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FCC TEST REPORT

Test report On Behalf of Shenzhen Shangjian Technology Co., Ltd For Wifi Camera

Model No.: AS02, AS03, AS07, AS08, AS05, AS06, AS09, AS10, AS11, AS12, AS28, AS29, AS60, AS66

FCC ID: 2BC6D-AS02

Prepared For : Shenzhen Shangjian Technology Co., Ltd Building C, Building B 1510, Lingshang Times, No. 66 Baguasi Road, Hualin Community, Yuanling Street, Futian 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:
 Oct. 24, 2023 ~ Oct. 31, 2023

 Date of Report:
 Oct. 31, 2023

 Report Number:
 HK2310305086-E

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TEST RESULT CERTIFICATION

Applicant's name:	Shenzhen Shangjian Technology Co., Ltd				
Address:	Building C, Building B 1510, Lingshang Times, No. 66 Baguasi Road Hualin Community, Yuanling Street, Futian District, Shenzhen, Chin				
Manufacture's Name:	Shenzhen Shangjian Technology Co., Ltd				
Address:	Building C, Building B 1510, Lingshang Times, No. 66 Baguasi Road, Hualin Community, Yuanling Street, Futian District, Shenzhen, China				
Product description					
Trade Mark:	N/A				
Product name	Wifi Camera				
Model and/or type reference :	AS02, AS03, AS07, AS08, AS05, AS06, AS09, AS10, AS11, AS12, AS28, AS29, AS60, AS66				
Standards:	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, 2023 ~ Oct. 31, 2023
Date of Issue:	Oct. 31, 2023
Test Result	Pass

Testing Engineer

(Gary Qian)

Technical Manager

(Eden Hu)

Authorized Signatory :

Those

(Jason Zhou)

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Т 691

** Modified History **

			5 1 m 1	
Revision	Description	Issued Data	Remark	
Revision 1.0	Initial Test Report Release	Oct. 31, 2023	Jason Zhou	
MG	alan alan	-mG	G	

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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 $y \pm U$, 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
5.00	All emissions, radiated(>1G)	±4.28dB
6	Temperature	±0.1°C
7	Humidity	±1.0%

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2. EUT DESCRIPTION

HUAK TESTING

2.1. GENERAL DESCRIPTION OF EUT

Equipment:	Wifi Camera	WAKTESTING	WUAK TESTIN
Model Name:	AS02	0.	0
Series Model:	AS03, AS07, AS08, AS05, AS AS28, AS29, AS60, AS66	06, AS09, AS10,	AS11, AS12,
Model Difference:	All model's the function, software, only model named difference AS02.	are and electric c erent. Test sample	ircuit are the model:
FCC ID:	2BC6D-AS02	HUAKTESTIN	HUAK TESI.
Antenna Type:	Ceramics Antenna	Ŵ	~
Antenna Gain:	1.24dBi	K TESTING	KTESTIN
Operation frequency:	802.11b/g/n 20:2412~2462 MI 802.11n 40: 2422~2452MHz	Hz	O HUM
Number of Channels:	802.11b/g/n20: 11CH 802.11n 40: 7CH	C HUANTESTIN.	NAK TESTING
Modulation Type:	CCK/OFDM/DBPSK/DAPSK	STING	D m
Power Source:	DC 5V from Type-C or DC 3.7	V from battery	TESTING
Power Rating:	DC 5V from Type-C or DC 3.7	V from battery	O HUM
Hardware Version	V1.0		
Software Version	V1.0	HUAKTESTING	HUAKTESTIN

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2.2. Carrier Frequency of Channels

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

Channel List For 802.11n (HT40)							
Channel Frequency (MHz) Channel (MHz)					Frequency (MHz)	Channel	Frequency (MHz)
ESTING	N TESTA	04	2427	07	2442	TESTIN	STE
(D) ⁺¹		05	2432	08	2447	HUAN	C-HOM
03	2422	06	2437	09	2452	<i>.</i>	

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 below 1GHz radiation testing and conducted testing:



Operation of EUT during above 1GHz radiation 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. For the full battery state and the output power to the maximum state.

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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.

1.1.				W LE	
ltem	Equipment	Mfr/Brand	Model/Type No.	Specification	Note
ING	Wifi Camera	N/A	AS02	N/A	EUT
2	Adapter	HUAWEI	HW-100225C00	Input: AC100-240V, 50/60Hz, 0.75A Output: DC5V/2A, 9V/2A, 10V/2.25A MAX	Peripheral
	NG SIMIG	HUAK	Diana Diana	NG HUAN	STING
NUAKTES	HUAKTE	- 10	K TEST	HUANTEST	HUAKTE
		0			

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 connect to the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.

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ENERA INFORMATION 3.

3.1. TEST ENVIRONMENT AND MODE

О	Operating Environment:							
5	Temperature:	25.0 °C	HUAKTESI	HUAKTES				
	Humidity:	56 % RH	0	⁽¹⁾				
2	Atmospheric Pressure:	1010 mbar	K TESTING	.6				

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	<i>.</i>
 802.11b	1Mbps	
802.11g	6Mbps	JAK TES
802.11n(H20)	6.5Mbps	0
802.11n(H40)	13.5Mbps	

Final Test Mode:

Operation mode:	Keep the EUT in continuous transmitting 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), 13.5Mbps for 802.11(H40).

3.Mode Test Duty Cycle

Mode	Duty Cycle	Duty Cycle Factor (dB)
802.11b	0.932	-0.304
802.11g	0.958	-0.187
802.11n(H20)	0.955	-0.200
802.11n(H40)	0.928	-0.327

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4. TEST RESULTS AND MEASUREMENT DATA

4.1. CONDUCTED EMISSION

Test Specification

- The	-100	-700	-100	100			
Test Requirement:	FCC Part15 C Sect	FCC Part15 C Section 15.207					
Test Method:	ANSI C63.10:2013	ANSI C63.10:2013					
Frequency Range:	150 kHz to 30 MHz	150 kHz to 30 MHz					
Receiver setup:	RBW=9 kHz, VBW=	RBW=9 kHz, VBW=30 kHz, Sweep time=auto					
Limits:	Frequency range (MHz) 0.15-0.5 0.5-5 5-30	Limit (Quasi-peak 66 to 56* 56 60	dBuV) Average 56 to 46* 46 50	as resine			
Test Setup:	Ref 40c E.U.T AC Test table/Insulation Remark E.U.T. Equipment Under Test LISN Line impedence Stabiliz Test table height=0.8m	Reference Plane					
Test Mode:	Charging + transmit	Charging + transmitting with modulation					
Test Procedure:	 The E.U.T is conline impedance a provides a 500hr measuring equipring. The peripheral de power through a coupling impedar refer to the blophotographs). Both sides of A conducted interferemission, the related the interface cated ANSI C63.10: 20 	 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 emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement. 					
Test Result:	PASS		TING				
	100		2				

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Conducted Emission Shielding Room Test Site (843)							
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due		
Receiver	R&S	ESR-7	HKE-010	Feb. 17, 2023	Feb. 16, 2024		
LISN	R&S	ENV216	HKE-002	Feb. 17, 2023	Feb. 16, 2024		
Coax cable (9KHz-30MHz)	Times 🌑	381806-002	N/A	Feb. 17, 2023	Feb. 16, 2024		
Conducted test software	Tonscend	TS+ Rev 2.5.0.0	HKE-081	N/A	N/A		
10dB Attenuator	SCHWARZBE CK	VTSD9561F	HKE-153	Feb. 17, 2023	Feb. 16, 2024		

Test Instruments

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 the test modes completed for test. only the worst result of 802. 11b was reported as below:

Sus	Suspected List								
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Туре	
1	0.1635	39.29	19.98	65.28	25.99	19.31	PK	L	
2	0.3750	34.54	20.05	58.39	23.85	14.49	PK	L	
3	0.5685	39.65	20.05	56.00	16.35	19.60	PK	L	
4	2.2020	33.00	20.17	56.00	23.00	12.83	PK	L	
5	3.6960	36.42	20.25	56.00	19.58	16.17	PK	L	
6	5.9010	34.01	20.23	60.00	25.99	13.78	РК	L	

Remark: Margin = Limit – Level Correction factor = Cable lose + LISN insertion loss

Level=Test receiver reading + correction factor

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Suspected List								
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Туре
1	0.1860	38.37	20.05	64.21	25.84	18.32	PK	N
2	0.5640	43.58	20.06	56.00	12.42	23.52	PK	N
3	1.3605	35.43	20.11	56.00	20.57	15.32	РК	N
4	2.1120	34.37	20.16	56.00	21.63	14.21	PK	N
5	3.8535	37.62	20.25	56.00	18.38	17.37	РК	N
6	7.7415	34.97	20.17	60.00	25.03	14.80	РК	N

Remark: Margin = Limit – Level

Correction factor = Cable lose + LISN 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	O HUM	O HUM		
Limit:	30dBm	AK TESTING	.slG		
Test Setup:	Power meter	EUT	6 WIAKTESTING		
Test Mode:	Transmitting mode with mod	lulation			
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 power meter 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 				
Test Result:	PASS	O HOM	0		

Test Instruments

ADDA YVY ADDA Y			ATTAL YOU	All	All have been a second se			
RF Test Room								
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due			
Spectrum analyzer	Agilent	N9020A	HKE-048	Feb. 17, 2023	Feb. 16, 2024			
Power meter	Agilent	E4419B	HKE-085	Feb. 17, 2023	Feb. 16, 2024			
Power Sensor	Agilent	E9300A	HKE-086	Feb. 17, 2023	Feb. 16, 2024			
RF cable	Times	1-40G	HKE-034	Feb. 17, 2023	Feb. 16, 2024			
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 17, 2023	Feb. 16, 2024			

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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FICATION

Test Data

Test	Frequency	Maximum Peak Conducted Output Power	LIMIT	
onannor	(MHz)	(dBm)	(dBm))
0	HUAK	TX 802.11b Mode	. 0	HUAK
CH01	2412	11.22	30	
CH06	2437	11.35	30	MAKTEST
CH11	2462	11.67	30	0
	20	TX 802.11g Mode		
CH01	2412	8.03	30	IN LAK T
CH06	2437	8.33	30	0
CH11	2462	8.68	30	TING
0	HUAKTES	TX 802.11n20 Mode	0	HUAKTES
CH01	2412	8.31	30	
CH06	2437	8.40	30	AK TEST
CH11	2462	8.64	30	0
		TX 802.11n40 Mode		
CH03	2422	8.50	30	- LAK TF
CH06	2437	8.51	30	0
CH09	2452	8.62	30	MAG

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4.4. EMISSION BANDWIDTH

Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (a)(2)				
Test Method:	KDB 558074	O HUM	O HOM		
Limit:	>500kHz	JAK TESTING	Bloc		
Test Setup:	Spectrum Analyzer	 EUT	NG HURKTESTING		
Test Mode:	Transmitting mode wit	h modulation			
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. 				
Test Result:	PASS	O HOL	O m		

Test Instruments

ALL YV			Aller VI-	ALLES Y V	All In CV		
RF Test Room							
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due		
Spectrum analyzer	Agilent	N9020A	HKE-048	Feb. 17, 2023	Feb. 16, 2024		
RF cable	Times	1-40G	HKE-034	Feb. 17, 2023	Feb. 16, 2024		
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 17, 2023	Feb. 16, 2024		

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	6dB Emission Bandwidth (MHz)					
	802.11b	802.11g	802.11n(H20)	802.11n(H40)		
Lowest	9.560	16.320	16.960	35.520		
Middle	9.560	16.320	17.520	35.760		
Highest	8.640	16.320	16.640	35.680		
Limit:	S HUNK TES	;	>500k	G A		
Test Result:		TESTING HUAK TESTIN	PASS	TIME WAX TESTIN		

Test plots as follows:

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802.11b Modulation





Middle channel



Highest channel



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802.11g Modulation

Lowest channel



Middle channel



Highest channel



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802.11n (HT20) Modulation

Lowest channel



Middle channel



Highest channel

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802.11n (HT40) Modulation

Lowest channel



Middle channel



Highest channel

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4.5. POWER SPECTRAL DENSITY

Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (e)				
Test Method:	KDB 558074				
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				
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				

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Test Instruments

RF Test Room					
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Spectrum analyzer	Agilent	N9020A	HKE-048	Feb. 17, 2023	Feb. 16, 2024
RF Cable (9KHz-26.5GHz)	Tonscend	170660	N/A	Feb. 17, 2023	Feb. 16, 2024
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 17, 2023	Feb. 16, 2024
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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Test data

EUT Set Mode	Channel	Result (dBm/30kHz) Result (dBm/3kHz	
802.11b	Lowest	-1.41	-11.41
	Middle	-1.61	-11.61
	Highest	-1.06	-11.06
802.11g	Lowest	-7.16	-17.16
	Middle	-7.15	-17.15
	Highest	-6.2	-16.2
802.11n(H20)	Lowest	-6.83	-16.83
	Middle	-7.17	-17.17
	Highest	-7.18	-17.18
802.11n(H40)	Lowest	-8.03	-18.03
	Middle	-7.89	-17.89
	Highest	-8.09	-18.09
PSD test result (dBm/3kHz)= P	SD test result (dBm	/30kHz)-10
Limit: 8dBm/3kH	z		
Test Result: PASS			

Test plots as follows:

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802.11b Modulation



Middle channel



Highest channel



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802.11g Modulation



Middle channel



Highest channel



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Report No.: HK2310305086-E

FICATION

802.11n (HT20) Modulation



Middle channel



Highest channel



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802.11n (HT40) Modulation



Middle channel



Highest channel



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4.6. CONDUCTED BAND EDGE AND SPURIOUS EMISSION MEASUREMENT

Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (d)			
Test Method:	KDB558074			
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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RF Test Room						
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due	
Spectrum analyzer	Agilent	N9020A	HKE-048	Feb. 17, 2023	Feb. 16, 2024	
High pass filter unit	Tonscend	JS0806-F	HKE-055	Feb. 17, 2023	Feb. 16, 2024	
RF Cable (9KHz-26.5GHz)	Tonscend	170660	N/A	Feb. 17, 2023	Feb. 16, 2024	
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 17, 2023	Feb. 16, 2024	
RF test software	Tonscend	JS1120-B Version 2.6	HKE-083	N/A	N/A	

Test Instruments

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





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802.11g Modulation



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