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Report No.: 1408RSU00103  
Report Version: V02  
Issue Date: 10-28-2014

## MEASUREMENT REPORT

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

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**Applicant:** Compex Systems Pte Ltd

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

**Product:** WIRELESS-AC 2X2 27DBM NETWORK MINI PCIE ADAPTER

**Model No.:** WLE600V5-27ESD

**Brand Name:** COMPEX

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

**Result:** Complies

**Test Date:** Aug. 03 ~ 24, 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.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

### Revision History

Report No.	Version	Description	Issue Date
1408RSU00103	Rev. 01	Initial report	08-25-2014
1408RSU00103	Rev. 02	Update the Mask test format	10-28-2014

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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, 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.



#### 1.4. Feature of Product

Product Name	WIRELESS-AC 2X2 27DBM NETWORK MINI PCIE ADAPTER
Model No.	WLE600V5-27ESD
Brand Name	COMPEX
Frequency Range	802.11a /n-HT20/ac-VHT20: 5500 ~ 5700MHz 802.11n-HT40/ac-VHT40: 5510 ~ 5670MHz 802.11ac-VHT80: 5530, 5610MHz
Channel Number	802.11a /n-HT20/ac-VHT20: 11 802.11n-HT40/ac-VHT40: 5 802.11ac-VHT80: 2
Type of Modulation	802.11a/n/ac: OFDM
Data Rate	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.6Mbps

## 1.5. Frequency / Channel Operation

### Channel List for 802.11a/n-HT20/ac-VHT20

Channel	Frequency	Channel	Frequency	Channel	Frequency
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

### Channel List for 802.11n-HT40MHz/ac-VHT40

Channel	Frequency	Channel	Frequency	Channel	Frequency
102	5510 MHz	110	5550 MHz	118	5590 MHz
126	5630 MHz	134	5670 MHz	N/A	N/A

### Channel List for 802.11ac-VHT80

Channel	Frequency	Channel	Frequency	Channel	Frequency
106	5530 MHz	122	5610 MHz	N/A	N/A

## 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	Lanbowan Communications Ltd.	2	23
Panel Antenna 3#	5.1 ~ 5.8	Kenbotong Communication LTD	2	19
Panel Antenna 4#	5.1 ~ 5.8	Compex Systems Pte Ltd	2	17
Panel Antenna 5#	5.1 ~ 5.8	Compex Systems Pte Ltd	2	16
Panel Antenna 6#	5.1 ~ 5.8	Compex Systems Pte Ltd	2	15
Panel Antenna 7#	5.1 ~ 5.8	Kenbotong Communication LTD	2	10
Panel Antenna 8#	5.1 ~ 5.8	Smart Ant Inc	2	7
Panel Antenna 9#	5.1 ~ 5.8	Compex Systems Pte Ltd	2	5
Panel Antenna 10#	5.1 ~ 5.8	Compex Systems Pte Ltd	2	5
Dipole Antenna 1#	5.1 ~ 5.8	Kunshan Wavelink Electronic Co., Ltd.	2	2

Note1: 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	100	5500	6	3.92
				24	3.78
				54	3.52
11n	20	100	5500	6.5	3.77
				26	3.56
				65	3.27
11n	40	102	5510	13.5	3.78
				54	3.59
				135	3.22
11ac	20	100	5500	6.5	3.79
				39	3.57
				78	3.31
11ac	40	102	5510	13.5	4.02
				81	3.88
				180.	3.64
11ac	80	106	5530	29.3	3.95
				175.5	3.73
				390	3.46

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%
11ac-VHT20	100%
11ac-VHT40	100%
11ac-VHT80	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	Test Frequency	Power Parameter Value		
		Ant 0	Ant 0	Ant 0 + 1
802.11a	5500	4.5	4.5	Not Support
	5700	4.0	4.5	
802.11n-HT20	5500	4.5	4.5	1.50
	5700	4.5	4.5	1.50
802.11n-HT40	5510	4.5	4.5	2.50
	5670	4.5	5.0	2.50
802.11ac-VHT20	5500	4.5	4.5	1.50
	5700	4.5	4.5	1.50
802.11ac-VHT40	5510	5.5	5.0	2.50
	5670	5.0	5.5	2.50
802.11ac-VHT80	5530	6.0	5.5	3.00
	5610	5.5	6.0	3.50

### 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	--

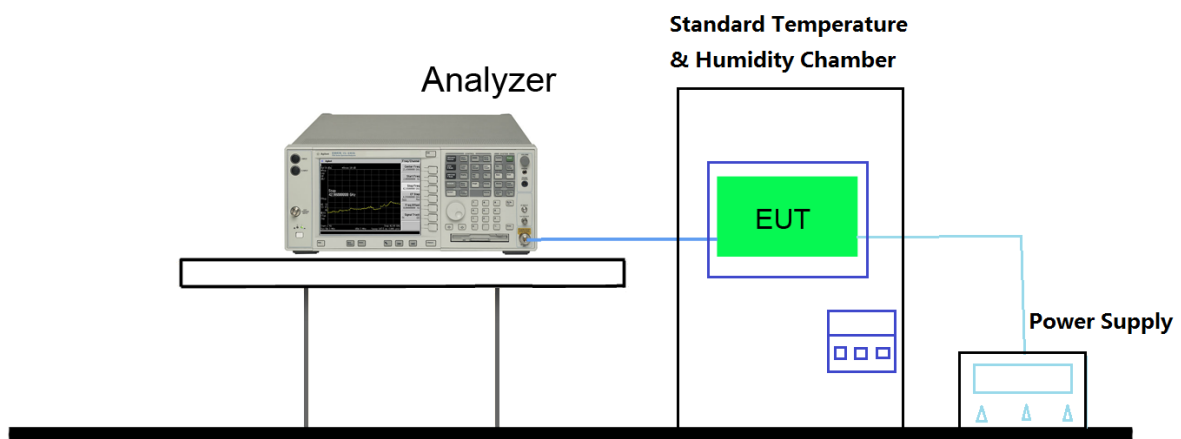
## 4. Carrier Frequencies

### 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 Time	08-20-2014	Relative Humidity	60%

Test Conditions		Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Limit (ppm)	Result
Tnom (25°C)	Vnom (AC 230V)	5500	5500.026143	4.75	≤ 20	Pass
Tmin (-20°C)	Vmin (AC 207V)	5500	5500.018016	3.28	≤ 20	Pass
	Vmax (AC 253V)	5500	5500.018842	3.43	≤ 20	Pass
Tmax (70°C)	Vmin (AC 207V)	5500	5499.987425	-2.29	≤ 20	Pass
	Vmax (AC 253V)	5500	5499.987251	-2.32	≤ 20	Pass

## 5. Occupied Channel Bandwidth

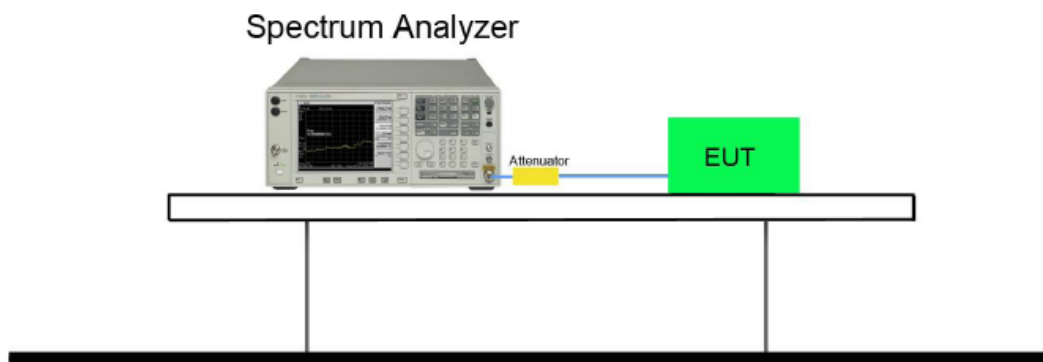
### 5.1. Limit

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.

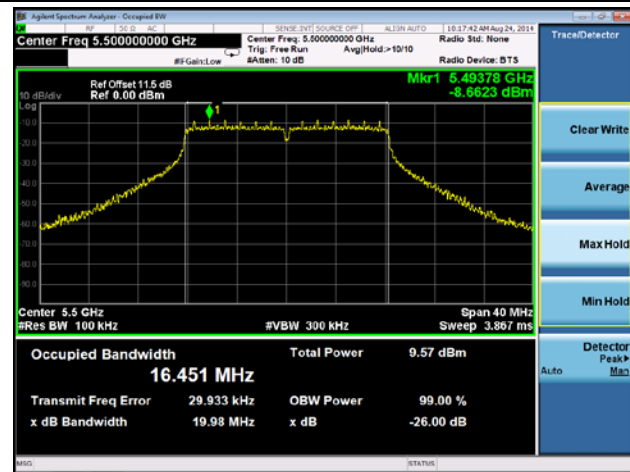
#### 5.4. Test Result

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

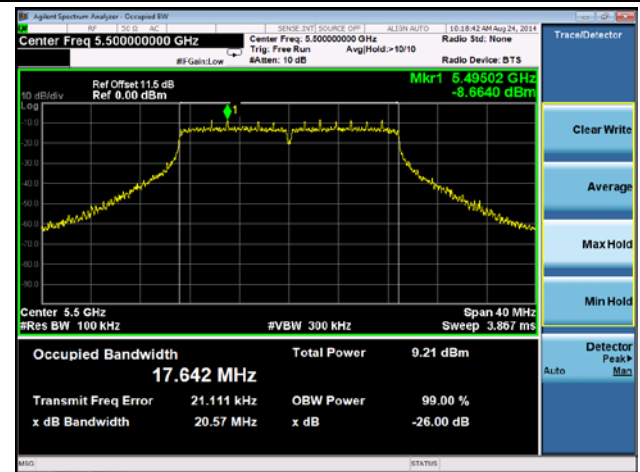
Test Mode	Channel No.	Frequency (MHz)	99% Bandwidth (MHz)	Declared Nominal Channel Bandwidth (MHz)	Limit (%)	Result
Ant 0						
802.11a	100	5500	16.451	20	80 - 100	Pass
802.11n-HT20	100	5500	17.642	20	80 - 100	Pass
802.11n-HT40	102	5510	36.090	40	80 - 100	Pass
802.11ac-VHT20	100	5500	17.634	20	80 - 100	Pass
802.11ac-VHT40	102	5510	36.115	40	80 - 100	Pass
802.11ac-VHT80	106	5530	75.571	80	80 - 100	Pass
Ant 1						
802.11a	100	5500	16.449	20	80 - 100	Pass
802.11n-HT20	100	5500	17.645	20	80 - 100	Pass
802.11n-HT40	102	5510	36.110	40	80 - 100	Pass
802.11ac-VHT20	100	5500	17.648	20	80 - 100	Pass
802.11ac-VHT40	102	5510	36.102	40	80 - 100	Pass
802.11ac-VHT80	106	5530	75.737	80	80 - 100	Pass
Ant 0 + 1						
802.11a	100	5500	16.466	20	80 - 100	Pass
802.11n-HT20	100	5500	17.625	20	80 - 100	Pass
802.11n-HT40	102	5510	36.114	40	80 - 100	Pass
802.11ac-VHT20	100	5500	17.627	20	80 - 100	Pass
802.11ac-VHT40	102	5510	36.110	40	80 - 100	Pass
802.11ac-VHT80	106	5530	75.531	80	80 - 100	Pass

## Occupied Channel Bandwidth Ant 0

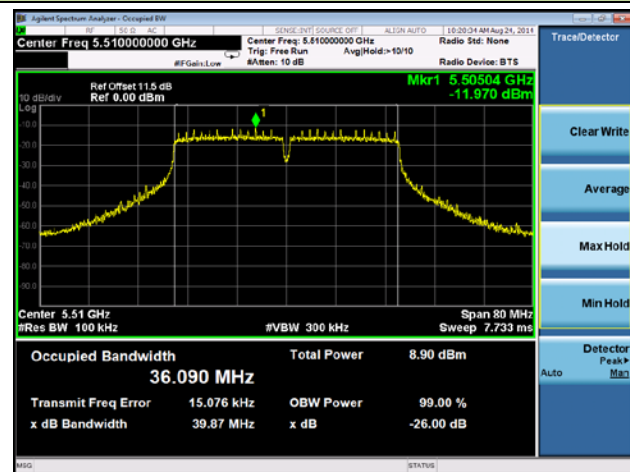
### 802.11a Channel 100 (5500MHz)



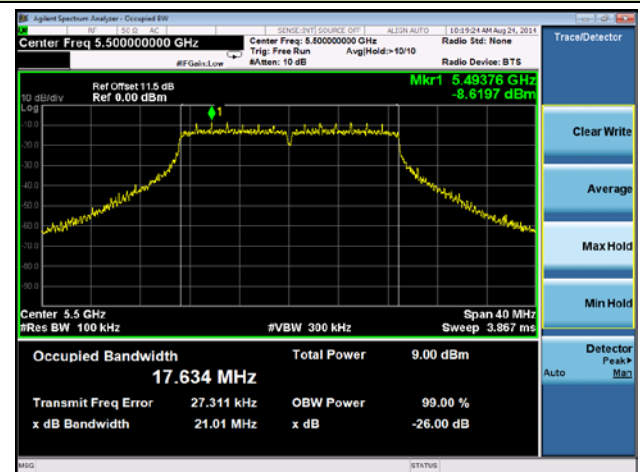
### 802.11n-HT20 Channel 100 (5500MHz)



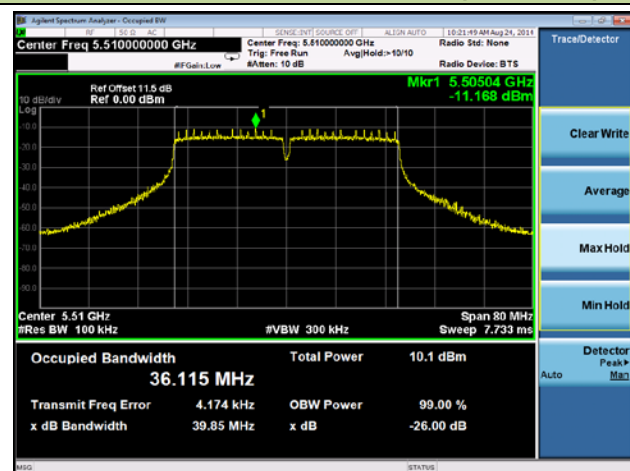
### 802.11n-HT40 Channel 102 (5510MHz)



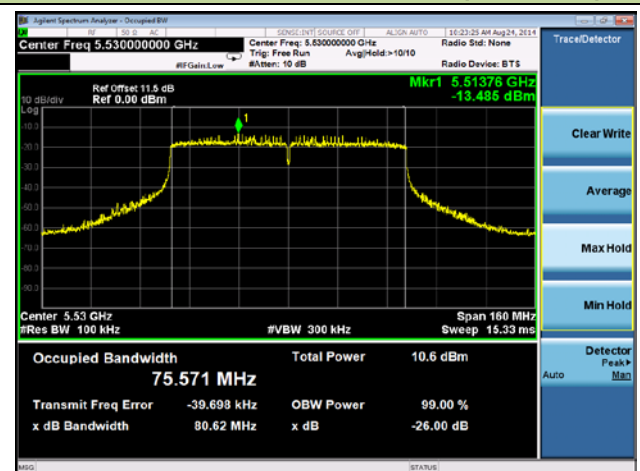
### 802.11ac-VHT20 Channel 100 (5500MHz)



### 802.11ac-VHT40 Channel 102 (5510MHz)



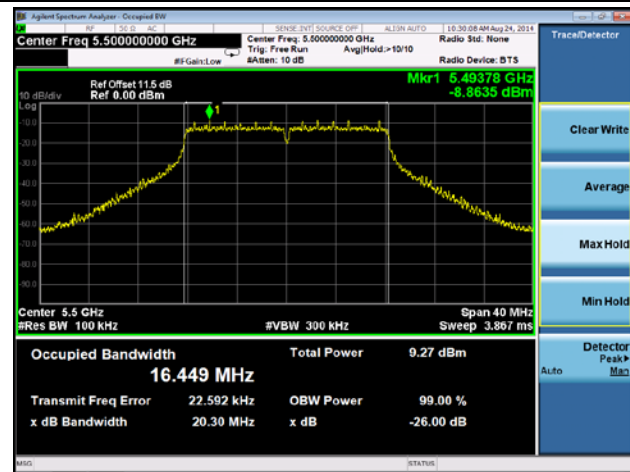
### 802.11ac-VHT80 Channel 106 (5530MHz)



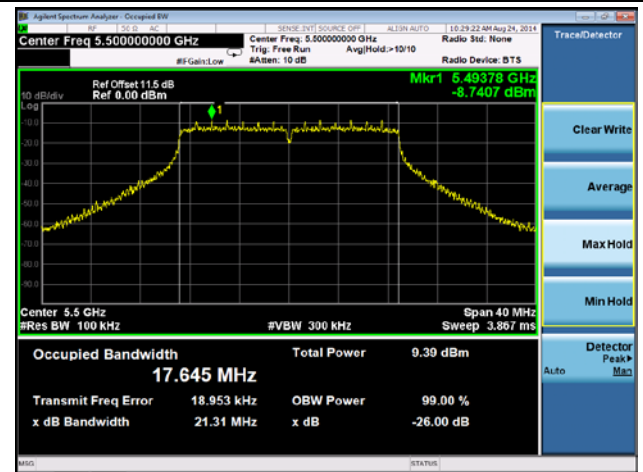


## Occupied Channel Bandwidth Ant 1

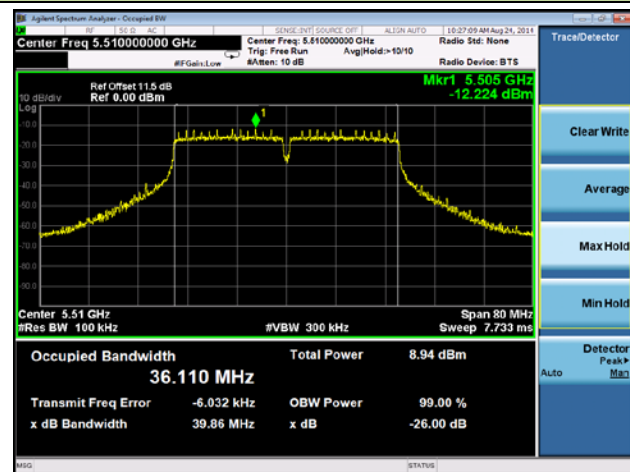
### 802.11a Channel 100 (5500MHz)



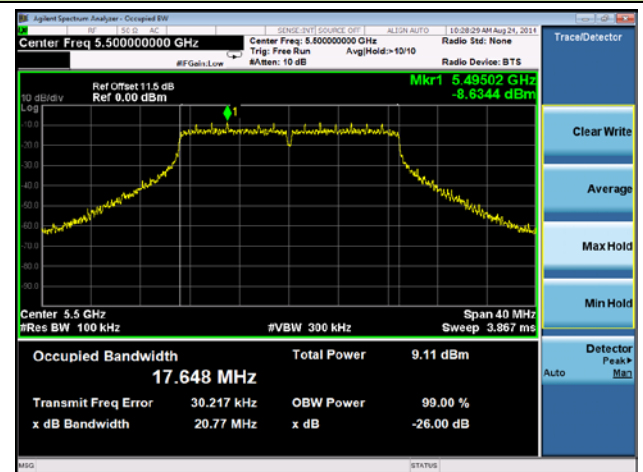
### 802.11n-HT20 Channel 100 (5500MHz)



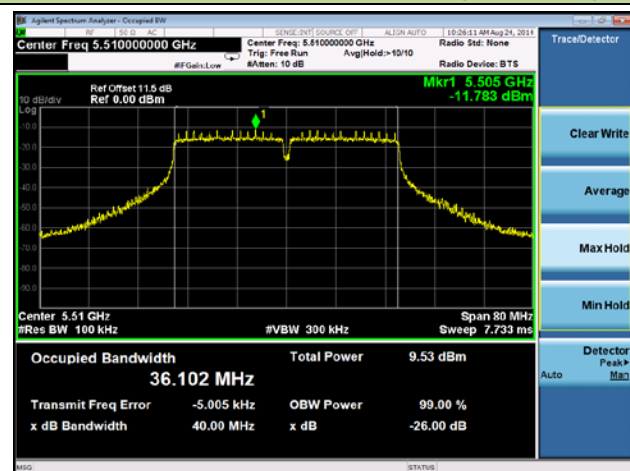
### 802.11n-HT40 Channel 102 (5510MHz)



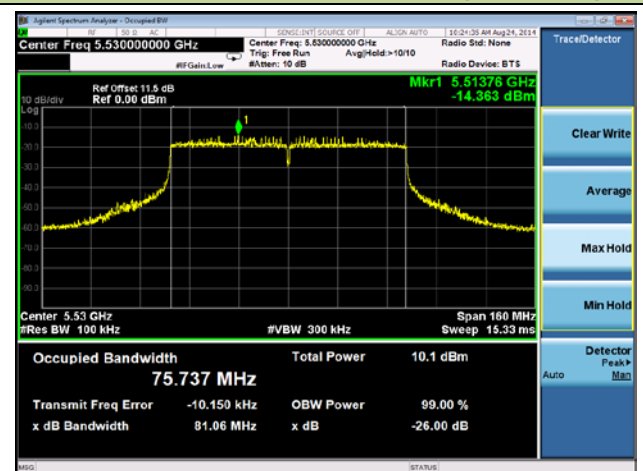
### 802.11ac-VHT20 Channel 100 (5500MHz)



### 802.11ac-VHT40 Channel 102 (5510MHz)

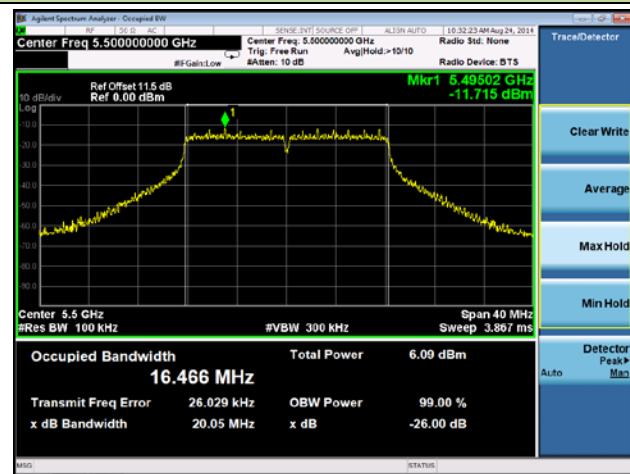


### 802.11ac-VHT80 Channel 106 (5530MHz)

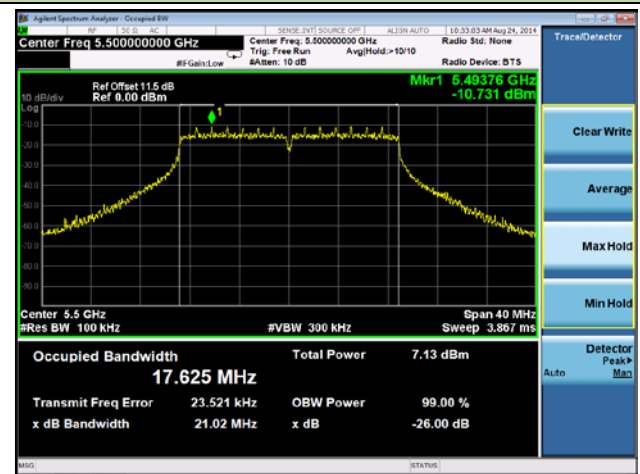


## Occupied Channel Bandwidth Ant 0 + 1

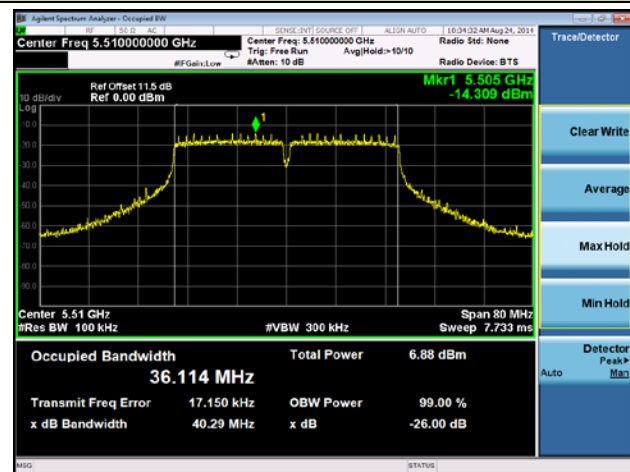
### 802.11a Channel 100 (5500MHz)



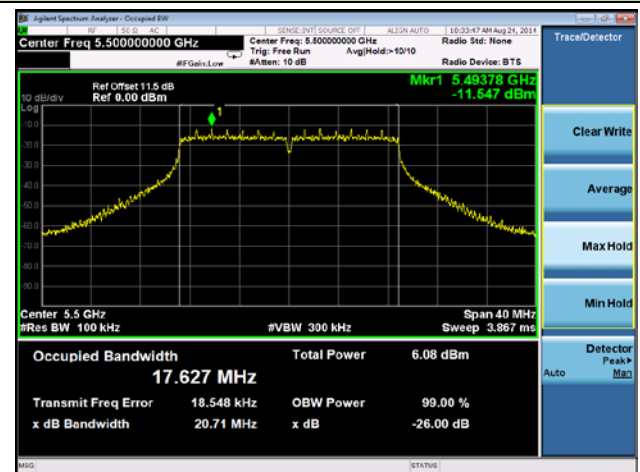
### 802.11n-HT20 Channel 100 (5500MHz)



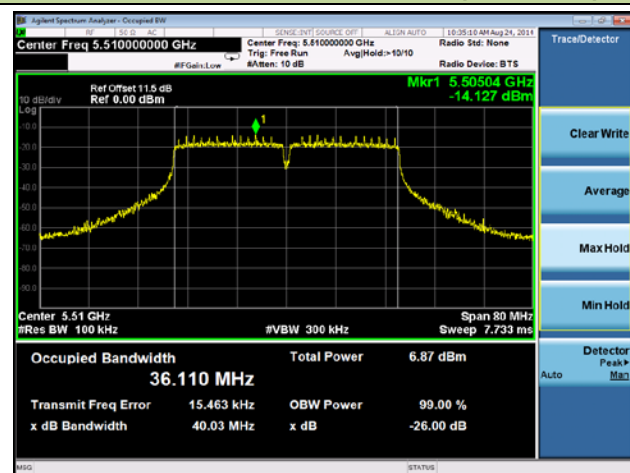
### 802.11n-HT40 Channel 102 (5510MHz)



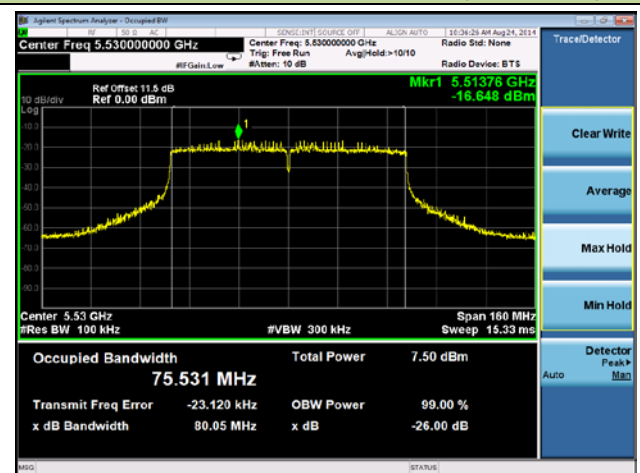
### 802.11ac-VHT20 Channel 100 (5500MHz)



### 802.11ac-VHT40 Channel 102 (5510MHz)



### 802.11ac-VHT80 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.				

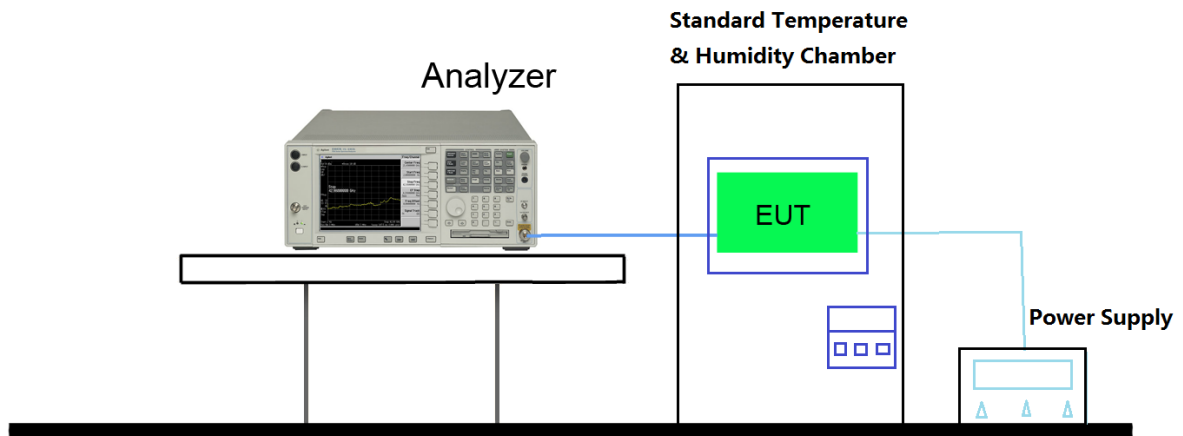
#### RF Output Power at the Lowest Power Level of the TPC Range

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	08-20-2014	Relative Humidity	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						
				230V	207V	253V	207V					253V
Ant 0												
11a	100	5500	3.92	4.57	4.50	3.31	3.48	25	29.57	30	Pass	
11a	140	5700	3.71	4.35	4.23	3.11	3.33	25	29.35	30	Pass	
n-HT20	100	5500	3.77	4.45	4.22	3.08	3.29	25	29.45	30	Pass	
n-HT20	140	5700	4.08	4.70	4.65	3.59	3.38	25	29.70	30	Pass	
n-HT40	102	5510	3.78	4.30	4.29	3.17	3.55	25	29.30	30	Pass	
n-HT40	134	5670	4.04	4.47	4.70	3.40	3.81	25	29.70	30	Pass	
ac-VHT20	100	5500	3.79	4.50	4.20	3.42	3.47	25	29.50	30	Pass	
ac-VHT20	140	5700	4.14	4.79	4.85	3.92	3.62	25	29.85	30	Pass	
ac-VHT40	102	5510	4.02	4.80	4.48	3.47	3.57	25	29.80	30	Pass	
ac-VHT40	134	5670	4.06	4.52	4.76	3.62	3.74	25	29.76	30	Pass	
ac-VHT80	106	5530	3.95	4.64	4.38	3.37	3.54	25	29.64	30	Pass	
ac-VHT80	122	5610	3.84	4.57	4.56	3.53	3.19	25	29.57	30	Pass	
Ant 1												
11a	100	5500	3.90	4.45	4.42	3.38	3.64	25	29.45	30	Pass	
11a	140	5700	3.93	4.58	4.59	3.38	3.47	25	29.59	30	Pass	
n-HT20	100	5500	3.72	4.32	4.52	3.27	3.12	25	29.52	30	Pass	
n-HT20	140	5700	3.76	4.24	4.26	3.37	3.17	25	29.26	30	Pass	
n-HT40	102	5510	3.76	4.25	4.20	3.04	3.26	25	29.25	30	Pass	
n-HT40	134	5670	3.82	4.27	4.34	3.34	3.27	25	29.34	30	Pass	
ac-VHT20	100	5500	3.77	4.49	4.45	3.32	3.23	25	29.49	30	Pass	
ac-VHT20	140	5700	3.82	4.30	4.41	3.46	3.33	25	29.41	30	Pass	
ac-VHT40	102	5510	3.78	4.47	4.40	3.52	3.41	25	29.47	30	Pass	
ac-VHT40	134	5670	4.01	4.53	4.54	3.63	3.37	25	29.54	30	Pass	
ac-VHT80	106	5530	3.73	4.20	4.35	3.21	3.48	25	29.35	30	Pass	
ac-VHT80	122	5610	3.74	4.32	4.54	3.30	3.21	25	29.54	30	Pass	

Ant 0 + 1											
n-HT20	100	5500	3.76	4.43	4.41	3.15	3.27	25	29.43	30	Pass
n-HT20	140	5700	3.83	4.37	4.49	3.15	3.32	25	29.49	30	Pass
n-HT40	102	5510	3.89	4.60	4.45	3.28	3.20	25	29.60	30	Pass
n-HT40	134	5670	3.81	4.37	4.49	3.28	3.35	25	29.49	30	Pass
ac-VHT20	100	5500	3.74	4.41	4.30	3.24	3.40	25	29.41	30	Pass
ac-VHT20	140	5700	3.87	4.47	4.47	3.38	3.35	25	29.47	30	Pass
ac-VHT40	102	5510	3.94	4.48	4.47	3.64	3.47	25	29.48	30	Pass
ac-VHT40	134	5670	3.82	4.58	4.34	3.32	3.47	25	29.58	30	Pass
ac-VHT80	106	5530	3.88	4.46	4.57	3.46	3.34	25	29.57	30	Pass
ac-VHT80	122	5610	4.11	4.75	4.76	3.52	3.80	25	29.76	30	Pass

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

Antenna Gain = 25 dBi, 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	100	5500	-2.26	-1.62	-1.51	-2.79	-2.63	25	23.49	24	Pass	
11a	140	5700	-2.37	-1.83	-1.93	-2.73	-2.57	25	23.17	24	Pass	
n-HT20	100	5500	-2.41	-1.57	-1.98	-2.92	-2.69	25	23.43	24	Pass	
n-HT20	140	5700	-1.80	-1.30	-1.36	-2.34	-2.54	25	23.70	24	Pass	
n-HT40	102	5510	-2.30	-1.77	-1.76	-2.78	-2.25	25	23.24	24	Pass	
n-HT40	134	5670	-2.01	-1.41	-1.26	-2.60	-2.29	25	23.74	24	Pass	
ac-VHT20	100	5500	-2.26	-1.40	-1.98	-2.49	-2.40	25	23.60	24	Pass	
ac-VHT20	140	5700	-1.77	-1.13	-1.11	-2.19	-2.28	25	23.89	24	Pass	
ac-VHT40	102	5510	-2.11	-1.16	-1.44	-2.67	-2.36	25	23.84	24	Pass	
ac-VHT40	134	5670	-2.05	-1.65	-1.19	-2.47	-2.26	25	23.81	24	Pass	
ac-VHT80	106	5530	-1.96	-1.37	-1.64	-2.76	-2.45	25	23.63	24	Pass	
ac-VHT80	122	5610	-2.31	-1.31	-1.47	-2.55	-2.75	25	23.69	24	Pass	
Ant 1												
11a	100	5500	-2.23	-1.46	-1.38	-2.66	-2.19	25	23.62	24	Pass	
11a	140	5700	-2.00	-1.49	-1.34	-2.79	-2.48	25	23.66	24	Pass	
n-HT20	100	5500	-2.17	-1.76	-1.53	-2.78	-2.83	25	23.47	24	Pass	
n-HT20	140	5700	-2.17	-1.60	-1.82	-2.80	-2.90	25	23.40	24	Pass	
n-HT40	102	5510	-2.31	-1.60	-1.62	-2.83	-2.87	25	23.40	24	Pass	
n-HT40	134	5670	-2.10	-1.81	-1.52	-2.65	-2.65	25	23.48	24	Pass	
ac-VHT20	100	5500	-2.17	-1.40	-1.57	-2.72	-2.87	25	23.60	24	Pass	
ac-VHT20	140	5700	-2.21	-1.82	-1.43	-2.72	-2.79	25	23.57	24	Pass	
ac-VHT40	102	5510	-2.21	-1.63	-1.69	-2.54	-2.41	25	23.37	24	Pass	
ac-VHT40	134	5670	-1.99	-1.65	-1.53	-2.30	-2.79	25	23.47	24	Pass	
ac-VHT80	106	5530	-2.24	-1.78	-1.54	-2.83	-2.34	25	23.46	24	Pass	
ac-VHT80	122	5610	-2.26	-1.63	-1.55	-2.65	-2.93	25	23.45	24	Pass	

Ant 0 + 1											
n-HT20	100	5500	-2.36	-1.51	-1.66	-2.91	-2.88	25	23.49	24	Pass
n-HT20	140	5700	-2.27	-1.50	-1.57	-2.86	-2.63	25	23.50	24	Pass
n-HT40	102	5510	-2.02	-1.35	-1.56	-2.69	-2.71	25	23.65	24	Pass
n-HT40	134	5670	-2.21	-1.61	-1.45	-2.56	-2.65	25	23.55	24	Pass
ac-VHT20	100	5500	-2.13	-1.64	-1.62	-2.63	-2.63	25	23.38	24	Pass
ac-VHT20	140	5700	-2.15	-1.50	-1.53	-2.60	-2.69	25	23.50	24	Pass
ac-VHT40	102	5510	-2.02	-1.47	-1.56	-2.34	-2.43	25	23.53	24	Pass
ac-VHT40	134	5670	-2.11	-1.53	-1.49	-2.68	-2.58	25	23.51	24	Pass
ac-VHT80	106	5530	-2.15	-1.55	-1.48	-2.65	-2.68	25	23.52	24	Pass
ac-VHT80	122	5610	-1.96	-1.31	-1.24	-2.47	-2.08	25	23.76	24	Pass

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

Antenna Gain = 25 dBi, 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	100	5500	-8.06	16.94	17	Pass
11a	140	5700	-8.12	16.88	17	Pass
n-HT20	100	5500	-8.38	16.62	17	Pass
n-HT20	140	5700	-8.08	16.92	17	Pass
n-HT40	102	5510	-12.25	12.75	17	Pass
n-HT40	134	5670	-11.33	13.67	17	Pass
ac-VHT20	100	5500	-8.44	16.56	17	Pass
ac-VHT20	140	5700	-8.18	16.82	17	Pass
ac-VHT40	102	5510	-11.61	13.39	17	Pass
ac-VHT40	134	5670	-10.82	14.18	17	Pass
ac-VHT80	106	5530	-14.29	10.71	17	Pass
ac-VHT80	122	5610	-13.90	11.10	17	Pass
Ant 1						
11a	100	5500	-8.16	16.84	17	Pass
11a	140	5700	-8.41	16.59	17	Pass
n-HT20	100	5500	-8.49	16.51	17	Pass
n-HT20	140	5700	-8.59	16.41	17	Pass
n-HT40	102	5510	-12.40	12.60	17	Pass
n-HT40	134	5670	-12.38	12.62	17	Pass
ac-VHT20	100	5500	-8.63	16.37	17	Pass
ac-VHT20	140	5700	-8.88	16.12	17	Pass
ac-VHT40	102	5510	-11.62	13.38	17	Pass
ac-VHT40	134	5670	-11.45	13.55	17	Pass
ac-VHT80	106	5530	-15.16	9.84	17	Pass
ac-VHT80	122	5610	-15.37	9.63	17	Pass

Ant 0 + 1						
n-HT20	100	5500	-11.65	16.52	17	Pass
n-HT20	140	5700	-11.52	16.52	17	Pass
n-HT40	102	5510	-13.99	14.13	17	Pass
n-HT40	134	5670	-14.10	13.62	17	Pass
ac-VHT20	100	5500	-11.41	16.73	17	Pass
ac-VHT20	140	5700	-11.58	16.71	17	Pass
ac-VHT40	102	5510	-13.91	14.15	17	Pass
ac-VHT40	134	5670	-14.31	13.68	17	Pass
ac-VHT80	106	5530	-17.06	11.05	17	Pass
ac-VHT80	122	5610	-16.33	11.22	17	Pass

Note: Measured Power Density (dBm/MHz) = Reading Power Density (dBm/MHz) + Antenna Gain (dBi) + 10  
log (1/Duty Cycle). Antenna Gain = 25 dBi, Duty Cycle = 100%.

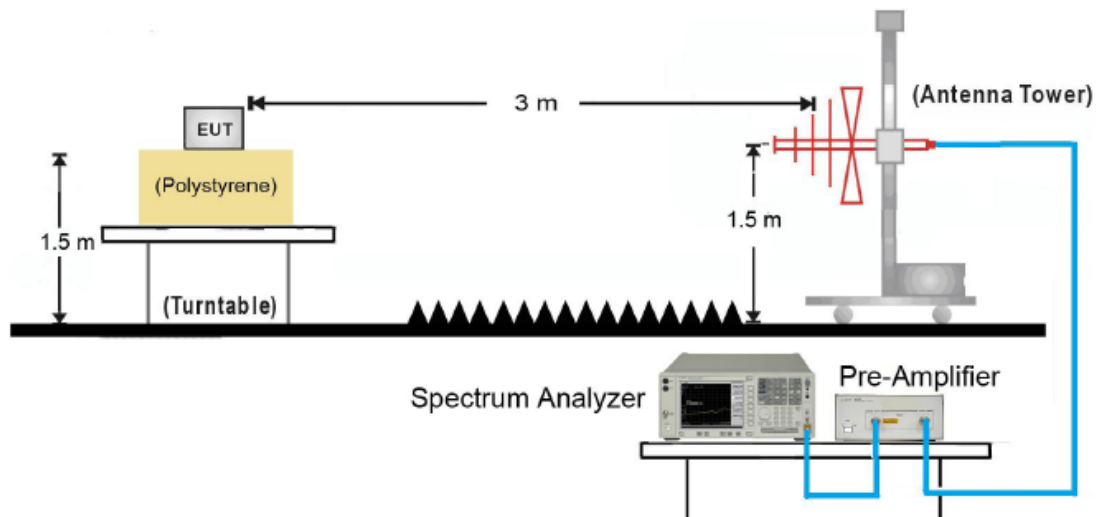
## 7. Transmitter Unwanted Emissions Outside the 5GHz RLAN Bands

### 7.1. Limit

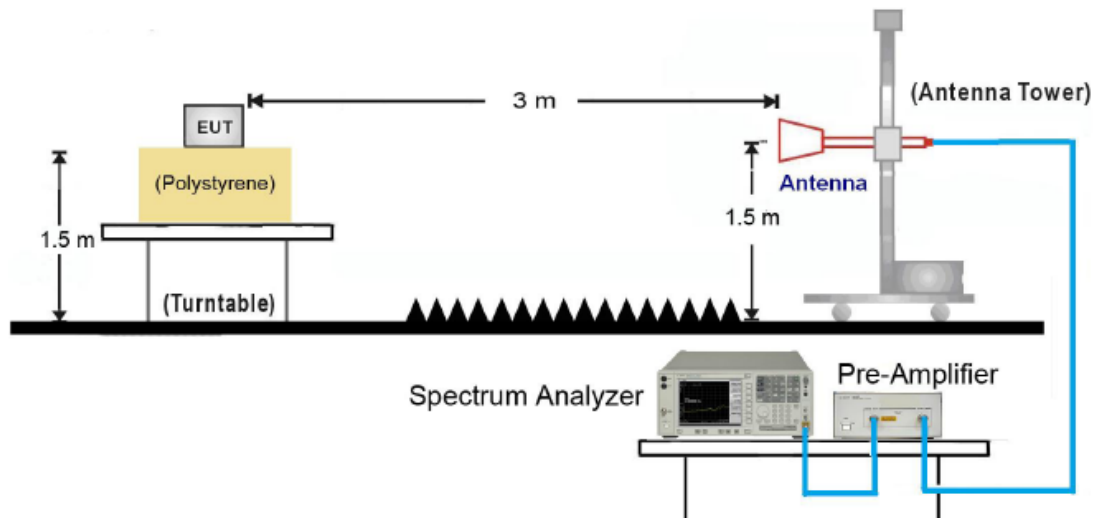
Frequency Range	Maximum Power	Bandwidth
30 MHz to 47 MHz	-36dBm	100 kHz
47 MHz to 74 MHz	-54dBm	100 kHz
74 MHz to 87.5 MHz	-36dBm	100 kHz
87.5 MHz to 118 MHz	-54dBm	100 kHz
118 MHz to 174 MHz	-36dBm	100 kHz
174 MHz to 230 MHz	-54dBm	100 kHz
230 MHz to 470 MHz	-36dBm	100 kHz
470 MHz to 862 MHz	-54dBm	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 Time	08-22-2014	Relative Humidity	54%
Test Mode	802.11a	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
Ant 0						
100	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
Ant 1						
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	08-22-2014	Relative Humidity	54%
Test Mode	802.11n-HT20	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
Ant 0						
100	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
Ant 1						
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
Ant 0 + 1						
100	562.5	-66.76	-54	-12.76	Peak	Horizontal
	164.9	-58.26	-36	-22.26	Peak	Vertical
	743.2	-69.06	-54	-15.06	Peak	Horizontal
	769.8	-61.63	-54	-7.63	Peak	Vertical
	11000.0	-36.59	-30	-6.59	Peak	Horizontal
	11000.0	-35.53	-30	-5.53	Peak	Vertical
	16500.0	-38.29	-30	-8.29	Peak	Horizontal
	16500.0	-37.96	-30	-7.96	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Time	08-22-2014	Relative Humidity	54%
Test Mode	802.11n-HT40	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
Ant 0						
102	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
Ant 1						
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
Ant 0 + 1						
102	674.0	-71.49	-54	-17.49	Peak	Horizontal
	180.2	-62.50	-54	-8.50	Peak	Vertical
	739.0	-71.83	-54	-17.83	Peak	Horizontal
	586.3	-61.78	-54	-7.78	Peak	Vertical
	11020.0	-36.24	-30	-6.24	Peak	Horizontal
	11020.0	-37.67	-30	-7.67	Peak	Vertical
	16530.0	-36.92	-30	-6.92	Peak	Horizontal
	16530.0	-36.02	-30	-6.02	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Time	08-22-2014	Relative Humidity	54%
Test Mode	802.11ac-VHT20	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
Ant 0						
100	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
Ant 1						
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
Ant 0 + 1						
100	620.3	-72.22	-54	-18.22	Peak	Horizontal
	172.6	-65.02	-36	-29.02	Peak	Vertical
	897.4	-59.91	-36	-23.91	Peak	Horizontal
	763.3	-63.73	-54	-9.73	Peak	Vertical
	11000.0	-38.18	-30	-8.18	Peak	Horizontal
	11000.0	-41.09	-30	-11.09	Peak	Vertical
	16500.0	-36.83	-30	-6.83	Peak	Horizontal
	16500.0	-37.63	-30	-7.63	Peak	Vertical



Test Engineer	Milo Li	Temperature	26°C
Test Time	08-22-2014	Relative Humidity	54%
Test Mode	802.11ac-VHT40	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
Ant 0						
102	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
Ant 1						
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
Ant 0 + 1						
102	638.7	-80.84	-54	-26.84	Peak	Horizontal
	160.0	-60.17	-36	-24.17	Peak	Vertical
	748.8	-65.52	-54	-11.52	Peak	Horizontal
	593.5	-63.81	-54	-9.81	Peak	Vertical
	11020.0	-36.67	-30	-6.67	Peak	Horizontal
	11020.0	-44.66	-30	-14.66	Peak	Vertical
	16530.0	-39.05	-30	-9.05	Peak	Horizontal
	16530.0	-35.51	-30	-5.51	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Time	08-22-2014	Relative Humidity	54%
Test Mode	802.11ac-VHT80	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
Ant 0						
106	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
Ant 1						
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
Ant 0 + 1						
106	597.4	-64.49	-54	-10.49	Peak	Horizontal
	638.5	-67.58	-54	-13.58	Peak	Vertical
	738.6	-68.23	-54	-14.23	Peak	Horizontal
	751.2	-68.32	-54	-14.32	Peak	Vertical
	11060.0	-35.18	-30	-5.18	Peak	Horizontal
	11060.0	-45.22	-30	-15.22	Peak	Vertical
	16590.0	-35.17	-30	-5.17	Peak	Horizontal
	16590.0	-42.42	-30	-12.42	Peak	Vertical

**Test by Dipole Antenna – 2dBi**

Test Engineer	Milo Li	Temperature	26°C
Test Time	08-22-2014	Relative Humidity	54%
Test Mode	802.11a	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
Ant 0						
100	79.7	-76.04	-36	-40.04	Peak	Horizontal
	122.8	-73.16	-36	-37.16	Peak	Vertical
	842.1	-77.78	-54	-23.78	Peak	Horizontal
	228.4	-70.52	-54	-16.52	Peak	Vertical
	11000.0	-42.83	-30	-12.83	Peak	Horizontal
	11000.0	-44.63	-30	-14.63	Peak	Vertical
	16500.0	-38.30	-30	-8.30	Peak	Horizontal
	16500.0	-38.39	-30	-8.39	Peak	Vertical
Ant 1						
100	463.0	-73.34	-36	-37.34	Peak	Horizontal
	602.9	-68.79	-54	-14.79	Peak	Vertical
	742.6	-69.08	-54	-15.08	Peak	Horizontal
	899.7	-62.51	-36	-26.51	Peak	Vertical
	11000.0	-32.70	-30	-2.70	Peak	Horizontal
	11000.0	-39.09	-30	-9.09	Peak	Vertical
	16500.0	-36.19	-30	-6.19	Peak	Horizontal
	16500.0	-35.02	-30	-5.02	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Time	08-22-2014	Relative Humidity	54%
Test Mode	802.11n-HT20	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
Ant 0						
100	567.9	-64.92	-54	-10.92	Peak	Horizontal
	140.8	-65.26	-36	-29.26	Peak	Vertical
	748.0	-64.11	-54	-10.11	Peak	Horizontal
	722.0	-64.34	-54	-10.34	Peak	Vertical
	11000.0	-43.24	-30	-13.24	Peak	Horizontal
	11000.0	-40.01	-30	-10.01	Peak	Vertical
	16500.0	-37.07	-30	-7.07	Peak	Horizontal
	16500.0	-36.52	-30	-6.52	Peak	Vertical
Ant 1						
100	553.5	-72.49	-54	-18.49	Peak	Horizontal
	140.4	-64.49	-36	-28.49	Peak	Vertical
	767.1	-60.79	-54	-6.79	Peak	Horizontal
	757.4	-63.37	-54	-9.37	Peak	Vertical
	11000.0	-38.94	-30	-8.94	Peak	Horizontal
	11000.0	-37.64	-30	-7.64	Peak	Vertical
	16500.0	-37.63	-30	-7.63	Peak	Horizontal
	16500.0	-34.28	-30	-4.28	Peak	Vertical
Ant 0 + 1						
100	557.5	-70.95	-54	-16.95	Peak	Horizontal
	120.7	-61.99	-36	-25.99	Peak	Vertical
	715.1	-69.33	-54	-15.33	Peak	Horizontal
	714.3	-62.05	-54	-8.05	Peak	Vertical
	11000.0	-35.58	-30	-5.58	Peak	Horizontal
	11000.0	-45.99	-30	-15.99	Peak	Vertical
	16500.0	-34.77	-30	-4.77	Peak	Horizontal
	16500.0	-35.89	-30	-5.89	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Time	08-22-2014	Relative Humidity	54%
Test Mode	802.11n-HT40	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
Ant 0						
102	111.6	-70.04	-54	-16.04	Peak	Horizontal
	617.2	-65.24	-54	-11.24	Peak	Vertical
	255.1	-65.68	-36	-29.68	Peak	Horizontal
	791.6	-65.18	-54	-11.18	Peak	Vertical
	11020.0	-37.82	-30	-7.82	Peak	Horizontal
	11020.0	-45.50	-30	-15.50	Peak	Vertical
	16530.0	-35.18	-30	-5.18	Peak	Horizontal
	16530.0	-40.80	-30	-10.80	Peak	Vertical
Ant 1						
102	575.9	-75.03	-54	-21.03	Peak	Horizontal
	93.0	-59.22	-54	-5.22	Peak	Vertical
	632.4	-64.29	-54	-10.29	Peak	Horizontal
	586.7	-67.85	-54	-13.85	Peak	Vertical
	11020.0	-33.21	-30	-3.21	Peak	Horizontal
	11020.0	-38.12	-30	-8.12	Peak	Vertical
	16530.0	-37.16	-30	-7.16	Peak	Horizontal
	16530.0	-36.46	-30	-6.46	Peak	Vertical
Ant 0 + 1						
102	619.7	-74.59	-54	-20.59	Peak	Horizontal
	175.4	-56.66	-54	-2.66	Peak	Vertical
	705.0	-68.57	-54	-14.57	Peak	Horizontal
	680.9	-62.15	-54	-8.15	Peak	Vertical
	11020.0	-37.97	-30	-7.97	Peak	Horizontal
	11020.0	-44.90	-30	-14.90	Peak	Vertical
	16530.0	-35.45	-30	-5.45	Peak	Horizontal
	16530.0	-43.20	-30	-13.20	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Time	08-22-2014	Relative Humidity	54%
Test Mode	802.11ac-VHT20	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
Ant 0						
100	577.4	-66.91	-54	-12.91	Peak	Horizontal
	130.7	-59.51	-36	-23.51	Peak	Vertical
	778.5	-59.61	-54	-5.61	Peak	Horizontal
	796.4	-59.90	-54	-5.90	Peak	Vertical
	11054.7	-37.60	-30	-7.60	Peak	Horizontal
	11031.7	-42.89	-30	-12.89	Peak	Vertical
	16553.8	-37.41	-30	-7.41	Peak	Horizontal
	16567.6	-43.27	-30	-13.27	Peak	Vertical
Ant 1						
100	483.1	-66.10	-54	-12.10	Peak	Horizontal
	156.0	-60.77	-36	-24.77	Peak	Vertical
	678.0	-66.19	-54	-12.19	Peak	Horizontal
	832.1	-61.92	-54	-7.92	Peak	Vertical
	11005.7	-43.86	-30	-13.86	Peak	Horizontal
	11014.4	-41.48	-30	-11.48	Peak	Vertical
	16490.6	-37.55	-30	-7.55	Peak	Horizontal
	16507.5	-36.35	-30	-6.35	Peak	Vertical
Ant 0 + 1						
100	578.3	-70.99	-54	-16.99	Peak	Horizontal
	90.4	-56.71	-54	-2.71	Peak	Vertical
	690.2	-61.62	-54	-7.62	Peak	Horizontal
	826.9	-59.46	-54	-5.46	Peak	Vertical
	11065.9	-38.64	-30	-8.64	Peak	Horizontal
	11049.9	-40.73	-30	-10.73	Peak	Vertical
	16478.6	-36.18	-30	-6.18	Peak	Horizontal
	16528.6	-39.15	-30	-9.15	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Time	08-22-2014	Relative Humidity	54%
Test Mode	802.11ac-VHT40	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
Ant 0						
102	123.3	-68.62	-36	-32.62	Peak	Horizontal
	620.6	-60.60	-54	-6.60	Peak	Vertical
	256.1	-61.28	-36	-25.28	Peak	Horizontal
	751.7	-61.80	-54	-7.80	Peak	Vertical
	11020.0	-39.49	-30	-9.49	Peak	Horizontal
	11020.0	-36.75	-30	-6.75	Peak	Vertical
	16530.0	-35.90	-30	-5.90	Peak	Horizontal
	16530.0	-34.08	-30	-4.08	Peak	Vertical
Ant 1						
102	676.6	-77.25	-54	-23.25	Peak	Horizontal
	73.9	-63.25	-54	-9.25	Peak	Vertical
	773.7	-63.05	-54	-9.05	Peak	Horizontal
	568.0	-68.21	-54	-14.21	Peak	Vertical
	11020.0	-35.51	-30	-5.51	Peak	Horizontal
	11020.0	-38.01	-30	-8.01	Peak	Vertical
	16530.0	-37.84	-30	-7.84	Peak	Horizontal
	16530.0	-40.51	-30	-10.51	Peak	Vertical
Ant 0 + 1						
102	565.8	-74.87	-54	-20.87	Peak	Horizontal
	150.9	-63.88	-36	-27.88	Peak	Vertical
	783.0	-68.18	-54	-14.18	Peak	Horizontal
	620.9	-62.48	-54	-8.48	Peak	Vertical
	11020.0	-38.64	-30	-8.64	Peak	Horizontal
	11020.0	-37.62	-30	-7.62	Peak	Vertical
	16530.0	-37.67	-30	-7.67	Peak	Horizontal
	16530.0	-36.44	-30	-6.44	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Time	08-22-2014	Relative Humidity	54%
Test Mode	802.11ac-VHT80	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
Ant 0						
106	186.4	-79.91	-54	-25.91	Peak	Horizontal
	170.8	-67.91	-36	-31.91	Peak	Vertical
	811.7	-70.04	-54	-16.04	Peak	Horizontal
	377.5	-64.75	-36	-28.75	Peak	Vertical
	11060.0	-41.12	-30	-11.12	Peak	Horizontal
	11060.0	-38.92	-30	-8.92	Peak	Vertical
	16590.0	-38.43	-30	-8.43	Peak	Horizontal
	16590.0	-37.95	-30	-7.95	Peak	Vertical
Ant 1						
106	575.0	-63.06	-54	-9.06	Peak	Horizontal
	672.5	-64.87	-54	-10.87	Peak	Vertical
	749.1	-74.11	-54	-20.11	Peak	Horizontal
	743.1	-68.35	-54	-14.35	Peak	Vertical
	11060.0	-36.87	-30	-6.87	Peak	Horizontal
	11060.0	-36.99	-30	-6.99	Peak	Vertical
	16590.0	-35.54	-30	-5.54	Peak	Horizontal
	16590.0	-36.36	-30	-6.36	Peak	Vertical
Ant 0 + 1						
106	541.2	-62.71	-54	-8.71	Peak	Horizontal
	604.8	-64.73	-54	-10.73	Peak	Vertical
	700.3	-70.73	-54	-16.73	Peak	Horizontal
	807.2	-62.63	-54	-8.63	Peak	Vertical
	11060.0	-37.46	-30	-7.46	Peak	Horizontal
	11060.0	-44.81	-30	-14.81	Peak	Vertical
	16590.0	-38.87	-30	-8.87	Peak	Horizontal
	16590.0	-37.81	-30	-7.81	Peak	Vertical



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

### 8.1. Limit

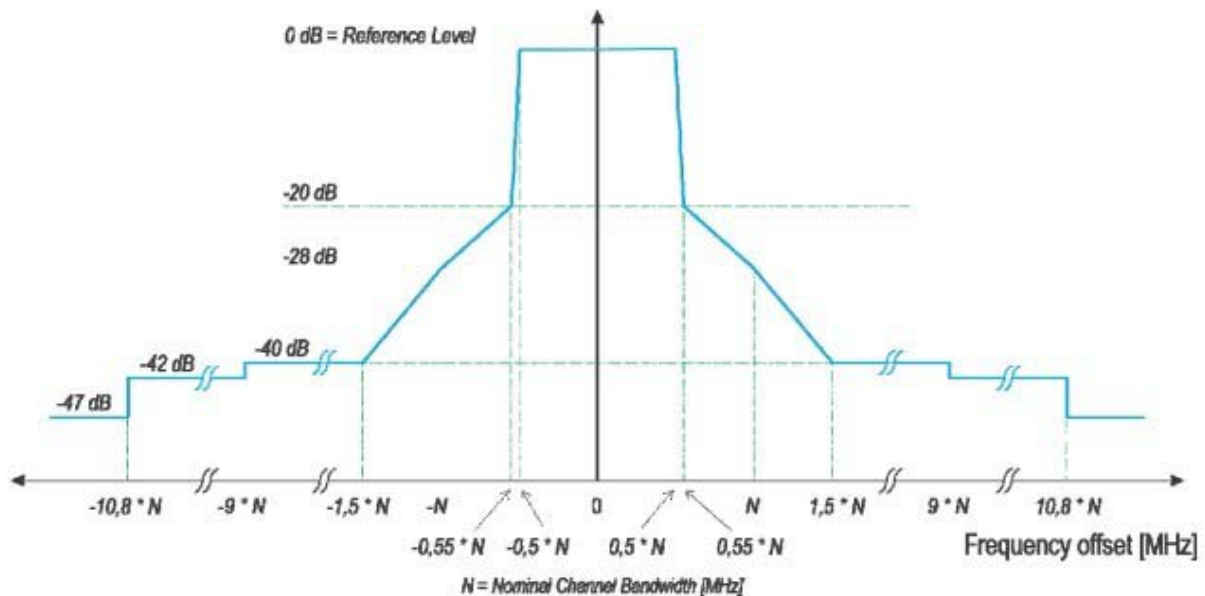
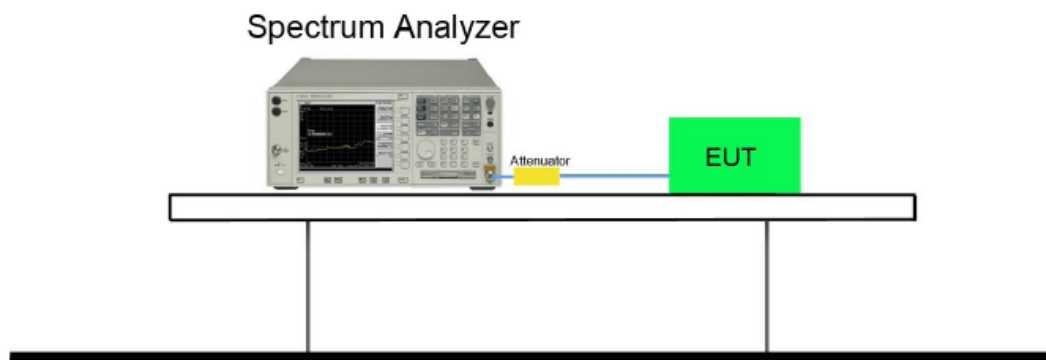


Figure 1: Transmit spectral power mask

### 8.2. Test Setup

#### Conducted measurements



### 8.3. Test Procedure

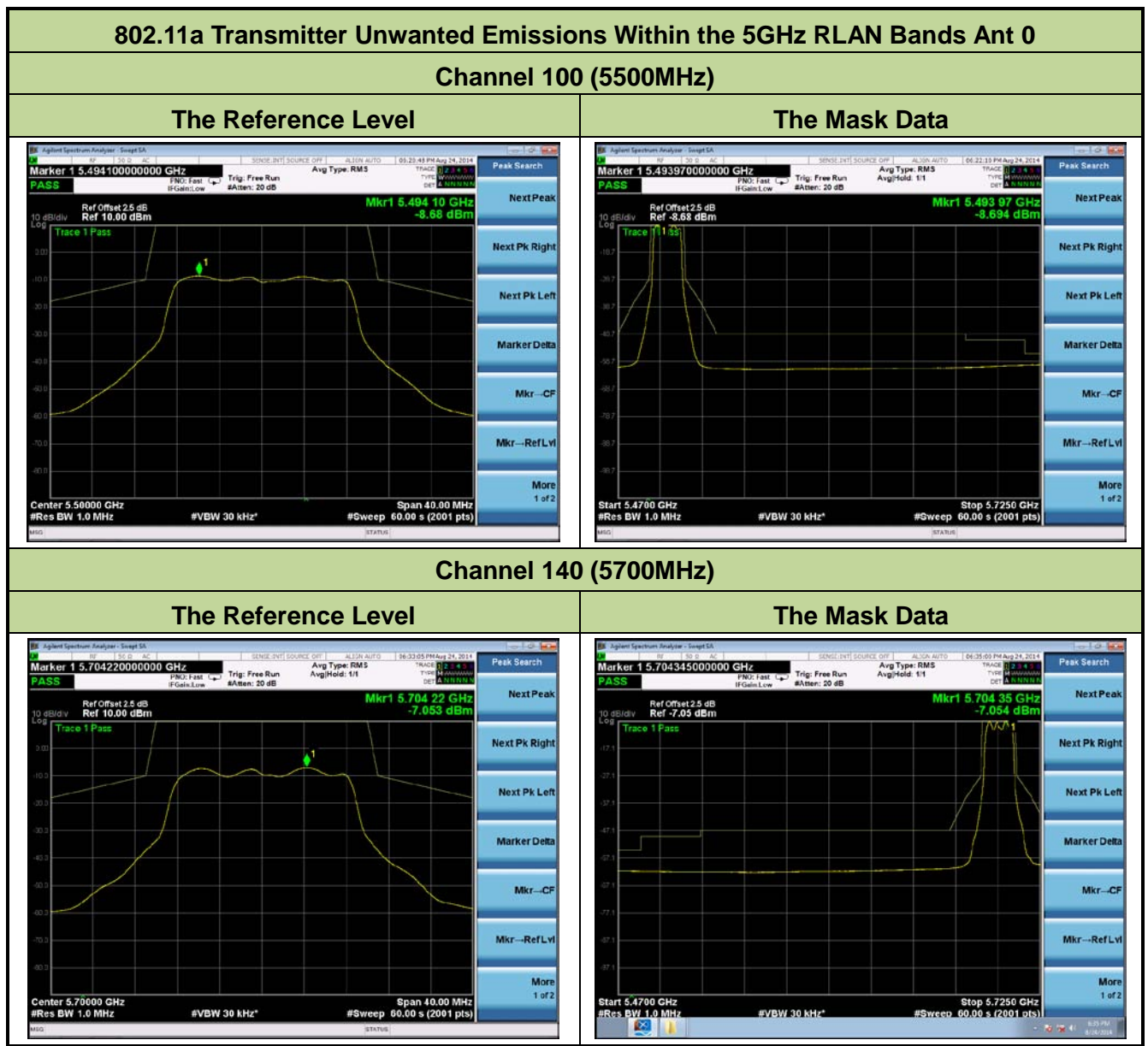
Refer to ETSI EN 301 893 V1.7.1 (2012-06) Clause 5.3.6.2.1.

#### 8.4. Test Result

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

Test Mode	Channel No.	Frequency (MHz)	Result
Ant 0			
802.11a	100	5500	Pass
802.11a	140	5700	Pass
802.11n-HT20	100	5500	Pass
802.11n-HT20	140	5700	Pass
802.11n-HT40	102	5510	Pass
802.11n-HT40	134	5670	Pass
802.11ac-VHT20	100	5500	Pass
802.11ac-VHT20	140	5700	Pass
802.11ac-VHT40	102	5510	Pass
802.11ac-VHT40	134	5670	Pass
802.11ac-VHT80	106	5530	Pass
802.11ac-VHT80	122	5610	Pass
Ant 1			
802.11a	100	5500	Pass
802.11a	140	5700	Pass
802.11n-HT20	100	5500	Pass
802.11n-HT20	140	5700	Pass
802.11n-HT40	102	5510	Pass
802.11n-HT40	134	5670	Pass
802.11ac-VHT20	100	5500	Pass
802.11ac-VHT20	140	5700	Pass
802.11ac-VHT40	102	5510	Pass
802.11ac-VHT40	134	5670	Pass
802.11ac-VHT80	106	5530	Pass
802.11ac-VHT80	122	5610	Pass

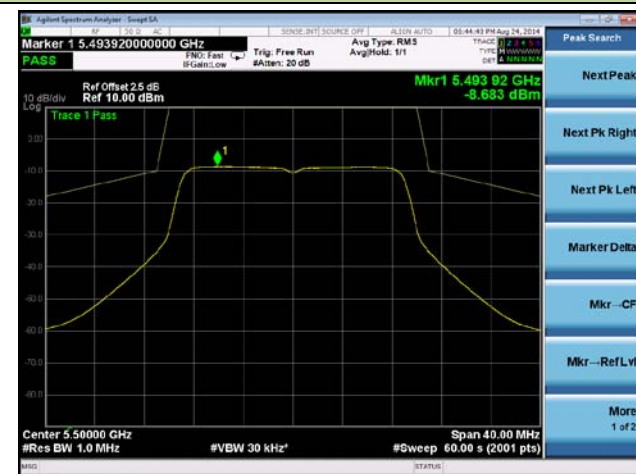
Ant 0 + 1			
802.11n-HT20	100	5500	Pass
802.11n-HT20	140	5700	Pass
802.11n-HT40	102	5510	Pass
802.11n-HT40	134	5670	Pass
802.11ac-VHT20	100	5500	Pass
802.11ac-VHT20	140	5700	Pass
802.11ac-VHT40	102	5510	Pass
802.11ac-VHT40	134	5670	Pass
802.11ac-VHT80	106	5530	Pass
802.11ac-VHT80	122	5610	Pass



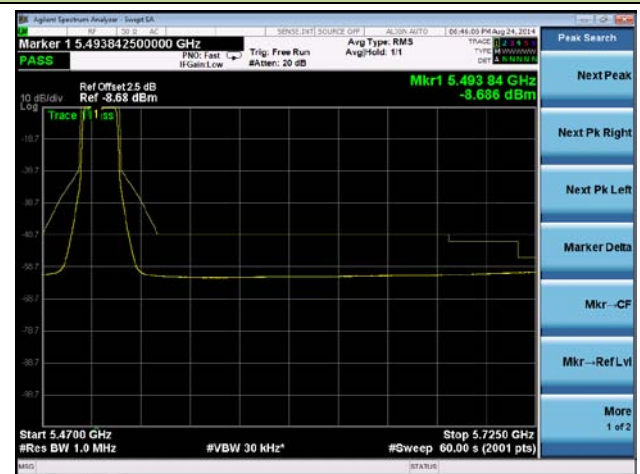
## 802.11n-HT20 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 0

### Channel 100 (5500MHz)

#### The Reference Level

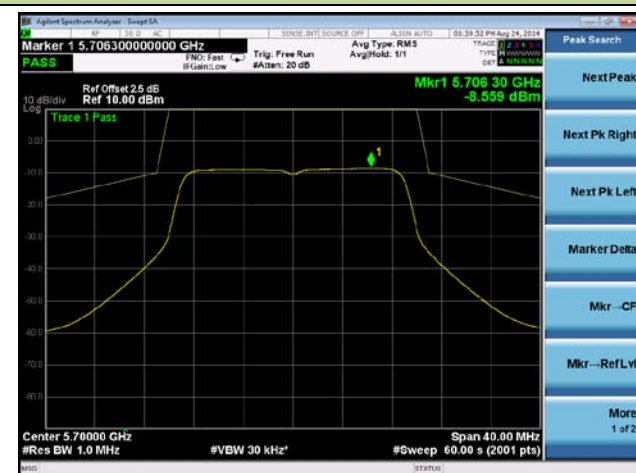


#### The Mask Data



### Channel 140 (5700MHz)

#### The Reference Level



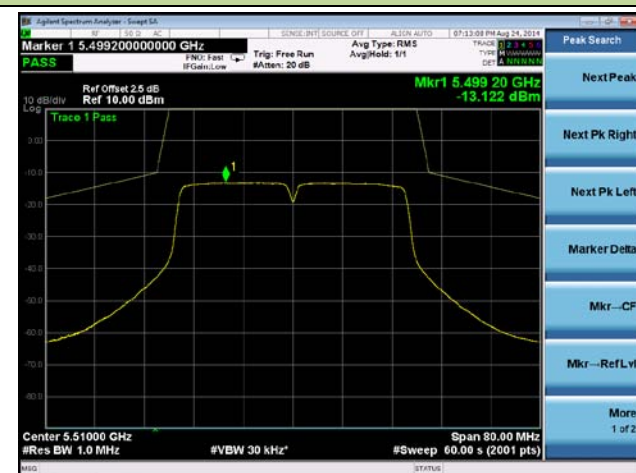
#### The Mask Data



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

### Channel 102 (5510MHz)

#### The Reference Level



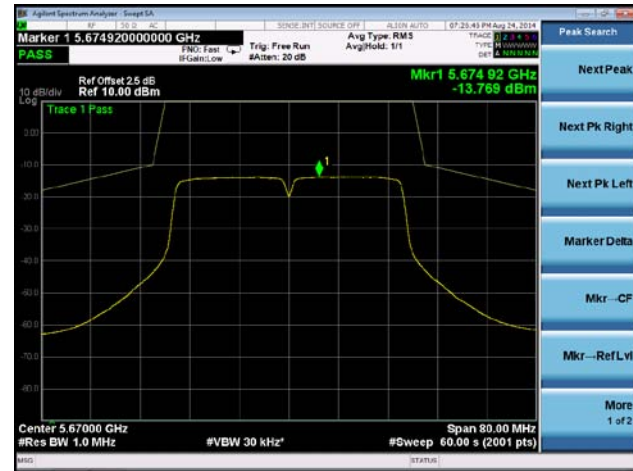
#### The Mask Data



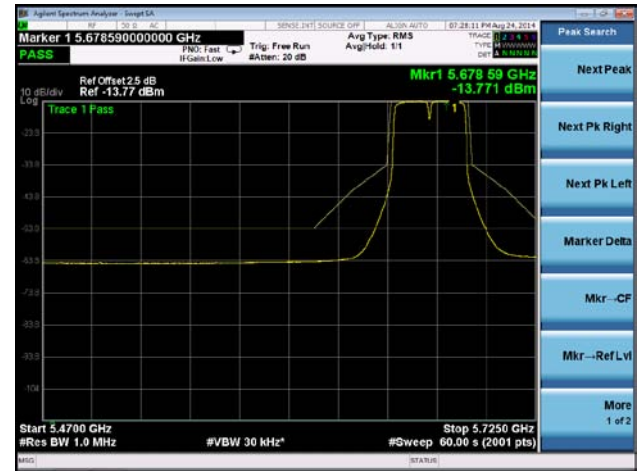


### Channel 134 (5670MHz)

#### The Reference Level



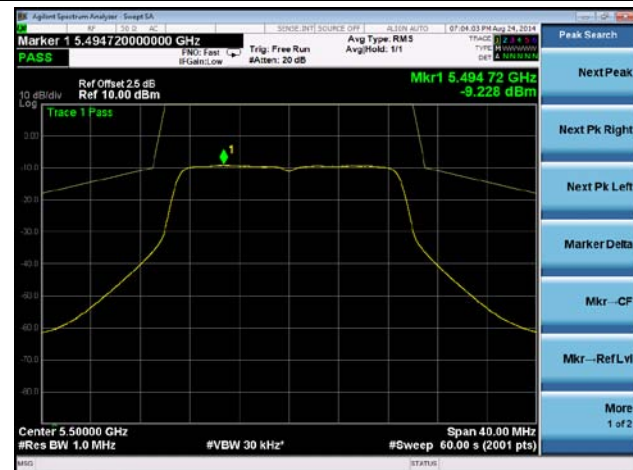
#### The Mask Data



### 802.11ac-VHT20 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 0

### Channel 100 (5500MHz)

#### The Reference Level

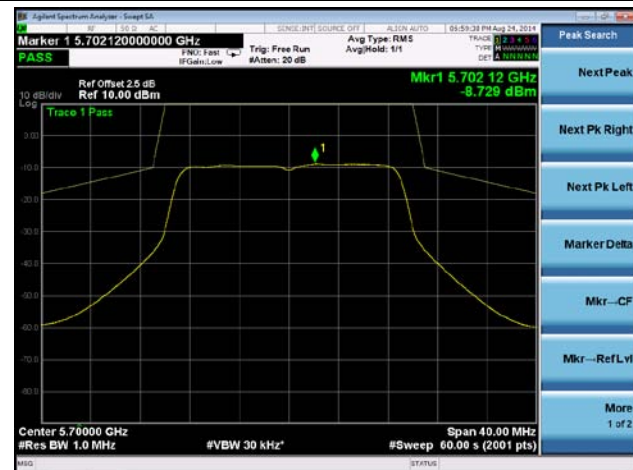


#### The Mask Data



### Channel 140 (5700MHz)

#### The Reference Level



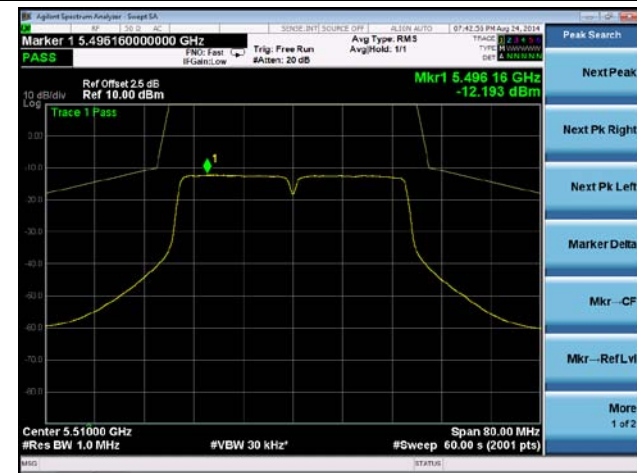
#### The Mask Data



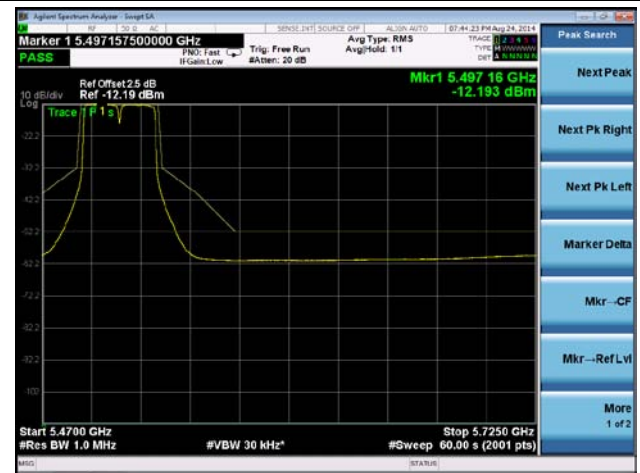
## 802.11ac-VHT40 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 0

### Channel 102 (5510MHz)

#### The Reference Level

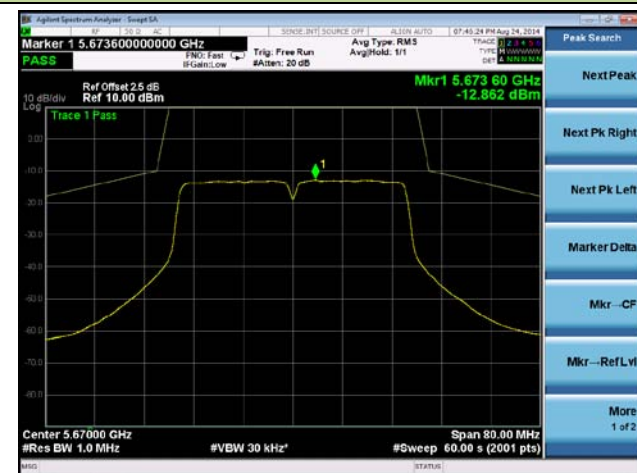


#### The Mask Data



### Channel 134 (5670MHz)

#### The Reference Level



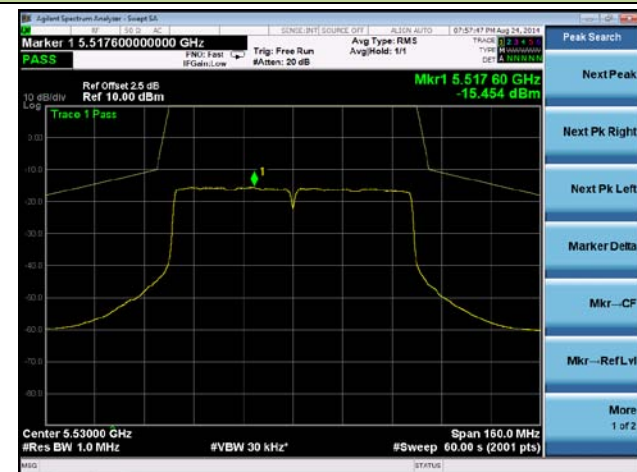
#### The Mask Data



## 802.11ac-VHT80 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 0

### Channel 106 (5530MHz)

#### The Reference Level

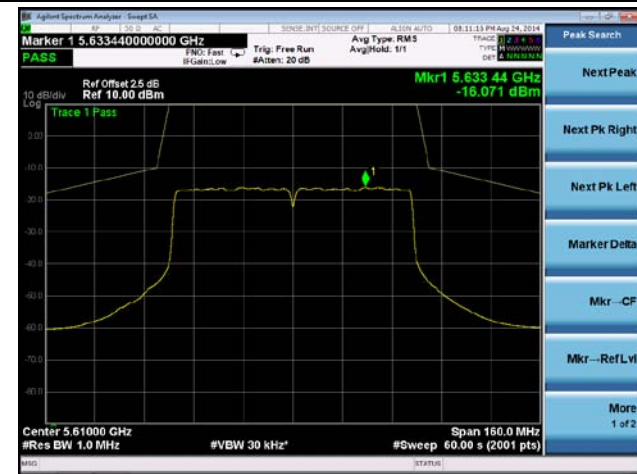


#### The Mask Data



## Channel 122 (5610MHz)

### The Reference Level



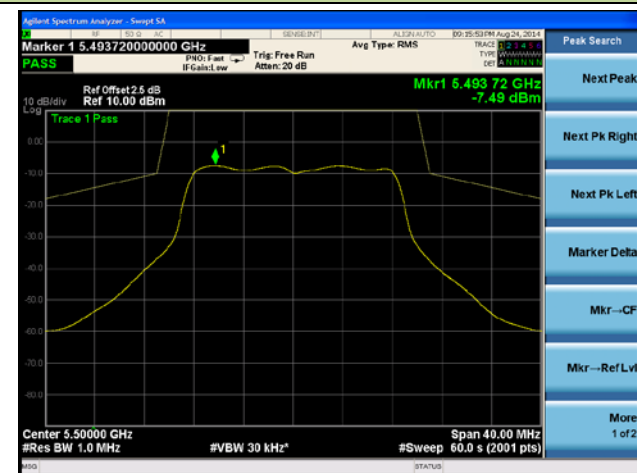
### The Mask Data



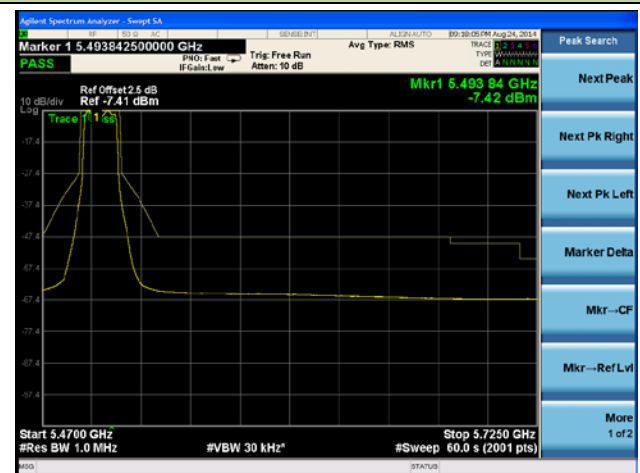
## 802.11a Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 1

## Channel 100 (5500MHz)

### The Reference Level

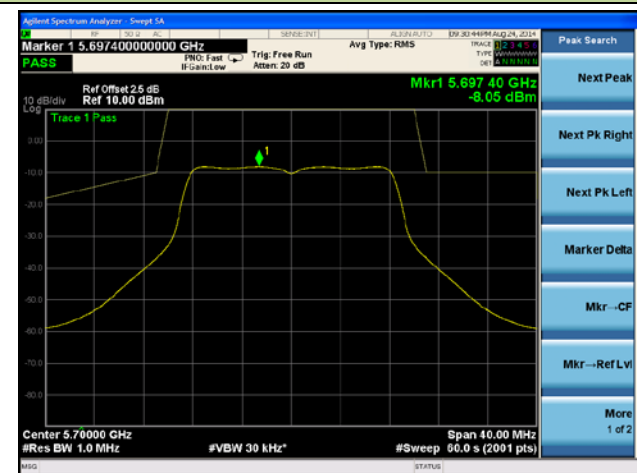


### The Mask Data

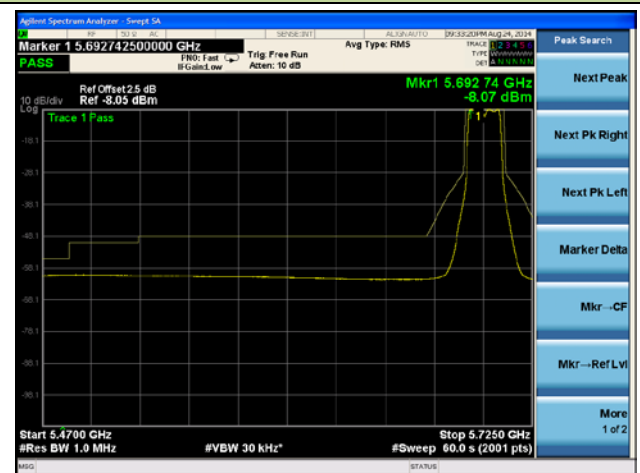


## Channel 140 (5700MHz)

### The Reference Level



### The Mask Data

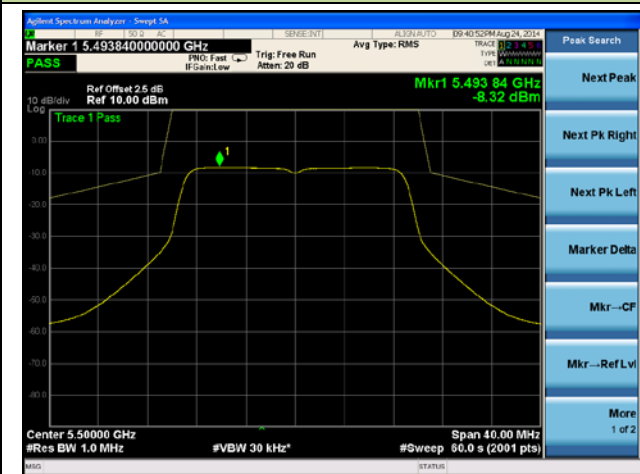




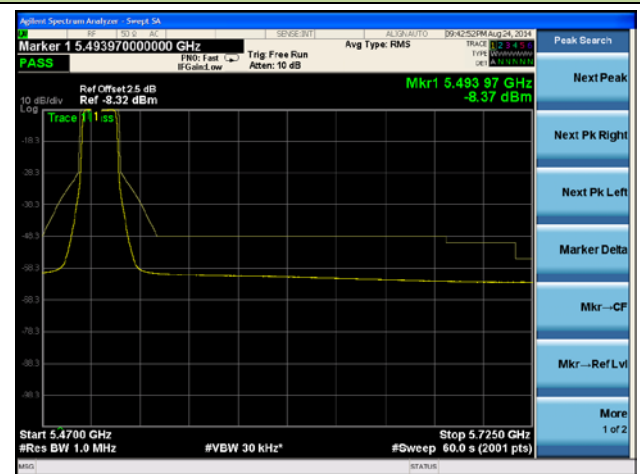
## 802.11n-HT20 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 1

### Channel 100 (5500MHz)

#### The Reference Level

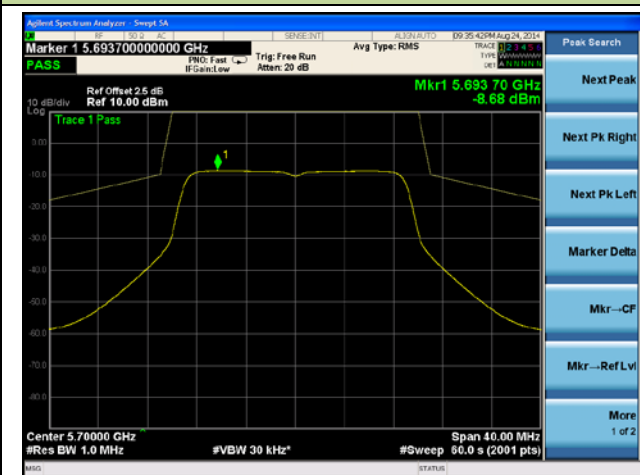


#### The Mask Data

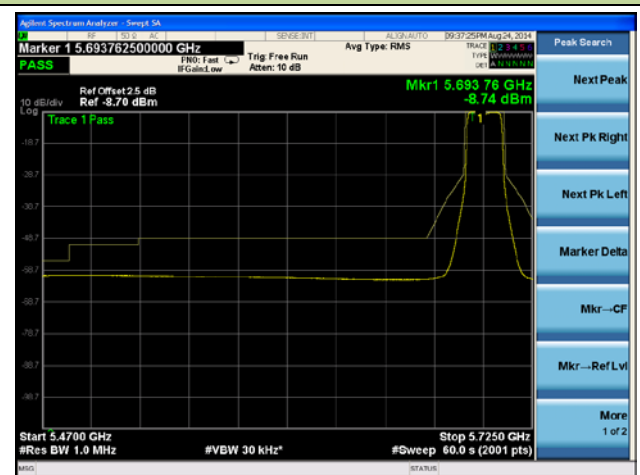


### Channel 140 (5700MHz)

#### The Reference Level



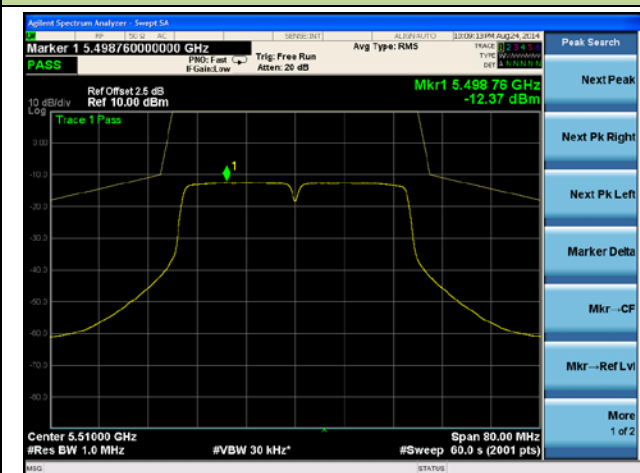
#### The Mask Data



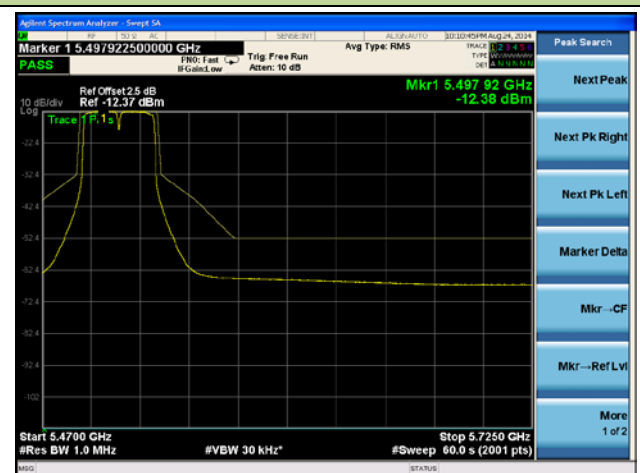
## 802.11n-HT40 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 1

### Channel 102 (5510MHz)

#### The Reference Level



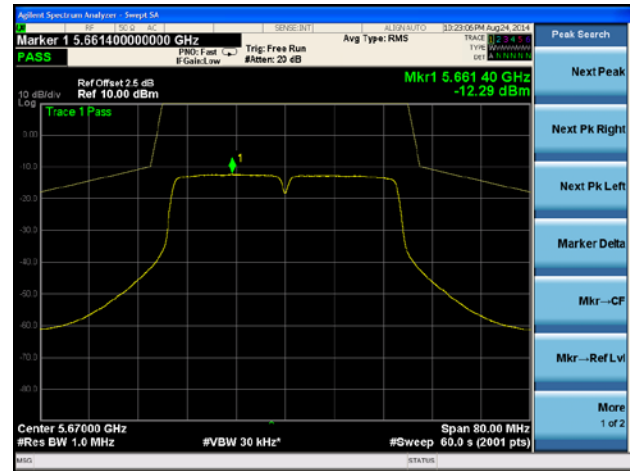
#### The Mask Data



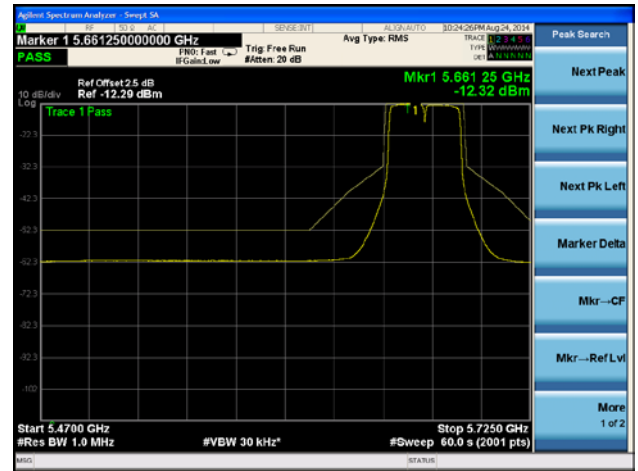


### Channel 134 (5670MHz)

#### The Reference Level



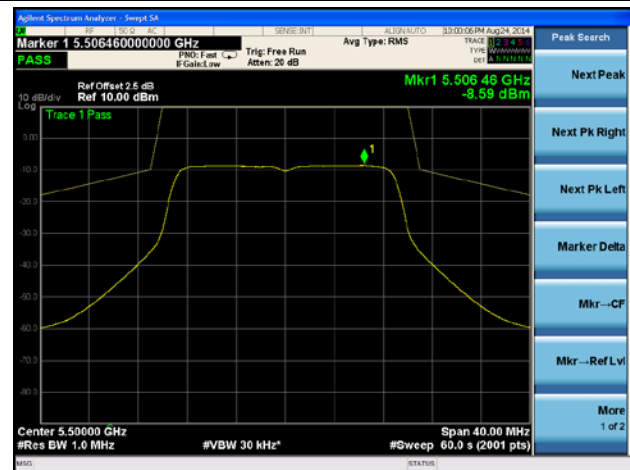
#### The Mask Data



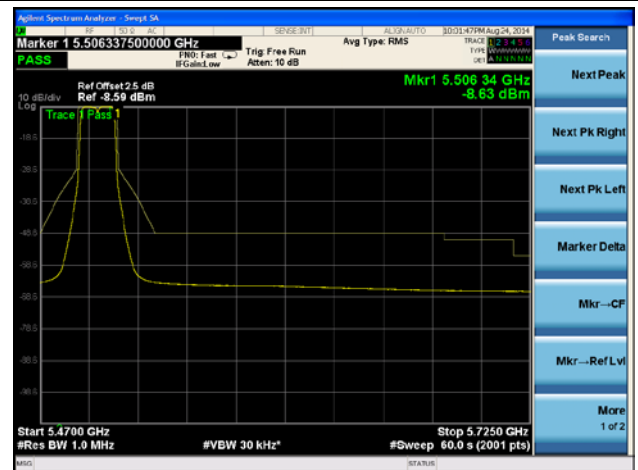
### 802.11ac-VHT20 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 1

### Channel 100 (5500MHz)

#### The Reference Level

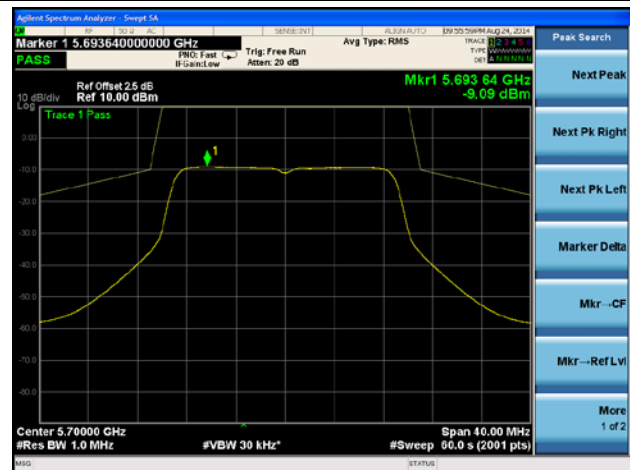


#### The Mask Data

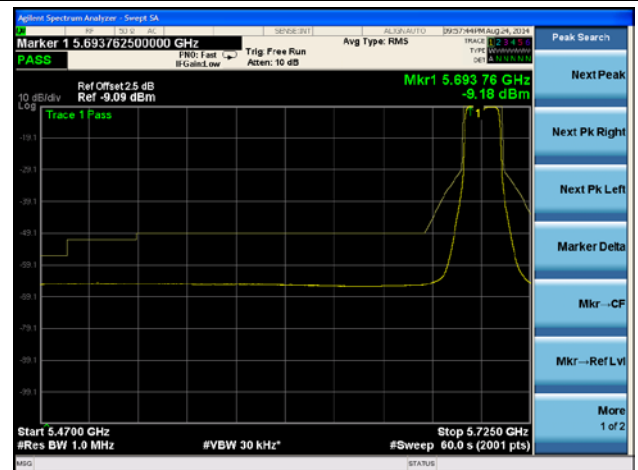


### Channel 140 (5700MHz)

#### The Reference Level



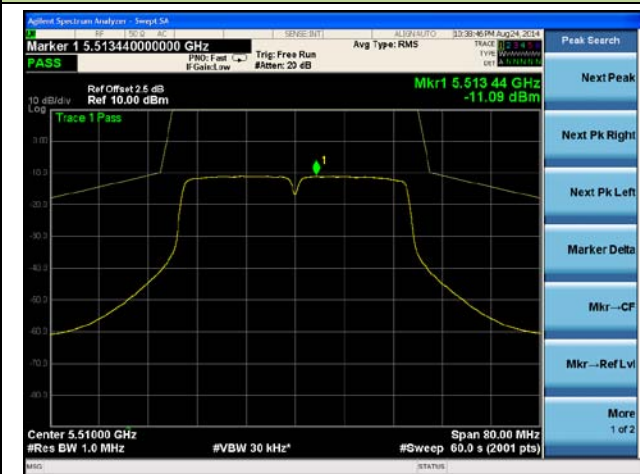
#### The Mask Data



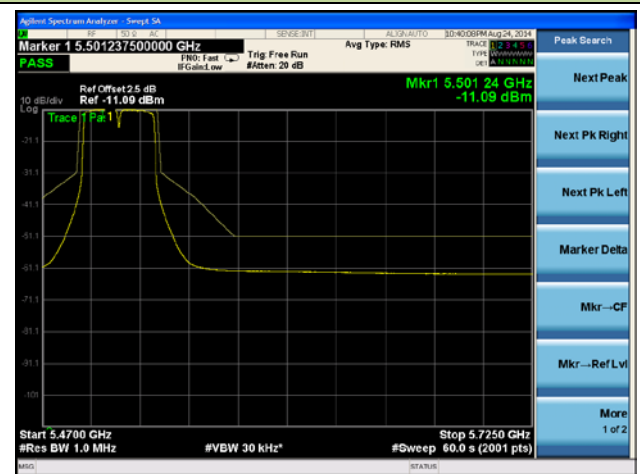
## 802.11ac-VHT40 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 1

### Channel 102 (5510MHz)

#### The Reference Level

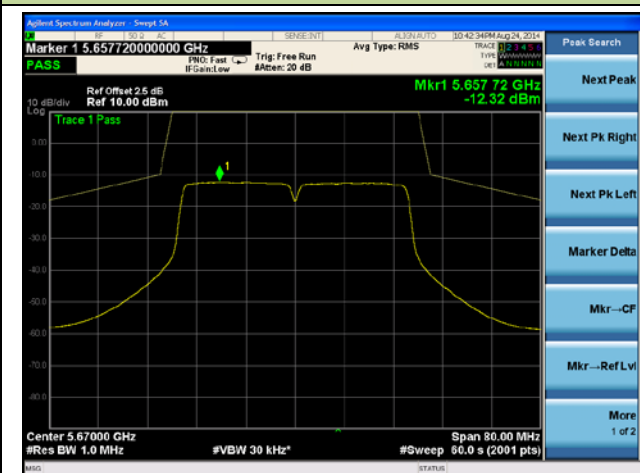


#### The Mask Data

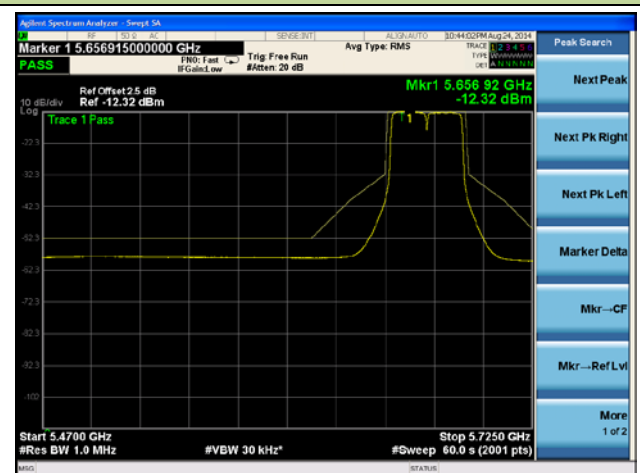


### Channel 134 (5670MHz)

#### The Reference Level



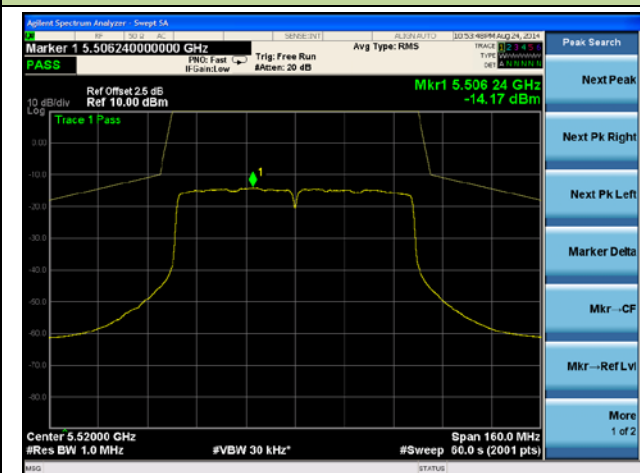
#### The Mask Data



## 802.11ac-VHT80 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 1

### Channel 106 (5530MHz)

#### The Reference Level

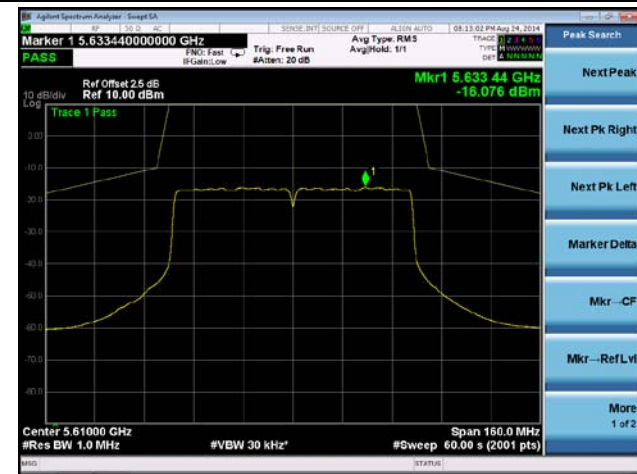


#### The Mask Data

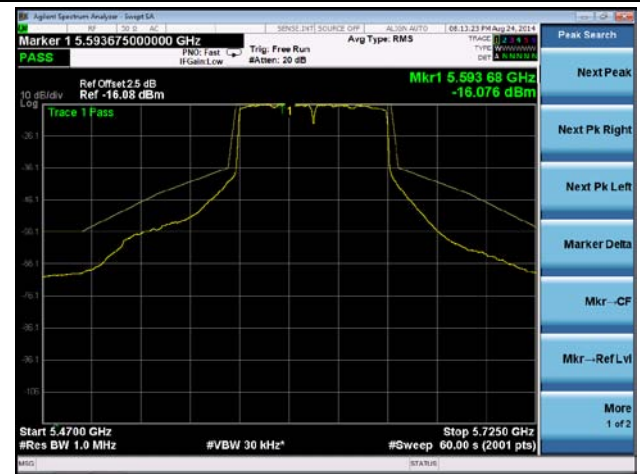


## Channel 122 (5610MHz)

### The Reference Level



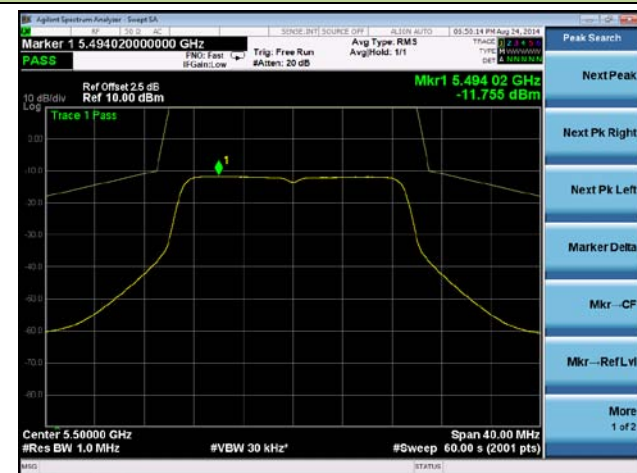
### The Mask Data



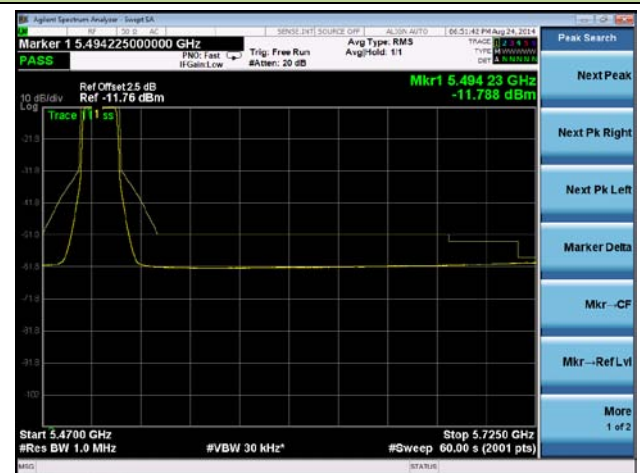
## 802.11n-HT20 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 0 + 1

## Channel 100 (5500MHz)

### The Reference Level

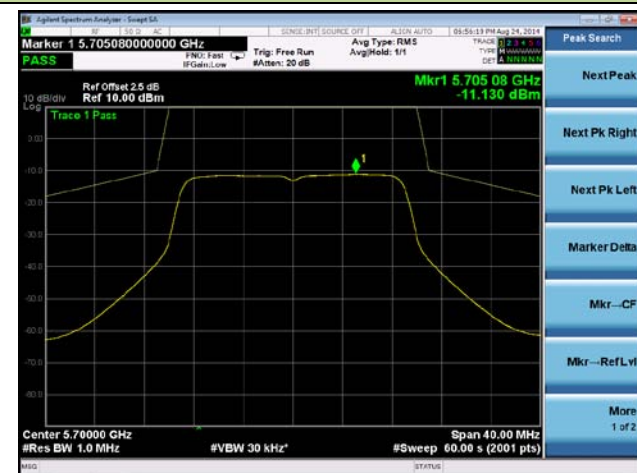


### The Mask Data

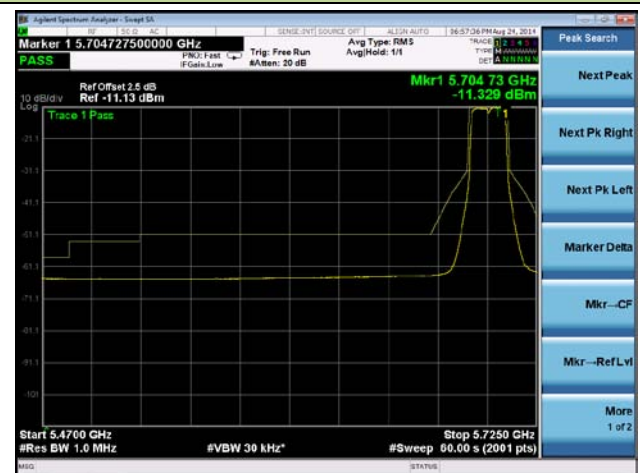


## Channel 140 (5700MHz)

### The Reference Level



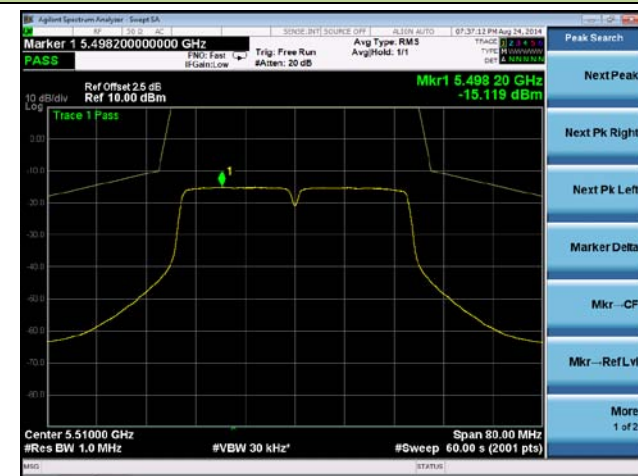
### The Mask Data



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

### Channel 102 (5510MHz)

#### The Reference Level

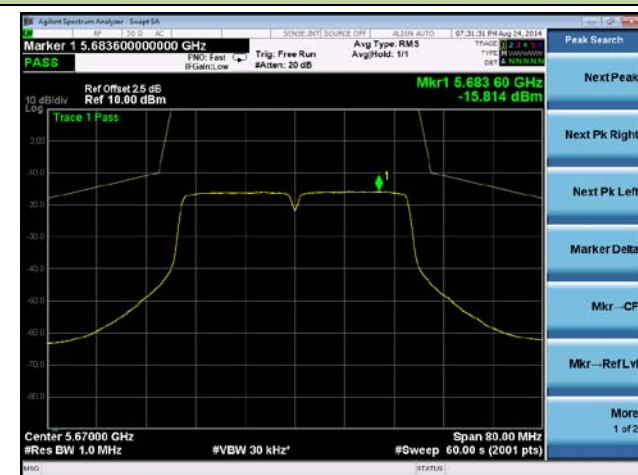


#### The Mask Data

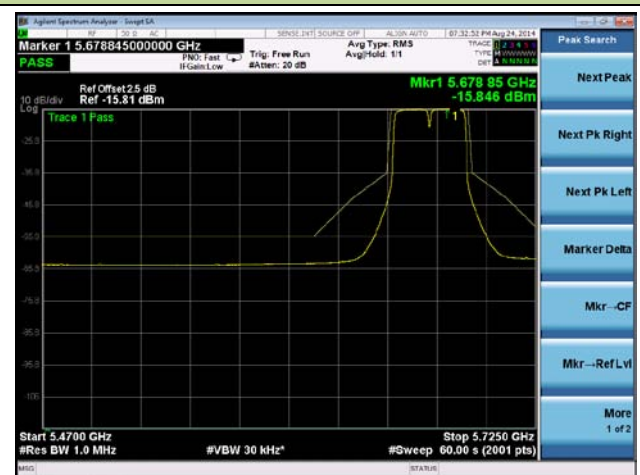


### Channel 134 (5670MHz)

#### The Reference Level



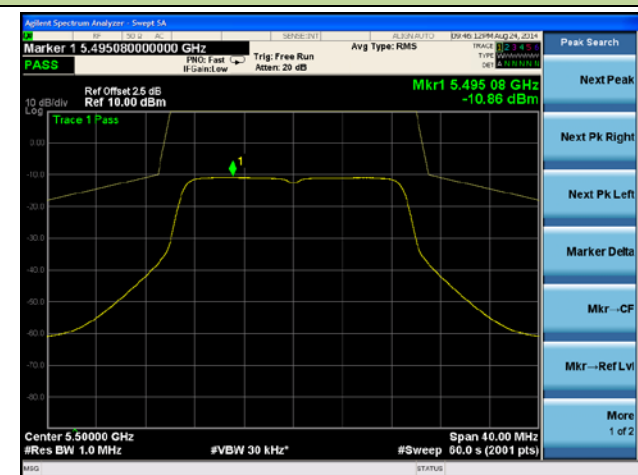
#### The Mask Data



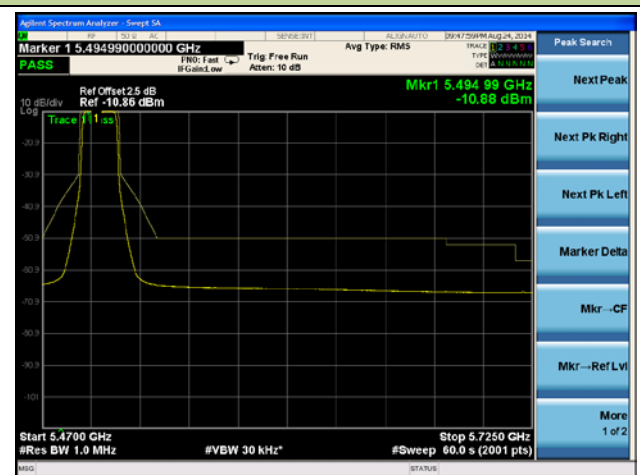
## 802.11ac-VHT20 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 0 + 1

### Channel 100 (5500MHz)

#### The Reference Level



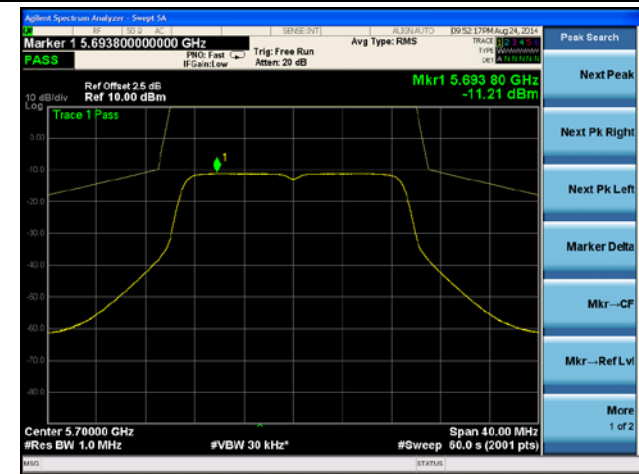
#### The Mask Data



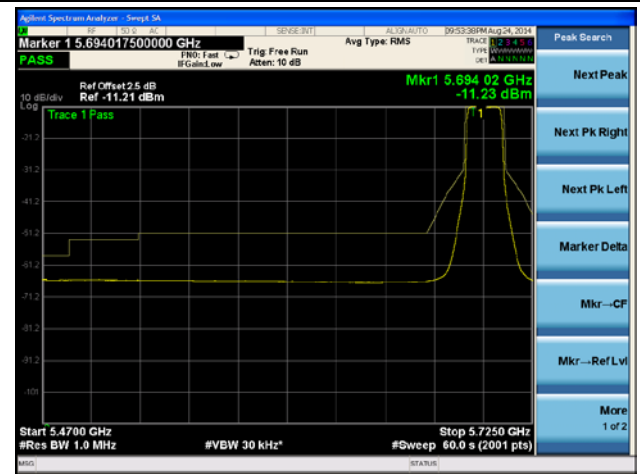


### Channel 140 (5700MHz)

#### The Reference Level



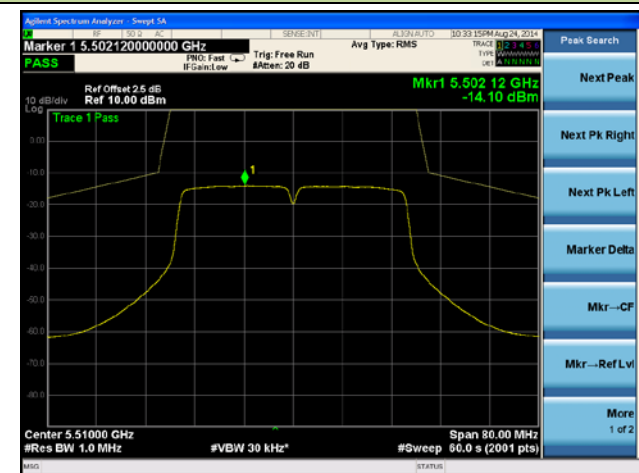
#### The Mask Data



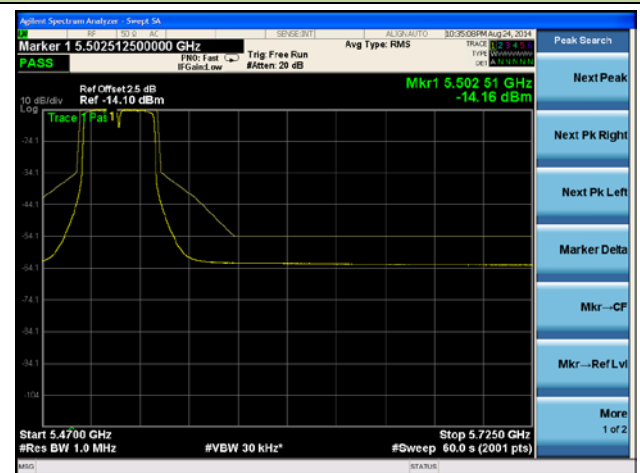
### 802.11ac-VHT40 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 0 + 1

### Channel 102 (5510MHz)

#### The Reference Level

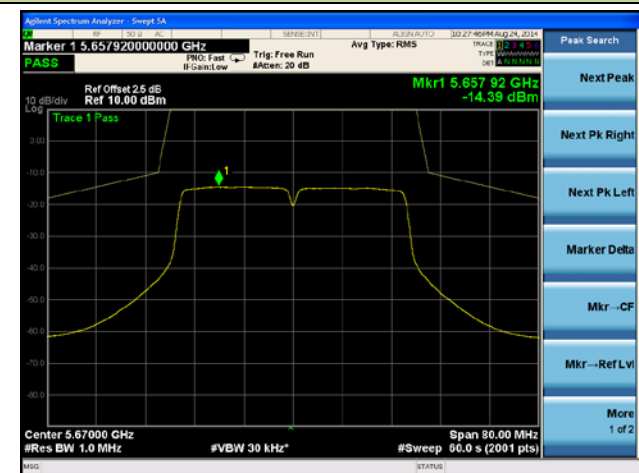


#### The Mask Data

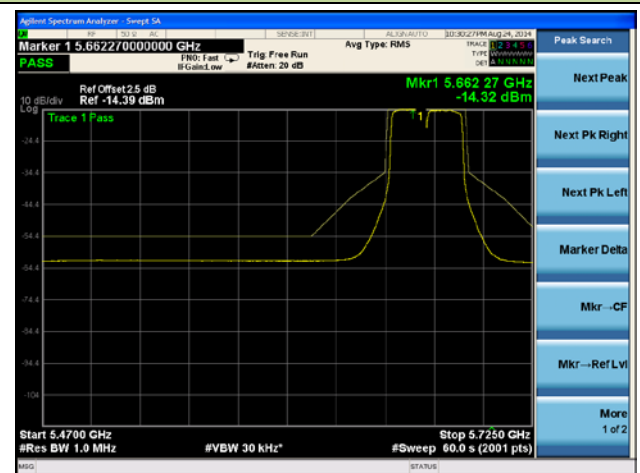


### Channel 134 (5670MHz)

#### The Reference Level



#### The Mask Data



## 802.11ac-VHT80 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 0 + 1

### Channel 106 (5530MHz)

#### The Reference Level

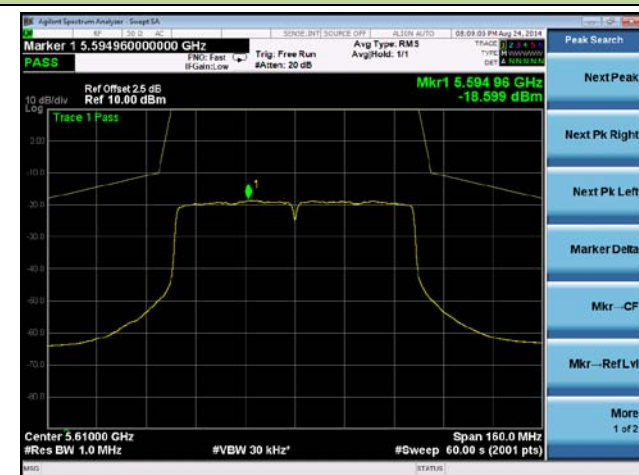


#### The Mask Data



### Channel 122 (5610MHz)

#### The Reference Level



#### The Mask Data



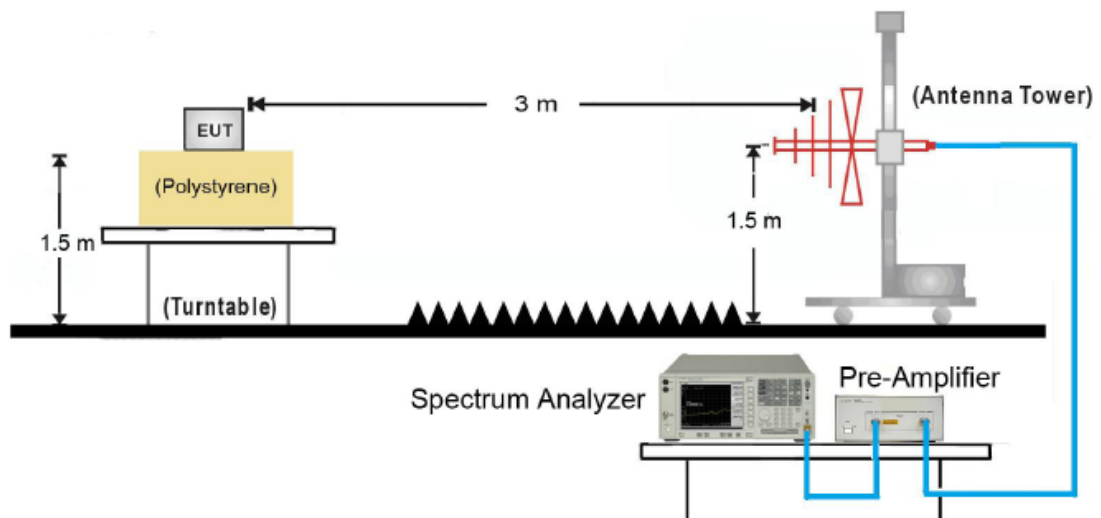
## 9. Receiver Spurious Emissions

### 9.1. Limit

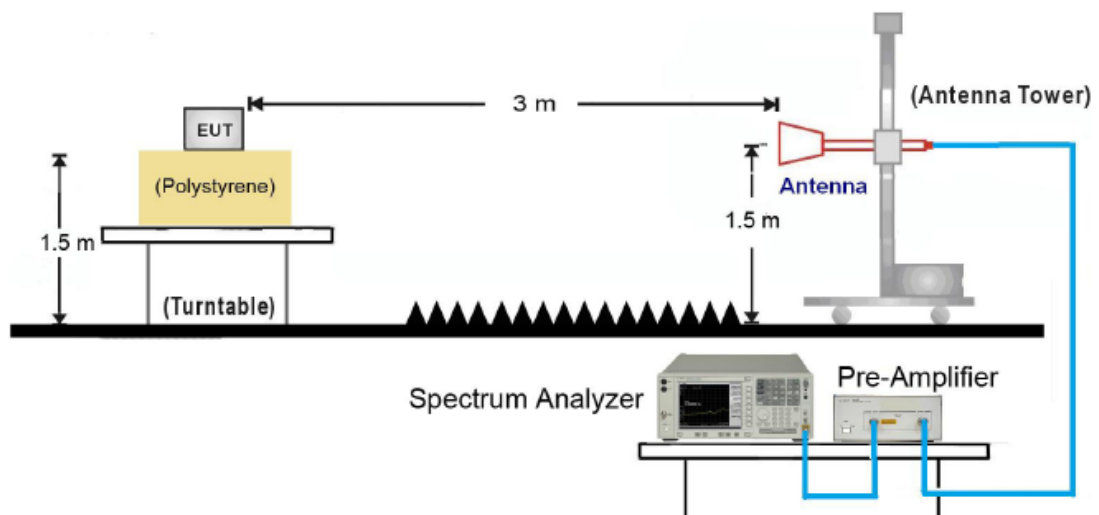
Frequency Range	Maximum Power	Bandwidth
30 MHz to 1GHz	-57dBm	100 kHz
1 GHz to 26 GHz	-47dBm	1 MHz

### 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 by Panel Antenna – 25dBi

Test Engineer	Milo Li	Temperature	26°C
Test Time	08-22-2014	Relative Humidity	54%
Test Mode	802.11a	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
Ant 0						
100	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
Ant 1						
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	08-22-2014	Relative Humidity	54%
Test Mode	802.11n-HT20	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
Ant 0						
100	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
Ant 1						
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
Ant 0 + 1						
100	525.2	-73.51	-57	-16.51	Peak	Horizontal
	386.5	-61.50	-57	-4.50	Peak	Vertical
	708.2	-68.53	-57	-11.53	Peak	Horizontal
	609.0	-62.86	-57	-5.86	Peak	Vertical
	1268.9	-51.50	-47	-4.50	Peak	Horizontal
	1551.3	-56.05	-47	-9.05	Peak	Vertical
	2210.6	-57.82	-47	-10.82	Peak	Horizontal
	2046.0	-52.67	-47	-5.67	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Time	08-22-2014	Relative Humidity	54%
Test Mode	802.11n-HT40	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
Ant 0						
102	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
Ant 1						
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
Ant 0 + 1						
102	232.2	-70.51	-57	-13.51	Peak	Horizontal
	169.8	-69.66	-57	-12.66	Peak	Vertical
	445.6	-69.38	-57	-12.38	Peak	Horizontal
	317.9	-66.92	-57	-9.92	Peak	Vertical
	1528.2	-57.04	-47	-10.04	Peak	Horizontal
	1308.3	-55.46	-47	-8.46	Peak	Vertical
	2176.9	-57.43	-47	-10.43	Peak	Horizontal
	2650.1	-52.47	-47	-5.47	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Time	08-22-2014	Relative Humidity	54%
Test Mode	802.11ac-VHT20	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
Ant 0						
100	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
Ant 1						
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
Ant 0 + 1						
100	450.0	-71.20	-57	-14.20	Peak	Horizontal
	292.1	-63.23	-57	-6.23	Peak	Vertical
	670.6	-72.28	-57	-15.28	Peak	Horizontal
	594.3	-63.42	-57	-6.42	Peak	Vertical
	1220.9	-54.92	-47	-7.92	Peak	Horizontal
	1607.8	-54.22	-47	-7.22	Peak	Vertical
	2176.2	-54.04	-47	-7.04	Peak	Horizontal
	2094.5	-51.62	-47	-4.62	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Time	08-22-2014	Relative Humidity	54%
Test Mode	802.11ac-VHT40	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
Ant 0						
102	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
Ant 1						
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
Ant 0 + 1						
102	220.6	-75.92	-57	-18.92	Peak	Horizontal
	207.5	-64.71	-57	-7.71	Peak	Vertical
	472.0	-72.42	-57	-15.42	Peak	Horizontal
	347.6	-64.43	-57	-7.43	Peak	Vertical
	1455.0	-59.12	-47	-12.12	Peak	Horizontal
	1254.9	-60.73	-47	-13.73	Peak	Vertical
	2218.9	-55.53	-47	-8.53	Peak	Horizontal
	2599.3	-53.03	-47	-6.03	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Time	08-22-2014	Relative Humidity	54%
Test Mode	802.11ac-VHT80	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
Ant 0						
106	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
Ant 1						
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
Ant 0 + 1						
106	416.7	-66.44	-57	-9.44	Peak	Horizontal
	411.8	-66.22	-57	-9.22	Peak	Vertical
	724.4	-72.09	-57	-15.09	Peak	Horizontal
	626.1	-62.14	-57	-5.14	Peak	Vertical
	2168.5	-59.63	-47	-12.63	Peak	Horizontal
	1587.0	-58.14	-47	-11.14	Peak	Vertical
	3055.1	-57.59	-47	-10.59	Peak	Horizontal
	2167.3	-59.66	-47	-12.66	Peak	Vertical

**Test by Dipole Antenna – 2dBi**

Test Engineer	Milo Li	Temperature	26°C
Test Time	08-22-2014	Relative Humidity	54%
Test Mode	802.11a	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
Ant 0						
100	428.6	-72.90	-57	-15.90	Peak	Horizontal
	384.9	-63.74	-57	-6.74	Peak	Vertical
	773.3	-71.13	-57	-14.13	Peak	Horizontal
	625.2	-67.46	-57	-10.46	Peak	Vertical
	2134.6	-54.56	-47	-7.56	Peak	Horizontal
	2413.4	-54.19	-47	-7.19	Peak	Vertical
	3933.1	-51.70	-47	-4.70	Peak	Horizontal
	2785.4	-51.88	-47	-4.88	Peak	Vertical
Ant 1						
100	545.4	-73.42	-57	-16.42	Peak	Horizontal
	363.6	-66.47	-57	-9.47	Peak	Vertical
	758.9	-71.94	-57	-14.94	Peak	Horizontal
	602.4	-62.98	-57	-5.98	Peak	Vertical
	2181.8	-59.35	-47	-12.35	Peak	Horizontal
	1546.1	-53.78	-47	-6.78	Peak	Vertical
	3057.0	-52.05	-47	-5.05	Peak	Horizontal
	2165.1	-53.35	-47	-6.35	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Time	08-22-2014	Relative Humidity	54%
Test Mode	802.11n-HT20	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
Ant 0						
100	428.0	-68.93	-57	-11.93	Peak	Horizontal
	328.3	-68.13	-57	-11.13	Peak	Vertical
	680.5	-70.89	-57	-13.89	Peak	Horizontal
	582.4	-69.17	-57	-12.17	Peak	Vertical
	1238.5	-59.01	-47	-12.01	Peak	Horizontal
	1626.6	-51.99	-47	-4.99	Peak	Vertical
	2177.6	-55.12	-47	-8.12	Peak	Horizontal
	2115.9	-52.41	-47	-5.41	Peak	Vertical
Ant 1						
100	434.0	-72.86	-57	-15.86	Peak	Horizontal
	300.9	-62.80	-57	-5.80	Peak	Vertical
	651.6	-67.19	-57	-10.19	Peak	Horizontal
	603.0	-64.75	-57	-7.75	Peak	Vertical
	1240.6	-55.51	-47	-8.51	Peak	Horizontal
	1520.5	-55.40	-47	-8.40	Peak	Vertical
	2111.0	-52.66	-47	-5.66	Peak	Horizontal
	2082.4	-56.71	-47	-9.71	Peak	Vertical
Ant 0 + 1						
100	460.8	-67.86	-57	-10.86	Peak	Horizontal
	411.2	-66.78	-57	-9.78	Peak	Vertical
	797.3	-67.00	-57	-10.00	Peak	Horizontal
	601.1	-64.48	-57	-7.48	Peak	Vertical
	1141.4	-57.57	-47	-10.57	Peak	Horizontal
	1572.0	-57.75	-47	-10.75	Peak	Vertical
	2144.9	-52.07	-47	-5.07	Peak	Horizontal
	2116.8	-57.32	-47	-10.32	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Time	08-22-2014	Relative Humidity	54%
Test Mode	802.11n-HT40	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
Ant 0						
102	532.3	-73.14	-57	-16.14	Peak	Horizontal
	409.8	-63.84	-57	-6.84	Peak	Vertical
	768.6	-74.93	-57	-17.93	Peak	Horizontal
	562.5	-66.64	-57	-9.64	Peak	Vertical
	1516.3	-59.76	-47	-12.76	Peak	Horizontal
	1334.2	-54.97	-47	-7.97	Peak	Vertical
	2205.8	-52.02	-47	-5.02	Peak	Horizontal
	2617.5	-52.16	-47	-5.16	Peak	Vertical
Ant 1						
102	128.8	-70.71	-57	-13.71	Peak	Horizontal
	117.2	-70.85	-57	-13.85	Peak	Vertical
	470.4	-71.80	-57	-14.80	Peak	Horizontal
	316.4	-63.11	-57	-6.11	Peak	Vertical
	1483.4	-57.20	-47	-10.20	Peak	Horizontal
	1286.1	-61.03	-47	-14.03	Peak	Vertical
	2134.7	-57.36	-47	-10.36	Peak	Horizontal
	2613.9	-53.98	-47	-6.98	Peak	Vertical
Ant 0 + 1						
102	168.2	-72.24	-57	-15.24	Peak	Horizontal
	153.8	-66.90	-57	-9.90	Peak	Vertical
	500.0	-73.55	-57	-16.55	Peak	Horizontal
	301.9	-63.20	-57	-6.20	Peak	Vertical
	1445.3	-52.76	-47	-5.76	Peak	Horizontal
	1317.3	-56.68	-47	-9.68	Peak	Vertical
	2125.4	-54.93	-47	-7.93	Peak	Horizontal
	2654.3	-54.08	-47	-7.08	Peak	Vertical



Test Engineer	Milo Li	Temperature	26°C
Test Time	08-22-2014	Relative Humidity	54%
Test Mode	802.11ac-VHT20	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
Ant 0						
100	423.9	-67.46	-57	-10.46	Peak	Horizontal
	402.8	-62.07	-57	-5.07	Peak	Vertical
	700.1	-65.47	-57	-8.47	Peak	Horizontal
	620.5	-64.97	-57	-7.97	Peak	Vertical
	1265.2	-52.46	-47	-5.46	Peak	Horizontal
	1516.8	-55.27	-47	-8.27	Peak	Vertical
	2150.4	-55.76	-47	-8.76	Peak	Horizontal
	2137.1	-55.02	-47	-8.02	Peak	Vertical
Ant 1						
100	433.7	-66.45	-57	-9.45	Peak	Horizontal
	318.0	-66.95	-57	-9.95	Peak	Vertical
	770.2	-69.21	-57	-12.21	Peak	Horizontal
	625.2	-62.73	-57	-5.73	Peak	Vertical
	1222.4	-52.03	-47	-5.03	Peak	Horizontal
	1601.0	-52.93	-47	-5.93	Peak	Vertical
	2160.5	-56.63	-47	-9.63	Peak	Horizontal
	2058.3	-53.22	-47	-6.22	Peak	Vertical
Ant 0 + 1						
100	530.2	-72.36	-57	-15.36	Peak	Horizontal
	383.1	-66.64	-57	-9.64	Peak	Vertical
	720.7	-70.63	-57	-13.63	Peak	Horizontal
	642.2	-65.02	-57	-8.02	Peak	Vertical
	1228.7	-52.66	-47	-5.66	Peak	Horizontal
	1504.1	-56.95	-47	-9.95	Peak	Vertical
	2228.7	-52.55	-47	-5.55	Peak	Horizontal
	2062.0	-52.14	-47	-5.14	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Time	08-22-2014	Relative Humidity	54%
Test Mode	802.11ac-VHT40	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
Ant 0						
102	484.8	-65.14	-57	-8.14	Peak	Horizontal
	421.0	-66.84	-57	-9.84	Peak	Vertical
	719.4	-69.42	-57	-12.42	Peak	Horizontal
	600.2	-67.13	-57	-10.13	Peak	Vertical
	1432.2	-55.03	-47	-8.03	Peak	Horizontal
	1301.3	-59.93	-47	-12.93	Peak	Vertical
	2207.4	-52.44	-47	-5.44	Peak	Horizontal
	2572.5	-52.11	-47	-5.11	Peak	Vertical
Ant 1						
102	124.2	-75.06	-57	-18.06	Peak	Horizontal
	187.9	-66.53	-57	-9.53	Peak	Vertical
	459.8	-72.14	-57	-15.14	Peak	Horizontal
	382.8	-64.83	-57	-7.83	Peak	Vertical
	1490.0	-56.30	-47	-9.30	Peak	Horizontal
	1274.8	-57.22	-47	-10.22	Peak	Vertical
	2236.9	-57.60	-47	-10.60	Peak	Horizontal
	2617.3	-52.65	-47	-5.65	Peak	Vertical
Ant 0 + 1						
102	196.0	-72.16	-57	-15.16	Peak	Horizontal
	163.8	-66.03	-57	-9.03	Peak	Vertical
	535.3	-67.80	-57	-10.80	Peak	Horizontal
	302.5	-64.88	-57	-7.88	Peak	Vertical
	1501.0	-57.12	-47	-10.12	Peak	Horizontal
	1302.9	-57.68	-47	-10.68	Peak	Vertical
	2187.4	-56.98	-47	-9.98	Peak	Horizontal
	2558.2	-55.73	-47	-8.73	Peak	Vertical

Test Engineer	Milo Li	Temperature	26°C
Test Time	08-22-2014	Relative Humidity	54%
Test Mode	802.11ac-VHT80	Test Site	AC1

Channel	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Polarization
Ant 0						
106	487.4	-67.06	-57	-10.06	Peak	Horizontal
	343.7	-62.43	-57	-5.43	Peak	Vertical
	767.0	-70.11	-57	-13.11	Peak	Horizontal
	651.1	-68.77	-57	-11.77	Peak	Vertical
	2185.0	-52.87	-47	-5.87	Peak	Horizontal
	2385.3	-53.48	-47	-6.48	Peak	Vertical
	3952.9	-52.01	-47	-5.01	Peak	Horizontal
	2727.9	-55.91	-47	-8.91	Peak	Vertical
Ant 1						
106	514.9	-65.68	-57	-8.68	Peak	Horizontal
	349.7	-60.30	-57	-3.30	Peak	Vertical
	779.9	-73.38	-57	-16.38	Peak	Horizontal
	613.3	-68.10	-57	-11.10	Peak	Vertical
	2212.5	-54.09	-47	-7.09	Peak	Horizontal
	1559.2	-58.44	-47	-11.44	Peak	Vertical
	3032.3	-55.47	-47	-8.47	Peak	Horizontal
	2131.3	-56.51	-47	-9.51	Peak	Vertical
Ant 0 + 1						
106	420.5	-70.05	-57	-13.05	Peak	Horizontal
	288.3	-67.46	-57	-10.46	Peak	Vertical
	671.5	-67.59	-57	-10.59	Peak	Horizontal
	586.2	-62.13	-57	-5.13	Peak	Vertical
	2159.9	-52.04	-47	-5.04	Peak	Horizontal
	1563.4	-55.46	-47	-8.46	Peak	Vertical
	3028.3	-52.90	-47	-5.90	Peak	Horizontal
	2133.3	-52.95	-47	-5.95	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,  $q = [4 \sim 32]$ .

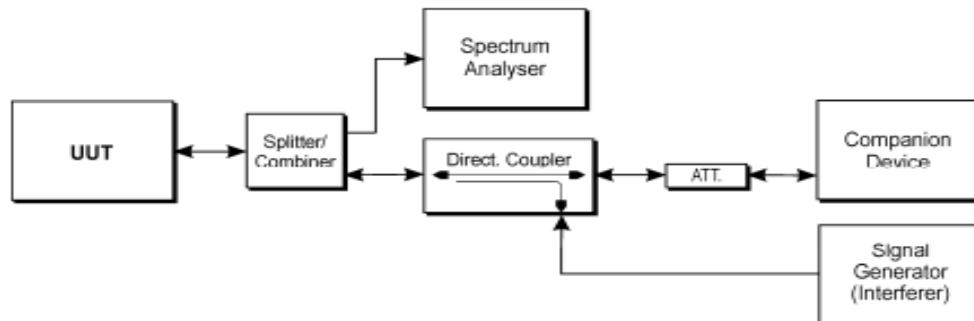
The minimum idle period varied between CCA and  $q * CCA$ .

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



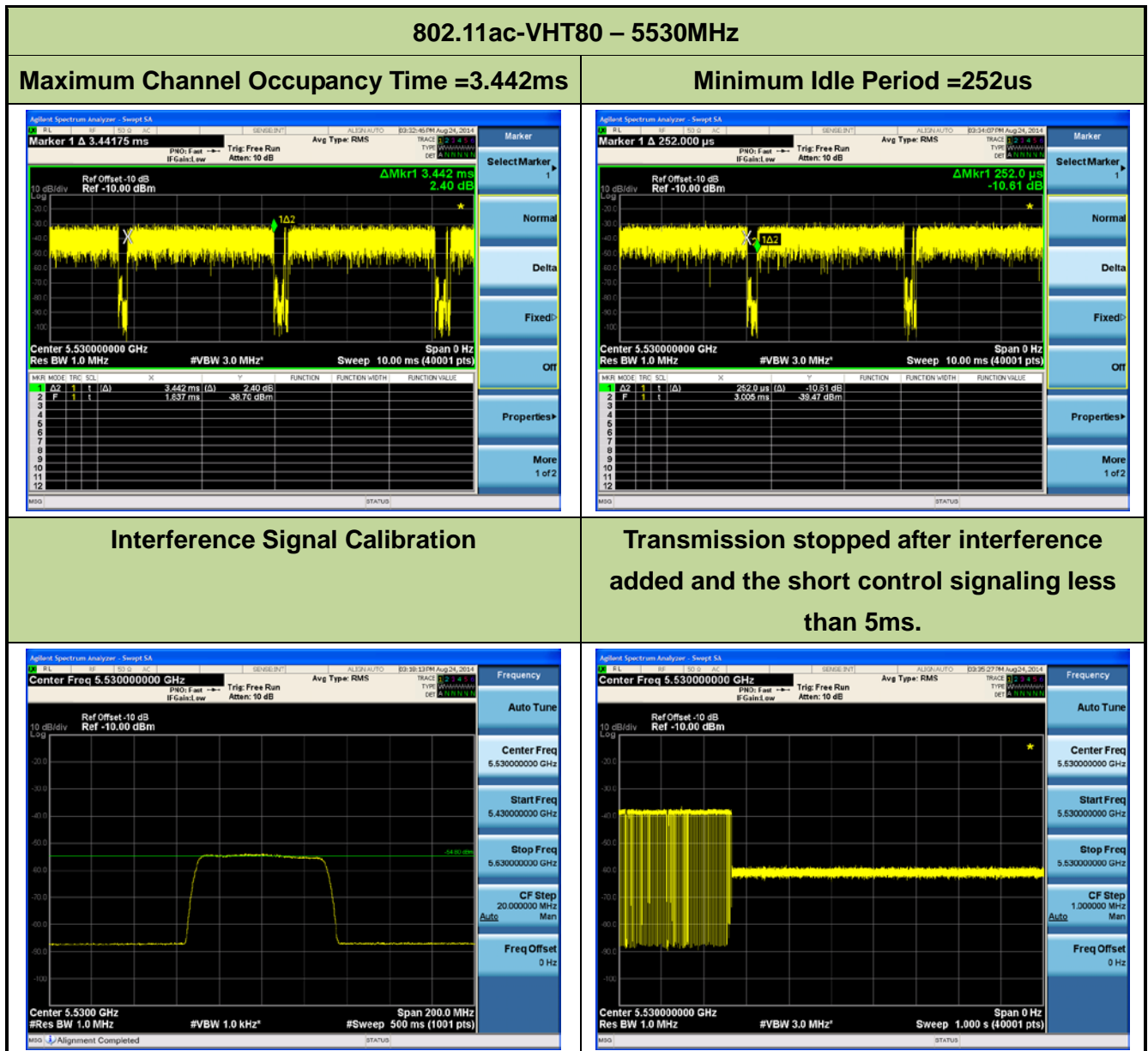
### 10.3. Test Procedure

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

## 10.4. Test Result

Test Engineer	Andy Zhu	Temperature	26°C
Test Time	08-24-2014	Relative Humidity	54%

The CCA observation time was 20 us, and the maximum factor of  $q = 25$  which were declared by the supplier. So the idle period varied between 20 us and 500 us and the channel occupancy time shall less than  $(13 / 32) * 25 = 10.16$  ms.



Note: The Worst Detection Level =  $-73 \text{ dBm/MHz} + 23$  – the max conducted power (dBm) =  $-73 \text{ dBm/MHz} + 23 - 4.80 \text{ dBm} = -54.80 \text{ dBm/MHz}$ .

Test Result:	Pass
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## **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 Below 1GHz  
(Panel Antenna 25dBi)



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





Description: Radiated Spurious Emissions Test Setup for 18 - 40GHz  
(Panel Antenna 25dBi)



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



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



Description: Radiated Spurious Emissions Test Setup for 18 - 40GHz  
(Dipole Antenna 2dBi)



## 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	2015/10/06
Preamplifier	MRT	AP01G18	1 year	2015/10/06
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
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



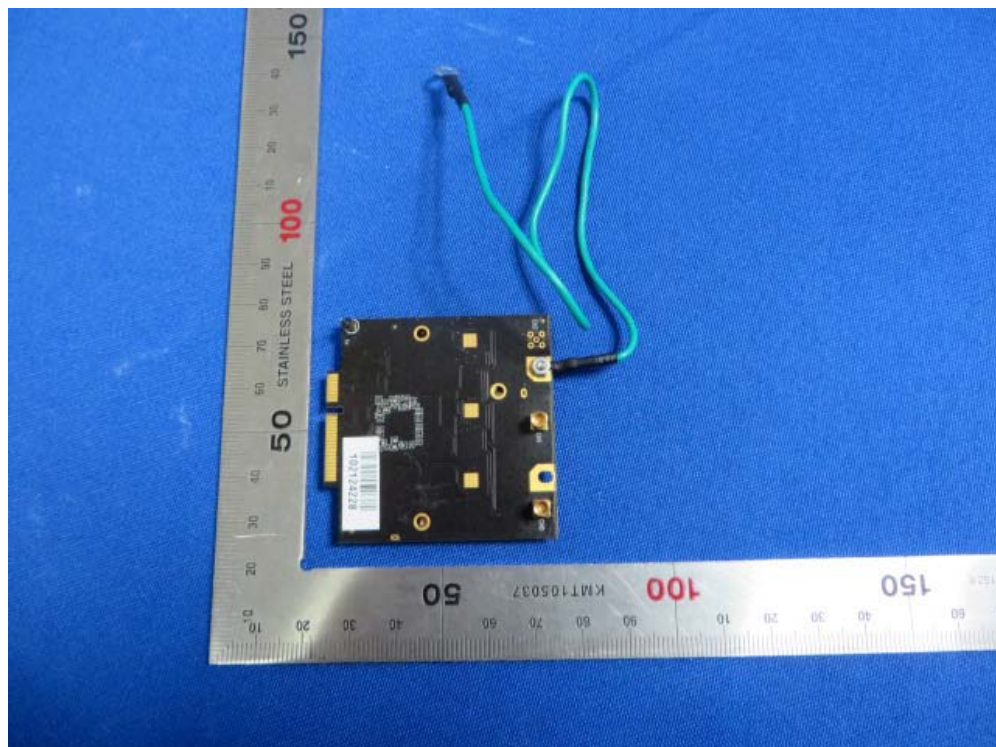
## Appendix

### EUT Photograph

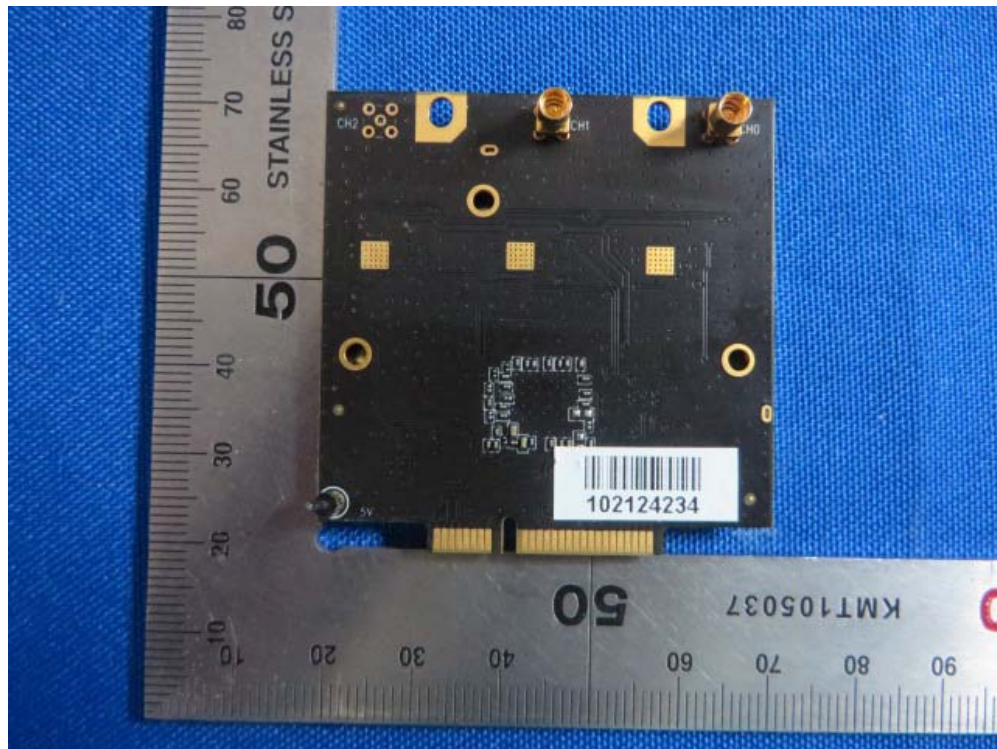
(1) EUT Photo



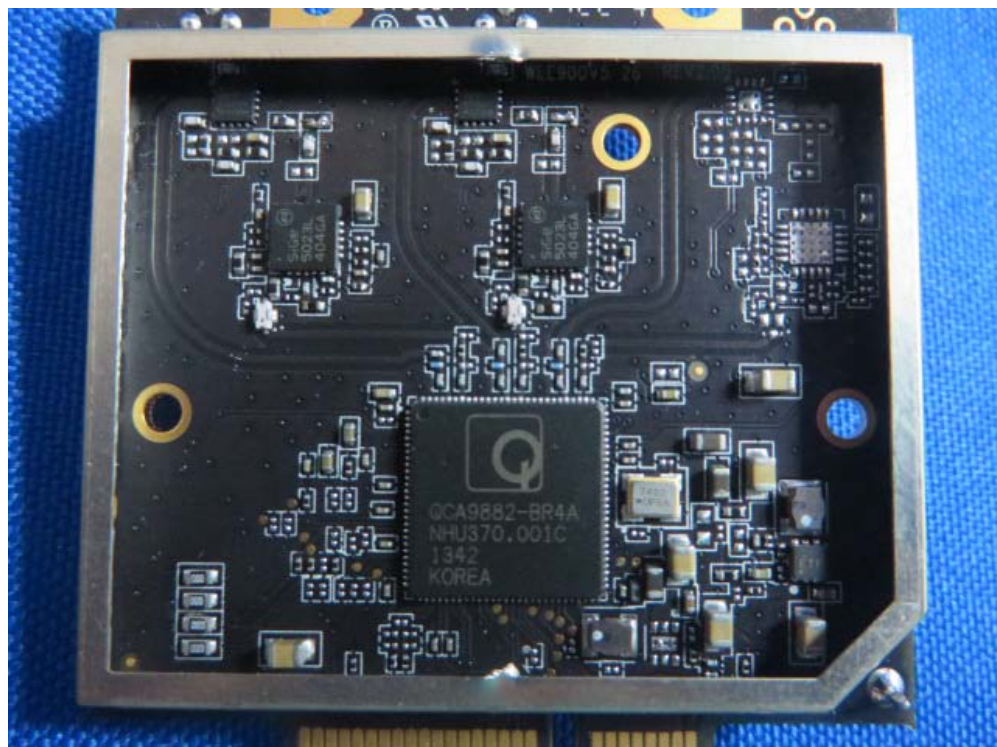
(2) EUT Photo



(3) EUT Photo



(4) EUT Photo





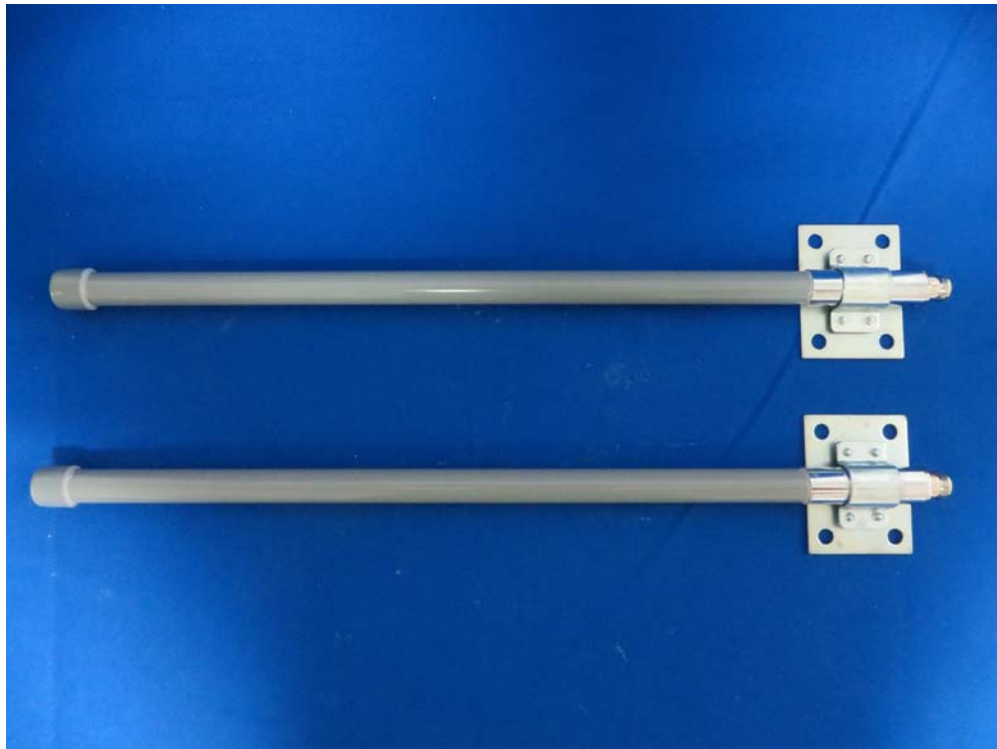
(5) EUT Photo (Dipole Antenna 2dBi)



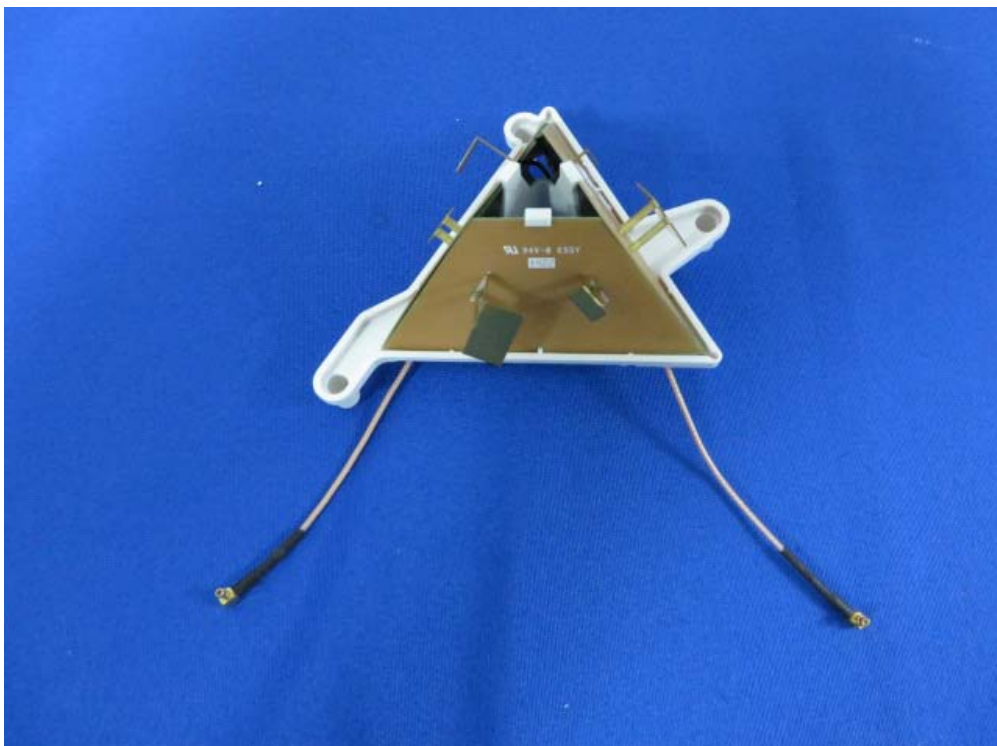
(6) EUT Photo (Panel Antenna 7dBi)



(7) EUT Photo (Panel Antenna 10dBi)

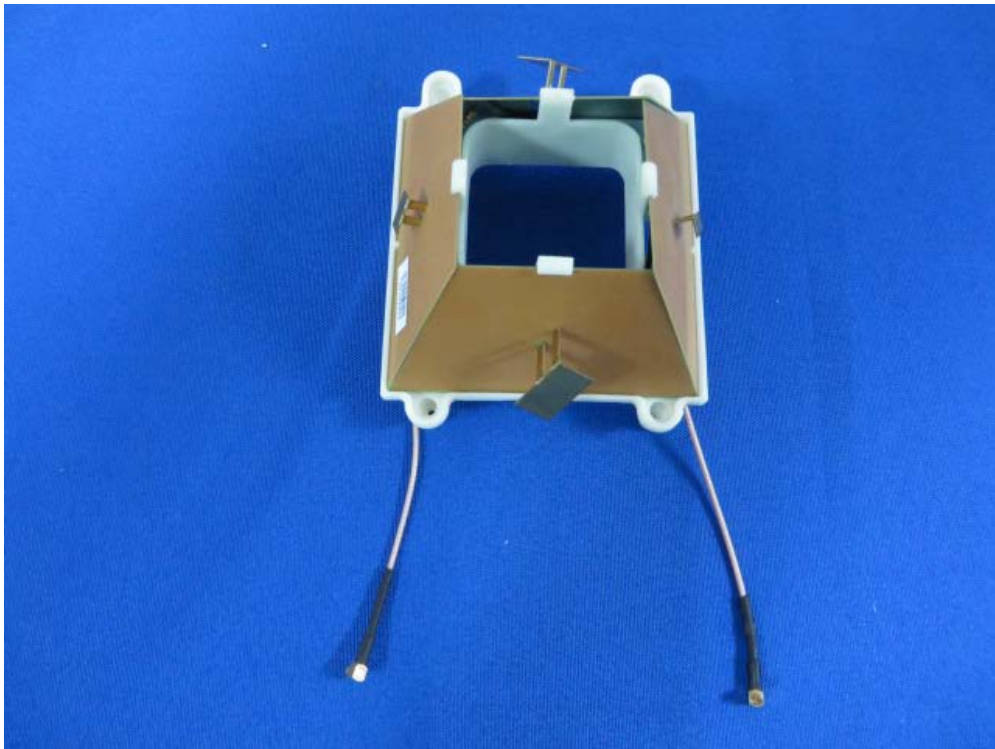


(8) EUT Photo (Panel Antenna 5dBi)

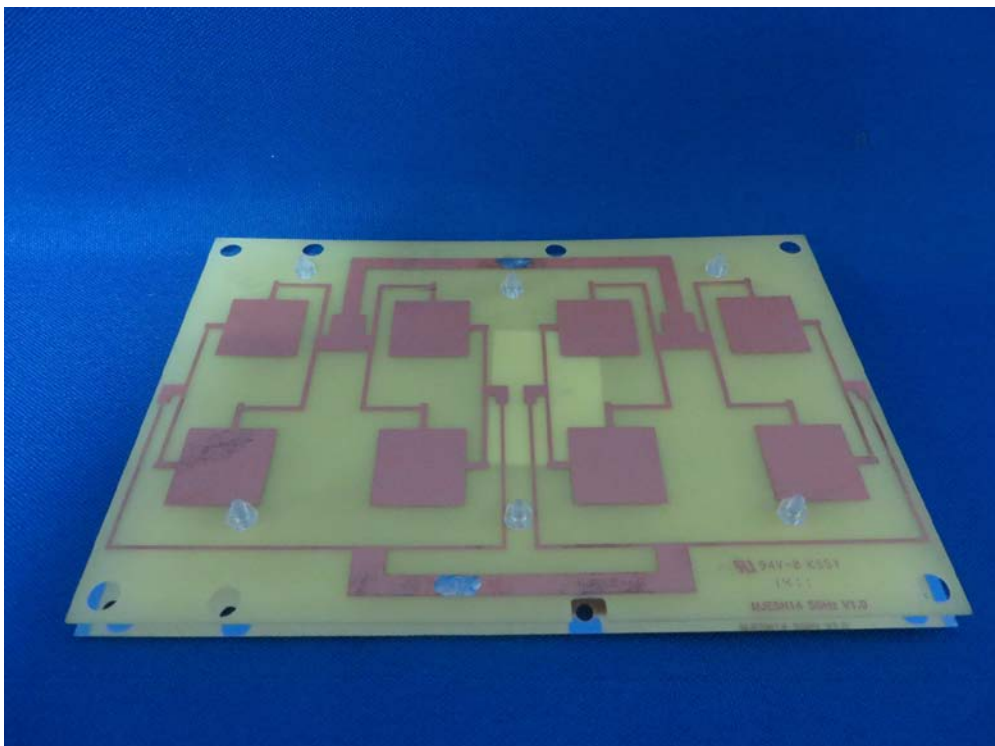




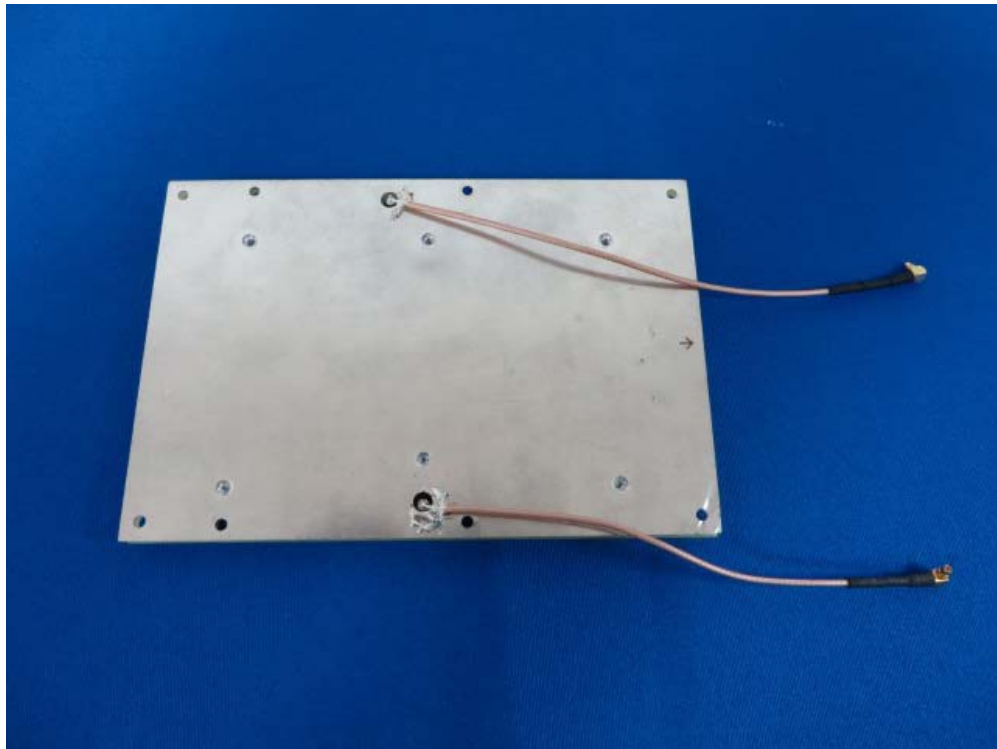
(9) EUT Photo (Panel Antenna 5dBi)



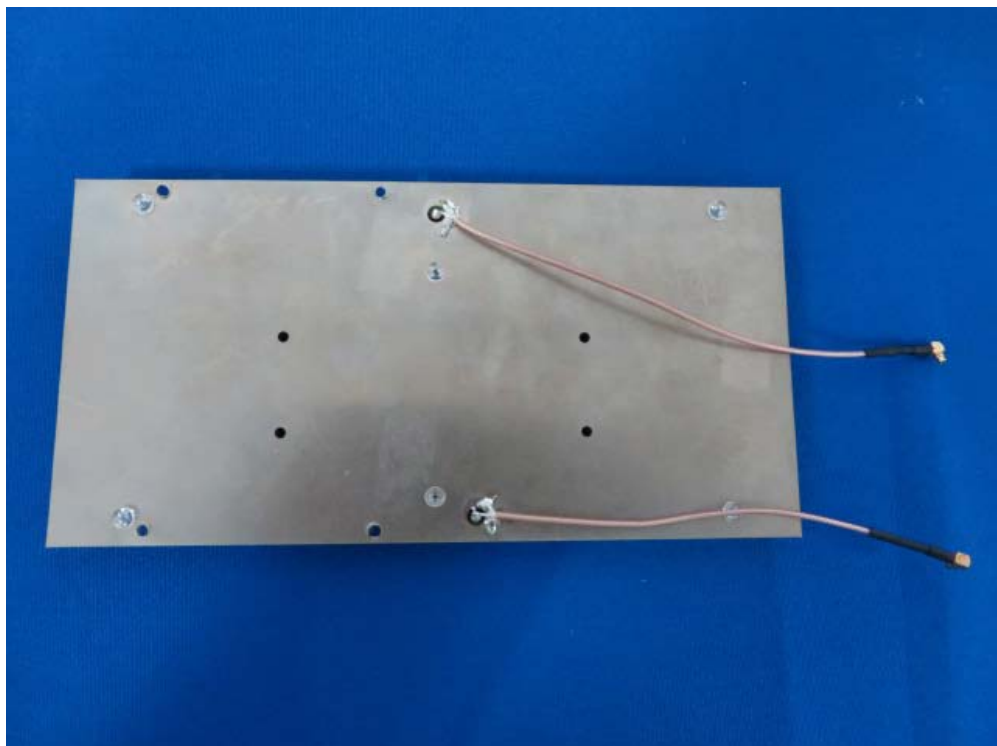
(10) EUT Photo (Panel Antenna 15dBi)



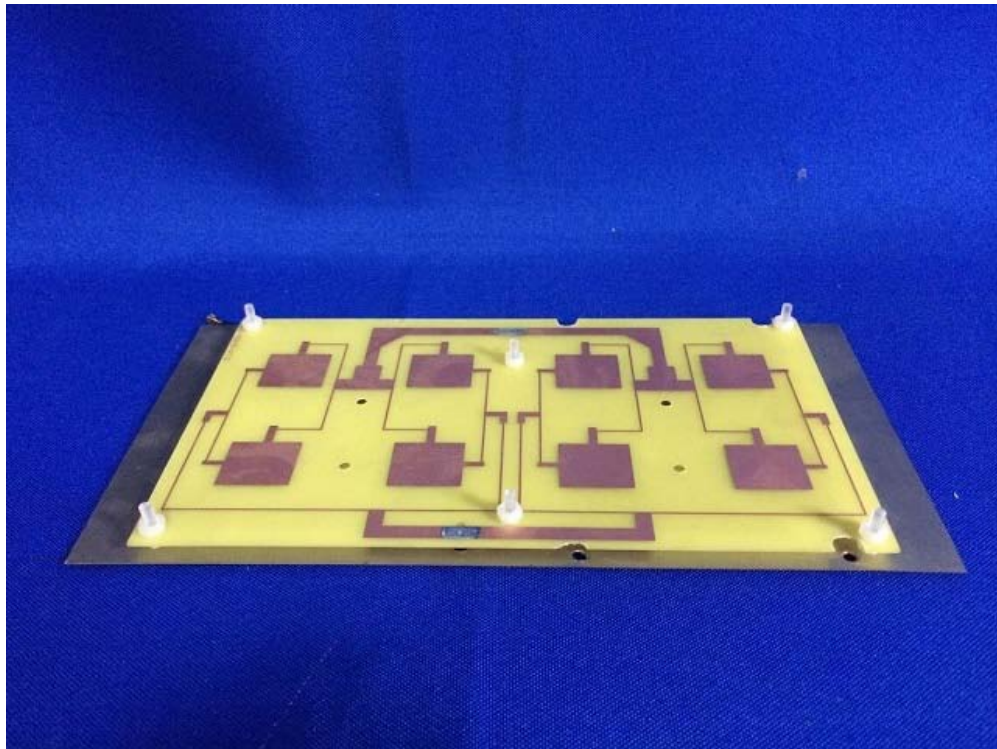
(11) EUT Photo (Panel Antenna 15dBi)



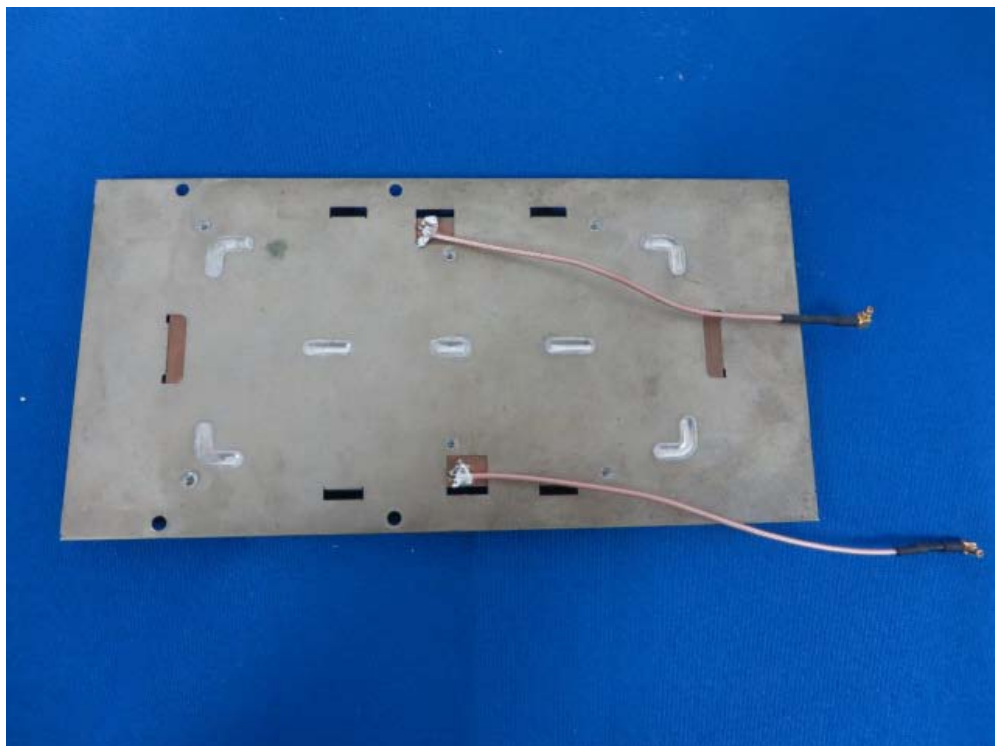
(12) EUT Photo (Panel Antenna 16dBi)



(13) EUT Photo (Panel Antenna 16dBi)



(14) EUT Photo (Panel Antenna 17dBi)





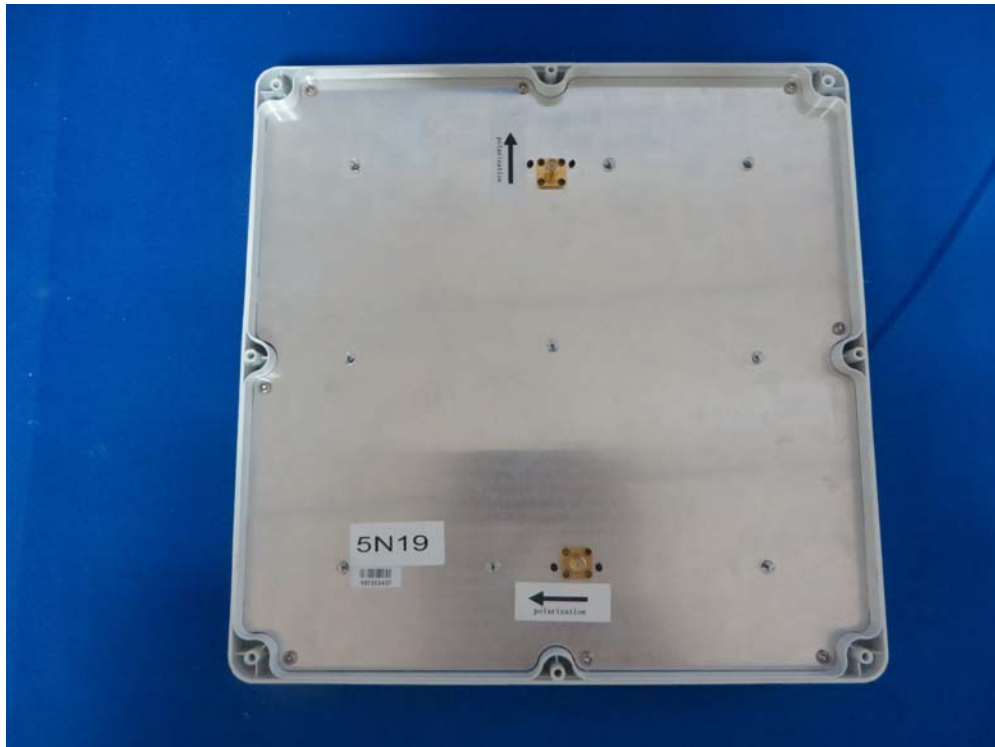
(15) EUT Photo (Panel Antenna 17dBi)



(16) EUT Photo (Panel Antenna 19dBi)



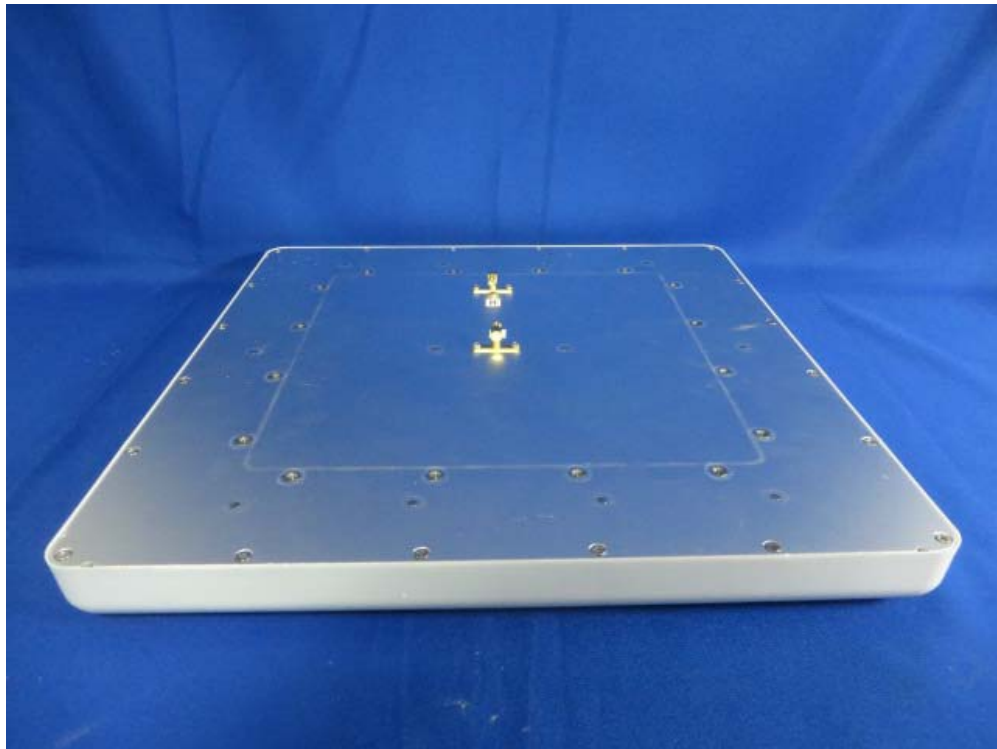
(17) EUT Photo (Panel Antenna 19dBi)



(18) EUT Photo (Panel Antenna 23dBi)



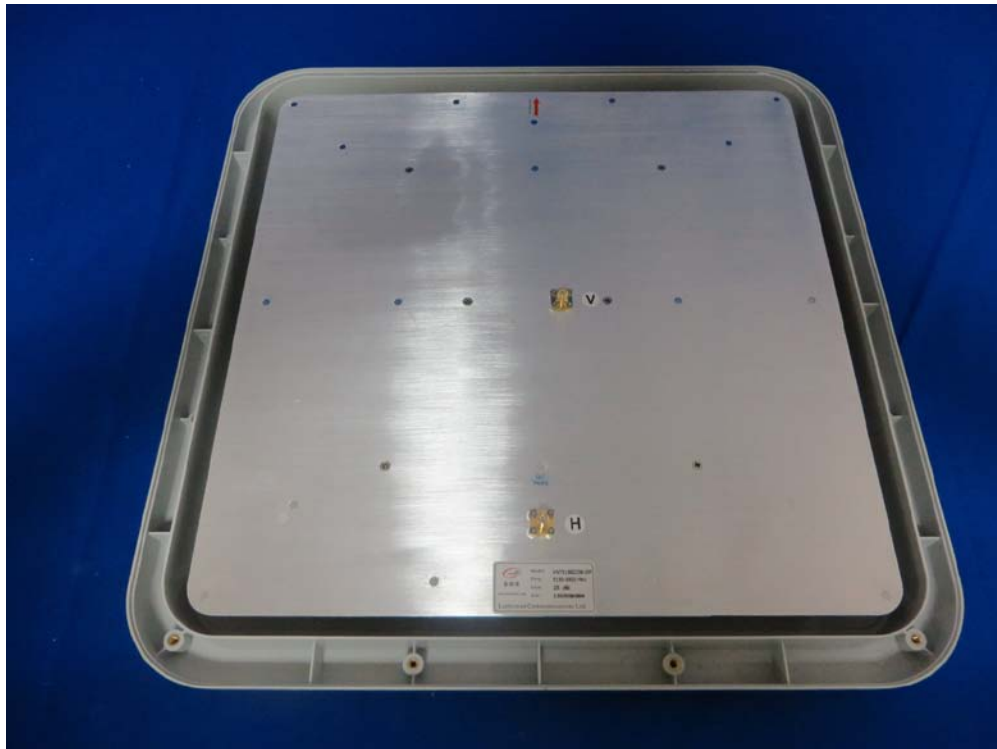
(19) EUT Photo (Panel Antenna 23dBi)



(20) EUT Photo (Panel Antenna 25dBi)



(21) EUT Photo (Panel Antenna 25dBi)



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The End

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