

FCC Test Report

Test report
On Behalf of
Shenzhen Ningyuanda Technology Co., Ltd
For
WIFI CAMERA
Model No.: DP16

FCC ID: 2BEXJ-DP16

Prepared For: Shenzhen Ningyuanda Technology Co., Ltd

402 Kaiteng Building, Bantian Street, Longgang District, Shenzhen, China

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: Sept. 27, 2024 ~ Nov. 11, 2024

Date of Report: Nov. 11, 2024

Report Number: HK2409275700-E



Test Result Certification

Applicant's name Shenzhen Ningyuanda Technology Co., Ltd

402 Kaiteng Building, Bantian Street, Longgang District,

Shenzhen, China

Manufacturer's Name Shenzhen Ningyuanda Technology Co., Ltd

402 Kaiteng Building, Bantian Street, Longgang District,

Shenzhen, China

Product description

Trade Mark N/A

Product name....: WIFI CAMERA

Model and/or type reference...: DP16

FCC Rules and Regulations Part 15 Subpart C Section 15.247

ANSI C63.10: 2013

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Date of Test:

Date of Issue...... Nov. 11, 2024

Test Result..... Pass

Testing Engineer

en lian

(Len Liao)

Technical Manager

Whom

(Sliver Wan)

Authorized Signatory:

Jason Www

(Jason Zhou)



Table of Contents

1.	Test Result Summary	5
	1.1. Test Procedures and Results	5
	1.2. Information of the Test Laboratory	5
	1.3. Measurement Uncertainty	
2.		7
	2.1. General Description of EUT	
	2.2. Carrier Frequency of Channels	
	2.3. Operation of EUT During Testing	
	2.4. Description of Test Setup	9
	2.5. Description of Support Units	10
3.		11
	3.1. Test Environment and Mode	11
4.	Test Results and Measurement Data	13
	4.1. Conducted Emission	13
	4.2. Test Result	
	4.3. Maximum Conducted Output Power	17
	4.4. Emission Bandwidth	19
	4.5. Power Spectral Density	27
	4.6. Conducted Band Edge and Spurious Emission Measurement	36
	4.7. Radiated Spurious Emission Measurement	46
	4.8. Antenna Requirement	72
5.	Photograph of Test	73
G	Photos of the EUT	75





** Modified History **

Revision	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	Nov. 11, 2024	Jason Zhou
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1. Test Result Summary

1.1. Test Procedures and Results

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.

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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 HUMETE	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:	WIFI CAMERA	
Model Name:	DP16	
Series Model:	N/A HUMPTESTING	HUAKTESTING
Model Difference:	N/A	
FCC ID:	2BEXJ-DP16	HUAK TESTING
Antenna Type:	FPC Antenna	9
Antenna Gain:	3dBi	STIN
Operation frequency:	802.11b/g/n (HT20):2412~2462 MHz 802.11 (HT40):2422~2452 MHz	MUAK TO
Number of Channels:	802.11b/g/n(HT20): 11CH 802.11 (HT40): 7CH	TESTING
Modulation Type:	DSSS, OFDM	HUAN
Power Source:	Input: 110-240V~, 50/60Hz, 9.7W Max	TING
Power Rating:	Input: 110-240V~, 50/60Hz, 9.7W Max	MAK TEST
Hardware Version:	V2.0	
Software Version:	V2.0°	V TESTIV

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

Channel List For 802.11b/802.11g/802.11n (HT20)							
Channel	Channel Frequency (MHz) Channel Frequency (MHz) Channel Frequency (MHz) Channel Frequency (MHz)						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	

Channel List For 802.11n (HT40) Channel Frequency (MHz) Channel Frequency (MHz) Channel Channel (MHz) Channel (MHz) Channel (MHz)							
STING_	XTESTING (04	2427	07	2442	- TESTIN	WTE
@ H		05	2432	08	2447	HILAK	Monage Home
03	2422	06	2437	09	2452		

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

The mode is used: Transmitting mode for 802.11n (HT40)

Low Channel: 2422MHz Middle Channel: 2437MHz High Channel: 2452MHz

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2.4. Description of Test Setup

Operation of EUT during radiation testing and conducted 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.

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2.5. 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
1	WIFI CAMERA	N/A	DP16	N/A	EUT
N TE	TIME	MD.	AKTESTING WAKTESTING	OKTESTINES	WAY TESTING WHO

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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3. Genera Information

3.1. Test Environment and Mode

Operating Environment:			
Temperature:	25.0 °C	WAK TEST	HUAKTE
Humidity:	56 % RH		(1)
Atmospheric Pressure:	1010 mbar	ONTESTING	.vG
Test Mode:			
Engineering mode: Keep the EUT in continuous transmitting by select channel and modulations			

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(HT20)	6.5Mbps
802.11n(HT40)	13.5Mbps

Final Test Mode:

Operation mode	the EUT in continuous transmitting modulation
----------------	-----------------------------------------------

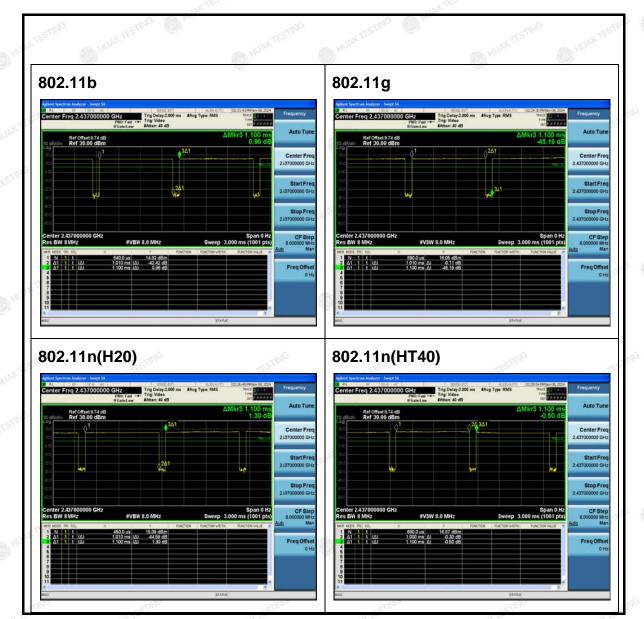
- 1. For WIFI function, the engineering test program was provided and enabled to make EUT continuous transmit/receive.
- 2.According to ANSI C63.10 standards, the test results are both the "worst case" and "worst setup" 1Mbps for 802.11b, 6Mbps for 802.11g, 6.5Mbps for 802.11n(HT20), 13.5Mbps for 802.11n(HT40).

3. Mode Test Duty Cycle

Mode	Duty Cycle	Duty Cycle Factor (dB)
802.11b	0.92	-0.37
802.11g	0.92	-0.37
802.11n(HT20)	0.92	-0.37
802.11n(HT40)	0.91 NOW	-0.41

Test plots as follows:

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4. Test Results and Measurement Data

4.1. Conducted Emission

Test Specification

TING	TIME	TING	TING	Mr.			
Test Requirement:	FCC Part15 C Secti	on 15.207	AKTE	HUAKTES			
Test Method:	ANSI C63.10:2013		TING				
Frequency Range:	150 kHz to 30 MHz	150 kHz to 30 MHz					
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 (c Quasi-peak 66 to 56* 56 60	Average 56 to 46* 46 50	WESTNE			
Test Setup:	40cm	blane EMI Receiver] ter — AC power	ANTESTA.			
Test Mode:	transmitting with mo	dulation	AK TESTING	WAK TESTIN			
Test Procedure:	1. The E.U.T is conline impedance is provided a 50 ohr measuring equipmed. The peripheral depower through a coupling impedance refer to the bloophotographs). 3. Both sides of A. conducted interfeemission, the relating interface cab ANSI C63.10: 207	stabilization netwon/50uH couplingment. evices are also conceed LISN that province with 50ohm ock diagram of the coupling are chartive positions of oles must be chartive positions of the coupling are chartive positions of the coupling are chartive positions of the coupling are charting are	work (L.I.S.N g impedance onnected to the ides a 50ohr termination. (the test set to find the material anged according impediance)	ne main m/50uH (Please up and aximum aximum ad all of ding to			
Test Result:	PASS	NKTE	TING	nIG			
25"	1 TO	NEW AIRWAY		100			

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Test Instruments

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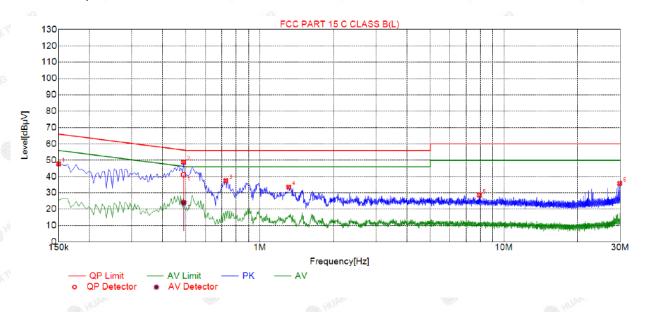
4.2. Test Result

Remark: All the test modes completed for test. only the worst result

Report No.: HK2409275700-E

Of was reported as below: Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)

Test Specification: Line



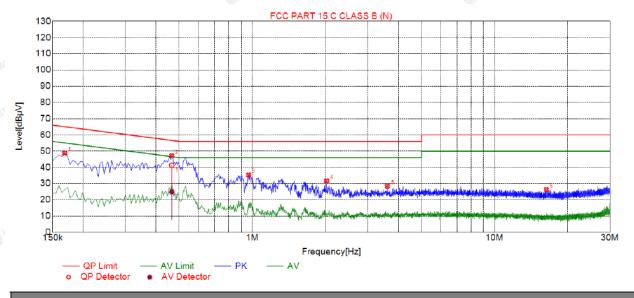
Sus	Suspected List									
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Туре		
1	0.1500	47.79	19.83	66.00	18.21	27.96	PK	L		
2	0.4875	48.74	19.84	56.21	7.47	28.90	PK	L		
3	0.7260	37.41	19.86	56.00	18.59	17.55	PK	L		
4	1.3155	33.54	19.91	56.00	22.46	13.63	PK	L		
5	7.9440	28.65	20.03	60.00	31.35	8.62	PK	L		
6	29.8545	35.84	20.26	60.00	24.16	15.58	PK	L		

Final	Final Data List										
NO.	Freq. [MHz]	Correction factor[dB]	QP Value [dBµV]	QP Limit [dΒμV]	QP Margin [dB]	QP Reading [dBμV]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	ΑV Reading [dBμV]	Туре
1	0.4875	19.84	41.15	56.21	15.06	21.31	24.06	46.21	22.15	4.22	L

Remark: Margin = Limit - Level

Correction factor = Cable lose + LISN insertion loss Level=Test receiver reading + correction factor

Test Specification: Neutral



7,77	Sus	Suspected List									
	NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Туре		
	1	0.1680	48.76	19.71	65.06	16.30	29.05	PK	N		
	2	0.4650	47.18	19.73	56.60	9.42	27.45	PK	N		
	3	0.9645	35.37	19.74	56.00	20.63	15.63	PK	N		
	4	2.0265	31.69	19.84	56.00	24.31	11.85	PK	N		
	5	3.6105	28.37	19.97	56.00	27.63	8.40	PK	N		
N.	6	16.3680	26.42	19.84	60.00	33.58	6.58	PK	N		

ı	Final Data List											
X's	NO.	Freq. [MHz]	Correction factor[dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	QP Reading [dBμV]	AV Value [dBµV]	AV Limit [dΒμV]	AV Margin [dB]	AV Reading [dBµV]	Туре
	1	0.4650	19.73	41.26	56.60	15.34	21.53	24.94	46.60	21.66	5.21	N

Remark: Margin = Limit – Level

Correction factor = Cable lose + LISN insertion loss Level=Test receiver reading + correction factor



4.3. Maximum Conducted Output Power

Test Specification

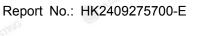
Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	KDB 558074 D01 15.247 Meas Guidance v05r02
Limit:	30dBm
Test Setup:	RF automatic control unit EUT
Test Mode:	Transmitting mode with modulation
Test Procedure:	 The testing follows the Measurement Procedure of FCC KDB 558074 D01 15.247 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 THE REPORT OF THE PASS TH

Test Instruments

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

Test Channel	Frequency	Maximum Peak Conducted Output Power	LIMIT
0110111101	(MHz)	(dBm)	dBm
CH01	2412	13.29	30
CH06	2437	13.61	30
CH11	2462	13.48	30
CH01	2412	10.01	30
CH06	2437	12.51	30
CH11	2462	12.16	30
CH01	2412	12.37	30
CH06	2437	12.68	30
CH11	2462	12.30	30
CH03	2422	11.97	30
CH06	2437	11.83	30
CH09	2452	11.72	30
	Channel CH01 CH06 CH11 CH06 CH11 CH01 CH06 CH11 CH06 CH11 CH06 CH11 CH06	Channel (MHz) CH01 2412 CH06 2437 CH11 2462 CH01 2412 CH06 2437 CH11 2462 CH01 2412 CH06 2437 CH11 2462 CH01 2422 CH03 2422 CH06 2437	Test ChannelFrequency Conducted Output Power(MHz)(dBm)CH01241213.29CH06243713.61CH11246213.48CH01241210.01CH06243712.51CH11246212.16CH01241212.37CH06243712.68CH11246212.30CH03242211.97CH06243711.83

Note: 1. The test results including the cable lose.



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						
Test Setup:	Spectrum Analyzer EUT						
Test Mode:	Transmitting mode with modulation						
Test Procedure:	 The testing follows FCC KDB Publication 558074 D0 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 mus be greater than 500 kHz. Measure and record the results in the test report. 						
Test Result:	PASS						

Test Instruments

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

411	4.17	4.17	4.17	
Test channel		6dB Emission	on Bandwidth (MHz)	
rest channel	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)
Lowest	8.560	16.280	17.600	36.000
Middle	8.040	16.360	17.600	36.080
Highest	7.560	16.360	17.600	36.000
Limit:	, n	AK TESTING HUAK T	>500kHz	TESTING HUAK TESTING
Test Result:	0,	9	PASS	(0)

Test plots as follows:

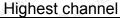
802.11b Modulation

Lowest channel



Middle channel







802.11g Modulation

Lowest channel



Middle channel



Highest channel



802.11n (HT20) Modulation

Lowest channel



Middle channel



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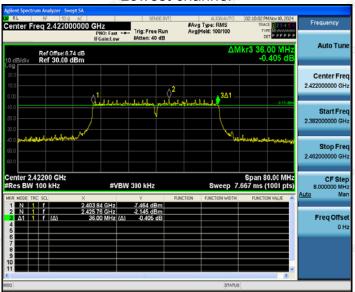
CATION.





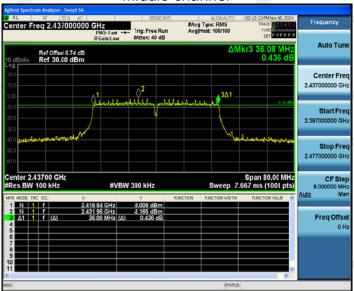
802.11n (HT20) Modulation

Lowest channel



6 of 75 Report No.: HK2409275700-E

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 EU1				
Test Mode:	Transmitting mode with modulation				
Test Procedure:	 Transmitting mode with modulation 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 (Market Market Mar				

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Test Instruments

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

EUT Set Mode	Channel	Test Result (dBm/30kHz)	Result (dBm/3kHz)	
802.11b	Lowest	0.14	-9.86	
	Middle	1.97	-8.03	
	Highest	0.88	-9.12	
802.11g	Lowest	-6.15	-16.15	
	Middle	-2.95	-12.95	
	Highest	-3.35	-13.35	
802.11n(H20)	Lowest	-3.86	-13.86	
	Middle	-3.42	-13.42	
	Highest	-3.69	-13.69	
802.11n(H40)	Lowest	-5.27	-15.27	
	Middle	-5.3	-15.3	
	Highest	-5.38	-15.38	
PSD test result (dE	3m/3kHz)= PSD	test result (dBm/30kl	Hz)-10	
Limit: 8dBm/3kHz				
Test Result:	PASS			
- ak-tu-	TES! NY TES!			

Test plots as follows:

AL

802.11b Modulation

Lowest channel



Middle channel



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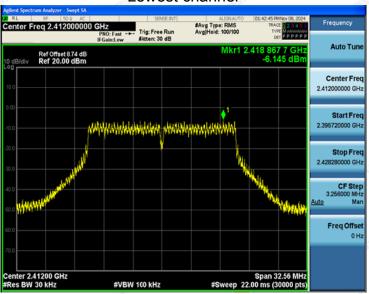






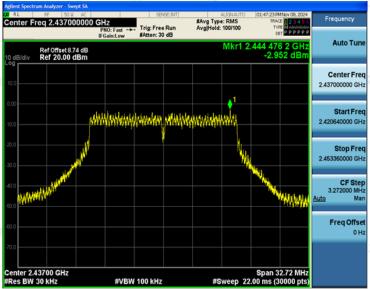
802.11g Modulation

Lowest channel

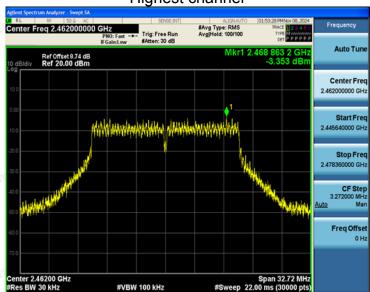




Middle channel



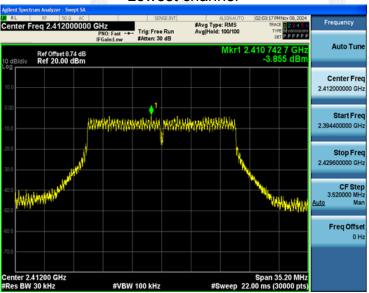
Highest channel



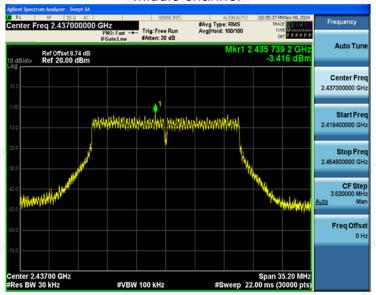


802.11n (HT20) Modulation

Lowest channel

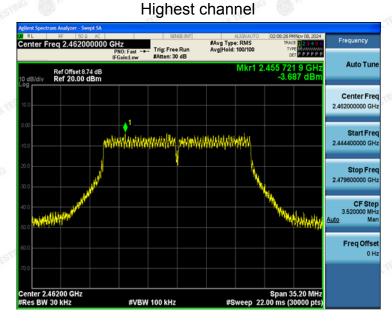


Middle channel



WAK TE

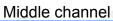
Report No.: HK2409275700-E

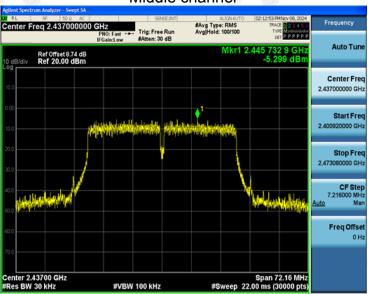


802.11n (HT40) Modulation

Lowest 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 			
Test Result:	PASS			

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Test Instruments

RF Test Room					
Equipment	Manufacturer	Model	Serial Number	Calibration Due	
Spectrum analyzer	Agilent	N9020A	HKE-025	Feb. 19, 2025	
High pass filter unit	Tonscend	JS0806-F	HKE-055	Feb. 19, 2025	
RF Cable (9KHz-26.5GHz)	Tonscend	170660	N/A	Feb. 19, 2025	
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 19, 2025	
RF test software	Tonscend	JS1120-B Version 2.6	HKE-083	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 802.11b Modulation

