Audix Technology Corp.
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FCC 15.407 NII
5 GHz Test Report

for

Datalogic S.r.l.

Via S. Vitalino 13 Calderara di Reno Italy 40012

Product Name	**:**	**802.11ag/draft 802.11n WLAN PCI-E Minicard**
Model Name	**:**	**SDC-PE15N**
FCC ID	**:**	**U4G-RHINOIIWIN**

Prepared by: **:** **AUDIX Technology Corporation, EMC Department**

Testing Laboratory
1724

TESTING
NVLAP LAB CODE 200077-0

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Audix Technology Corp.
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TEST REPORT CERTIFICATION

Applicant	:	Datalogic S.r.l.
Manufacturer	:	SUMMIT DATA COMMUNICATIONS, INC.
EUT Description		
(1) Product	:	802.11ag/draft 802.11n WLAN PCI-E Minicard
(2) Model	:	SDC-PE15N
(3) Rating	:	DC 3.3V

Applicable Standards:

47 CFR FCC Part 15 Subpart E
ANSI C63.10:2013
KDB 789033 D02 General UNII Test Procedures New Rules v01r04

Audix Technology Corp. tested the equipment mentioned in accordance with the requirements set forth in the above standards. Test results indicate that the equipment tested is capable of demonstrating compliance with the requirements as documented within this report.
Audix Technology Corp. does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens and samples.

Date of Report: 2017. 10. 30

Reviewed by: (Annie Yu/Administrator)

Approved by: (Ben Cheng/Manager)

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1. REVISION RECORD OF TEST REPORT

Edition No	Issued Data	Revision Summary	Report Number
0	2017. 10. 30	Original Report	EM-F170620

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2. SUMMARY OF TEST RESULTS

Rule	Description	Results
15.207	Conducted Emission	**PASS**
15.205	Radiated Band Edge and Radiated Spurious Emission	**PASS**
15.407(a)(5)/15.407(e)	Emission Bandwidth Measurement	**PASS**
15.407(a)	Maximum Output	**PASS**
15.407(b)	Conducted Band Edges and Conducted Spurious Emission	**PASS**
15.407(a)	Power Spectral Density	**PASS**
15.203	Antenna Requirement	**Compliance**
15.407	Frequency Stability	**PASS**

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3. GENERAL INFORMATION

3.1. Description of Application

Applicant	Datalogic S.r.l. Via S. Vitalino 13 Calderara di Reno taly 40012
Manufacturer	SUMMIT DATA COMMUNICATIONS, INC. 526 South Main Street Suite 805 Akron OH 44311 United States Of America
Product	802.11ag/draft 802.11n WLAN PCI-E Minicard
Model	SDC-PE15N

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3.2. Description of EUT

<table>
<tr><td>Test Model</td><td>SDC-PE15N</td></tr>
<tr><td>Serial Number</td><td>N/A</td></tr>
<tr><td>Power Rating</td><td>DC 3.3V</td></tr>
<tr><td>RF Features</td><td>802.11a/b/g/n</td></tr>
<tr><td>Transmit Type</td><td>
<table>
<tr><th colspan="2">2.4 GHz with PCB antenna</th></tr>
<tr><td>802.11b</td><td>1T1R</td></tr>
<tr><td>802.11g</td><td>1T1R</td></tr>
<tr><td>802.11n-HT20</td><td>2T2R</td></tr>
<tr><td>802.11n-HT40</td><td>2T2R</td></tr>
</table>
<table>
<tr><th colspan="2">2.4 GHz with omni-s antenna</th></tr>
<tr><td>802.11b</td><td>1T1R</td></tr>
<tr><td>802.11g</td><td>1T1R</td></tr>
<tr><td>802.11n-HT20</td><td>1T1R</td></tr>
<tr><td>802.11n-HT40</td><td>1T1R</td></tr>
</table>
<table>
<tr><th colspan="2">UNII Bands with PCB antenna</th></tr>
<tr><td>802.11a</td><td>1T1R</td></tr>
<tr><td>802.11n-HT20</td><td>2T2R</td></tr>
<tr><td>802.11n-HT40</td><td>2T2R</td></tr>
</table>
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<tr><td>802.11a</td><td>1T1R</td></tr>
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<tr><td>802.11n-HT40</td><td>1T1R</td></tr>
</table>
</td></tr>
<tr><td>Device Category</td><td>☐Outdoor Access Point
☐Fixed point-to-point Access Point
☐Indoor Access Point
■Mobile and Portable client device</td></tr>
<tr><td>Sample Status</td><td>Production</td></tr>
<tr><td>Date of Receipt</td><td>2017. 08. 17</td></tr>
<tr><td>Date of Test</td><td>2017. 09. 04 ~ 10. 30</td></tr>
<tr><td>I/O Ports List</td><td>N/A</td></tr>
<tr><td>Accessories Supplied</td><td>N/A</td></tr>
</table>

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3.3. Antenna Information

2.4G Antenna					
No.	**Antenna Part Number**	**Manufacture**	**Antenna Type**	**Frequency (MHz)**	**Max Gain (dBi)**
1	1399.99.0124 (Tx1 Antenna)	HUBER+SUHNER	PCB	2400 to 2500	1
2	1399.99.0124 (Tx2 Antenna)		PCB	2400 to 2500	1
3	1399.17.0106	HUBER+SUHNER	Omni-S	2400 to 2500	6
				2500 to 2700	6

5G Antenna					
No.	**Antenna Part Number**	**Manufacture**	**Antenna Type**	**Frequency (MHz)**	**Max Gain (dBi)**
1	1399.99.0124 (Tx1 Antenna)	HUBER+SUHNER	PCB	5150 to 5875	1
2	1399.99.0124 (Tx2 Antenna)		PCB	5150 to 5875	1
3	1399.17.0106	HUBER+SUHNER	Omni-S	4900 to 5470	8
				5470 to 5935	8

Note: The two type antennas can't simultaneous use. They will be setup done by software before market. The output power depends on antenna type accordingly.

3.4. EUT Specifications Assessed in Current Report

Mode	UNII Band	Fundamental Range (MHz)	Channel Number
802.11a	I	5180-5240	4
	II-2A	5260-5320	4
	II-2C	5500-5700	11
	III	5745-5825	5
802.11n-HT20	I	5180-5240	4
	II-2A	5260-5320	4
	II-2C	5500-5700	11
	III	5745-5825	5
802.11n-HT40	I	5190-5230	2
	II-2A	5270-5310	2
	II-2C	5510-5670	5
	III	5755-5795	2
Remark: UNII Band II (DFS Function, Slave/no In service monitor, no Ad-Hoc mode)			

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Mode	Modulation	Data Rate (Mbps)
802.11a	OFDM (BPSK/QPSK/16QAM/64QAM)	Up to 54
802.11n-HT20	OFDM (BPSK/QPSK/16QAM/64QAM)	Up to 144.4
802.11n-HT40		Up to 300

Channel List					
802.11a/802.11n-HT20					
UNII Band	Channel Number	Frequency (MHz)	UNII Band	Channel Number	Frequency (MHz)
I	36	5180	II-2C	120	5600
	40	5200		124	5620
	44	5220		128	5640
	48	5240		132	5660
II-2A	52	5260		136	5680
	56	5280		140	5700
	60	5300	III	149	5745
	64	5320		153	5765
II-2C	100	5500		157	5785
	104	5520		161	5805
	108	5540		165	5825
	112	5560			
	116	5580			

Channel List					
802.11n-HT40					
UNII Band	Channel Number	Frequency (MHz)	UNII Band	Channel Number	Frequency (MHz)
I	38	5190	II-2C	118	5590
	46	5230		126	5630
II-2A	54	5270		134	5670
	62	5310	III	151	5755
II-2C	102	5510		159	5795
	110	5550			

Note Test modes are presented at section 3.7.

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3.5. Description of Key Components

None

3.6. Data Rate Relative to Output Power

802.11a			
Channel	Modulation	Date Rate	Power (dBm)
36	BPSK	6	5.67
36	QPSK	9	5.62
36	QPSK	12	5.53
36	16-QAM	18	5.25
36	16-QAM	24	4.98
36	64-QAM	36	4.62
36	64-QAM	48	4.24
36	64-QAM	54	3.98

802.11n-HT20 (with PCB antenna)				802.11n-HT20 (with omni-s antenna)			
Channel	Modulation	Date Rate	Power (dBm)	Channel	Modulation	Date Rate	Power (dBm)
36	BPSK	6	5.66	36	BPSK	MCS0	6.01
36	QPSK	9	5.28	36	QPSK	MCS1	5.75
36	QPSK	12	4.82	36	QPSK	MCS2	5.56
36	16-QAM	18	4.57	36	16-QAM	MCS3	5.34
36	16-QAM	24	3.98	36	16-QAM	MCS4	4.97
36	64-QAM	36	3.80	36	64-QAM	MCS5	4.59
36	64-QAM	48	3.48	36	64-QAM	MCS6	4.42
36	64-QAM	54	3.43	36	64-QAM	MCS7	4.38

802.11n-HT40 (with PCB antenna)				802.11n-HT40 (with omni-s antenna)			
Channel	Modulation	Date Rate	Power (dBm)	Channel	Modulation	Date Rate	Power (dBm)
38	BPSK	MCS8	7.36	38	BPSK	MCS0	7.89
38	QPSK	MCS9	6.45	38	QPSK	MCS1	7.25
38	QPSK	MCS10	6.01	38	QPSK	MCS2	6.93
38	16-QAM	MCS11	5.51	38	16-QAM	MCS3	6.55
38	16-QAM	MCS12	5.13	38	16-QAM	MCS4	5.97
38	64-QAM	MCS13	4.61	38	64-QAM	MCS5	5.59
38	64-QAM	MCS14	4.48	38	64-QAM	MCS6	5.50
38	64-QAM	MCS15	4.32	38	64-QAM	MCS7	5.24

Note: Above results are assessed in average power.

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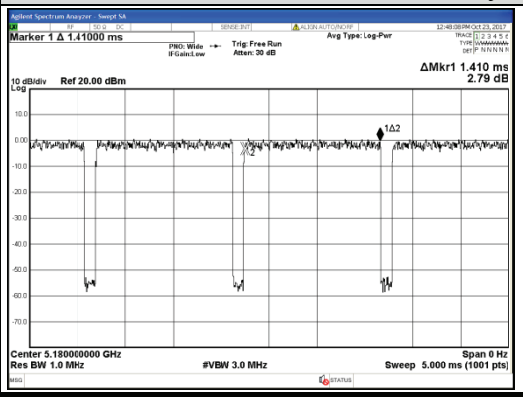
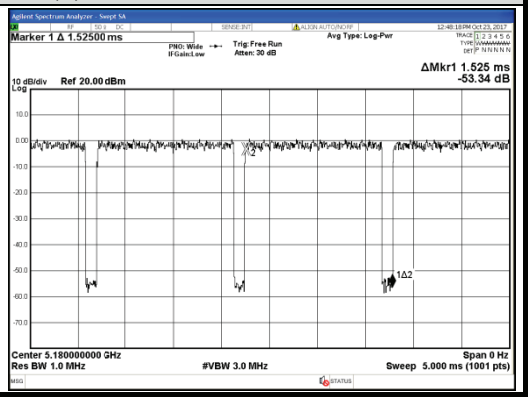
3.7. Test Configuration

Mode	Duty Cycle (x)	T (ms)	Duty Cycle Factor (dB)
802.11a	0.93	1.41	0.33

Mode	Duty Cycle (x)		T (ms)		Duty Cycle Factor (dB)	
	PCB antenna	Omni-s antenna	PCB antenna	Omni-s antenna	PCB antenna	Omni-s antenna
802.11n-HT20	0.92	0.92	1.325	1.325	0.36	0.36
802.11n-HT40	0.85	0.85	0.660	0.660	0.71	0.71

Note: When duty cycle is less than 98% (0.98) that duty cycle factor 10log(1/x) is needed to add in conducted test items measured in average detector.

Mode	Duty Cycle (x)
802.11a	 

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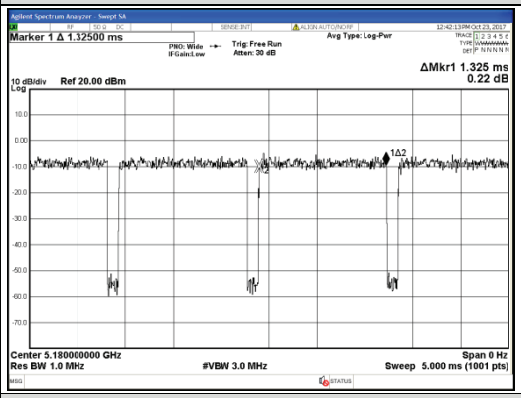
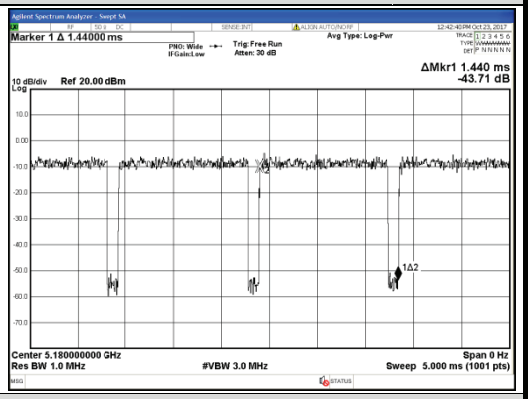
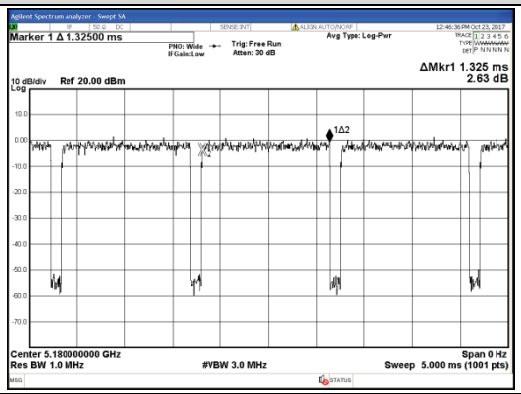
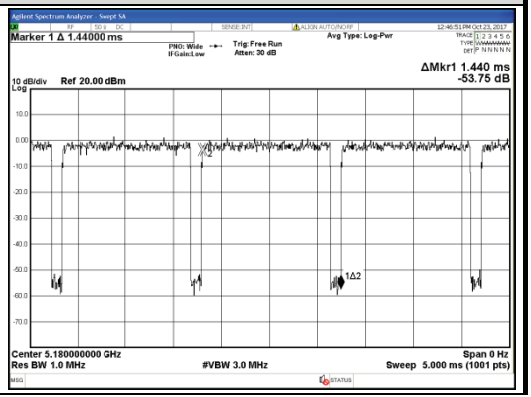
Mode	Duty Cycle (x)
	PCB antenna
802.11n-HT20	 
	Omni-s antenna
	 

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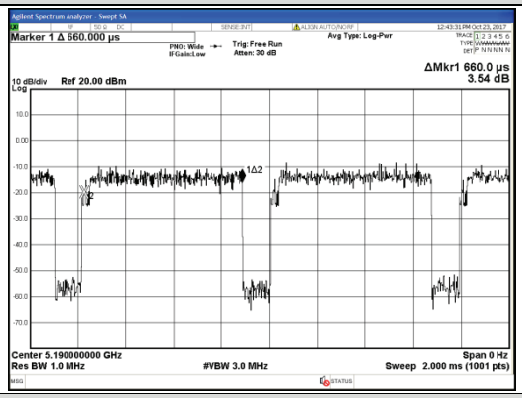
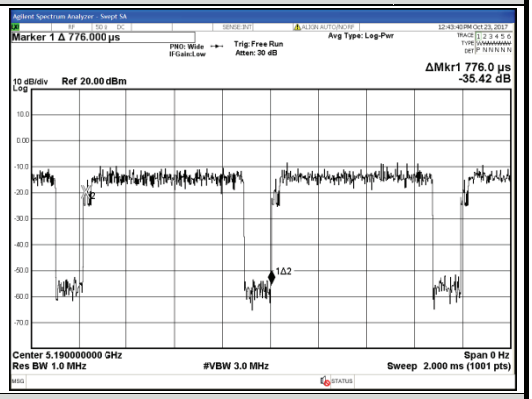
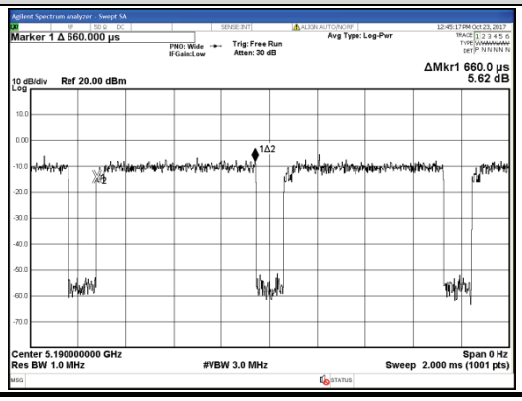
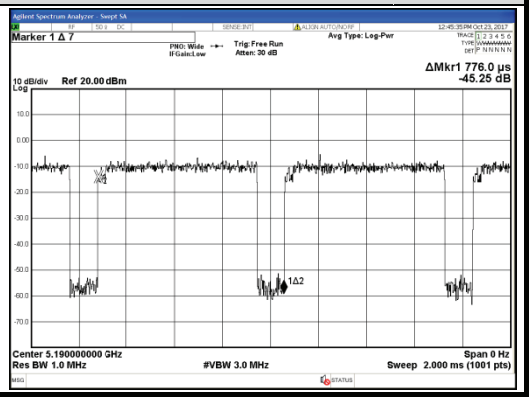
Mode	Duty Cycle (x)
	PCB antenna
802.11n-HT40	 
	Omni-s antenna
	 

AC Conduction	
Test Case	Normal operation

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Item			Mode	Data Rate	Test Channel
Radiated Test Case	Radiated Band Edge Note1	with PCB antenna	802.11a	6 Mbps	36/64/100/140
			802.11n-HT20	MCS8	36/64/100/140
			802.11n-HT40	MCS8	38/62/102/134
		with omni-s antenna	802.11a	6 Mbps	36/64/100/140
			802.11n-HT20	MCS0	36/64/100/140
			802.11n-HT40	MCS0	38/62/102/134
	Radiated Spurious Emission Note1 & 2	with PCB antenna	802.11a	6 Mbps	40/60/140/165
			802.11n-HT20	MCS8	40/52/140/165
			802.11n-HT40	MCS8	46/54/134/159
		with omni-s antenna	802.11a	6 Mbps	40/60/140/165
			802.11n-HT20	MCS0	40/52/140/165
			802.11n-HT40	MCS0	46/54/134/159
Conducted Test Case	Emission Bandwidth		802.11a	6 Mbps	36/40/48/52/60/64/ 100/120/140/149/457/165
			802.11n-HT20	MCS8	36/40/48/52/60/64/ 100/120/140/149/457/165
			802.11n-HT40	MCS8	38/46/54/62/ 102/118/134/151/159
	Maximum output power	with PCB antenna	802.11a	6 Mbps	36/40/48/52/60/64/ 100/120/140/149/457/165
			802.11n-HT20	MCS8	36/40/48/52/60/64/ 100/120/140/149/457/165
			802.11n-HT40	MCS8	38/46/54/62/ 102/118/134/151/159
		with omni-s antenna	802.11a	6 Mbps	36/40/48/52/60/64/ 100/120/140/149/457/165
			802.11n-HT20	MCS0	36/40/48/52/60/64/ 100/120/140/149/457/165
			802.11n-HT40	MCS0	38/46/54/62/ 102/118/134/151/159

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Item			Mode	Data Rate	Test Channel
Conducted Test Case	Emission Limitations	with PCB antenna	802.11a	6 Mbps	36/40/48/52/60/64/ 100/120/140/149/457/165
			802.11n-HT20	MCS8	36/40/48/52/60/64/ 100/120/140/149/457/165
			802.11n-HT40	MCS8	38/46/54/62/ 102/118/134/151/159
		with omni-s antenna	802.11a	6 Mbps	36/40/48/52/60/64/ 100/120/140/149/457/165
			802.11n-HT20	MCS0	36/40/48/52/60/64/ 100/120/140/149/457/165
			802.11n-HT40	MCS0	38/46/54/62/ 102/118/134/151/159
	Power spectral density	with PCB antenna	802.11a	6 Mbps	36/40/48/52/60/64/ 100/120/140/149/457/165
			802.11n-HT20	MCS8	36/40/48/52/60/64/ 100/120/140/149/457/165
			802.11n-HT40	MCS8	38/46/54/62/ 102/118/134/151/159
		with omni-s antenna	802.11a	6 Mbps	36/40/48/52/60/64/ 100/120/140/149/457/165
			802.11n-HT20	MCS0	36/40/48/52/60/64/ 100/120/140/149/457/165
			802.11n-HT40	MCS0	38/46/54/62/ 102/118/134/151/159

Note 1:

☐ Mobile Device.

■ Portable Device, and 3 axis were assessed.

- ☐ Lie
- ☐ Side
- ■ Stand

Note 2: Low, mid, and high channels were measured, only the worst channel of each modulation was presented in this report.

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3.8. Tested Supporting System List

3.8.1. Support Peripheral Unit

No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	Notebook PC	acer	MS2362	N/A	Contains FCC ID: PPD-AAR5B22
2.	JIG	N/A	N/A	N/A	N/A

3.8.2. Cable Lists

No.	Cable Description Of The Above Support Units
1.	Adapter: Enerironix, M/N EXA1208UH DC Power Cord: Unshielded, Detachable, 1.8m, Bonded a ferrite core AC Power Cord: Unshielded, Detachable, 1.8m
2.	

3.9. Setup Configuration

3.9.1. EUT Configuration for Power Line & Radiated Emission

3.9.2. EUT Configuration for RF Conducted Test Items

3.10. Operating Condition of EUT

Test program “LRU” is used for enabling EUT WLAN function under continues transmitting and choosing data rate/ channel.

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3.11.Description of Test Facility

Name of Test Firm	Audix Technology Corporation / EMC Department No. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan Tel: +886-2-26092133 Fax: +886-2-26099303 Website : www.audixtech.com Contact e-mail: sales@audixtech.com
Accreditations	The laboratory is accredited by following organizations under ISO/IEC 17025:2005 (1) NVLAP(USA) NVLAP Lab Code 200077-0 (2) TAF(Taiwan) No. 1724 (3) FCC OET Designation No. TW1004 & TW1090 & TW1724
Test Facilities	(1) No. 7 Shielding Room (2) Semi-Anechoic Chamber (IC Test Site Registration No.: 5183B-1) (3) Fully Anechoic Chamber (IC Test Site Registration No.: 5183B-4)

3.12.Measurement Uncertainty

Test Item	Frequency Range	Uncertainty
Conduction Test	150kHz~30MHz	±3.50dB
Radiation Test (Distance: 3m)	30MHz~1000MHz	± 3.68dB
	Above 1GHz	± 5.82dB

Remark：Uncertainty = $ku_c(y)$

Test Item	Uncertainty
Emission Bandwidth	± 0.2kHz
Maximum output power	± 0.33dB
Power spectral density	± 0.13dB
Conducted Emission Limitations	± 0.13dB

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4. MEASUREMENT EQUIPMENT LIST

4.1. Conducted Emission Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Test Receiver	R&S	ESCI	101276	2017. 03. 23	1 Year
2.	A.M.N.	R&S	ESH2-Z5	100366	2017. 07. 20	1 Year
3.	L.I.S.N.	Kyoritsu	KNW-407	8-881-13	2016. 12. 28	1 Year
4.	Pulse Limiter	R&S	ESH3-Z2	101495	2017. 01. 16	1 Year
5.	Test Software	Audix	e3	V.120619C	N.C.R.	N.C.R.

4.2. Radiated Emission Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9010A-526	MY53400071	2017. 09. 13	1 Year
2.	Spectrum Analyzer	Agilent	N9010A-526	MY52220368	2016. 12. 01	1 Year
3.	Test Receiver	R & S	ESCS30	100338	2017. 06. 19	1 Year
4.	Amplifier	HP	8447D	2944A06305	2017. 02. 16	1 Year
5.	Amplifier	Sonoma	310N	187161	2017. 06. 08	1 Year
6.	Bilog Antenna	CHASE	CBL6112D	33821	2017. 01. 21	1 Year
7.	Loop Antenna	R&S	HFH2-Z2	891847/27	2016. 12. 23	1 Year
8.	Double-Ridged Waveguide Horn	ETS-Lindgren	3117	00135902	2017. 03. 08	1 Year
10.	5G Notch Filter	Microware Circuits	N0452502	459775	2016. 12. 28	1 Year
11.	5G Notch Filter	Microware Circuits	N0555983	459481	2017. 05. 05	1 Year
12.	5G Notch Filter	Microware Circuits	N0257881	459776	2017. 02. 03	1 Year
13.	Test Software	Audix	e3	V.6.110601	N.C.R.	N.C.R.

4.3. RF Conducted Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9030A-526	MY53310269	2017. 01. 02	1 Year
2.	Power Meter	Anritsu	ML2495A	1145008	2016. 10. 27	1 Year
3.	Power Sensor	Anritsu	MA2411B	1126096	2016. 10. 27	1 Year

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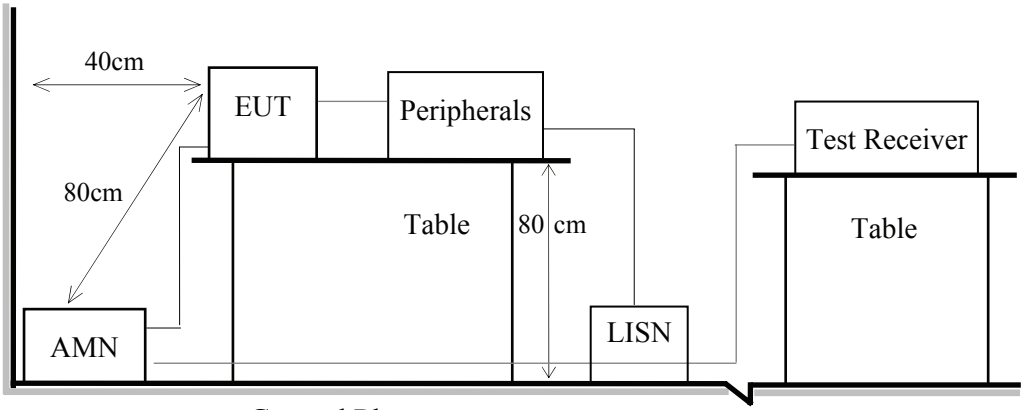
5. CONDUCTED EMISSION

5.1. Block Diagram of Test Setup

5.1.1. Block Diagram of EUT

Indicated as section 3.9

5.1.2. Shielded Room Setup Diagram



5.2. Conducted Emission Limit

Frequency	Conducted Limit	
	Quasi-Peak Level	Average Level
150kHz ~ 500kHz	66 ~ 56 dBμV	56 ~ 46 dBμV
500kHz ~ 5MHz	56 dBμV	46 dBμV
5MHz ~ 30MHz	60 dBμV	50 dBμV

Remark 1.: If the average limit is met when using a Quasi-Peak detector, the measurement using the average detector is not required.
2.: The lower limit applies to the band edges.

5.3. Test Procedure

5.3.1. To set up the EUT as indicated in ANSI C 63.10. The EUT was placed on the table which has 80 cm height to the ground and 40 cm distance to the conducting wall.

5.3.2. Power supplier of the EUT was connected to the AC mains through an Artificial Mains Network (A.M.N.).

5.3.3. The AC power supplies to all peripheral devices must be provided through line impedance stabilization network (L.I.S.N.)

5.3.4. Checking frequency range from 150 kHz to 30 MHz and record the emission which does not have 20 dB below limit.

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5.4. Test Results

Please refer to Appendix A.

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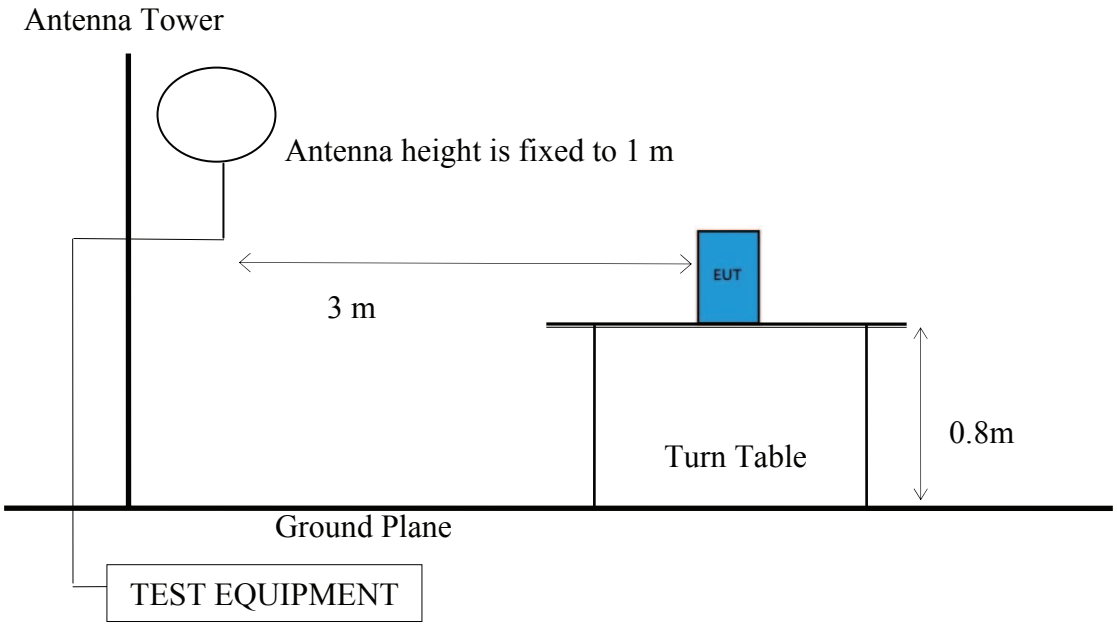
6. RADIATED EMISSION

6.1. Block Diagram of Test Setup

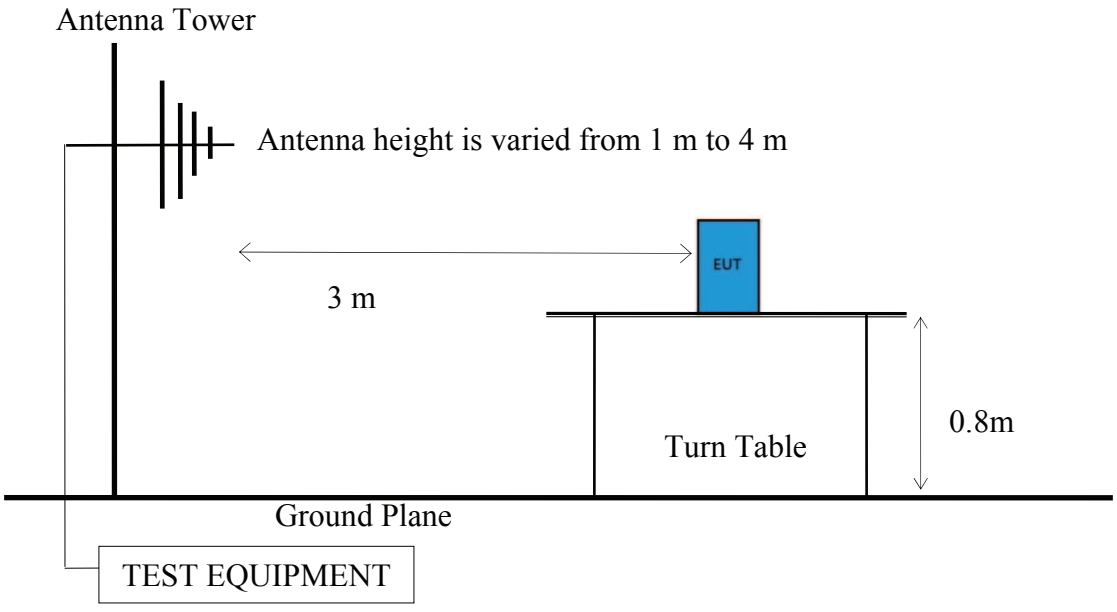
6.1.1. Block Diagram of EUT

Indicated as section 3.9

6.1.2. Setup Diagram for 9kHz-30MHz



6.1.3. Setup Diagram for 30-1000 MHz



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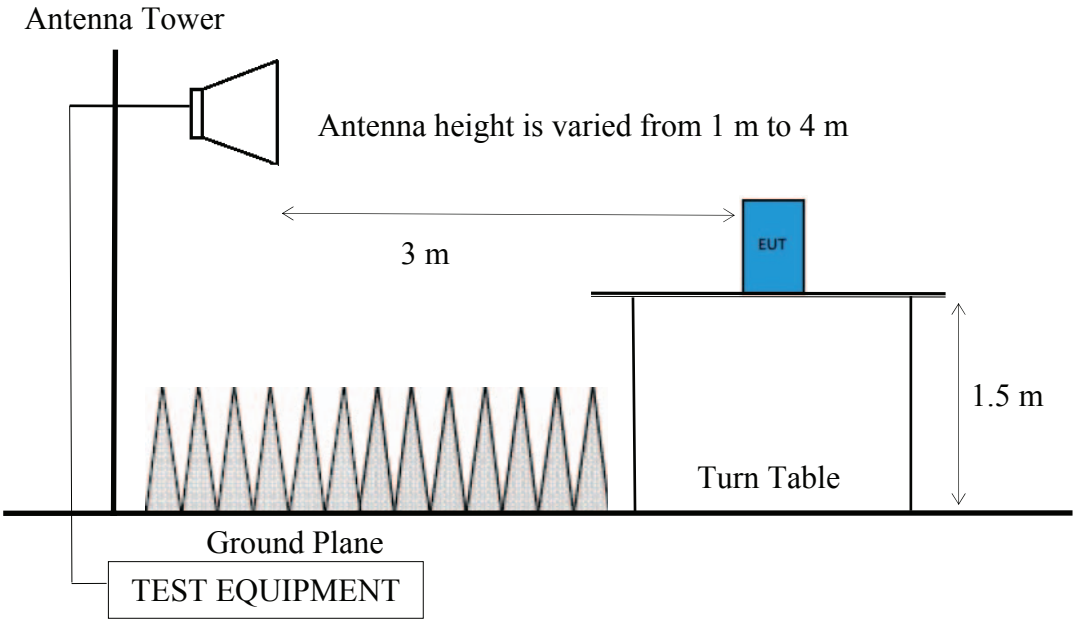
6.1.4. Setup Diagram for above 1GHz



6.2. Radiated Emission Limits

Radiated emissions fall in restricted bands, as defined in Section 15.205 must be in compliance with the radiated emission limits specified in 15.209 as below.

6.2.1. General Limit

Frequency (MHz)	Distance (m)	Limits	
		dBμV/m	μV/m
0.009 - 0.490	300	67.6	2400/kHz
0.490 - 1.705	30	87.6	24000/kHz
1.705 - 30	30	29.5	30
30 - 88	3	40.0	100
88- 216	3	43.5	150
216- 960	3	46.0	200
Above 960	3	54.0	500
Above 1000	3	74.0 dBμV/m (Peak) 54.0 dBμV/m (Average)	

Remark：(1) dBμV/m = 20 log (μV/m)
(2) The tighter limit applies to the edge between two frequency bands.
(3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
(4) Fundamental and emission fall within operation band are exempted from this section.
(5) Pursuant to ANSI C63.10: 6.6.4.3, if the maximized peak measured value complies with the average limit, then it is unnecessary to perform an average measurement.

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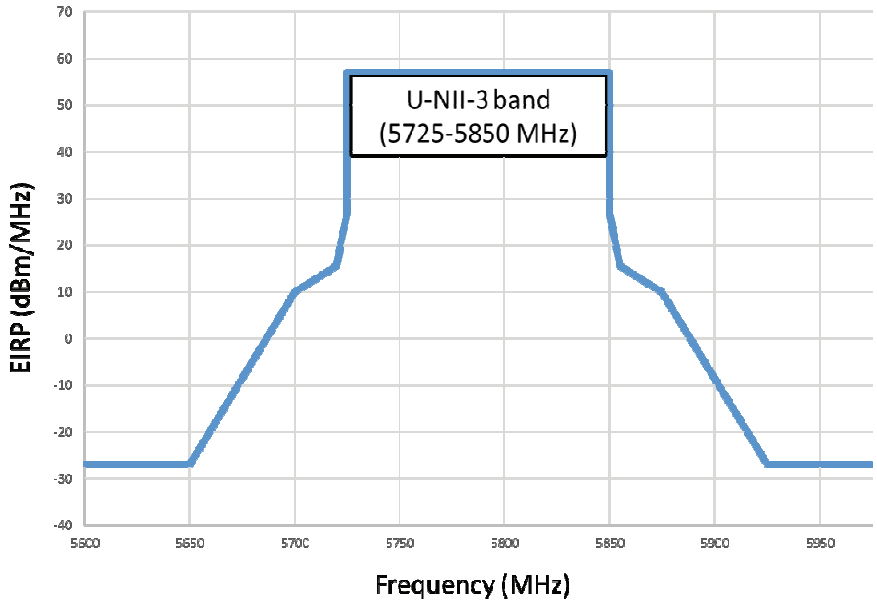
6.2.2. Limit for non-restricted frequency above 1 GHz

Frequency Band (MHz)	E.I.R.P. Limit	Field Strength Limit at 3 m
5150 to 5250	-27 dBm	68.2
5250 to 5350		68.2
5470 to 5725		68.2

Note: Field Strength at 3 m= E.I.R.P. + 95.2 dB

Frequency Band (MHz)	Field Strength Limit at 3 m	
5725 to 5850	☒	15.407(b)(4)(i) All emissions shall be limited to a level of 68.2 dBμV/m at 75 MHz or more above or below the band edge increasing linearly to 105.2dBμV/m at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 110.8 dBμV/m 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 68.2 dBμV/m at the band edge.
	☐	15.407(b)(4)(ii) ,compliance with the emission limits in § 15.247(d) Shall be at least 30dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power,. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c))



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6.3. Test Procedure

Frequency Range 9kHz~30MHz:
The EUT setup on the turn table which has 0.8 m height to the ground. The turn table rotated 360 degrees and antenna fixed to 1 m to find the maximum emission level.
In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2013 regulation.

(1) RBW = 9kHz with peak and average detector.
(2) Detector: average and peak (9kHz-490kHz)
Q.P. (490kHz-30MHz)

Frequency Range 30MHz ~ 40GHz:
The EUT setup on the turn find table which has 80 cm (for 30-1000 MHz) and 1.5m (for above 1GHz) height to the ground. The turn table rotated 360 degrees and antenna varied from 1 m to 4 m to find the maximum emission level. Both horizontal and vertical polarization are required. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2013 regulation.

Frequency below 1 GHz:
Spectrum Analyzer is used for pre-testing with following setting:
(1)RBW = 120KHz
(2)VBW ≥ 3 x RBW.
(3)Detector = Peak.
(4)Sweep time = auto.
(5)Trace mode = max hold.
(6)Allow sweeps to continue until the trace stabilizes.
(7)When peak-detected value is lower than limit that the measurement using the Q.P. detector is not required. Otherwise using Q.P. for finally measurement.

Frequency above 1GHz to 10th harmonic (up to 40 GHz):
Peak Detector:
(1)RBW = 1MHz
(2)VBW ≥ 3 x RBW.
(3)Detector = Peak.
(4)Sweep time = auto.
(5)Trace mode = max hold.
(6)Allow sweeps to continue until the trace stabilizes.
(7)When peak-detected value is lower than limit that the measurement using the average detector is not required. Otherwise using average detector for finally measurement.

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Average Detector:

■**Option 1:**

(1)RBW = 1MHz

(2)VBW ≥ 1/ T.

Modulation Type	T (ms)	1/ T (kHz)	VBW Setting (kHz)
802.11a	1.41	0.710	0.68
802.11n-HT20	1.325	0.755	0.75
802.11n-HT40	0.66	1.515	1.50

N/A: 1/ T is not implemented when duty cycle presented in section 3.7 is ≥98 %.

(1)Detector = Peak.

(2)Sweep time = auto.

(3)Trace mode = max hold.

(4)Allow sweeps to continue until the trace stabilizes.

□**Option 2:**

Average Emission Level= Peak Emission Level+ D.C.C.F.

6.4. Measurement Result Explanation

■Peak Emission Level=Antenna Factor + Cable Loss + Meter Reading

■Average Emission Level l=Antenna Factor + Cable Loss + Meter Reading

□Average Emission Level= Peak Emission Level+ DCCF

Duty Cycle Correction Factor (DCCF)= 20log (TX_{on}/TX_{on+off}) presented in section 3.7

□ERP= Peak Emission Level-95.2dB-2.14dB

6.5. Test Results

Please refer to Appendix A.

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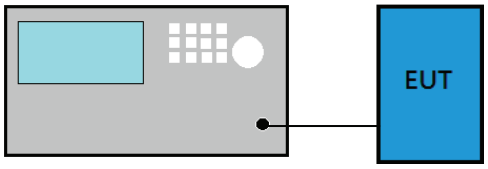
7. EMISSION BANDWIDTH

7.1. Block Diagram of Test Setup



7.2. Specification Limits

Frequency Band (MHz)	Limit
5150 to 5250	Reference only
5250 to 5350	
5470 to 5725	
5725 to 5850	≥ 500kHz

7.3. Test Procedure

Following measurement procedure is reference to KDB 789033 D02 General UNII Test Procedures New Rules v01r04:

■ Applicable to all bands except to 5725 MHz- 5850 MHz

(1) Set RBW= 1% of the emission bandwidth
(2) Set VBW > RBW
(3) Detector = Peak
(4) Trace mode = max hold
(5) Setting channel bandwidth function x dB to -26 dB to record the final bandwidth.

■ 5725 MHz- 5850 MHz

(1) Set RBW = 100 kHz.
(2) Set the video bandwidth (VBW) ≥ 3 × RBW.
(3) Detector = Peak.
(4) Trace mode = max hold.
(5) Sweep = auto couple.
(6) Allow the trace to stabilize.
(7) Setting channel bandwidth function x dB to -6 dB to record the final bandwidth.

7.4. Test Results

Please refer to Appendix A

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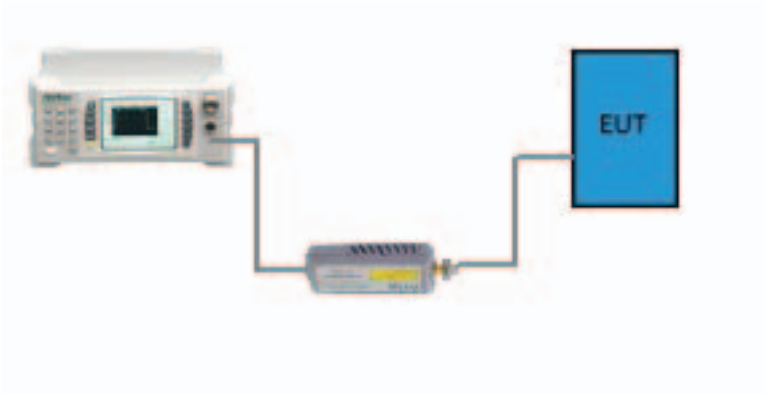
8. MAXIMUM OUTPUT POWER

8.1. Block Diagram of Test Setup



8.2. Specification Limits

Frequency Band (MHz)	Category	Limit
5150 to 5250	Outdoor Access Point	1 W(30 dBm)/ Max e.i.r.p. ≤125 mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon
	Fixed point-to-point Access Point	1 W(30 dBm)
	Indoor Access Point	1 W(30 dBm)
	Mobile and Portable client device	250 mW(24 dBm)
5250 to 5350	N/A	250 mW or 11 dBm + 10 log B[Note1]
5470 to 5725		250 mW or 11 dBm + 10 log B [Note1]
5725 to 5850		1 W(30 dBm)

Note 1: B is the 26 dB emission bandwidth, which presented in section 7 and appendix A.1.

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8.3. Test Procedure

Following measurement procedure is reference to KDB 789033 D02 General UNII Test Procedures New Rules v01r04:

■**Method AVGPM (Measurement using an RF average power meter):**

EUT is connected to power sensor and record the maximum average output power and duty cycle factor is added when duty cycle presented in section 3.7 is < 98%.

□**Method AVGSA-2 (Spectrum channel power)**

(1) Set span to at least 1.5 times the OBW
(2) Set RBW = 1 MHz
(3) Set the video bandwidth (VBW) ≥ 3 MHz.
(4) Detector = RMS.
(5) Trace mode = trace average at least 100 traces
(6) Sweep = auto couple.
(7) Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function with band limits set equal to the OBW band edges.
(8) Duty cycle factor is added when duty cycle presented in section 3.7 is < 98%.

8.4. Test Results

Please refer to Appendix A

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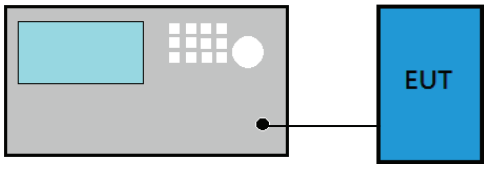
9. EMISSION LIMITATIONS MEASUREMENT

9.1. Block Diagram of Test Setup



9.2. Specification Limits

Frequency Band (MHz)	E.I.R.P. Limit
5150 to 5250	-27 dBm
5250 to 5350	
5470 to 5725	

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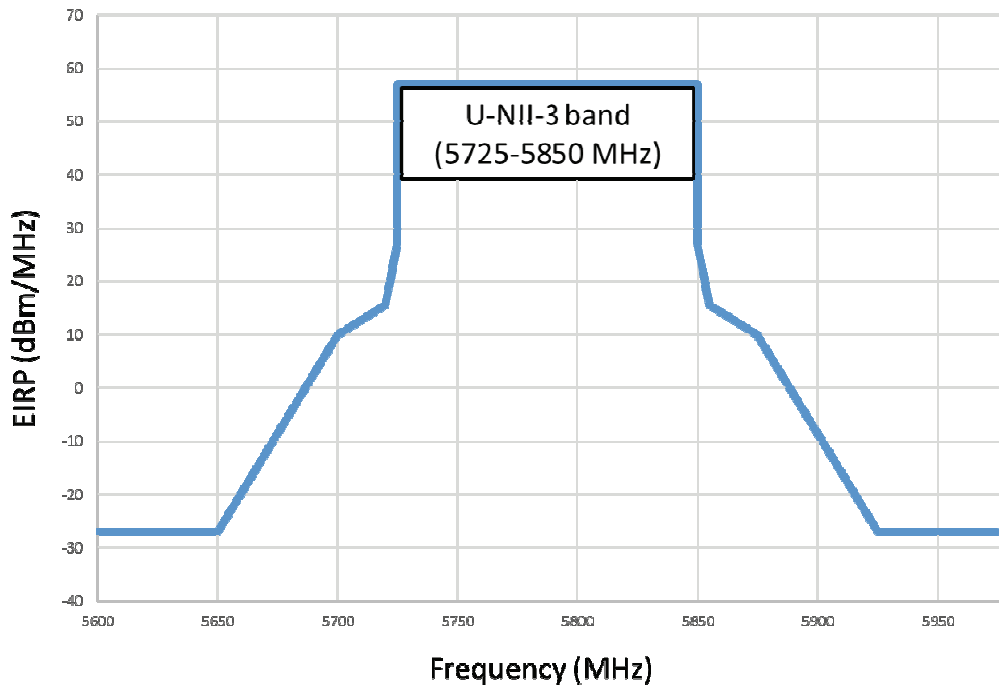
Frequency Band (MHz)	E.I.R.P. Limit	
5725 to 5850	☒	15.407(b)(4)(i) All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing 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 27 dBm/MHz at the band edge.
	☐	15.407(b)(4)(ii) ,compliance with the emission limits in § 15.247(d) Shall be at least 30dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power,. Attenuation below the general limits specified in §15.209(a) is not required. In addition,radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c))



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9.3. Test Procedure

Following measurement procedure is reference to KDB 789033 D02 General UNII Test Procedures New Rules v01r04:

(1) RBW = 1 MHz
(2) VBW ≥ 3 x RBW
(3) Detector = Peak
(4) Sweep time = auto
(5) Trace mode = max hold
(6) Allow sweeps to continue until the trace stabilizes.

9.4. Test Results

Please refer to Appendix A

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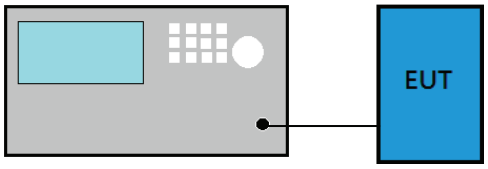
10. POWER SPECTRAL DENSITY

10.1. Block Diagram of Test Setup



10.2. Specification Limits

Frequency Band (MHz)	Category	Limit
5150 to 5250	Outdoor Access Point	17dBm
	Fixed point-to-point Access Point	
	Indoor Access Point	
	Mobile and Portable client device	11 dBm/MHz
5250 to 5350	N/A	11 dBm/MHz
5470 to 5725		11 dBm/MHz
5725 to 5850		30dBm/500 kHz

10.3. Test Procedure

Following measurement procedure is reference to KDB 789033 D02 General UNII Test Procedures New Rules v01r04:

■Method AVGSA-2 (Spectrum channel power)

(1) Set span to at least 1.5 times the OBW
(2) Set RBW = 1 MHz
(3) Set the video bandwidth (VBW) ≥ 3 MHz.
(4) Detector = RMS.
(5) Trace mode = trace average at least 100 traces
(6) Sweep = auto couple.
(7) Use peak search function to find out the maximum power density.
(8) Duty cycle factor is added when duty cycle presented in section 3.7 is < 98%.

10.4. Test Results

Please refer to Appendix A

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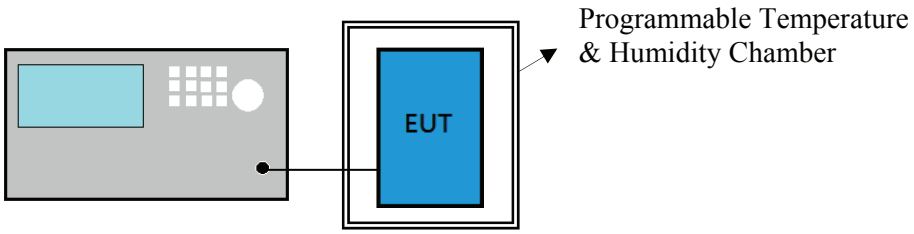
11. FREQUENCY STABILITY

11.1. Block Diagram of Test Setup



11.2. Specification Limits

NONE

11.3. Test Procedure

(1) Frequency: Test frequency.
(2) Span: enough to cover the complete power envelope
(3) RBW: 1MHz(modulation ON) ; 10KHz(CW)
(4) VBW: 1MHz(modulation ON) ; 10KHz(CW)
(5) Detector Mode: Positive Peak
(6) Indication mode: Max hold
(7) Find the peak frequency and take calculate by the formula:
(Measurement Value-declaration frequency)/ declaration frequency)

11.4. Test Results

Please refer to Appendix A

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12. DEVIATION TO TEST SPECIFICATIONS

【NONE】

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APPDNDIX A

TEST DATA AND PLOTS

(Model: SDC-PE15N)

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APPDNDIX B

TEST PHOTOGRAPHS

(Model: SDC-PE15N)