

FCC Test Report

Test Report
On Behalf of
Winner Wave Limited
For
Pocket
Model No.: R-2, R-1, XR-1, ZR-1

FCC ID: 2ADFS-POCKET-R-2

Prepared For: Winner Wave Limited

Unit 2003 Cheong Tai Commercial Building 287-289 Reclamation Street,

Kowloon, Hong Kong

Prepared By: Shenzhen HUAK Testing Technology Co., Ltd.

1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping,

Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Date of Test: Oct. 24, 2024 ~ Nov. 07, 2024

Date of Report: Nov. 07, 2024

Report Number: HK2410246283-1E



Test Result Certification

Applicant's Name.....: Winner Wave Limited

Address Unit 2003 Cheong Tai Commercial Building 287-289 Reclamation

Street, Kowloon, Hong Kong

Manufacturer's Name Actions Microelectronics Co., Ltd.

Address 201, No.9 Building, Software Park, KeJiZhongEr Road,

GaoXinQu, NanShan, Shenzhen, China

Product Description

Trade Mark EZCast

Product Name..... Pocket

Model and/or Type Reference: R-2, R-1, XR-1, ZR-1

FCC Rules and Regulations Part 15 Subpart C Section 15.247

..... ANSI C63.10: 2013

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Date of Test

Date (s) of Performance of Tests Oct. 24, 2024 ~ Nov. 07, 2024

Test Result..... Pass

Testing Engineer

. .

Len Liao

Technical Manager

iox vuont

Sliver Wan

Authorized Signatory

Jason Whou

Jason Zhou



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** Modified History **

Revision	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	Nov. 07, 2024	Jason Zhou
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1. Test Result Summary

1.1 Test Procedures and Results

-711	-711	_7111"
Requirement	CFR 47 Section	Result
Antenna requirement	§15.203/§15.247(b)(4)	PASS
AC Power Line Conducted Emission	§15.207	PASS
Conducted Peak Output Power	§15.247(b)(3)	PASS
6dB Emission Bandwidth	§15.247(a)(2)	PASS
Power Spectral Density	§15.247(e)	PASS
Band Edge	§15.247(d)	PASS
Spurious Emission	§15.205/§15.209	PASS

Note:

- 1. PASS: Test item meets the requirement.
- 2. Fail: Test item does not meet the requirement.
- 3. N/A: Test case does not apply to the test object.
- 4. The test result judgment is decided by the limit of test standard.

1.2 Information of the Test Laboratory

Shenzhen HUAK Testing Technology Co., Ltd.

Add.: 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Testing Laboratory Authorization:

A2LA Accreditation Code is 4781.01. FCC Designation Number is CN1229. Canada IC CAB identifier is CN0045. CNAS Registration Number is L9589.



1.3 Measurement Uncertainty

The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %

No.	Item	MU
1	Conducted Emission	±2.71dB
2	RF Power, Conducted	±0.37dB
3	Spurious Emissions, Conducted	±0.11dB
4	All Emissions, Radiated(<1G)	±3.90dB
5	All Emissions, Radiated(>1G)	±4.28dB
6	Temperature	±0.1°C
7	Humidity	±1.0%

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2. EUT Description

2.1 General Description of EUT

Equipment:	Pocket	WAK TESTING	"IAK TESTING
Model Name:	R-2	(a)	(i)
Series Model:	R-1, XR-1, ZR-1	AK TESTING	a)G
Model Difference:	All model's the function, softw same, only with product mode model: R-2.		
FCC ID:	2ADFS-POCKET-R-2		
Antenna Type:	Iron sheet antenna	1 HUAVE	O HUAN
Antenna Gain:	3.04dBi		
Operation Frequency:	802.11b/g/n 20:2412~2462 M	Hz MAK TESTING	WAY TESTING
Number of Channels:	802.11b/g/n20: 11CH		
Modulation Type:	DSSS, OFDM	WAY TESTING	TNG.
Power Source:	DC5V from Type-C	9"	HUAKTES
Power Rating:	DC5V from Type-C	TESTING	9

Note:

- 1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- 2. Antenna gain Refer to the antenna specifications.
- 3. The cable loss data is obtained from the supplier.
- 4. The test results in the report only apply to the tested sample.

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2.2 Carrier Frequency of Channels

	Char	nnel List F	or 802.11b	/802.11g/8	302.11n (HT	20)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	04	2427	07	2442	10	2457
02	2417	05	2432	08	2447	11	2462
03	2422	06	2437	09	2452	-STING	

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

2.3 Operation of EUT during Testing

Operating Mode

The mode is used: Transmitting mode for 802.11b/802.11g/802.11n (HT20)

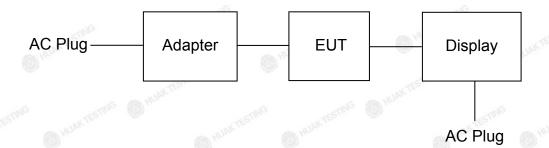
Low Channel: 2412MHz Middle Channel: 2437MHz High Channel: 2462MHz

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2.4 Description of Test Setup

Operation of EUT during Conducted and Radiation below 1GHz testing:



Operation of EUT during Radiation Above 1GHz testing:



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



3. General Information

3.1 Test Environment and Mode

perating Environment:			
Temperature:	25.0 °C	HUAKTESI	HUAKT
Humidity:	56 % RH	9	0
Atmospheric Pressure:	1010 mbar	AK TESTING	
est Mode:		4.150	213-
Engineering Mode:	Keep the EUT in continuous transmitting by select channel and modulations		

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

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We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

Per-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.

Mode	Data rate
802.11b	1Mbps
802.11g	6Mbps
802.11n(H20)	6.5Mbps

Final Test Mode:

Operation mode:	Keep the EUT in continuous transmitting
Operation mode.	with modulation

- 1. For WIFI function, the engineering test program was provided and enabled to make EUT continuous transmit/receive.
- 2.According to ANSI C63.10 standards, the test results are both the "worst case" and "worst setup" 1Mbps for 802.11b, 6Mbps for 802.11g, 6.5Mbps for 802.11n(H20).

3. Mode Test Duty Cycle

The state of the s		Photogra
Mode	Duty Cycle	Duty Cycle Factor (dB)
802.11b	0.918	-0.371
802.11g	0.918	-0.371
802.11n(H20)	0.918	-0.371

Test plots as follows:

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3.2 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Trade Mark	Model/Type No.	Specification	Remark
CTEST ⁴ IG	Pocket	EZCast	R-2	N/A	EUT
2	USB Cable	N/A	N/A	Length: 100cm	Accessory
3	Adapter	N/A	MDY-10-EH	Input: AC100-240V, 50/60Hz, 0.7A Output: DC5V/3A, 9V/3A, 12V/2.25A, 20V/1.35A	Peripheral
4	Display	AOC	N/A	N/A	Peripheral
TESTIN) TESTINE	75 TB	6 757016	TE PORT	TESTING
MAKTESTAV	THAN TESTINE	WANTES TO	S MAKTESTAIG	WALK TEFFINE	

Note:

- 1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
- 2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.
- 3. For conducted measurements (Output Power, 6dB Emission Bandwidth, Power Spectral Density, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.

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4. Test Results and Measurement Data

4.1 Conducted Emission

Test Specification

TING	TING	TING	TING	717	
Test Requirement:	FCC Part15 C Secti	on 15.207	AKTE	HUAKTES	
Test Method:	ANSI C63.10:2013				
Frequency Range:	150 kHz to 30 MHz	HUAKTE	.015	ESTING	
Receiver Setup:	RBW=9 kHz, VBW=	30 kHz, Sweep	time=auto		
Limits:	Frequency range (MHz) 0.15-0.5 0.5-5 5-30	Limit (d Quasi-peak 66 to 56* 56 60	AVerage 56 to 46* 46 50	AN TESTING	
Test Setup:	Reference Plane 40cm E.U.T AC power 80cm Filter AC power Remark E.U.T. Equipment Under Test LISN Line Impedence Stabilization Network Test table height=0.8m				
Test Mode:	Transmitting with mo	odulation			
Test Procedure:	 The E.U.T is connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement. 				

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Test Instruments

Conducted Emission Shielding Room Test Site (843)							
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due		
Receiver	R&S	ESR	HKE-005	Feb. 20, 2024	Feb. 19, 2025		
LISN	R&S	ENV216	HKE-002	Feb. 20, 2024	Feb. 19, 2025		
LISN	R&S	ENV216	HKE-059	Feb. 20, 2024	Feb. 19, 2025		
Coax cable (9KHz-30MHz)	Times	381806-002	N/A	Feb. 20, 2024	Feb. 19, 2025		
EMI Test Software	Tonscend	JS32-CE 2.5.0.6	HKE-081	Feb. 20, 2024	Feb. 19, 2025		
10dB Attenuator	Schwarzbeck	VTSD9561F	HKE-153	Feb. 20, 2024	Feb. 19, 2025		

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

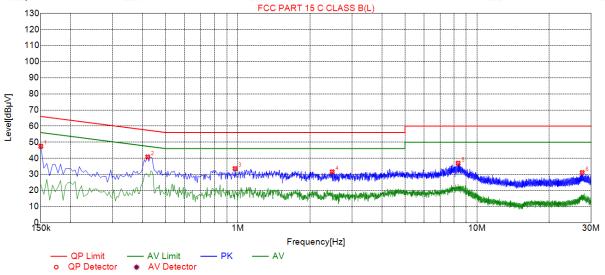
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4.2 Test Result

All modes have been tested, only the worst result was reported as below:





Suspected List

- 1		•							
3	NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµ∀]	Detector	Туре
	1	0.1500	47.46	19.83	66.00	18.54	27.63	PK	L
90	2	0.4200	40.83	19.84	57.45	16.62	20.99	PK	L
70	3	0.9735	33.55	19.87	56.00	22.45	13.68	PK	L
	4	2.4810	31.63	20.01	56.00	24.37	11.62	PK	L
77	5	8.3355	36.97	20.02	60.00	23.03	16.95	PK	L
	6	27.5280	31.12	20.21	60.00	28.88	10.91	PK	L

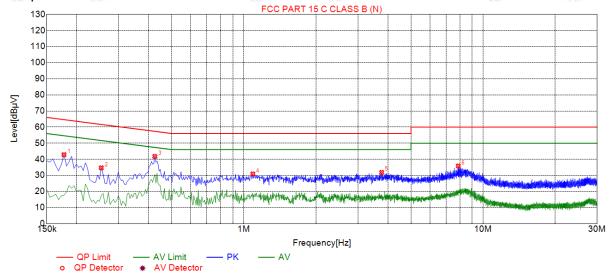
Remark: Margin = Limit - Level

Correction factor = Cable lose + ISN insertion loss

Level=Test receiver reading + correction factor







Sus	Suspected List									
NO.	Freq. [MHz]	Level [dBµ∀]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµ∀]	Detector	Туре		
1	0.1770	42.86	19.75	64.63	21.77	23.11	PK	N		
2	0.2535	34.67	19.74	61.64	26.97	14.93	PK	N		
3	0.4245	41.78	19.74	57.36	15.58	22.04	PK	N		
4	1.0905	30.88	19.75	56.00	25.12	11.13	PK	N		
5	3.7680	31.82	19.97	56.00	24.18	11.85	PK	N		
6	7.8855	35.82	19.93	60.00	24.18	15.89	PK	N		

Remark: Margin = Limit - Level

Correction factor = Cable lose + ISN insertion loss

Level=Test receiver reading + correction factor

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4.3 Maximum Conducted Output Power

Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (b)(3)					
Test Method:	KDB 558074 D01 15.247 Meas Guidance v05r02					
Limit:	30dBm					
Test Setup:	RF automatic control unit EUT HUMATESTING HUMATESTING					
Test Mode:	Transmitting mode with modulation					
Test Procedure:	 The testing follows the Measurement Procedure of FCC KDB 558074 D01 15.247 Meas Guidance v05r02. The RF output of EUT was connected to the RF automatic control unit by RF cable and attenuator. The path loss was compensated to the results for each measurement. Set to the maximum power setting and enable the EUT transmit continuously. Measure the Peak output power and record the results in the test report. 					
Test Result:	PASS					

TION



Test Instruments

RF Test Room								
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due			
Spectrum analyzer	Agilent	N9020A	HKE-025	Feb. 20, 2024	Feb. 19, 2025			
Power meter	Agilent	E4419B	HKE-085	Feb. 20, 2024	Feb. 19, 2025			
Power Sensor	Agilent	E9300A	HKE-086	Feb. 20, 2024	Feb. 19, 2025			
RF cable	Times	1-40G	HKE-034	Feb. 20, 2024	Feb. 19, 2025			
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 20, 2024	Feb. 19, 2025			
RF Test Software	Tonscend	JS1120-3 Version 3.3.23	HKE-083	Feb. 20, 2024	Feb. 19, 2025			

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).



Test Data

		TX 802.11b Mode	
Test Channel	Frequency	Maximum Peak Conducted Output Power	LIMIT
	(MHz)	(dBm)	dBm
CH01	2412	12.42	30
CH06	2437	13.91	30
CH11	2462	12.66	30
STING HUAK TESTIN		TX 802.11g Mode	TING HUAKTE
CH01	2412	12.22	30
CH06	2437	12.19	30
CH11	2462	12.23	30
		TX 802.11n20 Mode	
CH01	2412	12.82	30
CH06	2437	12.90	30
CH11	2462	12.44	30

Note: The test results including the cable loss.

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4.4 Emission Bandwidth

Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (a)(2)					
Test Method:	KDB 558074 D01 15.247 Meas Guidance v05r02					
Limit:	>500kHz	W. TESTING				
Test Setup:	Spectrum Analyzer	EUT NAME TO STORE				
Test Mode:	Transmitting mode with modul	lation				
Test Procedure:	 The testing follows FCC KDB Publication 558074 D01 15.247 Meas Guidance v05r02. Set to the maximum power setting and enable the EUT transmit continuously. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6dB bandwidth must be greater than 500 kHz. Measure and record the results in the test report. 					
Test Result:	PASS	O HUMA O HE				

Test Instruments

RF Test Room						
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due	
Spectrum analyzer	Agilent	N9020A	HKE-025	Feb. 20, 2024	Feb. 19, 2025	
RF cable	Times	1-40G	HKE-034	Feb. 20, 2024	Feb. 19, 2025	
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 20, 2024	Feb. 19, 2025	
RF Test Software	Tonscend	JS1120-3 Version 3.3.23	HKE-083	N/A	N/A	

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

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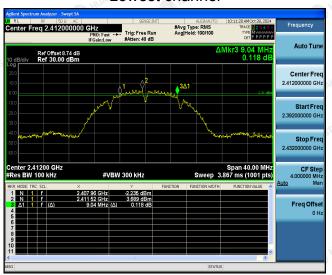
Test Data

Took Observed	6dB Emission Bandwidth (MHz)				
Test Channel	802.11b	802.11g	802.11n(H20)		
Lowest	9.040	13.840	13.800		
Middle	9.120	12.560	13.120		
Highest	9.000	13.840	13.760		
Limit:		>500kHz	(I) HUAD		
Test Result:	JUANTESTINA	PASS			

Test plots as follows:

802.11b Modulation

Lowest channel



Middle channel



Highest channel

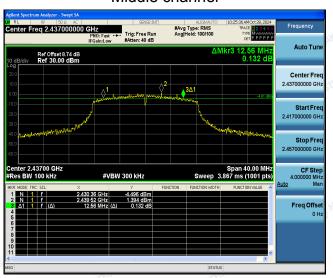


802.11g Modulation

Lowest channel



Middle channel



Highest channel



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802.11n (HT20) Modulation

Lowest channel



Middle channel



Highest channel







4.5 Power Spectral Density

Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	KDB 558074 D01 15.247 Meas Guidance v05r02
Limit:	The average power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.
Test Setup:	Spectrum Analyzer EUT
Test Mode:	Transmitting mode with modulation
Test Procedure:	 The testing follows Measurement procedure 10.2 method PKPSD of FCC KDB Publication 558074 D01 15.247 Meas Guidance v05r02. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. Set to the maximum power setting and enable the EUT transmit continuously. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW): 3 kHz ≤ RBW ≤ 100 kHz. Video bandwidth VBW ≥ 3 x RBW. Set the span to at least 1.5 times the OBW. Detector = Peak, Sweep time = auto couple. Employ trace averaging (Peak) mode over a minimum of 100 traces. Use the peak marker function to determine the maximum power level. Measure and record the results in the test report.
Test Result:	PASS



Test Instruments

RF Test Room							
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due		
Spectrum analyzer	Agilent	N9020A	HKE-025	Feb. 20, 2024	Feb. 19, 2025		
RF cable	Times (1-40G	HKE-034	Feb. 20, 2024	Feb. 19, 2025		
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 20, 2024	Feb. 19, 2025		
RF Test Software	Tonscend	JS1120-3 Version 3.3.23	HKE-083	N/A	N/A		

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).



Test Data

_			_	
EUT Set Mode	Channel	Result (dBm/30KHz)	Result (dBm/3kHz)	
802.11b	Lowest	-0.13	-10.13	
	Middle	0.95	-9.05	
	Highest	-1.67	-11.67	
802.11g	Lowest	-1.76	-11.76	
	Middle	-1.72	-11.72	
	Highest	-3.11	-13.11	
802.11n(H20)	Lowest	-0.21	-10.21	
	Middle	-0.94	-10.94	
	Highest	-3.72	-13.72	
PSD Test Resu	It (dBm/3kHz)= P	SD Test Result (dBm/30kl	Hz)-10	
Limit: 8dBm/3kl	Hz			
Test Result:	TESTIN	PASS	TESTING	
		1973	100	

Test plots as follows:

802.11b Modulation

Lowest channel



Middle channel

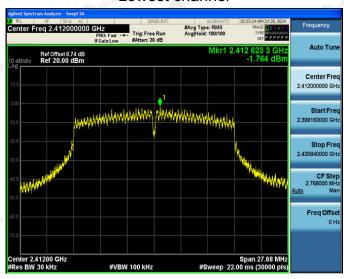


Highest channel

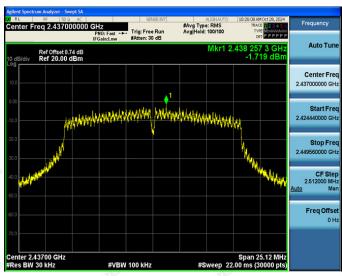


802.11g Modulation

Lowest channel



Middle channel

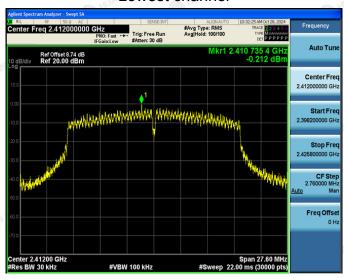


Highest channel



802.11n (HT20) Modulation

Lowest channel



Middle channel



Highest channel





4.6 Conducted Band Edge and Spurious Emission Measurement

Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (d)				
Test Method:	KDB 558074 D01 15.247 Meas Guidance v05r02				
Limit:	In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement and radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).				
Test Setup:	Spectrum Analyzer EUT				
Test Mode:	Transmitting mode with modulation				
Test Procedure:	 Transmitting mode with modulation The testing follows FCC KDB Publication 558074 D01 15.247 Meas Guidance v05r02. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. Set to the maximum power setting and enable the EUT transmit continuously. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d). Measure and record the results in the test report. The RF fundamental frequency should be excluded against the limit line in the operating frequency band. 				
Test Result:	PASS				

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Test Instruments

RF Test Room							
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due		
Spectrum analyzer	Agilent	N9020A	HKE-025	Feb. 20, 2024	Feb. 19, 2025		
High pass filter unit	Tonscend	JS0806-F	HKE-055	Feb. 20, 2024	Feb. 19, 2025		
RF Cable (9KHz-26.5GHz)	Tonscend	170660	N/A	Feb. 20, 2024	Feb. 19, 2025		
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 20, 2024	Feb. 19, 2025		
RF Test software	Tonscend	JS1120-B Version 2.6	HKE-083	N/A	N/A		

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

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