Shenzhen Huaxin Information Technology Service Co., Ltd

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TEST REPORT

Report No. ·····:	**HX250318R005**
FCC ID·····:	**2BCAX-HY300ULTRA**
Applicant·····:	**GuangDong SINOY Smart Technology CO., LTD**
Address·····:	5TH Floor, Building #2, RunFengZhiGu Industrial Park Changpin Town, DongGuan City, Guangdong, China
Manufacturer·····:	GuangDong SINOY Smart Technology CO., LTD
Address·····:	5TH Floor, Building #2, RunFengZhiGu Industrial Park Changpin Town, DongGuan City, Guangdong, China
Product Name·····:	**Smart Projector**
Trade Mark·····:	/
Model/Type reference·····:	HY300Ultra
Listed Model(s) ·····:	HY300Pro+, Gimbal 3S, W210, SMOON 300, HY200mini, HY200C, Gimbal 3 Pro, HY300Plus, HY300 Pro+, HY300Pro, HY300PRO, C2, AC1075
Standard……..……..…:	**FCC Part 15, Subpart E 15. 407**
Date of receipt of test sample…:	Mar. 11, 2025
Date of testing……..:	Mar. 12, 2025 ~ Mar. 24, 2025
Date of issue……....:	Mar. 25, 2025
Result……:	**PASS**

Compiled by: (Printed name + signature)	Terry Su	Terry Su
Approved by: (Printed name + signature)	Michael Wu	Michael wu

SHENZHEN HUAXIN INFORMATION TECHNOLOGY SERVICE CO., LTD H X

Testing Laboratory Name……:	**Shenzhen Huaxin Information Technology Service Co., Ltd**
Address……:	101, R & D Building, No.3 guansheng 4th Road, Luhu Community, Guanhu Street, Longhua District, Shenzhen, Guangdong, China

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1. TEST SUMMARY

1.1. Test Standards

The tests were performed according to following standards:

FCC Part 15, Subpart E(15.407) — for 802.11a/n/ac, the test procedure follows the FCC KDB 789033 D02 General UNII Test Procedures New Rules V02r01.
RSS-247 Issue 3 — Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices
RSS-Gen — General Requirements for Compliance of Radio Apparatus

1.2. Report version

Revised No.	Date of issue	Description
01	Mar. 25, 2025	Original

1.3. Test Description

FCC Part 15 Subpart E (15.407) / RSS-247 Issue 3				
Test Item	Test require		Result	Test Engineer
	FCC	IC		
Antenna Requirement	15.203& 15.247(b)(4)	/	Pass	Sain Liao
Conducted Emission	15.207	RSS-Gen 8.8	Pass	Ann Lu
Radiated Emissions Restricted Band	15.407(b)	RSS-247 6.2.1.2 RSS-247 6.2.2.2 RSS-247 6.2.3.2 RSS-247 6.2.4.3	Pass	Sain Liao
26dB Bandwidth & 99% Bandwidth	15.407(a) (5)	/	Pass	Sain Liao
6dB Bandwidth (only for UNII-3)	15.407(e)	RSS-247 6.2.4.2	Pass	Sain Liao
Output Power	15.407(a)	RSS-247 6.2.1.1 RSS-247 6.2.2.1 RSS-247 6.2.3.1 RSS-247 6.2.4.2	Pass	Sain Liao
Power Spectral Density	15.407(a)	RSS-247 6.2.1.1 RSS-247 6.2.2.1 RSS-247 6.2.3.1 RSS-247 6.2.4.2	Pass	Sain Liao
Transmitter Radiated Spurious Emission	15.407(b) &15.209	RSS-Gen 8.9 RSS-247 6.2.1.2 RSS-247 6.2.2.2 RSS-247 6.2.3.2 RSS-247 6.2.4.3	Pass	Sain Liao
Frequency Stability	15.407(g)	/	Pass	Sain Liao
Dynamic Frequency Selection (DFS)	15.407(h)	RSS-247 6.3	N/A	N/A

Note: “N/A” is not applicable.

The measurement uncertainty is not included in the test result.

1.4. Test Facility

Shenzhen Huaxin Information Technology Service Co., Ltd

Add: 101, R & D Building, No.3 guansheng 4th Road, Luhu Community, Guanhu Street, Longhua District, Shenzhen, Guangdong, China

Laboratory accreditation

The test facility is recognized, certified, or accredited by the following organizations:

A2LA-Lab Cert. No.: 6855.01

Shenzhen Huaxin Information Technology Service 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: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

Industry Canada (Company Number: 31786, CAB Identifier: CN0147)

Shenzhen Huaxin Information Technology Service Co., Ltd EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 31786.

FCC (Registration No.: 932271, Designation Number CN1344)

Shenzhen Huaxin Information Technology Service 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. Registration NO.: 932271.

1.5. Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. 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 Huaxin Information Technology Service Co., Ltd quality system acc. to DIN EN 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.

Below is the best measurement capability for Shenzhen Huaxin Information Technology Service Co., Ltd

Emission Bandwidth	±4.22%	(1)
Maximum Conduct Output Power	±0.41dB	(1)
Power Spectral Density	±0.39dB	(1)
Band Edge Measurements	±0.59dB	(1)
Unwanted Emissions Measurement	9kHz-1GHz: ±0.746dB 1GHz-40GHz: ±1.328dB	(1)
Frequency Stability	±2.76%	(1)
Conducted Emissions 9kHz~30MHz	±2.18dB	(1)
Radiated Emissions 30~1000MHz	±4.17dB	(1)
Radiated Emissions 1~18GHz	±4.82dB	(1)
Radiated Emissions 18~40GHz	±6.12dB	(1)

Note (1): This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

1.6. Environmental conditions

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

Temperature:	25°C
Relative Humidity:	56%
Air Pressure:	101kPa

2. GENERAL INFORMATION

2.1. Client Information

Applicant:	GuangDong SINOY Smart Technology CO., LTD
Address:	5TH Floor, Building #2, RunFengZhiGu Industrial Park Changpin Town, DongGuan City, Guangdong, China
Manufacturer:	GuangDong SINOY Smart Technology CO., LTD
Address:	5TH Floor, Building #2, RunFengZhiGu Industrial Park Changpin Town, DongGuan City, Guangdong, China

2.2. General Description of EUT

Product Name:	Smart Projector			
Trade Mark:	/			
Model/Type reference:	HY300Ultra			
Listed Model(s):	HY300Pro+, Gimbal 3S, W210, SMOON 300, HY200mini, HY200C, Gimbal 3 Pro, HY300Plus, HY300 Pro+, HY300Pro, HY300PRO, C2, AC1075			
Model Different:	All these models are identical in the same PCB, layout and electrical circuit, The difference is model name and speaker location.			
Power supply:	36V⎓0.95A and 12V⎓0.7A from AC/DC Adapter			
Adapter Model:	HYP317-360095US Input: 100-240V~ 50/60Hz 1.0A Max Output 1: 36V⎓0.95A Output 2: 12V⎓0.7A			
Hardware version:	/			
Software version:	/			
Antenna type:	FPC Antenna			
Antenna gain:	4.45dBi Max			
Technical index for 5G WIFI				
Operation Band:	☒U-NII-1	☐U-NII-2A	☐U-NII-2C	☒U-NII-3
Operation Frequency Range:	U-NII-1:	5180MHz~5240MHz		
	U-NII-3:	5745MHz~5825MHz		
Support bandwidth:	802.11a	☒20MHz		
	802.11n	☒20MHz	☒40MHz	
	802.11ac	☒20MHz	☒40MHz	☐80MHz ☐160MHz
	802.11ax	☒20MHz	☒40MHz	☐80MHz ☐160MHz
Modulation:	802.11a: OFDM (BIT/SK, QPSK, BPSK, 16QAM) 802.11n: OFDM (BIT/SK, QPSK, BPSK, 16QAM, 64QAM) 802.11ac: OFDM (BIT/SK, QPSK, BPSK, 16QAM, 64QAM, 256QAM) 802.11ax: OFDM (BIT/SK, QPSK, BPSK, 16QAM, 64QAM, 256QAM, 1024QAM)			
Bit Rate of Transmitter:	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 300Mbps 802.11ac: at most 866.7Mbps 802.11ax: at most 1201Mbps			

2.3. Accessory Equipment information

Equipment Information			
Name	Model	S/N	Manufacturer
Notebook	ThinkBook 14G3 ACL	MP246QDR	Lenovo
Cable Information			
Name	Shielded Type	Ferrite Core	Length
DC In Cable	Without	Without	1.2M
Test Software Information			
Name	Versions	/	/
SecureCRT.exe	8.7.1	/	/

2.4. Operation state

Operation Frequency List: The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing, Only Full RU supported in 802. 11ax mode.

Operation Frequency List:

Band (MHz)	20MHz Bandwidth		40MHz Bandwidth	
	Channel	Frequency (MHz)	Channel	Frequency (MHz)
U-NII-1	36	5180	38	5190
	40	5200		
	44	5220	46	5230
	48	5240		
U-NII-3	149	5745	151	5755
	153	5765		
	157	5785	159	5795
	161	5805		
	165	5825		

Test channel is below:

Operating Band	Test Channel	20MHz		40MHz	
		Channel	Frequency (MHz)	Channel	Frequency (MHz)
U-NII-1	CH_L	36	5180	38	5190
	CH_M	40	5200	/	/
	CH_H	48	5240	46	5230
U-NII-3	CH_L	149	5745	151	5755
	CH_M	157	5785	/	/
	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)/ 802.11n(HT40)	HT-MCS0
802.11ac(VHT20)/ 802.11ac(VHT40) / 802.11ac(VHT80)	VHT-MCS0
802.11ax(HE20)/ 802.11ax(HE40)/ 802.11ax(HE80)	HE-MCS0

Test mode

For RF test items
The engineering test program was provided and enabled to make EUT continuous transmit.
For AC power line conducted emissions:
The EUT was set to connect with the WLAN AP under large package sizes transmission.

For Radiated spurious emissions test item:
The engineering test program was provided and enabled to make EUT continuous transmit. The EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data Recorded in the report.

2.5. Measurement Instruments List

RF Test System - SRD					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY51280803	Apr. 13, 2025
2	Wideband Radio Communication Tester	R&S	CMW500	157763	Apr. 13, 2025
3	MXG Vector Signal Generator	Agilent	N5182A	101795	Apr. 13, 2025
4	EXG Analog Signal Generator	Agilent	N5181A	MY47421151	Apr. 13, 2025
5	RF Control Unit	Techy	TR1029-1	20220428C009	Apr. 14, 2025
6	RF Sensor Unit	Techy	TR1029-2	/	/
7	High and low temperature test chamber	Asprey	LX-225L	2020091401	Apr. 13, 2025
8	SRD Test Software	TACHOY	RTS	/	/
9	2G/3G/4G Test Software	TST	TST-PASS	2023.11.24_17.14.16	/

Radiated emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	EMI spectrum receiver	R&S	ESR7	102543	Apr. 13, 2025
2	9*6*6 anechoic chamber	Mao Rui	9*6*6	/	Apr. 13, 2025
3	Spectrum analyzer	R&S	FSV40-N	101795	Apr. 14, 2025
4	Preamplifier	Agilent	8449B	3008A00551	Apr. 13, 2025
5	Preamplifier	HP	8447D	1616A02061	Apr. 13, 2025
6	Horn Antenna	A. H. System, Inc	SAS-571	915	Apr. 18, 2025
7	Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	01318	Apr. 18, 2025
8	Test Software	SKET	EMC-I	/	/
9	Wideband Radio Communication Tester	R&S	CMW500	157763	Apr. 13, 2025

Conducted emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	LISN	R&S	ENV216	101291	Apr. 13, 2025
2	LISN	R&S	ESH3-Z5	894981/024	Apr. 13, 2025
3	EMI Test Receiver	R&S	ESR7	102543	Apr. 13, 2025
4	10dB Pulse Limiter	SCHWARZBECK	/	9618	Apr. 13, 2025
5	Test Software	SKET	EMC-I	/	/
6	Wideband Radio Communication Tester	R&S	CMW500	157763	Apr. 13, 2025

Note: 1. The Cal. Interval was one year.
2. The cable loss has calculated in test result which connection between each test instruments.

3. TEST ITEM AND RESULTS

3.1. Conducted Emission

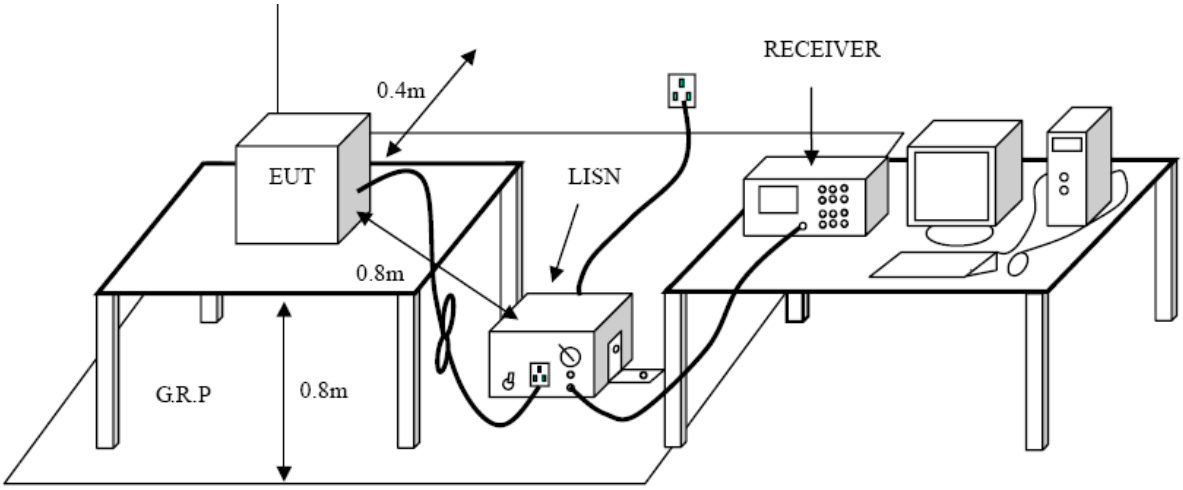
Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.207/ RSS – Gen 8.8:

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

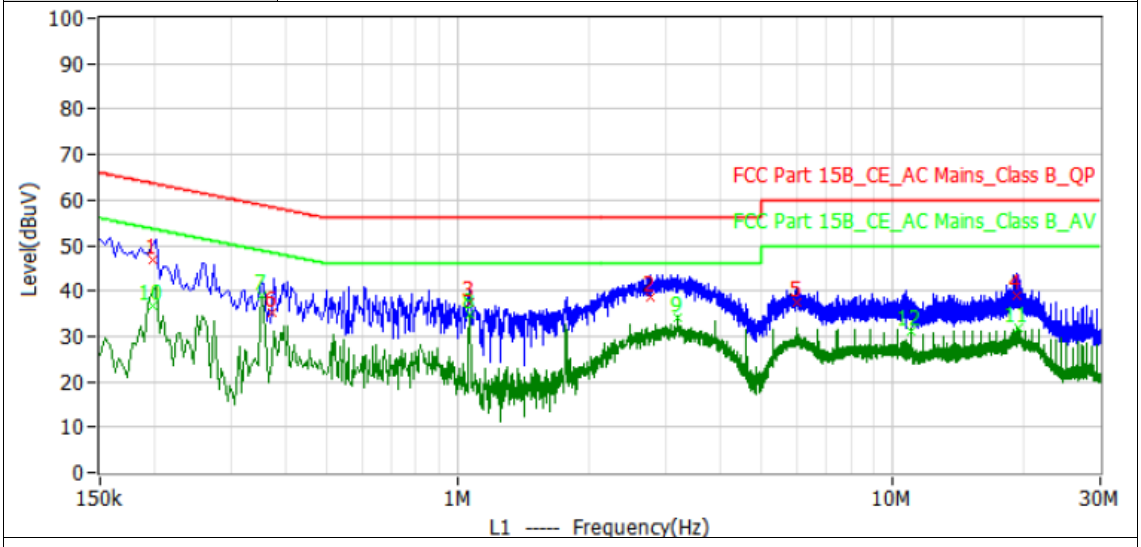
1. The EUT was setup according to ANSI C63.10:2013 requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from 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.
   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)
4. 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.
5. 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.
6. Conducted Emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
7. During the above scans, the emissions were maximized by cable manipulation.

Test Mode

Please refer to the clause 2.4.

Test Results

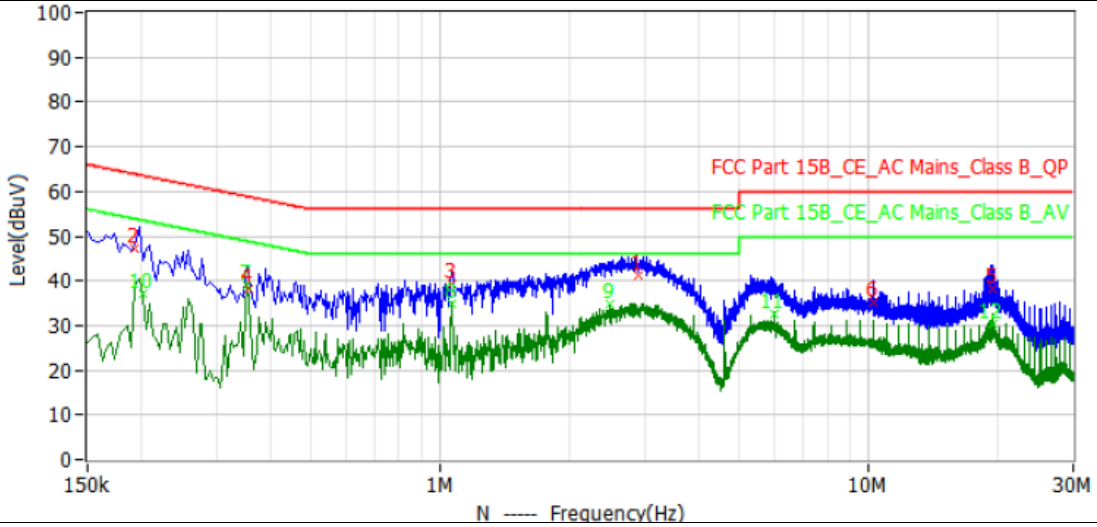
Test Voltage:	AC 120V/60Hz
Test Mode:	802.11a Mode 5180MHz (U-NII-1)
Terminal:	Line



No.	Frequency	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Delta dB	Detector	Polar
1	198.000kHz	37.22	9.70	46.92	63.69	-16.77	QP	L1
2	2.758MHz	28.72	10.00	38.72	56.00	-17.28	QP	L1
3	1.062MHz	27.40	9.90	37.30	56.00	-18.70	QP	L1
4	19.350MHz	28.75	10.20	38.95	60.00	-21.05	QP	L1
5	6.022MHz	27.53	10.10	37.63	60.00	-22.37	QP	L1
6	374.000kHz	25.29	9.80	35.09	58.41	-23.32	QP	L1
7	354.000kHz	29.29	9.80	39.09	48.87	-9.78	AV	L1
8	1.062MHz	25.10	9.90	35.00	46.00	-11.00	AV	L1
9	3.190MHz	23.95	10.00	33.95	46.00	-12.05	AV	L1
10	198.000kHz	26.82	9.70	36.52	53.69	-17.17	AV	L1
11	19.494MHz	21.49	10.20	31.69	50.00	-18.31	AV	L1
12	10.982MHz	20.81	10.30	31.11	50.00	-18.89	AV	L1

Emission Level= Read Level+ Correct Factor

Test Voltage:	AC 120V/60Hz
Test Mode:	802.11a Mode 5180MHz (U-NII-1)
Terminal:	Neutral



No.	Frequency	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Delta dB	Detector	Polar
1	2.886MHz	31.52	9.60	41.12	56.00	-14.88	QP	N
2	194.000kHz	37.84	9.50	47.34	63.86	-16.52	QP	N
3	1.062MHz	29.71	9.60	39.31	56.00	-16.69	QP	N
4	358.000kHz	28.44	9.60	38.04	58.77	-20.74	QP	N
5	19.466MHz	28.47	9.60	38.07	60.00	-21.93	QP	N
6	10.278MHz	25.59	9.70	35.29	60.00	-24.71	QP	N
7	354.000kHz	29.42	9.60	39.02	48.87	-9.85	AV	N
8	1.062MHz	25.30	9.60	34.90	46.00	-11.10	AV	N
9	2.482MHz	25.13	9.60	34.73	46.00	-11.27	AV	N
10	202.000kHz	27.69	9.50	37.19	53.53	-16.34	AV	N
11	6.022MHz	23.09	9.60	32.69	50.00	-17.31	AV	N
12	19.494MHz	20.71	9.60	30.31	50.00	-19.69	AV	N

Emission Level= Read Level+ Correct Factor

3.2. Radiated Emission

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.209/ RSS-Gen 8.9

Frequency	Limit (dBuV/m @3m)	Value
30 MHz ~ 88 MHz	40.00	Quasi-peak
88 MHz ~ 216 MHz	43.50	Quasi-peak
216 MHz ~ 960 MHz	46.00	Quasi-peak
960 MHz ~ 1 GHz	54.00	Quasi-peak
Above 1 GHz	54.00	Average
	74.00	Peak

Note:

(1) The tighter limit applies at the band edges.

(2) Emission Level (dBuV/m)= 20log Emission Level (uV/m).

Limits of unwanted emission out of the restricted bands

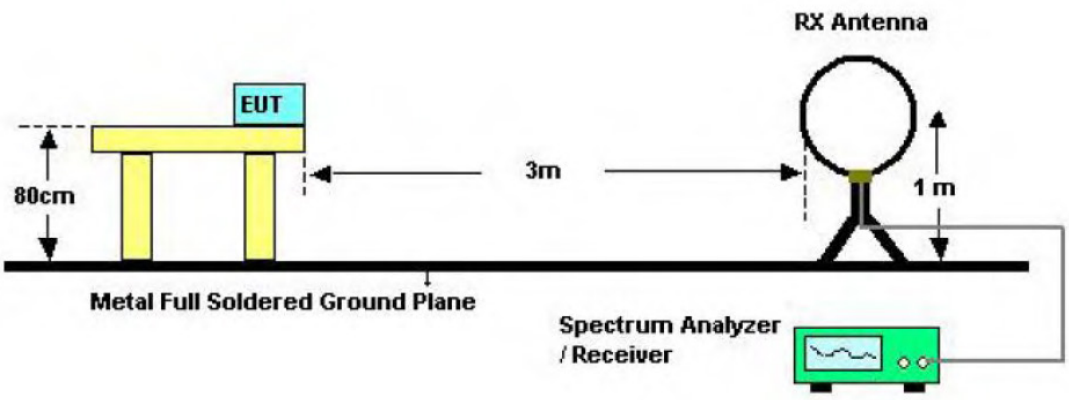
FCC CFR Title 47 Part 15 Subpart C Section 15.407(b)/ RSS-247 6.2.1.2 & RSS-247 6.2.4.2

Frequency (MHz)	EIRP Limits (dBm)	Equivalent Field Strength at 3m (dBuV/m)
5150~5250	-27	68.2
5250~5350	-27	68.2
5470~5725	-27	68.2
5725~5825	-27(Note 2)	68.2
	10(Note 2)	105.2
	15.6(Note 2)	110.8
	27(Note 2)	122.2

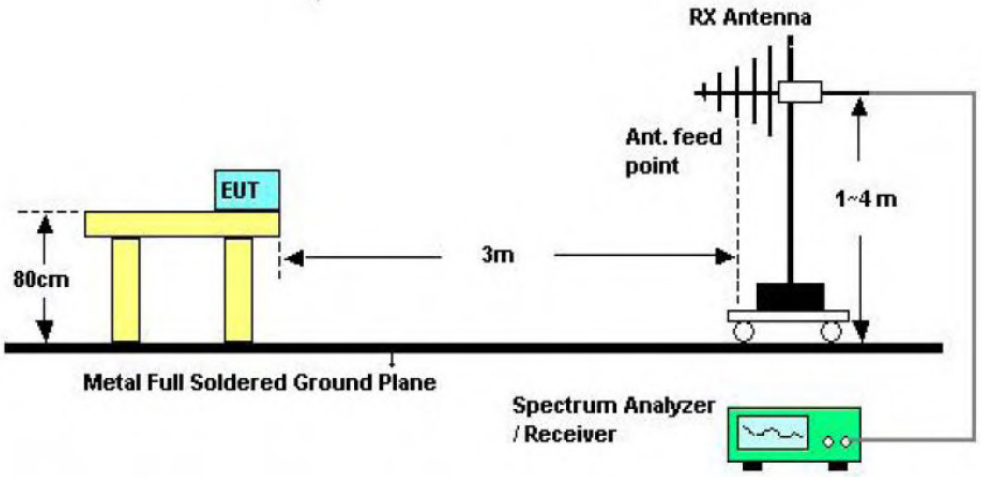
Note: 1. The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength: E= $\frac{1000000\sqrt{30P}}{3}$ uV/m, where P is the eirp (Watts)

2. According to FCC 16-24, All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27dBm/MHz at the band edge.

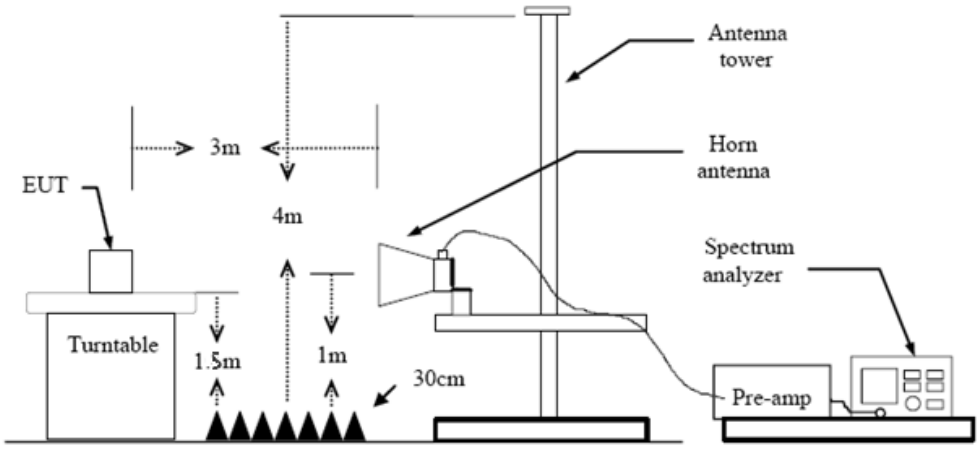
Test Configuration



Below 30MHz Test Setup



Below 1000MHz Test Setup



Above 1GHz Test Setup

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 10th harmonic:
   RBW=1MHz, VBW=3MHz Peak detector for Peak value.
   RBW=1MHz, VBW≥1/T Peak detector for Average value.
   Note 1: For the 1/T& Duty Cycle please refer to clause Duty Cycle.

Test Mode

Please refer to the clause 2.4.

Test Result

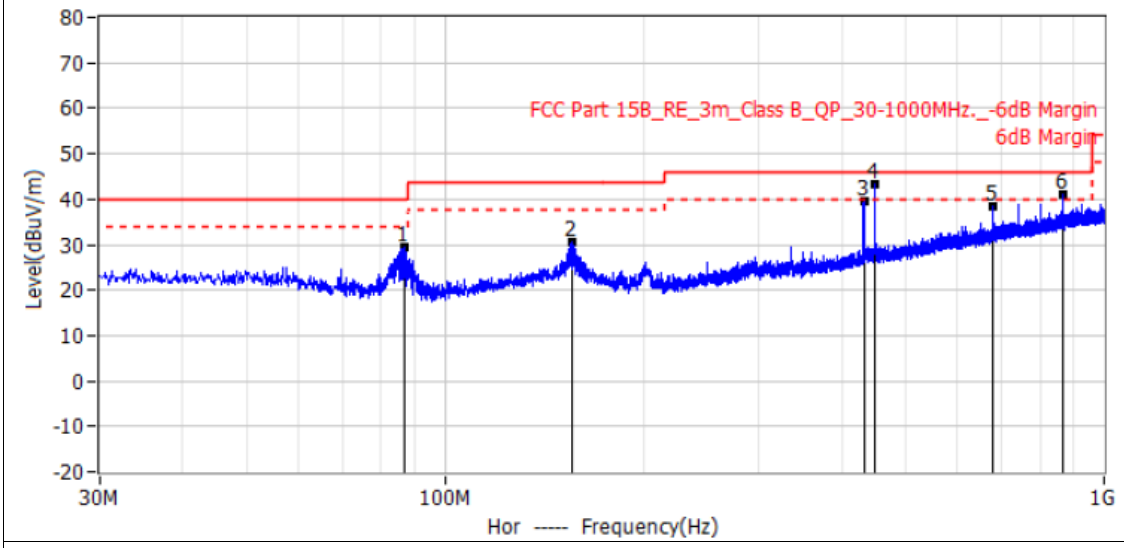
9 KHz~30 MHz

From 9 KHz to 30 MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

30MHz-1GHz

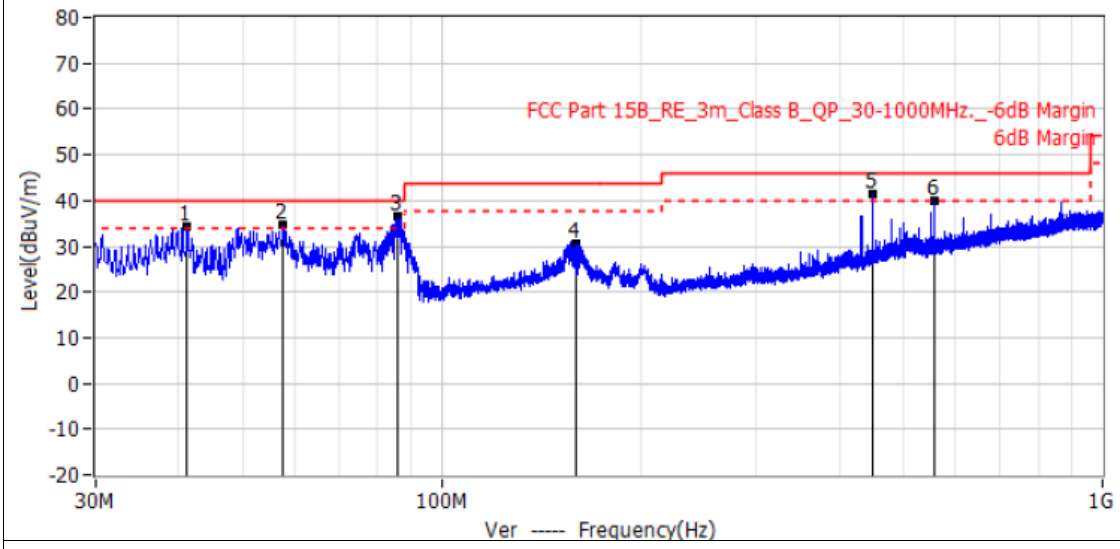
Ant. Pol.:	Horizontal
Test Mode:	802.11a Mode 5180MHz (U-NII-1)
Remark:	Only worse case is reported



No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Delta dB	Detector	Polar	Height cm	Angle deg
1*	86.624MHz	18.2	11.4	29.6	40.0	-10.4	QP	Hor	100.0	0.0
2*	156.100MHz	14.5	16.0	30.5	43.5	-13.0	QP	Hor	100.0	222.0
3*	432.065MHz	20.8	18.8	39.6	46.0	-6.4	QP	Hor	100.0	0.0
4*	450.010MHz	24.2	19.1	42.3	46.0	-3.7	QP	Hor	100.0	0.0
5*	678.930MHz	15.0	23.6	38.6	46.0	-7.4	QP	Hor	100.0	130.0
6*	864.079MHz	14.9	26.2	41.1	46.0	-4.9	QP	Hor	100.0	211.0

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Ant. Pol.:	Vertical
Test Mode:	802.11a Mode 5180MHz (U-NII-1)
Remark:	Only worse case is reported



No.	Frequency	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Delta dB	Detector	Polar	Height cm	Angle deg
1*	41.276MHz	19.2	15.0	34.2	40.0	-5.8	QP	Ver	100.0	320.0
2*	57.645MHz	20.6	14.0	34.6	40.0	-5.4	QP	Ver	100.0	304.0
3*	85.896MHz	25.1	11.4	36.5	40.0	-3.5	QP	Ver	100.0	214.0
4*	159.374MHz	14.5	16.1	30.6	43.5	-12.9	QP	Ver	100.0	300.0
5*	450.010MHz	22.4	19.1	41.5	46.0	-4.5	QP	Ver	100.0	176.0
6*	555.498MHz	18.4	21.4	39.8	46.0	-6.2	QP	Ver	100.0	144.0

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

Above 1GHz

Remark: Pre-scan all modulation mode and all bandwidth, and found the 802.11a mode which were the worst case, So only show the test data for worst case.

802.11a Mode 5180MHz							
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Polarization	Detector
10360	45.36	11.47	56.83	74	-17.17	Horizontal	Peak
10360	43.62	11.47	55.09	74	-18.91	Vertical	Peak
10360	33.32	11.47	44.79	54	-9.21	Horizontal	Average
10360	30.2	11.47	41.67	54	-12.33	Vertical	Average
Remarks: 1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor 2.Margin value = Level -Limit value 3.No report for the emission which more than 10 dB below the prescribed limit							

802.11a Mode 5200MHz							
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Polarization	Detector
10400	46.56	11.50	58.06	74	-15.94	Horizontal	Peak
10400	42.23	11.50	53.73	74	-20.27	Vertical	Peak
10400	34.44	11.50	45.94	54	-8.06	Horizontal	Average
10400	31.52	11.50	43.02	54	-10.98	Vertical	Average
Remarks: 1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor 2.Margin value = Level -Limit value 3.No report for the emission which more than 10 dB below the prescribed limit							

802.11a Mode 5240MHz							
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Polarization	Detector
10480	47.26	11.56	58.82	74	-15.18	Horizontal	Peak
10480	44.22	11.56	55.78	74	-18.22	Vertical	Peak
10480	35.25	11.56	46.81	54	-7.19	Horizontal	Average
10480	33.14	11.56	44.7	54	-9.3	Vertical	Average
Remarks: 1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor 2.Margin value = Level -Limit value 3.No report for the emission which more than 10 dB below the prescribed limit							

802.11a Mode 5745MHz							
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Polarization	Detector
11490	46.62	11.83	58.45	74	-15.55	Horizontal	Peak
11490	43.55	11.83	55.38	74	-18.62	Vertical	Peak
11490	34.15	11.83	45.98	54	-8.02	Horizontal	Average
11490	32.00	11.83	43.83	54	-10.17	Vertical	Average
Remarks: 1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor 2.Margin value = Level -Limit value 3.No report for the emission which more than 10 dB below the prescribed limit							

802.11a Mode 5785MHz							
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Polarization	Detector
11570	46.15	11.87	58.02	74	-15.98	Horizontal	Peak
11570	43.25	11.87	55.12	74	-18.88	Vertical	Peak
11570	34.41	11.87	46.28	54	-7.72	Horizontal	Average
11570	33.51	11.87	45.38	54	-8.62	Vertical	Average
Remarks: 1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor 2.Margin value = Level -Limit value 3.No report for the emission which more than 10 dB below the prescribed limit							

802.11a Mode 5825MHz							
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Polarization	Detector
11650	46.14	11.93	58.07	74	-15.93	Horizontal	Peak
11650	44.36	11.93	56.29	74	-17.71	Vertical	Peak
11650	34.15	11.93	46.08	54	-7.92	Horizontal	Average
11650	32.11	11.93	44.04	54	-9.96	Vertical	Average
Remarks: 1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor 2.Margin value = Level -Limit value 3.No report for the emission which more than 10 dB below the prescribed limit							

3.3. Radiated Emissions Restricted Band

Limit

Limits of unwanted emission out of the restricted bands

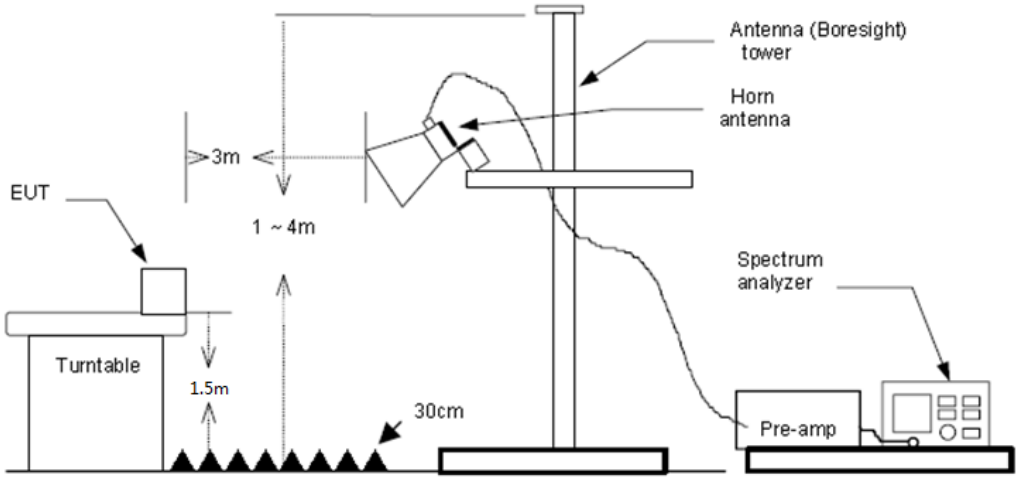
FCC CFR Title 47 Part 15 Subpart C Section 15.407(b)/ RSS-247 6.2.1.2 & RSS-247 6.2.4.2

Frequency (MHz)	EIRP Limits (dBm)	Equivalent Field Strength at 3m (dBuV/m)
5150~5250	-27	68.2
5250~5350	-27	68.2
5470~5725	-27	68.2
5725~5825	-27(Note 2)	68.2
	10(Note 2)	105.2
	15.6(Note 2)	110.8
	27(Note 2)	122.2

Note: 1. The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength: $E=\frac{1000000\sqrt{30P}}{3}$ uV/m, where P is the eirp (Watts)

2. According to FCC 16-24, All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27dBm/MHz at the band edge.

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 was positioned 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 the maximum 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 see note 1 with Peak Detector for Average Value.

Note 1: For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to appendix clause: Duty Cycle

Test Mode

Please refer to the clause 2.4.

Test Results

Remark: Pre-scan all modulation mode and all bandwidth, and found the 802.11a mode which were the worst case, So only show the test data for worst case.

802.11a Mode 5180MHz

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Polarization	Detector
5150	49.25	4.4	53.65	74	-20.35	Horizontal	Peak
5150	47.11	4.4	51.51	74	-22.49	Vertical	Peak
5150	35.15	4.4	39.55	54	-14.45	Horizontal	Average
5150	33.15	4.4	37.55	54	-16.45	Vertical	Average

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

802.11a Mode 5240MHz

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Polarization	Detector
5350	48.66	4.4	53.06	74	-20.94	Horizontal	Peak
5350	46.25	4.4	50.65	74	-23.35	Vertical	Peak
5350	36.41	4.4	40.81	54	-13.19	Horizontal	Average
5350	33.22	4.4	37.62	54	-16.38	Vertical	Average

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

802.11a Mode 5745MHz

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Polarization	Detector
5725	51.25	5.1	56.35	122.2	-65.85	Horizontal	Peak
5725	49.61	5.1	54.71	122.2	-67.49	Vertical	Peak

Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

802.11a Mode 5825MHz

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Polarization	Detector
5850	52.33	5.5	57.83	122.2	-64.37	Horizontal	Peak
5850	49.52	5.5	55.02	122.2	-67.18	Vertical	Peak

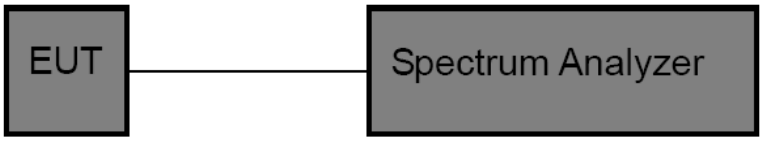
Remarks:
1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
2.Margin value = Level -Limit value

3.4. Bandwidth Test

Limit

FCC Part 15 Subpart C(15.407)/ RSS-247		
Test Item	**Limit**	**Frequency Range (MHz)**
26 Bandwidth	N/A	5150~5250
		5250~5350
		5500~5700
6 dB Bandwidth	>500kHz	5725~5850

Test Configuration



Test Procedure

Please refer to According to KDB789033 D02, for the measurement methods.

The setting of the spectrum analyser as below:

26dB Bandwidth Test	
Spectrum Parameters	**Setting**
Attenuation	Auto
Span	>26 dB Bandwidth
RBW	Approximately 1% of the emission bandwidth
VBW	VBW>RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

6dB Bandwidth Test	
Spectrum Parameters	**Setting**
Attenuation	Auto
Span	>6 dB Bandwidth
RBW	100 kHz
VBW	VBW>=3*RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto
99% Occupied Bandwidth Test	
Spectrum Parameters	**Setting**
Attenuation	Auto
RBW	1% to 5% of the OBW
VBW	≥ 3RBW
Detector	Peak
Trace	Max Hold

Note: The EUT was set to continuously transmitting in each mode and low, Middle and high channel for the test.

Test Mode

Please refer to the clause 2.4.

Test Results

Please see the Appendix.

3.5. Output Power Test

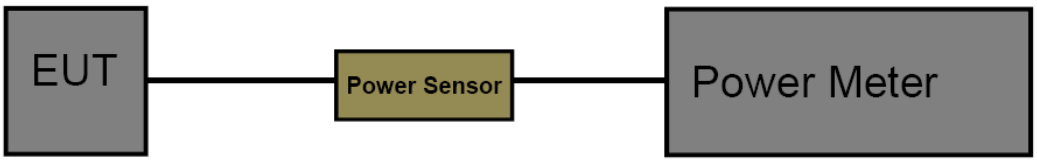
Limit

FCC Part 15 Subpart E (15.407)		
Test Item	**Limit**	**Frequency Range(MHz)**
Conducted Output Power	Fixed: 1 Watt (30dBm) Mobile and Portable: 250mW (24dBm)	5150~5250
	250mW (24dBm)	5250~5350
	250mW (24dBm)	5500~5700
	1 Watt (30dBm)	5725~5850

IC Power&PSD Limit

Frequency	Type of devices	Maximum Conducted Output Power	EIRP Output Power	Conducted Power Spectral Density	EIRP Power Spectral Density
5150MHz-5250MHz	in vehicles		30mW or 1.76 + 10 × log10B dBm, whichever is less (B=99% OBW in MHz)		
	Other Devices		200mW or 10 + 10 × log10B dBm, whichever is less (B=99% OBW in MHz)		10dBm/MHz
5250MHz-5350MHz	in vehicles		30mW or 1.76 + 10 × log10B dBm, whichever is less (B=99% OBW in MHz)		
	Other Devices	250mW or 11 + 10 × log10B dBm, whichever is less (B=99% OBW in MHz)	1W or 17 + 10 ×log10B dBm, whichever is less (B=99% OBW in MHz)	11dBm/Mhz	
5470MHz-5600MHz 5650MHz-5725MHz	ALL Devices	250mW or 11 + 10 × log10B dBm, whichever is less (B=99% OBW in MHz)	1W or 17 + 10 ×log10B dBm, whichever is less (B=99% OBW in MHz)	11dBm/Mhz	
5725MHz-5850MHz	ALL Devices	1W		30dBm/500KHz	

Test Configuration



Test Procedure

The measurement is according to section 3 of KDB 789033 D02 General UNII Test Procedures New Rules V02r01.

Test Mode

Please refer to the clause 2.4.

Test Result

Please see the Appendix.

3.6. Power Spectral Density Test

Limit

FCC Part 15 Subpart E(15.407)/ RSS-247

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 5.25~5.35GHz band:

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 5.47~5.725GHz band:

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)

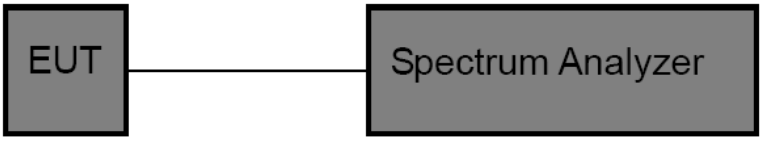
  The peak power spectral density (PSD) shall not exceed the lesser of 30dBm/500kHz.

Note: G_{Tx}: EUT Antenna gain.

IC Power&PSD Limit

Frequency	Type of devices	Maximum Conducted Output Power	EIRP Output Power	Conducted Power Spectral Density	EIRP Power Spectral Density
5150MHz-5250MHz	in vehicles		30mW or 1.76 + 10 × log10B dBm, whichever is less (B=99% OBW in MHz)		
	Other Devices		200mW or 10 + 10 × log10B dBm, whichever is less (B=99% OBW in MHz)		10dBm/MHz
5250MHz-5350MHz	in vehicles		30mW or 1.76 + 10 × log10B dBm, whichever is less (B=99% OBW in MHz)		
	Other Devices	250mW or 11 + 10 × log10B dBm, whichever is less (B=99% OBW in MHz)	1W or 17 + 10 ×log10B dBm, whichever is less (B=99% OBW in MHz)	11dBm/Mhz	
5470MHz-5600MHz 5650MHz-5725MHz	ALL Devices	250mW or 11 + 10 × log10B dBm, whichever is less (B=99% OBW in MHz)	1W or 17 + 10 ×log10B dBm, whichever is less (B=99% OBW in MHz)	11dBm/Mhz	
5725MHz-5850MHz	ALL Devices	1W		30dBm/500KHz	

Test Configuration



Test Procedure

The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement is according to KDB 789033 D02 General UNII Test Procedures New Rules V02r01.

(1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
(2) Set analyzer center frequency to transmitting frequency.
(3) Set the span to encompass the entire emissions bandwidth (EBW)(alternatively, the entire 99% OBW) of the signal.
(4) 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
(5) Set the VBW to: ≥ 3 RBW
(6) Detector: AVG
(7) Trace: Max Hold and View
(7) Sweep time: auto
(8) Trace average at least 100 traces in power averaging.
(9) User the peak marker function to determine the maximum amplitude level within the RBW. Apply correction to the result if different RBW is used.

NOTE: The EUT was set to continuously transmitting in each mode and low, Middle and high channel for the test.

Test Mode

Please refer to the clause 2.4.

Test Result

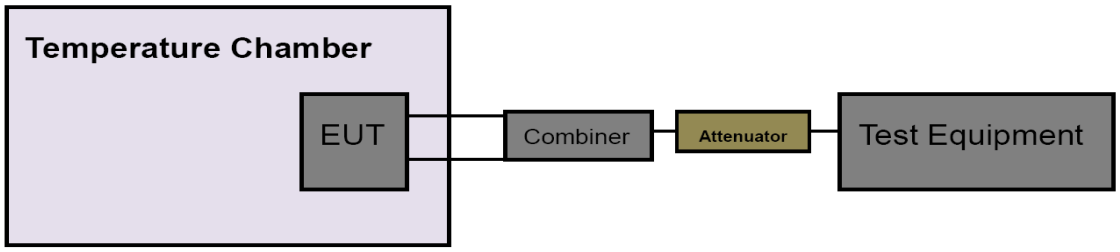
Please see the Appendix.

3.7. Frequency Stability Measurement

Limit

Within Operation Band

Test Configuration



Test Procedure

The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above.

(1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
(2) Set analyzer center frequency to transmitting frequency.
(3) Set the span to encompass the entire emissions bandwidth (EBW) of the signal.
(4) Set the RBW to: 10MHz, VBW=10MHz with peak detector and maxhold settings.
(5) The test extreme voltage is to change the primary supply voltage from 10.8V to 13.2V percent of the nominal value.
(6) Extreme temperature is -10℃~40℃

NOTE: The EUT was set to continuously transmitting in continuously un-modulation transmitting mode.

Test Mode

Please refer to the clause 2.4.

Test Result

Please see the Appendix.

3.8. 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 antenna 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.
FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i):
(i) Systems operating in the 2400~2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

Test Result
The directional gain of the antenna less than 6dBi, please refer to the EUT internal photographs antenna photo.

3.9. Dynamic Frequency Selection (DFS)

Requirement

Table 1: Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode	
	Master Device or Client with Radar Detection	Client Without Radar Detection
DFS Detection Threshold	Yes	Not required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required

Additional requirements for devices with multiple bandwidth modes	Master Device or Client with Radar Detection	Client Without Radar Detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required
Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.		

LIMIT

1. DFS Detection Thresholds

Table 3: DFS Detection Thresholds for Master Devices and Client Devices With Radar Detection

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP ≥ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm
Note 1: This is the level at the input of the receiver assuming a 0dBi receive antenna. Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.	

2. DFS Response Requirements

Table 4: DFS Response Requirement Values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.
Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required facilitating a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions. Note 3: During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.	

RADAR TEST WAVEFORMS

This section provides the parameters for required test waveforms, minimum percentage of successful detections, and the minimum number of trials that must be used for determining DFS conformance. Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

Table 5 Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a	$\text{Roundup}\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot10^6}{\text{PRI}_{\mu\text{sec}}}\right)\right\}$	60%	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A			
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120
Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					

A minimum of 30 unique waveforms are required for each of the Short Pulse Radar Types 2 through 4. If more than 30 waveforms are used for Short Pulse Radar Types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms. If more than 30 waveforms are used for Short Pulse Radar Type 1, then each additional waveform is generated with Test B and must also be unique and not repeated from the previous waveforms in Tests A or B.

For example if in Short Pulse Radar Type 1 Test B a PRI of 3066 μsec is selected, the number of pulses would be Round up $\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot10^6}{3066}\right)\right\}$ = Round up {17.2} = 18.

Table 5a - Pulse Repetition Intervals Values for Test A

Pulse Repetition Frequency Number	Pulse Repetition Frequency (Pulses Per Second)	Pulse Repetition Interval (Microseconds)
1	1930.5	518
2	1858.7	538
3	1792.1	558
4	1730.1	578
5	1672.2	598
6	1618.1	618
7	1567.4	638
8	1519.8	658
9	1474.9	678
10	1432.7	698
11	1392.8	718

12	1355	738
13	1319.3	758
14	1285.3	778
15	1253.1	798
16	1222.5	818
17	1193.3	838
18	1165.6	858
19	1139	878
20	1113.6	898
21	1089.3	918
22	1066.1	938
23	326.2	3066

Table 6 – Long Pulse Radar Test Waveform

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Number of Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

The parameters for this waveforms are randomly chosen. Thirty unique waveforms are required for the Long Pulse Radar Type waveforms. If more than 30 waveforms are used for the Long Pulse Radar Type wave forms, then each additional waveform must also be unique and not repeated from the previous waveforms.

Table 7 – Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Number of Trials
6	1	333	9	0.333	300	70%	30

For the Frequency Hopping Radar Type, the same Burst parameters are used for each wave form. The hopping sequence is different for each wave form and a 100-length segment is selected from the hopping sequence defined by the following algorithm:

The first frequency in a hopping sequence is selected randomly from the group of 475 integer frequencies from 5250–5724MHz.Next,the frequency that was just chosen is removed from the group and a frequency is randomly selected from the remaining 474 frequencies in the group. This process continues until all 475 frequencies are chosen for the set. For selection of a random frequency, the frequencies remaining within the group are always treated as equally likely.

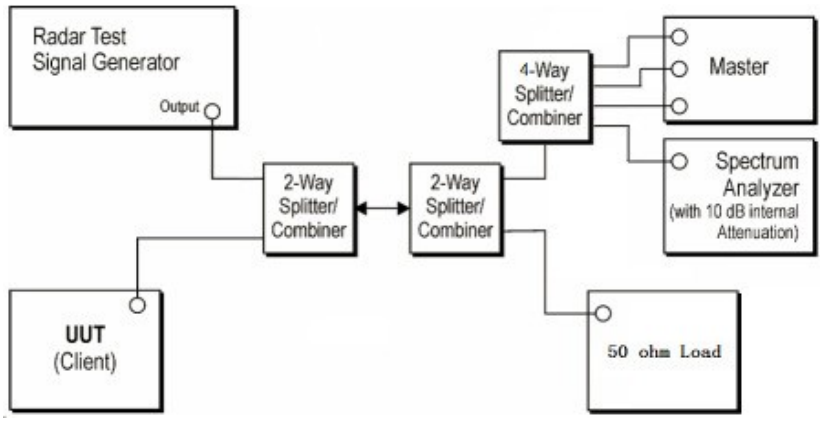
Calibration of Radar Waveform

Radar Waveform Calibration Procedure

1) A 50 ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to place of the master
2) The interference Radar Detection Threshold Level is -62dBm + 0dBi +1dB = -61dBm that had been taken into account the output power range and antenna gain.
3) The following equipment setup was used to calibrate the conducted radar waveform. A vector signal generator was utilized to establish the test signal level for radar type 0. During this process there were no transmissions by either the master or client device. The spectrum analyzer was switched to the zero spans (time domain) at the frequency of the radar waveform generator. Peak detection was used. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) were set to 3 MHz. The spectrum analyzer had offset -1.0dB to compensate RF cable loss 1.0dB.
4) The vector signal generator amplitude was set so that the power level measured at the spectrum

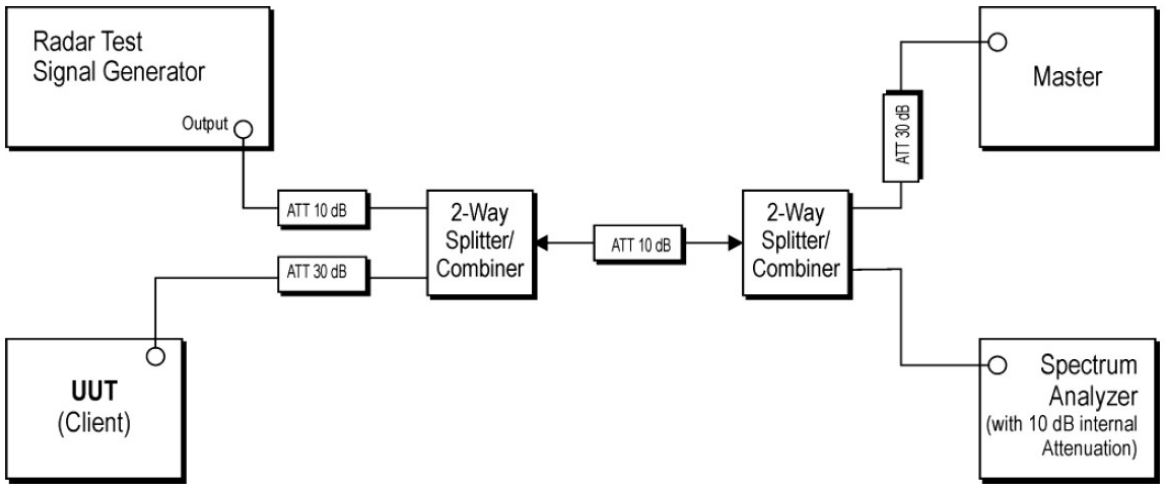
analyzer was - -62dBm + 0dBi +1dB = -61dBm. Capture the spectrum analyzer plots on short pulse radar waveform.

Conducted Calibration Setup



Test Configuration

Setup for Client with injection at the Master



Radar Waveform Calibration Result

N/A

Test Procedure

1. The radar pulse generator is setup to provide a pulse at frequency that the master and client are operating. A type 0 radar pulse with a 1us pulse width and a 1428us PRI is used for the testing.
2. The vector signal generator is adjusted to provide the radar burst (18 pulses) at the level of approximately -61dBm at the antenna port of the master device
3. A trigger is provided from the pulse generator to the DFS monitoring system in order to capture the traffic and the occurrence of the radar pulse.
4. EUT will associate with the master at channel. The file “iperf.exe” specified by the FCC is streamed from the PC 2 through the master and the client device to the PC 1 and played in full motion video using Media Player Classic Ver. 6.4.8.6 in order to properly load the network for the entire period of the test.
5. When radar burst with a level equal to the DFS Detection Threshold +1dB is generated on the operating channel of the U-NII device. At time T0 the radar waveform generator sends a burst of pulse of the radar waveform at Detection Threshold +1dB.
6. Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel Measure and record the transmissions from the UUT during the observation time (Channel Move Time). One 15 seconds plot is reported for the Short Pulse Radar Type 0. The plot for the Short Pulse Radar Types start at the end of the radar burst. The Channel Move Time will be calculated based on the zoom in 600ms plot of the Short Pulse Radar Type
7. Measurement of the aggregate duration of the Channel Closed Transmission Time method. With the spectrum analyzer set to zero span tuned to the center frequency of the EUT operating channel at the radar simulated frequency, peak detection, and max hold, the dwell time per bin is given by: Dwell (0.3ms) =S (12000ms) / B (4000); where Dwell is the dwell time per spectrum analyzer sampling bin, S is sweep time and B is the number of spectrum analyzer sampling bins. An upper bound of the aggregate duration of the intermittent control signals of Channel Closing Transmission Time is calculated by: C (ms)= N X Dwell (0.3ms); where C is the Closing Time, N is the number of spectrum analyzer sampling bins (intermittent control signals) showing a U-NII transmission and Dwell is the dwell time per bin.
8. Measurement the EUT for more than 30 minutes following the channel move time to verify that no transmission or beacons occur on this channel.

Test Mode

Please refer to the clause 2.4.

Test Results

☐ **Passed** ☒ **Not Applicable**

**************************THE END*************************