

FCC Test Report

Report No.: AGC01664180701FE04

FCC ID : 2AQLRG1
APPLICATION PURPOSE : Original Equipment
PRODUCT DESIGNATION : Smart AC controller
BRAND NAME : Gidbo
MODEL NAME : 00860293002309
CLIENT : Electronic Design Solutions LLC
DATE OF ISSUE : Aug. 10, 2018
STANDARD(S) : FCC Part 15.247
TEST PROCEDURE(S) : KDB 558074 D01 DTS Meas Guidance v04
REPORT VERSION : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

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Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Aug. 10, 2018	Valid	Initial Release

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1. VERIFICATION OF CONFORMITY

Applicant	Electronic Design Solutions LLC
Address	331 east 83rd St #3, New York NY 10028
Manufacturer	Electronic Design Solutions LLC
Address	331 east 83rd St #3, New York NY 10028
Product Designation	Smart AC controller
Brand Name	Gidbo
Test Model	00860293002309
Date of test	Jul. 25, 2018 to Aug. 07, 2018
Deviation	None
Condition of Test Sample	Normal
Report Template	AGCRT-US-BGN/RF

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance(Shenzhen) Co., Ltd. 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 tested as described in this report is in compliance with requirement of FCC Part 15 Rules requirement.

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

Tested By

donjon. huang

Dongon Huang(Huang Dongyang)

Aug. 08, 2018

Reviewed By

Bart Xie

Bart Xie(Xie Xiaobin)

Aug. 10, 2018

Approved By

Forrest Lei

Forrest Lei(Lei Yonggang)
Authorized Officer

Aug. 10, 2018

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2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

The EUT is designed as "Smart AC controller". It is designed by way of utilizing the DSSS and OFDM technology to achieve the system operation.

A major technical description of EUT is described as following

Operation Frequency	2.412 GHz ~ 2.462GHz
Output Power	IEEE 802.11b: 17.62 dBm, IEEE 802.11g: 16.23 dBm; IEEE 802.11n(20): 15.96 dBm
Modulation	DSSS(DBPSK/DQPSK/CCK);OFDM(BPSK/QPSK/16-QAM/64-QAM)
Number of channels	11 Channels (IEEE802.11b/g/n20)
Hardware Version	2.2
Software Version	1321
Antenna Designation	PCB Antenna
Antenna Gain	3.0dBi
Power Supply	DC5.0V

2.2. TABLE OF CARRIER FREQUENCIES

Frequency Band	Channel Number	Frequency
2400~2483.5MHZ	1	2412 MHZ
	2	2417 MHZ
	3	2422 MHZ
	4	2427 MHZ
	5	2432 MHZ
	6	2437 MHZ
	7	2442 MHZ
	8	2447 MHZ
	9	2452 MHZ
	10	2457 MHZ
	11	2462 MHZ

Note: For 20MHZ bandwidth system use Channel 1 to Channel 11

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2.3. IEEE 802.11N MODULATION SCHEME

MCS Index	Nss	Modulation	R	NBPSC	NCBPS		NDBPS		Data rate(Mbps)	
					20MHz	40MHz	20MHz	40MHz	800nsGI	800nsGI
0	1	BPSK	1/2	1	52	108	26	54	6.5	13.5
1	1	QPSK	1/2	2	104	216	52	108	13.0	27.0
2	1	QPSK	3/4	2	104	216	78	162	19.5	40.5
3	1	16-QAM	1/2	4	208	432	104	216	26.0	54.0
4	1	16-QAM	3/4	4	208	432	156	324	39.0	81.0
5	1	64-QAM	2/3	6	312	648	208	432	52.0	108.0
6	1	64-QAM	3/4	6	312	648	234	489	58.5	121.5
7	1	64-QAM	5/6	6	312	648	260	540	65.0	135.0

Symbol	Explanation
NSS	Number of spatial streams
R	Code rate
NBPSC	Number of coded bits per single carrier
NCBPS	Number of coded bits per symbol
NDBPS	Number of data bits per symbol
GI	Guard interval

2.4. RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2AQLRG1** filing to comply with the FCC Part 15 requirements.

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2.5. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10 (2013).

Radiated testing was performed at an antenna to EUT distance 3 meters.

Others testing (listed at item 5.3) was performed according to the procedures in FCC Part 15.247 rules KDB 558074 D01 DTS Meas Guidance v04.

2.6. SPECIAL ACCESSORIES

Refer to section 5.2.

2.7. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

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3. MEASUREMENT UNCERTAINTY

- Uncertainty of Conducted Emission, $U_c = \pm 3.2\text{dB}$
- Uncertainty of Radiated Emission below 1GHz, $U_c \pm 3.9\text{dB}$
- Uncertainty of Radiated Emission above 1GHz, $U_c \pm 4.8\text{dB}$

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4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Low channel TX
2	Middle channel TX
3	High channel TX
4	Normal operating

Note:
 Transmit by 802.11b with Data rate (1/2/5.5/11)
 Transmit by 802.11g with Data rate (6/9/12/18/24/36/48/54)
 Transmit by 802.11n (20MHz) with Data rate (6.5/13/19.5/26/39/52/58.5/65)

Note:

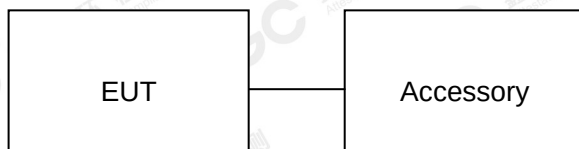
1. The EUT has been set to operate continuously on the lowest, middle and highest operation frequency Individually, and the eut is operating at its maximum duty cycle>or equal 98%
2. All modes under which configure applicable have been tested and the worst mode test data recording in the test report, if no other mode data.
3. For Radiated Emission, 3axis were chosen for testing for each applicable mode.

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5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Configure:



5.2. EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	Smart AC controller	00860293002309	2AQLRG1	EUT
2	Adapter	A18A-050100U-US2	DC 5.0V 1A	Accessory
3	USB	N/A	N/A	Accessory

Note: All the accessories have been used during the test in conduction emission test.

5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.247	Output Power	Compliant
§15.247	6 dB Bandwidth	Compliant
§15.247	Conducted Spurious Emission	Compliant
§15.247	Maximum Conducted Output Power SPECTRAL Density	Compliant
§15.209	Radiated Emission	Compliant
§15.247	Band Edges	Compliant
§15.207	Line Conduction Emission	Compliant

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6. TEST FACILITY

Test Firm	Shenzhen HUAK Testing Technology Co., Ltd.
Address	1F, B2 Building, Junfeng Zhongcheng Zhizao Innovation Park, Fuhai Street, Bao'an District, Shenzhen City, China
Designation Number	CN1229
Registration Number	616276

ALL TEST EQUIPMENT LIST

Equipment	Manufacturer	Model	S/N	Cal. Due
Receiver	R&S	ESCI 7	HKE-010	Dec. 28, 2018
LISN	R&S	ENV216	HKE-002	Dec. 28, 2018
Conducted test software	Tonscend	TS+ Rev 2.5.0.0	HKE-081	N/A
Power meter	Agilent	E4417B	HKE-107	Dec. 28, 2018
Power Sensor	Agilent	E9327A	HKE-113	Dec. 28, 2018
RF cable	Times	1-40G	HKE-034	Dec. 28, 2018
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Dec. 28, 2018
Spectrum analyzer	Agilent	N9020A	HKE-048	Dec. 28, 2018
RF Cable (9KHz-26.5GHz)	Tonscend	170660	N/A	Dec. 28, 2018
Signal generator	Agilent	N5183A	HKE-071	Dec. 28, 2018
Receiver	R&S	ESCI-7	HKE-010	Dec. 28, 2018
Preamplifier	EMCI	EMC051845SE	HKE-015	Dec. 28, 2018
Preamplifier	Agilent	83051A	HKE-016	Dec. 28, 2018
Loop antenna	Schwarzbeck	FMZB 1519 B	HKE-014	Dec. 28, 2018
Broadband antenna	Schwarzbeck	VULB 9163	HKE-012	Dec. 28, 2018
Horn antenna	Schwarzbeck	9120D	HKE-013	Dec. 28, 2018
Antenna Mast	Keleto	CC-A-4M	N/A	N/A
Position controller	Taiwan MF	MF7802	HKE-011	Dec. 28, 2018
RF cable (9KHz-1GHz)	Times	381806-001	N/A	N/A

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7. OUTPUT POWER

7.1. MEASUREMENT PROCEDURE

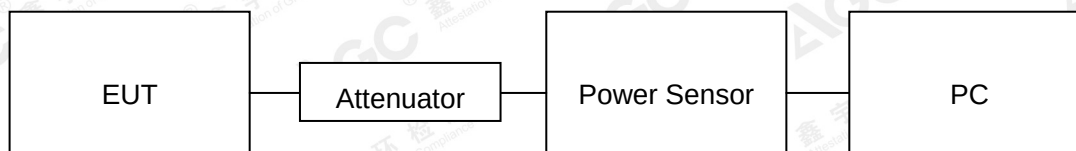
For max average conducted output power test:

1. Connect EUT RF output port to power probe through an RF attenuator.
2. Connect the power probe to the PC.
3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
4. Record the maximum power from the software.

Note : The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

7.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

AVERAGE POWER SETUP



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7.3. LIMITS AND MEASUREMENT RESULT

TEST ITEM	OUTPUT POWER
TEST MODE	802.11b with data rate 1

Frequency (GHz)	Average Power (dBm)	Applicable Limits (dBm)	Pass or Fail
2.412	17.62	30	Pass
2.437	16.19	30	Pass
2.462	14.56	30	Pass

TEST ITEM	OUTPUT POWER
TEST MODE	802.11g with data rate 6

Frequency (GHz)	Average Power (dBm)	Applicable Limits (dBm)	Pass or Fail
2.412	16.23	30	Pass
2.437	15.97	30	Pass
2.462	11.56	30	Pass

TEST ITEM	OUTPUT POWER
TEST MODE	802.11n 20 with data rate 6.5

Frequency (GHz)	Average Power (dBm)	Applicable Limits (dBm)	Pass or Fail
2.412	15.96	30	Pass
2.437	15.68	30	Pass
2.462	11.35	30	Pass

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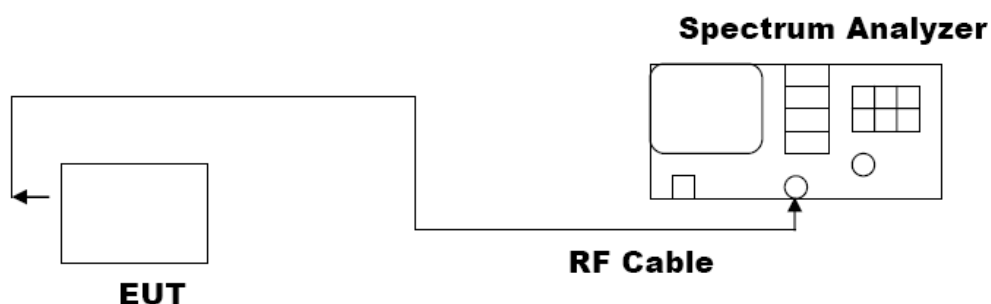
8. 6dB BANDWIDTH

8.1. MEASUREMENT PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set SPA Centre Frequency = Operation Frequency, RBW= 100 KHz, VBW $\geq 3 \times$ RBW.
4. Set SPA Trace 1 Max hold, then View.

Note: The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



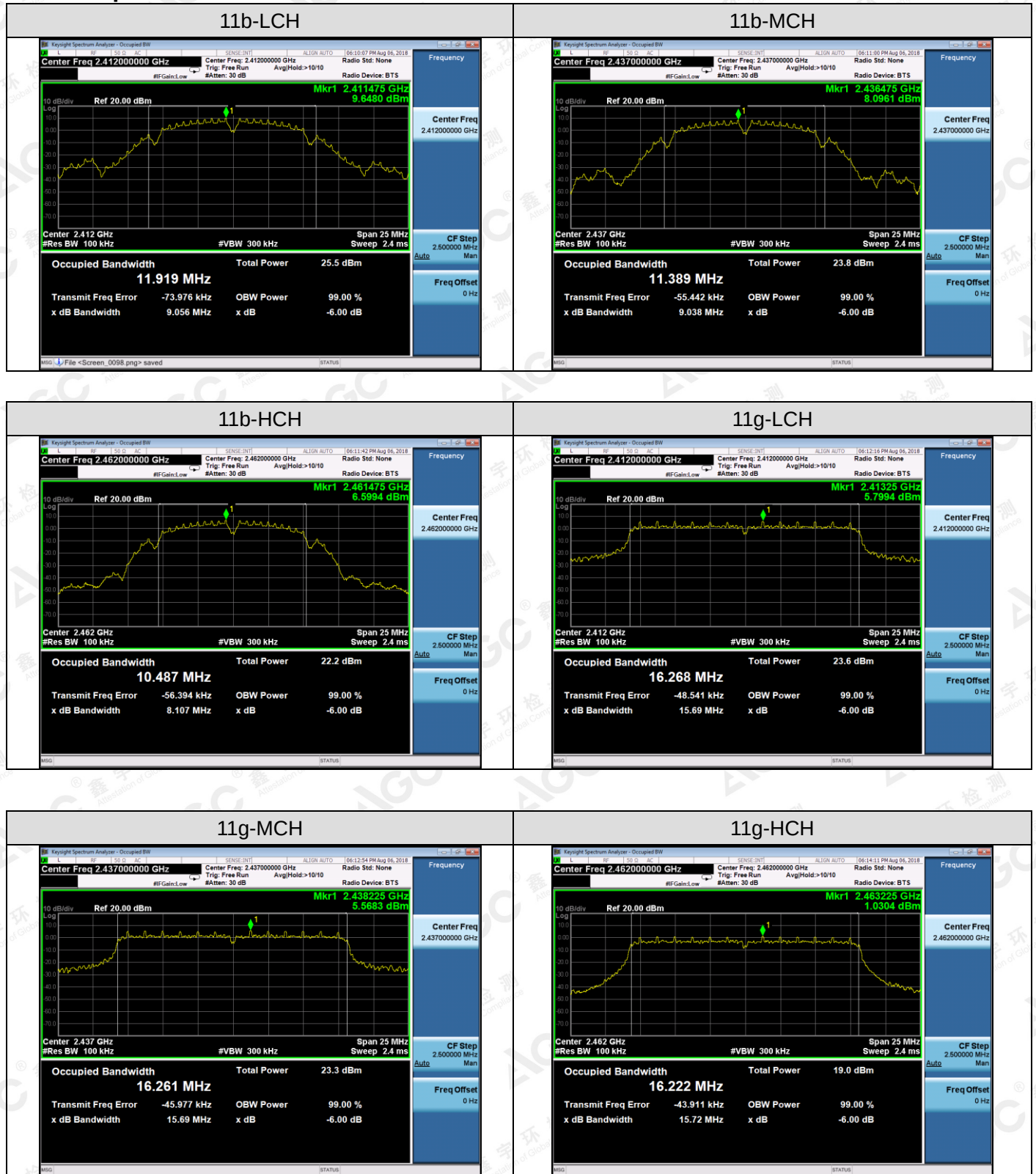
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8.3. LIMITS AND MEASUREMENT RESULTS

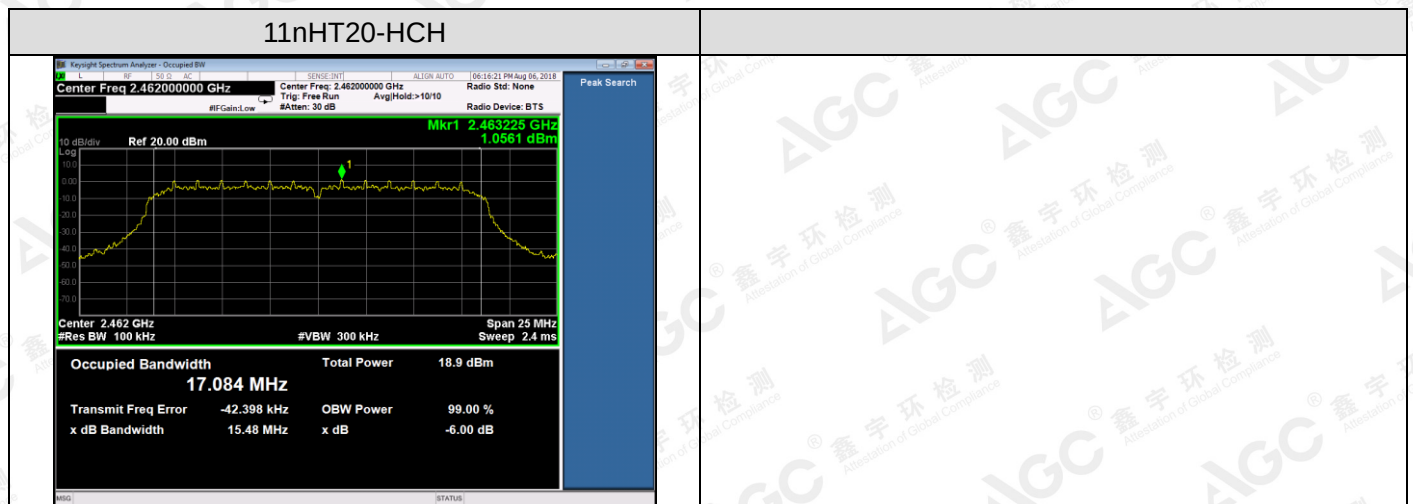
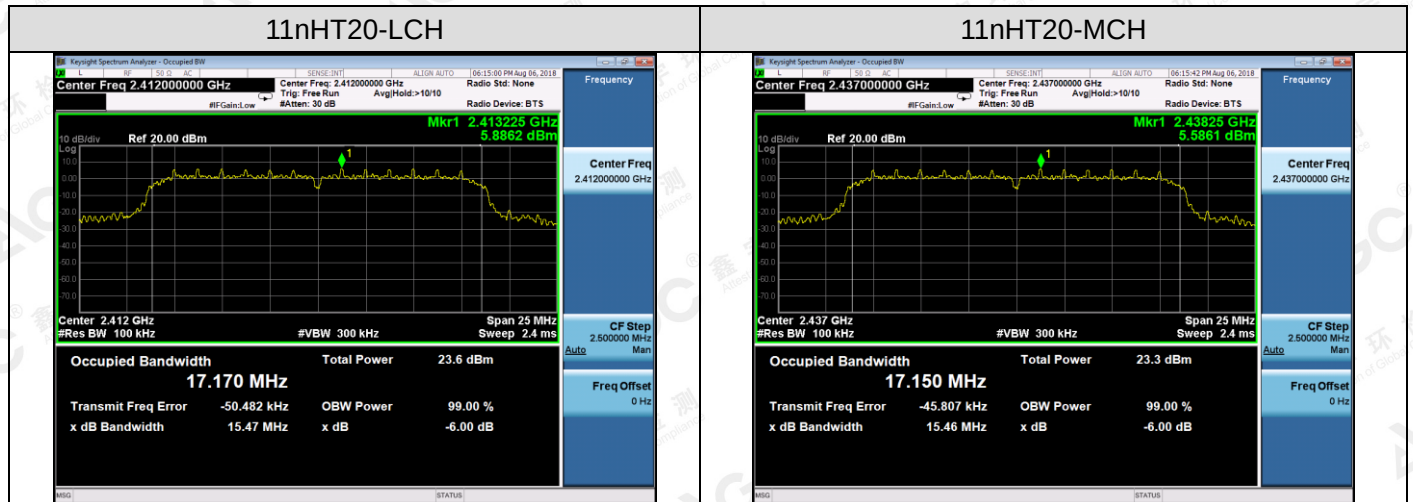
Mode	Channel	6dB Bandwidth [MHz]	Verdict
11b	LCH	9.056	PASS
	MCH	9.038	PASS
	HCH	8.107	PASS
11g	LCH	15.69	PASS
	MCH	15.69	PASS
	HCH	15.72	PASS
11nHT20	LCH	15.47	PASS
	MCH	15.46	PASS
	HCH	15.48	PASS

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Test Graph



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9. CONDUCTED SPURIOUS EMISSION

9.1. MEASUREMENT PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set SPA Trace 1 Max hold, then View.

Note: The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

Owing to satisfy the requirements of the number of measurement points, we set the RBW=1MHz, VBW>RBW, scan up through 10th harmonic, and consider the tested results as the worst case, if the tested results conform to the requirement, we can deem that the real tested results(set the RBW=100KHz, VBW>RBW) are conform to the requirement.

9.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The same as described in section 8.2.

9.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6.

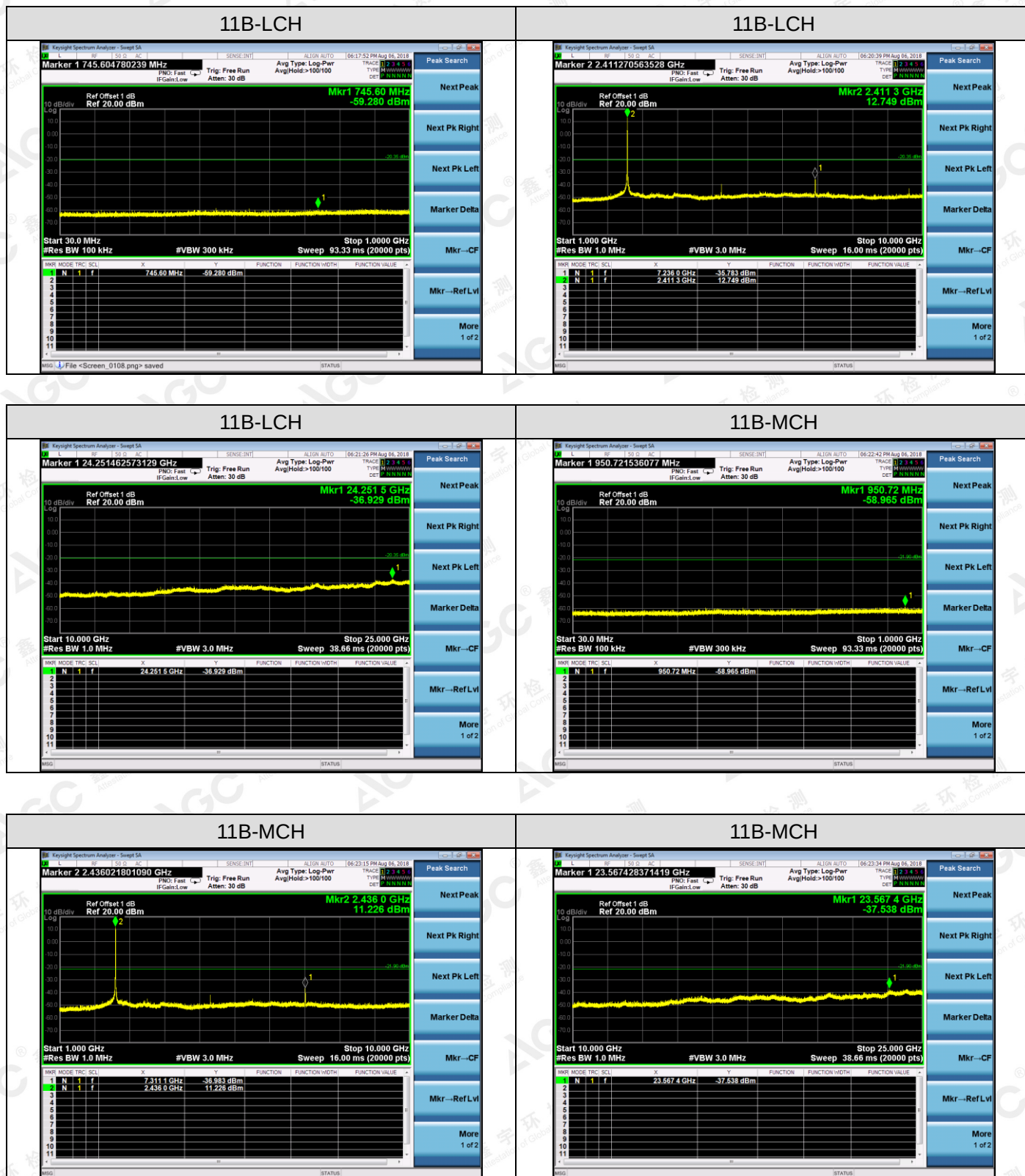
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9.4. LIMITS AND MEASUREMENT RESULT

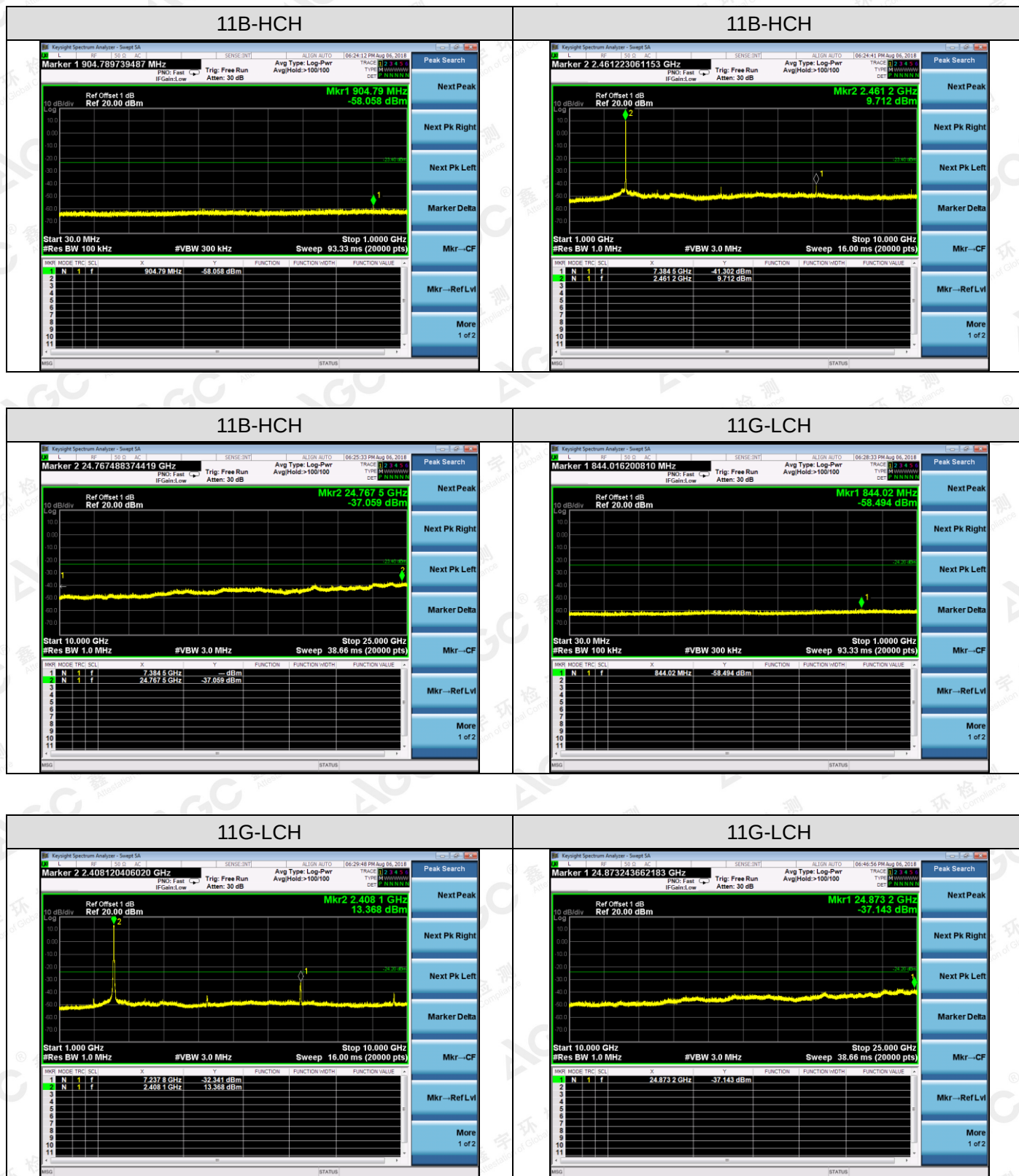
LIMITS AND MEASUREMENT RESULT		
Applicable Limits	Measurement Result	
	Test Data	Criteria
In any 100 KHz Bandwidth Outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produce by the intentional radiator shall be at least 20 dB below that in 100KHz bandwidth within the band that contains the highest level of the desired power. In addition, radiation emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in§15.209(a)	At least -20dBc than the limit Specified on the BOTTOM Channel	PASS
	At least -20dBc than the limit Specified on the TOP Channel	PASS

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Test Graph



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