

**FCC PART 15 SUBPART E TEST REPORT**

**For**

**High Power AC1750 Wi-Fi Router**

**Model No.: RTA1750**

**FCC ID: ZTT-RTA1750**

of

**Applicant: Amped Wireless**

**Address: 13089 Peyton Dr. #C307 Chino Hills, California 91709  
United State**

Tested and Prepared

by

**Worldwide Testing Services (Taiwan) Co., Ltd.**

**FCC Registration No.: 930600**

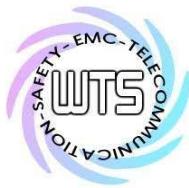
**Industry Canada filed test laboratory Reg. No. IC 5679A-1**

**A2LA Accredited No.: 2732.01**



**Report No.: W6M21410-14564-C-54-R1**

6F, NO. 58, LANE 188, RUEY-KUANG RD., NEIHU TAIPEI 114, TAIWAN, R.O.C.  
TEL: 886-2-66068877      FAX: 886-2-66068879      E-mail: [wts@wts-lab.com](mailto:wts@wts-lab.com)

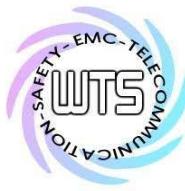


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750

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## 1 General Information

### 1.1 Notes

The purpose of conformity testing is to increase the probability of adherence to the essential requirements or conformity specifications, as appropriate.

The complexity of the technical specifications, however, means that full and thorough testing is impractical for both technical and economic reasons.

Furthermore, there is no guarantee that a test sample which has passed all the relevant tests conforms to a specification.

Neither is there any guarantee that such a test sample will interwork with other genuinely open systems. The existence of the tests nevertheless provides the confidence that the test sample possesses the qualities as maintained and that its performance generally conforms to representative cases of communications equipment.

The test results of this test report relate exclusively to the item tested as specified in 1.5.

The test report may only be reproduced or published in full.

Reproduction or publication of extracts from the report requires the prior written approval of the Worldwide Testing Services(Taiwan) Co., Ltd.

Specific Conditions:

Usage of the hereunder tested device in combination with other integrated or external antennas requires at least additional output power measurements, spurious emission measurements, conducted emission measurements (AC supply lines) and radio frequency exposure evaluations for each individual configuration performed, for certification by FCC.

Tester:

January 30, 2015

Rick Chen

Date

WTS-Lab.

Name

Signature

Technical responsibility for area of testing:

January 30, 2015

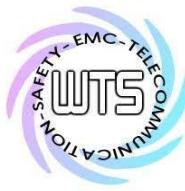
Kevin Wang

Date

WTS

Name

Signature



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## **1.2 Testing laboratory**

### **1.2.1 Location**

OATS

No.5-1, Lishui, Shuang Sing Village,  
Wanli Dist., New Taipei City 207,  
Taiwan (R.O.C.)

3 meter semi-anechoic chamber

No.35, Aly. 21, Ln. 228, Ankang Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

TEL:886-2-6613-0228

FAX:886-2-2791-5046

Company

Worldwide Testing Services(Taiwan) Co., Ltd.

6F, NO. 58, LANE 188, RUEY-KUANG RD.

NEIHU, TAIPEI 114, TAIWAN R.O.C.

Tel : 886-2-66068877

Fax : 886-2-66068879

### **1.2.2 Details of accreditation status**

Accredited testing laboratory

A2LA accredited number: 2732.01

FCC filed test laboratory Reg. No. 930600

Industry Canada filed test laboratory Reg. No. IC 5679A-1, IC 5107A-1



### **Test location, where different from Worldwide Testing Services (Taiwan) Co., Ltd. :**

Name: /.

Accredited number: /.

Street: /.

Town: /.

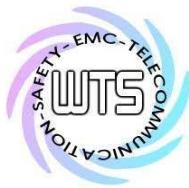
Country: /.

Telephone: /.

Fax: /.

## **1.3 Details of approval holder**

Name:	Amped Wireless
Street:	13089 Peyton Dr. #C307
Town:	Chino Hills, California 91709
Country:	United States
Telephone:	(909) 217-3229
Fax:	(909) 580-8883



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## **1.4 Application details**

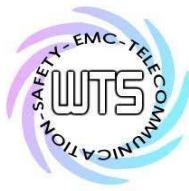
Date of receipt of test item: November 04, 2014  
Date of test: from November 05, 2014 to January 30, 2015

## **1.5 General information of Test item**

Type of test item: High Power AC1750 Wi-Fi Router  
Model Number: RTA1750  
Brand Name: Amped Wireless  
Multi-listing model number: RE1750A  
Photos: see Appendix

### **Technical data**

Frequency band: 5.725 GHz-5.850 GHz  
802.11a: Low Channel (CH149): 5745 MHz  
Middle Channel (CH157): 5785 MHz  
High Channel (CH165): 5825 MHz  
  
802.11n 20MHz: Low Channel (CH149): 5745 MHz  
Middle Channel (CH157): 5785 MHz  
High Channel (CH165): 5825 MHz  
  
802.11n 40MHz: Low Channel (CH151): 5755 MHz  
High Channel (CH159): 5795 MHz  
  
802.11ac: CH155: 5780 MHz  
  
Numbers of channel: 802.11a: 5 channels  
802.11n 20 MHz: 5 channels  
802.11n 40 MHz: 2 channels  
802.11ac : 1 channel  
  
Operating modes: duplex  
  
Type of modulation: OFDM  
  
Fixed point to point operation: Yes / No  
  
Antenna: DualBand Omni Antenna  
  
Antenna gain: ANT0: 5 dBi / ANT1: 5 dBi / ANT2: 5 dBi



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Directional gain: 9.77 dBi

\*According to KDB 662911 D01 Multiple Transmitter Output v02r01, If *any* transmit signals are correlated with each other, Directional gain =  $G_{ANT} + 10 \log(N_{ANT})$  dBi

Power supply: Adapter (I/P: 100-240Vac, 50/60Hz, MAX 0.5A  
O/P: 12Vdc, 1.5A)

Emission designator:  
802.11a: 16M2D1D  
802.11n 20 MHz: 21M9D1D  
802.11n 40 MHz: 43M2D1D  
802.11ac:46M2D4D

Note: Tests were performed under worst case mode 802.11a 6 Mbps, 802.11n 20MHz(MCS0), 802.11n 40MHz(MCS0) and 802.11ac 80MHz(6Mbps).

Classification:

Fixed Device	<input checked="" type="checkbox"/>
Mobile Device (Human Body distance > 20cm)	<input type="checkbox"/>
Portable Device (Human Body distance < 20cm)	<input type="checkbox"/>

Manufacturer: (if applicable)

Name: ./.  
Street: ./.  
Town: ./.  
Country: ./.

## Transmitter **ANT0**

### Unom

#### **Mode A (OFDM)**

Power ( ch 149 or A): Conducted: 16.32 dBm  
Power ( ch 157 or B): Conducted: 15.07 dBm  
Power ( ch 165 or C): Conducted: 15.45 dBm

#### **Mode B (OFDM)**

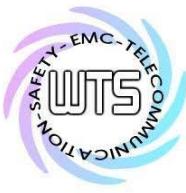
Power ( ch 149 or A): Conducted: 12.19 dBm  
Power ( ch 157 or B): Conducted: 15.28 dBm  
Power ( ch 165 or C): Conducted: 15.65 dBm

#### **Mode C (OFDM)**

Power ( ch 151 or A): Conducted: 15.37 dBm  
Power ( ch 159 or B): Conducted: 15.38 dBm

#### **Mode D (OFDM)**

Power ( ch 155 or A): Conducted: 13.52 dBm



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## **ANT1**

### **Mode A (OFDM)**

Power ( ch 149 or A): Conducted: 19.00 dBm  
Power ( ch 157 or B): Conducted: 12.92 dBm  
Power ( ch 165 or C): Conducted: 14.13 dBm

### **Mode B (OFDM)**

Power ( ch 149 or A): Conducted: 12.40 dBm  
Power ( ch 157 or B): Conducted: 11.92 dBm  
Power ( ch 165 or C): Conducted: 15.39 dBm

### **Mode C (OFDM)**

Power ( ch 151 or A): Conducted: 13.65 dBm  
Power ( ch 159 or B): Conducted: 15.69 dBm

### **Mode D (OFDM)**

Power ( ch 155 or A): Conducted: 13.31 dBm

## **ANT2**

### **Mode A (OFDM)**

Power ( ch 149 or A): Conducted: 17.04 dBm  
Power ( ch 157 or B): Conducted: 18.13 dBm  
Power ( ch 165 or C): Conducted: 13.56 dBm

### **Mode B (OFDM)**

Power ( ch 149 or A): Conducted: 15.08 dBm  
Power ( ch 157 or B): Conducted: 16.08 dBm  
Power ( ch 165 or C): Conducted: 14.59 dBm

### **Mode C (OFDM)**

Power ( ch 151 or A): Conducted: 12.26 dBm  
Power ( ch 159 or B): Conducted: 12.02 dBm

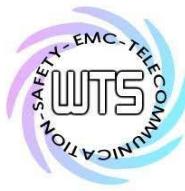
### **Mode D (OFDM)**

Power ( ch 155 or A): Conducted: 13.31 dBm

Combine	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	66.15	89.84	100.09	18.21	19.53	20.00
802.11n 40MHz	73.65	--	87.50	18.67	--	19.42
802.11ac	65.35	--	--	18.15	--	--

## **1.6 Test standards**

Technical standard : 47 CFR FCC Part 15 Subpart E § 15.407



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## 2      Technical test

## 2.1 Summary of test results

No deviations from the technical specification(s) were ascertained in the course of the tests performed.

or

The deviations as specified in 3 were ascertained in the course of the tests performed.

□

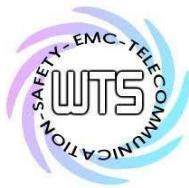
## 2.2 Test environment

Temperature: 23 °C

Relative humidity content: 20 ... 75 %

Air pressure: 86 ... 103 kPa

Details of power supply: Adapter (I/P: 100-240Vac, 50/60Hz, MAX 0.5A  
O/P: 12Vdc, 1.5A)

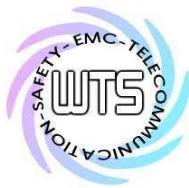


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## 2.3 Test Equipment List

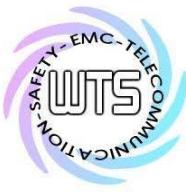
No.	Test equipment	Type	Serial No.	Manufacturer	Cal. Date	Next Cal. Date
ETSTW-CE 001	EMI TEST RECEIVER	ESHS10	842121/013	R&S	2014/9/2	2015/9/1
ETSTW-CE 003	AC POWER SOURCE	APS-9102	D161137	GW	Function Test	
ETSTW-CE 008	HF-EICHLEITUNG RF STEP ATTENUATOR 139dB DPSP	334.6010.02	844581/024	R&S	Function Test	
ETSTW-CE 009	TEMP.&HUMIDITY CHAMBER	GTH-225-40-1P-U	MAA0305-009	GIANT FORCE	2014/7/8	2015/7/7
ETSTW-CE 016	TWO-LINE V-NETWORK	ENV216	100050	R&S	2014/10/13	2015/10/12
ETSTW-RE 004	EMI TEST RECEIVER	ESI 40	832427/004	R&S	2014/9/2	2015/9/1
ETSTW-RE 005	EMI TEST RECEIVER	ESVS10	843207/020	R&S	2014/9/2	2015/9/1
ETSTW-RE 012	TUNABLE BANDREJECT FILTER	D.C 0309	146	K&L	Function Test	
ETSTW-RE 013	TUNABLE BANDREJECT FILTER	D.C 0336	397	K&L	Function Test	
ETSTW-RE 018	MICROWAVE HORN ANTENNA	AT4560	27212	AR	2014/10/15	2015/10/14
ETSTW-RE 027	Passive Loop Antenna	6512	00034563	ETS-Lindgren	2014/7/01	2015/6/30
ETSTW-RE 030	Double-Ridged Guide Horn Antenna	3117	00035224	ETS-Lindgren	2014/2/25	2015/2/24
ETSTW-RE 045	ESA-E SERIES SPECTRUM ANALYZER	E4404B	MY45111242	Agilent	Pre-test Use	
ETSTW-RE 049	TRILOG Super Broadband test Antenna	VULB 9160	9160-3185	Schwarzbeck	2014/2/18	2015/2/17
ETSTW-RE 050	Attenuator 10dB	50HF-010-1	None	JFW	2014/3/3	2015/3/2
ETSTW-RE 051	Attenuator 6dB	50HF-006-1	None	JFW	2014/3/3	2015/3/2
ETSTW-RE 053	Attenuator 3dB	50HF-003-1	None	JFW	2014/3/3	2015/3/2
ETSTW-RE 055	SPECTRUM ANALYZER	FSU 26	200074	R&S	2014/6/05	2015/6/04
ETSTW-RE 060	Attenuator 30dB	5015-30	F651012z-01	ATM	2014/3/3	2015/3/2
ETSTW-RE 062	Amplifier Module	CHC 2	None	KMIC	2014/11/26	2015/11/25
ETSTW-RE 064	Bluetooth Test Set	MT8852B-042	6K00005709	Anritsu	Function Test	
ETSTW-RE 069	Double-Ridged Guide Horn Antenna	3117	00069377	ETS-Lindgren	Function Test	
ETSTW-RE 072	CELL SITE TEST SET	8921A	3339A00375	HP	2014/10/9	2015/10/8
ETSTW-RE 088	SOLID STATE AMPLIFIER	KMA180265A01	99057	KMIC	2014/9/22	2015/9/21
ETSTW-RE 099	DC Block	50DB-007-1	None	JFW	2014/3/3	2015/3/2
ETSTW-RE 106	Humidity Temperature Meter	TES-1366	091011113	TES	2014/11/7	2015/11/6
ETSTW-RE 111	TRILOG Super Broadband test Antenna	VULB 9160	9160-3309	Schwarzbeck	2014/12/5	2015/12/4
ETSTW-RE 112	AC POWER SOURCE	TFC-1005	None	T-Power	Function test	
ETSTW-RE 115	2.4GHz Notch Filter	N0124411	473874	MICROWAVE CIRCUITS	2015/1/7	2016/1/6
ETSTW-RE 120	RF Player	MP9200	MP9210-111022	ADIVIC	Function test	
ETSTW-RE 122	SIGNAL GENERATOR	SMF100A	102149	R&S	2014/6/11	2015/6/10
ETSTW-RE 125	5GHz Notch filter	5NSL11-5200/E221.3-O/O	1	K&L Microwave	2014/8/12	2015/8/11



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ETSTW-RE 126	5GHz Notch filter	5NSL11-5800/E221.3-O/O	1	K&L Microwave	2014/8/12	2015/8/11
ETSTW-RE 127	RF Switch Box	RFS-01	None	WTS	2014/3/3	2015/3/2
ETSTW-RE 128	5.3GHz Notch filter	N0153001	SN487233	Microwave Circuits	2014/8/12	2015/8/11
ETSTW-RE 129	5.5GHz Notch filter	N0555984	SN487234	Microwave Circuits	2014/8/12	2015/8/11
ETSTW-RE 130	Handheld RF Spectrum Analyzer	N9340A	CN0147000204	Agilent	Pre-test Use	
ETSTW-GSM 002	Universal Radio Communication Tester	CMU 200	109439	R&S	2014/10/20	2015/10/19
ETSTW-GSM 019	Band Reject Filter	WRCTF824/849-822/851-40/12+9SS	3	WI	2015/1/7	2016/1/6
ETSTW-GSM 020	Band Reject Filter	WRCD1747/1748-1743/1752-32/5SS	1	WI	2015/1/7	2016/1/6
ETSTW-GSM 021	Band Reject Filter	WRCD1879.5/1880.5-1875.5/1884.5-32/5SS	3	WI	2015/1/7	2016/1/6
ETSTW-GSM 022	Band Reject Filter	WRCT901.9/903.1-904.25-50/8SS	1	WI	2015/1/7	2016/1/6
ETSTW-GSM 023	Power Divider	4901.19.A	None	SUHNER	2014/9/17	2015/9/16
ETSTW-Cable 010	BNC Cable	5 M BNC Cable	None	JYE BAO CO.,LTD.	2014/10/15	2015/10/14
ETSTW-Cable 011	BNC Cable	BNC Cable 1	None	JYE BAO CO.,LTD.	Pre-test Use NCR	
ETSTW-Cable 012	N TYPE To SMA Cable	Cable 012	None	JYE BAO CO.,LTD.	2014/10/15	2015/10/14
ETSTW-Cable 016	BNC Cable	Switch Box	B Cable 1	Schwarz beck	2014/2/27	2015/2/26
ETSTW-Cable 017	BNC Cable	X Cable	B Cable 2	Schwarz beck	2014/2/27	2015/2/26
ETSTW-Cable 018	BNC Cable	Y Cable	B Cable 3	Schwarz beck	2014/2/27	2015/2/26
ETSTW-Cable 019	BNC Cable	Z Cable	B Cable 4	Schwarz beck	2014/2/27	2015/2/26
ETSTW-Cable 022	N TYPE Cable	5006	0002	JYE BAO CO.,LTD.	2014/2/19	2015/2/18
ETSTW-Cable 026	Microwave Cable	SUCOFLEX 104	279075	HUBER+SUHNER	2014/3/3	2015/3/2
ETSTW-Cable 027	Microwave Cable	SUCOFLEX 104	279083	HUBER+SUHNER	2014/3/3	2015/3/2
ETSTW-Cable 028	Microwave Cable	FA147A0015M2020	30064-2	UTIFLEX	2015/1/16	2016/1/15
ETSTW-Cable 029	Microwave Cable	FA147A0015M2020	30064-3	UTIFLEX	2014/9/22	2015/9/21
ETSTW-Cable 030	Microwave Cable	SUCOFLEX 104 (S_Cable 9)	279067	HUBER+SUHNER	2014/3/3	2015/3/2
ETSTW-Cable 031	Microwave Cable	SUCOFLEX 104 (S_Cable 10)	238092	HUBER+SUHNER	2014/11/26	2015/11/25
ETSTW-Cable 043	Microwave Cable	SUCOFLEX 104	317576	HUBER+SUHNER	2014/11/26	2015/11/25
ETSTW-Cable 048	Microwave Cable	SUCOFLEX 104	325518	HUBER+SUHNER	2014/11/26	2015/11/25
ETSTW-Cable 053	N TYPE To SMA Cable	RG142	None	JYE BAO CO.,LTD.	2014/2/19	2015/2/18
ETSTW-Cable 058	Microwave Cable	SUCOFLEX 104	none	HUBER+SUHNER	2014/2/19	2015/2/18
WTSTW-SW 002	EMI TEST SOFTWARE	EZ_EMC	None	Farad	Version ETS-03A1	



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## **2.4 Test Procedure**

The test procedures are performed following the test stands ANSI STANDARD C63.4 and FCC 789033 D02 General UNII Test Procedures New Rules v01.

### ■ Minimum Emission Bandwidth for the band 5.725-5.85 GHz

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW)  $\geq 3 \times \text{RBW}$ .
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

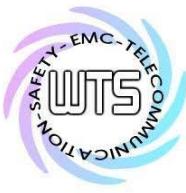
Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

### ■ 99 Percent Occupied Bandwidth

The 99-percent occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5 % of the total mean power of the given emission. Measurement of the 99-percent occupied bandwidth is required only as a condition for using the optional band-edge measurement techniques described in section H3)d). Measurements of 99-percent occupied bandwidth may also optionally be used in lieu of the 6-dB emission bandwidth to define the minimum frequency range over which the spectrum is integrated when measuring maximum conducted output power as described in section E). However, the 6-dB bandwidth must be measured to determine bandwidth dependent limits on maximum conducted output power in accordance with 15.407(a).

The following procedure shall be used for measuring (99 %) power bandwidth.

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW  $\geq 3 \cdot \text{RBW}$
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.



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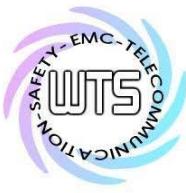
## ■ Maximum conducted output power

- (i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.
- (ii) Set RBW = 1 MHz.
- (iii) Set VBW  $\geq$  3 MHz.
- (iv) Number of points in sweep  $\geq$  2 Span / RBW. (This ensures that bin-to-bin spacing is  $\leq$  RBW/2, so that narrowband signals are not lost between frequency bins.)
- (v) Sweep time = auto.
- (vi) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
- (vii) If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle  $\geq$  98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run”.
- (viii) Trace average at least 100 traces in power averaging (i.e., RMS) mode.
- (ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument’s band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the spectrum.

## ■ Power Density

The rules requires “maximum power spectral density” measurements where the intent is to measure the maximum value of the time average of the power spectral density measured during a period of continuous transmission.

1. Create an average power spectrum for the EUT operating mode being tested by following the instructions in section II.E.2. for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, “Compute power...”. (This procedure is required even if the maximum conducted output power measurement was performed using a power meter, method PM.)
2. Use the peak search function on the instrument to find the peak of the spectrum and record its value.
3. Make the following adjustments to the peak value of the spectrum, if applicable:
  - a) If Method SA-2 or SA-2 Alternative was used, add  $10 \log(1/x)$ , where x is the duty cycle, to the peak of the spectrum.
  - b) If Method SA-3 Alternative was used and the linear mode was used in step II.E.2.g)(viii), add 1 dB to the final result to compensate for the difference between linear averaging and power averaging.
4. The result is the Maximum PSD over 1 MHz reference bandwidth.
5. For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus



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Registration number: W6M21410-14564-C-54-R1

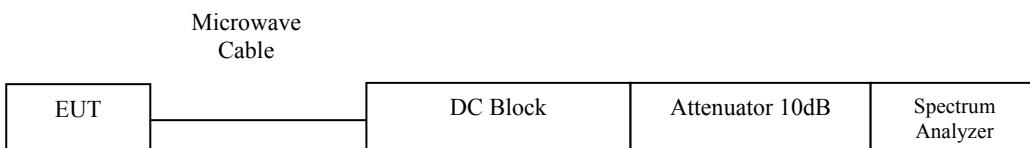
FCC ID: ZTT-RTA1750

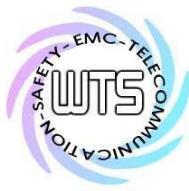
a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, "provided that the measured power is integrated over the full reference bandwidth" to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:

- a) Set RBW  $\geq 1/T$ , where T is defined in section II.B.1.a).
- b) Set VBW  $\geq 3$  RBW.
- c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add  $10\log(500\text{kHz}/\text{RBW})$  to the measured result, whereas RBW (< 500 KHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
- d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add  $10\log(1\text{MHz}/\text{RBW})$  to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.
- e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 KHz for the sections 5.c) and 5.d) above, since RBW=100 KHZ is available on nearly all spectrum analyzers.

## Conducted measurement test setup





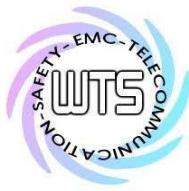
# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750

## 3 Test results (enclosure)

Test case	Para. Number	Required	Test passed	Test failed
Peak Transmit Power	15.407(a)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6-dB emission bandwidth	15.407(a)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
99 % Occupied Bandwidth	789033 D02 General UNII Test Procedures New Rules v01	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Peak Power Spectral Density	15.407(a)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Undesirable emission limits	15.407(b)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Radio Frequency Exposure	15.407(f)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Radiated Emission from Receiver Part	15.109	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AC Conducted Emissions	15.207	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

The following is intentionally left blank.



# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750

## 3.1 Peak Transmit Power, FCC 15.407 (a)

According to §15.407(a)

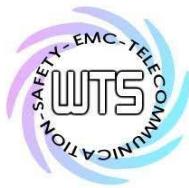
1. For the band 5.15-5.25 GHz, the maximum conducted power over the frequency of operation shall not exceed the lesser of 50 mW (17dBm) or 4 dBm + 10log B.
2. For the band 5.25-5.35 GHz and 5.47-5.725GHz, the maximum conducted power over the frequency of operation shall not exceed the lesser of 250 mW (24dBm) or 11 dBm + 10log B.
3. For the band 5.725-5.825 GHz, the maximum conducted power over the frequency of operation shall not exceed the lesser of 1W (30dBm) or 17 dBm + 10log B.

where B is the 6-dB emission bandwidth in MHz.

ANT0

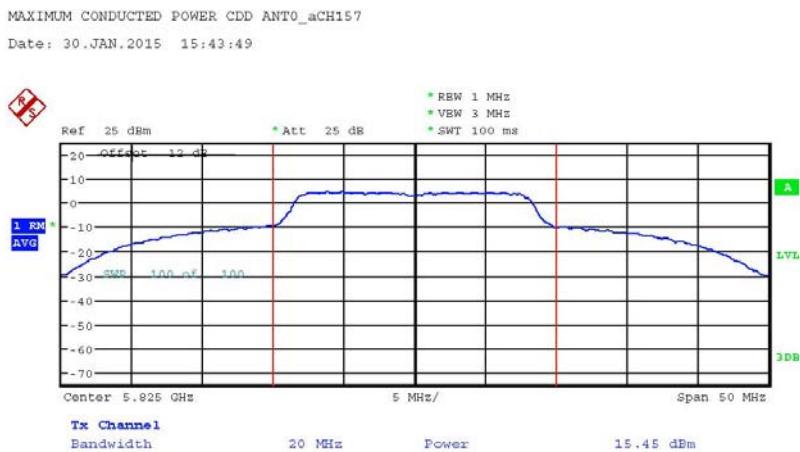
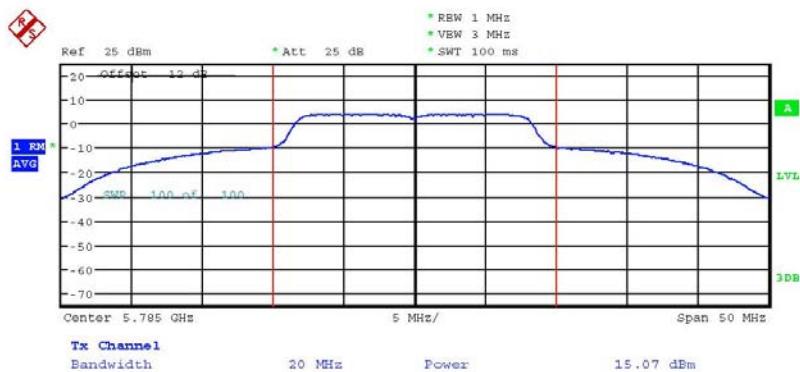


MAXIMUM CONDUCTED POWER CDD ANTO\_aCH149  
Date: 30.JAN.2015 15:42:57

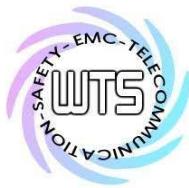


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750

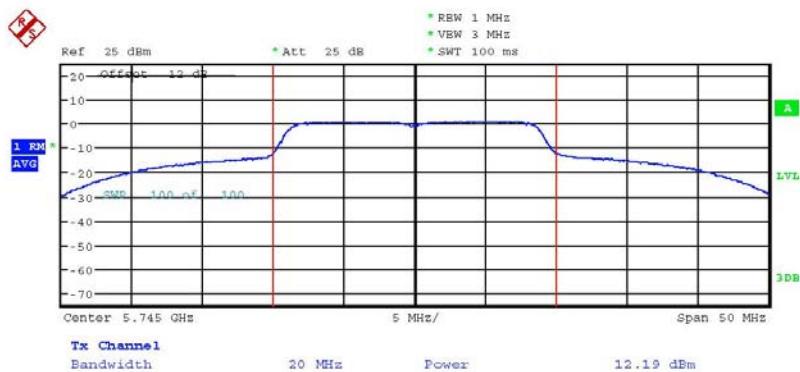


MAXIMUM CONDUCTED POWER CDD ANTO\_aCH165  
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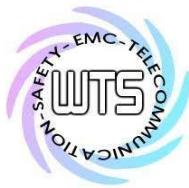


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750

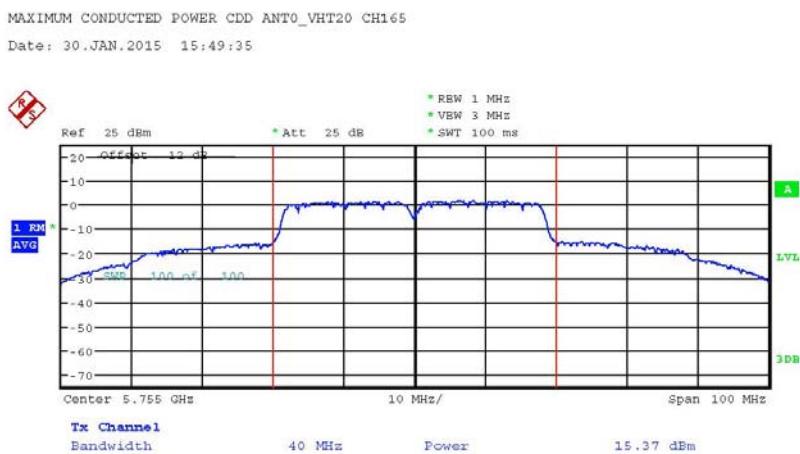
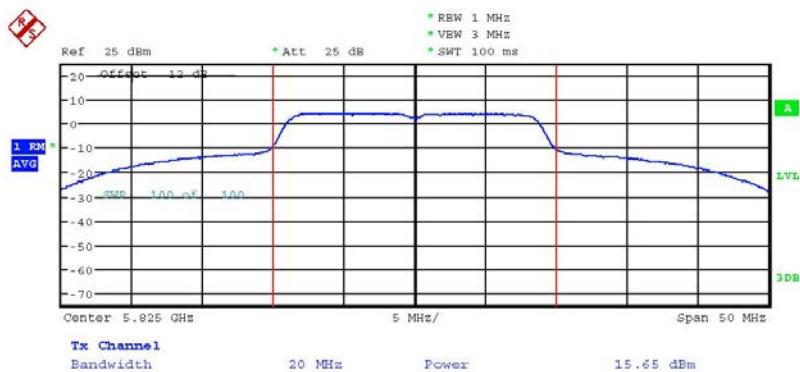


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Date: 30.JAN.2015 15:50:59

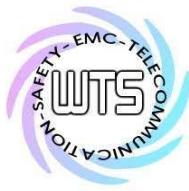


# Worldwide Testing Services(Taiwan) Co., Ltd.

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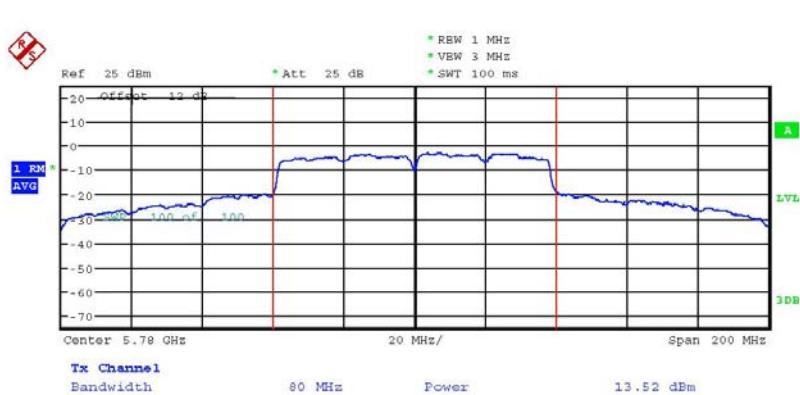
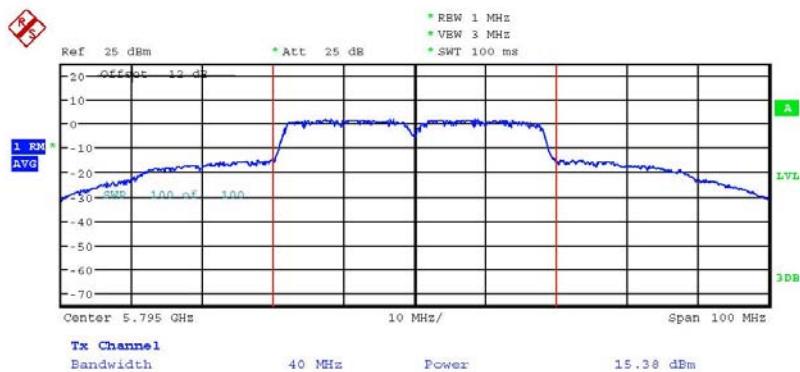


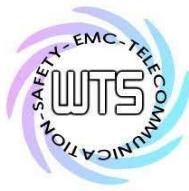
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Date: 30.JAN.2015 16:03:14



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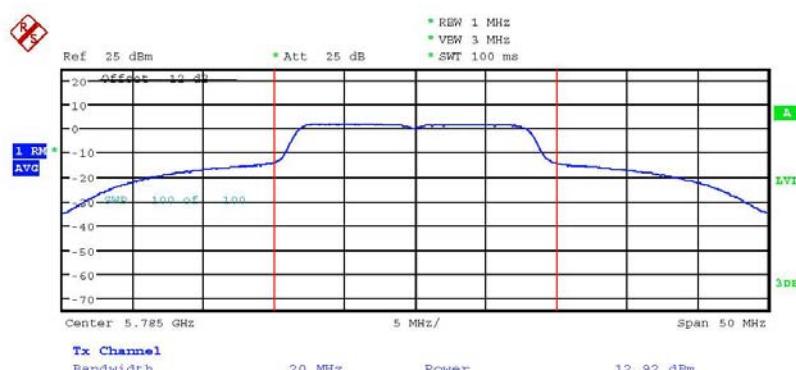


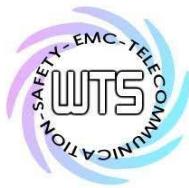


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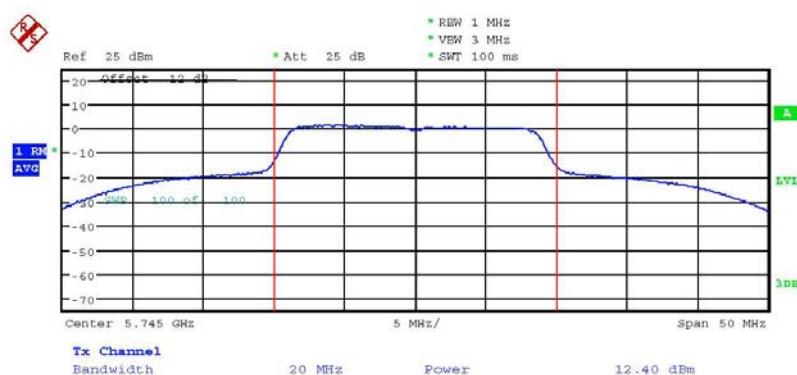
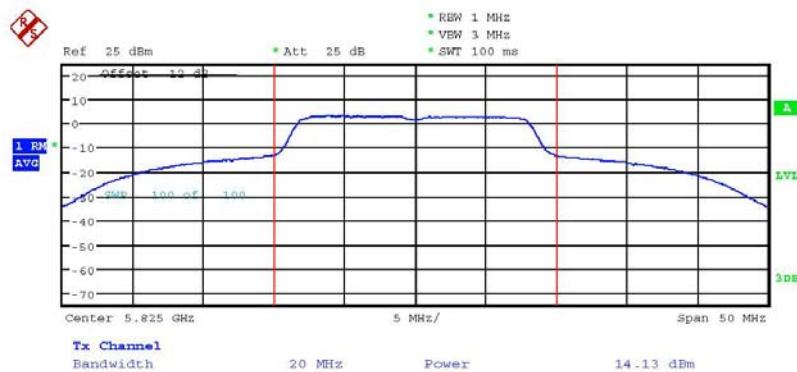
ANT1



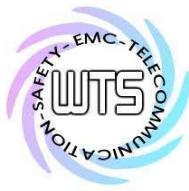


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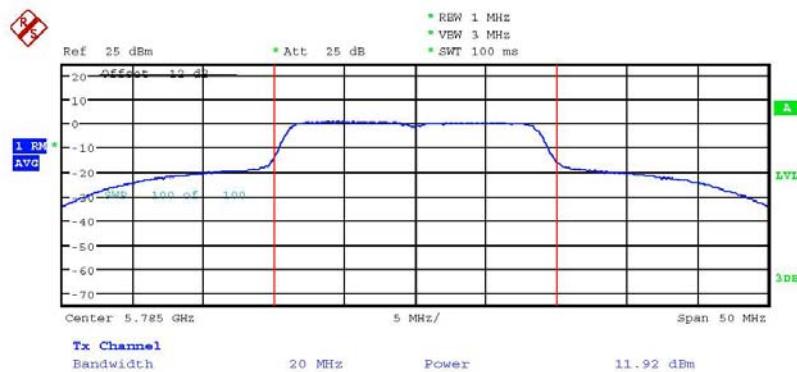


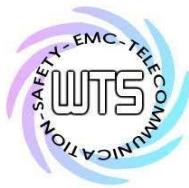
MAXIMUM CONDUCTED POWER CDD ANTI\_VHT20 CH149  
Date: 30.JAN.2015 15:52:37



# Worldwide Testing Services(Taiwan) Co., Ltd.

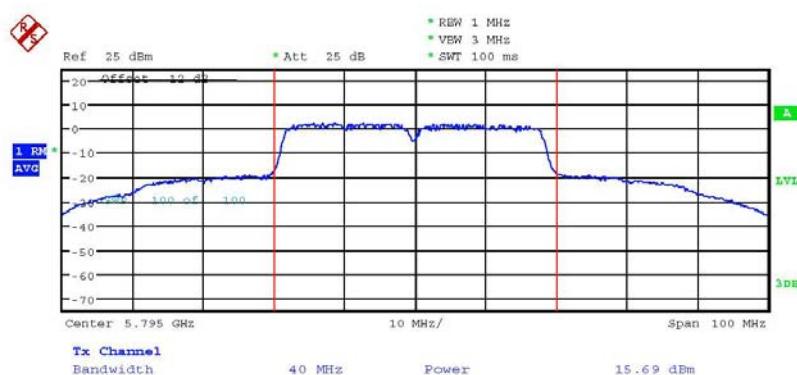
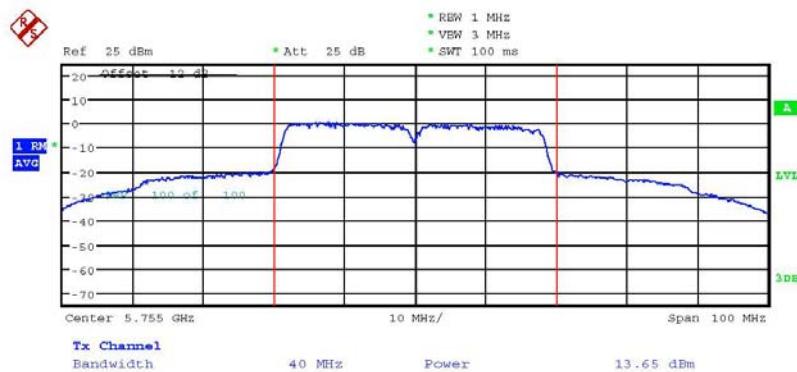
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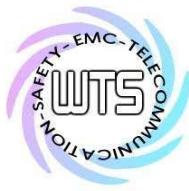




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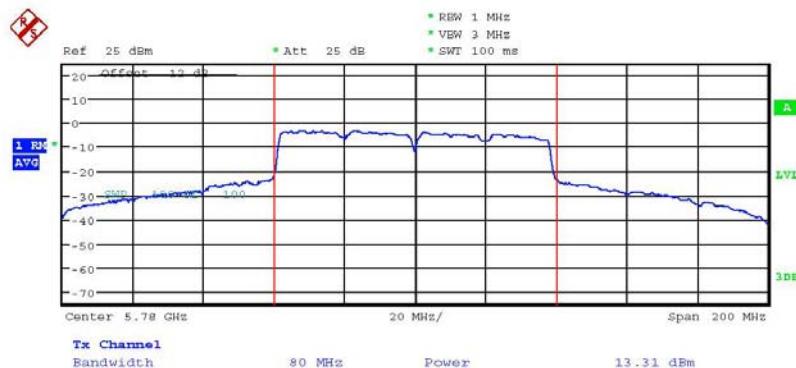
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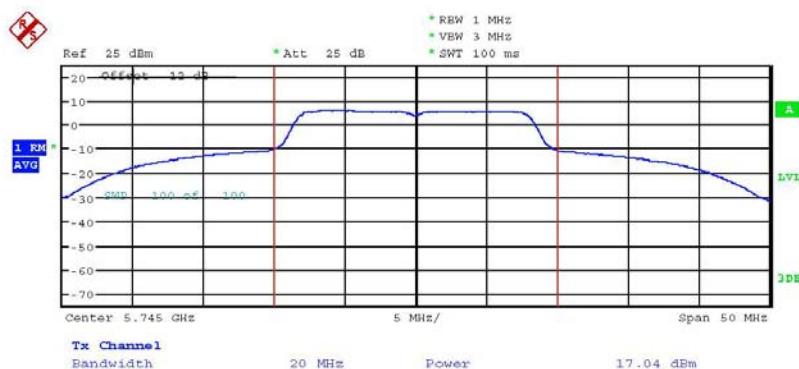


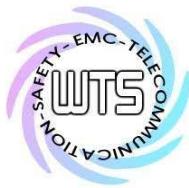
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Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750



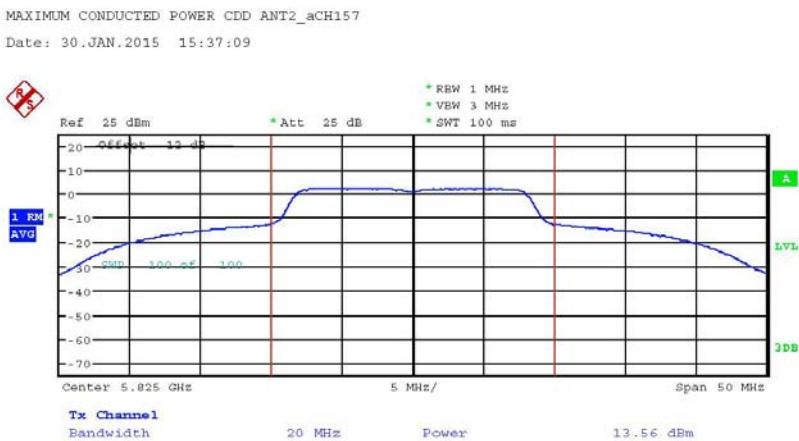
ANT2





# Worldwide Testing Services(Taiwan) Co., Ltd.

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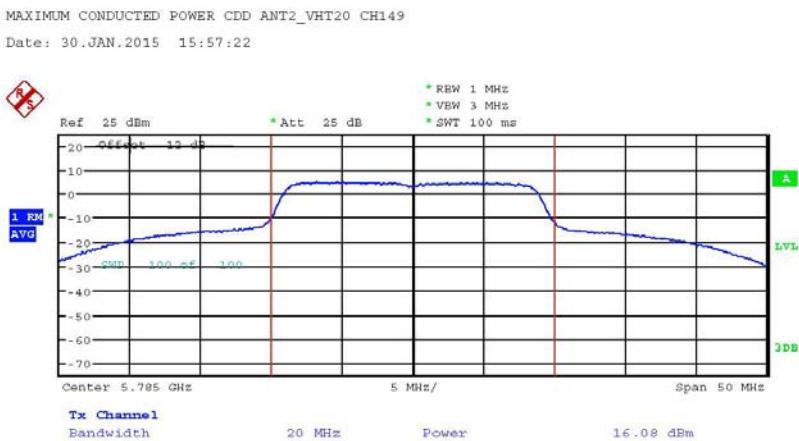


MAXIMUM CONDUCTED POWER CDD ANT2\_aCH165  
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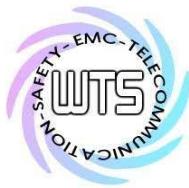


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750

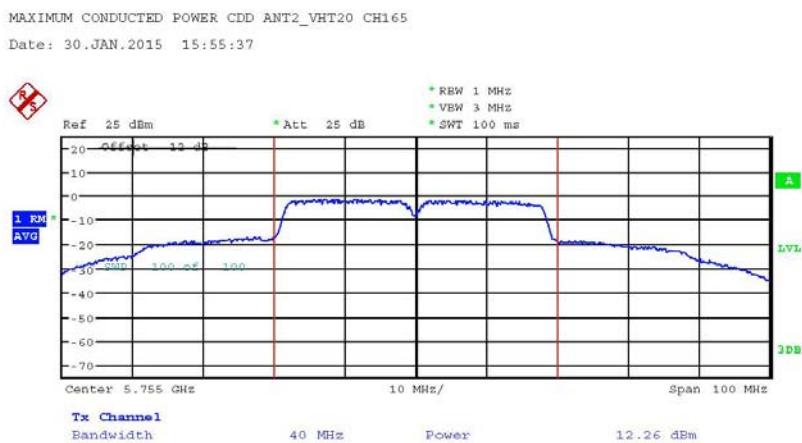


MAXIMUM CONDUCTED POWER CDD ANT2\_VHT20 CH157  
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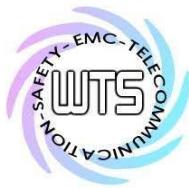


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750

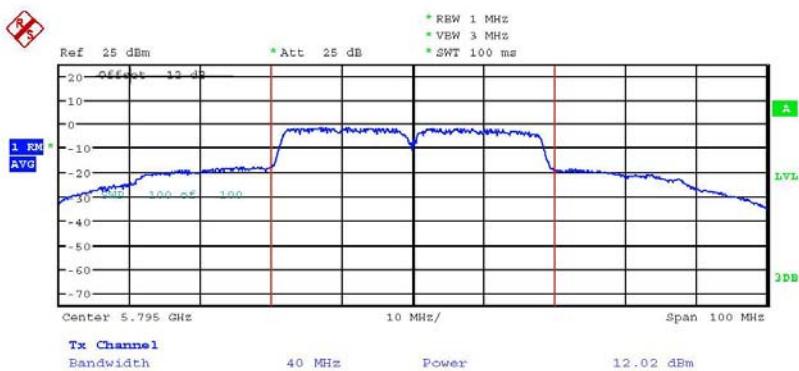


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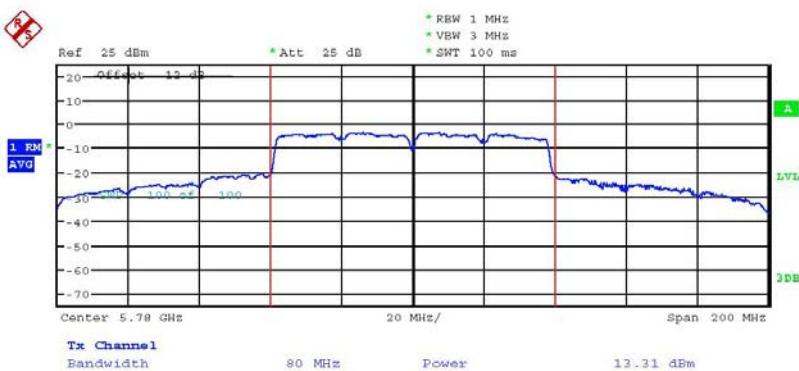
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Registration number: W6M21410-14564-C-54-R1  
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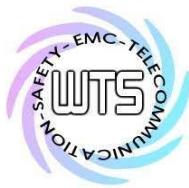
MAXIMUM CONDUCTED POWER CDD ANT2\_VHT40 CH159

Date: 30.JAN.2015 16:00:18



MAXIMUM CONDUCTED POWER CDD ANT2\_VHT80 CH156

Date: 30.JAN.2015 16:08:57

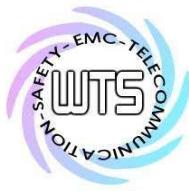


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750

ANT0	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	19.54	33.73	36.73	12.91	15.28	15.65
802.11n 40MHz	34.43	--	34.51	15.37	--	15.38
802.11ac	22.49	--	--	13.52	--	--
ANT1	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	17.38	15.56	34.59	12.40	11.92	15.39
802.11n 40MHz	23.17	--	37.07	13.65	--	15.69
802.11ac	21.43	--	--	13.31	--	--
ANT2	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	32.21	40.55	28.77	15.08	16.08	14.59
802.11n 40MHz	16.83	--	15.92	12.26	--	12.02
802.11ac	21.43	--	--	13.31	--	--
Combine	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	69.13	89.84	100.09	18.40	19.53	20.00
802.11n 40MHz	74.43	--	87.50	18.72	--	19.42
802.11ac	65.35	--	--	18.15	--	--

Test equipment used: ETSTW-RE 055, ETSTW-RE 050



# Worldwide Testing Services(Taiwan) Co., Ltd.

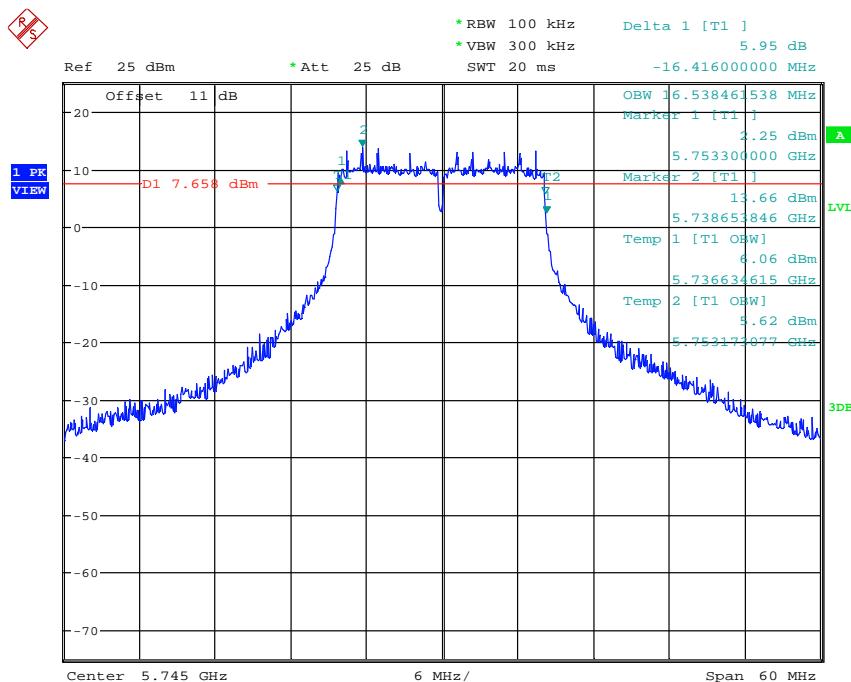
Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750

## 3.2 6dB emission bandwidth, 99% Occupied Bandwidth, FCC 15.407 (a)

According to §15.407(a). No Limit required.

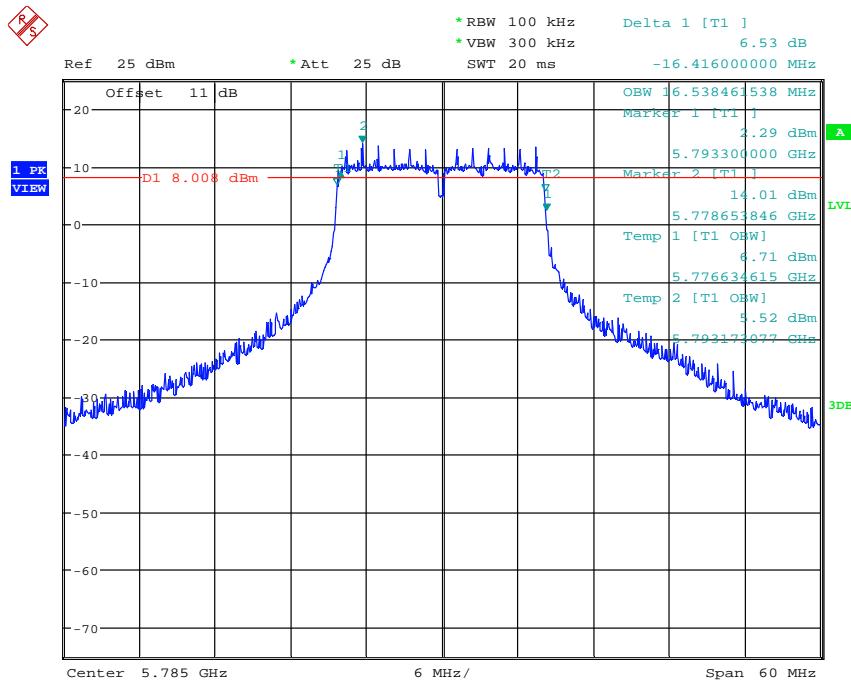
Result:

ANT0



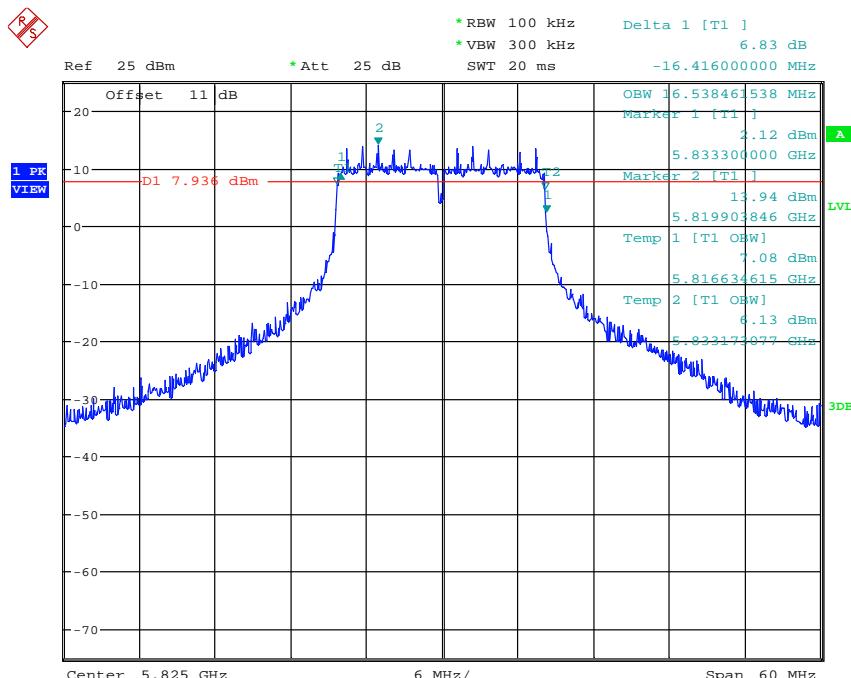
99% OBW & 6DB BANDWIDTH CDD ANT0\_a Mode\_CH149  
Date: 25.NOV.2014 16:48:58

Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750



99% OBW & 6DB BANDWIDTH CDD ANTO\_a Mode\_CH157

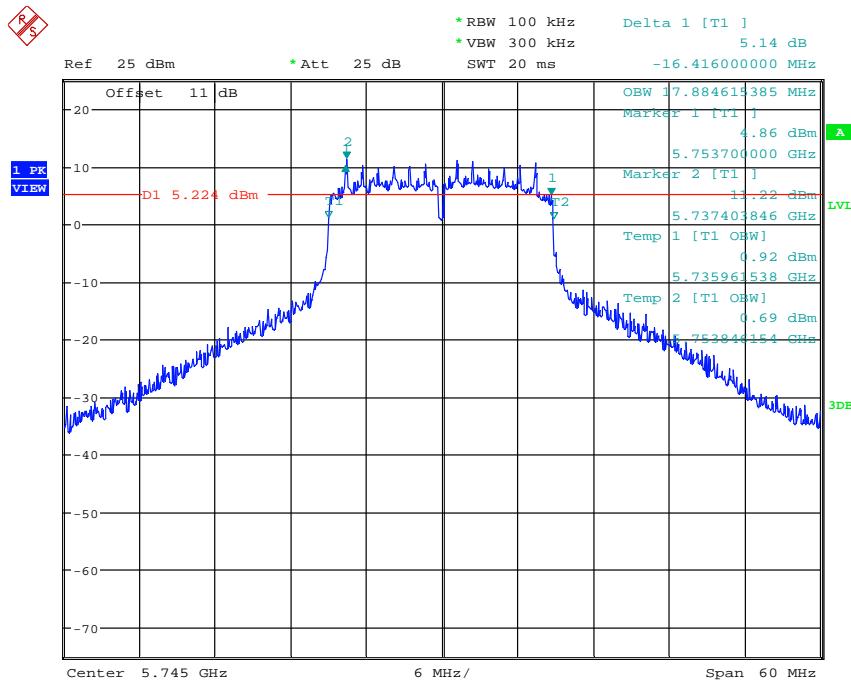
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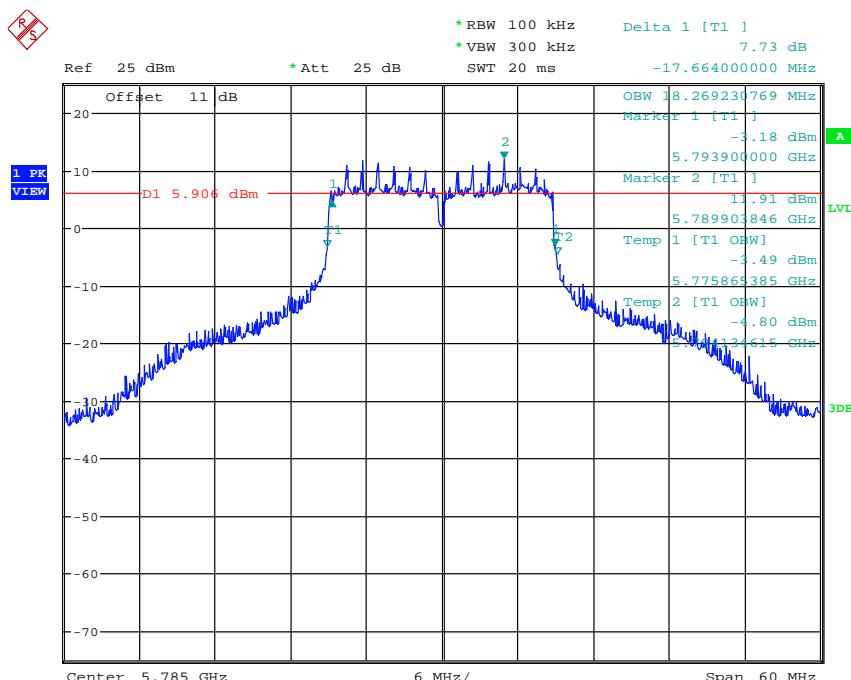
99% OBW & 6DB BANDWIDTH CDD ANTO\_a Mode\_CH165

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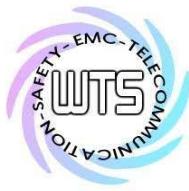
Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750



99% OBW & 6DB BANDWIDTH CDD ANTO\_VHT20\_CH149  
Date: 25.NOV.2014 22:13:32

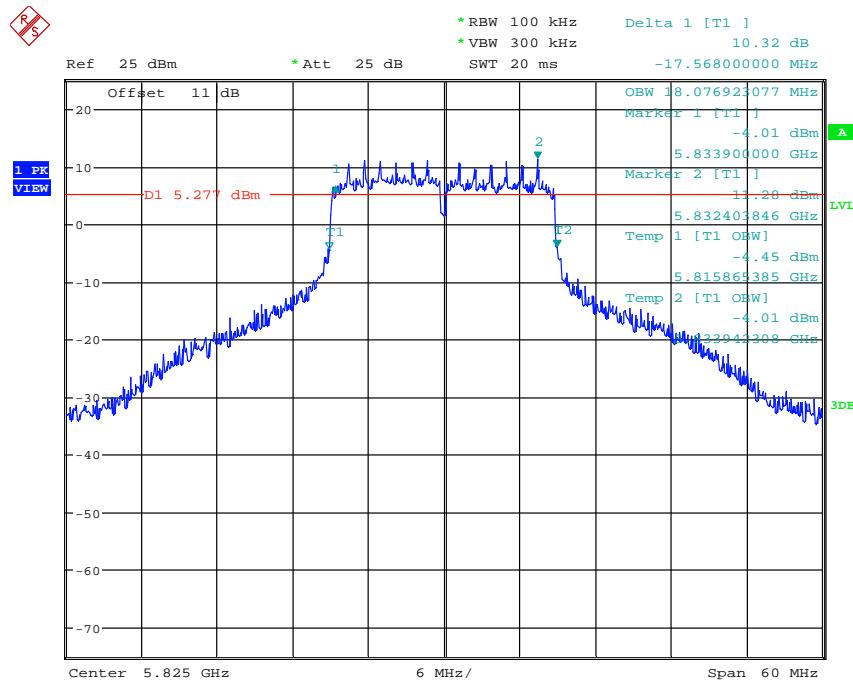


99% OBW & 6DB BANDWIDTH CDD ANTO\_VHT20\_CH157  
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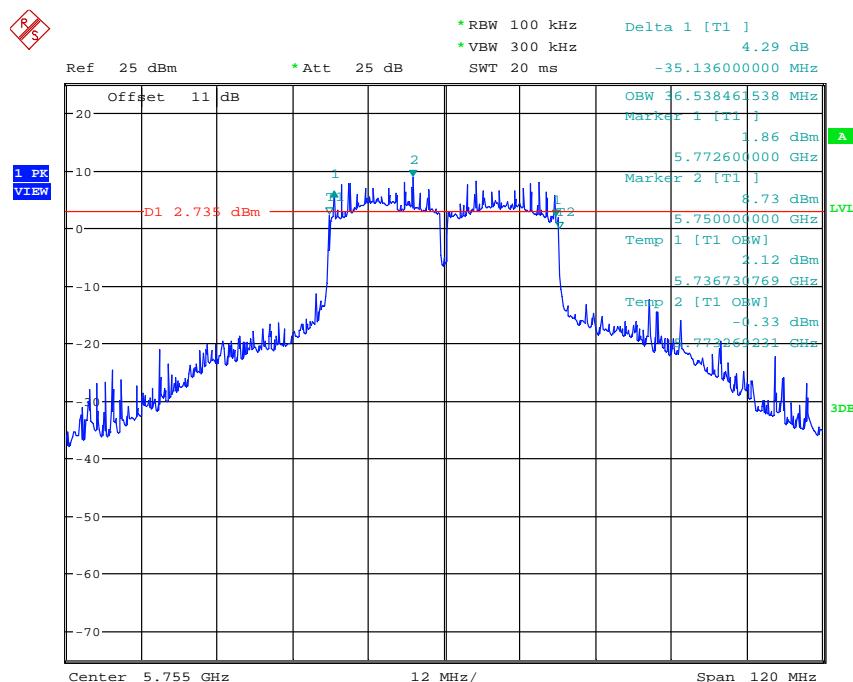


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750

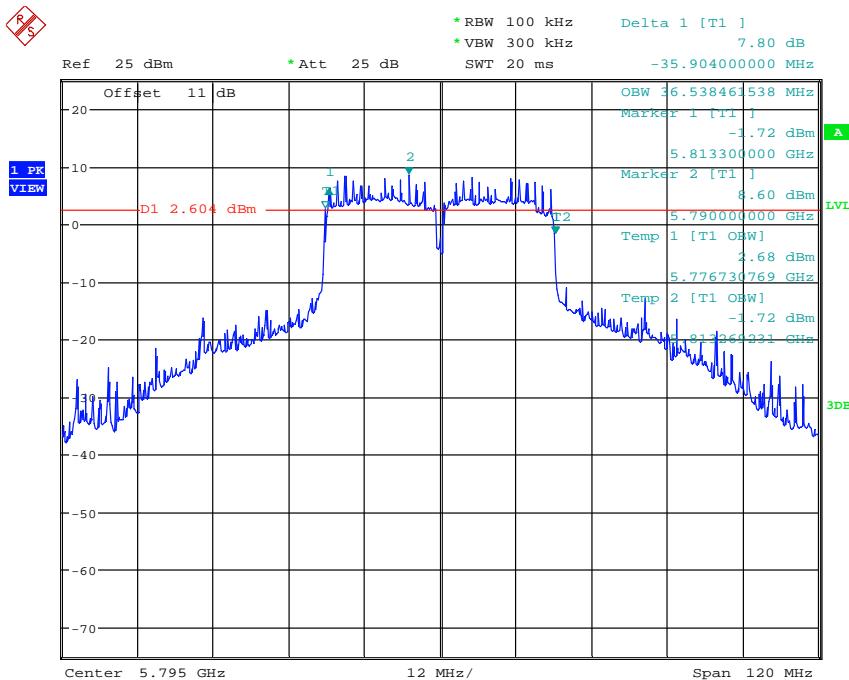


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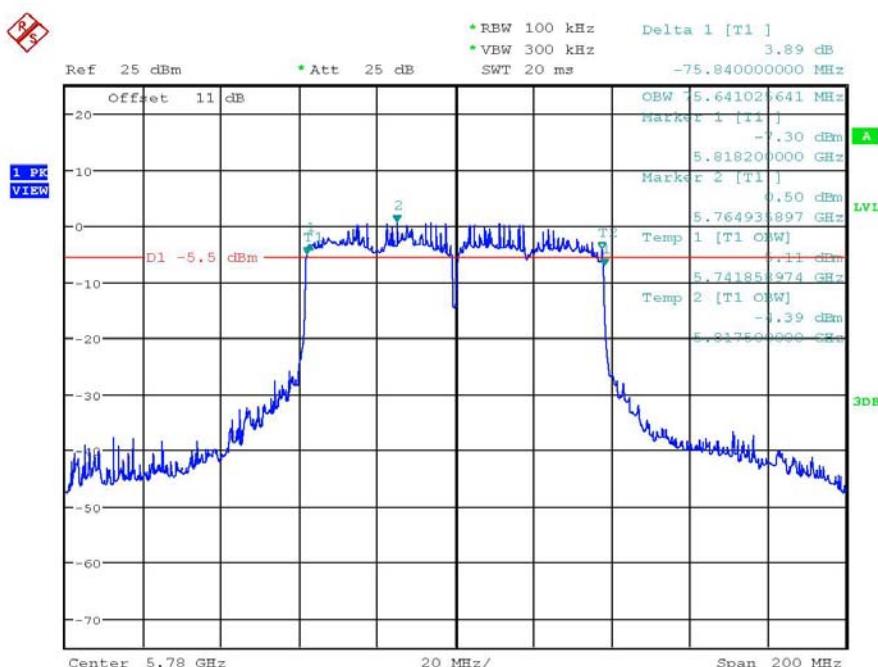


99% OBW & 6DB BANDWIDTH CDD ANTO\_VHT40\_CH151  
Date: 25.NOV.2014 23:27:14

Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750



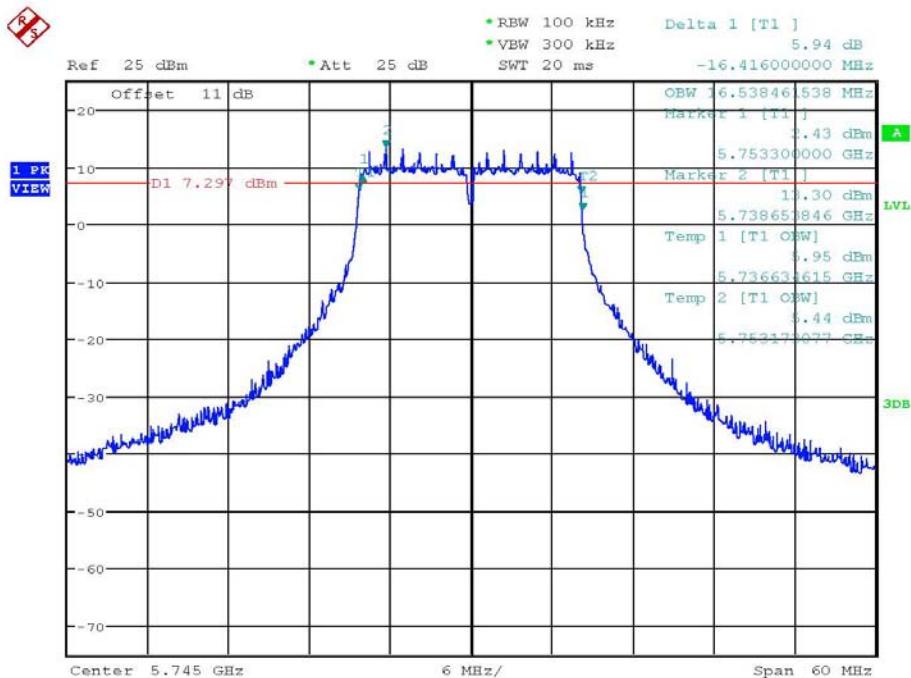
99% OBW & 6DB BANDWIDTH CDD ANT0\_VHT40\_CH159  
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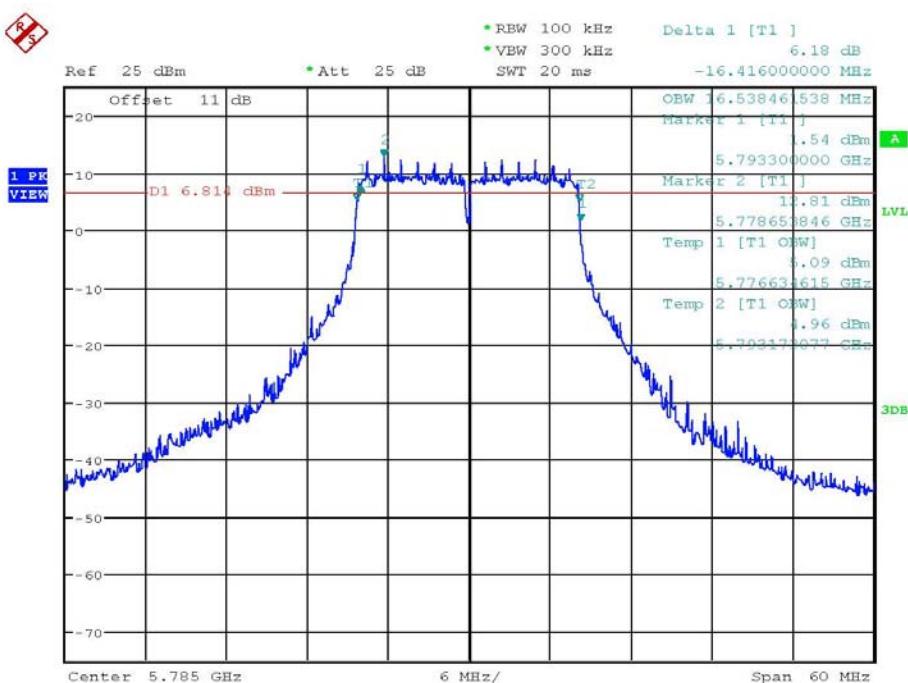
99% OBW & 6DB BANDWIDTH CDD ANT0\_VHT80\_CH156  
Date: 25.NOV.2014 23:45:04

Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750

## ANT1



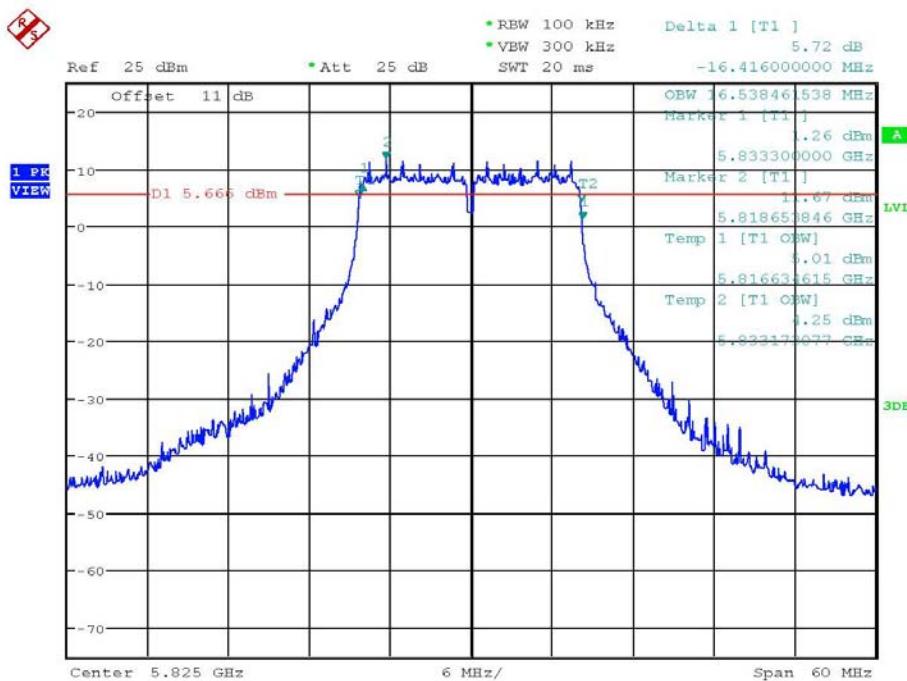
99% OBW & 6DB BANDWIDTH CDD ANT1\_a Mode\_CH149  
Date: 25.NOV.2014 17:28:10



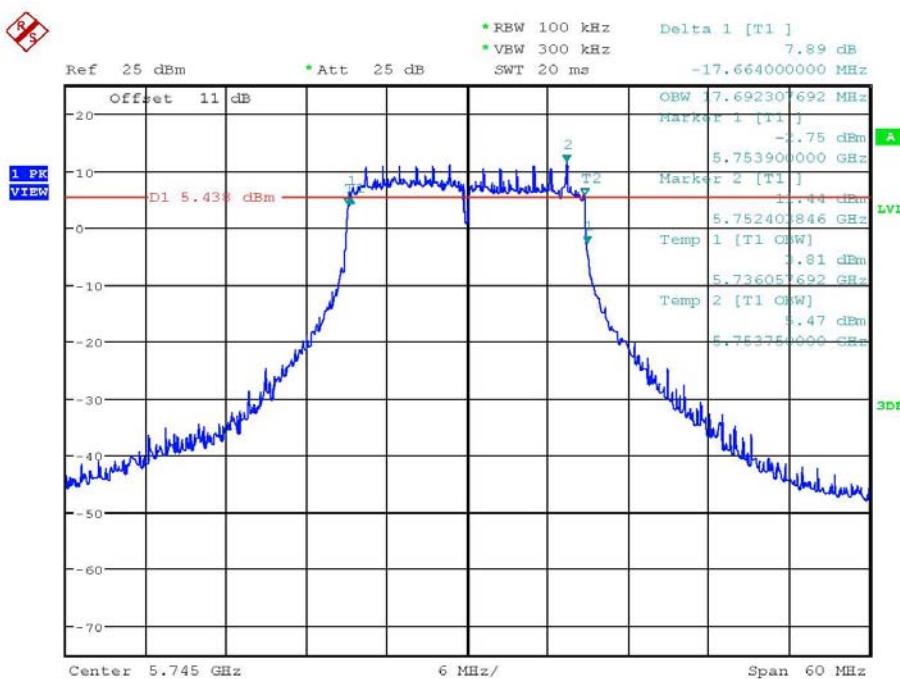
99% OBW & 6DB BANDWIDTH CDD ANT1\_a Mode\_CH157  
Date: 25.NOV.2014 18:09:28

# Worldwide Testing Services(Taiwan) Co., Ltd.

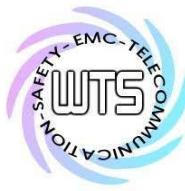
Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750



99% OBW & 6DB BANDWIDTH CDD ANTI\_a Mode\_CH165  
Date: 25.NOV.2014 18:14:08

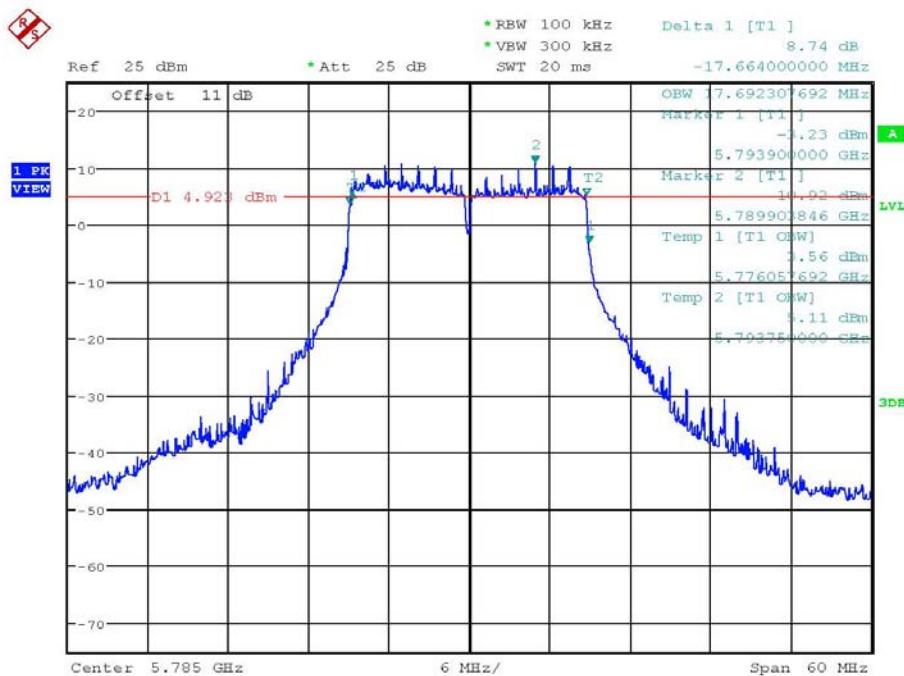


99% OBW & 6DB BANDWIDTH CDD ANTI\_VHT20\_CH149  
Date: 25.NOV.2014 22:32:12

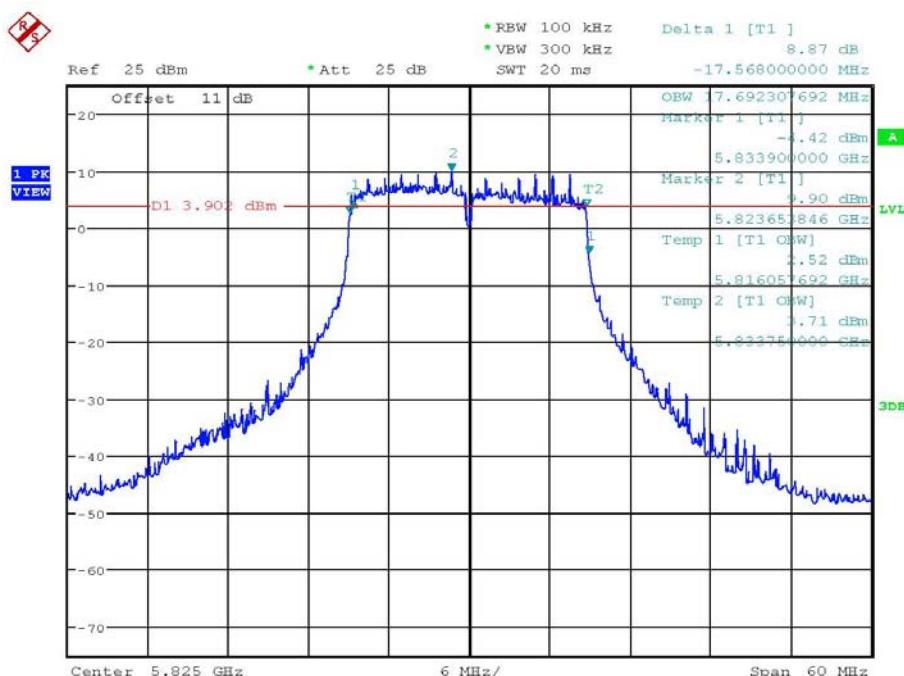


# Worldwide Testing Services(Taiwan) Co., Ltd.

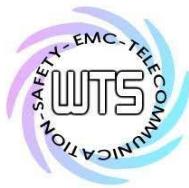
Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750



99% OBW & 6DB BANDWIDTH CDD ANTI\_VHT20\_CH157  
Date: 25.NOV.2014 22:35:14

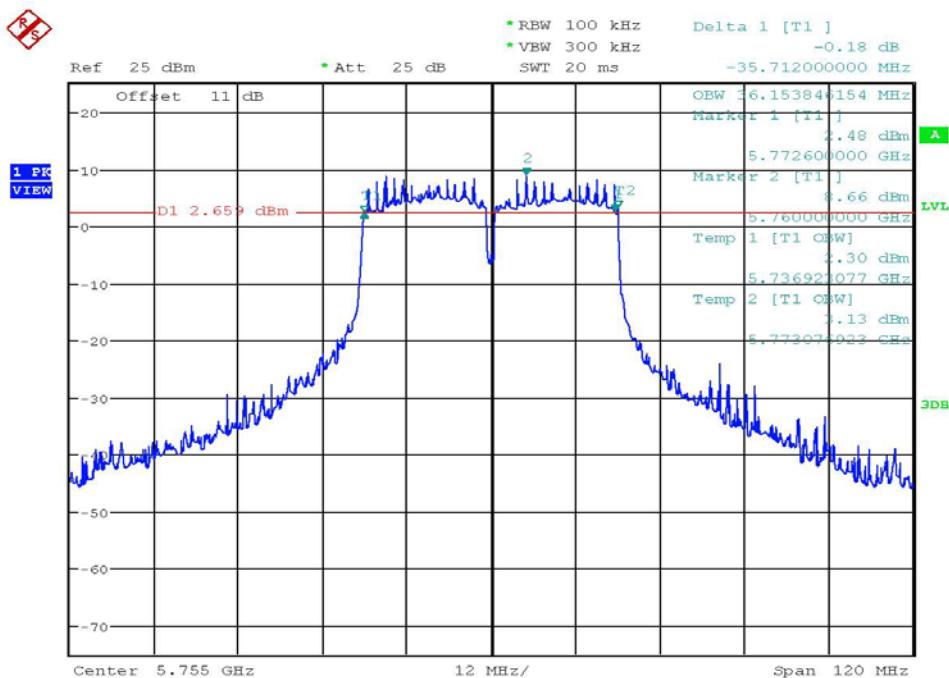


99% OBW & 6DB BANDWIDTH CDD ANTI\_VHT20\_CH165  
Date: 25.NOV.2014 22:38:37

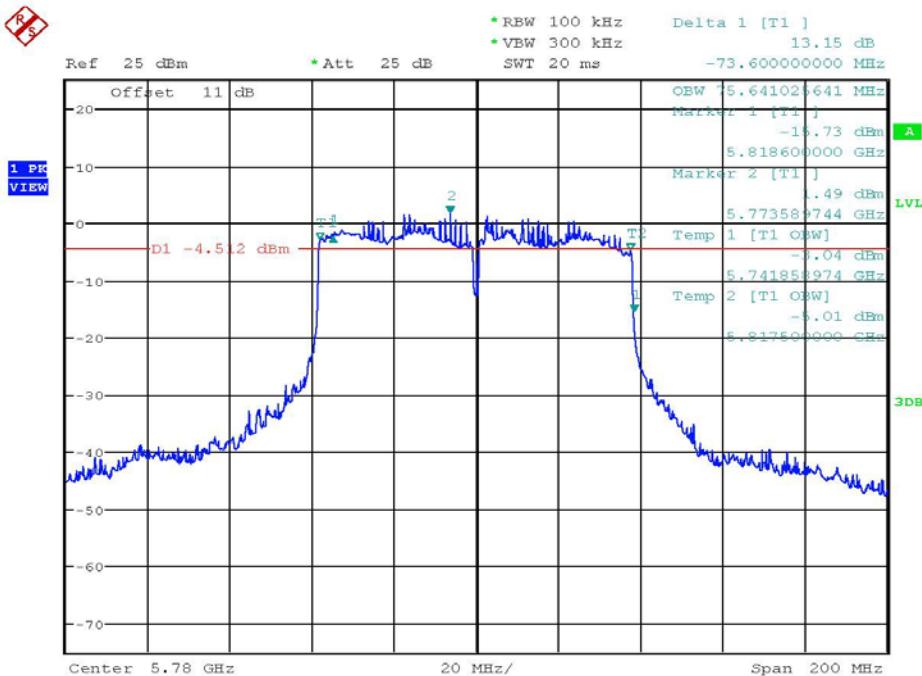


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750

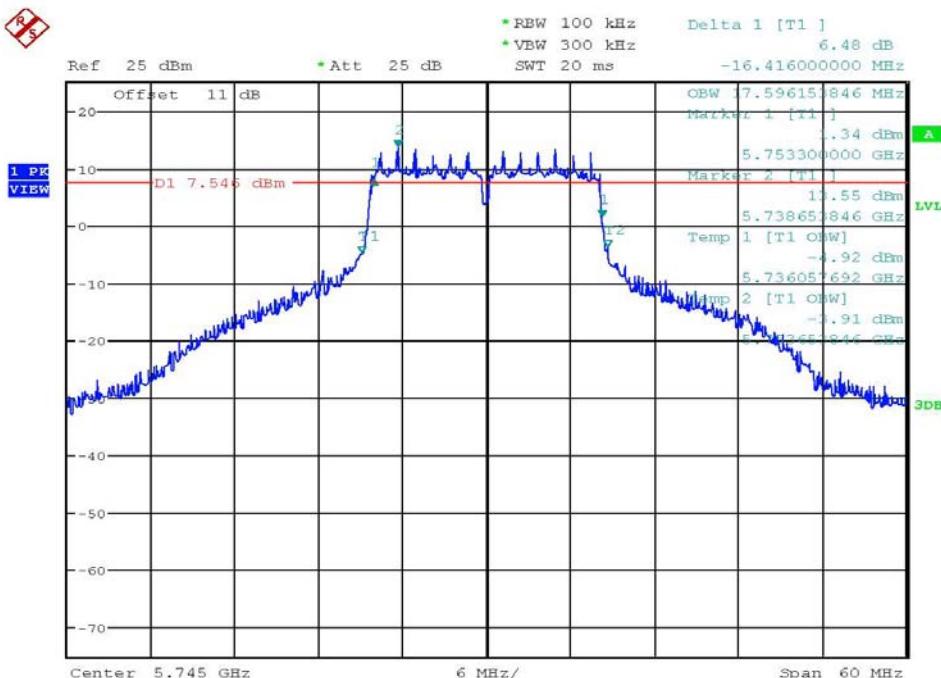


Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750

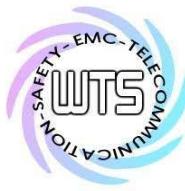


99% OBW & 6DB BANDWIDTH CDD ANT1\_VHT80\_CH156  
Date: 25.NOV.2014 23:53:34

## ANT2

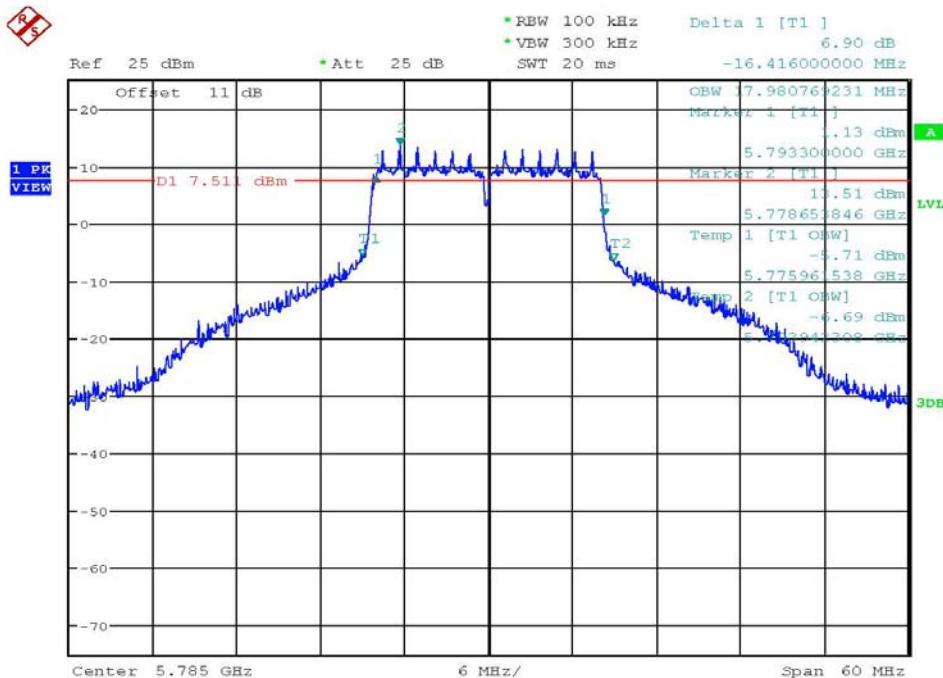


99% OBW & 6DB BANDWIDTH CDD ANT2\_a\_Mode\_CH149  
Date: 25.NOV.2014 18:38:24

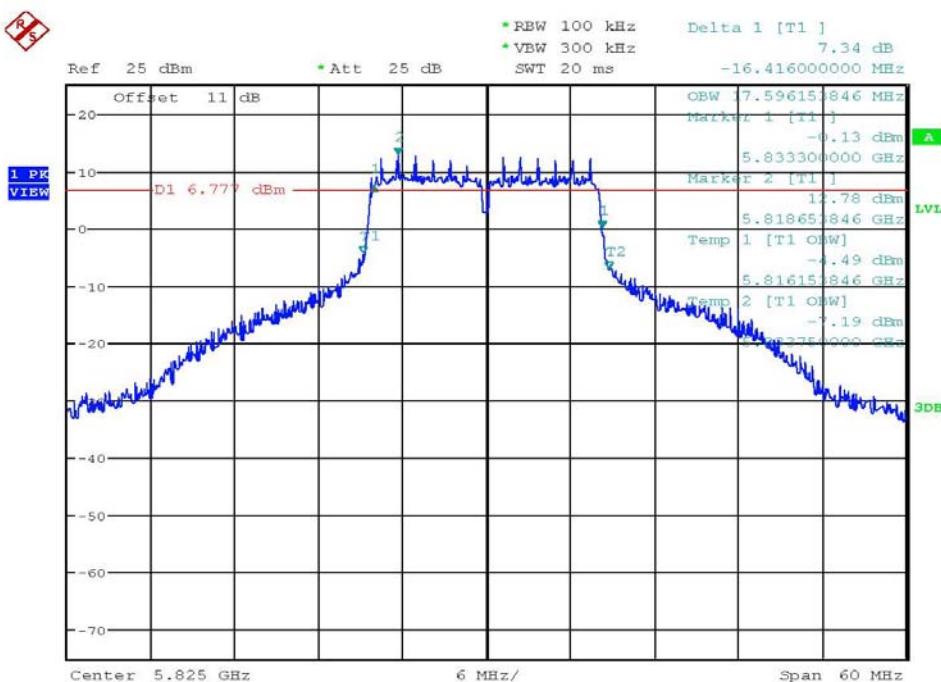


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750



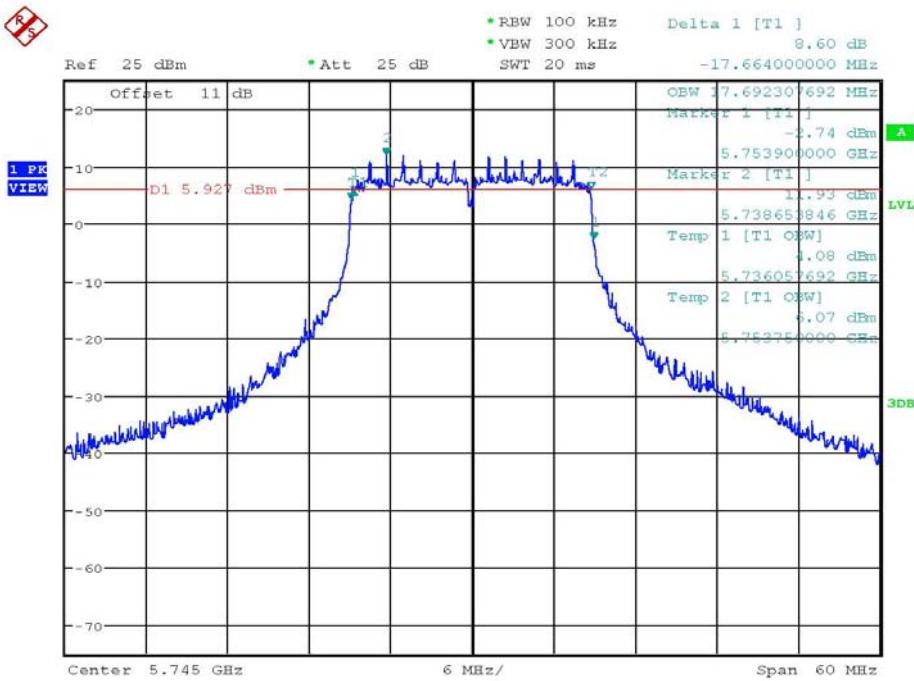
99% OBW & 6DB BANDWIDTH CDD ANT2\_a Mode\_CH157  
Date: 25.NOV.2014 18:50:59



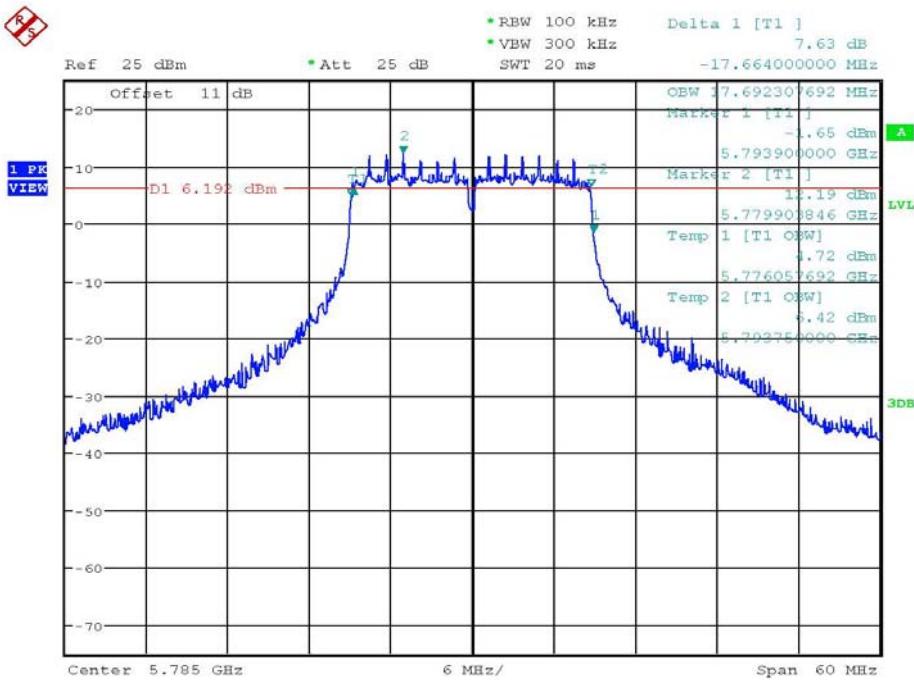
99% OBW & 6DB BANDWIDTH CDD ANT2\_a Mode\_CH165  
Date: 25.NOV.2014 18:33:44

# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750



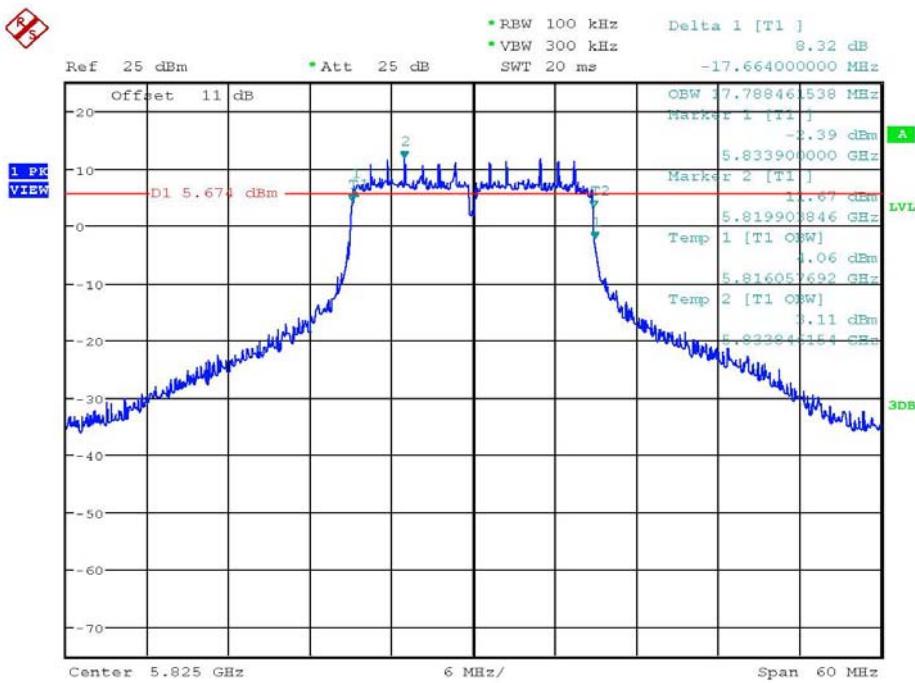
99% OBW & 6DB BANDWIDTH CDD ANT2\_VHT20\_CH149  
Date: 25.NOV.2014 22:44:33



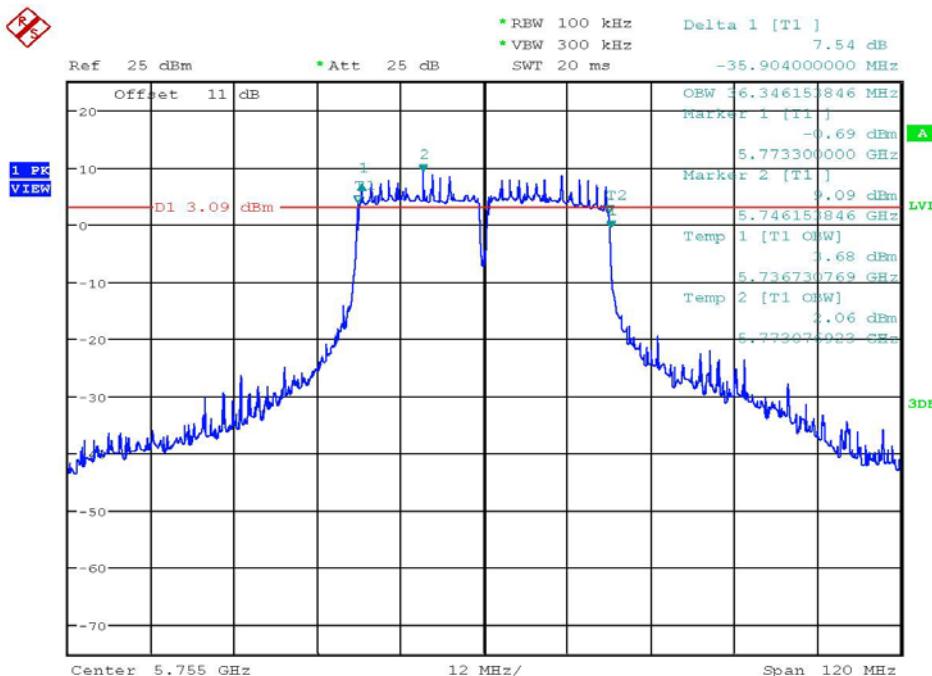
99% OBW & 6DB BANDWIDTH CDD ANT2\_VHT20\_CH157  
Date: 25.NOV.2014 22:48:03

# Worldwide Testing Services(Taiwan) Co., Ltd.

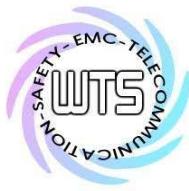
Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750



99% OBW & 6DB BANDWIDTH CDD ANT2\_VHT20\_CH165  
Date: 25.NOV.2014 22:51:12

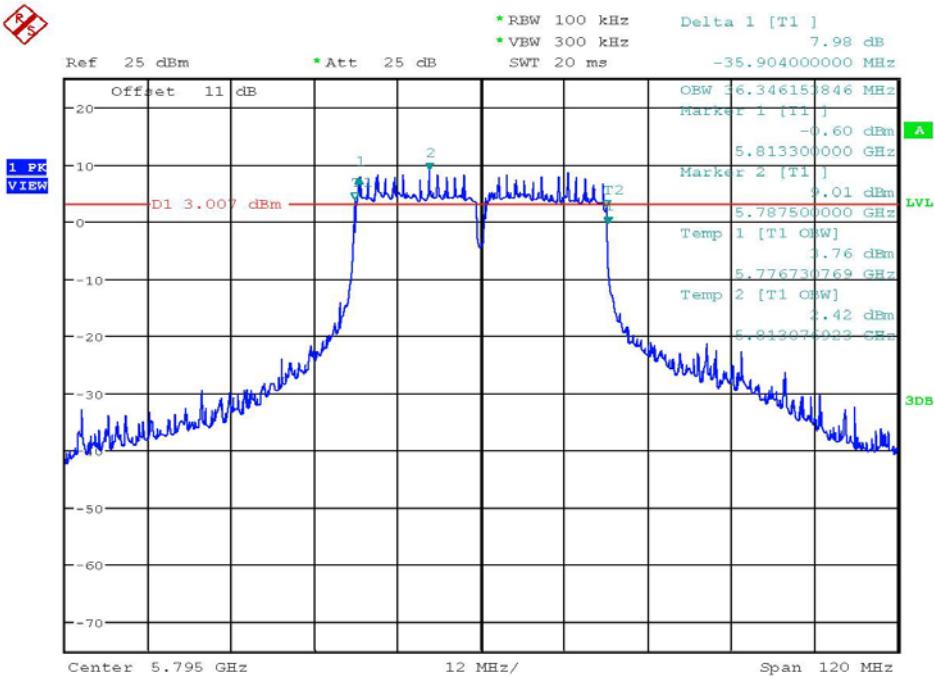


99% OBW & 6DB BANDWIDTH CDD ANT2\_VHT40\_CH151  
Date: 25.NOV.2014 22:56:26

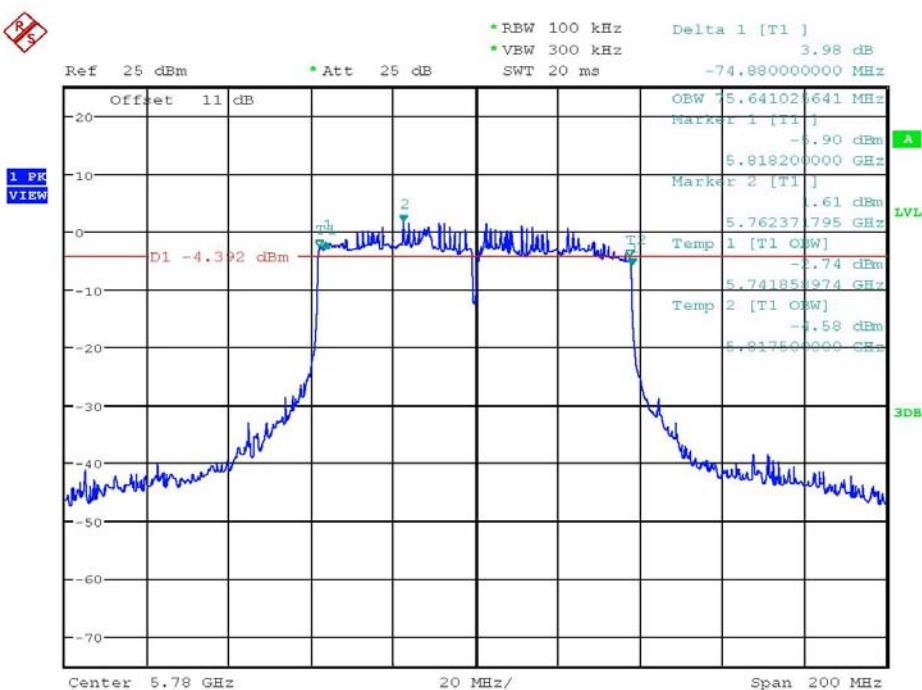


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750



99% OBW & 6DB BANDWIDTH CDD ANT2\_VHT40\_CH159  
Date: 25.NOV.2014 23:01:38



99% OBW & 6DB BANDWIDTH CDD ANT2\_VHT80\_CH156  
Date: 26.NOV.2014 00:02:14

Test equipment used: ETSTW-RE 055, ETSTW-RE 050

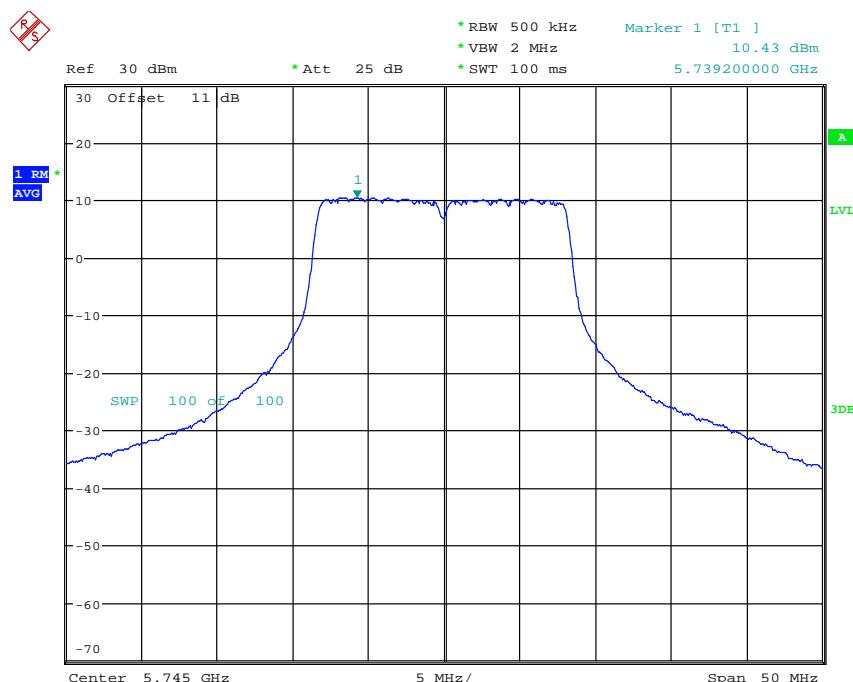
Registration number: W6M21410-14564-C-54-R1  
 FCC ID: ZTT-RTA1750

### 3.3 Peak Power Spectral Density, FCC 15.407 (a)

According to §15.407(a)

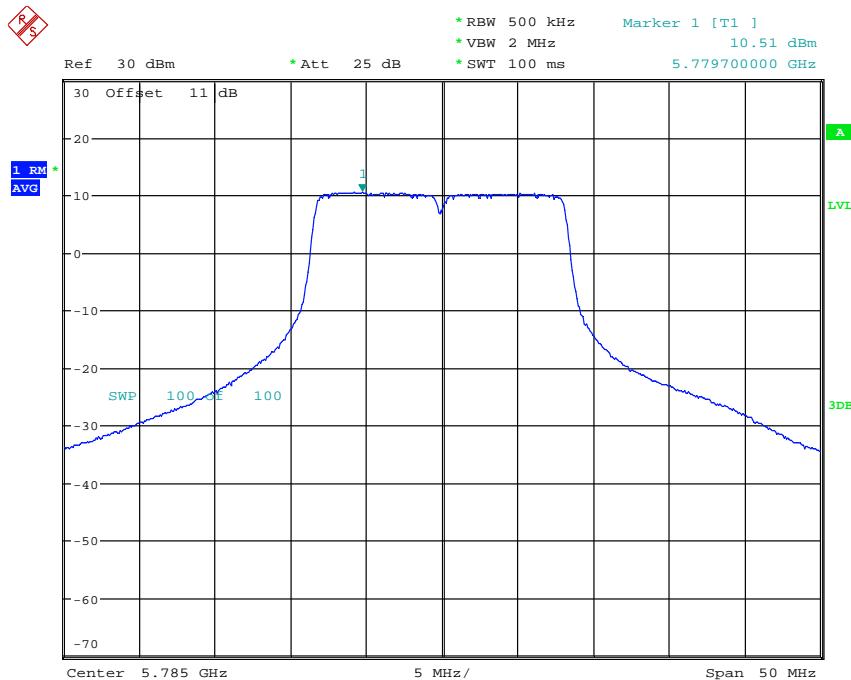
1. For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 4 dBm in any 1-MHz band.
2. For the band 5.25-5.35 GHz and 5.47-5.725GHz, the peak power spectral density shall not exceed 11 dBm in any 1-MHz band.
3. For the band 5.725-5.825 GHz, the peak power spectral density shall not exceed 17 dBm in any 1-MHz band.

ANT0



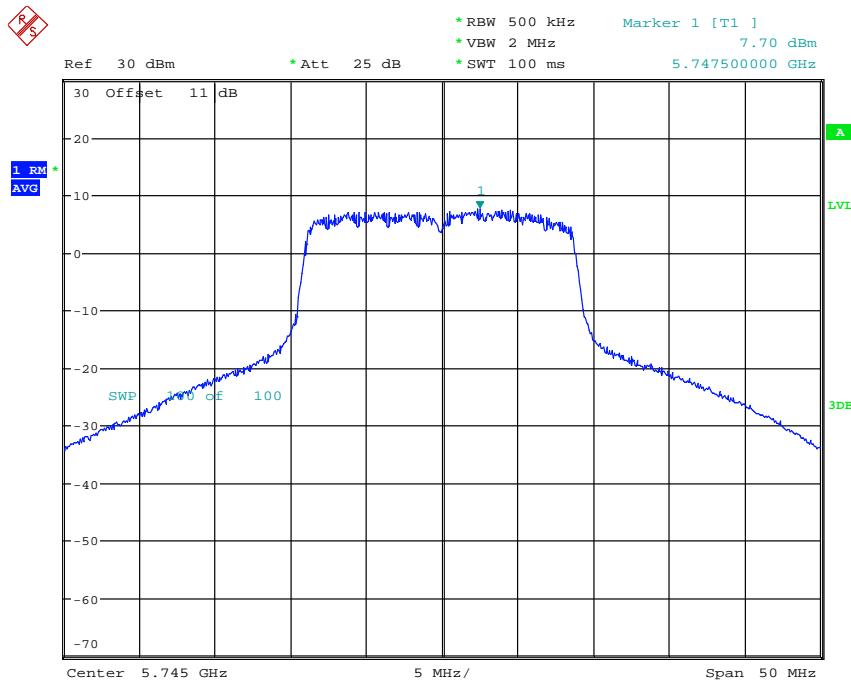
POWER DENSITY CDD ANT0\_aCH149  
 Date: 25.NOV.2014 16:45:50

Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750

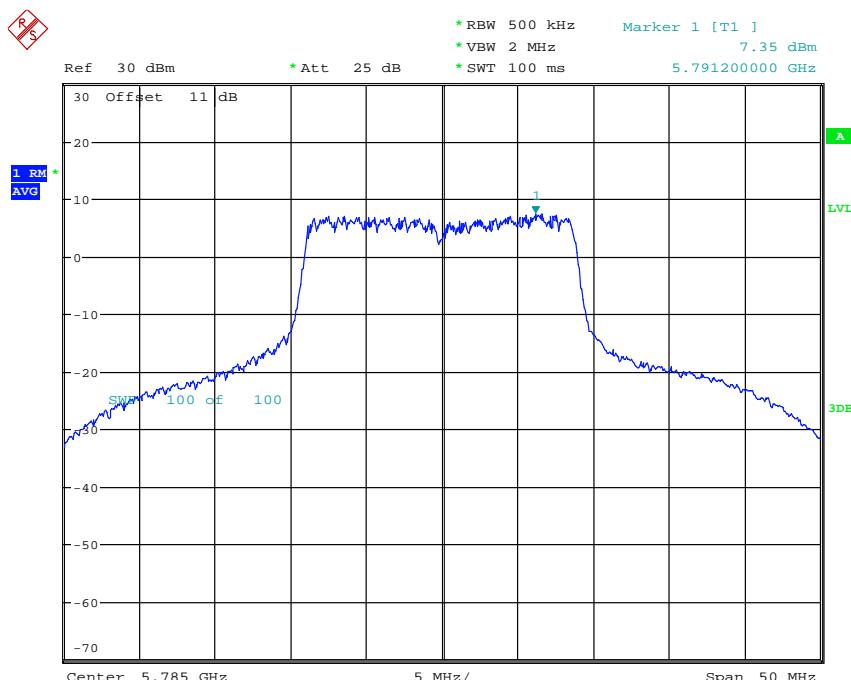


POWER DENSITY CDD ANT0\_aCH165  
Date: 25.NOV.2014 17:13:57

Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750

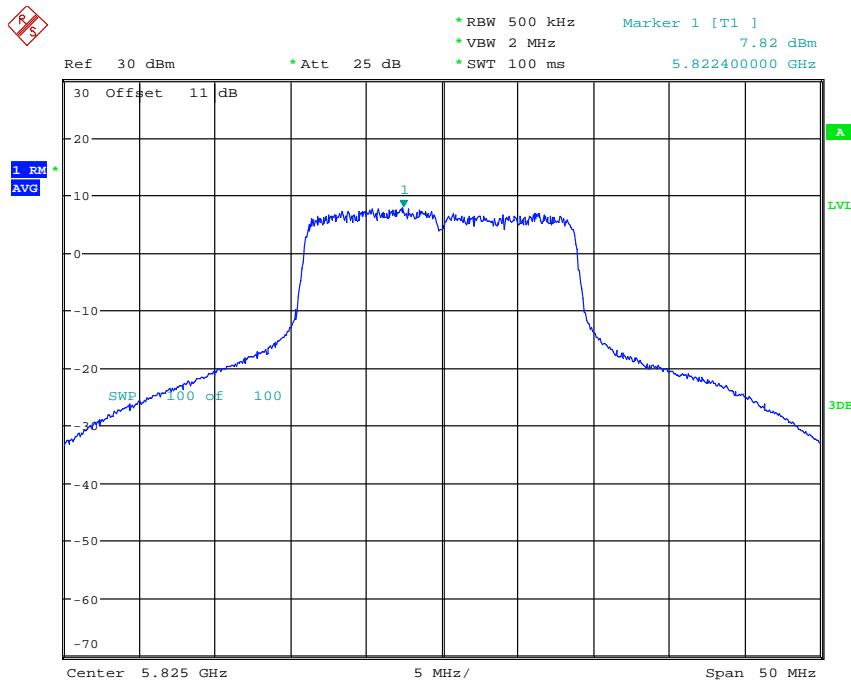


POWER DENSITY CDD ANTO\_VHT20CH149  
Date: 25.NOV.2014 22:12:16

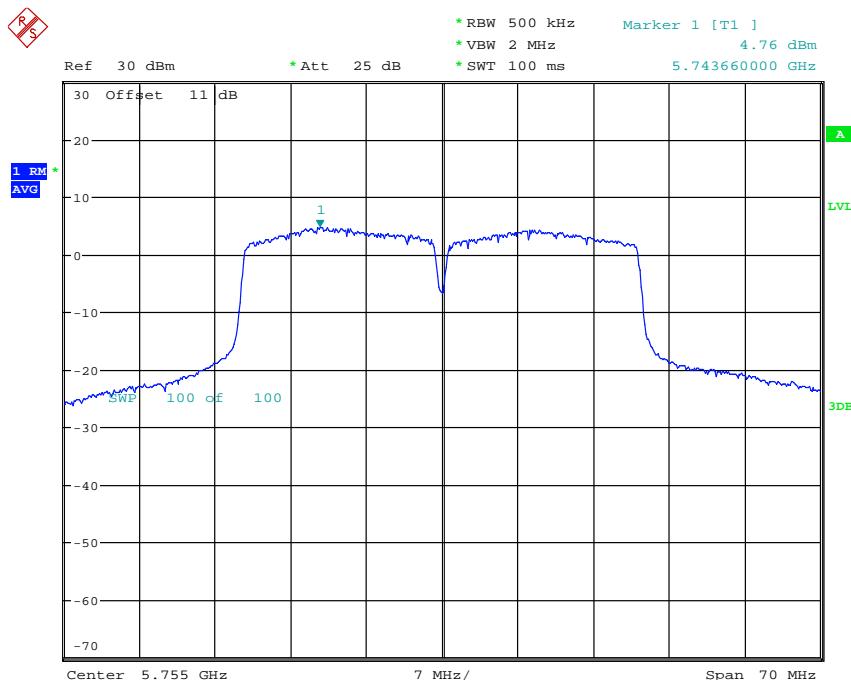


POWER DENSITY CDD ANTO\_VHT20CH157  
Date: 25.NOV.2014 22:17:24

Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750

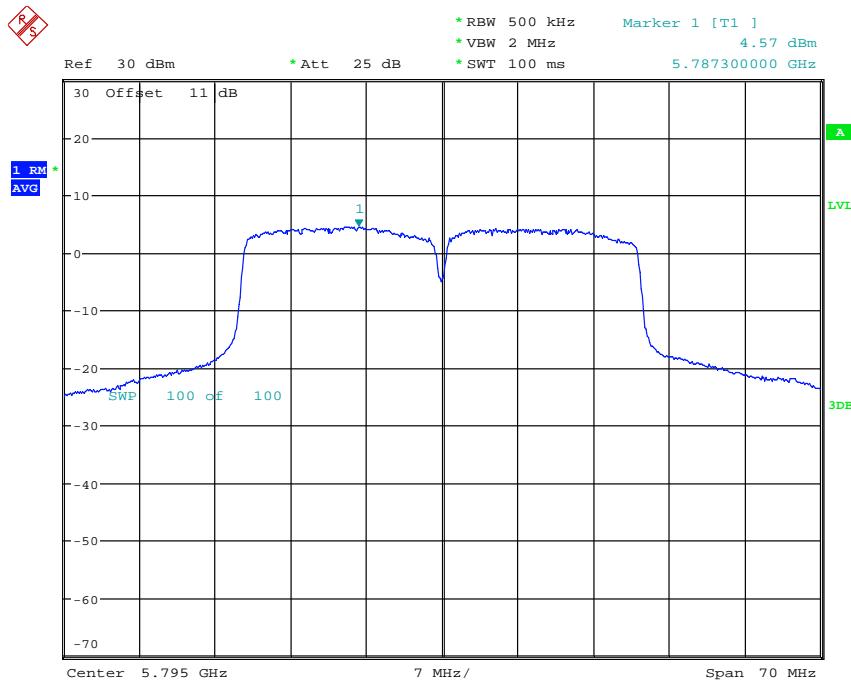


POWER DENSITY CDD ANTO\_VHT20CH165  
Date: 25.NOV.2014 22:20:40



POWER DENSITY CDD ANTO\_VHT40CH151  
Date: 25.NOV.2014 23:26:03

Registration number: W6M21410-14564-C-54-R1  
 FCC ID: ZTT-RTA1750



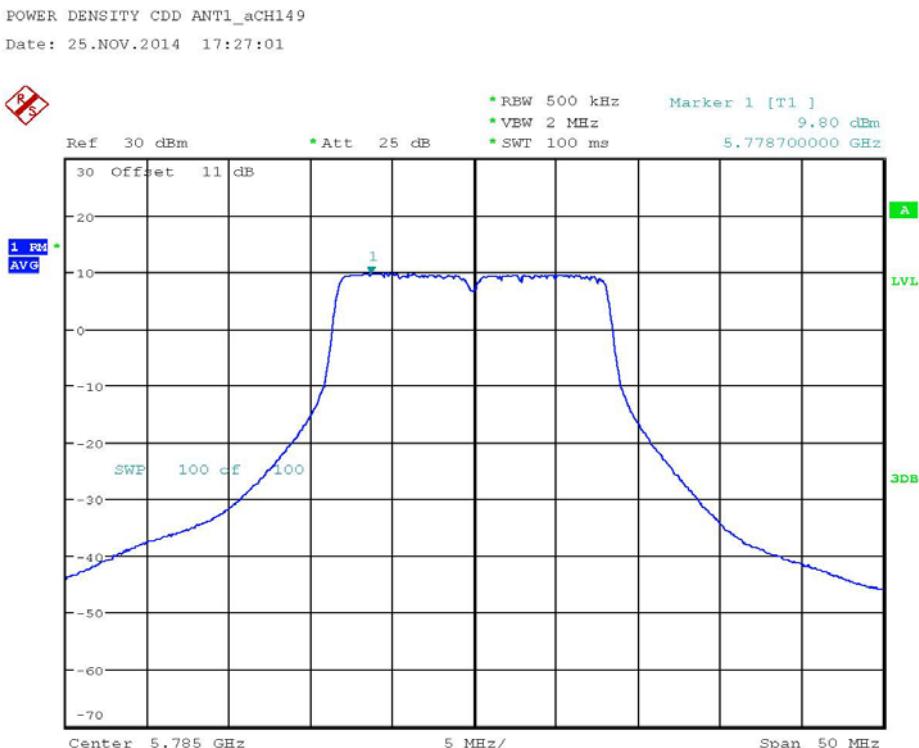
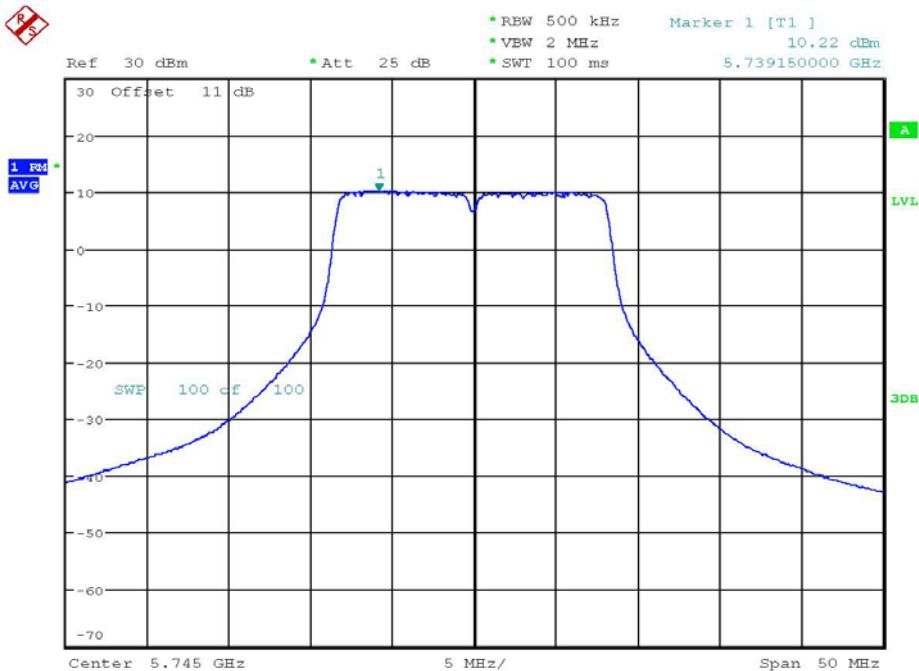
POWER DENSITY CDD ANTO\_VHT40CH159  
 Date: 25.NOV.2014 23:30:43

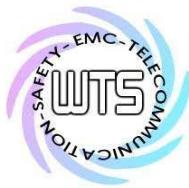


POWER DENSITY CDD ANTO\_VHT80CH156  
 Date: 25.NOV.2014 23:43:43

Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750

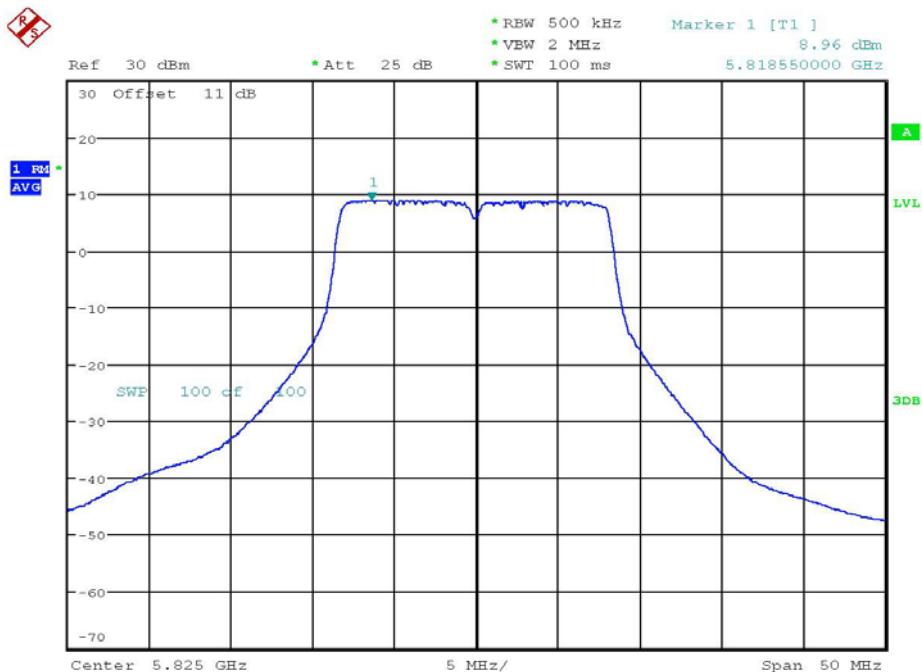
## ANT1



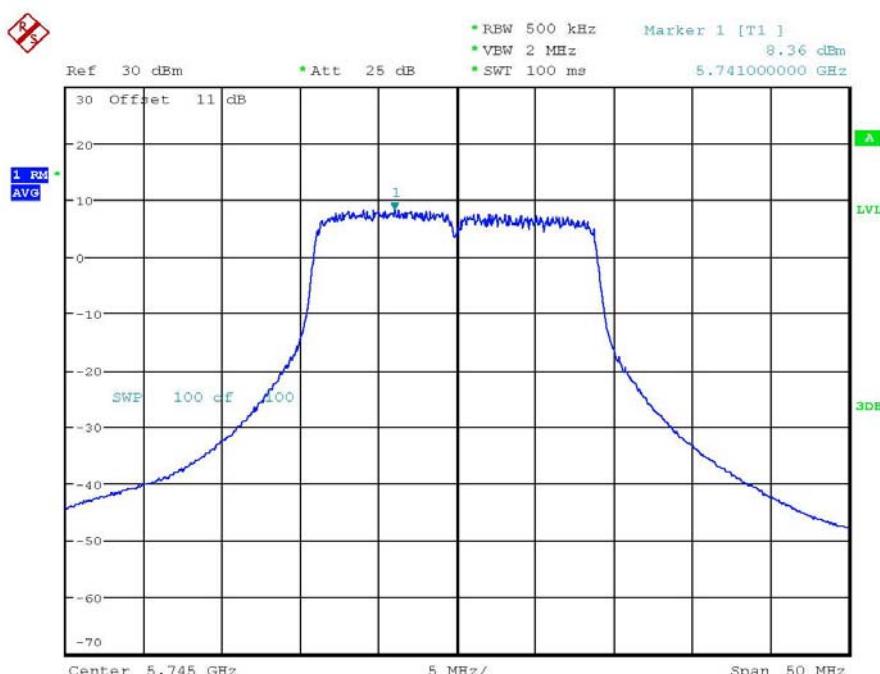


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750



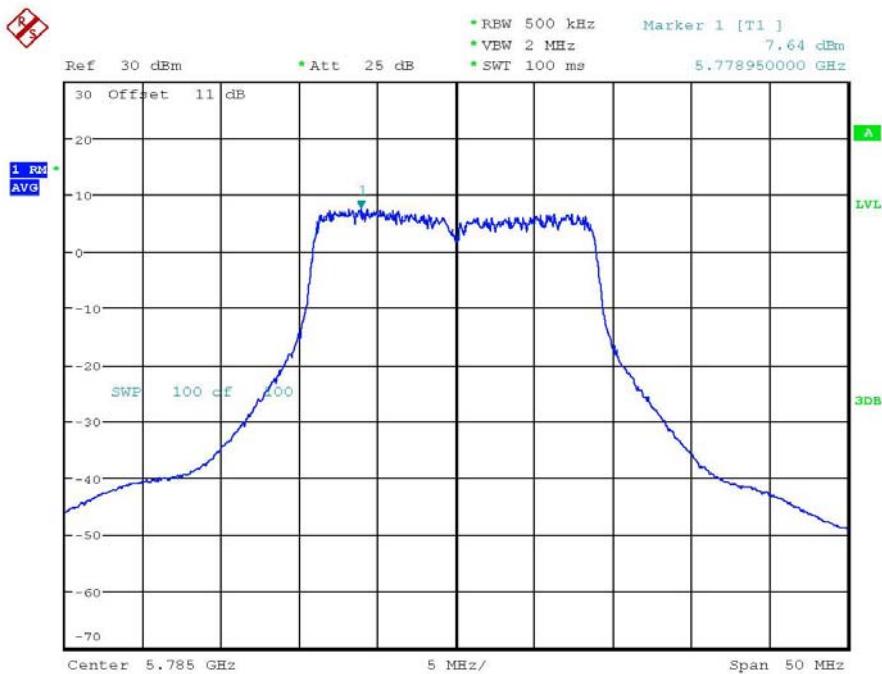
POWER DENSITY CDD ANTL\_aCH165  
Date: 25.NOV.2014 18:12:52



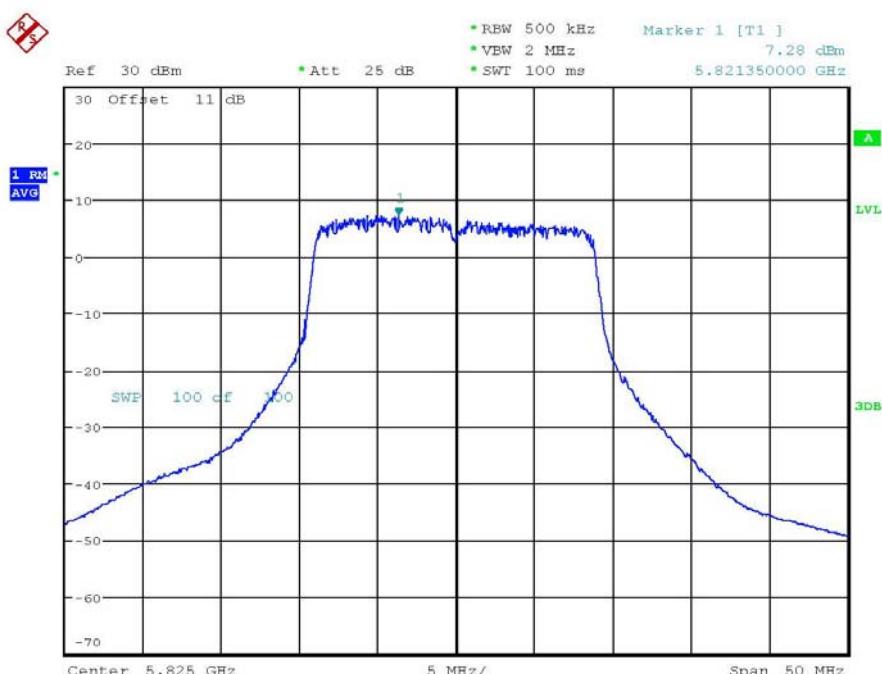
POWER DENSITY CDD ANTL\_VHT20CH149  
Date: 25.NOV.2014 22:31:17

# Worldwide Testing Services(Taiwan) Co., Ltd.

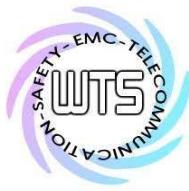
Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750



POWER DENSITY CDD ANTI\_VHT20CH157  
Date: 25.NOV.2014 22:34:26

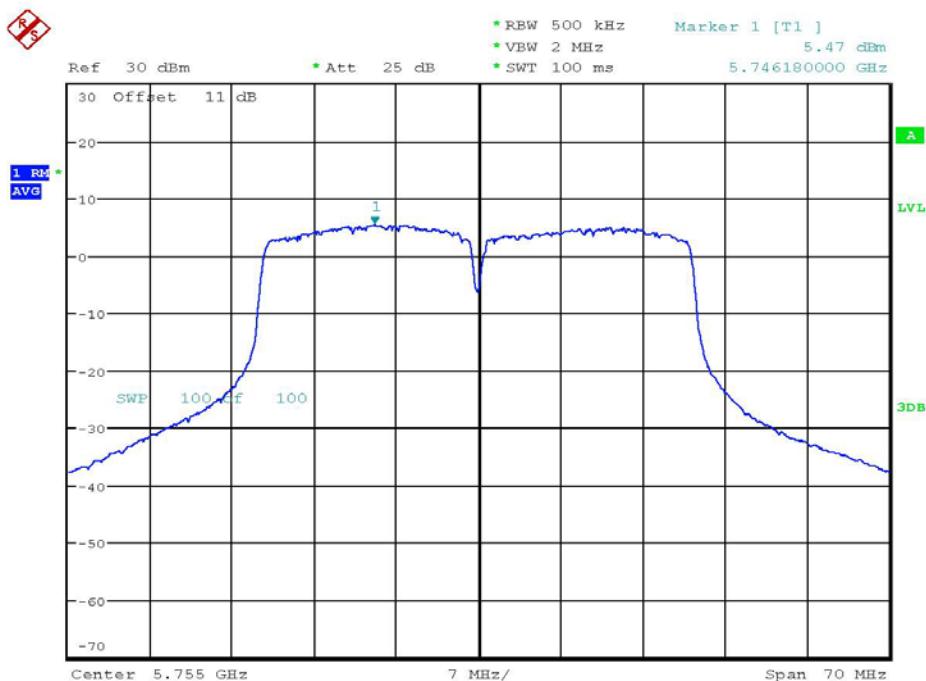


POWER DENSITY CDD ANTI\_VHT20CH165  
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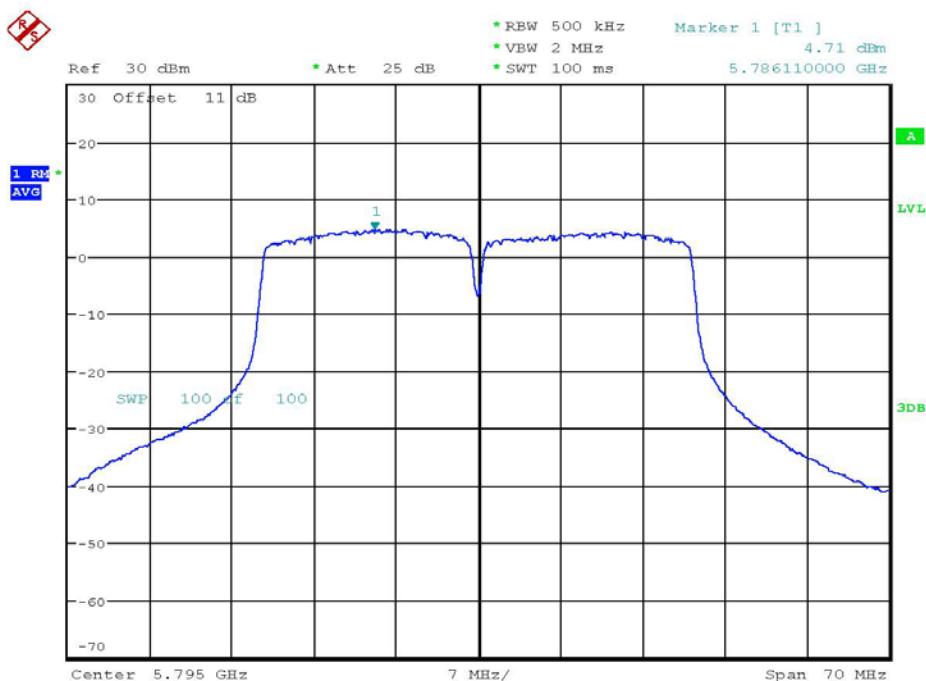


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750

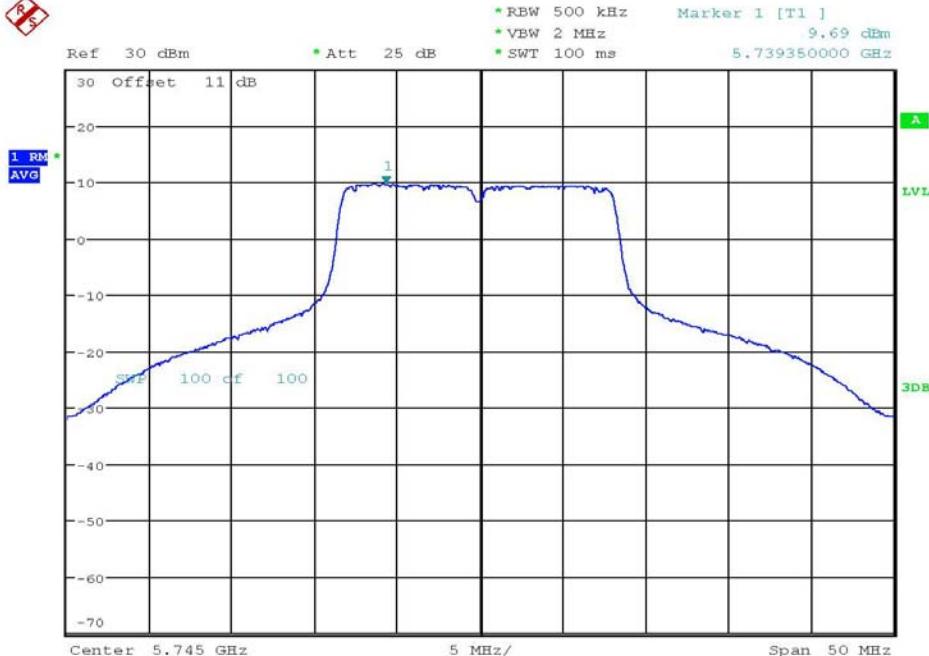


POWER DENSITY CDD ANT1\_VHT40CH151  
Date: 25.NOV.2014 23:08:19



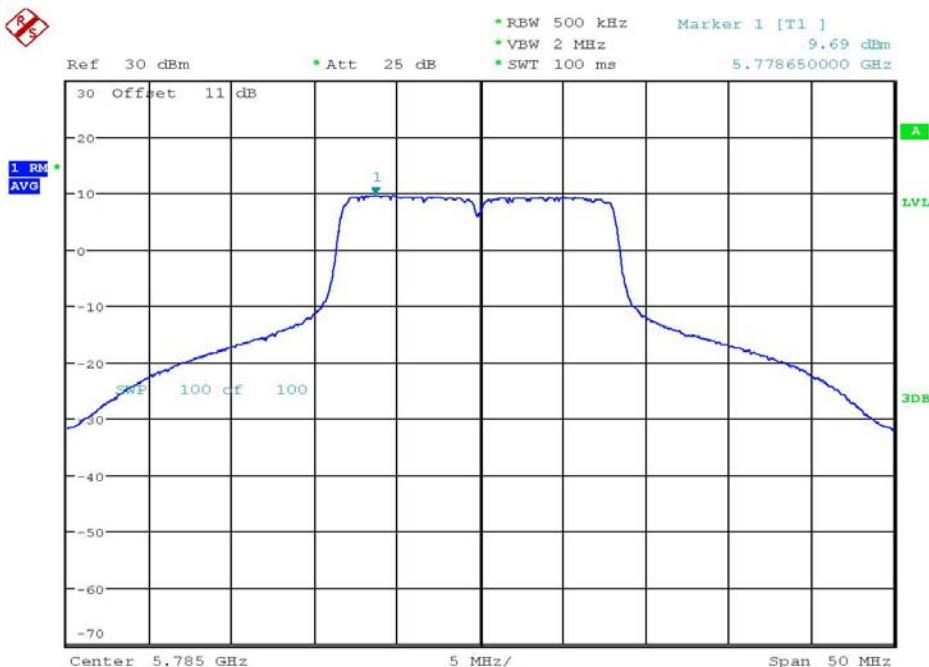
POWER DENSITY CDD ANT1\_VHT40CH159  
Date: 25.NOV.2014 23:11:55

Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750

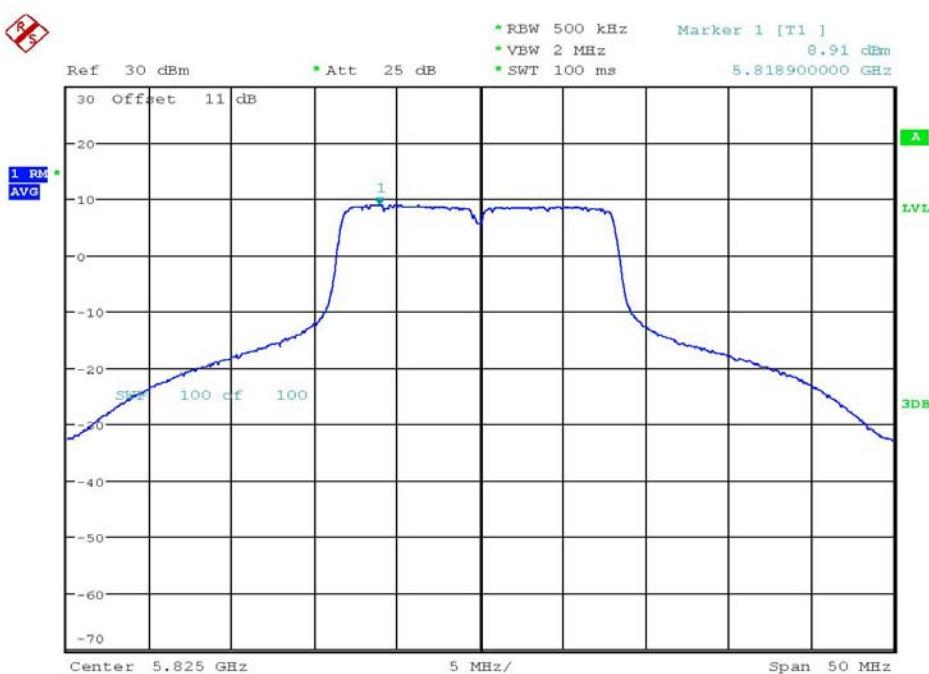


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750

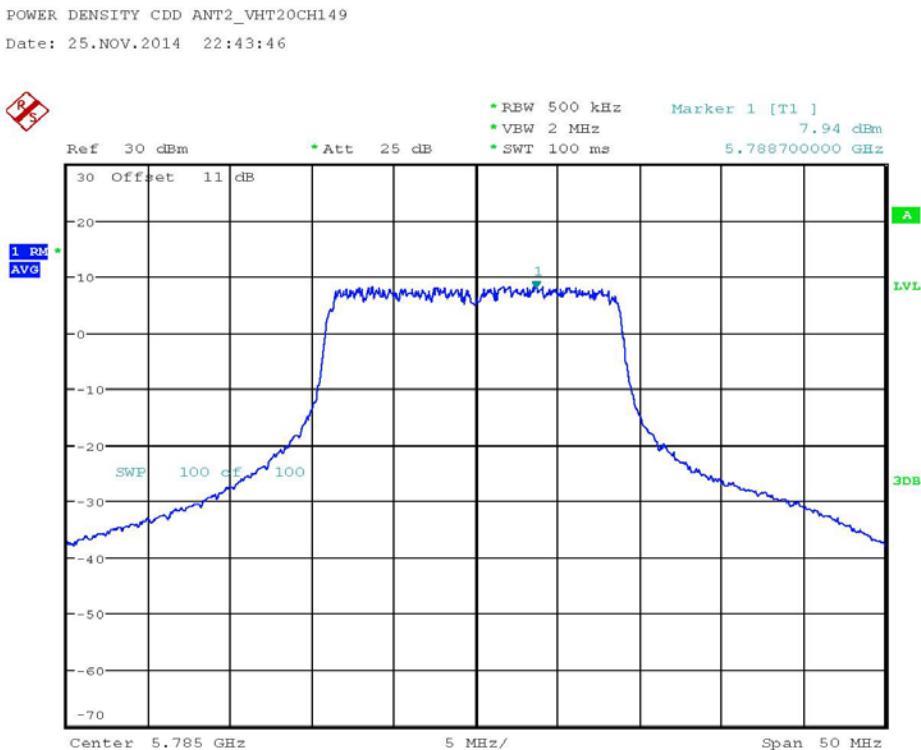
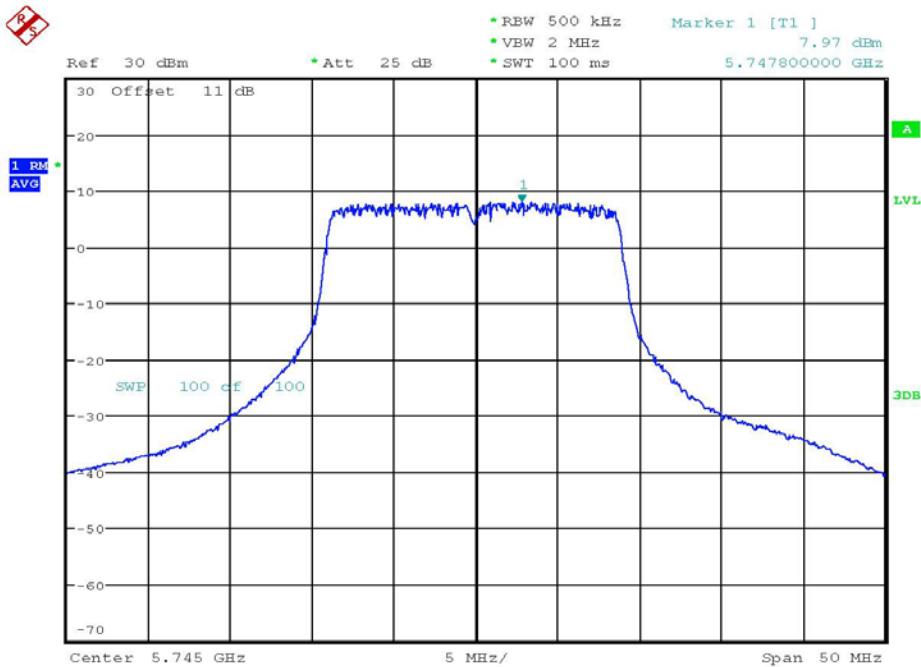


POWER DENSITY CDD ANT2\_aCH157  
Date: 25.NOV.2014 18:48:48



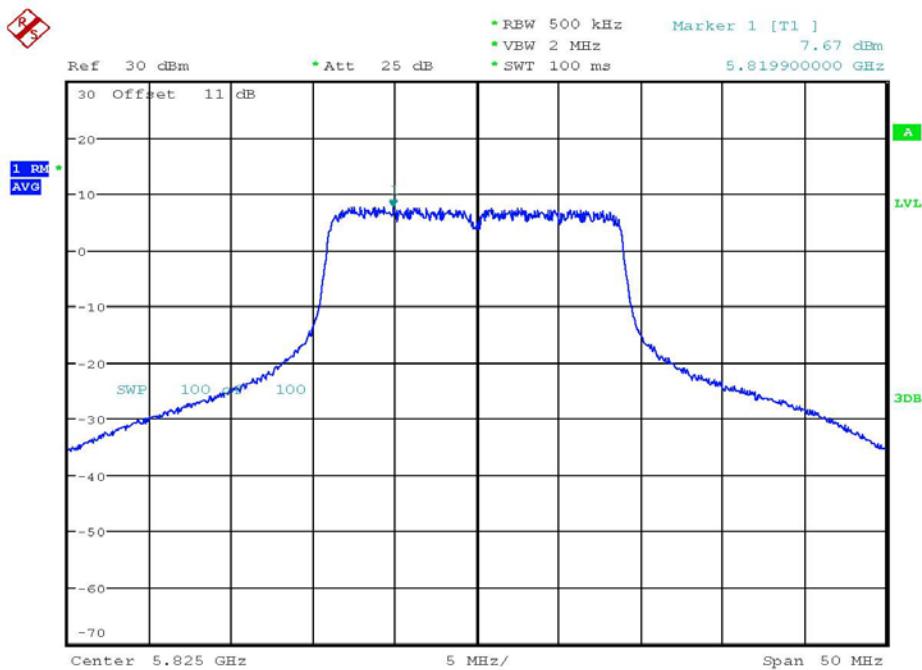
POWER DENSITY CDD ANT2\_aCH165  
Date: 25.NOV.2014 18:32:00

Registration number: W6M21410-14564-C-54-R1  
 FCC ID: ZTT-RTA1750

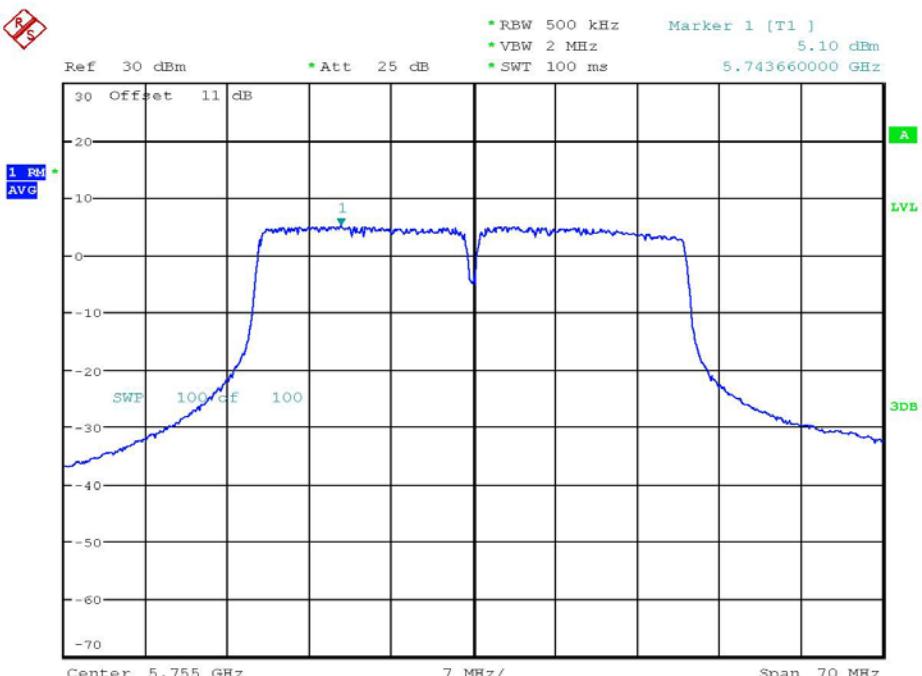


# Worldwide Testing Services(Taiwan) Co., Ltd.

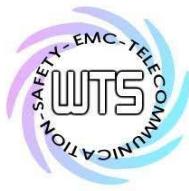
Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750



POWER DENSITY CDD ANT2\_VHT20CH165  
Date: 25.NOV.2014 22:50:24

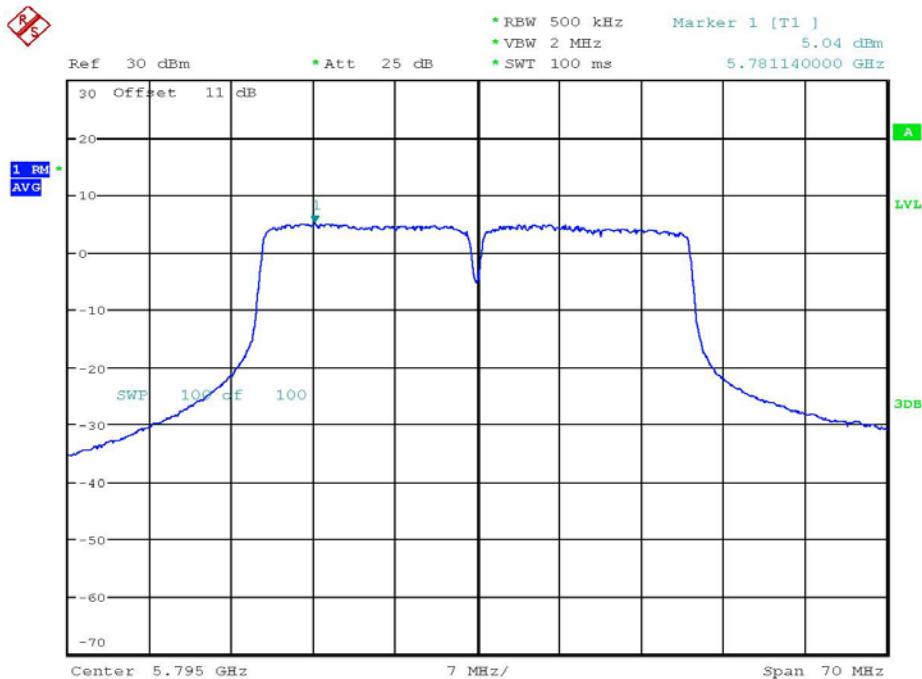


POWER DENSITY CDD ANT0\_VHT40CH151  
Date: 25.NOV.2014 22:55:31



# Worldwide Testing Services(Taiwan) Co., Ltd.

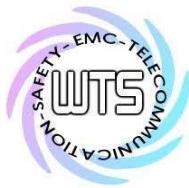
Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750



POWER DENSITY CDD ANTO\_VHT40CH159  
Date: 25.NOV.2014 23:00:43



POWER DENSITY CDD ANT2\_VHT80CH156  
Date: 26.NOV.2014 00:00:45



# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21410-14564-C-54-R1  
FCC ID: ZTT-RTA1750

ANT0	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	5.888	5.433	6.053	7.70	7.35	7.82
802.11n 40MHz	2.992	--	2.864	4.76	--	4.57
802.11ac	0.535	--	--	-2.72	--	--
ANT1	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	6.855	5.808	5.346	8.36	7.64	7.28
802.11n 40MHz	3.524	--	2.958	5.47	--	4.71
802.11ac	0.589	--	--	-2.30	--	--
ANT2	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	6.266	6.223	5.848	7.97	7.94	7.67
802.11n 40MHz	3.236	--	3.192	5.10	--	5.04
802.11ac	0.585	--	--	-2.33	--	--
Combine	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	19.009	17.464	17.247	12.79	12.42	12.37
802.11n 40MHz	9.752	--	9.014	9.89	--	9.55
802.11ac	1.709	--	--	2.33	--	--

Test equipment used: ETSTW-RE 055, ETSTW-RE 050