



TEST REPORT

REPORT NUMBER: I21W00017-BLE_Rev2

ON

Type of Equipment: Tracker

Model Name: PA32

Manufacturer: Micron Electronics LLC.

ACCORDING TO

FCC Part 15, Subpart C, 2019:

15.205 Restricted bands of operation,

15.209 Radiated emission limits; general requirements,

15.247 Operation within the bands 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz

ANSI C63.10-2013:American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

Chongqing Academy of Information and Communications Technology

Month date, year

Aug, 16, 2021

Signature



Xiang Luoyong

Director

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of Chongqing Academy of Information and Communications Technology.

Report No.:I21W00017-BLE_Rev2

Revision Version

Report Number	Revision	Date	Memo
I21W00017-BLE	V0.0	2021-08-02	--
I21W00017-BLE_Rev1	V1.0	2021-08-13	--
I21W00017-BLE_Rev2	V2.0	2021-08-16	--

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

Report No.:I21W00017-BLE_Rev2

FCC ID: ZKQ-CM911B

Report Date: 2021-08-16

Test Firm Name: Chongqing Academy of Information and Communications Technology

FCC Registration Number: CN1239

Statement

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported tests were carried out on a sample equipment to demonstrate limited compliance with FCC Parts 15, subpart C. The sample tested was found to comply with the requirements defined in the applied rules.

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336

Tel: 0086-23-88069965

FAX: 0086-23-88608777

CONTENTS

1 GENERAL INFORMATION.....	4
1.1 NOTES.....	4
1.2 TESTERS.....	5
1.3 TESTING LABORATORY INFORMATION.....	6
1.4 DETAILS OF APPLICANT OR MANUFACTURER.....	7
2 TEST ITEM.....	8
2.1 GENERAL INFORMATION.....	8
2.2 OUTLINE OF EQUIPMENT UNDER TEST.....	9
2.3 MODIFICATIONS INCORPORATED IN EUT.....	9
2.4 EQUIPMENT CONFIGURATION.....	9
2.5 OTHER INFORMATION.....	10
3 SUMMARY OF TEST RESULTS.....	11
4 TEST EQUIPMENTS AND ANCILLARIES USED FOR TESTS.....	12
5 TEST RESULTS.....	13
5.1 MAXIMUM PEAK OUTPUT POWER.....	13
5.2 PEAK POWER SPECTRAL DENSITY.....	18
5.3 6dB OCCUPIED BANDWIDTH.....	26
5.4 BAND EDGES COMPLIANCE.....	31
5.5 TRANSMITTER SPURIOUS EMISSION-CONDUCTED.....	34
5.6 TRANSMITTER SPURIOUS EMISSION-RADIATED.....	42
5.7 POWER LINE CONDUCTED EMISSIONS.....	53
ANNEX A EUT PHOTOS.....	56
ANNEX B DEVIATIONS FROM PRESCRIBED TEST METHODS.....	57

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

1 General Information

1.1 Notes

All reported tests were carried out on a sample equipment to demonstrate limited compliance with FCC Parts 15, subpart C and ANSI C63.10-2013.

The test results of this test report relate exclusively to the item(s) tested as specified in section 2.

The following deviation from, additions to, or exclusions from the test specifications have been made. See Annex B.

Chongqing Academy of Information and Communications Technology authorizes the applicant or manufacturer (see section 1.4) to reproduce this report provided, and the test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of Chongqing Academy of Information and Communications Technology. Mr. Zhang Yan.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Chongqing Institute of Telecommunications accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965

FAX: 0086-23-88608777

1.2 Testers

Name: Zhang qinghao
Position: Engineer
Department: Department of RF test
Date: 2021-06-18 to 2021-06-30

Signature:



Editor of this test report:

Name: Chen Wen
Position: Engineer
Department: Department of RF test
Date: 2021-08-16

Signature:



Technical responsibility for area of testing:

Name: Xiang Luoyong
Position: Manager
Department: Director of the laboratory
Date: 2021-08-16

Signature:



1.3 Testing Laboratory information

1.3.1 Location

Name: Chongqing Academy of Information and Communications Technology

Address: Building B, Technology Innovation Center, No.8, Yuma Road, Chayuan New Area, Nan'an District, Chongqing, People's Republic of China, 401336

Tel: +86-23-88069965

Fax: +86-23-88608777

Email: liqiao@caict.ac.cn

1.3.2 Test location, where different from section 1.3.1

Name: -----

Street: -----

City: -----

Country: -----

Telephone: -----

Fax: -----

Postcode: -----

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

1.4 Details of applicant or manufacturer

1.4.1 Applicant

Name: Micron Electronics LLC.

Address: 1001 Yamato Road, Suite 400, Boca Raton, FL 33431, USA

Country: USA

Telephone: +18885383489

Fax: --

Contact: Ping Cheng

Email: pcheng@micron-electronics.com

1.4.2 Manufacturer (if different from applicant in section 1.4.1)

Name: --

Address: --

Country: --

Telephone: --

Fax: --

Contact: --

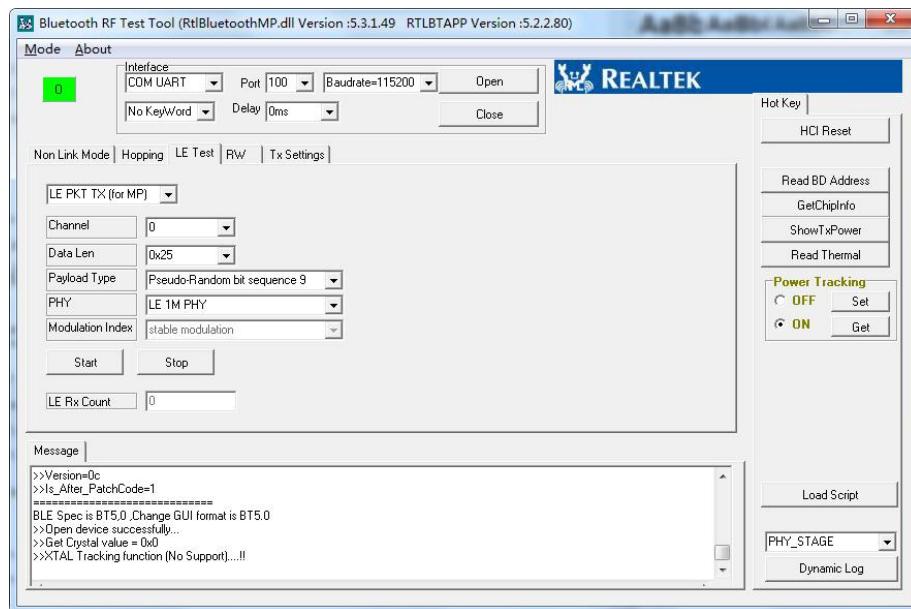
Email: --

2 Test Item

2.1 General Information

Manufacturer: Micron Electronics LLC.
Type of Equipment: Tracker
Model Name: PA32
Production Status: Product
Hardware Version: A108_V2_PCB
Software Version: PA32V02.01B06.I01
Antenna description: Built in FPC antenna
Antenna Gain: 0.5dBi
Test SW Version: 5.2.2.80
frequency range: 2402-2480MHz
Normal Voltages: 3.80 V
Receipt date of test item: 2021-06-18

EUT uses tool to control emission measurement, Change power level, channel, rate and bandwidth. TX transmitter power level set to 8.



Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

2.2 Outline of Equipment under Test

The PA32, referred to as “EUT” hereafter, is a multi-Band wireless modem operating on the GSM/CAT-M1/Wi-Fi/BLUETOOTH 5.0 networks. The table below shows the supported bands for the EUT.

Technology	Freq.(MHz)	Note
Bluetooth	2402-2480	--

2.3 Modifications Incorporated in EUT

The EUT has not been modified from what is described by the brand name and unique type identification stated above.

2.4 Equipment Configuration

Equipment configuration list:

Item	Generic Description	Manufacturer	Type	Serial No.	Remarks
A	Modules	Micron Electronics LLC.	Tracker	866884045657996	--
B	Modules	Micron Electronics LLC.	Tracker	866884045658127	--
C	data line	--	--	--	--
D	Adapter	--	--	50714	--

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

2.5 ANTENNA REQUIREMENT

Standard Applicable

For intentional device , according to FCC 47 FR Section 15.203 , an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device .

Refer to statement below for compliance .

The manufacturer may design the unit so that the user can replace a broken antenna , but the use of a standard antenna jack or electrical connector is prohibited . Further , this requirement does not apply to intentional radiators that must be professionally installed.

Antenna Connected Construction

The antenna used in this product is a Internal Antenna . It conforms to the standard requirements . The directional gains of antenna used for transmitting is 0.5dBi

2.6 Other Information

--

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

Report No.:I21W00017-BLE_Rev2

3 Summary of Test Results

A brief summary of the tests carried out is shown as following.

FCC Rules	Name of Test	Result
15.247(b)	Maximum Peak Output Power	Pass
15.247(e)	Peak Power Spectral Density	Pass
15.247(a)	6dB Occupied Bandwidth	Pass
15.247(d)	Band Edges Compliance	Pass
15.247 (d)	Transmitter Spurious Emission-Conducted	Pass
15.247, 15.205, 15.209	Transmitter Spurious Emission-Radiated	Pass
15.207	Power line Conducted Emissions	Pass
Note:--		

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336

Tel: 0086-23-88069965

FAX: 0086-23-88608777

Report No.:I21W00017-BLE_Rev2

4 Test Equipments and Ancillaries Used For Tests

The test equipments and ancillaries used are as follows.

No.	Equipment	Model	SN	Manufacture	Cal. Date	Cal. Due Date
1	EMI Test Receiver	ESU26	100367	R&S	2021-05-12	2022-06-11
2	Trilog super broad band test antenna	VULB 9163	00995	R&S	2021-03-04	2023-04-03
3	Double-Ridged Horn Antenna	HF907	100357	R&S	2019-07-21	2021-08-20
4	Double Ridged Guide Antenna	DATE 1152	LM7127	ETS	2020-07-15	2021-08-16
5	Double Ridged Guide Antenna	DATE 1012	LM5945	ETS	2020-07-15	2021-08-16
6	Fully-Anechoic Chamber	11.8m×6.5m×6.3m	--	ETS	2020-12-23	2024-01-22
7	Spectrum analyzer	FSQ 26	201137/026	R&S	2021-05-12	2022-06-11
8	DC Power Supply	N6705B	MY50000919	Agilent	2021-05-12	2022-06-11
9	Artificial Power Network	ENV 216	101128	R&S	2021-05-12	2022-06-11
10	Test Receiver	ESCI 9KHz-3GHZ	101214	R&S	2021-05-12	2022-06-11

Test software Used:				
No.	Test item	Test software name	Manufacturer	Version:
1	Radiated Emission	EMC32	R/S	V8.51.0
2	Conducted Emission	EMC32	R/S	V8.51.0

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

5 Test Results

5.1 Maximum Peak Output Power

Specifications:	FCC Part 15.247(b)
DUT Serial Number:	866884045657996
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Limit Level Construction:

The maximum peak output power of the intentional radiator shall not exceed the following:

1. For systems using digital modulation in the bands of 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz: 1 watt.
2. Except as shown in paragraphs (b)(3) (i), (ii) and (iii) of this section, if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Measurement Uncertainty:

Measurement Uncertainty	±1.0dB
-------------------------	--------

Test Method:

The measurement is according to dANSI C63.10 section 11.9.1.1

1. The output power of EUT was connected to the spectrum analyzer. The path loss was compensated to the results for each measurement.
2. Enable EUT transmitter maximum power continuously.
3. set the $RBW \geq DTS$ bandwidth, Set $VBW \geq [3 \times RBW]$.
4. Detector : Peak.
5. Trace mode: Max Hold

Note: --

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

Measurement Results:

	Channel No.	Output Power (dBm)	Result
1 M	Low: 0	4.86	Pass
	Middle: 19	5.34	Pass
	High: 39	4.44	Pass
2 M	Channel No.	Output Power (dBm)	Result
	Low: 0	5.33	Pass
	Middle: 19	5.44	Pass
	High: 39	4.89	Pass

	Channel No.	EIRP(dBm)
1 M	Low: 0	5.36
	Middle: 19	5.84
	High: 39	4.94
2 M	Channel No.	EIRP(dBm)
	Low: 0	5.83
	Middle: 19	5.94
	High: 39	5.39

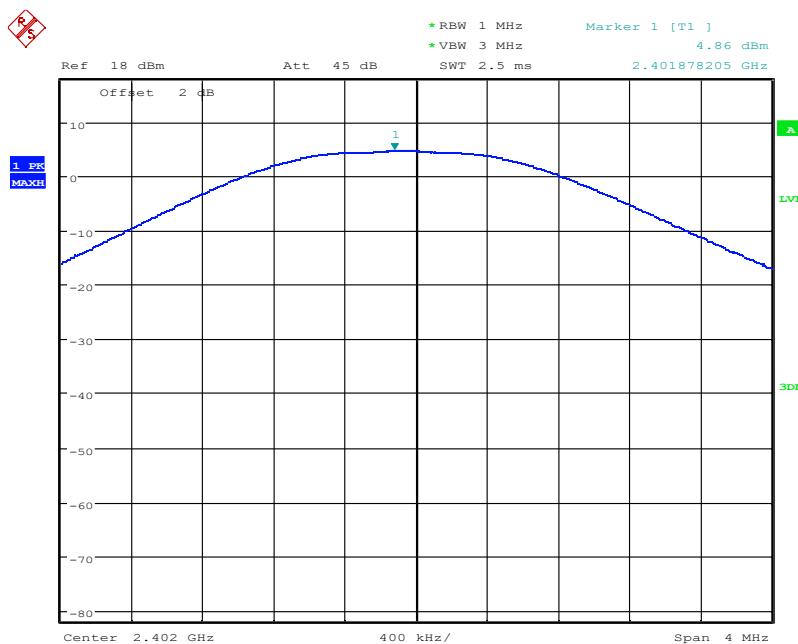
Conclusion: PASS

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
 Tel: 0086-23-88069965 FAX: 0086-23-88608777

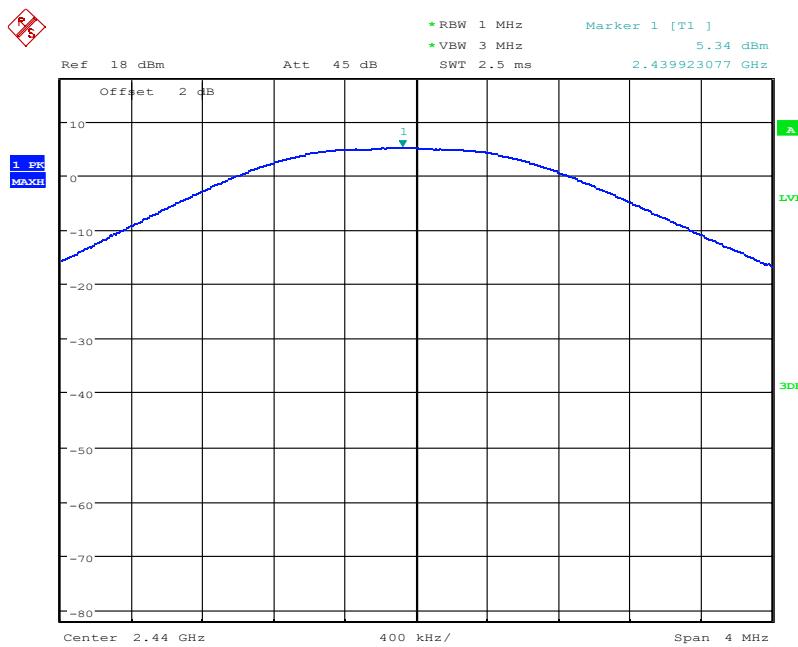
Report No.:I21W00017-BLE_Rev2

Test figure as below:



Date: 24.JUN.2021 15:52:44

1M CH0



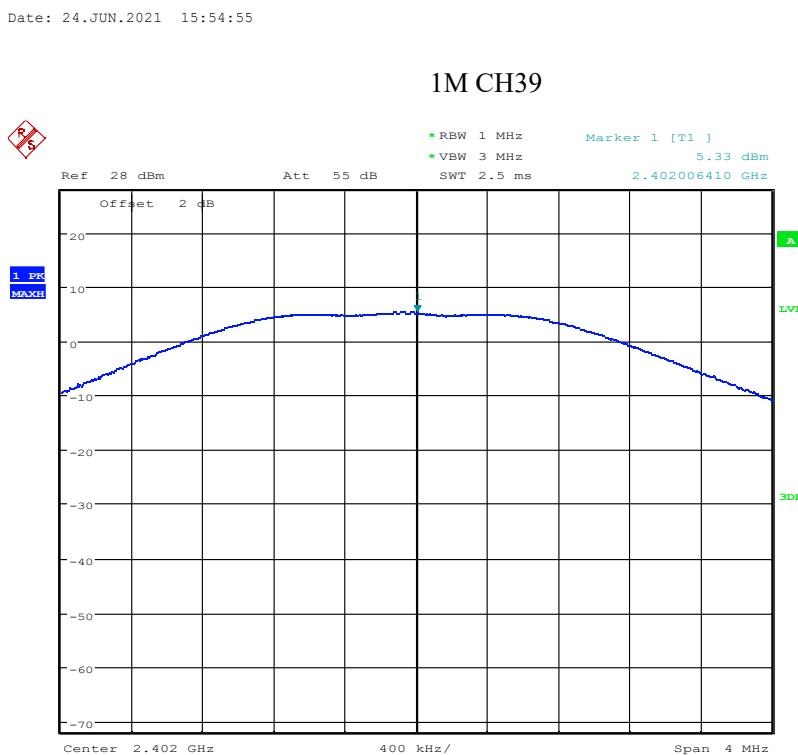
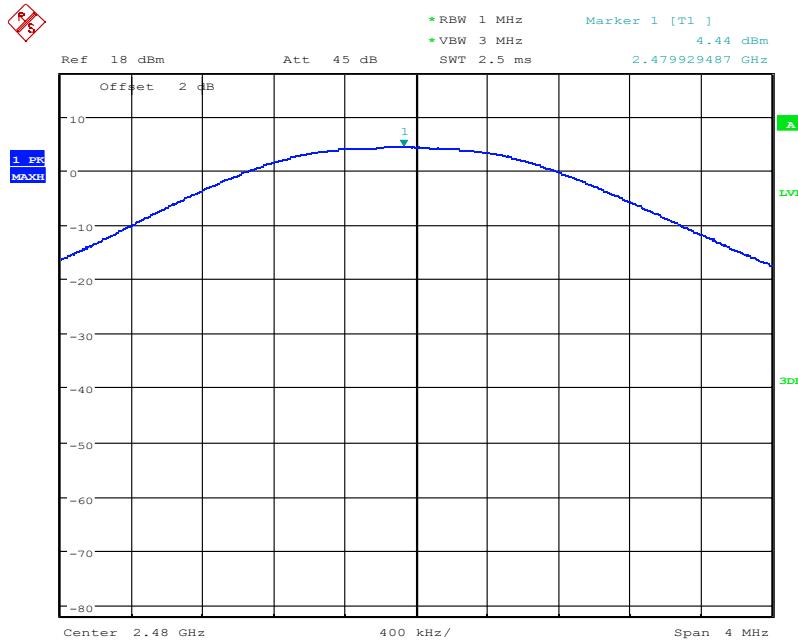
Date: 24.JUN.2021 15:54:34

1M CH19

Chongqing Academy of Information and Communication Technology

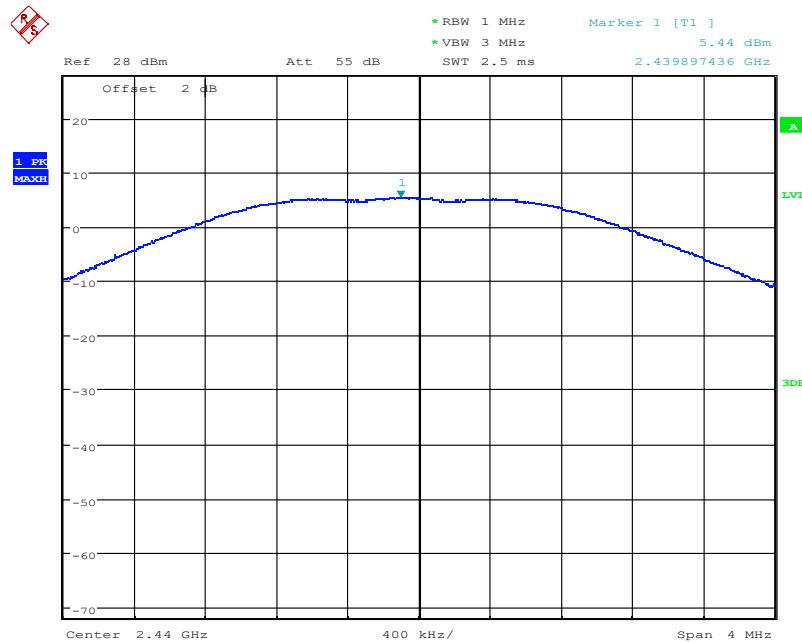
Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

Report No.:I21W00017-BLE_Rev2



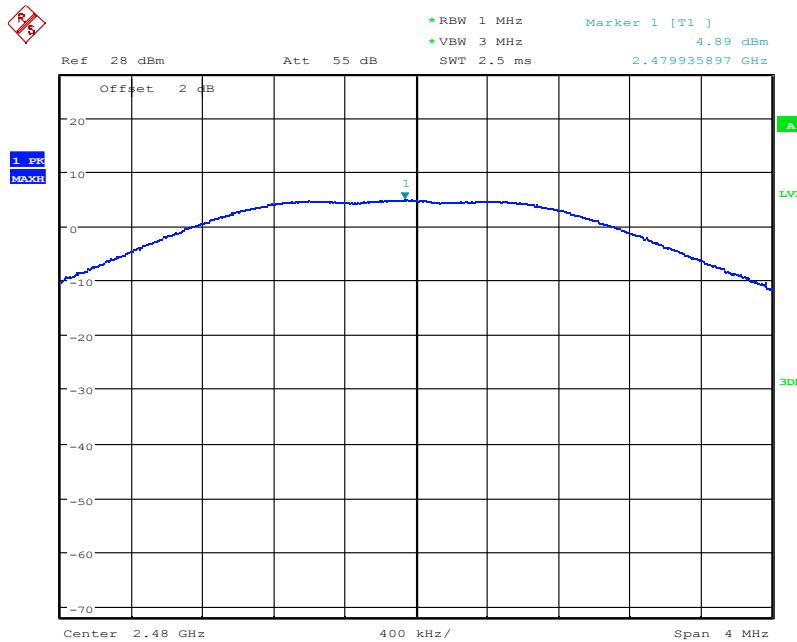
2M CH0

Report No.:I21W00017-BLE_Rev2



Date: 24.JUN.2021 16:25:10

2M CH19



Date: 24.JUN.2021 16:25:27

2M CH39

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

5.2 Peak Power Spectral Density

Specifications:	FCC CFR Part 15.247(e)
DUT Serial Number:	866884045657996
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Limit Level Construction:

Standard	Limit
FCC CFR Part 15.247(e)	< 8dBm/3 KHz

Measurement Uncertainty:

Measurement Uncertainty	±0.82dBm/KHz
-------------------------	--------------

Test procedure:

The measurement is according to ANSI C63.10 clause 11.10.

1. The output power of EUT was connected to the spectrum analyzer. The path loss was compensated to the results for each measurement.
2. Enable EUT transmitter maximum power continuously.
3. Set analyzer center frequency to DTS channel center frequency.
4. Set the span to 1.5 times the DTS bandwidth.
5. Set the RBW to $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
6. Set the VBW $\geq [3 \times \text{RBW}]$.
7. Detector = peak.
8. Sweep time = auto couple.
9. Trace mode = max hold.
10. Allow trace to fully stabilize.
11. Use the peak marker function to determine the maximum amplitude level within the RBW.
12. If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.

Note: --

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

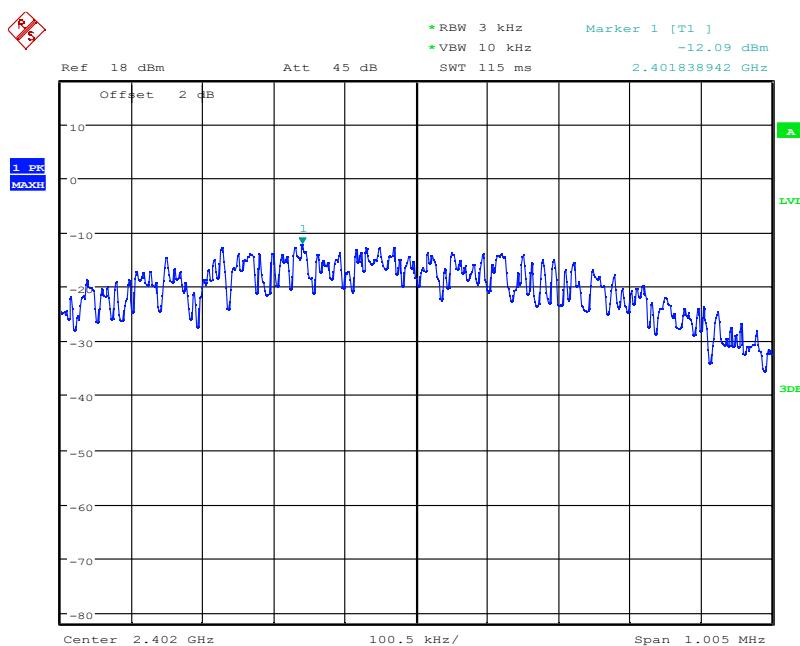
Test Results:

1 M	Power Spectral Density(dBm/3kHz)			Conclusion
	Ch0	Ch19	Ch39	
	-12.09	-9.93	-11.13	Pass
	Power Spectral Density(dBm/100kHz)			Conclusion
2 M	Ch0	Ch19	Ch39	
	4.16	4.61	3.73	
				Pass

2 M	Power Spectral Density(dBm/3kHz)			Conclusion
	Ch0	Ch19	Ch39	
	-13.74	-13.24	-13.30	Pass
	Power Spectral Density(dBm/100kHz)			Conclusion
2 M	Ch0	Ch19	Ch39	
	4.47	4.62	4.05	
				Pass

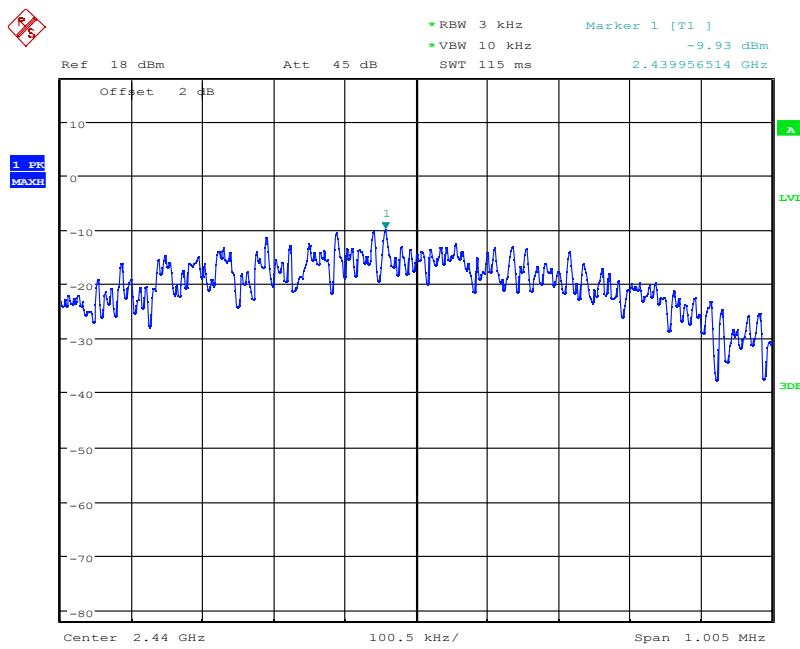
Conclusion: PASS**Chongqing Academy of Information and Communication Technology**Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

Test figure as below:



Date: 24.JUN.2021 15:59:05

Fig.1 Power spectral density: 1M CH0 PSD/3KHz



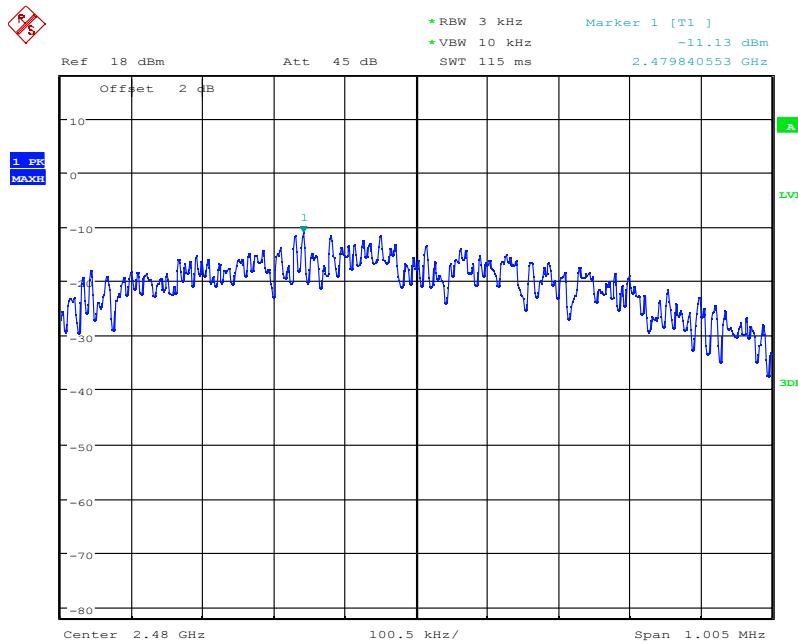
Date: 24.JUN.2021 15:59:31

Fig.2 Power spectral density: 1M CH19 PSD/3KHz

Chongqing Academy of Information and Communication Technology

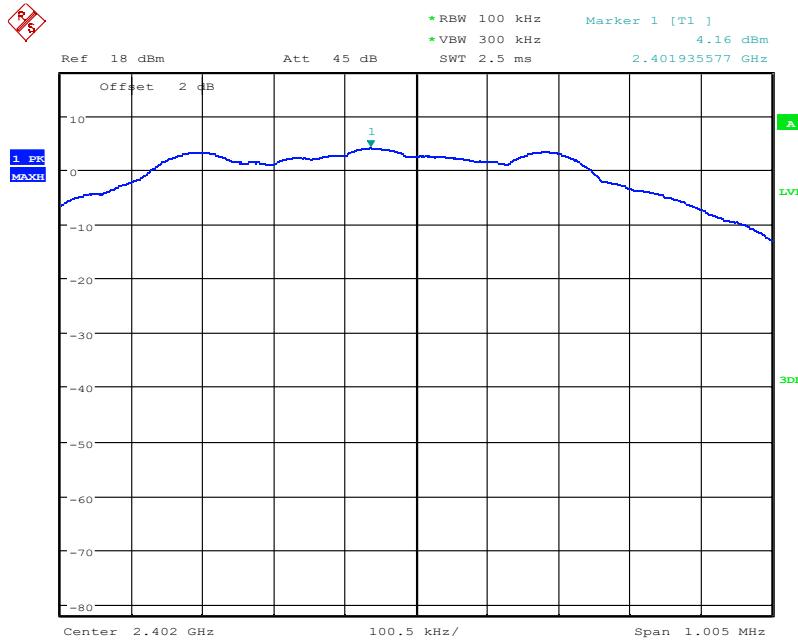
Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

Report No.:I21W00017-BLE_Rev2



Date: 24.JUN.2021 15:59:49

Fig.3 Power spectral density: 1M CH39 PSD/3KHz



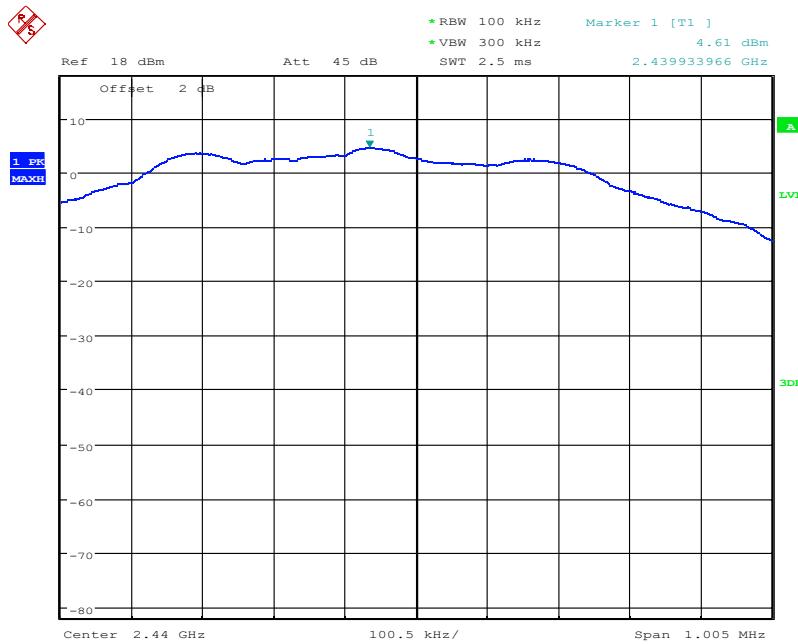
Date: 24.JUN.2021 16:22:07

Fig.4 Power spectral density: 1M CH0 PSD/100KHz

Chongqing Academy of Information and Communication Technology

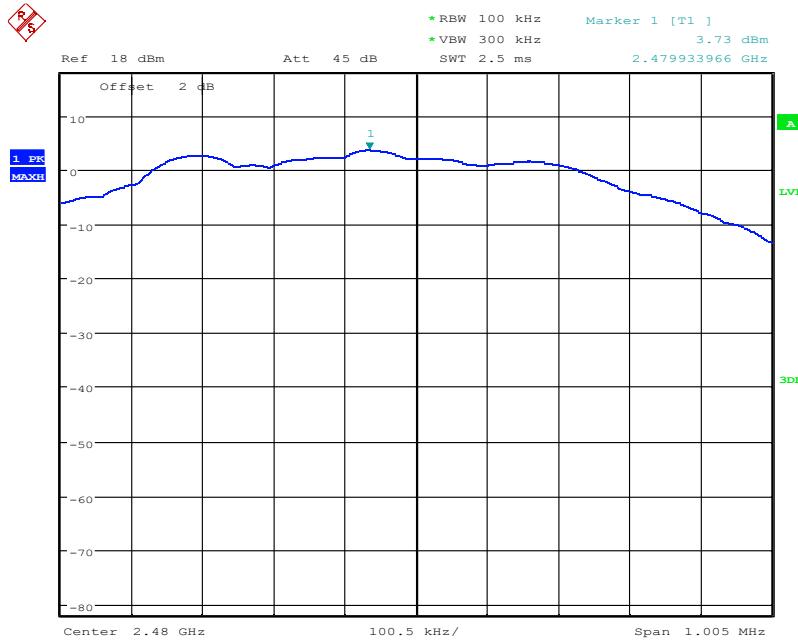
Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

Report No.:I21W00017-BLE_Rev2



Date: 24.JUN.2021 16:21:43

Fig.5 Power spectral density: 1M CH19 PSD/100KHz



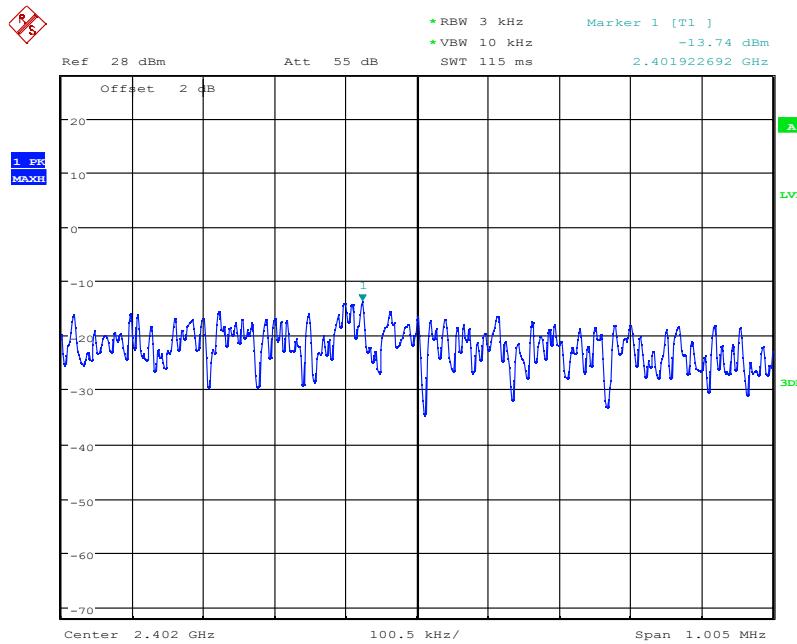
Date: 24.JUN.2021 16:21:19

Fig.6 Power spectral density: 1M CH39 PSD/100KHz

Chongqing Academy of Information and Communication Technology

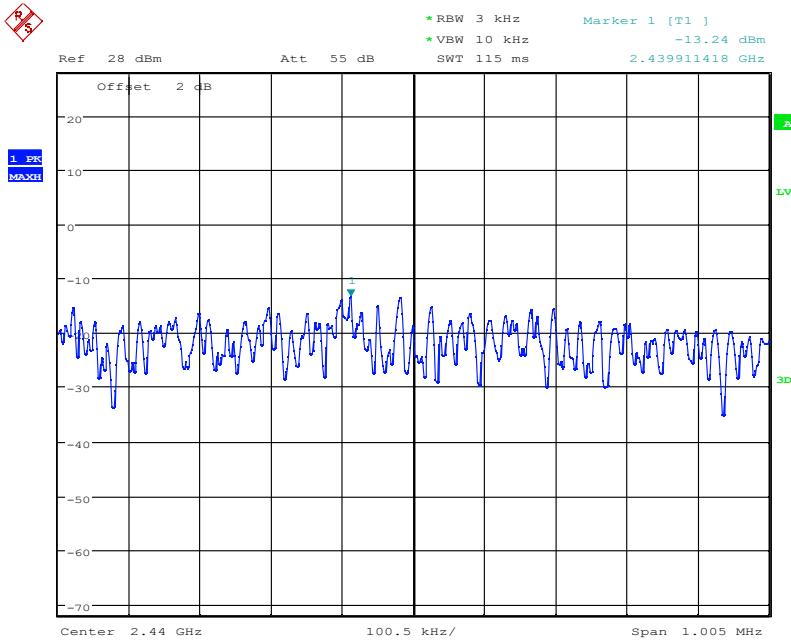
Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

Report No.:I21W00017-BLE_Rev2



Date: 24.JUN.2021 16:27:54

Fig.7 Power spectral density: 2M CH0 PSD/3KHz



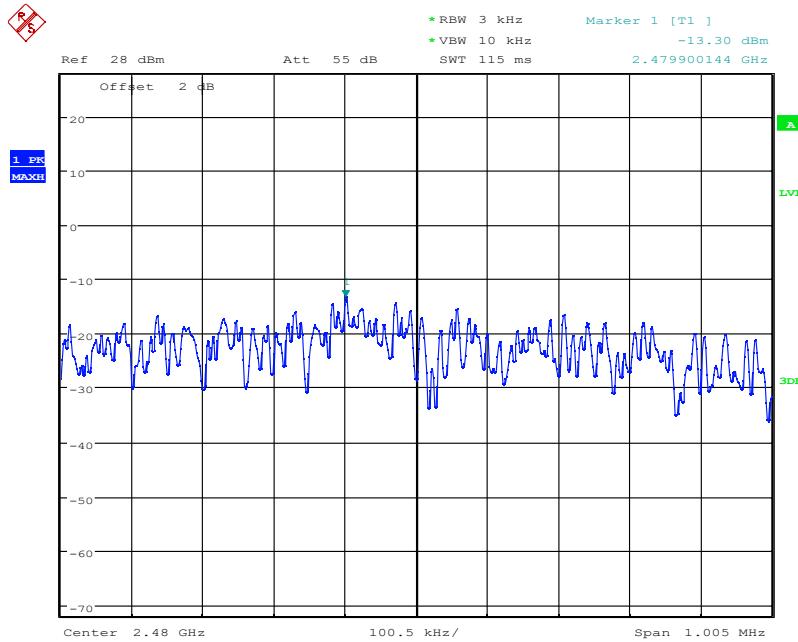
Date: 24.JUN.2021 16:27:14

Fig.8 Power spectral density: 2M CH19 PSD/3KHz

Chongqing Academy of Information and Communication Technology

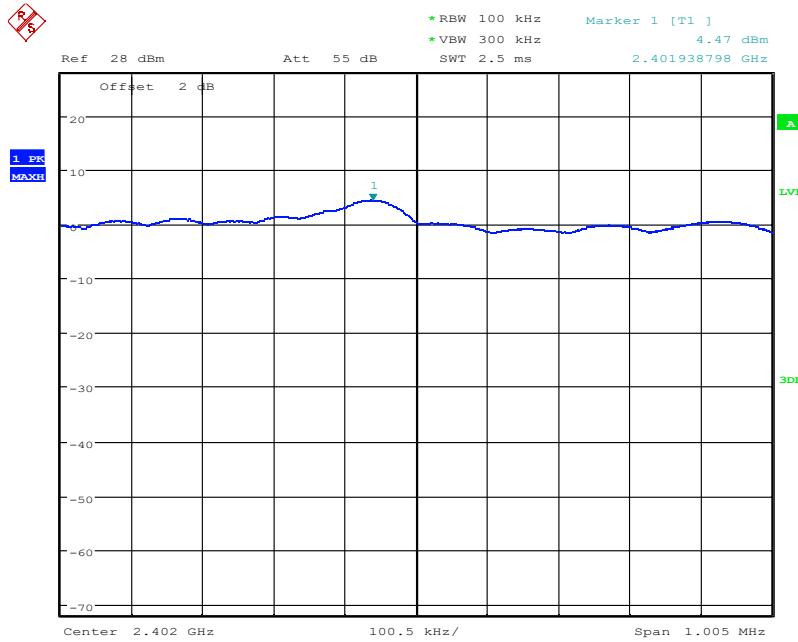
Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

Report No.:I21W00017-BLE_Rev2



Date: 24.JUN.2021 16:27:38

Fig.9 Power spectral density: 2M CH39 PSD/3KHz



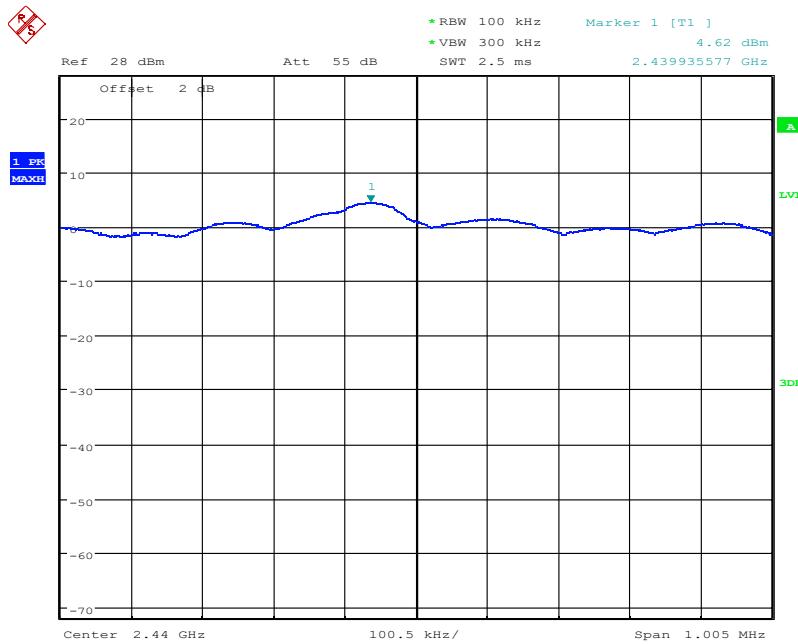
Date: 24.JUN.2021 16:28:24

Fig.10 Power spectral density: 2M CH0 PSD/100KHz

Chongqing Academy of Information and Communication Technology

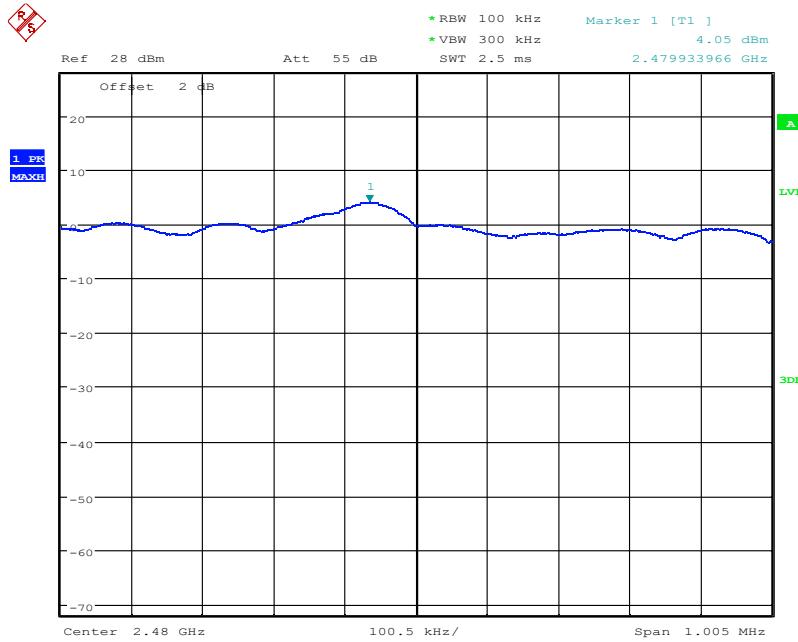
Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

Report No.:I21W00017-BLE_Rev2



Date: 24.JUN.2021 16:28:51

Fig.11 Power spectral density: 2M CH19 PSD/100KHz



Date: 24.JUN.2021 16:29:15

Fig.12 Power spectral density: 2M CH39 PSD/100KHz

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

5.3 6dB Occupied Bandwidth

Specifications:	FCC 47 CFR Part 15.247(a)
DUT Serial Number:	866884045657996
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Limit Level Construction:

Standard	Limit(KHz)
FCC 47 CFR Part 15.247(a)	≥500

Measurement Uncertainty:

Measurement Uncertainty	±1.1KHz
-------------------------	---------

Test Procedure

The measurement is according to ANSI C63.10 clause 11.8.

1. The output power of EUT was connected to the spectrum analyzer. The path loss was compensated to the results for each measurement.
2. Enable EUT transmitter maximum power continuously.
3. Set RBW = 100 kHz.
4. Set the VBW $\geq [3 \times \text{RBW}]$.
5. Detector = peak.
6. Trace mode = max hold.
7. Sweep = auto couple.
8. Allow the trace to stabilize.
9. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Note: --

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

Report No.:I21W00017-BLE_Rev2

Test Result:

1M	Occupied 6dB Bandwidth(MHz)			Conclusion
	Ch0	Ch19	Ch39	
	0.666	0.660	0.660	Pass

2M	Occupied 6dB Bandwidth(MHz)			Conclusion
	Ch0	Ch19	Ch39	
	0.916	0.910	0.967	Pass

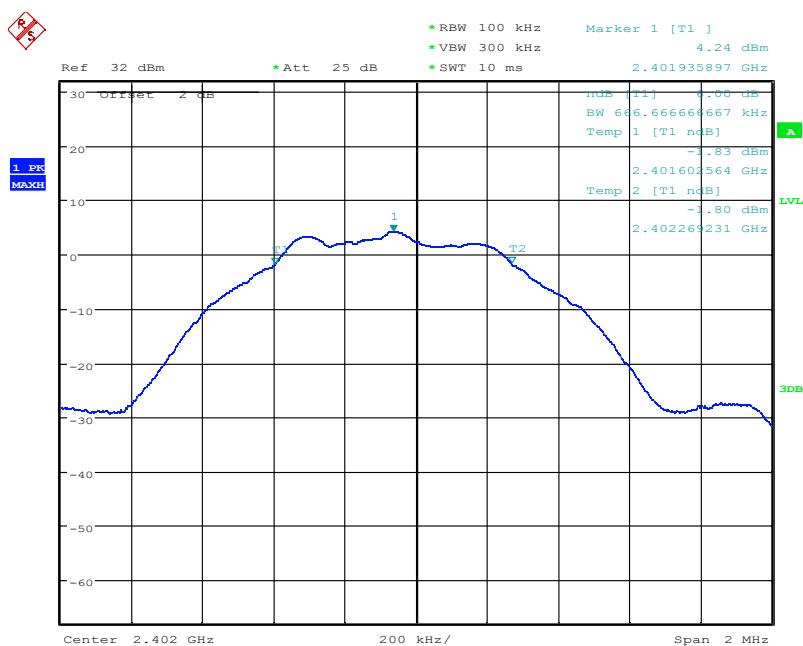
Conclusion: PASS

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

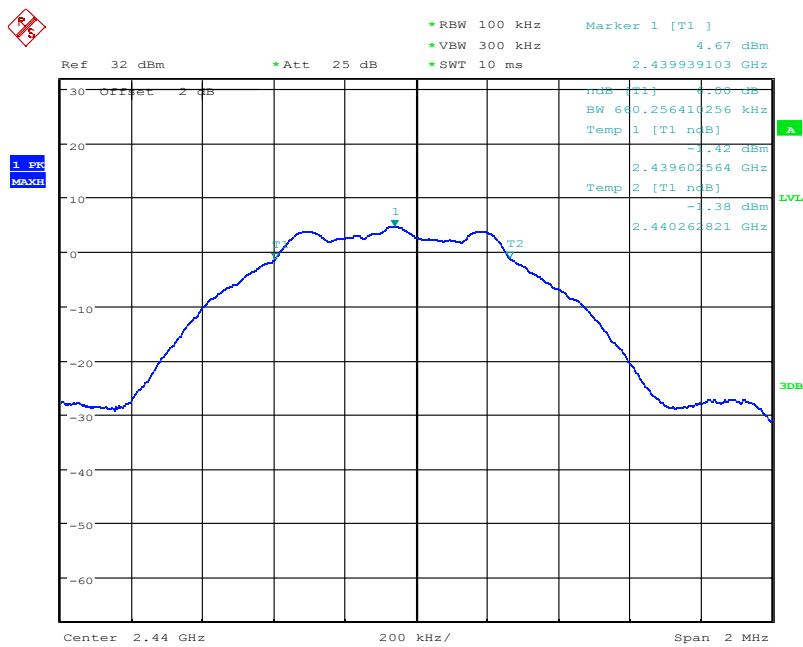
Report No.:I21W00017-BLE_Rev2

Test figure as below:



Date: 25.JUN.2021 11:03:18

Fig.13 6dB Bandwidth: 1M Ch0



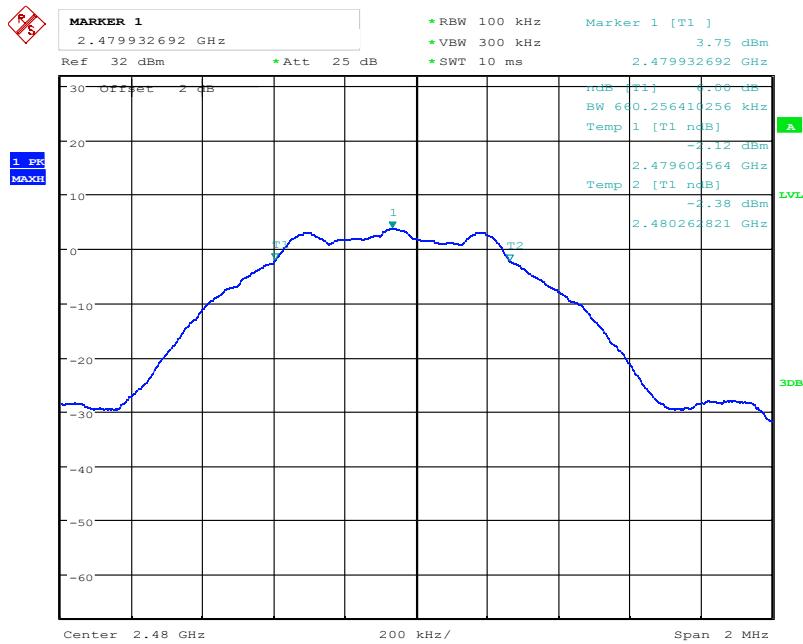
Date: 25.JUN.2021 11:02:51

Fig.14 6dB Bandwidth: 1M Ch19

Chongqing Academy of Information and Communication Technology

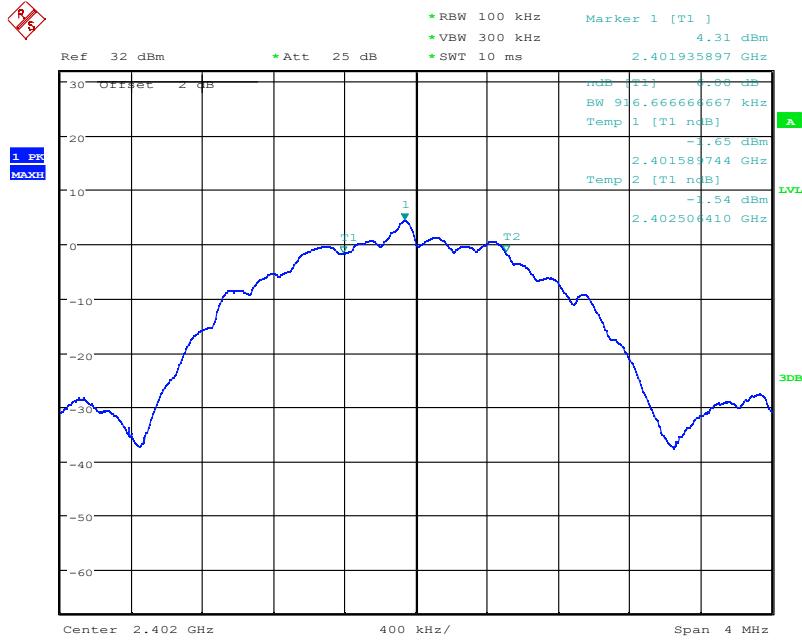
Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

Report No.:I21W00017-BLE_Rev2



Date: 25.JUN.2021 11:02:29

Fig.15 6dB Bandwidth: 1M Ch39



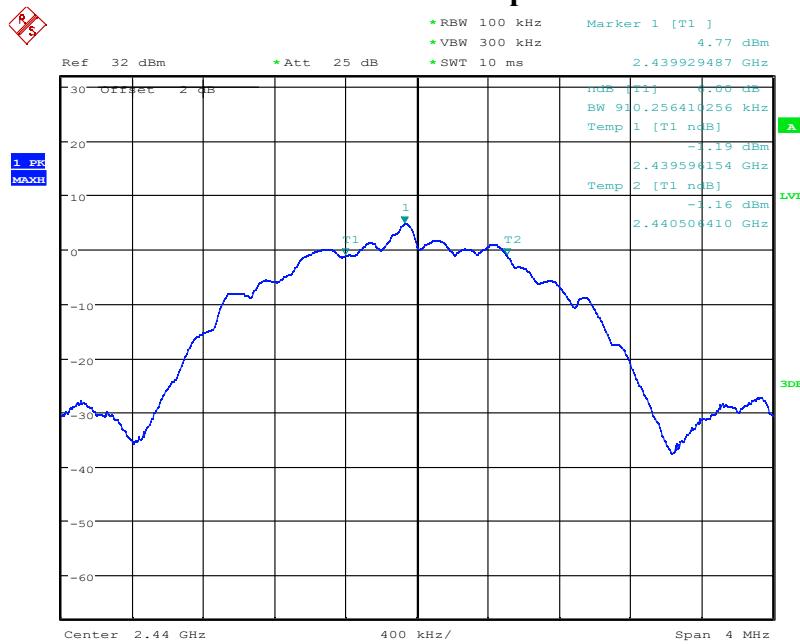
Date: 25.JUN.2021 11:07:06

Fig.16 6dB Bandwidth: 2M Ch0

Chongqing Academy of Information and Communication Technology

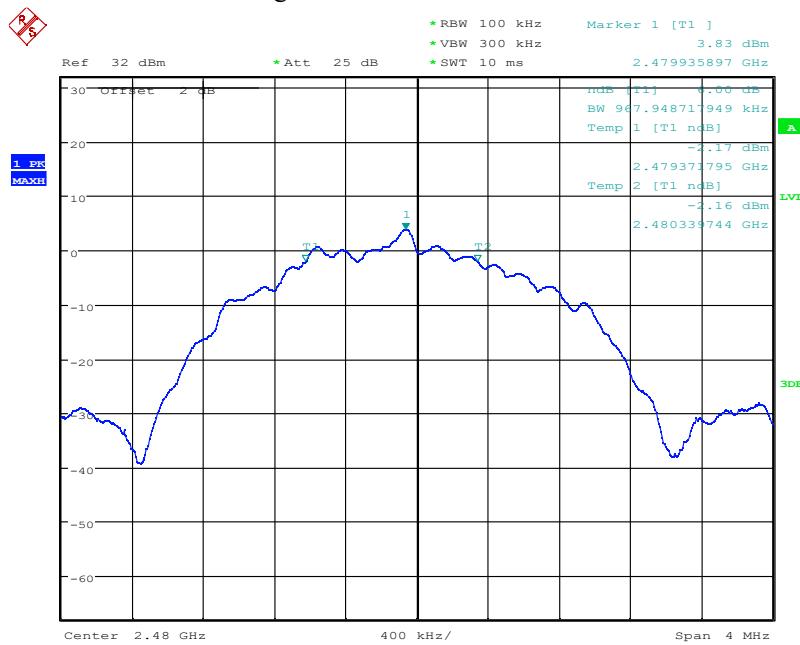
Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

Report No.:I21W00017-BLE_Rev2



Date: 25.JUN.2021 11:07:28

Fig.17 6dB Bandwidth: 2M Ch19



Date: 25.JUN.2021 11:08:11

Fig.18 6dB Bandwidth: 2M Ch39

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

5.4 Band Edges Compliance

Specifications:	FCC 47 CFR Part 15.247(d)、15.205
DUT Serial Number:	866884045657996
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Limit Level Construction:

Standard	Limited(dBuV/m)	
FCC 47 CFR Part 15.209	Peak	74
	Average	54

Measurement Uncertainty:

Frequency Range	Uncertainty
1 GHz to 6 GHz	4.84

Test Procedure

The measurement is according to ANSI C63.10 clause11.13.

1. Span: Wide enough to capture the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products that fall outside of the authorized band of operation.
2. Reference level offset: Corrected for gains and losses of test antenna factor, preamp gain and cable loss, so as to indicate field strength, in units of dB μ V/m at 3 m, directly on the instrument display. Alternatively, the reference level offset may be set to zero and calculations shall be provided showing the conversion of raw measured data to the field strength in dB μ V/m at 3 m.
3. Reference level: As required to keep the signal from exceeding the maximum spectrum analyzer input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2..
4. Attenuation: Auto (at least 10 dB preferred).
5. Sweep time: Coupled.
6. Resolution bandwidth: Above 1 GHz: 1 MHz
7. Video bandwidth: VBW for Peak, Quasi-peak, or Average Detector Function: 3 \times RBW
8. Detector (unless specified otherwise): Peak and average above 1 GHz
9. Trace: Max hold for final measurement; a combination of two traces, clear-write and max hold, is recommended for maximizing the emission.

Note: The curve represents V polarization.

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

Test Result:

RE 1GHz-3GHz

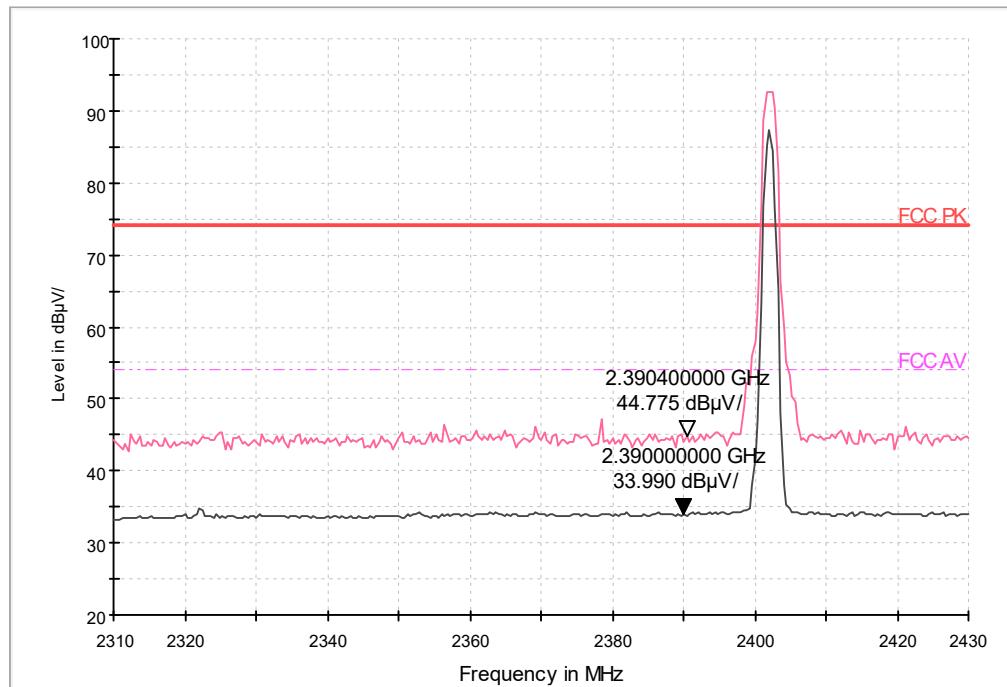


Fig.19 Frequency Band Edge: 1M Ch0

RE 1GHz-3GHz

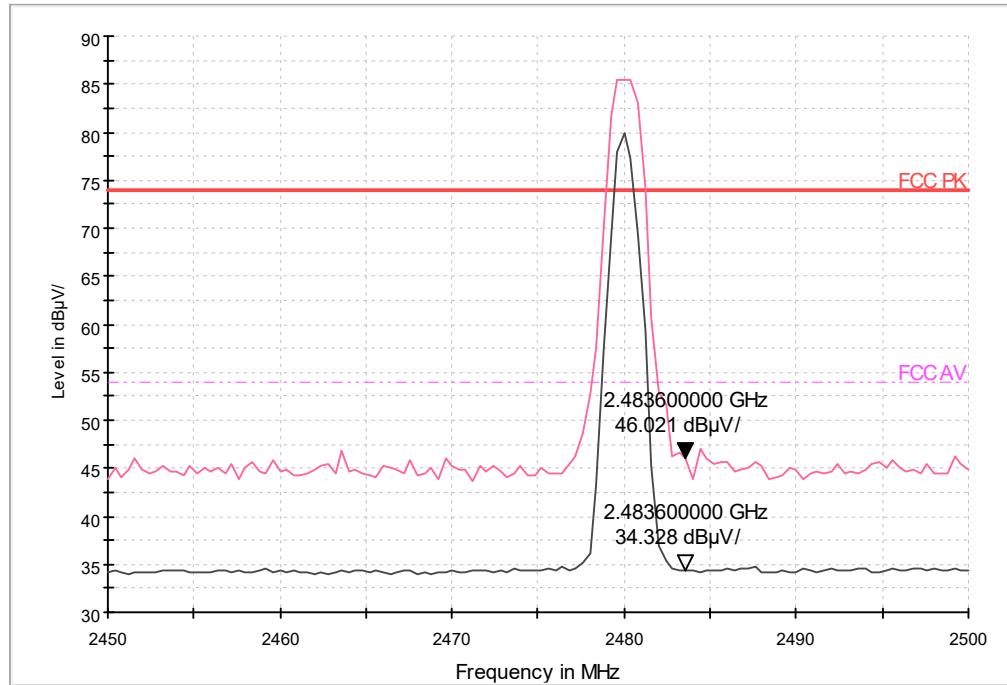


Fig.20 Frequency Band Edge: 1M Ch39

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

Report No.:I21W00017-BLE_Rev2

RE 1GHz-3GHz

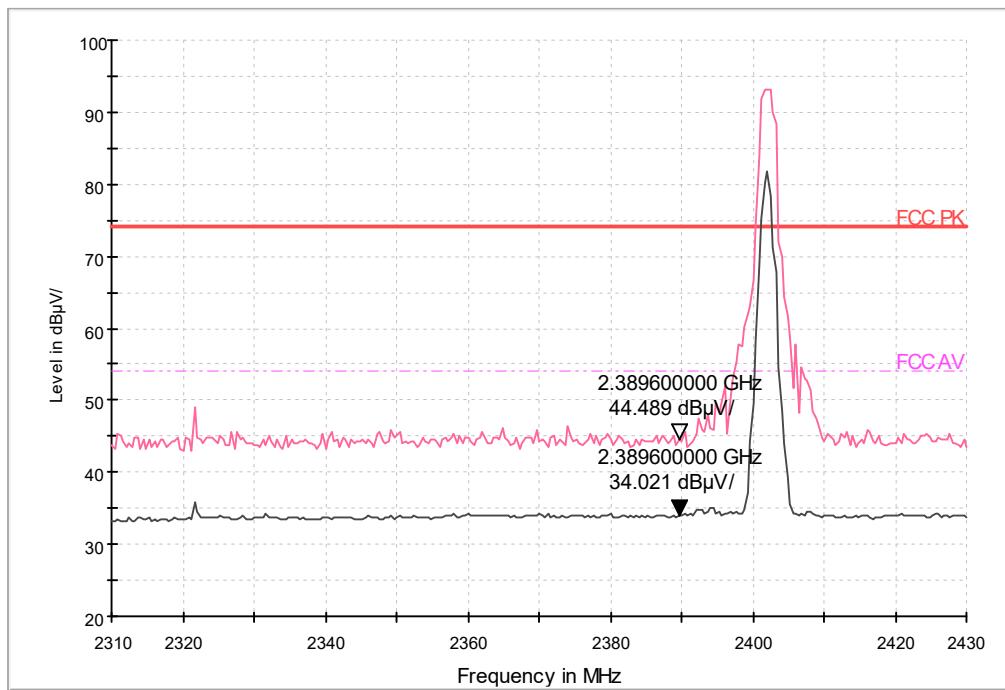


Fig.21 Frequency Band Edge: 2M Ch0

RE 1GHz-3GHz

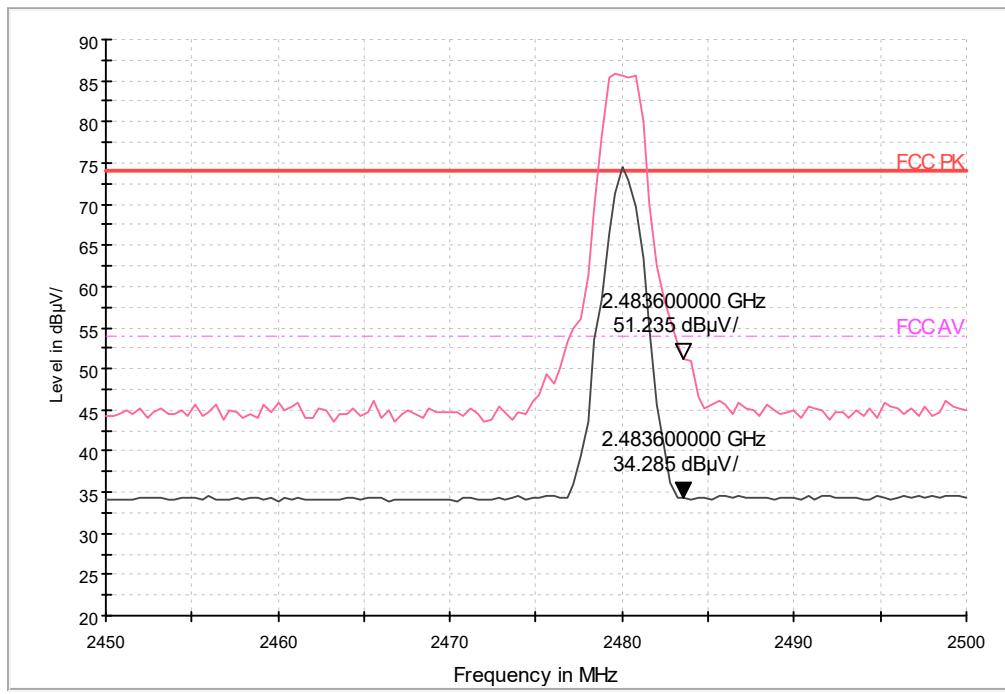


Fig.22 Frequency Band Edge: 2M Ch39

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

5.5 Transmitter Spurious Emission-Conducted

Specifications:	FCC 47 CFR Part15.247 (d)
DUT Serial Number:	866884045657996
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Limit

Standard	Limit
FCC 47 CFR Part15.247 (d)	20dB below peak output power in 100KHz bandwidth

Measurement Uncertainty:

Frequency Range	Uncertainty
30MHz ≤ f ≤ 26GHz	±2.7

Test Procedure

This measurement is according to ANSI C63.10 clause 11.11.

1. The output power of EUT was connected to the spectrum analyzer. The path loss was compensated to the results for each measurement.
2. Enable EUT transmitter maximum power continuously.

Reference level measurement

3. Set instrument center frequency to DTS channel center frequency.
4. Set the span to ≥ 1.5 times the DTS bandwidth.
5. Set the RBW = 100 kHz.
6. Set the VBW $\geq [3 \times \text{RBW}]$.
7. Detector = peak.
8. Sweep time = auto couple.
9. Trace mode = max hold.
10. Allow trace to fully stabilize.
11. Use the peak marker function to determine the maximum PSD level.

Emission level measurement

12. Set the center frequency and span to encompass frequency range to be measured.
13. Set the RBW = 100 kHz.
14. Set the VBW $\geq [3 \times \text{RBW}]$.
15. Detector = peak.
16. Sweep time = auto couple.
17. Trace mode = max hold.
18. Allow trace to fully stabilize.
19. Use the peak marker function to determine the maximum amplitude level.

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

Test Result:

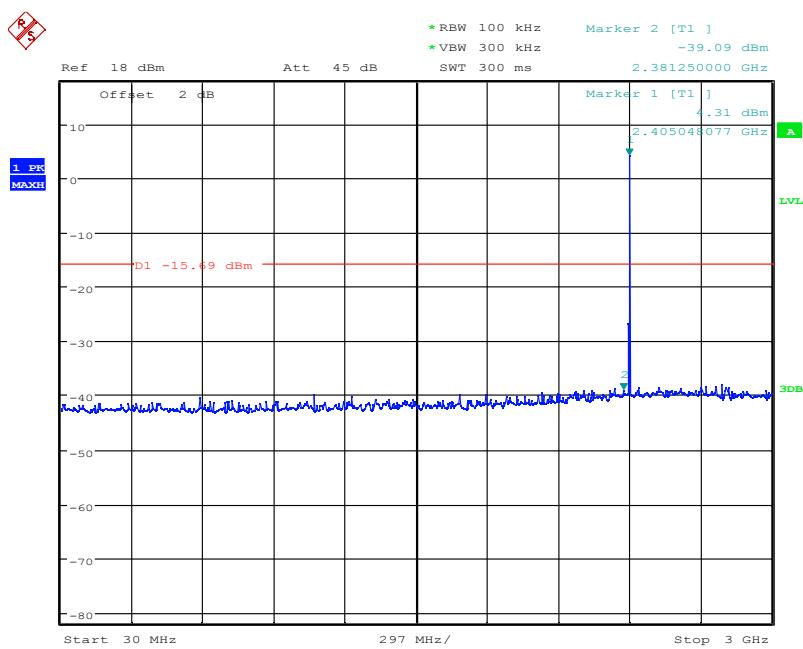
1M	Channel	Frequency Range	Test Results	Conclusion
	0	30MHz~3GHz	Fig.23	Pass
		3GHz~26.5GHz	Fig.24	Pass
	19	30MHz~3GHz	Fig.25	Pass
		3GHz~26.5GHz	Fig.26	Pass
	39	30MHz~3GHz	Fig.27	Pass
		3GHz~26.5GHz	Fig.28	Pass

2M	Channel	Frequency Range	Test Results	Conclusion
	0	30MHz~3GHz	Fig.29	Pass
		3GHz~26.5GHz	Fig.30	Pass
	19	30MHz~3GHz	Fig.31	Pass
		3GHz~26.5GHz	Fig.32	Pass
	39	30MHz~3GHz	Fig.33	Pass
		3GHz~26.5GHz	Fig.34	Pass

Conclusion: PASS**Chongqing Academy of Information and Communication Technology**Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

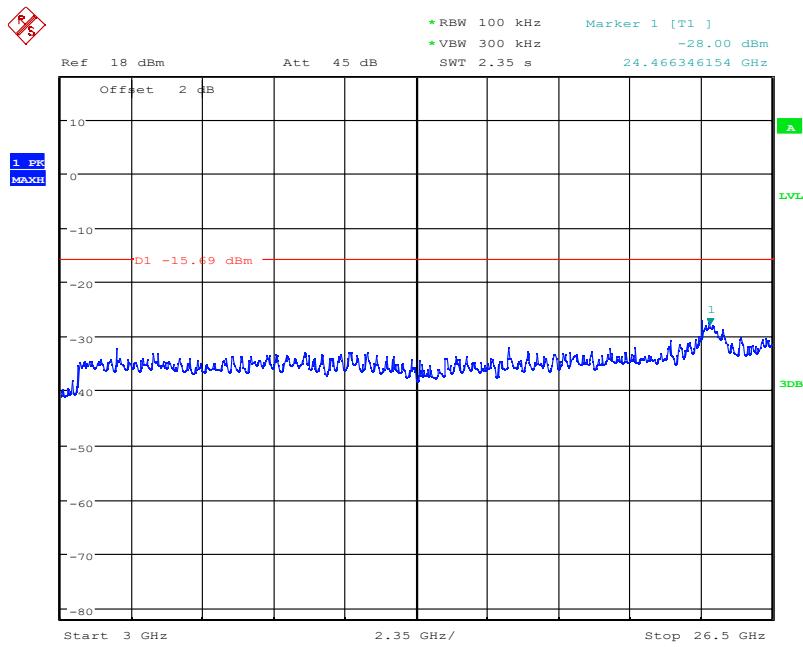
Report No.:I21W00017-BLE_Rev2

Test figure as below:



Date: 24.JUN.2021 16:11:26

Fig.23 Conducted spurious emission: 1M Ch0, 30MHz~3GHz



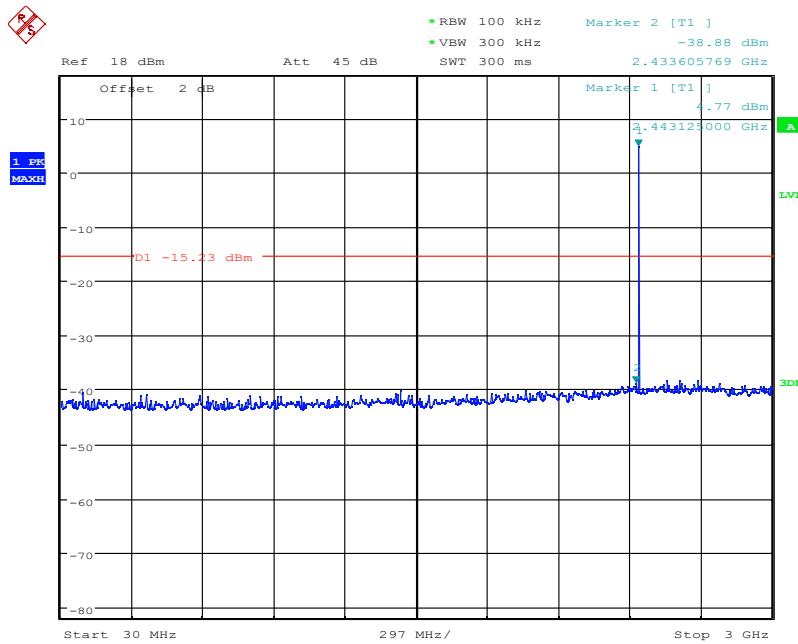
Date: 24.JUN.2021 16:12:16

Fig.24 Conducted spurious emission: 1M Ch0, 3GHz~26.5GHz

Chongqing Academy of Information and Communication Technology

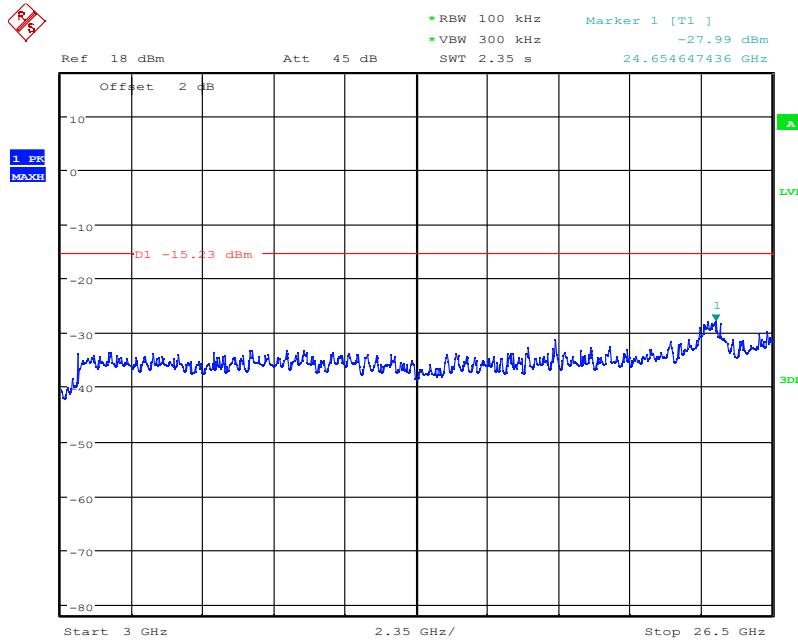
Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

Report No.:I21W00017-BLE_Rev2



Date: 24.JUN.2021 16:13:11

Fig.25 Conducted spurious emission: 1M Ch19, 30MHz~3GHz



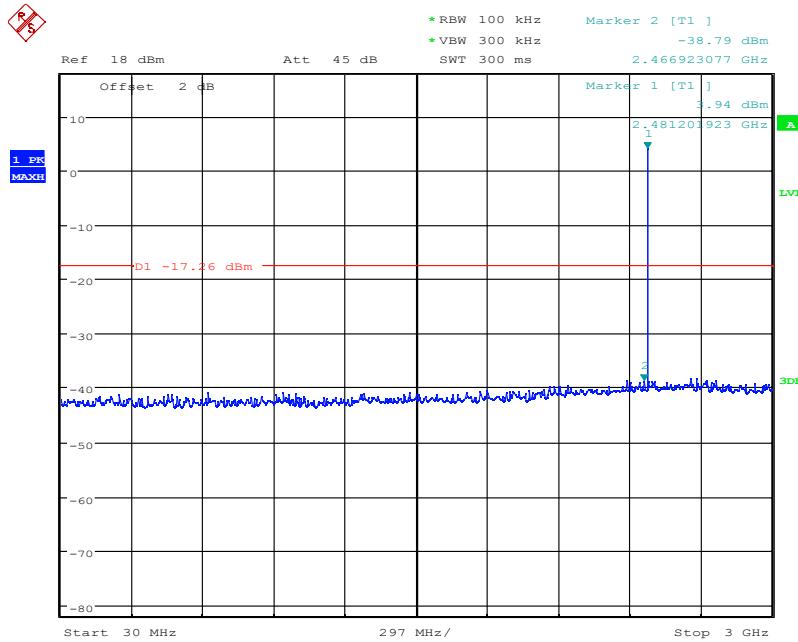
Date: 24.JUN.2021 16:13:33

Fig.26 Conducted spurious emission: 1M Ch19, 3GHz~26.5GHz

Chongqing Academy of Information and Communication Technology

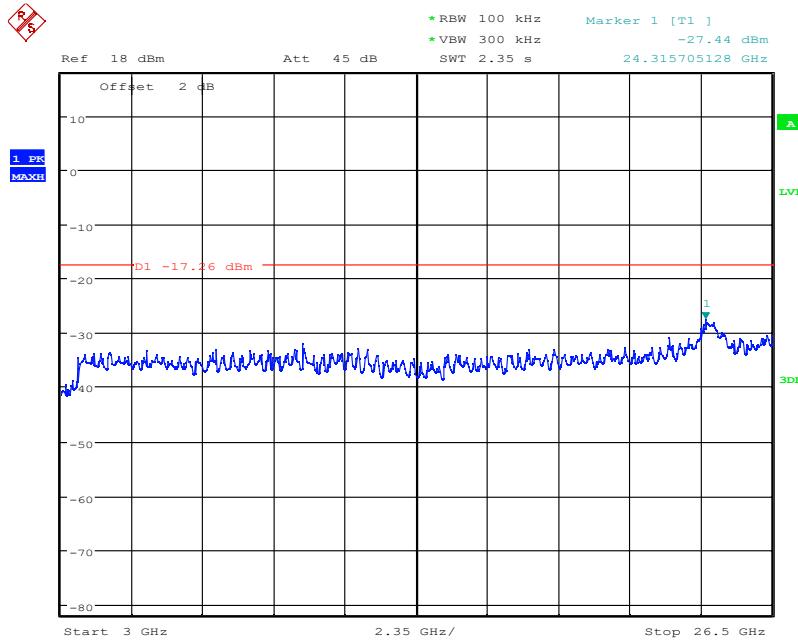
Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

Report No.:I21W00017-BLE_Rev2



Date: 24.JUN.2021 16:14:26

Fig.27 Conducted spurious emission: 1M Ch39, 30MHz~3GHz



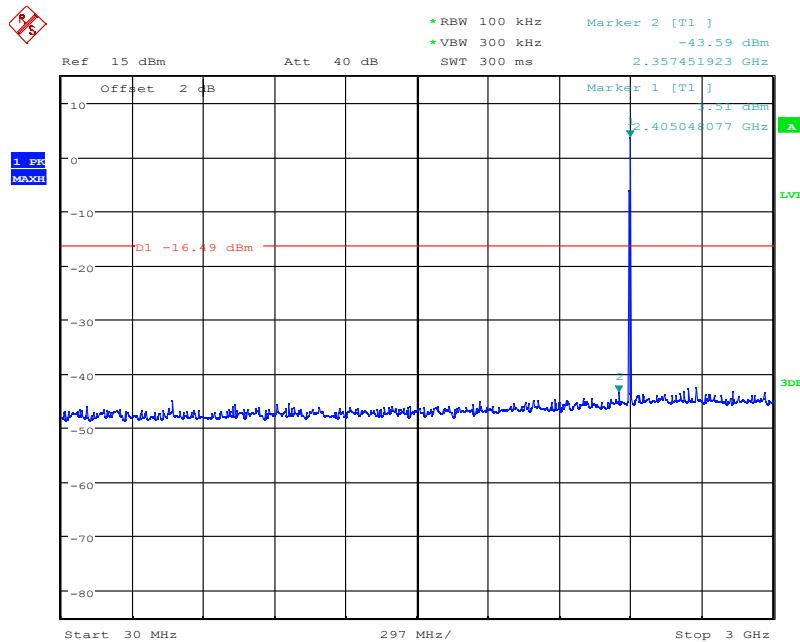
Date: 24.JUN.2021 16:14:47

Fig.28 Conducted spurious emission: 1M Ch39, 3GHz~26.5GHz

Chongqing Academy of Information and Communication Technology

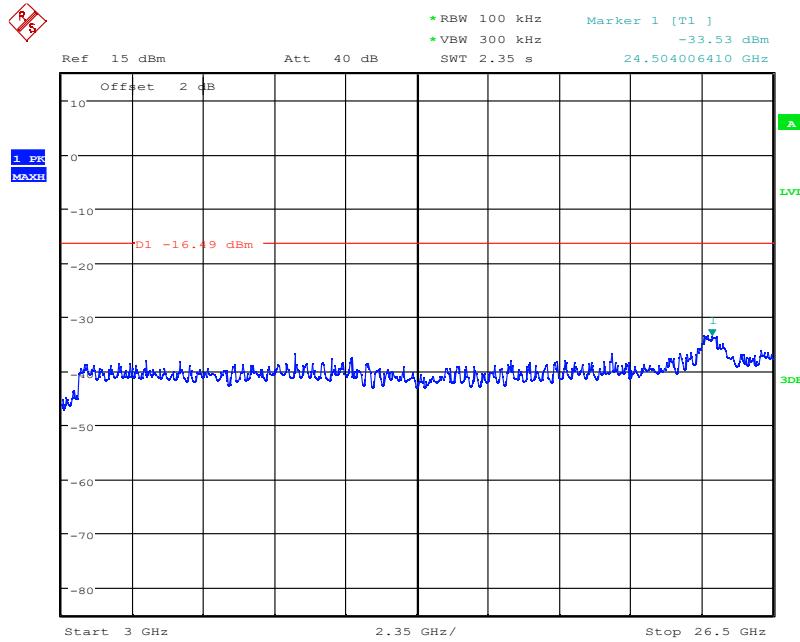
Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

Report No.:I21W00017-BLE_Rev2



Date: 24.JUN.2021 16:38:42

Fig.29 Conducted spurious emission: 2M Ch0, 30MHz~3GHz



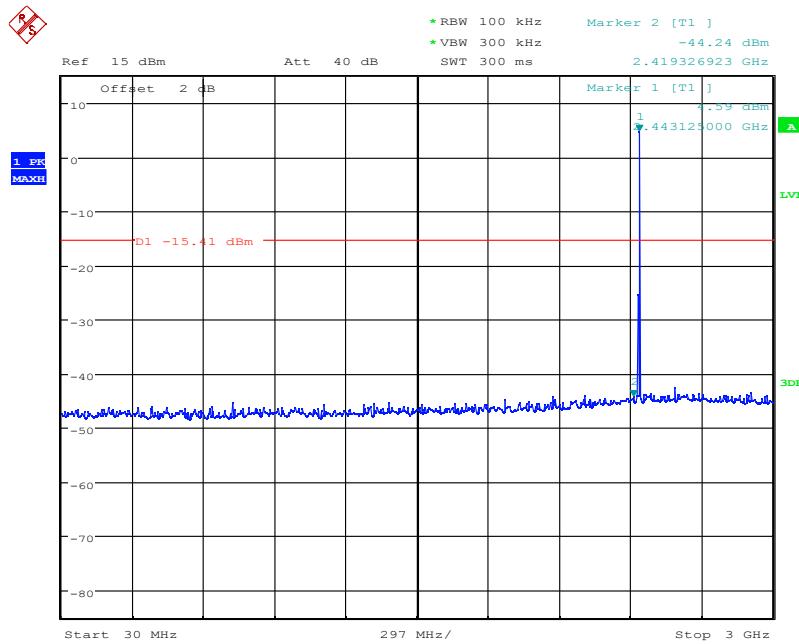
Date: 24.JUN.2021 16:39:01

Fig.30 Conducted spurious emission: 2M Ch0, 3GHz~26.5GHz

Chongqing Academy of Information and Communication Technology

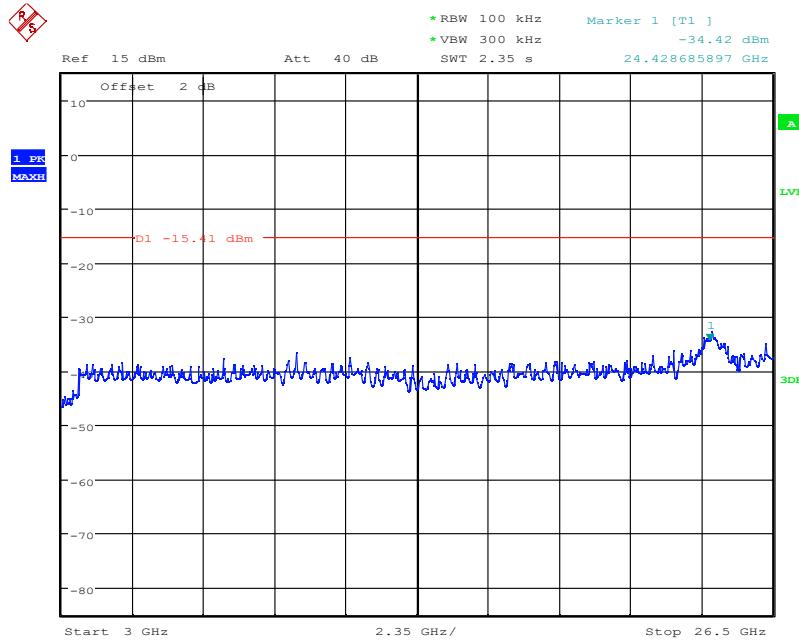
Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

Report No.:I21W00017-BLE_Rev2



Date: 24.JUN.2021 16:37:24

Fig.31 Conducted spurious emission: 2M Ch19, 30MHz~3GHz



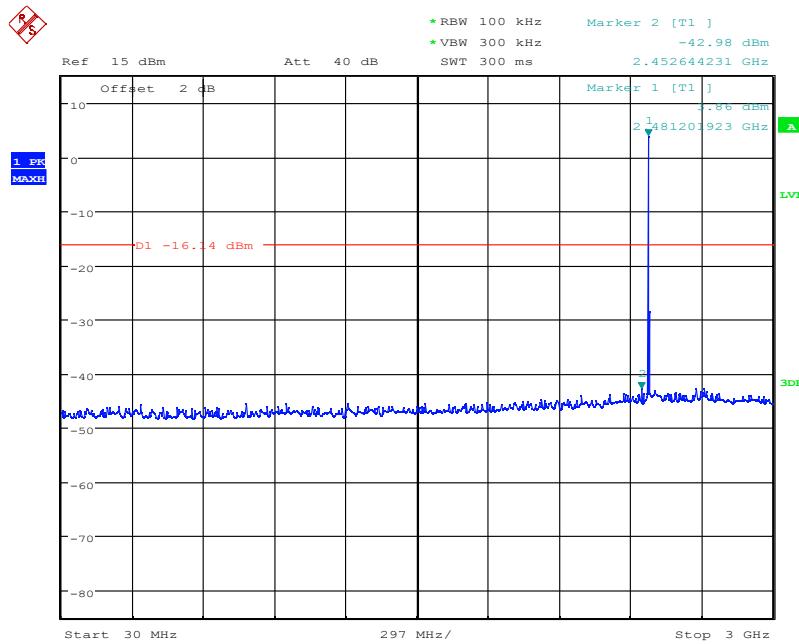
Date: 24.JUN.2021 16:37:39

Fig.32 Conducted spurious emission: 2M Ch19, 3GHz~26.5GHz

Chongqing Academy of Information and Communication Technology

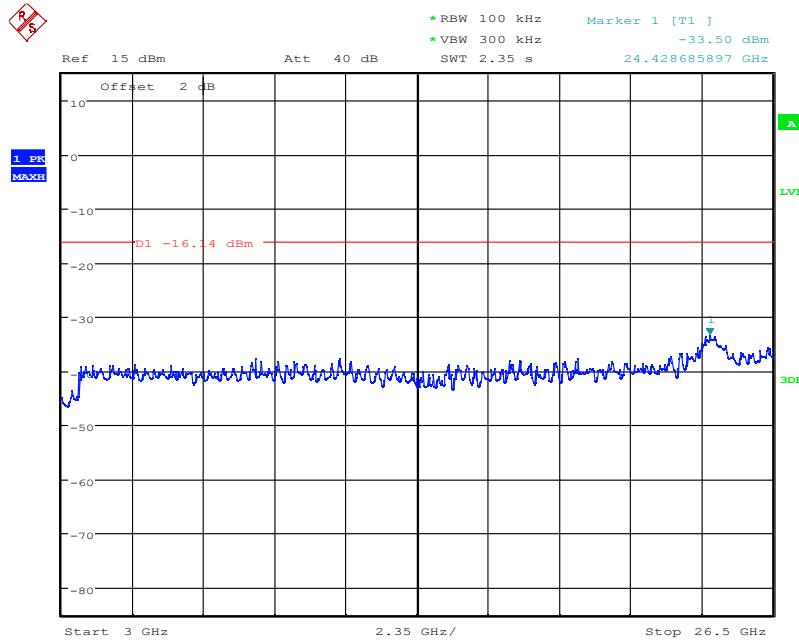
Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

Report No.:I21W00017-BLE_Rev2



Date: 24.JUN.2021 16:36:00

Fig.33 Conducted spurious emission: 2M Ch39, 30MHz~3GHz



Date: 24.JUN.2021 16:36:19

Fig.34 Conducted spurious emission: 2M Ch39, 3GHz~26.5GHz

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

5.6 Transmitter Spurious Emission-Radiated

Specifications:	FCC 47 CFR Part 15.247, 15.205, 15.209
DUT Serial Number:	866884045658127
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

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)).

Measurement Uncertainty:

Frequency Range	Uncertainty
30MHz -1GHz	3.51
1GHz - 6GHz	4.84
6GHz - 18GHz	4.52
18GHz – 26.5GHz	6.19

Limit in restricted band:

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

Test Procedure

Portable, small, lightweight, or modular devices that may be handheld, worn on the body, or placed on a table during operation shall be positioned on a non-conducting platform, the top of which is 80 cm above the reference ground plane. The preferred area occupied by the EUT arrangement is 1 m by 1.5 m, but it may be larger or smaller to accommodate various sized EUTs. For testing purposes, ceiling- and wall-mounted devices also shall be positioned on a tabletop (see

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

Report No.:I21W00017-BLE_Rev2

also ANSI C63.10-2013 section 6.3.4 and 6.3.5). In making any tests involving handheld, body-worn, or ceiling-mounted equipment, it is essential to recognize that the measured levels may be dependent on the orientation (attitude) of the three orthogonal axes of the EUT. Thus, exploratory tests as specified in 8.3.1 shall be carried out for various axes orientations to determine the attitude having maximum or near-maximum emission level.

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

Frequency of emission (MHz)	RBW/VBW	Sweep Time
30~1000	100KHz/300KHz	5s
1000~3000	1MHz/3MHz	3s
3000~18000	1MHz/3MHz	7s
18000~26500	1MHz/3MHz	0.5s

Test Result:

A “reference path loss” is established and ARpi is the attenuation of “reference path loss”, and including the gain of receive antenna , the gain of the preamplifier, the cable loss.

The measurement results are obtained as described below:

$$ARpi = \text{Cable loss} + \text{Antenna Gain-Preamplifier gain}$$

$$\text{Result} = PMea + ARpi$$

	Channel	Frequency Range	Test Results	Conclusion
	All channels	30MH-1GHz	Fig.35	Pass
1M	0	1GHz-3GHz	Fig.36	Pass
		3GHz-18GHz	Fig.37	
	19	1GHz-3GHz	Fig.38	Pass
		3GHz-18GHz	Fig.39	
	39	1GHz-3GHz	Fig.40	Pass
		3GHz-18GHz	Fig.41	

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777

Report No.:I21W00017-BLE_Rev2

	Channel	Frequency Range	Test Results	Conclusion
2M	0	1GHz-3GHz	Fig.42	Pass
		3GHz-18GHz	Fig.43	
19	19	1GHz-3GHz	Fig.44	Pass
		3GHz-18GHz	Fig.45	
39	39	1GHz-3GHz	Fig.46	Pass
		3GHz-18GHz	Fig.47	
	All channels	18GHz-26.5GHz	Fig.48	Pass

Note: The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement –X, Y, and Z-plane. The X-plane results were found as the worst case and were shown in this report.

Transmitter Spurious Emission-Radiated H and V are tested together, The test result is maximum hold. Therefore, the result is only one set of data. Found the emission level are attenuated 20dB below the limits for frequency rage 9kHz to 30MHz, so it does not recorded in report.

The 30MHz-1GHz and 18GHz-26.5GHz results were found as the worst case and were shown in this report.

Conclusion: PASS

Chongqing Academy of Information and Communication Technology

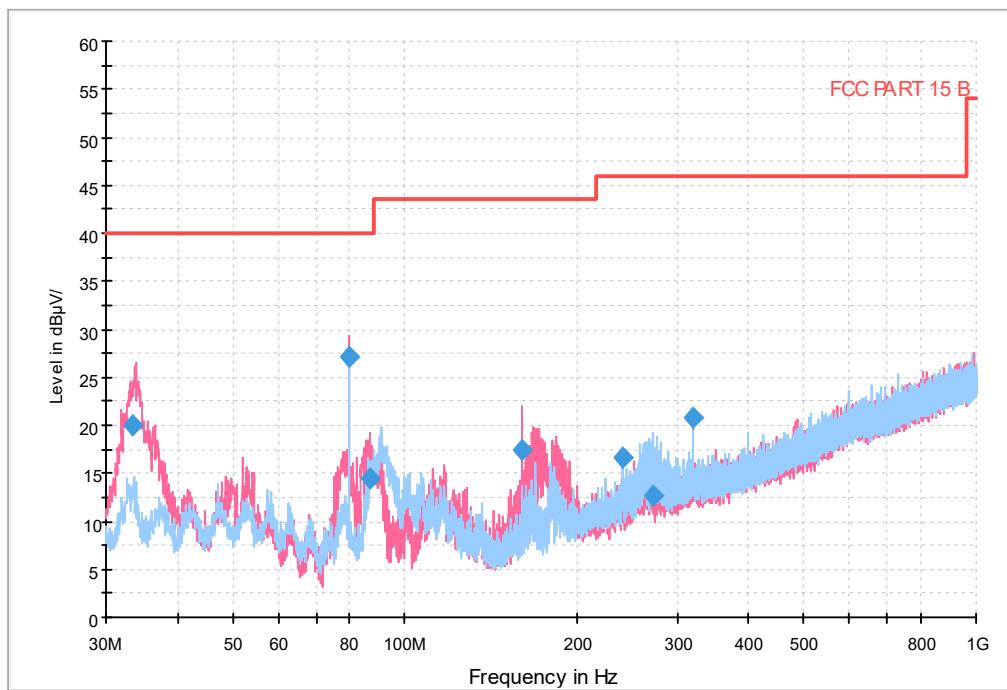
Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336

Tel: 0086-23-88069965

FAX: 0086-23-88608777

Test graphs as below:

RE 30MHz-1GHz



Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)
33.383000	20.0	5000.0	120.000	102.0	V	80.0	-19.9	20.0
79.955000	27.1	5000.0	120.000	102.0	V	-1.0	-23.0	12.9
87.284500	14.4	5000.0	120.000	117.0	V	89.0	-22.4	25.6
160.028500	17.4	5000.0	120.000	102.0	V	-10.0	-21.4	26.1
239.956500	16.6	5000.0	120.000	102.0	V	190.0	-17.0	29.4
272.551500	12.8	5000.0	120.000	117.0	H	260.0	-15.5	33.2
319.981500	20.9	5000.0	120.000	200.0	V	180.0	-14.5	25.1

Fig.35 Radiated emission: 30MHz-1GHz

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

RE 1GHz-3GHz

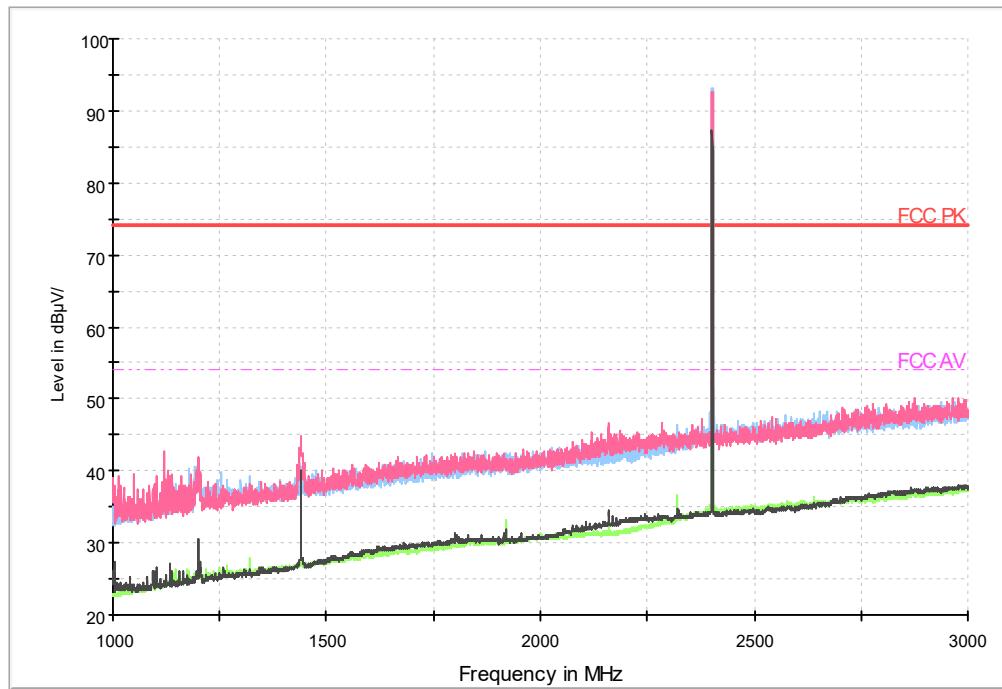


Fig.36 Radiated emission: 1M Ch0, 1GHz-3GHz

RE 3GHz-18GHz

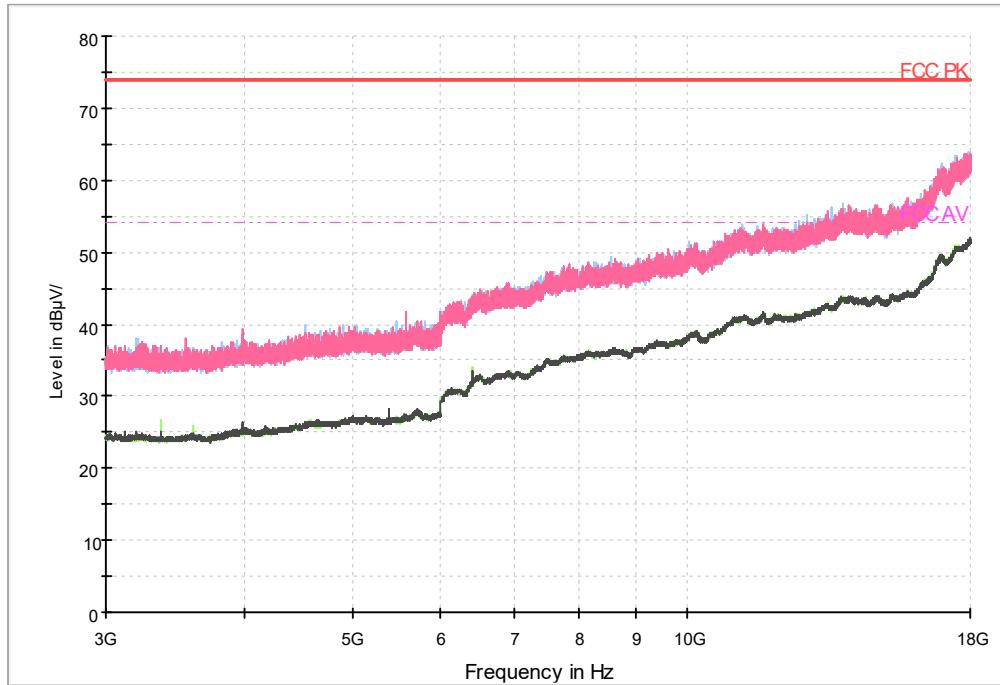


Fig.37 Radiated emission: Ch0, 3GHz-18GHz

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

Report No.:I21W00017-BLE_Rev2

RE 1GHz-3GHz

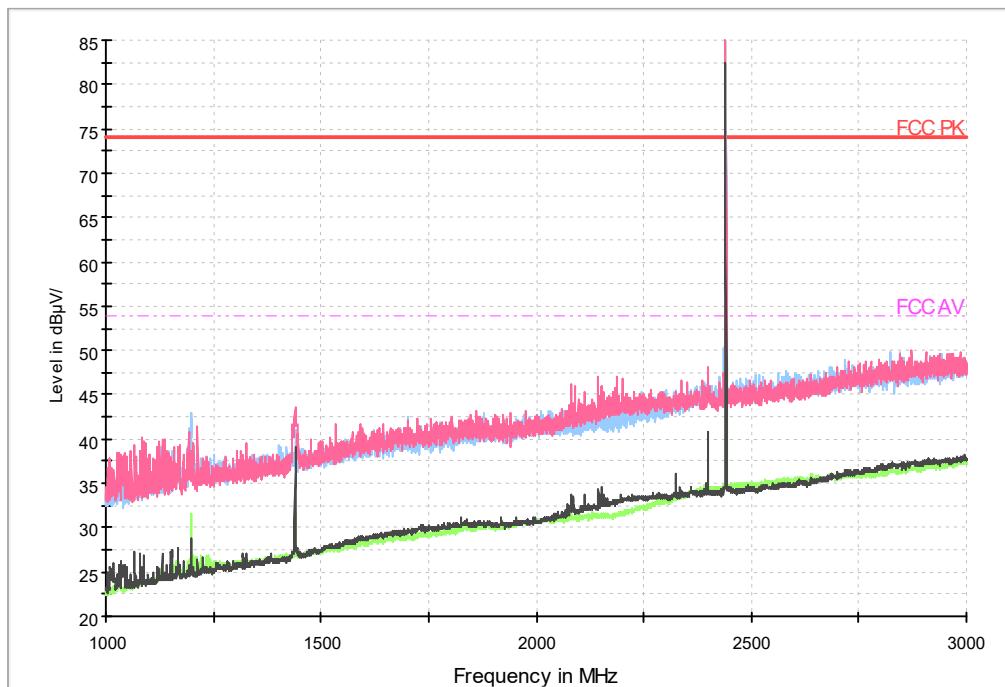


Fig.38 Radiated emission: 1M Ch19, 1GHz-3GHz

RE 3GHz-18GHz

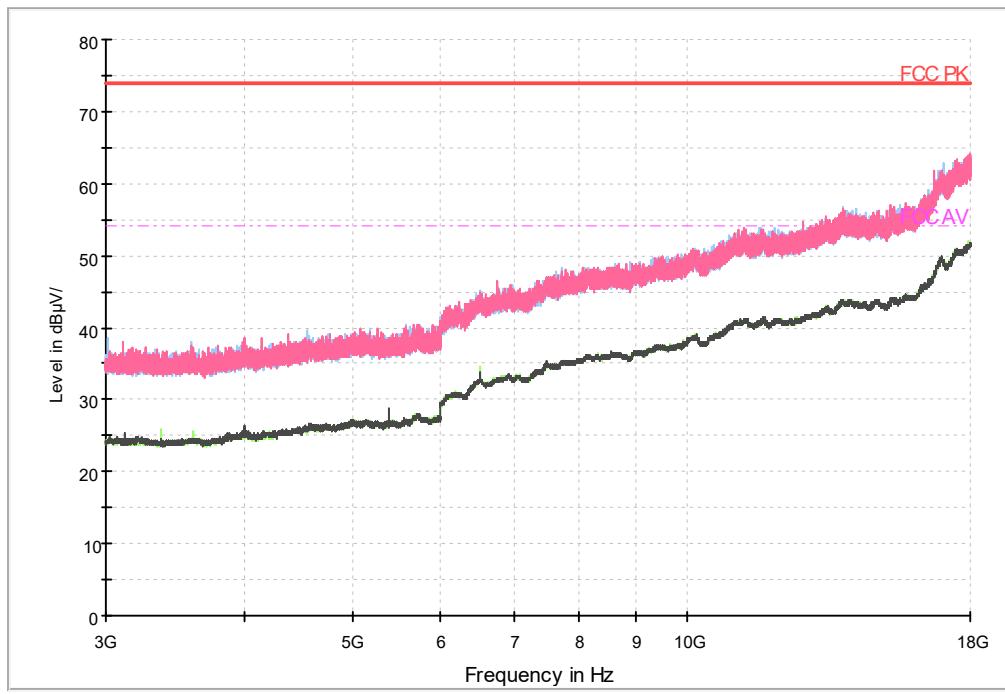


Fig.39 Radiated emission: 1M Ch19, 3GHz-18GHz

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

Report No.:I21W00017-BLE_Rev2

RE 1GHz-3GHz

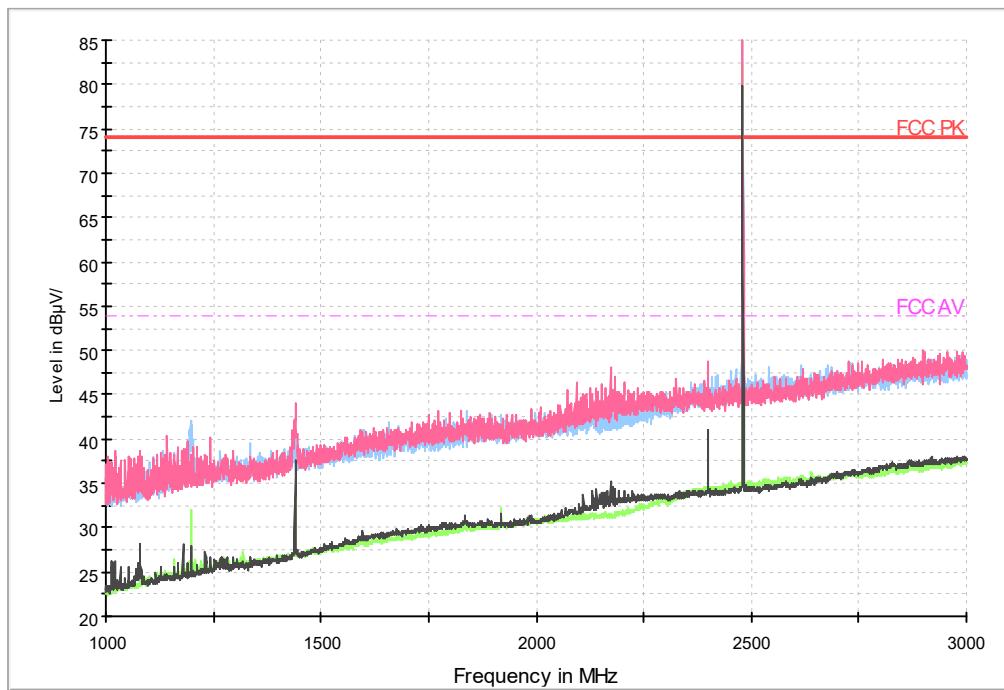


Fig.40 Radiated emission: 1M Ch39, 1GHz-3GHz

RE 3GHz-18GHz

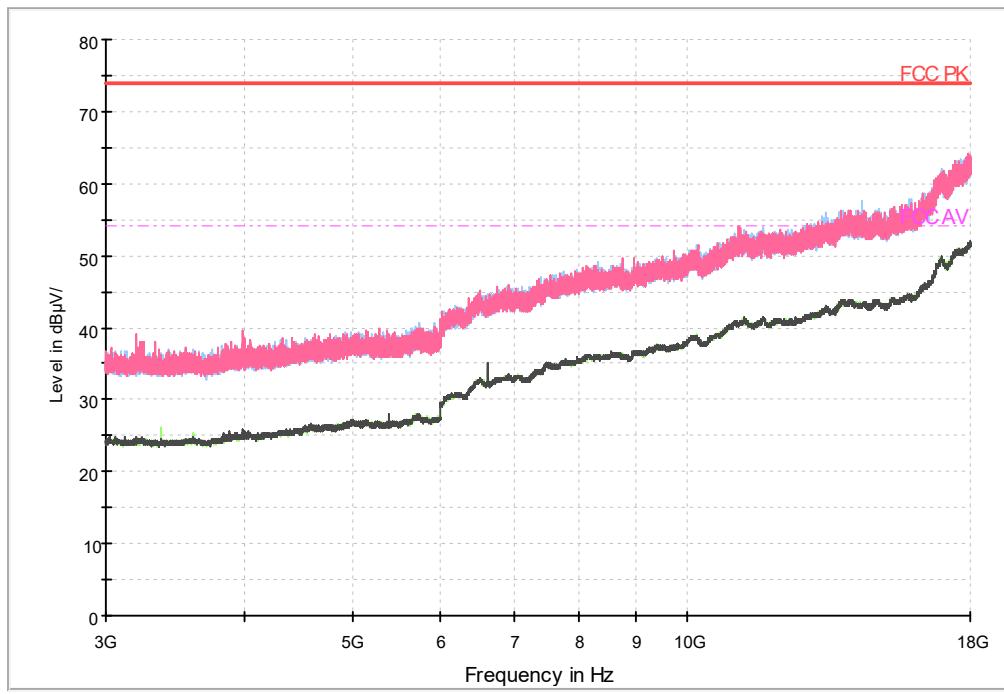


Fig.41 Radiated emission: 1M Ch39, 3GHz-18GHz

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
 Tel: 0086-23-88069965 FAX: 0086-23-88608777

Report No.:I21W00017-BLE_Rev2

RE 1GHz-3GHz

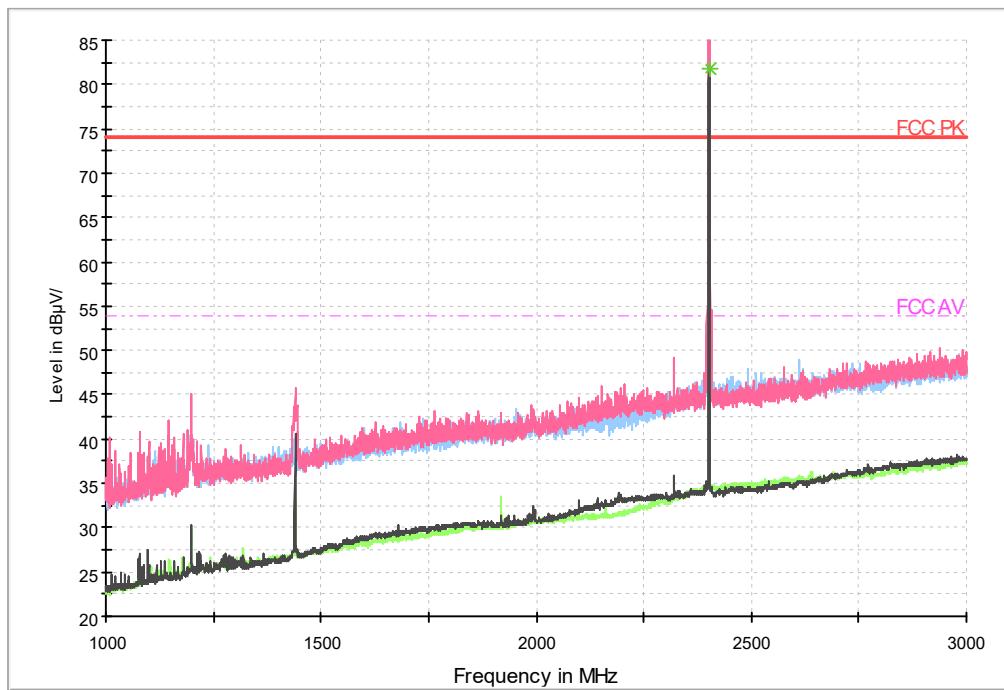


Fig.42 Radiated emission: 2M Ch0, 1GHz-3GHz

RE 3GHz-18GHz

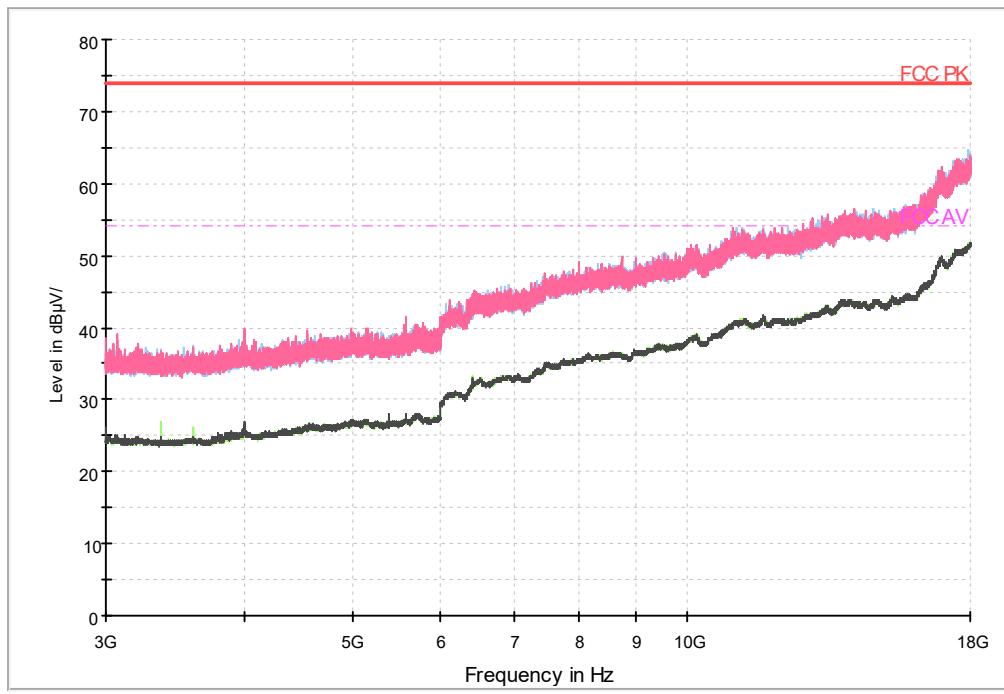


Fig.43 Radiated emission: 2M Ch0, 3GHz-18GHz

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

Report No.:I21W00017-BLE_Rev2

RE 1GHz-3GHz

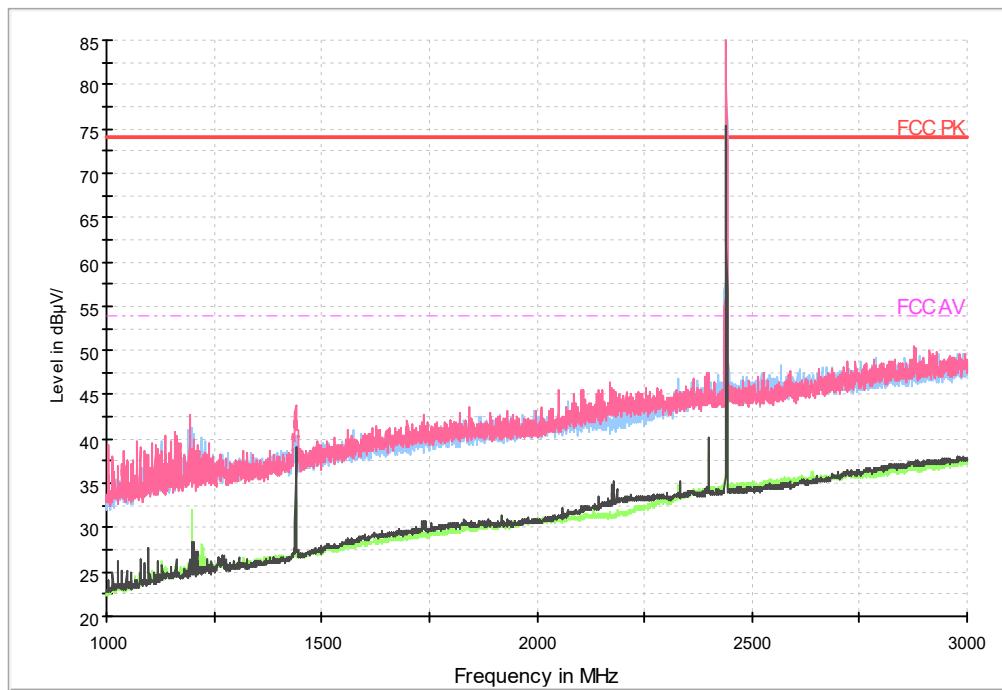


Fig.44 Radiated emission: 2M Ch19, 1GHz-3GHz

RE 3GHz-18GHz

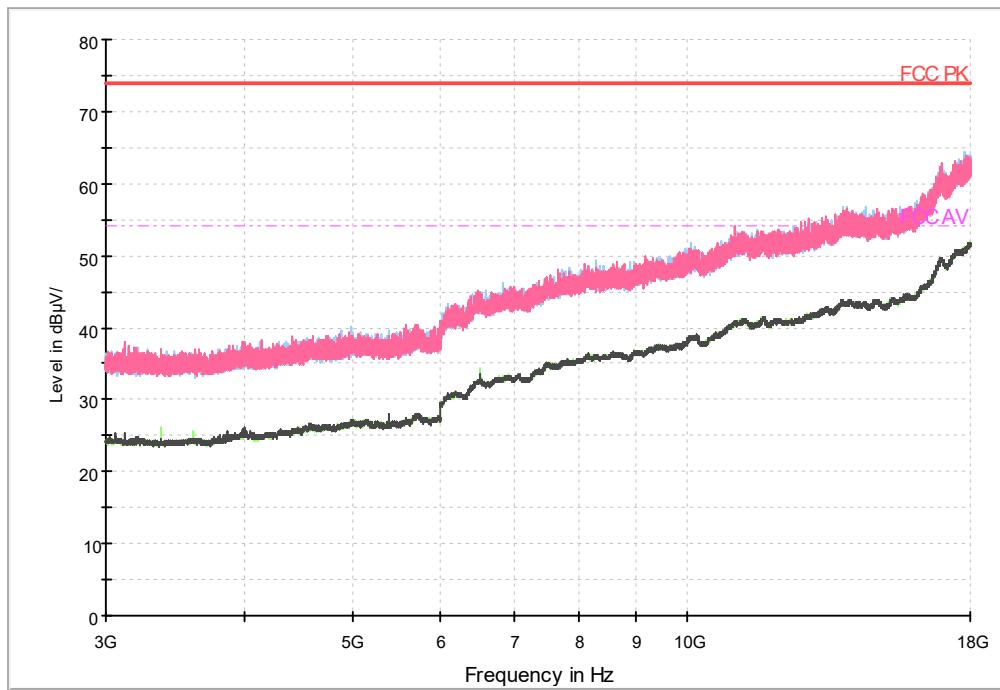


Fig.45 Radiated emission: 2M Ch19, 3GHz-18GHz

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

RE 1GHz-3GHz

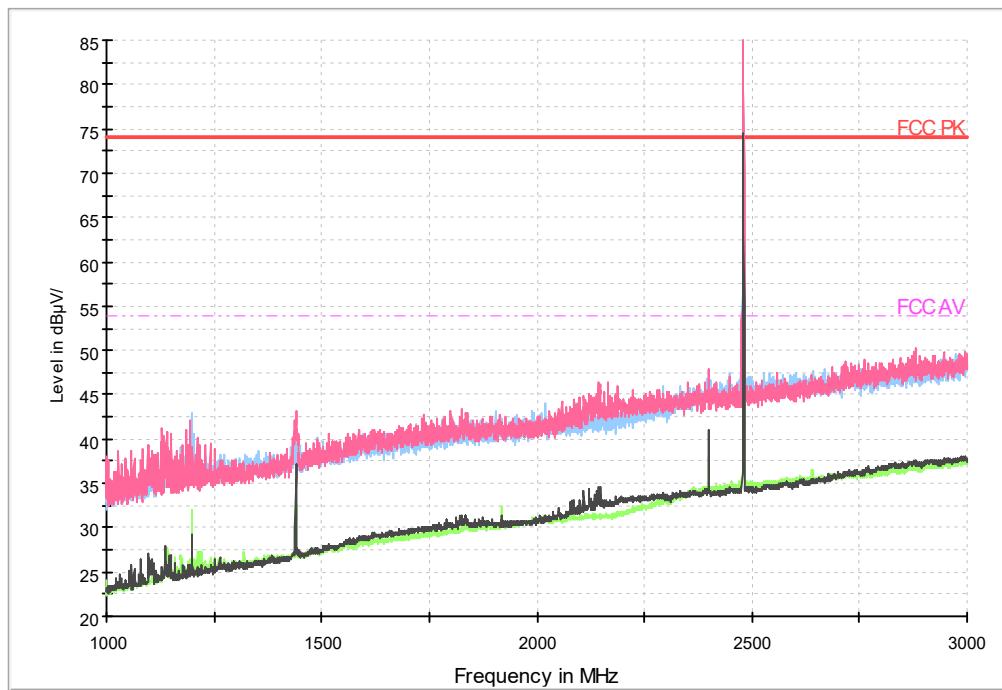


Fig.46 Radiated emission: 2M Ch39, 1GHz-3GHz

RE 3GHz-18GHz

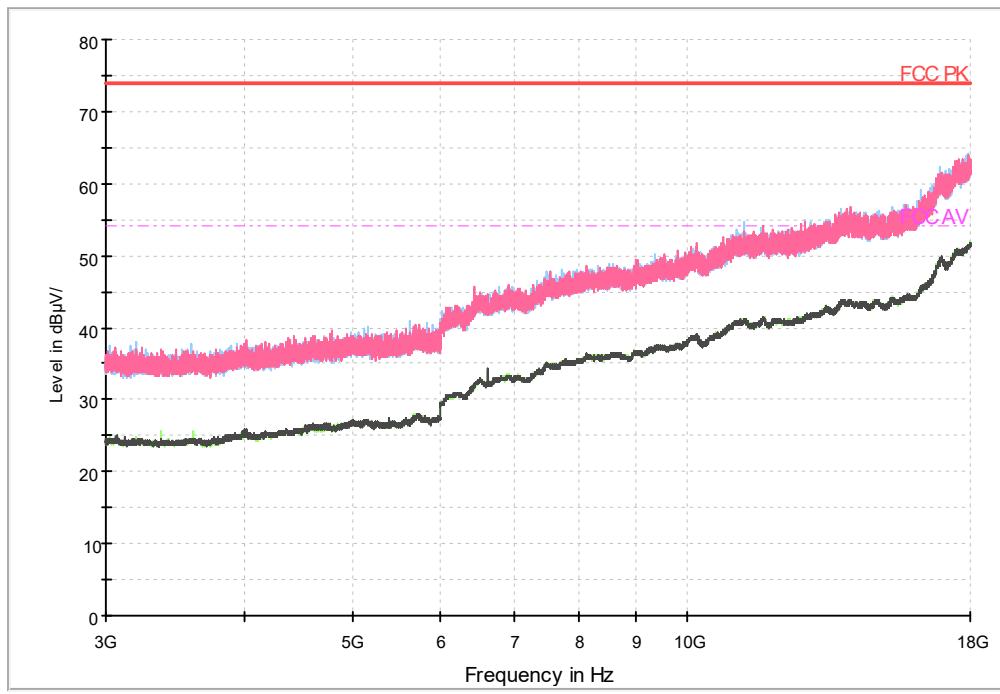


Fig.47 Radiated emission: 2M Ch39, 3GHz-18GHz

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

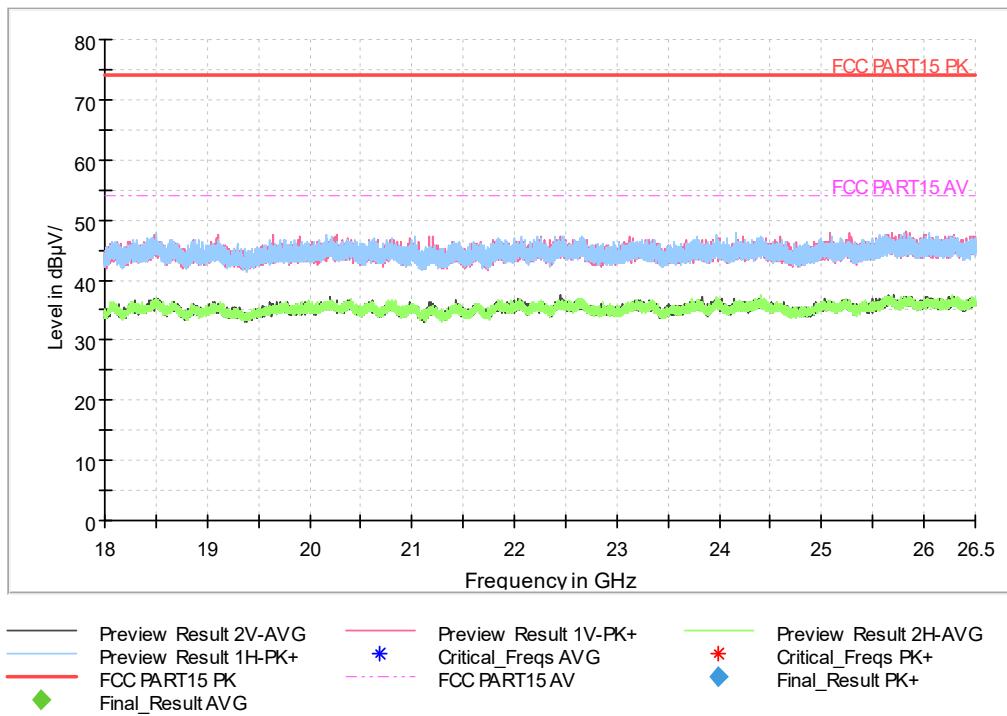


Fig.48 Radiated emission: 18 GHz – 26.5 GHz

Fig.49 Test photo

Fig.50 See the Pic1- Pic 2 in document "PA32_Wifi_BT_Test Setup Photos".

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

5.7 Power line Conducted Emissions

Specifications:	Part 15.207
DUT Serial Number:	866884045658127
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Limit

The EUT meets the requirement of having a peak to average ratio of less than 13dB.

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolt (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range are listed as follows:

Measurement Uncertainty:

Frequency Range	Uncertainty
150 kHz to 30 MHz	1.83

Limits of the conducted disturbance at the AC mains ports:

Frequency range	Limit(Quasi-peak)	Limit(Average)
0.15 MHz to 0.5 MHz	66 dB μ V – 56 dB μ V	56 dB μ V – 46 dB μ V
>0.5 MHz to 5MHz	56 dB μ V	46 dB μ V
>5 MHz to 30 MHz	60 dB μ V	50 dB μ V

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

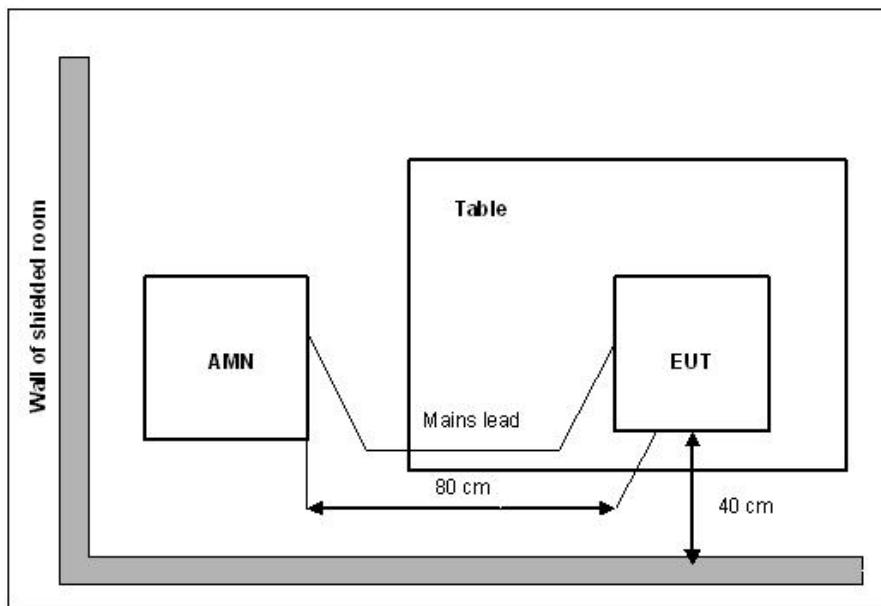
Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Setup

The EUT was placed in a shielding room. The WLAN TESTER was used to set the TX channel and power level. The ac adapter output is connected to Receiver through an AMN (Artificial Mains Network).

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777



Test Procedure

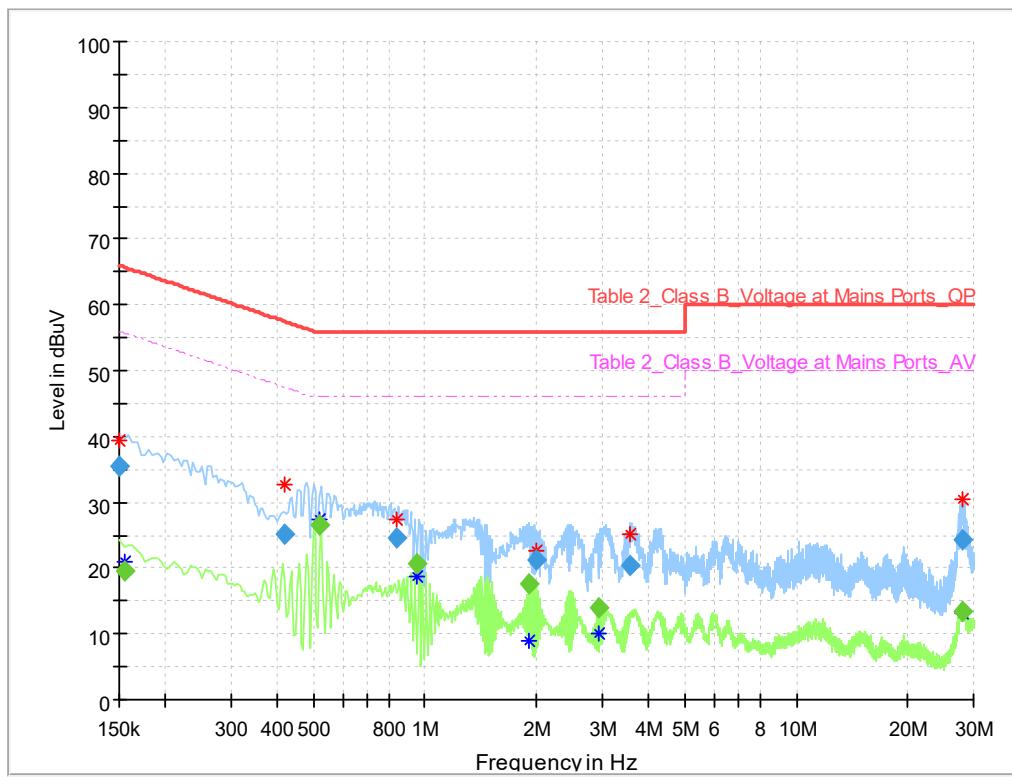
1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors – Quasi Peak and Average Detector.

The measurement is made according to ANSI C63.10-2013.

Conclusion: PASS

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

Test Result:

Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit dBuV	Margin (dB)	Meas. Time (ms)	Line	Filter	Corr. (dB)
0.150000	35.41	---	66.00	30.59	1000.0	N	ON	10.9
0.154500	---	19.67	55.75	36.08	1000.0	N	ON	10.6
0.416228	25.18	---	57.52	32.34	1000.0	L1	ON	10.0
0.518625	---	26.58	46.00	19.42	1000.0	N	ON	10.1
0.841698	24.63	---	56.00	31.37	1000.0	N	ON	9.9
0.952544	---	20.78	46.00	25.22	1000.0	N	ON	9.9
1.904779	---	17.60	46.00	28.40	1000.0	N	ON	9.8
2.003779	21.30	---	56.00	34.70	1000.0	N	ON	9.8
2.941412	---	13.96	46.00	32.04	1000.0	N	ON	9.8
3.556191	20.40	---	56.00	35.60	1000.0	N	ON	9.8
27.989184	24.17	---	60.00	35.83	1000.0	N	ON	10.3
28.012897	---	13.40	50.00	36.60	1000.0	L1	ON	10.2

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965

FAX:0086-23-88608777

Report No.:I21W00017-BLE_Rev2

Annex A EUT Photos

See the document " PA32 -External Photos".

See the document " PA32 -Internal Photos".

Chongqing Academy of Information and Communication Technology

Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336

Tel: 0086-23-88069965

FAX:0086-23-88608777

Report No.:I21W00017-BLE_Rev2

ANNEX B Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

End Of Report

Chongqing Academy of Information and Communication Technology

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777