



TEST REPORT

Report Reference No:	CHTEW19050098 Report veri SHT1901065803EW Image: Character of the second seco	fication:			
FCC ID:	2ASRT-SCN650				
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 Pa	rk,Nanshan, Shenzhen,China.			
Test item description:	Home Projector				
Trade Mark:	Philips				
Model/Type reference:	Screeneo S6				
Listed Model(s)	-				
Standard:	FCC CFR Title 47 Part 15 Subpart E Section 15.407				
Date of receipt of test sample:	Mar 29, 2019				
Date of testing	Mar 30, 2019- May 23, 2019				
Date of issue	May 24, 2019				
Result	PASS				
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Testing Laboratory Name: :	: Shenzhen Huatongwei International Inspection Co., Ltd				
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The test report merely correspond to the test sample.

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1. TEST STANDARDS AND REPORT VERSION

1.1. Test Standards

The tests were performed according to following standards: <u>FCC Rules Part 15.407</u>: 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	2019-05-24	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	Michael Jie
Maximum Conducted Output Power	15.407(a)	PASS	Jiongsheng Feng
Maximum Power Spectral Density	15.407(a)	PASS	Jiongsheng Feng
26dB Bandwidth and 99% Ocuppy bandwith	15.407(a)	PASS	Jiongsheng Feng
6dB Bandwidth	15.407(a)	PASS	Jiongsheng Feng
Band edge	15.407(b)	PASS	Jiongsheng Feng
Radiated Spurious Emissions	15.209	PASS	Shower Dai
Frequency Stability	15.407(g)	PASS	Jiongsheng Feng

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	Philips					
Model No.:	Screeneo S6	Screeneo S6					
Listed Model(s):	-						
Power supply:	DC 19V						
	Model:GQ150-1900780						
Adapter information:	Input:100-240Va.c., 50	/60Hz, 2.0A Max					
	Output:19Vd.c., 7.8A	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:	PIFA 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.

	Test	20MHz		40MHz		80MHz	
Band	Channel	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
	CH∟	36	5180	38	5190	-	-
I	СН _м	44	5220	-	-	42	5210
	CH _H	48	5240	46	5230	-	-
	CH∟	149	5745	151	5755	-	-
IV	СН _м	157	5785	-	-	155	5775
	СН _н	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	
0		Model No. :	N/A
	N/A	Manufacturer :	N/A
0	○ 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		
0	Single Balanced Telecom Pair ISN	FCC	FCC-TLISN-T2-02	20371	2018/10/28	2019/10/27		
0	Two Balanced Telecom Pairs ISN	FCC	FCC-TLISN-T4-02	20373	2018/10/28	2019/10/27		
0	Four Balanced Telecom Pairs ISN	FCC	FCC-TLISN-T8-02	20375	2018/10/28	2019/10/27		
0	V-Network	R&S	ESH3-Z6	100211	2018/10/27	2019/10/26		
0	V-Network	R&S	ESH3-Z6	100210	2018/10/27	2019/10/26		
0	2-Line V-Network	R&S	ESH3-Z5	100049	2018/10/27	2019/10/26		

•	Radiated Emissi	on-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
0	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 emissi	on-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
0	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	2019/04/26	2020/04/25
•	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

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•	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 N	lethod				
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
0	Radio communication tester	R&S	CMW500	137688-Lv	2018/09/29	2019/09/28
0	Test software	Tonscend	JS1120-1(LTE)	N/A	N/A	N/A
0	Test software	Tonscend	JS1120-2(WIFI)	N/A	N/A	N/A
0	Test software	Tonscend	JS1120-3(WCDMA)	N/A	N/A	N/A
0	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)

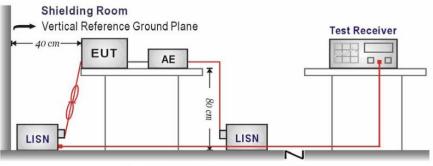
<u>LIMIT</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.207:

	Limit (d	BuV)
Frequency range (MHz)	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



→ Horizontal Ground Reference Plane →

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:

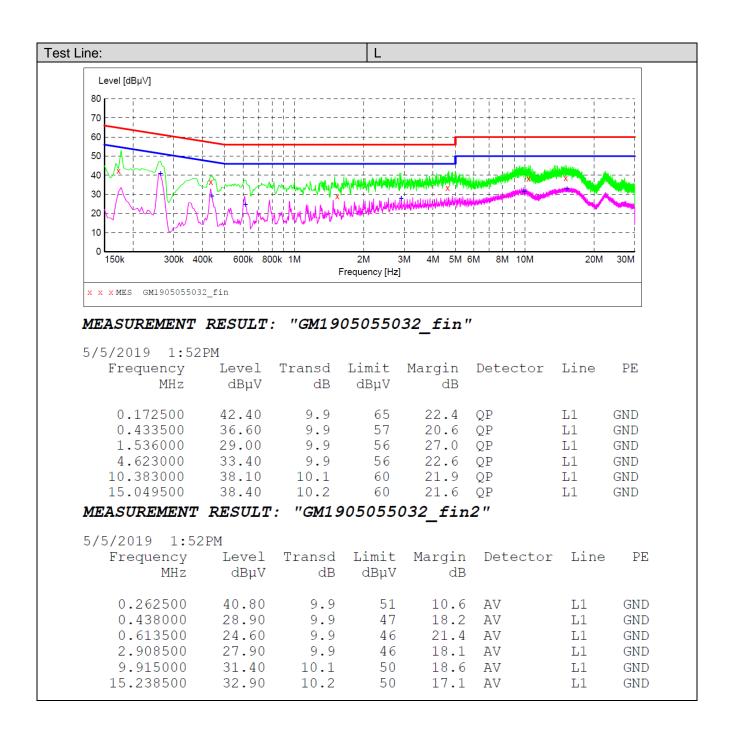
Please refer to the clause 3.3

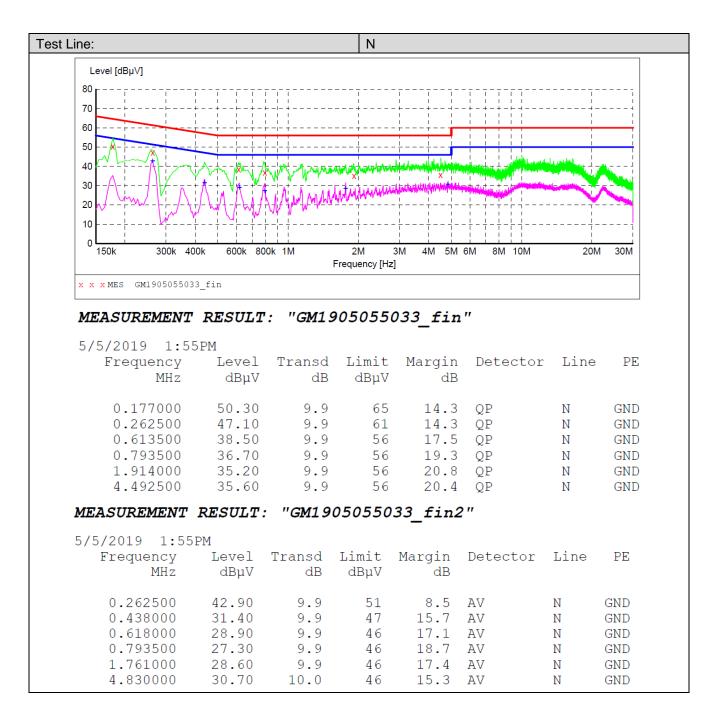
TEST RESULTS

☑ Passed □ Not Applicable

Note:

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





5.3. Maximum Conducted Output Power

<u>LIMIT</u>

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

For the 5.15~5.25GHz band:

Outdoor AP

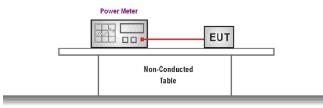
The maximum conducted output power (P_{out}) shall not exceed the lesser of 1W (30dBm). if G_{Tx} >6dBi, then P_{out} =30-(G_{Tx} -6). e.i.r.p. at any elevation angle above 30 degrees \leq 125mW (21dBm)

- 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 (Pout) shall not exceed the lesser of 1W (30dBm).

TEST CONFIGURATION



Ground Reference Plane

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)	Туре	Channel	Conducted Output Power (dBm)	Limit (dBm)	Result
			CH∟	10.94		
		802.11ac	СНм	11.60	24.00	Pass
			СН _н	12.56		
			CH∟	11.95		
	20	802.11n	СН _м	11.86	24.00	Pass
			СН _Н	12.80		
I			CH∟	12.01		
I		802.11a	СН _м	13.65	24.00	Pass
			СН _н	13.70		
		000 11	CH∟	10.97	24.00	Deee
	10	802.11ac	СН _н	11.81	24.00	Pass
	40	000.44.5	CH_{L}	11.07	04.00	Dees
		802.11n	СН _н	12.42	24.00	Pass
	80	802.11ac	СН _м	11.81	24.00	Pass
			CH∟	12.35		
		802.11ac	CH _M	12.12	30.00	Pass
			СН _Н	10.90		
			CH∟	12.43		
	20	802.11n	СН _м	12.45	30.00	Pass
			СН _Н	10.90		
IV			CH_{L}	13.00		
IV		802.11a	СН _м	13.06	30.00	Pass
			СН _Н	11.48		
		902 1100	CH∟	11.99	20.00	Deee
	40	802.11ac	СН _н	11.55	30.00	Pass
	40	002.44-	CH∟	12.13	20.00	Dess
		802.11n	CH _H	11.54	30.00	Pass
	80	802.11ac	СН _м	12.24	30.00	Pass

5.4. Maximum Power Spectral Density

<u>LIMIT</u>

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

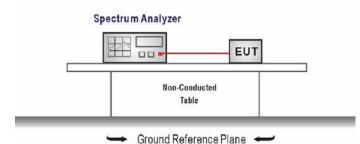
For the 5.15~5.25GHz band:

- 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 \geq 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)	Туре	Channel	Power Spectral Density (dBm/MHz)	Limit (dBm/MHz)	Result
			CH∟	-0.03		
		802.11ac	CH _M	1.16	11.00	Pass
			CH _H	1.69		
			CH∟	1.07		
	20	802.11n	CH _M	0.94	11.00	Pass
			CH _H	1.87		
			CH∟	1.35		
		802.11a	CH _M	3.40	11.00	Pass
			CH _H	3.66		
		802.11ac	CH∟	-3.14	11.00	Pass
	40	002.11aC	CH _H	-2.32	11.00	Pass
	40	902 11p	CH∟	-2.72	11.00	Deee
		802.11n	CH _H	-1.21	11.00	Pass
	80	802.11ac	CH _M	-4.27	11.00	Pass
Band	Bandwidth (MHz)	Туре	Channel	Power Spectral Density (dBm/500kHz)	Limit (dBm/500KHz)	Result
			CH∟	0.00		
		802.11ac	CH _M	0.21	30.00	Pass
			CH _H	-1.31		
			CH∟	-0.32		
	20	802.11n	CH _M	-0.06	30.00	Pass
			CH _H	-1.19		
IV			CH∟	1.15		
IV		802.11a	CH _M	0.64	30.00	Pass
			CH _H	-0.38		
		902 1100	CH∟	-3.39	20.00	Dece
	40	802.11ac	CH _H	-3.80	30.00	Pass
	40	902 11r	CH∟	-3.21	20.00	Deea
		802.11n	CH _H	-3.67	30.00	Pass
	80	802.11ac	CH _M	-4.85	30.00	Pass

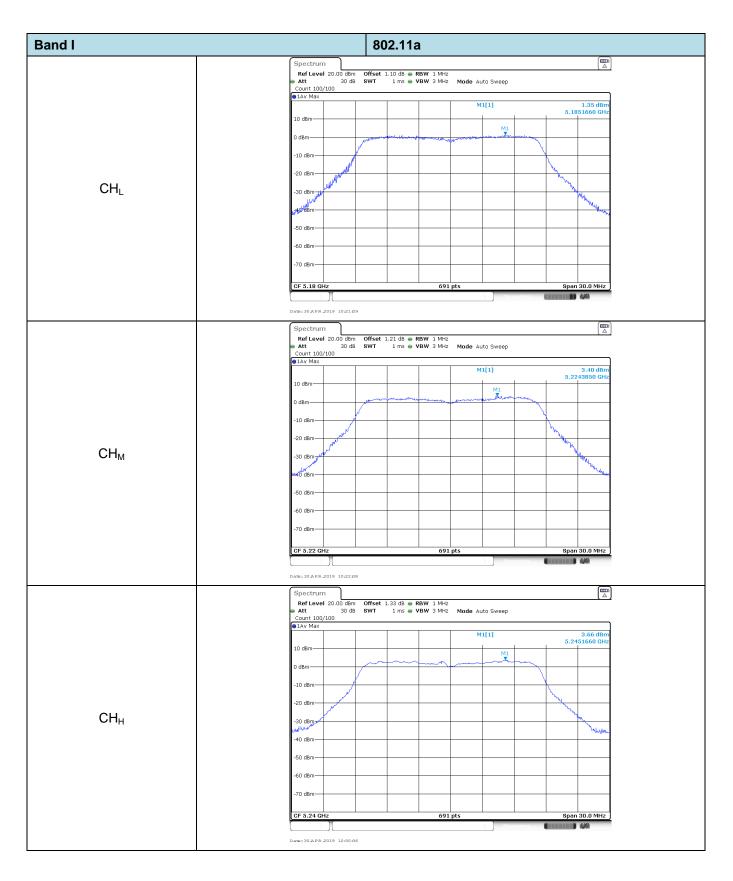
Test plot as follows:

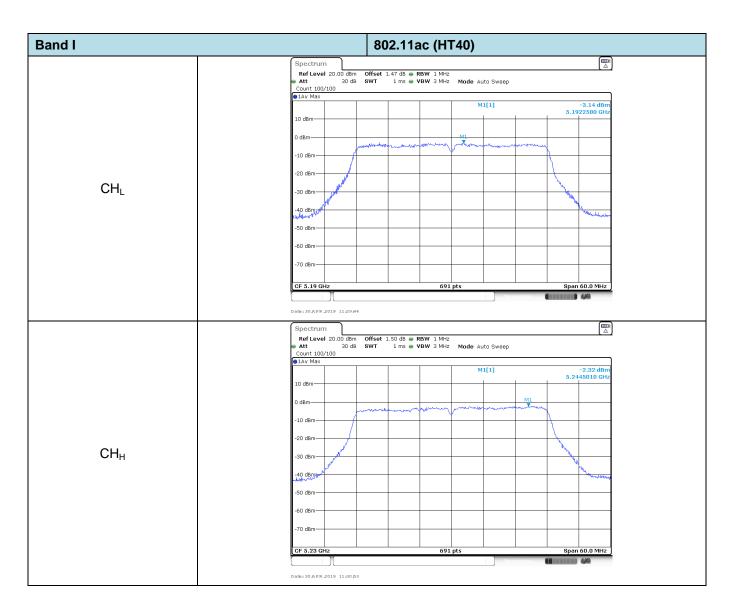
Band I

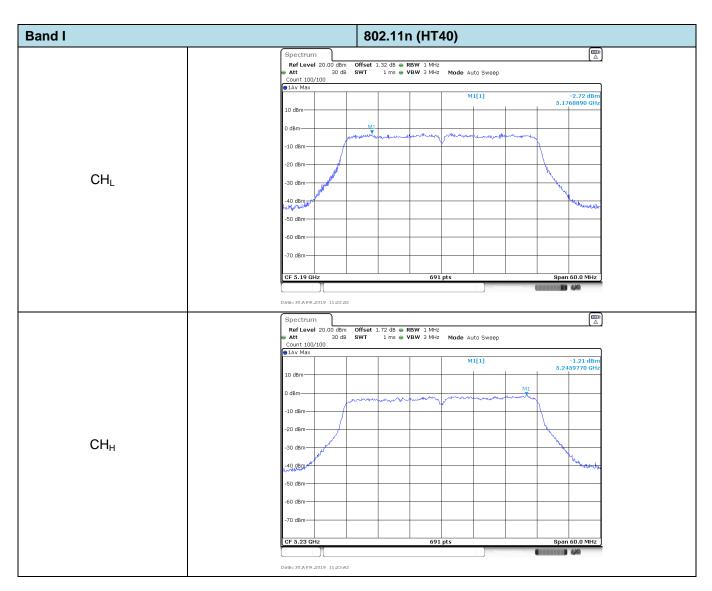
Г

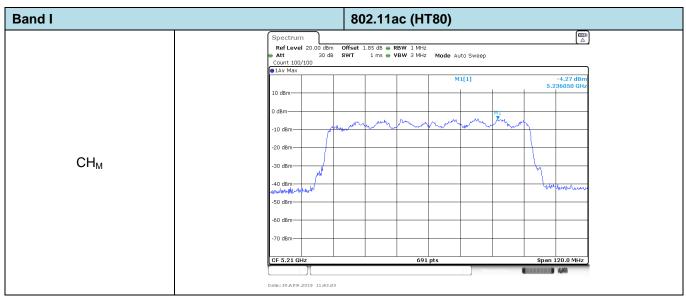
Band I	802.11ac (HT20)
	Spectrum 🖾
	RefLevel 20.00 dBm Offset 1.10 dB RBW 1 MHz Att 30 dB SWT 1 ms VBW 3 MHz Mode Auto Sweep
	Count 100/100
	M1[1] -0.03 dBm 5.1858180 GHz
	10 dBm
	0 dBm
	-10 dBm
	-20 d8m
CH∟	-30 dBm
_	.+50/40m
	-50 dBm-
	-60 d8m
	-70 dBm-
	CF 5.18 GHz 691 pts Span 30.0 MHz
	Measuring-
	Dam: 30 APR 2019 112564
	Spectrum 🛄
	RefLevel 20.00 dBm Offset 1.30 dB ■ RBW 1 MHz ● Att 30 dB SWT 1 ms ● VBW 3 MHz ● comb 140 dB SWT 1 ms ● VBW 3 MHz
	Count 100/100 Av Max
	10 dBm 1.16 dBm 5.2263820 GHz
	M1
	0 dBm
	-10 dBm
	-20 dBm
CH _M	-30 dBm
	and and a second s
	-50 dBm
	-60 dBm
	-70 dBm
	CF 5.22 GHz 691 pts Span 30.0 MHz
	Date: 30 AFR 2019 1127-01
	Spectrum Ref Level 20.00 dBm Offset 1.20 dB RBW 1 MHz
	● Att 30 dB SWT 1 ms ● VBW 3 MHz Mode Auto Sweep Count 100/100
	●IAv Max M1[1] 1.69 dBm 5.2432560 GHz
	10 dBm
	O dBm
	-10 dBm
	-20 dBm
CH _H	
	-30 dBm
	-50 dBm
	-60 dBm-
	-70 dBm
	CF 5.24 GHz 691 pts Span 30.0 MHz
	CE-5.24 GHZ D91 pts Spin du MHZ
	Datu: 30 APR 2019 11 28:10

Band I	802.11n (HT20)
	Spectrum Image: Constraint of the system Constand of the system Constraint of the
	Count 100/100
	10 dBm 5.1857740 GHz
	0 dBm
	-20 dBm
CHL	-30 dBm
	-50 dBm
	-60 dBm
	-70 d8m
	Data: 30 APR JOL9 1147.14
	Spectrum
	Att 30 dB SWT 1 ms VBW 3 MHz Mode Auto Sweep Count 100/100 Av Max
	10 dBm
	0 dBm
	-10 dBm
CH _M	-30 dBm
	-60 dBm
	-70 dBm-
	CF 5.22 GHz 691 pts Span 30.0 MHz
	Spectrum
	RefLevel 20.00 dBm Offset 1.36 dB ● RBW 1 MHz ● Att 30 dB SWT 1 ms ● VBW 3 MHz Mode Auto Sweep Count 100/100
	Av Max M1[1] 1.87 dBm 5.2452970 GHz 10 dBm
	0 dBm
	-10 dBm
CH _H	-30 dam -
	AND dBm
	-50 dBm
	-70 dBm
	CF 5.24 GHz 691 pts Span 30.0 MHz
	Dam:30APR.2019 1120.54









Band IV	802.11ac (HT20)
	Spectrum A
	RefLevel 20.00 dBm Offset 1.33 dB RBW 500 kHz Att 30 dB SWT 1 ms VBW 3 MHz Mode Auto Sweep
	Count 100/100 Alay Max
	10 dBm M1[1] 0.00 dBm 5.7403550 GHz
	M1
	0 dBm
	-10 dBm
	-20 dBm
CH∟	-30 dBm
	-50 d8m
	-60 dBm
	-70 dBm-
	CF 5.745 GHz 691 pts Span 30.0 MHz
	Date: 30 APR. 2019 13:53:47
	Spectrum RefLevel 20.00 dBm Offset 1.20 dB ● RBW 500 kHz
	Att 30 dB SWT 1 ms VBW 3 MHz Mode Auto Sweep Count 100/100
	Av Max M1[1] 0.21 dBm 5.7796160 GHz
	10 dBm
	0 dBm
	-10 dBm-
	-20 dBm
CH _M	-20 dBm
	And relit.
	-50 dBm
	-60 dBm
	-70 dBm
	CF 5.785 GHz 691 pts Span 30.0 MHz
	Measuring URBERT D 44
	Dam: 30 APR 2019 13:34:55
	Spectrum Image: Constraint of the sector
	Att 30 dB SWT 1 ms VBW 3 MHz Mode Auto Sweep Count 100/100
	● 1Av Max
	10 dBm 10 dBm10 dBm10 dBm10 dBm10 dBm
	-10 dBm
	-20 dBm
CH _H	-30 dBm
	140 đếm
	-50 d8m
	-60 dBm
	-70 dBm
	CF 5.825 GHz 691 pts Span 30.0 MHz
	Data: 30 APR 2019 13:55 x42

Band IV	802.11n (HT20)
	Spectrum 🛄
	Ref Level 20.00 dBm Offset 1.10 dB RBW 500 kHz Att 30 dB SWT 1 ms VBW 3 MHz Mode Auto Sweep
	Count 100/100 @ IAv Max
	10 dBm
	MI
	-10 d8m
	-20 dBm
CH∟	-30 dBm m
	Hato dam
	-50 dBm
	-60 dBm
	-70 dBm
	CF 5.745 GHz 691 pts Span 30.0 MHz
	Datu:30APR.2019 132545
	Spectrum 🛄
	Ref Level 20.00 dBm Offset 1.34 dB RBW 500 kHz Att 30 dB SWT 1 ms VBW 3 MHz Mode Auto Sweep
	Count 100/100 All Av Max
	M1[1] -0.06 dBm 5.7803110 GHz
	0 dBm
	-10 dBm
	-20 dBm
CH _M	-30 dBm
	Het dam
	-50 dBm
	-60 dBm
	-70 dBm
	CF 5.785 GHz 691 pts Span 30.0 MHz
	Data: 30APR 2019 13:26:29
	Spectrum 🛄
	Ref Level 20.00 dBm Offset 1.14 dB RBW 500 kHz Att 30 dB SWT 1 ms VBW 3 MHz Mode Auto Sweep
	Count 100/100 Plav Max
	M1[1] -1.19 dBm 5.8302100 GHz
	10 dBm M1
	0 dBm
	-10 dBm
	-20 d8m
CH _H	-30 dBm
	ragida ^{nne}
	-50 d8m
	-60 d8m
	-70 dBm
	CF 5.825 GHz 691 pts Span 30.0 MHz

Band IV 802.11a Spectrum Ref Level 20.00 dBm Att 30 dB Count 100/100 1Av Max Offset 1.10 dB ● RBW 500 kHz SWT 1 ms ● VBW 3 MHz Mode Auto Sweep M1[1] 1.15 dE 5.7498190 G LO dBmм1 ▼) dBrr 10 dBm--20 dBm m CH_{L} 30 dBm Way 40 dBm--50 dBm--60 dBm 70 dBm CF 5.745 GH 691 pts Sp 30.0 MHz 100 B 440 Date: 30 APR 2019 13:20:43 Spectrum
 Ref Level
 20.00 dBm
 Offset
 1.17 dB
 RBW
 500 kHz

 Att
 30 dB
 SWT
 1 ms
 VBW
 3 MHz
 Mode Auto Sweep Count 100/100 M1[1] 0.64 dE 5.7915990 G 10 dBm 11 0 dBm--10 dBm -20 dBm CH_M -30 dBm-48 dBm--50 dBm -60 dBm 70 dBm-Span 30.0 MHz CF 5.785 GH 691 pts III 44 Date:30 APR 2019 13:22:4 Spectrum Ref Level 20.00 dBm Offset 1.30 dB
RBW 500 kHz Att 30 dB SWT 1 ms
VBW 3 MHz Mode Auto Sweep Count 100/100 M1[1] -0.38 dB 5.8203980 GH 10 dBmм1 Л. 0 dBm -10 dBm 20 dBm ₩. CH_{H} 30 dBm here un dem--50 dBm -60 dBm 70 dBm 691 pts Span 30.0 MHz CF 5.825 GH III 430 100 Date: 30 APR 2019 13:23:56



802.11ac (HT40)

		002.						
	Spectrum							
	Ref Level 20.00 df	3m Offset 1.58 (18 👄 RBW 500 kH	łz				(=
	Att 30		ns 🖶 VBW 3 MH	iz Mode /	Auto Sweep			
	Count 100/100							
	1Av Max							
				M	1[1]		5 77	-3.39 dBm 03690 GHz
	10 dBm				L		3.77	03090 GHZ
	0 dBm					M1		
	0.0011	neveranno	a and amount	mon	mour	morting		
	-10 dBm			ft "			1	
	-10 0011	/					N	
	-20 dBm	1					1	
	20 0000							
CHL	-30 dBm						N.	
L	-so dom						1	
	19.48 mark						~~~	hy
	Day Article Providence							and we have by
	-50 dBm							
	-60 dBm							
	-70 dBm	+ +						L
	CF 5.755 GHz						0	60.0 MU-
	GF 5.755 GHZ		091	pts				60.0 MHz
					Mea	suring		4,74
	Date: 30 APR 2019 13:37	7:41						
	Spectrum							
	Ref Level 20.00 dt		iB 🖷 RBW 500 kH					
	RefLevel 20.00 da Att 30		IB ● RBW 500 kH Ins ● VBW 3 MH		Auto Sweep			
	Ref Level 20.00 df Att 30 Count 100/100				Auto Sweep			
	RefLevel 20.00 da Att 30			iz Mode /				-3.80 dBm
	RefLevel 20.00 di Att 30 Count 100/100 @1Av Max			iz Mode /	Auto Sweep 1[1]		5.78	-3.80 dBm 00650 GHz
	Ref Level 20.00 df Att 30 Count 100/100			iz Mode /			5.78	-3.80 dBm
	RefLevel 20.00 di ▲ At 30/100 Count 100/100 ● 1AV Max 10 d8m			iz Mode /			5.78	-3.80 dBm
	RefLevel 20.00 di Att 30 Count 100/100 @1Av Max	dB SWT 1 m	ns • VBW 3 MH	Mode /	1[1]		5.78	-3.80 dBm
	RefLevel 20.00 30 ▲ Att 30/100 © lav Max 10 dBm 0 dBm			Mode /			5.76	-3.80 dBm
	RefLevel 20.00 di ▲ At 30/100 Count 100/100 ● 1AV Max 10 d8m	dB SWT 1 m	ns • VBW 3 MH	Mode /	1[1]		5.76	-3.80 dBm
	Ref Level 20.00 di Att 30 Count 100/100 I Av Max 10 dBm -10 dBm -10 dBm	dB SWT 1 m	ns • VBW 3 MH	Mode /	1[1]		5.76	-3.80 dBm
	RefLevel 20.00 30 ▲ Att 30/100 © lav Max 10 dBm 0 dBm	dB SWT 1 m	ns • VBW 3 MH	Mode /	1[1]		5.76	-3.80 dBm
:H.,	Ref Level 20.00 di Att Court 100/100 ● 1AV Max 10 dBm 0 dBm -10 dBm -20 dBm	dB SWT 1 m	ns • VBW 3 MH	Mode /	1[1]		5.76	-3.80 dBm
H _H	Ref Level 20.00 di Att 30 Count 100/100 I Av Max 10 dBm -10 dBm -10 dBm	dB SWT 1 m	ns • VBW 3 MH	Mode /	1[1]		5.76	-3.80 dBm
:Н _н	Ref Level 20.00 di Att Count 100/100 ● IAV Max 10 dBm -10 dBm -20 dBm -30 dBm	dB SWT 1 m	ns • VBW 3 MH	Mode /	1[1]		5.76	-3.80 dBm
СНн	Ref Level 20.00 di Att Court 100/100 ● 1AV Max 10 dBm 0 dBm -10 dBm -20 dBm	dB SWT 1 m	ns • VBW 3 MH	Mode /	1[1]		5.76	-3.80 dBm
H _H	Ref Level 20.00 di ▲ At 3 Count 100/100 ● 1AV Max 10 dBm -10 dBm -20 dBm -20 dBm -30 dBm -30 dBm	dB SWT 1 m	ns • VBW 3 MH	Mode /	1[1]		5.7E	-3.80 dBm 000650 GHz
ХНн	Ref Level 20.00 di Att Count 100/100 ● IAV Max 10 dBm -10 dBm -20 dBm -30 dBm	dB SWT 1 m	ns • VBW 3 MH	Mode /	1[1]		5.76	-3.80 dBm 000650 GHz
Нн	Ref Level 20.00 di Att Court 100/100 ● 1AV Max 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm -50 dBm	dB SWT 1 m	ns • VBW 3 MH	Mode /	1[1]		5.7E	-3.80 dBm 000650 GHz
СНн	Ref Level 20.00 di ▲ At 3 Count 100/100 ● 1AV Max 10 dBm -10 dBm -20 dBm -20 dBm -30 dBm -30 dBm	dB SWT 1 m	ns • VBW 3 MH	Mode /	1[1]		5.76	-3.80 dBm 000650 GHz
СН _н	Ref Level 20.00 di Att Att Count 100/100 DAW Max 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -50 dBm -60 dBm	dB SWT 1 m	ns • VBW 3 MH	Mode /	1[1]		5.76	-3.80 dBm 000650 GHz
СН _Н	Ref Level 20.00 di Att Court 100/100 ● 1AV Max 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -30 dBm -50 dBm	dB SWT 1 m	ns • VBW 3 MH	Mode /	1[1]		5.76	-3.80 dBm 000650 GHz
H _H	Ref Level 20.00 dl ▲ At ■ At Court 100/100 ● 1AV Max 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -50 dBm -60 dBm -70 dBm	dB SWT 1 m	s • VBW 3 MH		1[1]		the second secon	-3.80 dBm 00650 GHz
Чн	Ref Level 20.00 di Att Att Count 100/100 DAW Max 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -50 dBm -60 dBm	dB SWT 1 m	s • VBW 3 MH	Mode /	1[1]		Span	-3.80 dBm 00650 GH2
Η	Ref Level 20.00 dl ▲ At ■ At Court 100/100 ● 1AV Max 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -50 dBm -60 dBm -70 dBm	dB SWT 1 m	s • VBW 3 MH		1[1]		the second secon	-3.80 dBm 00650 GH2
;Н _н	Ref Level 20.00 dt ● At ○ Court 100/100 ● 1AV Max 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -50 dBm -50 dBm -70 dBm -70 dBm		s • VBW 3 MH		1[1]		Span	-3.80 dBm 00650 GH2
СН _н	Ref Level 20.00 dl ▲ At ■ At Court 100/100 ● 1AV Max 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -50 dBm -60 dBm -70 dBm		s • VBW 3 MH		1[1]		Span	-3.80 dBm 00650 GH2

and IV	802.11n (HT40)
	Spectrum Image: Construct of the second
	Av Max M1[1] -3.21 dBm 5.7679380 GHz
	10 dBm
	-10 dBm
CH∟	-30 dBm
	-50 dBm
	-70 dBm-
	CF 5.755 GHz 691 pts Span 60.0 MHz Messeries Messeries Messeries Date: 30 A PR 2019 13:2933
	Cabe: 30 A PR 2019 332933 Spectrum Image: Cabe: 20.00 dBm Ref Level 20.00 dBm Offset 1.20 dB RBW 500 kHz Image: Cabe: Cab
	Spectrum Image: Society 13:23:33 Spectrum Image: Society 11:20:00 Att 30:00 BWT 1 ms VBW Count 100/100 Introduction
	Date: 30 A PR 2019 312933 Spectrum Image: Comparison of the time of time of the time of
	Spectrum Image: Control of the control of
	Spectrum Image: Count 100/100 • Att 30 dB SWT 1 ms • VBW 3 MHz Mode Auto Sweep Count 100/100 • Att 30 dB SWT 1 ms • VBW 3 MHz Mode Auto Sweep Count 100/100 • Atv Max • M1[1] -3.67 dBm 0 dBm • Max • M1[1] 5.7963890 GHz
CH _H	Spectrum Image: Control of the second s
CH _H	Spectrum Control Ref Level 20.00 dBm Offset 1.20 dB RBW 500 kHz Att 30 dB SWT 1 ms VBW 3 MHz Mode Auto Sweep Count 100/100 0 dBm M1[1] -9.67.dBm -9.67.dBm 0 dBm 0 dBm M1[1] -9.67.dBm -9.67.dBm -10 dBm -10 dBm -10 dBm -10 dBm -10 dBm -10 dBm
СН _н	Spectrum Image: Control of the second seco
CH _H	Date: 30 APR 2019 13:29:33

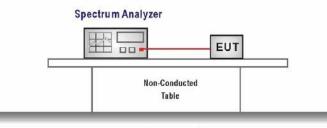
Band IV	802.11ac (HT80)
	Spectrum Image: Constraint of the section
	10 dBm
	0 dBm - M1
CH _M	-20 dBm
	198deraum
	-50 dBm
	-70 dBm
	CF 5.775 GHz 691 pts Span 120.0 MH

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



Ground Reference Plane

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

Shenzhen Huatongwei International Inspection Co., Ltd.

Band	Bandwidth (MHz)	Туре	Channel	99% Occupy bandwith (MHz)	26dB bandwidth (MHz)	Result
			CH∟	17.62	21.15	
		802.11ac	CH _M	17.65	20.97	Pass
			СН _н	17.68	20.91	
			CH∟	17.68	21.24	Pass Pass
	20	802.11n	СН _м	17.71	21.24	
		C	CH _H	17.80	21.60	
			CH∟	16.63	20.58	
I		802.11a	CH _M	16.75	20.91	
			СН _н	16.48	20.16	
		902 1100	CH∟	36.62	44.16	Pass
	10	802.11ac	СН _н	36.68	44.22	
	40	000.44m	CH∟	36.56	43.38	Pass
		802.11n	СН _н	36.56	44.22	
	80	802.11ac	СН _м	75.17	82.56	Pass

Band I	802.11ac (HT20)
CHL	Spectrum The file will 20.50 dim Offset 1.00 dim R BW 200 kHz R file will 20.50 dim 0 dim 37.8 µs V BW 1 MHZ Mode Auto FFT Cont 500/500 91Pt View M1[1] 2.9.30 dim 5.1692000 CHz 7.022377622 KHZ 10 dim 0 dim 0 cc Bw 17.022377622 KHZ 3.1692100 CHZ 3.1692100 CHZ 20 dim 10 dim 0 dim 0 dim 0 dim 0 dim 0 dim 0.3.24 dim 30 dim 10 dim 10 dim 10 dim 10 dim 10 dim 0 dim
CHM	Spectrum Dispectrum Ref Level 20.50 dBm Offset 1.00 dB RBW 200 kHz Att 30 dB SWT 37.8 µs VBW 1 MHz Mode Auto FFT Control Status 20.74 dBm 5.2093500 GHz 5.2093500 GHz 5.2093500 GHz 0 dBm M1[1] .29.74 dBm 5.2093500 GHz 2.72 dBm 10 dBm M2[1] M2 5.20237052 MHz 2.72 dBm -10 dBm M2[1] M2 5.2202100 GHz 2.72 dBm -20 dBm M1 0 30 dB 30 dB 2.72 dBm -30 dBm M1 0 0 30 dB 30 dB 30 dB -30 dBm M1 0 0 30 dB 30 dB 30 dB 30 dB -70 dBm M1 0 0 0 5.220935 GHz 52036 GHz 5200 GHz 5200 GHz 5200 GHz </td
CH _H	Spectrum Image: Construction of the section of the

Band I	802.11n (HT20)
	Spectrum Π Ref Level 20.50 dBm Offset 1.00 dB ● RBW 200 kHz Att 30 dB SWT 37.8 μs • Offset 1.00 dB • VBW • Att 30 dB • Offset 1.00 dB • VBW • Offset 1.00 dB • VBW • Att 30 dB • Offset 1.00 dB • VBW
CHL	M1[1] -28.00 dBm 10 d8m M1[1] -28.00 dBm 0 d8m Occ Bw 17.669317662 HHz - 10 d8m
	-20 dBm M1 -30 dBm 01 - 23.001 dBm 03 -40 dBm
	-60 dBm
	Type Ref Trc X-value Y-value Function Function Function Result M1 1 5.16953 OHz -28.00 dHm -
	Spectrum
	Opecode Call Ref Level 20.50 dBm Offset 1.00 dB extrm{ RBW 200 kHz} Att 30 dB extrm{ SWT 37.8 µs extrm{ VBW 1 MHz}} Multi 200/500 0 dB extrm{ VBW 1 MHz} Image: Image of the state of
	M dem Occ Bw 17.712287712 MHz 0 dem M2 M2[1] -2.68 dem -10 dem 1
CH _M	-30 dBm 01 03 -30 dBm 04 04 -40 dBm 04 04 -56 dBm 04 04
	-60 dBm
	M1 I S.20935 GHz -28.95 GBm Control Contro Contro
	Dawi 30 APR 2019 11 d 7 46
CH _H	Ref Level 20.50 dam Offset 1.00 db RBW 200 Hz Att 30 db SWT 37.8 µs VBW 1 MHz Mode Auto FFT Count 500/500 Optimize M1[1] -28.65 dBm
	Oddem M2 Occ Bw 17.802197802 MH2 0 dBm M2 M211 -2.20 dBm -10 dBm 1
	-20 dBm 01 28 287 dBm 03 03 03 03 04 04 05 05 05 05 05 05 05 05 05 05 05 05 05
	-70 dBm Image: CF 5.24 GHz 1001 pts Span 30.0 MHz Marker Trc X-value Y-value Function Function Result
	M1 1 5.22926 GHz -28.65 dBm 17.002197802 MHz T1 1 5.231289 GHz -9.20 dBm 0cc Bw 17.802197802 MHz T2 1 5.249931 GHz -9.82 dBm 0 0cc Bw 17.802197802 MHz M2 1 5.2337 GHz -2.29 dBm 0.33 dB 0 0
	Data: 30 APR 2019 11 20 43

Band I	802.11a
Band I CHL	Spectrum Image: Construction of first 1.00 dB = RBW 200 kHz Image: Construction of first 1.00 dB = RBW 200 kHz • Att 30 dB SWT 37.8 µs • VBW 1 MHz Mode Auto FFT Count 500/500 • IFk View 5.1695900 GHz • IPk View • 0cc Bw 16.633366633 MHz • 0 dBm • 10 dBm • 28.76 dBm • 10 dBm • 10 dBm • 22.70 dBm • 10 dBm • 11 0 dBm • 23.70 dBm • 0 dBm • 12 0 dBm • 12.70 dBm • 20 dBm • 11 0 dBm • 23.70 dBm • 0 dBm • 10 0 dBm • 02 0 dBm • 0 dBm • 10 0 dBm • 03 0 dBm • 0 dBm • 0 0 dBm • 0 0 dBm • 0 dBm • 0 0 dBm • 0 0 dBm • 0 dBm • 0 0 dBm • 0 0 dBm • 0 dBm • 0 0 dBm • 0 0 dBm • 0 dBm • 0 0 dBm • 0 0 dBm • 0 dBm • 0 0 dBm • 0 0 dBm • 0 dBm • 0 0 dBm • 0 0 dBm • 0 dBm • 0 0 dBm • 0 0 dBm • 0 dBm
CHM	
CH _H	Spectrum Image: Construction of first 1.00 db e RBW 200 kHz Cart Service 30 db WT 37.8 µs e VBW 1 MHz Mode Auto FFT Control Struction 91% View Image: Pix View M1[1] 5.22900 GHz -27.37.0Hz Image: Pix View M1[1] 5.22900 GHz -1.22 dBm Image: Pix View M1[1] 5.22900 GHz -1.22 dBm Image: Pix View M2[1] 5.2337000 GHz -1.22 dBm Image: Pix View M2[1] S.2337000 GHz -1.22 dBm Image: Pix View S.2337000 GHz -1.22 dBm Separation

CHL	Spectrum Image: Construct State Construct
СН	10 dBm M1[1] -29.67 dBm 10 dBm S.1670800 GHz S.1670800 GHz 0 dBm M2 W2[1] -3.45 dBm -20 dBm -3.45 dBm C3 C3 -30 dBm -3.45 dBm C3 C3
СН	-20 dBm
CH	-40 dBm
	-50 dbm
	CF 5.19 GHz 1001 pts Span 60.0 MHz Marker Type Ref Trc X-value Y-value Function Function Function Result M1 1 5.1678 GHz -29.67 dBm Function Function Result Function T1 1 5.1716583 GHz -9.04 oBm Occ Bw 36.623376623 MHz
	T2 1 5.2002817 GHz -9.25 dBm M2 1 5.10222 GHz -3.45 dBm D3 M1 1 44.16 MHz 0.17 dB
	Dam: 30 APR 2019 11 2903
	Att 30 dB SWT 1 ms VBW 2 MHz Mode Auto Sweep Count 500/500 IPk View M1[1] F 20000 dBm
	O dBm Occ Bw 36.68331683 MHz 0 dBm -2.37 dBm -10 dBm -2.37 dBm
	-20 dBm
CH _H	-60 dbm
	CF 5.23 GHz 1001 pts Span 60.0 MHz Marker Type Ref Trc X-value Y-value Function Function Function Result M1 1 5.20028 GHz -30.07 dBm -30.
	III 3.242 (MZ -2.37 (DBH) D3 MI 1 3.442 (MZ 1.52 (BB) D3 MI 1 1.52 (BB) 1.52 (BB) Date: 30 APR 2019 11:00:12 11:00:12 11:00:12 11:00:12

Band I	802.11n (HT40)
	Spectrum Image: Construct the system of the sy
CHL	
	-10 dBm
	-50 dbm
	CF 5.19 GHz 1001 pts Span 60.0 MHz Marker Type [Ref] Trc X-value Y-value Function Function Result M1 1 5.16828 GHz -29.22 dBm Function Function Result
	mil 1 3:100260 draz 2:9:22 dbin Occ Bw 36:563436563 MHz T1 1 1:17782 dHz -8:72 dbin Occ Bw 36:563436563 MHz T2 1 5:2003417 GHz -9:20 dbin Occ Bw 36:563436563 MHz M2 1 5:20126 GHz -2:86 dbin Occ Bw 0.27 dB
	Measuring
	Dam: 30 APR 2019 11/21/51
	Date: 30 A PR 2019 11 21 61 Spectrum Image: 201 A PR 2019 Ref Level 20.50 dBm Offset 1.00 dB Att 30 dB SWT 1 ms VBW 2 MHz Mode Auto Sweep
	Spectrum Image: 100 APR 2019 112161 Ref Level 20.50 dBm Offset 1.00 dB = RBW 500 kHz att 30 dB SWT 1 ms = VBW Count 500/500 FIK View 10 dBm 0 dB 0 dB 0 dB 0 dBm 0 dBm
	Spectrum Image: 30 A PR 2019 112161 Ref Level 20.50 dBm Offset 1.00 dB • RBW 500 kHz • Att 30 dB SWT 1 ms • VBW 2 MHz Mode Auto Sweep Count 500/500 • IPK View 0 dBm 0
CH _H	Spectrum Image: 30 APR. 2019 11 21 61 Ref Level 20.50 dBm Offset 1.00 dB • RBW 500 kHz • Att 30 dB • SWT • Dame: 30 APR. 2019 11 21 61
CH _H	Spectrum Provide and the second
CH _H	Spectrum Image: Spectrum Ref Level 20.50 dBm Offset 1.00 dB RBW 500 kHz att 30 dB SWT 1 ms VBW 2 MHz Mode Auto Sweep Count 500/500 Count 500/500 M1[1] -28.80 dBm -28.80 dBm 10 dBm 0cc BW 20.52 dBm 0cc BW 25.2460800 GHz -1.0 dBm -1.65 dBm -30.63 dBm -30.563 dBm -30.563 dBm -30 dBm 01 %27.652 dBm -0 -0 -0 -0 -50 dBm -0 -0 -0 -0 -0 -0 -50 dBm -0

Band I	802.11ac (HT80)
CH _M	Spectrum Image: Constraint of the second secon
	-70 dBm
	Marker Type I Ref Trc X-value Y-value Function Function Result M1 1 5.16996 GHz -28.90 dBm - T1 1 5.17277 GHz -28.90 dBm Occ Bw 75.164935165 MHz T2 1 5.247982 GHz -5.26 dBm - - M2 1 5.22848 GHz 0.09 dBm - - D3 M1 82.56 MHz 2.40 dB - - -
	Dette: 30 A P.R. 2019 11:42:62

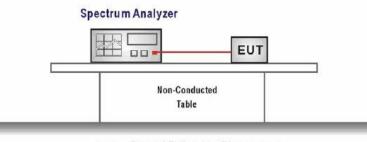
5.6. 6dB Bandwidth

<u>LIMIT</u>

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



Ground Reference Plane

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)	Туре	Channel	6dB bandwith (MHz)	99% Occupy bandwith (MHz)	Result	
			CH∟	17.64	17.59		
		802.11ac	CH _M	17.58	17.62	Pass	
			CH _н	17.64	17.65		
			CH∟	17.34	17.62		
	20	802.11n	CH _M	17.37	17.59	Pass	
			CH _н	17.67	17.62		
IV			CH∟	16.38	16.45		
IV		802.11a	CH_{M}	16.38	16.45	Pass	
			CH _н	16.56	16.48		
		802.11ac	CH∟	36.00	36.08	Pass	
	40	002.1140	CH _н	34.68	36.14	F d 5 5	
	40	802.11n	CH∟	36.44	36.21	Dooo	
		002.1111	CH _H	36.52	36.21	Pass	
	80	802.11ac	CH _M	72.96	75.05	Pass	

Test channel 802.11ac (HT20) Spectrum Ref Level 20.50 dBm Att 30 dB Count 500/500 1Pk View Offset 1.00 dB ● RBW 100 kHz SWT 75.9 µs ● VBW 300 kHz Mode Auto FFT -11.20 dB 5.7361200 G 17.592407592 M -3.65 dB 5.7499500 G M1[1] 10 dBm-Occ Bw M2[1] M2 0 dBm ٨., -0 Anna 10 dBm 01 -9.65 20 dBm-30 dBm 40 dBm-~~~ -50 dBm- CH_{L} 60 dBm -70 dBm 1001 pts CF 5.745 GHz Span 30.0 MHz larke X-value 5.73612 GHz 5.7361289 GHz 5.7537213 GHz 5.74995 GHz 17.64 MHz Y-value -11.20 dBm -11.20 dBm -8.80 dBm -3.65 dBm 0.53 dB Type Ref Trc Function Function Result M1 T1 T2 Occ Bw 17.592407592 MHz M1 4/4 Date: 30 APR 2019 13:32:36 Spectrum Ref Level 20.50 dBm Att 30 dB Count 500/500 1Pk View
 Offset
 1.00 dB
 RBW
 100 kHz

 SWT
 75.9 μs
 VBW
 300 kHz
 Mode Auto FFT -9.53 dB 5.7761500 GI 17.622377622 MI -3.01 dB 5.7899500 GI M1[1] 10 dBm-Occ Bw M2[1] M2) dBm Annah. -10 dBm D1 -9.000 -20 dBm 30 dBm 40 dBm--50 dBm-СH_м 60 dBm 70 dBm CF 5.785 GHz 1001 pts Span 30.0 MHz X-value 5.77615 GHz 5.7761289 GHz 5.7937512 GHz 5.78995 GHz 17.58 MHz
 Y-value
 Function

 -9.53 dBm

 -11.32 dBm
 Occ Bw

 -10.82 dBm

 -3.01 dBm

 0.41 dB
 Type Ref Trc Function Result M1 T1 T2 17.622377622 MHz M2 D3 М1 44 Date: 30 APR 2019 13:33:54 Spectrum RefLevel 20.50 dBm Att 30 dB 0 dBm Offset 1.00 dB ● RBW 100 kHz 30 dB SWT 75.9 µs ● VBW 300 kHz Mode Auto FFT Count 500/500 -12.34 dB 5.8161200 GF 17.652347652 MF -4.90 dB 5.8299500 GF M1[1] 10 dBm Occ E M2[1] M2 0 dBm 10 dBm 1 -10 0 20 dBm -30 dBm -40 dBm-Storagen-CH_H -60 dBm 70 dBm CF 5.825 GHz 1001 pts Span 30.0 MHz arke X-value 5.81612 GHz 5.8161289 GHz 5.8337812 GHz 5.82995 GHz 17.64 MHz Y-value -12.34 dBm -12.34 dBm -12.96 dBm -4.90 dBm 0.39 dB Type Ref Trc Function Function Result 17.652347652 MHz Occ Bw M 4/4 Date: 30 APR .2019 13:35:01

Test channel 802.11n (HT20) Spectrum Ref Level 20.50 dBm Att 30 dB Count 500/500 1Pk View Offset 1.00 dB ● RBW 100 kHz SWT 75.9 µs ● VBW 300 kHz Mode Auto FFT -9.29 dB 5.7361500 GI 17.622377622 MI -3.00 dB 5.7499500 GI M1[1] 10 dBm-Occ Bw M2[1] 0 dBm м2 menomente Mar يملم Sheulypalm 9.000 10 dBm-20 dBm-30 dBm -40 dBmnot a -50 dBm- CH_{L} 60 dBm -70 dBm 1001 pts CF 5.745 GHz Span 30.0 MHz larke X-value 5.73615 GHz 5.7361289 GHz 5.7537512 GHz 5.74995 GHz 17.34 MHz Y-value -9.29 dBm -10.99 dBm -11.14 dBm -3.00 dBm 0.23 dB Type Ref Trc Function Function Result M1 T1 T2 Occ Bw 17.622377622 MHz M1 4/4 Date: 30 APR 2019 13:24:34 Spectrum Ref Level 20.50 dBm Att 30 dB Count 500/500 1Pk View
 Offset
 1.00 dB
 RBW
 100 kHz

 SWT
 75.9 μs
 VBW
 300 kHz
 Mode Auto FFT -8.90 dE 5.7761500 G 17.592407592 M -2.89 dE 5.7899500 G M1[1] 10 dBm-Occ Bw M2[1] M2) dBm Anent D1 -8.88 -10 dBm -20 dBm 30 dBm-41 40 dBmwhen -50 dBm-СH_м 60 dBm 70 dBm CF 5.785 GHz 1001 pts Span 30.0 MHz X-value 5.77615 GHz 5.7761289 GHz 5.7937213 GHz 5.78995 GHz 17.37 MHz
 Y-value
 Function

 -8.90 dBm

 -10.93 dBm
 Occ Bw

 -9.01 dBm

 -2.89 dBm

 -0.81 dB
 Type Ref Trc Function Result M1 T1 T2 17.592407592 MHz M2 D3 М1 Date: 30 APR 2019 13:25:48 Spectrum RefLevel 20.50 dBm Att 30 dB 0 dBm Offset 1.00 dB ● RBW 100 kHz 30 dB SWT 75.9 µs ● VBW 300 kHz Mode Auto FFT Count 500/500 -12.91 dB 5.8161200 GH 17.622377622 MH -6.77 dB 5.8186700 GH M1[1] 10 dBm Occ 0 dBm M2[1] -10 dBm 20 dBm -30 dBm 40 dBm--50 dBm CH_H -60 dBm 70 dBm CF 5.825 GHz 1001 pts Span 30.0 MHz arko X-value 5.81612 GHz 5.8161289 GHz 5.8337512 GHz 5.81867 GHz 17.67 MHz Y-value -12.91 dBm -12.91 dBm -12.21 dBm -6.77 dBm -0.62 dB Type Ref Trc Function Function Result 17.622377622 MHz Occ Bw M 4/4 Date:30 APR 2019 13:27:16

Test channel 802.11a Spectrum Ref Level 20.50 dBm Att 30 dB Count 500/500 1Pk View Offset 1.00 dB ● RBW 100 kHz SWT 75.9 µs ● VBW 300 kHz Mode Auto FFT -9.40 dB 5.7367500 GF 16.453546454 MF -2.48 dB 5.7499500 GF M1[1] 10 dBm-Occ By M2[1] 0 dBm M2 Mynnesty marent mound Warde л. D1 -8.482 10 dBm-20 dBm-30 dBm -40 dBmwww -50 dBm- CH_{L} -60 dBm -70 dBm 1001 pts CF 5.745 GHz Span 30.0 MHz larke X-value 5.73675 GHz 5.7366983 GHz 5.7531518 GHz 5.74995 GHz 16.38 MHz Y-value -9.40 dBm -10.20 dBm -10.44 dBm -2.48 dBm 0.57 dB Type Ref Trc Function Function Result M1 T1 T2 Occ Bw 16.453546454 MHz M1 4/4 Date: 30 APR 2019 13:20:11 Spectrum Ref Level 20.50 dBm Att 30 dB Count 500/500 1Pk View Offset SWT 1.00 dB 👄 RBW 100 kHz 75.9 μs 👄 VBW 300 kHz Mode Auto FFT -9.50 dB 5.7767500 GI 16.453546454 MI -2.60 dB 5.7786700 GI M1[1] 10 dBm-Occ By M2[1] 0 dBm alumb Lugar Myul D1 -8.603 -10 dBm--20 dBm 30 dBm-40 dBm A., -50 dBm-СH_м 60 dBm 70 dBm CF 5.785 GHz 1001 pts Span 30.0 MHz X-value 5.77675 GHz 5.7767283 GHz 5.7931818 GHz 5.77867 GHz 16.38 MHz
 Y-value
 Function

 -9.50 dBm

 -10.73 dBm
 Occ Bw

 -10.39 dBm

 -2.60 dBm

 0.42 dB
 Type Ref Trc Function Result M1 T1 T2 16.453546454 MHz M2 D3 М1 Date: 30 APR 2019 13:21:17 Spectrum RefLevel 20.50 dBm Att 30 dB 0 dBm Offset 1.00 dB ● RBW 100 kHz 30 dB SWT 75.9 µs ● VBW 300 kHz Mode Auto FFT Count 500/500 -12.55 dB 5.8166900 GF 16.483516484 MF -6.46 dB 5.8312100 GF M1[1] 10 dBm Occ 0 dBm M2[1] 11_{AU} -10 dBm 20 dBm -30 dBm Yn, 40 dBmmyla -50 dBm-CH_H -60 dBm 70 dBm CF 5.825 GHz 1001 pts Span 30.0 MHz arko X-value 5.81669 GHz 5.8166983 GHz 5.8331818 GHz 5.83121 GHz 16.56 MHz Y-value -12.55 dBm -12.55 dBm -11.92 dBm -6.46 dBm -1.31 dB Type Ref Trc Function Function Result 16.483516484 MHz Occ Bw M 4,43 Date:30 APR 2019 13:23:14

Test channel	802.11ac (HT40)
	Spectrum Image: Control of the image: Control o
	• 1Pk Max M1[1] -12.93 dBm 10 dBm M1[1] -12.93 dBm 10 dBm Occ Bw 0 dBm Occ Bw 0 dBm M1[1] 0 dBm M2
	-10 dBm
CHL	-60 d8m
	CF 5.755 GHz 1001 pts Span 60.0 MHz Marker Type Ref Trc X-value Y-value Function Function Result M1 1 5.736994 GHz -12.93 dBm 100.0 Cc Bw 36.083916084 MHz T1 1 5.7369981 GHz -13.62 dBm Occ Bw 36.083916084 MHz T2 1 5.772982 GHz -14.15 dBm 36.083916084 MHz 36.083916084 MHz
	12 1 5.772902 uniz -14-13 0001 M2 1 5.76999 GHz -6.79 dBm D3 M1 1 36.0 MHz -0.22 dB Date: 30 APR 2019 13:37:00 MA -0.22 dB
	Spectrum Ref Level 20.50 dBm Offset 1.00 dB ● RBW 100 kHz
	Att 30 dB SWT 132.7 µs VBW 300 kHz Mode Auto FFT Count 460/500 PIk View 10 dBm
	0 dBm
CH _H	-30 dbm
- 11	-60 dBm
	CF 5.795 GHz 1001 pts Span 60.0 MHz
	CF 5.795 GHz 1001 pts Span 60.0 MHz Marker Type Ref Trc X-value Function Function Result M1 1 5.777 GHz -12.04 dBm Function Function Result T1 1 5.7776382 GHz -11.92 dBm Occ Bw 36.143856144 MHz T2 1 5.812992 GHz -14.82 dBm 0cc Bw 36.143856144 MHz M2 1 5.79242 GHz -5.86 dBm 0.23 dB 0.23 dB

Test channel	802.11n (HT40)
	Spectrum Image: Constraint of the sector of th
	• 1Pk. View M1[1] -12.56 dBm 10 dBm M1[1] .12.56 dBm 10 dBm Occ Bw 0 dBm Occ Bw -10 dBm 0t 01 -12.327 dBm -1.2.56 dBm
	-20 dBm -30 dBm -40 dBm U1 - 12.32 / 06m
CHL	-60 dBm
	Marker Type Ref Trc X-value Y-value Function Function Result M1 1 5.7367391 GHz -12.56 dbm Function Result T1 1 5.7366324 GHz -12.27 dbm Occ 8w 36.208393632 MHz T2 1 5.739060 GHz -12.21 dbm MI 36.208393632 MHz M2 1 5.7399565 GHz -6.33 dbm O 03 MI 36.4948 MHz -0.90 db
	Neasuring
	Dam: 30 APR 2019 132859
	Date: 30 APR 2019 13 28 89 Spectrum Ref Level 20.50 dBm Offset 1.00 dB ● RBW 100 kH2 ● Att = 30 dB SWT 132.7 µs ● VBW 300 kH2 Mode Auto FFT Count 461/200 ● IFK View
	Spectrum Image: Control of Spectrum Ref Level 20.50 dBm Offset 1.00 dB RBW 100 kHz Mode Auto FFT Count 461/500 Image: Count 461/500 Image: Coun
011	Spectrum Image: Constraint of the second secon
CH _H	Spectrum Image: Control of Set 1.00 dB • RBW 100 kHz • Att 30 dB SWT 132.7 µ5 • VBW 300 kHz • Mode Auto FFT • Out 461/500 • FFK View • ID dBm • Occ Bw • 10 dBm • Occ Bw • 10 dBm • Occ Bw • 10 dBm • Occ Bw • Oddm • Occ Bw • Occ Bw • Occ Bw <
CH _H	Spectrum Image: Constraint of Spectrum Image: Constraint of Spectrum Image: Constraint of Spectrum Made auto FFT • Att 30 dB SWT 132.7 µs • VBW 300 kHz Mode Auto FFT • Count 661/S00 • IPK View • III -15.63 dBm -15.63 dBm 10 dBm • III • State Spectrum • IIII -7.35 dBm • 0 dBm • IIII • State Spectrum • IIIII -7.35 dBm • 0 dBm • IIIIII • State Spectrum • IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII

est channel	802.11ac (HT80)
	Spectrum Image: Spectrum </td
CH _M	-60 dBm
	CF 5.775 GHz 1001 pts Span 120.0 MHz
	Marker Type Function Function Result M1 1 5.7372 GHz -17.91 dBm
	M1 1 5.7372 GHz -17.91 dBm T1 1 5.73738 GHz -13.19 dBm Occ Bw 75.044955045 MHz T2 1 5.812403 GHz -16.33 dBm M2 1 5.79252 GHz -6.0 dBm D3 M1 1.72.96 MHz 1.28 dB
	D3 M1 1 72:30 MHZ 1:20 00 Messuring

Shenzhen Huatongwei International Inspection Co., Ltd.

5.7. Band edge

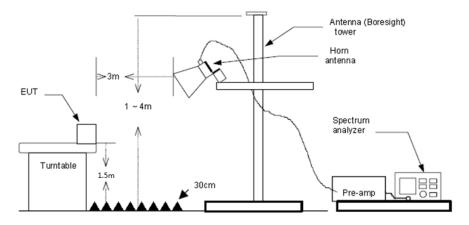
FCC CFR Title 47	Part 15 Subpart E	E Section 15.407(b)	

	Un-restricted band	d 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	
	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	5.7GHz-5.72GHz 10*dBm/MHz to 15.6dBm/MHz (105.6*dBuV/m to 110.8dBuV/m)		
	5.72GHz-5.725GHz	15.6*dBm/MHz to 27dBm/MHz (110.8dBuV/m to* 122.2dBuV/m)	Peak	
5725-5850 MHz	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	e 5.925GHz -27 dBm/MHz(68.2dBuV/m)@3m		

* 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. $E[dB\mu V/m] = EIRP[dBm] + 95.2$, 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. This is 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.
- 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 mo	ode: 802.11a	a	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	7.95	31.70	9.79	0.00	49.44	54.00	-4.56	Horizontal	Average
5150.00	7.76	31.70	9.79	0.00	49.25	54.00	-4.75	Vertical	Average
5150.00	13.54	31.70	9.79	0.00	55.03	74.00	-18.97	Horizontal	Peak
5150.00	13.48	31.70	9.79	0.00	54.97	74.00	-19.03	Vertical	Peak

Band: I				Worst mo	ode: 802.11a	a	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	7.35	31.40	9.91	0.00	48.66	54.00	-5.34	Horizontal	Average
5250.00	6.83	31.40	9.91	0.00	48.14	54.00	-5.86	Vertical	Average
5250.00	14.02	31.40	9.91	0.00	55.33	74.00	-18.67	Horizontal	Peak
5250.00	12.81	31.40	9.91	0.00	54.12	74.00	-19.88	Vertical	Peak

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.

Band: IV				Worst mo	ode: 802.11a	1	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	3.86	31.73	10.47	0.00	46.06	54.00	-7.94	Horizontal	Average
5725.00	4.23	31.73	10.47	0.00	46.43	54.00	-7.57	Vertical	Average
5725.00	7.07	31.73	10.47	0.00	49.27	74.00	-24.73	Horizontal	Peak
5725.00	10.44	31.73	10.47	0.00	52.64	74.00	-21.36	Vertical	Peak

Band: IV				Worst mo	ode: 802.11a	a	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	7.15	32.20	10.61	0.00	49.96	54.00	-4.04	Horizontal	Average
5850.00	6.94	32.20	10.61	0.00	49.75	54.00	-4.25	Vertical	Average
5850.00	6.74	32.20	10.61	0.00	49.55	74.00	-24.45	Horizontal	Peak
5850.00	12.21	32.20	10.61	0.00	55.02	74.00	-18.98	Vertical	Peak

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.

5.8. Radiated Spurious Emissions

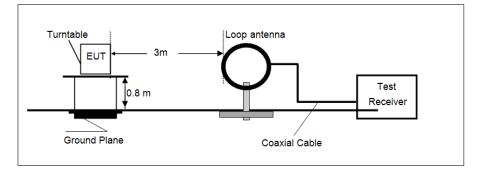
<u>LIMIT</u>

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

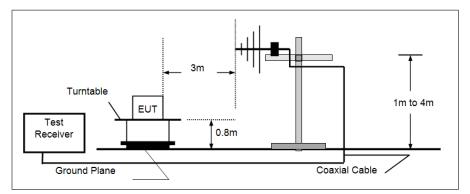
Unwanted emissions below	Unwanted emissions below 1GHz and Restricted band emissions above 1GHz									
Frequency	Limit (dBuV/m @3m)	Value								
30MHz-88MHz	40.00	Quasi-peak								
88MHz-216MHz	43.50	Quasi-peak								
216MHz-960MHz	46.00	Quasi-peak								
960MHz-1GHz	54.00	Quasi-peak								
Above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

TEST CONFIGURATION

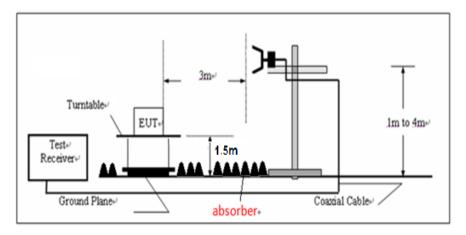
• 9KHz ~30MHz



• 30MHz ~ 1GHz



• Above 1GHz



TEST PROCEDURE

- 1. The EUT was setup and tested according to ANSI C63.10:2013
- 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 10th harmonic: RBW=1MHz, VBW=3MHz Peak detector for Peak value. RBW=1MHz, VBW=3MHz RMS detector for Average value.

TEST MODE:

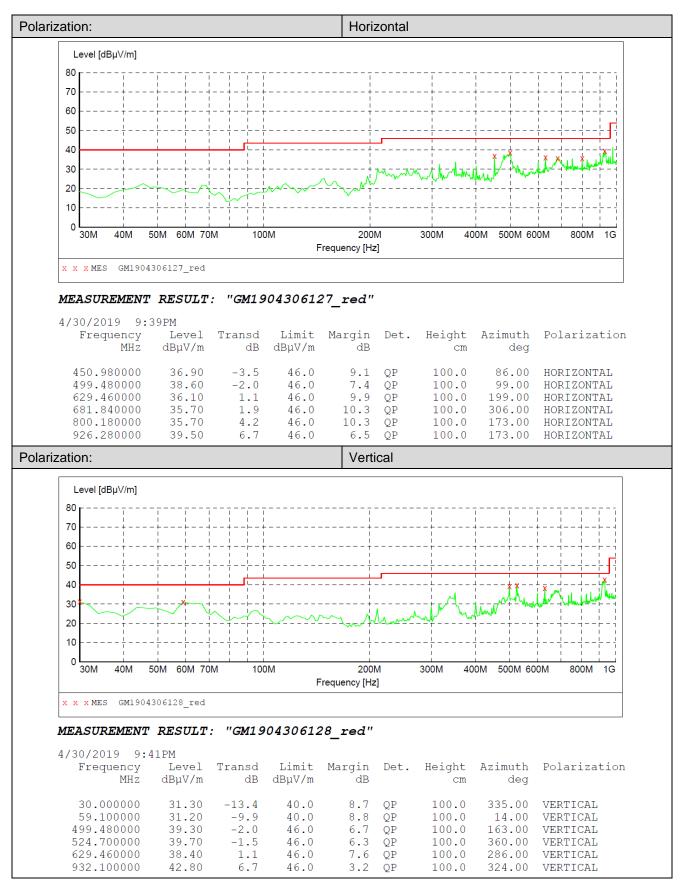
Please refer to the clause 3.3

TEST RESULTS

☑ Passed □ Not Applicable

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.



Remark:

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

Above 1GHz

Band: I				Worst mo	ode: 802.11a	a	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
1755.16	37.81	25.31	5.87	37.36	31.63	74.00	-42.37	Vertical	Peak
3151.99	36.99	28.80	7.66	37.44	36.01	74.00	-37.99	Vertical	Peak
6544.35	31.14	34.09	11.26	33.64	42.85	74.00	-31.15	Vertical	Peak
9909.80	33.29	39.10	13.59	34.15	51.83	74.00	-22.17	Vertical	Peak
2241.03	39.02	26.26	4.72	37.20	32.80	74.00	-41.20	Horizontal	Peak
3607.26	38.81	25.31	5.87	37.36	32.63	74.00	-41.37	Horizontal	Peak
6577.75	37.99	28.80	7.66	37.44	37.01	74.00	-36.99	Horizontal	Peak
9019.05	33.14	34.09	11.26	33.64	44.85	74.00	-29.15	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
3018.50	36.07	28.64	7.50	37.56	34.65	74.00	-39.35	Vertical	Peak
4524.47	33.26	30.75	9.34	36.24	37.11	74.00	-36.89	Vertical	Peak
5836.04	30.73	32.17	10.60	34.24	39.26	74.00	-34.74	Vertical	Peak
7063.69	29.41	35.49	11.85	33.77	42.98	74.00	-31.02	Vertical	Peak
2883.32	35.55	28.43	7.42	37.58	33.82	74.00	-40.18	Horizontal	Peak
4181.16	33.08	29.98	8.92	36.58	35.40	74.00	-38.60	Horizontal	Peak
5776.92	32.28	31.99	10.55	34.27	40.55	74.00	-33.45	Horizontal	Peak
8271.29	30.39	36.49	12.80	32.98	46.70	74.00	-27.30	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.

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
1630.26	36.50	24.99	5.63	37.22	29.90	74.00	-44.10	Vertical	Peak
3143.98	36.45	28.80	7.65	37.45	35.45	74.00	-38.55	Vertical	Peak
5791.65	32.62	32.06	10.58	34.26	41.00	74.00	-33.00	Vertical	Peak
8104.56	29.97	36.99	12.55	33.04	46.47	74.00	-27.53	Vertical	Peak
2263.96	36.32	27.89	6.55	37.59	33.17	74.00	-40.83	Horizontal	Peak
2942.64	36.64	28.54	7.45	37.58	35.05	74.00	-38.95	Horizontal	Peak
3893.52	33.48	29.69	8.63	36.84	34.96	74.00	-39.04	Horizontal	Peak
7227.39	29.83	36.23	11.89	33.48	44.47	74.00	-29.53	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
2179.15	36.47	27.34	6.42	37.60	32.63	74.00	-41.37	Vertical	Peak
3472.12	34.45	28.78	8.07	37.16	34.14	74.00	-39.86	Vertical	Peak
5022.19	35.04	31.59	9.69	35.34	40.98	74.00	-33.02	Vertical	Peak
6974.36	30.89	35.15	11.82	33.87	43.99	74.00	-30.01	Vertical	Peak
1621.99	37.00	24.97	5.61	37.21	30.37	74.00	-43.63	Horizontal	Peak
3151.99	37.99	28.80	7.66	37.44	37.01	74.00	-36.99	Horizontal	Peak
5791.65	32.62	32.06	10.58	34.26	41.00	74.00	-33.00	Horizontal	Peak
8145.93	30.18	36.86	12.64	33.02	46.66	74.00	-27.34	Horizontal	Peak

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.

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
3561.64	36.89	29.19	8.21	37.09	37.20	74.00	-36.80	Vertical	Peak
4712.55	34.63	31.25	9.51	35.89	39.50	74.00	-34.50	Vertical	Peak
6544.35	32.14	34.09	11.26	33.64	43.85	74.00	-30.15	Vertical	Peak
8063.40	31.49	37.04	12.45	33.05	47.93	74.00	-26.07	Vertical	Peak
1541.48	34.77	25.42	5.40	37.12	28.47	74.00	-45.53	Horizontal	Peak
2275.52	36.13	27.96	6.56	37.59	33.06	74.00	-40.94	Horizontal	Peak
3225.04	35.02	28.65	7.75	37.37	34.05	74.00	-39.95	Horizontal	Peak
6094.14	32.14	32.50	10.83	34.05	41.42	74.00	-32.58	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
2980.33	35.32	28.58	7.47	37.58	33.79	74.00	-40.21	Vertical	Peak
4223.95	34.53	30.05	8.96	36.54	37.00	74.00	-37.00	Vertical	Peak
6094.14	30.49	32.50	10.83	34.05	39.77	74.00	-34.23	Vertical	Peak
8996.12	31.22	37.90	13.31	33.03	49.40	74.00	-24.60	Vertical	Peak
1323.14	36.50	26.13	4.87	37.16	30.34	74.00	-43.66	Horizontal	Peak
2124.37	35.59	26.90	6.38	37.60	31.27	74.00	-42.73	Horizontal	Peak
2905.42	34.83	28.51	7.43	37.58	33.19	74.00	-40.81	Horizontal	Peak
6781.78	31.24	34.04	11.58	33.77	43.09	74.00	-30.91	Horizontal	Peak

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.

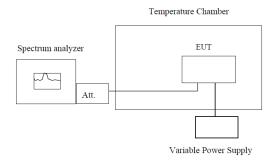
3. Measuring frequencies from 1 GHz to 40GHz.

5.9. Frequency stability

<u>LIMIT</u>

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°C. 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 🗌 No

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	-49000.00	-9.45946	PASS		
25	17.1	-50000.00	-9.65251	PASS		
25	20.9	-47000.00	-9.07336	PASS		

Band: IV			Test Frequency: 5745.00MHz			
Temperature (℃)	Voltage (V)	Frequency Deviation (Hz)	Frequency Deviation (ppm)	Result		
25	19.0	-50900.00	-8.85988	PASS		
25	17.1	-55900.00	-9.73020	PASS		
25	20.9	-45000.00	-7.83290	PASS		

Temperature VS Frequency stability

Band: I			Test Frequency: 5180.00MHz			
Voltage (V)	Temperature ($^{\circ}C$)	Frequency Deviation (Hz)	Frequency Deviation (ppm)	Result		
19.00	-20	-44000.00	-8.49421	PASS		
19.00	-10	-43000.00	-8.30116	PASS		
19.00	0	-42000.00	-8.10811	PASS		
19.00	10	-41000.00	-7.91506	PASS		
19.00	20	-40000.00	-7.72201	PASS		
19.00	30	-40000.00	-7.72201	PASS		
19.00	40	-40000.00	-7.72201	PASS		
19.00	50	-39000.00	-7.52896	PASS		

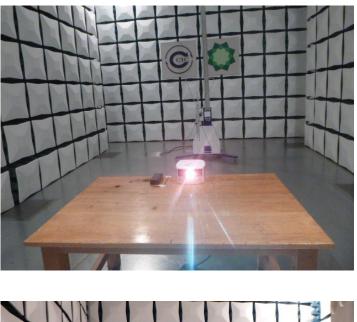
Band: IV			Test Frequency: 5745.00MHz		
Voltage (V)	Temperature (℃)	Frequency Deviation (Hz)	Frequency Deviation (ppm)	Result	
19.00	-20	-40000.00	-6.96258	PASS	
19.00	-10	-39000.00	-6.78851	PASS	
19.00	0	-38000.00	-6.61445	PASS	
19.00	10	-36000.00	-6.26632	PASS	
19.00	20	-36000.00	-6.26632	PASS	
19.00	30	-35000.00	-6.09225	PASS	
19.00	40	-34000.00	-5.91819	PASS	
19.00	50	-34000.00	-5.91819	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.: CHTEW19050094

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