



Test Report

Date : 2023-05-26
No. : HMD2305006

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Applicant : The Singing Machine Company, Inc.
6301 NW 5th Way, Suite 2900, Fort Lauderdale, FL 33309, USA

Supplier / Manufacturer : ZHUHAI FULLWING ELECTRONIC CO., LTD ZHONGSHAN
BRANCH
4/F&5/F, No 10, Xingye Road, Xinxu, San Xiang, Zhongshan,
Guangdong, China

Description of Sample(s) : Submitted sample(s) said to be
Product: CUBE SINGCAST
Brand Name: Singing Machine
Model No.: SMC2068
FCC ID: 2AAXO-SMC2068

Date Samples Received : 2023-05-08

Date Tested : 2023-05-08 to 2023-05-25

Investigation Requested : Perform Electro Magnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15 and ANSI C63.10:2013 for FCC Certification.

Conclusions : The submitted product COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.

Remarks : WIFI (802.11a/n20/n40)

Test by Susu


Dr.CHAN Kwok Hung, Brian
Authorized Signatory



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The Hong Kong Standards and Testing Centre Limited
10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong

Tel: +852 2666 1888 Fax: +852 2664 4353 Email: hkstc@stc.group Website: www.stc.group

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1.0 General Details

1.1 Test Laboratory

The Hong Kong Standards and Testing Centre Ltd.
EMC Laboratory
10 Dai Wang Street, Taipo Industrial Estate, New Territories, Hong Kong
Telephone: 852 2666 1888
Fax: 852 2664 4353

1.2 Equipment Under Test [EUT]

Description of Sample(s)

Product: CUBE SINGCAST
Manufacturer: ZHUHAI FULLWING ELECTRONIC CO., LTD
ZHONGSHAN BRANCH
4/F&5/F, No 10, Xingye Road, Xinxu, San Xiang, Zhongshan, Guangdong, China
Brand Name: Singing Machine
Model Number: SMC2068
Additional model numbers: SMC2072, SMC2075
Rating: 9.0Vd.c. by adapter or
7.4Vd.c. (lithium battery * 1)

The AC/DC adapter was provided by the applicant with following details:

Brand name: REYIPOWER; Model no.: RY24D090100US

Input: 100-240Va.c. 50-60Hz 0.8A, Output: 9.0Vd.c. 1000mA

Remark: AC mains mode and battery mode have been investigated and the worst-case test results are recorded in this report.

1.2.1 Description of EUT Operation

The Equipment Under Test (EUT) is a CUBE SINGCAST. The transmission signal is digital modulated with channel frequency range 5150-5250MHz.

1.3 Antenna Details

Antenna Type: Integral antenna
Antenna Gain: 1.2 dBi

1.4 Date of Order

2023-05-08

1.5 Submitted Sample(s):

1 Sample

1.6 Test Duration

2023-05-08 to 2023-05-25

1.7 Country of Origin

China

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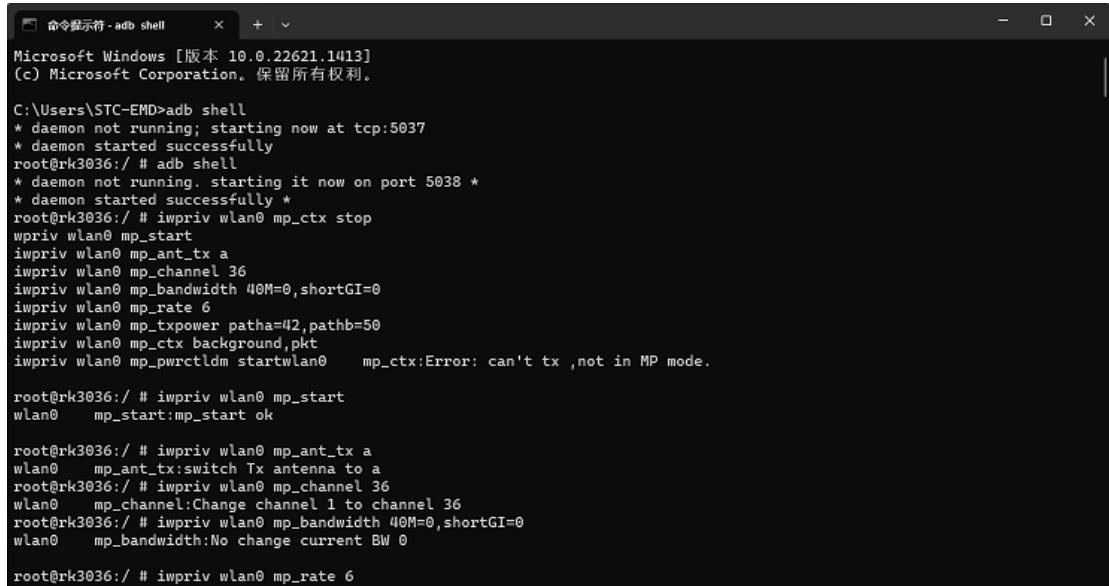
2.0 Technical Details

2.1 **Investigations Requested**

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15 Regulations and ANSI C63.10:2013 for FCC Certification.
According FCC KDB 789033D02 Measurement Guidance, Duty cycle $\geq 98\%$.
The test mode sample is provided by manufacturer.

2.1.0 **Operating conditions for the EUT**

The sample went into test mode handled by the manufacturer using the software and no the RF power for select..



```
命令提示符 - adb shell
Microsoft Windows [版本 10.0.22621.1413]
(c) Microsoft Corporation. 保留所有权利。

C:\Users\STC-EMD>adb shell
* daemon not running; starting now at tcp:5037
* daemon started successfully
root@rk3036:/ # adb shell
* daemon not running. starting it now on port 5038 *
* daemon started successfully *
root@rk3036:/ # iwpriv wlan0 mp_ctxt stop
iwpriv wlan0 mp_start
iwpriv wlan0 mp_ant_tx a
iwpriv wlan0 mp_channel 36
iwpriv wlan0 mp_bandwidth 40M=0,shortGI=0
iwpriv wlan0 mp_rate 6
iwpriv wlan0 mp_txpower patha=42,pathb=50
iwpriv wlan0 mp_ctxt background,pkt
iwpriv wlan0 mp_pwrctldm startwlan0    mp_ctxt:Error: can't tx ,not in MP mode.

root@rk3036:/ # iwpriv wlan0 mp_start
wlan0    mp_start:mp_start ok

root@rk3036:/ # iwpriv wlan0 mp_ant_tx a
wlan0    mp_ant_tx:switch Tx antenna to a
root@rk3036:/ # iwpriv wlan0 mp_channel 36
wlan0    mp_channel:Change channel 1 to channel 36
root@rk3036:/ # iwpriv wlan0 mp_bandwidth 40M=0,shortGI=0
wlan0    mp_bandwidth:No change current BW 0

root@rk3036:/ # iwpriv wlan0 mp_rate 6
```

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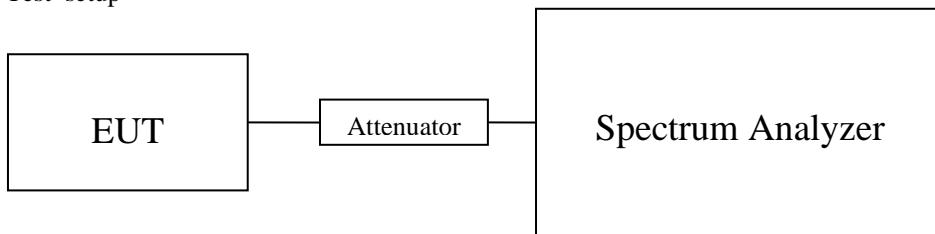
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2.1.1 EUT Duty cycle

The EUT shall be configured or modified to transmit continuously. The intent is to test at 100% duty cycle; however, a small reduction in duty cycle (to no lower than 98%) is permitted if required by the EUT for amplitude control purposes.

The test mode sample is provided by manufacturer.

Test setup

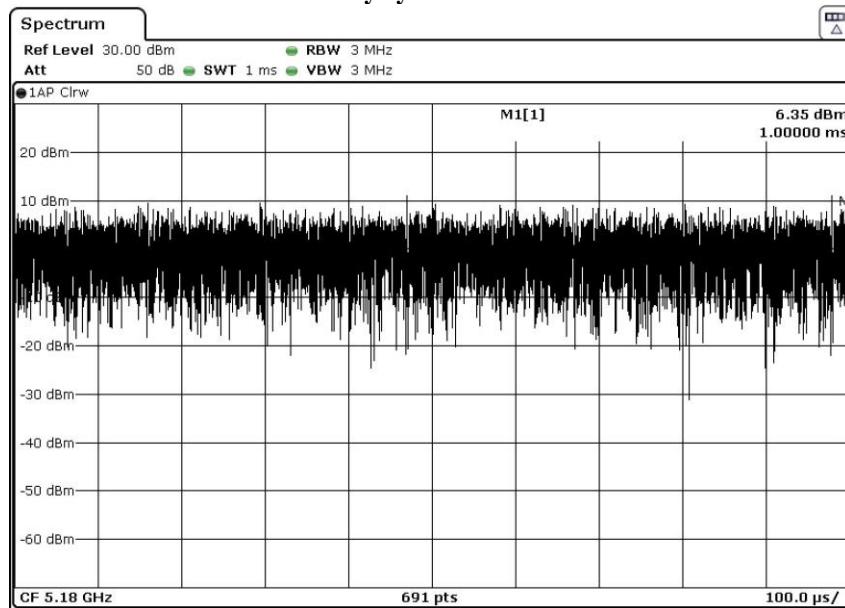


Results

Mode	On Time (msec)	Period (msec)	Duty Cycle X (Linear)	Duty Cycle (%)*
802.11a	1	1	1	100
802.11n20	1	1	1	100
802.11n40	1	1	1	100

*: If a specific emission is demonstrated to be continuous (100% duty cycle) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that emission.

Duty cycle: 802.11a



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2.2 Test Standards and Results Summary Tables

EMISSION Results Summary						
Test Condition	Test Requirement	Test Method	Class / Severity	Test Result		
				Pass	Failed	N/A
Maximum Peak Output Power	15.407(a)(1)	ANSI C63.10:2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radiated Emissions	15.205(a) 15.209 15.407(b)	ANSI C63.10:2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conducted Emissions	FCC 47CFR 15.207	ANSI C63.10:2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Power Spectral Density	15.407(a)	ANSI C63.10:2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26 dB Bandwidth and 99%Occupied Bandwidth	15.407(a)	ANSI C63.10:2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Antenna requirement	FCC 47CFR 15.203	N/A	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note: N/A - Not Applicable

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3.0 Test Results

3.1 Emission

3.1.1 Maximum Peak Output Power

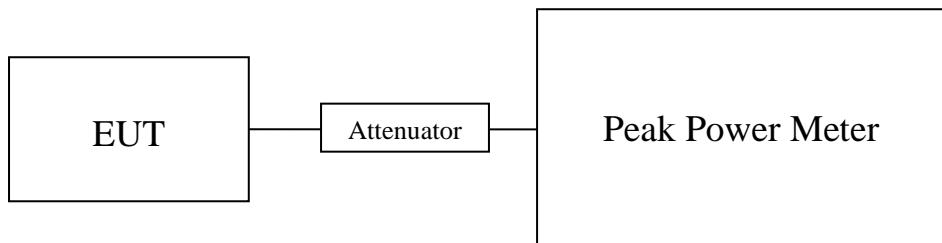
Test Requirement: FCC 47CFR 15.407(a)(1)
Test Method: ANSI C63.10: 2013/ KDB 789033D02
Test Date: 2023-05-18
Mode of Operation: WIFI Tx mode

Ambient Temperature: 25°C Relative Humidity: 51% Atmospheric Pressure: 101 kPa

Test Method:

The RF output of the EUT was connected to the peak power meter. All the attenuation or cable loss will be added to the measured maximum output power. The results are recorded in Watt.

Test Setup:



Note: a temporary antenna connector was soldered to the RF output.

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Limits for Peak Output Power of Fundamental & Harmonics Emissions [FCC 47CFR 15.407]:

For Digital Transmission systems in 5150-5250 MHz Band: 0.25 Watt (24dBm)

Results of WiFi mode 802.11 a, (5150MHz to 5250MHz) : Pass (TX Unit)					
Maximum conducted output power					
Channel	Frequency (MHz)	Conducted power(dBm)	Antenna Gain(dBi)	E.I.R.P(dBm)	E.I.R.P (Watt)
Low	5180	13.813	1.2	15.013	0.031718
Middle	5200	13.779	1.2	14.979	0.03147
High	5240	13.715	1.2	14.915	0.03101

Results of WiFi mode 802.11 n20, (5150MHz to 5250MHz) : Pass (TX Unit)					
Maximum conducted output power					
Channel	Frequency (MHz)	Conducted power(dBm)	Antenna Gain(dBi)	E.I.R.P(dBm)	E.I.R.P (Watt)
Low	5180	10.926	1.2	12.126	0.016315
Middle	5200	11.408	1.2	12.608	0.018231
High	5240	11.552	1.2	12.752	0.018845

Results of WiFi mode 802.11 n40, (5190MHz to 5230MHz) : Pass (TX Unit)					
Maximum conducted output power					
Channel	Frequency (MHz)	Conducted power(dBm)	Antenna Gain(dBi)	E.I.R.P(dBm)	E.I.R.P (Watt)
Low	5190	11.344	1.2	12.544	0.017964
High	5230	11.804	1.2	13.004	0.019971

Calculated measurement uncertainty : 30MHz to 1GHz 1.7dB
1GHz to 26GHz 1.7dB

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3.1.2 Radiated Emissions

Test Requirement: FCC 47CFR 15.209 & 15.407(b)
Test Method: ANSI C63.10:2013/ KDB 789033D02
Test Date: 2023-05-19
Mode of Operation: WIFI Tx mode

Ambient Temperature: 24°C Relative Humidity: 52% Atmospheric Pressure: 101 kPa

Test Method:

For emission measurements at or below 1 GHz, the sample was placed 0.8m above the ground plane of semi-anechoic Chamber*. For emission measurements above 1 GHz, the sample was placed 1.5m above the ground plane of semi-anechoic Chamber*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

* Semi-Anechoic chamber located on the G/F of The Hong Kong Standards and Testing Centre Ltd. with
Registration Number: HK0001
Test Firm Registration Number: 367672

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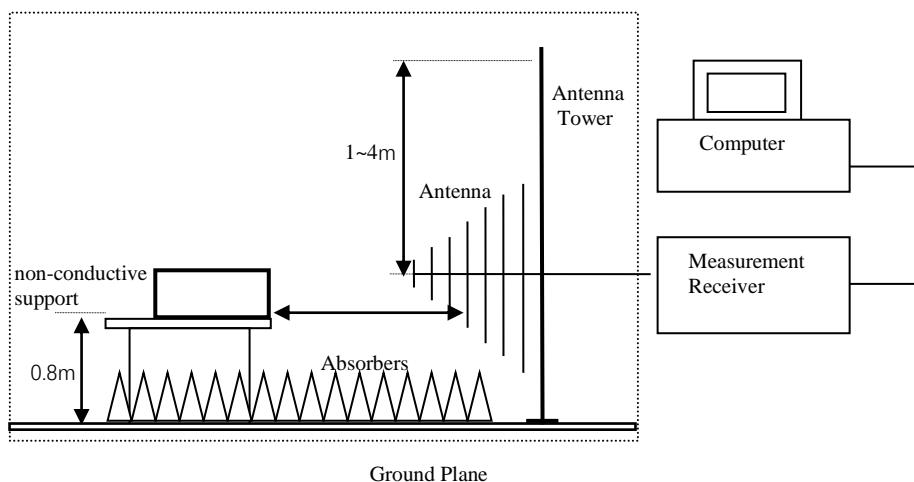
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Spectrum Analyzer Setting:

9KHz – 30MHz (Pk & Av)	RBW: 10kHz VBW: 30kHz Sweep: Auto Span: Fully capture the emissions being measured Trace: Max. hold
30MHz – 1GHz (QP)	RBW: 120kHz VBW: 120kHz Sweep: Auto Span: Fully capture the emissions being measured Trace: Max. hold
Above 1GHz (Pk)	RBW: 1MHz VBW: 1MHz Sweep: Auto Span: Fully capture the emissions being measured Trace: Max. hold
Above 1GHz (Av)	RBW: 1MHz VBW: 10Hz Sweep: Auto Span: Fully capture the emissions being measured Trace: Max. hold

Test Setup:



- Absorbers placed on top of the ground plane are for measurements above 1000MHz only.
- Measurements between 30MHz to 1000MHz made with Bi-log antennas, above 1000MHz horn antennas are used.



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Limits for Radiated Emissions FCC 47 CFR 15.407]:

- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further.
- (3) The provisions of §15.205 apply to intentional radiators operating under this section.

Frequency Range [MHz]	Quasi-Peak Limits [μ V/m]
0.009-0.490	2400/F (kHz)
0.490-1.705	24000/F (kHz)
1.705-30	30
30-88	100
88-216	150
216-960	200
Above 960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Result of Tx mode (5180.0 MHz) (802.11a) (9kHz – 30MHz): Pass

Field Strength of Spurious Emissions Peak Value						
Frequency MHz	Measured Level dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit μ V/m	E-Field Polarity
Emissions detected are more than 20 dB below the FCC Limits						

Result of Tx mode (5180.0 MHz) (802.11a) (1GHz-40GHz): Pass

Field Strength of Spurious Emissions Peak Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Limit @3m dB μ V/m	Margin dB	E-Field Polarity
10360.0	48.2	8.90	57.1	68.2	11.1	Vertical
10360.0	47.1	8.70	55.8	68.2	12.4	Horizontal
15540.0	45.0	11.80	56.8	68.2	11.4	Vertical
15540.0	44.4	11.90	56.3	68.2	11.9	Horizontal
20720.0	44.3	12.20	56.5	68.2	11.7	Vertical
20720.0	43.7	12.40	56.1	68.2	12.1	Horizontal
25900.0	43.5	13.10	56.6	68.2	11.6	Vertical
25900.0	43.1	13.30	56.4	68.2	11.8	Horizontal

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Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Limit @3m dB μ V/m	Margin dB	E-Field Polarity
10360.0	33.2	8.90	42.1	54.0	11.9	Vertical
10360.0	32.1	8.70	40.8	54.0	13.2	Horizontal
15540.0	30.8	11.80	42.6	54.0	11.4	Vertical
15540.0	31.5	11.90	43.4	54.0	10.6	Horizontal
20720.0	30.2	12.20	42.4	54.0	11.6	Vertical
20720.0	30.0	12.40	42.4	54.0	11.6	Horizontal
25900.0	30.8	13.10	43.9	54.0	10.1	Vertical
25900.0	30.9	13.30	44.2	54.0	9.8	Horizontal

Result of Tx mode (5200 MHz) (802.11a) (9kHz – 30MHz): Pass

Field Strength of Spurious Emissions Peak Value						
Frequency MHz	Measured Level dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit μ V/m	E-Field Polarity
Emissions detected are more than 20 dB below the FCC Limits						

Result of Tx mode (5200 MHz) (802.11a) (1GHz-40GHz): Pass

Field Strength of Spurious Emissions Peak Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Limit @3m dB μ V/m	Margin dB	E-Field Polarity
10400.0	48.4	8.90	57.3	68.2	10.9	Vertical
10400.0	47.7	8.70	56.4	68.2	11.8	Horizontal
15600.0	45.0	11.80	56.8	68.2	11.4	Vertical
15600.0	43.8	11.90	55.7	68.2	12.5	Horizontal
20800.0	44.3	12.20	56.5	68.2	11.7	Vertical
20800.0	43.4	12.40	55.8	68.2	12.4	Horizontal
26000.0	42.2	13.10	55.3	68.2	12.9	Vertical
26000.0	41.1	13.30	54.4	68.2	13.8	Horizontal

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Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Limit @3m dB μ V/m	Margin dB	E-Field Polarity
10400.0	32.8	8.90	41.7	54.0	12.3	Vertical
10400.0	30.5	8.70	39.2	54.0	14.8	Horizontal
15600.0	30.2	11.80	42.0	54.0	12.0	Vertical
15600.0	30.5	11.90	42.4	54.0	11.6	Horizontal
20800.0	29.3	12.20	41.5	54.0	12.5	Vertical
20800.0	29.5	12.40	41.9	54.0	12.1	Horizontal
26000.0	28.2	13.10	41.3	54.0	12.7	Vertical
26000.0	28.3	13.30	41.6	54.0	12.4	Horizontal

Result of Tx mode (5240 MHz) (802.11a) (9kHz – 30MHz): Pass

Field Strength of Spurious Emissions Peak Value						
Frequency MHz	Measured Level dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit μ V/m	E-Field Polarity
Emissions detected are more than 20 dB below the FCC Limits						

Result of Tx mode (5240 MHz) (802.11a) (1GHz-25GHz): Pass

Field Strength of Spurious Emissions Peak Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Limit @3m dB μ V/m	Margin dB	E-Field Polarity
10480.0	47.7	8.90	56.6	68.2	11.6	Vertical
10480.0	48.1	8.70	56.8	68.2	11.4	Horizontal
17520.0	45.2	11.80	57.0	68.2	11.2	Vertical
17520.0	44.8	11.90	56.7	68.2	11.5	Horizontal
20960.0	43.9	12.20	56.1	68.2	12.1	Vertical
20960.0	44.3	12.40	56.7	68.2	11.5	Horizontal
26200.0	43.1	13.10	56.2	68.2	12.0	Vertical
26200.0	43.0	13.30	56.3	68.2	11.9	Horizontal

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Field Strength of Spurious Emissions						
Average Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Limit @3m dB μ V/m	Margin dB	E-Field Polarity
10480.0	31.9	8.90	40.8	54.0	13.2	Vertical
10480.0	31.8	8.70	40.5	54.0	13.5	Horizontal
17520.0	30.8	11.80	42.6	54.0	11.4	Vertical
17520.0	30.4	11.90	42.3	54.0	11.7	Horizontal
20960.0	29.2	12.20	41.4	54.0	12.6	Vertical
20960.0	29.4	12.40	41.8	54.0	12.2	Horizontal
26200.0	27.4	13.10	40.5	54.0	13.5	Vertical
26200.0	27.6	13.30	40.9	54.0	13.1	Horizontal

Result of Tx mode (5180 MHz) (802.11n20) (9kHz – 30MHz): Pass

Field Strength of Spurious Emissions						
Peak Value						
Frequency MHz	Measured Level dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit μ V/m	E-Field Polarity
Emissions detected are more than 20 dB below the FCC Limits						

Result of Tx mode (5180 MHz) (802.11n20) (1GHz-40GHz): Pass

Field Strength of Spurious Emissions						
Peak Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Limit @3m dB μ V/m	Margin dB	E-Field Polarity
10360.0	48.5	8.90	57.4	68.2	10.8	Vertical
10360.0	48.5	8.70	57.2	68.2	11.0	Horizontal
15540.0	43.8	11.80	55.6	68.2	12.6	Vertical
15540.0	44.1	11.90	56.0	68.2	12.2	Horizontal
20720.0	42.2	12.20	54.4	68.2	13.8	Vertical
20720.0	43.5	12.40	55.9	68.2	12.3	Horizontal
25900.0	42.1	13.10	55.2	68.2	13.0	Vertical
25900.0	41.5	13.30	54.8	68.2	13.4	Horizontal

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Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Limit @3m dB μ V/m	Margin dB	E-Field Polarity
10360.0	33.1	8.90	42.0	54.0	12.0	Vertical
10360.0	32.5	8.70	41.2	54.0	12.8	Horizontal
15540.0	30.6	11.80	42.4	54.0	11.6	Vertical
15540.0	30.3	11.90	42.2	54.0	11.8	Horizontal
20720.0	29.4	12.20	41.6	54.0	12.4	Vertical
20720.0	26.9	12.40	39.3	54.0	14.7	Horizontal
25900.0	29.0	13.10	42.1	54.0	11.9	Vertical
25900.0	28.2	13.30	41.5	54.0	12.5	Horizontal

Result of Tx mode (5200 MHz) (802.11n20) (1GHz-40GHz): Pass

Field Strength of Spurious Emissions Peak Value						
Frequency MHz	Measured Level dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit μ V/m	E-Field Polarity
Emissions detected are more than 20 dB below the FCC Limits						

Result of Tx mode (5200 MHz) (802.11n20) (1GHz-40GHz): Pass

Field Strength of Spurious Emissions Peak Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Limit @3m dB μ V/m	Margin dB	E-Field Polarity
10400.0	48.1	8.90	57.0	68.2	11.2	Vertical
10400.0	47.9	8.70	56.6	68.2	11.6	Horizontal
15600.0	43.8	11.80	55.6	68.2	12.6	Vertical
15600.0	44.0	11.90	55.9	68.2	12.3	Horizontal
20800.0	43.5	12.20	55.7	68.2	12.5	Vertical
20800.0	43.5	12.40	55.9	68.2	12.3	Horizontal
26000.0	42.6	13.10	55.7	68.2	12.5	Vertical
26000.0	42.7	13.30	56.0	68.2	12.3	Horizontal

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Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Limit @3m dB μ V/m	Margin dB	E-Field Polarity
10400.0	33.0	8.90	41.9	54.0	12.1	Vertical
10400.0	31.8	8.70	40.5	54.0	13.5	Horizontal
15600.0	30.5	11.80	42.3	54.0	11.7	Vertical
15600.0	29.9	11.90	41.8	54.0	12.2	Horizontal
20800.0	28.8	12.20	41.0	54.0	13.0	Vertical
20800.0	28.7	12.40	41.1	54.0	12.9	Horizontal
26000.0	27.9	13.10	41.0	54.0	13.0	Vertical
26000.0	27.7	13.10	40.8	54.0	13.2	Horizontal

Result of Tx mode (5240 MHz) (802.11n20) (1GHz-40GHz): Pass

Field Strength of Spurious Emissions Peak Value						
Frequency MHz	Measured Level dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit μ V/m	E-Field Polarity
Emissions detected are more than 20 dB below the FCC Limits						

Result of Tx mode (5240 MHz) (802.11n20) (1GHz-40GHz): Pass

Field Strength of Spurious Emissions Peak Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Limit @3m dB μ V/m	Margin dB	E-Field Polarity
10480.0	47.5	8.90	56.4	68.2	11.8	Vertical
10480.0	47.9	8.70	56.6	68.2	11.6	Horizontal
17520.0	44.1	11.80	55.9	68.2	12.3	Vertical
17520.0	43.8	11.90	55.7	68.2	12.5	Horizontal
20960.0	44.0	12.20	56.2	68.2	12.0	Vertical
20960.0	43.2	12.40	55.6	68.2	12.6	Horizontal
26200.0	44.4	13.10	57.5	68.2	10.7	Vertical
26200.0	44.1	13.30	57.4	68.2	10.8	Horizontal

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Field Strength of Spurious Emissions						
Average Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Limit @3m dB μ V/m	Margin dB	E-Field Polarity
10480.0	32.7	8.90	41.6	54.0	12.4	Vertical
10480.0	33.6	8.70	42.3	54.0	11.7	Horizontal
17520.0	29.4	11.80	41.2	54.0	12.8	Vertical
17520.0	30.2	11.90	42.1	54.0	11.9	Horizontal
20960.0	29.5	12.40	41.9	54.0	12.1	Vertical
20960.0	28.8	12.40	41.2	54.0	12.8	Horizontal
26200.0	28.7	13.10	41.8	54.0	12.2	Vertical
26200.0	28.0	13.30	41.3	54.0	12.7	Horizontal

Result of Tx mode (5190.0 MHz) (802.11n40) (9kHz – 30MHz): Pass

Field Strength of Spurious Emissions						
Peak Value						
Frequency MHz	Measured Level dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit μ V/m	E-Field Polarity
Emissions detected are more than 20 dB below the FCC Limits						

Result of Tx mode (5190 MHz) (802.11n40) (1GHz-40GHz): Pass

Field Strength of Spurious Emissions						
Peak Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Limit @3m dB μ V/m	Margin dB	E-Field Polarity
10380.0	47.7	8.90	56.6	68.2	11.6	Vertical
10380.0	47.4	8.70	56.1	68.2	12.1	Horizontal
15570.0	45.1	11.80	56.9	68.2	11.3	Vertical
15570.0	44.1	11.90	56.0	68.2	12.2	Horizontal
20760.0	43.6	12.20	55.8	68.2	12.4	Vertical
20760.0	44.2	12.40	56.6	68.2	11.6	Horizontal
25950.0	43.8	13.10	56.9	68.2	11.3	Vertical
25950.0	43.2	13.30	56.5	68.2	11.7	Horizontal

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Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Limit @3m dB μ V/m	Margin dB	E-Field Polarity
10380.0	33.2	8.90	42.1	54.0	11.9	Vertical
10380.0	32.8	8.70	41.5	54.0	12.5	Horizontal
15570.0	30.5	11.80	42.3	54.0	11.7	Vertical
15570.0	30.4	11.90	42.3	54.0	11.7	Horizontal
20760.0	30.5	12.20	42.7	54.0	11.3	Vertical
20760.0	29.6	12.40	42.0	54.0	12.0	Horizontal
25950.0	29.4	13.10	42.5	54.0	11.5	Vertical
25950.0	29.1	13.30	42.4	54.0	11.6	Horizontal

Result of Tx mode (5230 MHz) (802.11n40) (9kHz – 30MHz): Pass

Field Strength of Spurious Emissions Peak Value						
Frequency MHz	Measured Level dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit μ V/m	E-Field Polarity
Emissions detected are more than 20 dB below the FCC Limits						

Result of Tx mode (5230 MHz) (802.11n40) (1GHz-40GHz): Pass

Field Strength of Spurious Emissions Peak Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Limit @3m dB μ V/m	Margin dB	E-Field Polarity
10460.0	48.1	8.90	57.0	68.2	11.2	Vertical
10460.0	47.5	8.70	56.2	68.2	12.0	Horizontal
15690.0	45.0	11.80	56.8	68.2	11.4	Vertical
15690.0	44.3	11.90	56.2	68.2	12.0	Horizontal
20920.0	43.6	12.20	55.8	68.2	12.4	Vertical
20920.0	44.6	12.40	57.0	68.2	11.2	Horizontal
26150.0	44.1	13.10	57.2	68.2	11.0	Vertical
26150.0	43.4	13.30	56.7	68.2	11.5	Horizontal

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Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Limit @3m dB μ V/m	Margin dB	E-Field Polarity
10460.0	33.2	8.90	42.1	54.0	11.9	Vertical
10460.0	32.6	8.70	41.3	54.0	12.7	Horizontal
15690.0	30.4	11.80	42.2	54.0	11.8	Vertical
15690.0	31.0	11.90	42.9	54.0	11.1	Horizontal
20920.0	30.1	12.20	42.3	54.0	11.7	Vertical
20920.0	30.2	12.40	42.6	54.0	11.4	Horizontal
26150.0	29.2	13.10	42.3	54.0	11.7	Vertical
26150.0	29.3	13.30	42.6	54.0	11.4	Horizontal

Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

* Denotes restricted band of operation.

Measurements were made using a peak detector. Any emission less than 1000MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement
uncertainty
(9kHz-30MHz): 2.0dB
(30MHz -1GHz): 4.9dB
(1GHz -26GHz): 4.02dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.

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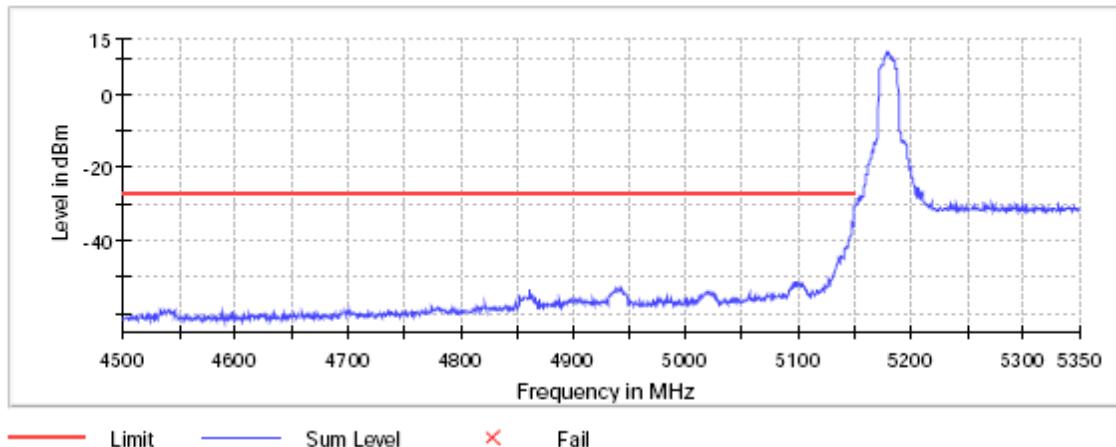
Undesirable emission:

Result: (Lowest)-802.11a 5180MHz, Undesirable emission of Band-edge Compliance

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
5148.250000	-35.1	8.1	-27.0	PASS
5148.750000	-35.7	8.7	-27.0	PASS
5149.250000	-36.0	9.0	-27.0	PASS
5149.750000	-36.3	9.3	-27.0	PASS
5147.750000	-36.6	9.6	-27.0	PASS
5147.250000	-37.4	10.4	-27.0	PASS
5146.750000	-38.4	11.4	-27.0	PASS
5145.750000	-38.8	11.8	-27.0	PASS
5146.250000	-38.8	11.8	-27.0	PASS
5145.250000	-39.4	12.4	-27.0	PASS
5144.750000	-40.2	13.2	-27.0	PASS
5144.250000	-40.5	13.5	-27.0	PASS
5143.750000	-40.8	13.8	-27.0	PASS
5143.250000	-41.8	14.8	-27.0	PASS
5141.750000	-42.1	15.1	-27.0	PASS

Band Edge



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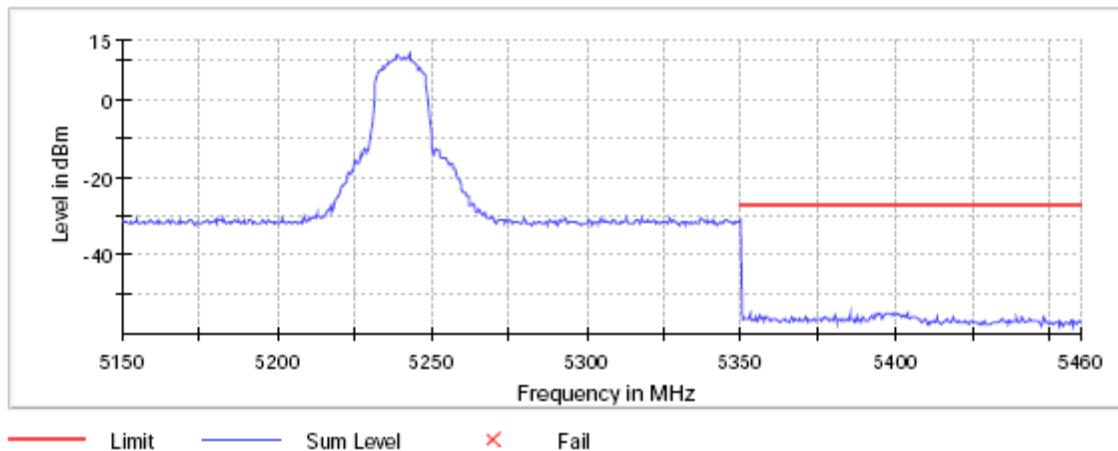
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Result: (High)-802.11a 5240MHz, Undesirable emission of Band-edge Compliance

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
5403.750000	-54.7	27.7	-27.0	PASS
5397.750000	-54.8	27.8	-27.0	PASS
5398.250000	-54.8	27.8	-27.0	PASS
5400.750000	-54.9	27.9	-27.0	PASS
5352.750000	-54.9	27.9	-27.0	PASS
5394.250000	-54.9	27.9	-27.0	PASS
5393.750000	-55.0	28.0	-27.0	PASS
5396.750000	-55.0	28.0	-27.0	PASS
5395.250000	-55.0	28.0	-27.0	PASS
5385.250000	-55.0	28.0	-27.0	PASS
5399.250000	-55.0	28.0	-27.0	PASS
5397.250000	-55.1	28.1	-27.0	PASS
5401.750000	-55.1	28.1	-27.0	PASS
5350.750000	-55.1	28.1	-27.0	PASS
5402.750000	-55.2	28.2	-27.0	PASS

Band Edge



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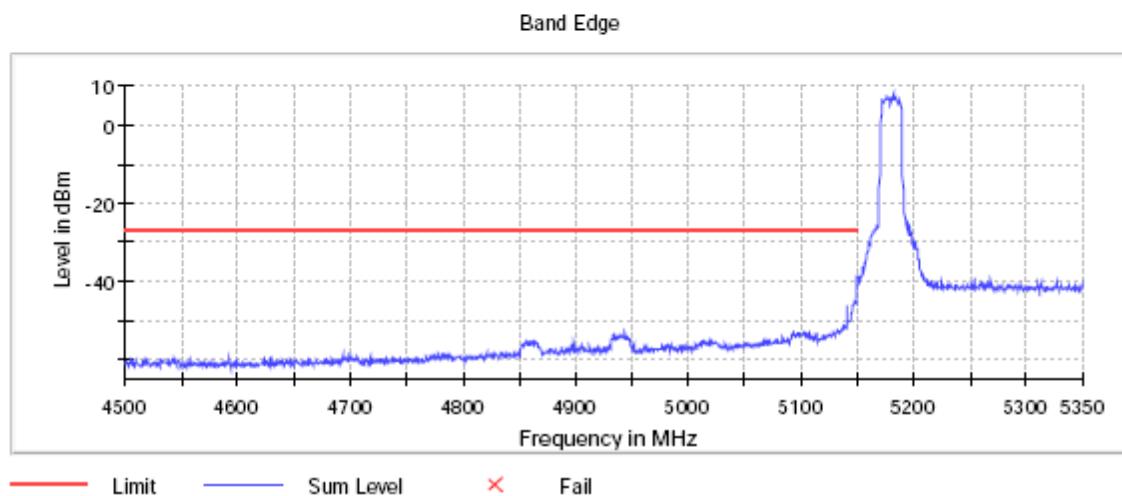
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Result: (Lowest)-802.11n20 5180MHz, Undesirable emission of Band-edge Compliance

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
5149.750000	-43.4	16.4	-27.0	PASS
5149.250000	-45.1	18.1	-27.0	PASS
5147.750000	-45.1	18.1	-27.0	PASS
5148.250000	-45.2	18.2	-27.0	PASS
5147.250000	-45.5	18.5	-27.0	PASS
5148.750000	-45.6	18.6	-27.0	PASS
5146.750000	-46.0	19.0	-27.0	PASS
5146.250000	-46.1	19.1	-27.0	PASS
5140.750000	-46.4	19.4	-27.0	PASS
5145.750000	-46.5	19.5	-27.0	PASS
5145.250000	-47.7	20.7	-27.0	PASS
5144.250000	-47.9	20.9	-27.0	PASS
5144.750000	-48.7	21.7	-27.0	PASS
5143.750000	-49.2	22.2	-27.0	PASS
5143.250000	-49.9	22.9	-27.0	PASS



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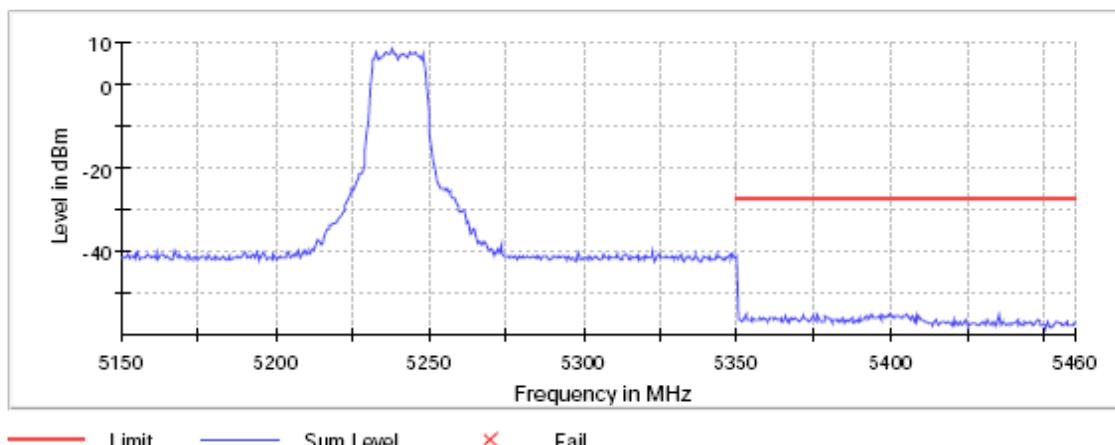
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Result: (High)-802.11n20 5240MHz, Undesirable emission of Band-edge Compliance

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
5376.250000	-55.1	28.1	-27.0	PASS
5399.250000	-55.1	28.1	-27.0	PASS
5405.250000	-55.1	28.1	-27.0	PASS
5435.250000	-55.3	28.3	-27.0	PASS
5397.250000	-55.3	28.3	-27.0	PASS
5400.250000	-55.3	28.3	-27.0	PASS
5393.750000	-55.4	28.4	-27.0	PASS
5352.750000	-55.4	28.4	-27.0	PASS
5404.750000	-55.4	28.4	-27.0	PASS
5404.250000	-55.5	28.5	-27.0	PASS
5407.250000	-55.6	28.6	-27.0	PASS
5401.750000	-55.6	28.6	-27.0	PASS
5409.250000	-55.6	28.6	-27.0	PASS
5397.750000	-55.6	28.6	-27.0	PASS
5365.750000	-55.6	28.6	-27.0	PASS

Band Edge



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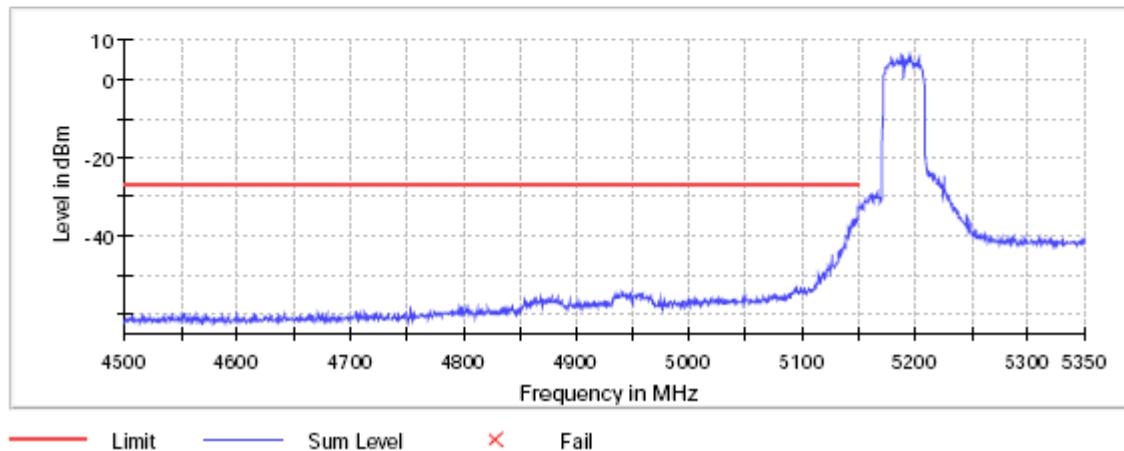
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Result: (Lowest)-802.11n40 5190MHz, Undesirable emission of Band-edge Compliance

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
5149.250000	-34.7	7.7	-27.0	PASS
5149.750000	-34.7	7.7	-27.0	PASS
5147.250000	-35.4	8.4	-27.0	PASS
5147.750000	-35.6	8.6	-27.0	PASS
5146.250000	-35.9	8.9	-27.0	PASS
5148.750000	-35.9	8.9	-27.0	PASS
5143.750000	-36.1	9.1	-27.0	PASS
5145.750000	-36.2	9.2	-27.0	PASS
5146.750000	-36.5	9.5	-27.0	PASS
5143.250000	-36.6	9.6	-27.0	PASS
5148.250000	-37.1	10.1	-27.0	PASS
5144.250000	-37.1	10.1	-27.0	PASS
5145.250000	-37.4	10.4	-27.0	PASS
5144.750000	-37.9	10.9	-27.0	PASS
5141.250000	-37.9	10.9	-27.0	PASS

Band Edge



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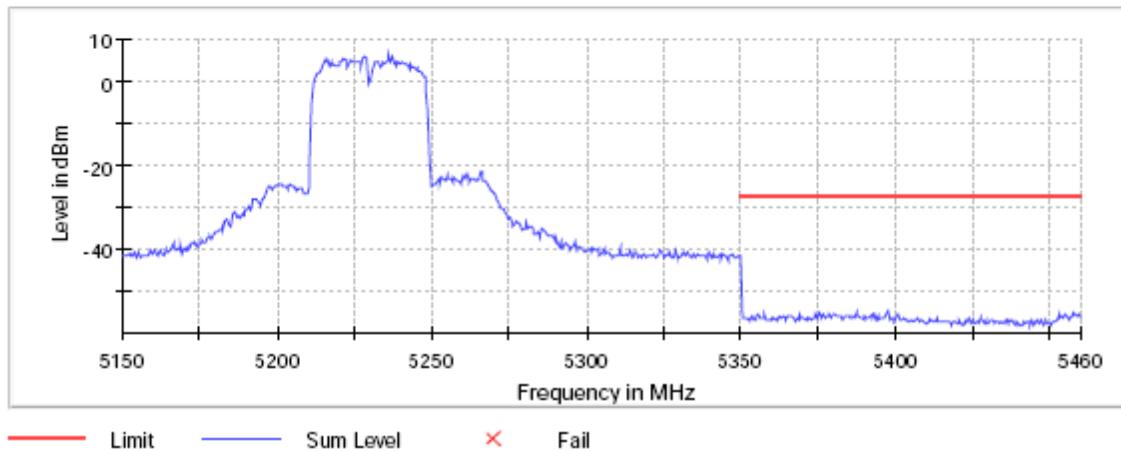
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Result: (High)-802.11n40 5230MHz, Undesirable emission of Band-edge Compliance

Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
5397.750000	-54.7	27.7	-27.0	PASS
5375.250000	-55.0	28.0	-27.0	PASS
5457.750000	-55.2	28.2	-27.0	PASS
5387.250000	-55.3	28.3	-27.0	PASS
5459.250000	-55.4	28.4	-27.0	PASS
5369.250000	-55.5	28.5	-27.0	PASS
5393.250000	-55.5	28.5	-27.0	PASS
5380.250000	-55.5	28.5	-27.0	PASS
5379.750000	-55.5	28.5	-27.0	PASS
5452.750000	-55.5	28.5	-27.0	PASS
5376.750000	-55.5	28.5	-27.0	PASS
5396.750000	-55.5	28.5	-27.0	PASS
5458.250000	-55.6	28.6	-27.0	PASS
5397.250000	-55.6	28.6	-27.0	PASS
5454.750000	-55.7	28.7	-27.0	PASS

Band Edge



— Limit — Sum Level ✕ Fail

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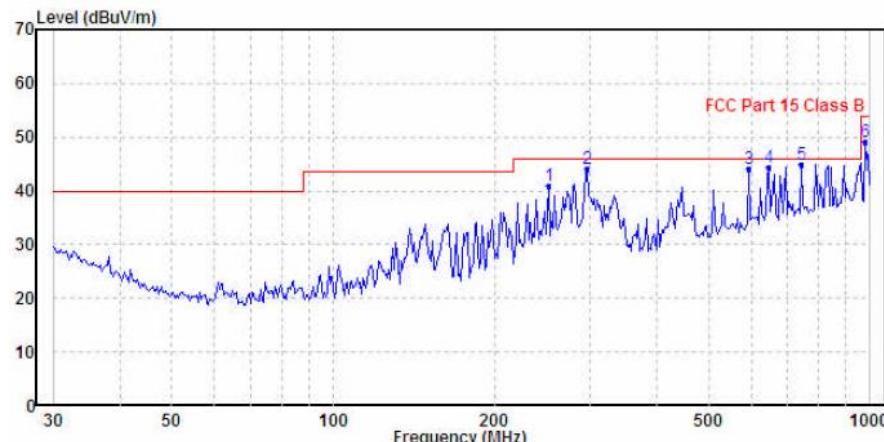
Limits for Radiated Emissions FCC 47 CFR 15.247]:

Frequency Range [MHz]	Quasi-Peak Limits [μ V/m]
0.009-0.490	2400/F (kHz)
0.490-1.705	24000/F (kHz)
1.705-30	30
30-88	100
88-216	150
216-960	200
Above 960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Results of WIFI TX mode: Pass

Please refer to the following table for result details (The data is the worst cases)
Horizontal



Ambient Temperature: 25C

Relative Humidity : 50%

Freq MHz	Level dBuV/m	Line dBuV/m	Limit	Over	Remark	Pol/Phase
			Limit dB	Limit dB		
1 251.180	40.93	46.00	-5.07	QP	Horizontal	
2 297.224	44.23	46.00	-1.77	QP	Horizontal	
3 595.133	44.19	46.00	-1.81	QP	Horizontal	
4 647.386	44.50	46.00	-1.50	QP	Horizontal	
5 744.866	44.82	46.00	-1.18	QP	Horizontal	
6 979.180	49.01	54.00	-4.99	QP	Horizontal	

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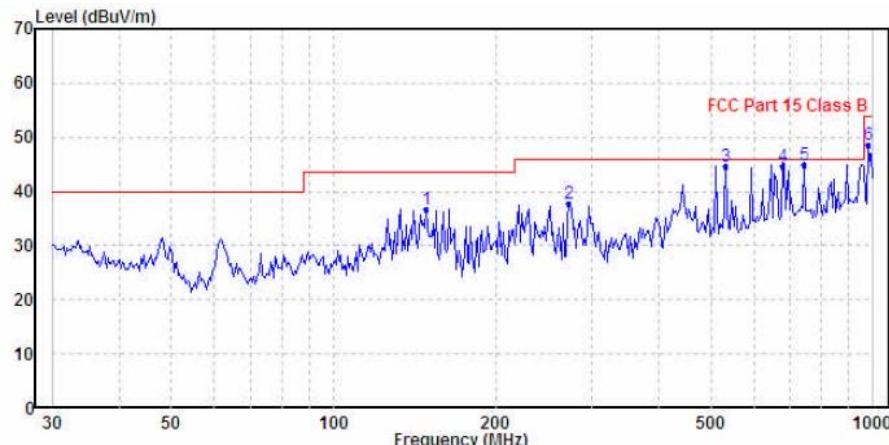
Limits for Radiated Emissions FCC 47 CFR 15.247 Class B:

Frequency Range [MHz]	Quasi-Peak Limits [μ V/m]
0.009-0.490	2400/F (kHz)
0.490-1.705	24000/F (kHz)
1.705-30	30
30-88	100
88-216	150
216-960	200
Above 960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Results of WIFI TX mode: Pass

Please refer to the following table for result details (The data is the worst cases)
Vertical



Ambient Temperature: 25C

Relative Humidity : 50%

Freq	Level	Line	Limit	Over	Pol/Phase
			Limit	Remark	
1	148.441	36.84	43.50	-6.66 QP	Vertical
2	273.234	37.82	46.00	-8.18 QP	Vertical
3	531.964	44.70	46.00	-1.30 QP	Vertical
4	679.960	44.61	46.00	-1.39 QP	Vertical
5	744.866	44.97	46.00	-1.03 QP	Vertical
6	979.180	48.64	54.00	-5.36 QP	Vertical

Remarks: Calculated measurement uncertainty (30MHz – 1GHz): 4.9dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.

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3.1.3 AC Mains Conducted Emissions (0.15MHz to 30MHz)

Test Requirement:	FCC 47CFR 15.207
Test Method:	ANSI C63.10:2013
Test Date:	2023-05-24
Mode of Operation:	WIFI TX mode
Test Voltage:	120V a.c. 60Hz

Ambient Temperature: 25°C Relative Humidity: 51% Atmospheric Pressure: 101 kPa

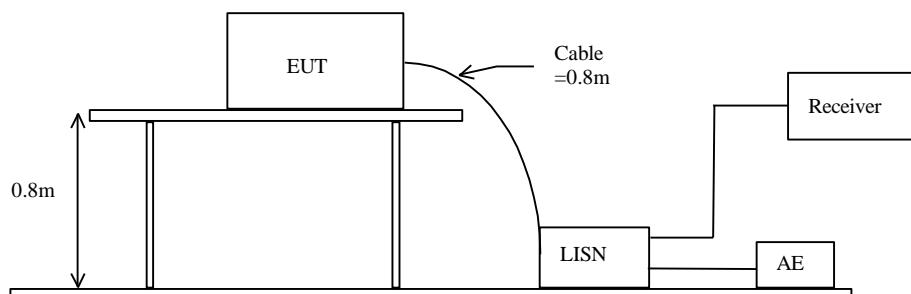
Test Method:

The test was performed in accordance with ANSI C63.10:2013, with the following: an initial measurement was performed in peak and average detection mode on the live line, any emissions recorded within 30dB of the relevant limit line were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.

Receiver Setting:

Bandw. = 9 kHz, Meas. Time= 10.0 ms, Step Width = 5.0kHz
 Detector = MaxPeak and CISPR AV

Test Setup:



Limits for Conducted Emissions (FCC 47 CFR 15.207):

Frequency Range [MHz]	Quasi-Peak Limits [dB μ V]	Average [dB μ V]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* Decreases with the logarithm of the frequency.

Remarks:

Calculated measurement uncertainty (0.15MHz – 30MHz): 3.25dB

*- Emission(s) that is far below the corresponding limit line.

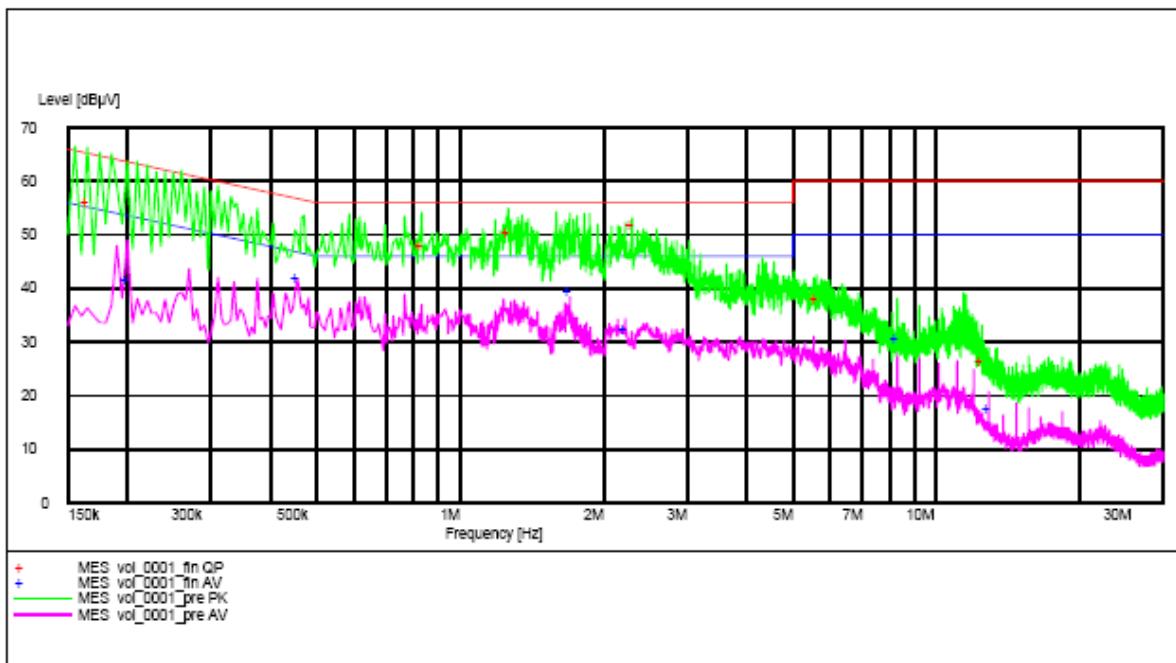
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Results of WIFI TX mode (L): PASS

Please refer to the following diagram for individual results.



MEASUREMENT RESULT: "vol_0001_fin QP"

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Line	PE
0.165000	56.00	9.7	65	9.0	L1	GND
0.830000	48.00	9.7	56	8.0	L1	GND
1.260000	50.60	9.7	56	5.4	L1	GND
2.300000	52.00	9.8	56	4.0	L1	GND
5.605000	38.00	9.9	60	22.0	L1	GND
12.480000	26.30	10.1	60	33.7	L1	GND

MEASUREMENT RESULT: "vol_0001_fin AV"

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Line	PE
0.200000	41.70	9.7	53	11.3	L1	GND
0.455000	41.90	9.7	46	4.1	L1	GND
1.700000	39.50	9.8	46	6.5	L1	GND
2.225000	32.40	9.8	46	13.6	L1	GND
8.295000	30.70	10.0	50	19.3	L1	GND
12.905000	17.70	10.1	50	32.3	L1	GND

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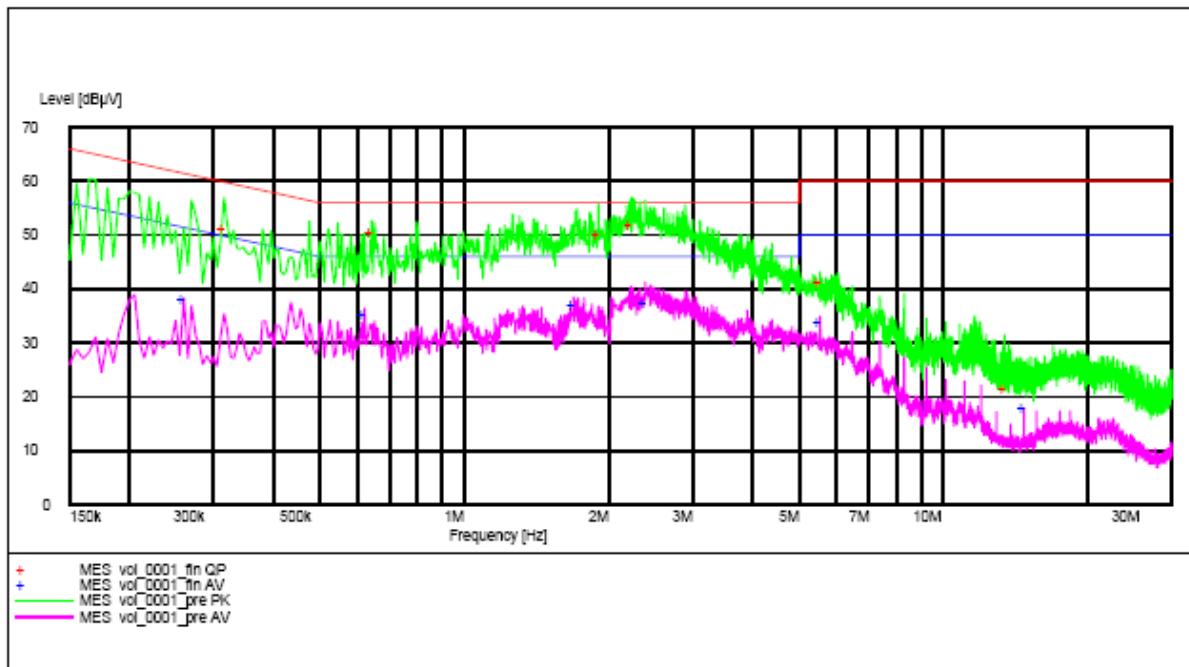
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Results of WIFI TX mode (N): PASS

Please refer to the following diagram for individual results.



MEASUREMENT RESULT: "vol_0001_fin QP"

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Line	PE
0.315000	51.30	9.7	60	8.7	N	GND
0.640000	50.50	9.7	56	5.5	N	GND
1.905000	50.20	9.8	56	5.8	N	GND
2.230000	51.80	9.8	56	4.2	N	GND
5.535000	41.40	9.9	60	18.6	N	GND
13.445000	21.40	10.2	60	38.6	N	GND

MEASUREMENT RESULT: "vol_0001_fin AV"

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Line	PE
0.260000	38.00	9.7	51	13.0	N	GND
0.620000	35.20	9.7	46	10.8	N	GND
1.690000	37.10	9.8	46	8.9	N	GND
2.390000	37.40	9.8	46	8.6	N	GND
5.535000	33.80	9.9	50	16.2	N	GND
14.755000	17.90	10.2	50	32.1	N	GND



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3.1.4 Power Spectral Density

Test Requirement: FCC 47CFR 15.407(a)
Test Method: ANSI C63.10:2013/ KDB 789033D02
Test Date: 2023-05-18
Mode of Operation: WIFI TX mode

Ambient Temperature: 25°C Relative Humidity: 51% Atmospheric Pressure: 101 kPa

Test Method:

The RF output of the EUT was connected to the spectrum analyzer. Set the fundamental frequency as the center frequency of the spectral analyzer. Use RBW=1000kHz , VBW= 3000KHz , Set the span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal. . Detector = rms, Sweep time = auto couple . Measure the Power Spectral Density (PSD) and record the results in dBm.

Test Setup:

As Test Setup of clause 3.1.1 in this test report.

Test Limit:

For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi

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Results of WIFI TX Mode 802.11 a (Tx:5150MHz to 5250MHz): Pass (TX Unit)
Maximum power spectral density

Transmitter Frequency (MHz)	Maximum Power spectral density level / 1MHz band (dBm)	Maximum Power spectral density / 1MHz band limit
5150.0	3.160	11dBm
5220.0	3.249	11dBm
5240.0	3.245	11dBm

Results of WIFI TX Mode 802.11 n20 (Tx:5150MHz to 5250MHz): Pass (TX Unit)
Maximum power spectral density

Transmitter Frequency (MHz)	Maximum Power spectral density level / 1MHz band (dBm)	Maximum Power spectral density / 1MHz band limit
5150.0	-0.287	11dBm
5220.0	0.322	11dBm
5240.0	0.037	11dBm

Results of WIFI TX Mode 802.11 n40 (Tx:5190MHz to 5230MHz): Pass (TX Unit)
Maximum power spectral density

Transmitter Frequency (MHz)	Maximum Power spectral density level / 1MHz band (dBm)	Maximum Power spectral density / 1MHz band limit
5190.0	-2.590	11dBm
5230.0	-2.099	11dBm

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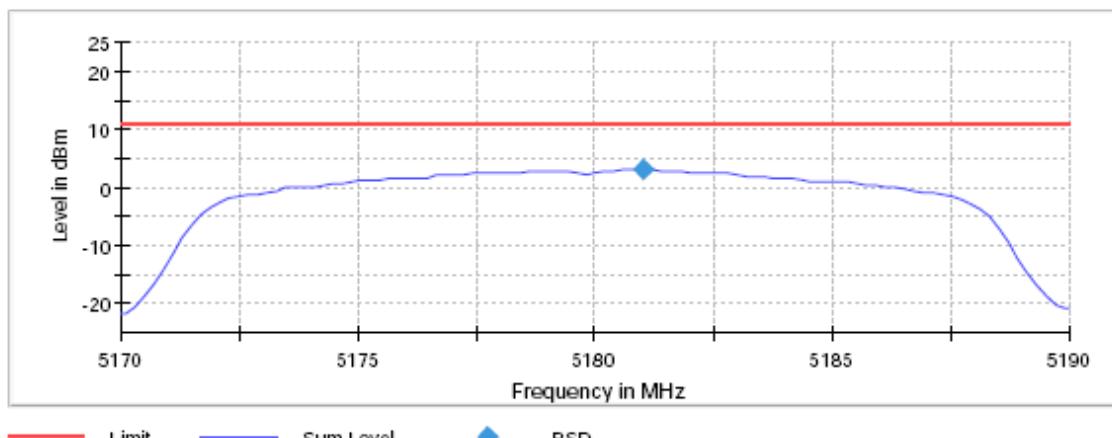
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WiFi mode 802.11 a
CH 36 (5180.0 MHz)

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
5180.000000	5180.990099	3.160	11.0	PASS

Power Spectral Density

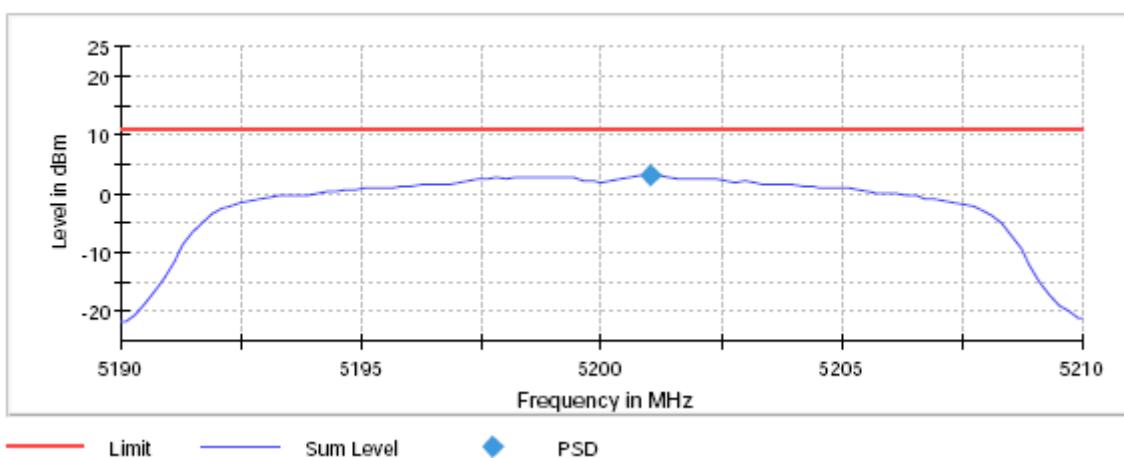


CH 40 (5200.0 MHz)

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
5200.000000	5200.990099	3.249	11.0	PASS

Power Spectral Density





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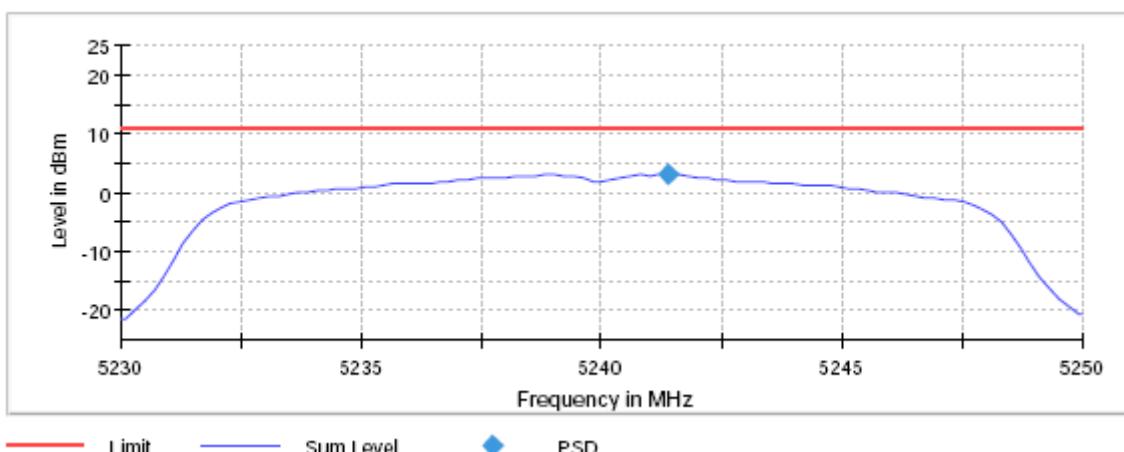
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CH 48 (5240.0 MHz)

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
5240.000000	5241.386139	3.245	11.0	PASS

Power Spectral Density



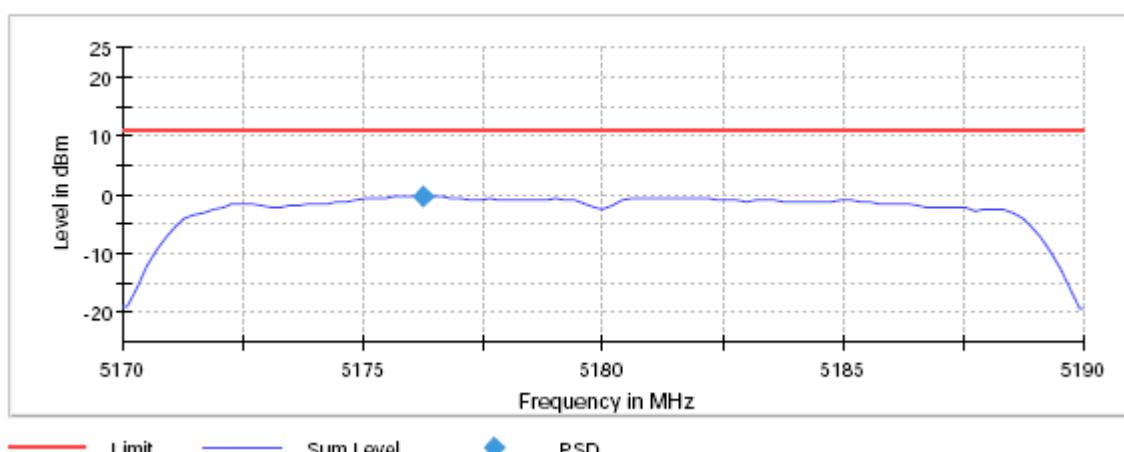
WiFi mode 802.11 n20

CH 36 (5180.0 MHz)

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
5180.000000	5176.237624	-0.287	11.0	PASS

Power Spectral Density



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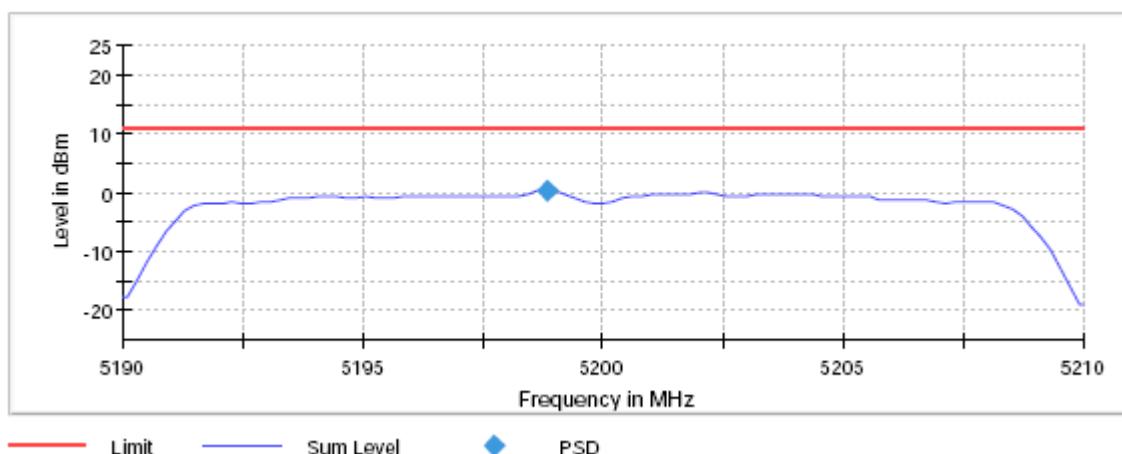
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CH 40 (5200.0 MHz)

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
5200.000000	5198.811881	0.322	11.0	PASS

Power Spectral Density

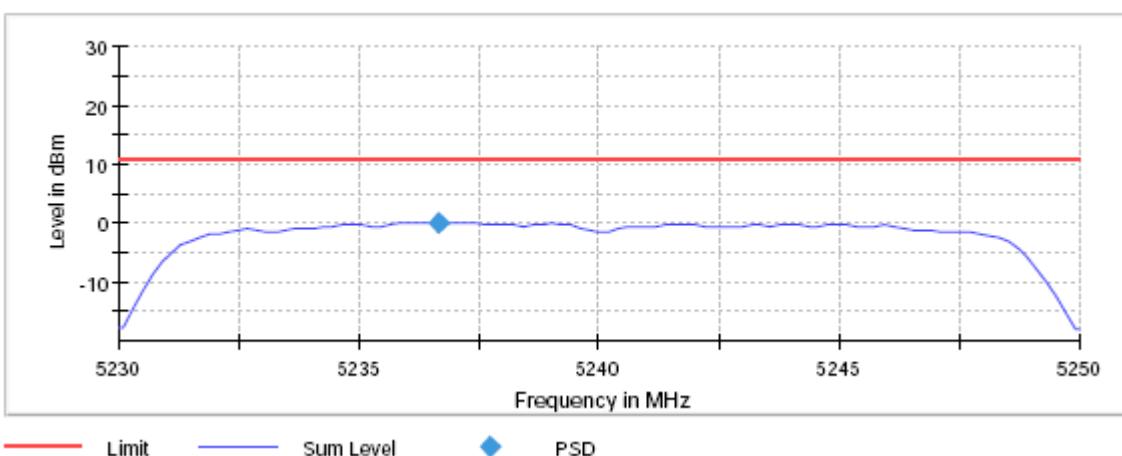


CH 48 (5240.0 MHz)

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
5240.000000	5236.633663	0.037	11.0	PASS

Power Spectral Density



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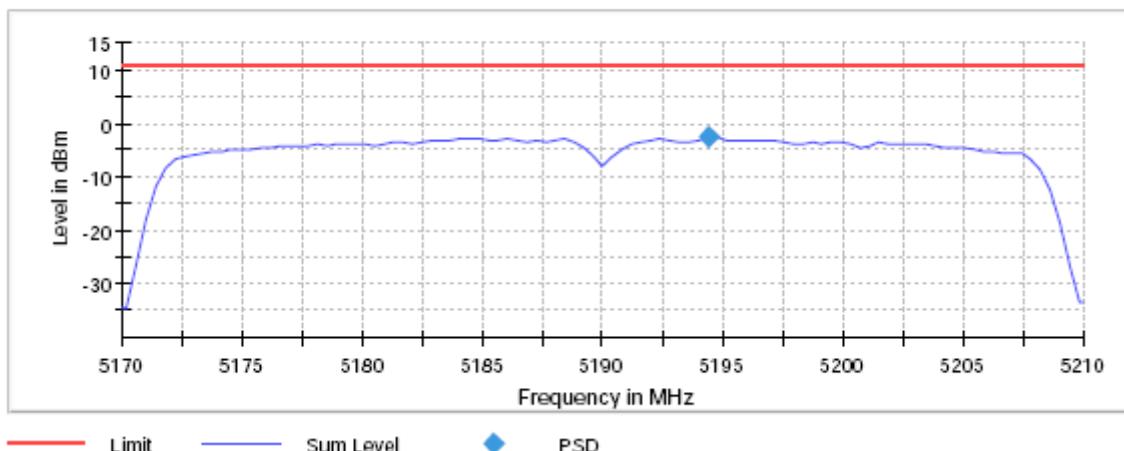
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WiFi mode 802.11 n40
 CH 38 (5190.0 MHz)

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
5190.000000	5194.356436	-2.590	11.0	PASS

Power Spectral Density

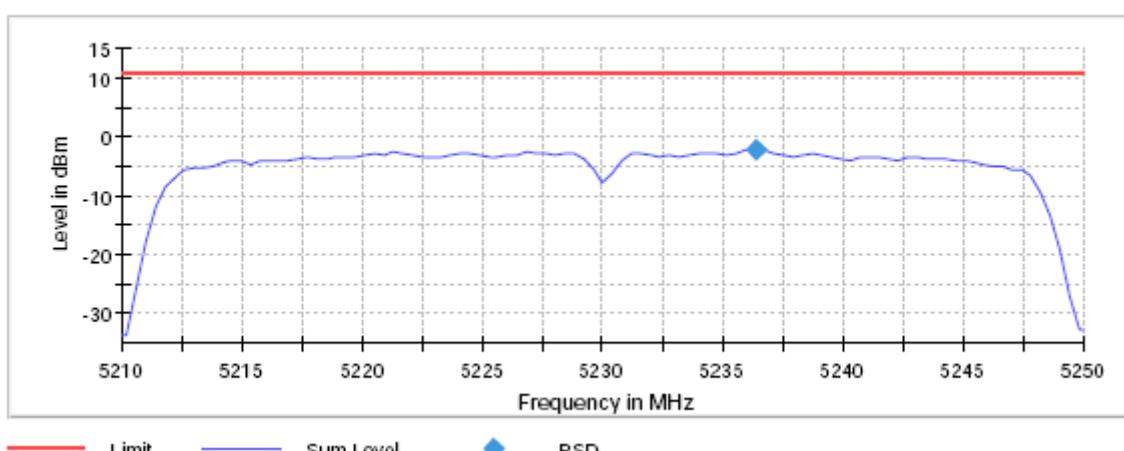


CH 46 (5230.0 MHz)

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
5230.000000	5236.336634	-2.099	11.0	PASS

Power Spectral Density



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3.1.5 26 dB Bandwidth and 99%Occupied Bandwidth Measurement

Test Requirement: FCC 47CFR 15.407(a) / KDB 789033D02

Test Method: ANSI C63.10:2013

Test Date: 2023-05-17

Mode of Operation: WIFI TX mode

Ambient Temperature: 25°C

Relative Humidity: 51%

Atmospheric Pressure: 101 kPa

Test Method:

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

Spectrum Analyzer Setting:

RBW = 1% to 5% of the OBW

VBW \geq 3*RBW, Sweep = Auto couple

Detector = Peak, Trace = Max. hold

Test Setup:

As Test Setup of clause 3.1.1 in this test report.

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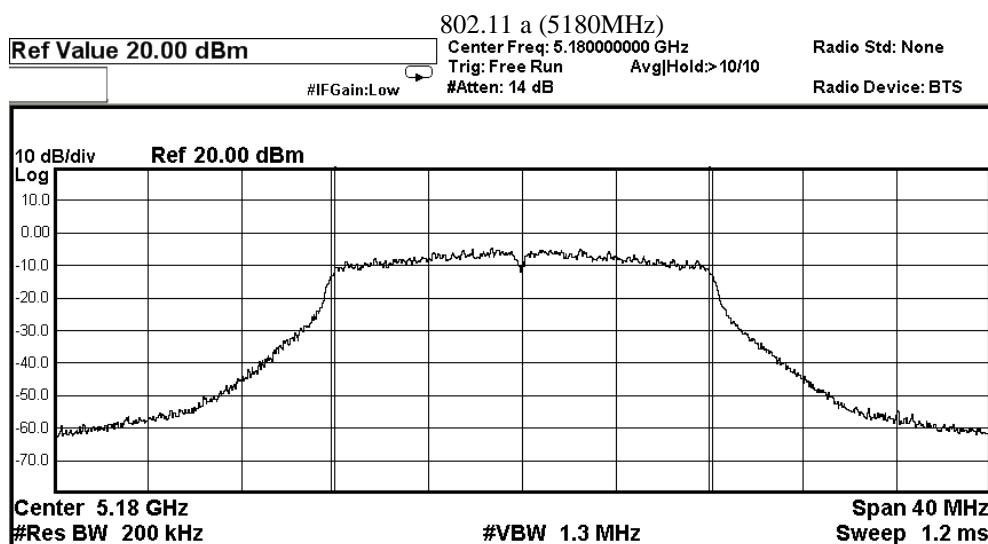
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26 dB Bandwidth and 99% Occupied Bandwidth Measurement:

Center Frequency [MHz]	26dB Bandwidth [MHz]	99% Bandwidth [MHz]
5180.0	19.03	16.215



Occupied Bandwidth

16.215 MHz

Transmit Freq Error	-4.920 kHz	OBW Power	99.00 %
x dB Bandwidth	19.03 MHz	x dB	-26.00 dB

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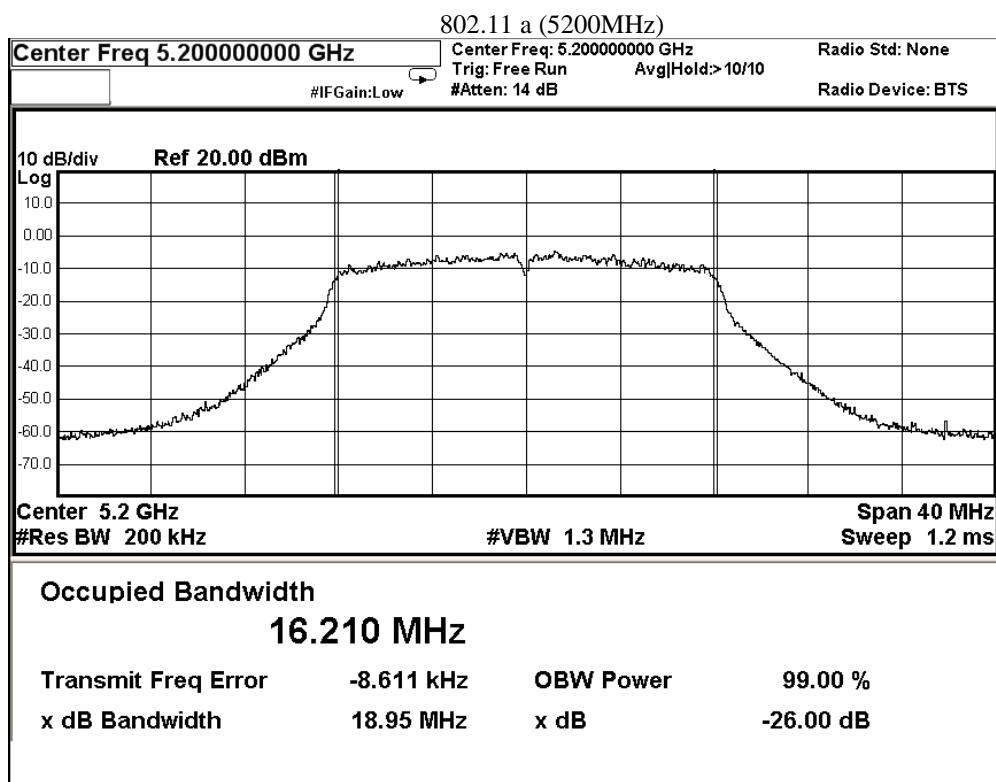
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26 dB Bandwidth and 99% Occupied Bandwidth Measurement:

Center Frequency [MHz]	26dB Bandwidth [MHz]	99% Bandwidth [MHz]
5200.0	18.95	16.210



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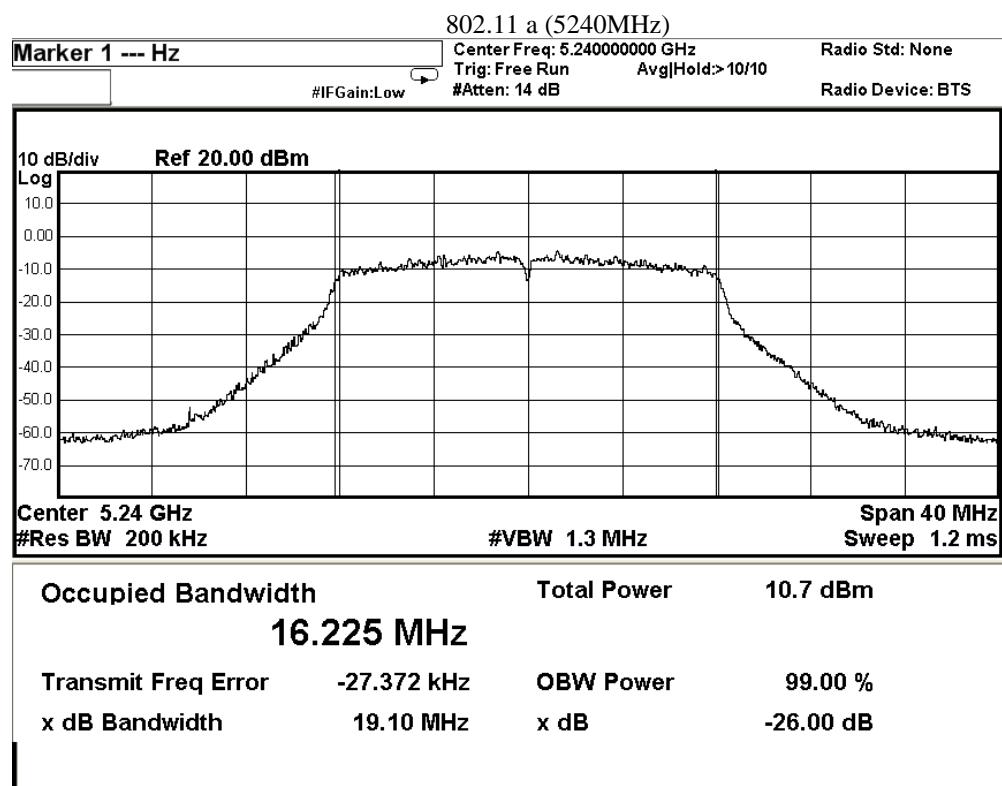
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26 dB Bandwidth and 99% Occupied Bandwidth Measurement:

Center Frequency [MHz]	26dB Bandwidth [MHz]	99% Bandwidth [MHz]
5240.0	19.10	16.225



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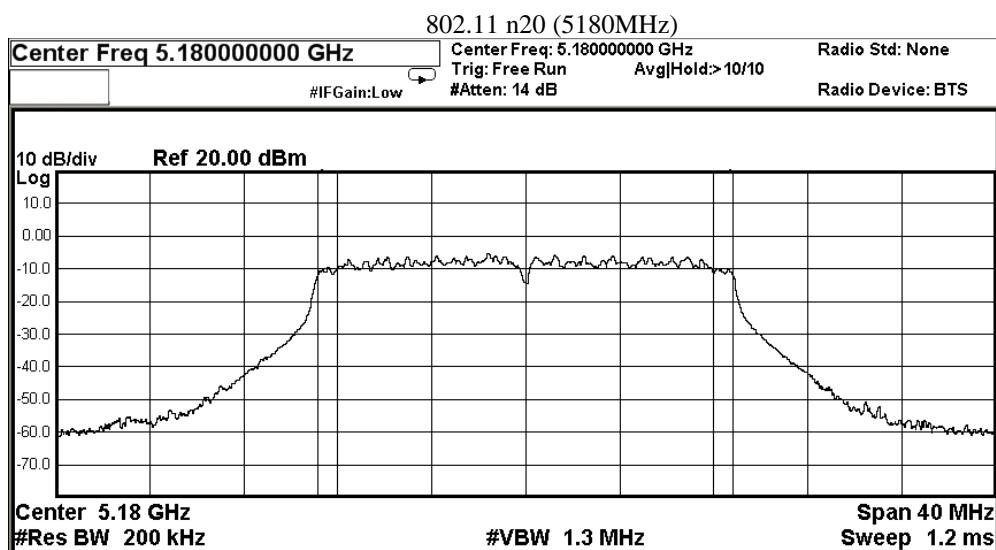
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26 dB Bandwidth and 99% Occupied Bandwidth Measurement:

Center Frequency [MHz]	26dB Bandwidth [MHz]	99% Bandwidth [MHz]
5180.0	20.12	17.592



Occupied Bandwidth

17.592 MHz

Transmit Freq Error	-13.651 kHz	OBW Power	99.00 %
x dB Bandwidth	20.12 MHz	x dB	-26.00 dB

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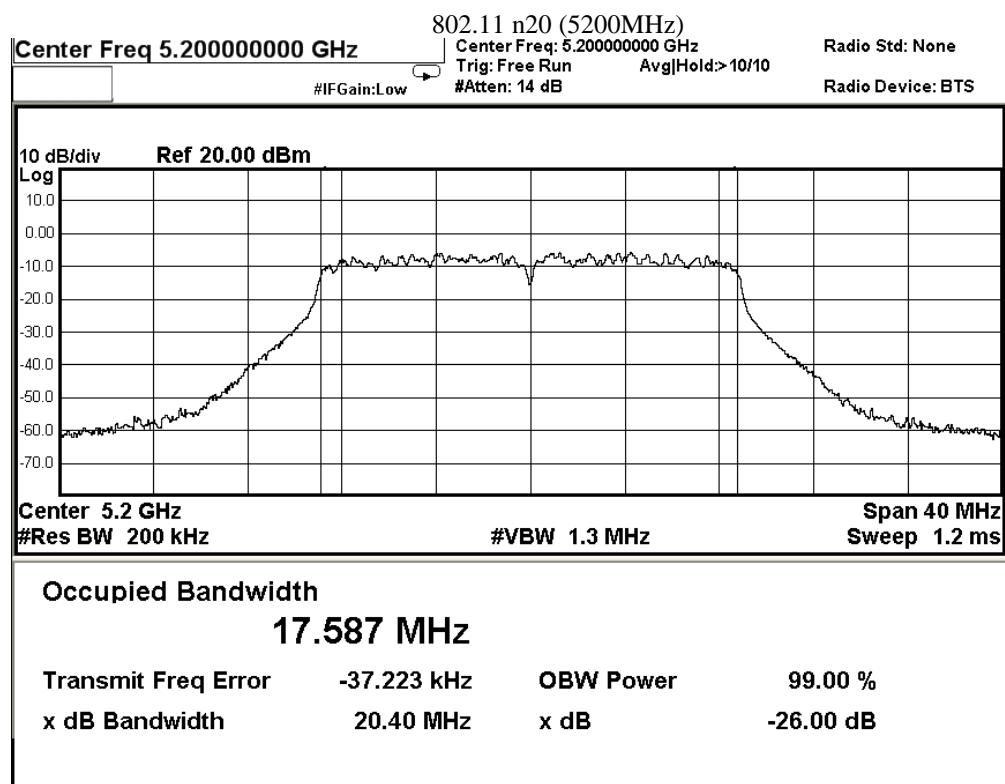
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26 dB Bandwidth and 99% Occupied Bandwidth Measurement:

Center Frequency [MHz]	26dB Bandwidth [MHz]	99% Bandwidth [MHz]
5200.0	20.40	17.587



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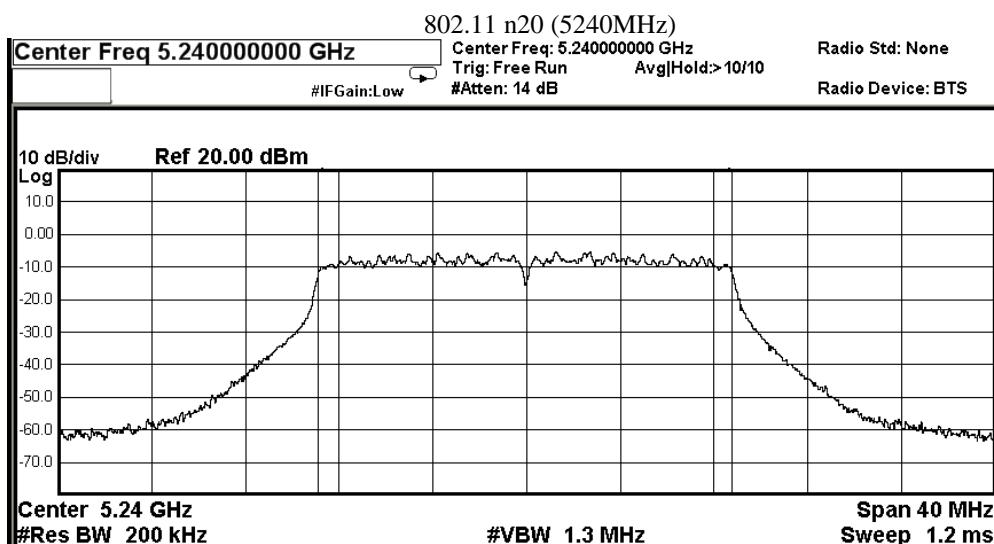
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26 dB Bandwidth and 99% Occupied Bandwidth Measurement:

Center Frequency [MHz]	26dB Bandwidth [MHz]	99% Bandwidth [MHz]
5240.0	20.10	17.565



Occupied Bandwidth

17.565 MHz

Transmit Freq Error	-32.047 kHz	OBW Power	99.00 %
x dB Bandwidth	20.10 MHz	x dB	-26.00 dB

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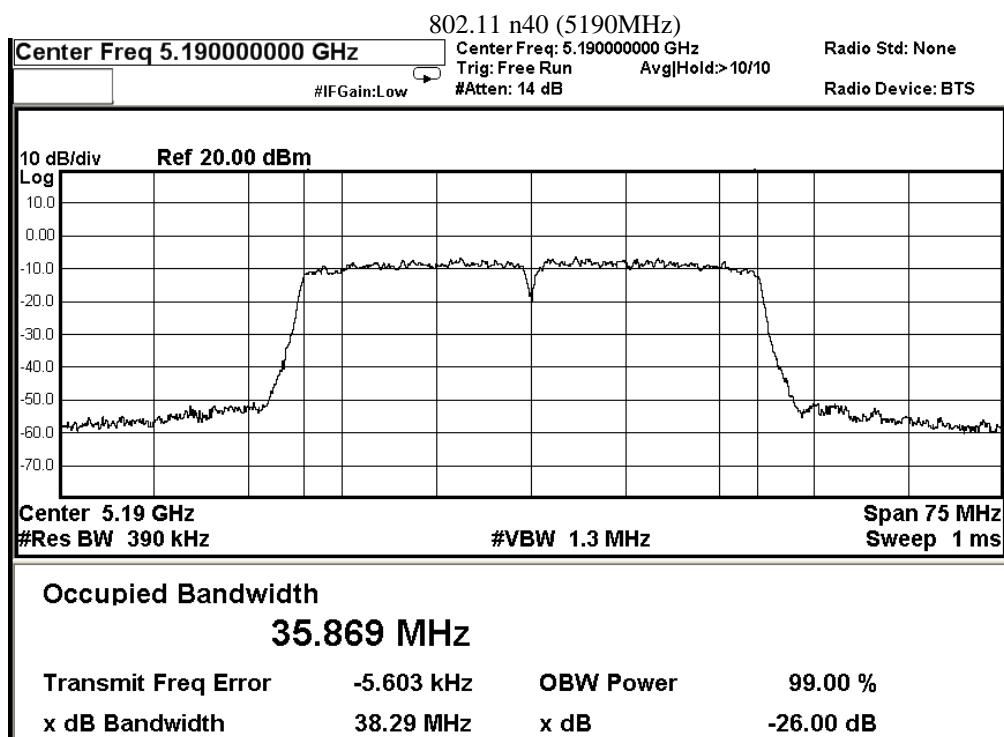
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26 dB Bandwidth and 99% Occupied Bandwidth Measurement:

Center Frequency [MHz]	26dB Bandwidth [MHz]	99% Bandwidth [MHz]
5190.0	38.29	35.869



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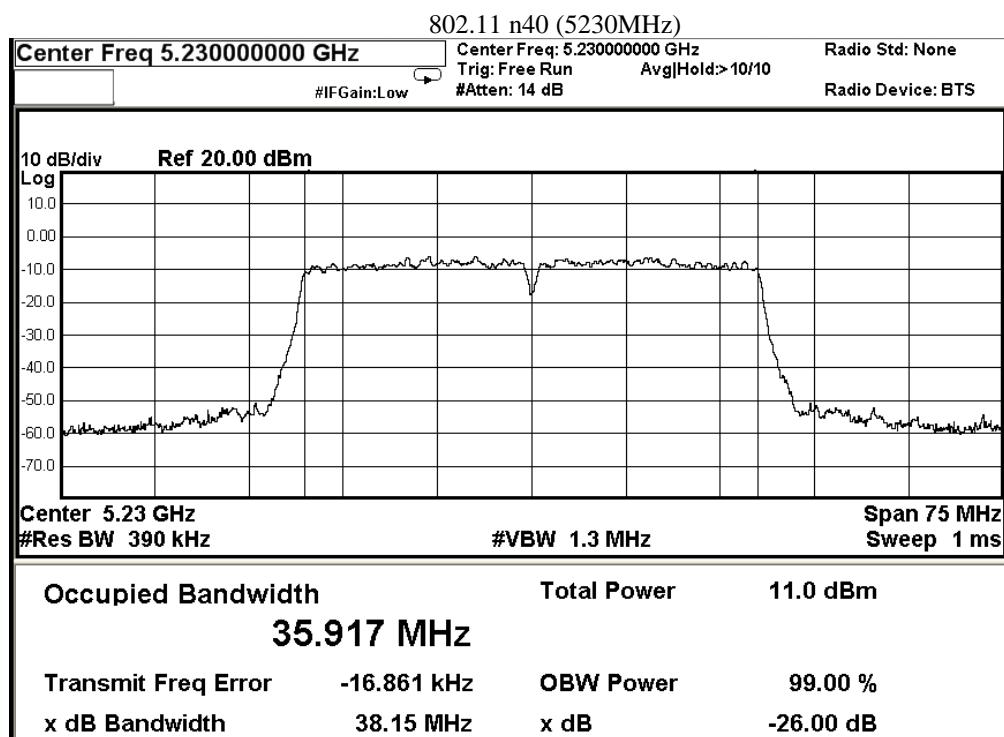
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26 dB Bandwidth and 99% Occupied Bandwidth Measurement:

Center Frequency [MHz]	26dB Bandwidth [MHz]	99% Bandwidth [MHz]
5230.0	38.15	35.917



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3.1.6 Antenna Requirement

Ambient Temperature: 25°C Relative Humidity: 51% Atmospheric Pressure: 101 kPa

Test Requirements: § 15.203

Test Specification:

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. 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. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Test Results:

This is monopole antenna. There is no external antenna, the antenna gain = 1.2dBi. User is unable to remove or changed the Antenna.

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Appendix A

List of Measurement Equipment

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM215	MULTIDEVICE CONTROLLER	EMCO	2090	00024676	N/A	N/A
EM217	ELECTRIC POWERED TURNTABLE	EMCO	2088	00029144	N/A	N/A
EM218	ANECHOIC CHAMBER	ETS-LINDGREN	FACT-3	--	2019/04/16	2024/04/16
EM356	ANTENNA POSITIONING TOWER	ETS-LINDGREN	2171B	00150346	N/A	N/A
EM293	SPECTRUM ANALYZER	AGILENT TECHNOLOGIES	N9020A	MY50510152	2022/11/25	2024/11/25
EM299	BROADBAND HORN ANTENNA	ETS-LINDGREN	3115	00114120	2022/11/24	2024/11/24
EM300	PYRAMIDAL STANDARD GAIN HORN ANTENNA	ETS-LINDGREN	3160-09	00130130	2022/11/25	2024/11/25
EM301	PYRAMIDAL STANDARD GAIN HORN ANTENNA	ETS-LINDGREN	3160-10	00130988	2022/11/25	2024/11/25
EM353	LOOP ANTENNA	ETS-LINDGREN	6502	00206533	2022/06/10	2024/09/10
EM355	Biconilog Antenna	ETS-Lindgren	3143B	00094856	2022/06/17	2024/09/17
EM200	DUAL CHANNEL POWER METER	R & S	NRVD	100592	2022/10/11	2025/10/11
EM012	PRE-AMPLIFIER	HP	HP8448B	3008A00262	2022/11/08	2025/11/08
EM215	MULTIDEVICE CONTROLLER	EMCO	2090	00024676	N/A	N/A

Line Conducted

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM232	LISN	SCHAFFNER	NNB41	04/100082	2022/07/20	2023/07/20
EM181	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB7	100072	2022/05/30	2023/05/30
EM179	PULSE LIMITER	ROHDE & SCHWARZ	ESH3-Z2	357.8810.52/54	2023/03/17	2025/03/17
EM154	SHIELDING ROOM	SIEMENS MATSUSHITA COMPONENTS	N/A	803-740-057-99A	2022/02/02	2027/02/02
N/A	MEASUREMENT AND EVALUATION SOFTWARE	ROHDE & SCHWARZ	BSIB-K1	V1.20	N/A	N/A

Remarks:-

CM Corrective Maintenance
N/A Not Applicable
TBD To Be Determined

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Appendix B

Photographs of EUT

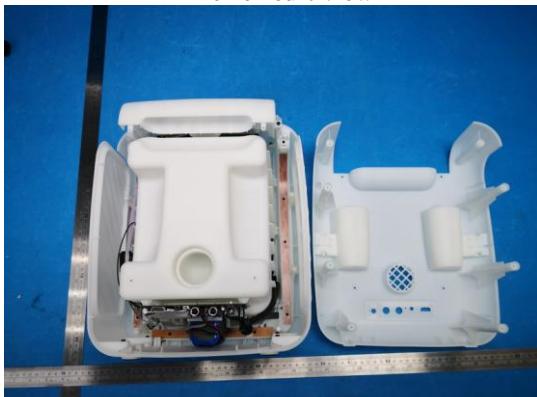
View of the product



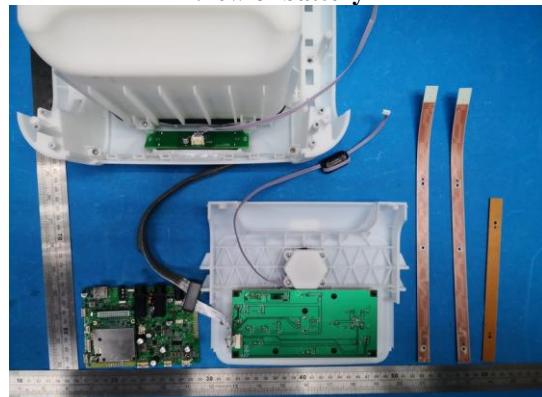
View of the product



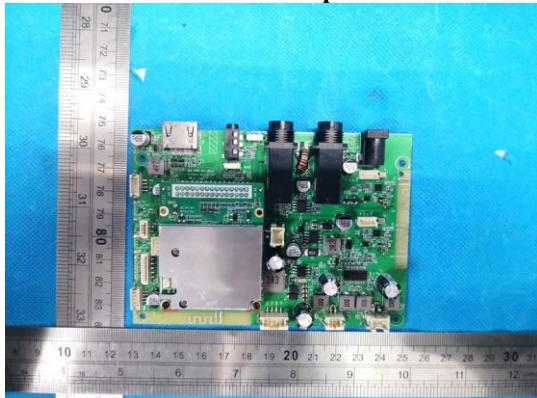
Inner circuit view



View of battery



Inner circuit top view



Inner circuit bottom view



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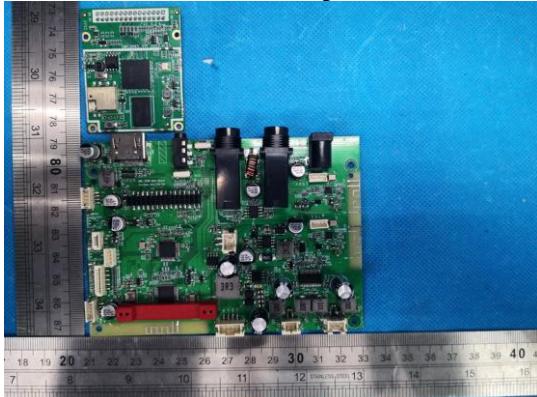
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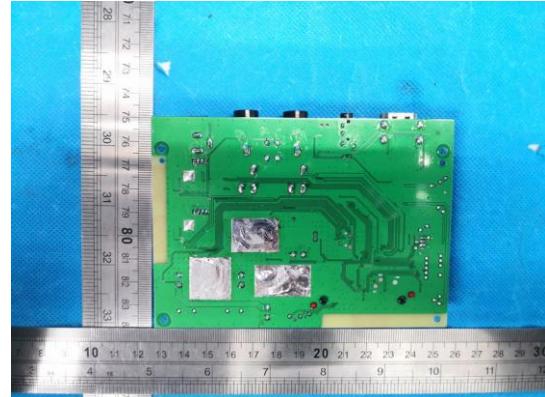
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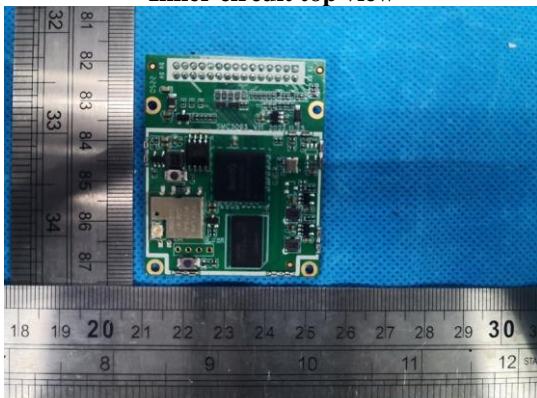
Inner circuit top view



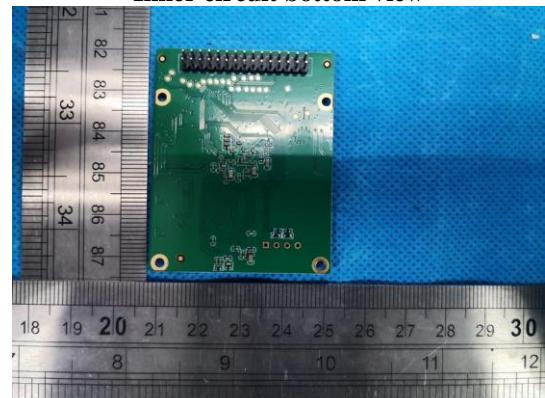
Inner circuit bottom view



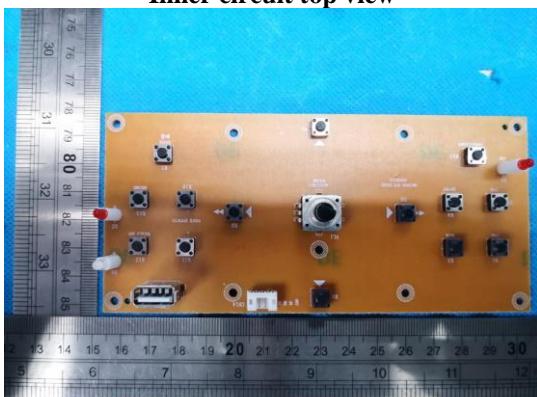
Inner circuit top view



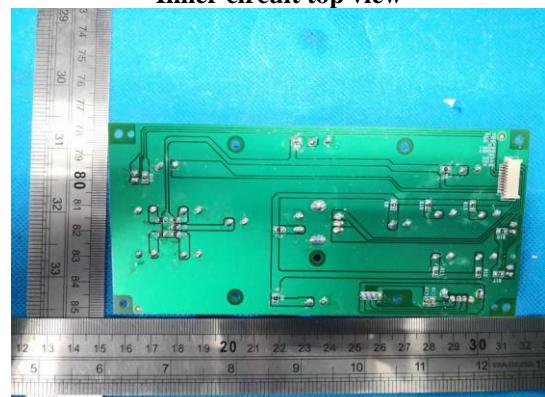
Inner circuit bottom view



Inner circuit top view



Inner circuit top view

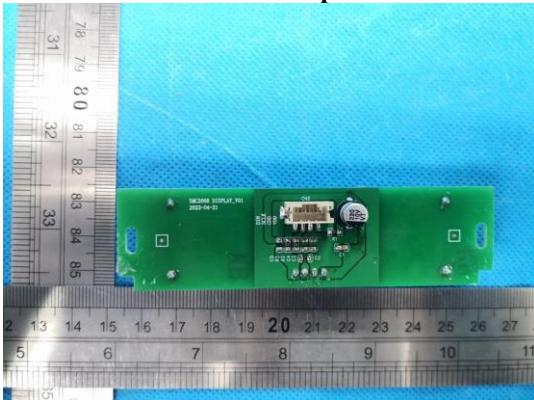


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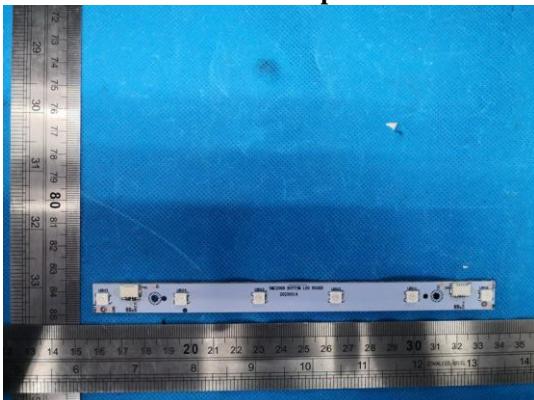
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Inner circuit top view



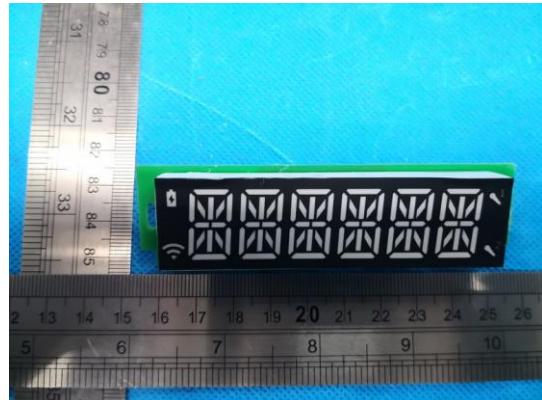
Inner circuit top view



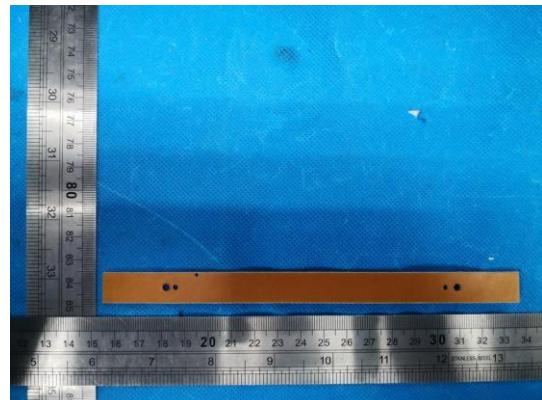
Inner circuit top view



Inner circuit bottom view



Inner circuit bottom view



Inner circuit top view



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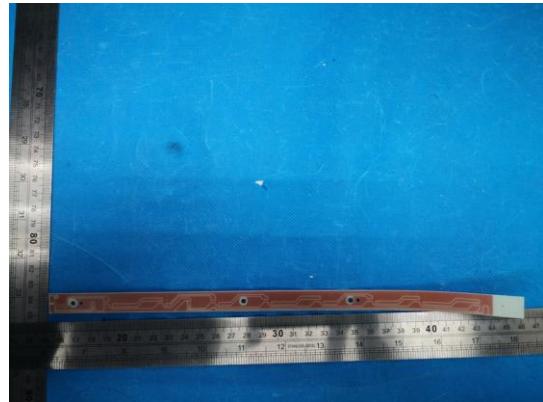
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Inner circuit top view



Inner circuit bottom view



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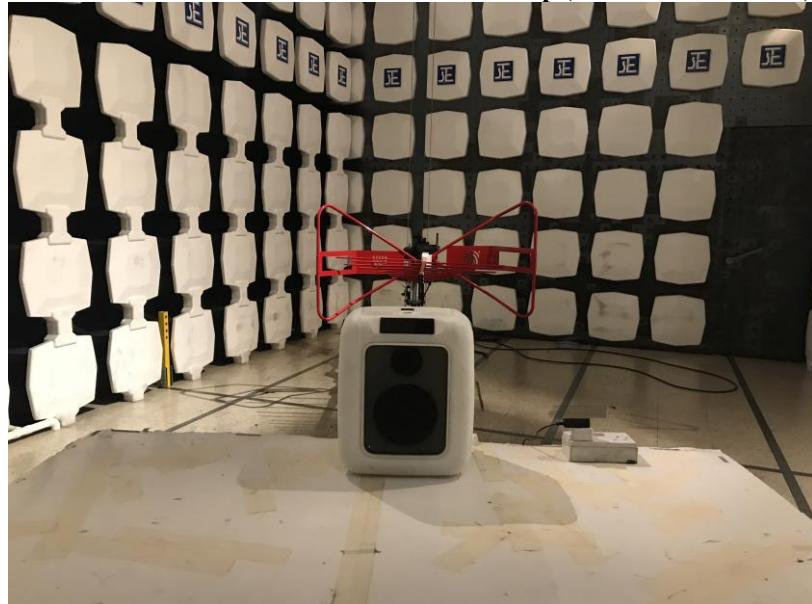
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Photographs of EUT

Measurement of Radiated Emission Test Set Up (9kHz – 30MHz)



Measurement of Radiated Emission Test Set Up (30MHz to 1000MHz)



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Photographs of EUT

Measurement of Radiated Emission Test Set Up (Above 1000MHz)



Measurement of Conducted Emission Test Set Up



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