

FCC / ISED RF Test Report

Report No.: FCC_IC_RF_SL20113001-HAR-291_5G

FCC ID: 2AHPN-BE2843

IC ID: 6434C-BE2843

Model: GM MY20

Received Date: 12/04/2020

Test Date: 12/04/2020 - 12/11/2020

Issued Date: 12/14/2020

Applicant: Harman International Industries Inc.

Address: 30001 Cabot Drive, Novi, MI 48377, USA

Manufacturer: Harman International Industries Inc.

Address: 30001 Cabot Drive, Novi, MI 48377, USA

Issued By: Bureau Veritas Consumer Products Services, Inc.

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FCC Registration / 540430

Designation Number:..

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Release Control Record

Issue No.	Description	Date Issued
FCC_IC_RF_SL20113001-HAR-291_5G	Original release	12/14/2020

1 Certificate of Conformity

Product: Unlicensed National Information Infrastructure Device

Brand: HARMAN

Model: GM MY20

Sample Status: Engineer Sample

Applicant: Harman International Industries Inc.

Test Date: 12/04/2020 - 12/11/2020

Standard: 47 CFR FCC Part 15, Subpart E (Section 15.407)

RSS Gen Iss 5: March 2019, RSS 247 Issue 2: February 2017

789033 D02 General UNII Test Procedures New Rules v02r01

ANSI C63.10:2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services, Inc. Milpitas Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : Gary Chou, **Date:** 12/14/2020
Gary Chou / Test Engineer

Approved by : Deon, **Date:** 12/21/2020
Deon Dai / Engineer Review

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407), RSS 247 Issue2, RSS Gen Issue5				
Standard Section		Test Item	Result	Remarks
15.203	RSS 247	Antenna Requirement	Pass	Note1*
15.407 (b)(6)	RSS 247	AC Power Conducted Emissions	N/A	N/A
15.407 (b)(1/2/3/4(i/ii)/6)	RSS 247	Radiated Emissions & Band Edge Measurement*	Pass	Meet the requirement of limit.
15.407 (a)(1/2/3)	RSS 247	Max Average Transmit Power	Pass	Meet the requirement of limit.
-	RSS 247	Occupied Bandwidth	Pass	Note1*
15.407 (e)	RSS 247	6 dB Emission Bandwidth	Pass	Note1*
15.407 (a)(1/2/3)	RSS 247	Peak Power Spectral Density	Pass	Note1*
15.407(g)	RSS 247	Frequency Stability	Pass	Note1*

Note: The EUT is DC powered.

Note1*: Please refer to report FCC ID" 2AHPN-BE2843".

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	3.51dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	3.73dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	4.64dB
	6GHz ~ 18GHz	4.82dB
	18GHz ~ 40GHz	4.91dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Unlicensed National Information Infrastructure Device
Brand	HARMAN
Test Model	GM MY20
Status of EUT	Engineering Sample
Power Supply Rating	12Vdc
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11a: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 433Mbps
Operating Frequency	5180~5240MHz, 5745~5825MHz
Number of Channel	5180~5240MHz: 4 channels for 802.11a, 802.11n,11ac (20MHz) 2 channels for 802.11n,11ac (40MHz) 1 channel for 802.11ac (80MHz) 5745~5825MHz: 5 channels for 802.11a, 802.11n,11ac (20MHz) 2 channels for 802.11n,11ac (40MHz) 1 channel for 802.11ac (80MHz)
Antenna Type	PCB Antenna 5.05dBi
Antenna Connector	N/A

Note:

1. The EUT provides one completed transmitter and one receiver.

Modulation Mode	Tx Function
802.11a	1TX
802.11n	1TX
802.11ac	1TX

3.2 Description of Operation Modes

FOR 5180 ~ 5240MHz

4 channels are provided for 802.11a, 802.11n (20MHz), 802.11ac(20MHz):

Channel	Frequency	Channel	Frequency
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

2 channels are provided for, 802.11n (40MHz), 802.11 ac (40MHz):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channels are provided for, 802.11ac (80MHz):

Channel	Frequency	Channel	Frequency
38	5210 MHz		

FOR 5745 ~ 5825MHz:

5 channels are provided for 802.11a, 802.11n (HT20):

Channel	Frequency	Channel	Frequency
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz		

2 channels are provided for 802.11n (40MHz), 802.11ac(40MHz):

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channels are provided for 802.11ac(80MHz):

Channel	Frequency	Channel	Frequency
155	5775MHz	--	--

Power setting is as below:

802.11a		802.11n, ac(20MHz)	
Channel	Power Setting	Channel	Power Setting
36	12	36	12
40	12	40	12
48	12	48	12
149	14	149	13
157	14	157	13
165	14	165	13
802.11n, ac(40MHz)		802.11ac(80MHz)	
Channel	Power Setting	Channel	Power Setting
38	13	42	14
46	13	155	15
151	13	-	-
159	13	-	-

1. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE \geq 1G	RE<1G	PLC	APCM	
A	√	√	-	√	Powered 12Vdc Battery

Where **RE \geq 1G**: Radiated Emission above 1GHz **RE<1G**: Radiated Emission below 1GHz
PLC: Power Line Conducted Emission **APCM**: Antenna Port Conducted Measurement

NOTE:

1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.
2. "-" means no effect.

Radiated Emission Test (Above 1GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type
-	802.11a	5180-5240	36 to 48	40	OFDM	BPSK
-	802.11n (HT20)		36 to 48	-	OFDM	BPSK
-	802.11n (HT40)		38 to 46	-	OFDM	BPSK
-	802.11ac (VHT80)		42	-	OFDM	BPSK
-	802.11a	5745-5825	149 to 165	-	OFDM	BPSK
-	802.11n (HT20)		149 to 165	-	OFDM	BPSK
-	802.11n (HT40)		151 to 159	-	OFDM	BPSK
-	802.11ac (VHT80)		155	-	OFDM	BPSK

Radiated Emission Test (Below 1GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type
-	802.11a	5180-5320	36 to 64	36	OFDM	BPSK

Power Line Conducted Emission Test:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type
-	802.11a	5180-5320	36 to 64	62	OFDM	BPSK
-	802.11a	5745-5825	149 to 165	149	OFDM	BPSK

Antenna Port Conducted Measurement:

- This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type
-	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK
-	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	BPSK
-	802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK
-	802.11ac (VHT80)		42	42	OFDM	BPSK
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK
-	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK
-	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK
-	802.11ac (VHT80)		155	155	OFDM	BPSK

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	25deg. C, 65%RH	12Vdc	Gary Chou
RE<1G	25deg. C, 65%RH	12Vdc	Gary Chou
APCM	21deg. C, 60%RH	12Vdc	Gary Chou

3.3 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.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	Dell	Latitude 3550	N/A	N/A	N/A
B.						
C.						
D.						

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	USB	1	1m	No	0	Connect from EUT to Laptop
2.						
3.						

3.4 General Description of Applied Standard

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

47 CFR FCC Part 15, Subpart E (Section 15.407)

RSS Gen Iss 5: March 2019, RSS 247 Issue 2: February 2017

789033 D02 General UNII Test Procedures New Rules v02r01

ANSI C63.10:2013

All test items have been performed and recorded as per the above standards.

4 Test Types and Results

4.1 Antenna Requirement

Spec	Requirement	Applicable
15.203	<p>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.</p> <p>Antenna requirement must meet at least one of the following:</p> <ul style="list-style-type: none"> a) Antenna must be permanently attached to the device. b) The antenna must use a unique type of connector to attach to the device. c) Device must be professionally installed. The installer shall be responsible for ensuring that the correct antenna is employed by the device. 	<input checked="" type="checkbox"/>
Remark	The EUT uses a PCB antenna to permanently attach to the device.	
Result	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL	

4.2 Radiated Emission and Bandedge Measurement

4.2.1 Limits of Radiated Emission Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

- The lower limit shall apply at the transition frequencies.
- Emission level (dBuV/m) = 20 log Emission level (uV/m).
- For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

Limits of unwanted emission out of the restricted bands

Applicable To		Limit	
789033 D02 General UNII Test Procedure New Rules v02r01		Field Strength at 3m	
		PK:74 (dBµV/m)	AV:54 (dBµV/m)
Frequency Band	Applicable To	EIRP Limit	Equivalent Field Strength at 3m
5150~5250 MHz	15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBµV/m)
5250~5350 MHz	15.407(b)(2)		
5470~5725 MHz	15.407(b)(3)		
5725~5850 MHz	<input checked="" type="checkbox"/> 15.407(b)(4)(i)	PK:-27 (dBm/MHz) ^{*1} PK:10 (dBm/MHz) ^{*2} PK:15.6 (dBm/MHz) ^{*3} PK:27 (dBm/MHz) ^{*4}	PK: 68.2(dBµV/m) ^{*1} PK:105.2 (dBµV/m) ^{*2} PK: 110.8(dBµV/m) ^{*3} PK:122.2 (dBµV/m) ^{*4}
	<input type="checkbox"/> 15.407(b)(4)(ii)	Emission limits in section 15.247(d)	
*1 beyond 75 MHz or more above of the band edge.		*2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.	
*3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.		*4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.	

Note:

The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3} \mu\text{V/m, where P is the eirp (Watts).}$$

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
EMI Test Receiver	ESW44	1328.4100K44-1016 62-MH	10/23/2020	10/23/2021
Biconilog Antenna Sunol	JB6	A111717	03/09/2020	03/09/2021
Horn Antenna ETS-Lindgren	3117	218554	12/20/2019	12/20/2020
Pre-Amplifier RF-Lambda	RAMP00M50GA	17032300048	06/18/2020	06/18/2021

4.2.3 Test Procedure

For Radiated emission below 30MHz

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

- The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

- The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle $< 98\%$) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

For Band edge Measurement

789033 D02 General U-NII Test Procedures New Rules v02r01, II.F. Method SA-1

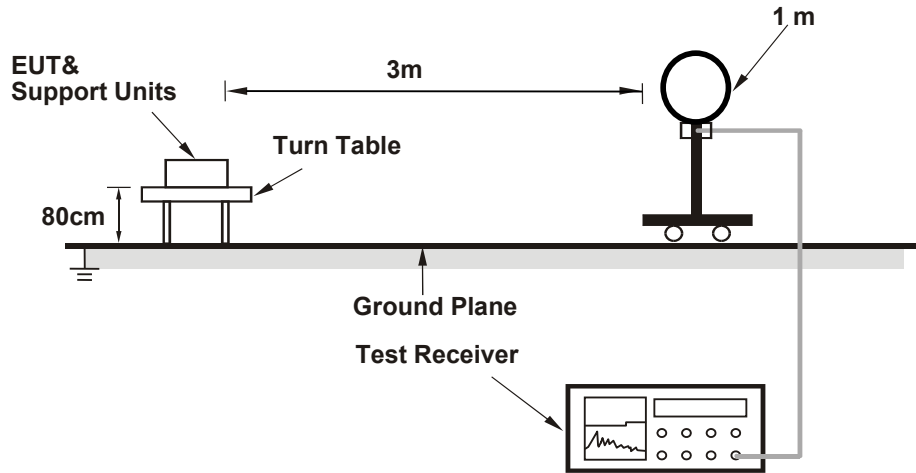
1. For average emissions measurements, follow the procedures described in section II.G.6., "Procedures for Average Unwanted Emissions Measurements above 1000 MHz", except for the following changes:
2. Set RBW=100 kHz
3. Set VBW=300 kHz
4. Perform a band-power integration across the 1 MHz bandwidth in which the band-edge emission level is to be measured.

4.2.4 Deviation from Test Standard

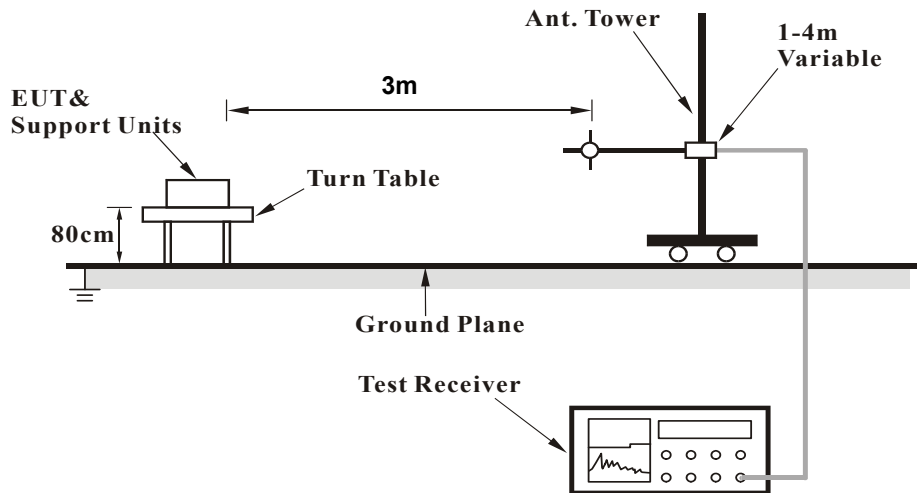
No deviation.

4.2.5 Test Setup

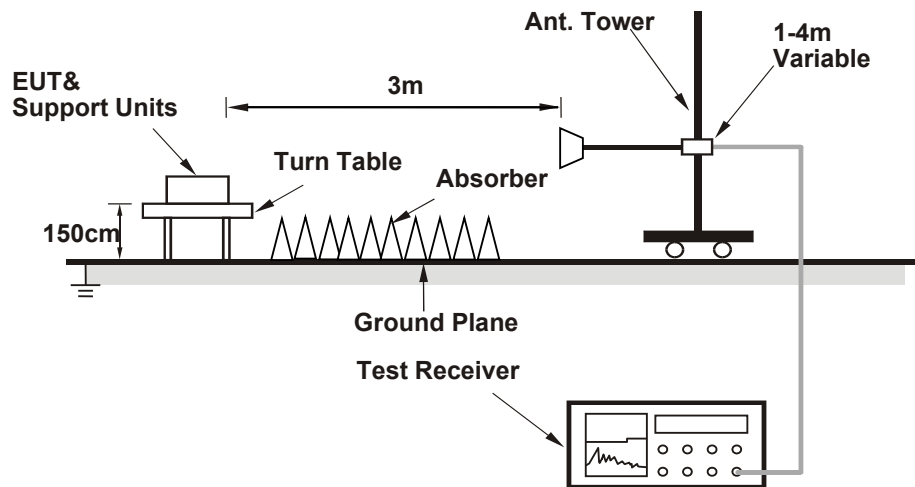
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT Operating Condition

- a. Placed the EUT on the testing table.
- b. Prepared notebooks to act as communication partner and placed it outside of testing area.
- c. The communication partner connected with EUT via a USB cable and ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
- d. The necessary accessories enable the system in full functions.

4.2.7 Test Results

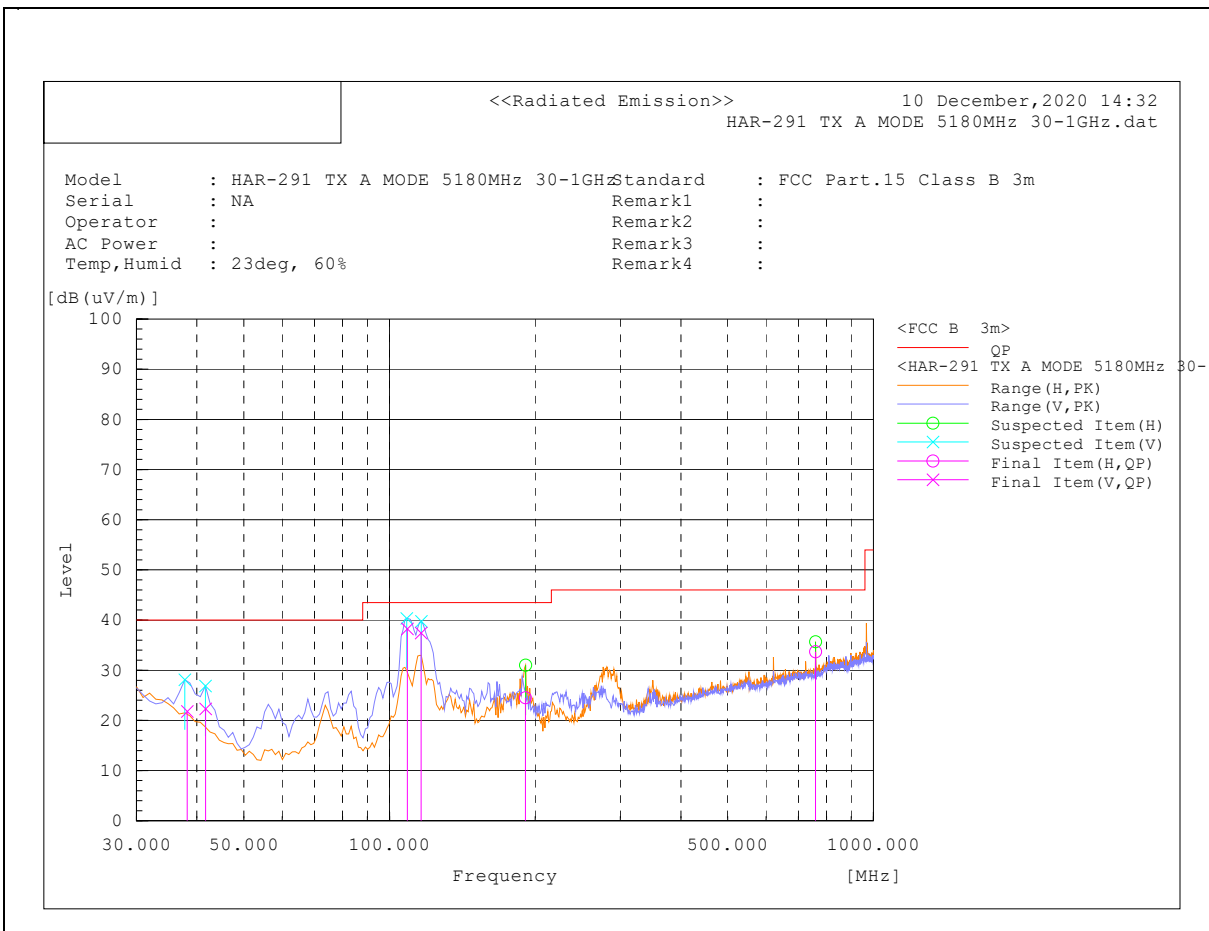
Below 1GHz Worst-Case Data:

CHANNEL	802.11a Channel 36	DETECTOR FUNCTION	Quasi Peak
FREQUENCY RANGE	30MHz – 1GHz		

Antenna Polarity & Test Distance: Vertical and Horizontal at 3m										
No.	Frequency (MHz)	Polarization (H/V)	Reading QP [dB(uV)]	Factor [dB(1/m)]	Level QP [dB(uV/m)]	LimitQP dB(uV/m)	Margin QP [dB]	Height (cm)	Angle (Deg)	Pass/Fail
1	38.23	V	2.1	19.7	21.8	40	-18.2	106	357.1	Pass
2	41.683	V	4.9	17.4	22.3	40	-17.7	106	359.9	Pass
3	108.878	V	20	18.3	38.3	43.5	-5.2	100	231.7	Pass
4	116.224	V	18.3	19.1	37.4	43.5	-6.1	100	63.6	Pass
5	190.874	H	6.7	17.8	24.5	43.5	-19	181	262.4	Pass
6	759.571	H	5	28.7	33.7	46	-12.3	143	212.7	Pass

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Cable Loss (dB) + AF (dB)
2. AF (dB/m) = Antenna Factor (dB/m) – Pre-amplifier Gain (dB).
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)



Above 1GHz Worst-Case Test Data:

1GHz-40GHz – 802.11a – 5200MHz

Antenna Polarity & Test Distance: Vertical and Horizontal at 3m														
No.	Frequency (MHz)	Polarization (H/V)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	Factor [dB(1/m)]	Level AV [dB(uV/m)]	Level PK dB(uV/m)	LimitAV dB(uV/m)	Limit\PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height (cm)	Angle (Deg)	Pass/Fail
1	10400.068	V	35.5	45.8	2.5	38	48.3	54	74	-16	-25.7	145	23	Pass
2	10400.068	H	37	47.5	2.5	39.5	50	54	74	-14.5	-24	100	0	Pass
3	15600.377	V	25.7	37.5	9.4	35.1	46.9	54	74	-18.9	-27.1	351	46	Pass
4	15600.377	H	27.2	39.2	9.4	36.6	48.6	54	74	-17.4	-25.4	344	0	Pass

4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p \leq 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
		Indoor Access Point	1 Watt (30 dBm)
	√	Client device	250mW (24 dBm)
U-NII-2A	---		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-2C	---		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-3	√		1 Watt (30 dBm)

*B is the 26 dB emission bandwidth in megahertz

Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

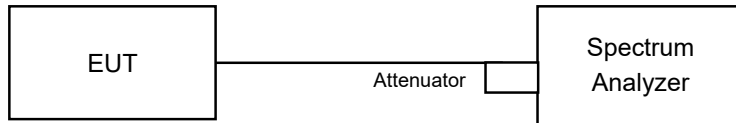
Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

For power measurements on all other devices: Array Gain = $10 \log(N_{ANT}/N_{SS})$ dB.

4.3.2 Test Setup

FOR POWER OUTPUT MEASUREMENT

◆ Spectrum Measurement



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

For Average Power Measurement

For 802.11a, 802.11n (HT20), 802.11n (HT40)

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst and set the detector to AVERAGE. Duty factor is not added to measured value.

For 802.11ac (VHT80)

- 1) Set span to encompass the entire 26 dB EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
- 2) Set sweep trigger to "free run".
- 3) Set RBW = 1 MHz.
- 4) Set VBW \geq 3 MHz
- 5) Number of points in sweep \geq 2 Span / RBW.
- 6) Sweep time \leq (number of points in sweep) * T
- 7) Using emission bandwidth to determine the frequency span for integration the channel bandwidth.
- 8) Detector = RMS.
- 9) Trace mode = max hold.
- 10) Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.

◆ Power Meter Measurement

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

◆ Spectrum Measurement

Follow FCC KDB 789033 UNII test procedure:

Method SA-1

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1MHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Number of points in sweep ≥ 2 Span / RBW.
5. Sweep time = auto.
6. Set trigger to free run (duty cycle ≥ 98 percent)
7. Detector = RMS.
8. Trace average at least 100 traces in power averaging mode
9. Compute power by integrating the spectrum across the 26 dB EBW of the signal.

Follow FCC KDB 789033 UNII test procedure:

Method SA-2

1. Set span to encompass the emission bandwidth (EBW) of the signal.
2. Set RBW = 1MHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Number of points in sweep ≥ 2 Span / RBW.
5. Sweep time = auto.
6. Detector = RMS.
7. Trace average at least 100 traces in power averaging mode
8. Compute power by integrating the spectrum across the 26 dB EBW of the signal.
9. Duty factor need added to measured value (duty cycle < 98 percent).

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 Test Results

Output Power measurement result for UNII-1 Band

Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)	Limit (dBm)	Result
Output Power	802.11a	5180	Low	6.39	24	Pass
		5200	Mid	6.18	24	Pass
		5240	High	6.63	24	Pass
	802.11n-HT20	5180	Low	6.20	24	Pass
		5200	Mid	6.42	24	Pass
		5240	High	6.61	24	Pass
	802.11n-HT40	5190	Low	6.07	24	Pass
		5230	High	5.84	24	Pass
	802.11ac-VHT80	5210	Low	5.82	24	Pass

Output Power measurement result for UNII-3 Band

Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)	Limit (dBm)	Result
Output Power	802.11a	5745	Low	7.59	30	Pass
		5785	Mid	7.67	30	Pass
		5825	High	7.26	30	Pass
	802.11n-HT20	5745	Low	4.95	30	Pass
		5785	Mid	6.14	30	Pass
		5825	High	6.13	30	Pass
	802.11n-HT40	5755	Low	5.39	30	Pass
		5795	High	5.04	30	Pass
	802.11ac-VHT80	5775	Low	4.66	30	Pass

Appendix – Information on the Testing Laboratories

Bureau Veritas is a global leader in testing, inspection and certification (TIC) services. We help businesses improve safety, sustainability and productivity; and our clients include the majority of leading brands in retail, manufacturing and other industries. With a presence in every major country around the world, our quality assurance and compliance solutions are vital in helping our customers enhance product quality and concept-to-consumer journeys. We also assist with increasing speed to market, profitability and brand equity throughout the supply chain. Bureau Veritas is a leading wireless/IoT testing, inspection, audit and certification provider, with a global network of test laboratories to support the IoT industry in areas of connectivity, security, interoperability as well as quality, health & safety, and environmental/chemical requirements.

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

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