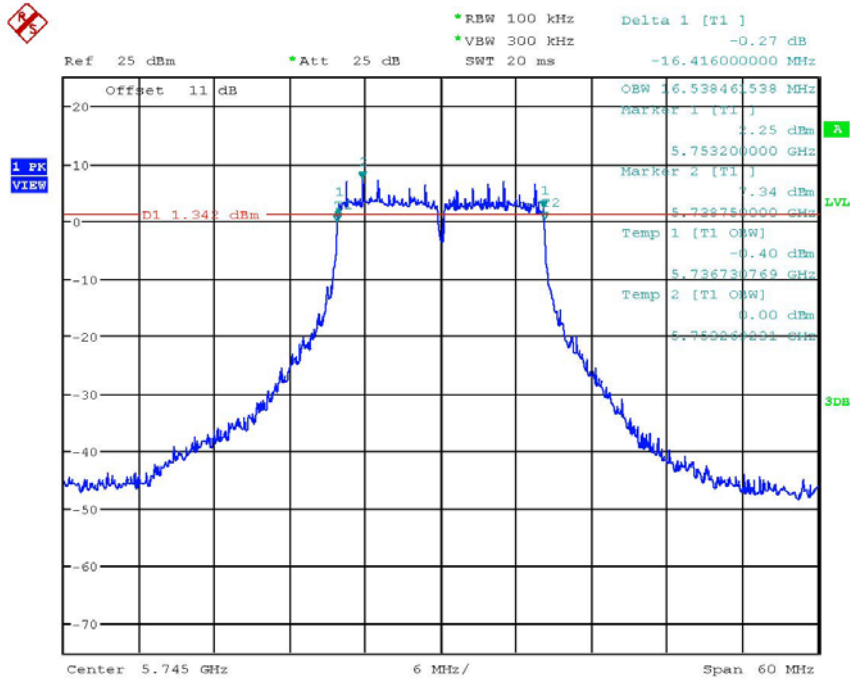


# Worldwide Testing Services(Taiwan) Co., Ltd.

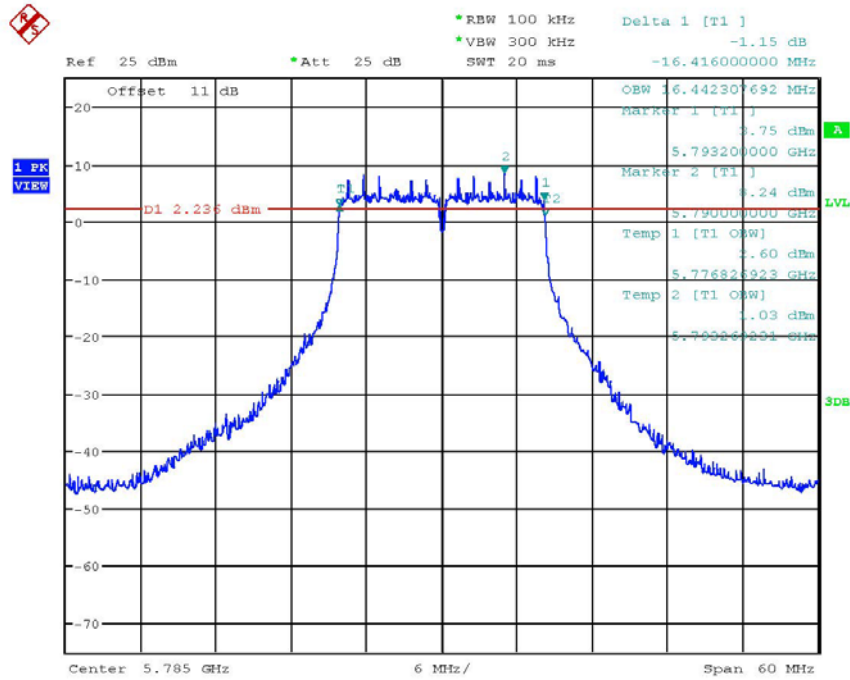
Registration number: W6M21501-14799-C-54

FCC ID: ZTT-REC22A

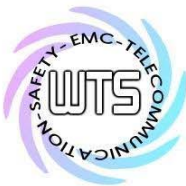
ANT2



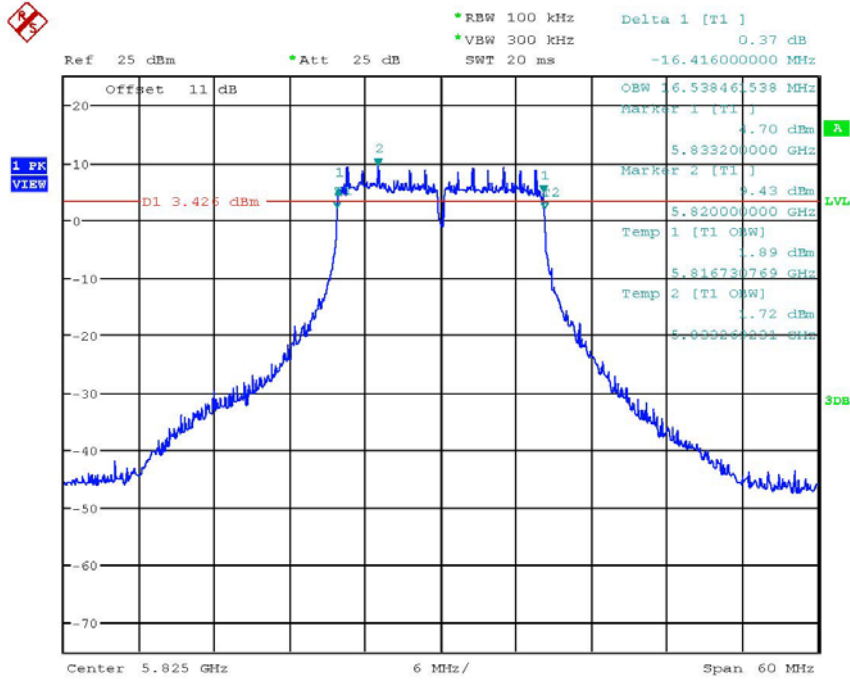
99% OBW & 6DB BANDWIDTH CDD ANT2\_a Mode\_CH149  
 Date: 24.MAR.2015 12:22:23



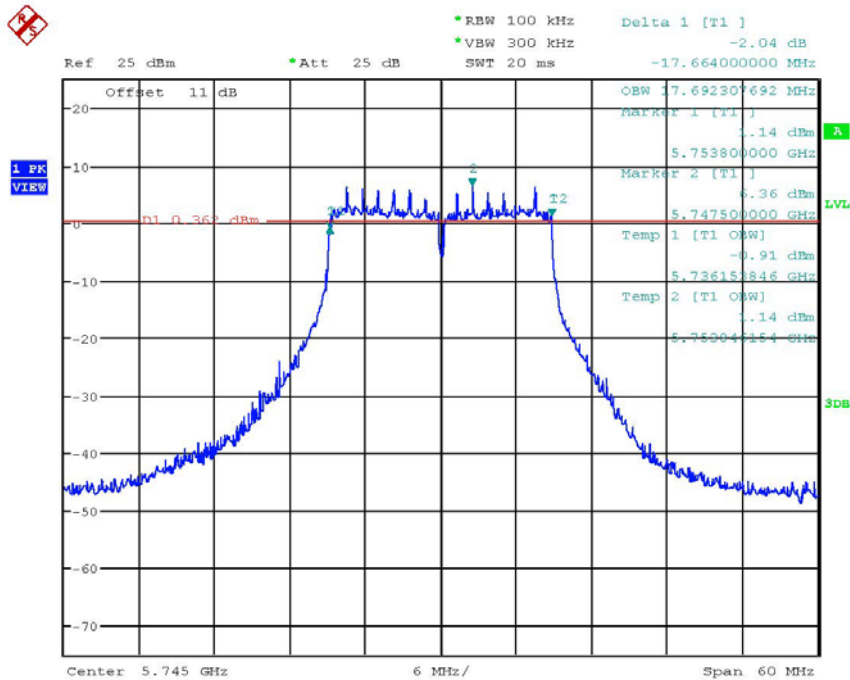
99% OBW & 6DB BANDWIDTH CDD ANT2\_a Mode\_CH157  
 Date: 24.MAR.2015 12:16:54



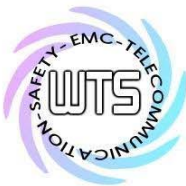
Registration number: W6M21501-14799-C-54  
 FCC ID: ZTT-REC22A



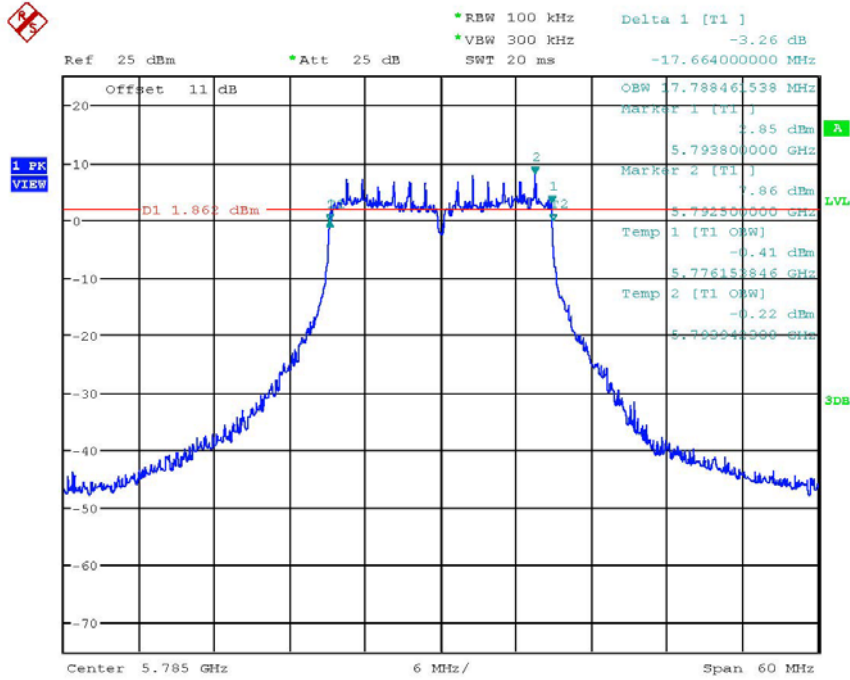
99% OBW & 6DB BANDWIDTH CDD ANT2\_a Mode\_CH165  
 Date: 24.MAR.2015 12:10:29



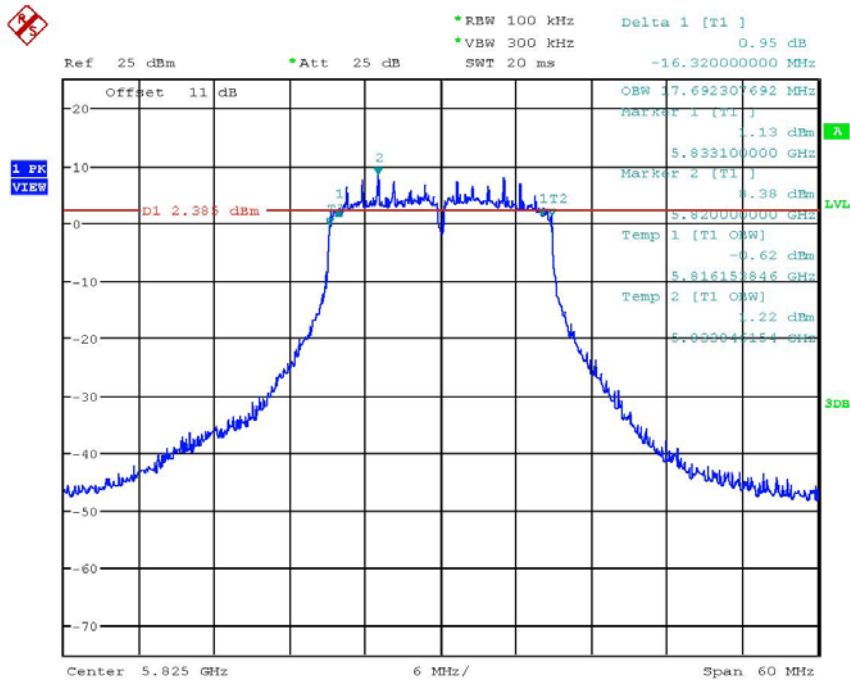
99% OBW & 6DB BANDWIDTH CDD ANT2\_VHT20\_CH149  
 Date: 24.MAR.2015 10:47:54



Registration number: W6M21501-14799-C-54  
 FCC ID: ZTT-REC22A

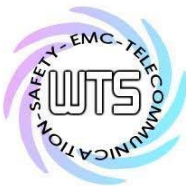


99% OBW & 6DB BANDWIDTH CDD ANT2\_VHT20\_CH157  
 Date: 24.MAR.2015 10:57:28

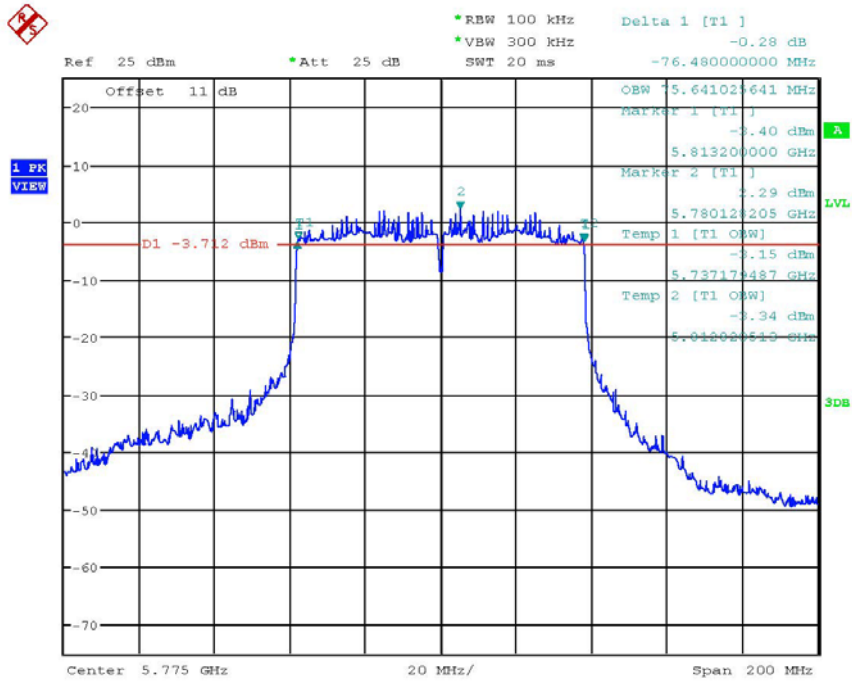


99% OBW & 6DB BANDWIDTH CDD ANT2\_VHT20\_CH165  
 Date: 24.MAR.2015 12:05:43



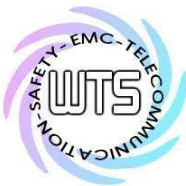


Registration number: W6M21501-14799-C-54  
 FCC ID: ZTT-REC22A



99% OBW & 6DB BANDWIDTH CDD ANT2\_VHT80\_CH155  
 Date: 24.MAR.2015 10:29:21

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



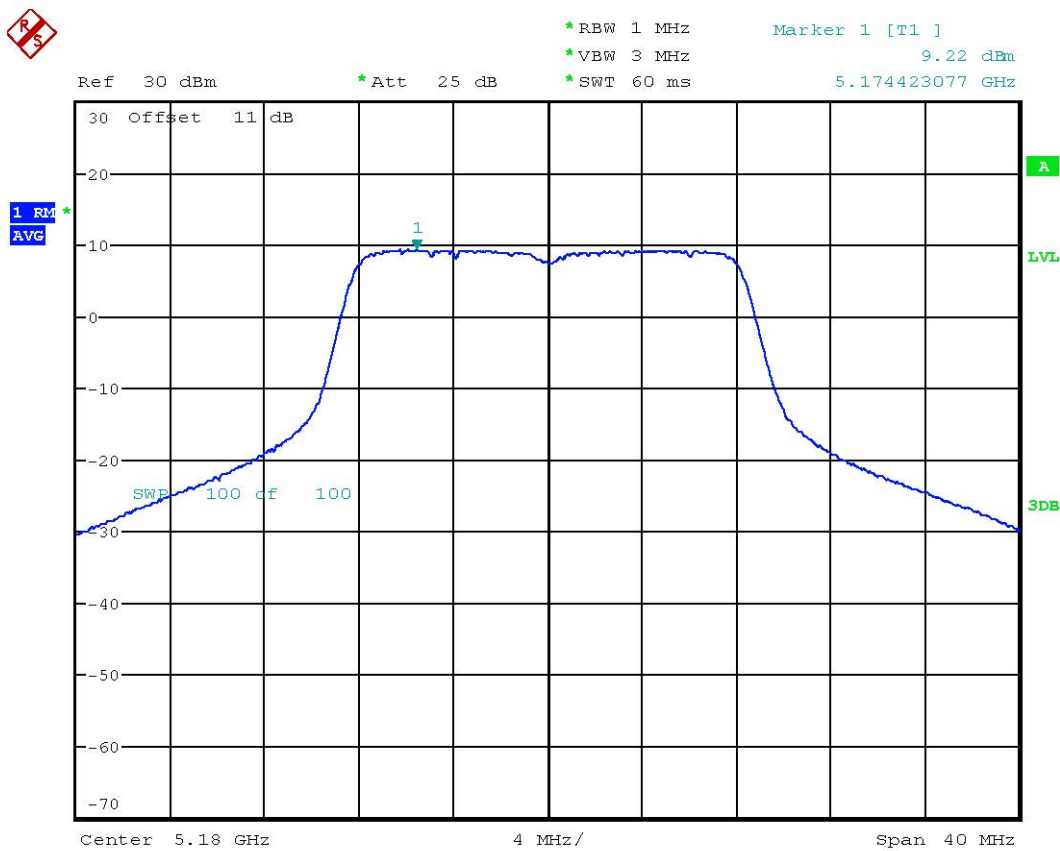
Registration number: W6M21501-14799-C-54  
FCC ID: ZTT-REC22A

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

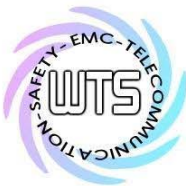
According to §15.407(a)

1. For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 17 dBm/MHz for master device and 11 dBm/MHz for mobile/portable client device.
2. For the band 5.25-5.35 GHz and 5.47-5.725 GHz, the peak power spectral density shall not exceed 11 dBm/MHz.
3. For the band 5.725-5.850 GHz, the peak power spectral density shall not exceed 30 dBm/500kHz.

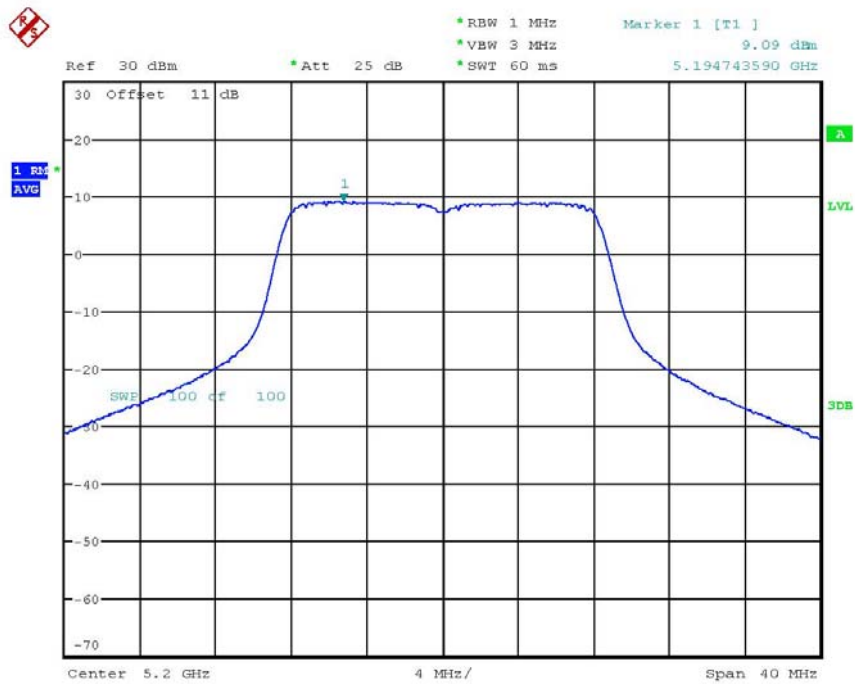
Band 1  
ANT1



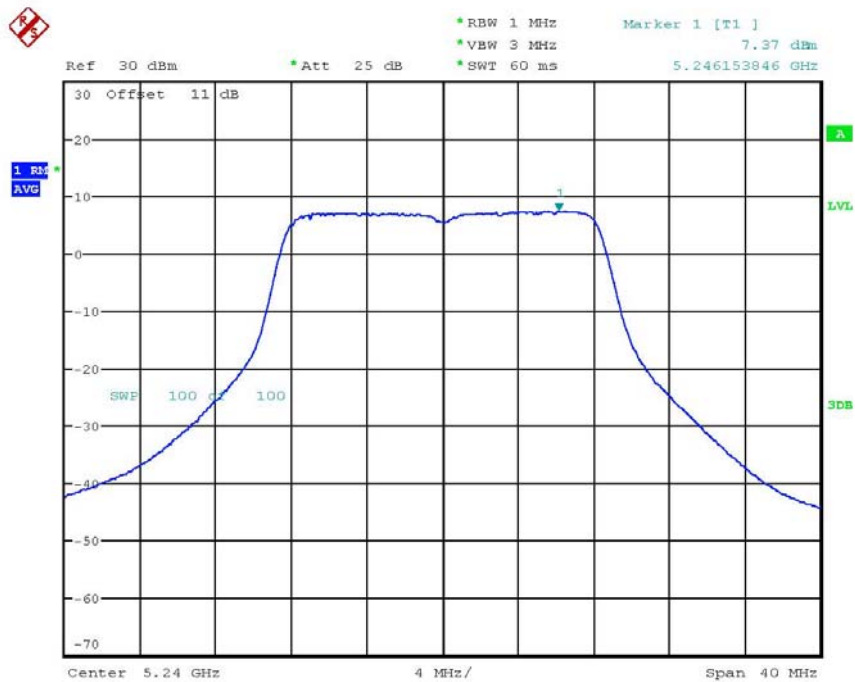
POWER DENSITY AV ANT1\_11aCH36  
Date: 24.MAR.2015 13:40:07



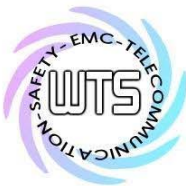
Registration number: W6M21501-14799-C-54  
FCC ID: ZTT-REC22A



POWER DENSITY AV ANT1\_11aCH40  
Date: 24.MAR.2015 13:42:30

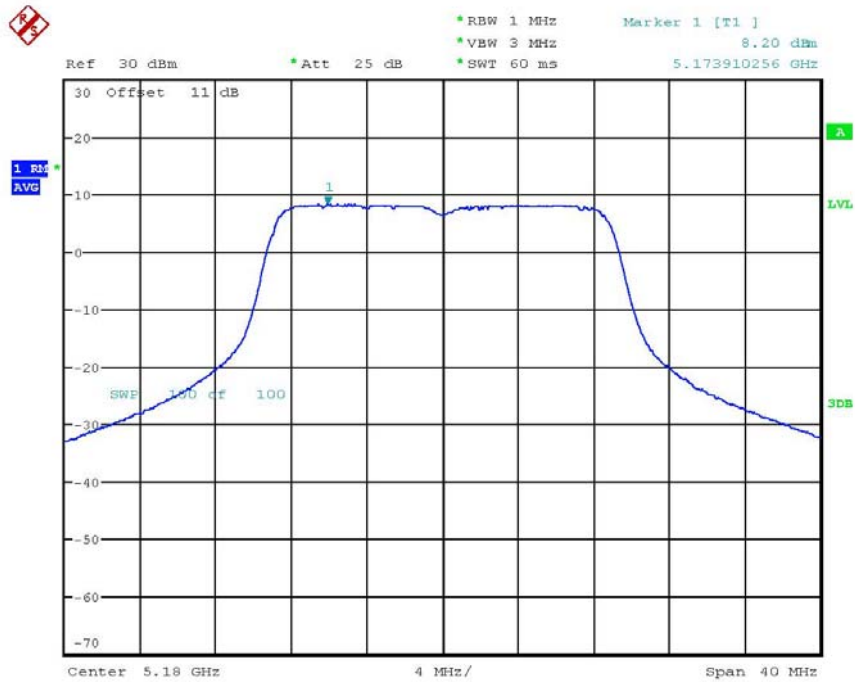


POWER DENSITY AV ANT1\_11aCH48  
Date: 24.MAR.2015 13:44:40

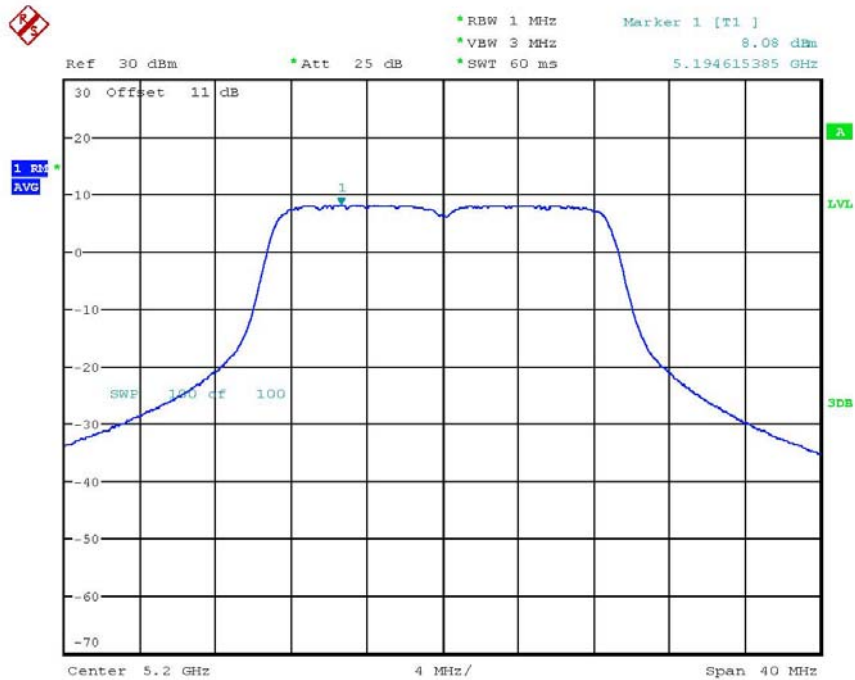


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21501-14799-C-54  
FCC ID: ZTT-REC22A

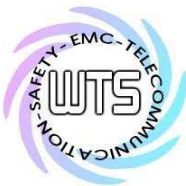


POWER DENSITY AV ANT1\_11n20CH36  
Date: 24.MAR.2015 13:33:50

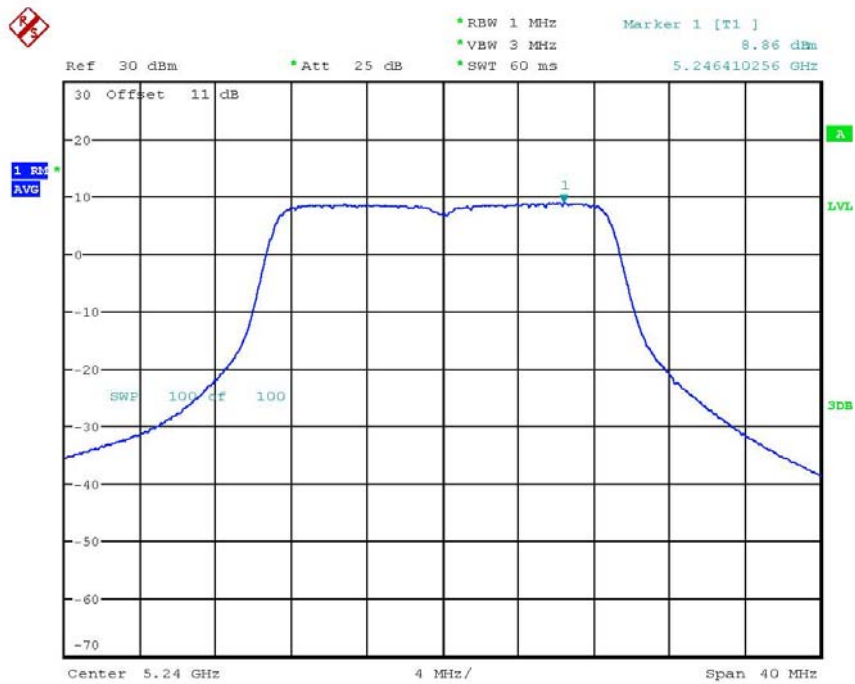


POWER DENSITY AV ANT1\_11n20CH40  
Date: 24.MAR.2015 13:35:47

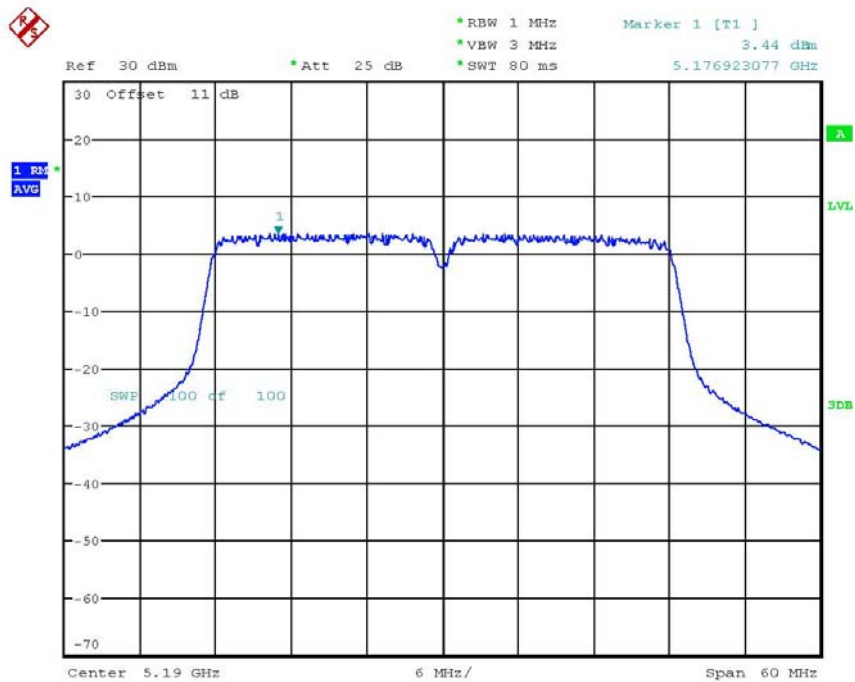




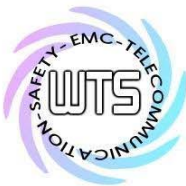
Registration number: W6M21501-14799-C-54  
FCC ID: ZTT-REC22A



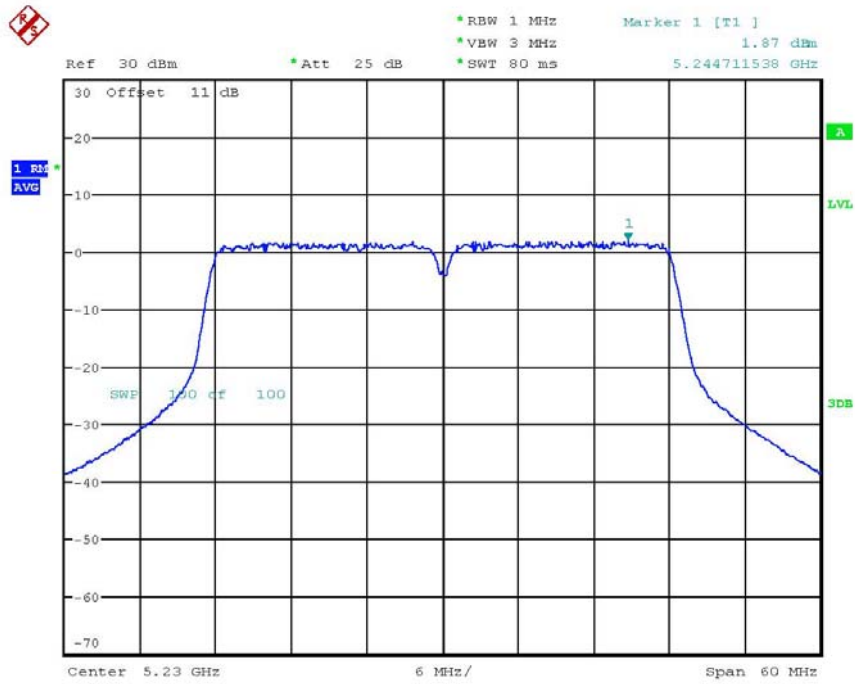
POWER DENSITY AV ANT1\_11n20CH48  
Date: 24.MAR.2015 13:37:18



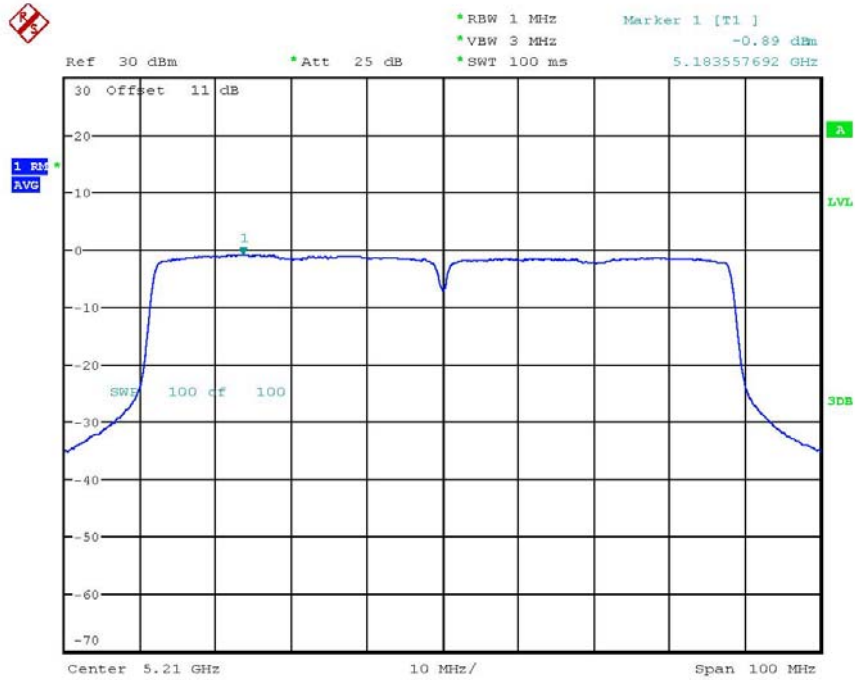
POWER DENSITY AV ANT1\_11n40CH38  
Date: 24.MAR.2015 13:28:08



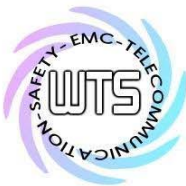
Registration number: W6M21501-14799-C-54  
FCC ID: ZTT-REC22A



POWER DENSITY AV ANT1\_11n40CH46  
Date: 24.MAR.2015 13:30:23



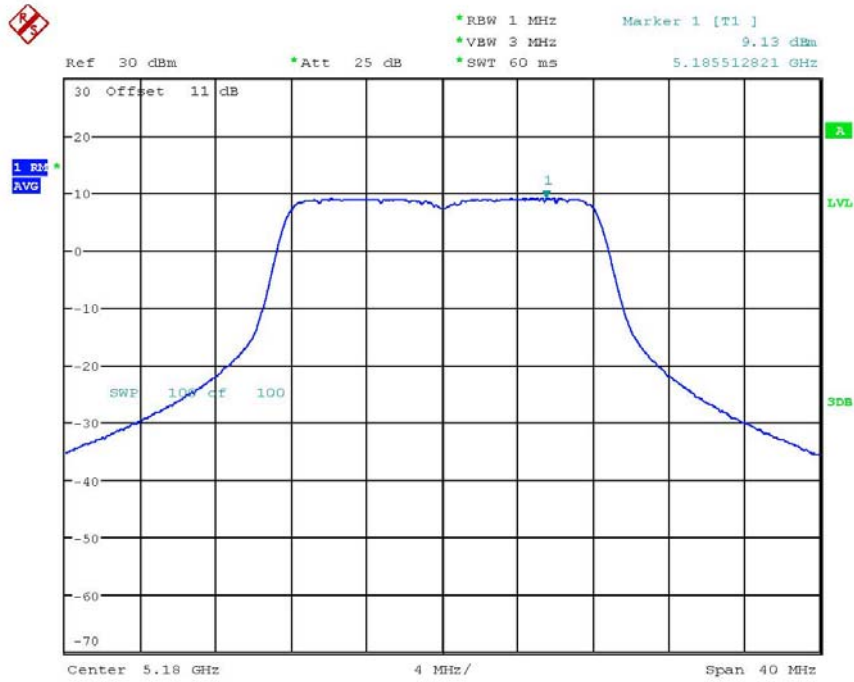
POWER DENSITY AV ANT1\_11ac80CH42  
Date: 24.MAR.2015 13:23:56



Registration number: W6M21501-14799-C-54

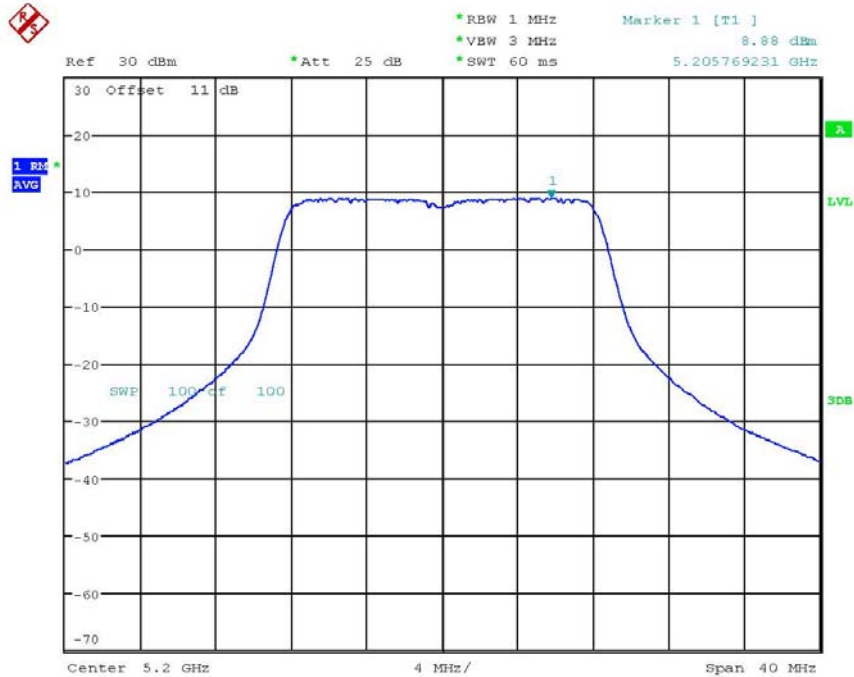
FCC ID: ZTT-REC22A

ANT2



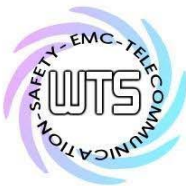
POWER DENSITY AV ANT2\_11aCH36

Date: 24.MAR.2015 13:01:14

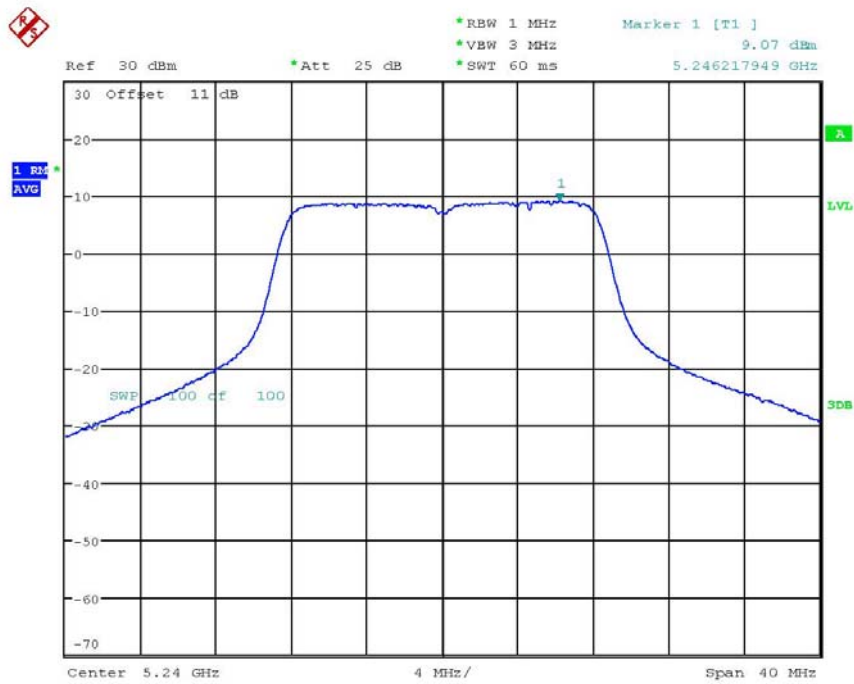


POWER DENSITY AV ANT2\_11aCH40

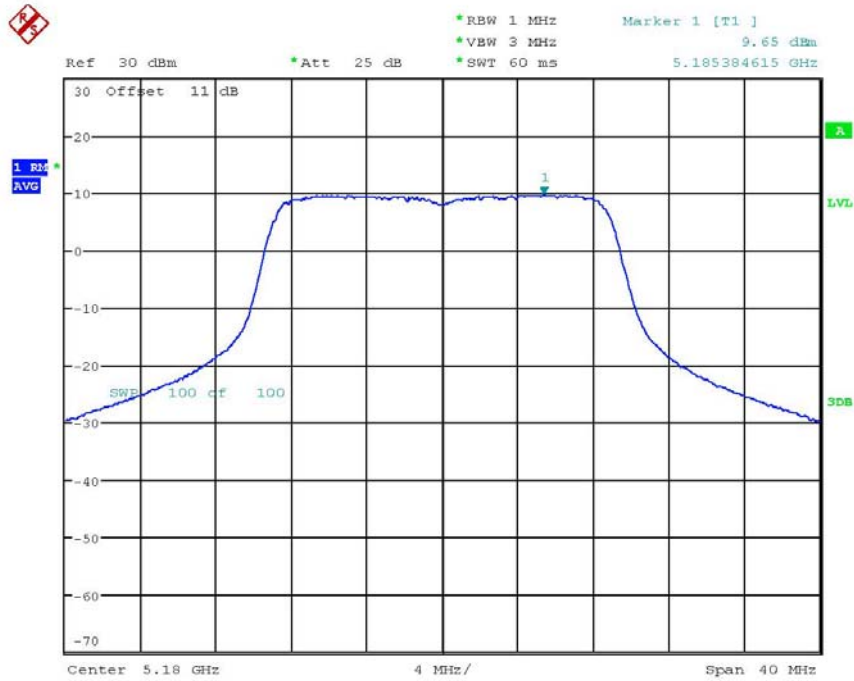
Date: 24.MAR.2015 13:03:37



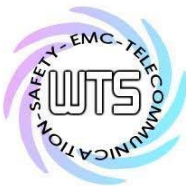
Registration number: W6M21501-14799-C-54  
FCC ID: ZTT-REC22A



POWER DENSITY AV ANT2\_11aCH48  
Date: 24.MAR.2015 13:05:34

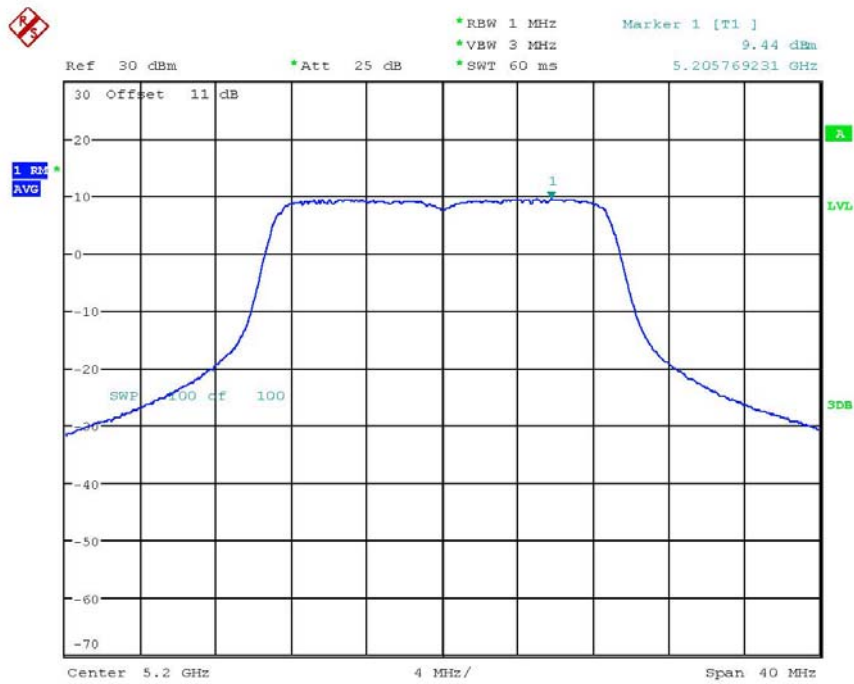


POWER DENSITY AV ANT2\_11n20CH36  
Date: 24.MAR.2015 13:07:44

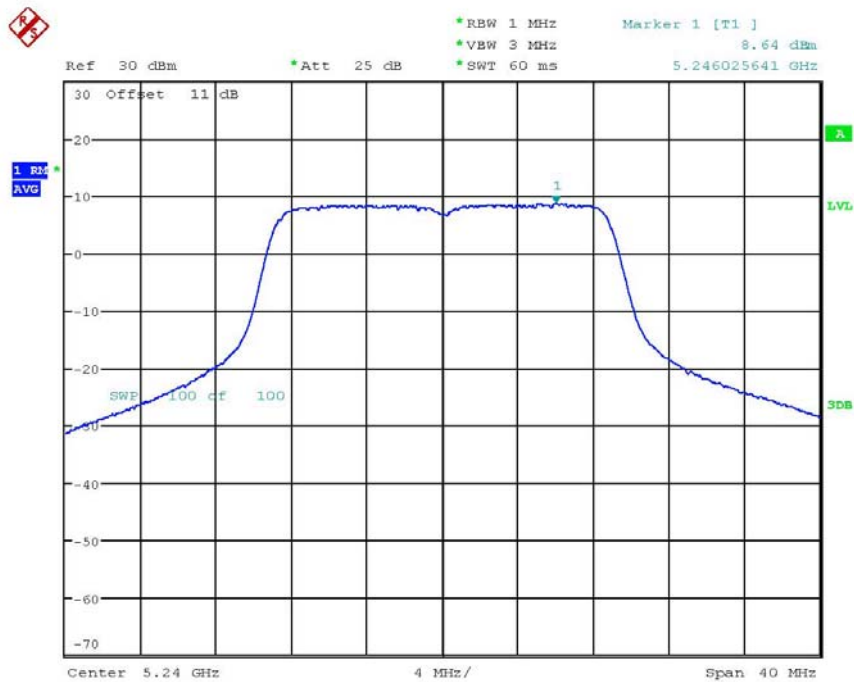


# Worldwide Testing Services(Taiwan) Co., Ltd.

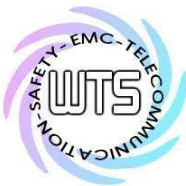
Registration number: W6M21501-14799-C-54  
FCC ID: ZTT-REC22A



POWER DENSITY AV ANT2\_11n20CH40  
Date: 24.MAR.2015 13:09:48

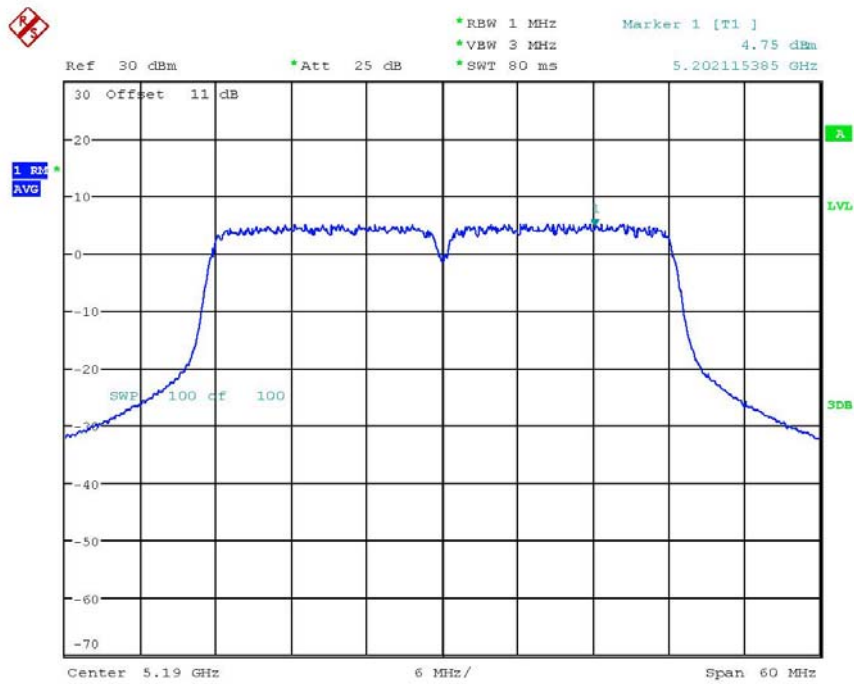


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Date: 24.MAR.2015 13:11:19

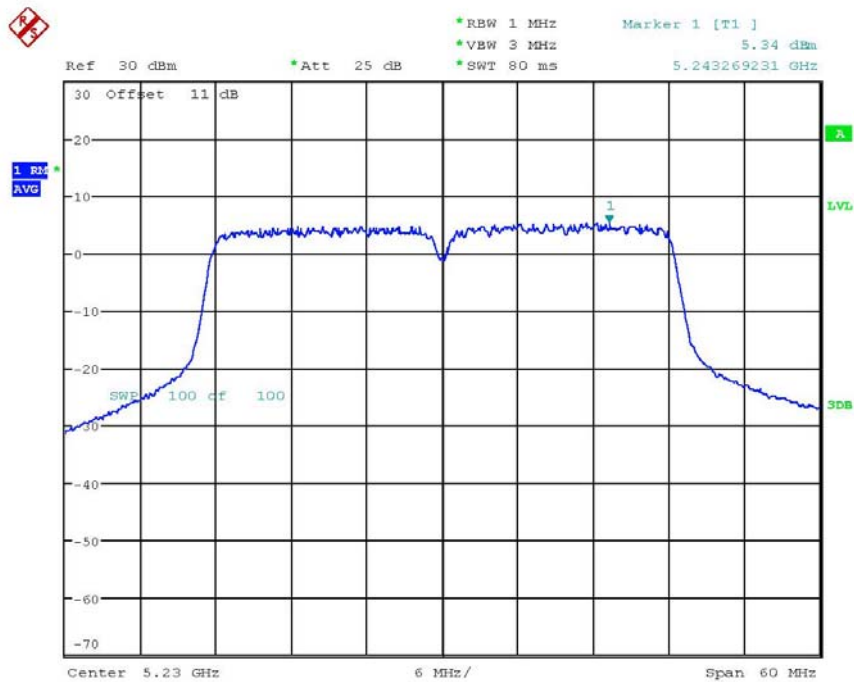


# Worldwide Testing Services(Taiwan) Co., Ltd.

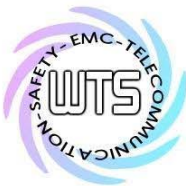
Registration number: W6M21501-14799-C-54  
FCC ID: ZTT-REC22A



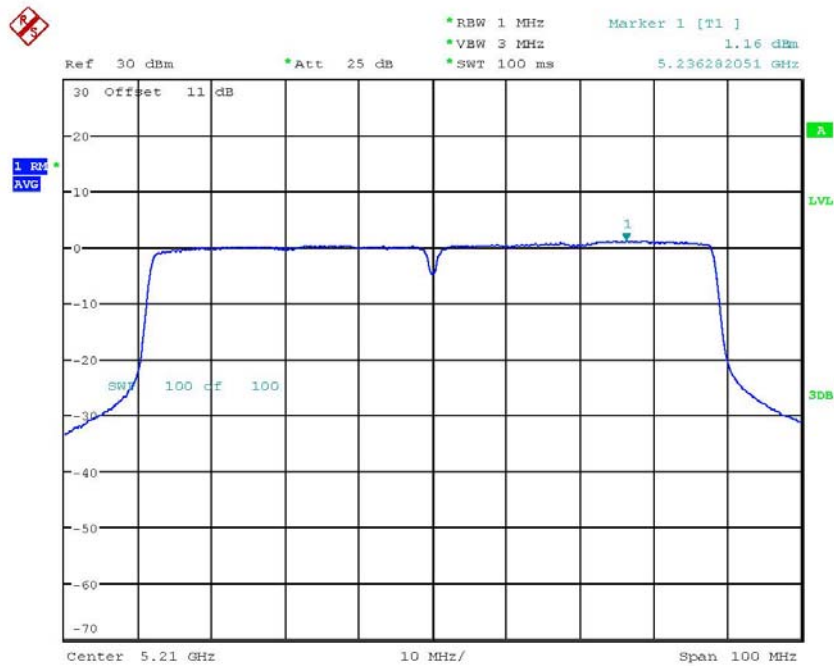
POWER DENSITY AV ANT2\_11n40CH38  
Date: 24.MAR.2015 13:13:16



POWER DENSITY AV ANT2\_11n40CH46  
Date: 24.MAR.2015 13:15:38

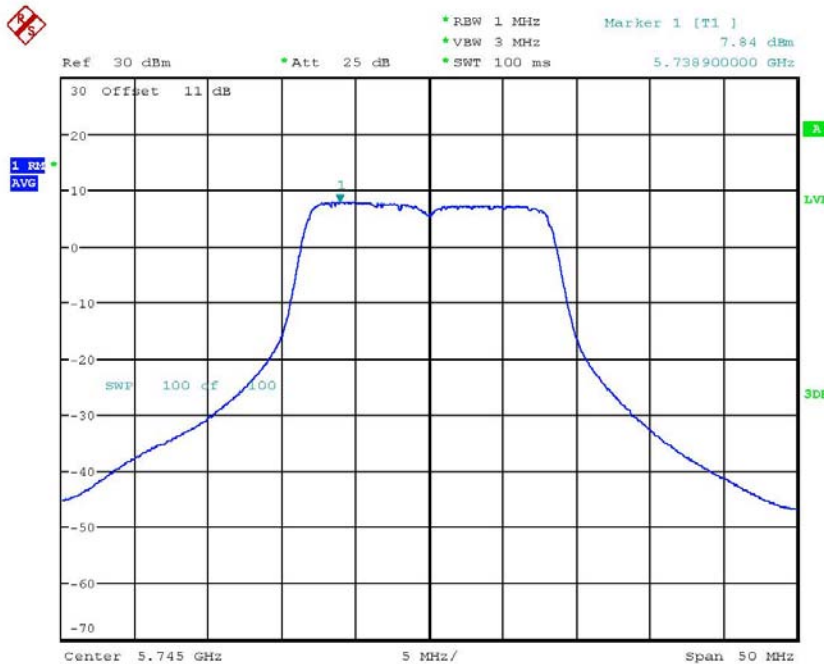


Registration number: W6M21501-14799-C-54  
FCC ID: ZTT-REC22A

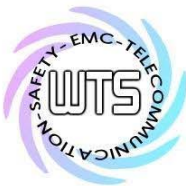


POWER DENSITY AV ANT2\_1lac80CH42  
Date: 24.MAR.2015 13:17:59

Band 4  
ANT1

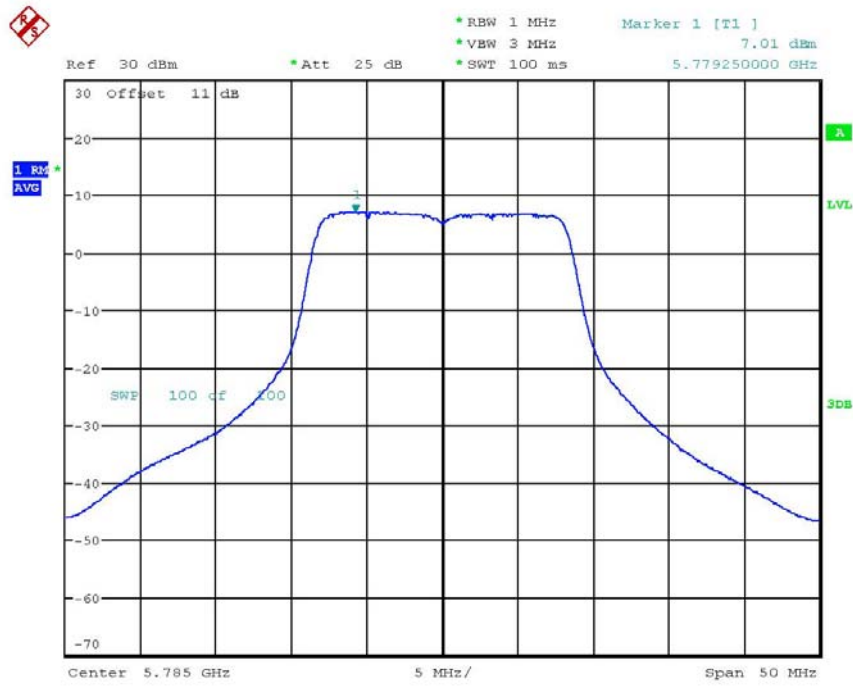


POWER DENSITY CDD ANT1\_aCH149  
Date: 24.MAR.2015 09:20:26

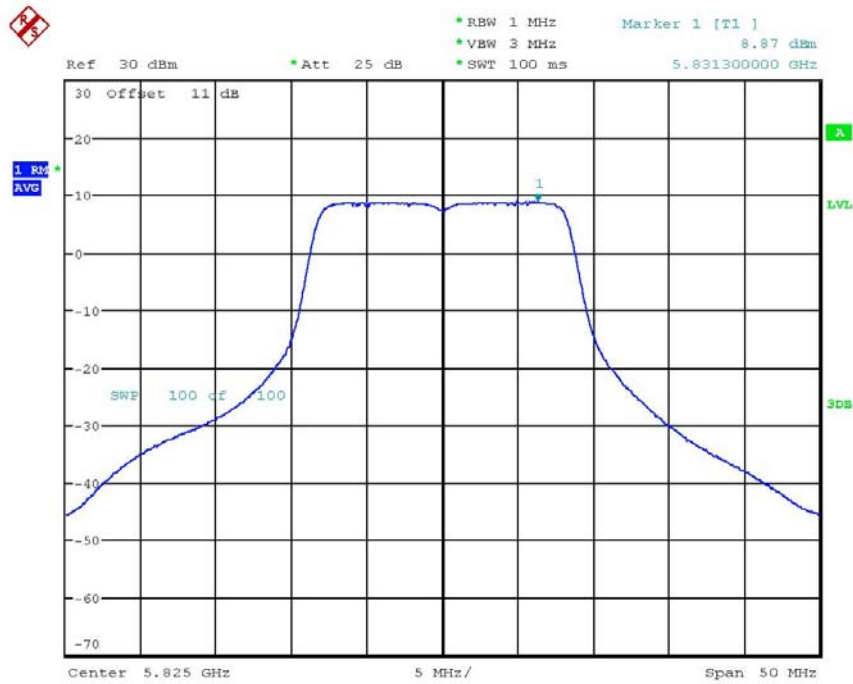


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21501-14799-C-54  
FCC ID: ZTT-REC22A

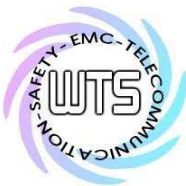


POWER DENSITY CDD ANT1\_aCH157  
Date: 24.MAR.2015 09:27:19



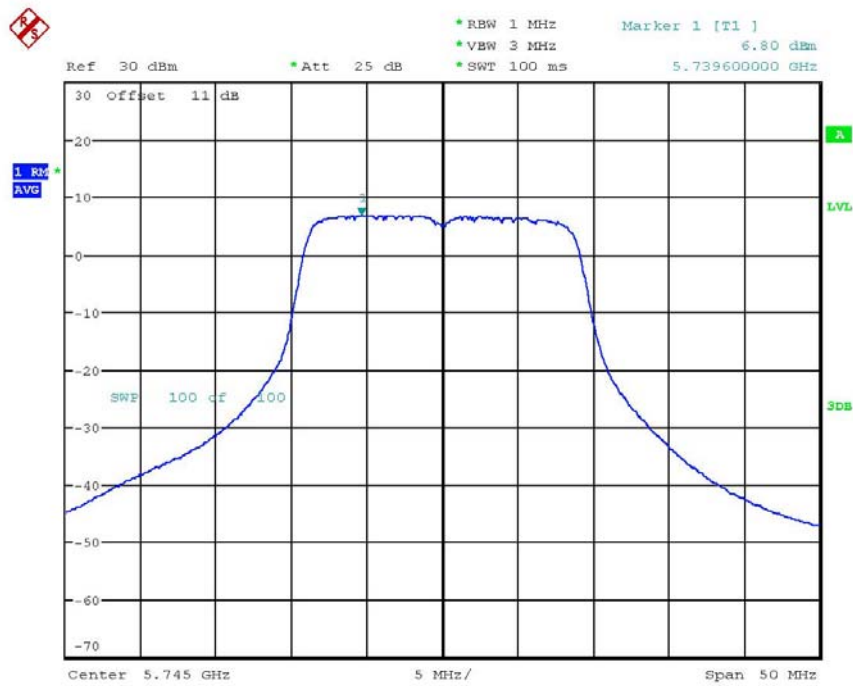
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Date: 24.MAR.2015 09:32:20



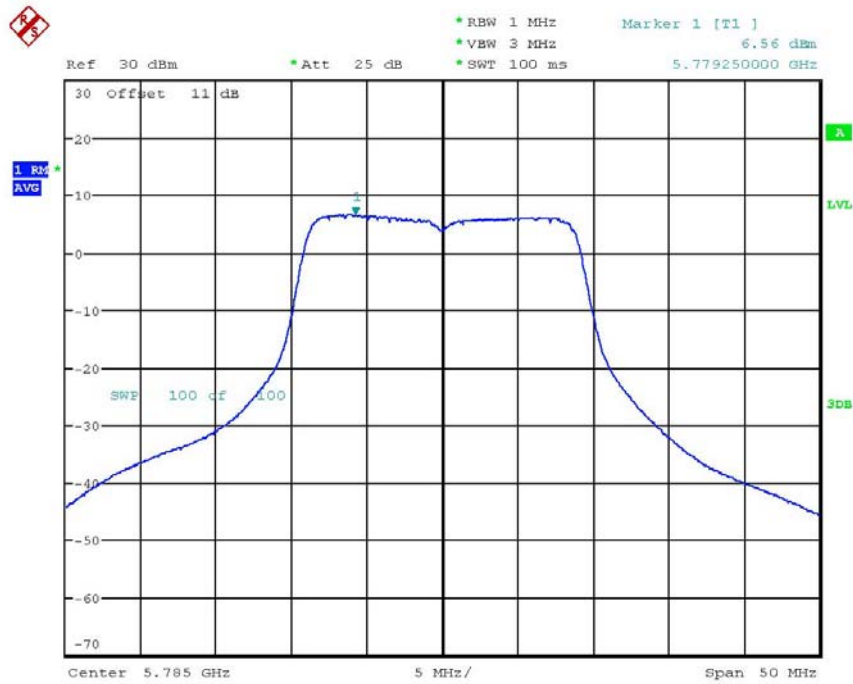


# Worldwide Testing Services(Taiwan) Co., Ltd.

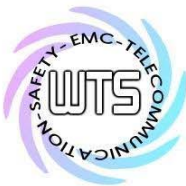
Registration number: W6M21501-14799-C-54  
FCC ID: ZTT-REC22A



POWER DENSITY CDD ANT1\_VHT20CH149  
Date: 24.MAR.2015 09:39:13

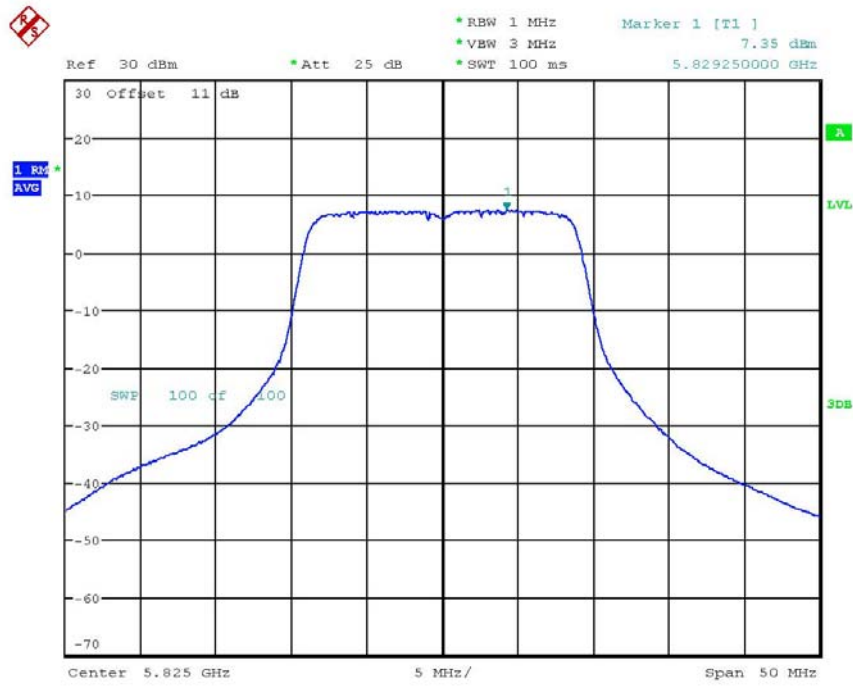


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Date: 24.MAR.2015 09:44:55

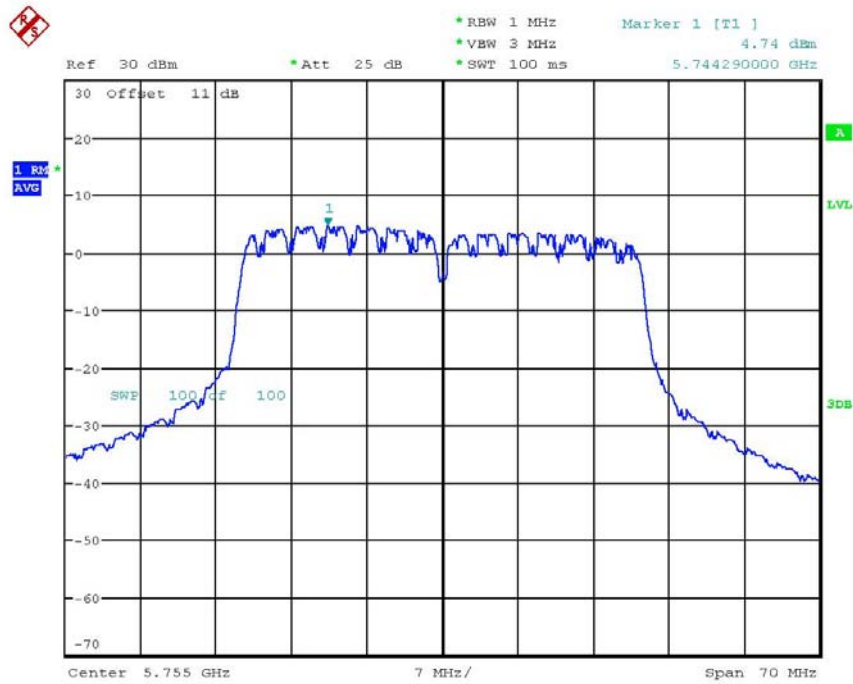


# Worldwide Testing Services(Taiwan) Co., Ltd.

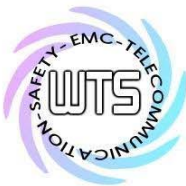
Registration number: W6M21501-14799-C-54  
FCC ID: ZTT-REC22A



POWER DENSITY CDD ANT1\_VHT20CH165  
Date: 24.MAR.2015 09:53:26

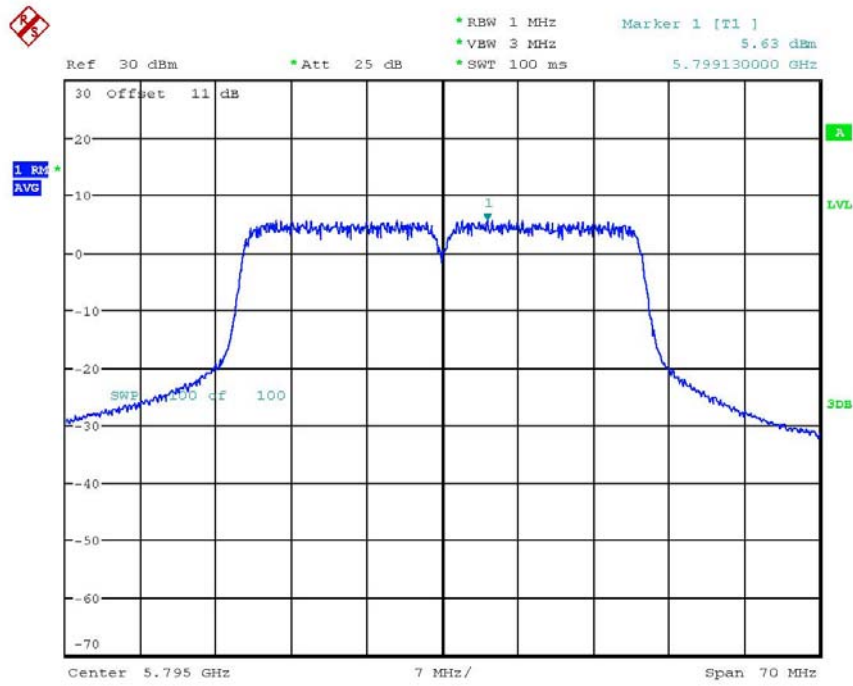


POWER DENSITY CDD ANT1\_VHT40CH151  
Date: 24.MAR.2015 10:02:52

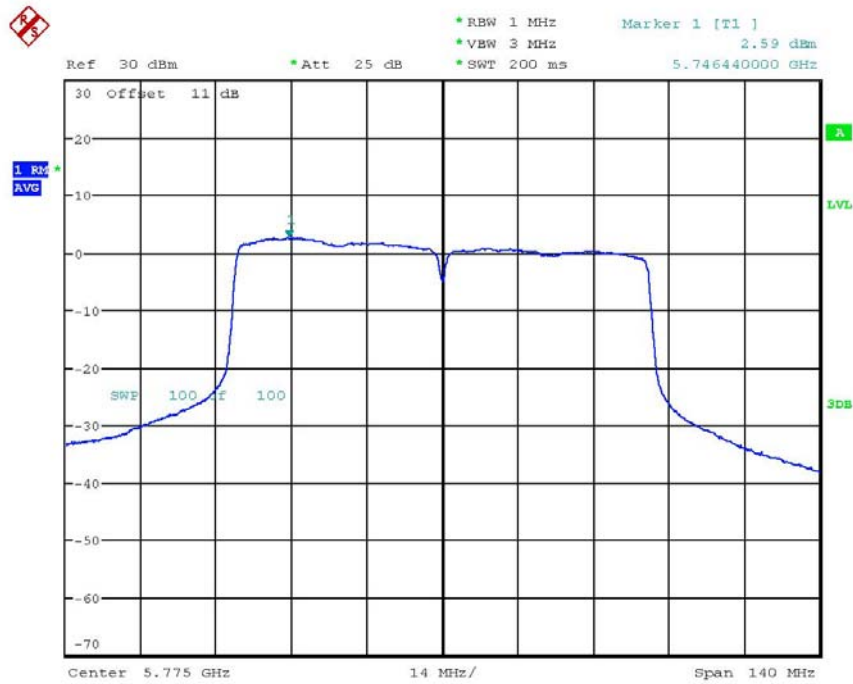


# Worldwide Testing Services(Taiwan) Co., Ltd.

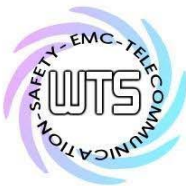
Registration number: W6M21501-14799-C-54  
 FCC ID: ZTT-REC22A



POWER DENSITY CDD ANT1\_VHT40CH159  
 Date: 24.MAR.2015 10:06:52



POWER DENSITY CDD ANT1\_VHT80CH155  
 Date: 24.MAR.2015 10:12:06

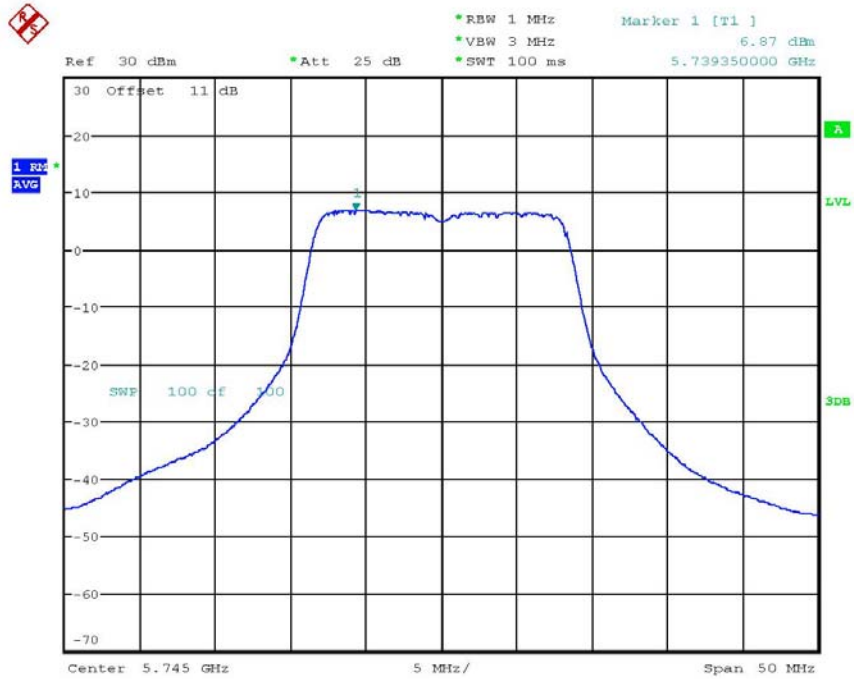


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21501-14799-C-54

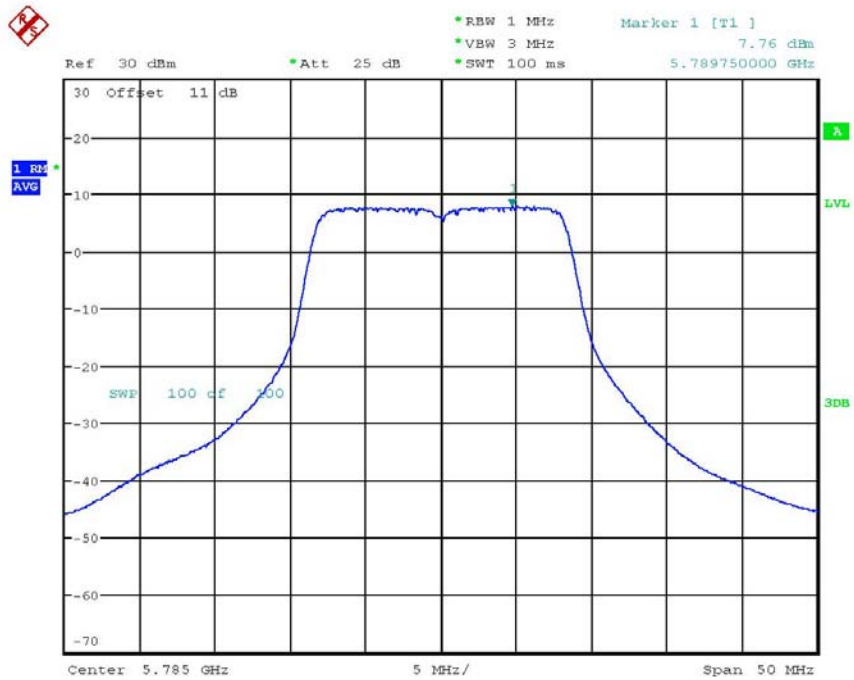
FCC ID: ZTT-REC22A

ANT2



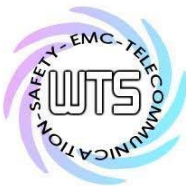
POWER DENSITY CDD ANT2\_aCH149

Date: 24.MAR.2015 12:20:25

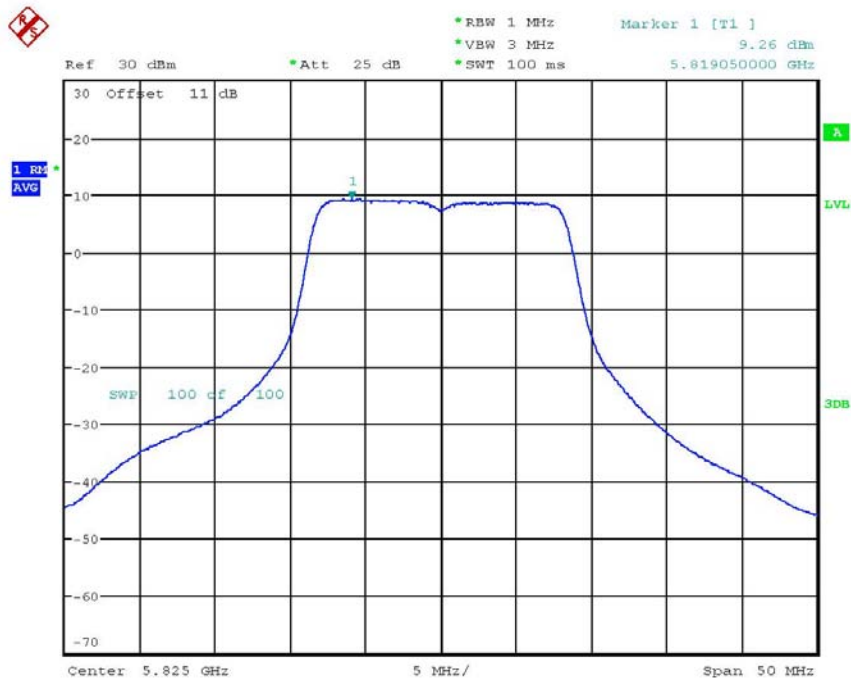


POWER DENSITY CDD ANT2\_aCH157

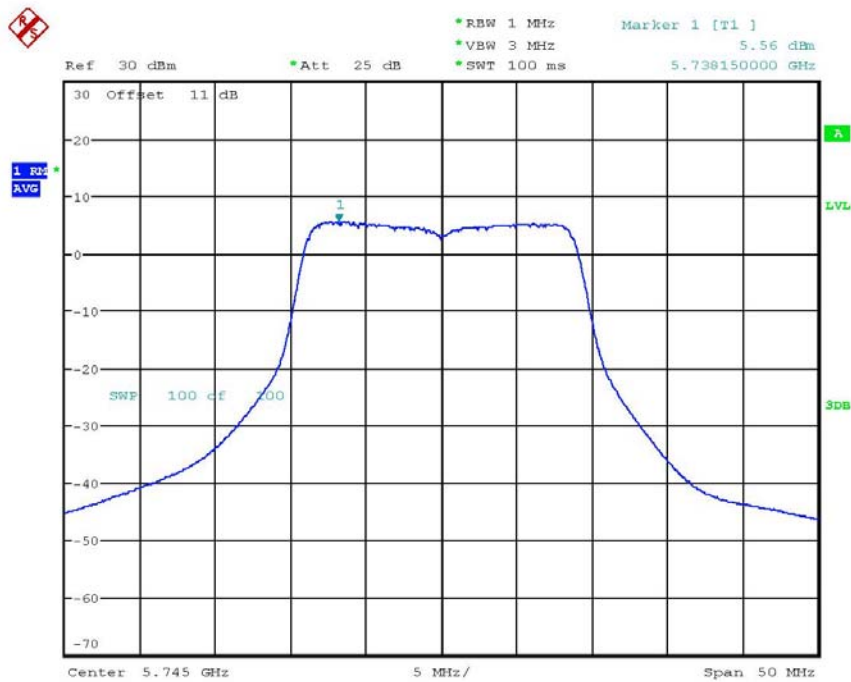
Date: 24.MAR.2015 12:14:42



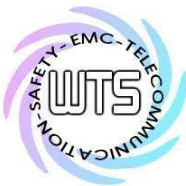
Registration number: W6M21501-14799-C-54  
FCC ID: ZTT-REC22A



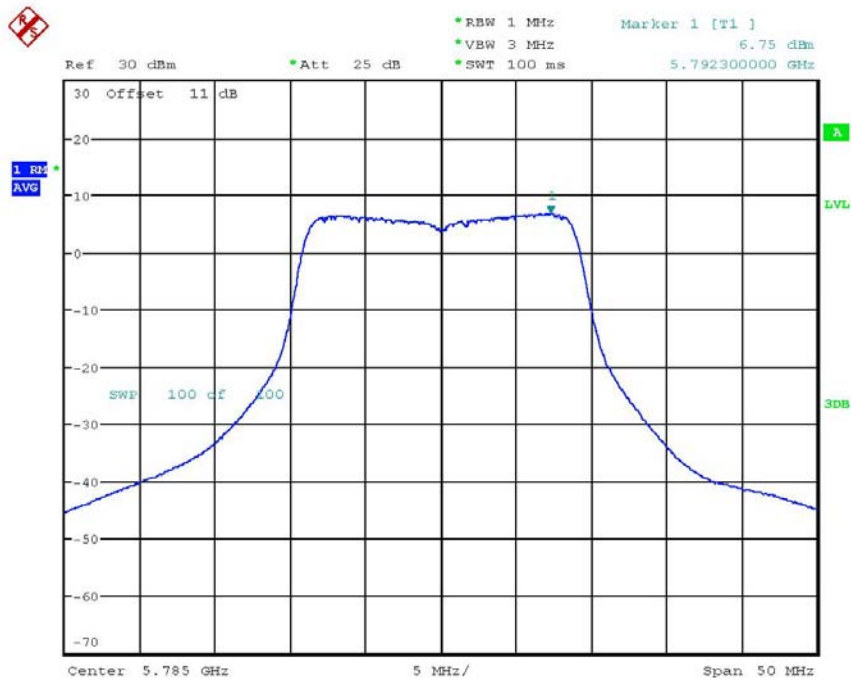
POWER DENSITY CDD ANT2\_aCH165  
Date: 24.MAR.2015 12:09:14



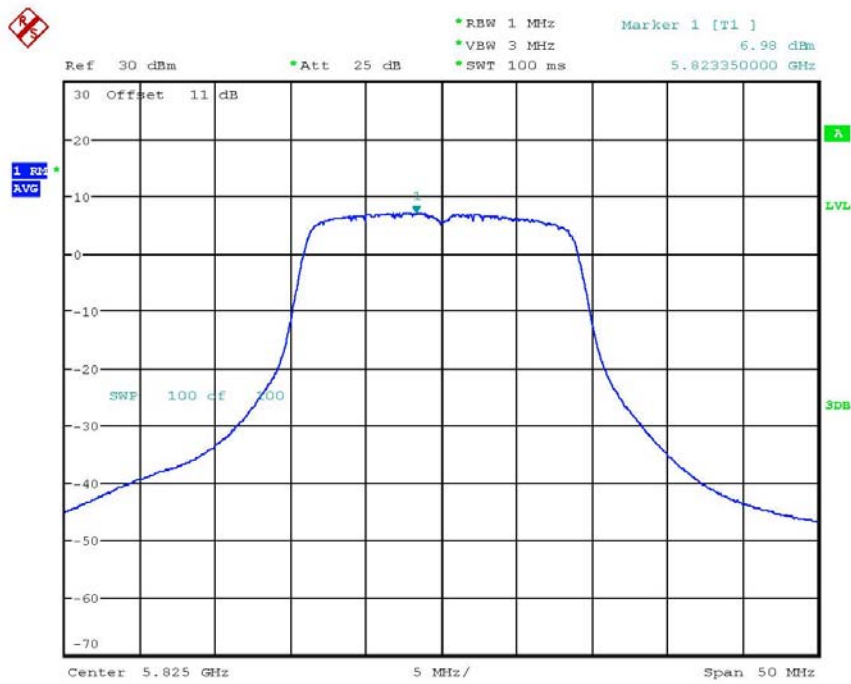
POWER DENSITY CDD ANT2\_VHT20CH149  
Date: 24.MAR.2015 10:46:45



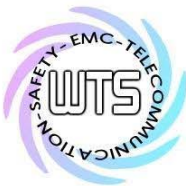
Registration number: W6M21501-14799-C-54  
FCC ID: ZTT-REC22A



POWER DENSITY CDD ANT2\_VHT20CH157  
Date: 24.MAR.2015 10:56:05

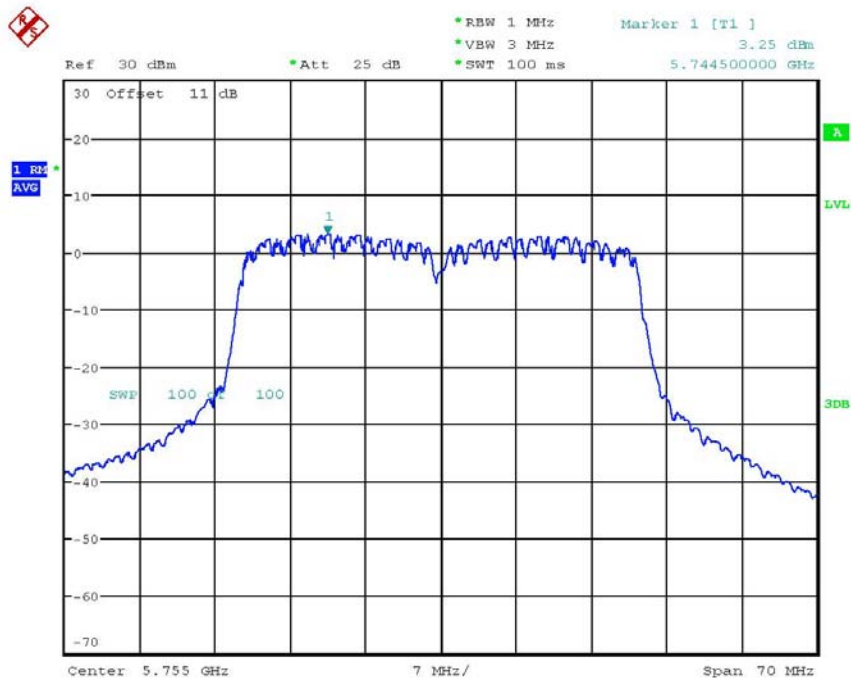


POWER DENSITY CDD ANT2\_VHT20CH165  
Date: 24.MAR.2015 12:04:48

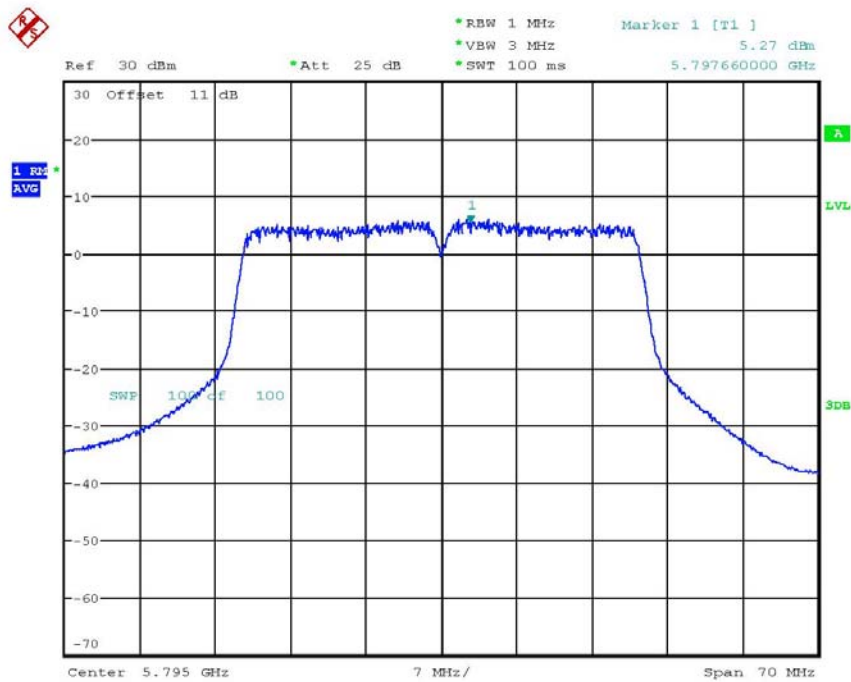


# Worldwide Testing Services(Taiwan) Co., Ltd.

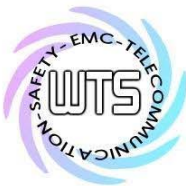
Registration number: W6M21501-14799-C-54  
 FCC ID: ZTT-REC22A



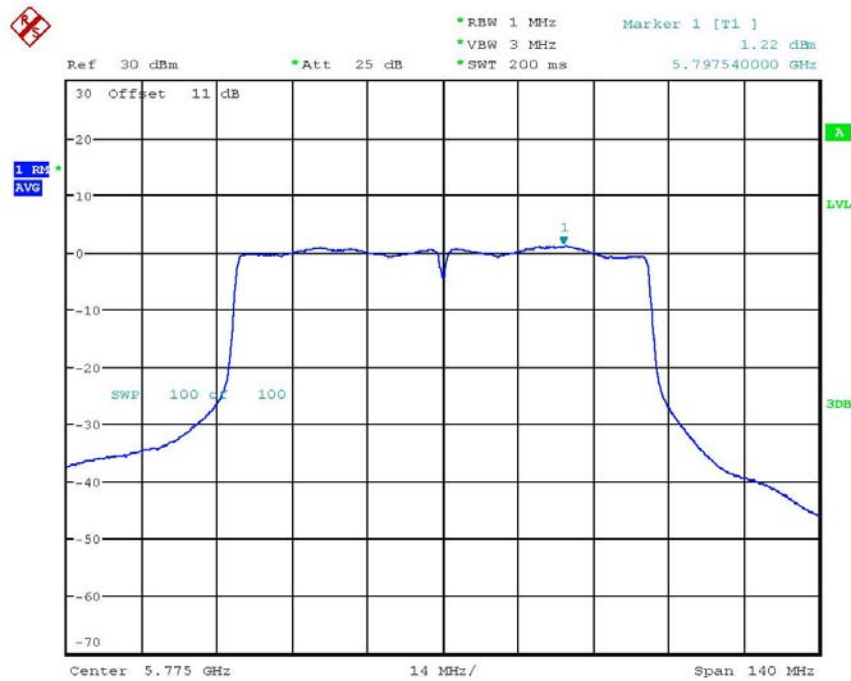
POWER DENSITY CDD ANT2\_VHT40CH151  
 Date: 24.MAR.2015 10:33:48



POWER DENSITY CDD ANT2\_VHT40CH159  
 Date: 24.MAR.2015 10:40:44



Registration number: W6M21501-14799-C-54  
 FCC ID: ZTT-REC22A



POWER DENSITY CDD ANT2\_VHT80CH155  
 Date: 24.MAR.2015 10:27:30

**Band 1**

ANT1	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	6.61	6.43	7.70	8.20	8.08	8.86
802.11n 40MHz	2.21	--	1.54	3.44	--	1.87
802.11ac	0.82	--	--	-0.89	--	--
ANT2	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	9.23	8.79	7.31	9.65	9.44	8.64
802.11n 40MHz	2.99	--	3.42	4.75	--	5.34
802.11ac	1.31	--	--	1.16	--	--
Combine	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	15.83	15.22	15.00	12.00	11.82	11.76
802.11n 40MHz	5.19	--	4.96	7.15	--	6.95
802.11ac	2.12	--	--	3.27	--	--





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

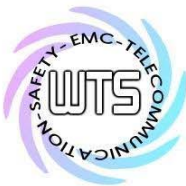
Registration number: W6M21501-14799-C-54

FCC ID: ZTT-REC22A

## Band 4

ANT1	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	4.79	4.53	5.43	6.80	6.56	7.35
802.11n 40MHz	2.98	--	3.66	4.74	--	5.63
802.11ac	1.82	--	--	2.59	--	--
ANT2	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	3.60	4.73	4.99	5.56	6.75	6.98
802.11n 40MHz	2.11	--	3.37	3.25	--	5.27
802.11ac	1.32	--	--	1.22	--	--
Combine	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	8.38	9.26	10.42	9.23	9.67	10.18
802.11n 40MHz	5.09	--	7.02	7.07	--	8.46
802.11ac	3.14	--	--	4.97	--	--

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

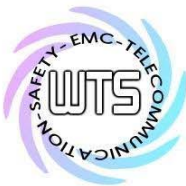


Registration number: W6M21501-14799-C-54  
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**3.5 Undesirable emission limits, FCC 15.407 (b)**

1. For transmitters operating in the 5.15–5.25 GHz band: all emissions out-side of the 5.15–5.35 GHz band shall not exceed an EIRP of –27 dBm/MHz.
2. For transmitters operating in the 5.25–5.35 GHz band: all emissions out-side of the 5.15–5.35 GHz band shall not exceed an EIRP of –27 dBm/MHz. De-vices operating in the 5.25–5.35 GHz band that generate emissions in the 5.15–5.25 GHz band must meet all appli-cable technical requirements for operation in the 5.15–5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15–5.25 GHz band.
3. For transmitters operating in the 5.47–5.725 GHz band: all emissions out-side of the 5.47–5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.
4. For transmitters operating in the 5.725–5.850 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz.
5. The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.
6. Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209.
7. According to According to KDB 789033 D02 General UNII Test Procedures v01, as specified in 15.407(b), emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz (or -17 dBm/MHz as specified in 15.407(b)(4)). However, an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit.
8. If radiated measurements are performed, field strength is then converted to EIRP as follows:
  - (i)  $EIRP = ((E*d)^2) / 30$ , where: E is the field strength in V/m; d is the measurement distance in meters. EIRP is the equivalent isotropically radiated power in watts.
  - (ii) Working in dB units, the above equation is equivalent to:  $EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$ .
  - (iii) Or, if d is 3 meters:  $EIRP[dBm] = E[dB\mu V/m] - 95.2$ .

Applicable to	Limit	
<input checked="" type="checkbox"/>	FIELD STRENGTH at 3m (dBμV/m)	
	PK	AV
	74	54
<input type="checkbox"/>	EIRP LIMIT (dBm)	EQUIVALENT FIELD STRENGTH at 3m (dBμV/m)
	PK	PK
	-27	68.3



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

Registration number: W6M21501-14799-C-54  
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Model: REC22A Date: --  
 Mode: -- Temperature: -- °C Engineer: --  
 Polarization: Horizontal Humidity: -- %

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--

Frequency (MHz)	Reading (dBuV)		Factor (dB) Corr.	Result (dBuV/m)		Limit (dBuV/m)		Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
	Peak	Ave.		Peak	Ave.	Peak	Ave.			
--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--

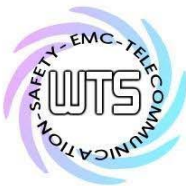
Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--

Frequency (MHz)	Reading (dBuV)		Factor (dB) Corr.	Result (dBuV/m)		Limit (dBuV/m)		Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
	Peak	Ave.		Peak	Ave.	Peak	Ave.			
--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--

Test equipment used: ETSTW-RE 004, ETSTW-RE 030, ETSTW-RE 111, ETSTW-RE 088, ETSTW-RE 018

Explanation: See attached diagrams in appendix.



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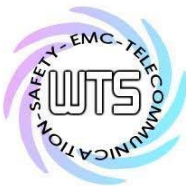
**3.6 Automatic Discontinuation of transmission, FCC 15.407 (c)**

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure.  
This function will be declared by manufacturer.

**3.7 Reserved, FCC 15.407 (d)**

**3.8 Indoor Operation Restriction, FCC 15.407 (e)**

Within the 5.15–5.25 GHz band, U- NII devices will be restricted to indoor operations to reduce any potential for harmful interference to co-channel MSS operations. This equipment has to be declared by manufacturer of the final product as content of the user manual.



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**3.9 Equivalent isotropic radiated power, FCC 15.407 (f)**

FCC Rule: 15.407(b)(3)

For systems using digital modulation in the 5.150 GHz-5.250 GHz and 5.725 GHz-5.850GHz bands: 1 Watt.

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Test equipment used: ETSTW-RE 055

**3.10 RF Exposure Compliance Requirements**

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.25 m normally can be maintained between the user and the device.

FCC OET Bulletin 65 Edition 97.01 determines the equations for predicting RF fields and applicable limits.

The prediction for power density in the far-field but will over-predict power density in the near field, where it could be used for walking a “worst case” or conservative prediction.

$$S = \frac{PG}{4\pi R^2}$$

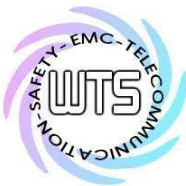
- S – Power Density
- P – Output power ERP
- R – Distance
- D – Cable Loss
- AG – Antenna Gain

**Band 1**

Item	Unit	Value	Remarks
P	mW	314.0509	Peak value
D	dB	--	--
AG	dBi	6.83	--
G	--	4.8195	Calculated Value
R	cm	20	Assumed value
S	mW/cm2	0.3011	Calculated value

**Band 4**

Item	Unit	Value	Remarks
P	mW	253.513	Peak value
D	dB	--	--
AG	dBi	6.83	--
G	--	4.8195	Calculated Value
R	cm	20	Assumed value
S	mW/cm2	0.2431	Calculated value



Registration number: W6M21501-14799-C-54  
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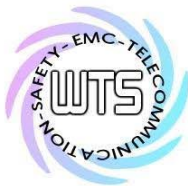
Limits:

<b>Limit for General Population / Uncontrolled Exposure</b>	
<b>Frequency (MHz)</b>	<b>Power Density (mW/cm<sup>2</sup>)</b>
1500 – 100.000	1.0

### **3.11 Transmit Power Control (TPC)**

Transmit power control (TPC). U-NII devices operating in the 5.25-5.35 GHz band and the 5.47-5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

Explanation: The EUT operates 5150 MHz – 5250 MHz and 5725 MHz-5850 MHz , so this test item is not required.



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**3.12 Radiated Emissions from Receiver Part**

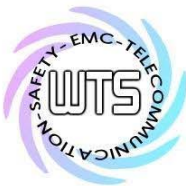
FCC Rule: 15.109

Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency of Emission (MHz)	Field Strength (microvolts/meter)	Field Strength (dBmicrovolts/meter)
30 – 88	100	40.0
88 – 216	150	43.5
216 – 960	200	46.0
Above 960	500	54.0

Test equipment used: ETSTW-RE 004, ETSTW-RE 030, ETSTW-RE 111, ETSTW-RE 088, ETSTW-RE 018

Explanation: The test results are listed in the separated test report no.: W6M21501-14799-P-15B.

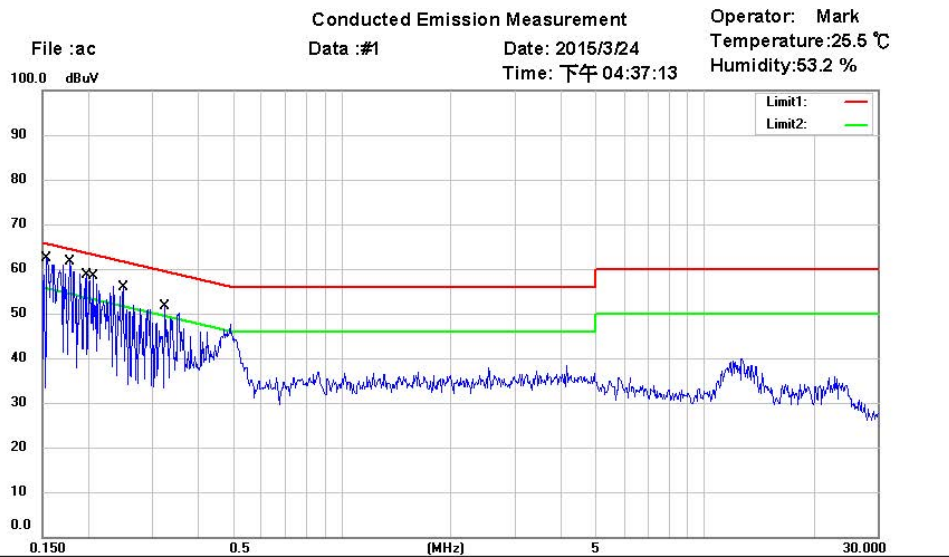


Registration number: W6M21501-14799-C-54  
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### 3.13 Power Line Conducted Emission

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the table bellows with this provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals.

This measurement was transact first with instrumentation using an average and peak detector and a 10 kHz bandwidth. If the peak detector achieves a calculated level, the measurement is repeated by an instrumentation using a quasi-peak detector.



Site : Chamber\_03  
 Condition : FCC Part 15 Class B Conduction (QP)      Phase: N  
 EUT : W6M21501-14799      Power : 120 V.a.c.  
 MN:  
 Test Mode :  
 Note :

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Comment
*	0.1540	39.30	QP	9.76	49.06	65.78	-16.72	
	0.1540	17.31	AVG	9.76	27.07	55.78	-28.71	
	0.1782	36.46	QP	9.76	46.22	64.57	-18.35	
	0.1782	15.79	AVG	9.76	25.55	54.57	-29.02	
	0.1983	34.34	QP	9.76	44.10	63.68	-19.58	
	0.1983	14.95	AVG	9.76	24.71	53.68	-28.97	
	0.2058	34.48	QP	9.76	44.24	63.37	-19.13	
	0.2058	14.68	AVG	9.76	24.44	53.37	-28.93	
	0.2484	29.57	QP	9.76	39.33	61.81	-22.48	
	0.2484	12.56	AVG	9.76	22.32	51.81	-29.49	
	0.3248	24.40	QP	9.76	34.16	59.58	-25.42	
	0.3248	11.07	AVG	9.76	20.83	49.58	-28.75	