



ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT



Applicant: Quanta Computer Inc.
 No. 188, Wenhua 2nd Road, Guishan District, Taoyuan City
 33377, Taiwan

Manufacturer: Quanta Computer Inc.
 No. 188, Wenhua 2nd Road, Guishan District, Taoyuan City
 33377, Taiwan

Product Name: Kitchen Display System

Brand Name: Clover

Model No.: C700

Model Difference: N/A

Report Number: TERF2212002688E2

FCC ID HFS-C700

IC: 1787B-C700

Date of EUT Received: December 09, 2022

Date of Test: December 14, 2022~December 23, 2022

Issue Date: January 12, 2023

Approved By

Arno Hsieh

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Central RF Lab. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10:2013 and the energy emitted by the sample EUT comply with FCC rule part §15.247, ISED RSS-247.

The results of this report relate only to the sample identified in this report.

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Revision History

Report Number	Revision	Description	Issue Date	Revised By	Remark
TERF2212002688E2	00	Original.	Jan. 12, 2023	Yi-Shan Tsai	

Note:

- 1、The remark "*" indicates modification of the report upon requests from certification body.

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1 GENERAL INFORMATION

1.1 Product Description

Product Name:	Kitchen Display System		
Brand Name:	Clover		
Model No.:	C700		
Model Difference:	N/A		
Hardware Version:	N/A		
Firmware Version:	N/A		
EUT Series No.:	C070UQ24650075 (Conducted) TE_SP_20221209466 (Conduction、Radiated)		
Power Supply:	Adapter 12Vdc		
Test Software (Name/Version)	Qualcomm Radio Control ToolKit v4.0		

1.2 RF Specification

WLAN 2.4GHz

Wi-Fi	Frequency Range	Channels	Rated Power (dBm)		Modulation Technology
			Peak	Avg.	
802.11b	2412~2462	11	22.41	20.16	DSSS
802.11g	2412~2462	11	23.84	19.23	OFDM
802.11n20	2412~2462	11	23.82	18.83	OFDM
802.11n40	2422~2452	7	24.84	18.25	OFDM
Modulation type:		CCK, DQPSK, DBPSK for DSSS			
		64QAM, 16QAM, QPSK, BPSK for OFDM			
Data Rate:		802.11 b: 1/2/5.5/11 Mbps			
		802.11 g: 6/9/12/18/24/36/48/54 Mbps			
		802.11 n_20MHz:up to 144.4Mbps			
		802.11 n_40MHz:up to 300Mbps			

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WLAN 2.4GHz for IC

Wi-Fi	Frequency Range	Channels	Rated Power (dBm)		Rated Power in dBm (EIRP)	Modulation Technology
			Peak	Avg.		
802.11b	2412~2462	11	22.41	20.16	23.51	DSSS
802.11g	2412~2462	11	23.84	19.23	22.58	OFDM
802.11n20	2412~2462	11	23.82	18.83	22.18	OFDM
802.11n40	2422~2452	7	24.84	18.25	21.60	OFDM
Modulation type:		CCK, DQPSK, DBPSK for DSSS				
		64QAM, 16QAM, QPSK, BPSK for OFDM				
Data Rate:		802.11 b: 1/2/5.5/11 Mbps				
		802.11 g: 6/9/12/18/24/36/48/54 Mbps				
		802.11 n_20MHz:up to 144.4Mbps				
		802.11 n_40MHz:up to 300Mbps				

1.3 Antenna Designation

Antenna Type	WIFI 1/2	Freq. (MHz)	Peak Antenna Gain (dBi)	Directional Gain (dBi)
PIFA	WIFI 1	2412~2462	0.51	3.35
	WIFI 2	2412~2462	0.17	3.35

Note:

1. Pre-scanned was done on the above antennas, measurements were demonstrated by using the antenna with the highest gain as the worst case scenarios.
2. Antenna information is provided by the applicant.

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1.4 Test Methodology of Applied Standards

FCC Part 15, Subpart C §15.247

FCC KDB 558074 D01 15.247 Meas Guidance v05r02

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

RSS-247 issue 2 Feb. 2017

RSS-Gen, issue 5 April, 2018

ANSI C63.10:2013

1.5 Test Facility

Laboratory	Test Site Address	Test Site Name	FCC Designation number	IC CAB identifier
SGS Taiwan Ltd.	No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan.	SAC 1 SAC 2 SAC 3 Conduction 1 Conducted 1 Conducted 2 Conducted 3 Conducted 4 Conducted 5 Conducted 6	TW0027	
Central RF Lab. (TAF code 3702)	No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333	Conduction C SAC C SAC D SAC G Conducted A Conducted B Conducted C Conducted D Conducted E Conducted F Conducted G	TW3702	TW0028

Note: Test site name is remarked on the equipment list in each section of this report as an indication where measurements occurred in specific test site and address.

1.6 Special Accessories

There are no special accessories used while test was conducted.

1.7 Equipment Modifications

There was no modification incorporated into the EUT.

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2 SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is placed on a table which is 0.8 m above ground plane. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz. The CISPR Quasi-Peak and Average detector mode is employed. The two LISNs provide 50uH/50 ohm of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

2.3.2 Conducted Test (RF)

The active antenna port of the unlicensed wireless device is connected to the spectrum analyzer with attenuator to protect the instrumentation. If a second antenna port is available, it is tested at one operating frequency, with other port(s) appropriately terminated, to verify it has similar output characteristics as the fully tested port.

2.3.3 Radiated Emissions

The EUT is placed on a turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

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2.4 Measurement Results Explanation Example

2.4.1 Radiated Emission Test Sites For Measurements From 9 kHz To 30 MHz

Radiated emission below 30MHz is measured in a 9m*6m*6m semi-anechoic chamber, the measurements correspond to those obtained at an open-field test site.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

2.4.2 For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

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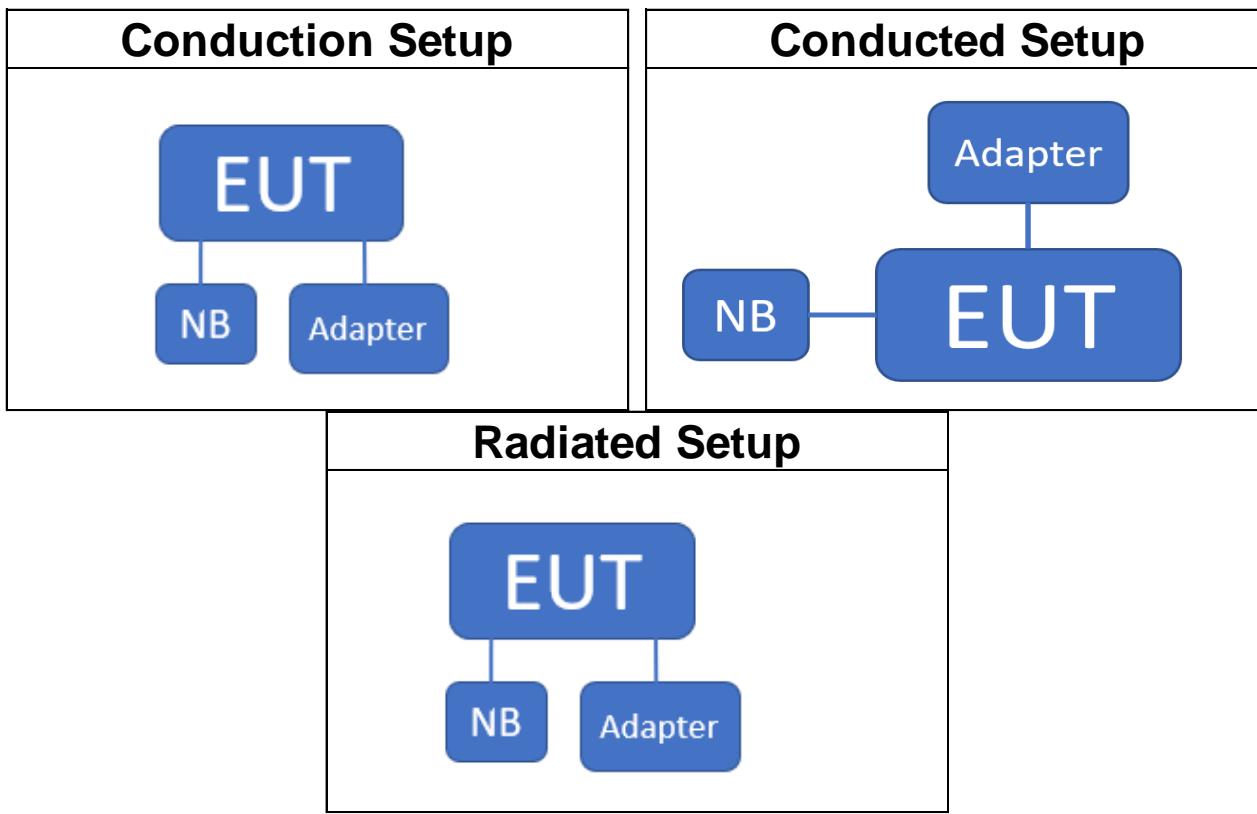
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2.5 Test Configuration



2.6 Control Unit(s)

AC Power-Line Conducted Emission Test Site: Conduction C					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
adapter	clover	FSP040-RHBN3	N/A	N.C.R	N.C.R
Notebook	Lenovo	L430	P0000195	N.C.R	N.C.R
Conducted Emission Test Site: Conducted G					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Notebook	Lenovo	T470	P0001293	N/A	N/A
Radiated Emission Test Site: SAC G					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
adapter	clover	FSP040-RHBN3	N/A	N.C.R	N.C.R
Notebook	Lenovo	L430	P0000195	N.C.R	N.C.R

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3 SUMMARY OF TEST RESULTS

FCC Rules	ISED Rules	Description Of Test	Result
§15.207(a)	RSS-Gen §8.8	AC Power Line Conducted Emission	Compliant
§15.247(b) (3)	RSS-247 §5.4 d	Peak Output Power	Compliant
§15.247(a)(2)	RSS-247 §5.2 a RSS-Gen §6.7	Emission Bandwidth	Compliant
§15.205 §15.209 §15.247(d)	RSS-247 §5.5 RSS-Gen §8.9 RSS-Gen §8.10 RSS-Gen §6.13	Radiated & Conducted Band Edge and Spurious Emission	Compliant
§15.247(e)	RSS-247 §5.2 b	Power Spectral Density	Compliant
§15.203	N/A	Antenna Requirement	Compliant

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4 DESCRIPTION OF TEST MODES

4.1 Operatin Frequencies

Modulation of BW 20MHz		Modulation of BW 40MHz	
CHANNEL	FREQUENCY (MHz)	CHANNEL	FREQUENCY (MHz)
1	2412	3	2422
2	2417	4	2427
3	2422	5	2432
4	2427	6	2437
5	2432	7	2442
6	2437	8	2447
7	2442	9	2452
8	2447		
9	2452		
10	2457		
11	2462		

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4.2 The Worst Test Modes and Channel Details

1. The EUT has been tested under operating condition.
2. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.
3. Investigation has been done on all the possible configurations for searching the worst case.

The given UE is pre-scanned among below modes.

Modulation	Transmission Chain					Single Transmission Spatial	Multiple Transmission Spatial
	<input checked="" type="checkbox"/> Ch0	<input checked="" type="checkbox"/> Ch1	<input type="checkbox"/> Ch2	<input type="checkbox"/> Ch3	<input type="checkbox"/> 1TX		
<input checked="" type="checkbox"/> 802.11 b	<input checked="" type="checkbox"/> Ch0	<input checked="" type="checkbox"/> Ch1	<input type="checkbox"/> Ch2	<input type="checkbox"/> Ch3	<input type="checkbox"/> 1TX	<input checked="" type="checkbox"/> 2TX	
<input checked="" type="checkbox"/> 802.11 g	<input checked="" type="checkbox"/> Ch0	<input checked="" type="checkbox"/> Ch1	<input type="checkbox"/> Ch2	<input type="checkbox"/> Ch3	<input type="checkbox"/> 1TX	<input checked="" type="checkbox"/> 2TX	
<input checked="" type="checkbox"/> 802.11 n	<input checked="" type="checkbox"/> Ch0	<input checked="" type="checkbox"/> Ch1	<input type="checkbox"/> Ch2	<input type="checkbox"/> Ch3	<input type="checkbox"/> 1TX	<input checked="" type="checkbox"/> 2TX	

4. Therefore, below summary is the modes of test configuration that yield the highest reading and generate the highest emission chosen to carry out the relevantly mandatory test items.

Conducted					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11b	1 to 11	1,6,11	DSSS	1	2TX
802.11g	1 to 11	1,2,6,11	OFDM	6	2TX
802.11n (HT20)	1 to 11	1,2,6,11	OFDM	MCS0	2TX
802.11n (HT40)	3 to 9	3,4,6,9	OFDM	MCS0	2TX

RADIATED EMISSION TEST (BELOW 1 GHz)					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11g	1 to 11	6	OFDM	6	2TX
802.11n (HT40)	3 to 9	3,6,9	OFDM	MCS0	2TX

RADIATED EMISSION TEST (ABOVE 1 GHz)					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11b	1 to 11	1,6,11	DSSS	1	2TX
802.11g	1 to 11	1,6,11	OFDM	6	2TX
802.11n (HT20)	1 to 11	1,6,11	OFDM	MCS0	2TX
802.11n (HT40)	3 to 9	3,6,9	OFDM	MCS0	2TX

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**Note:**

The field strength of radiated emission was measured as the EUT positioned in different orthogonal planes (E1/E2/H) based on actual usage of the EUT to pre-scan the emissions for determining the worst case scenario.

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5 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.32 dB
Output Power measurement	+/- 1 dB
Emission Bandwidth	+/- 1.53 Hz
Undesignable radiated emission measurement	+/- 1.68 dB
Peak Power Density	+/- 2.16 dB
Temperature	+/- 0.7 °C
Humidity	+/- 3 %
DC / AC Power Source	+/- 1 %

Radiated Spurious Emission Measurement Uncertainty			
Polarization: Vertical	+/- 2.8 dB	9kHz~30MHz	
	+/- 4.82 dB	30MHz - 1000MHz	
	+/- 4.37 dB	1GHz - 18GHz	
	+/- 4.21 dB	18GHz - 40GHz	
Polarization: Horizontal	+/- 2.8 dB	9kHz~30MHz	
	+/- 4.54 dB	30MHz - 1000MHz	
	+/- 4.37 dB	1GHz - 18GHz	
	+/- 4.21 dB	18GHz - 40GHz	

Note:

1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
2. The conformity assessment statement in this report is based solely on the test results, measurement uncertainty is excluded.

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6 MEASUREMENT EQUIPMENT USED

6.1 Emission from AC power line

AC Power-Line Conducted Emission Test Site: Conduction C					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
LISN	SCHWARZBECK Mess-Elektronik	NSLK8127	973	04/13/2022	04/12/2023
Test Software	audix	e3	E3 20923 SGS Ver.9 (C)	N.C.R	N.C.R
EMI Test Receiver	R&S	ESCI	101342	04/25/2022	04/24/2023
Coaxial Cable	EC Lab	RF-HY-CAB-250	RF-HY-CAB-250-01	03/27/2022	03/26/2023
Pulse Limiter	EC Lab	VTSD 9561F-N	485	03/27/2022	03/26/2023

6.2 Conduted Measurement

Conducted Emission Test Site: Conducted G					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	KEYSIGHT	N9010B	MY60240506	06/08/2022	06/07/2023
Power Meter	Anritsu	ML2496A	1804002	04/27/2022	04/26/2023
Power Sensor	Anritsu	MA2411B	1726105	04/27/2022	04/26/2023
Power Sensor	Anritsu	MA2411B	1726106	04/27/2022	04/26/2023
Test Software	SGS Taiwan	Radio Test Software	Ver.21	N.C.R	N.C.R
Attenuator	Woken	WATT-218FS-10	RF22	11/16/2022	11/15/2023
DC Block	PASTERNACK	PE8210	RF158	11/16/2022	11/15/2023

6.3 Radiated Measurement

Radiated Emission Test Site: SAC G					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Broadband Antenna	SCHWARZBECK	VULB 9168	1206	02/15/2022	02/14/2023
Horn Antenna	Schwarzbeck	BBHA9170	184	12/15/2022	12/14/2023
Horn Antenna	RF SPIN	DRH18-E	210105A18E	04/08/2022	04/07/2023
Loop Antenna	ETS.LINDGREN	6502	143303	05/06/2022	05/07/2023
3m Site NSA	SGS	966 chamber G	N/A	03/30/2022	03/29/2023
Spectrum Analyzer	KEYSIGHT	N9010A	MY51440113	07/13/2022	07/14/2023
Pre-Amplifier	EMC Instruments	EMC18405SEE	980881	10/25/2022	10/24/2023
Pre-Amplifier	EMC Instruments	EMC330N	980781	03/15/2022	03/14/2023
Pre-Amplifier	EMC Instruments	EMC118A45SE	980815	03/15/2022	03/14/2023
Test Software	audix	e3	E3 20923 SGS Ver.9 (C)	N.C.R	N.C.R
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM-8000-5000-2000	210216、210217、210218	03/15/2022	03/14/2023
Coaxial Cable	EMC Instruments	EMC104-SM-SM-8000-5000-5000	210219、210220、210221	03/15/2022	03/14/2023
Coaxial Cable	EMC Instruments	EMC105-NM-NM-5000-15000	210224、210306	03/15/2022	03/14/2023

NOTE: N.C.R refers to Not Calibrated Required.

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7 CONDUCTED EMISSION TEST

7.1 Standard Applicable

Frequency range within 150kHz to 30MHz shall not exceed the Limit table as below.

Frequency range MHz	Limits (dBuV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

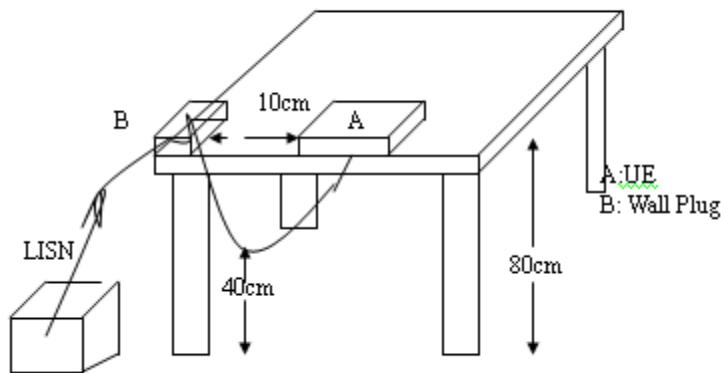
Note

1. The lower limit shall apply at the transition frequencies
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

7.2 EUT Setup

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.10:2013.
2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
3. The LISN was connected with 120Vac/60Hz power source.

7.3 Test Setup



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7.4 Measurement Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all phases of power being supplied by given UE are completed

7.5 Measurement Result

Note: Refer to next page for measurement data and plots.

Note2: The * reveals the worst-case results that closest to the limit.

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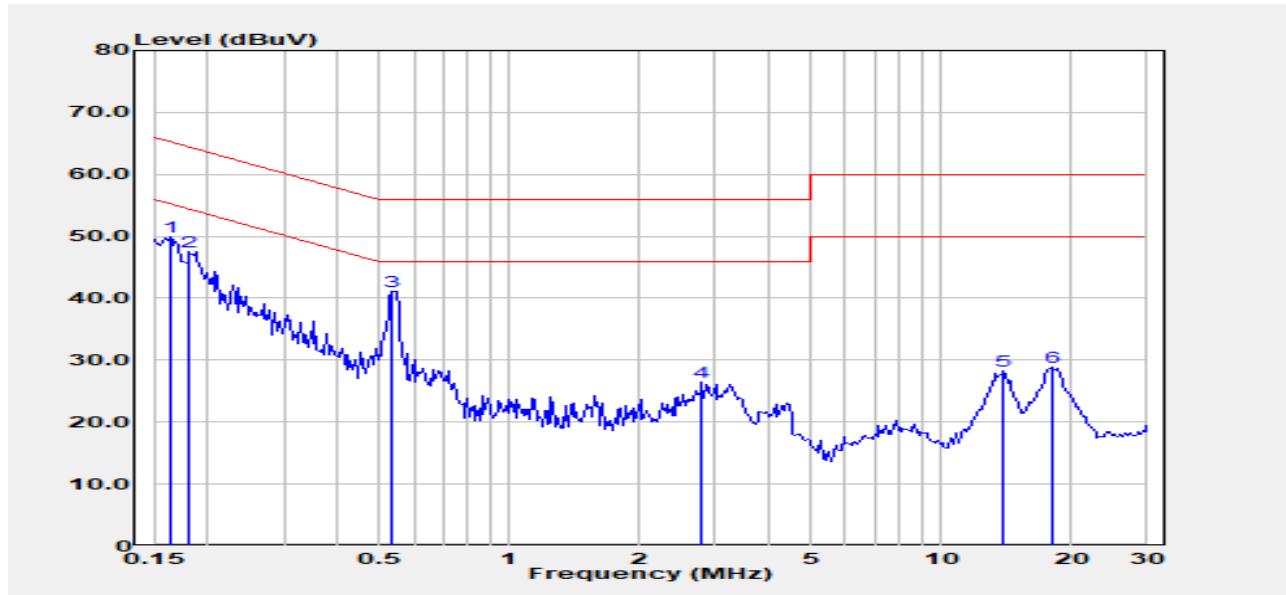
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AC POWER LINE CONDUCTED EMISSION TEST DATA

Report Number :TERF2212002688E2
 Test Mode :2.4G
 Power :120V/60Hz
 Probe :L1

Test Site :Conduction C
 Test Date :2022-12-20
 Temp./Humi. :20.4/63
 Engineer :Temo Chen



Freq. MHz	Detector Mode	Spectrum Reading	Factor	Actual		Margin
				PK	Q μ V	
MHz	PK/QP/AV	Level dB μ V	dB	dB μ V	dB μ V	dB
0.163	Peak	39.63	10.30	49.93	65.30	-15.36
0.182	Peak	37.29	10.30	47.59	64.42	-16.82
0.535	Peak	30.80	10.34	41.14	56.00	-14.86
2.794	Peak	15.49	10.99	26.48	56.00	-29.52
13.989	Peak	17.36	10.81	28.17	60.00	-31.83
18.232	Peak	17.93	10.89	28.82	60.00	-31.18

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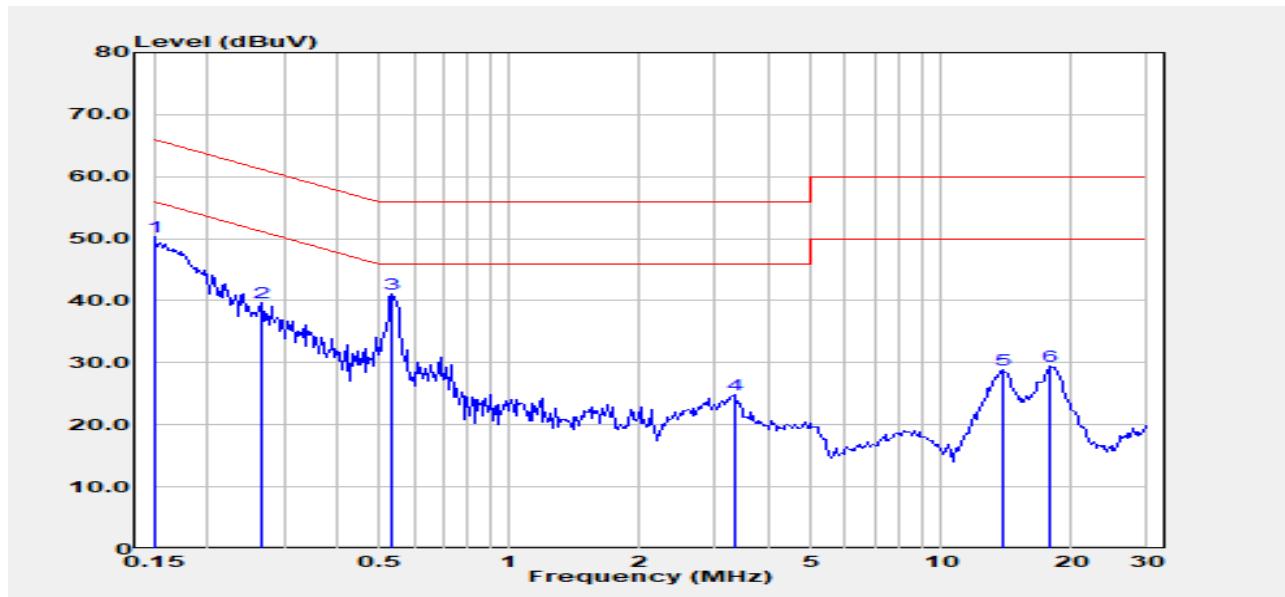
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Report Number :TERF2212002688E2
 Test Mode :2.4G
 Power :120V/60Hz
 Probe :N

Test Site :Conduction C
 Test Date :2022-12-20
 Temp./Humi. :20.4/63
 Engineer :Temo Chen



Freq. MHz	Detector Mode	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V	Limit dB μ V	Margin
						dB
0.150	Peak	40.11	10.31	50.42	66.00	-15.58
0.266	Peak	29.40	10.31	39.71	61.25	-21.54
0.535	Peak	30.85	10.33	41.18	56.00	-14.82
3.310	Peak	14.03	10.83	24.86	56.00	-31.14
13.989	Peak	18.08	10.77	28.85	60.00	-31.15
17.849	Peak	18.53	10.85	29.38	60.00	-30.62

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8 PEAK OUTPUT POWER MEASUREMENT

8.1 Standard Applicable

8.2 Duty Cycle

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle.

All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

8.3 Output Power

For systems using digital modulation in the 2400-2483.5 MHz bands, the limit for peak output power is 1Watt and the e.i.r.p. shall not exceed 4 W.

If the transmitting antenna of directional gain greater than 6dBi are used the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the Antenna exceeds 6dBi.

In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of Antenna exceeds 6dBi.

Note:

As per section F. 2). e). (ii) of FCC KDB 662911 D01

If antenna gains are not equal and each transmit antenna is driven by only one spatial stream, directional gain may be calculated by either of the following formulas.

$$\bullet \quad \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

NSS = the number of independent spatial streams of data;

NANT = the total number of antennas

$g_{j,k} = 10^{G_k/20}$ if the kth antenna is being fed by spatial stream j, or zero if it is not;

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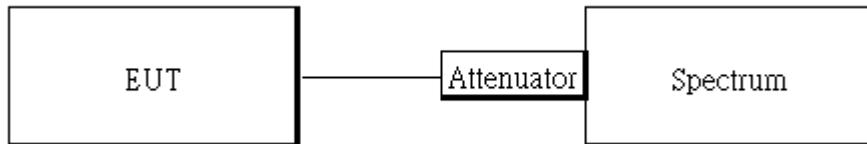
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G_k is the gain in dBi of the k th antenna.

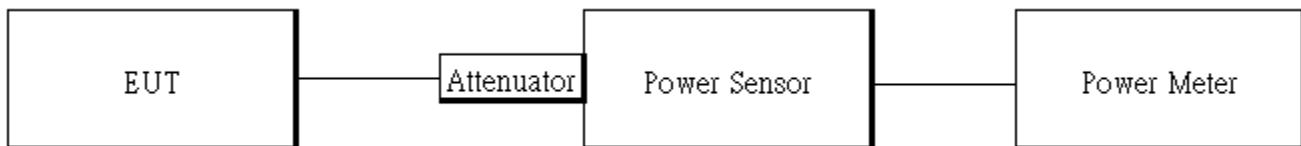
The antenna gain is not greater than 6 dBi. Therefore, reduction of power is not required.

8.4 Test Setup

8.4.1 Duty Cycle



8.4.2 Output Power:



8.5 Measurement Procedure

8.5.1 Duty Cycle:

1. Set span = Zero
2. RBW = 8MHz
3. VBW = 8MHz,
4. Detector = Peak

8.5.2 Output Power

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance .
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter.

Power Meter:

It is used as the auxiliary test equipment to conduct the output power measurement.

4. Record the max. Reading as observed from Spectrum or Power Meter.
5. MIMO mode: offset is set with “measure and add 10 Log (N)” to measurement for MIMO mode. Offset = cable loss + 10 log (N), where N is number of transmitting antenna, cable loss is specified below.

*** Note: The duty cycle factor and below is compensated to obtain the maximum value of measurement in average.**

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8.6 Measurement Result

8.6.1 Duty Cycle:

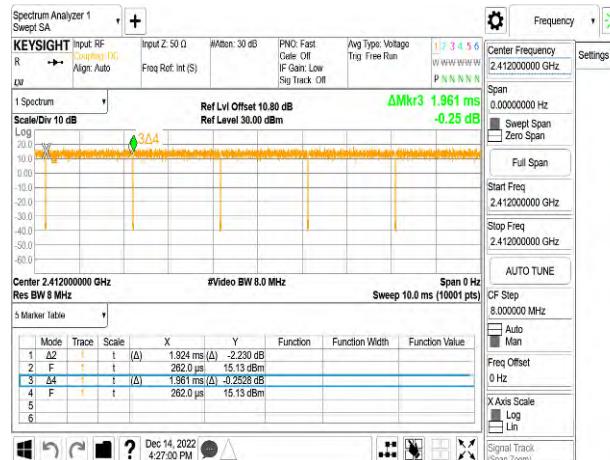
	Duty Cycle (%) = Ton / (Ton+Toff)	Duty Factor (dB) = $10 \log (1/\text{Duty Cycle})$	1/T (kHz)	VBW setting (kHz)
802.11b	99.20	0.03	0.08	0.01
802.11g	98.23	0.08	0.48	0.01
802.11n_20	98.11	0.08	0.52	0.01
802.11n_40	94.89	0.23	1.05	2.00

8.6.2 Duty Cycle test plots

802.11b_20MHz_Chain0_2412MHz



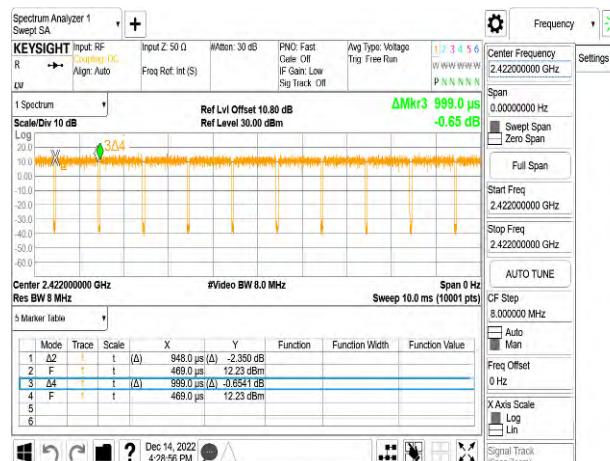
802.11n_20MHz_Chain0_2412MHz



802.11g_20MHz_Chain0_2412MHz



802.11n_40MHz_Chain0_2422MHz



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8.6.3 Output Power

802.11b_2TX								
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)		Total Peak Output Power (dBm)	Limit (dBm)	RESULT
				Ch0	Ch1			
1	2412	1	12.5	15.41	15.33	18.38	30.00	PASS
6	2437	1	14	16.98	16.76	19.88	30.00	PASS
11	2462	1	17	19.48	19.31	22.41	30.00	PASS
802.11b_2TX								
CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Limit (dBm)	RESULT
				Ch0	Ch1			
1	2412	1	12.5	13.29	13.06	16.19	30.00	PASS
6	2437	1	14	14.59	14.31	17.47	30.00	PASS
11	2462	1	17	17.24	17.05	20.16	30.00	PASS
802.11g_2TX								
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)		Total Peak Output Power (dBm)	Limit (dBm)	RESULT
				Ch0	Ch1			
1	2412	6	10	14.77	14.71	17.75	30.00	PASS
2	2417	6	13.5	18.21	17.88	21.06	30.00	PASS
6	2437	6	15	19.75	19.71	22.74	30.00	PASS
11	2462	6	16.5	20.89	20.76	23.84	30.00	PASS
802.11g_2TX								
CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Limit (dBm)	RESULT
				Ch0	Ch1			
1	2412	6	10	10.41	10.08	13.26	30.00	PASS
2	2417	6	13.5	13.40	13.23	16.32	30.00	PASS
6	2437	6	15	14.94	14.89	17.92	30.00	PASS
11	2462	6	16.5	16.26	16.19	19.23	30.00	PASS

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802.11n_HT_20M_2TX

CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)		Total Peak Output Power (dBm)	Limit (dBm)	RESULT
				Ch0	Ch1			
1	2412	MCS0	11.5	16.47	16.24	19.37	30.00	PASS
2	2417	MCS0	13	17.55	17.26	20.42	30.00	PASS
6	2437	MCS0	15	19.87	19.76	22.83	30.00	PASS
11	2462	MCS0	16.5	20.87	20.75	23.82	30.00	PASS

802.11n_HT_20M_2TX

CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Limit (dBm)	RESULT
				Ch0	Ch1			
1	2412	MCS0	11.5	11.81	11.46	14.65	30.00	PASS
2	2417	MCS0	13	12.97	12.79	15.89	30.00	PASS
6	2437	MCS0	15	14.89	14.79	17.85	30.00	PASS
11	2462	MCS0	16.5	15.93	15.70	18.83	30.00	PASS

802.11n_HT_40M_2TX

CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)		Total Peak Output Power (dBm)	Limit (dBm)	RESULT
				Ch0	Ch1			
3	2422	MCS0	12.5	19.19	19.01	22.11	30.00	PASS
4	2427	MCS0	13	19.52	19.45	22.50	30.00	PASS
6	2437	MCS0	15	21.91	21.74	24.84	30.00	PASS
9	2452	MCS0	14	20.79	20.58	23.70	30.00	PASS

802.11n_HT_40M_2TX

CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Limit (dBm)	RESULT
				Ch0	Ch1			
3	2422	MCS0	12.5	12.99	12.80	15.90	30.00	PASS
4	2427	MCS0	13	13.45	13.32	16.39	30.00	PASS
6	2437	MCS0	15	15.31	15.17	18.25	30.00	PASS
9	2452	MCS0	14	14.35	14.21	17.29	30.00	PASS

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802.11b Ch0							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
1	2412	1	13.18	0.51	13.69	36	PASS
6	2437	1	14.46	0.51	14.97	36	PASS
11	2462	1	17.15	0.51	17.66	36	PASS

802.11b Ch1							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
1	2412	1	13.11	0.17	13.28	36	PASS
6	2437	1	14.38	0.17	14.55	36	PASS
11	2462	1	17.01	0.17	17.18	36	PASS

802.11b_2TX									
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
			Ch0	Ch1					
1	2412	1	13.29	13.06	16.19	3.35	19.54	36	PASS
6	2437	1	14.59	14.31	17.47	3.35	20.82	36	PASS
11	2462	1	17.24	17.05	20.16	3.35	23.51	36	PASS

802.11g Ch0							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
1	2412	6	10.25	0.51	10.76	36	PASS
2	2417	6	13.04	0.51	13.55	36	PASS
6	2437	6	14.91	0.51	15.42	36	PASS
11	2462	6	16.22	0.51	16.73	36	PASS

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802.11g Ch1							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
1	2412	6	10.19	0.17	10.36	36	PASS
2	2417	6	12.90	0.17	13.07	36	PASS
6	2437	6	14.87	0.17	15.04	36	PASS
11	2462	6	16.12	0.17	16.29	36	PASS

802.11g_2TX									
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
			Ch0	Ch1					
1	2412	6	10.41	10.08	13.26	3.35	16.61	36	PASS
2	2417	6	13.40	13.23	16.32	3.35	19.67	36	PASS
6	2437	6	14.94	14.89	17.92	3.35	21.27	36	PASS
11	2462	6	16.26	16.19	19.23	3.35	22.58	36	PASS

802.11n_HT_20M Ch0							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	11.64	0.51	12.15	36	PASS
2	2417	MCS0	12.84	0.51	13.35	36	PASS
6	2437	MCS0	14.79	0.51	15.30	36	PASS
11	2462	MCS0	15.98	0.51	16.49	36	PASS

802.11n_HT_20M Ch1							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	11.59	0.17	11.76	36	PASS
2	2417	MCS0	12.80	0.17	12.97	36	PASS
6	2437	MCS0	14.77	0.17	14.94	36	PASS
11	2462	MCS0	15.83	0.17	16.00	36	PASS

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802.11n_HT_20M_2TX

CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
			Ch0	Ch1					
1	2412	MCS0	11.81	11.46	14.65	3.35	18.00	36	PASS
2	2417	MCS0	12.97	12.79	15.89	3.35	19.24	36	PASS
6	2437	MCS0	14.89	14.79	17.85	3.35	21.20	36	PASS
11	2462	MCS0	15.93	15.70	18.83	3.35	22.18	36	PASS

802.11n_HT_40M Ch0

CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	12.87	0.51	13.38	36	PASS
4	2427	MCS0	13.31	0.51	13.82	36	PASS
6	2437	MCS0	15.22	0.51	15.73	36	PASS
9	2452	MCS0	14.28	0.51	14.79	36	PASS

802.11n_HT_40M Ch1

CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	12.79	0.17	12.96	36	PASS
4	2427	MCS0	13.26	0.17	13.43	36	PASS
6	2437	MCS0	15.19	0.17	15.36	36	PASS
9	2452	MCS0	14.26	0.17	14.43	36	PASS

802.11n_HT_40M_2TX

CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
			Ch0	Ch1					
3	2422	MCS0	12.99	12.80	15.90	3.35	19.25	36	PASS
4	2427	MCS0	13.45	13.32	16.39	3.35	19.74	36	PASS
6	2437	MCS0	15.31	15.17	18.25	3.35	21.60	36	PASS
9	2452	MCS0	14.35	14.21	17.29	3.35	20.64	36	PASS

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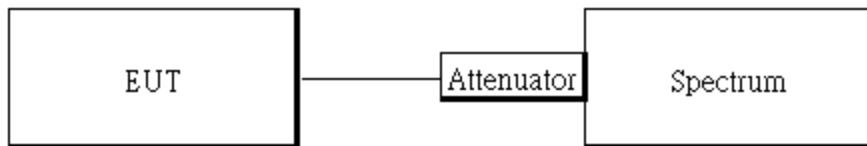
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9 EMISSION BANDWIDTH MEASUREMENT

9.1 Standard Applicable

The minimum 6 dB bandwidth shall be at least 500 kHz.

9.2 Test Setup



9.3 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance .
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
4. Set the spectrum analyzer as
 $RBW = 100\text{kHz}$,
 $VBW = 3 \times RBW$,
 $Span = 2$ to 5 times of the OBW ,
 $Sweep = \text{auto}$,
 $Detector = \text{Peak}$, and Max hold for -6dB Bandwidth test.
5. Set the spectrum analyzer as
 $RBW = 1\%$ to 5% of 99% Bandwidth ,
 $VBW \geq 3 \times RBW$,
 $Span = \text{large enough to capture all products of the modulation process}$,
 $Sweep = \text{auto}$,
 $Detector = \text{Peak}$, and Max hold for 99% Bandwidth test.
6. Turn on the 99% bandwidth function, max reading.
7. Repeat above procedures until all test default channel is completed

9.4 6dB Bandwidth

802.11b Ch0

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	9078.00	≥ 500	PASS
2437	8604.00	≥ 500	PASS
2462	8575.00	≥ 500	PASS

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802.11b Ch1

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	8604.00	≥ 500	PASS
2437	9080.00	≥ 500	PASS
2462	9064.00	≥ 500	PASS

802.11g Ch0

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	15730.00	≥ 500	PASS
2437	15720.00	≥ 500	PASS
2462	15750.00	≥ 500	PASS

802.11g Ch1

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	15690.00	≥ 500	PASS
2437	15750.00	≥ 500	PASS
2462	15760.00	≥ 500	PASS

802.11n HT 20M Ch0

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	15980.00	≥ 500	PASS
2437	15970.00	≥ 500	PASS
2462	16370.00	≥ 500	PASS

802.11n HT 20M Ch1

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	16160.00	≥ 500	PASS
2437	16370.00	≥ 500	PASS
2462	16380.00	≥ 500	PASS

802.11n HT 40M Ch0

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2422	35160.00	≥ 500	PASS
2437	35190.00	≥ 500	PASS
2452	35480.00	≥ 500	PASS

802.11n HT 40M Ch1

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2422	35120.00	≥ 500	PASS
2437	35180.00	≥ 500	PASS
2452	35720.00	≥ 500	PASS

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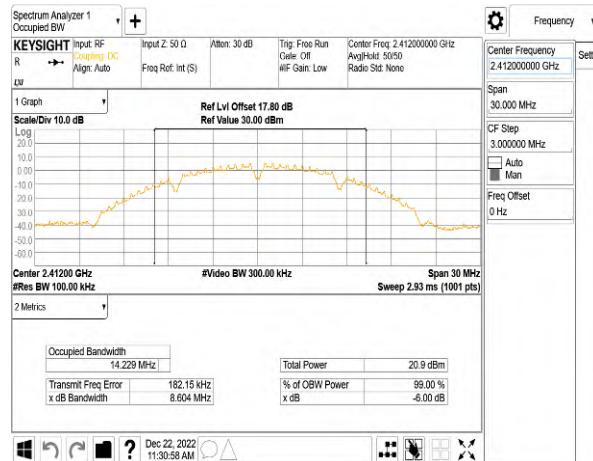
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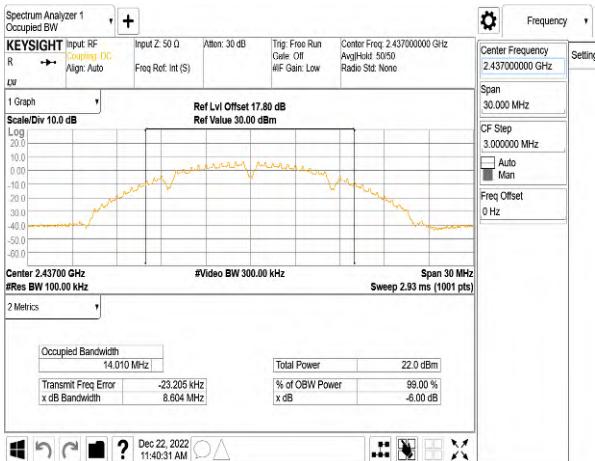
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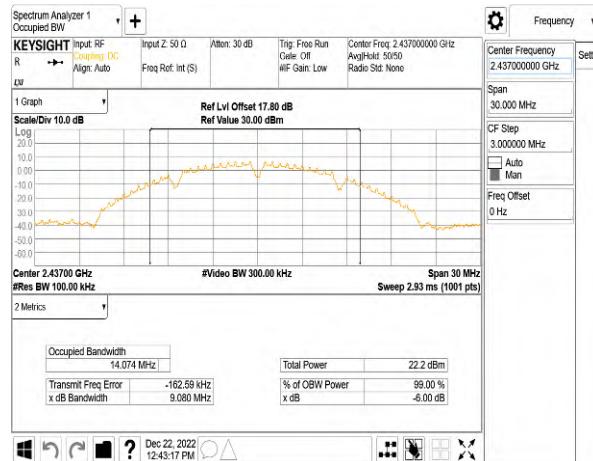
802.11b_20MHz_Chain1_2412MHz



802.11b_20MHz_Chain0_2437MHz



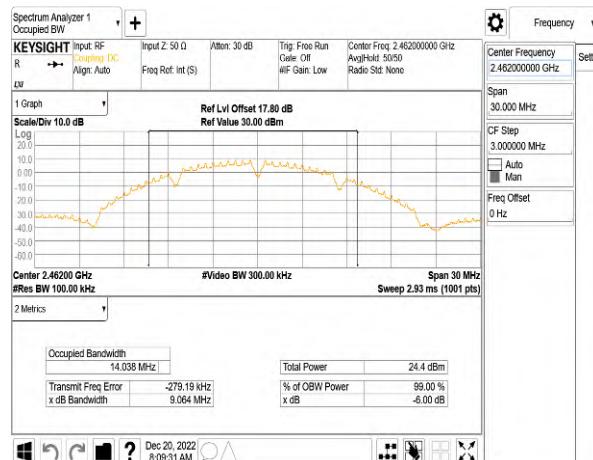
802.11b_20MHz_Chain1_2437MHz



802.11b_20MHz_Chain0_2462MHz



802.11b_20MHz_Chain1_2462MHz



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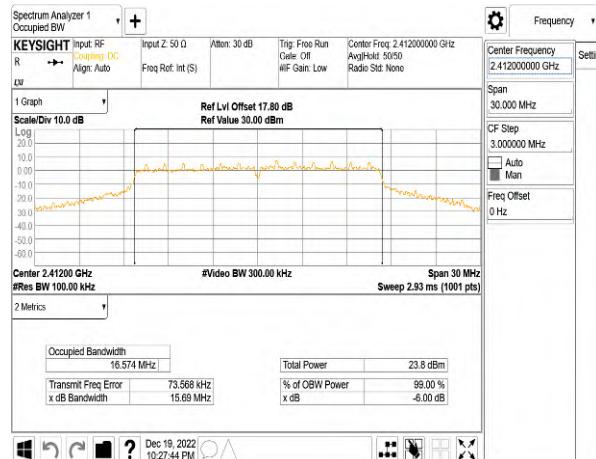
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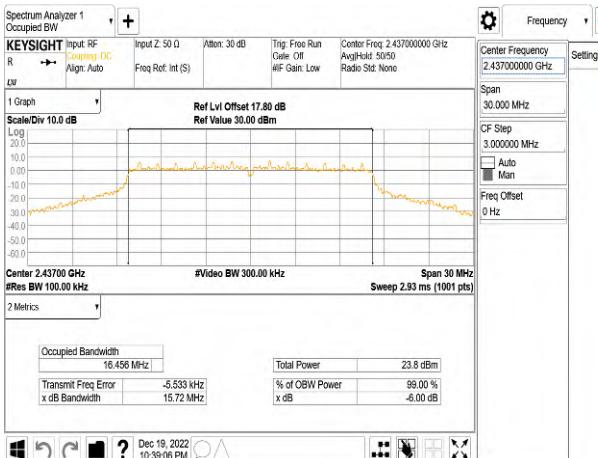
802.11g_20MHz_Chain0_2412MHz



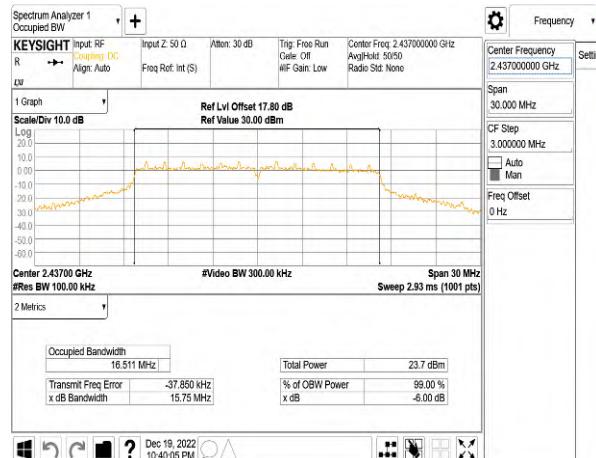
802.11g_20MHz_Chain1_2412MHz



802.11g_20MHz_Chain0_2437MHz



802.11g_20MHz_Chain1_2437MHz



802.11g_20MHz_Chain0_2462MHz



802.11g_20MHz_Chain1_2462MHz



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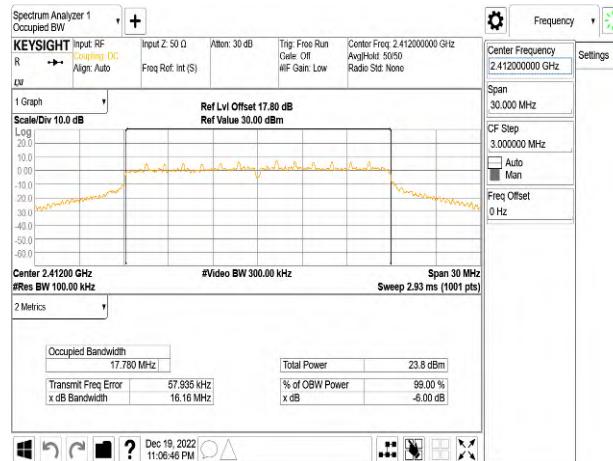
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802.11n_20MHz_Chain0_2412MHz



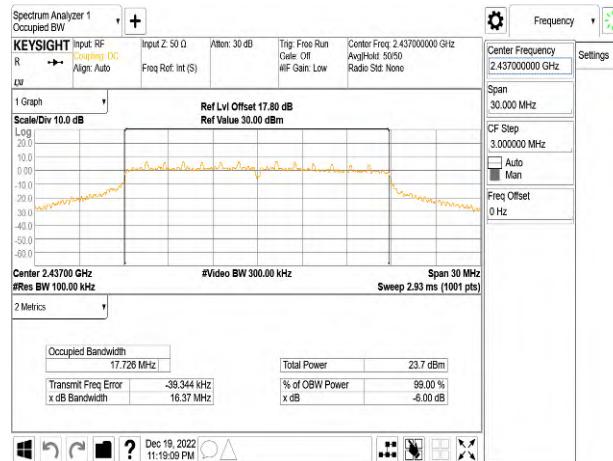
802.11n_20MHz_Chain1_2412MHz



802.11n 20MHz Chain0 2437MHz



802.11n 20MHz Chain1 2437MHz



802.11n_20MHz_Chain0_2462MHz



802.11n_20MHz_Chain1_2462MHz



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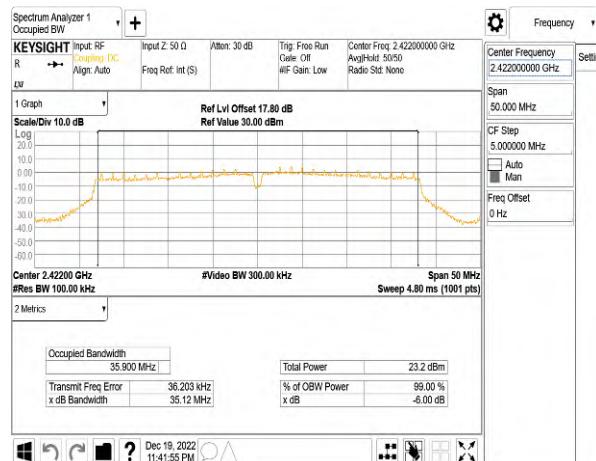
本条款及細則於民國一百零八年一月一日起施行
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802.11n_40MHz_Chain0_2422MHz



802.11n_40MHz_Chain1_2422MHz



802.11n_40MHz_Chain0_2437MHz



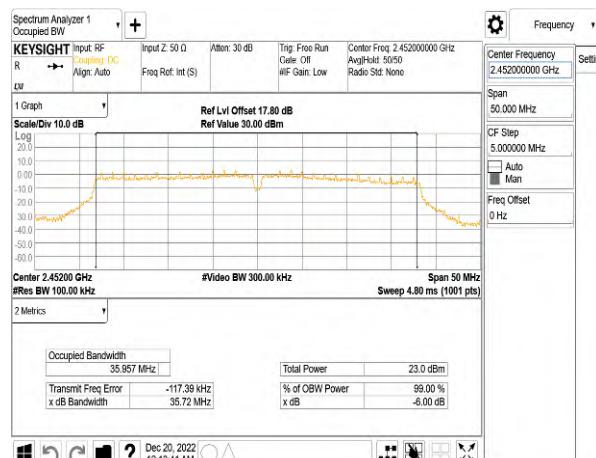
802.11n_40MHz_Chain1_2437MHz



802.11n_40MHz_Chain0_2452MHz



802.11n_40MHz_Chain1_2452MHz



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9.5 99% Bandwidth

802.11b Ch0

Freq. (MHz)	99% BW (MHz)
2412	14.005
2437	14.058
2462	13.594

802.11b Ch1

Freq. (MHz)	99% BW (MHz)
2412	14.294
2437	14.119
2462	14.127

802.11g Ch0

Freq. (MHz)	99% BW (MHz)
2412	16.681
2437	16.653
2462	16.639

802.11g Ch1

Freq. (MHz)	99% BW (MHz)
2412	16.967
2437	16.858
2462	16.819

802.11n_HT20M Ch0

Freq. (MHz)	99% BW (MHz)
2412	17.851
2437	17.877
2462	17.804

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802.11n_HT20M Ch1

Freq. (MHz)	99% BW (MHz)
2412	18.124
2437	18.000
2462	17.967

802.11n_HT40M Ch0

Freq. (MHz)	99% BW (MHz)
2422	36.136
2437	36.184
2452	36.081

802.11n_HT40M Ch1

Freq. (MHz)	99% BW (MHz)
2422	36.057
2437	36.181
2452	36.156

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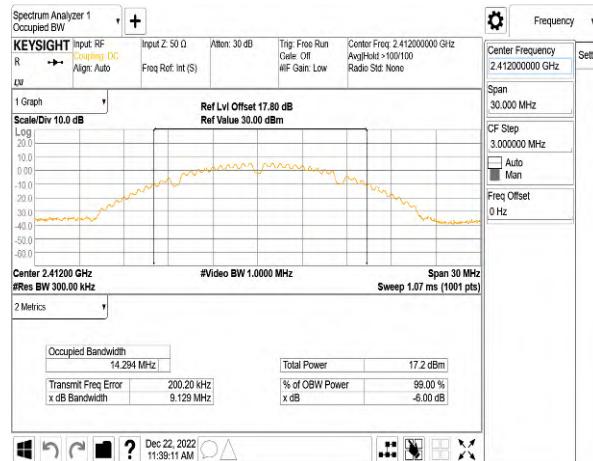
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802.11b_20MHz_Chain0_2412MHz



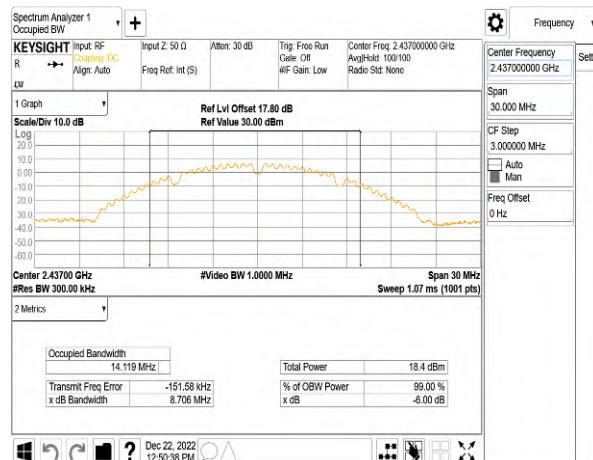
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802.11b_20MHz_Chain0_2437MHz



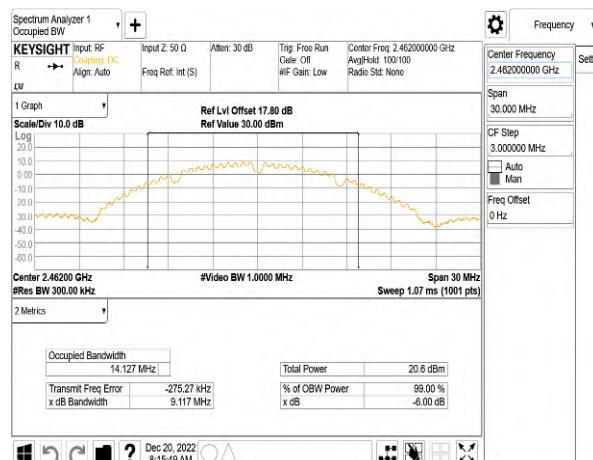
802.11b_20MHz_Chain1_2437MHz



802.11b_20MHz_Chain0_2462MHz



802.11b_20MHz_Chain1_2462MHz



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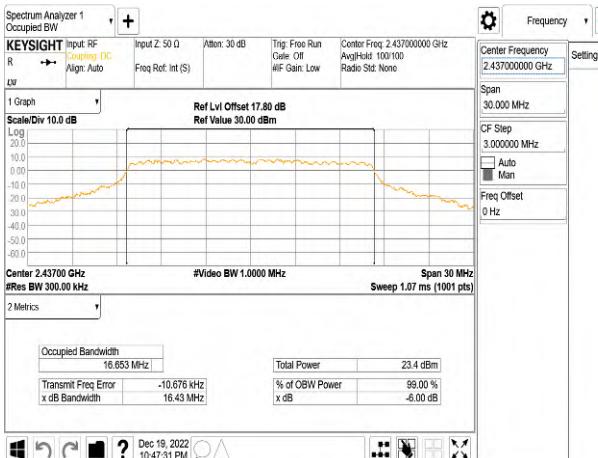
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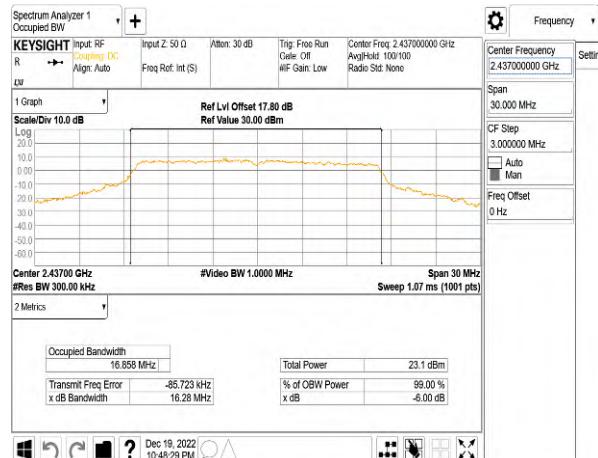
802.11g_20MHz_Chain1_2412MHz



802.11g_20MHz_Chain0_2437MHz



802.11g_20MHz_Chain1_2437MHz



802.11g_20MHz_Chain0_2462MHz



802.11g_20MHz_Chain1_2462MHz



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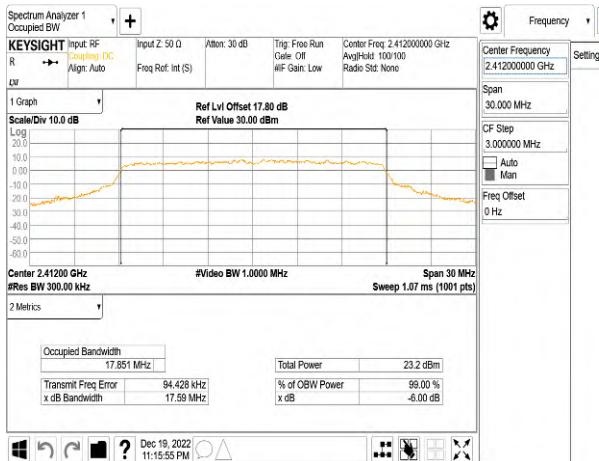
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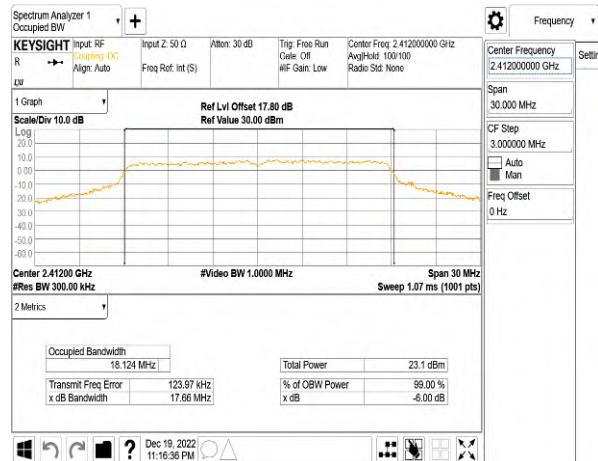
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802.11n_20MHz_Chain0_2412MHz



802.11n_20MHz_Chain1_2412MHz



802.11n_20MHz_Chain0_2437MHz



802.11n_20MHz_Chain1_2437MHz



802.11n_20MHz_Chain0_2462MHz



802.11n_20MHz_Chain1_2462MHz



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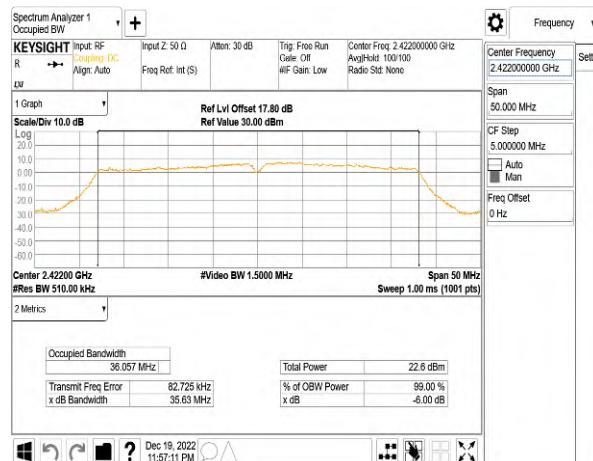
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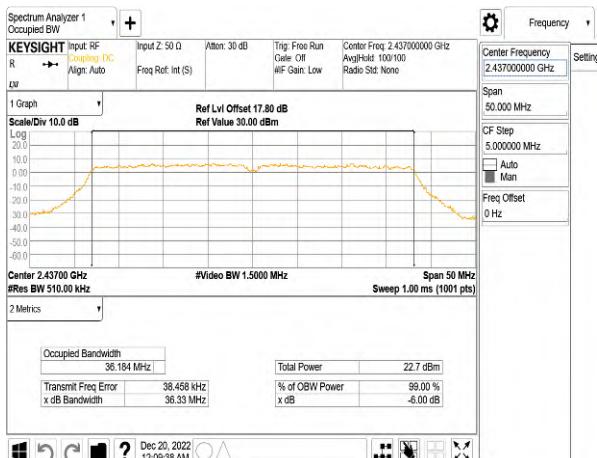
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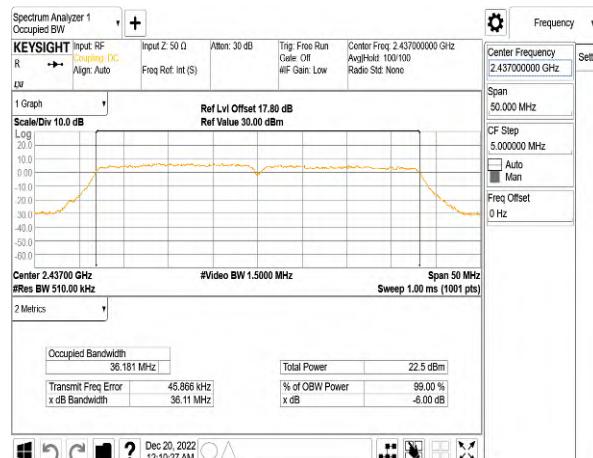
802.11n_40MHz_Chain1_2422MHz



802.11n_40MHz_Chain0_2437MHz



802.11n_40MHz_Chain1_2437MHz



802.11n_40MHz_Chain0_2452MHz



802.11n_40MHz_Chain1_2452MHz



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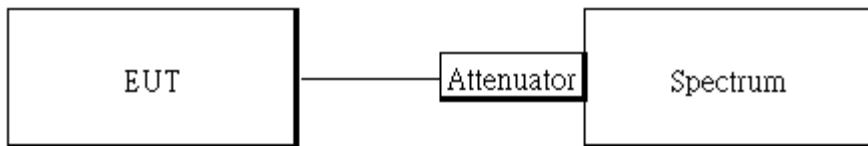
10 CONDUCTED BAND EDGES AND SPURIOUS EMISSION MEASUREMENT

10.1 Standard Applicable

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.

In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a) & RSS-Gen §8.10, must also comply with the radiated emission limits specified in §15.209(a) & RSS-Gen §8.9.

10.2 Test Setup



10.3 Measurement Procedure

10.3.1 Reference Level of Emission Limit:

1. Set analyzer center frequency to DTS channel center frequency.
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance .
3. Set the span to 1.5 times the DTS channel bandwidth.
4. Set the RBW = 100kHz & VBW = 300 kHz.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. MIMO mode: offset is set following “measure and add 10 Log (N)” on spectrum to measure for MIMO mode. Offset = cable loss + 10 log (N), where N is number of transmitting antenna.

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10.3.2 Conducted Band Edge:

1. To connect Antenna Port of EUT to Spectrum.
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance .
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
4. Set start to edge frequency, and stop frequency of spectrum analyzer so as to encompass the spectrum to be examined.
5. Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz, Detector = Peak, Sweep = auto
6. Mark the highest reading of the emission as the reference level measurement.
7. Set DL as the limit = reading on marker of reference level measurement – 20dBm
8. Mark the highest readings of the emissions outside of 2400MHz~2483.5MHz.
9. Repeat above procedures until all default test channel (low, middle, and high) was complete.
10. MIMO mode: offset is set following “measure and add 10 Log (N)” on spectrum to measure for MIMO mode. Offset = cable loss + 10 log (N), where N is number of transmitting antenna.

Conducted Spurious Emission:

1. To connect Antenna Port of EUT to Spectrum
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance .
3. Set RBW = 100 kHz & VBW= 300 kHz, Detector =Peak, Sweep = Auto.
4. Allow trace to fully stabilize.
5. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
6. Repeat above procedures until all default test channel measured were complete.
7. MIMO mode: offset is set following “measure and add 10 Log (N)” on spectrum to measure for MIMO mode. Offset = cable loss + 10 log (N), where N is number of transmitting antenna.

Note:

For test of MIMO mode, the highest emission of worst case employing Measure and add 10 log (N) technical is reported on this report after the comparison between Main Antenna at single transmitting mode and Aux that yields the higher value. The MIMO transmitting mode produces higher value of outcome.

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10.4 Measurement Result

802.11b Ch0

Reference Level of Limit			Reference Level of Limit		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)	Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2412	4.76	-15.24	2412	4.88	-15.12
2437	6.09	-13.91	2437	6.54	-13.46
2462	8.81	-11.19	2462	8.92	-11.08

802.11g Ch0

Reference Level of Limit 802.11g mode			Reference Level of Limit 802.11g mode		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)	Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2412	0.66	-19.34	2412	0.85	-19.15
2437	4.92	-15.08	2437	5.46	-14.54
2462	6.15	-13.85	2462	6.33	-13.67

802.11n HT 20M Ch0

Reference Level of Limit 802.11n20 MODE			Reference Level of Limit 802.11ac20 MODE		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)	Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2412	2.24	-17.76	2412	2.69	-17.31
2437	5.27	-14.73	2437	5.41	-14.59
2462	6.17	-13.83	2462	6.31	-13.69

802.11n HT 40M Ch0

Reference Level of Limit 802.11n40 MODE			Reference Level of Limit 802.11ac40 MODE		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)	Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2422	0.3	-19.70	2422	1.44	-18.56
2437	2.39	-17.61	2437	2.37	-17.63
2452	1.67	-18.33	2452	1.6	-18.40

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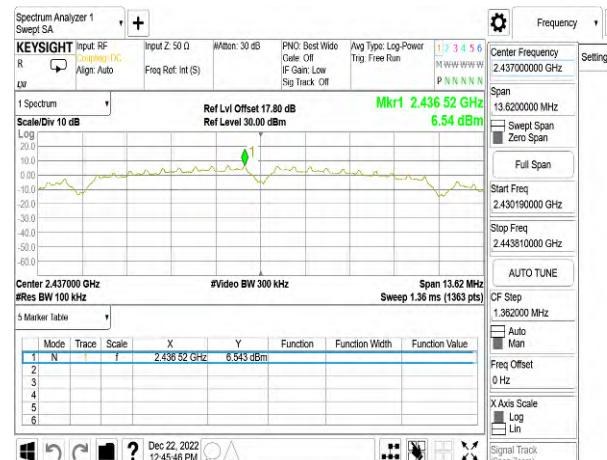
802.11b_20MHz_Chain1_2412MHz



802.11b_20MHz_Chain0_2437MHz



802.11b_20MHz_Chain1_2437MHz



802.11b_20MHz_Chain0_2462MHz



802.11b_20MHz_Chain1_2462MHz



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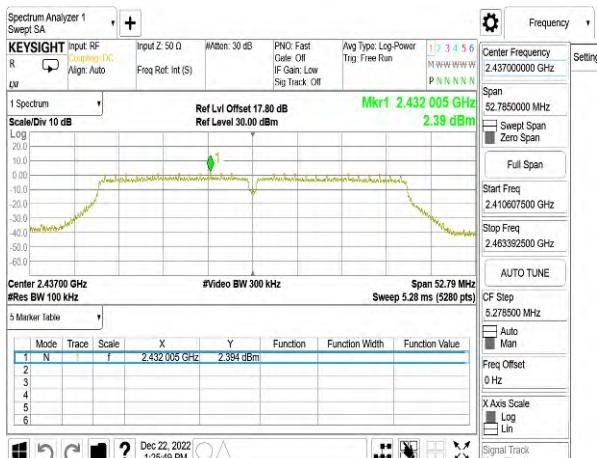
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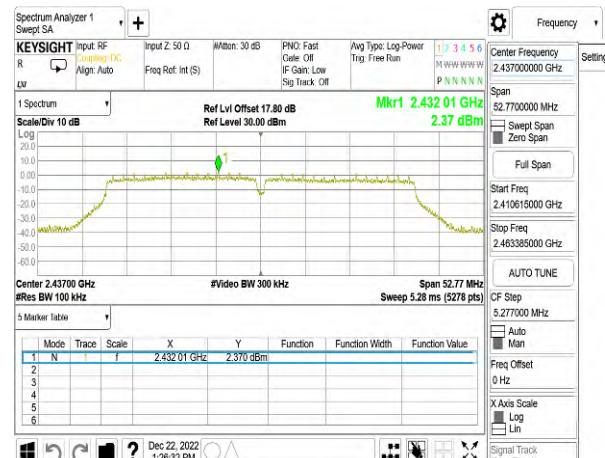
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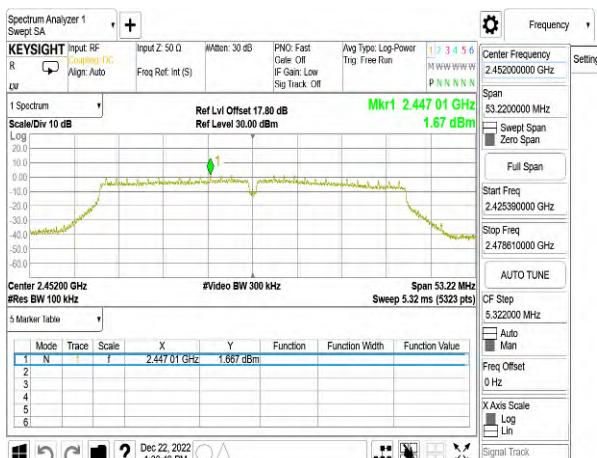
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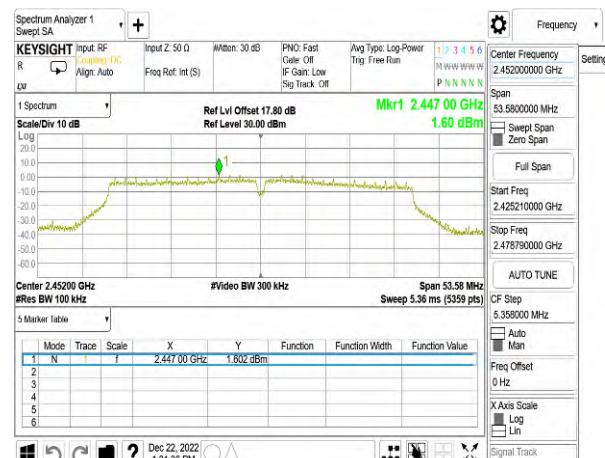
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802.11n_40MHz_Chain0_2452MHz



802.11n_40MHz_Chain1_2452MHz



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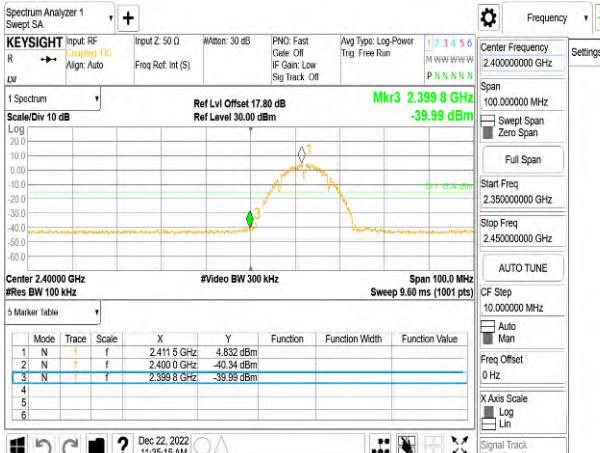
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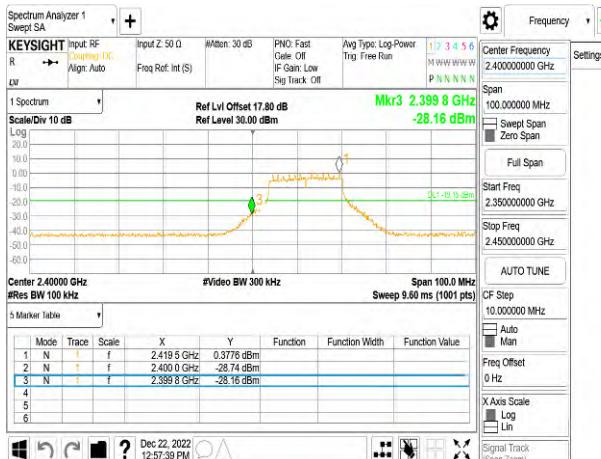
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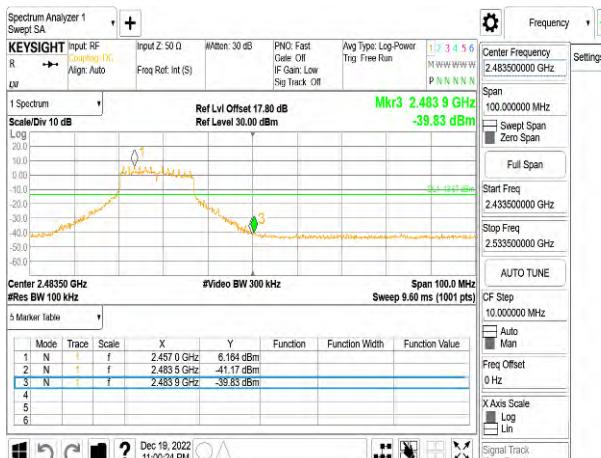
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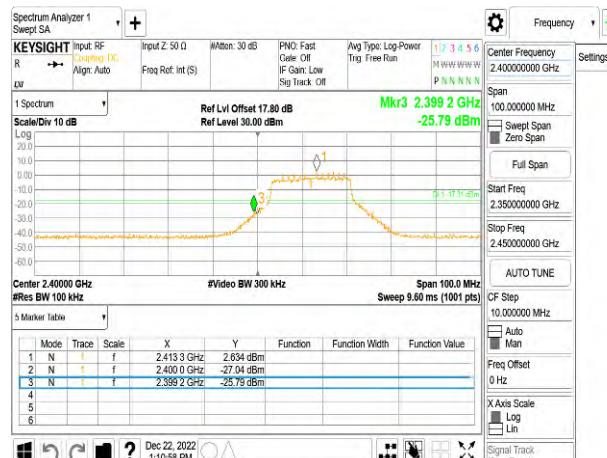
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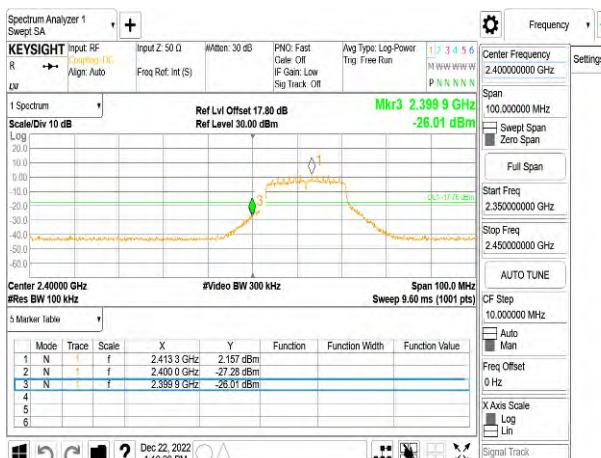
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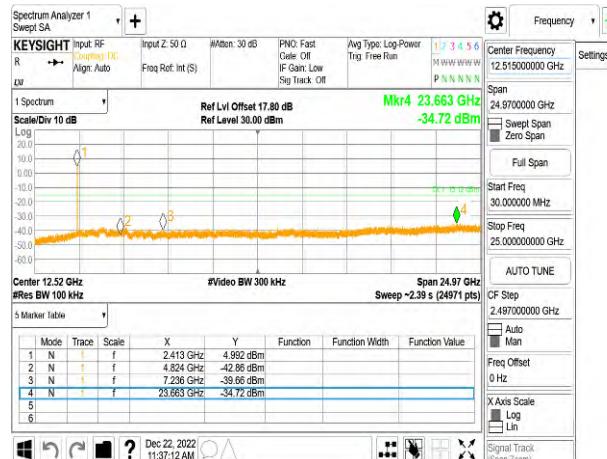
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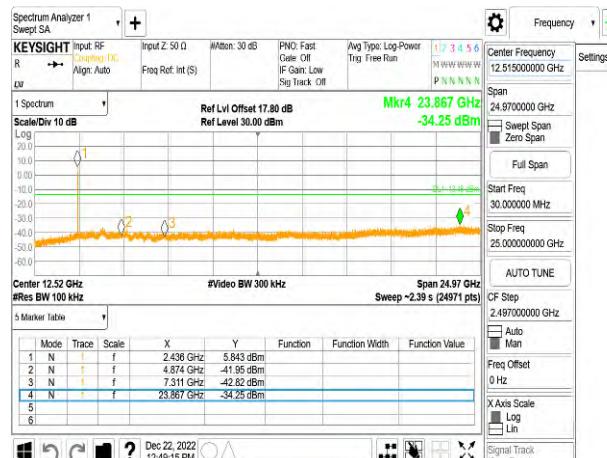
802.11b_20MHz_Chain1_2412MHz



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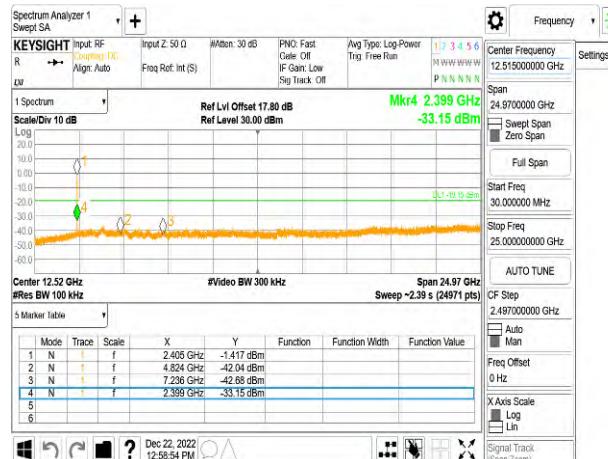
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802.11g_20MHz_Chain0_2412MHz



802.11g_20MHz_Chain1_2412MHz



802.11g_20MHz_Chain0_2437MHz



802.11g_20MHz_Chain1_2437MHz



802.11g_20MHz_Chain0_2462MHz



802.11g_20MHz_Chain1_2462MHz



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802.11n_20MHz_Chain0_2412MHz



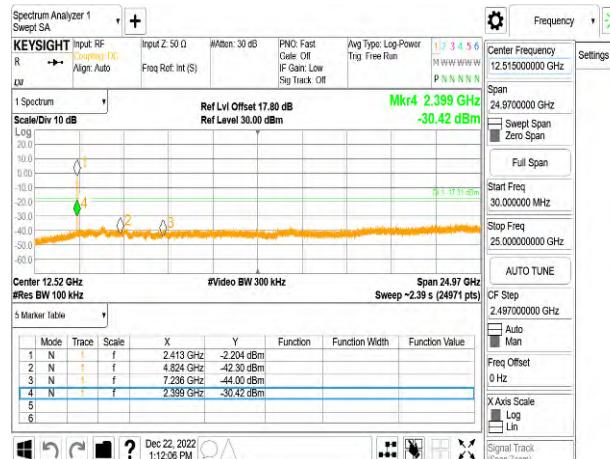
802.11n_20MHz_Chain0_2437MHz



802.11n_20MHz_Chain0_2462MHz



802.11n_20MHz_Chain1_2412MHz



802.11n_20MHz_Chain1_2437MHz



802.11n_20MHz_Chain1_2462MHz



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802.11n_40MHz_Chain0_2422MHz



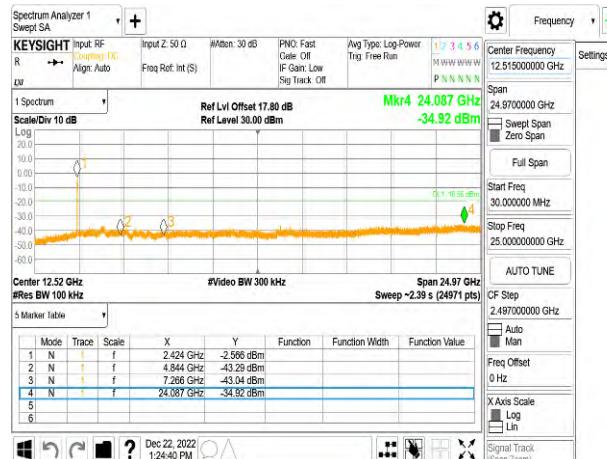
802.11n_40MHz_Chain0_2437MHz



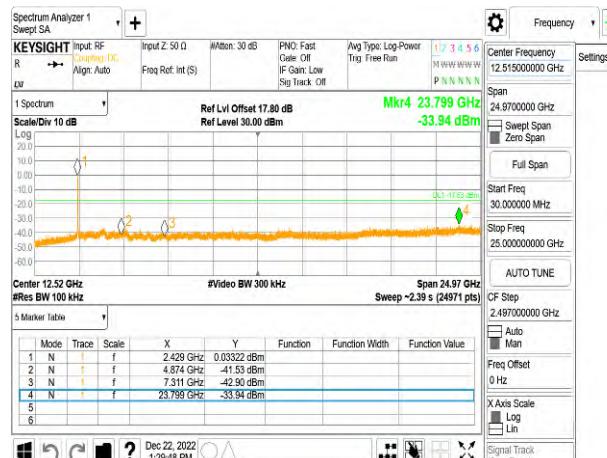
802.11n_40MHz_Chain0_2452MHz



802.11n_40MHz_Chain1_2422MHz



802.11n_40MHz_Chain1_2437MHz



802.11n_40MHz_Chain1_2452MHz



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11 RADIATED BANDEDGE AND SPURIOUS EMISSION MEASUREMENT

11.1 Standard Applicable

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. In addition, radiated emissions which fall in the restricted bands must also comply with the §15.209 and RSS-Gen §8.9 Table 5 and 6 limit as below.

And according to §15.33(a) (1) & RSS-Gen §6.13.2.a, for an intentional radiator operates below 10GHz, the frequency range of measurements: to the tenth harmonic of the highest fundamental frequency or to 40GHz, whichever is lower.

Frequency (MHz)	Field strength (microvolts/meter)	Distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note:

1. The lower limit shall apply at the transition frequencies.

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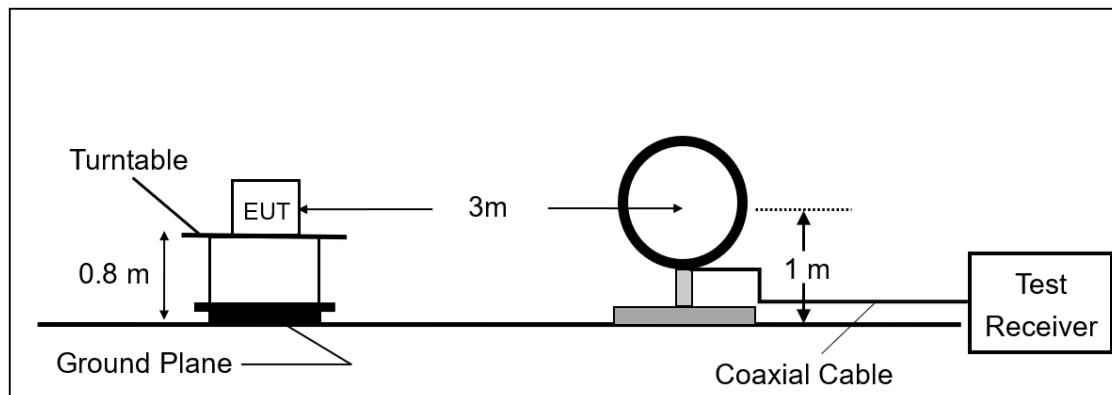
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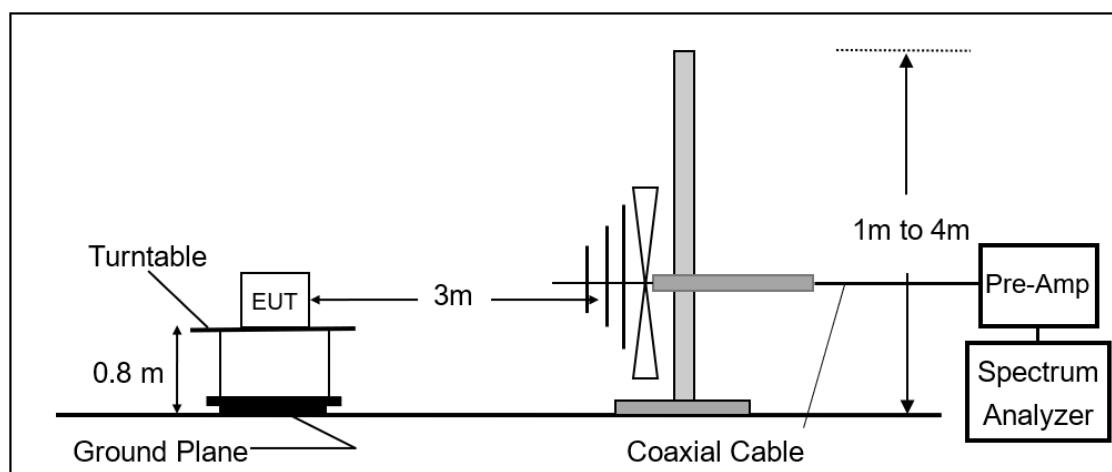
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11.2 Test Setup

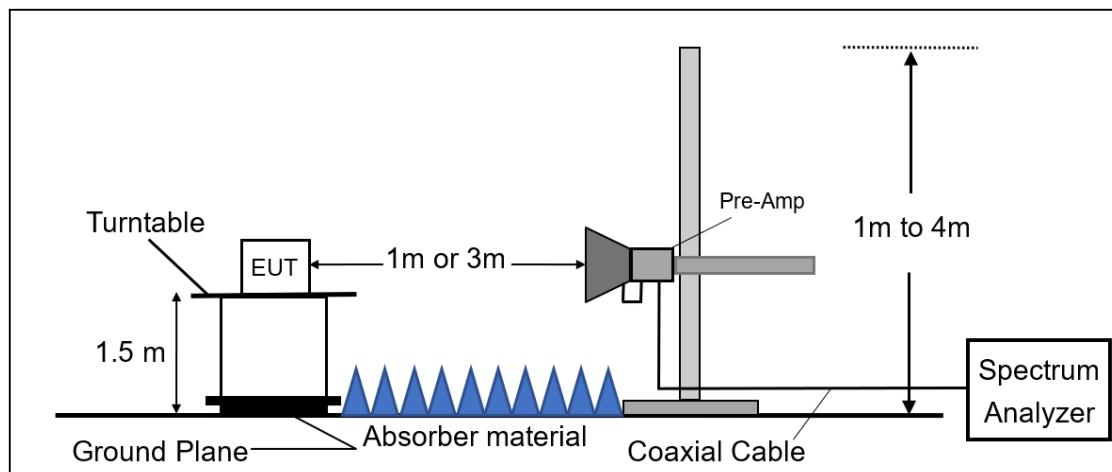
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz.



(B) Radiated Emission Test Set-Up, Frequency From 30MHz to 1000MHz.



(C) Radiated Emission Test Set-Up, Frequency Above 1GHz.



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11.3 Measurement Procedure

1. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance .
2. The EUT was placed on a turn table with 0.8m for frequency< 1GHz and 1.5m for frequency> 1GHz above ground plane.
3. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
4. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
5. Set the spectrum analyzer as RBW=100 kHz and VBW=300 kHz for Peak Detector (PK) at frequency between 30MHz and 1 GHz.
6. Use receiver mode as RBW=120 kHz for Quasi-peak (QP) at frequency between 30MHz and 1 GHz.
7. Set the spectrum analyzer as RBW=1 MHz, VBW=3 MHz for Maximum Emission Measurements at frequency above 1 GHz.
8. Set the spectrum analyzer as RBW=1 MHz, VBW=10 Hz (Duty cycle > 98%) or VBW \geq 1/T (Duty cycle < 98%) for Average Emission Measurements at frequency above 1 GHz.
9. When measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made “while keeping the antenna in the ‘cone of radiation’ from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.” is still within the 3dB illumination BW of the measurement antenna.
10. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
11. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
12. Repeat above procedures until all default test channel measured were complete.

11.4 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where FS = Field Strength

CL = Cable Attenuation Factor (Cable Loss)

RA = Reading Amplitude

AG = Amplifier Gain

AF = Antenna Factor

The limit of the emission level is expressed in dBuV/m, which converts $20 \log(uV/m)$

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Actual $FS(dB\mu V/m) = SPA. Reading\ level(dB\mu V) + Factor(dB)$

$Factor(dB) = Antenna\ Factor(dB\mu V/m) + Cable\ Loss(dB) - Pre_Amplifier\ Gain(dB)$

11.5 Test Results of Radiated Spurious Emissions from 9 kHz to 30 MHz

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit per 15.31(o) & RSS-GEN §6.13.2 was not reported.

11.6 Measurement Result

Note:

1. Refer to next page spectrum analyzer data chart and tabular data sheets.
2. Measurements are completed at peak and average level, the mark of average is the highest emission in restricted bands

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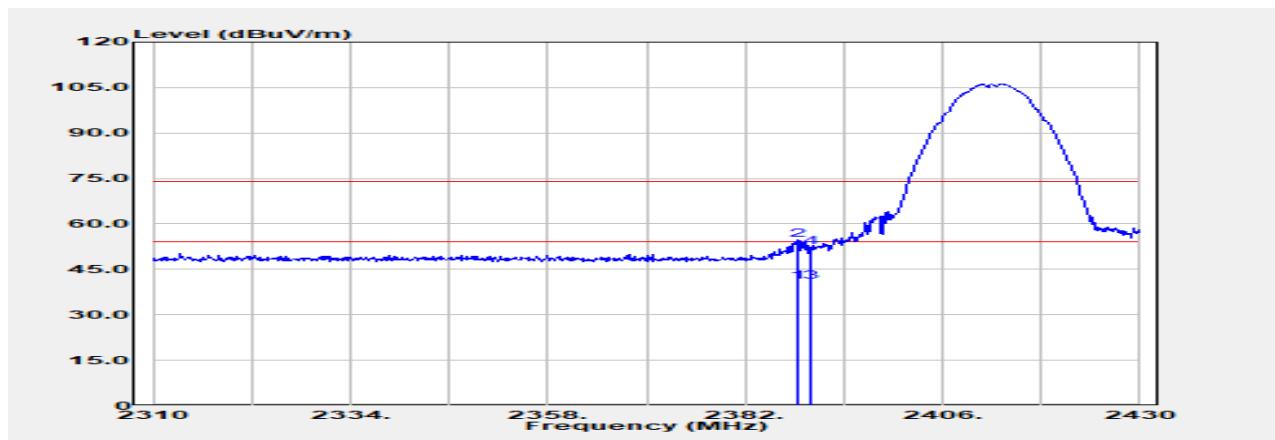
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11.6.1 Radiated Band Edge Measurement Result

Report Number :TERF2212002688E2
 Operation Mode :802.11b
 Test Frequency :2412 MHz
 Test Mode :Bandedge
 EUT Pol :E2 Plane

Test Site :SAC G Chamber
 Test Date :2022-12-19
 Temp./Humi. :20.8/52
 Antenna Pol. :Vertical
 Engineer :Temo Chen



Freq. MHz	Detector Mode	Spectrum Reading Level dB μ V	Factor dB	Actual	Limit	Margin
				FS dB μ V/m	@3m dB μ V/m	dB
2388.360	Average	44.57	-3.79	40.78	54.00	-13.22
2388.360	Peak	58.46	-3.79	54.66	74.00	-19.34
2390.000	Average	44.79	-3.80	40.99	54.00	-13.01
2390.000	Peak	56.09	-3.80	52.29	74.00	-21.71

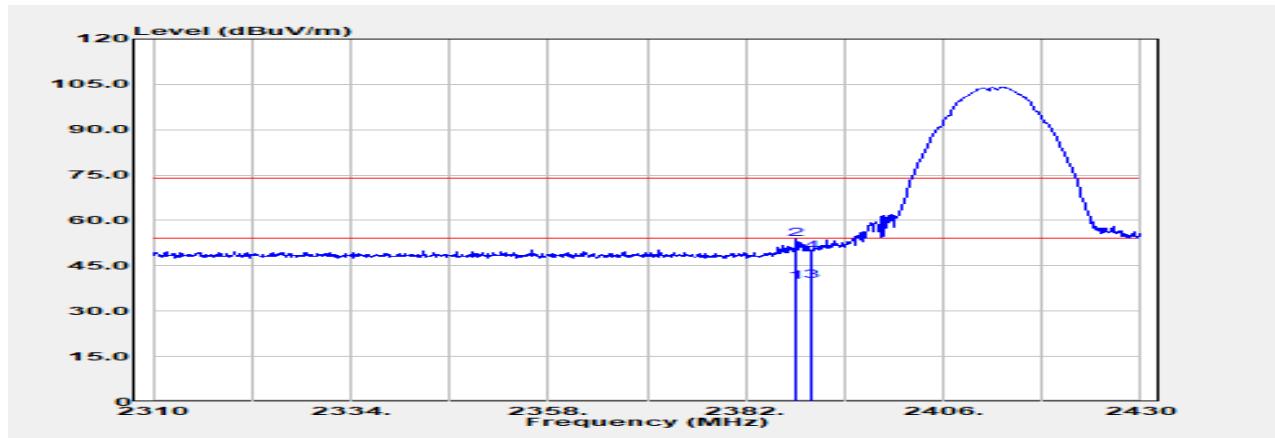
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Report Number :TERF2212002688E2
 Operation Mode :802.11b
 Test Frequency :2412 MHz
 Test Mode :Bandedge
 EUT Pol :E2 Plane

Test Site :SAC G Chamber
 Test Date :2022-12-19
 Temp./Humi. :20.8/52
 Antenna Pol. :Horizontal
 Engineer :Temo Chen



Freq. MHz	Detector Mode	Spectrum Reading Level dB μ V	Factor dB	Actual	Limit	Margin
				FS	@3m	
				dB μ V/m	dB μ V/m	dB
2388.120	Average	43.54	-3.79	39.75	54.00	-14.25
2388.120	Peak	57.48	-3.79	53.69	74.00	-20.31
2390.000	Average	43.72	-3.80	39.92	54.00	-14.08
2390.000	Peak	53.31	-3.80	49.50	74.00	-24.50

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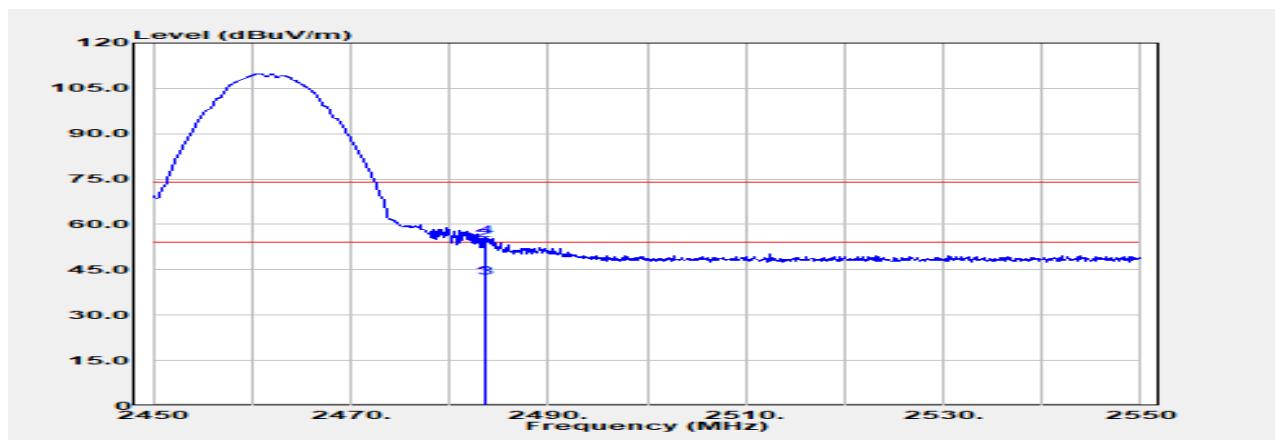
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Report Number :TERF2212002688E2
 Operation Mode :802.11b
 Test Frequency :2462 MHz
 Test Mode :Bandedge
 EUT Pol :E2 Plane

Test Site :SAC G Chamber
 Test Date :2022-12-19
 Temp./Humi. :20.8/52
 Antenna Pol. :Vertical
 Engineer :Temo Chen



Freq. MHz	Detector Mode	Spectrum Reading	Factor dB	Actual FS dB μ V/m	Limit @3m	Margin
					dB μ V/m	dB
2483.500	Average	46.29	-3.82	42.47	54.00	-11.53
2483.500	Peak	58.59	-3.82	54.77	74.00	-19.23
2483.700	Average	46.35	-3.82	42.54	54.00	-11.46
2483.700	Peak	59.74	-3.82	55.93	74.00	-18.07

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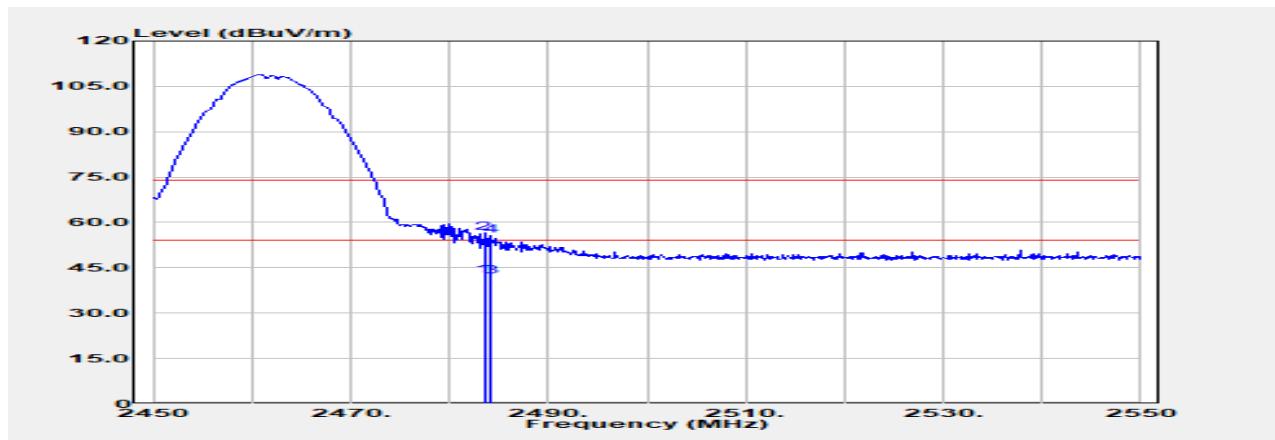
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 EUT Pol :E2 Plane

Test Site :SAC G Chamber
 Test Date :2022-12-19
 Temp./Humi. :20.8/52
 Antenna Pol. :Horizontal
 Engineer :Temo Chen



Freq. MHz	Detector Mode	Spectrum Reading Level dB μ V	Factor dB	Actual	Limit	Margin
				FS	@3m	
				dB μ V/m	dB μ V/m	dB
2483.500	Average	46.34	-3.82	42.52	54.00	-11.48
2483.500	Peak	60.47	-3.82	56.65	74.00	-17.35
2484.100	Average	45.79	-3.82	41.97	54.00	-12.03
2484.100	Peak	59.45	-3.82	55.64	74.00	-18.36

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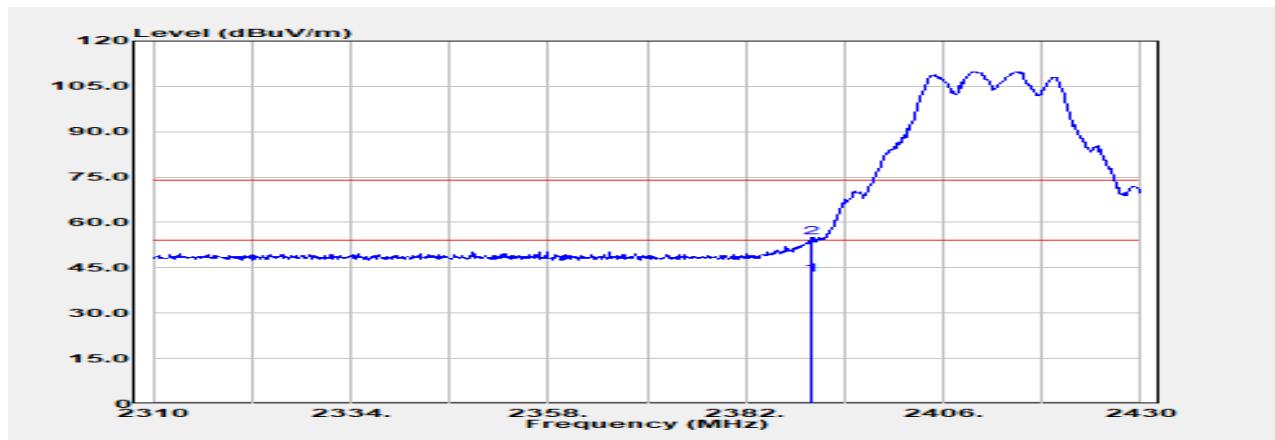
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Report Number :TERF2212002688E2
 Operation Mode :802.11g
 Test Frequency :2412 MHz
 Test Mode :Bandedge
 EUT Pol :E2 Plane

Test Site :SAC G Chamber
 Test Date :2022-12-23
 Temp./Humi. :22.1/53
 Antenna Pol. :Vertical
 Engineer :Temo Chen



Freq. MHz	Detector Mode	Spectrum Reading Level dB μ V	Factor dB	Actual	Limit	Margin
				FS	@3m	
				dB μ V/m	dB μ V/m	dB
2390.040	Average	46.43	-3.80	42.63	54.00	-11.37
2390.040	Peak	58.79	-3.80	54.99	74.00	-19.01

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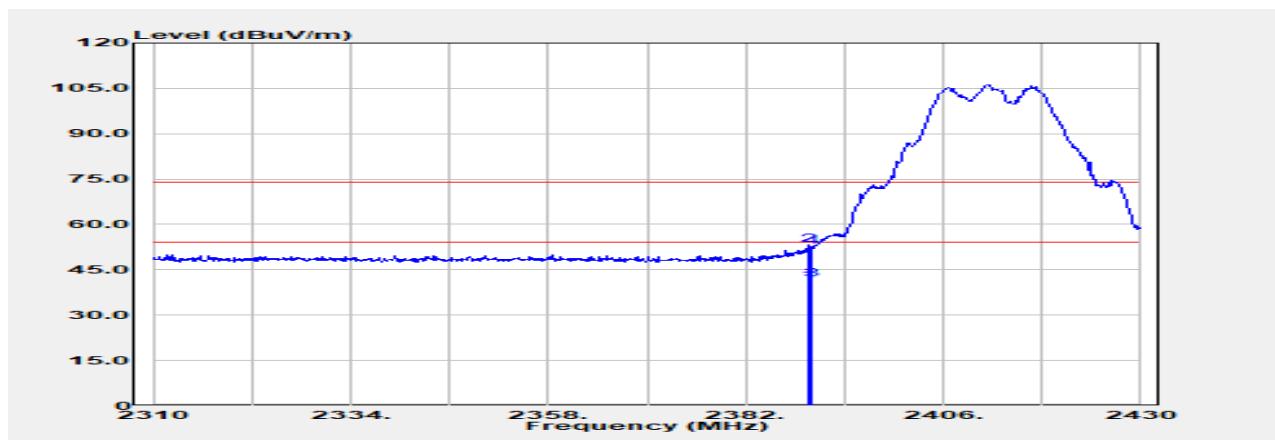
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Report Number :TERF2212002688E2
 Operation Mode :802.11g
 Test Frequency :2412 MHz
 Test Mode :Bandedge
 EUT Pol :E2 Plane

Test Site :SAC G Chamber
 Test Date :2022-12-23
 Temp./Humi. :22.1/53
 Antenna Pol. :Horizontal
 Engineer :Temo Chen



Freq. MHz	Detector Mode	Spectrum Reading Level dB μ V	Factor dB	Actual	Limit	Margin
				FS	@3m	
				dB μ V/m	dB μ V/m	dB
2389.560	Average	44.99	-3.80	41.19	54.00	-12.81
2389.560	Peak	56.96	-3.80	53.16	74.00	-20.84
2390.000	Average	45.65	-3.80	41.85	54.00	-12.15
2390.000	Peak	56.43	-3.80	52.63	74.00	-21.37

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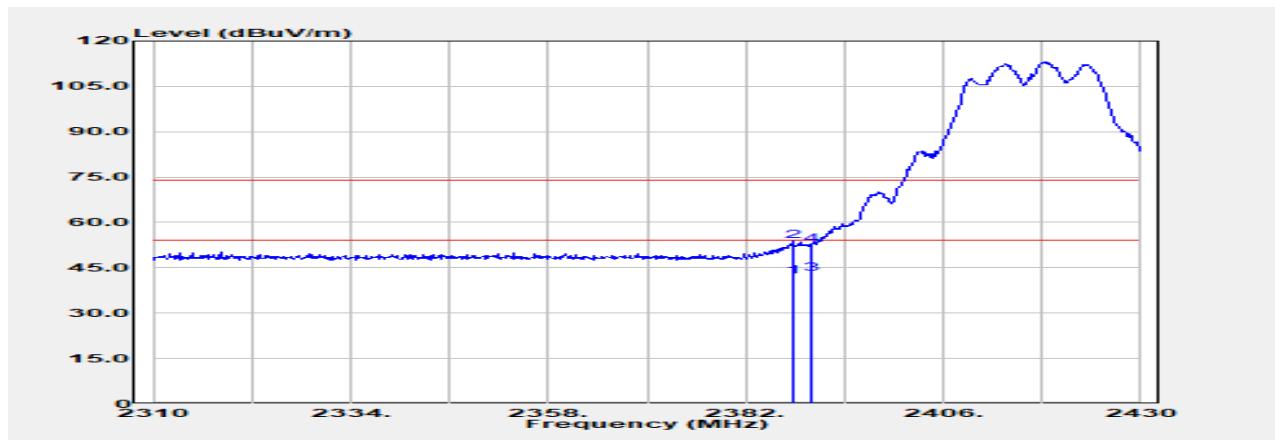
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Report Number :TERF2212002688E2
 Operation Mode :802.11g
 Test Frequency :2417 MHz
 Test Mode :Bandedge
 EUT Pol :E2 Plane

Test Site :SAC G Chamber
 Test Date :2022-12-23
 Temp./Humi. :22.1/53
 Antenna Pol. :Vertical
 Engineer :Temo Chen



Freq. MHz	Detector Mode	Spectrum Reading Level dB μ V	Factor dB	Actual	Limit	Margin
				FS	@3m	
				dB μ V/m	dB μ V/m	dB
2387.640	Average	45.84	-3.79	42.05	54.00	-11.95
2387.640	Peak	57.51	-3.79	53.71	74.00	-20.29
2390.000	Average	46.71	-3.80	42.91	54.00	-11.09
2390.000	Peak	56.56	-3.80	52.76	74.00	-21.24

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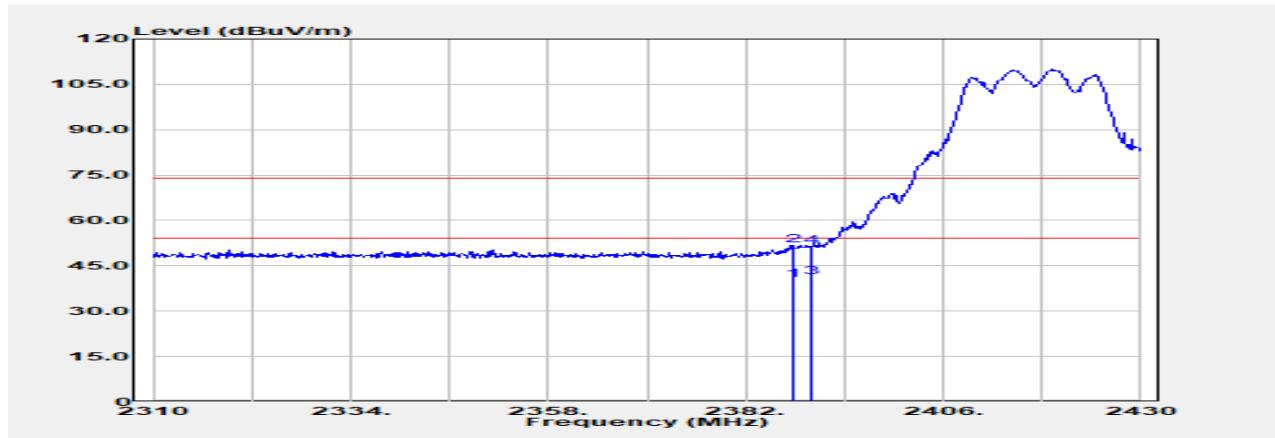
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Report Number :TERF2212002688E2
 Operation Mode :802.11g
 Test Frequency :2417 MHz
 Test Mode :Bandedge
 EUT Pol :E2 Plane

Test Site :SAC G Chamber
 Test Date :2022-12-23
 Temp./Humi. :22.1/53
 Antenna Pol. :Horizontal
 Engineer :Temo Chen



Freq. MHz	Detector Mode	Spectrum Reading Level dB μ V	Factor dB	Actual	Limit	Margin
				FS	@3m	
				dB μ V/m	dB μ V/m	dB
2387.640	Average	44.18	-3.79	40.39	54.00	-13.61
2387.640	Peak	55.53	-3.79	51.74	74.00	-22.26
2390.000	Average	45.01	-3.80	41.21	54.00	-12.79
2390.000	Peak	55.28	-3.80	51.48	74.00	-22.52

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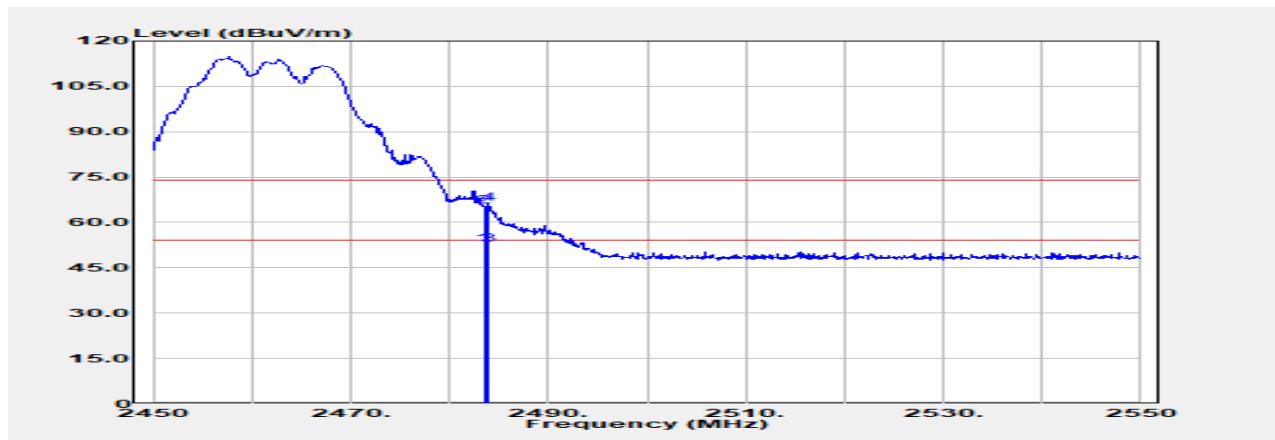
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Report Number :TERF2212002688E2
 Operation Mode :802.11g
 Test Frequency :2462 MHz
 Test Mode :Bandedge
 EUT Pol :E2 Plane

Test Site :SAC G Chamber
 Test Date :2022-12-23
 Temp./Humi. :22.1/53
 Antenna Pol. :Vertical
 Engineer :Temo Chen



Freq. MHz	Detector Mode	Spectrum Reading Level dB μ V	Factor dB	Actual	Limit	Margin
				FS	@3m	
				dB μ V/m	dB μ V/m	dB
2483.500	Average	56.41	-3.82	52.59	54.00	-1.41
2483.500	Peak	69.07	-3.82	65.25	74.00	-8.75
2484.000	Average	56.32	-3.82	52.50	54.00	-1.50
2484.000	Peak	69.83	-3.82	66.02	74.00	-7.98

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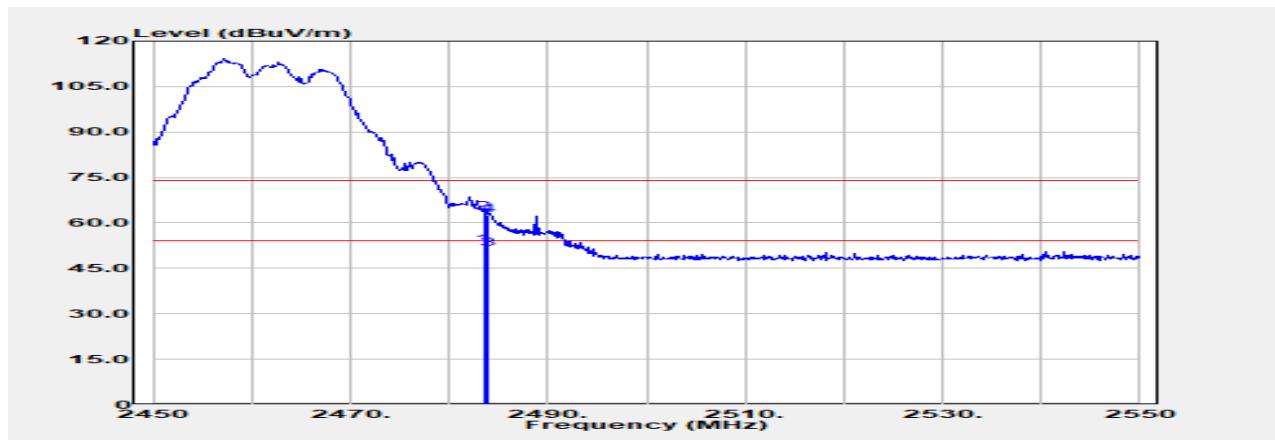
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Report Number :TERF2212002688E2
 Operation Mode :802.11g
 Test Frequency :2462 MHz
 Test Mode :Bandedge
 EUT Pol :E2 Plane

Test Site :SAC G Chamber
 Test Date :2022-12-26
 Temp./Humi. :22.1/53
 Antenna Pol. :Horizontal
 Engineer :Temo Chen



Freq. MHz	Detector Mode	Spectrum Reading Level dB μ V	Factor dB	Actual	Limit	Margin
				FS	@3m	
				dB μ V/m	dB μ V/m	dB
2483.500	Average	56.34	-3.82	52.52	54.00	-1.48
2483.500	Peak	67.31	-3.82	63.49	74.00	-10.51
2484.000	Average	55.33	-3.82	51.51	54.00	-2.49
2484.000	Peak	66.32	-3.82	62.50	74.00	-11.50

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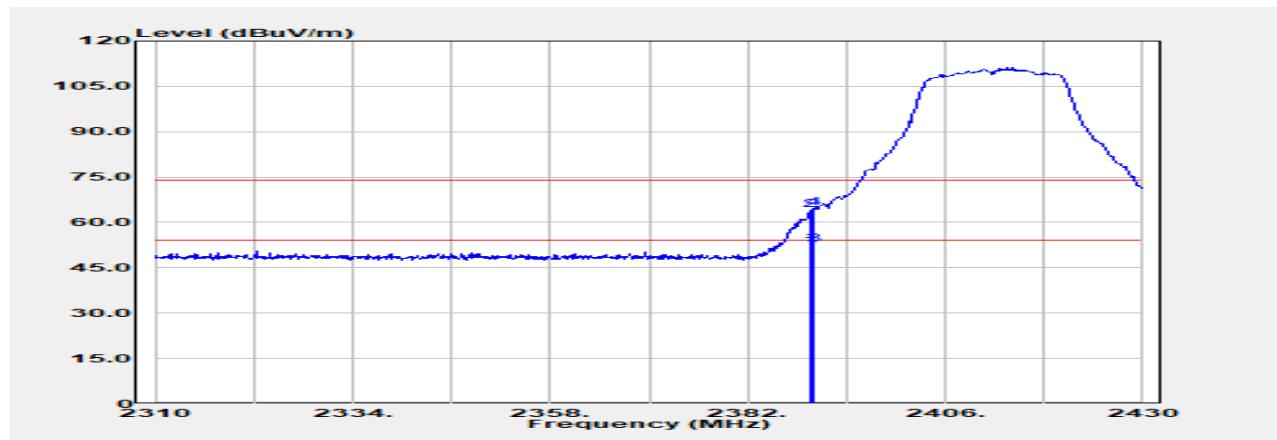
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Report Number :TERF2212002688E2
 Operation Mode :802.11n20
 Test Frequency :2412 MHz
 Test Mode :Bandedge
 EUT Pol :E2 Plane

Test Site :SAC G Chamber
 Test Date :2022-12-19
 Temp./Humi. :20.8/52
 Antenna Pol. :Vertical
 Engineer :Temo Chen



Freq. MHz	Detector Mode	Spectrum Reading Level dB μ V	Factor dB	Actual	Limit	Margin
				FS	@3m	
				dB μ V/m	dB μ V/m	dB
2389.680	Average	55.88	-3.80	52.08	54.00	-1.92
2389.680	Peak	67.89	-3.80	64.09	74.00	-9.91
2390.000	Average	56.45	-3.80	52.65	54.00	-1.35
2390.000	Peak	68.51	-3.80	64.71	74.00	-9.29

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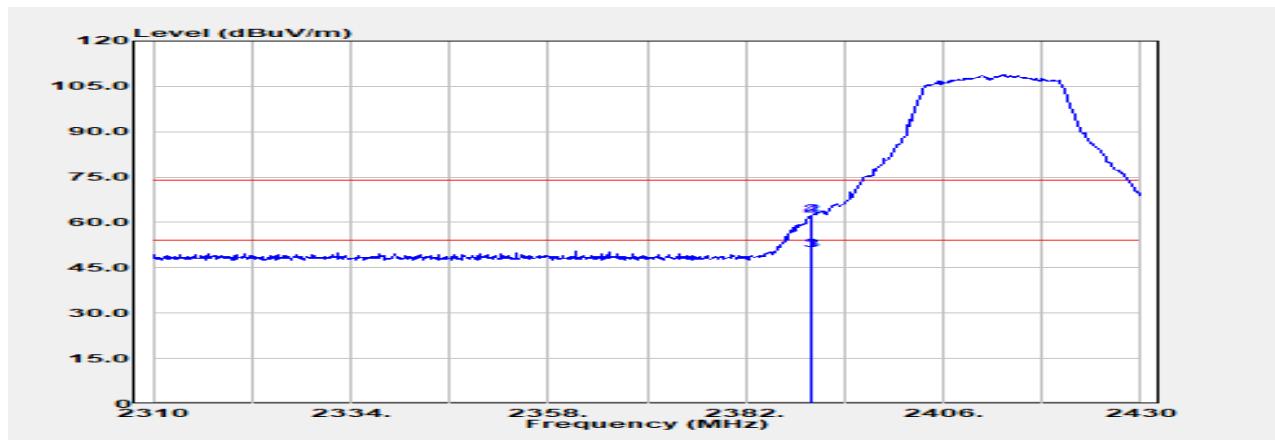
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Report Number :TERF2212002688E2
 Operation Mode :802.11n20
 Test Frequency :2412 MHz
 Test Mode :Bandedge
 EUT Pol :E2 Plane

Test Site :SAC G Chamber
 Test Date :2022-12-19
 Temp./Humi. :20.8/52
 Antenna Pol. :Horizontal
 Engineer :Temo Chen



Freq. MHz	Detector Mode	Spectrum Reading	Factor dB	Actual	Limit	Margin
				FS	@3m	
		dB μ V	dB	dB μ V/m	dB μ V/m	dB
2389.920	Average	54.53	-3.80	50.73	54.00	-3.27
2389.920	Peak	66.15	-3.80	62.35	74.00	-11.65
2390.000	Average	54.58	-3.80	50.78	54.00	-3.22
2390.000	Peak	66.05	-3.80	62.25	74.00	-11.75

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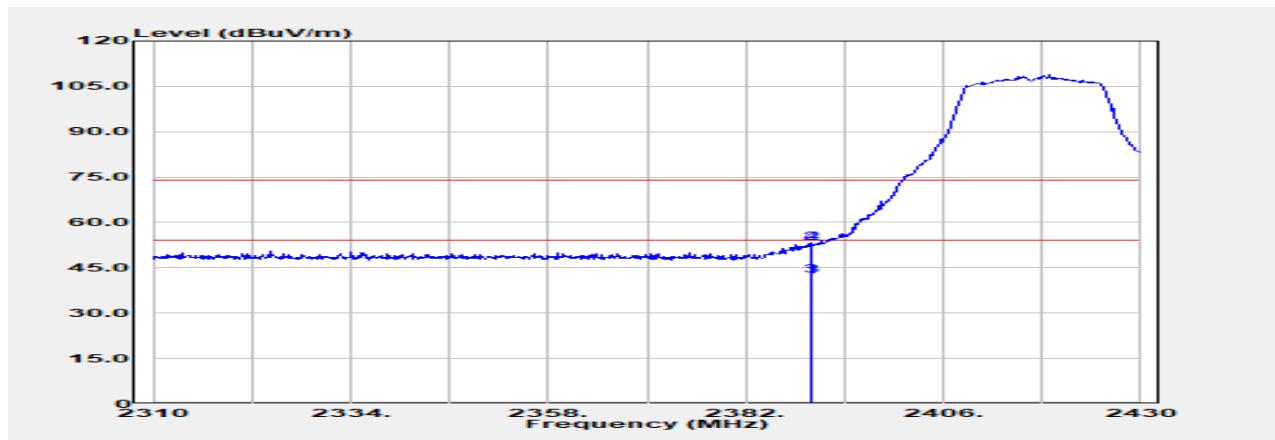
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Report Number :TERF2212002688E2
 Operation Mode :802.11n20
 Test Frequency :2417 MHz
 Test Mode :Bandedge
 EUT Pol :E2 Plane

Test Site :SAC G Chamber
 Test Date :2022-12-23
 Temp./Humi. :22.1/53
 Antenna Pol. :Vertical
 Engineer :Temo Chen



Freq. MHz	Detector Mode	Spectrum Reading Level dB μ V	Factor dB	Actual	Limit	Margin
				FS	@3m	
				dB μ V/m	dB μ V/m	dB
2389.920	Average	46.03	-3.80	42.23	54.00	-11.77
2389.920	Peak	56.92	-3.80	53.12	74.00	-20.88
2390.000	Average	46.06	-3.80	42.26	54.00	-11.74
2390.000	Peak	56.93	-3.80	53.13	74.00	-20.87

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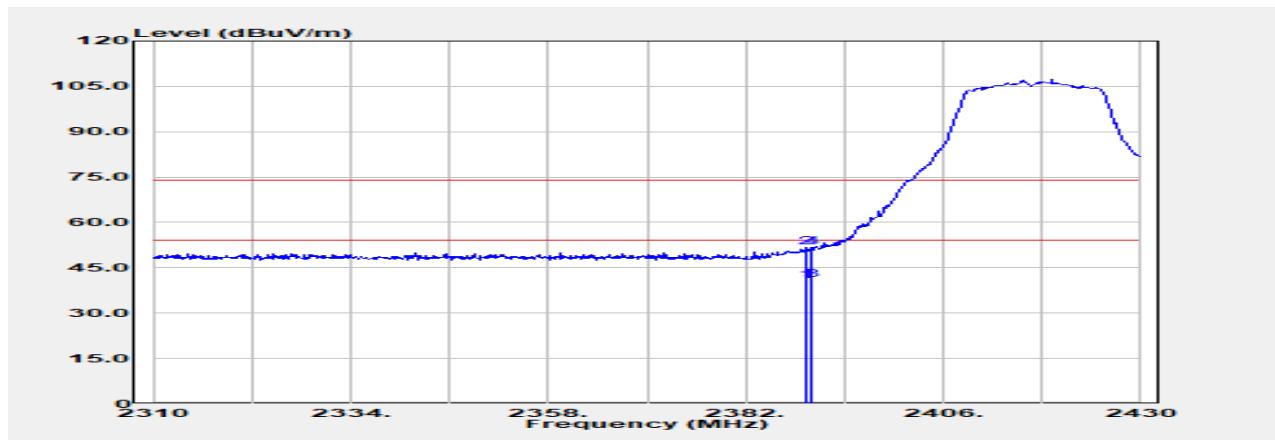
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Report Number :TERF2212002688E2
 Operation Mode :802.11n20
 Test Frequency :2417 MHz
 Test Mode :Bandedge
 EUT Pol :E2 Plane

Test Site :SAC G Chamber
 Test Date :2022-12-23
 Temp./Humi. :22.1/53
 Antenna Pol. :Horizontal
 Engineer :Temo Chen



Freq. MHz	Detector Mode	Spectrum Reading Level dB μ V	Factor dB	Actual	Limit	Margin
				FS	@3m	
				dB μ V/m	dB μ V/m	dB
2389.200	Average	44.37	-3.80	40.57	54.00	-13.43
2389.200	Peak	55.51	-3.80	51.71	74.00	-22.29
2390.000	Average	44.67	-3.80	40.87	54.00	-13.13
2390.000	Peak	55.55	-3.80	51.75	74.00	-22.25

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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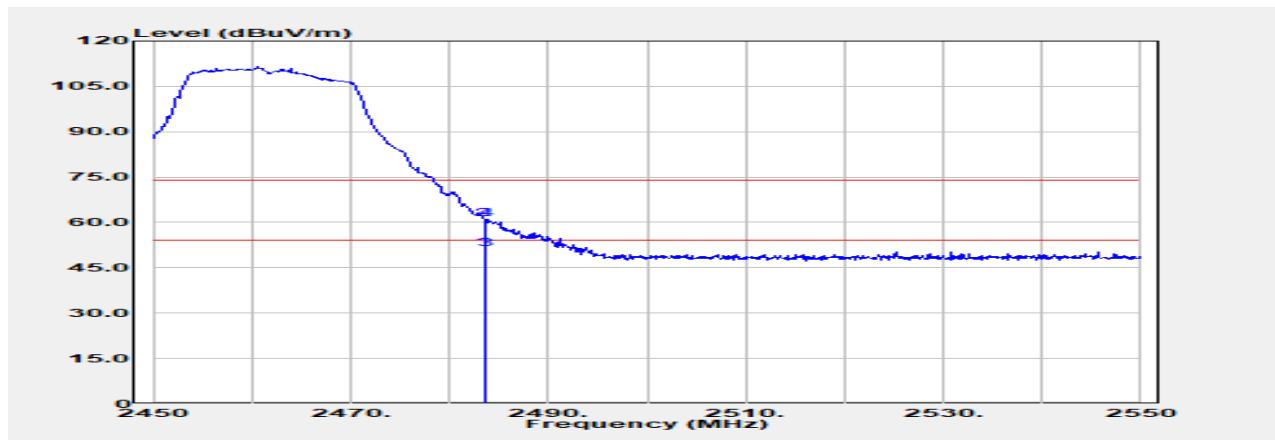
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Report Number :TERF2212002688E2
 Operation Mode :802.11n20
 Test Frequency :2462 MHz
 Test Mode :Bandedge
 EUT Pol :E2 Plane

Test Site :SAC G Chamber
 Test Date :2022-12-19
 Temp./Humi. :20.8/52
 Antenna Pol. :Vertical
 Engineer :Temo Chen



Freq. MHz	Detector Mode	Spectrum Reading Level dB μ V	Factor dB	Actual	Limit	Margin
				FS	@3m	
				dB μ V/m	dB μ V/m	dB
2483.500	Average	55.25	-3.82	51.43	54.00	-2.57
2483.500	Peak	64.97	-3.82	61.15	74.00	-12.85
2483.600	Average	54.95	-3.82	51.13	54.00	-2.87
2483.600	Peak	64.98	-3.82	61.16	74.00	-12.84

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