz ~ 5700 MHz; 5745 MHz ~ 5825 MHz	
Ancillary Equipment:	AC Adapter 1	
	Brand Name:	Orbic
	Model No.:	BLJ-QC06HU
	Serial No.:	(N/A, marked #1 by test site)
	Rated Input:	100-240V~50/60Hz, 0.5A
	Rated Output:	5V=3A, 9V=2A, 12V=1.5A
	Manufacturer:	Zhongshan Baolijin Electronic Co., Ltd.
	Battery 1	
	Brand Name:	Orbic
	Model No.:	BTE-6001
	Serial No.:	(N/A, marked #1 by test site)
	Capacity:	6000mAh
	Rated Voltage:	3.85V
	Charge Limit:	4.4V
	Manufacturer:	HUIZHOU DXDRAGON INC

Note:

- For a more detailed description, please refer to specification or user's manual supplied by the applicant and/or manufacturer.



2. Test Results

2.1. Applied Reference Documents

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart B:

No.	Identity	Document Title
1	47 CFR Part 15	Radio Frequency Devices

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Test Date	Test Engineer	Result	Method Determination Remark
1	15.107	Conducted Emission	2022.01.11	Huang Zhiye	PASS	No deviation
2	15.109	Radiated Emission	2022.01.18	Lin Jiayong	PASS	No deviation

Note 1: Additions to, deviation, or exclusions from the method shall be judged in the "method determination" column of add, deviate or exclude from the specific method shall be explained in the "Remark" of the above table.

Note 2: When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% confidence intervals.



2.2. EUT Setup and Operating Conditions

Note: All of the following test modes are tested in all the test items.

Test Modes	
Mode 1 :	WCDMA Band II Idle + Bluetooth Idle + 2.4G WLAN Idle + Battery + USB Cable(Charging from Adapter) + Earphone + Adapter + SIM Card
Mode 2 :	WCDMA Band IV Idle + Bluetooth Idle + 5G WLAN Idle + Battery + USB Cable(Charging from Adapter) + Earphone + Adapter + SIM Card
Mode 3 :	WCDMA Band V Idle + Bluetooth Idle + 2.4G WLAN Idle + Battery + USB Cable(Charging from Adapter) + Earphone + Adapter + SIM Card
Mode 4 :	LTE Band 2 Idle + Bluetooth Idle + 5G WLAN Idle + Battery + USB Cable(Charging from Adapter) + Earphone + Adapter + SIM Card
Mode 5 :	LTE Band 4 Idle + Bluetooth Idle + 2.4G WLAN Idle + Battery + USB Cable(Charging from Adapter) + Earphone + Adapter + SIM Card
Mode 6 :	LTE Band 5 Idle + Bluetooth Idle + 5G WLAN Idle + Battery + USB Cable(Charging from Adapter) + Earphone + Adapter + SIM Card
Mode 7 :	LTE Band 12 Idle + Bluetooth Idle + 5G WLAN Idle + Battery + USB Cable(Charging from Adapter) + Earphone + Adapter + SIM Card
Mode 8 :	LTE Band 13 Idle + Bluetooth Idle + 2.4G WLAN Idle + Battery + USB Cable(Charging from Adapter) + Earphone + Adapter + SIM Card
Mode 9 :	LTE Band 48 Idle + Bluetooth Idle + 5G WLAN Idle + Battery + USB Cable(Charging from Adapter) + Earphone + Adapter + SIM Card
Mode 10 :	LTE Band 66 Idle + Bluetooth Idle + 2.4G WLAN Idle + Battery + USB Cable(Charging from Adapter) + Earphone + Adapter + SIM Card
Mode 11 :	SA_n2 Idle + Bluetooth Idle + 5G WLAN Idle + Battery + USB Cable(Charging from Adapter) + Earphone + Adapter + SIM Card
Mode 12 :	SA_n5 Idle + Bluetooth Idle + 2.4G WLAN Idle + Battery + USB Cable(Charging from Adapter) + Earphone + Adapter + SIM Card
Mode 13 :	SA_n66 Idle + Bluetooth Idle + 5G WLAN Idle + Battery + USB Cable(Charging from Adapter) + Earphone + Adapter + SIM Card
Mode 14 :	NSA_2A_n2A Idle + Bluetooth Idle + 2.4G WLAN Idle + Battery + USB Cable(Charging from Adapter) + Earphone + Adapter + SIM Card
Mode 15 :	NSA_2A_n5A Idle + Bluetooth Idle + 5G WLAN Idle + Battery + USB Cable(Charging from Adapter) + Earphone + Adapter + SIM Card
Mode 16 :	NNSA_2A_n66A Idle + Bluetooth Idle + 2.4G WLAN Idle + Battery + USB Cable(Charging from Adapter) + Earphone + Adapter + SIM Card + 5.8G SRD Link
Mode 17 :	NSA_2A_n77A Idle + Bluetooth Idle + 5G WLAN Idle + Camera + Battery + USB Cable(Charging from Adapter) + Earphone + Adapter + SIM Card



Mode 18 :	NSA_2A_n260A Idle + Bluetooth Idle + 2.4G WLAN Idle + MP4 + Battery + USB Cable(Charging from Adapter) + Earphone + Adapter + SIM Card
Mode 19 :	NSA_2A_n261A Idle + Bluetooth Idle + 5G WLAN Idle+ PC(data transfer) + Battery + Earphone + USB Cable + SIM Card + PC Adapter
Remark: The above test mode in boldface (Mode 17) was the worst case of conducted emission test, only the test data of these modes were reported. The above test mode in boldface (Mode 19) was the worst case of radiated emission test, only the test data of these modes were reported.	

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15 - 35
Relative Humidity (%):	30 - 60
Atmospheric Pressure (kPa):	86 - 106

3. 47 CFR Part 15B Requirements

3.1. Conducted Emission

3.1.1. Requirement

According to FCC section 15.107, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 Ω line impedance stabilization network (LISN).

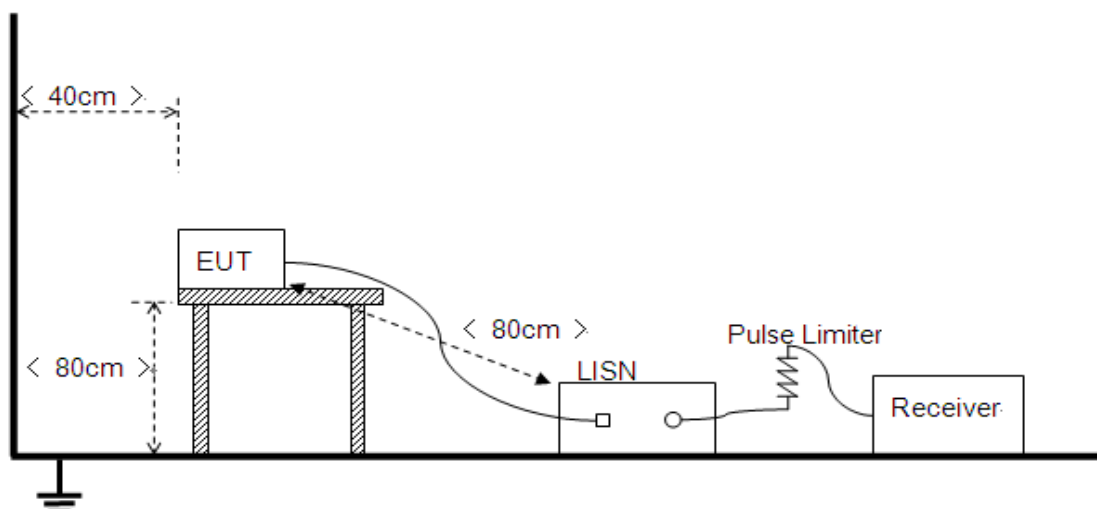
Frequency Range (MHz)	Conducted Limit (dB μ V)	
	Quasi-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

NOTE:

- The limit subjects to the Class B digital device.
- The lower limit shall apply at the band edges.
- The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

3.1.2. Test Setup

Please refer to Annex A for the photographs of the Test Configuration.





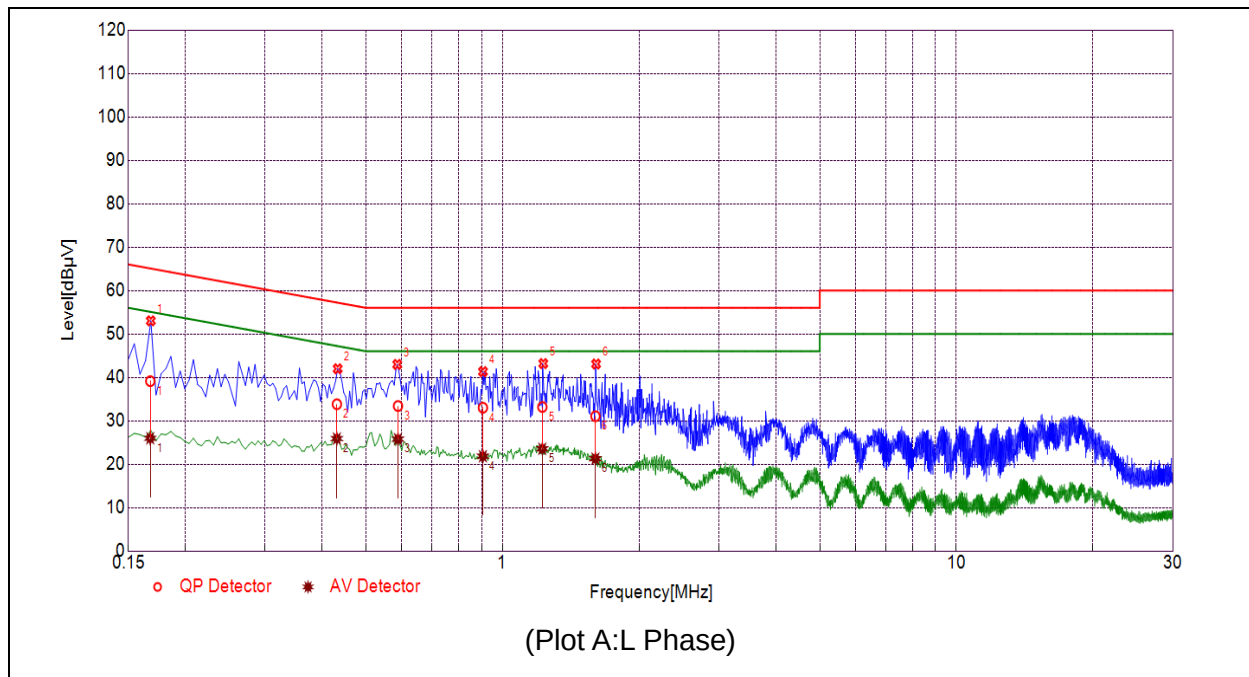
The EUT is placed on a 0.8m high insulating table, which stands on the grounded conducting floor, and keeps 0.4m away from the grounded conducting wall. The EUT is connected to the power mains through a LISN which provides $50\Omega/50\mu\text{H}$ of coupling impedance for the measuring instrument. A Pulse Limiter is used to protect the measuring instrument. The factors of the whole test system are calibrated to correct the reading.

The power strip or extension cord has been investigated to make sure that the LISN integrity is maintained with respect to the impedance characteristics as prescribed in ANSI C63.4-2014 at Clause 4.3.

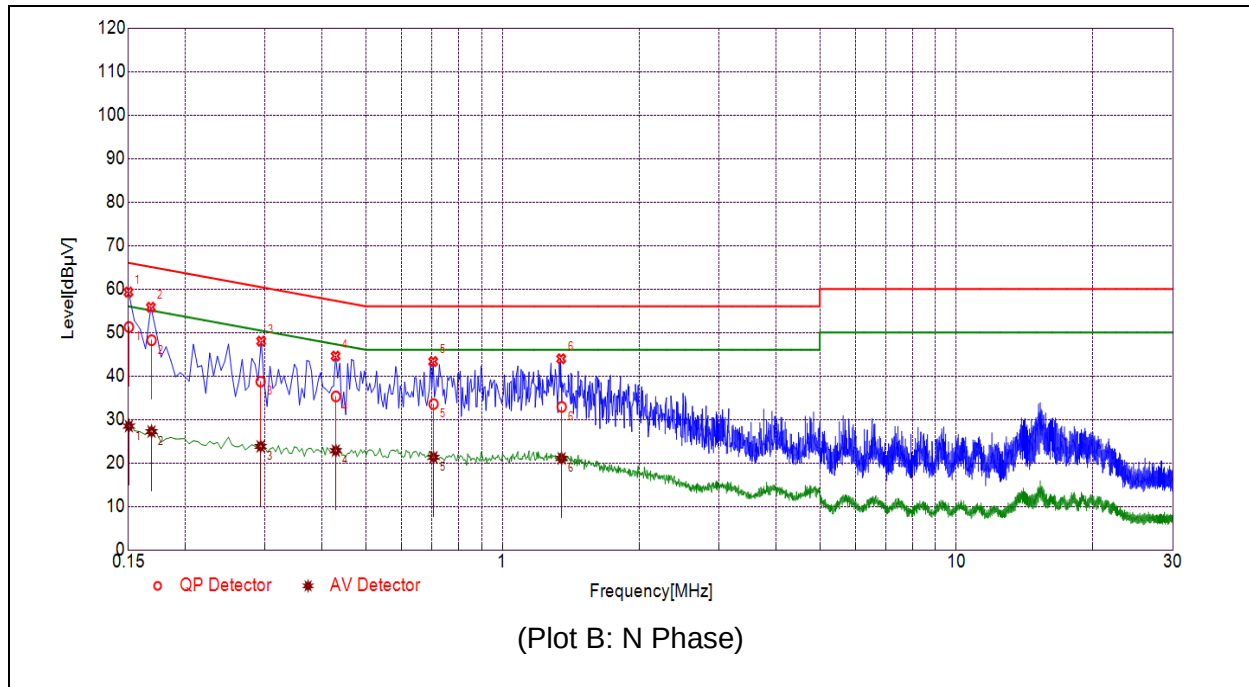
3.1.3. Test Result

Set RBW=9 kHz, VBW=30 kHz. The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. All test modes are considered, refer to recorded points and plots below.

A. Test Plot and Suspicious Points:



NO.	Fre. (MHz)	Emission Level (dBμV)		Limit (dBμV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1675	39.12	25.95	65.09	55.09	Line	PASS
2	0.4317	33.80	25.88	57.22	47.22		PASS
3	0.5885	33.39	25.75	56.00	46.00		PASS
4	0.9055	33.00	21.82	56.00	46.00		PASS
5	1.2239	33.16	23.53	56.00	46.00		PASS
6	1.6024	31.04	21.26	56.00	46.00		PASS



NO.	Fre. (MHz)	Emission Level (dBμV)		Limit (dBμV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1503	51.25	28.46	65.98	55.98	Neutral	PASS
2	0.1686	48.21	27.20	65.03	55.03		PASS
3	0.2932	38.71	23.79	60.43	50.43		PASS
4	0.4294	35.28	22.81	57.26	47.26		PASS
5	0.7048	33.52	21.28	56.00	46.00		PASS
6	1.3501	32.87	21.03	56.00	46.00		PASS



3.2. Radiated Emission

3.2.1. Requirement

According to FCC section 15.109 (a), the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency Range (MHz)	Field Strength Limitation at 3m Measurement Dist	
	($\mu\text{V/m}$)	(dB $\mu\text{V/m}$)
30.0 - 88.0	100	20log 100
88.0 - 216.0	150	20log 150
216.0 - 960.0	200	20log 200
Above 960.0	500	20log 500

As shown in FCC section 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector. When average radiated emission measurements are specified in this part, including emission measurements below 1000MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.

Note:

- 1) The tighter limit shall apply at the boundary between two frequency range.
- 2) Limitation expressed in dB $\mu\text{V/m}$ is calculated by $20\log$ Emission Level($\mu\text{V/m}$).

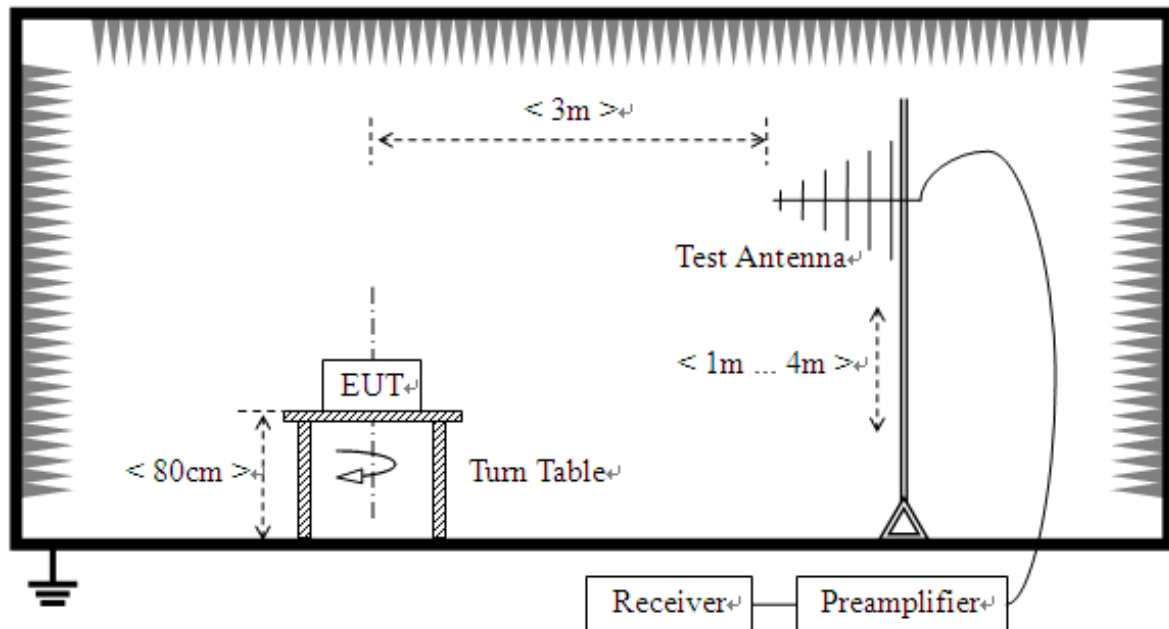
3.2.2. Frequency Range of Measurement

According to 15.33(b)(1), the frequency range of radiated measurement for the EUT is listed in the following table:

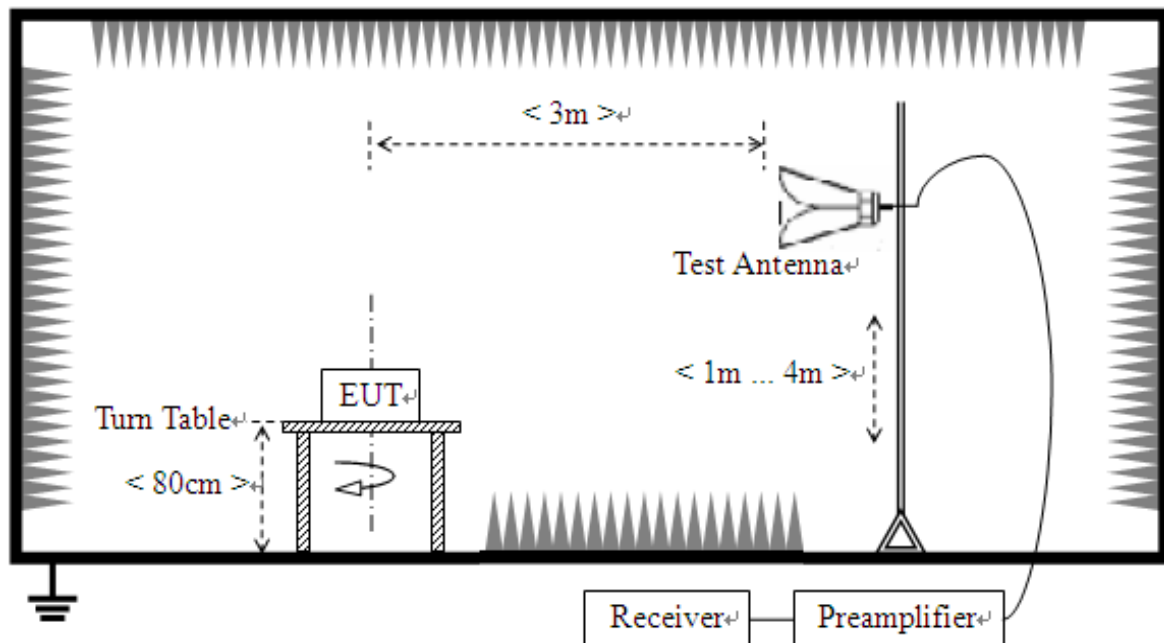
Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30.
1.705–108	1000.
108–500	2000.
500–1000	5000.
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower.

3.2.3. Test Setup

- 1) For radiated emissions from 30MHz to 1GHz



- 2) For radiated emissions above 1GHz





The test is performed in a 3m Semi-Anechoic Chamber; the antenna factor, cable loss and so on of the site (factors) is calculated to correct the reading. The EUT is placed on a 0.8m high insulating Turn Table, and keeps 3m away from the Test Antenna, which is mounted on variable-height antenna master tower.

For the test Antenna:

In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength. The emission levels at both horizontal and vertical polarizations should be tested.

For measurements below 1GHz the resolution bandwidth is set to 120 kHz for peak detection measurements or 120kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

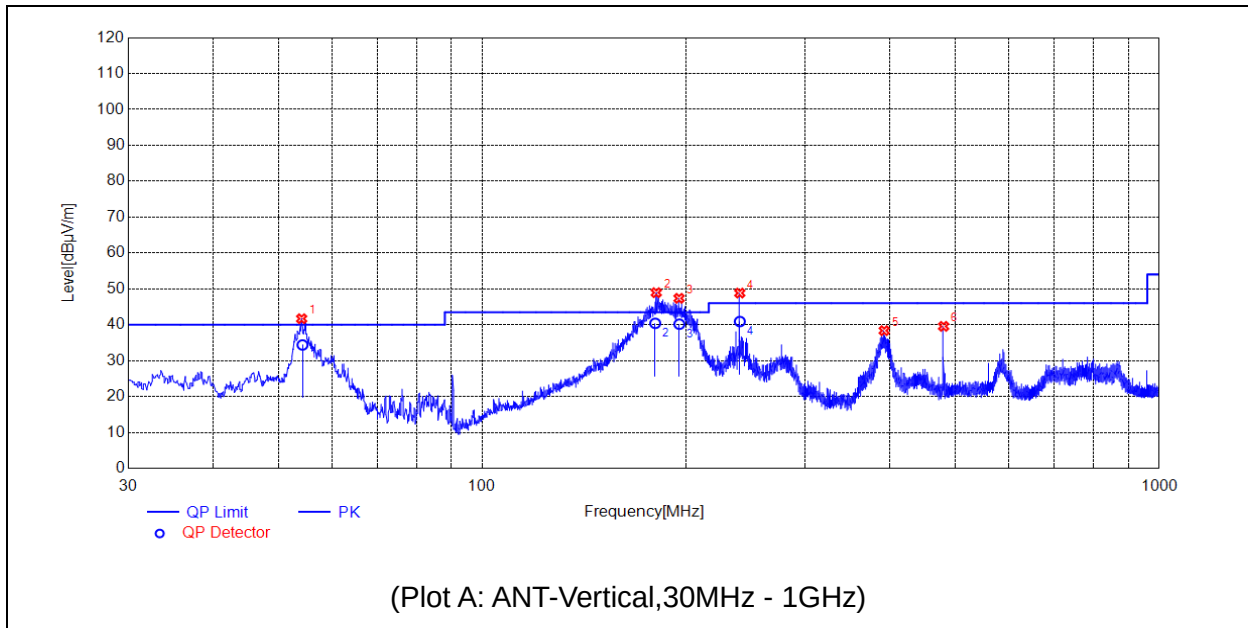
For measurements above 1GHz the resolution bandwidth is set to 1MHz, the video bandwidth is set to 3MHz for peak measurements and as applicable for average measurements.

3.2.4. Test Result

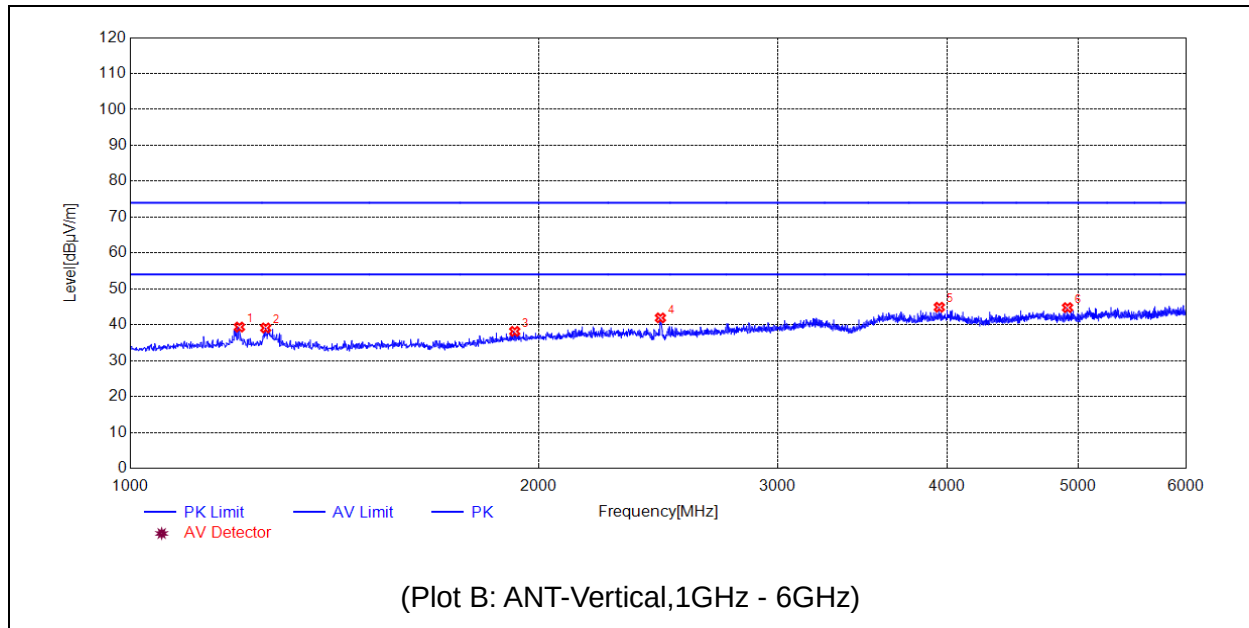
The maximum radiated emission is searched using PK, QP and AV detectors; the emission levels more than the limits, and that have narrow margins from the limits will be re-measured with AV and QP detectors. Both the vertical and the horizontal polarizations of the Test Antenna are considered to perform the tests. All test modes are considered, refer to recorded points and plots below.

The amplitude of emissions which (6GHz-40GHz) are attenuated more than 20 dB below the permissible value need not be reported.

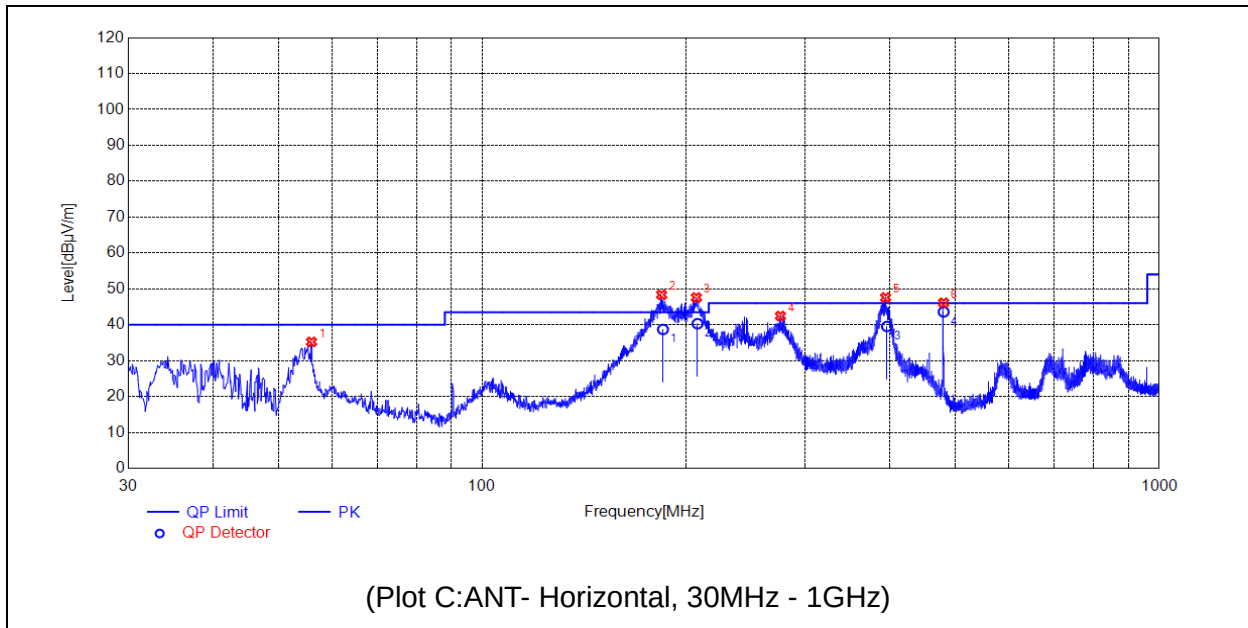
Note: All radiated emission tests were performed in X, Y, Z axis direction, and only the worst axis test condition was recorded in this test report.



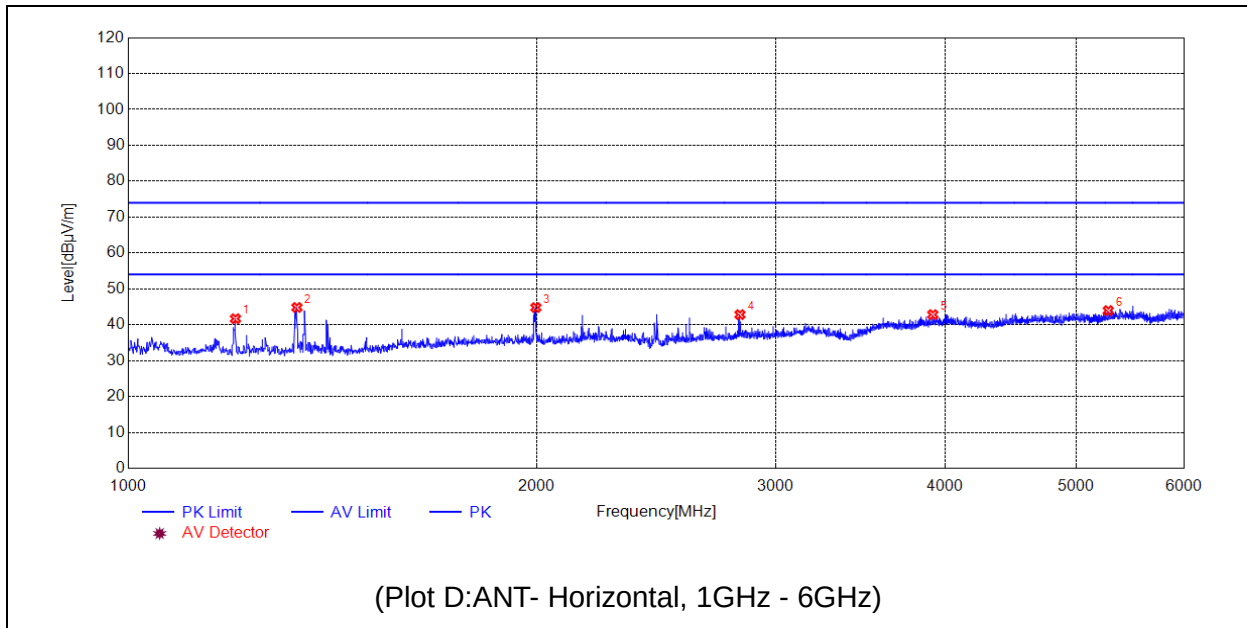
No.	Fre. MHz	PK dBμV/m	QP dBμV/m	AV dBμV/m	Limit-PK dBμV/m	Limit-QP dBμV/m	Limit-AV dBμV/m	ANT	Verdict
1	54.0584	41.69	34.38	N.A	N.A	40.00	N.A	V	PASS
2	180.6561	48.94	40.41	N.A	N.A	43.50	N.A	V	PASS
3	195.2075	47.37	40.17	N.A	N.A	43.50	N.A	V	PASS
4	240.0260	48.83	40.91	N.A	N.A	46.00	N.A	V	PASS
5	392.2342	38.36	N.A	N.A	N.A	46.00	N.A	V	PASS
6	480.0280	39.56	N.A	N.A	N.A	46.00	N.A	V	PASS



No.	Fre. MHz	PK dBμV/m	QP dBμV/m	AV dBμV/m	Limit-PK dBμV/m	Limit-QP dBμV/m	Limit-AV dBμV/m	ANT	Verdict
1	1203.0406	39.36	N.A	N.A	74.00	N.A	54.00	V	PASS
2	1258.0516	39.11	N.A	N.A	74.00	N.A	54.00	V	PASS
3	1920.1840	38.16	N.A	N.A	74.00	N.A	54.00	V	PASS
4	2459.2919	41.91	N.A	N.A	74.00	N.A	54.00	V	PASS
5	3948.5897	44.89	N.A	N.A	74.00	N.A	54.00	V	PASS
6	4908.7818	44.78	N.A	N.A	74.00	N.A	54.00	V	PASS



No.	Fre. MHz	PK dBμV/m	QP dBμV/m	AV dBμV/m	Limit-PK dBμV/m	Limit-QP dBμV/m	Limit-AV dBμV/m	ANT	Verdict
1	55.9016	35.23	N.A	N.A	N.A	40.00	N.A	H	PASS
2	183.9544	48.35	38.70	N.A	N.A	43.50	N.A	H	PASS
3	207.0427	47.59	40.30	N.A	N.A	43.50	N.A	H	PASS
4	275.6286	42.44	N.A	N.A	N.A	46.00	N.A	H	PASS
5	394.0774	47.59	39.54	N.A	N.A	46.00	N.A	H	PASS
6	480.0280	46.12	43.59	N.A	N.A	46.00	N.A	H	PASS



No.	Fre. MHz	PK dBμV/m	QP dBμV/m	AV dBμV/m	Limit-PK dBμV/m	Limit-QP dBμV/m	Limit-AV dBμV/m	ANT	Verdict
1	1199.0398	41.69	N.A	N.A	74.00	N.A	54.00	H	PASS
2	1331.0662	44.82	N.A	N.A	74.00	N.A	54.00	H	PASS
3	1997.1994	44.79	N.A	N.A	74.00	N.A	54.00	H	PASS
4	2824.3649	42.82	N.A	N.A	74.00	N.A	54.00	H	PASS
5	3918.5837	42.83	N.A	N.A	74.00	N.A	54.00	H	PASS
6	5278.8558	43.95	N.A	N.A	74.00	N.A	54.00	H	PASS



Annex B Test Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

Uncertainty of Conducted Emission Measurement

Measuring Uncertainty for a Level of Confidence of 95%(U=2Uc(y))	9kHz-150kHz	±3.3dB
	150kHz-30MHz	±2.8dB

Uncertainty of Radiated Emission Measurement

Measuring Uncertainty for a Level of Confidence of 95%(U=2Uc(y))	30MHz-200MHz	±5.06dB
	200MHz-1000MHz	±5.04dB
	1GHz-6GHz	±5.18dB
	6GHz-18GHz	±5.48dB



Annex C Testing Laboratory Information

1. Identification of the Responsible Testing Laboratory

Laboratory Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Laboratory Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
Telephone:	+86 755 36698555
Facsimile:	+86 755 36698525

2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

3. Accreditation Certificate

Accredited Testing Laboratory:	The FCC designation number is CN1192. Test firm registration number is 226174. (Shenzhen Morlab Communications Technology Co., Ltd.)
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4. Test Software Utilized

Model	Version Number	Producer
TS+ -[JS32-RE]	Version 2.5.0.6	Tonscend
TS+ -[JS32-CE]	Version 2.5.0.0	Tonscend

**5. Test Equipments Utilized**

Description	Model	Serial No.	Manufacturer	Cal. Date	Due. Date
Bi-Log Antenna	VULB 9163	9163-519	SCHWARZBECK	2019/5/24	2022/5/23
Horn Antenna	BBHA 9120D	01774	SCHWARZBECK	2019/7/26	2022/7/25
Receiver	N9038A	MY56400093	KEYSIGHT	2021/3/9	2022/3/8
Signal Analyzer	N9020A	MY56060145	Agilent	2021/7/26	2022/7/25
Horn Antenna	BBHA 9170	BBHA 9170#774	SCHWARZBECK	2019/7/26	2022/7/25
6db Attenuator	BW-N6W5+	E191001	Mini-circuits	2021/10/18	2022/10/17
Preamplifier	S020180L3203	61171/61172	LUCIX CORP.	2021/7/16	2022/7/15
Preamplifier	S10M100L3802	46732	LUCIX CORP.	2021/7/16	2022/7/15
Preamplifier	S150300L3202	71136	LUCIX CORP.	2021/7/16	2022/7/15
Receiver	ESPI	101052	R&S	2021/7/16	2022/7/15
LISN	NSLK 8127	8127449	Schwarzbeck	2021/3/9	2022/3/8
10dB Pulse Limiter	VTSD 9561-F	VTSD 9561 F-B #206	SCHWARZBECK	2021/7/21	2022/7/20

5. Ancillary Equipment Utilized

Description	Manufacturer	Model	Serial No.
PC	APPLE	A1370	NA
PC Adapter	APPLE	A1374	NA
Earphone	NA	NA	NA

_____ END OF REPORT _____