



MRT Technology (Suzhou) Co., Ltd  
Phone: +86-512-66308358  
Fax: +86-512-66308368  
Web: www.mrt-cert.com

Report No.: 1407RSU04201  
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Issue Date: 08-28-2014

## MEASUREMENT REPORT

### EN 301 893 V1.7.1 WLAN 802.11a/n

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**Applicant:** Compex Systems Pte Ltd

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

**Product:** WIRELESS ACCESS POINT

**Model No.:** WPJ342LV, WPJ342HV, MML342LV, ML342HV, MMJ342LV, MMJ342HV, MMS342LV, MMS342HV

**Brand Name:** COMPEX

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

**Result:** Complies

**Test Date:** Aug. 03 ~ 21, 2014

Reviewed By : Robin Wu  
( Robin Wu )

Approved By : Marlin Chen  
( Marlin Chen )



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

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### Revision History

Report No.	Version	Description	Issue Date
1407RSU04201	Rev. 01	Initial report	08-22-2014
1407RSU04201	Rev. 02	Modified some test limit and added some antenna information	08-28-2014

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## 1. General Information

### 1.1. Applicant

Compex Systems Pte Ltd  
135, Joo Seng Road, #08-01 Singapore 368363

## 1.2. Manufacturer

Compex Systems Pte Ltd  
135, Joo Seng Road, #08-01 Singapore 368363

### 1.3. Testing Facility

## Test Site

MRT Technology (Suzhou) Co., Ltd

## Test Site Location

D8 Building, Youxin Industrial Park, 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 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.**
  - **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 and Industry Canada (11384A-1).**
  - **MRT facility is an IC registered (11384A-1) test laboratory with the site description on file at Industry Canada.**
- The image shows a formal accreditation certificate from A2LA (American Association for Laboratory Accreditation). The certificate is titled 'Accredited Laboratory' and identifies the client as 'MRT TECHNOLOGY (SUZHOU) CO., LTD.' located in 'Suzhou, China'. The scope of accreditation is 'Electrical Testing'. The certificate is issued on the 17th day of June 2014 and is valid until August 31, 2016. It references the ISO/IEC 17025:2005 standard and A2LA Cert. No. 3628.01. The certificate is signed by the President & CEO and the Accreditation Council. The certificate is framed by a blue border and includes the A2LA logo and the A2LA seal.



#### 1.4. Feature of Product

Product Name	WIRELESS ACCESS POINT
Model No.	WPJ342HV, MML342LV, MML342HV, MMJ342LV, MMJ342HV, MMS342LV, MMS342HV
Brand Name	COMPEX
Frequency Range	802.11a /n-HT20 5180 ~ 5240MHz; 5260 ~5320MHz; 5500 ~ 5700MHz 802.11n-HT40MHz 5190 ~ 5230MHz; 5270 ~5310MHz; 5510 ~ 5670MHz
Channel Number	802.11a/n-HT20: 19 802.11n-HT40: 9
Type of Modulation	802.11a/n: OFDM
Data Rate	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 300Mbps

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

#### 1.5. Frequency / Channel Operation

##### Channel List for 802.11a/n-HT20

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

##### Channel List for 802.11n-HT40MHz

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

### 1.6. Description of Available Antennas

Antenna Type	Frequency Band (GHz)	Manufacturer	Tx Paths	Max Directional Gain (dBi)
Panel Antenna 1#	5.1 ~ 5.8	Lanbowan Communications Ltd.	2	25
Panel Antenna 2#	5.1 ~ 5.8	Kenbotong Communication LTD	2	19
Panel Antenna 3#	5.1 ~ 5.8	Compex Systems Pte Ltd	2	17
Panel Antenna 4#	5.1 ~ 5.8	Compex Systems Pte Ltd	2	15
Panel Antenna 5#	5.1 ~ 5.8	Kenbotong Communication LTD	2	10
Panel Antenna 6#	5.1 ~ 5.8	Smart Ant Inc	2	7
Panel Antenna 7#	5.1 ~ 5.8	Compex Systems Pte Ltd	2	5
Panel Antenna 8#	5.1 ~ 5.8	Compex Systems Pte Ltd	2	5
Dipole Antenna 1#	5.1 ~ 5.8	Kunshan Wavelink Electronic Co., Ltd.	2	2

Note: We selected the panel antenna 1# and dipole antenna 1# for all radiated emission testing.

### 1.7. 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

Pre-Test RF Output Power at various data rates.

Test Mode	Bandwidth (MHz)	Channel No.	Frequency (MHz)	Data Rate (Mbps)	RF Output Power (dBm)
11a	20	64	5320	6	-4.27
				24	-4.59
				54	-4.83
11n	20	64	5320	6.5	-5.49
				26	-5.96
				65	-6.11
11n	40	62	5310	13.5	-5.55
				54	-5.82
				135	-6.08

Note: All modes of operation and data rates were investigated, so all RF test requirements shall be executed at low data rates.

Test Mode	Duty Cycle
11a	100%
11n-HT20	100%
11n-HT40	100%

## 2.2. Description of Test Software

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

Final Power Parameter Value of the test software.

Test Mode	Frequency (MHz)	Power Parameter Value		
		Ant 0	Ant 1	Ant 0 + 1
802.11a	5180	6.5	8	Not support
	5320	6.5	8	
	5500	10.5	12.5	
	5700	10.5	12.5	
802.11n-HT20	5180	6.5	8	5
	5320	6.5	8	5
	5500	10.5	12.5	8
	5700	10.5	12.5	8
802.11n-HT40	5190	6.5	8	5
	5310	6.5	8	5
	5510	10.5	12.5	8
	5670	10.5	12.5	8

### 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: The EUT can operate in an adaptive mode, and can't operate in a non-adaptive mode which is stated by the supplier.

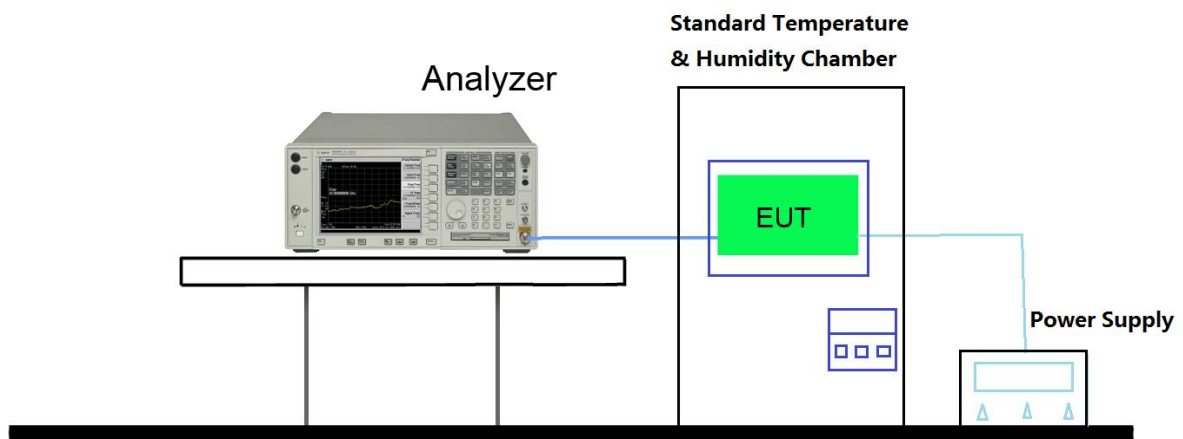
## 4. Carrier Frequencies

### 4.1. Limit

The actual centre frequency for any given channel declared by the manufacturer shall be maintained within the range  $f_c \pm 20\text{ppm}$ .

### 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 Date	08-05-2014	Relative Humidity	58%

Test Conditions		Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Limit (ppm)	Result
T <sub>nom</sub> (25°C)	V <sub>nom</sub> (AC 230V)	5320	5319.993202	-1.278	≤ 20	Pass
		5500	5499.986124	-2.523	≤ 20	Pass
T <sub>min</sub> (-20°C)	V <sub>min</sub> (AC 207V)	5320	5320.011035	2.074	≤ 20	Pass
		5500	5500.034950	6.355	≤ 20	Pass
	V <sub>max</sub> (AC 253V)	5320	5320.005895	1.108	≤ 20	Pass
		5500	5500.050939	9.262	≤ 20	Pass
T <sub>max</sub> (70°C)	V <sub>min</sub> (AC 207V)	5320	5319.978909	-3.964	≤ 20	Pass
		5500	5499.977255	-4.135	≤ 20	Pass
	V <sub>max</sub> (AC 253V)	5320	5319.983546	-3.093	≤ 20	Pass
		5500	5499.979103	-3.799	≤ 20	Pass



## **5. Occupied Channel Bandwidth**

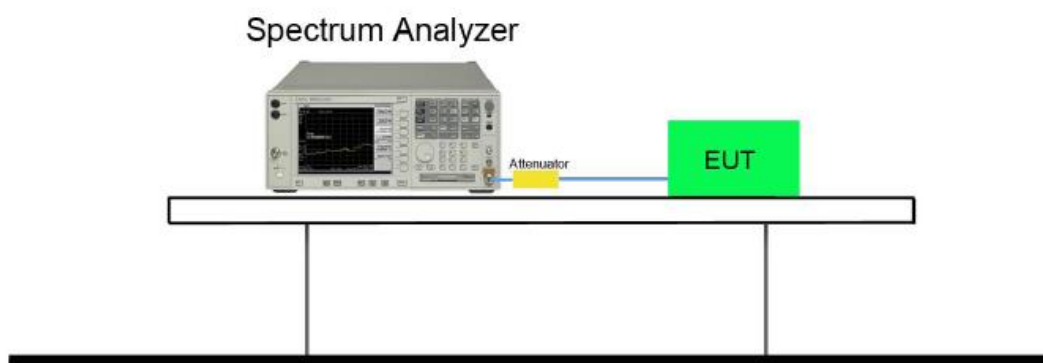
### **5.1. Limit**

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.

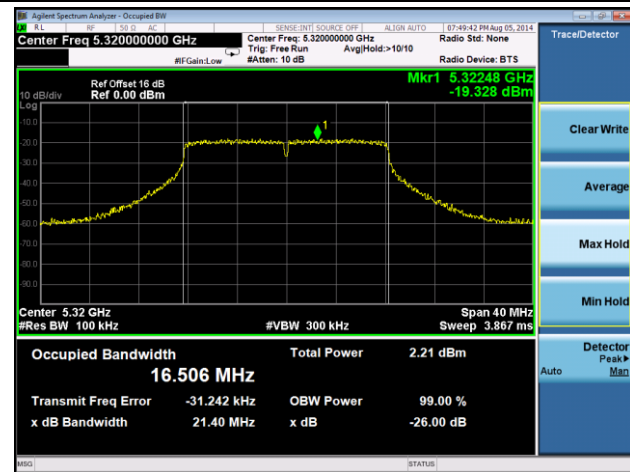
#### 5.4. Test Result

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-05-2014	Relative Humidity	62%

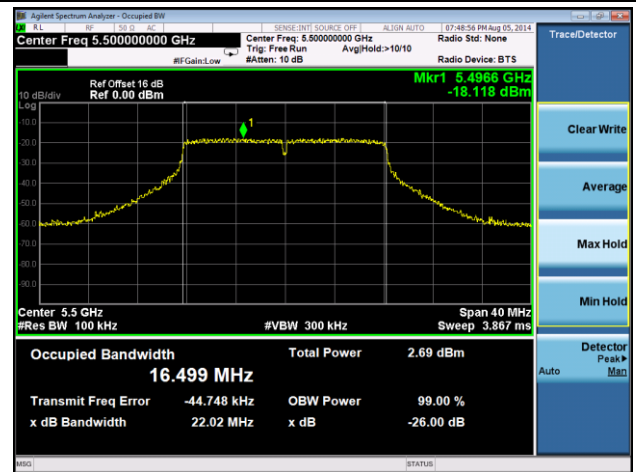
Test Mode	Channel No.	Frequency (MHz)	99% Bandwidth (MHz)	Declared Nominal Channel Bandwidth (MHz)	Limit (%)	Result
Ant 0						
802.11a	64	5320	16.51	20	80 - 100	Pass
802.11a	100	5500	16.50	20	80 - 100	Pass
802.11n-HT20	64	5320	17.67	20	80 - 100	Pass
802.11n-HT20	100	5500	17.66	20	80 - 100	Pass
802.11n-HT40	62	5310	36.19	40	80 - 100	Pass
802.11n-HT40	102	5510	36.19	40	80 - 100	Pass
Ant 1						
802.11a	64	5320	16.49	20	80 - 100	Pass
802.11a	100	5500	17.64	20	80 - 100	Pass
802.11n-HT20	64	5320	17.65	20	80 - 100	Pass
802.11n-HT20	100	5500	17.64	20	80 - 100	Pass
802.11n-HT40	62	5310	36.18	40	80 - 100	Pass
802.11n-HT40	102	5510	36.19	40	80 - 100	Pass
Ant 0 / Ant 0 + 1						
802.11n-HT20	64	5320	17.66	20	80 - 100	Pass
802.11n-HT20	100	5500	17.69	20	80 - 100	Pass
802.11n-HT40	62	5310	36.06	40	80 - 100	Pass
802.11n-HT40	102	5510	36.06	40	80 - 100	Pass

## 802.11a Occupied Channel Bandwidth Ant 0

### Channel 64 (5320MHz)

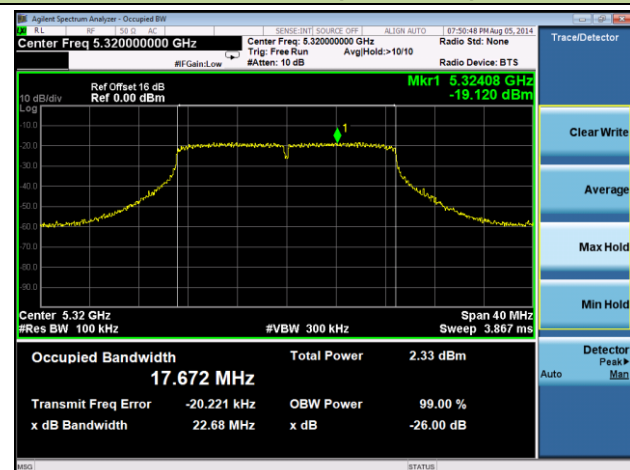


### Channel 100 (5500MHz)

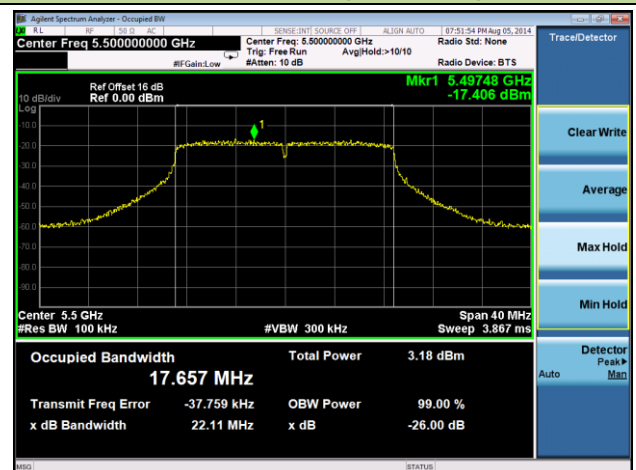


## 802.11n-HT20 Occupied Channel Bandwidth Ant 0

### Channel 64 (5320MHz)

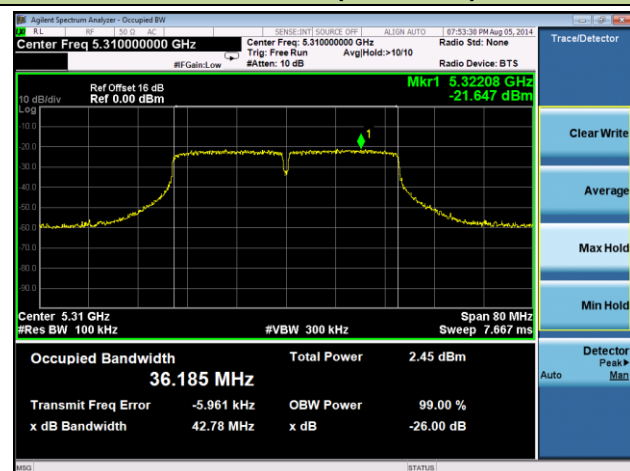


### Channel 100 (5500MHz)

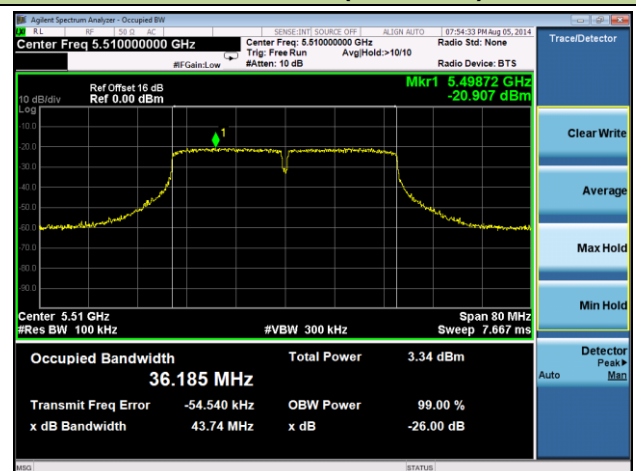


## 802.11n-HT40 Occupied Channel Bandwidth Ant 0

### Channel 62 (5310MHz)

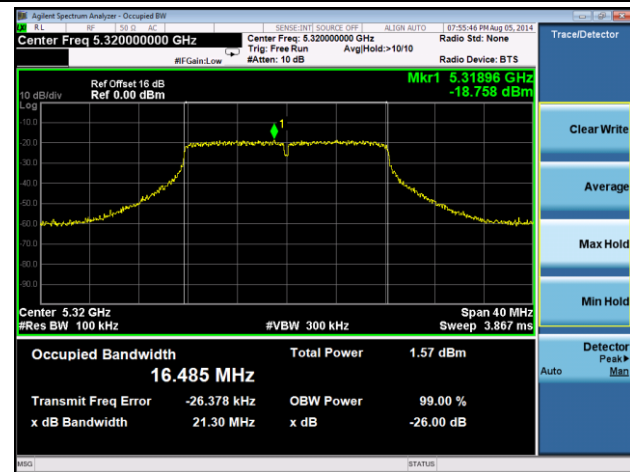


### Channel 102 (5510MHz)

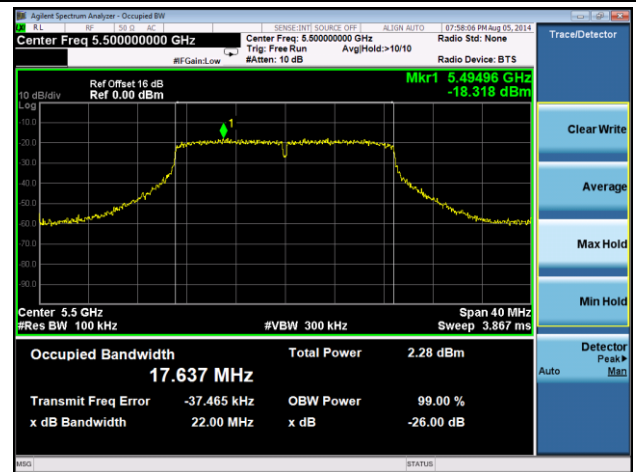


## 802.11a Occupied Channel Bandwidth Ant 1

### Channel 64 (5320MHz)

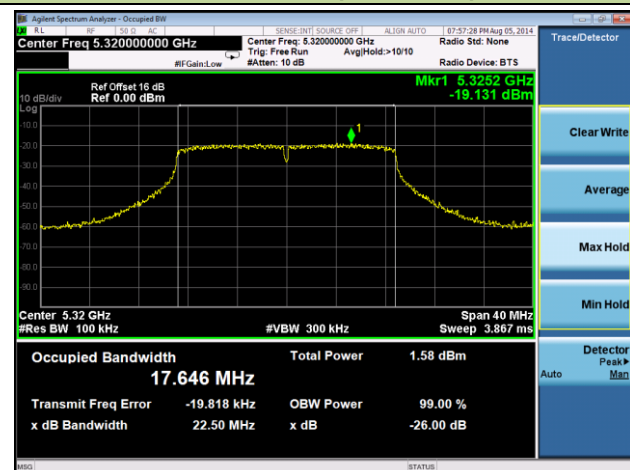


### Channel 100 (5500MHz)

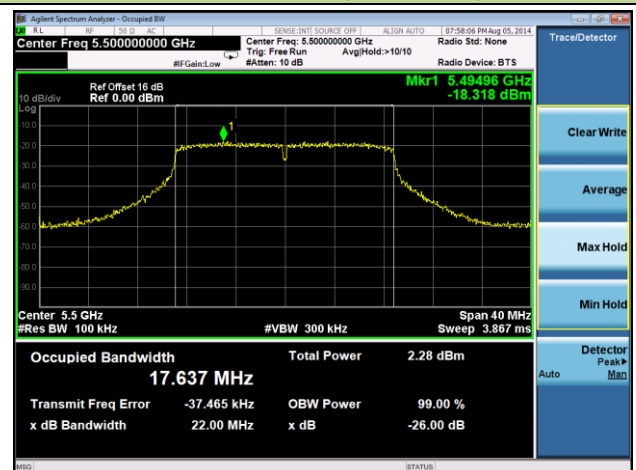


## 802.11n-HT20 Occupied Channel Bandwidth Ant 1

### Channel 60 (5300MHz)

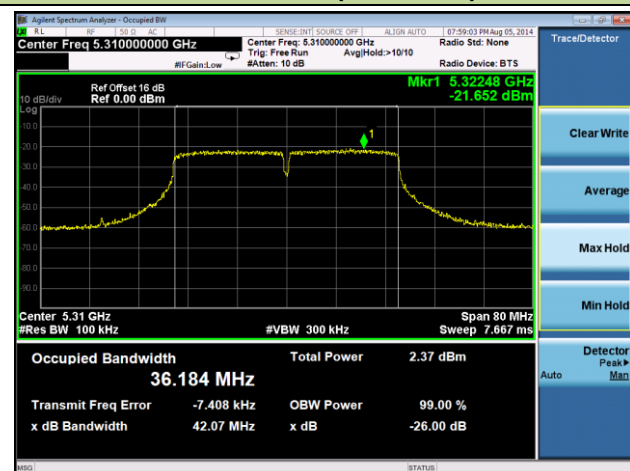


### Channel 100 (5500MHz)

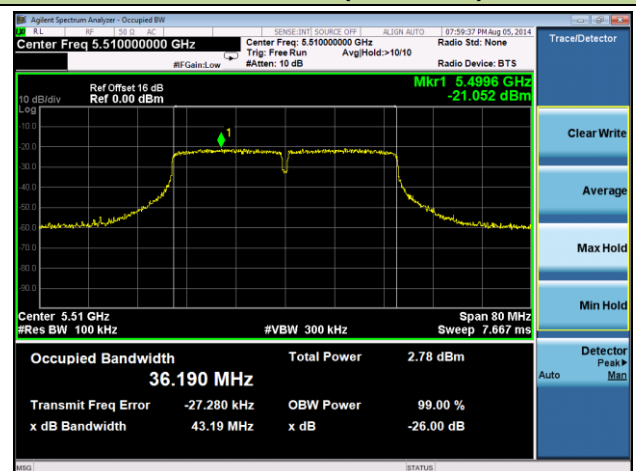


## 802.11n-HT40 Occupied Channel Bandwidth Ant 1

### Channel 62 (5310MHz)

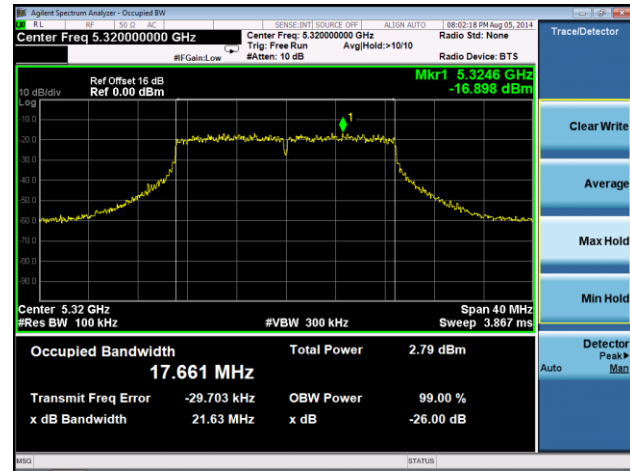


### Channel 102 (5510MHz)

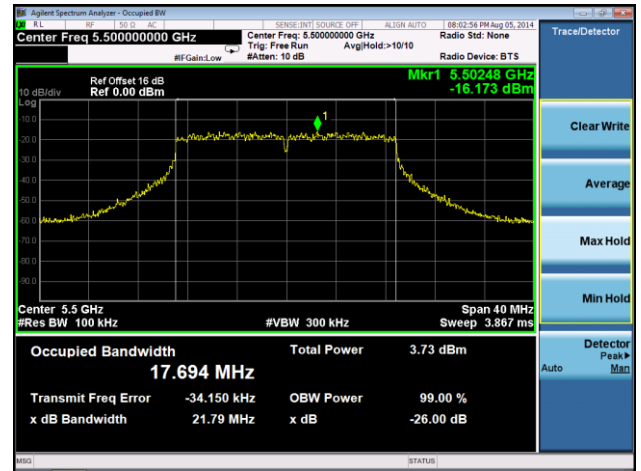


## 802.11n-HT20 Occupied Channel Bandwidth Ant 0 / Ant 0 + 1

### Channel 64 (5320MHz)

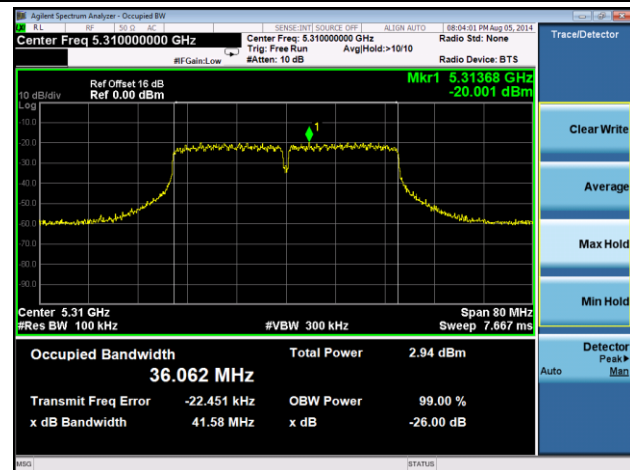


### Channel 100 (5500MHz)

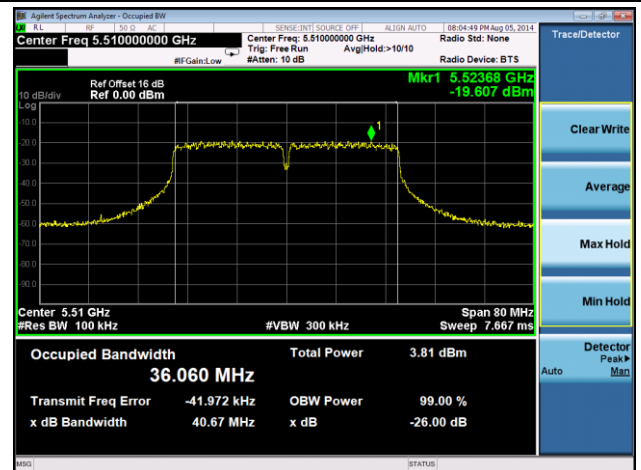


## 802.11n-HT40 Occupied Channel Bandwidth Ant 0 / Ant 0 + 1

### Channel 62 (5310MHz)



### Channel 102 (5510MHz)



## 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.				

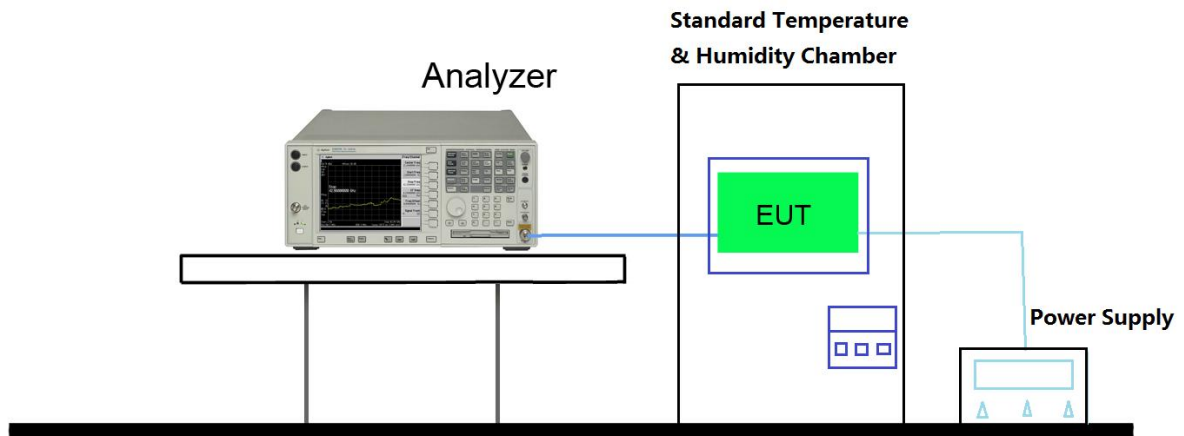
#### RF Output Power at the Lowest Power Level of the TPC Range

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 Date	08-05-2014	Relative Humidity	50 ~ 54%

#### RF Output Power

Mode	Channel	Freq. (MHz)	RF Average Power (dBm)					Gain (dBi)	Max EIRP Power (dBm)	Limit (dBm)	Result
			Normal	Extreme							
				-20°C		70°C					
				25°C	230V	207V	253V				
Ant 0											
11a	36	5180	-3.41	-2.33	-2.53	-4.52	-4.83	25	22.67	23	Pass
11a	64	5320	-4.27	-3.52	-3.67	-5.36	-5.54	25	21.48	23	Pass
11a	100	5500	3.47	4.66	4.39	2.13	2.01	25	29.66	30	Pass
11a	140	5700	3.72	4.54	4.21	2.52	2.36	25	29.54	30	Pass
n-HT20	36	5180	-4.57	-3.61	-3.82	-5.54	-5.90	25	21.39	23	Pass
n-HT20	64	5320	-5.49	-4.38	-4.44	-6.28	-6.61	25	20.62	23	Pass
n-HT20	100	5500	2.72	3.46	3.23	1.60	1.28	25	28.46	30	Pass
n-HT20	140	5700	2.86	3.90	3.61	1.69	1.34	25	28.90	30	Pass
n-HT40	38	5190	-5.08	-4.19	-4.39	-6.26	-6.53	25	20.81	23	Pass
n-HT40	62	5310	-5.55	-4.64	-4.77	-6.38	-6.56	25	20.36	23	Pass
n-HT40	102	5510	2.95	3.71	3.46	2.03	1.92	25	28.71	30	Pass
n-HT40	134	5670	2.77	3.52	3.28	1.85	1.67	25	28.52	30	Pass
Ant 1											
11a	36	5180	-4.28	-3.23	-3.53	-5.44	-5.71	25	21.77	23	Pass
11a	64	5320	-4.14	-3.25	-3.66	-5.03	-5.24	25	21.75	23	Pass
11a	100	5500	3.69	4.41	4.19	2.74	2.46	25	29.41	30	Pass
11a	140	5700	3.94	4.62	4.31	3.15	3.03	25	29.62	30	Pass
n-HT20	36	5180	-5.15	-4.29	-4.46	-6.24	-6.56	25	20.71	23	Pass
n-HT20	64	5320	-5.52	-4.71	-4.94	-6.38	-6.61	25	20.29	23	Pass
n-HT20	100	5500	2.13	3.25	3.03	2.02	1.82	25	28.25	30	Pass
n-HT20	140	5700	2.26	3.38	3.14	2.09	2.01	25	28.38	30	Pass
n-HT40	38	5190	-4.27	-3.19	-3.64	-4.54	-4.75	25	21.81	23	Pass
n-HT40	62	5310	-4.63	-3.74	-3.90	-4.81	-4.98	25	21.26	23	Pass
n-HT40	102	5510	2.42	3.61	3.36	2.19	2.04	25	28.61	30	Pass
n-HT40	134	5670	2.96	3.84	3.58	2.63	2.39	25	28.84	30	Pass



Ant 0 + 1											
n-HT20	36	5180	-4.39	-3.51	-3.73	-5.04	-5.16	25	21.49	23	Pass
n-HT20	64	5320	-5.07	-4.19	-4.44	-5.85	-6.11	25	20.81	23	Pass
n-HT20	100	5500	3.63	4.35	4.21	2.84	2.63	25	29.35	30	Pass
n-HT20	140	5700	3.53	4.28	4.06	2.91	2.64	25	29.28	30	Pass
n-HT40	38	5190	-4.04	-3.28	-3.59	-4.78	-4.95	25	21.72	23	Pass
n-HT40	62	5310	-4.75	-3.91	-4.12	-5.26	-5.41	25	21.09	23	Pass
n-HT40	102	5510	2.55	3.32	4.08	2.69	2.31	25	28.32	30	Pass
n-HT40	134	5670	2.20	3.03	3.82	2.46	2.26	25	28.03	30	Pass

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

Duty Cycle = 100%.

**Transmit Power Control (TPC)**

Mode	Channel	Freq. (MHz)	RF Average Power (dBm)					Gain (dBi)	Max EIRP Power (dBm)	Limit (dBm)	Result	
			Normal	Extreme								
				25°C	-20°C		70°C					
					230V	207V	253V					207V
Ant 0												
11a	64	5320	-8.93	-8.52	-8.64	-9.36	-9.56	25	16.48	17	Pass	
11a	100	5500	-2.54	-2.31	-2.63	-2.94	-3.17	25	22.69	24	Pass	
n-HT20	64	5320	-9.08	-8.79	-8.96	-9.53	-9.72	25	16.21	17	Pass	
n-HT20	100	5500	-3.69	-3.36	-3.62	-3.94	-4.16	25	21.64	24	Pass	
n-HT40	62	5310	-8.47	-8.24	-8.51	-9.03	-9.46	25	16.76	17	Pass	
n-HT40	102	5510	-3.36	-3.12	-3.44	-3.59	-3.75	25	21.88	24	Pass	
Ant 1												
11a	64	5320	-8.79	-8.43	-8.66	-9.21	-9.46	25	16.57	17	Pass	
11a	100	5500	-2.62	-2.14	-2.43	-2.92	-3.06	25	22.86	24	Pass	
n-HT20	64	5320	-9.34	-8.89	-9.14	-9.60	-9.79	25	16.11	17	Pass	
n-HT20	100	5500	-3.61	-3.41	-3.55	-3.89	-4.12	25	21.59	24	Pass	
n-HT40	62	5310	-9.36	-8.97	-9.25	-9.64	-9.81	25	16.03	17	Pass	
n-HT40	102	5510	-3.23	-2.83	-2.99	-3.69	-3.84	25	22.17	24	Pass	
Ant 0 + 1												
n-HT20	64	5320	-9.17	-8.77	-8.89	-9.53	-9.72	25	16.23	17	Pass	
n-HT20	100	5500	-2.56	-2.04	-2.26	-2.96	-3.15	25	22.96	24	Pass	
n-HT40	62	5310	-9.08	-8.71	-8.88	-9.54	-9.80	25	16.29	17	Pass	
n-HT40	102	5510	-3.46	-3.12	-3.30	-3.79	-3.94	25	21.88	24	Pass	

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

Duty Cycle = 100%.

### Power Density

Mode	Channel	Freq. (MHz)	Reading Power Density (dBm/MHz)	Measured Power Density (dBm/MHz)	Max. Power Density Limit (dBm/MHz)	Result
Ant 0						
11a	36	5180	-16.24	8.76	10	Pass
11a	64	5320	-15.66	9.34	10	Pass
11a	100	5500	-14.62	10.38	17	Pass
11a	140	5700	-14.44	10.56	17	Pass
n-HT20	36	5180	-16.06	8.94	10	Pass
n-HT20	64	5320	-16.48	8.52	10	Pass
n-HT20	100	5500	-15.20	9.80	17	Pass
n-HT20	140	5700	-15.34	9.66	17	Pass
n-HT40	38	5180	-19.31	5.69	10	Pass
n-HT40	62	5320	-19.78	5.22	10	Pass
n-HT40	102	5500	-18.38	6.62	17	Pass
n-HT40	134	5700	-18.23	6.77	17	Pass
Ant 1						
11a	36	5180	-17.12	7.88	10	Pass
11a	64	5320	-17.48	7.52	10	Pass
11a	100	5500	-15.85	9.15	17	Pass
11a	140	5700	-15.51	9.49	17	Pass
n-HT20	36	5180	-17.78	7.22	10	Pass
n-HT20	64	5320	-17.09	7.91	10	Pass
n-HT20	100	5500	-16.80	8.20	17	Pass
n-HT20	140	5700	-15.99	9.01	17	Pass
n-HT40	38	5190	-20.46	4.54	10	Pass
n-HT40	62	5310	-21.05	3.95	10	Pass
n-HT40	102	5510	-19.65	5.35	17	Pass
n-HT40	134	5670	-20.38	4.62	17	Pass
Ant 0 + 1						
n-HT20	36	5180	-14.99	10.01	10	Pass
n-HT20	64	5320	-15.27	9.73	10	Pass
n-HT20	100	5500	-13.09	11.91	17	Pass
n-HT20	140	5700	-13.24	11.76	17	Pass
n-HT40	38	5190	-17.93	7.07	10	Pass

n-HT40	62	5310	-17.94	7.06	10	Pass
n-HT40	102	5510	-17.31	7.69	17	Pass
n-HT40	134	5670	-16.83	8.17	17	Pass

Note: Max. Power Density (dBm/MHz) = Measured Power Density (dBm/MHz) + Antenna Gain (dBi) + 10 log (1/Duty Cycle).

Antenna Gain = 25 dBi, Duty Cycle = 100%.

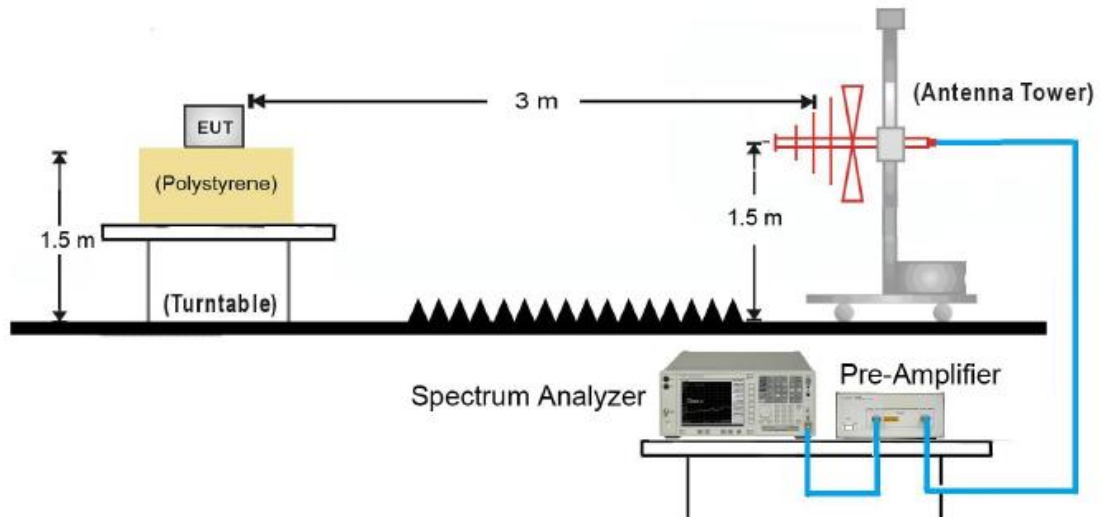
## 7. Transmitter Unwanted Emissions Outside the 5GHz RLAN Bands

### 7.1. Limit

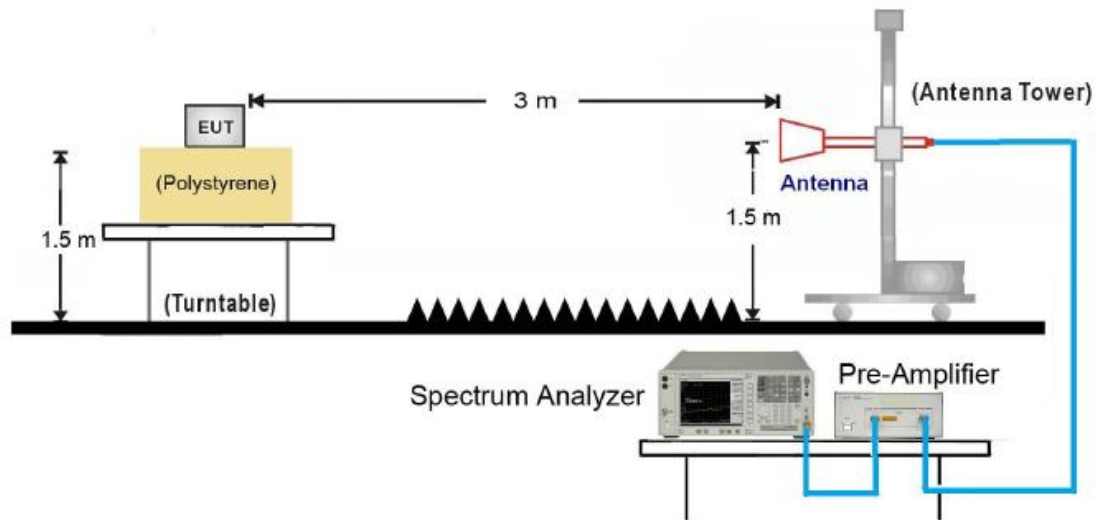
Frequency Range	Maximum Power	Bandwidth
30 MHz to 47 MHz	-36dBm	100 kHz
47 MHz to 74 MHz	-54dBm	100 kHz
74 MHz to 87.5 MHz	-36dBm	100 kHz
87.5 MHz to 118 MHz	-54dBm	100 kHz
118 MHz to 174 MHz	-36dBm	100 kHz
174 MHz to 230 MHz	-54dBm	100 kHz
230 MHz to 470 MHz	-36dBm	100 kHz
470 MHz to 862 MHz	-54dBm	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 by Panel Antenna – 25dBi

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-09-2014	Relative Humidity	54%
Test Mode	802.11a - Ant 0	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
64	607.7	-77.17	-54	-23.17	Peak	Horizontal
	120.1	-72.08	-36	-36.08	Peak	Vertical
	706.0	-73.56	-54	-19.56	Peak	Horizontal
	114.9	-68.21	-54	-14.21	Peak	Vertical
	10640.0	-41.45	-30	-11.45	Peak	Horizontal
	10640.0	-41.26	-30	-11.26	Peak	Vertical
	15960.0	-39.81	-30	-9.81	Peak	Horizontal
	15960.0	-40.38	-30	-10.38	Peak	Vertical
100	152.6	-76.21	-36	-40.21	Peak	Horizontal
	133.7	-69.76	-36	-33.76	Peak	Vertical
	807.7	-74.54	-54	-20.54	Peak	Horizontal
	115.1	-68.91	-54	-14.91	Peak	Vertical
	11000.0	-38.53	-30	-8.53	Peak	Horizontal
	11000.0	-42.07	-30	-12.07	Peak	Vertical
	16500.0	-37.19	-30	-7.19	Peak	Horizontal
	16500.0	-39.21	-30	-9.21	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-09-2014	Relative Humidity	54%
Test Mode	802.11n-HT20 - Ant 0	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
64	762.5	-75.04	-54	-21.04	Peak	Horizontal
	56.6	-64.03	-54	-10.03	Peak	Vertical
	779.0	-74.01	-54	-20.01	Peak	Horizontal
	107.4	-68.51	-54	-14.51	Peak	Vertical
	10640.0	-41.64	-30	-11.64	Peak	Horizontal
	10640.0	-40.94	-30	-10.94	Peak	Vertical
	15960.0	-39.48	-30	-9.48	Peak	Horizontal
	15960.0	-40.56	-30	-10.56	Peak	Vertical
100	527.2	-68.78	-54	-14.78	Peak	Horizontal
	114.7	-60.43	-54	-6.43	Peak	Vertical
	711.0	-65.62	-54	-11.62	Peak	Horizontal
	784.8	-59.65	-54	-5.65	Peak	Vertical
	11000.0	-40.16	-30	-10.16	Peak	Horizontal
	11000.0	-41.46	-30	-11.46	Peak	Vertical
	16500.0	-36.97	-30	-6.97	Peak	Horizontal
	16500.0	-39.18	-30	-9.18	Peak	Vertical



Test Engineer	Milo Li	Temperature	26°C
Test Date	08-09-2014	Relative Humidity	54%
Test Mode	802.11n-HT40 - Ant 0	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
62	532.4	-67.52	-54	-13.52	Peak	Horizontal
	117.3	-59.17	-54	-5.17	Peak	Vertical
	713.8	-69.28	-54	-15.28	Peak	Horizontal
	605.6	-64.03	-54	-10.03	Peak	Vertical
	10620.0	-41.76	-30	-11.76	Peak	Horizontal
	10620.0	-41.58	-30	-11.58	Peak	Vertical
	15930.0	-39.66	-30	-9.66	Peak	Horizontal
	15930.0	-39.58	-30	-9.58	Peak	Vertical
102	125.8	-64.94	-36	-28.94	Peak	Horizontal
	644.3	-63.59	-54	-9.59	Peak	Vertical
	145.9	-65.20	-36	-29.20	Peak	Horizontal
	786.8	-66.66	-54	-12.66	Peak	Vertical
	11020.0	-39.62	-30	-9.62	Peak	Horizontal
	11020.0	-40.57	-30	-10.57	Peak	Vertical
	16530.0	-37.41	-30	-7.41	Peak	Horizontal
	16530.0	-39.14	-30	-9.14	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-09-2014	Relative Humidity	54%
Test Mode	802.11a - Ant 1	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
64	527.4	-68.24	-54	-14.24	Peak	Horizontal
	122.9	-60.27	-36	-24.27	Peak	Vertical
	591.7	-71.32	-54	-17.32	Peak	Horizontal
	611.8	-64.49	-54	-10.49	Peak	Vertical
	10640.0	-41.65	-30	-11.65	Peak	Horizontal
	11000.0	-41.64	-30	-11.64	Peak	Vertical
	15960.0	-40.17	-30	-10.17	Peak	Horizontal
	16500.0	-39.35	-30	-9.35	Peak	Vertical
100	532.3	-68.40	-54	-14.40	Peak	Horizontal
	641.6	-64.22	-54	-10.22	Peak	Vertical
	707.4	-70.39	-54	-16.39	Peak	Horizontal
	780.8	-67.26	-54	-13.26	Peak	Vertical
	11000.0	-38.28	-30	-8.28	Peak	Horizontal
	11000.0	-40.02	-30	-10.02	Peak	Vertical
	16500.0	-37.48	-30	-7.48	Peak	Horizontal
	16500.0	-38.68	-30	-8.68	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-09-2014	Relative Humidity	54%
Test Mode	802.11n-HT20 – Ant 1	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
64	760.2	-74.64	-54	-20.64	Peak	Horizontal
	59.5	-64.09	-54	-10.09	Peak	Vertical
	777.9	-74.15	-54	-20.15	Peak	Horizontal
	116.9	-68.11	-54	-14.11	Peak	Vertical
	10640.0	-41.22	-30	-11.22	Peak	Horizontal
	10640.0	-41.61	-30	-11.61	Peak	Vertical
	15960.0	-39.94	-30	-9.94	Peak	Horizontal
	15960.0	-40.43	-30	-10.43	Peak	Vertical
100	527.1	-68.92	-54	-14.92	Peak	Horizontal
	119.3	-60.30	-36	-24.30	Peak	Vertical
	708.0	-65.92	-54	-11.92	Peak	Horizontal
	782.2	-60.13	-54	-6.13	Peak	Vertical
	11000.0	-40.10	-30	-10.10	Peak	Horizontal
	11000.0	-41.79	-30	-11.79	Peak	Vertical
	16500.0	-37.49	-30	-7.49	Peak	Horizontal
	16500.0	-39.38	-30	-9.38	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-09-2014	Relative Humidity	54%
Test Mode	802.11n-HT40 – Ant 1	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
62	530.6	-68.60	-54	-14.60	Peak	Horizontal
	112.1	-59.58	-54	-5.58	Peak	Vertical
	709.6	-69.56	-54	-15.56	Peak	Horizontal
	613.1	-64.04	-54	-10.04	Peak	Vertical
	10620.0	-41.65	-30	-11.65	Peak	Horizontal
	10620.0	-41.89	-30	-11.89	Peak	Vertical
	15930.0	-39.42	-30	-9.42	Peak	Horizontal
	15930.0	-40.10	-30	-10.10	Peak	Vertical
102	608.9	-77.32	-54	-23.32	Peak	Horizontal
	112.4	-59.43	-54	-5.43	Peak	Vertical
	708.5	-69.40	-54	-15.40	Peak	Horizontal
	604.1	-64.55	-54	-10.55	Peak	Vertical
	11013.0	-36.62	-30	-6.62	Peak	Horizontal
	11020.0	-41.43	-30	-11.43	Peak	Vertical
	16530.0	-37.94	-30	-7.94	Peak	Horizontal
	16530.0	-38.57	-30	-8.57	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-10-2014	Relative Humidity	54%
Test Mode	802.11n-HT20 - Ant 0 + 1	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
64	765.2	-75.19	-54	-21.19	Peak	Horizontal
	60.5	-64.67	-54	-10.67	Peak	Vertical
	775.1	-74.61	-54	-20.61	Peak	Horizontal
	114.1	-68.36	-54	-14.36	Peak	Vertical
	10640.0	-41.28	-30	-11.28	Peak	Horizontal
	10640.0	-41.34	-30	-11.34	Peak	Vertical
	15960.0	-40.03	-30	-10.03	Peak	Horizontal
	15960.0	-40.64	-30	-10.64	Peak	Vertical
100	532.7	-68.94	-54	-14.94	Peak	Horizontal
	118.4	-60.31	-36	-24.31	Peak	Vertical
	706.8	-65.56	-54	-11.56	Peak	Horizontal
	783.9	-59.62	-54	-5.62	Peak	Vertical
	11000.0	-39.60	-30	-9.60	Peak	Horizontal
	11000.0	-41.16	-30	-11.16	Peak	Vertical
	16500.0	-37.32	-30	-7.32	Peak	Horizontal
	16500.0	-39.55	-30	-9.55	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-10-2014	Relative Humidity	54%
Test Mode	802.11n-HT40 - Ant 0 + 1	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
62	523.8	-68.29	-54	-14.29	Peak	Horizontal
	113.3	-59.39	-54	-5.39	Peak	Vertical
	716.1	-69.79	-54	-15.79	Peak	Horizontal
	611.9	-63.84	-54	-9.84	Peak	Vertical
	10620.0	-41.76	-30	-11.76	Peak	Horizontal
	10620.0	-41.40	-30	-11.40	Peak	Vertical
	15930.0	-39.71	-30	-9.71	Peak	Horizontal
	15930.0	-40.64	-30	-10.64	Peak	Vertical
102	608.4	-76.98	-54	-22.98	Peak	Horizontal
	113.7	-59.96	-54	-5.96	Peak	Vertical
	715.7	-69.06	-54	-15.06	Peak	Horizontal
	604.1	-64.19	-54	-10.19	Peak	Vertical
	11013.0	-36.60	-30	-6.60	Peak	Horizontal
	11020.0	-41.48	-30	-11.48	Peak	Vertical
	16530.0	-37.72	-30	-7.72	Peak	Horizontal
	16530.0	-38.51	-30	-8.51	Peak	Vertical

**Test by Dipole Antenna – 2dBi**

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-10-2014	Relative Humidity	54%
Test Mode	802.11a - Ant 0	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
64	637.0	-78.02	-54	-24.02	Peak	Horizontal
	124.0	-72.15	-36	-36.15	Peak	Vertical
	688.9	-74.45	-54	-20.45	Peak	Horizontal
	105.4	-69.14	-54	-15.14	Peak	Vertical
	10640.0	-42.95	-30	-12.95	Peak	Horizontal
	10640.0	-42.67	-30	-12.67	Peak	Vertical
	15960.0	-40.16	-30	-10.16	Peak	Horizontal
	15960.0	-41.56	-30	-11.56	Peak	Vertical
100	111.2	-77.29	-54	-23.29	Peak	Horizontal
	131.1	-69.77	-36	-33.77	Peak	Vertical
	831.6	-75.58	-54	-21.58	Peak	Horizontal
	112.5	-70.43	-54	-16.43	Peak	Vertical
	11000.0	-39.76	-30	-9.76	Peak	Horizontal
	11000.0	-43.49	-30	-13.49	Peak	Vertical
	16500.0	-38.05	-30	-8.05	Peak	Horizontal
	16500.0	-40.33	-30	-10.33	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-10-2014	Relative Humidity	54%
Test Mode	802.11n-HT20 - Ant 0	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
64	793.8	-76.45	-54	-22.45	Peak	Horizontal
	37.7	-64.50	-36	-28.50	Peak	Vertical
	775.0	-74.41	-54	-20.41	Peak	Horizontal
	138.4	-69.74	-36	-33.74	Peak	Vertical
	10640.0	-42.52	-30	-12.52	Peak	Horizontal
	10640.0	-41.41	-30	-11.41	Peak	Vertical
	15960.0	-40.55	-30	-10.55	Peak	Horizontal
	15960.0	-40.58	-30	-10.58	Peak	Vertical
100	516.6	-69.59	-54	-15.59	Peak	Horizontal
	112.4	-61.92	-54	-7.92	Peak	Vertical
	716.4	-67.01	-54	-13.01	Peak	Horizontal
	754.5	-60.00	-54	-6.00	Peak	Vertical
	11000.0	-41.34	-30	-11.34	Peak	Horizontal
	11000.0	-41.97	-30	-11.97	Peak	Vertical
	16500.0	-37.43	-30	-7.43	Peak	Horizontal
	16500.0	-39.77	-30	-9.77	Peak	Vertical



Test Engineer	Milo Li	Temperature	26°C
Test Date	08-10-2014	Relative Humidity	54%
Test Mode	802.11n-HT40 - Ant 0	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
62	507.8	-67.98	-54	-13.98	Peak	Horizontal
	109.7	-59.54	-54	-5.54	Peak	Vertical
	714.3	-69.78	-54	-15.78	Peak	Horizontal
	633.5	-64.60	-54	-10.60	Peak	Vertical
	10620.0	-42.35	-30	-12.35	Peak	Horizontal
	10620.0	-42.31	-30	-12.31	Peak	Vertical
	15930.0	-40.18	-30	-10.18	Peak	Horizontal
	15930.0	-40.20	-30	-10.20	Peak	Vertical
102	128.6	-65.94	-36	-29.94	Peak	Horizontal
	656.4	-64.20	-54	-10.20	Peak	Vertical
	151.6	-65.27	-36	-29.27	Peak	Horizontal
	808.3	-67.90	-54	-13.90	Peak	Vertical
	11020.0	-40.89	-30	-10.89	Peak	Horizontal
	11020.0	-41.48	-30	-11.48	Peak	Vertical
	16530.0	-37.47	-30	-7.47	Peak	Horizontal
	16530.0	-40.05	-30	-10.05	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-10-2014	Relative Humidity	54%
Test Mode	802.11a - Ant 1	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
64	489.4	-69.49	-54	-15.49	Peak	Horizontal
	160.7	-60.78	-36	-24.78	Peak	Vertical
	584.4	-71.98	-54	-17.98	Peak	Horizontal
	576.3	-65.39	-54	-11.39	Peak	Vertical
	10640.0	-42.41	-30	-12.41	Peak	Horizontal
	11000.0	-42.16	-30	-12.16	Peak	Vertical
	15960.0	-40.38	-30	-10.38	Peak	Horizontal
	16500.0	-40.53	-30	-10.53	Peak	Vertical
100	507.2	-69.62	-54	-15.62	Peak	Horizontal
	634.8	-64.50	-54	-10.50	Peak	Vertical
	675.1	-71.70	-54	-17.70	Peak	Horizontal
	835.0	-68.36	-54	-14.36	Peak	Vertical
	11000.0	-38.30	-30	-8.30	Peak	Horizontal
	11000.0	-40.25	-30	-10.25	Peak	Vertical
	16500.0	-38.33	-30	-8.33	Peak	Horizontal
	16500.0	-39.17	-30	-9.17	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-10-2014	Relative Humidity	54%
Test Mode	802.11n-HT20 - Ant 1	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
64	760.3	-76.09	-54	-22.09	Peak	Horizontal
	50.4	-65.51	-54	-11.51	Peak	Vertical
	762.7	-75.29	-54	-21.29	Peak	Horizontal
	117.7	-69.50	-54	-15.50	Peak	Vertical
	10640.0	-41.85	-30	-11.85	Peak	Horizontal
	10640.0	-42.71	-30	-12.71	Peak	Vertical
	15960.0	-40.34	-30	-10.34	Peak	Horizontal
	15960.0	-40.53	-30	-10.53	Peak	Vertical
100	523.2	-69.34	-54	-15.34	Peak	Horizontal
	116.6	-60.44	-54	-6.44	Peak	Vertical
	713.4	-67.31	-54	-13.31	Peak	Horizontal
	762.0	-60.79	-54	-6.79	Peak	Vertical
	11000.0	-40.37	-30	-10.37	Peak	Horizontal
	11000.0	-42.18	-30	-12.18	Peak	Vertical
	16500.0	-37.83	-30	-7.83	Peak	Horizontal
	16500.0	-39.95	-30	-9.95	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-10-2014	Relative Humidity	54%
Test Mode	802.11n-HT40 - Ant 1	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
62	512.9	-69.13	-54	-15.13	Peak	Horizontal
	111.1	-59.86	-54	-5.86	Peak	Vertical
	715.7	-70.16	-54	-16.16	Peak	Horizontal
	623.2	-64.12	-54	-10.12	Peak	Vertical
	10620.0	-42.93	-30	-12.93	Peak	Horizontal
	10620.0	-42.37	-30	-12.37	Peak	Vertical
	15930.0	-39.97	-30	-9.97	Peak	Horizontal
	15930.0	-41.61	-30	-11.61	Peak	Vertical
102	567.9	-78.03	-54	-24.03	Peak	Horizontal
	121.6	-59.47	-36	-23.47	Peak	Vertical
	662.1	-70.84	-54	-16.84	Peak	Horizontal
	590.9	-65.62	-54	-11.62	Peak	Vertical
	11013.0	-38.16	-30	-8.16	Peak	Horizontal
	11020.0	-41.71	-30	-11.71	Peak	Vertical
	16530.0	-39.24	-30	-9.24	Peak	Horizontal
	16530.0	-39.29	-30	-9.29	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-10-2014	Relative Humidity	54%
Test Mode	802.11n-HT20 - Ant 0 + 1	Test Site	AC1

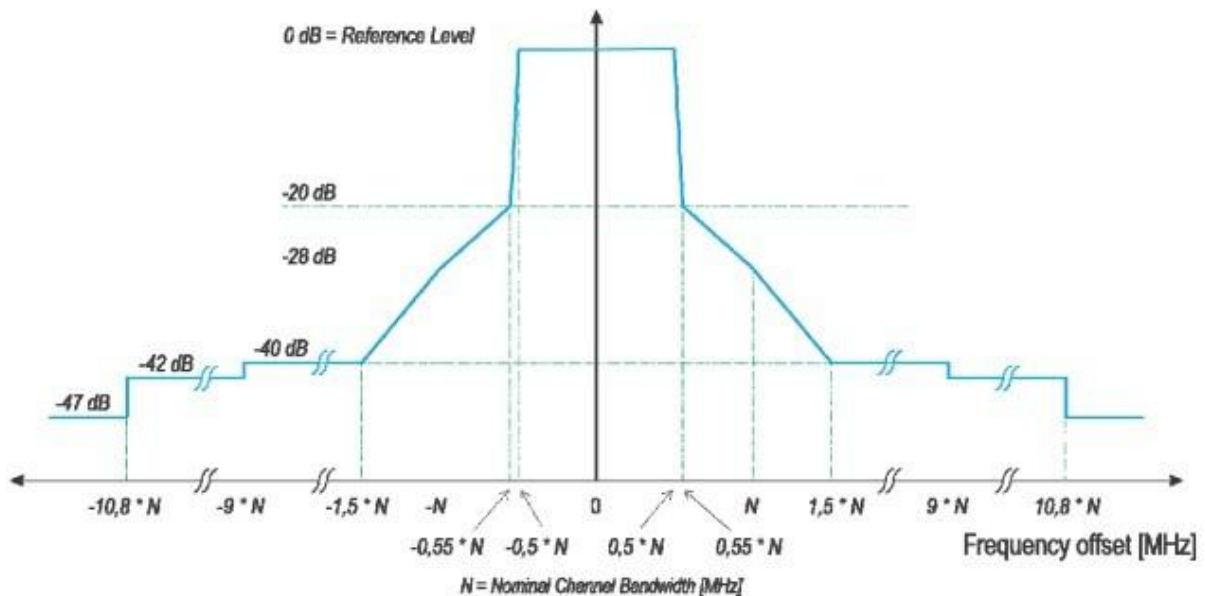
Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
64	761.6	-75.43	-54	-21.43	Peak	Horizontal
	76.5	-66.06	-36	-30.06	Peak	Vertical
	801.7	-75.18	-54	-21.18	Peak	Horizontal
	121.4	-69.64	-36	-33.64	Peak	Vertical
	10640.0	-42.52	-30	-12.52	Peak	Horizontal
	10640.0	-42.62	-30	-12.62	Peak	Vertical
	15960.0	-40.88	-30	-10.88	Peak	Horizontal
	15960.0	-41.42	-30	-11.42	Peak	Vertical
100	552.1	-69.64	-54	-15.64	Peak	Horizontal
	114.9	-61.05	-54	-7.05	Peak	Vertical
	698.1	-65.84	-54	-11.84	Peak	Horizontal
	752.2	-60.82	-54	-6.82	Peak	Vertical
	11000.0	-40.53	-30	-10.53	Peak	Horizontal
	11000.0	-42.18	-30	-12.18	Peak	Vertical
	16500.0	-38.45	-30	-8.45	Peak	Horizontal
	16500.0	-39.67	-30	-9.67	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-10-2014	Relative Humidity	54%
Test Mode	802.11n-HT40 - Ant 0 + 1	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
62	522.4	-68.88	-54	-14.88	Peak	Horizontal
	123.7	-60.45	-36	-24.45	Peak	Vertical
	711.3	-70.72	-54	-16.72	Peak	Horizontal
	590.6	-64.08	-54	-10.08	Peak	Vertical
	10620.0	-42.74	-30	-12.74	Peak	Horizontal
	10620.0	-42.03	-30	-12.03	Peak	Vertical
	15930.0	-40.76	-30	-10.76	Peak	Horizontal
	15930.0	-41.75	-30	-11.75	Peak	Vertical
102	589.9	-78.25	-54	-24.25	Peak	Horizontal
	157.0	-61.12	-36	-25.12	Peak	Vertical
	687.1	-69.80	-54	-15.80	Peak	Horizontal
	629.5	-64.50	-54	-10.50	Peak	Vertical
	11013.0	-36.64	-30	-6.64	Peak	Horizontal
	11020.0	-41.90	-30	-11.90	Peak	Vertical
	16530.0	-38.41	-30	-8.41	Peak	Horizontal
	16530.0	-39.61	-30	-9.61	Peak	Vertical

## 8. Transmitter Unwanted Emissions Within the 5GHz RLAN Bands

### 8.1. Limit

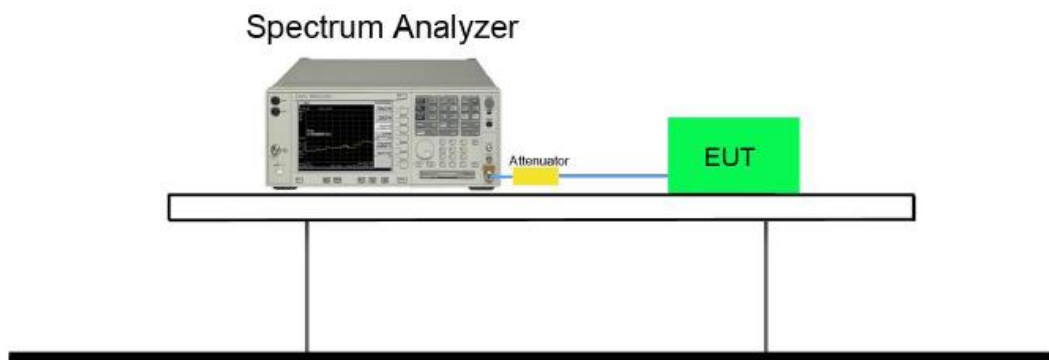


NOTE: dBc is the spectral density relative to the maximum spectral power density of the transmitted signal.

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

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-05-2014	Relative Humidity	54%

Test Mode	Channel No.	Frequency (MHz)	Result
Ant 0			
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
Ant 1			
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
Ant 1 / Ant 0 + 1			
802.11n-HT20	36	5180	Pass
802.11n-HT20	64	5320	Pass
802.11n-HT20	100	5500	Pass

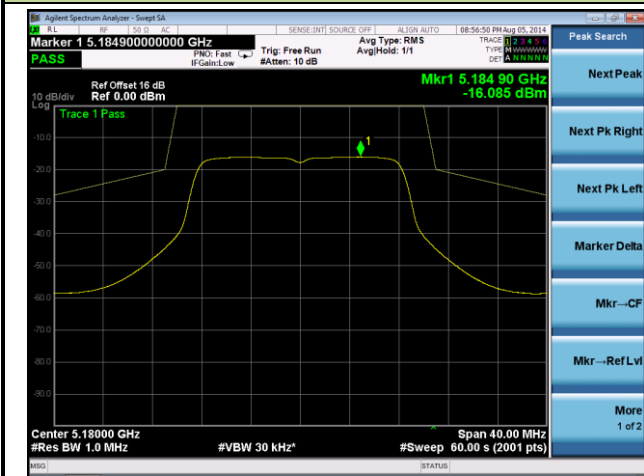


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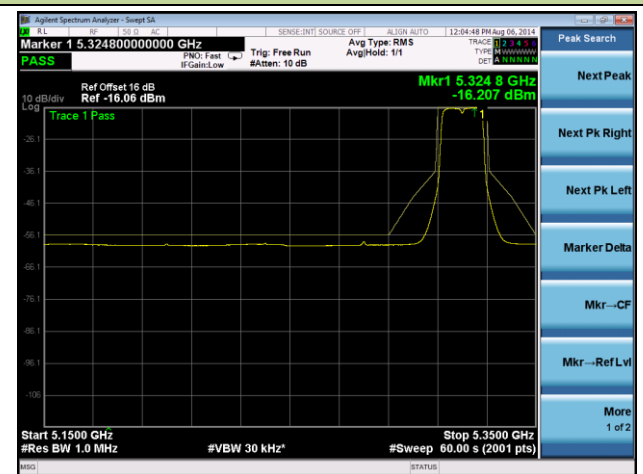
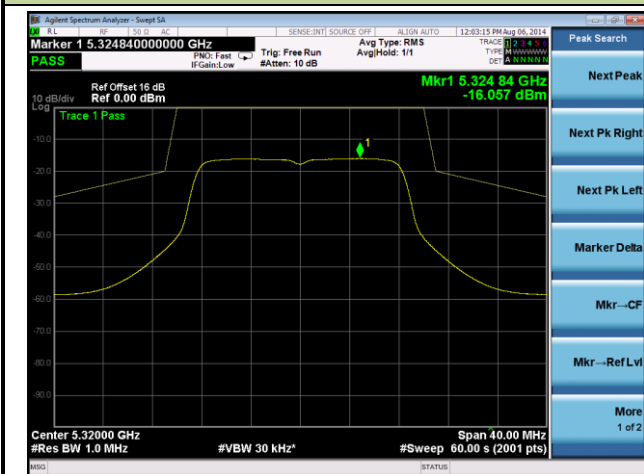
802.11n-HT20	140	5700	Pass
802.11n-HT40	38	5190	Pass
802.11n-HT40	62	5310	Pass
802.11n-HT40	102	5510	Pass
802.11n-HT40	134	5670	Pass

## 802.11a Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 0

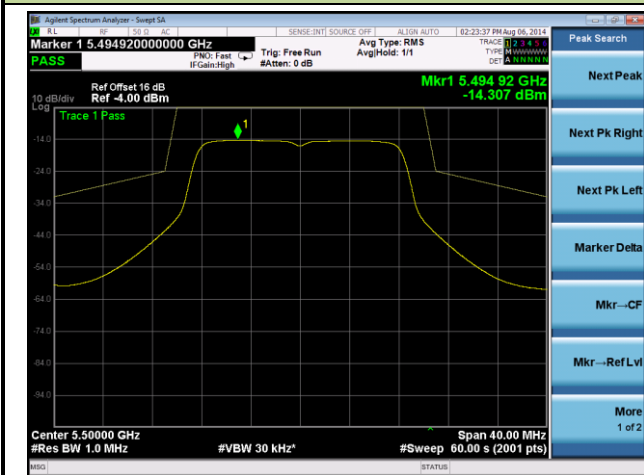
### Channel 36 (5180MHz)



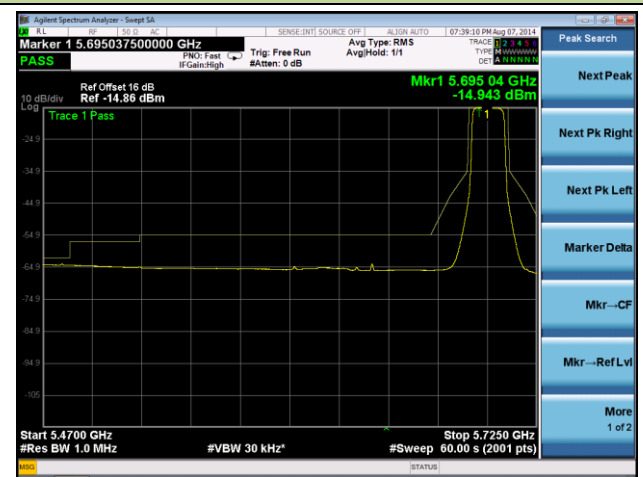
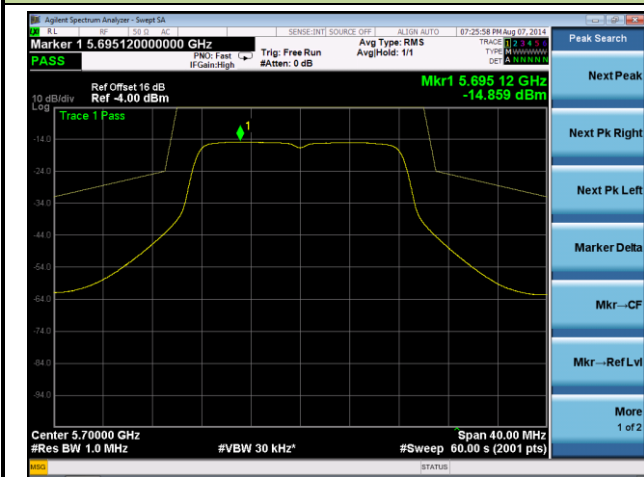
### Channel 64 (5320MHz)



### Channel 100 (5500MHz)

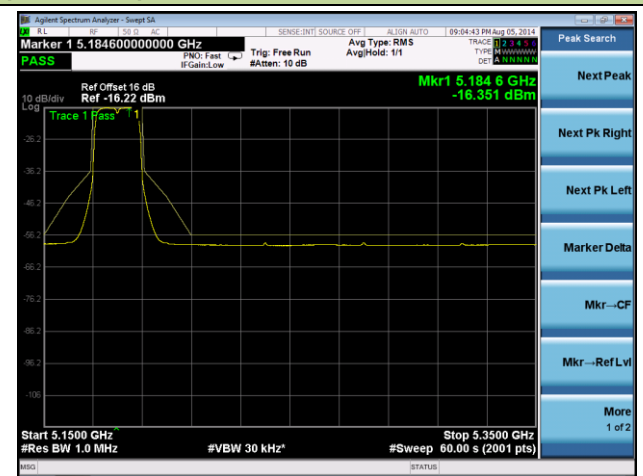
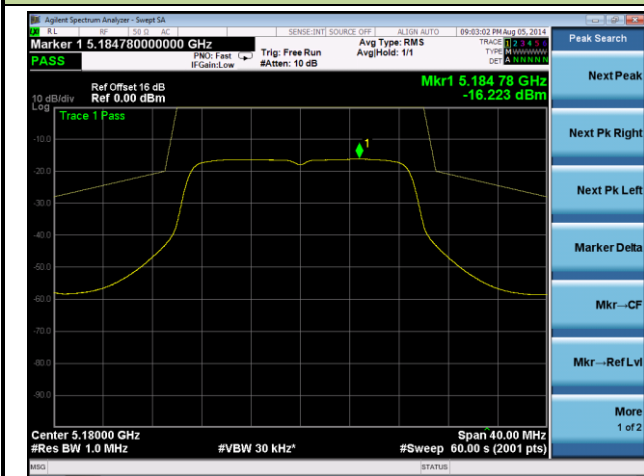


### Channel 140 (5700MHz)

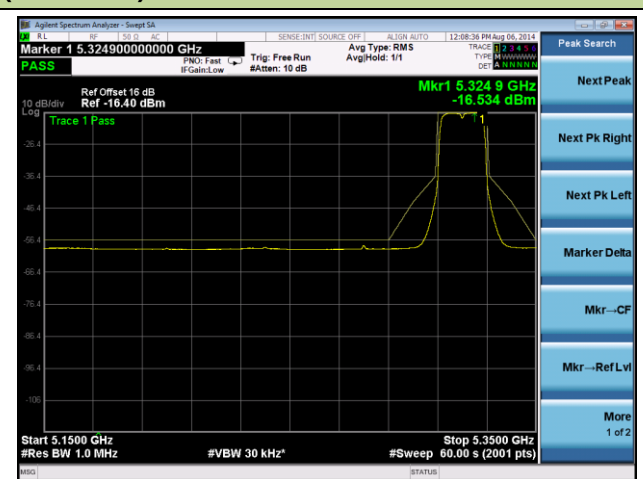
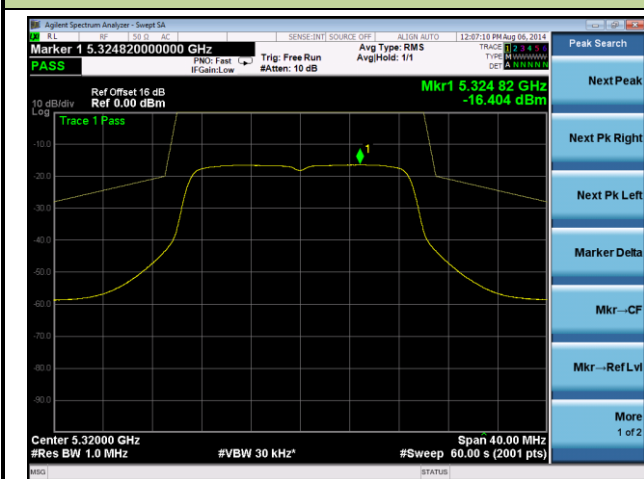


### 802.11n-HT20 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 0

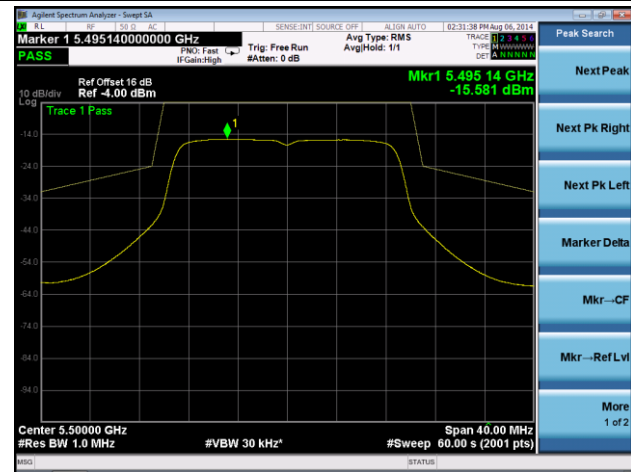
### Channel 36 (5180MHz)



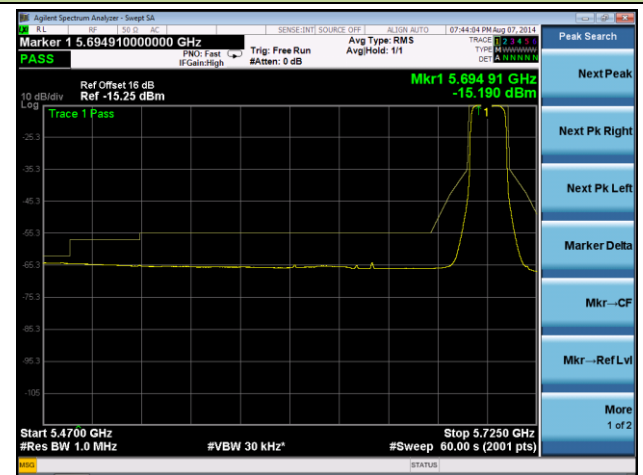
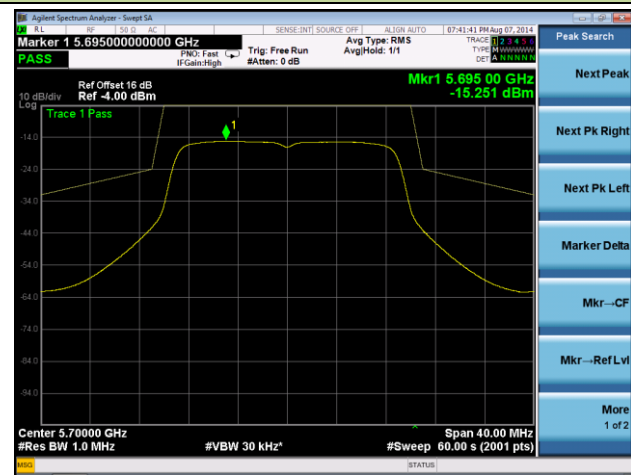
### Channel 64 (5320MHz)



### Channel 100 (5500MHz)

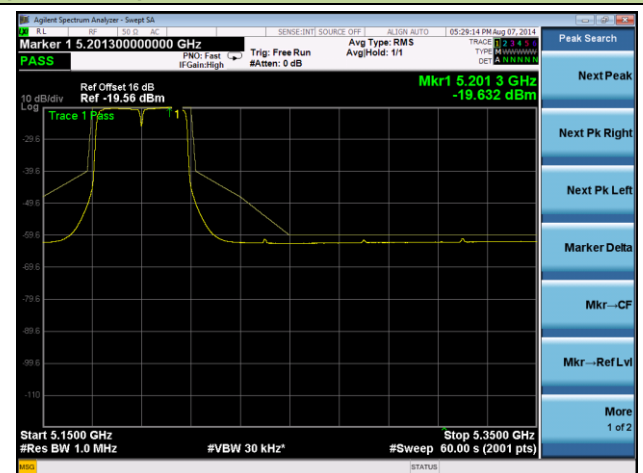
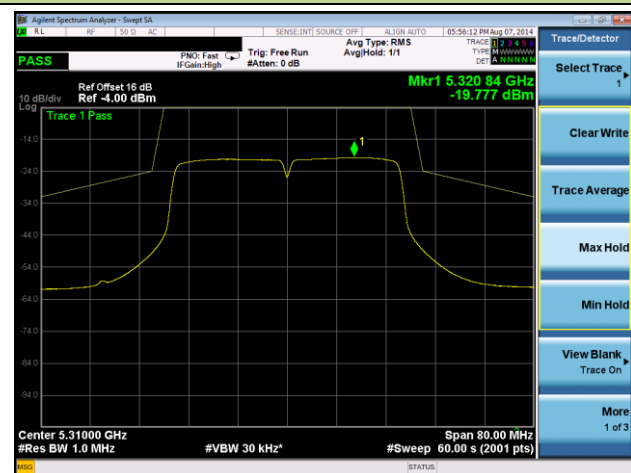


### Channel 140 (5700MHz)

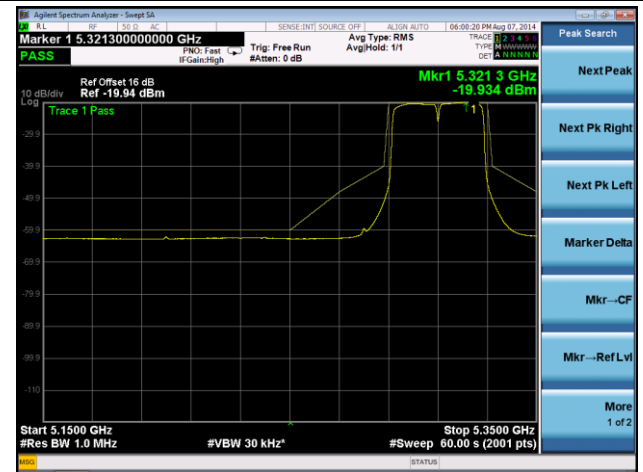
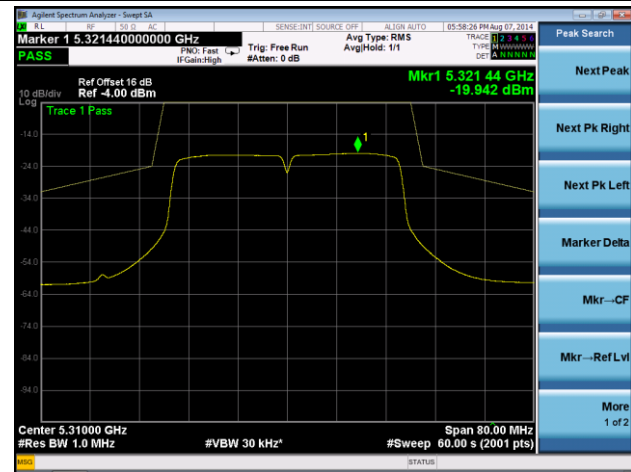


### 802.11n-HT40 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 0

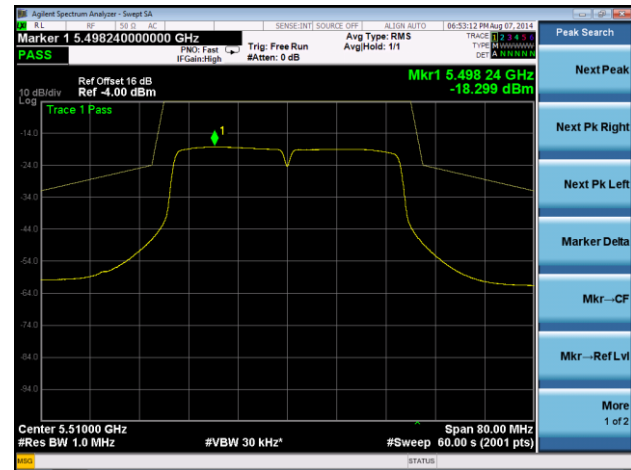
### Channel 38 (5190MHz)



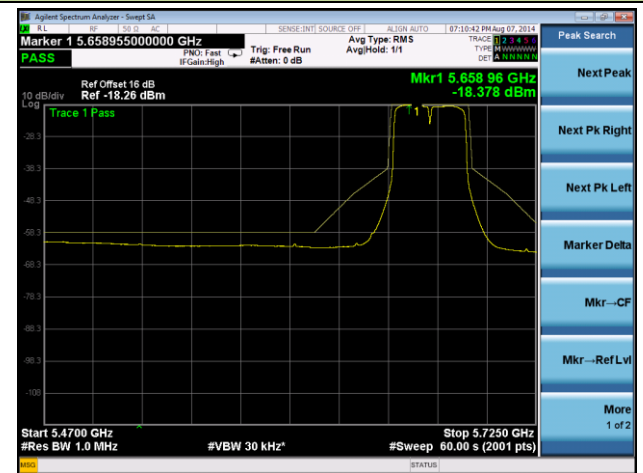
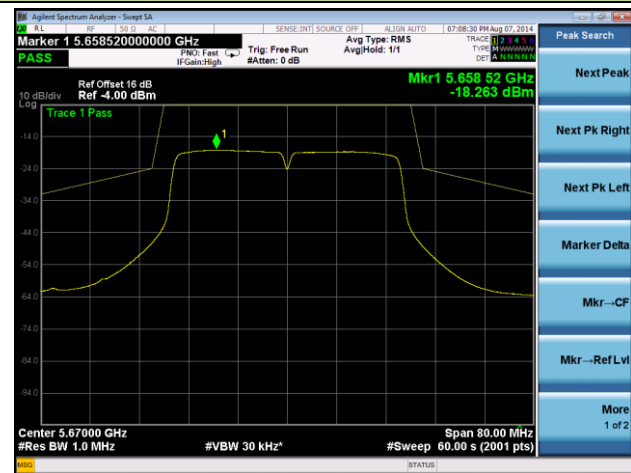
### Channel 62 (5310MHz)



### Channel 102 (5510MHz)

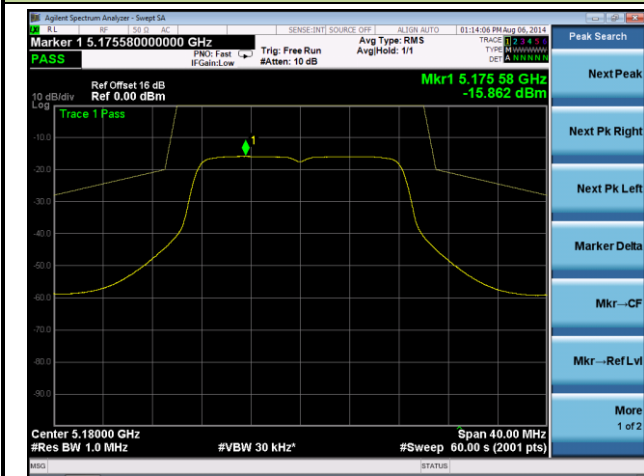


### Channel 134 (5670MHz)

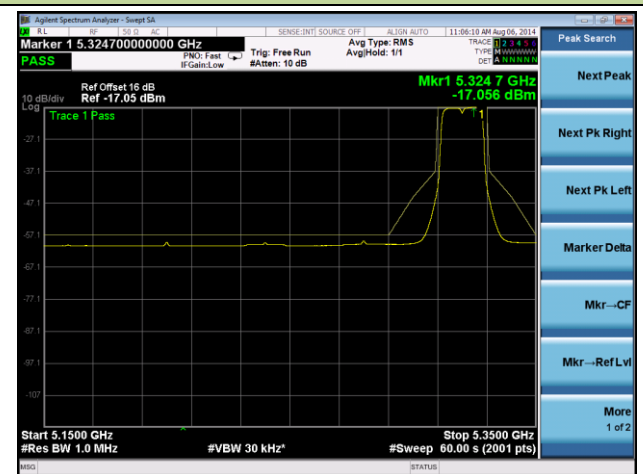
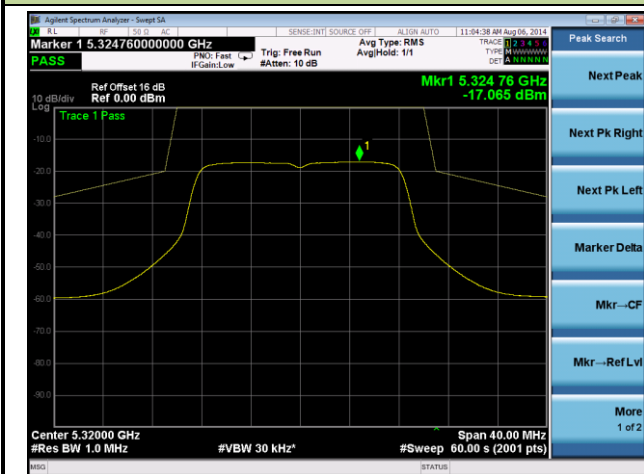


## 802.11a Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 1

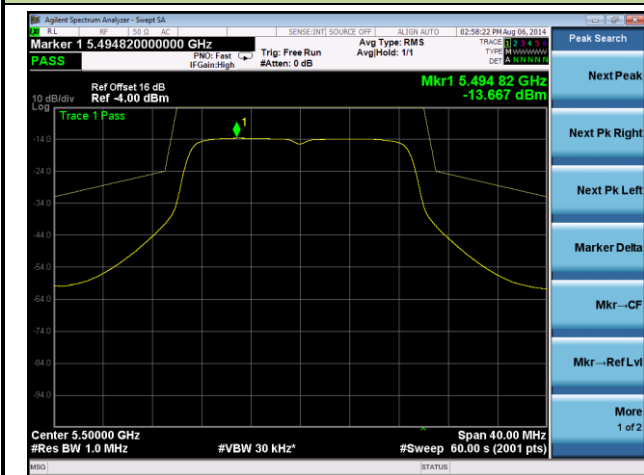
### Channel 36 (5180MHz)



### Channel 64 (5320MHz)

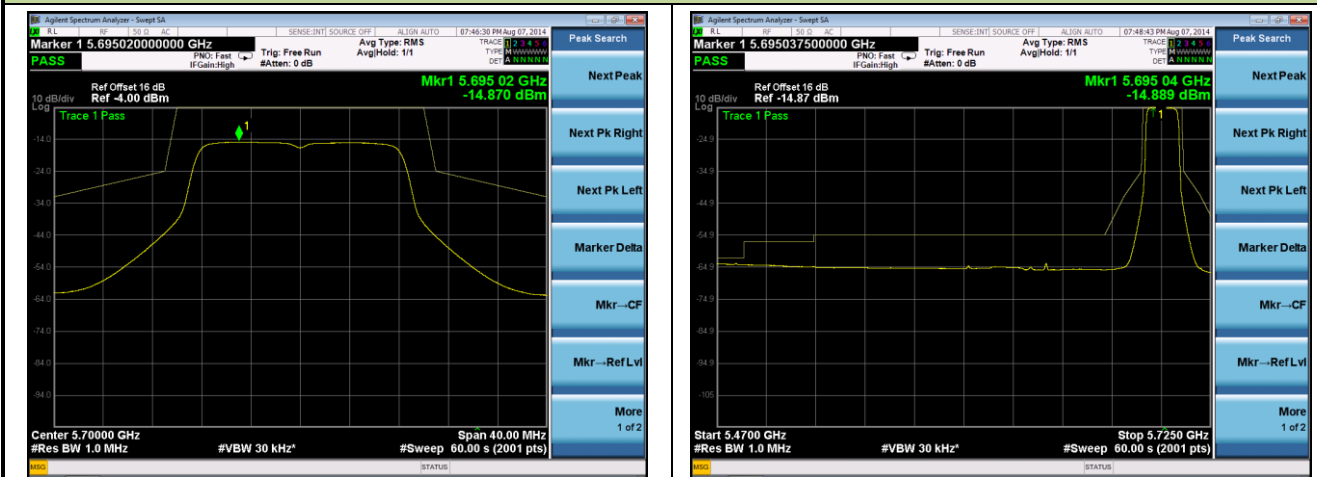


### Channel 100 (5500MHz)



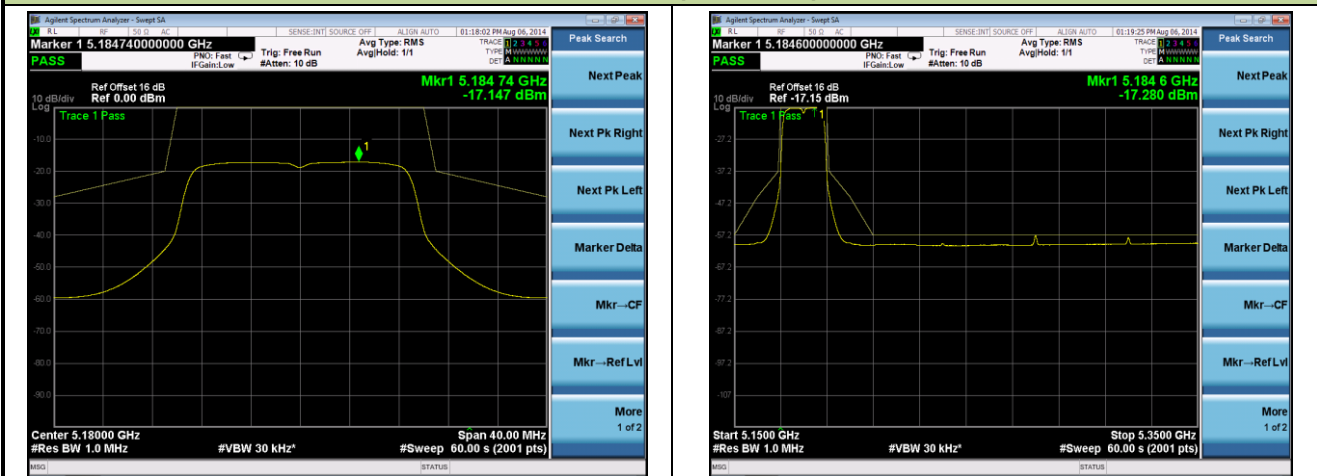


### Channel 140 (5700MHz)

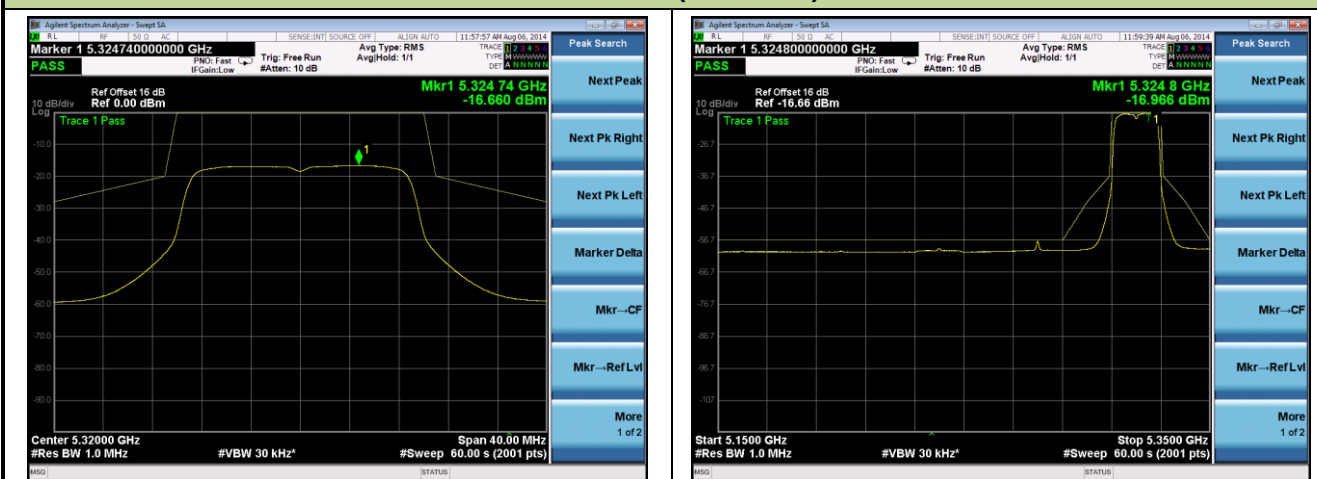


### 802.11n-HT20 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 1

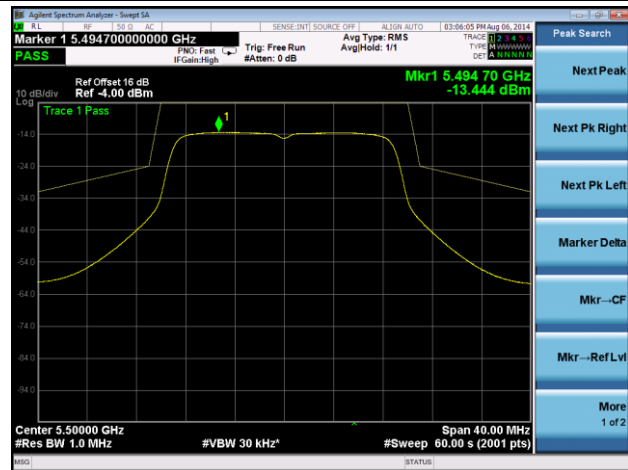
### Channel 36 (5180MHz)



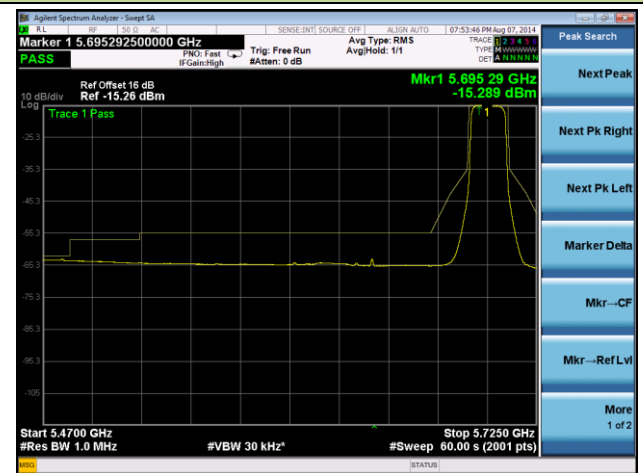
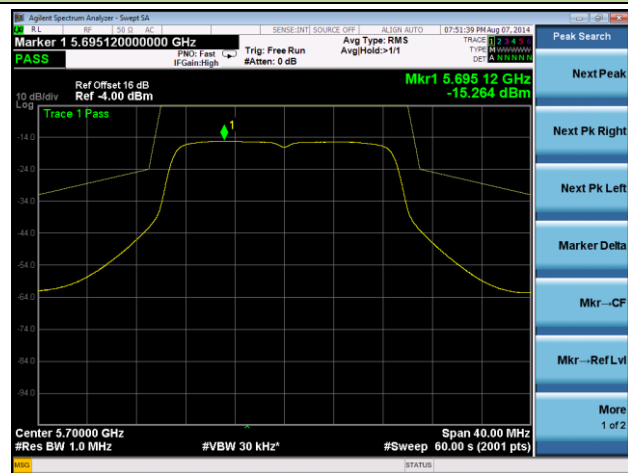
### Channel 64 (5320MHz)



### Channel 100 (5500MHz)

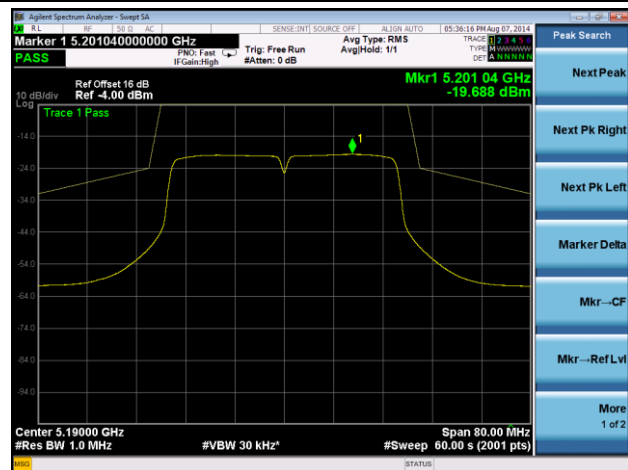


### Channel 140 (5700MHz)



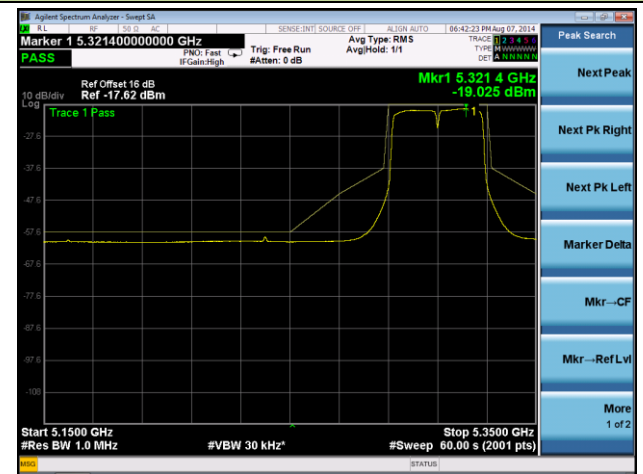
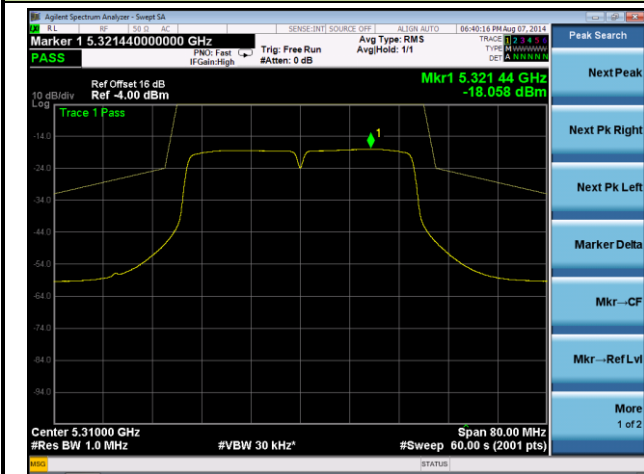
### 802.11n-HT40 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 1

### Channel 38 (5190MHz)

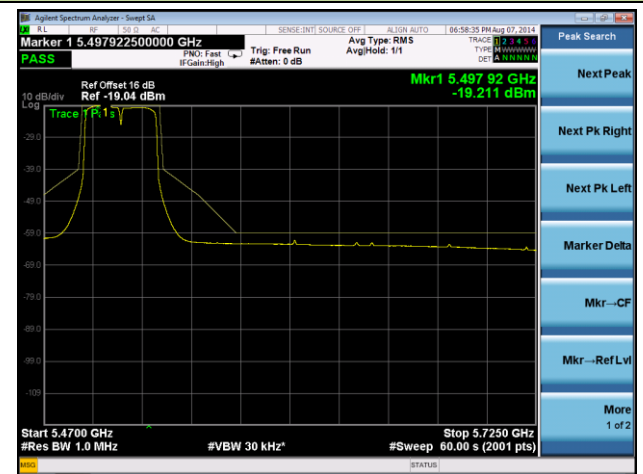
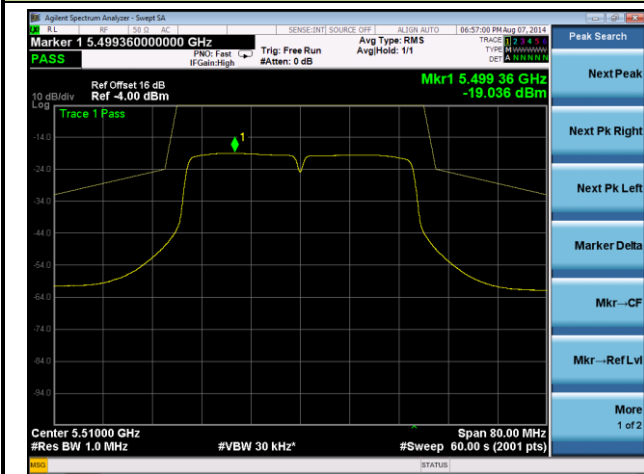




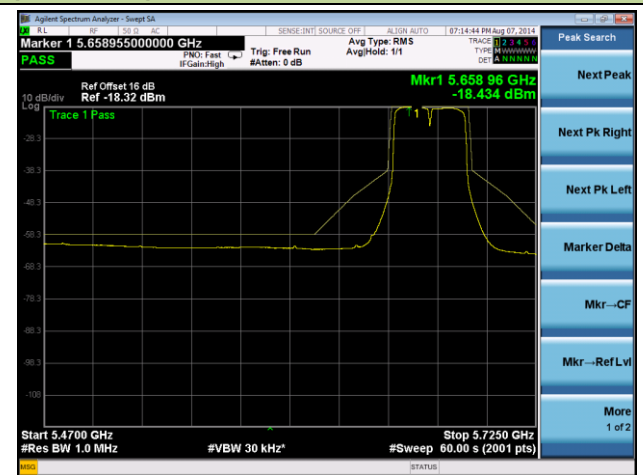
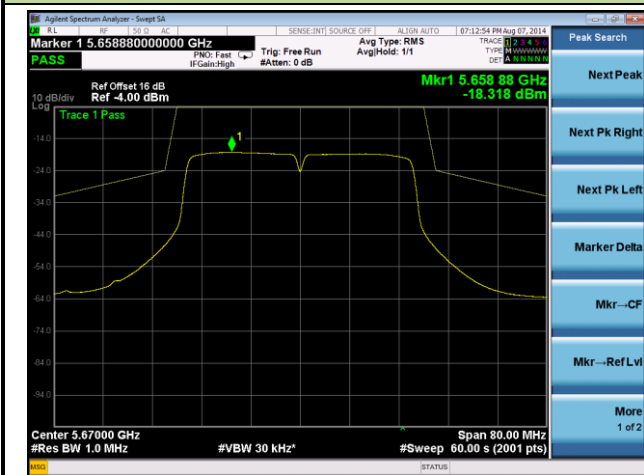
### Channel 62 (5310MHz)



### Channel 102 (5510MHz)

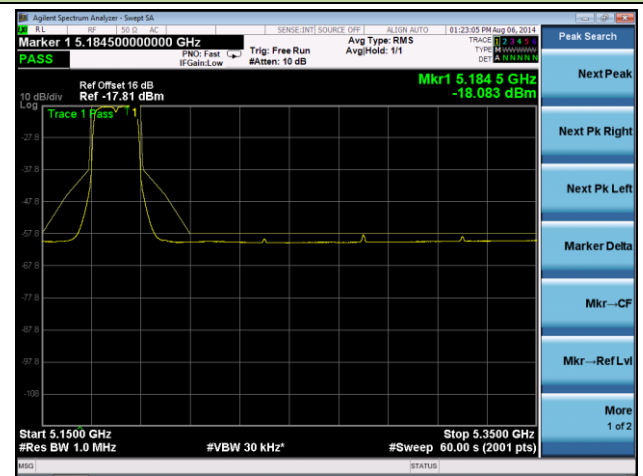
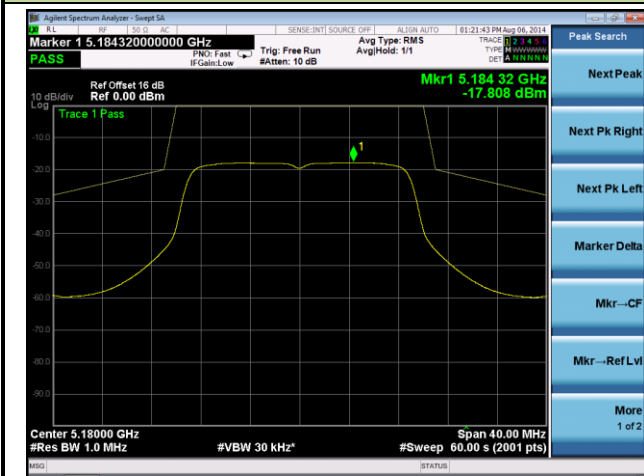


### Channel 134 (5670MHz)

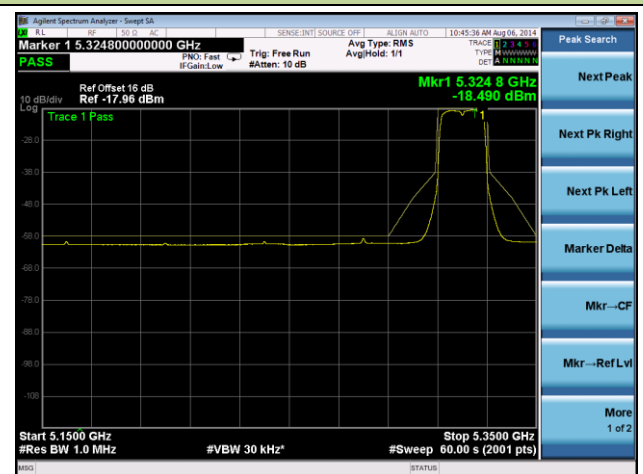
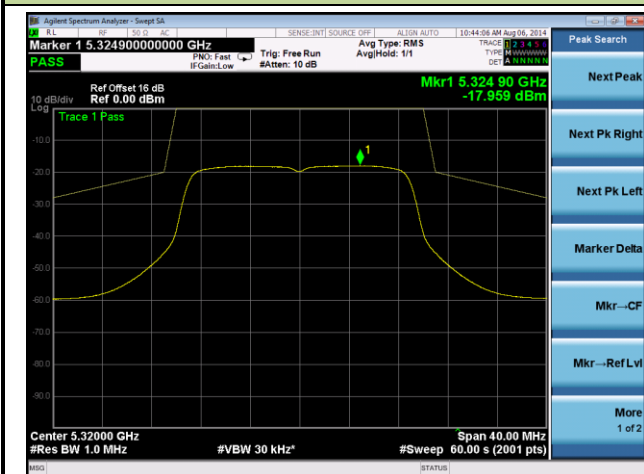


## 802.11n-HT20 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 0 / Ant 0 + 1

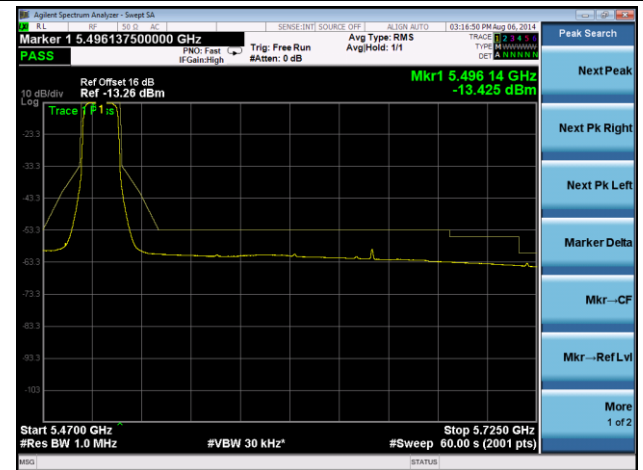
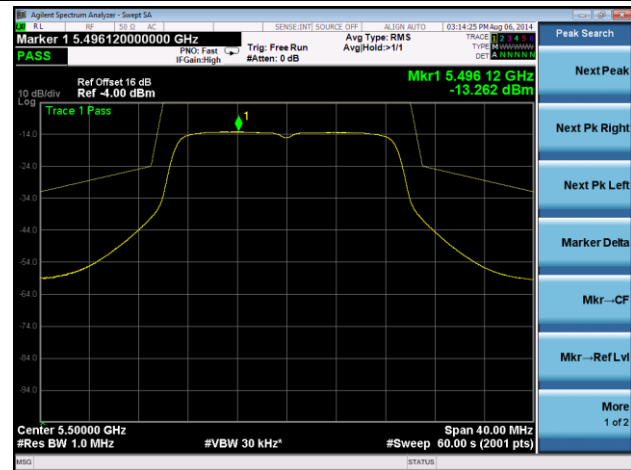
### Channel 36 (5180MHz)



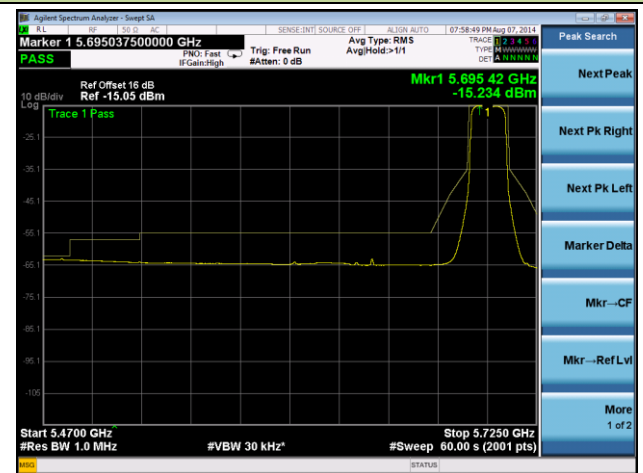
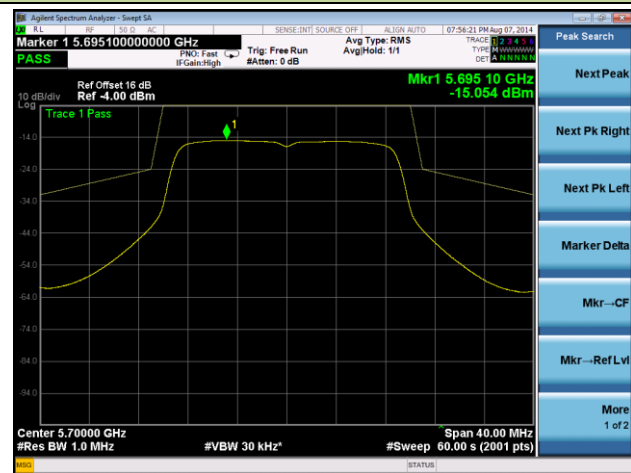
### Channel 60 (5300MHz)



### Channel 100 (5500MHz)

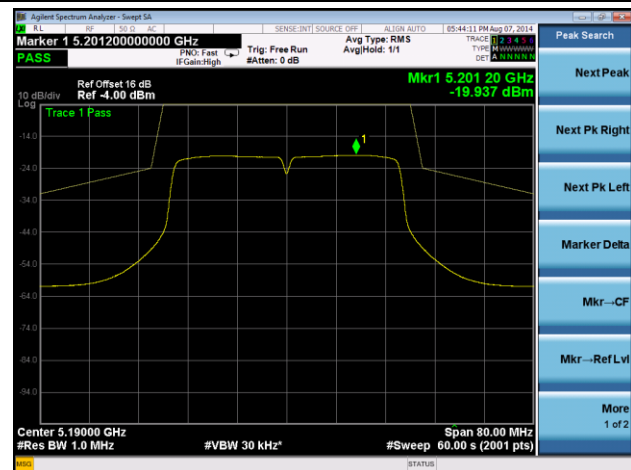


### Channel 140 (5700MHz)

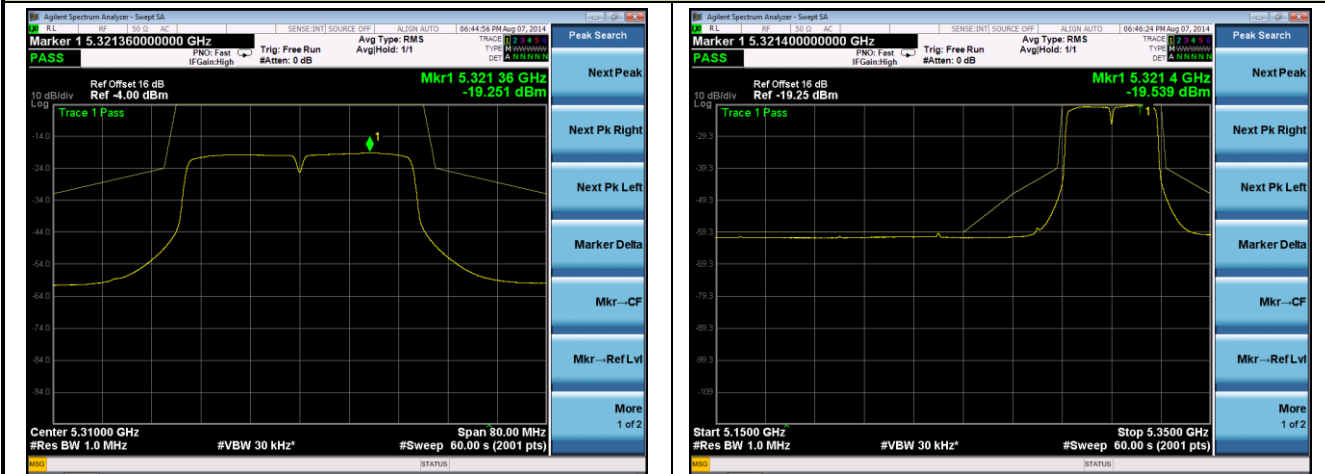


## 802.11n-HT40 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 0 / Ant 0 + 1

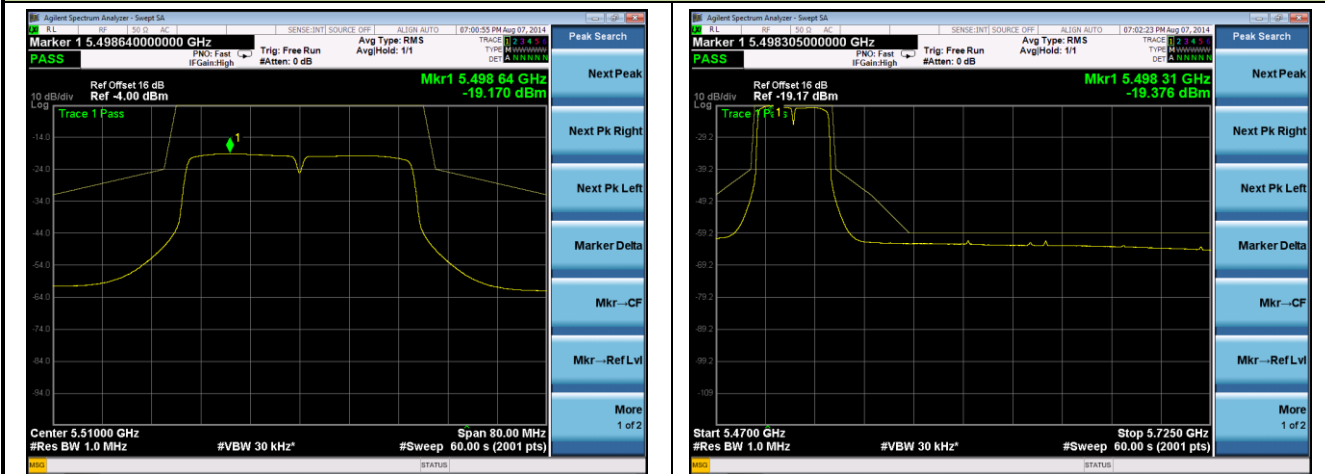
### Channel 38 (5190MHz)



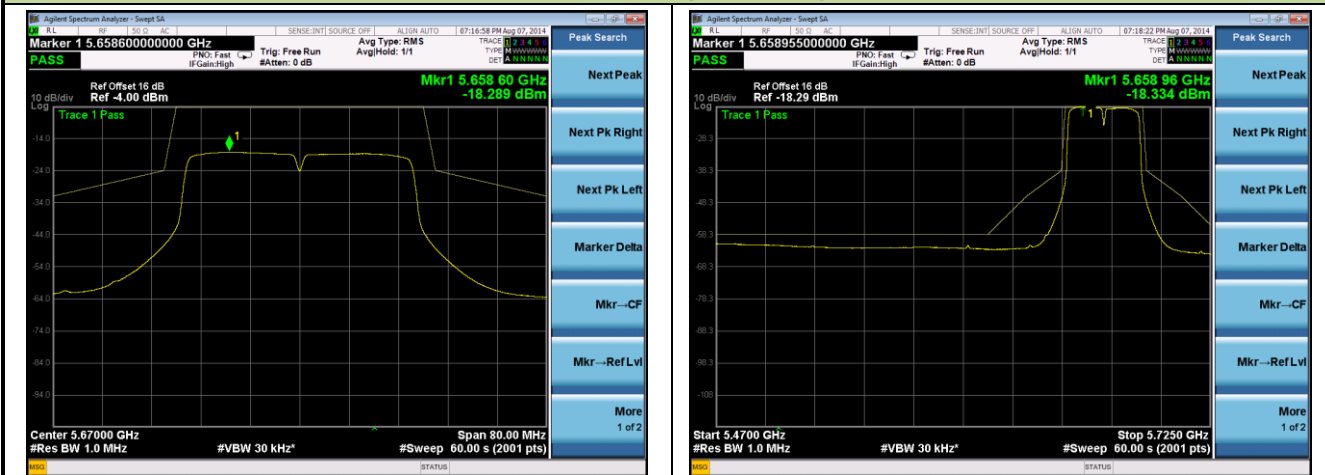
### Channel 62 (5310MHz)



### Channel 102 (5510MHz)



### Channel 134 (5670MHz)



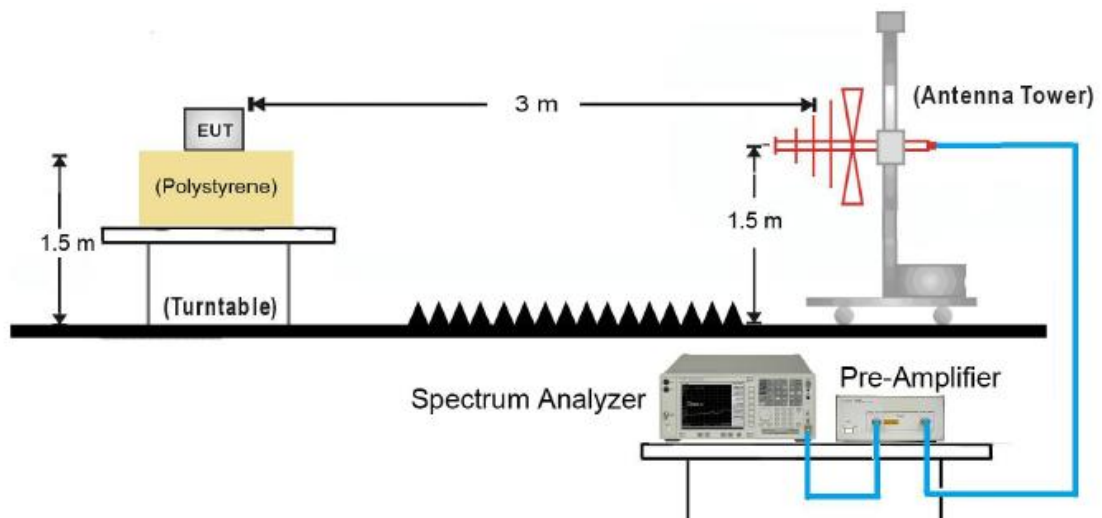
## 9. Receiver Spurious Emissions

### 9.1. Limit

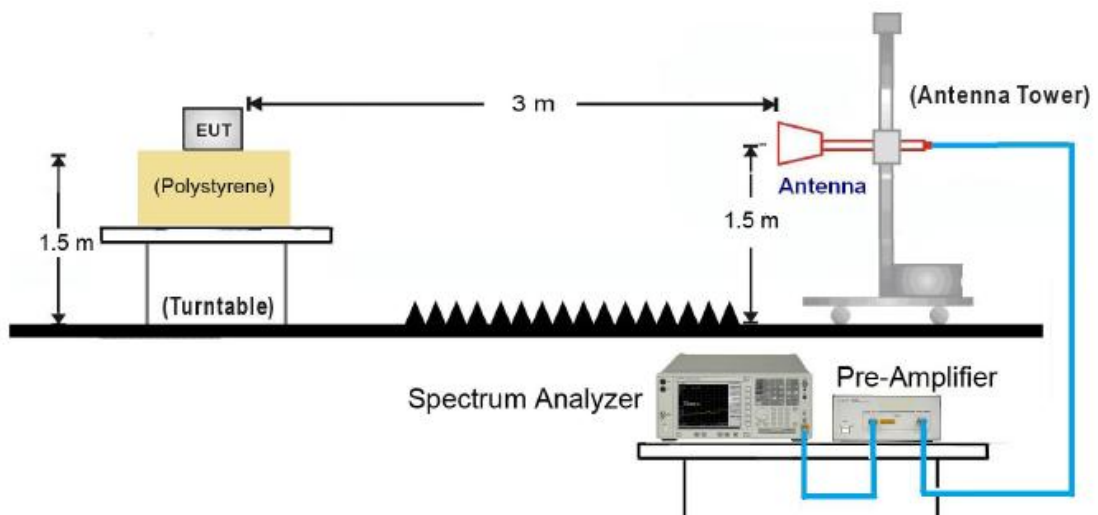
Frequency Range	Maximum Power	Bandwidth
30 MHz to 1GHz	-57dBm	100 kHz
1 GHz to 26 GHz	-47dBm	1 MHz

### 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 by Panel Antenna – 25dBi

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-11-2014	Relative Humidity	54%
Test Mode	802.11a - Ant 0	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
64	212.1	-70.65	-57	-13.65	Peak	Horizontal
	164.0	-67.09	-57	-10.09	Peak	Vertical
	493.7	-68.91	-57	-11.91	Peak	Horizontal
	354.4	-62.67	-57	-5.67	Peak	Vertical
	2174.5	-52.94	-47	-5.94	Peak	Horizontal
	1580.6	-51.92	-47	-4.92	Peak	Vertical
	2995.0	-51.33	-47	-4.33	Peak	Horizontal
	2116.8	-52.32	-47	-5.32	Peak	Vertical
100	497.7	-68.69	-57	-11.69	Peak	Horizontal
	356.3	-62.94	-57	-5.94	Peak	Vertical
	748.0	-69.81	-57	-12.81	Peak	Horizontal
	621.9	-64.79	-57	-7.79	Peak	Vertical
	2223.7	-53.16	-47	-6.16	Peak	Horizontal
	2379.2	-52.38	-47	-5.38	Peak	Vertical
	3912.1	-50.78	-47	-3.78	Peak	Horizontal
	2768.2	-52.18	-47	-5.18	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-12-2014	Relative Humidity	54%
Test Mode	802.11n-HT20 - Ant 0	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
64	203.4	-71.23	-57	-14.23	Peak	Horizontal
	365.3	-62.97	-57	-5.97	Peak	Vertical
	485.0	-68.57	-57	-11.57	Peak	Horizontal
	604.1	-64.25	-57	-7.25	Peak	Vertical
	2123.2	-53.30	-47	-6.30	Peak	Horizontal
	1601.0	-53.62	-47	-6.62	Peak	Vertical
	3128.7	-52.46	-47	-5.46	Peak	Horizontal
	3187.5	-51.38	-47	-4.38	Peak	Vertical
100	488.5	-69.40	-57	-12.40	Peak	Horizontal
	364.9	-62.98	-57	-5.98	Peak	Vertical
	728.9	-68.48	-57	-11.48	Peak	Horizontal
	604.1	-64.74	-57	-7.74	Peak	Vertical
	1221.8	-53.44	-47	-6.44	Peak	Horizontal
	1582.7	-52.51	-47	-5.51	Peak	Vertical
	2170.8	-53.13	-47	-6.13	Peak	Horizontal
	2118.3	-53.11	-47	-6.11	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-12-2014	Relative Humidity	54%
Test Mode	802.11n-HT40 - Ant 0	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
62	497.3	-69.20	-57	-12.20	Peak	Horizontal
	361.0	-62.95	-57	-5.95	Peak	Vertical
	737.3	-70.91	-57	-13.91	Peak	Horizontal
	616.2	-63.94	-57	-6.94	Peak	Vertical
	2178.1	-54.03	-47	-7.03	Peak	Horizontal
	2186.9	-52.67	-47	-5.67	Peak	Vertical
	3151.9	-52.86	-47	-5.86	Peak	Horizontal
	3686.7	-51.28	-47	-4.28	Peak	Vertical
102	483.6	-68.18	-57	-11.18	Peak	Horizontal
	373.5	-63.17	-57	-6.17	Peak	Vertical
	737.3	-70.33	-57	-13.33	Peak	Horizontal
	618.8	-64.61	-57	-7.61	Peak	Vertical
	1479.6	-54.78	-47	-7.78	Peak	Horizontal
	1332.7	-55.36	-47	-8.36	Peak	Vertical
	2195.1	-53.50	-47	-6.50	Peak	Horizontal
	2612.8	-51.92	-47	-4.92	Peak	Vertical



Test Engineer	Milo Li	Temperature	26°C
Test Date	08-12-2014	Relative Humidity	54%
Test Mode	802.11a - Ant 1	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
64	488.0	-68.58	-57	-11.58	Peak	Horizontal
	363.8	-63.27	-57	-6.27	Peak	Vertical
	734.5	-68.38	-57	-11.38	Peak	Horizontal
	615.2	-64.06	-57	-7.06	Peak	Vertical
	2233.5	-53.51	-47	-6.51	Peak	Horizontal
	2117.7	-52.90	-47	-5.90	Peak	Vertical
	3117.5	-52.62	-47	-5.62	Peak	Horizontal
	3183.1	-51.32	-47	-4.32	Peak	Vertical
100	486.8	-68.44	-57	-11.44	Peak	Horizontal
	353.9	-63.02	-57	-6.02	Peak	Vertical
	745.2	-68.99	-57	-11.99	Peak	Horizontal
	603.9	-64.24	-57	-7.24	Peak	Vertical
	2184.3	-53.82	-47	-6.82	Peak	Horizontal
	1589.4	-53.99	-47	-6.99	Peak	Vertical
	3022.1	-52.11	-47	-5.11	Peak	Horizontal
	2178.3	-53.92	-47	-6.92	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-12-2014	Relative Humidity	54%
Test Mode	802.11n-HT20 – Ant 1	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
64	199.8	-71.33	-57	-14.33	Peak	Horizontal
	369.6	-62.95	-57	-5.95	Peak	Vertical
	487.9	-68.55	-57	-11.55	Peak	Horizontal
	609.3	-64.16	-57	-7.16	Peak	Vertical
	2130.9	-53.29	-47	-6.29	Peak	Horizontal
	1599.8	-53.35	-47	-6.35	Peak	Vertical
	3112.5	-52.40	-47	-5.40	Peak	Horizontal
	3191.1	-51.37	-47	-4.37	Peak	Vertical
100	496.3	-69.39	-57	-12.39	Peak	Horizontal
	374.8	-62.91	-57	-5.91	Peak	Vertical
	728.9	-68.52	-57	-11.52	Peak	Horizontal
	619.8	-64.68	-57	-7.68	Peak	Vertical
	1217.1	-53.36	-47	-6.36	Peak	Horizontal
	1585.7	-52.26	-47	-5.26	Peak	Vertical
	2185.1	-53.23	-47	-6.23	Peak	Horizontal
	2120.6	-53.03	-47	-6.03	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-12-2014	Relative Humidity	54%
Test Mode	802.11n-HT40 – Ant 1	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
62	207.0	-71.64	-57	-14.64	Peak	Horizontal
	165.6	-65.62	-57	-8.62	Peak	Vertical
	499.9	-67.57	-57	-10.57	Peak	Horizontal
	372.8	-62.69	-57	-5.69	Peak	Vertical
	2172.3	-54.02	-47	-7.02	Peak	Horizontal
	2190.6	-52.78	-47	-5.78	Peak	Vertical
	3148.4	-52.83	-47	-5.83	Peak	Horizontal
	3681.1	-51.37	-47	-4.37	Peak	Vertical
102	206.0	-70.85	-57	-13.85	Peak	Horizontal
	175.2	-66.11	-57	-9.11	Peak	Vertical
	484.9	-68.60	-57	-11.60	Peak	Horizontal
	356.3	-63.09	-57	-6.09	Peak	Vertical
	1499.4	-54.75	-47	-7.75	Peak	Horizontal
	1319.5	-55.31	-47	-8.31	Peak	Vertical
	2186.7	-53.40	-47	-6.40	Peak	Horizontal
	2617.0	-52.04	-47	-5.04	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-12-2014	Relative Humidity	54%
Test Mode	802.11n-HT20 - Ant 0 + 1	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
64	205.8	-71.31	-57	-14.31	Peak	Horizontal
	362.8	-62.99	-57	-5.99	Peak	Vertical
	497.2	-68.44	-57	-11.44	Peak	Horizontal
	623.3	-64.22	-57	-7.22	Peak	Vertical
	2123.4	-53.41	-47	-6.41	Peak	Horizontal
	1591.7	-53.44	-47	-6.44	Peak	Vertical
	3131.2	-52.25	-47	-5.25	Peak	Horizontal
	3176.3	-51.21	-47	-4.21	Peak	Vertical
100	479.5	-69.26	-57	-12.26	Peak	Horizontal
	355.4	-62.99	-57	-5.99	Peak	Vertical
	744.5	-68.35	-57	-11.35	Peak	Horizontal
	612.4	-64.83	-57	-7.83	Peak	Vertical
	1219.3	-53.41	-47	-6.41	Peak	Horizontal
	1575.9	-52.47	-47	-5.47	Peak	Vertical
	2186.2	-53.33	-47	-6.33	Peak	Horizontal
	2120.2	-52.94	-47	-5.94	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-12-2014	Relative Humidity	54%
Test Mode	802.11n-HT40 - Ant 0 + 1	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
62	198.3	-71.57	-57	-14.57	Peak	Horizontal
	172.4	-65.75	-57	-8.75	Peak	Vertical
	479.9	-67.63	-57	-10.63	Peak	Horizontal
	357.6	-62.83	-57	-5.83	Peak	Vertical
	2187.6	-54.03	-47	-7.03	Peak	Horizontal
	2187.9	-52.71	-47	-5.71	Peak	Vertical
	3156.4	-52.85	-47	-5.85	Peak	Horizontal
	3691.5	-51.19	-47	-4.19	Peak	Vertical
102	206.4	-70.82	-57	-13.82	Peak	Horizontal
	170.7	-65.94	-57	-8.94	Peak	Vertical
	484.6	-68.85	-57	-11.85	Peak	Horizontal
	357.7	-62.99	-57	-5.99	Peak	Vertical
	1500.3	-54.89	-47	-7.89	Peak	Horizontal
	1334.0	-55.30	-47	-8.30	Peak	Vertical
	2190.1	-53.33	-47	-6.33	Peak	Horizontal
	2622.6	-51.92	-47	-4.92	Peak	Vertical

**Test by dipole antenna – 2dBi**

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-12-2014	Relative Humidity	54%
Test Mode	802.11a - Ant 0	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
64	216.4	-71.50	-57	-14.50	Peak	Horizontal
	153.9	-68.39	-57	-11.39	Peak	Vertical
	485.2	-70.12	-57	-13.12	Peak	Horizontal
	361.4	-63.55	-57	-6.55	Peak	Vertical
	2167.9	-54.01	-47	-7.01	Peak	Horizontal
	1577.4	-52.97	-47	-5.97	Peak	Vertical
	2998.7	-52.09	-47	-5.09	Peak	Horizontal
	2127.1	-53.26	-47	-6.26	Peak	Vertical
100	492.9	-69.80	-57	-12.80	Peak	Horizontal
	351.0	-63.91	-57	-6.91	Peak	Vertical
	747.5	-70.55	-57	-13.55	Peak	Horizontal
	627.3	-65.58	-57	-8.58	Peak	Vertical
	2217.0	-53.89	-47	-6.89	Peak	Horizontal
	2370.6	-53.41	-47	-6.41	Peak	Vertical
	3916.3	-51.46	-47	-4.46	Peak	Horizontal
	2761.4	-53.02	-47	-6.02	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-12-2014	Relative Humidity	54%
Test Mode	802.11n-HT20 - Ant 0	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
64	208.1	-72.47	-57	-15.47	Peak	Horizontal
	360.8	-64.28	-57	-7.28	Peak	Vertical
	487.1	-69.46	-57	-12.46	Peak	Horizontal
	604.6	-65.05	-57	-8.05	Peak	Vertical
	2128.0	-54.60	-47	-7.60	Peak	Horizontal
	1594.2	-54.67	-47	-7.67	Peak	Vertical
	3135.7	-53.73	-47	-6.73	Peak	Horizontal
	3187.9	-52.48	-47	-5.48	Peak	Vertical
100	492.2	-70.16	-57	-13.16	Peak	Horizontal
	370.3	-63.79	-57	-6.79	Peak	Vertical
	719.8	-69.74	-57	-12.74	Peak	Horizontal
	608.8	-65.89	-57	-8.89	Peak	Vertical
	1228.8	-54.37	-47	-7.37	Peak	Horizontal
	1586.5	-53.45	-47	-6.45	Peak	Vertical
	2161.9	-54.02	-47	-7.02	Peak	Horizontal
	2125.7	-54.26	-47	-7.26	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-12-2014	Relative Humidity	54%
Test Mode	802.11n-HT40 - Ant 0	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
62	492.7	-69.96	-57	-12.96	Peak	Horizontal
	358.6	-64.24	-57	-7.24	Peak	Vertical
	736.9	-72.13	-57	-15.13	Peak	Horizontal
	615.3	-65.26	-57	-8.26	Peak	Vertical
	2184.1	-55.30	-47	-8.30	Peak	Horizontal
	2179.1	-53.64	-47	-6.64	Peak	Vertical
	3150.7	-53.71	-47	-6.71	Peak	Horizontal
	3687.6	-52.51	-47	-5.51	Peak	Vertical
102	486.5	-69.27	-57	-12.27	Peak	Horizontal
	371.5	-64.19	-57	-7.19	Peak	Vertical
	747.5	-71.62	-57	-14.62	Peak	Horizontal
	620.8	-65.74	-57	-8.74	Peak	Vertical
	1480.8	-55.96	-47	-8.96	Peak	Horizontal
	1337.0	-56.30	-47	-9.30	Peak	Vertical
	2192.1	-54.57	-47	-7.57	Peak	Horizontal
	2616.9	-52.68	-47	-5.68	Peak	Vertical



Test Engineer	Milo Li	Temperature	26°C
Test Date	08-12-2014	Relative Humidity	54%
Test Mode	802.11a - Ant 1	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
64	494.6	-69.61	-57	-12.61	Peak	Horizontal
	360.6	-64.01	-57	-7.01	Peak	Vertical
	737.7	-69.56	-57	-12.56	Peak	Horizontal
	605.1	-65.28	-57	-8.28	Peak	Vertical
	2236.6	-54.62	-47	-7.62	Peak	Horizontal
	2120.3	-54.08	-47	-7.08	Peak	Vertical
	3112.0	-53.28	-47	-6.28	Peak	Horizontal
	3176.0	-52.13	-47	-5.13	Peak	Vertical
100	490.9	-69.66	-57	-12.66	Peak	Horizontal
	347.6	-63.78	-57	-6.78	Peak	Vertical
	743.1	-70.05	-57	-13.05	Peak	Horizontal
	595.0	-65.40	-57	-8.40	Peak	Vertical
	2176.8	-54.59	-47	-7.59	Peak	Horizontal
	1593.5	-55.06	-47	-8.06	Peak	Vertical
	3029.6	-53.20	-47	-6.20	Peak	Horizontal
	2184.6	-55.06	-47	-8.06	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-12-2014	Relative Humidity	54%
Test Mode	802.11n-HT20 - Ant 1	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
64	192.5	-72.48	-57	-15.48	Peak	Horizontal
	362.2	-63.63	-57	-6.63	Peak	Vertical
	490.7	-69.36	-57	-12.36	Peak	Horizontal
	611.5	-65.48	-57	-8.48	Peak	Vertical
	2135.9	-54.53	-47	-7.53	Peak	Horizontal
	1594.0	-54.11	-47	-7.11	Peak	Vertical
	3119.7	-53.34	-47	-6.34	Peak	Horizontal
	3199.8	-52.29	-47	-5.29	Peak	Vertical
100	504.6	-70.52	-57	-13.52	Peak	Horizontal
	371.3	-63.91	-57	-6.91	Peak	Vertical
	718.9	-69.80	-57	-12.80	Peak	Horizontal
	620.9	-65.62	-57	-8.62	Peak	Vertical
	1225.6	-54.13	-47	-7.13	Peak	Horizontal
	1578.0	-53.12	-47	-6.12	Peak	Vertical
	2177.2	-54.14	-47	-7.14	Peak	Horizontal
	2119.6	-53.98	-47	-6.98	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-12-2014	Relative Humidity	54%
Test Mode	802.11n-HT40 - Ant 1	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
62	209.8	-72.56	-57	-15.56	Peak	Horizontal
	156.1	-66.48	-57	-9.48	Peak	Vertical
	502.1	-68.77	-57	-11.77	Peak	Horizontal
	374.5	-63.36	-57	-6.36	Peak	Vertical
	2168.7	-55.27	-47	-8.27	Peak	Horizontal
	2195.3	-53.52	-47	-6.52	Peak	Vertical
	3157.2	-53.72	-47	-6.72	Peak	Horizontal
	3672.7	-52.43	-47	-5.43	Peak	Vertical
102	208.5	-71.95	-57	-14.95	Peak	Horizontal
	172.5	-66.81	-57	-9.81	Peak	Vertical
	475.3	-69.62	-57	-12.62	Peak	Horizontal
	363.0	-64.17	-57	-7.17	Peak	Vertical
	1492.0	-55.59	-47	-8.59	Peak	Horizontal
	1315.4	-56.25	-47	-9.25	Peak	Vertical
	2185.7	-54.57	-47	-7.57	Peak	Horizontal
	2624.3	-52.79	-47	-5.79	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-12-2014	Relative Humidity	54%
Test Mode	802.11n-HT20 - Ant 0 + 1	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
64	208.7	-72.61	-57	-15.61	Peak	Horizontal
	365.8	-64.25	-57	-7.25	Peak	Vertical
	500.9	-69.21	-57	-12.21	Peak	Horizontal
	616.9	-65.39	-57	-8.39	Peak	Vertical
	2126.8	-54.57	-47	-7.57	Peak	Horizontal
	1586.3	-54.37	-47	-7.37	Peak	Vertical
	3133.5	-53.11	-47	-6.11	Peak	Horizontal
	3173.6	-52.16	-47	-5.16	Peak	Vertical
100	471.0	-70.52	-57	-13.52	Peak	Horizontal
	358.0	-64.15	-57	-7.15	Peak	Vertical
	747.4	-69.52	-57	-12.52	Peak	Horizontal
	605.6	-65.60	-57	-8.60	Peak	Vertical
	1218.8	-54.71	-47	-7.71	Peak	Horizontal
	1576.9	-53.66	-47	-6.66	Peak	Vertical
	2188.3	-53.99	-47	-6.99	Peak	Horizontal
	2114.3	-54.05	-47	-7.05	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-12-2014	Relative Humidity	54%
Test Mode	802.11n-HT40 - Ant 0 + 1	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
62	195.5	-72.49	-57	-15.49	Peak	Horizontal
	171.2	-66.64	-57	-9.64	Peak	Vertical
	489.5	-68.34	-57	-11.34	Peak	Horizontal
	354.2	-63.80	-57	-6.80	Peak	Vertical
	2196.0	-55.20	-47	-8.20	Peak	Horizontal
	2191.5	-53.67	-47	-6.67	Peak	Vertical
	3153.3	-53.56	-47	-6.56	Peak	Horizontal
	3691.9	-51.89	-47	-4.89	Peak	Vertical
102	215.4	-71.49	-57	-14.49	Peak	Horizontal
	170.4	-66.79	-57	-9.79	Peak	Vertical
	474.4	-69.85	-57	-12.85	Peak	Horizontal
	357.8	-64.29	-57	-7.29	Peak	Vertical
	1490.3	-55.80	-47	-8.80	Peak	Horizontal
	1330.7	-56.49	-47	-9.49	Peak	Vertical
	2188.6	-54.22	-47	-7.22	Peak	Horizontal
	2623.6	-52.73	-47	-5.73	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,  $q = [4 \sim 32]$ .

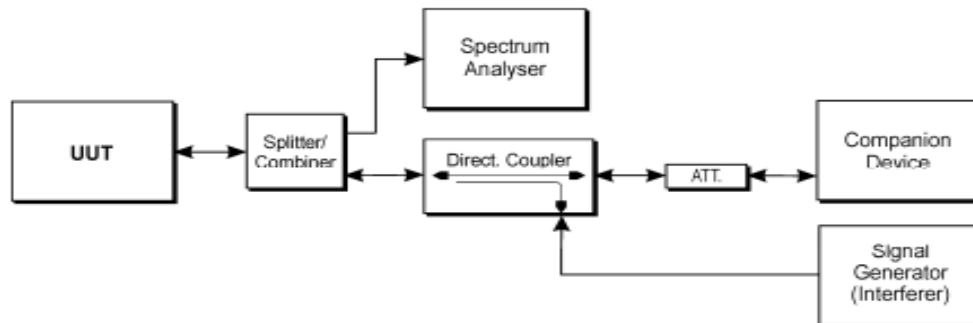
The minimum idle period varied between CCA and  $q * CCA$ .

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

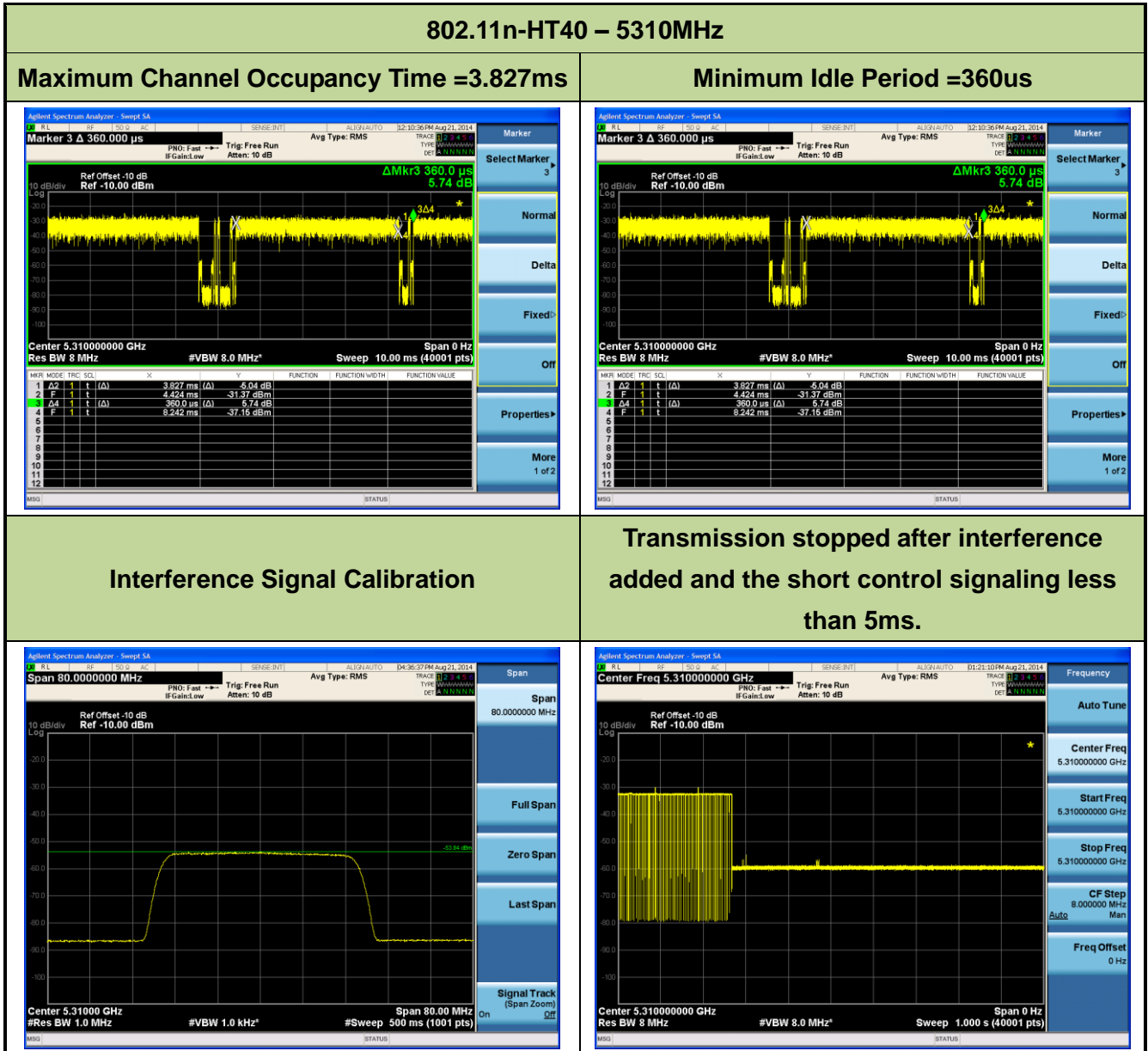


### 10.3. Test Procedure

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

## 10.4. Test Result

Test Engineer	Milo Li	Temperature	26°C
Test Date	08-21-2014	Relative Humidity	54%



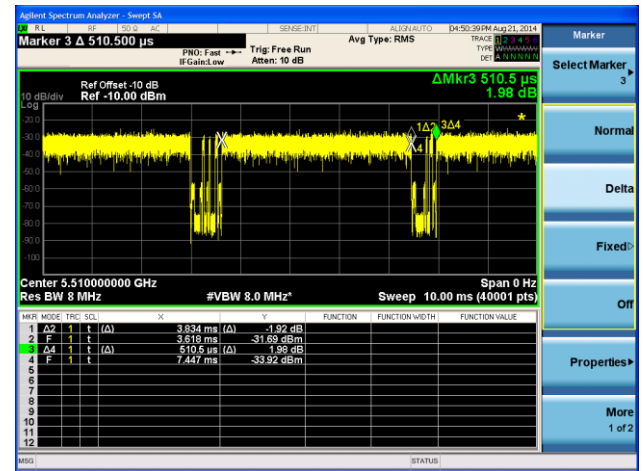
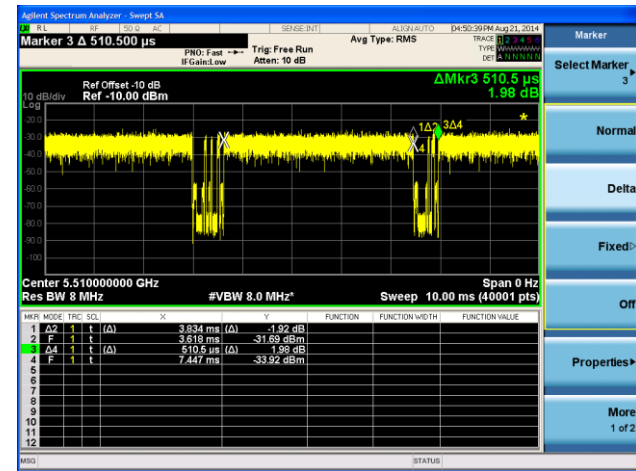
Note: The Worst Detection Level = -73 dBm/MHz + 23 – the max conducted power (dBm) = -73 dBm/MHz + 23 – 3.84 dBm = -53.84 dBm/MHz.

Test Result:	Pass
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## 802.11n-HT40 – 5510MHz

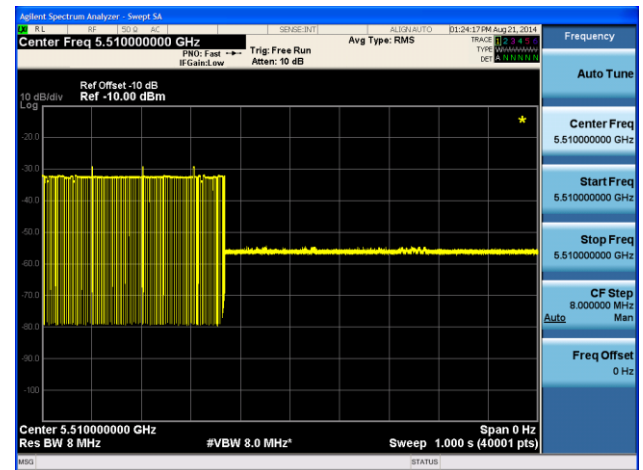
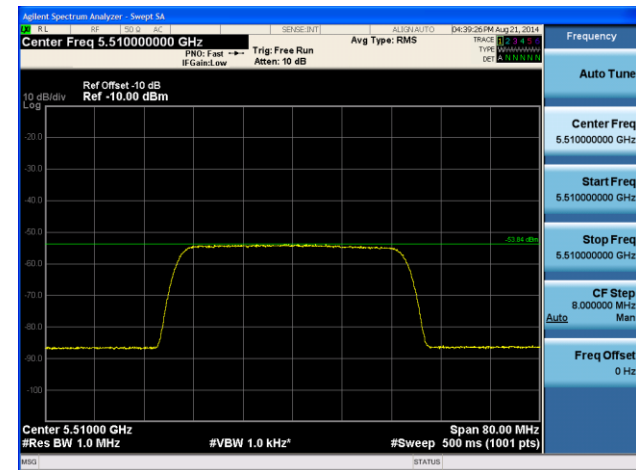
Maximum Channel Occupancy Time = 3.834ms

Minimum Idle Period = 510.5us



Interference Signal Calibration

Transmission stopped after interference added and the short control signaling less than 5ms.



Note: The Worst Detection Level = -73 dBm/MHz + 23 – the max conducted power (dBm) = -73 dBm/MHz + 23 – 3.84 dBm = -53.84 dBm/MHz.

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	$\pm 1 \times 10^{-5}$
RF Power Conducted	$\pm 1.5\text{dB}$
RF Power Radiated	$\pm 6\text{dB}$
Spurious Emissions, Conducted	$\pm 3\text{dB}$
Spurious Emissions, Radiated	$\pm 6\text{dB}$
Humidity	$\pm 5\%$
Temperature	$\pm 1^\circ\text{C}$
Time	$\pm 10\%$

### 13. Test Photograph

Description: Radiated Spurious Emissions Test Setup for 30MHz - 1GHz (Dipole Antenna 2dBi)



Description: Radiated Spurious Emissions Test Setup for 1-18GHz (Dipole Antenna 2dBi)



Description: Radiated Spurious Emissions Test Setup for 18 - 26GHz (Dipole Antenna 2dBi)



Description: Radiated Spurious Emissions Test Setup for 30MHz - 1GHz (Panel Antenna 25dBi)



Description: Radiated Spurious Emissions Test Setup for 1 - 18 GHz (Panel Antenna 25dBi)



Description: Radiated Spurious Emissions Test Setup for 18 - 26GHz (Panel Antenna 25dBi)



## 14. List of Measuring Instrument

### Carrier Frequencies

Instrument	Manufacturer	Type No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	E4447A	1 year	2014/11/08
DC Power Supply	GWINSTEK	GPS-3030D	1 year	2014/11/14
Programmable Temperature & Humidity Chamber	BAOYT	BYH-1500L	1 year	2014/11/20
Temperature/Humidity Meter	Anymetre	TH101B	1 year	2014/11/15

### Occupied Channel Bandwidth

Instrument	Manufacturer	Type No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	N9010A	1 year	2015/01/04
Temperature/Humidity Meter	Anymetre	TH101B	1 year	2014/11/15

### 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
DC Power Supply	GWINSTEK	GPS-3030D	1 year	2014/11/14
Programmable Temperature & Humidity Chamber	BAOYT	BYH-1500L	1 year	2014/11/20
Temperature/Humidity Meter	Anymetre	TH101B	1 year	2014/11/15

### Transmitter Unwanted Emissions Within the 5GHz RLAN Bands

Instrument	Manufacturer	Type No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	N9010A	1 year	2015/01/04
Temperature/Humidity Meter	Anymetre	TH101B	1 year	2014/11/15

### Transmitter Spurious Emissions and Receiver Spurious Emissions

Instrument	Manufacturer	Type No.	Cali. Interval	Cal. Due Date
Spectrum Analyzer	Agilent	E4447A	1 year	2014/11/08
Preamplifier	MRT	AP25M01	1 year	2014/10/07
Preamplifier	MRT	AP01G18	1 year	2014/12/14
Bilog Period Antenna	Schwarzbeck	VULB 9162	1 year	2014/11/24
Horn Antenna	Schwarzbeck	BBHA9120D	1 year	2014/11/24
Broadband Horn Antenna	Schwarzbeck	BBHA9170	1 year	2014/12/11
Temperature/Humidity Meter	Anymetre	TH101B	1 year	2014/11/15

## Adaptivity (Channel Access Mechanism)

Instrument	Manufacturer	Type No.	Cali. Interval	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	1 year	2015/01/04
Vector Signal Generator	Agilent	E4438C	1 year	2014/12/14
Vector Signal Generator	Agilent	E4438C	1 year	2014/11/08
Directional Coupler	Narda	4216-20	1 year	2015/02/15
Combiner	Mini-Circuits	ZFRSC-123-S+ DC-12000MHz	1 year	2014/11/20
Temperature/Humidity Meter	Anymetre	TH101B	1 year	2014/11/15



# Appendix

## EUT Photograph

(1) EUT Photo

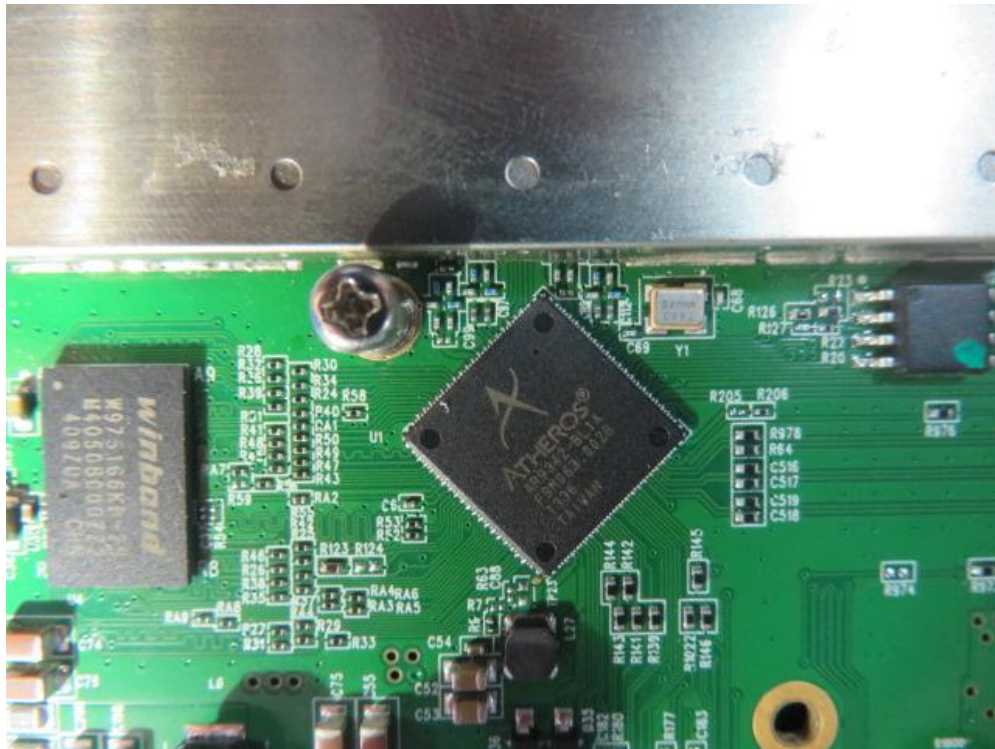


(2) EUT Photo

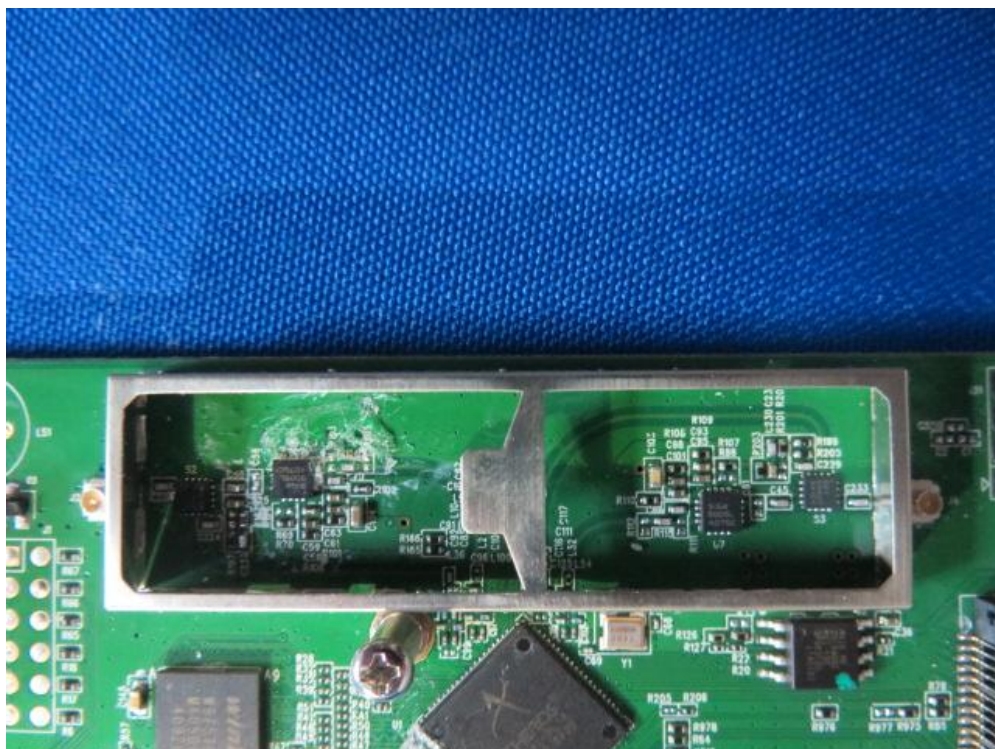




### (3) EUT Photo



### (4) EUT Photo



(5) EUT Photo (Dipole Antenna 1#)

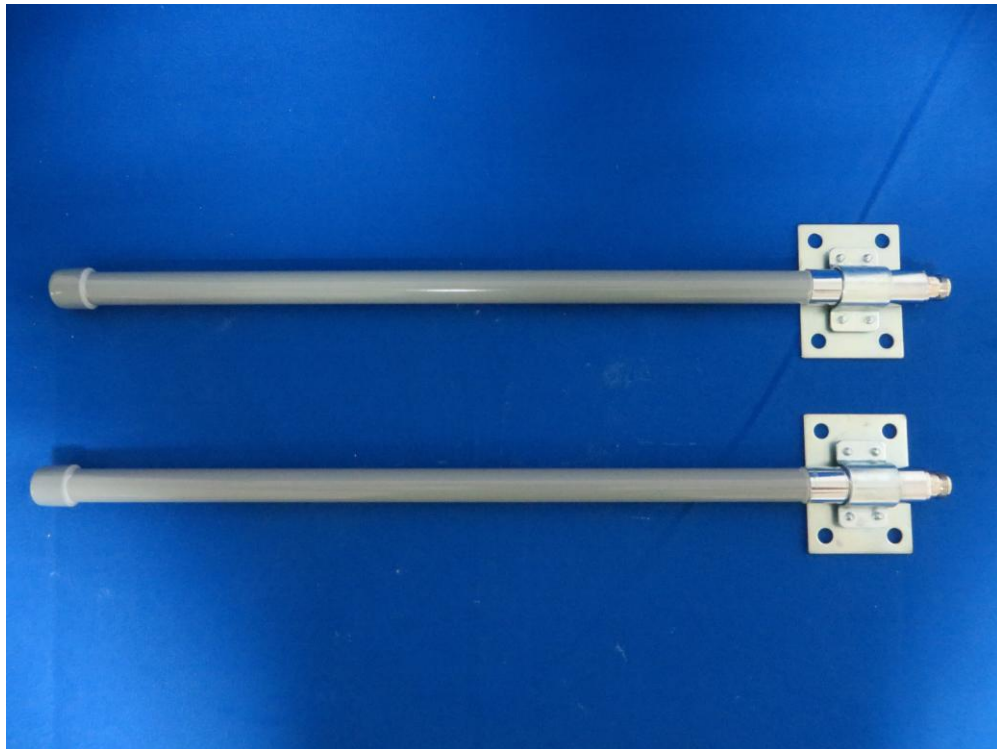


(6) EUT Photo (Panel Antenna 5#)

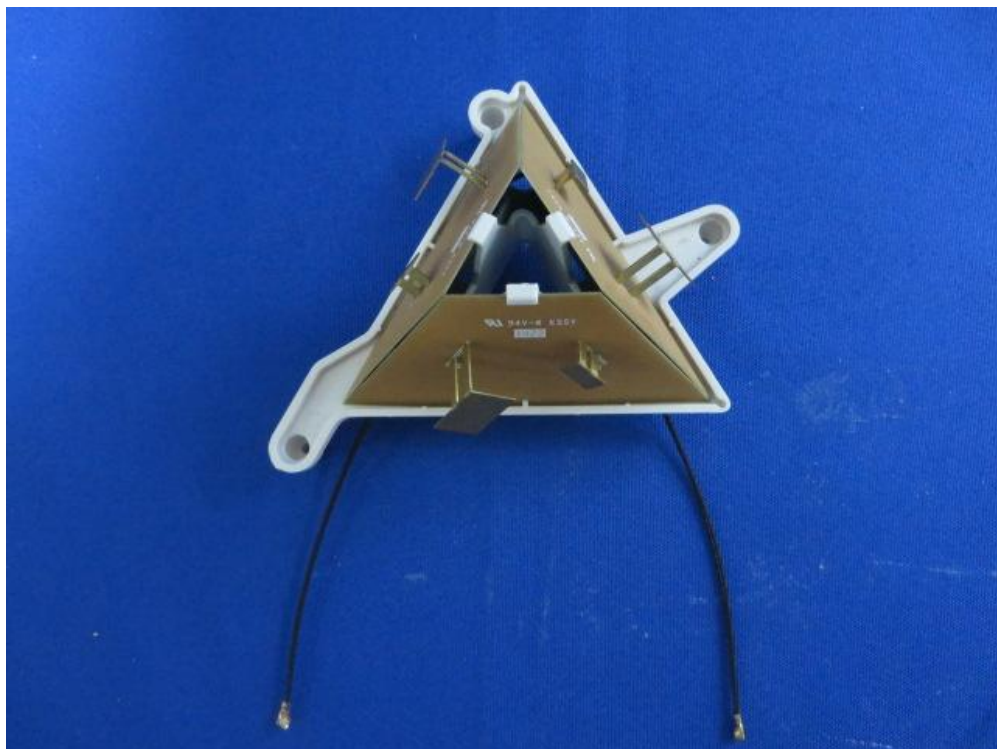




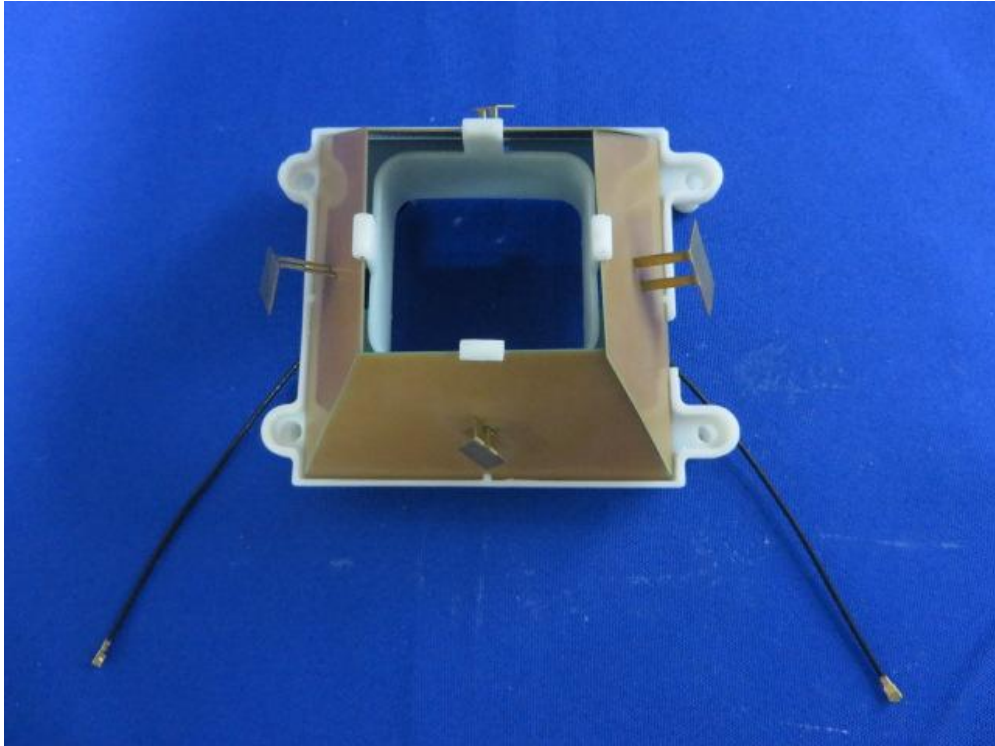
(7) EUT Photo (Panel Antenna 4#)



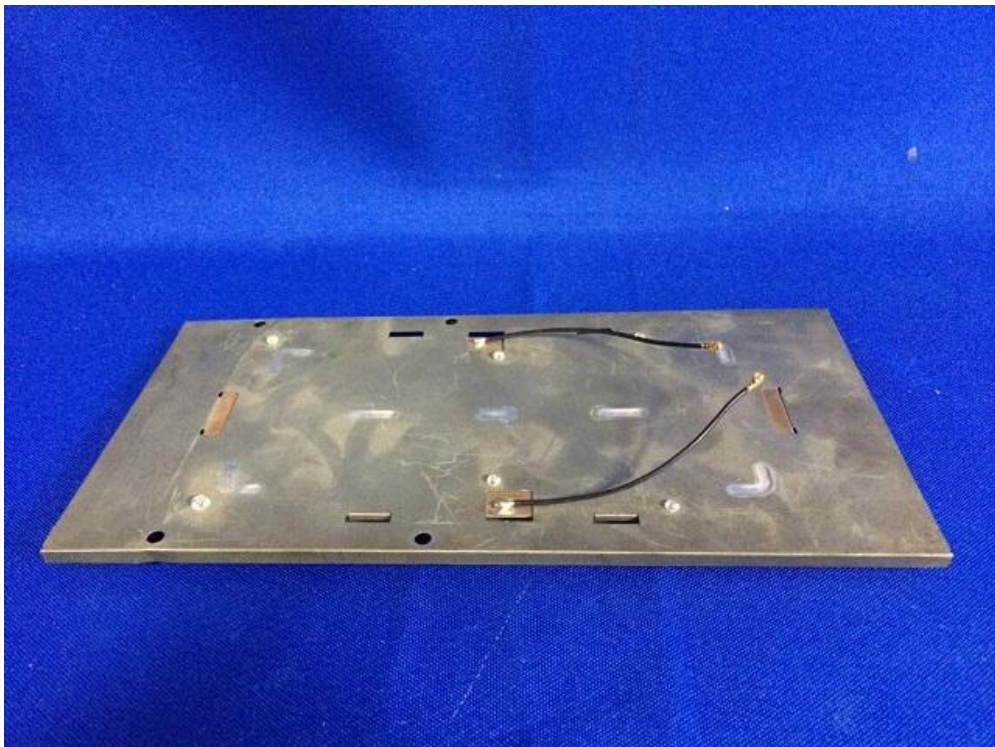
(8) EUT Photo (Panel Antenna 6#)



(9) EUT Photo (Panel Antenna 7#)



(10) EUT Photo (Panel Antenna 3#)



(11) EUT Photo (Panel Antenna 3#)

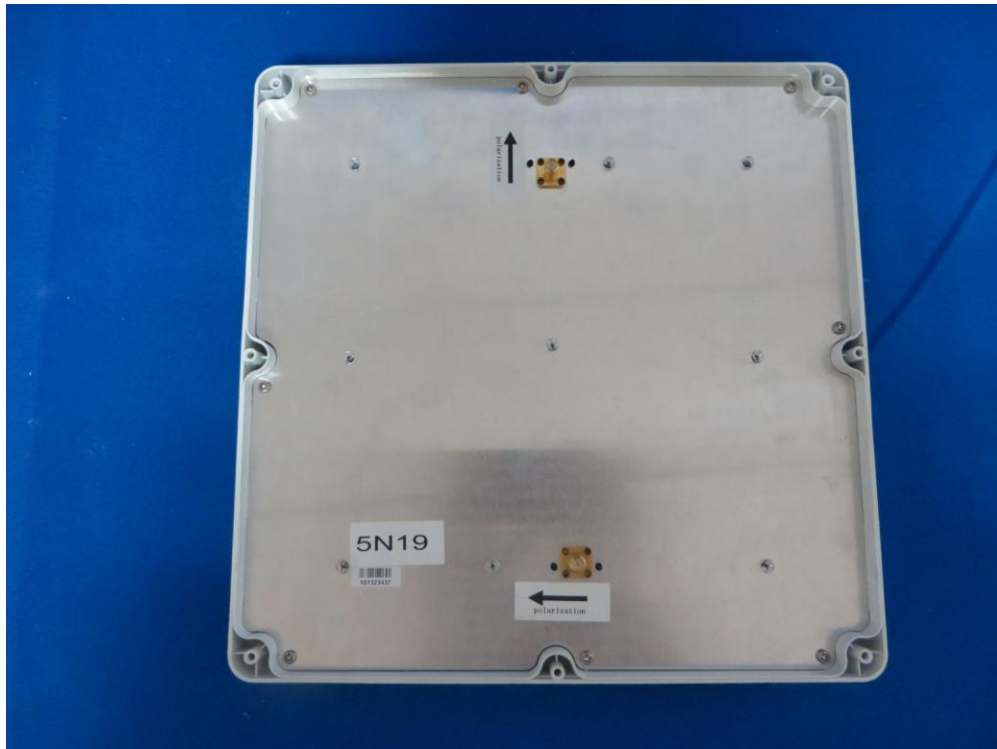


(12) EUT Photo (Panel Antenna 2#)

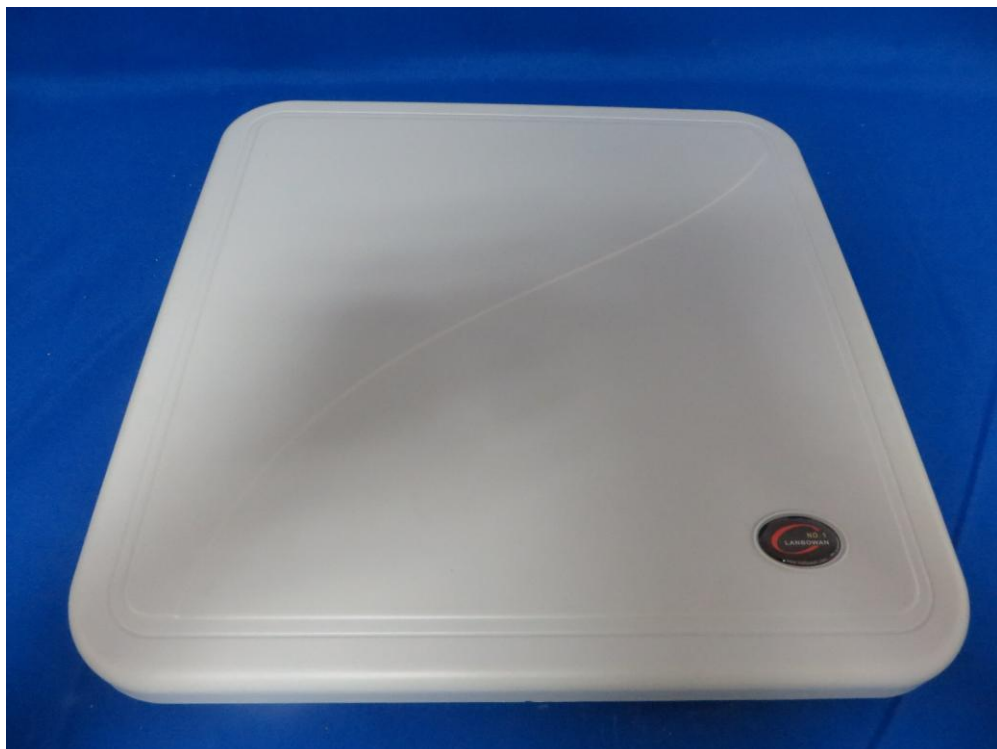




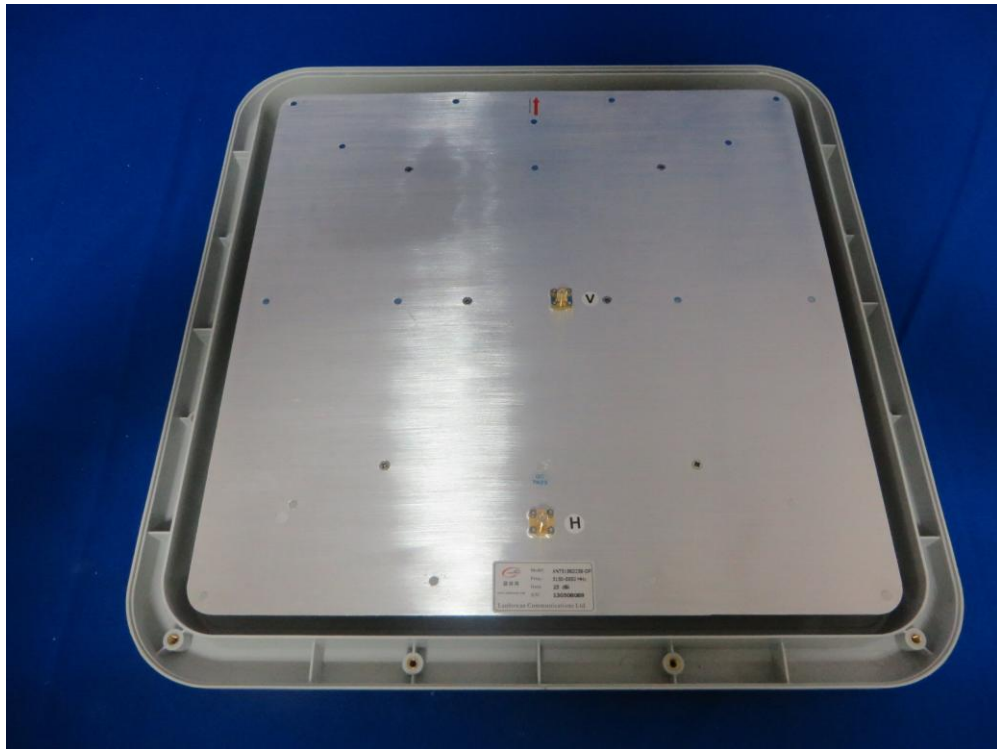
(13) EUT Photo (Panel Antenna 2#)



(14) EUT Photo (Panel Antenna 1#)



(15) EUT Photo (Panel Antenna 1#)



(16) EUT Photo (Adapter 1#)



(17) EUT Photo (Adapter 1#)



(18) EUT Photo (Adapter 1#)





(19) EUT Photo (Adapter 2#)



(20) EUT Photo (Adapter 2#)



(21) EUT Photo (Adapter 2#)



(22) EUT Photo (Adapter 2#)



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The End

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