Shenzhen Huatongwei International Inspection Co., Ltd.
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TEST REPORT

Report Reference No. ..... :	**CHTEW19060134**	Report verification:
Project No. ..... :	**SHT1901065806EW**	
FCC ID ..... :	**2ASRT-SCN450**	
Applicant's name ..... :	**Screeneo Innovation SA**	
Address.....:	Route de Lully 5C, 1131 Tolochenaz, Switzerland	
Manufacturer.....:	SHENZHEN HOLATEK CO. LTD.	
Address.....:	1001,10F,Building B4,KeXing Science Park,Nanshan,Shenzhen, China.	
Test item description ..... :	**Home Projector**	
Trade Mark .....:	Philips	
Model/Type reference.....:	Screeneo S4	
Listed Model(s) .....:	-	
Standard ..... :	**FCC CFR Title 47 Part 15 Subpart E Section 15.407**	
Date of receipt of test sample……...:	Mar 30,2019	
Date of testing……..:	Mar 31,2019- Jun 19,2019	
Date of issue……....:	Jun 20,2019	
Result..... ……..:	**PASS**	

Compiled by (position+printedname+signature)...:	File administrators Silvia Li	Silvia Li
Supervised by (position+printedname+signature)....:	Project Engineer Aaron Fang	Aaron.Fang
Approved by (position+printedname+signature)....:	RF Manager Hans Hu	Hans Hu

Testing Laboratory Name ..... :	**Shenzhen Huatongwei International Inspection Co., Ltd**
Address.....:	1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

Contents

1. TEST STANDARDS AND REPORT VERSION

1.1. Test Standards

The tests were performed according to following standards:
FCC Rules Part 15.407: General technical requirements.

ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices

KDB789033 D02 v02r01: GUIDELINES FOR COMPLIANCE TESTING OF UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE (U-NII) DEVICES PART 15, SUBPART E

1.2. Report Version

Revision No.	Date of issue	Description
N/A	2019-06-20	Original

2. TEST DESCRIPTION

Test Item	FCC Rule	Result	Test Engineer
Antenna Requirement	15.203	PASS	Jiongsheng Feng
Line Conducted Emissions (AC Main)	15.207	PASS	Jiongsheng Feng
Maximum Conducted Output Power	15.407(a)	PASS	Bruse.Li
Maximum Power Spectral Density	15.407(a)	PASS	Bruse.Li
26dB Bandwidth and 99% Ocuppy bandwith	15.407(a)	PASS	Bruse.Li
6dB Bandwidth	15.407(a)	PASS	Bruse.Li
Band edge	15.407(b)	PASS	Bruse.Li
Radiated Spurious Emissions	15.209	PASS	Bruse.Li
Frequency Stability	15.407(g)	PASS	Bruse.Li

Remark: The measurement uncertainty is not included in the test result.

3. SUMMARY

3.1. Client Information

Applicant:	Screeneo Innovation SA
Address:	Route de Lully 5C, 1131 Tolochenaz, Switzerland
Manufacturer:	SHENZHEN HOLATEK CO. LTD.
Address:	1001,10F,Building B4,KeXing Science Park,Nanshan, Shenzhen,China.

3.2. Product Description

Name of EUT	Home Projector		
Trade Mark:	Philips		
Model No.:	Screeneo S4		
Listed Model(s):	-		
Power supply:	DC 19.0V		
Adapter information :	Model:GQ150-1900780-E1 Input:100-240Va.c., 50/60Hz, 2.0A Max Output:19Vd.c., 7.8A		
5G WIFI			
Supported type:	☒ 802.11a	☒ 802.11n(HT20)	☒ 802.11n(HT40)
	☒ 802.11ac(HT20)	☒ 802.11ac(HT40)	☒ 802.11ac(HT80)
Function:	☐ Outdoor AP	☒ Indoor AP	☐ Fixed P2P
	☐ Client		
Modulation:	BPSK, QPSK, 16QAM, 64QAM		
Operation frequency:	☒ Band I:	5150MHz~5250MHz	
	☒ Band IV:	5725MHz~5850MHz	
Supported Bandwidth	20MHz:	802.11ac, 802.11n, 802.11a	
	40MHz:	802.11ac, 802.11n	
	80MHz:	802.11ac	
Antenna type:	FPC Antenna		
Antenna gain:	4.83dBi		

3.3. Operation state

➢ **Frequency list**

According to section 15.31(m), regards to the operating frequency range over 10 MHz, must select three channel which were tested. the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, please see the above gray bottom.

Band	Test Channel	20MHz		40MHz		80MHz	
		Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
I	CH_L	36	5180	38	5190	-	-
	CH_M	44	5220	-	-	42	5210
	CH_H	48	5240	46	5230	-	-
IV	CH_L	149	5745	151	5755	-	-
	CH_M	157	5785	-	-	155	5775
	CH_H	165	5825	159	5795	-	-

➢ **Data Rated**

Preliminary tests were performed in different data rate, and found which the below bit rate is worst case mode, so only show data which it is a worst case mode.

Mode	Data rate (worst mode)
802.11a	6Mbps
802.11n(HT20)/ 802.11ac(HT20)	MCS0
802.11n(HT40)/ 802.11ac(HT40)	MCS0
802.11ac(HT80)	MCS0

➢ **Test mode**

For RF test items
The engineering test program was provided and enabled to make EUT continuous transmit (duty cycle>98%).
For AC power line conducted emissions:
The EUT was set to connect with the WLAN AP under large package sizes transmission.
For Radiated suprious emissions test item:
The engineering test program was provided and enabled to make EUT continuous transmit(duty cycle>98%). The EUT in each of three orthogonal axis emissions had been tested ,but only the worst case (X axis) data Recorded in the report.

3.4. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

- ● - supplied by the manufacturer
- ○ - supplied by the lab

○	N/A	Manufacturer :	N/A
		Model No. :	N/A
○	N/A	Manufacturer :	N/A
		Model No. :	N/A

3.5. Modifications

No modifications were implemented to meet testing criteria.

4. TEST ENVIRONMENT

4.1. Address of the test laboratory

Laboratory:Shenzhen Huatongwei International Inspection Co., Ltd.
Address: 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China
Phone: 86-755-26748019 Fax: 86-755-26748089

4.2. Test Facility

CNAS-Lab Code: L1225

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No.: 3902.01

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 762235

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files.

IC-Registration No.:5377B-1

Two 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No.: 5377B-1.

ACA

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

4.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15~35°C
Relative Humidity:	30~60 %
Air Pressure:	950~1050mba

4.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors in calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report according to TR-100028-01 “Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1” and TR-100028-02 “Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2” and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd. quality system according to ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Here after the best measurement capability for Shenzhen Huatongwei International Inspection Co., Ltd. is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.63 dB	(1)
Conducted spurious emissions 9kHz~40GHz	0.63 dB	(1)
Conducted Disturbance 150kHz~30MHz	3.35 dB	(1)
Radiated Emissions below 1GHz	4.28 dB	(1)
Radiated Emissions above 1GHz	5.16 dB	(1)
Occupied Bandwidth	69 Hz	(1)
Frequency error	69 Hz	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

4.5. Equipments Used during the Test

● Conducted Emission						
Used	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Shielded Room	Albatross projects	N/A	N/A	2018/09/28	2023/09/27
●	EMI Test Receiver	R&S	ESCI	101247	2018/10/27	2019/10/26
●	Artificial Mains	SCHWARZBECK	NNLK 8121	573	2018/10/27	2019/10/26
●	Pulse Limiter	R&S	ESH3-Z2	100499	2018/10/27	2019/10/26
●	RF Connection Cable	HUBER+SUHNER	EF400	N/A	2018/11/15	2019/11/14
●	Test Software	R&S	ES-K1	N/A	N/A	N/A
○	Single Balanced Telecom Pair ISN	FCC	FCC-TLISN-T2-02	20371	2018/10/28	2019/10/27
○	Two Balanced Telecom Pairs ISN	FCC	FCC-TLISN-T4-02	20373	2018/10/28	2019/10/27
○	Four Balanced Telecom Pairs ISN	FCC	FCC-TLISN-T8-02	20375	2018/10/28	2019/10/27
○	V-Network	R&S	ESH3-Z6	100211	2018/10/27	2019/10/26
○	V-Network	R&S	ESH3-Z6	100210	2018/10/27	2019/10/26
○	2-Line V-Network	R&S	ESH3-Z5	100049	2018/10/27	2019/10/26

● Radiated Emission-6th test site						
Used	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Semi-Anechoic Chamber	Albatross projects	SAC-3m-02	N/A	2018/09/30	2021/09/29
●	EMI Test Receiver	R&S	ESCI	100900	2018/10/28	2019/10/27
●	Loop Antenna	R&S	HFH2-Z2	100020	2017/11/20	2020/11/19
●	Ultra-Broadband Antenna	SCHWARZBECK	VULB9163	546	2017/04/05	2020/04/04
●	Pre-Amplifer	SCHWARZBECK	BBV 9742	N/A	2018/11/15	2019/11/14
●	RF Connection Cable	HUBER+SUHNER	N/A	N/A	2018/09/28	2019/09/27
●	RF Connection Cable	HUBER+SUHNER	SUCOFLEX104	501184/4	2018/09/28	2019/09/27
●	Test Software	R&S	ES-K1	N/A	N/A	N/A
●	Turntable	Maturo Germany	TT2.0-1T	N/A	N/A	N/A
●	Antenna Mast	Maturo Germany	CAM-4.0-P-12	N/A	N/A	N/A

● Radiated emission-7th test site						
Used	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Semi-Anechoic Chamber	Albatross projects	SAC-3m-01	N/A	2018/09/30	2021/09/29
●	Spectrum Analyzer	R&S	FSP40	100597	2018/10/27	2019/10/26
●	Horn Antenna	SCHWARZBECK	9120D	1011	2017/03/27	2020/03/26
●	Pre-amplifier	BONN	BLWA0160-2M	1811887	2018/11/14	2019/11/13
●	Pre-amplifier	CD	PAP-0102	12004	2018/11/14	2019/11/13
●	Broadband Pre-amplifier	SCHWARZBECK	BBV 9718	9718-248	2019/04/28	2020/04/27
●	RF Connection Cable	HUBER+SUHNER	RE-7-FH	N/A	2018/11/15	2019/11/14
●	RF Connection Cable	HUBER+SUHNER	RE-7-FL	N/A	2018/11/15	2019/11/14
●	Test Software	Audix	E3	N/A	N/A	N/A

●	Turntable	Maturo Germany	TT2.0-1T	N/A	N/A	N/A
●	Antenna Mast	Maturo Germany	CAM-4.0-P-12	N/A	N/A	N/A

●	RF Conducted Method					
Used	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Signal and spectrum Analyzer	R&S	FSV40	100048	2018/10/28	2019/10/27
●	Spectrum Analyzer	Agilent	N9020A	MY50510187	2018/09/29	2019/09/28
●	OSP	R&S	OSP120	101317	N/A	N/A
○	Radio communication tester	R&S	CMW500	137688-Lv	2018/09/29	2019/09/28
○	Test software	Tonscend	JS1120-1(LTE)	N/A	N/A	N/A
○	Test software	Tonscend	JS1120-2(WIFI)	N/A	N/A	N/A
○	Test software	Tonscend	JS1120-3(WCDMA)	N/A	N/A	N/A
○	Test software	Tonscend	JS1120-4(GSM)	N/A	N/A	N/A

5. TEST CONDITIONS AND RESULTS

5.1. Antenna requirement

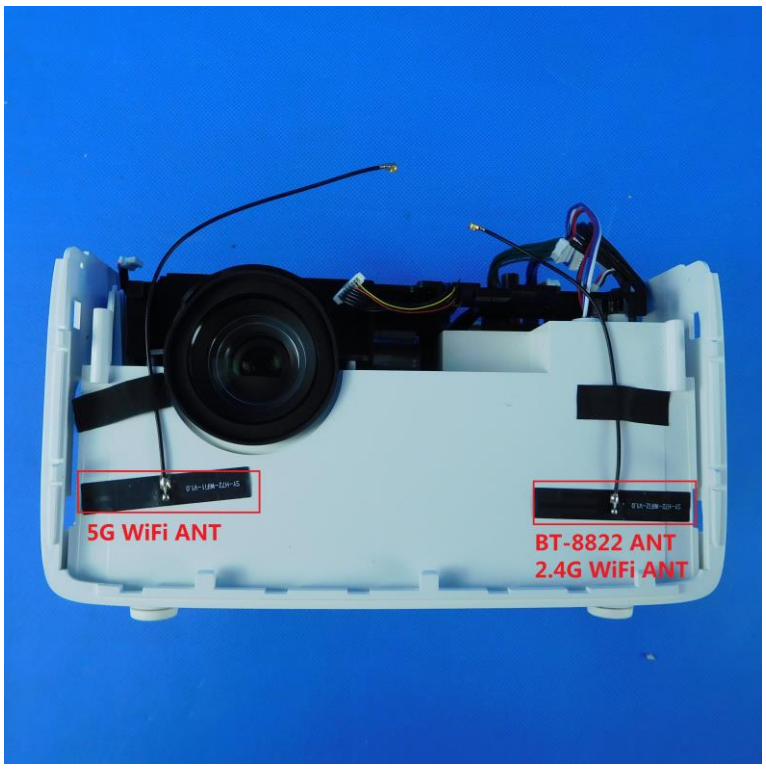
Requirement

FCC CFR Title 47 Part 15 Subpart C Section 15.203:

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. The use of a permanently attached antenna or of anantenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Test Result:

The directional gain of the antenna less than 6 dBi, please refer to the below antenna photo.



5.2. Conducted Emissions (AC Main)

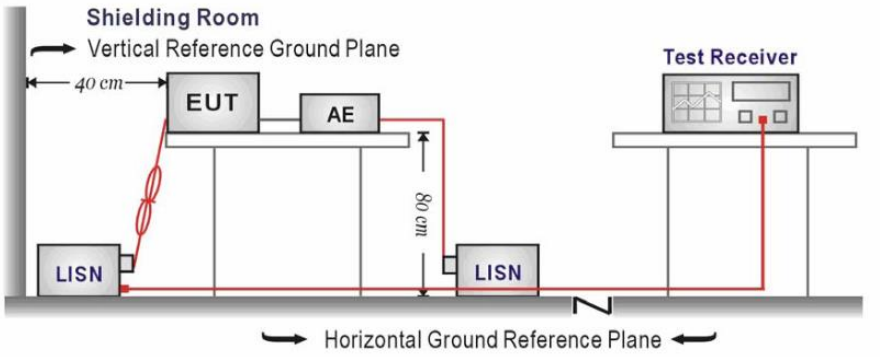
LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.207:

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST CONFIGURATION



TEST PROCEDURE

1. The EUT was setup according to ANSI C63.10:2013 requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment.
4. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor,was individually connected through a LISN to the input power source.
6. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
7. Conducted Emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
8. During the above scans, the emissions were maximized by cable manipulation.

TEST MODE:

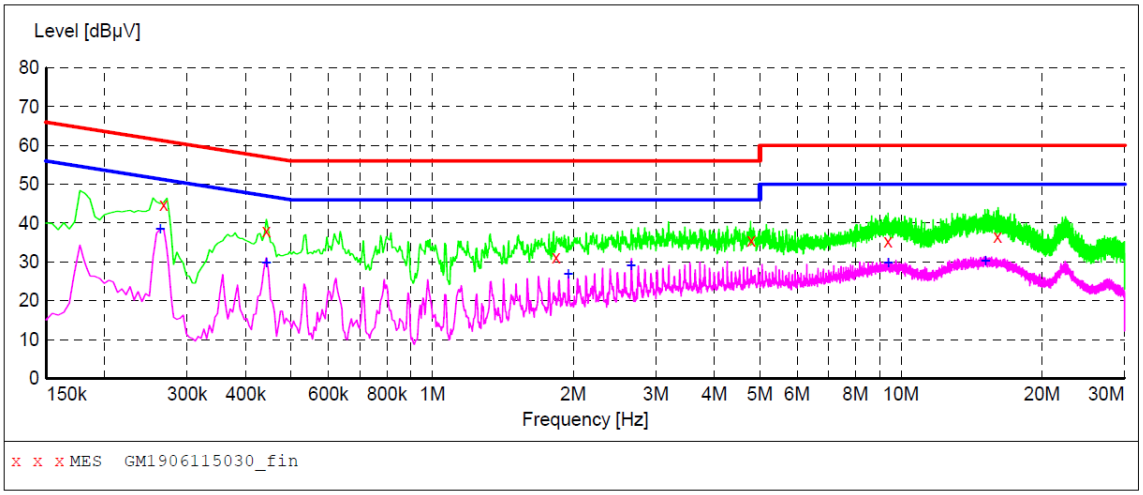
Please refer to the clause 3.3

TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

Note:
1) Transd=Cable lose+ Pulse Limiter Factor + Artificial Mains Factor
2) Margin= Limit -Level

Test Line:	L



MEASUREMENT RESULT: "GM1906115030_fin"

6/11/2019 12:36PM

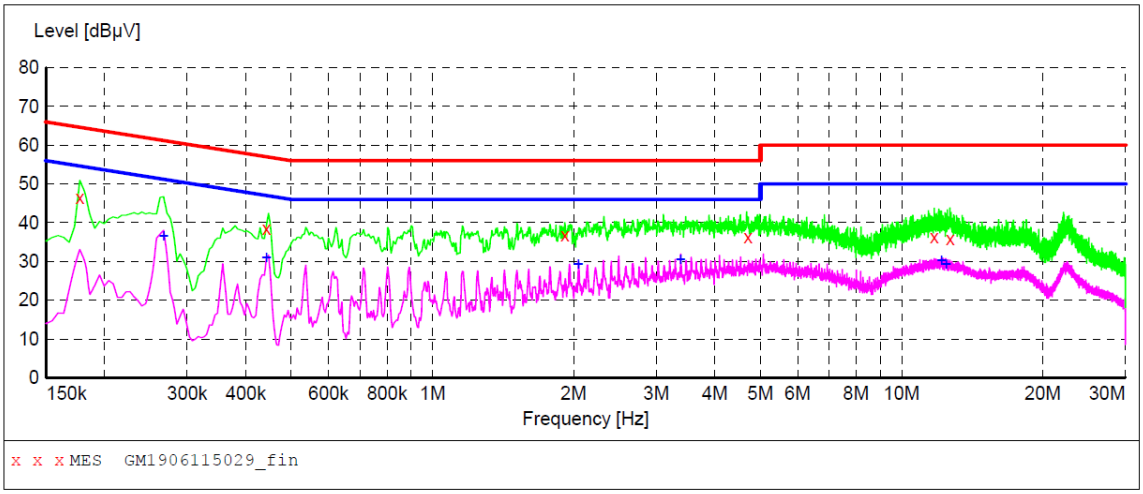
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.267000	44.80	9.9	61	16.4	QP	L1	GND
0.442500	38.00	9.9	57	19.0	QP	L1	GND
1.837500	31.20	9.9	56	24.8	QP	L1	GND
4.794000	35.60	9.9	56	20.4	QP	L1	GND
9.379500	35.30	10.1	60	24.7	QP	L1	GND
16.071000	36.50	10.2	60	23.5	QP	L1	GND

MEASUREMENT RESULT: "GM1906115030_fin2"

6/11/2019 12:36PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.262500	38.60	9.9	51	12.8	AV	L1	GND
0.442500	29.80	9.9	47	17.2	AV	L1	GND
1.950000	26.90	9.9	46	19.1	AV	L1	GND
2.656500	28.90	9.9	46	17.1	AV	L1	GND
9.388500	29.80	10.1	50	20.2	AV	L1	GND
15.148500	30.20	10.2	50	19.8	AV	L1	GND

Test Line:	N



MEASUREMENT RESULT: "GM1906115029_fin"

6/11/2019 12:34PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.177000	46.50	9.9	65	18.1	QP	N	GND
0.442500	38.40	9.9	57	18.6	QP	N	GND
1.914000	36.70	9.9	56	19.3	QP	N	GND
4.699500	36.30	9.9	56	19.7	QP	N	GND
11.728500	36.20	10.1	60	23.8	QP	N	GND
12.691500	35.80	10.1	60	24.2	QP	N	GND

MEASUREMENT RESULT: "GM1906115029_fin2"

6/11/2019 12:34PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.267000	36.50	9.9	51	14.7	AV	N	GND
0.442500	30.90	9.9	47	16.1	AV	N	GND
2.044500	29.40	9.9	46	16.6	AV	N	GND
3.376500	30.50	9.9	46	15.5	AV	N	GND
12.165000	30.30	10.1	50	19.7	AV	N	GND
12.435000	29.30	10.1	50	20.7	AV	N	GND

5.3. Maximum Conducted Output Power

LIMIT

FCC CFR Title 47 Part 15 Subpart E Section 15.407(a):

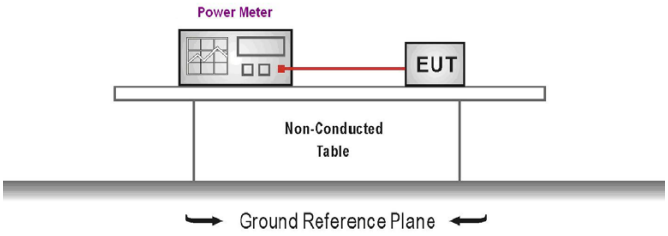
For the 5.15~5.25GHz band:

- Outdoor AP
  The maximum conducted output power (P_{out}) shall not exceed the lesser of 1W (30dBm).
  if G_{Tx}>6dBi, then P_{out} =30-(G_{Tx}-6). e.i.r.p. at any elevation angle above 30 degrees≤125mW (21dBm)
- Indoor AP
  The maximum conducted output power (P_{out}) shall not exceed the lesser of 1W (30dBm).
  if G_{Tx}>6dBi, then Pout =30-(G_{Tx}-6).
- Point-to-point AP
  The maximum conducted output power (P_{out}) shall not exceed the lesser of 1W (30dBm).
  if G_{Tx}>23dBi, then Pout =30-(G_{Tx}-23).
- Client devices
  The maximum conducted output power (P_{out}) shall not exceed the lesser of 250W (24dBm).
  if G_{Tx}>6dBi, then Pout =24-(G_{Tx}-6).

For the 5.725~5.85GHz band:

- Point-to-multipoint systems (P2M)
  The maximum conducted output power (P_{out}) shall not exceed the lesser of 1W (30dBm).
  if G_{Tx}>6dBi, then P_{out} =30-(G_{Tx}-6).
- Point-to-point systems (P2P)
  The maximum conducted output power (P_{out}) shall not exceed the lesser of 1W (30dBm).

TEST CONFIGURATION



TEST PROCEDURE

1. The EUT was tested according to KDB789033 Section E-3-b)
2. The maximum conducted output power may be measured using a broadband AVG RF power meter.
3. Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor.
4. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.
5. Record the measurement data.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

Band	Bandwidth (MHz)	Type	Channel	Conducted Output Power (dBm)	Limit (dBm)	Result
I	20	802.11ac	CH_L	12.09	30.00	Pass
			CH_M	12.56		
			CH_H	11.03		
		802.11n	CH_L	11.83	30.00	Pass
			CH_M	11.76		
			CH_H	12.90		
		802.11a	CH_L	12.01	30.00	Pass
			CH_M	13.25		
			CH_H	13.47		
	40	802.11ac	CH_L	12.25	30.00	Pass
			CH_H	11.50		
		802.11n	CH_L	11.06	30.00	Pass
			CH_H	12.38		
	80	802.11ac	CH_M	11.37	30.00	Pass
IV	20	802.11ac	CH_L	12.82	30.00	Pass
			CH_M	11.70		
			CH_H	10.98		
		802.11n	CH_L	12.88	30.00	Pass
			CH_M	12.05		
			CH_H	10.78		
		802.11a	CH_L	12.52	30.00	Pass
			CH_M	12.96		
			CH_H	11.37		
	40	802.11ac	CH_L	12.06	30.00	Pass
			CH_H	11.26		
		802.11n	CH_L	12.51	30.00	Pass
			CH_H	11.24		
	80	802.11ac	CH_M	12.06	30.00	Pass

5.4. Maximum Power Spectral Density

LIMIT

FCC CFR Title 47 Part 15 Subpart E Section 15.407(a):

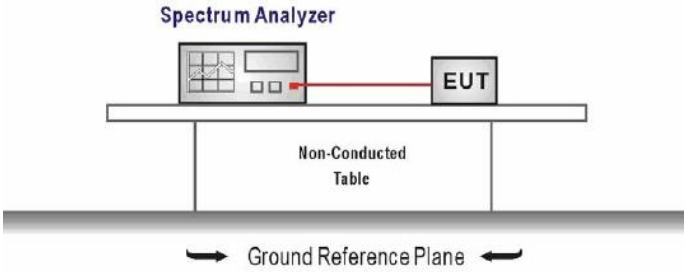
For the 5.15~5.25GHz band:

- Outdoor AP
  The peak power spectral density (PSD) shall not exceed the lesser of 17dBm/MHz.
  if G_{Tx}>6dBi, then PSD =17-(G_{Tx}-6).
- Indoor AP
  The peak power spectral density (PSD) shall not exceed the lesser of 17dBm/MHz.
  if G_{Tx}>6dBi, then PSD =17-(G_{Tx}-6).
- Point-to-point AP
  The peak power spectral density (PSD) shall not exceed the lesser of 17dBm/MHz.
  if G_{Tx}>23dBi, then PSD =17-(G_{Tx}-23).
- Client devices
  The peak power spectral density (PSD) shall not exceed the lesser of 11dBm/MHz.
  if G_{Tx}>6dBi, then PSD =11-(G_{Tx}-6).

For the 5.725~5.85GHz band:

- Point-to-multipoint systems (P2M)
  The peak power spectral density (PSD) shall not exceed the lesser of 30dBm/500kHz.
  if G_{Tx}>6dBi, then PSD =30-(G_{Tx}-6).
- Point-to-point systems (P2P)
  The peak power spectral density (PSD) shall not exceed the lesser of 30dBm/500kHz.

TEST CONFIGURATION



TEST PROCEDURE

1. According KDB 789033 D02 – Section F
2. Analyzer was setting as follow:
   Center frequency: test channel
   Span was set to encompass the entire emission bandwidth of the signal
   RBW=1MHz for devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz
   RBW=500kHz for devices operating in the band 5.725-5.85 GHz
   VBW ≥ 3 RBW
   Number of sweep points > 2 x (span/RBW)
   Sweep time = auto
   Detector = Peak
   Trigger was set to free run for all modes, trace was averaged over 100 sweeps
3. The peak search function of the spectrum analyzer was used to find the peak of the spectrum.

TEST MODE:

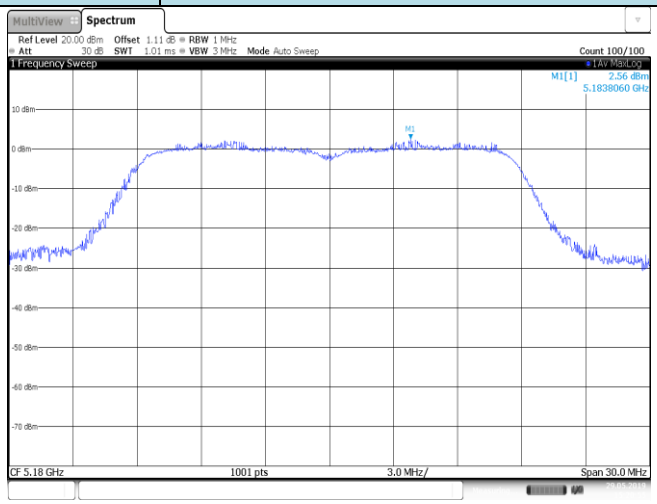
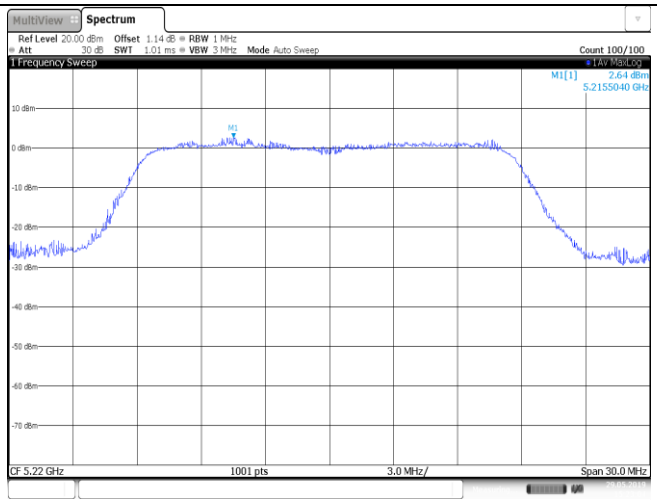
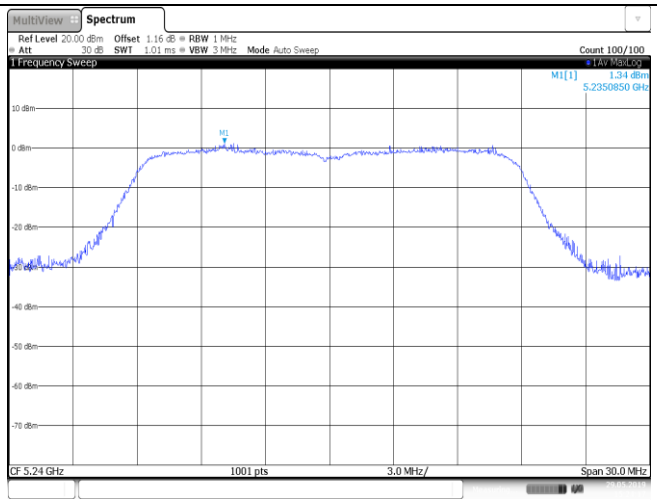
Please refer to the clause 3.3

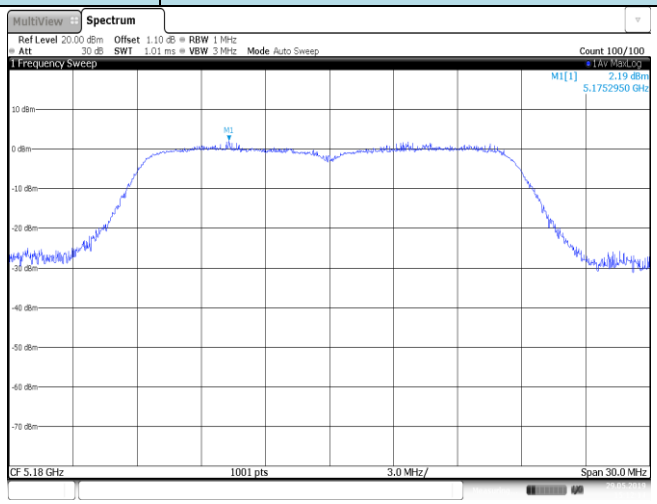
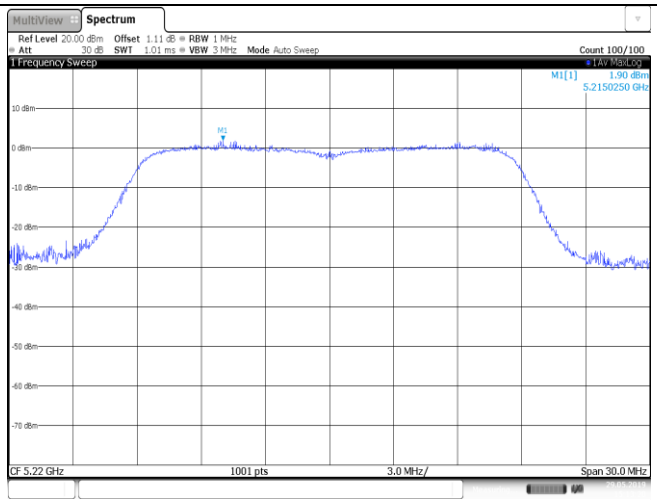
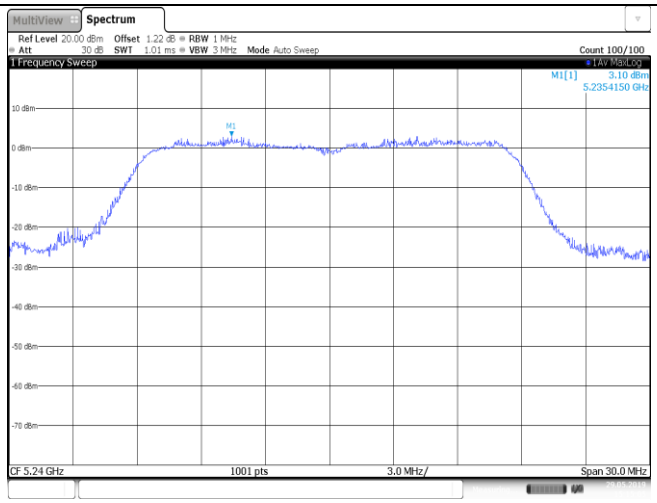
TEST RESULTS

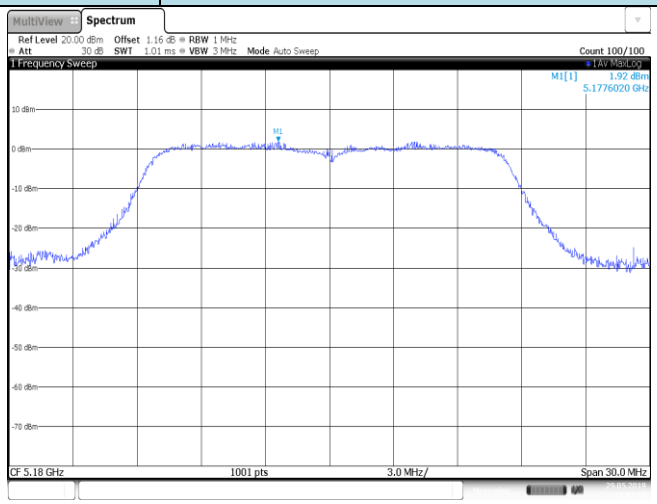
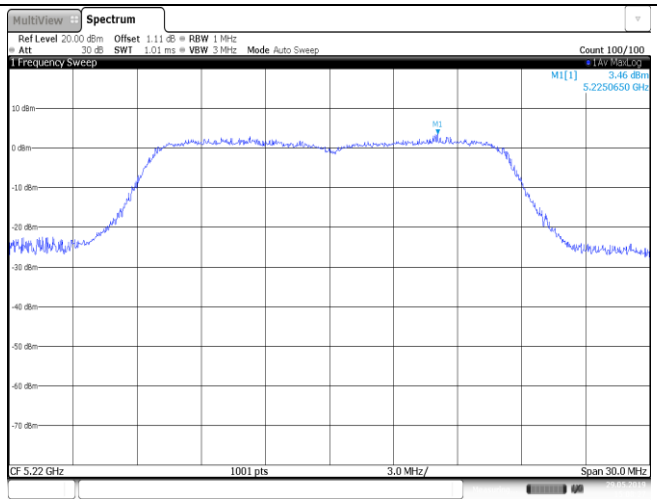
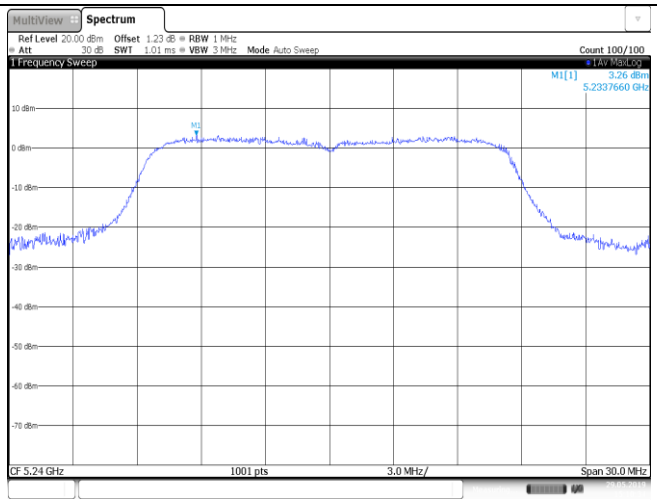
☒ **Passed** ☐ **Not Applicable**

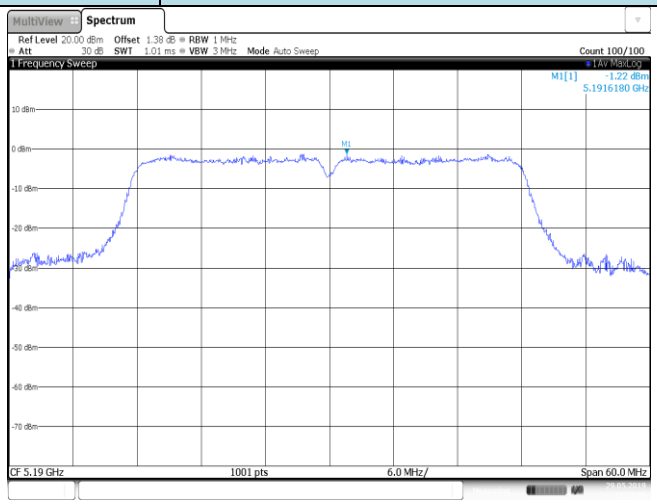
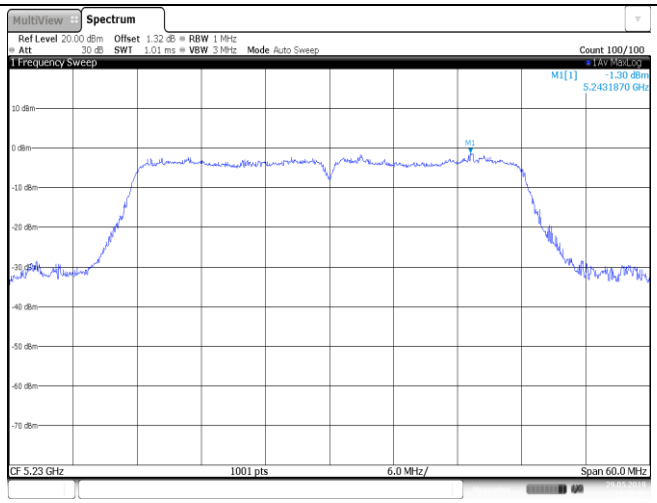
Band	Bandwidth (MHz)	Type	Channel	Power Spectral Density (dBm/MHz)	Limit (dBm/MHz)	Result
I	20	802.11ac	CH_L	2.56	17.00	Pass
			CH_M	2.64		
			CH_H	1.34		
		802.11n	CH_L	2.19	17.00	Pass
			CH_M	1.90		
			CH_H	3.10		
		802.11a	CH_L	1.92	17.00	Pass
			CH_M	3.46		
			CH_H	3.26		
	40	802.11ac	CH_L	-1.22	17.00	Pass
			CH_H	-1.30		
		802.11n	CH_L	-2.20	17.00	Pass
			CH_H	-0.78		
	80	802.11ac	CH_M	-4.55	17.00	Pass
Band	Bandwidth (MHz)	Type	Channel	Power Spectral Density (dBm/500kHz)	Limit (dBm/500KHz)	Result
IV	20	802.11ac	CH_L	1.48	30.00	Pass
			CH_M	-0.16		
			CH_H	-0.62		
		802.11n	CH_L	0.97	30.00	Pass
			CH_M	-0.70		
			CH_H	-0.93		
		802.11a	CH_L	2.95	30.00	Pass
			CH_M	1.63		
			CH_H	-0.02		
	40	802.11ac	CH_L	-2.29	30.00	Pass
			CH_H	-4.07		
		802.11n	CH_L	-2.92	30.00	Pass
			CH_H	-4.14		
	80	802.11ac	CH_M	-5.02	30.00	Pass

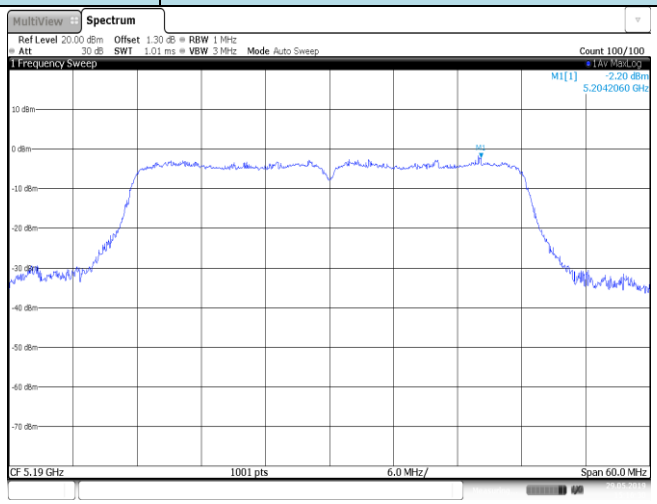
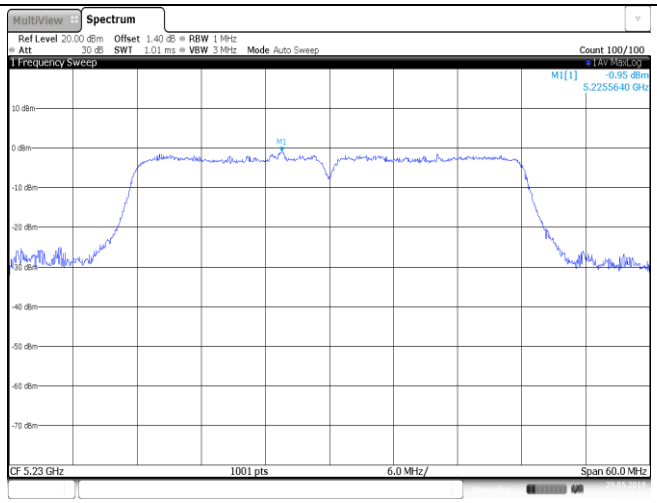
Test plot as follows:

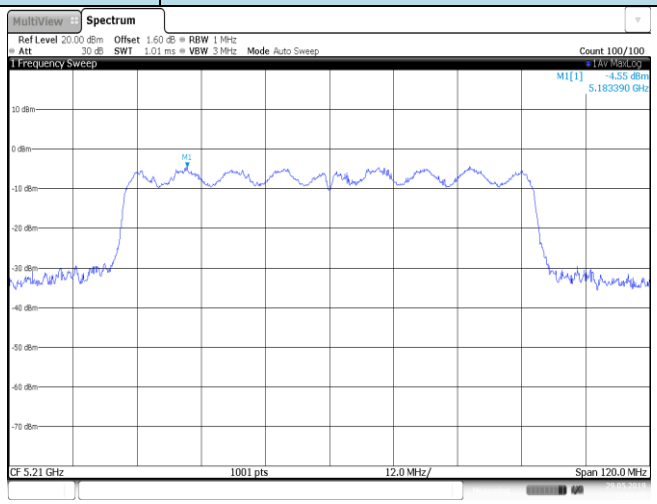
Band I	802.11ac (HT20)
CH_L	
CH_M	
CH_H	

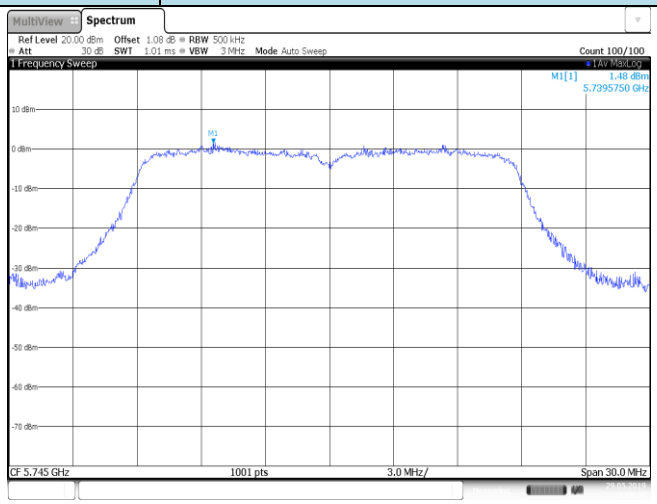
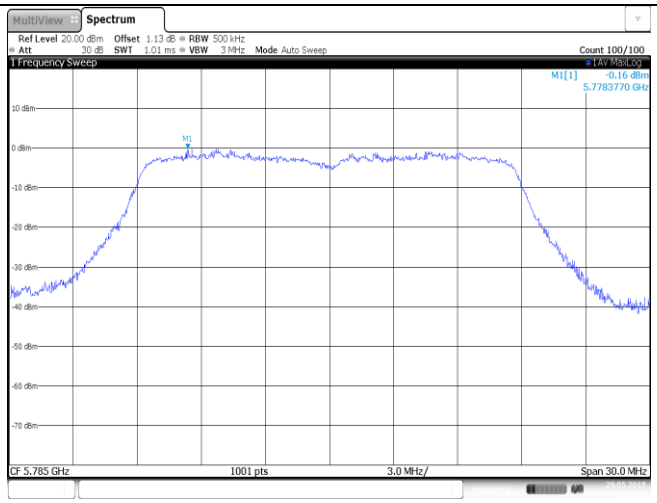
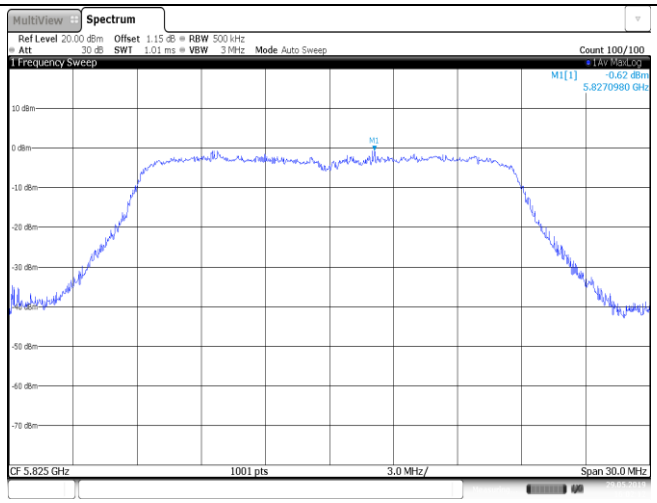
Band I	802.11n (HT20)
CH_L	
CH_M	
CH_H	

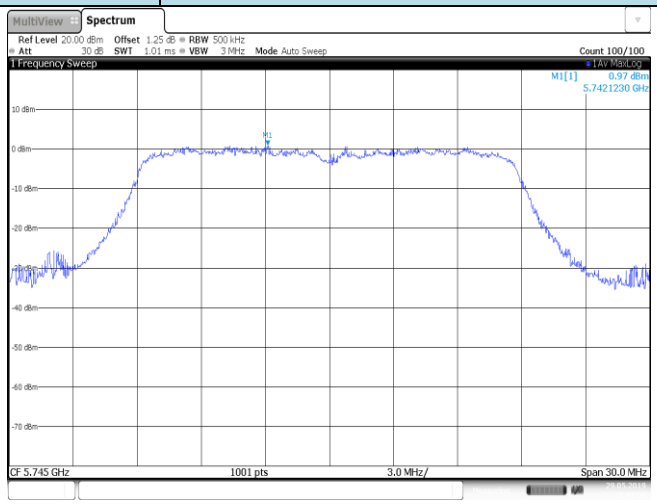
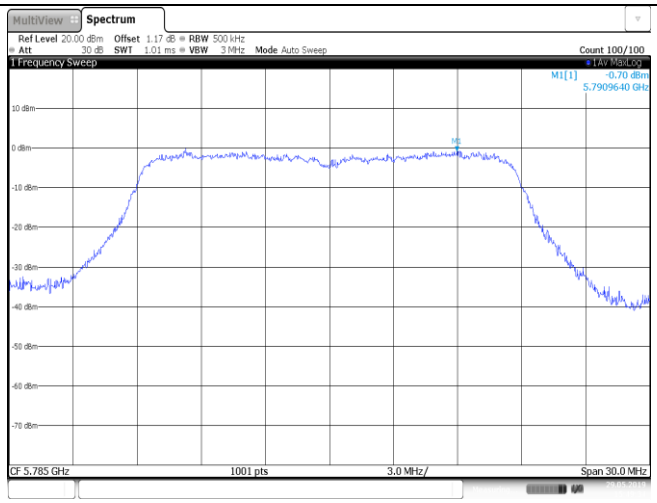
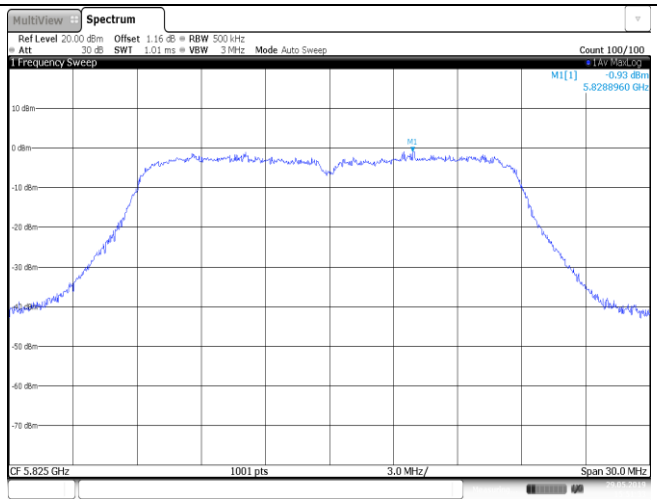
Band I	802.11a
CH_L	
CH_M	
CH_H	

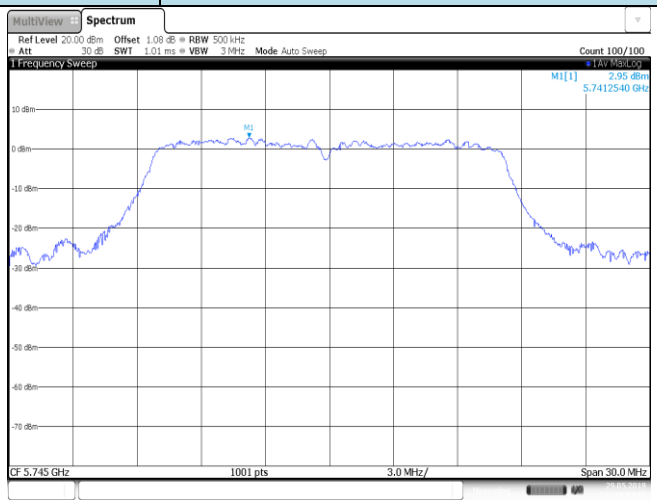
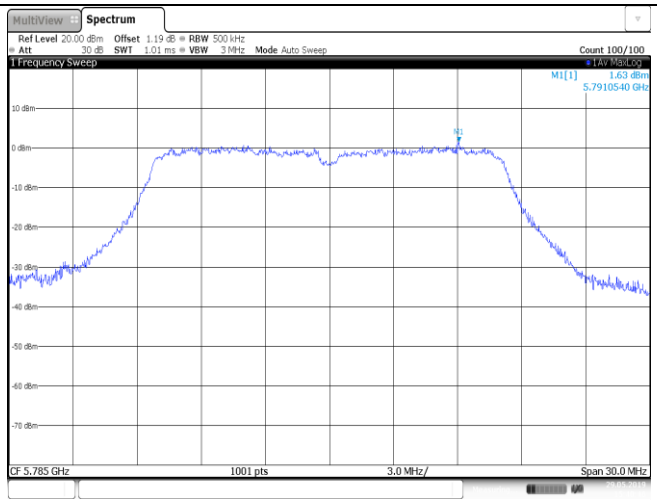
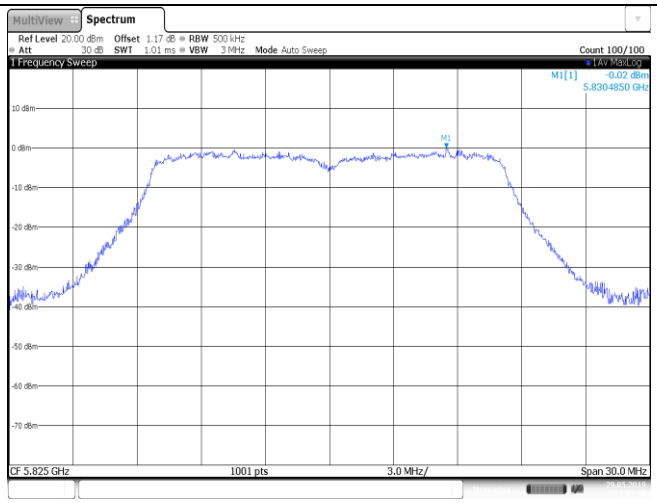
Band I	802.11ac (HT40)
CH_L	
CH_H	

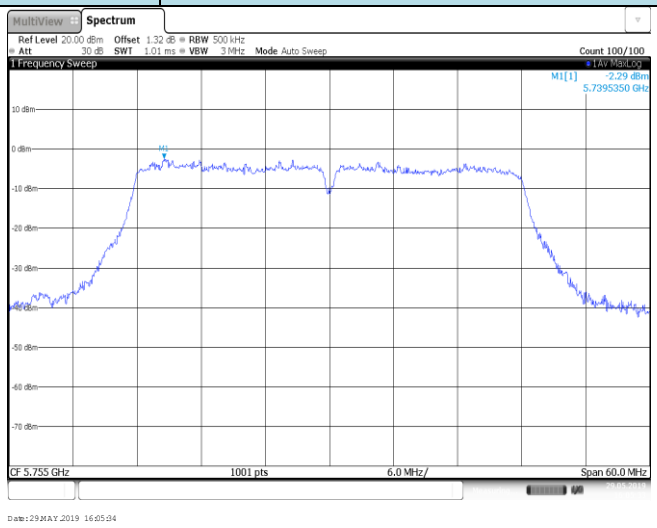
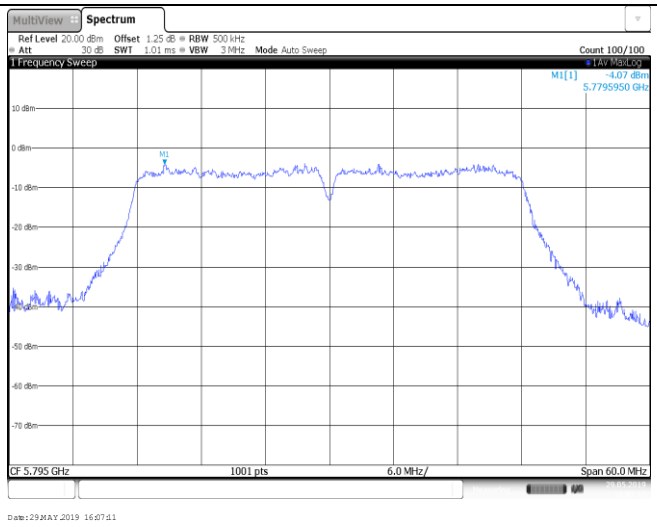
Band I	802.11n (HT40)
CH_L	
CH_H	

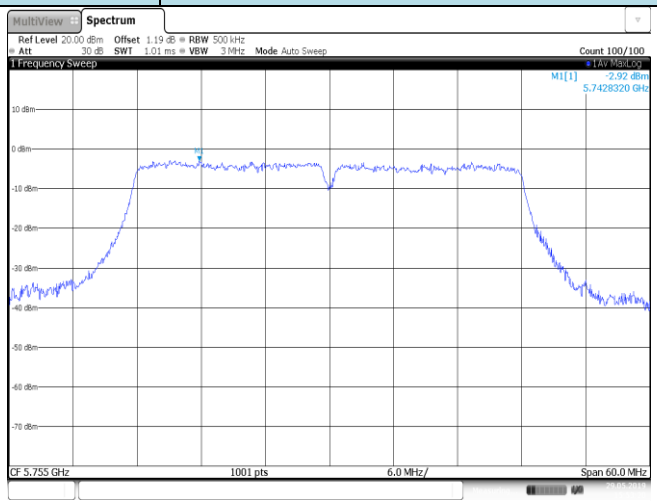
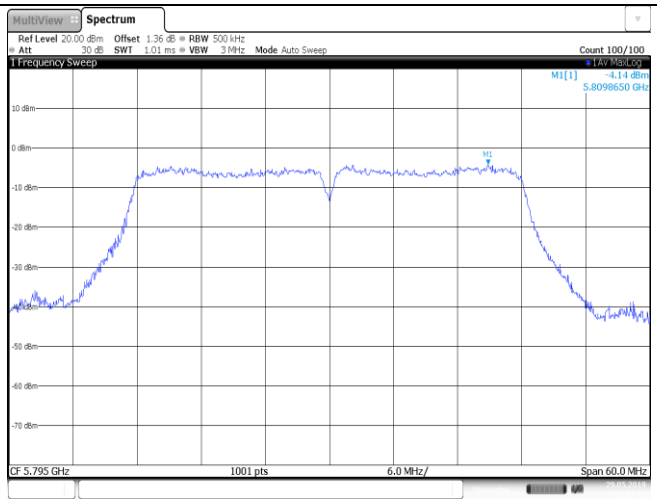
Band I	802.11ac (HT80)
CH_M	

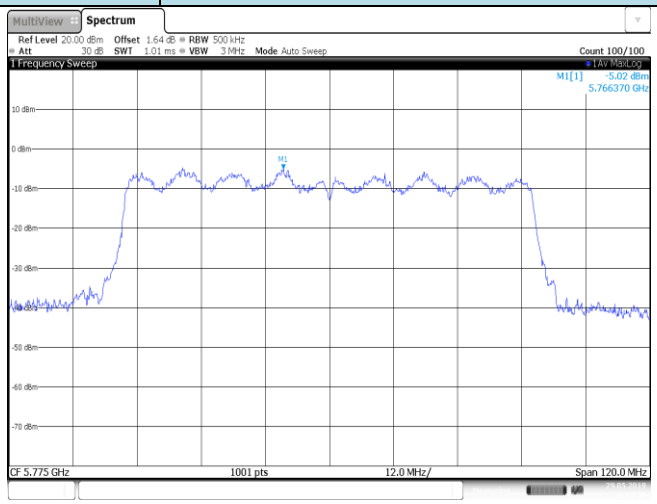
Band IV	802.11ac (HT20)
CH_L	
CH_M	
CH_H	

Band IV	802.11n (HT20)
CH_L	
CH_M	
CH_H	

Band IV	802.11a
CH_L	
CH_M	
CH_H	

Band IV	802.11ac (HT40)
CH_L	
CH_H	

Band IV	802.11n (HT40)
CH_L	
CH_H	

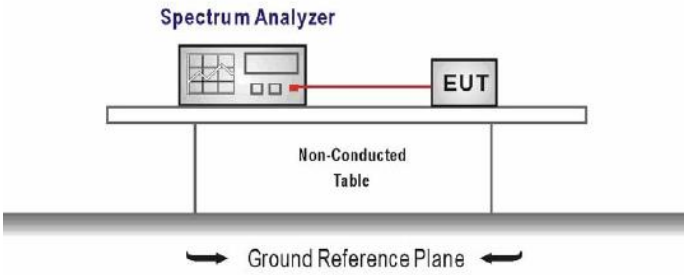
Band IV	802.11ac (HT80)
CH_M	

5.5. 26dB bandwidth and 99% Occupy bandwidth

LIMIT

The bandwidth at 26dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in KDB 789033 D02 , and at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 26dB bandwidth.

TEST CONFIGURATION



TEST PROCEDURE

1. According KDB 789033 D02 – Section C
2. Connect the antenna port(s) to the spectrum analyzer input.
3. Configure the spectrum analyzer as shown below (enter all losses between the transmitter output and the spectrum analyzer).
   Center Frequency =Channel center frequency
   Span=2 x emission bandwidth
   RBW = 1% to 5% of the emission bandwidth
   VBW>3 x RBW
   Sweep time= auto couple
   Detector = Peak
   Trace mode = max hold
4. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter wave form on the spectrum analyzer.
5. Measure the maximum width of the emission that is 26 dB down from the maximum of the emission, and use the 99 % power bandwidth function of the instrument

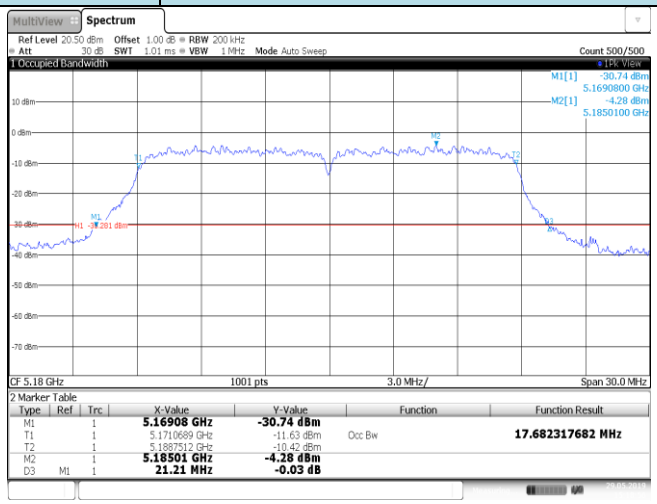
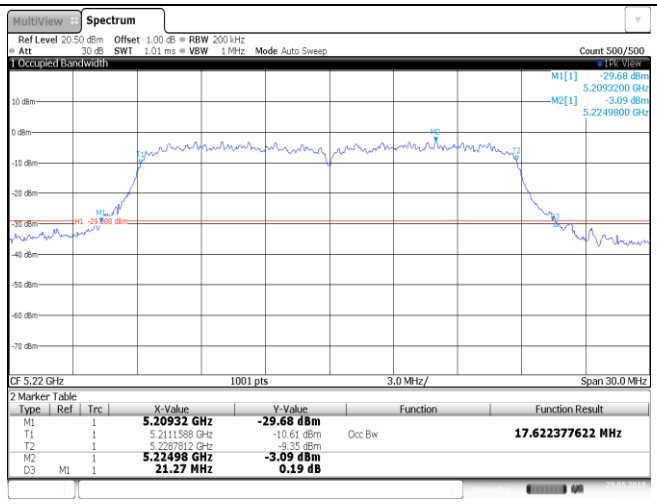
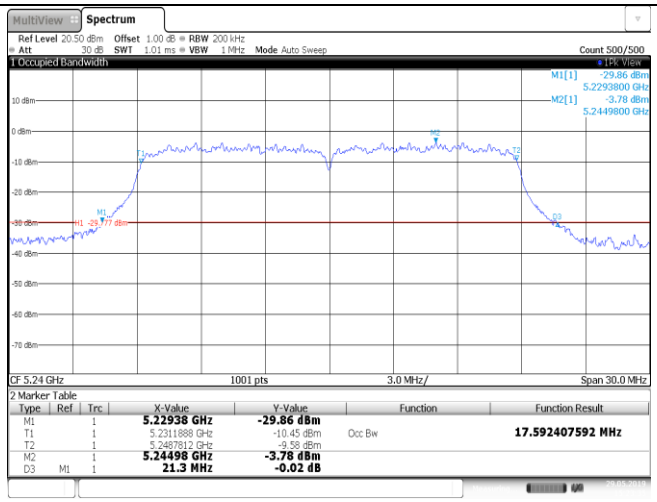
TEST MODE:

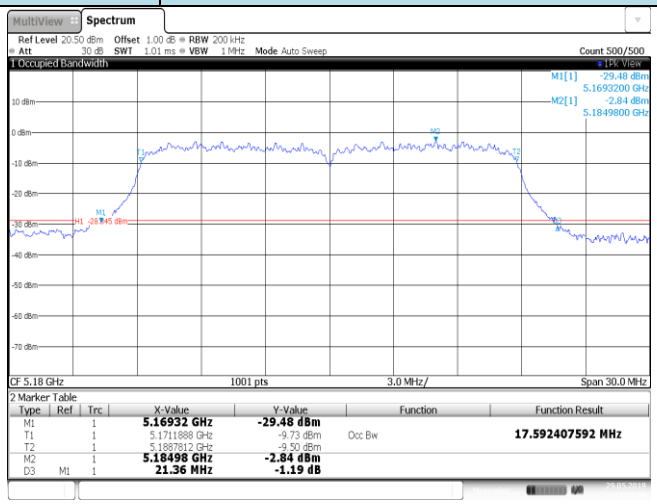
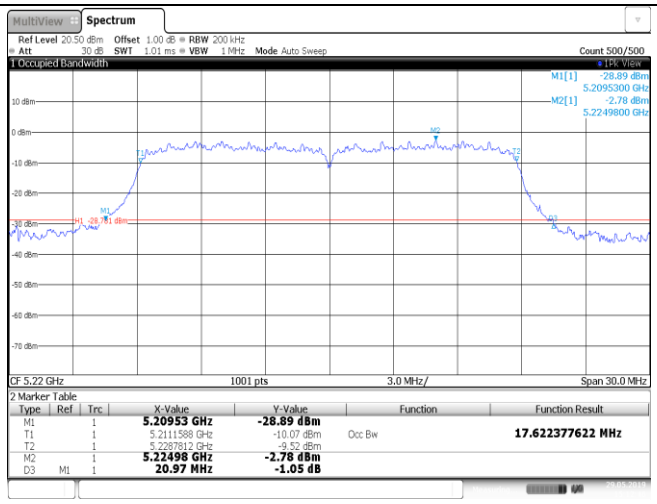
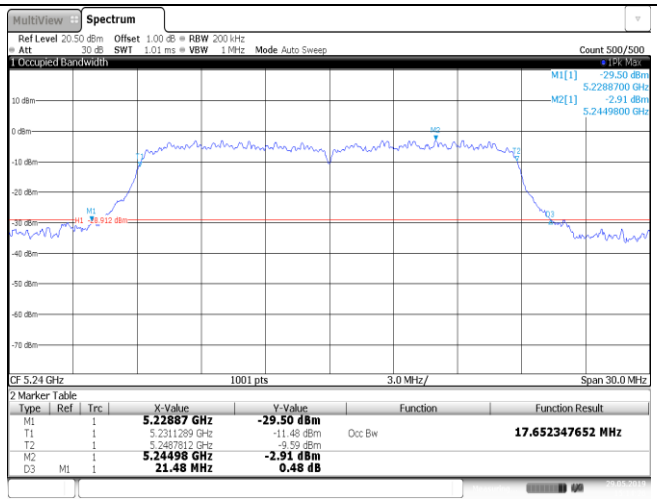
Please refer to the clause 3.3

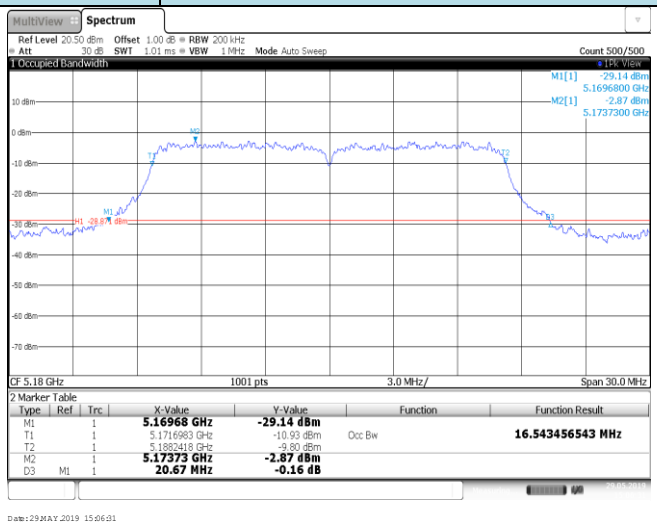
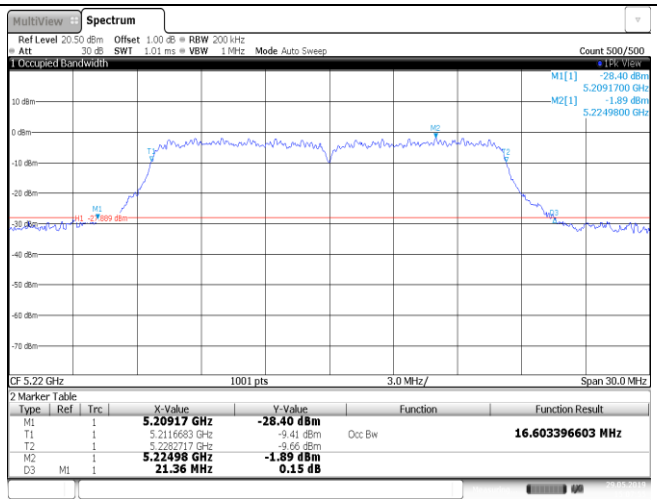
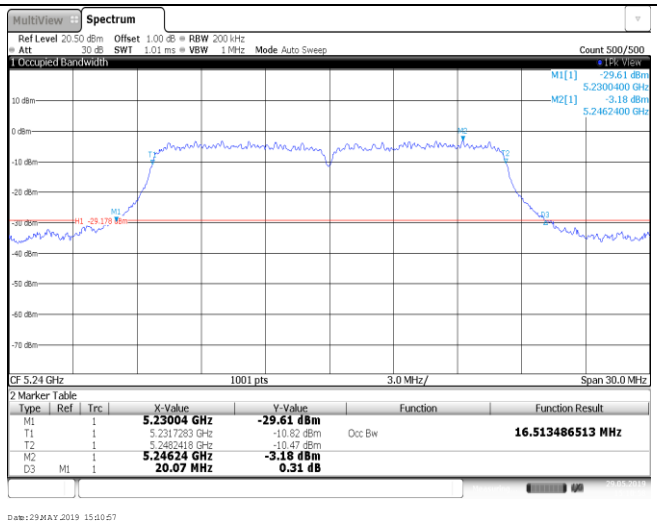
TEST RESULTS

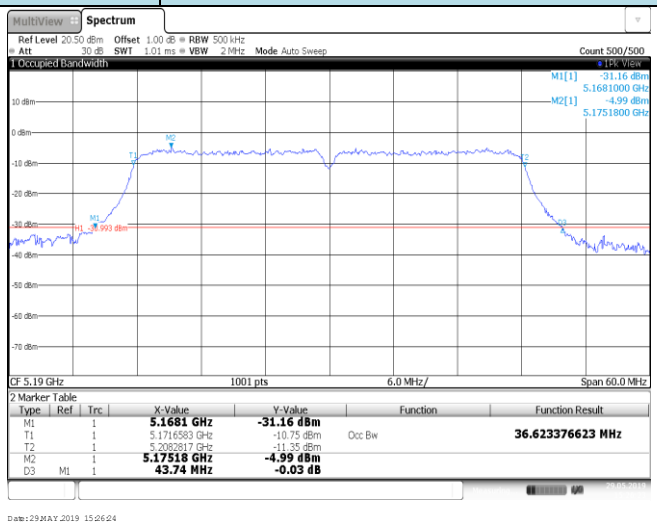
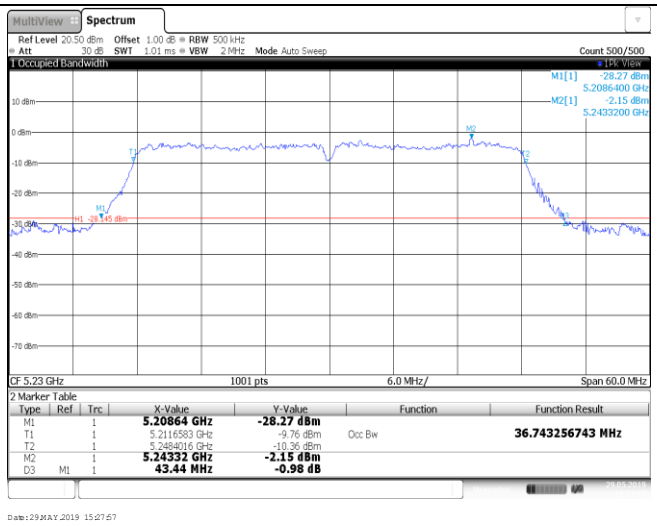
☒ **Passed** ☐ **Not Applicable**

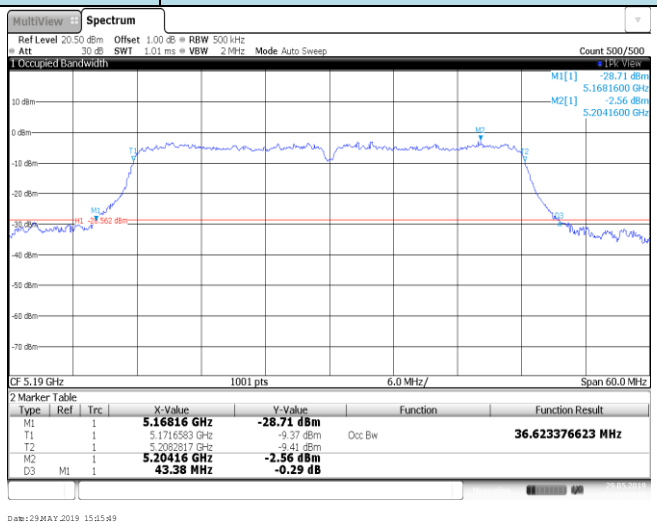
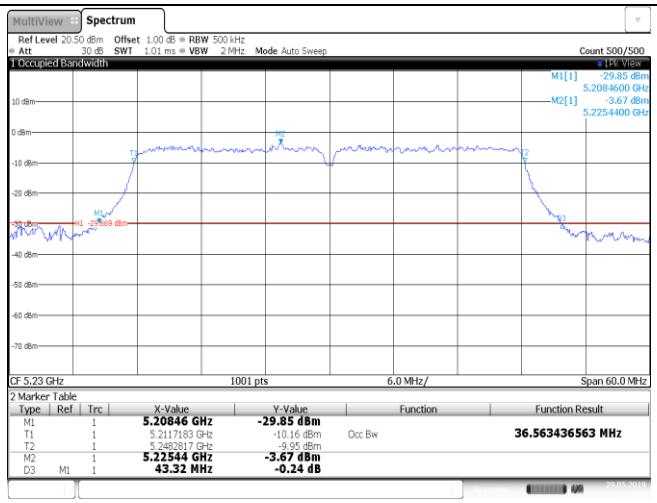
Band	Bandwidth (MHz)	Type	Channel	99% Occupy bandwith (MHz)	26dB bandwidth (MHz)	Result
I	20	802.11ac	CH_L	17.68	21.21	Pass
			CH_M	17.62	21.27	
			CH_H	17.59	21.30	
		802.11n	CH_L	17.59	21.36	Pass
			CH_M	17.62	20.97	
			CH_H	17.65	21.48	
		802.11a	CH_L	16.54	20.67	Pass
			CH_M	16.60	21.36	
			CH_H	16.51	20.07	
	40	802.11ac	CH_L	36.62	43.74	Pass
			CH_H	36.74	43.44	
		802.11n	CH_L	36.62	43.38	Pass
			CH_H	36.56	43.32	
	80	802.11ac	CH_M	75.76	83.52	Pass

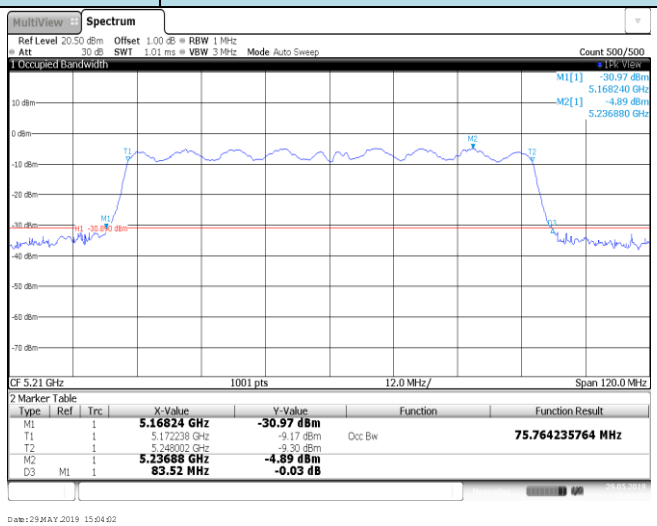
Band I	802.11ac (HT20)
CH_L	
CH_M	
CH_H	

Band I	802.11n (HT20)
CH_L	
CH_M	
CH_H	

Band I	802.11a
CH_L	
CH_M	
CH_H	

Band I	802.11ac (HT40)
CH_L	
CH_H	

Band I	802.11n (HT40)
CH_L	
CH_H	

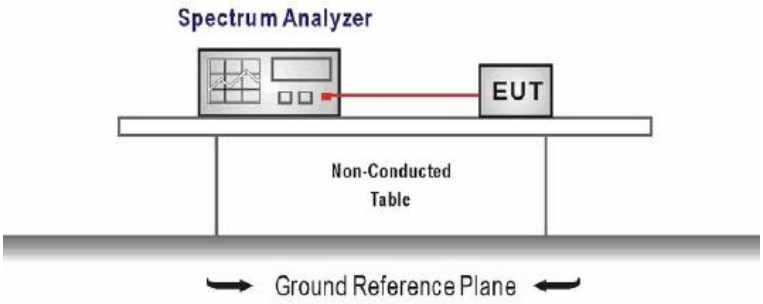
Band I	802.11ac (HT80)
CH_M	

5.6. 6dB Bandwidth

LIMIT

FCC CFR Title 47 Part 15 Subpart E Section 15.407(e)
Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz

TEST CONFIGURATION



TEST PROCEDURE

1. Connect the antenna port(s) to the spectrum analyzer input.
2. Configure the spectrum analyzer as shown below (enter all losses between the transmitter output and the spectrum analyzer).
   Center Frequency =test channel center frequency
   Span=2 x emission bandwidth
   RBW = 100 kHz, VBW ≥ 3 × RBW
   Sweep time= auto couple
   Detector = Peak
   Trace mode = max hold
3. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter wave form on the spectrum analyzer.
4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission, and record the pertinent measurements.

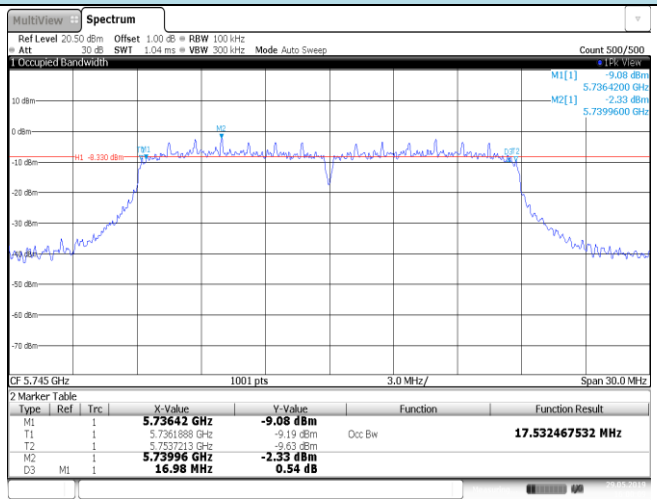
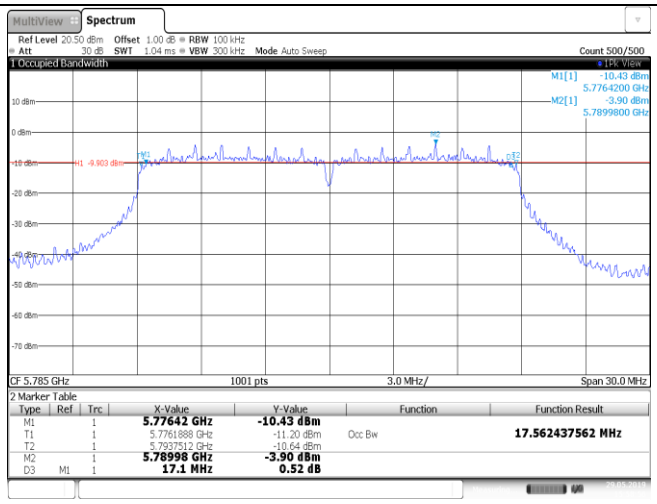
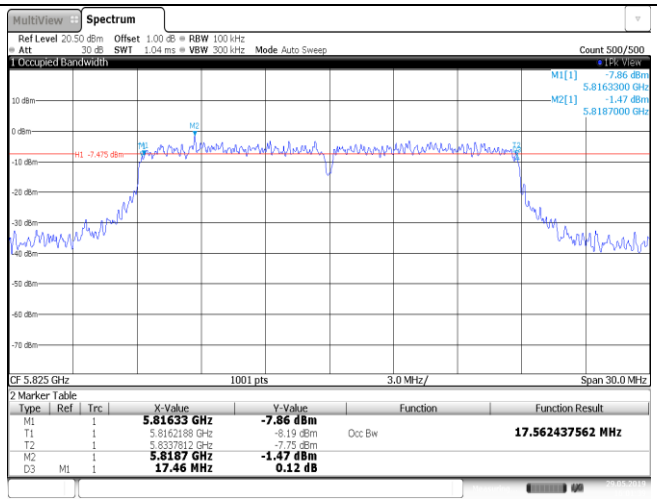
TEST MODE:

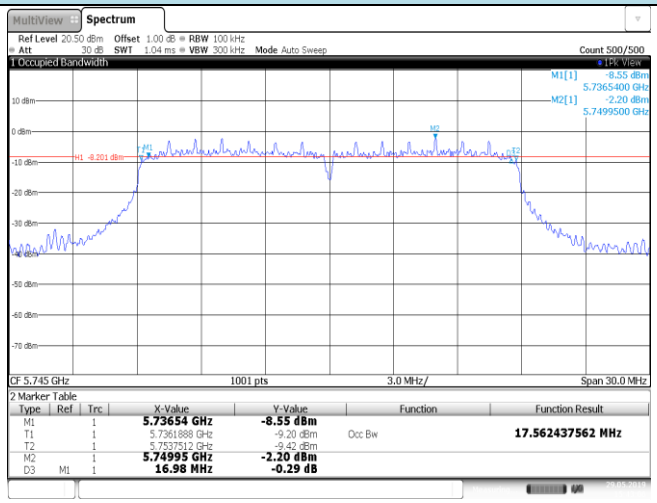
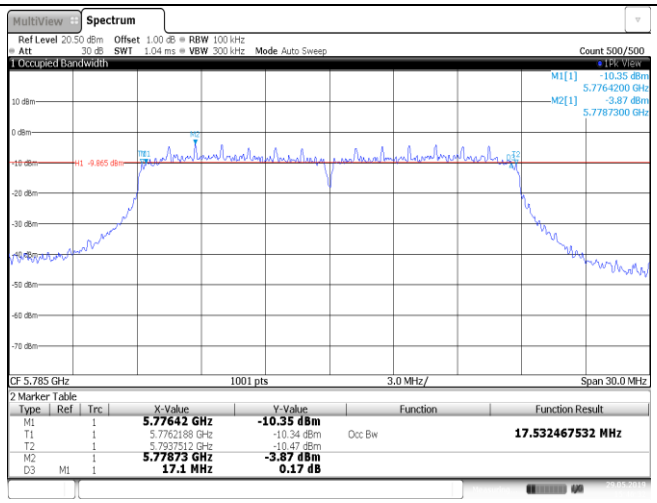
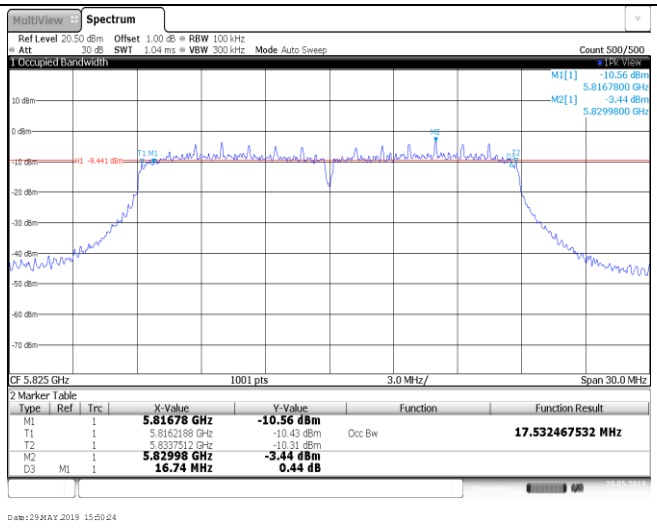
Please refer to the clause 3.3

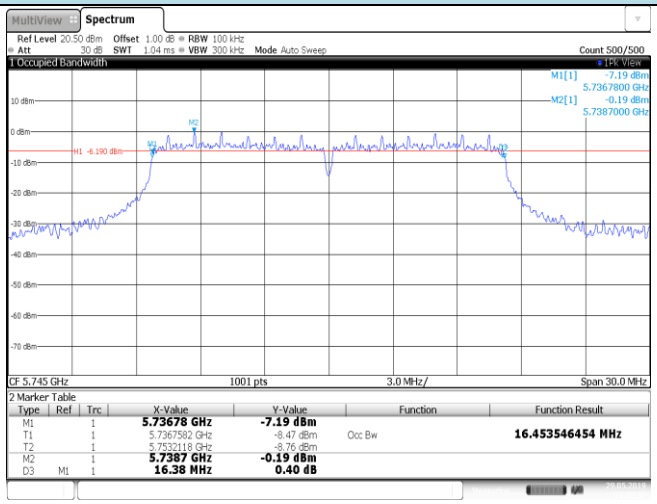
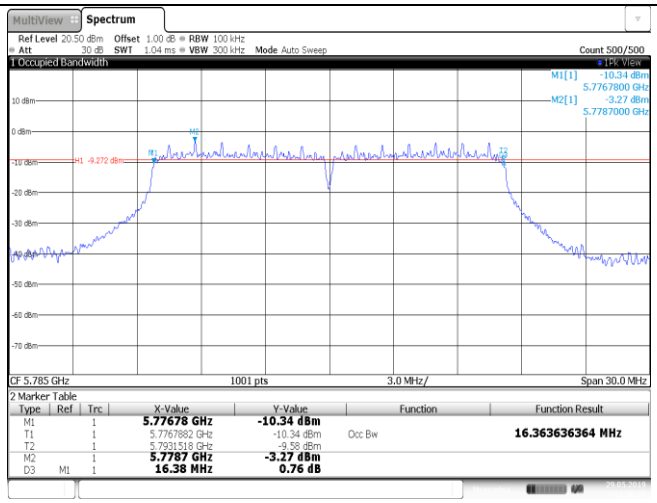
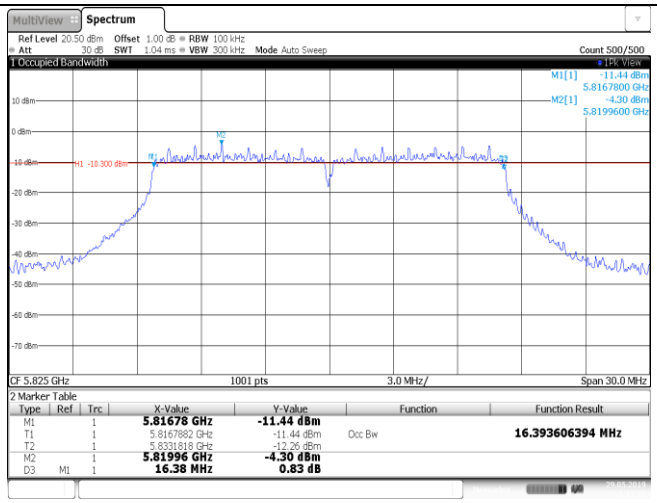
TEST RESULTS

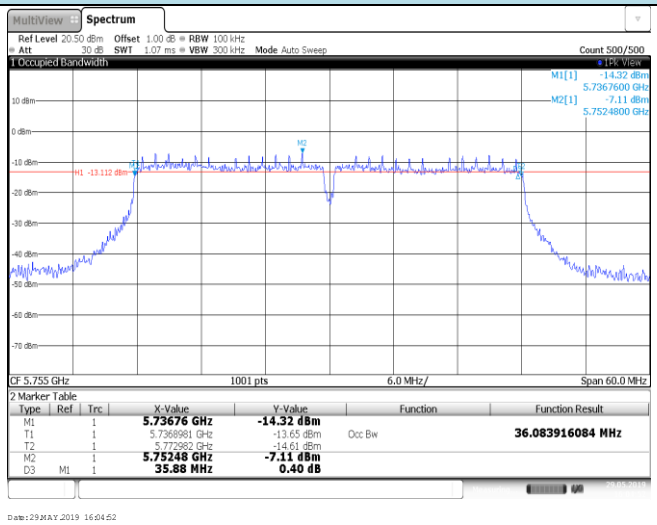
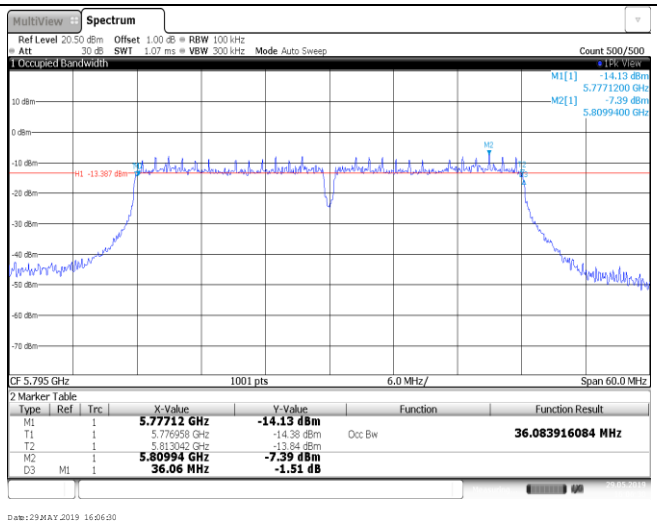
☒ **Passed** ☐ **Not Applicable**

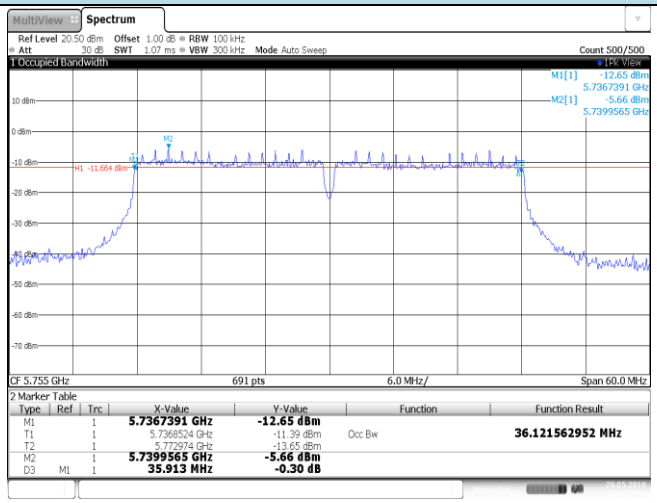
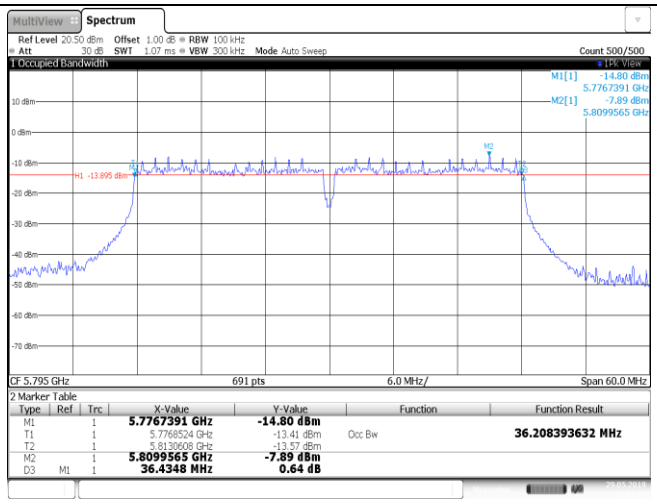
Band	Bandwidth (MHz)	Type	Channel	6dB bandwith (MHz)	99% Occupy bandwith (MHz)	Result
IV	20	802.11ac	CH_L	16.98	17.53	Pass
			CH_M	17.10	17.56	
			CH_H	17.46	17.56	
		802.11n	CH_L	16.98	17.56	Pass
			CH_M	17.10	17.53	
			CH_H	16.74	17.53	
		802.11a	CH_L	16.38	16.45	Pass
			CH_M	16.38	16.36	
			CH_H	16.38	16.39	
	40	802.11ac	CH_L	35.88	36.08	Pass
			CH_H	36.06	36.08	
		802.11n	CH_L	35.91	36.12	Pass
			CH_H	36.44	36.21	
	80	802.11ac	CH_M	75.48	75.29	Pass

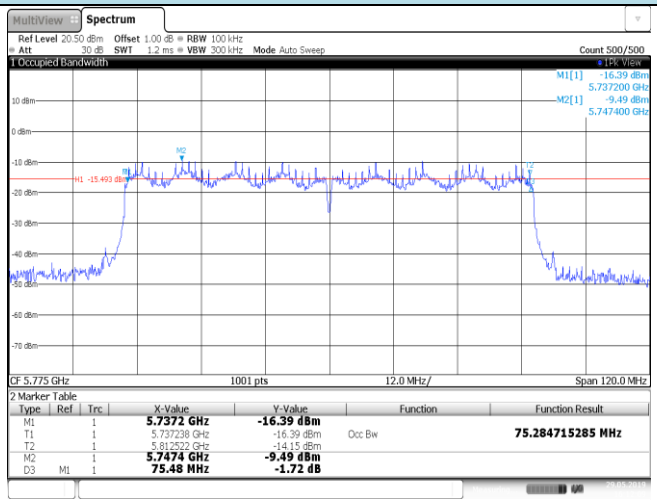
Test channel	802.11ac (HT20)
CH_L	
CH_M	
CH_H	

Test channel	802.11n (HT20)
CH_L	
CH_M	
CH_H	

Test channel	802.11a
CH_L	
CH_M	
CH_H	

Test channel	802.11ac (HT40)
CH_L	
CH_H	

Test channel	802.11n (HT40)
CH_L	
CH_H	

Test channel	802.11ac (HT80)
CH_M	

5.7. Band edge

LIMIT

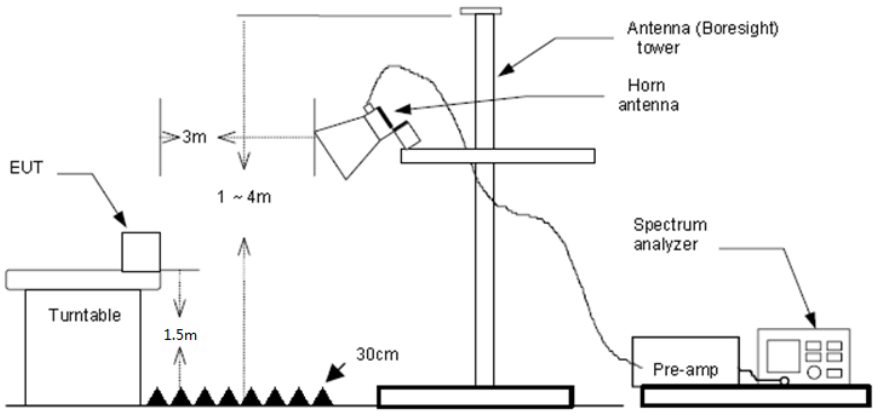
FCC CFR Title 47 Part 15 Subpart E Section 15.407(b)

Un-restricted band emissions above 1GHz			
Operating Band	Frequency	EIRP Limit	Value
5150-5250MHz	Above 1GHz	-27dBm/MHz(68.2dBuV/m)@3m	Peak
5250-5350MHz	Above 1GHz	-27dBm/MHz(68.2dBuV/m)@3m	Peak
5470-5725MHz	Above 1GHz	-27dBm/MHz(68.2dBuV/m)@3m	Peak
5725-5850 MHz	1GHz-5.65GHz	-27 dBm/MHz(68.2dBuV/m)@3m	Peak
	5.65GHz-5.7GHz	-27*dBm/MHz to 10dBm/MHz (68.2* dBuV/m to 105.6dBuV/m)	Peak
	5.7GHz-5.72GHz	10*dBm/MHz to 15.6dBm/MHz (105.6*dBuV/m to 110.8dBuV/m)	Peak
	5.72GHz-5.725GHz	15.6*dBm/MHz to 27dBm/MHz (110.8dBuV/m to* 122.2dBuV/m)	Peak
	5.85GHz-5.855GHz	27dBm/MHz to 15.6*dBm/MHz (122.2dBuV/m to110.8* dBuV/m)	Peak
	5.855GHz-5.875GHz	15.6dBm/MHz to 10*dBm/MHz (110.8dBuV/m to 105.6* dBuV/m	Peak
	5.875GHz-5.925GHz	10dBm/MHz to -27*dBm/MHz (105.6dBuV/m to 68.2* dBuV/m)	Peak
	Above 5.925GHz	-27 dBm/MHz(68.2dBuV/m)@3m	Peak

* Increase/Decreases with the linearly of the frequency.

For emission above 1GHz and in restricted band, according to FCC KDB 789033 D02 General UNII Test Procedure, all emission that complies with both the average and peak limits of Section 15.209 is not required to satisfy the -27 dBm/MHz peak emission limit. E[dBμV/m] = EIRP[dBm] + 95.2, for d = 3 meters.

TEST CONFIGURATION



TEST PROCEDURE

1. The EUT was setup and tested according to ANSI C63.10:2013 requirements.
2. The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT waspositioned such that the distance from antenna to the EUT was 3 meters.
4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. Thisis repeated for both horizontal and vertical polarization of the antenna. In order to find themaximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
5. The receiver set as follow:
   RBW=1MHz, VBW=3MHz PEAK detector for Peak value.
   RBW=1MHz, VBW=3MHz RMS detector for Average value.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

Band: I				Worst mode: 802.11a			Test channel: CH_L		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
5150.00	8.09	31.70	9.79	0.00	49.58	54.00	-4.42	Horizontal	Average
5150.00	7.79	31.70	9.79	0.00	49.28	54.00	-4.72	Vertical	Average
5150.00	14.85	31.70	9.79	0.00	56.34	74.00	-17.66	Horizontal	Peak
5150.00	16.08	31.70	9.79	0.00	57.57	74.00	-16.43	Vertical	Peak

Band: I				Worst mode: 802.11a			Test channel: CH_H		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
5250.00	8.73	31.40	9.91	0.00	50.04	54.00	-3.96	Horizontal	Average
5250.00	8.97	31.40	9.91	0.00	50.28	54.00	-3.72	Vertical	Average
5250.00	14.65	31.40	9.91	0.00	55.96	74.00	-18.04	Horizontal	Peak
5250.00	15.60	31.40	9.91	0.00	56.91	74.00	-17.09	Vertical	Peak

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
3. *Test 802.11a, 802.11n, 802.11ac mode,all modulations have been tested,only worst case is reported*

Band: IV				Worst mode: 802.11a			Test channel: CH_L		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
5725.00	8.09	31.73	10.47	0.00	50.29	54.00	-3.71	Horizontal	Average
5725.00	7.79	31.73	10.47	0.00	49.99	54.00	-4.01	Vertical	Average
5725.00	14.85	31.73	10.47	0.00	57.05	74.00	-16.95	Horizontal	Peak
5725.00	16.08	31.73	10.47	0.00	58.28	74.00	-15.72	Vertical	Peak

Band: IV				Worst mode: 802.11a			Test channel: CH_H		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
5850.00	7.46	32.20	10.61	0.00	50.27	54.00	-3.73	Horizontal	Average
5850.00	7.71	32.20	10.61	0.00	50.52	54.00	-3.48	Vertical	Average
5850.00	14.79	32.20	10.61	0.00	57.60	74.00	-16.40	Horizontal	Peak
5850.00	16.69	32.20	10.61	0.00	59.50	74.00	-14.50	Vertical	Peak

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
3. *Test 802.11a, 802.11n, 802.11ac mode,all modulations have been tested,only worst case is reported*

5.8. Radiated Spurious Emissions

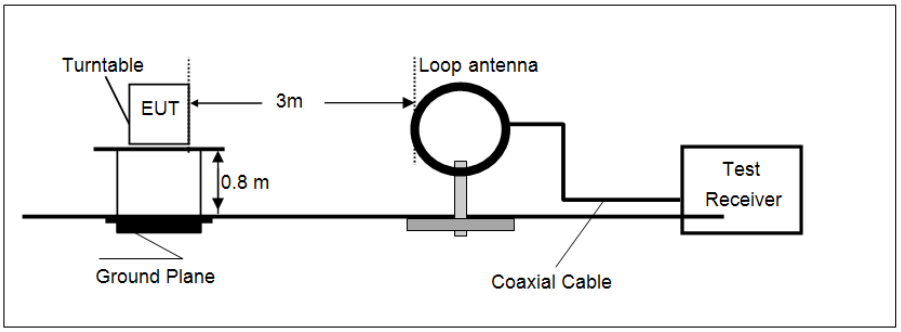
LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.209 and Part 15 Subpart E Section 15.407

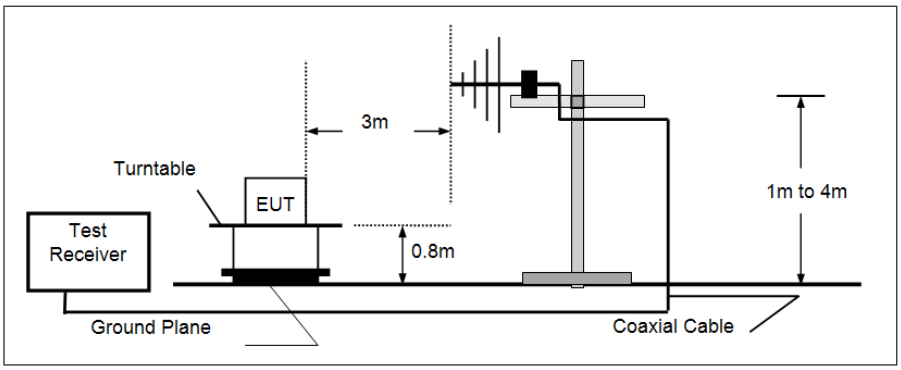
Unwanted emissions below 1GHz and Restricted band emissions above 1GHz		
Frequency	Limit (dBuV/m @3m)	Value
30MHz-88MHz	40.00	Quasi-peak
88MHz-216MHz	43.50	Quasi-peak
216MHz-960MHz	46.00	Quasi-peak
960MHz-1GHz	54.00	Quasi-peak
Above 1GHz	54.00	Average
	74.00	Peak

TEST CONFIGURATION

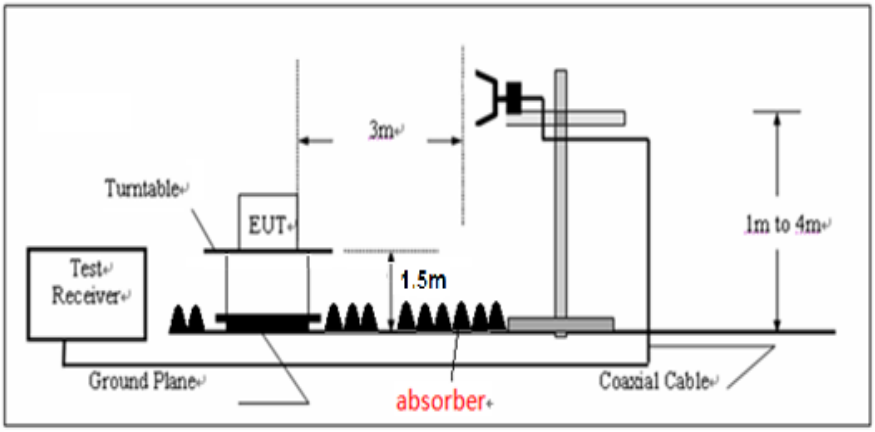
- 9KHz ~30MHz



- 30MHz ~ 1GHz



- Above 1GHz



TEST PROCEDURE

1. The EUT was setup and tested according to ANSI C63.10:2013
2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Use the following spectrum analyzer settings
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Below 1 GHz:
   RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold;
   If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
   (3) From 1 GHz to 10^{th} harmonic:
   RBW=1MHz, VBW=3MHz Peak detector for Peak value.
   RBW=1MHz, VBW=3MHz RMS detector for Average value.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

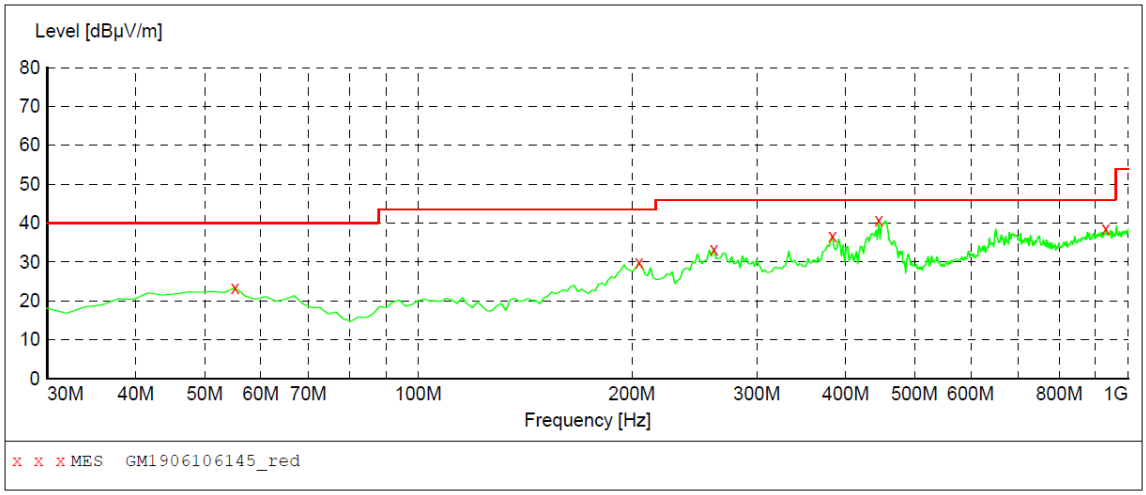
☒ **Passed** ☐ **Not Applicable**

Measurement data:

■ **9kHz ~ 30MHz**

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

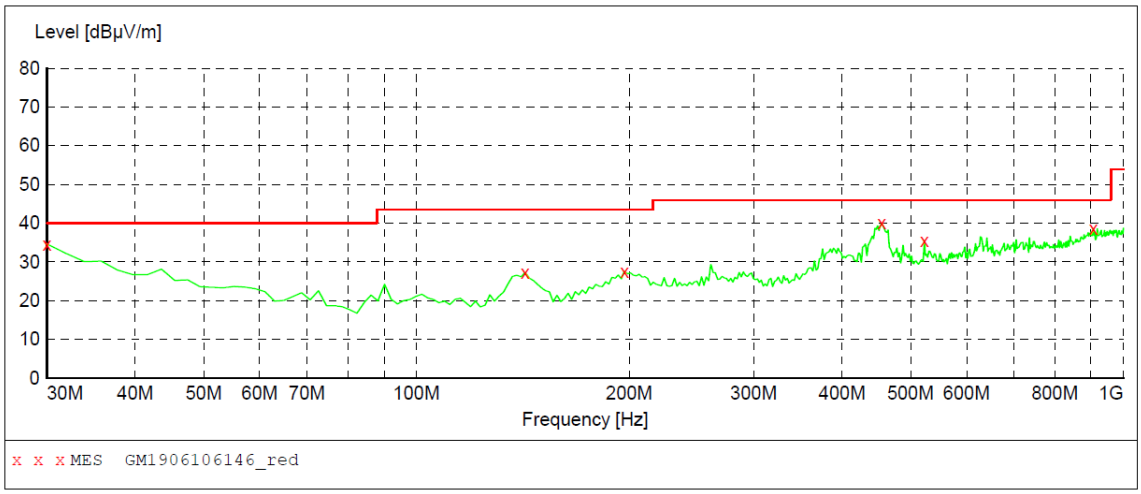
■ **30MHz ~ 1GHz**



MEASUREMENT RESULT: "GM1906106145_red"

6/11/2019 1:40AM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
55.220000	23.40	-5.3	40.0	16.6	QP	100.0	65.00	HORIZONTAL
204.600000	29.80	-6.5	43.5	13.7	QP	100.0	232.00	HORIZONTAL
260.860000	33.20	-4.3	46.0	12.8	QP	100.0	3.00	HORIZONTAL
383.080000	36.70	-1.1	46.0	9.3	QP	100.0	111.00	HORIZONTAL
445.160000	40.80	0.4	46.0	5.2	QP	100.0	305.00	HORIZONTAL
930.160000	38.70	10.7	46.0	7.3	QP	100.0	133.00	HORIZONTAL



MEASUREMENT RESULT: "GM1906106146_red"

6/11/2019 1:43AM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	34.60	-9.4	40.0	5.4	QP	100.0	208.00	VERTICAL
142.520000	27.30	-10.0	43.5	16.2	QP	100.0	159.00	VERTICAL
196.840000	27.60	-5.9	43.5	15.9	QP	100.0	321.00	VERTICAL
454.860000	40.00	0.5	46.0	6.0	QP	100.0	332.00	VERTICAL
522.760000	35.60	2.5	46.0	10.4	QP	100.0	258.00	VERTICAL
906.880000	38.60	10.5	46.0	7.4	QP	100.0	236.00	VERTICAL

Remark:

Transd=Cable lose+ Antenna factor- Pre-amplifier; Margin=Limit -Level

Above 1GHz

Band: I				Worst mode: 802.11a			Test channel: CH_L		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
1634.42	35.26	25.01	5.64	36.79	29.12	74.00	-44.88	Vertical	Peak
3844.28	33.52	29.64	8.56	38.20	33.52	74.00	-40.48	Vertical	Peak
6992.14	30.70	35.25	11.84	34.80	42.99	74.00	-31.01	Vertical	Peak
8462.98	30.90	36.79	12.86	34.34	46.21	74.00	-27.79	Vertical	Peak
1346.93	34.88	26.06	4.91	36.49	29.36	74.00	-44.64	Horizontal	Peak
2382.20	32.32	27.69	6.74	37.85	28.90	74.00	-45.10	Horizontal	Peak
4883.52	31.98	31.43	9.59	36.73	36.27	74.00	-37.73	Horizontal	Peak
7338.62	31.27	36.30	12.01	34.90	44.68	74.00	-29.32	Horizontal	Peak

Band: I				Worst mode: 802.11a			Test channel: CH_M		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
2564.71	34.19	27.59	6.89	37.85	30.82	74.00	-43.18	Vertical	Peak
4170.53	33.69	29.97	8.92	37.72	34.86	74.00	-39.14	Vertical	Peak
6001.77	31.15	32.50	10.67	35.45	38.87	74.00	-35.13	Vertical	Peak
7282.79	30.27	36.28	11.95	34.97	43.53	74.00	-30.47	Vertical	Peak
1472.44	33.42	25.83	5.21	36.55	27.91	74.00	-46.09	Horizontal	Peak
3662.78	34.24	29.30	8.34	38.26	33.62	74.00	-40.38	Horizontal	Peak
4223.95	33.50	30.05	8.96	37.64	34.87	74.00	-39.13	Horizontal	Peak
7470.56	31.78	36.16	12.30	34.88	45.36	74.00	-28.64	Horizontal	Peak

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
3. *Measuring frequencies from 1 GHz to 40GHz.*
4. *Test 802.11a, 802.11n, 802.11ac mode,all modulations have been tested,only worst case is reported*

Band: I				Worst mode: 802.11a			Test channel: CH_H		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
1706.70	34.17	25.21	5.78	36.94	28.22	74.00	-45.78	Vertical	Peak
4223.95	33.15	30.05	8.96	37.64	34.52	74.00	-39.48	Vertical	Peak
6063.19	30.75	32.50	10.78	35.40	38.63	74.00	-35.37	Vertical	Peak
8904.99	30.34	37.81	13.21	34.35	47.01	74.00	-26.99	Vertical	Peak
1706.70	35.22	25.21	5.78	36.94	29.27	74.00	-44.73	Horizontal	Peak
3561.64	35.45	29.19	8.21	38.32	34.53	74.00	-39.47	Horizontal	Peak
5164.81	35.43	31.64	9.80	36.24	40.63	74.00	-33.37	Horizontal	Peak
7470.56	31.78	36.16	12.30	34.88	45.36	74.00	-28.64	Horizontal	Peak

Band: IV				Worst mode: 802.11a			Test channel: CH_L		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
1260.67	34.69	26.24	4.76	36.54	29.15	74.00	-44.85	Vertical	Peak
2364.08	31.92	27.78	6.71	37.80	28.61	74.00	-45.39	Vertical	Peak
3316.62	34.67	28.20	7.86	38.40	32.33	74.00	-41.67	Vertical	Peak
5865.83	30.45	32.23	10.62	35.36	37.94	74.00	-36.06	Vertical	Peak
1953.21	33.22	25.84	6.20	37.26	28.00	74.00	-46.00	Horizontal	Peak
2610.82	33.99	27.83	6.93	37.87	30.88	74.00	-43.12	Horizontal	Peak
5434.56	32.46	31.64	10.15	36.64	37.61	74.00	-36.39	Horizontal	Peak
7741.59	29.93	36.10	13.10	35.04	44.09	74.00	-29.91	Horizontal	Peak

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
3. *Measuring frequencies from 1 GHz to 40GHz.*
4. *Test 802.11a, 802.11n, 802.11ac mode,all modulations have been tested,only worst case is reported*

Band: IV				Worst mode: 802.11a			Test channel: CH_M		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
1374.64	33.15	25.97	4.96	36.47	27.61	74.00	-46.39	Vertical	Peak
2532.28	34.80	27.40	6.86	37.86	31.20	74.00	-42.80	Vertical	Peak
3815.03	34.20	29.62	8.52	38.22	34.12	74.00	-39.88	Vertical	Peak
7900.86	30.89	36.70	12.78	34.80	45.57	74.00	-28.43	Vertical	Peak
1565.20	34.07	25.21	5.47	36.67	28.08	74.00	-45.92	Horizontal	Peak
3143.98	35.97	28.80	7.65	38.21	34.21	74.00	-39.79	Horizontal	Peak
4971.32	32.07	31.47	9.65	36.48	36.71	74.00	-37.29	Horizontal	Peak
8292.38	31.81	36.42	12.81	34.42	46.62	74.00	-27.38	Horizontal	Peak

Band: IV				Worst mode: 802.11a			Test channel: CH_H		
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
1557.25	33.66	25.28	5.45	36.66	27.73	74.00	-46.27	Vertical	Peak
2468.63	32.39	27.32	6.82	37.88	28.65	74.00	-45.35	Vertical	Peak
4700.57	32.81	31.20	9.50	37.09	36.42	74.00	-37.58	Vertical	Peak
6956.63	31.35	35.04	11.80	34.83	43.36	74.00	-30.64	Vertical	Peak
1413.67	33.21	25.89	5.04	36.48	27.66	74.00	-46.34	Horizontal	Peak
2775.30	32.52	28.10	7.31	38.30	29.63	74.00	-44.37	Horizontal	Peak
3983.75	33.60	29.70	8.76	38.12	33.94	74.00	-40.06	Horizontal	Peak
6577.75	31.22	34.16	11.32	35.35	41.35	74.00	-32.65	Horizontal	Peak

Remark:

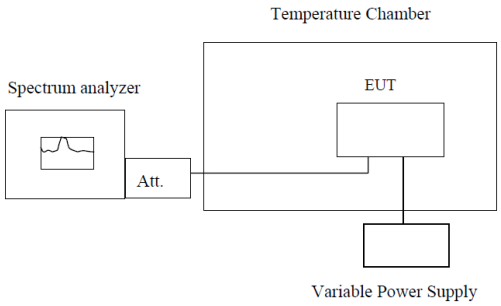
1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
3. *Measuring frequencies from 1 GHz to 40GHz.*
4. *Test 802.11a, 802.11n, 802.11ac mode,all modulations have been tested,only worst case is reported*

5.9. Frequency stability

LIMIT

Within Operation Band

TEST CONFIGURATION



Note : Measurement setup for testing on Antenna connector

TEST PROCEDURE

1. The equipment under test was connected to an external power supply.
2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators.
3. The EUT was placed inside the temperature chamber.
4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25℃ operating frequency as reference frequency.
5. Turn EUT off and set the chamber temperature to –20℃. After the temperature stabilized for approximately 30 minutes recorded the frequency.
6. Repeat step measure with 10℃ increased per stage until the highest temperature of +50℃ reached.

TEST MODE:

Transmitting with unmodulation

TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

Voltage VS Frequency stability

Band: I			Test Frequency: 5180.00MHz	
Temperature (℃)	Voltage (V)	Frequency Deviation (Hz)	Frequency Deviation (ppm)	Result
25	19.0	-15000.00	-2.89575	PASS
25	17.1	-17000.00	-3.28185	PASS
25	20.9	-13000.00	-2.50965	PASS

Band: IV			Test Frequency: 5745.00MHz	
Temperature (℃)	Voltage (V)	Frequency Deviation (Hz)	Frequency Deviation (ppm)	Result
25	19.0	-14000.00	-2.43690	PASS
25	17.1	-15000.00	-2.61097	PASS
25	20.9	-14000.00	-2.43690	PASS

Temperature VS Frequency stability

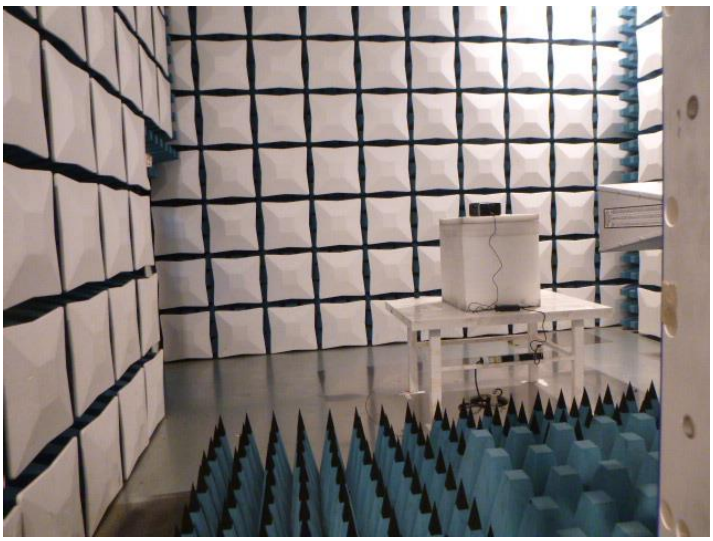
Band: I			Test Frequency: 5180.00MHz	
Voltage (V)	Temperature (℃)	Frequency Deviation (Hz)	Frequency Deviation (ppm)	Result
19.0	-20	-12000.00	-2.31660	PASS
19.0	-10	-12000.00	-2.31660	PASS
19.0	0	-12000.00	-2.31660	PASS
19.0	10	-12000.00	-2.31660	PASS
19.0	20	-11000.00	-2.12355	PASS
19.0	30	-12000.00	-2.31660	PASS
19.0	40	-12000.00	-2.31660	PASS
19.0	50	-12000.00	-2.31660	PASS

Band: IV			Test Frequency: 5745.00MHz	
Voltage (V)	Temperature (℃)	Frequency Deviation (Hz)	Frequency Deviation (ppm)	Result
19.0	-20	-14000.00	-2.43690	PASS
19.0	-10	-14000.00	-2.43690	PASS
19.0	0	-14000.00	-2.43690	PASS
19.0	10	-14000.00	-2.43690	PASS
19.0	20	-14000.00	-2.43690	PASS
19.0	30	-14000.00	-2.43690	PASS
19.0	40	-14000.00	-2.43690	PASS
19.0	50	-14000.00	-2.43690	PASS

6. Test Setup Photos of the EUT

Conducted Emissions (AC Mains)

Radiated Emissions



7. External and Internal Photos of the EUT

Reference to the report No.: CHTEW19060130

----------End of Report----------