

**FCC PART 15 SUBPART E TEST REPORT**  
**for**  
**IEEE 802.11a/b/g/n/ac Wireless LAN 2T2R and**  
**Bluetooth 4.2 Combo Module (M.2 1216)**  
**Model No.: AW-CM308NF**  
**FCC ID: TLZ-CM308NF**

of

Applicant: **AzureWave Technologies, Inc.**  
Address: **8F ., No.94, Baozhong Rd., Xindian District, New Taipei City,**  
**Taiwan 231**

Tested and Prepared

by

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

**FCC Registration No.: 930600**

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

**A2LA Accredited No.: 2732.01**



**Report No.: W6M21706-17141-C-54**

6F, NO. 58, LANE 188, RUEY-KUANG RD., NEIHU TAIPEI 114, TAIWAN, R.O.C.  
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Registration number: W6M21706-17141-C-54  
FCC ID: TLZ-CM308NF

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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.

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#### 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:

July 24, 2017

Robert Ren

Date

WTS-Lab.

Name

Signature

#### Technical responsibility for area of testing:

July 24, 2017

Kevin Wang

Date

WTS

Name

Signature



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

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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: AzureWave Technologies, Inc.

Street: 8F ., No.94, Baozhong Rd., Xindian District,

Town: New Taipei City,

Country: Taiwan 231

Telephone: +886-2-55995599

Fax: +886-2-66289666

## **1.4 Application details**

Date of receipt of test item: June 29, 2017

Date of test: from June 30, 2017 to July 21, 2017



Registration number: W6M21706-17141-C-54  
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**1.5 General information of Test item**

Type of test item: IEEE 802.11a/b/g/n/ac Wireless LAN 2T2R and Bluetooth 4.2 Combo Module (M.2 1216)  
Model Number: AW-CM308NF  
Brand Name: AzureWave  
Multi-listing model number: AW-CM308HA  
Photos: see Appendix

**Technical data**

Frequency band: Band 1: 5.150 GHz-5.250 GHz, Band 2: 5.250 GHz-5.350 GHz  
Band 3: 5.470 GHz-5.725 GHz, Band 4: 5.725 GHz-5.850 GHz

**Band 1**

802.11a: Low Channel (CH36): 5180 MHz  
Middle Channel (CH40): 5200 MHz  
High Channel (CH48): 5240 MHz

802.11n 20MHz: Low Channel (CH36): 5180 MHz  
Middle Channel (CH40): 5200 MHz  
High Channel (CH48): 5240 MHz

802.11n 40MHz: Low Channel (CH38): 5190 MHz  
High Channel (CH46): 5230 MHz

802.11ac 80MHz: CH42: 5210 MHz

**Band 2**

802.11a: Low Channel (CH52): 5260 MHz  
Middle Channel (CH56): 5280 MHz  
High Channel (CH64): 5320 MHz

802.11n 20MHz: Low Channel (CH52): 5260 MHz  
Middle Channel (CH56): 5280 MHz  
High Channel (CH64): 5320 MHz

802.11n 40MHz: Low Channel (CH54): 5270 MHz  
High Channel (CH62): 5310 MHz

802.11ac 80MHz: CH58: 5290 MHz



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**Band 3**

802.11a: Low Channel (CH100): 5500MHz  
Middle Channel (CH116): 5580 MHz  
High Channel (CH140): 5700 MHz

802.11n 20MHz: Low Channel (CH100): 5500 MHz  
Middle Channel (CH116): 5580 MHz  
High Channel (CH140): 5700 MHz

802.11n 40MHz: Low Channel (CH102): 5510 MHz  
Middle Channel (CH110): 5550 MHz  
High Channel (CH134): 5670 MHz

802.11ac 80MHz Low Channel (CH106): 5530 MHz  
High Channel (CH122): 5610 MHz

**Band 4**

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 80MHz CH155: 5775 MHz



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**Band 1**

Numbers of channel: 802.11a: 4 channels  
802.11n 20 MHz: 4 channels  
802.11n 40 MHz: 2 channels  
802.11ac 80 MHz: 1 channel

**Band 2**

Numbers of channel: 802.11a: 4 channels  
802.11n 20 MHz: 4 channels  
802.11n 40 MHz: 2 channels  
802.11ac 80 MHz: 1 channel

**Band 3**

Numbers of channel: 802.11a: 11 channels  
802.11n 20 MHz: 11 channels  
802.11n 40 MHz: 5 channels  
802.11ac 80 MHz: 2 channel

**Band 4**

Numbers of channel: 802.11a: 5 channels  
802.11n20 MHz: 5 channels  
802.11n 40 MHz: 2 channels  
802.11ac 80 MHz: 1 channel

Operating modes: Duplex

Type of modulation: OFDM

Fixed point to point operation: Yes / No

Antenna: METAL STAMPING ANTENNA

Antenna gain: 5.16 dBi (Antenna A & B & Band 1~ Band 4)

Directional gain: 8.17 dBi

Power supply: 3.3 Vd.c.

**Band 1**

Emission designator: 802.11a: 17M3D1D  
802.11n 20 MHz: 18M6D1D  
802.11n 40 MHz: 36M7D1D  
802.11ac 80 MHz: 75M6D1D

**Band 2**

Emission designator: 802.11a:20M9D1D  
802.11n 20 MHz: 19M0D1D  
802.11n 40 MHz: 36M5D1D  
802.11ac 80 MHz: 76M0D1D



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### Band 3

Emission designator:                   802.11a: 17M3D1D  
   802.11n 20 MHz: 18M7D1D  
   802.11n 40 MHz: 36M9D1D  
   802.11ac 80 MHz: 76M0D1D

### Band 4

Emission designator:                   802.11a: 16M5D1D  
   802.11n 20 MHz: 17M7D1D  
   802.11n 40 MHz: 36M4D1D  
   802.11ac 80 MHz: 76M0D1D

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

Classification:

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

Note: This device was functioned as a Master Slave device during the DFS

Manufacturer: (if applicable)

Name:                                        AzureWave Technologies (Shanghai) Inc./China  
 Street:                                       ./.  
 Town:                                        ./.  
 Country:                                    ./.

		ANT A	ANT B
5.15 GHz~5.25 GHz	IEEE 802.11 a	Mode A	Mode A
	IEEE 802.11 n(20M)	Mode B	Mode B
	IEEE 802.11 n(40M)	Mode C	Mode C
	IEEE 802.11 ac(80M)	Mode D	Mode D
	5.25 GHz~5.35 GHz	IEEE 802.11 a	Mode E
IEEE 802.11 n(20M)		Mode F	Mode F
IEEE 802.11 n(40M)		Mode G	Mode G
IEEE 802.11 ac(80M)		Mode H	Mode H
5.47 GHz~5.725GHz	IEEE 802.11 a	Mode I	Mode I
	IEEE 802.11 n(20M)	Mode J	Mode J
	IEEE 802.11 n(40M)	Mode K	Mode K
	IEEE 802.11 ac(80M)	Mode L	Mode L
5.725 GHz~5.85GHz	IEEE 802.11 a	Mode M	Mode M
	IEEE 802.11 n(20M)	Mode N	Mode N
	IEEE 802.11 n(40M)	Mode O	Mode O
	IEEE 802.11 ac(80M)	Mode P	Mode P





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<b><u>Transmitter</u></b>	<b><u>Unom</u></b>
<b>Antenna A</b>	
<b>Band 1</b>	
<b>Mode A (OFDM)</b>	
Power ( ch 36 or A):	Conducted: 14.52 dBm
Power ( ch 40 or B):	Conducted: 14.74 dBm
Power ( ch 48 or C):	Conducted: 14.31 dBm
<b>Mode B (OFDM)</b>	
Power ( ch 36 or A):	Conducted: 14.83 dBm
Power ( ch 40 or B):	Conducted: 14.86 dBm
Power ( ch 48 or C):	Conducted: 14.36 dBm
<b>Mode C (OFDM)</b>	
Power ( ch 38 or A):	Conducted: 10.37 dBm
Power ( ch 46 or B):	Conducted: 11.47 dBm
<b>Mode D (OFDM)</b>	
Power ( ch 42 or A):	Conducted: 10.18 dBm
<b>Band 2</b>	
<b>Mode E (OFDM)</b>	
Power ( ch 52 or A):	Conducted: 16.59 dBm
Power ( ch 56 or B):	Conducted: 16.55 dBm
Power ( ch 64 or C):	Conducted: 16.09 dBm
<b>Mode F (OFDM)</b>	
Power ( ch 52 or A):	Conducted: 16.04 dBm
Power ( ch 56 or B):	Conducted: 15.64 dBm
Power ( ch 64 or C):	Conducted: 15.63 dBm
<b>Mode G (OFDM)</b>	
Power ( ch 54 or A):	Conducted: 11.58 dBm
Power ( ch 62 or B):	Conducted: 11.06 dBm
<b>Mode H (OFDM)</b>	
Power ( ch 58 or A):	Conducted: 10.39 dBm
<b>Band 3</b>	
<b>Mode I (OFDM)</b>	
Power ( ch 100 or A):	Conducted: 16.61 dBm
Power ( ch 120 or B):	Conducted: 15.08 dBm
Power ( ch 140 or C):	Conducted: 12.21 dBm
<b>Mode J (OFDM)</b>	
Power ( ch 100 or A):	Conducted: 16.81 dBm
Power ( ch 120 or B):	Conducted: 15.42 dBm
Power ( ch 140 or C):	Conducted: 11.49 dBm
<b>Mode K (OFDM)</b>	
Power ( ch 102 or A):	Conducted: 13.54 dBm
Power ( ch 118 or B):	Conducted: 14.20 dBm
Power ( ch 134 or C):	Conducted: 13.46 dBm
<b>Mode L (OFDM)</b>	
Power ( ch 106 or A):	Conducted: 11.21 dBm
Power ( ch 122 or B):	Conducted: 11.15 dBm



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**Band 4**

**Mode M (OFDM)**

Power ( ch 149 or A): Conducted: 15.33 dBm  
Power ( ch 157 or B): Conducted: 15.48 dBm  
Power ( ch 165 or C): Conducted: 16.10 dBm

**Mode N (OFDM)**

Power ( ch 149 or A): Conducted: 15.48 dBm  
Power ( ch 157 or B): Conducted: 15.52 dBm  
Power ( ch 165 or C): Conducted: 16.07 dBm

**Mode O (OFDM)**

Power ( ch 151 or A): Conducted: 15.33 dBm  
Power ( ch 159 or B): Conducted: 16.24 dBm

**Mode P (OFDM)**

Power ( ch 155 or A): Conducted: 16.20 dBm

**Antenna B**

**Band 1**

**Mode A (OFDM)**

Power ( ch 36 or A): Conducted: 14.03 dBm  
Power ( ch 40 or B): Conducted: 14.22 dBm  
Power ( ch 48 or C): Conducted: 14.84 dBm

**Mode B (OFDM)**

Power ( ch 36 or A): Conducted: 15.09 dBm  
Power ( ch 40 or B): Conducted: 14.96 dBm  
Power ( ch 48 or C): Conducted: 15.46 dBm

**Mode C (OFDM)**

Power ( ch 38 or A): Conducted: 10.50 dBm  
Power ( ch 46 or B): Conducted: 12.43 dBm

**Mode D (OFDM)**

Power ( ch 42 or A): Conducted: 10.70 dBm

**Band 2**

**Mode E (OFDM)**

Power ( ch 52 or A): Conducted: 17.32 dBm  
Power ( ch 56 or B): Conducted: 17.11 dBm  
Power ( ch 64 or C): Conducted: 17.18 dBm

**Mode F (OFDM)**

Power ( ch 52 or A): Conducted: 16.37 dBm  
Power ( ch 56 or B): Conducted: 15.97 dBm  
Power ( ch 64 or C): Conducted: 16.37 dBm

**Mode G (OFDM)**

Power ( ch 54 or A): Conducted: 11.92 dBm  
Power ( ch 62 or B): Conducted: 11.74 dBm

**Mode H (OFDM)**

Power ( ch 58 or A): Conducted: 10.86 dBm



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## Band 3

### Mode I (OFDM)

Power ( ch 100 or A): Conducted: 15.17 dBm  
 Power ( ch 120 or B): Conducted: 15.68 dBm  
 Power ( ch 140 or C): Conducted: 15.02 dBm

### Mode J (OFDM)

Power ( ch 100 or A): Conducted: 17.91 dBm  
 Power ( ch 120 or B): Conducted: 16.34 dBm  
 Power ( ch 140 or C): Conducted: 12.07 dBm

### Mode K (OFDM)

Power ( ch 102 or A): Conducted: 14.65 dBm  
 Power ( ch 118 or B): Conducted: 14.81 dBm  
 Power ( ch 134 or C): Conducted: 13.70 dBm

### Mode L (OFDM)

Power ( ch 106 or A): Conducted: 12.02 dBm  
 Power ( ch 122 or B): Conducted: 11.33 dBm

## Band 4

### Mode M (OFDM)

Power ( ch 149 or A): Conducted: 16.41 dBm  
 Power ( ch 157 or B): Conducted: 16.47 dBm  
 Power ( ch 165 or C): Conducted: 17.27 dBm

### Mode N (OFDM)

Power ( ch 149 or A): Conducted: 16.40 dBm  
 Power ( ch 157 or B): Conducted: 16.50 dBm  
 Power ( ch 165 or C): Conducted: 17.26 dBm

### Mode O (OFDM)

Power ( ch 151 or A): Conducted: 16.71 dBm  
 Power ( ch 159 or B): Conducted: 17.22 dBm

### Mode P (OFDM)

Power ( ch 155 or A): Conducted: 17.21 dBm

## Band 1 (5.15GHz~5.25GHz)

Combine	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	62.69	61.95	62.45	17.97	17.92	17.96
802.11n 40MHz	22.11	--	31.53	13.45	--	14.99
802.11ac	22.17	--	--	13.46	--	--

## Band 2 (5.25GHz~5.35GHz)

Combine	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	83.53	76.18	79.91	19.22	18.82	19.03
802.11n 40MHz	29.95	--	27.69	14.76	--	14.42
802.11ac	23.13	--	--	13.64	--	--



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

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## Band 3 (5.47GHz~5.725GHz)

Combine	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	109.77	77.88	30.2	20.4	18.91	14.8
802.11n 40MHz	51.76	56.57	45.62	17.14	--	16.59
802.11ac	29.13	--	26.61	14.64	--	14.25

## Band 4 (5.725GHz~5.85GHz)

Combine	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	78.97	80.32	93.67	18.97	19.05	19.72
802.11n 40MHz	81	--	94.79	19.08	--	19.77
802.11ac	94.29	--	--	19.74	--	--

## 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.

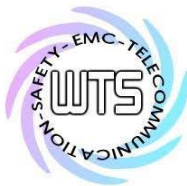
or

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: 3.3Vd.c.

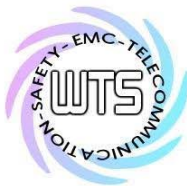
Test item Name	Uncertainty
Estimation Result of Uncertainty of Conducted Emission	Expanded Uncertainty : 0.74 dB
Estimation Result of Uncertainty of Radiated Emission(3M)	Expanded Uncertainty : 0.009-30 MHz : 2.17 dB 30-1000 MHz : 3.30 dB 1-18 GHz : 2.28 dB 18-40 GHz : 2.19 dB
Estimation Result of Uncertainty of Bandwidth Measurement 20 dB Bandwidth, Occupied bandwidth, Channel bandwidth, Necessary Bandwidth	Expanded Uncertainty : 0.45 kHz
Estimation Result of Uncertainty of Conducted Output Power Measurement Output power	Expanded Uncertainty : 1.01 dB
Estimation Result of Uncertainty of Power Density Measurement Power density	Expanded Uncertainty : 1.09 dB
Estimation Result of Uncertainty of Band Edge Measurement	Expanded Uncertainty : 0.98 dBc
Estimation Result of Uncertainty of Conducted Spurious Emission Measurement Conducted spurious emission	Expanded Uncertainty : 1.01 dB
Estimation Result of Uncertainty of EIRP Measurement EIRP 、 ERP 、 Output power(dBm) 、 Radiated spurious emission(dBm), Receiver spurious radiations (≥30 MHz)	Expanded Uncertainty : 30-200MHz : 2.11 dB 200-1000MHz : 2.09 dB 1-18GHz : 3.09 dB 18-40GHz : 2.71 dB



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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	2017/5/26	2018/5/25
ETSTW-CE 003	AC POWER SOURCE	APS-9102	D161137	GW	Function Test	
ETSTW-CE 008	HF-EICHLITUNG 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	2017/7/12	2018/7/11
ETSTW-CE 016	TWO-LINE V-NETWORK	ENV216	100050	R&S	2016/9/12	2017/9/11
ETSTW-CE 028	MXE EMI Receiver	N9038A	MY53220110	Agilent	2016/8/26	2017/8/25
ETSTW-RE 003	EMI TEST RECEIVER	ESI 26	831438/001	R&S	2017/5/26	2018/5/25
ETSTW-RE 004	EMI TEST RECEIVER	ESI 40	832427/004	R&S	2017/5/17	2018/5/16
ETSTW-RE 005	EMI TEST RECEIVER	ESVS10	843207/020	R&S	2017/7/3	2018/7/2
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	2017/7/4	2018/7/3
ETSTW-RE 027	Passive Loop Antenna	6512	00034563	ETS-Lindgren	2017/7/3	2018/7/2
ETSTW-RE 030	Double-Ridged Guide Horn Antenna	3117	00035224	ETS-Lindgren	2017/3/22	2018/3/21
ETSTW-RE 042	Biconical Antenna	HK116	100172	R&S	2017/2/7	2018/2/6
ETSTW-RE 043	Log-Periodic Dipole Antenna	HL223	100166	R&S	2017/4/10	2018/4/9
ETSTW-RE 044	Log-Periodic Antenna	HL050	100094	R&S	2017/4/27	2018/4/26
ETSTW-RE 045	ESA-E SERIES SPECTRUM ANALYZER	E4404B	MY45111242	Agilent	Pre-test Use	
ETSTW-RE 050	Attenuator 10dB	50HF-010-1	None	JFW	2017/3/1	2018/2/28
ETSTW-RE 051	Attenuator 6dB	50HF-006-1	None	JFW	2017/3/1	2018/2/28
ETSTW-RE 053	Attenuator 3dB	50HF-003-1	None	JFW	2017/3/1	2018/2/28
ETSTW-RE 055	SPECTRUM ANALYZER	FSU 26	200074	R&S	2017/3/1	2018/2/28
ETSTW-RE 060	Attenuator 30dB	5015-30	F651012z-01	ATM	2017/3/1	2018/2/28
ETSTW-RE 062	Amplifier Module	CHC 2	None	KMIC	2017/4/12	2018/4/11
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	2016/9/8	2017/9/7
ETSTW-RE 088	SOLID STATE AMPLIFIER	KMA180265A01	99057	KMIC	2016/9/20	2017/9/19
ETSTW-RE 091	Match Pad	MDCS1500	None	WOKEN	2017/4/6	2018/4/5
ETSTW-RE 099	DC Block	50DB-007-1	None	JFW	2017/3/1	2018/2/28
ETSTW-RE 112	AC POWER SOURCE	TFC-1005	T-0A023536	T-Power	Function test	
ETSTW-RE 115	2.4GHz Notch Filter	N0124411	473874	MICROWAVE CIRCUITS	2017/1/12	2018/1/11
ETSTW-RE 120	RF Player	MP9200	MP9210-111022	ADIVIC	Function test	



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ETSTW-RE 122	SIGNAL GENERATOR	SMF100A	102149	R&S	2017/5/26	2018/5/25
ETSTW-RE 125	5GHz Notch filter	5NSL11-5200/E221.3-O/O	1	K&L Microwave	2016/8/10	2017/8/9
ETSTW-RE 126	5GHz Notch filter	5NSL12-5800/E221.3-O/O	1	K&L Microwave	2016/8/10	2017/8/9
ETSTW-RE 127	RF Switch Box	RFS-01	None	WTS	2017/3/1	2018/2/28
ETSTW-RE 128	5.3GHz Notch filter	N0153001	SN487233	Microwave Circuits	2016/8/10	2017/8/9
ETSTW-RE 129	5.5GHz Notch filter	N0555984	SN487234	Microwave Circuits	2016/8/10	2017/8/9
ETSTW-RE 130	Handheld RF Spectrum Analyzer	N9340A	CN0147000204	Agilent	Pre-test Use	
ETSTW-RE 142	Amplifier	8447D	2805A03378	Agilent	2017/4/12	2018/4/11
ETSTW-RE 143	Humidity Temperature Meter	TES-1260	110104623	TES	2016/8/19	2017/8/18
ETSTW-RE 147	Bi-log Hybrid Antenna	MCTD 2786B	BLB16M04005	ETC	2017/3/22	2018/3/21
ETSTW-EMI 011	USB Compact Modulator	SFC-U	101689	R&S	2017/5/10	2018/5/9
ETSTW-GSM 002	Universal Radio Communication Tester	CMU 200	109439	R&S	2017/2/24	2018/2/23
ETSTW-GSM 003	Radio Communication Analyzer	MT8820C	6201342073	Anritsu	2017/2/10	2018/2/9
ETSTW-GSM 004	Wideband Radio Communication Tester	CMW500	128092	R&S	2016/12/15	2017/12/14
ETSTW-GSM 019	Band Reject Filter	WRCTF824/849-822/851-40 /12+9SS	3	WI	2017/1/12	2018/1/11
ETSTW-GSM 020	Band Reject Filter	WRCD1747/1748-1743/1752-32/5SS	1	WI	2017/1/12	2018/1/11
ETSTW-GSM 021	Band Reject Filter	WRCD1879.5/1880.5-1875.5/1884.5-32/5SS	3	WI	2017/1/12	2018/1/11
ETSTW-GSM 022	Band Reject Filter	WRCT901.9/903.1-904.25-50/8SS	1	WI	2017/1/12	2018/1/11
ETSTW-GSM 023	Power Divider	4901.19.A	None	SUHNER	2016/9/14	2017/9/13
ETSTW-Cable 010	BNC Cable	RGS-142	None	THERMAX	2016/9/12	2017/9/11
ETSTW-Cable 011	SMA to N type Cable	RGU-400	None	THERMAX	Pre-test Use NCR	
ETSTW-Cable 012	BNC Cable	RGS-400	None	THERMAX	2016/9/12	2017/9/11
ETSTW-Cable 016	BNC Cable	Switch Box	B Cable 1	Schwarz beck	2017/2/23	2018/2/22
ETSTW-Cable 017	BNC Cable	X Cable	B Cable 2	Schwarz beck	2017/2/23	2018/2/22
ETSTW-Cable 018	BNC Cable	Y Cable	B Cable 3	Schwarz beck	2017/2/23	2018/2/22
ETSTW-Cable 019	BNC Cable	Z Cable	B Cable 4	Schwarz beck	2017/2/23	2018/2/22
ETSTW-Cable 020	N TYPE Cable	OATS Cable 1	N30N30-L335-15M	JYE BAO CO.,LTD.	2017/7/3	2018/7/2
ETSTW-Cable 022	N TYPE Cable	5006	0002	JYE BAO CO.,LTD.	2017/4/6	2018/4/5
ETSTW-Cable 026	Microwave Cable	SUCOFLEX 104	279075	HUBER+SUHNER	2017/3/1	2018/2/28
ETSTW-Cable 027	Microwave Cable	SUCOFLEX 104	279083	HUBER+SUHNER	2017/5/12	2018/5/11
ETSTW-Cable 028	Microwave Cable	FA147A0015M2020	30064-2	UTIFLEX	2016/9/20	2017/9/19
ETSTW-Cable 029	Microwave Cable	FA147A0015M2020	30064-3	UTIFLEX	2016/9/20	2017/9/19
ETSTW-Cable 030	Microwave Cable	SUCOFLEX 104 (S Cable 9)	279067	HUBER+SUHNER	2017/3/1	2018/2/28
ETSTW-Cable 031	Microwave Cable	SUCOFLEX 104 (S Cable 10)	238092	HUBER+SUHNER	2017/4/12	2018/4/11
ETSTW-Cable 043	Microwave Cable	SUCOFLEX 104	317576	HUBER+SUHNER	2017/4/12	2018/4/11
ETSTW-Cable 048	Microwave Cable	SUCOFLEX 104	325519	HUBER+SUHNER	2017/4/12	2018/4/11





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ETSTW-Cable 058	Microwave Cable	SUCOFLEX 104	none	HUBER+SUHNER	2017/2/20	2018/2/19
ETSTW-Cable 064	Microwave Cable	SUCOFLEX 104	MY28891	HUBER+SUHNER	2017/4/12	2018/4/11
ETSTW-Cable 066	SMA type cable	32022	None	ASTROLAB	2016/9/12	2017/9/11
ETSTW-Cable 071	N TYPE CABLE	EMCCFD400-NM- NM-25000	170239	EMCI	2017/2/20	2018/2/19
WTSTW-SW 002	EMI TEST SOFTWARE	EZ_EMG	None	Farad	Version ETS-03A1	
WTSTW-SW 006	EMI TEST SOFTWARE	e3	None	AUDIX	Version 9.161014	
WTSTW-SW 008	Signal studio	Agilent	None	AUDIX	Version 2.0.0.1	





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## **2.4 Test Procedure**

The test procedures are performed following the test stands ANSI STANDARD C63.10 and FCC 789033 D02 General UNII Test Procedures New Rules v01r04.

### ■ Minimum Emission Bandwidth for the band 5.150-5.250 GHz, 5.725-5.850 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)  $\geq 3 \times$  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 H)3)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  $\geq 3 \cdot$  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



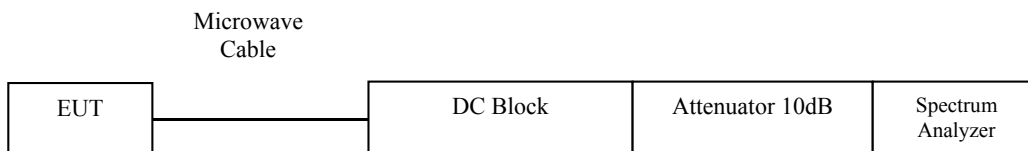
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a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (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  $10\log(500\text{kHz}/RBW)$  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  $10\log(1\text{MHz}/RBW)$  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





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**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"/>
26-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"/>
Transmit Power Control	15.407(h)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dynamic Frequency Selection (DFS)	15.407(h)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Channel Move Time, Channel Closing Transmission Time	15.407(i)	<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.



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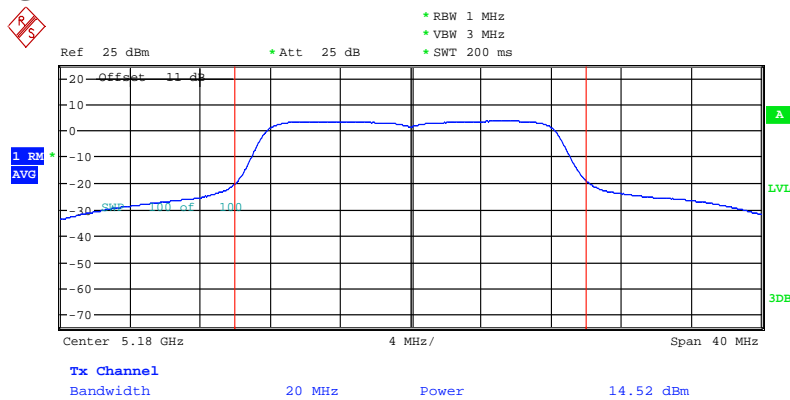
### 3.1 Peak Transmit Power, FCC 15.407 (a)

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 30 dBm (1 W) for master device and 24 dBm (250 mW) for mobile/portable client device.
2. For the band 5.25-5.35 GHz and 5.47-5.725 GHz, the maximum conducted power over the frequency of operation shall not exceed the lesser of 24 dBm (250 mW) or  $11\text{dBm} + 10 \log B$ , whichever is lower (B= 26-dB emission BW).
3. For the band 5.725-5.850 GHz, the maximum conducted power over the frequency of operation shall not exceed the lesser of 30 dBm (1 W).

### ANTA

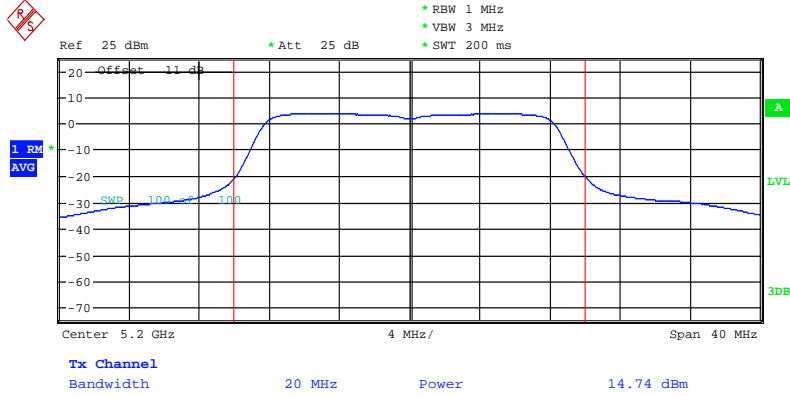
#### 5.15 GHz ~ 5.25 GHz



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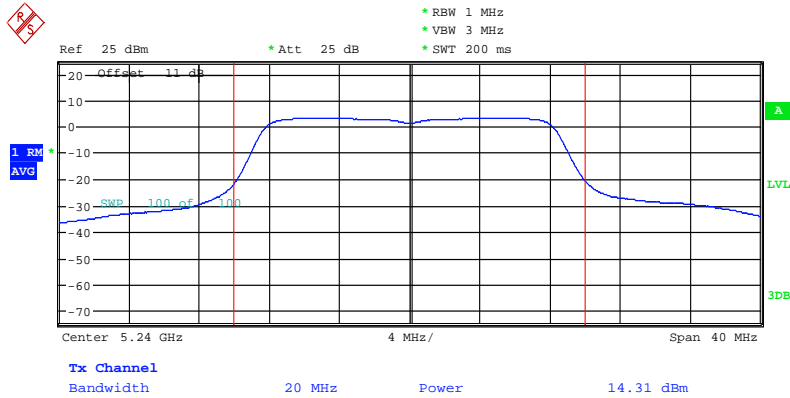


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MAXIMUM CONDUCTED POWER ANTI\_11aCH40

Date: 7.JUL.2017 13:24:00



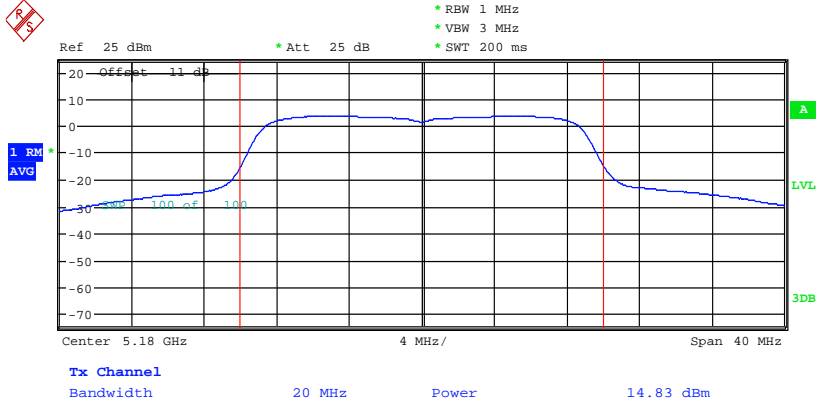
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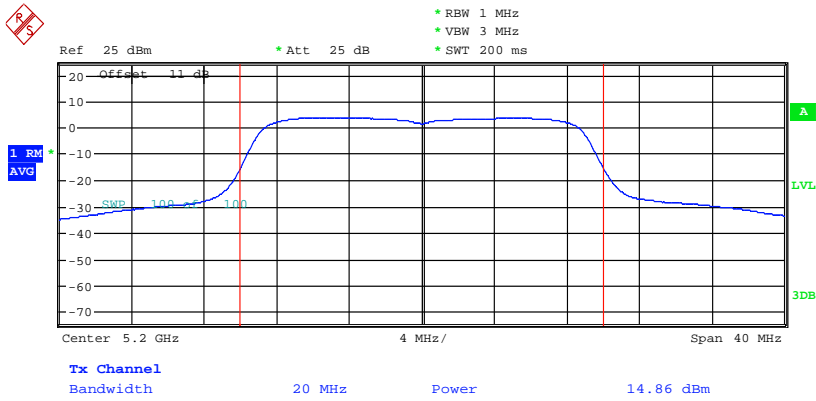
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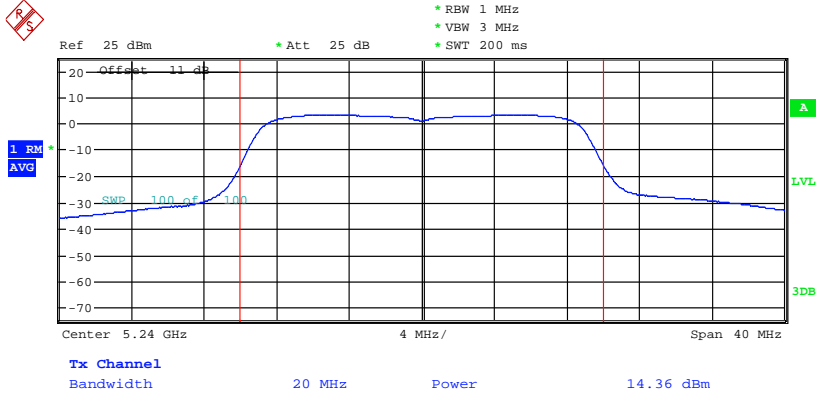


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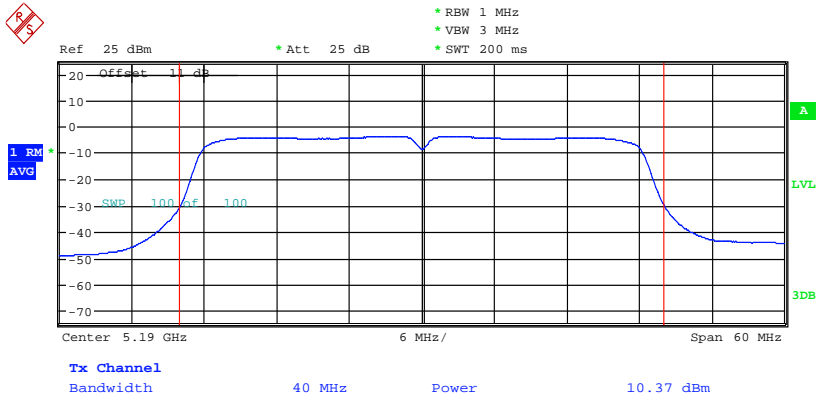
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Registration number: W6M21706-17141-C-54  
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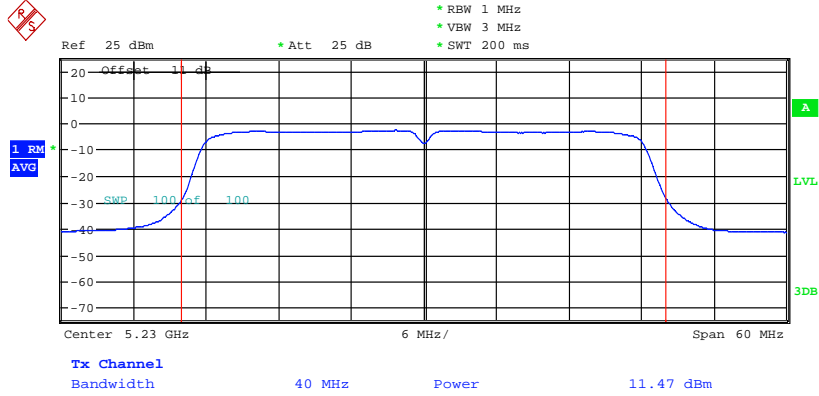


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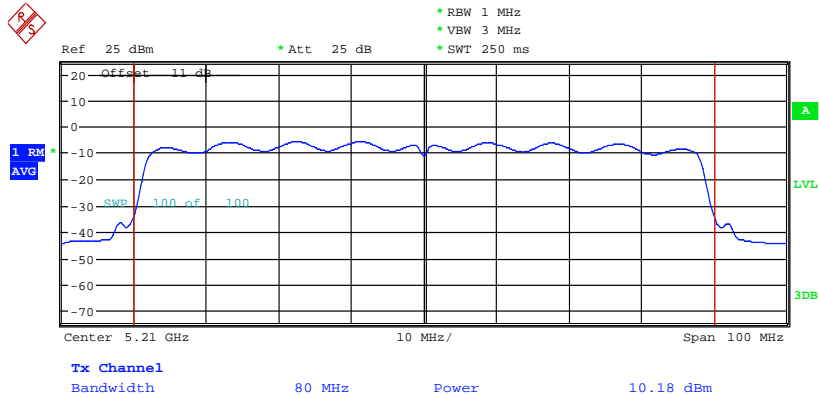


Registration number: W6M21706-17141-C-54  
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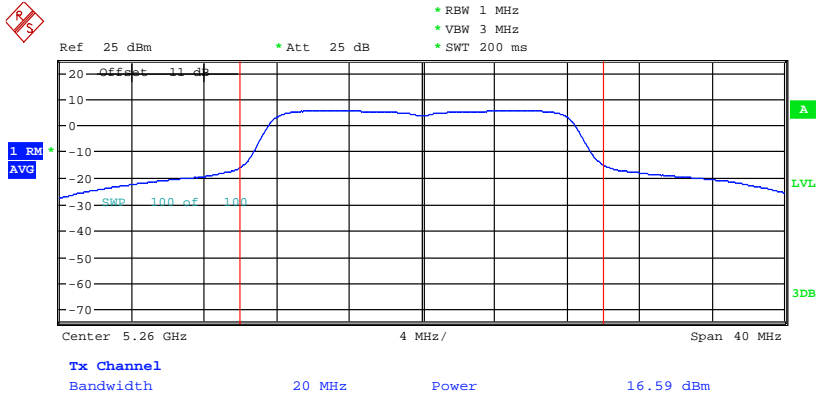
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Registration number: W6M21706-17141-C-54

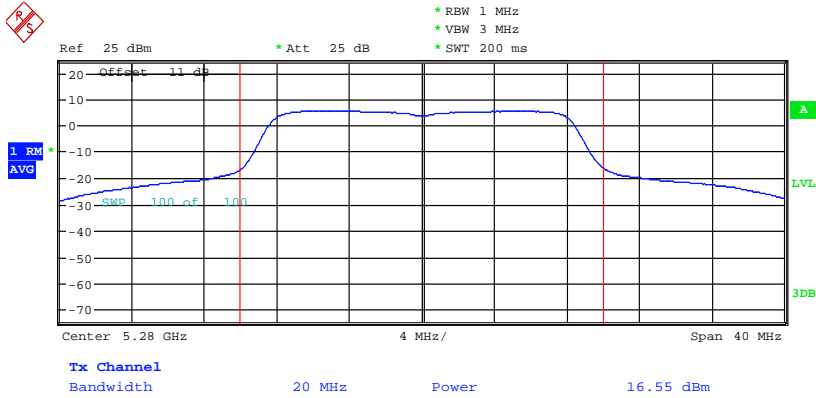
FCC ID: TLZ-CM308NF

## 5.25 GHz ~ 5.35 GHz



MAXIMUM CONDUCTED POWER ANTI\_11aCH52

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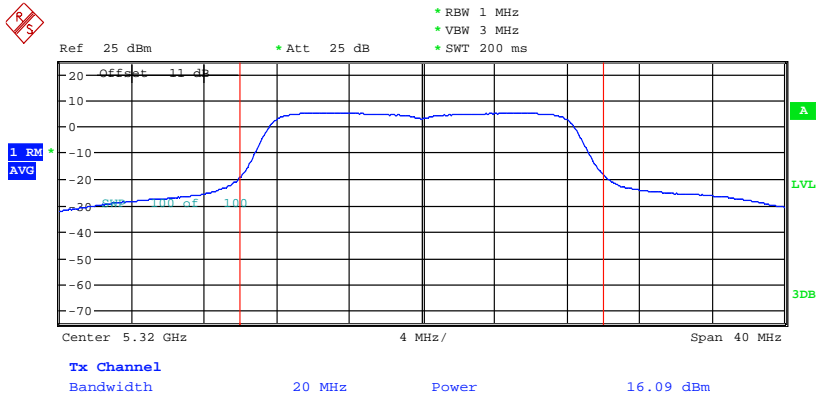


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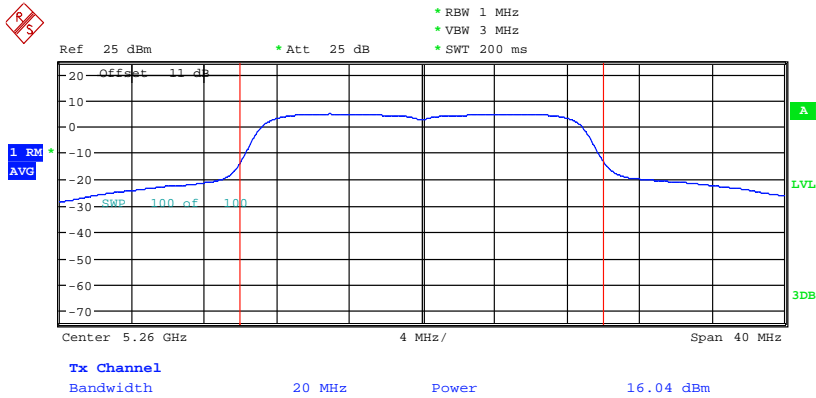


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FCC ID: TLZ-CM308NF



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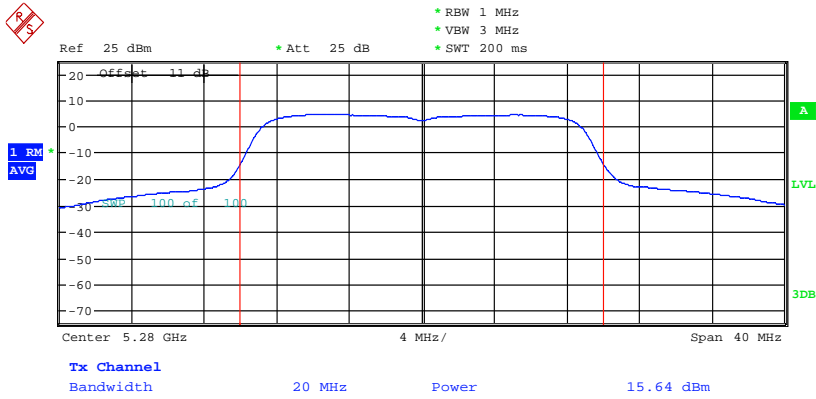


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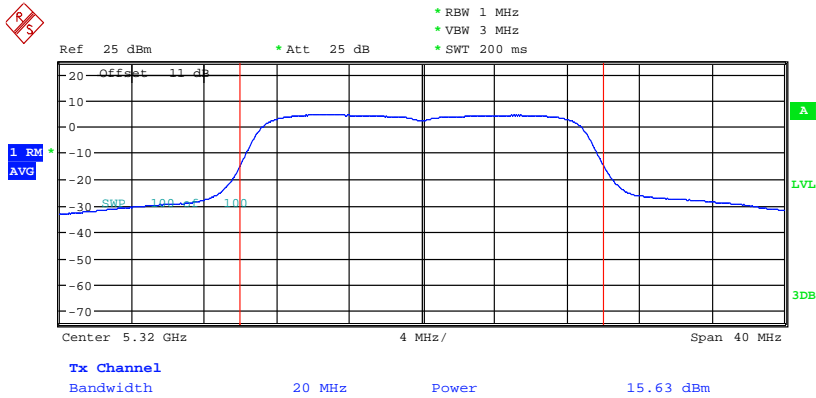
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FCC ID: TLZ-CM308NF



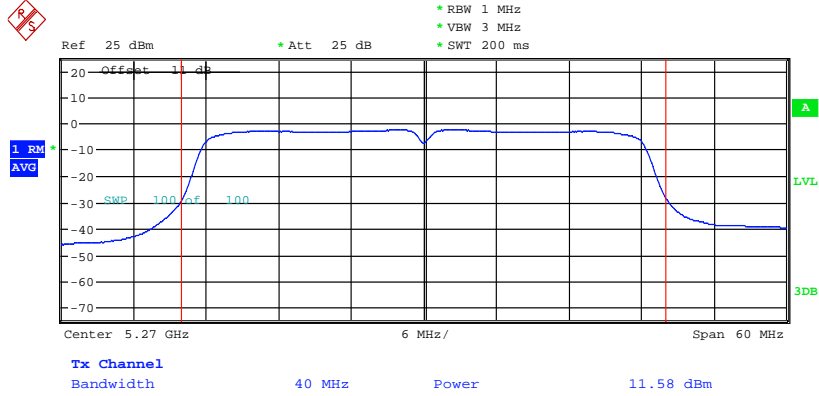
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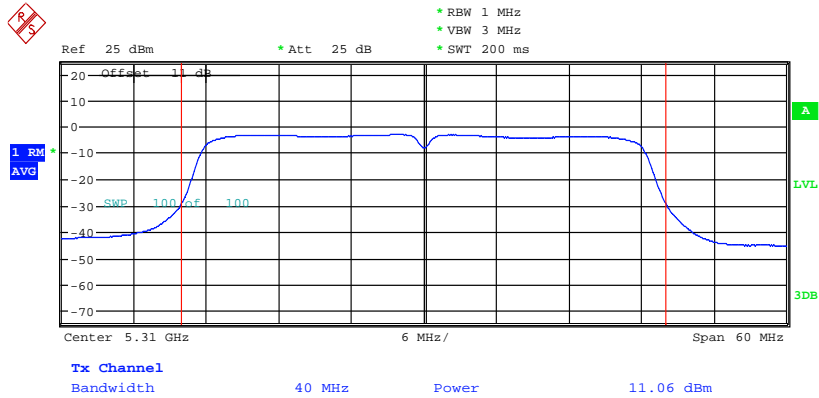


Registration number: W6M21706-17141-C-54  
FCC ID: TLZ-CM308NF



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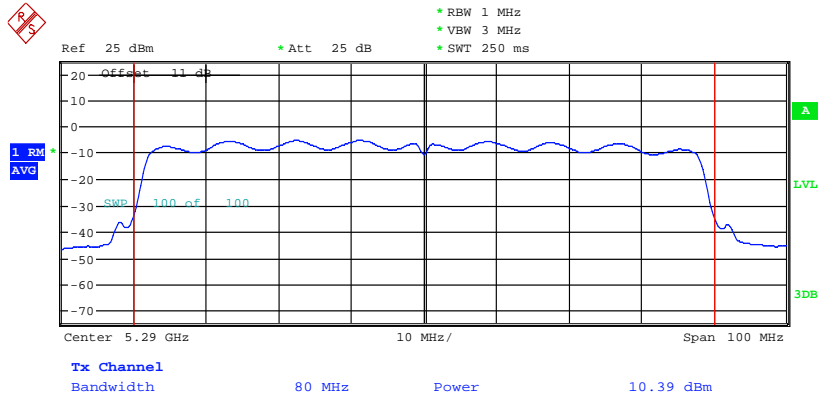


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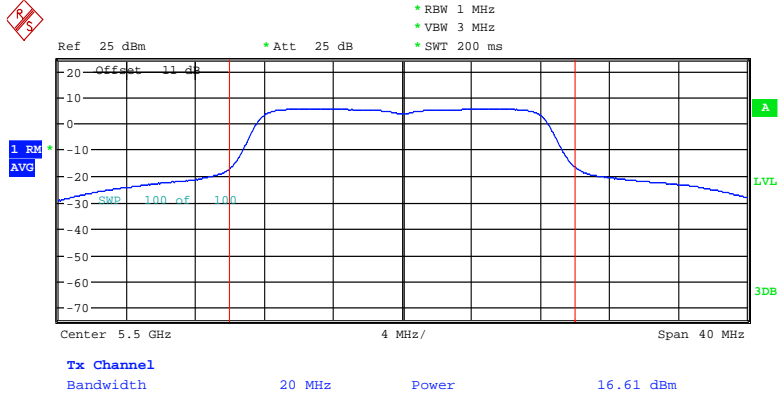


Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



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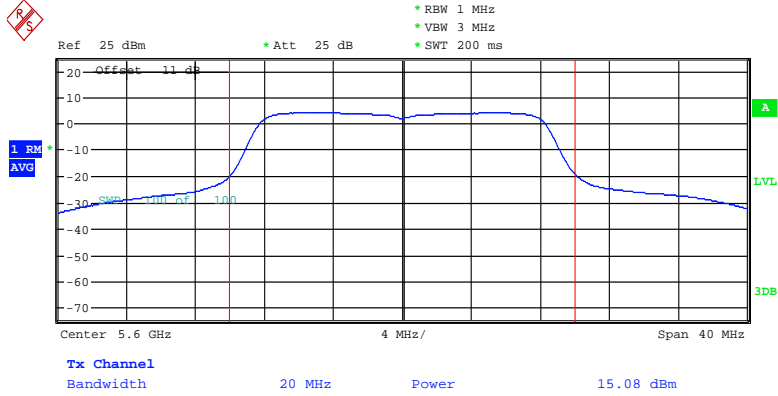
## 5.47 GHz ~ 5.725 GHz



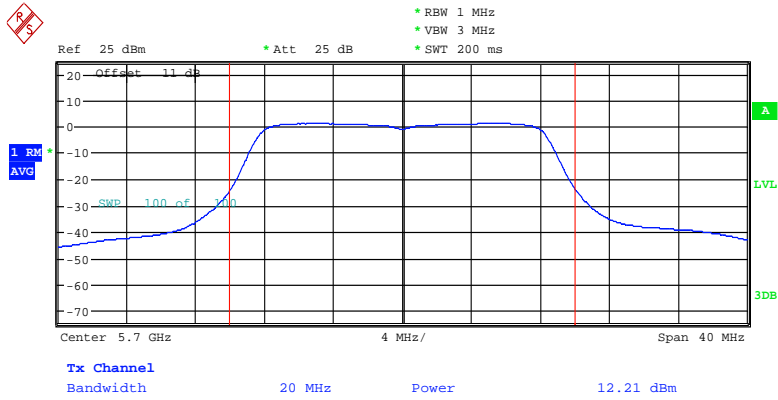
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Registration number: W6M21706-17141-C-54  
FCC ID: TLZ-CM308NF



MAXIMUM CONDUCTED POWER ANTI1\_11aCH120  
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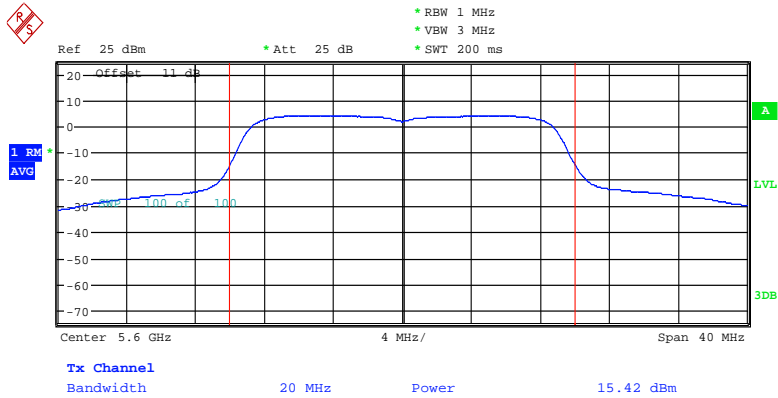


Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



MAXIMUM CONDUCTED POWER ANTI\_11n20CH100

Date: 7.JUL.2017 15:37:09



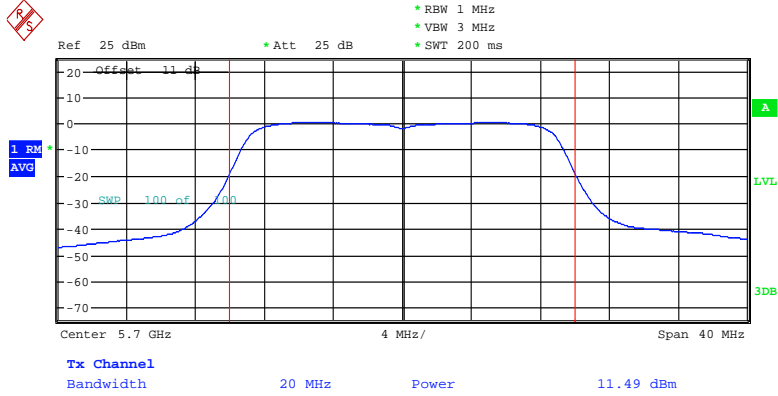
MAXIMUM CONDUCTED POWER ANTI\_11n20CH120

Date: 7.JUL.2017 15:38:59

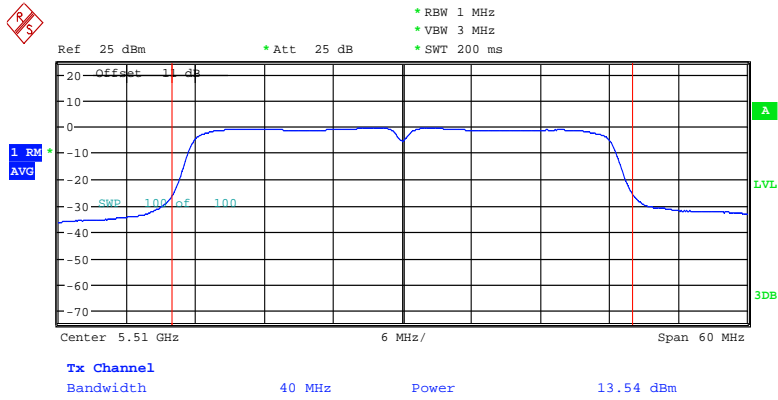




Registration number: W6M21706-17141-C-54  
FCC ID: TLZ-CM308NF



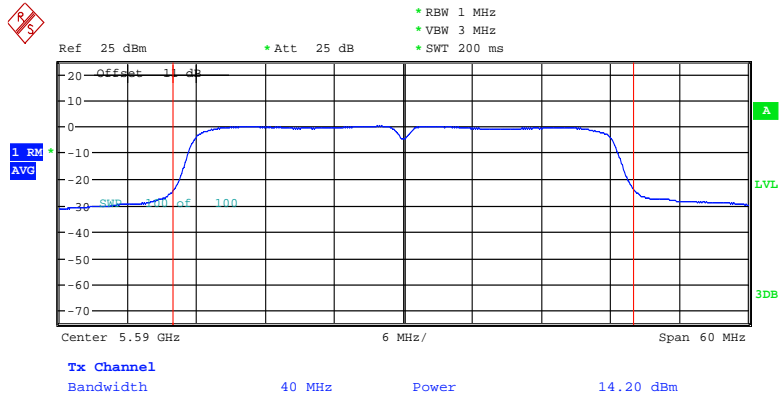
MAXIMUM CONDUCTED POWER ANTI\_11n20CH140  
Date: 7.JUL.2017 15:48:29



MAXIMUM CONDUCTED POWER ANTI\_11n40CH102  
Date: 7.JUL.2017 15:50:29

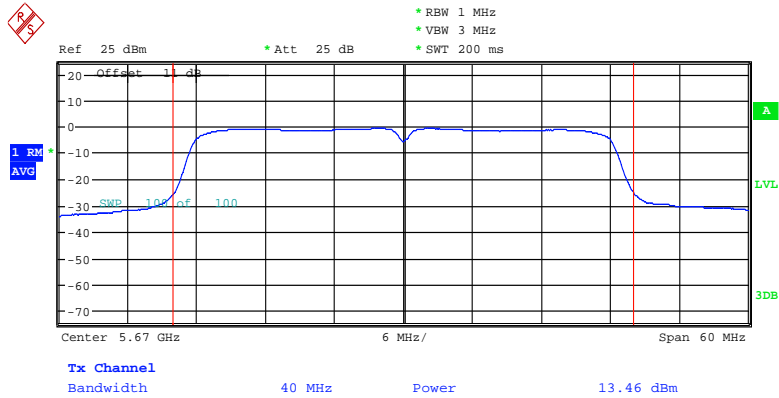


Registration number: W6M21706-17141-C-54  
FCC ID: TLZ-CM308NF



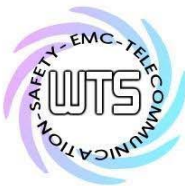
MAXIMUM CONDUCTED POWER ANTI\_11n40CH118

Date: 7.JUL.2017 15:57:39



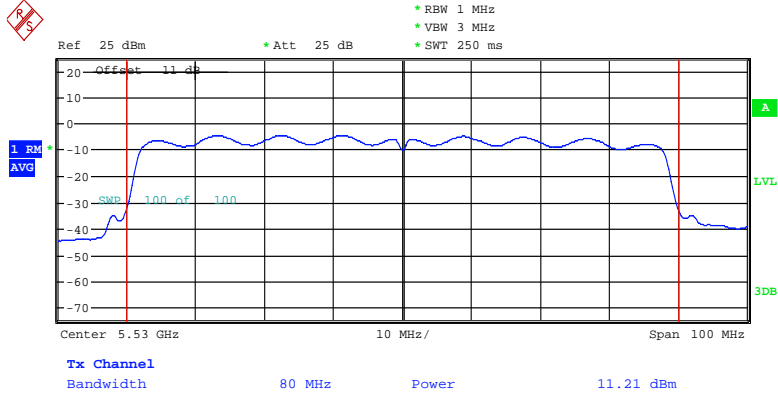
MAXIMUM CONDUCTED POWER ANTI\_11n40CH134

Date: 7.JUL.2017 15:59:49



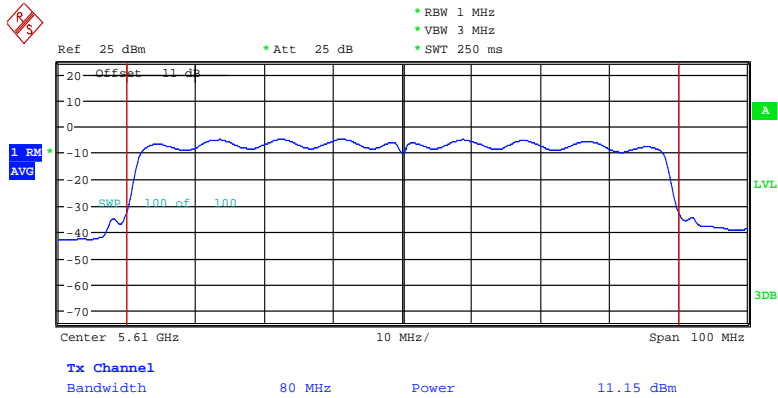
# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21706-17141-C-54  
FCC ID: TLZ-CM308NF



MAXIMUM CONDUCTED POWER ANT1\_11ac80CH106

Date: 7.JUL.2017 16:17:51



MAXIMUM CONDUCTED POWER ANT1\_11ac80CH122

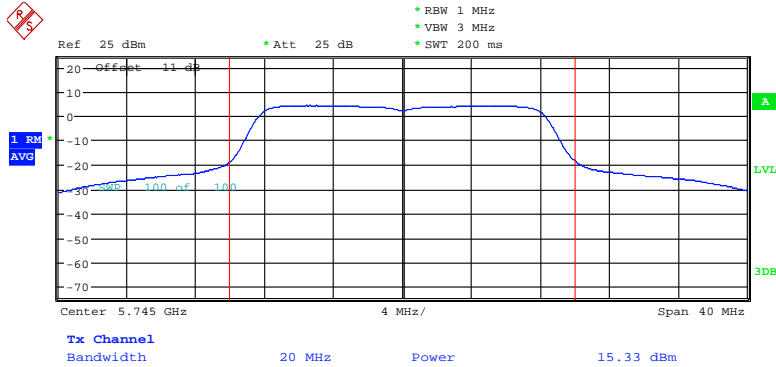
Date: 7.JUL.2017 16:20:53



Registration number: W6M21706-17141-C-54

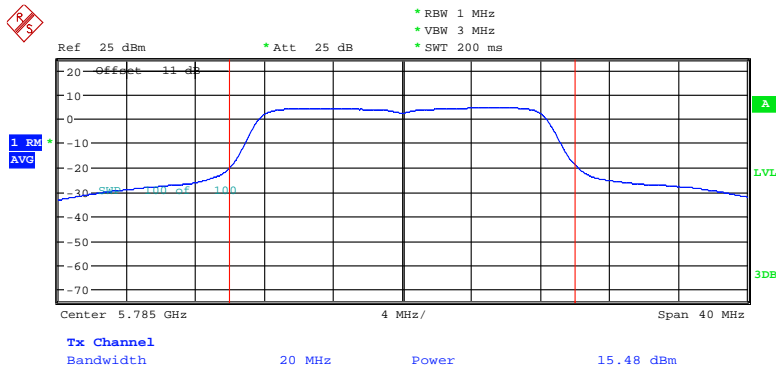
FCC ID: TLZ-CM308NF

## 5.725 GHz ~ 5.85 GHz



MAXIMUM CONDUCTED POWER ANT1\_11aCH149

Date: 7.JUL.2017 16:36:59



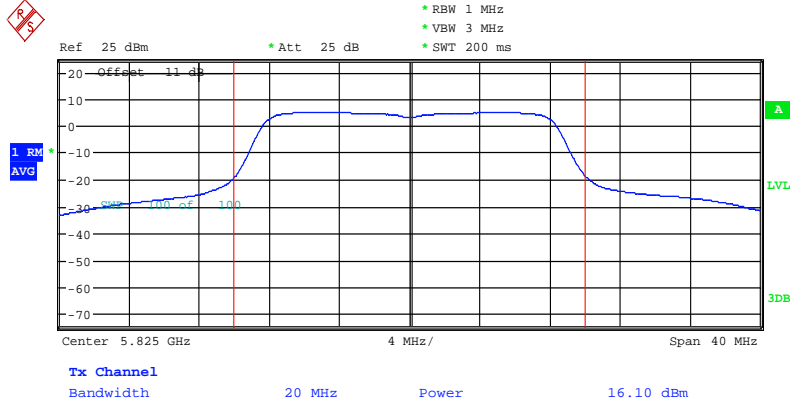
MAXIMUM CONDUCTED POWER ANT1\_11aCH157

Date: 7.JUL.2017 16:38:59

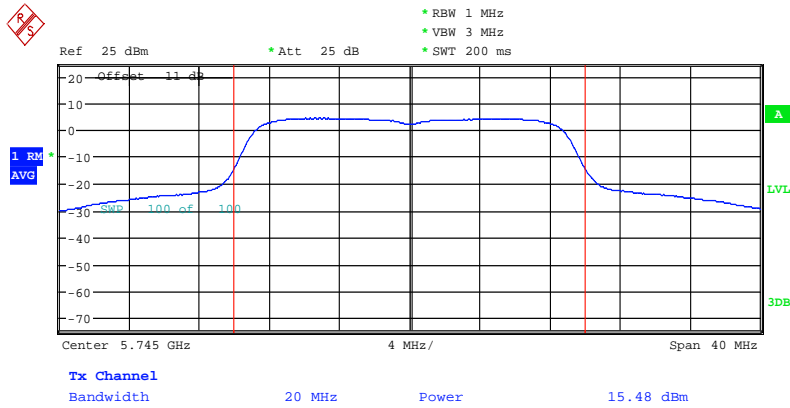


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21706-17141-C-54  
FCC ID: TLZ-CM308NF



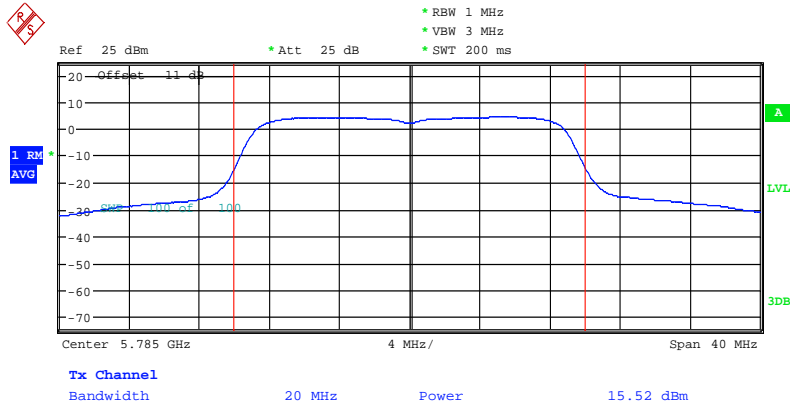
MAXIMUM CONDUCTED POWER ANTI1\_11aCH165  
Date: 7.JUL.2017 16:45:29



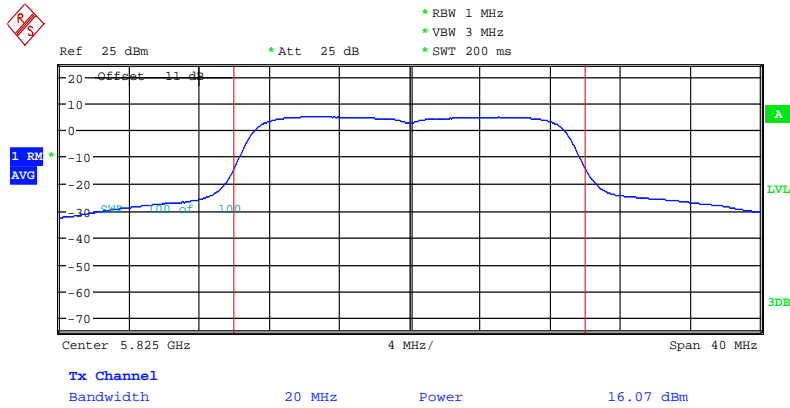
MAXIMUM CONDUCTED POWER ANTI1\_11n20CH149  
Date: 7.JUL.2017 16:47:29



Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



MAXIMUM CONDUCTED POWER ANTI\_11n20CH157  
 Date: 7.JUL.2017 16:52:39

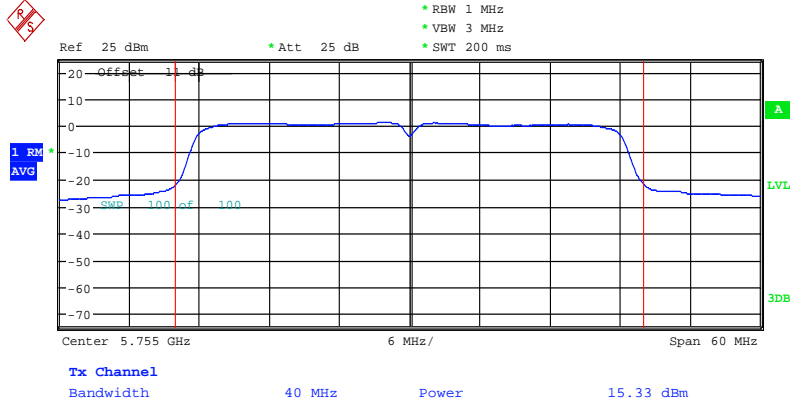


MAXIMUM CONDUCTED POWER ANTI\_11n20CH165  
 Date: 7.JUL.2017 16:54:19



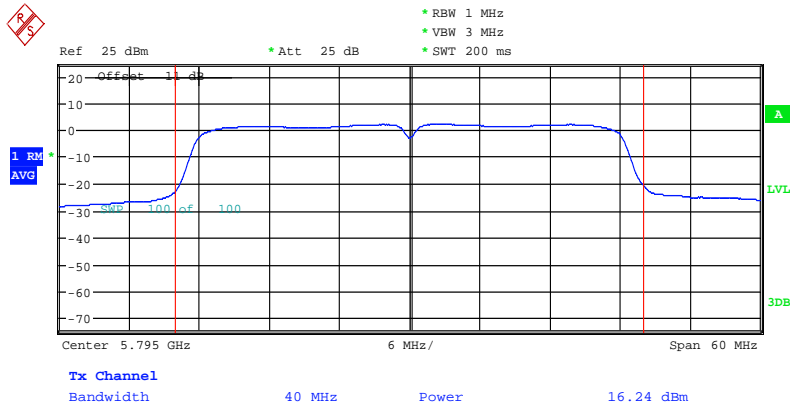
# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21706-17141-C-54  
FCC ID: TLZ-CM308NF



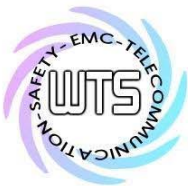
MAXIMUM CONDUCTED POWER ANTI1\_11n40CH151

Date: 7.JUL.2017 16:59:49

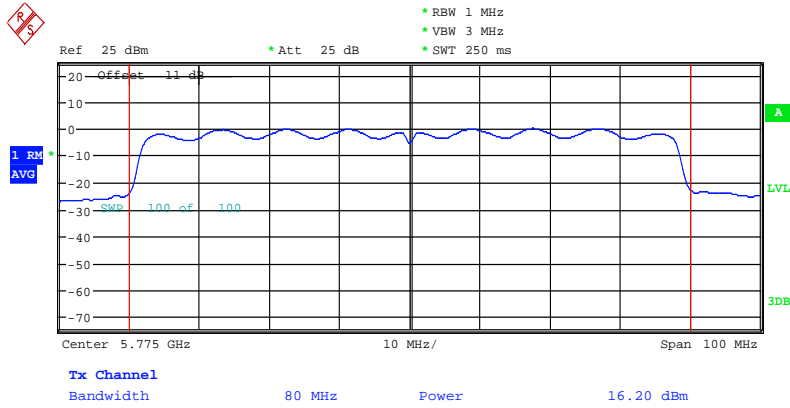


MAXIMUM CONDUCTED POWER ANTI1\_11n40CH159

Date: 7.JUL.2017 17:01:49



Registration number: W6M21706-17141-C-54  
FCC ID: TLZ-CM308NF



MAXIMUM CONDUCTED POWER ANT1\_11ac80CH155  
Date: 7.JUL.2017 17:09:46



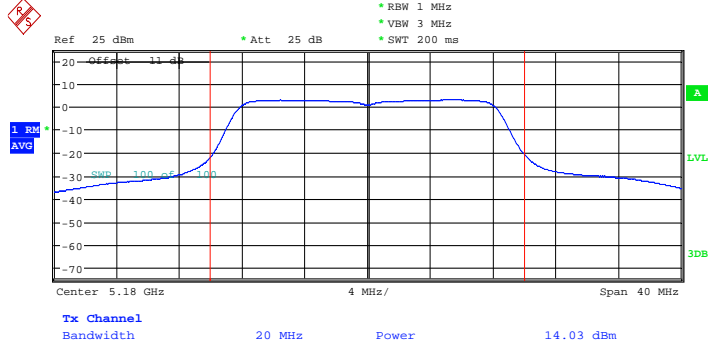


Registration number: W6M21706-17141-C-54

FCC ID: TLZ-CM308NF

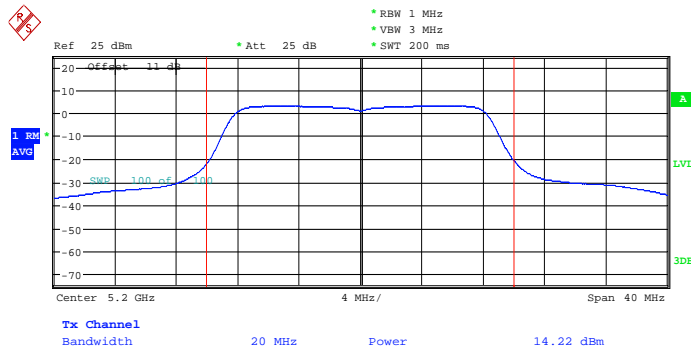
ANTB

5.15 GHz ~ 5.25 GHz



MAXIMUM CONDUCTED POWER ANT2\_11aCH36

Date: 7.JUL.2017 13:19:10

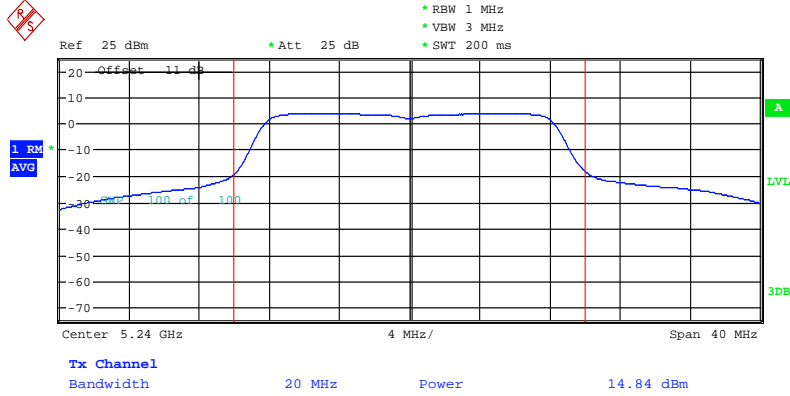


MAXIMUM CONDUCTED POWER ANT2\_11aCH40

Date: 7.JUL.2017 13:22:20

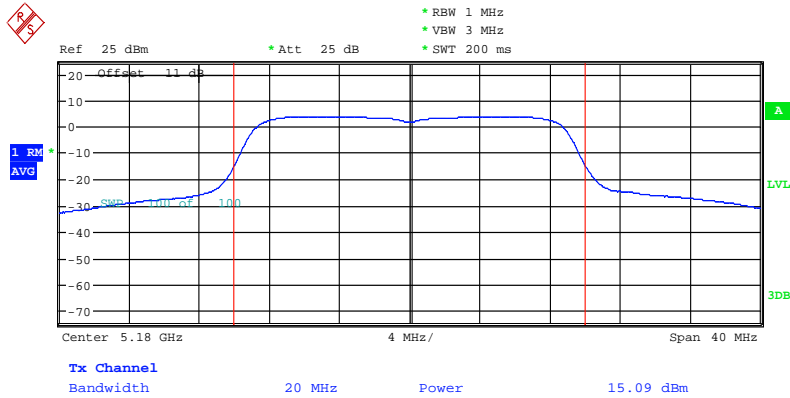


Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



MAXIMUM CONDUCTED POWER ANT2\_11aCH48

Date: 7.JUL.2017 13:28:10



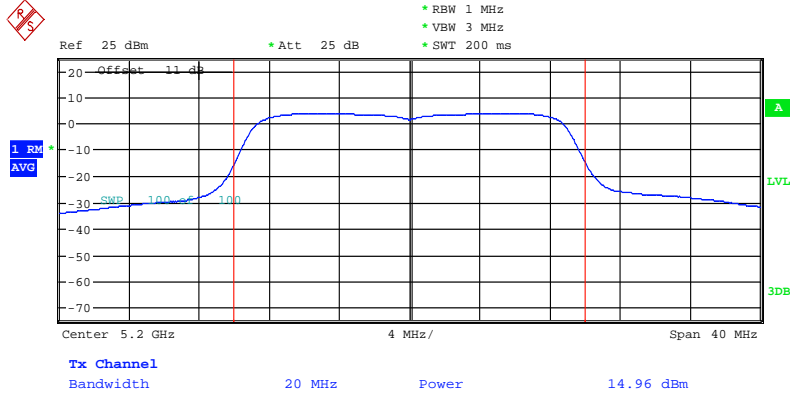
MAXIMUM CONDUCTED POWER ANT2\_11n20CH36

Date: 7.JUL.2017 13:31:50



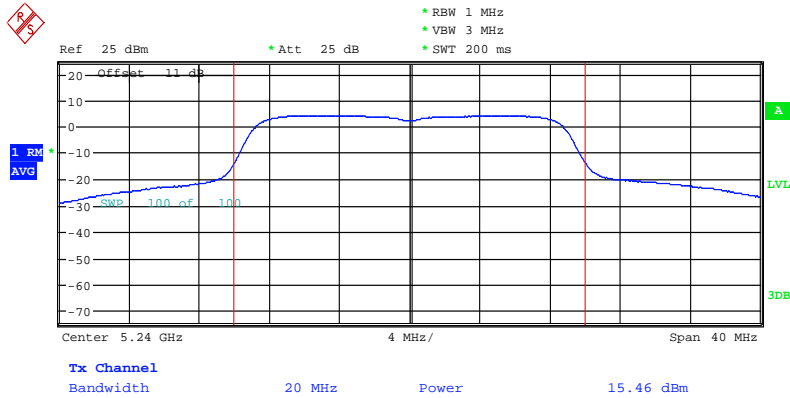
# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21706-17141-C-54  
FCC ID: TLZ-CM308NF



MAXIMUM CONDUCTED POWER ANT2\_11n20CH40

Date: 7.JUL.2017 13:41:30

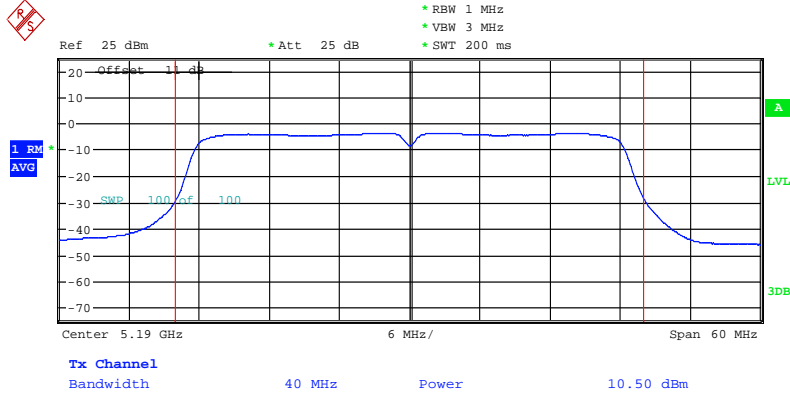


MAXIMUM CONDUCTED POWER ANT2\_11n20CH48

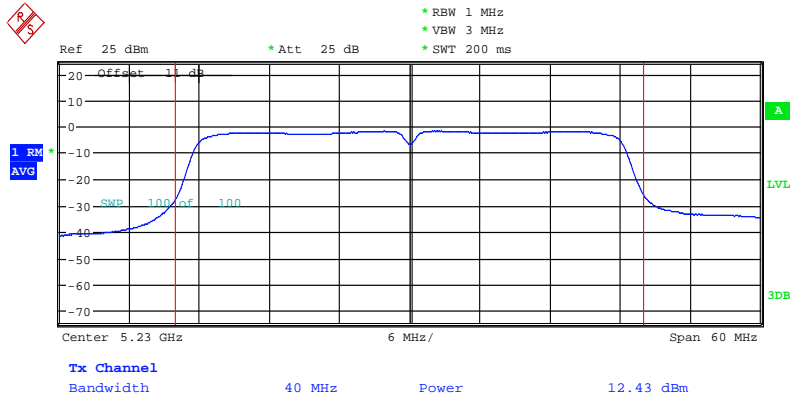
Date: 7.JUL.2017 13:43:50



Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



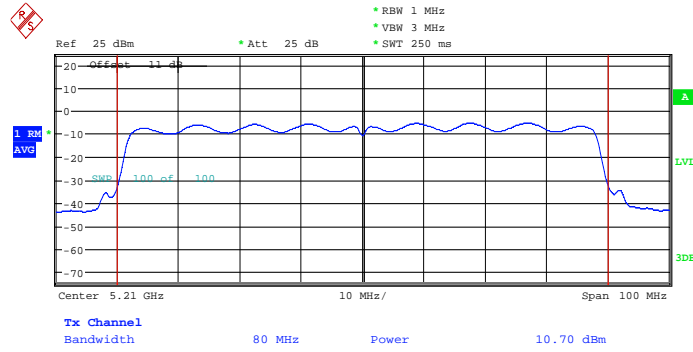
MAXIMUM CONDUCTED POWER ANT2\_11n40CH38  
 Date: 7.JUL.2017 13:49:50



MAXIMUM CONDUCTED POWER ANT2\_11n40CH46  
 Date: 7.JUL.2017 13:51:50

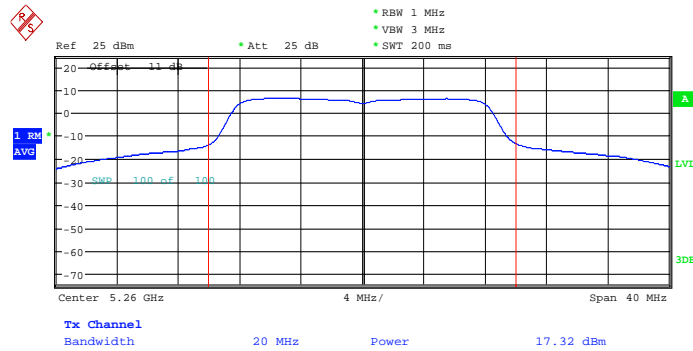


Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



MAXIMUM CONDUCTED POWER ANT2\_11ac80CH42  
 Date: 7.JUL.2017 14:01:10

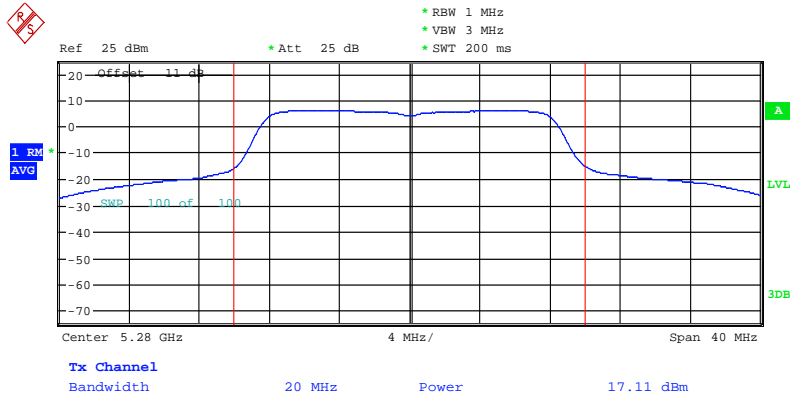
## 5.25 GHz ~ 5.35 GHz



MAXIMUM CONDUCTED POWER ANT2\_11ac80CH52  
 Date: 7.JUL.2017 14:07:40

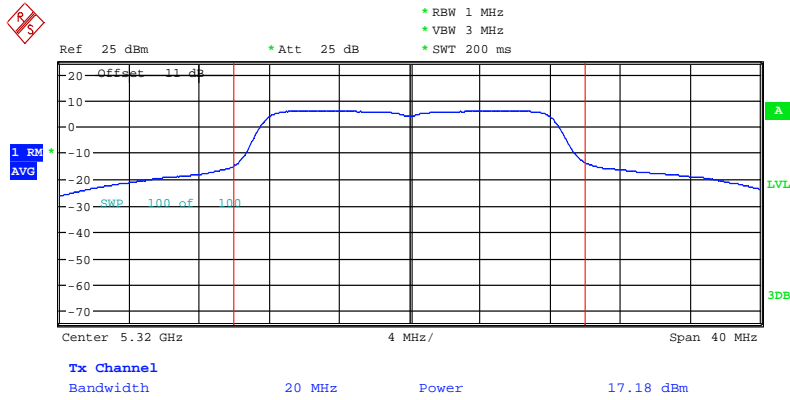


Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



MAXIMUM CONDUCTED POWER ANT2\_11aCH56

Date: 7.JUL.2017 14:14:10



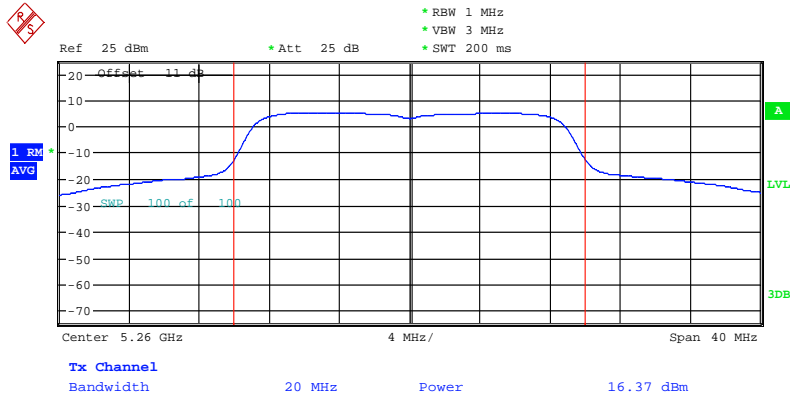
MAXIMUM CONDUCTED POWER ANT2\_11aCH64

Date: 7.JUL.2017 14:18:20

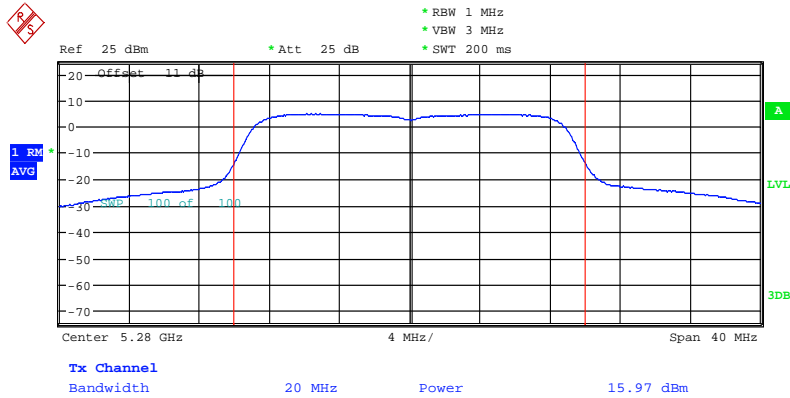


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Registration number: W6M21706-17141-C-54  
FCC ID: TLZ-CM308NF



MAXIMUM CONDUCTED POWER ANT2\_11n20CH52  
Date: 7.JUL.2017 14:26:50

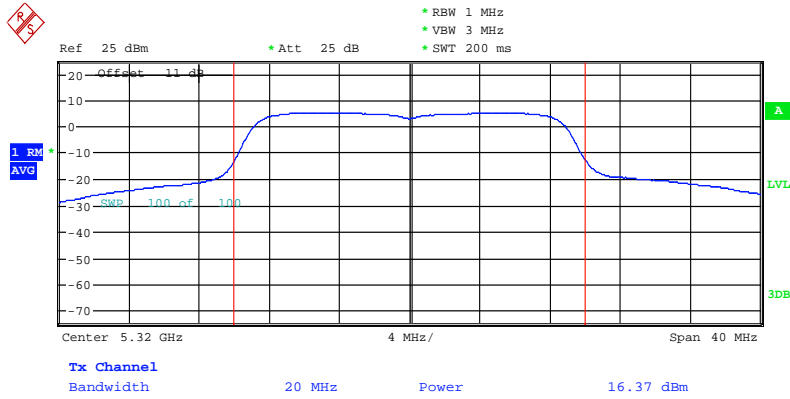


MAXIMUM CONDUCTED POWER ANT2\_11n20CH56  
Date: 7.JUL.2017 14:29:00

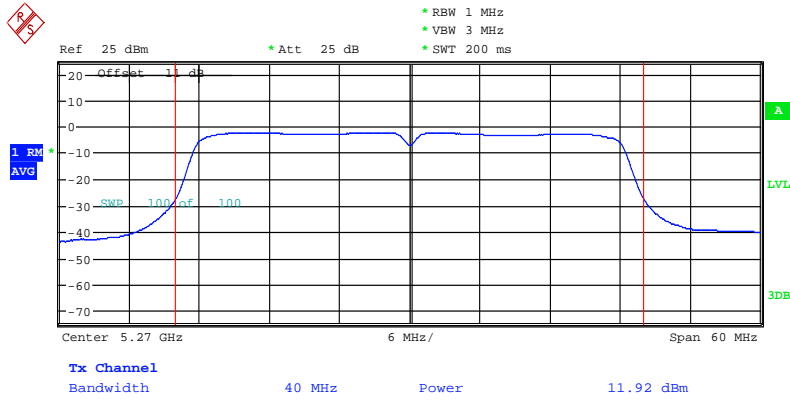


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



MAXIMUM CONDUCTED POWER ANT2\_11n20CH64  
 Date: 7.JUL.2017 14:34:50

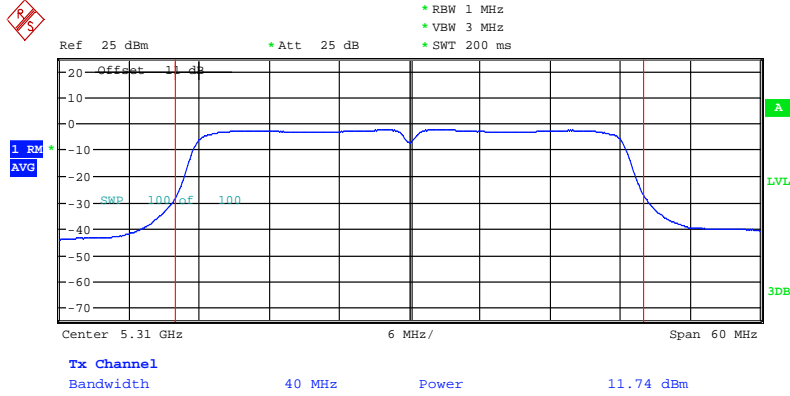


MAXIMUM CONDUCTED POWER ANT2\_11n40CH54  
 Date: 7.JUL.2017 14:37:30

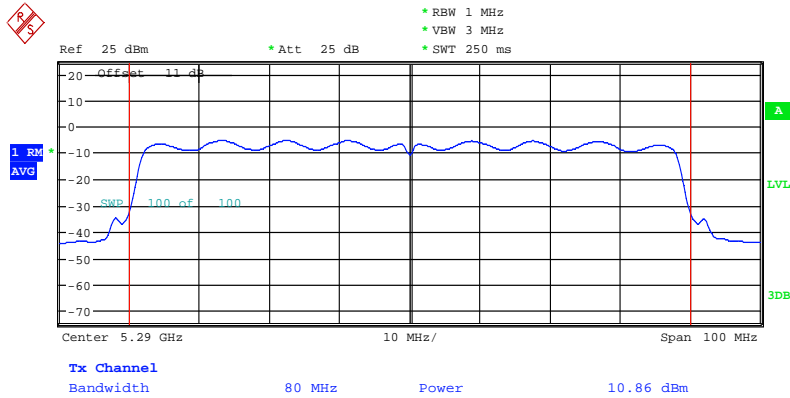




Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



MAXIMUM CONDUCTED POWER ANT2\_11n40CH62  
 Date: 7.JUL.2017 14:43:00



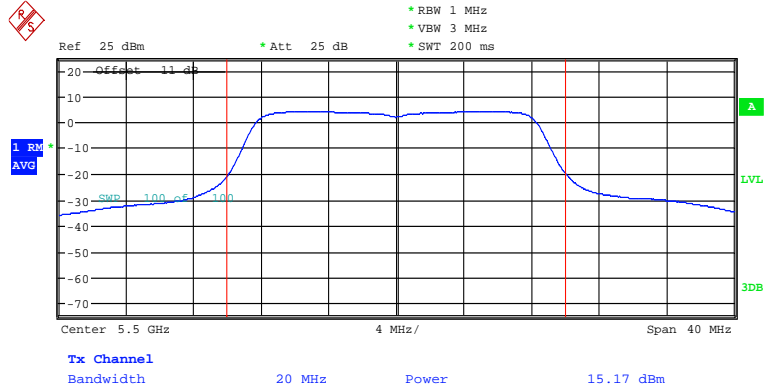
MAXIMUM CONDUCTED POWER ANT2\_11ac80CH58  
 Date: 7.JUL.2017 14:46:06



Registration number: W6M21706-17141-C-54

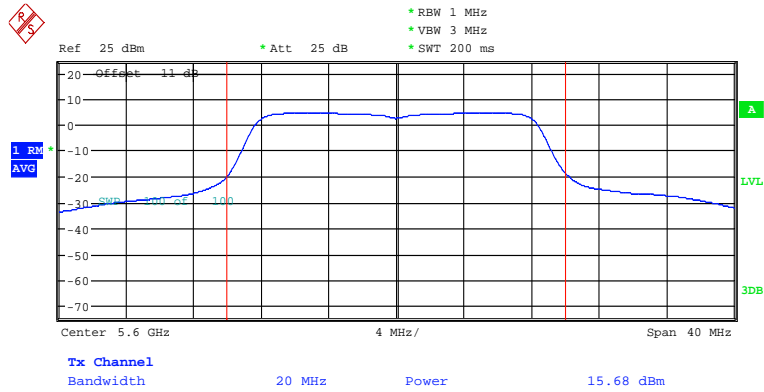
FCC ID: TLZ-CM308NF

5.47 GHz ~ 5.725 GHz



MAXIMUM CONDUCTED POWER ANT2\_11aCH100

Date: 7.JUL.2017 14:59:20

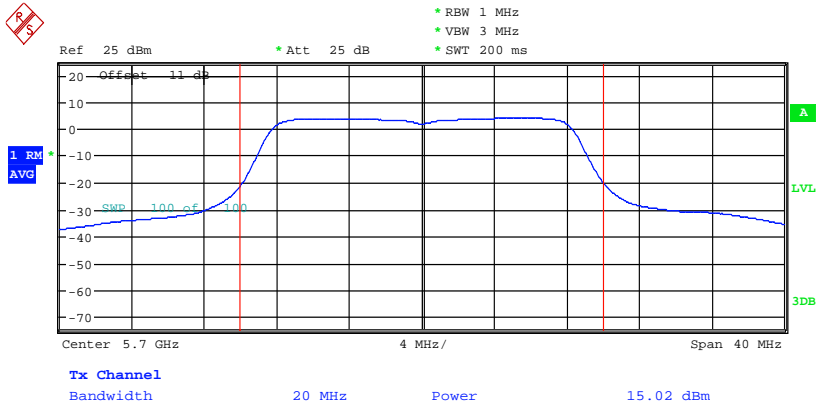


MAXIMUM CONDUCTED POWER ANT2\_11aCH120

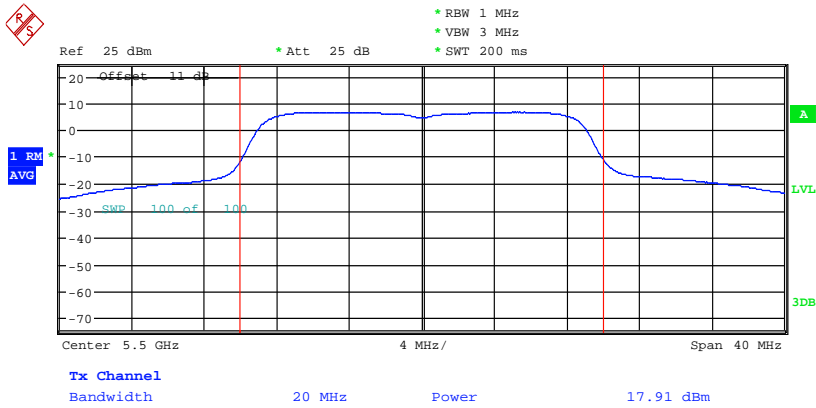
Date: 7.JUL.2017 15:01:20



Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



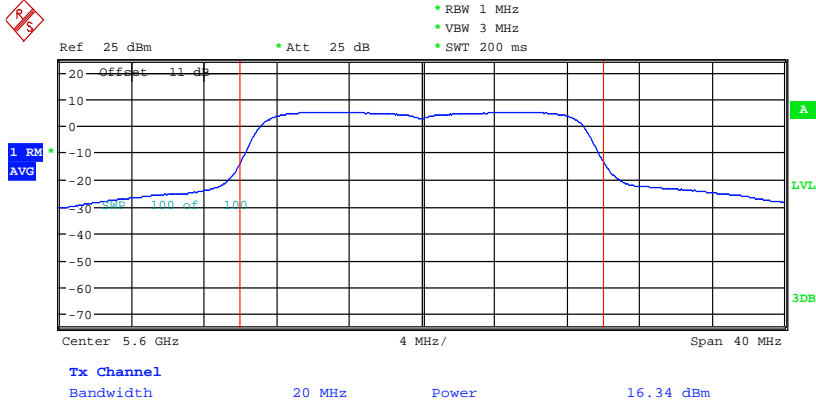
MAXIMUM CONDUCTED POWER ANT2\_11aCH140  
 Date: 7.JUL.2017 15:33:49



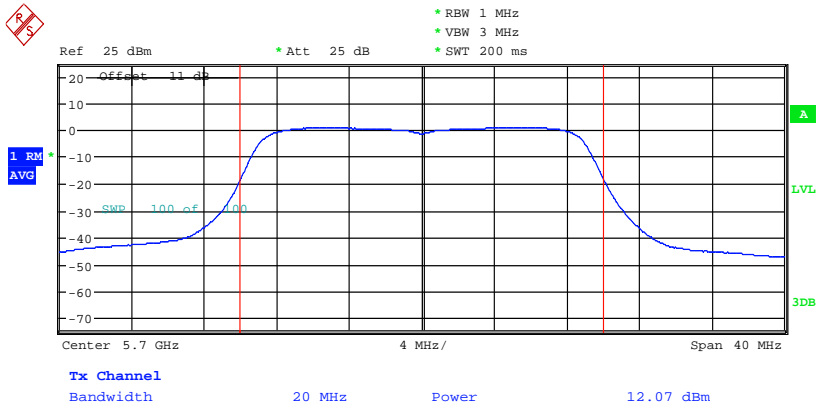
MAXIMUM CONDUCTED POWER ANT2\_11n20CH100  
 Date: 7.JUL.2017 15:35:39



Registration number: W6M21706-17141-C-54  
FCC ID: TLZ-CM308NF



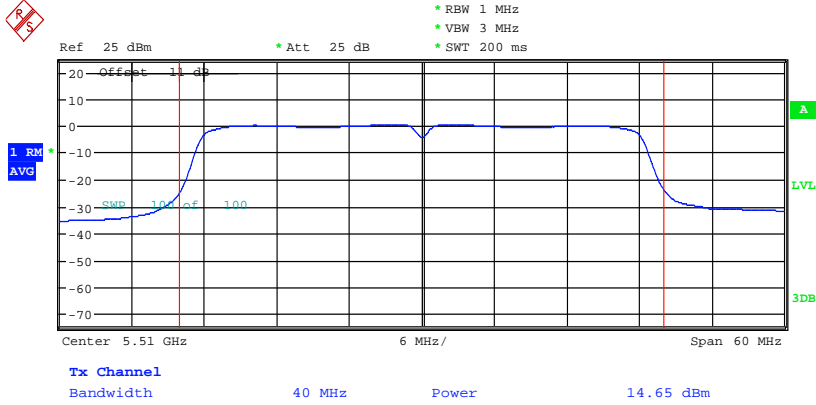
MAXIMUM CONDUCTED POWER ANT2\_11n20CH120  
Date: 7.JUL.2017 15:44:39



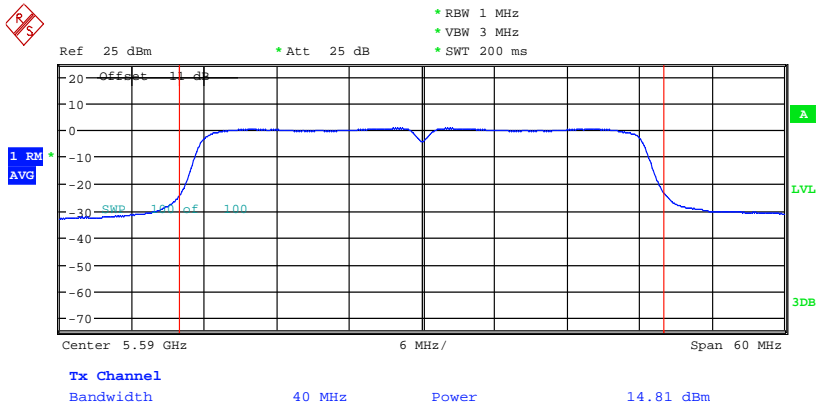
MAXIMUM CONDUCTED POWER ANT2\_11n20CH140  
Date: 7.JUL.2017 15:46:29



Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



MAXIMUM CONDUCTED POWER ANT2\_11n40CH102  
 Date: 7.JUL.2017 15:53:49

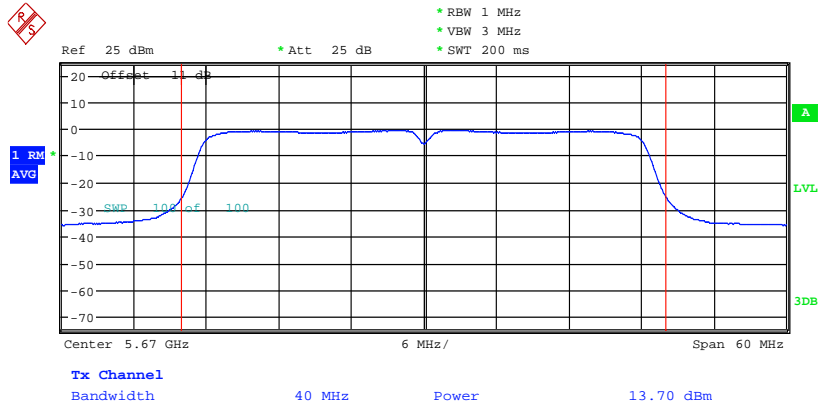


MAXIMUM CONDUCTED POWER ANT2\_11n40CH118  
 Date: 7.JUL.2017 15:55:39

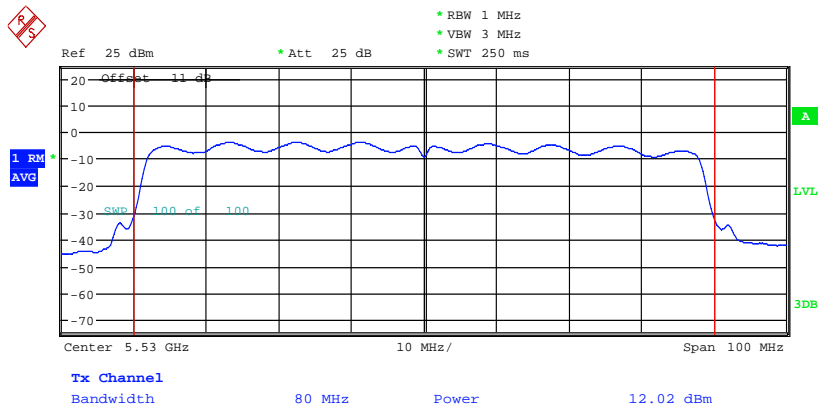


# Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



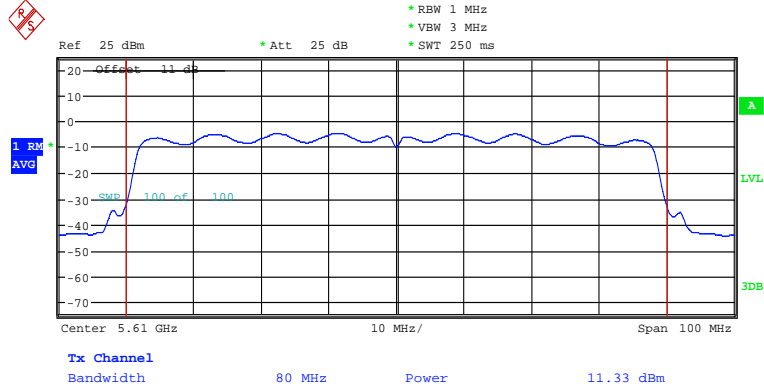
MAXIMUM CONDUCTED POWER ANT2\_11n40CH134  
 Date: 7.JUL.2017 16:01:29



MAXIMUM CONDUCTED POWER ANT2\_11ac80CH106  
 Date: 7.JUL.2017 16:04:51

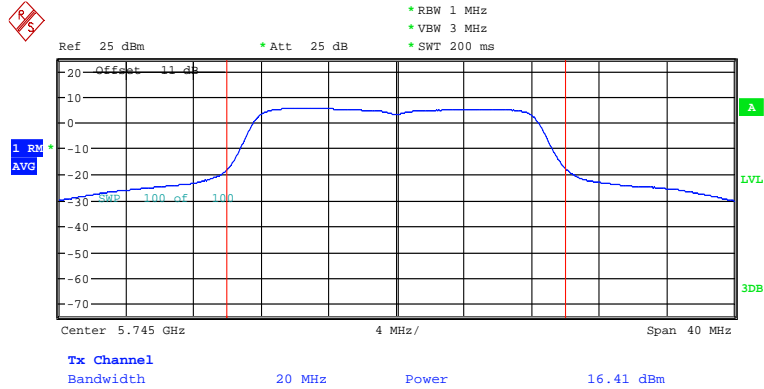


Registration number: W6M21706-17141-C-54  
FCC ID: TLZ-CM308NF



MAXIMUM CONDUCTED POWER ANT2\_11ac80CH122  
Date: 7.JUL.2017 16:26:29

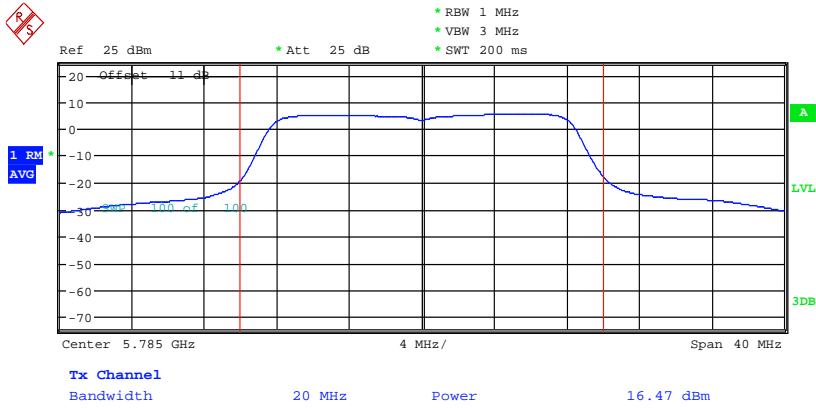
## 5.725 GHz ~ 5.85 GHz



MAXIMUM CONDUCTED POWER ANT2\_11acCH149  
Date: 7.JUL.2017 16:35:19

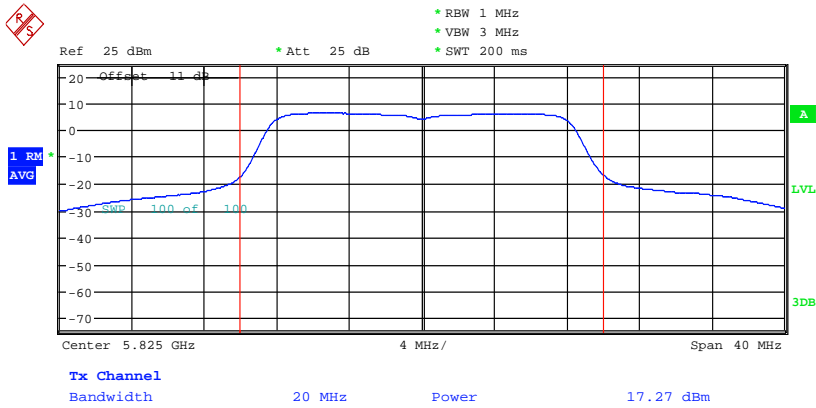


Registration number: W6M21706-17141-C-54  
FCC ID: TLZ-CM308NF



MAXIMUM CONDUCTED POWER ANT2\_11aCH157

Date: 7.JUL.2017 16:41:59



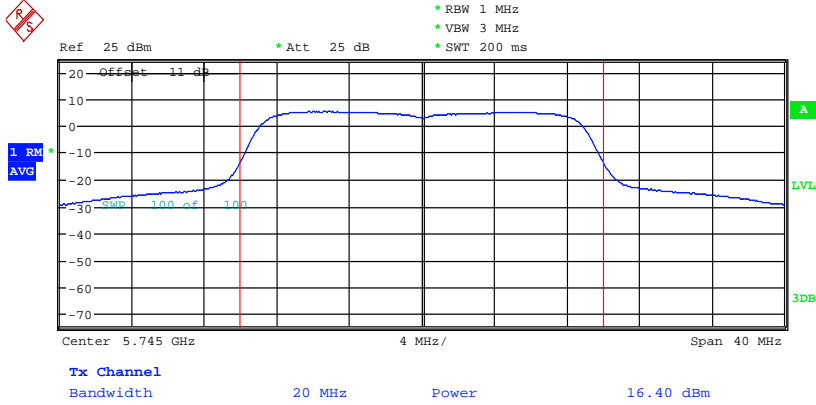
MAXIMUM CONDUCTED POWER ANT2\_11aCH165

Date: 7.JUL.2017 16:43:49

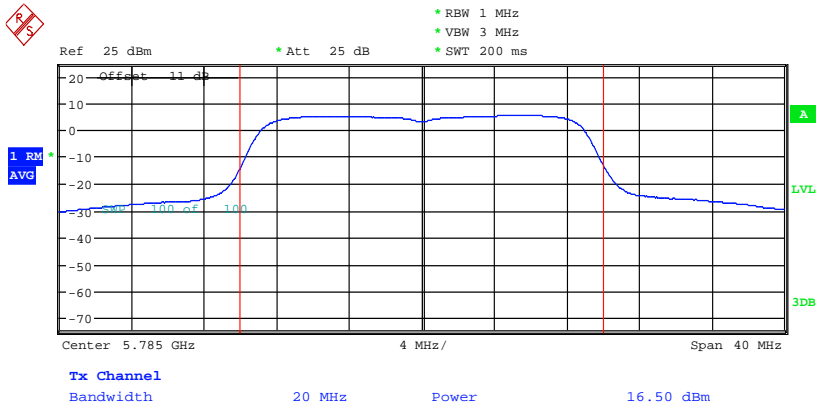




Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



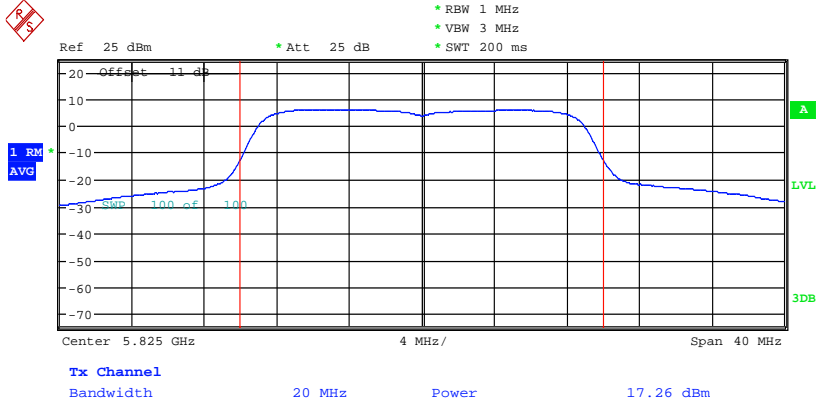
MAXIMUM CONDUCTED POWER ANT2\_11n20CH149  
 Date: 7.JUL.2017 16:49:09



MAXIMUM CONDUCTED POWER ANT2\_11n20CH157  
 Date: 7.JUL.2017 16:51:09

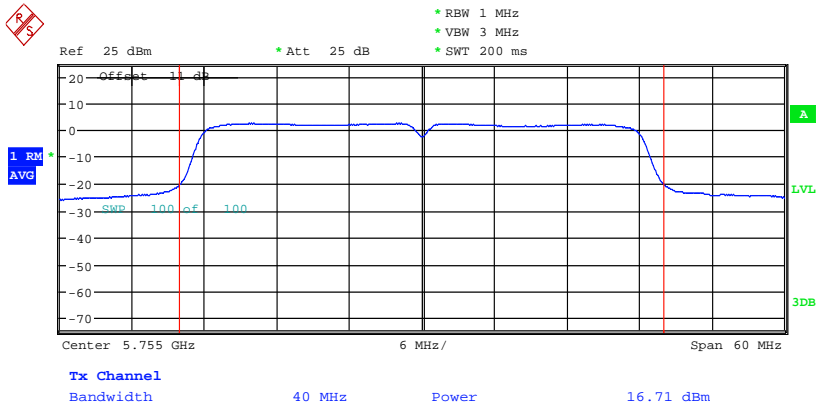


Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



MAXIMUM CONDUCTED POWER ANT2\_11n20CH165

Date: 7.JUL.2017 16:55:59

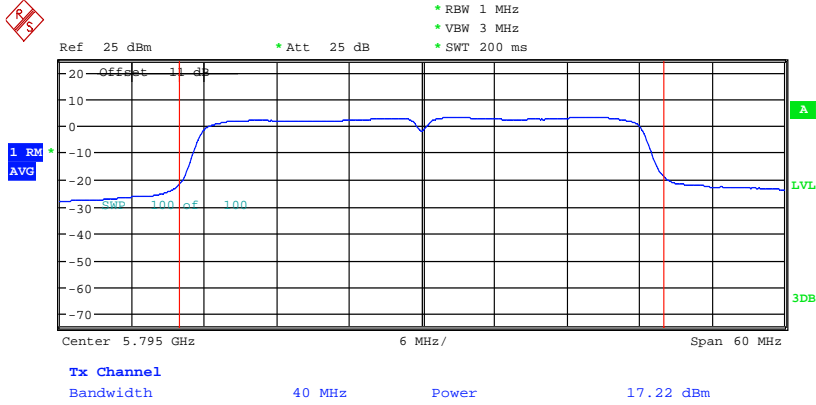


MAXIMUM CONDUCTED POWER ANT2\_11n40CH151

Date: 7.JUL.2017 16:58:09

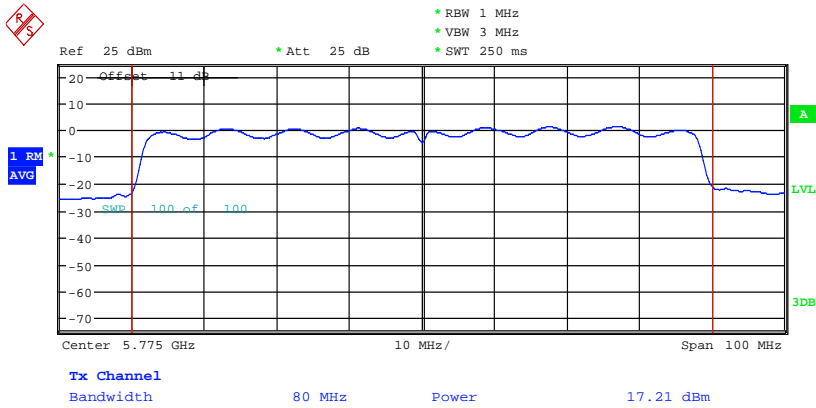


Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



MAXIMUM CONDUCTED POWER ANT2\_11n40CH159

Date: 7.JUL.2017 17:04:29



MAXIMUM CONDUCTED POWER ANT2\_11ac80CH155

Date: 7.JUL.2017 17:07:09



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

Registration number: W6M21706-17141-C-54

FCC ID: TLZ-CM308NF

5.15GHz~5.25GHz

Antenna A	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	30.41	30.62	27.29	14.83	14.86	14.36
802.11n 40MHz	10.89	--	14.03	10.37	--	11.47
802.11ac	10.42	--	--	10.18	--	--
Antenna B	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	32.28	31.33	35.16	15.09	14.96	15.46
802.11n 40MHz	11.22	--	17.5	10.5	--	12.43
802.11ac	11.75	--	--	10.7	--	--
Combine	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	62.69	61.95	62.45	17.97	17.92	17.96
802.11n 40MHz	22.11	--	31.53	13.45	--	14.99
802.11ac	22.17	--	--	13.46	--	--

5.25GHz~5.35GHz

Antenna A	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	40.18	36.64	36.56	16.04	15.64	15.63
802.11n 40MHz	14.39	--	12.76	11.58	--	11.06
802.11ac	10.94	--	--	10.39	--	--
Antenna B	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	43.35	39.54	43.35	16.37	15.97	16.37
802.11n 40MHz	15.56	--	14.93	11.92	--	11.74
802.11ac	12.19	--	--	10.86	--	--
Combine	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	83.53	76.18	79.91	19.22	18.82	19.03
802.11n 40MHz	29.95	--	27.69	14.76	--	14.42
802.11ac	23.13	--	--	13.64	--	--



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

Registration number: W6M21706-17141-C-54

FCC ID: TLZ-CM308NF

5.47GHz~5.725GHz

Antenna A	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	47.97	34.83	14.09	16.81	15.42	11.49
802.11n 40MHz	22.59	26.3	22.18	13.54	14.2	13.46
802.11ac	13.21	--	13.03	11.21	--	11.15
Antenna B	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	61.8	43.05	16.11	17.91	16.34	12.07
802.11n 40MHz	29.17	30.27	23.44	14.65	14.81	13.7
802.11ac	15.92	--	13.58	12.02	--	11.33
Combine	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	109.77	77.88	30.2	20.4	18.91	14.8
802.11n 40MHz	51.76	56.57	45.62	17.14	--	16.59
802.11ac	29.13	--	26.61	14.64	--	14.25

5.725GHz~5.85GHz

Antenna A	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	35.32	35.65	40.46	15.48	15.52	16.07
802.11n 40MHz	34.12	--	42.07	15.33	--	16.24
802.11ac	41.69	--	--	16.2	--	--
Antenna B	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	43.65	44.67	53.21	16.4	16.5	17.26
802.11n 40MHz	46.88	--	52.72	16.71	--	17.22
802.11ac	52.6	--	--	17.21	--	--
Combine	mW			dBm		
	Ch Low	Ch Mid	Ch High	Ch Low	Ch Mid	Ch High
802.11n 20MHz	78.97	80.32	93.67	18.97	19.05	19.72
802.11n 40MHz	81	--	94.79	19.08	--	19.77
802.11ac	94.29	--	--	19.74	--	--

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



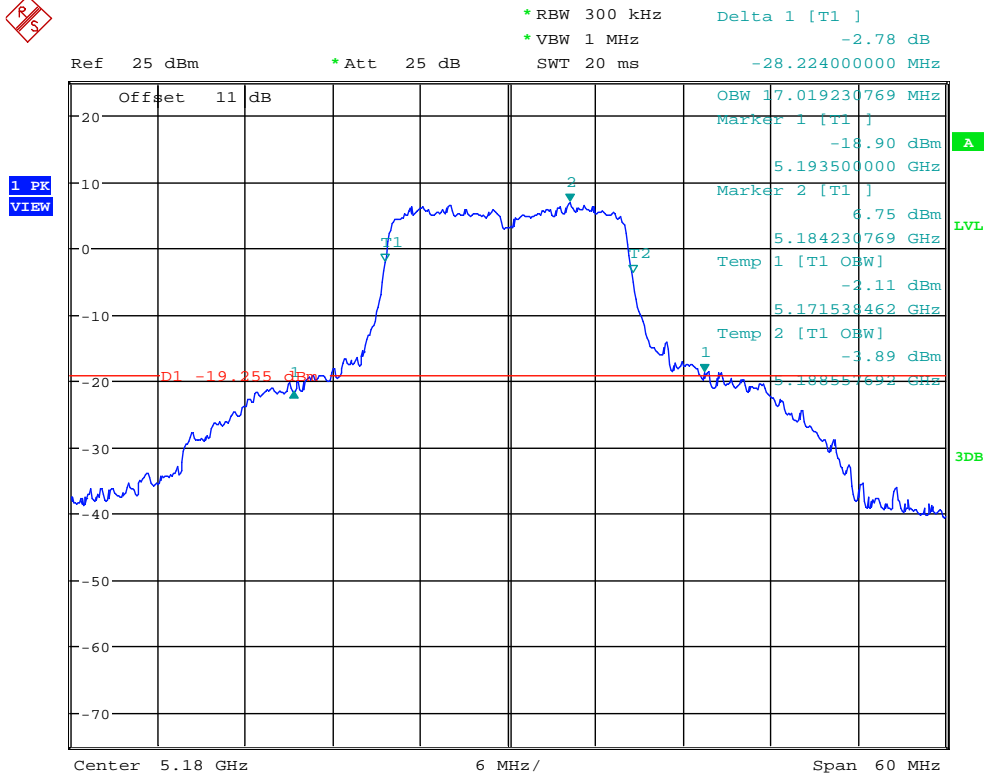
Registration number: W6M21706-17141-C-54  
FCC ID: TLZ-CM308NF

### 3.2 26dB emission bandwidth, 99% Occupied Bandwidth, FCC 15.407 (a)

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

Result:

ANTA  
5.15 GHz ~ 5.25 GHz

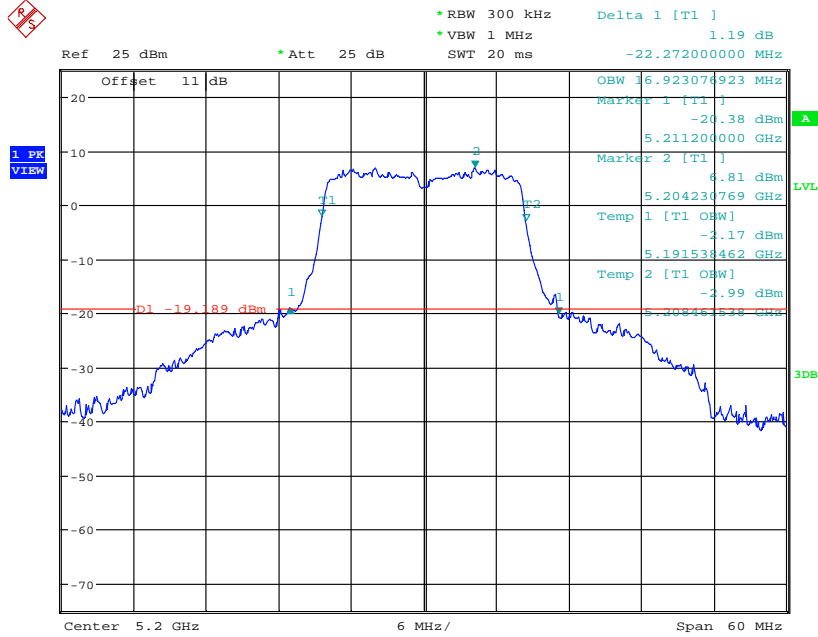


99% OBW & 26DB BANDWIDTH ANTI\_11a\_CH36

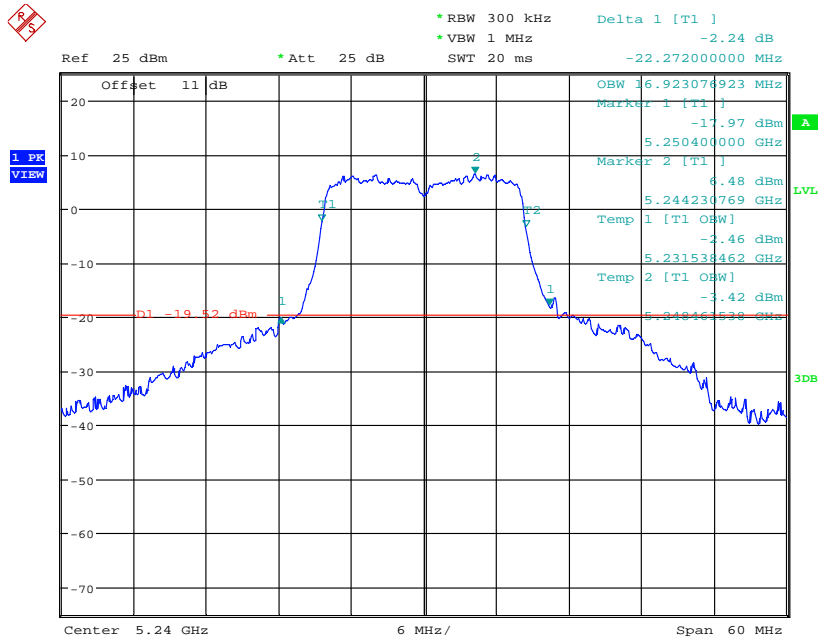
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Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



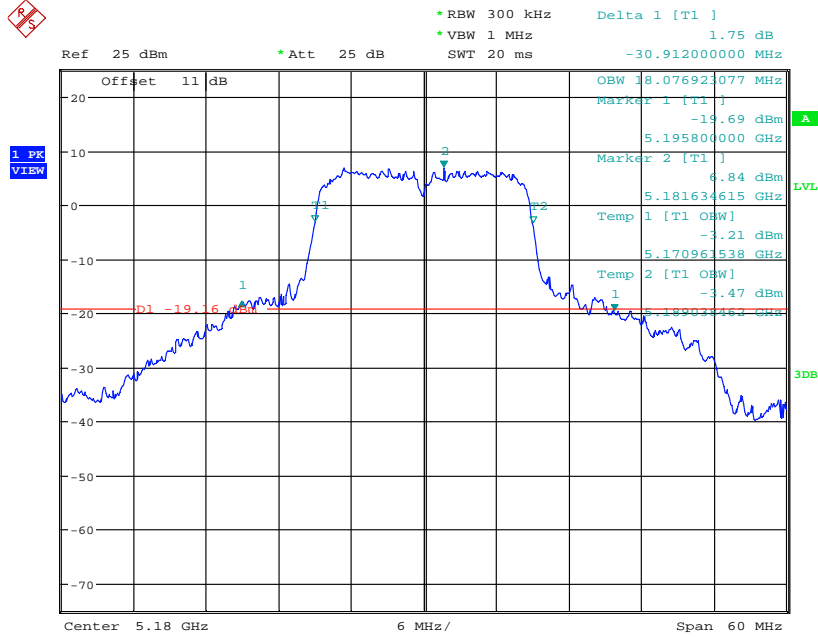
99% OBW & 26DB BANDWIDTH ANTI\_11a\_CH40  
 Date: 7.JUL.2017 13:24:35



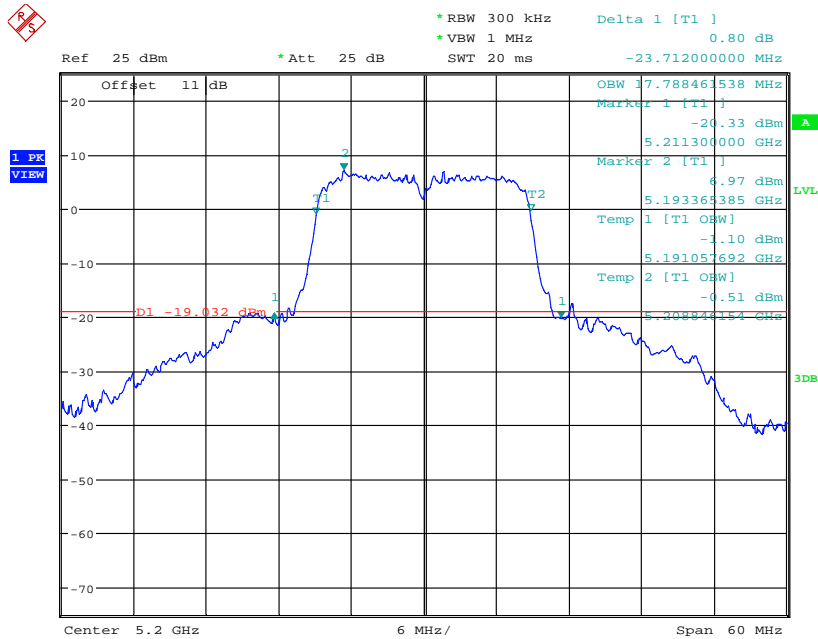
99% OBW & 26DB BANDWIDTH ANTI\_11a\_CH48  
 Date: 7.JUL.2017 13:27:03



Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



99% OBW & 26DB BANDWIDTH ANTI\_11n20\_CH36  
 Date: 7.JUL.2017 13:35:29

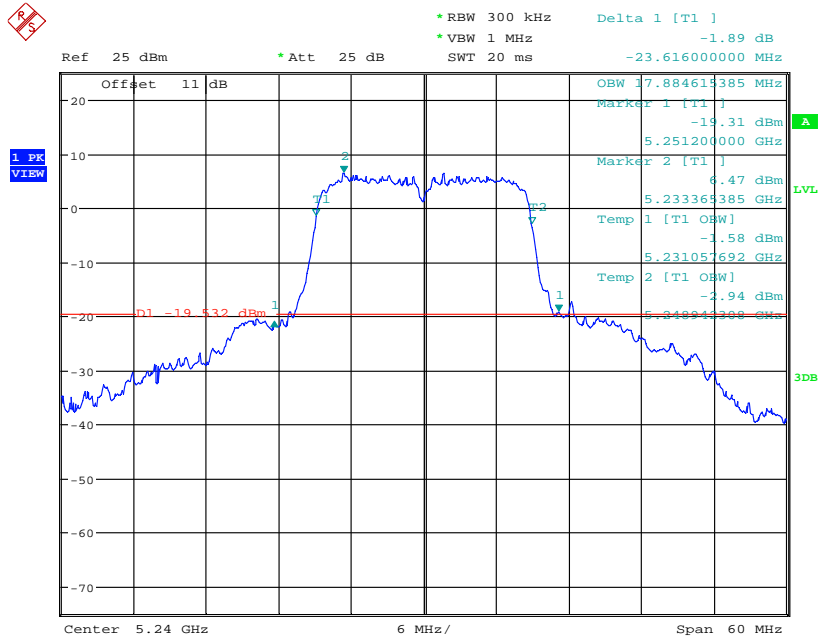


99% OBW & 26DB BANDWIDTH ANTI\_11n20\_CH40  
 Date: 7.JUL.2017 13:40:32

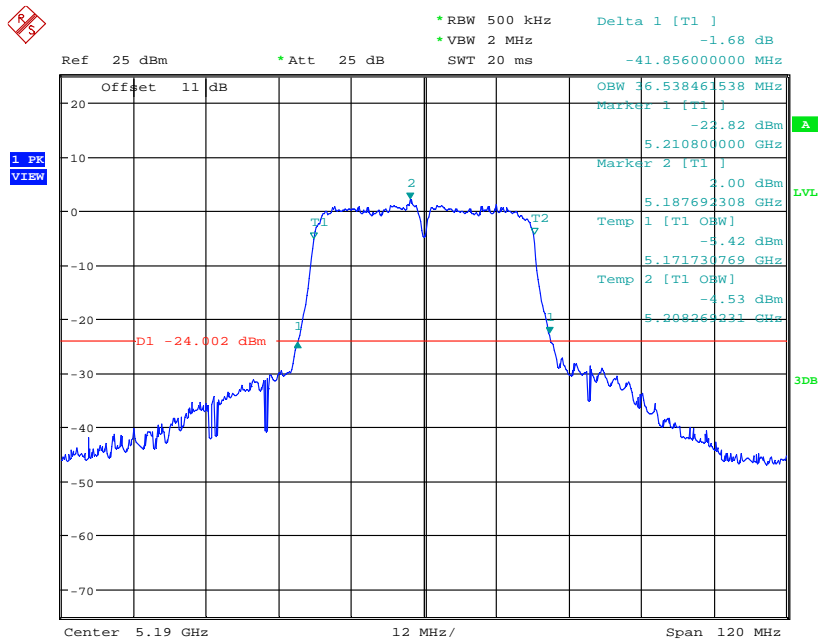




Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



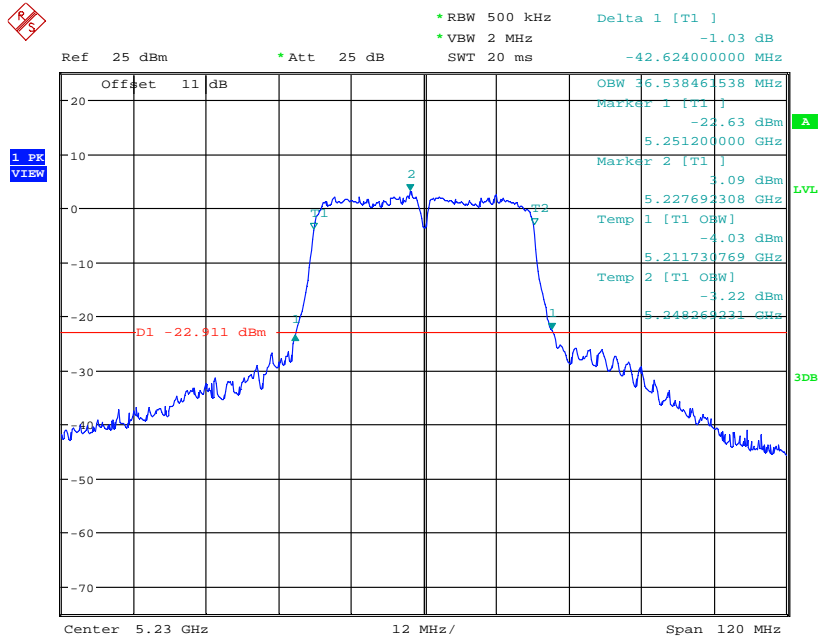
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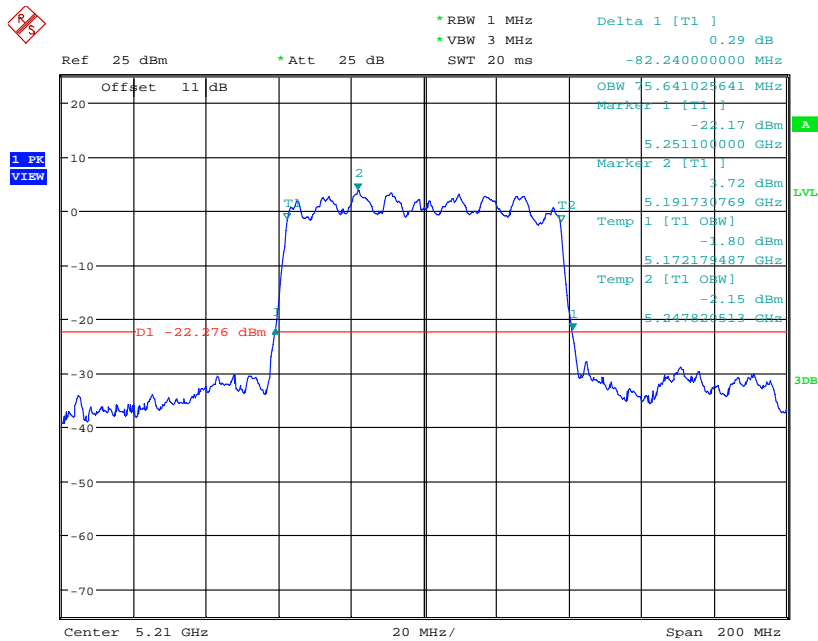
99% OBW & 26DB BANDWIDTH ANT1\_11n40\_CH38  
 Date: 7.JUL.2017 13:48:52



Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



99% OBW & 26DB BANDWIDTH ANTI\_11n40\_CH46  
 Date: 7.JUL.2017 13:55:39



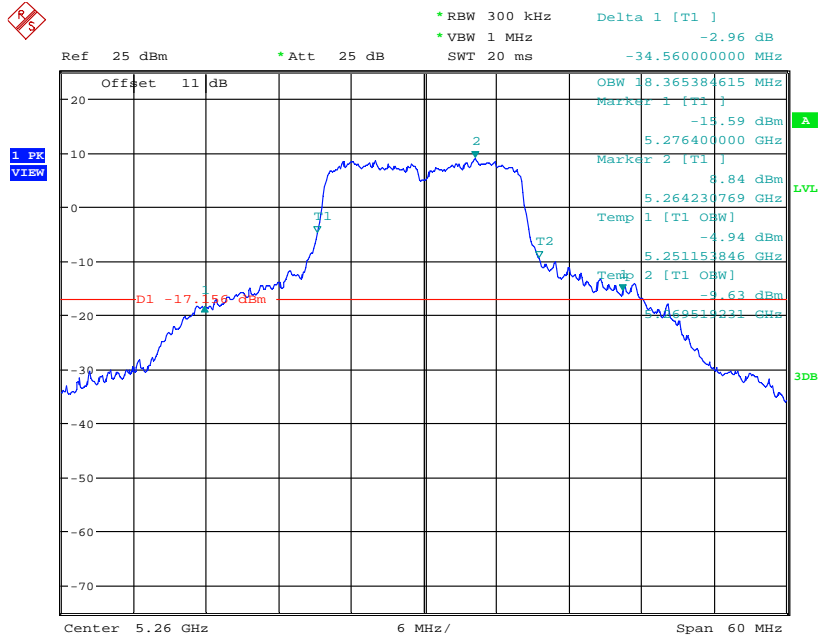
99% OBW & 26DB BANDWIDTH ANTI\_11ac80\_CH42  
 Date: 7.JUL.2017 13:58:18



Registration number: W6M21706-17141-C-54

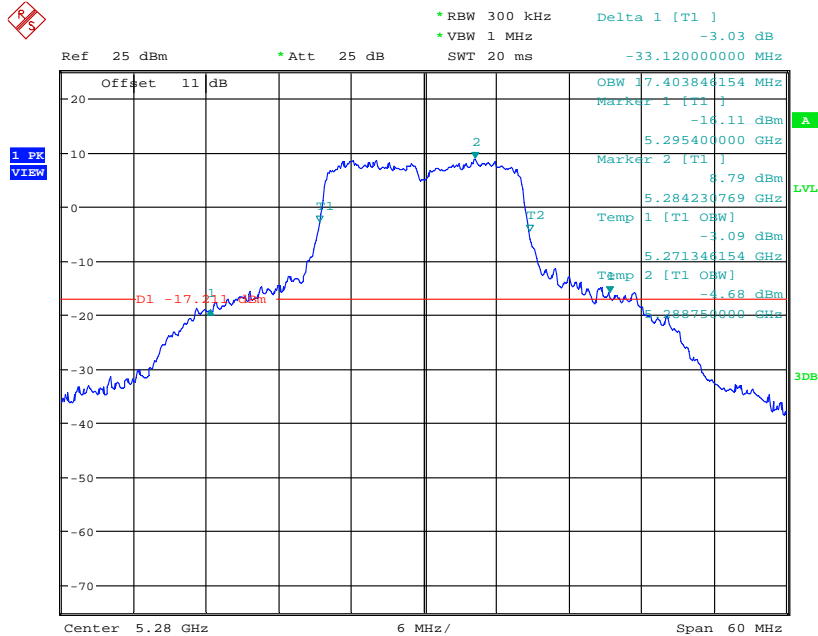
FCC ID: TLZ-CM308NF

## 5.25 GHz ~ 5.35 GHz



99% OBW & 26DB BANDWIDTH ANT1\_11a\_CH52

Date: 7.JUL.2017 14:10:52

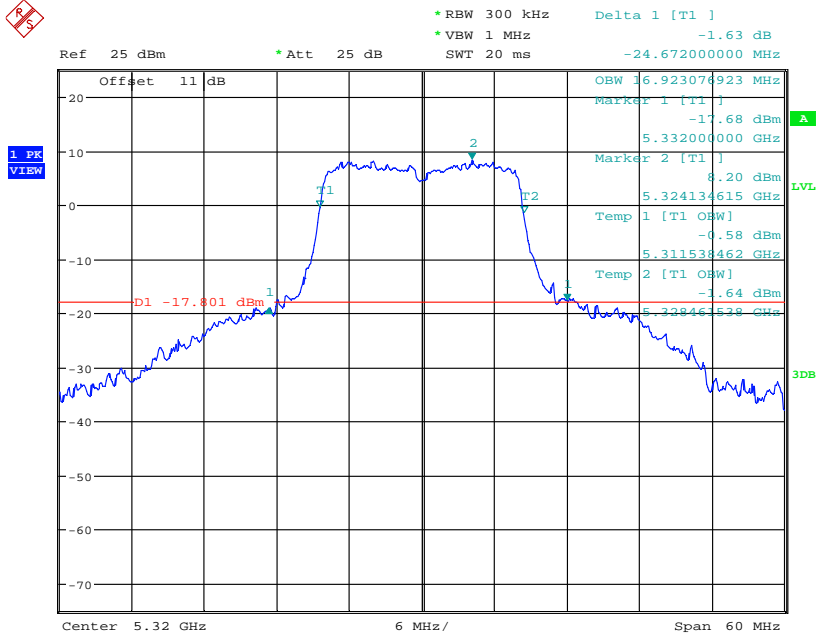


99% OBW & 26DB BANDWIDTH ANT1\_11a\_CH56

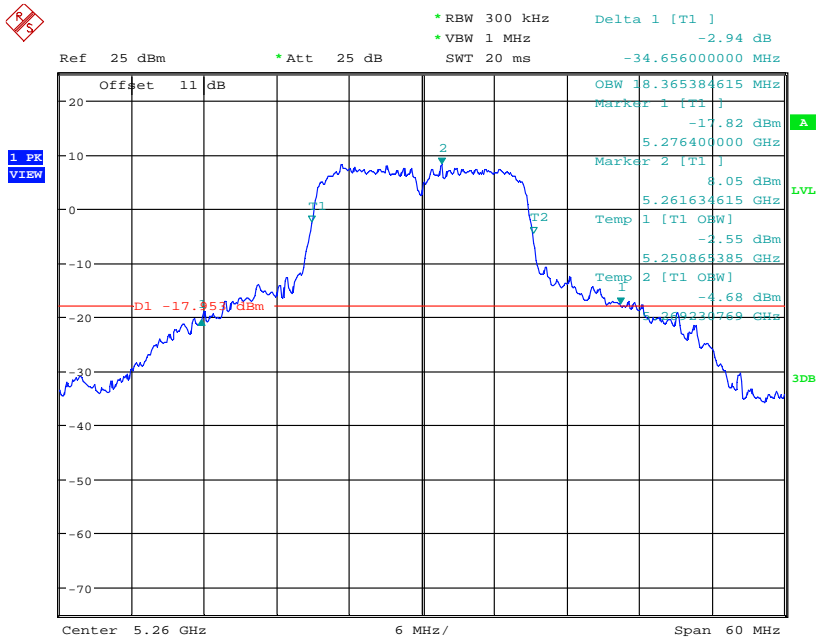
Date: 7.JUL.2017 14:12:58



Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



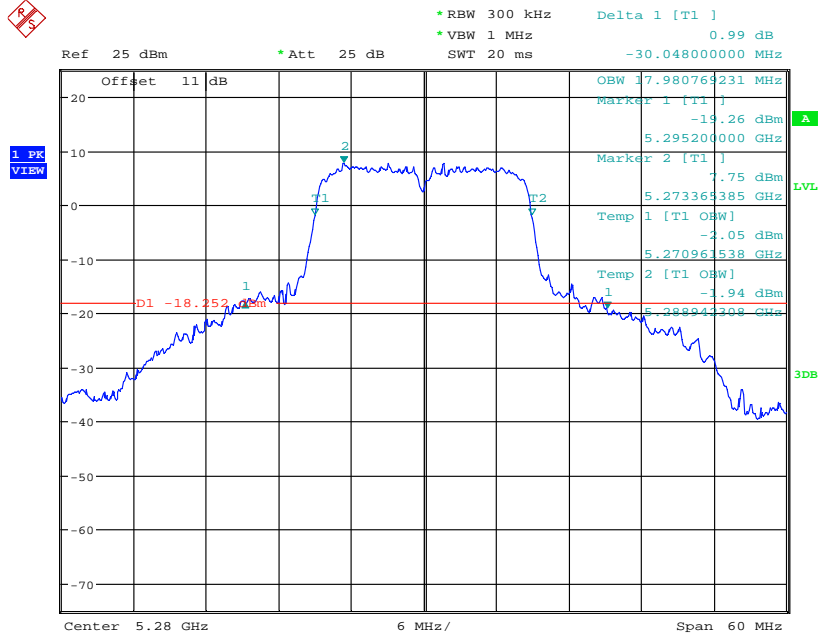
99% OBW & 26DB BANDWIDTH ANTI\_11a\_CH64  
 Date: 7.JUL.2017 14:21:19



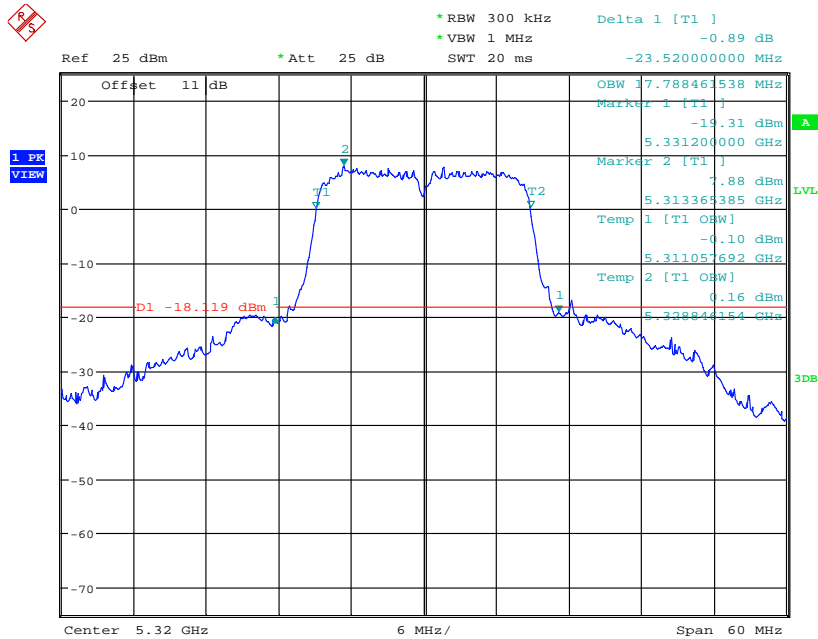
99% OBW & 26DB BANDWIDTH ANTI\_11n20\_CH52  
 Date: 7.JUL.2017 14:25:48



Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



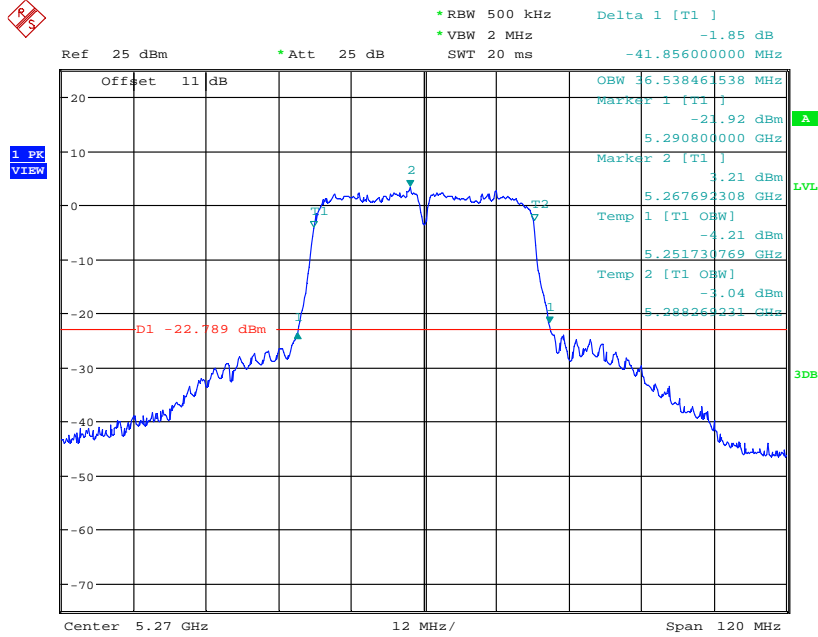
99% OBW & 26DB BANDWIDTH ANTI\_11n20\_CH56  
 Date: 7.JUL.2017 14:32:13



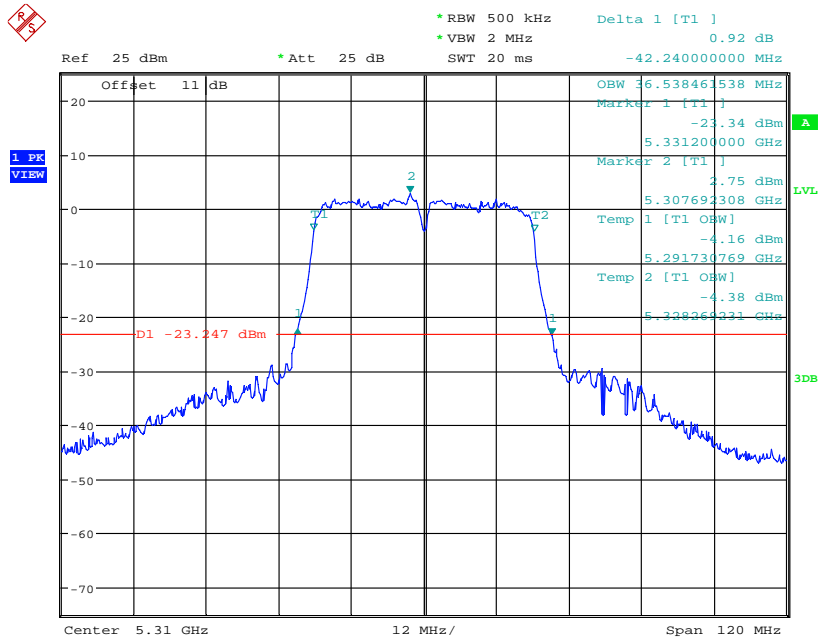
99% OBW & 26DB BANDWIDTH ANTI\_11n20\_CH64  
 Date: 7.JUL.2017 14:33:52



Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



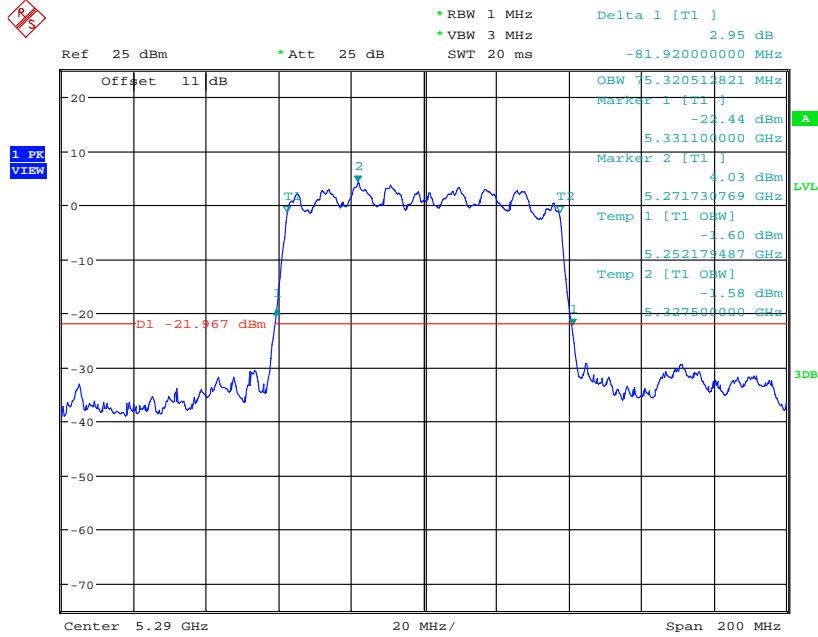
99% OBW & 26DB BANDWIDTH ANTI\_11n40\_CH54  
 Date: 7.JUL.2017 14:40:01



99% OBW & 26DB BANDWIDTH ANTI\_11n40\_CH62  
 Date: 7.JUL.2017 14:41:51

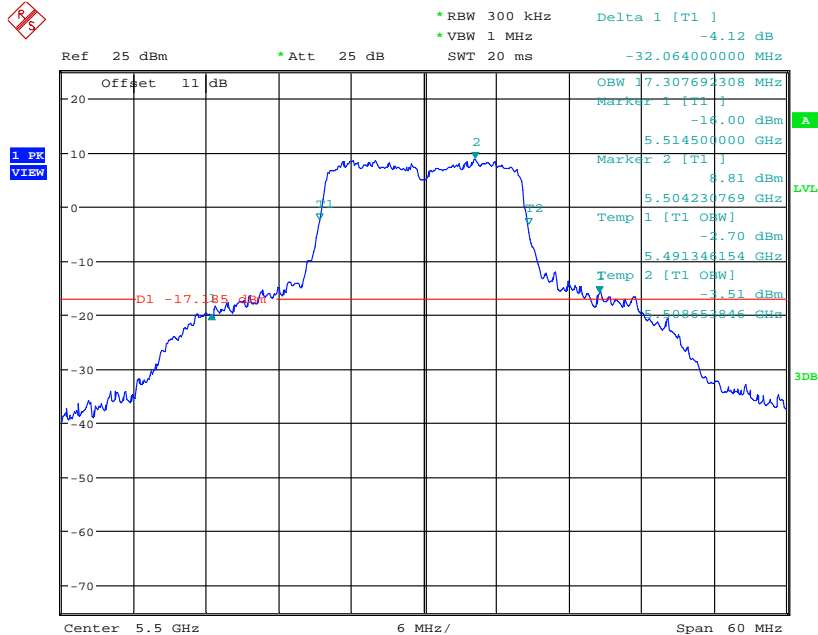


Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



99% OBW & 26DB BANDWIDTH ANT1\_11ac80\_CH58  
 Date: 7.JUL.2017 14:49:44

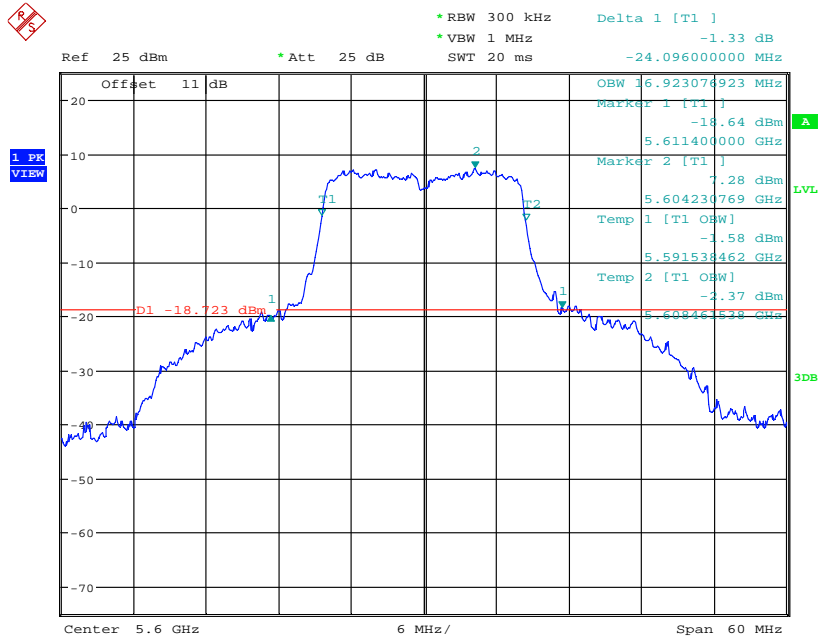
## 5.47 GHz ~ 5.725 GHz



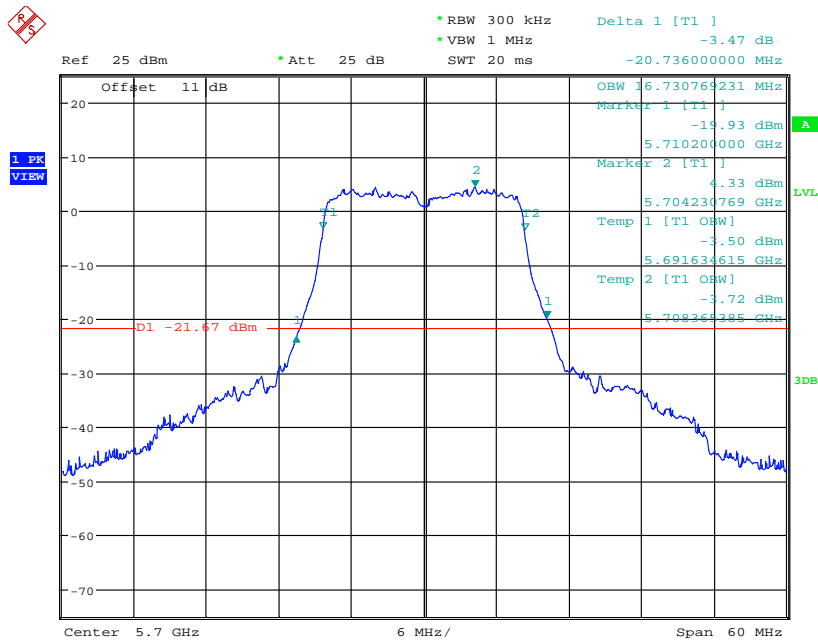
99% OBW & 26DB BANDWIDTH ANT1\_11a\_CH100  
 Date: 7.JUL.2017 14:58:15



Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



99% OBW & 26DB BANDWIDTH ANTI\_11a\_CH120  
 Date: 7.JUL.2017 15:03:51

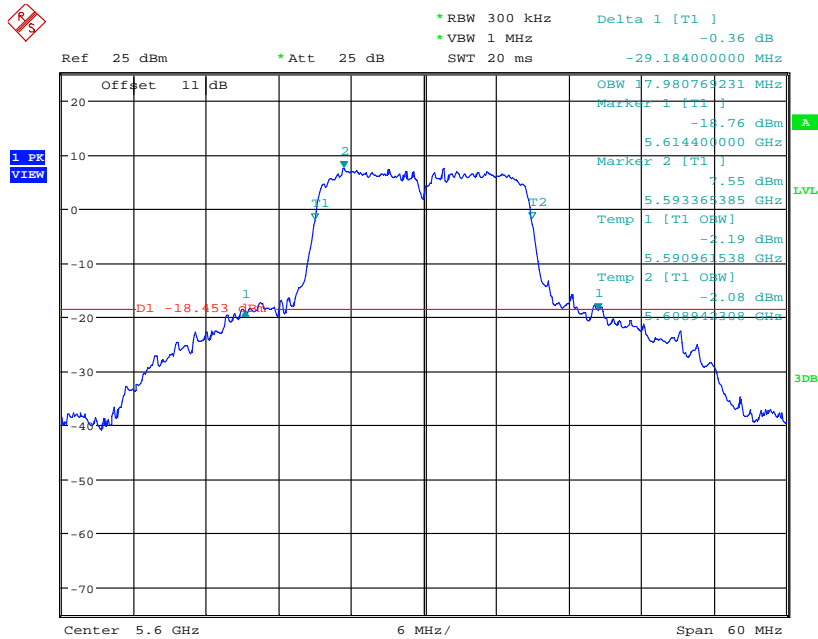
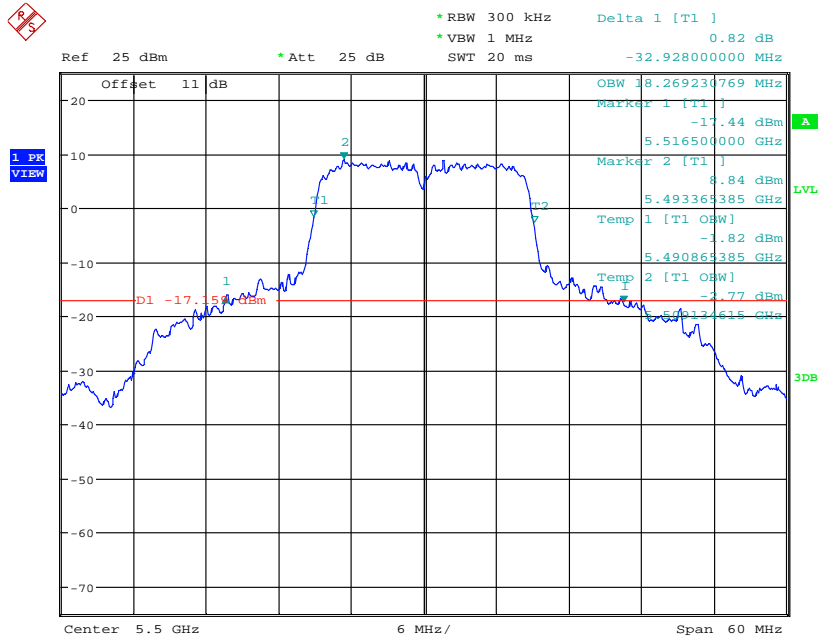


99% OBW & 26DB BANDWIDTH ANTI\_11a\_CH140  
 Date: 7.JUL.2017 15:05:51



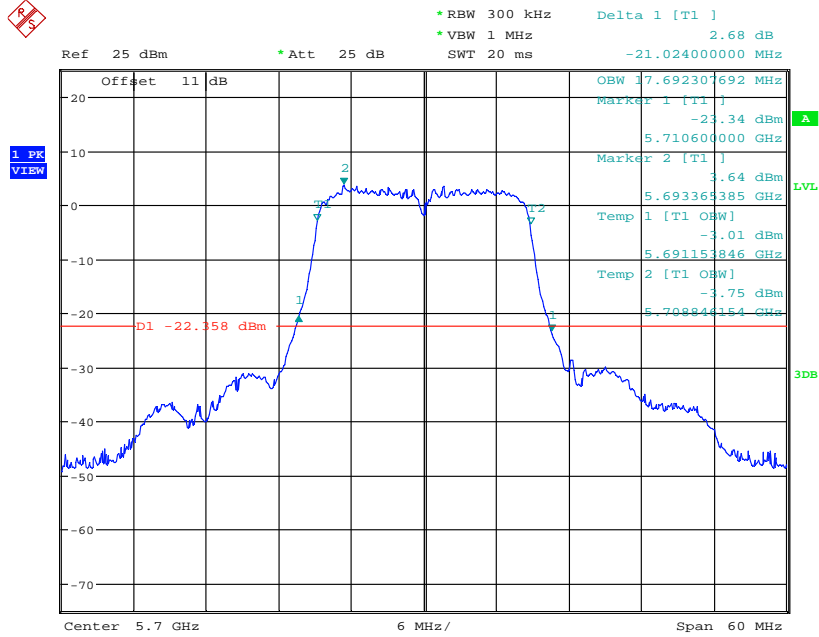


Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF

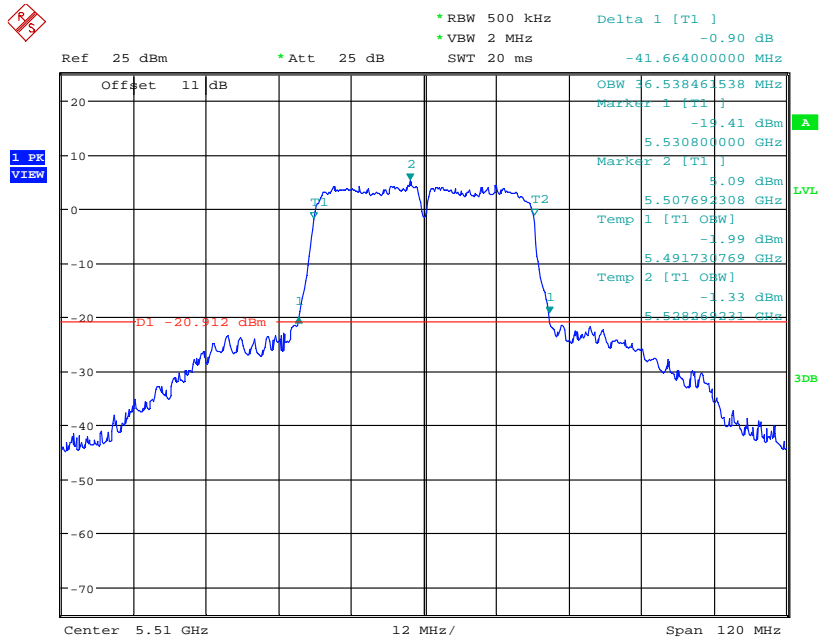




Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



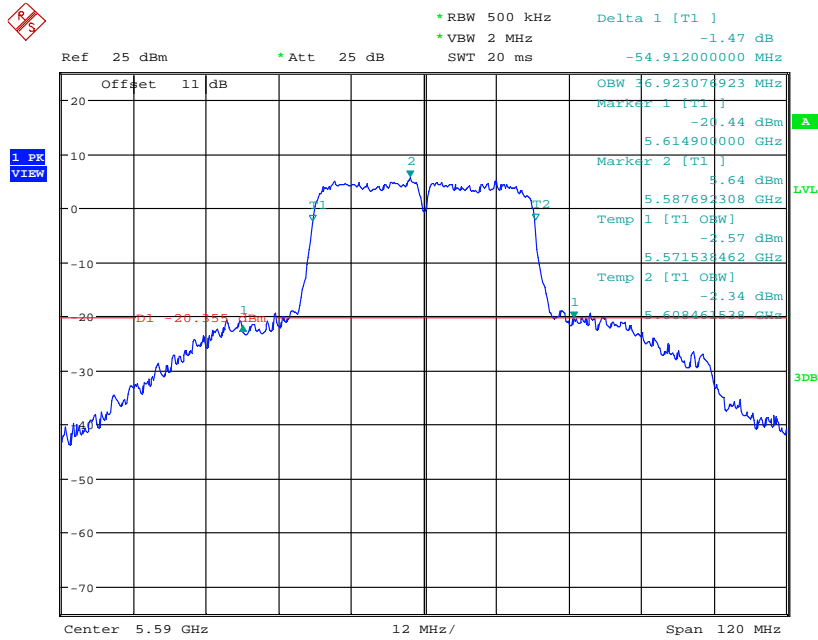
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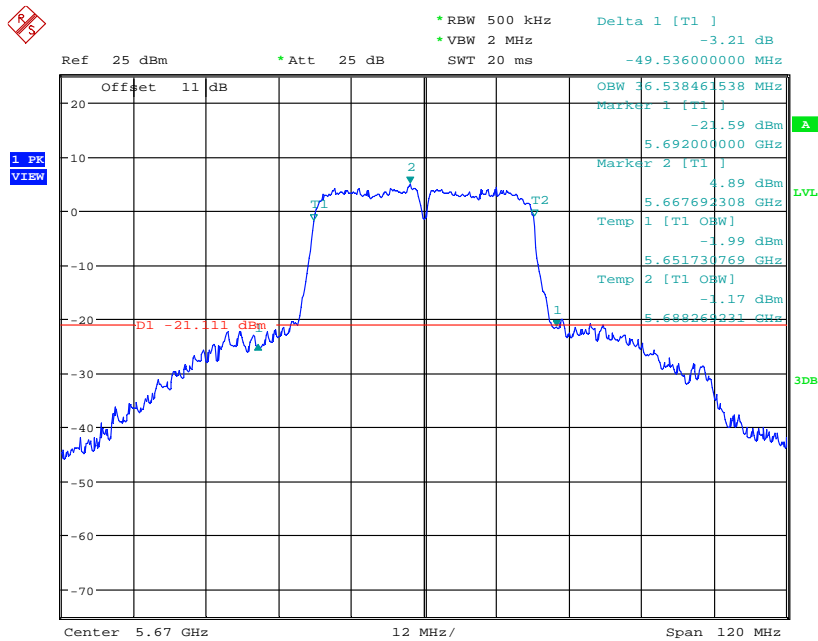
99% OBW & 26DB BANDWIDTH ANTI\_11n40\_CH102  
 Date: 7.JUL.2017 15:51:14



Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



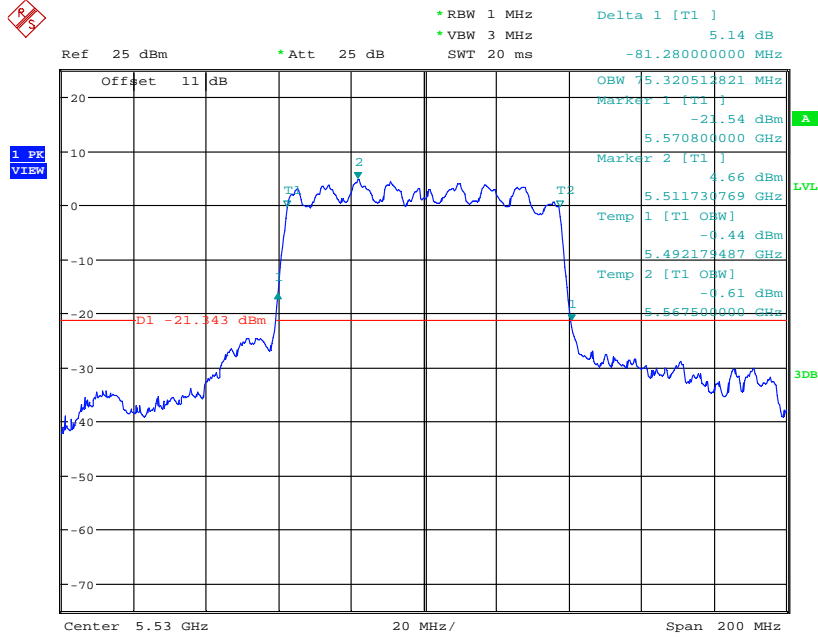
99% OBW & 26DB BANDWIDTH ANTI\_11n40\_CH118  
 Date: 7.JUL.2017 15:58:23



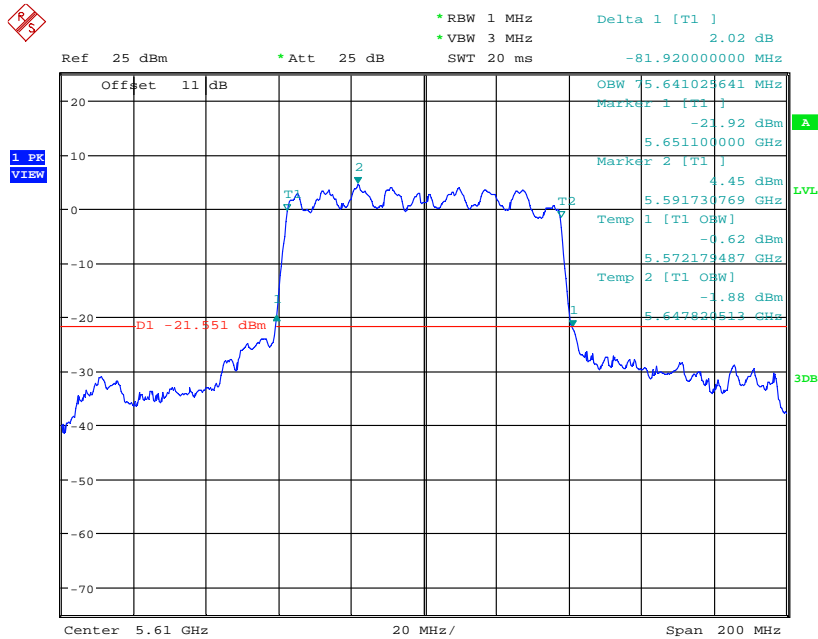
99% OBW & 26DB BANDWIDTH ANTI\_11n40\_CH134  
 Date: 7.JUL.2017 16:00:29



Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



99% OBW & 26DB BANDWIDTH ANT1\_11ac80\_CH106  
 Date: 7.JUL.2017 16:18:38

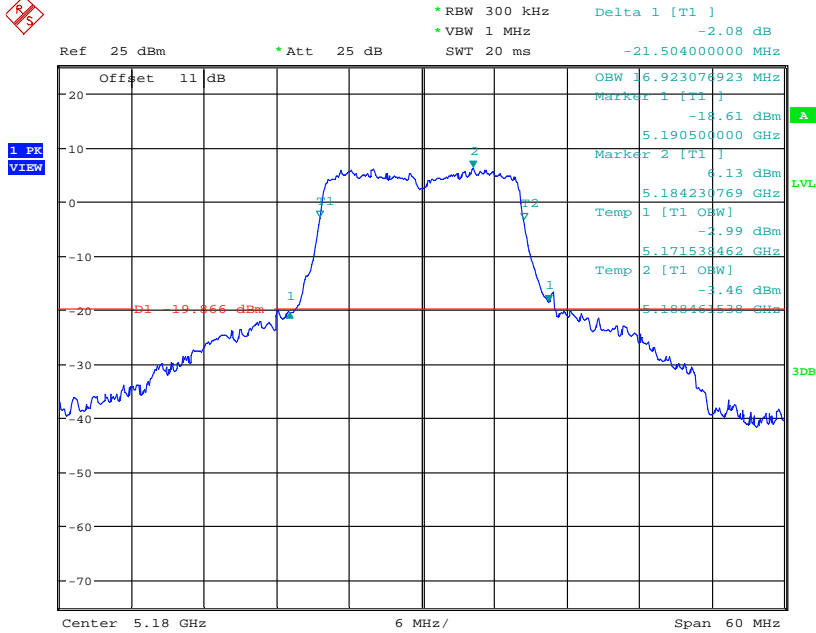


99% OBW & 26DB BANDWIDTH ANT1\_11ac80\_CH122  
 Date: 7.JUL.2017 16:23:46

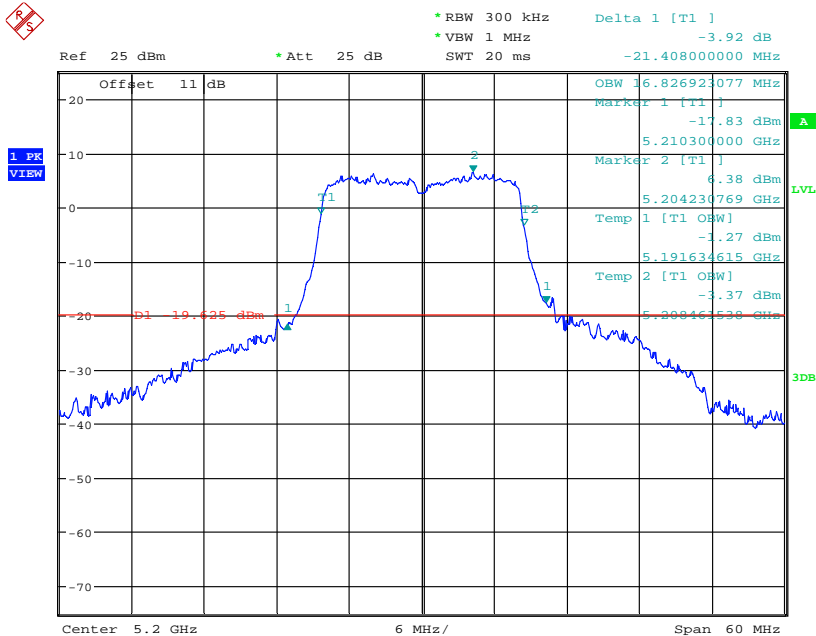


Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF

## ANTB 5.15 GHz ~ 5.25 GHz



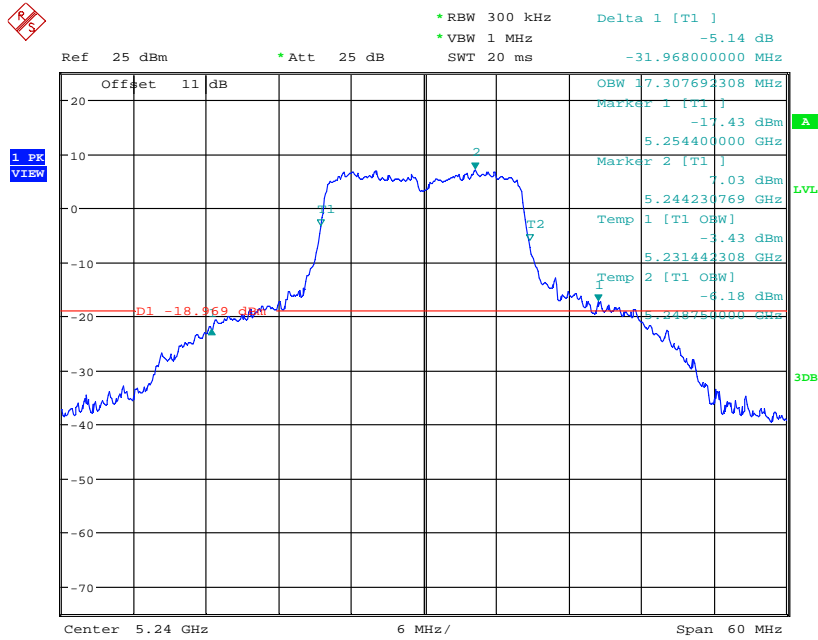
99% OBW & 26DB BANDWIDTH ANT2\_11a\_CH36  
 Date: 7.JUL.2017 13:19:54



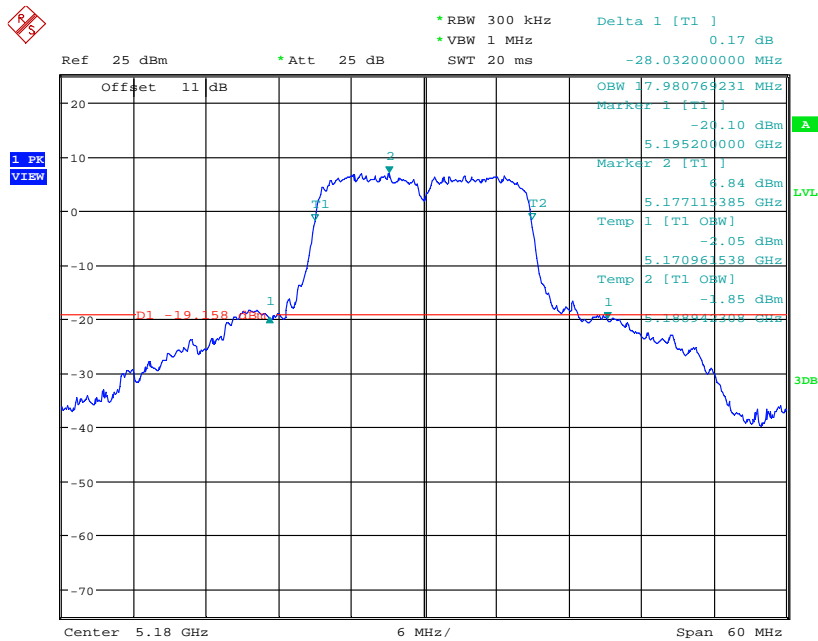
99% OBW & 26DB BANDWIDTH ANT2\_11a\_CH40  
 Date: 7.JUL.2017 13:22:56



Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



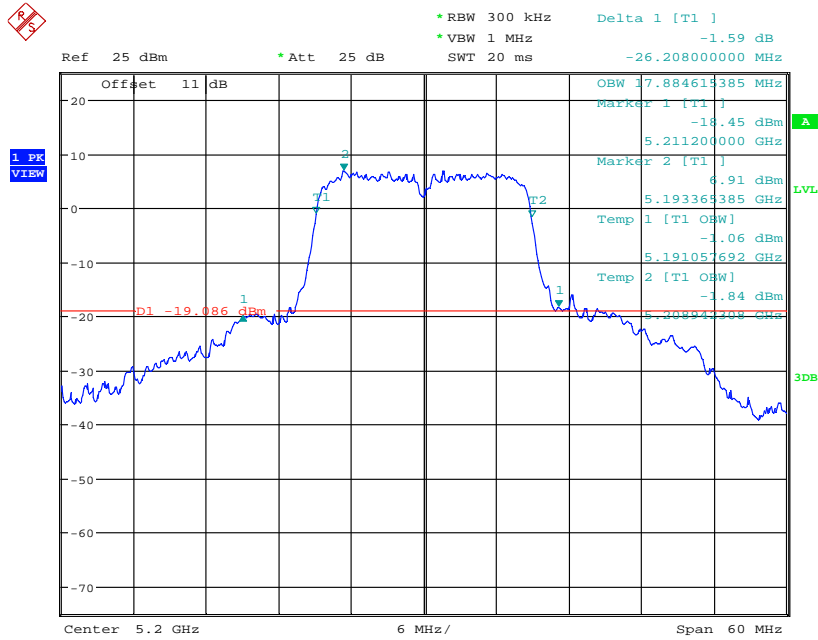
99% OBW & 26DB BANDWIDTH ANT2\_11a\_CH48  
 Date: 7.JUL.2017 13:28:48



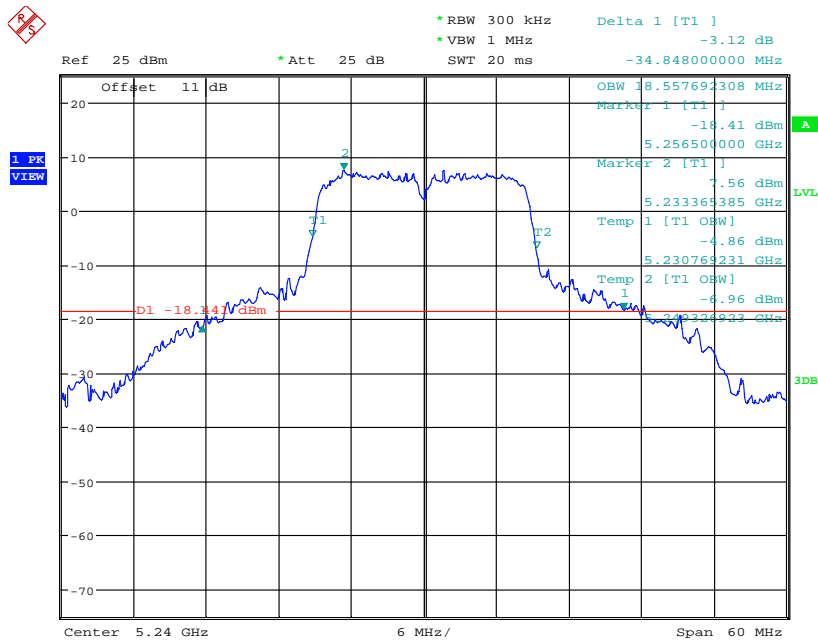
99% OBW & 26DB BANDWIDTH ANT2\_11n20\_CH36  
 Date: 7.JUL.2017 13:33:23



Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



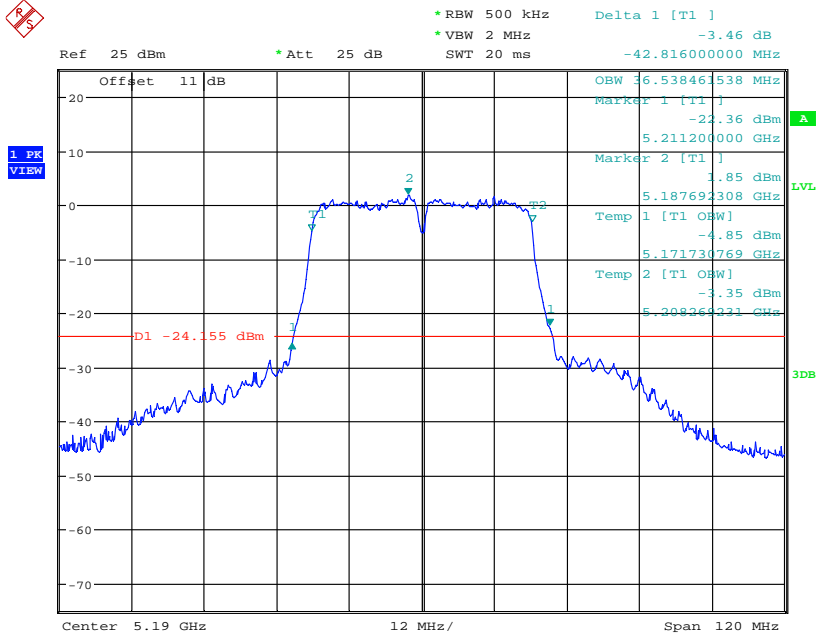
99% OBW & 26DB BANDWIDTH ANT2\_11n20\_CH40  
 Date: 7.JUL.2017 13:42:11



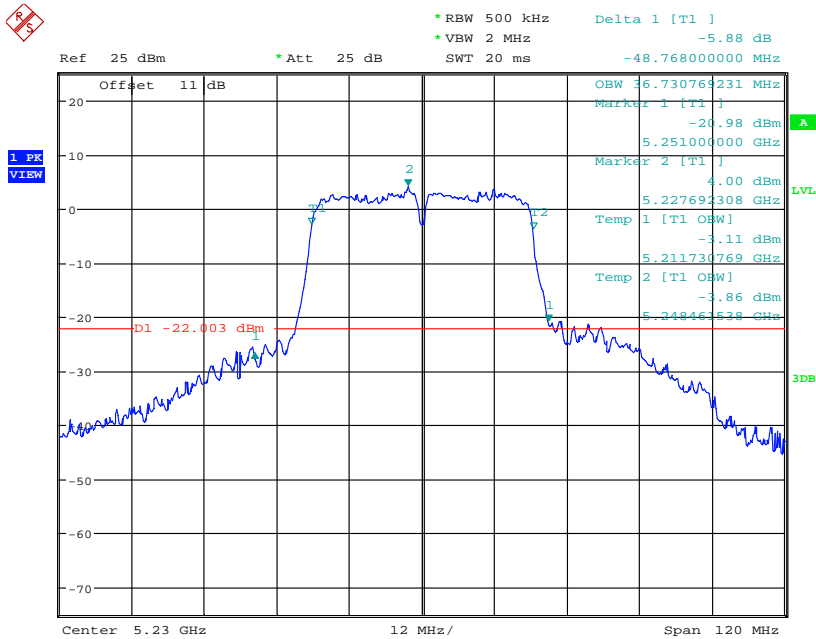
99% OBW & 26DB BANDWIDTH ANT2\_11n20\_CH48  
 Date: 7.JUL.2017 13:44:50



Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



99% OBW & 26DB BANDWIDTH ANT2\_11n40\_CH38  
 Date: 7.JUL.2017 13:50:31

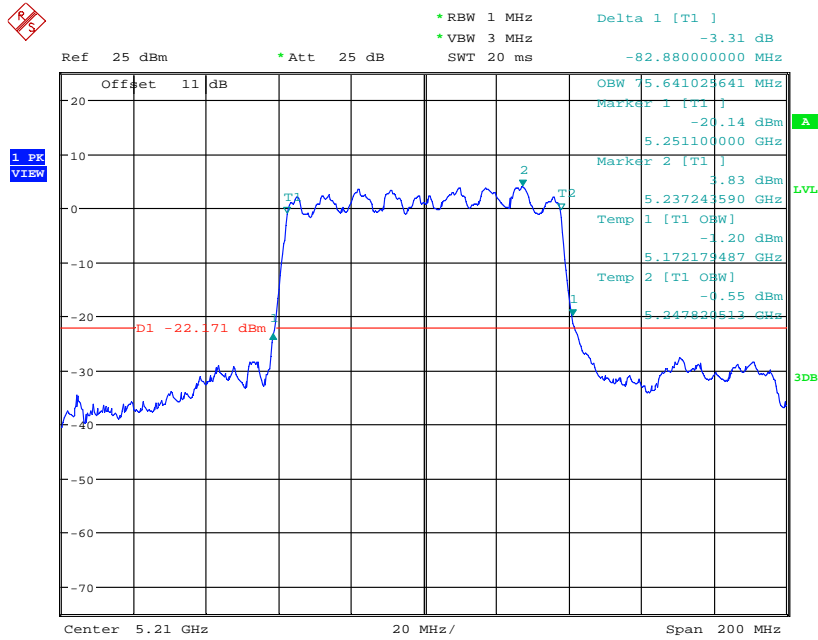


99% OBW & 26DB BANDWIDTH ANT2\_11n40\_CH46  
 Date: 7.JUL.2017 13:52:32



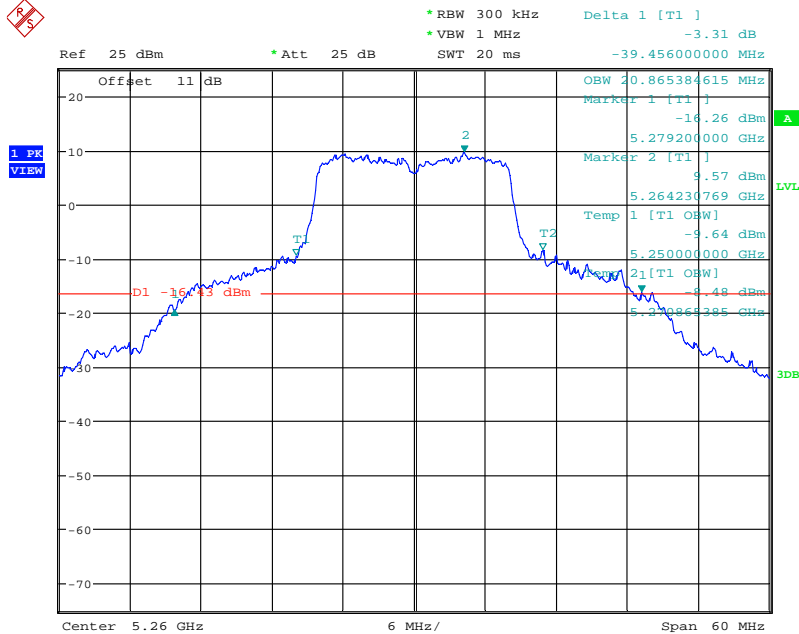


Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



99% OBW & 26DB BANDWIDTH ANT2\_11ac80\_CH42  
 Date: 7.JUL.2017 14:03:48

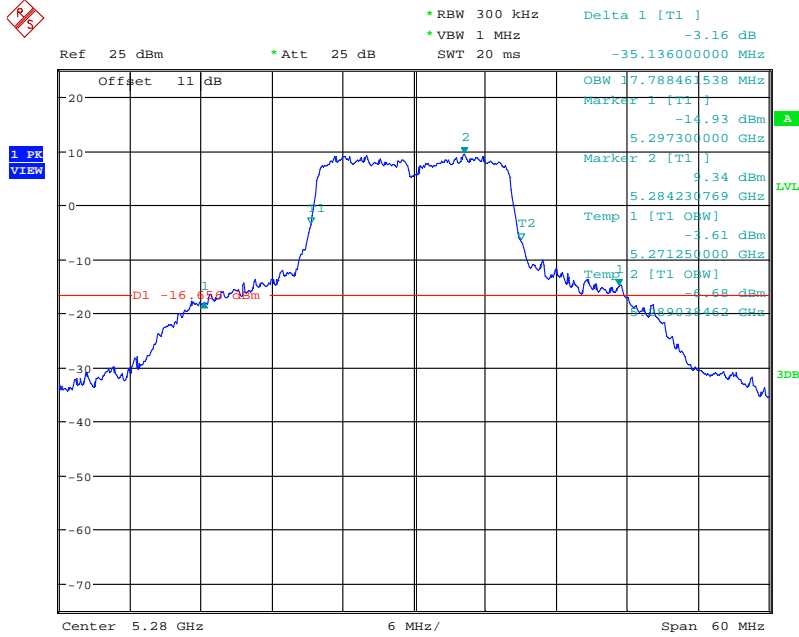
## 5.25 GHz ~ 5.35 GHz



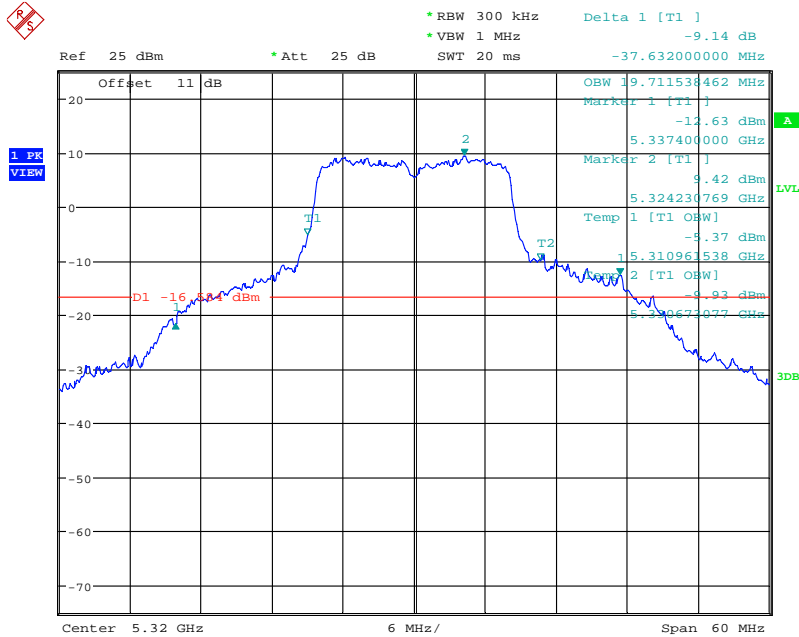
99% OBW & 26DB BANDWIDTH ANT2\_11a\_CH52  
 Date: 7.JUL.2017 14:08:23



Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



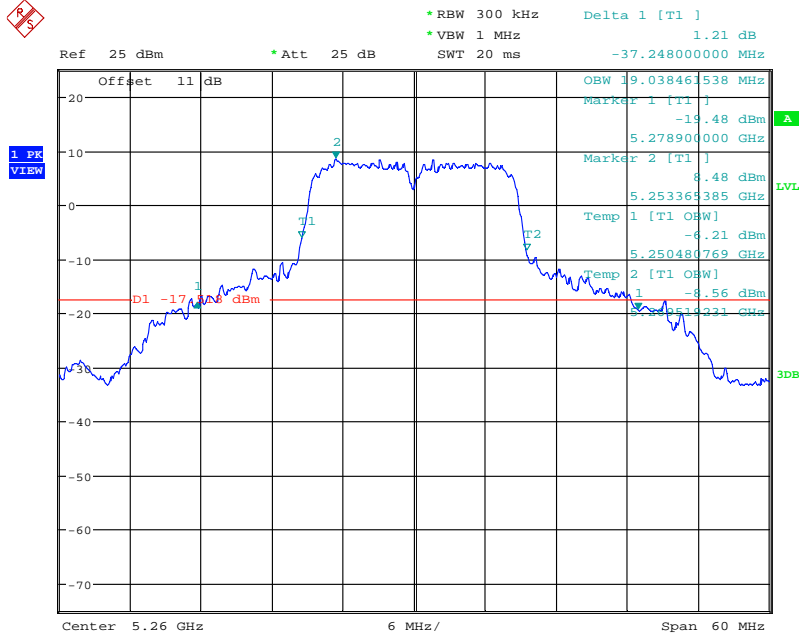
99% OBW & 26DB BANDWIDTH ANT2\_11a\_CH56  
 Date: 7.JUL.2017 14:14:48



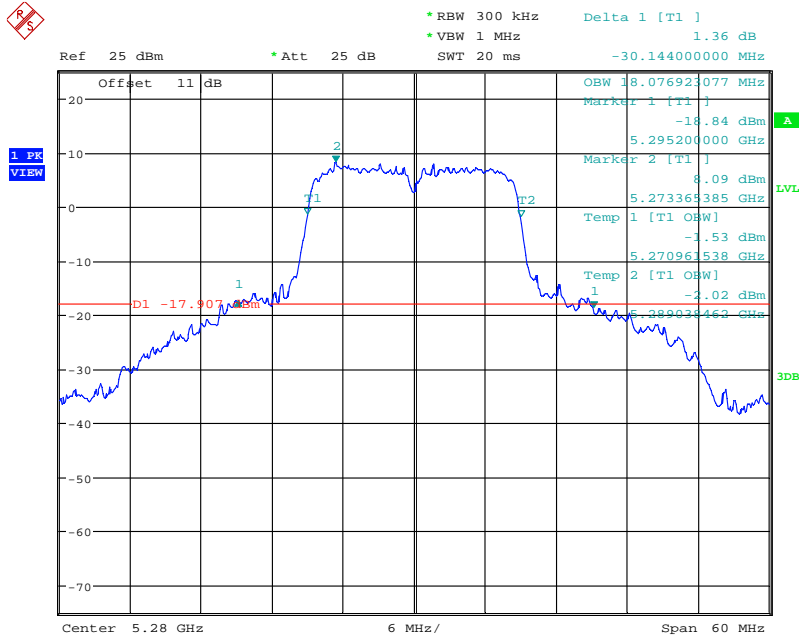
99% OBW & 26DB BANDWIDTH ANT2\_11a\_CH64  
 Date: 7.JUL.2017 14:19:07



Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



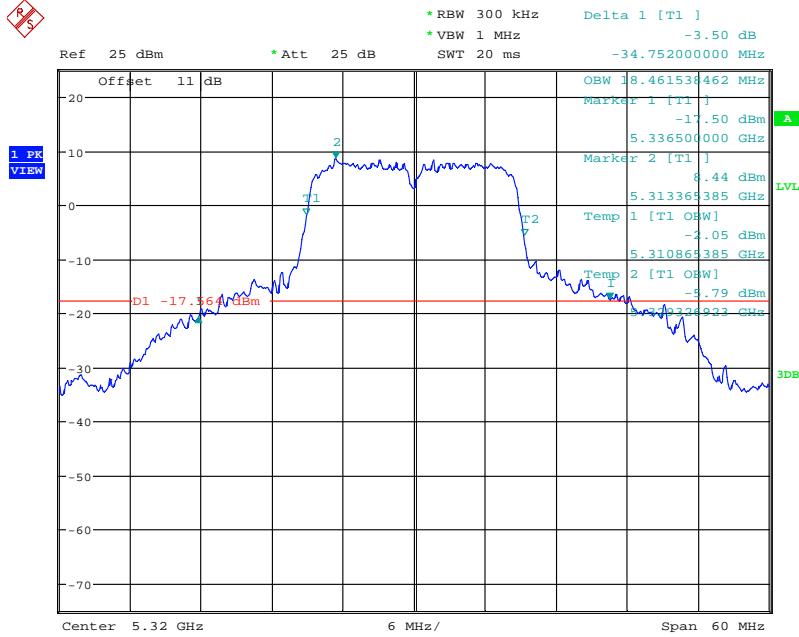
99% OBW & 26DB BANDWIDTH ANT2\_11n20\_CH52  
 Date: 7.JUL.2017 14:27:33



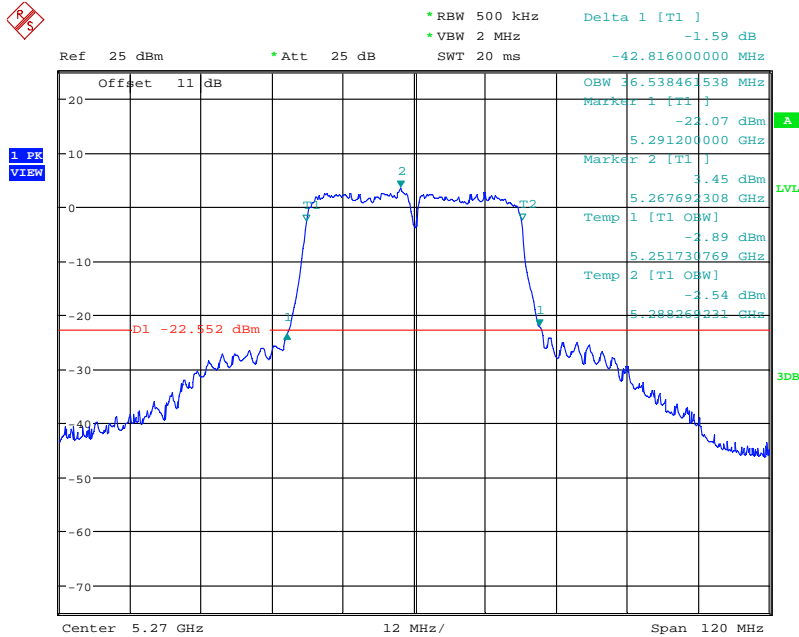
99% OBW & 26DB BANDWIDTH ANT2\_11n20\_CH56  
 Date: 7.JUL.2017 14:29:39



Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



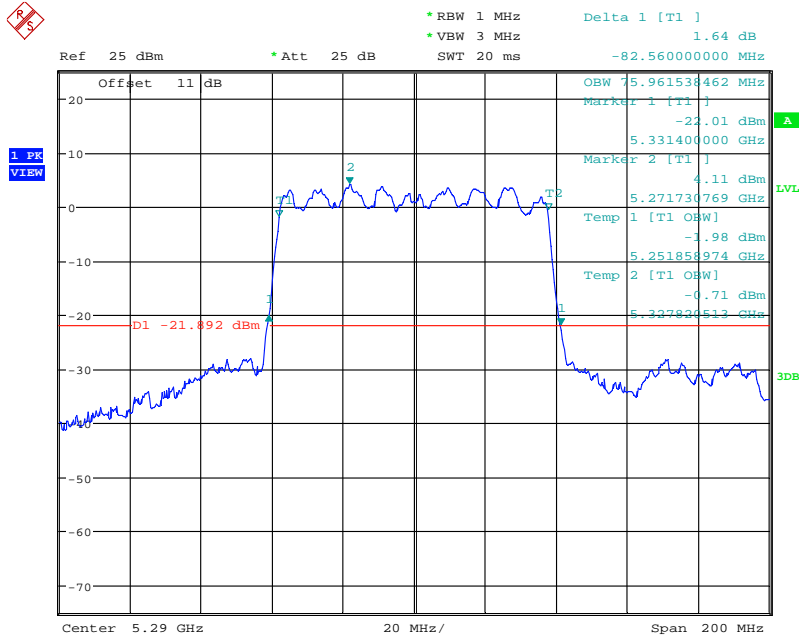
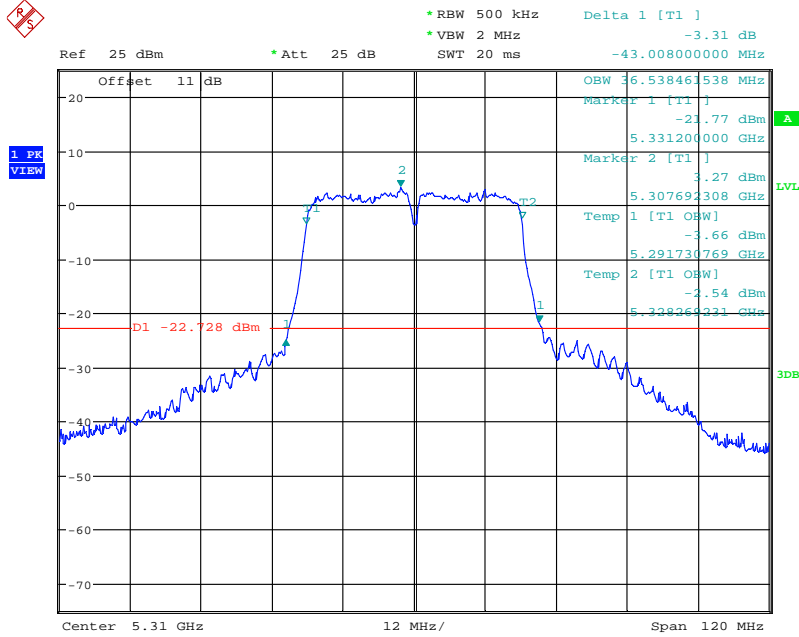
99% OBW & 26DB BANDWIDTH ANT2\_11n20\_CH64  
 Date: 7.JUL.2017 14:35:26



99% OBW & 26DB BANDWIDTH ANT2\_11n40\_CH54  
 Date: 7.JUL.2017 14:38:16



Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF

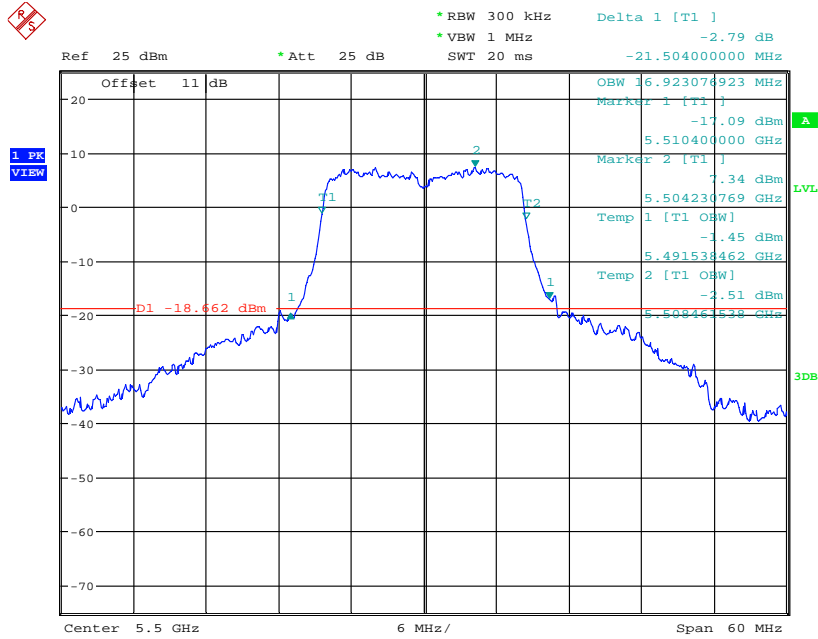




Registration number: W6M21706-17141-C-54

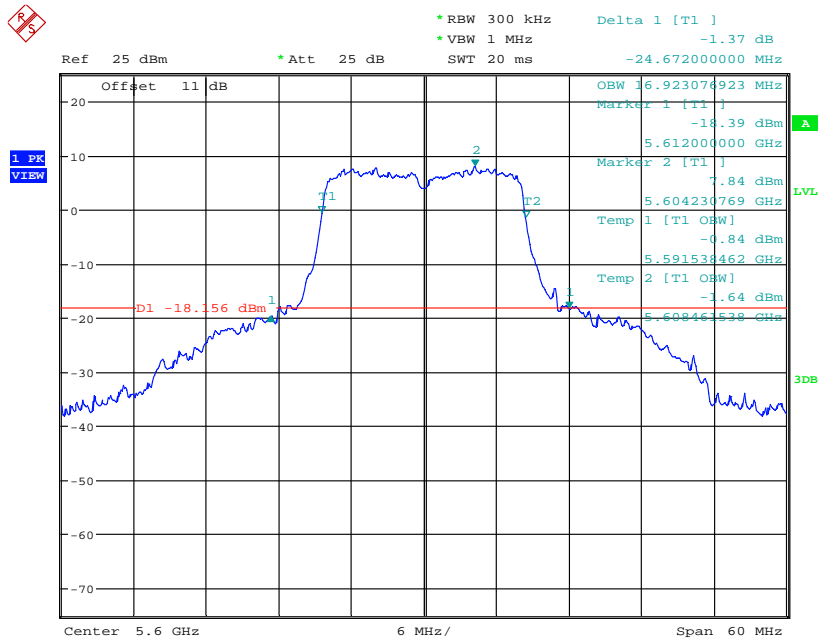
FCC ID: TLZ-CM308NF

## 5.47 GHz ~ 5.725 GHz



99% OBW & 26DB BANDWIDTH ANT2\_11a\_CH100

Date: 7.JUL.2017 14:59:54

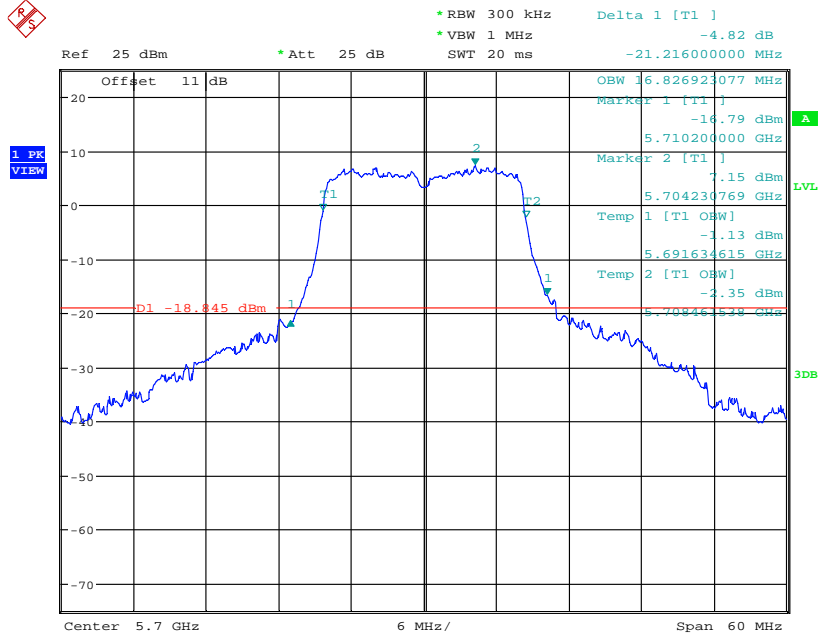


99% OBW & 26DB BANDWIDTH ANT2\_11a\_CH120

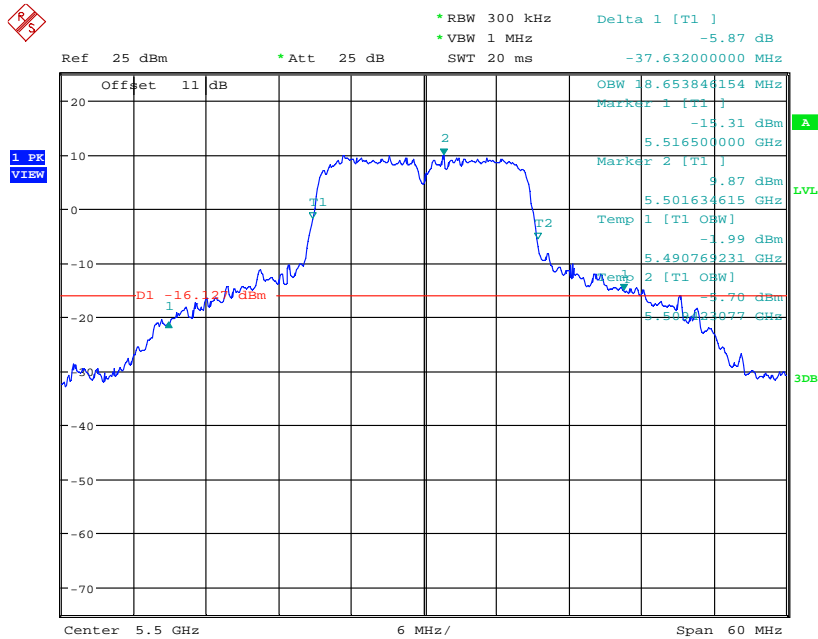
Date: 7.JUL.2017 15:02:06



Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



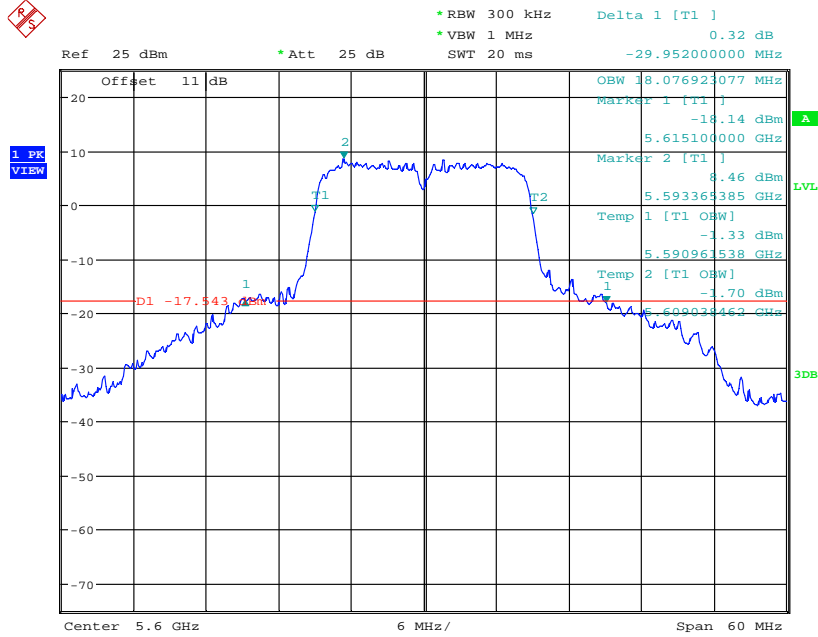
99% OBW & 26DB BANDWIDTH ANT2\_11a\_CH140  
 Date: 7.JUL.2017 15:34:33



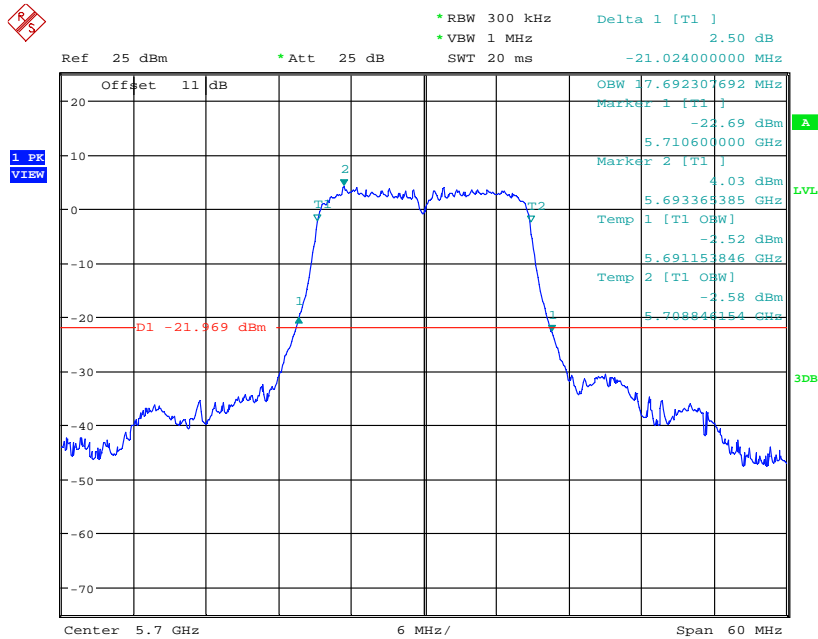
99% OBW & 26DB BANDWIDTH ANT2\_11n20\_CH100  
 Date: 7.JUL.2017 15:36:17



Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



99% OBW & 26DB BANDWIDTH ANT2\_11n20\_CH120  
 Date: 7.JUL.2017 15:45:16

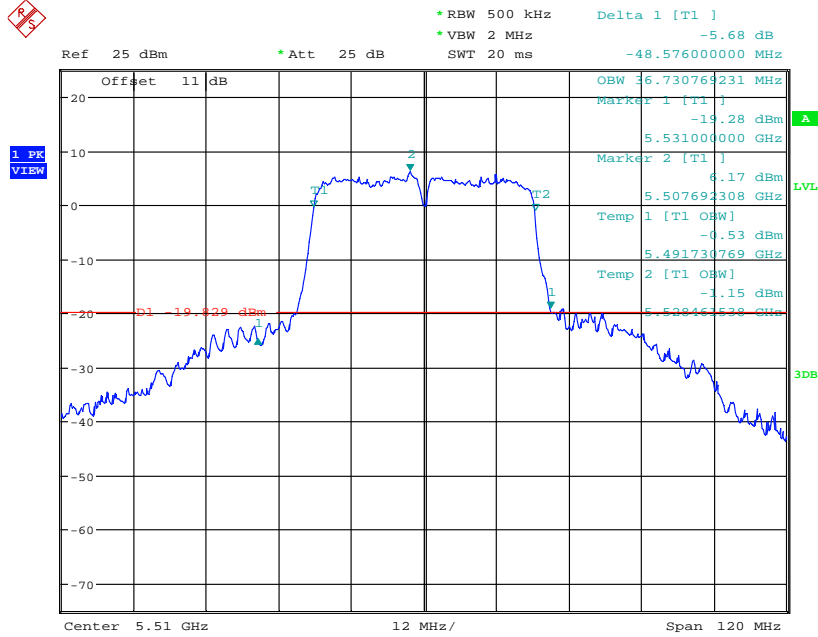


99% OBW & 26DB BANDWIDTH ANT2\_11n20\_CH140  
 Date: 7.JUL.2017 15:47:06

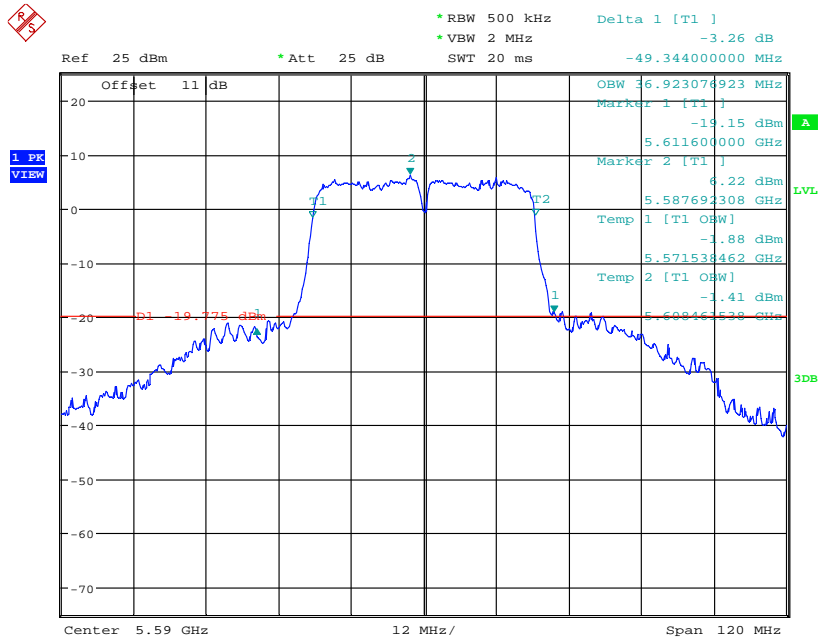




Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



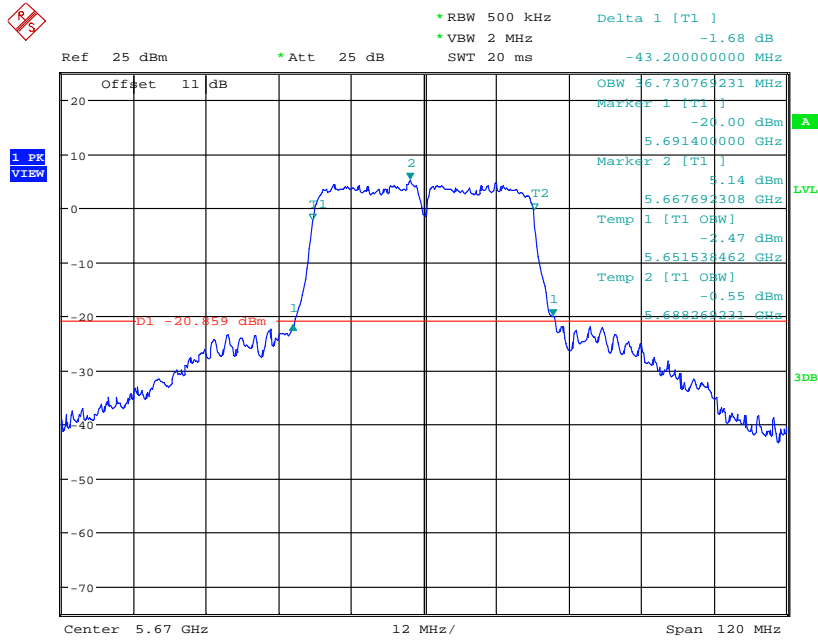
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 Date: 7.JUL.2017 15:54:32



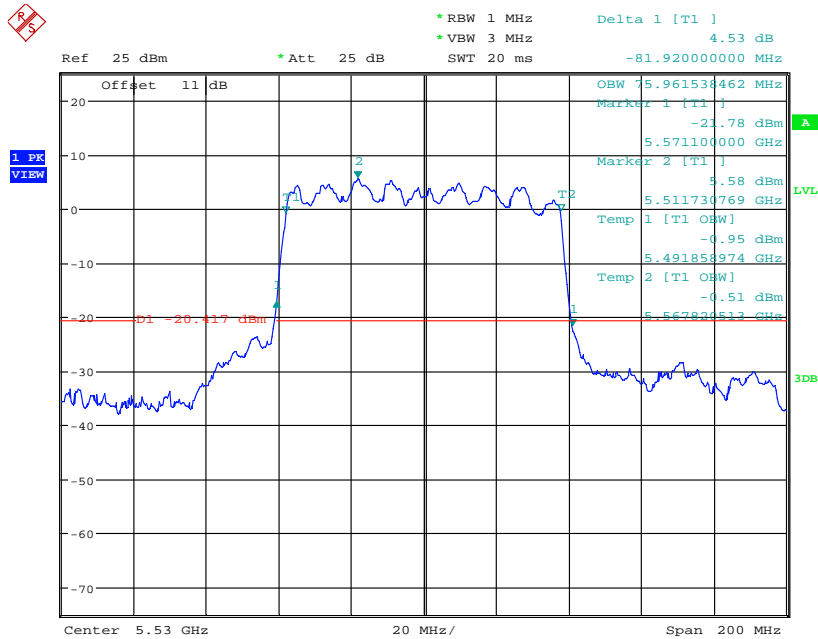
99% OBW & 26DB BANDWIDTH ANT2\_11n40\_CH118  
 Date: 7.JUL.2017 15:56:22



Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



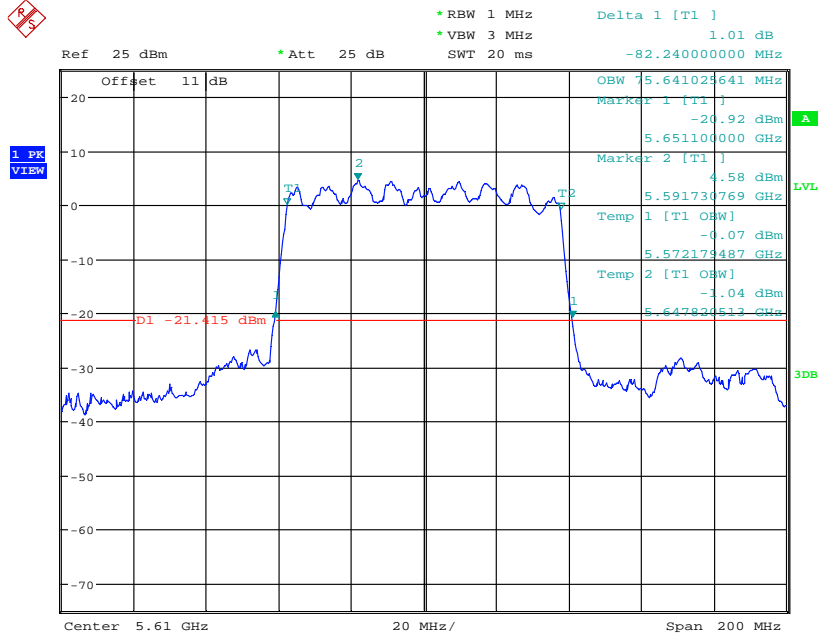
99% OBW & 26DB BANDWIDTH ANT2\_11n40\_CH134  
 Date: 7.JUL.2017 16:02:08



99% OBW & 26DB BANDWIDTH ANT2\_11ac80\_CH106  
 Date: 7.JUL.2017 16:06:54



Registration number: W6M21706-17141-C-54  
 FCC ID: TLZ-CM308NF



99% OBW & 26DB BANDWIDTH ANT2\_11ac80\_CH122  
 Date: 7.JUL.2017 16:27:15

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