



TEST REPORT

REPORT NUMBER: I21W00032-BLE_Rev.01

ON

Type of Equipment:

Wireless Module

Model name:

A7672SA、A7672SA miniPCIE

Brand Name:

SIMCOM

Manufacturer:

SIMCom Wireless Solutions Limited

FCC ID:

2AJYU-8BAE001

ACCORDING TO

FCC Part 15, Subpart C:

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

Nov 15, 2021

Signature



Xiang Luoyong

Director

Note:

The test results in this test report relate only to the devices specified in this report.
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Chongqing Academy of Information and Communications Technology.



Report No.: I21W00032-BLE

Revision Version

Report Number	Revision	Date	Memo
I21W00032-BLE	00	2021-10-27	Initial creation of test report
I21W00032-BLE	01	2021-11-15	First modified of test report

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1. Test Laboratory

1.1. Testing Location

Name:	Chongqing Academy of Information and Communications Technology
FCC Registration Number:	CN1239
Address:	Building C, Technology Innovation Center, No.8, Yuma Road, Chayuan New Area, Nan'an District, Chongqing, People's Republic of China
Postal Code:	401336
Telephone:	0086-23-88069965
Fax:	0086-23-88608777

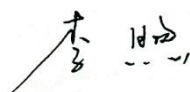
1.2. Testing Environment

Normal Temperature:	15-35°C
Relative Humidity:	30-60%

1.3. Project data

Testing Start Date:	2021-08-26
Testing End Date:	2021-11-12

1.4. Signature



2021-11-15

(Prepared this test report)

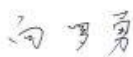
Date



2021-11-15

(Reviewed this test report)

Date



2021-11-15

Director of the laboratory
(Approved this test report)

Date

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2. Client Information

2.1. Applicant Information

Company Name:	SIMCom Wireless Solutions Limited
Address /Post:	Building 3, No. 289, Linhong Road, Changning District, Shanghai, P.R.China
City:	Shanghai
Country:	CHINA
Telephone:	15902149520
Fax:	--
Email:	yue.hai@simcom.com
Contact Person:	Haiyue

2.2. Manufacturer Information(if different from applicant in section 2.1)

Company Name:	--
Address /Post:	--
City:	--
Country:	--
Telephone:	--
Fax:	--
Email:	--
Contact Person:	--

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3. Equipment under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Manufacturer: SIMCom Wireless Solutions Limited

Type of Equipment: Wireless Module

Model Name: A7672SA、A7672SA miniPCIE

Brand name: SIMCOM

Production Status: Product

Hardware Version: V1.01

Software Version: A011B01A7672M7_GPS

Antenna description: External antenna

Antenna Gain: 3.39 dBi

frequency range: 2402-2480MHz

Normal Voltages: 3.80 V

Receipt date of test item: 2021-08-26

Note: Photographs of EUT are shown in ANNEX A of this test report.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
S1	860710050007205	V1.01	A011B01A7672M7_GPS	2021-08-26
S2	860710050007536	V1.01	A011B01A7672M7_GPS	2021-08-26
S5	860710050007619	V1.01	A011B01A7672M7_GPS	2021-08-26

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

3.3. Outline of Equipment under Test

Technology	Band	UL Freq.(MHz)	DL Freq.(MHz)	Note
GSM	GSM850	824 – 849	869 – 894	--
	PCS1900	1850 – 1910	1930 – 1990	--

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LTE	B2	1850 – 1910	1930 – 1990	--
	B4	1710 – 1755	2110 – 2155	--
	B5	824 – 849	869 – 894	--
	B66	1710-1780	2110-2200	--
BLUETOOTH	BLE	2402-2480		--

3.4. Internal Identification of AE used during the test

AE ID*	Description	dB*
AE1	RF cable	--

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

dB*: is provided customer.

3.5. ANTENNA REQUIREMENT

Standard Applicable

For intentional device, according to FCC 47 CFR 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

EUT equipped a permanent connector Reversed-SMA connector.It conforms to the standard requirements . The directional gains of antenna used for transmitting is 3.39dBi.

3.6. EUT Test RF Confagle Configuration

Set DUT power, rate and channel through at command, and set the power level to 0.

4. Reference Documents

4.1. Documents supplied by applicant

PICS/PIXIT, referring to Annex B 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	Year number
FCC Part 15, Subpart C, 2019	Intentional Radiators	2019
ANSI C63.10-2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices	2013

5. Test Equipments Utilized

5.1. RF Test System

No.	Equipment	Model	SN	HW Version	SW Version	Manufacture	Cal.Due Date
1	spectrum analyzer	FSQ 26	201137/026	--	--	R&S	2022-06-11
2	DC Power Supply	N6705B	MY50000919	--	--	Agilent	2022-06-11
3	Universal Radio Communication Tester	CMW500	152395	--	--	R&S	2022-06-11

5.2. RSE Test System

No.	Equipment	Model	SN	HW Version	SW Version	Manufacture	Cal.Due Date
1	EMI Test Receiver	ESU26	100367	01	4.43 SP3	R&S	2022-06-11
2	Trilog super broadBand test antenna	VULB 9163	01392	--	--	R&S	2023-03-04
3	Double-Ridged Horn Antenna	HF907	100357	--	--	R&S	2023-02-10
4	Trilog super broadBand test antenna	VULB 9163	00995	--	--	R&S	2023-04-03
5	Double-Ridged Horn Antenna	HF907	100356	--	--	R&S	2022-08-20

5.3. Climate Chamber

No.	Name	Type	SN	Manufacture	Cal.Due Date
1	Climate chamber	SH-241	92010759	ESPEC	2022-06-11
2	Fully-Anechoic Chamber	11.8m×6.5m×6.3m	--	ETS	2024-01-22

Anechoic chamber

Fully anechoic chamber by ETS-LINDGREN.

5.4. Test software

No.	Name	version	SN	Manufacture
1	EMC32	V8.51.0	--	R&S

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6. 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:--		

7 Test Results

7.1 Maximum Peak Output Power

Specifications:	FCC Part 15.247(b)
DUT Serial Number:	860710050007205
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	$\pm 1.0\text{dB}$
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The measurement is according to ANSI C63.10 clause 11.9.1.3

Test Method:

- 1) The RF output of EUT was connected to the RF power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 2) Set to the maximum power setting and enable the EUT transmit continuously.
- 3) Measure the conducted output power and record the results in the test report.

Note: --

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Measurement Results:

1 M	Channel No.	Output Power (dBm)	Result
	Low: 0	6.11	Pass
	Middle: 19	6.27	Pass
	High: 39	6.37	Pass
2 M	Low: 0	6.11	Pass
	Middle: 19	6.36	Pass
	High: 39	6.02	Pass

1 M	Channel No.	EIRP(dBm)
	Low: 0	8.11
	Middle: 19	8.27
	High: 39	8.37
2 M	Low: 0	8.11
	Middle: 19	8.36
	High: 39	8.02

Conclusion: PASS

7.2 Peak Power Spectral Density

Specifications:	FCC CFR Part 15.247(e)
DUT Serial Number:	860710050007205
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	$\pm 0.82\text{dBm/KHz}$
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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: --

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Test Results:

1 M	Power Spectral Density(dBm/3kHz)			Conclusion
	Ch0	Ch19	Ch39	
	-11.87	-11.73	-11.85	Pass
	Power Spectral Density(dBm/100kHz)			Conclusion
	Ch0	Ch19	Ch39	
	5.69	6.24	6.20	Pass

2 M	Power Spectral Density(dBm/3kHz)			Conclusion
	Ch0	Ch19	Ch39	
	-13.66	-13.39	-13.45	Pass
	Power Spectral Density(dBm/100kHz)			Conclusion
	Ch0	Ch19	Ch39	
	6.02	6.26	6.23	Pass

Conclusion: PASS

Test figure as below:



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



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

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



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

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



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

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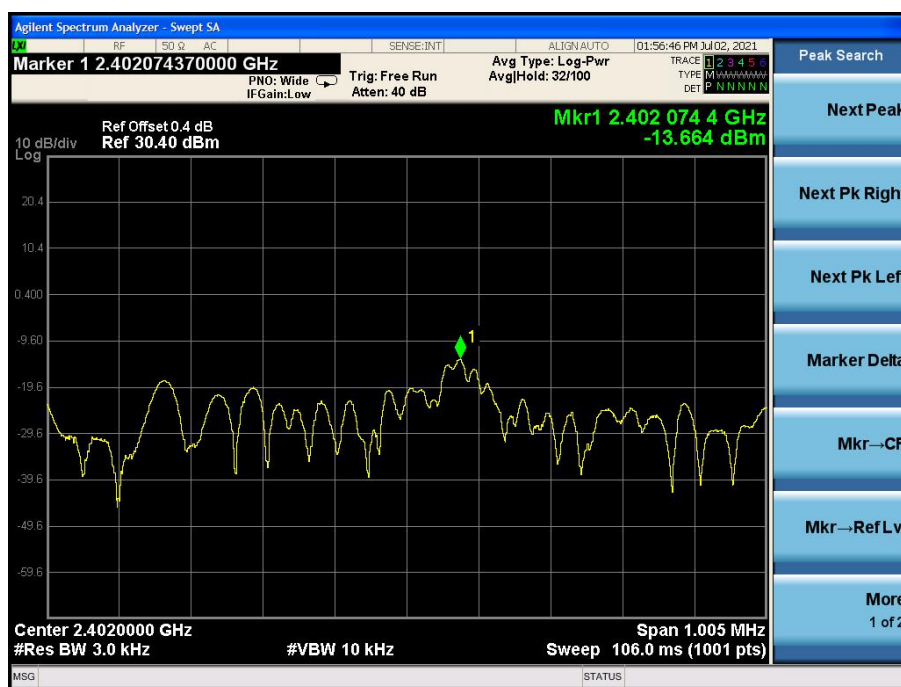


Fig.7 Power spectral density: 2M CH0 PSD/3KHz

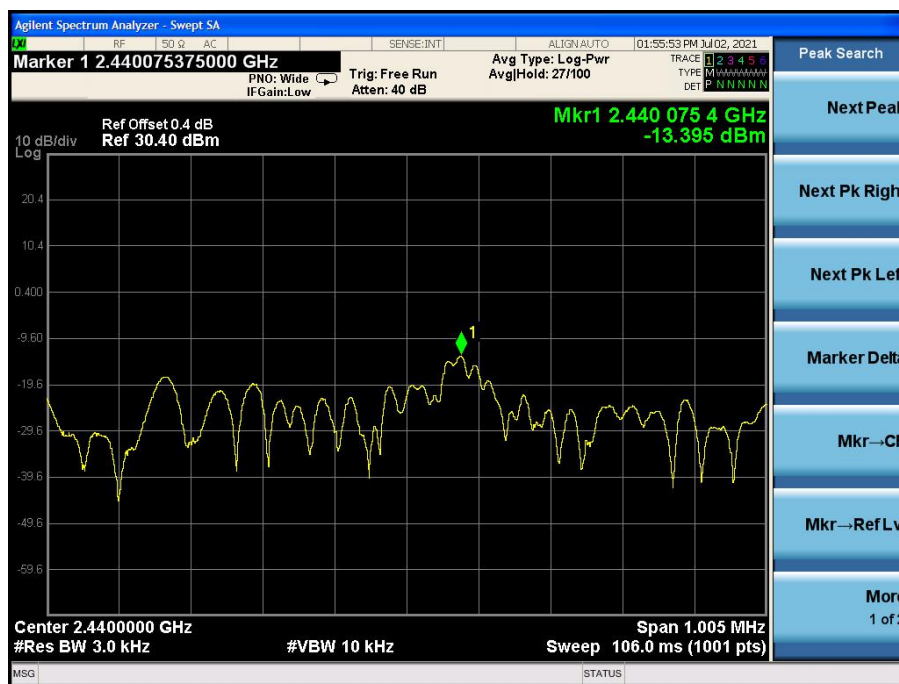


Fig.8 Power spectral density: 2M CH19 PSD/3KHz

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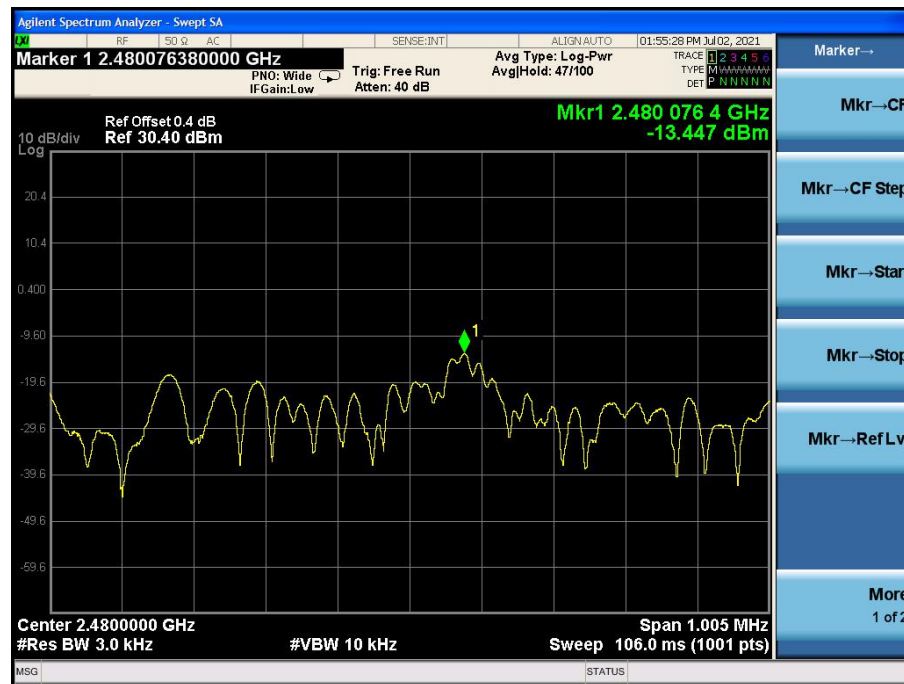


Fig.9 Power spectral density: 2M CH39 PSD/3KHz



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

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



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

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7.3 6dB Occupied Bandwidth

Specifications:	FCC 47 CFR Part 15.247(a)
DUT Serial Number:	860710050007205
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	$\pm 1.1\text{KHz}$
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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.

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Note: --

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Test Result:

1M	Occupied 6dB Bandwidth(MHz)			Conclusion
	Ch0	Ch19	Ch39	
	0.688	0.684	0.687	Pass

2M	Occupied 6dB Bandwidth(MHz)			Conclusion
	Ch0	Ch19	Ch39	
	1.174	1.177	1.188	Pass

Conclusion: PASS

Test figure as below:

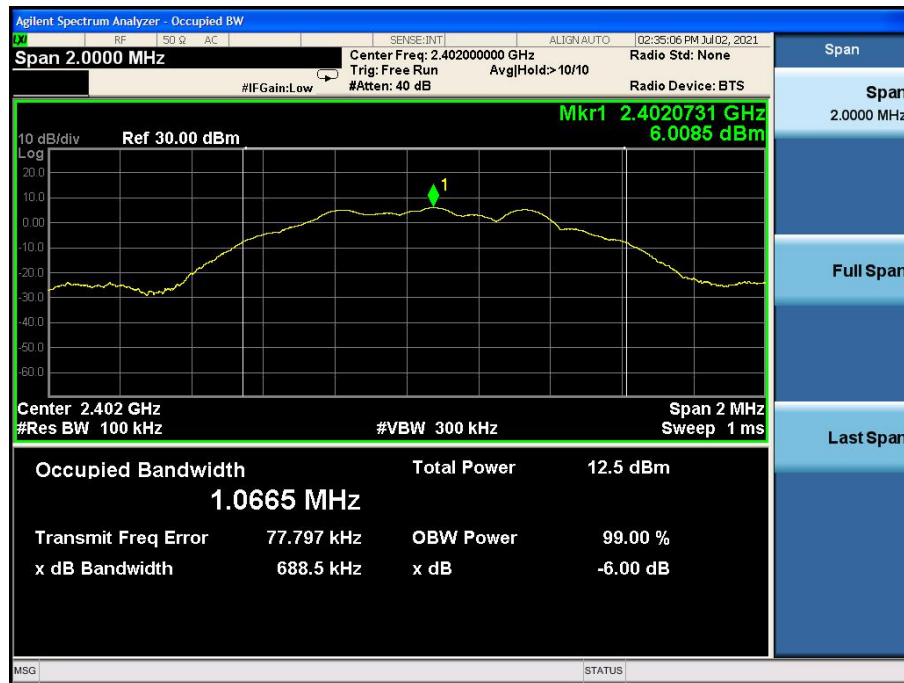


Fig.13 6dB Bandwidth: 1M Ch0

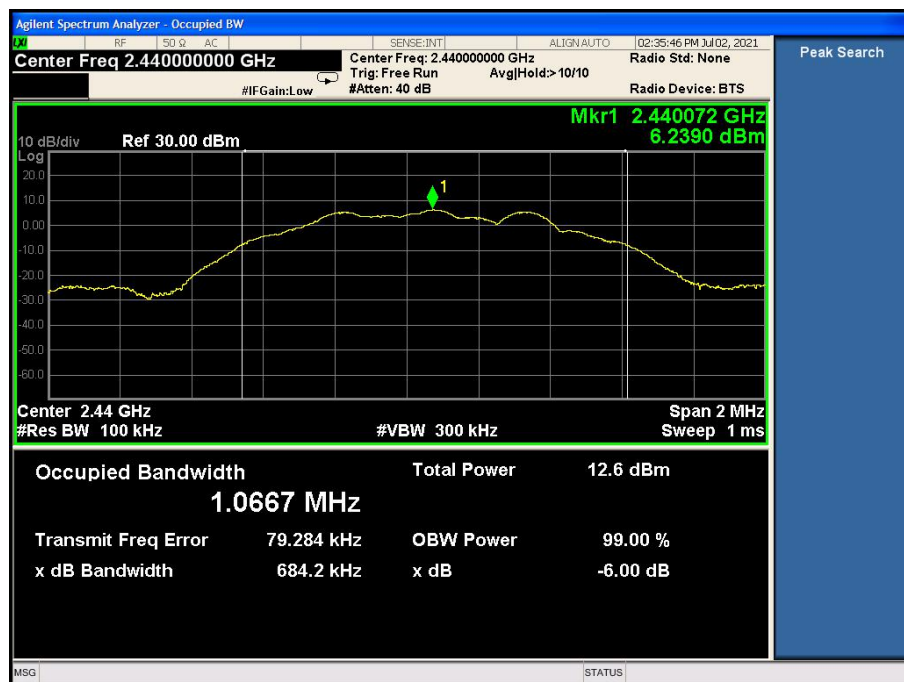


Fig.14 6dB Bandwidth: 1M Ch19

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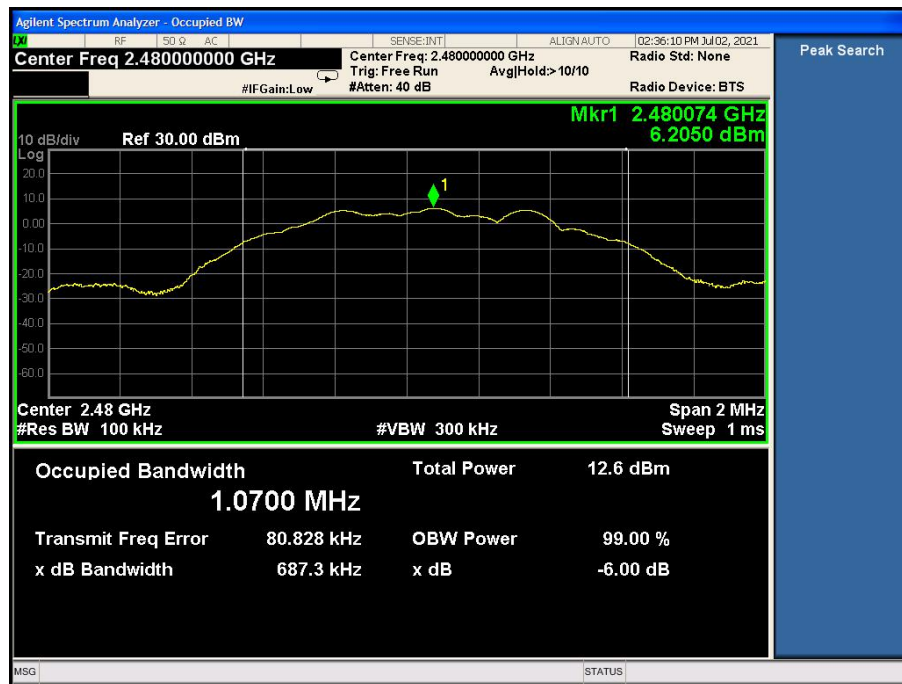


Fig.15 6dB Bandwidth: 1M Ch39

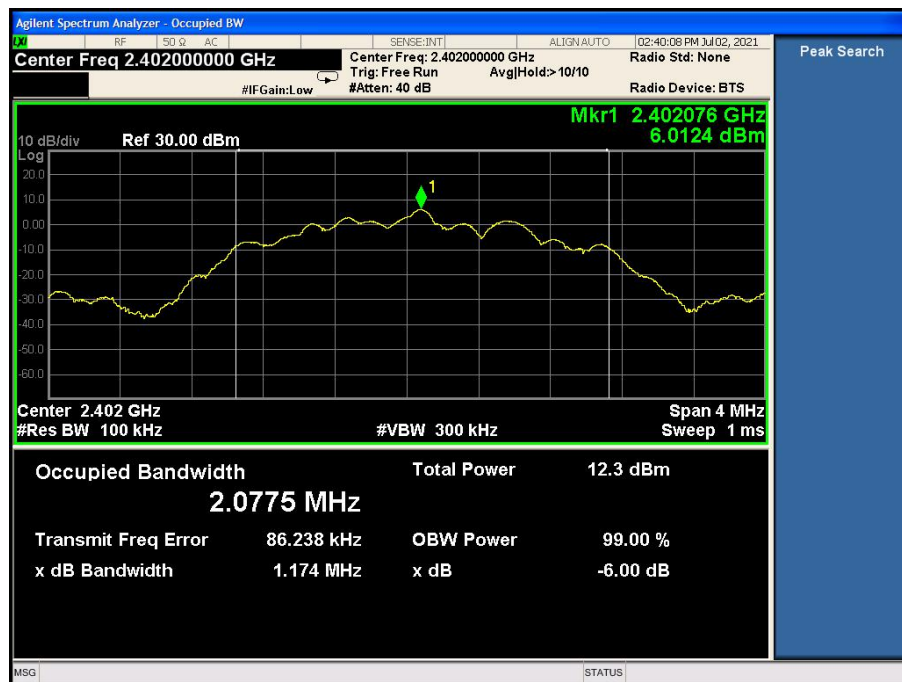


Fig.16 6dB Bandwidth: 2M Ch0

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Fig.17 6dB Bandwidth: 2M Ch19



Fig.18 6dB Bandwidth: 2M Ch39

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7.4 Band Edges Compliance

Specifications:	FCC 47 CFR Part 15.247(d)
DUT Serial Number:	860710050007205 860710050007536 860710050007619
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass
Note: Radiated bandedge both EUT S2 and S5 have been tested , and the data only reflect the worst case.	

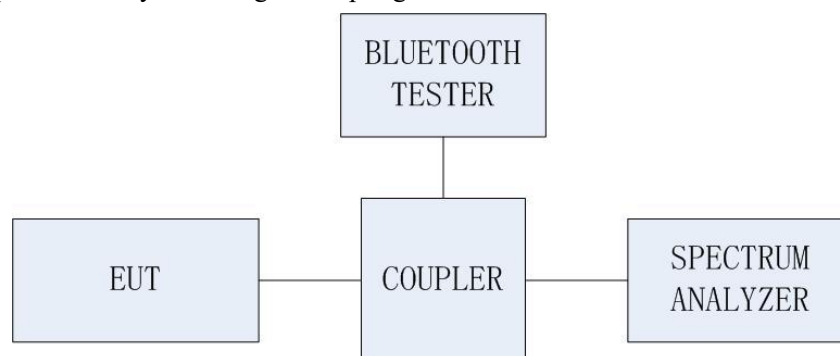
Limit Level Construction:

According to §15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

Measurement Uncertainty:

Measurement Uncertainty	$\pm 1.0\text{dB}$
-------------------------	--------------------

The BLUETOOTH TESTER was used to set the TX channel and power level. The transmitter output is connected to Spectrum analyzer through a coupling.



Test procedure:

The transmitter output is connected to the Spectrum Analyzer. The Spectrum Analyzer is set to the peak detector mode. The spectrum analyzer is set to:

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1. Span = 10 MHz
2. RBW = 100 KHz
3. VBW = 300 KHz
4. Sweep = auto

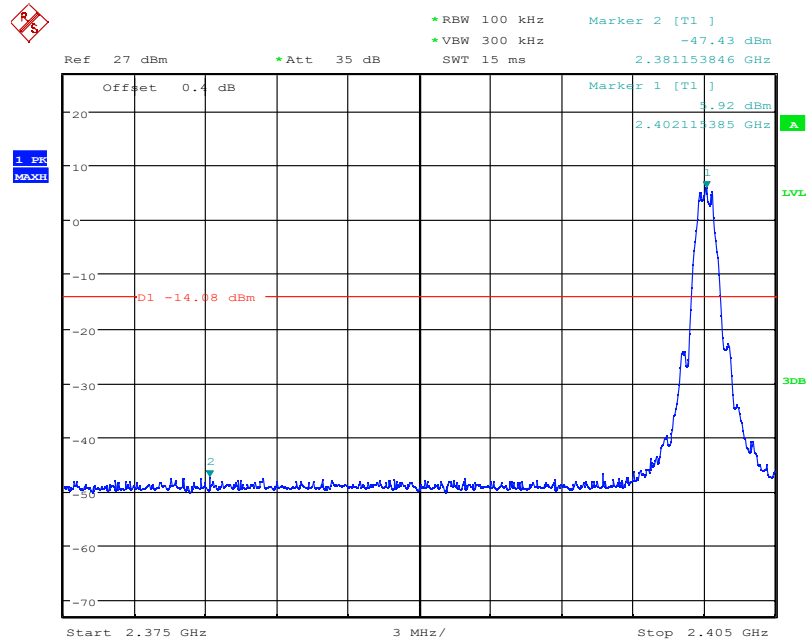
The measurement is made according to Public notice FCC Public Notice DA 00-705, March 2000, and ANSI C63.4-2003.

Note: --

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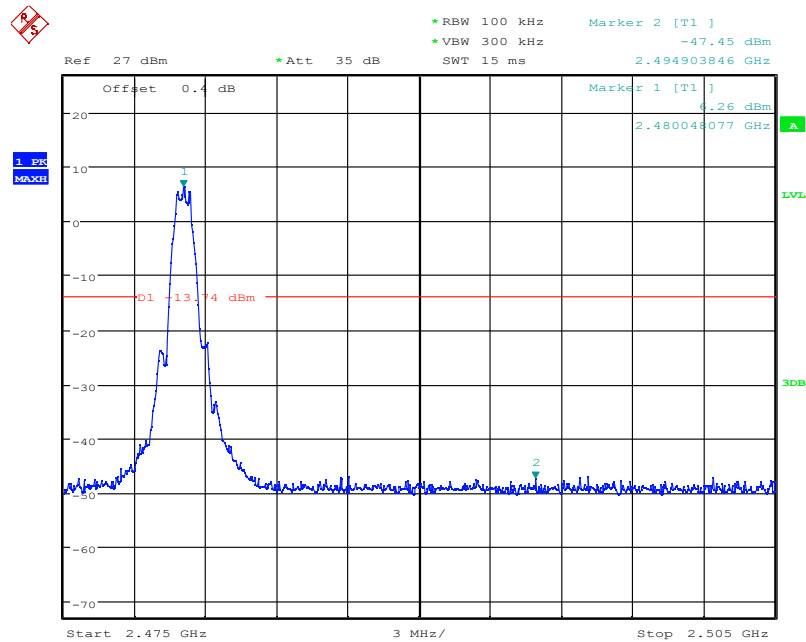
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Test Result:



Date: 2.JUL.2021 15:13:33

Fig.19 Frequency Band Edge: 1M Ch0

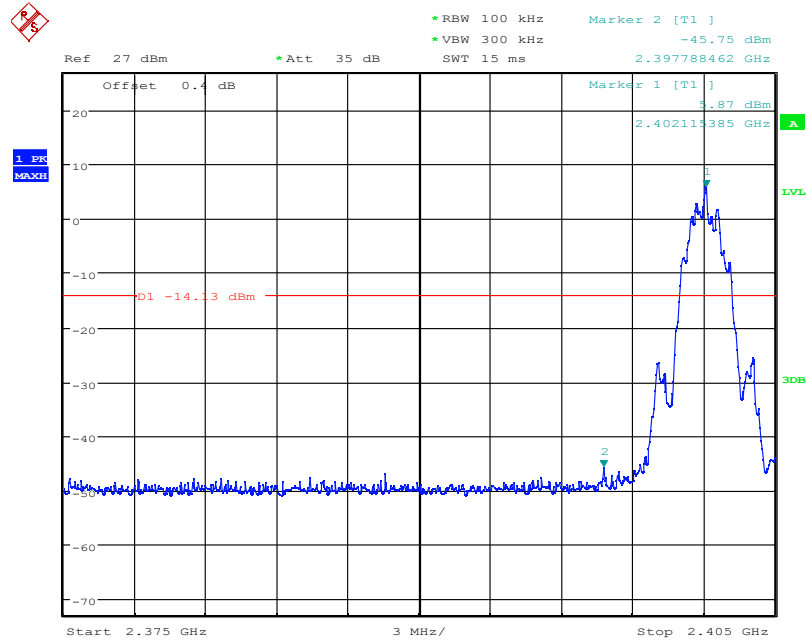


Date: 2.JUL.2021 15:14:58

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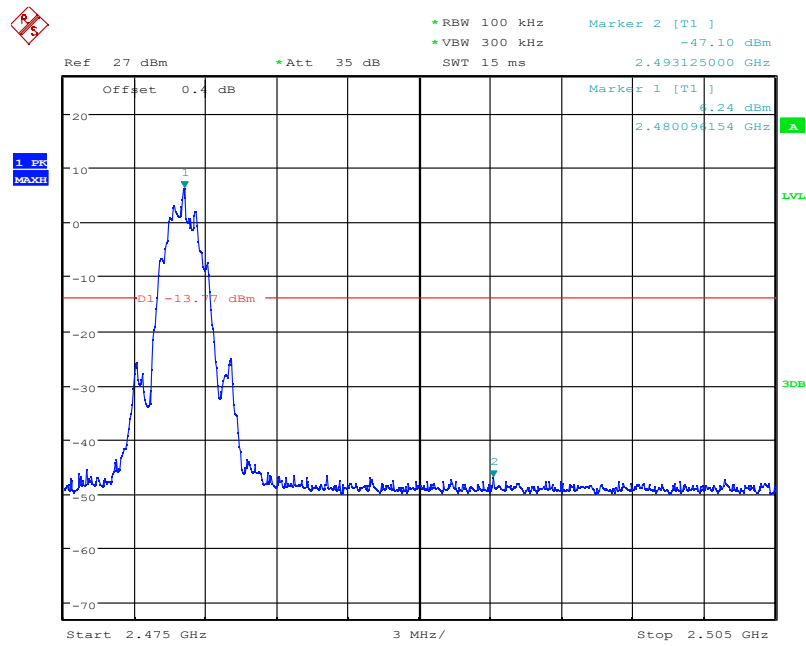
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Fig.20 Frequency Band Edge: 1M Ch39



Date: 2.JUL.2021 15:18:14

Fig.21 Frequency Band Edge: 2M Ch0



Date: 2.JUL.2021 15:16:55

Fig.22 Frequency Band Edge: 2M Ch39

BAND EDGERE 1GHz-3GHz 2.31-2.43G

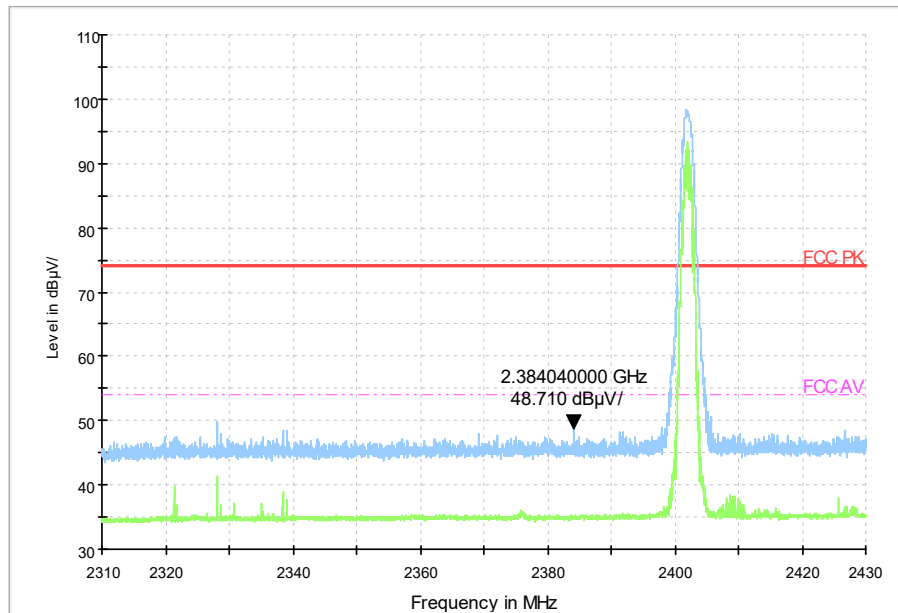


Fig.23 Frequency Band Edge: 1M Ch0

BAND EDGERE 1GHz-3GHz 2.45-2.5G

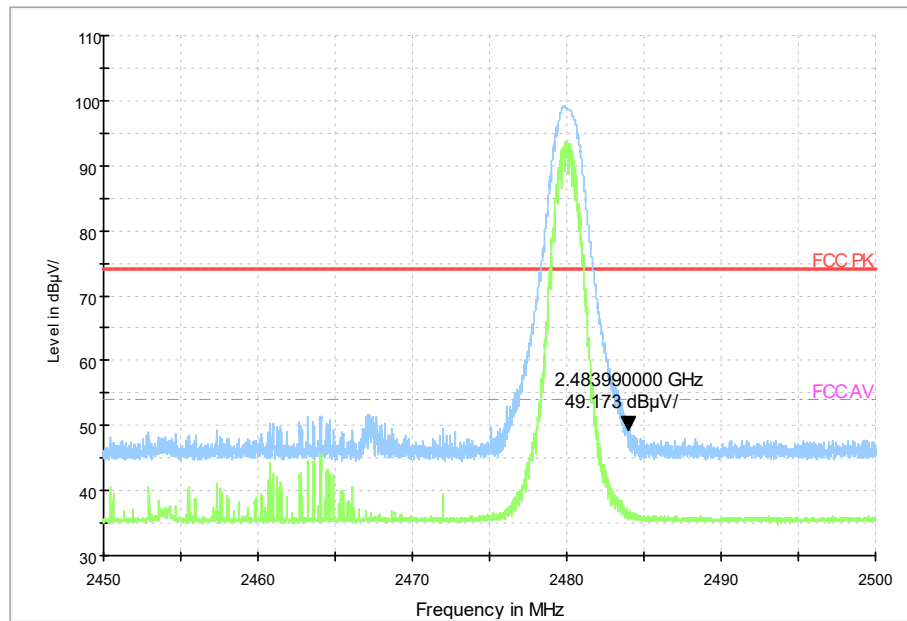


Fig.24 Frequency Band Edge: 1M Ch39

BAND EDGERE 1GHz-3GHz 2.31-2.43G

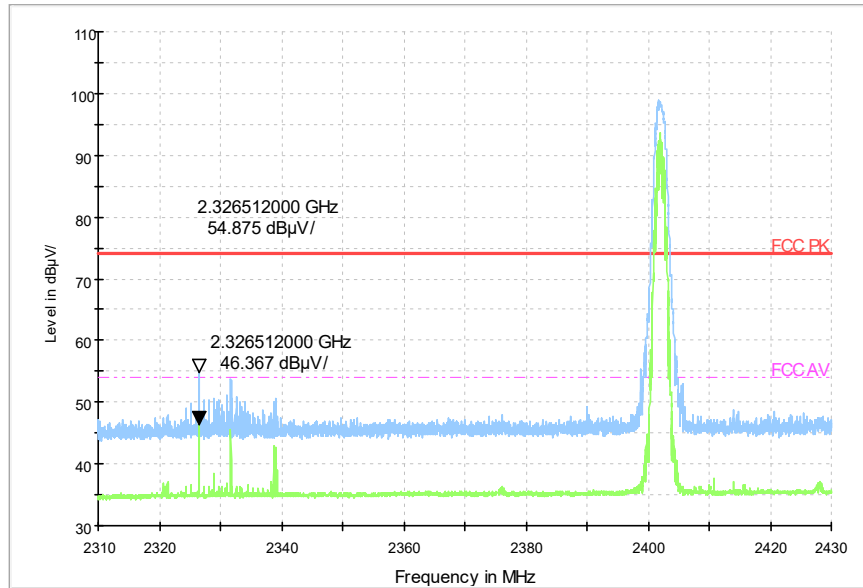


Fig.25 Frequency Band Edge:2M Ch0

BAND EDGERE 1GHz-3GHz 2.45-2.5G

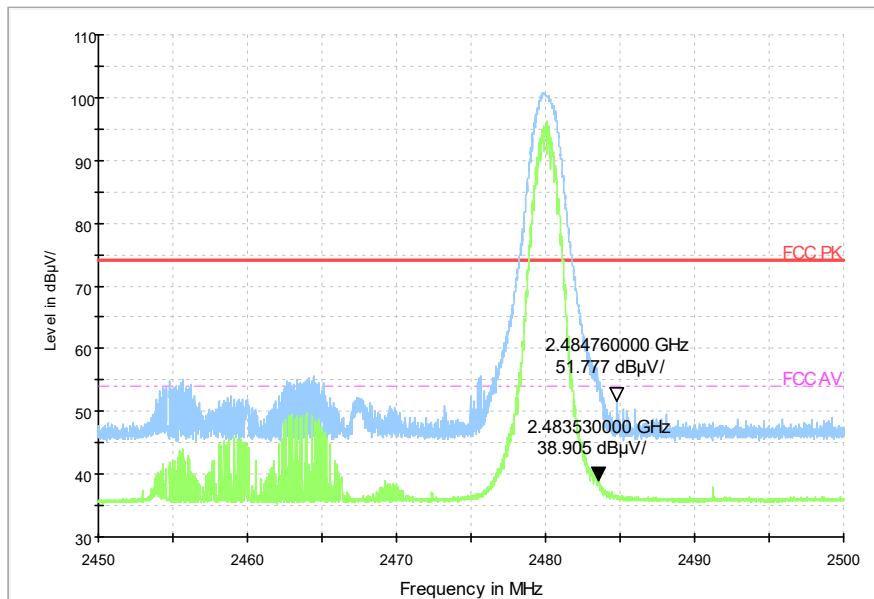


Fig.26 Frequency Band Edge: 2M Ch39

Conclusion: PASS

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7.5 Transmitter Spurious Emission-Conducted

Specifications:	FCC 47 CFR Part15.247 (d)
DUT Serial Number:	860710050007205
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
$30\text{MHz} \leq f \leq 26\text{GHz}$	± 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.

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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.

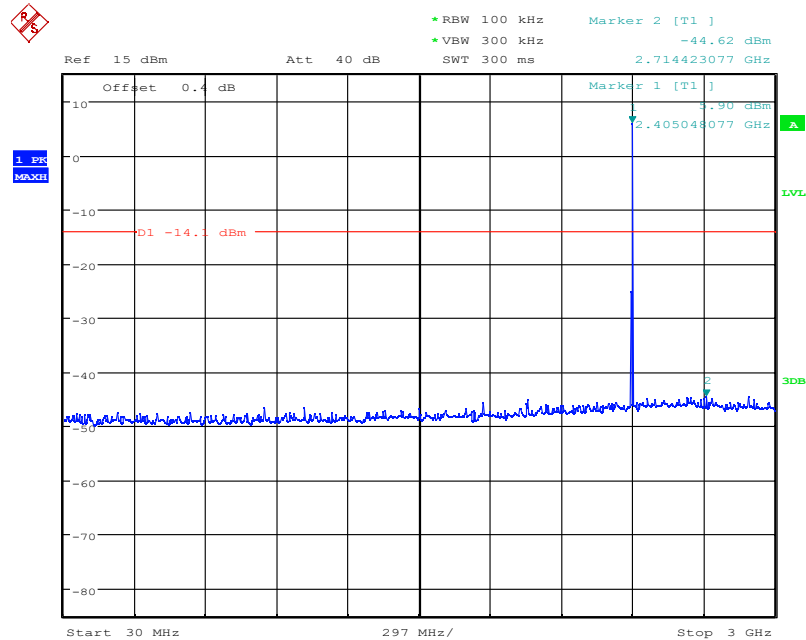
Test Result:

1M	Channel	Frequency Range	Test Results	Conclusion
	0	30MHz~3GHz	Fig.27	Pass
		3GHz~26.5GHz	Fig.28	Pass
	19	30MHz~3GHz	Fig.29	Pass
		3GHz~26.5GHz	Fig.30	Pass
	39	30MHz~3GHz	Fig.31	Pass
		3GHz~26.5GHz	Fig.32	Pass

2M	Channel	Frequency Range	Test Results	Conclusion
	0	30MHz~3GHz	Fig.33	Pass
		3GHz~26.5GHz	Fig.34	Pass
	19	30MHz~3GHz	Fig.35	Pass
		3GHz~26.5GHz	Fig.36	Pass
	39	30MHz~3GHz	Fig.37	Pass
		3GHz~26.5GHz	Fig.38	Pass

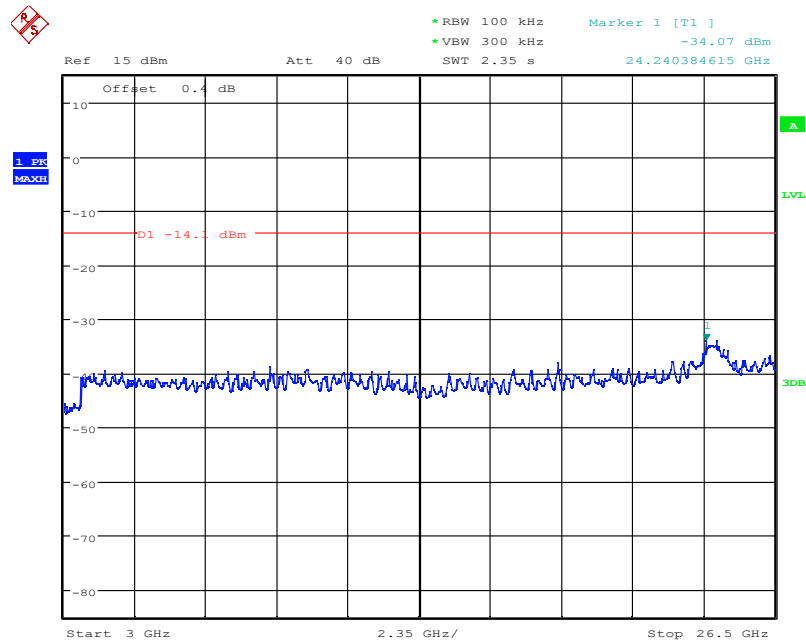
Conclusion: PASS

Test figure as below:



Date: 5.JUL.2021 08:54:50

Fig.27 Conducted spurious emission: 1M Ch0, 30MHz~3GHz

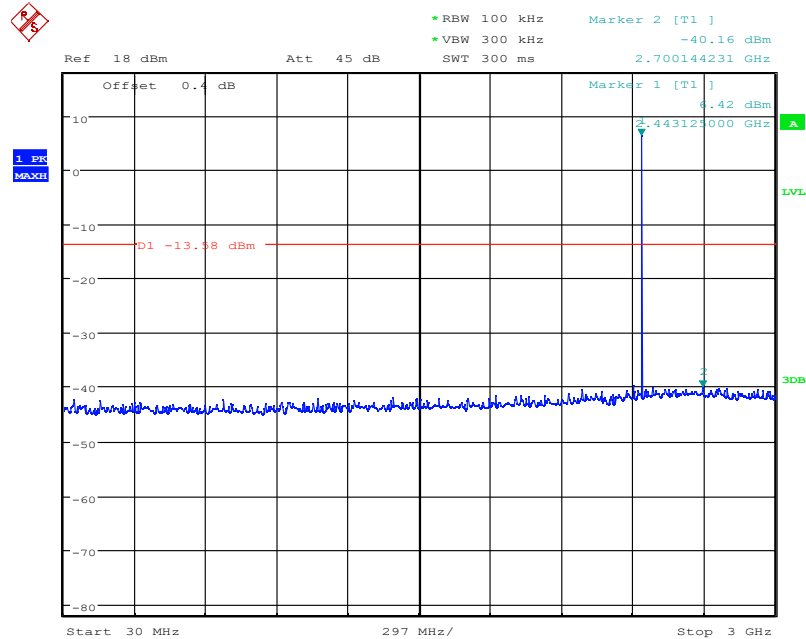


Date: 5.JUL.2021 08:55:31

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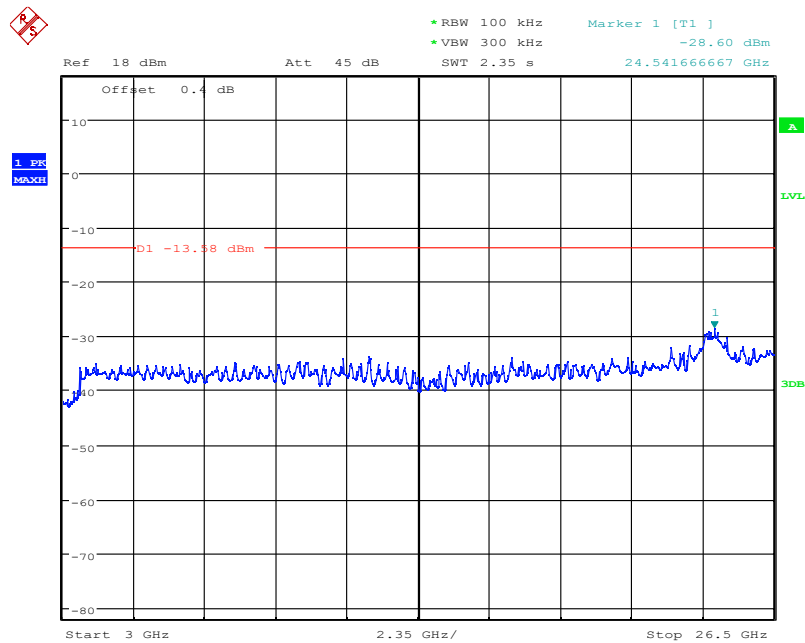
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Fig.28 Conducted spurious emission: 1M Ch0, 3GHz~26.5GHz



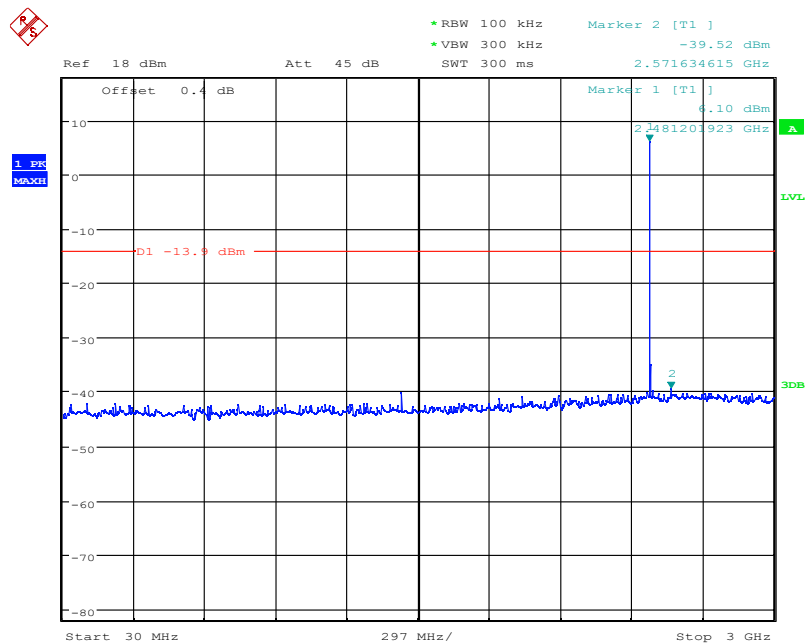
Date: 5.JUL.2021 08:58:06

Fig.29 Conducted spurious emission: 1M Ch19, 30MHz~3GHz



Date: 5.JUL.2021 08:58:30

Fig.30 Conducted spurious emission: 1M Ch19, 3GHz~26.5GHz

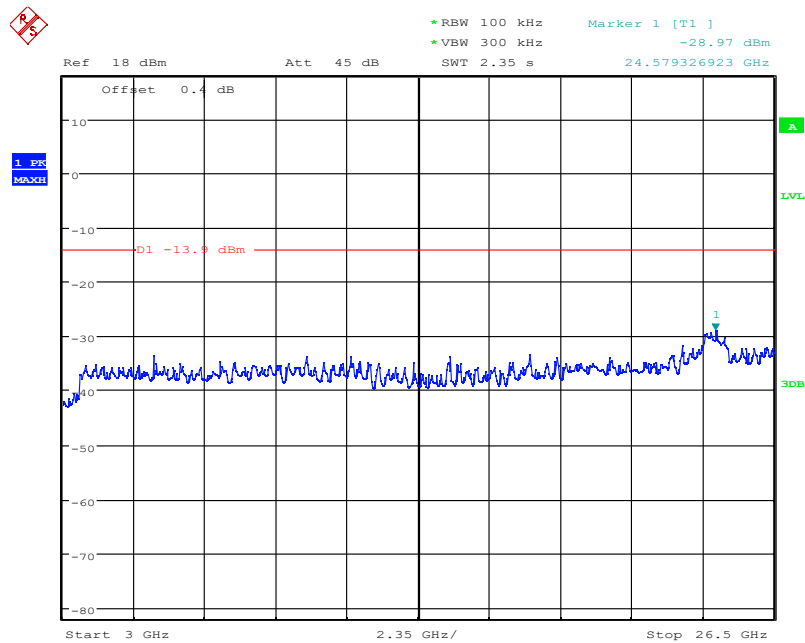


Date: 5.JUL.2021 09:01:39

Fig.31 Conducted spurious emission: 1M Ch39, 30MHz~3GHz

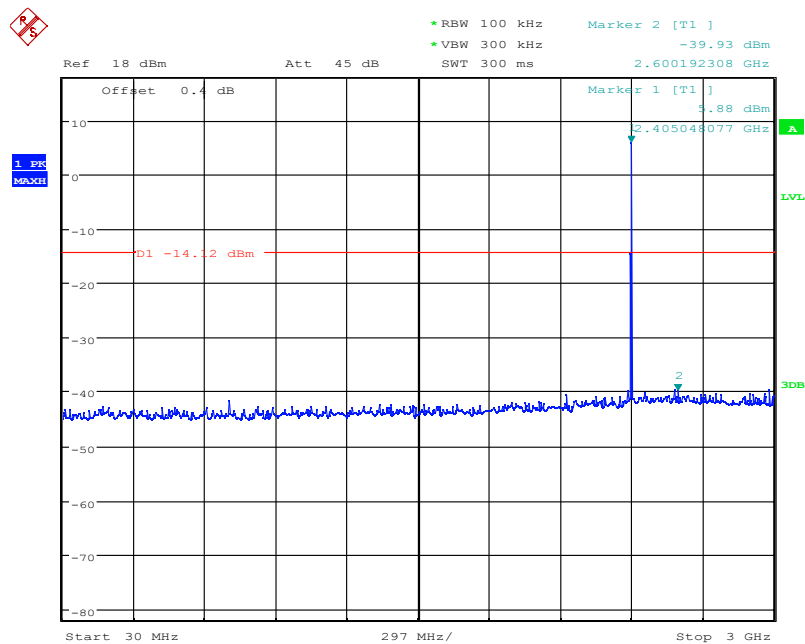
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Date: 5.JUL.2021 09:02:04

Fig.32 Conducted spurious emission: 1M Ch39, 3GHz~26.5GHz

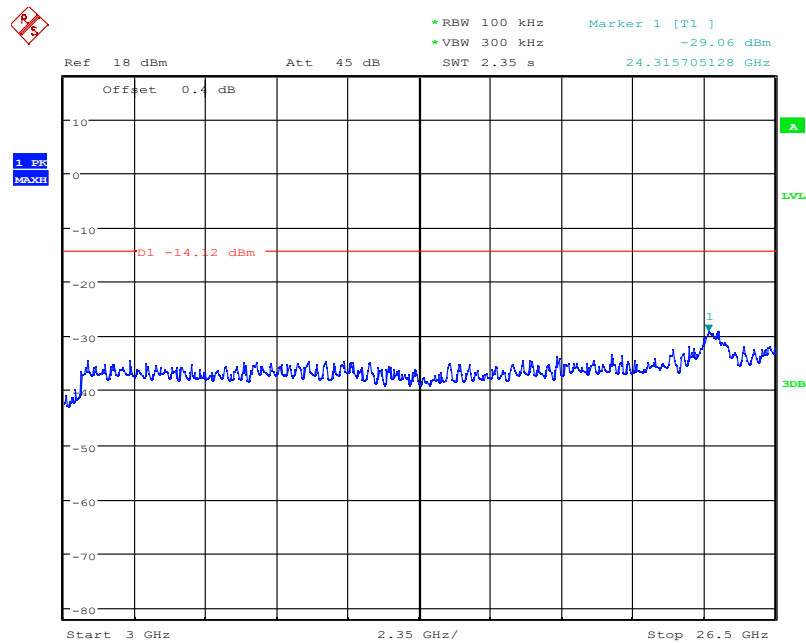


Date: 5.JUL.2021 09:06:22

Fig.33 Conducted spurious emission: 2M Ch0, 30MHz~3GHz

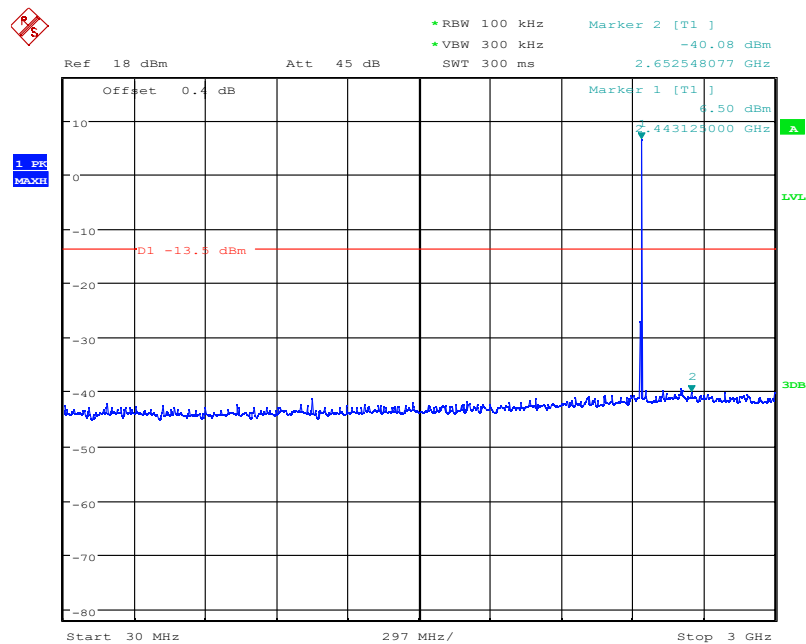
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Date: 5.JUL.2021 09:06:55

Fig.34 Conducted spurious emission: 2M Ch0, 3GHz~26.5GHz

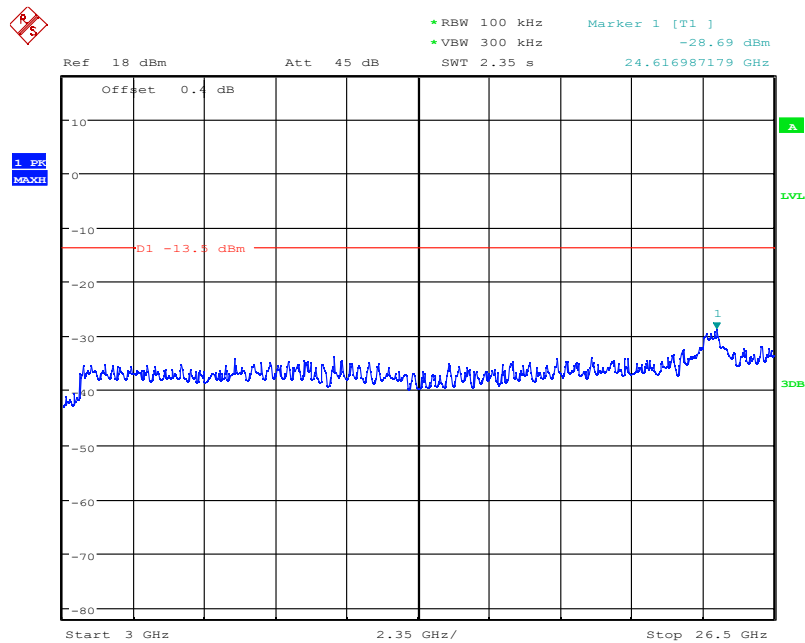


Date: 5.JUL.2021 09:05:22

Fig.35 Conducted spurious emission: 2M Ch19, 30MHz~3GHz

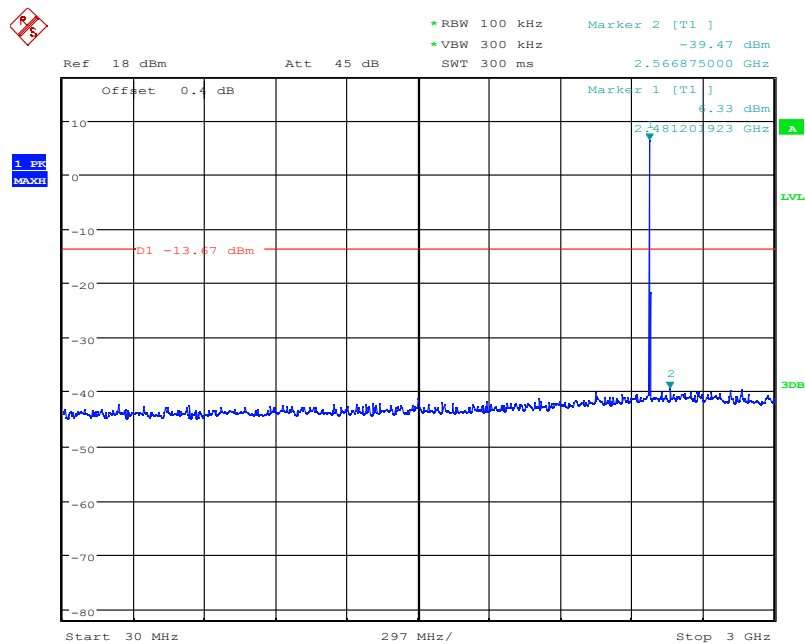
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Date: 5.JUL.2021 09:05:41

Fig.36 Conducted spurious emission: 2M Ch19, 3GHz~26.5GHz

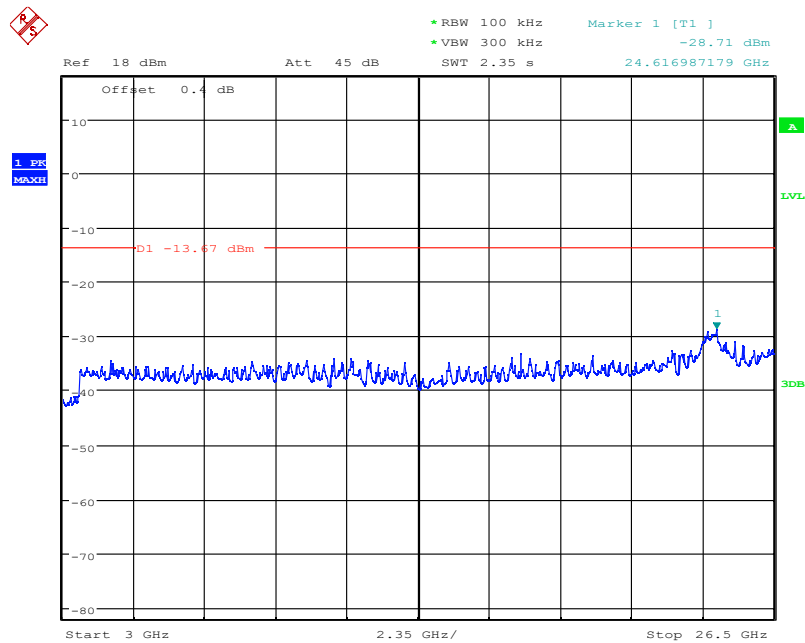


Date: 5.JUL.2021 09:03:43

Fig.37 Conducted spurious emission: 2M Ch39, 30MHz~3GHz

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Date: 5.JUL.2021 09:04:08

Fig.38 Conducted spurious emission: 2M Ch39, 3GHz~26.5GHz

7.6 Transmitter Spurious Emission-Radiated

Specifications:	FCC 47 CFR Part 15.247, 15.205, 15.209
DUT Serial Number:	860710050007536 860710050007619
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass
Note: Both EUT S2 and S5 have been tested , and the data only reflect the worst case.	

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
$30\text{MHz} \leq f \leq 2\text{GHz}$	± 1.13
$2\text{GHz} \leq f \leq 3.6\text{GHz}$	± 1.16
$3.6\text{GHz} \leq f \leq 8\text{GHz}$	± 2.45
$8\text{GHz} \leq f \leq 12.75\text{GHz}$	± 2.99

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

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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 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 (s)
30~1000	100KHz/300KHz	5
1000~4000	1MHz/1MHz	15
4000~18000	1MHz/1MHz	40
18000~26500	1MHz/1MHz	20

Test Result:

A “reference path loss” is established and AR_{pi} 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:

AR_{pi}= Cable loss + Antenna Gain-Preamplifier gain

Result=PM_{ea} + AR_{pi}

BLE	Channel	Frequency Range	Test Results	Conclusion
	All channels	30MH-1GHz	Fig.39	Pass
	0	1GHz-3GHz	Fig.40	Pass
		3GHz-18GHz	Fig.41	
	19	1GHz-3GHz	Fig.42	Pass

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		3GHz-18GHz	Fig.43	Pass
	39	1GHz-3GHz	Fig.44	
		3GHz-18GHz	Fig.45	

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 range 9kHz to 30MHz, so it does not recorded in report.

The 30MHz-1GHz and 18GHz-26GHz results were found as the worst case and were shown in this report.

Conclusion: PASS

Test graphs as below:

RE 30MHz-1GHz

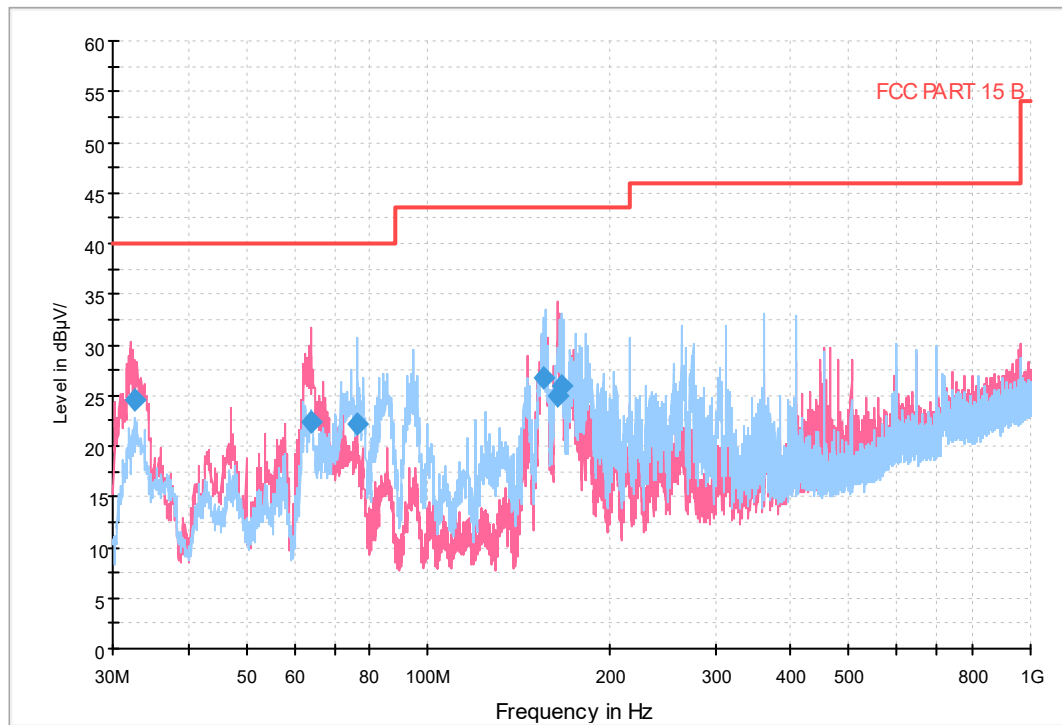


Fig.39 Radiated emission: Ch0, 30MHz-1GHz

Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
32.682500	24.6	40.0	15.4	1000.0	120.000	102.0	V	80.0	-21.0
64.147000	22.4	40.0	17.6	1000.0	120.000	102.0	V	280.0	-21.0
76.117500	22.2	40.0	17.8	1000.0	120.000	215.0	H	-10.0	-20.9
156.045500	26.7	43.5	16.8	1000.0	120.000	185.0	H	100.0	-20.9
164.751000	25.0	43.5	18.5	1000.0	120.000	117.0	V	88.0	-18.4
166.509500	25.9	43.5	17.6	1000.0	120.000	185.0	H	100.0	-20.4

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RE 1GHz-3GHz

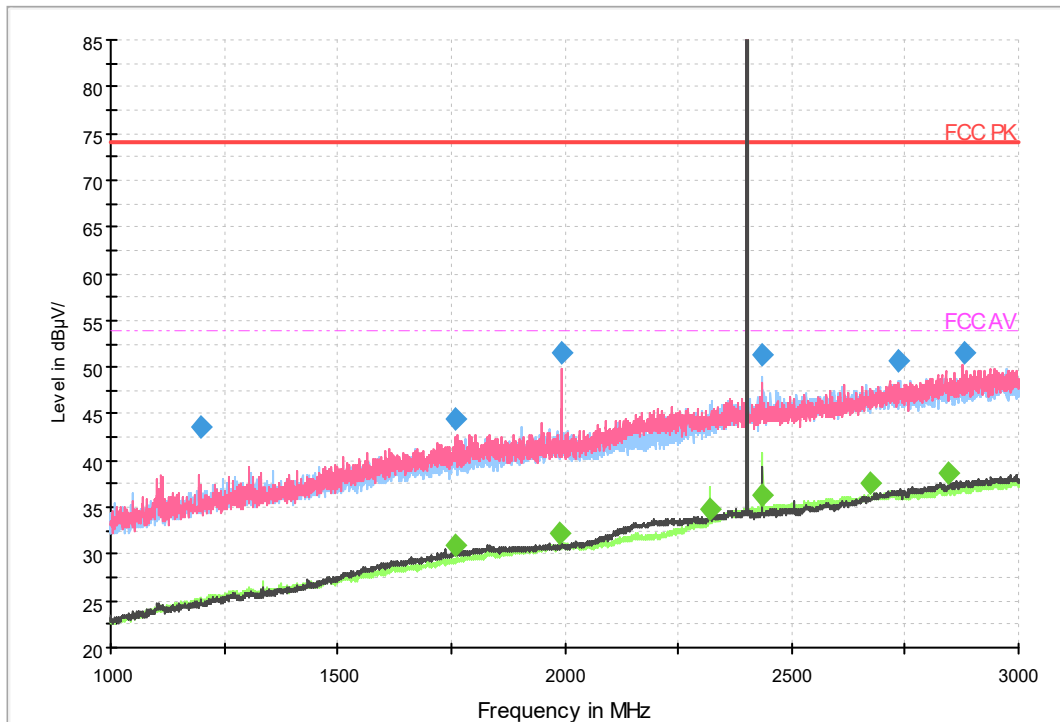


Fig.40 Radiated emission: Ch0, 1GHz-3GHz

Final Result 1

Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1200.000000	43.7	1500.0	1000.000	100.0	V	15.0	-1.6	30.3	74.0
1761.000000	44.5	1500.0	1000.000	100.0	V	255.0	3.3	29.5	74.0
1992.400000	51.6	1500.0	1000.000	100.0	V	274.0	4.1	22.4	74.0
2436.400000	51.3	1500.0	1000.000	100.0	H	195.0	8.3	22.7	74.0
2737.200000	50.7	1500.0	1000.000	100.0	H	285.0	9.9	23.3	74.0
2880.000000	51.5	1500.0	1000.000	100.0	V	15.0	11.0	22.5	74.0

Final Result 2

Frequency (MHz)	Average (dBμV/m)	Meas. Time	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1758.400000	31.0	1500.0	1000.000	100.0	V	285.0	3.3	23.0	54.0
1988.000000	32.1	1500.0	1000.000	100.0	H	173.0	4.1	21.9	54.0
2321.200000	34.8	1500.0	1000.000	100.0	H	173.0	6.8	19.2	54.0
2436.400000	36.3	1500.0	1000.000	100.0	H	165.0	8.3	17.7	54.0
2671.600000	37.5	1500.0	1000.000	100.0	H	285.0	9.5	16.5	54.0
2845.600000	38.7	1500.0	1000.000	100.0	V	285.0	10.9	15.3	54.0

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RE 3GHz-18GHz

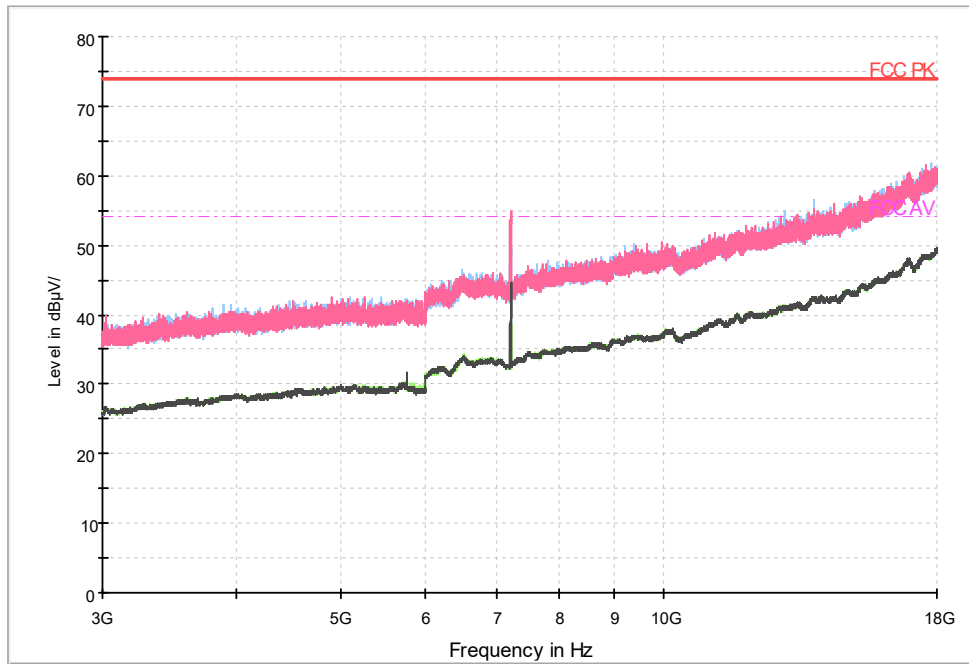


Fig.41 Radiated emission: Ch0, 3GHz-18GHz

RE 1GHz-3GHz

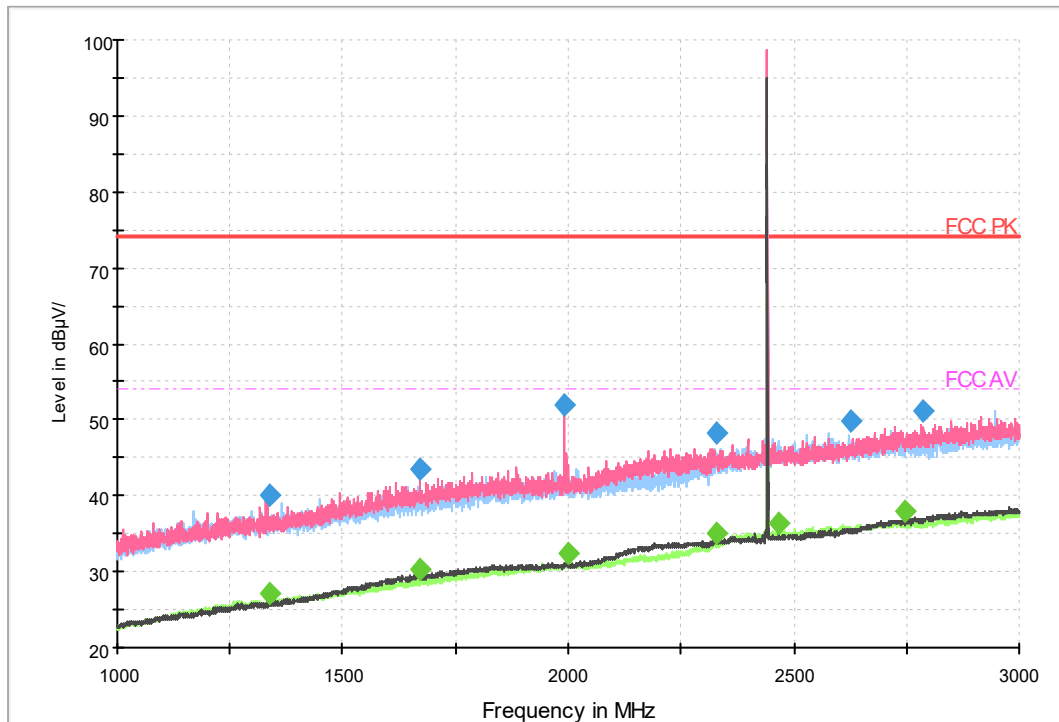


Fig.42 Radiated emission: Ch19, 1GHz-3GHz

Final Result 1

Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1336.400000	40.1	1500.0	1000.000	100.0	V	263.0	-0.6	33.9	74.0
1670.400000	43.6	1500.0	1000.000	100.0	V	105.0	2.7	30.4	74.0
1990.800000	51.8	1500.0	1000.000	100.0	V	285.0	4.1	22.2	74.0
2327.000000	48.3	1500.0	1000.000	100.0	V	285.0	7.1	25.7	74.0
2626.400000	49.9	1500.0	1000.000	100.0	H	285.0	9.3	24.1	74.0
2785.000000	51.1	1500.0	1000.000	100.0	V	105.0	10.5	22.9	74.0

Final Result 2

Frequency (MHz)	Average (dBμV/m)	Meas. Time	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1336.000000	27.2	1500.0	1000.000	100.0	H	273.0	-0.3	26.8	54.0
1672.600000	30.4	1500.0	1000.000	100.0	V	15.0	2.7	23.6	54.0
1999.800000	32.3	1500.0	1000.000	100.0	H	264.0	4.3	21.7	54.0
2330.600000	34.9	1500.0	1000.000	100.0	H	285.0	7.0	19.1	54.0
2467.200000	36.3	1500.0	1000.000	100.0	V	75.0	8.0	17.7	54.0
2744.800000	37.9	1500.0	1000.000	100.0	V	174.0	10.3	16.1	54.0

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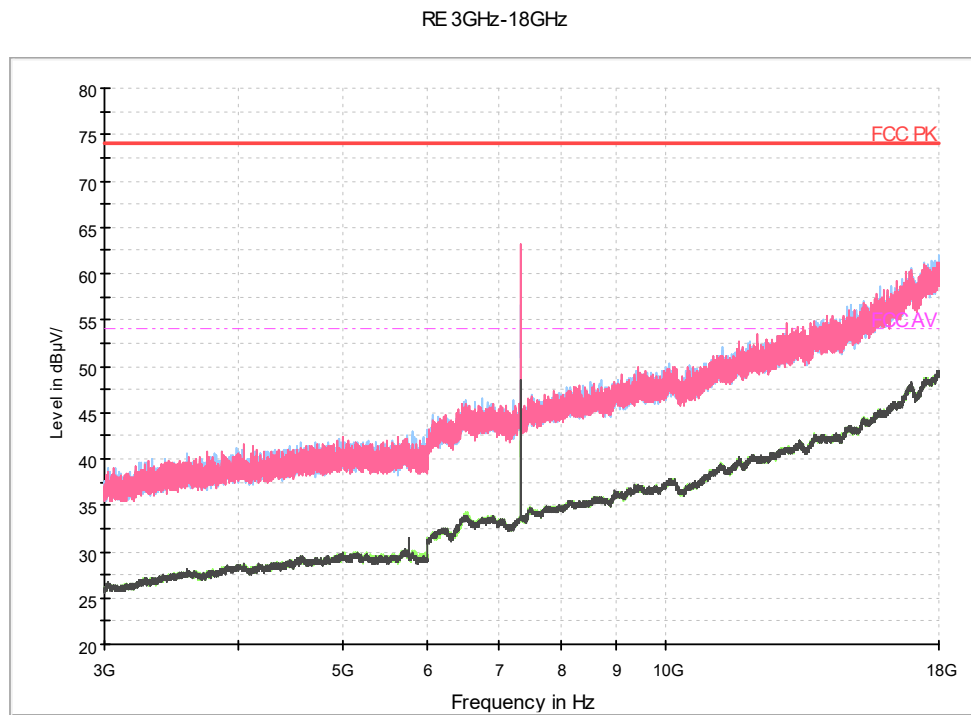


Fig.43 Radiated emission: Ch19, 3GHz-18GHz

RE 1GHz-3GHz

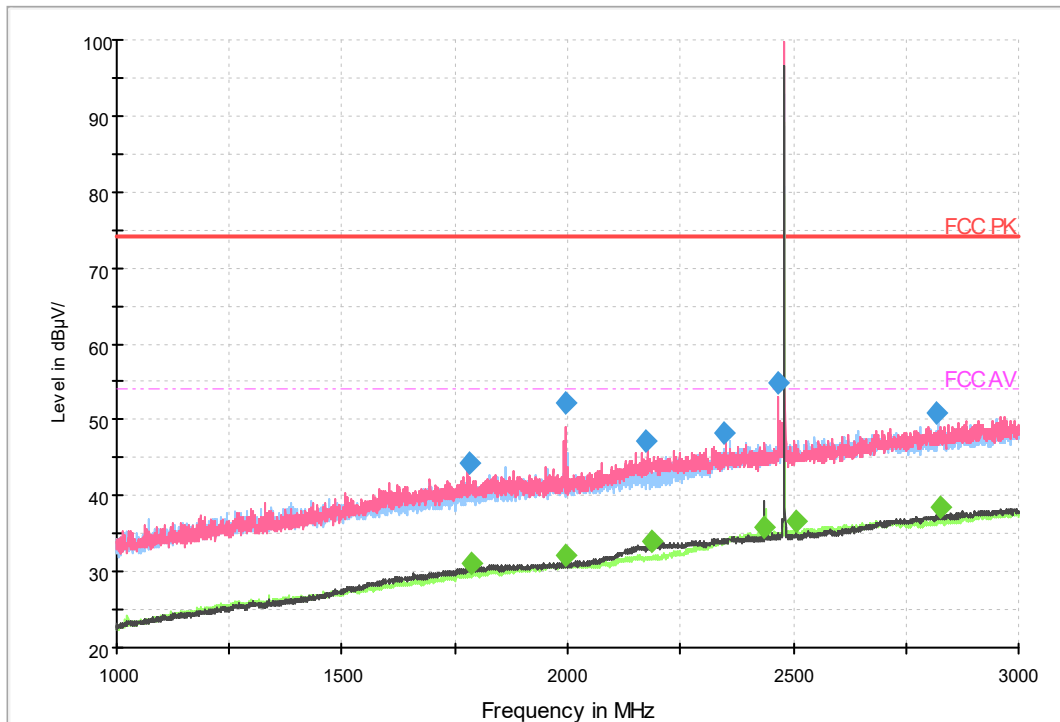


Fig.44 Radiated emission: 1M Ch39, 1GHz-3GHz

Final Result 1

Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1780.000000	44.2	1500.0	1000.000	100.0	V	264.0	3.5	29.8	74.0
1994.200000	52.1	1500.0	1000.000	100.0	V	270.0	4.1	21.9	74.0
2174.400000	47.2	1500.0	1000.000	100.0	V	195.0	5.9	26.8	74.0
2347.000000	48.2	1500.0	1000.000	100.0	V	165.0	7.2	25.8	74.0
2467.600000	54.9	1500.0	1000.000	100.0	V	195.0	8.0	19.1	74.0
2818.800000	50.9	1500.0	1000.000	100.0	H	285.0	10.1	23.1	74.0

Final Result 2

Frequency (MHz)	Average (dBμV/m)	Meas. Time	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1785.800000	31.2	1500.0	1000.000	100.0	V	75.0	3.5	22.8	54.0
1993.600000	32.2	1500.0	1000.000	100.0	V	15.0	4.1	21.8	54.0
2185.600000	34.1	1500.0	1000.000	100.0	V	165.0	5.9	19.9	54.0
2436.400000	35.8	1500.0	1000.000	100.0	V	180.0	7.8	18.2	54.0
2506.000000	36.6	1500.0	1000.000	100.0	V	75.0	8.2	17.4	54.0
2828.600000	38.6	1500.0	1000.000	100.0	V	-15.0	10.8	15.4	54.0

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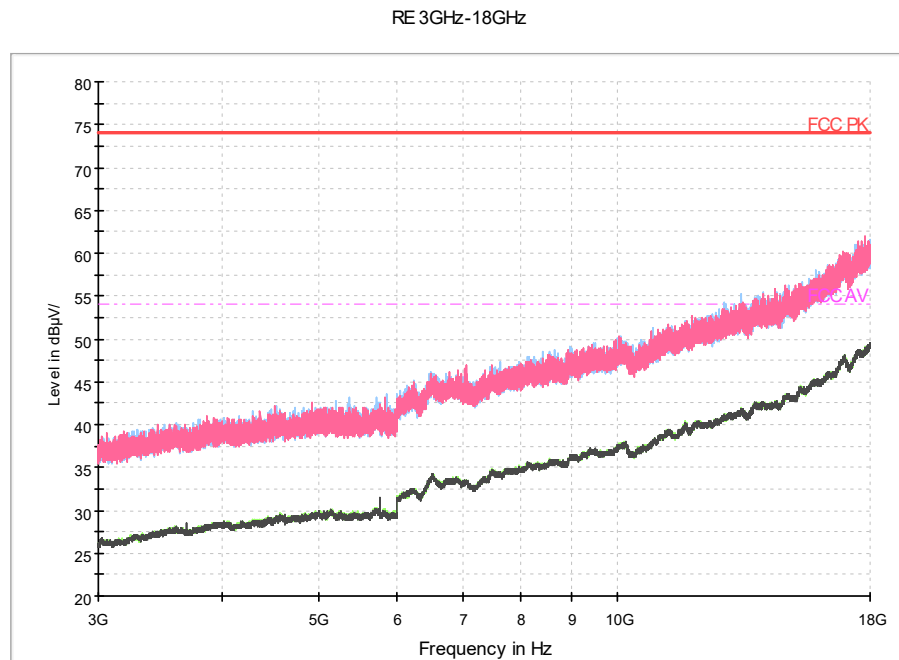


Fig.45 Radiated emission: Ch39, 3GHz-18GHz

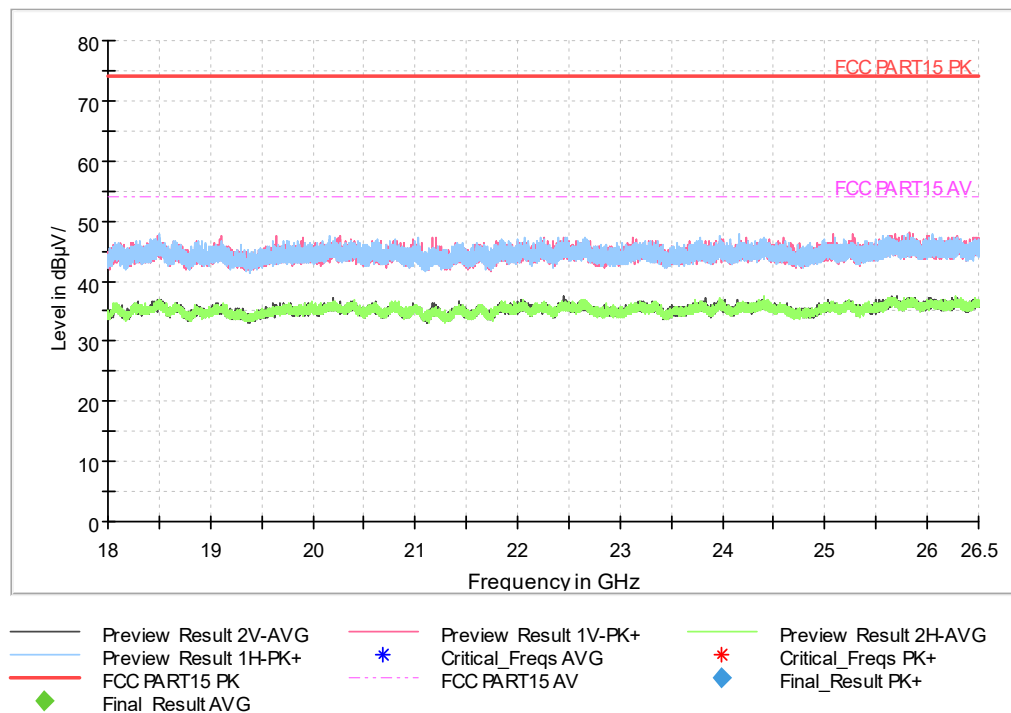


Fig.46 Radiated emission: 18 GHz - 26 GHz

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Report No.: I21W00032-BLE

Test photo

See the Pic1- Pic 2 in document” Porta _BT_Test Setup Photos”.

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7.7 Power line Conducted Emissions

Specifications:	ANSI C63.10 voltage mains test
DUT Serial Number:	860710050007536 860710050007619
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass
Note: Both EUT S2 and S5 have been tested , and the data only reflect the worst case.	

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 dBμV – 56 dBμV	56 dBμV – 46 dBμV
>0.5 MHz to 5MHz	56 dBμV	46 dBμV
>5 MHz to 30 MHz	60 dBμV	50 dBμV
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

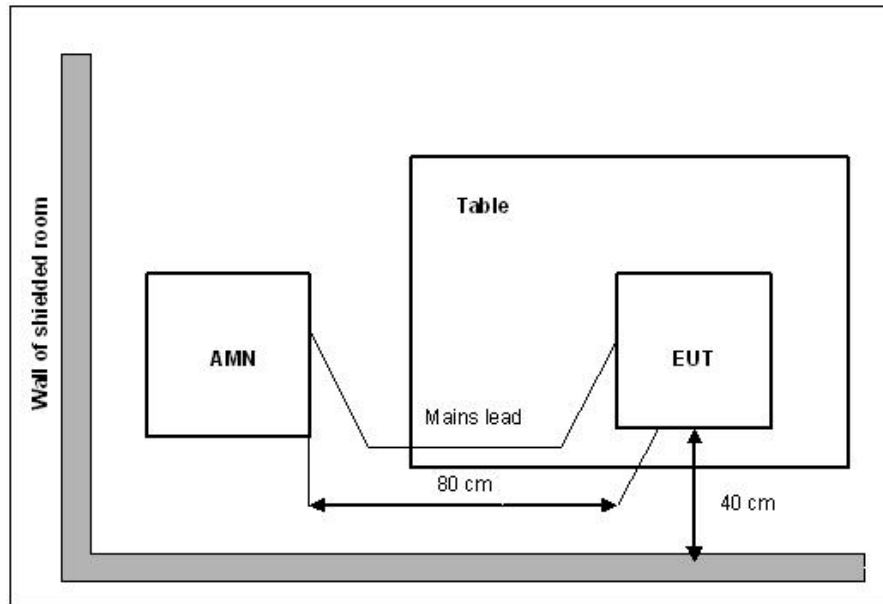
Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

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).

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Test Procedure

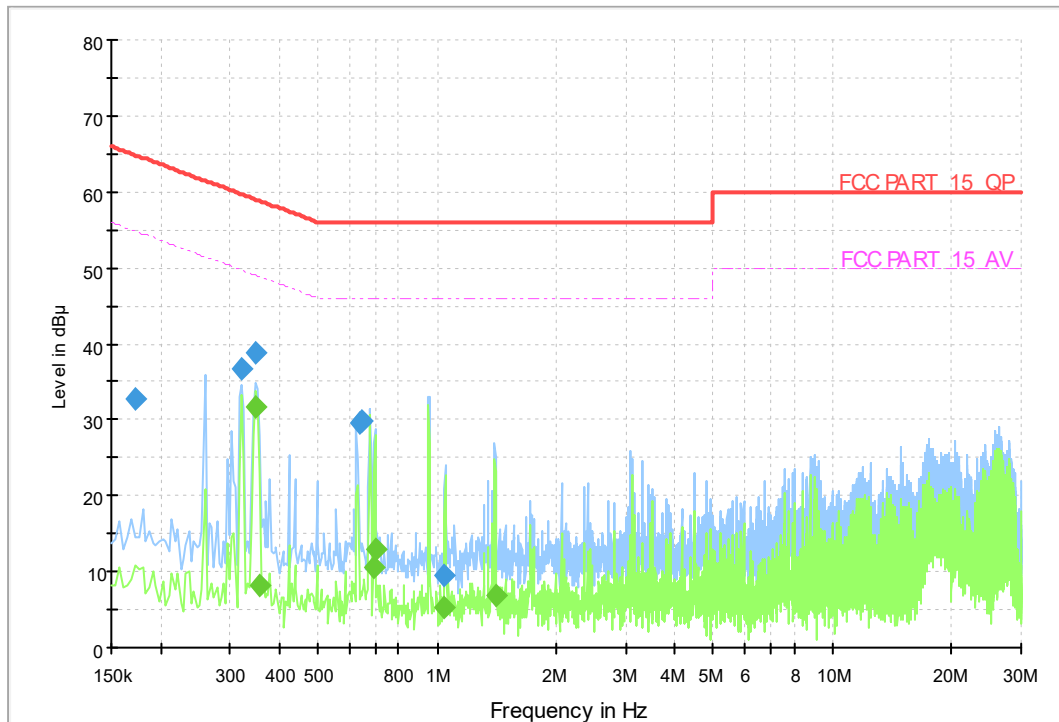
1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors – Quasi Peak and Average Detector.

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

Conclusion: PASS

Test Result:

CISPR N&L1 Voltage 150k to 30MHz-Class B



Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.172206	32.7	1000.0	9.000	On	N	9.6	32.2	64.9
0.319638	36.7	1000.0	9.000	On	N	9.7	23.0	59.7
0.345756	38.9	1000.0	9.000	On	N	9.7	20.2	59.1
0.637869	29.6	1000.0	9.000	On	N	9.7	26.4	56.0
0.642106	29.9	1000.0	9.000	On	N	9.7	26.1	56.0
1.038219	9.4	1000.0	9.000	On	L1	9.7	46.6	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.345756	31.6	1000.0	9.000	On	L1	9.7	17.5	49.1
0.355638	8.2	1000.0	9.000	On	N	9.7	40.6	48.8
0.690106	10.5	1000.0	9.000	On	L1	9.7	35.5	46.0
0.696494	13.1	1000.0	9.000	On	N	9.7	32.9	46.0
1.038219	5.2	1000.0	9.000	On	L1	9.7	40.8	46.0
1.401969	6.9	1000.0	9.000	On	N	9.7	39.1	46.0

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Annex A EUT Photos

See the document "Porta-External Photos".

See the document "Porta-Internal Photos".

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ANNEX B Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

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

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