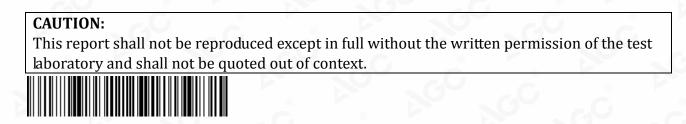


# **FCC Test Report**

Report No.: AGC06691200301FE06

FCC ID	: 2ARU9PAN001
APPLICATION PURPOSE	: Original Equipment
PRODUCT DESIGNATION	: TABLET PC
BRAND NAME	: НОМА
MODEL NAME	: HM-PAN-110
APPLICANT	: Homa Technologies JSC
DATE OF ISSUE	: Jul. 23, 2020
STANDARD(S) TEST PROCEDURE(S)	FCC Part 15.407 KDB 789033 D02 v02r01
REPORT VERSION	: V1.0

## Attestation of Global Compliance (Shenzhen) Co., Ltd



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## **REPORT REVISE RECORD**

	<b>Report Version</b>	Revise Time	Issued Date	Valid Version	Notes
,	V1.0	/	Jul. 23, 2020	Valid	Initial Release

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Attestation of Global Compliance(Shenzhen)Co., Ltd Attestation of Global Compliance(Shenzhen)Std & Tech Co., Ltd	pT102

Tel: +86-755 2523 4088 E-mail: agc@agc-cert.com Web: http://cn.agc-cert.com/



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## **1. VERIFICATION OF CONFORMITY**

Applicant	Homa Technologies JSC	
Address	Building 5, 13th Street, QTSC, Tan Chanh Hiep Ward, District12, Ho Chi Minh City, Vietnam	
Manufacturer	JIANGXI HONGYAODA COMMUNICATION LIMITED	
Address	NO.69, NORTH OF GOLD AVENUE, NORTH AREA OF HONGKONG INDUSTRIAL PARK, GANZHOU ECONOMIC AND TECHNOLOGICAL DEVELOPMENT ZONE, GANZHOU CITY, JIANGXI PROVINCE, CHINA	
Factory 1	JIANGXI HONGYAODA COMMUNICATION LIMITED	
Address	NO.69, NORTH OF GOLD AVENUE, NORTH AREA OF HONGKONG INDUSTRIAL PARK, GANZHOU ECONOMIC AND TECHNOLOGICAL DEVELOPMENT ZONE, GANZHOU CITY, JIANGXI PROVINCE, CHINA	
Product Designation	TABLET PC	
Brand Name	НОМА	
Test Model	HM-PAN-110	
Date of test	Jul. 10, 2020 to Jul. 23, 2020	
Deviation	No any deviation from the test method	
Condition of Test Sample	Normal	
Test Result	Pass	
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.

Zurk. Forg Prepared By Erik Yang Jul. 23, 2020 (Project Engineer) Max Zhan **Reviewed By** Max Zhang Jul. 23, 2020 (Reviewer) Fore Approved By Forrest Lei Jul. 23, 2020 (Authorized Officer)

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## 2. GENERAL INFORMATION

## 2.1. PRODUCT DESCRIPTION

The EUT is designed as "TABLET PC". It is designed by way of utilizing the OFDM technology to achieve the system operation.

A major technical description of EUT is described as following

Operation Frequency	5150 MHz~5250MHz		
Output Power	IEEE 802.11a20:7.14dBm IEEE 802.11n(20):7.06dBm; IEEE802.11n(40):6.97dBm IEEE802.11ac(20):7.08dBm IEEE802.11ac(40):7.04dBm EEE802.11ac(80):6.86dBm		
Modulation	BPSK, QPSK, 16QAM, 64QAM, 128QAM, 256QAM,OFDM		
Number of channels 7			
Hardware Version UX1.1			
Software Version	are Version         PF125UX.P0.V10.32.HYD-V05.8788_7249		
Antenna Designation	Integral antenna		
Directional gain	All transmit signals are completely uncorrelated with each other		
Antenna Gain	0dBi		
Power Supply	DC 5V by adapter or DC 3.7V by battery		

## 2.2. TABLE OF CARRIER FREQUENCYS

Frequency Band	Channel Number	Frequency
	36	5180 MHz
	38	5190 MHz
5150 GHz~5250GHz	40	5200 MHz
	42	5210 MHz
	44	5220 MHz
	46	5230 MHz
	48	5240 MHz

Note: For 20MHZ bandwidth system use Channel 36,40,44,48; For 40MHZ bandwidth system use Channel 38,46; For 80MHZ bandwidth system use Channel 42

## 2.3. RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for FCC ID: 2ARU9PAN001 filing to comply with the FCC Part 15

#### requirements.

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## 2.4. 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 15.407 rules KDB 789033 D02

2.5. SPECIAL ACCESSORIES

Refer to section 5.2.

## 2.6. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

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## **3. MEASUREMENT UNCERTAINTY**

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in

- measurement" (GUM) published by CISPR and ANSI.
- Uncertainty of Conducted Emission,  $Uc = \pm 3.1 dB$
- Uncertainty of Radiated Emission below 1GHz, Uc = ±4.0 dB
- Uncertainty of Radiated Emission above 1GHz, Uc = ±5.4 dB

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## 4. DESCRIPTION OF TEST MODES

Mode	Available channel	Tested channel	Modulation	Date rate(Mbps)
802.11a/n20/ac20	36,40,44,48	36,38,48	OFDM	6/6.5
802.11n40/ac40	38,46	38,46	OFDM	13.5
802.11ac80	42	42	OFDM	13.5

## Note:

- 1. The EUT has been set to operate continuously on tested channel 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. The test software is the engineering mode apk which can set the EUT into the individual test modes.

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## **5. SYSTEM TEST CONFIGURATION**

**5.1. CONFIGURATION OF EUT SYSTEM** 

Configure 1:

EUT	

AE

## 5.2. EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	TABLET PC	HM-PAN-110	2ARU9PAN001	EUT
2	Adapter	GLY-G43UA-050200-629A	Input: AC100-240V, 50/6Hz, 0.3A Output:DC5V, 2A	AE

## **5.3. SUMMARY OF TEST RESULTS**

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.407	Emission Bandwidth	Compliant
§15.407	Maximum conducted output power	Compliant
§15.407	Conducted Spurious Emission	Compliant
§15.407	Maximum Conducted Output Power Density	Compliant
§15.209	Radiated Emission	Compliant
§15.407	Band Edges	Compliant
§15.207	Line Conduction Emission	Compliant

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## 6. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd	
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China	
Designation Number	CN1259	
FCC Test Firm Registration Number	975832	
A2LA Cert. No.	5054.02	
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by A2LA	

## TEST EQUIPMENT OF CONDUCTED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	May 15, 2020	May 14, 2022
LISN	R&S	ESH2-Z5	100086	Aug. 26, 2019	Aug. 25, 2020
Test software	R&S	ES-K1(Ver.V1.71)	N/A	N/A	N/A

## TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	May 15, 2020	May 14, 2022
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec. 12, 2019	Dec. 11, 2020
Power sensor	Aglient	U2021XA	MY54110007	Sep. 09, 2019	Sep. 08, 2021
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep. 09, 2019	Sep. 08, 2021
preamplifier	ChengYi	EMC184045SE	980508	Sep. 21, 2017	Sep. 20, 2020
Active loop antenna (9K-30MHz)	A.H.	SAS-562B	18051	May 22, 2020	May 21, 2022
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May. 17, 2019	May. 16, 2021
Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-205	Oct. 15, 2019	Oct. 16, 2020
ANTENNA	SCHWARZBECK	VULB9168	D69250	Jan. 09, 2019	Jan. 08, 2021
Test software	Tonscend	JS32-RE (Ver.2.5)	N/A	N/A	N/A

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## 7. MAXIMUM CONDUCTED OUTPUT POWER

## 7.1. MEASUREMENT PROCEDURE

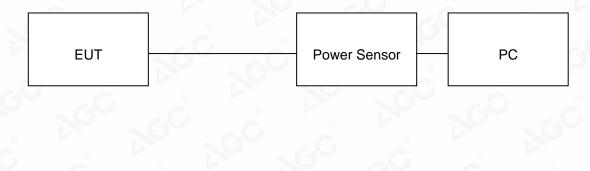
For average power test:

- 1. Connect EUT RF output port to power sensor through an RF attenuator.
- 2. Connect the power sensor 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 789033 for compliance to FCC 47CFR 15.407 requirements.

## 7.2. TEST SET-UP

## AVERAGE POWER SETUP



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#### 7.3. LIMITS AND MEASUREMENT RESULT

LIMITS AND MEASUREMENT RESULT FOR 802.11A20 MODULATION					
Frequency (MHz)	Average Power (dBm)	Applicable Limits (dBm)	Pass or Fail		
5180	6.35	24	Pass		
5200	7.14	24	Pass		
5240	6.48	24	Pass		

LIMITS AND MEASUREMENT RESULT FOR 802.11N20 MODULATION					
Frequency (MHz)	Average Power (dBm)	Applicable Limits (dBm)	Pass or Fail		
5180	7.06	24	Pass		
5200	6.93	24	Pass		
5240	6.39	24	Pass		

LIMITS A	LIMITS AND MEASUREMENT RESULT FOR 802.11AC20 MODULATION					
Frequency (MHz)	Average Power (dBm)	Applicable Limits (dBm)	Pass or Fail			
5180	7.08	24	Pass			
5200	6.98	24	Pass			
5240	6.38	24	Pass			

LIMITS AND MEASUREMENT RESULT FOR 802.11N40 MODULATION					
Frequency (MHz)Average Power (dBm)Applicable Limits (dBm)Pass or Fail					
5190	6.97	24	Pass		
5230	6.49	24	Pass		

LIMITS AND MEASUREMENT RESULT FOR 802.11AC40 MODULATION						
Frequency (MHz)Average Power (dBm)Applicable Limits (dBm)Pass or Fail						
5190	7.04	24	Pass			
5230	6.42	24	Pass			

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LIMITS AND MEASUREMENT RESULT FOR 802.11AC80 MODULATION					
Frequency (MHz)Average Power (dBm)Applicable Limits (dBm)Pass or Fail					
5210	6.86	24	Pass		

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## 8. EMISSION BANDWIDTH

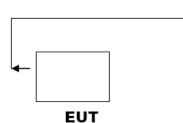
## 8.1. MEASUREMENT PROCEDURE

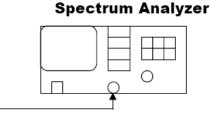
- a) Set RBW = approximately 1% of the emission bandwidth.
- b) Set the VBW > RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.

e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

Note: The EUT was tested according to KDB 789033 for compliance to FCC 47CFR 15.407 requirements.

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





RF Cable

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## **8.3. LIMITS AND MEASUREMENT RESULTS**

LIMITS AND MEASUREMENT RESULT FOR 802.11A20 MODULATION						
Applicable Limits						
Applicable Limits	Frequency (MHz)         -26dB Bandwidth         99.00% Occupied Bandwidth         Crite					
	5180MHz	19.85	16.416	PASS		
Within the Band	5200MHz	19.85	16.352	PASS		
CU aC	5240MHz	19.98	16.373	PASS		

LIMITS AND MEASUREMENT RESULT FOR 802.11N20/40 MODULATION				
		Applicat	ole Limits	
Applicable Limits	Frequency (MHz)	-26dB Bandwidth	99.00% Occupied Bandwidth	Criteria
	5180MHz	19.93	17.481	PASS
	5200MHz	19.66	17.499	PASS
Within the Band	5240MHz	19.86	17.486	PASS
SC SC SG	5190MHz	40.05	35.898	PASS
	5230MHz	40.87	35.893	PASS

LIMITS AND MEASUREMENT RESULT FOR 802.11AV20/40/80 MODULATION					
		Applicat	ole Limits		
Applicable Limits	Frequency (MHz)	-26dB Bandwidth	99.00% Occupied Bandwidth	Criteria	
	5180MHz	19.77	17.489	PASS	
	5200MHz	19.71	17.486	PASS	
Within the Dand	5240MHz	19.72	17.479	PASS	
Within the Band	5190MHz	39.71	35.828	PASS	
	5230MHz	39.88	35.821	PASS	
	5210MHz	80.59	75.692	PASS	

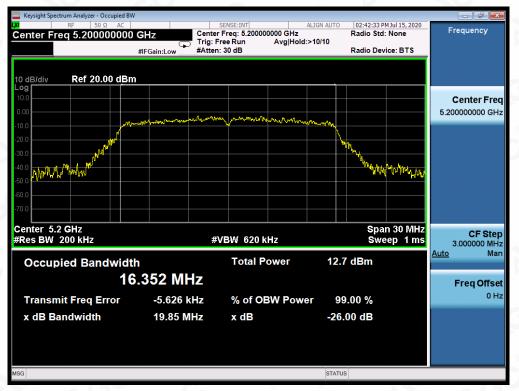
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#### Keysight Spectrum Analyzer - Occupied I 02:40:01 PM Jul 15, 2020 Radio Std: None JENSE:INI ALIGN AUTO Center Freq: 5.18000000 GHz Trig: Free Run Avg|Hold:>10/10 #Atten: 30 dB Aug Aug Frequency Freg 5, 180000000 G Radio Device: BTS Ref 20.00 dBm 0 dB/div **Center Freq** 5.180000000 GHz W when WWW. Wash Center 5.18 GHz #Res BW 200 kHz Span 30 MHz Sweep 1 ms CF Step 3.000000 MHz #VBW 620 kHz Ma Auto **Occupied Bandwidth Total Power** 12.5 dBm 16.416 MHz Freq Offset 0 Hz Transmit Freq Error -25.092 kHz % of OBW Power 99.00 % x dB Bandwidth 19.85 MHz x dB -26.00 dB

## 802.11a20 TEST RESULT

#### TEST PLOT OF BANDWIDTH FOR 5180MHz

#### TEST PLOT OF BANDWIDTH FOR 5200MHz



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## TEST PLOT OF BANDWIDTH FOR 5240MHz

## 802.11n20 TEST RESULT

#### TEST PLOT OF BANDWIDTH FOR 5180MHz



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## TEST PLOT OF BANDWIDTH FOR 5200MHz

## TEST PLOT OF BANDWIDTH FOR 5240MHz



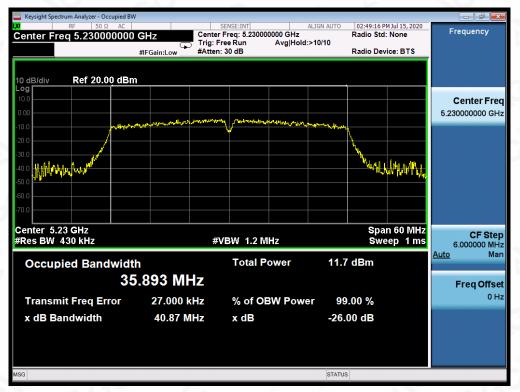
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#### Keysight Spectrum Analyzer - Occupied I 02:48:32 PM Jul 15, 2020 Radio Std: None Sense:INI ALIGN AUTO Center Freq: 5.19000000 GHz Trig: Free Run Avg|Hold:>10/10 #Atten: 30 dB Auton Avg/Hold:>10/10 Frequency Freg 5, 190000000 G Radio Device: BTS Ref 20.00 dBm 0 dB/div **Center Freq** 5.19000000 GHz MA Center 5.19 GHz #Res BW 430 kHz Span 60 MHz Sweep 1 ms CF Step 6.000000 MHz #VBW 1.2 MHz Ma Auto **Occupied Bandwidth Total Power** 12.6 dBm 35.898 MHz Freq Offset 0 Hz Transmit Freq Error 41.436 kHz % of OBW Power 99.00 % x dB Bandwidth 40.05 MHz x dB -26.00 dB

## 802.11n40 TEST RESULT

#### TEST PLOT OF BANDWIDTH FOR 5190MHz

#### TEST PLOT OF BANDWIDTH FOR 5230MHz



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#### Keysight Spectrum Analyzer - Occupied I 02:45:18 PM Jul 15, 2020 Radio Std: None JENSE:INI ALIGN AUTO Center Freq: 5.18000000 GHz Trig: Free Run Avg|Hold:>10/10 #Atten: 30 dB Aug Aug Frequency Freg 5, 180000000 G Radio Device: BTS Ref 20.00 dBm 0 dB/div **Center Freq** 5.180000000 GHz my my man March Center 5.18 GHz #Res BW 200 kHz Span 30 MHz Sweep 1 ms CF Step 3.000000 MHz #VBW 620 kHz Ma Auto **Occupied Bandwidth Total Power** 12.7 dBm 17.489 MHz Freq Offset 0 Hz Transmit Freq Error 12.564 kHz % of OBW Power 99.00 % x dB Bandwidth 19.77 MHz x dB -26.00 dB

## 802.11ac20 TEST RESULT

## TEST PLOT OF BANDWIDTH FOR 5180MHz

#### TEST PLOT OF BANDWIDTH FOR 5200MHz



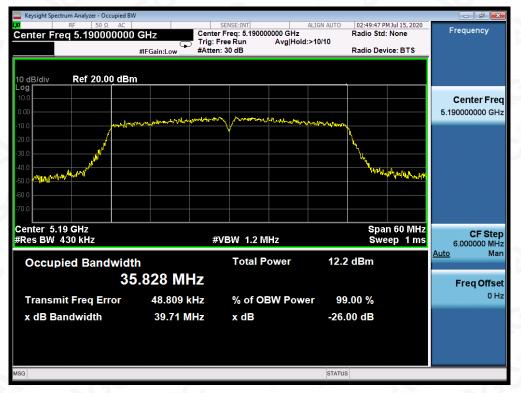
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## TEST PLOT OF BANDWIDTH FOR 5240MHz

## 802.11ac40 TEST RESULT

#### TEST PLOT OF BANDWIDTH FOR 5190MHz



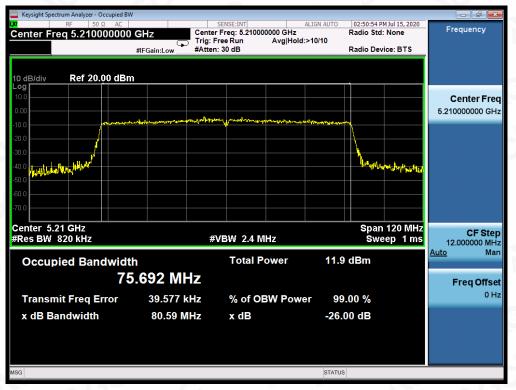
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## TEST PLOT OF BANDWIDTH FOR 5230MHz

## 802.11ac80 TEST RESULT

## TEST PLOT OF BANDWIDTH FOR 5210MHz



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## 9. MAXIMUM CONDUCTED OUTPUT PEAK POWER SPECTRAL DENSITY

#### 9.1 MEASUREMENT PROCEDURE

Refer to KDB 789033 section F

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

Refer To Section 8.2.

## 9.3 MEASUREMENT EQUIPMENT USED

Refer To Section 6.

#### 9.4 LIMITS AND MEASUREMENT RESULT

LIMITS AND MEASUREMENT RESULT FOR 802.11A20 MODULATION					
Frequency (MHz)	Power density (dBm/MHz)	Applicable Limits (dBm)	Pass or Fail		
5180	-3.857	11	Pass		
5200	-3.200	11	Pass		
5240	-3.758	11	Pass		

LIMITS AND MEASUREMENT RESULT FOR 802.11N20/40 MODULATION										
Frequency (MHz)	Power density (dBm/MHz)	Applicable Limits (dBm)	Pass or Fail							
5180	-2.642	11	Pass							
5200	-3.353	11	Pass							
5240	-4.249	11	Pass							
5190	-5.806	11	Pass							
5230	-6.852	11	Pass							

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Frequency (MHz)	Power density (dBm/MHz)	Applicable Limits (dBm)	Pass or Fail		
5180	-2.868	11 0	Pass		
5200	-3.273	11	Pass		
5240	-3.880	11	Pass		
5190	-5.910	11	Pass		
5230	-6.897	11	Pass		
5210	-10.115	11	Pass		

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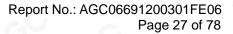


## 802.11a20 TEST RESULT TEST PLOT OF SPECTRAL DENSITY FOR 5180MHz

#### TEST PLOT OF SPECTRAL DENSITY FOR 5200MHz



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## TEST PLOT OF SPECTRAL DENSITY FOR 5240MHz AT CHAIN 1

802.11n20 TEST RESULT

TEST PLOT OF SPECTRAL DENSITY FOR 5180MHz



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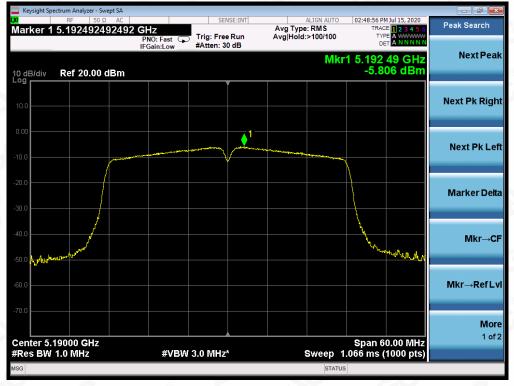
## TEST PLOT OF SPECTRAL DENSITY FOR 5200MHz

#### TEST PLOT OF SPECTRAL DENSITY FOR 5240MHz



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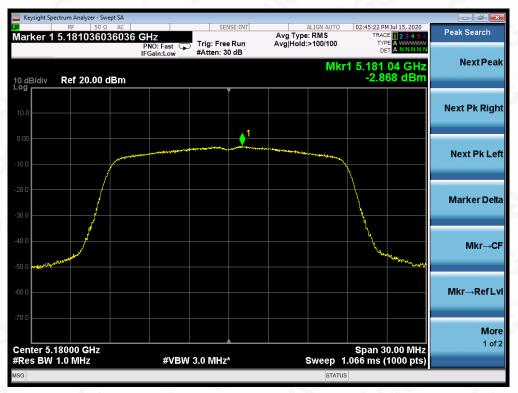
## 802.11n40 TEST RESULT TEST PLOT OF SPECTRAL DENSITY FOR 5190MHz

#### TEST PLOT OF SPECTRAL DENSITY FOR 5230MHz



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## 802.11ac20 TEST RESULT

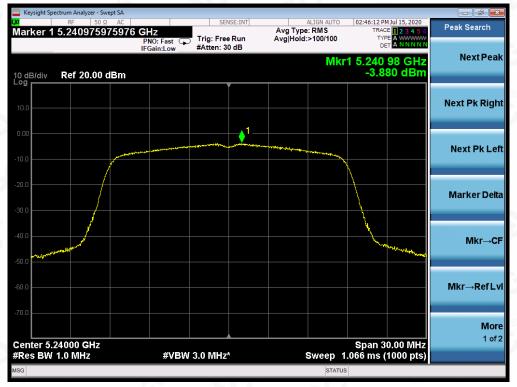
#### TEST PLOT OF SPECTRAL DENSITY FOR 5180MHz

#### TEST PLOT OF SPECTRAL DENSITY FOR 5200MHz



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## TEST PLOT OF SPECTRAL DENSITY FOR 5240MHz

## 802.11ac40 TEST RESULT

TEST PLOT OF SPECTRAL DENSITY FOR 5190MHz



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## TEST PLOT OF SPECTRAL DENSITY FOR 5230MHz

## 802.11ac80 TEST RESULT

#### TEST PLOT OF SPECTRAL DENSITY FOR 5210MHz



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## **10. CONDUCTED SPURIOUS EMISSION**

#### **10.1. 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 789033 for compliance to FCC 47CFR 15.407 requirements.

## **10.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)**

The same as described in section 8.2.

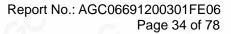
#### **10.3. MEASUREMENT EQUIPMENT USED**

The same as described in section 6.

## **10.4. LIMITS AND MEASUREMENT RESULT**

LIMITS AND MEASUREMENT RESULT								
Ampliantia Limita	Measurement Result							
Applicable Limits	Test channel	Criteria						
-27dBm/MHz	5150MHz-5250MHz	PASS						

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## FOR 802.11A20 MODULATION

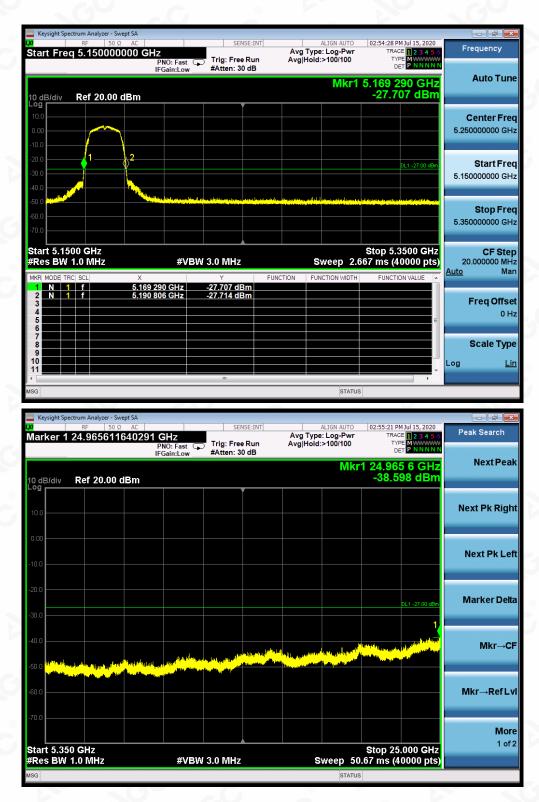
#### Keysight Spectrum Analyzer - Swept Si 9 PM Jul 15, 2020 Peak Search Avg Type: Log-Pw Avg|Hold:>100/100 Marker 1 851.998549964 MHz Trig: Free Run PNO: Fast IFGain:Low #Atten: 30 dB Next Peak Mkr1 851.999 MHz -58.799 dBm Ref 20.00 dBm 10 dB/div Next Pk Right Next Pk Left Marker Delta DL1 -27.00 d Mkr→CF ø Mkr→RefLvl More 1 of 2 Start 0.0300 GHz Stop 1.0000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 93.33 ms (40000 pts) 02:53:09 PM Jul 15, 2020 ALIGN AUTO Peak Search Avg Type: Log-Pwi Avg|Hold:>100/100 TRACE 1 2 3 4 5 Marker 1 5.120741768544 GHz Trig: Free Run #Atten: 30 dB түр PNO: Fast 😱 DET IEGai Next Peak Mkr1 5.120 74 GHz -45.016 dBm Ref 20.00 dBm 10 dB/div Next Pk Right Next Pk Left Marker Delta Mkr→CF Mkr→RefLvl More 1 of 2 Start 1.000 GHz #Res BW 1.0 MHz Stop 5.150 GHz Sweep 8.000 ms (40000 pts) #VBW 3.0 MHz STATUS

#### TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5180MHz

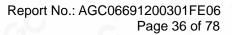
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#### Report No.: AGC06691200301FE06 Page 35 of 78

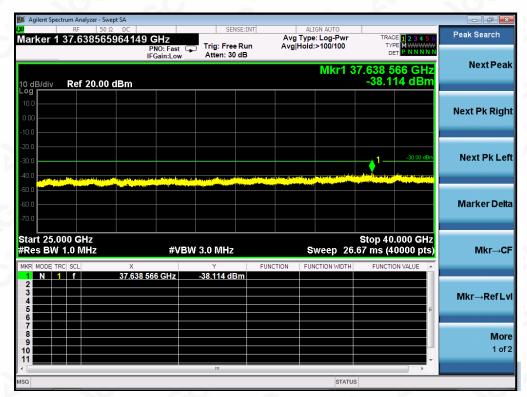




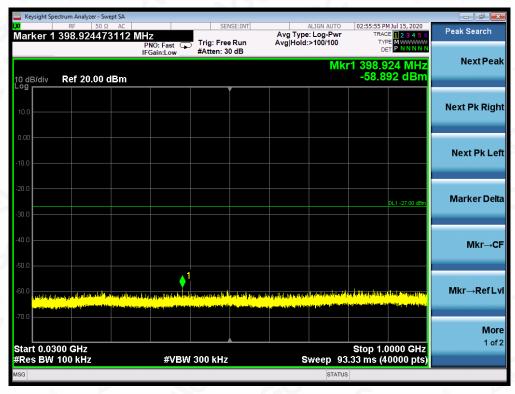
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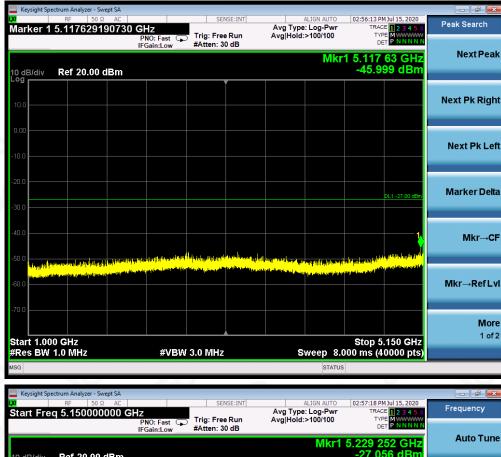


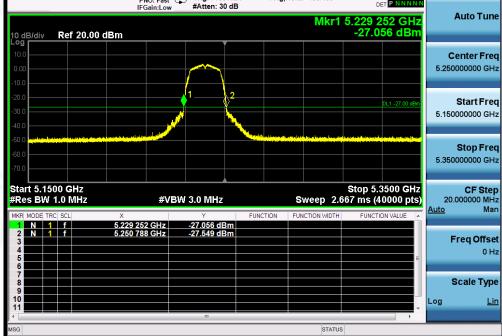


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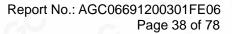
#### Report No.: AGC06691200301FE06 Page 37 of 78



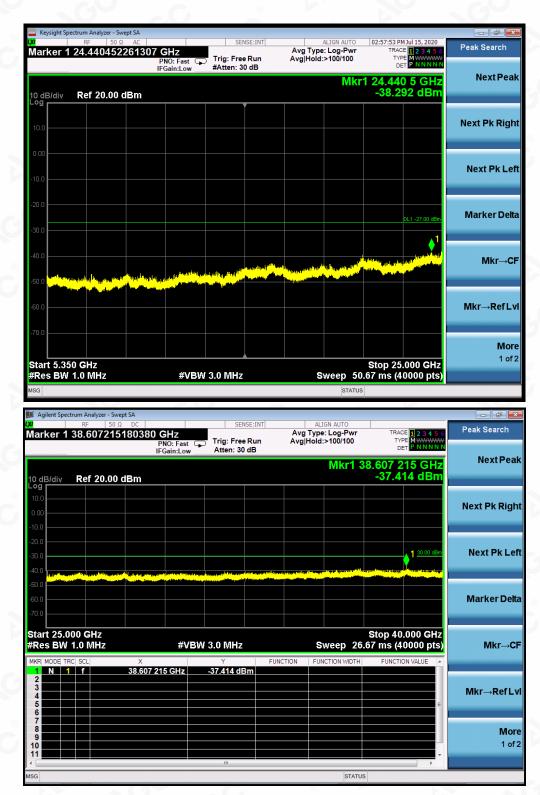




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## FOR 802.11N40 MODULATION

## ight Spectrum Analyzer - Swept S :35 PM Jul 15, 2020 ALIGN AUTO Avg Type: Log-Pwr Avg|Hold:>100/100 Peak Search Marker 1 203.076576914 MHz Trig: Free Run DE PNO: Fast IFGain:Low #Atten: 30 dB Next Peak Mkr1 203.077 MHz -59.253 dBm 10 dB/div Ref 20.00 dBm Next Pk Right Next Pk Left Marker Delta Mkr→CF Mkr→RefLv More 1 of 2 Start 0.0300 GHz #Res BW 100 kHz Stop 1.0000 GHz Sweep 93.33 ms (40000 pts) #VBW 300 kHz 53 PM Jul 15, 2020 Peak Search Avg Type: Log-Pw Avg|Hold:>100/100 Marker 1 4.823386834671 GHz Trig: Free Run #Atten: 30 dB TYF PNO: Fast IFGain:Low Next Peak Mkr1 4.823 39 GHz -46.963 dBm 10 dB/div Ref 20.00 dBm Next Pk Right Next Pk Left Marker Delta Mkr→CF ø Mkr→RefLvl More 1 of 2

#### TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5190MHz

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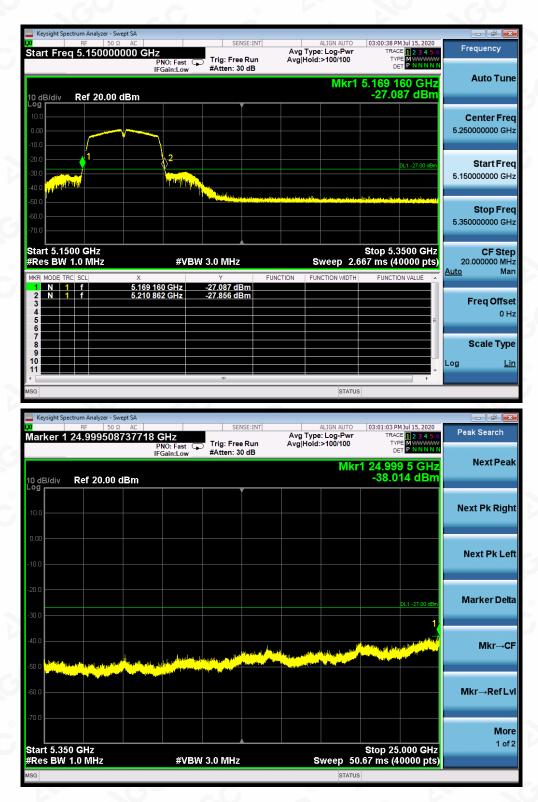
#VBW 3.0 MHz

Stop 5.150 GHz Sweep 8.000 ms (40000 pts)

Start 1.000 GHz #Res BW 1.0 MHz

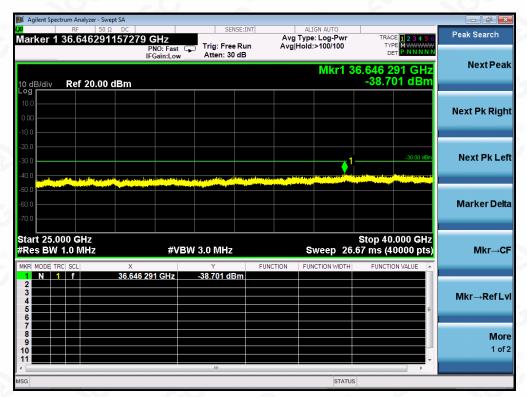
#### Report No.: AGC06691200301FE06 Page 40 of 78



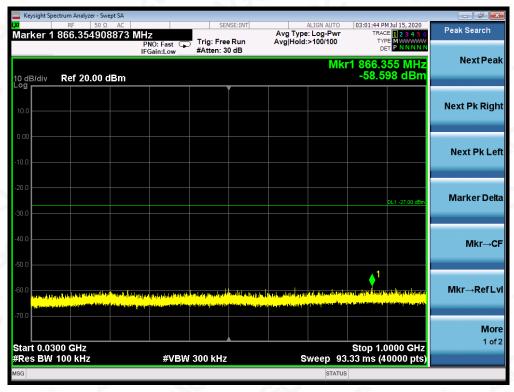


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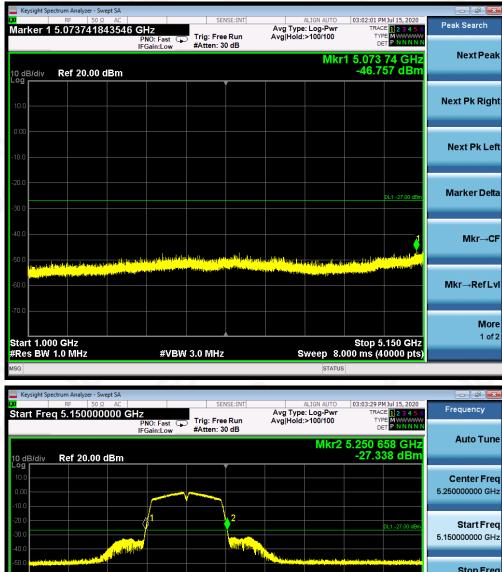




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#### Report No.: AGC06691200301FE06 Page 42 of 78





 IFGslin:Low
 #Atten: 30 dB
 Def
 Auto Tune

 Mkr2 5.250 658 GHz
 -27.338 dBm
 -27.338 dBm
 Center Freq

 100
 100
 100
 2
 011.2200 dBm
 Center Freq

 200
 100
 1
 2
 011.2200 dBm
 Start Freq

 200
 100
 1
 2
 011.2200 dBm
 Start Freq

 300
 1
 2
 011.2200 dBm
 Start Freq

 300
 1
 2
 011.2200 dBm
 Start Freq

 5.15000000 GHz
 #VBW 3.0 MHz
 Stop 5.3500 GHz
 CF Stop

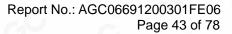
 300
 1
 1
 1
 5.250 658 GHz
 27.453 dBm

 1
 1
 1
 5.250 658 GHz
 27.338 dBm
 Function width
 Function value

 1
 1
 1
 5.250 658 GHz
 27.453 dBm
 Freq Offset
 0 Hz

 3
 1
 1
 5.250 658 GHz
 27.338 dBm
 Image: Startus
 Image: Startus
 Image: Startus

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💓 Agilent Spec	trum Analy:	zer - Swep	ot SA					-						
w Marker 1	<sup>RF</sup> 38.52	50 Ω 20880	DC 0 <b>5220</b>	1 GHz PNO: Fas		SEN			Туре	GN AUTO : Log-Pwr >100/100	TRA	CE 1 2 3 4	56 WW	Peak Search
10 dB/div	Ref 2	0.00 d	lBm	IFGain:Lo		Atten: 30	dB			Mkr1 3	8.522 (	)88 GH 36 dBi	E	NextPeak
Log 10.0 0.00														Next Pk Right
-20.0 -30.0 -40.0		- Constanting		The second state of the second state			क्षा र हे जीवित्रक के रहित की लिये		And and Andrew Control of the			1 <u>-30.00 d</u>	Bm Tar	Next Pk Left
-50.0 -60.0 -70.0														Marker Delta
Start 25.0 #Res BW	1.0 MH		×	#\	/BW (	3.0 MHz Y	FUN	ICTION		weep 26	.67 ms (4	0.000 GH	iz s)	Mkr→CF
1 N 1 2 3 4 5 6 7	f		38.522	088 GHz		-37.936 dE	3m						Ш	Mkr→RefLvl
7 8 9 10 11												•	•	More 1 of 2
MSG										STATU	s			

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1 of 2

Stop 5.150 GHz Sweep 8.000 ms (40000 pts)

## FOR 802.11AC80 MODULATION

## ight Spectrum Analyzer - Swept S 03:05:08 PM Jul 15, 2020 ALIGN AUTO Avg Type: Log-Pwr Avg|Hold:>100/100 Peak Search 1 863.760094002 MHz Trig: Free Run PNO: Fast IFGain:Low #Atten: 30 dB DE Next Peak Mkr1 863.760 MHz -58.610 dBm 10 dB/div Ref 20.00 dBm Next Pk Right Next Pk Left Marker Delta Mkr→CF ▲1 Mkr→RefLv More 1 of 2 Start 0.0300 GHz #Res BW 100 kHz Stop 1.0000 GHz Sweep 93.33 ms (40000 pts) #VBW 300 kHz 42 PM Jul 15, 2020 Peak Search Avg Type: Log-Pw Avg|Hold:>100/100 Marker 1 5.136304657616 GHz Trig: Free Run #Atten: 30 dB PNO: Fast IFGain:Low Next Peak Mkr1 5.136 30 GHz -33.691 dBm 10 dB/div Ref 20.00 dBm Next Pk Right Next Pk Left Marker Delta Mkr→CF Mkr→RefLvl More

#### TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5210MHz

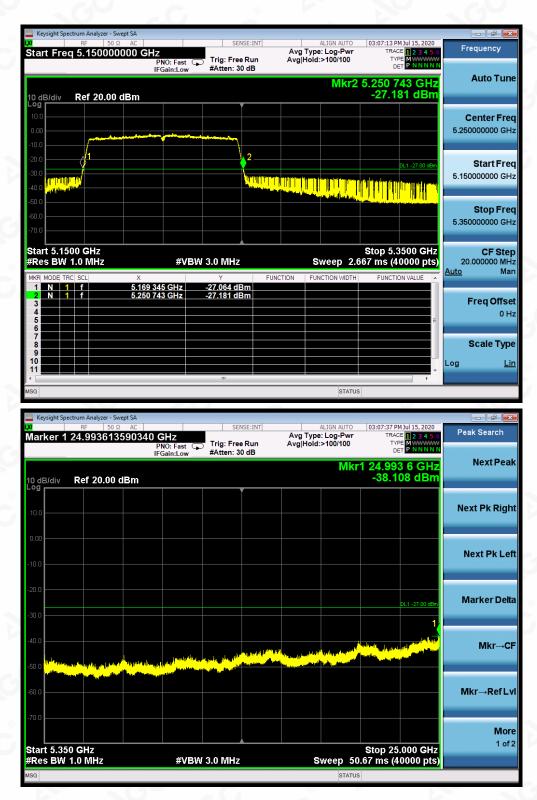
Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Sedicated Pesting/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written approver, be test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuence of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc~cert.com.

#VBW 3.0 MHz

Start 1.000 GHz #Res BW 1<u>.0 MHz</u>

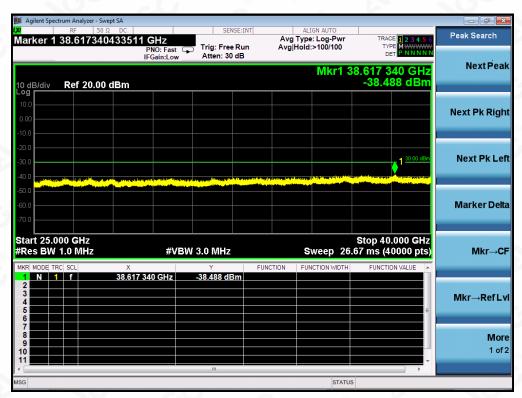
#### Report No.: AGC06691200301FE06 Page 45 of 78





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Note: All the 20MHz bandwidth modulation had been tested, the 802.11a20 was the worst case and record in his test report. All the 40MHz bandwidth modulation had been tested, the 802.11N40 was the worst case and record in his test report. All the 80MHz bandwidth modulation had been tested, the 802.11ac80 was the worst case and record in his test report.

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## **11. RADIATED EMISSION**

## **11.1. MEASUREMENT PROCEDURE**

- 1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
- 2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- 3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
- 4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- 5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
- 6. For emissions above 1GHz, use 1MHz RBW and 3M VBW for peak reading. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- 7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
- 8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
- 9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- 10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High Low scan is not required in this case.

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