FCC PART 15 SUBPART E TEST REPORT

For

Outdoor Long Range 802.11a/n 5GHz Wi-Fi

AP/CPE/Bridge

Model No.: LP-2596K

FCC ID:VYTLP2596KUS

of

Applicant: **Loopcomm Technology,.Inc.**
Address: **6F., No. 236, Bo'ai St., Shulin Dist., New Taipei City 23845 Taiwan**

Tested and Prepared

by

Worldwide Testing Services (Taiwan) Co., Ltd.

FCC Registration No.: 930600

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

A2LA Accredited No.: 2732.01

Report No.: W6M21410-14572-C-54

6F, NO. 58, LANE 188, RUEY-KUANG RD., NEIHU TAIPEI 114, TAIWAN, R.O.C.
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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 is performance generally conforms to representative cases of communications equipment.

The test results of this test report relate exclusively to the item tested as specified in 1.5.
The test report may only be reproduced or published in full.
Reproduction or publication of extracts from the report requires the prior written approval of the Worldwide Testing Services(Taiwan) Co., Ltd.

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

Tester:

December 03, 2014		Mark Cheng	Mark Cheng.
Date	WTS-Lab.	Name	Signature

Technical responsibility for area of testing:

December 03, 2014		Kevin Wang	Kevin Wang
Date	WTS	Name	Signature

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

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.
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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:	Loopcomm Technology,.Inc.
Street:	6F., No. 236, Bo'ai St., Shulin Dist.,
Town:	New Taipei City 23845
Country:	Taiwan
Telephone:	+886-2-86869685
Fax:	+886-2-86869687

1.4 Application details

Date of receipt of test item:	October 23, 2014
Date of test:	from October 24, 2014 to December 02, 2014

1.5 General information of Test item

Type of test item:	Outdoor Long Range 802.11a/n 5GHz Wi-Fi AP/CPE/Bridge
Model Number:	LP-2596K
Brand Name:	Loopcomm
Multi-listing model number:	LP-2596B, LP-2596E, LP-2596X(X=A~Z,0~9,Blank)
Photos:	see Appendix

Technical data

Frequency band:	5250 MHz ~ 5350 MHz / 5470 MHz ~ 5725 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
Numbers of channel:	802.11a: 4 channels 802.11n 20 MHz: 4 channels 802.11n 40 MHz: 2 channels
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
Numbers of channel:	802.11a: 8 channels 802.11n 20 MHz: 8 channels 802.11n 40 MHz: 3 channels
Operating modes:	duplex
Type of modulation:	OFDM
Fixed point to point operation:	Yes / No
Antenna:	PCB printed Antenna
Antenna gain:	ANT0: 14 dBi /ANT1: 14 dBi
Directional gain:	17.01 dBi

*According to KDB 662911 D01 Multiple Transmitter Output v02r01, Cross-polarized antennas with NANT = 2. In the case of a transmitter with only two outputs driving a pair of antennas that are cross-polarized (e.g., vertical and horizontal or left-circular and right-circular), directional gain is the gain of an individual antenna. If the two antennas have different gains, the larger gain applies.

Power supply:	24 VDC
Emission designator:	802.11a: 16M9D1D 802.11n 20 MHz: 18M0D1D 802.11n 40 MHz: 36M4D1D

Note: Tests were performed under worst case mode 802.11a 54 Mbps, 802.11n 20 MHz (MCS15) and 802.11n 40 MHz (MCS15).

Classification:

Fixed Device	☒
Mobile Device (Human Body distance ＞ 20cm)	☐
Portable Device (Human Body distance ＜ 20cm)	☐

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

Manufacturer: (if applicable)	
Name:	./.
Street:	./.
Town:	./.
Country:	./.

1.6 Test standards

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

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:	24 VDC

2.3 Test Equipment List

No.	Test equipment	Type	Serial No.	Manufacturer	Cal. Date	Next Cal. Date
ETSTW-CE 001	EMI TEST RECEIVER	ESHS10	842121/013	R&S	2014/9/2	2015/9/1
ETSTW-CE 003	AC POWER SOURCE	APS-9102	D161137	GW	Function Test	
ETSTW-CE 008	HF-EICHLEITUNG RF STEP ATTENUATOR 139dB DPSP	334.6010.02	844581/024	R&S	Function Test	
ETSTW-CE 009	TEMP.&HUMIDITY CHAMBER	GTH-225-40-1P-U	MAA0305-009	GIANT FORCE	2014/7/8	2015/7/7
ETSTW-CE 016	TWO-LINE V-NETWORK	ENV216	100050	R&S	2014/10/13	2015/10/12
ETSTW-RE 004	EMI TEST RECEIVER	ESI 40	832427/004	R&S	2014/9/2	2015/9/1
ETSTW-RE 005	EMI TEST RECEIVER	ESVS10	843207/020	R&S	2014/9/2	2015/9/1
ETSTW-RE 012	TUNABLE BANDREJECT FILTER	D.C 0309	146	K&L	Function Test	
ETSTW-RE 013	TUNABLE BANDREJECT FILTER	D.C 0336	397	K&L	Function Test	
ETSTW-RE 018	MICROWAVE HORN ANTENNA	AT4560	27212	AR	2014/10/15	2015/10/14
ETSTW-RE 027	Passive Loop Antenna	6512	00034563	ETS-Lindgren	2014/7/01	2015/6/30
ETSTW-RE 030	Double-Ridged Guide Horn Antenna	3117	00035224	ETS-Lindgren	2014/2/25	2015/2/24
ETSTW-RE 045	ESA-E SERIES SPECTRUM ANALYZER	E4404B	MY45111242	Agilent	Pre-test Use	
ETSTW-RE 049	TRILOG Super Broadband test Antenna	VULB 9160	9160-3185	Schwarzbeck	2014/2/18	2015/2/17
ETSTW-RE 050	Attenuator 10dB	50HF-010-1	None	JFW	2014/3/3	2015/3/2
ETSTW-RE 051	Attenuator 6dB	50HF-006-1	None	JFW	2014/3/3	2015/3/2
ETSTW-RE 053	Attenuator 3dB	50HF-003-1	None	JFW	2014/3/3	2015/3/2
ETSTW-RE 055	SPECTRUM ANALYZER	FSU 26	200074	R&S	2014/6/05	2015/6/04
ETSTW-RE 060	Attenuator 30dB	5015-30	F651012z-01	ATM	2014/3/3	2015/3/2
ETSTW-RE 062	Amplifier Module	CHC 2	None	KMIC	2014/11/26	2015/11/25
ETSTW-RE 064	Bluetooth Test Set	MT8852B-042	6K00005709	Anritsu	Function Test	
ETSTW-RE 069	Double-Ridged Guide Horn Antenna	3117	00069377	ETS-Lindgren	Function Test	
ETSTW-RE 072	CELL SITE TEST SET	8921A	3339A00375	HP	2014/10/9	2015/10/8
ETSTW-RE 088	SOLID STATE AMPLIFIER	KMA180265A01	99057	KMIC	2014/9/22	2015/9/21
ETSTW-RE 099	DC Block	50DB-007-1	None	JFW	2014/3/3	2015/3/2
ETSTW-RE 106	Humidity Temperature Meter	TES-1366	091011113	TES	2014/11/7	2015/11/6
ETSTW-RE 111	TRILOG Super Broadband test Antenna	VULB 9160	9160-3309	Schwarz beck	2013/12/27	2014/12/26
ETSTW-RE 112	AC POWER SOURCE	TFC-1005	None	T-Power	Function test	
ETSTW-RE 115	2.4GHz Notch Filter	N0124411	473874	MICROWAVE CIRCUITS	2014/1/10	2015/1/09
ETSTW-RE 120	RF Player	MP9200	MP9210-111022	ADIVIC	Function test	
ETSTW-RE 122	SIGNAL GENERATOR	SMF100A	102149	R&S	2014/6/11	2015/6/10
ETSTW-RE 125	5GHz Notch filter	5NSL11-5200/E221.3-O/O	1	K&L Microwave	2014/8/12	2015/8/11

ETSTW-RE 126	5GHz Notch filter	5NSL11-5800/E221.3-O/O	1	K&L Microwave	2014/8/12	2015/8/11
ETSTW-RE 127	RF Switch Box	RFS-01	None	WTS	2014/3/3	2015/3/2
ETSTW-RE 128	5.3GHz Notch filter	N0153001	SN487233	Microwave Circits	2014/8/12	2015/8/11
ETSTW-RE 129	5.5GHz Notch filter	N0555984	SN487234	Microwave Circits	2014/8/12	2015/8/11
ETSTW-RE 130	Handheld RF Spectrum Analyzer	N9340A	CN0147000204	Agilent	Pre-test Use	
ETSTW-RE 133	EXA Signal Analyzer	N9010A	MY53470566	Agilent	2014/3/10	2015/3/09
ETSTW-RE 134	RF Vector Signal Generator	N5182B	MY53050664	Agilent	2014/3/17	2015/3/16
ETSTW-GSM 002	Universal Radio Communication Tester	CMU 200	109439	R&S	2014/10/20	2015/10/19
ETSTW-GSM 019	Band Reject Filter	WRCTF824/849-822/851-40 /12+9SS	3	WI	2014/1/10	2015/1/09
ETSTW-GSM 020	Band Reject Filter	WRCD1747/1748-1743/1752-32/5SS	1	WI	2014/1/10	2015/1/09
ETSTW-GSM 021	Band Reject Filter	WRCD1879.5/1880.5-1875.5/1884.5-32/5SS	3	WI	2014/1/10	2015/1/09
ETSTW-GSM 022	Band Reject Filter	WRCT901.9/903.1-904.25-50/8SS	1	WI	2014/1/10	2015/1/09
ETSTW-GSM 023	Power Divider	4901.19.A	None	SUHNER	2014/9/17	2015/9/16
ETSTW-Cable 010	BNC Cable	5 M BNC Cable	None	JYE BAO CO.,LTD.	2014/10/15	2015/10/14
ETSTW-Cable 011	BNC Cable	BNC Cable 1	None	JYE BAO CO.,LTD.	Pre-test Use NCR	
ETSTW-Cable 012	N TYPE To SMA Cable	Cable 012	None	JYE BAO CO.,LTD.	2014/10/15	2015/10/14
ETSTW-Cable 016	BNC Cable	Switch Box	B Cable 1	Schwarz beck	2014/2/27	2015/2/26
ETSTW-Cable 017	BNC Cable	X Cable	B Cable 2	Schwarz beck	2014/2/27	2015/2/26
ETSTW-Cable 018	BNC Cable	Y Cable	B Cable 3	Schwarz beck	2014/2/27	2015/2/26
ETSTW-Cable 019	BNC Cable	Z Cable	B Cable 4	Schwarz beck	2014/2/27	2015/2/26
ETSTW-Cable 022	N TYPE Cable	5006	0002	JYE BAO CO.,LTD.	2014/2/19	2015/2/18
ETSTW-Cable 026	Microwave Cable	SUCOFLEX 104	279075	HUBER+SUHNER	2014/3/3	2015/3/2
ETSTW-Cable 027	Microwave Cable	SUCOFLEX 104	279083	HUBER+SUHNER	2014/3/3	2015/3/2
ETSTW-Cable 028	Microwave Cable	FA147A0015M2020	30064-2	UTIFLEX	2014/9/22	2015/9/21
ETSTW-Cable 029	Microwave Cable	FA147A0015M2020	30064-3	UTIFLEX	2014/9/22	2015/9/21
ETSTW-Cable 030	Microwave Cable	SUCOFLEX 104（S_Cable 9）	279067	HUBER+SUHNER	2014/3/3	2015/3/2
ETSTW-Cable 031	Microwave Cable	SUCOFLEX 104（S_Cable 10）	238092	HUBER+SUHNER	2014/11/26	2015/11/25
ETSTW-Cable 043	Microwave Cable	SUCOFLEX 104	317576	HUBER+SUHNER	2014/11/26	2015/11/25
ETSTW-Cable 047	Microwave Cable	SUCOFLEX 104	325518	HUBER+SUHNER	2014/11/26	2015/11/25
ETSTW-Cable 053	N TYPE To SMA Cable	RG142	None	JYE BAO CO.,LTD.	2014/2/19	2015/2/18
ETSTW-Cable 058	Microwave Cable	SUCOFLEX 104	none	HUBER+SUHNER	2014/2/19	2015/2/18
WTSTW-SW 002	EMI TEST SOFTWARE	EZ_EMC	None	Farad	Version ETS-03A1	

2.4 Test Procedure

The test procedures are performed following the test stands ANSI STANDARD C63.4 and FCC KDB 789033 D01 General UNII Test Procedures Old Rules v01r04 .

■ Emission bandwidth

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW > RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

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 26-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 26-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 ≥ 3 · 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.

- Maximum conducted output power

1. Set span to encompass the entire 26-dB emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.
2. Set RBW = 1 MHz.
3. Set VBW ≥ 3 MHz.
4. Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
5. Sweep time = auto.
6. Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
7. 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 ≥ 98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run".
8. Trace average at least 100 traces in power averaging (i.e., RMS) mode.
9. Compute power by integrating the spectrum across the 26 dB 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 26 dB EBW (or, alternatively, the entire 99% occupied bandwidth) of the spectrum.

- Power Density

1. Create an average power spectrum for the EUT operating mode being tested by following the instructions in section 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.

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 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 PPSD.

5. The above procedures make use of 1 MHz resolution bandwidth to satisfy the 1 MHz measurement bandwidth specified in the 15.407(a)(5). That rule section also permits use of resolution bandwidths less than 1 MHz "provided that the measured power is integrated to show the total power over the measurement bandwidth" (i.e., 1 MHz). If measurements are

performed using a reduced resolution bandwidth and integrated over 1 MHz bandwidth, the following adjustments to the procedures apply:

a) Set RBW ≥ 1/T, where T is defined in section B)1)a).
b) Set VBW ≥ 3 RBW.
c) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

■ Peak Excursion

1. Compliance with the peak excursion requirement of Section 15.407(a)(6) shall be demonstrated by confirming that the ratio of the maximum of the peak-max-hold spectrum to the maximum of the average spectrum for continuous transmission does not exceed 13 dB. (Earlier procedures that required computing the ratio of the two spectra at each frequency across the emission bandwidth can lead to unintended failures at band edges and will no longer be required.) The following guidance for limiting the number of tests applies only to peak excursion measurements:

   a) Testing each modulation mode on a single channel in a single operating band is sufficient to demonstrate compliance with the peak excursion requirement. (If all modulation modes are not available on a single channel in a single band, then testing must be extended to other channels and bands as needed to ensure that all modulation modes are tested.)

   b) Tests must include all variations in signal structure, such as:
   (i) All signal types (e.g., direct sequence spread spectrum (DSSS) and OFDM);
   (ii) All modulation types (e.g., BPSK, QPSK, 16-QAM, 64-QAM, and 256-QAM);
   (iii) All bandwidth modes;
   All variations in signal parameters (e.g., changes in subcarrier spacing or number of subcarriers).

   c) For a given signal structure, testing of multiple error-correction coding rates is not required (e.g., 1/2, 2/3, and 3/4 rate codes).

   d) For MIMO devices, testing of a single output port is sufficient to demonstrate compliance with the peak excursion requirement. If a given signal structure can be exercised with various combinations of spatial multiplexing (such as different numbers of spatial streams), beamforming, and cyclic delay diversity, peak excursion tests are not required to include those variations.

2. Set the spectrum analyzer or EMI receiver span to view the entire emission bandwidth.

3. Find the maximum of the peak-max-hold spectrum.
a) Set RBW = 1 MHz.
b) VBW ≥ 3 MHz.
c) Trace mode = max-hold.
d) Allow the sweeps to continue until the trace stabilizes.
e) Use the peak search function to find the peak of the spectrum.
f)
4. Use the procedure found under F) to measure the PPSD.
5. Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD.

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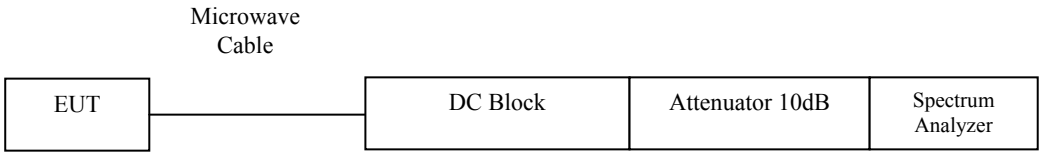
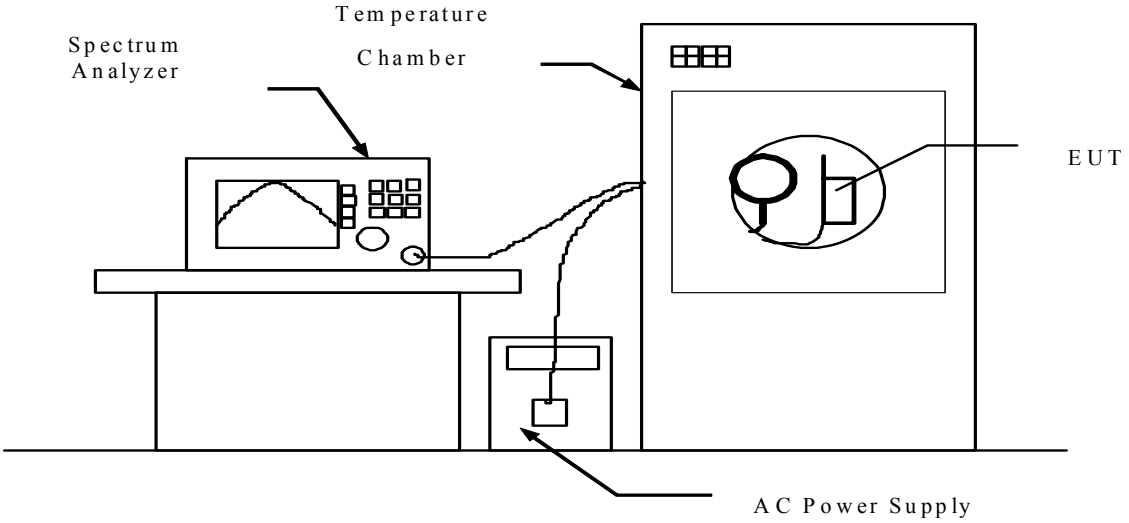
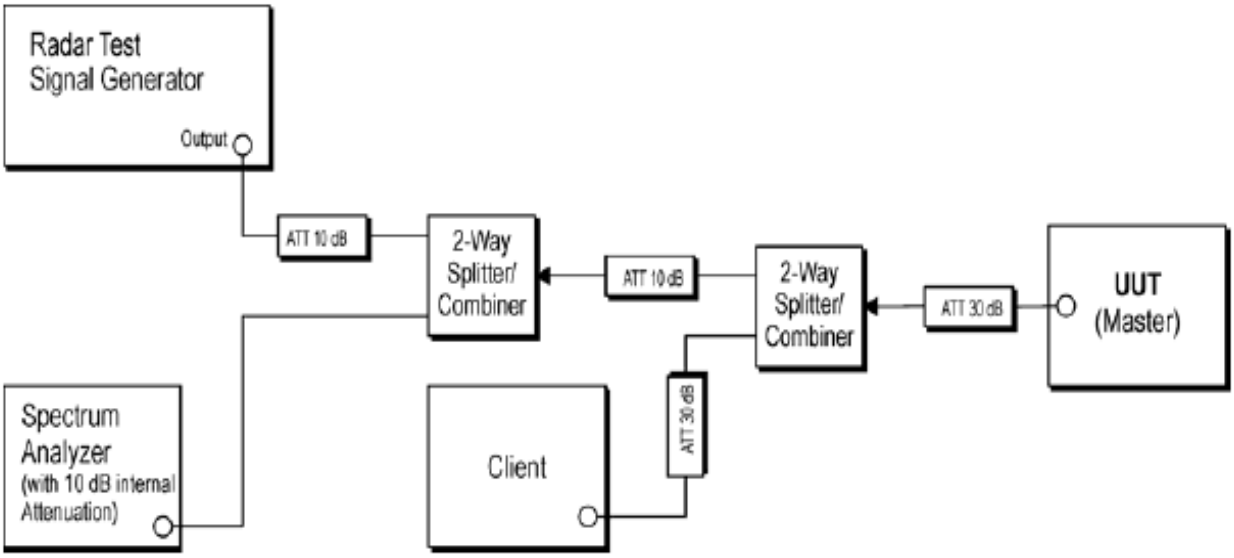
Conducted measurement test setup



Frequency Stability test setup



Setup for Master with injection at the Master



3 Test results (enclosure)

Test case	Para. Number	Required	Test passed	Test failed
Peak Transmit Power	15.407(a)	☒	☒	☐
26-dB emission bandwidth	15.407(a)	☒	☒	☐
99 % Occupied Bandwidth	KDB 789033 D01 General UNII Test Procedures	☒	☒	☐
Peak Power Spectral Density	15.407(a)	☒	☒	☐
Ratio of Peak Excursion of the modulation envelope	15.407(a)(6)	☒	☒	☐
Undesirable emission limits	15.407(b)	☒	☒	☐
Radio Frequency Exposure	15.407(f)	☒	☒	☐
Frequency Stability	15.407(g)	☒	☒	☐
Transmit Power Control	15.407(h)	☐	☐	☐
Dynamic Frequency Selection (DFS)	15.407(h)	☒	☒	☐
Radiated Emission from Receiver Part	15.109	☐	☐	☐
AC Conducted Emissions	15.207	☒	☒	☐

The following is intentionally left blank.

3.1 Peak Transmit Power, FCC 15.407 (a)

According to §15.407(a)

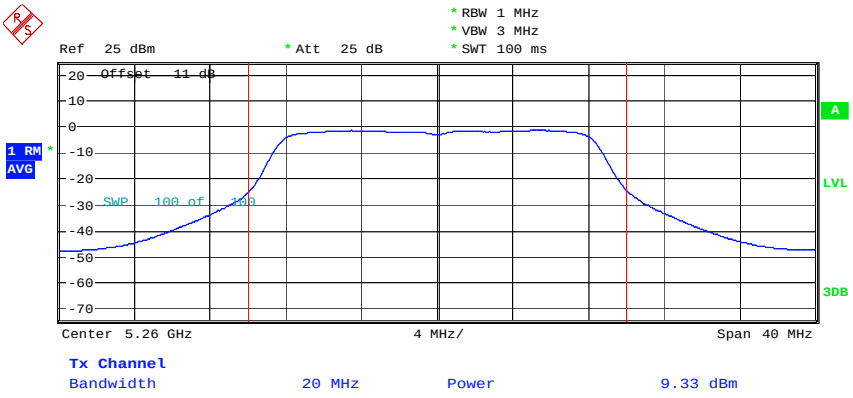
1. For the band 5.15-5.25 GHz, the maximum conducted power over the frequency of operation shall not exceed the lesser of 50 mW (17dBm) or 4 dBm + 10log B.

2. For the band 5.25-5.35 GHz and 5.47-5.725GMHz, the maximum conducted power over the frequency of operation shall not exceed the lesser of 250 mW (24dBm) or 11 dBm + 10log B.

3. For the band 5.725-5.825 GHz, the maximum conducted power over the frequency of op-eration shall not exceed the lesser of 1W (30dBm) or 17 dBm + 10log B.

where B is the 26-dB emission bandwidth in MHz.

Band 2
ANT 0



MAXIMUM CONDUCTED POWER CDD ANT0_aCH52
Date: 4.NOV.2014 16:54:21

Registration number: W6M21410-14572-C-54
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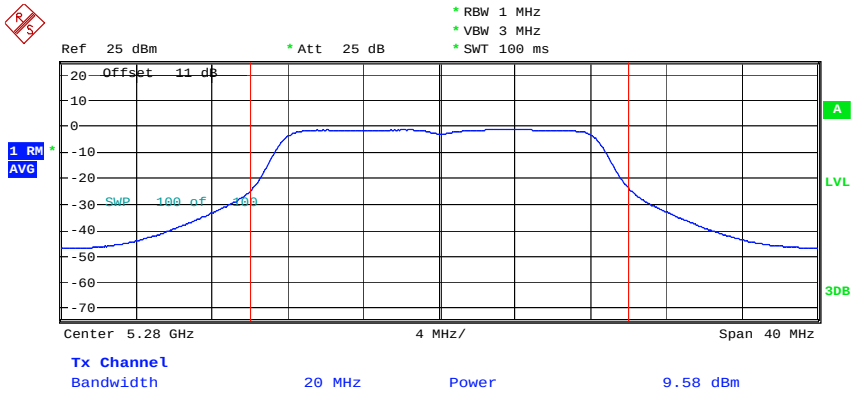

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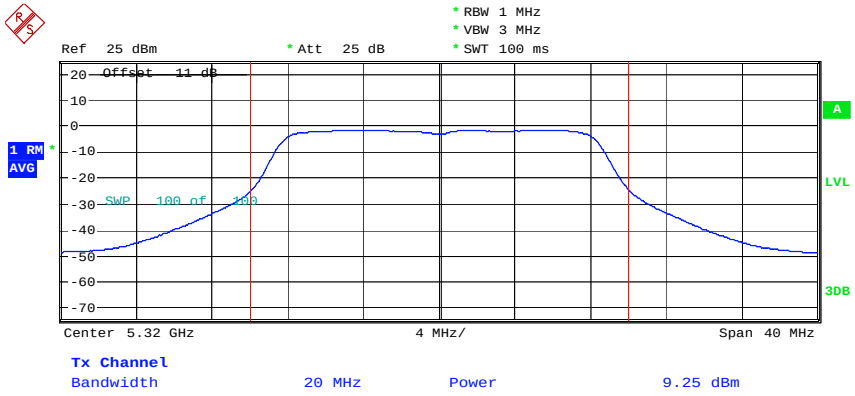
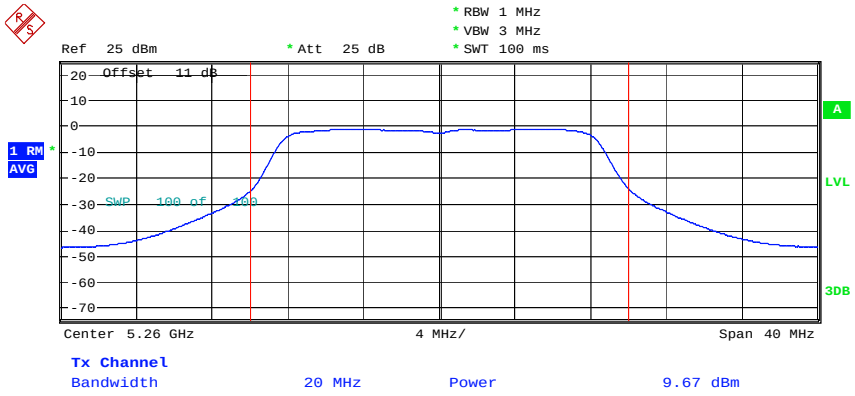
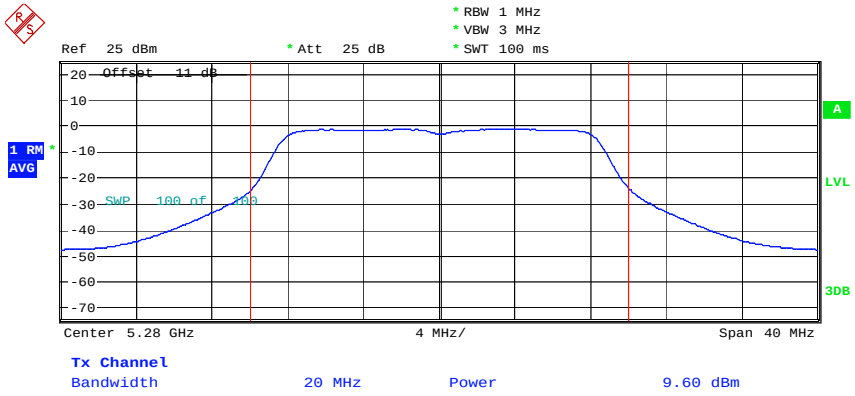


MAXIMUM CONDUCTED POWER CDD ANT0_aCH64
Date: 4.NOV.2014 17:41:44

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

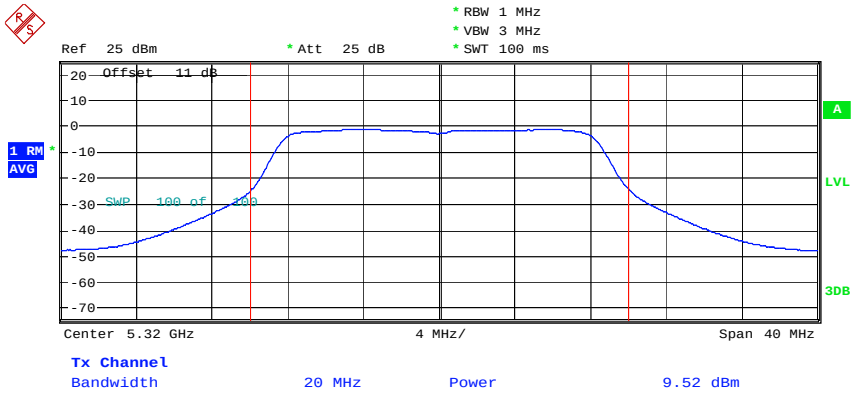


MAXIMUM CONDUCTED POWER CDD ANT0_VHT20CH52
Date: 4.NOV.2014 16:59:44

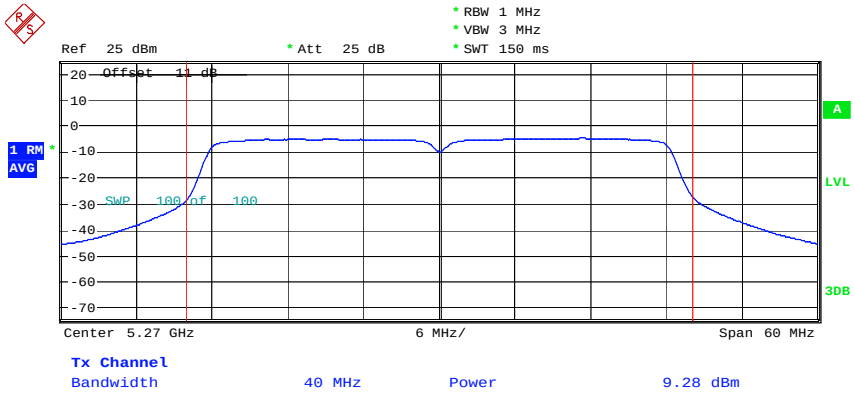


MAXIMUM CONDUCTED POWER CDD ANT0_VHT20CH56
Date: 4.NOV.2014 17:28:54

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

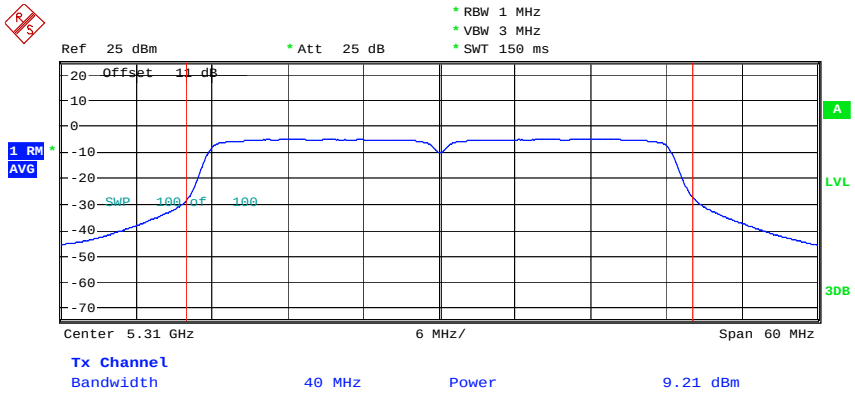


MAXIMUM CONDUCTED POWER CDD ANT0_VHT20CH64
Date: 4.NOV.2014 17:37:18



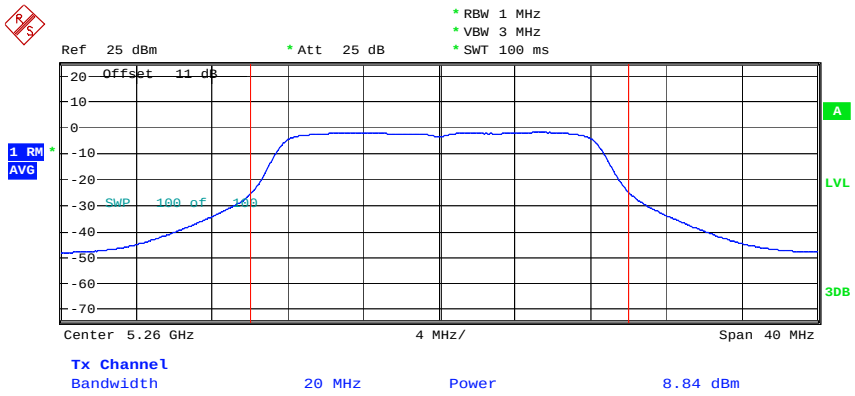
MAXIMUM CONDUCTED POWER CDD ANT0_VHT40CH54
Date: 4.NOV.2014 17:52:43

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS



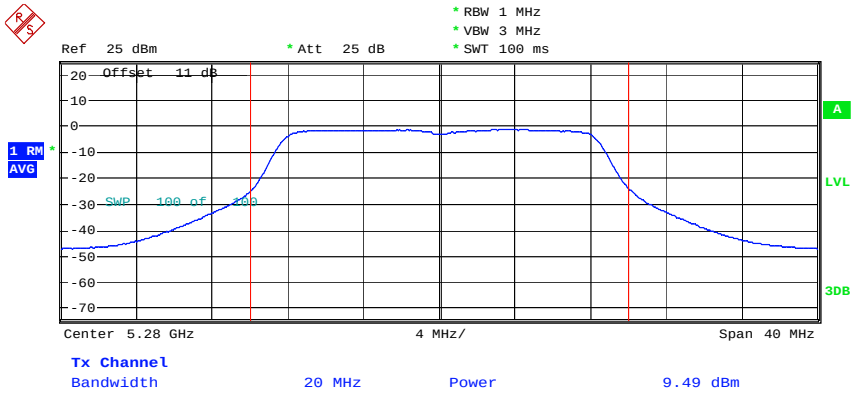
MAXIMUM CONDUCTED POWER CDD ANT0_VHT40CH62
Date: 4.NOV.2014 17:57:34

ANT 1

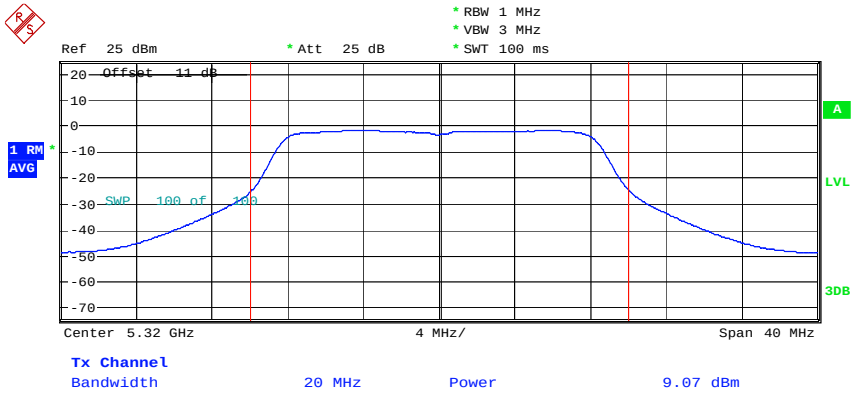


MAXIMUM CONDUCTED POWER CDD ANT1_aCH52
Date: 4.NOV.2014 16:54:43

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

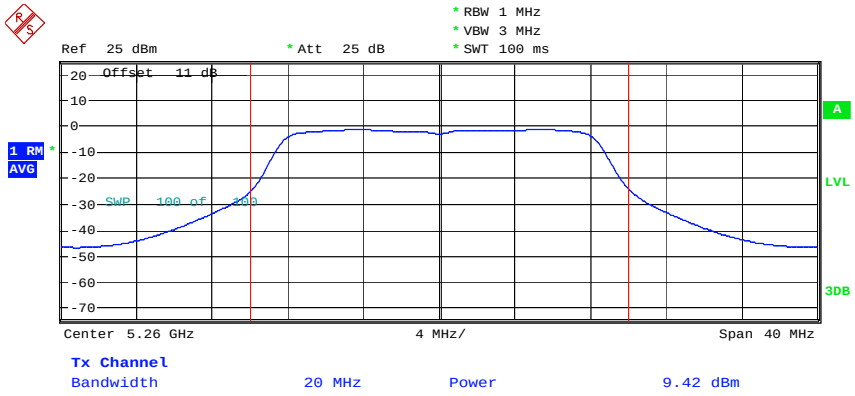


MAXIMUM CONDUCTED POWER CDD ANT1_aCH56
Date: 4.NOV.2014 17:11:59

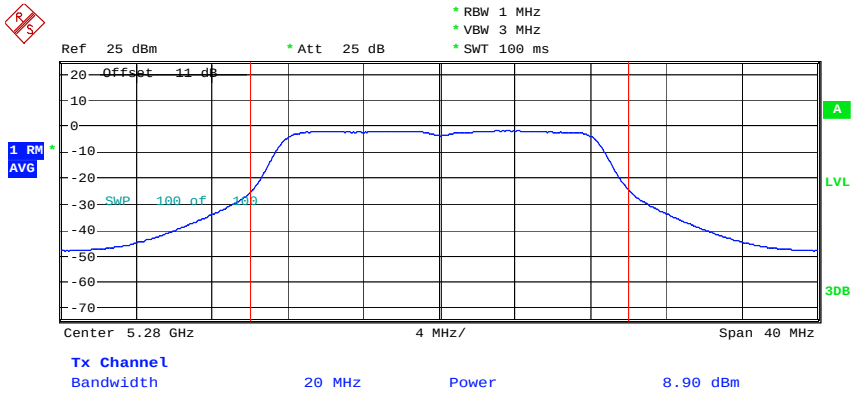


MAXIMUM CONDUCTED POWER CDD ANT1_aCH64
Date: 4.NOV.2014 17:42:05

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

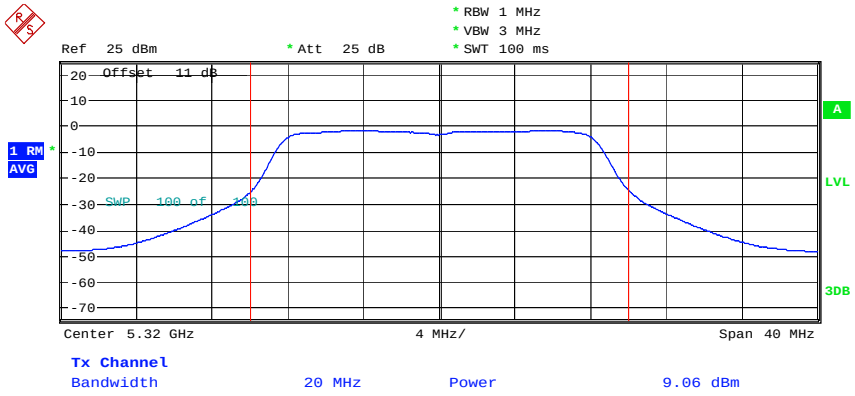


MAXIMUM CONDUCTED POWER CDD ANT1_VHT20CH52
Date: 4.NOV.2014 17:00:26

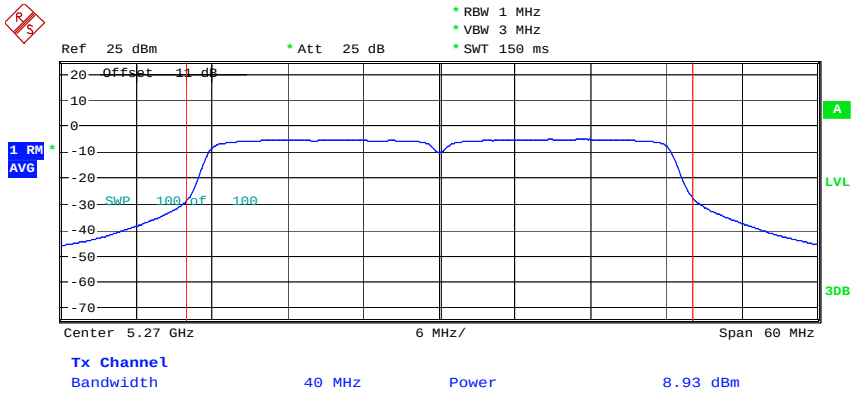


MAXIMUM CONDUCTED POWER CDD ANT1_VHT20CH56
Date: 4.NOV.2014 17:29:29

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

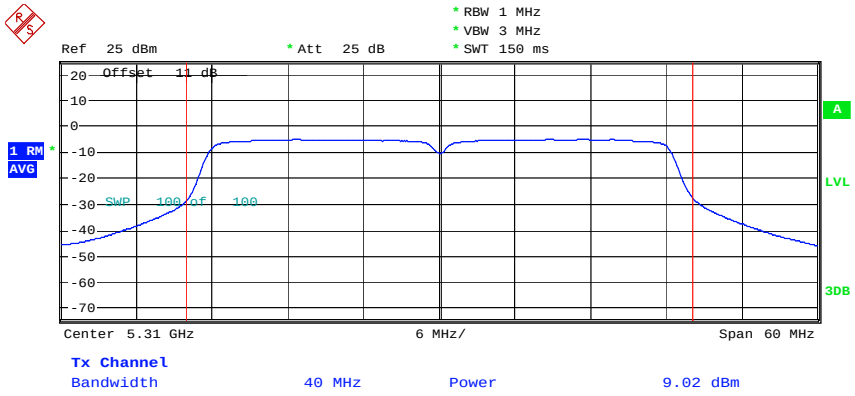


MAXIMUM CONDUCTED POWER CDD ANT1_VHT20CH64
Date: 4.NOV.2014 17:37:39



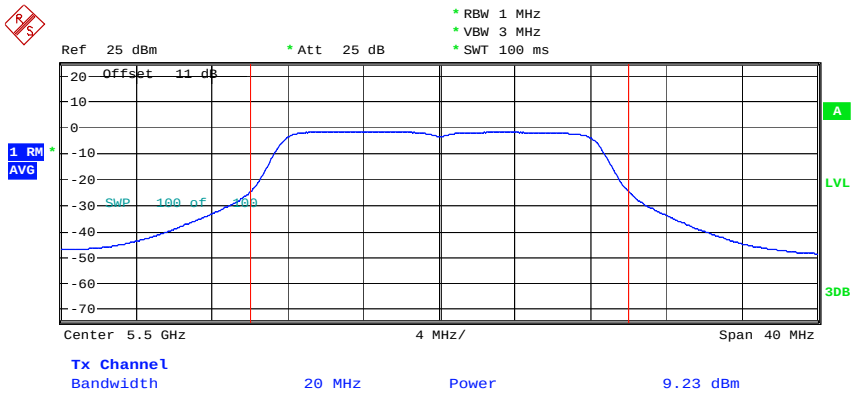
MAXIMUM CONDUCTED POWER CDD ANT1_VHT40CH54
Date: 4.NOV.2014 17:53:13

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS



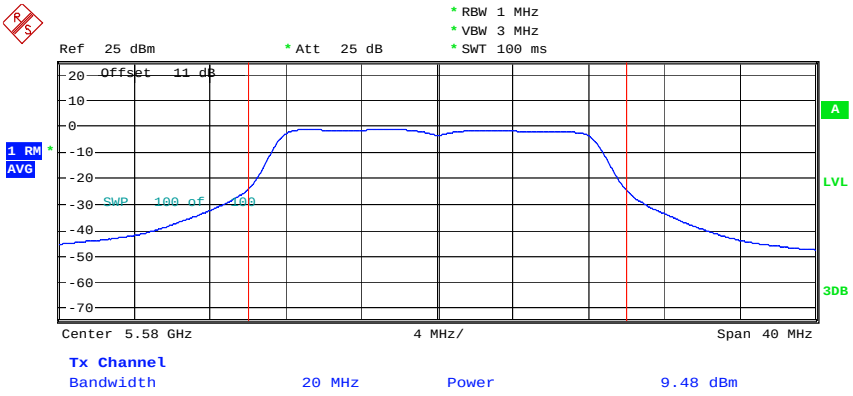
MAXIMUM CONDUCTED POWER CDD ANT1_VHT40CH62
Date: 4.NOV.2014 17:58:03

Band 3
ANT 0

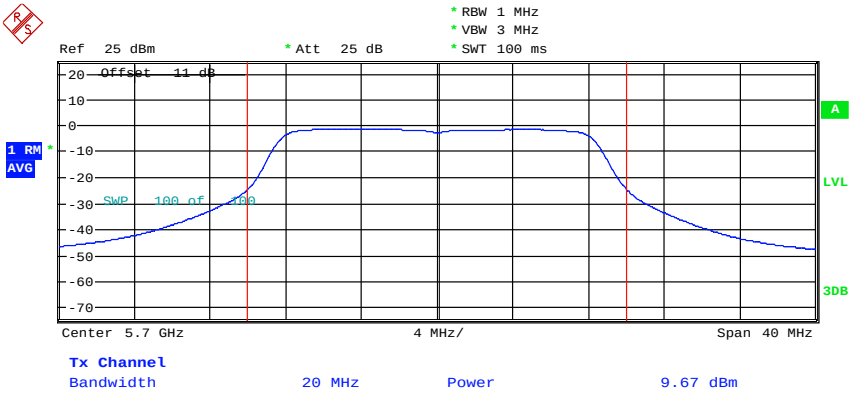


MAXIMUM CONDUCTED POWER CDD ANT0_aCH100
Date: 4.NOV.2014 13:33:19

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

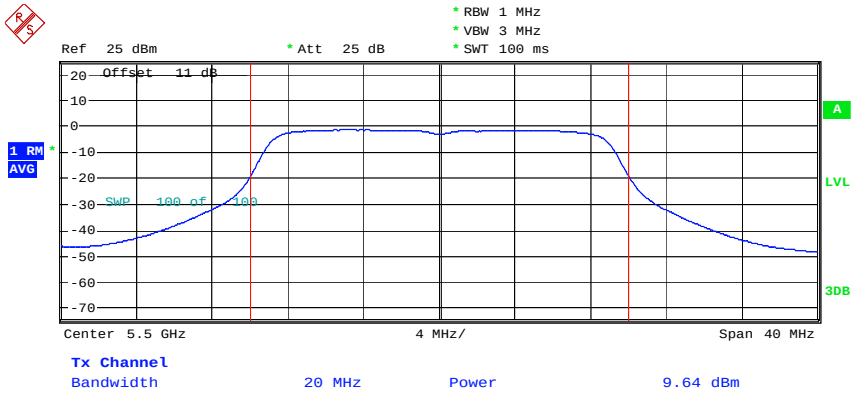


MAXIMUM CONDUCTED POWER CDD ANT0_aCH116
Date: 26.NOV.2014 18:04:45

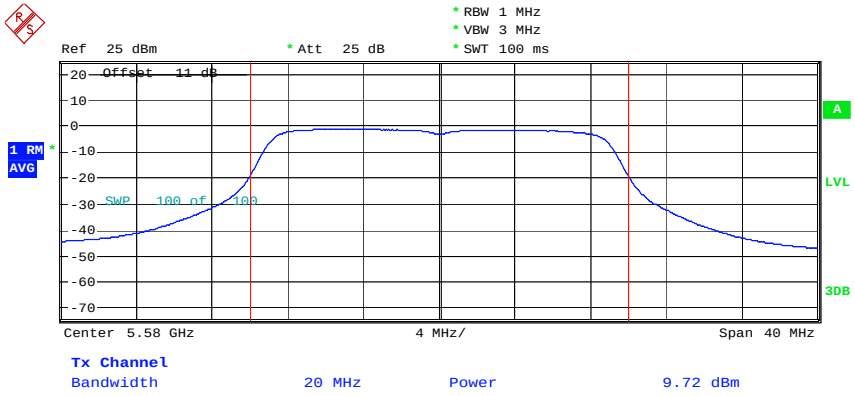


MAXIMUM CONDUCTED POWER CDD ANT0_aCH140
Date: 2.DEC.2014 09:33:21

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

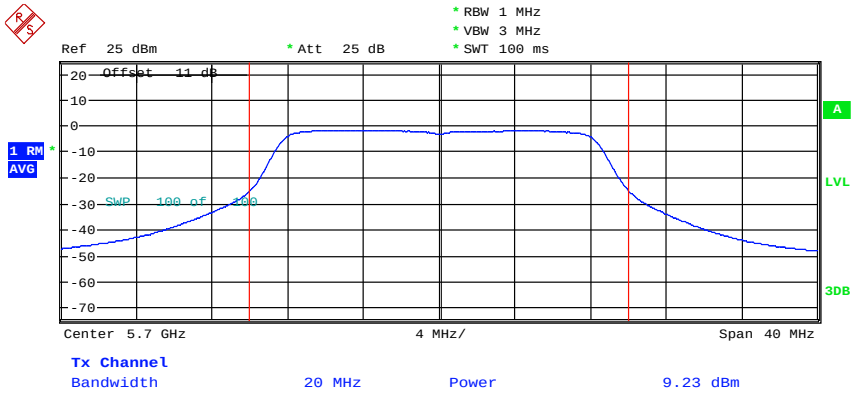


MAXIMUM CONDUCTED POWER CDD ANT0_VHT20CH100
Date: 4.NOV.2014 14:13:07



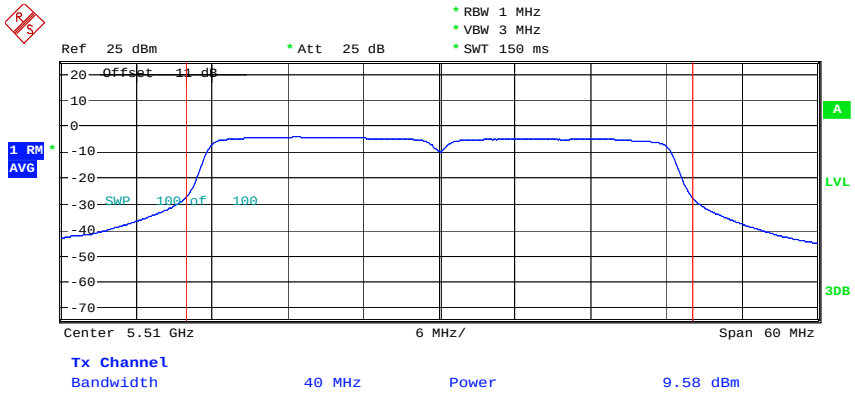
MAXIMUM CONDUCTED POWER CDD ANT0_VHT20CH116
Date: 26.NOV.2014 18:00:54

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS



MAXIMUM CONDUCTED POWER CDD ANT0_VHT20CH140

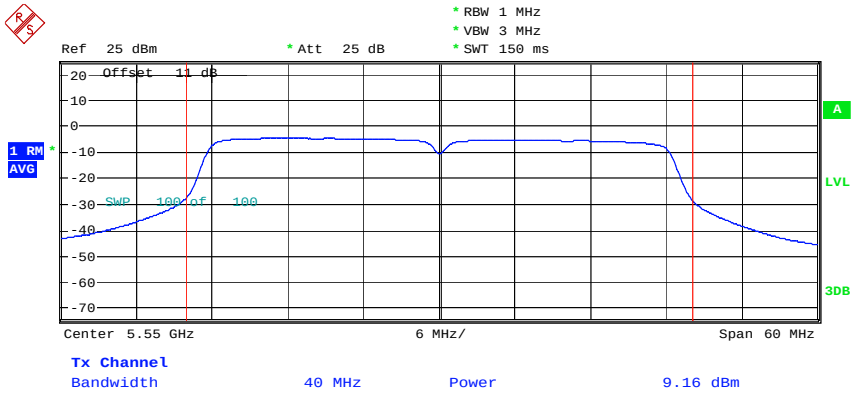
Date: 2.DEC.2014 09:37:26



MAXIMUM CONDUCTED POWER CDD ANT0_VHT40CH102

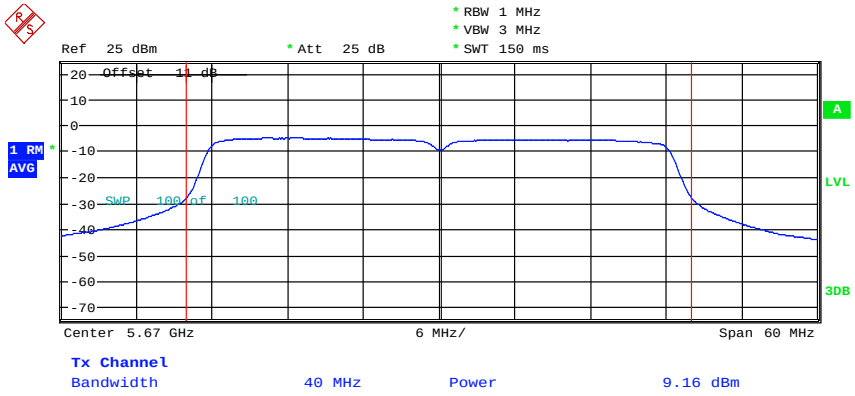
Date: 4.NOV.2014 14:25:33

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS



MAXIMUM CONDUCTED POWER CDD ANT0_VHT40CH110

Date: 27.NOV.2014 09:53:48

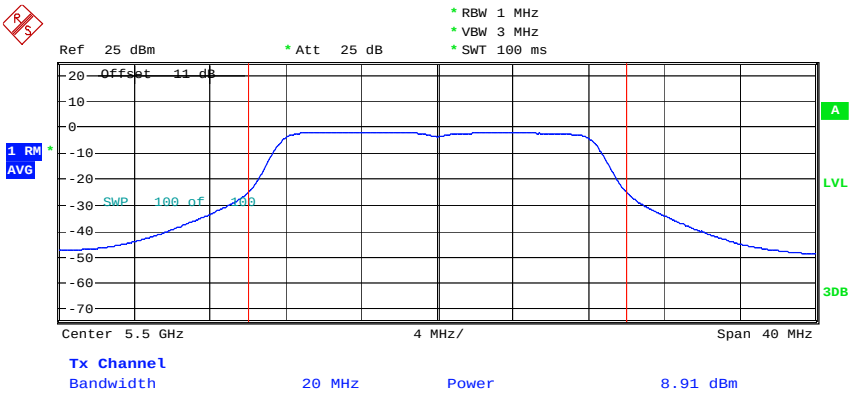


MAXIMUM CONDUCTED POWER CDD ANT0_VHT40CH134

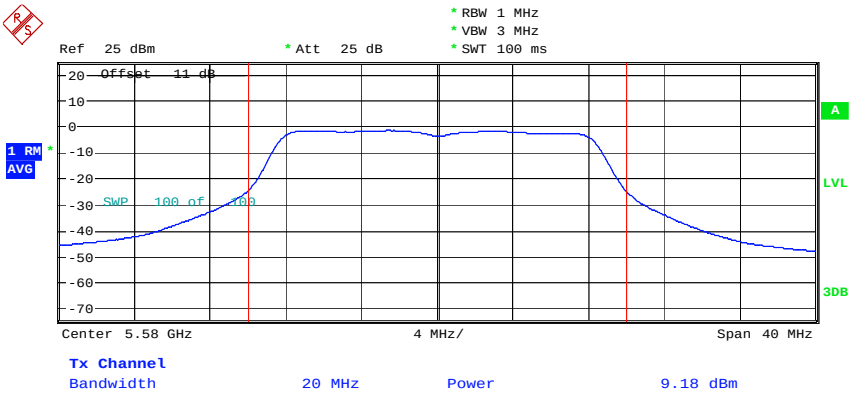
Date: 2.DEC.2014 09:47:44

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

ANT 1

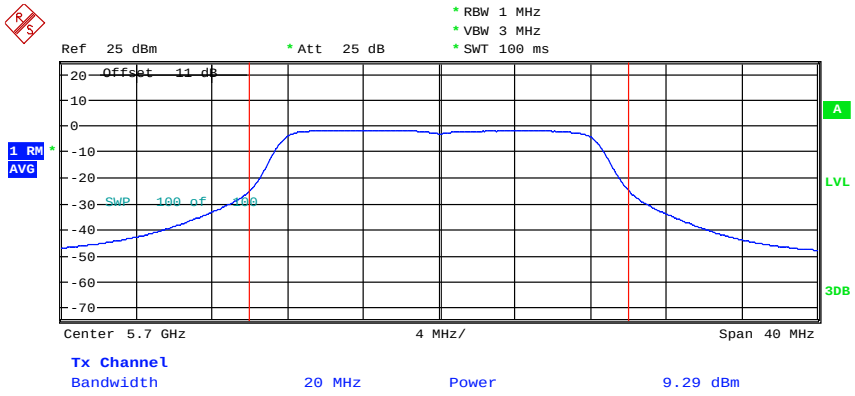


MAXIMUM CONDUCTED POWER CDD ANT1_aCH100
Date: 4.NOV.2014 13:33:48



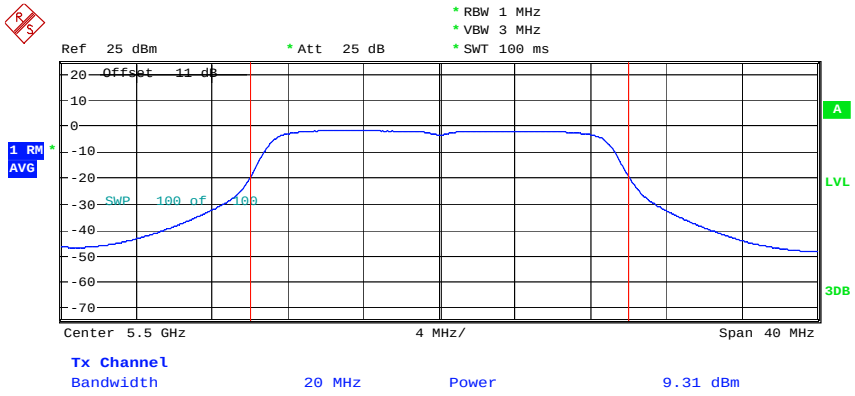
MAXIMUM CONDUCTED POWER CDD ANT1_aCH116
Date: 26.NOV.2014 18:05:13

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS



MAXIMUM CONDUCTED POWER CDD ANT1_aCH140

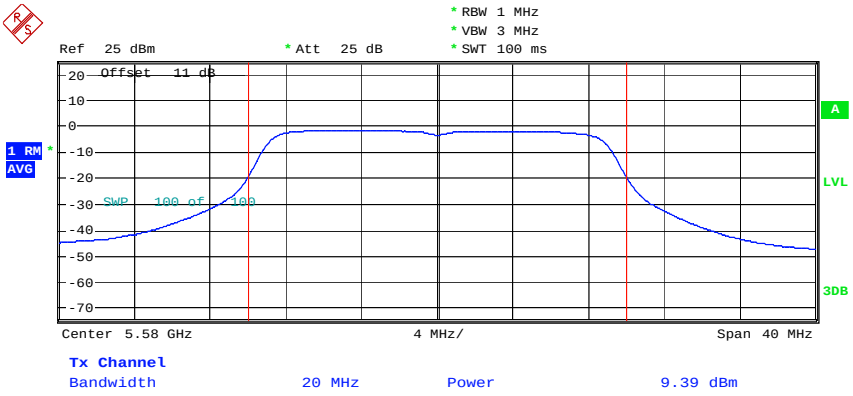
Date: 2.DEC.2014 09:33:49



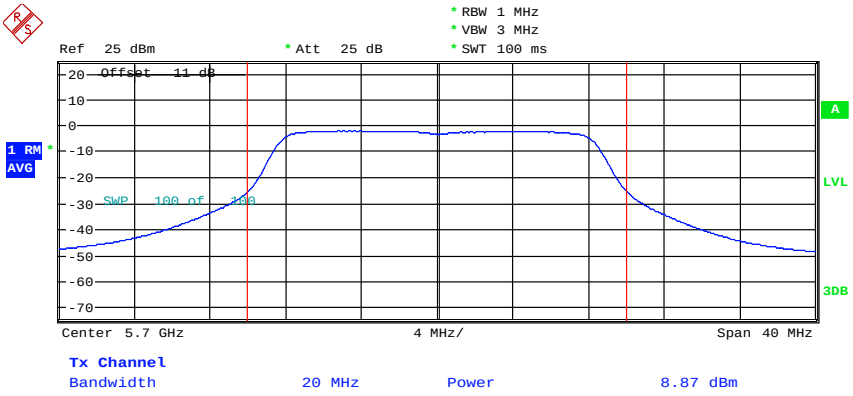
MAXIMUM CONDUCTED POWER CDD ANT1_VHT20CH100

Date: 4.NOV.2014 14:13:49

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

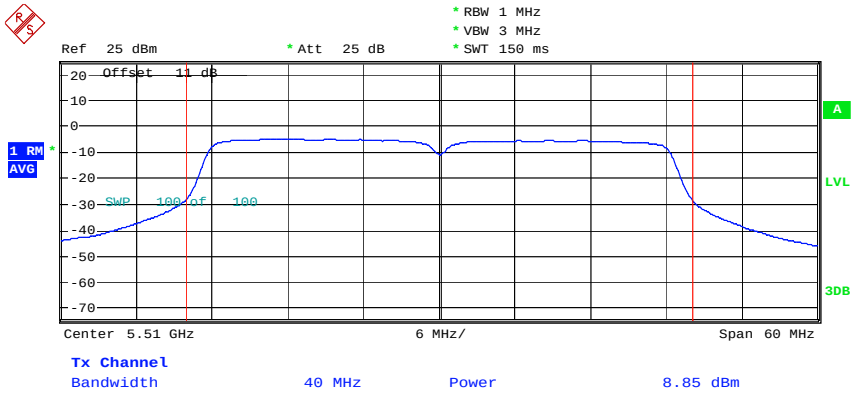


MAXIMUM CONDUCTED POWER CDD ANT1_VHT20CH116
Date: 26.NOV.2014 18:01:22

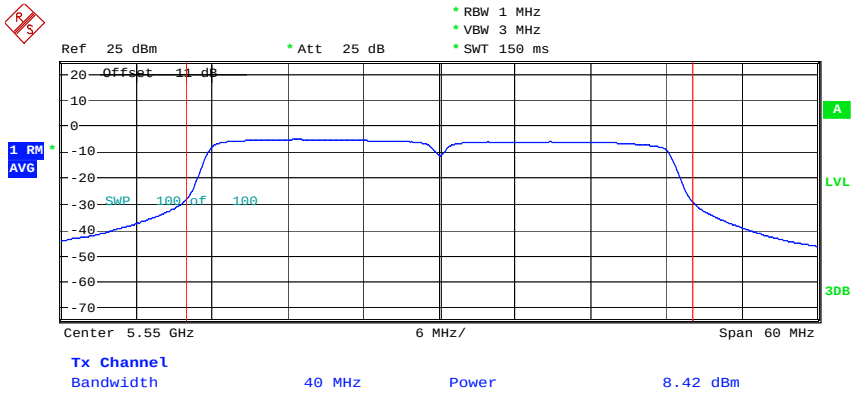


MAXIMUM CONDUCTED POWER CDD ANT1_VHT20CH140
Date: 2.DEC.2014 09:37:54

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

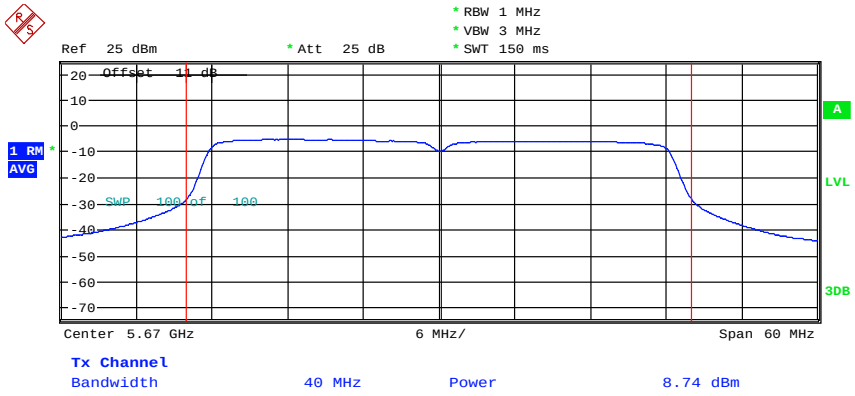


MAXIMUM CONDUCTED POWER CDD ANT1_VHT40CH102
Date: 5.NOV.2014 11:20:40



MAXIMUM CONDUCTED POWER CDD ANT1_VHT40CH110
Date: 27.NOV.2014 09:54:28

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS



MAXIMUM CONDUCTED POWER CDD ANT1_VHT40CH134
Date: 2.DEC.2014 09:48:24

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

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

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

Result:
Band 2
ANT 0

802.11a mode		
Frequency (MHz)	26 dB Bandwidth (MHz)	10 Log (B) (dB)
5260 MHz	22.27	13.48
5280 MHz	22.66	13.55
5320 MHz	22.46	13.51
802.11n 20 mode		
Frequency (MHz)	26 dB Bandwidth (MHz)	10 Log (B) (dB)
5260 MHz	22.27	13.48
5280 MHz	22.37	13.50
5320 MHz	22.27	13.48
802.11n 40 mode		
Frequency (MHz)	26 dB Bandwidth (MHz)	10 Log (B) (dB)
5270 MHz	46.08	16.64
5310 MHz	46.27	16.65

ANT 1

802.11a mode		
Frequency (MHz)	26 dB Bandwidth (MHz)	10 Log (B) (dB)
5260 MHz	22.27	13.48
5280 MHz	22.66	13.55
52405320	22.37	13.50
802.11n 20 mode		
Frequency (MHz)	26 dB Bandwidth (MHz)	10 Log (B) (dB)
5260 MHz	22.27	13.48
5280 MHz	21.79	13.38
5320 MHz	22.08	13.44
802.11n 40 mode		
Frequency (MHz)	26 dB Bandwidth (MHz)	10 Log (B) (dB)
5270 MHz	45.70	16.60
5310 MHz	44.93	16.53

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

Band 3
ANT 0

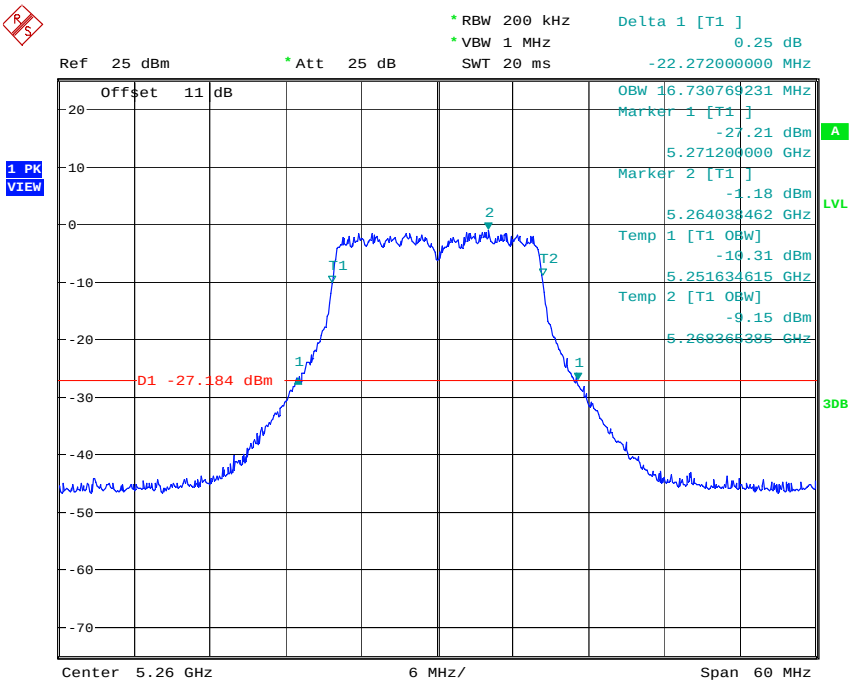
802.11a mode		
Frequency (MHz)	26 dB Bandwidth (MHz)	10 Log (B) (dB)
5500 MHz	22.37	13.50
5580 MHz	22.08	13.44
5700 MHz	22.46	13.51
802.11n 20 mode		
Frequency (MHz)	26 dB Bandwidth (MHz)	10 Log (B) (dB)
5500 MHz	22.27	13.48
5580 MHz	21.89	13.40
5700 MHz	22.37	13.50
802.11n 40 mode		
Frequency (MHz)	26 dB Bandwidth (MHz)	10 Log (B) (dB)
5510 MHz	46.08	16.64
5550 MHz	44.93	16.53
5670 MHz	45.31	16.56

ANT 1

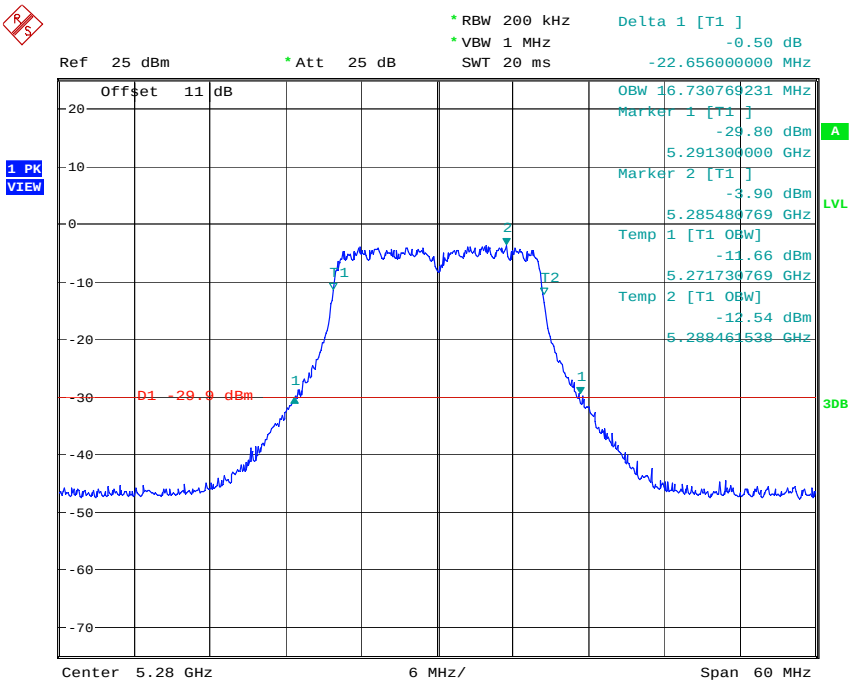
802.11a mode		
Frequency (MHz)	26 dB Bandwidth (MHz)	10 Log (B) (dB)
5500 MHz	22.08	13.44
5580 MHz	22.56	13.53
5700 MHz	22.18	13.46
802.11n 20 mode		
Frequency (MHz)	26 dB Bandwidth (MHz)	10 Log (B) (dB)
5500 MHz	22.46	13.51
5580 MHz	22.08	13.44
5700 MHz	22.37	13.50
802.11n 40 mode		
Frequency (MHz)	26 dB Bandwidth (MHz)	10 Log (B) (dB)
5510 MHz	45.31	16.56
5550 MHz	0.31	-5.09
5670 MHz	46.08	16.64

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

Band 2
ANT 0

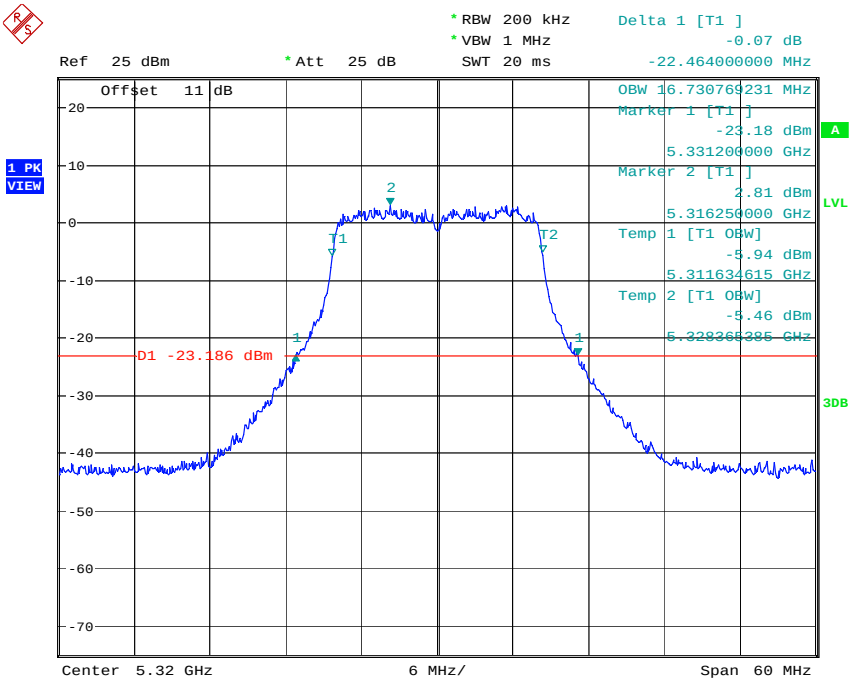


99% OBW & 26DB BANDWIDTH CDD ANT0_a Mode_CH52
Date: 5.NOV.2014 14:14:36

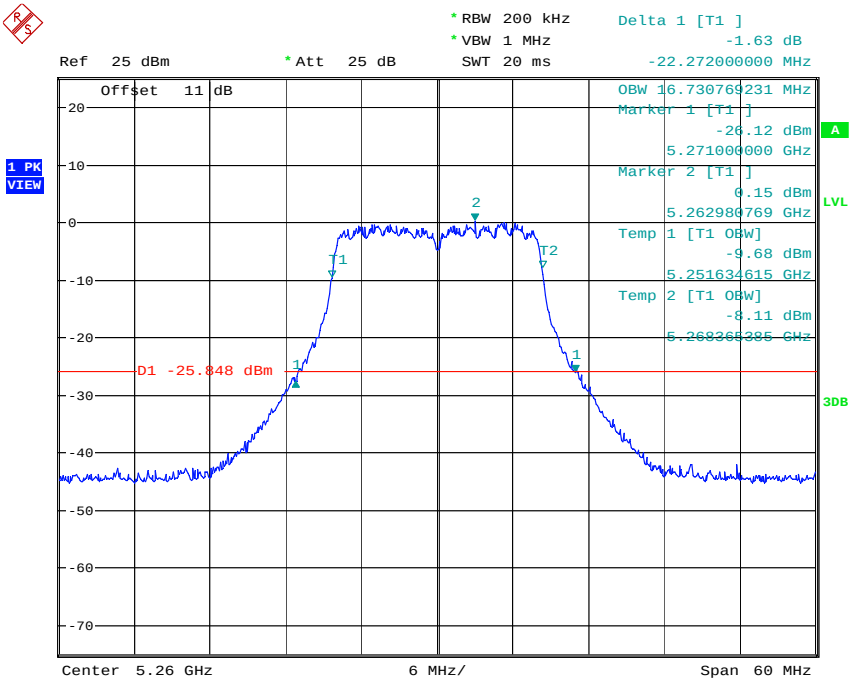


99% OBW & 26DB BANDWIDTH CDD ANT0_a Mode_CH56
Date: 5.NOV.2014 14:17:01

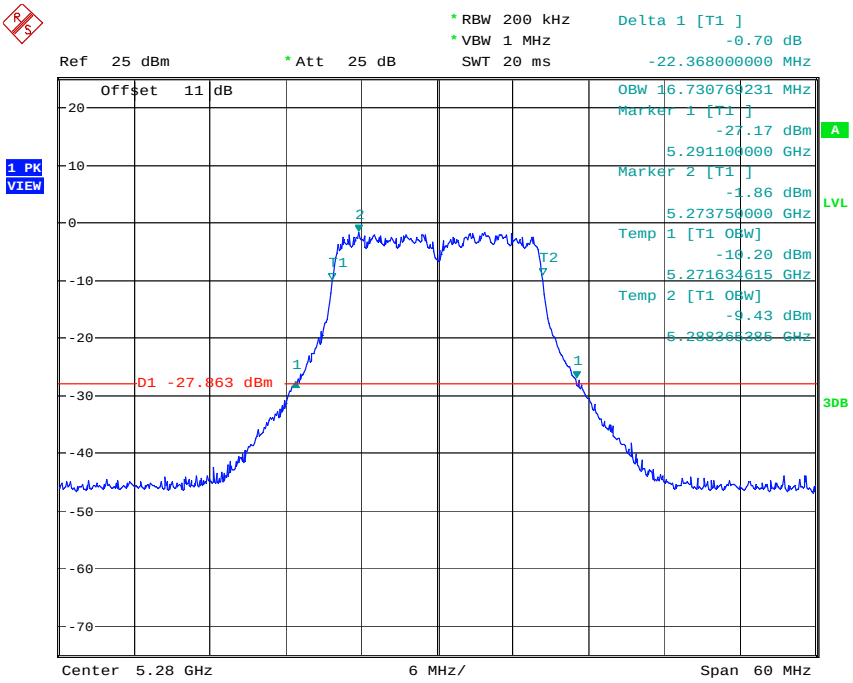
Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS



99% OBW & 26DB BANDWIDTH CDD ANT0_a Mode_CH64
Date: 5.NOV.2014 14:26:19

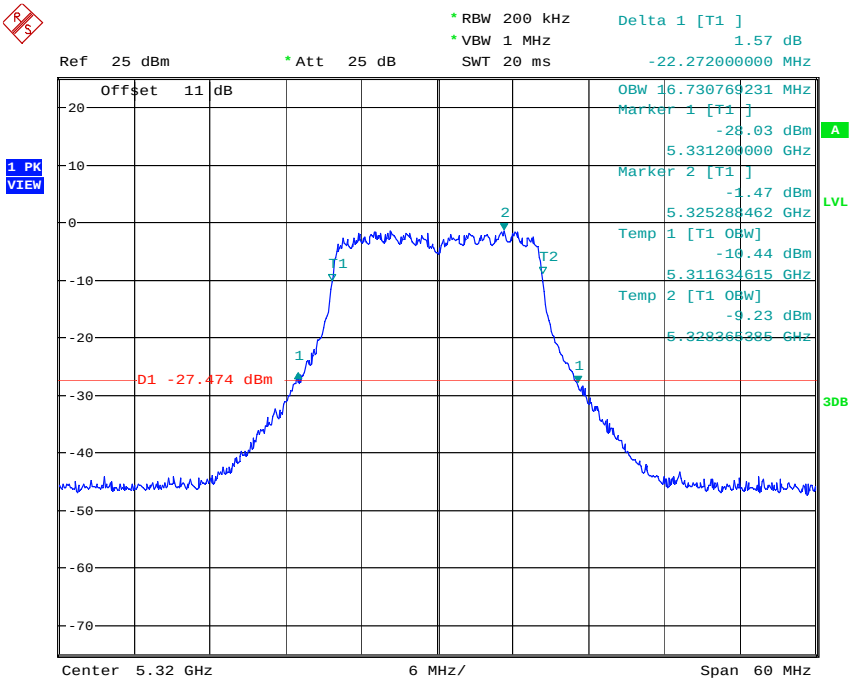


99% OBW & 26DB BANDWIDTH CDD ANT0_VHT20_CH52
Date: 4.NOV.2014 17:03:32



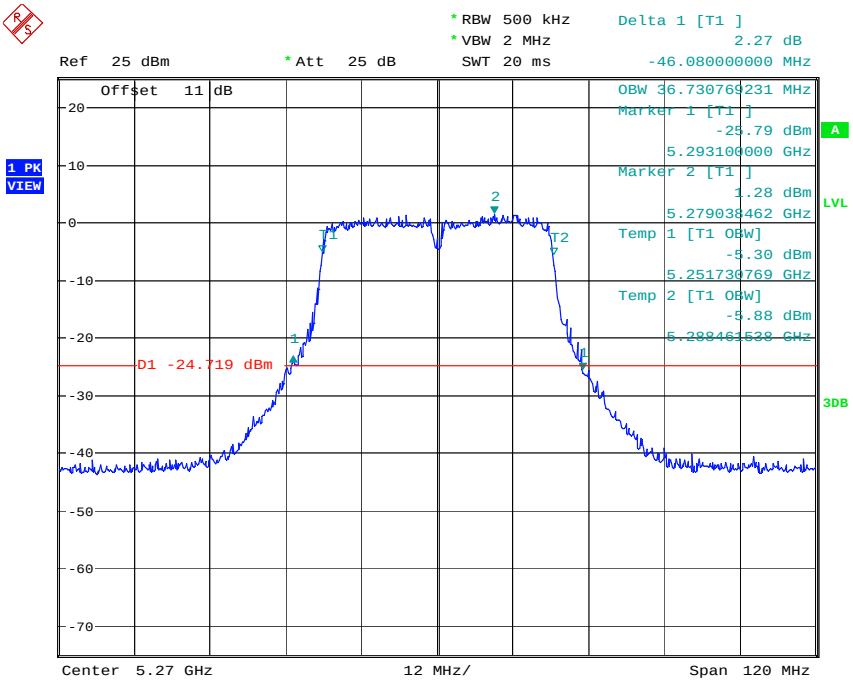
99% OBW & 26DB BANDWIDTH CDD ANT0_VHT20_CH56

Date: 4.NOV.2014 17:31:19



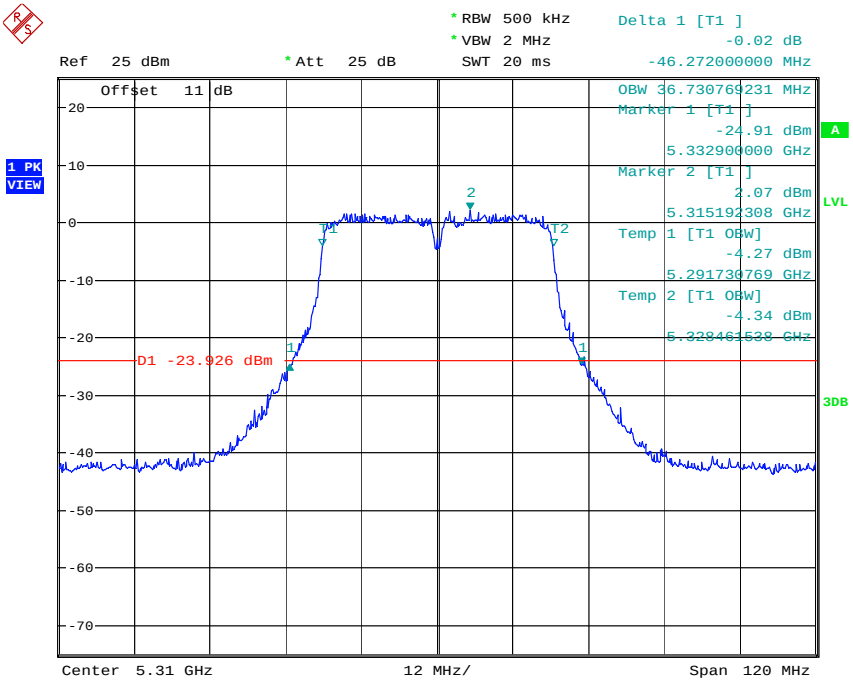
99% OBW & 26DB BANDWIDTH CDD ANT0_VHT20_CH64

Date: 4.NOV.2014 17:39:50



99% OBW & 26DB BANDWIDTH CDD ANT0_VHT40_CH54

Date: 4.NOV.2014 17:55:19

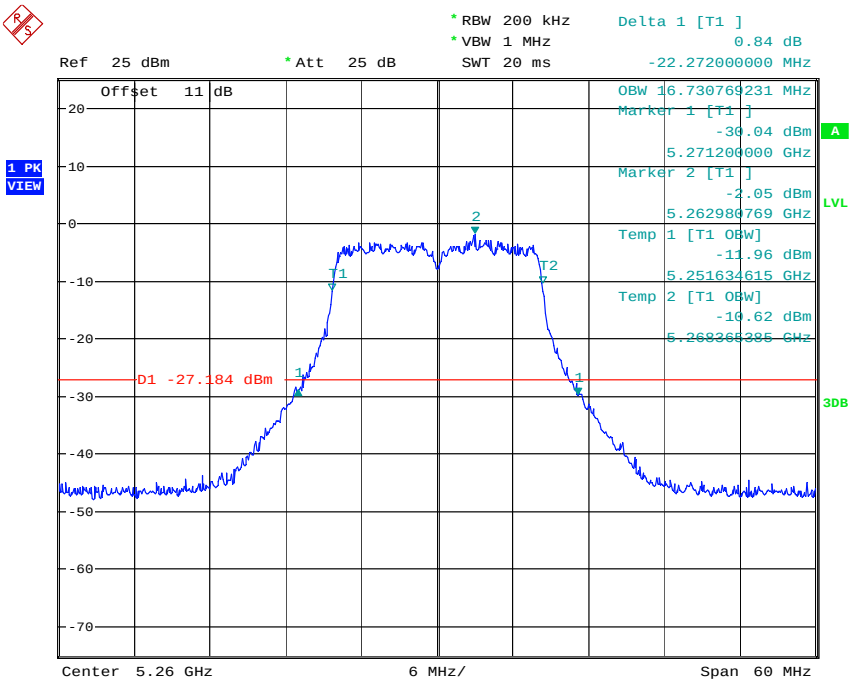


99% OBW & 26DB BANDWIDTH CDD ANT0_VHT40_CH62

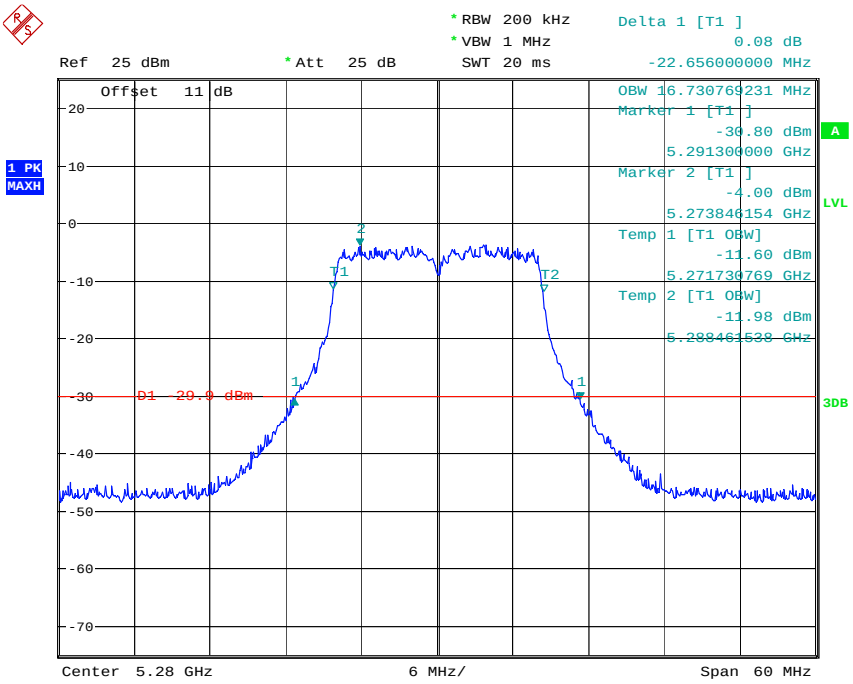
Date: 4.NOV.2014 18:00:05

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

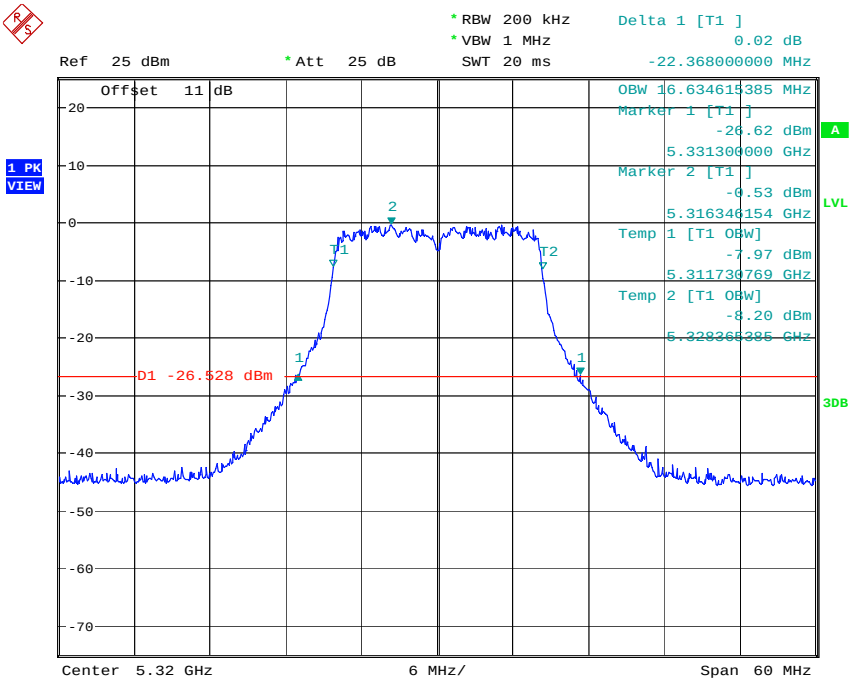
ANT 1



99% OBW & 26DB BANDWIDTH CDD ANT1_a Mode_CH52
Date: 5.NOV.2014 14:15:05

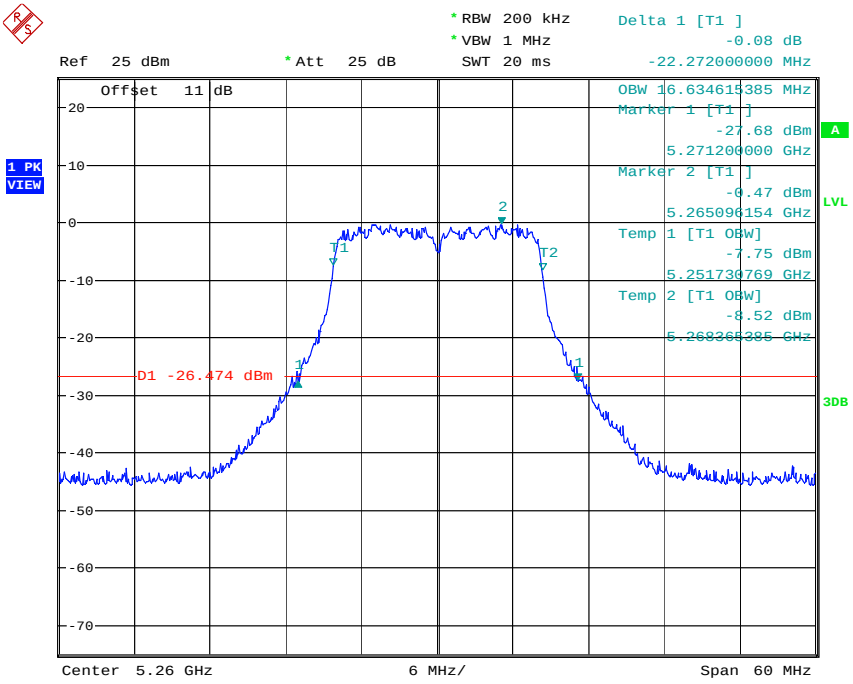


99% OBW & 26DB BANDWIDTH CDD ANT1_a Mode_CH56
Date: 5.NOV.2014 14:17:30



99% OBW & 26DB BANDWIDTH CDD ANT1_a Mode_CH64

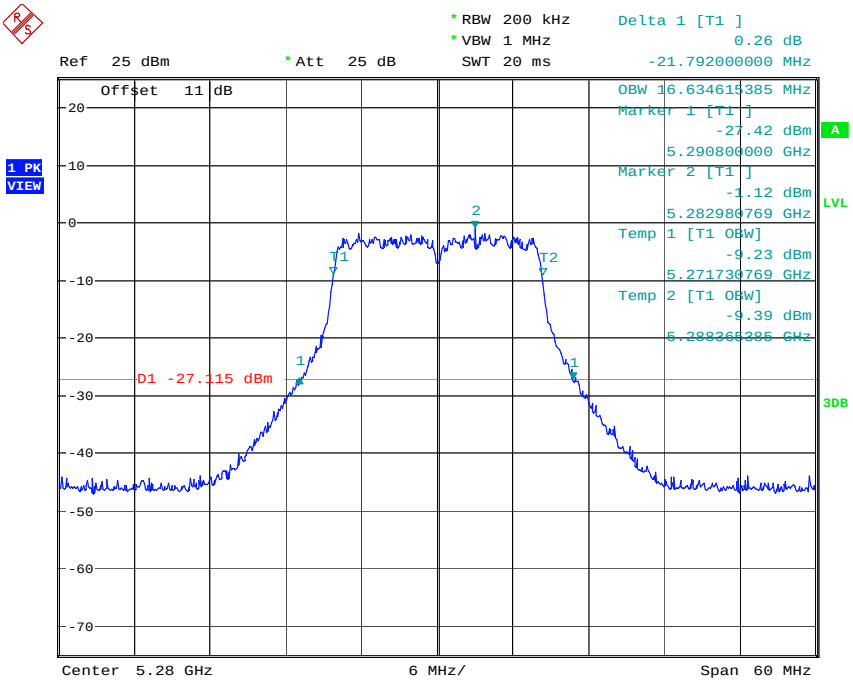
Date: 5.NOV.2014 14:20:50



99% OBW & 26DB BANDWIDTH CDD ANT1_VHT20_CH52

Date: 4.NOV.2014 17:04:10

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS



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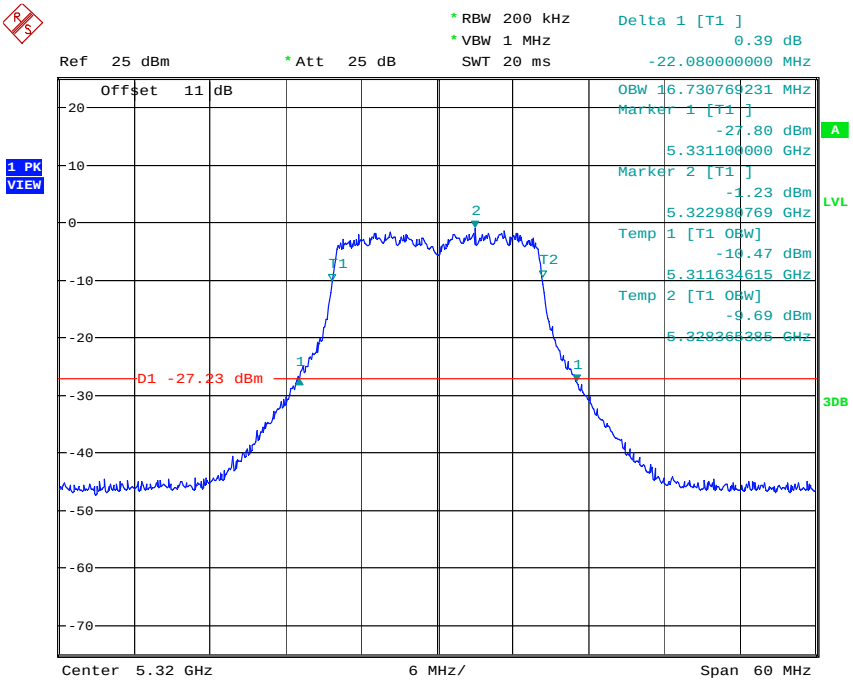
Date: 4.NOV.2014 17:31:40



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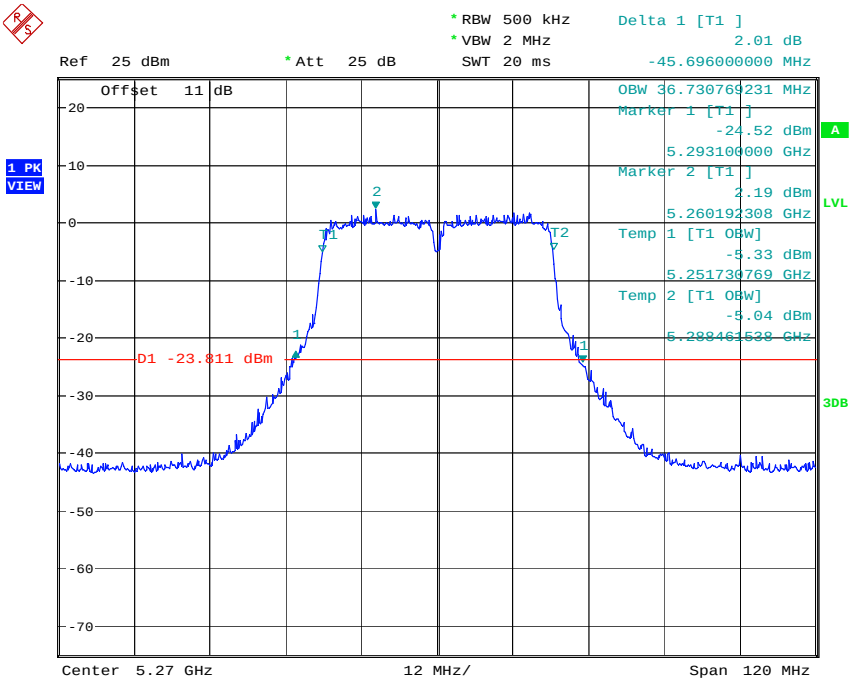
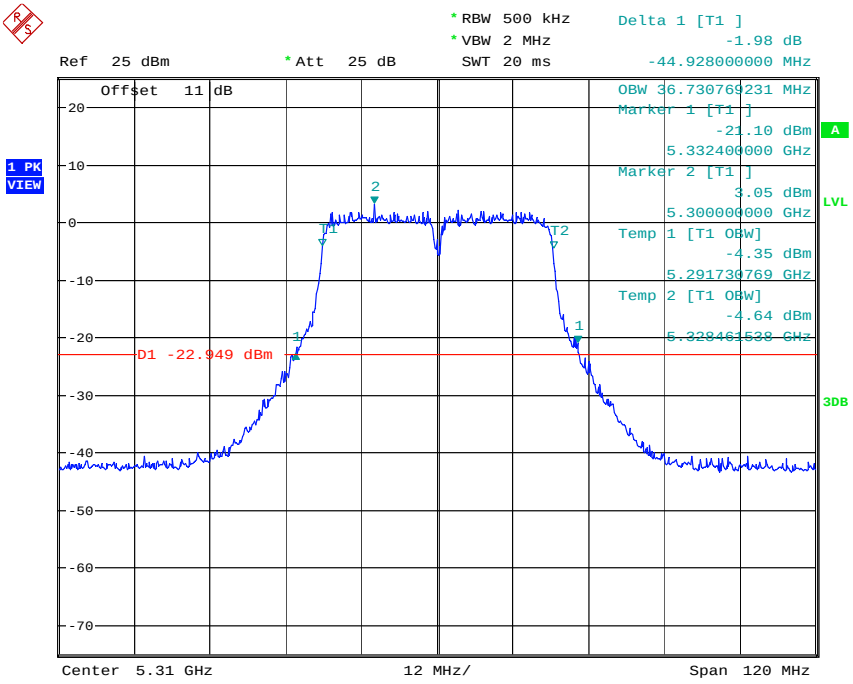
Date: 4.NOV.2014 17:40:28



99% OBW & 26DB BANDWIDTH CDD ANT1_VHT40_CH54

Date: 4.NOV.2014 17:55:41

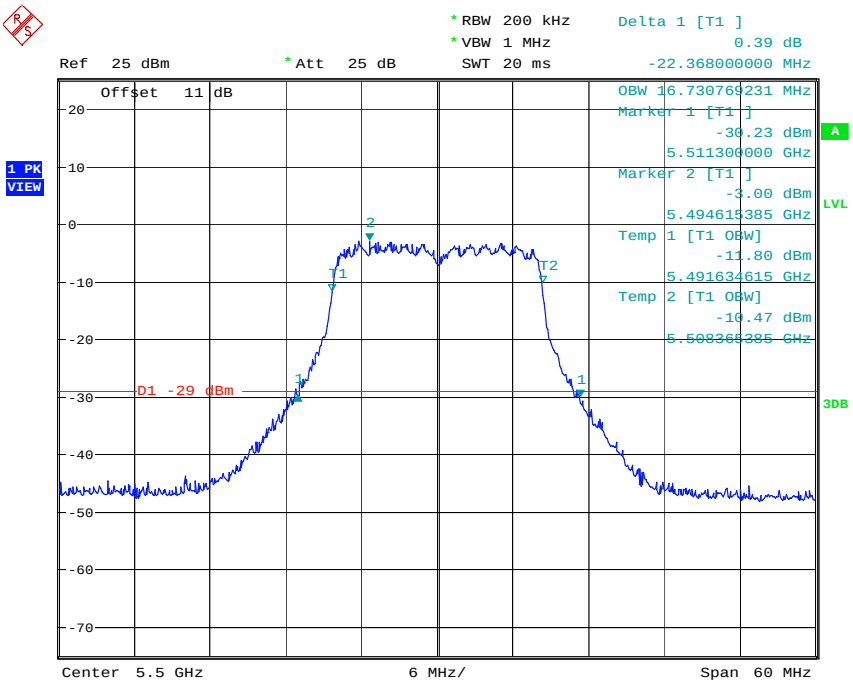


99% OBW & 26DB BANDWIDTH CDD ANT1_VHT40_CH62

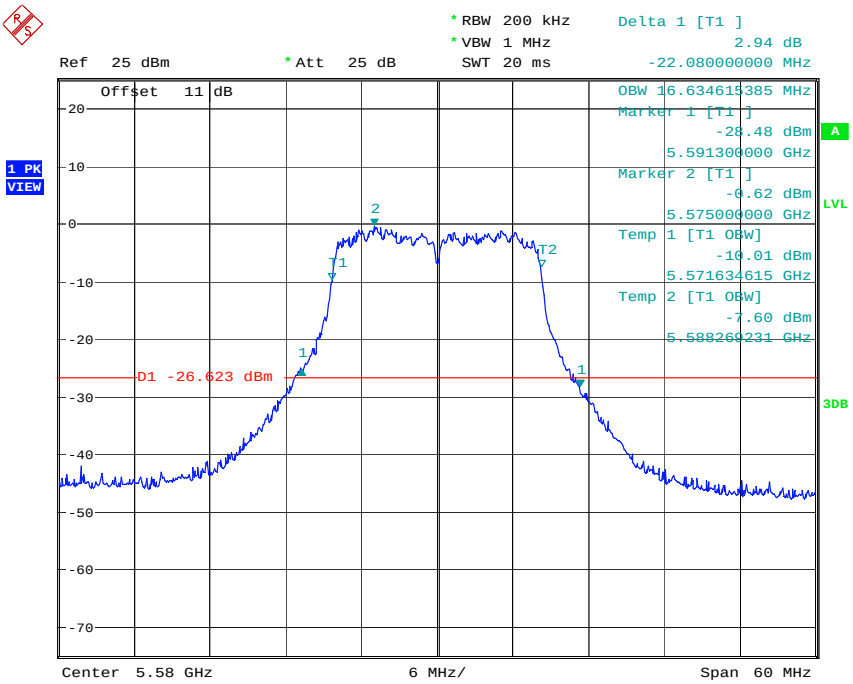
Date: 4.NOV.2014 18:00:33

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

Band 3
ANT 0

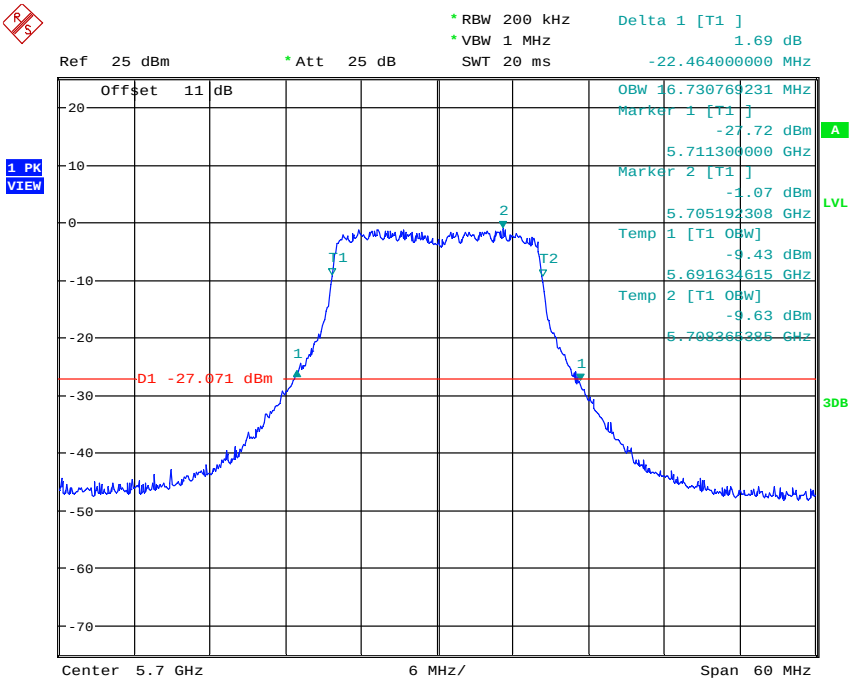


99% OBW & 26DB BANDWIDTH CDD ANT0_a Mode_CH100
Date: 5.NOV.2014 13:29:21

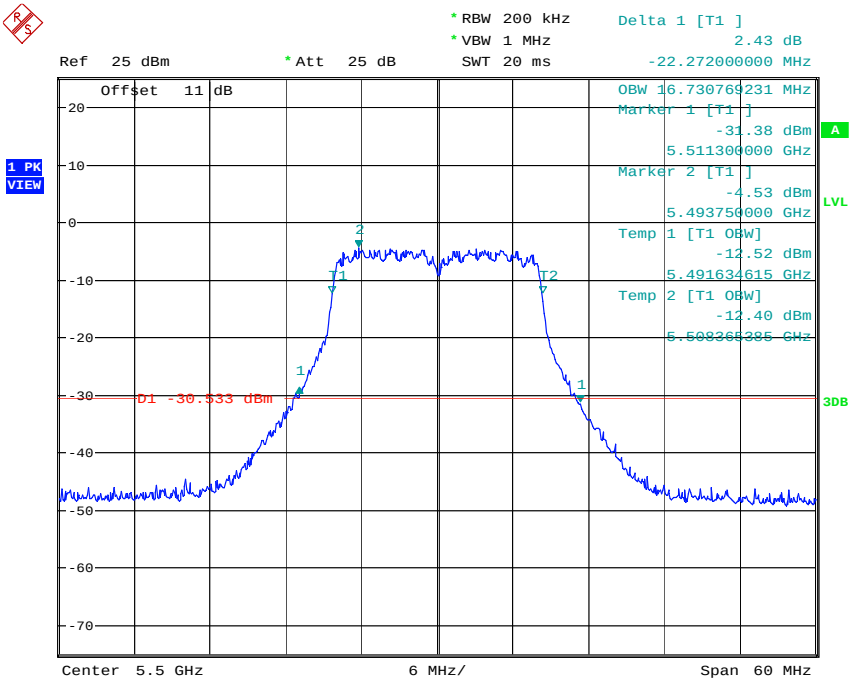


99% OBW & 26DB BANDWIDTH CDD ANT1_a Mode_CH116
Date: 27.NOV.2014 10:20:29

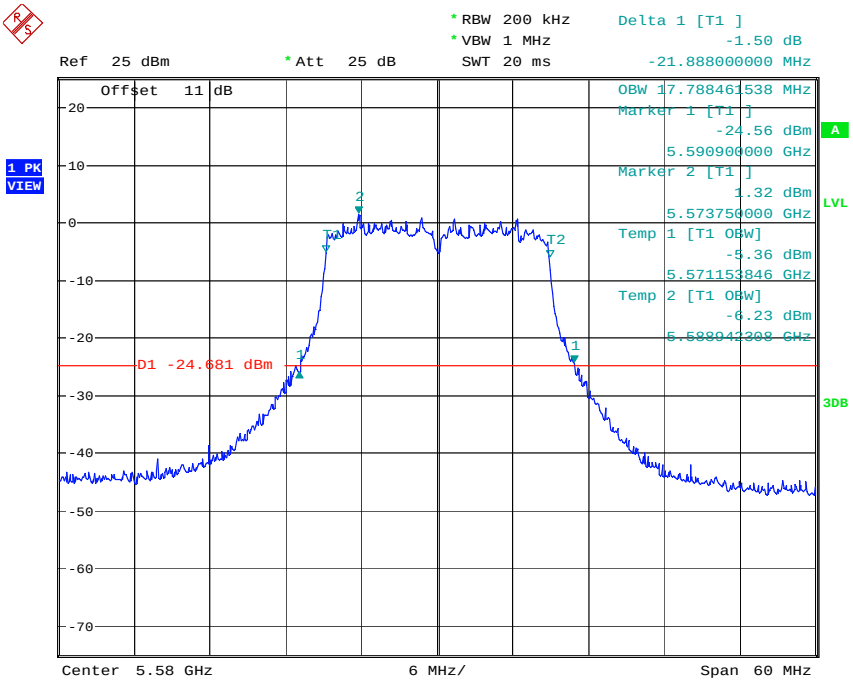
Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS



99% OBW & 26DB BANDWIDTH CDD ANT0_a Mode_CH140
Date: 2.DEC.2014 09:35:50

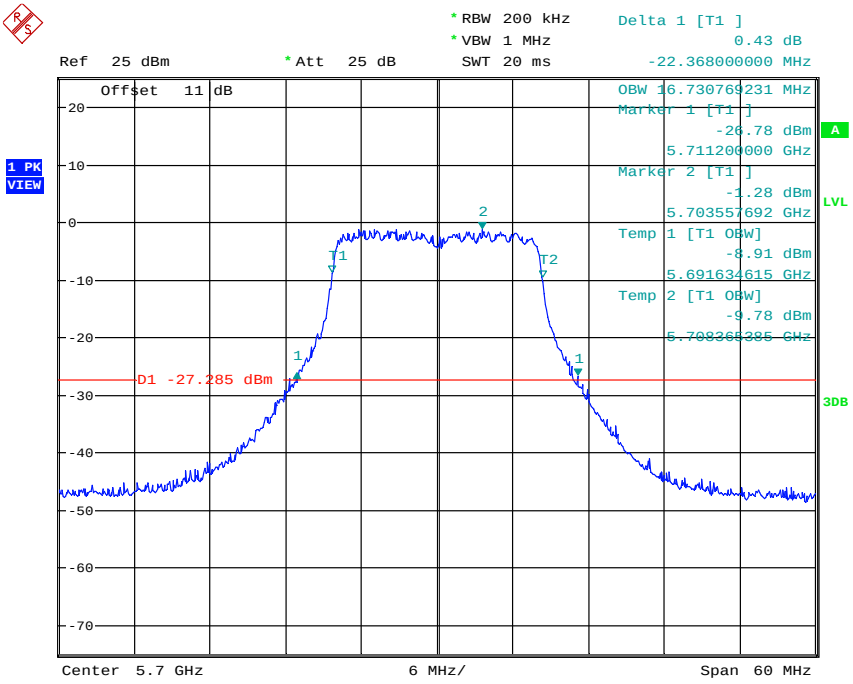


99% OBW & 26DB BANDWIDTH CDD ANT0_VHT20_CH100
Date: 5.NOV.2014 10:04:56



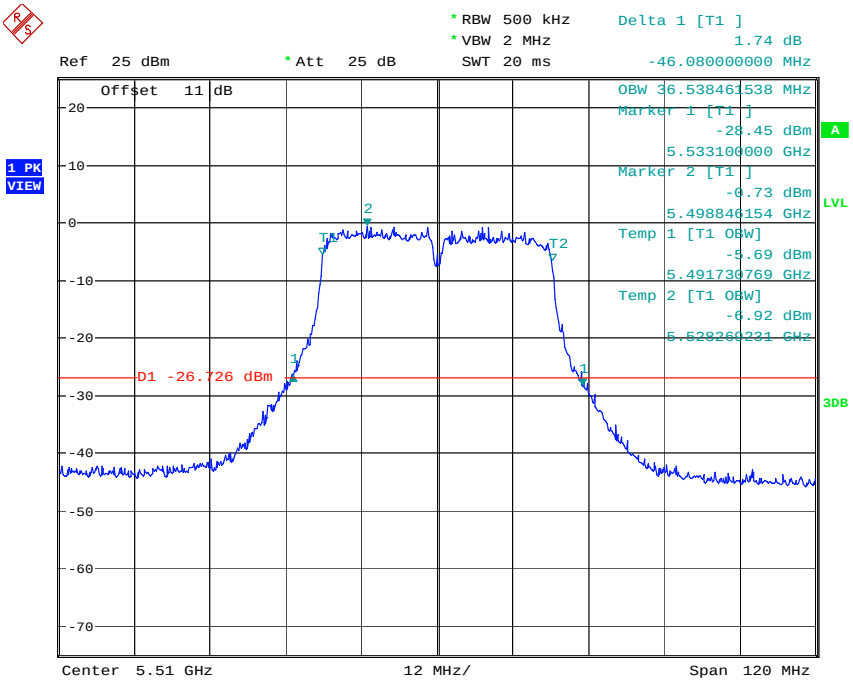
99% OBW & 26DB BANDWIDTH CDD ANT0_VHT20_CH116

Date: 26.NOV.2014 18:03:29



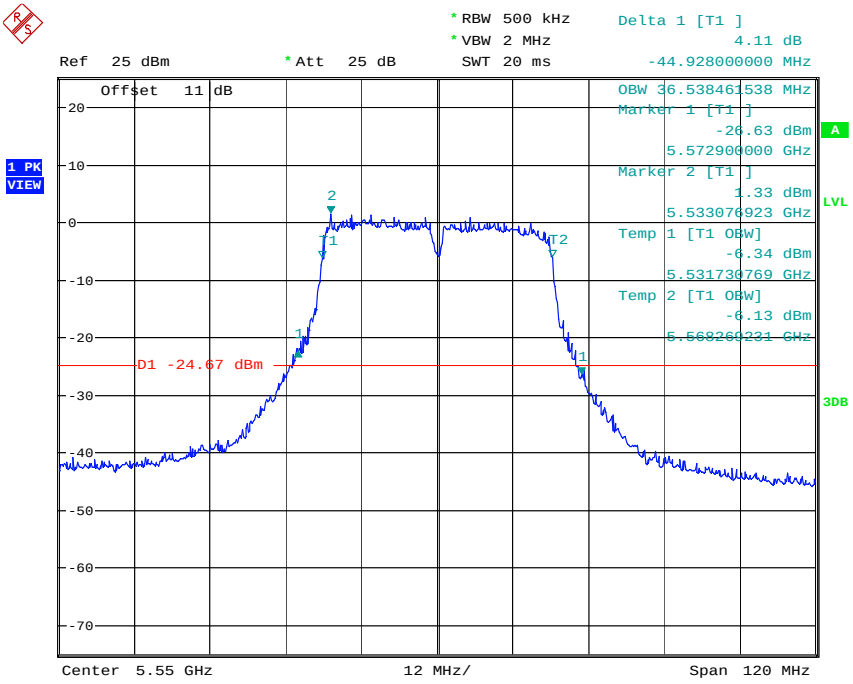
99% OBW & 26DB BANDWIDTH CDD ANT0_VHT20_CH140

Date: 2.DEC.2014 09:39:41



99% OBW & 26DB BANDWIDTH CDD ANT0_VHT40_CH102

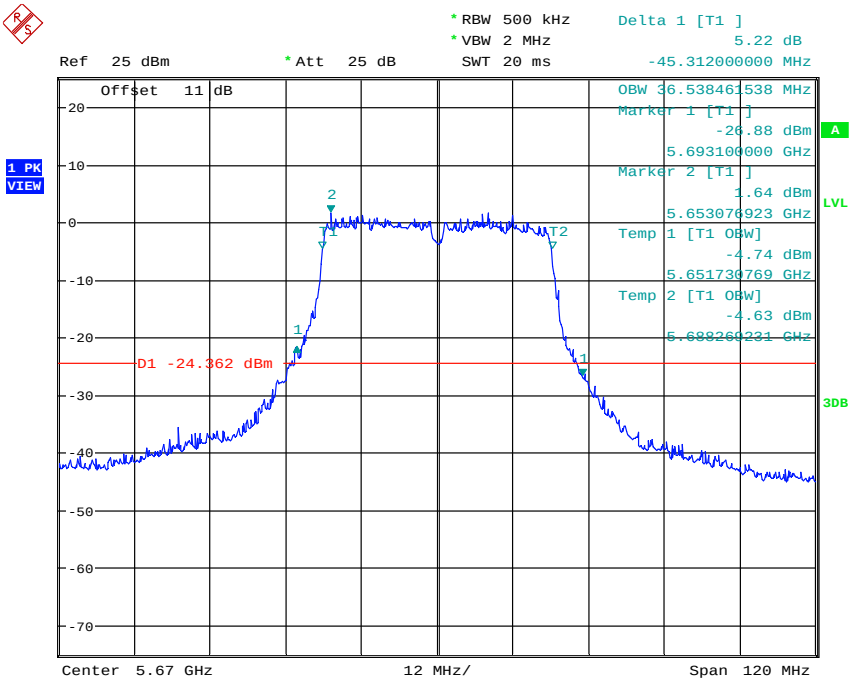
Date: 5.NOV.2014 10:13:22



99% OBW & 26DB BANDWIDTH CDD ANT0_VHT40_CH110

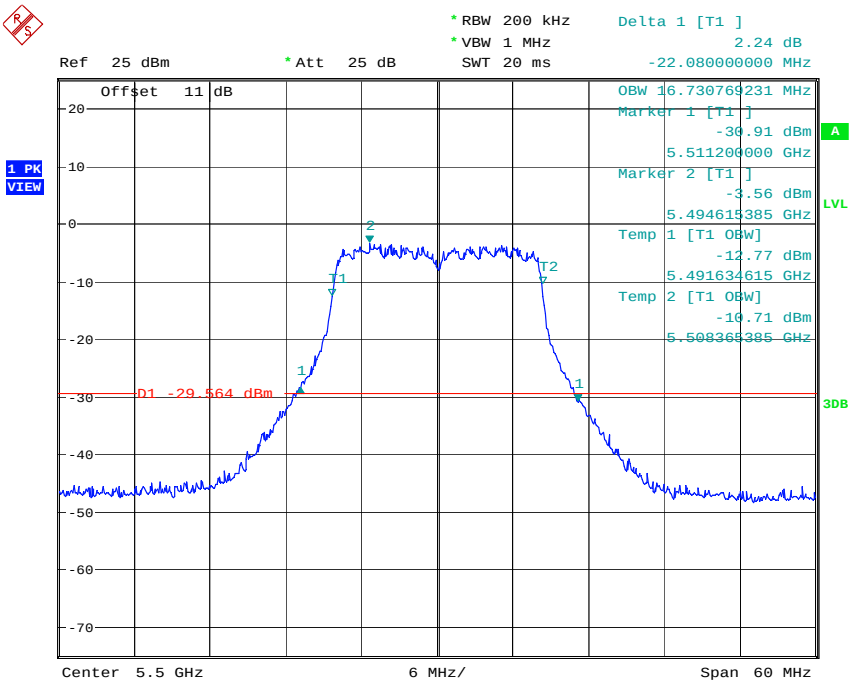
Date: 27.NOV.2014 09:56:37

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS



99% OBW & 26DB BANDWIDTH CDD ANT0_VHT40_CH134
Date: 2.DEC.2014 09:50:25

ANT 1



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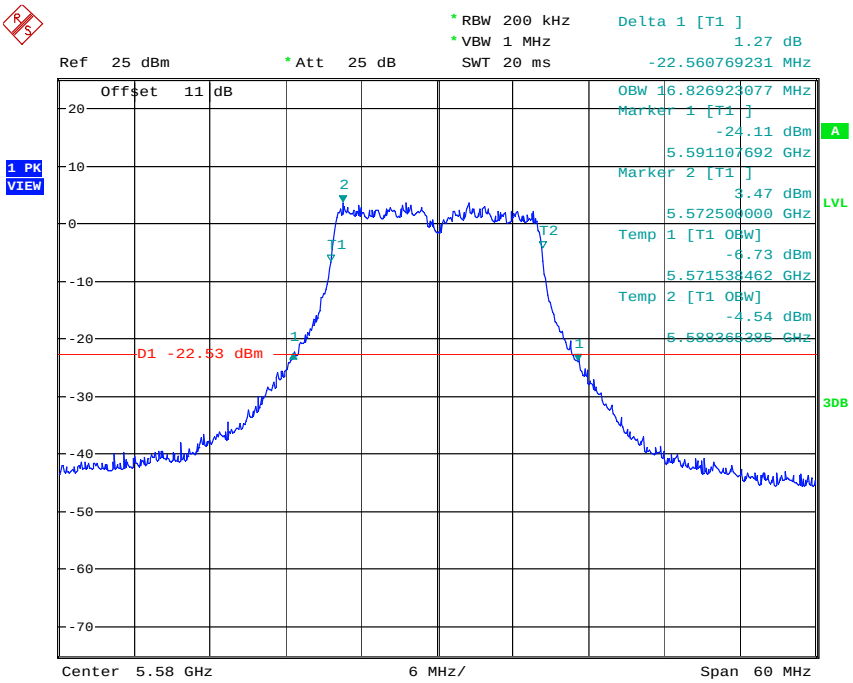
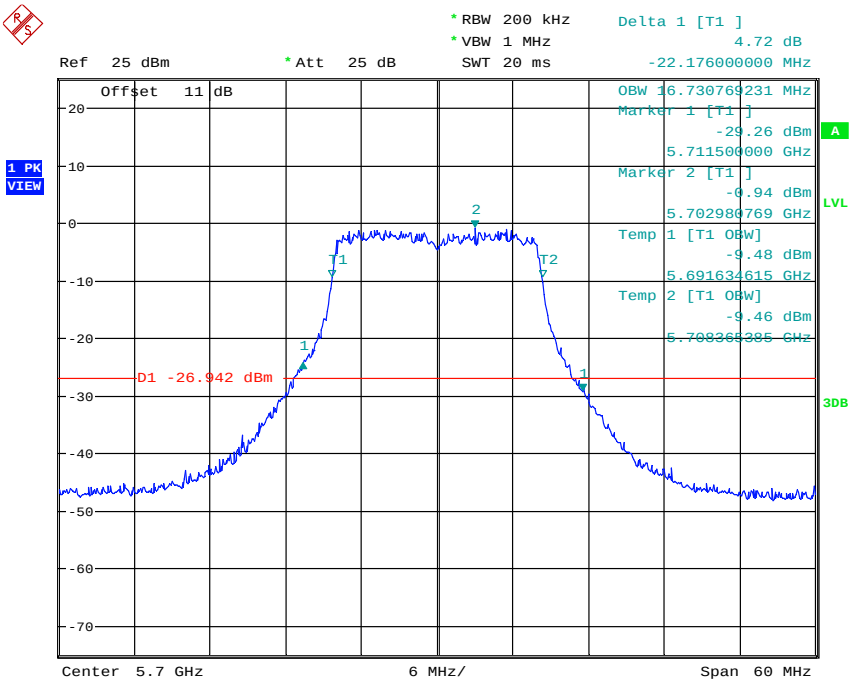
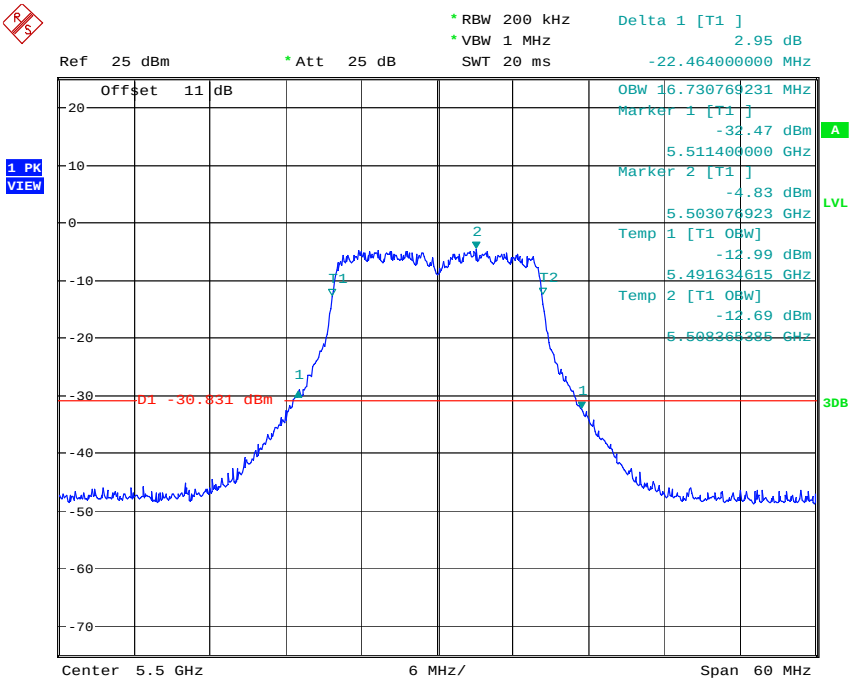
Date: 5.NOV.2014 13:29:50



99% OBW & 26DB BANDWIDTH CDD ANT0_a Mode_CH116
Date: 27.NOV.2014 10:25:45

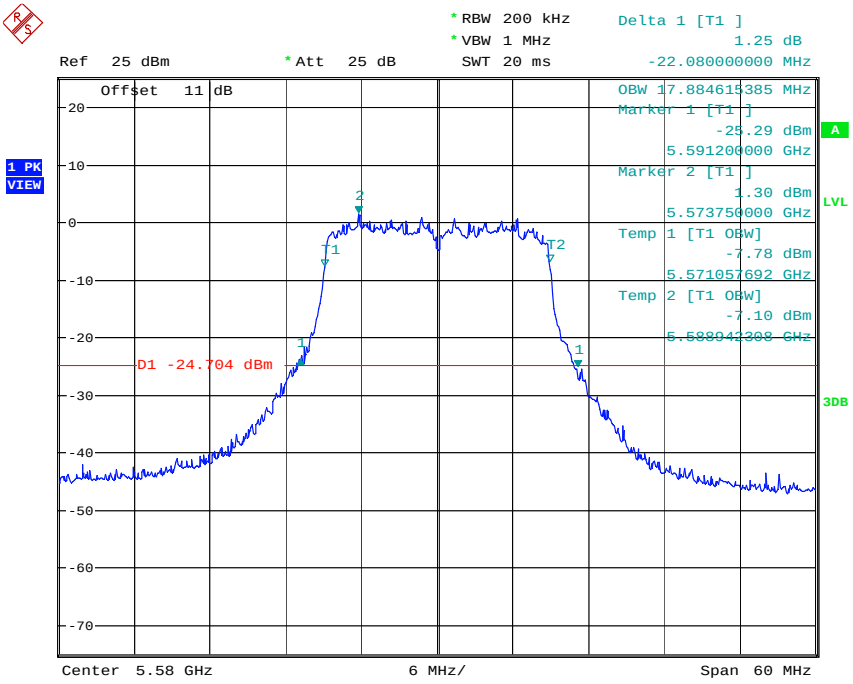


99% OBW & 26DB BANDWIDTH CDD ANT1_a Mode_CH140
Date: 2.DEC.2014 09:36:12



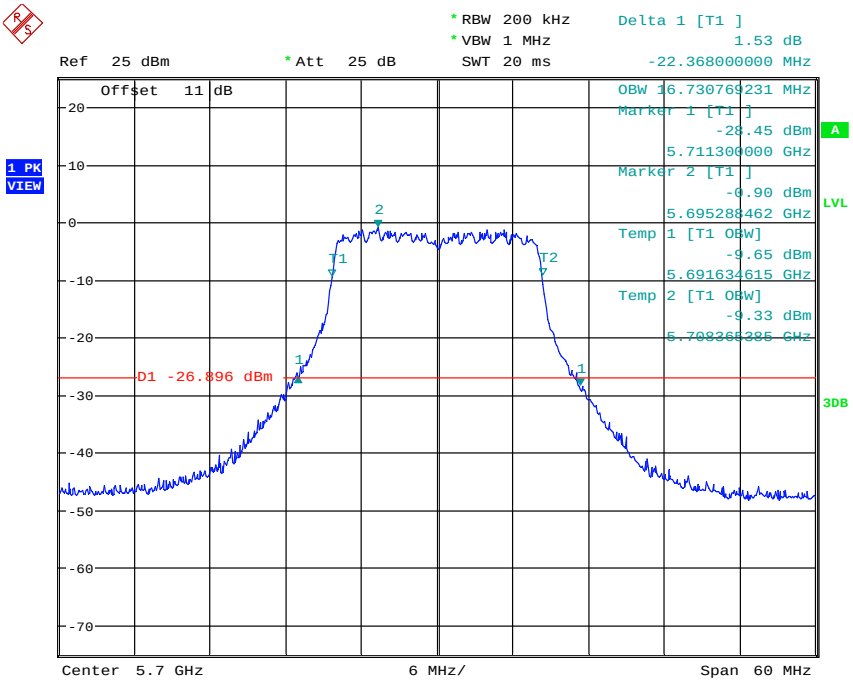
99% OBW & 26DB BANDWIDTH CDD ANT1_VHT20_CH100

Date: 5.NOV.2014 10:05:18



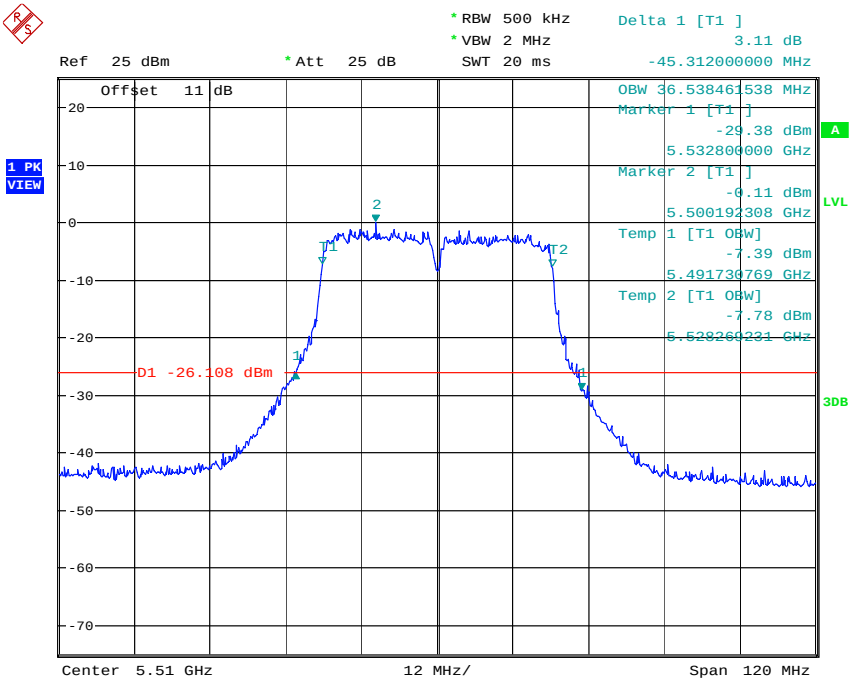
99% OBW & 26DB BANDWIDTH CDD ANT1_VHT20_CH116

Date: 26.NOV.2014 18:03:51



99% OBW & 26DB BANDWIDTH CDD ANT1_VHT20_CH140

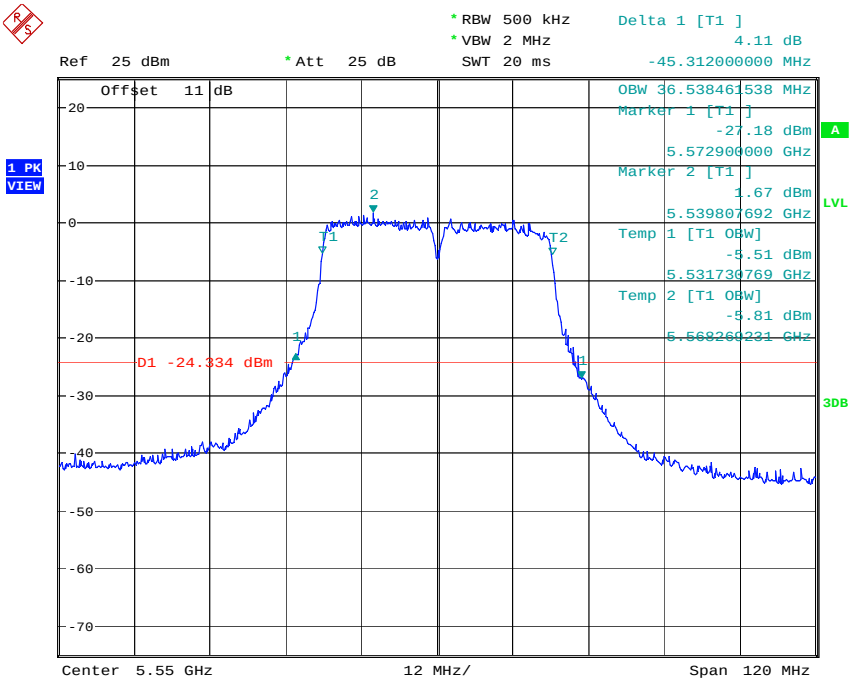
Date: 2.DEC.2014 09:40:09



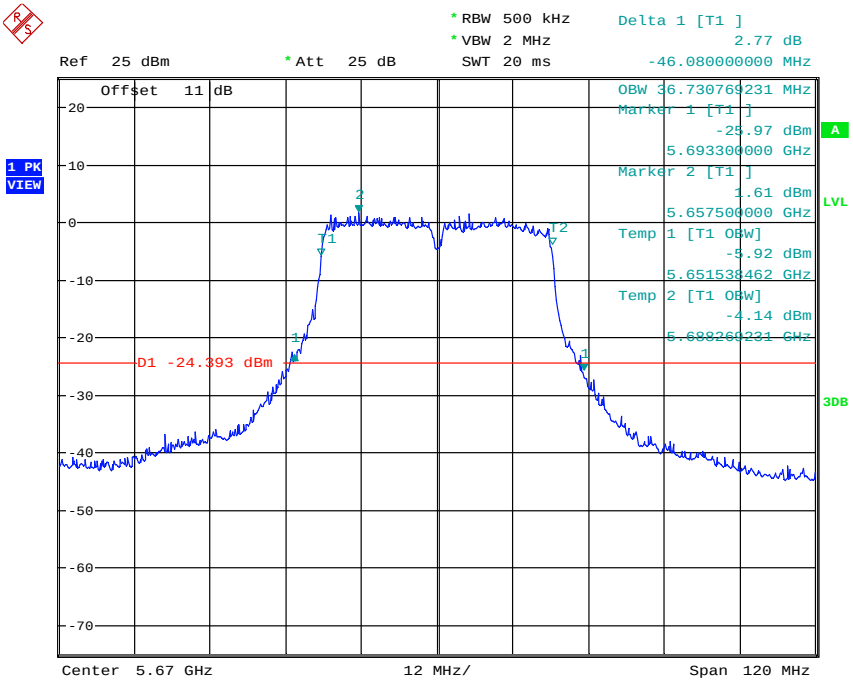
99% OBW & 26DB BANDWIDTH CDD ANT1_VHT40_CH102

Date: 5.NOV.2014 10:13:44

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS



99% OBW & 26DB BANDWIDTH CDD ANT1_VHT40_CH110
Date: 27.NOV.2014 09:57:05



99% OBW & 26DB BANDWIDTH CDD ANT1_VHT40_CH134
Date: 2.DEC.2014 09:50:47

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

3.3 Peak Power Spectral Density, FCC 15.407 (a)

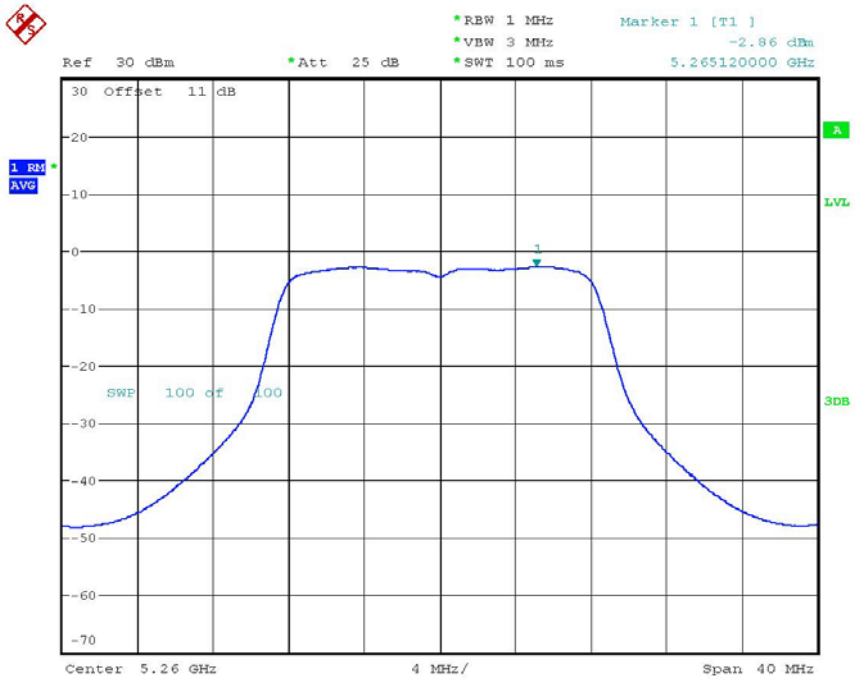
According to §15.407(a)

1. For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 4 dBm in any 1-MHz band.

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

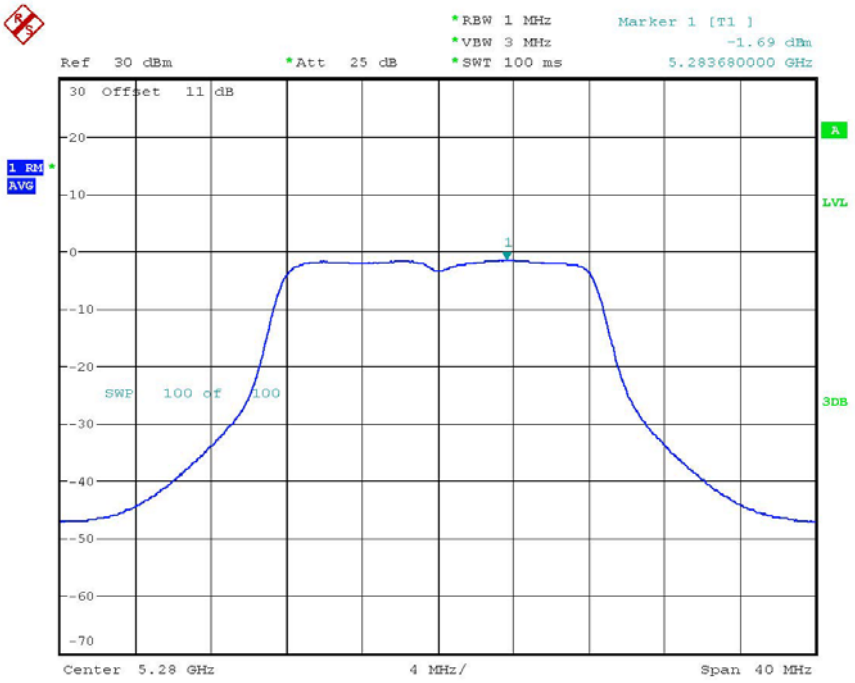
3. For the band 5.725-5.825 GHz, the peak power spectral density shall not exceed 17 dBm in any 1-MHz band.

Band 2
ANT 0

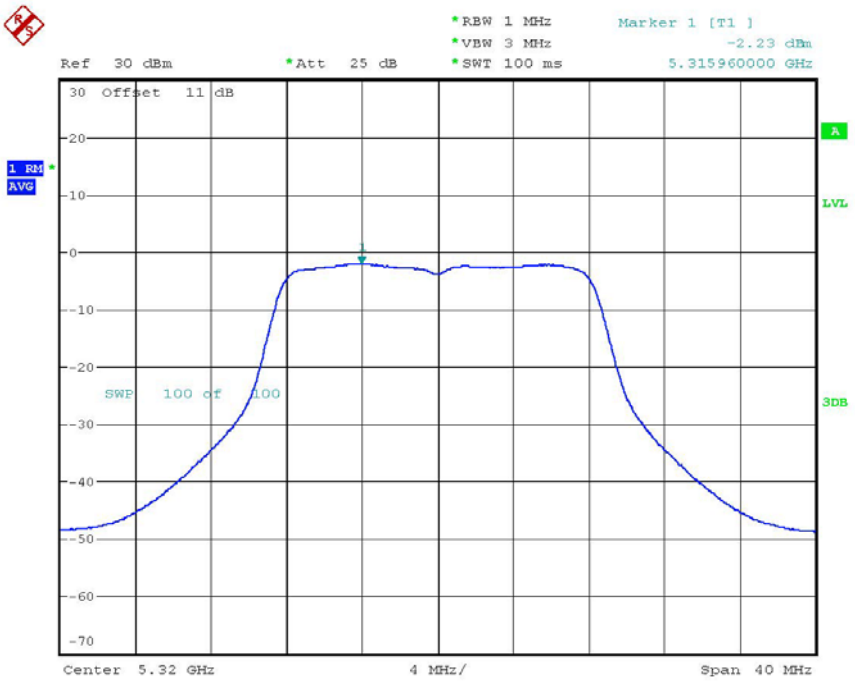


POWER DENSITY ANT0_aCH52
Date: 4.NOV.2014 16:55:18

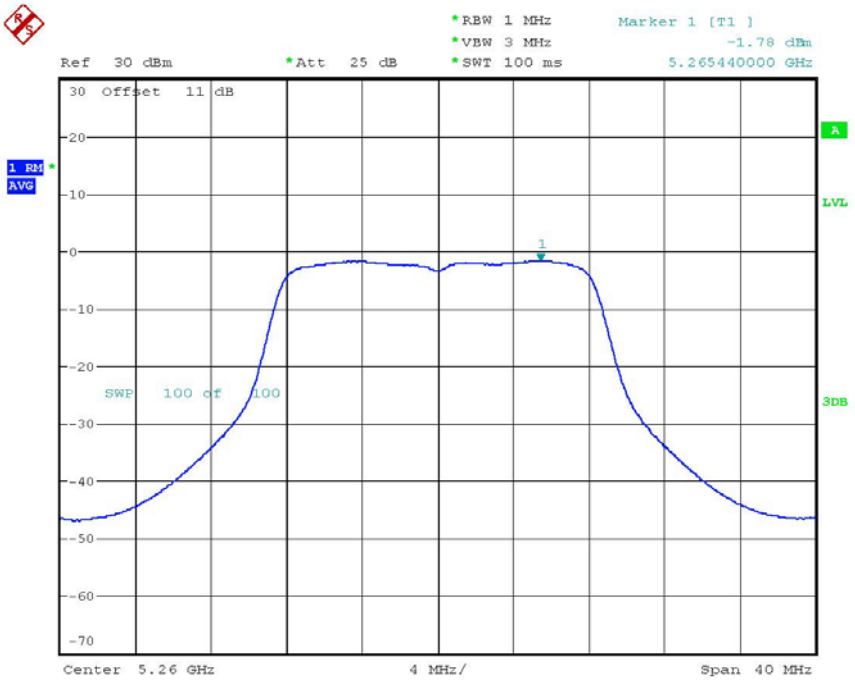
Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS



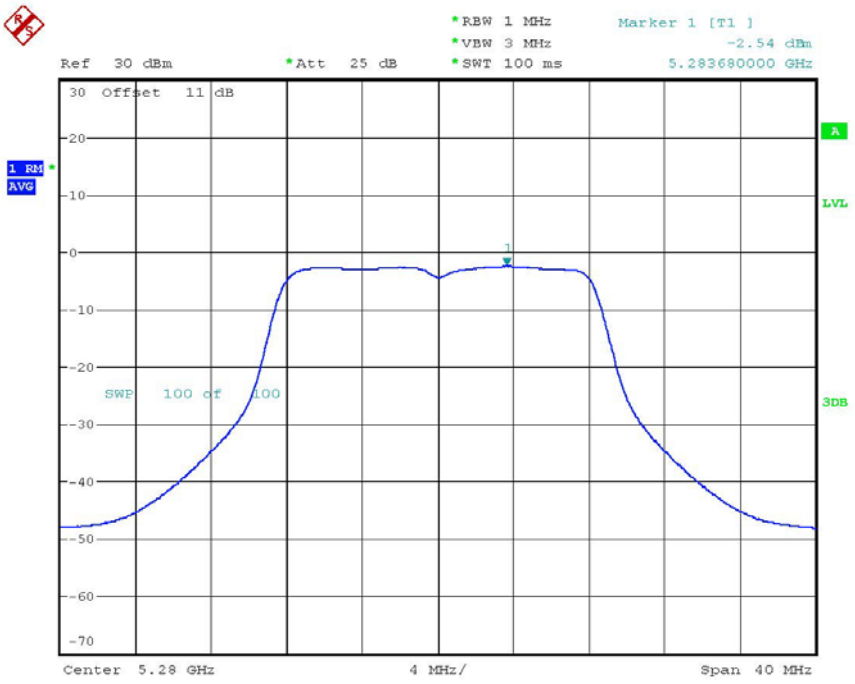
POWER DENSITY ANT0_aCH56
Date: 4.NOV.2014 17:12:20



POWER DENSITY ANT0_aCH64
Date: 4.NOV.2014 17:42:41

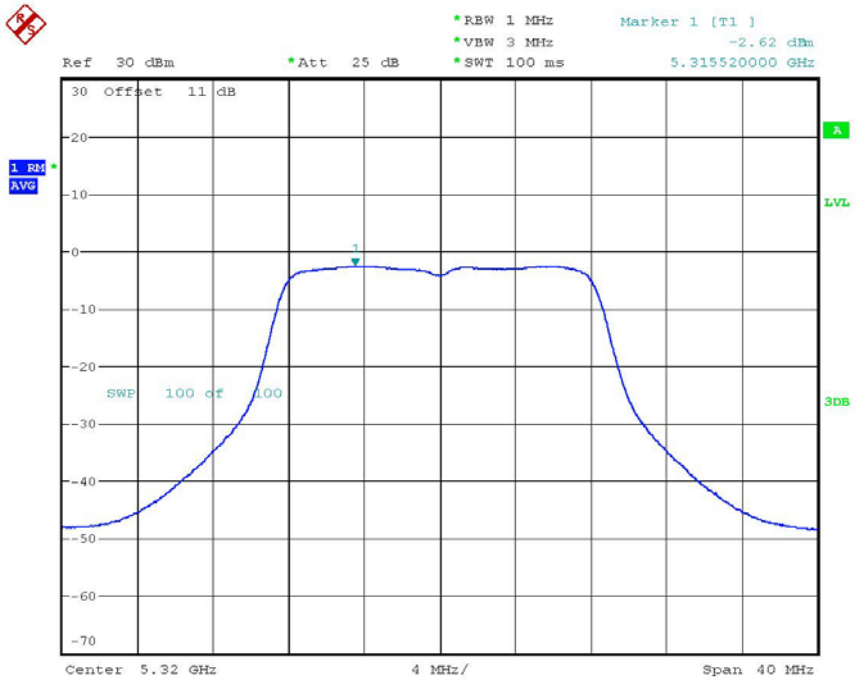


POWER DENSITY ANT0_VHT20CH52
Date: 4.NOV.2014 17:01:36

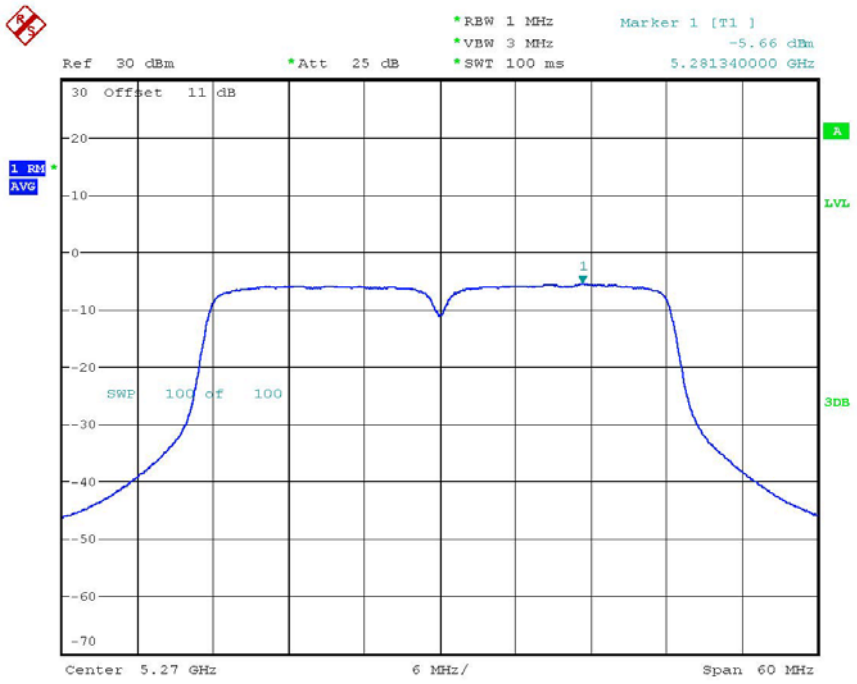


POWER DENSITY ANT0_VHT20CH56
Date: 4.NOV.2014 17:29:51

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

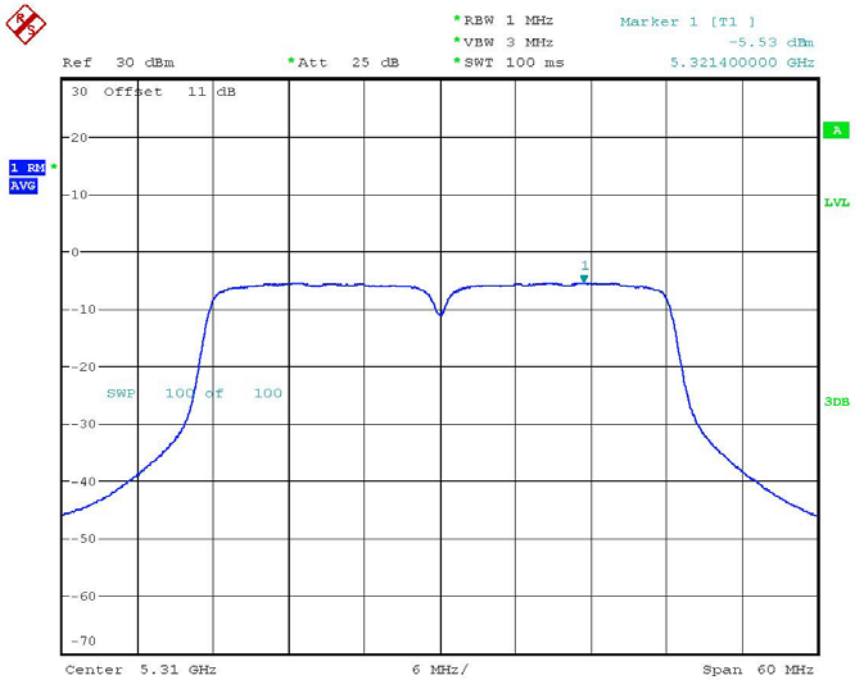


POWER DENSITY ANT0_VHT20CH64
Date: 4.NOV.2014 17:38:14



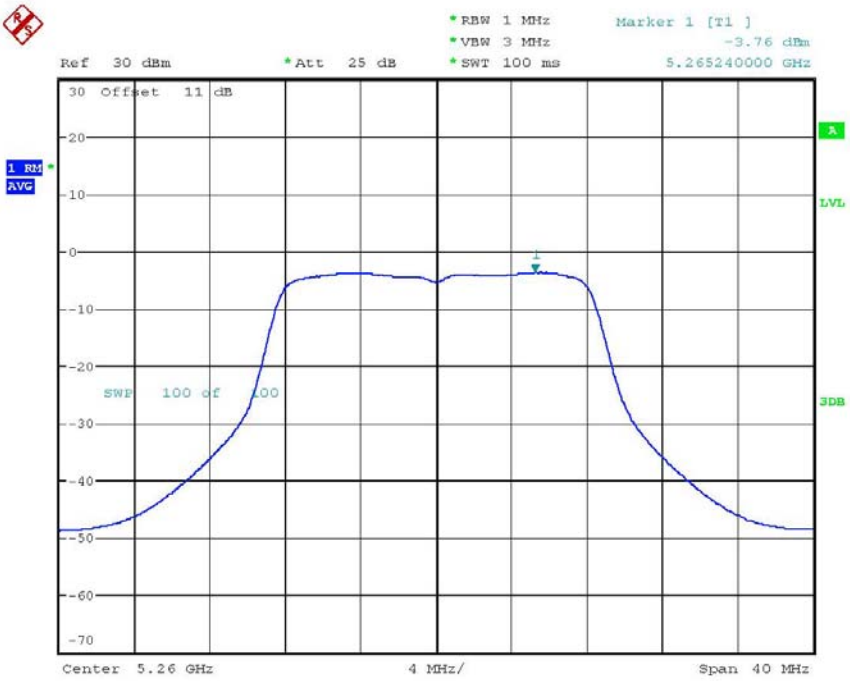
POWER DENSITY ANT0_VHT40CH54
Date: 4.NOV.2014 17:53:46

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

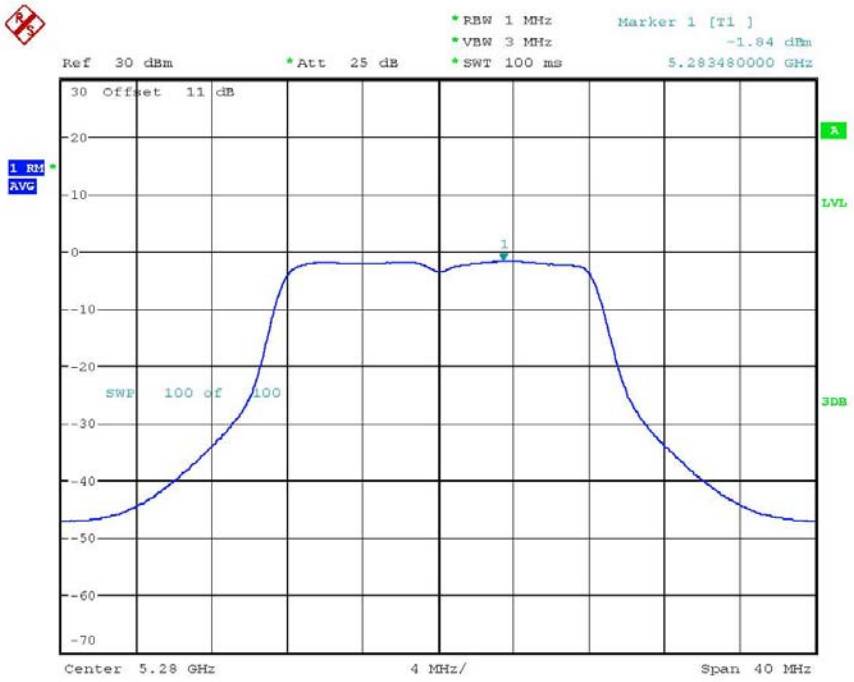


POWER DENSITY ANT0_VHT40CH62
Date: 4.NOV.2014 17:58:26

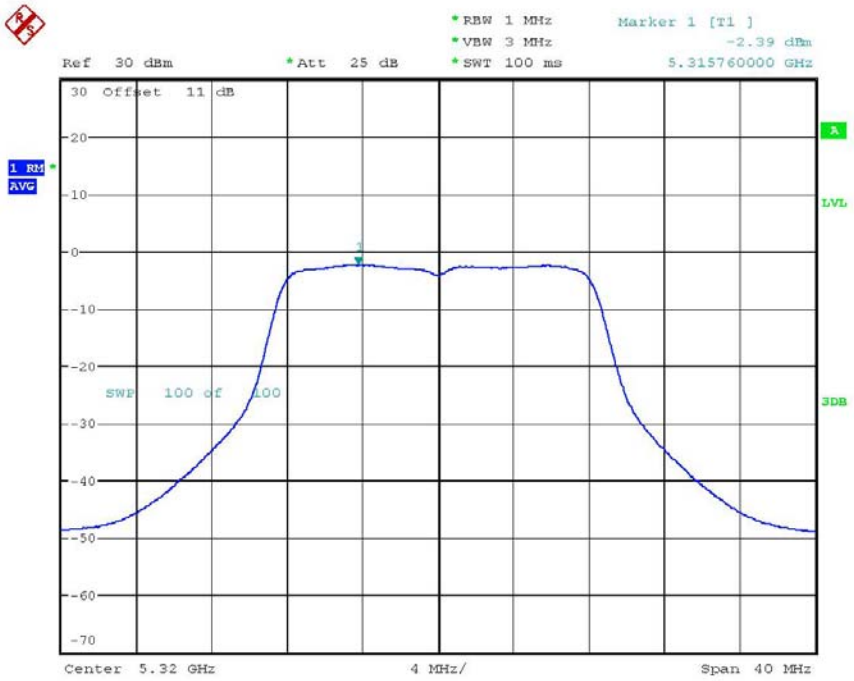
ANT 1



POWER DENSITY ANT1_aCH52
Date: 4.NOV.2014 16:56:56

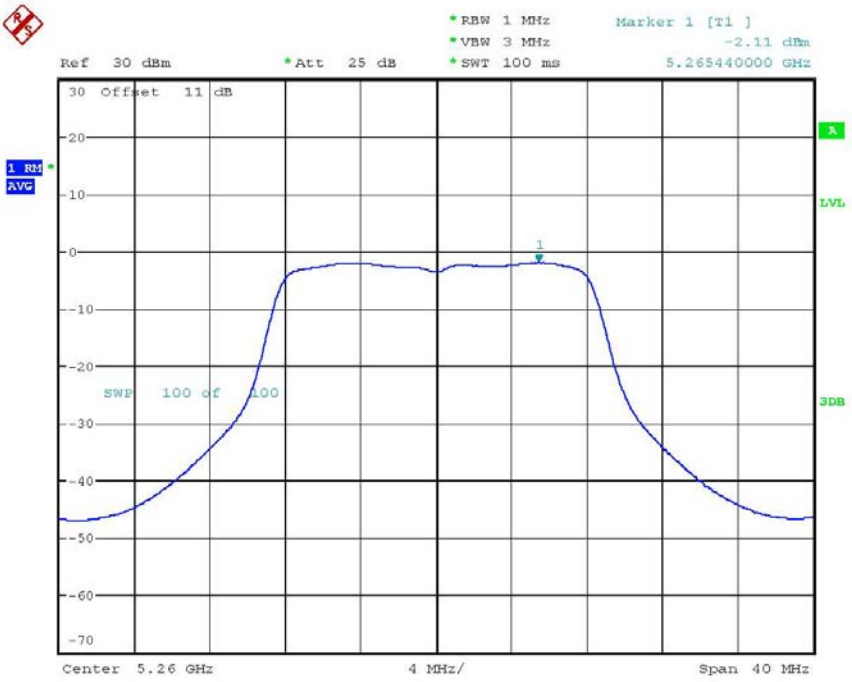


POWER DENSITY ANT1_aCH56
Date: 4.NOV.2014 17:13:16

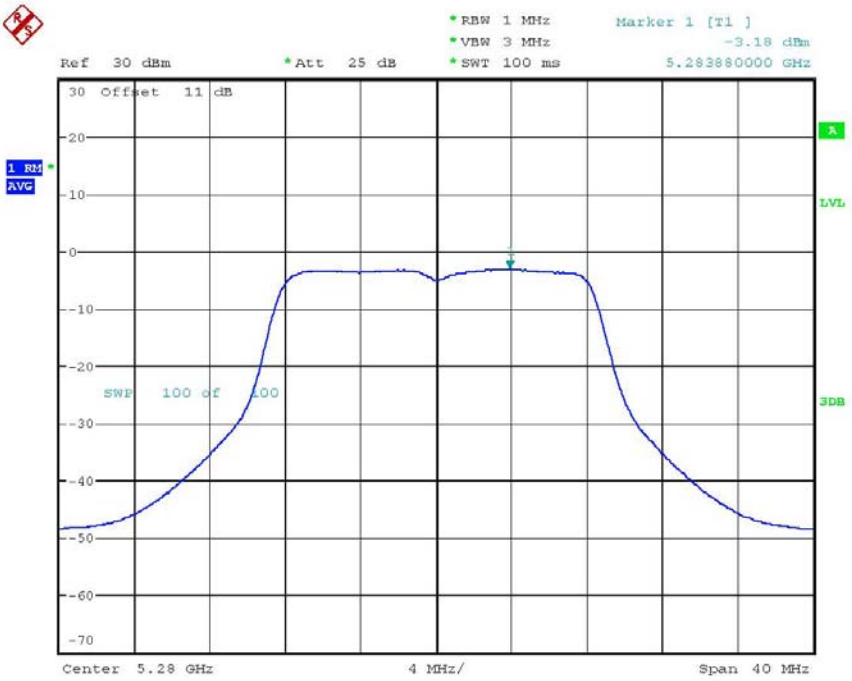


POWER DENSITY ANT1_aCH64
Date: 4.NOV.2014 17:43:57

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

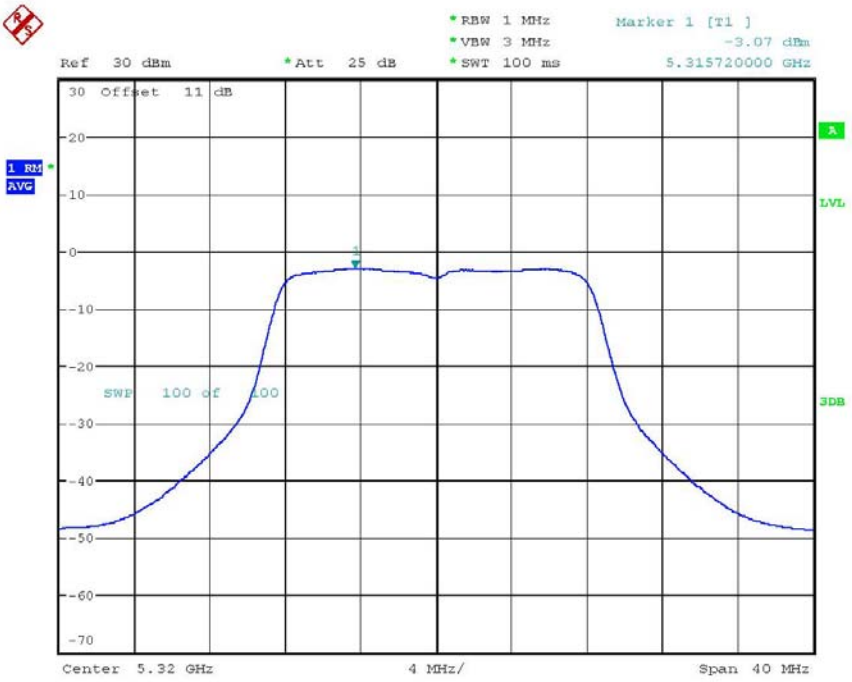


POWER DENSITY ANT1_VHT20CH52
Date: 4.NOV.2014 17:02:32

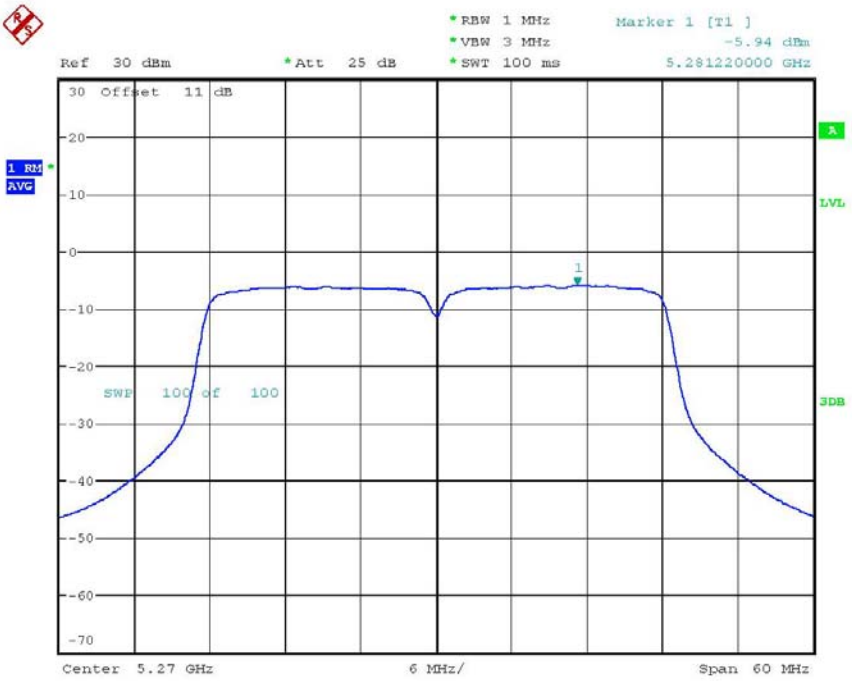


POWER DENSITY ANT1_VHT20CH56
Date: 4.NOV.2014 17:30:40

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

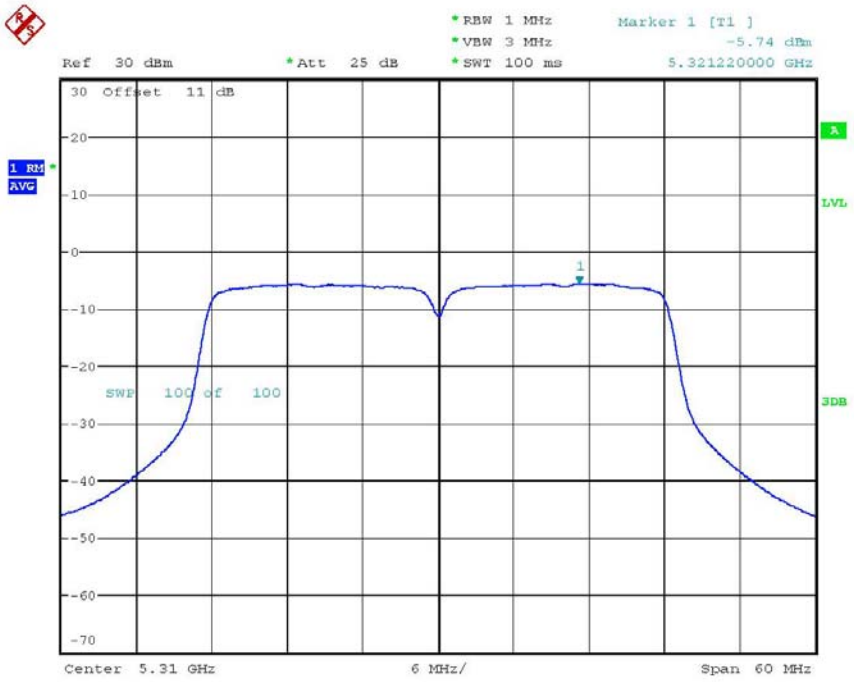


POWER DENSITY ANT1_VHT20CH64
Date: 4.NOV.2014 17:39:10



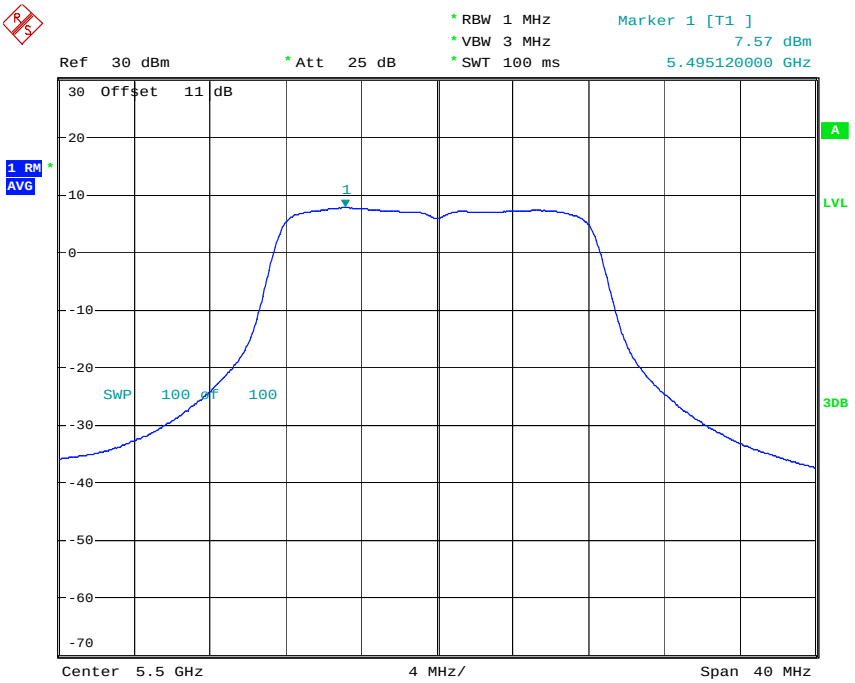
POWER DENSITY ANT1_VHT40CH54
Date: 4.NOV.2014 17:54:42

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

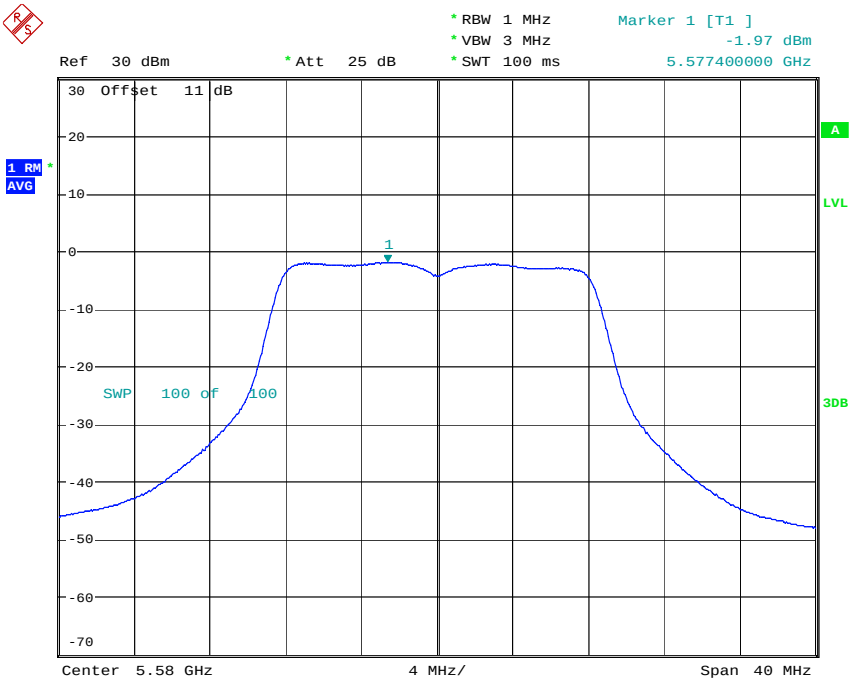


POWER DENSITY ANT1_VHT40CH62
Date: 4.NOV.2014 17:59:22

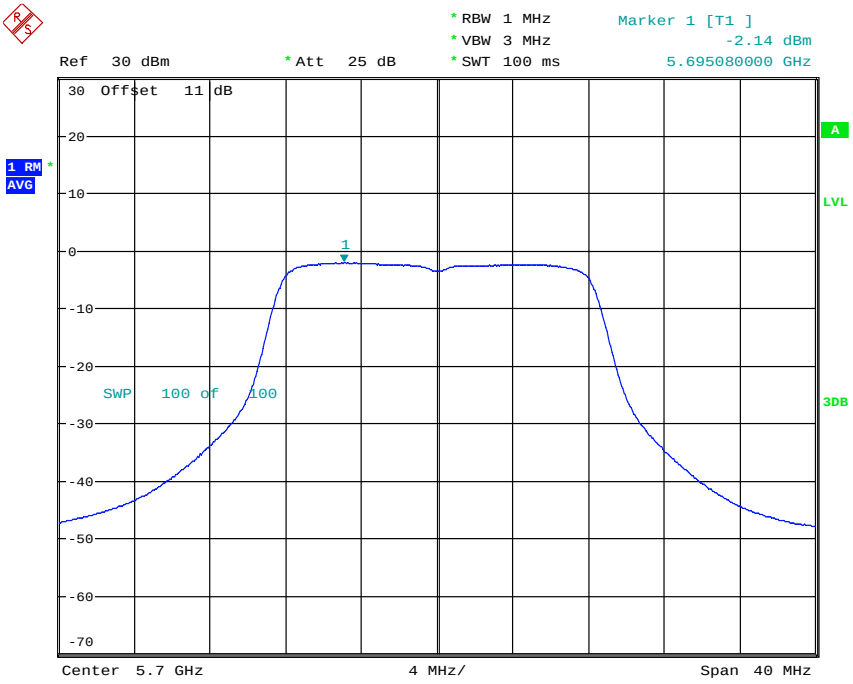
Band 3
ANT 0



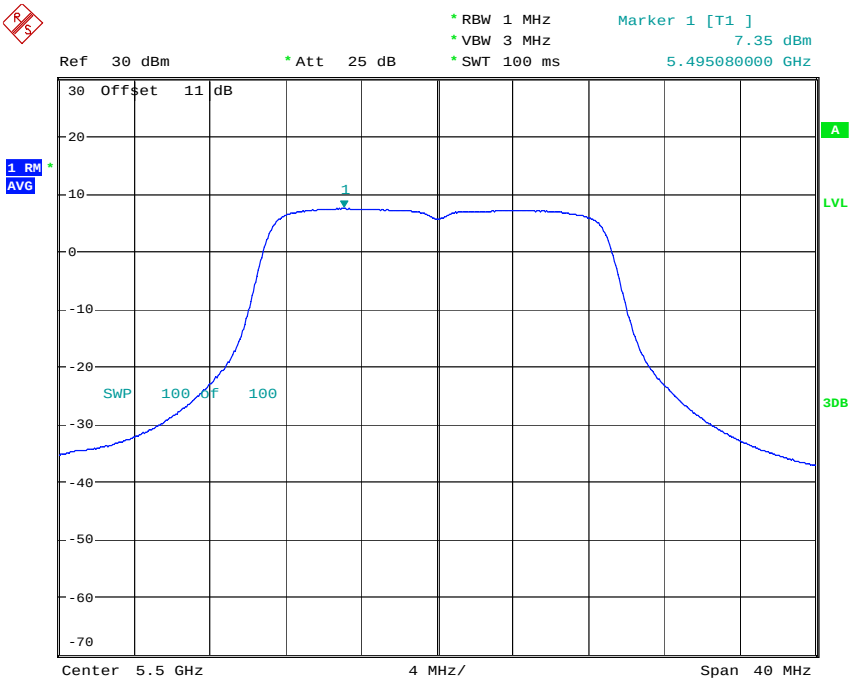
POWER DENSITY CDD ANT0_aCH100
Date: 4.NOV.2014 15:53:56



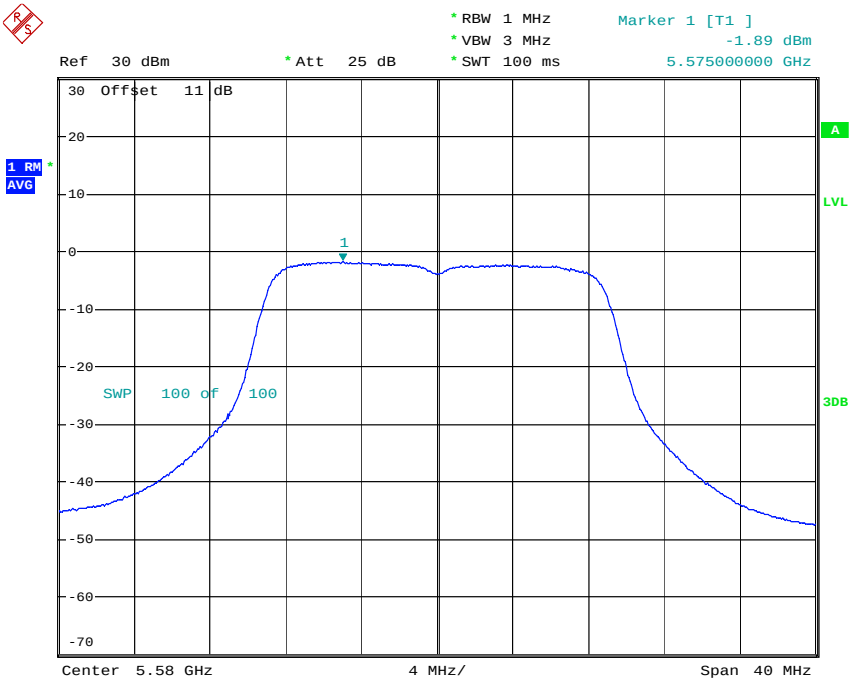
POWER DENSITY CDD ANT0_aCH116
Date: 26.NOV.2014 18:05:42



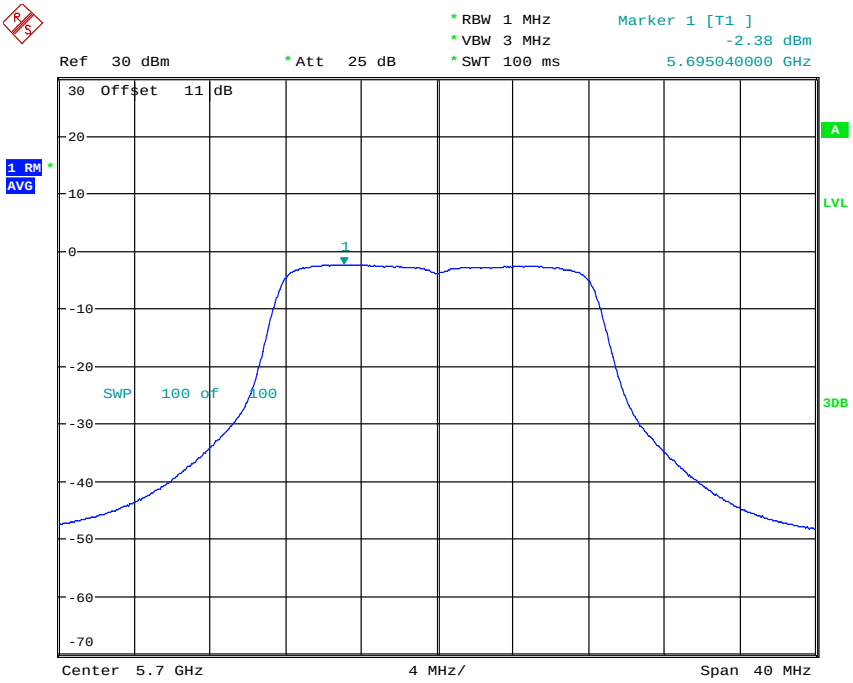
POWER DENSITY CDD ANT0_aCH140
Date: 2.DEC.2014 09:34:18



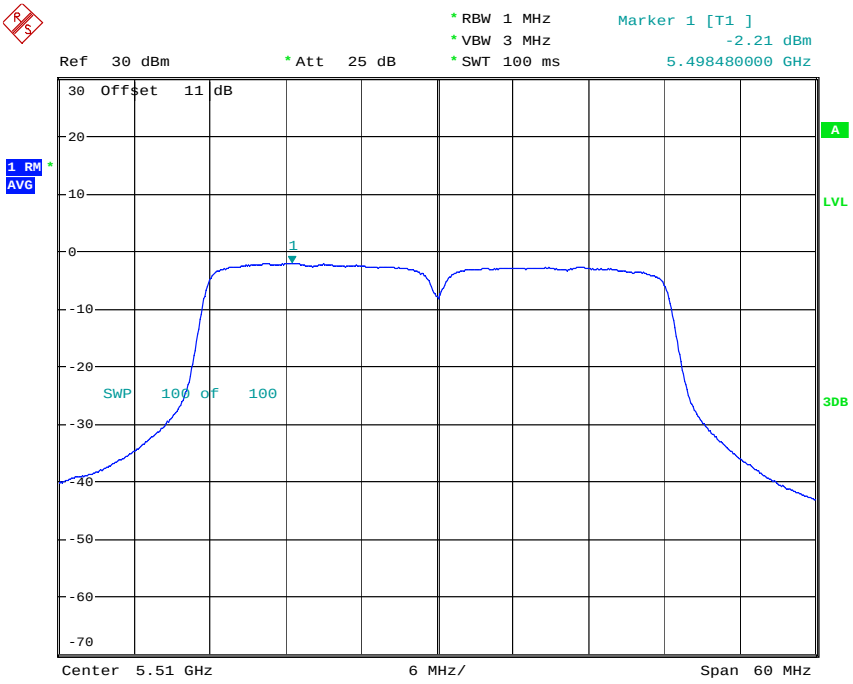
POWER DENSITY CDD ANT0_VHT20CH100
Date: 4.NOV.2014 15:56:43



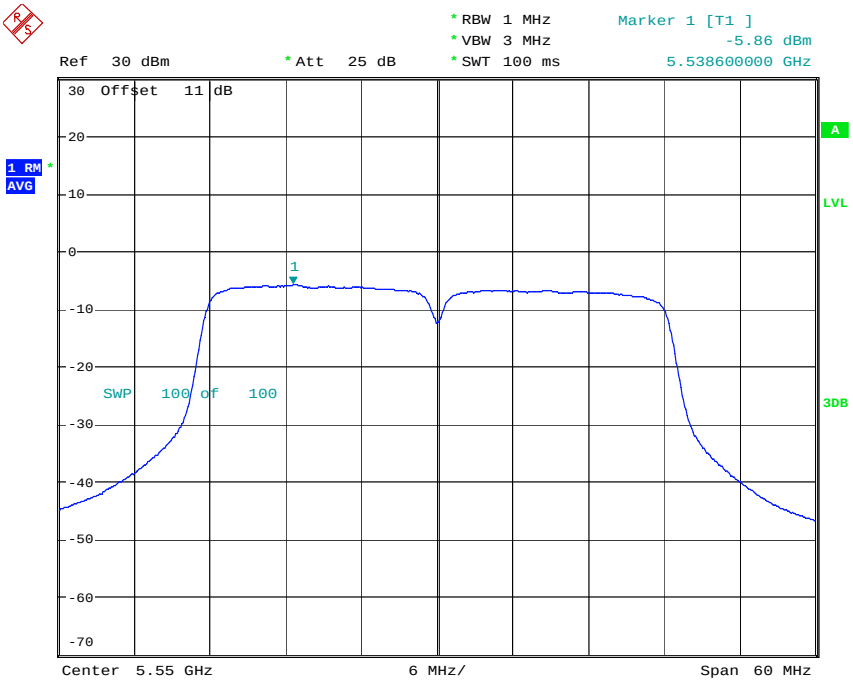
POWER DENSITY CDD ANT0_VHT20CH116
Date: 26.NOV.2014 18:01:44



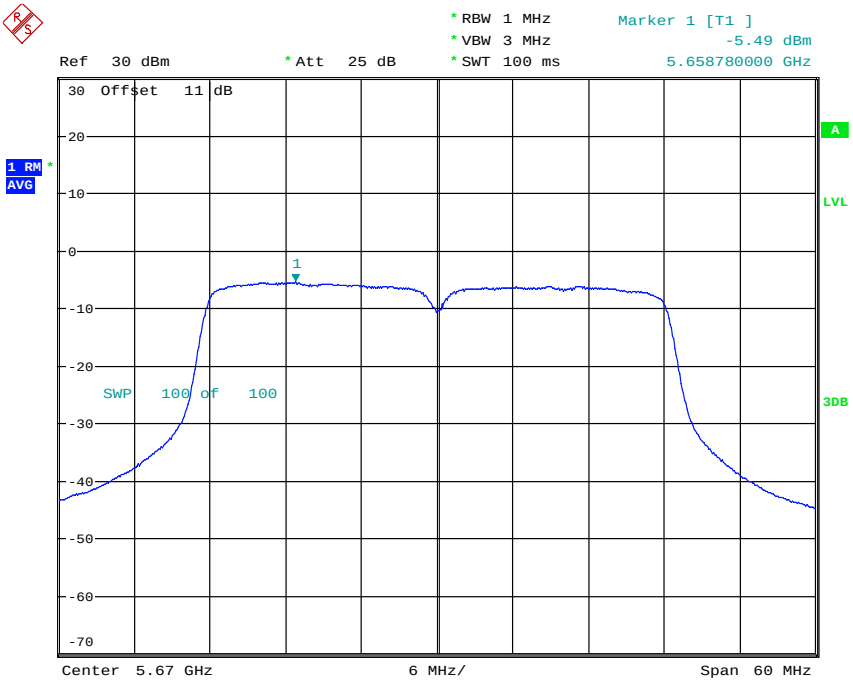
POWER DENSITY CDD ANT0_VHT20CH140
Date: 2.DEC.2014 09:38:16



POWER DENSITY CDD ANT0_VHT40CH102
Date: 4.NOV.2014 16:32:17



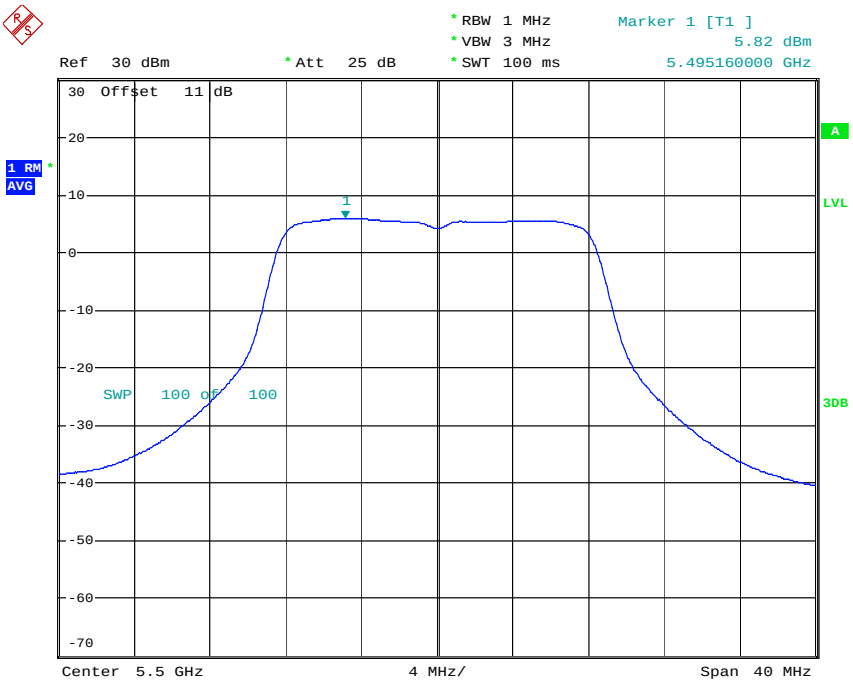
POWER DENSITY CDD ANT0_VHT40CH110
Date: 27.NOV.2014 09:55:03



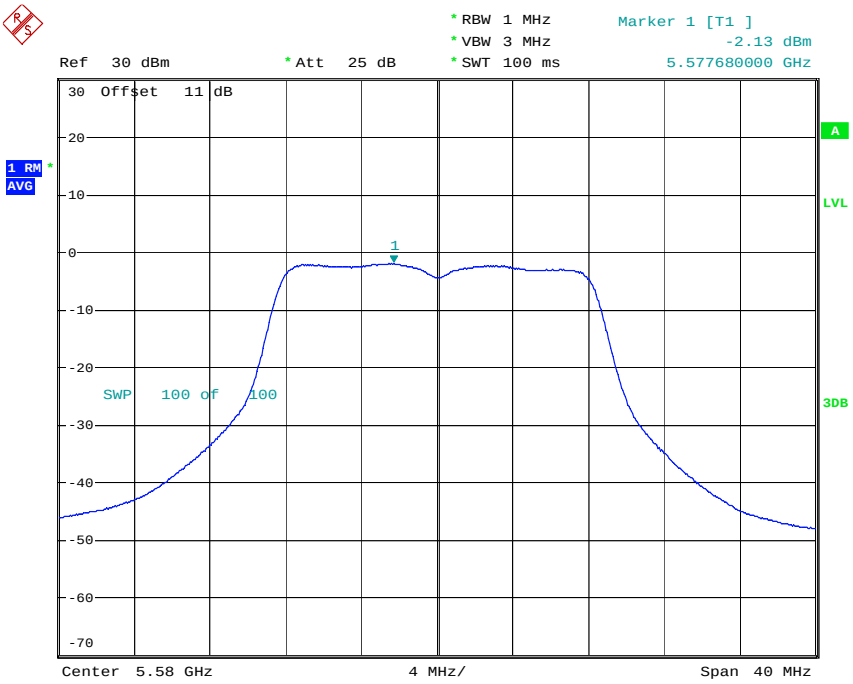
POWER DENSITY CDD ANT0_VHT40CH134
Date: 2.DEC.2014 09:48:48

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

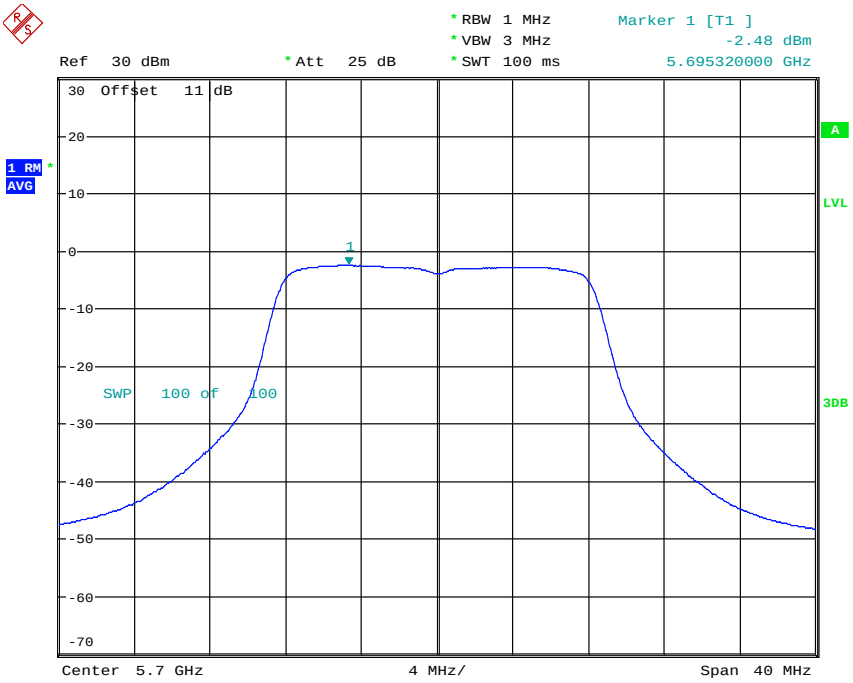
ANT 1



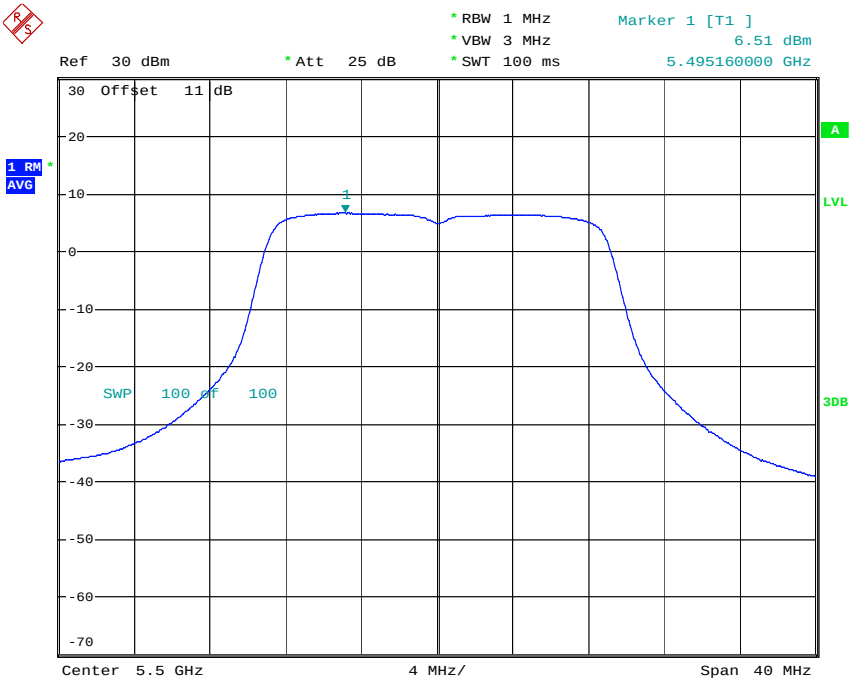
POWER DENSITY CDD ANT1_aCH100
Date: 4.NOV.2014 15:54:45



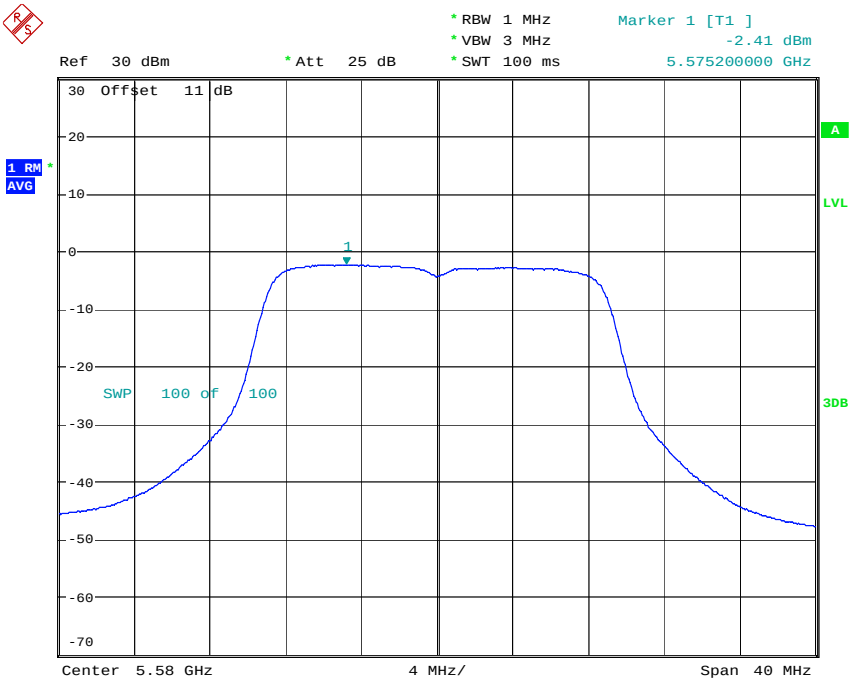
POWER DENSITY CDD ANT1_aCH116
Date: 26.NOV.2014 18:06:31



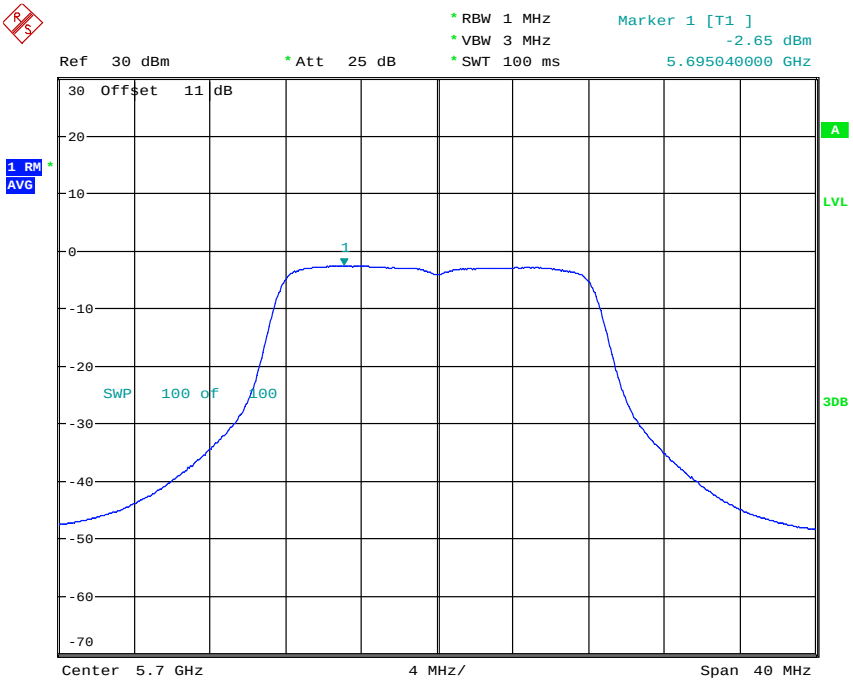
POWER DENSITY CDD ANT1_aCH140
Date: 2.DEC.2014 09:35:07



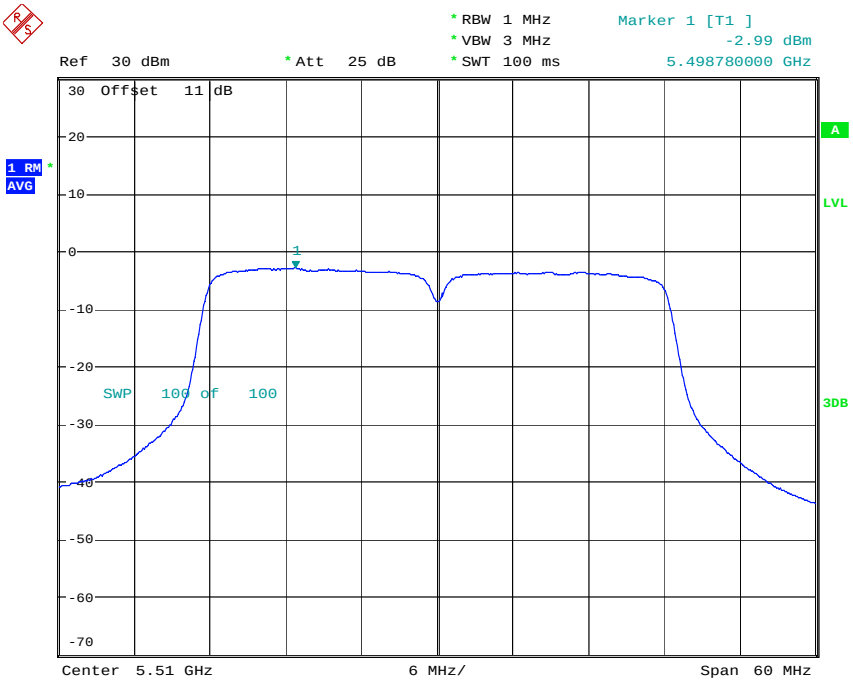
POWER DENSITY CDD ANT1_VHT20CH100
Date: 4.NOV.2014 15:57:32



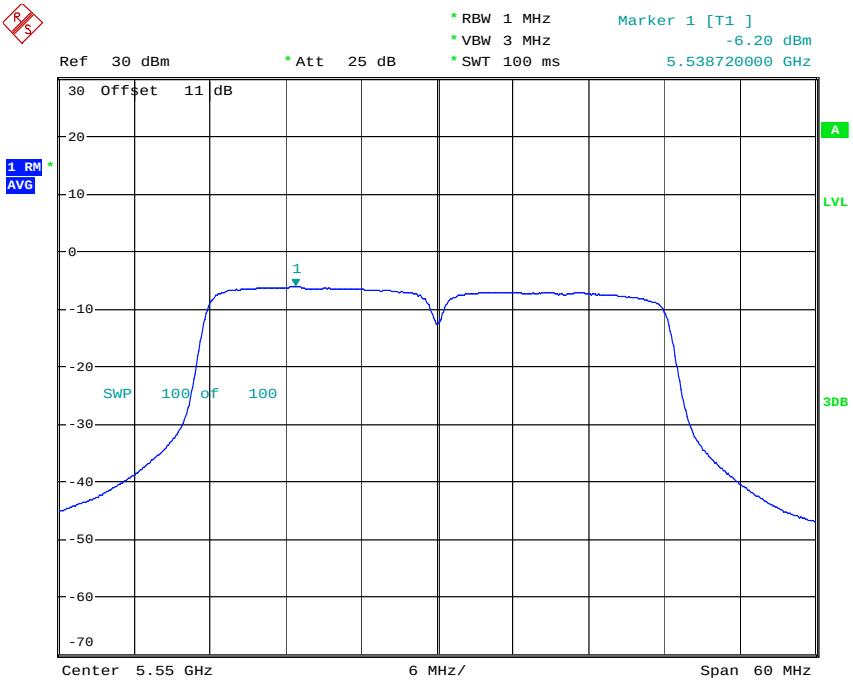
POWER DENSITY CDD ANT1_VHT20CH116
Date: 26.NOV.2014 18:02:54



POWER DENSITY CDD ANT1_VHT20CH140
Date: 2.DEC.2014 09:39:05

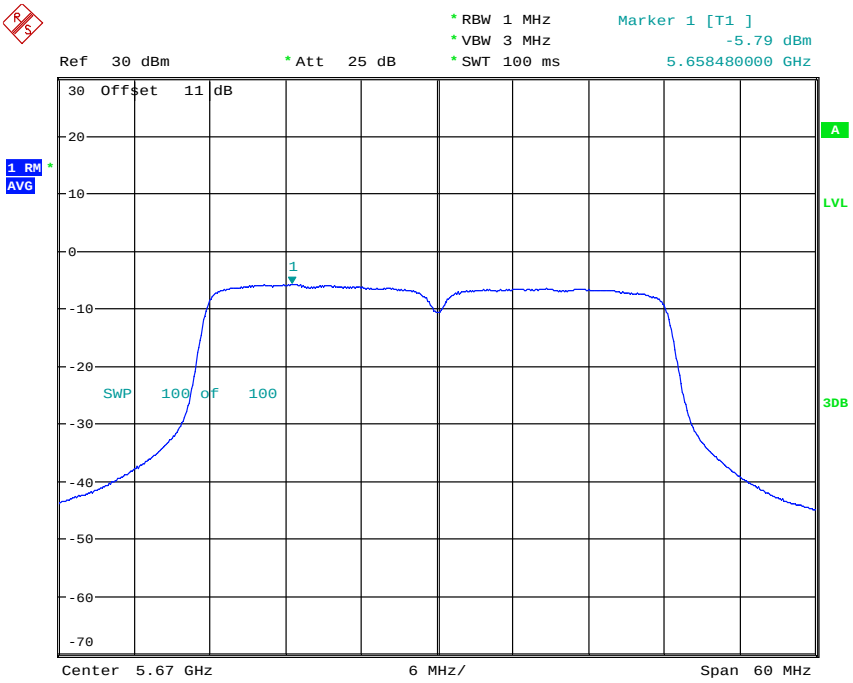


POWER DENSITY CDD ANT1_VHT40CH102
Date: 4.NOV.2014 16:33:29



POWER DENSITY CDD ANT1_VHT40CH110
Date: 27.NOV.2014 09:55:59

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS



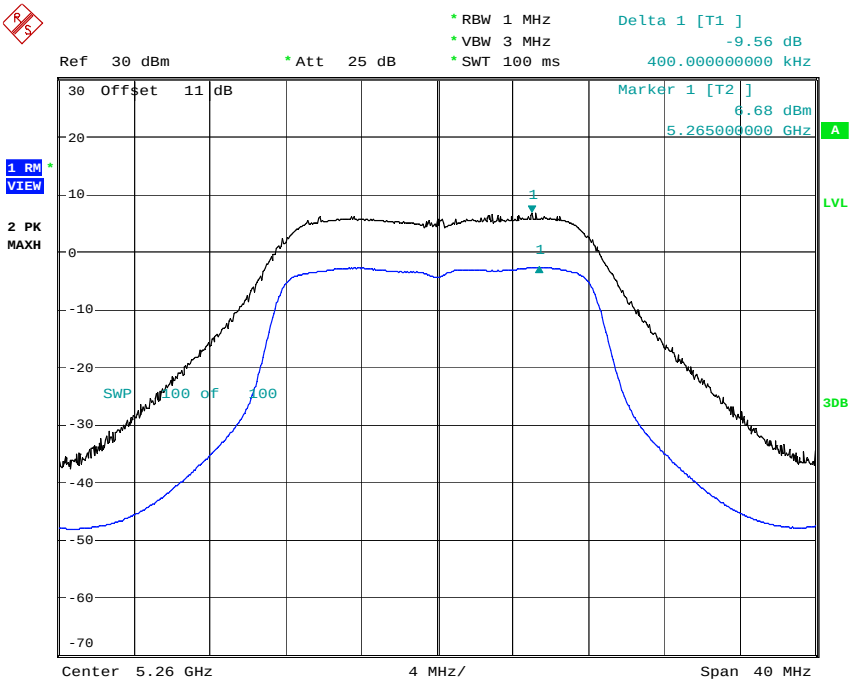
POWER DENSITY CDD ANT1_VHT40CH134
Date: 2.DEC.2014 09:49:44

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

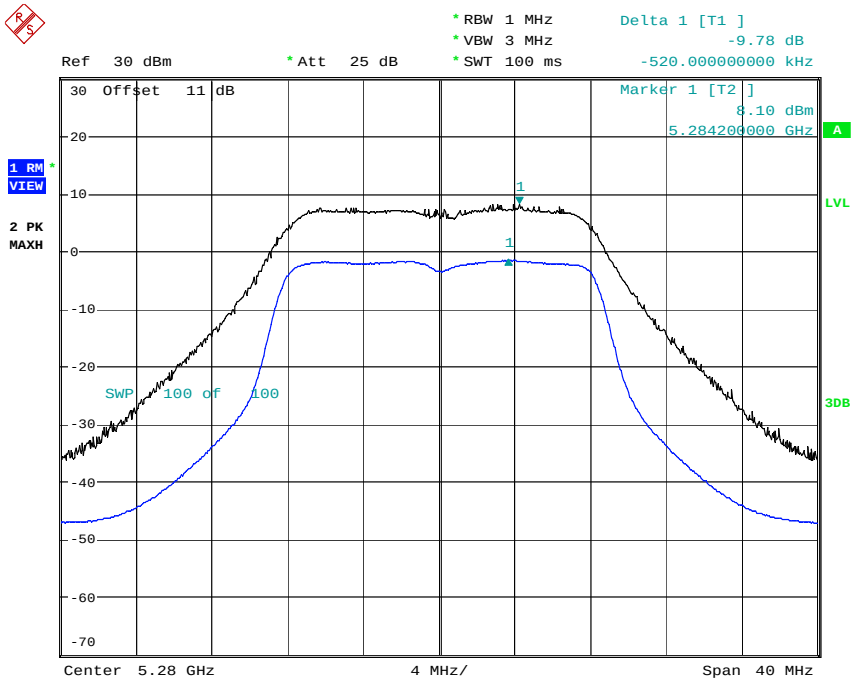
3.4 Ratio of the Peak Excursion of the modulation envelope, FCC 15.407 (a)(6)

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

Band 2
ANT 0

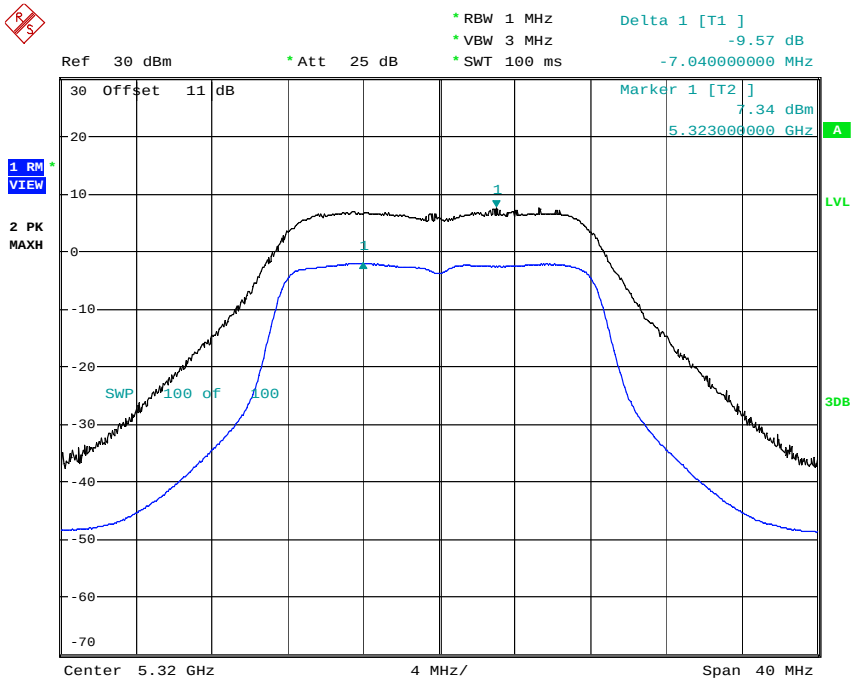


PEAK EXCURSION ANT0_aCH52
Date: 4.NOV.2014 16:56:00



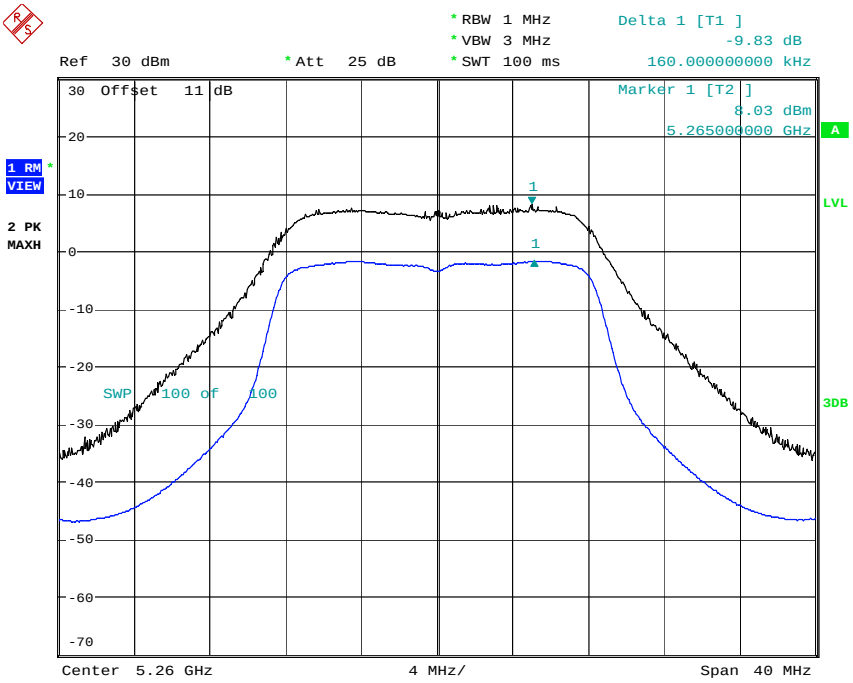
PEAK EXCURSION ANT0_aCH56

Date: 4.NOV.2014 17:12:41

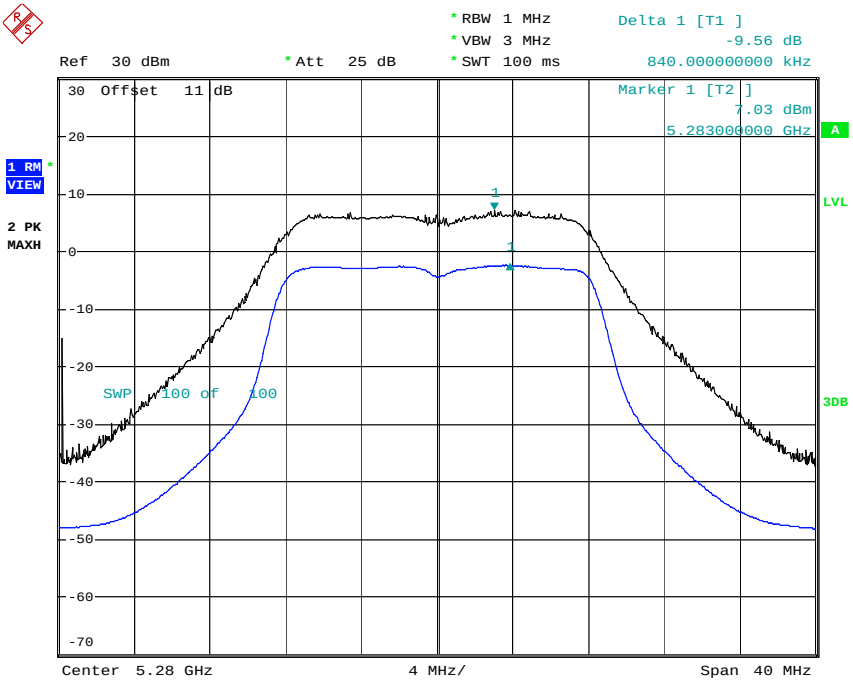


PEAK EXCURSION ANT0_aCH64

Date: 4.NOV.2014 17:43:21

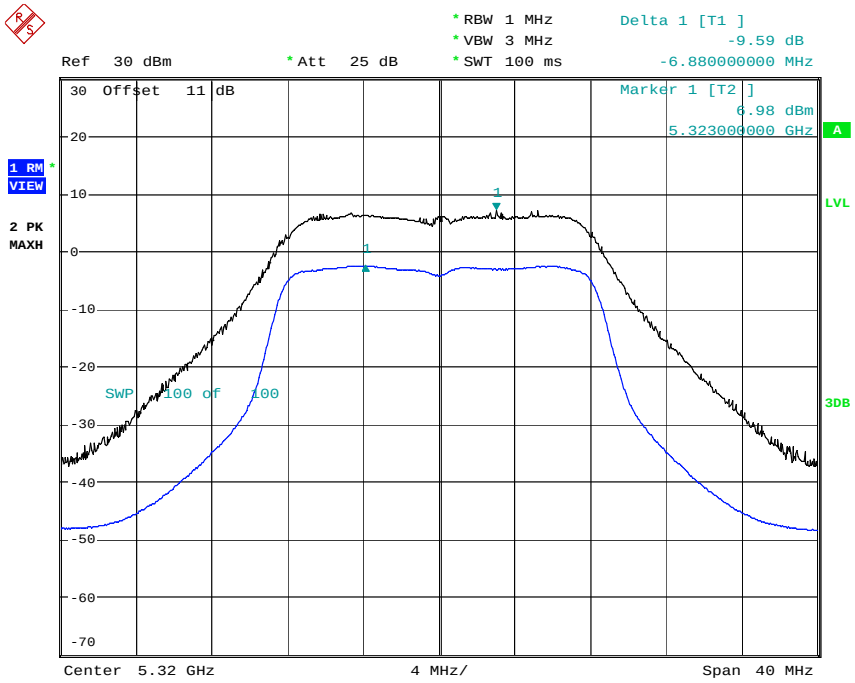


PEAK EXCURSION ANT0_VHT20CH52
Date: 4.NOV.2014 17:01:57



PEAK EXCURSION ANT0_VHT20CH56
Date: 4.NOV.2014 17:30:11

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS



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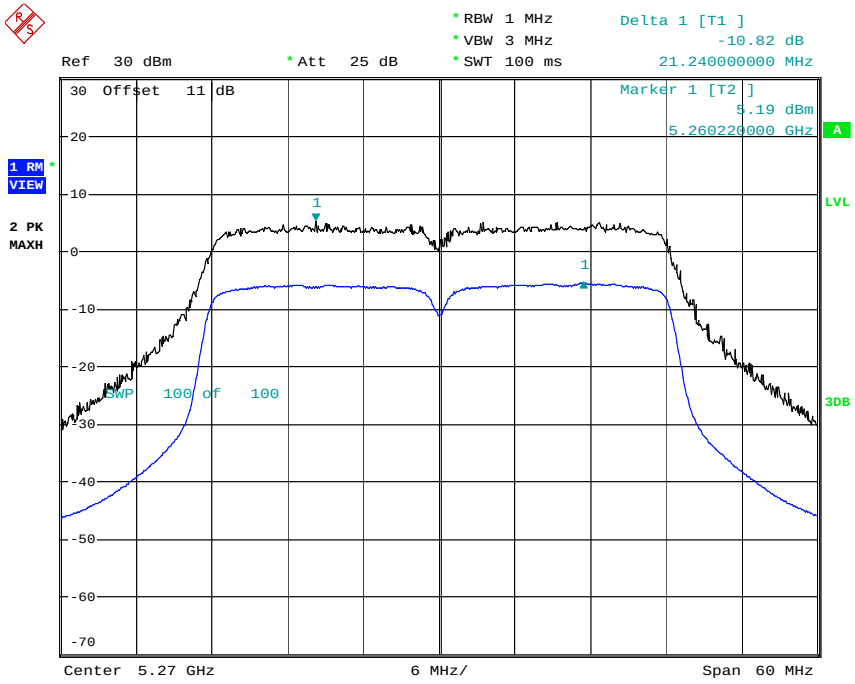
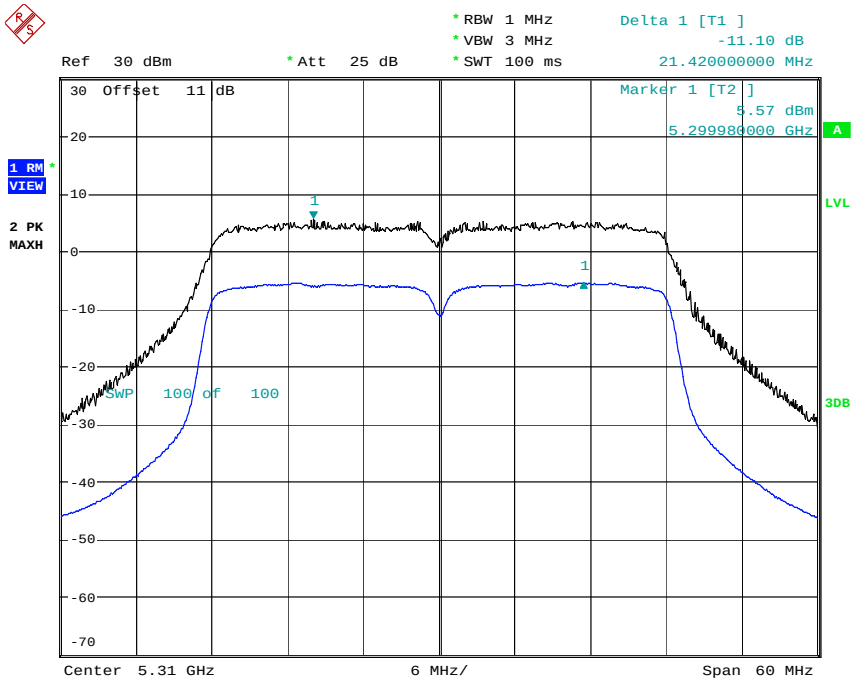
Date: 4.NOV.2014 17:38:35



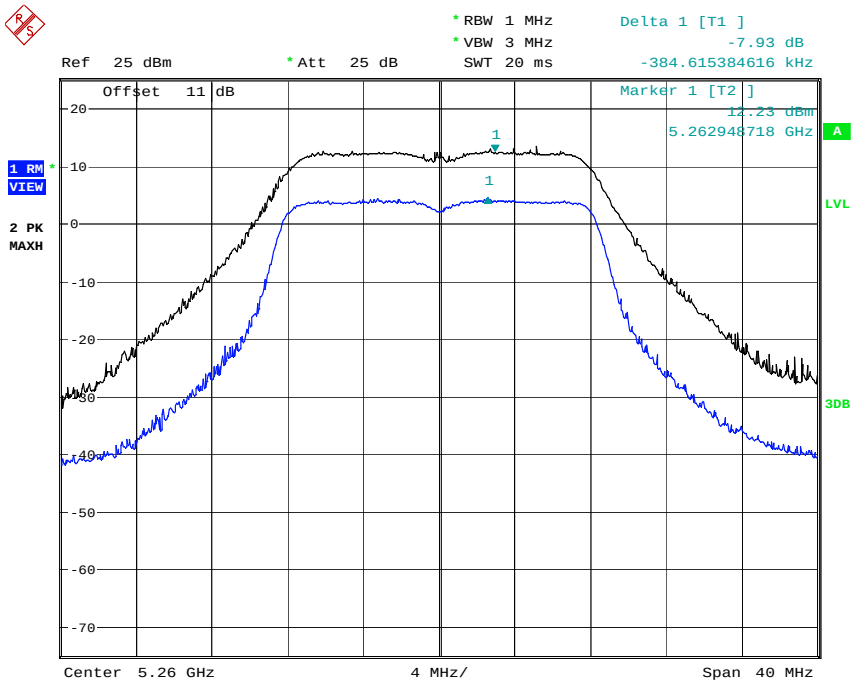
PEAK EXCURSION ANT0_VHT40CH54
Date: 4.NOV.2014 17:54:09

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS



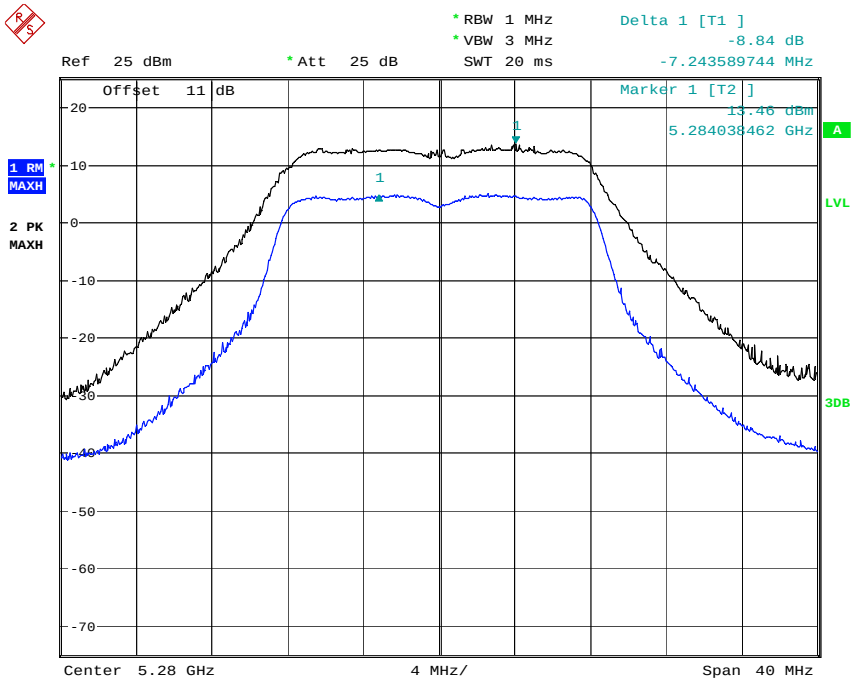
PEAK EXCURSION ANT0_VHT40CH62
Date: 4.NOV.2014 17:58:49

ANT 1

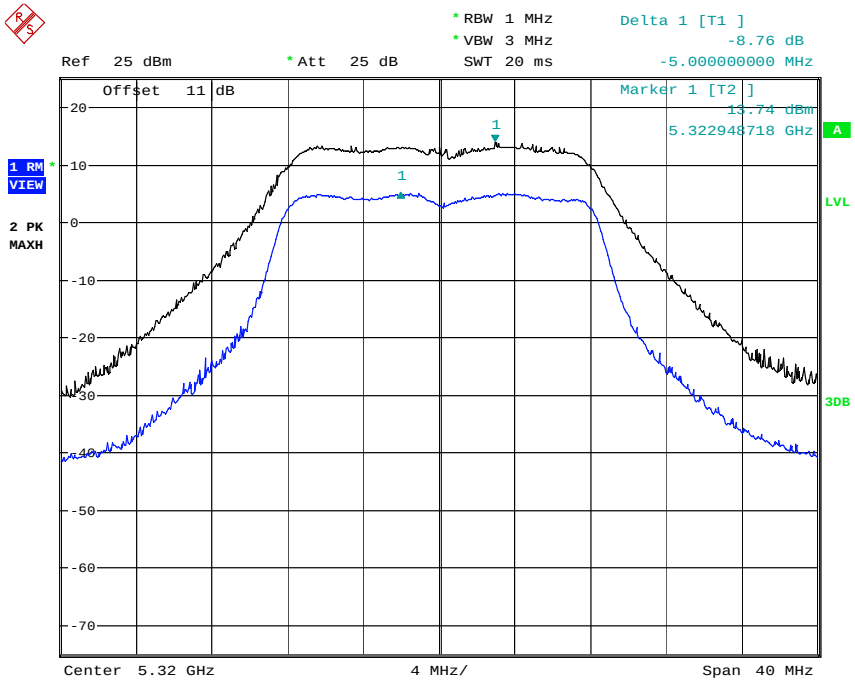


PEAK EXCURSION ANT1_aCH52
Date: 27.NOV.2014 10:37:58

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

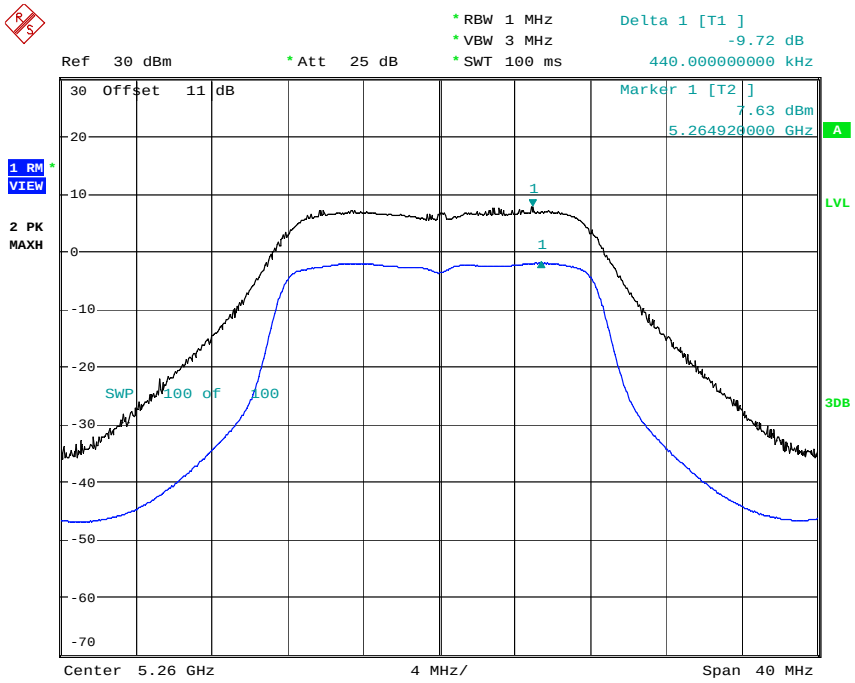


PEAK EXCURSION ANT1_aCH56
Date: 27.NOV.2014 10:39:33

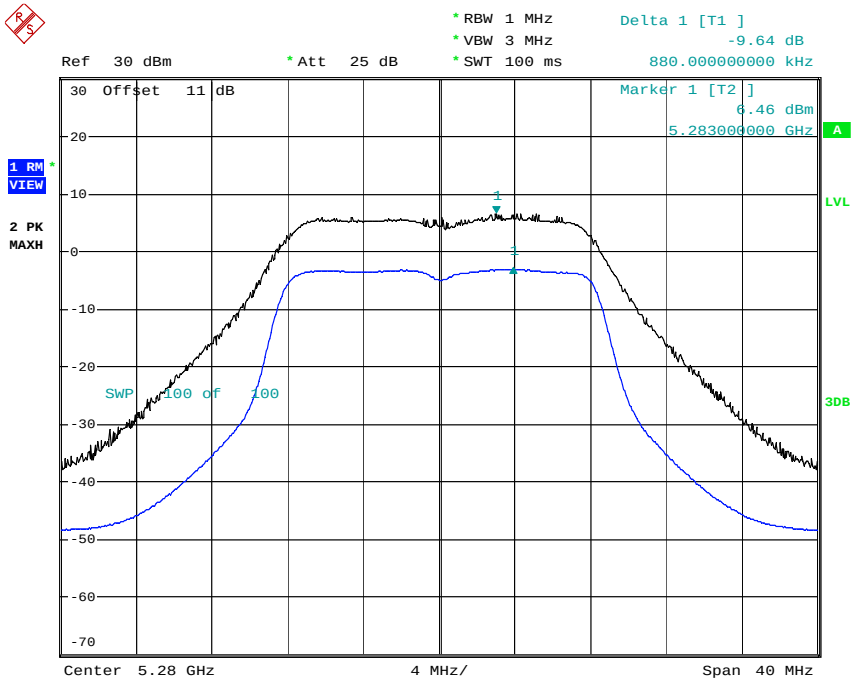


PEAK EXCURSION ANT1_aCH64
Date: 27.NOV.2014 10:40:57

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

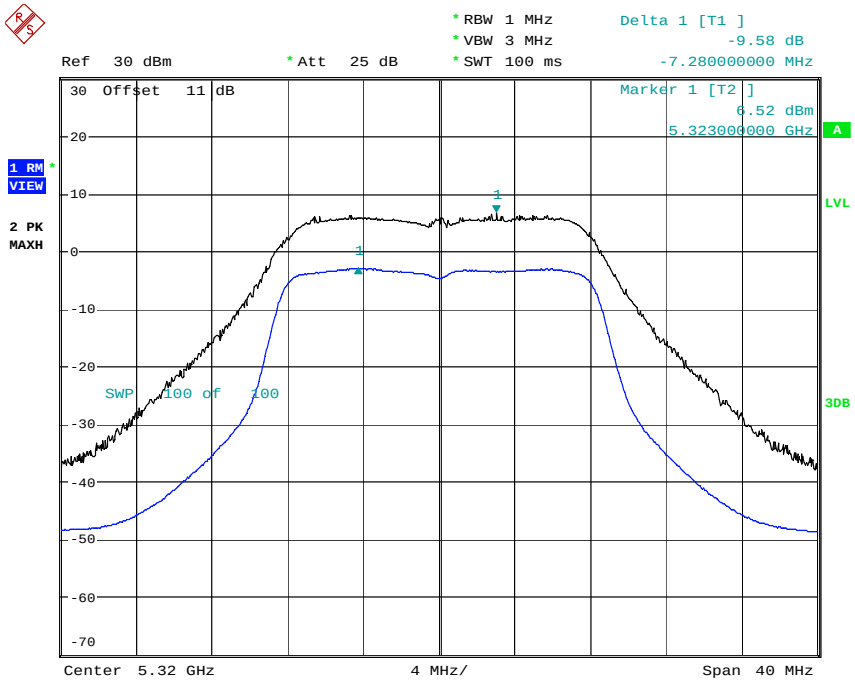


PEAK EXCURSION ANT1_VHT20CH52
Date: 4.NOV.2014 17:03:14

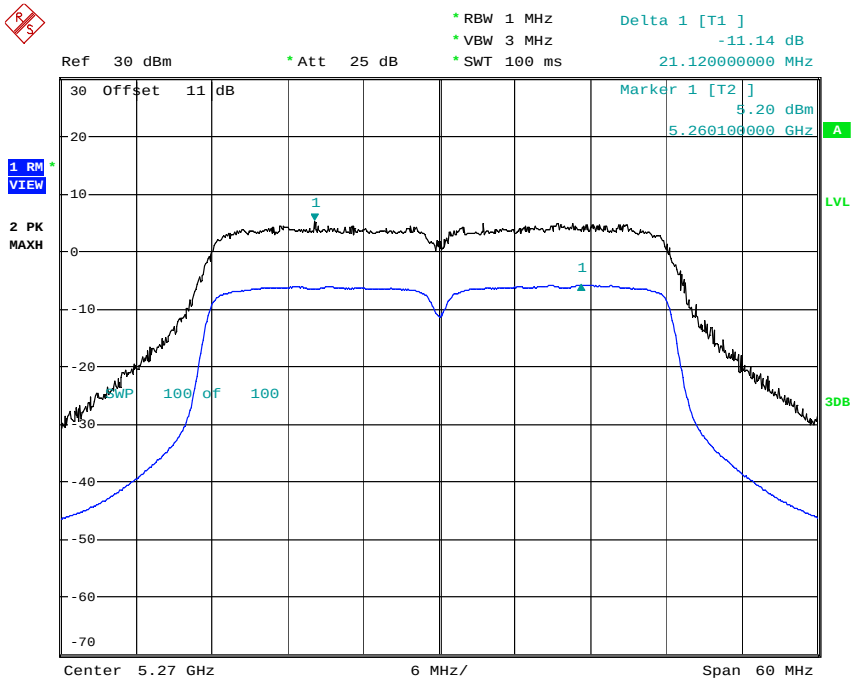


PEAK EXCURSION ANT1_VHT20CH56
Date: 4.NOV.2014 17:31:00

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

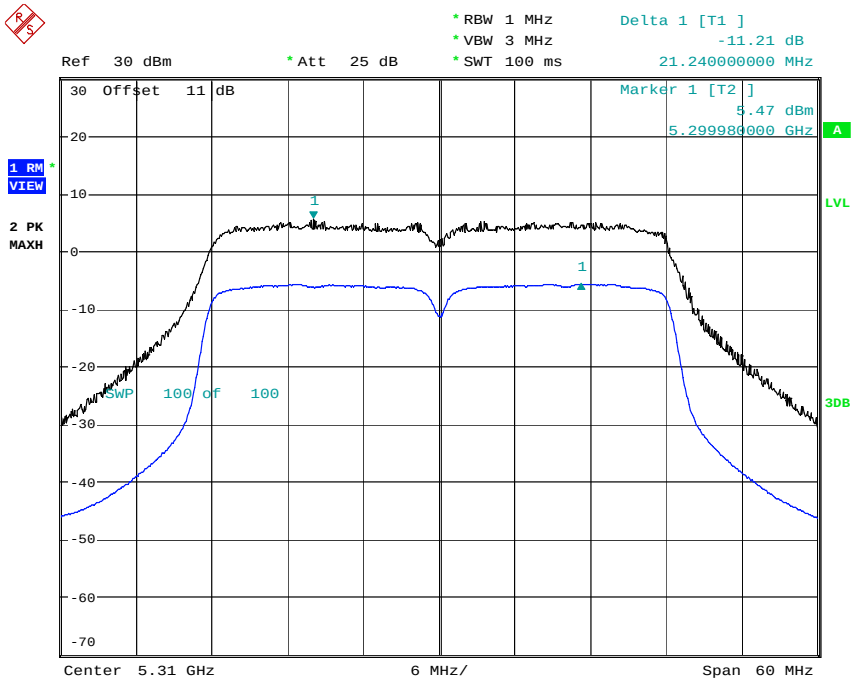


PEAK EXCURSION ANT1_VHT20CH64
Date: 4.NOV.2014 17:39:31



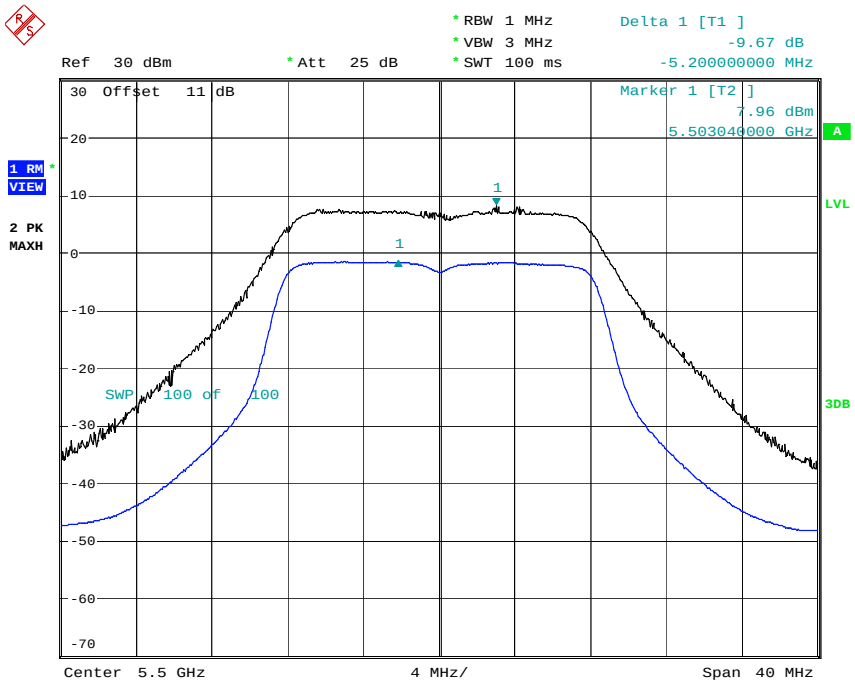
PEAK EXCURSION ANT1_VHT40CH54
Date: 4.NOV.2014 17:55:05

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

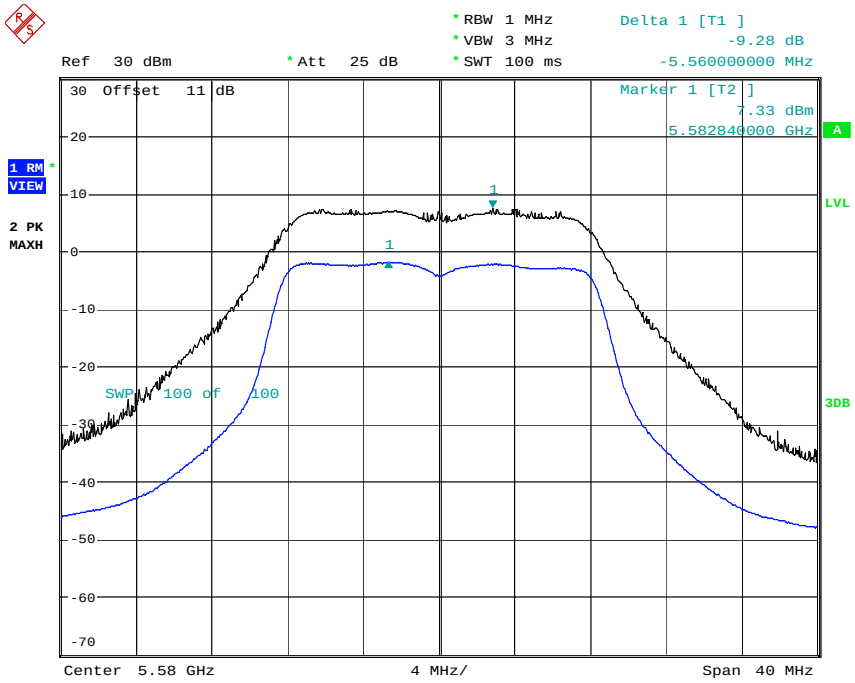


PEAK EXCURSION ANT1_VHT40CH62
Date: 4.NOV.2014 17:59:46

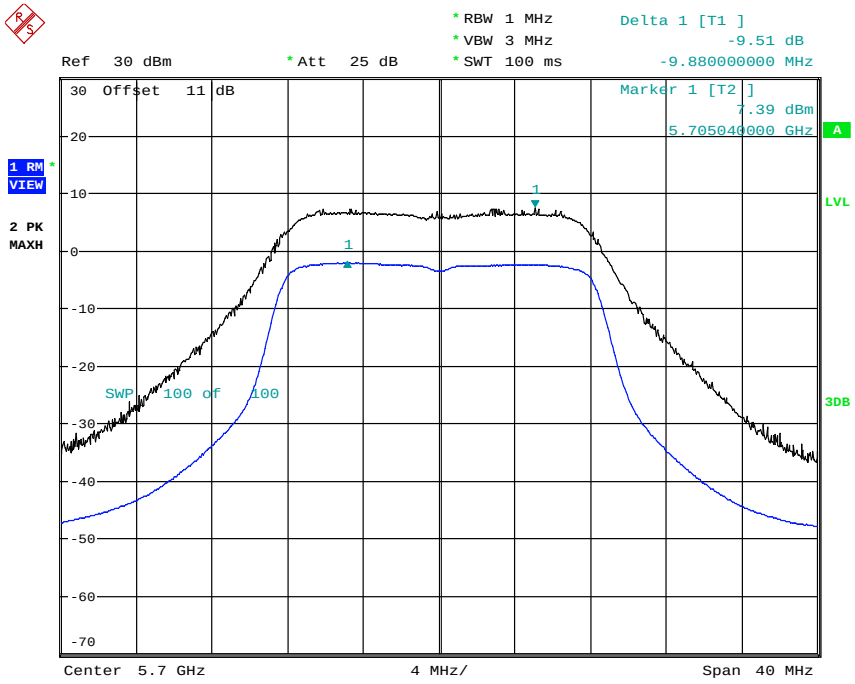
Band 3
ANT 0



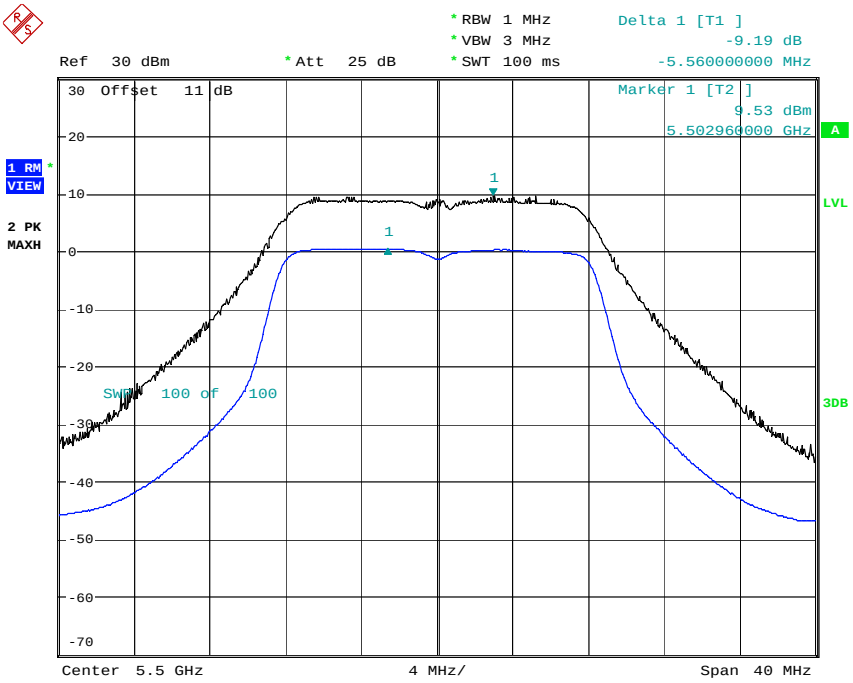
PEAK EXCURSION ANT0_aCH100
Date: 4.NOV.2014 16:30:47



PEAK EXCURSION ANT0_aCH116
Date: 26.NOV.2014 18:06:02

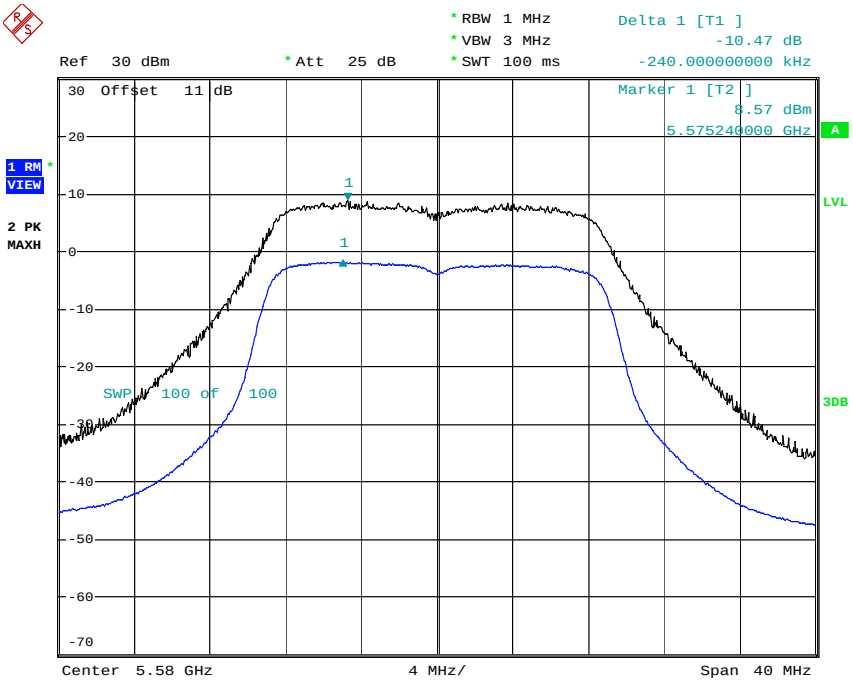


PEAK EXCURSION ANT0_aCH140
Date: 2.DEC.2014 09:34:38



PEAK EXCURSION ANT0_VHT20CH100

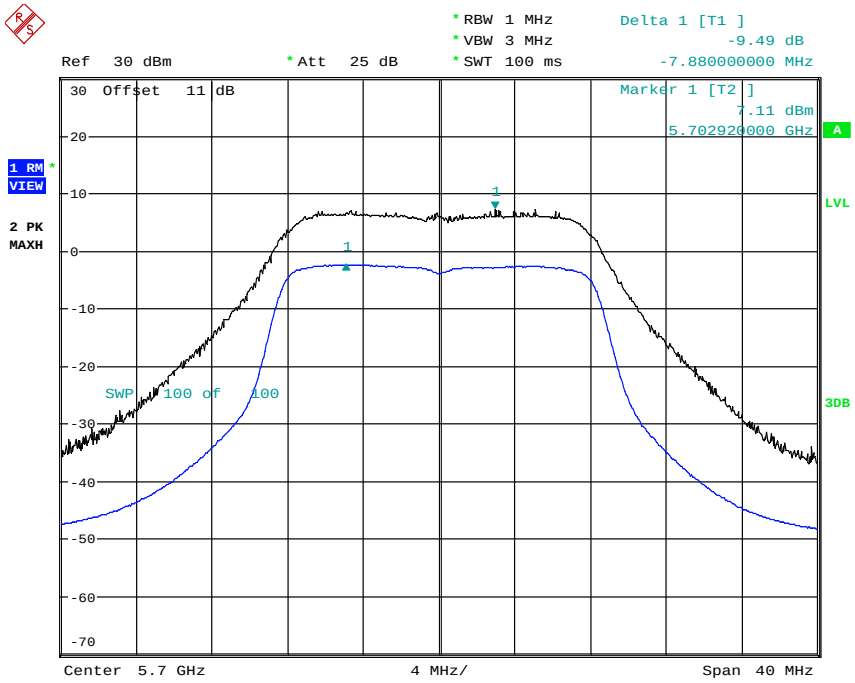
Date: 4.NOV.2014 16:29:02



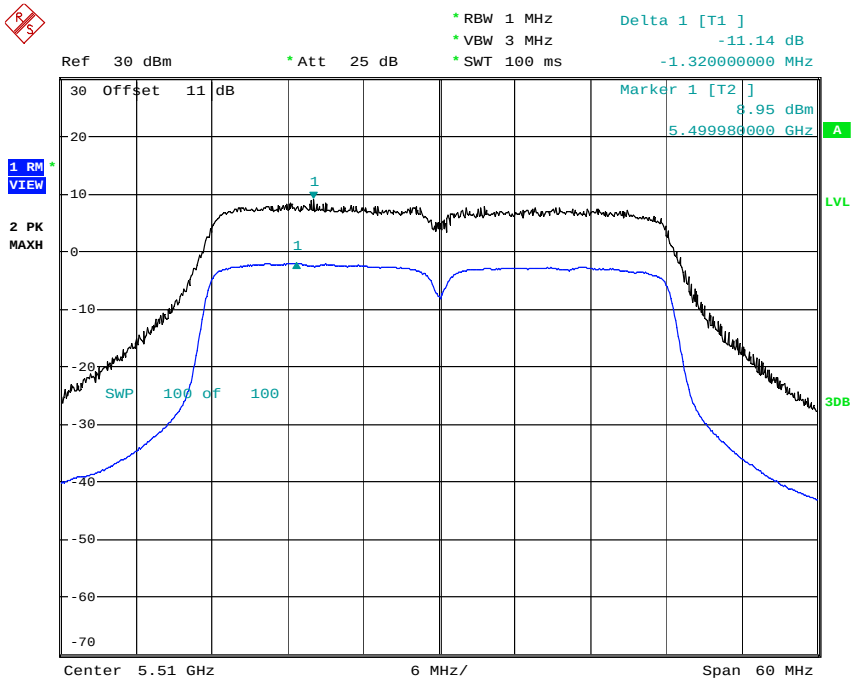
PEAK EXCURSION ANT0_VHT20CH116

Date: 26.NOV.2014 18:02:25

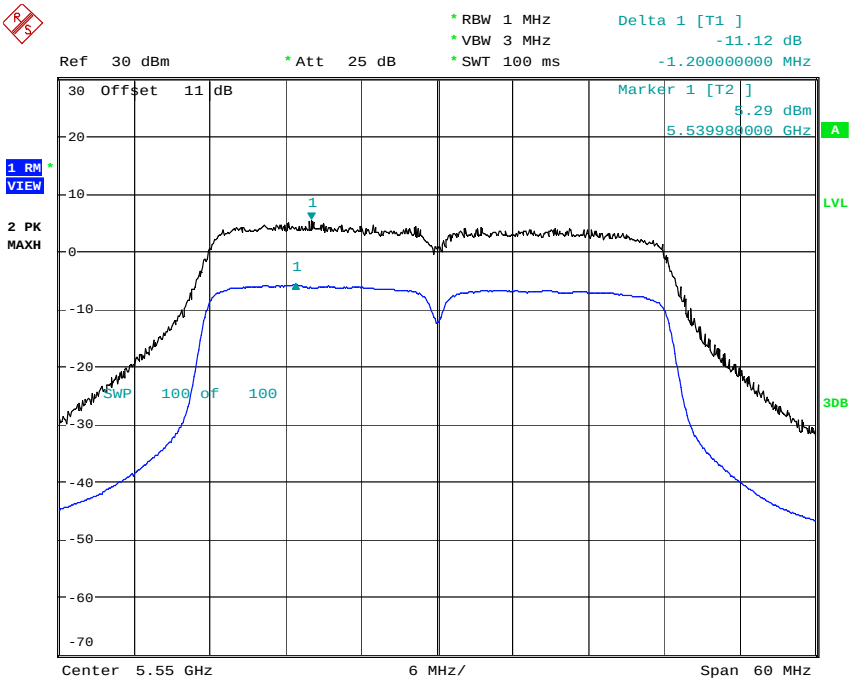
Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS



PEAK EXCURSION ANT0_VHT20CH140
Date: 2.DEC.2014 09:38:36

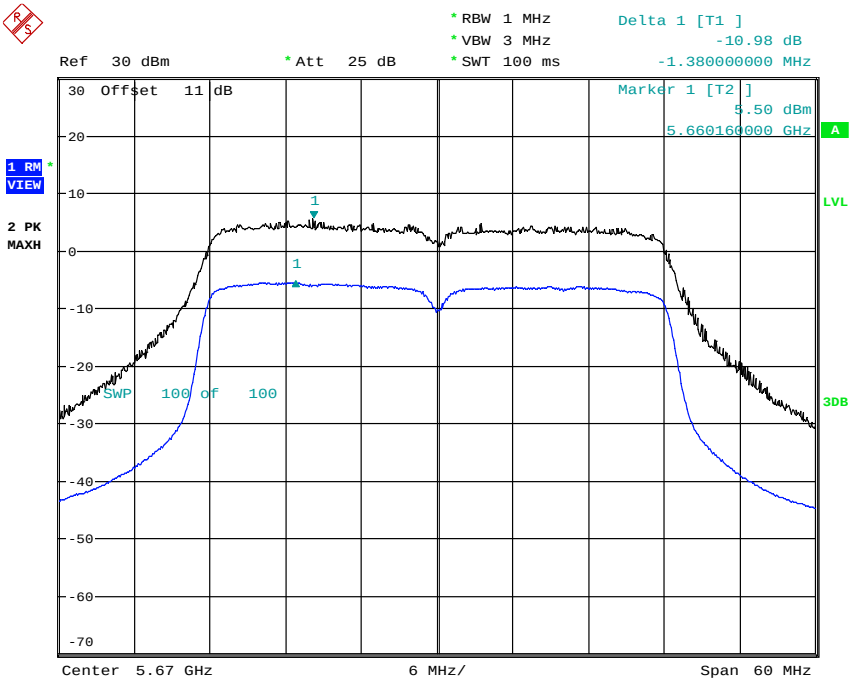


PEAK EXCURSION ANT0_VHT40CH102
Date: 4.NOV.2014 16:32:41



PEAK EXCURSION ANT0_VHT40CH110

Date: 27.NOV.2014 09:55:26

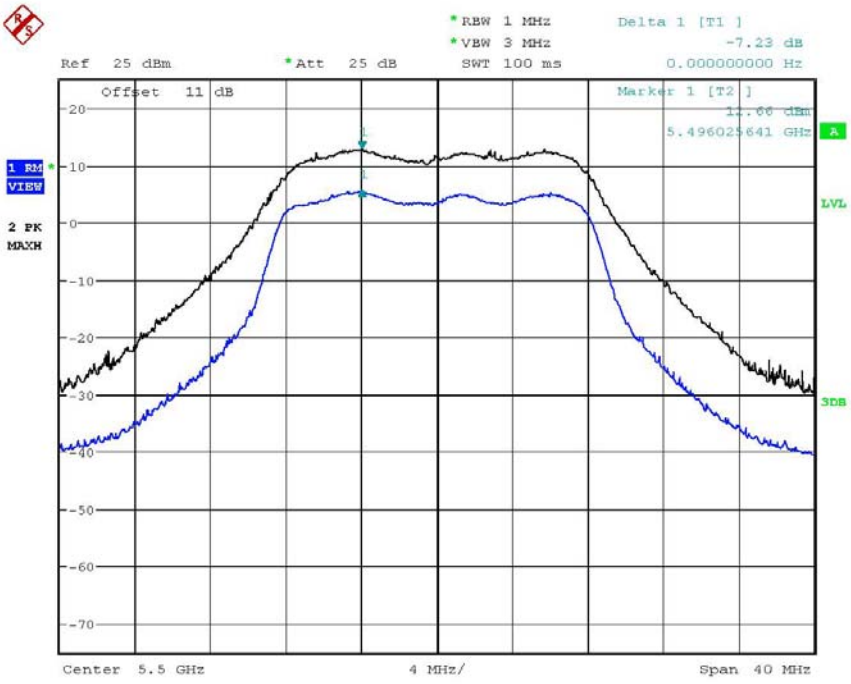


PEAK EXCURSION ANT0_VHT40CH134

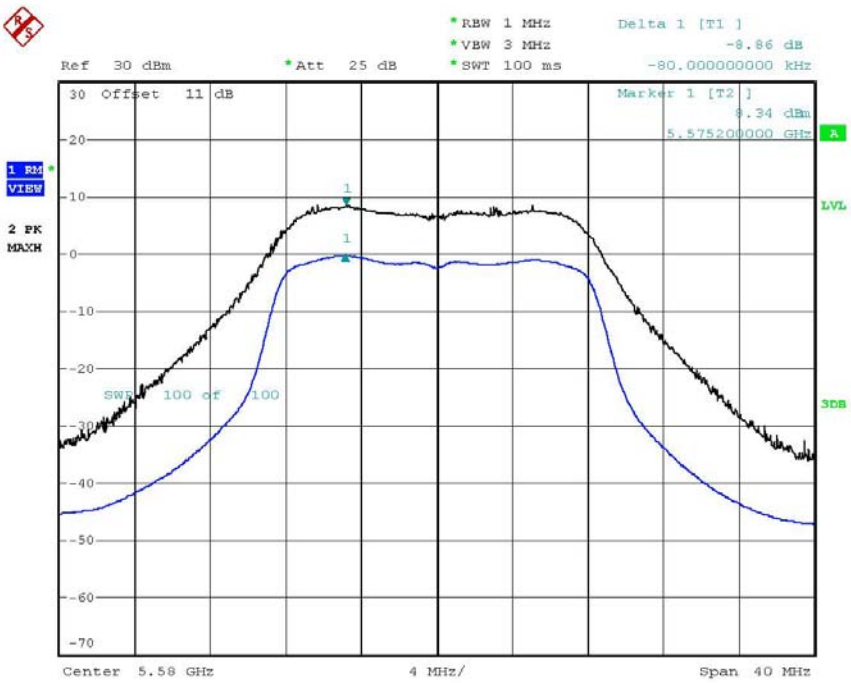
Date: 2.DEC.2014 09:49:12

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

ANT 1

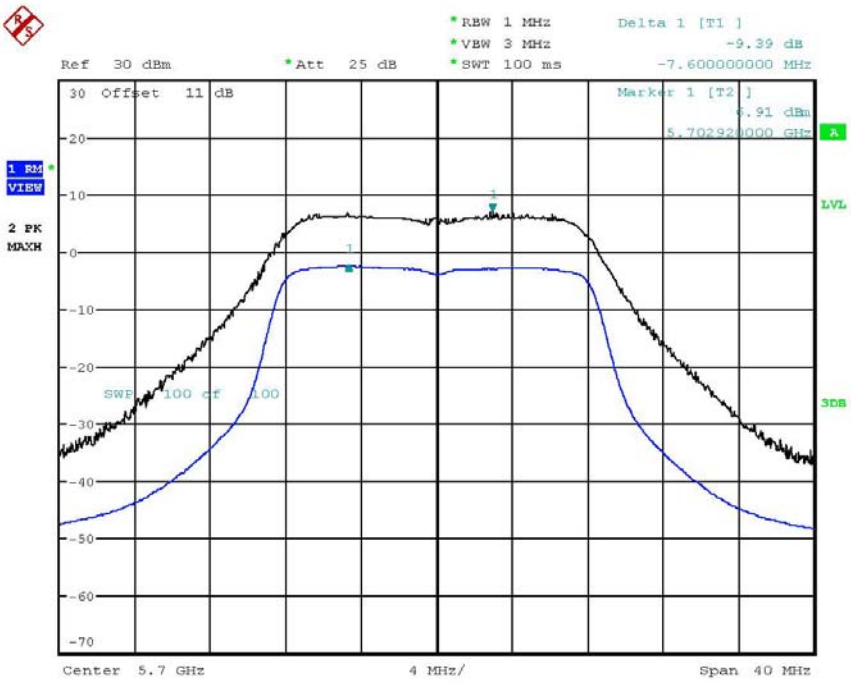


PEAK EXCURSION ANT1_aCH100
Date: 27.NOV.2014 10:35:27

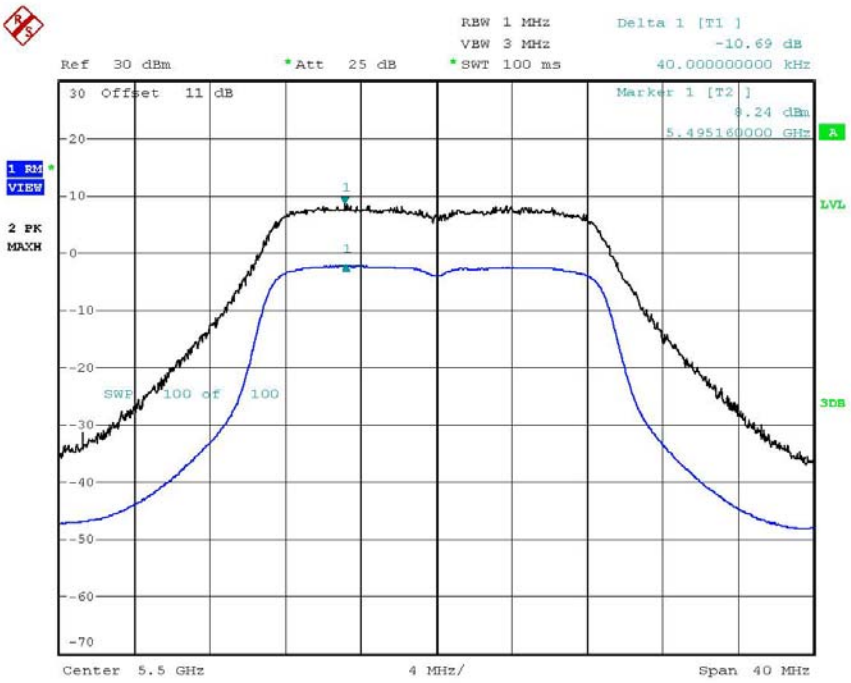


PEAK EXCURSION ANT0_aCH116
Date: 27.NOV.2014 10:13:25

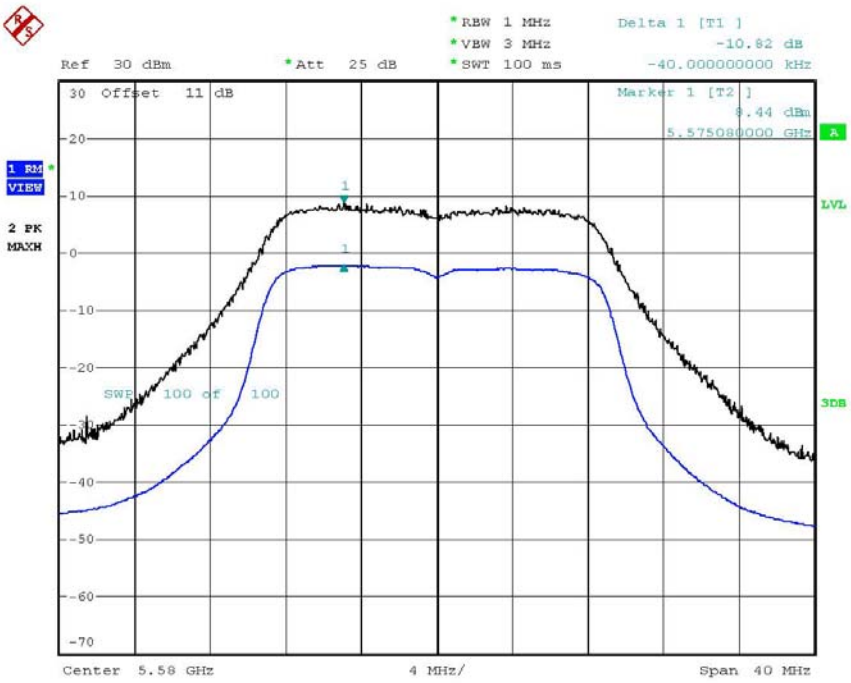
Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS



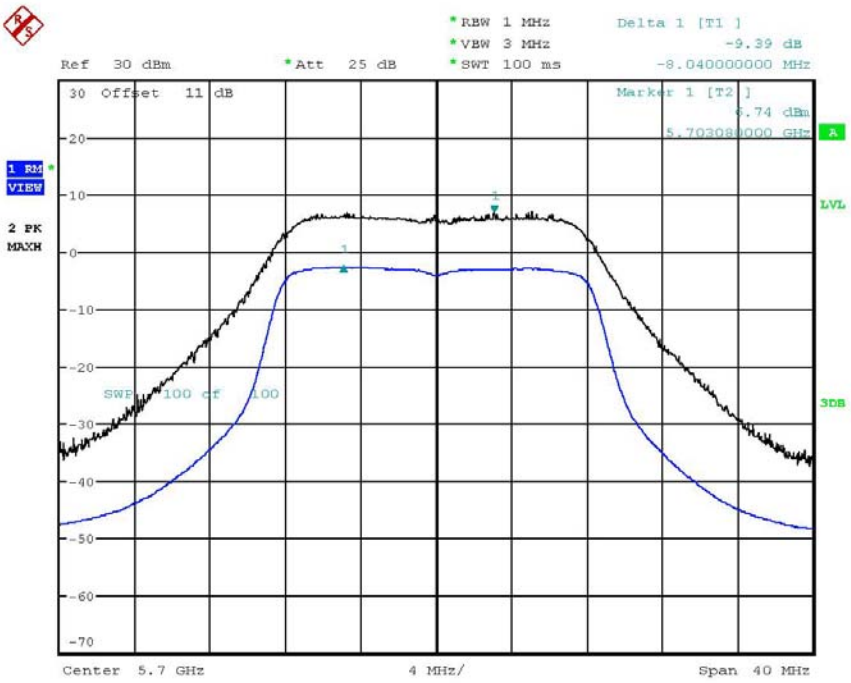
PEAK EXCURSION ANT1_aCH140
Date: 2.DEC.2014 09:35:27



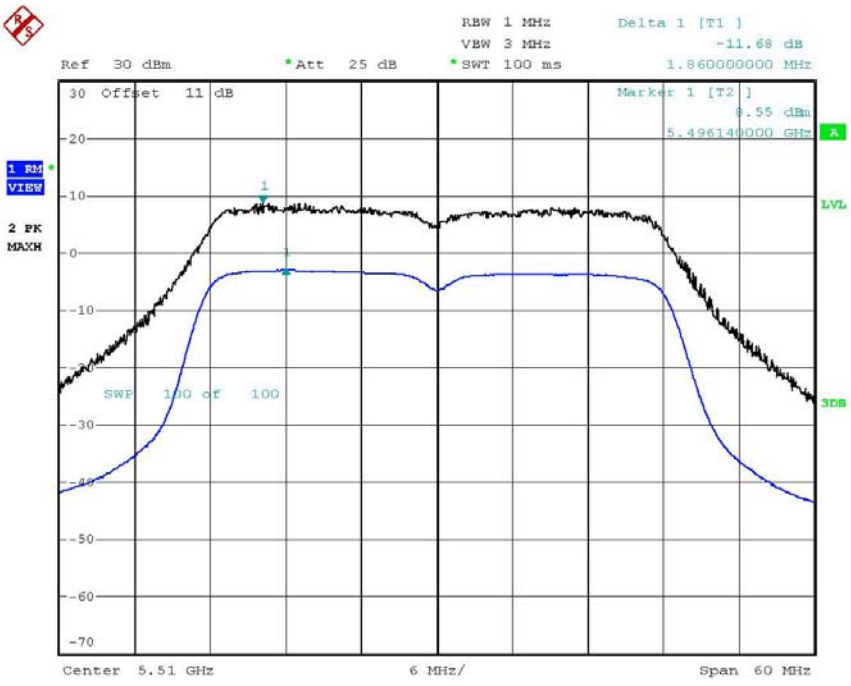
PEAK EXCURSION ANT1_VHT20CH100
Date: 4.NOV.2014 14:16:23



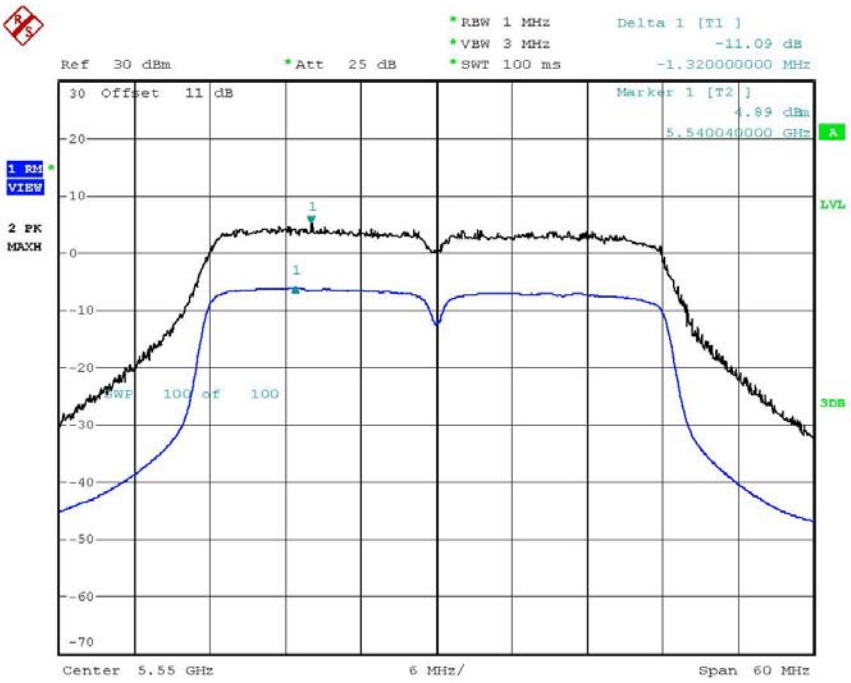
PEAK EXCURSION ANT1_VHT20CH116
Date: 26.NOV.2014 18:03:14



PEAK EXCURSION ANT1_VHT20CH140
Date: 2.DEC.2014 09:39:25

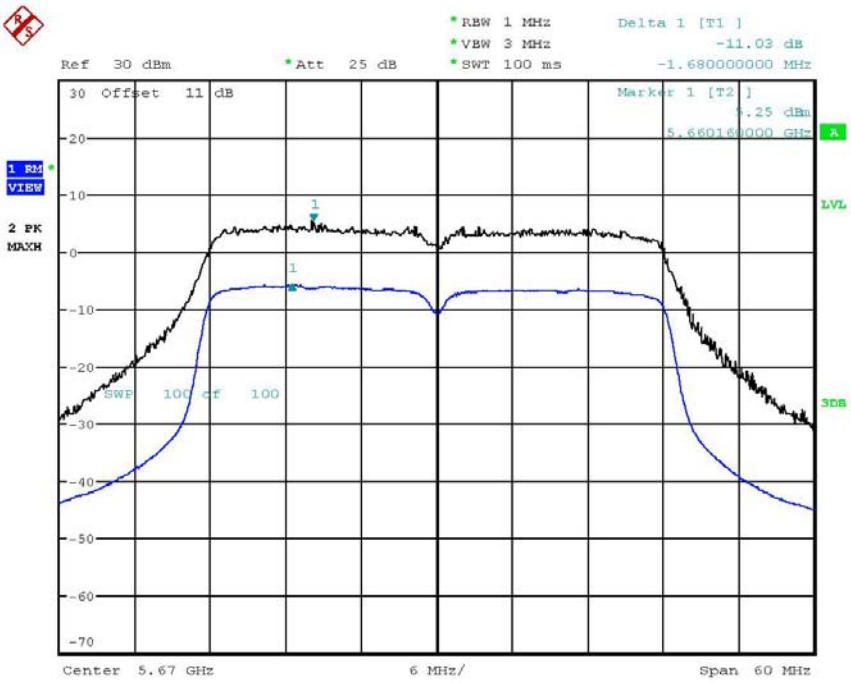


PEAK EXCURSION ANT1_VHT40CH102
Date: 4.NOV.2014 14:29:13



PEAK EXCURSION ANT1_VHT40CH110
Date: 27.NOV.2014 09:56:22

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS



PEAK EXCURSION ANT1_VHT40CH134
Date: 2.DEC.2014 09:50:08

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

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 5.725–5.825 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 D01 General UNII Test Procedures v01r03, 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.

Applicable to	Limit	
☒	FIELD STRENGTH at 3m (dBμV/m)	
	PK	AV
	74	54
☐	EIRP LIMIT (dBm)	EQUIVALENT FIELD STRENGTH at 3m (dBμV/m)
	PK	PK
	-27	68.3

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

Model: LP-2596K 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) Peak	Reading (dBuV) Ave.	Factor (dB) Corr.	Result (dBuV/m) Peak	Result (dBuV/m) Ave.	Limit (dBuV/m) Peak	Limit (dBuV/m) Ave.	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--

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

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

Explanation: See attached diagrams in appendix.

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.

3.9 Radio Frequency Radiation Exposure, FCC 15.407 (f)

Because the intended use of the test sample as a fixed device a theoretical MPE related evaluation
As an example is done below, for information purposes.
FCC OET Bulletin 65 Edition 97.01 determines the equations for predicting RF field and applicable limits.
The prediction for power density in the far-field of the antenna can be made by the general equation below.
The equation is generally accurate 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 G = AG-D
Band 2

Item	Unit	Value	Explanation
P	mW	9.2683	Peak value
D	dB		
AG	dBi	17.01	
G		50.2343	Calculated Value
R	cm	20	Assumed value
S	mW/cm^2	0.0926	Calculated value

Band 3

Item	Unit	Value	Explanation
P	mW	9.3756	Peak value
D	dB		
AG	dBi	17.01	
G		50.2343	Calculated Value
R	cm	20	Assumed value
S	mW/cm^2	0.0937	Calculated value

Limits:

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

3.10 Frequency Stability, FCC 15.407 (g)

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

Band 2

ANT 0

802.11a

Channel	Nominal Frequency(MHz)	FREQ.(L)	FREQ.(R)	Deviation(KHz)	Result
52	5260	5251.634	5268.365	-0.5	-0.1 ppm
56	5280	5271.73	5288.461	95.5	18.09 ppm
64	5320	5311.634	5328.365	-0.5	-0.09 ppm

802.11n 20MHz

Channel	Nominal Frequency(MHz)	FREQ.(L)	FREQ.(R)	Deviation(KHz)	Result
52	5260	5251.634	5268.365	-0.5	-0.1 ppm
56	5280	5271.634	5288.365	-0.5	-0.09 ppm
64	5320	5311.634	5328.365	-0.5	-0.09 ppm

802.11n 40MHz

Channel	Nominal Frequency(MHz)	FREQ.(L)	FREQ.(R)	Deviation(KHz)	Result
54	5270	5251.73	5288.461	95.5	18.12 ppm
62	5310	5291.73	5328.461	95.5	17.98 ppm

ANT 1

802.11a

Channel	Nominal Frequency(MHz)	FREQ.(L)	FREQ.(R)	Deviation(KHz)	Result
52	5260	5251.634	5268.365	-0.5	-0.1 ppm
56	5280	5271.73	5288.46	95	17.99 ppm
64	5320	5311.73	5328.365	47.5	8.93 ppm

802.11n 20MHz

Channel	Nominal Frequency(MHz)	FREQ.(L)	FREQ.(R)	Deviation(KHz)	Result
52	5260	5251.73	5268.365	47.5	9.03 ppm
56	5280	5271.73	5288.365	47.5	9 ppm
64	5320	5311.634	5328.365	-0.5	-0.09 ppm

802.11n 40MHz

Channel	Nominal Frequency(MHz)	FREQ.(L)	FREQ.(R)	Deviation(KHz)	Result
54	5270	5251.73	5288.46	95	18.03 ppm
62	5310	5291.73	5328.46	95	17.89 ppm

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

Band 3

ANT 0

802.11a

Channel	Nominal Frequency(MHz)	FREQ.(L)	FREQ.(R)	Deviation(KHz)	Result
100	5500	5491.634	5508.365	-0.5	-0.09 ppm
116	5580	5571.634	5588.269	-48.5	-8.69 ppm
140	5700	5691.634	5708.365	-0.5	-0.09 ppm

802.11n 20MHz

Channel	Nominal Frequency(MHz)	FREQ.(L)	FREQ.(R)	Deviation(KHz)	Result
100	5500	5491.634	5508.365	-0.5	-0.09 ppm
116	5580	5571.153	5588.942	47.5	8.51 ppm
140	5700	5691.634	5708.365	-0.5	-0.09 ppm

802.11n 40MHz

Channel	Nominal Frequency(MHz)	FREQ.(L)	FREQ.(R)	Deviation(KHz)	Result
102	5510	5491.73	5528.269	-0.5	-0.09 ppm
110	5550	5531.73	5568.269	-0.5	-0.09 ppm
134	5670	5651.73	5688.26	-5	-0.88 ppm

ANT 1

802.11a

Channel	Nominal Frequency(MHz)	FREQ.(L)	FREQ.(R)	Deviation(KHz)	Result
100	5500	5491.634	5508.365	-0.5	-0.09 ppm
116	5580	5571.538	5588.365	-48.5	-8.69 ppm
140	5700	5691.634	5708.365	-0.5	-0.09 ppm

802.11n 20MHz

Channel	Nominal Frequency(MHz)	FREQ.(L)	FREQ.(R)	Deviation(KHz)	Result
100	5500	5491.634	5508.365	-0.5	-0.09 ppm
116	5580	5571.057	5588.942	-0.5	-0.09 ppm
140	5700	5691.634	5708.365	-0.5	-0.09 ppm

802.11n 40MHz

Channel	Nominal Frequency(MHz)	FREQ.(L)	FREQ.(R)	Deviation(KHz)	Result
102	5510	5491.73	5528.269	-0.5	-0.09 ppm
110	5550	5531.73	5568.269	-0.5	-0.09 ppm
134	5670	5651.538	5688.269	-96.5	-17.02 ppm

The displayed frequency stability will ensure that emission is maintained within the band of operation.

Test equipment used: ETSTW-RE 055, ETSTW-CE 009

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.

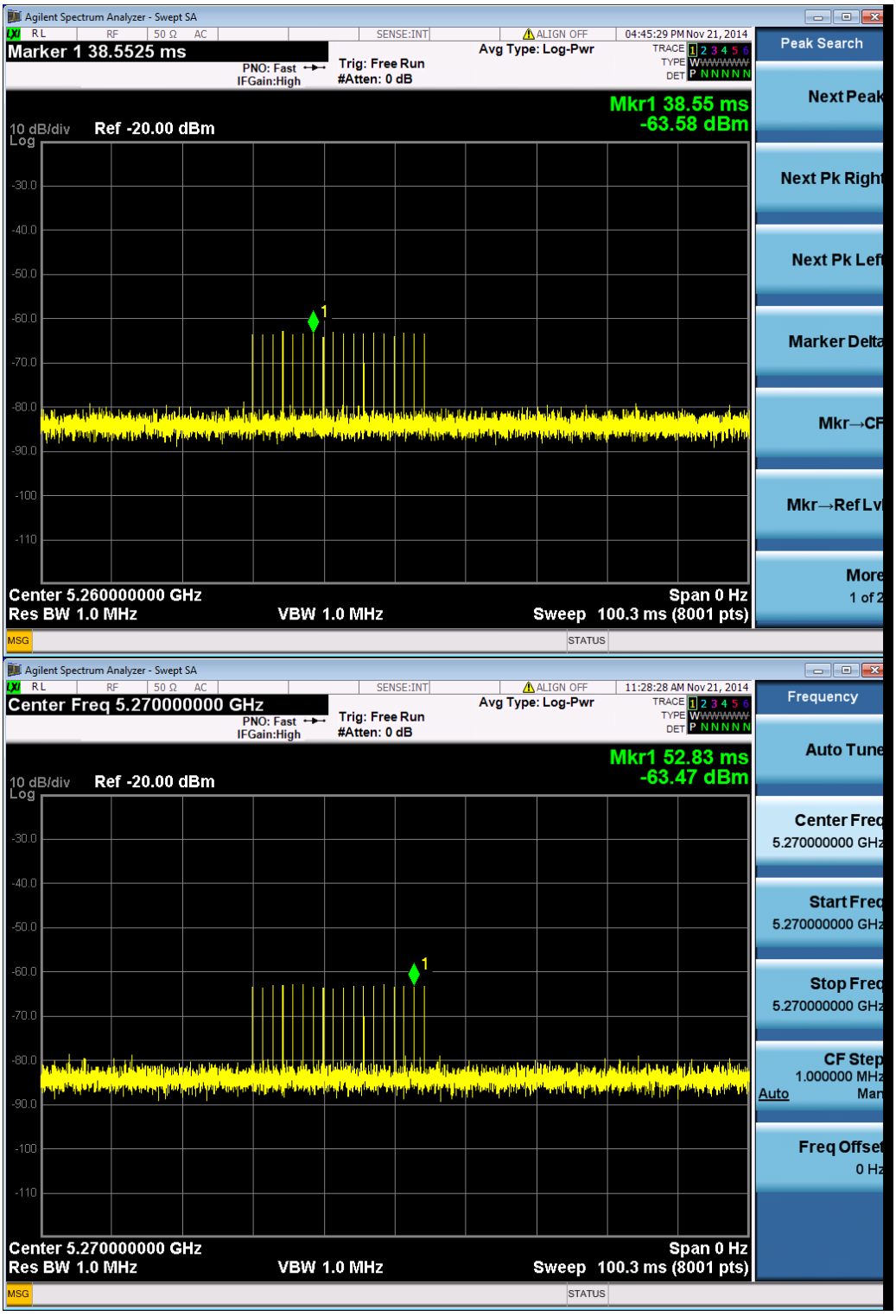
Explanation: The output power of this device is less than 500 mW, so this test item is not required.

3.12 Dynamic Frequency Selection (DFS)

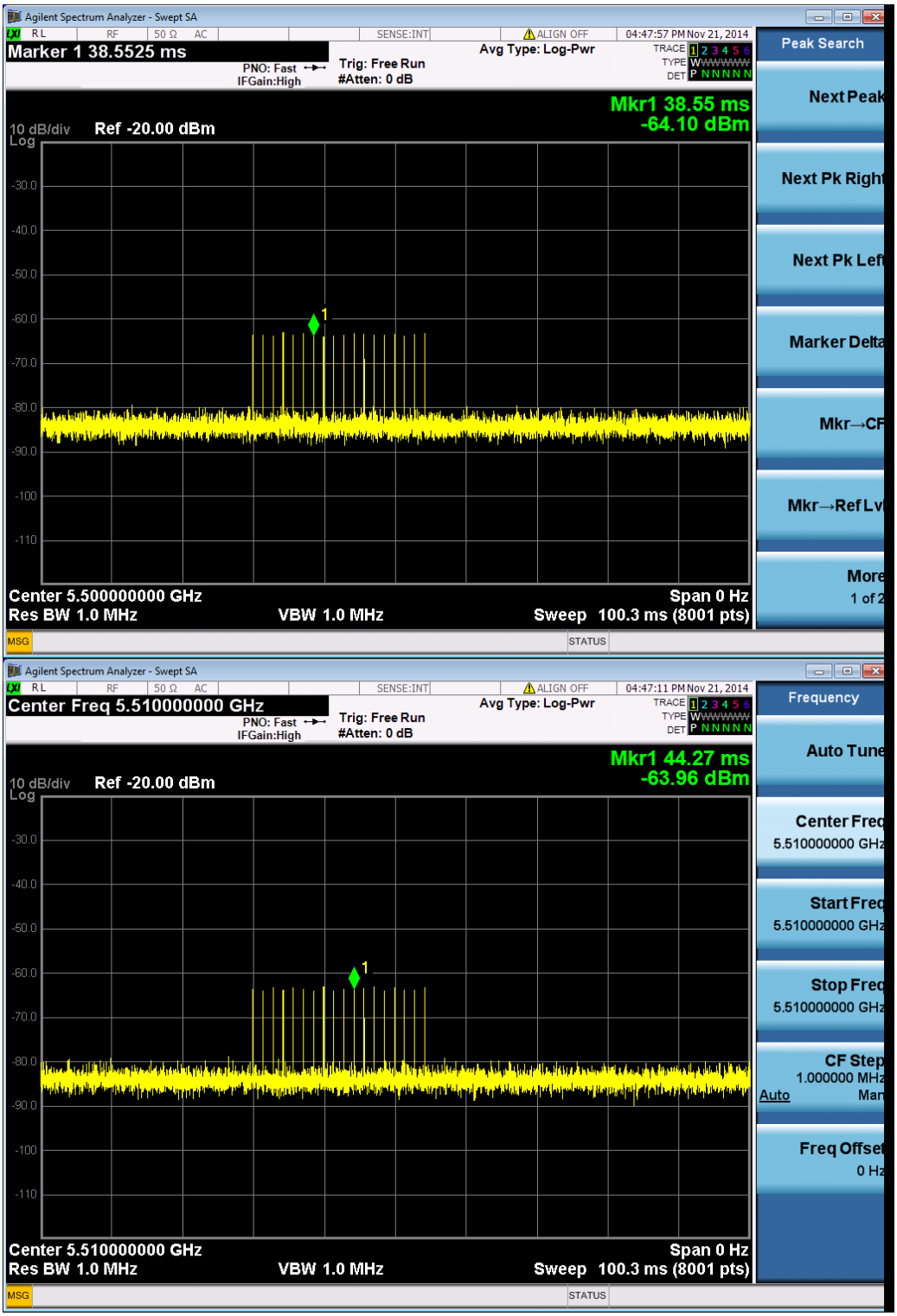
3.12.1 DFS Detection Threshold

Radar Type

Type 1

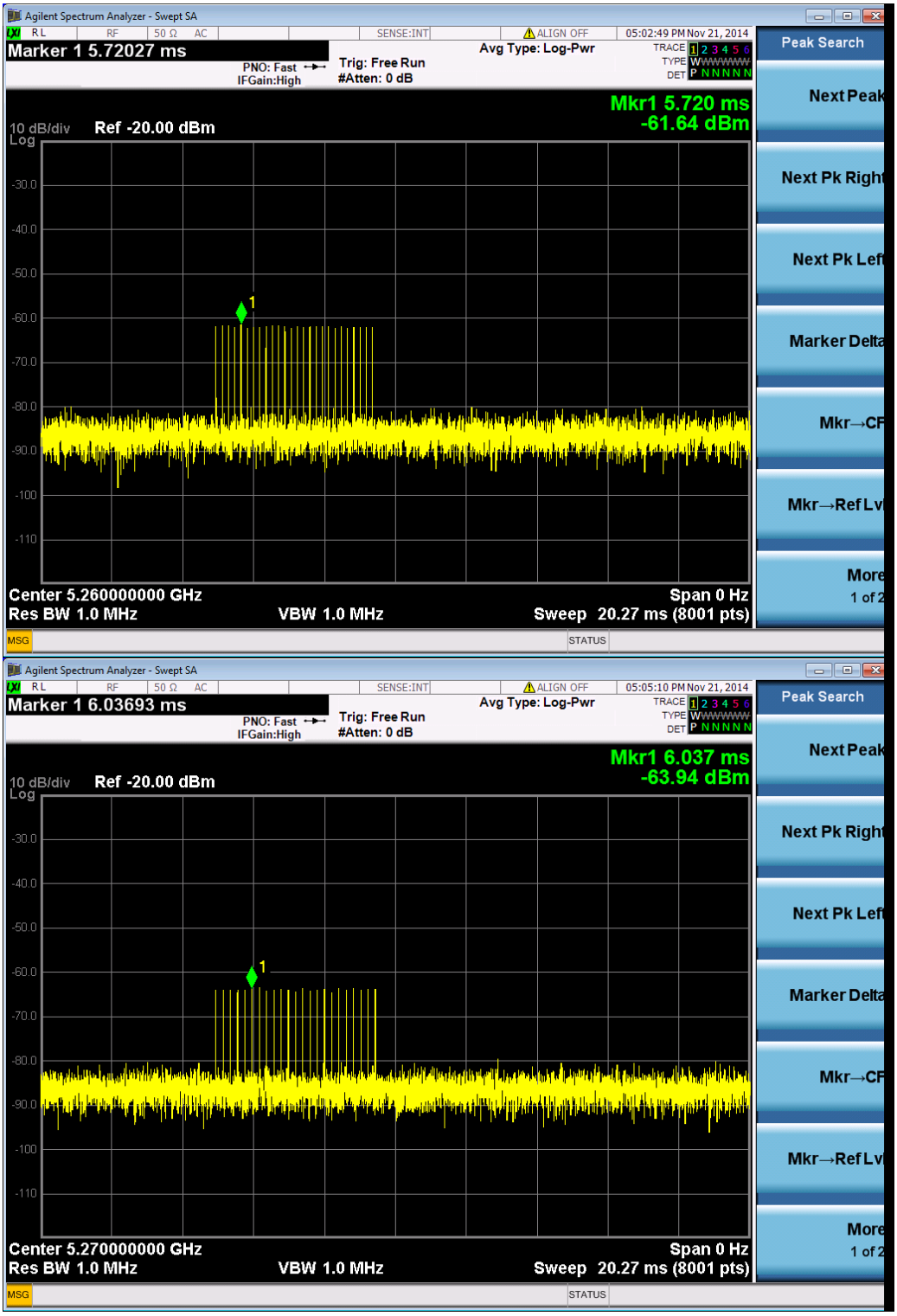


Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

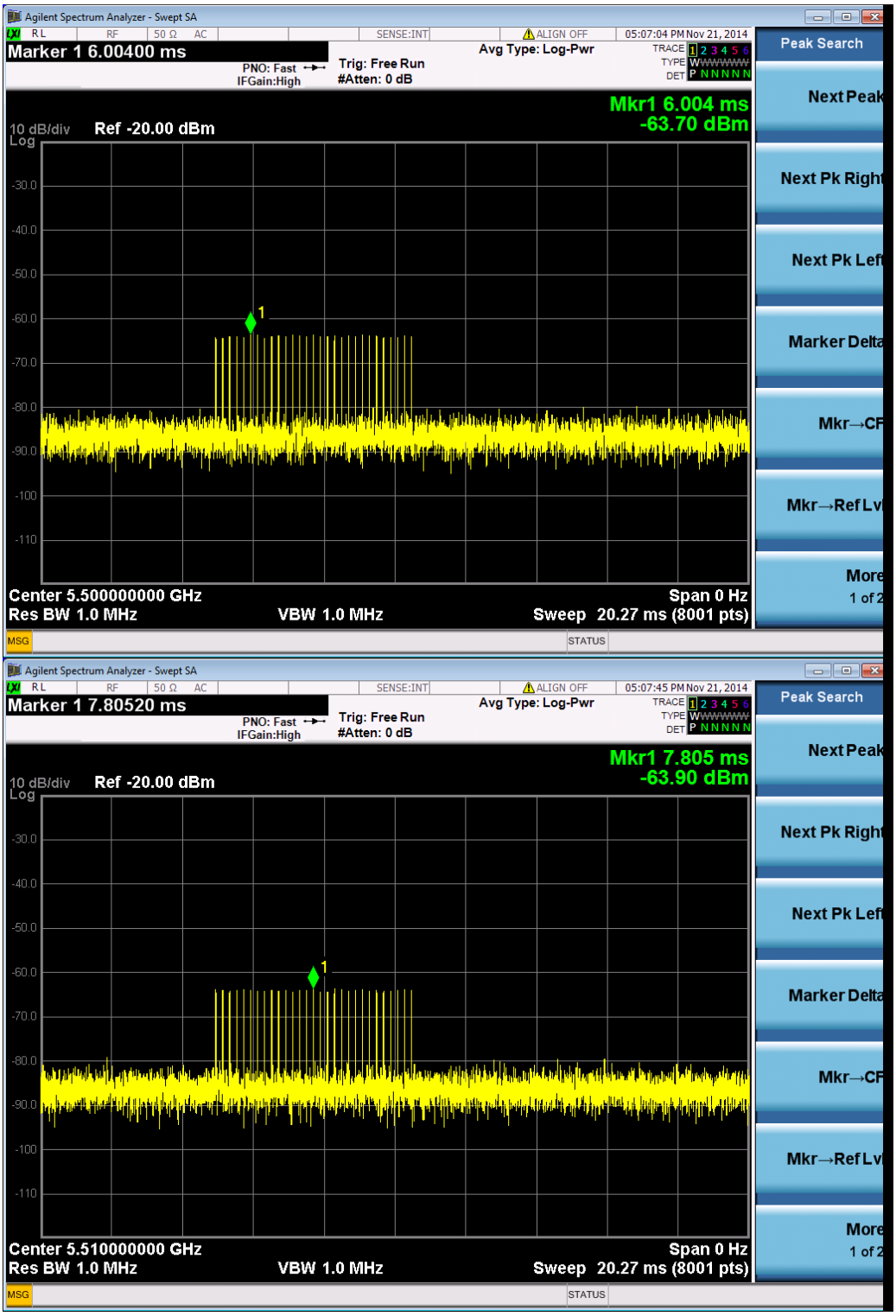


Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

Type 2

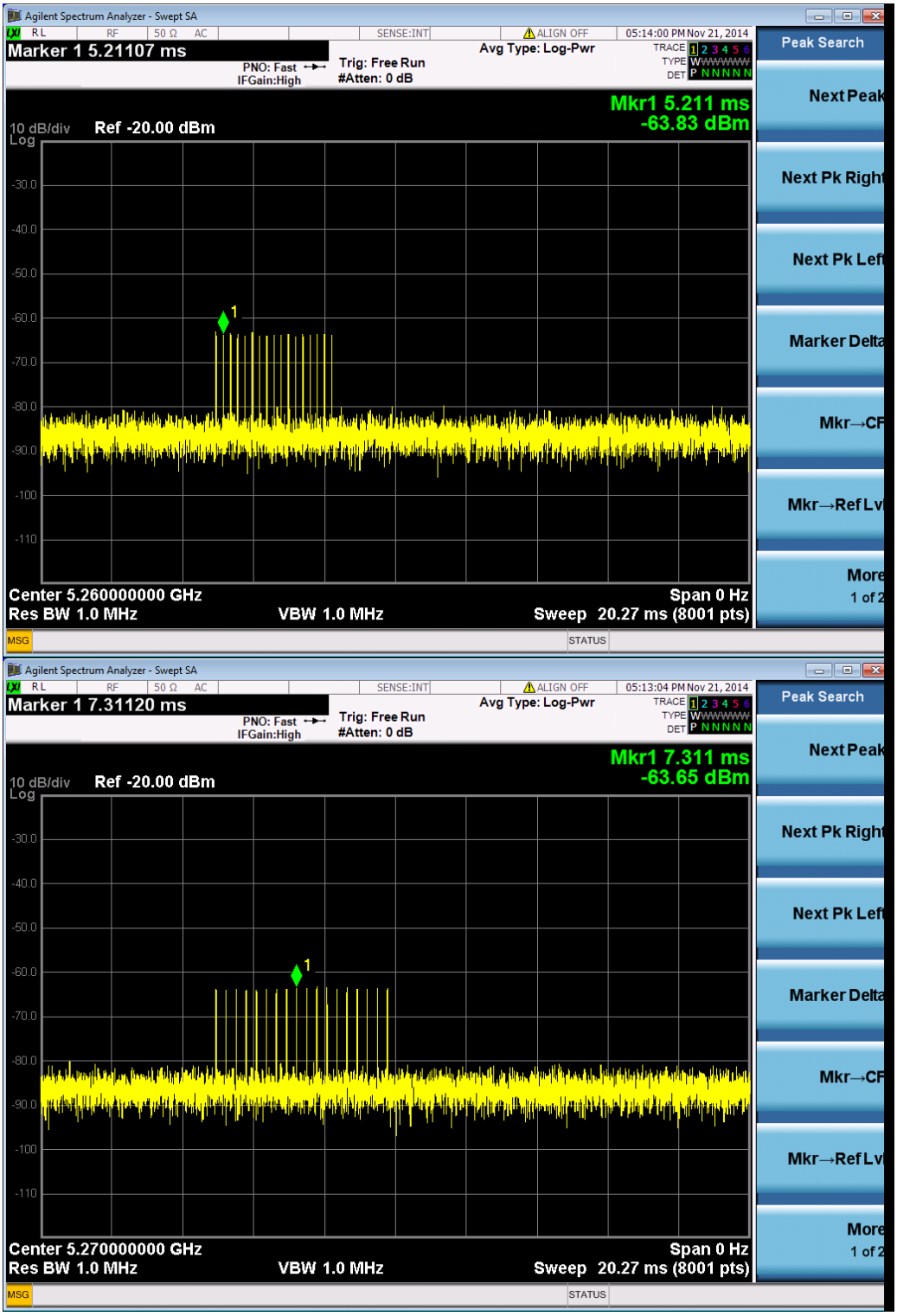


Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

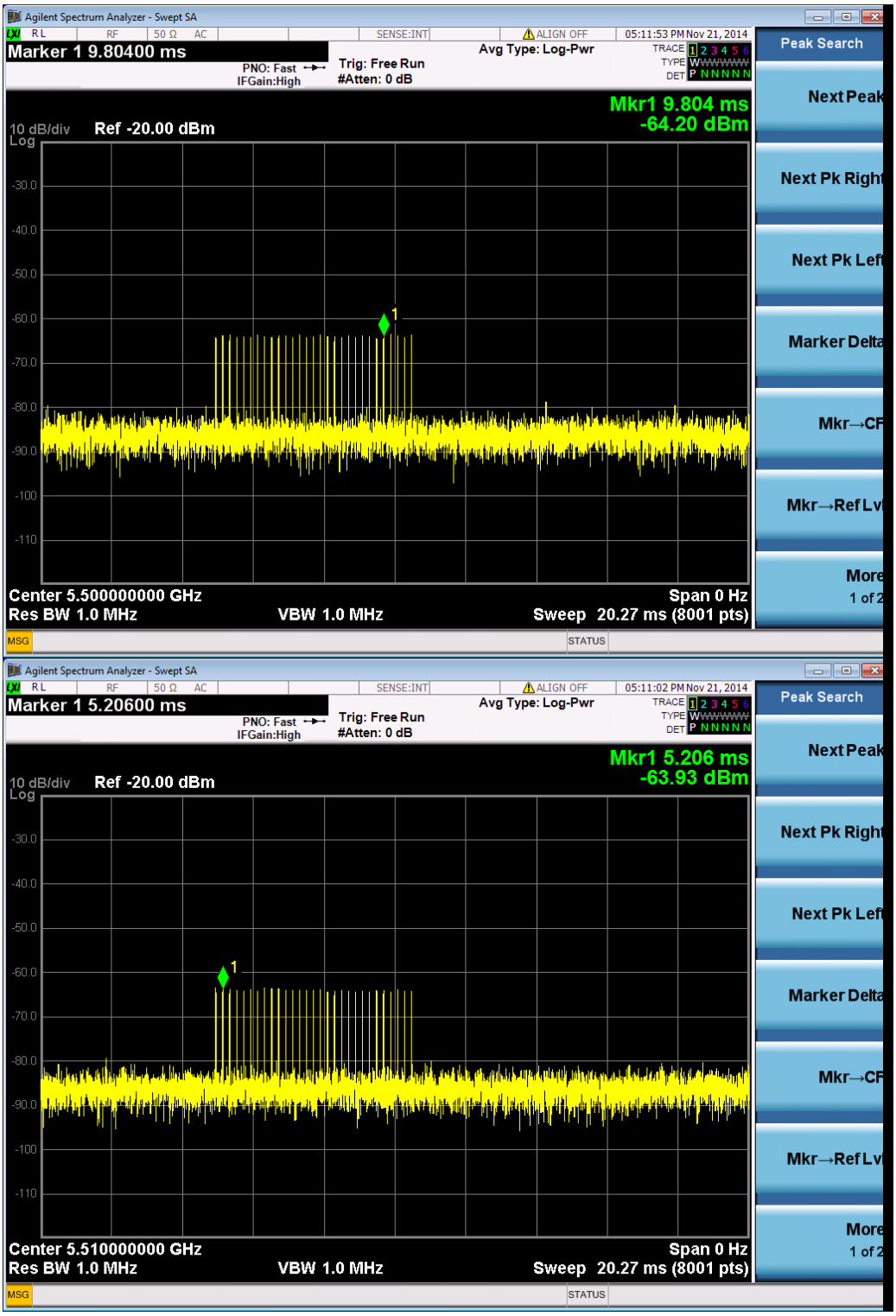


Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

Type 3

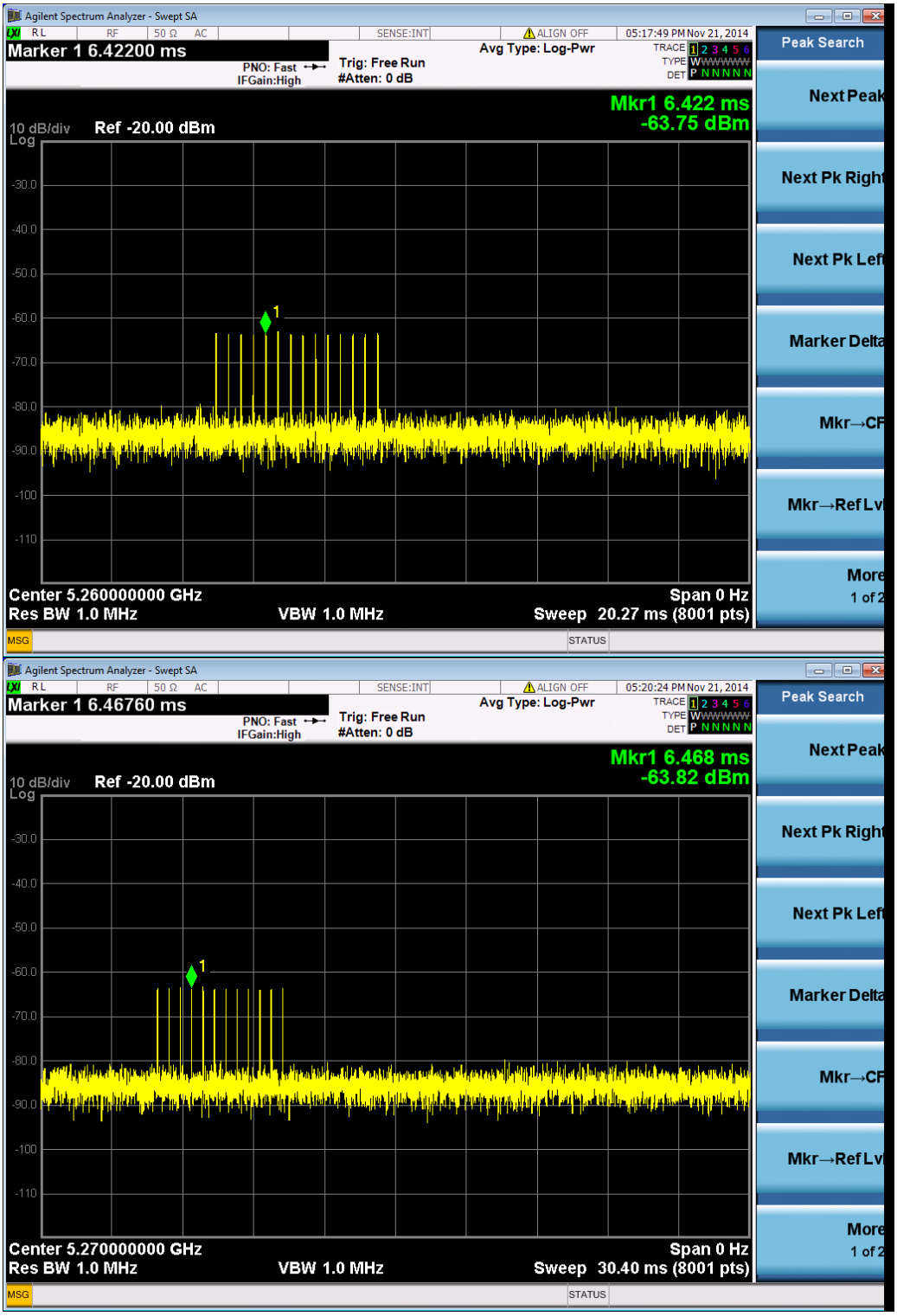


Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

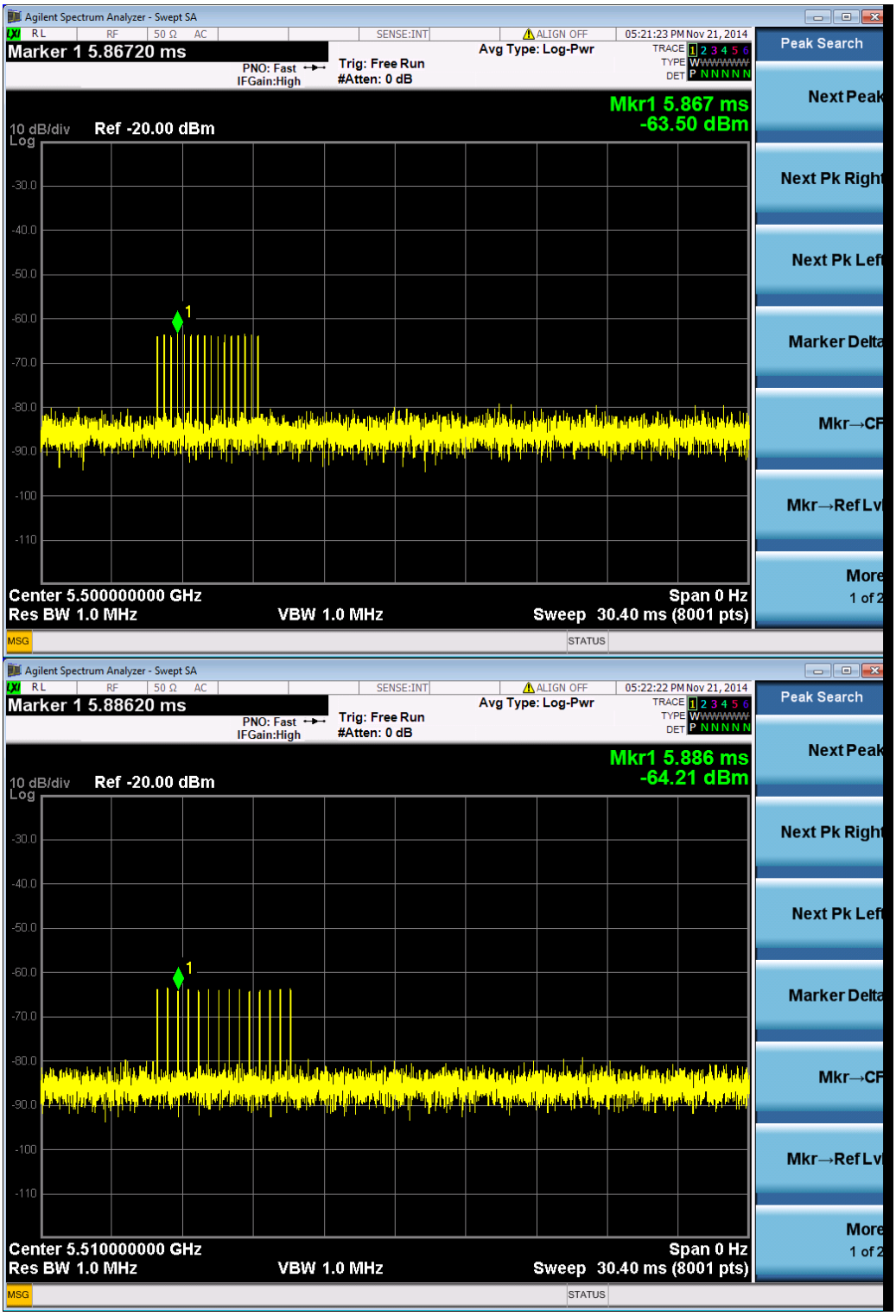


Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

Type 4

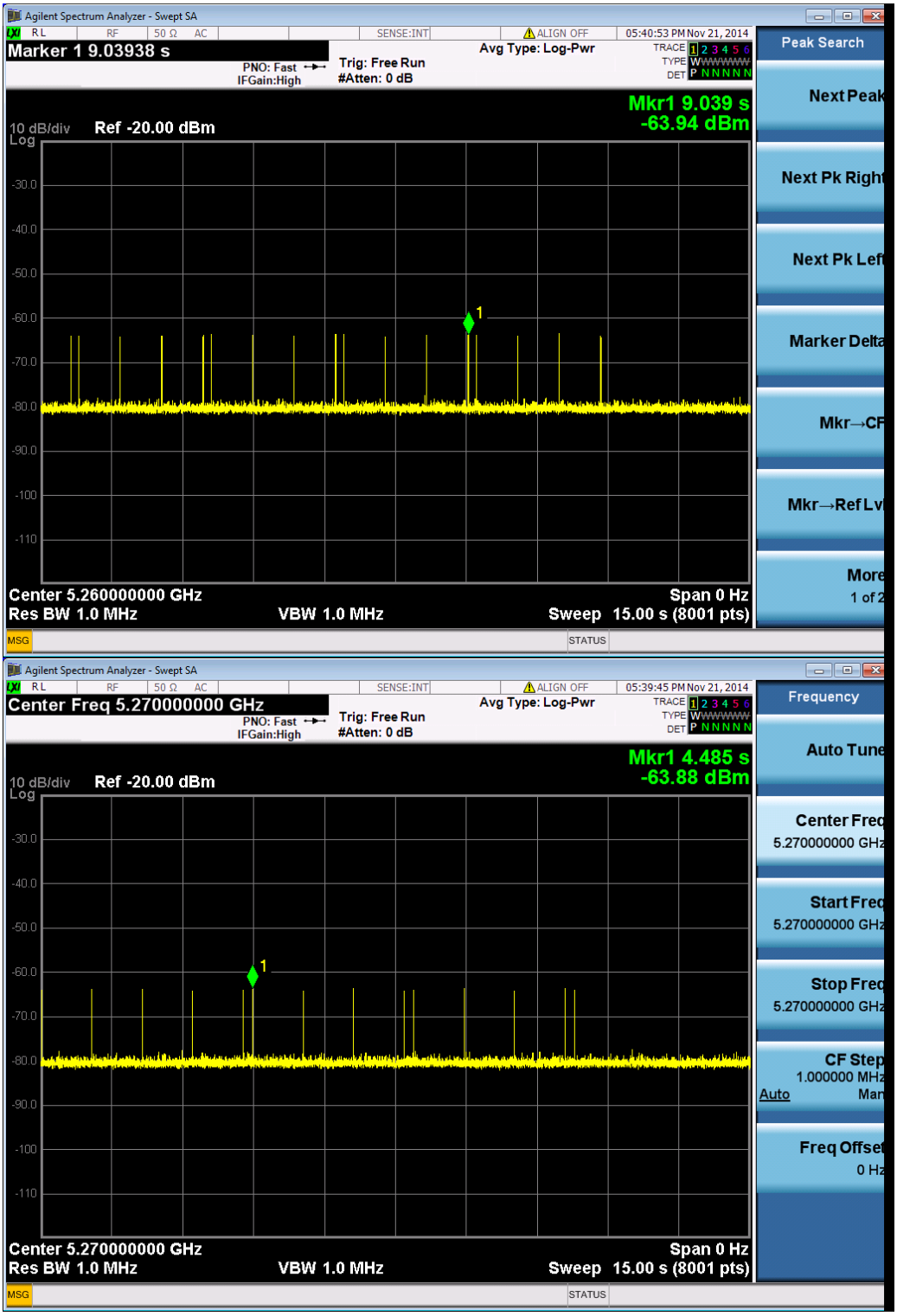


Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

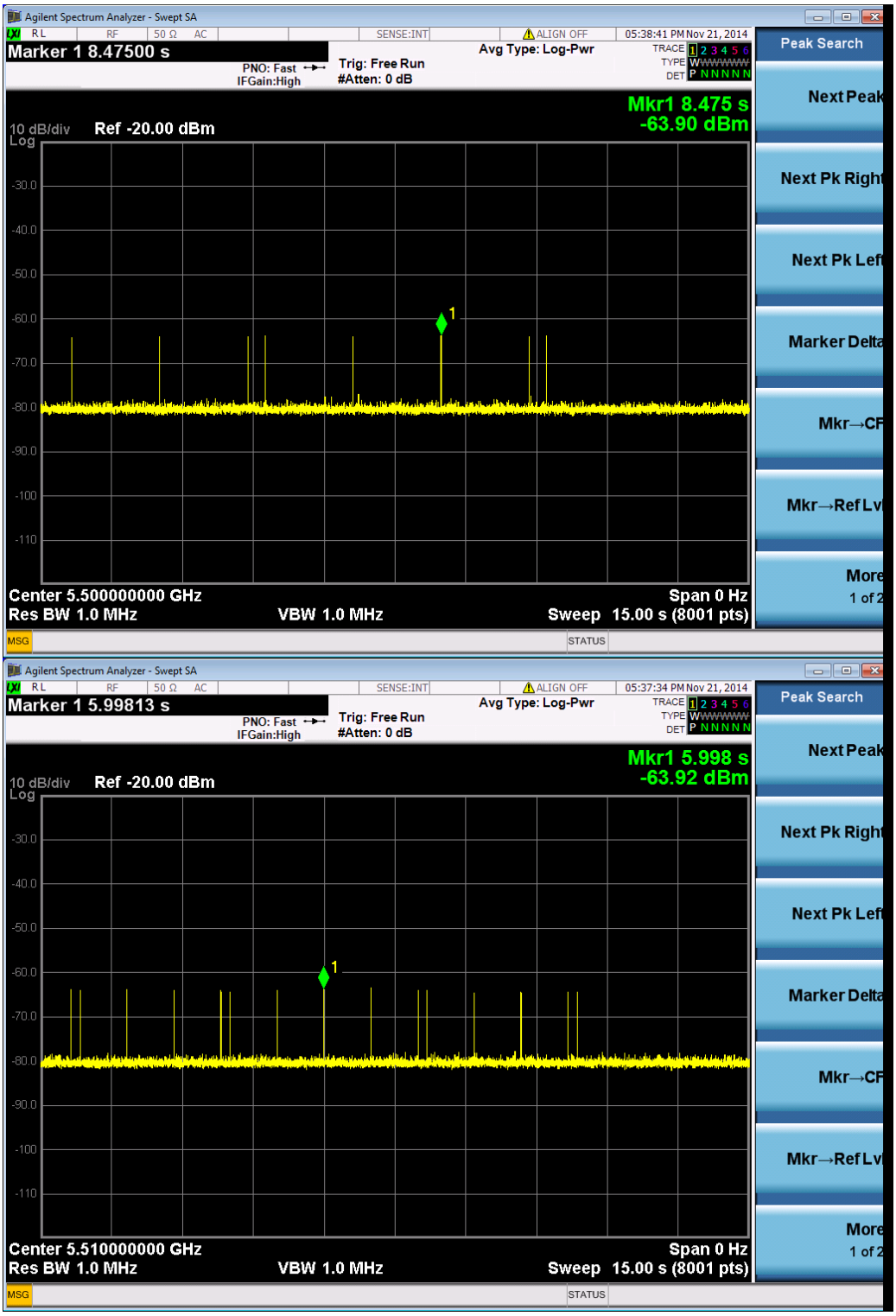


Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

Type 5

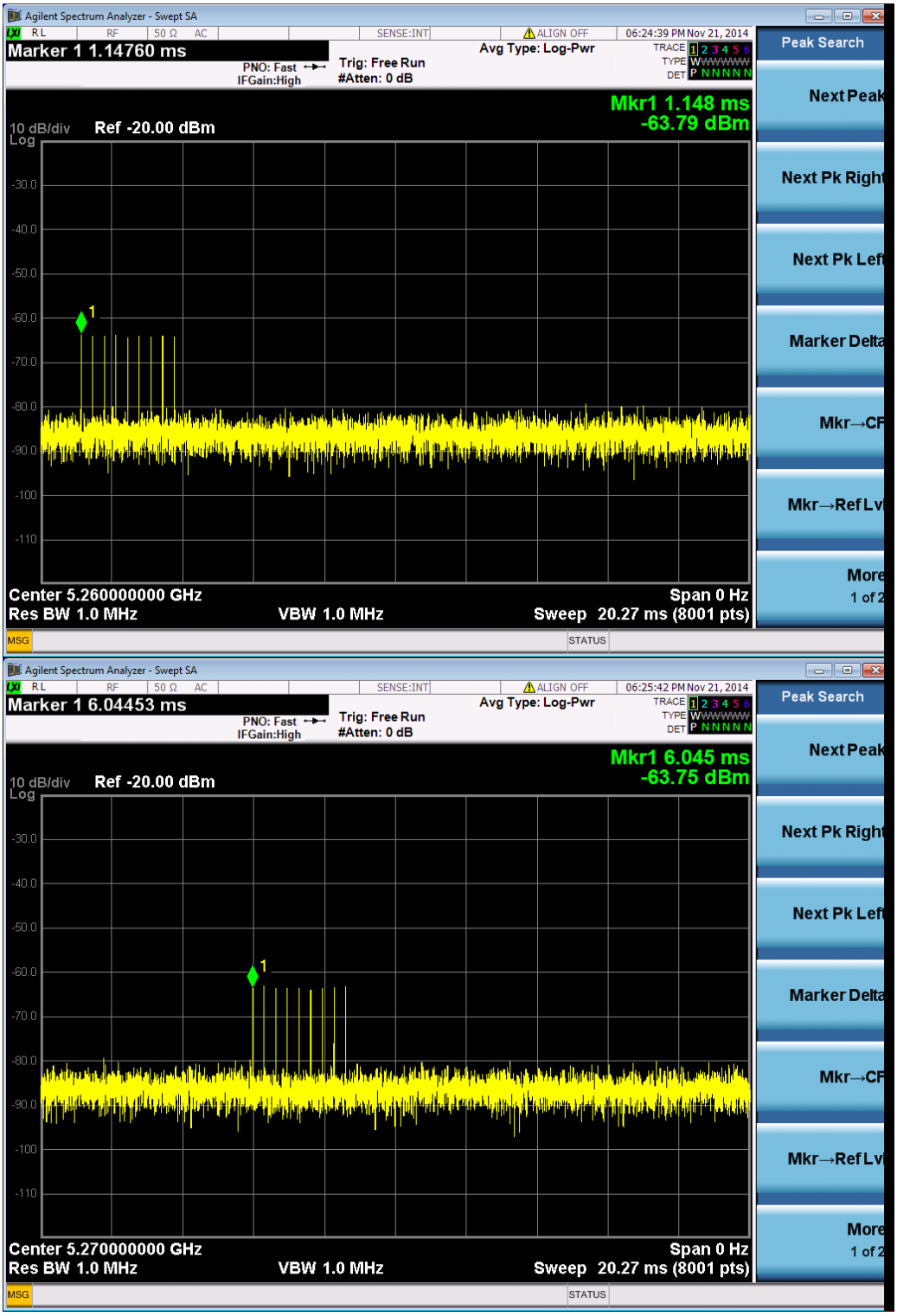


Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

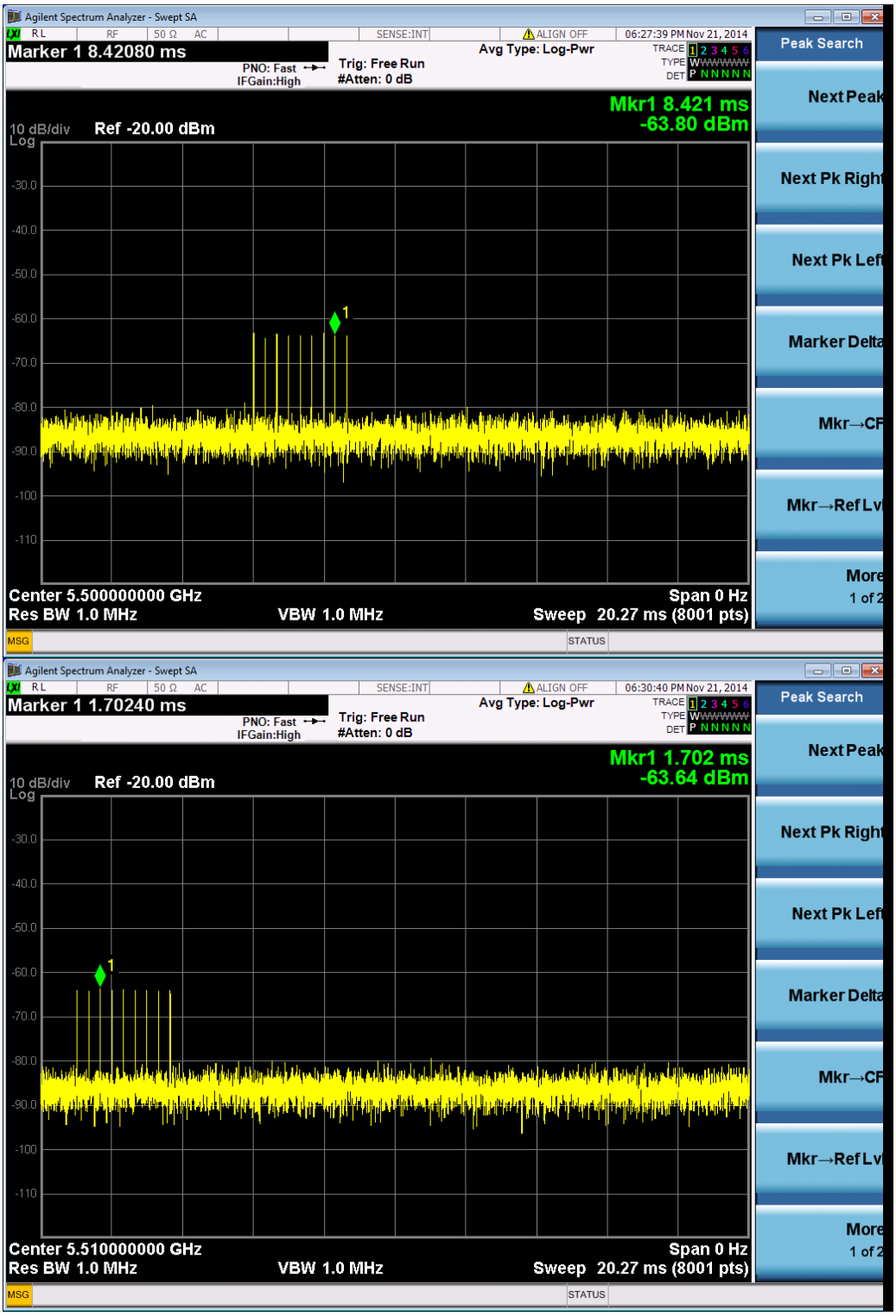


Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

Type 6

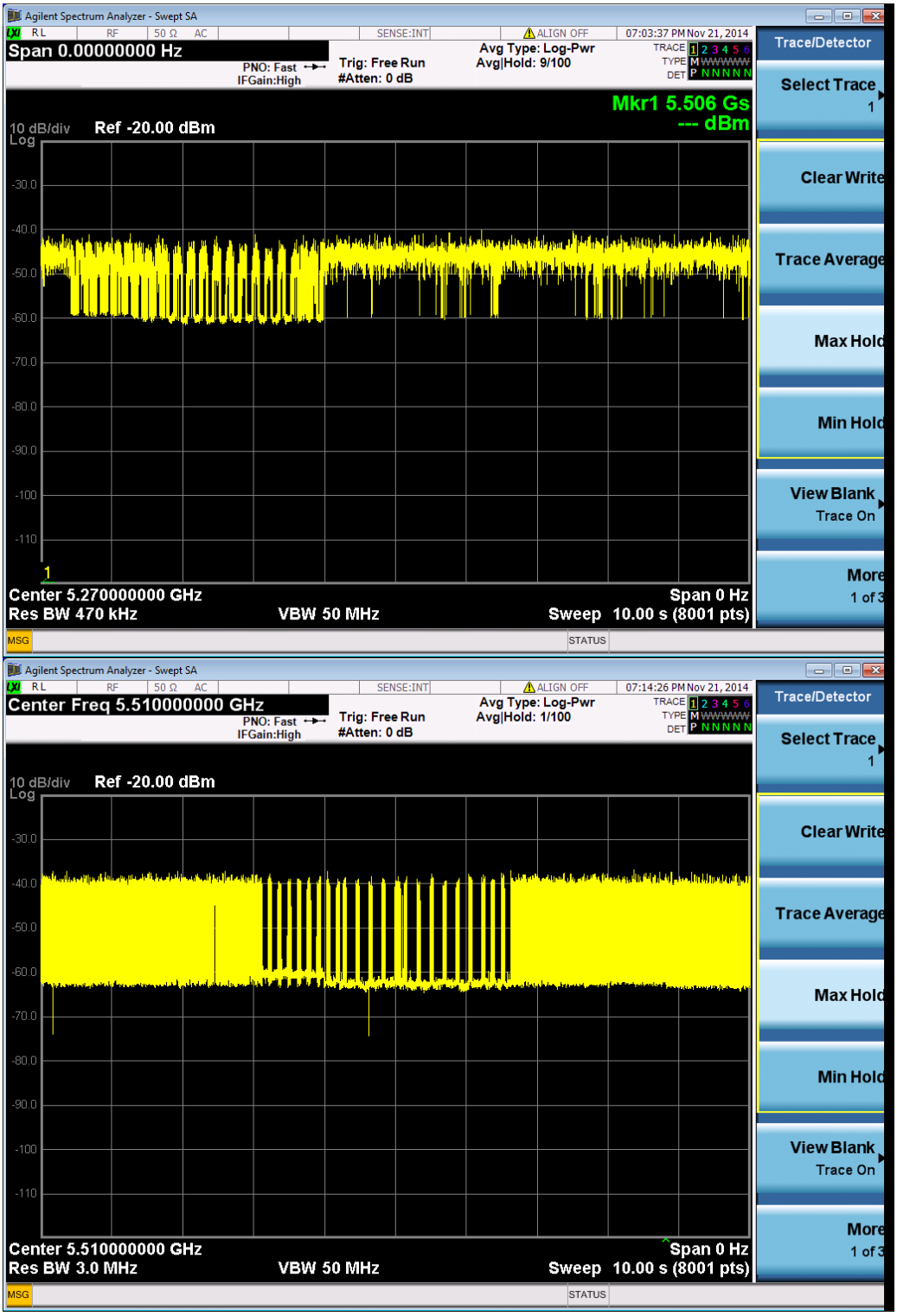


Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS



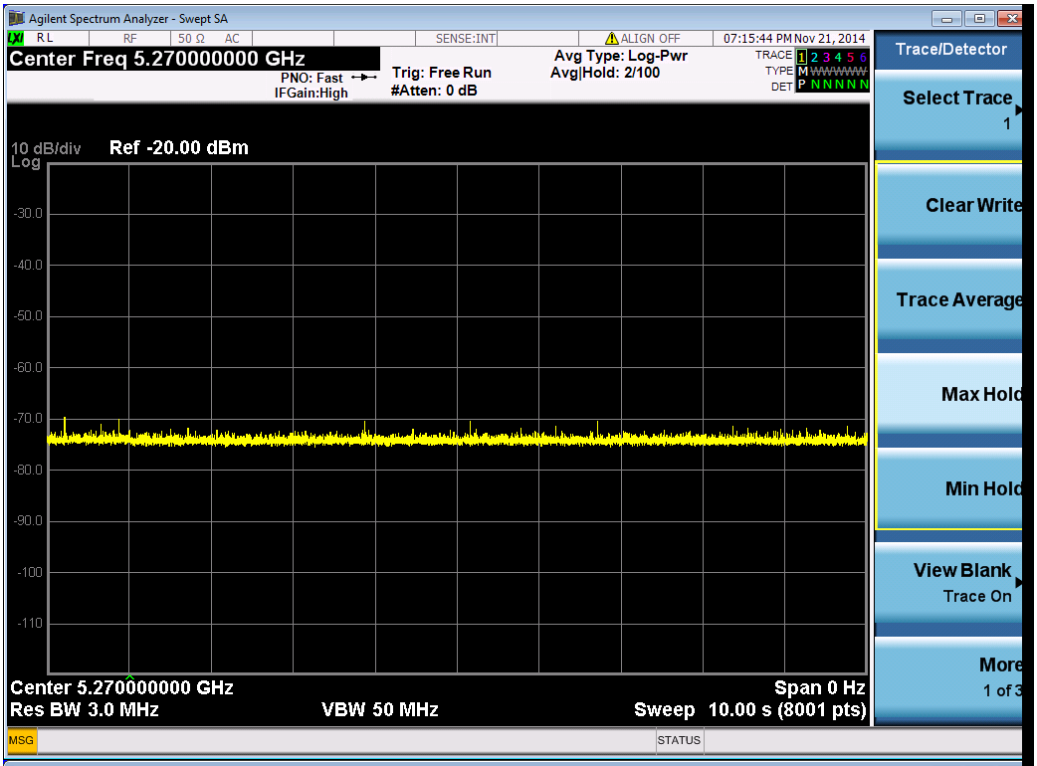
Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

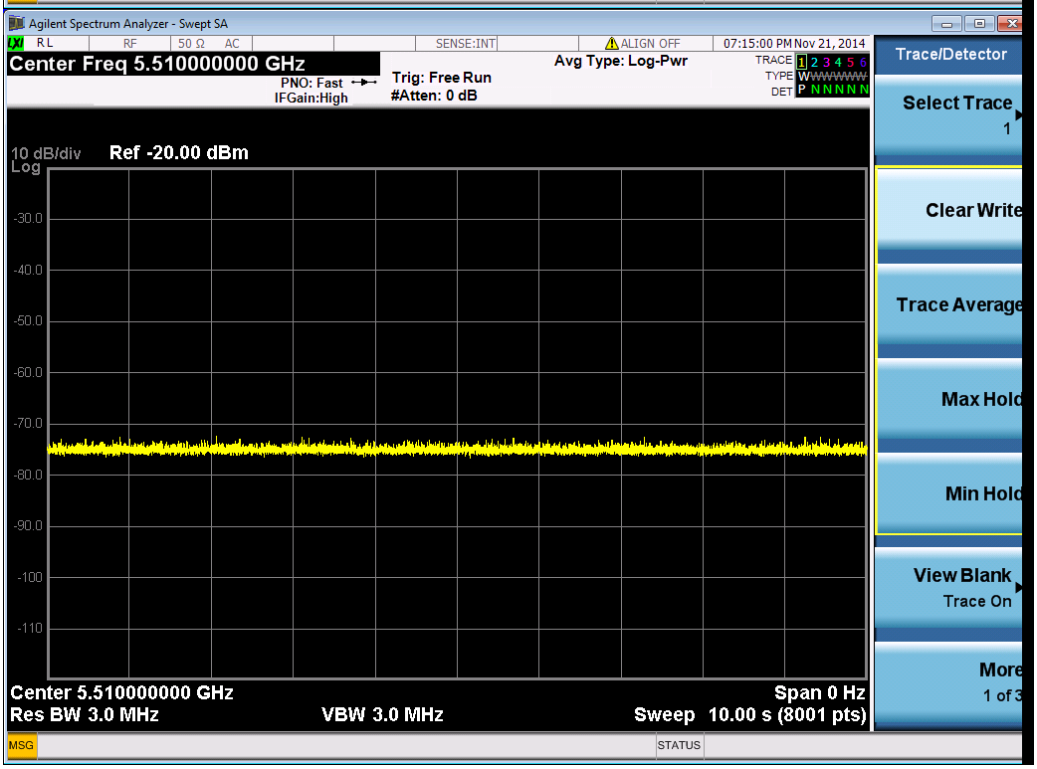
Traffic plot



Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

No Traffic Plot

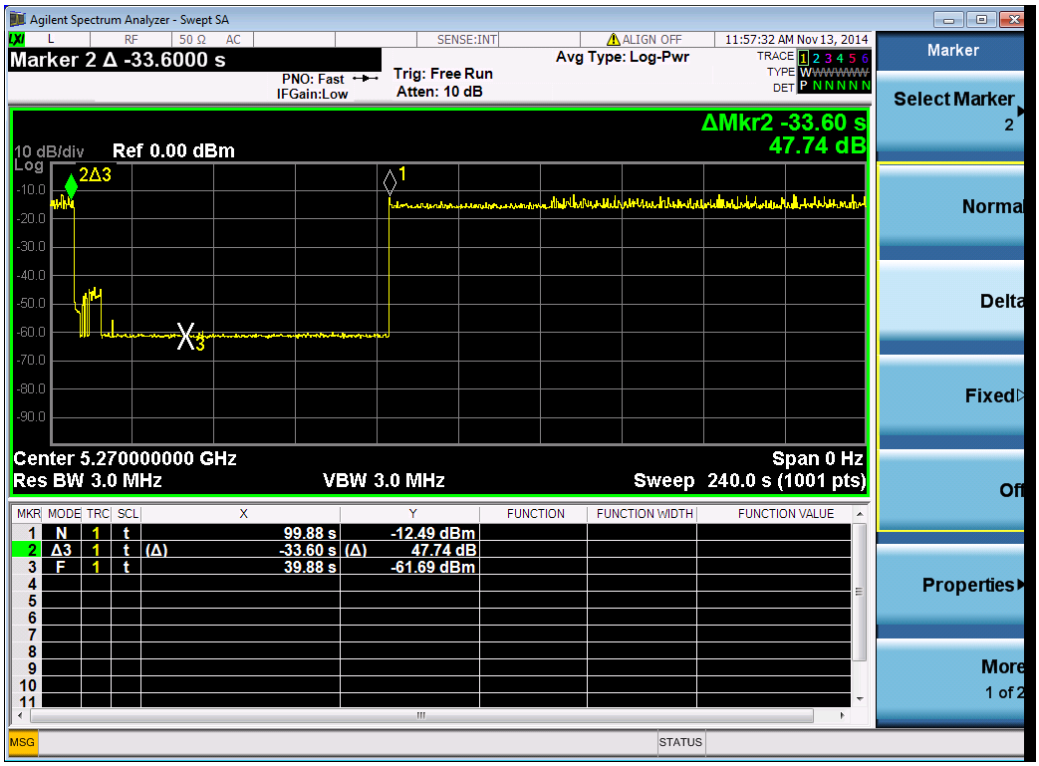




Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

3.12.2 CHANNEL AVAILABILITY CHECK TIME

Timing plot of initial CAC time for 5270MHz



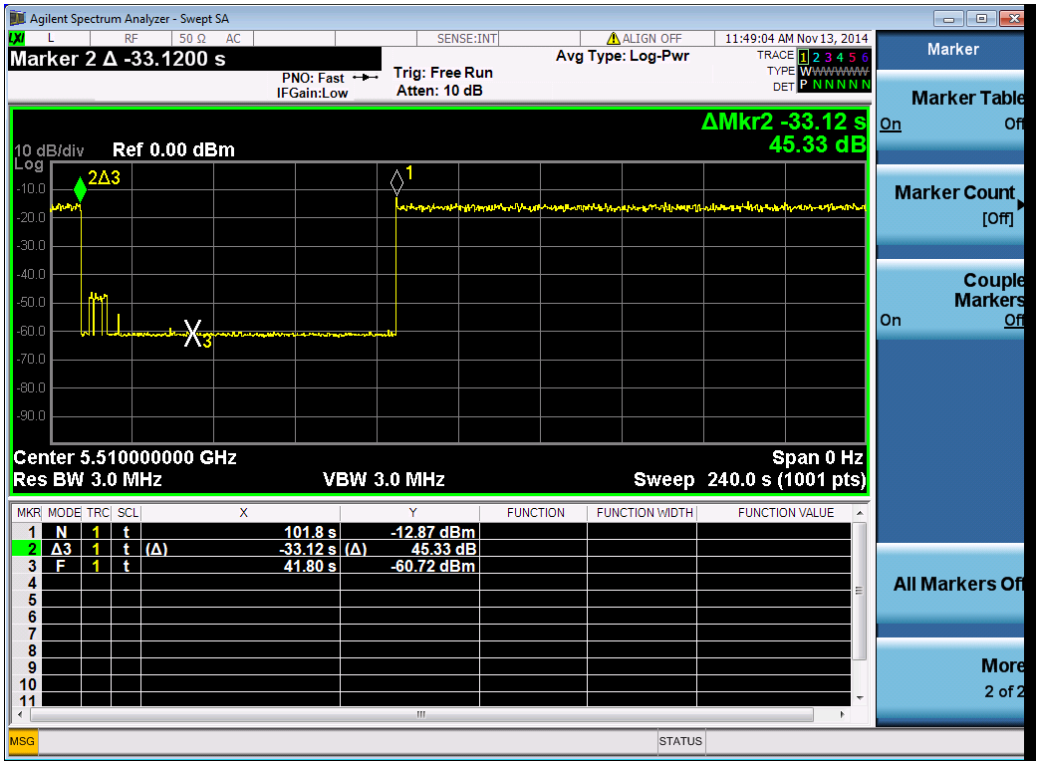
The initial power-up period is (93.6- 60) = 33.6 seconds

Timing plot of radar burst at the beginning of CAC time

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

Timing plot of radar burst at the end of CAC time

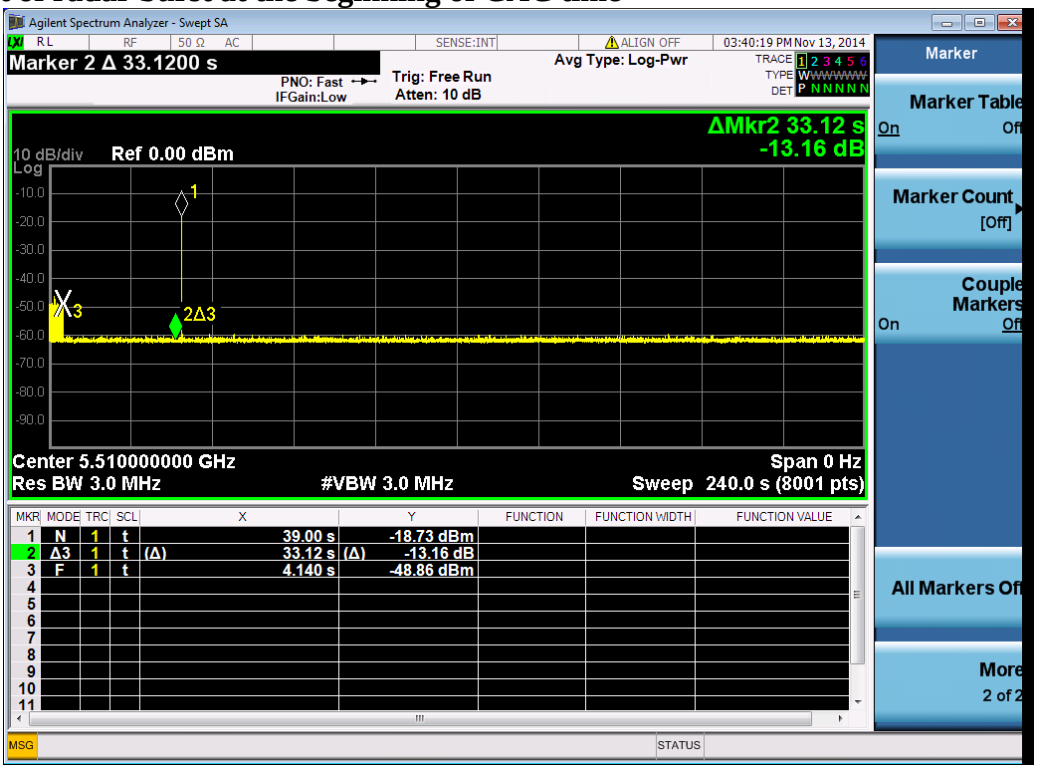
Timing plot of initial CAC time for 5510MHz



The initial power-up period is (93.12- 60) = 33.12 seconds

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

Timing plot of radar burst at the beginning of CAC time

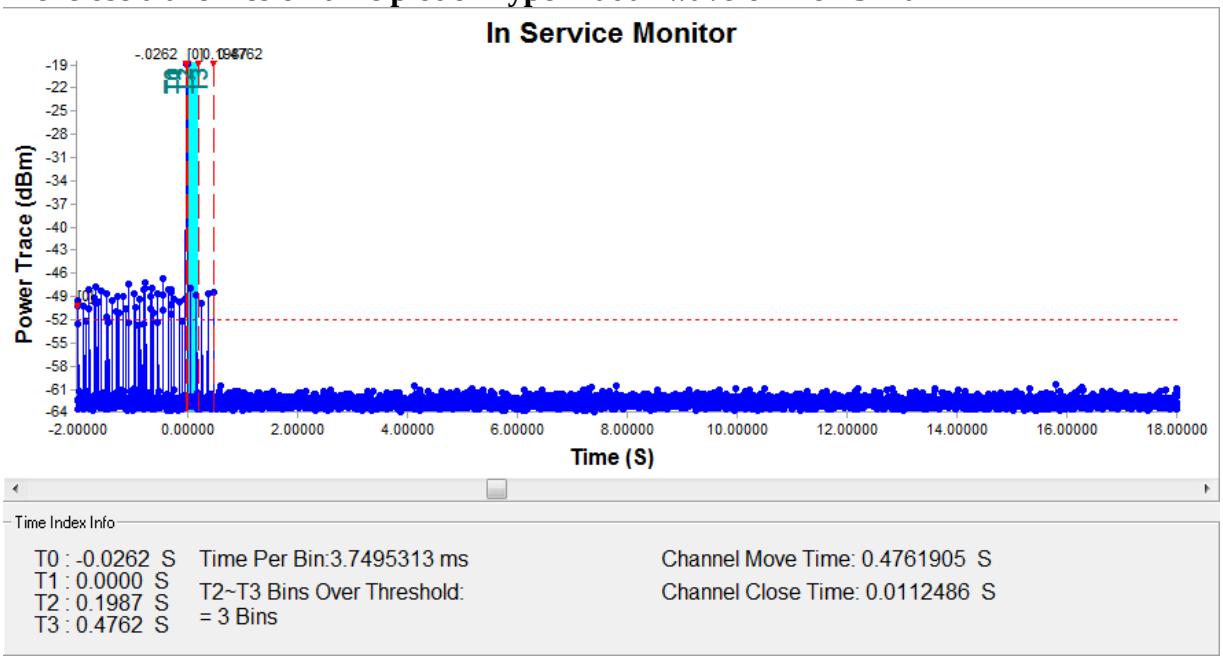


Timing plot of radar burst at the end of CAC time

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

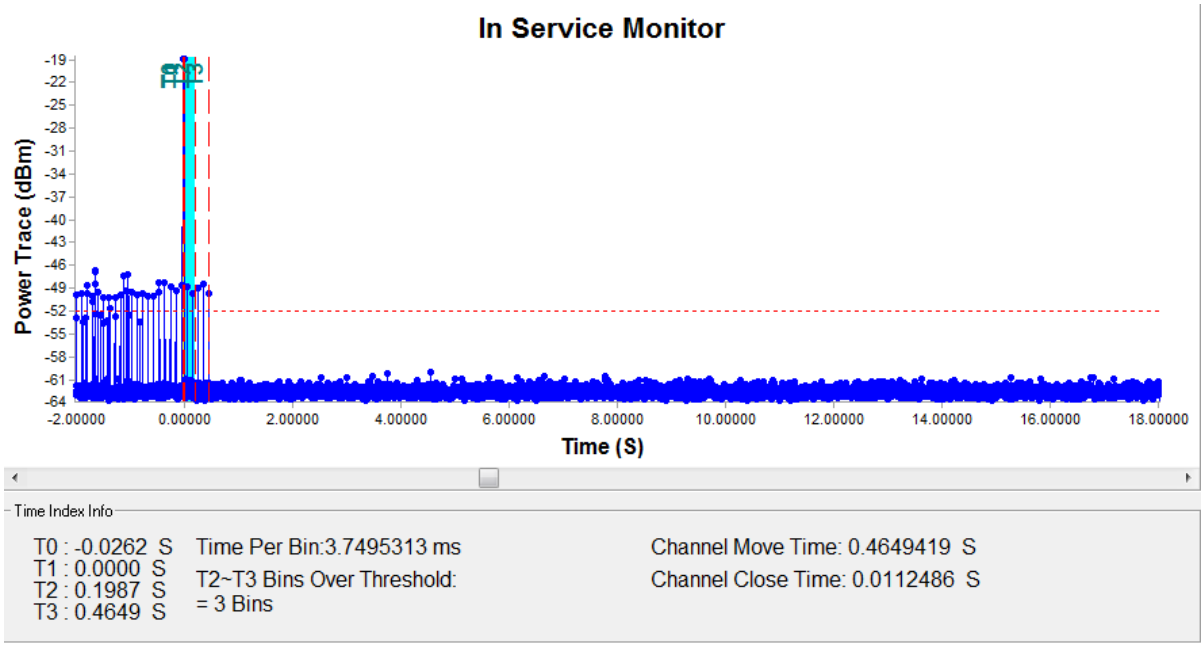
3.12.3 Channel move time plot of Type1 radar waveform on 5270MHz

Channel close transmission time plot of Type1 radar waveform on 5270MHz



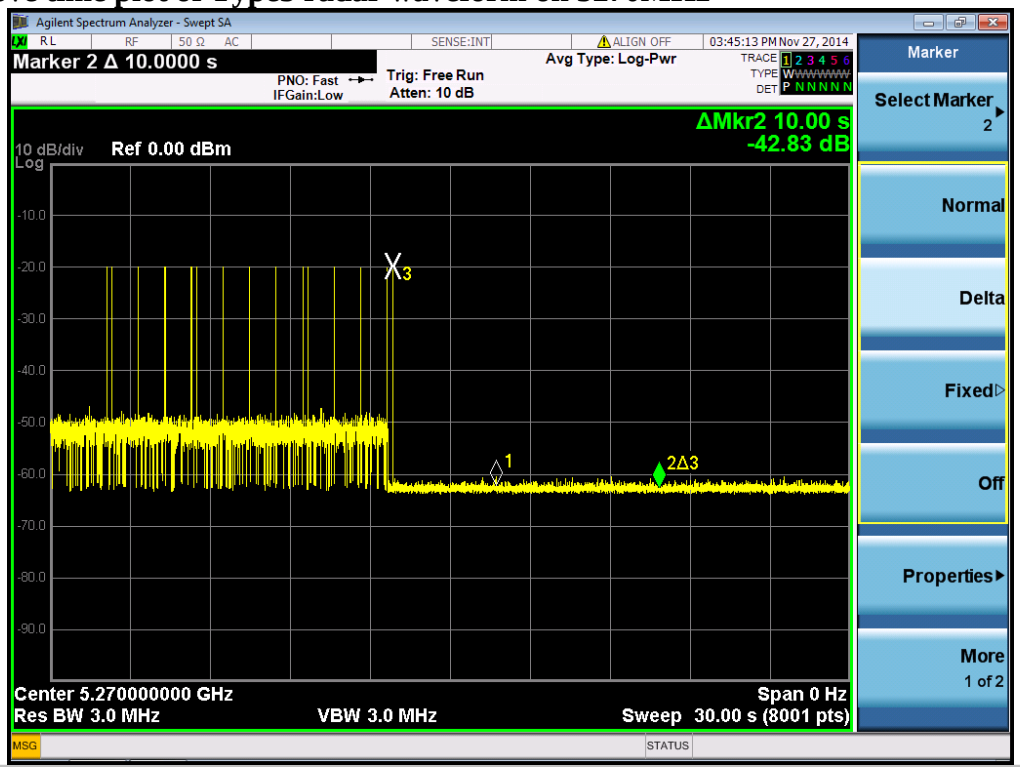
Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

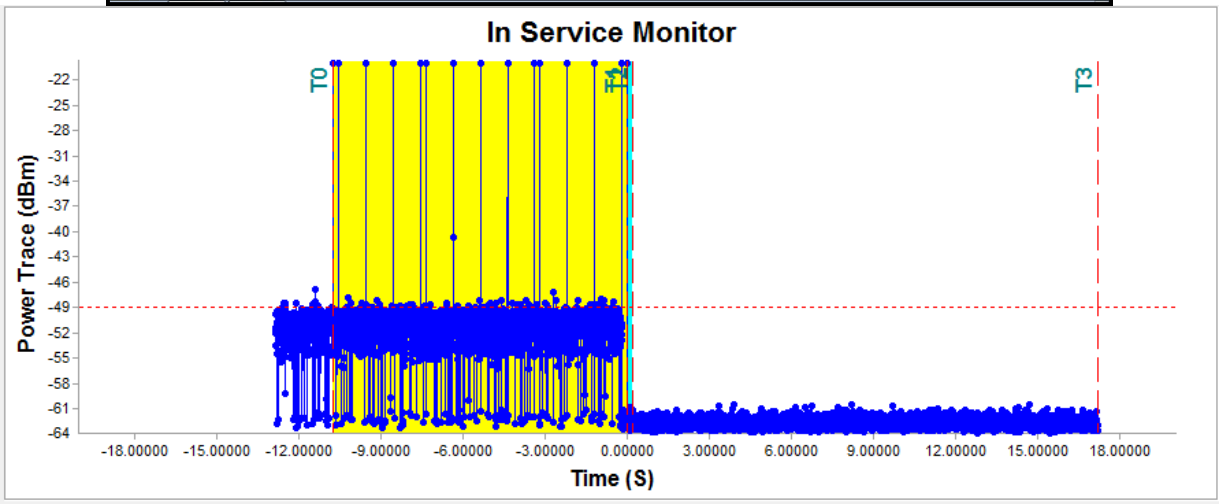
Channel move time plot of Type1 radar waveform on 5510MHz



Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

Channel move time plot of Type5 radar waveform on 5270MHz





Time Index Info

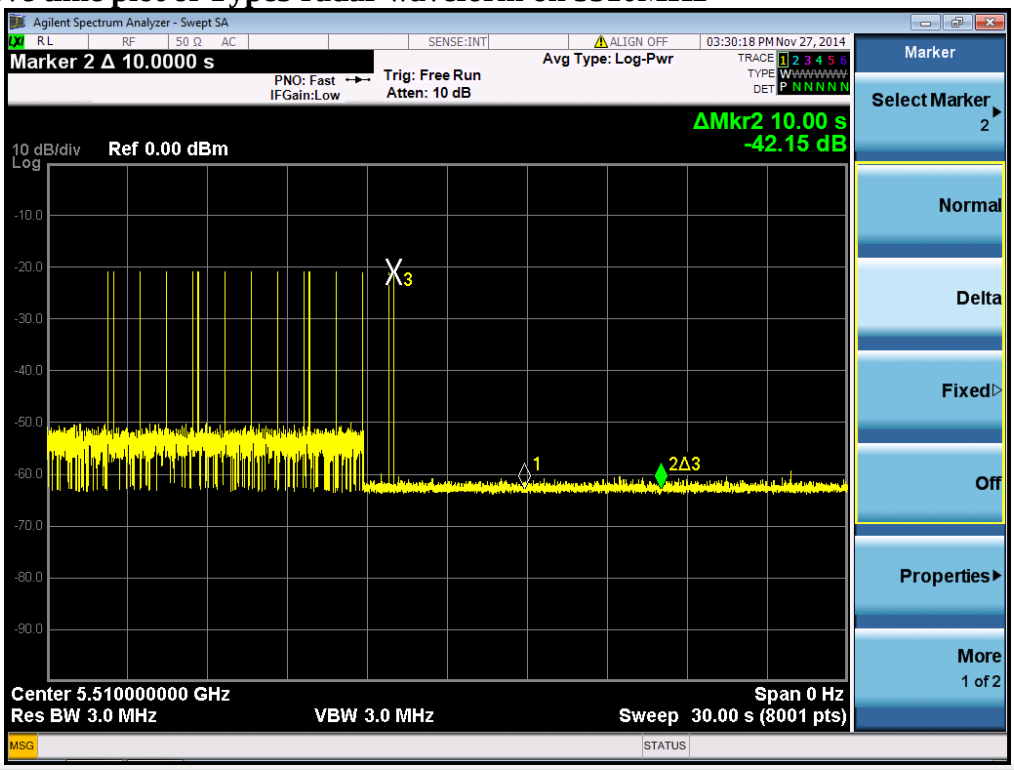
T0 : -10.7199 S
T1 : 0.0000 S
T2 : 0.1987 S
T3 : 0.0000 S

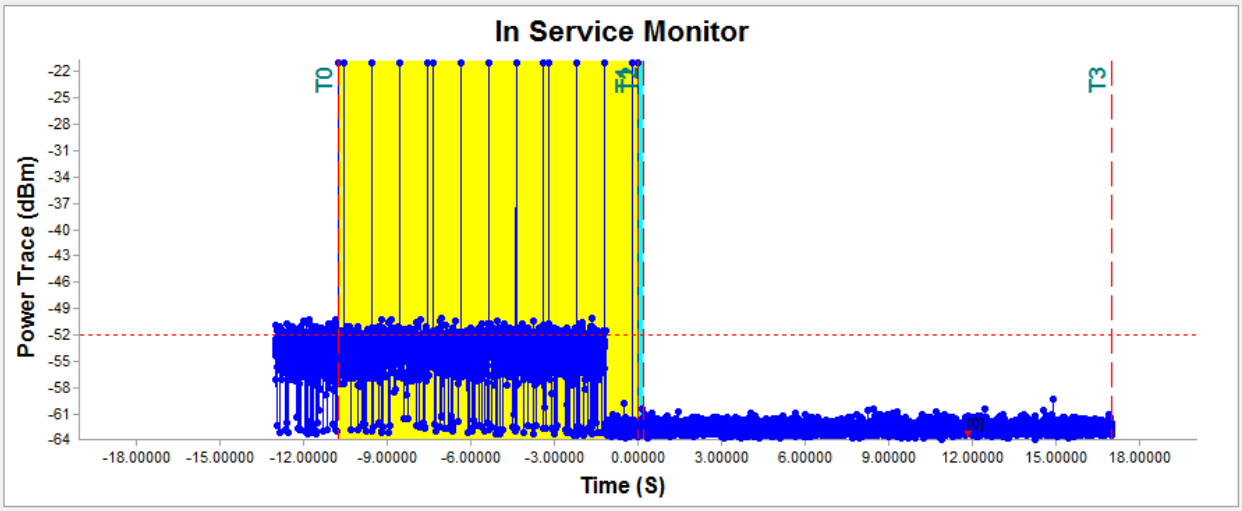
Time Per Bin:3.7495313 ms
T2~T3 Bins Over Threshold:
= 0 Bins

Channel Move Time: 0.0 S
Channel Close Time: 0.0 S

Registration number: W6M21410-14572-C-54
FCC ID: VYTLP2596KUS

Channel move time plot of Type5 radar waveform on 5510MHz





Time Index Info

T0 : -10.7199 S
T1 : 0.0000 S
T2 : 0.1987 S
T3 : 0.0000 S

Time Per Bin:3.7495313 ms
T2~T3 Bins Over Threshold:
= 0 Bins

Channel Move Time: 0.0 S
Channel Close Time: 0.0 S

Frequency (MHz)	Bandwidth (MHz)	Radar Type	Test Results	Limit	Results
5270	40	Type 5	0	60ms	Compliance
		Type 1	11.25	60ms	Compliance
5510	40	Type 5	0	60ms	Compliance
		Type 1	11.25	60ms	Compliance