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Report No.: 1503RSU03006
Report Version: V01
Issue Date: 05-21-2015

MEASUREMENT REPORT
EN 301 893 V1.7.1 WLAN 802.11a/n/ac

Applicant: Compex Systems Pte Ltd

Address: 135, Joo Seng Road, #08-01 Singapore 368363

Product: 802.11ac Dual Band Module

Model No.: WLE900VX

Brand Name: COMPEX

Standards: ETSI EN 301 893 V1.7.1 (2012-06)

Result: Complies

Test Date: Mar. 16 ~ May. 21, 2015

Reviewed By : Robin Wu
(Robin Wu)

Approved By : Marlin Chen
(Marlin Chen)

Revision History

Report No.	Version	Description	Issue Date
1503RSU03006	Rev. 01	Initial report	05-21-2015

CONTENTS

1. General Information

1.1. Applicant

Compex Systems Pte Ltd

135 Joo Seng Road, #08-01 PM Industrial Building Singapore 368363

1.2. Manufacturer

Compex Systems Pte Ltd

135 Joo Seng Road, #08-01 PM Industrial Building Singapore 368363

1.3. Testing Facility

Test Site

MRT Technology (Suzhou) Co., Ltd

Test Site Location

D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China

Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Tian'edang Rd., Suzhou, China

- **MRT facility is a FCC registered (MRT Reg. No. 809388) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules.**
- **MRT facility is an IC registered (MRT Reg. No. 11384A-1) test laboratory with the site description on file at Industry Canada.**
- **MRT facility is a VCCI registered (R-4179, G-814, C-4664, T-2206) test laboratory with the site description on file at VCCI Council.**
- **MRT Lab is accredited to ISO 17025 by the American Association for Laboratory Accreditation (A2LA) under the American Association for Laboratory Accreditation Program (A2LA Cert. No. 3628.01) in EMC, Telecommunications and Radio testing for FCC, Industry Canada, EU and TELEC Rules.**

1.4. Feature of Product

Product Name	802.11ac Dual Band Module
Model No.	WLE900VX
Brand Name	COMPEX
Wi-Fi Specification	802.11a/b/g/n/ac

Note: The difference of models is for different marketing requirement.

1.5. Product Specification Subjective to this Report

Frequency Range	802.11a /n-HT20/ac-VHT20: 5180~5240 MHz, 5260~5320 MHz, 5500~5700 MHz; 802.11n-HT40/ac-VHT40: 5190~5230 MHz, 5270~5310 MHz, 5510~5670 MHz; 802.11ac-VHT80: 5210 MHz, 5290 MHz, 5530 MHz, 5610 MHz;
Channel Number	802.11a/n-HT20/ac-VHT20: 19 802.11n-HT40/ac-VHT40: 9 802.11ac-VHT80: 4
Type of Modulation	802.11a/n/ac: OFDM
Data Rate	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 450Mbps 802.11ac: up to 1299.9Mbps

Note: For other features of this EUT, test report will be issued separately.

1.6. Operation Frequency / Channel List

802.11a/n-HT20/ac-VHT20

Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180 MHz	40	5200 MHz	44	5220 MHz
48	5240 MHz	52	5260 MHz	56	5280 MHz
60	5300 MHz	64	5320 MHz	100	5500 MHz
104	5520 MHz	108	5540 MHz	112	5560 MHz
116	5580 MHz	120	5600 MHz	124	5620 MHz
128	5640 MHz	132	5660 MHz	136	5680 MHz
140	5700 MHz	N/A	N/A	N/A	N/A

802.11n-HT40/ac-VHT40

Channel	Frequency	Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz	54	5270 MHz
62	5310 MHz	102	5510 MHz	110	5550 MHz
118	5590 MHz	126	5630 MHz	134	5670 MHz

802.11ac-VHT80

Channel	Frequency	Channel	Frequency	Channel	Frequency
42	5210 MHz	58	5290 MHz	106	5530 MHz
122	5610 MHz	N/A	N/A	N/A	N/A

1.7. Description of Available Antennas

Antenna No.	Manufacturer	Tx Paths	Max Directional Gain (dBi)
Antenna 1#	Kunshan Wavelink Electronic Co., Ltd.	3	2.4GHz: 2.0, 5GHz: 2.0
Antenna 2#	TAOGLAS Inc	3	2.4GHz: 4.5, 5GHz: 6.7
Antenna 3#	Compex Systems Pte Ltd	3	2.4GHz: 5.0, 5GHz: 5.0
Antenna 4#	Compex Systems Pte Ltd	3	2.4GHz: 5.0, 5GHz: 5.0
Antenna 5#	Smart Ant Inc	3	5GHz: 7.0
Antenna 6#	Kenbotong Communication LTD	3	5GHz: 10.0

Note 1: The frequency bands (5150~5350MHz & 5470~5725MHz) support the max antenna gain 7dBi and another frequency band (5725~5850MHz) supports the max antenna gain 10dBi.
Note 2: We selected the antenna 5# for all radiated emission testing in this report.

1.8. Standards Applicable for Testing

The EUT complies with the requirements of ETSI EN 301893 V1.7.1.

2. Test Configuration of Equipment under Test

2.1. Description of Test Mode

Test Mode	Mode 1: Transmit by 802.11a
	Mode 2: Transmit by 802.11n-HT20
	Mode 3: Transmit by 802.11n-HT40
	Mode 4: Transmit by 802.11ac-VHT20
	Mode 5: Transmit by 802.11ac-VHT40
	Mode 6: Transmit by 802.11ac-VHT80

Test Mode	Duty Cycle
11a	96.9%
11n-HT20	94.4%
11n-HT40	85.8%
11ac-VHT20	95.0%
11ac-VHT40	93.5%
11ac-VHT80	80.0%

2.2. Description of Test Software

The test utility software used during testing was “ART2-GUI Version: 2.3” and “CART Version: 4.9”.

Final Power Parameter Value of the test software.

Test Mode	Test Frequency	Power Parameter Value				
		Ant 0	Ant 1	Ant 2	Ant 0 + 1	Ant 0 + 1 + 2
802.11a	5180	14.0	14.5	14.0	Not Support	Not Support
	5320	13.5	14.0	15.0		
	5500	20.0	18.5	20.0		
	5700	20.0	20.0	20.0		
802.11n-HT20	5180	14.0	14.5	13.0	11.5	8.5
	5320	14.0	14.5	13.0	11.5	8.5
	5500	20.0	19.0	20.0	18.0	17.0
	5700	21.0	20.0	20.0	20.0	19.0
802.11n-HT40	5190	14.5	14.5	13.5	13.0	10.0
	5310	14.0	15.0	13.5	12.5	10.0
	5510	20.0	19.0	20.0	20.0	18.5
	5670	20.0	20.0	20.0	20.0	19.5
802.11ac-VHT20	5180	14.0	14.5	13.0	11.5	9.0
	5320	14.0	14.5	13.0	11.0	9.5
	5500	20.0	19.0	20.0	16.0	17.0
	5700	20.0	20.0	20.0	17.0	19.0
802.11ac-VHT40	5190	15.5	15.0	13.5	13.0	10.0
	5310	15.0	15.5	13.0	12.5	10.0
	5510	20.0	20.0	20.0	20.0	18.5
	5670	20.0	20.0	20.0	20.0	19.0
802.11ac-VHT80	5210	16.0	14.5	13.5	13.5	10.5
	5290	15.5	15.0	13.5	13.0	10.5
	5530	20.0	20.0	20.0	20.0	19.5
	5610	20.0	20.0	20.0	20.00	20.0

3. Test Summary

Clause EN301893	Test Parameter	Result (Pass/Fail)	Remark
4.2	Carrier Frequencies	Pass	--
4.3	Occupied Channel Bandwidth	Pass	--
4.4	RF Output Power, Transmit Power Control (TPC) and Power Density	Pass	--
4.5.1	Transmitter Unwanted Emissions Outside the 5GHz RLAN Bands	Pass	--
4.5.2	Transmitter Unwanted Emissions Within the 5GHz RLAN Bands	Pass	--
4.6	Receiver Spurious Emissions	Pass	--
4.7	Dynamic Frequency Selection (DFS)	Pass	Refer to DFS report
4.9	Adaptivity	Pass	--

Note 1: For Radiated spurious emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst case emissions.

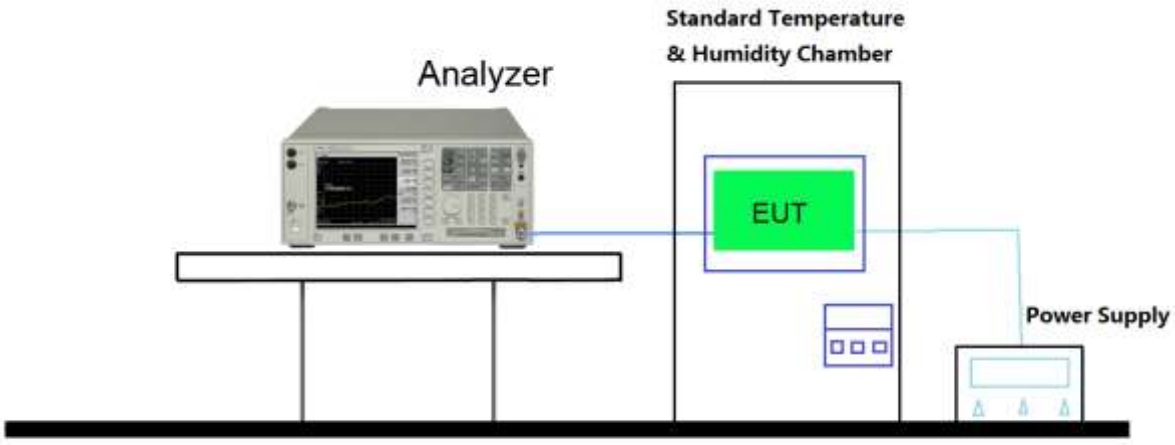
4. Carrier Frequencies

4.1. Limit

The actual centre frequency for any given channel declared by the manufacturer shall be maintained within the range fc ± 20ppm.

4.2. Test Setup

For Conducted Measurement



4.3. Test Procedure

Refer to ETSI EN 301 893 V1.7.1 (2012-06) Clause 5.3.2.2.1.

4.4. Test Result

Test Engineer	Milo Li	Temperature	-20°C ~ 70°C
Test Time	05-05-2015	Relative Humidity	60%

Test Conditions		Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Limit (ppm)	Result
T_{nom} (25°C)	V_{nom} (AC 230V)	5320	5319.987981	-2.259	≤ 20	Pass
		5500	5499.984857	-2.753	≤ 20	Pass
T_{min} (-20°C)	V_{min} (AC 207V)	5320	5319.987481	-2.353	≤ 20	Pass
		5500	5499.986958	-2.371	≤ 20	Pass
	V_{max} (AC 253V)	5320	5319.984871	-2.844	≤ 20	Pass
		5500	5499.982847	-3.119	≤ 20	Pass
T_{max} (70°C)	V_{min} (AC 207V)	5320	5319.985487	-2.728	≤ 20	Pass
		5500	5499.980135	-3.612	≤ 20	Pass
	V_{max} (AC 253V)	5320	5319.984847	-2.848	≤ 20	Pass
		5500	5499.984875	-2.750	≤ 20	Pass

5. Occupied Channel Bandwidth

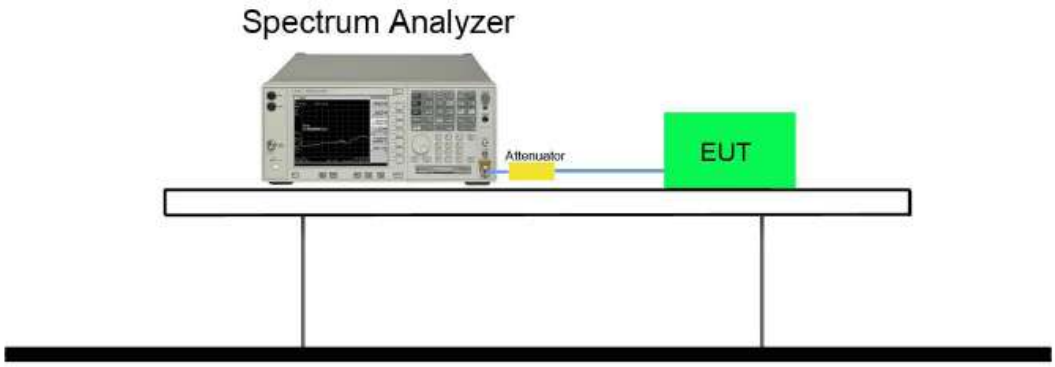
5.1. Limit

The Nominal Channel Bandwidth shall be at least 5 MHz at all times.

The Occupied Channel Bandwidth shall be between 80 % and 100 % of the declared Nominal Channel Bandwidth. In case of smart antenna systems (devices with multiple transmit chains) each of the transmit chains shall meet this requirement.

NOTE: During an established communication, a device is allowed to operate temporarily in a mode where its Occupied Channel Bandwidth may be reduced to as low as 40 % of its Nominal Channel Bandwidth with a minimum of 4 MHz.

5.2. Test Setup



5.3. Test Procedure

Refer to ETSI EN 301 893 V1.7.1 (2012-06) Clause 5.3.3.2.1.

5.4. Test Result

Test Engineer	Milo Li	Temperature	26°C
Test Time	08-24-2014	Relative Humidity	62%

Test Mode	Channel No.	Frequency (MHz)	99% Bandwidth (MHz)	Declared Nominal Channel Bandwidth (MHz)	Limit (%)	Result
1Tx						
11a	64	5320	16.50	20	80 - 100	Pass
11a	100	5500	16.48	20	80 - 100	Pass
11nHT20	64	5320	17.69	20	80 - 100	Pass
11n-HT20	100	5500	17.67	20	80 - 100	Pass
11ac-VHT20	64	5320	17.68	20	80 - 100	Pass
11ac-VHT20	100	5500	17.89	20	80 - 100	Pass
11n-HT40	62	5310	36.20	40	80 - 100	Pass
11n-HT40	102	5510	36.45	40	80 - 100	Pass
11ac-VHT40	62	5310	36.22	40	80 - 100	Pass
11ac-VHT40	102	5510	37.24	40	80 - 100	Pass
11ac-VHT80	42	5210	75.74	80	80 - 100	Pass
11ac-VHT80	58	5290	75.79	80	80 - 100	Pass
2Tx						
11nHT20	64	5320	17.68	20	80 - 100	Pass
11n-HT20	100	5500	17.68	20	80 - 100	Pass
11ac-VHT20	64	5320	17.68	20	80 - 100	Pass
11ac-VHT20	100	5500	17.70	20	80 - 100	Pass
11n-HT40	62	5310	36.22	40	80 - 100	Pass
11n-HT40	102	5510	36.41	40	80 - 100	Pass
11ac-VHT40	62	5310	36.21	40	80 - 100	Pass
11ac-VHT40	102	5510	36.37	40	80 - 100	Pass
11ac-VHT80	42	5210	75.81	80	80 - 100	Pass
11ac-VHT80	58	5290	75.81	80	80 - 100	Pass

3Tx						
11nHT20	64	5320	17.70	20	80 - 100	Pass
11n-HT20	100	5500	17.69	20	80 - 100	Pass
11ac-VHT20	64	5320	17.69	20	80 - 100	Pass
11ac-VHT20	100	5500	17.69	20	80 - 100	Pass
11n-HT40	62	5310	36.23	40	80 - 100	Pass
11n-HT40	102	5510	36.40	40	80 - 100	Pass
11ac-VHT40	62	5310	36.23	40	80 - 100	Pass
11ac-VHT40	102	5510	36.18	40	80 - 100	Pass
11ac-VHT80	42	5210	75.75	80	80 - 100	Pass
11ac-VHT80	58	5290	75.71	80	80 - 100	Pass

11a Occupied Channel Bandwidth – 1Tx

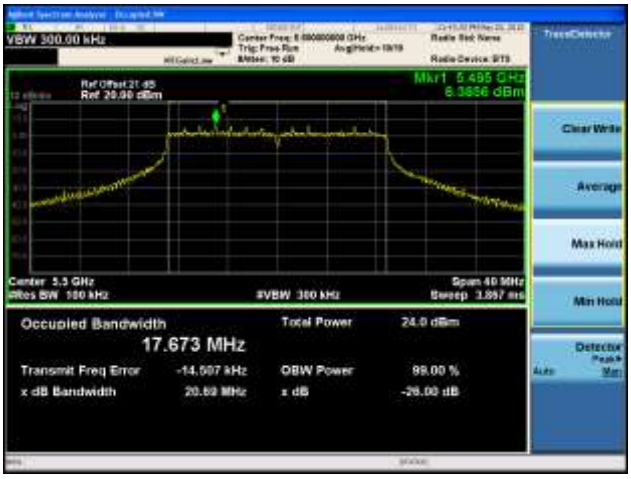
Channel 64 (5320MHz)

Channel 100 (5500MHz)

11n-HT20 Occupied Channel Bandwidth – 1Tx

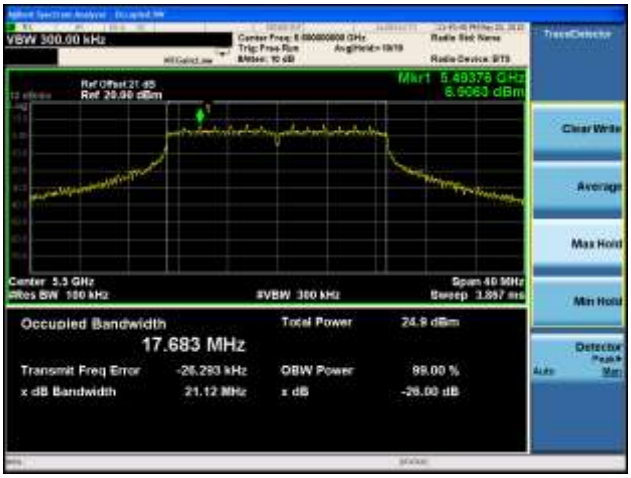
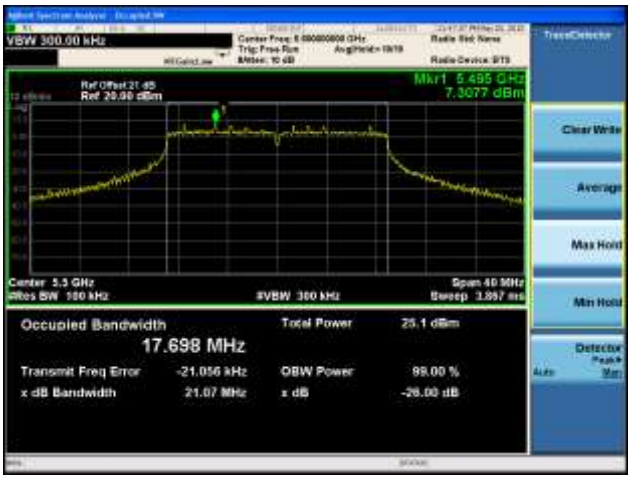
Channel 64 (5320MHz)

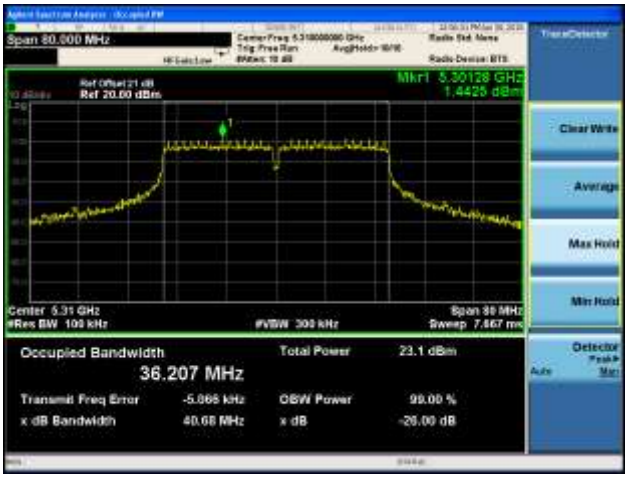
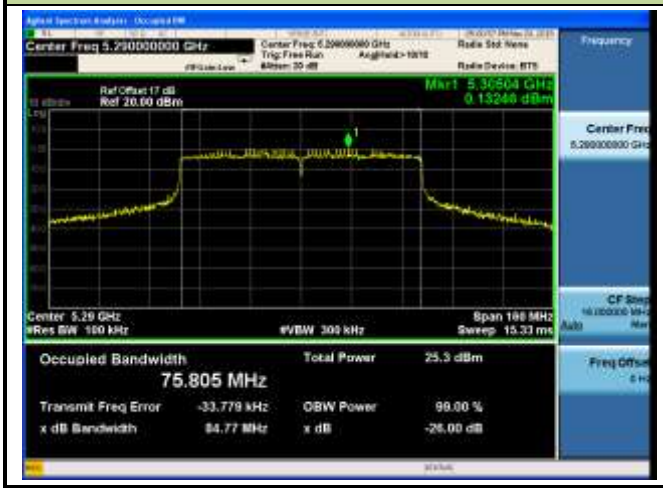
Channel 100 (5500MHz)



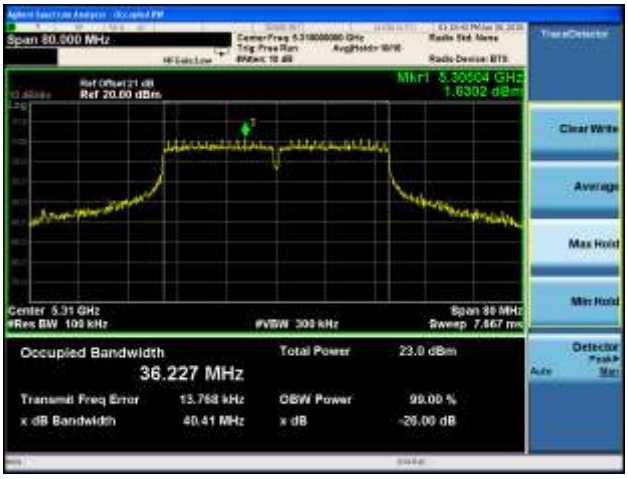
11ac-VHT20 Occupied Channel Bandwidth – 1Tx	
Channel 64 (5320MHz)	**Channel 100 (5500MHz)**
	
11n-HT40 Occupied Channel Bandwidth – 1Tx	
Channel 62 (5310MHz)	**Channel 102 (5510MHz)**
	
11ac-VHT40 Occupied Channel Bandwidth – 1Tx	
Channel 62 (5310MHz)	**Channel 102 (5510MHz)**
	

11ac-VHT80 Occupied Channel Bandwidth – 1Tx	
Channel 58 (5290MHz)	**Channel 106 (5530MHz)**
	

11n-HT20 Occupied Channel Bandwidth – 2Tx	
Channel 64 (5320MHz)	**Channel 100 (5500MHz)**
	
11ac-VHT20 Occupied Channel Bandwidth – 2Tx	
Channel 64 (5320MHz)	**Channel 100 (5500MHz)**
	
11n-HT40 Occupied Channel Bandwidth – 2Tx	
Channel 62 (5310MHz)	**Channel 102 (5510MHz)**
	

11ac-VHT40 Occupied Channel Bandwidth – 2Tx	
Channel 62 (5310MHz)	**Channel 102 (5510MHz)**
	
11ac-VHT80 Occupied Channel Bandwidth – 2Tx	
Channel 58 (5290MHz)	**Channel 106 (5530MHz)**
	

11n-HT20 Occupied Channel Bandwidth – 3Tx	
Channel 64 (5320MHz)	**Channel 100 (5500MHz)**
	
11ac-VHT20 Occupied Channel Bandwidth – 3Tx	
Channel 64 (5320MHz)	**Channel 100 (5500MHz)**
	
11n-HT40 Occupied Channel Bandwidth – 3Tx	
Channel 62 (5310MHz)	**Channel 102 (5510MHz)**
	

11ac-VHT40 Occupied Channel Bandwidth – 3Tx	
Channel 62 (5310MHz)	**Channel 102 (5510MHz)**
	
11ac-VHT80 Occupied Channel Bandwidth – 3Tx	
Channel 58 (5290MHz)	**Channel 106 (5530MHz)**
	

6. RF Output Power, Transmit Power Control (TPC) and Power Density

6.1. Limit

RF Output Power and Power density at the Highest Power Level

TPC is not required for channels whose nominal bandwidth falls completely within the band 5150 MHz to 5250 MHz.

For devices with TPC, the RF output power and the power density when configured to operate at the highest stated power level of the TPC range shall not exceed the levels given in following table.

Devices are allowed to operate without TPC. See table for applicable limits in this case.

Mean EIRP limits for RF Output Power and Power Density at the Highest Power Level				
Frequency Range	Mean EIRP Limit [dBm]		Mean EIRP Density Limit [dBm/MHz]	
	with TPC	without TPC	with TPC	without TPC
5150 MHz to 5350 MHz	23	20/23 (see note 1)	10	7/10 (see note 2)
5470 MHz to 5725 MHz	30 (see note 3)	27 (see note 3)	17 (see note 3)	14 (see note 3)
NOTE 1: The applicable limit is 20 dBm, except for transmissions whose nominal bandwidth falls completely within the band 5150 MHz to 5250 MHz, in which case the applicable limit is 23 dBm.				
NOTE 2: The applicable limit is 7 dBm/MHz, except for transmissions whose nominal bandwidth falls completely within the band 5150 MHz to 5250 MHz, in which case the applicable limit is 10 dBm/MHz.				
NOTE 3: Slave devices without a Radar Interference Detection function shall comply with the limits for the band 5250 MHz to 5350 MHz.				

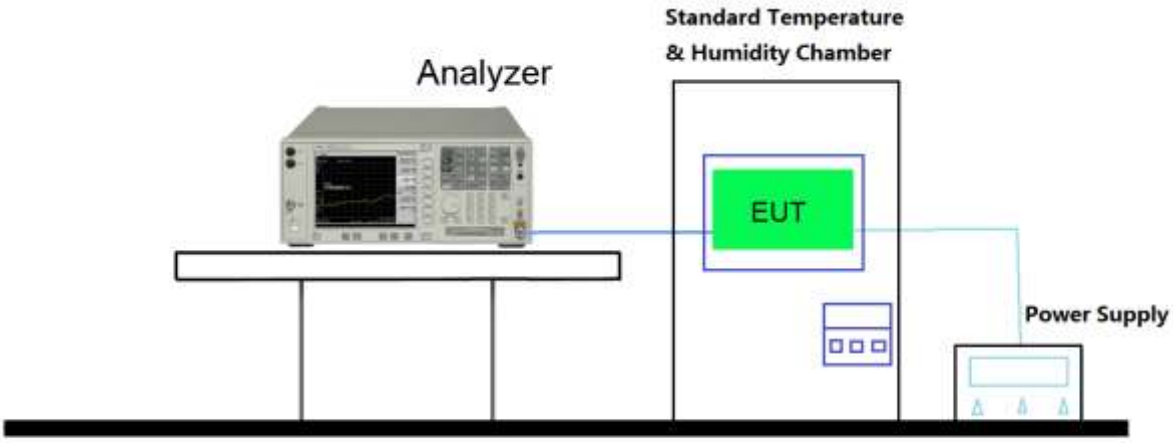
RF Output Power at the Lowest Power Level of the TPC Range

For devices using TPC, the RF output power during a transmission burst when configured to operate at the lowest stated power level of the TPC range shall not exceed the levels given in following table.

For devices without TPC, the limits in table do not apply.

Mean EIRP Limits for RF Output Power at the Lowest Power Level of the TPC Range	
Frequency Range	Mean EIRP [dBm]
5250 MHz to 5350 MHz	17
5470 MHz to 5725 MHz	24 (see note)
Note: Slave devices without a Radar Interference Detection function shall comply with the limits for the band 5250 MHz to 5350 MHz.	

6.2. Test Setup



6.3. Test Procedure

Refer to ETSI EN 301 893 V1.7.1 (2012-06) Clause 5.3.4.2.1.

6.4. Test Result

Test Engineer	Milo Li	Temperature	-20 ~ 70°C
Test Time	04-28-2015	Relative Humidity	54%

RF Output Power

Normal Conditions (Temperature 25°C)

1Tx

Mode	Ch. No.	Freq. (MHz)	RF Output Power (dBm)			Max EIRP Power (dBm)	Limit (dBm)	Result
			Ant 0	Ant 1	Ant 2			
11a	36	5180	14.55	13.89	14.56	21.70	23	Pass
11a	64	5320	14.35	14.01	14.65	21.79	23	Pass
11a	100	5500	18.50	18.47	18.43	25.64	30	Pass
11a	140	5700	18.38	18.50	18.65	25.79	30	Pass
11n-HT20	36	5180	14.56	14.02	14.70	21.95	23	Pass
11n-HT20	64	5320	14.32	14.69	14.67	21.94	23	Pass
11n-HT20	100	5500	18.30	18.98	18.56	26.23	30	Pass
11n-HT20	140	5700	17.70	18.23	18.76	26.01	30	Pass
11ac-VHT20	36	5180	14.47	13.98	14.65	22.32	23	Pass
11ac-VHT20	64	5320	14.30	14.30	14.60	22.27	23	Pass
11ac-VHT20	100	5500	18.32	18.98	18.30	26.65	30	Pass
11ac-VHT20	140	5700	18.58	18.27	18.34	26.25	30	Pass
11n-HT40	38	5190	14.45	13.90	14.45	21.67	23	Pass
11n-HT40	62	5310	14.20	14.30	14.60	21.82	23	Pass
11n-HT40	102	5510	18.34	18.70	18.25	25.92	30	Pass
11n-HT40	134	5670	18.45	18.69	18.45	25.91	30	Pass
11ac-VHT40	38	5190	14.50	13.50	14.70	21.99	23	Pass
11ac-VHT40	62	5310	14.60	14.50	14.45	21.89	23	Pass
11ac-VHT40	102	5510	18.57	18.50	18.50	25.86	30	Pass
11ac-VHT40	134	5670	18.40	18.36	18.45	25.74	30	Pass
11ac-VHT80	42	5210	14.50	13.98	14.67	22.64	23	Pass
11ac-VHT80	58	5290	14.54	13.10	14.67	22.64	23	Pass
11ac-VHT80	106	5530	18.45	18.45	18.35	26.42	30	Pass
11ac-VHT80	122	5610	18.47	18.67	18.20	26.64	30	Pass

Note: Max EIRP Power(dBm) = RF Output Power + Antenna Gain(dBi) + 10*Log(1/Duty Cycle).

Normal Conditions (Temperature 25°C)

2Tx

Mode	Ch. No.	Freq. (MHz)	RF Output Power (dBm)		Total EIRP Power (dBm)	Limit (dBm)	Result
			Ant 0	Ant 1			
11n-HT20	36	5180	11.30	11.11	21.47	23	Pass
11n-HT20	64	5320	11.45	11.10	21.54	23	Pass
11n-HT20	100	5500	18.15	18.98	28.85	30	Pass
11n-HT20	140	5700	18.45	18.67	28.82	30	Pass
11ac-VHT20	36	5180	11.86	11.56	22.39	23	Pass
11ac-VHT20	64	5320	11.90	11.56	22.41	23	Pass
11ac-VHT20	100	5500	18.23	18.87	29.24	30	Pass
11ac-VHT20	140	5700	18.10	18.45	28.95	30	Pass
11n-HT40	38	5190	11.05	11.35	21.44	23	Pass
11n-HT40	62	5310	11.55	11.36	21.69	23	Pass
11n-HT40	102	5510	18.56	18.45	28.74	30	Pass
11n-HT40	134	5670	18.54	18.57	28.79	30	Pass
11ac-VHT40	38	5190	11.95	11.45	22.01	23	Pass
11ac-VHT40	62	5310	11.56	11.42	21.79	23	Pass
11ac-VHT40	102	5510	18.56	18.25	28.71	30	Pass
11ac-VHT40	134	5670	18.25	18.75	28.81	30	Pass
11ac-VHT80	42	5210	11.85	11.35	22.59	23	Pass
11ac-VHT80	58	5290	11.57	11.02	22.28	23	Pass
11ac-VHT80	106	5530	18.56	18.45	29.48	30	Pass
11ac-VHT80	122	5610	18.45	18.56	29.48	30	Pass

Note: Total EIRP Power(dBm) = $10*\log\{10^{(\text{Ant 0 RF Output Power }/10)}+10^{(\text{Ant 1 RF Output Power }/10)}\}$ + Antenna Gain(dBi) + 10*Log(1/Duty Cycle).

Normal Conditions (Temperature 25°C)

3Tx

Mode	Ch. No.	Freq. (MHz)	RF Output Power (dBm)			Max EIRP Power (dBm)	Limit (dBm)	Result
			Ant 0	Ant 1	Ant 2			
11n-HT20	36	5180	9.01	7.98	11.69	21.87	23	Pass
11n-HT20	64	5320	8.45	7.98	9.98	20.91	23	Pass
11n-HT20	100	5500	16.85	17.75	15.20	28.75	30	Pass
11n-HT20	140	5700	16.35	16.80	16.20	28.48	30	Pass
11ac-VHT20	36	5180	8.56	7.70	11.56	22.04	23	Pass
11ac-VHT20	64	5320	9.34	8.98	11.21	22.39	23	Pass
11ac-VHT20	100	5500	16.98	17.56	16.25	29.40	30	Pass
11ac-VHT20	140	5700	16.12	16.89	16.21	28.86	30	Pass
11n-HT40	38	5190	8.95	8.11	11.35	21.69	23	Pass
11n-HT40	62	5310	8.91	8.88	10.75	21.60	23	Pass
11n-HT40	102	5510	16.98	16.85	16.35	28.73	30	Pass
11n-HT40	134	5670	16.95	16.78	16.60	28.77	30	Pass
11ac-VHT40	38	5190	8.95	8.10	11.26	21.71	23	Pass
11ac-VHT40	62	5310	9.01	8.88	10.61	21.64	23	Pass
11ac-VHT40	102	5510	17.32	16.93	16.30	28.93	30	Pass
11ac-VHT40	134	5670	15.98	16.00	15.57	27.92	30	Pass
11ac-VHT80	42	5210	8.75	7.90	11.34	22.33	23	Pass
11ac-VHT80	58	5290	8.89	8.30	10.89	22.25	23	Pass
11ac-VHT80	106	5530	16.86	16.95	15.87	29.33	30	Pass
11ac-VHT80	122	5610	16.40	16.65	16.35	29.21	30	Pass

Note: Total EIRP Power(dBm) = $10*\log\{10^{(\text{Ant 0 RF Output Power }/10)}+10^{(\text{Ant 1 RF Output Power }/10)}+10^{(\text{Ant 2 RF Output Power }/10)}\}$ + Antenna Gain(dBi) + 10*Log(1/Duty Cycle).

Extreme Conditions (Temperature -20°C)

1Tx

Mode	Ch. No.	Freq. (MHz)	RF Output Power (dBm)			Max EIRP Power (dBm)	Limit (dBm)	Result
			Ant 0	Ant 1	Ant 2			
11a	36	5180	13.54	12.89	13.57	20.71	23	Pass
11a	64	5320	13.37	13.11	13.67	20.81	23	Pass
11a	100	5500	17.52	17.47	17.45	24.66	30	Pass
11a	140	5700	17.39	17.50	17.67	24.81	30	Pass
11n-HT20	36	5180	18.00	17.60	17.65	25.25	23	Pass
11n-HT20	64	5320	17.45	17.31	17.59	24.84	23	Pass
11n-HT20	100	5500	18.00	17.49	17.58	25.25	30	Pass
11n-HT20	140	5700	13.58	13.00	13.70	20.95	30	Pass
11ac-VHT20	36	5180	13.37	13.69	13.68	21.36	23	Pass
11ac-VHT20	64	5320	17.31	17.99	17.58	25.66	23	Pass
11ac-VHT20	100	5500	16.78	17.25	17.78	25.45	30	Pass
11ac-VHT20	140	5700	13.45	14.99	13.65	22.66	30	Pass
11n-HT40	38	5190	13.34	14.35	13.60	21.57	23	Pass
11n-HT40	62	5310	17.35	17.98	17.30	25.20	23	Pass
11n-HT40	102	5510	17.59	17.28	17.35	24.81	30	Pass
11n-HT40	134	5670	13.48	12.92	13.47	20.70	30	Pass
11ac-VHT40	38	5190	13.26	13.45	13.58	20.87	23	Pass
11ac-VHT40	62	5310	17.37	17.78	17.27	25.07	23	Pass
11ac-VHT40	102	5510	17.48	17.70	17.48	24.99	30	Pass
11ac-VHT40	134	5670	13.56	12.50	13.68	20.97	30	Pass
11ac-VHT80	42	5210	13.65	13.50	13.48	21.62	23	Pass
11ac-VHT80	58	5290	17.58	17.50	17.66	25.63	23	Pass
11ac-VHT80	106	5530	17.45	17.37	17.56	25.53	30	Pass
11ac-VHT80	122	5610	13.55	12.99	13.70	21.67	30	Pass

Note: Max EIRP Power(dBm) = RF Output Power + Antenna Gain(dBi) + 10*Log(1/Duty Cycle).

Extreme Conditions (Temperature -20°C)

2Tx

Mode	Ch. No.	Freq. (MHz)	RF Output Power (dBm)		Total EIRP Power (dBm)	Limit (dBm)	Result
			Ant 0	Ant 1			
11n-HT20	36	5180	10.34	10.13	20.50	23	Pass
11n-HT20	64	5320	10.46	10.11	20.55	23	Pass
11n-HT20	100	5500	17.16	17.99	27.86	30	Pass
11n-HT20	140	5700	17.44	17.65	27.81	30	Pass
11ac-VHT20	36	5180	10.87	10.55	21.39	23	Pass
11ac-VHT20	64	5320	10.90	10.56	21.41	23	Pass
11ac-VHT20	100	5500	17.23	17.87	28.24	30	Pass
11ac-VHT20	140	5700	17.10	17.45	27.95	30	Pass
11n-HT40	38	5190	10.07	10.36	20.45	23	Pass
11n-HT40	62	5310	10.55	10.37	20.69	23	Pass
11n-HT40	102	5510	17.56	17.45	27.74	30	Pass
11n-HT40	134	5670	17.53	17.54	27.77	30	Pass
11ac-VHT40	38	5190	10.95	10.46	21.01	23	Pass
11ac-VHT40	62	5310	10.57	10.46	20.82	23	Pass
11ac-VHT40	102	5510	17.55	17.28	27.72	30	Pass
11ac-VHT40	134	5670	17.28	17.74	27.82	30	Pass
11ac-VHT80	42	5210	10.86	10.36	21.60	23	Pass
11ac-VHT80	58	5290	10.57	10.05	21.30	23	Pass
11ac-VHT80	106	5530	17.58	17.48	28.51	30	Pass
11ac-VHT80	122	5610	17.48	17.58	28.51	30	Pass

Note: Total EIRP Power(dBm) = $10*\log\{10^{(\text{Ant 0 RF Output Power }/10)}+10^{(\text{Ant 1 RF Output Power }/10)}\}$ + Antenna Gain(dBi) + 10*Log(1/Duty Cycle).

Extreme Conditions (Temperature -20°C)

3Tx

Mode	Ch. No.	Freq. (MHz)	RF Output Power (dBm)			Max EIRP Power (dBm)	Limit (dBm)	Result
			Ant 0	Ant 1	Ant 2			
11n-HT20	36	5180	8.01	6.72	10.66	20.80	23	Pass
11n-HT20	64	5320	7.46	6.99	8.98	19.92	23	Pass
11n-HT20	100	5500	15.87	16.78	14.26	27.78	30	Pass
11n-HT20	140	5700	15.38	15.86	15.28	27.54	30	Pass
11ac-VHT20	36	5180	7.86	6.74	10.57	21.14	23	Pass
11ac-VHT20	64	5320	8.34	7.98	10.23	21.40	23	Pass
11ac-VHT20	100	5500	15.98	16.55	15.27	28.40	30	Pass
11ac-VHT20	140	5700	15.12	15.88	15.23	27.86	30	Pass
11n-HT40	38	5190	7.98	7.13	10.38	20.72	23	Pass
11n-HT40	62	5310	7.95	7.88	9.78	20.62	23	Pass
11n-HT40	102	5510	15.98	15.88	15.38	27.75	30	Pass
11n-HT40	134	5670	15.97	15.77	15.64	27.79	30	Pass
11ac-VHT40	38	5190	7.95	7.10	10.26	20.71	23	Pass
11ac-VHT40	62	5310	8.01	7.88	9.70	20.68	23	Pass
11ac-VHT40	102	5510	16.35	15.95	15.35	27.97	30	Pass
11ac-VHT40	134	5670	14.98	15.01	14.58	26.92	30	Pass
11ac-VHT80	42	5210	7.70	6.80	10.36	21.30	23	Pass
11ac-VHT80	58	5290	7.88	7.35	9.90	21.26	23	Pass
11ac-VHT80	106	5530	15.88	15.98	14.87	28.35	30	Pass
11ac-VHT80	122	5610	15.38	15.66	15.36	28.21	30	Pass

Note: Total EIRP Power(dBm) = $10*\log\{10^{(\text{Ant 0 RF Output Power }/10)}+10^{(\text{Ant 1 RF Output Power }/10)}+10^{(\text{Ant 2 RF Output Power }/10)}\}$ + Antenna Gain(dBi) + 10*Log(1/Duty Cycle).

Extreme Conditions (Temperature 70°C)

1Tx

Mode	Ch. No.	Freq. (MHz)	RF Output Power (dBm)			Max EIRP Power (dBm)	Limit (dBm)	Result
			Ant 0	Ant 1	Ant 2			
11a	36	5180	15.53	14.53	15.40	22.67	23	Pass
11a	64	5320	15.39	15.32	15.50	22.64	23	Pass
11a	100	5500	19.42	19.30	19.37	26.56	30	Pass
11a	140	5700	19.36	19.43	19.60	26.74	30	Pass
11n-HT20	36	5180	15.43	14.98	15.68	22.93	23	Pass
11n-HT20	64	5320	15.22	15.57	15.55	22.82	23	Pass
11n-HT20	100	5500	19.30	19.53	19.47	26.78	30	Pass
11n-HT20	140	5700	19.66	19.28	19.50	26.91	30	Pass
11ac-VHT20	36	5180	14.47	14.45	14.67	22.34	23	Pass
11ac-VHT20	64	5320	14.23	15.09	14.57	22.76	23	Pass
11ac-VHT20	100	5500	19.32	19.58	19.28	27.25	30	Pass
11ac-VHT20	140	5700	19.61	19.30	19.27	27.28	30	Pass
11n-HT40	38	5190	15.45	14.41	15.38	22.67	23	Pass
11n-HT40	62	5310	15.22	15.15	15.46	22.68	23	Pass
11n-HT40	102	5510	19.30	19.54	19.19	26.76	30	Pass
11n-HT40	134	5670	19.40	19.59	19.33	26.81	30	Pass
11ac-VHT40	38	5190	15.50	14.48	15.61	22.90	23	Pass
11ac-VHT40	62	5310	15.62	15.47	15.32	22.91	23	Pass
11ac-VHT40	102	5510	19.58	19.37	19.41	26.87	30	Pass
11ac-VHT40	134	5670	19.40	19.26	19.33	26.69	30	Pass
11ac-VHT80	42	5210	14.45	14.84	14.50	22.81	23	Pass
11ac-VHT80	58	5290	14.47	13.95	14.48	22.45	23	Pass
11ac-VHT80	106	5530	19.40	19.49	19.27	27.46	30	Pass
11ac-VHT80	122	5610	19.48	19.50	19.11	27.47	30	Pass

Note: Max EIRP Power(dBm) = RF Output Power + Antenna Gain(dBi) + 10*Log(1/Duty Cycle).

Extreme Conditions (Temperature 70°C)

2Tx

Mode	Ch. No.	Freq. (MHz)	RF Output Power (dBm)		Total EIRP Power (dBm)	Limit (dBm)	Result
			Ant 0	Ant 1			
11n-HT20	36	5180	12.26	11.96	22.37	23	Pass
11n-HT20	64	5320	12.30	11.96	22.39	23	Pass
11n-HT20	100	5500	19.13	19.70	29.68	30	Pass
11n-HT20	140	5700	19.32	19.58	29.71	30	Pass
11ac-VHT20	36	5180	11.76	11.45	22.28	23	Pass
11ac-VHT20	64	5320	11.87	11.47	22.35	23	Pass
11ac-VHT20	100	5500	19.11	19.27	29.87	30	Pass
11ac-VHT20	140	5700	19.05	19.30	29.85	30	Pass
11n-HT40	38	5190	12.81	12.26	22.78	23	Pass
11n-HT40	62	5310	12.44	12.31	22.61	23	Pass
11n-HT40	102	5510	19.45	19.36	29.64	30	Pass
11n-HT40	134	5670	19.44	19.45	29.68	30	Pass
11ac-VHT40	38	5190	12.85	12.35	22.91	23	Pass
11ac-VHT40	62	5310	12.48	12.32	22.70	23	Pass
11ac-VHT40	102	5510	19.42	19.18	29.60	30	Pass
11ac-VHT40	134	5670	19.19	19.60	29.70	30	Pass
11ac-VHT80	42	5210	11.70	11.24	22.46	23	Pass
11ac-VHT80	58	5290	11.47	11.88	22.66	23	Pass
11ac-VHT80	106	5530	18.41	18.38	29.37	30	Pass
11ac-VHT80	122	5610	18.30	18.46	29.36	30	Pass

Note: Total EIRP Power(dBm) = $10*\log\{10^{(\text{Ant 0 RF Output Power }/10)}+10^{(\text{Ant 1 RF Output Power }/10)}\}$ + Antenna Gain(dBi) + 10*Log(1/Duty Cycle).

Extreme Conditions (Temperature 70°C)

3Tx

Mode	Ch. No.	Freq. (MHz)	RF Output Power (dBm)			Max EIRP Power (dBm)	Limit (dBm)	Result
			Ant 0	Ant 1	Ant 2			
11n-HT20	36	5180	9.53	8.68	12.53	22.60	23	Pass
11n-HT20	64	5320	10.20	9.79	11.82	22.72	23	Pass
11n-HT20	100	5500	17.75	18.62	16.19	29.65	30	Pass
11n-HT20	140	5700	17.24	17.78	17.15	29.42	30	Pass
11ac-VHT20	36	5180	9.53	8.66	12.46	22.97	23	Pass
11ac-VHT20	64	5320	10.25	9.75	11.12	22.85	23	Pass
11ac-VHT20	100	5500	17.83	17.43	17.12	29.91	30	Pass
11ac-VHT20	140	5700	17.36	17.70	17.06	29.82	30	Pass
11n-HT40	38	5190	9.93	9.06	12.34	22.67	23	Pass
11n-HT40	62	5310	9.90	9.86	11.71	22.57	23	Pass
11n-HT40	102	5510	17.99	17.82	17.34	29.72	30	Pass
11n-HT40	134	5670	17.93	17.75	17.59	29.75	30	Pass
11ac-VHT40	38	5190	9.90	9.11	12.24	22.69	23	Pass
11ac-VHT40	62	5310	10.00	9.77	11.59	22.59	23	Pass
11ac-VHT40	102	5510	18.20	17.86	17.25	29.85	30	Pass
11ac-VHT40	134	5670	16.93	17.00	16.50	28.88	30	Pass
11ac-VHT80	42	5210	9.72	8.85	10.28	22.40	23	Pass
11ac-VHT80	58	5290	9.86	9.22	9.88	22.40	23	Pass
11ac-VHT80	106	5530	16.82	16.91	16.86	29.60	30	Pass
11ac-VHT80	122	5610	16.38	16.63	16.30	29.18	30	Pass

Note: Total EIRP Power(dBm) = $10*\log\{10^{(\text{Ant 0 RF Output Power }/10)}+10^{(\text{Ant 1 RF Output Power }/10)}+10^{(\text{Ant 2 RF Output Power }/10)}\}$ + Antenna Gain(dBi) + 10*Log(1/Duty Cycle).

Transmit Power Control (TPC)

Normal Conditions (Temperature 25°C)

Mode	Ch. No.	Freq. (MHz)	RF Output Power (dBm)			Max EIRP Power (dBm)	Limit (dBm)	Result
			Ant 0	Ant 1	Ant 2			
11n-HT20	64	5320	2.08	1.61	3.61	14.54	17	Pass
11n-HT20	100	5500	10.48	11.38	8.83	22.38	24	Pass
11n-HT20	140	5700	9.98	10.43	9.83	22.11	24	Pass
11ac-VHT20	64	5320	2.97	2.61	4.84	16.02	17	Pass
11ac-VHT20	100	5500	10.61	11.19	9.88	23.03	24	Pass
11ac-VHT20	140	5700	9.75	10.52	9.84	22.49	24	Pass
11n-HT40	62	5310	2.54	2.51	4.38	15.23	17	Pass
11n-HT40	102	5510	10.61	10.48	9.98	22.36	24	Pass
11n-HT40	134	5670	10.58	10.41	10.23	22.40	24	Pass
11ac-VHT40	62	5310	2.64	2.51	4.24	15.27	17	Pass
11ac-VHT40	102	5510	10.95	10.56	9.93	22.56	24	Pass
11ac-VHT40	134	5670	9.61	9.63	9.20	21.55	24	Pass
11ac-VHT80	58	5290	2.52	1.93	4.52	15.88	17	Pass
11ac-VHT80	106	5530	10.49	10.58	9.50	22.96	24	Pass
11ac-VHT80	122	5610	10.03	10.28	9.98	22.84	24	Pass

Note: Total EIRP Power(dBm) = $10*\log\{10^{(\text{Ant 0 RF Output Power }/10)}+10^{(\text{Ant 1 RF Output Power }/10)}+10^{(\text{Ant 2 RF Output Power }/10)}\}$ + Antenna Gain(dBi) + 10*Log(1/Duty Cycle)

Extreme Conditions (Temperature -20°C)

Mode	Ch. No.	Freq. (MHz)	RF Output Power (dBm)			Max EIRP Power (dBm)	Limit (dBm)	Result
			Ant 0	Ant 1	Ant 2			
11n-HT20	64	5320	1.09	0.62	2.61	13.55	17	Pass
11n-HT20	100	5500	9.50	10.41	7.89	21.41	24	Pass
11n-HT20	140	5700	9.01	9.49	8.91	21.17	24	Pass
11ac-VHT20	64	5320	1.97	1.61	3.86	15.03	17	Pass
11ac-VHT20	100	5500	9.61	10.18	8.90	22.03	24	Pass
11ac-VHT20	140	5700	8.75	9.51	8.86	21.49	24	Pass
11n-HT40	62	5310	1.58	1.51	3.41	14.25	17	Pass
11n-HT40	102	5510	9.61	9.51	9.01	21.38	24	Pass
11n-HT40	134	5670	9.60	9.40	9.27	21.42	24	Pass
11ac-VHT40	62	5310	1.64	1.51	3.33	14.31	17	Pass
11ac-VHT40	102	5510	9.98	9.58	8.98	21.60	24	Pass
11ac-VHT40	134	5670	8.61	8.64	8.21	20.55	24	Pass
11ac-VHT80	58	5290	1.51	0.98	3.53	14.89	17	Pass
11ac-VHT80	106	5530	9.51	9.61	8.50	21.98	24	Pass
11ac-VHT80	122	5610	9.01	9.29	8.99	21.84	24	Pass

Note: Total EIRP Power(dBm) = $10*\log\{10^{(\text{Ant 0 RF Output Power }/10)}+10^{(\text{Ant 1 RF Output Power }/10)}+10^{(\text{Ant 2 RF Output Power }/10)}\}$ + Antenna Gain(dBi) + 10*Log(1/Duty Cycle)

Extreme Conditions (Temperature 70°C)

Mode	Ch. No.	Freq. (MHz)	RF Output Power (dBm)			Max EIRP Power (dBm)	Limit (dBm)	Result
			Ant 0	Ant 1	Ant 2			
11n-HT20	64	5320	3.83	3.42	5.45	16.35	17	Pass
11n-HT20	100	5500	11.38	12.25	9.82	23.28	24	Pass
11n-HT20	140	5700	10.87	11.41	10.78	23.05	24	Pass
11ac-VHT20	64	5320	3.88	3.38	4.75	16.48	17	Pass
11ac-VHT20	100	5500	11.46	11.06	10.75	23.54	24	Pass
11ac-VHT20	140	5700	10.99	11.33	10.69	23.45	24	Pass
11n-HT40	62	5310	3.53	3.49	5.34	16.20	17	Pass
11n-HT40	102	5510	11.62	11.45	10.97	23.35	24	Pass
11n-HT40	134	5670	11.56	11.38	11.22	23.38	24	Pass
11ac-VHT40	62	5310	3.63	3.40	5.22	16.22	17	Pass
11ac-VHT40	102	5510	11.83	11.49	10.88	23.48	24	Pass
11ac-VHT40	134	5670	10.56	10.63	10.13	22.51	24	Pass
11ac-VHT80	58	5290	3.49	2.85	3.51	16.03	17	Pass
11ac-VHT80	106	5530	10.45	10.54	10.49	23.23	24	Pass
11ac-VHT80	122	5610	10.01	10.26	9.93	22.81	24	Pass

Note: Total EIRP Power(dBm) = $10*\log\{10^{(\text{Ant 0 RF Output Power }/10)}+10^{(\text{Ant 1 RF Output Power }/10)}+10^{(\text{Ant 2 RF Output Power }/10)}\}$ + Antenna Gain(dBi) + 10*Log(1/Duty Cycle).

Power Density

1Tx

Mode	Ch. No.	Freq. (MHz)	Power Density (dBm/MHz)			Max Power Density (dBm/MHz)	Limit (dBm/MHz)	Result
			Ant 0	Ant 1	Ant 2			
11a	36	5180	2.65	2.81	1.79	9.95	10	Pass
11a	64	5320	2.38	2.56	2.56	9.70	10	Pass
11a	100	5500	7.15	8.10	8.75	15.89	17	Pass
11a	140	5700	7.73	7.62	7.06	14.87	17	Pass
11n-HT20	36	5180	2.38	2.56	0.49	9.81	10	Pass
11n-HT20	64	5320	2.70	2.65	1.21	9.95	10	Pass
11n-HT20	100	5500	6.94	7.92	7.76	15.17	17	Pass
11n-HT20	140	5700	8.10	7.25	7.05	15.35	17	Pass
11ac-VHT20	36	5180	2.46	2.36	0.57	9.13	10	Pass
11ac-VHT20	64	5320	2.62	2.63	1.13	9.30	10	Pass
11ac-VHT20	100	5500	6.92	8.25	8.05	15.92	17	Pass
11ac-VHT20	140	5700	7.71	7.09	6.57	15.38	17	Pass
11n-HT40	38	5190	-1.11	-1.54	-2.59	6.11	10	Pass
11n-HT40	62	5310	-1.41	-1.12	-2.56	6.10	10	Pass
11n-HT40	102	5510	3.41	3.13	4.35	11.57	17	Pass
11n-HT40	134	5670	3.16	3.49	3.92	11.14	17	Pass
11ac-VHT40	38	5190	0.37	-0.61	-2.00	7.66	10	Pass
11ac-VHT40	62	5310	-0.19	0.00	-2.54	7.29	10	Pass
11ac-VHT40	102	5510	4.44	4.94	4.79	12.23	17	Pass
11ac-VHT40	134	5670	3.89	3.90	3.22	11.19	17	Pass
11ac-VHT80	42	5210	-3.14	-3.08	-3.52	4.89	10	Pass
11ac-VHT80	58	5290	-3.28	-3.08	-2.97	5.00	10	Pass
11ac-VHT80	106	5530	0.56	0.68	0.71	8.68	17	Pass
11ac-VHT80	122	5610	0.41	0.55	0.64	8.61	17	Pass

Note: Max Power Density (dBm/MHz) = Power Density + Antenna Gain + 10*Log(1/Duty Cycle).

2Tx

Mode	Ch. No.	Freq. (MHz)	Power Density (dBm/MHz)		Total Power Density (dBm/MHz)	Limit (dBm/MHz)	Result
			Ant 0	Ant 1			
11n-HT20	36	5180	-0.04	-0.84	9.84	10	Pass
11n-HT20	64	5320	-0.44	-1.01	9.54	10	Pass
11n-HT20	100	5500	6.01	7.34	16.99	17	Pass
11n-HT20	140	5700	7.18	6.38	17.06	17	Pass
11ac-VHT20	36	5180	-0.92	-0.93	9.75	10	Pass
11ac-VHT20	64	5320	-0.86	-1.36	9.57	10	Pass
11ac-VHT20	100	5500	5.82	6.76	16.99	17	Pass
11ac-VHT20	140	5700	6.92	6.49	17.39	17	Pass
11n-HT40	38	5190	-2.46	-2.74	7.64	10	Pass
11n-HT40	62	5310	-2.73	-2.71	7.51	10	Pass
11n-HT40	102	5510	4.34	3.7	14.26	17	Pass
11n-HT40	134	5670	5.01	4.62	15.05	17	Pass
11ac-VHT40	38	5190	-2.15	-2.5	7.98	10	Pass
11ac-VHT40	62	5310	-2.58	-2.84	7.59	10	Pass
11ac-VHT40	102	5510	3.51	4.17	14.15	17	Pass
11ac-VHT40	134	5670	4.85	4.52	14.99	17	Pass
11ac-VHT80	42	5210	-5.81	-5.37	5.39	10	Pass
11ac-VHT80	58	5290	-5.66	-5.28	5.51	10	Pass
11ac-VHT80	106	5530	-2.18	-1.84	8.97	17	Pass
11ac-VHT80	122	5610	-2.07	-1.94	8.97	17	Pass

Note: Total Power Density(dBm/MHz) = $10*\log\{10^{(\text{Ant 0 Power Density }/10)}+10^{(\text{Ant 1 Power Density }/10)}\}$ + Antenna Gain(dBi) + 10*Log(1/Duty Cycle).

3Tx

Mode	Ch. No.	Freq. (MHz)	Power Density (dBm/MHz)			Max Power Density (dBm/MHz)	Limit (dBm/MHz)	Result
			Ant 0	Ant 1	Ant 2			
11n-HT20	36	5180	-3.03	-4.08	-0.81	9.60	10	Pass
11n-HT20	64	5320	-1.91	-3.78	-1.31	9.81	10	Pass
11n-HT20	100	5500	3.51	5.49	4.69	16.66	17	Pass
11n-HT20	140	5700	4.82	4.62	4.94	16.82	17	Pass
11ac-VHT20	36	5180	-2.7	-3.59	-2.08	9.69	10	Pass
11ac-VHT20	64	5320	-2.74	-3.12	-1.94	9.86	10	Pass
11ac-VHT20	100	5500	3.87	4.23	3.78	16.40	17	Pass
11ac-VHT20	140	5700	4.33	4.54	4.18	16.79	17	Pass
11n-HT40	38	5190	-5.41	-6.43	-3.23	7.18	10	Pass
11n-HT40	62	5310	-5.53	-5.72	-3.5	7.20	10	Pass
11n-HT40	102	5510	2.41	2.67	2.73	14.60	17	Pass
11n-HT40	134	5670	3.08	2.7	3.29	15.02	17	Pass
11ac-VHT40	38	5190	-5.85	-0.63	-3.34	9.30	10	Pass
11ac-VHT40	62	5310	-5.06	-5.51	-3.31	7.54	10	Pass
11ac-VHT40	102	5510	2.91	2.73	2.95	14.93	17	Pass
11ac-VHT40	134	5670	2.92	2.29	3.11	14.85	17	Pass
11ac-VHT80	42	5210	-7.79	-7.46	-7.44	5.18	10	Pass
11ac-VHT80	58	5290	-7.81	-7.55	-7.81	5.02	10	Pass
11ac-VHT80	106	5530	-4.45	-4.26	-4.31	8.40	17	Pass
11ac-VHT80	122	5610	-4.63	-4.11	-4.17	8.44	17	Pass

Note: Total Power Density(dBm/MHz) = $10*\log\{10^{(\text{Ant 0 Power Density }/10)}+10^{(\text{Ant 1 Power Density }/10)}+10^{(\text{Ant 1 Power Density }/10)}\}$ + Antenna Gain(dBi) + 10*Log(1/Duty Cycle).

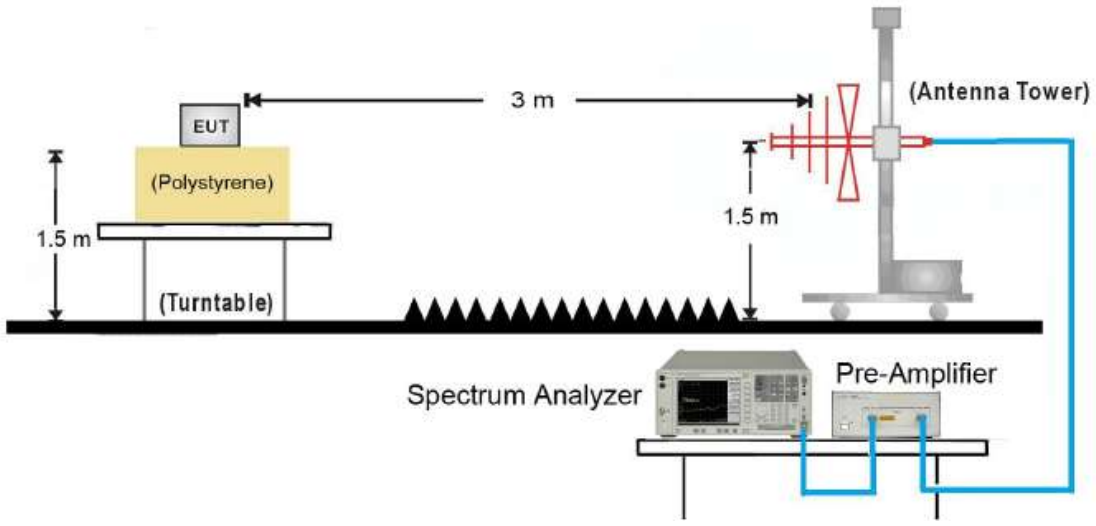
7. Transmitter Unwanted Emissions Outside the 5GHz RLAN Bands

7.1. Limit

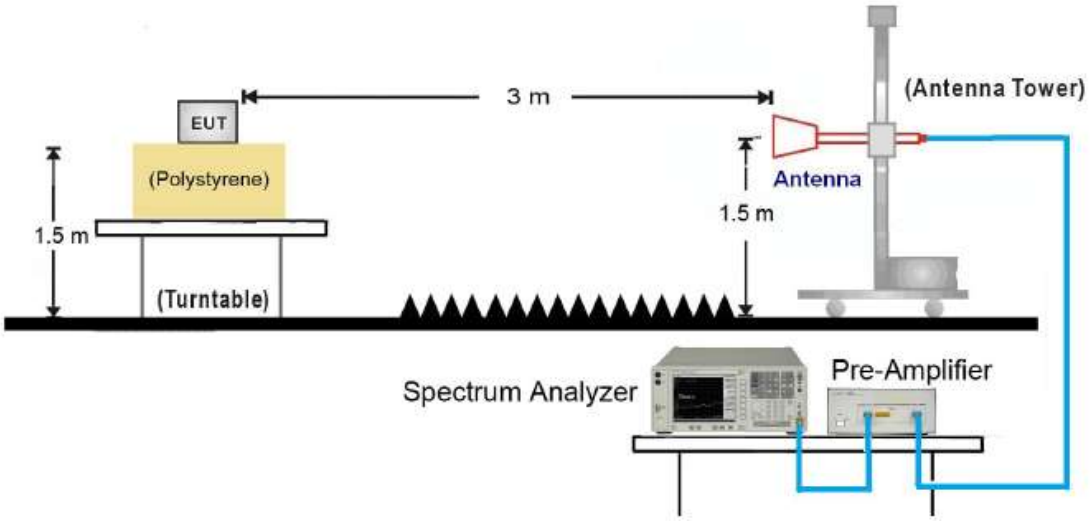
Frequency Range	Maximum Power	Bandwidth
30 MHz to 47 MHz	-36dBm	100 kHz
47 MHz to 74 MHz	-54dBm	100 kHz
74 MHz to 87.5 MHz	-36dBm	100 kHz
87.5 MHz to 118 MHz	-54dBm	100 kHz
118 MHz to 174 MHz	-36dBm	100 kHz
174 MHz to 230 MHz	-54dBm	100 kHz
230 MHz to 470 MHz	-36dBm	100 kHz
470 MHz to 862 MHz	-54dBm	100 kHz
862 MHz to 1 GHz	-36dBm	100 kHz
1 GHz to 5.15 GHz	-30dBm	1 MHz
5.35 GHz to 5.47 GHz	-30dBm	1 MHz
5.725 GHz to 26.5 GHz	-30dBm	1 MHz

7.2. Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



7.3. Test Procedure

Refer to ETSI EN 301 893 V1.7.1 (2012-06) Clause 5.3.5.2.2.

7.4. Test Result

Test Engineer	Milo Li	Temperature	26°C
Test Time	05-07-2015	Relative Humidity	54%
Test Mode	802.11a – 1Tx	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
60	154.2	-70.48	-36	-34.48	Peak	Horizontal
	99.7	-72.66	-54	-18.66	Peak	Vertical
	853.0	-73.71	-54	-19.71	Peak	Horizontal
	157.6	-67.00	-36	-31.00	Peak	Vertical
	11000.0	-42.28	-30	-12.28	Peak	Horizontal
	11000.0	-44.12	-30	-14.12	Peak	Vertical
	16500.0	-37.81	-30	-7.81	Peak	Horizontal
	16500.0	-42.38	-30	-12.38	Peak	Vertical
100	577.6	-63.17	-54	-9.17	Peak	Horizontal
	666.6	-61.93	-54	-7.93	Peak	Vertical
	670.2	-69.85	-54	-15.85	Peak	Horizontal
	806.4	-63.72	-54	-9.72	Peak	Vertical
	11000.0	-33.10	-30	-3.10	Peak	Horizontal
	11000.0	-34.15	-30	-4.15	Peak	Vertical
	16500.0	-41.87	-30	-11.87	Peak	Horizontal
	16500.0	-37.73	-30	-7.73	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Time	05-07-2015	Relative Humidity	54%
Test Mode	802.11n-HT20 – 3Tx	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
60	554.1	-71.71	-54	-17.71	Peak	Horizontal
	76.4	-64.13	-36	-28.13	Peak	Vertical
	681.9	-67.08	-54	-13.08	Peak	Horizontal
	805.7	-58.66	-54	-4.66	Peak	Vertical
	11000.0	-36.50	-30	-6.50	Peak	Horizontal
	11000.0	-35.44	-30	-5.44	Peak	Vertical
	16500.0	-39.56	-30	-9.56	Peak	Horizontal
	16500.0	-39.47	-30	-9.47	Peak	Vertical
100	535.0	-65.40	-54	-11.40	Peak	Horizontal
	164.1	-53.70	-36	-17.70	Peak	Vertical
	747.4	-64.73	-54	-10.73	Peak	Horizontal
	794.0	-62.31	-54	-8.31	Peak	Vertical
	11000.0	-39.91	-30	-9.91	Peak	Horizontal
	11000.0	-35.43	-30	-5.43	Peak	Vertical
	16500.0	-35.10	-30	-5.10	Peak	Horizontal
	16500.0	-38.25	-30	-8.25	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Time	05-07-2015	Relative Humidity	54%
Test Mode	802.11n-HT40 – 3Tx	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
62	92.6	-64.06	-54	-10.06	Peak	Horizontal
	609.8	-61.39	-54	-7.39	Peak	Vertical
	128.0	-66.05	-36	-30.05	Peak	Horizontal
	851.5	-70.58	-54	-16.58	Peak	Vertical
	11020.0	-36.49	-30	-6.49	Peak	Horizontal
	11020.0	-38.82	-30	-8.82	Peak	Vertical
	16530.0	-40.78	-30	-10.78	Peak	Horizontal
	16530.0	-34.86	-30	-4.86	Peak	Vertical
102	577.5	-81.57	-54	-27.57	Peak	Horizontal
	118.3	-63.32	-36	-27.32	Peak	Vertical
	764.9	-67.44	-54	-13.44	Peak	Horizontal
	616.2	-59.36	-54	-5.36	Peak	Vertical
	11020.0	-36.57	-30	-6.57	Peak	Horizontal
	11020.0	-43.55	-30	-13.55	Peak	Vertical
	16530.0	-34.12	-30	-4.12	Peak	Horizontal
	16530.0	-37.80	-30	-7.80	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Time	05-07-2015	Relative Humidity	54%
Test Mode	802.11ac-VHT20 – 3Tx	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
60	514.4	-71.74	-54	-17.74	Peak	Horizontal
	79.8	-65.34	-36	-29.34	Peak	Vertical
	672.2	-67.12	-54	-13.12	Peak	Horizontal
	723.4	-60.42	-54	-6.42	Peak	Vertical
	11000.0	-35.20	-30	-5.20	Peak	Horizontal
	11000.0	-43.68	-30	-13.68	Peak	Vertical
	16500.0	-35.38	-30	-5.38	Peak	Horizontal
	16500.0	-38.33	-30	-8.33	Peak	Vertical
100	516.7	-72.05	-54	-18.05	Peak	Horizontal
	85.4	-63.27	-36	-27.27	Peak	Vertical
	681.3	-63.73	-54	-9.73	Peak	Horizontal
	813.3	-63.95	-54	-9.95	Peak	Vertical
	11000.0	-42.79	-30	-12.79	Peak	Horizontal
	11000.0	-36.65	-30	-6.65	Peak	Vertical
	16500.0	-39.18	-30	-9.18	Peak	Horizontal
	16500.0	-40.15	-30	-10.15	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Time	05-07-2015	Relative Humidity	54%
Test Mode	802.11ac-VHT40 – 3Tx	Test Site	AC1

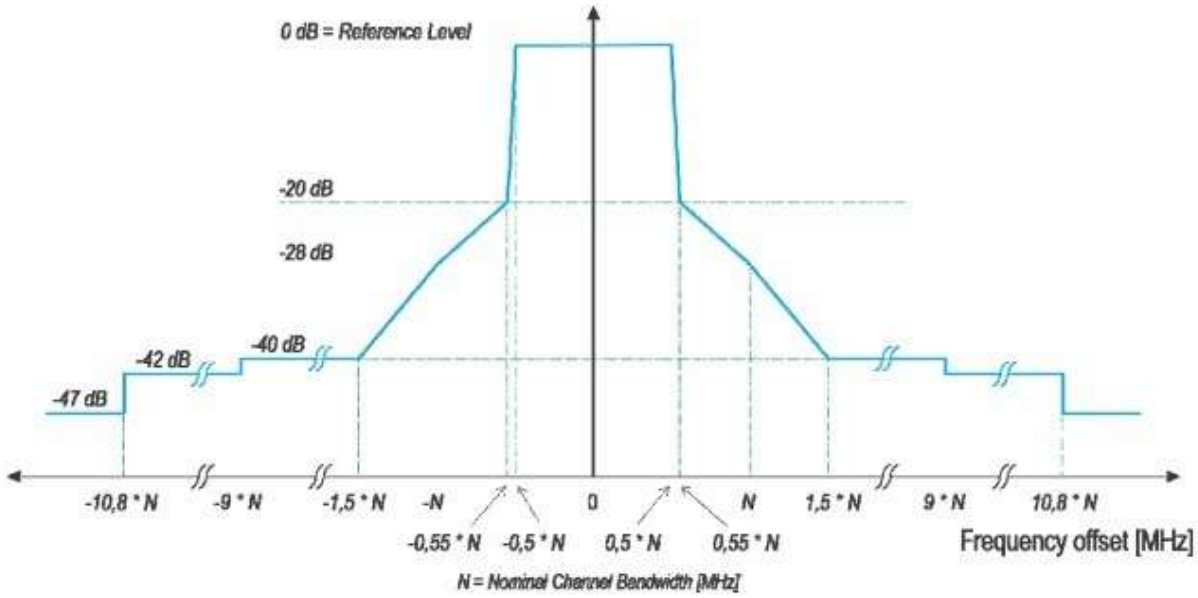
Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
62	176.7	-64.57	-54	-10.57	Peak	Horizontal
	716.0	-63.57	-54	-9.57	Peak	Vertical
	263.3	-63.26	-36	-27.26	Peak	Horizontal
	815.4	-61.65	-54	-7.65	Peak	Vertical
	11020.0	-38.81	-30	-8.81	Peak	Horizontal
	11020.0	-39.53	-30	-9.53	Peak	Vertical
	16530.0	-36.77	-30	-6.77	Peak	Horizontal
	16530.0	-37.54	-30	-7.54	Peak	Vertical
102	592.3	-76.17	-54	-22.17	Peak	Horizontal
	124.2	-60.57	-36	-24.57	Peak	Vertical
	676.0	-68.03	-54	-14.03	Peak	Horizontal
	639.5	-64.26	-54	-10.26	Peak	Vertical
	11020.0	-37.33	-30	-7.33	Peak	Horizontal
	11020.0	-43.42	-30	-13.42	Peak	Vertical
	16530.0	-42.29	-30	-12.29	Peak	Horizontal
	16530.0	-35.43	-30	-5.43	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Time	05-07-2015	Relative Humidity	54%
Test Mode	802.11ac-VHT80 – 3Tx	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
58	166.5	-76.62	-36	-40.62	Peak	Horizontal
	121.7	-72.63	-36	-36.63	Peak	Vertical
	883.2	-69.25	-36	-33.25	Peak	Horizontal
	134.3	-64.72	-36	-28.72	Peak	Vertical
	11060.0	-35.88	-30	-5.88	Peak	Horizontal
	11060.0	-44.33	-30	-14.33	Peak	Vertical
	16590.0	-39.87	-30	-9.87	Peak	Horizontal
	16590.0	-39.66	-30	-9.66	Peak	Vertical
106	463.5	-63.81	-36	-27.81	Peak	Horizontal
	668.5	-62.63	-54	-8.63	Peak	Vertical
	703.4	-75.81	-54	-21.81	Peak	Horizontal
	858.6	-67.10	-54	-13.10	Peak	Vertical
	11060.0	-37.46	-30	-7.46	Peak	Horizontal
	11060.0	-35.55	-30	-5.55	Peak	Vertical
	16590.0	-35.60	-30	-5.60	Peak	Horizontal
	16590.0	-36.71	-30	-6.71	Peak	Vertical

8. Transmitter Unwanted Emissions Within the 5GHz RLAN Bands

8.1. Limit

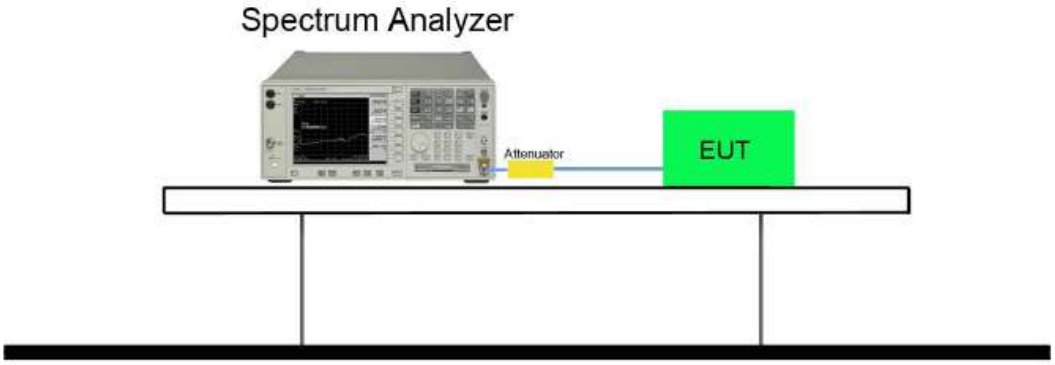


NOTE: dBc is the spectral density relative to the maximum spectral power density of the transmitted signal.

Figure 1: Transmit spectral power mask

8.2. Test Setup

Conducted measurements



8.3. Test Procedure

Refer to ETSI EN 301 893 V1.7.1 (2012-06) Clause 5.3.6.2.1.

8.4. Test Result

Product	Milo Li	Temperature	26°C
Test Engineer	08-24-2014	Relative Humidity	54%

1Tx

Test Mode	Channel No.	Frequency (MHz)	Result
802.11a	36	5180	Pass
802.11a	64	5320	Pass
802.11a	100	5500	Pass
802.11a	140	5700	Pass
802.11n-HT20	36	5180	Pass
802.11n-HT20	64	5320	Pass
802.11n-HT20	100	5500	Pass
802.11n-HT20	140	5700	Pass
802.11n-HT40	38	5190	Pass
802.11n-HT40	62	5310	Pass
802.11n-HT40	102	5510	Pass
802.11n-HT40	134	5670	Pass
802.11ac-VHT20	36	5180	Pass
802.11ac-VHT20	64	5320	Pass
802.11ac-VHT20	100	5500	Pass
802.11ac-VHT20	140	5700	Pass
802.11ac-VHT40	38	5190	Pass
802.11ac-VHT40	62	5310	Pass
802.11ac-VHT40	102	5510	Pass
802.11ac-VHT40	134	5670	Pass
802.11ac-VHT80	42	5210	Pass
802.11ac-VHT80	58	5290	Pass
802.11ac-VHT80	106	5530	Pass
802.11ac-VHT80	122	5610	Pass

2Tx

Test Mode	Channel No.	Frequency (MHz)	Result
802.11n-HT20	36	5180	Pass
802.11n-HT20	64	5320	Pass
802.11n-HT20	100	5500	Pass
802.11n-HT20	140	5700	Pass
802.11n-HT40	38	5190	Pass
802.11n-HT40	62	5310	Pass
802.11n-HT40	102	5510	Pass
802.11n-HT40	134	5670	Pass
802.11ac-VHT20	36	5180	Pass
802.11ac-VHT20	64	5320	Pass
802.11ac-VHT20	100	5500	Pass
802.11ac-VHT20	140	5700	Pass
802.11ac-VHT40	38	5190	Pass
802.11ac-VHT40	62	5310	Pass
802.11ac-VHT40	102	5510	Pass
802.11ac-VHT40	134	5670	Pass
802.11ac-VHT80	42	5210	Pass
802.11ac-VHT80	58	5290	Pass
802.11ac-VHT80	106	5530	Pass
802.11ac-VHT80	122	5610	Pass

3Tx

Test Mode	Channel No.	Frequency (MHz)	Result
802.11n-HT20	36	5180	Pass
802.11n-HT20	64	5320	Pass
802.11n-HT20	100	5500	Pass
802.11n-HT20	140	5700	Pass
802.11n-HT40	38	5190	Pass
802.11n-HT40	62	5310	Pass
802.11n-HT40	102	5510	Pass
802.11n-HT40	134	5670	Pass
802.11ac-VHT20	36	5180	Pass
802.11ac-VHT20	64	5320	Pass
802.11ac-VHT20	100	5500	Pass
802.11ac-VHT20	140	5700	Pass
802.11ac-VHT40	38	5190	Pass
802.11ac-VHT40	62	5310	Pass
802.11ac-VHT40	102	5510	Pass
802.11ac-VHT40	134	5670	Pass
802.11ac-VHT80	42	5210	Pass
802.11ac-VHT80	58	5290	Pass
802.11ac-VHT80	106	5530	Pass
802.11ac-VHT80	122	5610	Pass

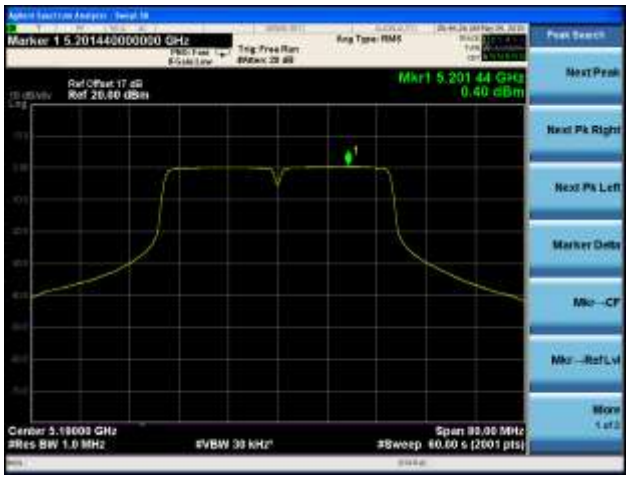
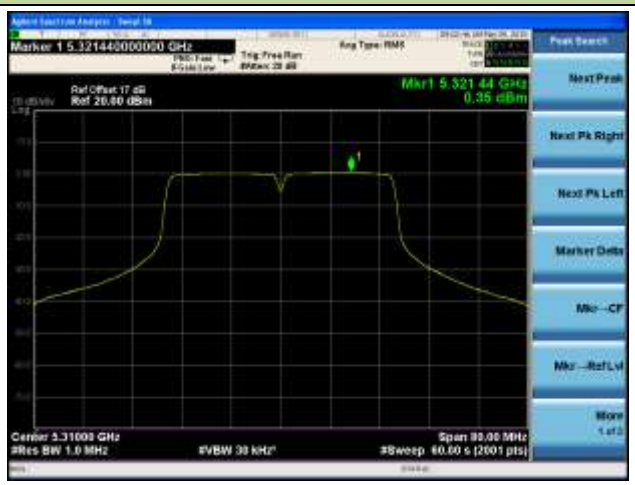
802.11a Transmitter Unwanted Emissions Within the 5GHz RLAN Bands – 1Tx	
Channel 36 (5180MHz)	
The Reference Level	**The Mask Data**
	
Channel 64 (5320MHz)	
The Reference Level	**The Mask Data**
	
Channel 100 (5500MHz)	
The Reference Level	**The Mask Data**
	

Channel 140 (5700MHz)	
The Reference Level	**The Mask Data**
	
802.11n-HT20 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands – 1Tx	
Channel 36 (5180MHz)	
The Reference Level	**The Mask Data**
	
Channel 64 (5320MHz)	
The Reference Level	**The Mask Data**
	

Channel 100 (5500MHz)	
The Reference Level	**The Mask Data**
	
Channel 140 (5700MHz)	
The Reference Level	**The Mask Data**
	
802.11n-HT40 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands – 1Tx	
Channel 38 (5190MHz)	
The Reference Level	**The Mask Data**
	

Channel 62 (5310MHz)	
The Reference Level	**The Mask Data**
	
Channel 102 (5510MHz)	
The Reference Level	**The Mask Data**
	
Channel 134 (5670MHz)	
The Reference Level	**The Mask Data**
	

802.11ac-VHT20 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands – 1Tx	
Channel 36 (5180MHz)	
The Reference Level	**The Mask Data**
	
Channel 64 (5320MHz)	
The Reference Level	**The Mask Data**
	
Channel 100 (5500MHz)	
The Reference Level	**The Mask Data**
	

Channel 140 (5700MHz)	
The Reference Level	**The Mask Data**
	
802.11ac-VHT40 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands – 1Tx	
Channel 38 (5190MHz)	
The Reference Level	**The Mask Data**
	
Channel 62 (5310MHz)	
The Reference Level	**The Mask Data**
	

Channel 102 (5510MHz)	
The Reference Level	**The Mask Data**
	
Channel 134 (5670MHz)	
The Reference Level	**The Mask Data**
	
802.11ac-VHT80 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands – 1Tx	
Channel 42 (5210MHz)	
The Reference Level	**The Mask Data**
	

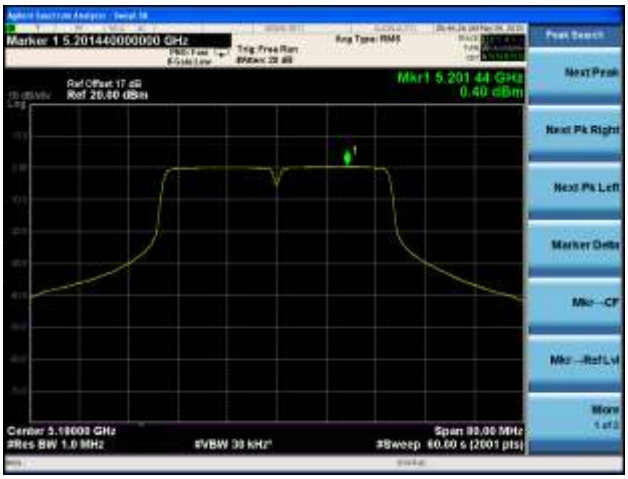
Channel 58 (5290MHz)	
The Reference Level	**The Mask Data**
	
Channel 106 (5530MHz)	
The Reference Level	**The Mask Data**
	
Channel 122 (5610MHz)	
The Reference Level	**The Mask Data**
	

802.11n-HT20 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands – 2Tx	
Channel 36 (5180MHz)	
The Reference Level	The Mask Data
	
Channel 64 (5320MHz)	
The Reference Level	The Mask Data
	
Channel 100 (5500MHz)	
The Reference Level	The Mask Data
	

Channel 140 (5700MHz)	
The Reference Level	**The Mask Data**
	
802.11n-HT40 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands – 2Tx	
Channel 38 (5190MHz)	
The Reference Level	**The Mask Data**
	
Channel 62 (5310MHz)	
The Reference Level	**The Mask Data**
	

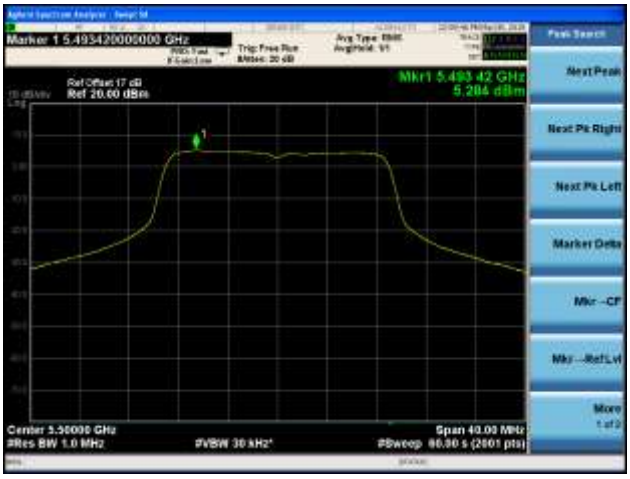
Channel 102 (5510MHz)	
The Reference Level	**The Mask Data**
	
Channel 134 (5670MHz)	
The Reference Level	**The Mask Data**
	
802.11ac-VHT20 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands – 2Tx	
Channel 36 (5180MHz)	
The Reference Level	**The Mask Data**
	

Channel 64 (5320MHz)	
The Reference Level	**The Mask Data**
	
Channel 100 (5500MHz)	
The Reference Level	**The Mask Data**
	
Channel 140 (5700MHz)	
The Reference Level	**The Mask Data**
	

802.11ac-VHT40 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands – 2Tx	
Channel 38 (5190MHz)	
The Reference Level	**The Mask Data**
	
Channel 62 (5310MHz)	
The Reference Level	**The Mask Data**
	
Channel 102 (5510MHz)	
The Reference Level	**The Mask Data**
	

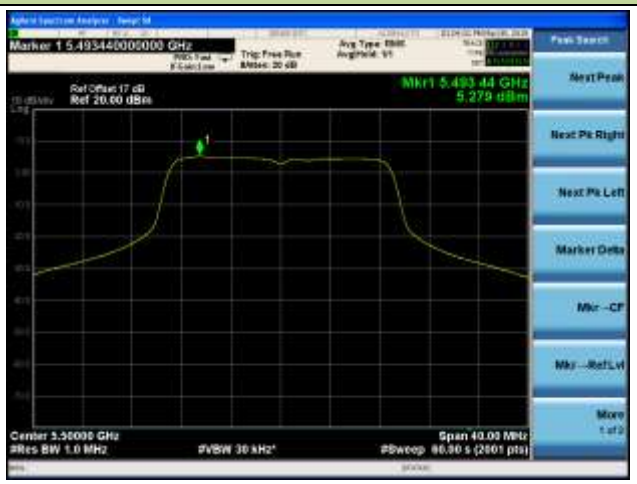
Channel 134 (5670MHz)	
The Reference Level	**The Mask Data**
	
802.11ac-VHT80 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands – 2Tx	
Channel 42 (5210MHz)	
The Reference Level	**The Mask Data**
	
Channel 58 (5290MHz)	
The Reference Level	**The Mask Data**
	

Channel 106 (5530MHz)	
The Reference Level	**The Mask Data**
	
Channel 122 (5610MHz)	
The Reference Level	**The Mask Data**
	

802.11n-HT20 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands – 3Tx	
Channel 36 (5180MHz)	
The Reference Level	The Mask Data
	
Channel 64 (5320MHz)	
The Reference Level	The Mask Data
	
Channel 100 (5500MHz)	
The Reference Level	The Mask Data
	

Channel 140 (5700MHz)	
The Reference Level	**The Mask Data**
	
802.11n-HT40 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands – 3Tx	
Channel 38 (5190MHz)	
The Reference Level	**The Mask Data**
	
Channel 62 (5310MHz)	
The Reference Level	**The Mask Data**
	

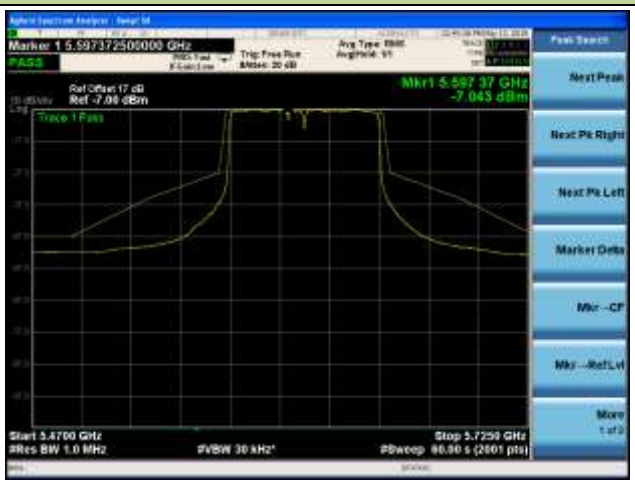
Channel 102 (5510MHz)	
The Reference Level	**The Mask Data**
	
Channel 134 (5670MHz)	
The Reference Level	**The Mask Data**
	
802.11ac-VHT20 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands – 3Tx	
Channel 36 (5180MHz)	
The Reference Level	**The Mask Data**
	

Channel 64 (5320MHz)	
The Reference Level	**The Mask Data**
	
Channel 100 (5500MHz)	
The Reference Level	**The Mask Data**
	
Channel 140 (5700MHz)	
The Reference Level	**The Mask Data**
	

802.11ac-VHT40 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands – 3Tx	
Channel 38 (5190MHz)	
The Reference Level	The Mask Data
	
Channel 62 (5310MHz)	
The Reference Level	The Mask Data
	
Channel 102 (5510MHz)	
The Reference Level	The Mask Data
	

Channel 134 (5670MHz)	
The Reference Level	**The Mask Data**
	

802.11ac-VHT80 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands – 3Tx	
Channel 42 (5210MHz)	
The Reference Level	**The Mask Data**
	
Channel 58 (5290MHz)	
The Reference Level	**The Mask Data**
	

Channel 106 (5530MHz)	
The Reference Level	**The Mask Data**
	
Channel 122 (5610MHz)	
The Reference Level	**The Mask Data**
	

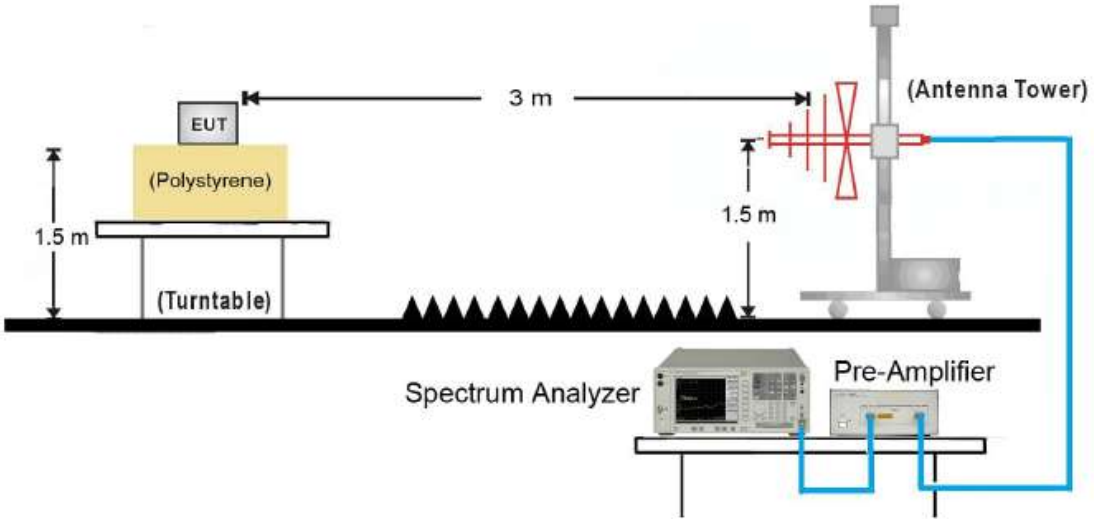
9. Receiver Spurious Emissions

9.1. Limit

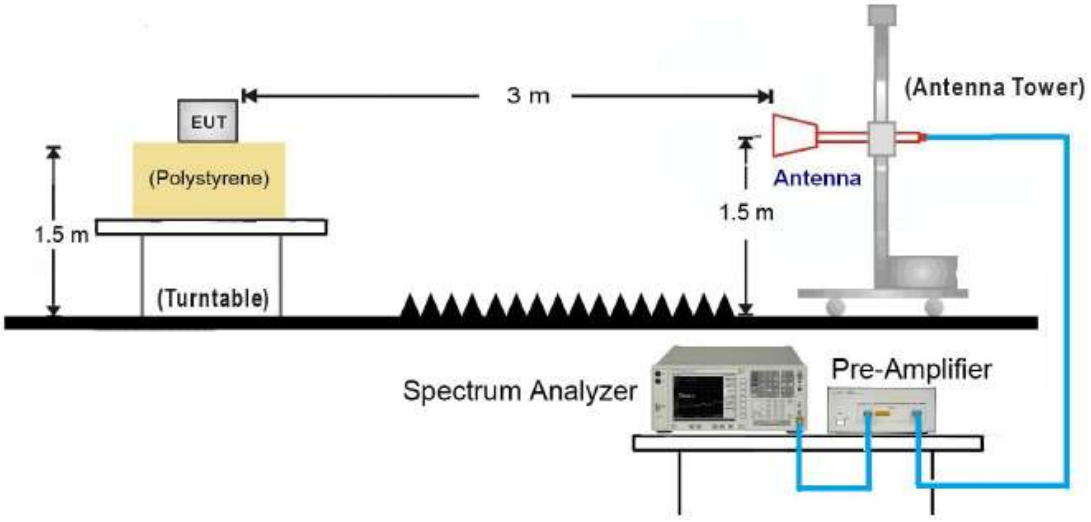
Frequency Range	Maximum Power	Bandwidth
30 MHz to 1GHz	-57dBm	100 kHz
1 GHz to 26 GHz	-47dBm	1 MHz

9.2. Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



9.3. Test Procedure

Refer to ETSI EN 301 893 V1.7.1 (2012-06) Clause 5.3.7.2.2.

9.4. Test Result

Test Engineer	Milo Li	Temperature	26°C
Test Time	05-12-2015	Relative Humidity	54%
Test Mode	802.11a – 1Tx	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
60	545.2	-67.35	-57	-10.35	Peak	Horizontal
	382.4	-67.39	-57	-10.39	Peak	Vertical
	706.2	-68.21	-57	-11.21	Peak	Horizontal
	568.3	-67.94	-57	-10.94	Peak	Vertical
	2202.8	-52.53	-47	-5.53	Peak	Horizontal
	2311.0	-53.55	-47	-6.55	Peak	Vertical
	3896.8	-52.38	-47	-5.38	Peak	Horizontal
	2761.9	-56.03	-47	-9.03	Peak	Vertical
100	451.7	-68.52	-57	-11.52	Peak	Horizontal
	362.9	-62.42	-57	-5.42	Peak	Vertical
	740.2	-69.76	-57	-12.76	Peak	Horizontal
	570.6	-68.56	-57	-11.56	Peak	Vertical
	2112.5	-55.55	-47	-8.55	Peak	Horizontal
	1625.9	-53.22	-47	-6.22	Peak	Vertical
	3068.6	-56.82	-47	-9.82	Peak	Horizontal
	2122.1	-55.14	-47	-8.14	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Time	05-12-2015	Relative Humidity	54%
Test Mode	802.11n-HT20 – 3Tx	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
60	417.5	-70.53	-57	-13.53	Peak	Horizontal
	284.6	-62.00	-57	-5.00	Peak	Vertical
	759.1	-68.05	-57	-11.05	Peak	Horizontal
	579.1	-66.87	-57	-9.87	Peak	Vertical
	1176.7	-56.11	-47	-9.11	Peak	Horizontal
	1537.0	-52.81	-47	-5.81	Peak	Vertical
	2173.1	-52.69	-47	-5.69	Peak	Horizontal
	2138.7	-54.33	-47	-7.33	Peak	Vertical
100	460.0	-69.93	-57	-12.93	Peak	Horizontal
	426.2	-62.41	-57	-5.41	Peak	Vertical
	676.3	-69.26	-57	-12.26	Peak	Horizontal
	639.5	-67.08	-57	-10.08	Peak	Vertical
	1170.6	-55.51	-47	-8.51	Peak	Horizontal
	1518.0	-56.79	-47	-9.79	Peak	Vertical
	2115.6	-54.48	-47	-7.48	Peak	Horizontal
	2119.8	-55.35	-47	-8.35	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Time	05-12-2015	Relative Humidity	54%
Test Mode	802.11n-HT40 – 3Tx	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
62	419.3	-71.02	-57	-14.02	Peak	Horizontal
	359.9	-64.39	-57	-7.39	Peak	Vertical
	744.9	-74.97	-57	-17.97	Peak	Horizontal
	633.1	-67.81	-57	-10.81	Peak	Vertical
	1483.5	-58.85	-47	-11.85	Peak	Horizontal
	1321.5	-58.49	-47	-11.49	Peak	Vertical
	2199.8	-52.97	-47	-5.97	Peak	Horizontal
	2571.9	-53.03	-47	-6.03	Peak	Vertical
102	149.9	-70.36	-57	-13.36	Peak	Horizontal
	101.4	-69.74	-57	-12.74	Peak	Vertical
	530.3	-66.86	-57	-9.86	Peak	Horizontal
	383.2	-60.34	-57	-3.34	Peak	Vertical
	1514.6	-59.53	-47	-12.53	Peak	Horizontal
	1366.6	-54.16	-47	-7.16	Peak	Vertical
	2217.9	-55.17	-47	-8.17	Peak	Horizontal
	2648.1	-53.32	-47	-6.32	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Time	05-12-2015	Relative Humidity	54%
Test Mode	802.11ac-VHT20 – 3Tx	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
60	465.4	-71.84	-57	-14.84	Peak	Horizontal
	380.1	-63.10	-57	-6.10	Peak	Vertical
	687.8	-68.94	-57	-11.94	Peak	Horizontal
	630.5	-64.98	-57	-7.98	Peak	Vertical
	1233.9	-53.86	-47	-6.86	Peak	Horizontal
	1628.3	-50.28	-47	-3.28	Peak	Vertical
	2149.2	-55.07	-47	-8.07	Peak	Horizontal
	2049.6	-58.86	-47	-11.86	Peak	Vertical
100	514.0	-67.59	-57	-10.59	Peak	Horizontal
	347.0	-62.62	-57	-5.62	Peak	Vertical
	637.0	-72.23	-57	-15.23	Peak	Horizontal
	562.8	-67.66	-57	-10.66	Peak	Vertical
	1203.4	-54.02	-47	-7.02	Peak	Horizontal
	1527.6	-57.91	-47	-10.91	Peak	Vertical
	2119.4	-55.59	-47	-8.59	Peak	Horizontal
	2069.3	-54.65	-47	-7.65	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Time	05-12-2015	Relative Humidity	54%
Test Mode	802.11ac-VHT40 – 3Tx	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
62	519.2	-73.07	-57	-16.07	Peak	Horizontal
	414.3	-67.94	-57	-10.94	Peak	Vertical
	740.1	-75.26	-57	-18.26	Peak	Horizontal
	581.7	-70.28	-57	-13.28	Peak	Vertical
	1479.3	-60.09	-47	-13.09	Peak	Horizontal
	1304.7	-57.80	-47	-10.80	Peak	Vertical
	2182.7	-57.21	-47	-10.21	Peak	Horizontal
	2661.8	-52.18	-47	-5.18	Peak	Vertical
102	220.7	-68.89	-57	-11.89	Peak	Horizontal
	209.2	-71.25	-57	-14.25	Peak	Vertical
	515.4	-66.67	-57	-9.67	Peak	Horizontal
	331.8	-61.38	-57	-4.38	Peak	Vertical
	1526.9	-53.07	-47	-6.07	Peak	Horizontal
	1289.2	-56.84	-47	-9.84	Peak	Vertical
	2233.6	-52.34	-47	-5.34	Peak	Horizontal
	2646.9	-56.65	-47	-9.65	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Time	05-12-2015	Relative Humidity	54%
Test Mode	802.11ac-VHT80 – 3Tx	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
58	449.2	-70.92	-57	-13.92	Peak	Horizontal
	356.3	-64.74	-57	-7.74	Peak	Vertical
	671.5	-67.40	-57	-10.40	Peak	Horizontal
	545.1	-62.89	-57	-5.89	Peak	Vertical
	2190.5	-57.15	-47	-10.15	Peak	Horizontal
	2407.1	-53.89	-47	-6.89	Peak	Vertical
	3873.1	-52.29	-47	-5.29	Peak	Horizontal
	2770.2	-52.88	-47	-5.88	Peak	Vertical
106	409.2	-70.81	-57	-13.81	Peak	Horizontal
	339.1	-62.64	-57	-5.64	Peak	Vertical
	695.3	-67.44	-57	-10.44	Peak	Horizontal
	552.3	-63.24	-57	-6.24	Peak	Vertical
	2191.5	-51.67	-47	-4.67	Peak	Horizontal
	1538.9	-53.45	-47	-6.45	Peak	Vertical
	3064.5	-52.80	-47	-5.80	Peak	Horizontal
	2229.4	-58.84	-47	-11.84	Peak	Vertical

10. Adaptivity (Channel Access Mechanism)

10.1. Limit

LBT based Detect and Avoid (Load based Equipment may implement an LBT based spectrum sharing mechanism as described in IEEE 802.11-2007, clauses 9 and 17, in IEEE 802.11n-2009, clauses 9, 11 and 20)

Adaptivity Limit

The CCA observation time shall be not less than 20 us, and the CCA time used by the equipment shall be declared by the supplier.

The Channel Occupancy Time shall be less than (13 / 32) * q ms, q = [4~32].

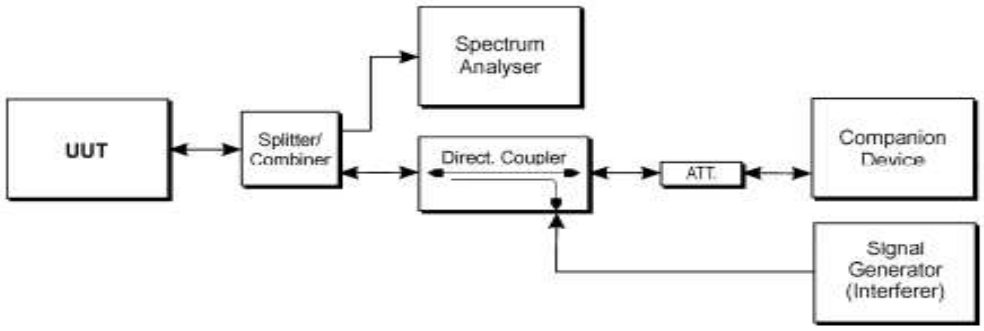
The minimum idle period varied between CCA and q*CCA.

When adding the interference signal, the EUT shall stop transmissions on the current operating channel.

Short Control Signalling Transmissions Limit

Short Control Signalling Transmissions shall have a maximum duty cycle of 5% within an observation period of 50ms.

10.2. Test Setup



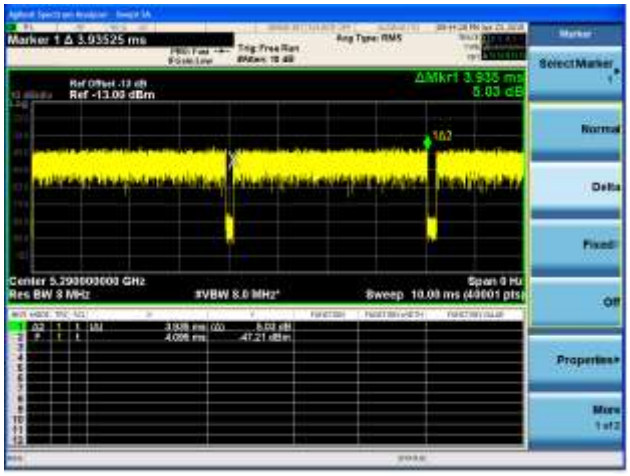
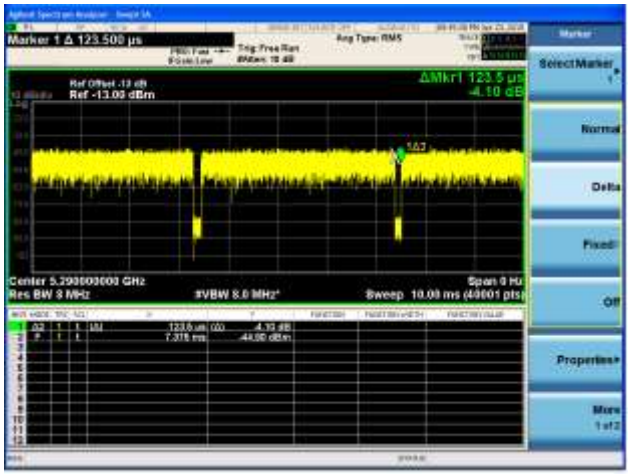
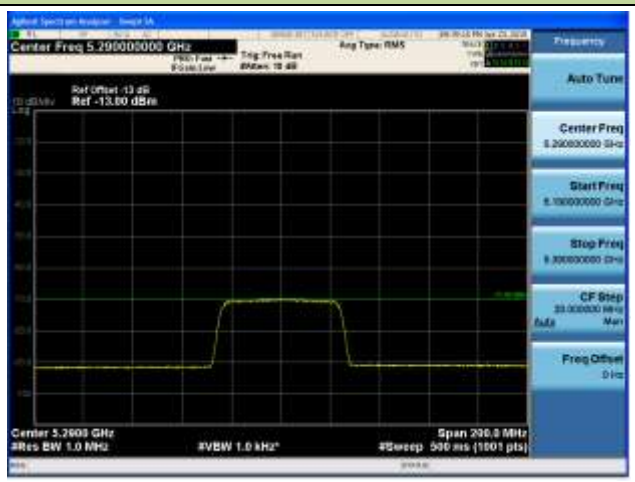
10.3. Test Procedure

Refer to ETSI EN 301 893 V1.7.1 (2012-06) Clause 5.3.9.2.1.

10.4. Test Result

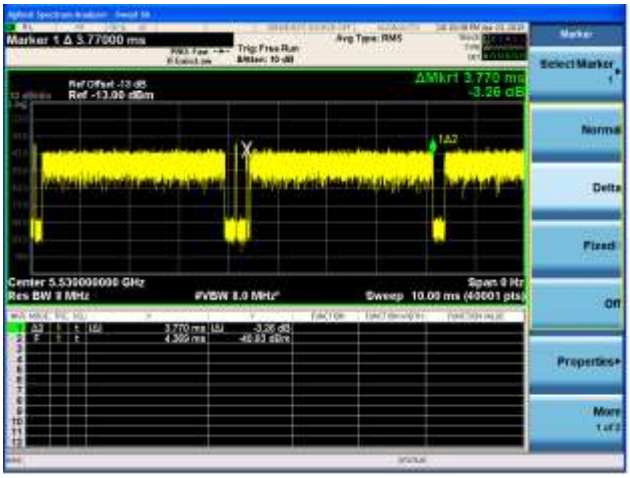
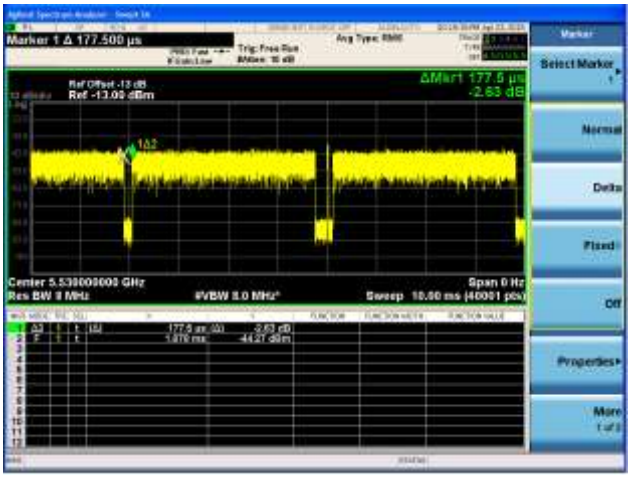
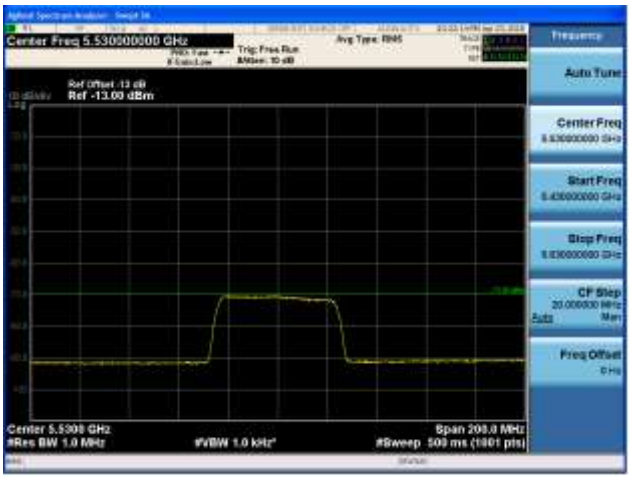
Test Engineer	Andy Zhu	Temperature	26°C
Test Time	04-23-2015	Relative Humidity	54%

The CCA observation time was 25 us, and the maximum factor of q = 24 which were declared by the supplier. So the idle period varied between 25 us and 600 us and the channel occupancy time shall less than (13 / 32) * 24 = 9.75 ms.

802.11ac-VHT80 – 5290MHz	
Maximum Channel Occupancy Time =3.935ms	**Minimum Idle Period =123.5us**
	
Interference Signal Calibration	**Transmission stopped after interference added and the short control signaling less than 5ms.**
	

Note: Detection Level = -70 dBm/MHz + 20 – the max conducted power (dBm).

Test Result:	Pass

802.11ac-VHT80 – 5530MHz	
Maximum Channel Occupancy Time =3.770ms	**Minimum Idle Period =177.5us**
	
Interference Signal Calibration	**Transmission stopped after interference added and the short control signaling less than 5ms.**
	

Note: Detection Level = -70 dBm/MHz + 20 – the max conducted power (dBm).

Test Result:	Pass

11. User Access Restrictions

11.1. Requirement

DFS controls (hardware or software) related to radar detection shall not be accessible to the user so that the DFS requirements described in clauses 4.7.2.1 to 4.7.2.6 can neither be disabled nor altered.

11.2. Test Result

In the hardware, there is no switch or button to modify the DFS function or parameter for the user.
In the software, there is no options to modify the DFS function or parameter for the user.
The user access restrictions mechanism shall be implemented by the equipment which was declared by the manufacturer.

12. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

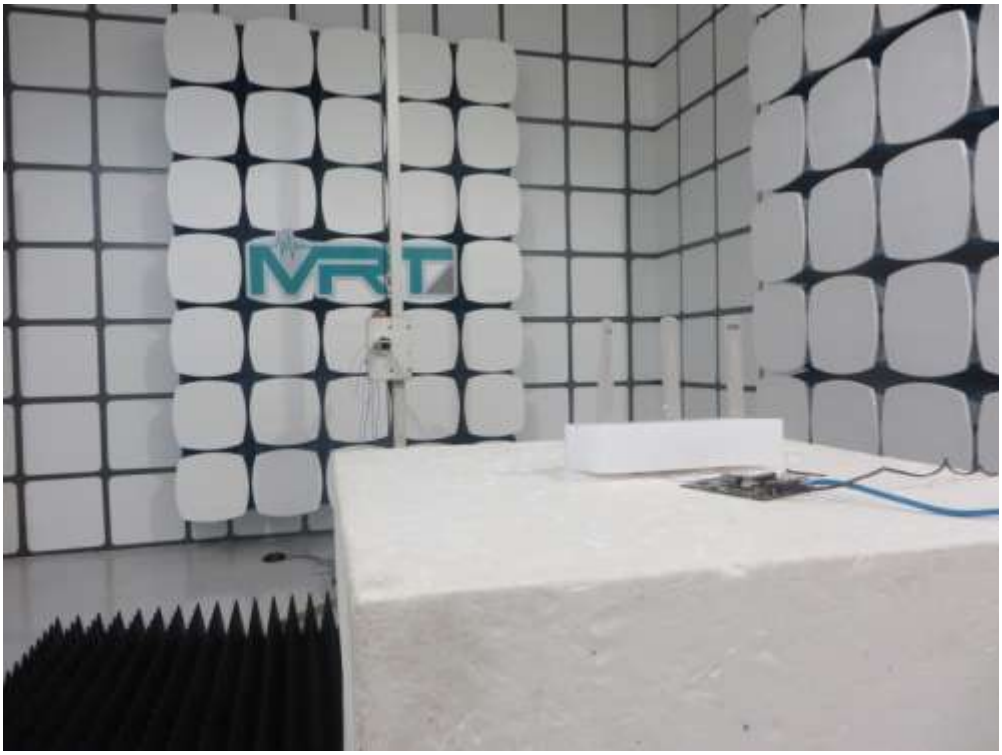
Parameter	Uncertainty
Radio Frequency	±1 x 10^{-5}
RF Power Conducted	±1.5dB
RF Power Radiated	±6dB
Spurious Emissions, Conducted	±3dB
Spurious Emissions, Radiated	±6dB
Humidity	±5%
Temperature	±1℃
Time	±10%

13. Test Photograph

Description: Radiated Spurious Emissions Test Setup for Below 1GHz

Description: Radiated Spurious Emissions Test Setup for Above 1GHz

Description: Radiated Spurious Emissions Test Setup for 18 - 40GHz



14. List of Measuring Instrument

Carrier Frequencies

Instrument	Manufacturer	Type No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	N9020A	1 year	2016/04/23
Programmable Temperature & Humidity Chamber	BAOYT	BYH-1500L	1 year	2015/12/10
Temperature/Humidity Meter	Anymetre	TH101B	1 year	2015/11/15

Occupied Channel Bandwidth

Instrument	Manufacturer	Type No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	N9020A	1 year	2016/04/23
Temperature/Humidity Meter	Anymetre	TH101B	1 year	2015/11/15

RF Output Power, Transmit Power Control (TPC) and Power Density

Instrument	Manufacturer	Type No.	Cali. Interval	Cali. Due Date
Power Meter	Agilent	U2021XA	1 year	2014/12/14
Programmable Temperature & Humidity Chamber	BAOYT	BYH-1500L	1 year	2015/12/10
Temperature/Humidity Meter	Anymetre	TH101B	1 year	2015/11/15

Transmitter Unwanted Emissions Within the 5GHz RLAN Bands

Instrument	Manufacturer	Type No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	N9020A	1 year	2016/04/23
Temperature/Humidity Meter	Anymetre	TH101B	1 year	2015/11/15

Transmitter Spurious Emissions and Receiver Spurious Emissions

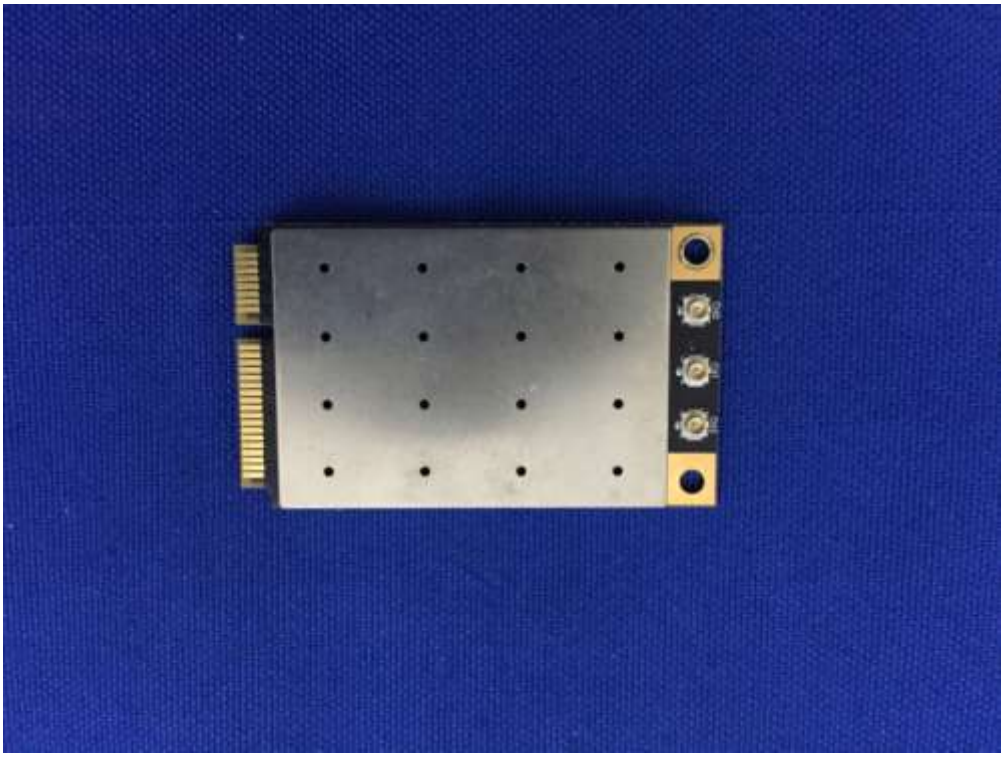
Instrument	Manufacturer	Type No.	Cali. Interval	Cal. Due Date
Spectrum Analyzer	Agilent	E4447A	1 year	2015/12/09
Preamplifier	MRT	AP25M01	1 year	2015/10/06
Preamplifier	MRT	AP01G18	1 year	2015/12/13
Bilog Period Antenna	Schwarzbeck	VULB 9162	1 year	2015/11/08
Horn Antenna	Schwarzbeck	BBHA9120D	1 year	2015/11/08
Broadband Horn Antenna	Schwarzbeck	BBHA9170	1 year	2015/12/11
Temperature/Humidity Meter	Anymetre	TH101B	1 year	2015/11/15

Adaptivity (Channel Access Mechanism)

Instrument	Manufacturer	Type No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	N9020A	1 year	2016/04/23
Vector Signal Generator	Agilent	E4438C	1 year	2015/12/09
Directional Coupler	Narda	4216-20	1 year	2016/02/15
Combiner	Mini-Circuits	ZFRSC-123-S+ DC-12000MHz	1 year	2015/11/19
Temperature/Humidity Meter	Anymetre	TH101B	1 year	2015/11/14

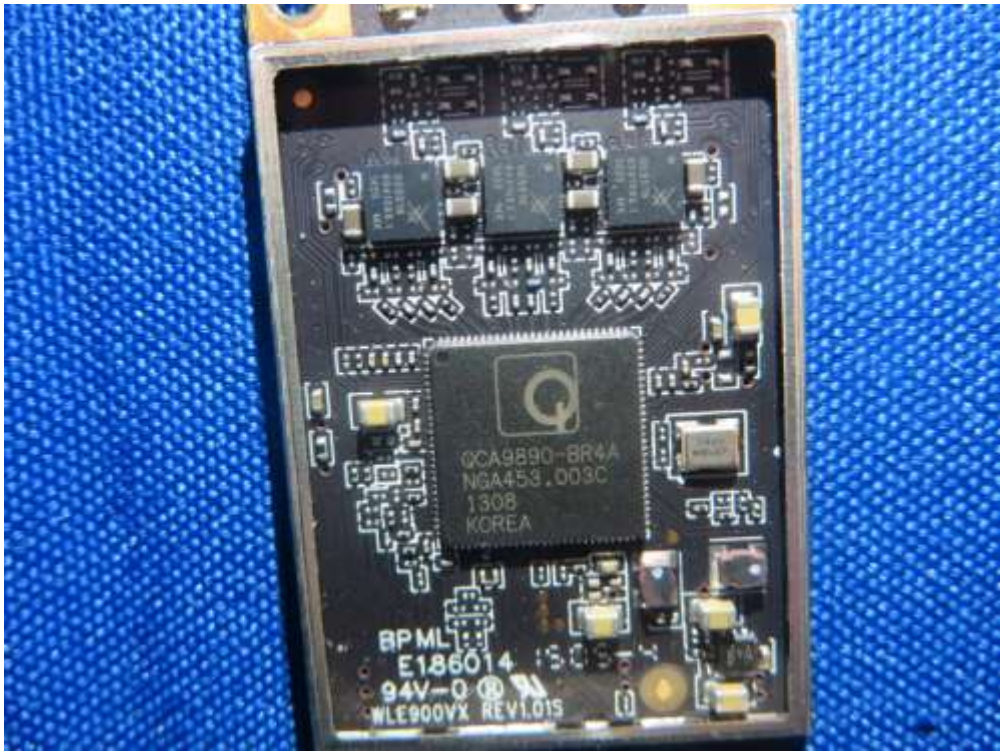
15. Appendix - EUT Photograph

(1) EUT Photo



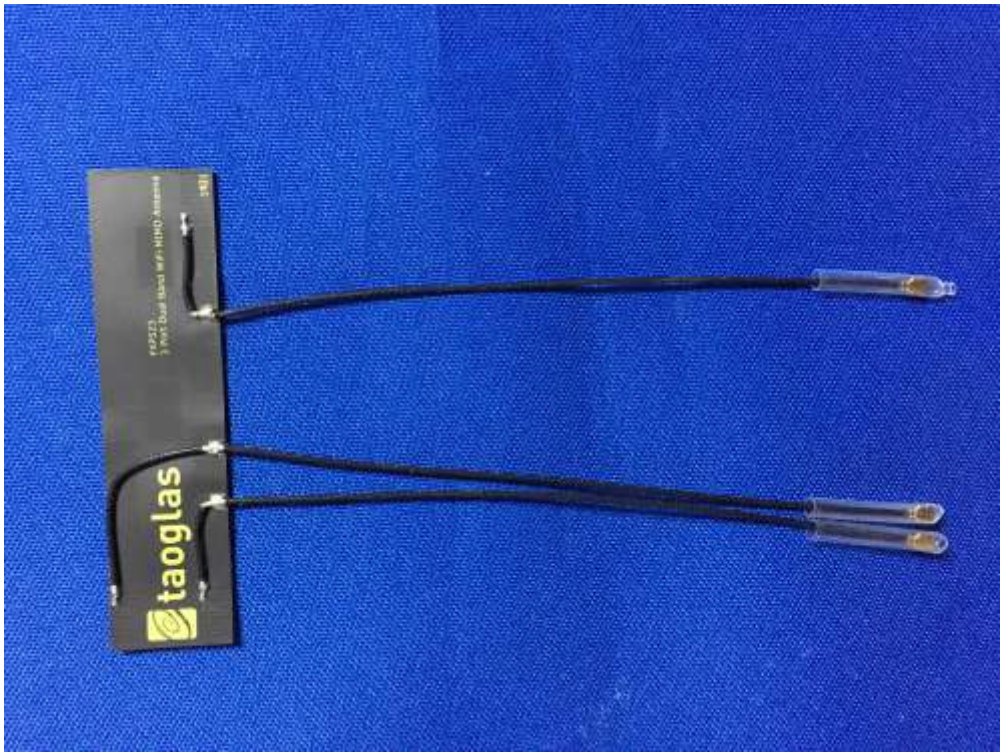
(2) EUT Photo

(3) EUT Photo

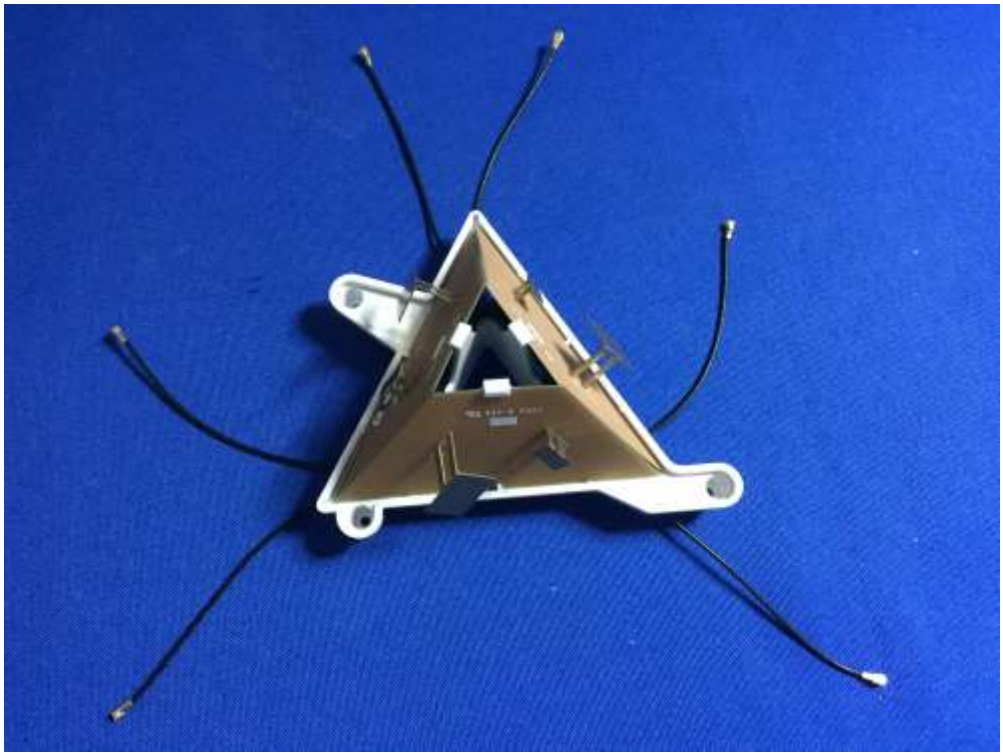


(4) EUT Photo (Antenna 1#)

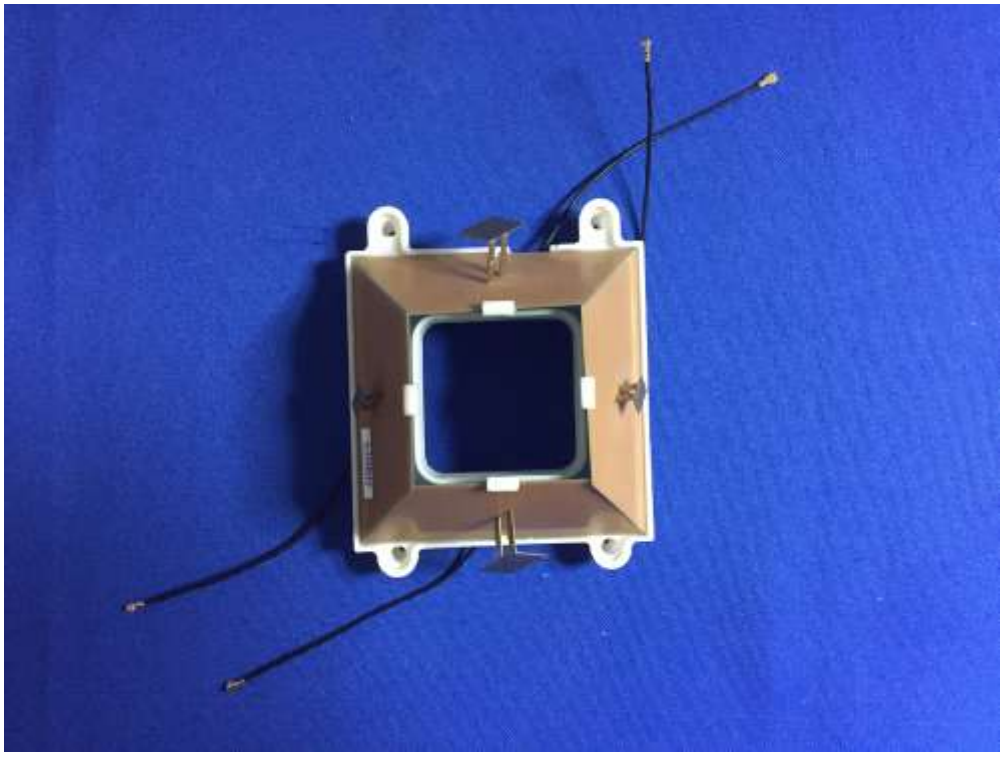
(5) EUT Photo (Antenna 2#)



(6) EUT Photo (Antenna 3#)

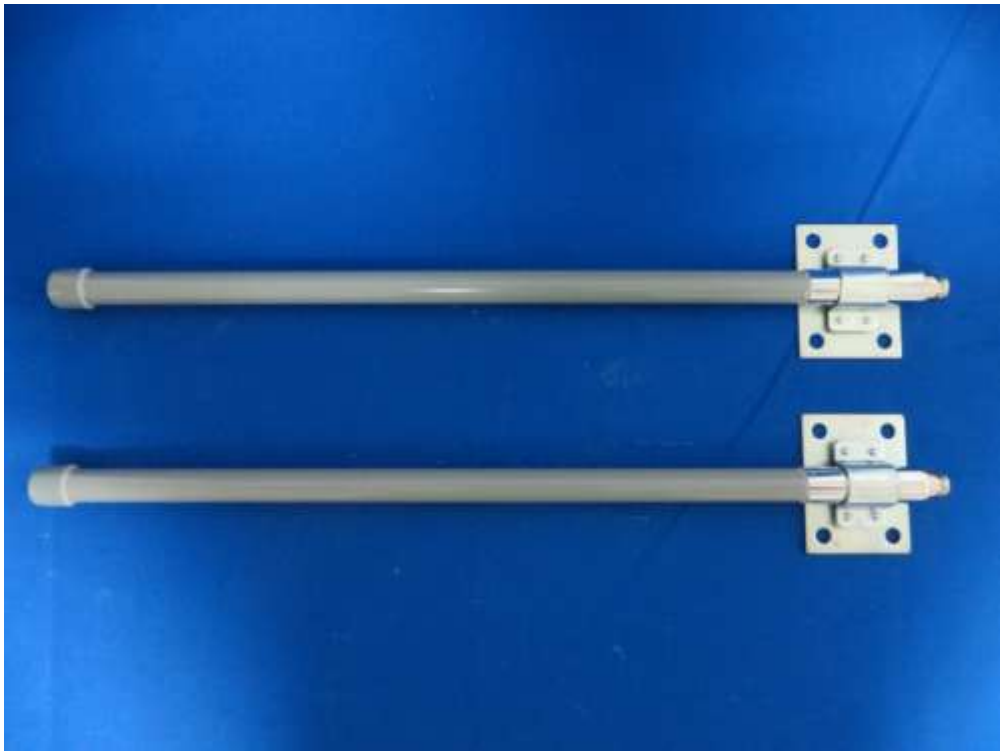


(7) EUT Photo (Antenna 4#)



(8) EUT Photo (Antenna 5#)

(9) EUT Photo (Antenna 6#)



The End