FCC PART 15C
TEST REPORT
No.I22Z60151-EMC03

for

Honor Device Co., Ltd.

Smart Phone

Model Name: VNE-N41

FCC ID: 2AYGCVNE-N41

with

Hardware Version: HN2VNEM

Software Version: 4.2.0.55(C900E55R1P1)

Issued Date: 2022-06-15

Note:

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The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S.Government.

Test Laboratory:

CTTL, Telecommunication Technology Labs, CAICT

No.52, HuayuanNorth Road, Haidian District, Beijing, P. R. China 100191.

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I22Z60151-EMC03	Rev.0	1st edition	2022-06-15

CONTENTS

1. Test Laboratory

1.1. Introduction &Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2017 accredited test laboratory under NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM (NVLAP) with lab code 600118-0, and is also an FCC accredited test laboratory (CN5017), and ISED accredited test laboratory (ISED#: 24849). The detail accreditation scope can be found on NVLAP website.

1.2. Testing Location

Test Location: CTTL (Huayuan North Road)

Address: No. 52 Huayuan North Road, Haidian District, Beijing 100191, P.R. China

1.3. Testing Environment

Normal Temperature: 15-35℃

Relative Humidity: 20-75%

1.4. Project data

Testing Start Date: 2022-04-27

Testing End Date: 2022-05-25

1.5. Signature

安辉

An Hui

(Prepared this test report)

张颖

Zhang Ying

(Reviewed this test report)

张夏

Zhang Xia

(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	Honor Device Co., Ltd.
Address /Post:	Suite 3401,Unit A,Building 6,Shum Yip Sky Park,No.8089,Hongli West Road,Xiangmihu Street,Futian District,Shenzhen,Guangdong 518040,People's Republic of China
Contact:	/
Email:	/
Telephone:	/

2.2. Manufacturer Information

Company Name:	Honor Device Co., Ltd.
Address /Post:	Suite 3401,Unit A,Building 6,Shum Yip Sky Park,No.8089,Hongli West Road,Xiangmihu Street,Futian District,Shenzhen,Guangdong 518040,People's Republic of China
Contact:	/
Email:	/
Telephone:	/

3. PRODUCT INFORMATION

3.1. About EUT

Description	Smart Phone
Model name	VNE-N41
FCC ID	2AYGCVNE-N41

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of T CTTL-Telecommunication Technology Labs, CAICT

3.2. Internal Identification of EUT

EUT ID*	SN or IMEI	HW Version	SW Version
UT22a	864258060052700/864258060067179	HN2VNEM	4.2.0.55(C900E55R1P1)
UT25a	864258060053740/864258060068219	HN2VNEM	4.2.0.55(C900E55R1P1)
UT27a	864258060054268/864258060068730	HN2VNEM	4.2.0.55(C900E55R1P1)
UT29a	864258060052007/864258060066478	HN2VNEM	4.2.0.55(C900E55R1P1)

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE

AE ID*	Description	Note
AE1-1	Adapter	HN-100225U00 (Salcomp)
AE1-2	Adapter	HN-100225E00 (Salcomp)
AE1-3	Adapter	HW-100225U00 (Huntkey)
AE1-4	Adapter	HW-100225E00 (Huntkey)
AE1-5	Adapter	HW-100225B00 (Huntkey)
AE2-1	USB Cable	CUDU01B-HC451 -EH (FF)
AE2-2	USB Cable	AU2-CRO013 HF (LJ)
AE2-3	USB Cable	L125UC007-CS-H (LX)
AE2-4	USB Cable	2120-00001-0 (MG)
AE2-5	USB Cable	RY0002 (NB)
AE3-1	Headset	1293-3283-3.5mm-339
AE3-2	Headset	EPAB542-2WH05-DH
AE3-3	Headset	MEND1532B528A11
AE4-1	Battery	HB496590EFW（SCUD）
AE4-2	Battery	HB496590EFW-F（SCUD）
AE4-3	Battery	HB496590EFW（NVT）
AE4-4	Battery	HB496590EFW-F（NVT）

*AE ID: is used to identify the test sample in the lab internally.

3.4. General Description

Equipment Under Test (EUT) is a model of Smart Phone with integrated antenna.

It has MP3, MP4,Camera, USB memory, Bluetooth 5.1, Wi-Fi (802.11b/g/n/ac/ax) , GNSS functions.

Manual and specifications of the EUT were provided to fulfil the test.

Samples undergoing test were selected by the client.

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

3.5. Interpretation of the Test Environment

For the test methods, the test environment uncertainty figures correspond to an expansion factor k=2.

Measurement Uncertainty

Parameter	Uncertainty
temperature	0.48°C
humidity	2 %
DC voltages	0.003V

4. Reference Documents

4.1. Documents supplied by applicant

EUT parameters, referring to Annex A for detailed information, is supplied by the client or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part15	FCC CFR 47, Part 15, Subpart C: 15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.247 Operation within the bands 902–928MHz, 2400–2483.5 MHz, and 5725–5850 MHz.	2021
ANSI C63.10	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices	June,2013
KDB 558074 D01	Federal Communications Commission Office of Engineering and Technology Laboratory Division GUIDANCE FOR COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEM, FREQUENCY HOPPING SPREAD SPECTRUM SYSTEM, AND HYBRID SYSTEM DEVICES OPERATING UNDER SECTION 15.247 OF THE FCC RULES	2019

Note: The test methods have no deviation with standards.

5. Test Results

5.1. Summary of Test Results

Abbreviations used in this clause:

P Pass, The EUT complies with the essential requirements in the standard.

F Fail, The EUT does not comply with the essential requirements in the standard

NA Not Applicable, The test was not applicable

NP Not Performed, The test was not performed by CTTL

SUMMARY OF MEASUREMENT RESULTS	Sub-clause of Part15C	Verdict
Radiated Spurious Emission	15.247, 15.205, 15.209	**P**
AC Power line Conducted Emission	15.107, 15.207	**P**

Please refer to **ANNEX C** for detail.

The measurement is made according to ANSI C63.10.

5.2. Statements

CTTL has evaluated the test cases requested by the applicant /manufacturer as listed in section 5.1 of this report for the EUT specified in section 3 according to the standards or reference documents listed in section 4.2

5.3. Test Conditions

For this report, if the test cases listed above are tested under normal temperature and normal voltage, and also under norm humidity, the specific condition is shown as follows:

Temperature	Normal Temperature	26℃
Voltage	Normal Voltage	4.0V
Humidity	Normal Humidity	20-75%

6. Test Facilities Utilized

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Loop Antenna	HFH2-Z2	829324/007	R&S	1 year	2022-12-22
2	EMI Antenna	3115	00167250	ETS-Lindgren	1 year	2022-07-01
3	EMI Antenna	VULB9163	9163-302	Schwarzbeck	1 year	2022-12-28
4	Test Receiver	ESW44	103023	R&S	1 year	2022-10-28
5	EMI Antenna	3116	2663	ETS-Lindgren	1 year	2022-08-11

AC Powerline Conducted Emission

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	LISN	ENV216	101200	Rohde & Schwarz	1 year	2022-05-30
2	Test Receiver	ESCI 7	100344	Rohde & Schwarz	1 year	2023-02-21

7. Measurement Uncertainty

Radiated Spurious Emission

Measurement Uncertainty:

Frequency Range	Uncertainty(dBm) (k=2)
9kHz-30MHz	4.92
30MHz ≤ f ≤ 1GHz	5.15
1GHz ≤ f ≤18GHz	5.54
18GHz ≤ f ≤40GHz	5.26

AC Power-line Conducted Emission

Measurement Uncertainty (k=2)	3.08dB

ANNEX A: EUT parameters

Disclaimer: The antenna gain and setting power provided by the client may affect the validity of the measurement results in this report, and the client shall bear the impact and consequences arising therefrom.

ANNEX B: Antenna Requirements

According to FCC 47 CFR § 15.203:
“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”
(1) The antennas of the EUT are permanently attached.
(2) The EUT complies with the requirement of §15.203

ANNEX C: Detailed Test Results

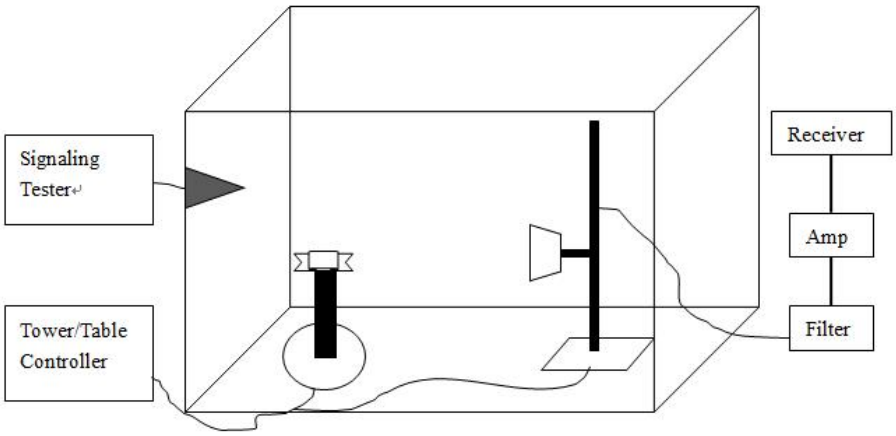
C.1. Radiated Spurious Emission

Specification Reference

FCC 47 CFR Part 15.247, 15.205, 15.209

Method of Measurement

Testing was performed in according with ANSI C63.10-2013 and KDB 558074.
The radiated emission test is performed in semi-anechoic chamber. The distance from the EUT to the reference point of measurement antenna is 3m. The test is carried out on both vertical and horizontal polarization and only maximization result of both polarizations is kept. During the test, the turntable is rotated 360° and the measurement antenna is moved from 1m to 4m to get the maximization result.



Measurement Limit

Standard	Limit
FCC 47 CFR Part 15.247, 15.205, 15.209	20dB below peak output power

In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

Limit in restricted band:

Frequency (MHz)	Field strength(μV/m)	Measurement distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30

Frequency of emission (MHz)	Field strength (uV/m)	Field strength (dBuV/m)	Measurement distance (m)
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Test settings

Frequency of emission (MHz)	RBW/VBW
30-1000	100kHz/300kHz
1000-4000	1MHz/3MHz
4000-18000	1MHz/3MHz
18000-26500	1MHz/3MHz

Sample Calculation

The measurement results are obtained as described below:

Result=P_{Mea}+$A_{Rpl=}$ P_{Mea}+Cable Loss+Antenna Factor

A "reference path loss" is established and the A_{Rpl} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

P_{Mea} is the field strength recorded from the instrument.

Test Notes

1. The EUT is operating at its maximum duty cycle and its maximum power control level.
2. Investigation has been done on all channel, modes and modulations/data rates. Only the radiated emissions of the configurations that produced the worst case emissions are reported in this section.

C.1.1 Radiated Spurious Emission- above 1GHz

EUT set-up No.	Combination of EUT and AE
Set.1-1	EUT1 + AE1-1 + AE2-1

Results Set.1-1

Average Measurement results

GFSK 2402MHz

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17701.0	42.33	-25.70	46.00	22.13	54.00	11.67	V
13758.5	39.95	-29.10	40.90	28.15	54.00	14.05	H
12364.5	37.85	-31.10	38.90	30.05	54.00	16.15	V
9122.5	35.03	-33.80	38.10	30.83	54.00	18.97	H
7903.5	34.05	-34.90	37.10	31.85	54.00	19.95	H
2353.2	42.47	-20.10	28.00	34.47	54.00	11.53	H

GFSK 2440MHz

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17600.5	41.94	-25.70	46.00	21.74	54.00	12.06	H
13761.5	39.35	-29.10	40.90	27.55	54.00	14.65	H
12854.5	37.18	-30.70	39.10	28.68	54.00	16.82	V
9631.0	34.77	-33.10	38.00	29.87	54.00	19.23	V
7318.0	33.57	-35.10	36.60	32.07	54.00	20.43	H
4940.0	28.41	-37.10	33.30	32.21	54.00	25.59	H

GFSK 2480MHz

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17993.5	41.71	-25.50	46.70	20.51	54.00	12.29	V
13664.5	39.15	-29.50	40.40	28.25	54.00	14.85	H
12842.5	36.95	-30.70	39.10	28.45	54.00	17.05	V
9149.5	34.57	-33.80	38.10	30.37	54.00	19.43	H
7221.5	33.34	-35.50	36.40	32.44	54.00	20.66	H
2489.7	42.98	-20.00	28.30	34.68	54.00	11.02	V

Peak Measurement results

GFSK 2402MHz

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17873.0	53.29	-25.50	46.70	32.09	74.00	20.71	V
13664.5	50.89	-29.50	40.40	39.99	74.00	23.11	V
12857.0	48.73	-30.70	39.10	40.23	74.00	25.27	V
9717.5	46.44	-33.00	38.00	41.44	74.00	27.56	H
7797.0	46.09	-35.10	37.00	44.19	74.00	27.91	H
2343.6	55.07	-20.10	28.00	47.17	74.00	18.93	H

GFSK 2440MHz

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17400.5	52.95	-26.90	45.20	34.55	74.00	21.05	H
13577.0	50.82	-29.50	40.40	39.92	74.00	23.18	V
12905.5	49.29	-30.50	39.20	40.59	74.00	24.71	H
9091.5	46.23	-33.80	38.10	41.83	74.00	27.77	V
7232.5	44.69	-35.50	36.40	43.79	74.00	29.31	H
4934.5	40.14	-37.10	33.30	43.94	74.00	33.86	V

GFSK 2480MHz

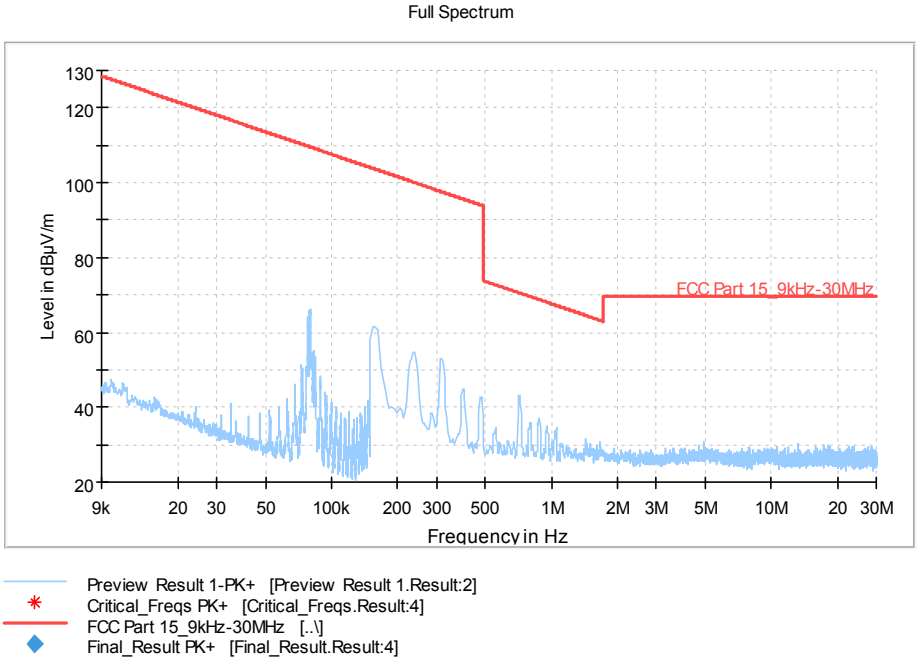
Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17910.5	53.93	-25.50	46.70	32.73	74.00	20.07	H
13538.5	50.98	-29.60	40.00	40.58	74.00	23.02	H
12876.0	48.47	-30.70	39.10	39.97	74.00	25.53	H
8940.0	46.06	-33.30	38.20	41.16	74.00	27.94	H
7829.0	44.60	-35.10	37.00	42.70	74.00	29.40	H
2497.9	54.67	-20.00	28.40	46.27	74.00	19.33	V

The EUT is no radiated spurious emission above 18GHz, all the signals are background noise.

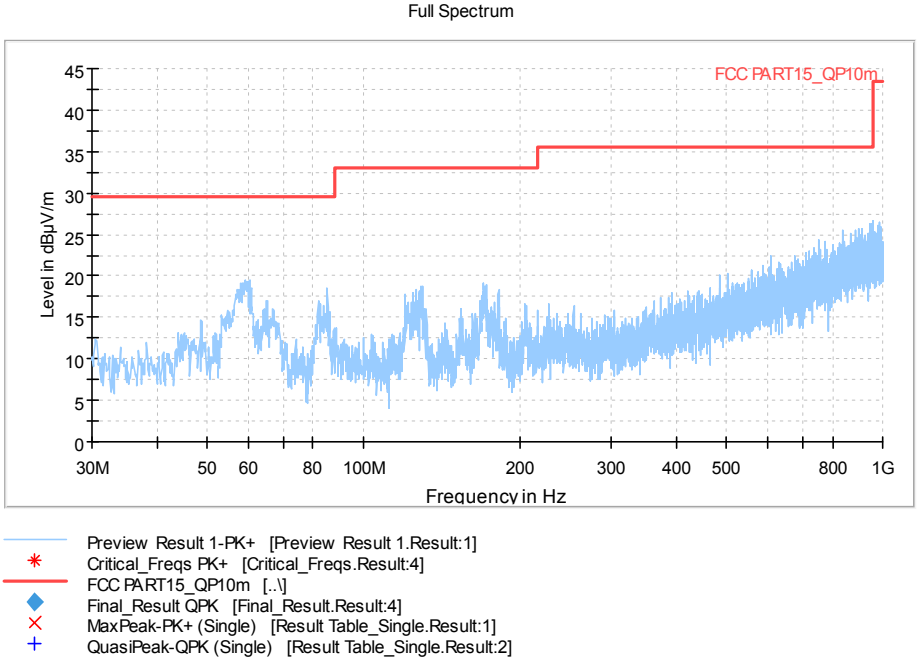
Conclusion: PASS

C.1.2 Radiated Spurious Emission- Below 1GHz

WOSRT CASE BELOW 30MHz（Set.1-1, GFSK Ch 0, Chain A）



WOSRT CASE BELOW 1GHz（Set.1-1, GFSK Ch 0, Chain A）



C.1.3 Band Edges Compliance– Radiated

EUT set-up No.	Combination of EUT and AE	ANT NO.
Set.1-1	EUT1 + AE6+AE2-1	Chain A
		Chain B
Set.1-2	EUT2 + AE6+AE2-2/AE2-3	Chain A

For EUT1 and EUT2 the measurements were performed separately in Chain A, Chain B and only the worst cases are shown in this report.

Results Set.1-1, Chain A

Mode	Channel	Frequency Range	Test Results	Conclusion
GFSK	0	2.31GHz ~2.43GHz	Fig.1	P
	39	2.45GHz ~2.5GHz	Fig.2	P

Conclusion: PASS

Test graphs as below

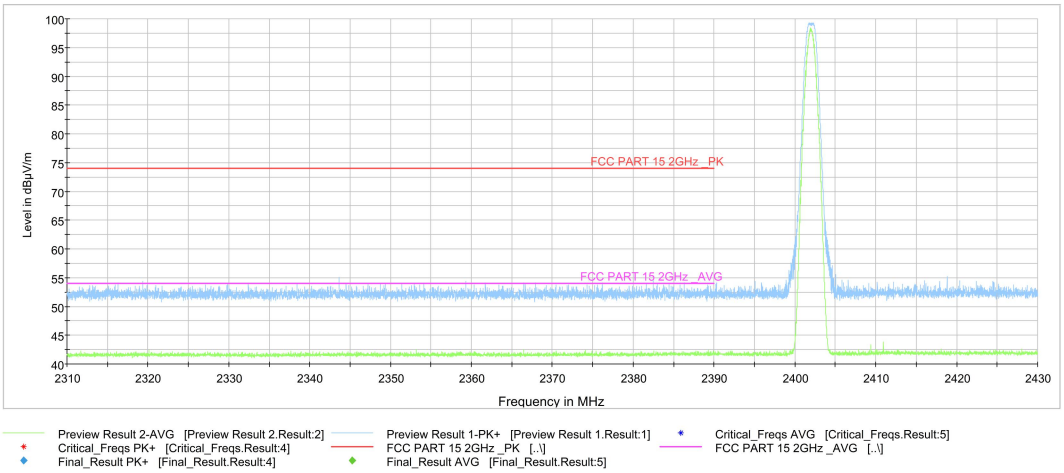


Fig.1. Frequency Band Edges: GFSK, 2402 MHz, 2.31 GHz – 2.43GHz

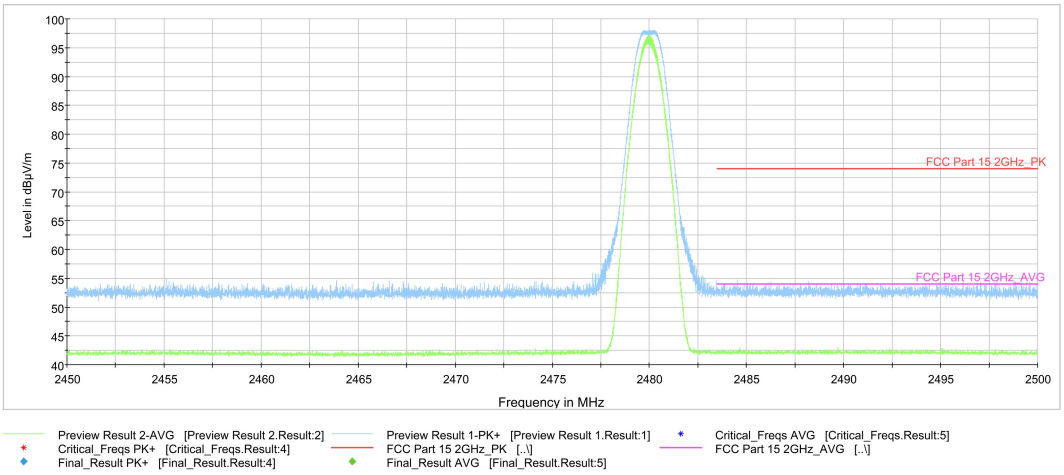


Fig.2. Frequency Band Edges: GFSK, 2480 MHz, 2.45 GHz - 2.50GHz

C.2. AC Power line Conducted Emission

Specification Reference

FCC 47 CFR Part 15.207, 15.107& RSS-GEN, 8.8

Method of Measurement:

See Clause 6.2 of ANSI C63.10-2013 specifically.

See Clause 4 and Clause 5 of ANSI C63.10-2013 generally.

The conducted emissions from the AC port of the EUT are measured in a shielding room. The EUT is connected to a Line Impedance Stabilization Network (LISN). An overview sweep with peak detection was performed. The measurements were performed with a quasi-peak detector and if required, an average detector.

The conducted emission measurements were made with the following detector of the test receiver: Quasi-Peak / Average Detector.

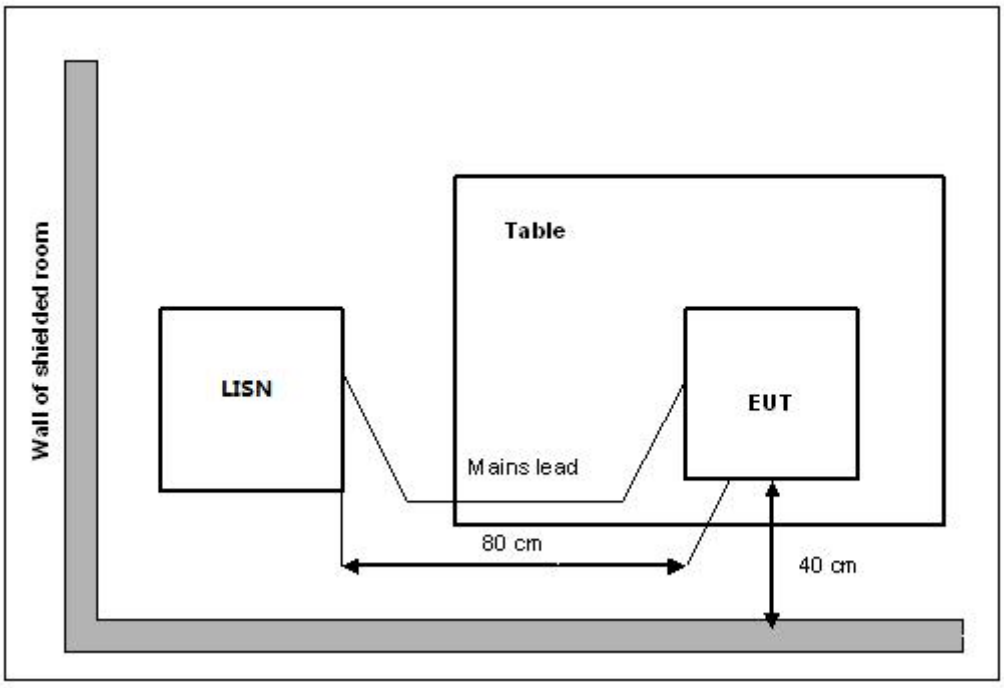
The measurement bandwidth is:

Frequency of Emission (MHz)	RBW/IF bandwidth	Sweep Time(s)
0.15-30	9kHz	1

Test Condition:

Voltage（V）	Frequency（Hz）
120	60

Measurement Setup



EUT Operating Mode and Test Conditions

The measurement of EUT is carried out under the transmit state.

The EUT is powered by an AC/travel adapter.

Measurement Result and limit:

EUT set-up No.	Combination of EUT and AE
Set.1-2	EUT1 + AE1-1 + AE2-1 + AE3-3

This configuration is the worst result of Set.1-1-Set.1-4 and Set.3-1-Set.3-4 in 15B.

Results Set.1-2

Bluetooth (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		With charger		
		bluetooth	Idle	
0.15 to 0.5	66 to 56	Fig.C.2.1	Fig.C.2.2	P
0.5 to 5	56			
5 to 30	60			
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

Bluetooth (Average Limit)

Frequency range (MHz)	Average Limit (dBμV)	Result (dBμV)		Conclusion
		With charger		
		bluetooth	Idle	
0.15 to 0.5	56 to 46	Fig.C.2.1	Fig.C.2.2	P
0.5 to 5	46			
5 to 30	50			
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

Conclusion: Pass

Test graphs as below:

Set.1-2, Ch 19

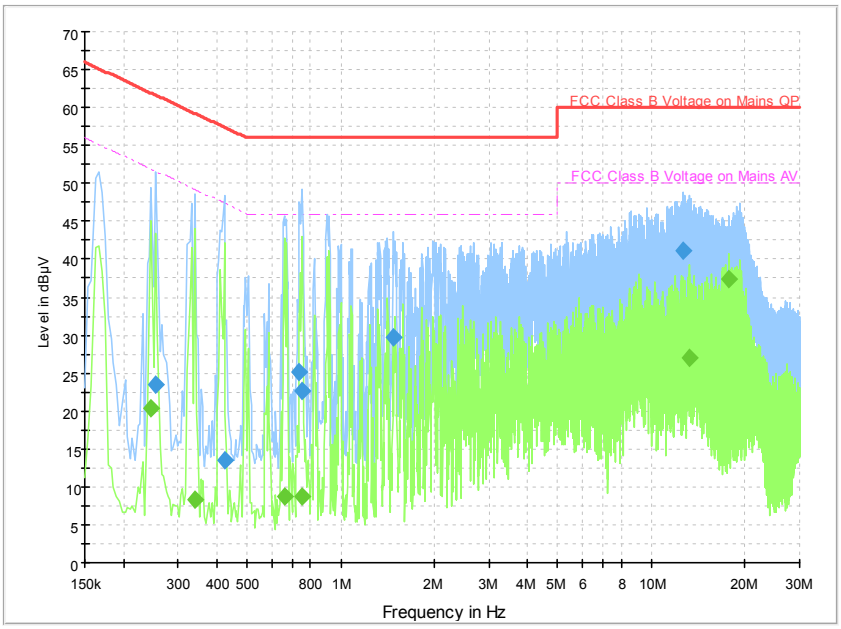


Fig.C.2.1 AC Power line Conducted Emission- bluetooth

Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.254000	23.5	5000.0	9.000	On	N	19.7	38.2	61.6
0.422000	13.4	5000.0	9.000	On	N	19.8	44.0	57.4
0.734000	25.0	5000.0	9.000	On	N	19.6	31.0	56.0
0.750000	22.6	5000.0	9.000	On	N	19.6	33.4	56.0
1.482000	29.7	5000.0	9.000	On	N	19.6	26.3	56.0
12.642000	41.2	5000.0	9.000	On	N	19.6	18.8	60.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.246000	20.4	5000.0	9.000	On	L1	19.8	31.5	51.9
0.338000	8.3	5000.0	9.000	On	N	19.8	41.0	49.3
0.658000	8.8	5000.0	9.000	On	L1	19.6	37.2	46.0
0.754000	8.7	5000.0	9.000	On	N	19.6	37.3	46.0
13.214000	27.1	5000.0	9.000	On	L1	19.6	22.9	50.0
17.834000	37.5	5000.0	9.000	On	L1	19.7	12.5	50.0

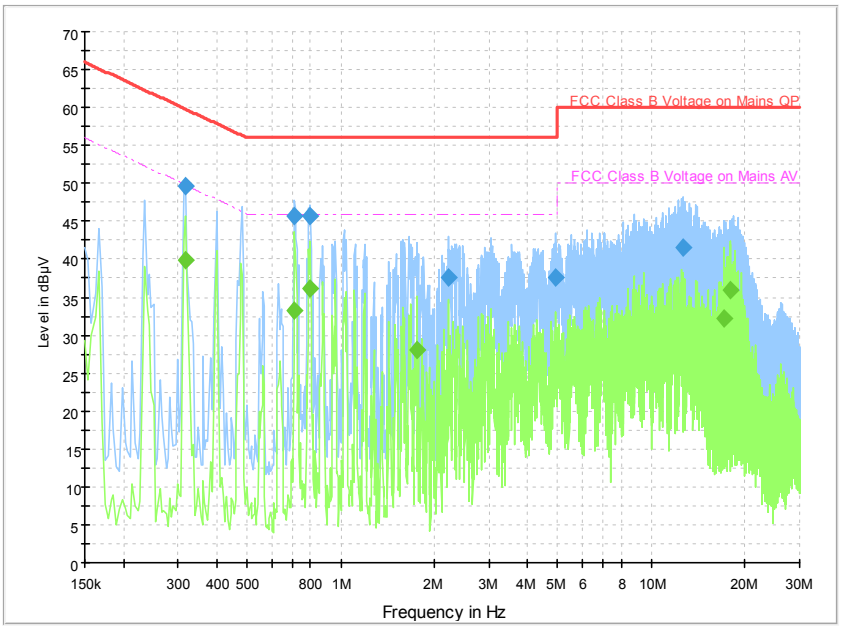


Fig.C.2.2 AC Power line Conducted Emission-Idle

Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.318000	49.6	5000.0	9.000	On	N	19.8	10.2	59.8
0.710000	45.8	5000.0	9.000	On	L1	19.6	10.2	56.0
0.798000	45.8	5000.0	9.000	On	N	19.6	10.2	56.0
2.214000	37.7	5000.0	9.000	On	L1	19.6	18.3	56.0
4.894000	37.6	5000.0	9.000	On	L1	19.6	18.4	56.0
12.706000	41.6	5000.0	9.000	On	L1	19.7	18.4	60.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.318000	39.9	5000.0	9.000	On	N	19.8	9.8	49.8
0.710000	33.3	5000.0	9.000	On	L1	19.6	12.7	46.0
0.798000	36.2	5000.0	9.000	On	N	19.6	9.8	46.0
1.758000	28.1	5000.0	9.000	On	N	19.6	17.9	46.0
17.202000	32.3	5000.0	9.000	On	L1	19.7	17.7	50.0
17.994000	36.0	5000.0	9.000	On	L1	19.7	14.0	50.0

*****END OF REPORT*****