

4.3 Power Spectral Density
FCC 15.247 (e)

4.3.1 Requirement

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna should not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

4.3.2 Procedure

The antenna port of the EUT was connected to the input of a spectrum analyzer to measure the Transmitter Power Density (PSD). The offset programmed on the analyzer is corrected to include cable loss, attenuator.

The procedure described in FCC Publication 558074 D01 DTS Meas Guidance, specifically section 10.2 Method PKPSD (peak PSD).

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the *DTS bandwidth*.
3. Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
4. Set the VBW $\geq 3 \times \text{RBW}$.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

Test Date:	September 25, 2017
------------	--------------------

4.3.3 Test Result

Refer to the following plots for the test result:

802.11b (2Mbps) – Peak Power Spectral Density

CH	Frequency MHz	Ant 0 – DB1 (dBm)	Plot #	Ant 1 – DB2 (dBm)	Plot #	Ant 2 – DB3 (dBm)	Plot #	Ant 3 – DB4 (dBm)	Plot #
1	2412	-0.20	3.1	-1.66	3.4	0.95	3.7	-0.44	3.10
6	2437	2.11	3.2	1.49	3.5	2.31	3.8	1.69	3.11
11	2462	-0.62	3.3	0.07	3.6	-0.31	3.9	0.08	3.12

802.11g (6Mbps) – Peak Power Spectral Density

CH	Frequency MHz	Ant 0 – DB1 (dBm)	Plot #	Ant 1 – DB2 (dBm)	Plot #	Ant 2 – DB3 (dBm)	Plot #	Ant 3 – DB4 (dBm)	Plot #
1	2412	-4.68	3.13	-4.18	3.16	-3.91	3.19	-5.22	3.22
6	2437	-0.75	3.14	-0.99	3.17	-0.78	3.20	-0.33	3.23
11	2462	-3.82	3.15	-4.07	3.18	-4.40	3.21	-4.51	3.24

802.11n 20MHz (MCS0) – Peak Power Spectral Density

CH	Frequency MHz	Ant 0 – DB1 (dBm)	Plot #	Ant 1 – DB2 (dBm)	Plot #	Ant 2 – DB3 (dBm)	Plot #	Ant 3 – DB4 (dBm)	Plot #
1	2412	-4.23	3.25	-4.47	3.28	-4.75	3.31	-5.19	3.34
6	2437	-1.58	3.26	-1.18	3.29	-1.95	3.32	-1.87	3.35
11	2462	-4.16	3.27	-5.67	3.30	-5.11	3.33	-5.68	3.36

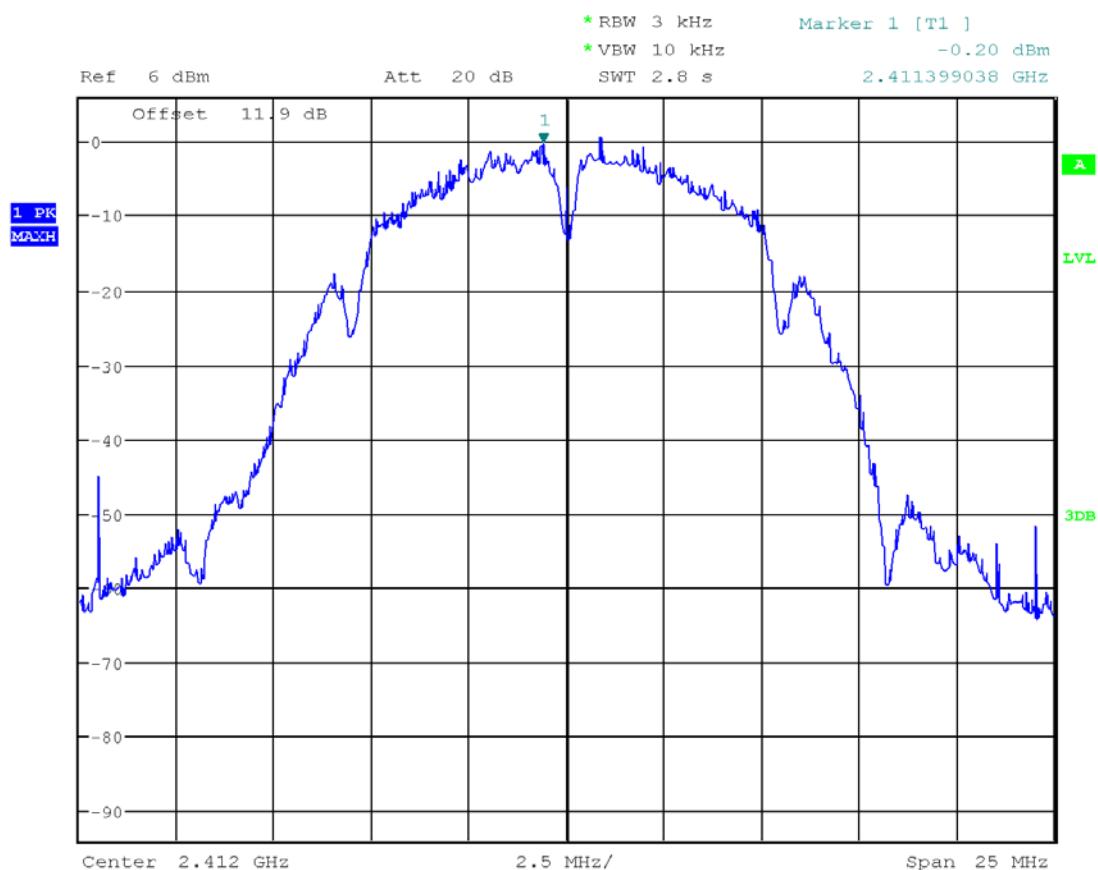
802.11n 40MHz (MCS0) – Peak Power Spectral Density

CH	Frequency MHz	Ant 0 – DB1 (dBm)	Plot #	Ant 1 – DB2 (dBm)	Plot #	Ant 2 – DB3 (dBm)	Plot #	Ant 3 – DB4 (dBm)	Plot #
3	2422	-10.45	3.37	-10.89	3.40	-10.97	3.43	-11.00	3.46
6	2437	-5.21	3.38	-4.51	3.41	-4.00	3.44	-5.13	3.47
9	2452	-10.84	3.39	-10.81	3.42	-9.49	3.45	-11.06	3.48

MIMO - Peak Power Spectral Density

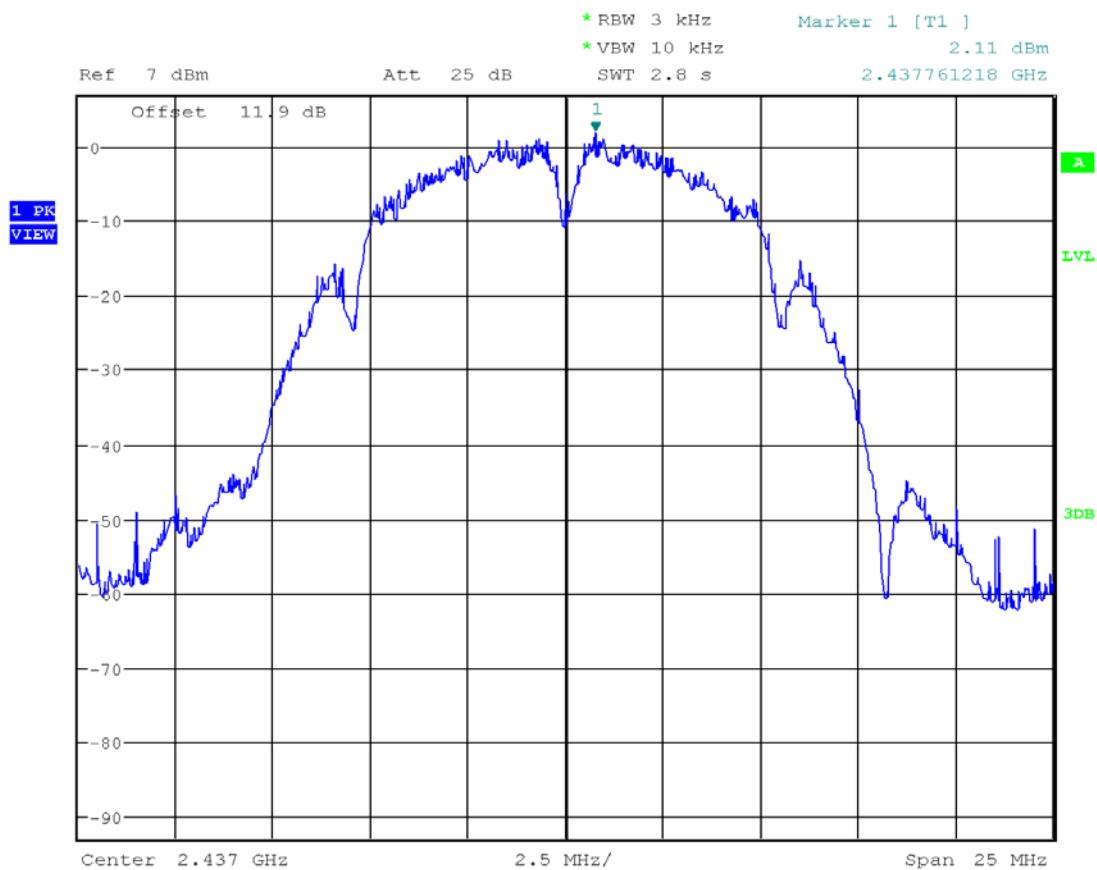
CH	Frequency (MHz)	Summed PSD (dBm)	Limit (dBm)	Margin (dB)
802.11b				
1	2412	5.78	8.0	-2.22
6	2437	7.93	8.0	-0.07
11	2462	5.84	8.0	-2.16
802.11g				
1	2412	1.55	8.0	-6.45
6	2437	5.31	8.0	-2.69
11	2462	1.83	8.0	-6.17
802.11n 20MHz				
1	2412	1.38	8.0	-6.62
6	2437	4.39	8.0	-3.61
11	2462	0.91	8.0	-7.09
802.11n 40MHz				
3	2422	-4.80	8.0	-12.80
6	2437	1.34	8.0	-6.66
9	2452	-4.48	8.0	-12.48

Plot 3. 1



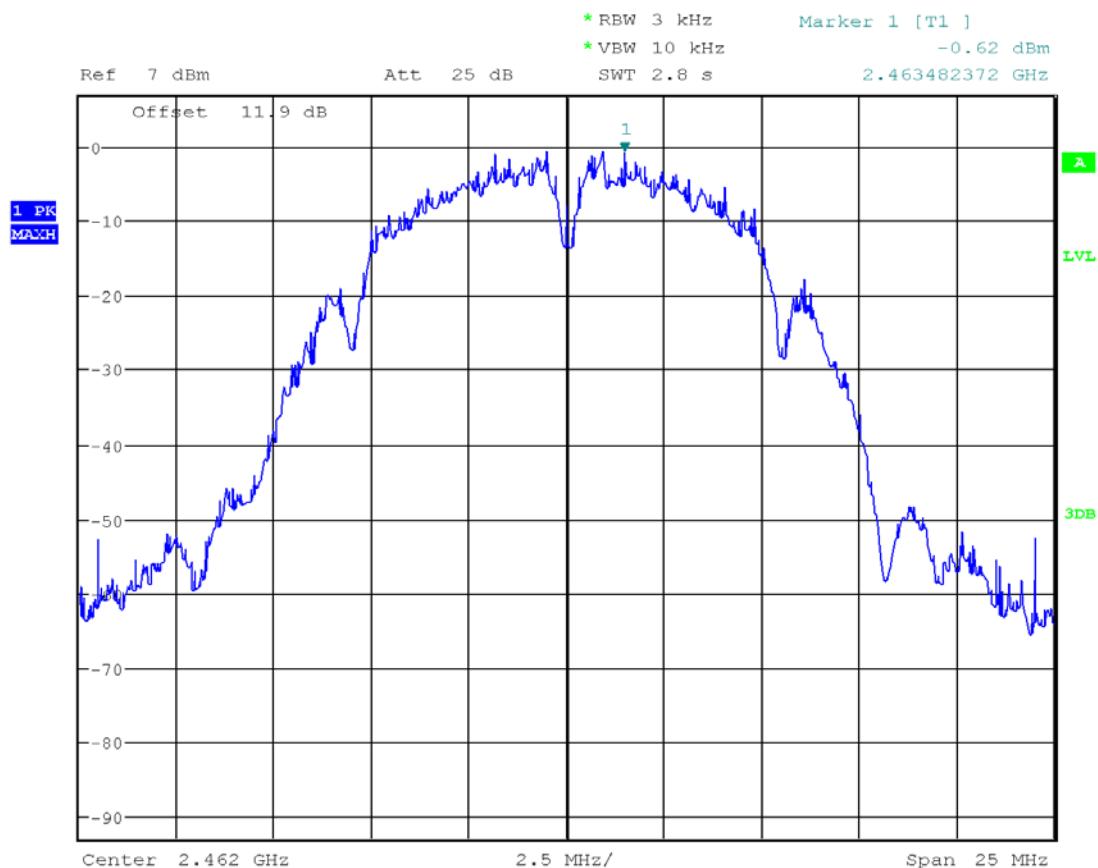
Date: 25.SEP.2017 15:01:50

Plot 3. 2



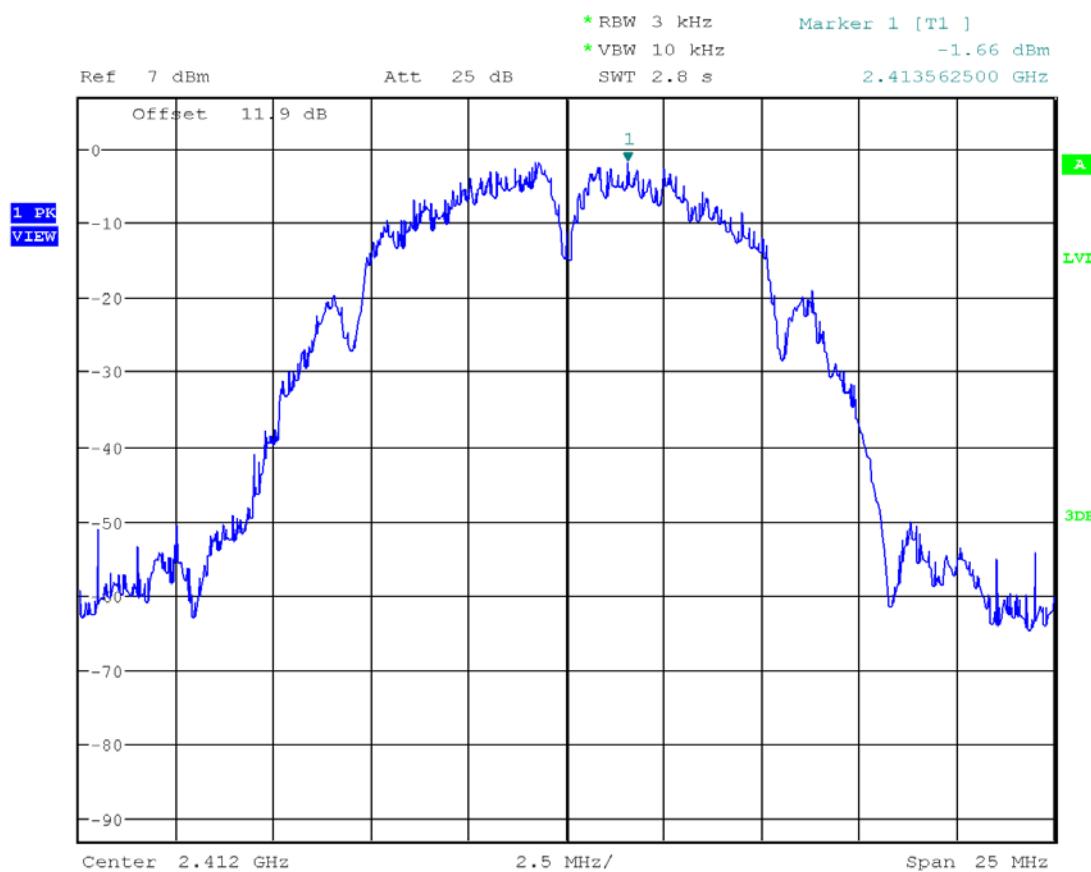
Date: 25.SEP.2017 15:27:04

Plot 3. 3



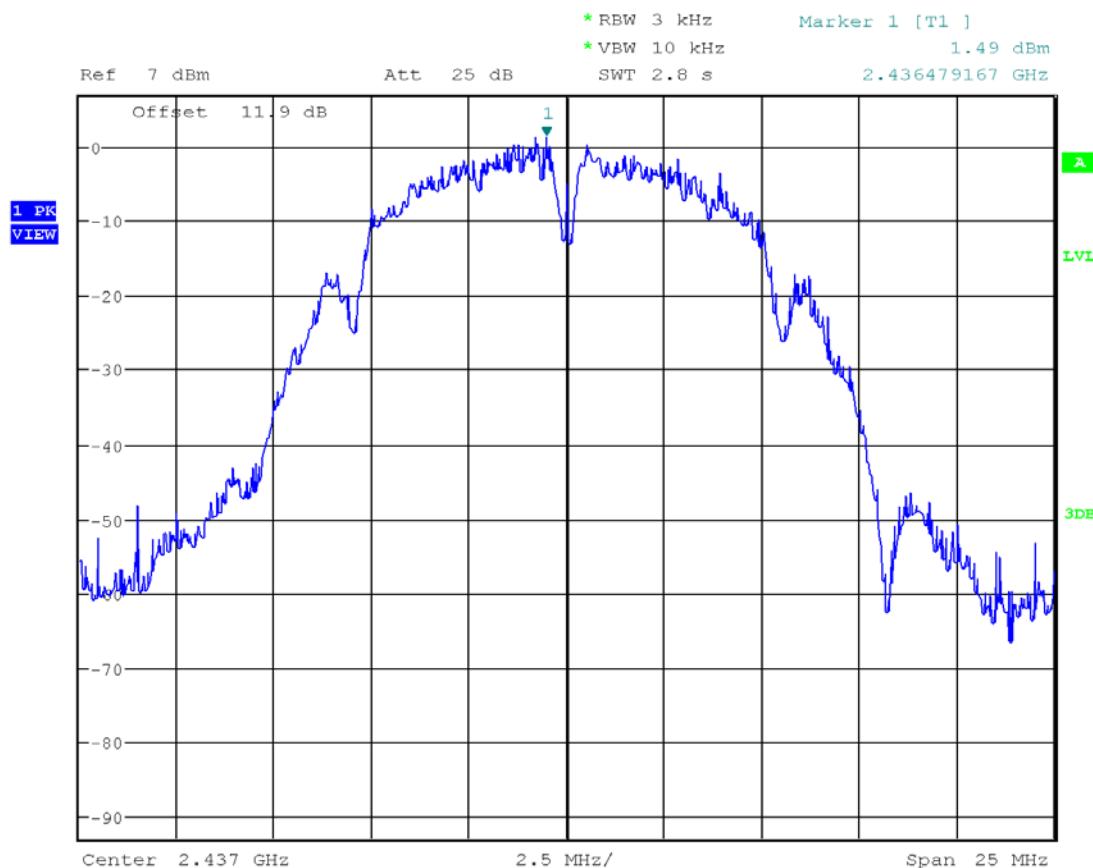
Date: 25.SEP.2017 15:09:12

Plot 3.4



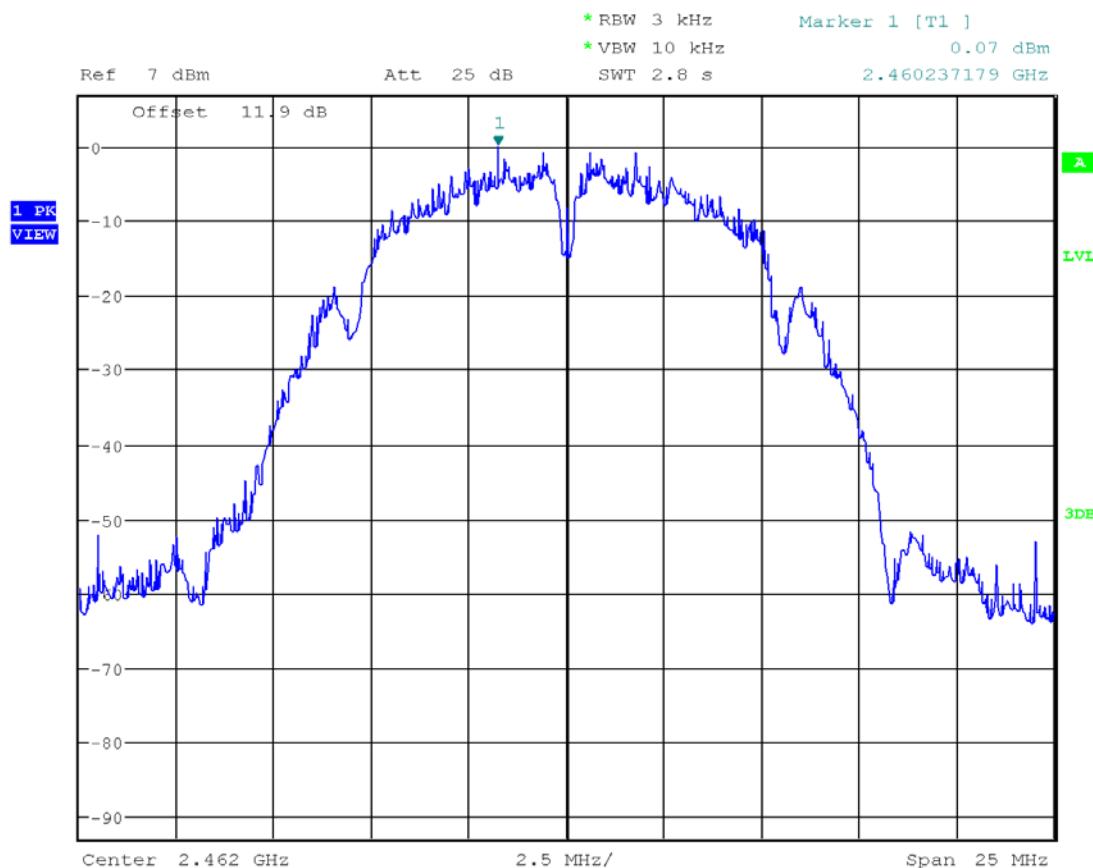
Date: 25.SEP.2017 15:23:48

Plot 3. 5



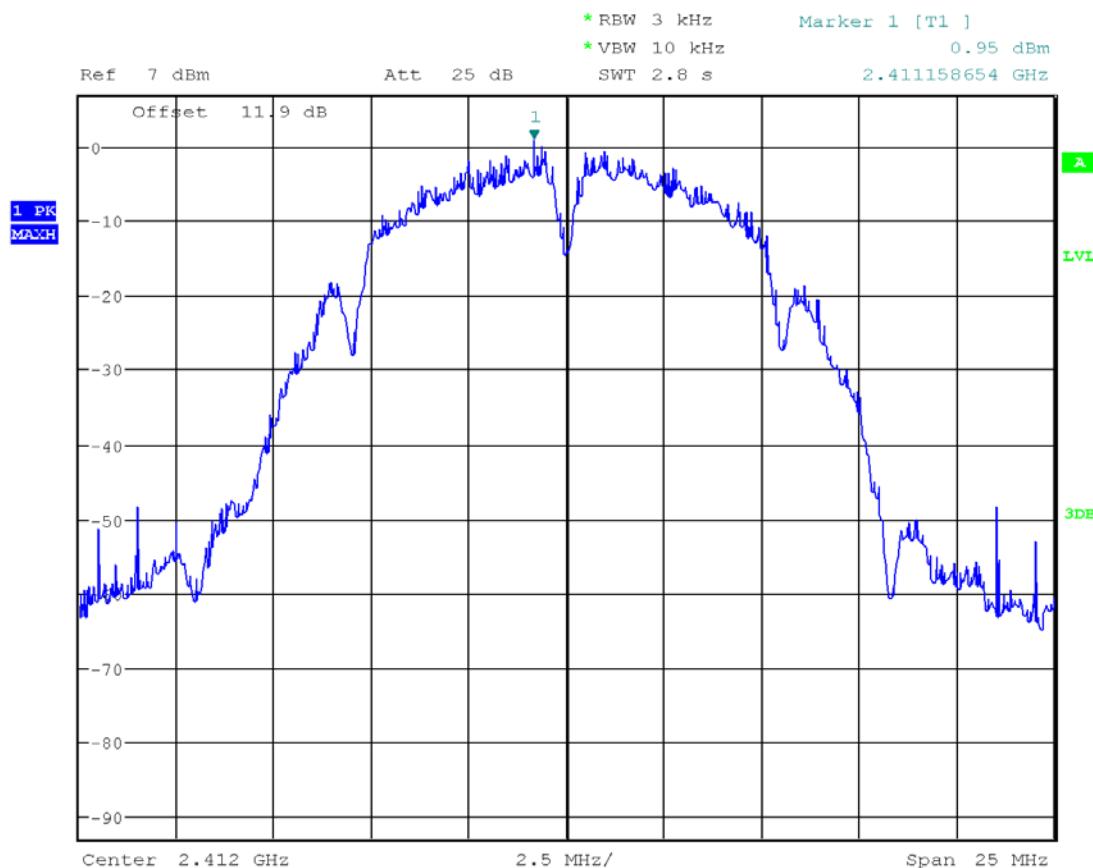
Date: 25.SEP.2017 15:29:16

Plot 3.6



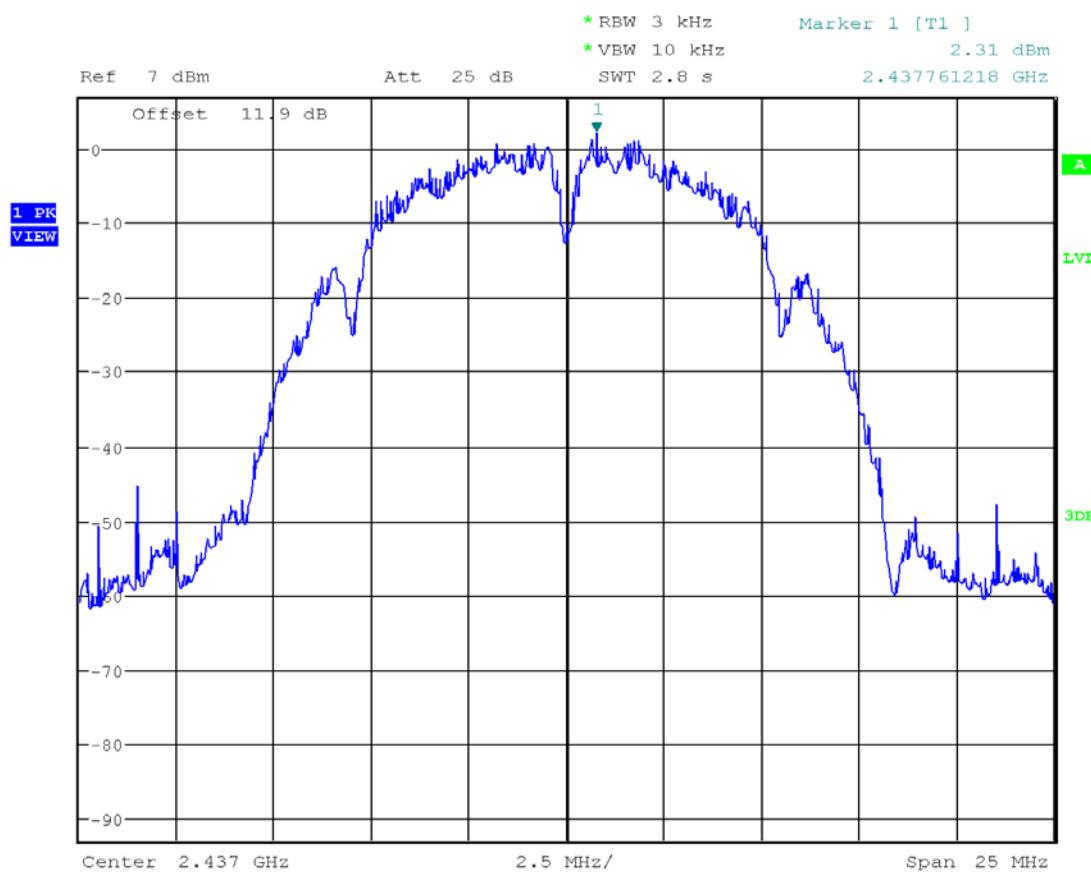
Date: 25.SEP.2017 15:24:36

Plot 3. 7



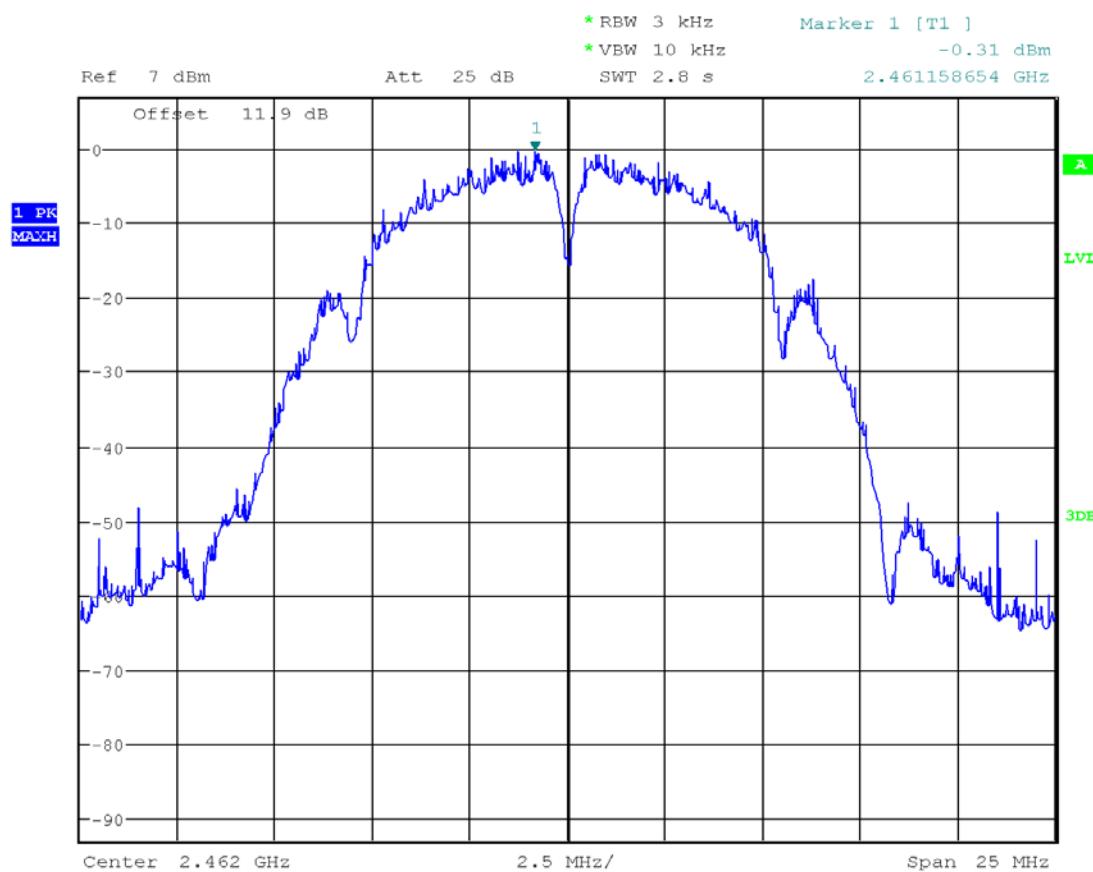
Date: 25.SEP.2017 15:32:20

Plot 3. 8



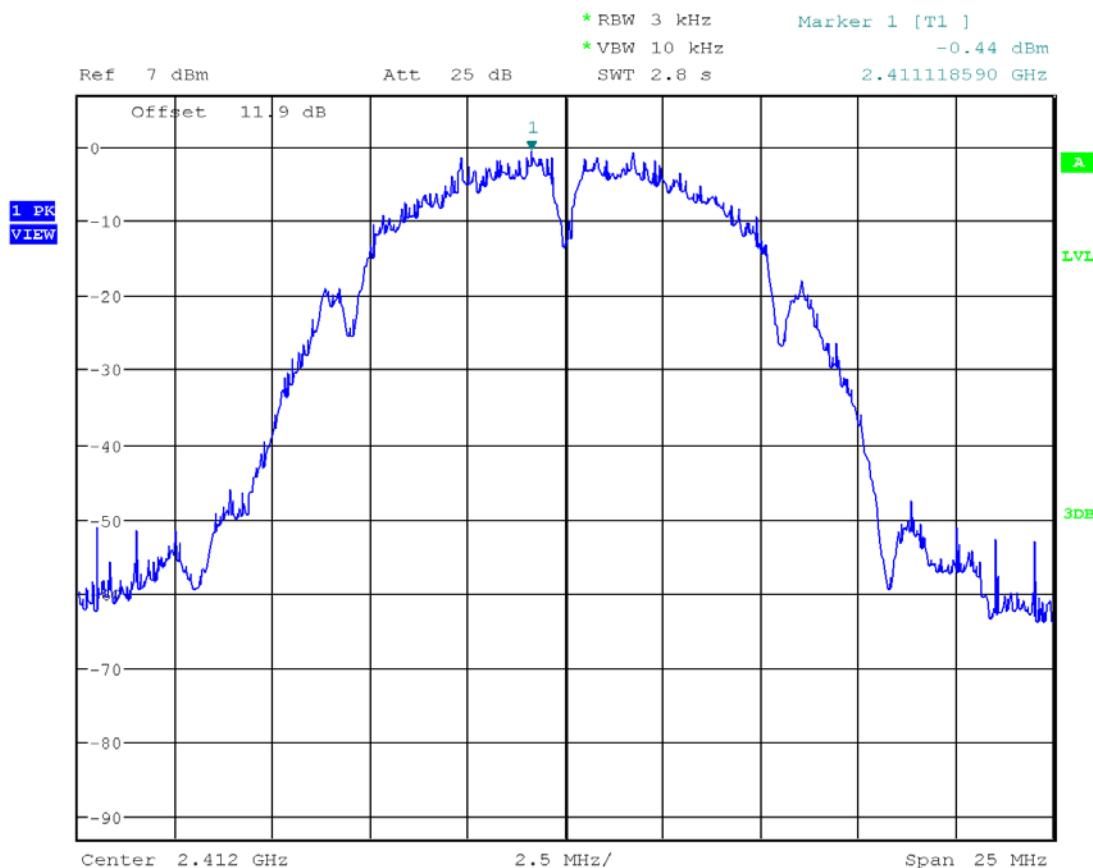
Date: 25.SEP.2017 15:31:21

Plot 3. 9



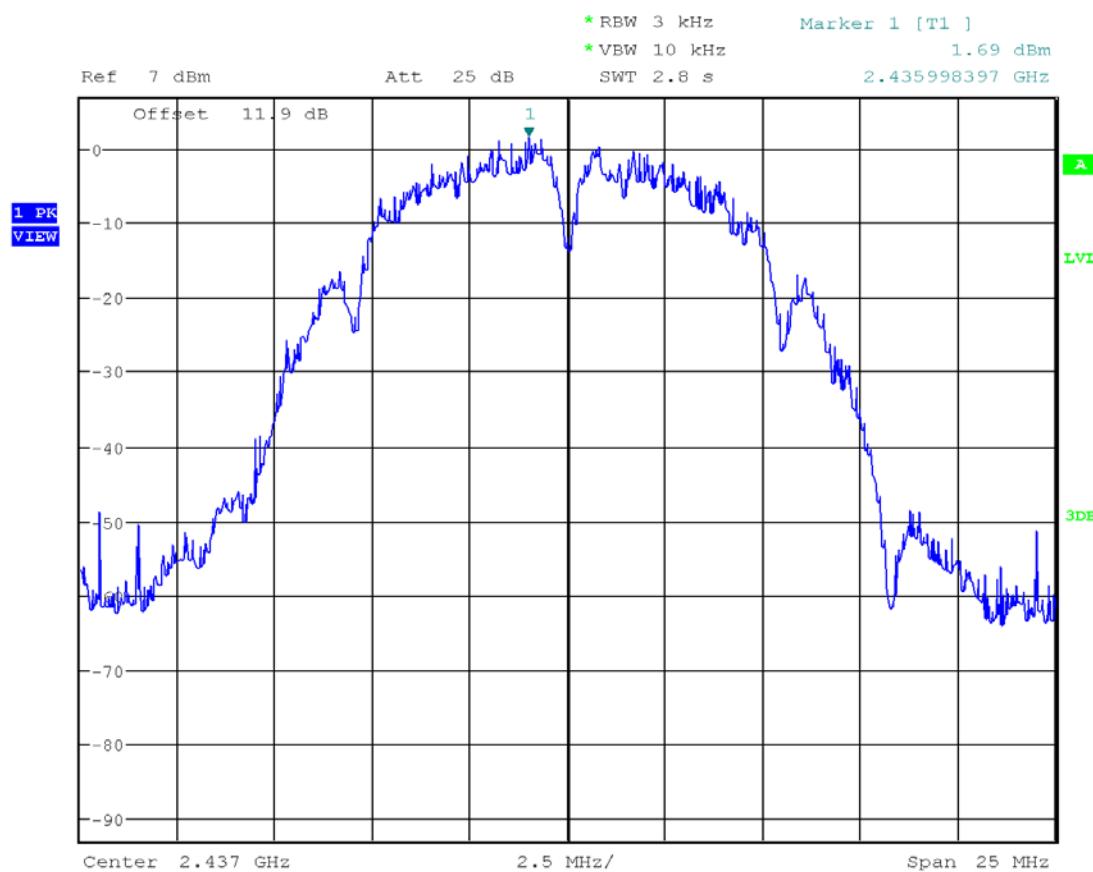
Date: 25.SEP.2017 15:33:10

Plot 3. 10



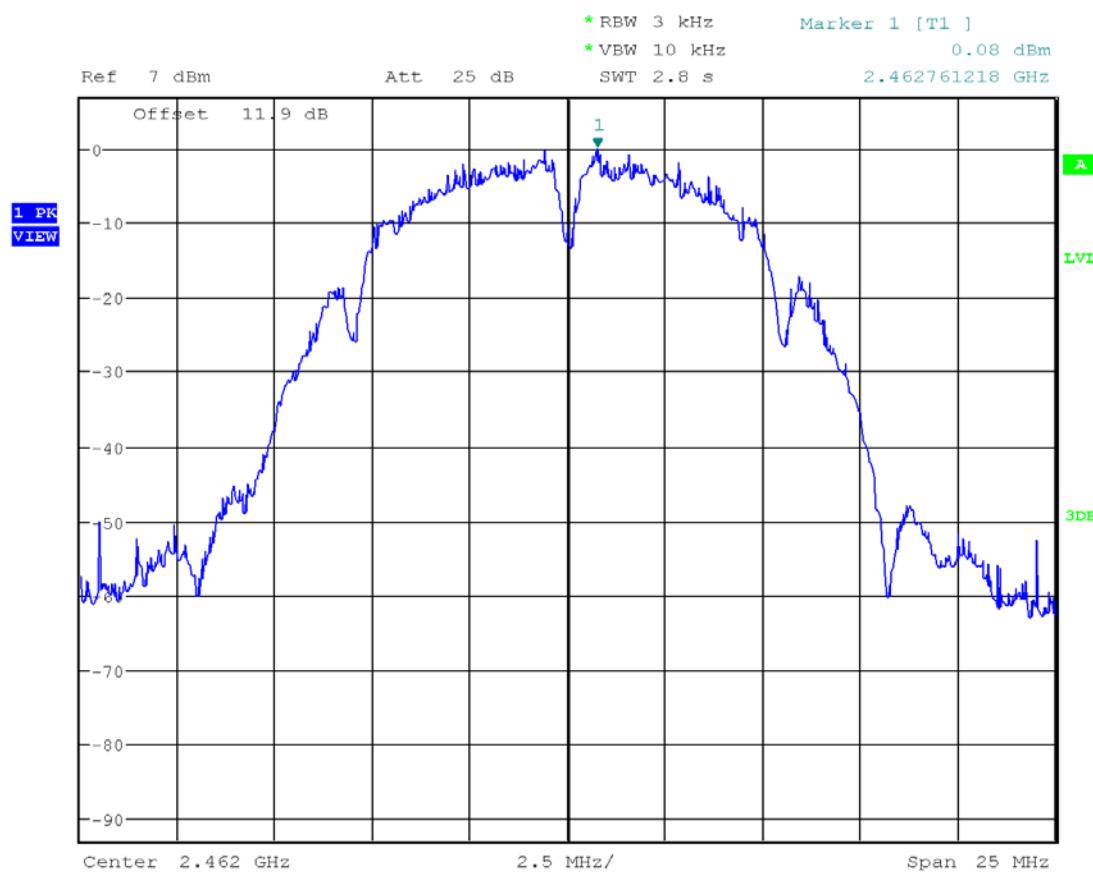
Date: 25.SEP.2017 15:34:27

Plot 3.11



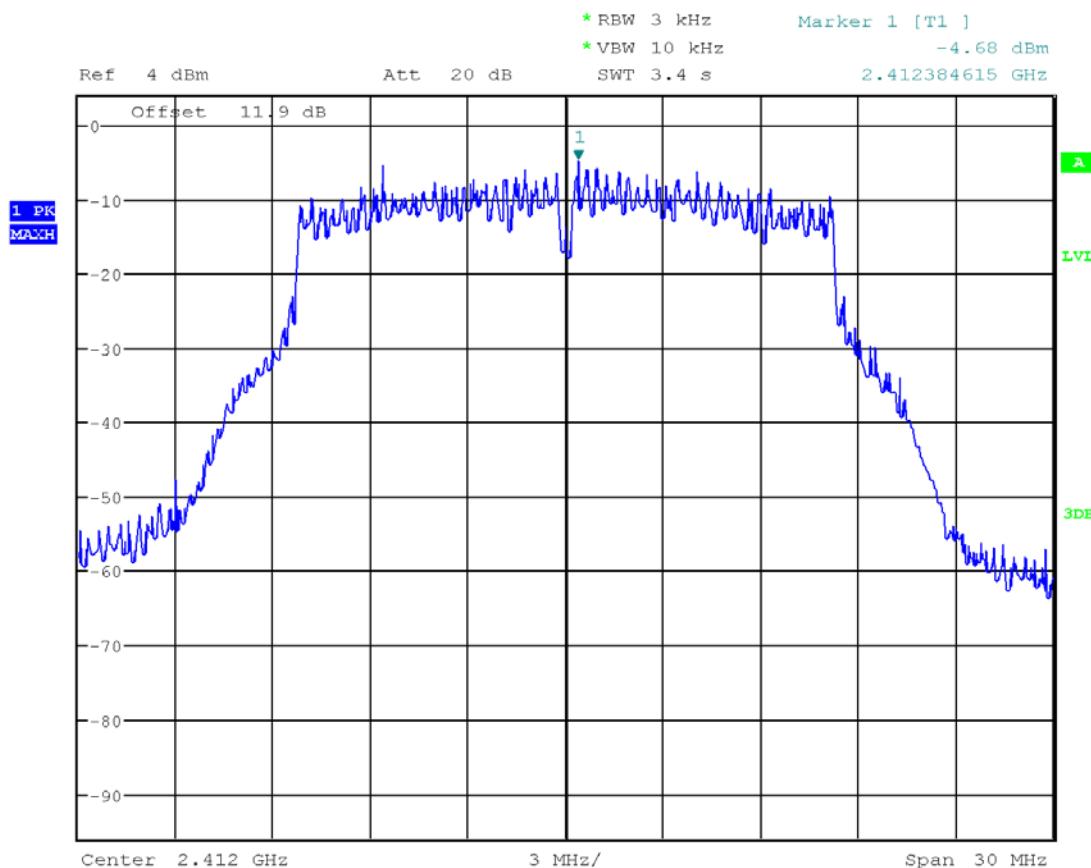
Date: 25.SEP.2017 15:35:46

Plot 3. 12



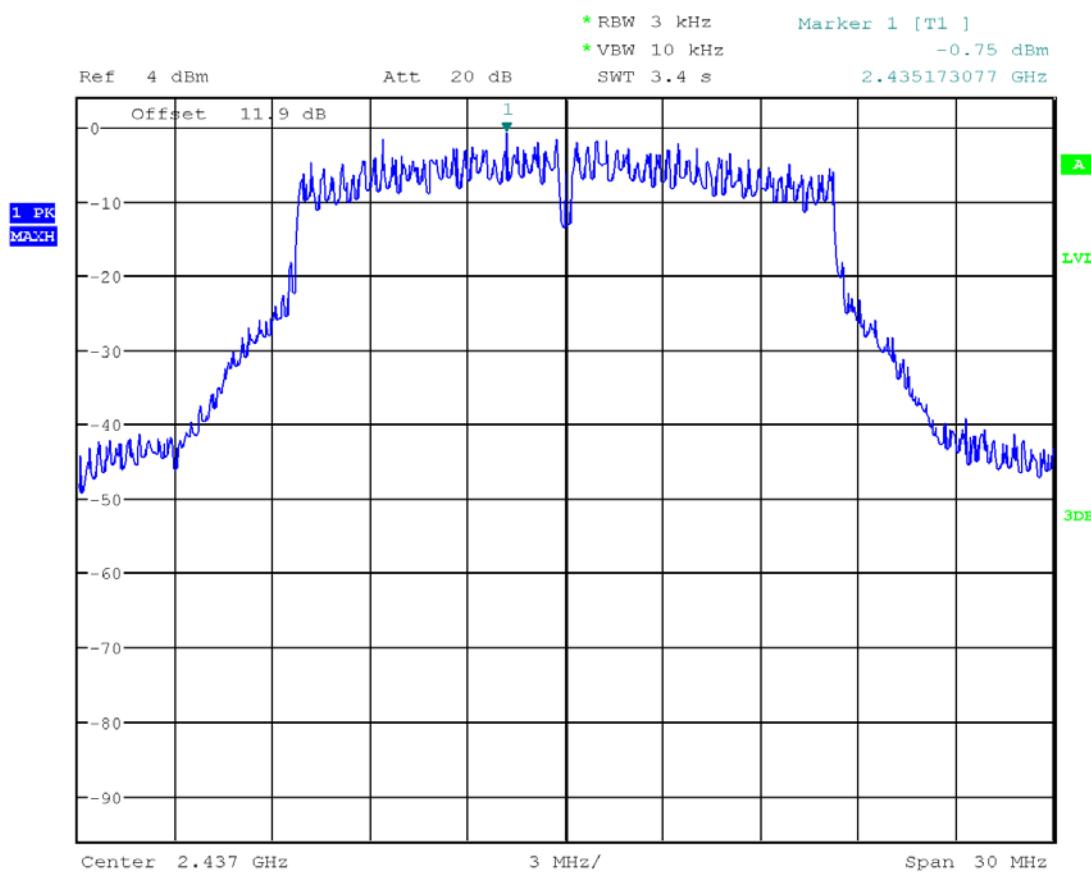
Date: 25.SEP.2017 15:36:49

Plot 3. 13



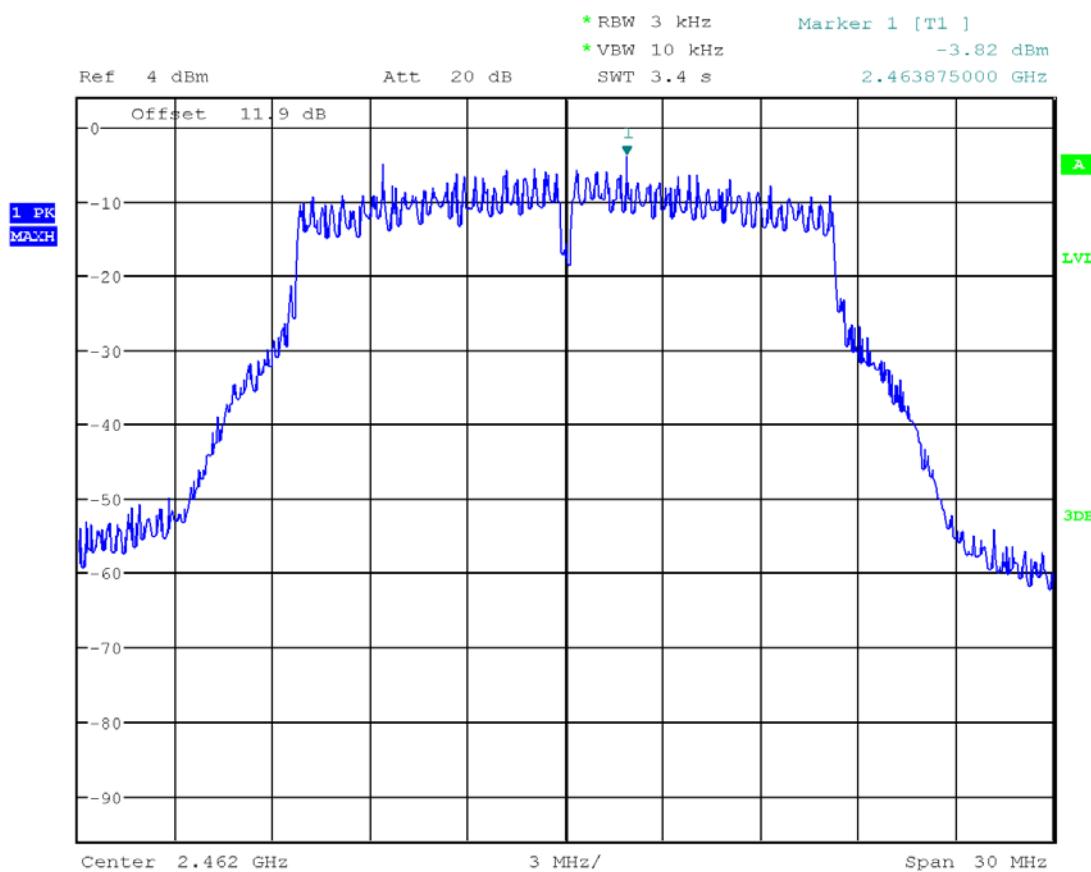
Date: 25.SEP.2017 15:41:41

Plot 3. 14



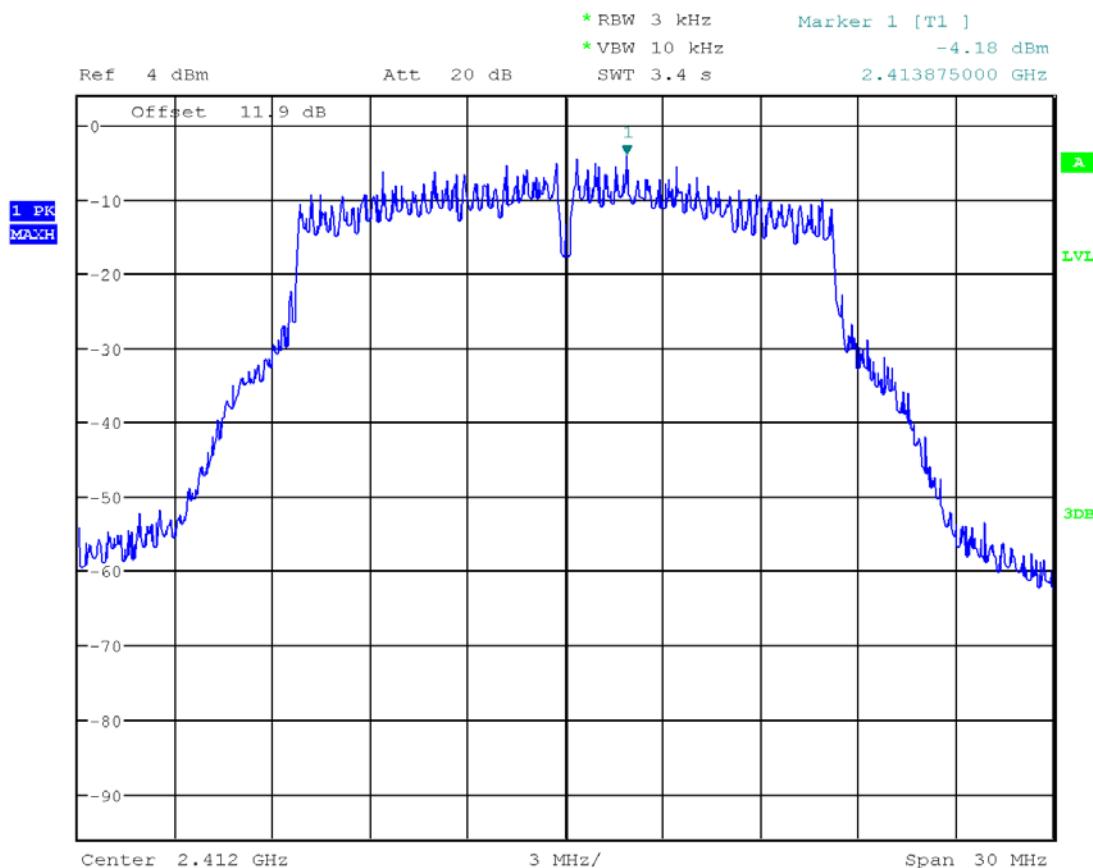
Date: 25.SEP.2017 15:42:26

Plot 3. 15



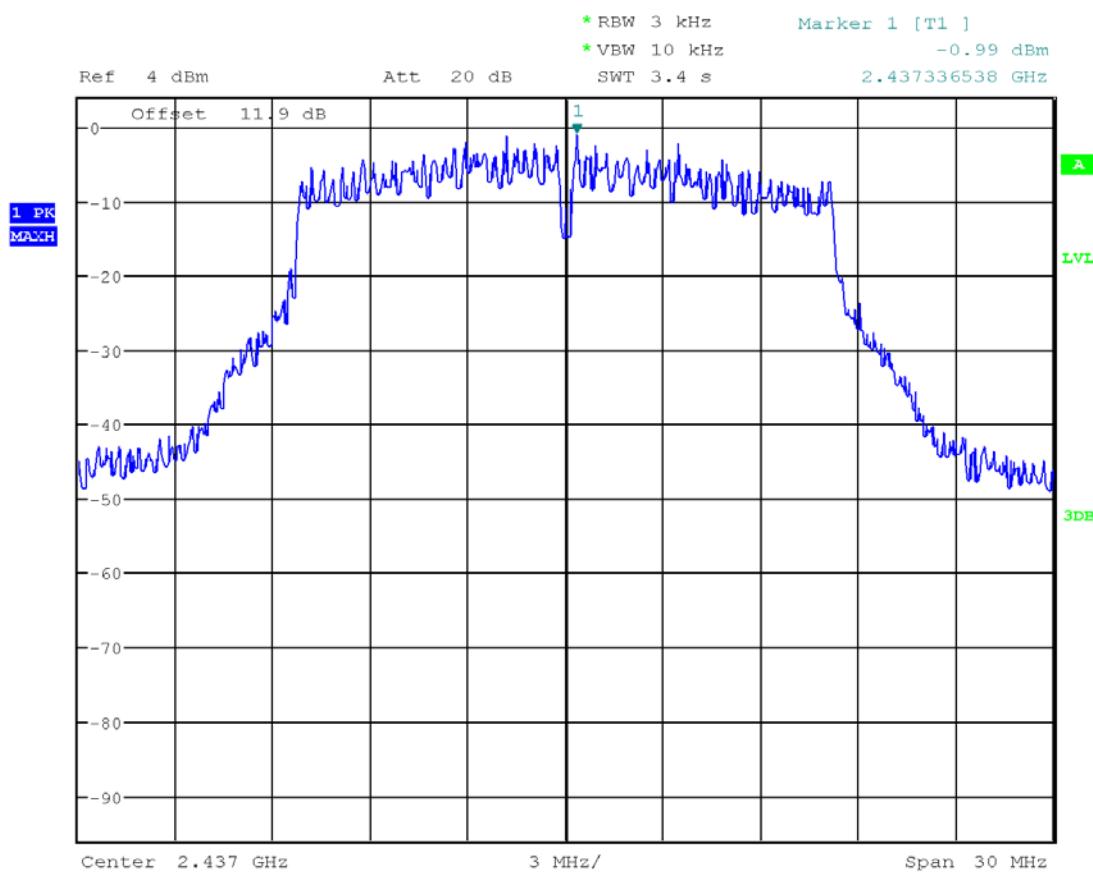
Date: 25.SEP.2017 15:43:09

Plot 3. 16



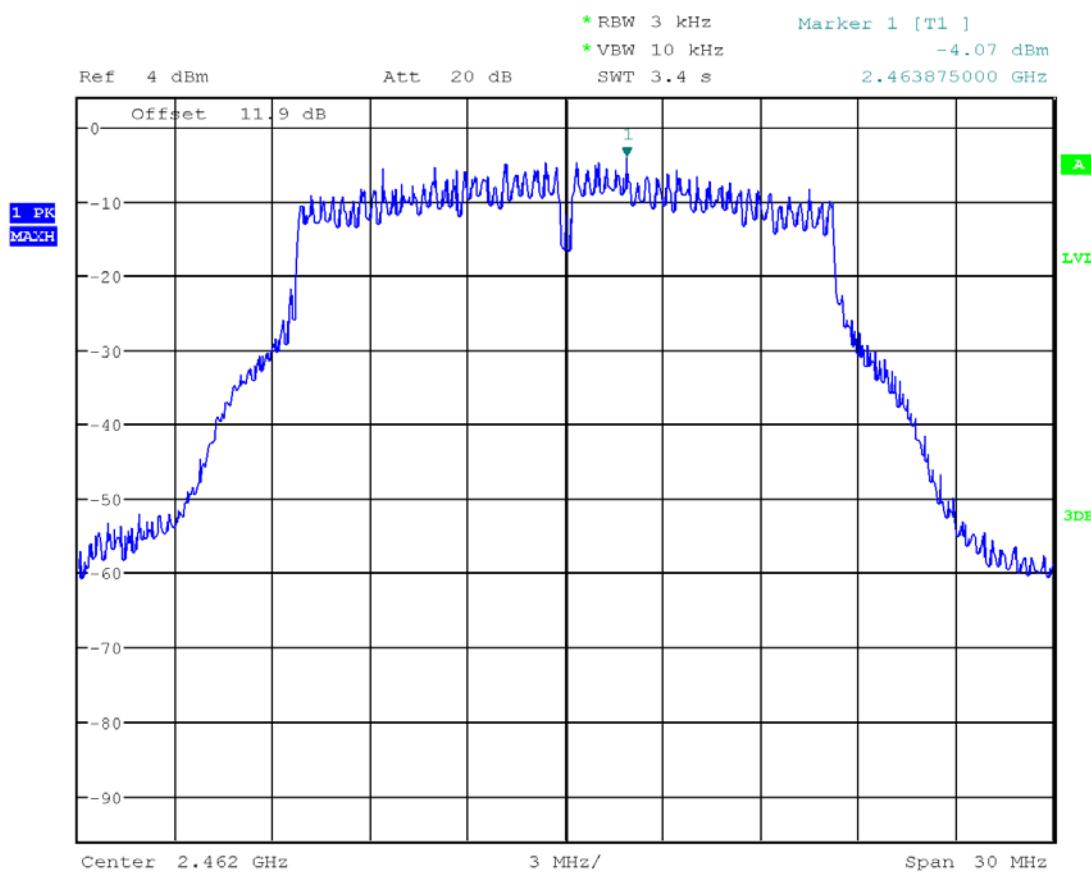
Date: 25.SEP.2017 15:44:25

Plot 3. 17



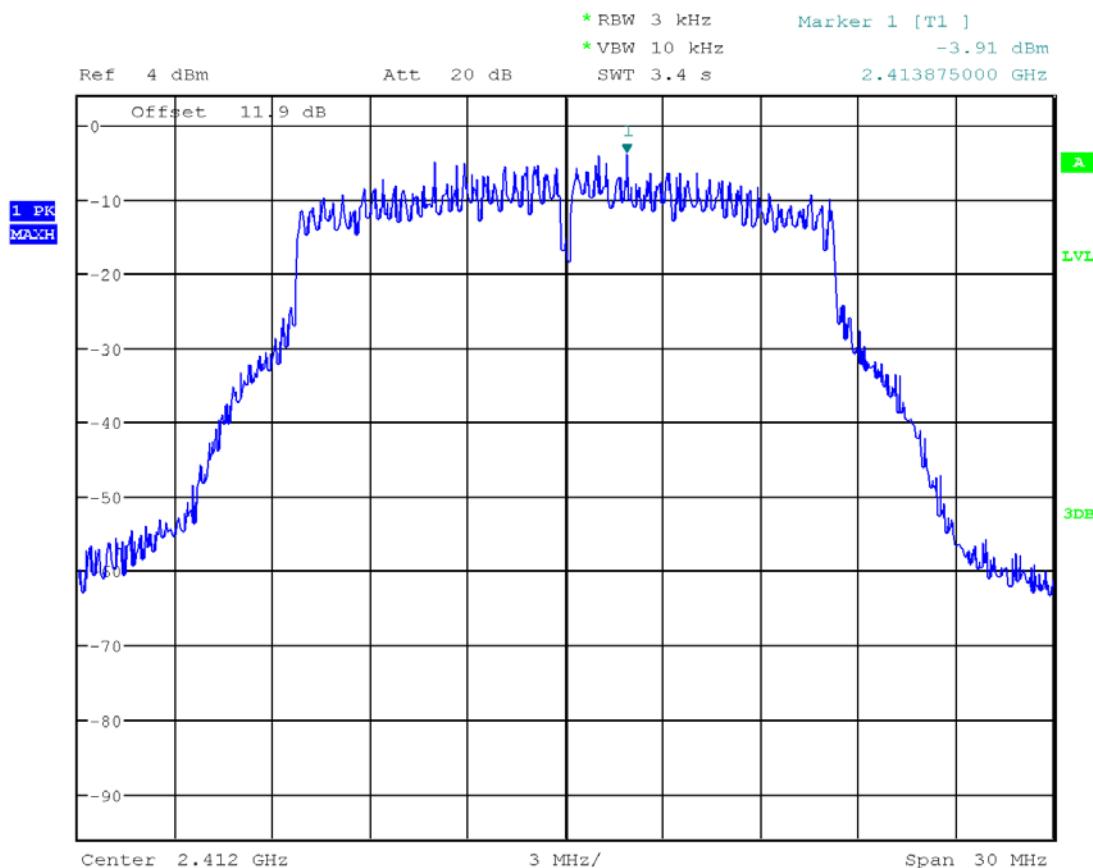
Date: 25.SEP.2017 15:45:10

Plot 3. 18



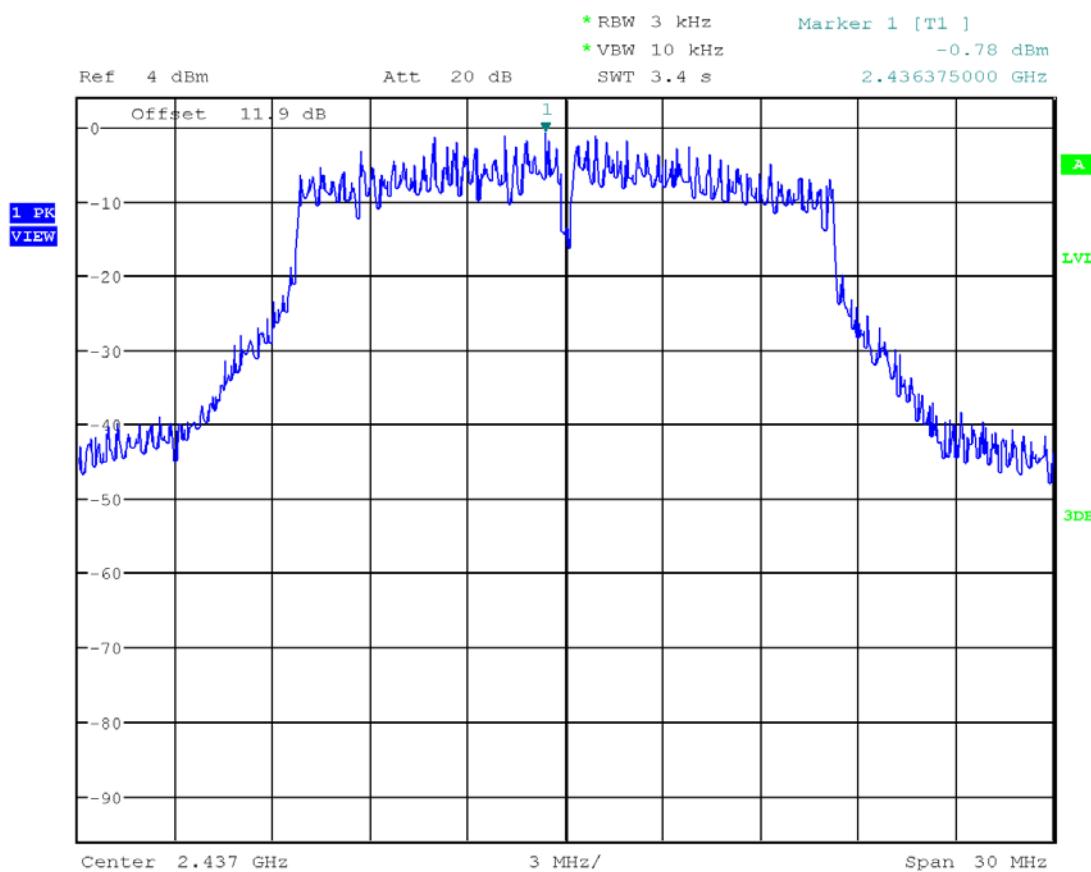
Date: 25.SEP.2017 15:47:14

Plot 3. 19



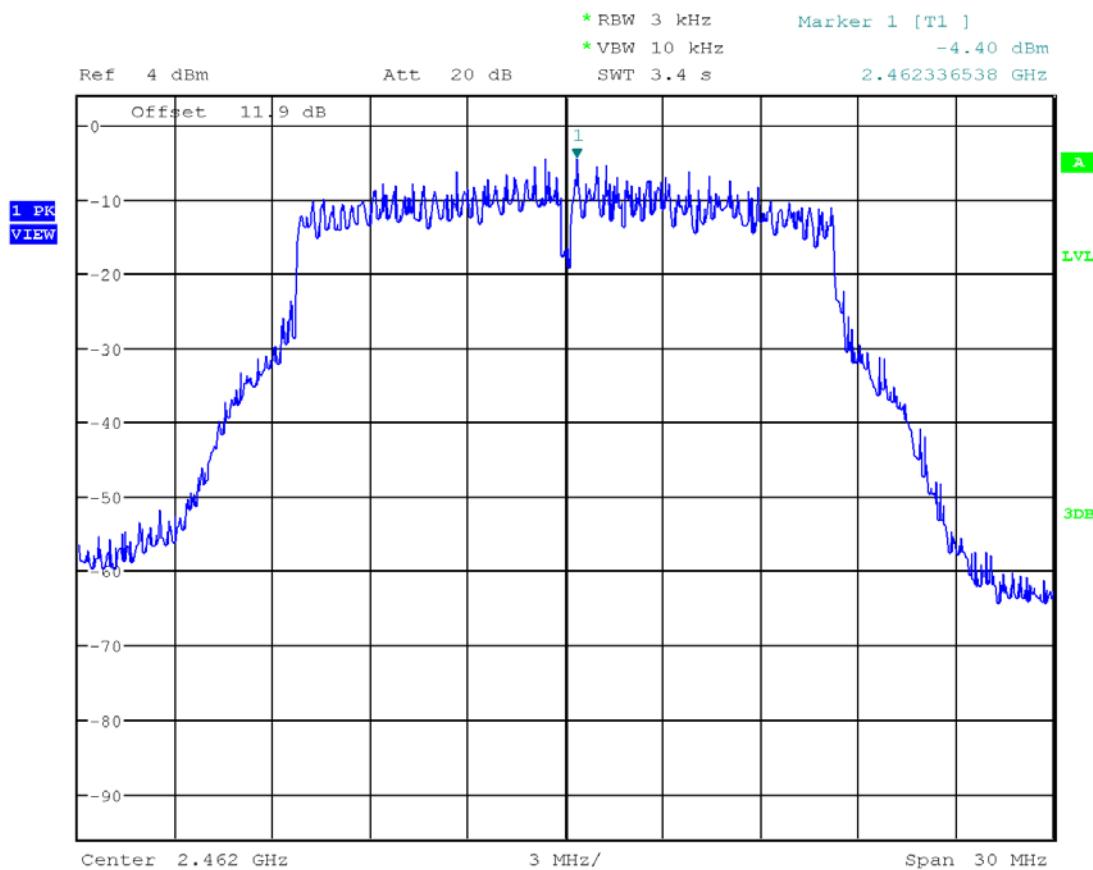
Date: 25.SEP.2017 15:48:38

Plot 3. 20



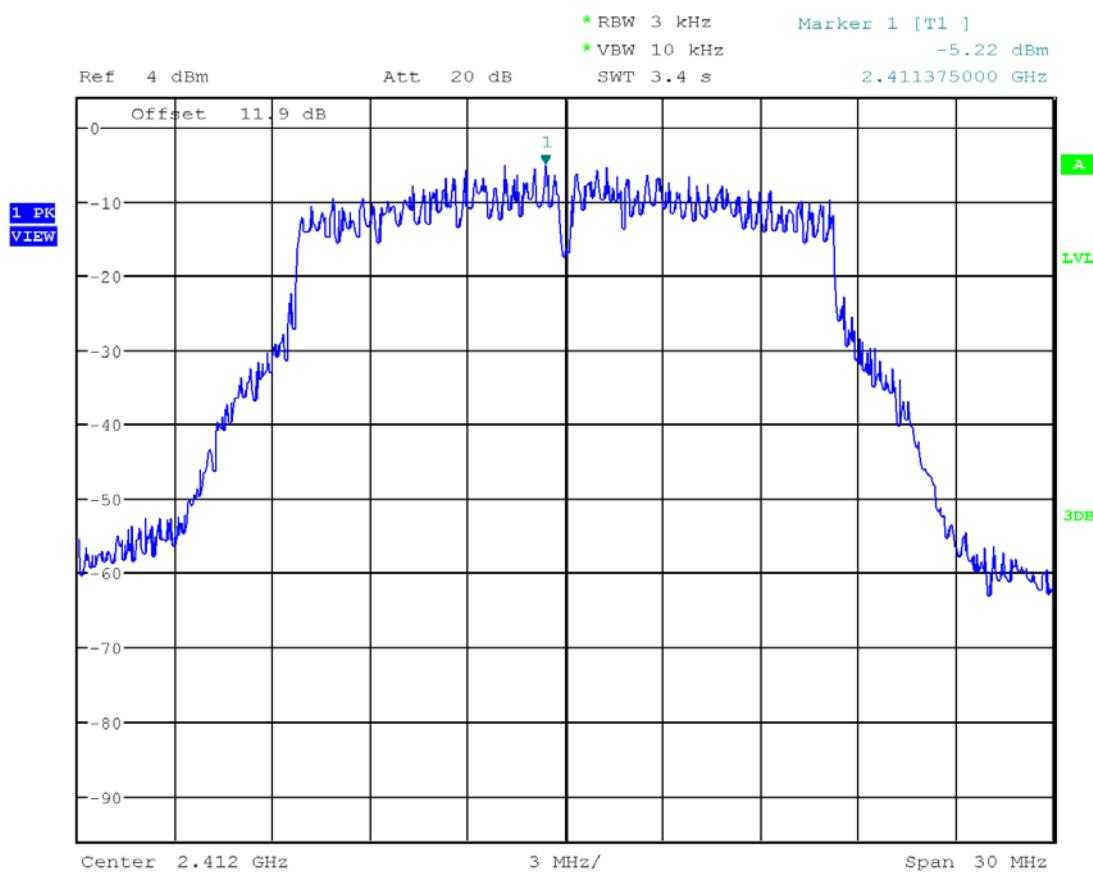
Date: 25.SEP.2017 15:49:46

Plot 3.21



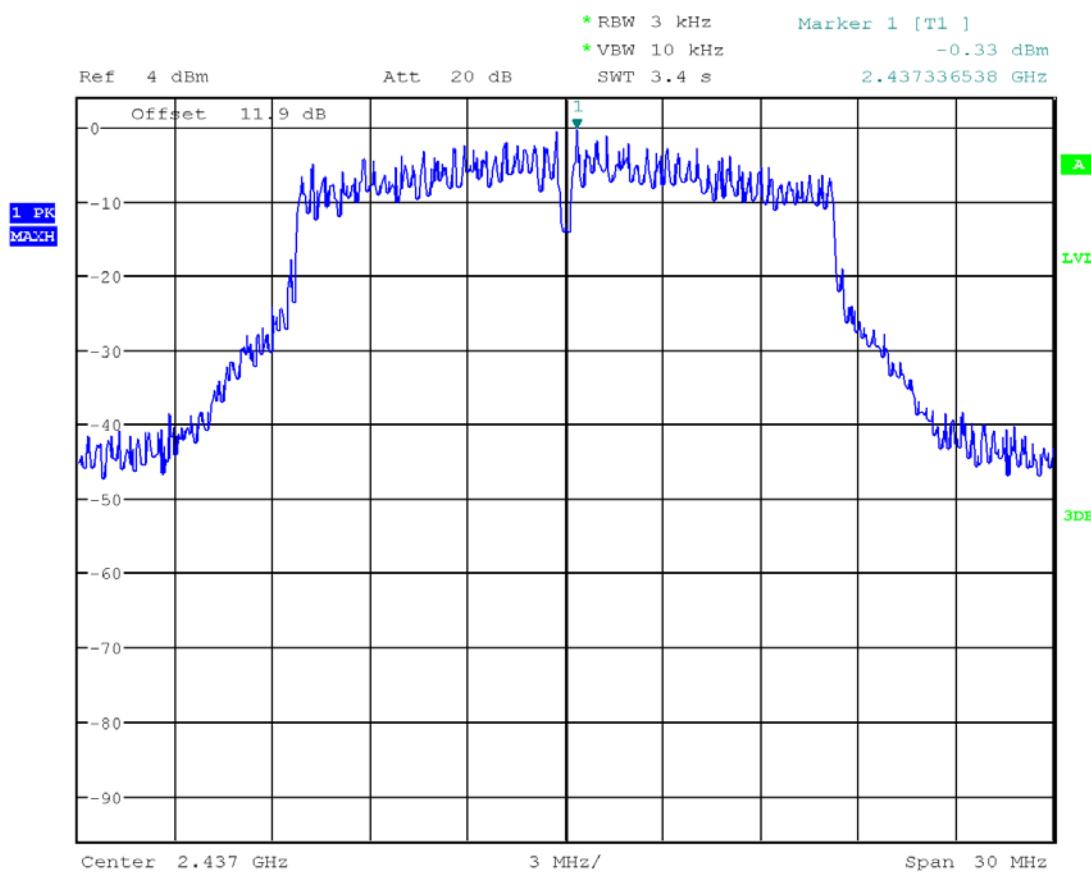
Date: 25.SEP.2017 15:50:35

Plot 3. 22



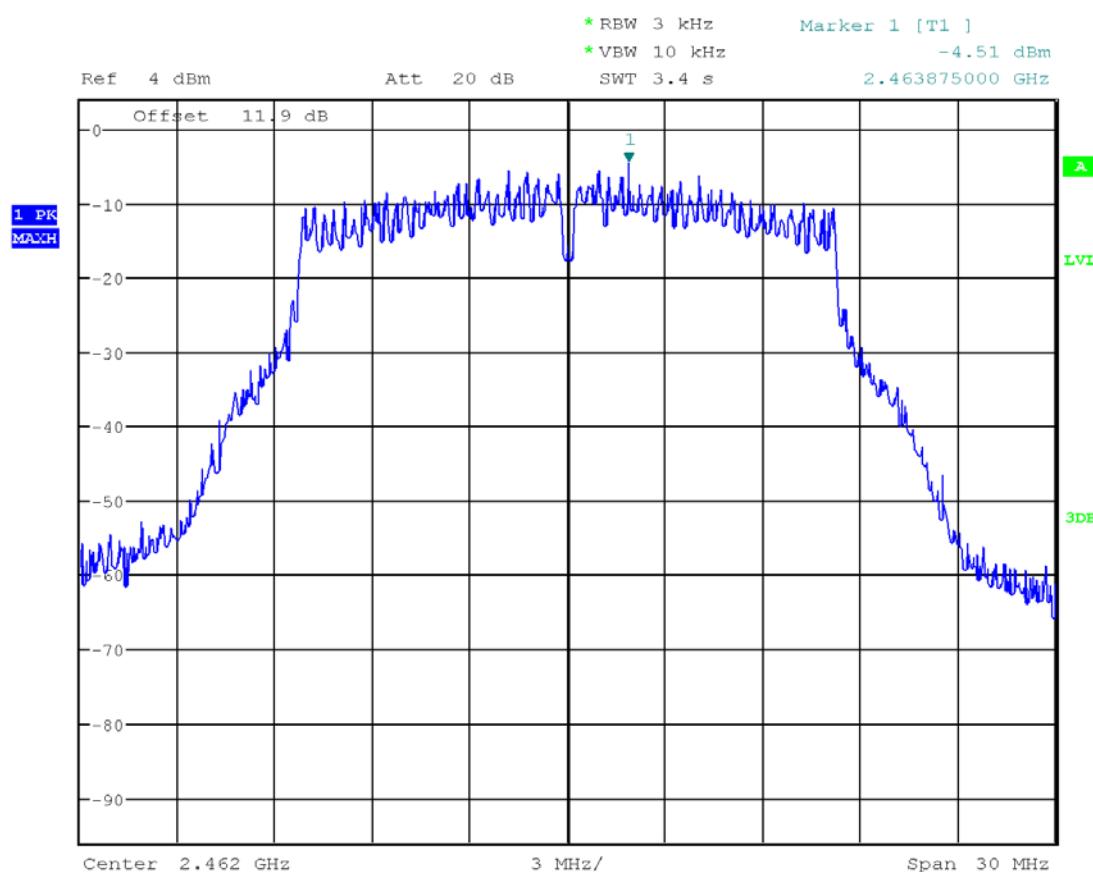
Date: 25.SEP.2017 15:38:55

Plot 3. 23



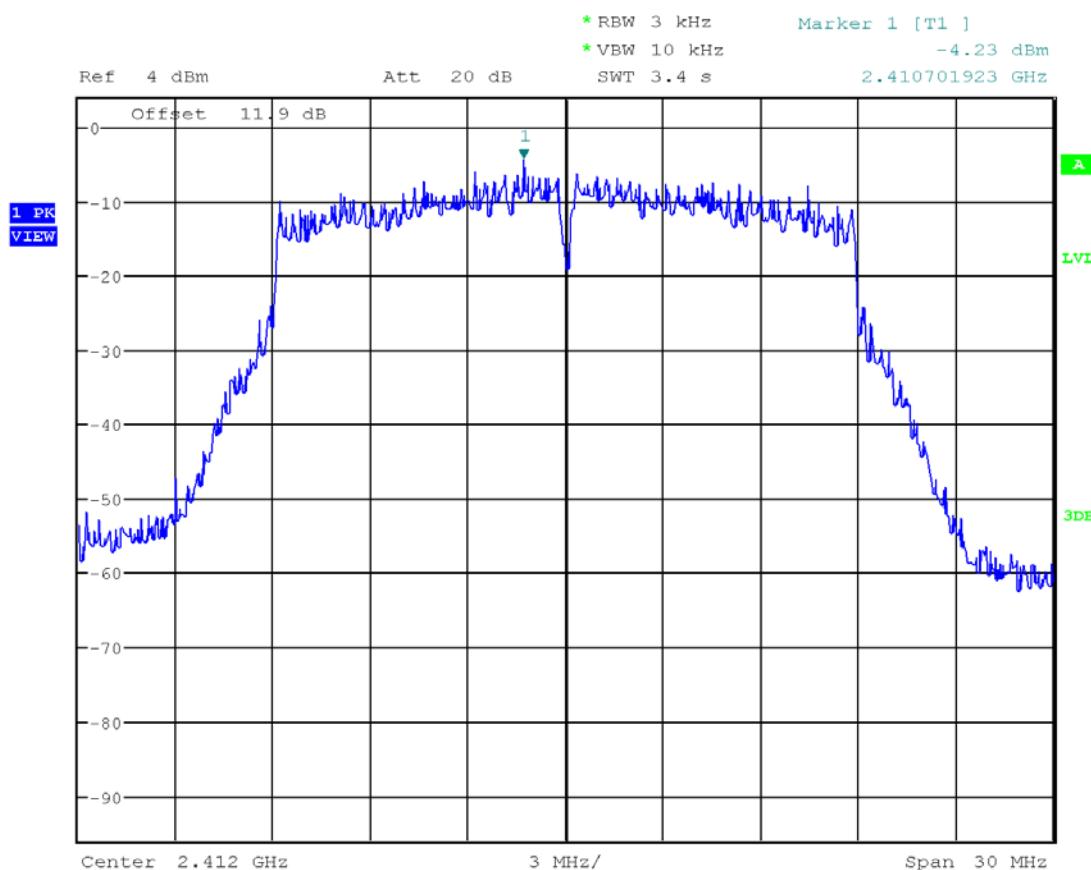
Date: 25.SEP.2017 15:39:45

Plot 3. 24



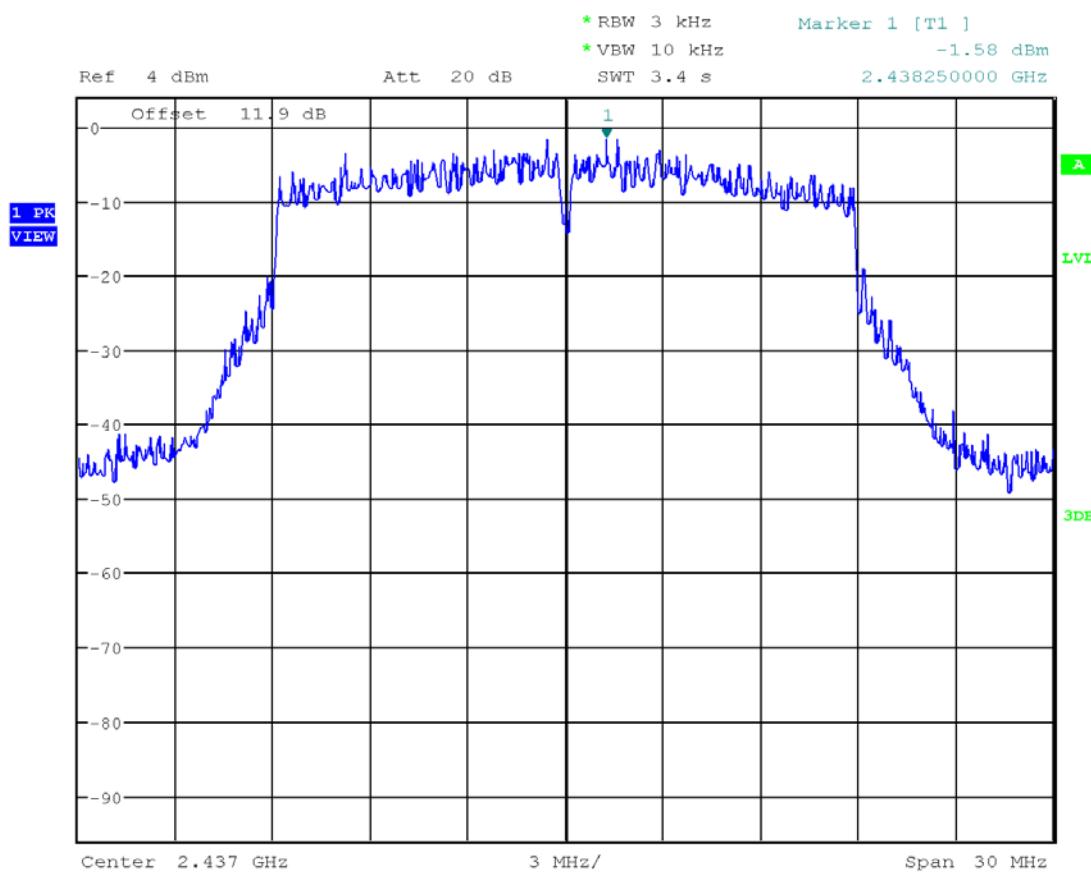
Date: 25.SEP.2017 15:40:23

Plot 3. 25



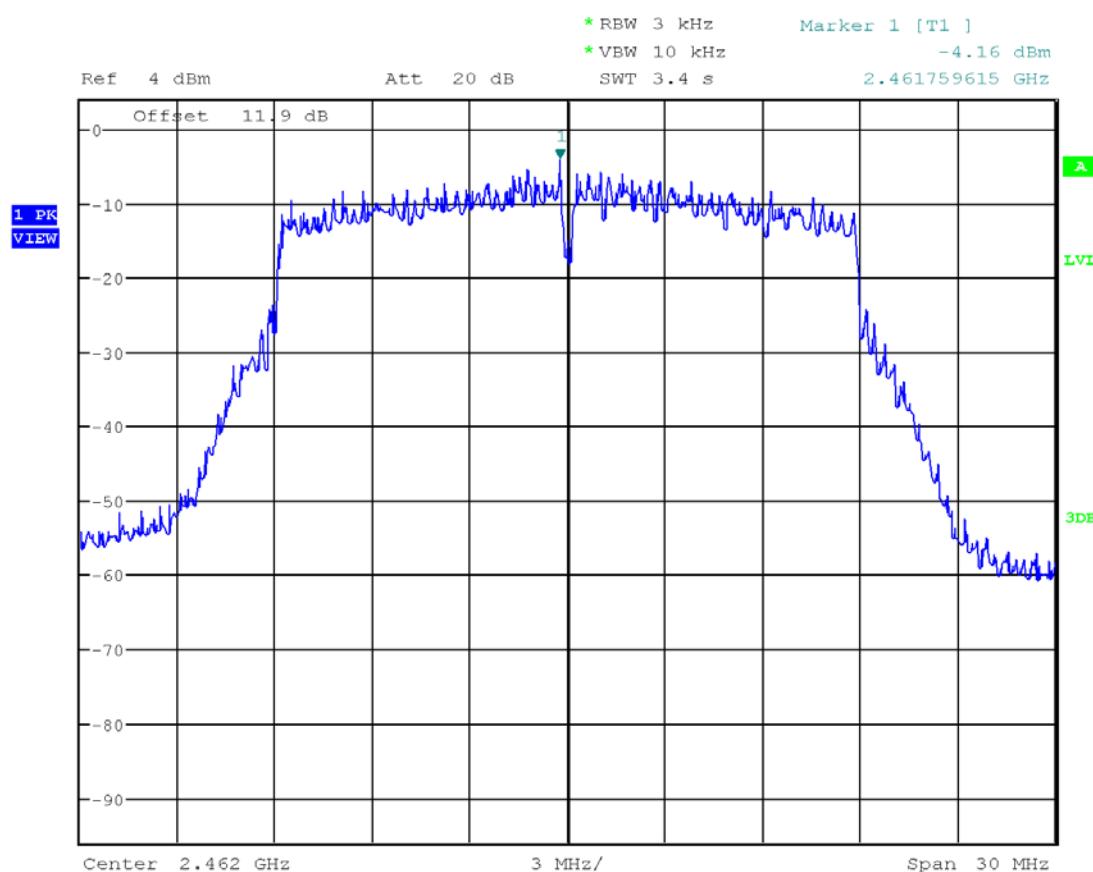
Date: 25.SEP.2017 15:52:18

Plot 3. 26



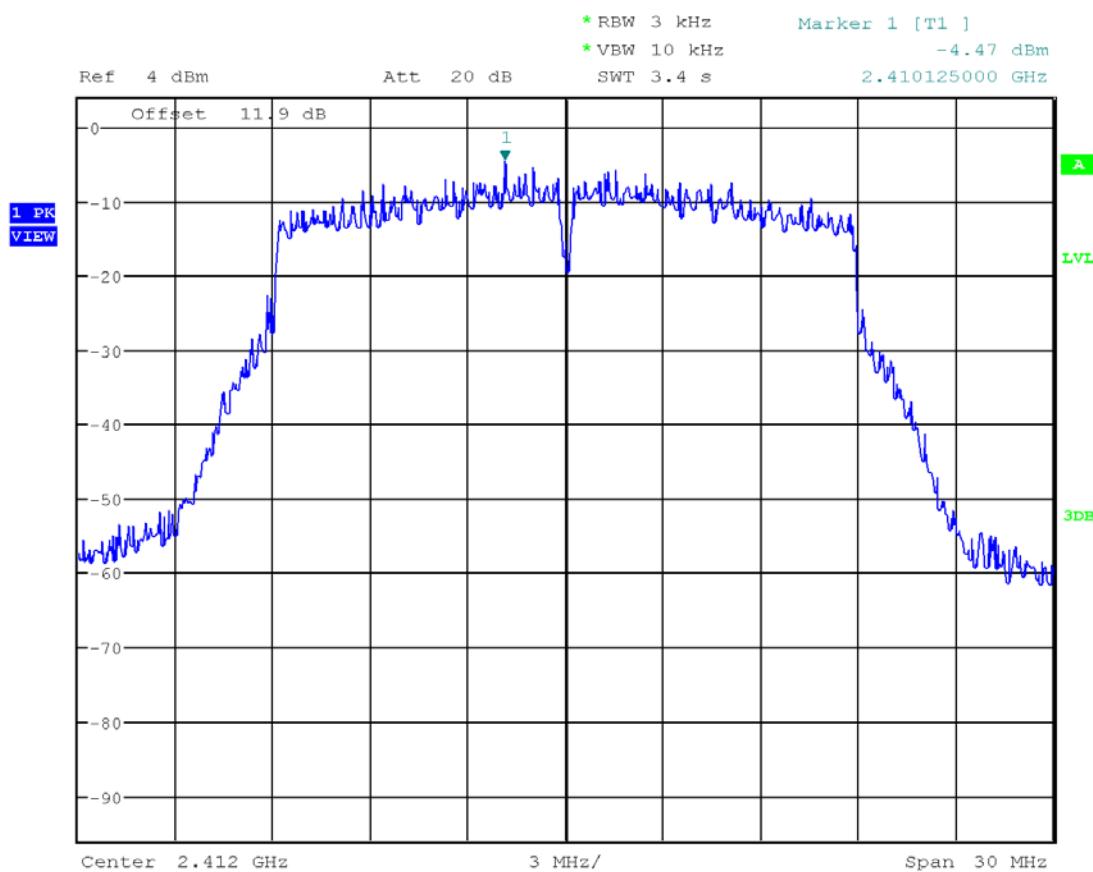
Date: 25.SEP.2017 15:53:17

Plot 3. 27



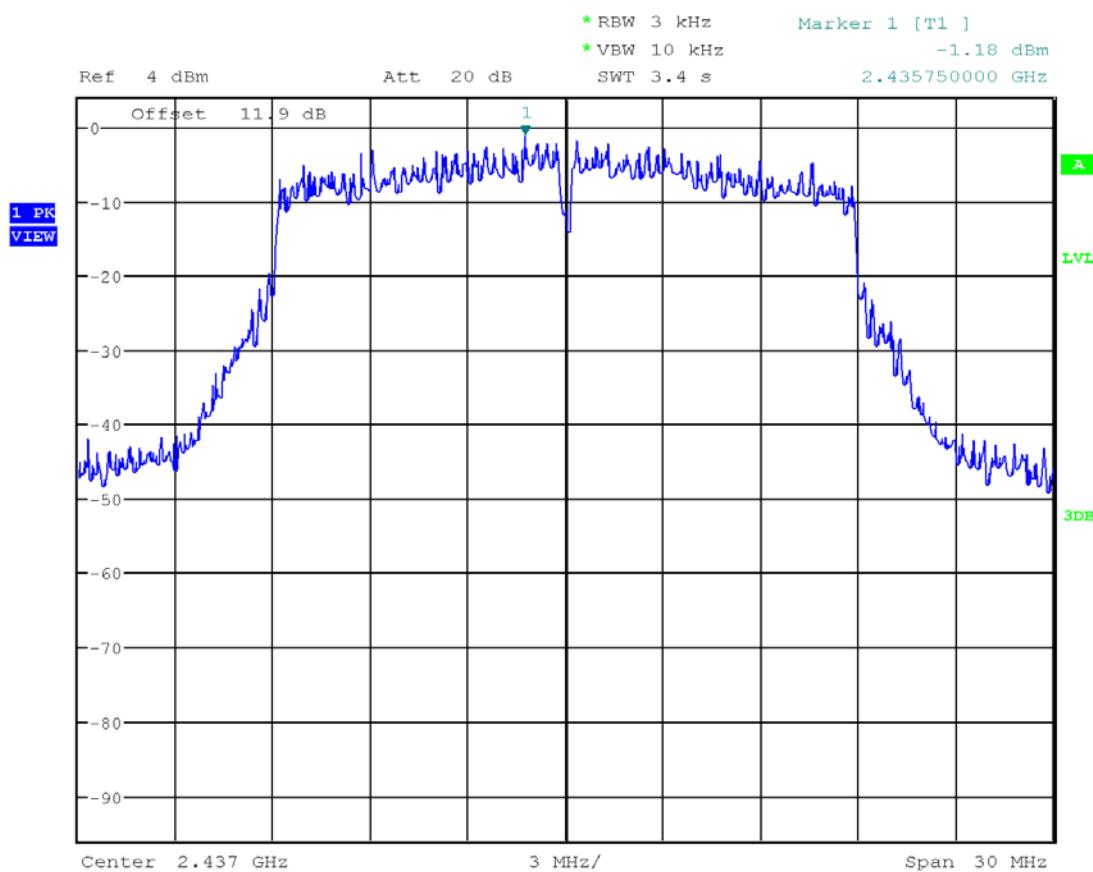
Date: 25.SEP.2017 15:54:04

Plot 3. 28



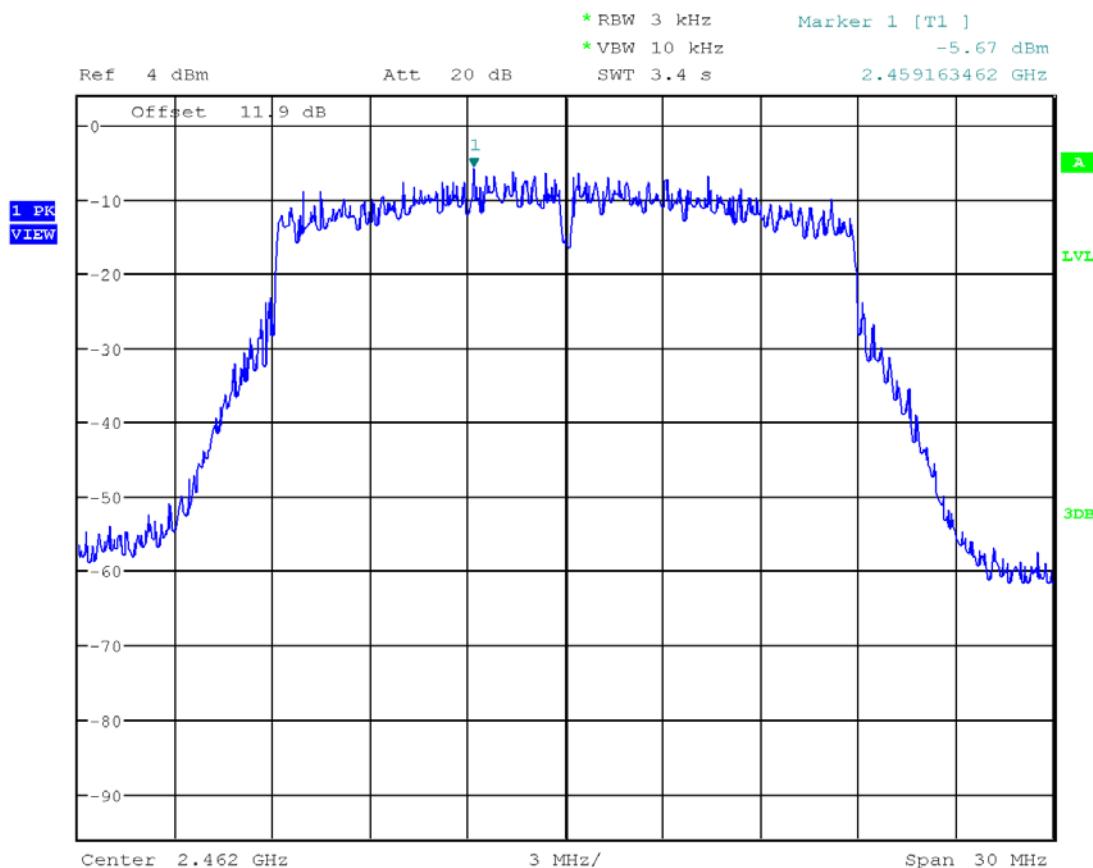
Date: 25.SEP.2017 15:55:14

Plot 3. 29



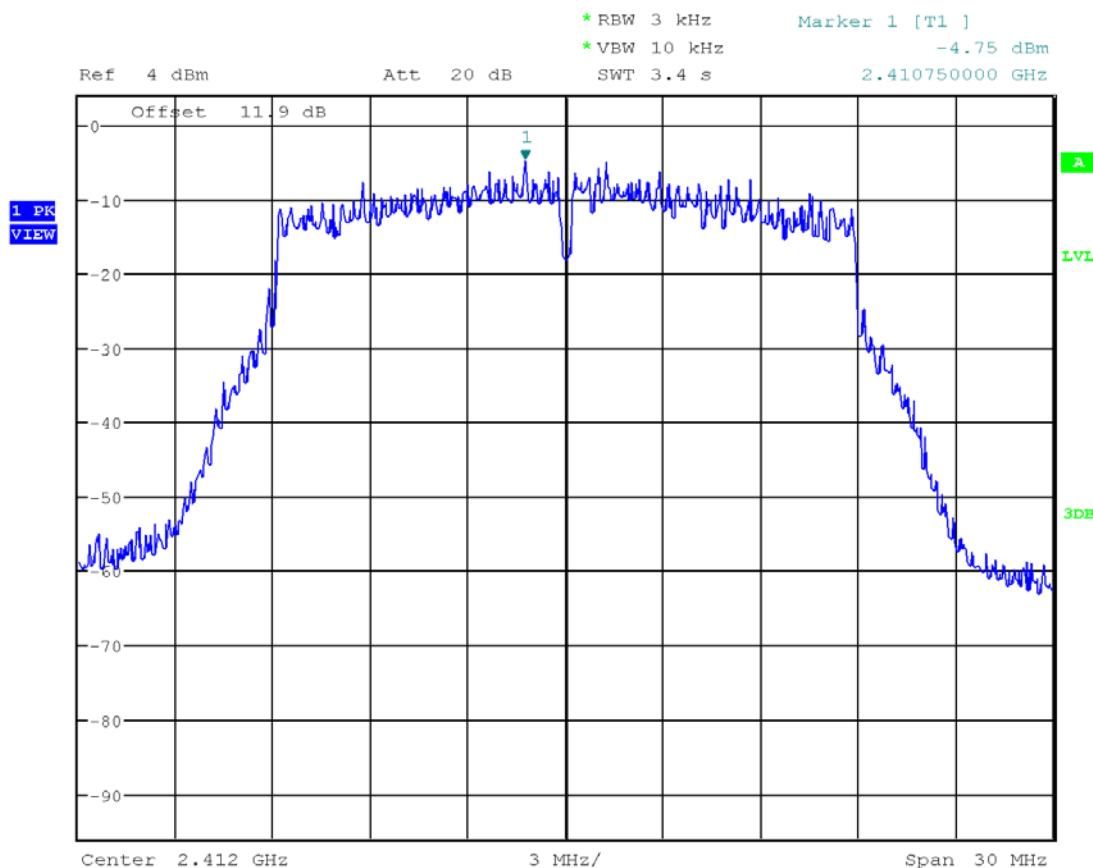
Date: 25.SEP.2017 15:56:02

Plot 3. 30



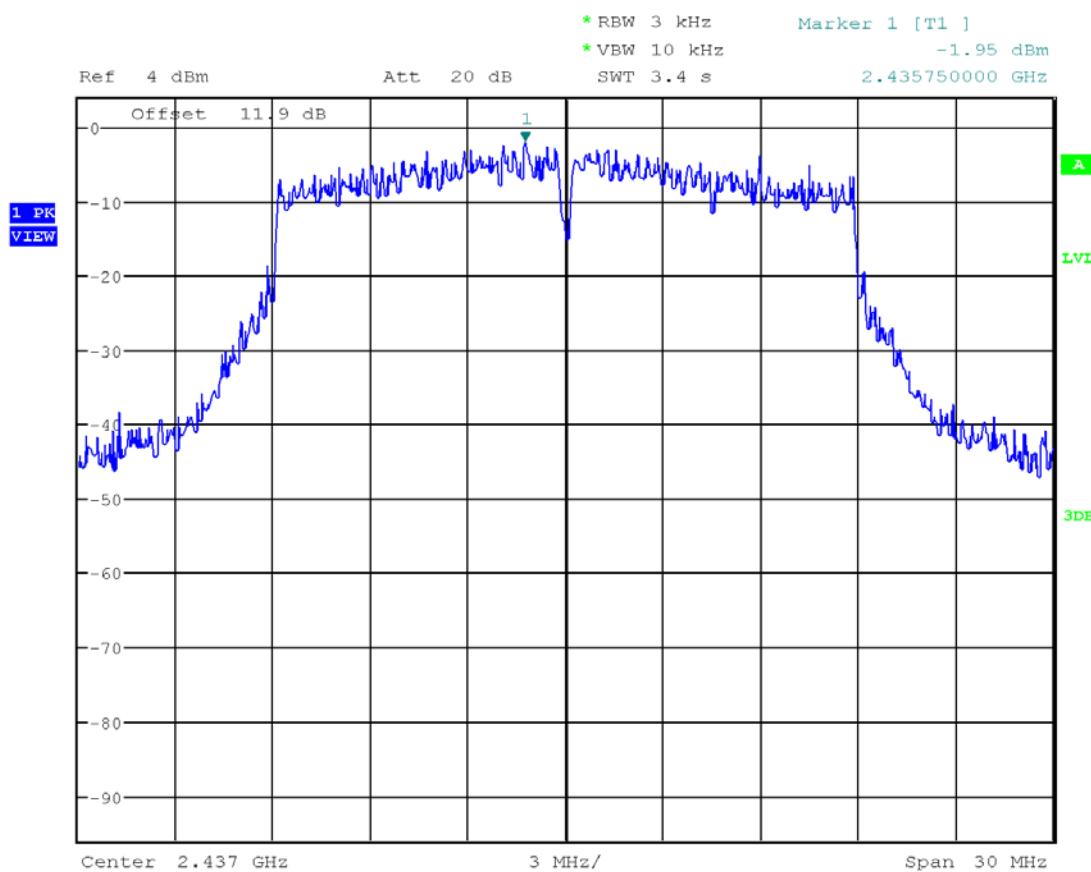
Date: 25.SEP.2017 15:56:44

Plot 3. 31



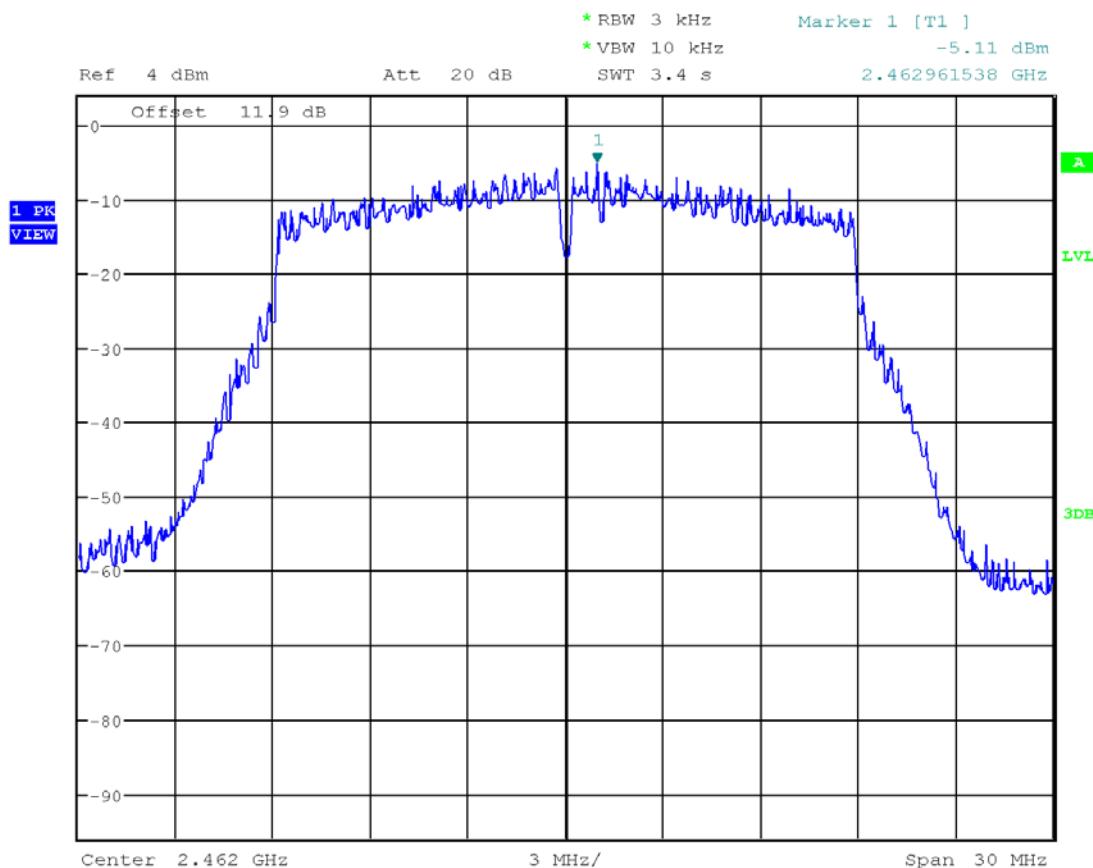
Date: 25.SEP.2017 15:58:03

Plot 3. 32



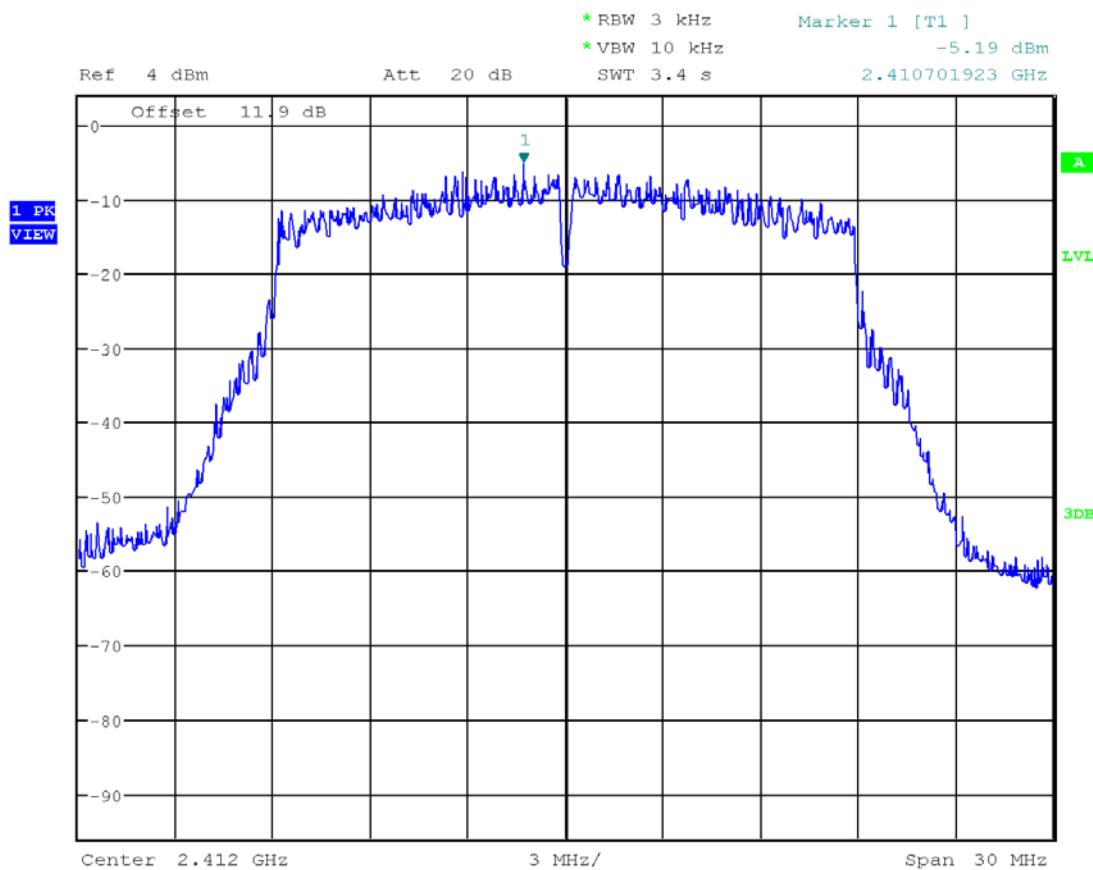
Date: 25.SEP.2017 15:58:42

Plot 3. 33



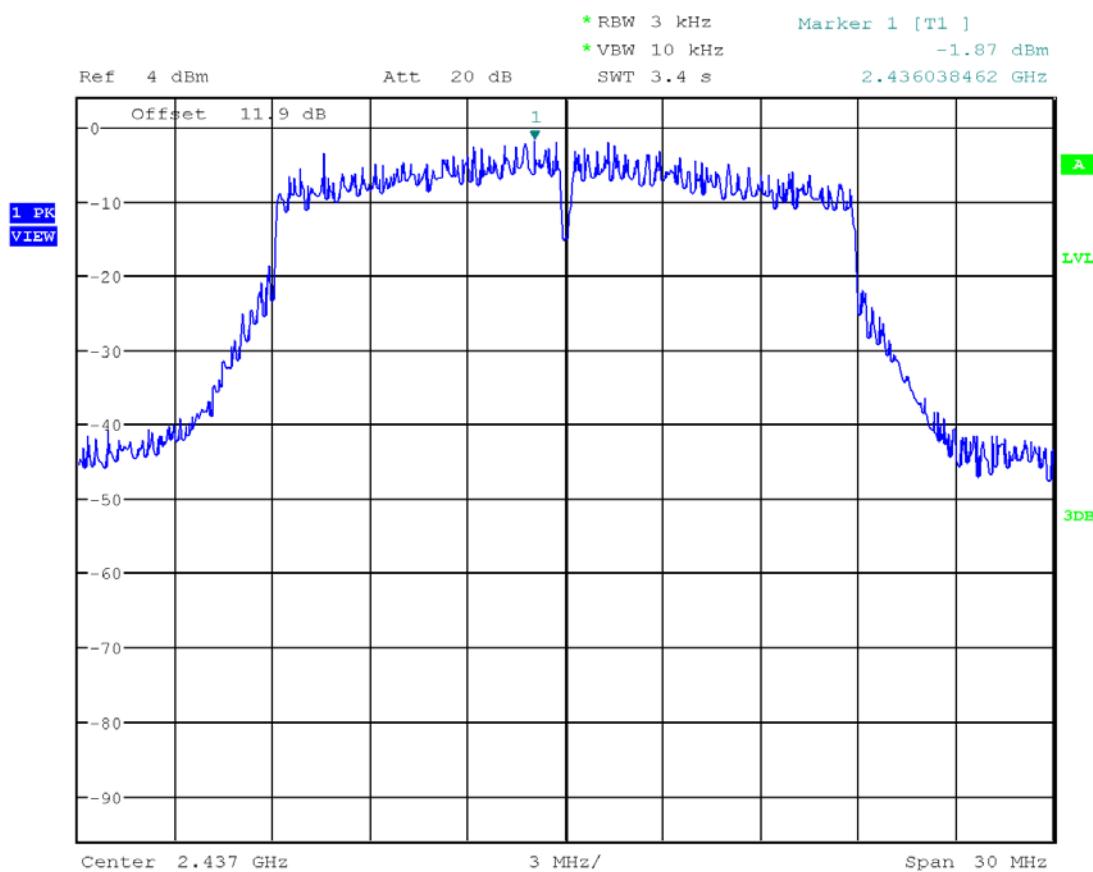
Date: 25.SEP.2017 15:59:43

Plot 3. 34



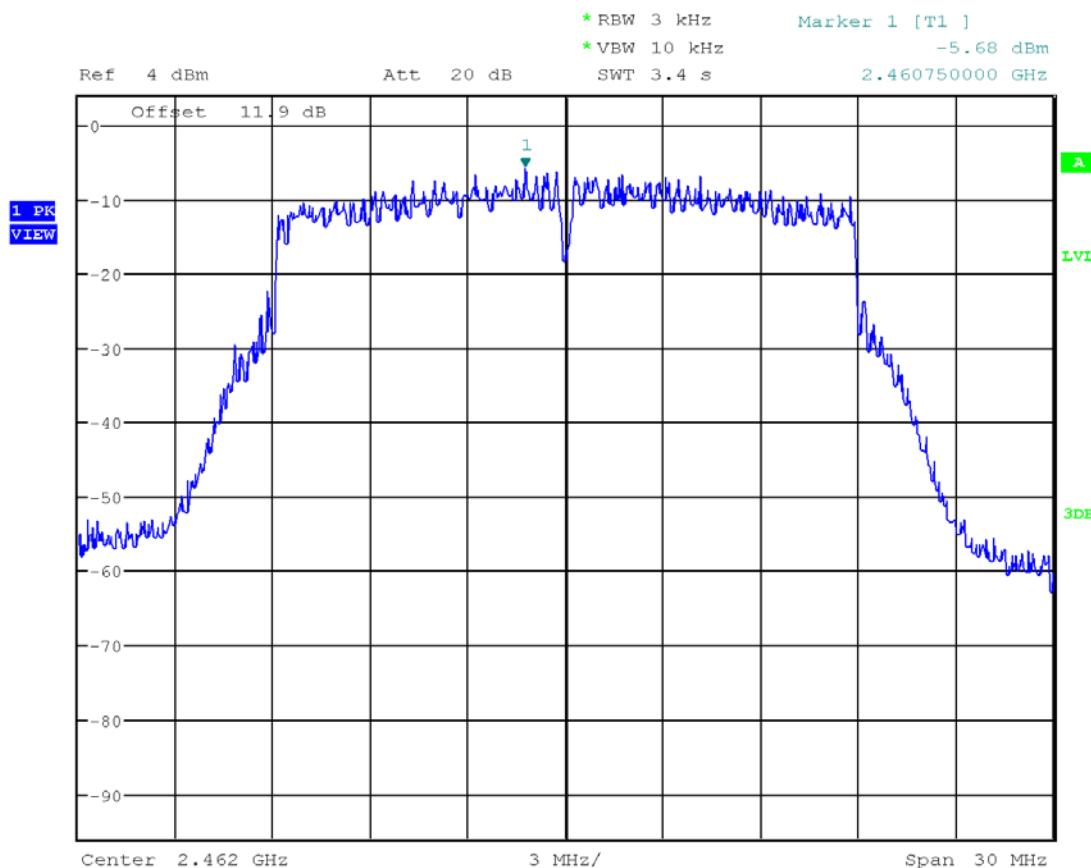
Date: 25.SEP.2017 16:00:44

Plot 3. 35



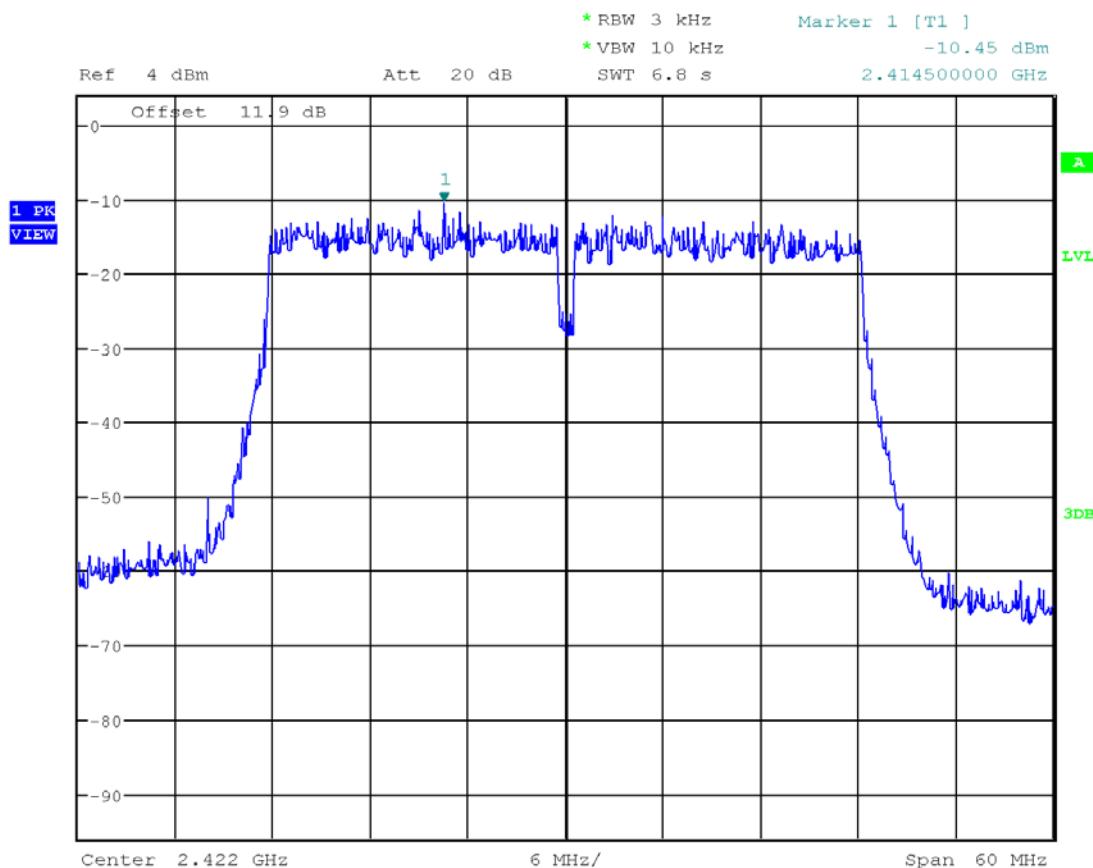
Date: 25.SEP.2017 16:01:27

Plot 3. 36



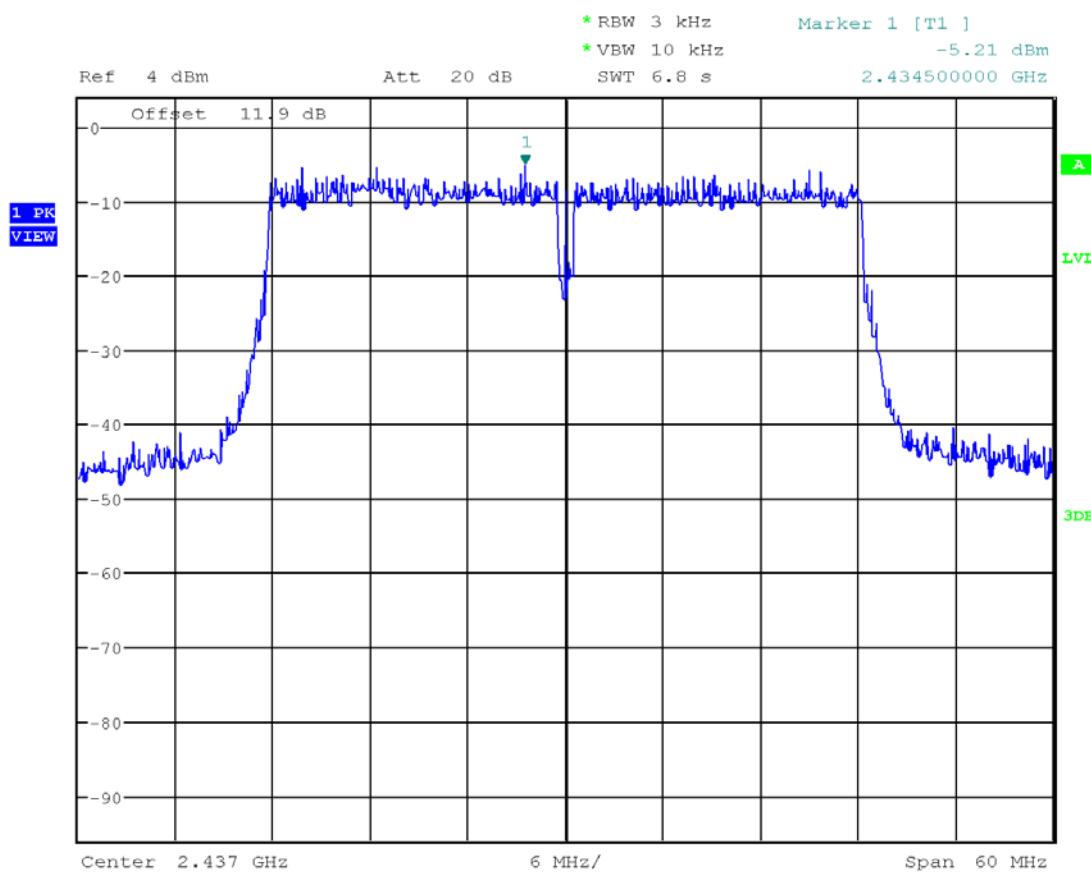
Date: 25.SEP.2017 16:02:15

Plot 3. 37



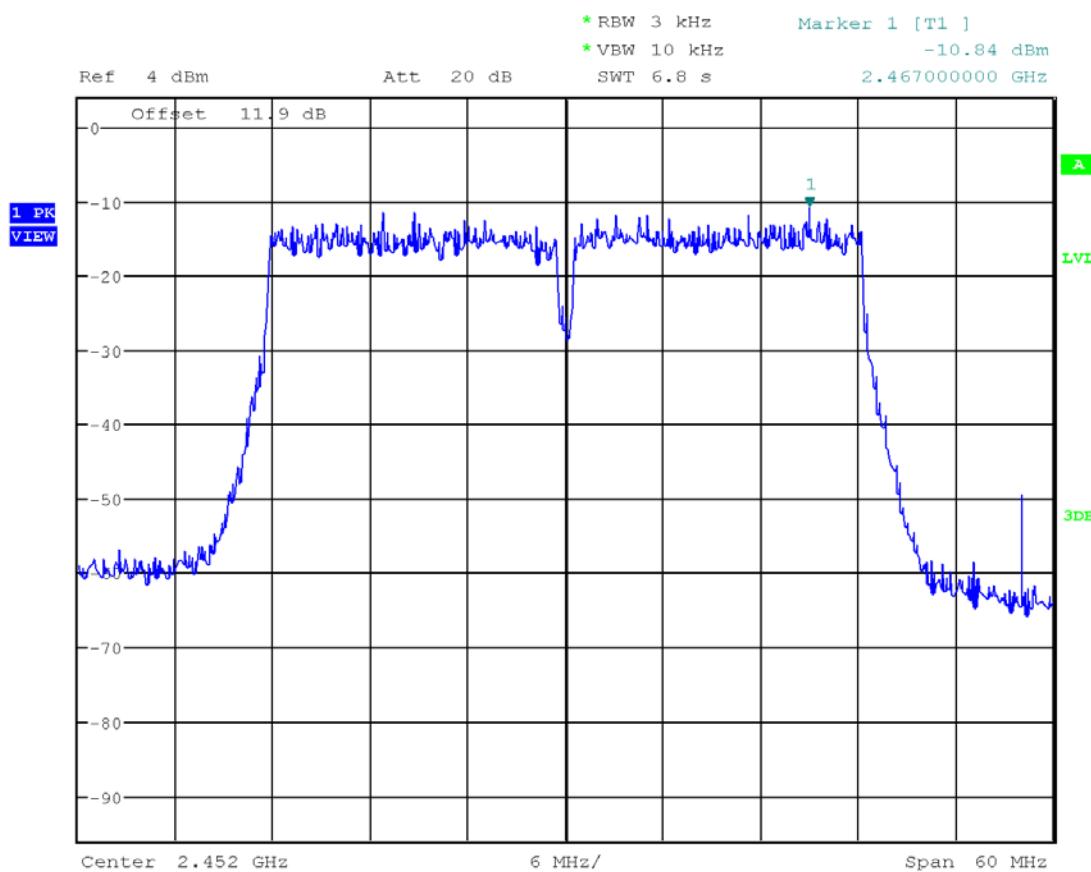
Date: 25.SEP.2017 16:04:25

Plot 3. 38



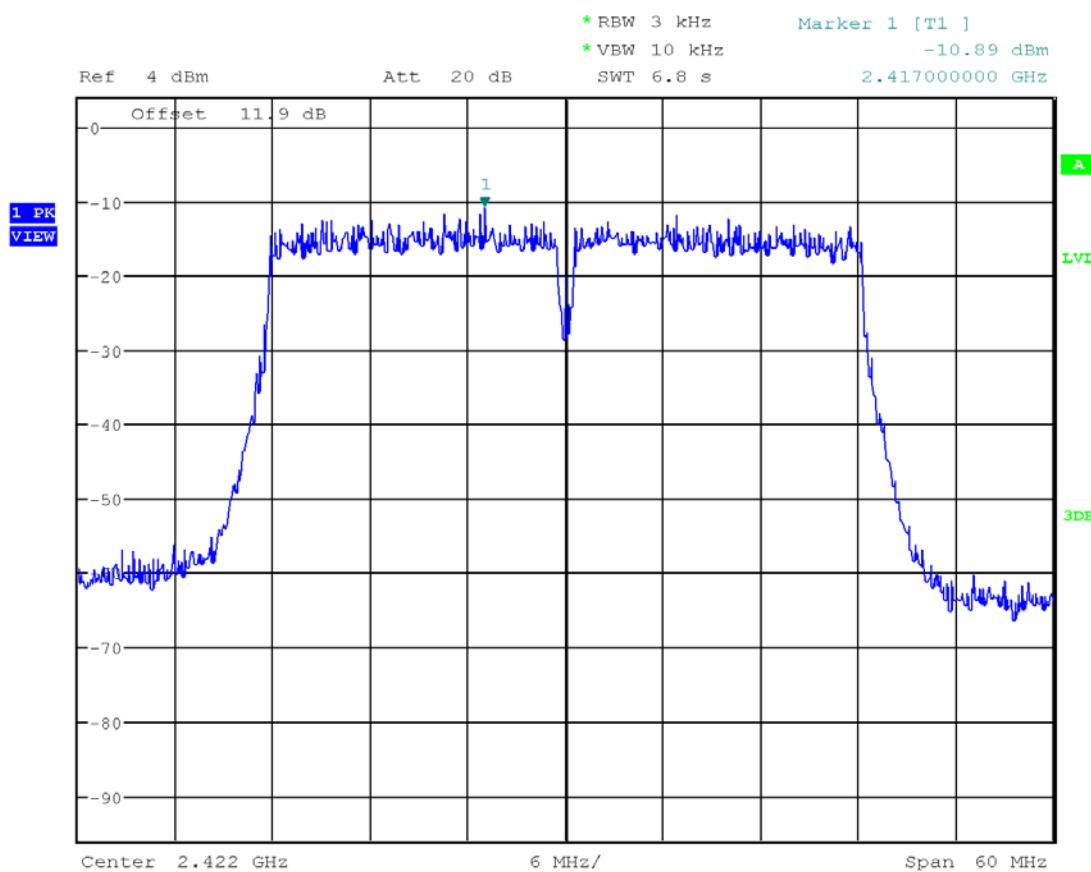
Date: 25.SEP.2017 16:05:54

Plot 3. 39



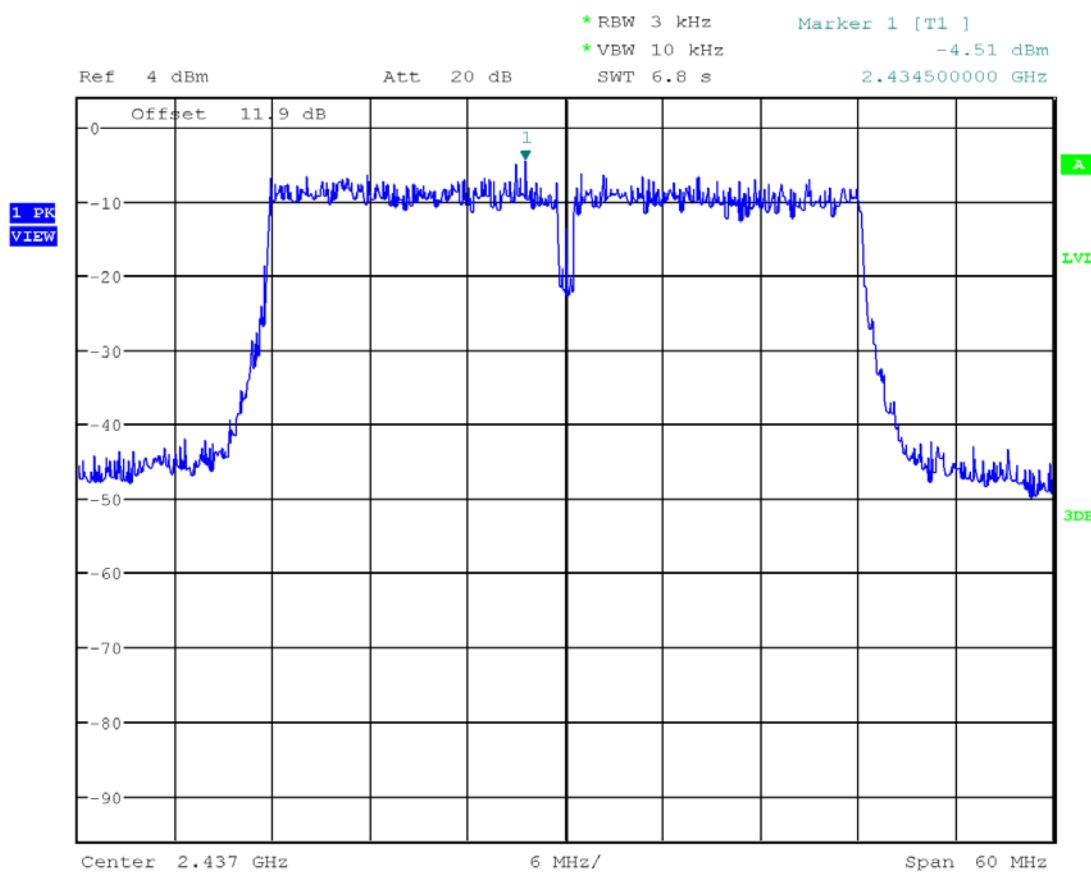
Date: 25.SEP.2017 16:06:44

Plot 3.40



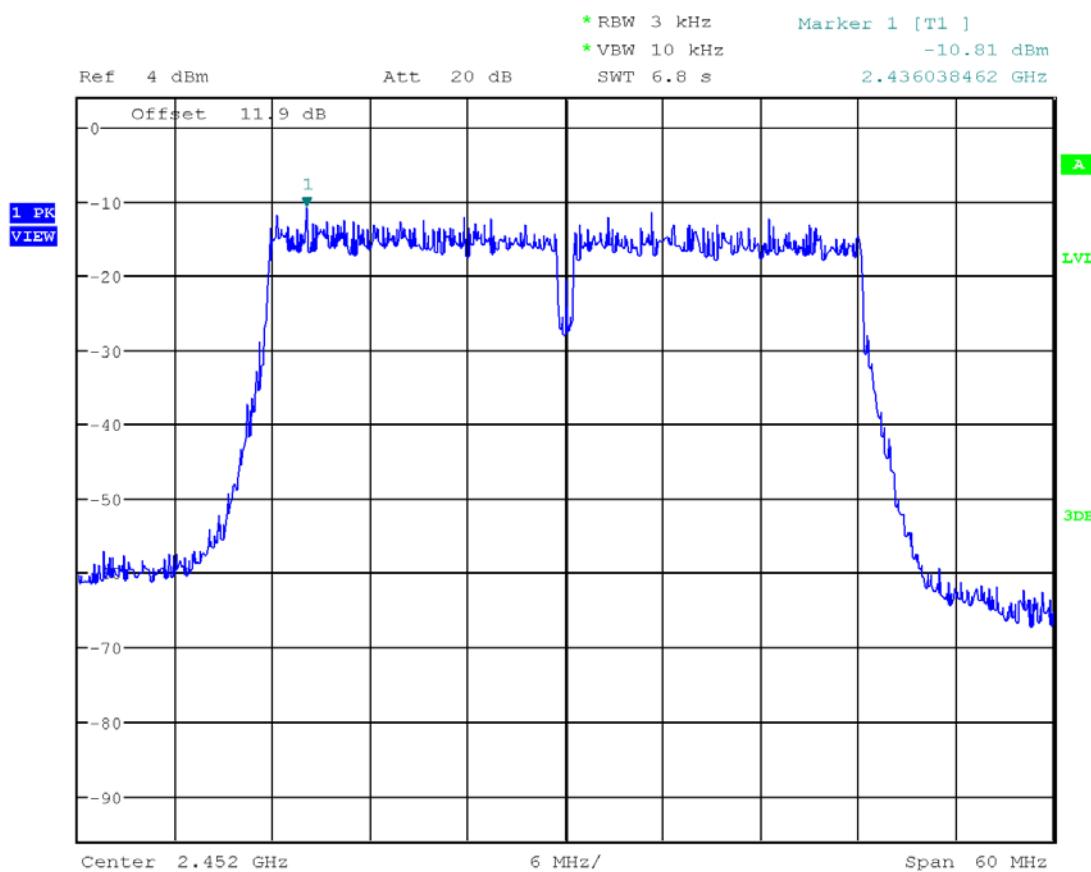
Date: 25.SEP.2017 16:08:20

Plot 3.41



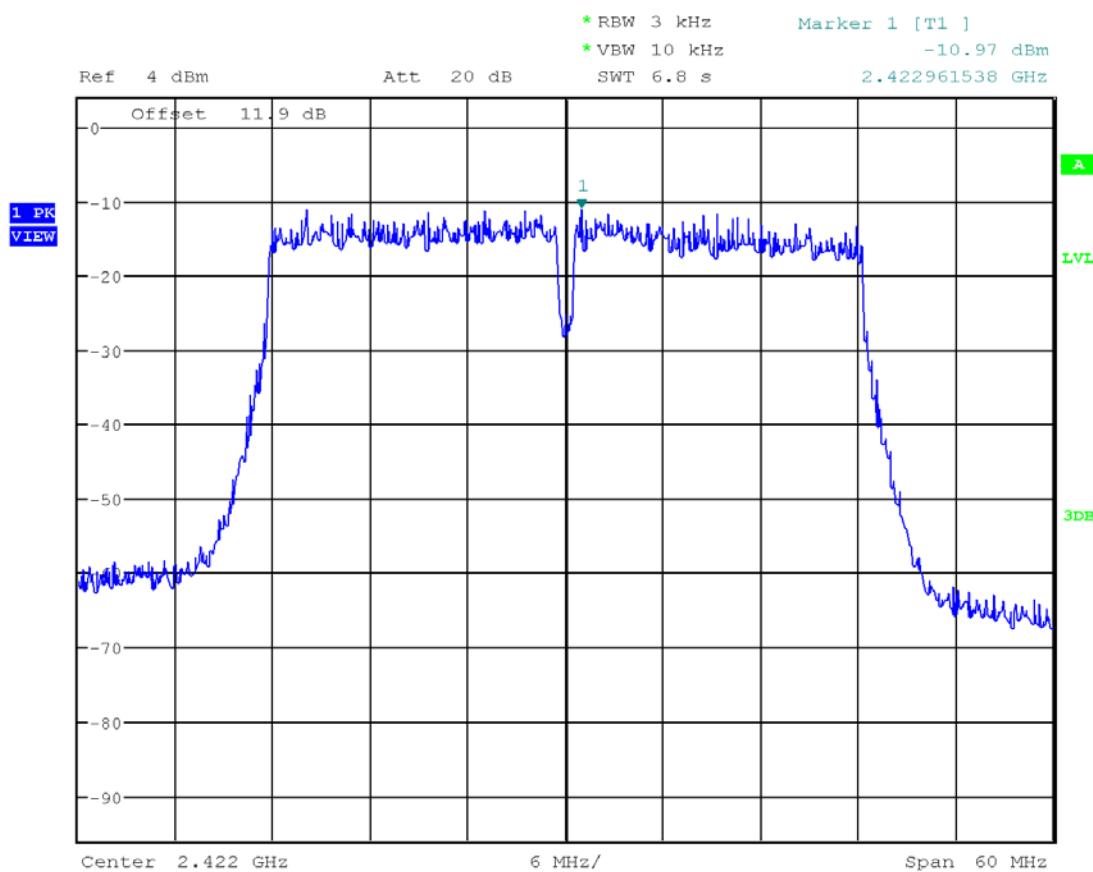
Date: 25.SEP.2017 16:23:51

Plot 3.42



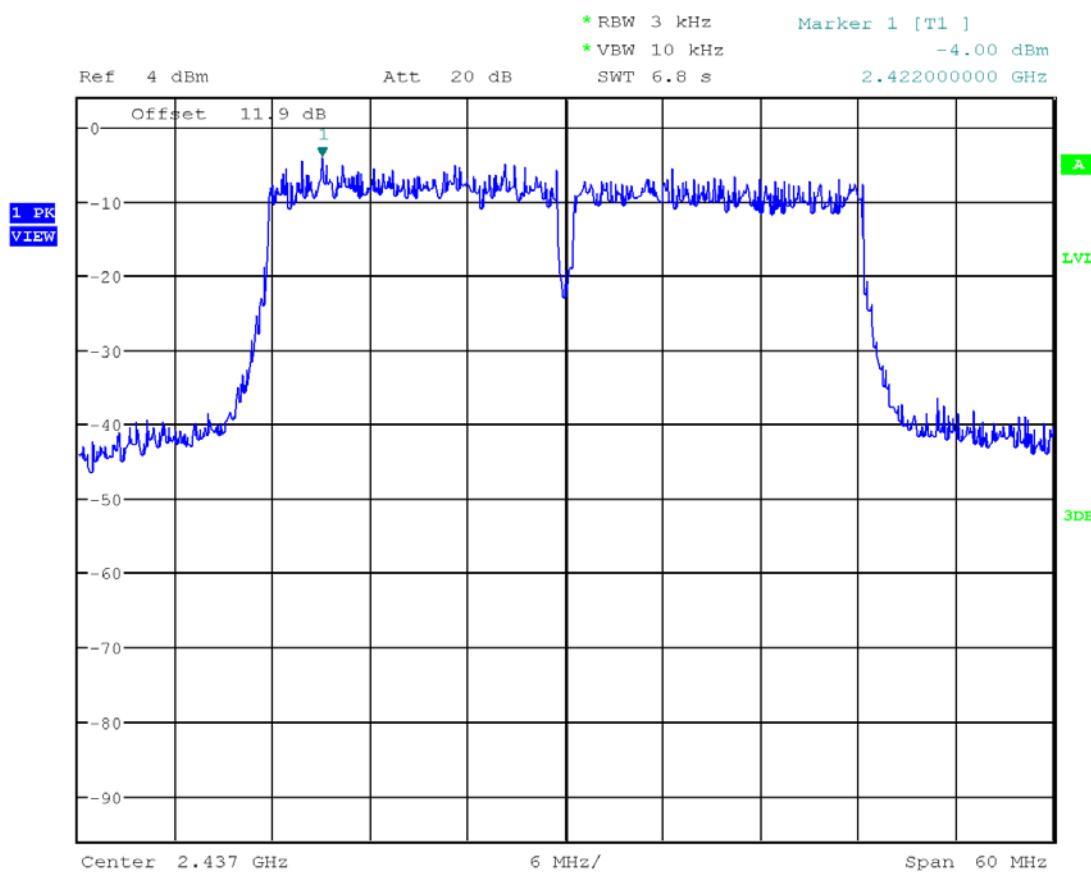
Date: 25.SEP.2017 16:24:42

Plot 3.43



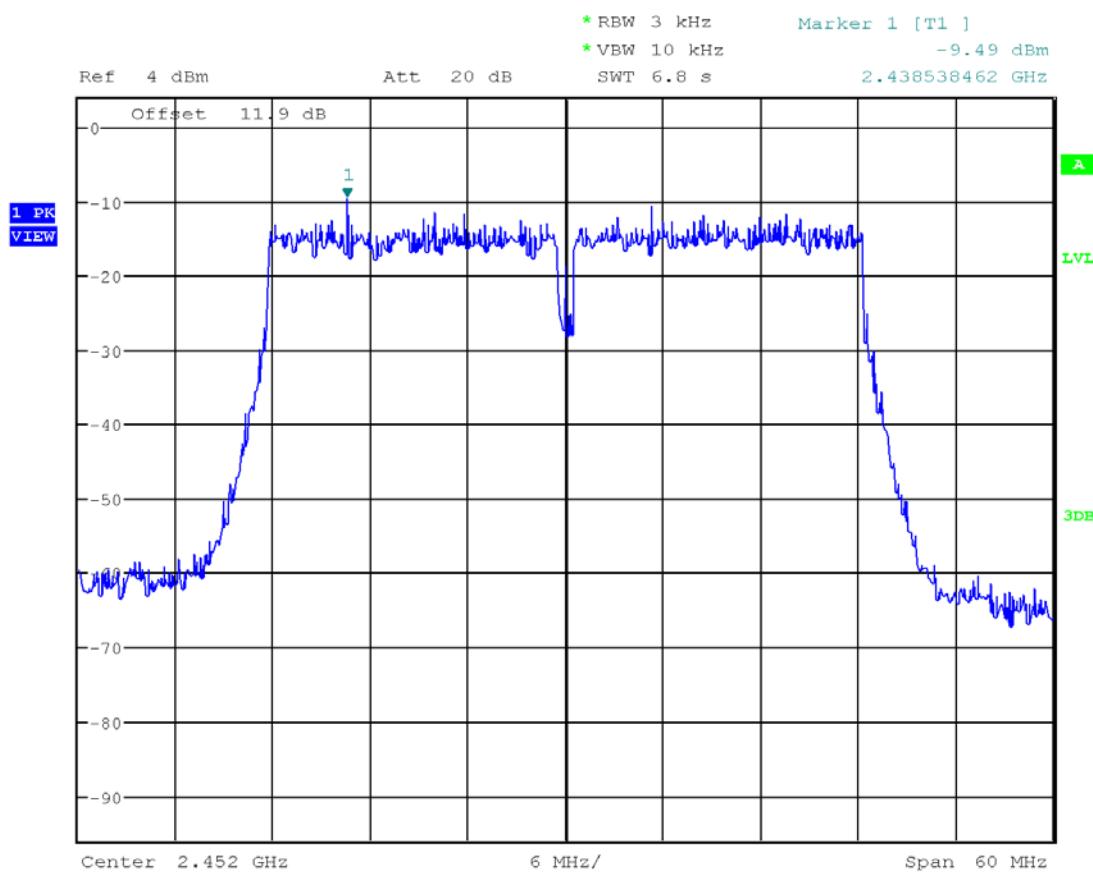
Date: 25.SEP.2017 16:27:54

Plot 3.44



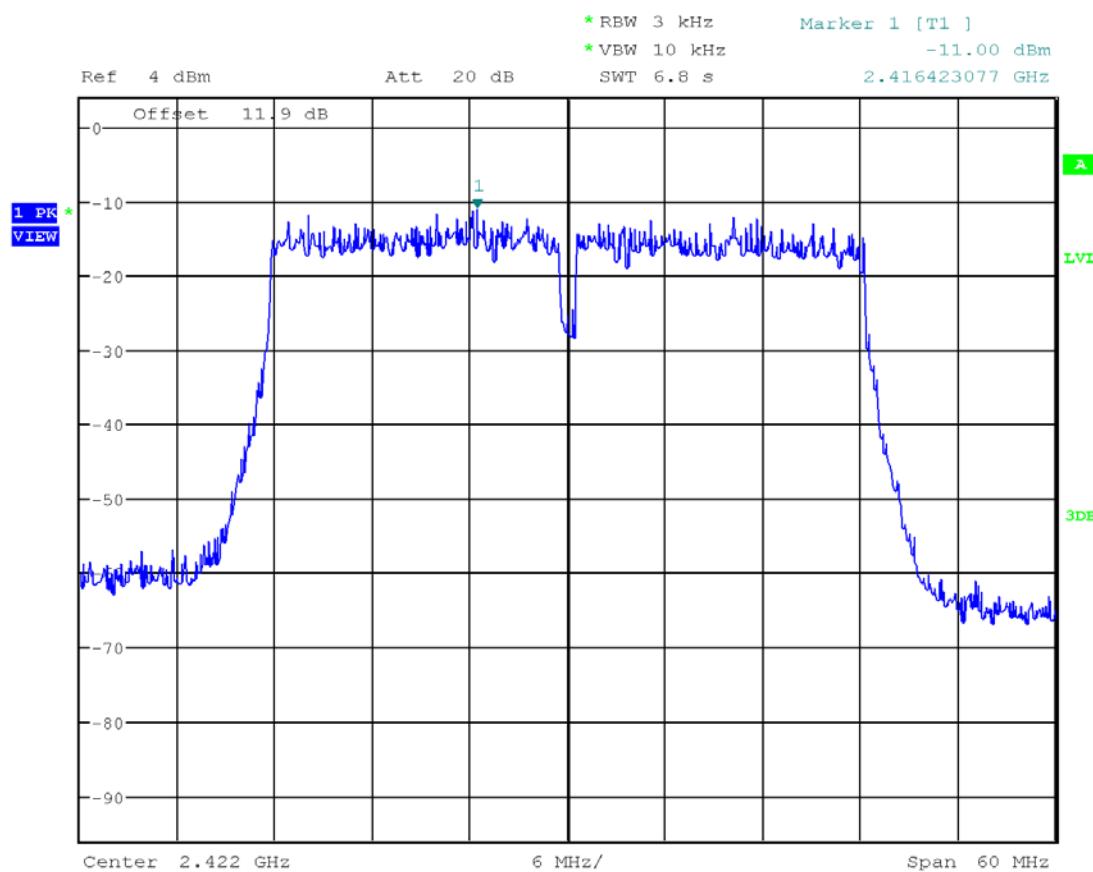
Date: 25.SEP.2017 16:29:19

Plot 3.45



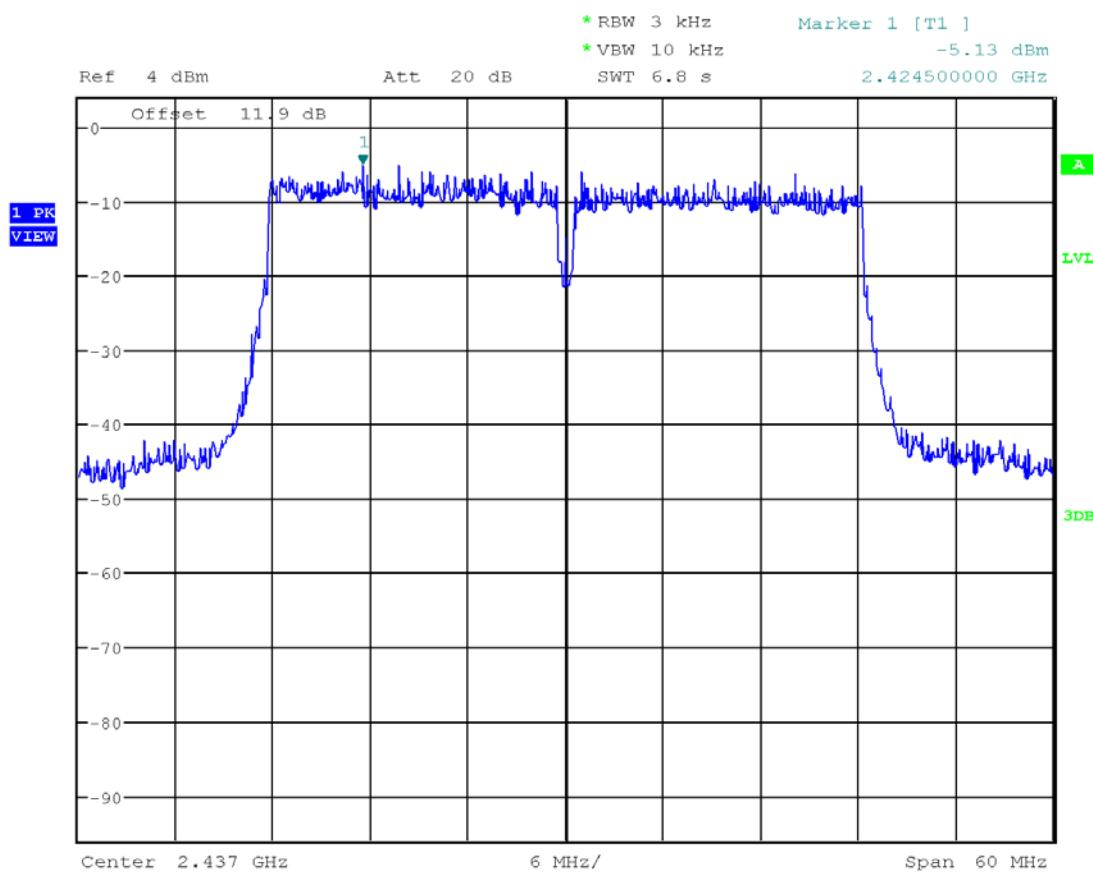
Date: 25.SEP.2017 16:30:41

Plot 3.46



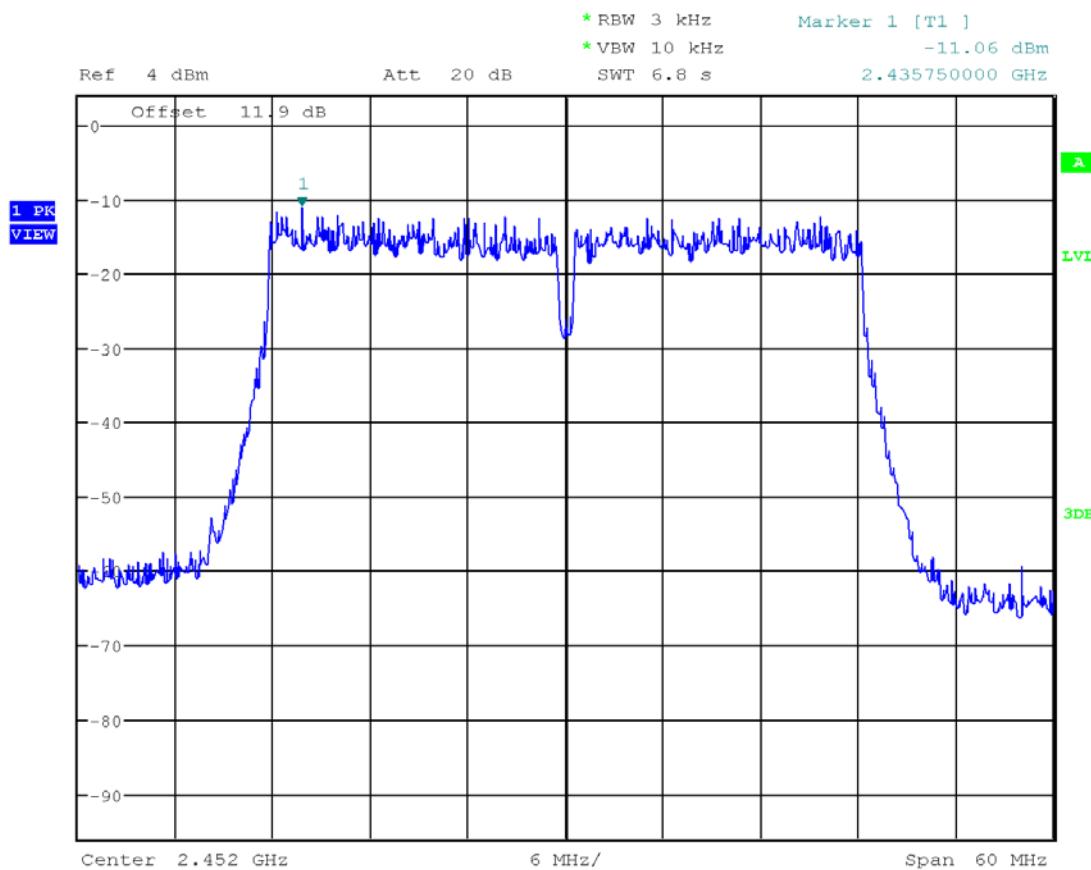
Date: 25.SEP.2017 16:32:34

Plot 3.47



Date: 25.SEP.2017 16:33:59

Plot 3. 48



Date: 25.SEP.2017 16:34:49

4.4 Out-of-Band Conducted Emissions
FCC 15.247(d)

4.4.1 Requirement

In any 100 kHz bandwidths outside the EUT pass-band, the RF power shall be at least 20dB (peak) or 30 dB (average) below that of the maximum in-band 100 kHz emissions.

4.4.2 Procedure

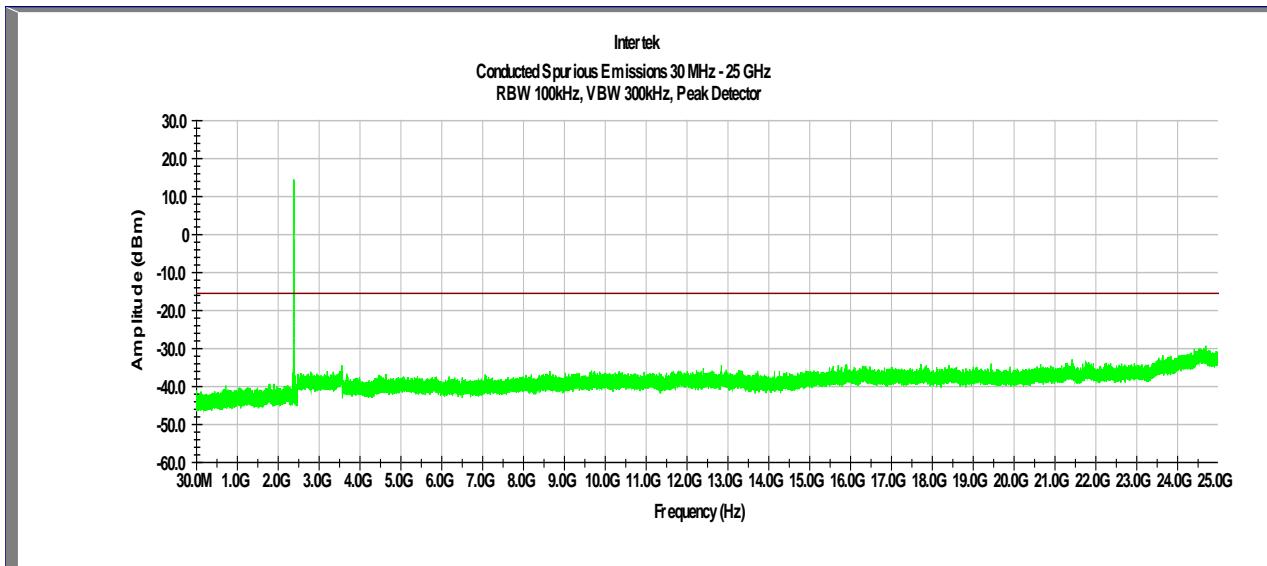
A spectrum analyzer was connected to the antenna port of the transmitter. Analyzer Resolution Bandwidth was set to 100 kHz. For each channel investigated, the in-band and out-of-band emission measurements were performed. The out-of-band emissions were measured from 30 MHz to 25 GHz.

4.4.3 Test Result

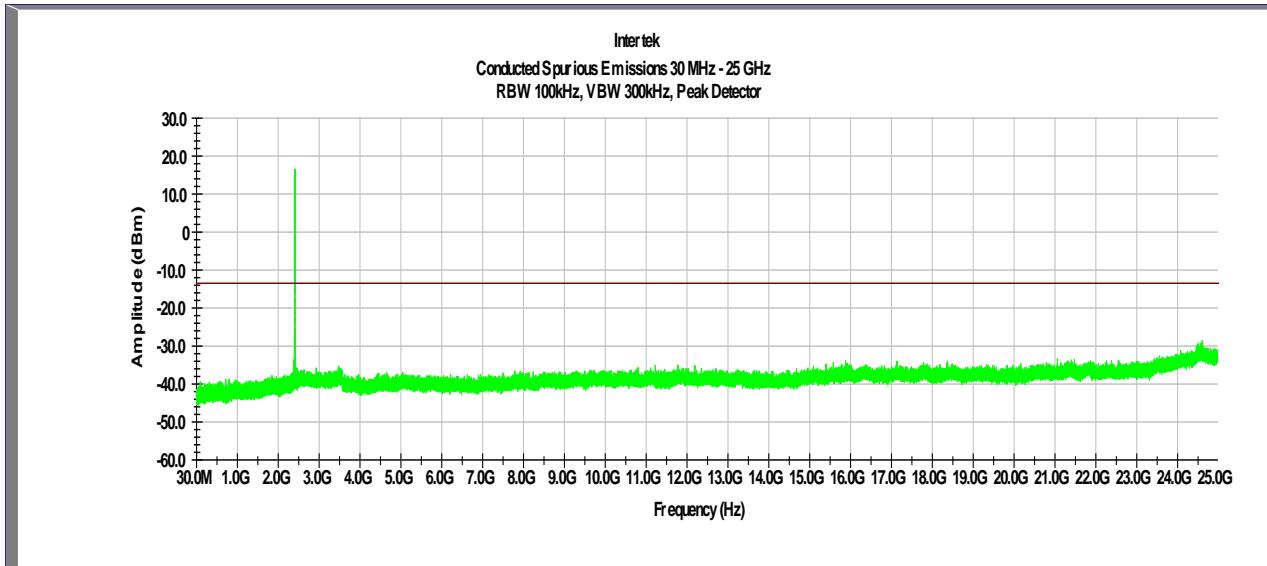
Refer to the following plots 4.1 – 4.48 for unwanted conducted emissions. The plot shows -30dB attenuation limit line.

Results	Complies
Test Date:	September 27, 2017

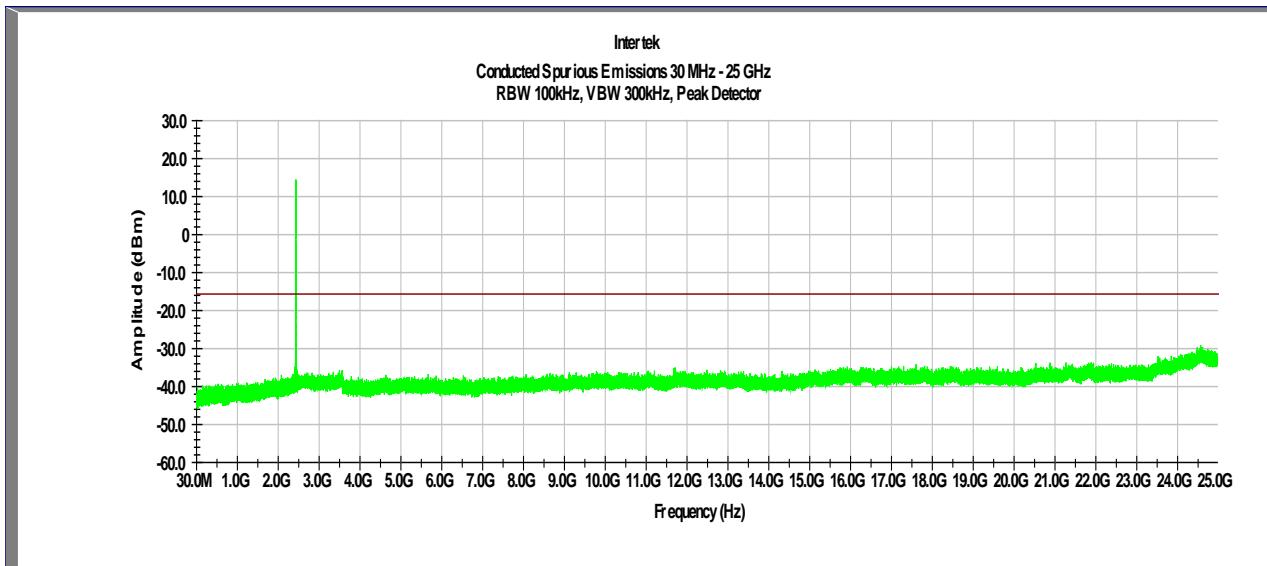
Plot 4.1
Ant 0, Tx @ 2412MHz 802.11b



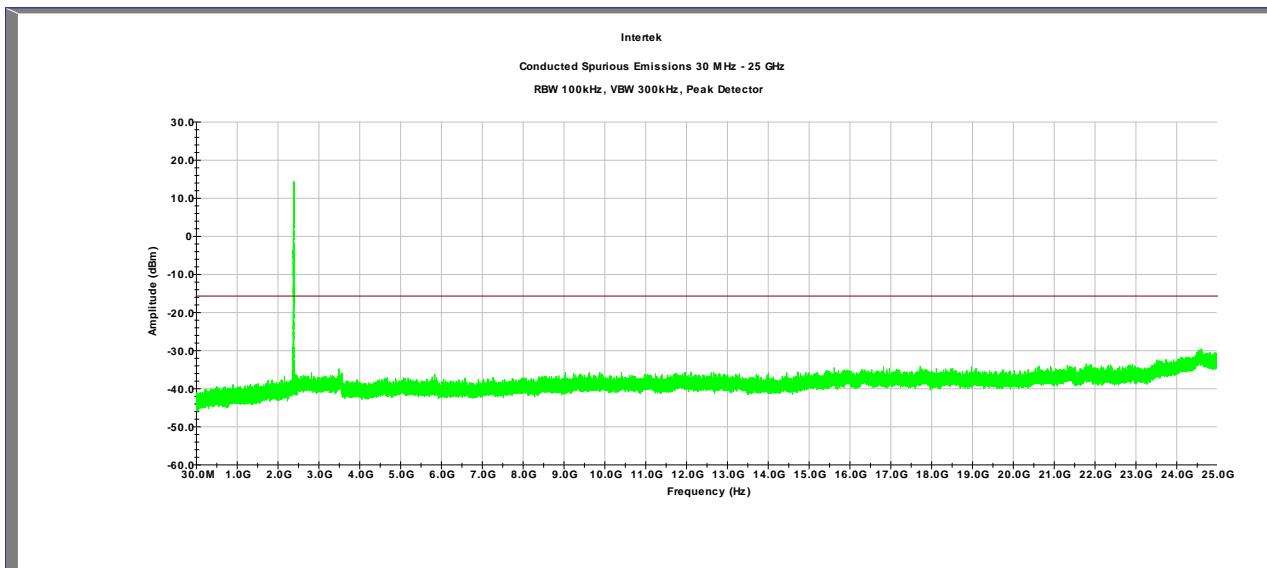
Plot 4.2
Ant 0, Tx @ 2437MHz 802.11b

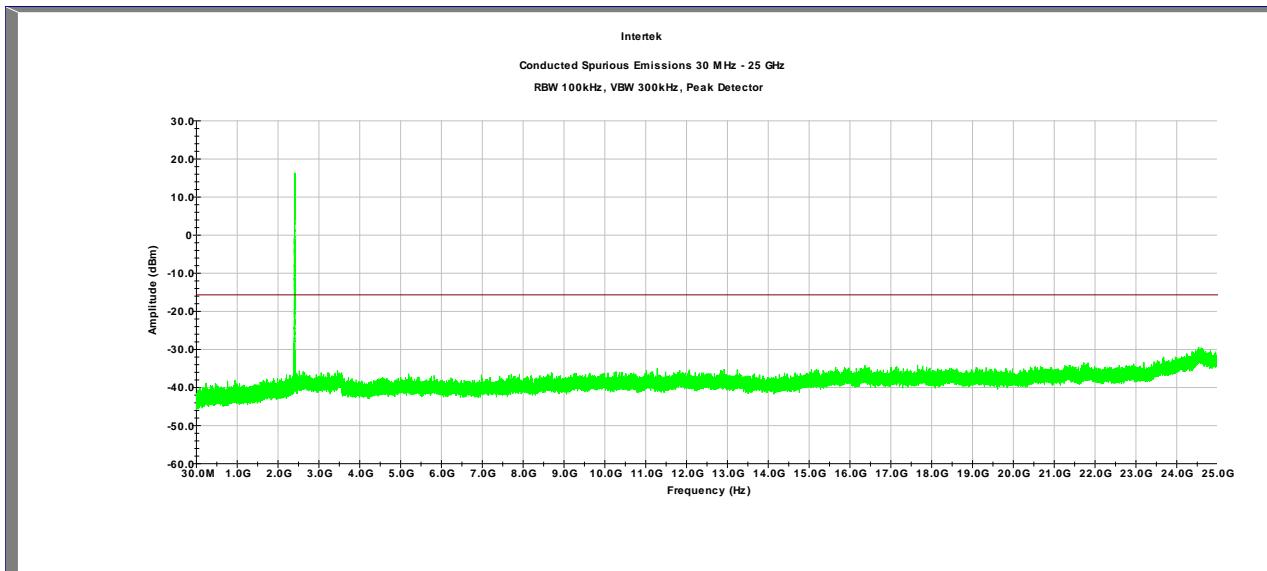
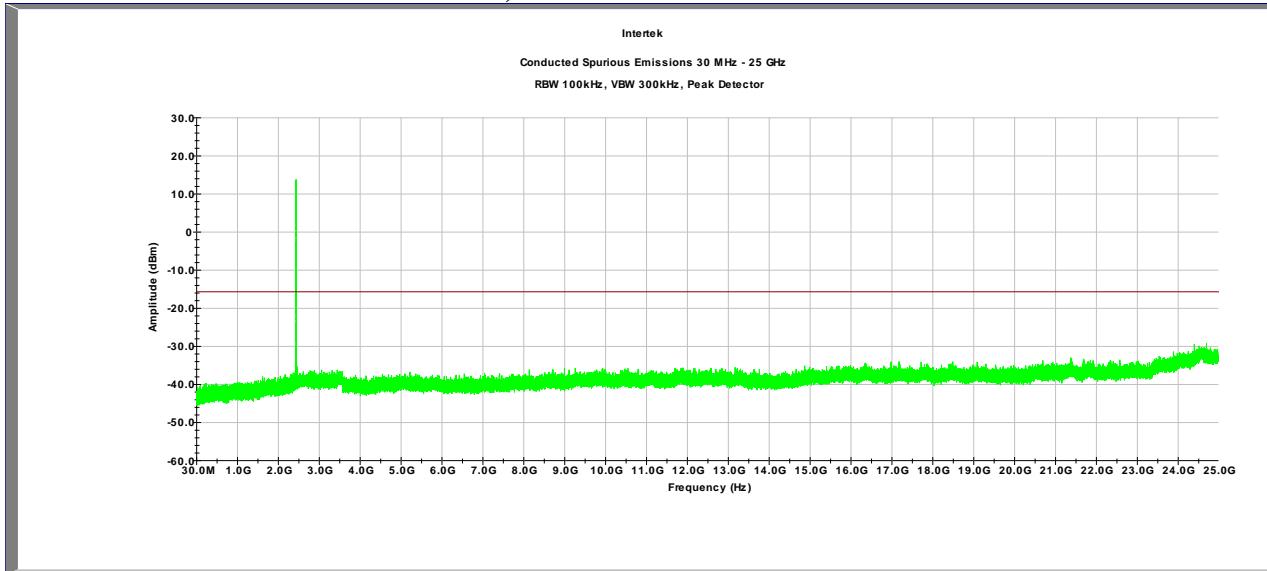


Plot 4.3
Ant 0, Tx @ 2462MHz 802.11b

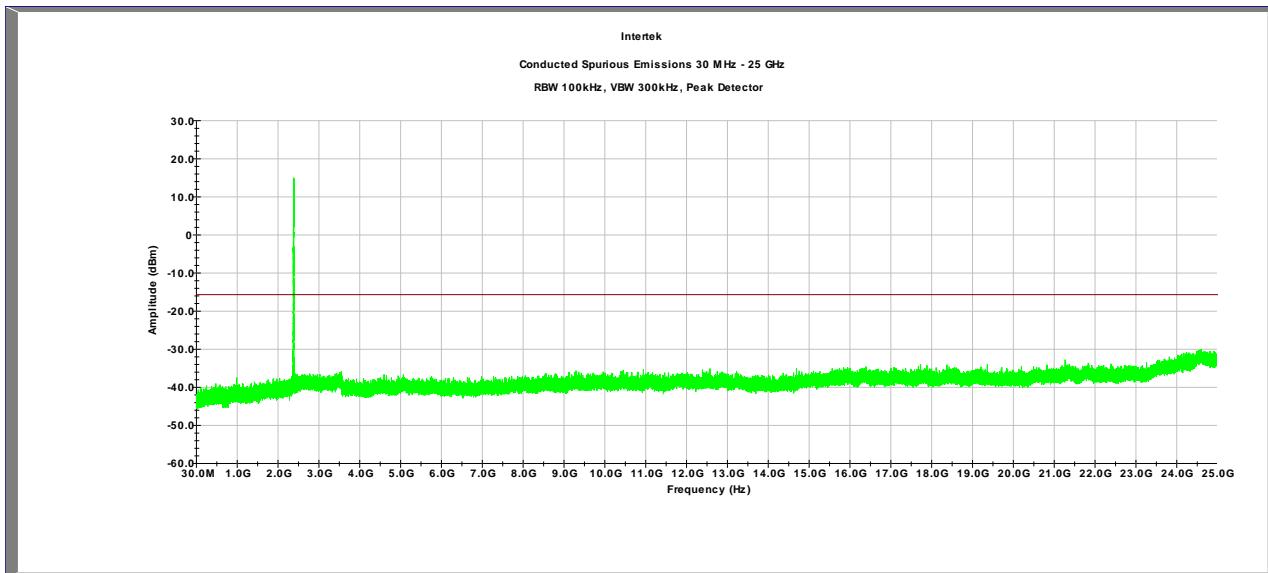


Plot 4.4
Ant 1, Tx @ 2412MHz 802.11b



Plot 4.5
Ant 1, Tx @ 2437MHz 802.11bPlot 4.6
Ant 1, Tx @ 2462MHz 802.11b

Plot 4.7
Ant 2, Tx @ 2412MHz 802.11b



Plot 4.8
Ant 2, Tx @ 2437MHz 802.11b

