

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT



Applicant: Westermo Neratec AG
Rosswiesstrasse 29, 8608 Bubikon, Switzerland

Manufacturer: Westermo Neratec AG
Rosswiesstrasse 29, 8608 Bubikon, Switzerland

Product Name: WLAN Access Point

Brand Name: WESTERMO

Model No.: Ibex-1510-T2G2.5 NA

ISED PMN: Ibex-1510

Report Number: TERF2410003002ER

FCC ID 2AEJD-3628-15102

IC: 9301A-362815102

Date of EUT Received: Oct. 09, 2024

Date of Test: Oct. 09, 2024~Nov. 19, 2024

Issue Date: Jan. 10, 2025



Approved By _____

Marcus Tseng

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
TERF2410003002ER	00	Original.	Dec. 20, 2024	Yami Kuo	
TERF2410003002ER	01	Revise chapter 1.1	Jan. 10, 2025	Yami Kuo	*

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:	WLAN Access Point
Brand Name:	WESTERMO
Model No.:	Ibex-1510-T2G2.5 NA
ISED PMN:	Ibex-1510
Hardware Version:	MK1 rev.4
Firmware Version:	6.11.5
EUT Series No.:	3628-15102 00000011 2434
Power Supply:	1.From 120 VAC / 48 VDC PoE adapter. 2.From 24 to 120 VDC to optional DC input connector.
Test Software (Name/Version)	QSPR x86/6.00.00146.1

1.2 RF Specification

WLAN 2.4GHz

Wi-Fi	Frequency Range	Channels	Rated Power (dBm)		Modulation Technology
			Peak	Avg.	
802.11b	2412~2462	11	27.69	24.87	DSSS
802.11g	2412~2462	11	29.97	24.86	OFDM
802.11n_HT20	2412~2462	11	29.84	24.31	OFDM
802.11n_HT40	2422~2452	7	29.76	24.41	OFDM
802.11ax_HE20	2412~2462	11	29.94	23.78	OFDMA
802.11ax_HE40	2422~2452	7	29.95	24.03	OFDMA
Modulation type:		CCK, DQPSK, DBPSK for DSSS in 802.11b			
		64QAM, 16QAM, QPSK, BPSK for OFDM in 802.11g, 11n			
		1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDMA in 802.11ax			
Data Rate:		802.11b: 1/2/5.5/11 Mbps			
		802.11g: 6/9/12/18/24/36/48/54 Mbps			
		802.11n_HT20: up to 144.4Mbps			
		802.11n_HT40: up to 300Mbps			
		802.11ax_HE20: up to 286.8Mbps			
		802.11ax_HE40: up to 573.6Mbps			

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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	27.69	24.87	28.87	DSSS
802.11g	2412~2462	11	29.97	24.86	28.86	OFDM
802.11n_HT20	2412~2462	11	29.84	24.31	28.31	OFDM
802.11n_HT40	2422~2452	7	29.76	24.41	28.41	OFDM
802.11ax_HE20	2412~2462	11	29.94	23.78	27.78	OFDMA
802.11ax_HE40	2422~2452	7	29.95	24.03	28.03	OFDMA
Modulation type:		CCK, DQPSK, DBPSK for DSSS in 802.11b				
		64QAM, 16QAM, QPSK, BPSK for OFDM in 802.11g, 11n				
		1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDMA in 802.11ax				
Data Rate:		802.11b: 1/2/5.5/11 Mbps				
		802.11g: 6/9/12/18/24/36/48/54 Mbps				
		802.11n_HT20: up to 144.4 Mbps				
		802.11n_HT40: up to 300 Mbps				
		802.11ax_HE20: up to 286.8 Mbps				
		802.11ax_HE40: up to 573.6 Mbps				

1.3 Antenna Designation

Antenna Type	Supplier	Antenna Part No.	Freq. (MHz)	Peak Antenna Gain (dBi)
omni-directional	HUBER+SUHNER	1399.35.0008	2412-2462	4

Note: 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 3 Aug. 2023

RSS-Gen, Issue 5 April 2018, Amendment 2 (February 2021)

ANSI C63.10:2013

1.5 Test Facility

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

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

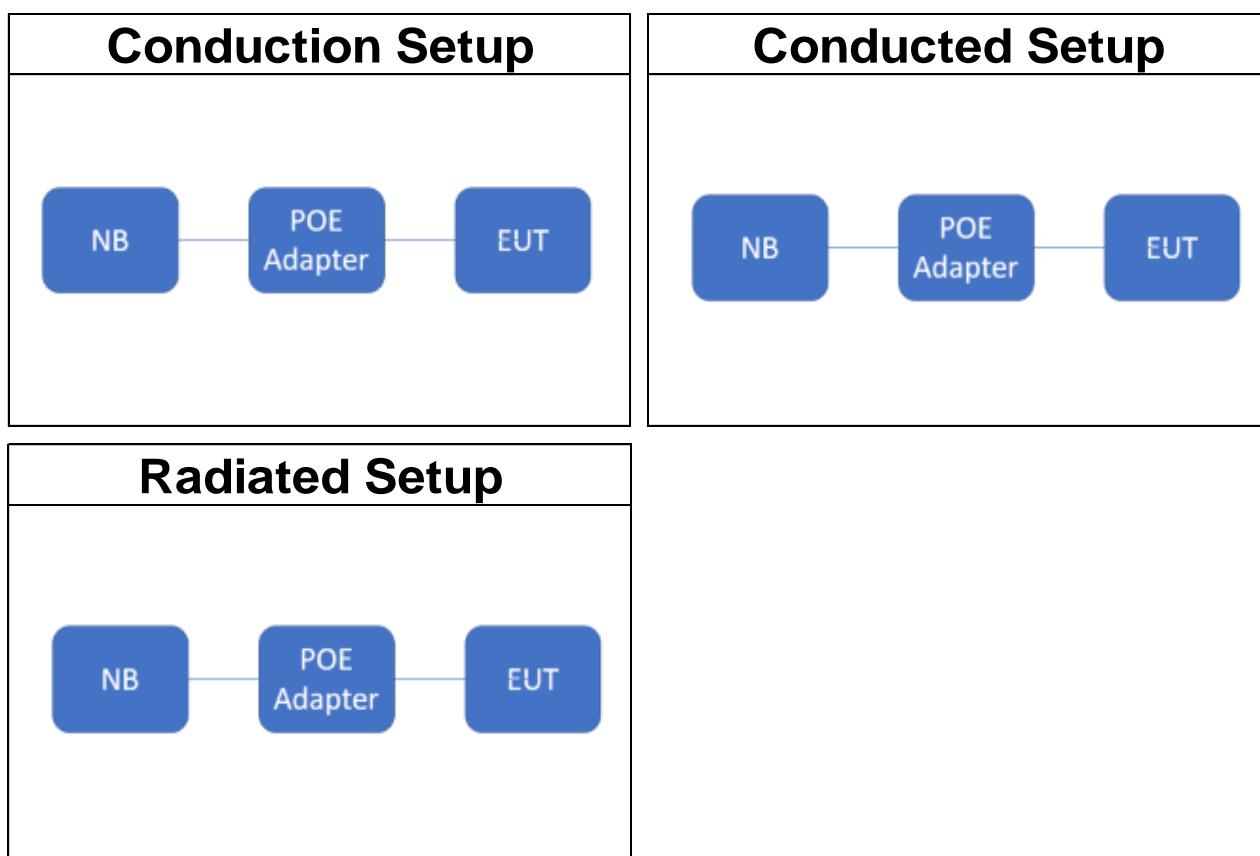
Radiated emission below 30MHz is measured in a 9m*6m*6m semi-anechoic chamber, the measurements correspond to those obtained at an open-field test site.

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.

2.5 Test Configuration



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2.6 Control Unit(s)

AC Power-Line Conducted Emission Test Site: Conduction 1					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Notebook	HP	HSN-Q35C-4	5CD2428X3N	N/A	N/A
POE Adapter	Gigabit	PSE301G	N/A	N/A	N/A
Conducted Emission Test Site: Conducted 1					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
PoE Adapter	FLUIDMESH	GMW241DA-480050G	N/A	N/A	N/A
Notebook	HP	HSN-Q35C-4	5CD2428X3N	N/A	N/A
Radiated Emission Test Site: SAC 2					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Notebook	HP	HSN-Q35C-4	5CD2428X3N	N/A	N/A
POE Adapter	Gigabit	PSE301G	N/A	N/A	N/A

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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
§15.209 §15.247(d)	RSS-247 §5.5	Conducted Band Edge and Spurious Emission	Compliant
§15.209 §15.247(d)	RSS-247 §5.5	Radiated Band Edge and Spurious Emission	Compliant
§15.205	RSS-Gen § 8.10	Restricted Bands	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 Operating Frequencies

2400~2483.5 MHz			
20MHz		40MHz	
CH	Freq. (MHz)	CH	Freq. (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"/> 802.11 b	<input checked="" type="checkbox"/>	<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"/>	<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"/>	<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 ax	<input checked="" type="checkbox"/>	<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 TEST					
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	1,6,9,10,11	OFDM	6	2TX
802.11n_HT20	1 to 11	1,6,10,11	OFDM	MCS0	2TX
802.11n_HT40	3 to 9	3,6,7,8,9	OFDM	MCS0	2TX

CONDUCTED TEST						
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	RU CONFIGURATION	DATA RATE (Mbps)	ANTENNA PORT
802.11ax_HE20	1 to 11	1,6,10,11	OFDMA	FULL RU	MCS0	2TX
802.11ax_HE40	3 to 9	3,6,7,8,9	OFDMA	FULL RU	MCS0	2TX

TRANSMIT 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

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TRANSMIT 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	1,6,9,10,11	OFDM	6	2TX
802.11n_HT20	1 to 11	1,6,10,11	OFDM	MCS0	2TX
802.11n_HT40	3 to 9	3,6,7,8,9	OFDM	MCS0	2TX

TRANSMIT RADIATED EMISSION TEST (ABOVE 1 GHz)						
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	RU CONFIGURATION	DATA RATE (Mbps)	ANTENNA PORT
802.11ax_HE20	1 to 11	1,6,10,11	OFDMA	FULL RU	MCS0	2TX
802.11ax_HE40	3 to 9	3,6,7,8,9	OFDMA	FULL RU	MCS0	2TX

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	+/- 1.54 dB
Output Power measurement	+/- 0.97 dB
Emission Bandwidth	+/- 1.38 Hz
Conducted emission measurement	+/- 0.77 dB
Peak Power Density	+/- 0.61 dB
Temperature	+/- 0.6 °C
Humidity	+/- 3 %
DC / AC Power Source	+/- 1 %

Radiated Spurious Emission Measurement Uncertainty			
Polarization: Vertical	+/- 1.89 dB	9kHz~30MHz	
	+/- 4.15 dB	30MHz - 1000MHz	
	+/- 3.43 dB	1GHz - 18GHz	
	+/- 3.86 dB	18GHz - 40GHz	
Polarization: Horizontal	+/- 1.89 dB	9kHz~30MHz	
	+/- 4.02 dB	30MHz - 1000MHz	
	+/- 3.43 dB	1GHz - 18GHz	
	+/- 3.86 dB	18GHz - 40GHz	
Radiated Spurious Emission	+/- 2 dB	33GHz-50GHz	
	+/- 1.59 dB	50GHz-60GHz	
	+/- 1.7 dB	60GHz-90GHz	
	+/- 1.64 dB	90GHz-140GHz	
	+/- 3.83 dB	140GHz-220GHz	

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 1					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Coaxial Cables	EMC Instruments Corp.	EMCCFD300-BM-BM-3000	161207	06/22/2024	06/21/2025
EMI Test Receiver	R&S	ESCI 7	100759	08/28/2024	08/27/2025
LISN	SCHWARZBECK	NSLK 8127	1040	09/07/2024	09/06/2025
Pulse Limiter	SCHWARZBECK	VTSD 9561F-N	793	06/22/2024	06/21/2025
Test Software	Audix	e3	Ver. 9.210616	N.C.R	N.C.R

6.2 Conducted Measurement

Conducted Emission Test Site: Conducted 1					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Attenuator	Mini-Circuits	BW-S10W2+	1	12/12/2023	12/11/2024
DC Block	Mini-Circuits	BLK-18-S+	10	12/12/2023	12/11/2024
EXA Spectrum Analyzer	KEYSIGHT	N9010B	MY59071571	06/04/2024	06/03/2025
Power Meter	Anritsu	ML2496A	1804001	04/16/2024	04/15/2025
Power Sensor	Anritsu	MA2411B	1726104	04/16/2024	04/15/2025
Power Sensor	Anritsu	MA2411B	1726107	04/16/2024	04/15/2025
Test Software	SGS	Radio Test Software	Ver. 21	N.C.R	N.C.R

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6.3 Radiated Measurement

Radiated Emission Test Site: SAC 2					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
4G High Pass Filter	WI	WHKX4.0	21	12/12/2023	12/11/2024
Band Reject Filter 2400-2483.5	Titan	T04N2400248350S0 1	23040703-10	12/12/2023	12/11/2024
Attenuator	SUHNER	20dB 18GHz 2W	6620.19.AA	12/12/2023	12/11/2024
Coaxial Cables	EMCI	EMC104-SM-SM- 600 +EMC105-SM-SM- 2000 +EMC105-SM-SM- 1500 +EMC105-SM-SM- 10000	RX Cable 9K-18G (220237+220909+22 0906+240801)	08/30/2024	08/29/2025
Coaxial Cables	Huber Suhner	SUCOFLEX 102	RX Cable 18G-40G MY2630/2+805062/ 2	08/30/2024	08/29/2025
EXA Spectrum Analyzer	KEYSIGHT	N9010B	MY60242392	12/22/2023	12/21/2024
Horn Antenna	RF SPIN	DRH0844	LE2D05A0844	07/10/2024	07/09/2025
Horn Antenna	RF SPIN	DRH18-E	210303A18-ES	02/16/2024	02/15/2025
Pre-Amplifier	EMCI	EMC118A45SEE	980867	08/30/2024	08/29/2025
Pre-Amplifier	EMCI	EMC184045SEE	9080939	08/30/2024	08/29/2025
Site Cal	SGS	SAC 2	N/A	08/30/2024	08/29/2025
Test Software	Audix	e3	Ver. 9.210616	N.C.R	N.C.R

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

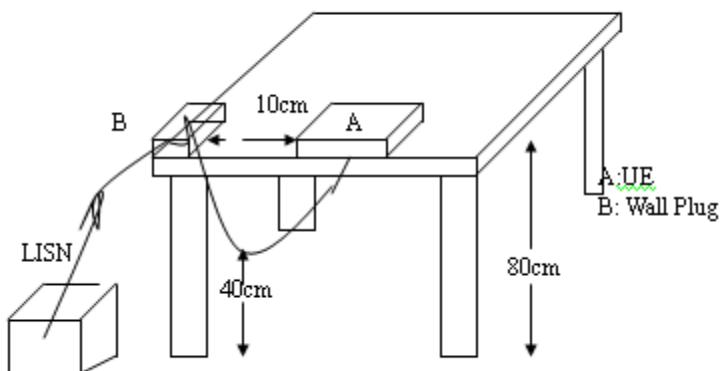
Note

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.

This device supports Dual power inputs from PoE and DC input connector, evaluation has been done on both inputs to determine the worst case scenario is from PoE input, thus the test result of PoE input is demonstrated in the report.

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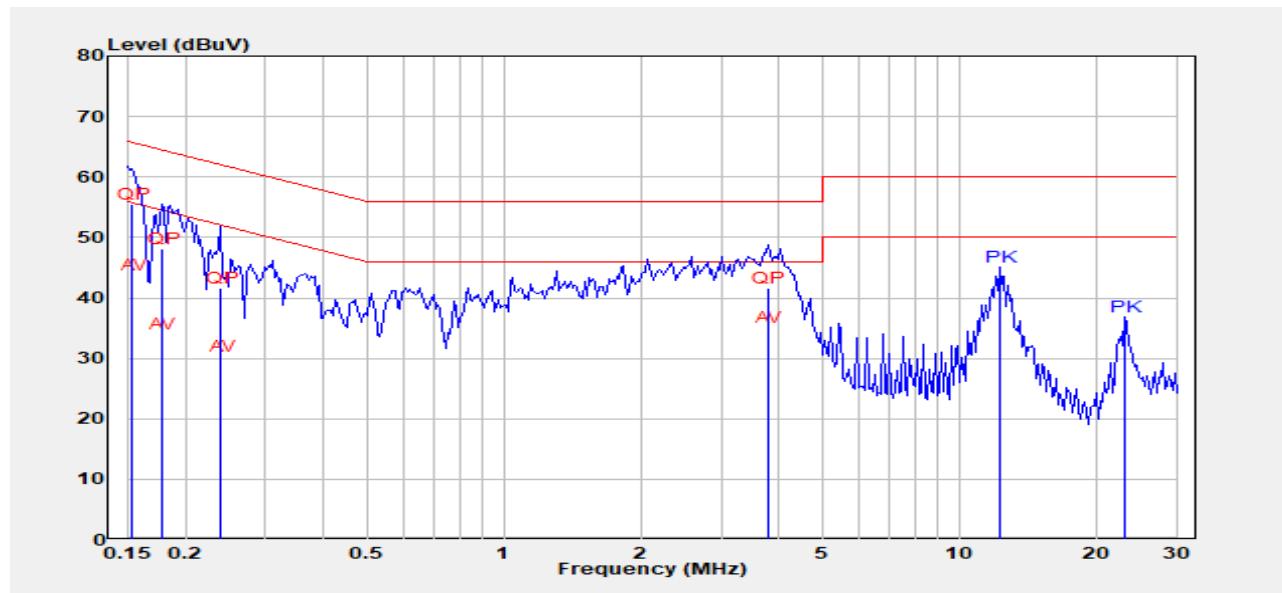
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AC POWER LINE CONDUCTED EMISSION TEST DATA

Report Number :TERF2410003002ER
 Operation Mode :WLAN_2.4G
 Power :120V/60Hz
 Probe :L
 Note: :

Test Site :Conduction 1
 Test Date :2024-11-19
 Temp./Humi. :20.0°C/78%
 Engineer :Bob Chao



Freq. MHz	Detector Mode	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V	Limit dB μ V	Margin dB
0.153	Average	33.67	10.13	43.80	55.82	-12.02
0.153	QP	45.32	10.13	55.45	65.82	-10.37
0.178	Average	23.80	10.13	33.93	54.59	-20.66
0.178	QP	38.09	10.13	48.22	64.59	-16.37
0.239	Average	20.22	10.14	30.36	52.13	-21.77
0.239	QP	31.39	10.14	41.53	62.13	-20.60
3.799	Average	24.83	10.29	35.12	46.00	-10.88
3.799	QP	31.42	10.29	41.71	56.00	-14.29
12.318	Peak	34.70	10.43	45.12	60.00	-14.88
23.018	Peak	26.32	10.53	36.86	60.00	-23.14

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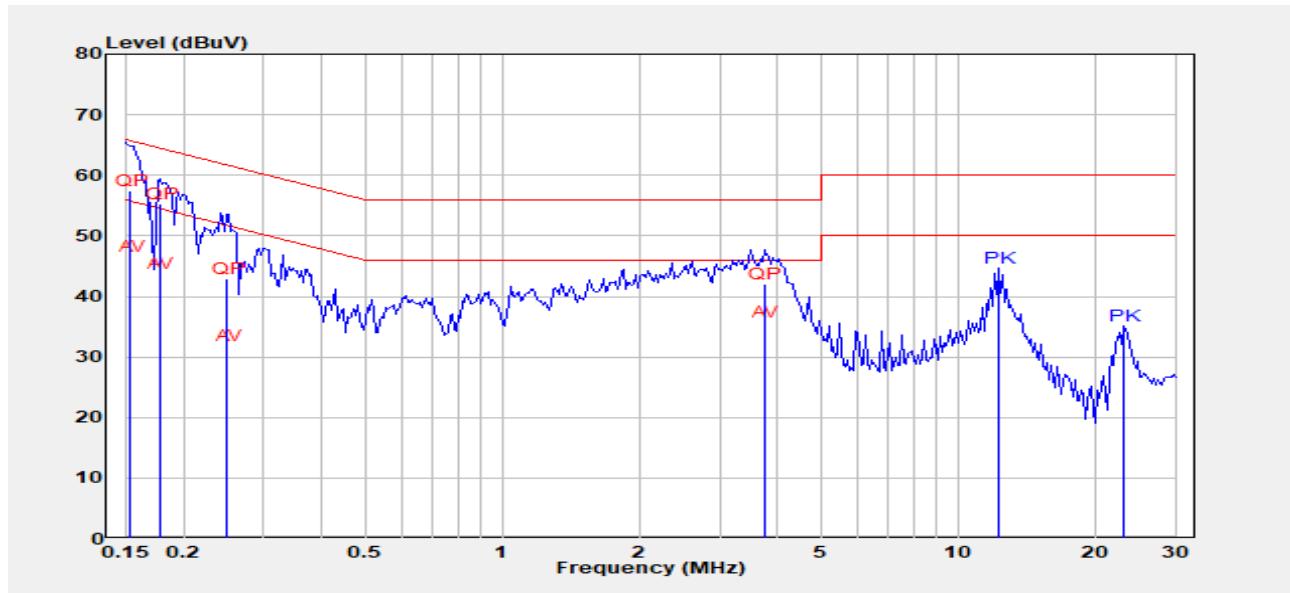
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Report Number :TERF2410003002ER
Operation Mode :WLAN_2.4G
Power :120V/60Hz
Probe :N
Note: :

Test Site :Conduction 1
Test Date :2024-11-19
Temp./Humi. :20.0°C/78%
Engineer :Bob Chao



Freq. MHz	Detector Mode	Spectrum Reading Level	Factor dB	Actual	Limit dB μ V	Margin dB
				FS dB μ V		
0.153	Average	36.44	10.12	46.56	55.82	-9.26
0.153	QP	47.43	10.12	57.55	65.82	-8.27
0.178	Average	33.67	10.12	43.79	54.59	-10.80
0.178	QP	45.12	10.12	55.24	64.59	-9.35
0.249	Average	21.76	10.13	31.89	51.78	-19.89
0.249	QP	32.77	10.13	42.90	61.78	-18.88
3.759	Average	25.51	10.30	35.81	46.00	-10.19
3.759	QP	31.77	10.30	42.07	56.00	-13.93
12.318	Peak	34.20	10.46	44.66	60.00	-15.34
23.018	Peak	24.58	10.61	35.19	60.00	-24.81

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8 PEAK OUTPUT POWER MEASUREMENT

8.1 Standard Applicable

8.1.1 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.

8.1.2 FCC

For systems using digital modulation in the 2400-2483.5 MHz bands, the limit for peak output power is 1Watt.

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.

8.1.3 ISED

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.

Note:

When the antenna gain is greater than 6 dBi, the power limit attenuated accordingly.

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;

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NSS = the number of independent spatial streams of data;

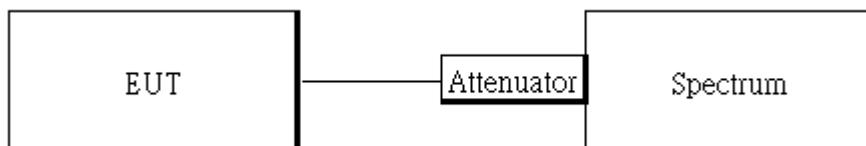
NANT = the total number of antennas

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

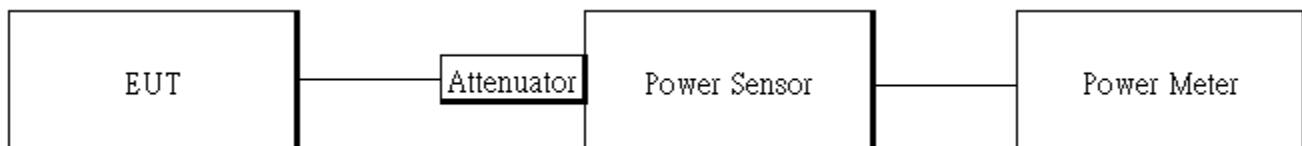
G_k is the gain in dBi of the kth antenna.

8.2 Test Setup

8.2.1 Duty Cycle



8.2.2 Output Power:



8.3 Measurement Procedure

8.3.1 Duty Cycle:

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

8.3.2 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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8.4 Measurement Result

8.4.1 Duty Cycle:

Mode		Duty Cycle (%) = Ton / (Ton+Toff)	Duty Factor (dB) =10*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
802.11b		71.67	1.45	1.45	2.00
802.11g		91.69	0.38	0.51	1.00
802.11n_20		80.32	0.95	0.18	1.00
802.11n_40		80.23	0.96	0.18	1.00
Mode	RU Config	Duty Cycle (%) = Ton / (Ton+Toff)	Duty Factor (dB) =10*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
802.11ax_20	Full	80.15	0.96	0.18	1.00
802.11ax_40	Full	80.25	0.96	0.18	1.00

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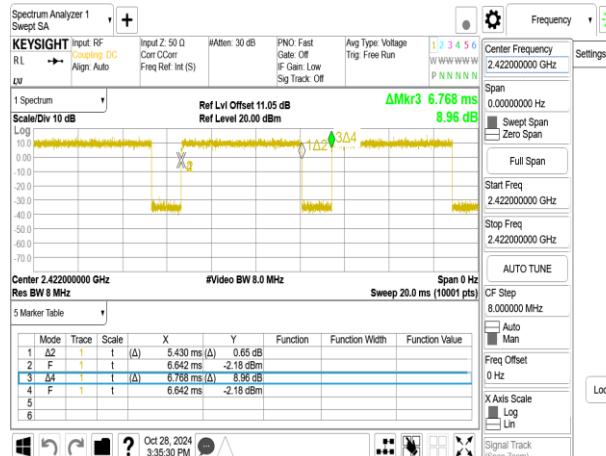


8.4.2 Duty Cycle test plots

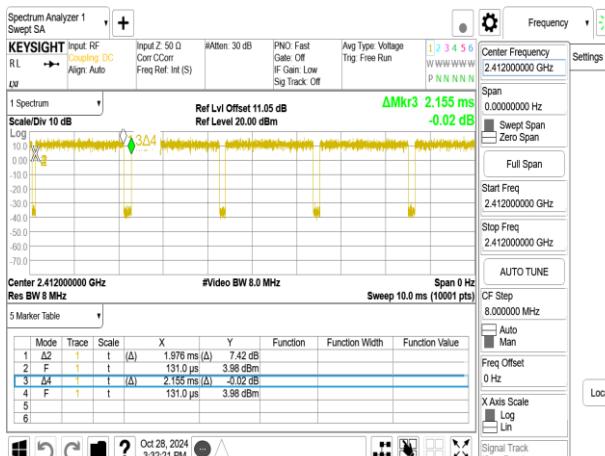
802.11b_20MHz_Chain0_2412MHz



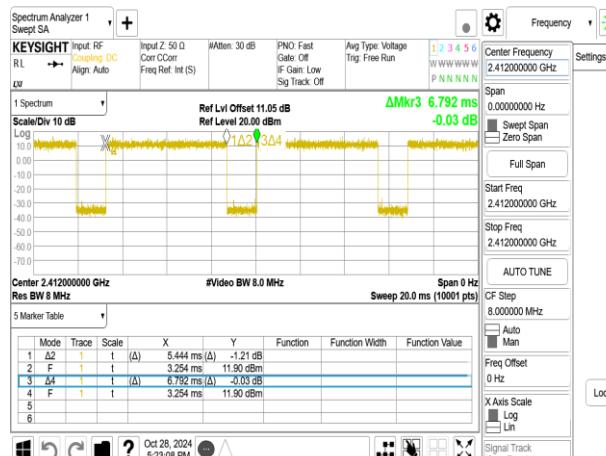
802.11n_40MHz_Chain0_2422MHz



802.11g_20MHz_Chain0_2412MHz



802.11ax_20MHz_Chain0_2412MHz



802.11n_20MHz_Chain0_2412MHz



802.11ax_40MHz_Chain0_2422MHz



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8.4.3 Output Power

802.11b Ch0

CH	Freq. (MHz)	Data Rate	Power Setting	Peak Output Power (mW)	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	1	22	281.84	24.50	30.00	PASS
6	2437	1	22	276.69	24.42	30.00	PASS
11	2462	1	22	277.33	24.43	30.00	PASS

802.11b Ch0

CH	Freq. (MHz)	Data Rate	Power Setting	Avg. Output Power (mW)	Avg. Output Power (dBm)	Limit (dBm)	RESULT
1	2412	1	22	148.48	21.72	30.00	PASS
6	2437	1	22	143.11	21.56	30.00	PASS
11	2462	1	22	146.10	21.65	30.00	PASS

802.11b Ch1

CH	Freq. (MHz)	Data Rate	Power Setting	Peak Output Power (mW)	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	1	22	295.80	24.71	30.00	PASS
6	2437	1	22	293.76	24.68	30.00	PASS
11	2462	1	22	278.61	24.45	30.00	PASS

802.11b Ch1

CH	Freq. (MHz)	Data Rate	Power Setting	Avg. Output Power (mW)	Avg. Output Power (dBm)	Limit (dBm)	RESULT
1	2412	1	22	156.55	21.95	30.00	PASS
6	2437	1	22	154.76	21.90	30.00	PASS
11	2462	1	22	150.54	21.78	30.00	PASS

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802.11b_2TX

CH	Freq. (MHz)	Data Rate	Power Setting	Peak Output Power (dBm)		Total Peak Output Power (mW)	Total Peak Output Power (dBm)	Limit (dBm)	RESULT
				Ch0	Ch1				
1	2412	1	22	24.56	24.79	587.06	27.69	30.00	PASS
6	2437	1	22	24.47	24.72	576.38	27.61	30.00	PASS
11	2462	1	22	24.50	24.53	565.63	27.53	30.00	PASS

802.11b_2TX

CH	Freq. (MHz)	Data Rate	Power Setting	Avg. Output Power (dBm)		Total Avg. Output Power (mW)	Total Avg. Output Power (dBm)	Limit (dBm)	RESULT
				Ch0	Ch1				
1	2412	1	22	21.75	21.98	307.15	24.87	30.00	PASS
6	2437	1	22	21.61	21.92	300.24	24.77	30.00	PASS
11	2462	1	22	21.68	21.81	298.70	24.75	30.00	PASS

802.11g Ch0

CH	Freq. (MHz)	Data Rate	Power Setting	Peak Output Power (mW)	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	6	22	475.34	26.77	30.00	PASS
6	2437	6	22	462.38	26.65	30.00	PASS
9	2452	6	22	489.78	26.90	30.00	PASS
10	2457	6	20.5	385.48	25.86	30.00	PASS
11	2462	6	19.5	311.89	24.94	30.00	PASS

802.11g Ch0

CH	Freq. (MHz)	Data Rate	Power Setting	Avg. Output Power (mW)	Avg. Output Power (dBm)	Limit (dBm)	RESULT
1	2412	6	22	149.17	21.74	30.00	PASS
6	2437	6	22	142.46	21.54	30.00	PASS
9	2452	6	22	149.17	21.74	30.00	PASS
10	2457	6	20.5	105.85	20.25	30.00	PASS
11	2462	6	19.5	85.05	19.30	30.00	PASS

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802.11g Ch1

CH	Freq. (MHz)	Data Rate	Power Setting	Peak Output Power (mW)	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	6	22	502.34	27.01	30.00	PASS
6	2437	6	22	500.03	26.99	30.00	PASS
9	2452	6	22	474.24	26.76	30.00	PASS
10	2457	6	20.5	374.97	25.74	30.00	PASS
11	2462	6	19.5	331.13	25.20	30.00	PASS

802.11g Ch1

CH	Freq. (MHz)	Data Rate	Power Setting	Avg. Output Power (mW)	Avg. Output Power (dBm)	Limit (dBm)	RESULT
1	2412	6	22	154.77	21.90	30.00	PASS
6	2437	6	22	153.70	21.87	30.00	PASS
9	2452	6	22	142.78	21.55	30.00	PASS
10	2457	6	20.5	105.36	20.23	30.00	PASS
11	2462	6	19.5	88.85	19.49	30.00	PASS

802.11g_2TX

CH	Freq. (MHz)	Data Rate	Power Setting	Peak Output Power (dBm)		Total Peak Output Power (mW)	Total Peak Output Power (dBm)	Limit (dBm)	RESULT
				Ch0	Ch1				
1	2412	6	22	26.83	27.08	992.45	29.97	30.00	PASS
6	2437	6	22	26.75	27.09	984.83	29.93	30.00	PASS
9	2452	6	22	26.98	26.81	978.62	29.91	30.00	PASS
10	2457	6	20.5	25.93	25.81	772.81	28.88	30.00	PASS
11	2462	6	19.5	25.05	25.26	655.63	28.17	30.00	PASS

802.11g_2TX

CH	Freq. (MHz)	Data Rate	Power Setting	Avg. Output Power (dBm)		Total Avg. Output Power (mW)	Total Avg. Output Power (dBm)	Limit (dBm)	RESULT
				Ch0	Ch1				
1	2412	6	22	21.76	21.95	306.42	24.86	30.00	PASS
6	2437	6	22	21.60	21.94	300.64	24.78	30.00	PASS
9	2452	6	22	21.78	21.59	294.65	24.69	30.00	PASS
10	2457	6	20.5	20.29	20.25	212.67	23.28	30.00	PASS
11	2462	6	19.5	19.33	19.55	175.73	22.45	30.00	PASS

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802.11n_HT_20M Ch0

CH	Freq. (MHz)	Data Rate	Power Setting	Peak Output Power (mW)	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	22	459.20	26.62	30.00	PASS
6	2437	MCS0	22	449.78	26.53	30.00	PASS
10	2457	MCS0	22	497.74	26.97	30.00	PASS
11	2462	MCS0	18	222.84	23.48	30.00	PASS

802.11n_HT_20M Ch0

CH	Freq. (MHz)	Data Rate	Power Setting	Avg. Output Power (mW)	Avg. Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	22	133.10	21.24	30.00	PASS
6	2437	MCS0	22	127.40	21.05	30.00	PASS
10	2457	MCS0	22	131.58	21.19	30.00	PASS
11	2462	MCS0	18	54.60	17.37	30.00	PASS

802.11n_HT_20M Ch1

CH	Freq. (MHz)	Data Rate	Power Setting	Peak Output Power (mW)	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	22	493.17	26.93	30.00	PASS
6	2437	MCS0	22	488.65	26.89	30.00	PASS
10	2457	MCS0	22	468.81	26.71	30.00	PASS
11	2462	MCS0	18	201.84	23.05	30.00	PASS

802.11n_HT_20M Ch1

CH	Freq. (MHz)	Data Rate	Power Setting	Avg. Output Power (mW)	Avg. Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	22	135.57	21.32	30.00	PASS
6	2437	MCS0	22	134.64	21.29	30.00	PASS
10	2457	MCS0	22	127.11	21.04	30.00	PASS
11	2462	MCS0	18	54.10	17.33	30.00	PASS

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802.11n_HT20M_2TX

CH	Freq. (MHz)	Data Rate	Power Setting	Peak Output Power (dBm)		Total Peak Output Power (mW)	Total Peak Output Power (dBm)	Limit (dBm)	RESULT
				Ch0	Ch1				
1	2412	MCS0	22	26.70	26.96	964.33	29.84	30.00	PASS
6	2437	MCS0	22	26.59	26.93	949.21	29.77	30.00	PASS
10	2457	MCS0	22	27.03	26.77	980.00	29.91	30.00	PASS
11	2462	MCS0	18	23.51	23.11	429.03	26.32	30.00	PASS

802.11n_HT20M_2TX

CH	Freq. (MHz)	Data Rate	Power Setting	Avg. Output Power (dBm)		Total Avg. Output Power (mW)	Total Avg. Output Power (dBm)	Limit (dBm)	RESULT
				Ch0	Ch1				
1	2412	MCS0	22	21.26	21.34	269.91	24.31	30.00	PASS
6	2437	MCS0	22	21.09	21.36	265.41	24.24	30.00	PASS
10	2457	MCS0	22	21.22	21.08	260.77	24.16	30.00	PASS
11	2462	MCS0	18	17.41	17.36	109.58	20.40	30.00	PASS

802.11n_HT_40M Ch0

CH	Freq. (MHz)	Data Rate	Power Setting	Peak Output Power (mW)	Peak Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	21.5	456.04	26.59	30.00	PASS
6	2437	MCS0	21.5	449.78	26.53	30.00	PASS
7	2442	MCS0	18	208.45	23.19	30.00	PASS
8	2447	MCS0	18.5	258.23	24.12	30.00	PASS
9	2452	MCS0	13	78.34	18.94	30.00	PASS

802.11n_HT_40M Ch0

CH	Freq. (MHz)	Data Rate	Power Setting	Avg. Output Power (mW)	Avg. Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	21.5	132.94	21.24	30.00	PASS
6	2437	MCS0	21.5	128.13	21.08	30.00	PASS
7	2442	MCS0	18	59.79	17.77	30.00	PASS
8	2447	MCS0	18.5	68.50	18.36	30.00	PASS
9	2452	MCS0	13	19.62	12.93	30.00	PASS

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802.11n_HT_40M Ch1

CH	Freq. (MHz)	Data Rate	Power Setting	Peak Output Power (mW)	Peak Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	21.5	470.98	26.73	30.00	PASS
6	2437	MCS0	21.5	466.66	26.69	30.00	PASS
7	2442	MCS0	18	230.14	23.62	30.00	PASS
8	2447	MCS0	18.5	244.91	23.89	30.00	PASS
9	2452	MCS0	13	63.10	18.00	30.00	PASS

802.11n_HT_40M Ch1

CH	Freq. (MHz)	Data Rate	Power Setting	Avg. Output Power (mW)	Avg. Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	21.5	140.17	21.47	30.00	PASS
6	2437	MCS0	21.5	144.43	21.60	30.00	PASS
7	2442	MCS0	18	62.76	17.98	30.00	PASS
8	2447	MCS0	18.5	67.71	18.31	30.00	PASS
9	2452	MCS0	13	18.14	12.59	30.00	PASS

802.11n_HT40M_2TX

CH	Freq. (MHz)	Data Rate	Power Setting	Peak Output Power (dBm)		Total Peak Output Power (mW)	Total Peak Output Power (dBm)	Limit (dBm)	RESULT
				Ch0	Ch1				
3	2422	MCS0	21.5	26.66	26.83	945.39	29.76	30.00	PASS
6	2437	MCS0	21.5	26.59	26.77	931.37	29.69	30.00	PASS
7	2442	MCS0	18	23.63	23.67	463.48	26.66	30.00	PASS
8	2447	MCS0	18.5	24.19	24.02	514.77	27.12	30.00	PASS
9	2452	MCS0	13	18.96	18.10	143.27	21.56	30.00	PASS

802.11n_HT40M_2TX

CH	Freq. (MHz)	Data Rate	Power Setting	Avg. Output Power (dBm)		Total Avg. Output Power (mW)	Total Avg. Output Power (dBm)	Limit (dBm)	RESULT
				Ch0	Ch1				
3	2422	MCS0	21.5	21.29	21.51	275.95	24.41	30.00	PASS
6	2437	MCS0	21.5	21.11	21.63	274.45	24.38	30.00	PASS
7	2442	MCS0	18	17.79	18.02	123.41	20.91	30.00	PASS
8	2447	MCS0	18.5	18.40	18.36	137.63	21.39	30.00	PASS
9	2452	MCS0	13	12.97	12.65	38.19	15.82	30.00	PASS

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802.11ax_HE_20M Ch0

CH	Freq. (MHz)	Data Rate	RU Config	Power Setting	Peak Output Power (mW)	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	full	21.5	458.14	26.61	30.00	PASS
6	2437	MCS0	full	21.5	454.99	26.58	30.00	PASS
10	2457	MCS0	full	21.5	502.34	27.01	30.00	PASS
11	2462	MCS0	full	18	228.03	23.58	30.00	PASS

802.11ax_HE_20M Ch0

CH	Freq. (MHz)	Data Rate	RU Config	Power Setting	Avg. Output Power (mW)	Avg. Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	full	21.5	115.37	20.62	30.00	PASS
6	2437	MCS0	full	21.5	111.45	20.47	30.00	PASS
10	2457	MCS0	full	21.5	116.71	20.67	30.00	PASS
11	2462	MCS0	full	18	50.71	17.05	30.00	PASS

802.11ax_HE_20M Ch1

CH	Freq. (MHz)	Data Rate	RU Config	Power Setting	Peak Output Power (mW)	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	full	21.5	494.31	26.94	30.00	PASS
6	2437	MCS0	full	21.5	490.91	26.91	30.00	PASS
10	2457	MCS0	full	21.5	462.38	26.65	30.00	PASS
11	2462	MCS0	full	18	248.89	23.96	30.00	PASS

802.11ax_HE_20M Ch1

CH	Freq. (MHz)	Data Rate	RU Config	Power Setting	Avg. Output Power (mW)	Avg. Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	full	21.5	119.98	20.79	30.00	PASS
6	2437	MCS0	full	21.5	120.53	20.81	30.00	PASS
10	2457	MCS0	full	21.5	111.71	20.48	30.00	PASS
11	2462	MCS0	full	18	52.86	17.23	30.00	PASS

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802.11ax_HE20M_2TX

CH	Freq. (MHz)	Data Rate	RU Config	Power Setting	Peak Output Power (dBm)		Total Peak Output Power (mW)	Total Peak Output Power (dBm)	Limit (dBm)	RESULT
					Ch0	Ch1				
1	2412	MCS0	full	21.5	26.71	27.01	971.16	29.87	30.00	PASS
6	2437	MCS0	full	21.5	26.67	26.97	962.25	29.83	30.00	PASS
10	2457	MCS0	full	21.5	27.13	26.72	986.31	29.94	30.00	PASS
11	2462	MCS0	full	18	23.64	24.06	485.89	26.87	30.00	PASS

802.11ax_HE20M_2TX

CH	Freq. (MHz)	Data Rate	RU Config	Power Setting	Avg. Output Power (dBm)		Total Avg. Output Power (mW)	Total Avg. Output Power (dBm)	Limit (dBm)	RESULT
					Ch0	Ch1				
1	2412	MCS0	full	21.5	20.68	20.85	238.62	23.78	30.00	PASS
6	2437	MCS0	full	21.5	20.53	20.83	234.09	23.69	30.00	PASS
10	2457	MCS0	full	21.5	20.70	20.53	230.52	23.63	30.00	PASS
11	2462	MCS0	full	18	17.10	17.27	104.64	20.20	30.00	PASS

802.11ax_HE_40M Ch0

CH	Freq. (MHz)	Data Rate	RU Config	Power Setting	Peak Output Power (mW)	Peak Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	full	21.5	484.17	26.85	30.00	PASS
6	2437	MCS0	full	18.5	281.19	24.49	30.00	PASS
7	2442	MCS0	full	18.5	273.53	24.37	30.00	PASS
8	2447	MCS0	full	19.5	381.94	25.82	30.00	PASS
9	2452	MCS0	full	14	105.44	20.23	30.00	PASS

802.11ax_HE_40M Ch0

CH	Freq. (MHz)	Data Rate	RU Config	Power Setting	Avg. Output Power (mW)	Avg. Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	full	21.5	120.10	20.80	30.00	PASS
6	2437	MCS0	full	18.5	62.60	17.97	30.00	PASS
7	2442	MCS0	full	18.5	58.55	17.68	30.00	PASS
8	2447	MCS0	full	19.5	79.35	19.00	30.00	PASS
9	2452	MCS0	full	14	23.15	13.65	30.00	PASS

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802.11ax_HE_40M Ch1

CH	Freq. (MHz)	Data Rate	RU Config	Power Setting	Peak Output Power (mW)	Peak Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	full	21.5	488.65	26.89	30.00	PASS
6	2437	MCS0	full	18.5	295.12	24.70	30.00	PASS
7	2442	MCS0	full	18.5	283.14	24.52	30.00	PASS
8	2447	MCS0	full	19.5	357.27	25.53	30.00	PASS
9	2452	MCS0	full	14	88.51	19.47	30.00	PASS

802.11ax_HE_40M Ch1

CH	Freq. (MHz)	Data Rate	RU Config	Power Setting	Avg. Output Power (mW)	Avg. Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	full	21.5	131.09	21.18	30.00	PASS
6	2437	MCS0	full	18.5	65.85	18.19	30.00	PASS
7	2442	MCS0	full	18.5	66.46	18.23	30.00	PASS
8	2447	MCS0	full	19.5	77.72	18.91	30.00	PASS
9	2452	MCS0	full	14	21.70	13.37	30.00	PASS

802.11ax_HE40M_2TX

CH	Freq. (MHz)	Data Rate	RU Config	Power Setting	Peak Output Power (dBm)		Total Peak Output Power (mW)	Total Peak Output Power (dBm)	Limit (dBm)	RESULT
					Ch0	Ch1				
3	2422	MCS0	full	21.5	26.91	26.96	987.50	29.95	30.00	PASS
6	2437	MCS0	full	18.5	24.63	24.76	589.63	27.71	30.00	PASS
7	2442	MCS0	full	18.5	24.46	24.58	566.33	27.53	30.00	PASS
8	2447	MCS0	full	19.5	25.90	25.62	753.80	28.77	30.00	PASS
9	2452	MCS0	full	14	20.29	19.55	197.06	22.95	30.00	PASS

802.11ax_HE40M_2TX

CH	Freq. (MHz)	Data Rate	RU Config	Power Setting	Avg. Output Power (dBm)		Total Avg. Output Power (mW)	Total Avg. Output Power (dBm)	Limit (dBm)	RESULT
					Ch0	Ch1				
3	2422	MCS0	full	21.5	20.82	21.22	252.96	24.03	30.00	PASS
6	2437	MCS0	full	18.5	18.02	18.24	129.93	21.14	30.00	PASS
7	2442	MCS0	full	18.5	17.71	18.25	125.73	20.99	30.00	PASS
8	2447	MCS0	full	19.5	19.04	18.94	158.35	22.00	30.00	PASS
9	2452	MCS0	full	14	13.68	13.41	45.22	16.55	30.00	PASS

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8.4.4 EIRP

802.11b Ch0							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
1	2412	1	21.72	4.00	25.72	36	PASS
6	2437	1	21.56	4.00	25.56	36	PASS
11	2462	1	21.65	4.00	25.65	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	21.95	4.00	25.95	36	PASS
6	2437	1	21.90	4.00	25.90	36	PASS
11	2462	1	21.78	4.00	25.78	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)	
			Ch0	Ch1					
1	2412	1	21.75	21.98	24.87	4.00	28.87	36	PASS
6	2437	1	21.61	21.92	24.77	4.00	28.77	36	PASS
11	2462	1	21.68	21.81	24.75	4.00	28.75	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	21.74	4.00	25.74	36	PASS
6	2437	6	21.54	4.00	25.54	36	PASS
9	2452	6	21.74	4.00	25.74	36	PASS
10	2457	6	20.25	4.00	24.25	36	PASS
11	2462	6	19.30	4.00	23.30	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	21.90	4.00	25.90	36	PASS
6	2437	6	21.87	4.00	25.87	36	PASS
9	2452	6	21.55	4.00	25.55	36	PASS
10	2457	6	20.23	4.00	24.23	36	PASS
11	2462	6	19.49	4.00	23.49	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	21.76	21.95	24.86	4.00	28.86	36	PASS
6	2437	6	21.60	21.94	24.78	4.00	28.78	36	PASS
9	2452	6	21.78	21.59	24.69	4.00	28.69	36	PASS
10	2457	6	20.29	20.25	23.28	4.00	27.28	36	PASS
11	2462	6	19.33	19.55	22.45	4.00	26.45	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	21.24	4.00	25.24	36	PASS
6	2437	MCS0	21.05	4.00	25.05	36	PASS
10	2457	MCS0	21.19	4.00	25.19	36	PASS
11	2462	MCS0	17.37	4.00	21.37	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	21.32	4.00	25.32	36	PASS
6	2437	MCS0	21.29	4.00	25.29	36	PASS
10	2457	MCS0	21.04	4.00	25.04	36	PASS
11	2462	MCS0	17.33	4.00	21.33	36	PASS

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802.11n_HT20M_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	21.26	21.34	24.31	4.00	28.31	36	PASS
6	2437	MCS0	21.09	21.36	24.24	4.00	28.24	36	PASS
10	2457	MCS0	21.22	21.08	24.16	4.00	28.16	36	PASS
11	2462	MCS0	17.41	17.36	20.40	4.00	24.40	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	21.24	4.00	25.24	36	PASS
6	2437	MCS0	21.08	4.00	25.08	36	PASS
7	2442	MCS0	17.77	4.00	21.77	36	PASS
8	2447	MCS0	18.36	4.00	22.36	36	PASS
9	2452	MCS0	12.93	4.00	16.93	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	21.47	4.00	25.47	36	PASS
6	2437	MCS0	21.60	4.00	25.60	36	PASS
7	2442	MCS0	17.98	4.00	21.98	36	PASS
8	2447	MCS0	18.31	4.00	22.31	36	PASS
9	2452	MCS0	12.59	4.00	16.59	36	PASS

802.11n_HT40M_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	21.29	21.51	24.41	4.00	28.41	36	PASS
6	2437	MCS0	21.11	21.63	24.38	4.00	28.38	36	PASS
7	2442	MCS0	17.79	18.02	20.91	4.00	24.91	36	PASS
8	2447	MCS0	18.40	18.36	21.39	4.00	25.39	36	PASS
9	2452	MCS0	12.97	12.65	15.82	4.00	19.82	36	PASS

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802.11ax_HE_20M Ch0

CH	Freq. (MHz)	Data Rate	RU Config	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit	RESULT
1	2412	MCS0	full	20.62	4.00	24.62	36	PASS
6	2437	MCS0	full	20.47	4.00	24.47	36	PASS
10	2457	MCS0	full	20.67	4.00	24.67	36	PASS
11	2462	MCS0	full	17.05	4.00	21.05	36	PASS

802.11ax_HE_20M Ch1

CH	Freq. (MHz)	Data Rate	RU Config	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit	RESULT
1	2412	MCS0	full	20.79	4.00	24.79	36	PASS
6	2437	MCS0	full	20.81	4.00	24.81	36	PASS
10	2457	MCS0	full	20.48	4.00	24.48	36	PASS
11	2462	MCS0	full	17.23	4.00	21.23	36	PASS

802.11ax_HE20M_2TX

CH	Freq. (MHz)	Data Rate	RU Config	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit	RESULT
				Ch0	Ch1					
1	2412	MCS0	full	20.68	20.85	23.78	4.00	27.78	36	PASS
6	2437	MCS0	full	20.53	20.83	23.69	4.00	27.69	36	PASS
10	2457	MCS0	full	20.70	20.53	23.63	4.00	27.63	36	PASS
11	2462	MCS0	full	17.10	17.27	20.20	4.00	24.20	36	PASS

802.11ax_HE_40M Ch0

CH	Freq. (MHz)	Data Rate	RU Config	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit	RESULT
3	2422	MCS0	full	20.80	4.00	24.80	36	PASS
6	2437	MCS0	full	17.97	4.00	21.97	36	PASS
7	2442	MCS0	full	17.68	4.00	21.68	36	PASS
8	2447	MCS0	full	19.00	4.00	23.00	36	PASS
9	2452	MCS0	full	13.65	4.00	17.65	36	PASS

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802.11ax_HE_40M Ch1

CH	Freq. (MHz)	Data Rate	RU Config	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit	RESULT
3	2422	MCS0	full	21.18	4.00	25.18	36	PASS
6	2437	MCS0	full	18.19	4.00	22.19	36	PASS
7	2442	MCS0	full	18.23	4.00	22.23	36	PASS
8	2447	MCS0	full	18.91	4.00	22.91	36	PASS
9	2452	MCS0	full	13.37	4.00	17.37	36	PASS

802.11ax_HE40M_2TX

CH	Freq. (MHz)	Data Rate	RU Config	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit	RESULT
				Ch0	Ch1					
3	2422	MCS0	full	20.82	21.22	24.03	4.00	28.03	36	PASS
6	2437	MCS0	full	18.02	18.24	21.14	4.00	25.14	36	PASS
7	2442	MCS0	full	17.71	18.25	20.99	4.00	24.99	36	PASS
8	2447	MCS0	full	19.04	18.94	22.00	4.00	26.00	36	PASS
9	2452	MCS0	full	13.68	13.41	16.55	4.00	20.55	36	PASS

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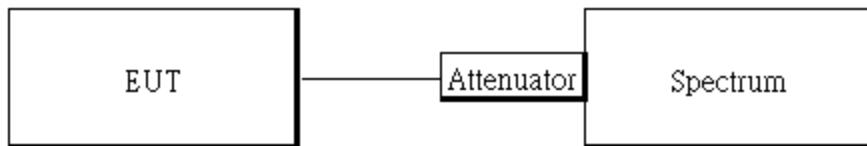
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9 EMISSION BANDWIDTH MEASUREMENT

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. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

9.3.1 6dB BW measurements

1. The testing follows the Measurement Procedure of the KDB 558074 D01.
2. Set the spectrum analyzer as
 $RBW = 100 \text{ kHz}$,
 $VBW = 3 \times RBW$,
 $Span = 2 \text{ to } 5 \text{ times of the OBW}$,
 $Sweep = \text{auto}$, $\text{Detector} = \text{Peak}$, and Max hold .
3. Mark the upper and lower frequencies of -6dB .
4. Repeat above procedures until all test default channel is completed.

9.3.2 99% BW measurements

1. The testing follows the Measurement Procedure of the RSS-Gen section 6.7.
2. Set the spectrum analyzer as
 $RBW = 1\% \text{ to } 5\% \text{ of } 99\%$,
 $VBW \geq 3 \times RBW$,
 $Span = \text{large enough to capture all products of the modulation process}$
 $Sweep = \text{auto}$, $\text{Detector} = \text{Peak}$, and Max hold .
3. Mark the upper and lower frequencies of 99%.
4. Repeat above procedures until all test default channel is completed.

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9.4 Measurement Result:

9.4.1 6dB BW measurements

802.11b Ch0

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	8101.00	≥ 500	PASS
2437	8090.00	≥ 500	PASS
2462	8123.00	≥ 500	PASS

802.11b Ch1

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	8067.00	≥ 500	PASS
2437	7668.00	≥ 500	PASS
2462	7650.00	≥ 500	PASS

802.11g Ch0

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	16340.00	≥ 500	PASS
2437	16320.00	≥ 500	PASS
2462	15850.00	≥ 500	PASS

802.11g Ch1

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	15640.00	≥ 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	17300.00	≥ 500	PASS
2437	16910.00	≥ 500	PASS
2462	16950.00	≥ 500	PASS

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802.11n_HT_20M Ch1

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	15950.00	≥ 500	PASS
2437	15760.00	≥ 500	PASS
2462	15940.00	≥ 500	PASS

802.11n_HT_40M Ch0

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2422	35510.00	≥ 500	PASS
2437	35470.00	≥ 500	PASS
2452	35540.00	≥ 500	PASS

802.11n_HT_40M Ch1

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2422	34760.00	≥ 500	PASS
2437	35730.00	≥ 500	PASS
2452	35780.00	≥ 500	PASS

802.11ax_HE_20M Ch0

Freq. (MHz)	RU Config	6dB BW (kHz)	Limit (kHz)	Result
2412	full	18690.00	≥ 500	PASS
2437	full	18330.00	≥ 500	PASS
2462	full	17630.00	≥ 500	PASS

802.11ax_HE_20M Ch1

Freq. (MHz)	RU Config	6dB BW (kHz)	Limit (kHz)	Result
2412	full	17730.00	≥ 500	PASS
2437	full	16670.00	≥ 500	PASS
2462	full	17940.00	≥ 500	PASS

802.11ax_HE_40M Ch0

Freq. (MHz)	RU Config	6dB BW (kHz)	Limit (kHz)	Result
2422	full	37340.00	≥ 500	PASS
2437	full	37330.00	≥ 500	PASS
2452	full	37830.00	≥ 500	PASS

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802.11ax_HE_40M Ch1

Freq. (MHz)	RU Config	6dB BW (kHz)	Limit (kHz)	Result
2422	full	37250.00	≥ 500	PASS
2437	full	37070.00	≥ 500	PASS
2452	full	37470.00	≥ 500	PASS

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802.11b_20MHz_Chain0_2412MHz



802.11b 20MHz Chain1 2412MHz



802.11b 20MHz Chain0 2437MHz



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802.11g_20MHz_Chain0_2412MHz



802.11g_20MHz_Chain1_2412MHz



802.11g_20MHz_Chain1_2412MHz



802.11g_20MHz_Chain1_2437MHz



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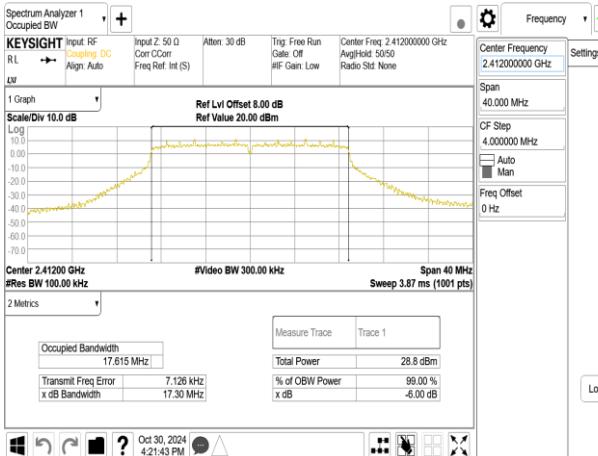
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802.11n_20MHz_Chain0_2412MHz



802.11n_20MHz_Chain1_2412MHz



802.11n_20MHz_Chain1_2412MHz



802.11n_20MHz_Chain1_2437MHz



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802.11n_40MHz_Chain0_2422MHz



802.11n_40MHz_Chain1_2437MHz



802.11n_40MHz_Chain1_2422MHz



802.11n_40MHz_Chain0_2452MHz



802.11n_40MHz_Chain0_2437MHz



802.11n_40MHz_Chain1_2452MHz



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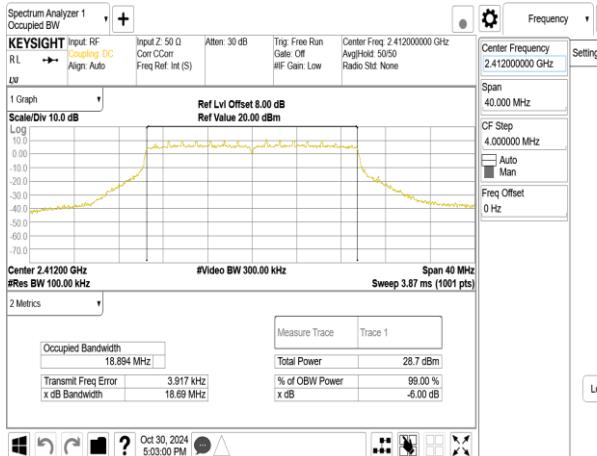
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802.11ax_20MHz_Chain0_2412MHz



802.11ax_20MHz_Chain1_2437MHz



802.11ax 20MHz Chain1 2412MHz



802.11ax 20MHz Chain0 2462MHz



802.11ax 20MHz Chain0 2437MHz



802.11ax 20MHz Chain1 2462MHz



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802.11ax_40MHz_Chain0_2422MHz



802.11ax_40MHz_Chain1_2437MHz



802.11ax_40MHz_Chain1_2422MHz



802.11ax_40MHz_Chain0_2452MHz



802.11ax_40MHz_Chain0_2437MHz



802.11ax_40MHz_Chain1_2452MHz



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9.4.2 99% Bandwidth

802.11b Ch0

Freq. (MHz)	99% BW (MHz)
2412	13.071
2437	13.041
2462	12.967

802.11b Ch1

Freq. (MHz)	99% BW (MHz)
2412	12.873
2437	12.828
2462	12.874

802.11g Ch0

Freq. (MHz)	99% BW (MHz)
2412	16.53
2437	16.5
2462	16.446

802.11g Ch1

Freq. (MHz)	99% BW (MHz)
2412	16.419
2437	16.406
2462	16.44

802.11n_HT20M Ch0

Freq. (MHz)	99% BW (MHz)
2412	17.693
2437	17.662
2462	17.592

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802.11n_HT20M Ch1

Freq. (MHz)	99% BW (MHz)
2412	17.59
2437	17.585
2462	17.599

802.11n_HT40M Ch0

Freq. (MHz)	99% BW (MHz)
2422	36.067
2437	36.116
2452	36.107

802.11n_HT40M Ch1

Freq. (MHz)	99% BW (MHz)
2422	36.161
2437	36.098
2452	36.126

802.11ax_HE20M Ch0

Freq. (MHz)	RU Config	99% BW (MHz)
2412	full	18.951
2437	full	18.955
2462	full	18.888

802.11ax_HE20M Ch1

Freq. (MHz)	RU Config	99% BW (MHz)
2412	full	18.907
2437	full	18.904
2462	full	18.914

802.11ax_HE40M Ch0

Freq. (MHz)	RU Config	99% BW (MHz)
2422	full	37.679
2437	full	37.68
2452	full	37.734

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802.11ax_HE40M Ch1

Freq. (MHz)	RU Config	99% BW (MHz)
2422	full	37.811
2437	full	37.748
2452	full	37.731

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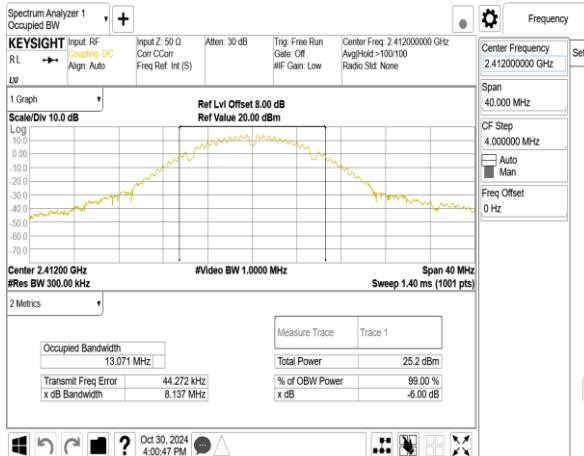
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802.11g_20MHz_Chain0_2412MHz



802.11g 20MHz Chain1 2412MHz

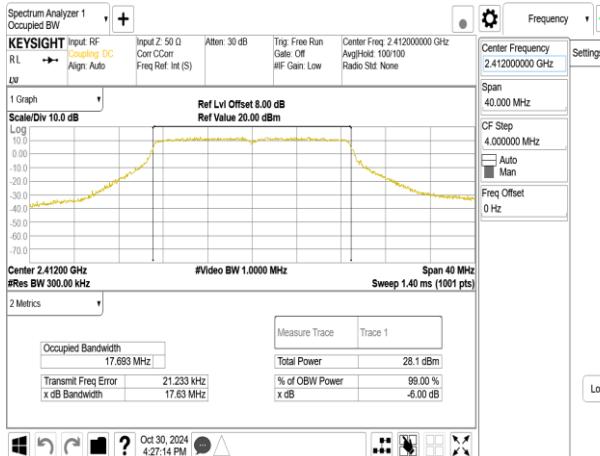


802.11g 20MHz Chain0 2437MHz



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802.11n 20MHz Chain1 2412MHz



802.11n 20MHz Chain0 2437MHz



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