

# MIC TEST REPORT

## (WIFI 5G)

**Product:** Portable Tablet Computer

**Brand Name:** Lenovo

**Model Name:** Lenovo TB-X605F

**Applicant:** Lenovo(Shanghai) Electronics Technology Co., Ltd.

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**Report No.:** RJ180530W011-3

**Received Date:** Jun. 15, 2018

**Test Date:** Jun. 19, 2018 ~ Jul. 16, 2018

**Issued Date:** Jul. 20, 2018

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## TABLE OF CONTENTS

<b>RELEASE CONTROL RECORD .....</b>	<b>4</b>
<b>1 CERTIFICATION .....</b>	<b>5</b>
<b>2 SUMMARY OF TEST RESULTS.....</b>	<b>6</b>
2.1 SUMMARY OF 802.11a/n/ac TEST RESULTS.....	6
2.2 MEASUREMENT UNCERTAINTY .....	7
<b>3 GENERAL INFORMATION .....</b>	<b>8</b>
3.1 GENERAL DESCRIPTION OF EUT .....	8
3.2 DESCRIPTION OF TEST CHANNELS.....	12
3.3 TEST CONDITIONS .....	13
3.4 ASSEMBLY .....	14
3.5 ANTENNA SPECIFICATIONS .....	14
3.5.1 ANTENNA GAIN.....	14
3.5.2 ANTENNA PATTERN .....	14
<b>4 TEST RESULTS OF 802.11a/ 802.11n(20MHz)/ 802.11n(40MHz)/ 802.11ac(80MHz) .....</b>	<b>15</b>
4.1 FREQUENCY TOLERANCE MEASUREMENT .....	15
4.1.1 LIMITS OF FREQUENCY TOLERANCE MEASUREMENT .....	15
4.1.2 TEST RESULTS.....	15
4.2 OCCUPIED BANDWIDTH MEASUREMENT (99% POWER BANDWIDTH).....	17
4.2.1 LIMITS OF OCCUPIED BANDWIDTH MEASUREMENT.....	17
4.2.2 TEST RESULTS.....	18
4.3 SPREADING BANDWIDTH MEASUREMENT (90% POWER BANDWIDTH).....	29
4.3.1 LIMITS OF SPREADING BANDWIDTH.....	29
4.3.2 TEST RESULTS.....	29
4.4 SPURIOUS EMISSIONS FOR TRANSMITTER MEASUREMENT.....	40
4.4.1 LIMITS OF SPURIOUS EMISSIONS.....	40
4.4.2 TEST RESULTS.....	42
4.5 OUT-BAND LEAKAGE POWER .....	79
4.5.1 LIMITS OF LEAKAGE POWER (EIRP) .....	79
4.5.2 TEST RESULTS.....	82
4.6 ADJACENT CHANNEL POWER TOLERANCE .....	103
4.6.1 LIMITS OF POWER TOLERANCE .....	103
4.6.2 TEST SETUP .....	103
4.6.3 TEST RESULTS.....	104
4.7 ANTENNA POWER MEASUREMENT .....	108
4.7.1 LIMITS OF ANTENNA POWER .....	108
4.7.2 TEST SETUP .....	108
4.7.3 TEST RESULTS.....	109
4.8 SPURIOUS EMISSIONS FOR RECEIVER .....	121
4.8.1 LIMITS OF SPURIOUS EMISSIONS FOR RECEIVER.....	121
4.8.2 TEST SETUP .....	121
4.8.3 TEST RESULTS.....	122
4.9 BURST LENGTH .....	126
4.9.1 LIMITS OF BURST LENGTH.....	126
4.9.2 TEST SETUP .....	126
4.9.3 TEST RESULTS.....	127
4.10 CARRIER SENSE CAPABILITY .....	138



**Test Report No.: RJ180530W011-3**

4.10.1	MEASURING SYSTEM BLOCK DIAGRAM .....	138
4.10.2	MEASURING OPERATION PROCEDURES .....	138
4.10.3	LEVEL OF THE AMBIENT CARRIER .....	139
4.11	INTERFERENCE PREVENTION FUNCTION .....	143
4.11.1	LIMITS OF INTERFERENCE PREVENTION FUNCTION .....	143
4.11.2	TEST SETUP .....	143
4.11.3	TEST RESULTS .....	143
<b>5</b>	<b>TEST INSTRUMENTS.....</b>	<b>144</b>
<b>6</b>	<b>PHOTOGRAPHS OF THE TEST CONFIGURATION.....</b>	<b>145</b>
<b>7</b>	<b>APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB.....</b>	<b>146</b>



Test Report No.: RJ180530W011-3

## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RJ180530W011-3	Original release	Jul. 20, 2018

## 1 CERTIFICATION

**PRODUCT:** Portable Tablet Computer  
**BRAND NAME:** Lenovo  
**MODEL NAME:** Lenovo TB-X605F  
**APPLICANT:** Lenovo(Shanghai) Electronics Technology Co., Ltd.  
**TESTED:** Jun. 19, 2018 ~ Jul. 16, 2018  
**TEST SAMPLE:** Production Unit  
**STANDARDS :** ARIB STD-T71, MIC notice 88 Appendix 45

The above equipment has been tested by **BV 7Layers Communications Technology (Shenzhen) Co. Ltd**, and found compliance with the requirement of the above standards. The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions herein specified.

**PREPARED BY :** Roger, **DATE:** Jul. 20, 2018  
(Roger Li/ Engineer)

**APPROVED BY :** [Signature], **DATE:** Jul. 20, 2018  
( Sam Tung / Manager)

## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

### 2.1 SUMMARY OF 802.11a/n/ac TEST RESULTS

Notice 88 Appendix 45	ARIB STD-T71 REF.	REPORT REFERENCE	PARAMETER	TEST RESULT (NOTE)
<b>GENERAL PROVISIONS</b>				
C	3.1.2 (4)	4.1	Frequency tolerance	C
D	3.1.2 (11)	4.2	Occupied bandwidth	C
E	3.1.2 (8)	4.4	Spurious emissions	C
<b>TRANSMITTING EQUIPMENT</b>				
F	3.1.2 (2)	4.7	Tolerance of antenna power	C
--	--	--	SAR	NA
<b>TRANSMITTING ANTENNA</b>				
--	--	3.5	Type, configuration, etc. of transmitting antenna	C
--	--	3.5	Direction pattern of transmitting antenna	C
<b>RECEIVING EQUIPMENT</b>				
H	3.1.3 (1)	4.8	Spurious emissions of receiver	C
--	--	3.5	Refer to all articles for transmitting antenna	C
<b>OPERATING FREQUENCY</b>				
--	3.1.8 (1)	3.2	High frequency	C
--	3.1.8 (1)	3.4	Modulation section can not be opened easily	C
--	3.1.1(1)	3.1	Communication method	C
--	3.1.2 (1)	3.1	Modulation method	C
--	3.1.2 (6)	3.1	Signal transmission rate	C
--	3.1.2 (7)	0	Burst length	C
--	3.1.2 (2)	4.7	Antenna power	C
--	3.1.2 (5)	4.6	Isotropically radiated power	C
--	3.1.2 (1)	4.2	Number of carriers	C
--	--	4.3	Spreading factor	C
--	3.1.2 (10)	4.5	Out-band leakage power	C
--	3.1.2 (9)	4.6	Adjacent channel power tolerance	C
--	--	--	Comply with the technical conditions	C
--	3.1.5	4.10	Carrier sense capability	C
--	--	--	Dynamic frequency selection	NA
<b>NOTE:</b> C = Conform NC = Not Conform NT = Not Tested NA = Not Applicable				

## 2.2 MEASUREMENT UNCERTAINTY

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

ITEM	UNCERTAINTY
Occupied Bandwidth	491.896Hz
Spurious emissions	3.508dB
Output power density	2.889dB
Adjacent Channel Leakage Power	1.35dB
Out of band radiated power	3.93dB
Frequency Tolerance	6805.18Hz
Burst length	0.01%

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k = 2$ .

### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	Portable Tablet Computer
<b>BRAND NAME</b>	Lenovo
<b>MODEL NAME</b>	Lenovo TB-X605F
<b>TYPE OF EQUIPMENT</b>	Data transmission equipment operating in the 5GHz ISM band using spread spectrum techniques
<b>MODULATION TYPE</b>	CCK, QPSK, BPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
<b>TRANSFER RATE</b>	802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n: up to MCS7 802.11ac: up to V9
<b>OPERATING FREQUENCY</b>	5180.0MHz ~ 5240.0MHz 5240.0 MHz ~ 5320.0MHz 5500.0 MHz ~ 5700.0MHz
<b>NUMBER OF CHANNEL</b>	5180 ~ 5240MHz: 4 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz) 1 for 802.11ac (80MHz) 5240 ~ 5320MHz: 4 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz) 1 for 802.11ac (80MHz) 5500 ~ 5700MHz: 6 for 802.11a, 802.11n (20MHz) 3 for 802.11n (40MHz) 2 for 802.11ac (80MHz)
<b>RATED RF OUTPUT POWER DENSITY (mW/MHz)</b>	Refer to NOTE 2
<b>CONDUCTED RF OUTPUT POWER DENSITY (mW/MHz)</b>	Refer to NOTE 2
<b>RADIATED RF OUTPUT POWER DENSITY (mW/MHz)</b>	Refer to NOTE 2
<b>HW-RELEASE NO.</b>	Lenovo Tablet TB-X605F
<b>SW-RELEASE NO.</b>	TB-X605F_RF01_20180615

**NOTE:**

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

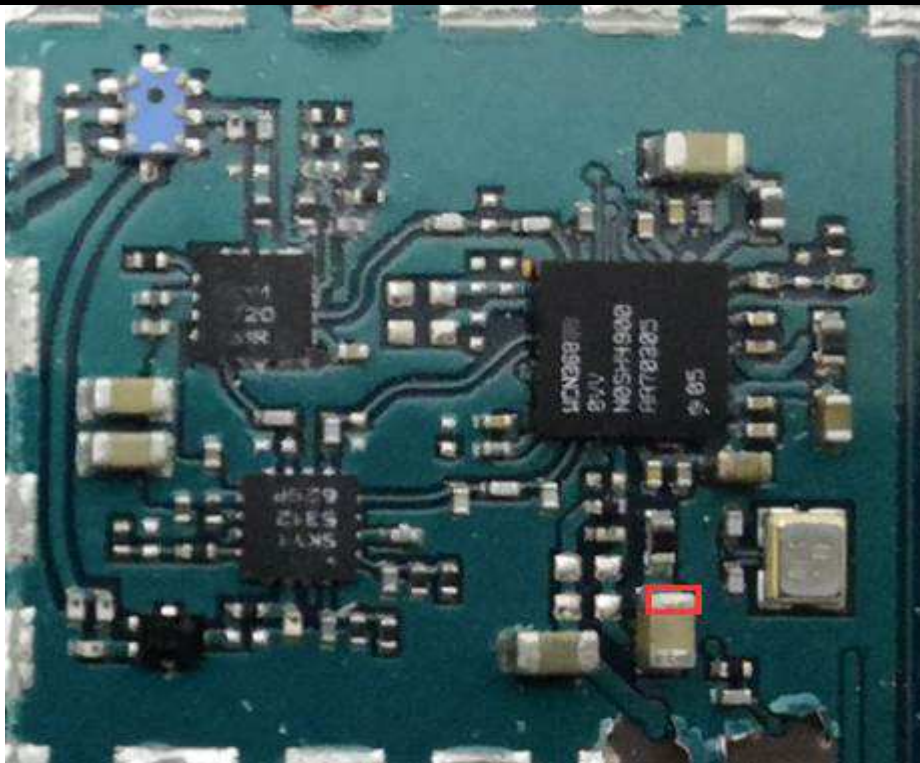


2. The power table as below:

	Rated Power (mW/MHz)	Total Conducted RF Output Power Density (mW/MHz)	Radiated RF Output Power Density (mW/MHz)
<b>W52</b>			
<b>802.11a</b>	2.3	2.245	0.894
<b>802.11n (20MHz)</b>	2.2	2.148	0.855
<b>802.11n (40MHz)</b>	1.4	1.370	0.545
<b>802.11ac (80MHz)</b>	0.5	0.453	0.180
<b>W53</b>			
<b>802.11a</b>	2.5	2.385	0.949
<b>802.11n (20MHz)</b>	2.4	2.296	0.914
<b>802.11n (40MHz)</b>	1.6	1.531	0.610
<b>802.11ac (80MHz)</b>	0.5	0.480	0.191
<b>W56</b>			
<b>802.11a</b>	2.3	2.255	0.898
<b>802.11n (20MHz)</b>	2.2	2.133	0.849
<b>802.11n (40MHz)</b>	1.5	1.409	0.561
<b>802.11ac (80MHz)</b>	0.5	0.443	0.176

3. When EUT be operated at  $\pm 10\%$  from the normal supply voltage, the supply voltage of RF part was varied within  $\pm 1\%$ . All test cased were done under the normal supply voltage.

Power supply voltage 3.85Vdc (Normal)	Power supply voltage 4.235Vdc (+10%)	Power supply voltage 3.465Vdc (-10%)
1.3	1.3	1.3
Measurement point		



4. There were Sample A, B, C, D, E and F for this project, the difference is as below:

SAMPLE	EUT CONFIGURATION INFORMATION
<b>A</b>	LCD Panel 2+Photo Camera 1+Photo Camera 3+CPU 1+EMMC1+DDR1+speaker 1+speaker 2+ motor2 + Main Broad 1+BT/WLAN Module+ Battery
<b>B</b>	LCD Panel 2+Photo Camera 2+Photo Camera 4+CPU 1+EMMC2+DDR2+speaker 1+speaker 2+motor1 + Main Broad 2 +BT/WLAN Module+ Battery
<b>C</b>	LCD Panel 2+Photo Camera 1+Photo Camera 3+CPU 1+EMMC3+DDR3+speaker 1+speaker 2 +motor2 + Main Broad 1+BT/WLAN Module+ Battery
<b>D</b>	LCD Panel 2+Photo Camera 2+Photo Camera 4+CPU 1+EMMC4+DDR4+speaker 1+speaker 2+motor1 + Main Broad 2+BT/WLAN Module+ Battery
<b>E</b>	LCD Panel 2+Photo Camera 1+Photo Camera 3+CPU 1+EMMC5+DDR5+speaker 1+speaker 2+motor2 + Main Broad 1+BT/WLAN Module+ Battery
<b>F</b>	LCD Panel 2+Photo Camera 2+Photo Camera 4+CPU 1+EMMC6+DDR6+speaker 1+speaker 2+motor1 + Main Broad 2+BT/WLAN Module+ Battery

5. For the test results, the EUT had been tested with normal supply voltage condition.

**List of Accessories:**

ACCESSORIES	BRAND	MODEL	SPECIFICATION
AC Adapter 1	Salom	SC-41	I/P:100-240Vac, 300mA O/P: 5Vdc, 2000mA
AC Adapter 2	AcBel	SC-41	I/P:100-240Vac, 30mA O/P: 5Vdc, 2000mA
Battery	Lenovo	L18D1P32	Rating: 3.85Vdc, 4850mAh
USB Cable 1(White)	LiQi	LQ-02300039	1.0m shielded cable w/o core
USB Cable 2(Black)	LiQi	LQ-02300040	1.0m shielded cable w/o core
LCD Panel1 (Black)	BOE	TV101WUM-LL2	10.1 "
LCD Panel2(White)	BOE	TV101WUM-LL3	10.1 "
EMMC1+DDR1	SAMSUNG	KMQE60013M-B318(2+16)	16G
EMMC2+DDR2	HYNIX	H9TQ17ABJTCCUR-KUM(2+16)	16G
EMMC3+DDR3	SAMSUNG	KMGD6001BM-B421(3+32)	32G
EMMC4+DDR4	HYNIX	H9TQ27ADFTMCUR-KUM(3+32)	32G
EMMC5+DDR5	SAMSUNG	KMRH60014A-B614(4+64)	64G
EMMC6+DDR6	HYNIX	H9TQ52ACLTMCUR-KUM(4+64)	64G
Speaker 1	Keysound	QM171219AW84	-
Speaker 2	Keysound	QM171219AW85	-
motor1	AWA	YK2455R	-
Motor2	Baolong	BLX-431320S	-
Photo Camera 1	Lcetron	LE5143AM	5M AF
Photo Camera 2	Holitek	MF81Q	5M AF
Photo Camera 3	Lcetron	ZRT2509V-P102F	2M FF
Photo Camera 4	Holitech	HSU1005	2M FF
CPU	Qualcomm	SDA450	792nsp
Main Broad 1	huashen	W93M71B2-3-03	-
Main Broad 2	yilianda	W93M71B2-3-05	-
BT/WLAN Module	Qualcomm	WCN3680B	-

**Remark:**

1. USB cabel 1 and USB cable 2 is identical, difference models are for color distinguished. Therefore, only USB cable 1 is as a representative for final test.
2. LCD Panel 1 and LCD Panel 2 is identical, difference models are for color distinguished. Therefore, only LCD Panel 2 is as a representative for final test.

### 3.2 DESCRIPTION OF TEST CHANNELS

#### 802.11a/ 802.11n (20MHz) (W52 & W53)

CHANNEL	TRANSMITTER	RECEIVER
36	5180MHz	5180MHz
48	5240MHz	5240MHz
52	5260MHz	5260MHz
64	5320MHz	5320MHz

#### 802.11n (40MHz) (W52 & W53):

CHANNEL	TRANSMITTER	RECEIVER
38	5190MHz	5190MHz
46	5230MHz	5230MHz
54	5270MHz	5270MHz
62	5310MHz	5310MHz

#### 802.11ac (80MHz) (W52 & W53):

CHANNEL	TRANSMITTER	RECEIVER
42	5210MHz	5210MHz
58	5290MHz	5290MHz

#### 802.11a/ 802.11n (20MHz) (W56):

CHANNEL	TRANSMITTER	RECEIVER
100	5500MHz	5500MHz
120	5600MHz	5600MHz
140	5700MHz	5700MHz

#### 802.11n (40MHz) (W56):

CHANNEL	TRANSMITTER	RECEIVER
102	5510MHz	5510MHz
118	5590MHz	5590MHz
134	5670MHz	5670MHz

#### 802.11ac (80MHz) (W56):

CHANNEL	TRANSMITTER	RECEIVER
106	5530MHz	5530MHz
122	5610MHz	5610MHz

**NOTE:** By means of test software (RF TEST) provided by manufacture, the power levels during the tests were set according to the following codes:

(W52 & W53):

802.11a		802.11n (20MHz)		802.11n (40MHz)		802.11ac (80MHz)	
CHANNEL	POWER SETTING	CHANNEL	CHANNEL	CHANNEL	POWER SETTING	CHANNEL	POWER SETTING
36	16.0	36	16.0	38	16.0	42	13.0
48	16.0	48	16.0	46	16.0	58	13.0
52	16.0	52	16.0	54	16.0		
64	16.0	64	16.0	62	16.0		

(W56):

802.11a		802.11n (20MHz)		802.11n (40MHz)		802.11ac (80MHz)	
CHANNEL	POWER SETTING	CHANNEL	POWER SETTING	CHANNEL	POWER SETTING	CHANNEL	POWER SETTING
100	16.0	100	16.0	102	16.0	106	13.0
120	16.0	120	16.0	118	16.0	122	13.0
140	16.0	140	16.0	134	16.0		

### 3.3 TEST CONDITIONS

TEST CONDITIONS	VOLTAGE (Vdc)
$V_{normal}$	3.85
$V_{+10\%}$	4.235
$V_{-10\%}$	3.465

### 3.4 ASSEMBLY

The RF circuits are located inside of the EUT. The RF circuit was covered by metal shielding case, Also it won't be easy to be opened. Frequency Band, channels and Modulation parameters are fixed inside the module. They cannot be edited or modified by end-user.

### 3.5 ANTENNA SPECIFICATIONS

#### 3.5.1 ANTENNA GAIN

	ANTENNA TYPE	GAIN (dBi)
WLAN: 5.0GHz	Monopole	W52: -4 W53: -4 W56: -4

#### 3.5.2 ANTENNA PATTERN

Please refer to the attached file (Antenna report).

## 4 TEST RESULTS OF 802.11a/ 802.11n(20MHz)/ 802.11n(40MHz)/ 802.11ac(80MHz)

### 4.1 FREQUENCY TOLERANCE MEASUREMENT

#### 4.1.1 LIMITS OF FREQUENCY TOLERANCE MEASUREMENT

Tolerance of frequency shall be +/- 20ppm

#### 4.1.2 TEST RESULTS

##### 802.11a / 802.11a 802.11n (20MHz)

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH	
CHANNEL	FREQUENCY (MHz)	V <sub>normal</sub>	
		CARRIER FREQUENCY (MHz)	FREQUENCY TOLERANCE (ppm)
36	5180	5179.976140	-4.606
48	5240	5239.975640	-4.649
52	5260	5259.976180	-4.529
64	5320	5319.975020	-4.695
100	5500	5499.973520	-4.815
120	5600	5599.972540	-4.904
140	5700	5699.972400	-4.842

##### 802.11a 802.11n (40MHz)

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH	
CHANNEL	FREQUENCY (MHz)	V <sub>normal</sub>	
		CARRIER FREQUENCY (MHz)	FREQUENCY TOLERANCE (ppm)
38	5190	5189.976220	-4.582
46	5230	5229.975720	-4.642
54	5270	5269.975640	-4.622
62	5310	5309.975140	-4.682
102	5510	5509.974340	-4.657
118	5590	5589.973620	-4.719
134	5670	5669.972960	-4.769



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Test Report No.: RJ180530W011-3

802.11ac (80MHz)

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH	
CHANNEL	FREQUENCY (MHz)	$V_{normal}$	
		CARRIER FREQUENCY (MHz)	FREQUENCY TOLERANCE (ppm)
42	5210	5209.978880	-4.054
58	5290	5289.974040	-4.907
106	5530	5529.973180	-4.850
122	5610	5609.972280	-4.941



## 4.2 OCCUPIED BANDWIDTH MEASUREMENT (99% POWER BANDWIDTH)

### 4.2.1 LIMITS OF OCCUPIED BANDWIDTH MEASUREMENT

ITEM	Operating Band	Limit	REMARK
Occupied bandwidth	W52 & W53	<19MHz	802.11a/n(HT20)/ac(VHT20)
Occupied bandwidth	W56	<19.7MHz	802.11a/n(HT20)/ac(VHT20)
Occupied bandwidth	W52 & W53 & W56	<38MHz	802.11n(HT40)/ac(VHT40)

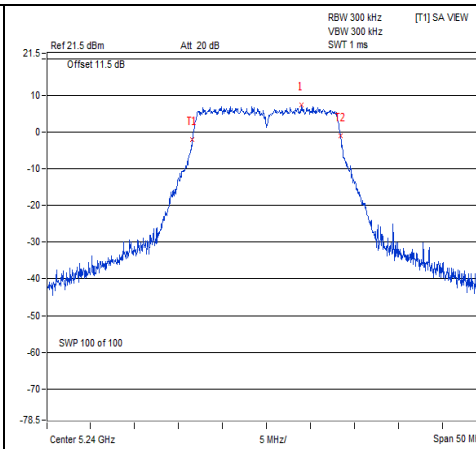
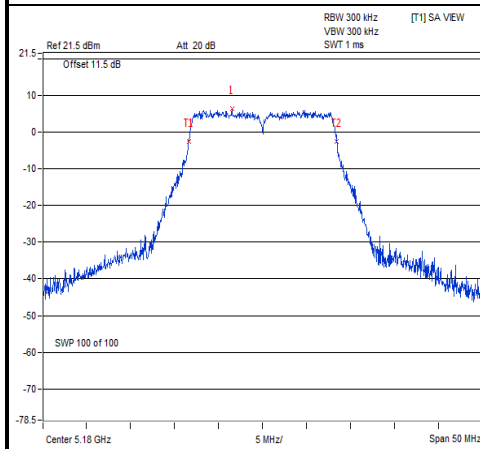
#### 4.2.2 TEST RESULTS

##### 802.11a

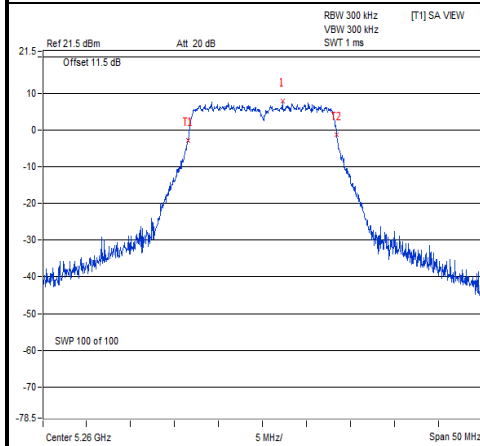
ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH
CHANNEL	FREQUENCY (MHz)	$V_{\text{normal}}$
		OCCUPIED BANDWIDTH (MHz)
36	5180	16.90
48	5240	16.95
52	5260	16.95
64	5320	16.85
100	5500	16.95
120	5600	16.75
140	5700	16.85
MEASUREMENT UNCERTAINTY		$\pm 206.50\text{Hz}$

**NOTE:** For the test plots please refer to the below pages.

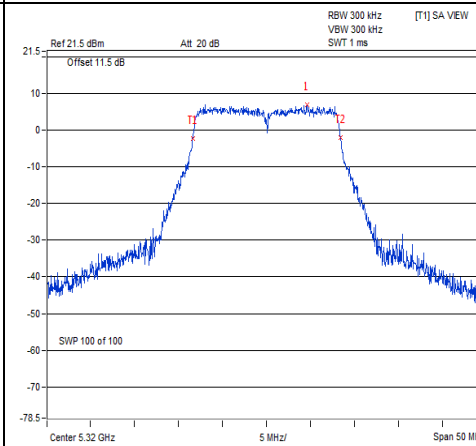
## Vnormal



## Channel 36



## Channel 48

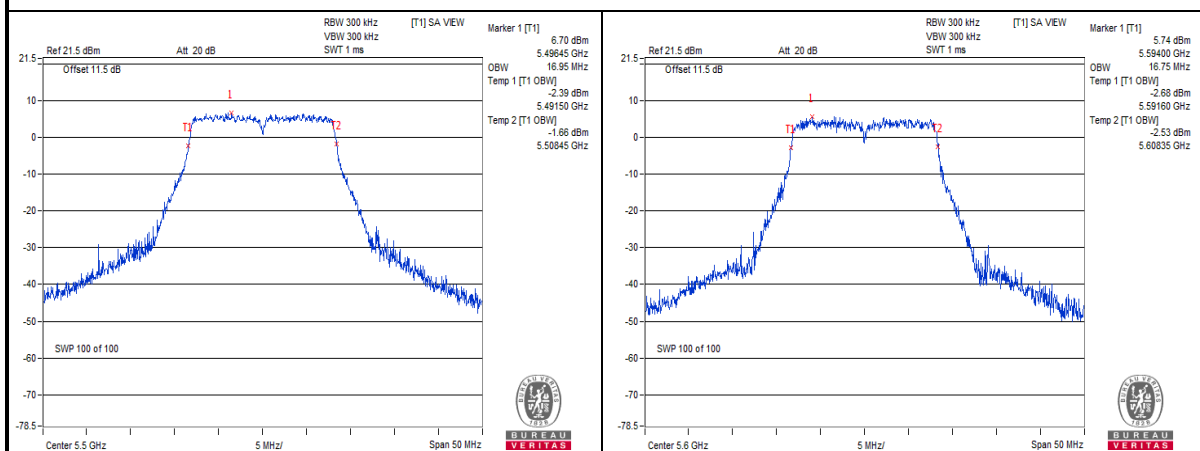


## Channel 52

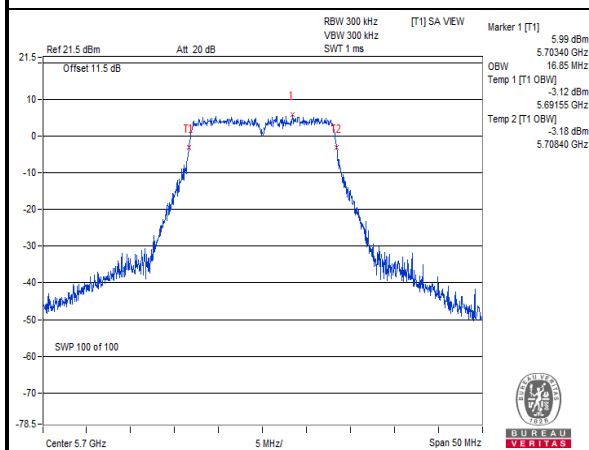
## Channel 64

Measurement uncertainty:  $\pm 206.50$  Hz

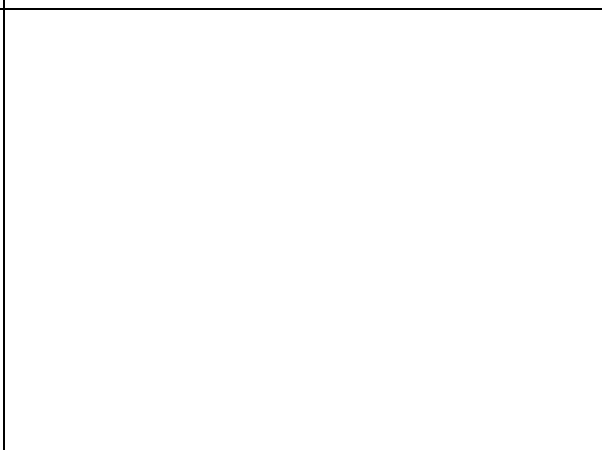
## Vnormal



## Channel 100



## Channel 120



## Channel 140

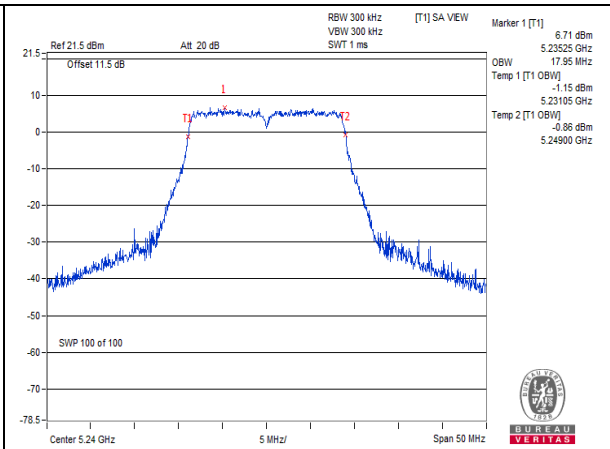
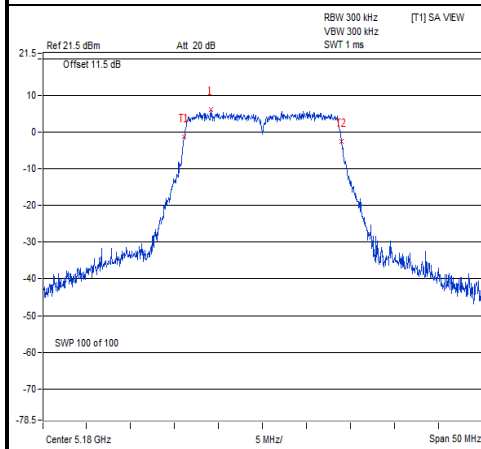
Measurement uncertainty:  $\pm 206.50$  Hz

**802.11n (20MHz)**

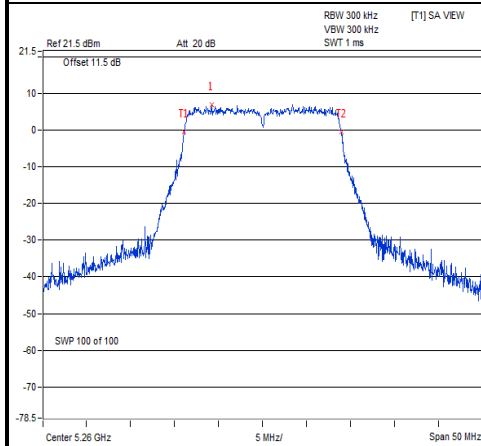
ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH
CHANNEL	FREQUENCY (MHz)	V <sub>normal</sub>
		OCCUPIED BANDWIDTH (MHz)
36	5180	17.90
48	5240	17.95
52	5260	17.90
64	5320	17.95
100	5500	18.00
120	5600	17.95
140	5700	17.90
MEASUREMENT UNCERTAINTY		± 206.50Hz

**NOTE:** For the test plots please refer to the below pages.

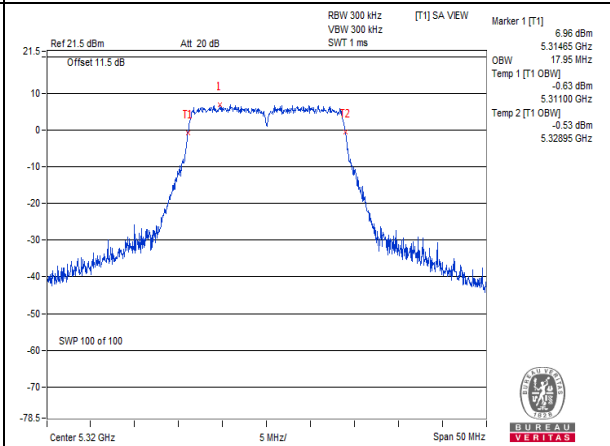
## Vnormal



## Channel 36



## Channel 48

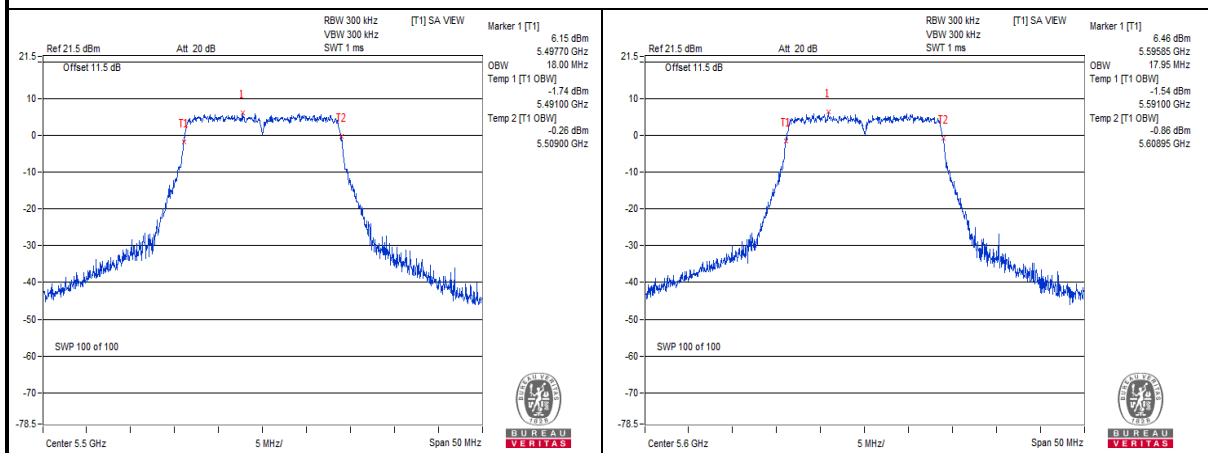


## Channel 52

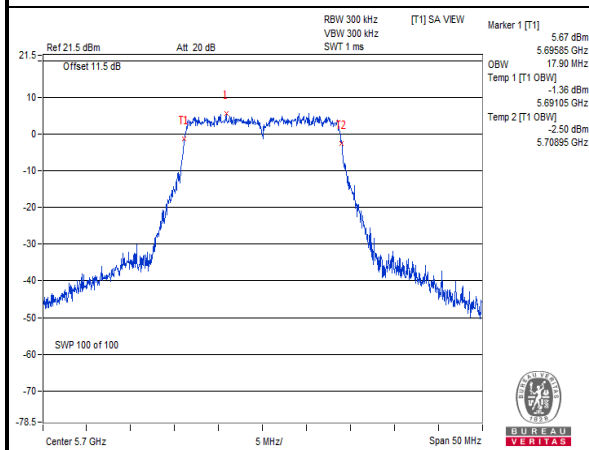
## Channel 64

Measurement uncertainty:  $\pm 206.50$  Hz

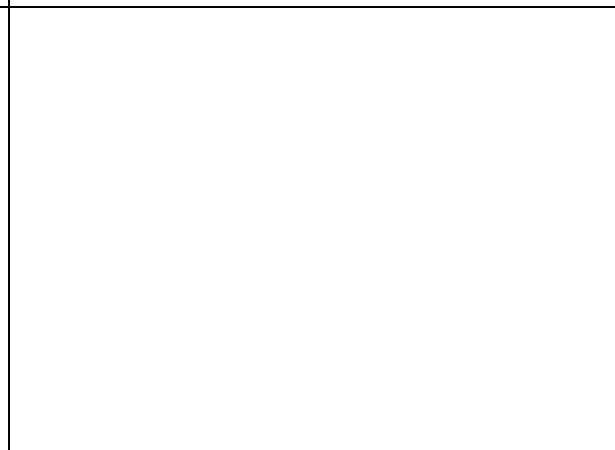
**Vnormal**



**Channel 100**



**Channel 120**



**Channel 140**

Measurement uncertainty:  $\pm 206.50$  Hz

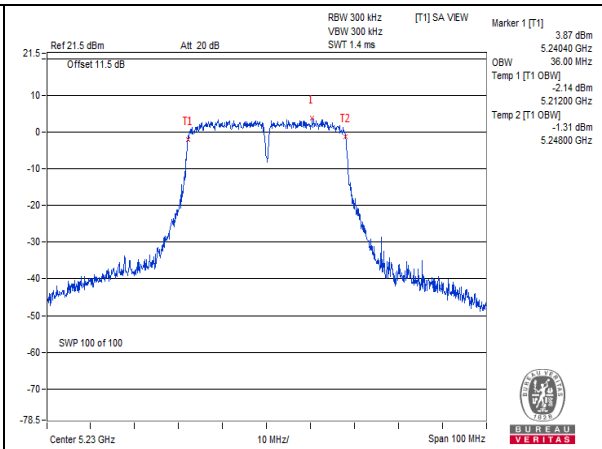
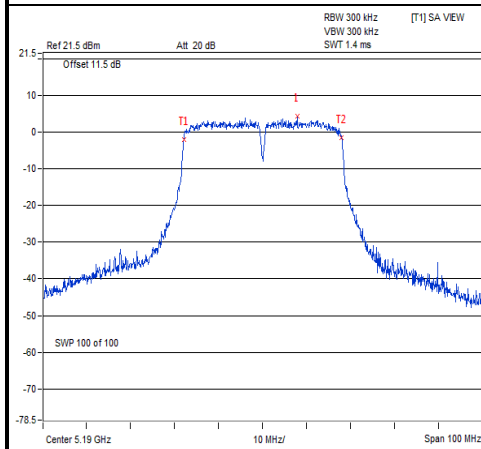
**802.11a 802.11n (40MHz)**

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH
CHANNEL	FREQUENCY (MHz)	V <sub>normal</sub>
		OCCUPIED BANDWIDTH (MHz)
38	5190	36.00
46	5230	36.00
54	5270	35.90
62	5310	35.90
102	5510	35.90
118	5590	35.90
134	5670	36.00
MEASUREMENT UNCERTAINTY		± 206.50Hz

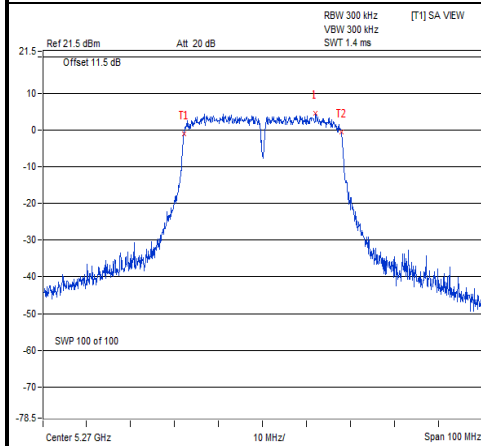
**NOTE:** For the test plots please refer to the below pages.



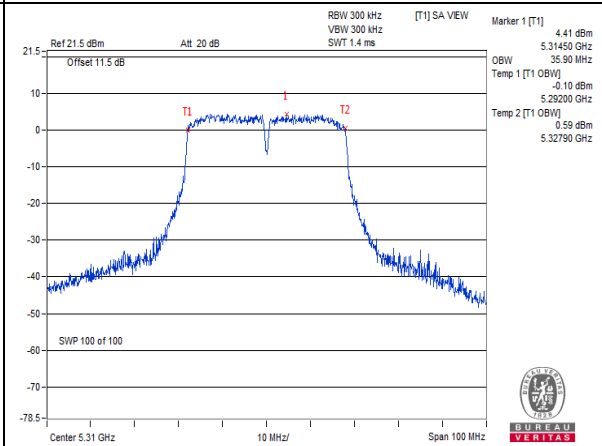
## Vnormal



## Channel 38



## Channel 46

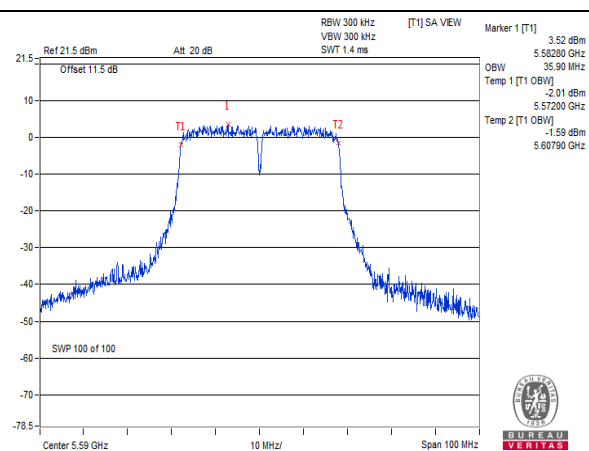
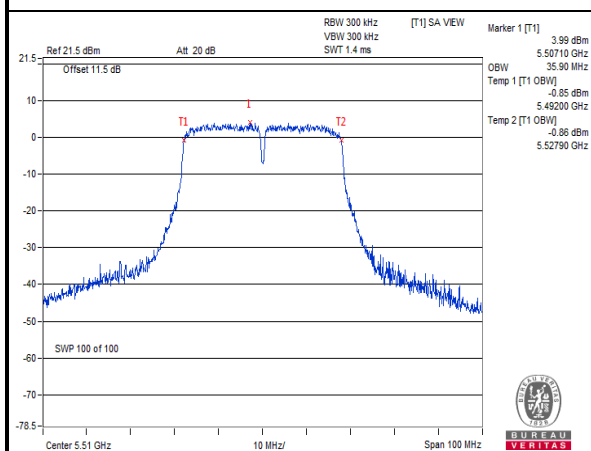


## Channel 54

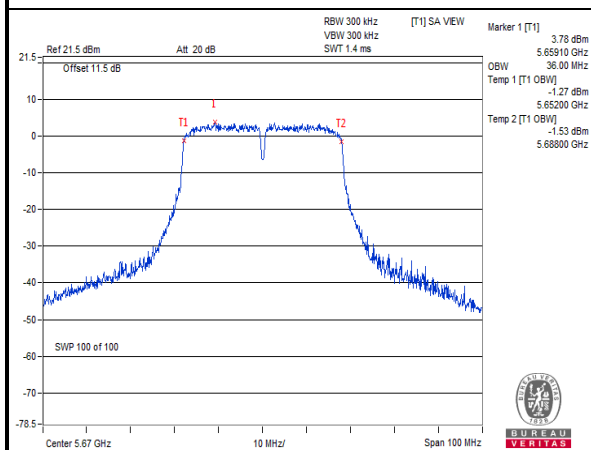
## Channel 62

Measurement uncertainty:  $\pm 206.50$  Hz

## Vnormal



## Channel 102



## Channel 118



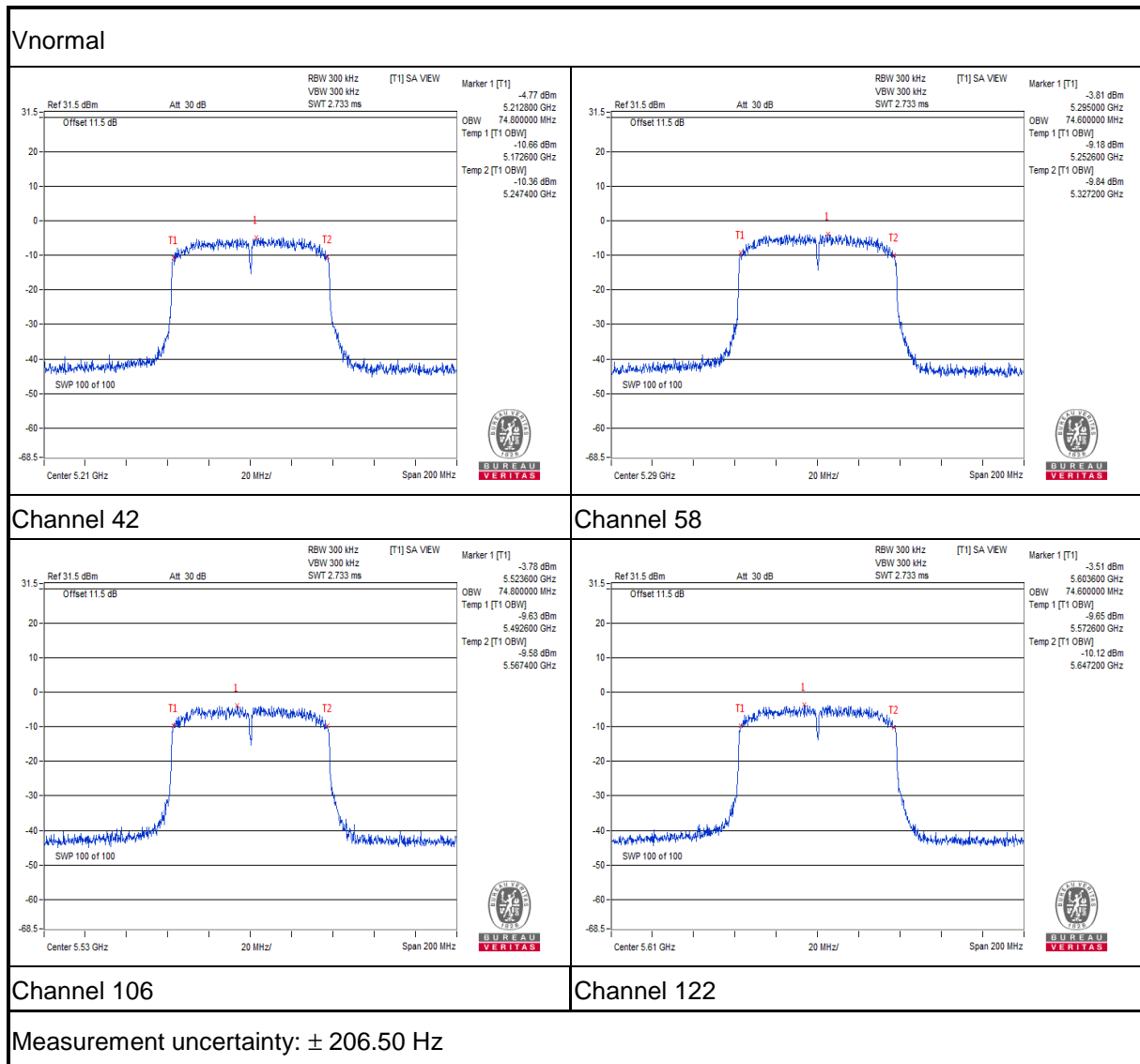
## Channel 134

Measurement uncertainty:  $\pm 206.50$  Hz

**802.11ac (80MHz)**

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH
CHANNEL	FREQUENCY (MHz)	V <sub>normal</sub>
		OCCUPIED BANDWIDTH (MHz)
42	5210	74.80
58	5290	74.60
106	5530	74.80
122	5610	74.60
MEASUREMENT UNCERTAINTY		± 206.50Hz

**NOTE:** For the test plots please refer to the below pages.



### 4.3 SPREADING BANDWIDTH MEASUREMENT (90% POWER BANDWIDTH)

#### 4.3.1 LIMITS OF SPREADING BANDWIDTH

ITEM	LIMIT
SPREADING BANDWIDTH	$\geq 500\text{kHz}$

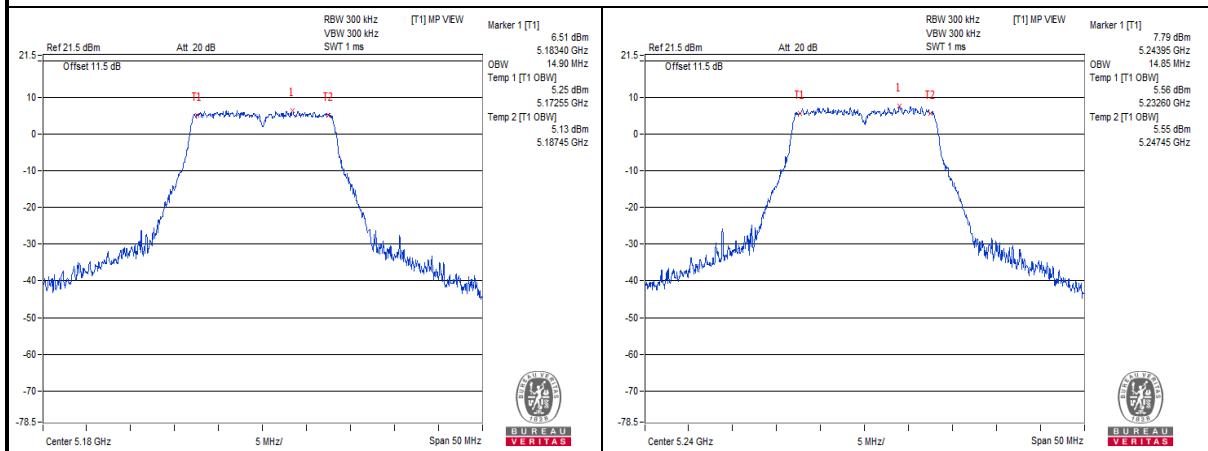
#### 4.3.2 TEST RESULTS

##### 802.11a

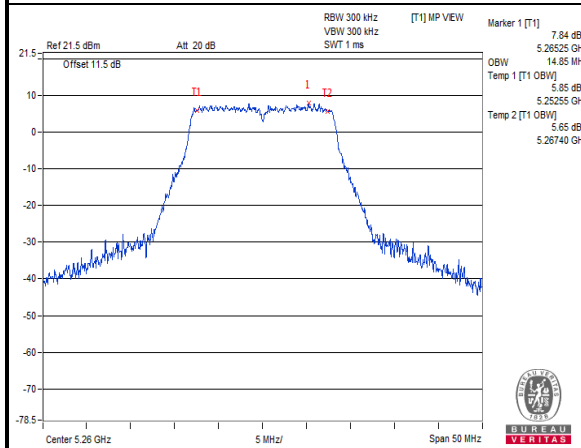
ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH
CHANNEL	FREQUENCY (MHz)	$V_{\text{normal}}$
		OCCUPIED BANDWIDTH (MHz)
36	5180	14.90
48	5240	14.85
52	5260	14.85
64	5320	14.90
100	5500	14.85
120	5600	14.85
140	5700	14.85
MEASUREMENT UNCERTAINTY		$\pm 206.50\text{Hz}$

**NOTE:** For the test plots please refer to the below pages.

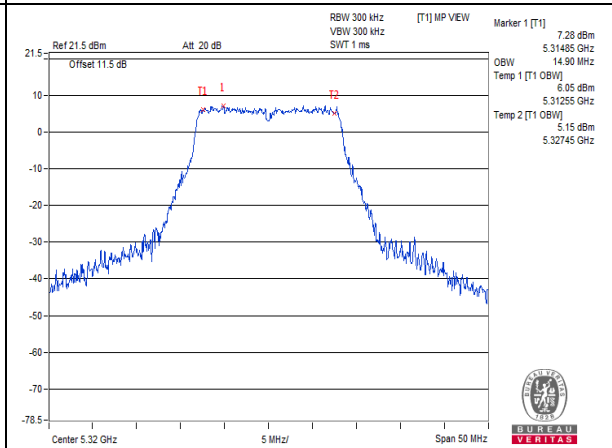
## Vnormal



## Channel 36



## Channel 48

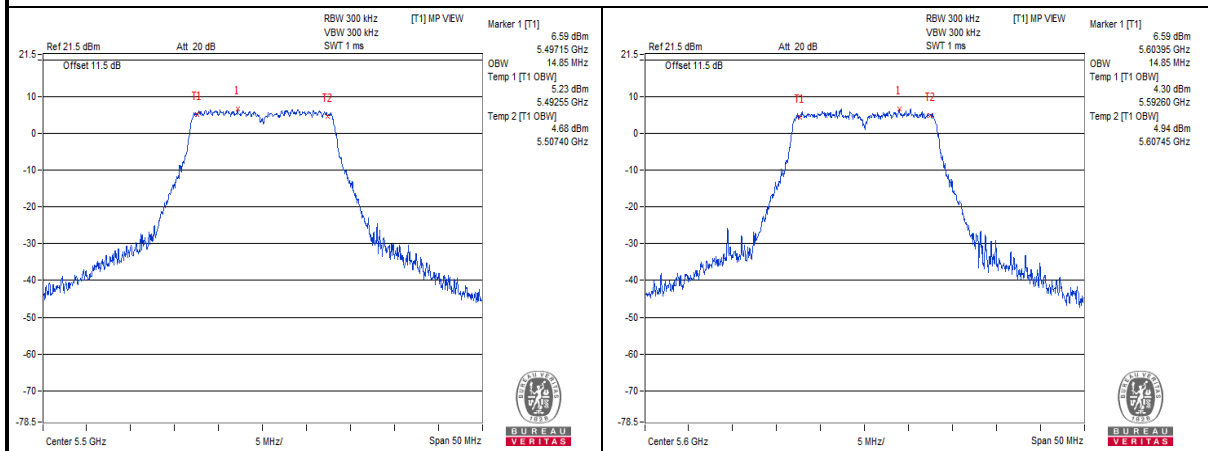


## Channel 52

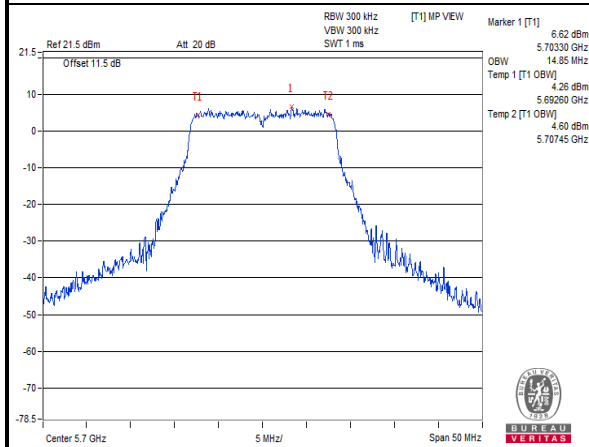
## Channel 64

Measurement uncertainty:  $\pm 206.50$  Hz

## Vnormal



## Channel 100



## Channel 120



## Channel 140

Measurement uncertainty:  $\pm 206.50$  Hz

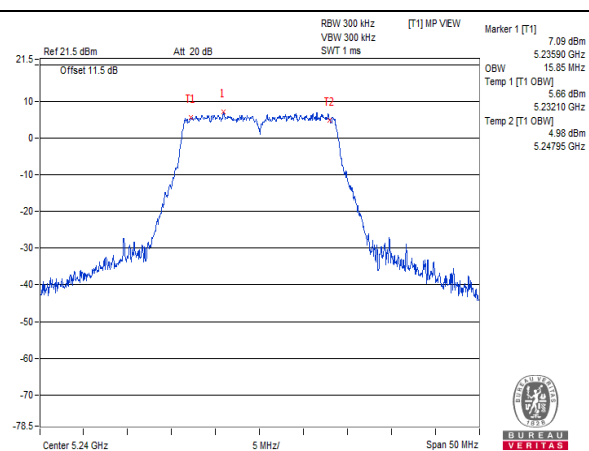
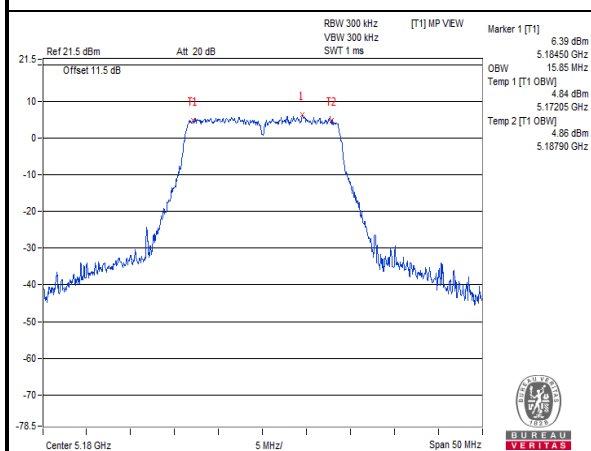
**802.11n (20MHz)**

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH
CHANNEL	FREQUENCY (MHz)	V <sub>normal</sub>
		OCCUPIED BANDWIDTH (MHz)
36	5180	15.85
48	5240	15.85
52	5260	15.85
64	5320	15.85
100	5500	15.85
120	5600	15.85
140	5700	15.90
MEASUREMENT UNCERTAINTY		± 206.50Hz

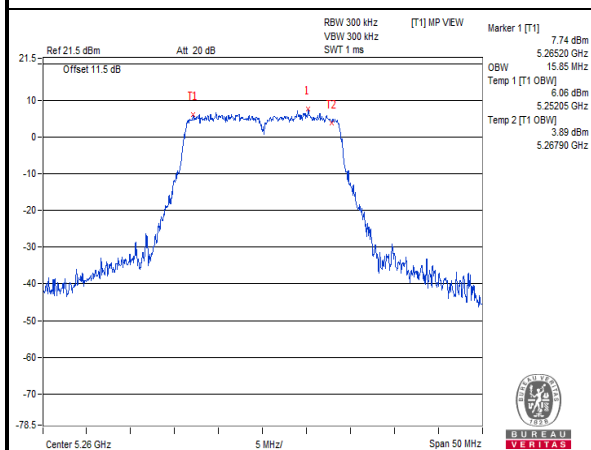
**NOTE:** For the test plots please refer to the below pages.



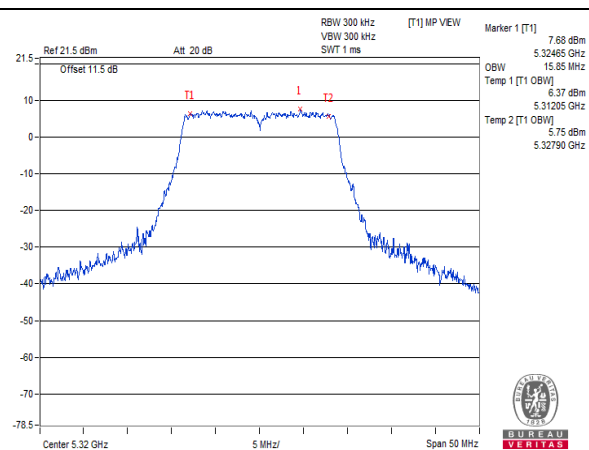
## Vnormal



## Channel 36



## Channel 48

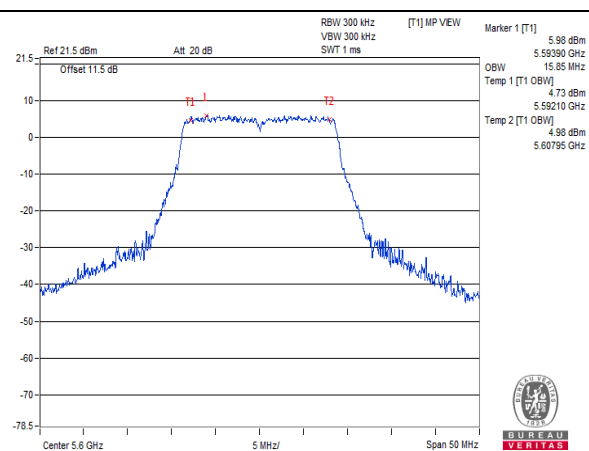
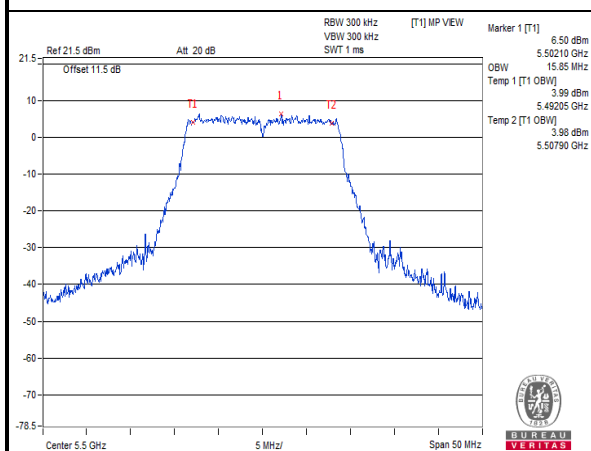


## Channel 52

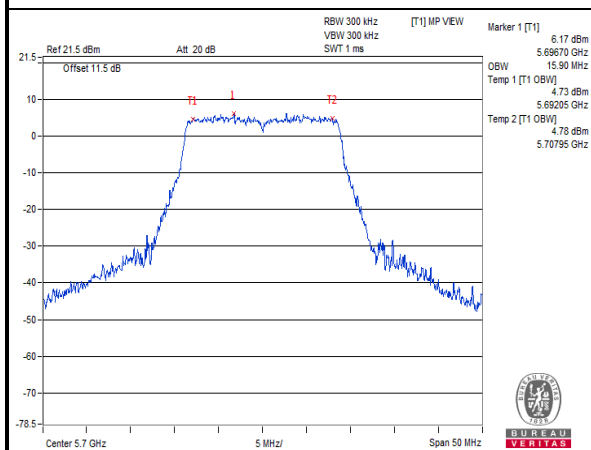
## Channel 64

Measurement uncertainty:  $\pm 206.50$  Hz

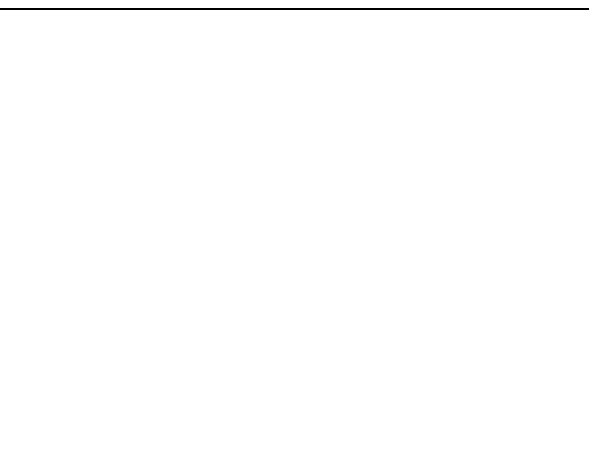
## Vnormal



## Channel 100



## Channel 120



## Channel 140

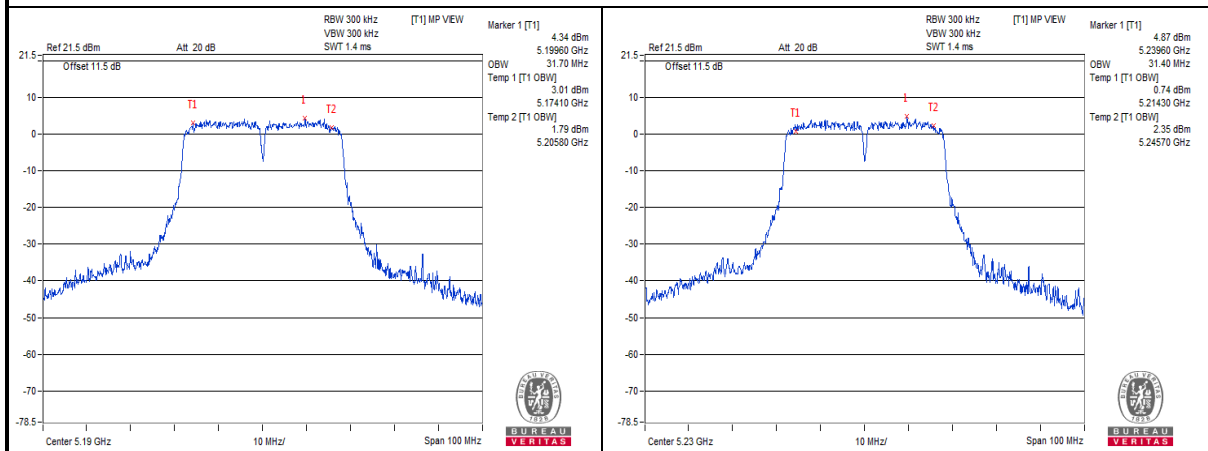
Measurement uncertainty:  $\pm 206.50$  Hz

**802.11n (40MHz)**

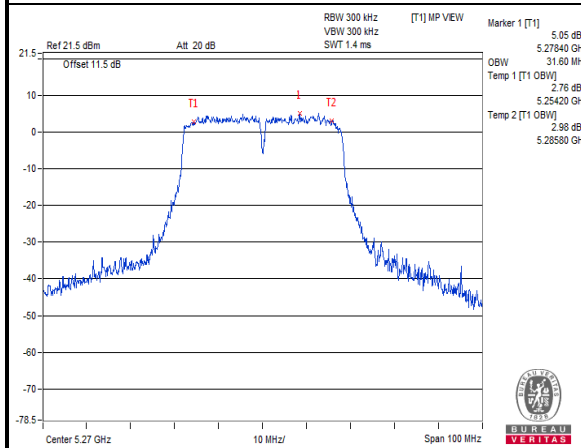
ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH
CHANNEL	FREQUENCY (MHz)	V <sub>normal</sub>
		OCCUPIED BANDWIDTH (MHz)
38	5190	31.70
46	5230	31.40
54	5270	31.60
62	5310	31.40
102	5510	31.60
118	5590	31.50
134	5670	31.60
MEASUREMENT UNCERTAINTY		± 206.50Hz

**NOTE:** For the test plots please refer to the below pages.

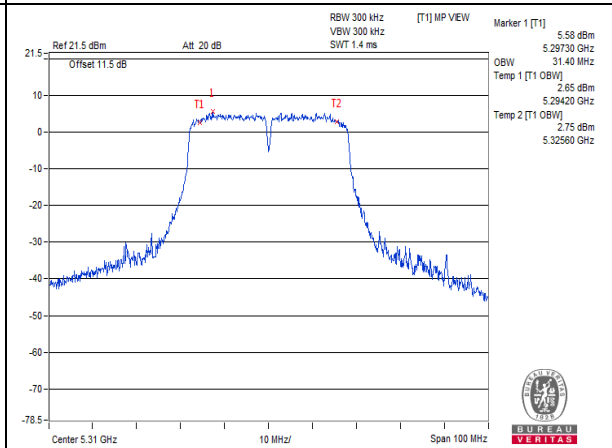
## Vnormal



## Channel 38



## Channel 46

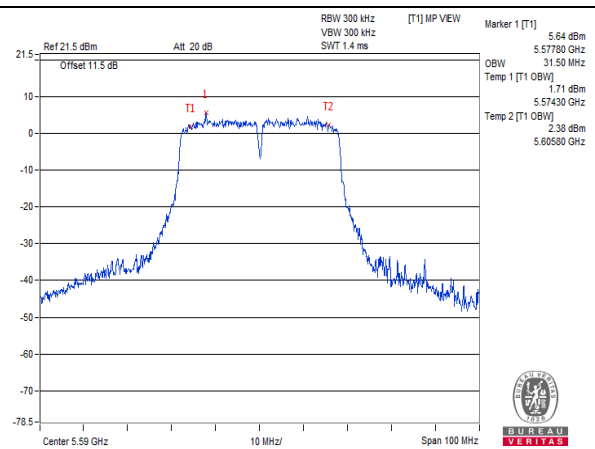
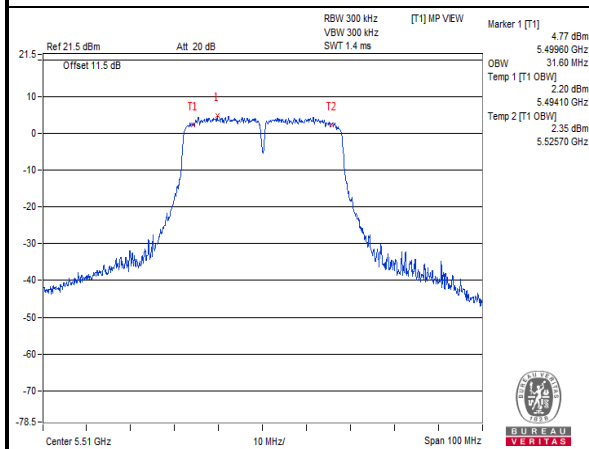


## Channel 54

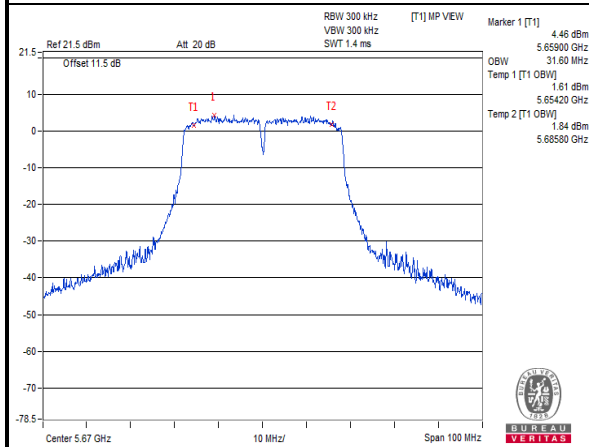
## Channel 62

Measurement uncertainty:  $\pm 206.50$  Hz

## Vnormal



## Channel 102



## Channel 118



## Channel 134

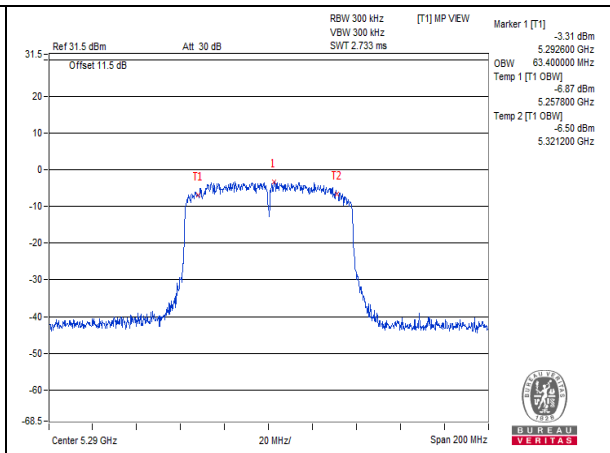
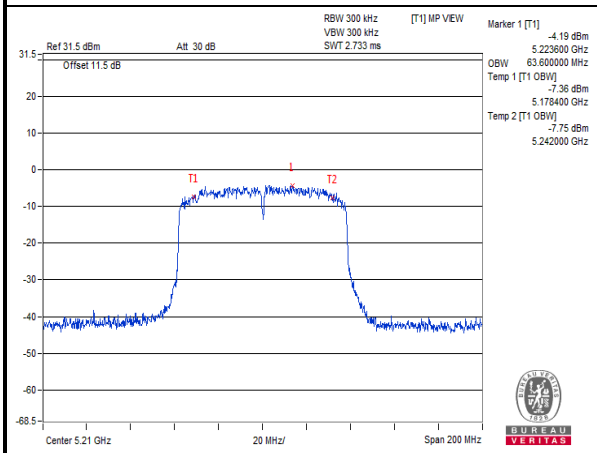
Measurement uncertainty:  $\pm 206.50$  Hz

**802.11ac (80MHz)**

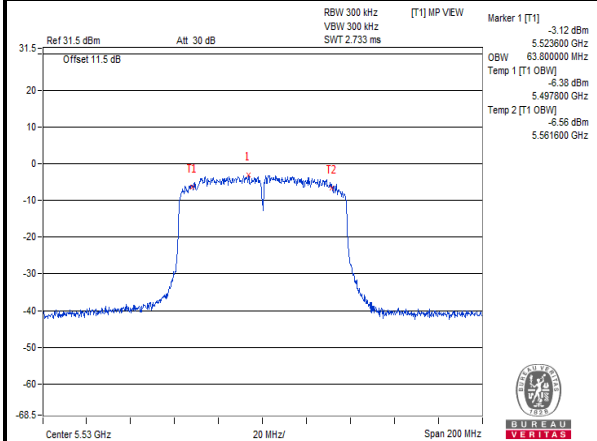
ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH
CHANNEL	FREQUENCY (MHz)	V <sub>normal</sub>
		OCCUPIED BANDWIDTH (MHz)
42	5210	63.60
58	5290	63.40
106	5530	63.80
122	5610	63.60
MEASUREMENT UNCERTAINTY		± 206.50Hz

**NOTE:** For the test plots please refer to the below pages.

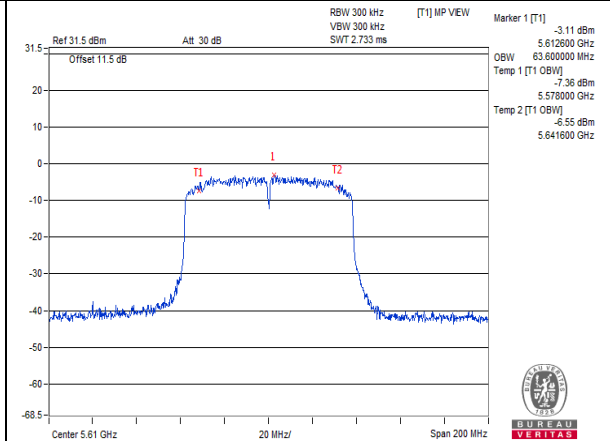
**Vnormal**



**Channel 42**



**Channel 58**



**Channel 106**

**Channel 122**

Measurement uncertainty:  $\pm 206.50$  Hz

## 4.4 SPURIOUS EMISSIONS FOR TRANSMITTER MEASUREMENT

### 4.4.1 LIMITS OF SPURIOUS EMISSIONS

#### W52 & W53 bands: 802.11a / 802.11n (HT20)

Frequencies (MHz)	Limit
<b>OBW <math>\leq</math> 18MHz</b>	
30.0MHz to 1000.0MHz	$\leq$ 0.25 $\mu$ W/100kHz
1000.0MHz to 5140.0MHz	$\leq$ 2.5 $\mu$ W/MHz
5360.0MHz to 26000.0MHz	$\leq$ 2.5 $\mu$ W/MHz
<b>18MHz &lt; OBW &lt; 19MHz</b>	
30.0MHz to 1000.0MHz	$\leq$ 0.25 $\mu$ W/100kHz
1000.0MHz to 5135.0MHz	$\leq$ 2.5 $\mu$ W/MHz
5365.0MHz to 26000.0MHz	$\leq$ 2.5 $\mu$ W/MHz

#### W52 & W53 bands: 802.11n (HT40)

Frequencies (MHz)	Limit
30.0MHz ~ 1000.0MHz	$\leq$ 0.25 $\mu$ W/100kHz
1000.0MHz ~ 5100.0MHz	$\leq$ 2.5 $\mu$ W/MHz
5400.0MHz ~ 26000.0MHz	$\leq$ 2.5 $\mu$ W/MHz

#### W52 & W53 bands: 802.11ac (VHT80)

Frequencies (MHz)	Limit
30.0MHz ~ 1000.0MHz	$\leq$ 0.25 $\mu$ W/100kHz
1000.0MHz ~ 5020.0MHz	$\leq$ 2.5 $\mu$ W/MHz
5480.0MHz ~ 26000.0MHz	$\leq$ 2.5 $\mu$ W/MHz



**W56 band: 802.11a / 802.11n (HT20)**

Frequencies (MHz)	Limit
30.0MHz to 1000.0MHz	$\leq 0.25 \mu\text{W}/100\text{kHz}$
1000.0MHz ~ 5455.0MHz	$\leq 2.5 \mu\text{W}/\text{MHz}$
5745.0MHz ~ 26000.0MHz	$\leq 2.5 \mu\text{W}/\text{MHz}$

**W56 band: 802.11n (HT40)**

Frequencies (MHz)	Limit
30.0MHz to 1000.0MHz	$\leq 0.25 \mu\text{W}/100\text{kHz}$
1000.0MHz ~ 5420.0MHz	$\leq 2.5 \mu\text{W}/\text{MHz}$
5760.0MHz ~ 26000.0MHz	$\leq 2.5 \mu\text{W}/\text{MHz}$

**W56 band: 802.11ac (VHT80)**

Frequencies (MHz)	Limit
30.0MHz to 1000.0MHz	$\leq 0.25 \mu\text{W}/100\text{kHz}$
1000.0MHz ~ 5340.0MHz	$\leq 2.5 \mu\text{W}/\text{MHz}$
5800.0MHz ~ 26000.0MHz	$\leq 2.5 \mu\text{W}/\text{MHz}$

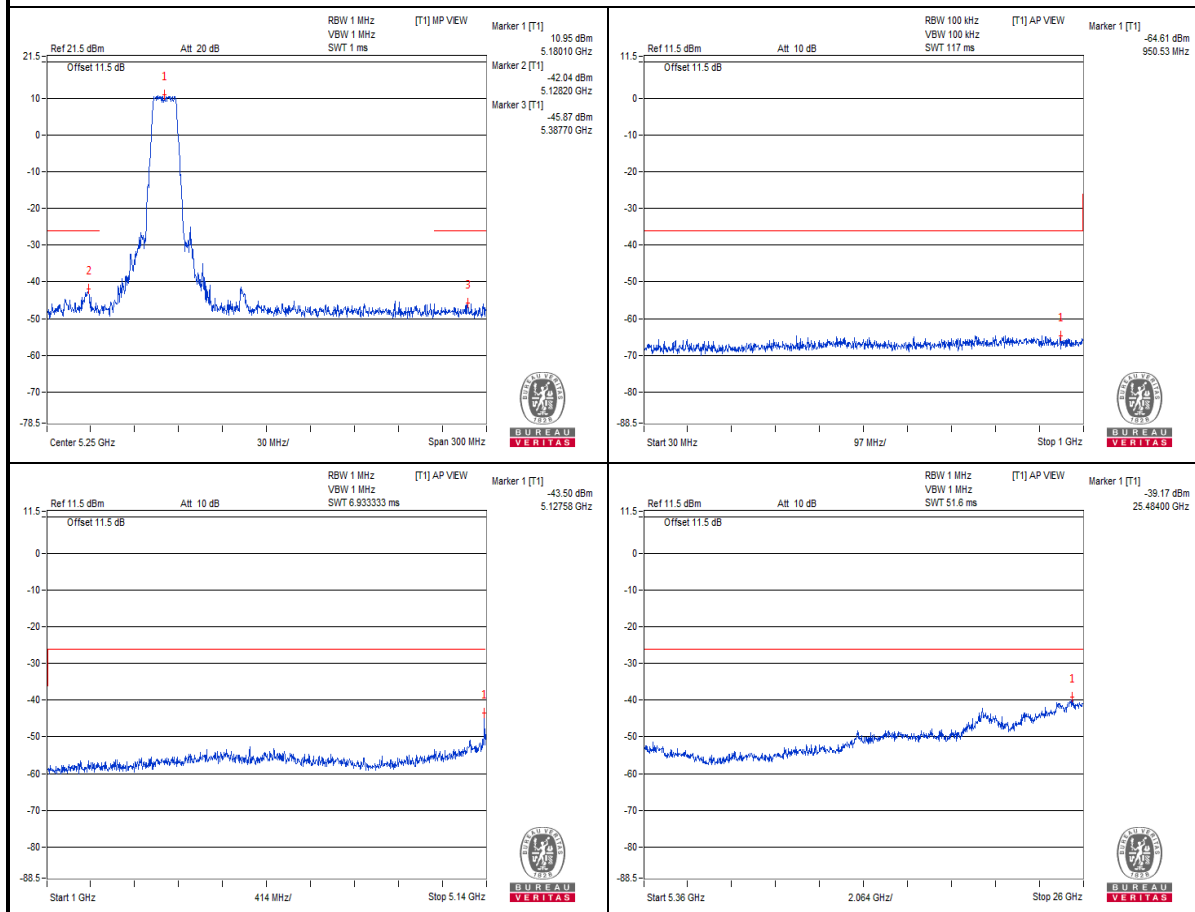
#### 4.4.2 TEST RESULTS

##### 802.11a (W52)

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH					
TEST CHANNEL		CH36 (5180MHz)		CH48 (5240MHz)		LIMIT	RESULT
TEST CONDITION	FREQUENCY RANGE	FREQUENCY (MHz)	MEASURE VALUE	FREQUENCY (MHz)	MEASURE VALUE		
V <sub>normal</sub>	30.0MHz ~ 1000.0MHz	950.530	0.000346uW	732.280	0.000412uW	0.25uW/100kHz	PASS
	1000.0MHz ~ 5140.0MHz	5127.580	0.04466uW	4953.700	0.006723uW	2.5uW/MHz	PASS
	5360.0MHz ~ 26000.0MHz	25484.000	0.120998uW	25339.520	0.123985uW	2.5uW/MHz	PASS

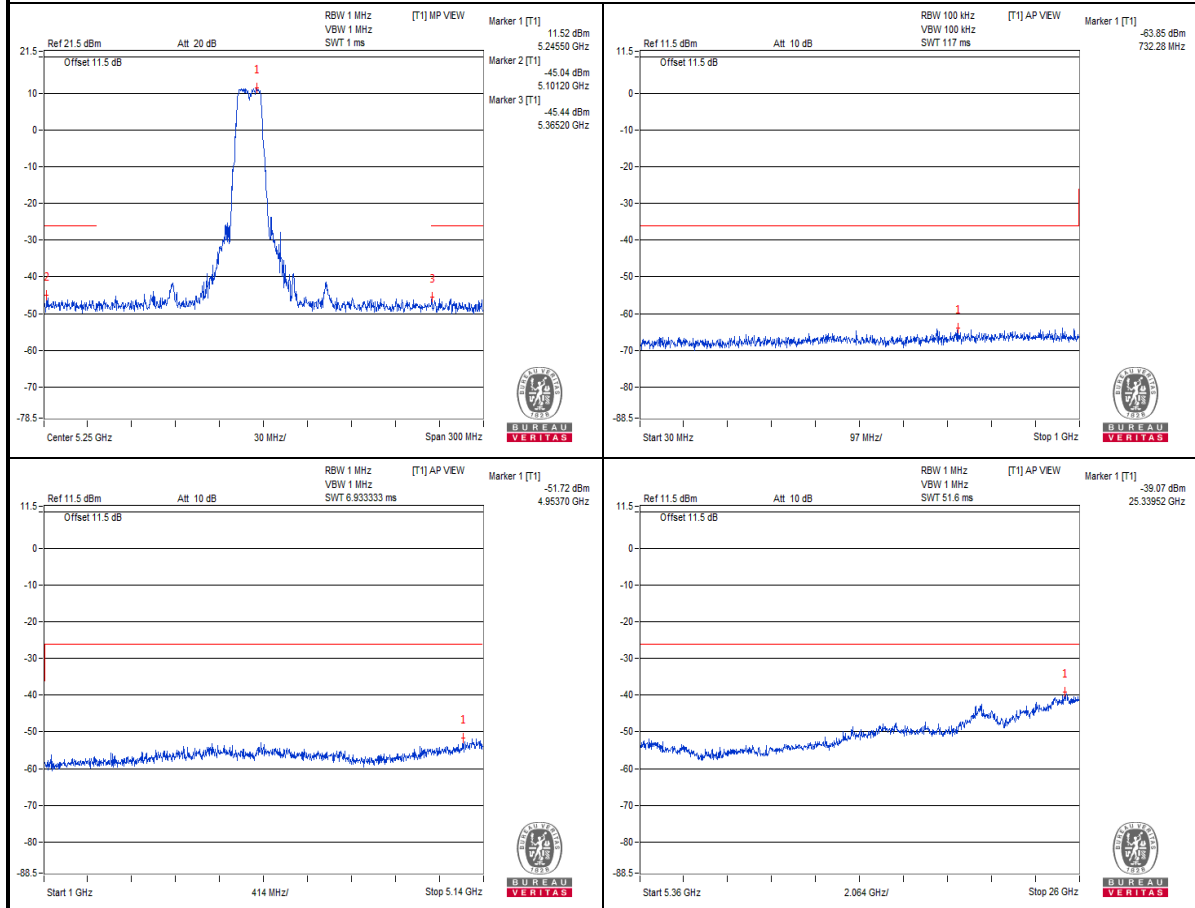
**NOTE:** 1. The worst value in each frequency range v.s. each channel has been marked by boldface.  
2. The spectrum plots are attached on the following pages.

Vnormal  
CH 36



Measurement uncertainty:  $\pm 3.93\text{dB}$

Vnormal  
CH 48



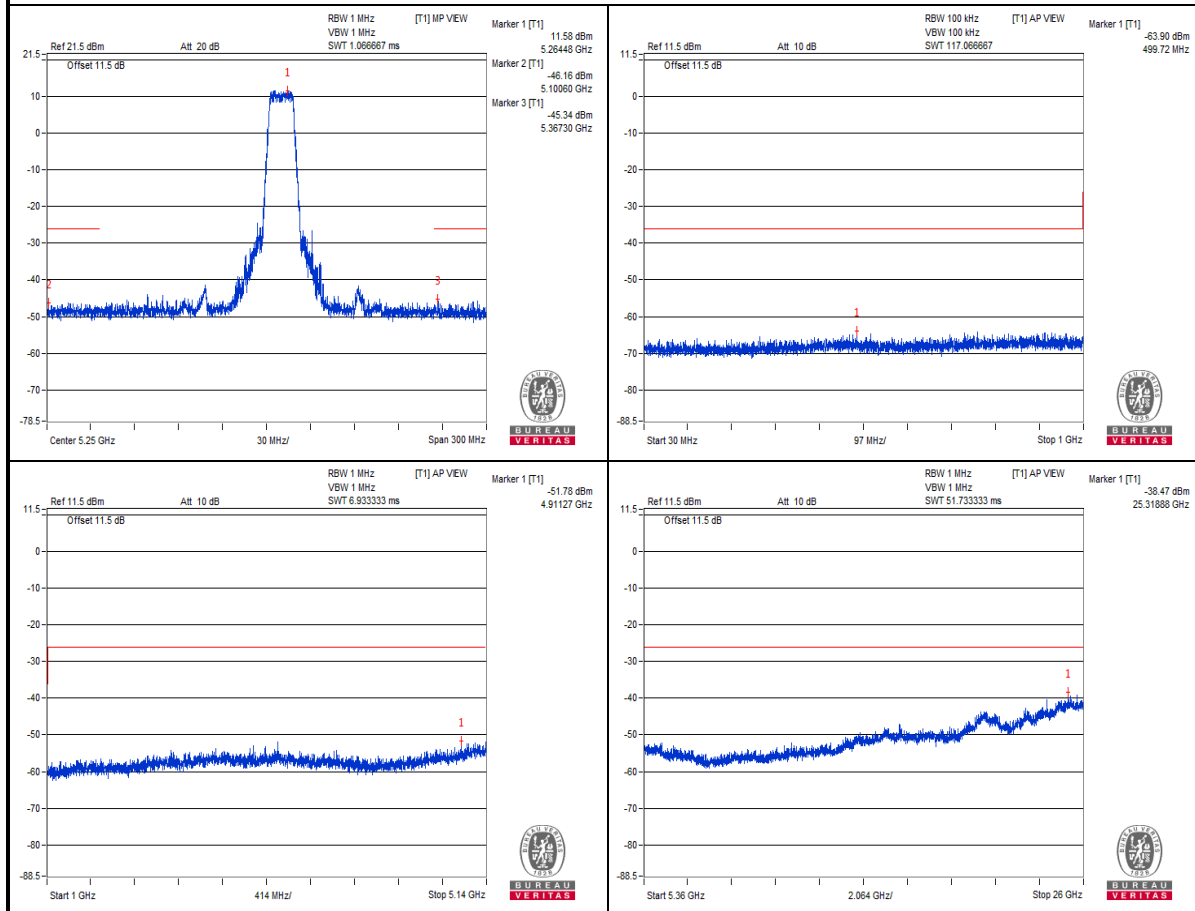
Measurement uncertainty:  $\pm 3.93\text{dB}$

**802.11a (W53)**

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH					
TEST CHANNEL		CH 52 (5260MHz)		CH 64 (5320MHz)		LIMIT	RESULT
TEST CONDITION	FREQUENCY RANGE	FREQUENCY (MHz)	MEASURE VALUE	FREQUENCY (MHz)	MEASURE VALUE		
<b>V<sub>normal</sub></b>	<b>30.0MHz ~ 1000.0MHz</b>	499.723	0.000407uW	914.640	0.000421uW	0.25uW/100kHz	PASS
	<b>1000.0MHz ~ 5135.0MHz</b>	4911.265	0.00663uW	5120.335	0.009051uW	2.5uW/MHz	PASS
	<b>5365.0MHz ~ 26000.0MHz</b>	25318.880	0.142243uW	25308.560	0.115529uW	2.5uW/MHz	PASS

**NOTE:** 1. The worst value in each frequency range v.s. each channel has been marked by boldface.  
2. The spectrum plots are attached on the following pages.

Vnormal  
CH 52



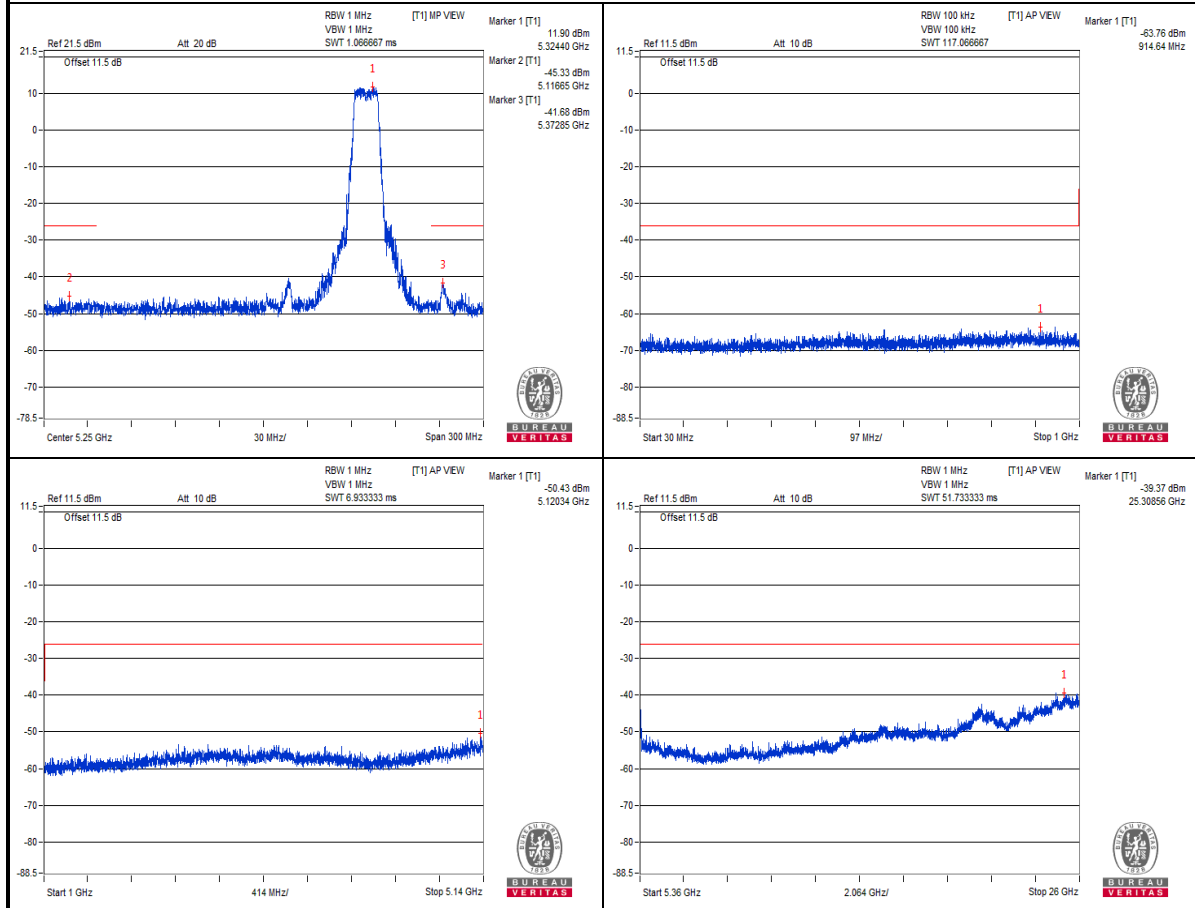
Measurement uncertainty:  $\pm 3.93\text{dB}$



BUREAU  
VERITAS

Test Report No.: RJ180530W011-3

Vnormal  
CH 64



Measurement uncertainty:  $\pm 3.93\text{dB}$

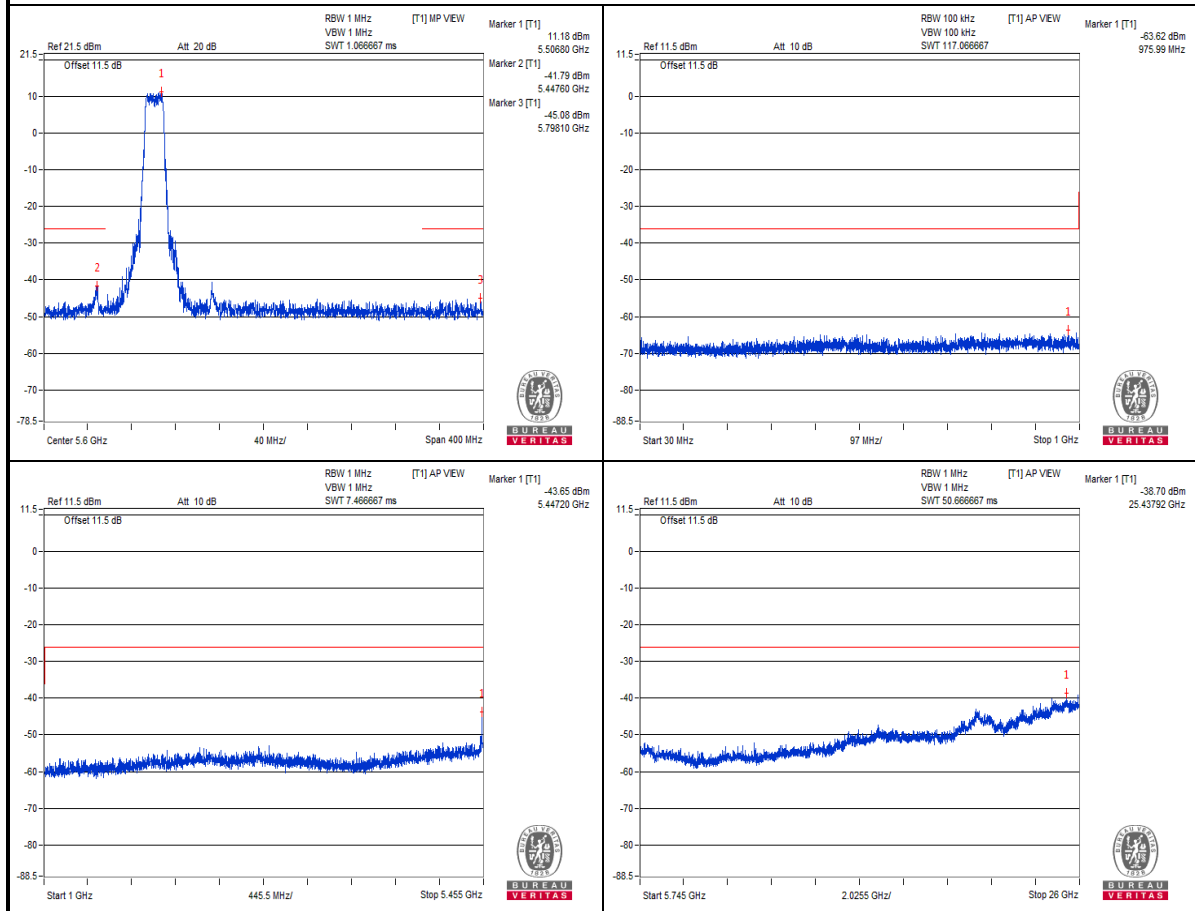
**802.11a (W56)**

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH					
TEST CHANNEL		CH 100 (5500MHz)		CH 120 (5600MHz)		LIMIT	RESULT
TEST CONDITION	FREQUENCY RANGE	FREQUENCY (MHz)	MEASURE VALUE	FREQUENCY (MHz)	MEASURE VALUE		
V <sub>normal</sub>	30.0MHz ~ 1000.0MHz	975.993	0.000434uW	878.265	0.000401uW	0.25uW/100kHz	PASS
	1000.0MHz ~ 5455.0MHz	5447.204	0.043178uW	5069.643	0.006173uW	2.5uW/MHz	PASS
	5745.0MHz ~ 26000.0MHz	25437.924	0.135009uW	25493.625	0.111922uW	2.5uW/MHz	PASS
TEST CHANNEL		CH140 (5700MHz)				LIMIT	RESULT
TEST CONDITION	FREQUENCY RANGE	FREQUENCY (MHz)		MEASURE VALUE			
V <sub>normal</sub>	30.0MHz ~ 1000.0MHz	996.120		0.000379uW		0.25uW/100kHz	PASS
	1000.0MHz ~ 5455.0MHz	5264.549		0.005797uW		2.5uW/MHz	PASS
	5745.0MHz ~ 26000.0MHz	25397.414		0.094754uW		2.5uW/MHz	PASS

**NOTE:** 1. The worst value in each frequency range v.s. each channel has been marked by boldface.  
2. The spectrum plots are attached on the following pages.

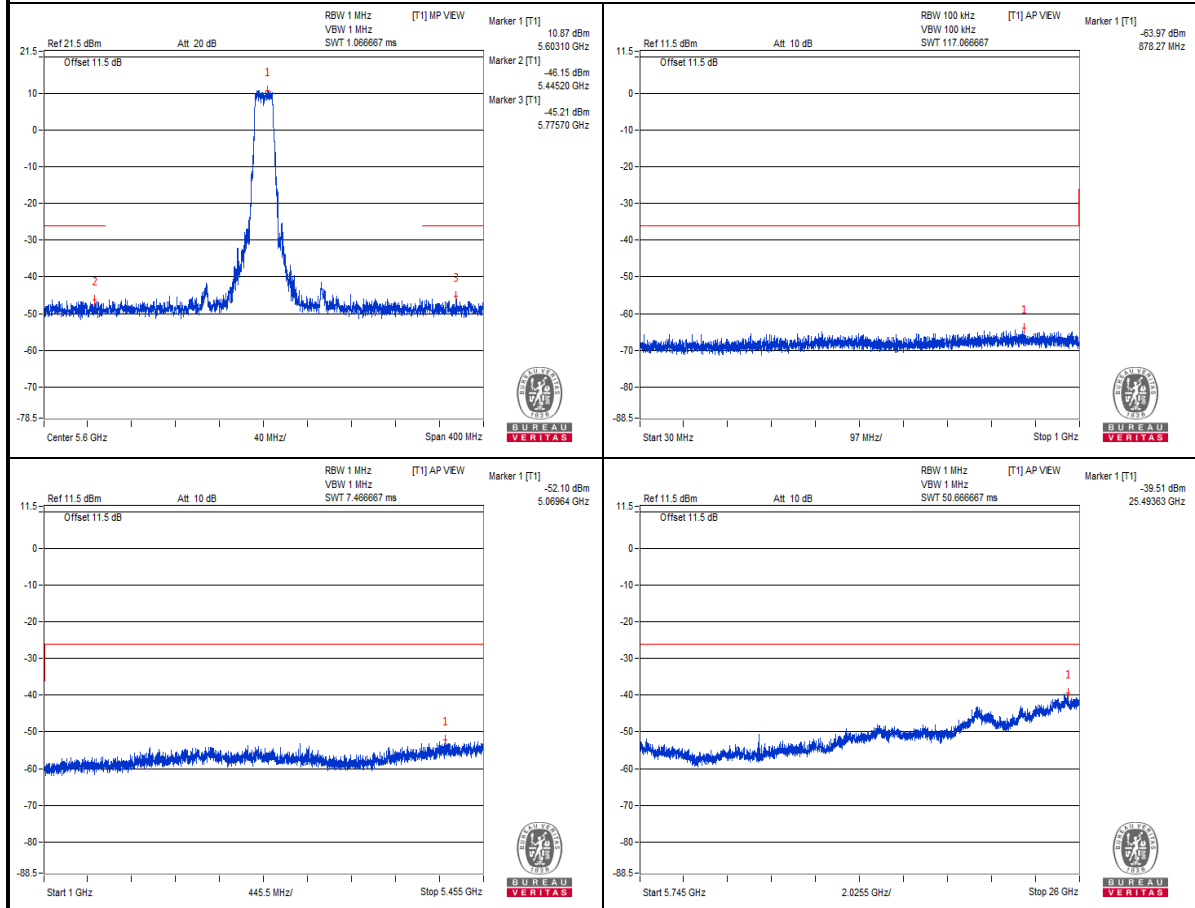


Vnormal  
CH 100



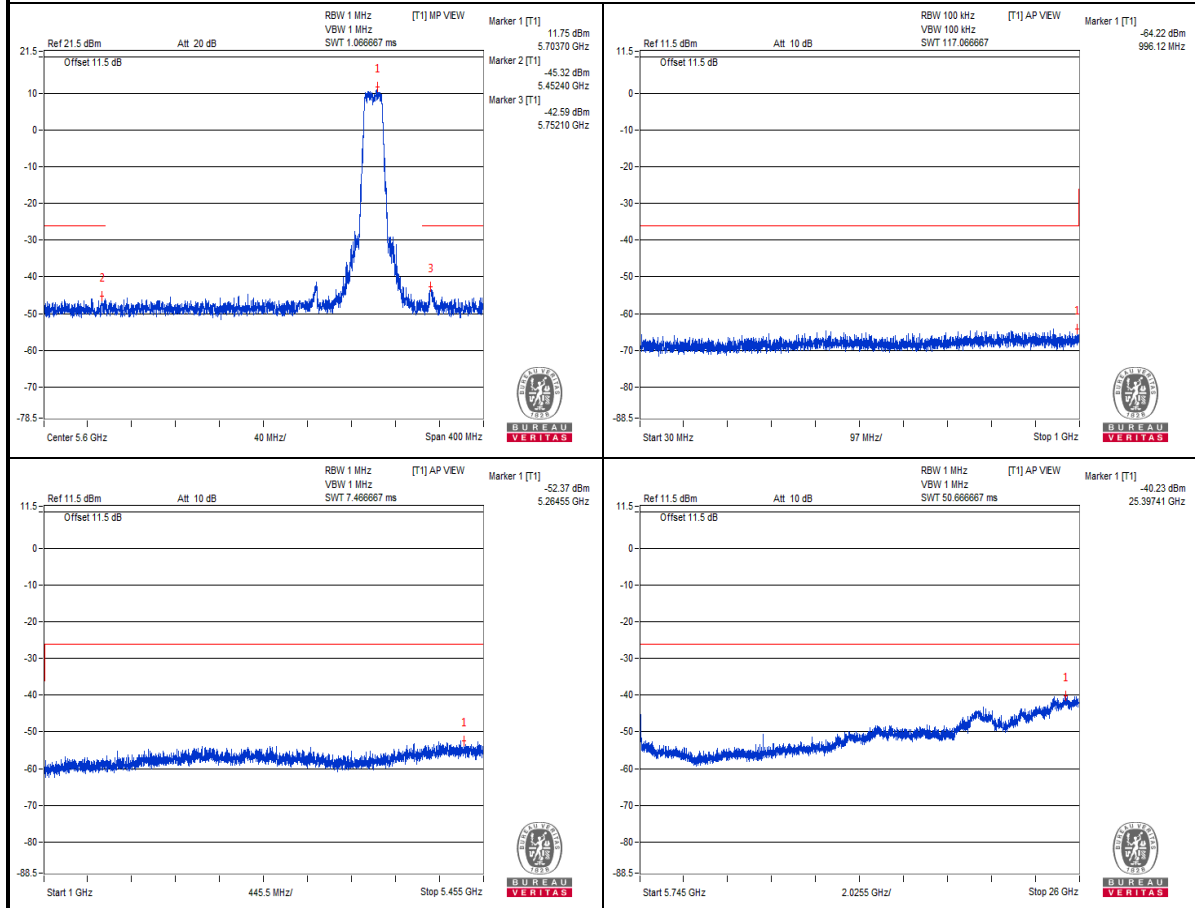
Measurement uncertainty:  $\pm 3.93\text{dB}$

Vnormal  
CH 120



Measurement uncertainty:  $\pm 3.93\text{dB}$

Vnormal  
CH 140



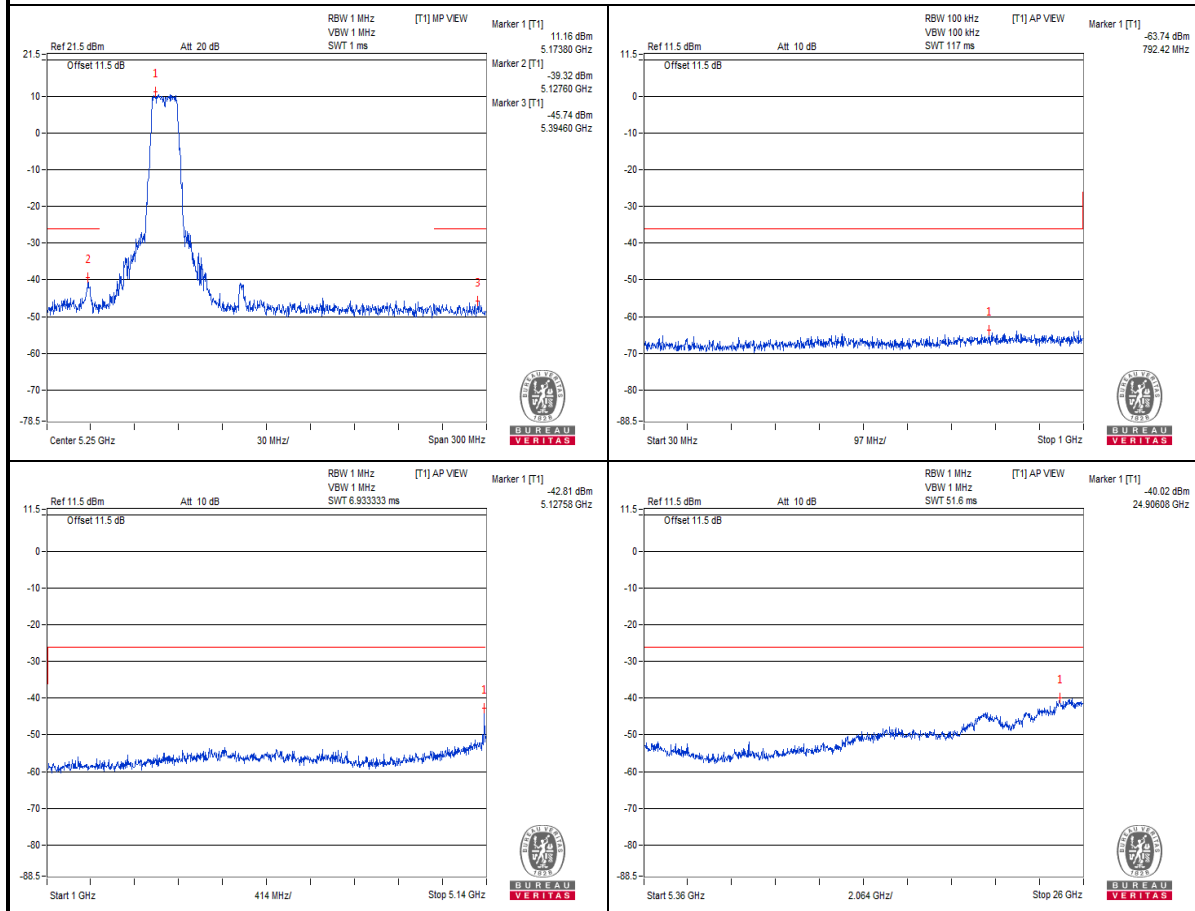
Measurement uncertainty:  $\pm 3.93\text{dB}$

**802.11n (20MHz) (W52)**

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH					
TEST CHANNEL		CH36 (5180MHz)		CH48 (5240MHz)		LIMIT	RESULT
TEST CONDITION	FREQUENCY RANGE	FREQUENCY (MHz)	MEASURE VALUE	FREQUENCY (MHz)	MEASURE VALUE		
V <sub>normal</sub>	30.0MHz ~ 1000.0MHz	792.420	0.000422uW	848.680	0.000355uW	0.25uW/100kHz	PASS
	1000.0MHz ~ 5135.0MHz	5127.580	0.052356uW	5057.200	0.006897uW	2.5uW/MHz	PASS
	5365.0MHz ~ 26000.0MHz	24906.080	0.099466uW	25380.800	0.102353uW	2.5uW/MHz	PASS

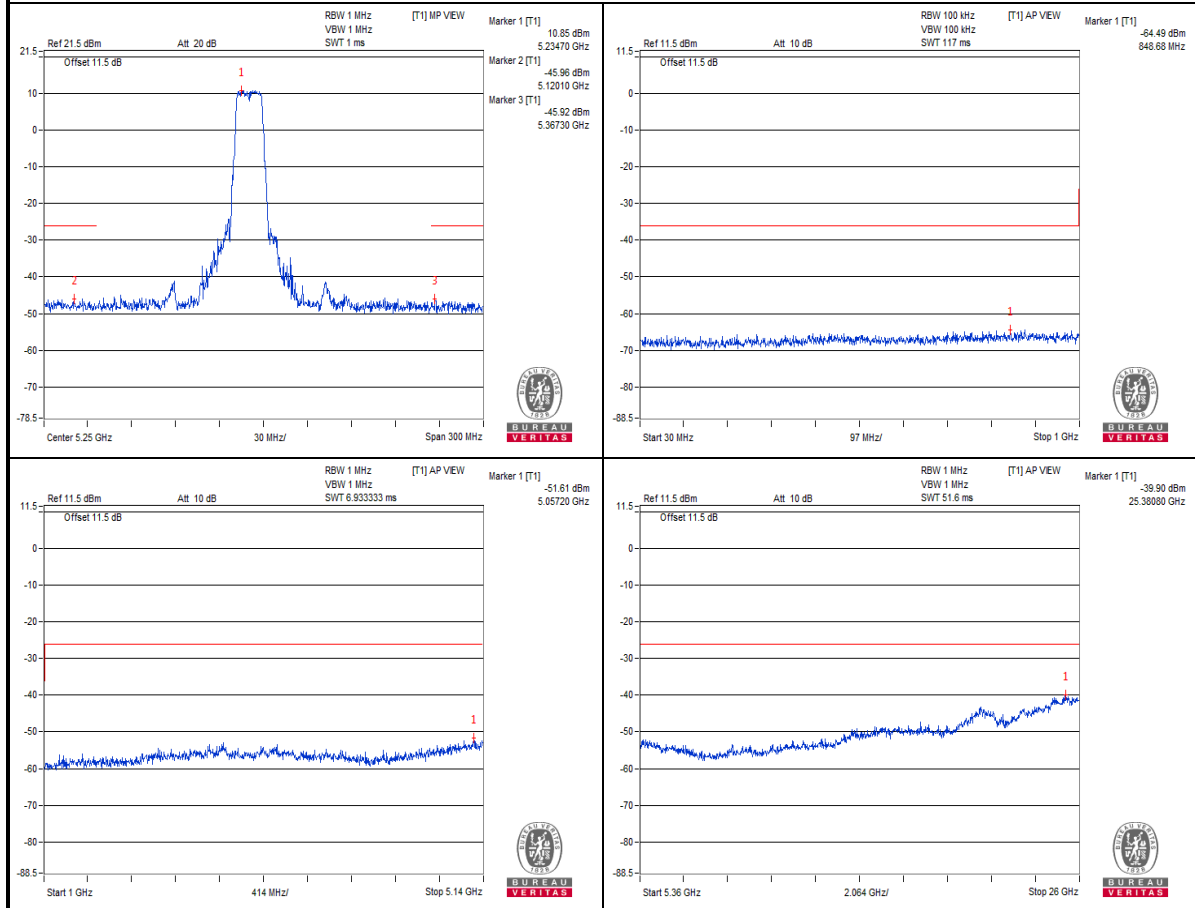
**NOTE:** 1. The worst value in each frequency range v.s. each channel has been marked by boldface.  
2. The spectrum plots are attached on the following pages.

Vnormal  
CH 36



Measurement uncertainty:  $\pm 3.93\text{dB}$

**Vnormal  
CH 48**



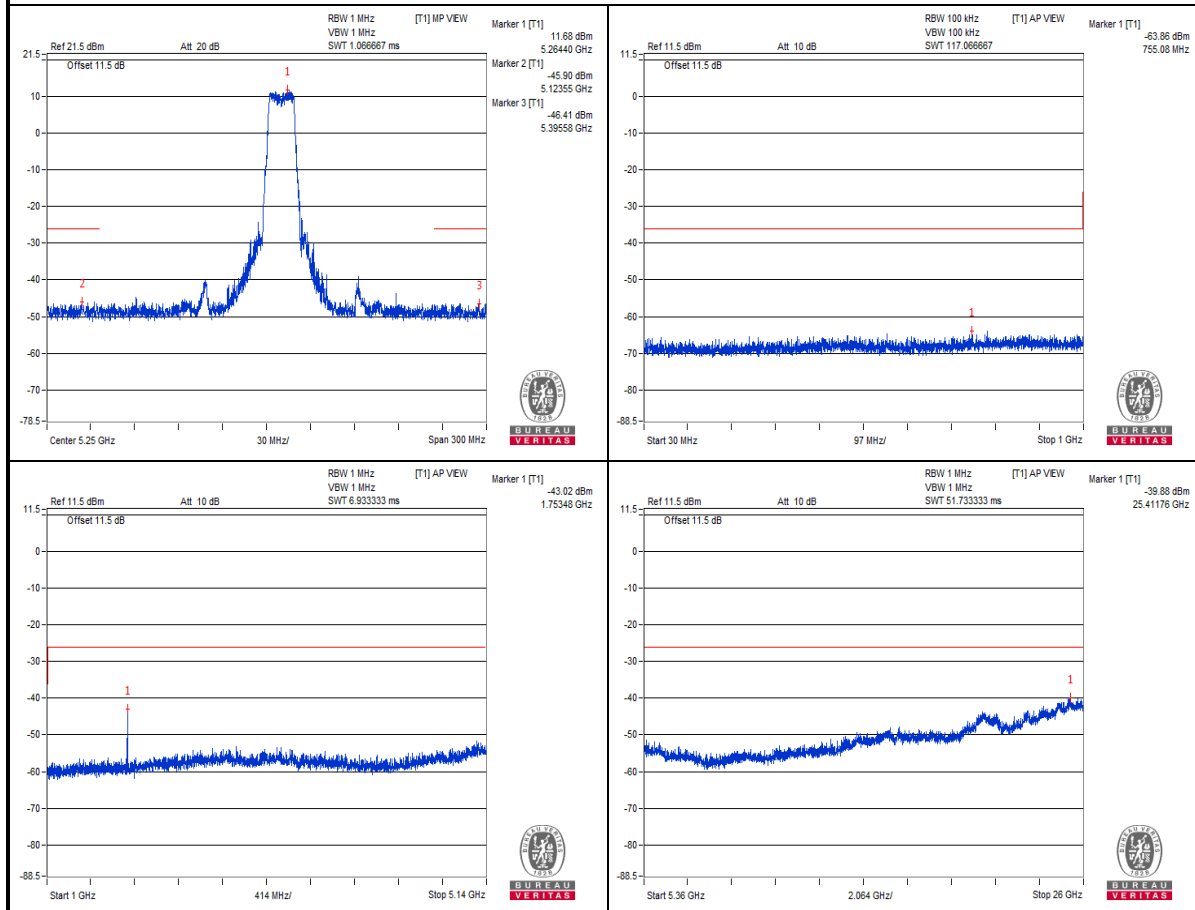
**Measurement uncertainty:  $\pm 3.93\text{dB}$**

**802.11n 20MHz (W53)**

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH					
TEST CHANNEL		CH 52 (5260MHz)		CH 64 (5320MHz)		LIMIT	RESULT
TEST CONDITION	FREQUENCY RANGE	FREQUENCY (MHz)	MEASURE VALUE	FREQUENCY (MHz)	MEASURE VALUE		
V <sub>normal</sub>	30.0MHz ~ 1000.0MHz	755.075	0.000411uW	857.653	0.0004uW	0.25uW/100kHz	PASS
	1000.0MHz ~ 5135.0MHz	1753.480	0.049868uW	1763.830	0.044718uW	2.5uW/MHz	PASS
	5365.0MHz ~ 26000.0MHz	25411.760	0.102717uW	25416.920	0.092609uW	2.5uW/MHz	PASS

**NOTE:** 1. The worst value in each frequency range v.s. each channel has been marked by boldface.  
2. The spectrum plots are attached on the following pages.

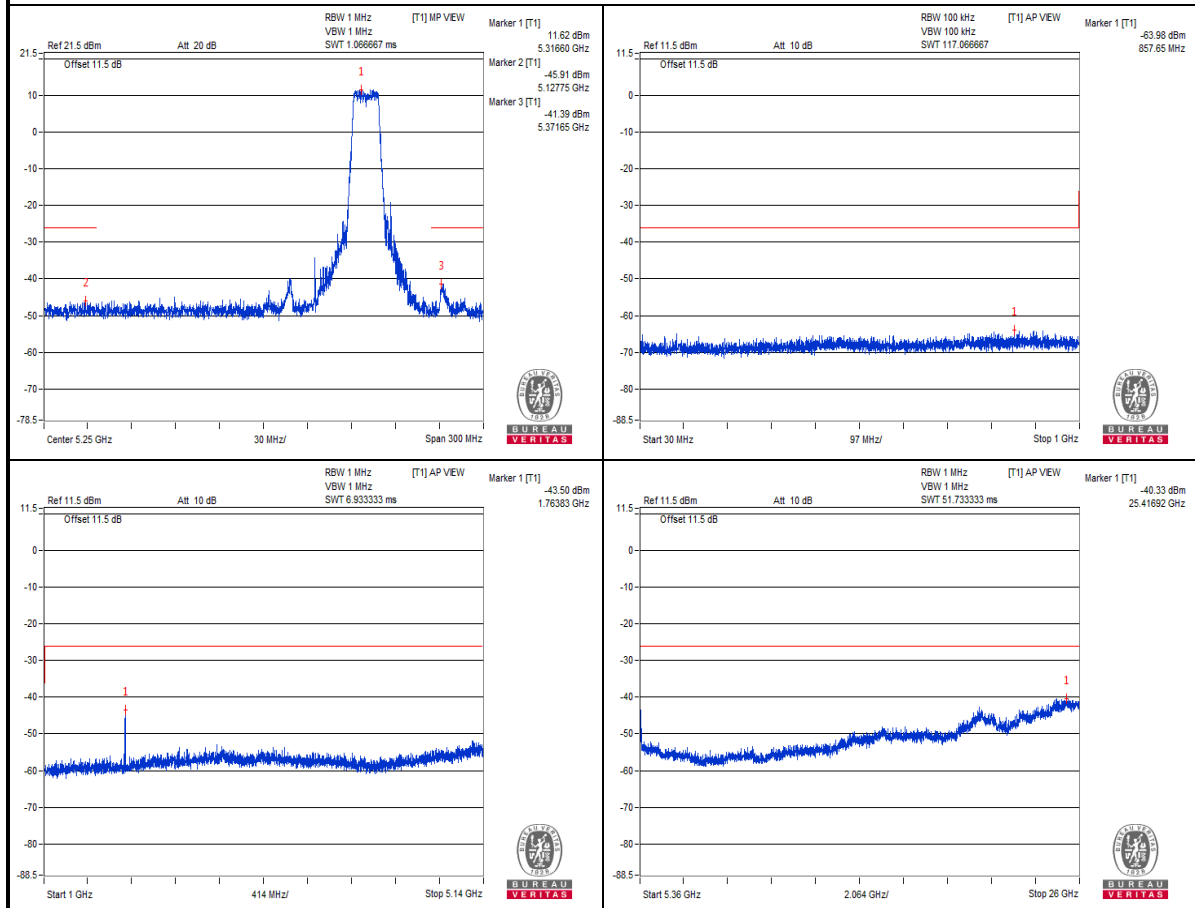
Vnormal  
CH 52



Measurement uncertainty:  $\pm 3.93\text{dB}$



Vnormal  
CH 64



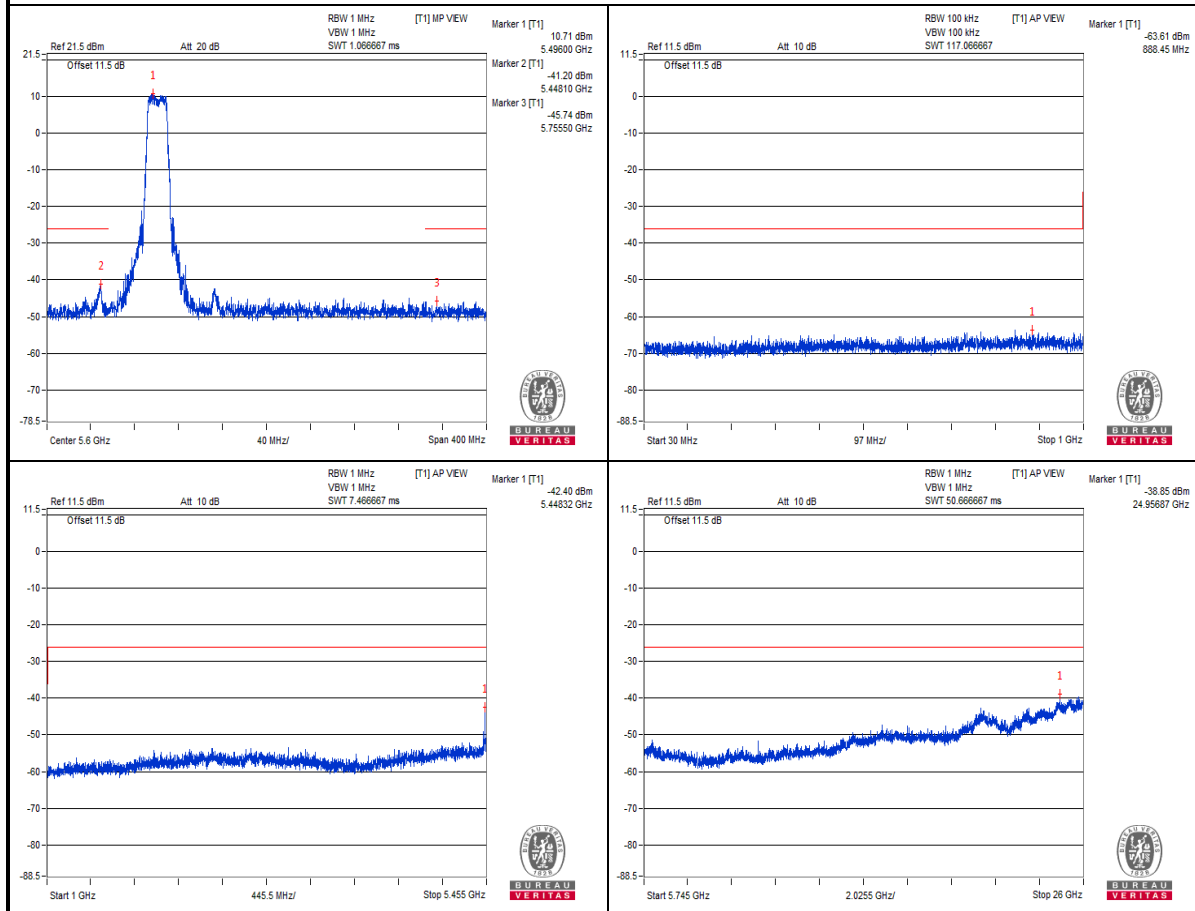
Measurement uncertainty:  $\pm 3.93\text{dB}$

**802.11n 20MHz (W56)**

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH					
TEST CHANNEL		CH 100 (5500MHz)		CH 120 (5600MHz)		LIMIT	RESULT
TEST CONDITION	FREQUENCY RANGE	FREQUENCY (MHz)	MEASURE VALUE	FREQUENCY (MHz)	MEASURE VALUE		
V <sub>normal</sub>	30.0MHz ~ 1000.0MHz	888.450	0.000436uW	830.493	0.000566uW	0.25uW/100kHz	PASS
	1000.0MHz ~ 5455.0MHz	5448.318	0.057553uW	5201.065	0.008572uW	2.5uW/MHz	PASS
	5745.0MHz ~ 26000.0MHz	24956.868	0.130192uW	25427.796	0.108862uW	2.5uW/MHz	PASS
TEST CHANNEL		CH140 (5700MHz)				LIMIT	RESULT
TEST CONDITION	FREQUENCY RANGE	FREQUENCY (MHz)		MEASURE VALUE			
V <sub>normal</sub>	30.0MHz ~ 1000.0MHz	774.960		0.000441uW		0.25uW/100kHz	PASS
	1000.0MHz ~ 5455.0MHz	1746.213		0.032067uW		2.5uW/MHz	PASS
	5745.0MHz ~ 26000.0MHz	25944.299		0.108928uW		2.5uW/MHz	PASS

**NOTE:** 1. The worst value in each frequency range v.s. each channel has been marked by boldface.  
2. The spectrum plots are attached on the following pages.

Vnormal  
CH 100



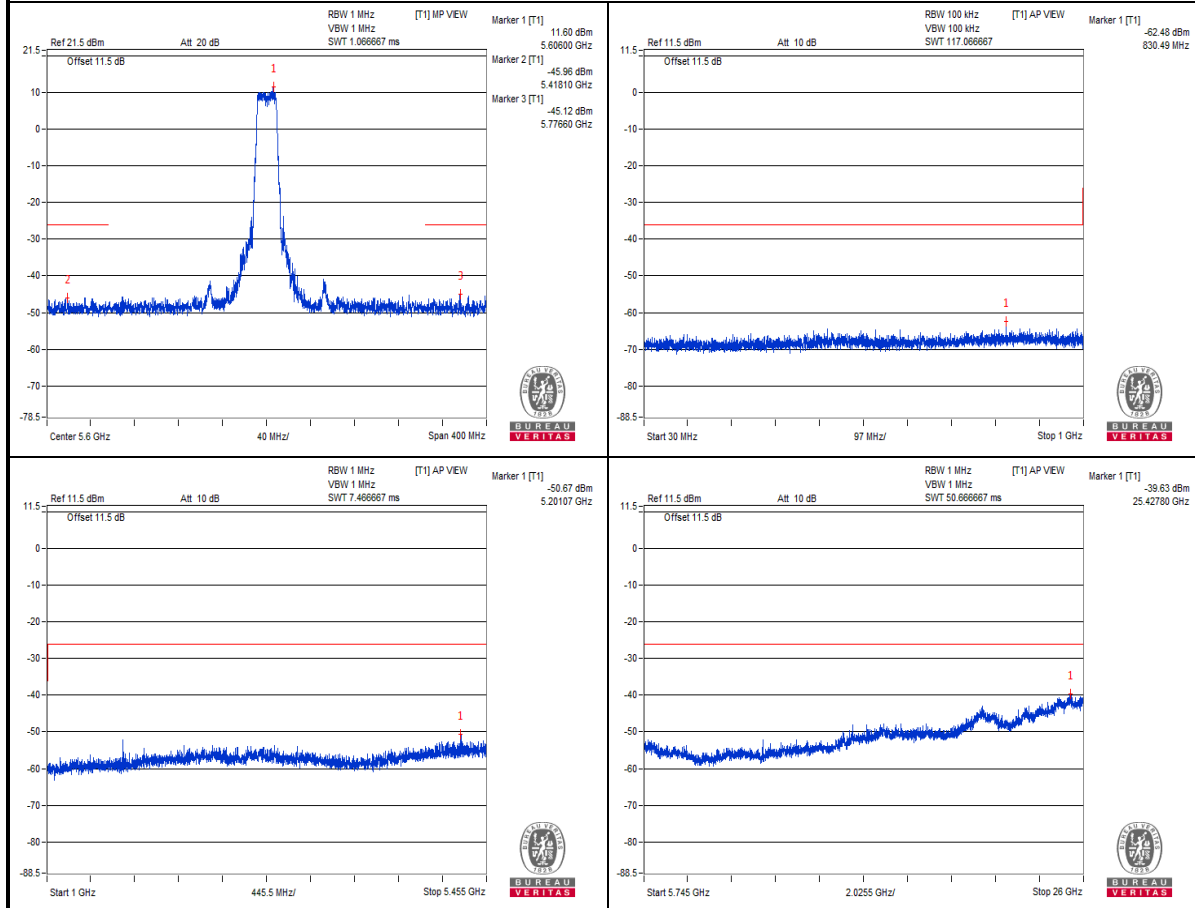
Measurement uncertainty:  $\pm 3.93\text{dB}$



BUREAU  
VERITAS

Test Report No.: RJ180530W011-3

Vnormal  
CH 120



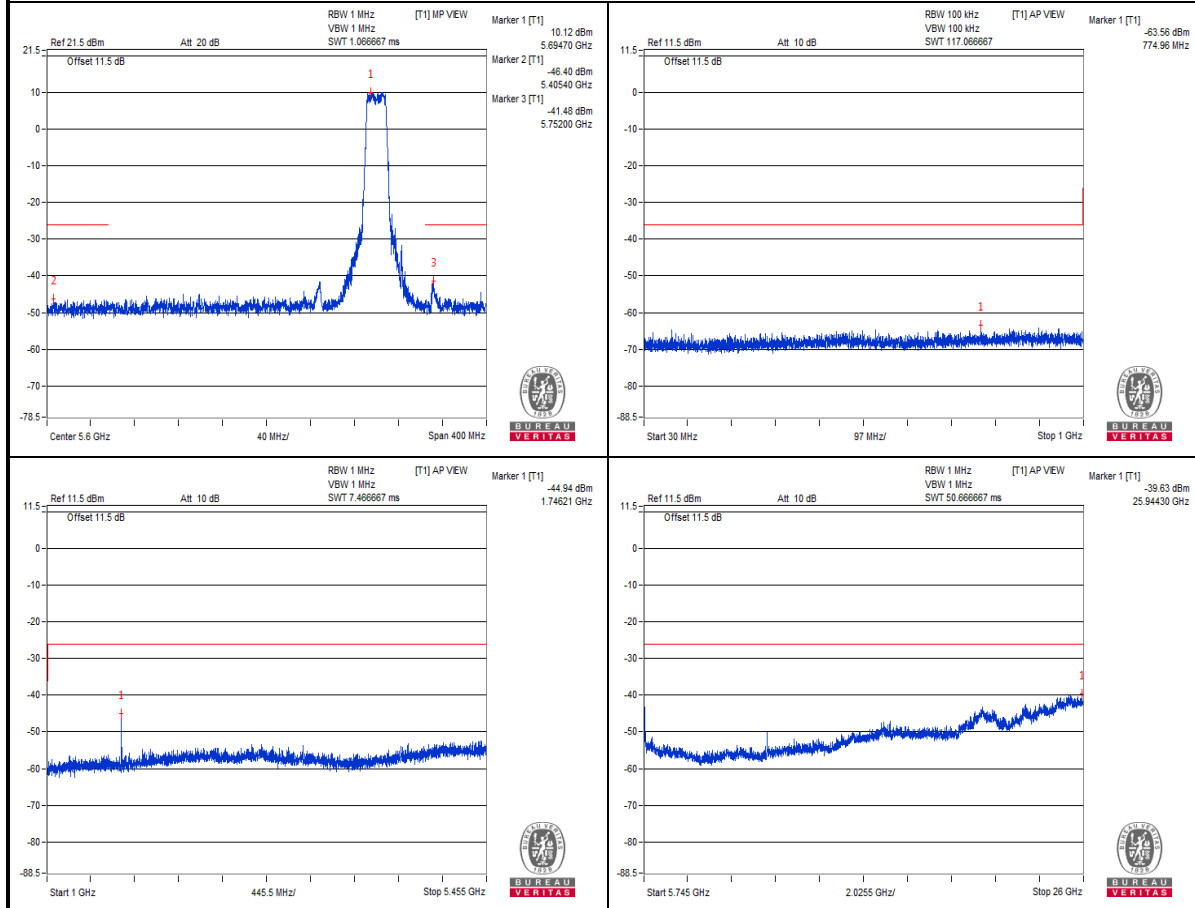
Measurement uncertainty:  $\pm 3.93\text{dB}$



BUREAU  
VERITAS

Test Report No.: RJ180530W011-3

Vnormal  
CH 140



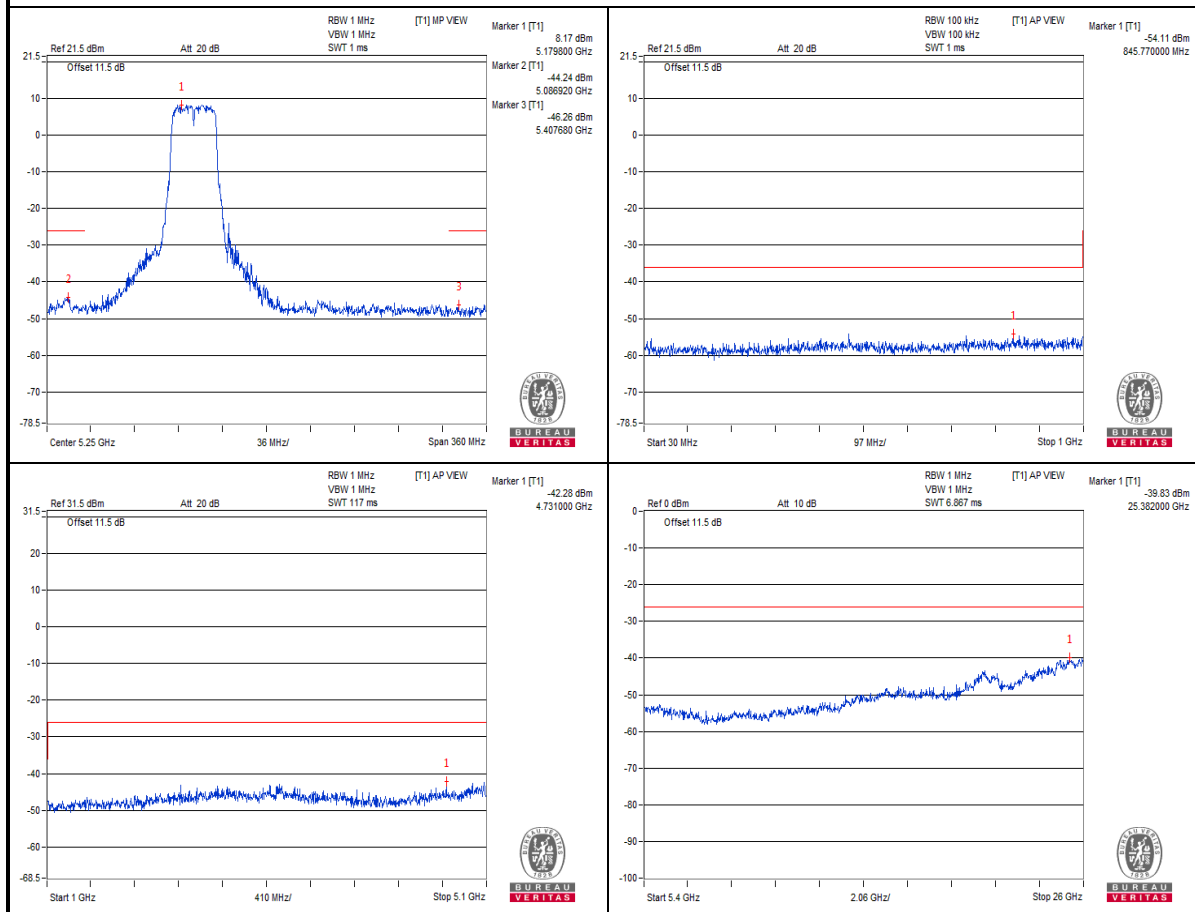
Measurement uncertainty:  $\pm 3.93\text{dB}$

**802.11n 40MHz (W52)**

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH					
TEST CHANNEL		CH38 (5190MHz)		CH46 (5230MHz)		LIMIT	RESULT
TEST CONDITION	FREQUENCY RANGE	FREQUENCY (MHz)	MEASURE VALUE	FREQUENCY (MHz)	MEASURE VALUE		
V <sub>normal</sub>	30.0MHz ~ 1000.0MHz	845.770	0.003878uW	504.330	0.003309uW	0.25uW/100kHz	PASS
	1000.0MHz ~ 5100.0MHz	4731.000	0.059091uW	4985.200	0.051248uW	2.5uW/MHz	PASS
	5400.0MHz ~ 26000.0MHz	25382.000	0.104032uW	25835.200	0.088327uW	2.5uW/MHz	PASS

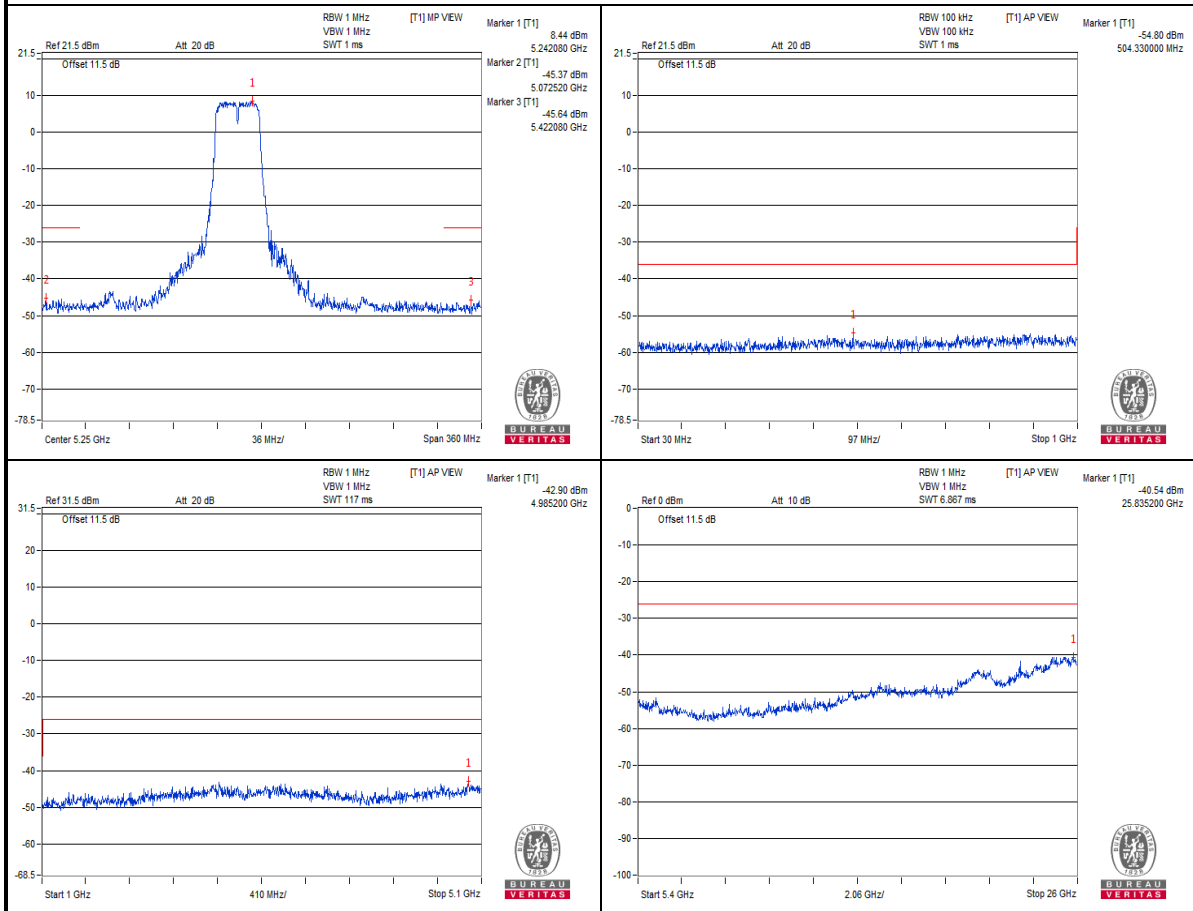
**NOTE:** 1. The worst value in each frequency range v.s. each channel has been marked by boldface.  
2. The spectrum plots are attached on the following pages.

Vnormal  
CH 38



Measurement uncertainty:  $\pm 3.93\text{dB}$

Vnormal  
CH 46



Measurement uncertainty:  $\pm 3.93\text{dB}$

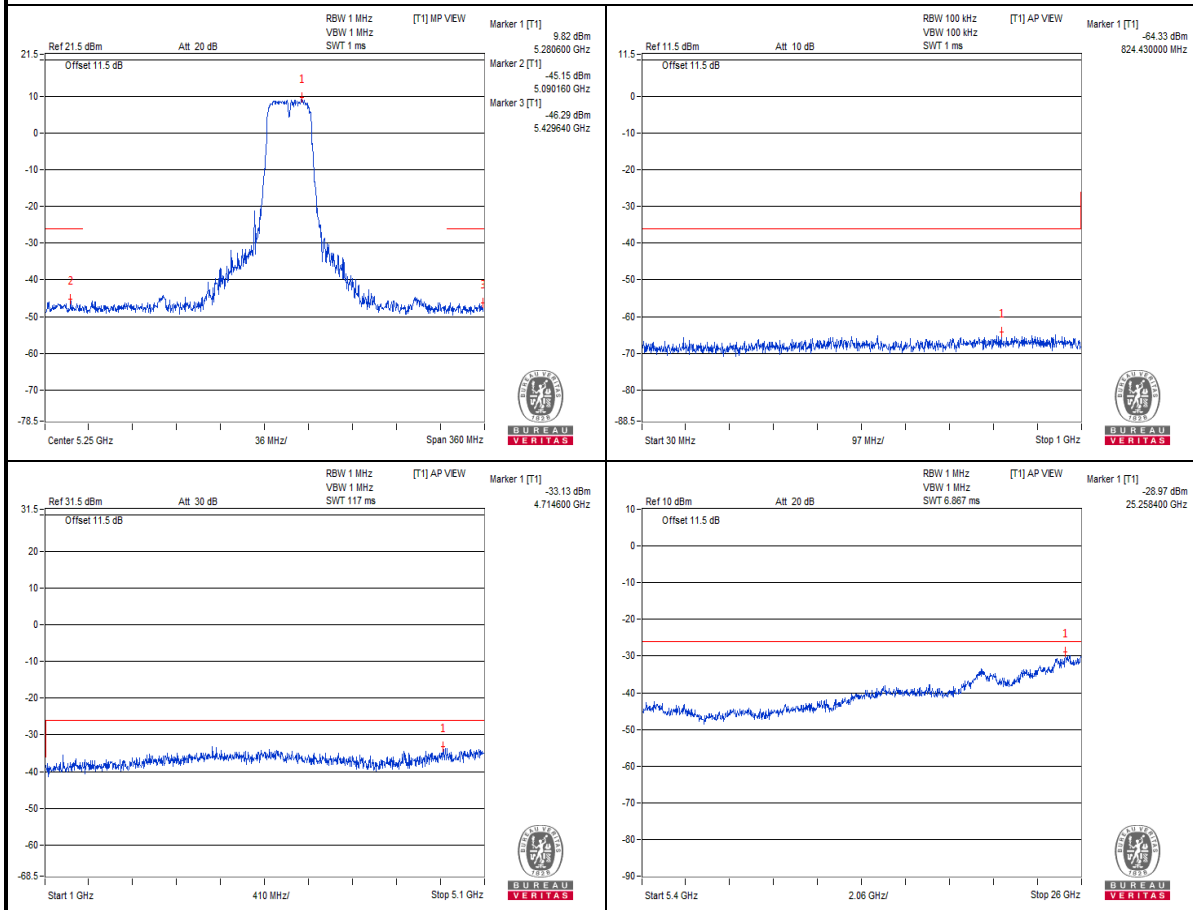


**802.11n 40MHz (W53)**

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH					
TEST CHANNEL		CH 54 (5270MHz)		CH 62 (5310MHz)		LIMIT	RESULT
TEST CONDITION	FREQUENCY RANGE	FREQUENCY (MHz)	MEASURE VALUE	FREQUENCY (MHz)	MEASURE VALUE		
V <sub>normal</sub>	30.0MHz ~ 1000.0MHz	824.430	0.000369uW	934.040	0.000327uW	0.25uW/100kHz	PASS
	1000.0MHz ~ 5100.0MHz	4714.600	0.486235uW	3041.800	0.556939uW	2.5uW/MHz	PASS
	5400.0MHz ~ 26000.0MHz	25258.400	1.266571uW	25897.000	1.059897uW	2.5uW/MHz	PASS

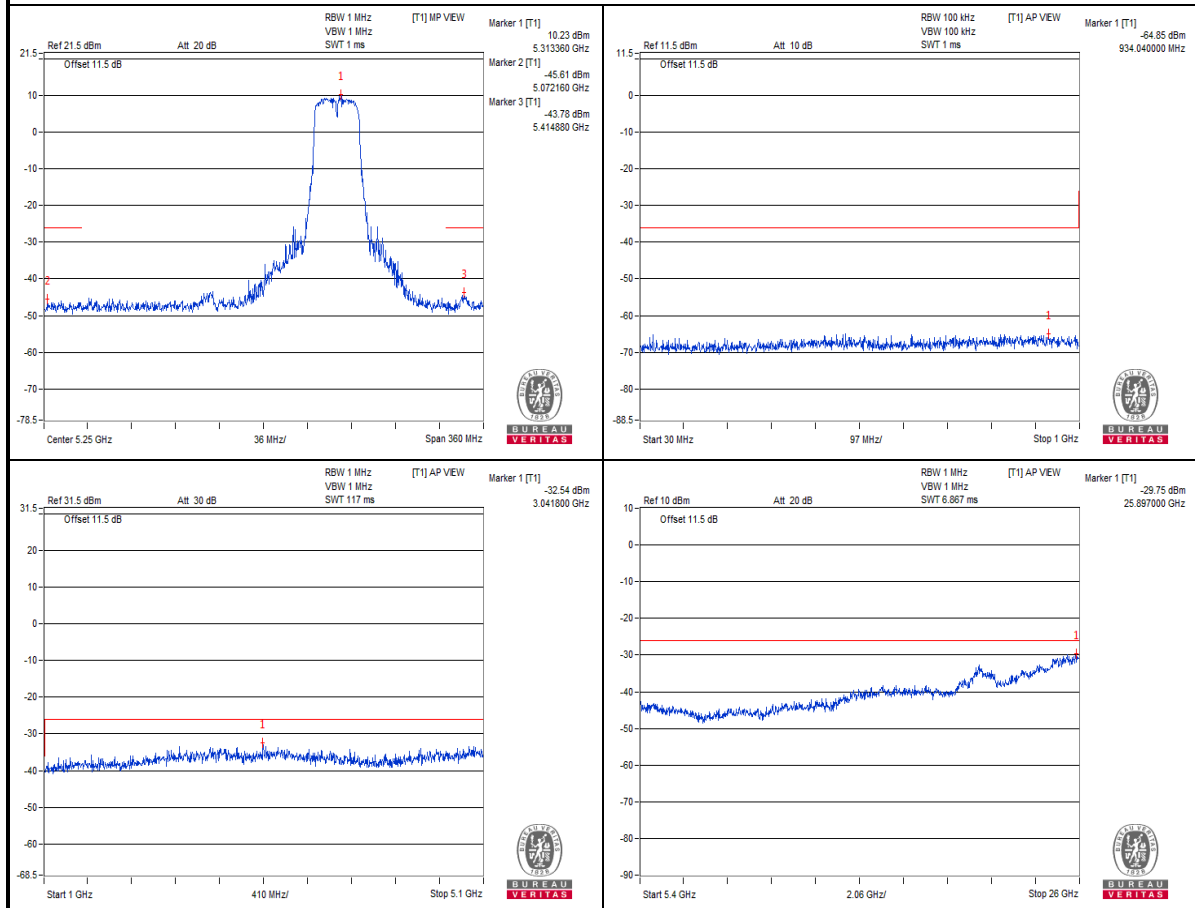
**NOTE:** 1. The worst value in each frequency range v.s. each channel has been marked by boldface.  
2. The spectrum plots are attached on the following pages.

Vnormal  
CH 54



Measurement uncertainty:  $\pm 3.93\text{dB}$

Vnormal  
CH 62



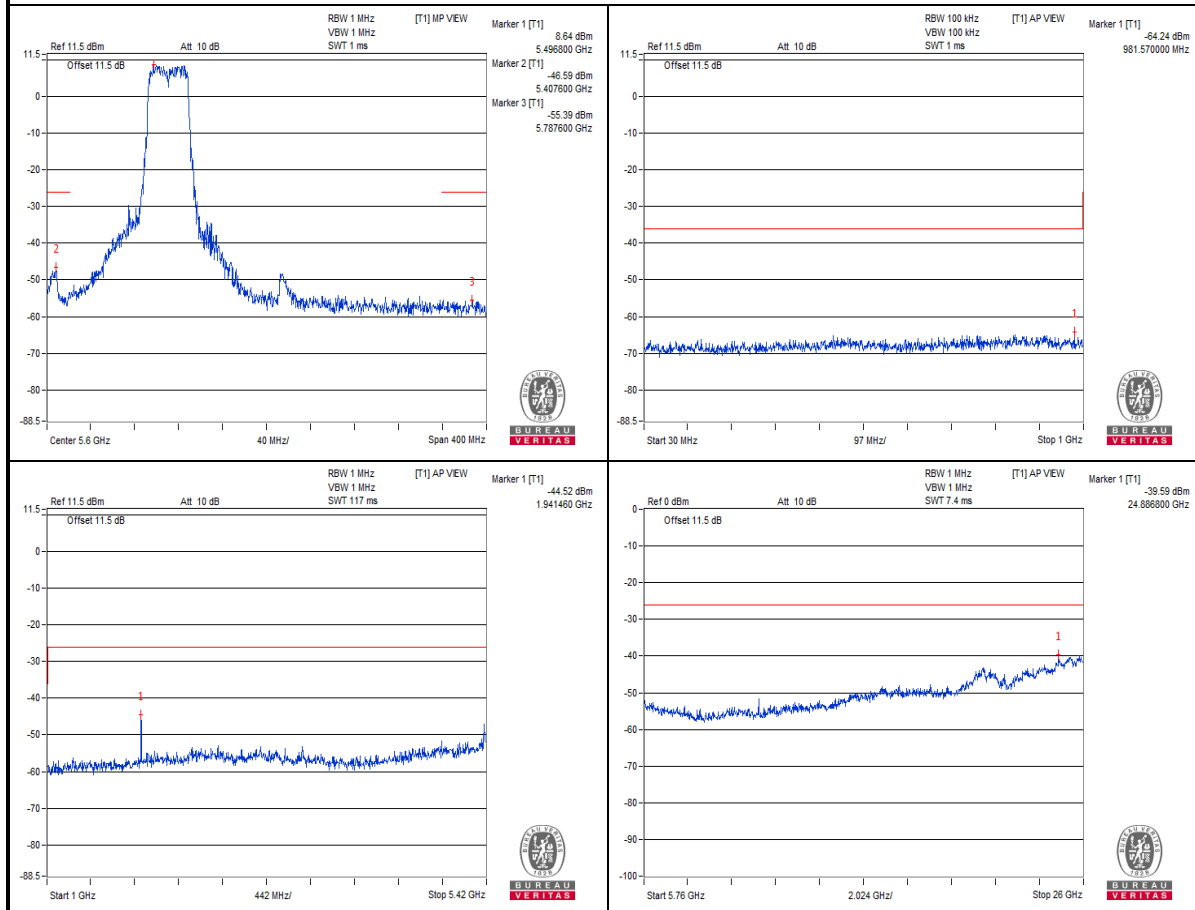
Measurement uncertainty:  $\pm 3.93\text{dB}$

**802.11n 40MHz (W56)**

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH					
TEST CHANNEL		CH 102 (5510MHz)		CH 118 (5590MHz)		LIMIT	RESULT
TEST CONDITION	FREQUENCY RANGE	FREQUENCY (MHz)	MEASURE VALUE	FREQUENCY (MHz)	MEASURE VALUE		
V <sub>normal</sub>	30.0MHz ~ 1000.0MHz	981.570	0.000377uW	423.820	0.000463uW	0.25uW/100kHz	PASS
	1000.0MHz ~ 5420.0MHz	1941.460	0.035288uW	1751.400	0.014548uW	2.5uW/MHz	PASS
	5760MHz ~ 26000.0MHz	24886.800	0.109777uW	25858.320	0.107978uW	2.5uW/MHz	PASS
TEST CHANNEL		CH 134 (5670MHz)				LIMIT	RESULT
TEST CONDITION	FREQUENCY RANGE	FREQUENCY (MHz)		MEASURE VALUE			
V <sub>normal</sub>	30.0MHz ~ 1000.0MHz	519.850		0.000476uW		0.25uW/100kHz	PASS
	1000.0MHz ~ 5420.0MHz	1751.400		0.015673uW		2.5uW/MHz	PASS
	5760MHz ~ 26000.0MHz	25919.040		0.097702uW		2.5uW/MHz	PASS

**NOTE:** 1. The worst value in each frequency range v.s. each channel has been marked by boldface.  
2. The spectrum plots are attached on the following pages.

Vnormal  
CH 102



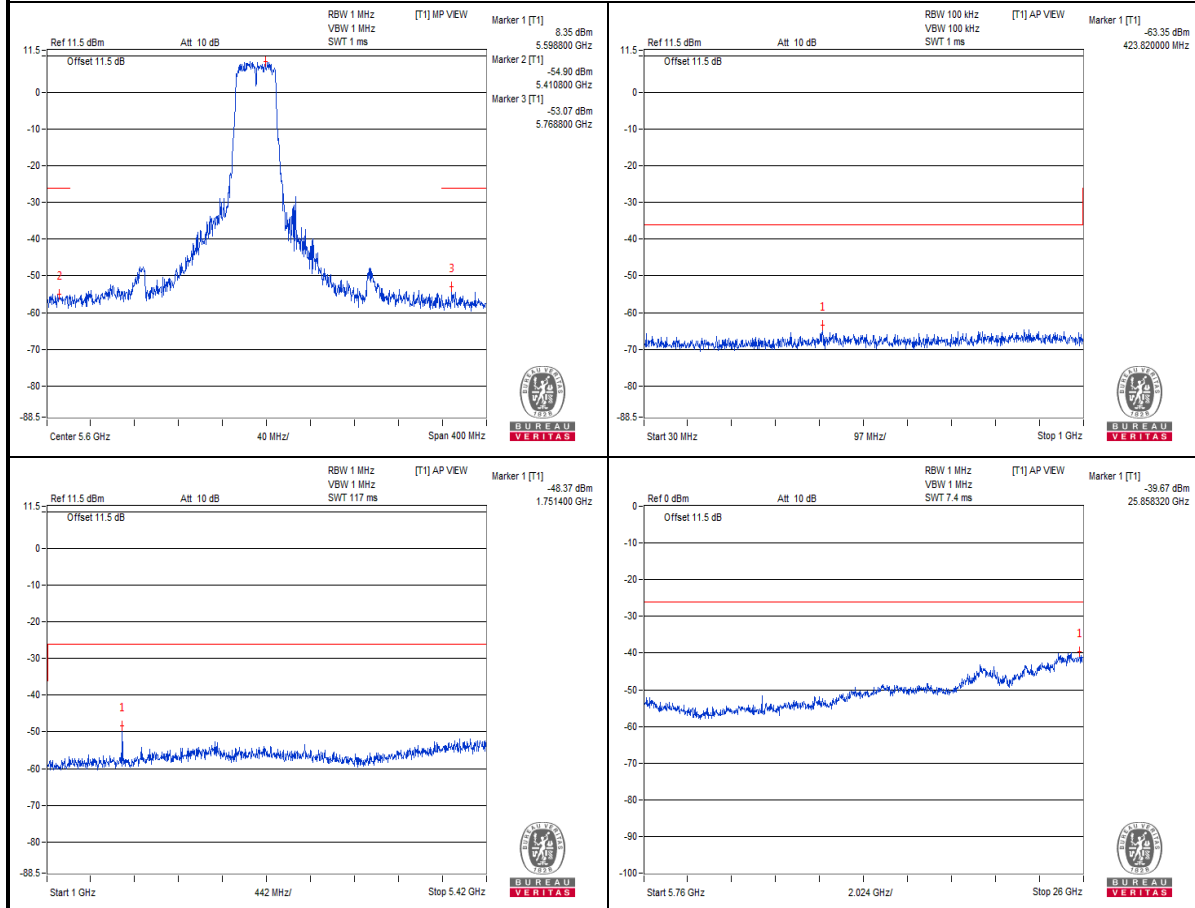
Measurement uncertainty:  $\pm 3.93\text{dB}$



BUREAU  
VERITAS

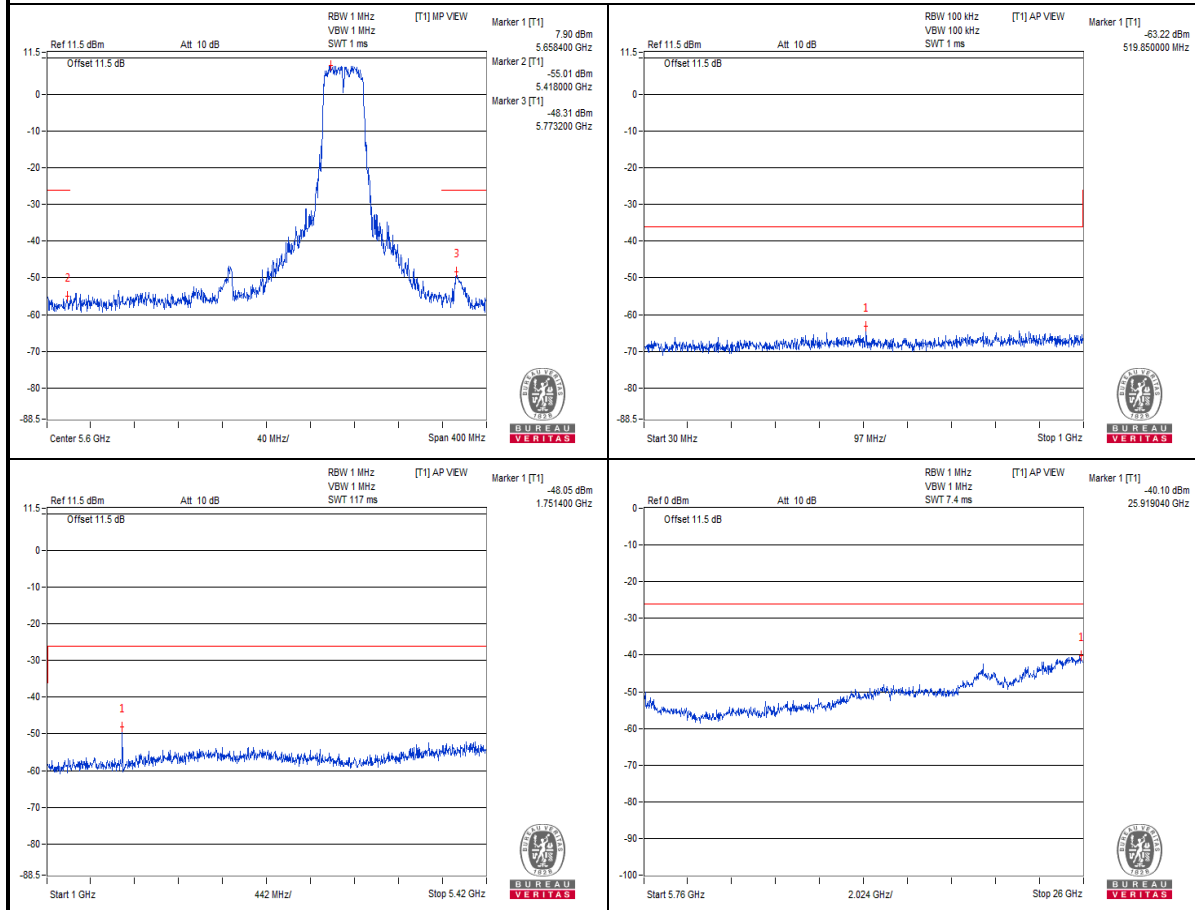
Test Report No.: RJ180530W011-3

Vnormal  
CH 118



Measurement uncertainty:  $\pm 3.93\text{dB}$

Vnormal  
CH 134



Measurement uncertainty:  $\pm 3.93\text{dB}$

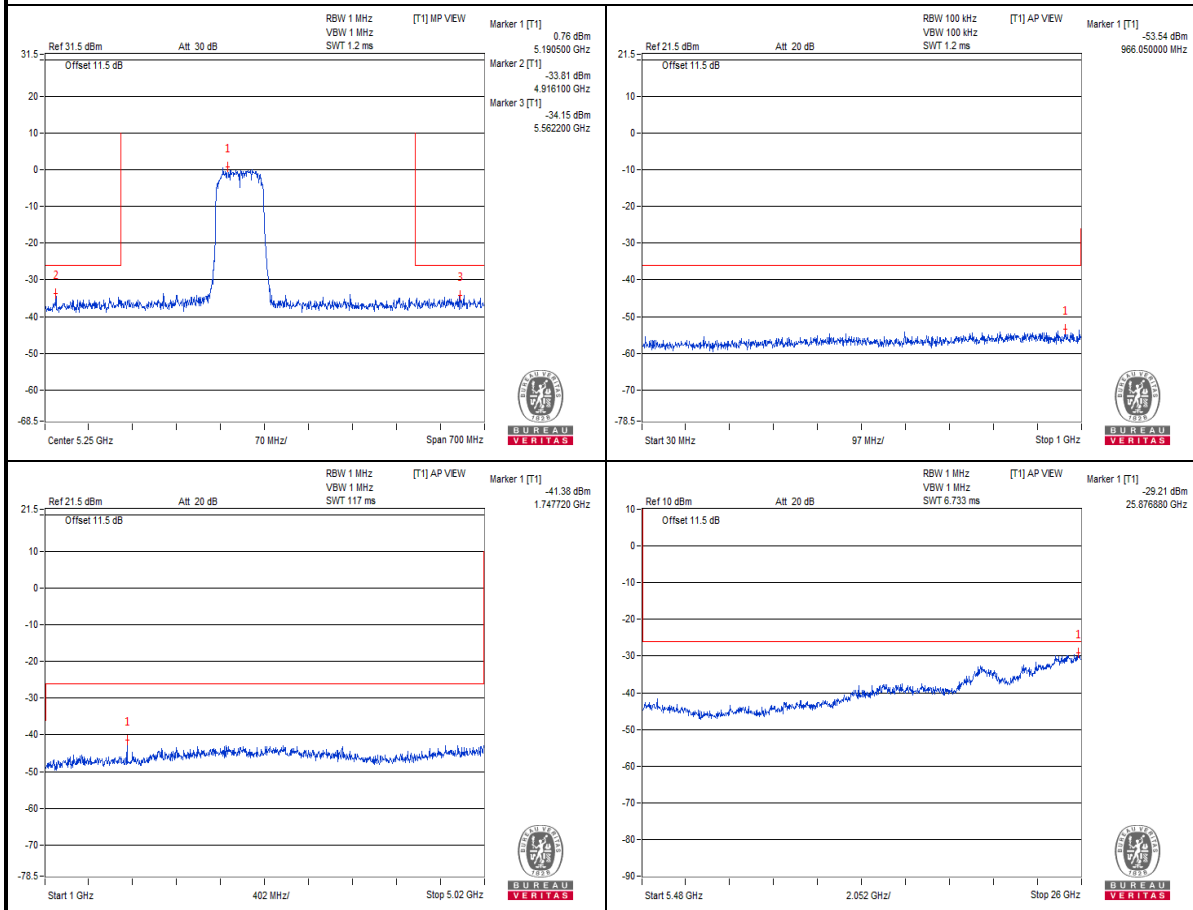
**802.11ac 80MHz (W52)**

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH			
TEST CHANNEL		CH 42 (5210MHz)		LIMIT	RESULT
TEST CONDITION	FREQUENCY RANGE	FREQUENCY (MHz)	MEASURE VALUE		
V <sub>normal</sub>	30MHz to 1000MHz	966.050	0.004426uW	0.25uW/100kHz	PASS
	1000MHz to 5020MHz	1747.720	0.072745uW	2.5uW/MHz	PASS
	5480MHz to 26000MHz	25876.880	1.198258uW	2.5uW/MHz	PASS

**NOTE:** 1. The worst value in each frequency range v.s. each channel has been marked by boldface.  
2. The spectrum plots are attached on the following pages.



Vnormal  
CH 42



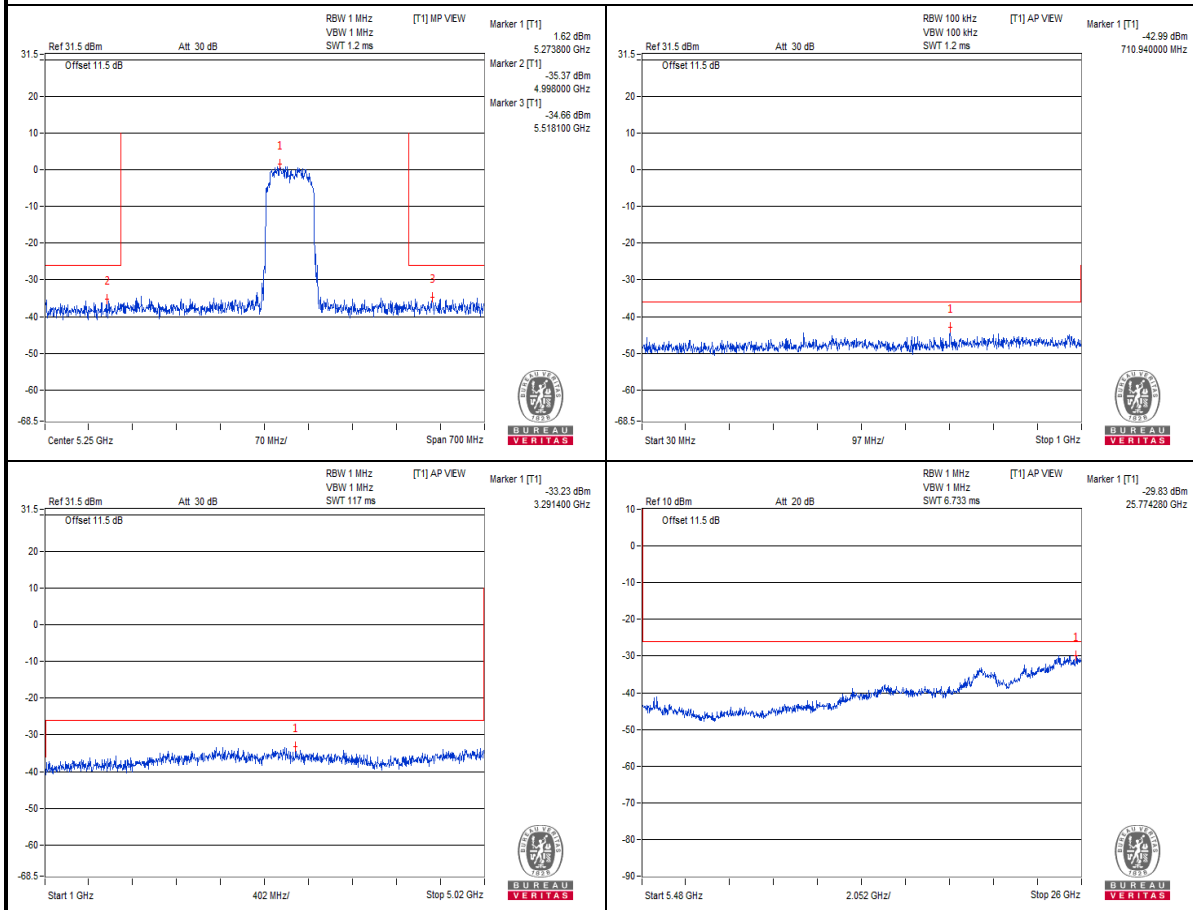
Measurement uncertainty:  $\pm 3.93\text{dB}$

**802.11ac 80MHz (W53)**

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH			
TEST CHANNEL		CH 58 (5290MHz)		LIMIT	RESULT
TEST CONDITION	FREQUENCY RANGE	FREQUENCY (MHz)	MEASURE VALUE		
V <sub>normal</sub>	30MHz to 1000MHz	710.940	0.050287uW	0.25uW/100kHz	PASS
	1000MHz to 5020MHz	3291.400	0.474792uW	2.5uW/MHz	PASS
	5480MHz to 26000MHz	25774.280	1.039532uW	2.5uW/MHz	PASS

**NOTE:** 1. The worst value in each frequency range v.s. each channel has been marked by boldface.  
2. The spectrum plots are attached on the following pages.

**Vnormal  
CH 58**



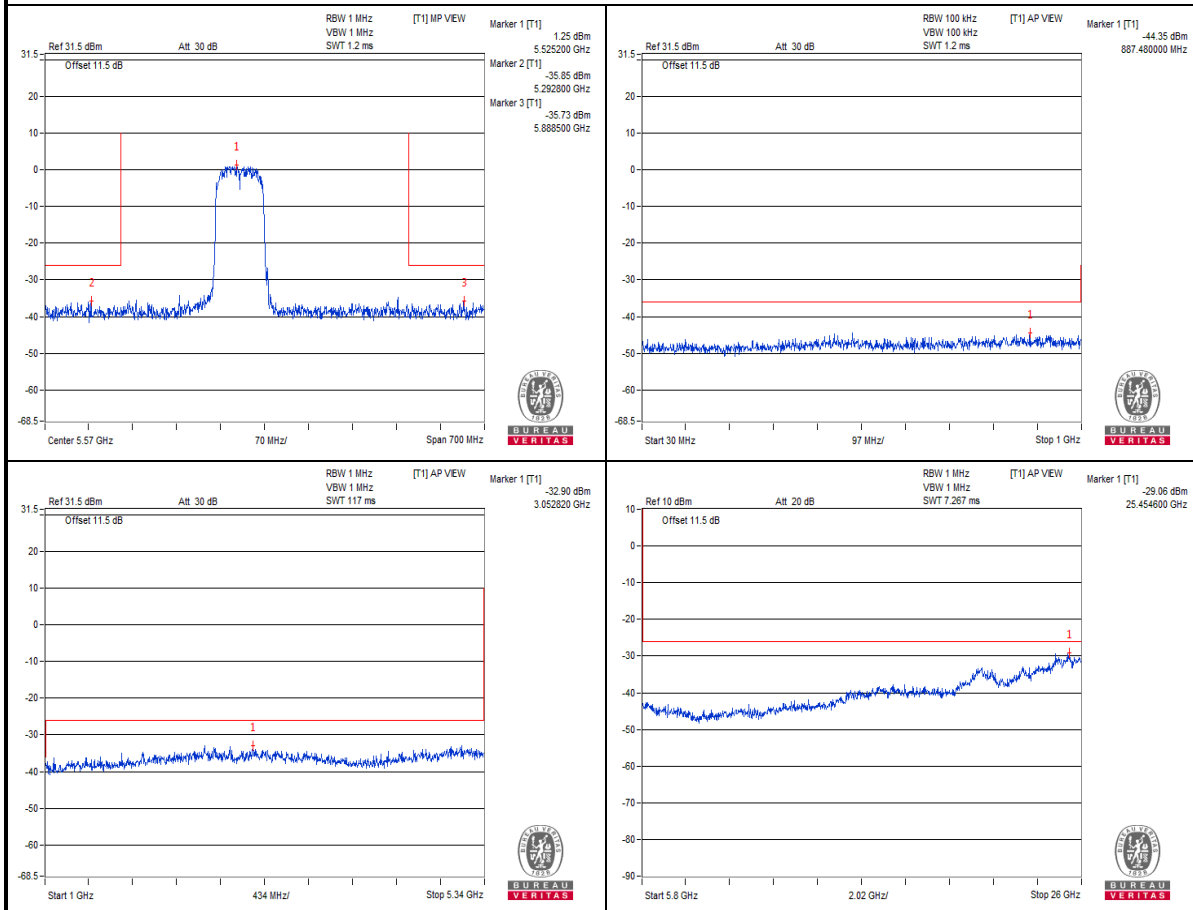
**Measurement uncertainty:  $\pm 3.93\text{dB}$**

**802.11ac 80MHz (W56)**

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH					
TEST CHANNEL		CH 106 (5530MHz)		CH 122 (5610MHz)		LIMIT	RESULT
TEST CONDITION	FREQUENCY RANGE	FREQUENCY (MHz)	MEASURE VALUE	FREQUENCY (MHz)	MEASURE VALUE		
V <sub>normal</sub>	30MHz to 1000MHz	887.480	0.036729uW	870.990	0.036324uW	0.25uW/100kHz	PASS
	1000MHz to 5340MHz	3052.820	0.513093uW	3048.480	0.890019uW	2.5uW/MHz	PASS
	5800MHz to 26000MHz	25454.600	1.240429uW	25414.200	1.096195uW	2.5uW/MHz	PASS

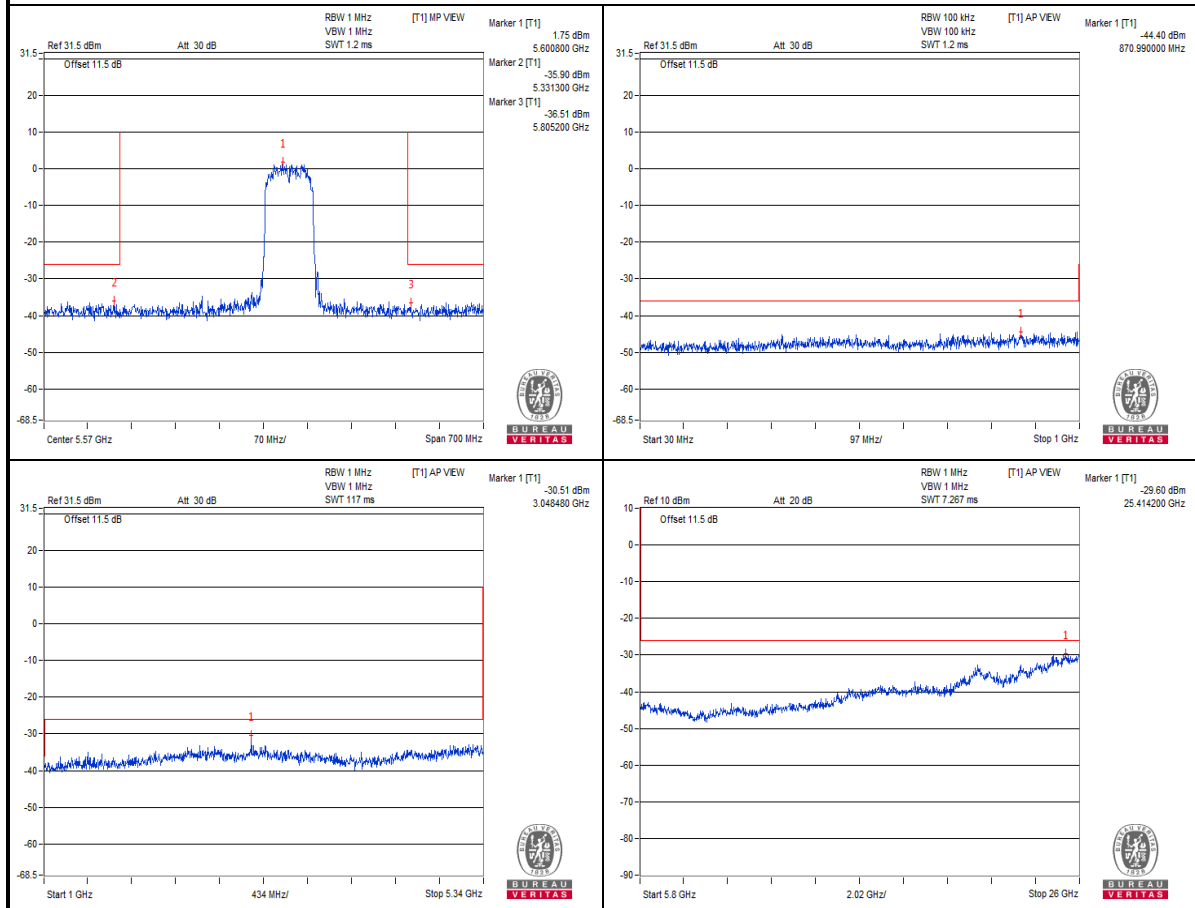
**NOTE:** 1. The worst value in each frequency range v.s. each channel has been marked by boldface.  
2. The spectrum plots are attached on the following pages.

Vnormal  
CH 106



Measurement uncertainty:  $\pm 3.93\text{dB}$

Vnormal  
CH 122



Measurement uncertainty:  $\pm 3.93\text{dB}$

## 4.5 OUT-BAND LEAKAGE POWER

### 4.5.1 LIMITS OF LEAKAGE POWER (EIRP)

W52 band: 802.11a / 802.11n (HT20)

Frequencies (MHz)	Limit
<b>OBW ≤ 18MHz</b>	
$5140.0 \leq f_o \leq 5142.0\text{MHz}$	$\leq 2.5 \text{ uW/MHz}$
$5142.0 < f_o \leq 5150.0\text{MHz}$	$\leq 15.0 \text{ uW/MHz}$
$5250.0 \leq f_o < 5251.0\text{MHz}$	$\leq 10.0^{1-(f-9)} \text{ mW/MHz}$
$5251.0 \leq f_o < 5260.0\text{MHz}$	$\leq 10.0^{1-(8/90)(f-11)} \text{ mW/MHz}$
$5260.0 \leq f_o < 5266.7\text{MHz}$	$\leq 10.0^{1.8-(6/50)(f-20)} \text{ mW/MHz}$
$5266.7 \leq f_o \leq 5360.0\text{MHz}$	$\leq 2.5 \text{ μW/MHz}$
<b>18MHz &lt; OBW &lt; 19MHz</b>	
$5135.0 \leq f_o \leq 5142.0\text{MHz}$	$\leq 2.5 \text{ uW/MHz}$
$5142.0 < f_o \leq 5150.0\text{MHz}$	$\leq 15.0 \text{ uW/MHz}$
$5250.0 \leq f_o < 5251.0\text{MHz}$	$\leq 10.0^{1-(f-9)} \text{ mW/MHz}$
$5251.0 \leq f_o < 5260.0\text{MHz}$	$\leq 10.0^{1-(8/90)(f-11)} \text{ mW/MHz}$
$5260.0 \leq f_o < 5266.7\text{MHz}$	$\leq 10.0^{1.8-(6/50)(f-20)} \text{ mW/MHz}$
$5266.7 \leq f_o \leq 5365.0\text{MHz}$	$\leq 2.5 \text{ μW/MHz}$

W52 band: 802.11n (HT40)

Frequencies (MHz)	Limit
$5100.0 \leq f_o \leq 5141.6\text{MHz}$	$\leq 2.5 \text{ uW/MHz}$
$5141.6 < f_o \leq 5150.0\text{MHz}$	$\leq 15.0 \text{ uW/MHz}$
$5250.0 \leq f_o < 5251.0\text{MHz}$	$\leq 10.0^{-(f-20)+\log(1/2)} \text{ mW/MHz}$
$5251.0 \leq f_o < 5270.0\text{MHz}$	$\leq 10.0^{-(8/190)(f-21)-1+\log(1/2)} \text{ mW/MHz}$
$5270.0 \leq f_o < 5278.4\text{MHz}$	$\leq 10.0^{-(3/50)(f-40)-1.8+\log(1/2)} \text{ mW/MHz}$
$5278.4 \leq f_o \leq 5400.0\text{MHz}$	$\leq 2.5 \text{ μW/MHz}$

W52 band: 802.11ac (VHT80)

Frequencies (MHz)	Limit
$5020.0 \leq f_o \leq 5123.2\text{MHz}$	$\leq 2.5 \text{ uW/MHz}$
$5123.2 < f_o \leq 5150.0\text{MHz}$	$\leq 15.0 \text{ uW/MHz}$
$5250.0 \leq f_o < 5251.0\text{MHz}$	$\leq 10.0^{-(f-40)+\log(1/4)} \text{ mW/MHz}$
$5251.0 \leq f_o < 5290.0\text{MHz}$	$\leq 10.0^{-(8/390)(f-41)-1+\log(1/4)} \text{ mW/MHz}$
$5290.0 \leq f_o < 5296.7\text{MHz}$	$\leq 10.0^{-(3/100)(f-80)-1.8+\log(1/4)} \text{ mW/MHz}$
$5296.7 \leq f_o \leq 5480.0\text{MHz}$	$\leq 2.5 \text{ μW/MHz}$

**W53 band: 802.11a / 802.11n (HT20)**

Frequencies (MHz)	Limit
<b>OBW ≤ 18MHz</b>	
$5140.0 \leq f_o \leq 5233.3\text{MHz}$	$\leq 2.5 \mu\text{W/MHz}$
$5233.3 < f_o \leq 5240.0\text{MHz}$	$\leq 10.0^{-1.8-(6/50)(f-20)}\text{mW/MHz}$
$5240.0 < f_o \leq 5249.0\text{MHz}$	$\leq 10.0^{-1-(8/90)(f-11)}\text{mW/MHz}$
$5249.0 < f_o \leq 5250.0\text{MHz}$	$\leq 10.0^{1-(f-9)}\text{mW/MHz}$
$5350.0 \leq f_o \leq 5360.0\text{MHz}$	$\leq 2.5 \mu\text{W/MHz}$
<b>18MHz &lt; OBW &lt; 19MHz</b>	
$5135.0 \leq f_o \leq 5233.3\text{MHz}$	$\leq 2.5 \mu\text{W/MHz}$
$5233.3 < f_o \leq 5240.0\text{MHz}$	$\leq 10.0^{-1.8-(6/50)(f-20)}\text{mW/MHz}$
$5240.0 < f_o \leq 5249.0\text{MHz}$	$\leq 10.0^{-1-(8/90)(f-11)}\text{mW/MHz}$
$5249.0 < f_o \leq 5250.0\text{MHz}$	$\leq 10.0^{1-(f-9)}\text{mW/MHz}$
$5350.0 \leq f_o \leq 5365.0\text{MHz}$	$\leq 2.5 \mu\text{W/MHz}$

**W53 band: 802.11n (HT40)**

Frequencies (MHz)	Limit
$5100.0 \leq f_o \leq 5210.0\text{MHz}$	$\leq 2.5 \mu\text{W/MHz}$
$5210.0 < f_o \leq 5221.6\text{MHz}$	$\leq 2.5 \mu\text{W/MHz}$
$5221.6 < f_o \leq 5230.0\text{MHz}$	$\leq 10.0^{-(3/50)(f-40)-1.8+\log(1/2)}\text{mW/MHz}$
$5230.0 < f_o \leq 5249.0\text{MHz}$	$\leq 10.0^{-(8/190)(f-21)-1+\log(1/2)}\text{mW/MHz}$
$5249.0 < f_o \leq 5250.0\text{MHz}$	$\leq 10.0^{-(f-20)+\log(1/2)}\text{mW/MHz}$
$5350.0 \leq f_o < 5358.4\text{MHz}$	$\leq 15 \mu\text{W/MHz}$
$5358.4 \leq f_o \leq 5400.0\text{MHz}$	$\leq 2.5 \mu\text{W/MHz}$

**W53 band: 802.11ac (VHT80)**

Frequencies (MHz)	Limit
$5020.0 \leq f_o \leq 5203.3\text{MHz}$	$\leq 2.5 \mu\text{W/MHz}$
$5203.3 < f_o \leq 5210.0\text{MHz}$	$\leq 10.0^{-(3/100)(f-80)-1.8+\log(1/4)}\text{mW/MHz}$
$5210.0 < f_o \leq 5249.0\text{MHz}$	$\leq 10.0^{-(8/390)(f-41)-1+\log(1/4)}\text{mW/MHz}$
$5249.0 < f_o \leq 5250.0\text{MHz}$	$\leq 10.0^{-(f-40)+\log(1/4)}\text{mW/MHz}$
$5350.0 \leq f_o < 5376.8\text{MHz}$	$\leq 15 \mu\text{W/MHz}$
$5376.8 \leq f_o \leq 5480.0\text{MHz}$	$\leq 2.5 \mu\text{W/MHz}$



**W56 band: 802.11a / 802.11n (HT20)**

Frequencies (MHz)	Limit
$5455 \leq f_o \leq 5460\text{MHz}$	$\leq 2.5 \mu\text{W/MHz}$
$5460 < f_o \leq 5470\text{MHz}$	$\leq 12.5 \mu\text{W/MHz}$
$5725 \leq f_o < 5740\text{MHz}$	$\leq 12.5 \mu\text{W/MHz}$
$5740 \leq f_o \leq 5745\text{MHz}$	$\leq 2.5 \mu\text{W/MHz}$

**W56 band: 802.11n (HT40)**

Frequencies (MHz)	Limit
$5420 \leq f_o \leq 5460\text{MHz}$	$\leq 12.5 \mu\text{W/MHz}$
$5460 < f_o \leq 5470\text{MHz}$	$\leq 50 \mu\text{W/MHz}$
$5725 \leq f_o \leq 5760\text{MHz}$	$\leq 12.5 \mu\text{W/MHz}$

**W56 band: 802.11ac (VHT80)**

Frequencies (MHz)	Limit
$5340 \leq f_o \leq 5460\text{MHz}$	$\leq 12.5 \mu\text{W/MHz}$
$5460 < f_o \leq 5469.5\text{MHz}$	$\leq 50 \mu\text{W/MHz}$
$5469.5 < f_o \leq 5470\text{MHz}$	$\leq 51.2 \mu\text{W/MHz}$
$5725 \leq f_o \leq 5800\text{MHz}$	$\leq 12.5 \mu\text{W/MHz}$

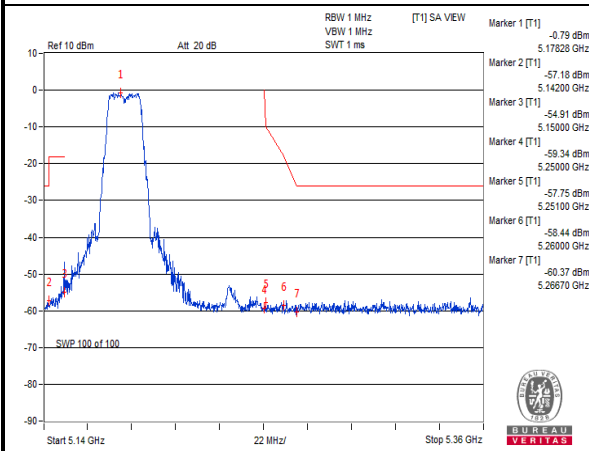
#### 4.5.2 TEST RESULTS

##### 802.11a (W52)

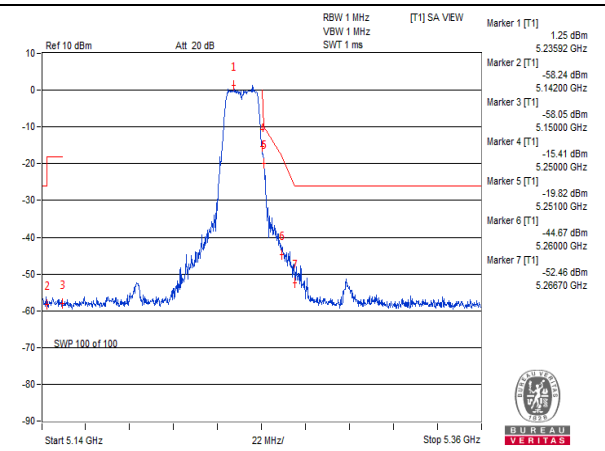
ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH				
TEST CONDITION		OUT-BAND LEAKAGE POWER (μW/MHz)				
	FREQUENCY BAND (MHz)	CH36 (5180MHz)		CH48 (5240MHz)		RESULT
		FREQUENCY (MHz)	MEASURE VALUE (uW/MHz)	FREQUENCY (MHz)	MEASURE VALUE (uW/MHz)	
<b>V<sub>normal</sub></b>	<b>5140.0 ≤ fo ≤ 5142.0MHz</b>	5142.00	0.001916	5142.00	0.001499	PASS
	<b>5142.0 ≤ fo ≤ 5150.0MHz</b>	5150.00	0.003228	5150.00	0.001566	PASS
	<b>5250.0 ≤ fo ≤ 5251.0MHz</b>	5250.00	0.001165	5250.00	28.765191	PASS
	<b>5251.0 ≤ fo &lt; 5260.0MHz</b>	5251.00	0.001679	5251.00	10.429119	PASS
	<b>5260.0 ≤ fo &lt; 5266.7MHz</b>	5260.00	0.001433	5260.00	0.034091	PASS
	<b>5266.7 ≤ fo ≤ 5360.0MHz</b>	5266.70	0.000919	5266.70	0.005672	PASS

- NOTE:** 1. The worst value in each frequency range v.s. each channel has been marked by boldface.  
 2. The spectrum plots are attached on the following pages.  
 3. Offset = Attenuator + Cable loss + Antenna Gain

V<sub>normal</sub>



Channel 36



Channel 48

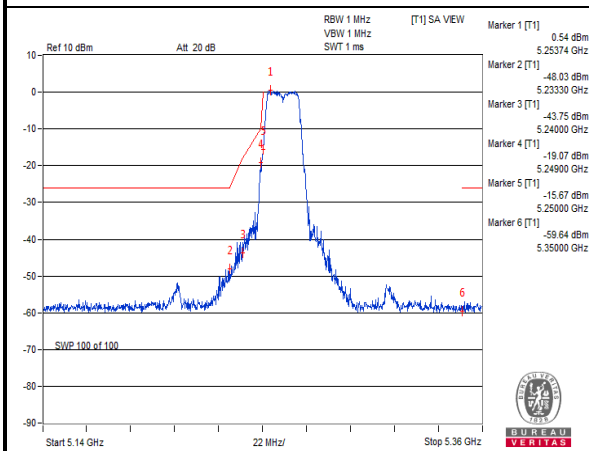
Measurement uncertainty:  $\pm 206.50$  Hz

**802.11a (W53)**

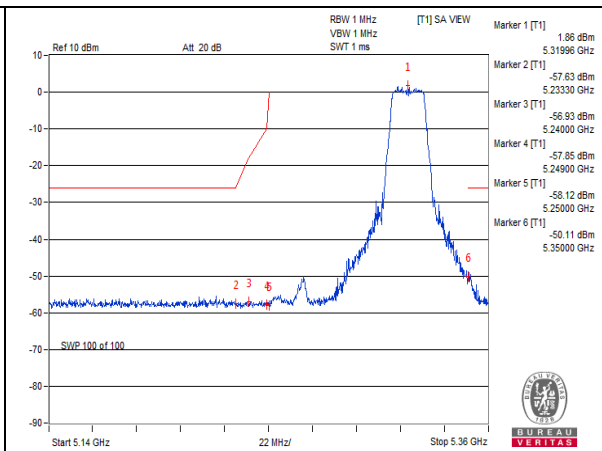
ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH				
TEST CONDITION		OUT-BAND LEAKAGE POWER (μW/MHz)				
	FREQUENCY BAND (MHz)	CH 52 (5260MHz)		CH 64 (5320MHz)		RESULT
		FREQUENCY (MHz)	MEASURE VALUE (uW/MHz)	FREQUENCY (MHz)	MEASURE VALUE (uW/MHz)	
<b>V<sub>normal</sub></b>	<b>5140.0 ≤ fo ≤ 5233.3</b>	5233.30	0.015733	5233.30	0.001727	PASS
	<b>5233.3 &lt; fo ≤ 5240.0</b>	5240.00	0.042191	5240.00	0.002029	PASS
	<b>5240.0 &lt; fo ≤ 5249.0</b>	5249.00	12.381842	5249.00	0.001641	PASS
	<b>5249.0 &lt; fo ≤ 5250.0</b>	5250.00	27.108731	5250.00	0.001543	PASS
	<b>5350.0 ≤ fo ≤ 5360.0</b>	5350.00	0.001087	5350.00	0.009740	PASS

- NOTE:** 1. The worst value in each frequency range v.s. each channel has been marked by boldface.  
 2. The spectrum plots are attached on the following pages.  
 3. Offset = Attenuator + Cable loss + Antenna Gain

V<sub>normal</sub>



**Channel 52**



**Channel 64**

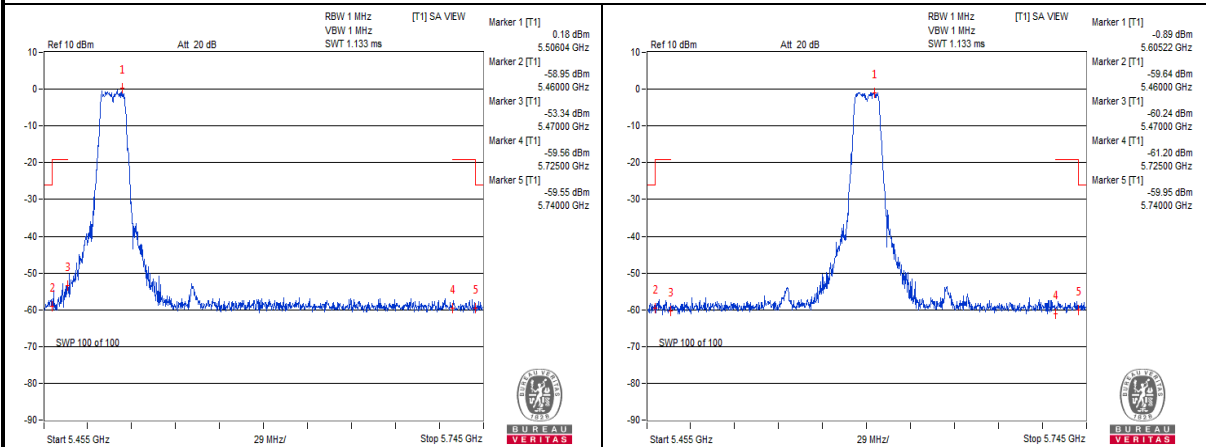
**Measurement uncertainty:  $\pm 206.50$  Hz**

**802.11a (W56)**

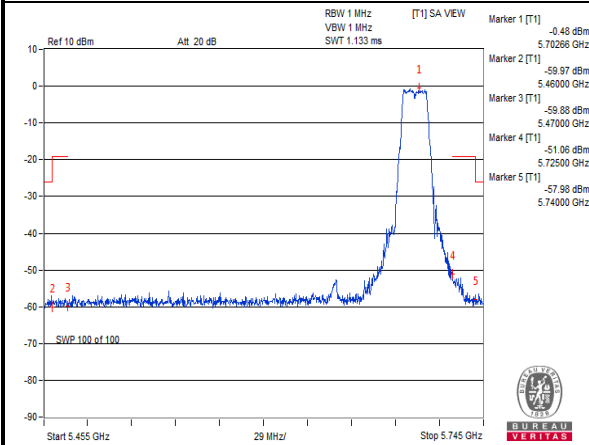
ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH				
TEST CONDITION		OUT-BAND LEAKAGE POWER (μW/MHz)				
	FREQUENCY BAND (MHz)	CH 100 (5500MHz)		CH 120 (5600MHz)		RESULT
		FREQUENCY (MHz)	MEASURE VALUE (uW/MHz)	FREQUENCY (MHz)	MEASURE VALUE (uW/MHz)	
V <sub>normal</sub>	5455.0 ≤ fo ≤ 5460.0	5460.00	0.001275	5460.00	0.001086	PASS
	5460.0 < fo ≤ 5470.0	5470.00	0.004633	5470.00	0.000946	PASS
	5725.0 ≤ fo < 5740.0	5725.00	0.001106	5725.00	0.000759	PASS
	5740.0 ≤ fo ≤ 5745.0	5740.00	0.001109	5740.00	0.001011	PASS
	FREQUENCY BAND (MHz)	CH 140 (5700MHz)				
		FREQUENCY (MHz)		MEASURE VALUE (uW/MHz)		
V <sub>normal</sub>	5455.0 ≤ fo ≤ 5460.0	5460.00		0.001006		PASS
	5460.0 < fo ≤ 5470.0	5470.00		0.001027		PASS
	5725.0 ≤ fo < 5740.0	5725.00		0.007838		PASS
	5740.0 ≤ fo ≤ 5745.0	5740.00		0.001593		PASS

**NOTE:** 1. The worst value in each frequency range v.s. each channel has been marked by boldface.  
 2. The spectrum plots are attached on the following pages.  
 3. Offset = Attenuator + Cable loss + Antenna Gain

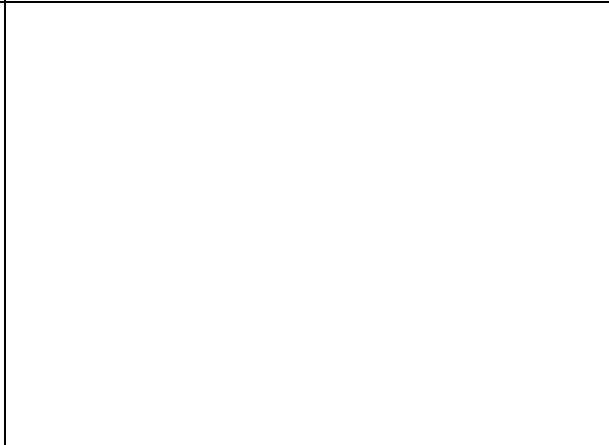
## Vnormal



## Channel 100



## Channel 120



## Channel 140

Measurement uncertainty:  $\pm 206.50$  Hz

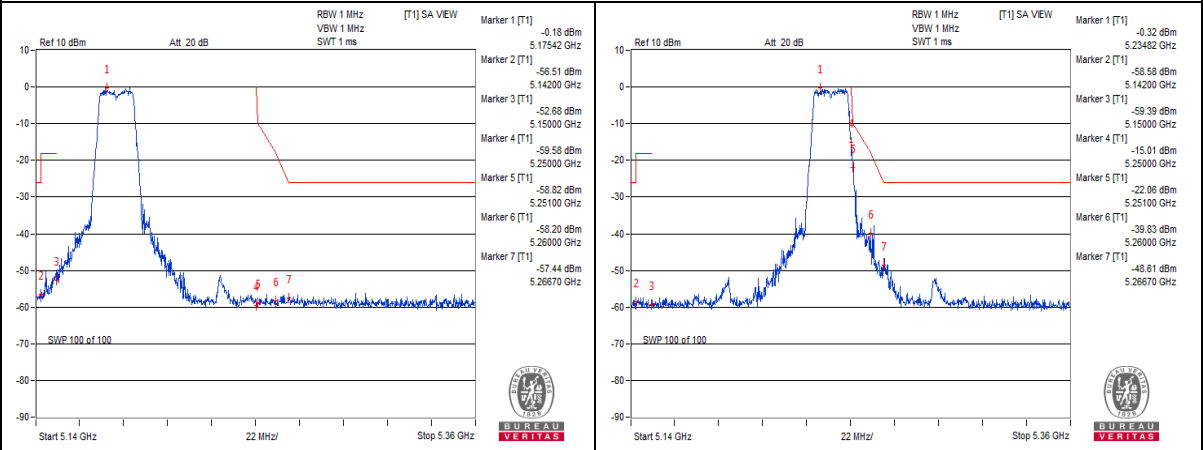
**802.11n 20MHz (W52)**

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH				
TEST CONDITION		OUT-BAND LEAKAGE POWER ( $\mu$ W/MHz)				
	FREQUENCY BAND (MHz)	CH36 (5180MHz)		CH48 (5240MHz)		RESULT
		FREQUENCY (MHz)	MEASURE VALUE ( $\mu$ W/MHz)	FREQUENCY (MHz)	MEASURE VALUE ( $\mu$ W/MHz)	
<b>V<sub>normal</sub></b>	<b>5140.0 <math>\leq</math> fo <math>\leq</math> 5142.0MHz</b>	5142.00	0.002234	5142.00	0.001386	PASS
	<b>5142.0 <math>\leq</math> fo <math>\leq</math> 5150.0MHz</b>	5150.00	0.005394	5150.00	0.001152	PASS
	<b>5250.0 <math>\leq</math> fo <math>\leq</math> 5251.0MHz</b>	5250.00	0.001102	5250.00	31.547869	PASS
	<b>5251.0 <math>\leq</math> fo &lt; 5260.0MHz</b>	5251.00	0.001312	5251.00	6.221861	PASS
	<b>5260.0 <math>\leq</math> fo &lt; 5266.7MHz</b>	5260.00	0.001513	5260.00	0.103906	PASS
	<b>5266.7 <math>\leq</math> fo <math>\leq</math> 5360.0MHz</b>	5266.70	0.001801	5266.70	0.013760	PASS

**NOTE:** 1. The worst value in each frequency range v.s. each channel has been marked by boldface.  
 2. The spectrum plots are attached on the following pages.  
 3. Offset = Attenuator + Cable loss + Antenna Gain



**Vnormal**



**Channel 36**

**Channel 48**

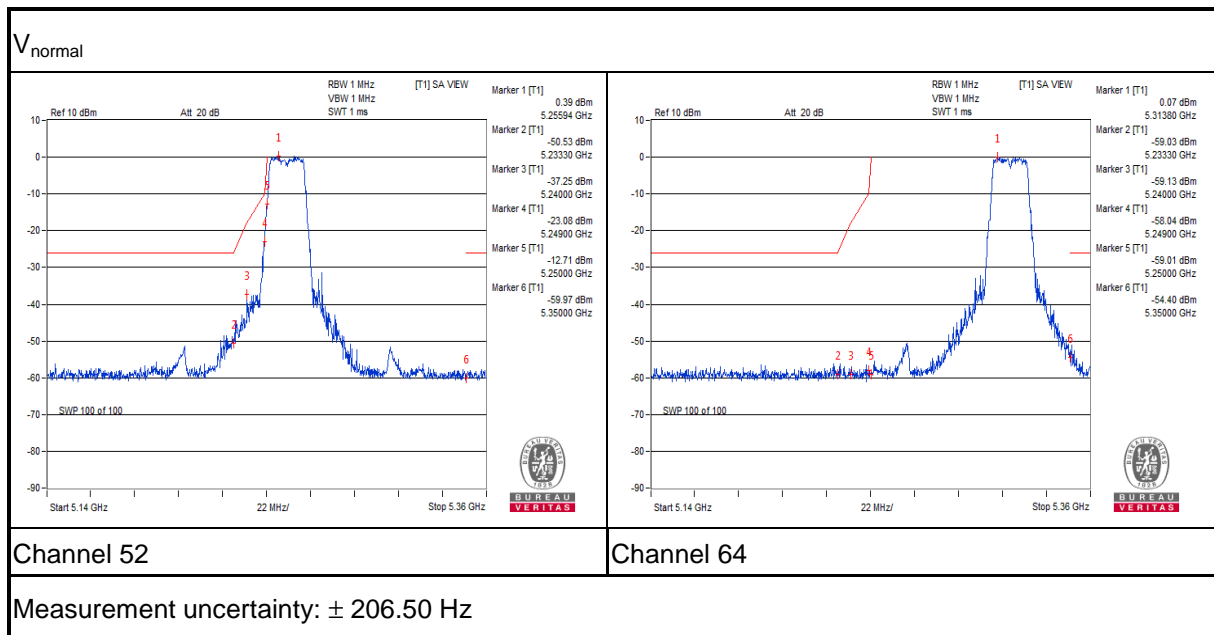
**Measurement uncertainty: ± 206.50 Hz**



## 802.11n 20MHz (W53)

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH				
TEST CONDITION		OUT-BAND LEAKAGE POWER ( $\mu$ W/MHz)				
	FREQUENCY BAND (MHz)	CH 52 (5260MHz)		CH 64 (5320MHz)		RESULT
		FREQUENCY (MHz)	MEASURE VALUE ( $\mu$ W/MHz)	FREQUENCY (MHz)	MEASURE VALUE ( $\mu$ W/MHz)	
<b>V<sub>normal</sub></b>	<b>5140.0 <math>\leq</math> fo <math>\leq</math> 5233.3</b>	5233.30	0.008859	5233.30	0.001251	PASS
	<b>5233.3 &lt; fo <math>\leq</math> 5240.0</b>	5240.00	0.188402	5240.00	0.001221	PASS
	<b>5240.0 &lt; fo <math>\leq</math> 5249.0</b>	5249.00	4.915285	5249.00	0.001569	PASS
	<b>5249.0 &lt; fo <math>\leq</math> 5250.0</b>	5250.00	53.574724	5250.00	0.001257	PASS
	<b>5350.0 <math>\leq</math> fo <math>\leq</math> 5360.0</b>	5350.00	0.001008	5350.00	0.003630	PASS

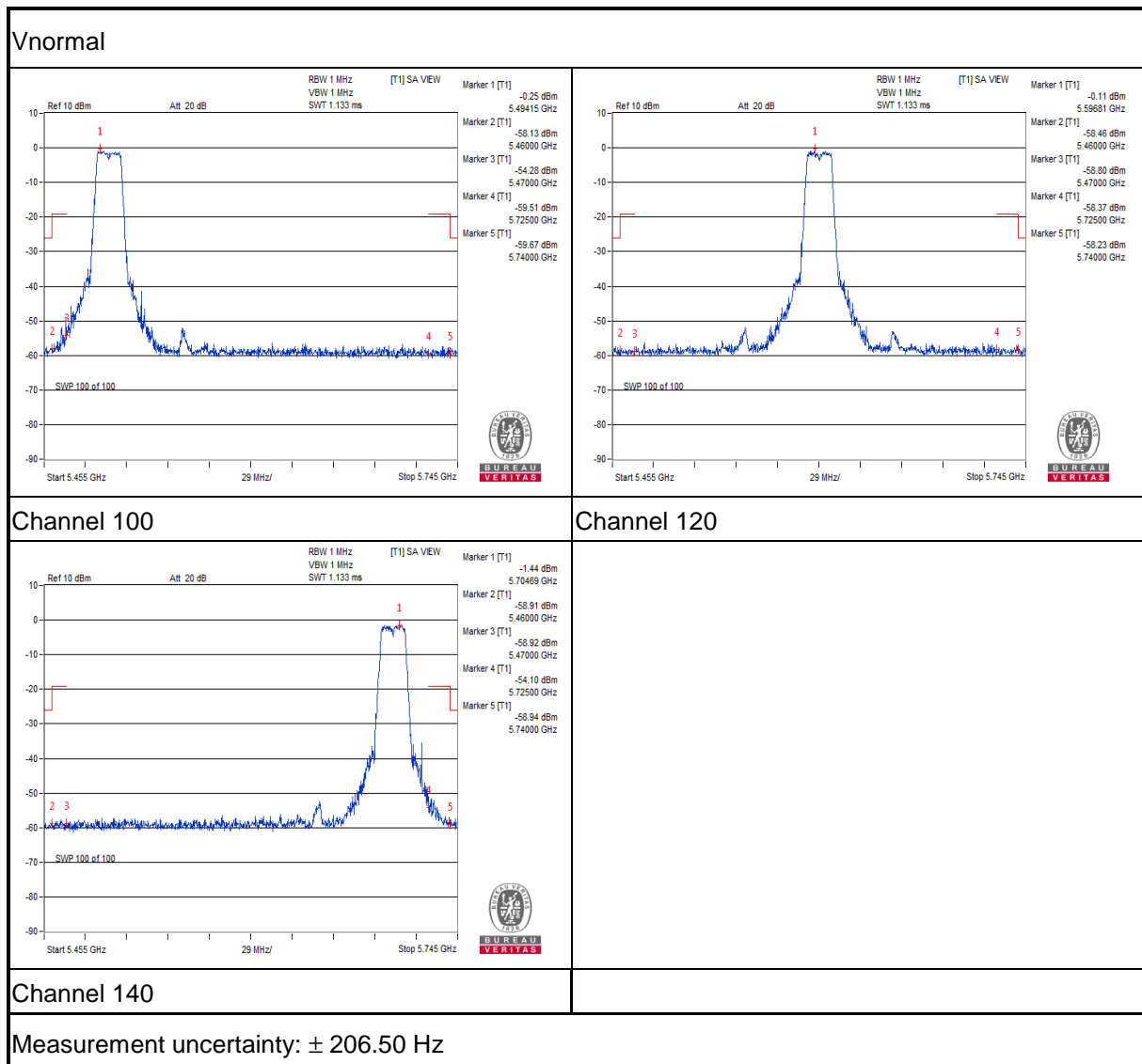
- NOTE:** 1. The worst value in each frequency range v.s. each channel has been marked by boldface.  
 2. The spectrum plots are attached on the following pages.  
 3. Offset = Attenuator + Cable loss + Antenna Gain



**802.11n20MHz (W56)**

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH				
TEST CONDITION		OUT-BAND LEAKAGE POWER (μW/MHz)				
	FREQUENCY BAND (MHz)	CH 100 (5500MHz)		CH 120 (5600MHz)		RESULT
		FREQUENCY (MHz)	MEASURE VALUE (uW/MHz)	FREQUENCY (MHz)	MEASURE VALUE (uW/MHz)	
V <sub>normal</sub>	5455.0 ≤ fo ≤ 5460.0	5460.00	0.001538	5460.00	0.001424	PASS
	5460.0 < fo ≤ 5470.0	5470.00	0.003736	5470.00	0.001318	PASS
	5725.0 ≤ fo < 5740.0	5725.00	0.001118	5725.00	0.001454	PASS
	5740.0 ≤ fo ≤ 5745.0	5740.00	0.001078	5740.00	0.001503	PASS
	FREQUENCY BAND (MHz)	CH 140 (5700MHz)				
		FREQUENCY (MHz)		MEASURE VALUE (uW/MHz)		
V <sub>normal</sub>	5455.0 ≤ fo ≤ 5460.0	5460.00		0.001287		PASS
	5460.0 < fo ≤ 5470.0	5470.00		0.001281		PASS
	5725.0 ≤ fo < 5740.0	5725.00		0.003890		PASS
	5740.0 ≤ fo ≤ 5745.0	5740.00		0.001277		PASS

- NOTE:** 1. The worst value in each frequency range v.s. each channel has been marked by boldface.  
 2. The spectrum plots are attached on the following pages.  
 3. Offset = Attenuator + Cable loss + Antenna Gain

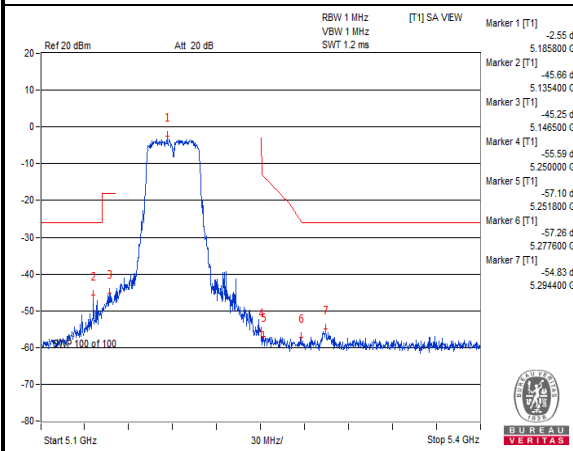


**802.11n 40MHz (W52)**

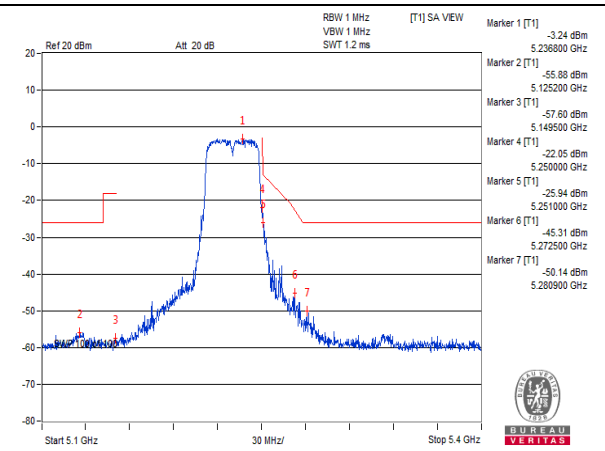
ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH				
TEST CONDITION		OUT-BAND LEAKAGE POWER (μW/MHz)				
	FREQUENCY BAND (MHz)	CH38 (5190MHz)		CH46 (5230MHz)		RESULT
		FREQUENCY (MHz)	MEASURE VALUE (uW/MHz)	FREQUENCY (MHz)	MEASURE VALUE (uW/MHz)	
<b>V<sub>normal</sub></b>	<b>5100.0 ≤ fo ≤ 5141.6MHz</b>	5135.40	0.027149	5125.20	0.002581	PASS
	<b>5141.6 ≤ fo ≤ 5150.0MHz</b>	5146.50	0.029887	5149.50	0.001739	PASS
	<b>5250.0 ≤ fo ≤ 5251.0MHz</b>	5250.00	0.002761	5250.00	6.230716	PASS
	<b>5251.0 ≤ fo &lt; 5270.0MHz</b>	5251.80	0.001952	5251.00	2.548783	PASS
	<b>5270.0 ≤ fo &lt; 5278.4MHz</b>	5277.60	0.001878	5272.50	0.029432	PASS
	<b>5278.4 ≤ fo ≤ 5400.0MHz</b>	5294.40	0.003288	5280.90	0.009682	PASS

**NOTE:** 1. The worst value in each frequency range v.s. each channel has been marked by boldface.  
 2. The spectrum plots are attached on the following pages.  
 3. Offset = Attenuator + Cable loss + Antenna Gain

V<sub>normal</sub>



Channel 38



Channel 46

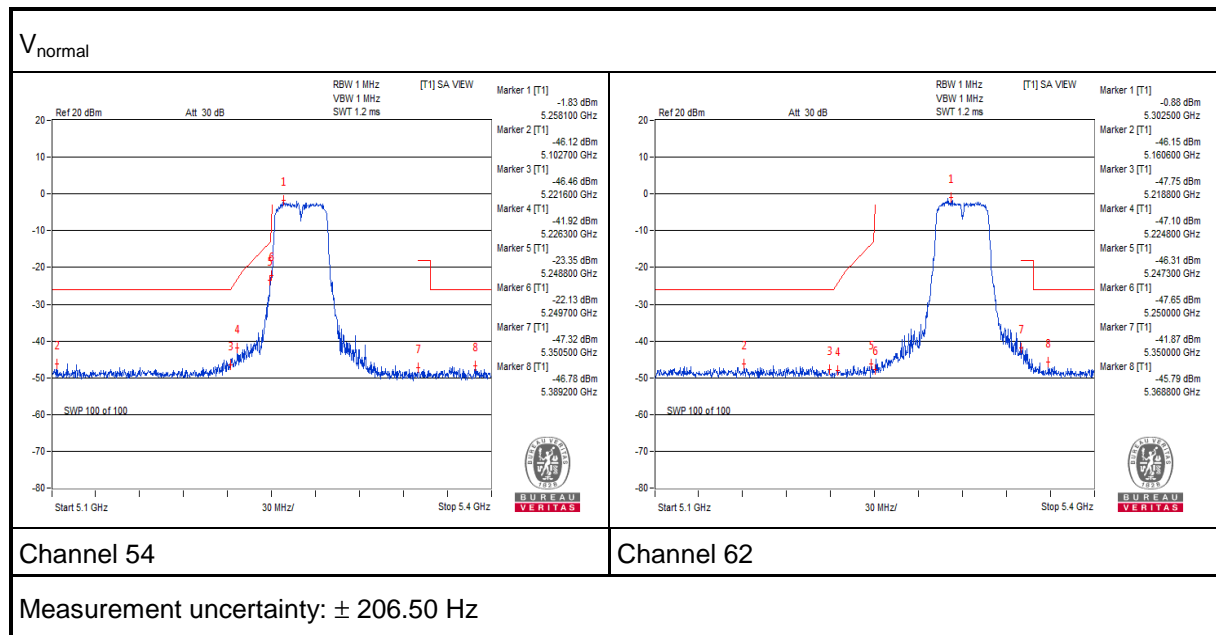
Measurement uncertainty:  $\pm 206.50$  Hz

802.11n 40MHz (W53)

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH				
TEST CONDITION		OUT-BAND LEAKAGE POWER (μW/MHz)				
	FREQUENCY BAND (MHz)	CH 54 (5270MHz)		CH 62 (5310MHz)		RESULT
		FREQUENCY (MHz)	MEASURE VALUE (μW/MHz)	FREQUENCY (MHz)	MEASURE VALUE (μW/MHz)	
<b>V<sub>normal</sub></b>	<b>5100 ≤ fo ≤ 5210</b>	5102.70	0.024410	5160.60	0.024279	PASS
	<b>5210 ≤ fo ≤ 5221.6</b>	5221.60	0.022589	5218.80	0.016773	PASS
	<b>5221.6 ≤ fo ≤ 5230</b>	5226.30	0.064299	5224.80	0.015856	PASS
	<b>5230 ≤ fo ≤ 5249</b>	5248.80	4.622025	5247.30	0.023415	PASS
	<b>5249 ≤ fo ≤ 5250</b>	5249.70	6.128735	5250.00	0.017182	PASS
	<b>5350 ≤ fo ≤ 5358.4</b>	5350.50	0.018541	5350.00	0.065041	PASS
	<b>5358.4 ≤ fo ≤ 5400</b>	5389.20	0.020997	5368.80	0.026334	PASS

**NOTE:** 1. The worst value in each frequency range v.s. each channel has been marked by boldface.  
 2. The spectrum plots are attached on the following pages.  
 3. Offset = Attenuator + Cable loss + Antenna Gain





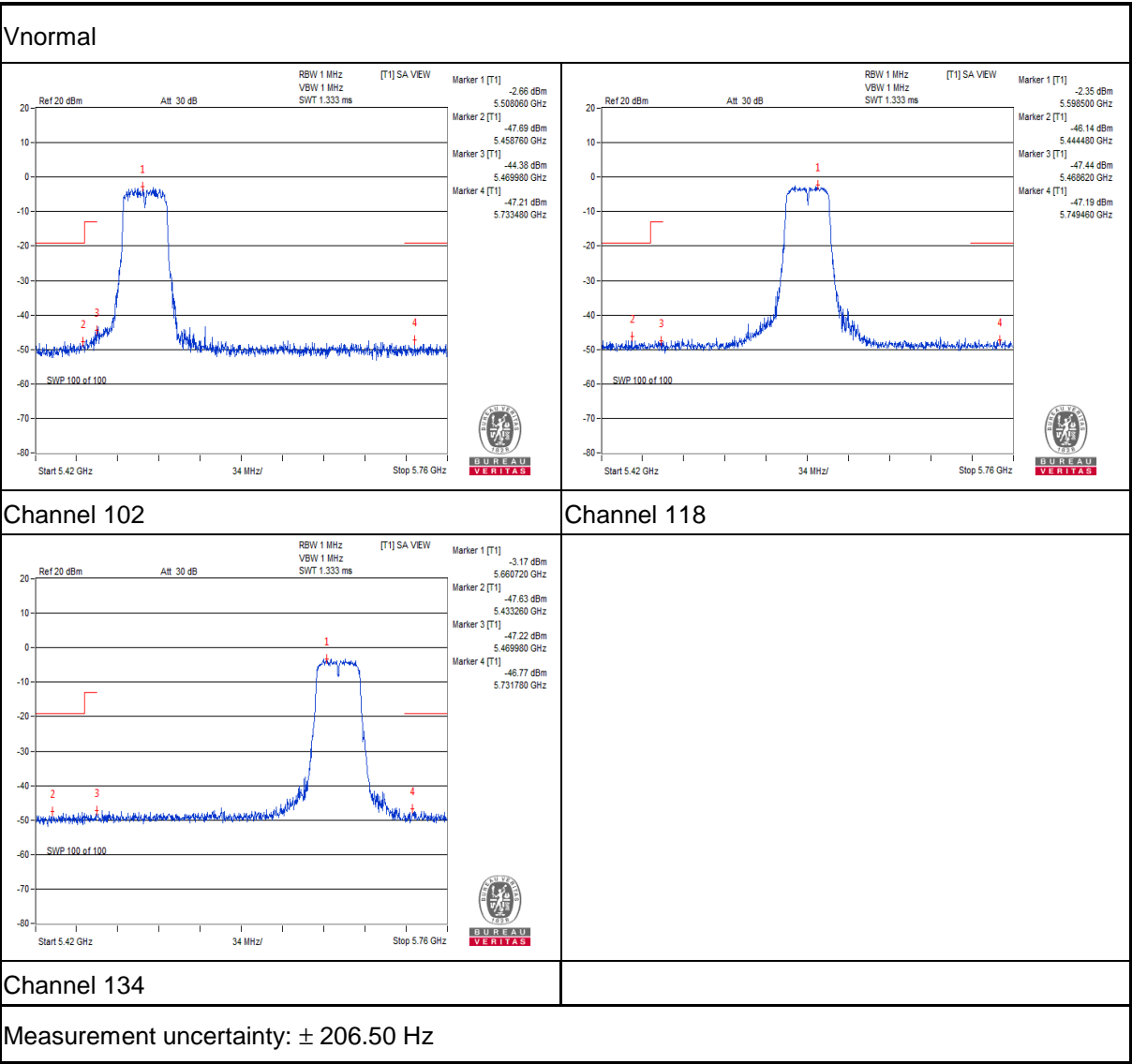
**802.11n40MHz (W56)**

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH				
TEST CONDITION		OUT-BAND LEAKAGE POWER (μW/MHz)				
	FREQUENCY BAND (MHz)	CH 102 (5510MHz)		CH 118 (5590MHz)		RESULT
		FREQUENCY (MHz)	MEASURE VALUE (uW/MHz)	FREQUENCY (MHz)	MEASURE VALUE (uW/MHz)	
V <sub>normal</sub>	5420.0 ≤ fo ≤ 5460.0	5458.76	0.017007	5444.48	0.024312	PASS
	5460.0 < fo ≤ 5470.0	5469.98	0.036437	5468.62	0.018027	PASS
	5725.0 ≤ fo ≤ 5760.0	5733.48	0.019031	5749.46	0.019112	PASS
	FREQUENCY BAND (MHz)	CH 134 (5670MHz)				
		FREQUENCY (MHz)		MEASURE VALUE (uW/MHz)		
V <sub>normal</sub>	5420.0 ≤ fo ≤ 5460.0	5433.26		0.017242		PASS
	5460.0 < fo ≤ 5470.0	5469.98		0.018965		PASS
	5725.0 ≤ fo ≤ 5760.0	5731.78		0.021036		PASS

**NOTE:** 1. The worst value in each frequency range v.s. each channel has been marked by boldface.

2. The spectrum plots are attached on the following pages.

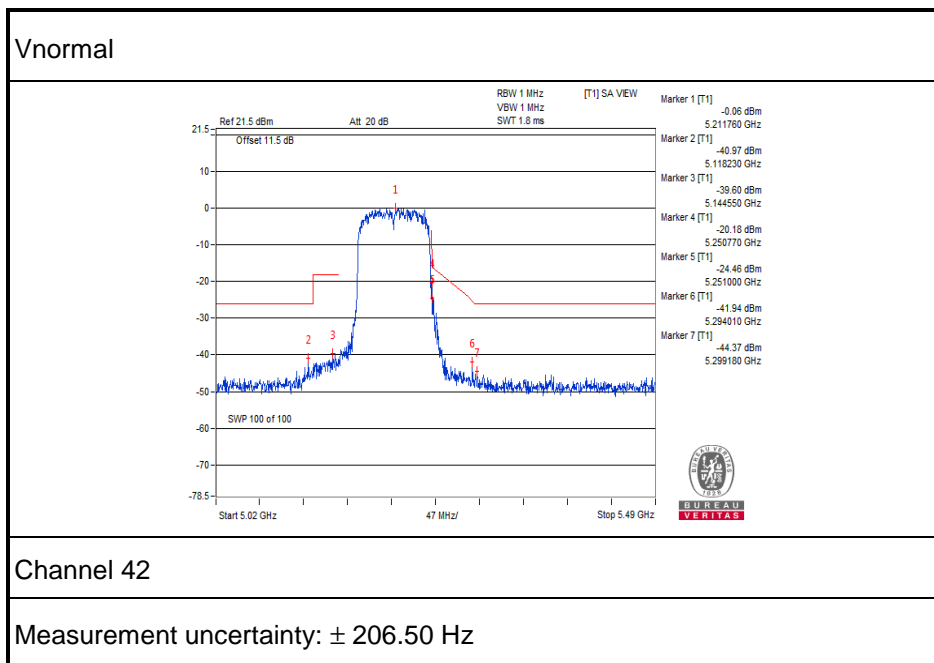
3. Offset = Attenuator + Cable loss + Antenna Gain



**802.11ac 80MHz (W52)**

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH		
TEST CONDITION		OUT-BAND LEAKAGE POWER (μW/MHz)		
	FREQUENCY BAND (MHz)	CH 42 (5210MHz)		RESULT
		FREQUENCY (MHz)	MEASURE VALUE (uW/MHz)	
<b>V<sub>normal</sub></b>	<b>5020.0 ≤ fo ≤ 5123.2MHz</b>	5118.23	0.080070	PASS
	<b>5123.2 ≤ fo ≤ 5150.0MHz</b>	5144.55	0.109591	PASS
	<b>5250.0 ≤ fo ≤ 5251.0MHz</b>	5250.77	9.587363	PASS
	<b>5251.0 ≤ fo &lt; 5290.0MHz</b>	5251.00	3.581798	PASS
	<b>5290.0 ≤ fo &lt; 5296.7MHz</b>	5294.01	0.064017	PASS
	<b>5296.7 ≤ fo ≤ 5480.0MHz</b>	5299.18	0.036598	PASS

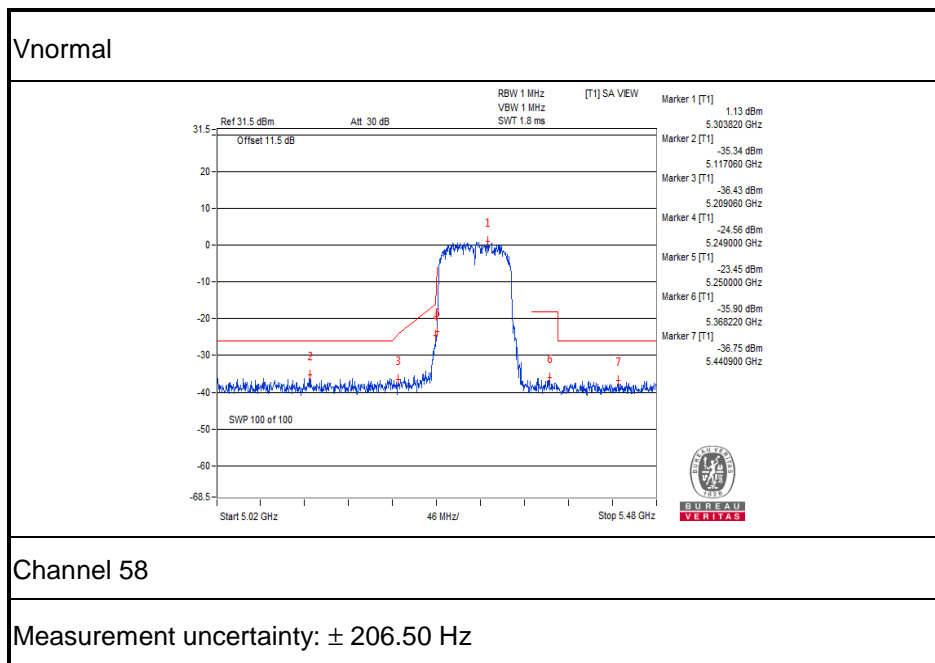
- NOTE:** 1. The worst value in each frequency range v.s. each channel has been marked by boldface.  
2. The spectrum plots are please refer to the below.  
3. Offset = Attenuator + Cable loss + Antenna Gain



**802.11ac 80MHz (W53)**

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH		
TEST CONDITION		OUT-BAND LEAKAGE POWER (μW/MHz)		
	FREQUENCY BAND (MHz)	CH 58 (5290MHz)		RESULT
		FREQUENCY (MHz)	MEASURE VALUE (uW/MHz)	
<b>V<sub>normal</sub></b>	<b>5020.0 ≤ fo ≤ 5203.3MHz</b>	5117.06	0.292732	PASS
	<b>5203.3 ≤ fo ≤ 5210.0MHz</b>	5209.06	0.227518	PASS
	<b>5210.0 ≤ fo ≤ 5249.0MHz</b>	5249.00	3.497590	PASS
	<b>5249.0 ≤ fo &lt; 5250.0MHz</b>	5250.00	4.522124	PASS
	<b>5350.0 ≤ fo &lt; 5376.8MHz</b>	5368.22	0.257006	PASS
	<b>5376.8 ≤ fo ≤ 5480.0MHz</b>	5440.90	0.211365	PASS

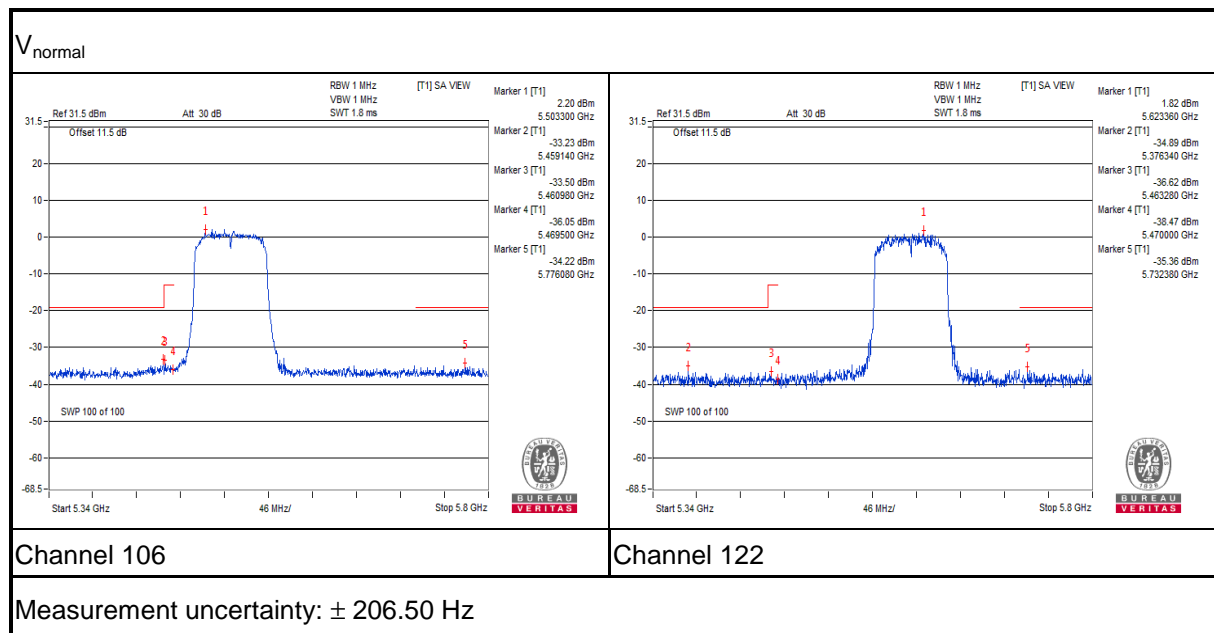
- NOTE:** 1. The worst value in each frequency range v.s. each channel has been marked by boldface.  
 2. The spectrum plots please refer to the below.  
 3. Offset = Attenuator + Cable loss + Antenna Gain



**802.11ac 80MHz (W56)**

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH				
TEST CONDITION		OUT-BAND LEAKAGE POWER (μW/MHz)				
	FREQUENCY BAND (MHz)	CH 106 (5530MHz)		CH 122 (5610MHz)		RESULT
		FREQUENCY (MHz)	MEASURE VALUE (uW/MHz)	FREQUENCY (MHz)	MEASURE VALUE (uW/MHz)	
<b>V<sub>normal</sub></b>	<b>5340 ≤ fo ≤ 5460</b>	5459.14	0.475296	5376.34	0.324512	PASS
	<b>5460 ≤ fo ≤ 5469.5</b>	5460.98	0.446260	5463.28	0.217886	PASS
	<b>5469.5 ≤ fo ≤ 5470</b>	5469.50	0.248210	5470.00	0.142157	PASS
	<b>5725 ≤ fo ≤ 5800</b>	5776.08	0.378089	5732.38	0.291153	PASS

- NOTE:** 1. The worst value in each frequency range v.s. each channel has been marked by boldface.  
2. The spectrum plots please refer to the below.  
3. Offset = Attenuator + Cable loss + Antenna Gain



## 4.6 ADJACENT CHANNEL POWER TOLERANCE

### 4.6.1 LIMITS OF POWER TOLERANCE

#### 802.11a/ 802.11n (20MHz)

FREQUENCIES (MHz)	LIMIT
MEAN POWER 20MHz DISTANCE OF CARRIER	$\geq 25\text{dBc}$
MEAN POWER 40MHz DISTANCE OF CARRIER	$\geq 40\text{dBc}$

#### 802.11n (40MHz)

FREQUENCIES (MHz)	LIMIT
MEAN POWER 40MHz DISTANCE OF CARRIER	$\geq 25\text{dBc}$
MEAN POWER 80MHz DISTANCE OF CARRIER	$\geq 40\text{dBc}$

#### 802.11ac (80MHz)

FREQUENCIES (MHz)	LIMIT
MEAN POWER 80MHz DISTANCE OF CARRIER	$\geq 25\text{dBc}$

### 4.6.2 TEST SETUP



#### 4.6.3 TEST RESULTS

##### 802.11a (W52 & W53)

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH				
VOLTAGE		CH 36	CH 48	CH 52	CH 64	LIMIT (dBc)
$V_{nom}$	MEAN POWER OF CARRIER (dBm)	16.03	16.12	16.38	16.75	-
	MEAN POWER +20MHz DISTANCE OF CARRIER (dBc)	42.76	42.52	41.70	42.64	25
	MEAN POWER -20MHz DISTANCE OF CARRIER (dBc)	41.27	41.38	40.64	41.28	25
	MEAN POWER +40MHz DISTANCE OF CARRIER (dBc)	57.80	57.73	58.20	58.56	40
	MEAN POWER -40MHz DISTANCE OF CARRIER (dBc)	57.54	57.55	57.92	58.11	40
MEASUREMENT UNCERTAINTY: $\pm 3.93\text{dB}$						

##### 802.11a (W56)

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH			
VOLTAGE		CH 100	CH 120	CH 140	LIMIT (dBc)
$V_{nom}$	MEAN POWER OF CARRIER (dBm)	15.97	16.10	15.99	-
	MEAN POWER +20MHz DISTANCE OF CARRIER (dBc)	42.82	42.85	43.23	25
	MEAN POWER -20MHz DISTANCE OF CARRIER (dBc)	41.20	41.21	41.48	25
	MEAN POWER +40MHz DISTANCE OF CARRIER (dBc)	57.79	57.63	57.88	40
	MEAN POWER -40MHz DISTANCE OF CARRIER (dBc)	57.60	57.32	57.51	40
MEASUREMENT UNCERTAINTY: $\pm 3.93\text{dB}$					



**802.11n (20MHz) (W52 & W53)**

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH				
VOLTAGE		CH 36	CH 48	CH 52	CH 64	LIMIT (dBc)
<b>V<sub>nom</sub></b>	MEAN POWER OF CARRIER (dBm)	15.67	16.54	16.94	16.77	-
	MEAN POWER +20MHz DISTANCE OF CARRIER (dBc)	37.75	38.68	38.57	38.13	25
	MEAN POWER -20MHz DISTANCE OF CARRIER (dBc)	38.16	38.23	38.36	38.57	25
	MEAN POWER +40MHz DISTANCE OF CARRIER (dBc)	57.06	57.92	58.29	58.15	40
	MEAN POWER -40MHz DISTANCE OF CARRIER (dBc)	56.58	57.51	57.70	57.42	40
MEASUREMENT UNCERTAINTY: ± 3.93dB						

**802.11n (20MHz) (W56)**

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH			
VOLTAGE		CH 100	CH 120	CH 140	LIMIT (dBc)
<b>V<sub>nom</sub></b>	MEAN POWER OF CARRIER (dBm)	16.27	15.93	15.82	-
	MEAN POWER +20MHz DISTANCE OF CARRIER (dBc)	39.07	38.83	39.30	25
	MEAN POWER -20MHz DISTANCE OF CARRIER (dBc)	37.86	38.10	38.21	25
	MEAN POWER +40MHz DISTANCE OF CARRIER (dBc)	57.69	57.18	57.37	40
	MEAN POWER -40MHz DISTANCE OF CARRIER (dBc)	57.54	56.74	56.88	40
MEASUREMENT UNCERTAINTY: ± 3.93dB					

**802.11n (40MHz) (W52 & W53)**

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH				
VOLTAGE		CH 38	CH 46	CH 54	CH 62	LIMIT (dBc)
<b>V<sub>nom</sub></b>	MEAN POWER OF CARRIER (dBm)	15.57	16.46	17.17	16.94	-
	MEAN POWER +40MHz DISTANCE OF CARRIER (dBc)	40.67	42.32	43.11	41.93	25
	MEAN POWER -40MHz DISTANCE OF CARRIER (dBc)	39.77	41.19	41.32	40.27	25
	MEAN POWER +80MHz DISTANCE OF CARRIER (dBc)	54.39	55.38	56.03	55.78	40
	MEAN POWER -80MHz DISTANCE OF CARRIER (dBc)	53.84	54.75	55.40	54.78	40
MEASUREMENT UNCERTAINTY: ± 3.93dB						

**802.11n (40MHz) (W56)**

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH			
VOLTAGE		CH 102	CH 118	CH 134	LIMIT (dBc)
<b>V<sub>nom</sub></b>	MEAN POWER OF CARRIER (dBm)	16.43	16.71	15.94	-
	MEAN POWER +40MHz DISTANCE OF CARRIER (dBc)	42.45	42.26	43.01	25
	MEAN POWER -40MHz DISTANCE OF CARRIER (dBc)	40.20	40.37	40.74	25
	MEAN POWER +80MHz DISTANCE OF CARRIER (dBc)	54.94	55.22	54.65	40
	MEAN POWER -80MHz DISTANCE OF CARRIER (dBc)	54.81	54.81	54.05	40
MEASUREMENT UNCERTAINTY: ± 3.93dB					

**802.11ac (80MHz) (W52 & W53 & W56)**

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH				
VOLTAGE		CH 42	CH 58	CH 106	CH 122	LIMIT (dBc)
$V_{nom}$	MEAN POWER OF CARRIER (dBm)	9.73	10.73	10.56	10.65	-
	MEAN POWER +80MHz DISTANCE OF CARRIER (dBc)	35.01	36.22	35.79	35.97	25
	MEAN POWER -80MHz DISTANCE OF CARRIER (dBc)	35.05	35.90	35.86	35.64	25
MEASUREMENT UNCERTAINTY: $\pm 3.93\text{dB}$						

## 4.7 ANTENNA POWER MEASUREMENT

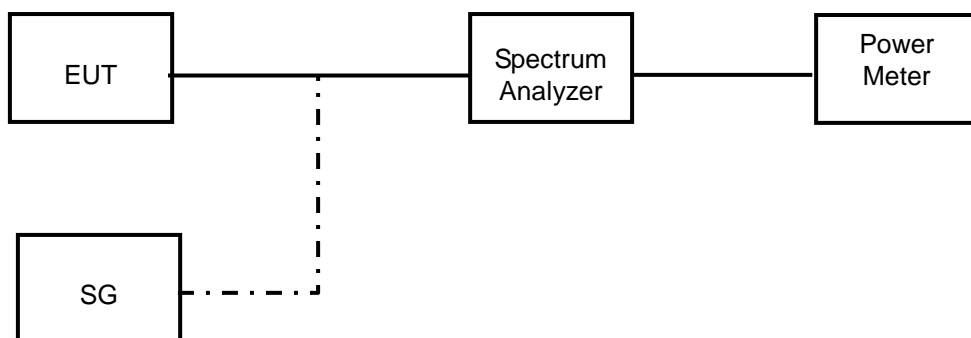
### 4.7.1 LIMITS OF ANTENNA POWER

W52			
Mode	802.11a / 802.11n(HT20)	802.11n(HT40)	802.11ac(VHT80)
Output power	10mW/MHz	5mW/MHz	2.5mW/MHz
E.I.R.P	10mW/MHz	5mW/MHz	2.5mW/MHz

W53			
Mode	802.11a / 802.11n(HT20)	802.11n(HT40)	802.11ac(VHT80)
Output power	10mW/MHz	5mW/MHz	2.5mW/MHz
E.I.R.P ( with TPC )	10mW/MHz	5mW/MHz	2.5mW/MHz
E.I.R.P ( without TPC )	5mW/MHz	2.5mW/MHz	1.25mW/MHz

W56			
Mode	802.11a / 802.11n(HT20)	802.11n(HT40)	802.11ac(VHT80)
Output power	10mW/MHz	5mW/MHz	2.5mW/MHz
E.I.R.P ( with TPC )	50mW/MHz	25mW/MHz	12.5mW/MHz
E.I.R.P ( without TPC )	25mW/MHz	12.5mW/MHz	6.25mW/MHz

### 4.7.2 TEST SETUP



#### 4.7.3 TEST RESULTS

##### 802.11a (W52)

ENVIRONMENTAL CONDITIONS	25 deg.C, 68% RH		
TEST CONDITION	CONDUCTED RF OUTPUT POWER DENSITY (mW/MHz)		
	CHANNEL 36 5180MHz	CHANNEL 48 5240MHz	MAX. LIMIT (mW/MHz)
V <sub>normal</sub>	2.245	2.084	10
RATED POWER	2.3mW/MHz		
TOLERANCE OF ANTENNA POWER	0.5mW/MHz ~3mW/MHz		
MEASUREMENT UNCERTAINTY	± 1.11dB		

**NOTE:** Output power tolerance (%) =  $\{(2.245 - 2.3) / 2.3\} * 100 = -2.39(\%)$ .

##### Monopole antenna with -4dBi gain

ENVIRONMENTAL CONDITIONS	25 deg.C, 68% RH		
TEST CONDITION	RADIATED RF OUTPUT POWER DENSITY (mW/MHz)		
	CHANNEL 36 5180MHz	CHANNEL 48 5240MHz	MAX. LIMIT (mW/MHz)
V <sub>normal</sub>	0.894	0.830	10
MEASUREMENT UNCERTAINTY	± 1.11dB		

**NOTE:**

1. The value of radiated RF output densities are "calculated" values.
2. Calculated radiated power is only for maximum antenna gain.

**802.11n (20MHz) (W52)**

ENVIRONMENTAL CONDITIONS	25 deg.C, 68% RH		
TEST CONDITION	CONDUCTED RF OUTPUT POWER DENSITY (mW/MHz)		
	CHANNEL 36 5180MHz	CHANNEL 48 5240MHz	MAX. LIMIT (mW/MHz)
V <sub>normal</sub>	2.052	2.148	10
RATED POWER	2.2mW/MHz		
TOLERANCE OF ANTENNA POWER	0.44mW/MHz ~2.64mW/MHz		
MEASUREMENT UNCERTAINTY	± 1.11dB		

**NOTE:** Output power tolerance (%) =  $\{(2.148 - 2.2) / 2.2\} * 100 = -2.36(\%)$ .

**Monopole antenna with -4dBi gain**

ENVIRONMENTAL CONDITIONS	25 deg.C, 68% RH		
TEST CONDITION	RADIATED RF OUTPUT POWER DENSITY (mW/MHz)		
	CHANNEL 36 5180MHz	CHANNEL 48 5240MHz	MAX. LIMIT (mW/MHz)
V <sub>normal</sub>	0.817	0.855	10
MEASUREMENT UNCERTAINTY	± 1.11dB		

**NOTE:**

1. The value of radiated RF output densities are "calculated" values.
2. Calculated radiated power is only for maximum antenna gain.

**802.11n (40MHz) (W52)**

<b>ENVIRONMENTAL CONDITIONS</b>	25 deg.C, 68% RH		
<b>TEST CONDITION</b>	<b>CONDUCTED RF OUTPUT POWER DENSITY (mW/MHz)</b>		
	<b>CHANNEL 38 5190MHz</b>	<b>CHANNEL 46 5230MHz</b>	<b>MAX. LIMIT (mW/MHz)</b>
<b>V<sub>normal</sub></b>	1.297	1.370	5
<b>RATED POWER</b>	1.4mW/MHz		
<b>TOLERANCE OF ANTENNA POWER</b>	0.28mW/MHz ~ 1.68mW/MHz		
<b>MEASUREMENT UNCERTAINTY</b>	± 1.11dB		

**NOTE:** Output power tolerance (%) =  $\{(1.370 - 1.4) / 1.4\} * 100 = -2.14(\%)$ .

**Monopole antenna with -4dBi gain**

<b>ENVIRONMENTAL CONDITIONS</b>	25 deg.C, 68% RH		
<b>TEST CONDITION</b>	<b>RADIATED RF OUTPUT POWER DENSITY (mW/MHz)</b>		
	<b>CHANNEL 38 5190MHz</b>	<b>CHANNEL 46 5230MHz</b>	<b>MAX. LIMIT (mW/MHz)</b>
<b>V<sub>normal</sub></b>	0.516	0.545	5
<b>MEASUREMENT UNCERTAINTY</b>	± 1.11dB		

**NOTE:**

1. The value of radiated RF output densities are "calculated" values.
2. Calculated radiated power is only for maximum antenna gain.

**802.11ac (80MHz) (W52)**

ENVIRONMENTAL CONDITIONS	25 deg.C, 68% RH	
TEST CONDITION	CONDUCTED RF OUTPUT POWER DENSITY (mW/MHz)	
	CHANNEL 42 5210MHz	MAX. LIMIT (mW/MHz)
V <sub>normal</sub>	0.453	2.5
RATED POWER	0.5mW/MHz	
TOLERANCE OF ANTENNA POWER	0.1mW/MHz ~ 0.6mW/MHz	
MEASUREMENT UNCERTAINTY	± 1.11dB	

**NOTE:** Output power tolerance (%) =  $\{(0.453 - 0.5) / 0.5\} * 100 = -9.40(\%)$ .

**Monopole antenna with -4dBi gain**

ENVIRONMENTAL CONDITIONS	25 deg.C, 68% RH	
TEST CONDITION	RADIATED RF OUTPUT POWER DENSITY (mW/MHz)	
	CHANNEL 42 5210MHz	MAX. LIMIT (mW/MHz)
V <sub>normal</sub>	0.180	2.5
MEASUREMENT UNCERTAINTY	± 1.11dB	

**NOTE:**

1. The value of radiated RF output densities are "calculated" values.
2. Calculated radiated power is only for maximum antenna gain.



**802.11a (W53)**

ENVIRONMENTAL CONDITIONS	25 deg.C, 68% RH		
TEST CONDITION	CONDUCTED RF OUTPUT POWER DENSITY (Mw/MHz)		
	CHANNEL 52 5260MHz	CHANNEL64 5320MHz	MAX. LIMIT (Mw/MHz)
V <sub>normal</sub>	2.259	2.385	10
RATED POWER	2.5mW/MHz		
TOLERANCE OF ANTENNA POWER	0.5mW/MHz ~3mW/MHz		
MEASUREMENT UNCERTAINTY	± 1.11dB		

**NOTE:** Output power tolerance (%) =  $\{(2.385 - 2.5) / 2.5\} * 100 = -4.60(\%)$ .

**Monopole antenna with -4dBi gain**

ENVIRONMENTAL CONDITIONS	25 deg.C, 68% RH		
TEST CONDITION	RADIATED RF OUTPUT POWER DENSITY (Mw/MHz)		
	CHANNEL 52 5260MHz	CHANNEL64 5320MHz	MAX. LIMIT (Mw/MHz)
V <sub>normal</sub>	0.899	0.949	5
MEASUREMENT UNCERTAINTY	± 1.11dB		

**NOTE:**

1. The value of radiated RF output densities are "calculated" values.
2. Calculated radiated power is only for maximum antenna gain.

**802.11n (20MHz) (W53)**

ENVIRONMENTAL CONDITIONS	25 deg.C, 68% RH		
TEST CONDITION	CONDUCTED RF OUTPUT POWER DENSITY (mW/MHz)		
	CHANNEL 52 5260MHz	CHANNEL64 5320MHz	MAX. LIMIT (mW/MHz)
V <sub>normal</sub>	2.090	2.296	10
RATED POWER	2.4mW/MHz		
TOLERANCE OF ANTENNA POWER	0.48mW/MHz ~ 2.88mW/MHz		
MEASUREMENT UNCERTAINTY	± 1.11dB		

**NOTE:** Output power tolerance (%) =  $\{(2.296 - 2.4) / 2.4\} * 100 = -4.33(\%)$ .

**Monopole antenna with -4dBi gain**

ENVIRONMENTAL CONDITIONS	25 deg.C, 68% RH		
TEST CONDITION	RADIATED RF OUTPUT POWER DENSITY (mW/MHz)		
	CHANNEL 52 5260MHz	CHANNEL64 5320MHz	MAX. LIMIT (mW/MHz)
V <sub>normal</sub>	0.832	0.914	5
MEASUREMENT UNCERTAINTY	± 1.11dB		

**NOTE:**

1. The value of radiated RF output densities are "calculated" values.
2. Calculated radiated power is only for maximum antenna gain.

**802.11n (40MHz) (W53)**

ENVIRONMENTAL CONDITIONS	25 deg.C, 68% RH		
TEST CONDITION	CONDUCTED RF OUTPUT POWER DENSITY (mW/MHz)		
	CHANNEL 54 5270MHz	CHANNEL 62 5310MHz	MAX. LIMIT (mW/MHz)
V <sub>normal</sub>	1.459	1.531	5
RATED POWER	1.6mW/MHz		
TOLERANCE OF ANTENNA POWER	0.32mW/MHz ~ 1.92mW/MHz		
MEASUREMENT UNCERTAINTY	± 1.11dB		

**NOTE:** Output power tolerance (%) =  $\{(1.531 - 1.6) / 1.6\} * 100 = -4.31(\%)$ .

**Monopole antenna with -4dBi gain**

ENVIRONMENTAL CONDITIONS	25 deg.C, 68% RH		
TEST CONDITION	RADIATED RF OUTPUT POWER DENSITY (mW/MHz)		
	CHANNEL 54 5270MHz	CHANNEL 62 5310MHz	MAX. LIMIT (mW/MHz)
V <sub>normal</sub>	0.581	0.610	2.5
MEASUREMENT UNCERTAINTY	± 1.11dB		

**NOTE:**

1. The value of radiated RF output densities are "calculated" values.
2. Calculated radiated power is only for maximum antenna gain.

**802.11ac (80MHz) (W53)**

<b>ENVIRONMENTAL CONDITIONS</b>	25 deg.C, 68% RH	
<b>TEST CONDITION</b>	<b>CONDUCTED RF OUTPUT POWER DENSITY (mW/MHz)</b>	
	<b>CHANNEL 58 5290MHz</b>	<b>MAX. LIMIT (mW/MHz)</b>
<b>V<sub>normal</sub></b>	0.480	2.5
<b>RATED POWER</b>	0.5mW/MHz	
<b>TOLERANCE OF ANTENNA POWER</b>	0.1mW/MHz ~ 0.6mW/MHz	
<b>MEASUREMENT UNCERTAINTY</b>	± 1.11dB	

**NOTE:** Output power tolerance (%) =  $\{(0.480 - 0.5) / 0.5\} * 100 = -4.00(\%)$ .

**Monopole antenna with -4dBi gain**

<b>ENVIRONMENTAL CONDITIONS</b>	25 deg.C, 68% RH	
<b>TEST CONDITION</b>	<b>RADIATED RF OUTPUT POWER DENSITY (mW/MHz)</b>	
	<b>CHANNEL 58 5290MHz</b>	<b>MAX. LIMIT (mW/MHz)</b>
<b>V<sub>normal</sub></b>	0.191	2.5
<b>MEASUREMENT UNCERTAINTY</b>	± 1.11dB	

**NOTE:**

1. The value of radiated RF output densities are "calculated" values.
2. Calculated radiated power is only for maximum antenna gain.

**802.11a (W56)**

ENVIRONMENTAL CONDITIONS	25 deg.C, 68% RH			
TEST CONDITION	CONDUCTED RF OUTPUT POWER DENSITY (mW/MHz)			
	CHANNEL 100 5500MHz	CHANNEL 120 5600MHz	CHANNEL 140 5700MHz	MAX. LIMIT (mW/MHz)
V <sub>normal</sub>	2.103	2.255	2.165	10
RATED POWER	2.3mW/MHz			
TOLERANCE OF ANTENNA POWER	0.46mW/MHz ~2.76mW/MHz			
MEASUREMENT UNCERTAINTY	± 1.11dB			

**NOTE:** Output power tolerance (%) =  $\{(2.255 - 2.3) / 2.3\} * 100 = -1.96(\%)$ .

**Monopole antenna with -4dBi gain**

ENVIRONMENTAL CONDITIONS	25 deg.C, 68% RH			
TEST CONDITION	RADIATED RF OUTPUT POWER DENSITY (mW/MHz)			
	CHANNEL 100 5500MHz	CHANNEL 120 5600MHz	CHANNEL 140 5700MHz	MAX. LIMIT (mW/MHz)
V <sub>normal</sub>	0.837	0.898	0.862	25
MEASUREMENT UNCERTAINTY	± 1.11dB			

**NOTE:**

1. The value of radiated RF output densities are "calculated" values.
2. Calculated radiated power is only for maximum antenna gain.

**802.11n (20MHz) (W56)**

<b>ENVIRONMENTAL CONDITIONS</b>	25 deg.C, 68% RH			
<b>TEST CONDITION</b>	<b>CONDUCTED RF OUTPUT POWER DENSITY (mW/MHz)</b>			
	<b>CHANNEL 100 5500MHz</b>	<b>CHANNEL 120 5600MHz</b>	<b>CHANNEL 140 5700MHz</b>	<b>MAX. LIMIT (mW/MHz)</b>
<b>V<sub>normal</sub></b>	1.927	2.133	2.033	10
<b>RATED POWER</b>	2.2mW/MHz			
<b>TOLERANCE OF ANTENNA POWER</b>	0.44mW/MHz ~ 2.64mW/MHz			
<b>MEASUREMENT UNCERTAINTY</b>	± 1.11dB			

**NOTE:** Output power tolerance (%) =  $\{(2.133 - 2.2) / 2.2\} * 100 = -3.05(\%)$ .

**Monopole antenna with -4dBi gain**

<b>ENVIRONMENTAL CONDITIONS</b>	25 deg.C, 68% RH			
<b>TEST CONDITION</b>	<b>RADIATED RF OUTPUT POWER DENSITY (mW/MHz)</b>			
	<b>CHANNEL 100 5500MHz</b>	<b>CHANNEL 120 5600MHz</b>	<b>CHANNEL 140 5700MHz</b>	<b>MAX. LIMIT (mW/MHz)</b>
<b>V<sub>normal</sub></b>	0.767	0.849	0.809	25
<b>MEASUREMENT UNCERTAINTY</b>	± 1.11dB			

**NOTE:**

1. The value of radiated RF output densities are "calculated" values.
2. Calculated radiated power is only for maximum antenna gain.

**802.11n (40MHz) (W56)**

ENVIRONMENTAL CONDITIONS	25 deg.C, 68% RH			
TEST CONDITION	CONDUCTED RF OUTPUT POWER DENSITY (mW/MHz)			
	CHANNEL 102 5510MHz	CHANNEL 118 5590MHz	CHANNEL 134 5670MHz	MAX. LIMIT (mW/MHz)
V <sub>normal</sub>	1.262	1.330	1.409	5
RATED POWER	1.5mW/MHz			
TOLERANCE OF ANTENNA POWER	0.3mW/MHz ~ 1.8mW/MHz			
MEASUREMENT UNCERTAINTY	± 1.11dB			

**NOTE:** Output power tolerance (%) =  $\{(1.409 - 1.5) / 1.5\} * 100 = -6.07(\%)$ .

**Monopole antenna with -4dBi gain**

ENVIRONMENTAL CONDITIONS	25 deg.C, 68% RH			
TEST CONDITION	RADIATED RF OUTPUT POWER DENSITY (mW/MHz)			
	CHANNEL 102 5510MHz	CHANNEL 118 5590MHz	CHANNEL 134 5670MHz	MAX. LIMIT (mW/MHz)
V <sub>normal</sub>	0.502	0.529	0.561	12.5
MEASUREMENT UNCERTAINTY	± 1.11dB			

**NOTE:**

1. The value of radiated RF output densities are "calculated" values.
2. Calculated radiated power is only for maximum antenna gain.

**802.11ac (80MHz) (W56)**

<b>ENVIRONMENTAL CONDITIONS</b>	25 deg.C, 68% RH		
<b>TEST CONDITION</b>	<b>CONDUCTED RF OUTPUT POWER DENSITY (mW/MHz)</b>		
	<b>CHANNEL 36 5180MHz</b>	<b>CHANNEL 48 5240MHz</b>	<b>MAX. LIMIT (mW/MHz)</b>
<b>V<sub>normal</sub></b>	0.389	0.443	10
<b>RATED POWER</b>	0.5mW/MHz		
<b>TOLERANCE OF ANTENNA POWER</b>	0.1mW/MHz ~ 0.6mW/MHz		
<b>MEASUREMENT UNCERTAINTY</b>	± 1.11dB		

**NOTE:** Output power tolerance (%) =  $\{(0.443 - 0.5) / 0.5\} * 100 = -11.40(\%)$ .

**Monopole antenna with -4dBi gain**

<b>ENVIRONMENTAL CONDITIONS</b>	25 deg.C, 68% RH		
<b>TEST CONDITION</b>	<b>RADIATED RF OUTPUT POWER DENSITY (mW/MHz)</b>		
	<b>CHANNEL 36 5180MHz</b>	<b>CHANNEL 48 5240MHz</b>	<b>MAX. LIMIT (mW/MHz)</b>
<b>V<sub>normal</sub></b>	0.155	0.176	10
<b>MEASUREMENT UNCERTAINTY</b>	± 1.11dB		

**NOTE:**

1. The value of radiated RF output densities are "calculated" values.
2. Calculated radiated power is only for maximum antenna gain.



## 4.8 SPURIOUS EMISSIONS FOR RECEIVER

### 4.8.1 LIMITS OF SPURIOUS EMISSIONS FOR RECEIVER

FREQUENCIES (MHz)	LIMIT
BELOW 1GHz	$\leq 4\text{nW} (-54\text{dBm})$
ABOVE 1GHz	$\leq 20\text{nW} (-47\text{dBm})$

### 4.8.2 TEST SETUP



#### 4.8.3 TEST RESULTS

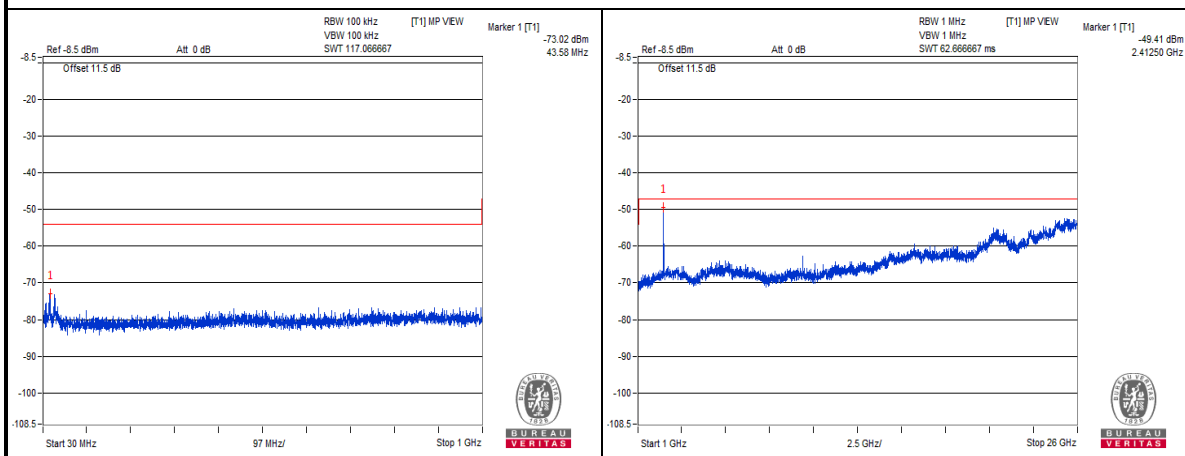
##### 802.11a (W52 & W53)

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH					
Test CHANNEL		CH36 (5180MHz)		CH48 (5240MHz)		LIMIT	RESULT
TEST CONDITION	FREQUENCY RANGE	FREQUENCY (MHz)	MEASURE VALUE	FREQUENCY (MHz)	MEASURE VALUE		
V <sub>normal</sub>	below 1GHz	43.580	0.049894nW	53.765	0.058272nW	4nW	PASS
	above 1GHz	2412.500	11.448903nW	25987.500	6.497913nW	20nW	PASS
Test CHANNEL		CH52 (5260MHz)		CH64 (5320MHz)		LIMIT	RESULT
TEST CONDITION	FREQUENCY RANGE	FREQUENCY (MHz)	MEASURE VALUE	FREQUENCY (MHz)	MEASURE VALUE		
V <sub>normal</sub>	below 1GHz	42.853	0.056931nW	42.853	0.056972nW	4nW	PASS
	above 1GHz	25406.250	7.161106nW	25943.750	6.057227nW	20nW	PASS

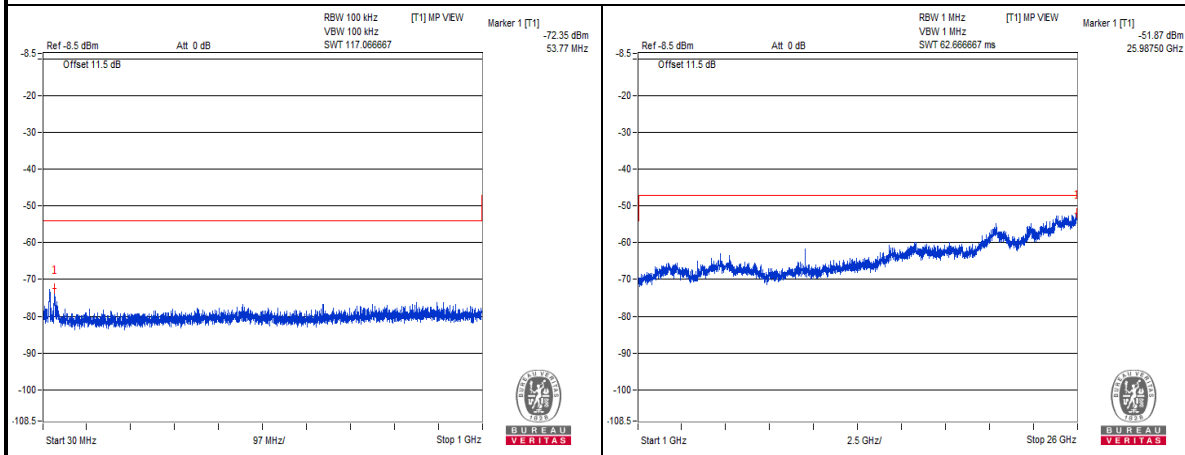
##### 802.11a (W56)

ENVIRONMENTAL CONDITIONS		25 deg.C, 68% RH					
Test CHANNEL		CH100 (5500MHz)		CH120 (5600MHz)		LIMIT	RESULT
TEST CONDITION	FREQUENCY RANGE	FREQUENCY (MHz)	MEASURE VALUE	FREQUENCY (MHz)	MEASURE VALUE		
V <sub>normal</sub>	below 1GHz	43.580	0.035134nW	43.095	0.03418nW	4nW	PASS
	above 1GHz	25418.750	6.164734nW	25350.000	5.938994nW	20nW	PASS
Test CHANNEL		CH140 (5700MHz)				LIMIT	RESULT
TEST CONDITION	FREQUENCY RANGE	FREQUENCY (MHz)		MEASURE VALUE			
V <sub>normal</sub>	below 1GHz	44.065		0.035972nW		4nW	PASS
	above 1GHz	25337.500		9.51104nW		20nW	PASS

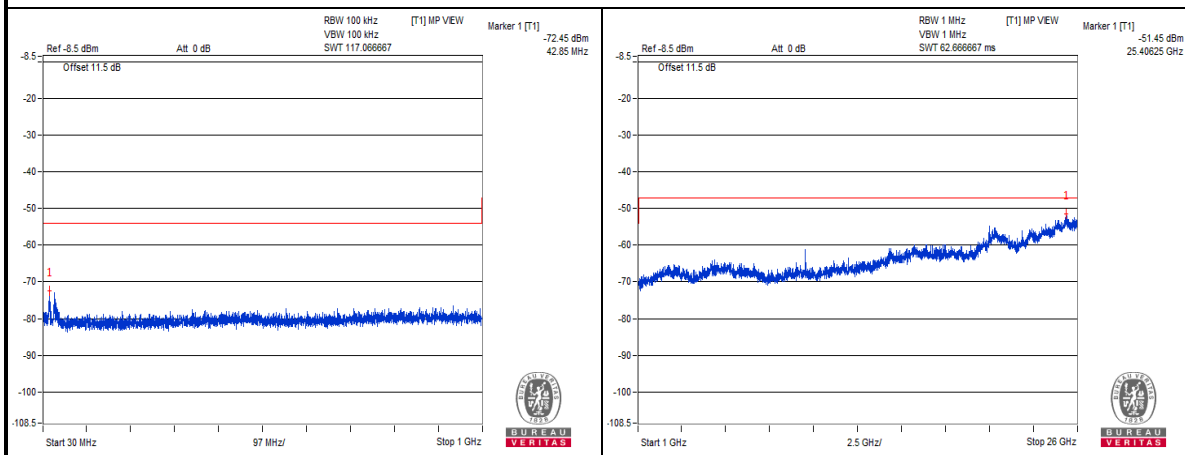
## Vnormal



## Channel 36



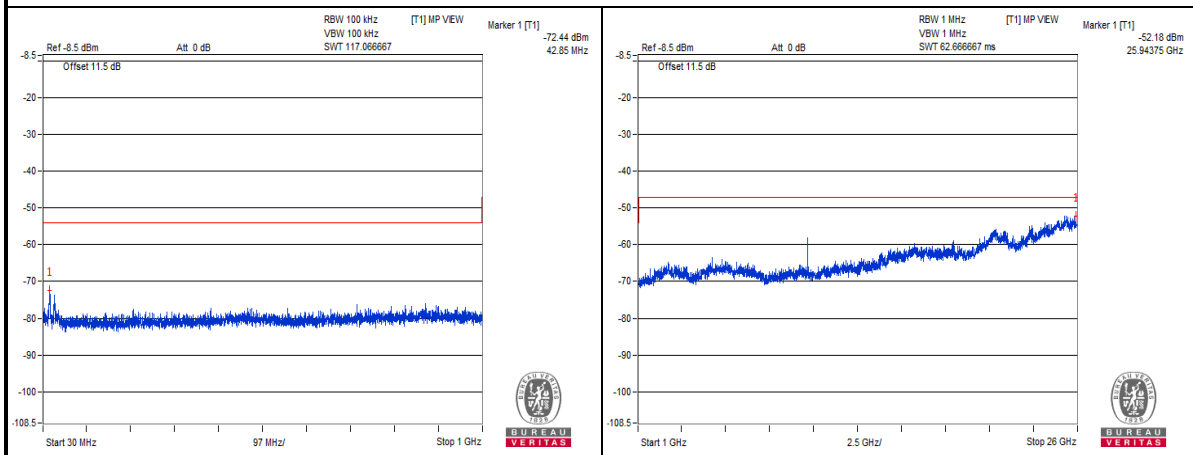
## Channel 48



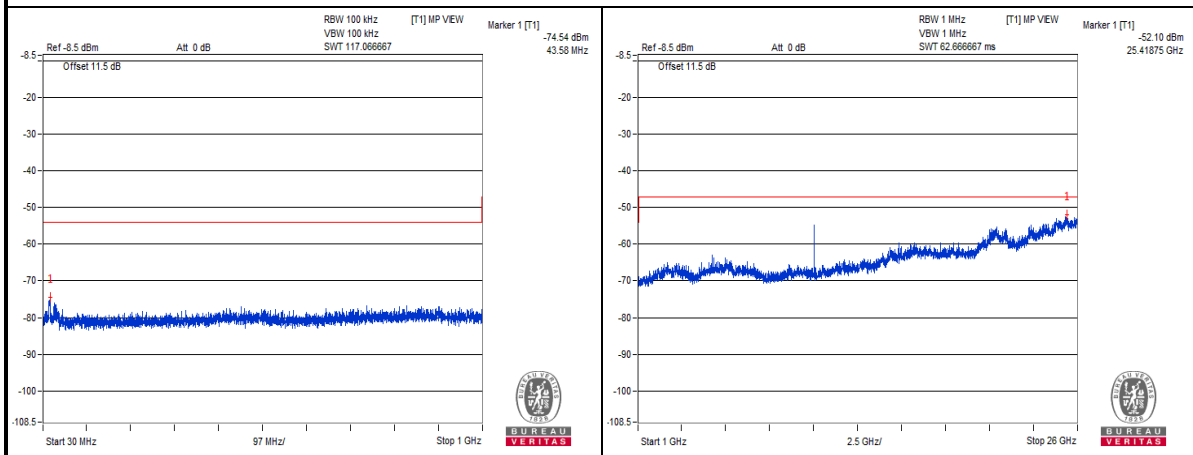
## Channel 52

Measurement uncertainty:  $\pm 3.93$  dB

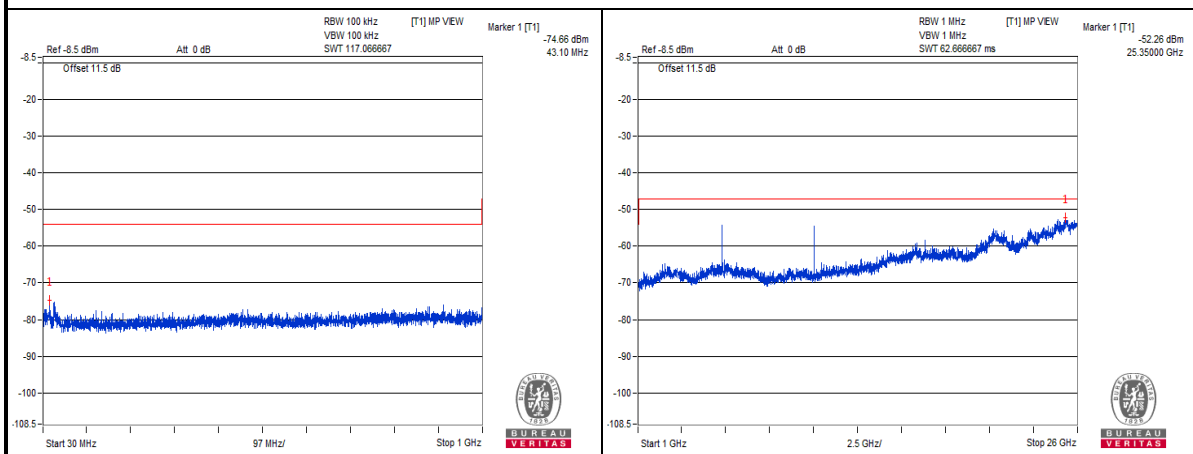
### Vnormal



### Channel 64



### Channel 100



### Channel 120

Measurement uncertainty:  $\pm 3.93\text{dB}$



Channel 140

Measurement uncertainty:  $\pm 3.93\text{dB}$

## 4.9 BURST LENGTH

### 4.9.1 LIMITS OF BURST LENGTH

FREQUENCIES (MHz)	LIMIT
TRANSMITTER OPERATING	$\leq 4\text{ms}$

### 4.9.2 TEST SETUP



#### 4.9.3 TEST RESULTS

##### 802.11a (W52 & W53)

ENVIRONMENTAL CONDITIONS	25 deg.C, 68% RH			
TEST CONDITION	BURST LENGTH (ms)			
	CHANNEL 36 5180MHz	CHANNEL 48 5240MHz	CHANNEL 52 5260MHz	CHANNEL 64 5320MHz
V <sub>normal</sub>	1.36	1.35	1.34	1.37
MEASUREMENT UNCERTAINTY	± 0.01%			

##### 802.11a (W56)

ENVIRONMENTAL CONDITIONS	25 deg.C, 68% RH		
TEST CONDITION	BURST LENGTH (ms)		
	CHANNEL 100 5500MHz	CHANNEL 120 5600MHz	CHANNEL 140 5700MHz
V <sub>normal</sub>	1.37	1.35	1.36
MEASUREMENT UNCERTAINTY	± 0.01%		

Vnormal





Vnormal



Measurement uncertainty:  $\pm 0.01\text{dB}$

**802.11n (20MHz) (W52 & W53)**

<b>ENVIRONMENTAL CONDITIONS</b>	25 deg.C, 68% RH			
<b>TEST CONDITION</b>	<b>BURST LENGTH (ms)</b>			
	<b>CHANNEL 36 5180MHz</b>	<b>CHANNEL 48 5240MHz</b>	<b>CHANNEL 52 5260MHz</b>	<b>CHANNEL 64 5320MHz</b>
<b>V<sub>normal</sub></b>	1.27	1.27	1.25	1.28
<b>MEASUREMENT UNCERTAINTY</b>	± 0.01%			

**802.11n (20MHz) (W56)**

<b>ENVIRONMENTAL CONDITIONS</b>	25 deg.C, 68% RH		
<b>TEST CONDITION</b>	<b>BURST LENGTH (ms)</b>		
	<b>CHANNEL 100 5500MHz</b>	<b>CHANNEL 120 5600MHz</b>	<b>CHANNEL 140 5700MHz</b>
<b>V<sub>normal</sub></b>	1.28	1.27	1.28
<b>MEASUREMENT UNCERTAINTY</b>	± 0.01%		

Vnormal



Measurement uncertainty:  $\pm 0.01\text{dB}$

**Vnormal**



**802.11n (40MHz) (W52 & W53)**

<b>ENVIRONMENTAL CONDITIONS</b>	25 deg.C, 68% RH			
<b>TEST CONDITION</b>	<b>BURST LENGTH (ms)</b>			
	<b>CHANNEL 38 5190MHz</b>	<b>CHANNEL 46 5230MHz</b>	<b>CHANNEL 54 5270MHz</b>	<b>CHANNEL 62 5310MHz</b>
<b>V<sub>normal</sub></b>	0.63	0.62	0.62	0.63
<b>MEASUREMENT UNCERTAINTY</b>	$\pm 0.01\%$			

**802.11n (40MHz) (W56)**

<b>ENVIRONMENTAL CONDITIONS</b>	25 deg.C, 68% RH		
<b>TEST CONDITION</b>	<b>BURST LENGTH (ms)</b>		
	<b>CHANNEL 102 5510MHz</b>	<b>CHANNEL 118 5590MHz</b>	<b>CHANNEL 134 5670MHz</b>
<b>V<sub>normal</sub></b>	0.64	0.62	0.63
<b>MEASUREMENT UNCERTAINTY</b>	$\pm 0.01\%$		

Vnormal



Measurement uncertainty:  $\pm 0.01\text{dB}$

Vnormal	
 <p>Ref 21.5 dBm    Alt 20 dB    RBW 1 MHz    VBW 1 MHz    SWT 5 ms    [T1] MP VIEW</p> <p>Marker 1 [T1]    -13.27 dBm    80.000000 us</p> <p>Delta 2 [T1]    12.75 dB    635.000000 us</p> <p>Delta 3 [T1]    0.00 dB    845.000000 us</p> <p>Center 5.51 GHz    500 us/</p>	 <p>Ref 21.5 dBm    Alt 20 dB    RBW 1 MHz    VBW 1 MHz    SWT 5 ms    [T1] MP VIEW</p> <p>Marker 1 [T1]    -8.31 dBm    50.000000 us</p> <p>Delta 2 [T1]    11.06 dB    620.000000 us</p> <p>Delta 3 [T1]    0.00 dB    835.000000 us</p> <p>Center 5.59 GHz    500 us/</p>
5510.00	5590.00
 <p>Ref 21.5 dBm    Alt 20 dB    RBW 1 MHz    VBW 1 MHz    SWT 5 ms    [T1] MP VIEW</p> <p>Marker 1 [T1]    -10.86 dBm    705.000000 us</p> <p>Delta 2 [T1]    9.86 dB    630.000000 us</p> <p>Delta 3 [T1]    0.37 dB    860.000000 us</p> <p>Center 5.67 GHz    500 us/</p>	
5670.00	
Measurement uncertainty: $\pm 0.01\text{dB}$	

**802.11ac (80MHz) (W52 & W53 & W56)**

<b>ENVIRONMENTAL CONDITIONS</b>	25 deg.C, 68% RH			
<b>TEST CONDITION</b>	<b>BURST LENGTH (ms)</b>			
	<b>CH 42 5210MHz</b>	<b>CH 58 5290MHz</b>	<b>CH 106 5530MHz</b>	<b>CH 122 5610MHz</b>
<b>V<sub>normal</sub></b>	0.24	0.25	0.25	0.25
<b>MEASUREMENT UNCERTAINTY</b>	<b>± 0.01%</b>			

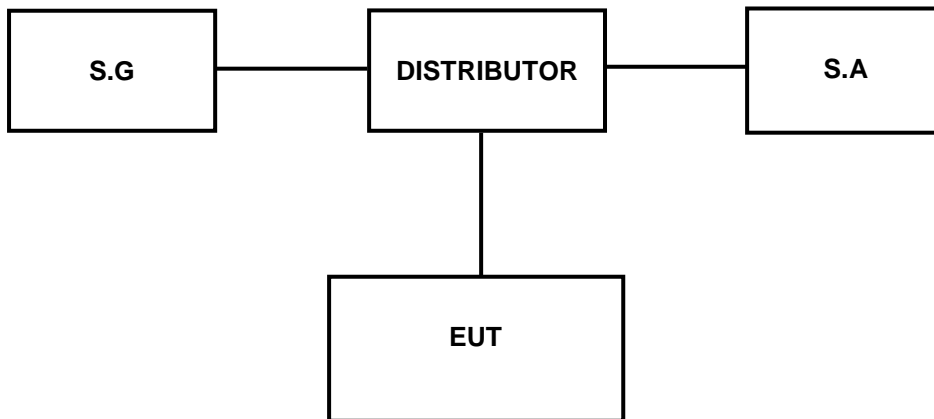


Vnormal



## 4.10 CARRIER SENSE CAPABILITY

### 4.10.1 MEASURING SYSTEM BLOCK DIAGRAM



### 4.10.2 MEASURING OPERATION PROCEDURES

- Turn the standard signal generator output OFF. Leave the equipment under test to be ready for transmission and verify the transmission with the spectrum analyzer.
- Set the equipment under test to the receiving state.
- Turn the standard signal generator ON and leave the equipment under test to be ready for transmission and verify with the spectrum analyzer that no transmission is being made.

#### 4.10.3 LEVEL OF THE AMBIENT CARRIER

##### 802.11a (W52)

FREQUENCY (MHz)	Pcs (dBm)	C.F (dB)	S.G LEVEL
5180	-55.50	5.00	-50.50
5240	-55.60	5.13	-50.47

**NOTE:**

**Pcs (dBm)** = 22.79 + Gr - 20log(F).

**Gr:** Antenna gain (5GHz: -4dBi).

**F:** Transmission frequency (MHz).

**CF** = Distributor loss + cable loss.

##### 802.11a (W53)

FREQUENCY (MHz)	Pcs (dBm)	C.F (dB)	S.G LEVEL
5260	-55.63	11.21	-44.42
5320	-51.73	11.31	-40.42

**NOTE:**

**Pcs (dBm)** = 22.79 + Gr - 20log(F).

**Gr:** Antenna gain (5GHz: -4dBi).

**F:** Transmission frequency (MHz).

**CF** = Distributor loss + cable loss.

##### 802.11a (W56)

FREQUENCY (MHz)	Pcs (dBm)	C.F (dB)	S.G LEVEL
5500	-52.02	11.49	-40.53
5600	-56.17	11.56	-44.61
5700	-56.33	11.61	-44.72

**NOTE:**

**Pcs (dBm)** = 22.79 + Gr - 20log(F).

**Gr:** Antenna gain (5GHz: -4dBi).

**F:** Transmission frequency (MHz).

**CF** = Distributor loss + cable loss.

**802.11n (20MHz) (W52)**

FREQUENCY (MHz)	Pcs (dBm)	C.F (dB)	S.G LEVEL
5180	-55.50	11.15	-44.35
5240	-55.60	11.16	-44.44

**NOTE:**

**Pcs (dBm)** = 22.79 + Gr - 20log(F).

**Gr:** Antenna gain (5GHz: -4dBi).

**F:** Transmission frequency (MHz).

**CF** = Distributor loss + cable loss.

**802.11n (20MHz) (W53)**

FREQUENCY (MHz)	Pcs (dBm)	C.F (dB)	S.G LEVEL
5260	-55.63	11.23	-44.40
5320	-55.73	11.32	-44.41

**NOTE:**

**Pcs (dBm)** = 22.79 + Gr - 20log(F).

**Gr:** Antenna gain (5GHz: -4dBi).

**F:** Transmission frequency (MHz).

**CF** = Distributor loss + cable loss.

**802.11n (20MHz) (W56)**

FREQUENCY (MHz)	Pcs (dBm)	C.F (dB)	S.G LEVEL
5500	-56.02	11.50	-44.52
5600	-56.17	11.57	-44.60
5700	-56.33	11.62	-44.71

**NOTE:**

**Pcs (dBm)** = 22.79 + Gr - 20log(F).

**Gr:** Antenna gain (5GHz: -4dBi).

**F:** Transmission frequency (MHz).

**CF** = Distributor loss + cable loss.

**802.11n (40MHz) (W52)**

FREQUENCY (MHz)	Pcs (dBm)	C.F (dB)	S.G LEVEL
5190	-55.51	11.15	-44.36
5230	-55.58	11.16	-44.42

**NOTE:**

**Pcs (dBm)** = 22.79 + Gr - 20log(F).

**Gr:** Antenna gain (5GHz: -4dBi).

**F:** Transmission frequency (MHz).

**CF** = Distributor loss + cable loss.

**802.11n (40MHz) (W53)**

FREQUENCY (MHz)	Pcs (dBm)	C.F (dB)	S.G LEVEL
5270	-55.65	11.24	-44.41
5310	-55.71	11.31	-44.40

**NOTE:**

**Pcs (dBm)** = 22.79 + Gr - 20log(F).

**Gr:** Antenna gain (5GHz: -4dBi).

**F:** Transmission frequency (MHz).

**CF** = Distributor loss + cable loss.

**802.11n (40MHz) (W56)**

FREQUENCY (MHz)	Pcs (dBm)	C.F (dB)	S.G LEVEL
5510	-56.03	11.49	-44.54
5590	-56.16	11.56	-44.60
5670	-56.28	11.59	-44.69

**NOTE:**

**Pcs (dBm)** = 22.79 + Gr - 20log(F).

**Gr:** Antenna gain (5GHz: -4dBi).

**F:** Transmission frequency (MHz).

**CF** = Distributor loss + cable loss.

**802.11ac (80MHz) (W52)**

FREQUENCY (MHz)	Pcs (dBm)	C.F (dB)	S.G LEVEL
5210	-55.55	11.15	-44.40

**NOTE:**

**Pcs (dBm)** = 22.79 + Gr - 20log(F).

**Gr:** Antenna gain (5GHz: -4dBi).

**F:** Transmission frequency (MHz).

**CF** = Distributor loss + cable loss.

**802.11ac (80MHz) (W53)**

FREQUENCY (MHz)	Pcs (dBm)	C.F (dB)	S.G LEVEL
5290	-55.68	11.24	-44.44

**NOTE:**

**Pcs (dBm)** = 22.79 + Gr - 20log(F).

**Gr:** Antenna gain (5GHz: -4dBi).

**F:** Transmission frequency (MHz).

**CF** = Distributor loss + cable loss.

**802.11ac (80MHz) (W56)**

FREQUENCY (MHz)	Pcs (dBm)	C.F (dB)	S.G LEVEL
5530	-56.06	11.49	-44.57
5610	-56.19	11.56	-44.63

**NOTE:**

**Pcs (dBm)** = 22.79 + Gr - 20log(F).

**Gr:** Antenna gain (5GHz: -4dBi).

**F:** Transmission frequency (MHz).

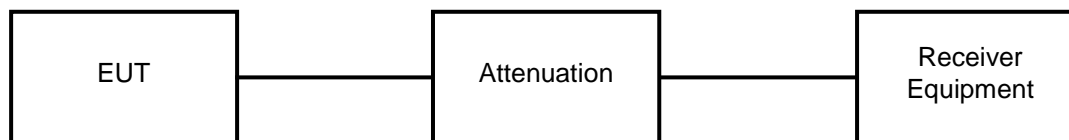
**CF** = Distributor loss + cable loss.

## 4.11 INTERFERENCE PREVENTION FUNCTION

### 4.11.1 LIMITS OF INTERFERENCE PREVENTION FUNCTION

NA

### 4.11.2 TEST SETUP



### 4.11.3 TEST RESULTS

ENVIRONMENTAL CONDITIONS	25 deg.C, 68% RH
Link Mode	Test Result
WiFi	PASS



BUREAU  
VERITAS

Test Report No.: RJ180530W011-3

## 5 TEST INSTRUMENTS

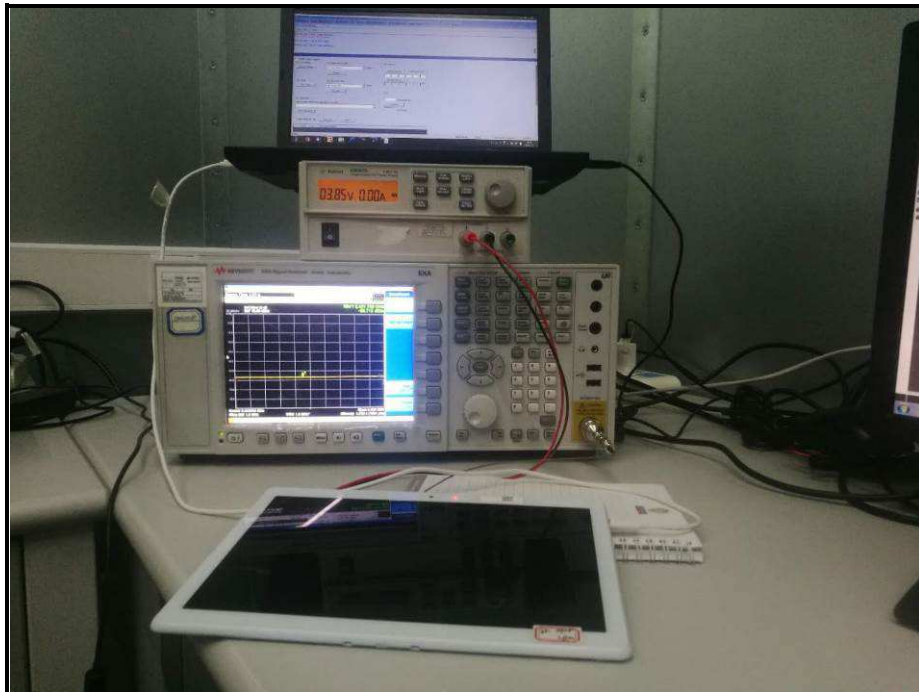
Equipment	Manufacturer	Model No.	Serial No.	Calibration Authority	Last Cal.	Next Cal.
Power Meter	ANRITSU	ML2495A	1506002	LiSai	Mar. 02,18	Mar. 01,19
DC Source	Kikusui/JP	PMX18-5A	0000001	N/A	Jan. 07,18	Jan. 06,19
EXA Signal Analyzer	KEYSIGHT	N9010A-526	MY54510322	LiSai	Mar. 16,18	Mar. 15,19
EXA Signal Analyzer	KEYSIGHT	N9010A-544	MY54510355	LiSai	Mar. 16,18	Mar. 15,19
Power Sensor	ANRITSU	MA2411B	1339352	LiSai	Mar. 16,18	Mar. 15,19

**NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

2. The test was performed in RF Oven room.



## 6 PHOTOGRAPHS OF THE TEST CONFIGURATION



## **7 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB**

No any modifications were made to the EUT by the lab during the test.

**--- END**