Radiated Emission, 1 - 40GHz, Horizontal and Vertical Antenna Orientations, HT8 40 MHz – Antenna 1+2 at 5310 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
10620	Vertical	Pk	40.75	68.23
15930	Horizontal	Pk	37.75	68.23
19105	Vertical	Pk	34.00	68.23
21893	Vertical	Pk	39.75	68.23
23474	Vertical	Pk	42.50	68.23
25497	Vertical	Pk	42.50	68.23

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 – 40 GHz, Horizontal and Vertical Antenna Orientations, HT8 40 MHz – Antenna 1+2 at 5310 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
10620	Vertical	Pk	42.70	68.23
15930	Horizontal	Pk	38.75	68.23
18697	Vertical	Pk	35.75	68.23
21944	Vertical	Pk	40.41	68.23
24307	Vertical	Pk	42.20	68.23
25769	Vertical	Pk	42.87	68.23

Note:
- Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 – 40 GHz, Horizontal and Vertical Antenna Orientations, VHT6 80 MHz – Antenna 1 at 5290 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
10580	Vertical	Pk	47.25	68.23
15870	Vertical	Pk	45.00	68.23
18816	Vertical	Pk	34.75	68.23
20176	Vertical	Pk	35.25	68.23
20448	Vertical	Pk	35.75	68.23
24001	Vertical	Pk	42.50	68.23

Note:
- Peak (Pk) value already within Average (Av) limits, therefore Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 – 40 GHz, Horizontal and Vertical Antenna Orientations, VHT6 80 MHz – Antenna 2 at 5290 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
10580	Vertical	Pk	48.00	68.23
15870	Vertical	Pk	47.25	68.23
18816	Vertical	Pk	35.25	68.23
20176	Vertical	Pk	37.00	68.23
20448	Vertical	Pk	37.75	68.23
24001	Vertical	Pk	42.50	68.23

Note:
- Peak (Pk) value already within Average (Av) limits, therefore Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 – 40 GHz, Horizontal and Vertical Antenna Orientations, VHT6 80 MHz – Antenna 1+2 at 5290 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
10580	Vertical	Pk	48.80	68.23
15870	Vertical	Pk	46.60	68.23
18816	Vertical	Pk	36.41	68.23
20176	Vertical	Pk	35.36	68.23
20448	Vertical	Pk	36.84	68.23
24001	Vertical	Pk	43.58	68.23

Note:

- Peak (Pk) value already within Average (Av) limits, therefore Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

6.2.5 Radiated Spurious Emissions of Transmitter in restricted bands

RESULT: PASS

Date of testing: 2013-01-28 / 2013-03-19

Requirements:

FCC 15.205, FCC 15.209 and FCC 15.247(d) and RSS-Gen

Radiated emissions which fall in the restricted bands, as defined in FCC 15.205(a), must comply with the radiated emission limits specified in FCC 15.209(a).

Test procedure:

ANSI C63.10-2009
KDB Publication No.789033 D01 v01r02 9/26/2012 .
KDB Publication No. 644545 D01 and D02.

The EUT was placed on a nonconductive turntable 0.8m above the ground plane. Before final measurements of radiated emissions were performed, the EUT was scanned to determine its emission spectrum profile. The physical arrangement of the test system, the associated cabling and the EUT orientation (X, Y, Z) were varied in order to ensure that maximum emission amplitudes were attained.

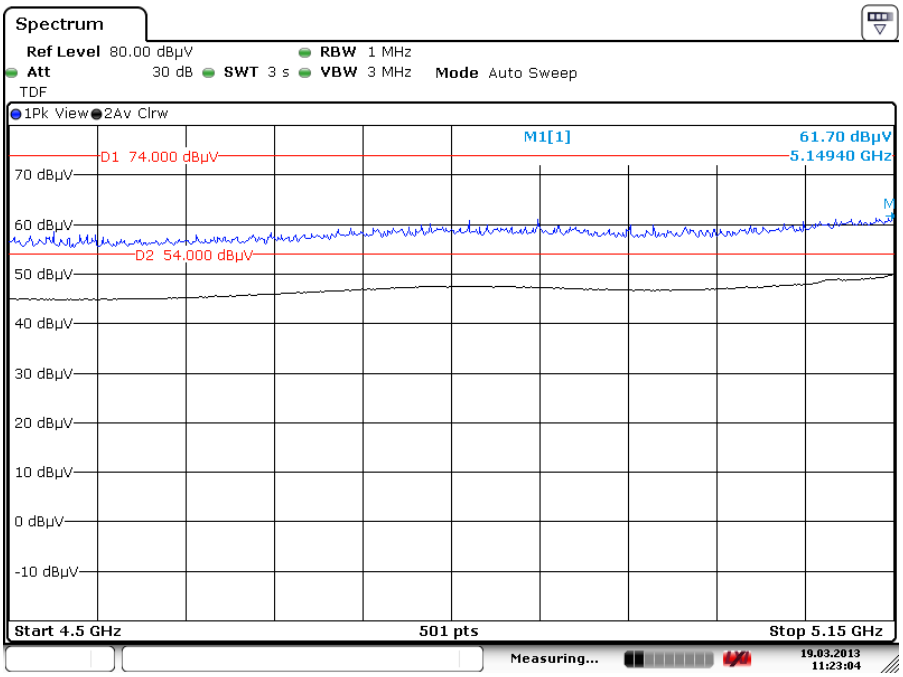
The spectrum was examined from 4.5-5.15 GHz and 5.35-5.46 GHz. Final radiated emission measurements were made at 3m distance.

At each frequency where a spurious emission was found, the EUT was rotated 360° and the antenna was raised and lowered from 1 to 4m in order to determine the emission's maximum level. Measurements were taken using both horizontal and vertical antenna polarizations.

The highest emission amplitudes relative to the appropriate limit were recorded in this report. Field strength values of radiated emissions at frequencies not listed in the tables are more than 20 dB below the applicable limit.

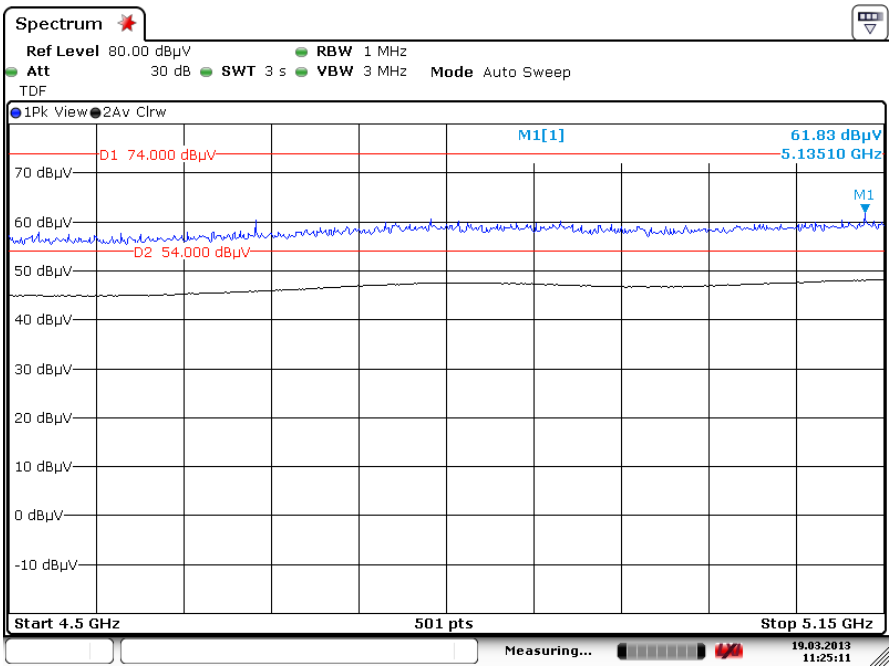
Correction factors are incorporated in the spectrum analyzers as an automated function.
Refer to section 4.2 for the power settings and modes.
Correction factors includes: antenna factor, cable loss and pre-amplifier gain.

The plots on the following pages show the limit line D1 (74 dBµV/m for Peak and 54 dBµV/m for Average values). Plots provided are of the highest value measured on either Antenna 1, Antenna 2 and Antenna 1+2.



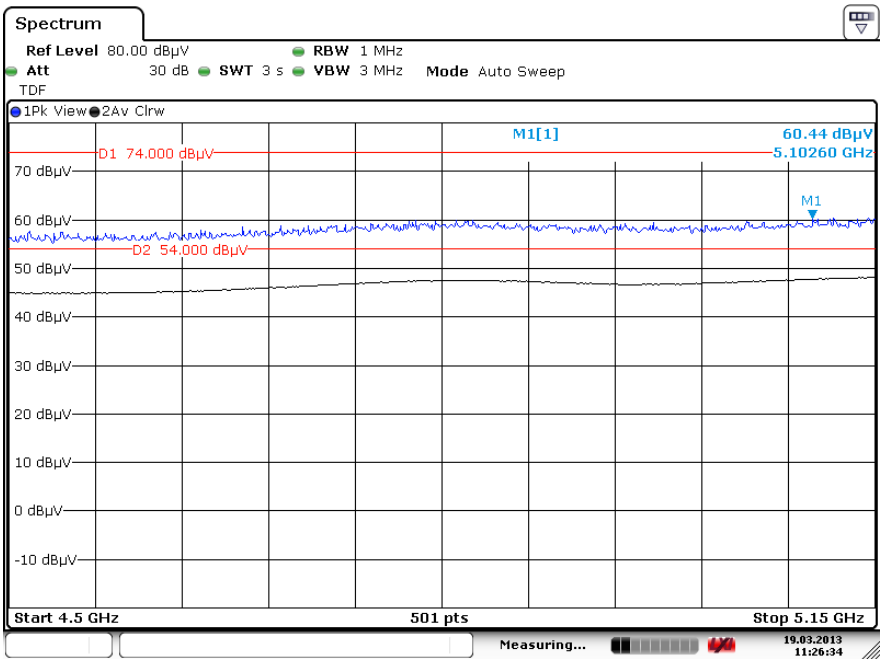
Date: 19.MAR.2013 11:23:04

Emissions in restricted band 4.5-5.15 GHz, 6Mb OFDM, 5260 MHz
valid for Antenna 1, Antenna 2



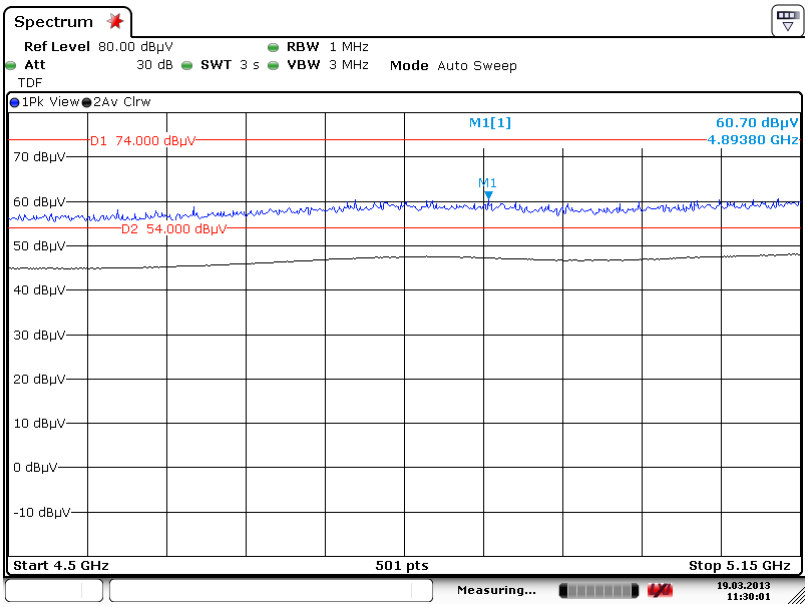
Date: 19.MAR.2013 11:25:10

Emissions in restricted band 4.5-5.15 GHz, HT4 20 MHz, 5260 MHz
valid for Antenna 1, Antenna 2 and HT8 20MHz Antenna 1+2



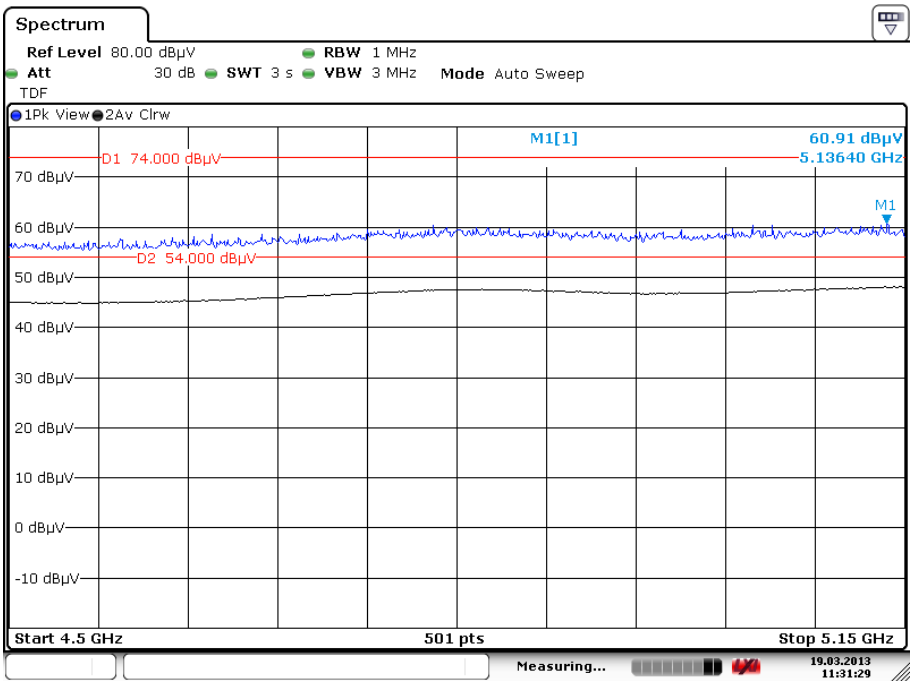
Date: 19.MAR.2013 11:26:34

Emissions in restricted band 4.5-5.15 GHz, HT4 40 MHz, 5260 MHz
valid for Antenna 1, Antenna 2 and HT8 40MHz Antenna 1+2



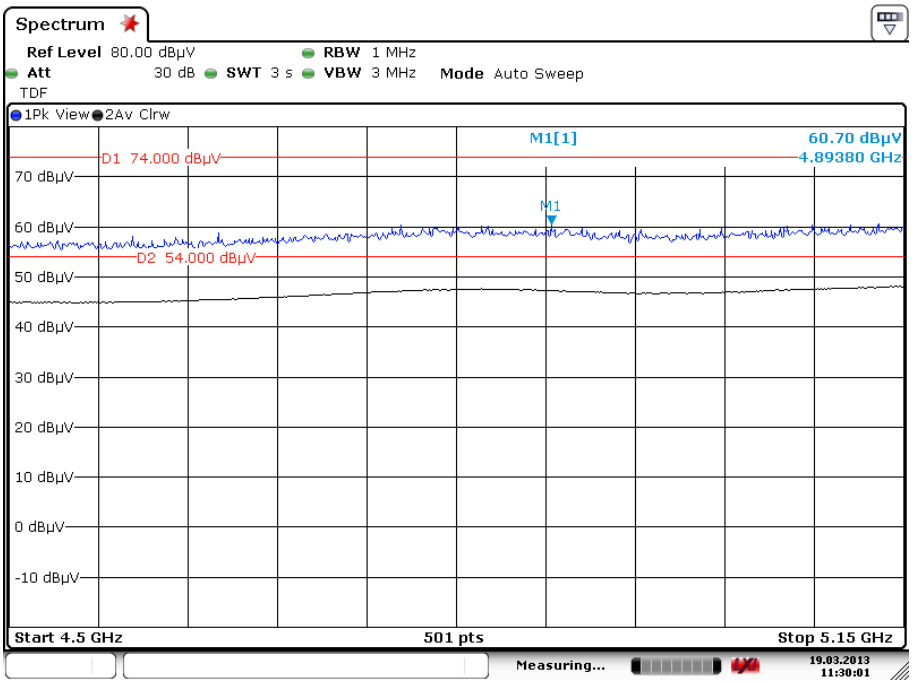
Date: 19.MAR.2013 11:30:01

Emissions in restricted band 4.5-5.15 GHz, 6Mb OFDM, 5300 MHz
valid for Antenna 1, Antenna 2



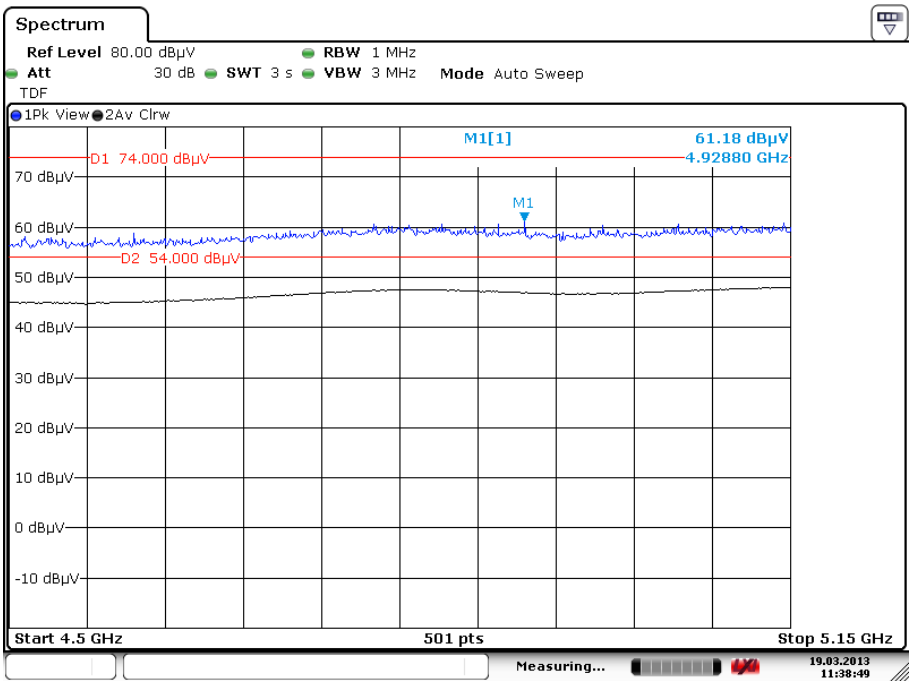
Date: 19.MAR.2013 11:31:29

Emissions in restricted band 4.5-5.15 GHz, HT4 20MHz , 5300 MHz
valid for Antenna 1, Antenna 2 and HT8 20 MHz Antenna 1+2



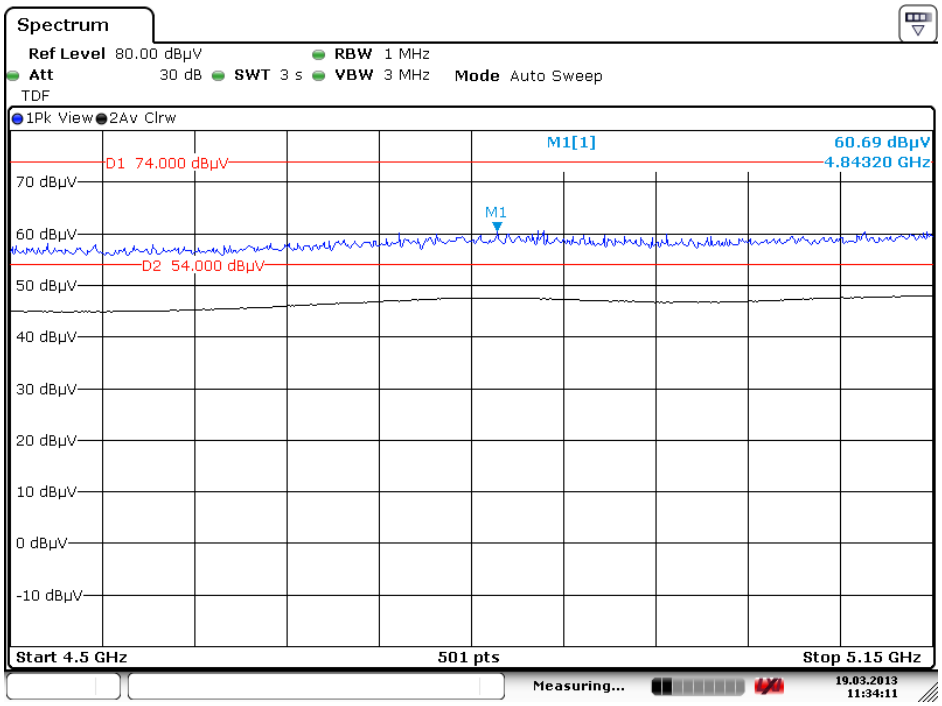
Date: 19.MAR.2013 11:30:01

Emissions in restricted band 4.5-5.15 GHz, HT4 40MHz , 5300 MHz
valid for Antenna 1, Antenna 2 and HT8 40 MHz Antenna 1+2



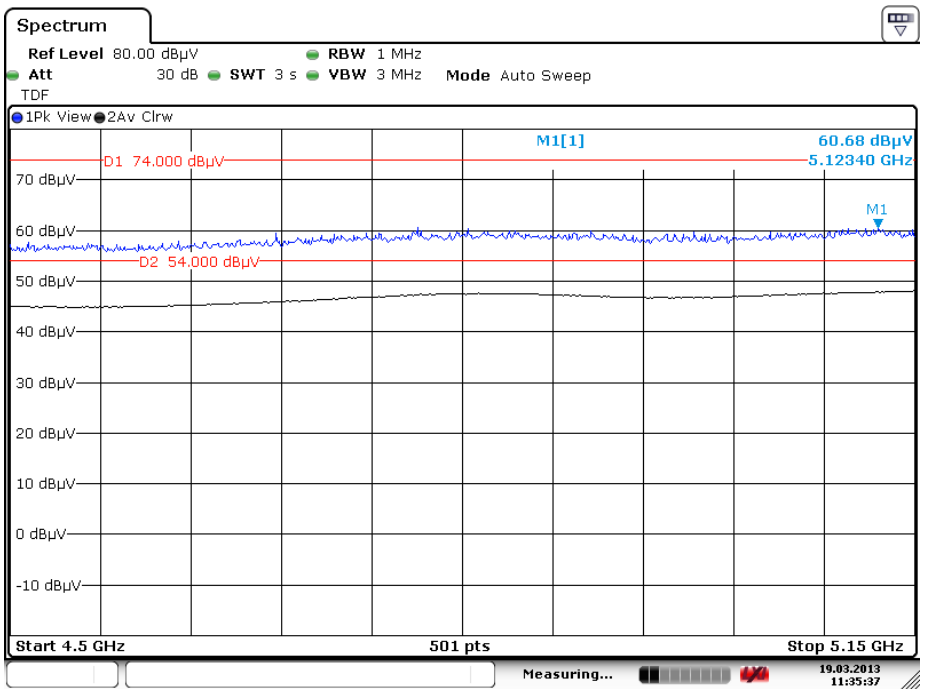
Date: 19.MAR.2013 11:38:48

Emissions in restricted band 4.5-5.15 GHz, VHT6 80 MHz, 5290 MHz
valid for Antenna 1, Antenna 2 and Antenna 1+2



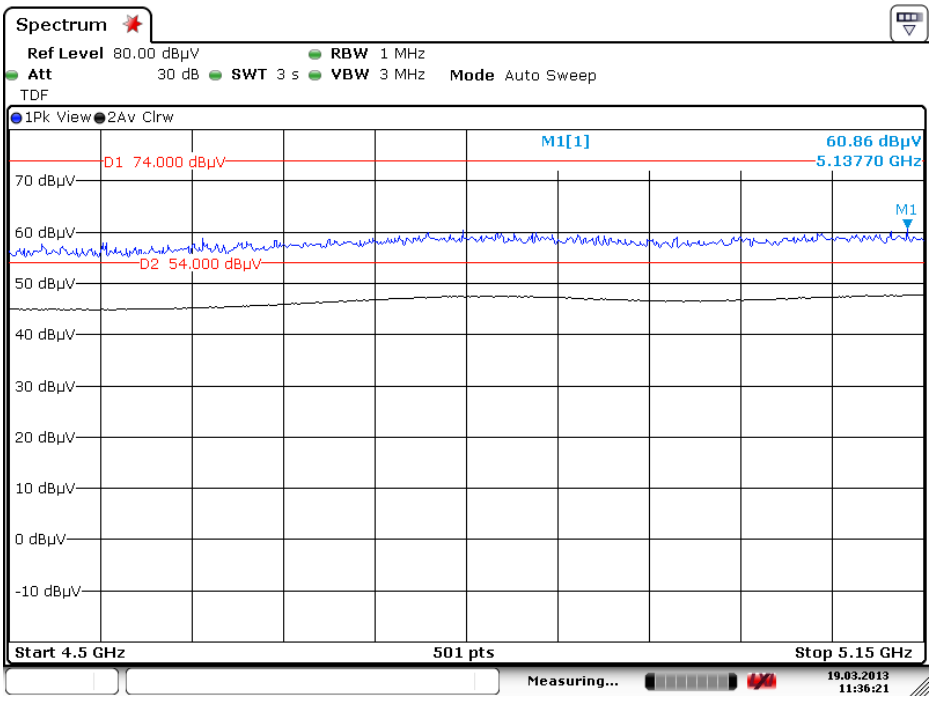
Date: 19.MAR.2013 11:34:10

Emissions in restricted band 4.5-5.15 GHz, 6Mb OFDM, 5320 MHz
valid for Antenna 1, Antenna 2



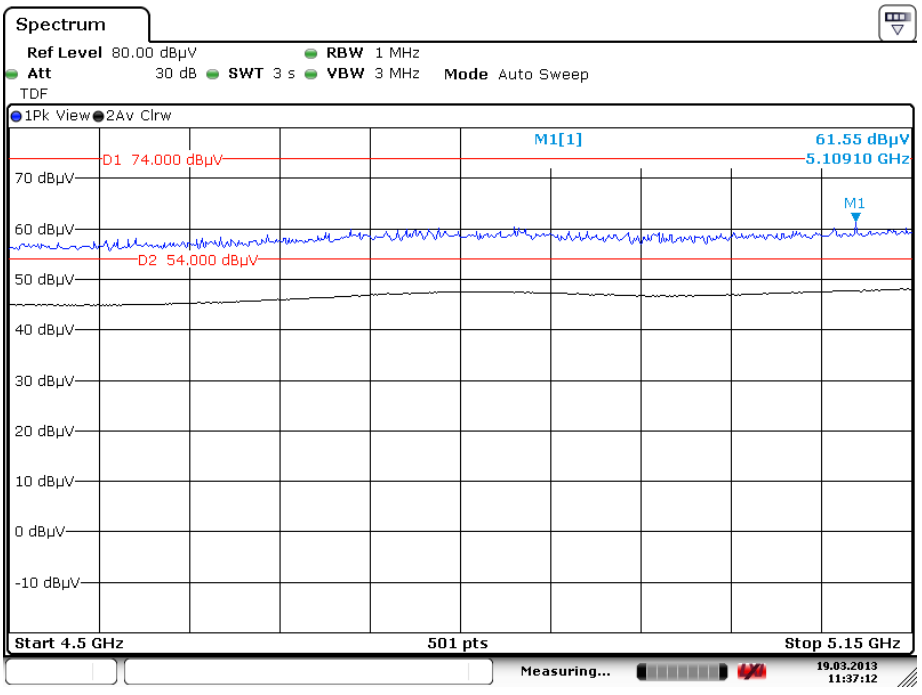
Date: 19.MAR.2013 11:35:37

Emissions in restricted band 4.5-5.15 GHz, HT4 20MHz, 5320 MHz
valid for Antenna 1, Antenna 2



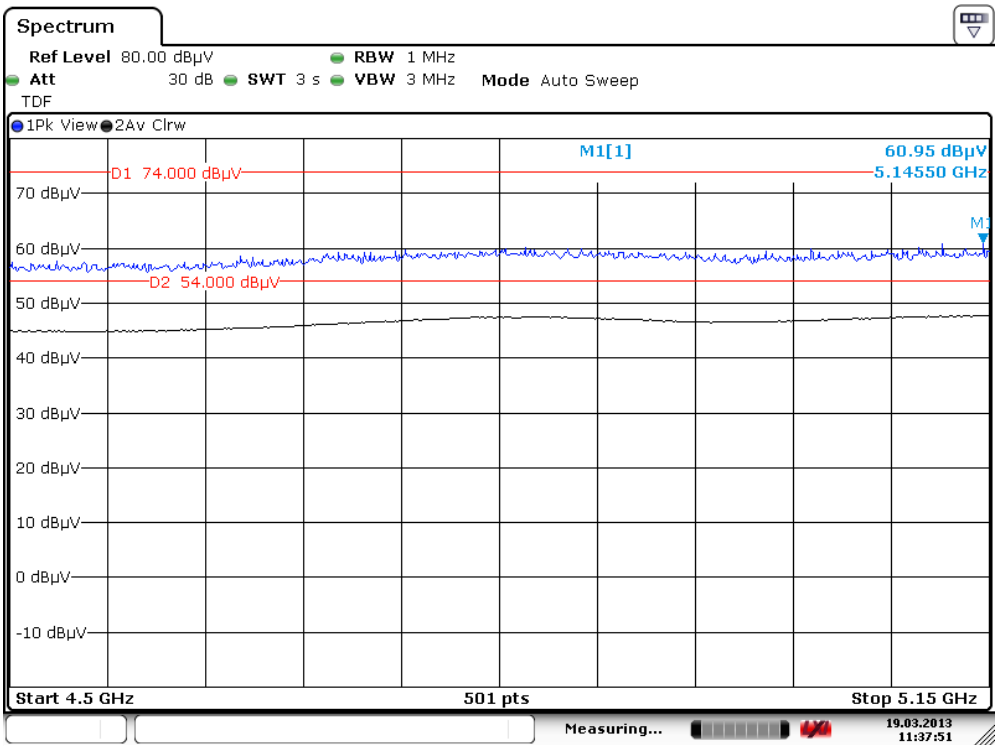
Date: 19.MAR.2013 11:36:21

Emissions in restricted band 4.5-5.15 GHz, HT8 20MHz, 5320 MHz
valid for Antenna 1+2



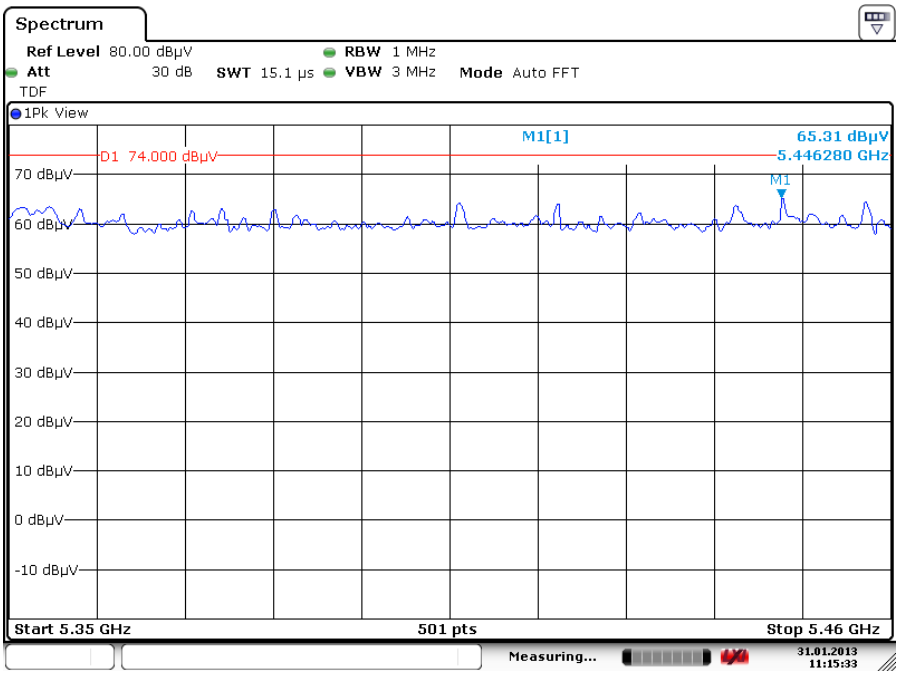
Date: 19.MAR.2013 11:37:12

Emissions in restricted band 4.5-5.15 GHz, HT4 40MHz , 5310 MHz
valid for Antenna 1, Antenna 2



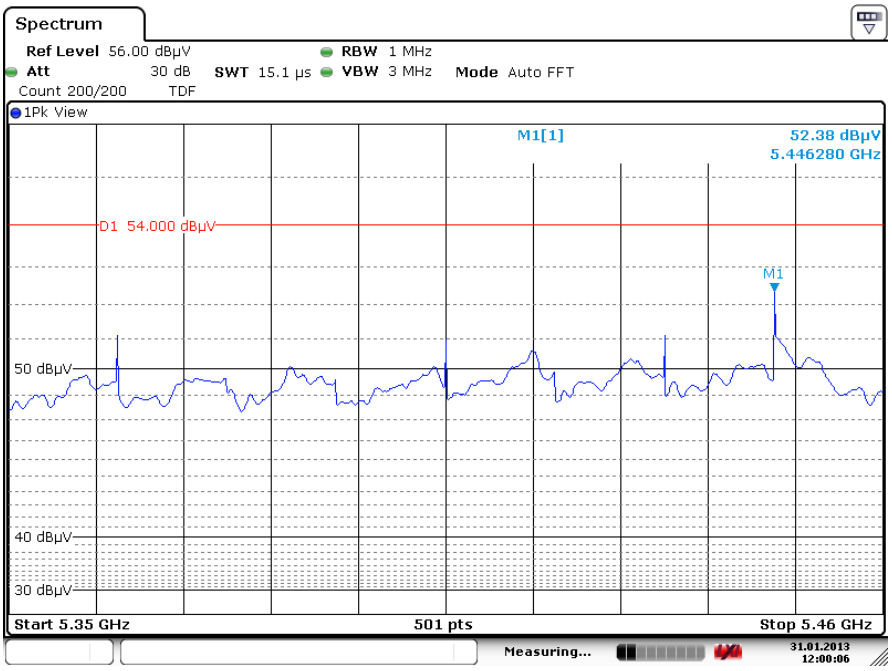
Date: 19.MAR.2013 11:37:50

Emissions in restricted band 4.5-5.15 GHz, HT8 40MHz, 5310 MHz
valid for Antenna 1+ Antenna 2



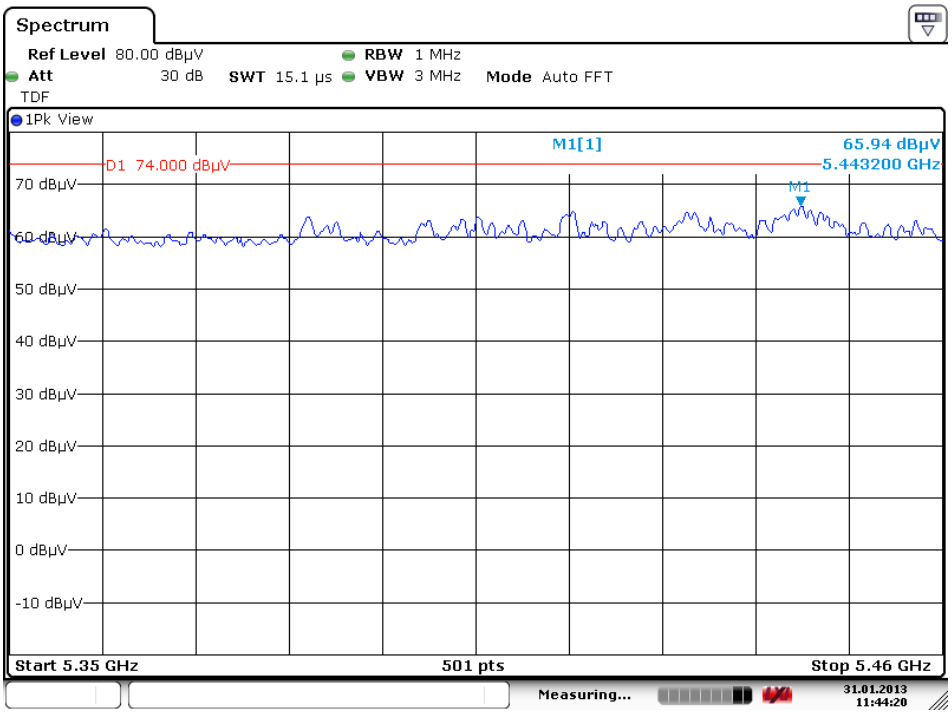
Date: 31.JAN.2013 11:15:33

Emissions in restricted band 5.35-5.46 GHz, Peak value, 6Mb OFDM, 5320 MHz
valid for Antenna 1, Antenna 2



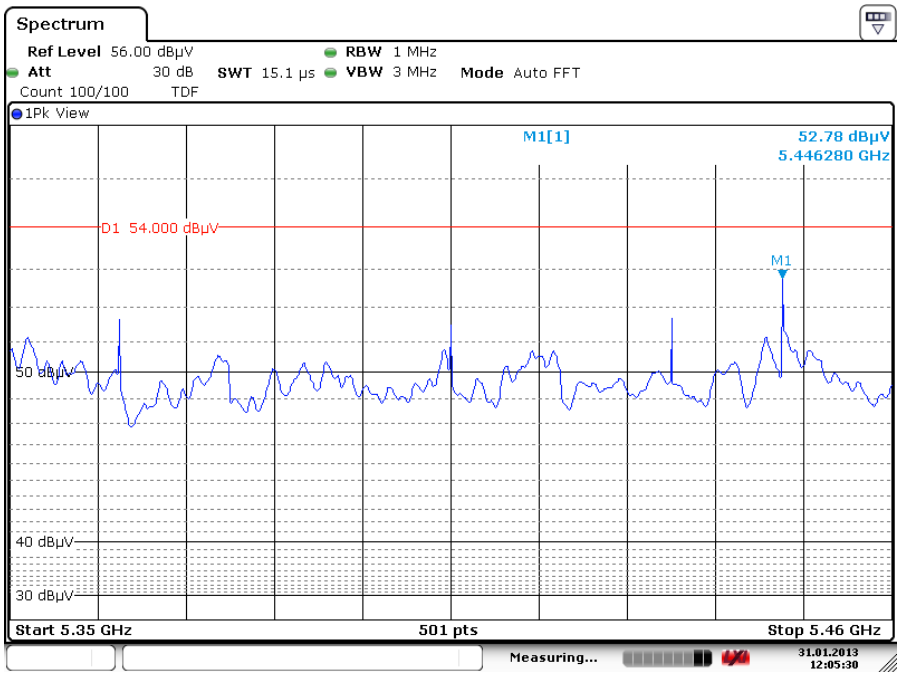
Date: 31.JAN.2013 12:00:05

Emissions in restricted band 5.35-5.46 GHz, Average value, 6Mb OFDM, 5320 MHz
valid for Antenna 1, Antenna 2



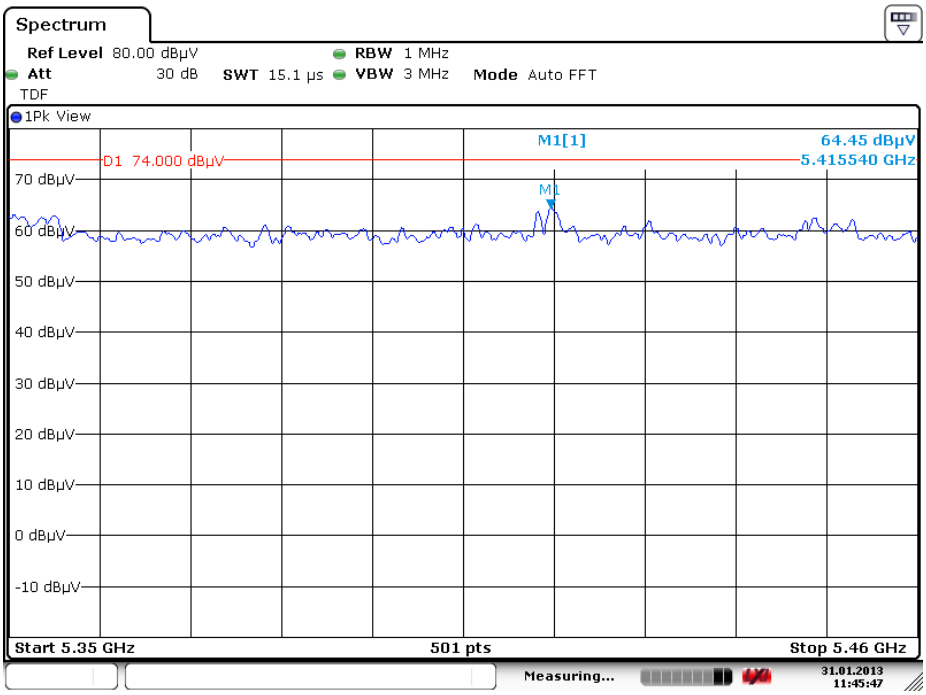
Date: 31.JAN.2013 11:44:20

Emissions in restricted band 5.35-5.46 GHz, Peak value, HT4 20 MHz, 5320 MHz valid for Antenna 1, Antenna 2



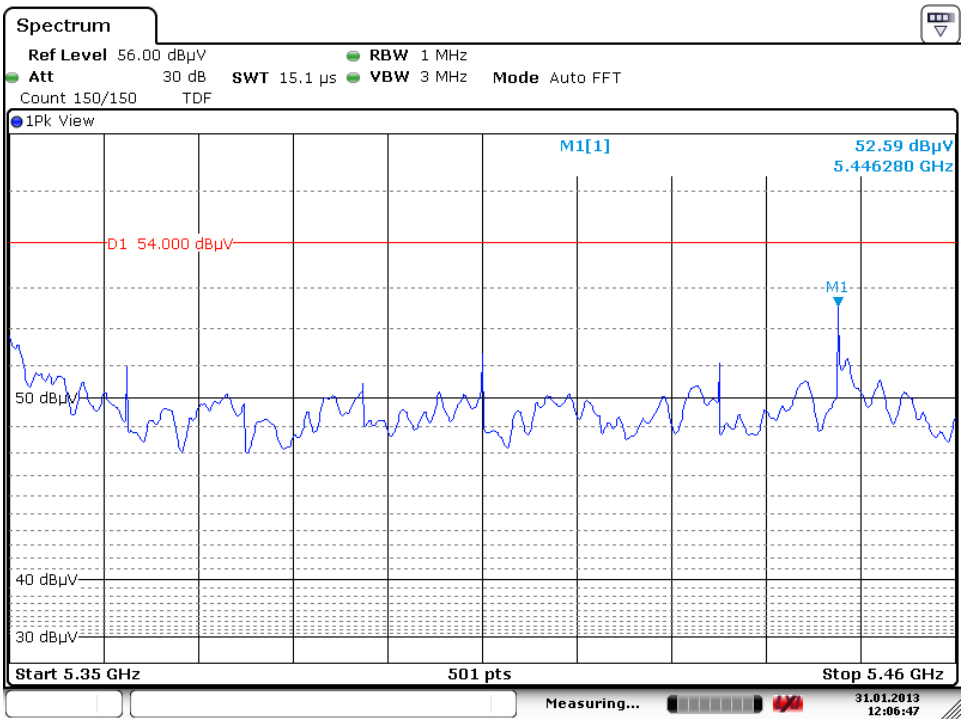
Date: 31.JAN.2013 12:05:30

Emissions in restricted band 5.35-5.46 GHz, Average value, HT4 20 MHz, 5320 MHz valid for Antenna 1, Antenna 2



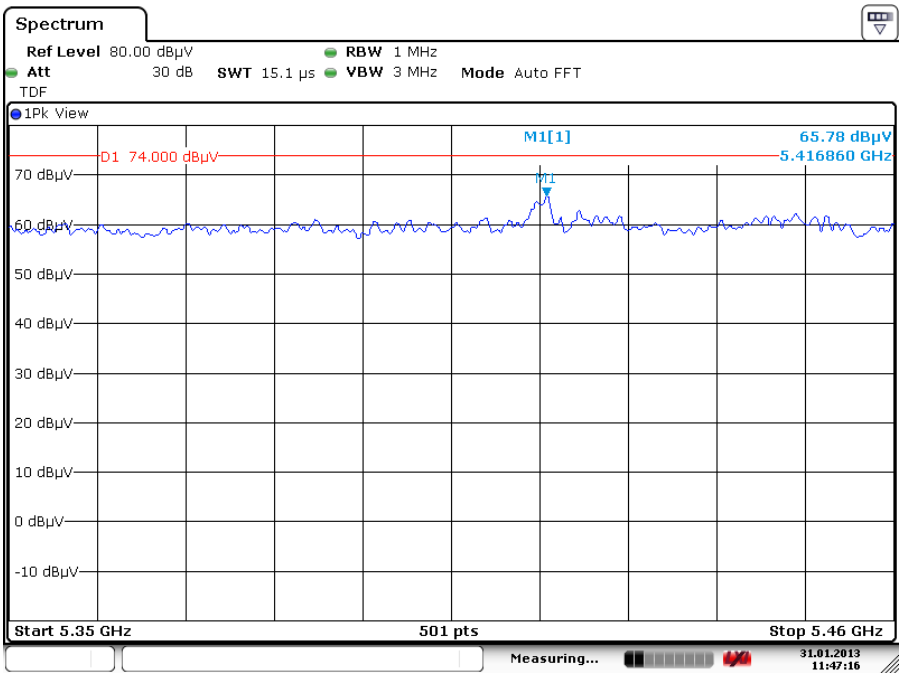
Date: 31.JAN.2013 11:45:47

Emissions in restricted band 5.35-5.46 GHz, Peak value, HT8 20 MHz, Antenna 1+ 2 -5320 MHz



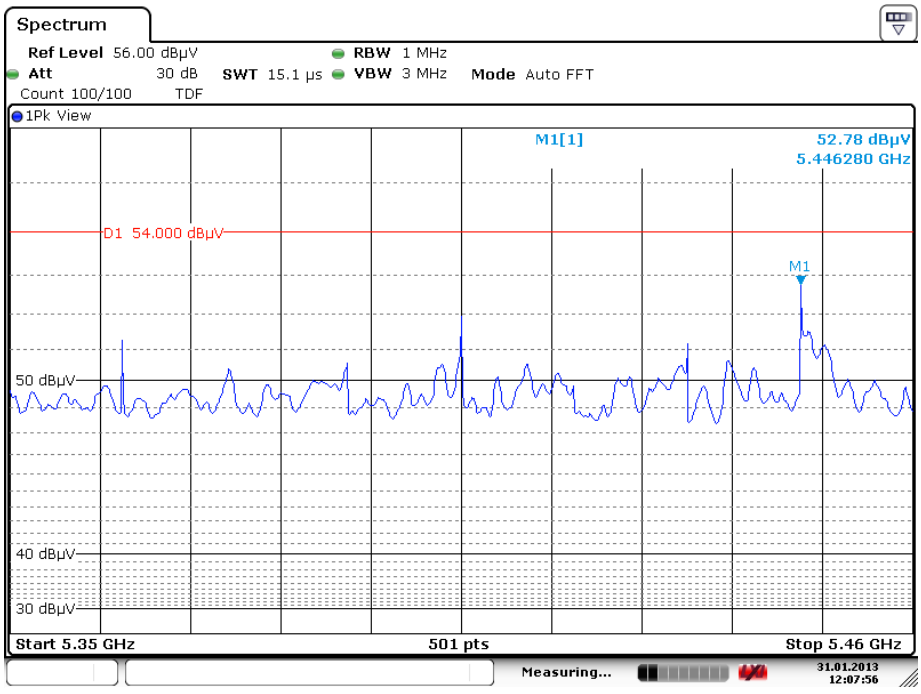
Date: 31.JAN.2013 12:06:47

Emissions in restricted band 5.35-5.46 GHz, Average value, HT8 20 MHz, Antenna 1+2 -5320 MHz



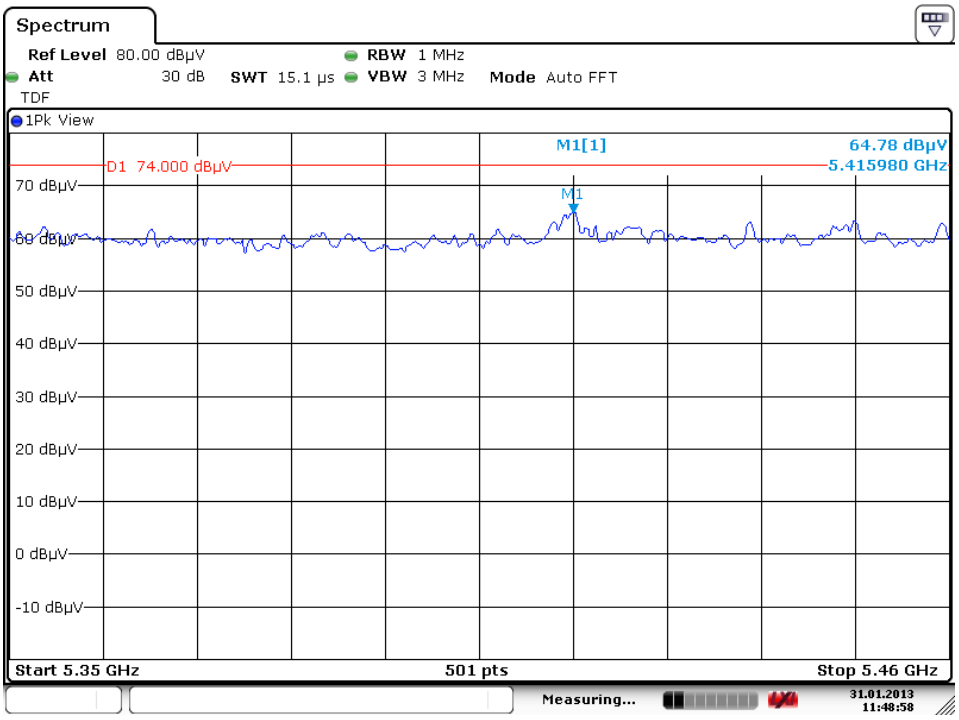
Date: 31.JAN.2013 11:47:16

Emissions in restricted band 5.35-5.46 GHz, Peak value, HT4 40 MHz, 5310 MHz
valid for Antenna 1, Antenna 2



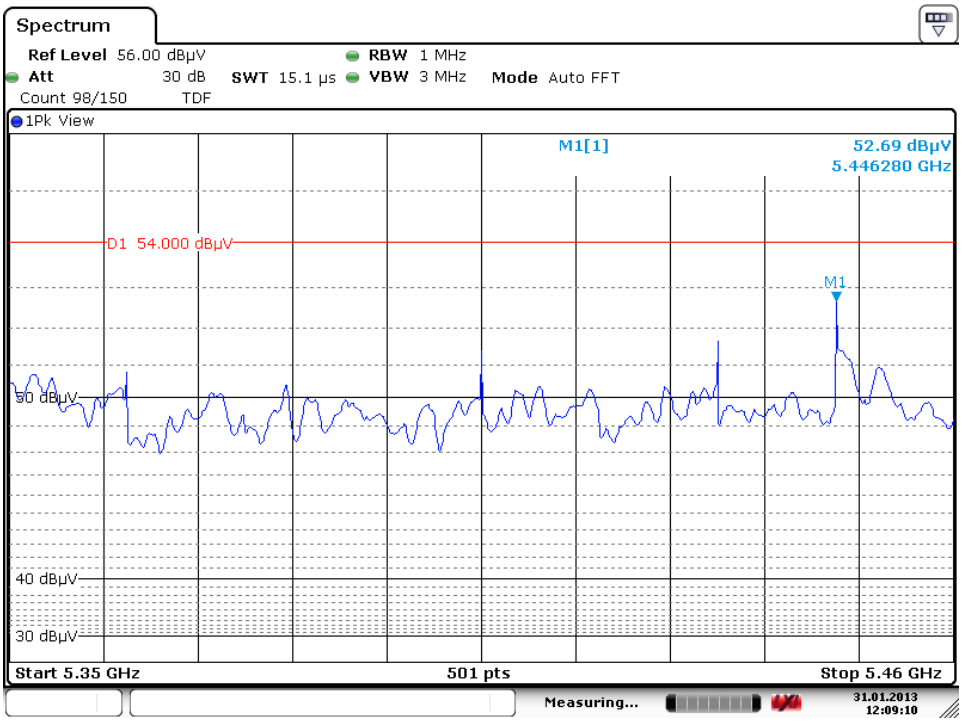
Date: 31.JAN.2013 12:07:56

Emissions in restricted band 5.35-5.46 GHz, Average value, HT4 40 MHz, 5310 MHz
valid for Antenna 1, Antenna 2



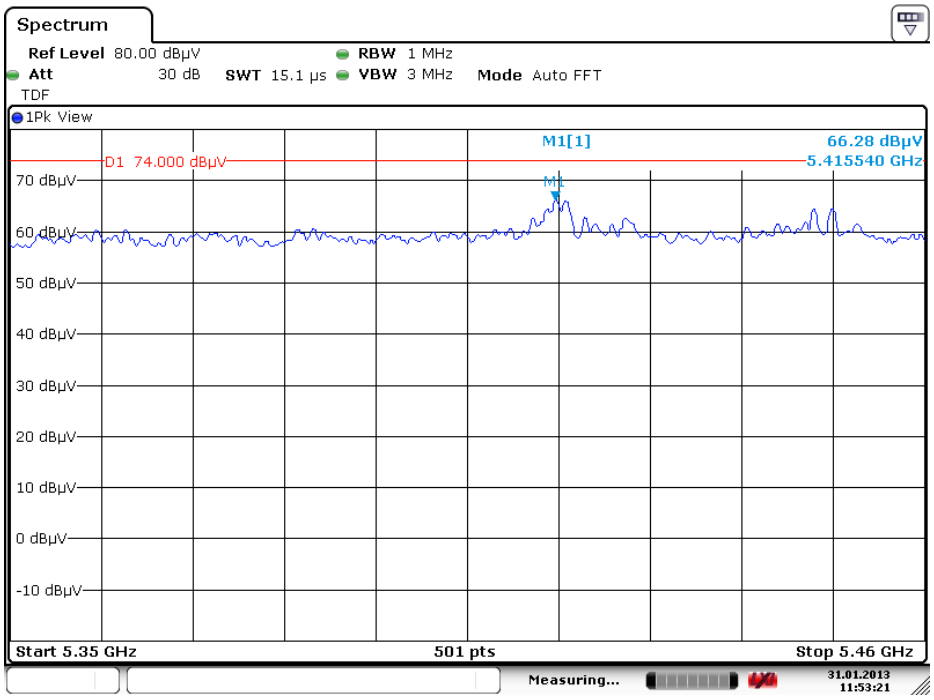
Date: 31.JAN.2013 11:48:58

Emissions in restricted band 5.35-5.46 GHz, Peak value, HT8 40 MHz, Antenna 1+2 -5310 MHz



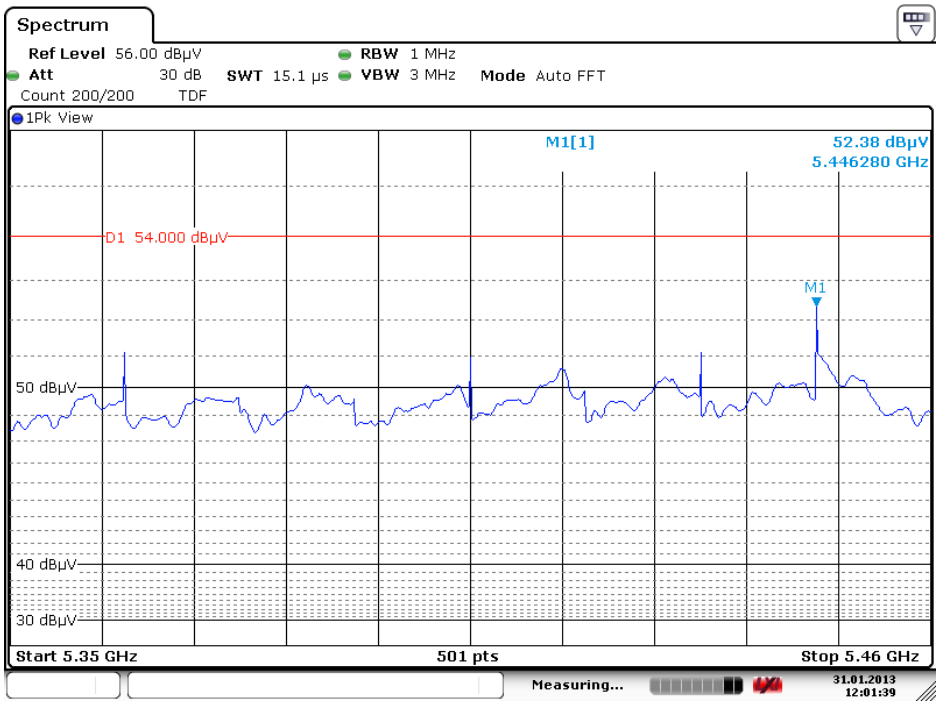
Date: 31.JAN.2013 12:09:10

Emissions in restricted band 5.35-5.46 GHz, Average value, HT8 40 MHz, Antenna 1+2 -5310 MHz



Date: 31.JAN.2013 11:53:21

Emissions in restricted band 5.35-5.46 GHz, Peak value, VHT6 80 MHz, -5290 MHz
valid for Antenna 1, Antenna 2 and Antenna 1+2



Date: 31.JAN.2013 12:01:39

Emissions in restricted band 5.35-5.46 GHz, Average value, VHT6 80 MHz, 5290 MHz
valid for Antenna 1, Antenna 2 and Antenna 1+2

6.2.6 Frequency Stability

RESULT: PASS

Date of testing: 2013-01-11 / 2013-01-15

Requirements:

FCC 15.407(6)(g)

Test procedure:

The EUT was placed inside the climat chamber and a range of temperature and supply voltages according to table on the next page was set. The climat chamber was stabilized for at least 30 minutes for every temperature required. The supply voltage was then adjusted on the EUT from 85% to 115%. The spectrum analyzer and Power supply regulator were placed outside of the climat chamber. The EUT's antenna port 1 was connected to the spectrum analyzer.

Test results Frequency stability

Operation temperature range according to the EUT"s User Guide is 0° - 80°C.

Tested in operation mode: 6Mb OFDM, Antenna 1 – 5320 MHz

Temperature (°C)	Power supply (Vac)	Frequency (MHz)	Deviation from reference (ppm)
20	120	5319.979	-3.9
0	102	5320.017	3.2
0	138	5320.017	3.2
50	102	5319.996	-0.7
50	138	5319.996	-0.7

Measurement uncertainty is ±257 Hz.

The reference is the channels frequency 5320.000 MHz.

Test results for 5.47 GHz – 5.725 GHz band

7. Test Results

7.1 Technical Requirements

7.1.1 Voltage Requirements

RESULT: PASS

Requirements:

FCC 15.31(e)

For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

Verdict:

The EUT has an internal voltage regulator to supply the RF circuit. Hence it complies with the power supply requirements.

7.1.2 Antenna Requirements

RESULT: PASS

Requirements:

FCC 15.203 and IC RSS-Gen section 7.1.2

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Verdict:

The EUT has two non standard PIFA antenna connectors which complies with the requirements.

7.2 Conducted Measurements at Antenna Port

7.2.1 Maximum Conducted Output Power and Peak Power Spectral Density

RESULT: PASS

Date of testing: 2013-03-24 / 2013-03-27

Requirements:

FCC 15.407(a)(3)

For the 5.47-5.725 GHz band, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW (23.97 dBm) or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RSS-210 A9.2 (3)

For the band 5.47-5.725 GHz the maximum conducted output power shall not exceed 250 mW (23.97 dBm) or 10 + 10 log10 B, dBm, whichever power is less. The power spectral density shall not exceed 11dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W (30 dBm) or 17 + 10log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.
For the band 5.725–5.825 GHz the maximum conducted output power shall not exceed 1.0 W (30 dBm) or 17 + 10 log10 B, dBm, whichever power is less. The power spectral density shall not exceed 17 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 4.0 W or 23 + 10 log10B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.
Within the emission bandwidth, when the peak spectral density per MHz over any continuous transmission exceeds the average (10 log10 B) value by more than 3 dB, the permissible power spectral density shall be reduced by the excess amount.

Test procedure:

ANSI C63.10-2009
KDB Publication No.789033 D01 v01r02 9/26/2012 and
KDB Publication No. 662911 D01 Multiple Transmitter Output v01r02.
KDB Publication No. 644545 D01 and D02.

The Maximum Conducted Output Power was measured using Method SA-2 in KDB 789033.

As per KDB publication 644545 D01 in case of transmission in non-contiguous spectra (ie at VHT6 80MHz), the power of each spectrum segment was measured by integrating across the EBW of that segment following the procedures of KDB Pulication 789033. The total power of the spectrum segments is then the sum of the power measurements.
The maximum output power (conducted) was measured at the antenna connector with a spectrum analyzer. The final measurement takes into account the loss generated by all the involved cables. An automated system corrects for duty cycle and cable losses.

The data rates of 6Mb/s for 802.11a, HT4 (SISO)/HT8 (MIMO) for 802.11n20/ac20 and n40/ac40, and VHT6 (SISO)/(MIMO) for 802.11 ac80 were selected based on preliminary testing that identified those rates corresponding to the worst cases for output power and spurious levels at the band edges.

Notes: mW = 10 ^ (dBm/10)
dBm = 10 x log(mW)

The peak power spectral density (PPSD) was measured using the method according to point E) (Method SA-1) of Guidance 789033 D01.
For channel 144 ac20MHz, channel 142 ac40 MHz and channel 138 ac80MHz the maximum conducted output power was measured using the method according to point H) 2) b) (ii) (Integration across the entire U-NII band) of the Guidance for IEEE 802.11ac and Pre-ac Device Emissions Testing “Guidance 644545 V01 for IEEE802.11ac.
For MIMO mode, the *Measure and add 10 log(NANT) dB*, (where *NANT* is the number of outputs) technique was used according to the Guidance for Emission Testing of Transmitters with Multiple Outputs in the Same Band 662911 D01 Multiple Transmitter Output v01r02 dated 9/26/2012.
With this technique, spectrum measurements are performed at each output of the EUT, and the quantity *10 log(NANT)* dB is added to each spectrum value before comparing to the emission limit.
Number of outputs = 2.
The measured results at both antenna ports are then summed mathematically to determine the total emission level from the device. Summing is performed in linear power units (mW—not dBm).
The e.i.r.p. levels are calculated by adding the declared maximum antenna gain (5.0 dBi).

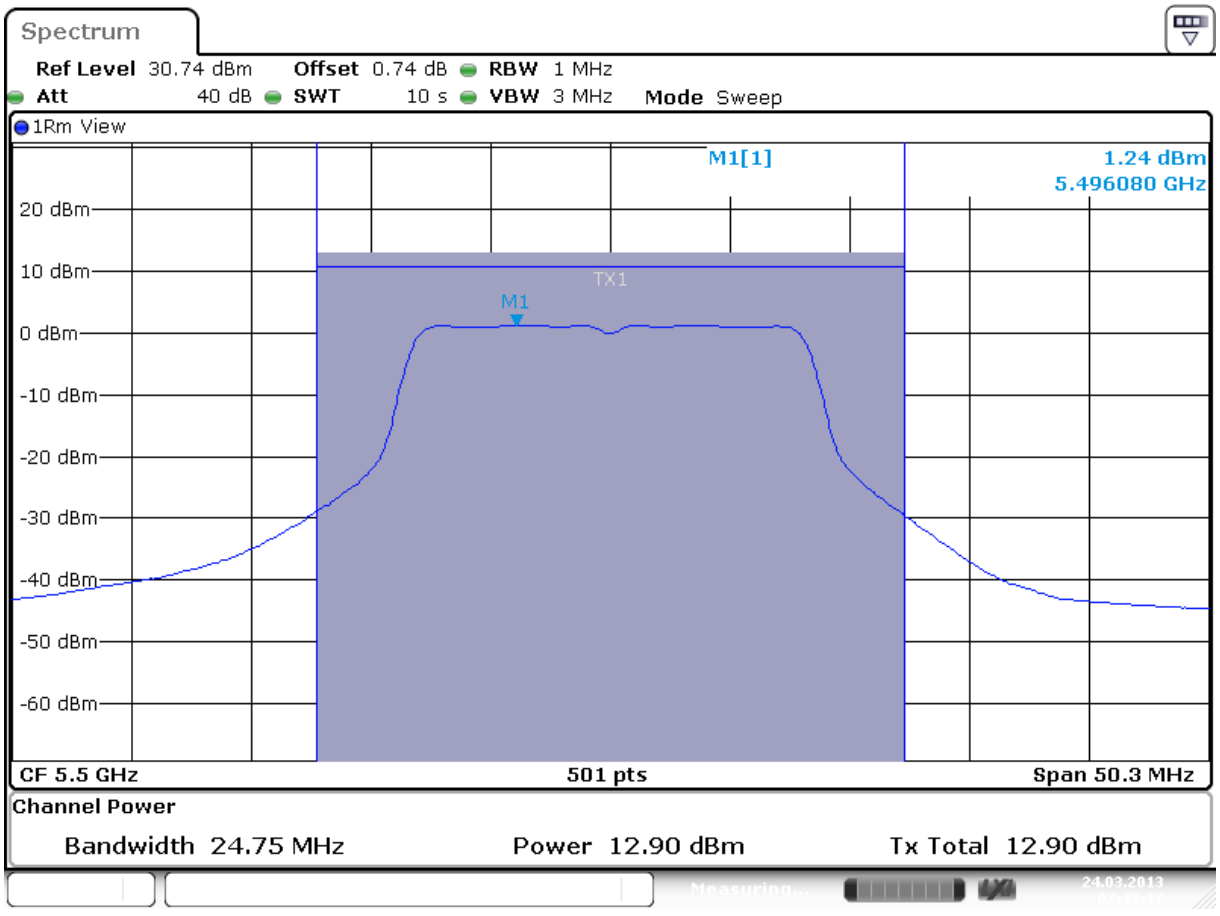
plots : Peak power plots,
Plots of the Maximum Conducted Output Power and Peak Power spectral Density are provided on the next pages, correction factors included in the reading.
Directional gain of the antennas used was 5.0 dBi so no reduction in maximum conducted output power and the peak power spectral density is required.

Maximum Conducted Output Power

Operation mode: 6Mb OFDM, Antenna 1

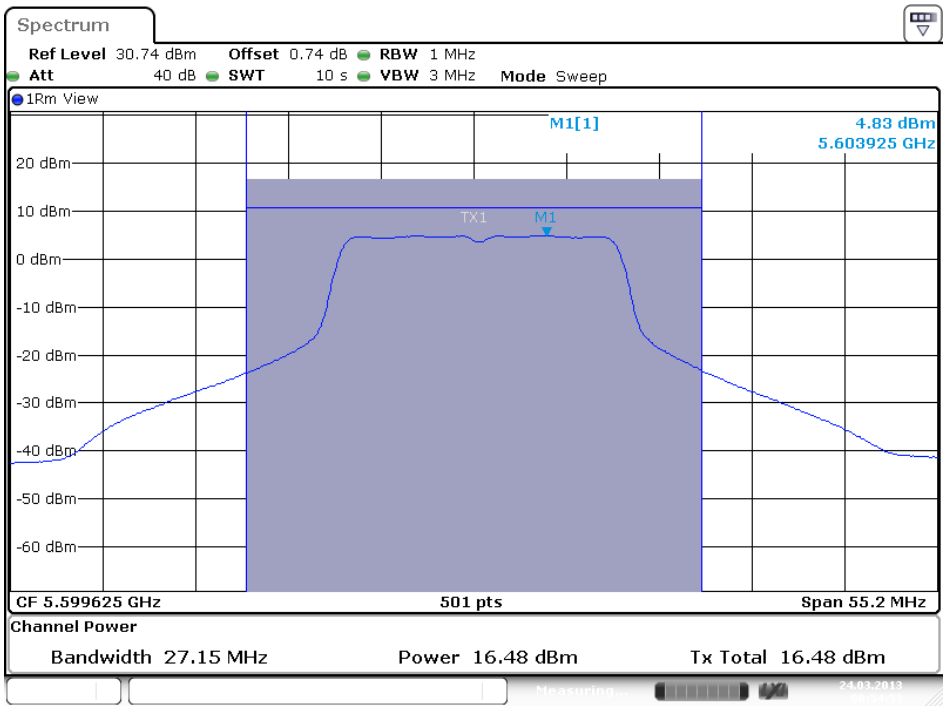
Frequency [MHz]	Maximum conducted output power [dBm]	Maximum conducted output power e.i.r.p. [dBm]	PPSD/MHz [dBm]	PPSD/MHz e.i.r.p. [dBm]	Plot number
5500	12.9	17.9	1.2	6.2	A
5600	16.5	21.5	4.8	9.8	B
5700	12.3	17.3	0.7	5.7	C

Result: Pass



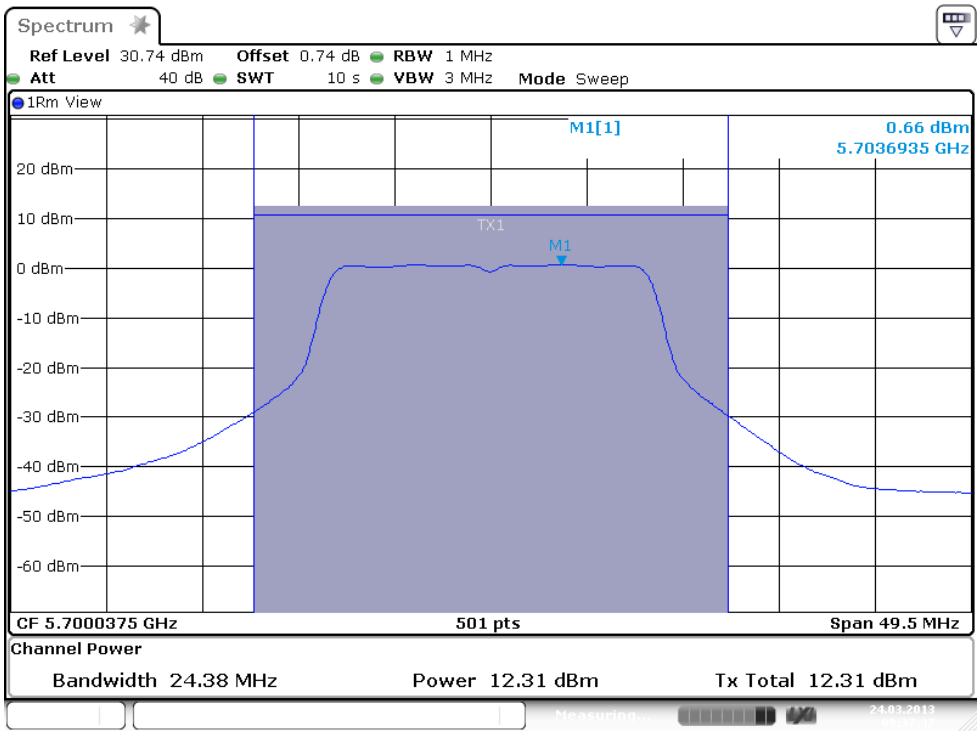
Date: 24.MAR.2013 07:43:16

Plot A



Date: 24.MAR.2013 08:54:53

Plot B



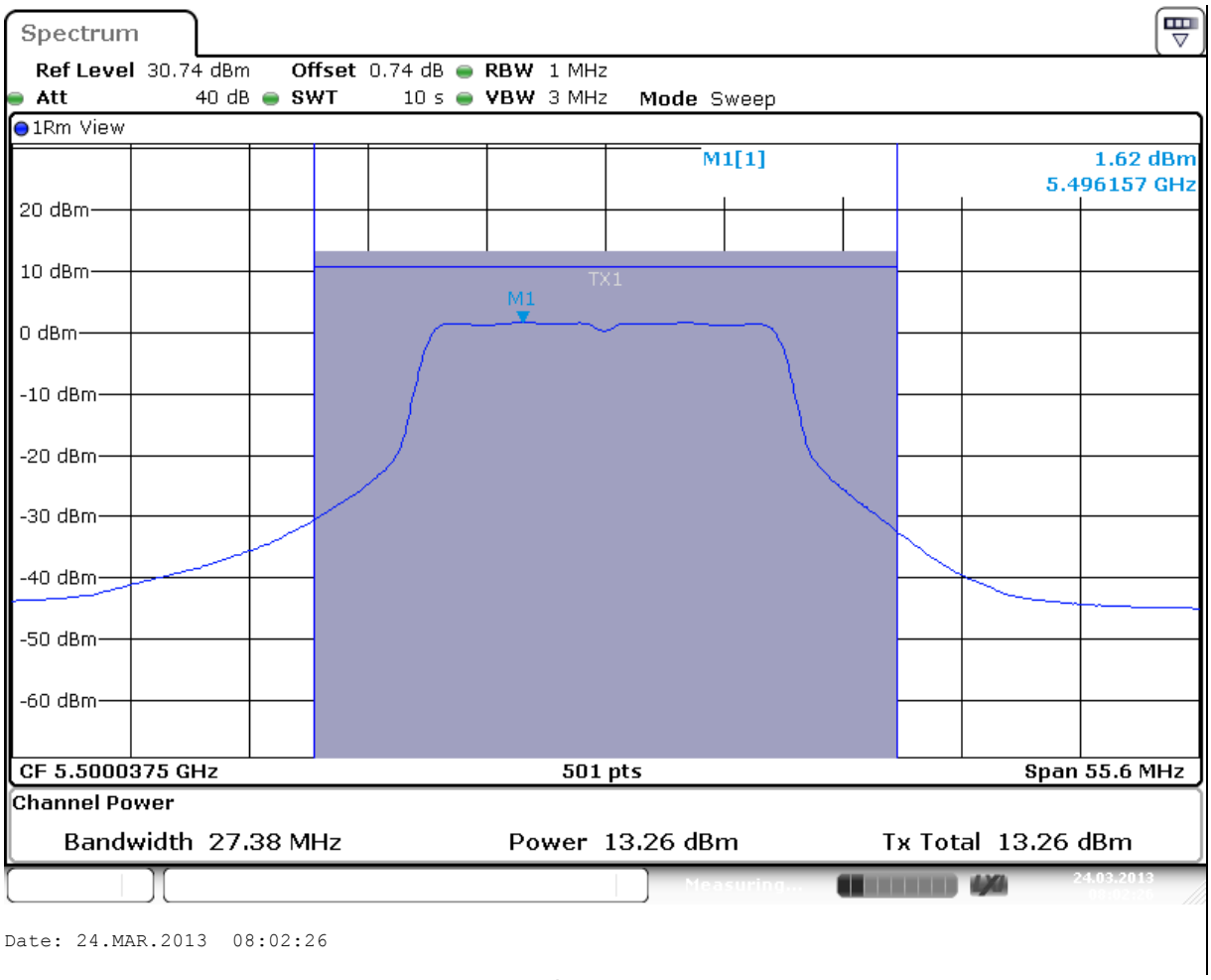
Date: 24.MAR.2013 09:37:37

Plot C

Operation mode: 6Mb OFDM, Antenna 2

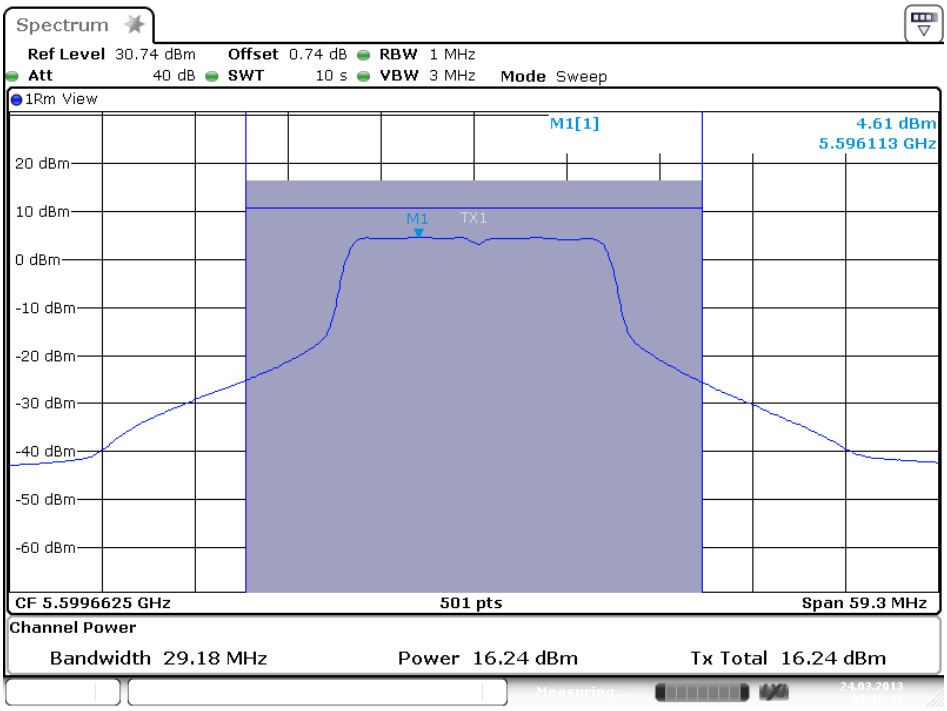
Frequency [MHz]	Maximum conducted output power [dBm]	Maximum conducted output power e.i.r.p. [dBm]	PPSD/MHz [dBm]	PPSD/MHz e.i.r.p. [dBm]	Plot number
5500	13.3	18.3	1.6	6.6	A
5580	16.2	21.2	4.6	9.6	B
5700	12.9	17.9	1.2	6.2	C

Result: Pass



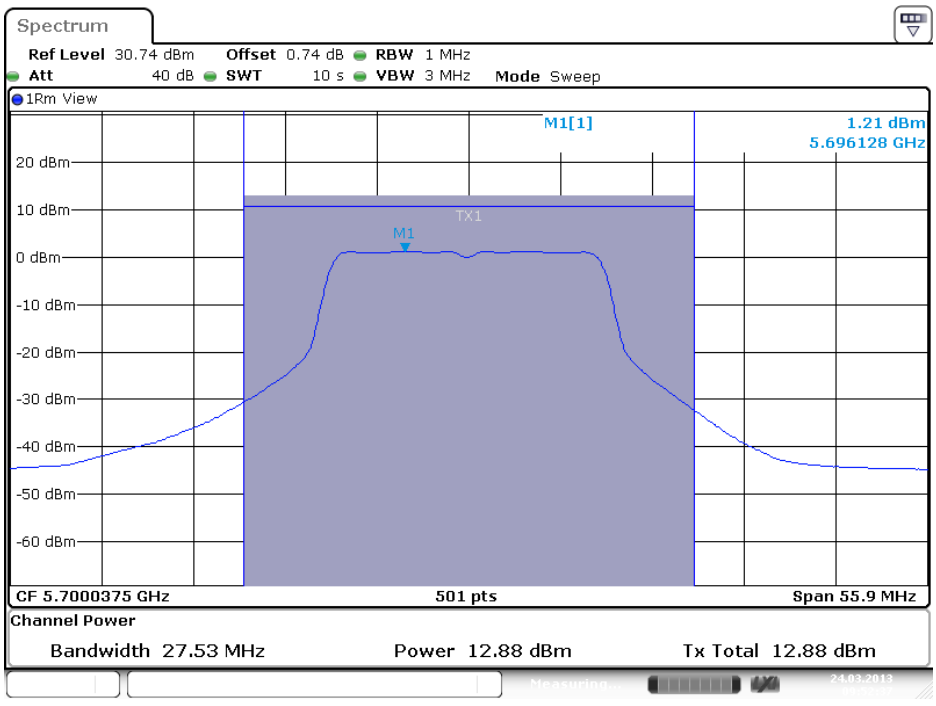
Date: 24.MAR.2013 08:02:26

Plot A



Date: 24.MAR.2013 09:10:47

Plot B



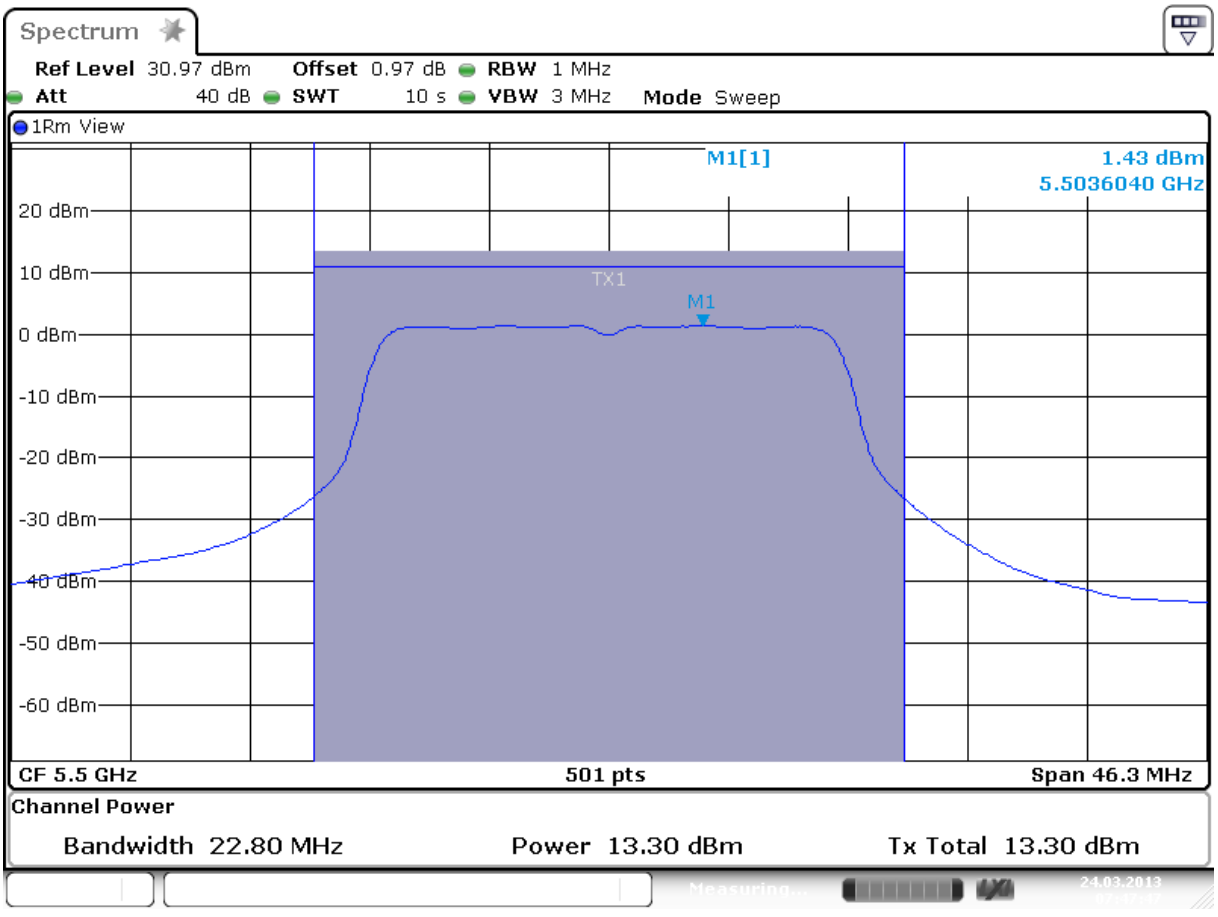
Date: 24.MAR.2013 09:52:37

Plot C

Operation mode: HT4 20 MHz, Antenna 1

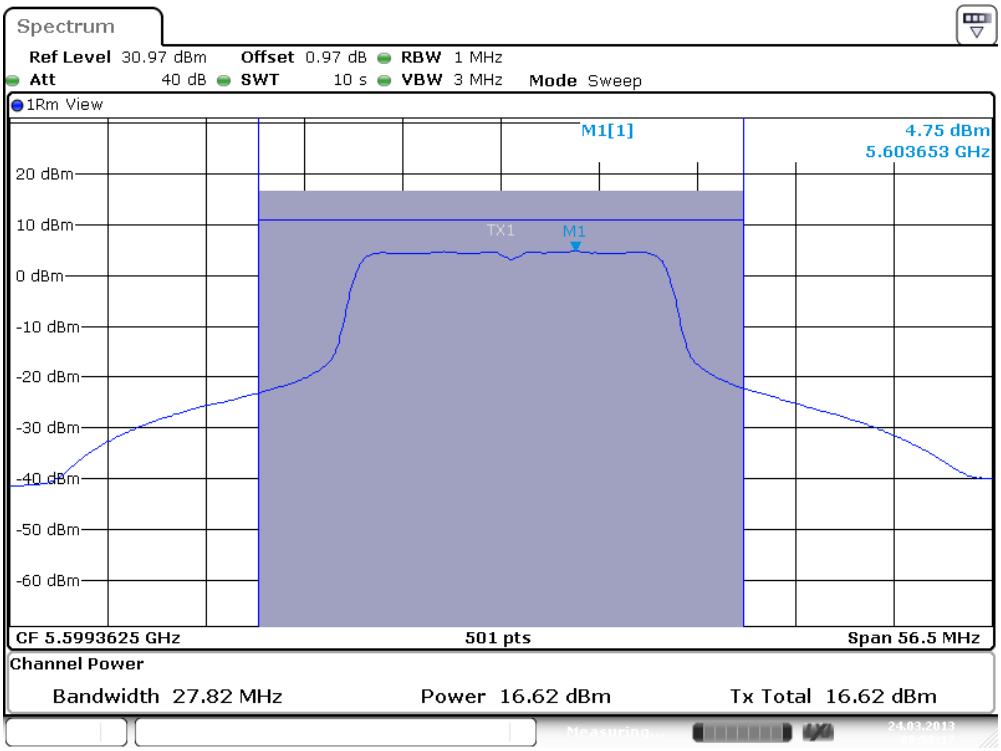
Frequency [MHz]	Maximum conducted output power [dBm]	Maximum conducted output power e.i.r.p. [dBm]	PPSD/MHz [dBm]	PPSD/MHz e.i.r.p. [dBm]	Plot number
5500	13.3	18.3	1.4	6.4	A
5580	16.6	21.6	4.7	9.7	B
5700	12.3	17.3	0.4	5.4	C

Result: Pass



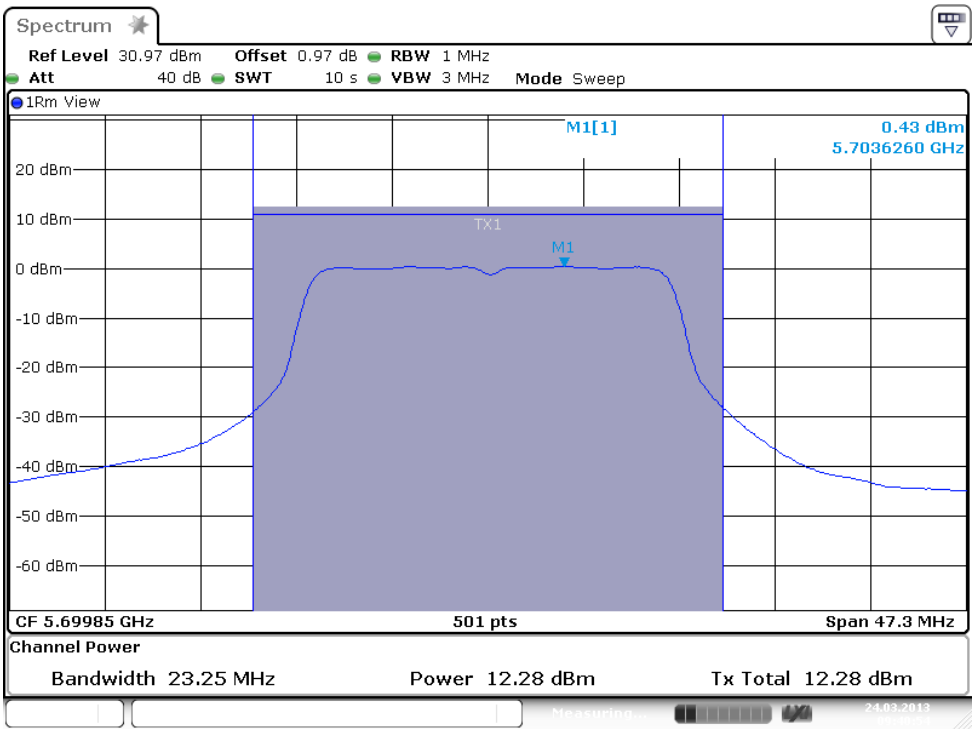
Date: 24.MAR.2013 07:47:47

Plot A



Date: 24.MAR.2013 08:58:17

Plot B



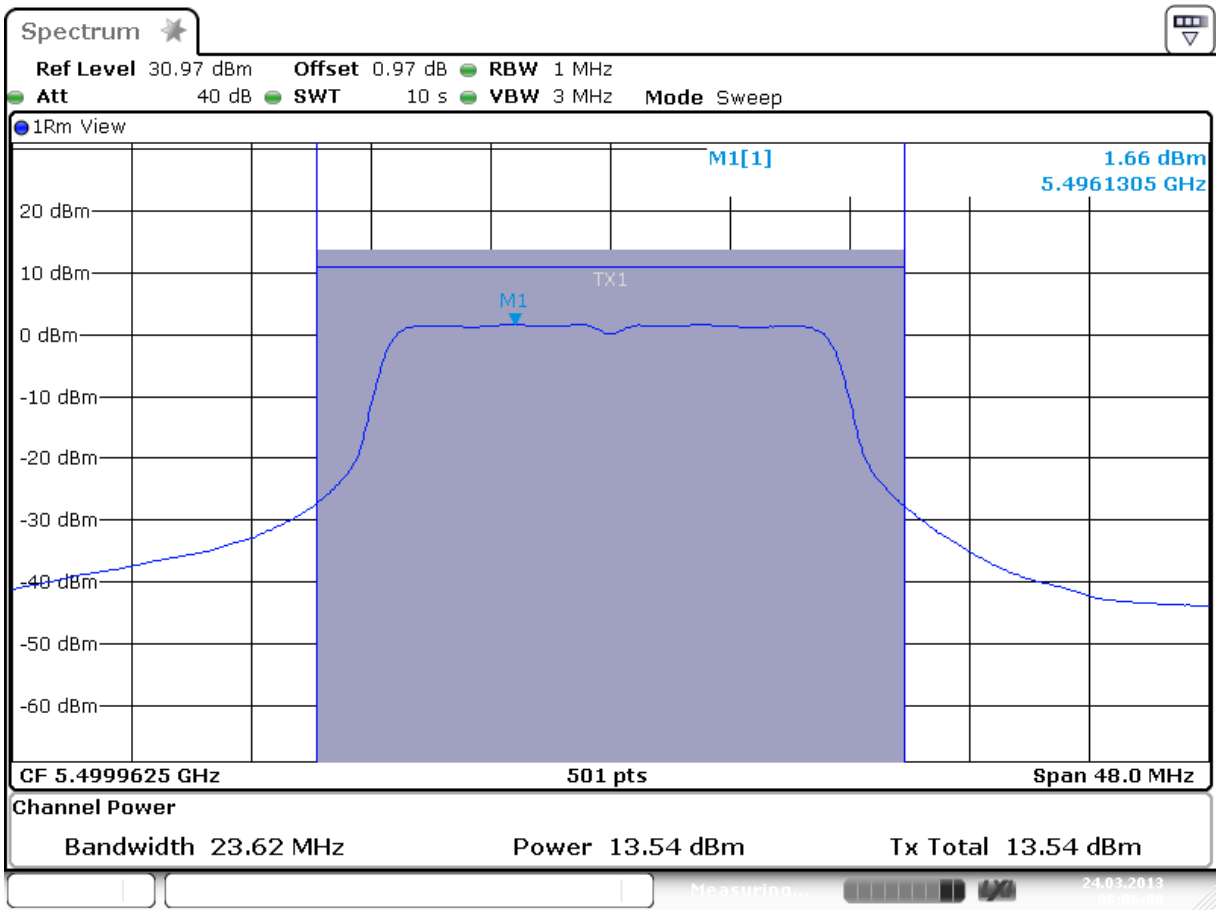
Date: 24.MAR.2013 09:40:54

Plot C

Operation mode: HT4 20 MHz, Antenna 2

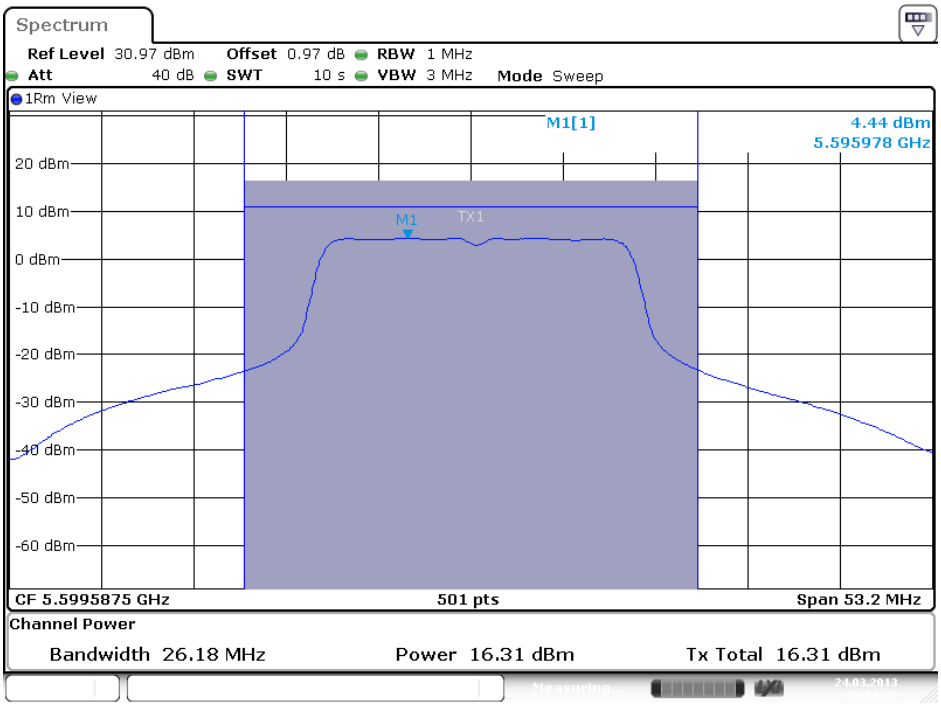
Frequency [MHz]	Maximum conducted output power [dBm]	Maximum conducted output power e.i.r.p. [dBm]	PPSD/MHz [dBm]	PPSD/MHz e.i.r.p. [dBm]	Plot number
5500	13.5	18.5	1.7	6.7	A
5580	16.3	21.3	4.4	9.4	B
5700	13.1	18.1	1.2	6.2	C

Result: Pass



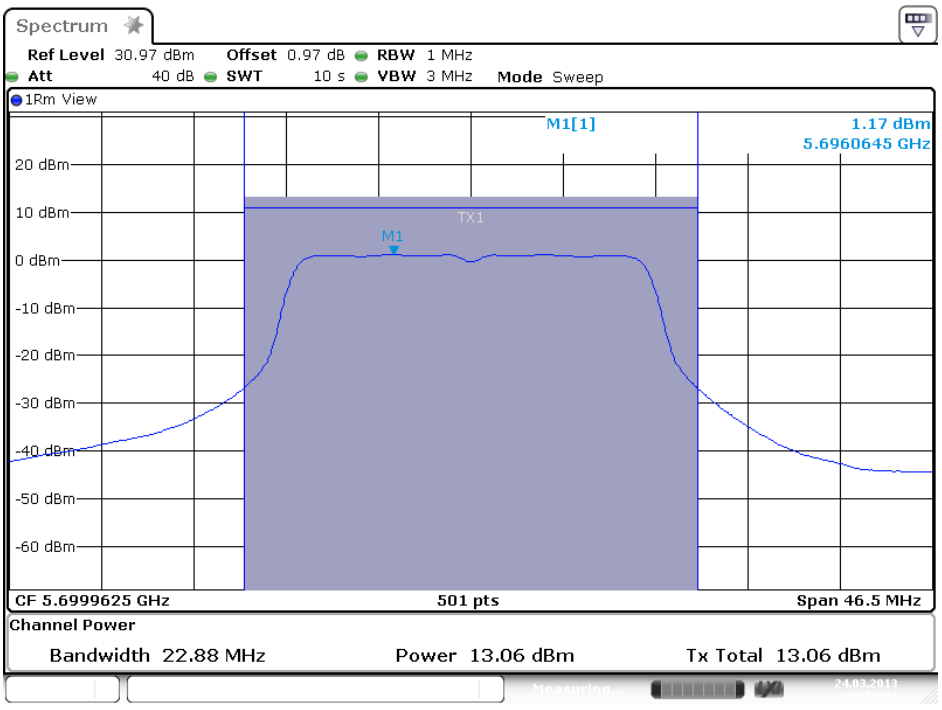
Date: 24.MAR.2013 08:06:01

Plot A



Date: 24.MAR.2013 09:14:46

Plot B



Date: 24.MAR.2013 09:56:23

Plot C

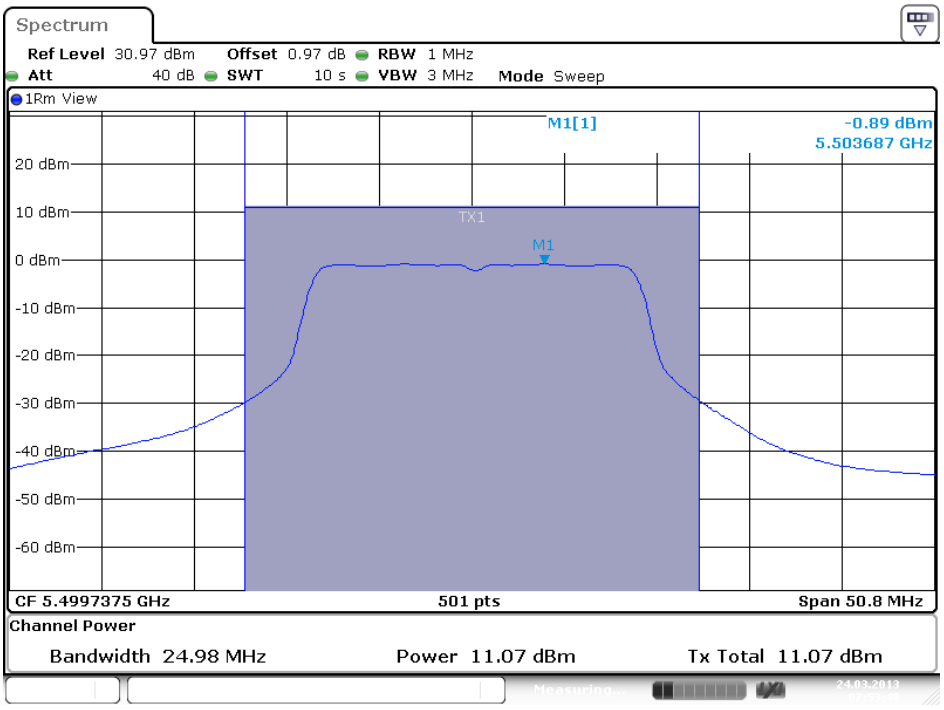
Operation mode: HT8 20 MHz, Antenna 1+2

Frequency [MHz]	Maximum conducted output power Antenna 1 [dBm]	Maximum conducted output power Antenna 2 [dBm]	Maximum conducted output power Antenna 1+ Antenna 2 [dBm]	Maximum conducted output power e.i.r.p. [dBm]	PPSD/MHz [dBm][1]	PPSD/MHz e.i.r.p. [dBm]	Plot number
5500	11.1	10.7	13.9 (25.5mW)	18.9	2.1	7.1	A
5580	13.3	13.3	16.5 (44.7mW)	21.5	1.6	6.6	B
5700	10.5	10.6	13.6 (=22.9mW)	18.6	1.6	6.6	C

Result: Pass

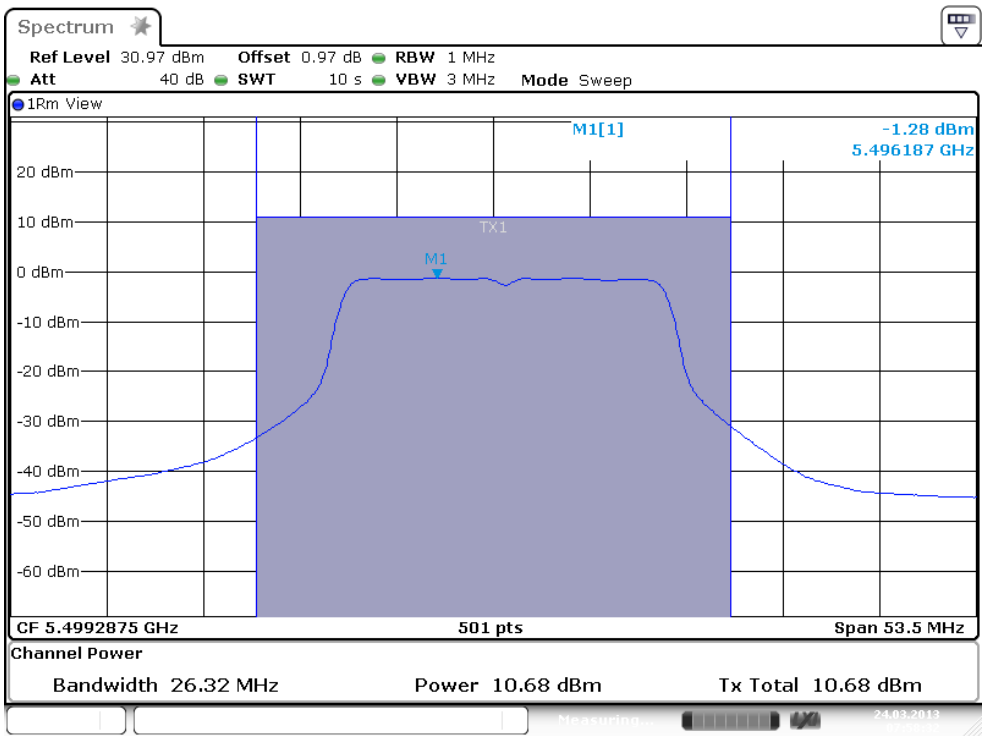
Note 1: The quantity 10*log 2 (two antennas) is added to the spectrum peak value according to document 662911 D01.

See plots on the next pages.



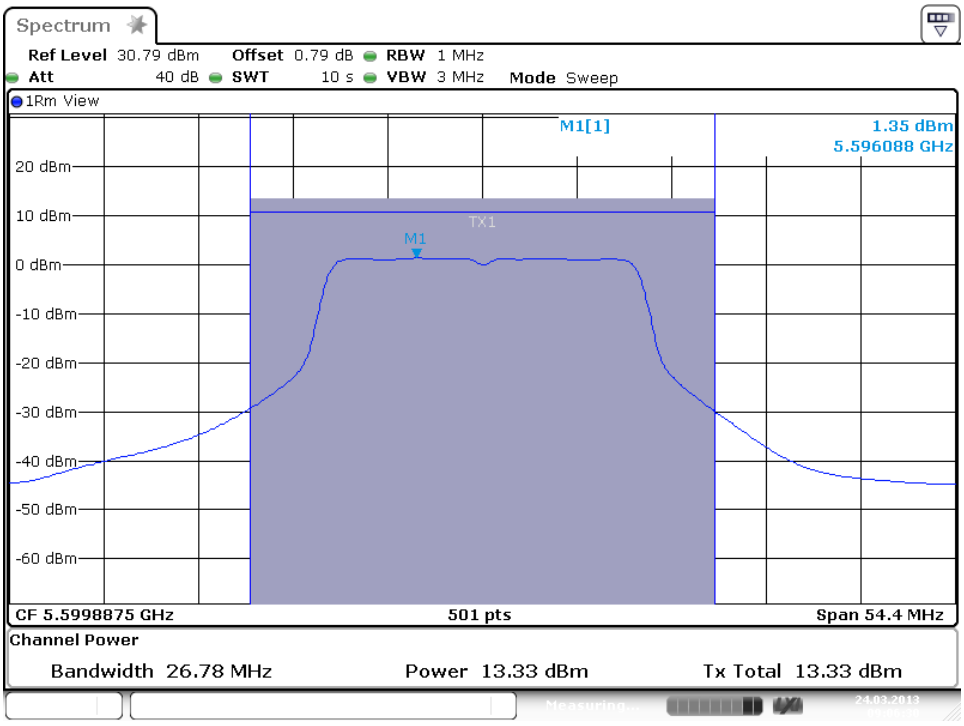
Date: 24.MAR.2013 07:53:41

Plot A1 Antenna 1



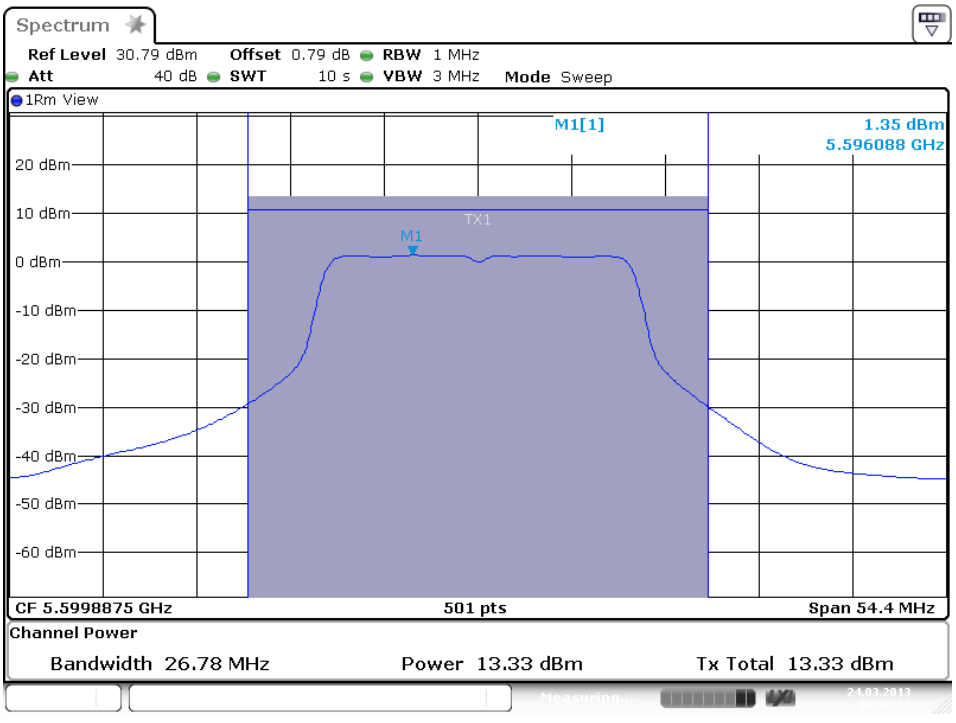
Date: 24.MAR.2013 07:58:32

Plot A2 Antenna 2



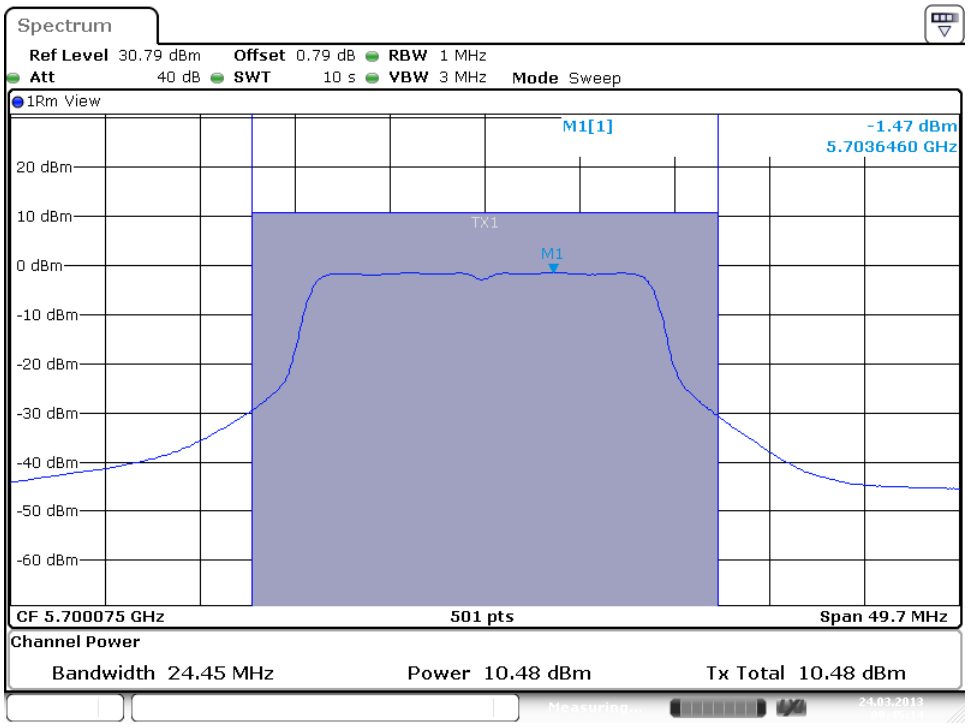
Date: 24.MAR.2013 09:06:30

Plot B1 Antenna 1



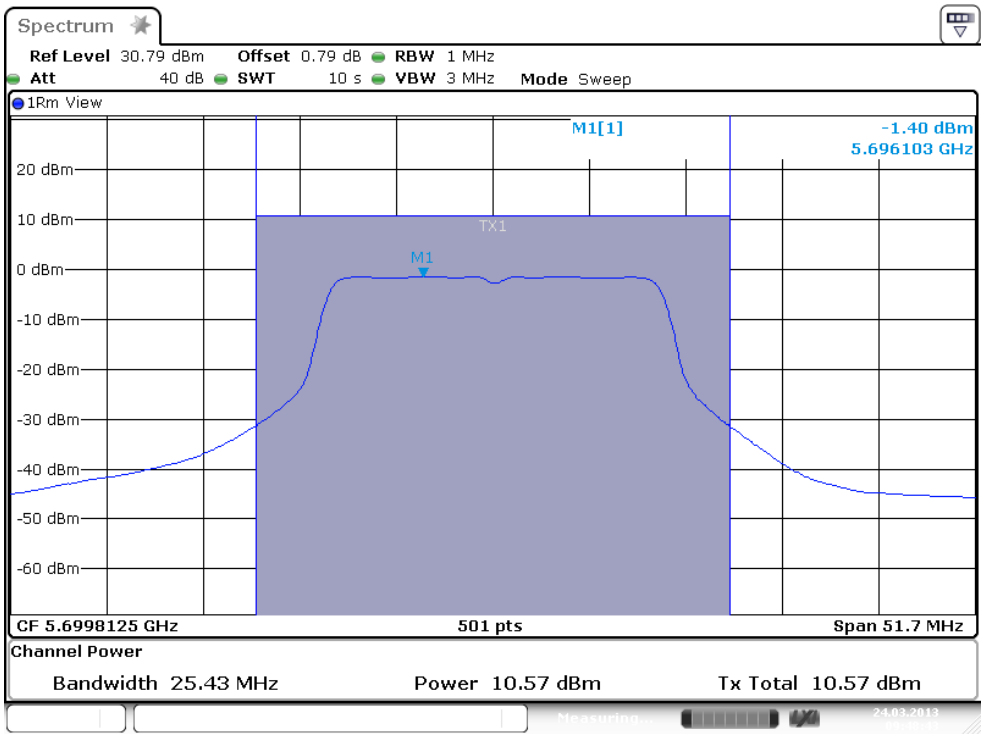
Date: 24.MAR.2013 09:06:30

Plot B2 Antenna 2



Date: 24.MAR.2013 09:45:15

Plot C1 Antenna 1



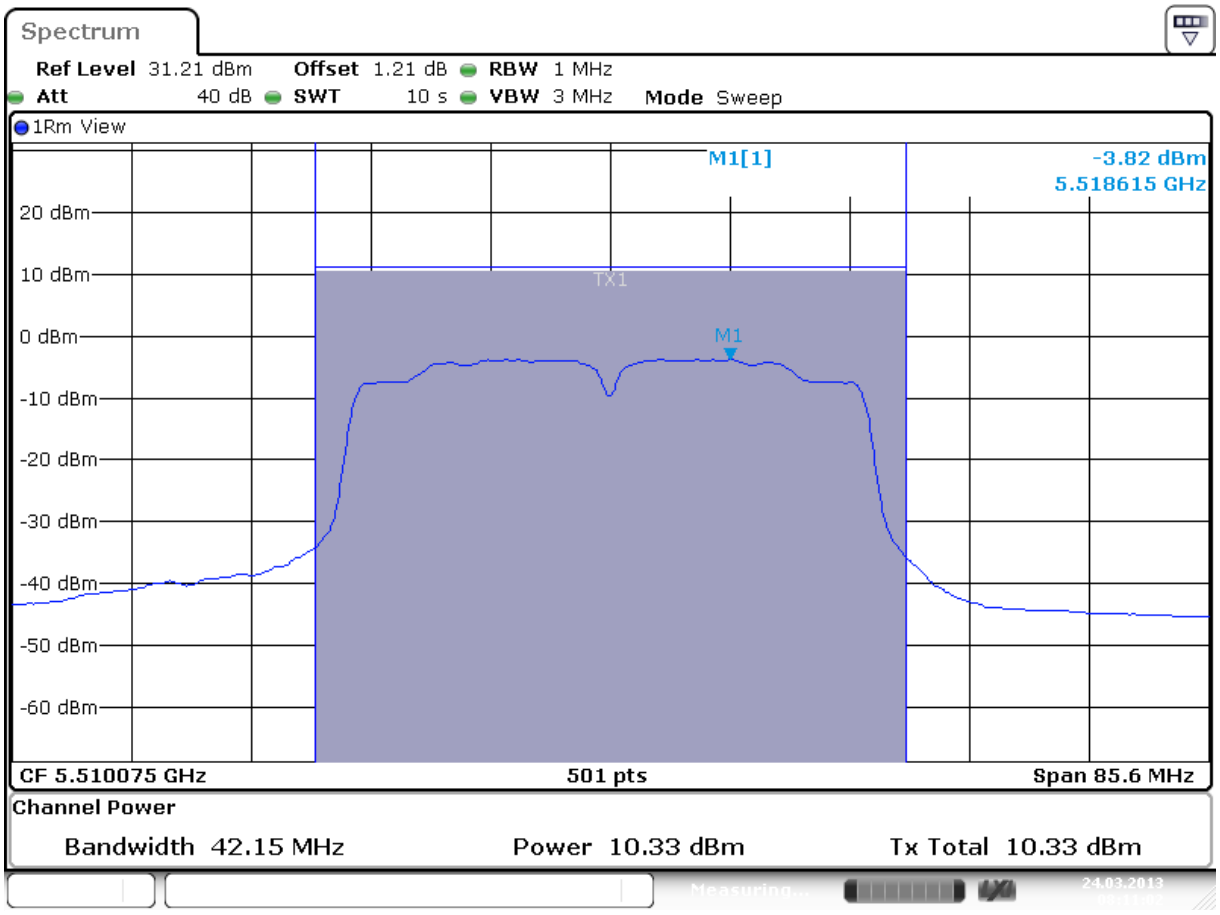
Date: 24.MAR.2013 09:48:43

Plot C2 Antenna2

Operation mode: HT4 40 MHz, Antenna 1

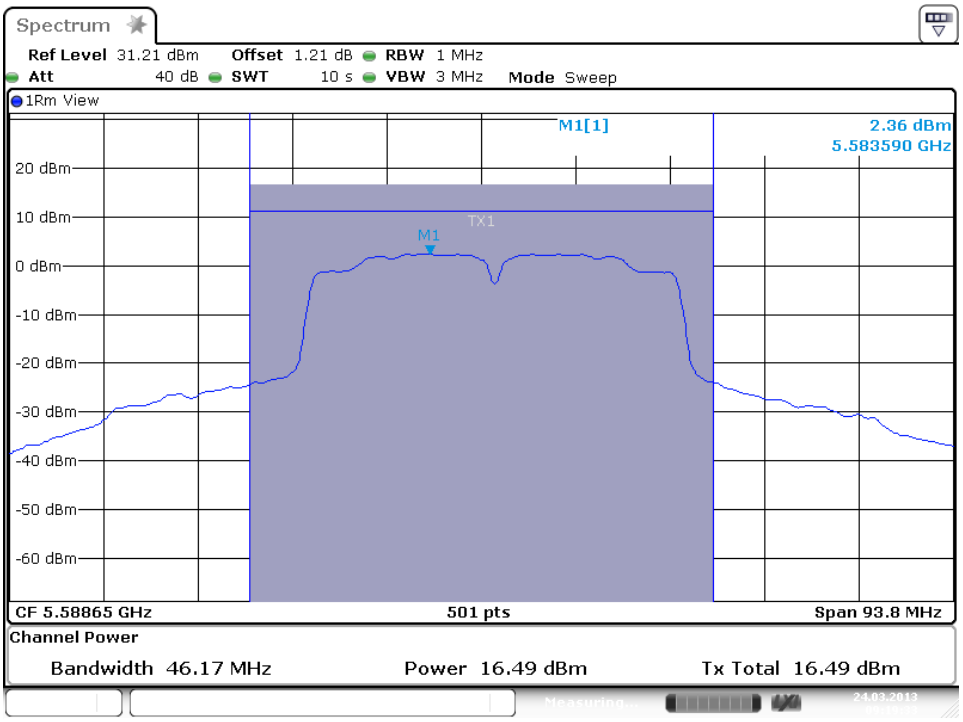
Frequency [MHz]	Maximum conducted output power [dBm]	Maximum conducted output power e.i.r.p. [dBm]	PPSD/MHz [dBm]	PPSD/MHz e.i.r.p. [dBm]	Plot number
5510	10.3	15.3	-3.8	1.2	A
5590	16.5	21.5	2.4	7.4	B
5670	15.6	20.6	1.5	6.5	C

Result: Pass



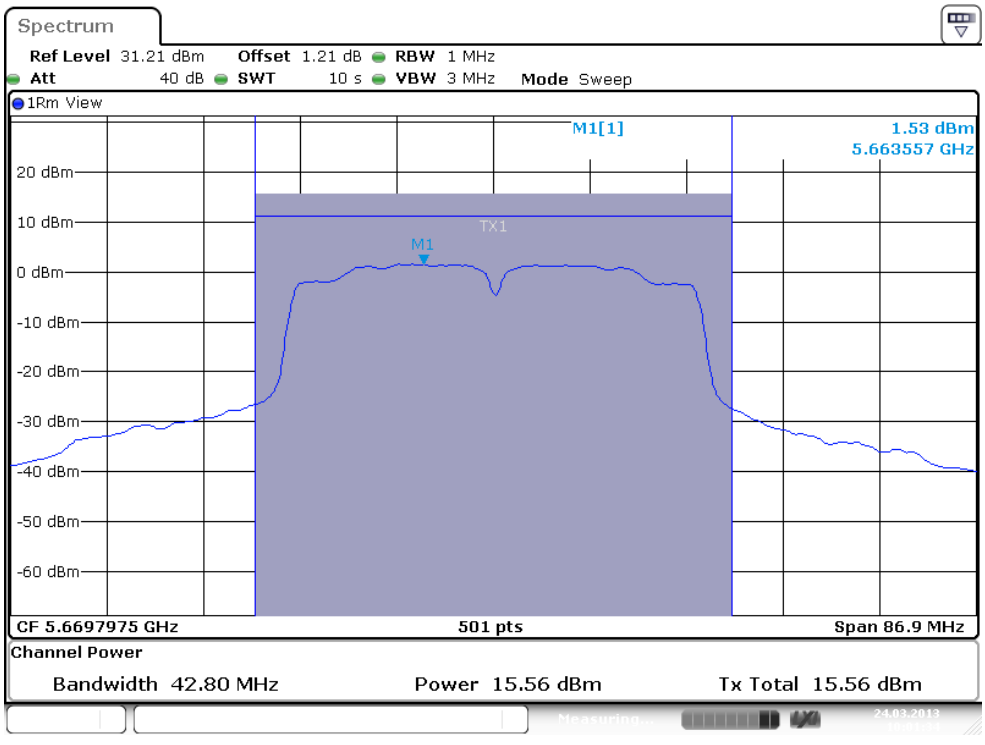
Date: 24.MAR.2013 08:11:02

Plot A



Date: 24.MAR.2013 09:19:32

Plot B



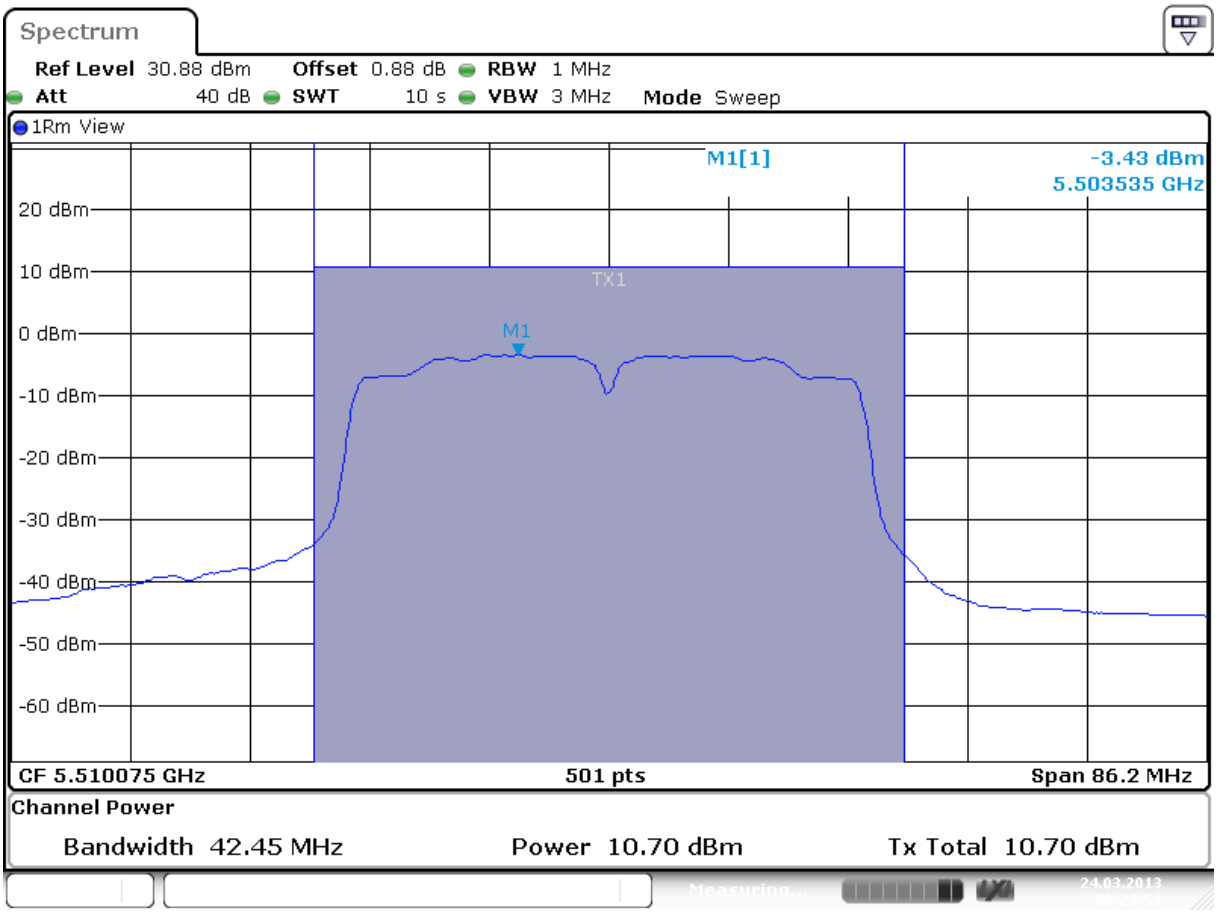
Date: 24.MAR.2013 10:01:34

Plot C

Operation mode: HT4 40 MHz, Antenna 2

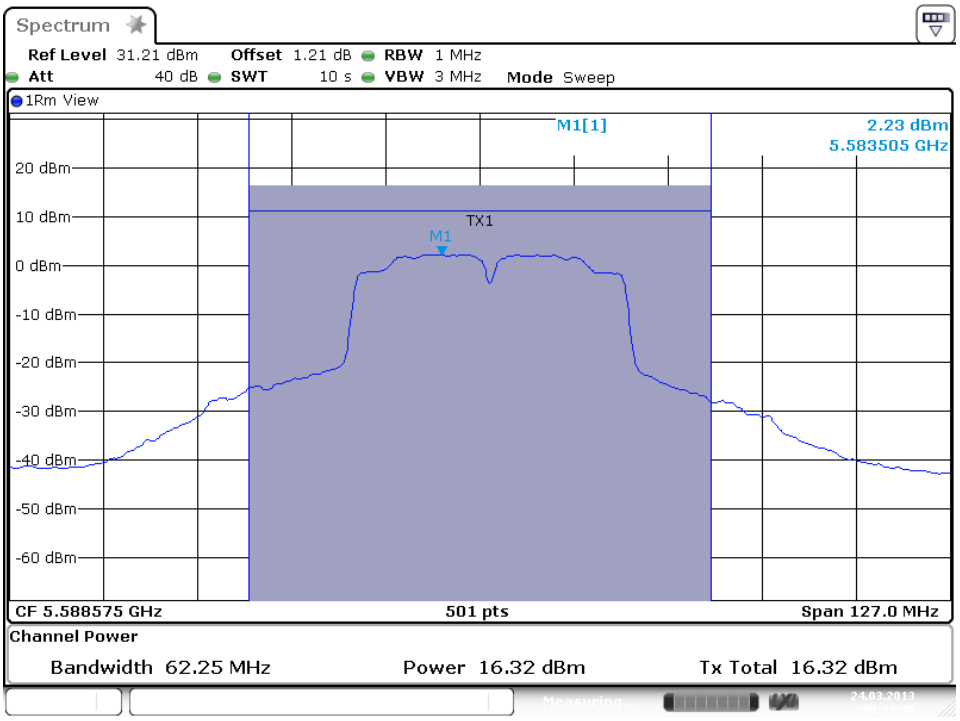
Frequency [MHz]	Maximum conducted output power [dBm]	Maximum conducted output power e.i.r.p. [dBm]	PPSD/MHz [dBm]	PPSD/MHz e.i.r.p. [dBm]	Plot number
5510	10.7	15.7	-3.4	1.6	A
5590	16.3	21.3	2.2	7.2	B
5670	15.5	20.5	1.5	6.5	C

Result: Pass



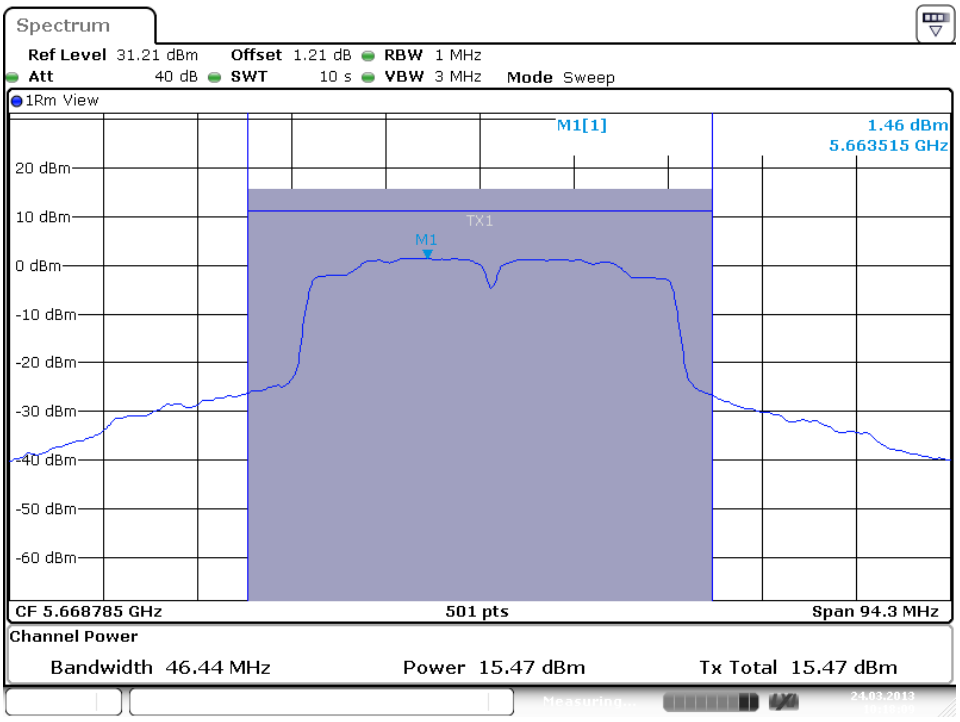
Date: 24.MAR.2013 08:21:51

Plot A



Date: 24.MAR.2013 09:33:36

Plot B



Date: 24.MAR.2013 10:18:09

Plot C

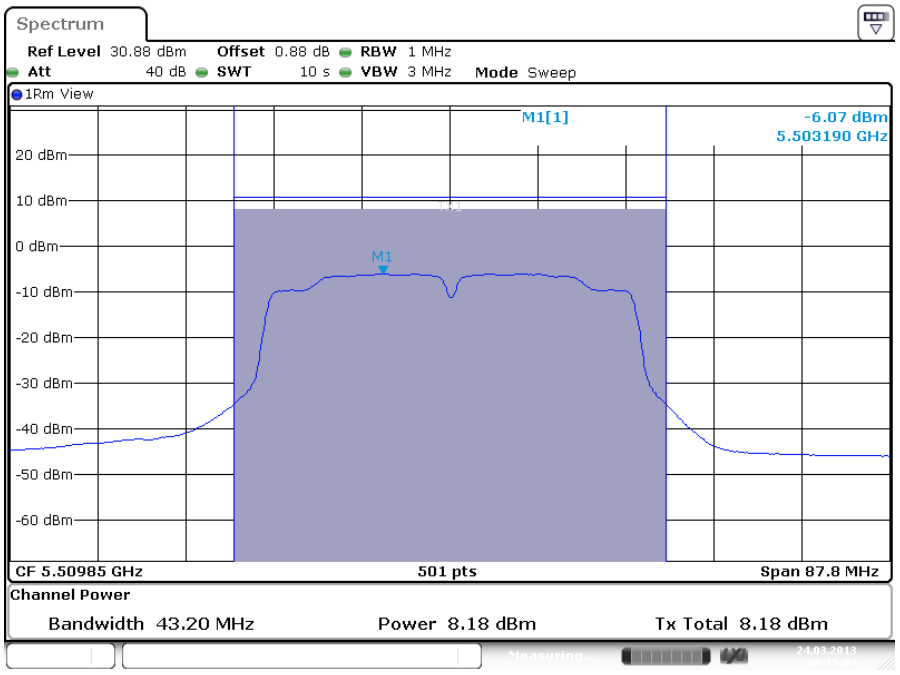
Operation mode: HT8 40 MHz, Antenna 1+2

Frequency [MHz]	Maximum conducted output power Antenna 1 [dBm]	Maximum conducted output power Antenna 2 [dBm]	Maximum conducted output power Antenna 1+ Antenna 2 [dBm]	Maximum conducted output power e.i.r.p. [dBm]	PPSD/MHz [dBm][1]	PPSD/MHz e.i.r.p. [dBm]	Plot number
5510	8.2	8.0	11.1 (12.9mW)	16.1	-3.1	1.9	A
5590	13.4	13.4	16.4 (43.7mW)	21.4	2.3	7.3	B
5670	13.2	13.9	16.6 (45.7mW)	21.6	2.8	7.8	C

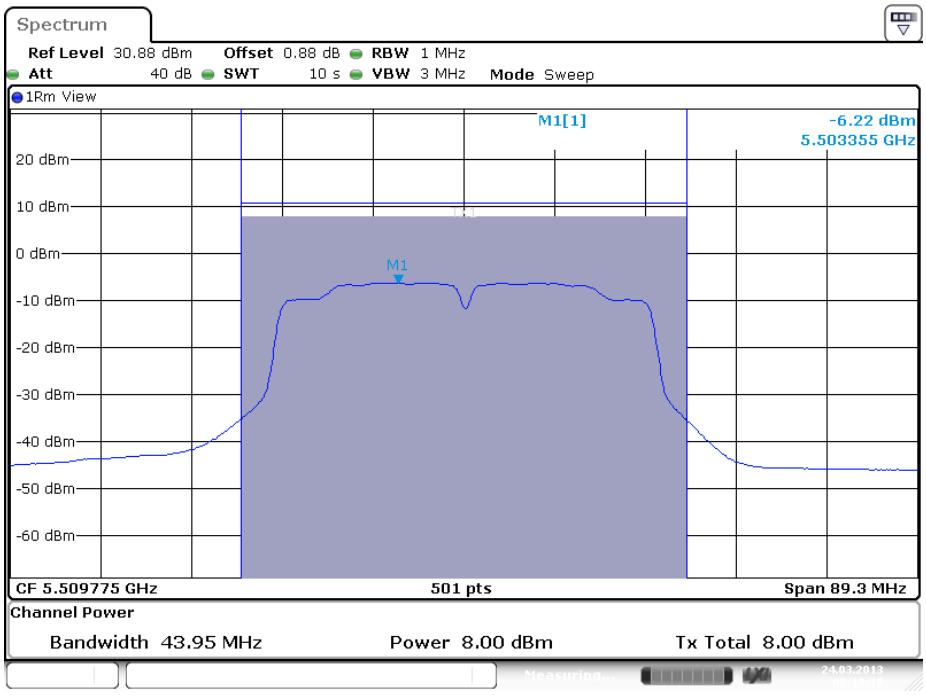
Result: Pass

Note 1: The quantity 10*log 2 (two antennas) is added to the spectrum peak value according to document 662911 D01.

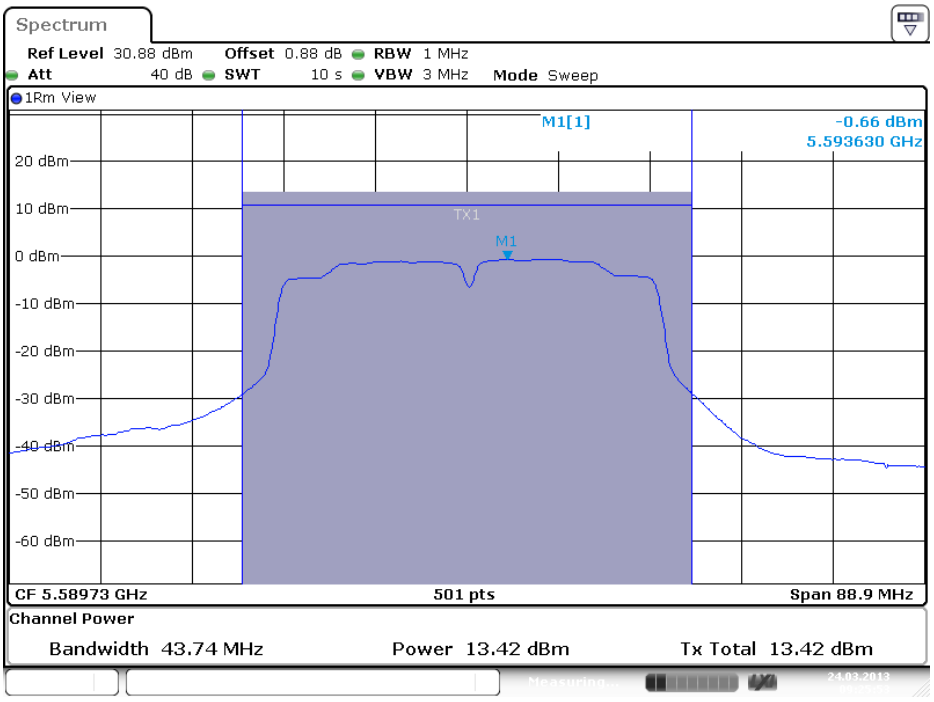
See plots on the next pages.



Plot A1 Antenna 1

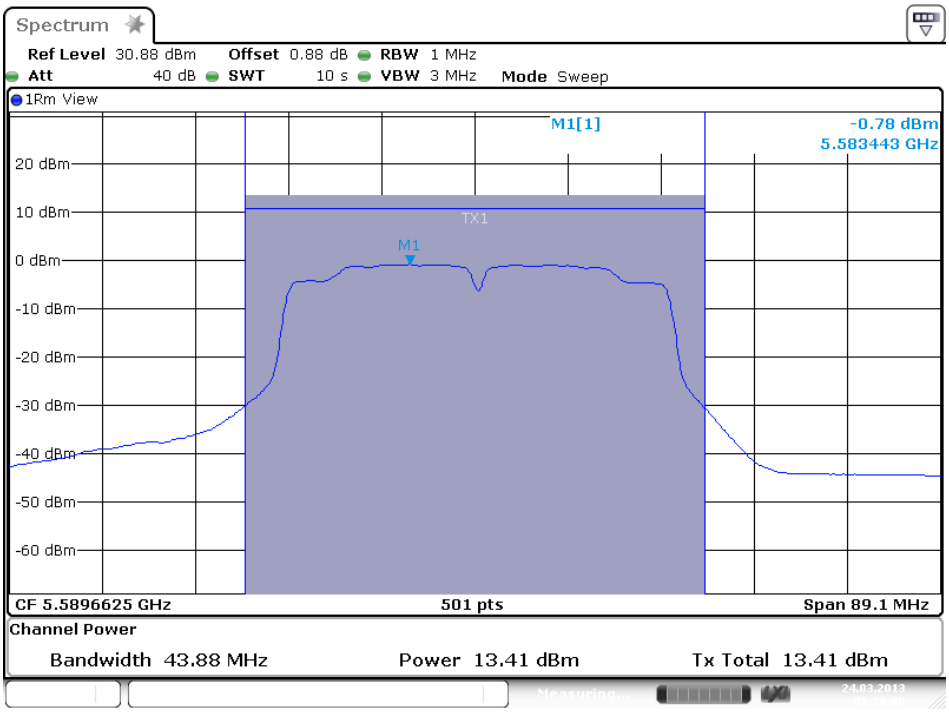


Plot A2 Antenna 2



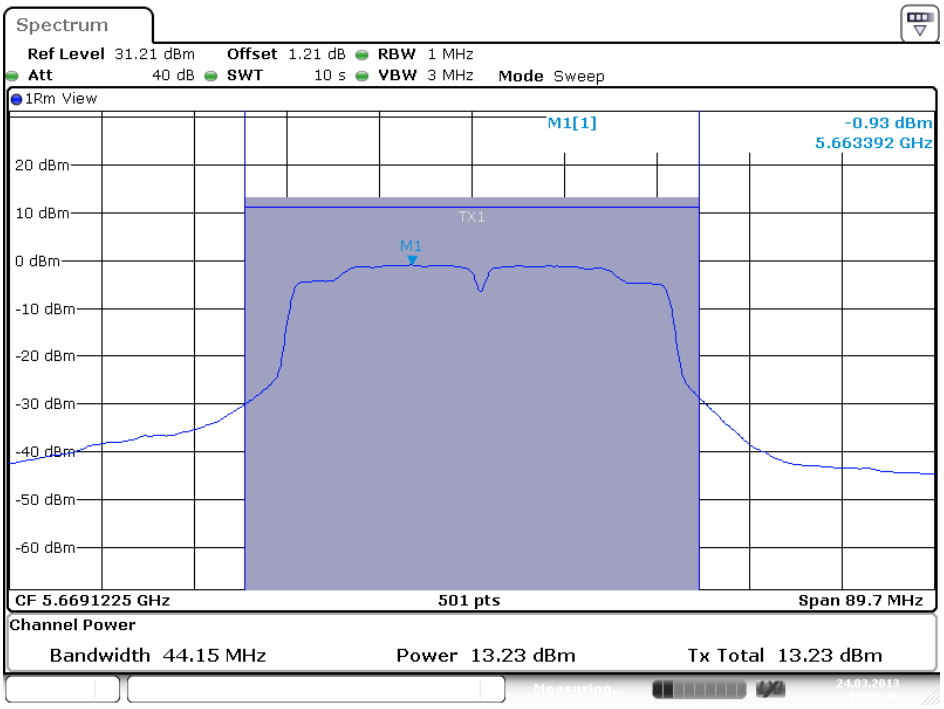
Date: 24.MAR.2013 09:25:53

Plot B1 Antenna 1



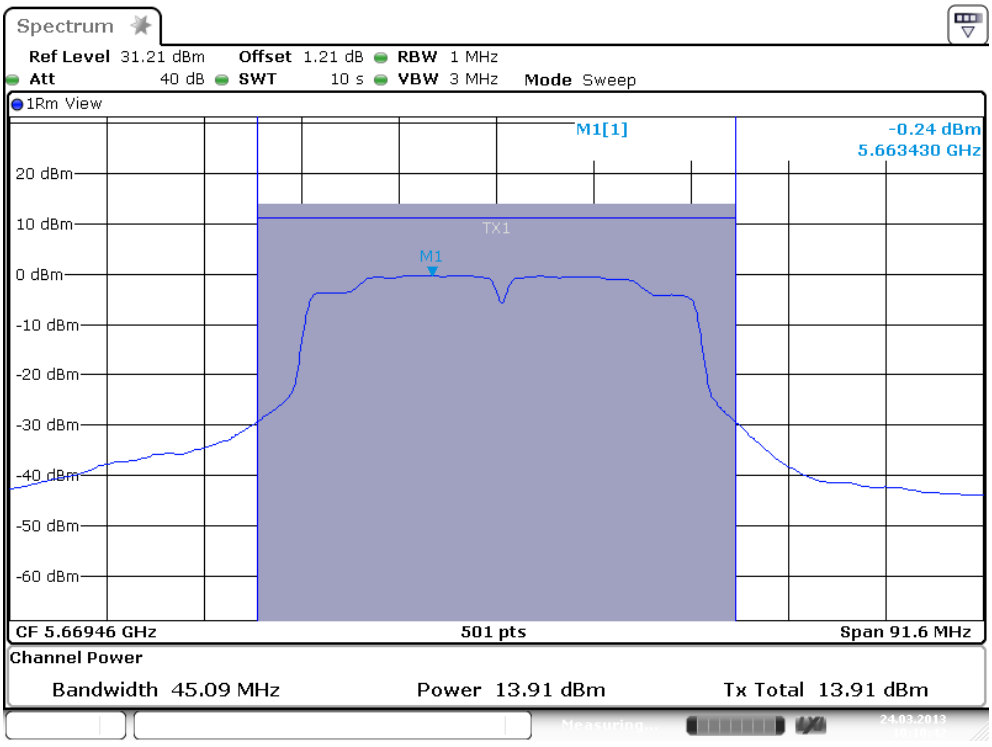
Date: 24.MAR.2013 09:29:00

Plot B2 Antenna 2



Date: 24.MAR.2013 10:06:47

Plot C1 Antenna 1



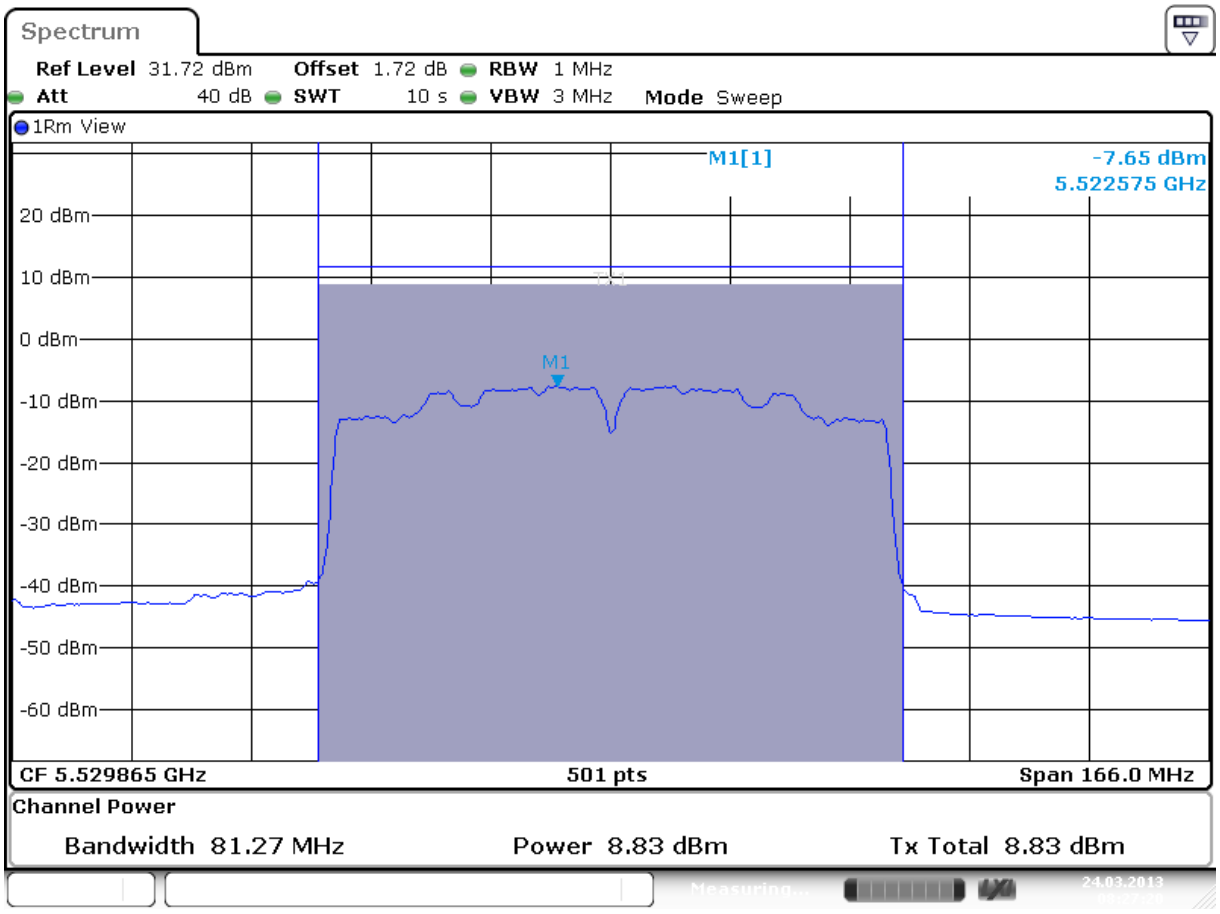
Date: 24.MAR.2013 10:10:43

Plot C2 Antenna 2

Operation mode: VHT6 80 MHz, Antenna 1

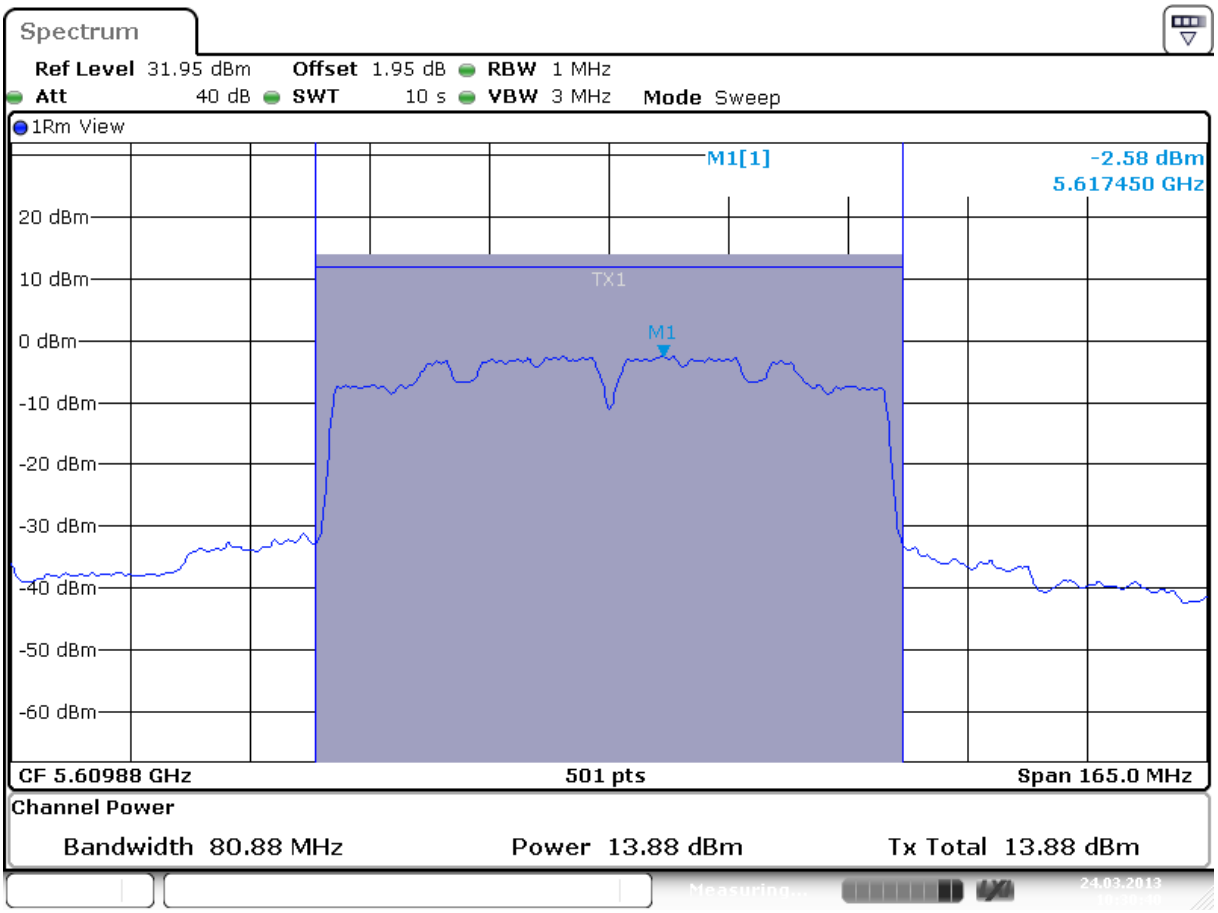
Frequency [MHz]	Maximum conducted output power [dBm]	Maximum conducted output power e.i.r.p. [dBm]	PPSD/MHz [dBm]	PPSD/MHz e.i.r.p. [dBm]	Plot number
5530	8.8	13.8	-7.7	-2.7	A
5610	13.9	18.9	-2.7	2.3	B1+B2

Result: Pass



Date: 24.MAR.2013 08:27:20

Plot A



Date: 24.MAR.2013 10:30:40

Plot B

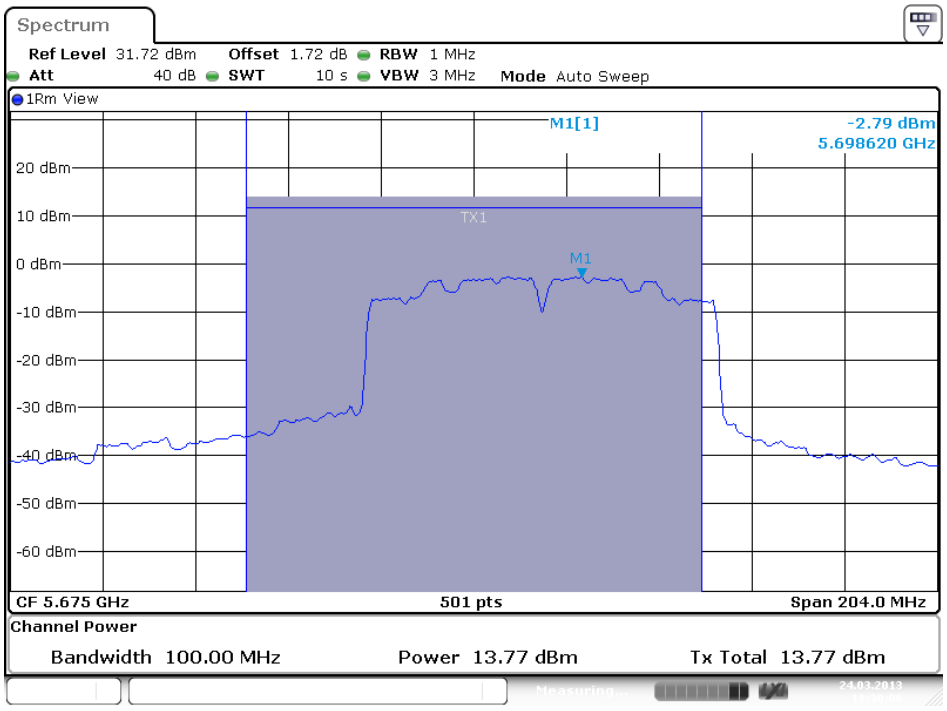
Operation mode: VHT6 80 MHz, Antenna 1

Freq-uency [MHz]	Maximum conducted output power per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	Maximum conducted output power e.i.r.p. per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	PPSD/MHz per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	Total PPSD/MHz e.i.r.p. per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm][1]
5690	13.8 / -3.6	18.8 / 2.4	-2.8 / -8.4	2.2 / -3.4

Result: Pass

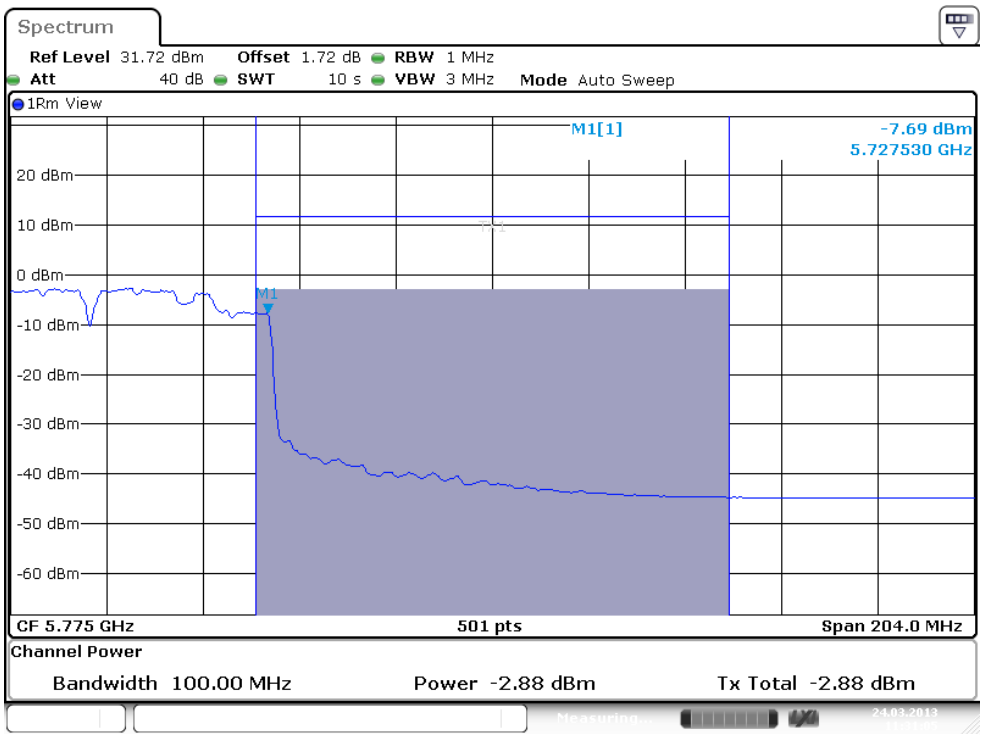
Note 1: The quantity 10*log 2 (two antennas) is added to the spectrum peak value according to document 662911 D01.

See plots on next pages.



Date: 24.MAR.2013 11:30:06

Plot VHT6 80 MHz, Antenna 1 U-NII 2 ext



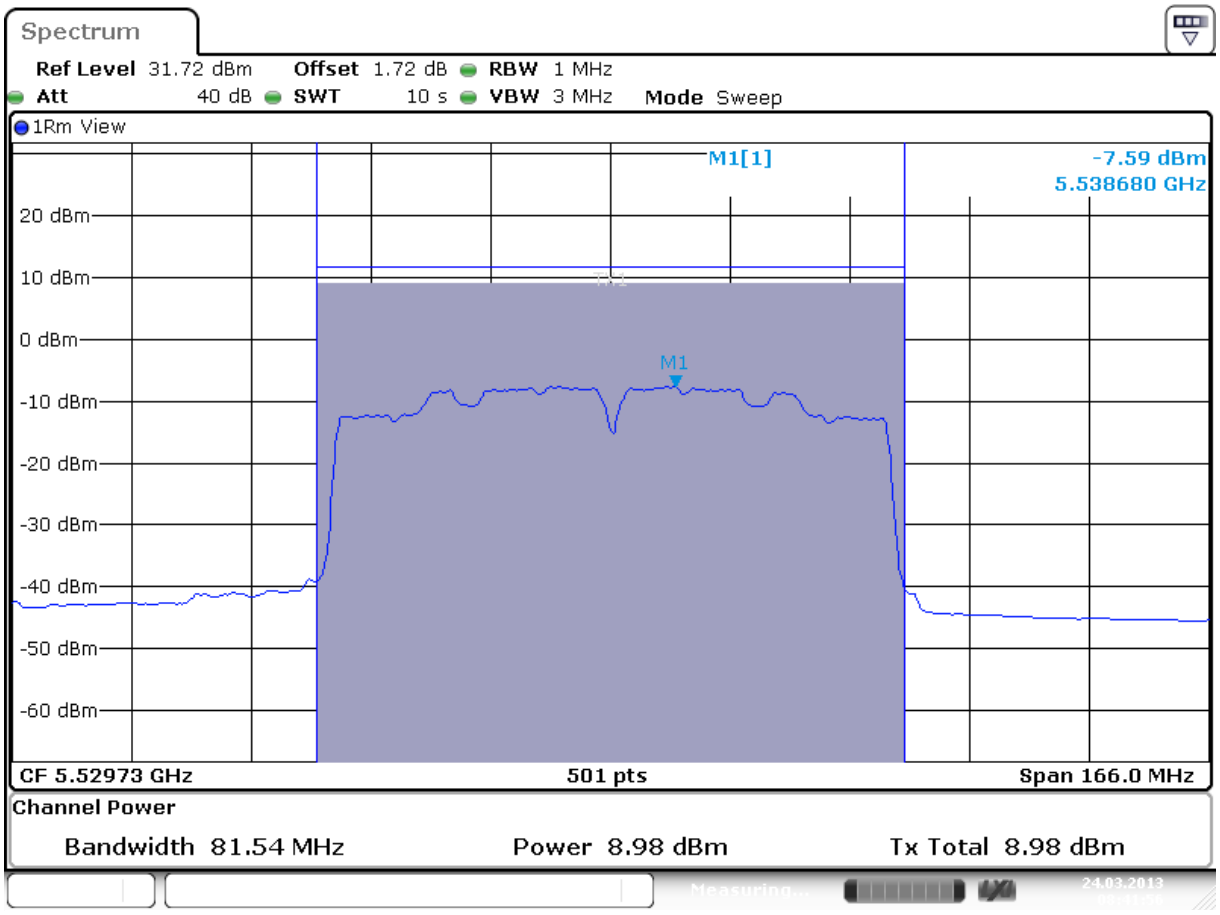
Date: 24.MAR.2013 11:31:06

Plot VHT6 80 MHz, Antenna 1 U-NII 3

Operation mode: VHT6 80 MHz, Antenna 2

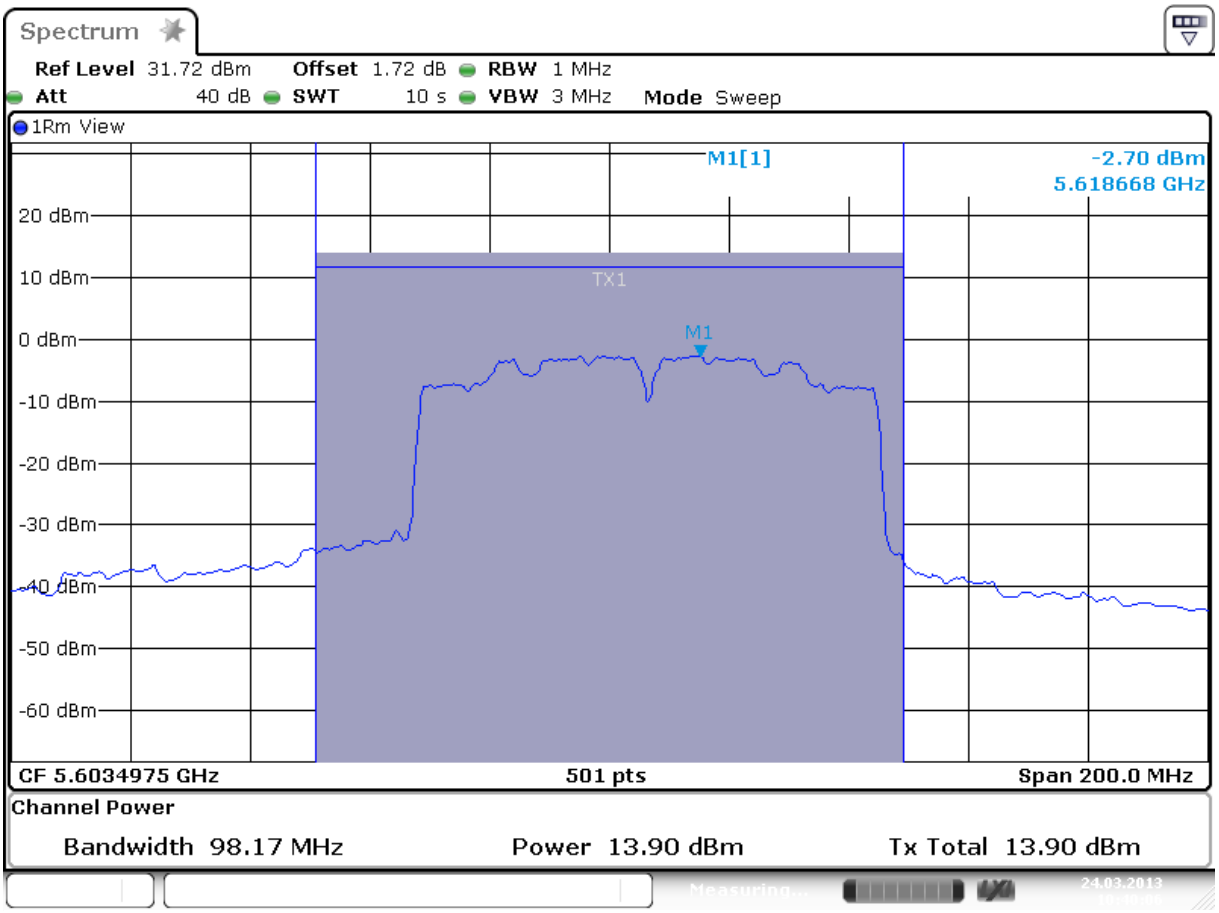
Frequency [MHz]	Maximum conducted output power [dBm]	Maximum conducted output power e.i.r.p. [dBm]	PPSD/MHz [dBm]	PPSD/MHz e.i.r.p. [dBm]	Plot number
5530	9.0	14.0	-7.6	-2.6	
5610	13.9	18.9	-2.7	2.3	A

Result: Pass



Date: 24.MAR.2013 08:41:56

Plot A



Date: 24.MAR.2013 10:40:06

Plot B

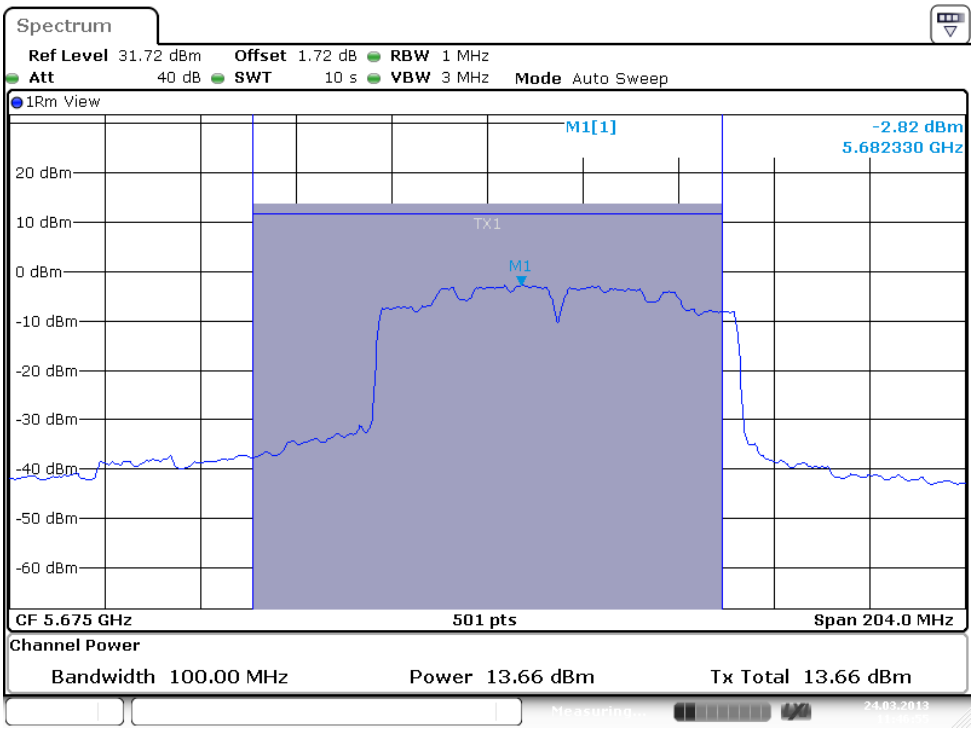
Operation mode: VHT6 80 MHz, Antenna 2

Freq-uency [MHz]	Maximum conducted output power per subband Antenna 2 U-NII 2ext/U-NII_3 [dBm]	Maximum conducted output power e.i.r.p. per subband Antenna 2 U-NII 2ext/U-NII_3 [dBm]	PPSD/MHz per subband Antenna 2 U-NII 2ext/U-NII_3 [dBm]	Total PPSD/MHz e.i.r.p. per subband Antenna 2 U-NII 2ext/U-NII_3 [dBm][1]
5690	13.7 / -3.2	18.7 / 2.8	-2.8 / -8.0	2.2 / -3.0

Result: Pass

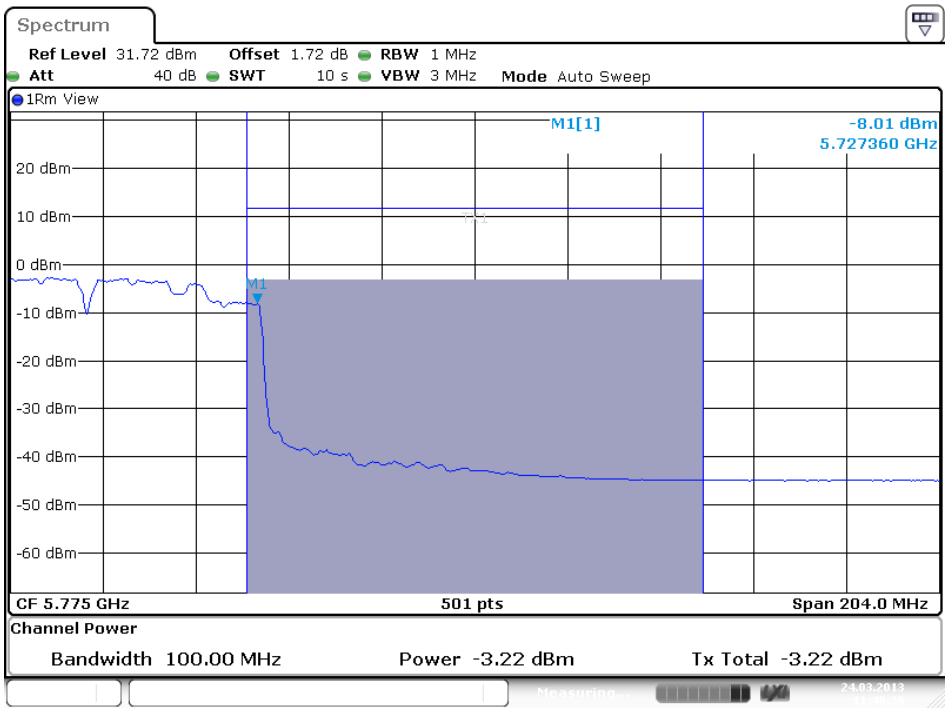
Note 1: The quantity 10*log 2 (two antennas) is added to the spectrum peak value according to document 662911 D01.

See plots on next pages.



Date: 24.MAR.2013 11:46:55

Plot VHT6 80 MHz, Antenna 2 U-NII 2 ext



Date: 24.MAR.2013 11:48:39

Plot VHT6 80 MHz, Antenna 2 U-NII 3

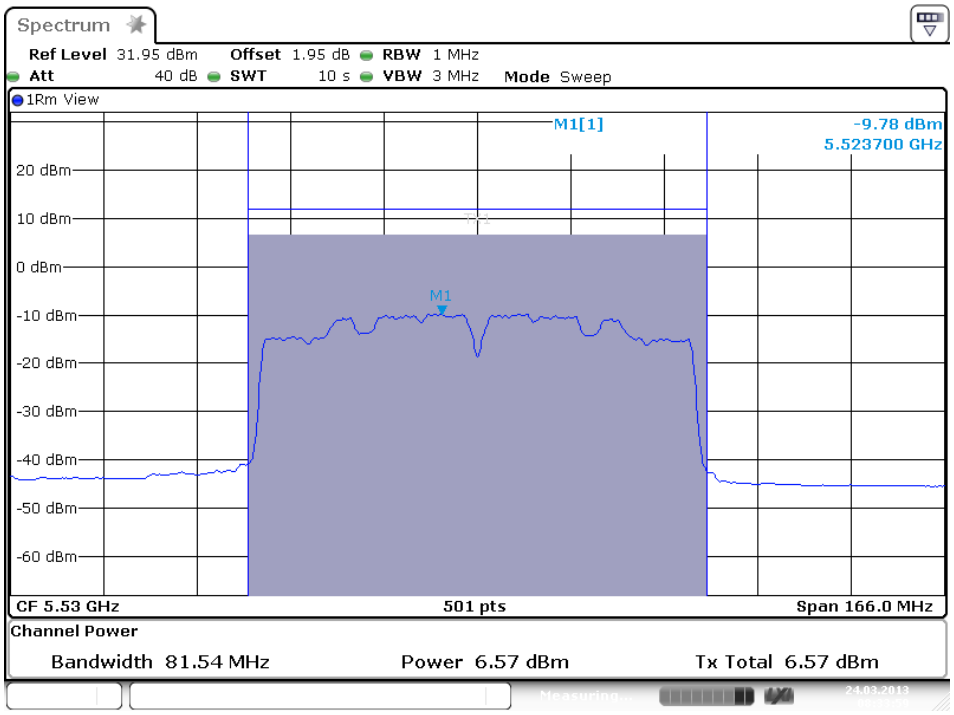
Operation mode: VHT6 80 MHz, Antenna 1+2

Frequency [MHz]	Maximum conducted output power Antenna 1 [dBm]	Maximum conducted output power Antenna 2 [dBm]	Maximum conducted output power Antenna 1+ Antenna 2 [dBm]	Maximum conducted output power e.i.r.p. [dBm]	PPSD/MHz [dBm][1]	PPSD/MHz e.i.r.p. [dBm]	Plot number
5530	6.6	6.8	9.7 (9.3mW)	14.7	-6.6	-1.6	A
5690	13.5	13.9	16.6 (45.7mW)	21.6	0.4	5.4	B

Result: Pass

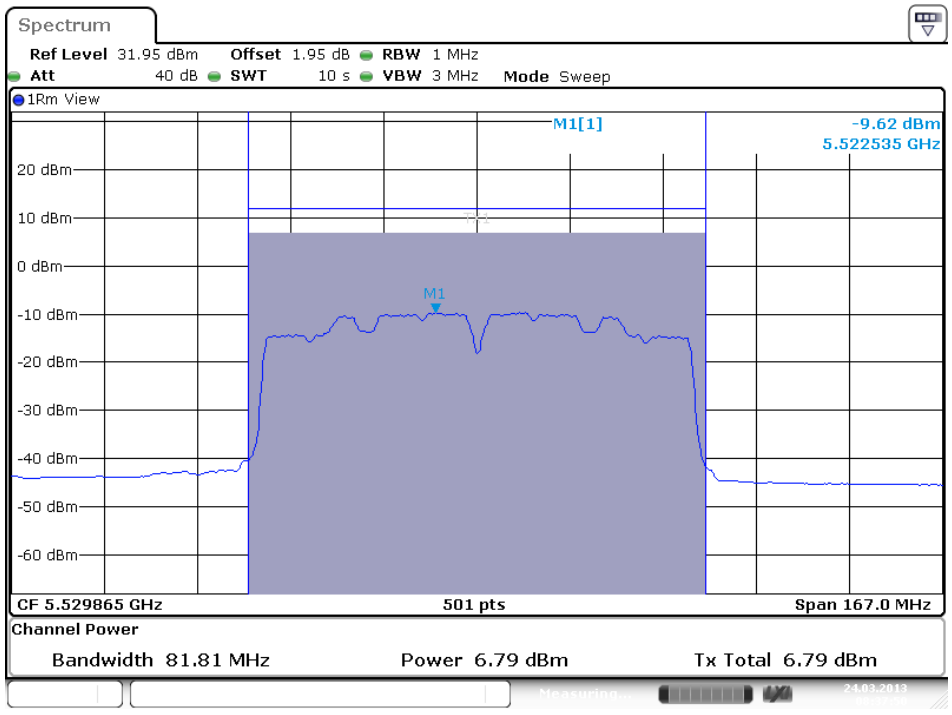
Note 1: The quantity 10*log 2 (two antennas) is added to the spectrum peak value according to document 662911 D01.

See plots on next pages.



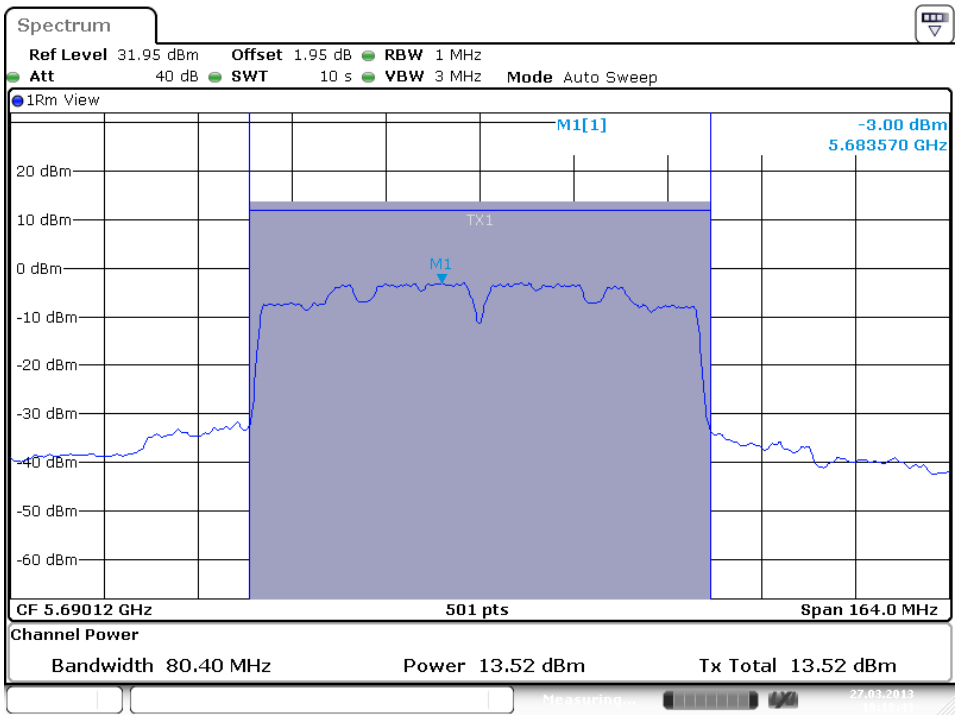
Date: 24.MAR.2013 08:33:59

Plot A1 Antenna 1 at 5530 MHz



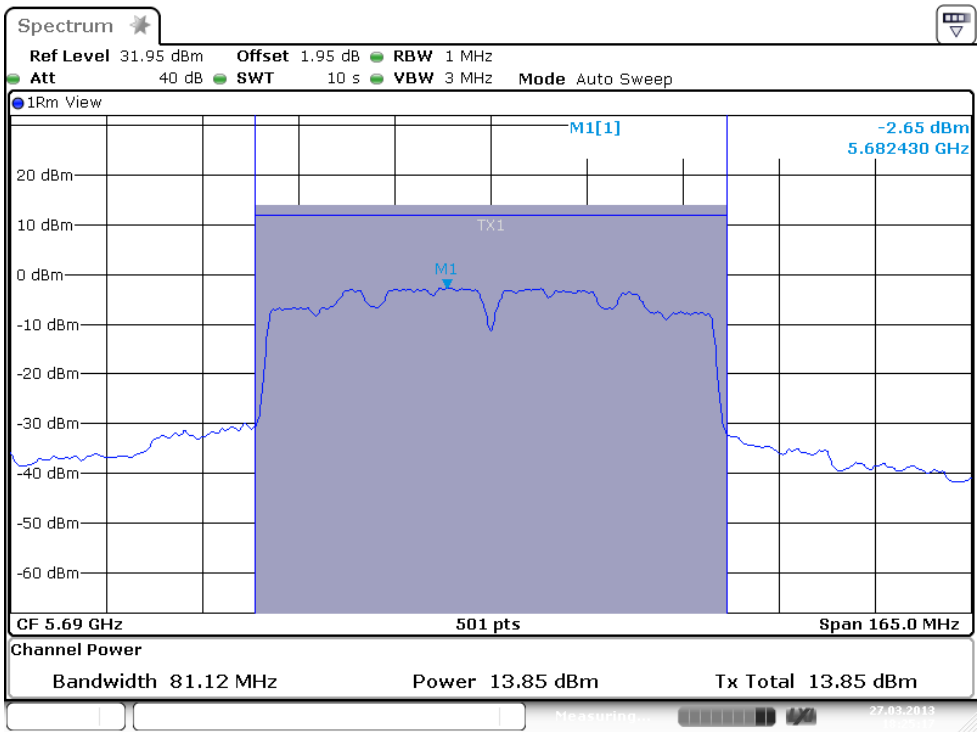
Date: 24.MAR.2013 08:37:51

Plot A2 Antenna 2 at 5530 MHz



Date: 27.MAR.2013 18:18:43

Plot B1 Antenna1 at 5690 MHz



Date: 27.MAR.2013 18:25:17

Plot B2 Antenna2 at 5690 MHz

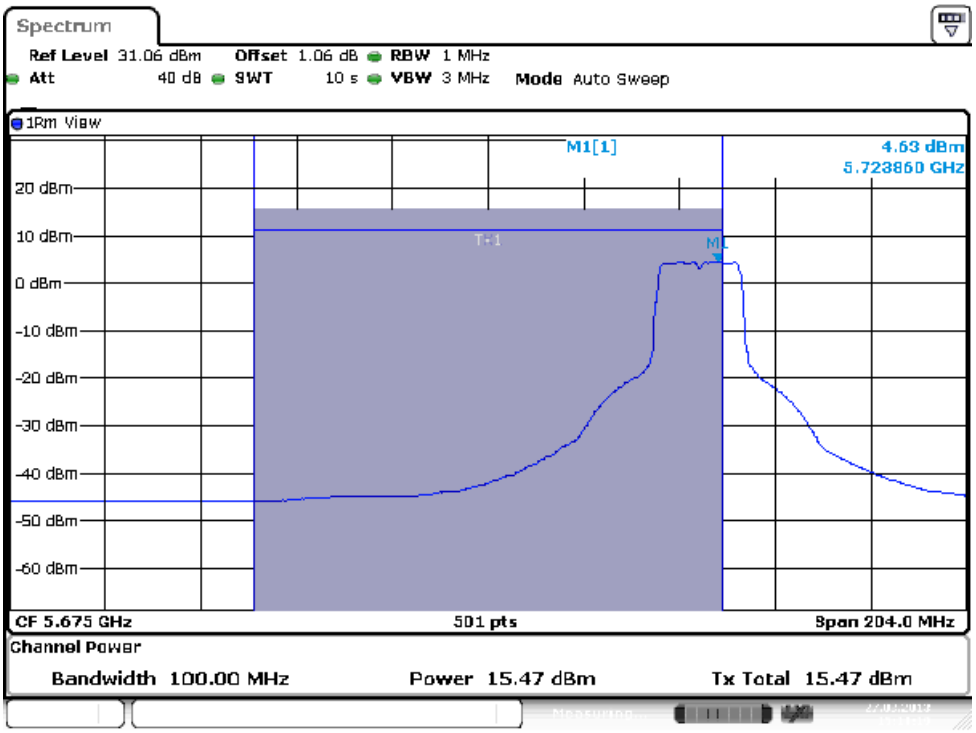
Operation mode: VHT6 20 MHz, Antenna 1

Freq-uency [MHz]	Maximum conducted output power per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	Maximum conducted output power e.i.r.p. per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	PPSD/MHz per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	Total PPSD/MHz e.i.r.p. per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm][1]
5720	15.5 / 9.94	20.5 / 14.94	4.63 / 4.41	9.63 / 9.41

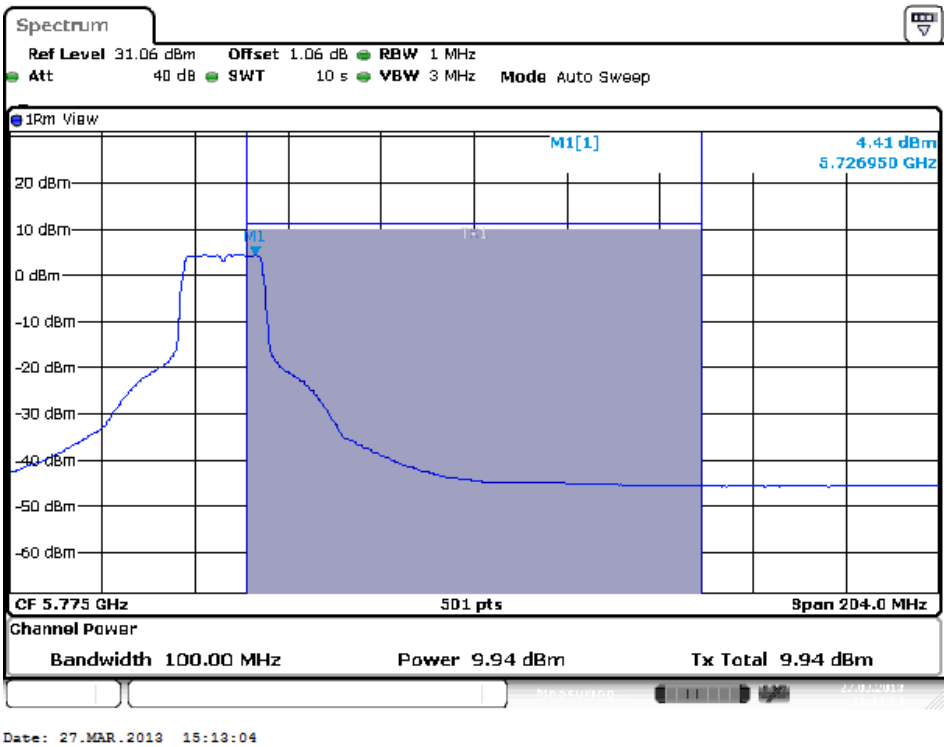
Result: Pass

Note 1: The quantity 10*log 2 (two antennas) is added to the spectrum peak value according to document 662911 D01.

.



Power and PPSD in UNII 2ext



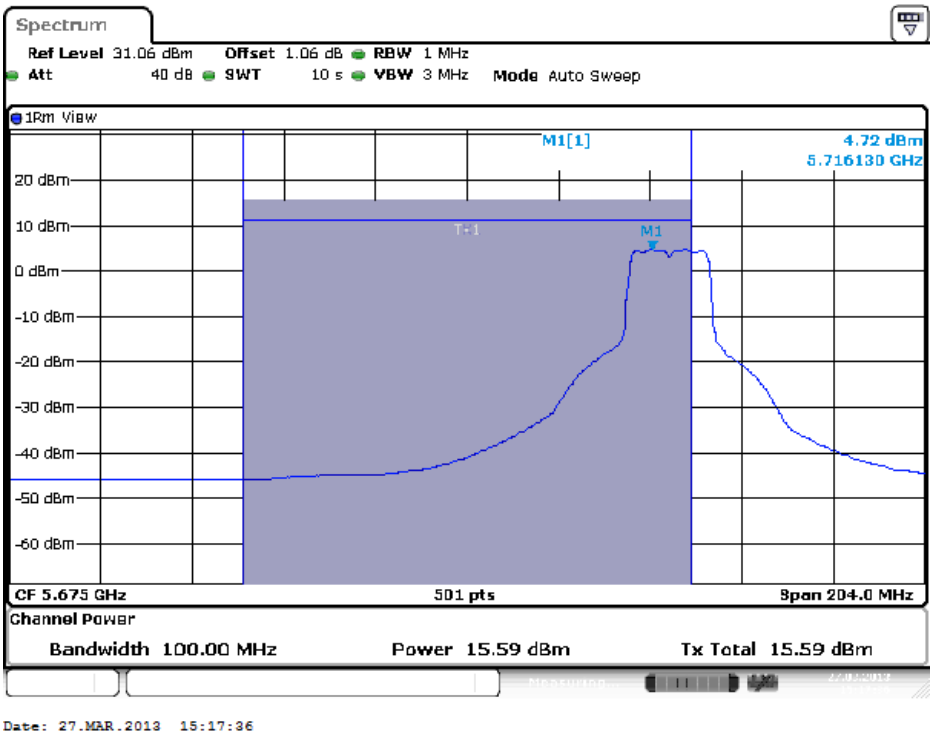
Power and PPSD in UNII 3

Operation mode: VHT6 20 MHz, Antenna 2

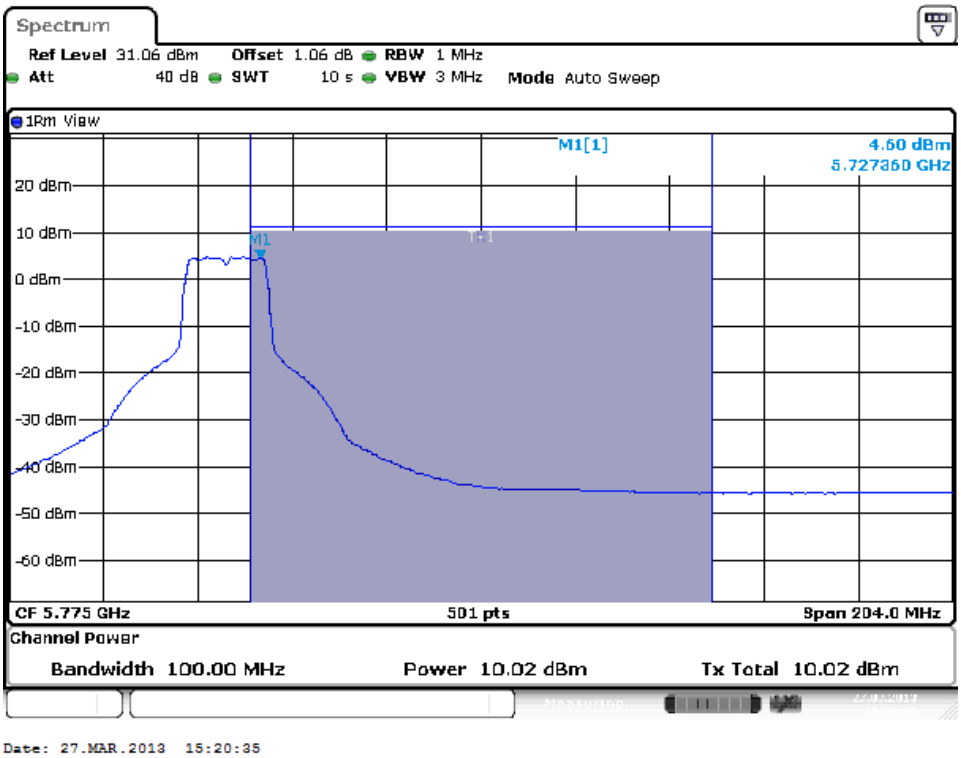
Freq-uency [MHz]	Maximum conducted output power per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	Maximum conducted output power e.i.r.p. per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	PPSD/MHz per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	Total PPSD/MHz e.i.r.p. per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm][1]
5720	15.6 / 10.0	20.6 / 15.0	4.72 / 4.50	9.72 / 9.50

Result: Pass

Note 1: The quantity 10*log 2 (two antennas) is added to the spectrum peak value according to document 662911 D01.



Power and PPSD in UNII 2ext



Power and PPSD in UNII 3

Operation mode: VHT6 20 MHz, Antenna 1+2

Freq-uency [MHz]	Maximum conducted output power per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	Maximum conducted output power e.i.r.p. per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	Maximum conducted output power per subband Antenna 2 U-NII 2ext/ U-NII_3 [dBm]	Maximum conducted output power e.i.r.p. per subband Antenna 2 U-NII 2ext/ U-NII_3 [dBm]	Total conducted output power (dBm) per subband U-NII 2ext/ U-NII_3 [dBm]	Total output power e.i.r.p. (dBm) per subband U-NII 2ext/ U-NII_3 [dBm]
5720	12.4 / 6.7	17.4 / 11.7	12.8 / 7.1	17.8 / 12.1	15.5 (35.5mW)	20.5

Result: Pass

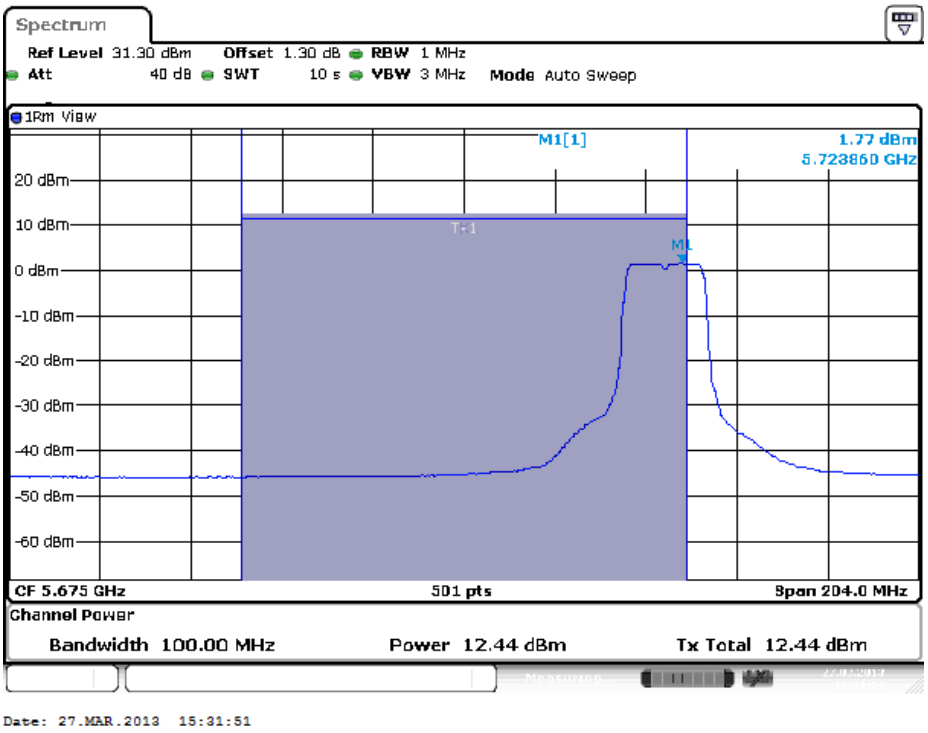
See plots on next pages.

Freq-uency [MHz]	PPSD/MHz per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	Total PPSD/MHz e.i.r.p. per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm][1]	PPSD/MHz per subband Antenna 2 U-NII 2ext/ U-NII_3 [dBm]	Total PPSD/MHz e.i.r.p. per subband Antenna 2 U-NII 2ext/ U-NII_3 [dBm][1]	Total PPSD/MHz e.i.r.p. per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	Total PPSD/MHz e.i.r.p. per subband Antenna 2 U-NII 2ext/ U-NII_3 [dBm]
5720	1.8 / 1.4	4.8	2.1 / 1.8	5.1	9.8	9.1

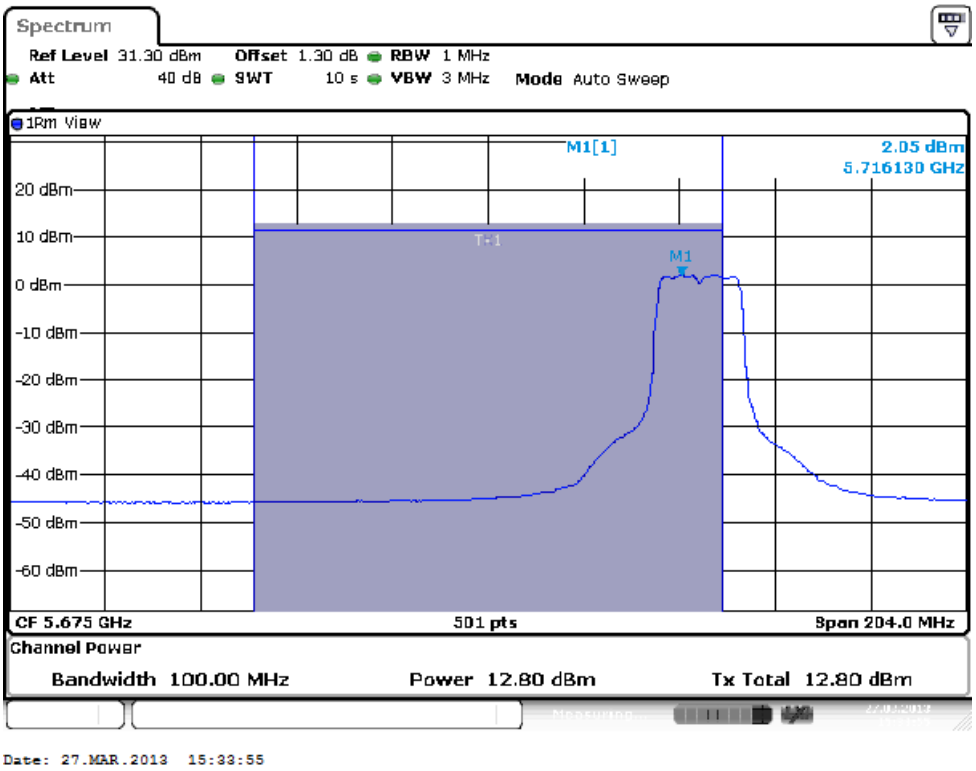
Result: Pass

Note 1: The quantity 10*log 2 (two antennas) is added to the spectrum peak value according to document 662911 D01.

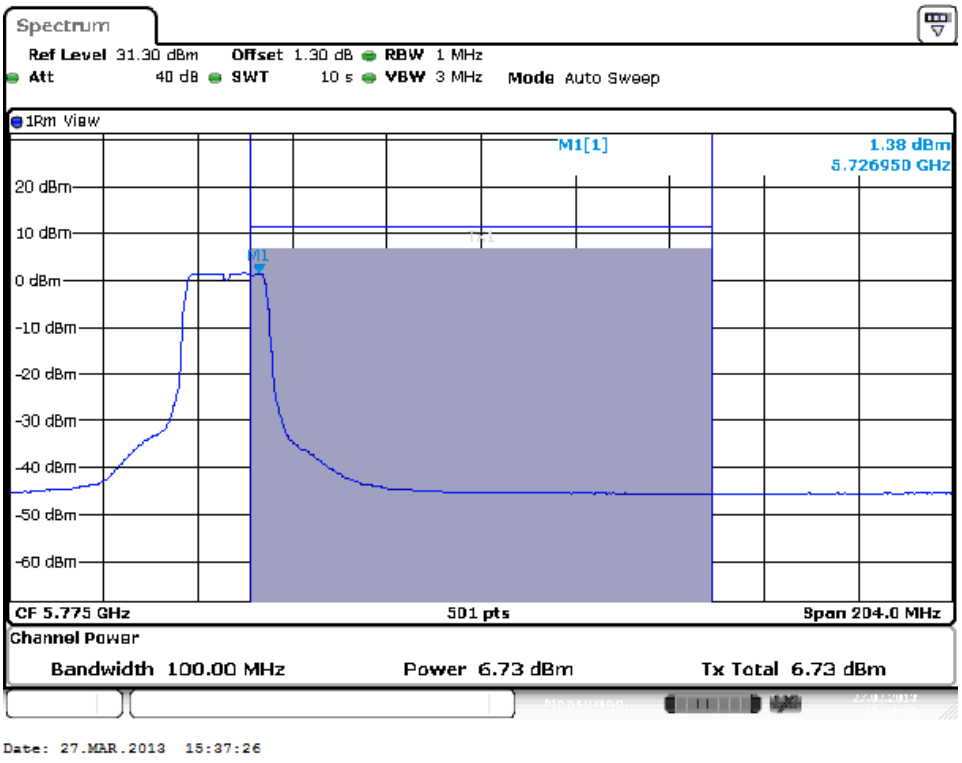
See plots on next pages.



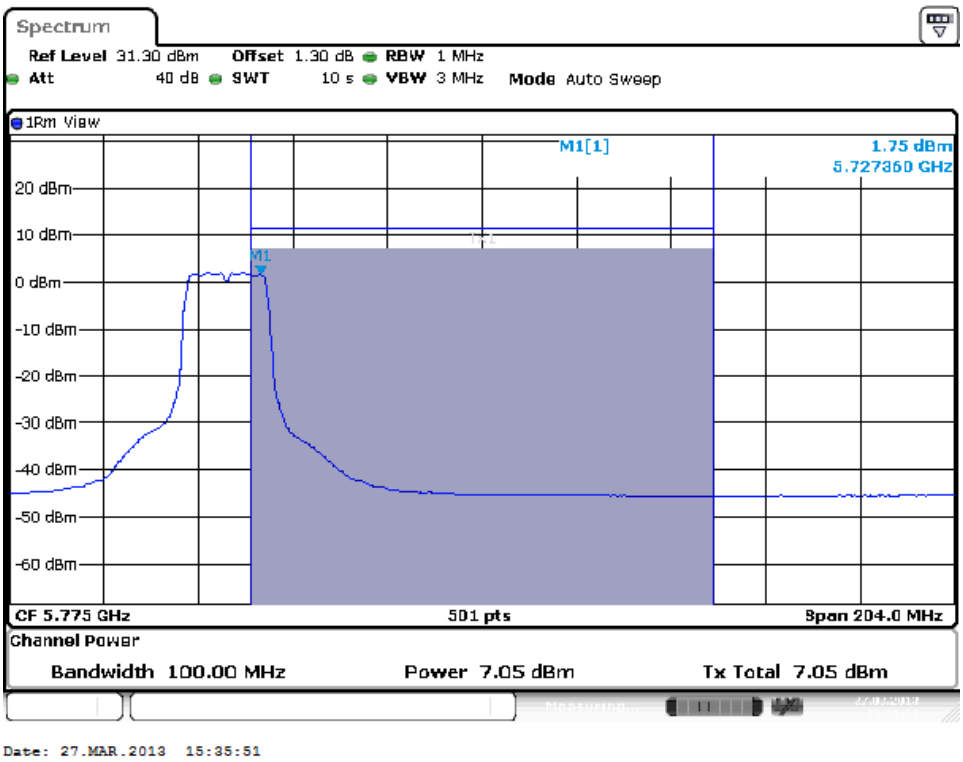
Power and PPSD in UNII 2ext, Antenna 1



Power and PPSD in UNII 2ext, Antenna 2



Power and PPSD in UNII 3, Antenna 1



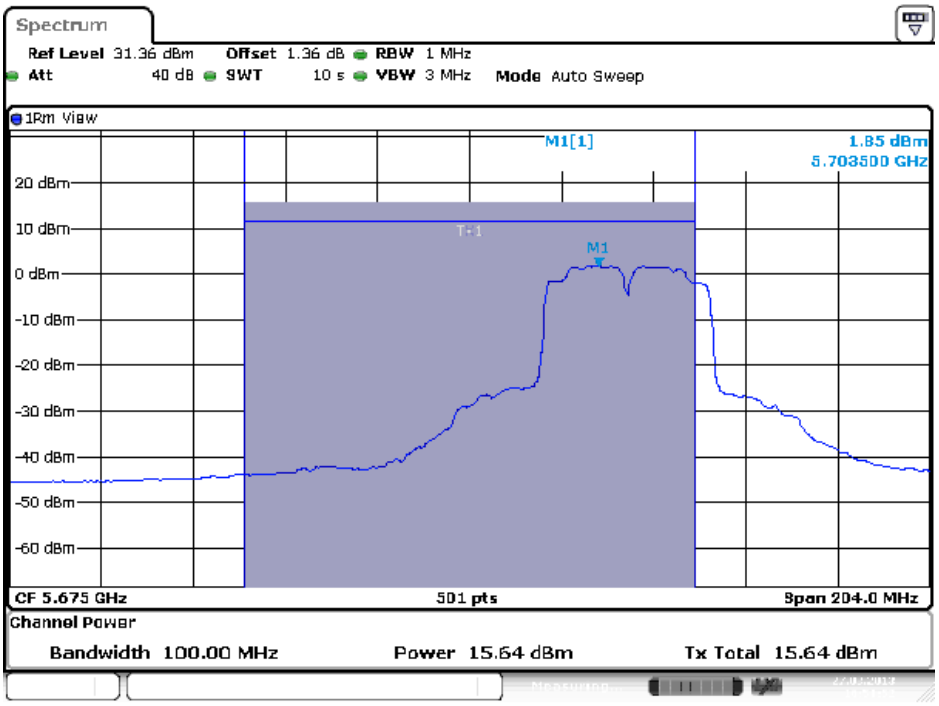
Power and PPSD in UNII 3, Antenna 2

Operation mode: VHT6 40 MHz, Antenna 1

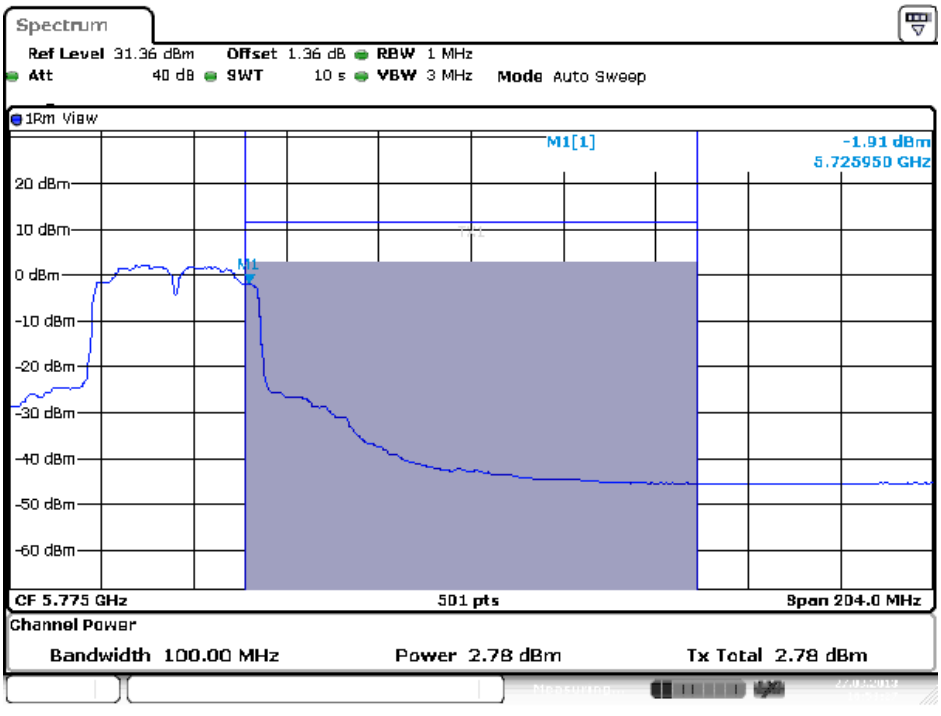
Freq-uency [MHz]	Maximum conducted output power per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	Maximum conducted output power e.i.r.p. per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	PPSD/MHz per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	Total PPSD/MHz e.i.r.p. per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm][1]
5710	15.6 / 2.8	20.6 / 7.8	1.85 / -1.91	4.85

Result: Pass

Note 1: The quantity 10*log 2 (two antennas) is added to the spectrum peak value according to document 662911 D01.



Power and PPSD in UNII 2ext



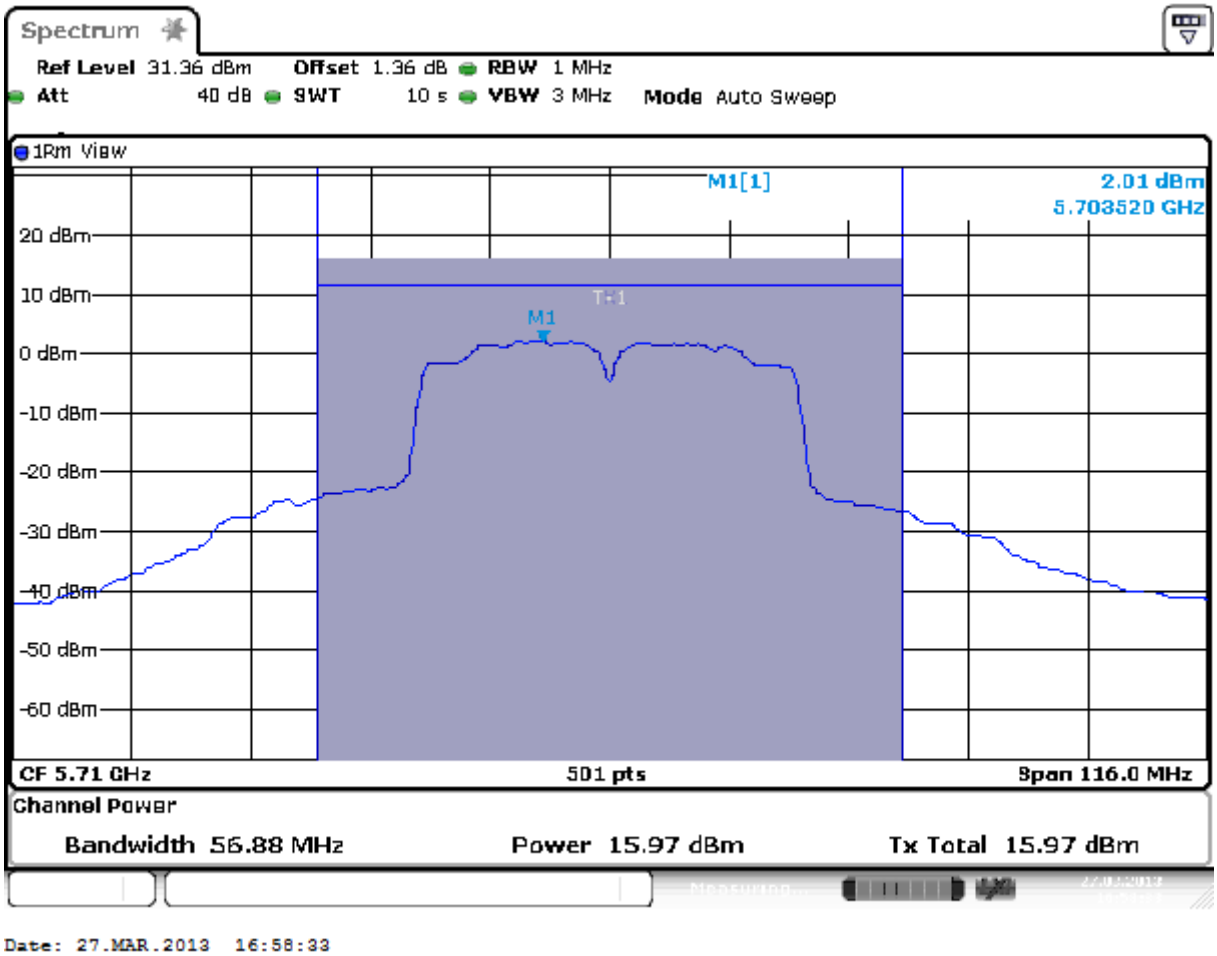
Power and PPSD in UNII 3

Operation mode: VHT6 40 MHz, Antenna 2

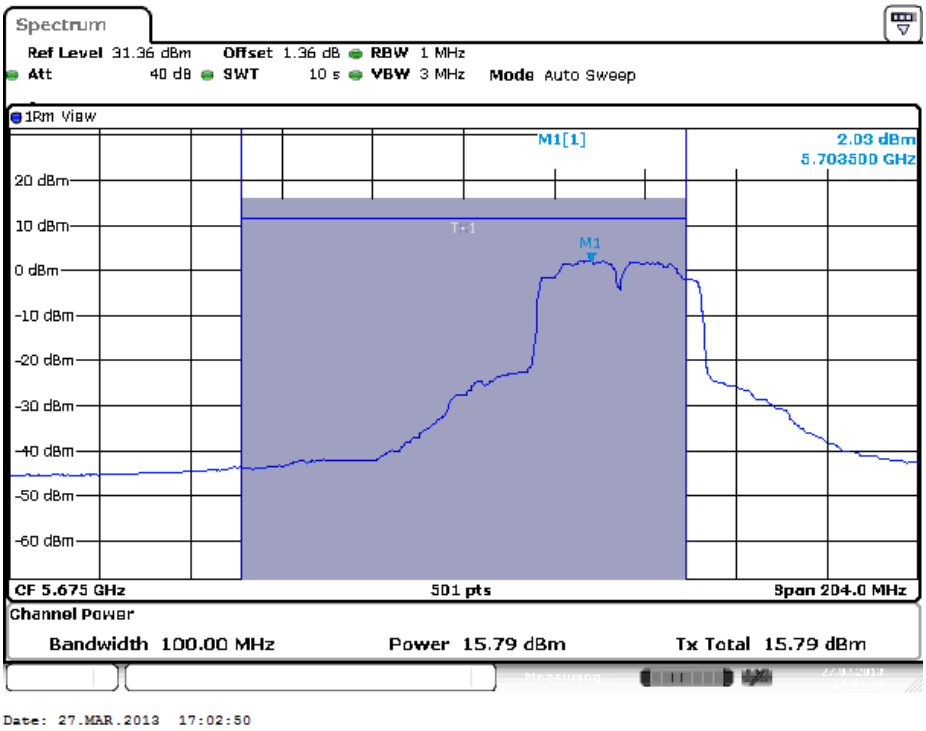
Freq-uency [MHz]	Maximum conducted output power per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	Maximum conducted output power e.i.r.p. per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	PPSD/MHz per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	Total PPSD/MHz e.i.r.p. per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm][1]
5710	15.8 / 2.7	20.8 / 7.7	2.0 / -2.0	5.0

Result: Pass

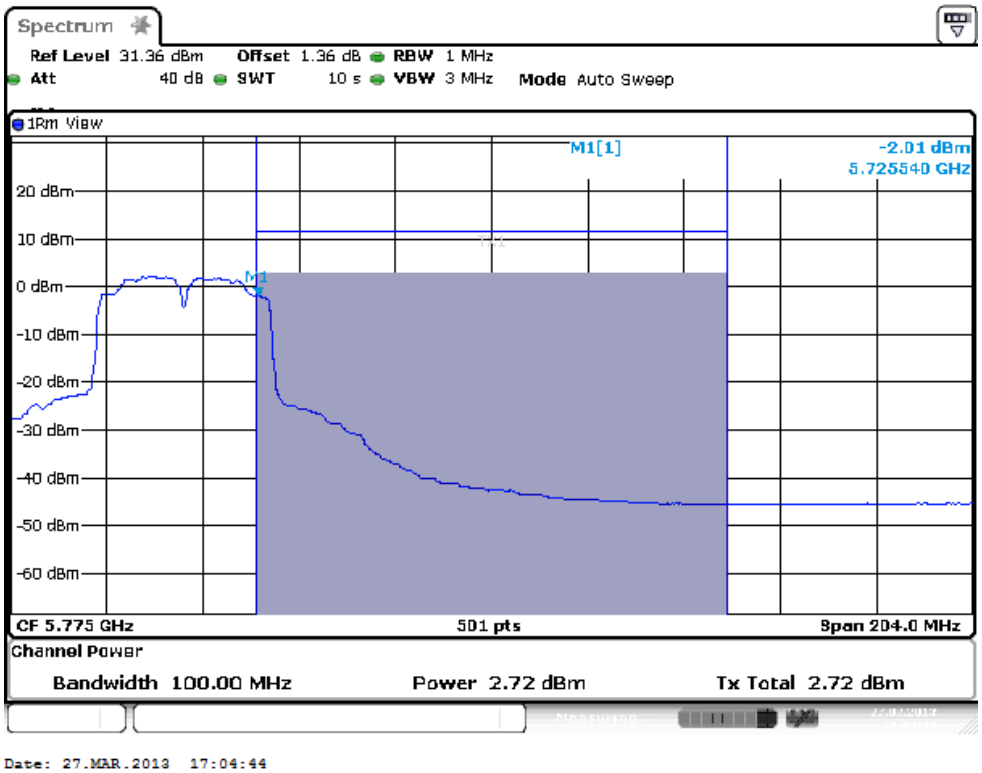
Note 1: The quantity 10*log 2 (two antennas) is added to the spectrum peak value according to document 662911 D01.



Total Power and PPSD



Power and PPSD in UNII 2ext



Power and PPSD in UNII 3

Operation mode: VHT6 40 MHz, Antenna 1+2 5710 MHz

Freq-uency [MHz]	Maximum conducted output power per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	Maximum conducted output power e.i.r.p. per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	Maximum conducted output power per subband Antenna 2 U-NII 2ext/ U-NII_3 [dBm]	Maximum conducted output power e.i.r.p. per subband Antenna 2 U-NII 2ext/ U-NII_3 [dBm]	Total conducted output power (dBm) per subband U-NII 2ext/ U-NII_3 [dBm]	Total output power e.i.r.p. (dBm) per subband U-NII 2ext/ U-NII_3 [dBm]
5710	11.2 / 0.1	16.2 / 5.1	13.3 / 0.4	18.3 / 5.4	15.7 / 5.5	20.7 / 10.8

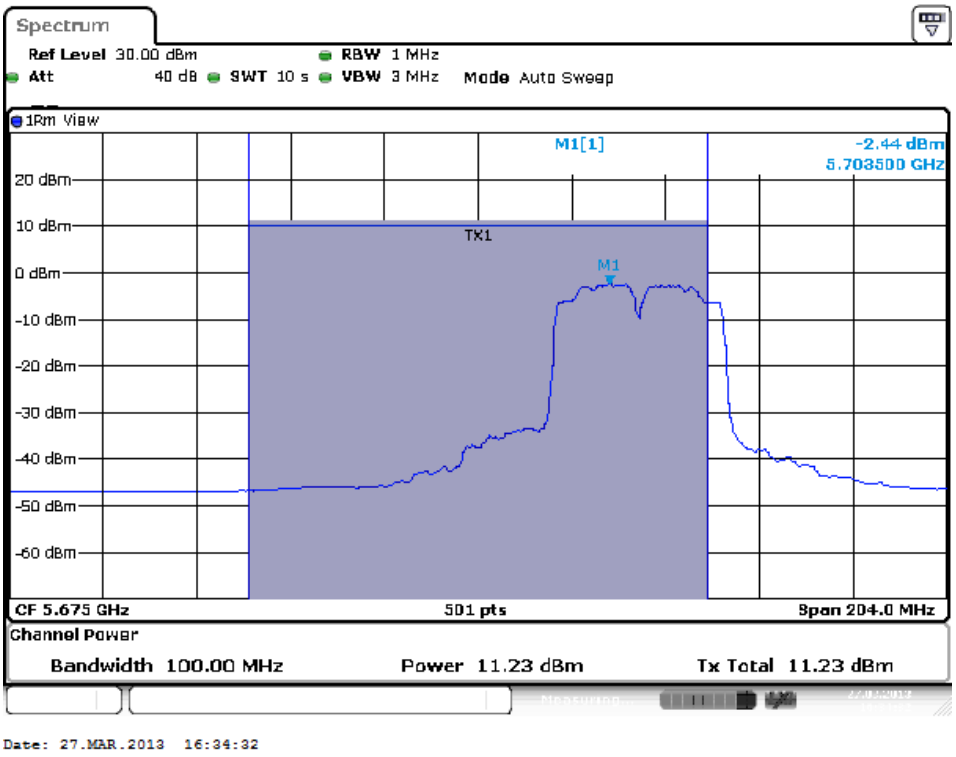
Result: Pass

See plots on next pages.

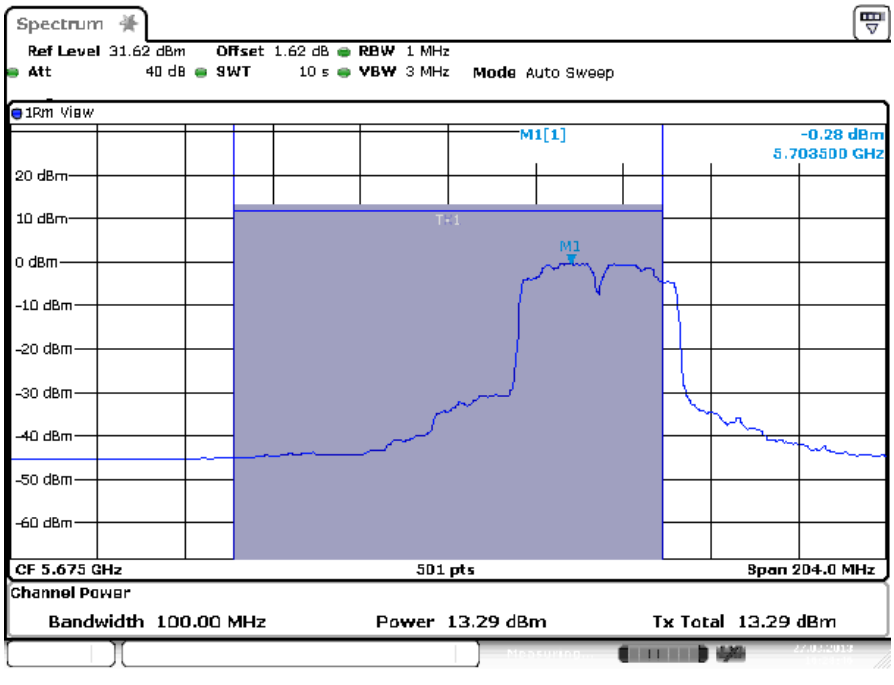
Freq-uency [MHz]	PPSD/MHz per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	Total PPSD/MHz e.i.r.p. per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm][1]	PPSD/MHz per subband Antenna 2 U-NII 2ext/ U-NII_3 [dBm]	Total PPSD/MHz e.i.r.p. per subband Antenna 2 U-NII 2ext/ U-NII_3 [dBm][1]	Total PPSD/MHz e.i.r.p. per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	Total PPSD/MHz e.i.r.p. per subband Antenna 2 U-NII 2ext/ U-NII_3 [dBm]
5710	-2.4 / -4.6	0.6	-0.3 / -4.4	4.7	5.6	9.7

Result: Pass

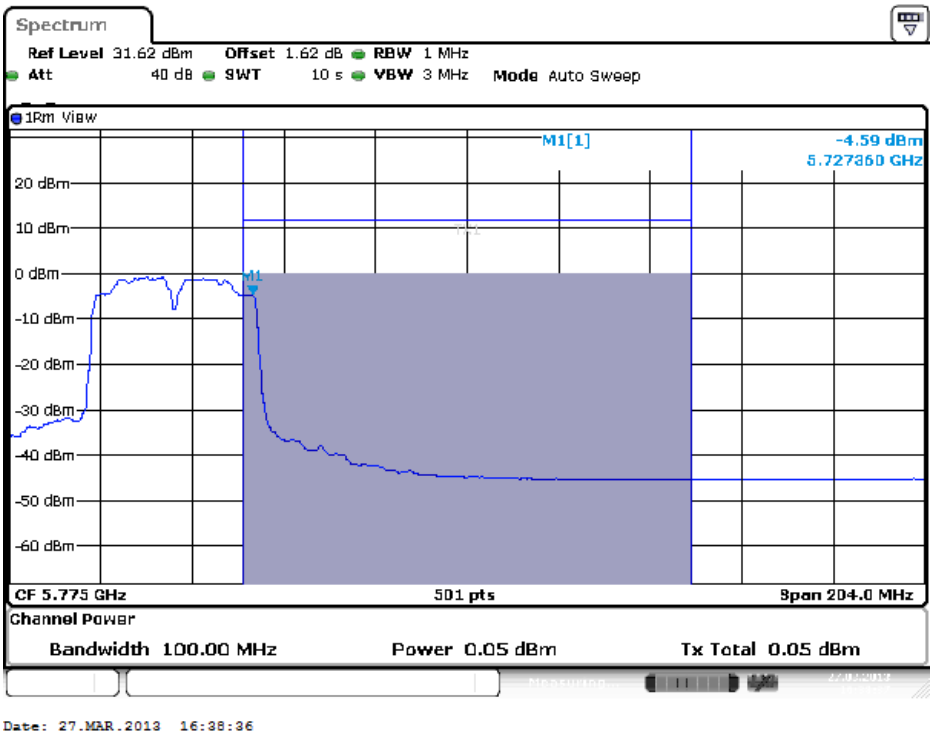
Note 1: The quantity 10*log 2 (two antennas) is added to the spectrum peak value according to document 662911 D01.



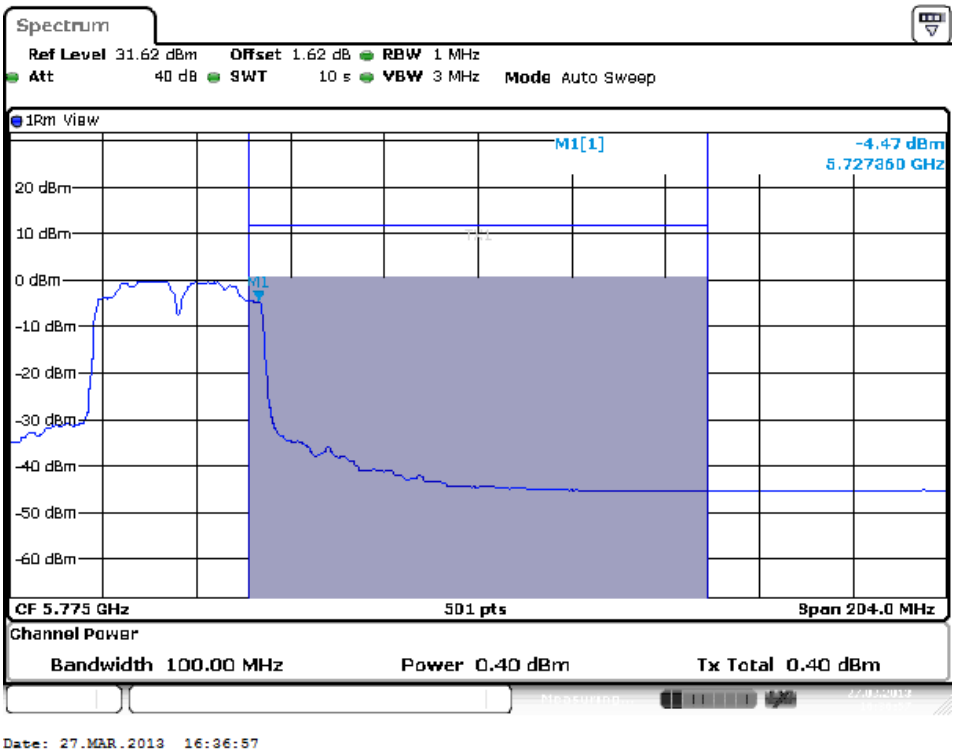
Power and PPSD in UNII 2ext , Antenna 1



Power and PPSD in UNII 2ext , Antenna 2



Power and PPSD in UNII 3, Antenna 1

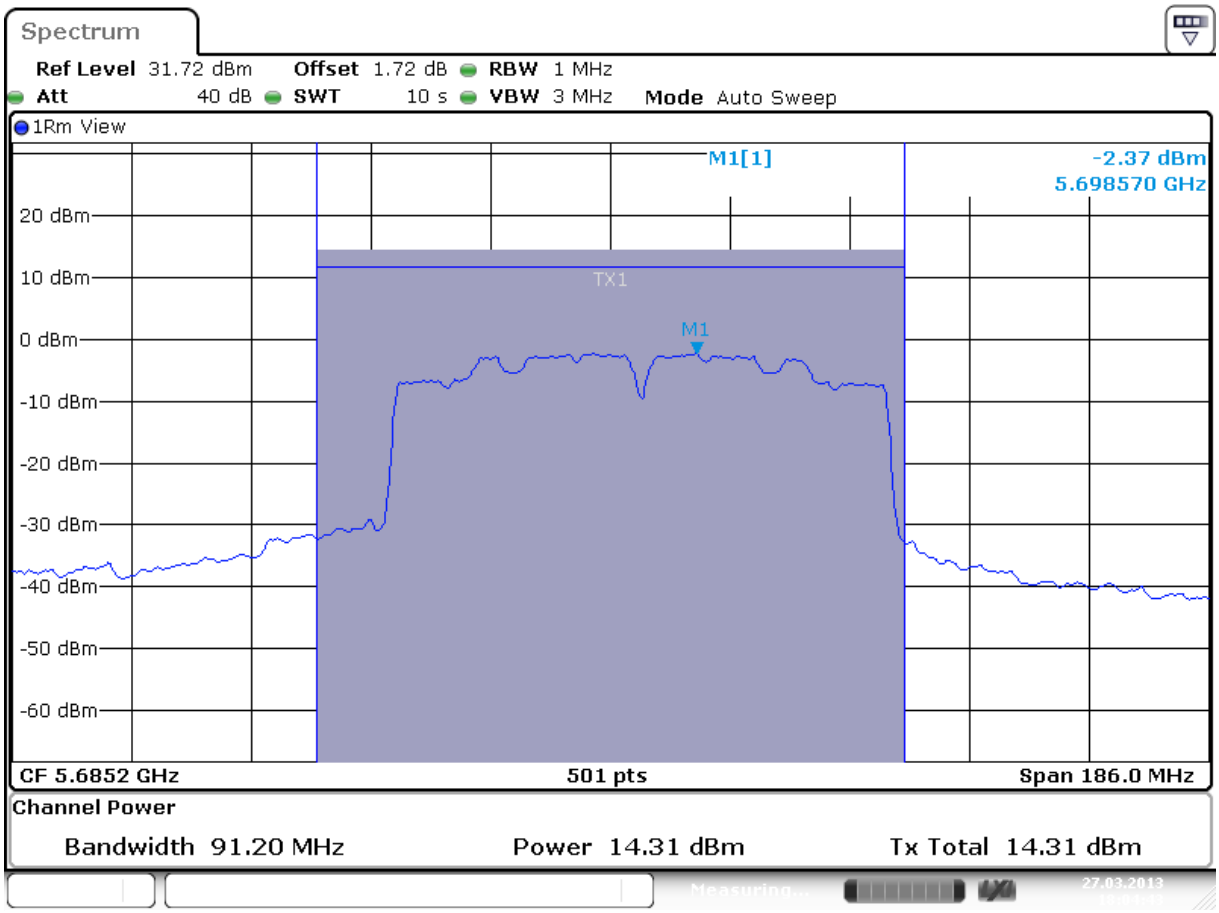


Power and PPSD in UNII 3, Antenna 2

Operation mode: VHT6 80 MHz Ch138, Antenna 1

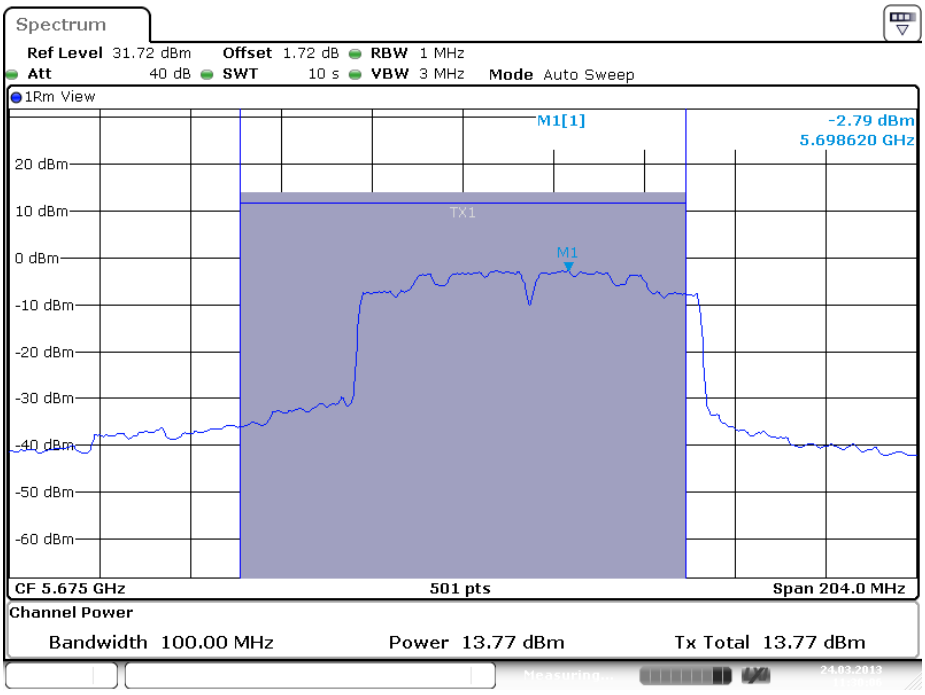
Freq-uency [MHz]	Maximum conducted output power per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	Maximum conducted output power e.i.r.p. per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	PPSD/MHz per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	Total PPSD/MHz e.i.r.p. per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm][1]
5690	13.8 / -3.6	18.8 / 1.4	-2.8 / -7.7	2.2

Result: Pass

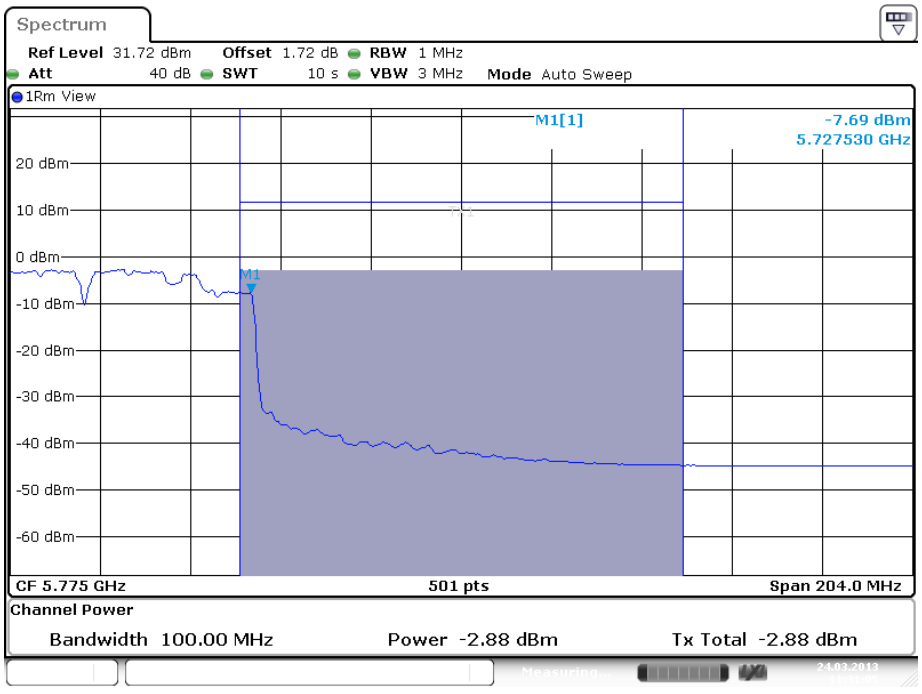


Date: 27.MAR.2013 18:04:44

Total power



Power and PPSD in UNII 2ext

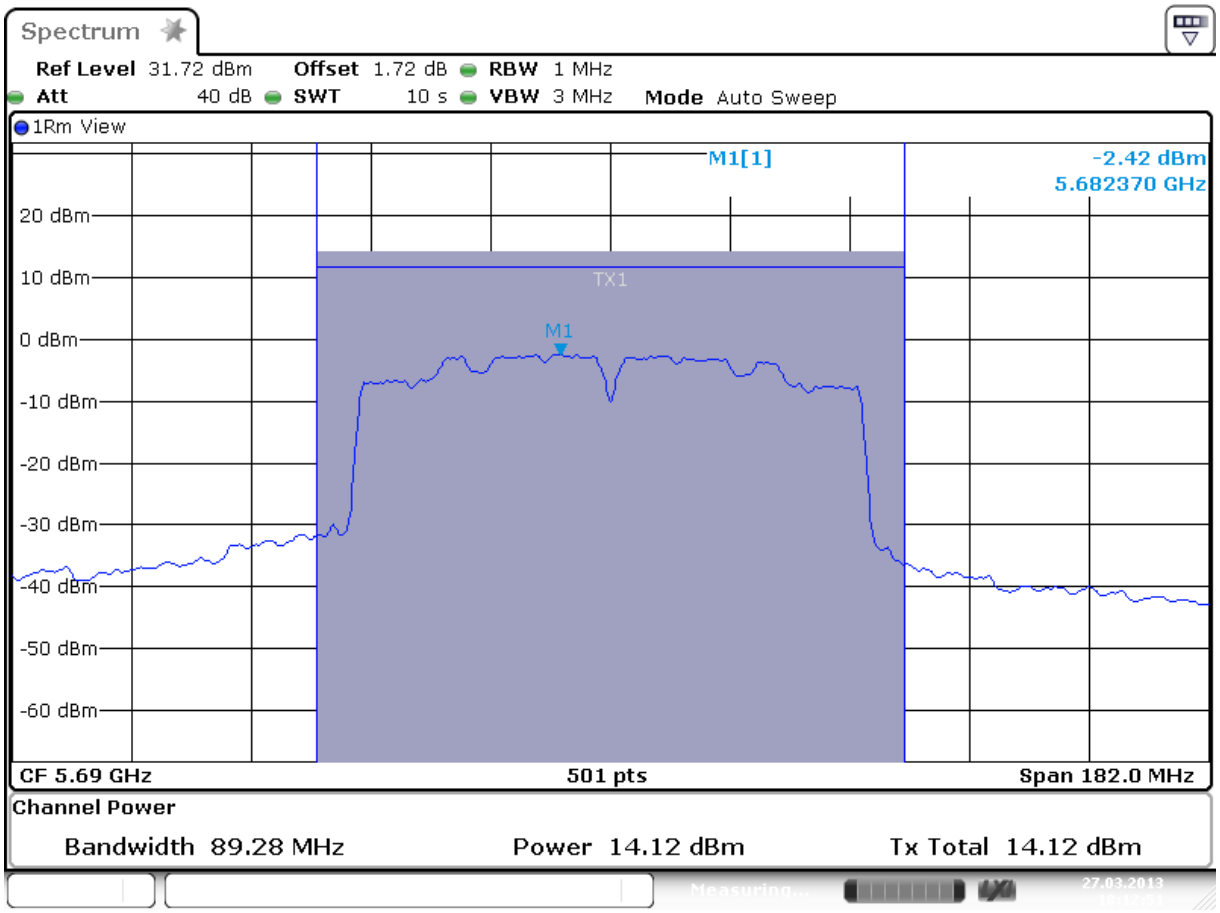


Power and PPSD in UNII 3

Operation mode: VHT6 80 MHz Ch138, Antenna 2

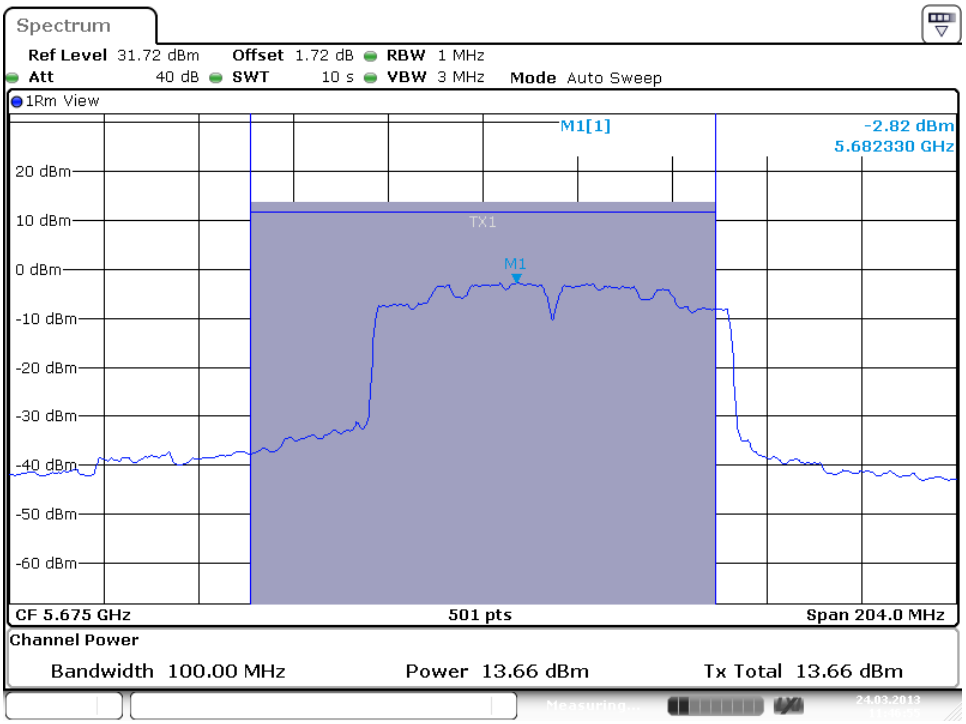
Freq-uency [MHz]	Maximum conducted output power per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	Maximum conducted output power e.i.r.p. per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	PPSD/MHz per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	Total PPSD/MHz e.i.r.p. per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm][1]
5690	13.7 / -3.2	18.7 / 1.8	-2.8 / 8.2	2.2

Result: Pass



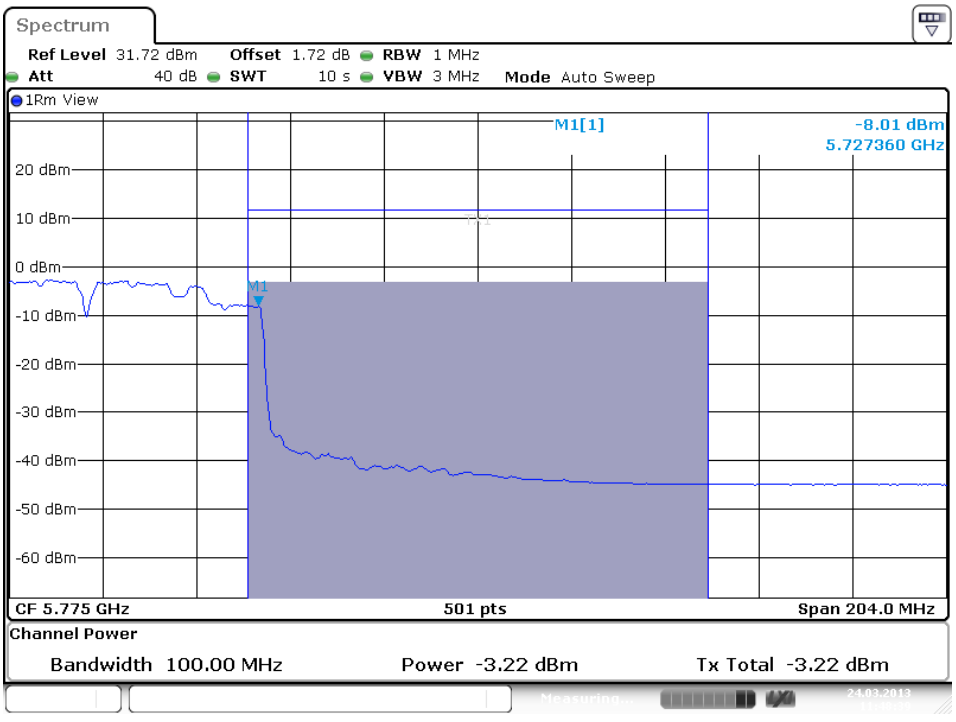
Date: 27.MAR.2013 18:12:51

Total Power



Date: 24.MAR.2013 11:46:55

Power and PPSD in UNII 2ext



Date: 24.MAR.2013 11:48:39

Power and PPSD in UNII 3

Operation mode: VHT6 80 MHz Ch138, Antenna 1+2

Freq-uency [MHz]	Maximum conducted output power per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	Maximum conducted output power e.i.r.p. per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	Maximum conducted output power per subband Antenna 2 U-NII 2ext/ U-NII_3 [dBm]	Maximum conducted output power e.i.r.p. per subband Antenna 2 U-NII 2ext/ U-NII_3 [dBm]	Total conducted output power (dBm) per subband U-NII 2ext/ U-NII_3 [dBm]	Total output power e.i.r.p. (dBm) per subband U-NII 2ext/ U-NII_3 [dBm]
5690	12.9 / -3.6	17.9 / 1.4	13.8 / -2.8	18.8 / 2.2	16.4 / -0.1	21.4 / 4.9

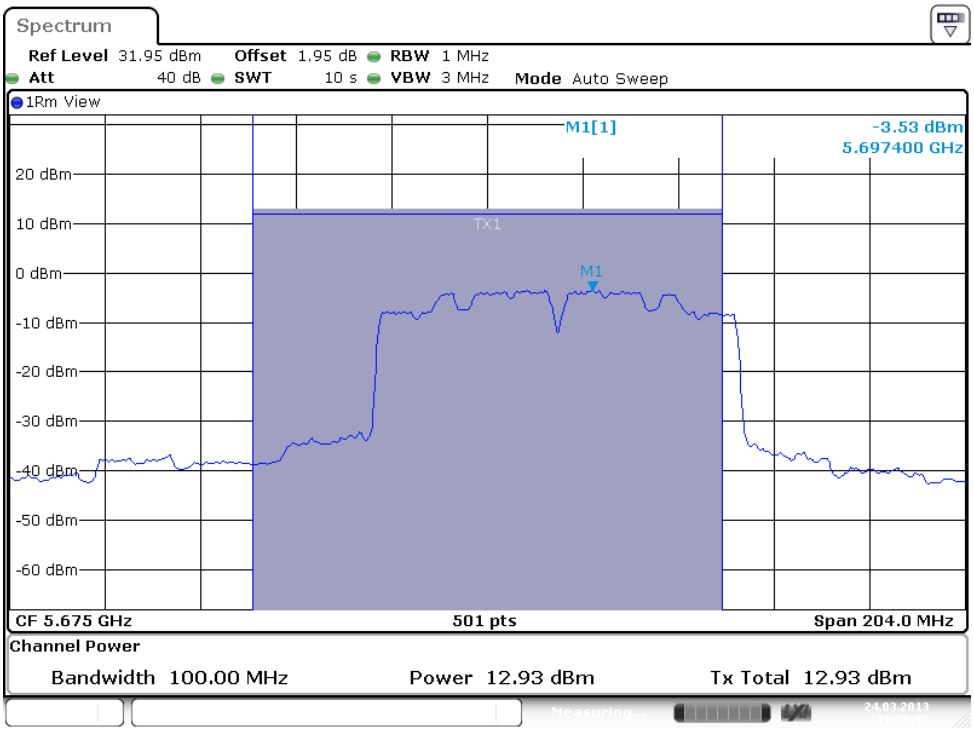
Result: Pass

See plots on next pages.

Freq-uency [MHz]	PPSD/MHz per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	Total PPSD/MHz e.i.r.p. per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm][1]	PPSD/MHz per subband Antenna 2 U-NII 2ext/ U-NII_3 [dBm]	Total PPSD/MHz e.i.r.p. per subband Antenna 2 U-NII 2ext/ U-NII_3 [dBm][1]	Total PPSD/MHz e.i.r.p. per subband Antenna 1 U-NII 2ext/ U-NII_3 [dBm]	Total PPSD/MHz e.i.r.p. per subband Antenna 2 U-NII 2ext/ U-NII_3 [dBm]
5690	-3.5 / -8.2	0.4	-2.6 / -7.5	-4.5	5.4	0.5

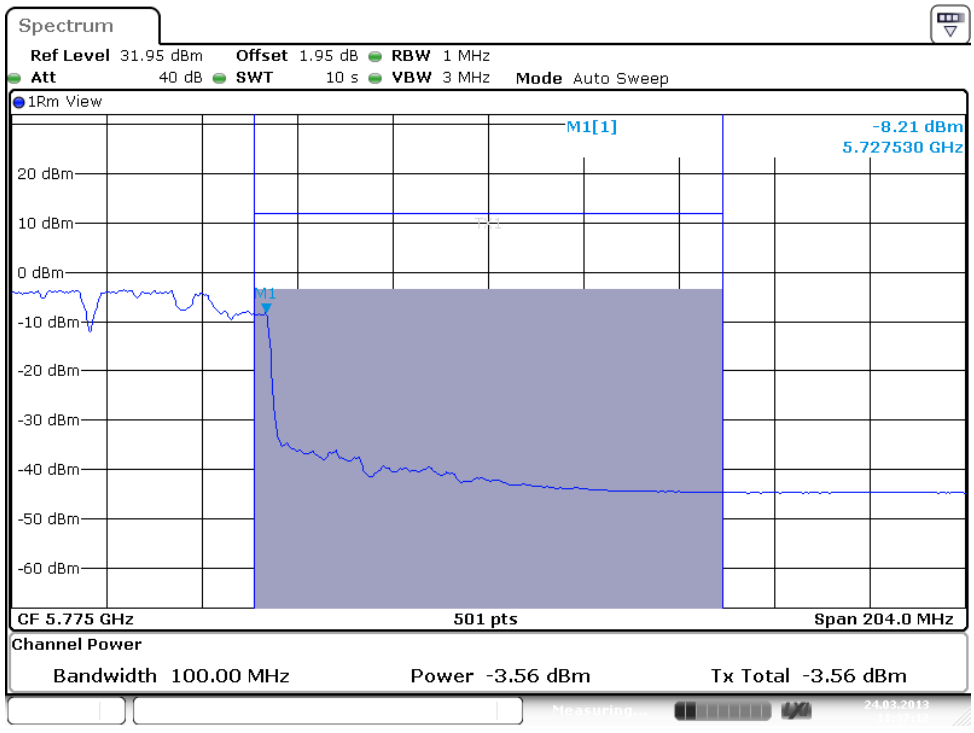
Result: Pass

Note 1: The quantity 10*log 2 (two antennas) is added to the spectrum peak value according to document 662911 D01.



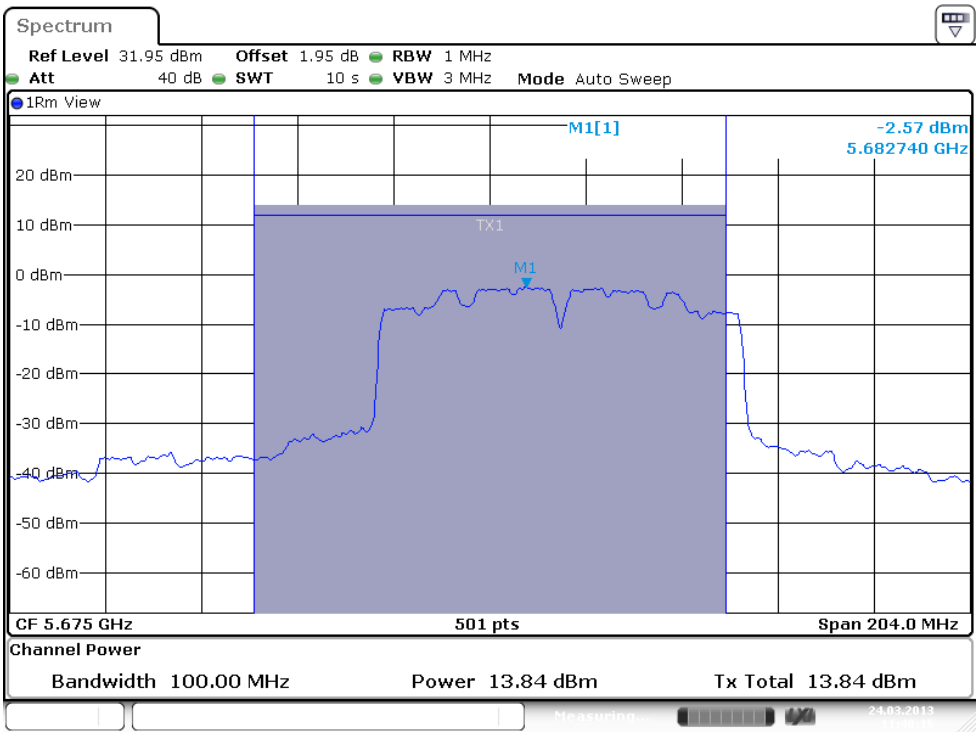
Date: 24.MAR.2013 11:35:51

Plot B1 Antenna1 at 5690 MHz UNII 2 band



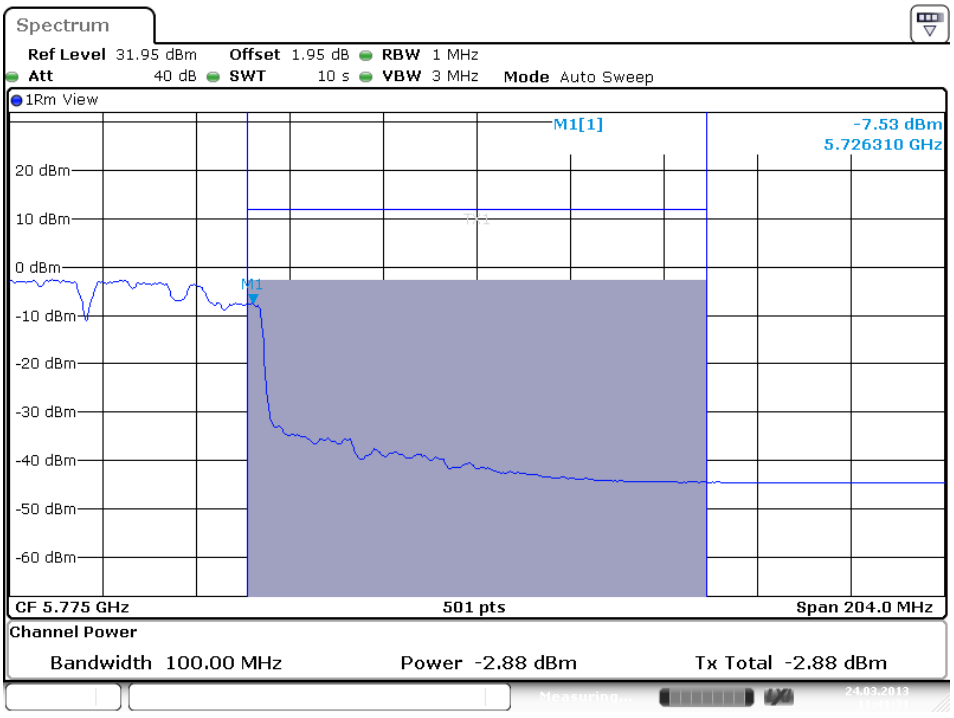
Date: 24.MAR.2013 11:37:11

Plot B1 Antenna1 at 5690 MHz UNII 3 band



Date: 24.MAR.2013 11:40:16

Plot B2 Antenna2 at 5690 MHz UNII 2 band



Date: 24.MAR.2013 11:41:31

Plot B2 Antenna2 at 5690 MHz UNII 3 band

7.2.2 26dB and 99% Bandwidth

RESULT: PASS

Date of testing: 2013-01-09 / 2013-03-27

Requirements:

FCC 15.407 and RSS-210
For FCC 26 dB bandwidth: No requirement is given.
For 99% Bandwidth: RSS-Gen Section 4.6.1: No requirement is given.

Test procedure 26dB bandwidth:

ANSI C63.10-2009
KDB Publication No.789033 D01 v01r02 9/26/2012 .

A spectrum analyzer was connected to the antenna port of the EUT. The spectrum analyzer resolution bandwidth was set to 100kHz, video bandwidth to 300kHz and the span wide enough to capture the modulated carrier.

For 99% Bandwidth:

ANSI C63.10-2009 and RSS-Gen.

The transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission sideskirts. The resolution bandwidth shall be set as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used given that a peak or peak hold may produce a wider bandwidth than actual.

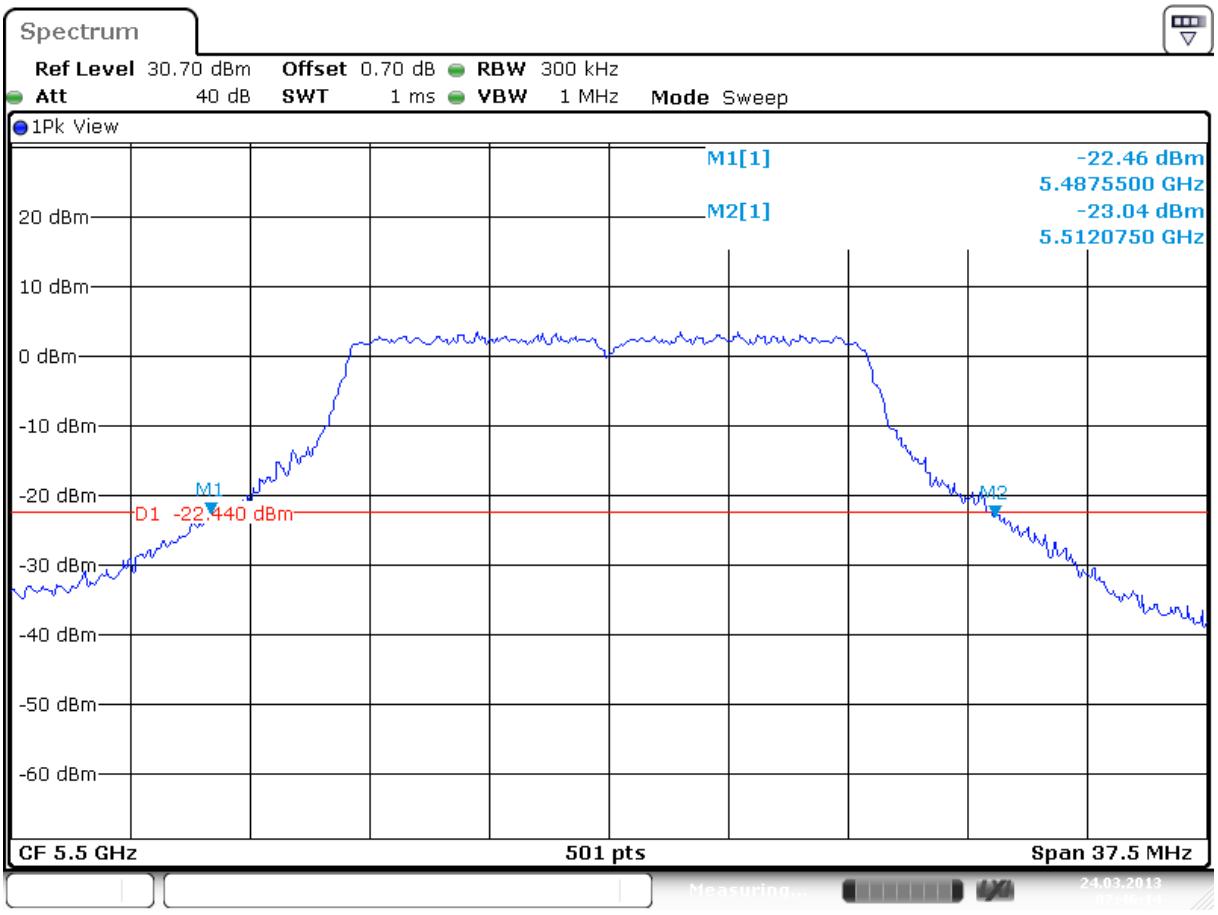
A spectrum analyzer was connected to the antenna port of the EUT. The spectrum analyzer resolution bandwidth was set to 1% of the selected span, Video bandwidth was set to 3 times the resolution bandwidth. The span was set to capture the whole modulation process. The Spectrum analyzers automated function for 99% BW was used.

Plots shown on the next pages are of the 26 dB bandwidth.

Table 6: 26dB and 99% Bandwidth

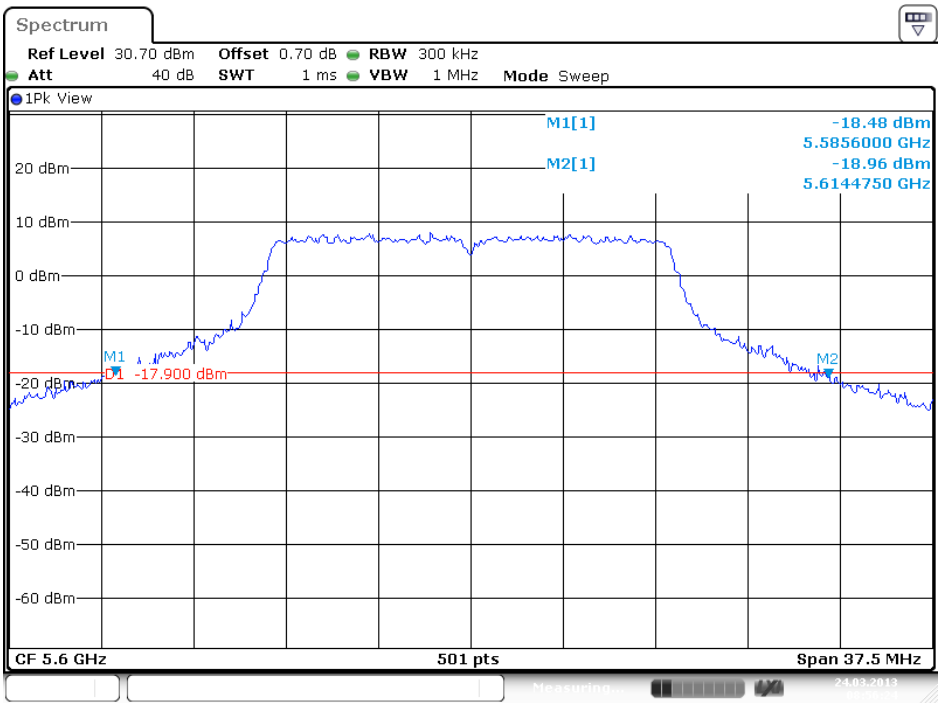
Operation mode: 6Mb OFDM, Antenna 1

Operating Frequency [MHz]	99% Bandwidth [kHz]	26dB Bandwidth [kHz]	Limit [kHz]	Plot number
5500	17140	24525	Not Applicable	A
5600	17589	28875	Not Applicable	B
5700	17065	25950	Not Applicable	C



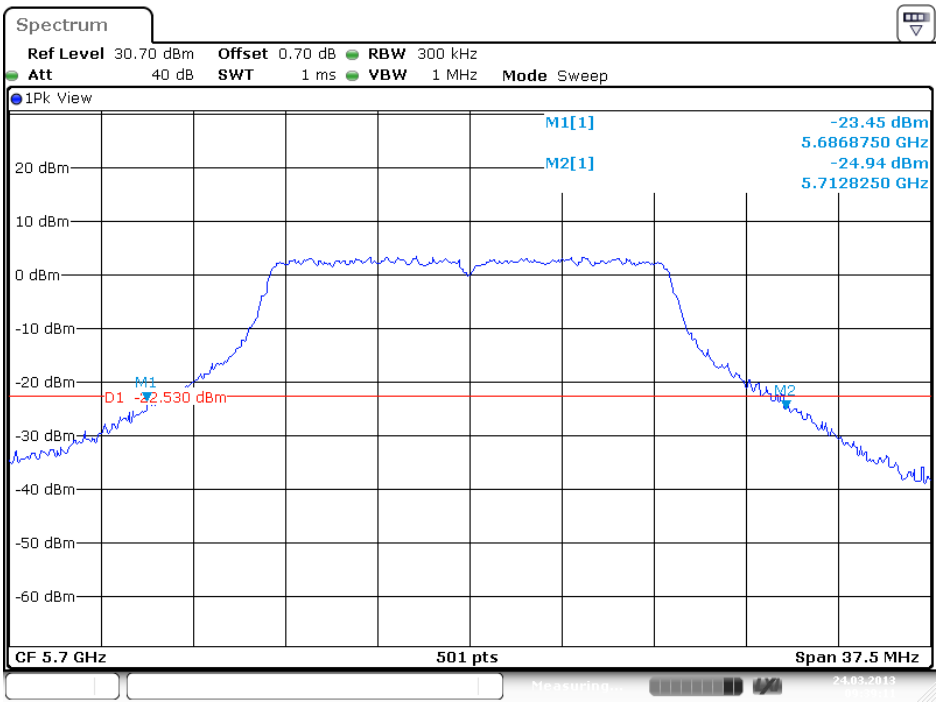
Date: 24.MAR.2013 07:46:14

Plot A



Date: 24.MAR.2013 08:56:24

Plot B

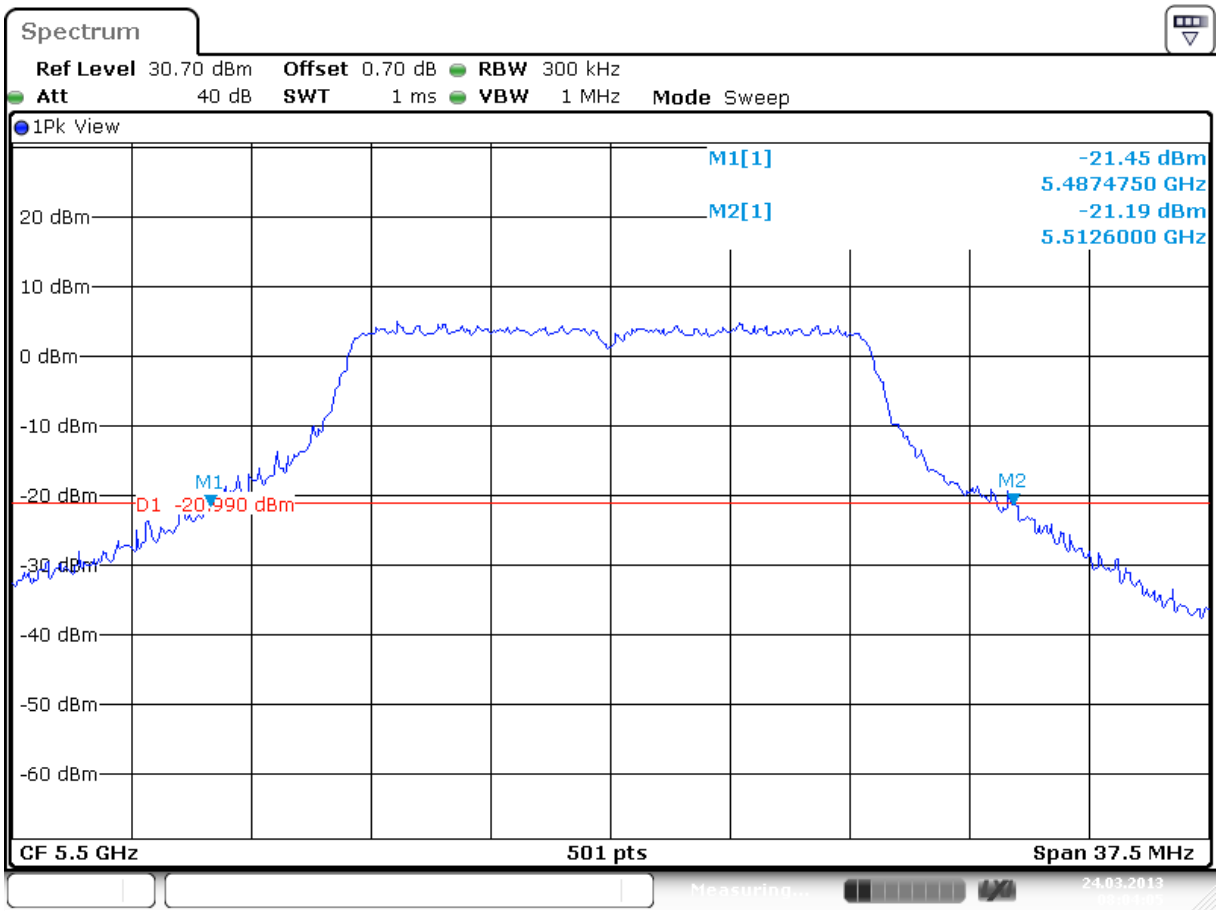


Date: 24.MAR.2013 09:39:11

Plot C

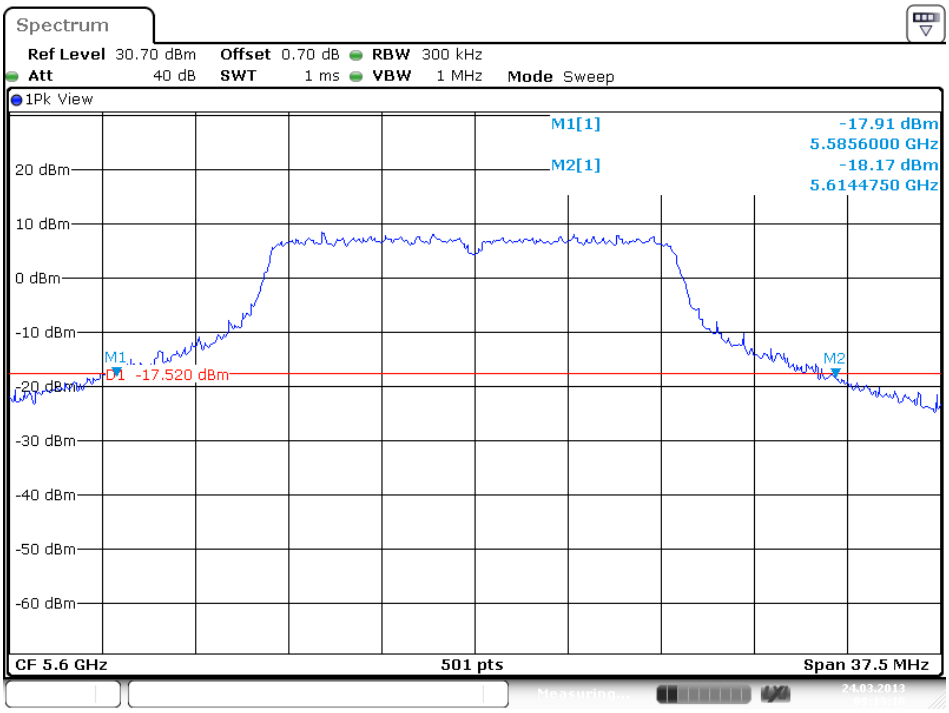
Operation mode: 6Mb OFDM, Antenna 2

Operating Frequency [MHz]	99% Bandwidth [kHz]	26dB Bandwidth [kHz]	Limit [kHz]	Plot number
5500	17140	25125	Not Applicable	A
5580	17664	28875	Not Applicable	B
5700	17140	25500	Not Applicable	C



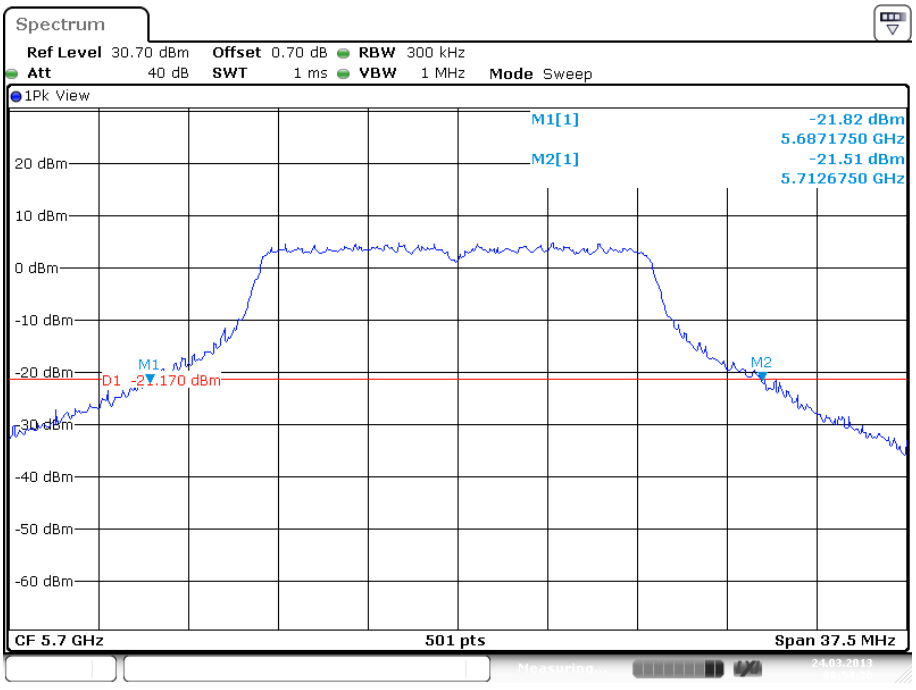
Date: 24.MAR.2013 08:04:05

Plot A



Date: 24.MAR.2013 09:13:11

Plot B

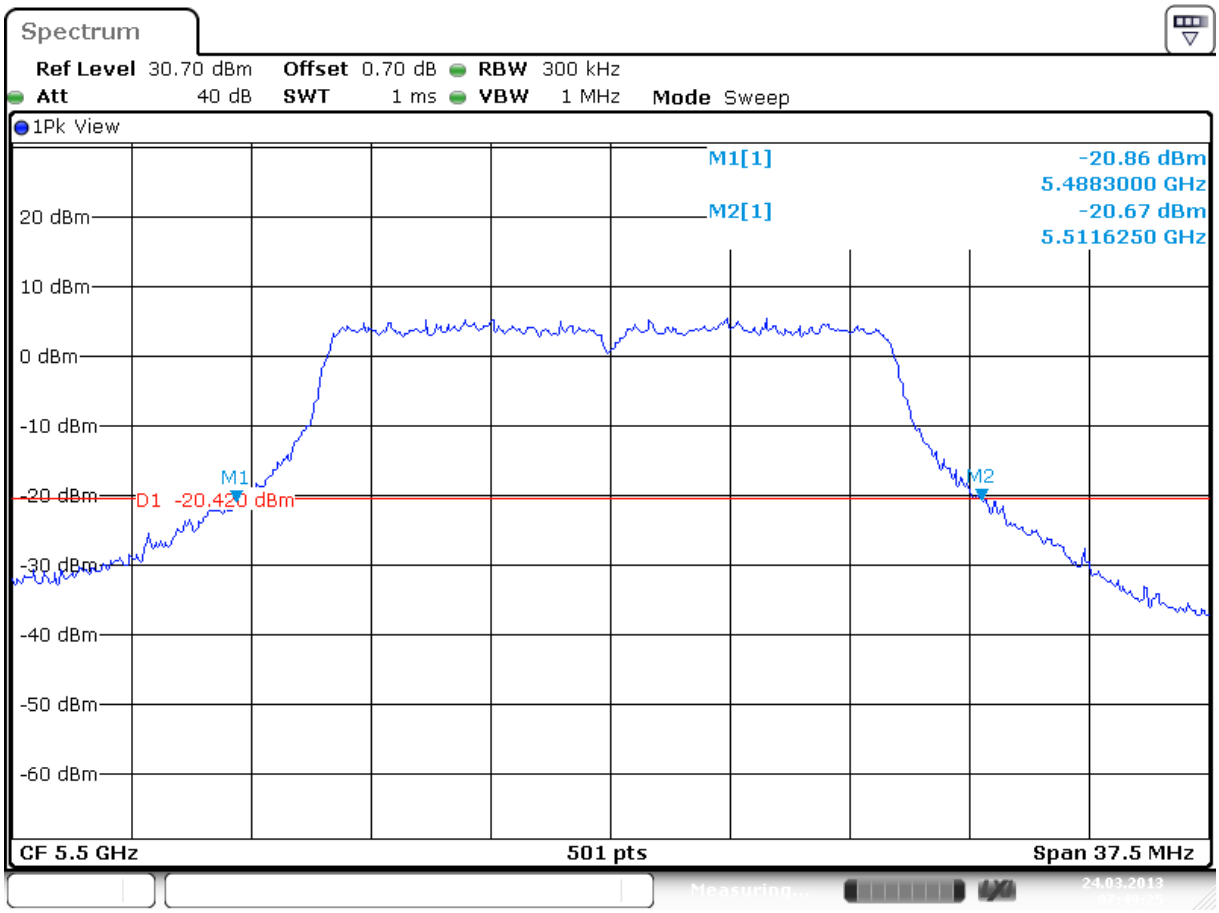


Date: 24.MAR.2013 09:54:20

Plot C

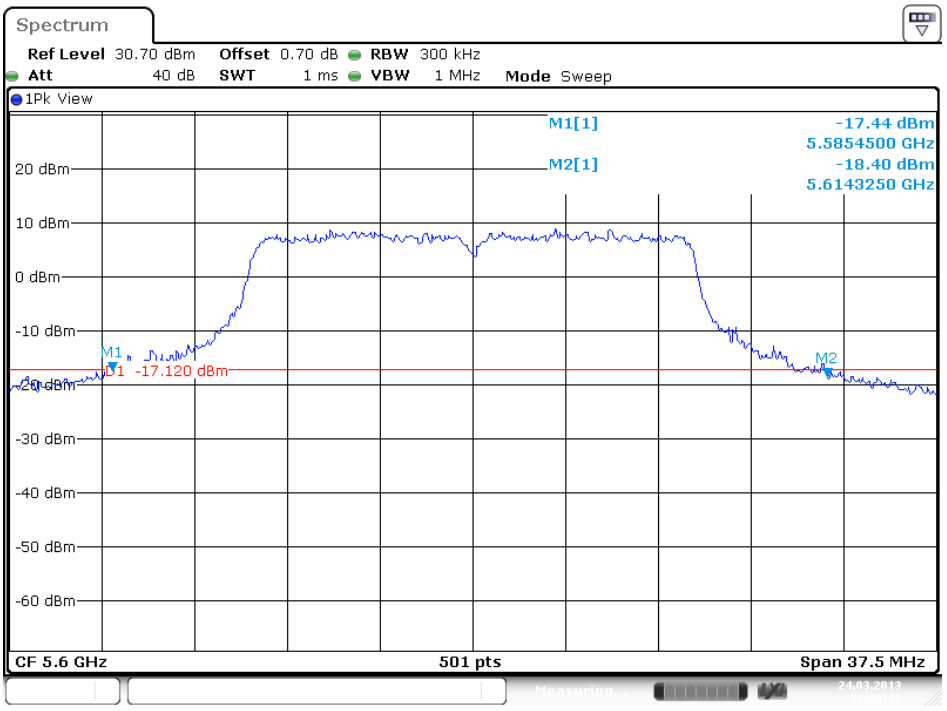
Operation mode: HT4 20 MHz, Antenna 1

Operating Frequency [MHz]	99% Bandwidth [kHz]	26dB Bandwidth [kHz]	Limit [kHz]	Plot number
5500	17964	23325	Not Applicable	A
5600	18338	28875	Not Applicable	B
5700	17964	23025	Not Applicable	C



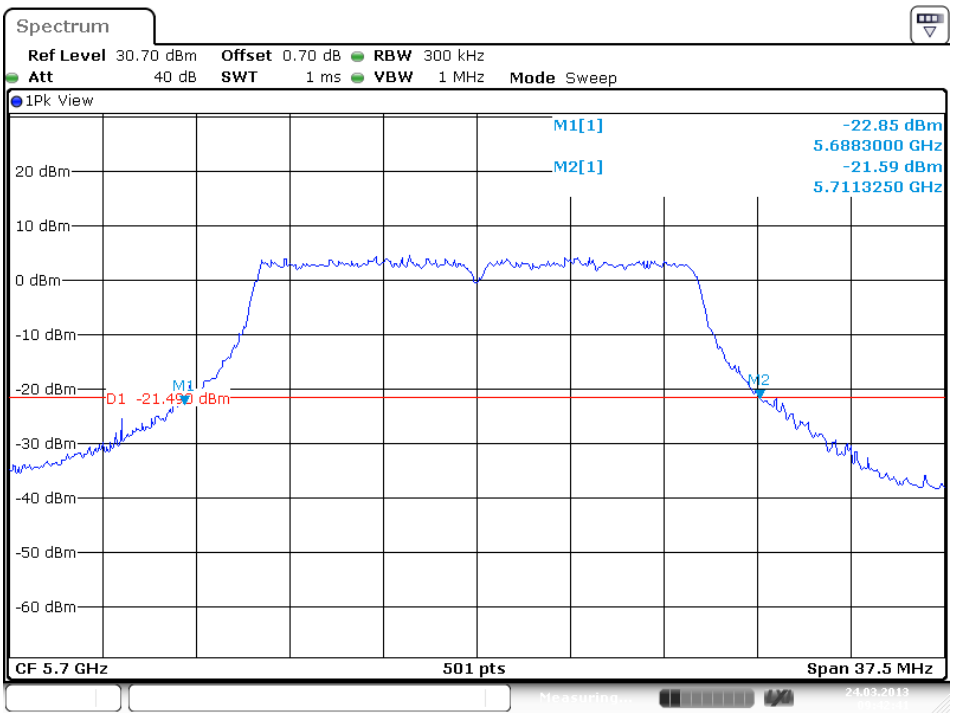
Date: 24.MAR.2013 07:49:26

Plot A



Date: 24.MAR.2013 08:59:46

Plot B

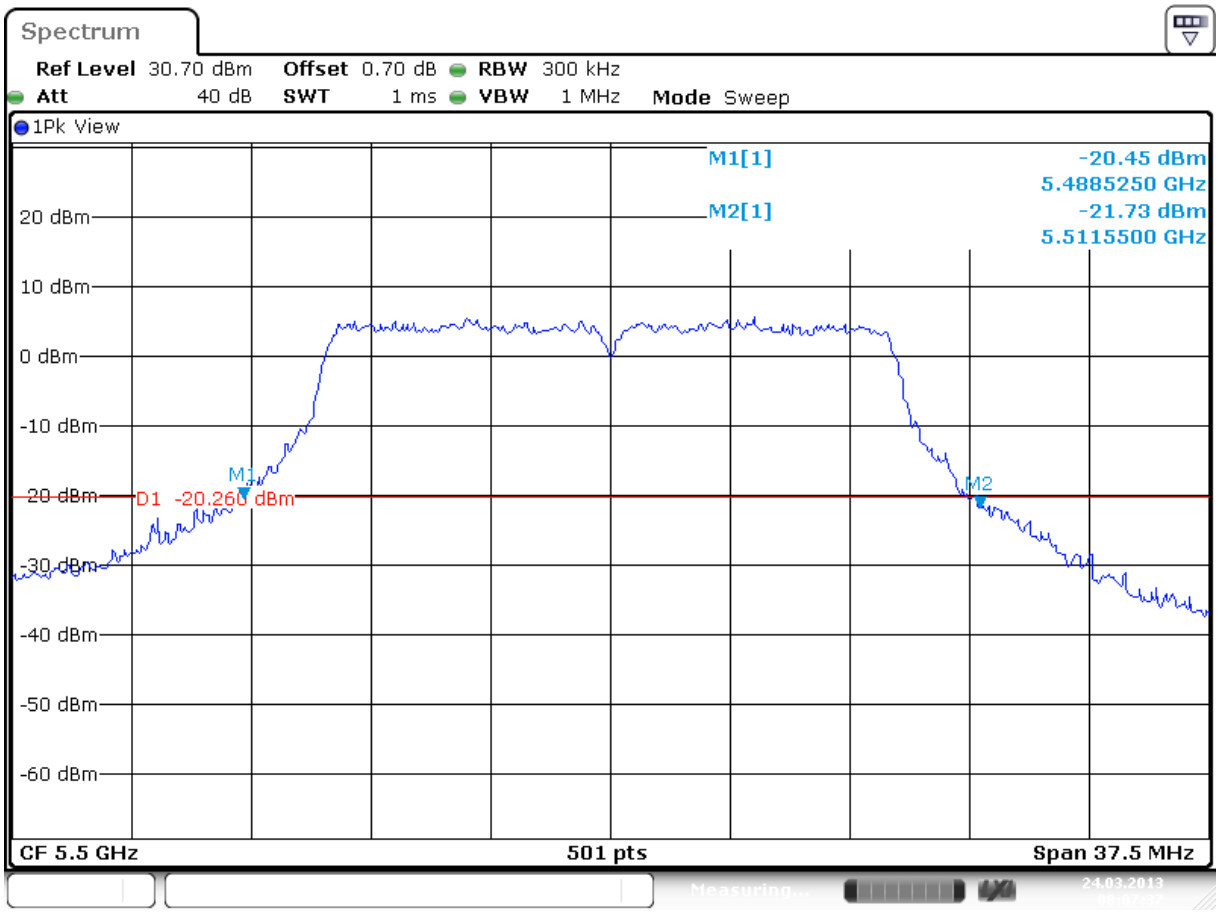


Date: 24.MAR.2013 09:42:41

Plot C

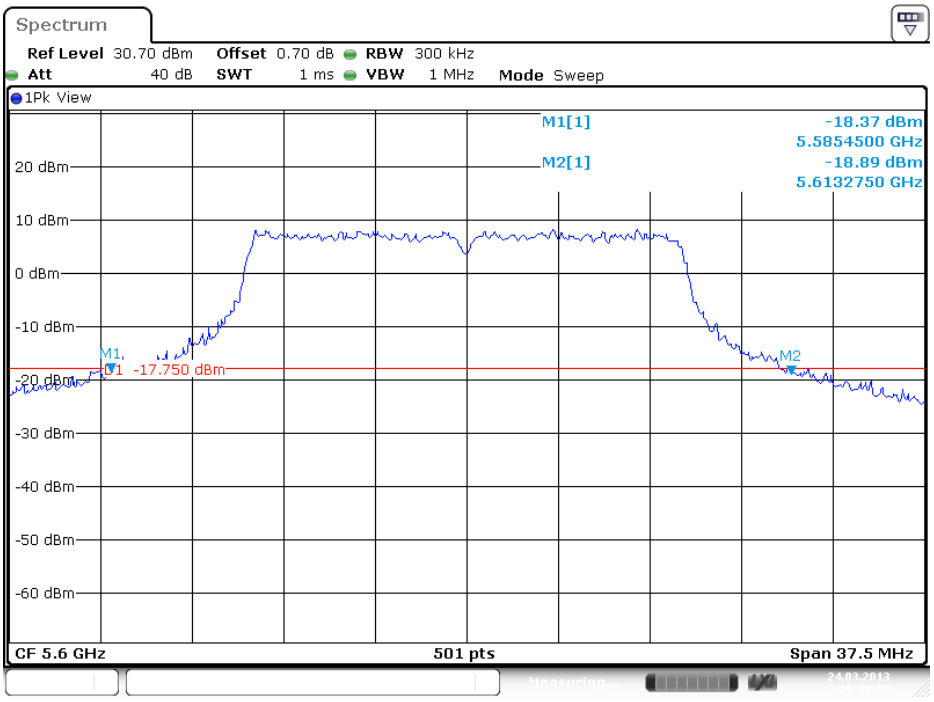
Operation mode: HT4 20 MHz, Antenna 2

Operating Frequency [MHz]	99% Bandwidth [kHz]	26dB Bandwidth [kHz]	Limit [kHz]	Plot number
5500	18038	23025	Not Applicable	A
5580	18188	27825	Not Applicable	B
5700	18038	23250	Not Applicable	C



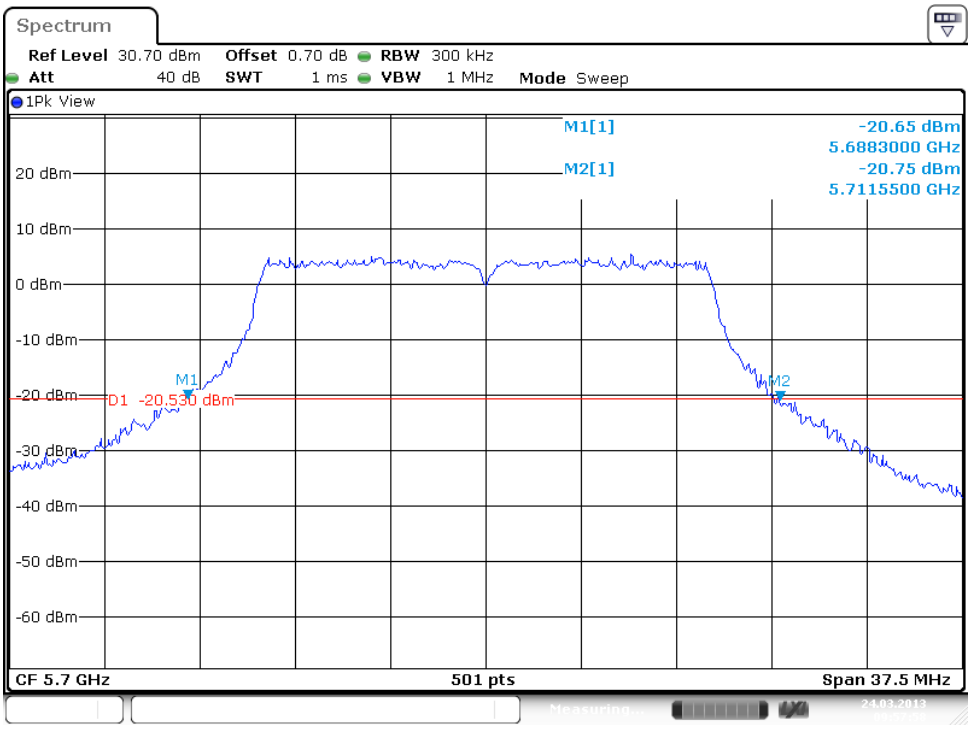
Date: 24.MAR.2013 08:07:37

Plot A



Date: 24.MAR.2013 09:16:18

Plot B



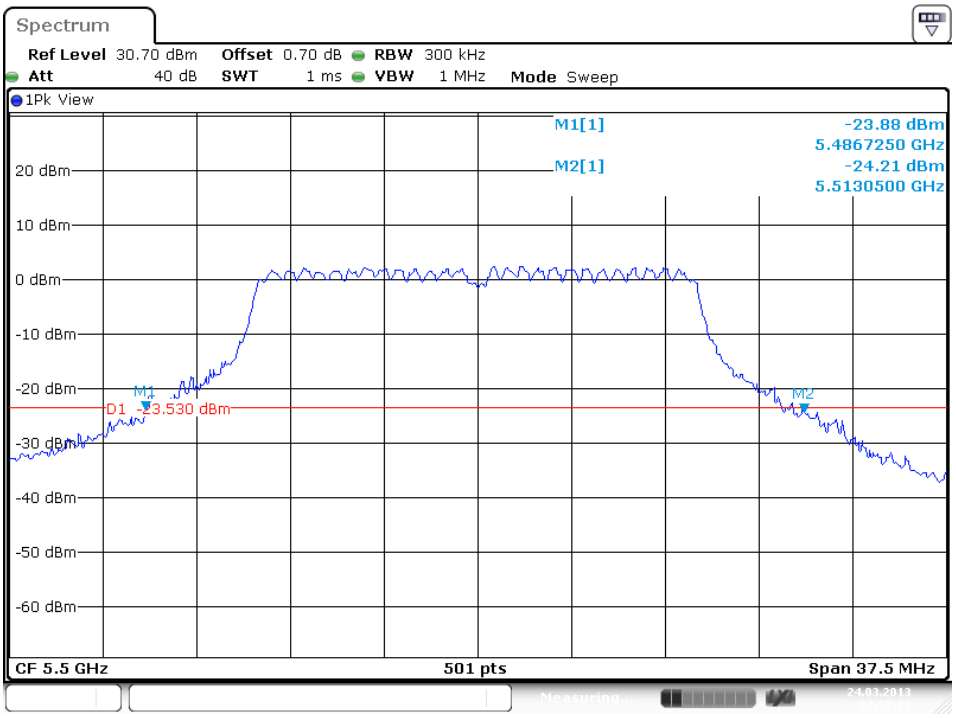
Date: 24.MAR.2013 09:57:58

Plot C

Operation mode: HT8 20 MHz, Antenna 1+2

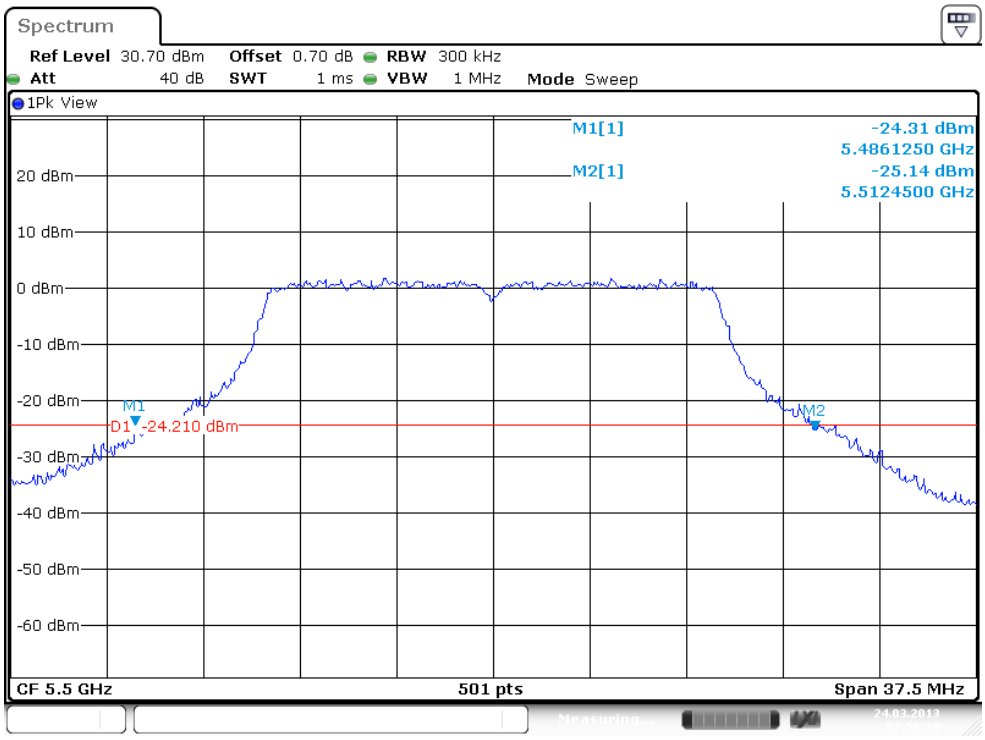
Operating Frequency [MHz]	99% Bandwidth Antenna1 / Antenna2 [kHz]	26dB Bandwidth Antenna1 / Antenna2 [kHz]	Limit [kHz]	Plot number
5500	18113 / 18263	26325 / 26325	Not Applicable	A
5580	18038 / 18263	26775 / 26775	Not Applicable	B
5700	18038 / 18188	25425 / 26550	Not Applicable	C

See plots on the next pages.



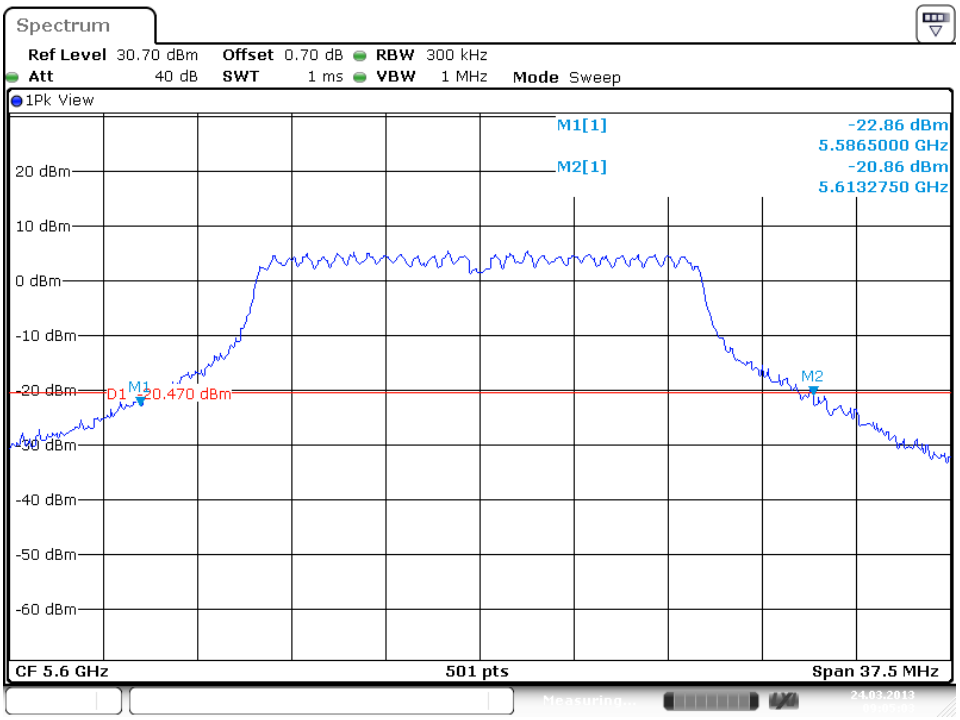
Date: 24.MAR.2013 07:55:22

Plot A1 Antenna 1



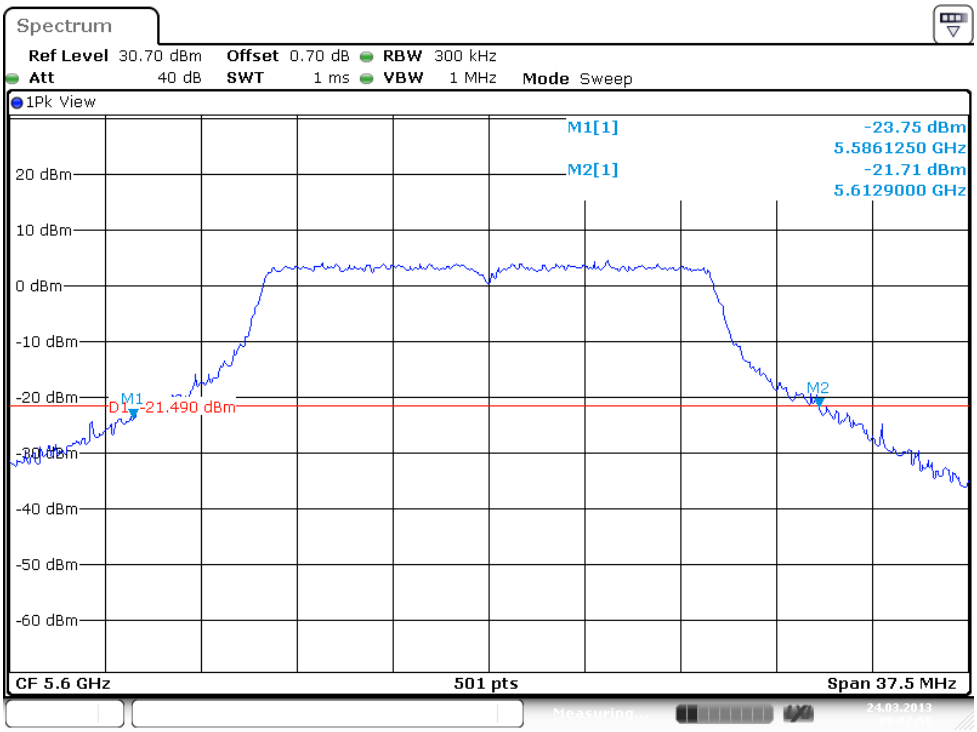
Date: 24.MAR.2013 07:56:30

Plot A2 Antenna 2



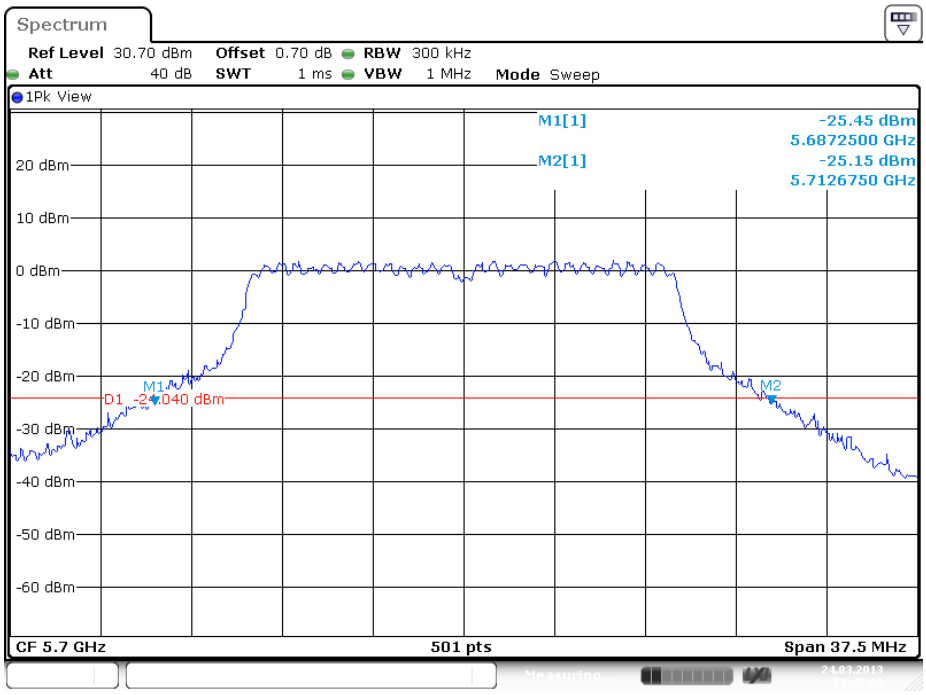
Date: 24.MAR.2013 09:05:03

Plot B1 Antenna 1



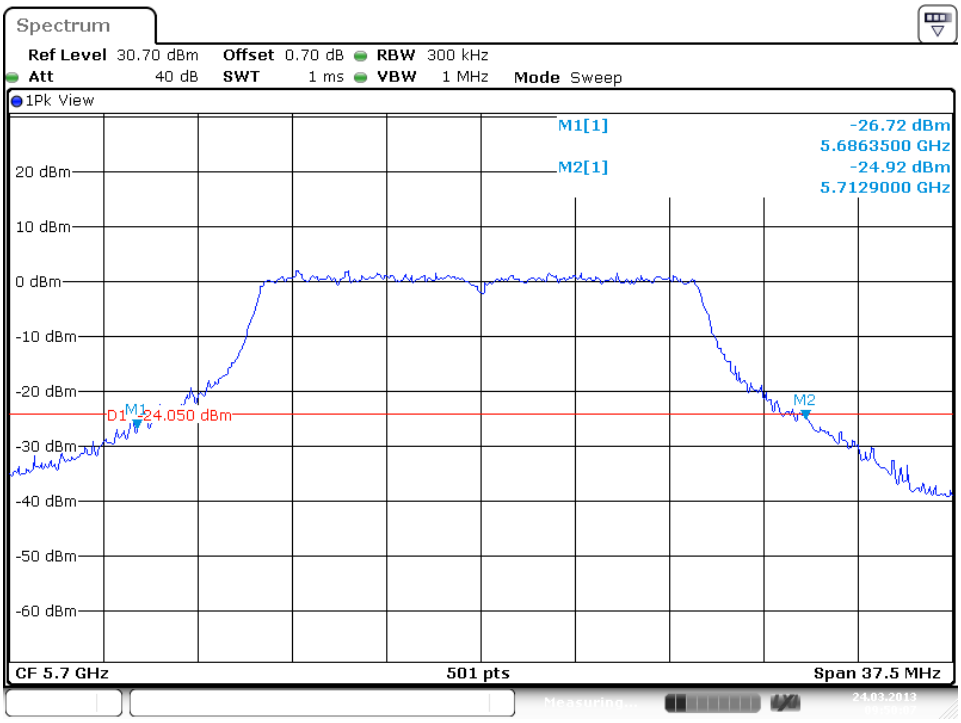
Date: 24.MAR.2013 09:07:58

Plot B2 Antenna 2



Date: 24.MAR.2013 09:47:09

Plot C1 Antenna 1

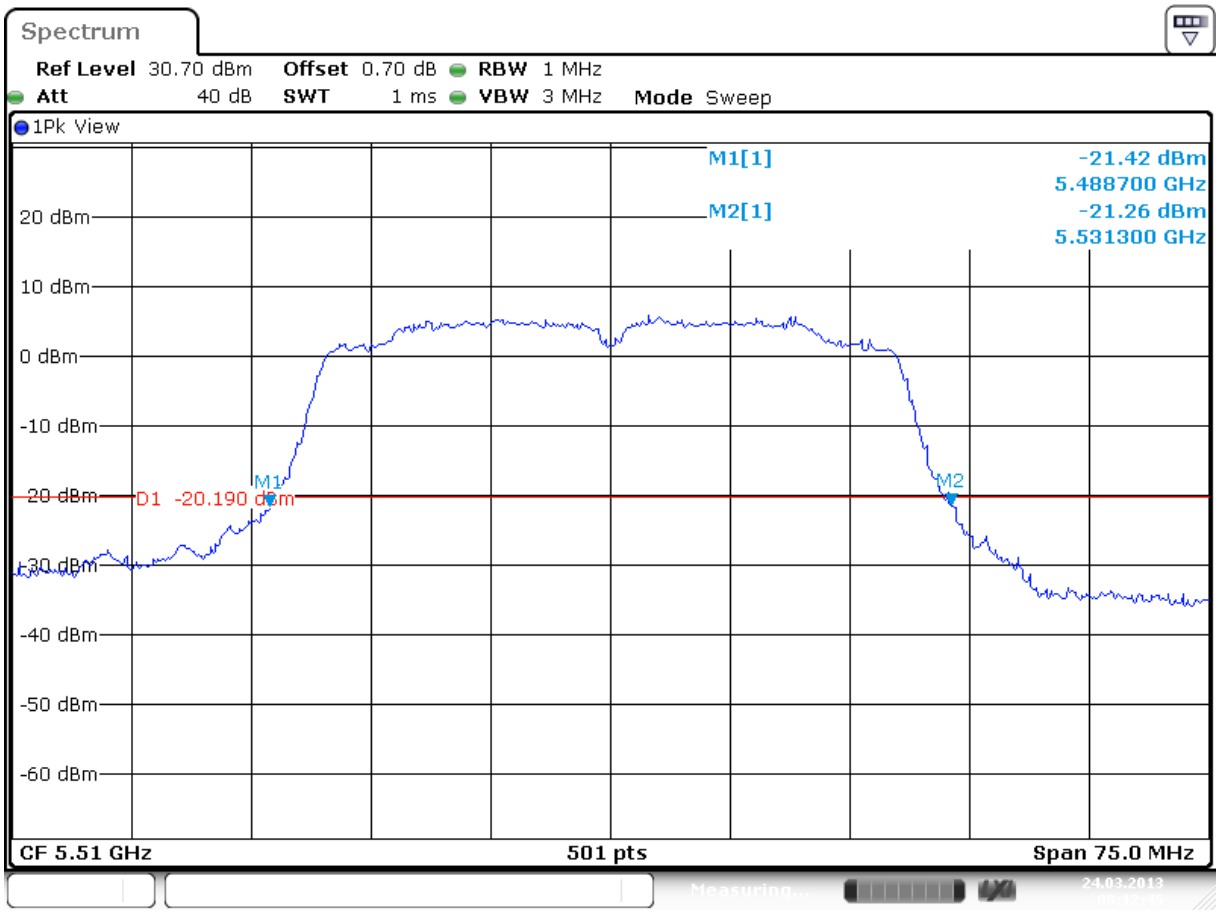


Date: 24.MAR.2013 09:50:07

Plot C2 Antenna 2

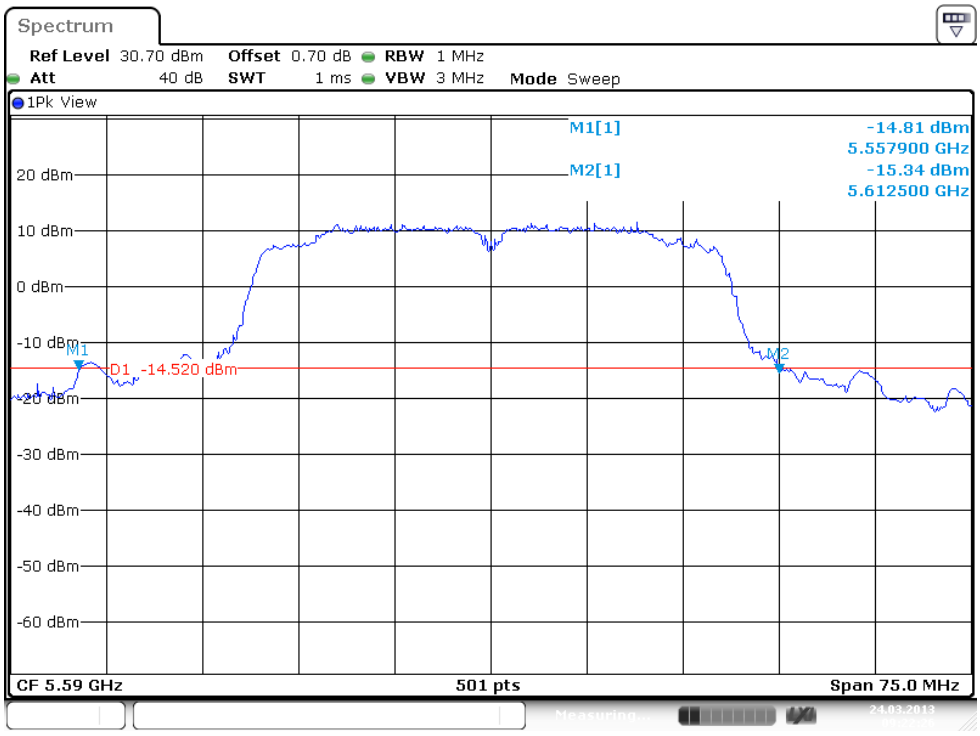
Operation mode: HT4 40 MHz, Antenna 1

Operating Frequency [MHz]	99% Bandwidth [kHz]	26dB Bandwidth [kHz]	Limit [kHz]	Plot number
5510	36227	42600	Not Applicable	A
5590	36526	54600	Not Applicable	B
5670	36377	46710	Not Applicable	C



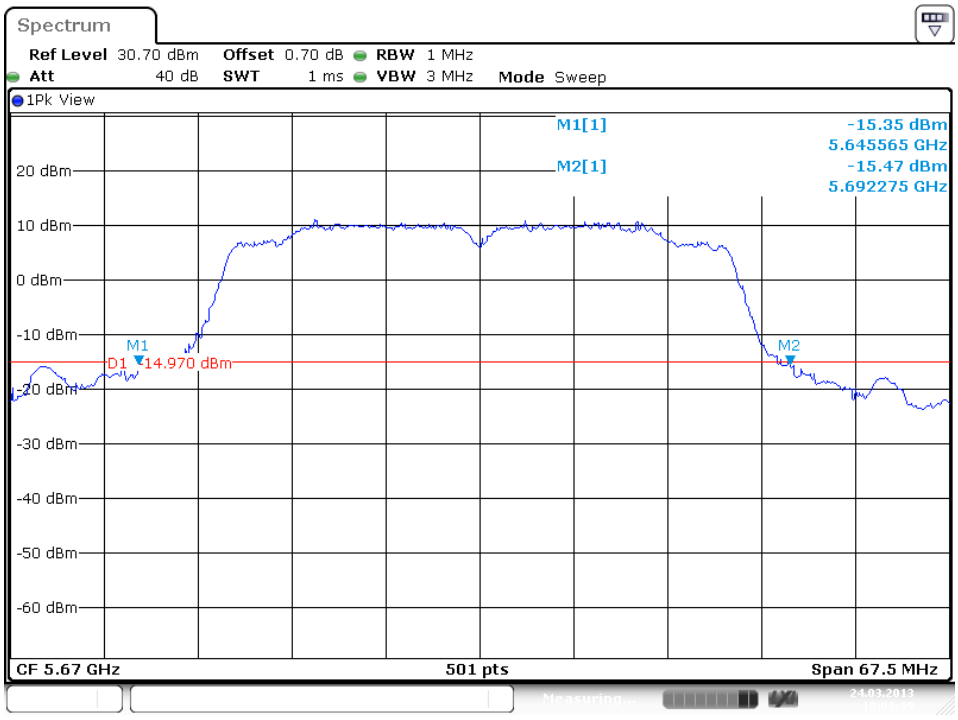
Date: 24.MAR.2013 08:12:45

Plot A



Date: 24.MAR.2013 09:22:26

Plot B

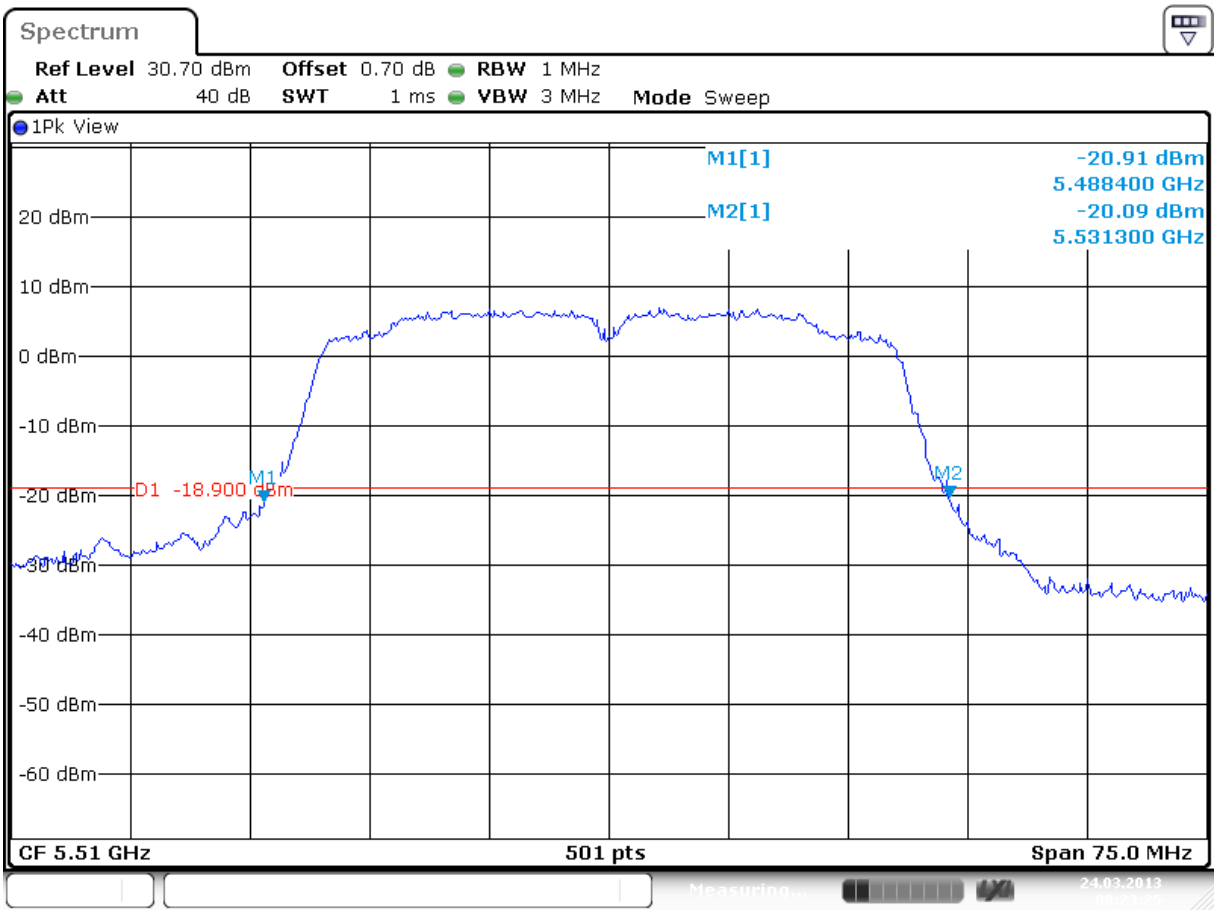


Date: 24.MAR.2013 10:03:40

Plot C

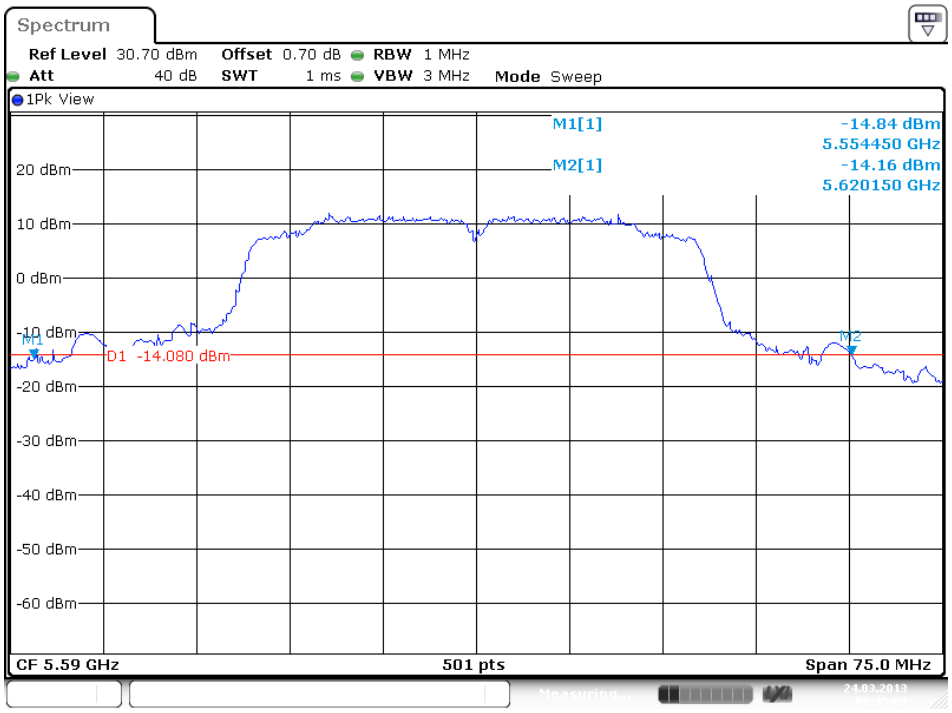
Operation mode: HT4 40 MHz, Antenna 2

Operating Frequency [MHz]	99% Bandwidth [kHz]	26dB Bandwidth [kHz]	Limit [kHz]	Plot number
5510	36227	42900	Not Applicable	A
5590	37275	65700	Not Applicable	B
5670	36646	55620	Not Applicable	C



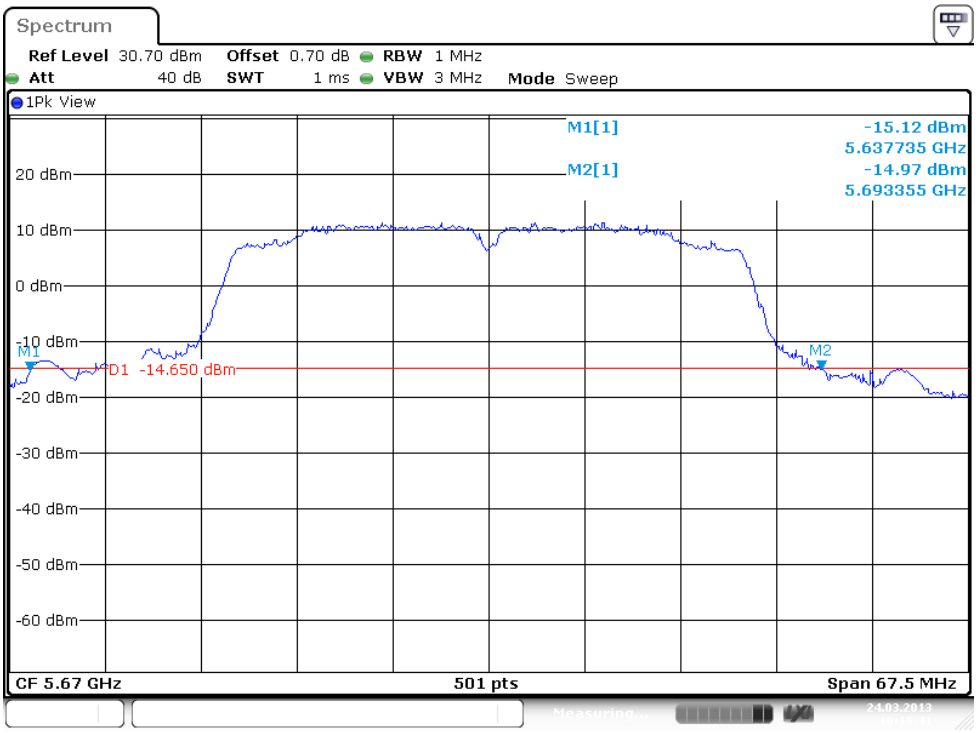
Date: 24.MAR.2013 08:23:25

Plot A



Date: 24.MAR.2013 09:35:09

Plot B



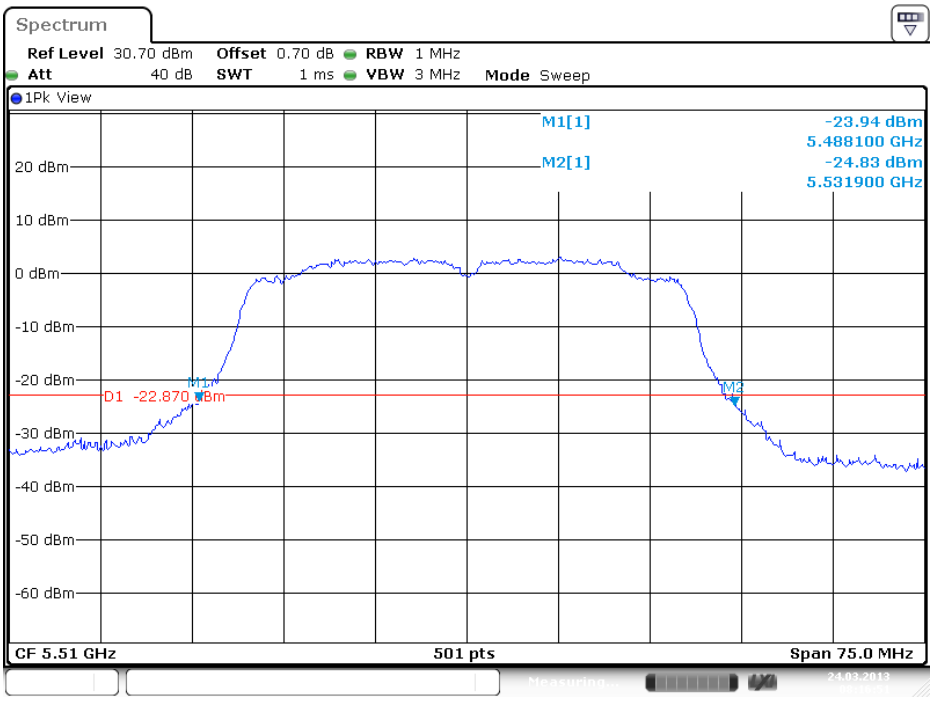
Date: 24.MAR.2013 10:19:42

Plot C

Operation mode: HT8 40 MHz, Antenna 1+2

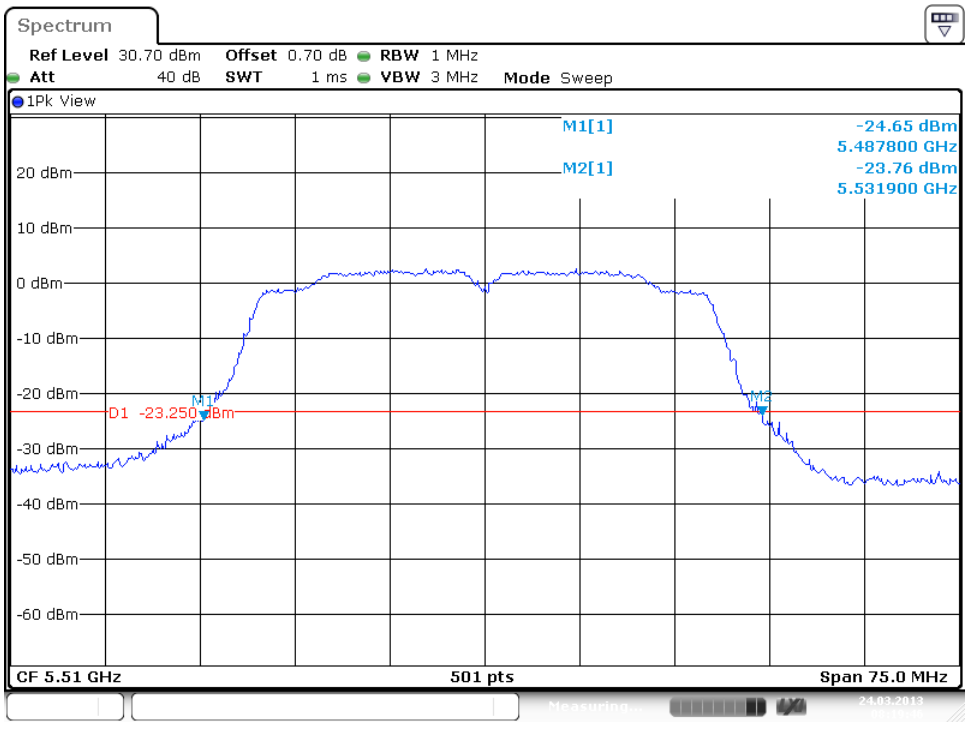
Operating Frequency [MHz]	99% Bandwidth Antenna1 / Antenna2 [kHz]	26dB Bandwidth Antenna1 / Antenna2 [kHz]	Limit [kHz]	Plot number
5510	36077 / 36377	43800 / 44100	Not Applicable	A
5590	36242 / 36242	43740 / 44280	Not Applicable	B
5670	36242 / 36377	43875 / 45360	Not Applicable	C

See plots on the next page.



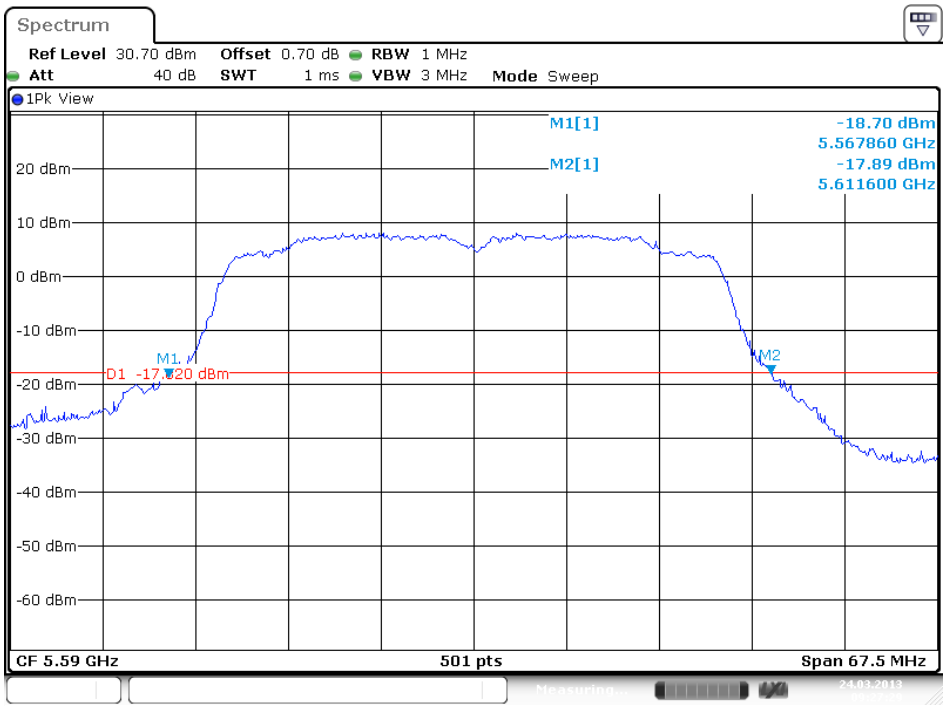
Date: 24.MAR.2013 08:16:52

Plot A1 Antenna 1



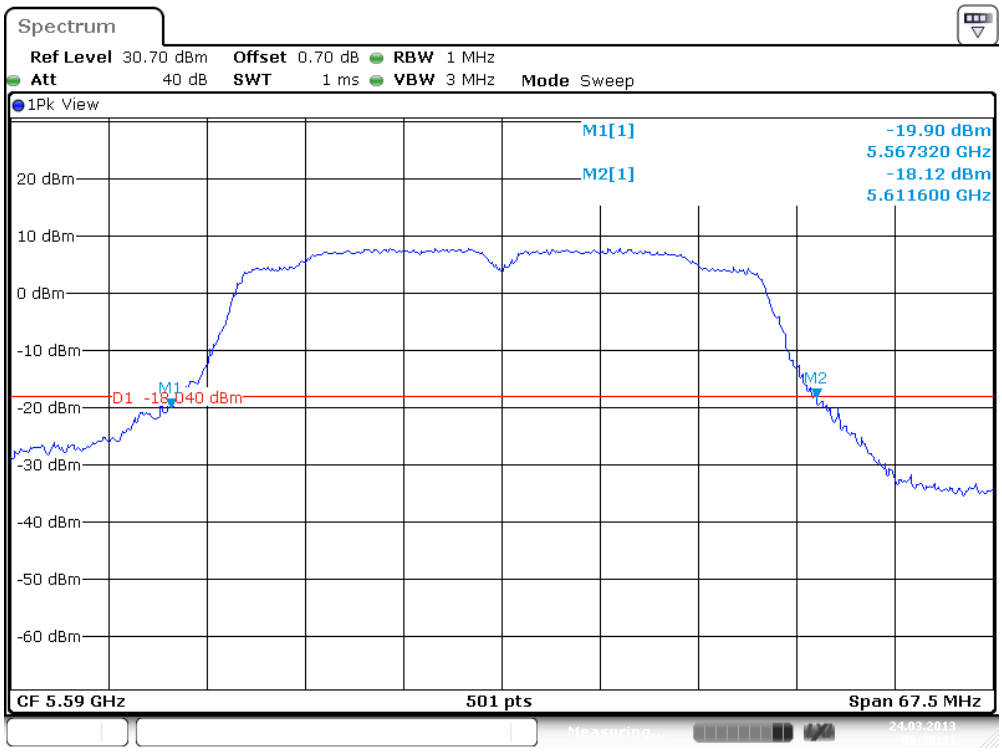
Date: 24.MAR.2013 08:19:47

Plot A2 Antenna 2



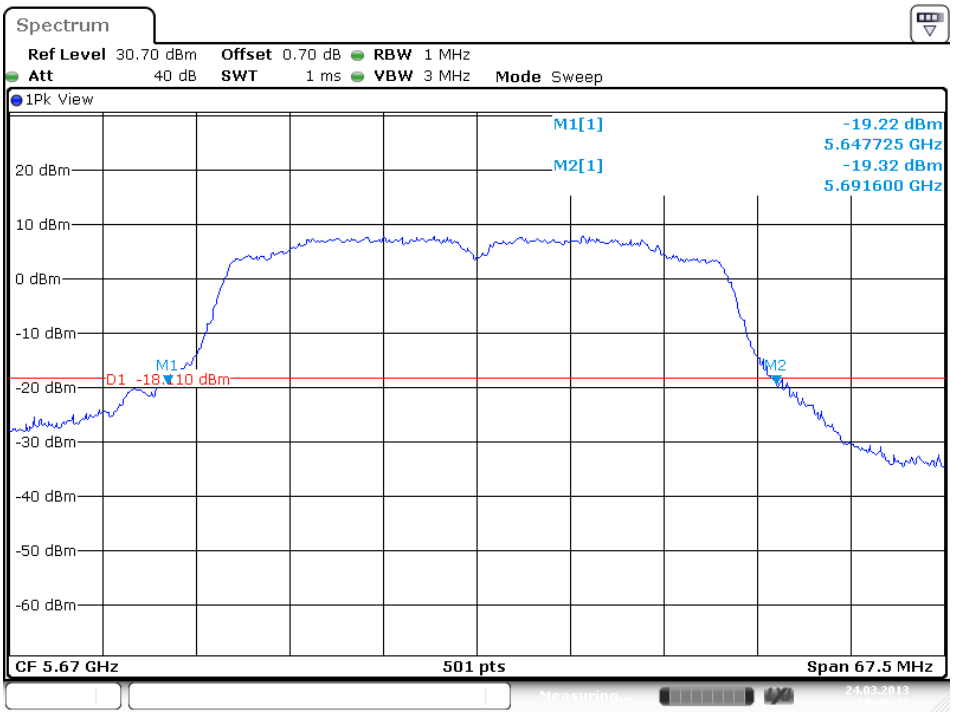
Date: 24.MAR.2013 09:27:29

Plot B1 Antenna 1



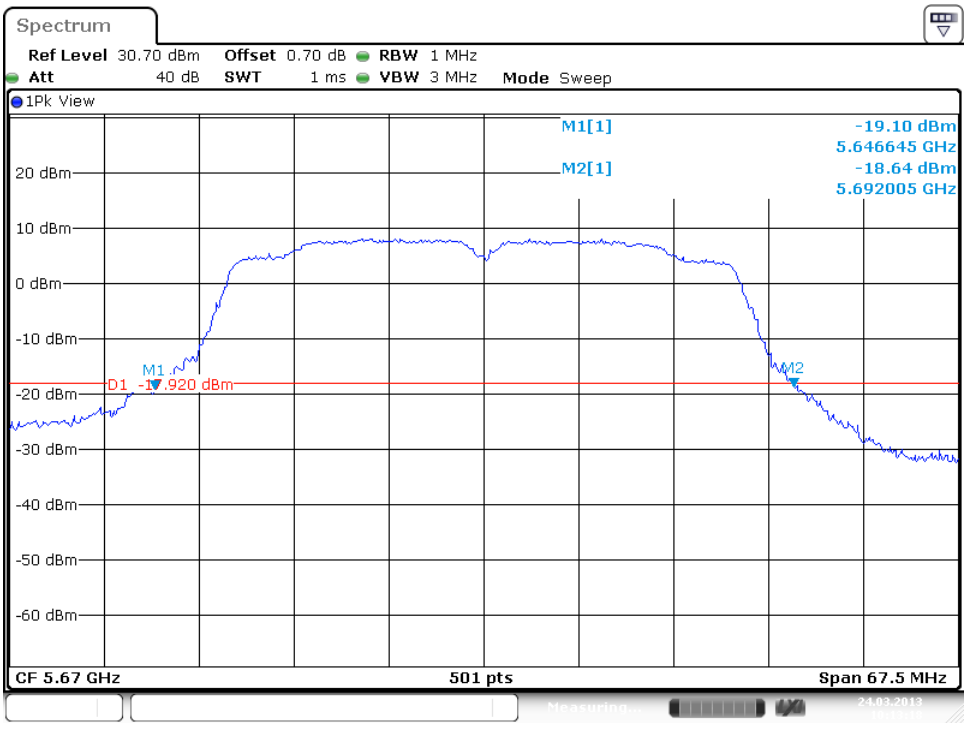
Date: 24.MAR.2013 09:30:32

Plot B2 Antenna 2



Date: 24.MAR.2013 10:08:42

Plot C1 Antenna 1

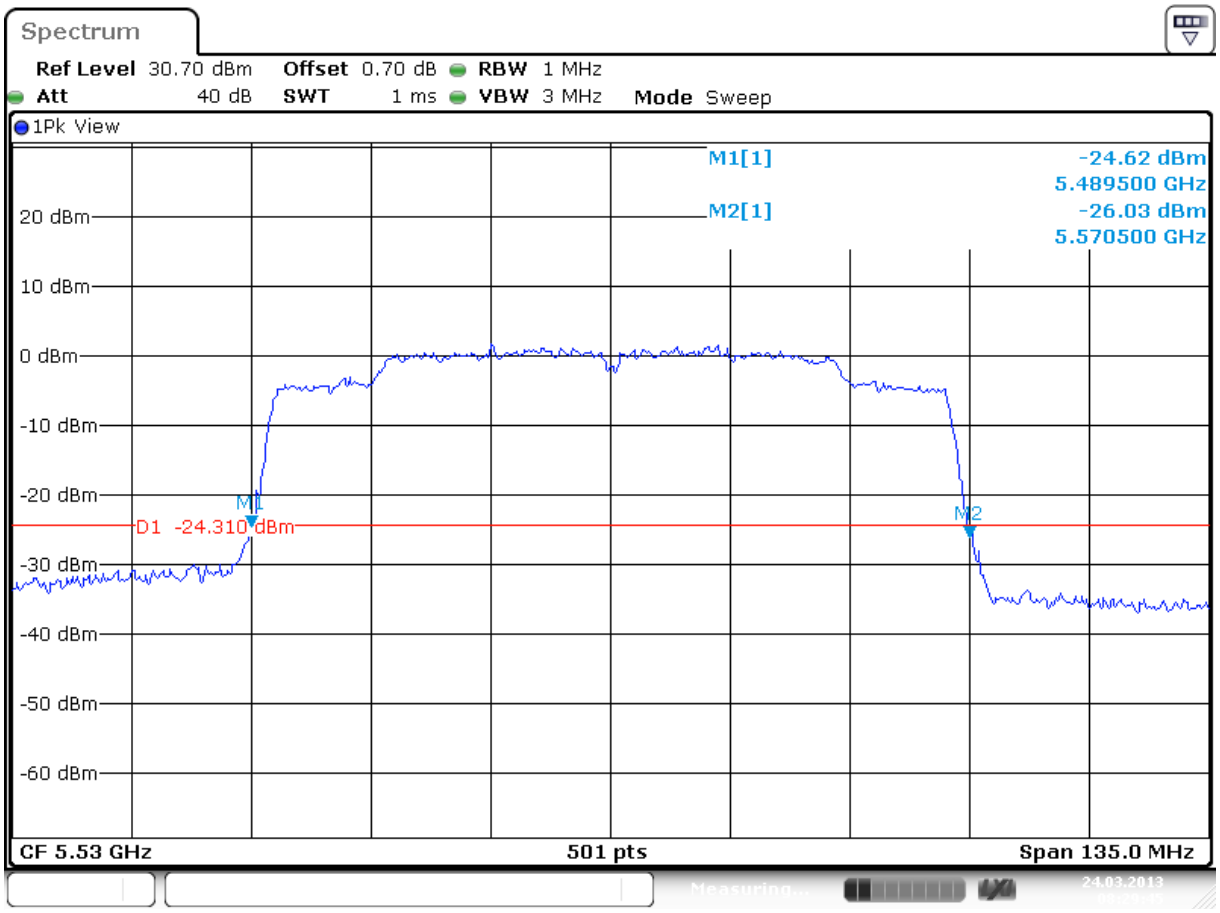


Date: 24.MAR.2013 10:13:17

Plot C2 Antenna 2

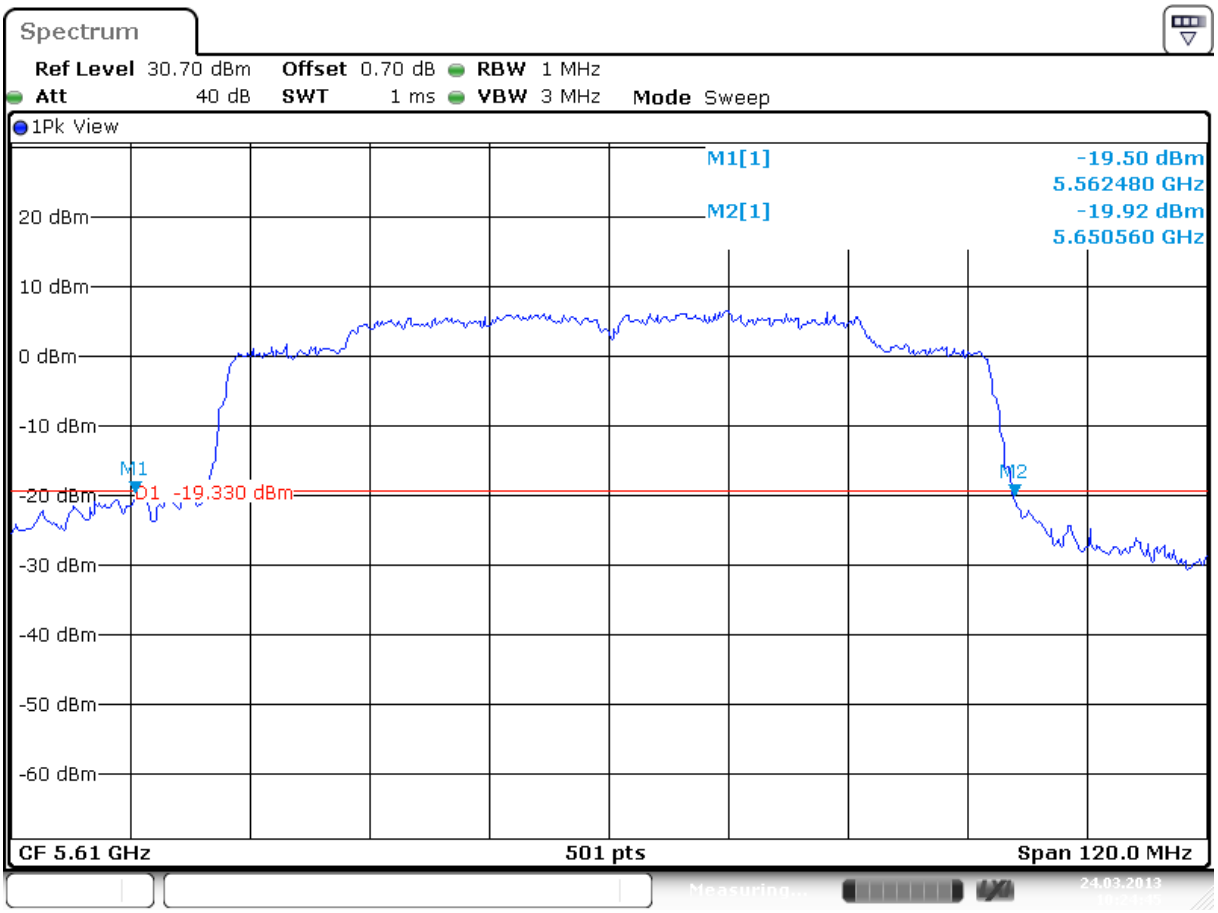
Operation mode: VHT6 80 MHz, Antenna 1

Operating Frequency [MHz]	99% Bandwidth [kHz]	26dB Bandwidth [kHz]	Limit [kHz]	Plot number
5530	74910	81000	Not Applicable	A
5610	75209	88080	Not Applicable	B



Date: 24.MAR.2013 08:29:45

Plot A

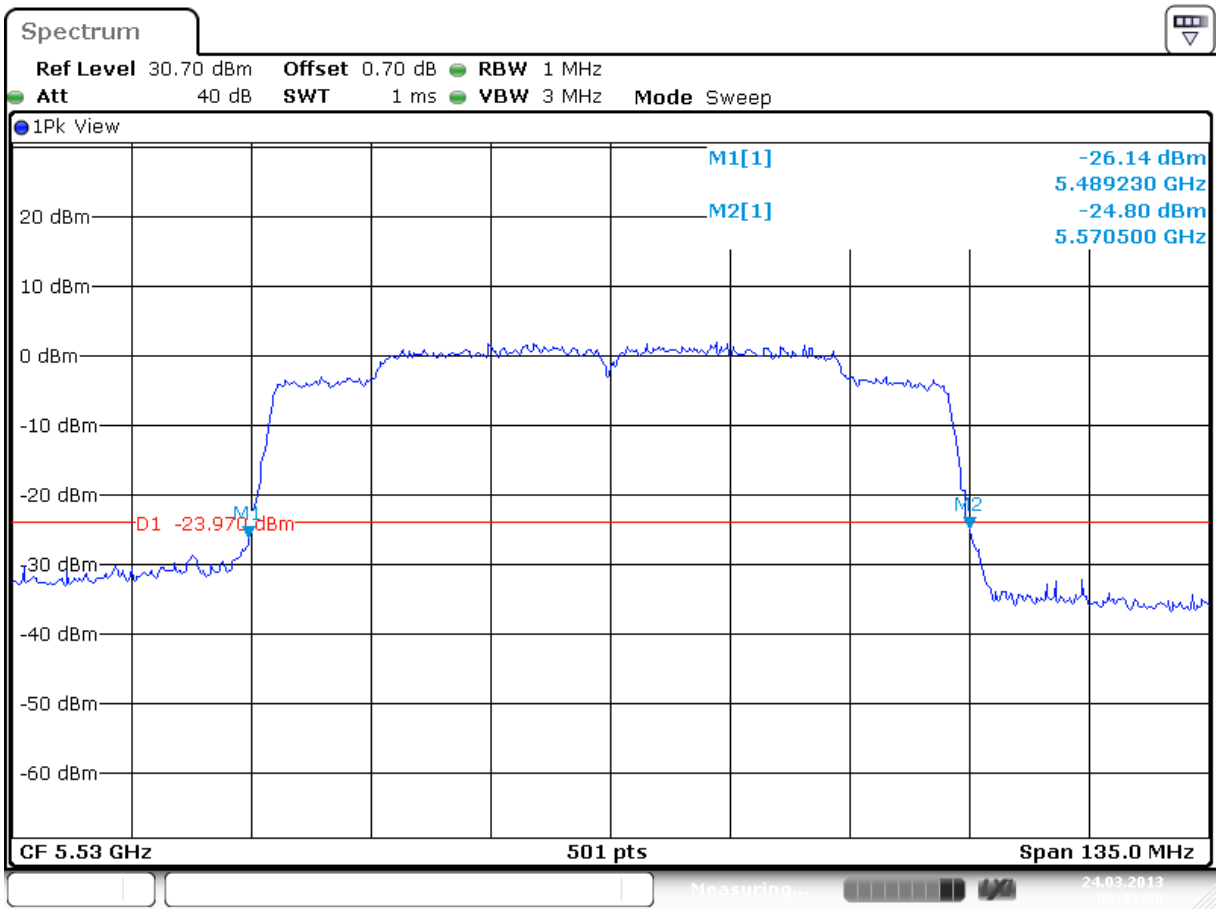


Date: 24.MAR.2013 10:24:45

Plot B

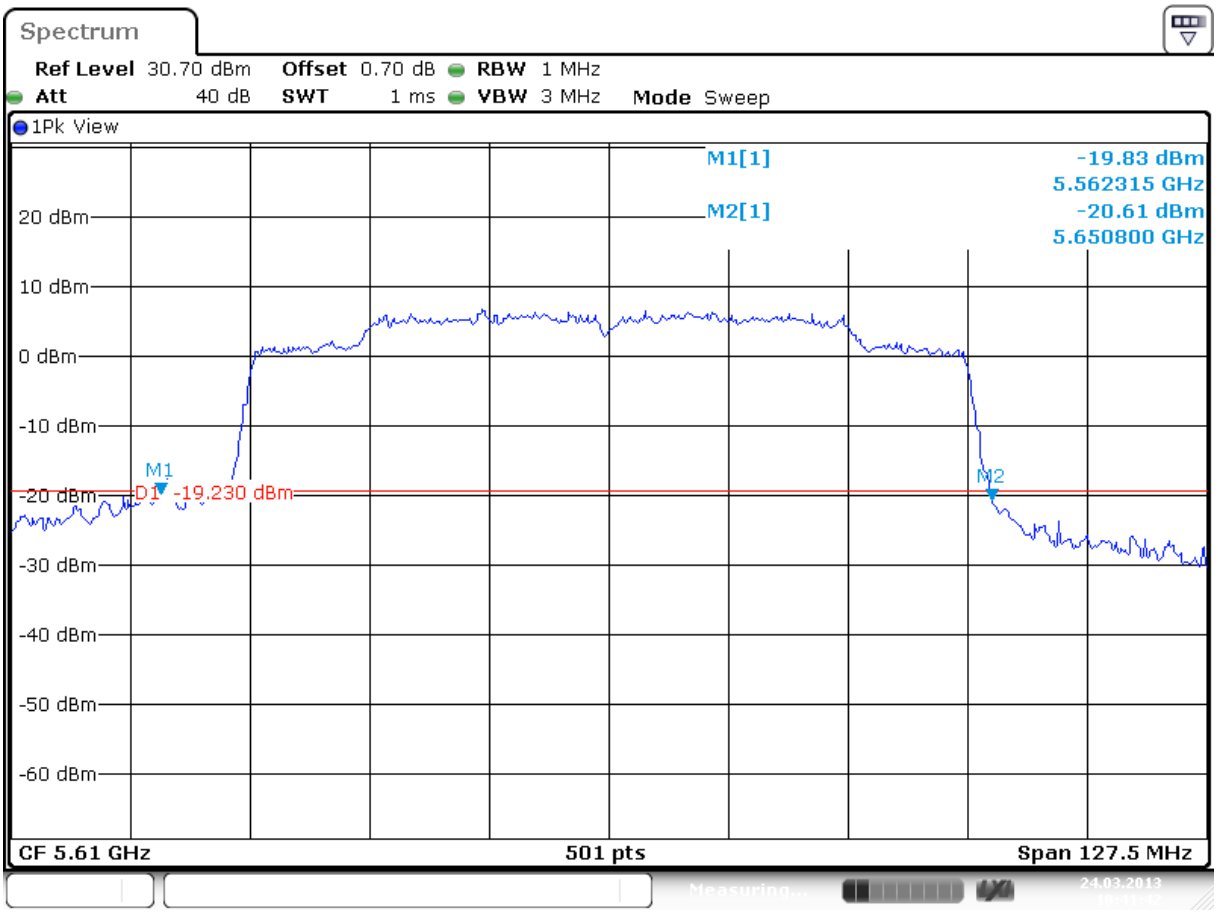
Operation mode: VHT6 80 MHz, Antenna 2

Operating Frequency [MHz]	99% Bandwidth [kHz]	26dB Bandwidth [kHz]	Limit [kHz]	Plot number
5530	74910	81270	Not Applicable	A
5610	75329	88485	Not Applicable	B



Date: 24.MAR.2013 08:43:20

Plot A



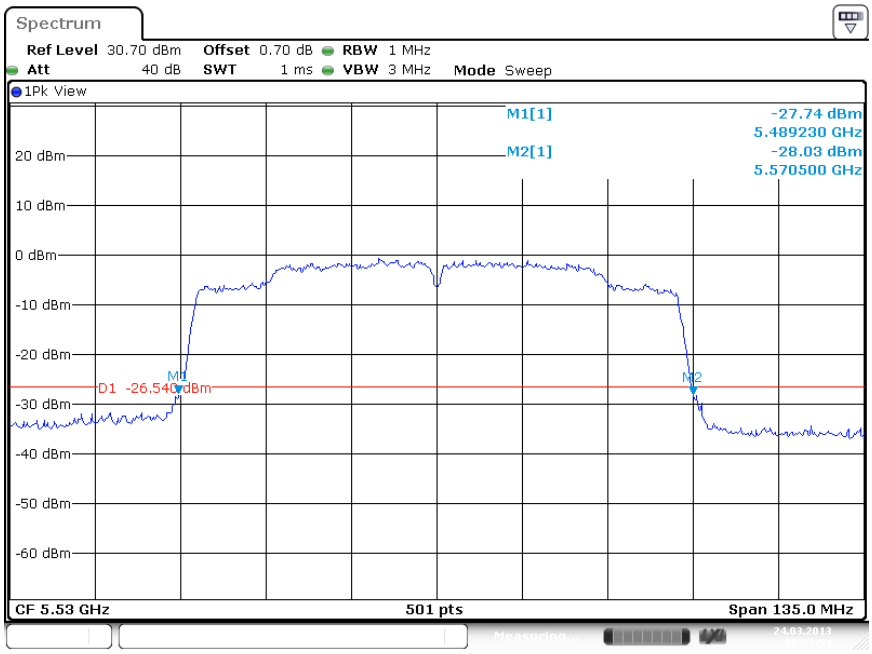
Date: 24.MAR.2013 10:41:42

Plot B

Operation mode: VHT6 80 MHz, Antenna 1+2

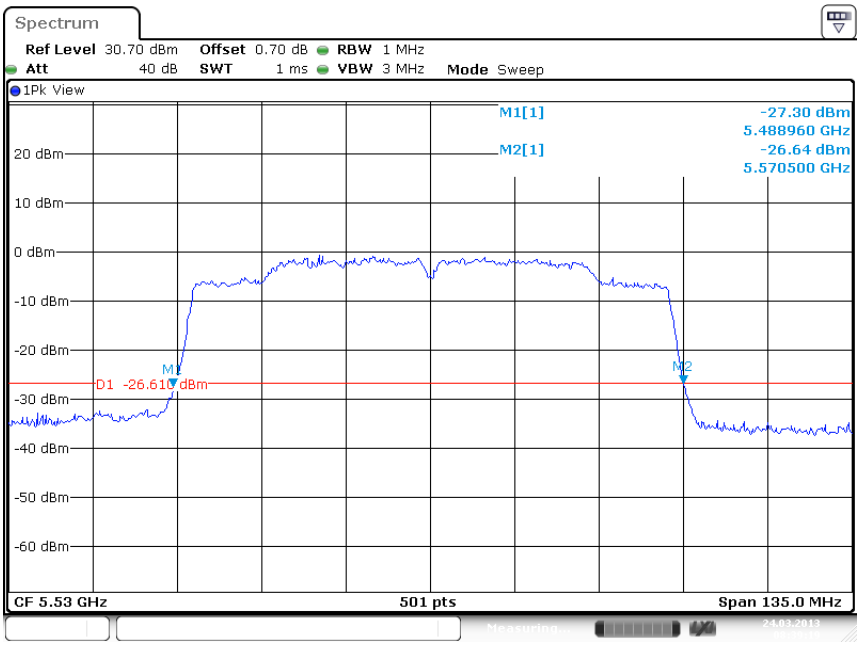
Operating Frequency [MHz]	99% Bandwidth Antenna1 / Antenna2 [kHz]	26dB Bandwidth Antenna1 / Antenna2 [kHz]	Limit [kHz]	Plot number
5530	74910 / 74910	81270 / 81540	Not Applicable	A
5610	75209 / 75209	88080 / 93360	Not Applicable	B

See plots on the next pages.



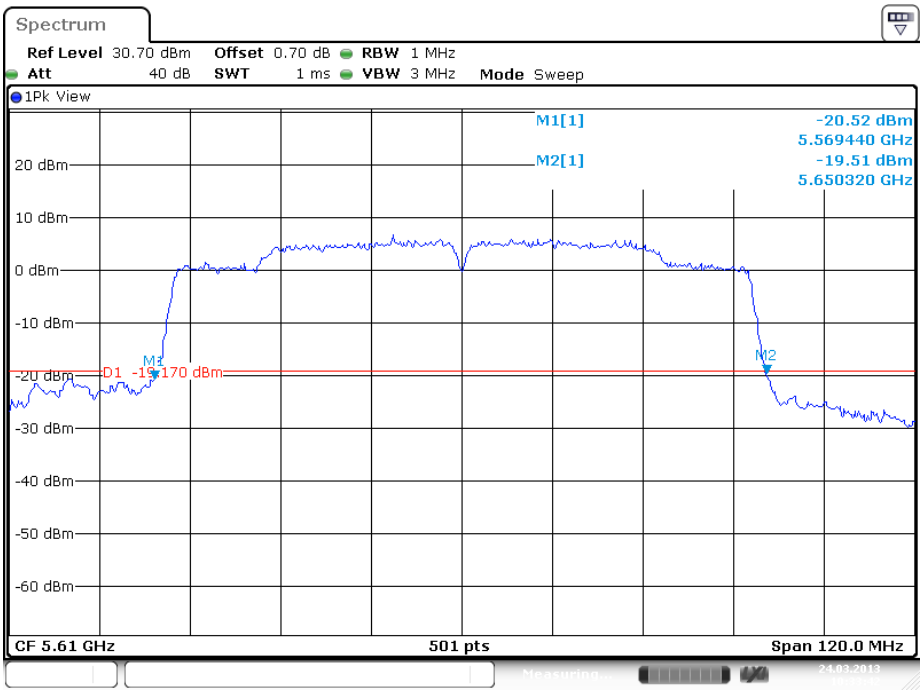
Date: 24.MAR.2013 08:35:54

Plot A1 Antenna 1



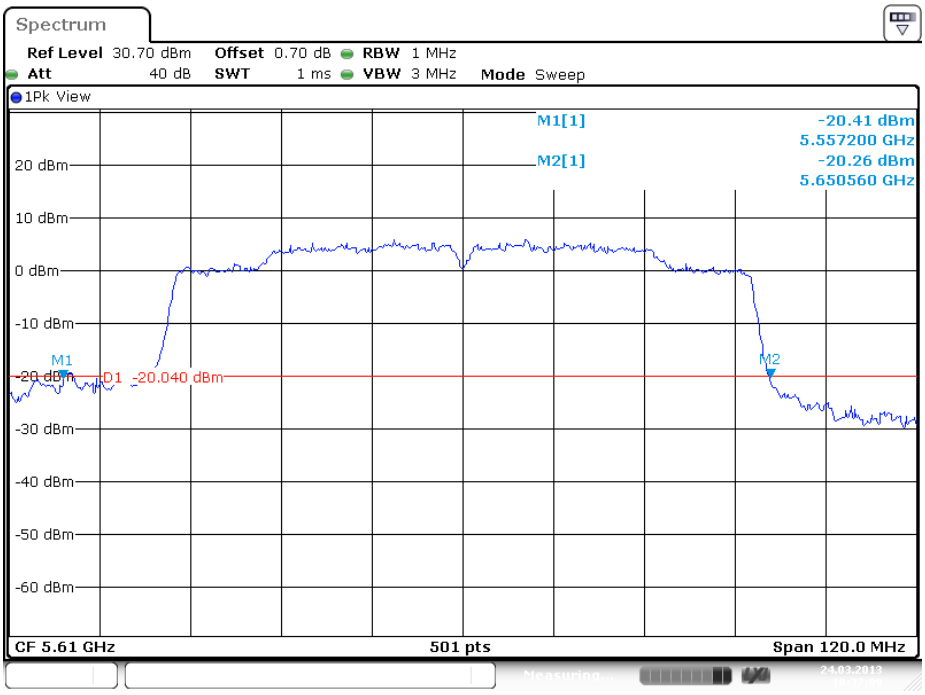
Date: 24.MAR.2013 08:39:19

Plot A2 Antenna 2



Date: 24.MAR.2013 10:33:42

Plot B1 Antenna 1

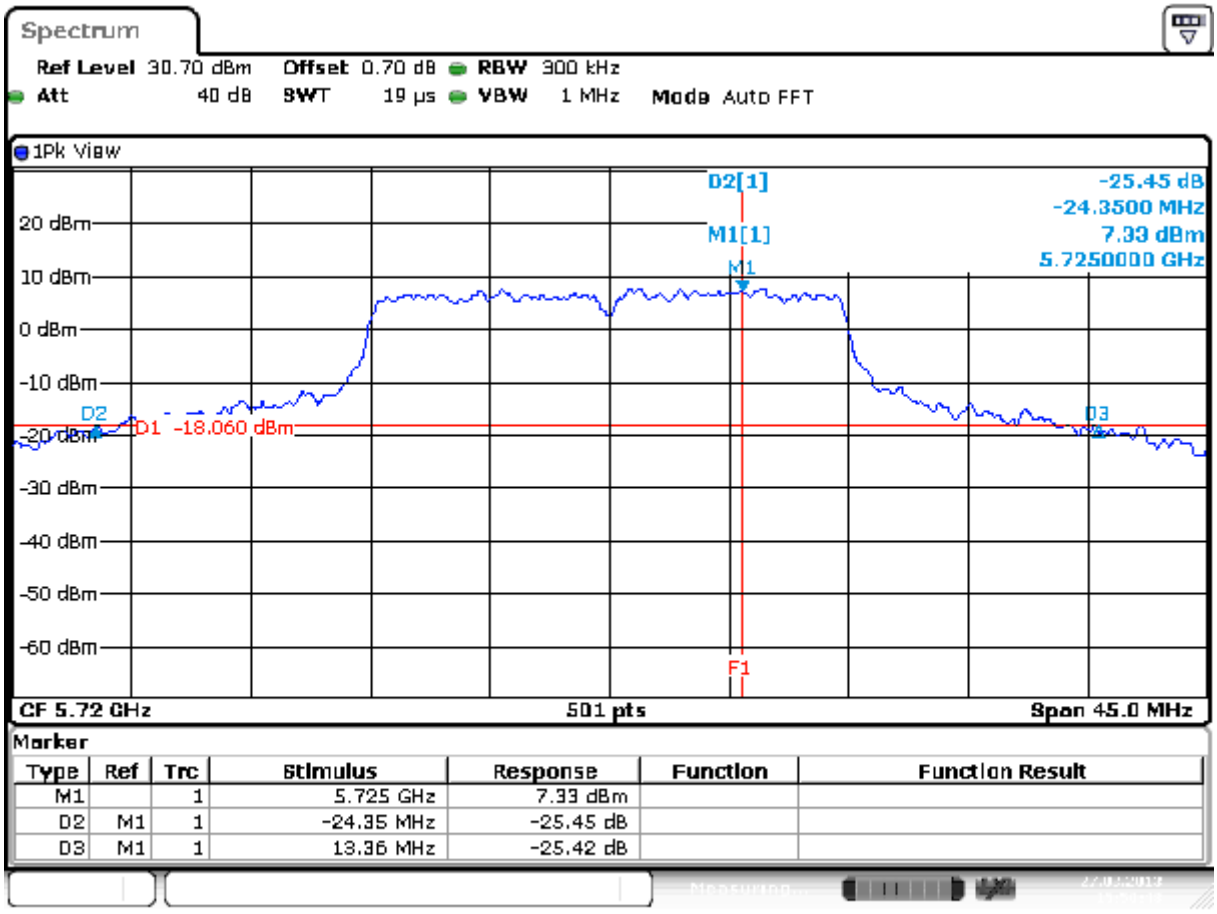


Date: 24.MAR.2013 10:37:09

Plot B2 Antenna 2

Operation mode: VHT6 20 MHz Ch144, Antenna 1

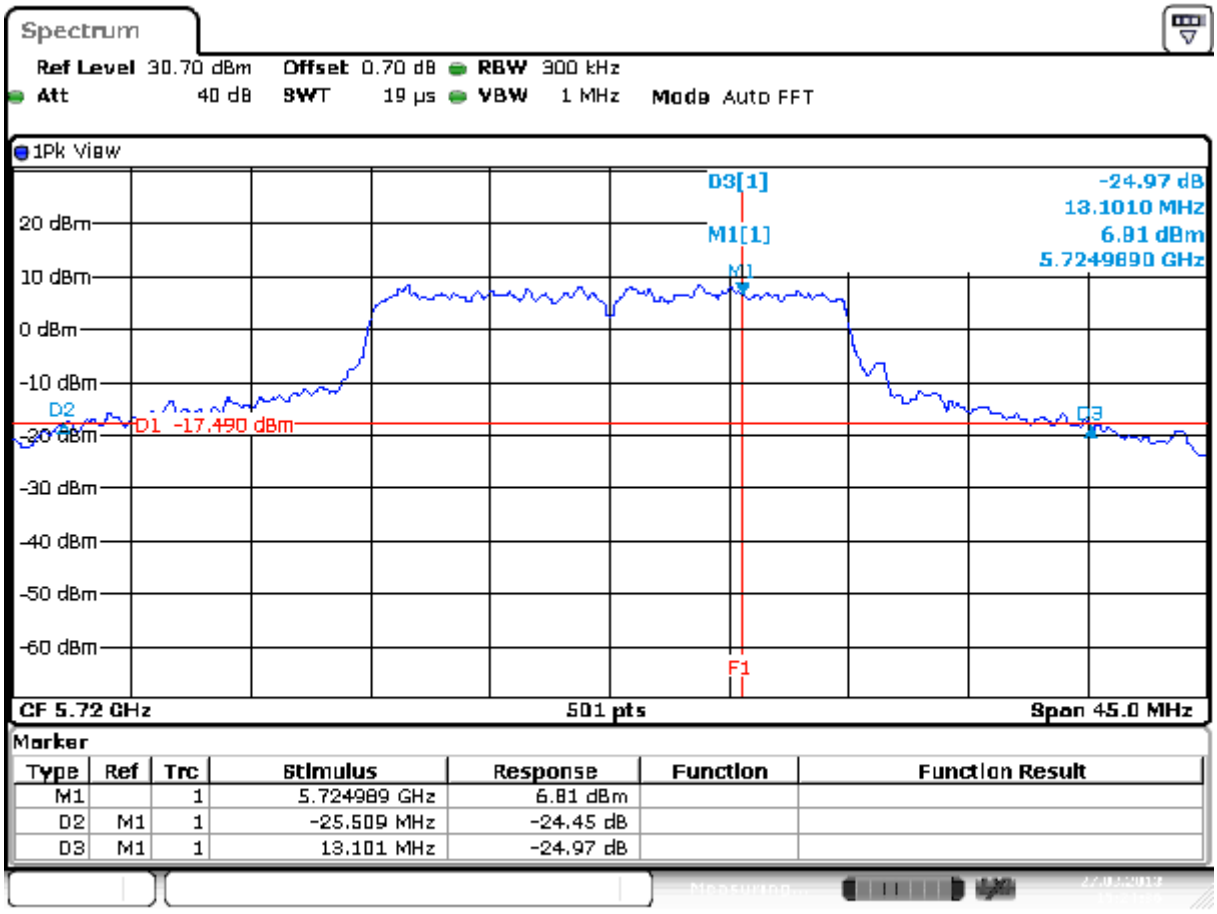
Operating Frequency [MHz]	99% Bandwidth [kHz]	26dB Bandwidth [kHz]	Limit [kHz]
5720	19500	24350 in UNII2ext 13360 in UNII3 37710 Total	Not Applicable



Date: 27.MAR.2013 15:50:48

Operation mode: VHT6 20 MHz Ch144, Antenna 2

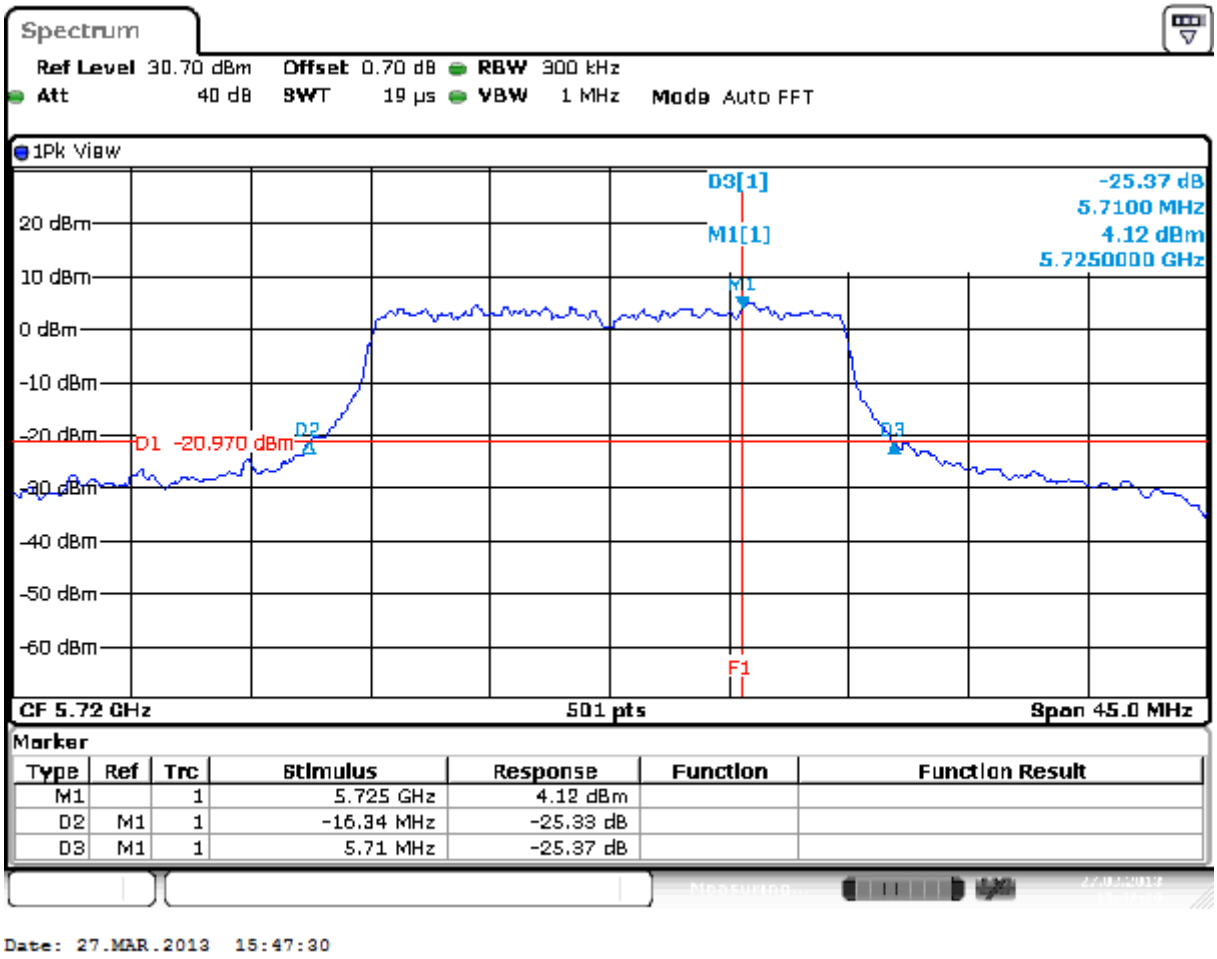
Operating Frequency [MHz]	99% Bandwidth [kHz]	26dB Bandwidth [kHz]	Limit [kHz]
5720	19450	25509 in UNII2ext 13101 in UNII3 38610 Total	Not Applicable



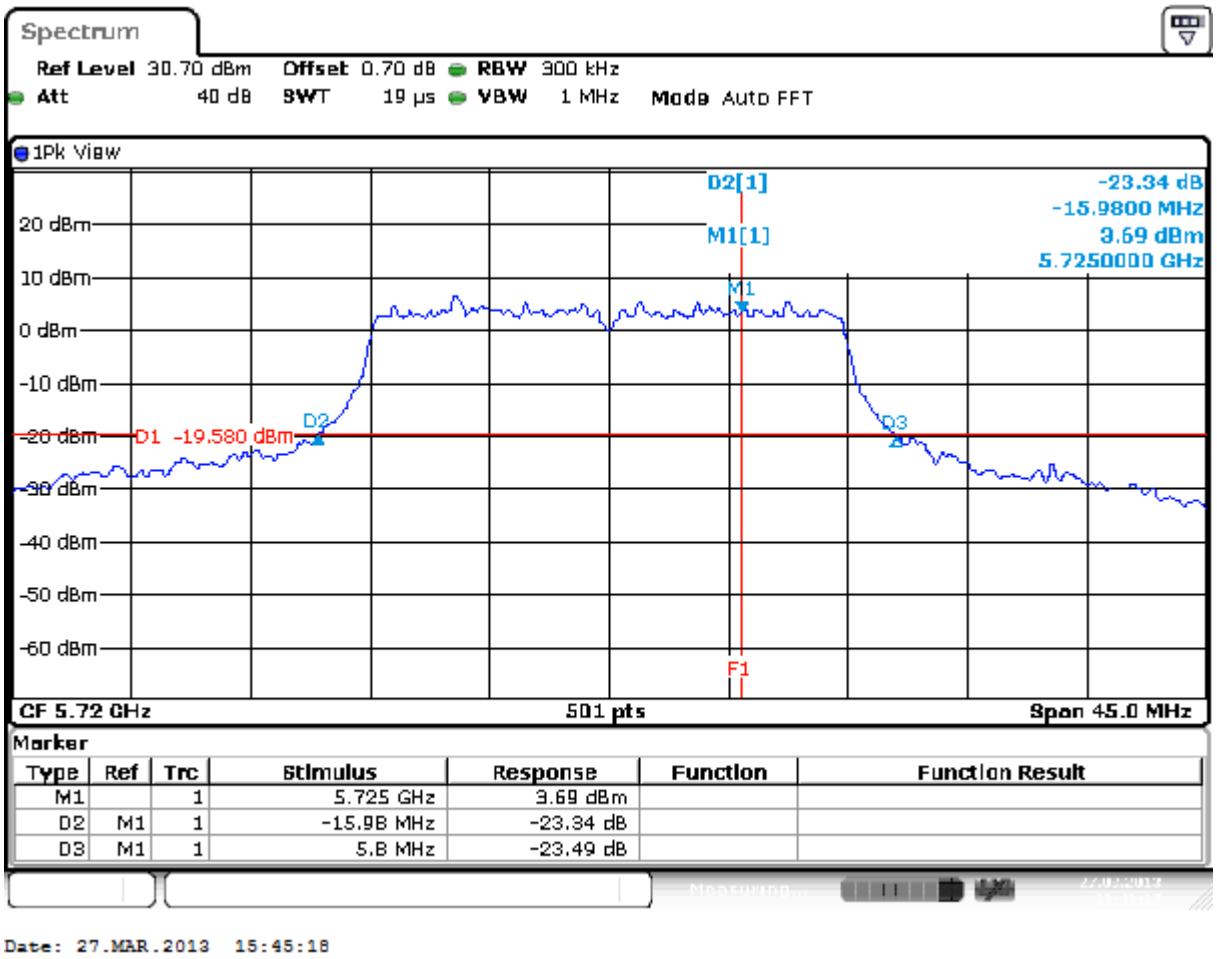
Date: 27.MAR.2013 15:24:36

Operation mode: VHT6 20 MHz, Antenna 1+2

Operating Frequency [MHz]	99% Bandwidth Antenna1 / Antenna2 [kHz]	26dB Bandwidth Antenna1 / Antenna2 [kHz]	Limit [kHz]
5720	19550 / 19500	16340 / 15980 in UNII2ext 5800 / 5710 in UNII3 21780 / 22050 Total	Not Applicable



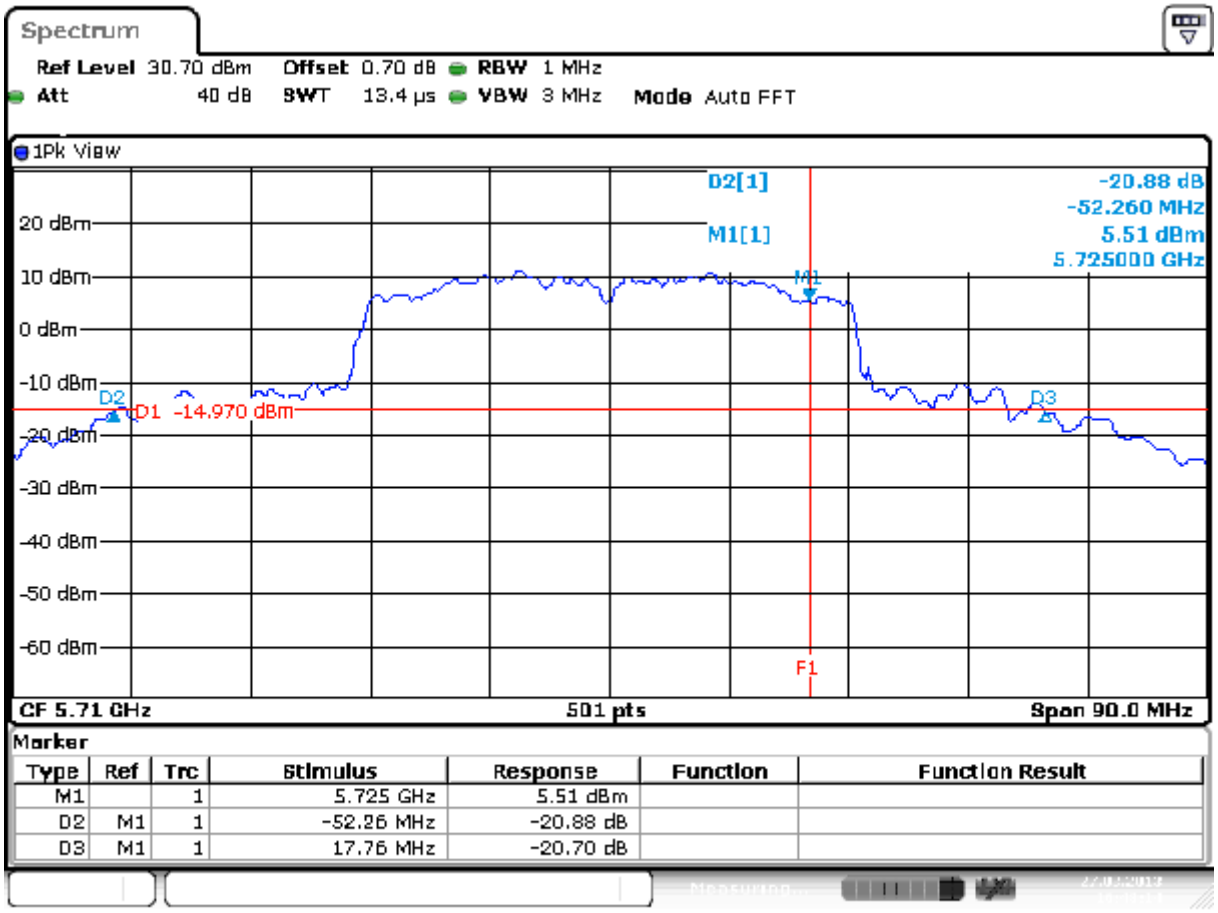
Plot 26 dB BW Antenna 1



Plot 26 dB BW Antenna 2

Operation mode: VHT6 40 MHz Ch142, Antenna 1

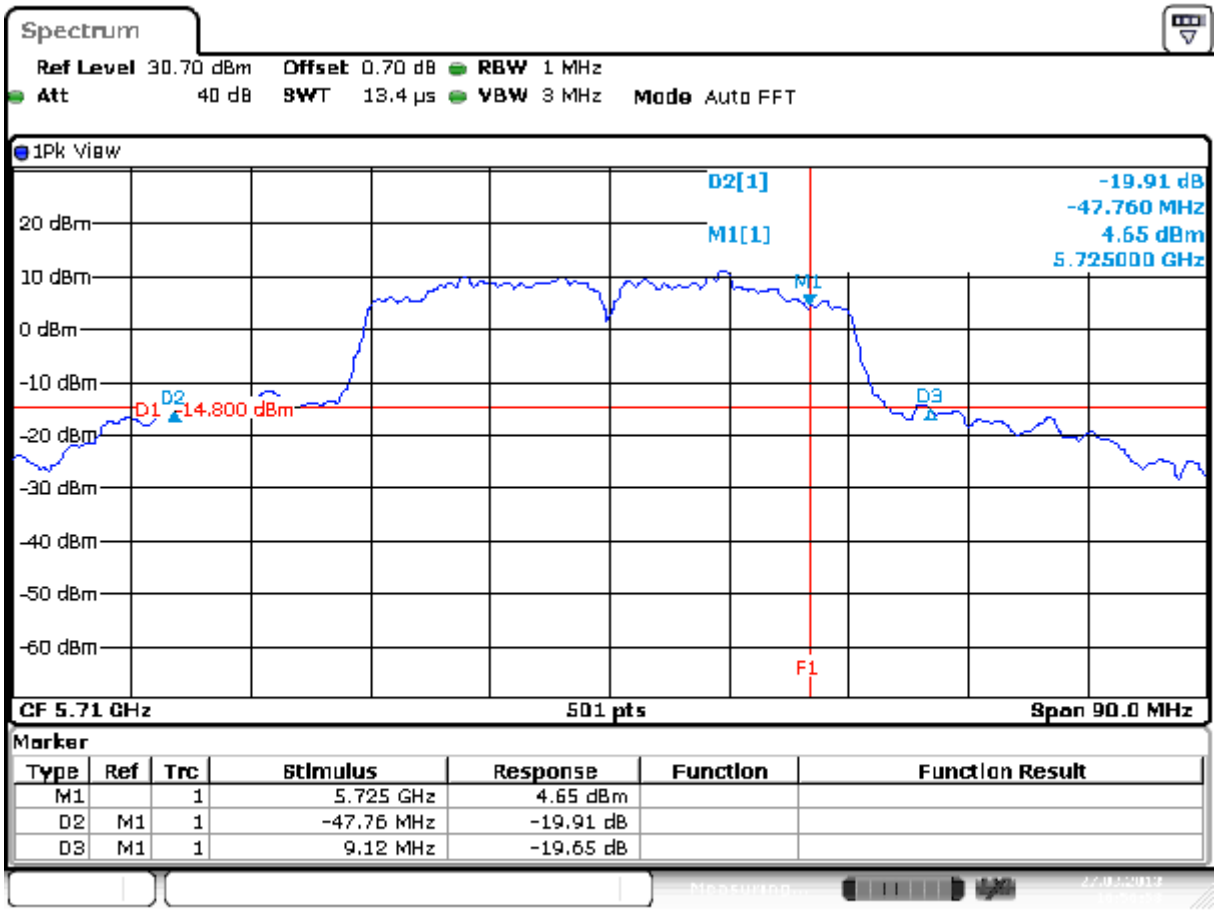
Operating Frequency [MHz]	99% Bandwidth [kHz]	26dB Bandwidth [kHz]	Limit [kHz]
5710	37700	52260 in UNII2ext 17760 in UNII3 70020 Total	Not Applicable



Date: 27.MAR.2013 16:48:14

Operation mode: VHT6 40 MHz Ch 142, Antenna 2

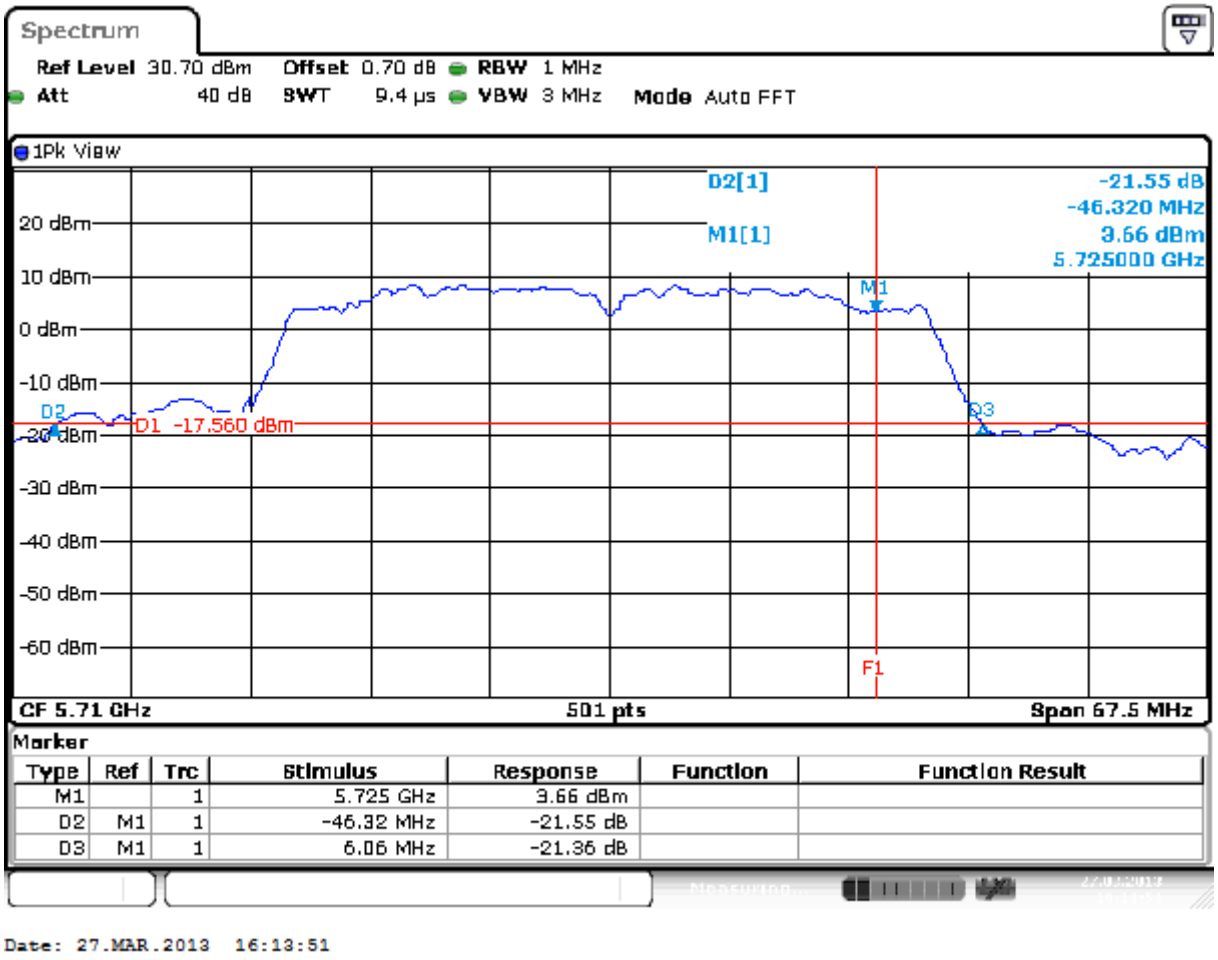
Operating Frequency [MHz]	99% Bandwidth [kHz]	26dB Bandwidth [kHz]	Limit [kHz]
5710	37850	47760 in UNII2ext 9120 in UNII3 56880 Total	Not Applicable



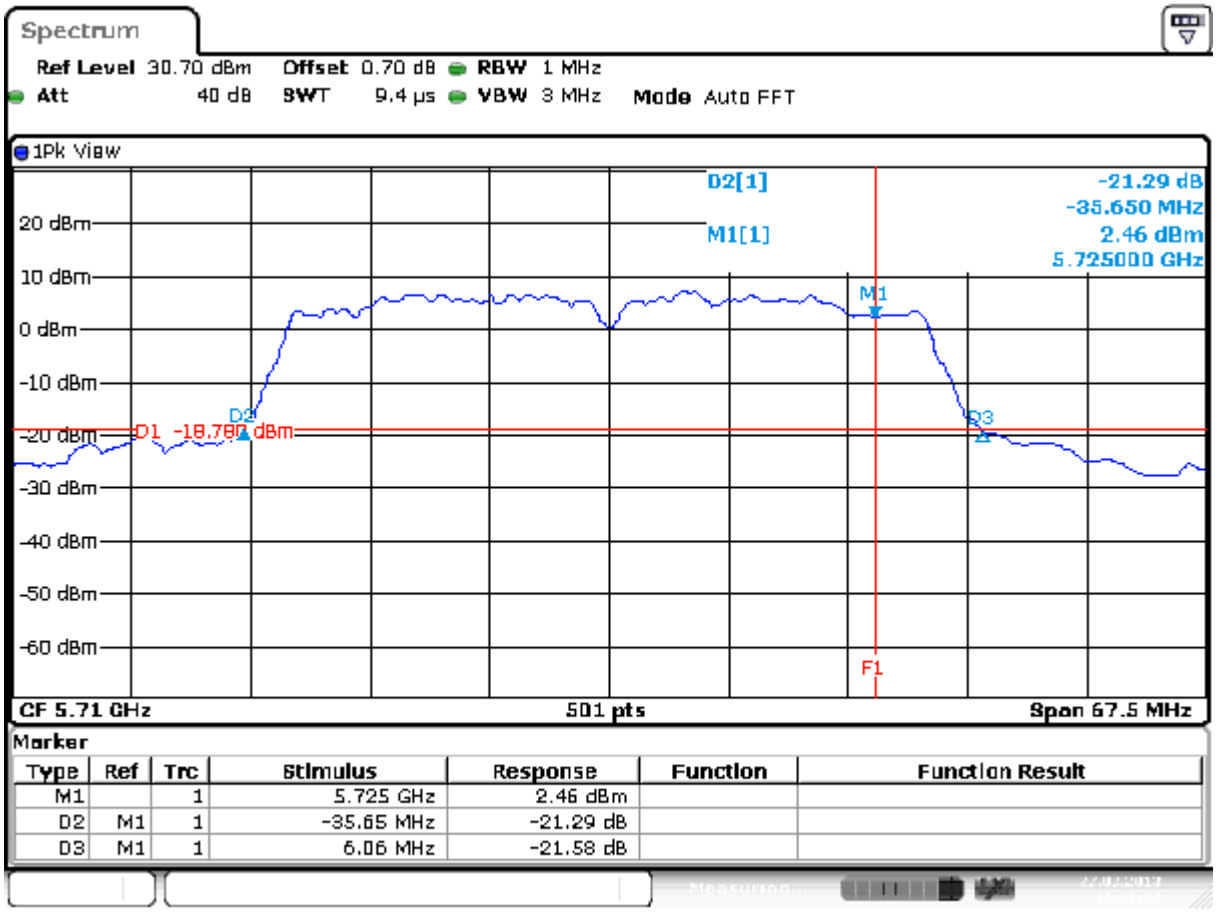
Date: 27.MAR.2013 16:56:58

Operation mode: VHT6 40 MHz, Antenna 1+2

Operating Frequency [MHz]	99% Bandwidth Antenna1 / Antenna2 [kHz]	26dB Bandwidth Antenna1 / Antenna2 [kHz]	Limit [kHz]
5710	37800 / 37750	46320 / 35650 in UNII2ext 6060 / 6060 in UNII3 52380 / 41715 Total	Not Applicable



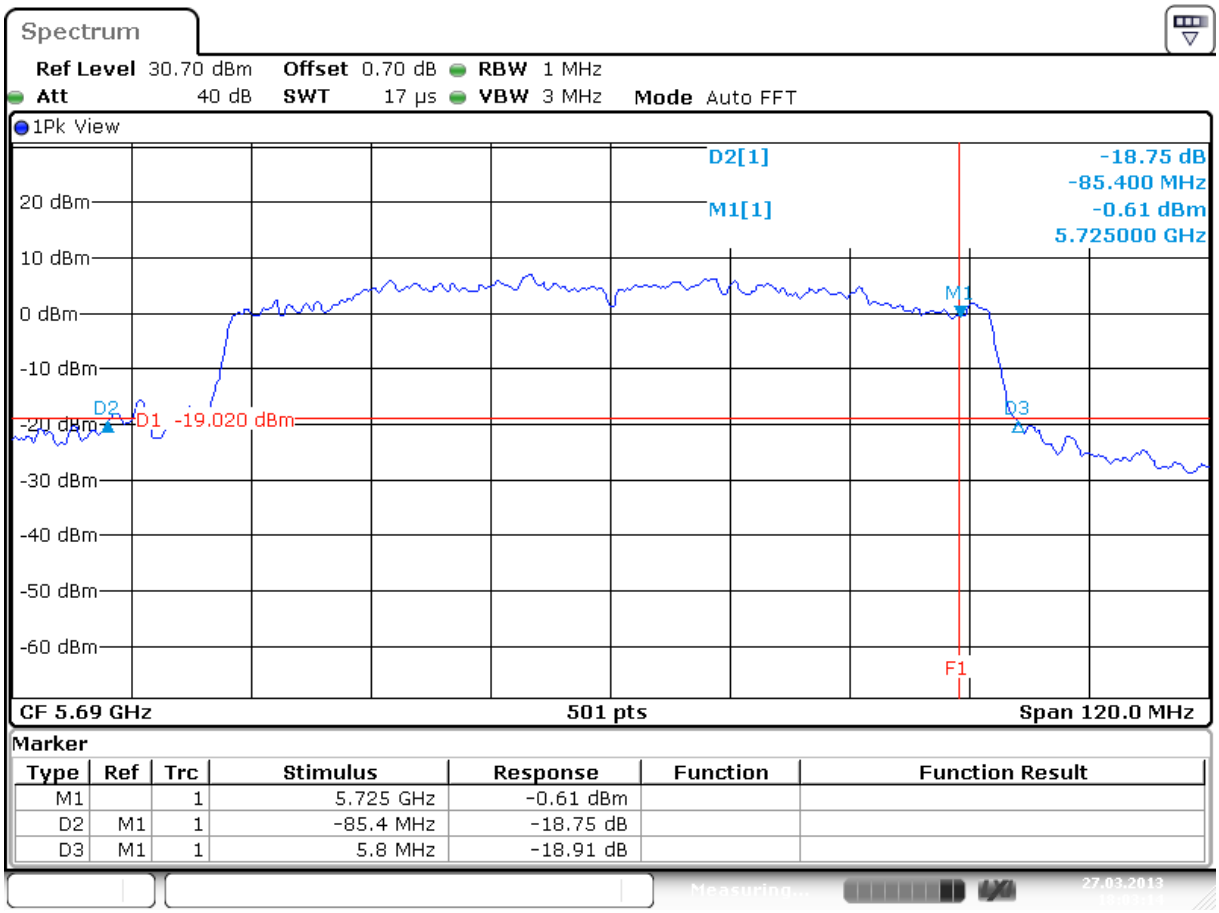
Plot 26 dB Antenna 1



Plot 26 dB Antenna 2

Operation mode: VHT6 80 MHz, Antenna 1

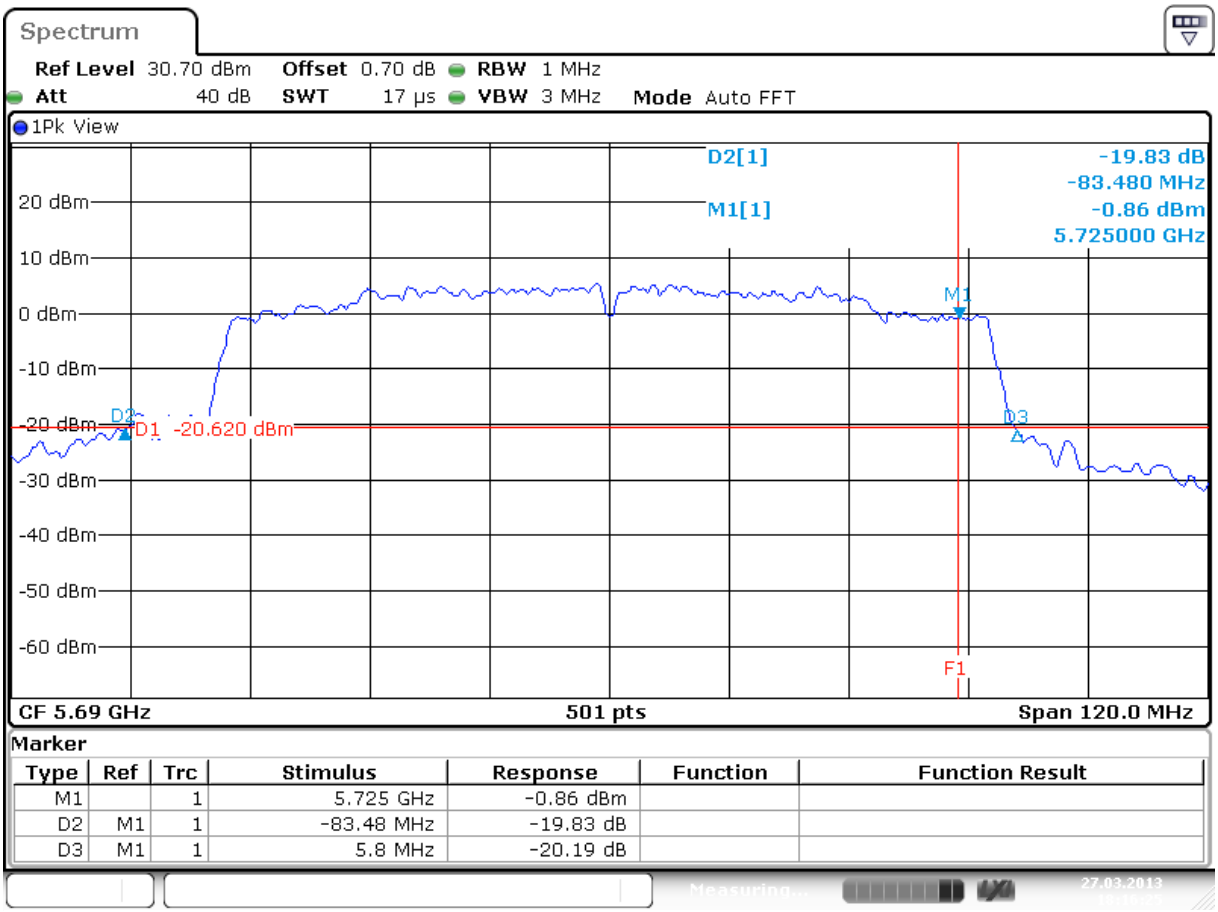
Operating Frequency [MHz]	99% Bandwidth [kHz]	26dB Bandwidth [kHz]	Limit [kHz]
5690	75250	85400 in UNII2ext 5800 in UNII3 91200 Total	Not Applicable



Date: 27.MAR.2013 18:03:14

Operation mode: VHT6 80 MHz, Antenna 2

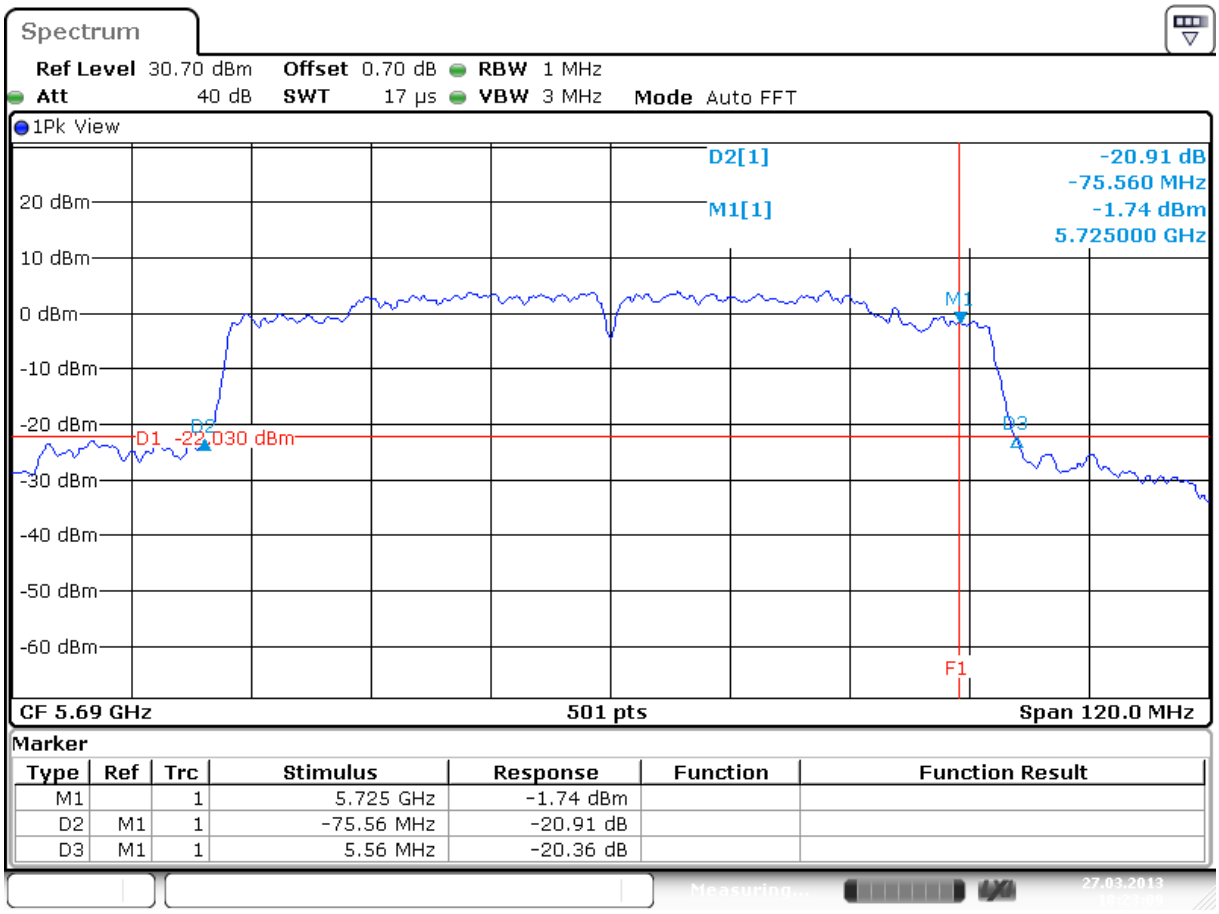
Operating Frequency [MHz]	99% Bandwidth [kHz]	26dB Bandwidth [kHz]	Limit [kHz]
5690	75150	83480 in UNII2ext 5800 in UNII3 89280 Total	Not Applicable



Date: 27.MAR.2013 18:16:25

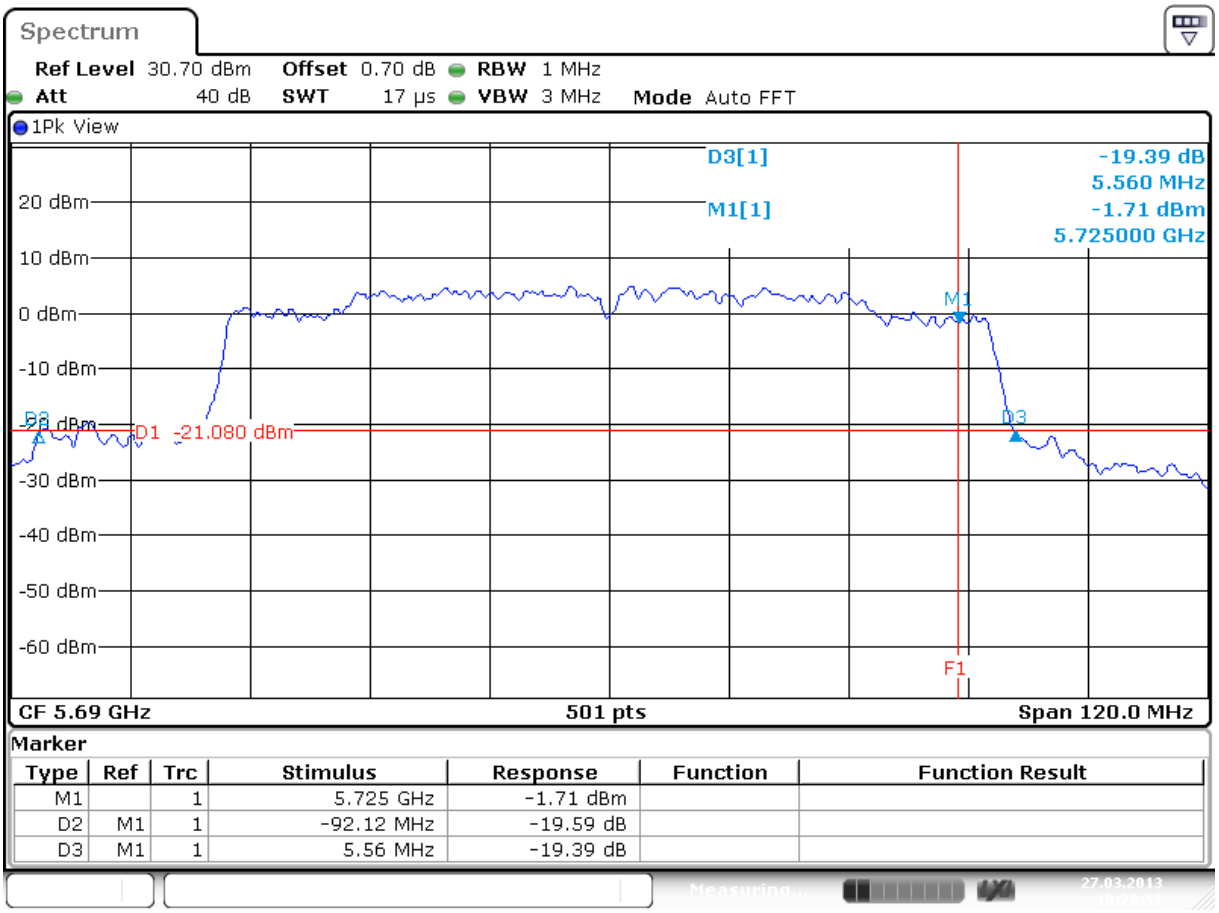
Operation mode: VHT6 80 MHz, Antenna 1+2

Operating Frequency [MHz]	99% Bandwidth Antenna1 / Antenna2 [kHz]	26dB Bandwidth Antenna1 / Antenna2 [kHz]	Limit [kHz]
5690	75200 / 75150	75560/ in UNII2ext 5560/ in UNII3 81120/ Total	Not Applicable



Date: 27.MAR.2013 18:23:09

Plot 26 dB BW Antenna 1



Date: 27.MAR.2013 18:28:57

Plot 26 dB BW Antenna 2

7.2.3 Peak excursion ratio of the modulation envelope

RESULT: PASS

Date of testing: 2013-01-24 / 2013-03-27

Requirements:

FCC 15.247(a)(6)

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

Test procedure:

ANSI C63.10-2009
KDB Publication No.789033 D01 v01r02 9/26/2012 .
KDB Publication No. 644545 D01 and D02.

Compliance with the peak excursion requirement of Section 15.407(a)(6) is 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 did not exceed 13 dB.
Testing each modulation mode on a single channel is sufficient to demonstrate compliance with the peak excursion requirement.

A spectrum analyzer was connected to the antenna port of the EUT. The analyzer resolution bandwidth was set to 1 MHz and the video bandwidth was set to 3MHz. The sweep time was set to auto couple and the trace was allowed to stabilize before making the final measurement. By using the Peak marker function the maximum amplitude was determined. The final measurement takes into account the loss generated by all the involved cables.

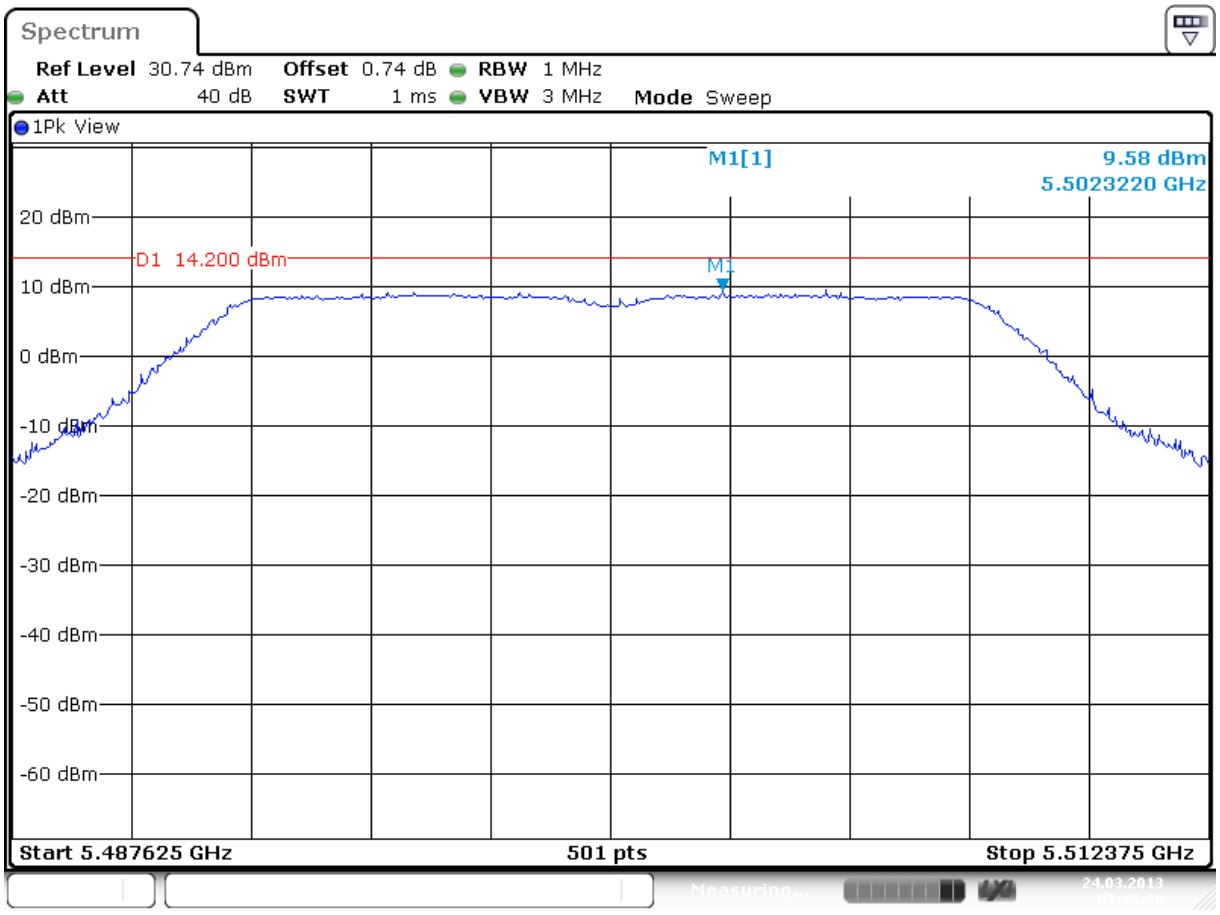
The Peak marker value is compared with the PPSD value found in section and the difference is calculated. The resulting difference may not exceed 13 dB. The limit line D1 in the plots shown on the next pages show the actual limit based on PPSD value + 13.

Peak excusion (dB) = Peak of spectrum (dBm) – PPSD(dBm)

Peak excursion of the modulation envelope

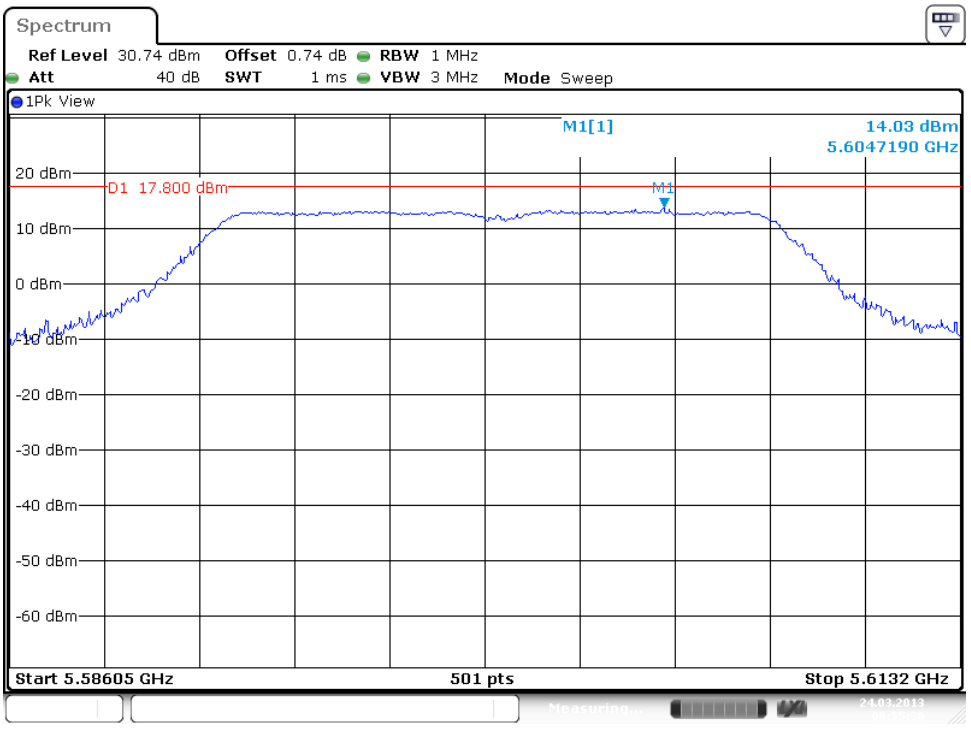
Operation mode: 6Mb OFDM, Antenna 1

Frequency [MHz]	Peak of spectrum [dBm]	PPSD/MHz [dBm]	Peak excursion [dB]	Limit [dB]	Result
5500	9.6	1.2	8.4	13	Pass
5580	14.0	4.8	9.2	13	Pass
5700	9.6	0.7	8.9	13	Pass



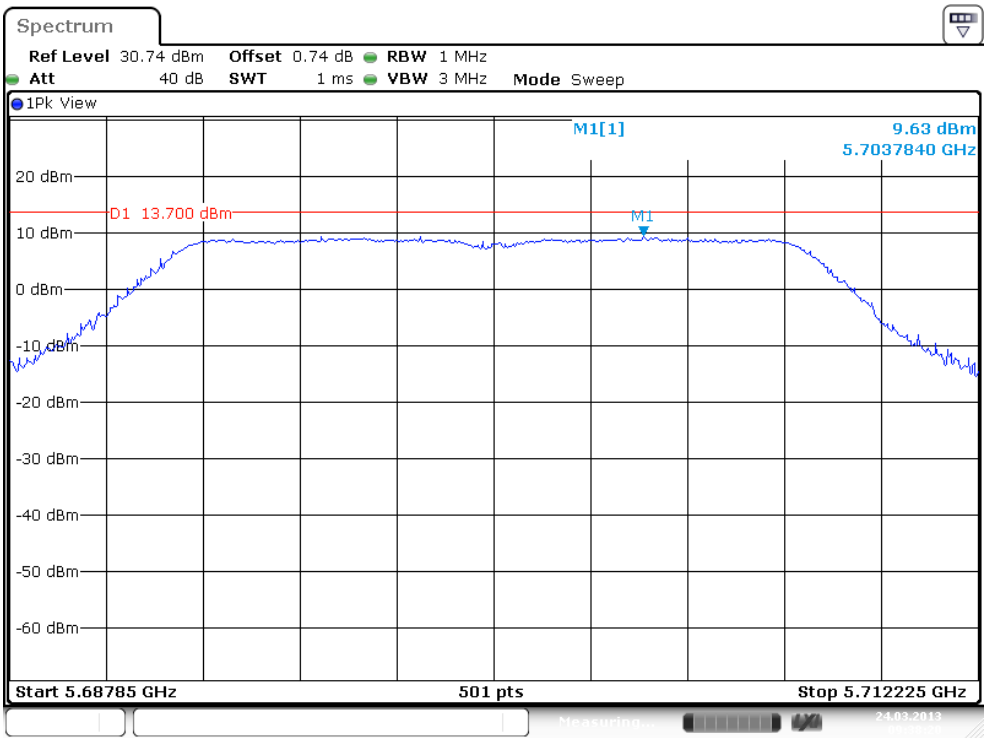
Date: 24.MAR.2013 07:45:20

Plot 5500 MHz



Date: 24.MAR.2013 08:55:37

Plot 5580 MHz

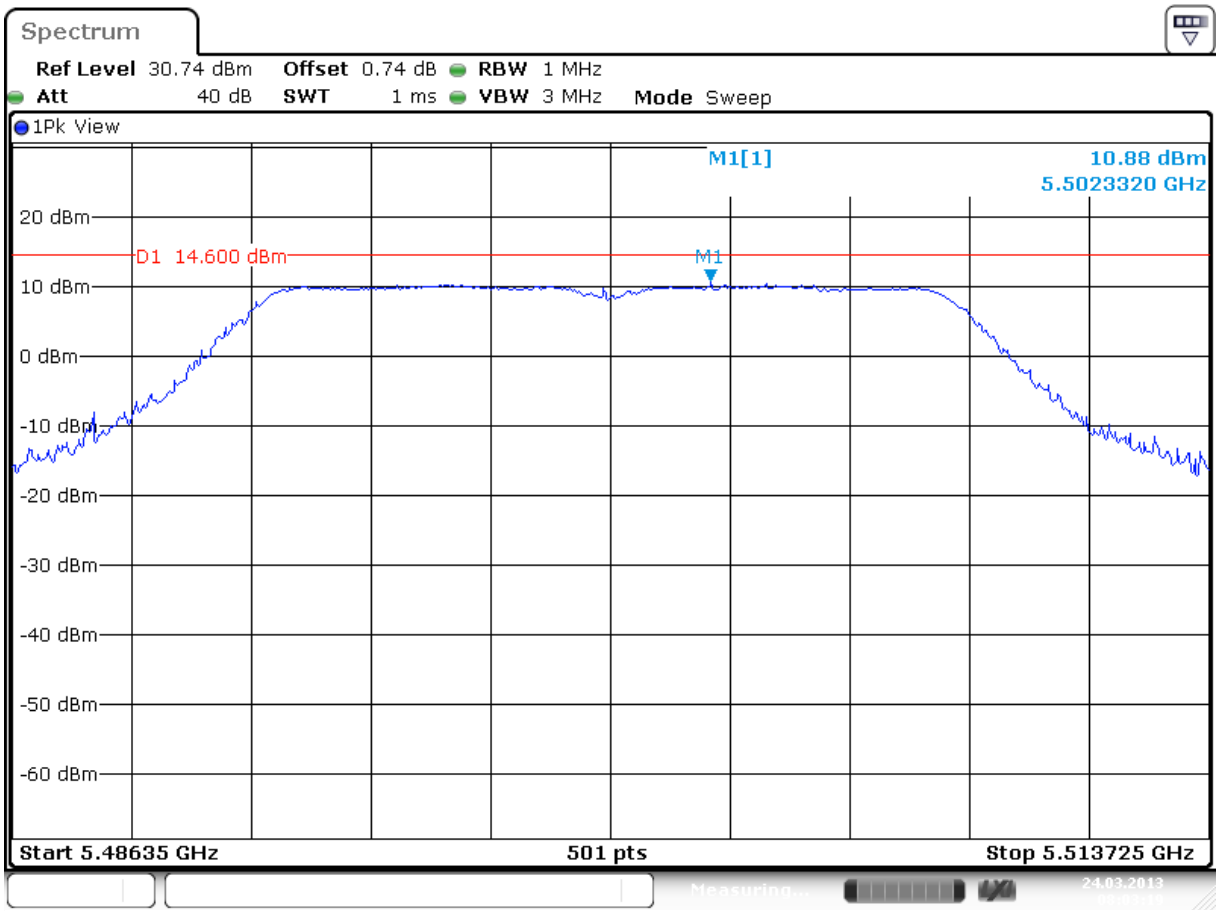


Date: 24.MAR.2013 09:38:20

Plot 5700 MHz

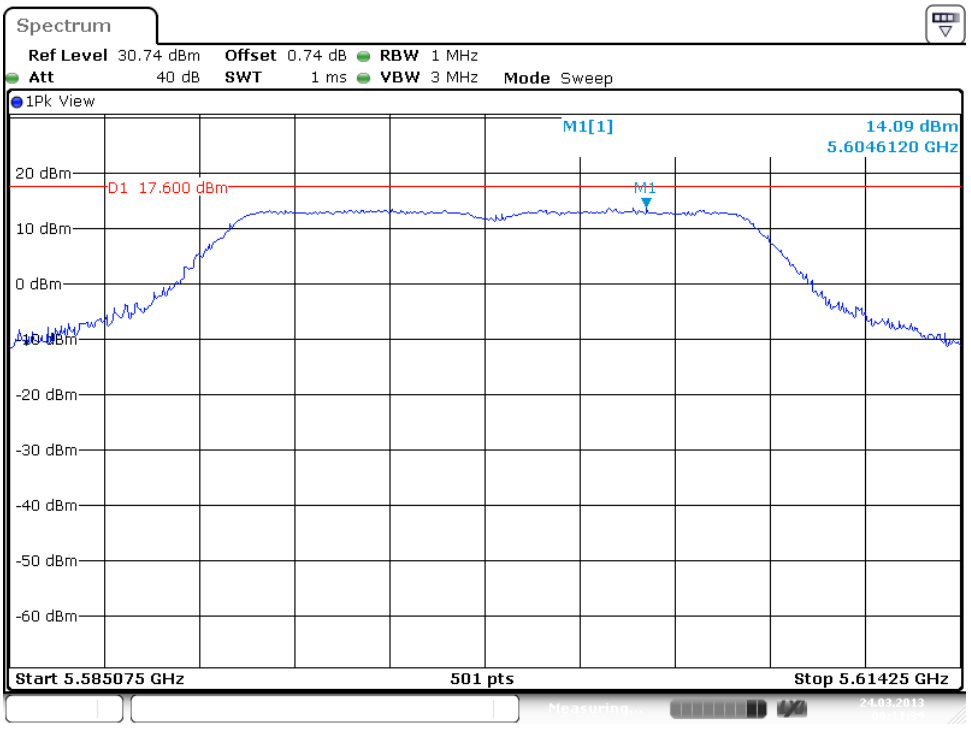
Operation mode: 6Mb OFDM, Antenna 2

Frequency [MHz]	Peak of spectrum [dBm]	PPSD/MHz [dBm]	Peak excursion [dB]	Limit [dB]	Result
5500	10.9	1.6	9.3	13	Pass
5580	14.1	4.6	9.5	13	Pass
5700	10.4	1.2	9.2	13	Pass



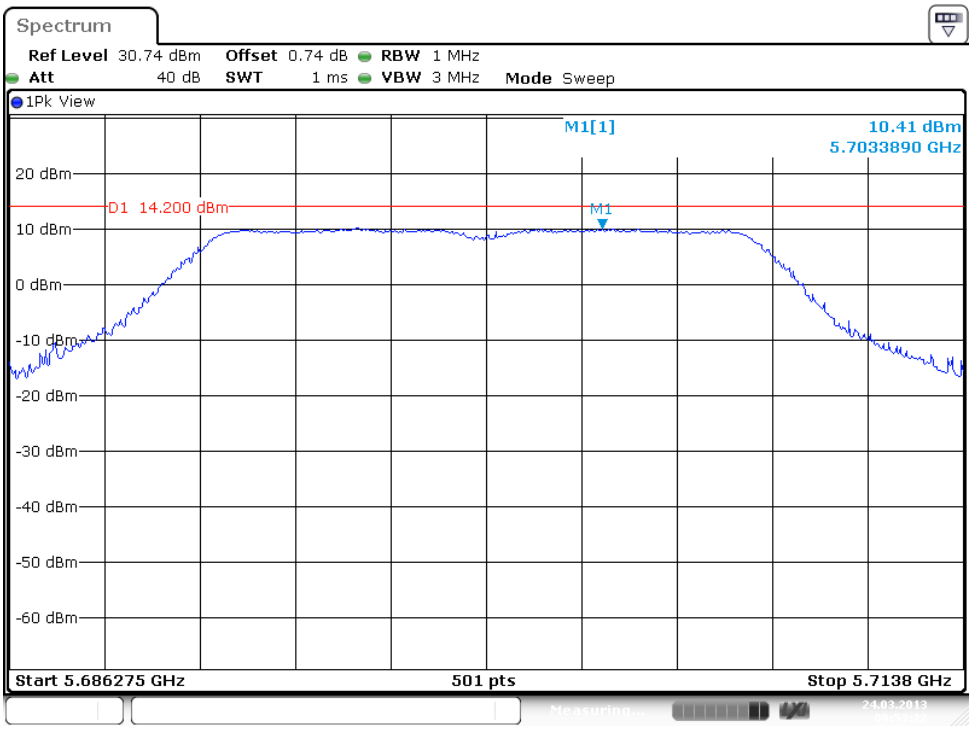
Date: 24.MAR.2013 08:03:20

Plot 5500 MHz



Date: 24.MAR.2013 09:11:39

Plot 5580 MHz

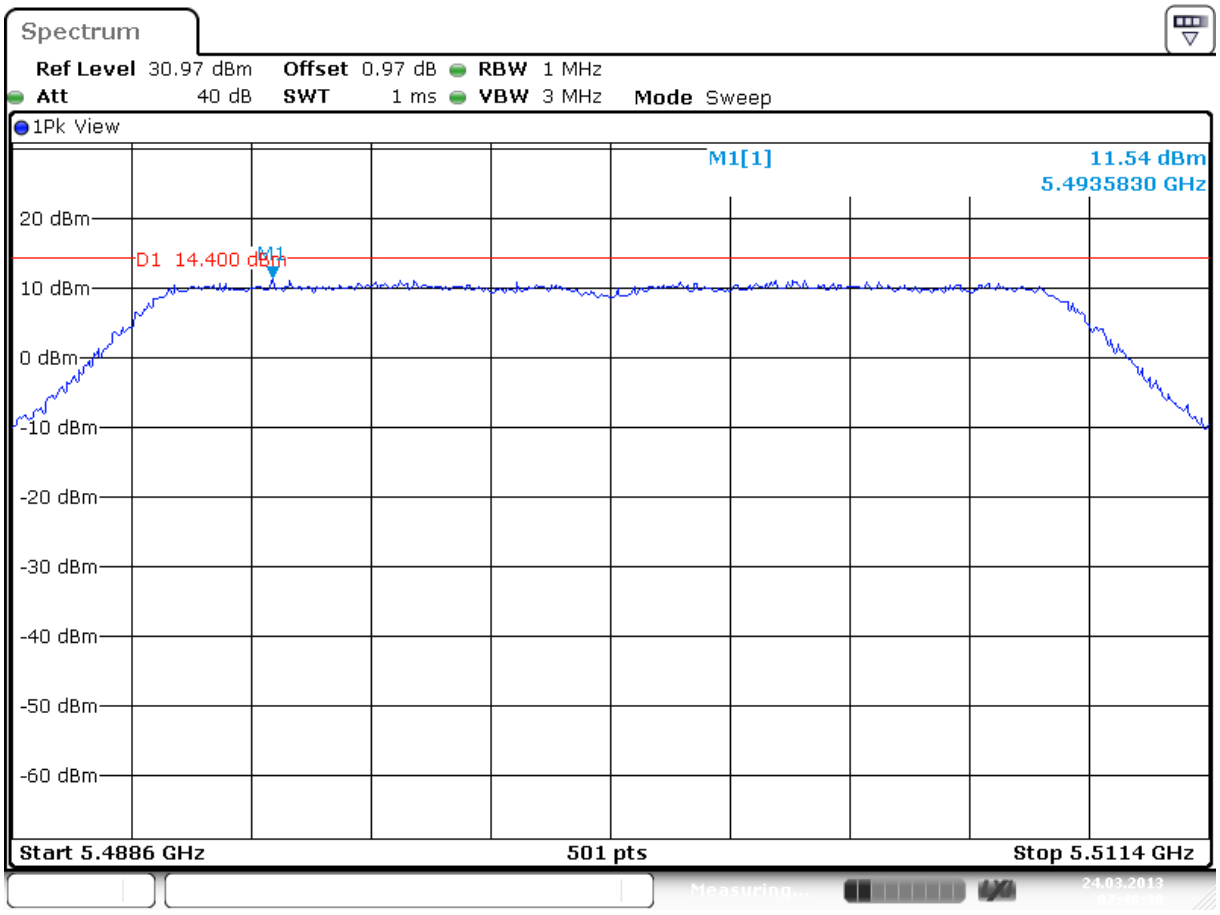


Date: 24.MAR.2013 09:53:23

Plot 5700 MHz

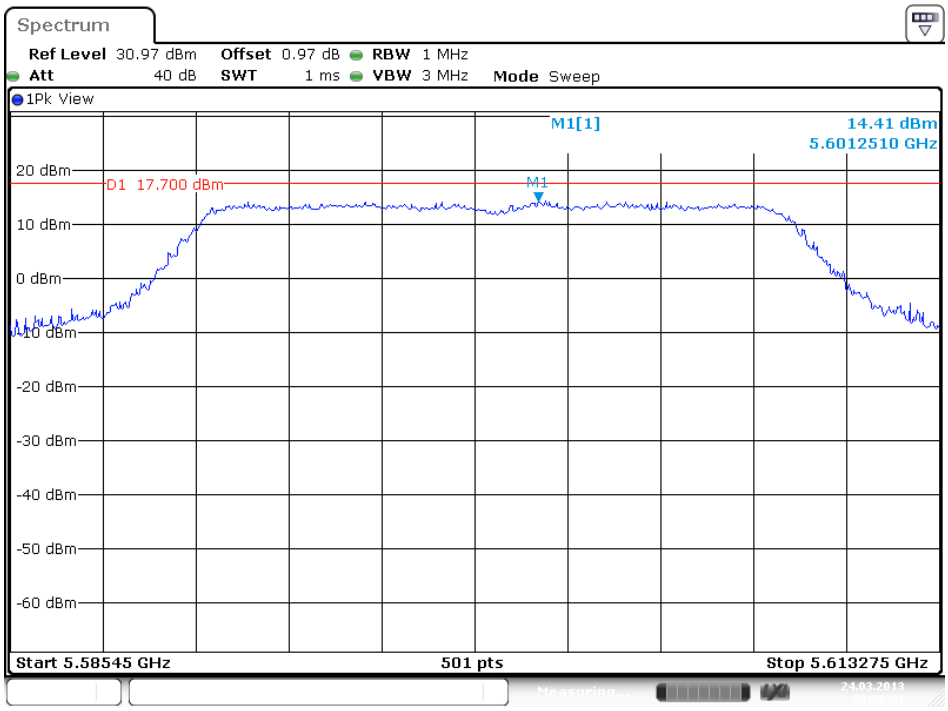
Operation mode: HT4 20 MHz, Antenna 1

Frequency [MHz]	Peak of spectrum [dBm]	PPSD/MHz [dBm]	Peak excursion [dB]	Limit [dB]	Result
5500	11.5	1.4	10.1	13	Pass
5580	14.4	4.7	9.7	13	Pass
5700	10.6	0.4	10.2	13	Pass



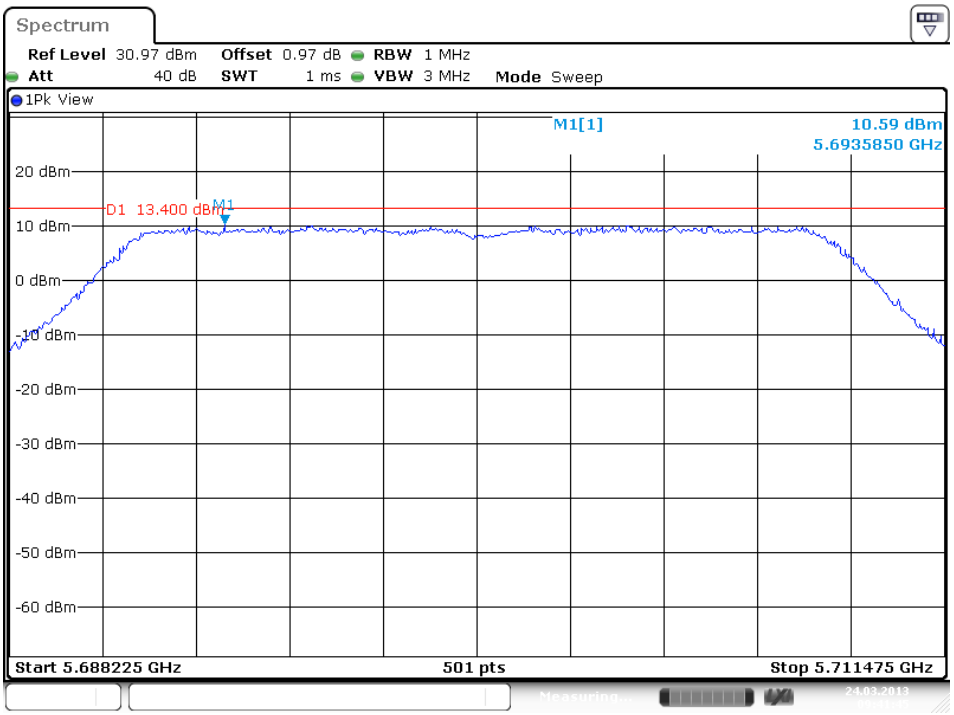
Date: 24.MAR.2013 07:48:39

Plot 5500 MHz



Date: 24.MAR.2013 08:59:01

Plot 5580 MHz

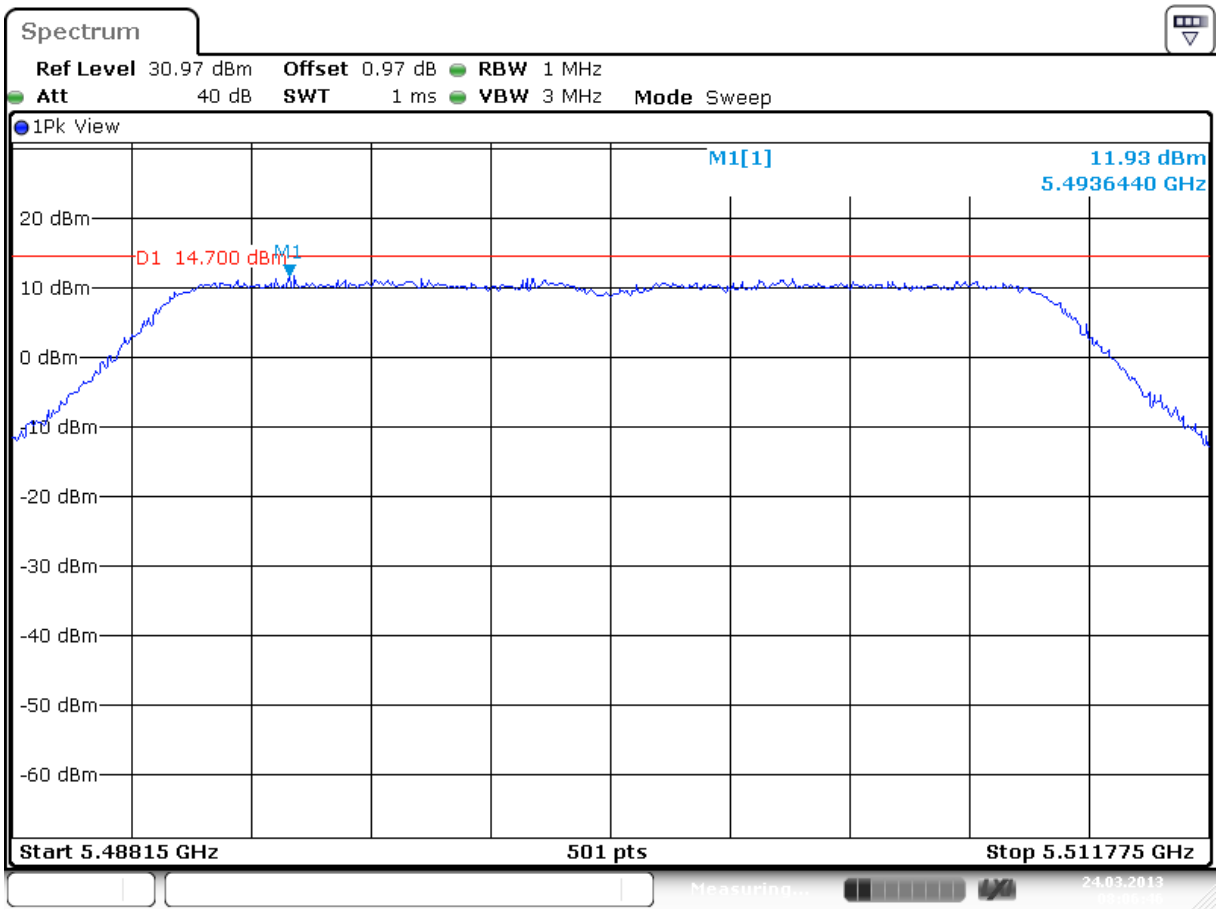


Date: 24.MAR.2013 09:41:45

Plot 5700 MHz

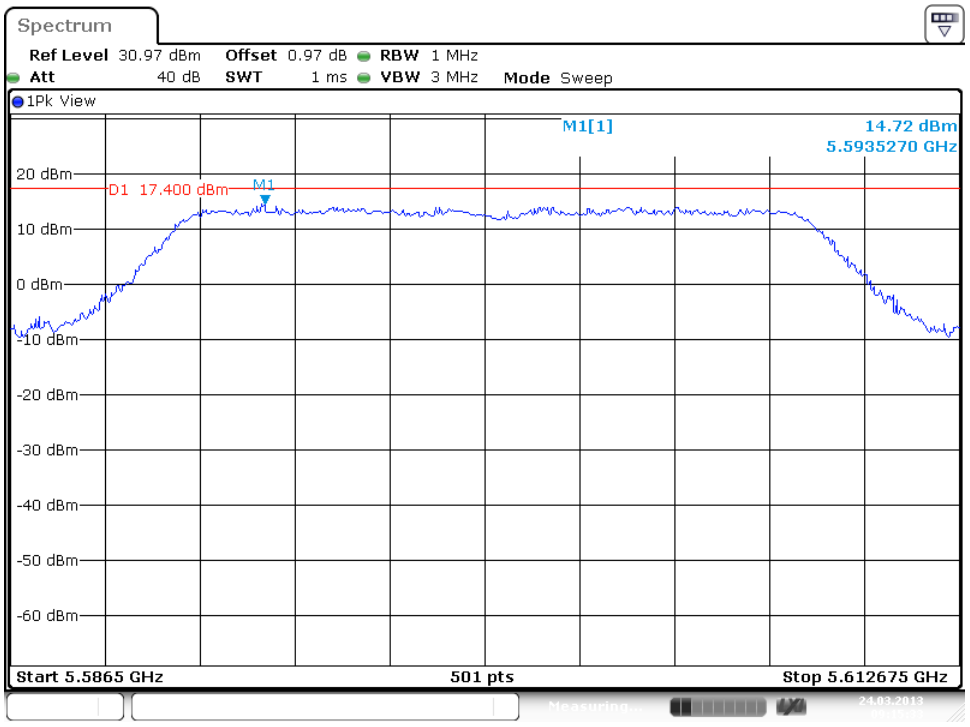
Operation mode: HT4 20 MHz, Antenna 2

Frequency [MHz]	Peak of spectrum [dBm]	PPSD/MHz [dBm]	Peak excursion [dB]	Limit [dB]	Result
5500	11.9	1.7	10.2	13	Pass
5580	14.7	4.4	10.3	13	Pass
5700	11.2	1.2	10.0	13	Pass



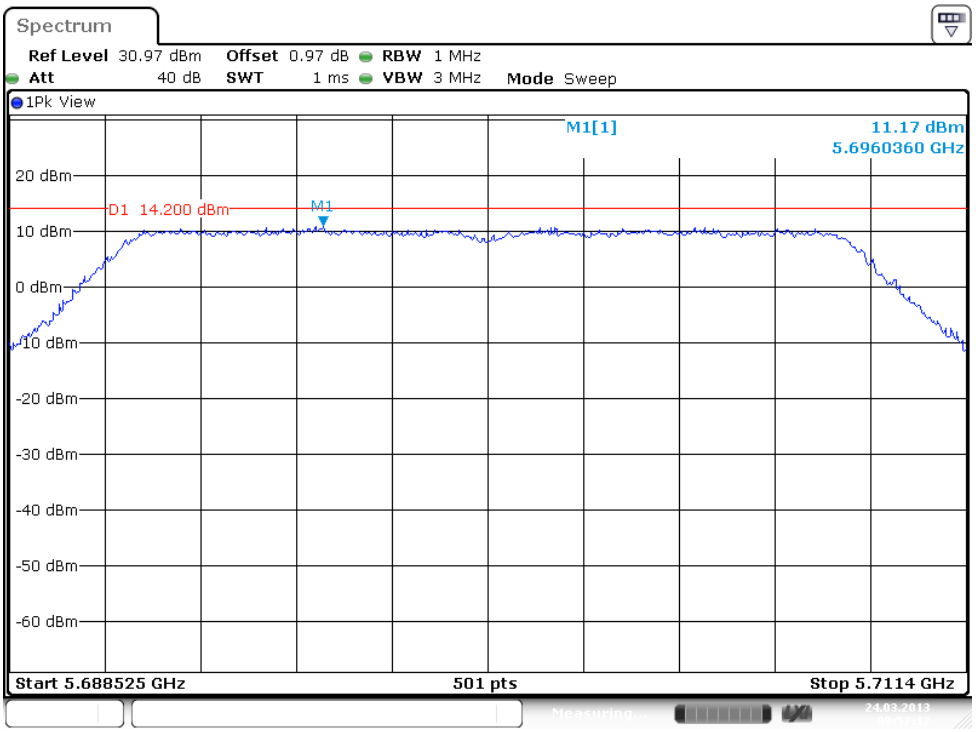
Date: 24.MAR.2013 08:06:47

Plot 5500 MHz



Date: 24.MAR.2013 09:15:33

Plot 5580 MHz



Date: 24.MAR.2013 09:57:12

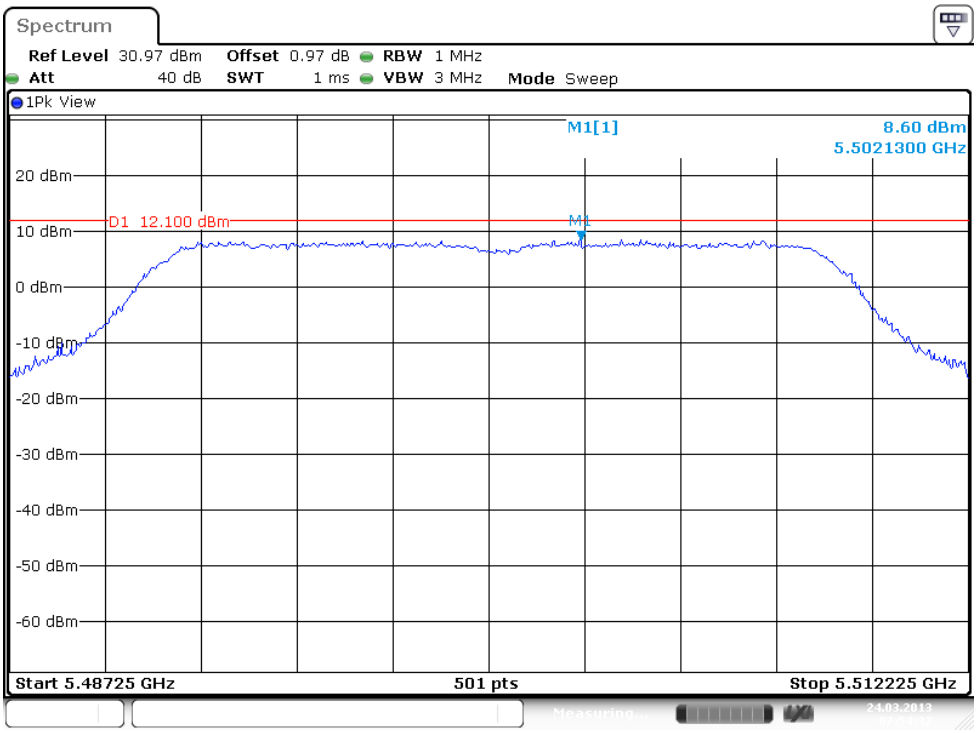
Plot 5700 MHz

Operation mode: HT8 20 MHz, Antenna 1+2

Frequency [MHz]	Peak of spectrum Ant1/Ant2 [dBm]	PPSD/MHz [dBm]	Peak excursion Ant1/Ant2 [dB]	Limit [dB]	Result
5500	8.6 / 7.9	2.1	9.5 / 8.8	13	Pass
5580	11.0 / 10.6	1.6	9.3 / 9.2	13	Pass
5700	8.1 / 7.7	1.6	9.6 / 9.0	13	Pass

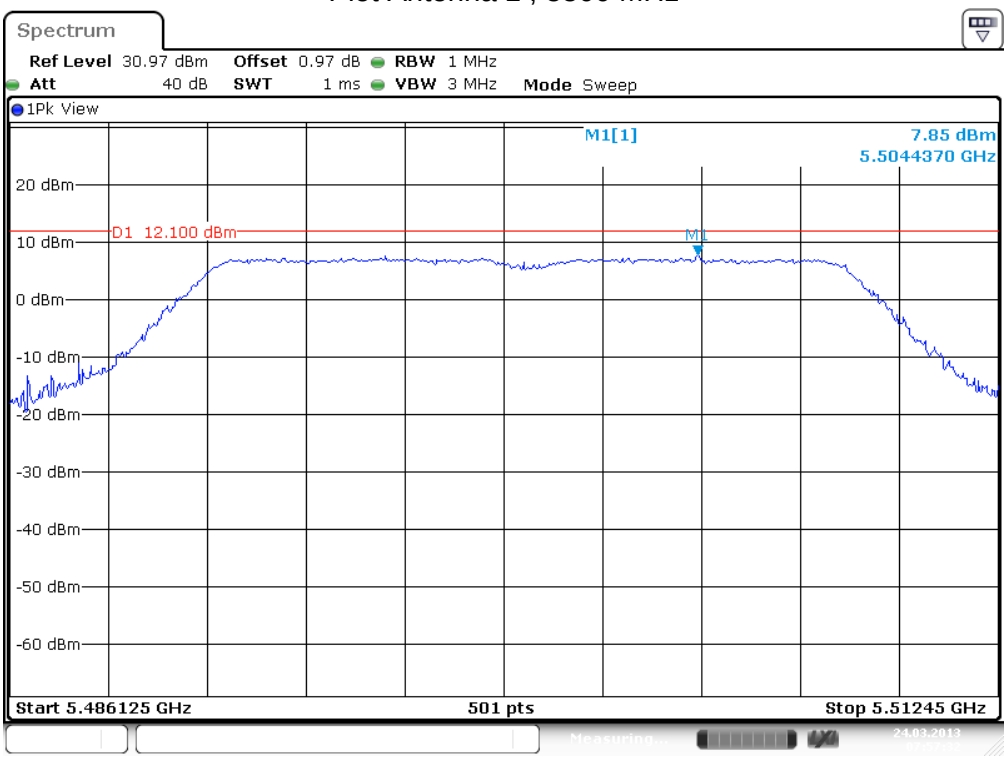
Note: Ant1 refers to Antenna 1 and Ant2 refers to Antenna 2

See plots on the next pages.



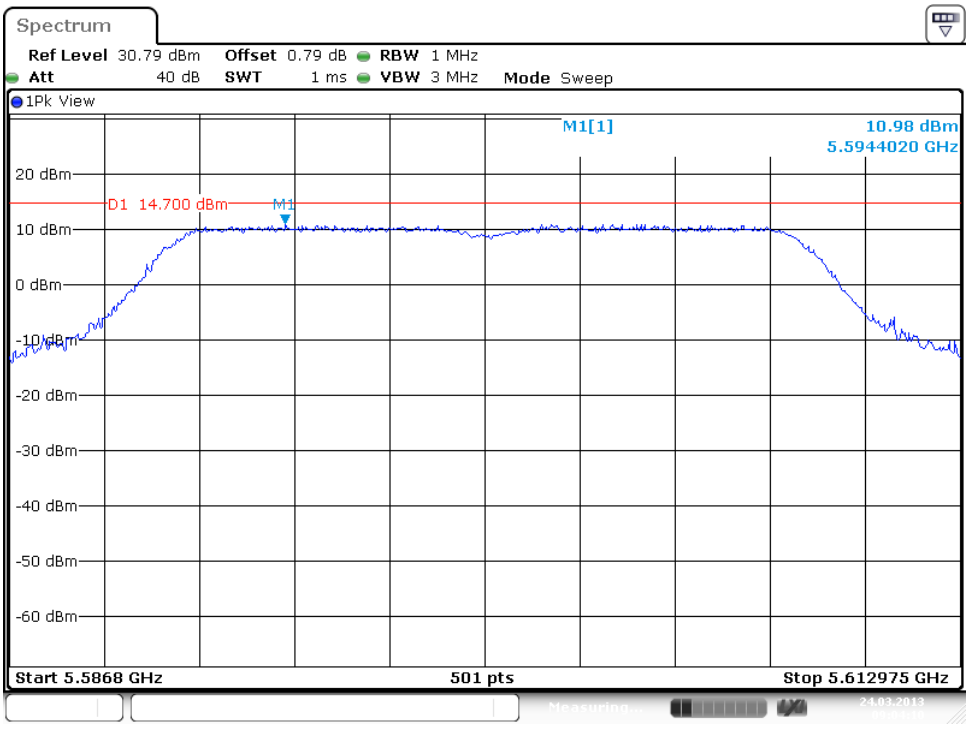
Date: 24.MAR.2013 07:54:32

Plot Antenna 1 , 5500 MHz



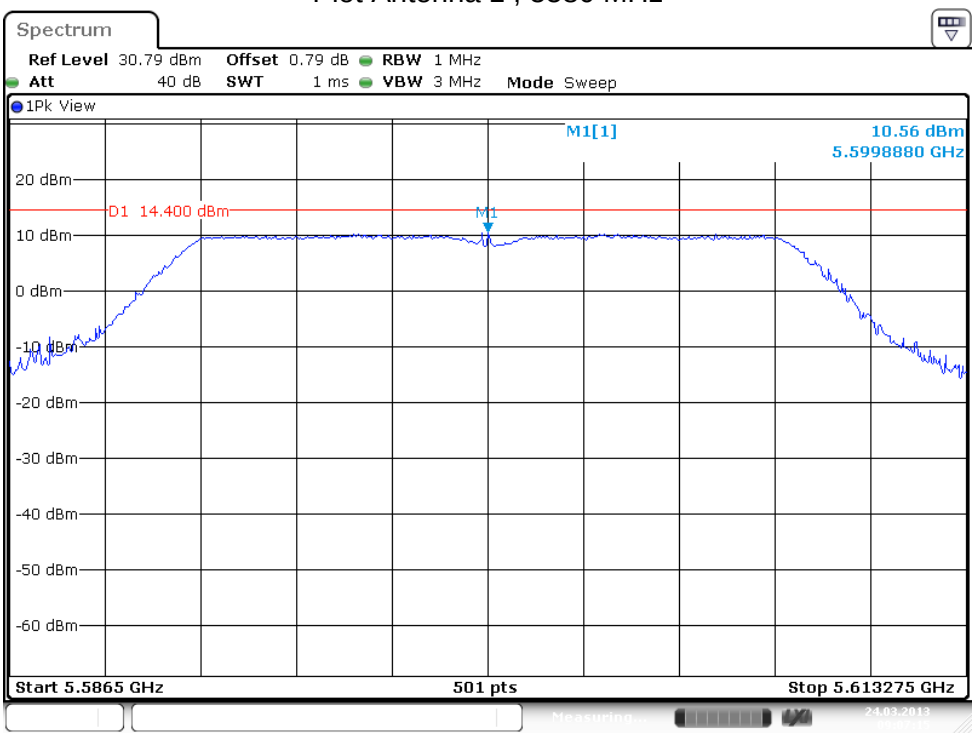
Date: 24.MAR.2013 07:57:32

Plot Antenna 2 , 5500 MHz



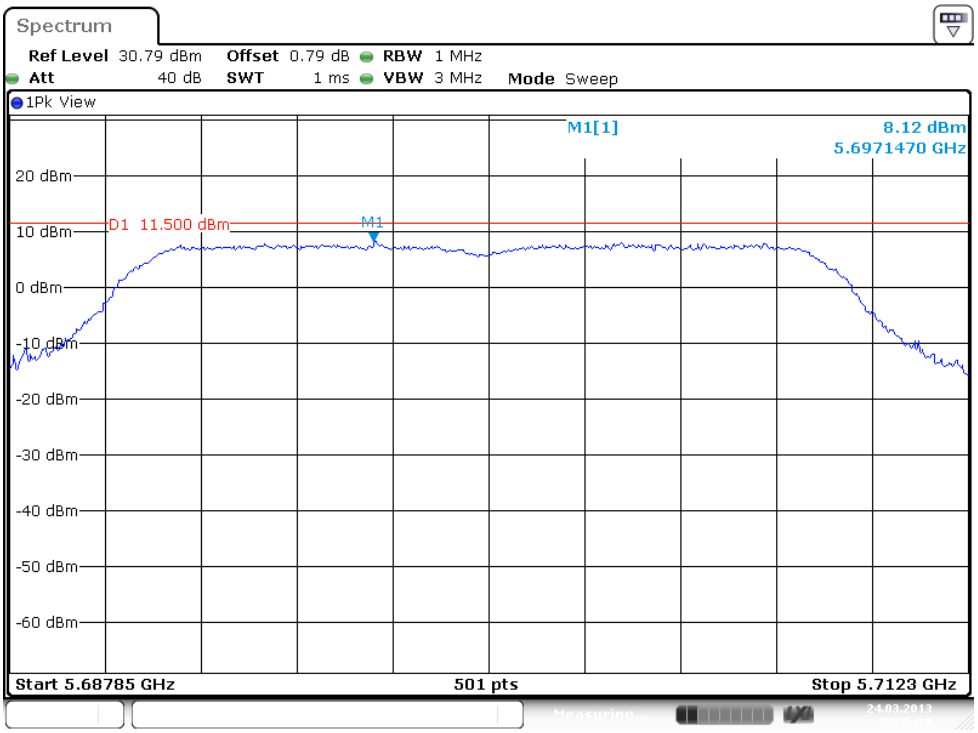
Date: 24.MAR.2013 09:04:10

Plot Antenna 1 , 5580 MHz



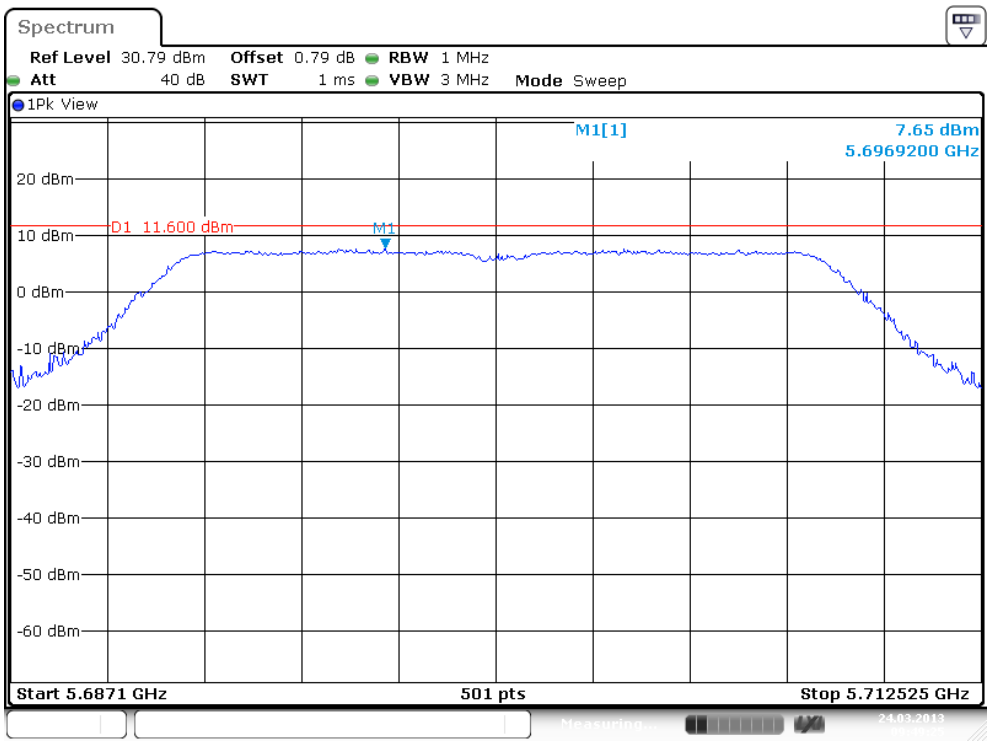
Date: 24.MAR.2013 09:07:16

Plot Antenna 2 , 5580 MHz



Date: 24.MAR.2013 09:46:18

Plot Antenna 1 , 5700 MHz

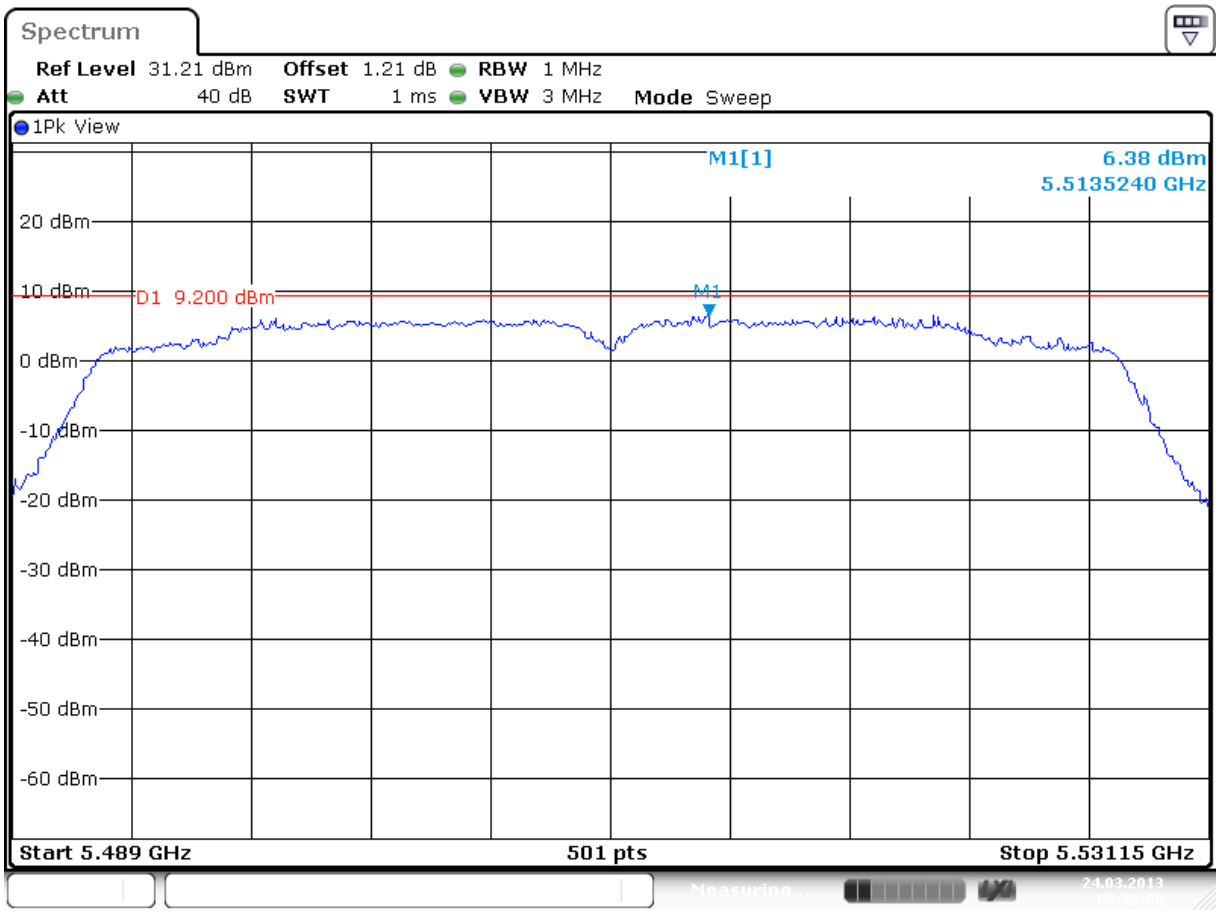


Date: 24.MAR.2013 09:49:26

Plot Antenna 2 , 5700 MHz

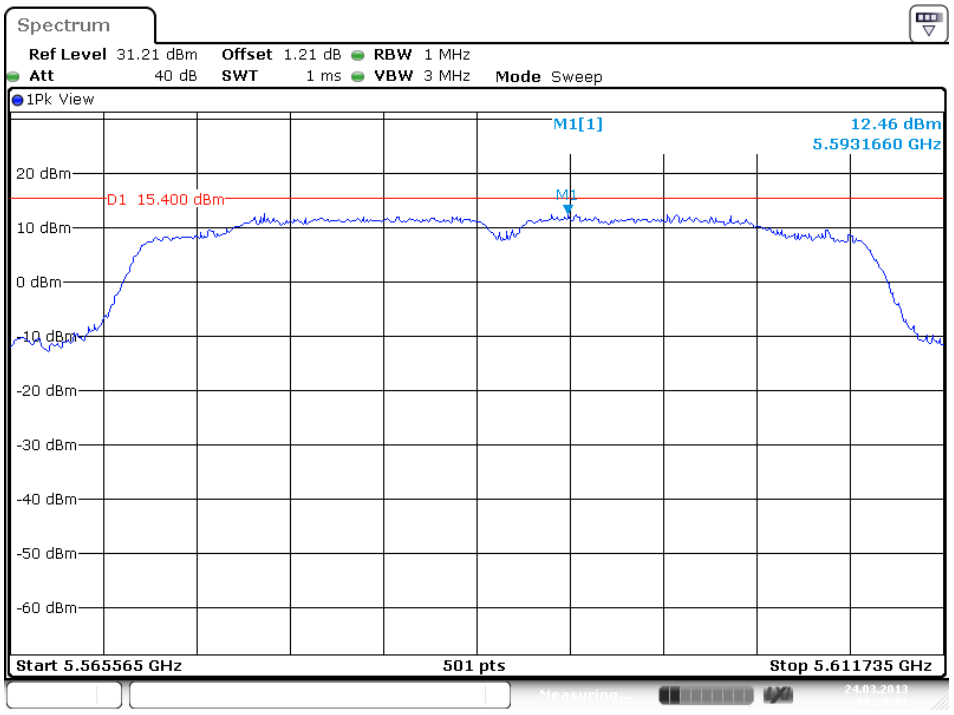
Operation mode: HT4 40 MHz, Antenna 1

Frequency [MHz]	Peak of spectrum [dBm]	PPSD/MHz [dBm]	Peak excursion [dB]	Limit [dB]	Result
5510	6.4	-3.8	10.2	13	Pass
5590	12.5	2.4	10.1	13	Pass
5670	11.6	1.5	10.1	13	Pass



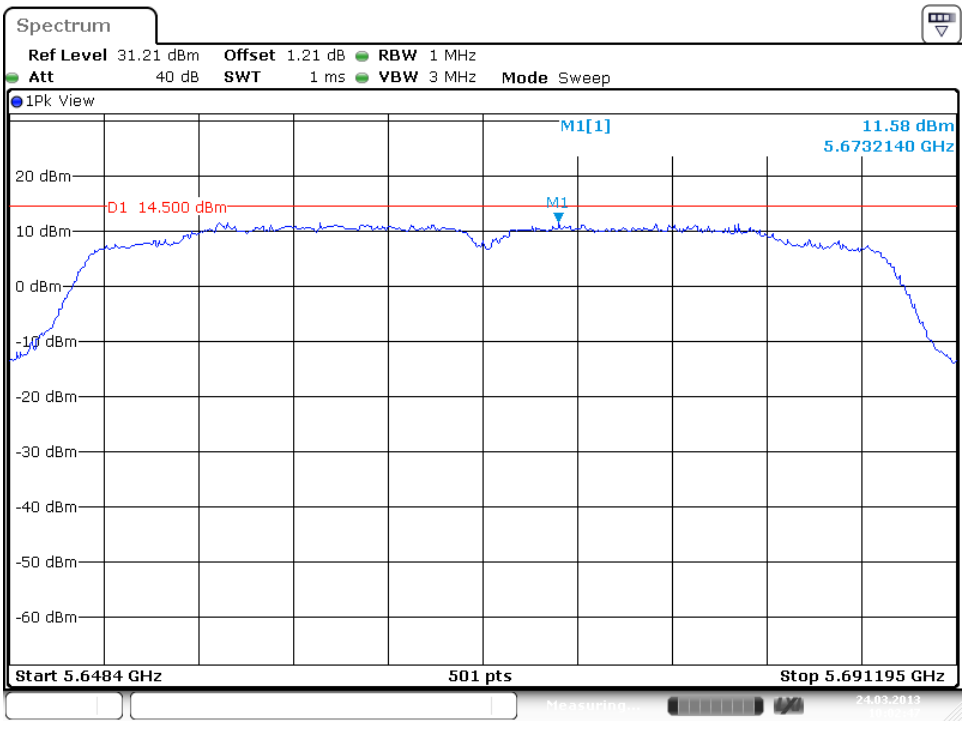
Date: 24.MAR.2013 08:12:00

Plot 5510 MHz



Date: 24.MAR.2013 09:20:31

Plot 5590 MHz

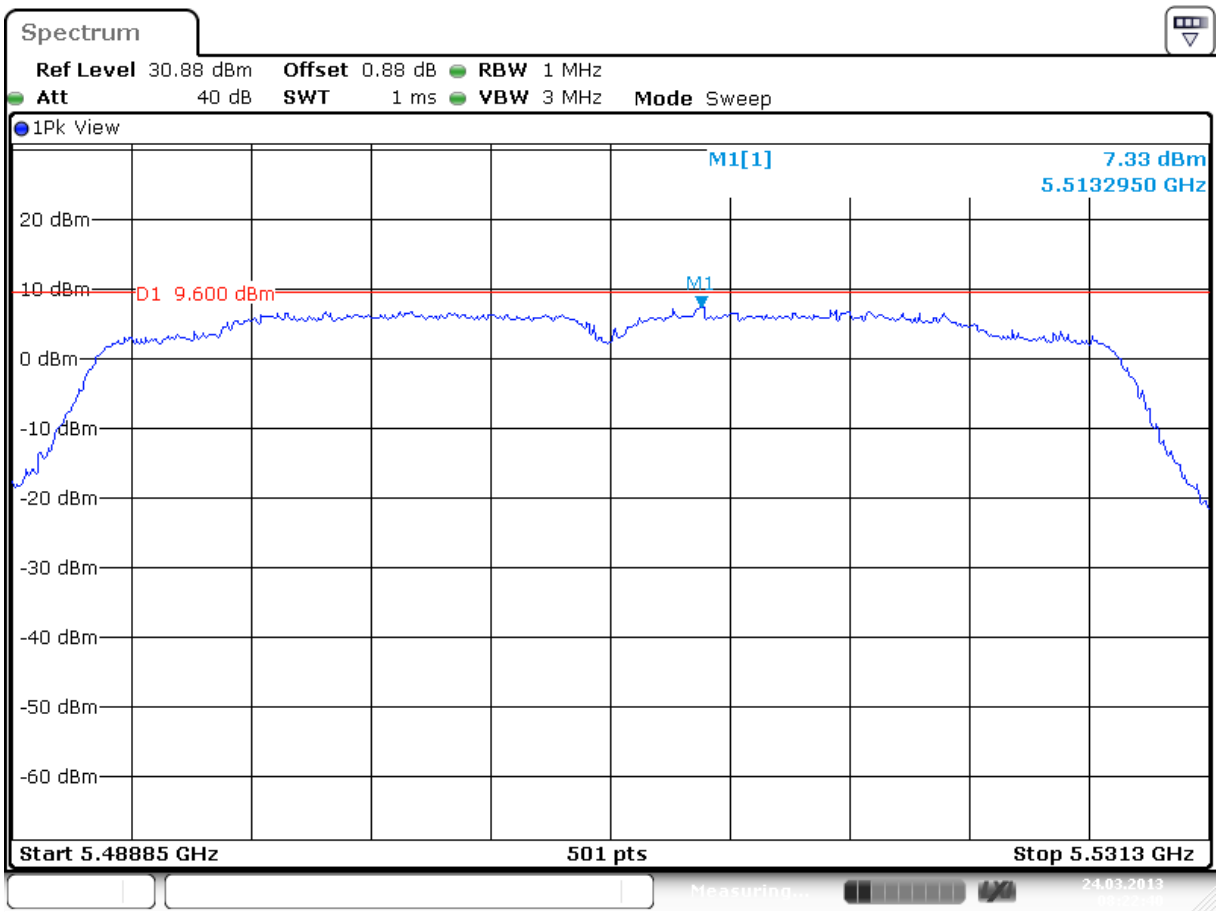


Date: 24.MAR.2013 10:02:48

Plot 5670 MHz

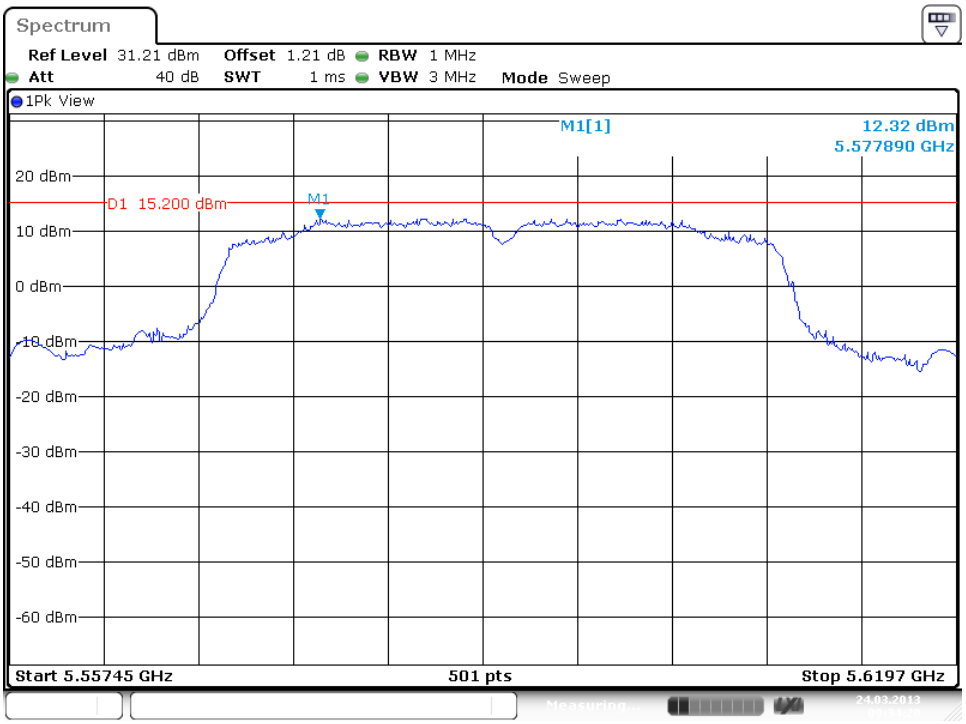
Operation mode: HT4 40 MHz, Antenna 2

Frequency [MHz]	Peak of spectrum [dBm]	PPSD/MHz [dBm]	Peak excursion [dB]	Limit [dB]	Result
5510	7.3	-3.4	10.7	13	Pass
5590	12.3	2.2	10.1	13	Pass
5670	8.7	1.5	10.4	13	Pass



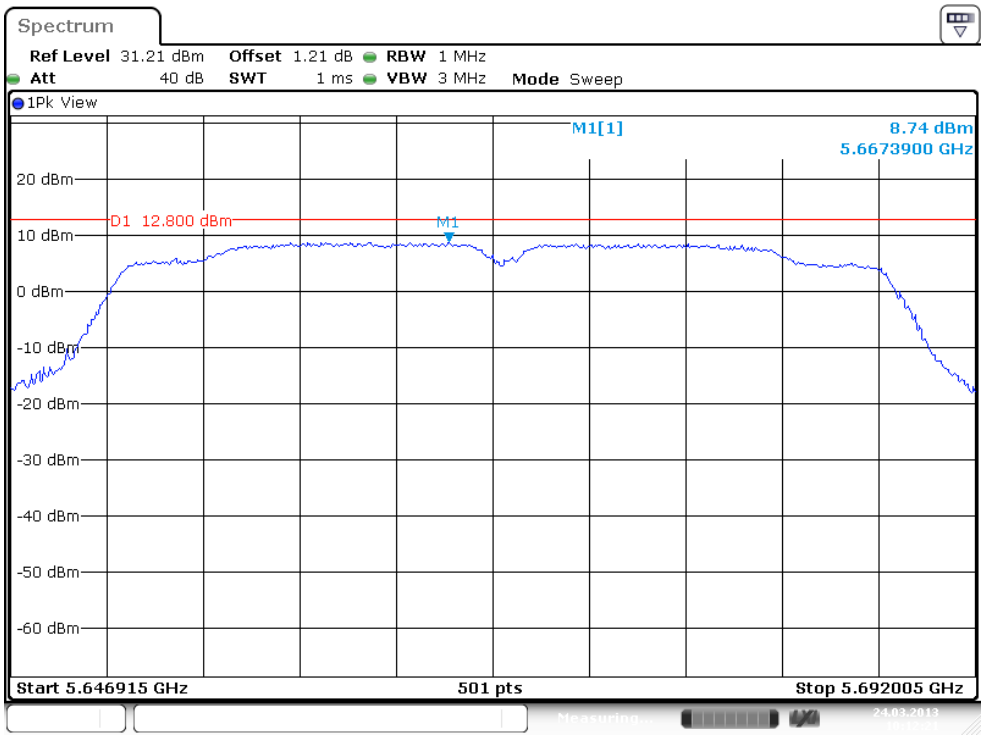
Date: 24.MAR.2013 08:22:40

Plot 5510 MHz



Date: 24.MAR.2013 09:34:21

Plot 5590 MHz



Date: 24.MAR.2013 10:12:21

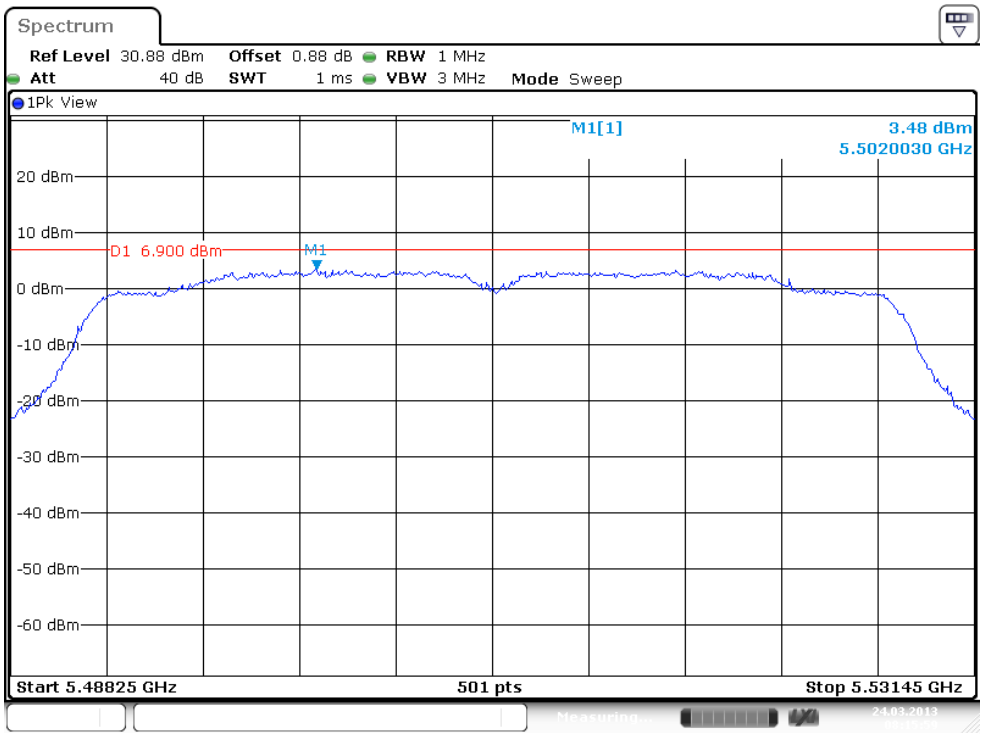
Plot 5670 MHz

Operation mode: HT8 40 MHz, Antenna 1+2

Frequency [MHz]	Peak of spectrum Ant1/Ant2 [dBm]	PPSD/MHz [dBm]	Peak excursion Ant1/Ant2 [dB]	Limit [dB]	Result
5510	3.5 / 2.9	-3.1	9.6 / 9.1	13	Pass
5590	8.8 / 8.4	2.3	9.5 / 9.2	13	Pass
5670	8.5 11.9	2.8	9.4 / 8.9	13	Pass

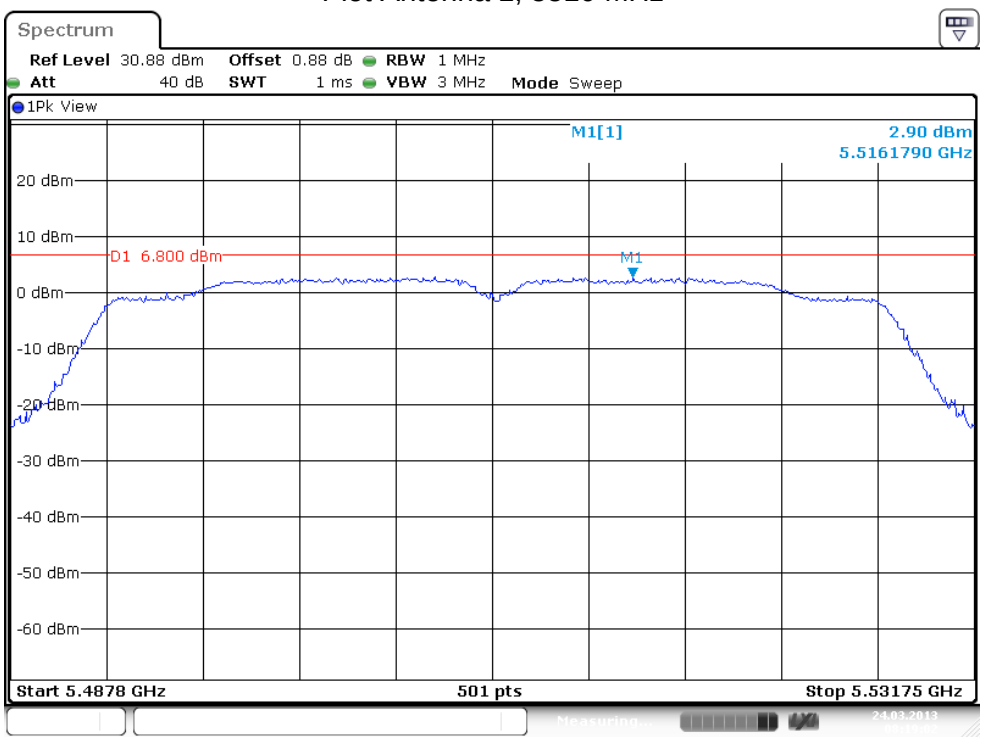
Note: Ant1 refers to Antenna 1 and Ant2 refers to Antenna 2

See plots on the next pages.



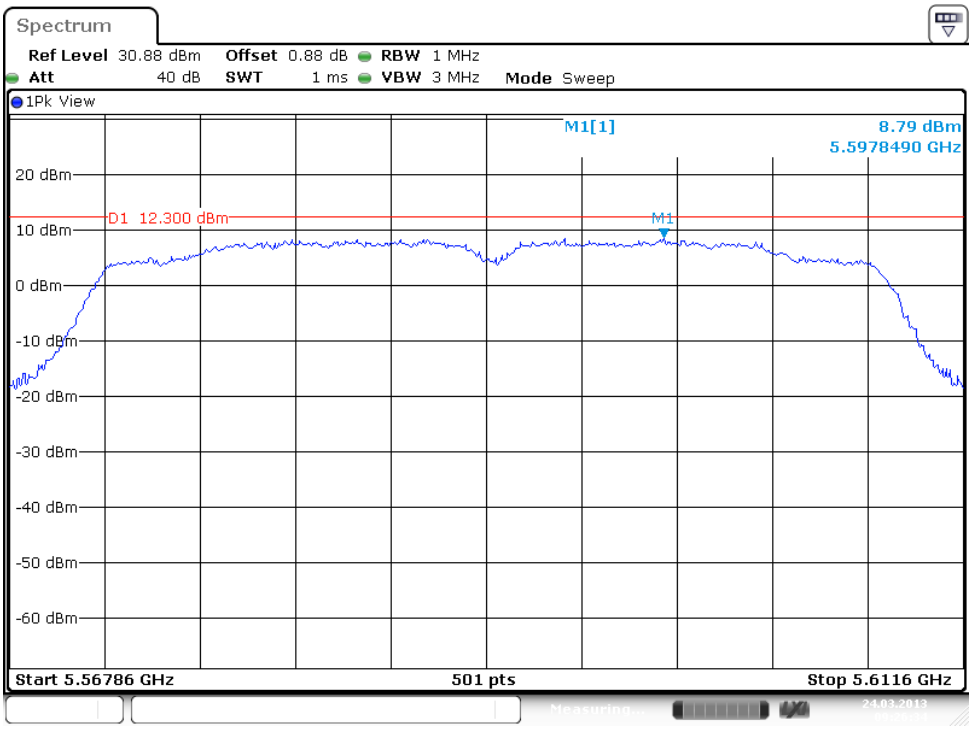
Date: 24.MAR.2013 08:15:59

Plot Antenna 1, 5510 MHz



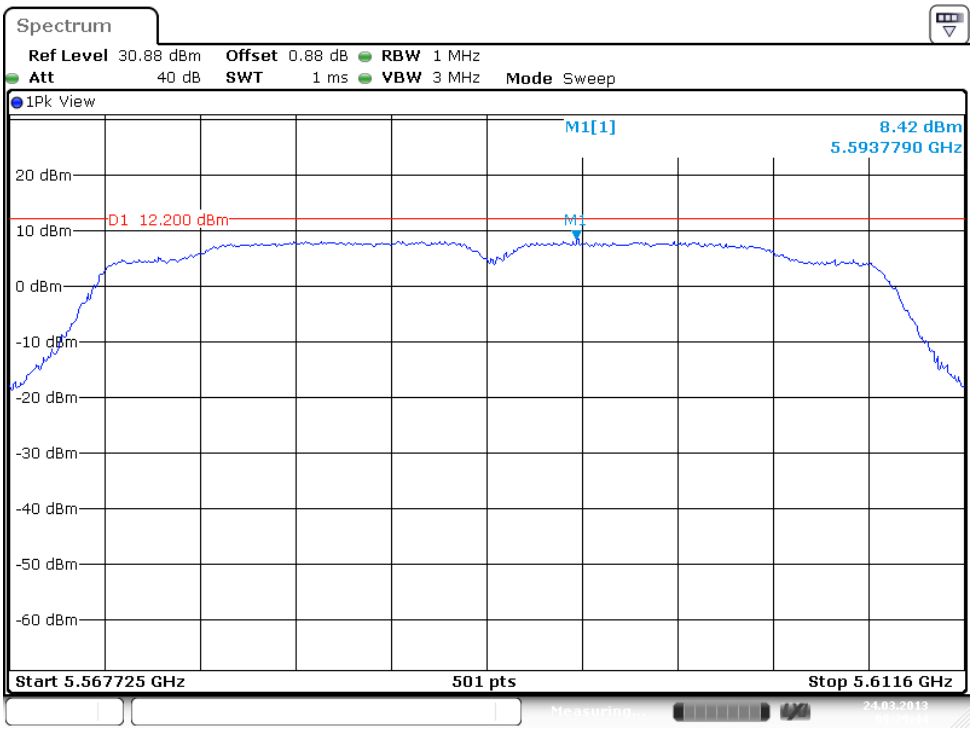
Date: 24.MAR.2013 08:19:03

Plot Antenna 2, 5510 MHz



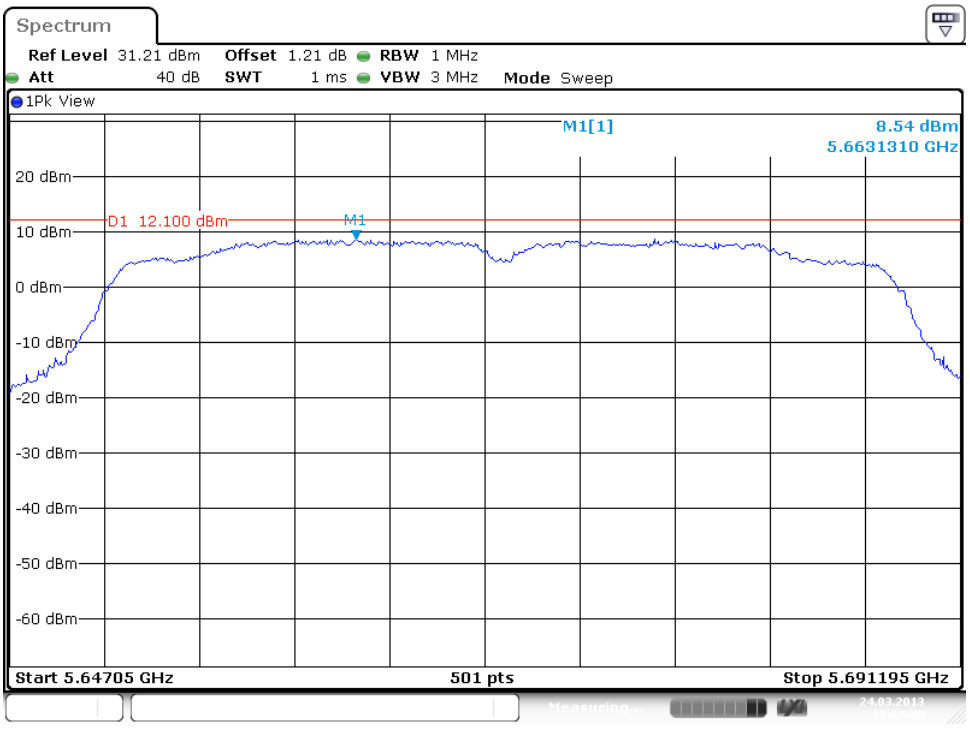
Date: 24.MAR.2013 09:26:34

Plot Antenna 1 , 5590 MHz



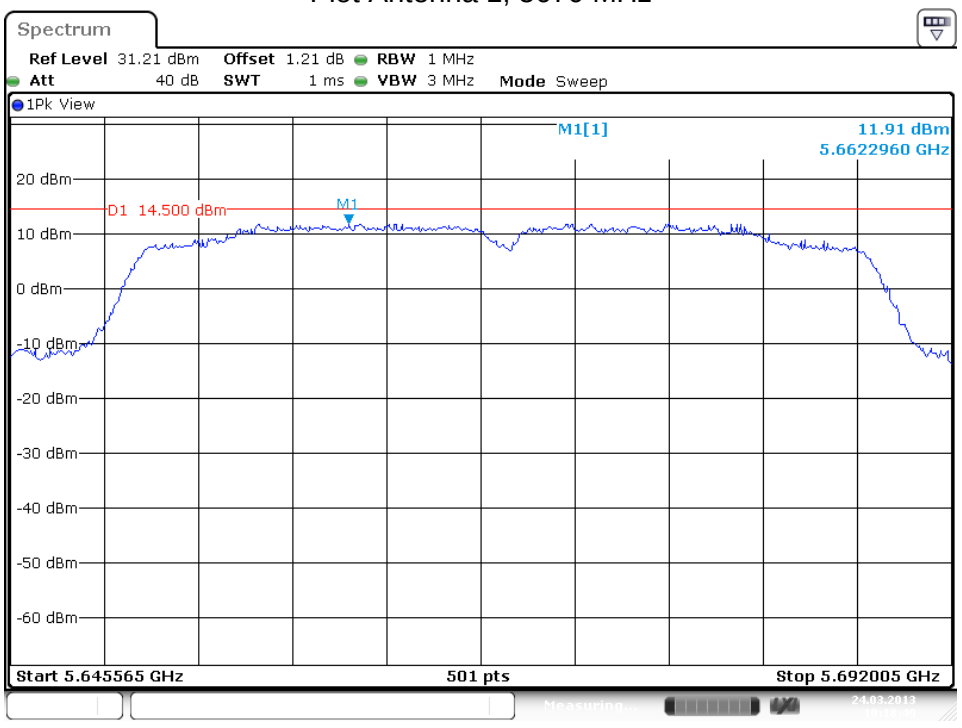
Date: 24.MAR.2013 09:29:44

Plot Antenna 2 , 5590 MHz



Date: 24.MAR.2013 10:07:49

Plot Antenna 1, 5670 MHz

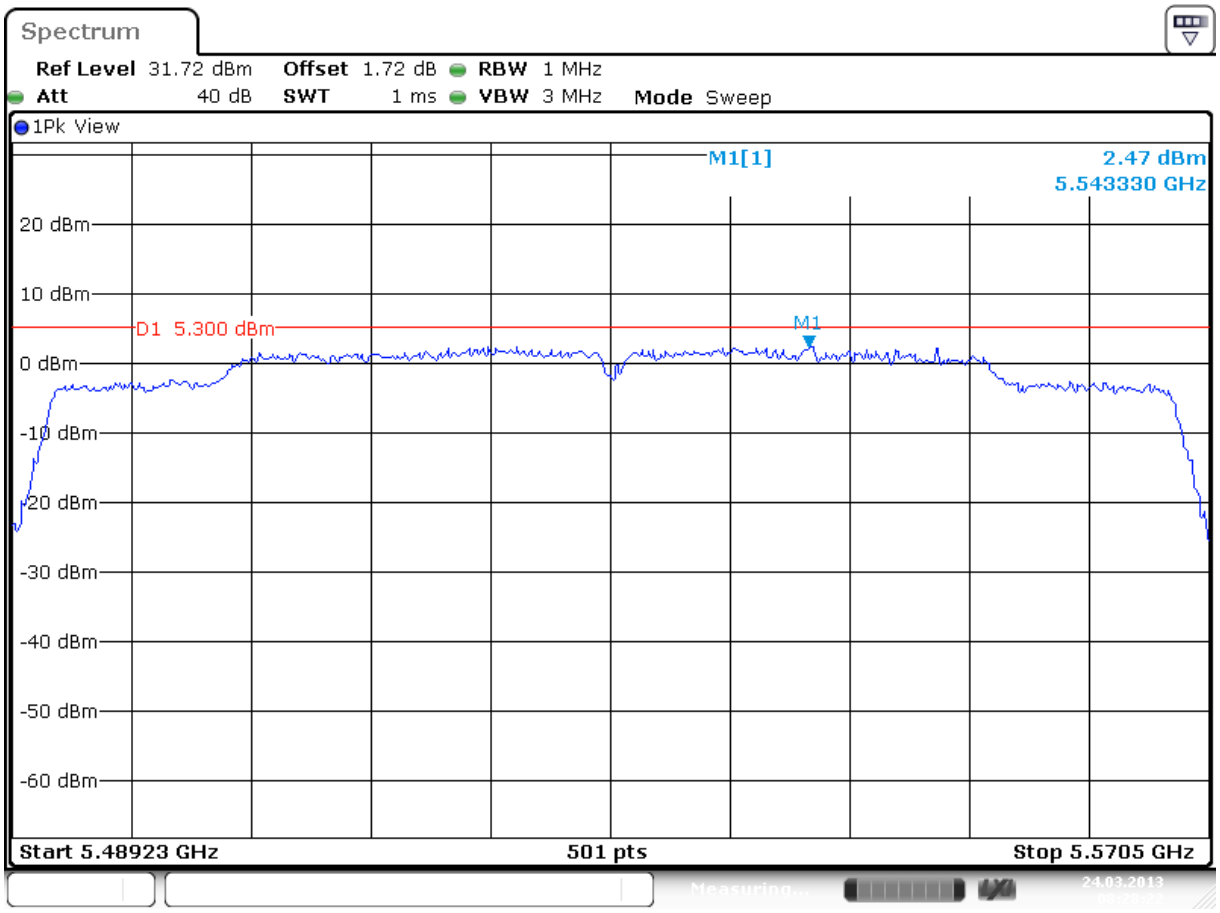


Date: 24.MAR.2013 10:18:49

Plot Antenna 2, 5670 MHz

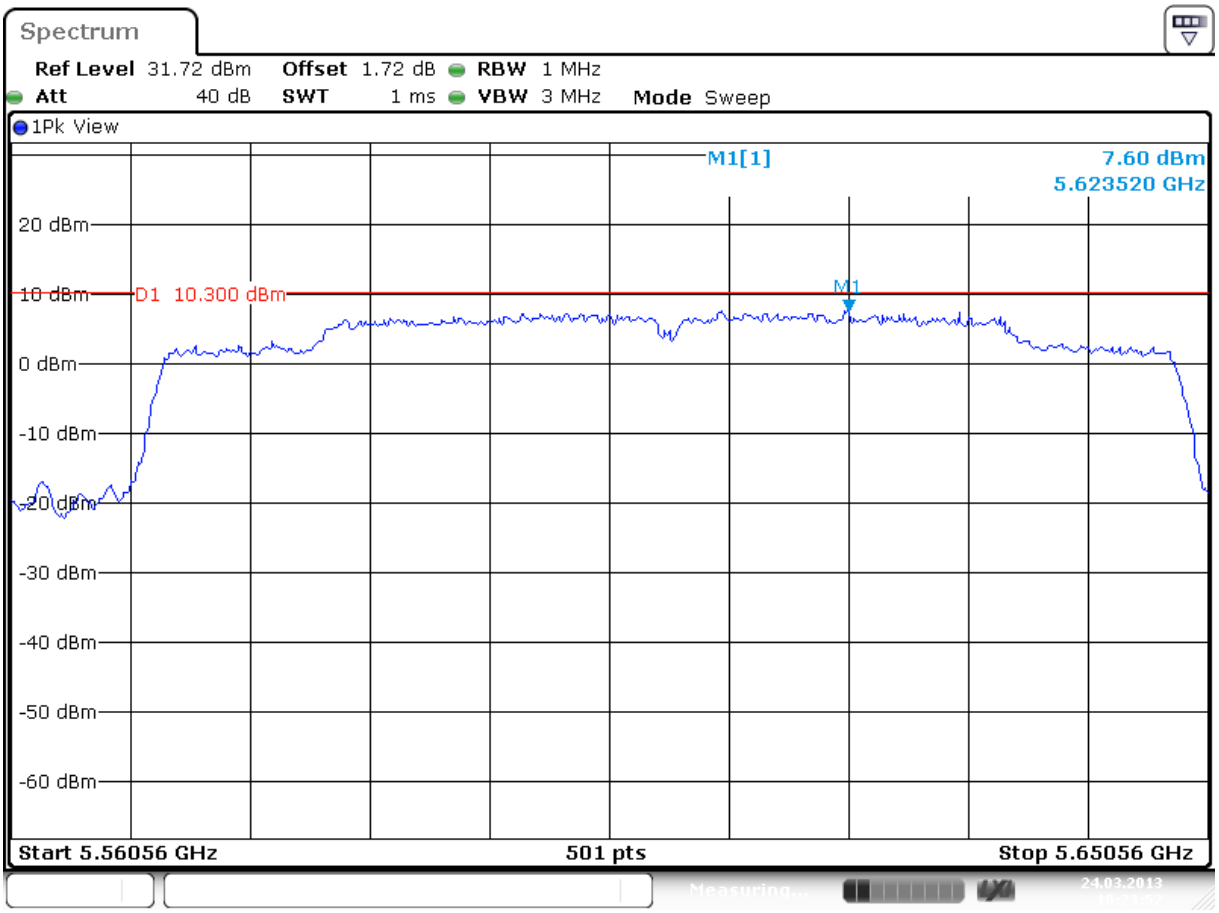
Operation mode: VHT6 80 MHz, Antenna 1

Frequency [MHz]	Peak of spectrum [dBm]	PPSD/MHz [dBm]	Peak excursion [dB]	Limit [dB]	Result
5530	2.5	-7.7	10.2	13	Pass
5610	7.6	-2.7	10.3	13	Pass



Date: 24.MAR.2013 08:28:22

Plot 5530 MHz

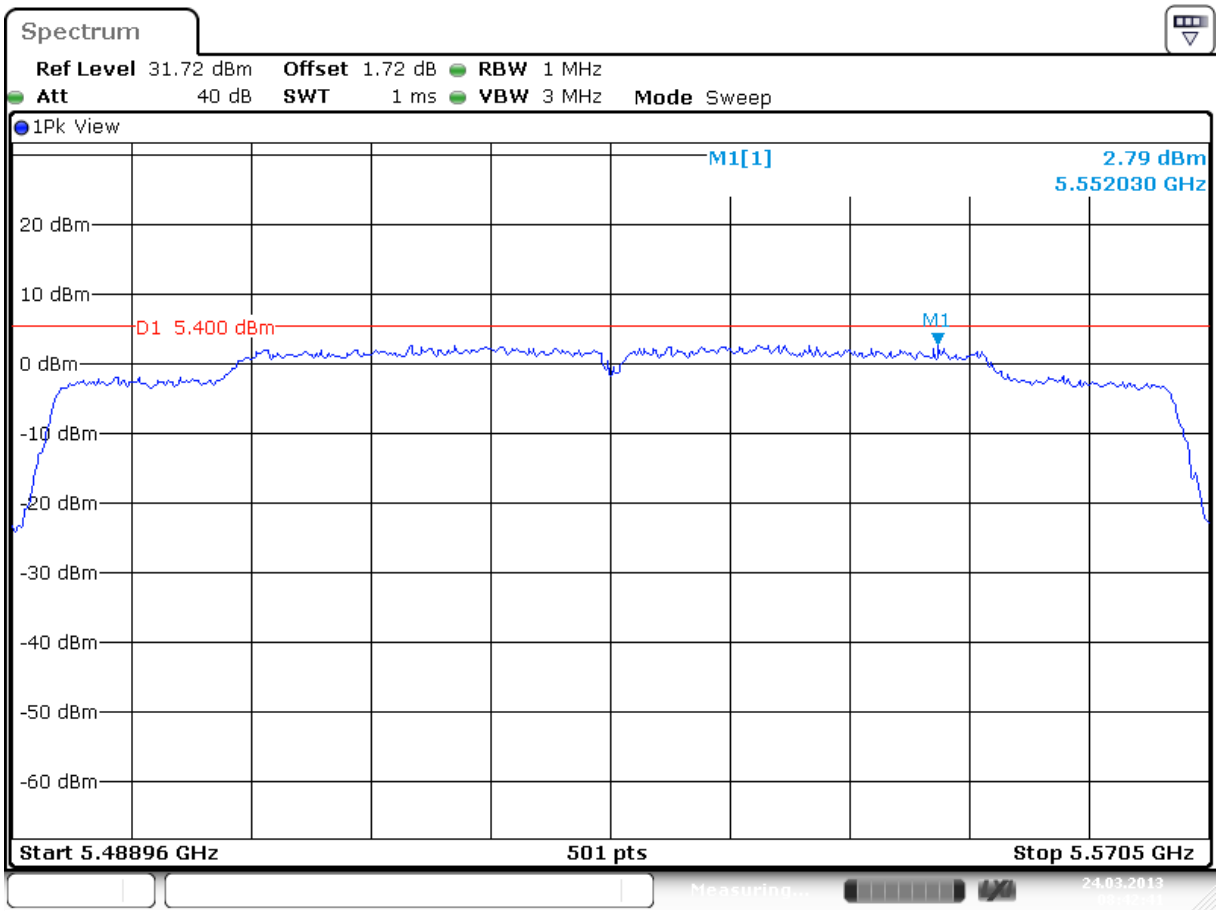


Date: 24.MAR.2013 10:23:53

Plot 5610 MHz

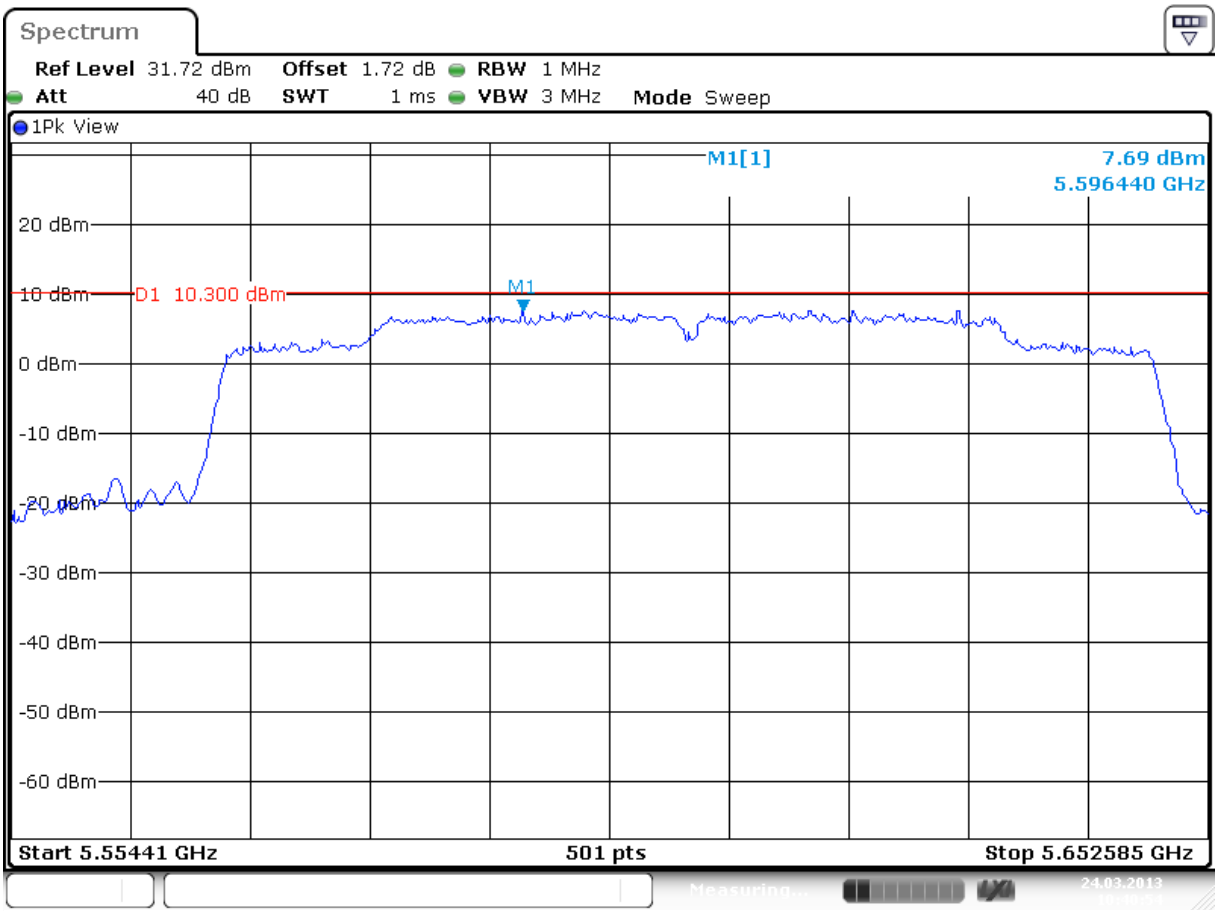
Operation mode: VHT6 80 MHz, Antenna 2

Frequency [MHz]	Peak of spectrum [dBm]	PPSD/MHz [dBm]	Peak excursion [dB]	Limit [dB]	Result
5530	2.8	-7.6	10.4	13	Pass
5610	7.7	-2.7	10.4	13	Pass



Date: 24.MAR.2013 08:42:42

Plot 5530 MHz



Date: 24.MAR.2013 10:40:54

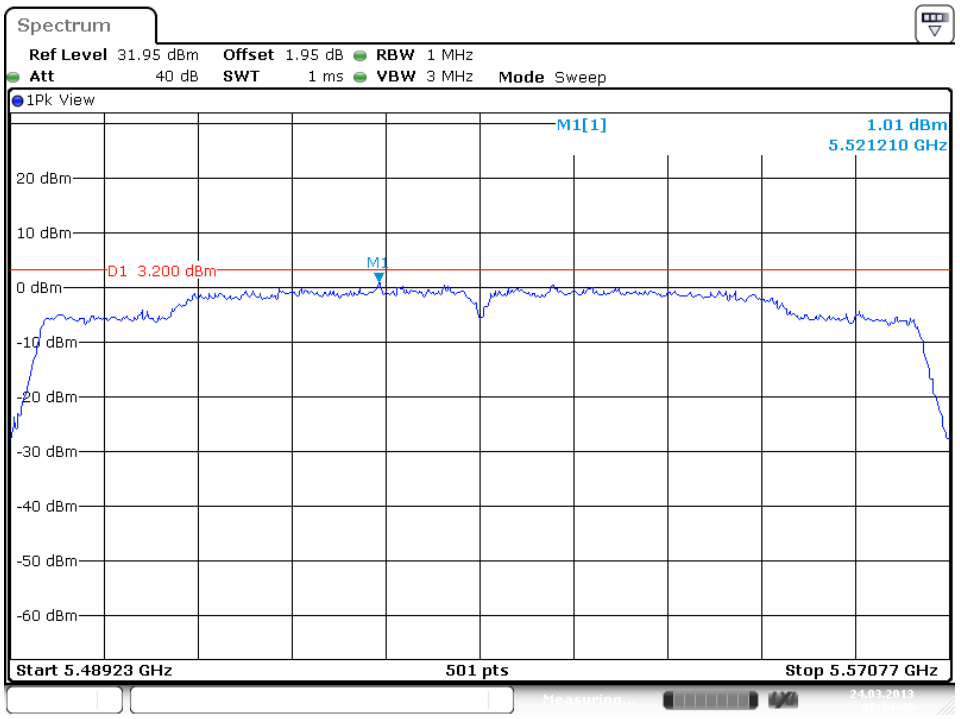
Plot 5610 MHz

Operation mode: VHT6 80 MHz, Antenna 1+2

Frequency [MHz]	Peak of spectrum Ant1/Ant2 [dBm]	PPSD/MHz [dBm]	Peak excursion Ant1/Ant2 [dB]	Limit [dB]	Result
5530	1.0 / 0.5	-6.6	10.8 / 10.1	13	Pass
5610	8.2 / 7.2	0.4	10.8 / 10.4	13	Pass

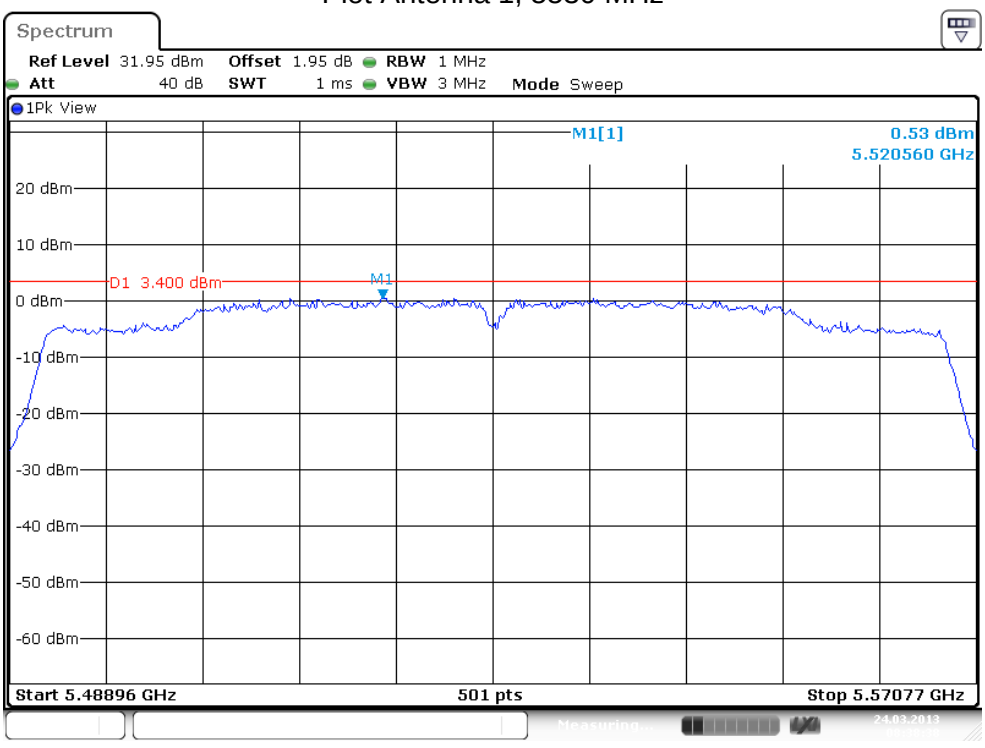
Note: Ant1 refers to Antenna 1 and Ant2 refers to Antenna 2

See plots on the next pages.



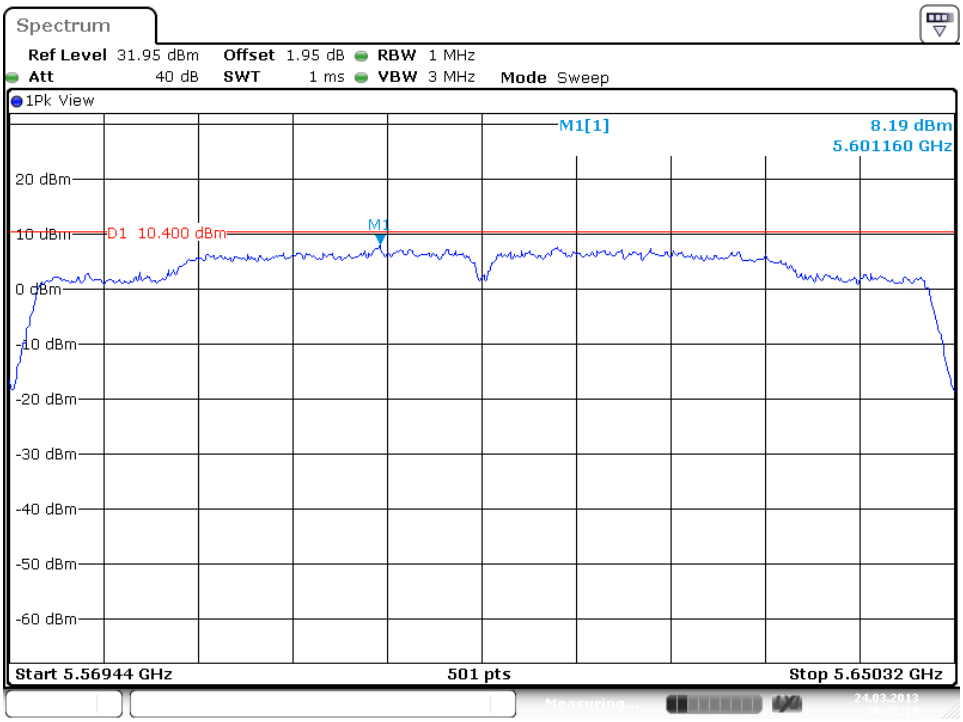
Date: 24.MAR.2013 08:34:46

Plot Antenna 1, 5530 MHz



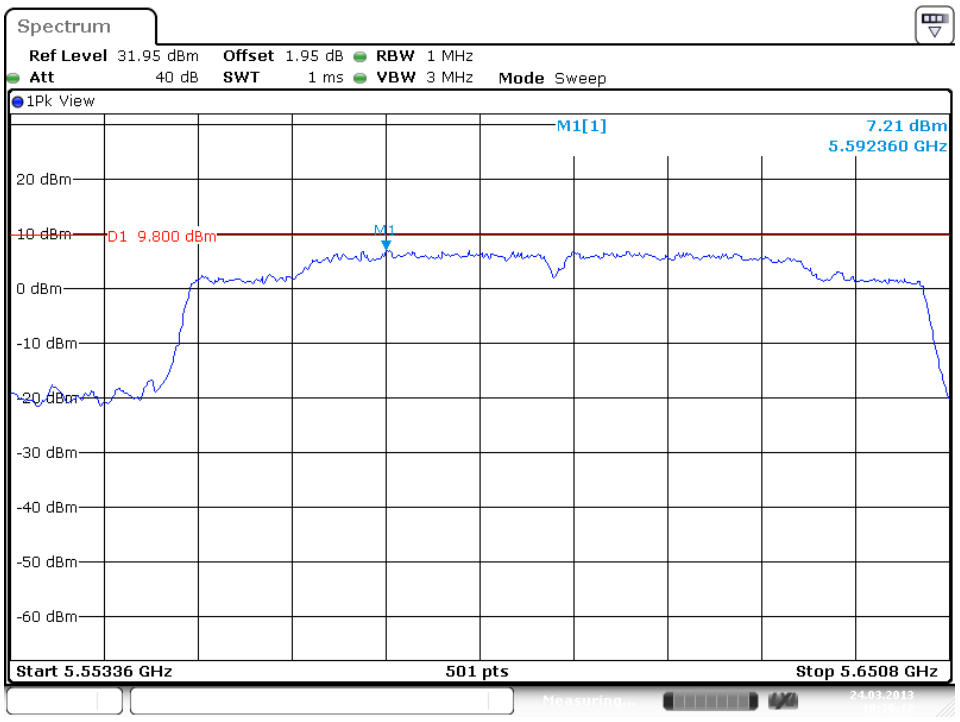
Date: 24.MAR.2013 08:38:38

Plot Antenna 2, 5530 MHz



Date: 24.MAR.2013 10:32:19

Plot Antenna 1, 5610 MHz

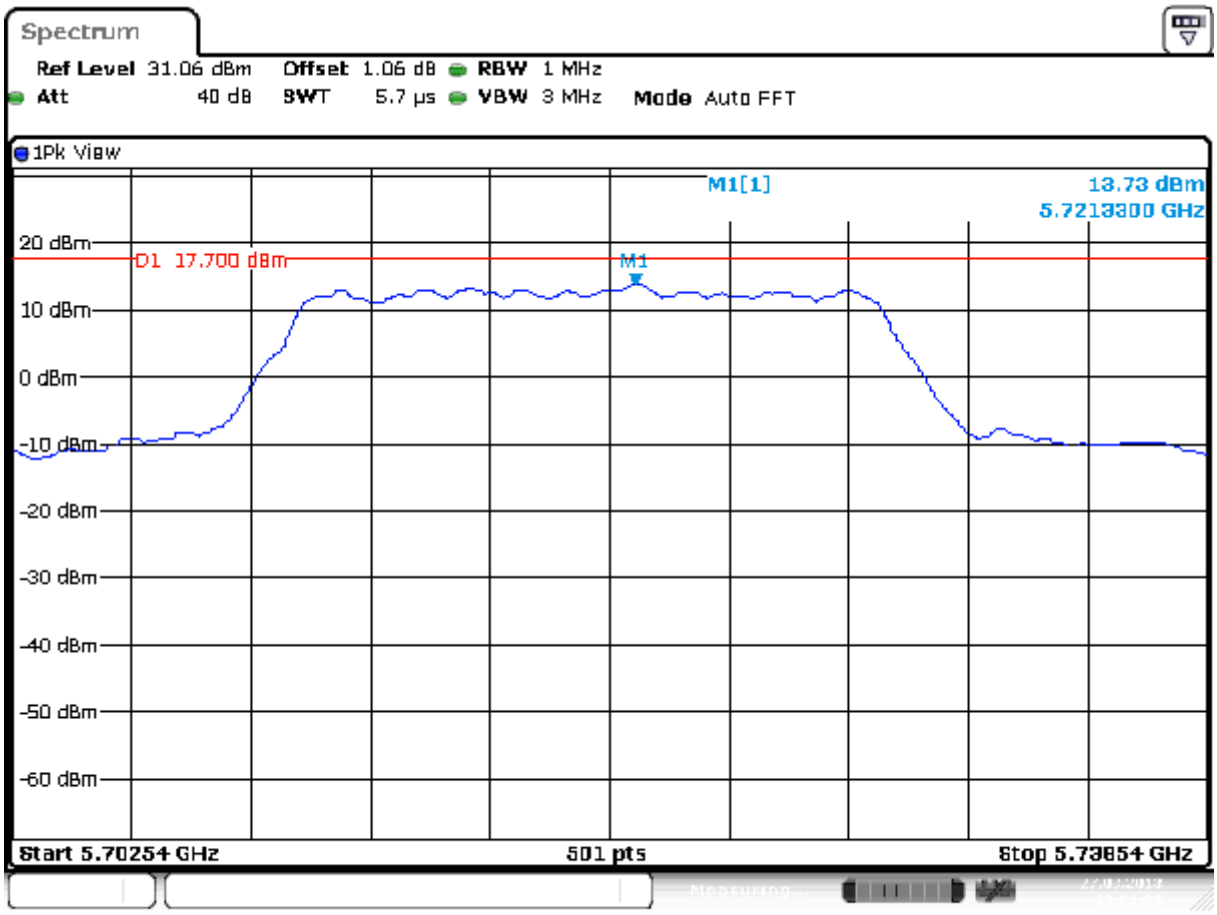


Date: 24.MAR.2013 10:36:12

Plot Antenna 2, 5610 MHz

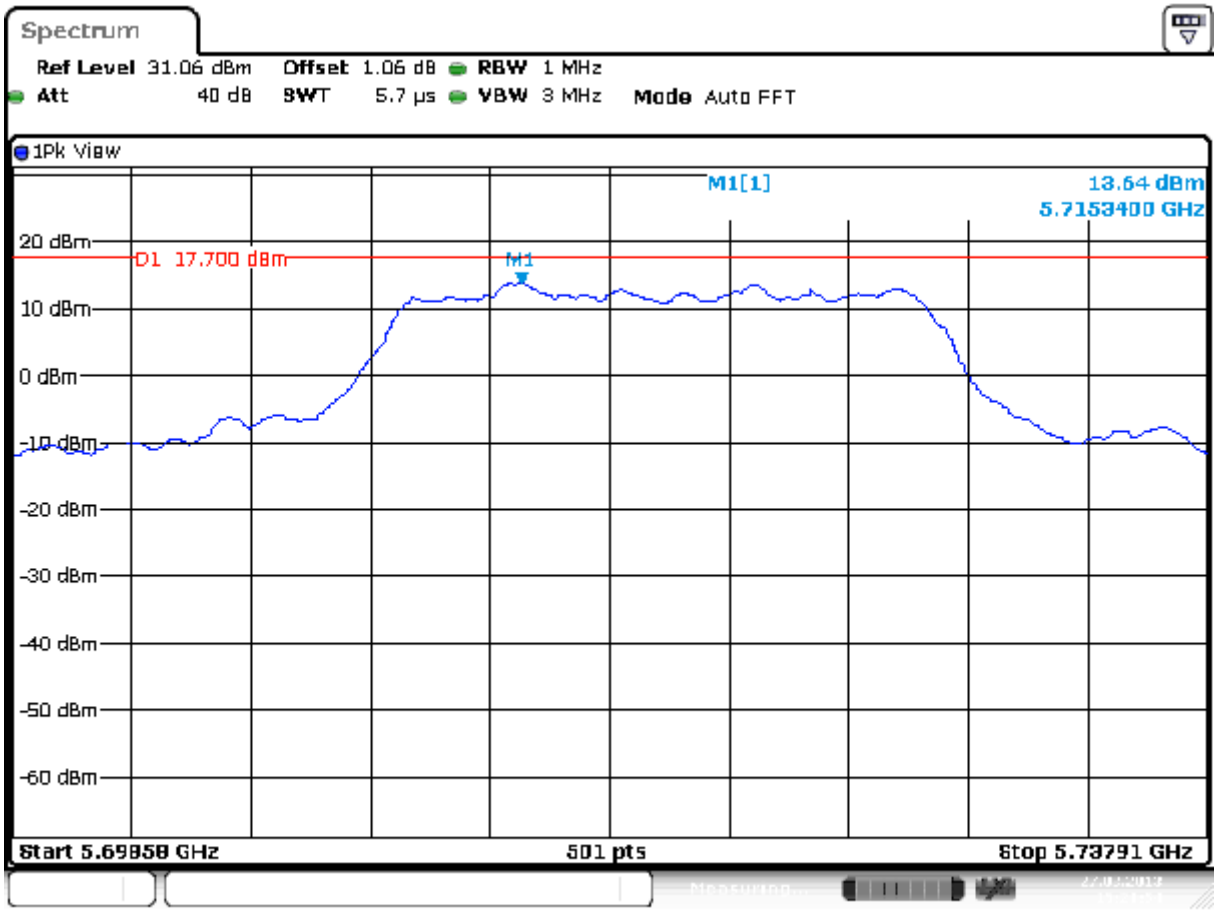
Operation mode: VHT6 20 MHz Ch144, Antenna 1

Frequency [MHz]	Peak of spectrum [dBm]	PPSD/MHz [dBm]	Peak excursion [dB]	Limit [dB]	Result
5720	13.73	4.73	9.0	13	Pass



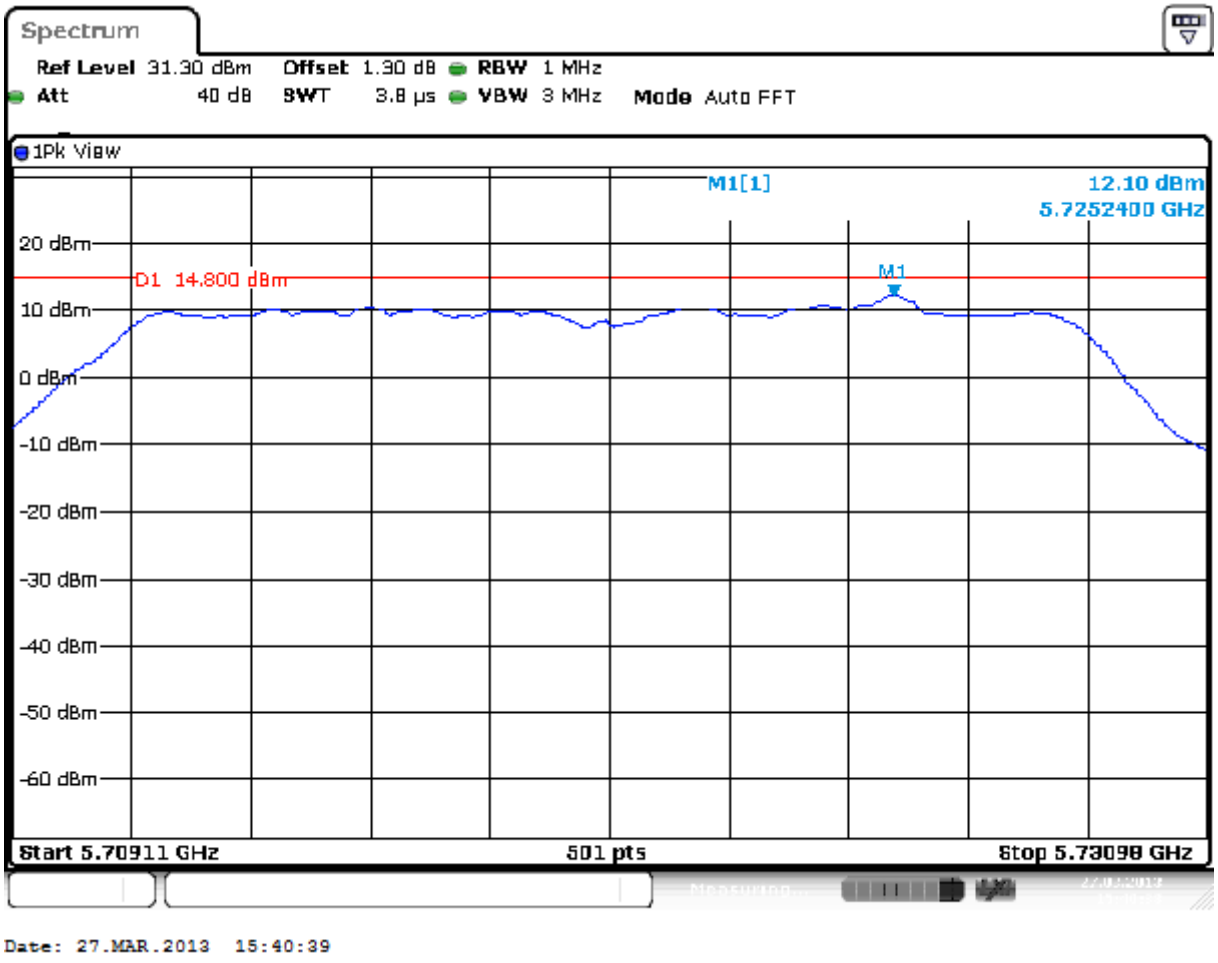
Operation mode: VHT6 20 MHz Ch144, Antenna 2

Frequency [MHz]	Peak of spectrum [dBm]	PPSD/MHz [dBm]	Peak excursion [dB]	Limit [dB]	Result
5720	13.64	4.74	8.9	13	Pass

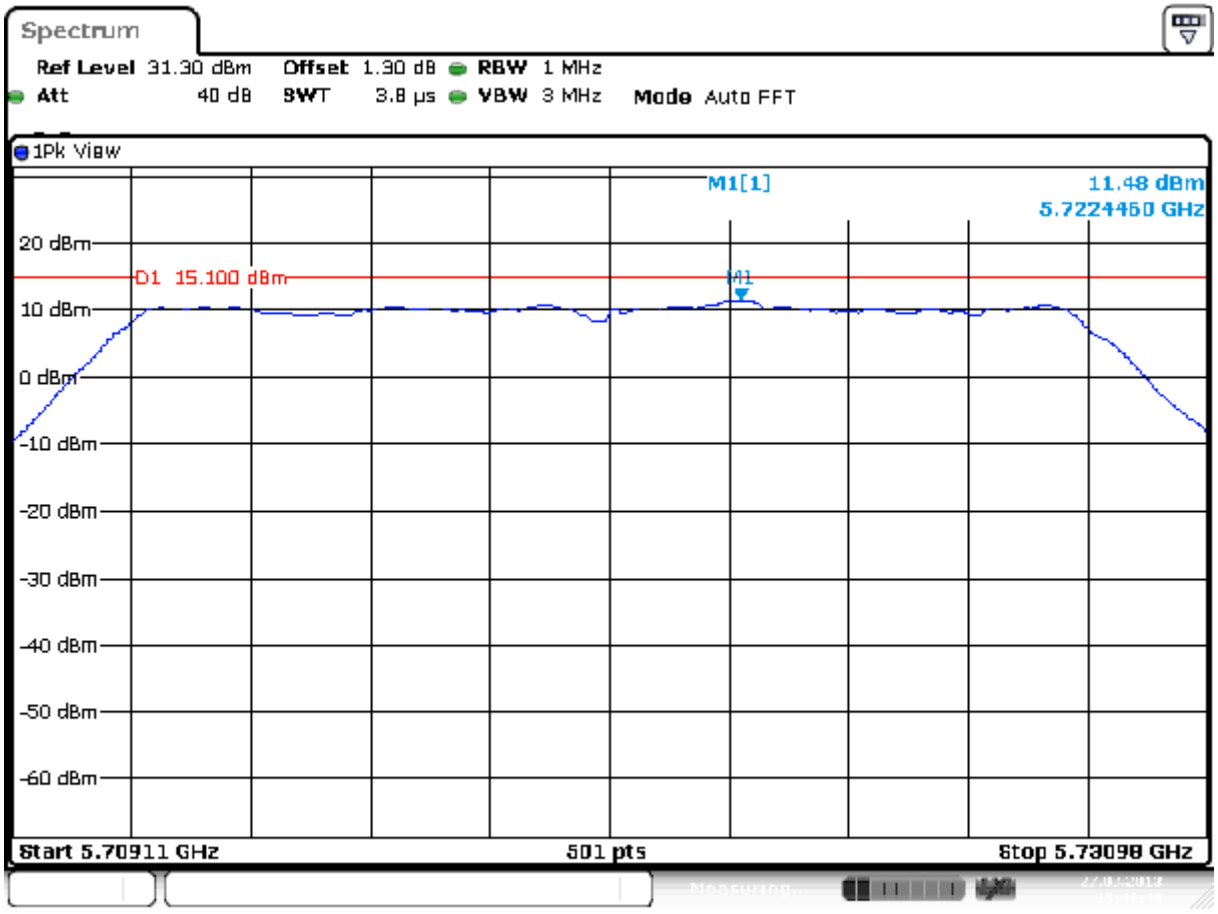


Operation mode: VHT6 20 MHz Ch144, Antenna 1+2

Frequency [MHz]	Peak of spectrum Antenna1/Antenna2 [dBm]	PPSD/MHz [dBm]	Peak excursion Antenna1/Antenna2 [dB]	Limit [dB]	Result
5720	12.10 / 11.48	1.8 / 2.08	10.3 / 9.4	13	Pass



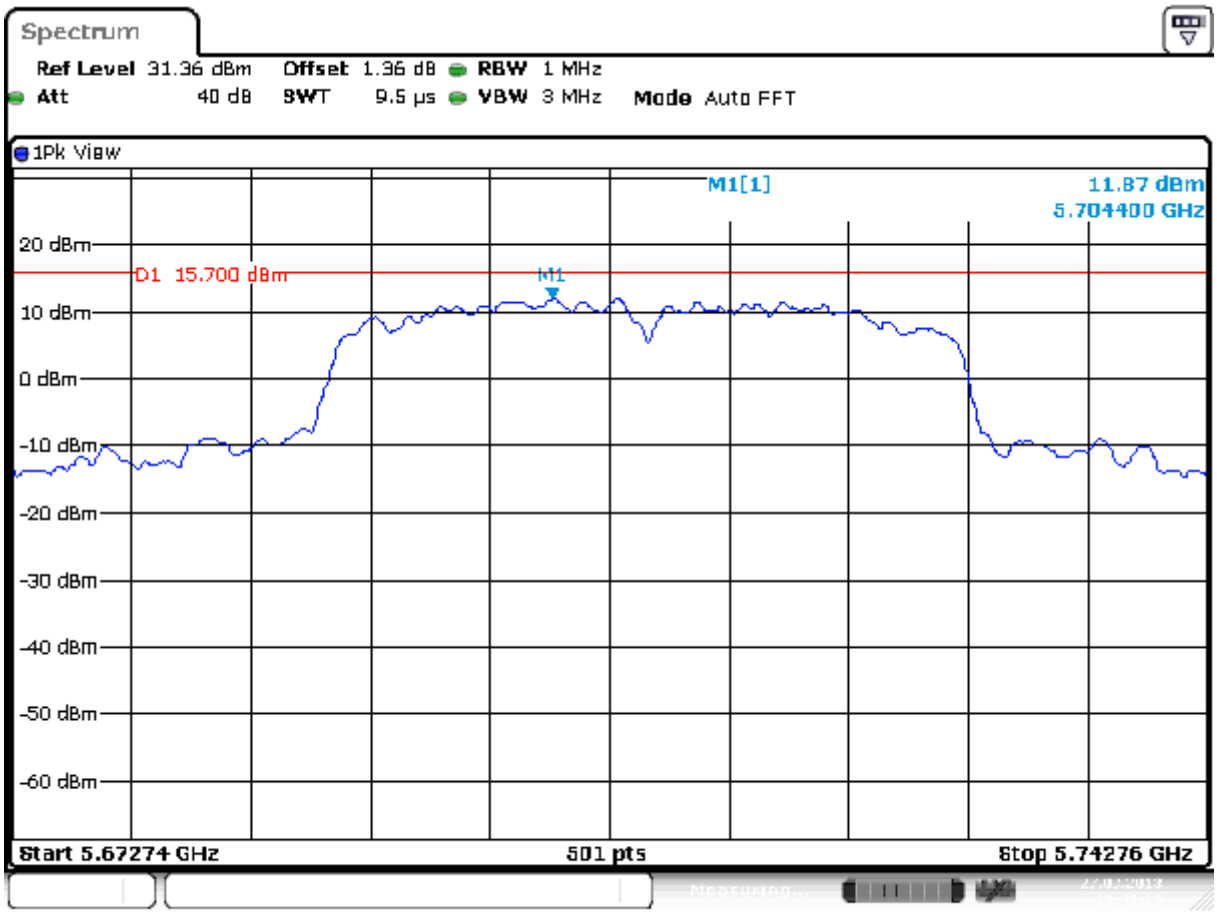
Peak of Spectrum Antenna 1



Peak of Spectrum Antenna 2

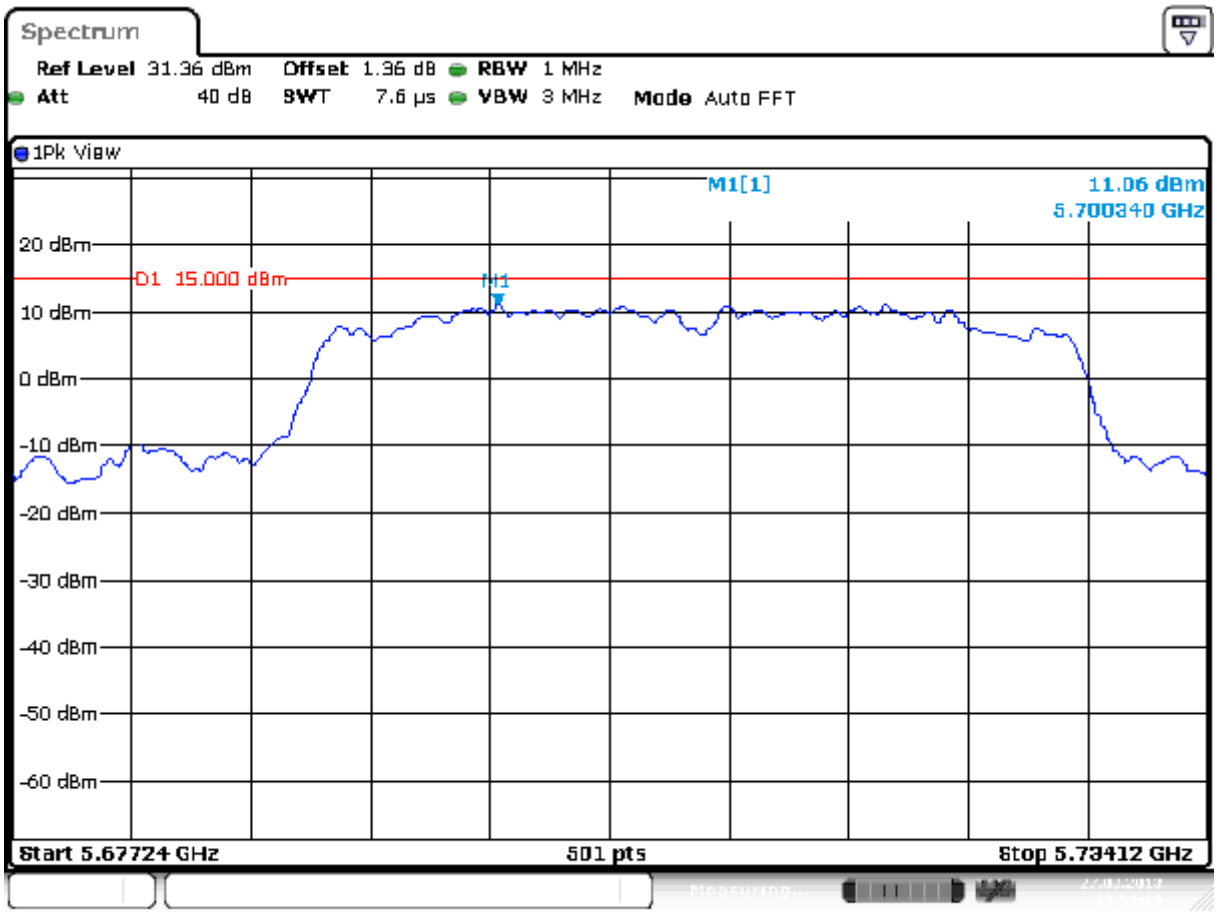
Operation mode: VHT6 40 MHz Ch142, Antenna 1

Frequency [MHz]	Peak of spectrum [dBm]	PPSD/MHz [dBm]	Peak excursion [dB]	Limit [dB]	Result
5710	11.87	2.67	9.2	13	Pass



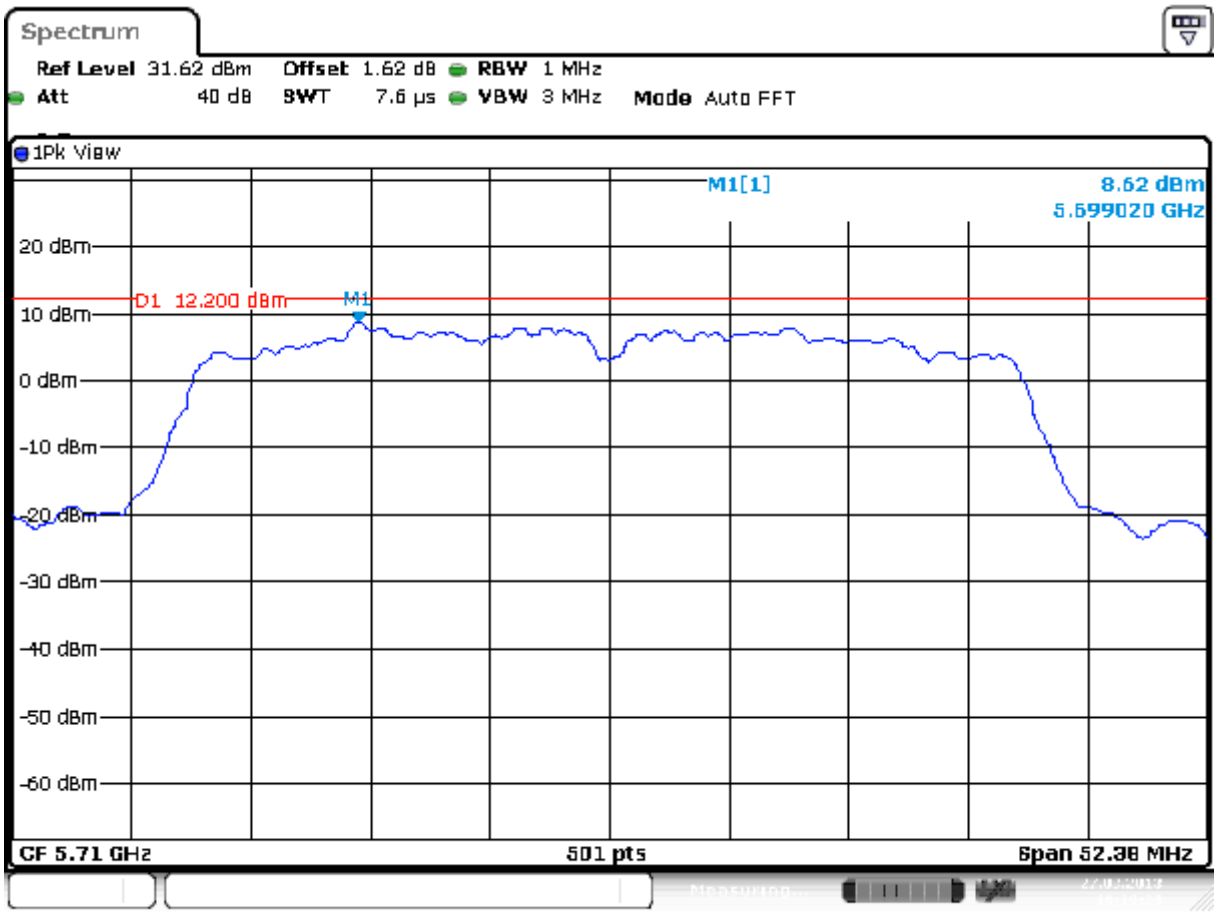
Operation mode: VHT6 40 MHz Ch142, Antenna 2

Frequency [MHz]	Peak of spectrum [dBm]	PPSD/MHz [dBm]	Peak excursion [dB]	Limit [dB]	Result
5710	11.06	2.05	9.1	13	Pass

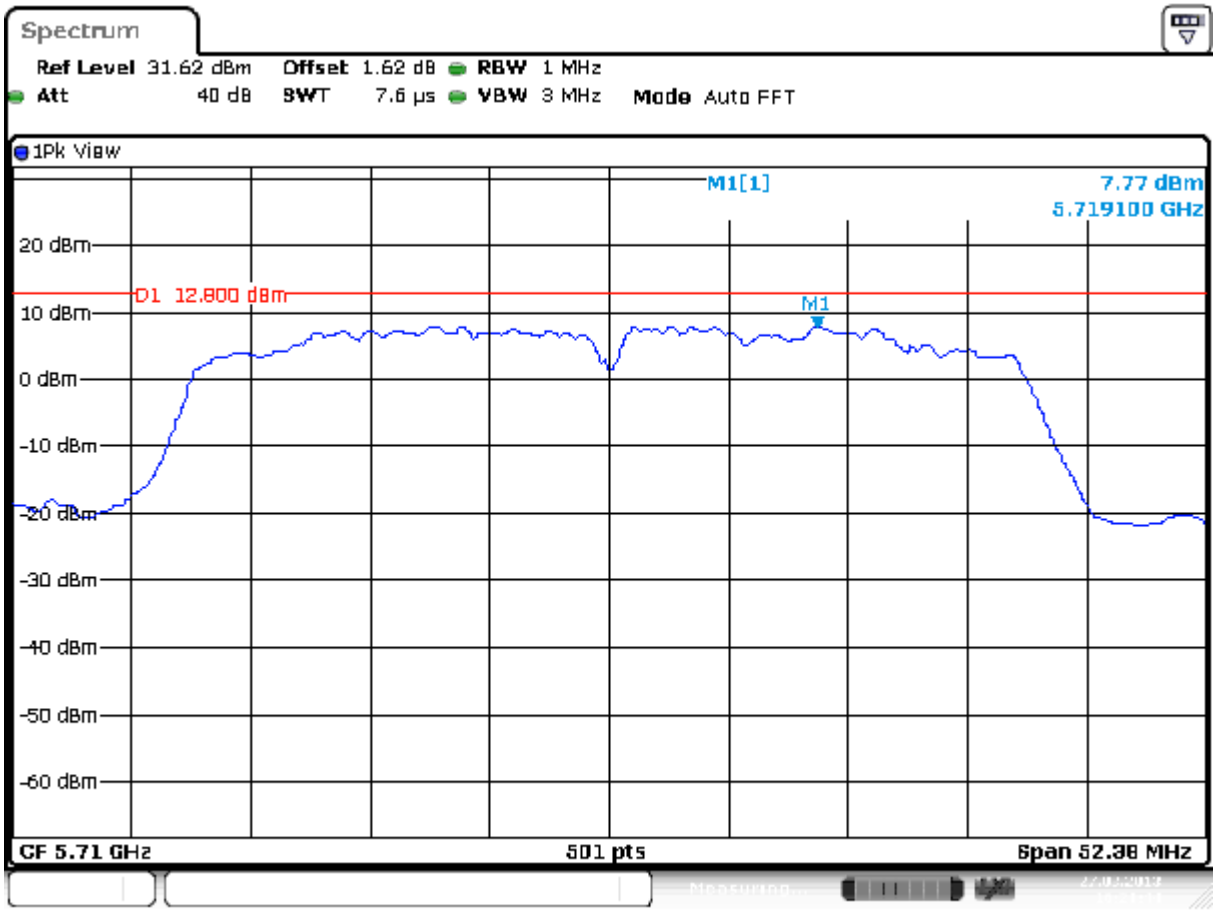


Operation mode: VHT6 40 MHz Ch142, Antenna 1+2

Frequency [MHz]	Peak of spectrum Antenna1/Antenna2 [dBm]	PPSD/MHz [dBm]	Peak excursion Antenna1/Antenna2 [dB]	Limit [dB]	Result
5710	8.62 / 7.77	-0.78 / -0.23	9.4 / 8.0	13	Pass



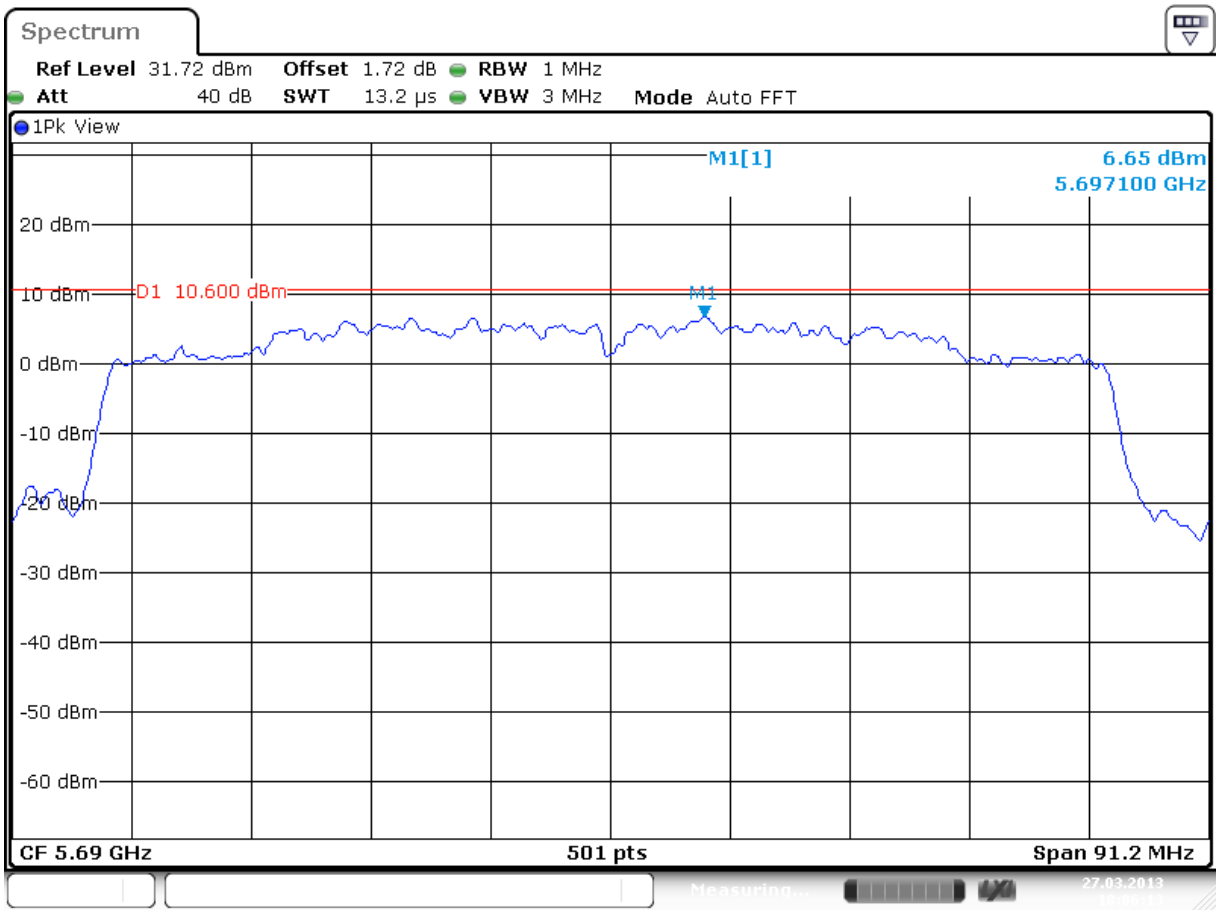
Peak of Spectrum , Antenna 1



Peak of Spectrum , Antenna 2

Operation mode: VHT6 80 MHz Ch138, Antenna 1

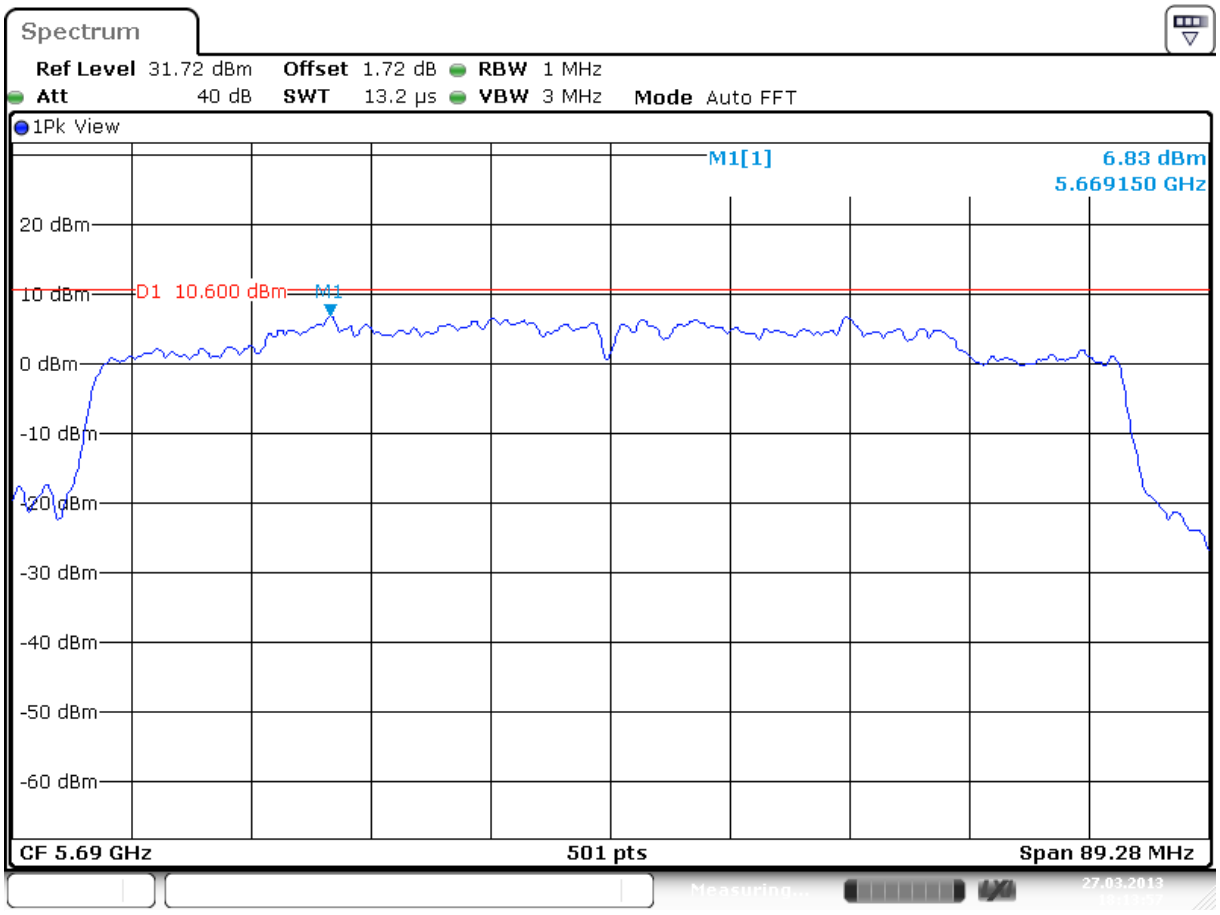
Frequency [MHz]	Peak of spectrum [dBm]	PPSD/MHz [dBm]	Peak excursion [dB]	Limit [dB]	Result
5690	6.65	-2.45	9.1	13	Pass



Date: 27.MAR.2013 18:06:13

Operation mode: VHT6 80 MHz Ch138, Antenna 2

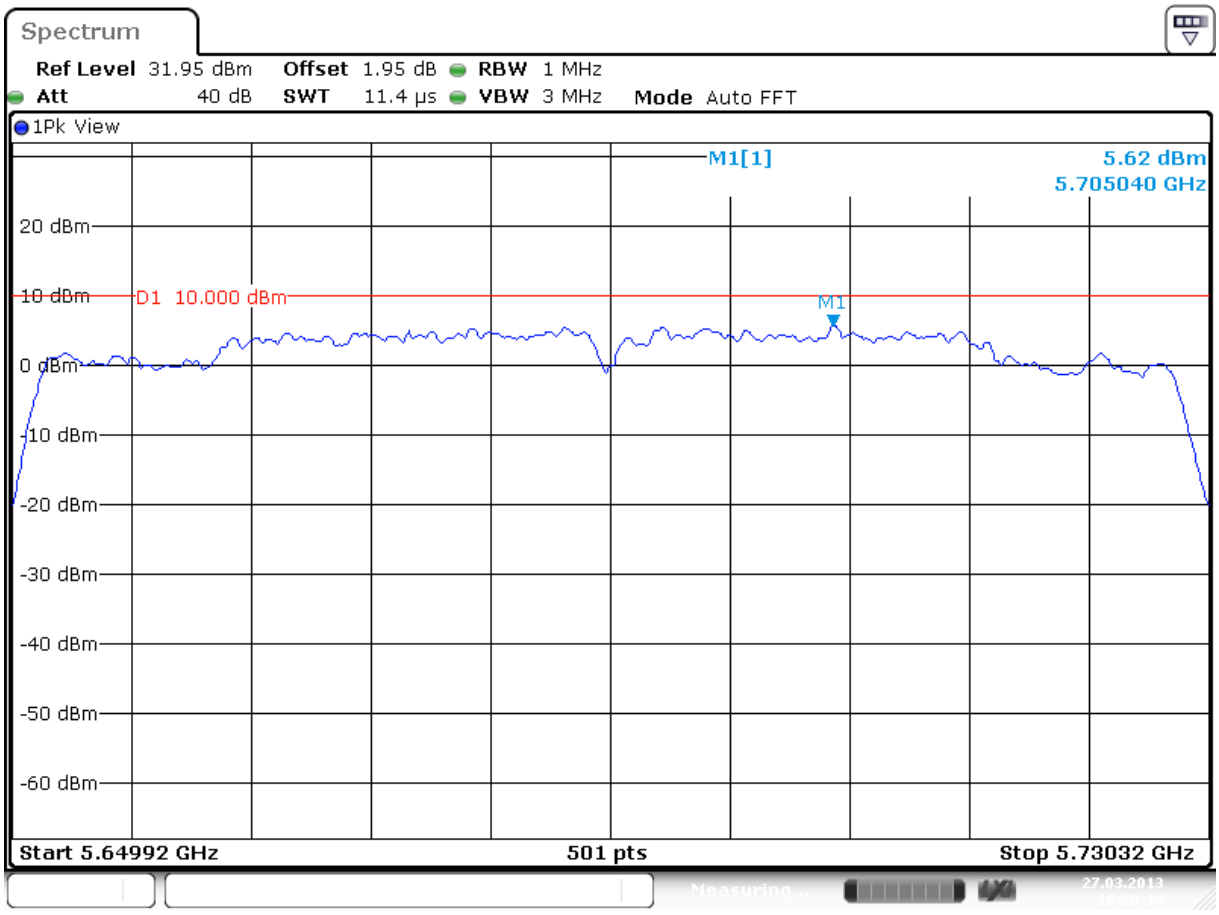
Frequency [MHz]	Peak of spectrum [dBm]	PPSD/MHz [dBm]	Peak excursion [dB]	Limit [dB]	Result
5690	6.83	-2.37	9.2	13	Pass



Date: 27.MAR.2013 18:13:57

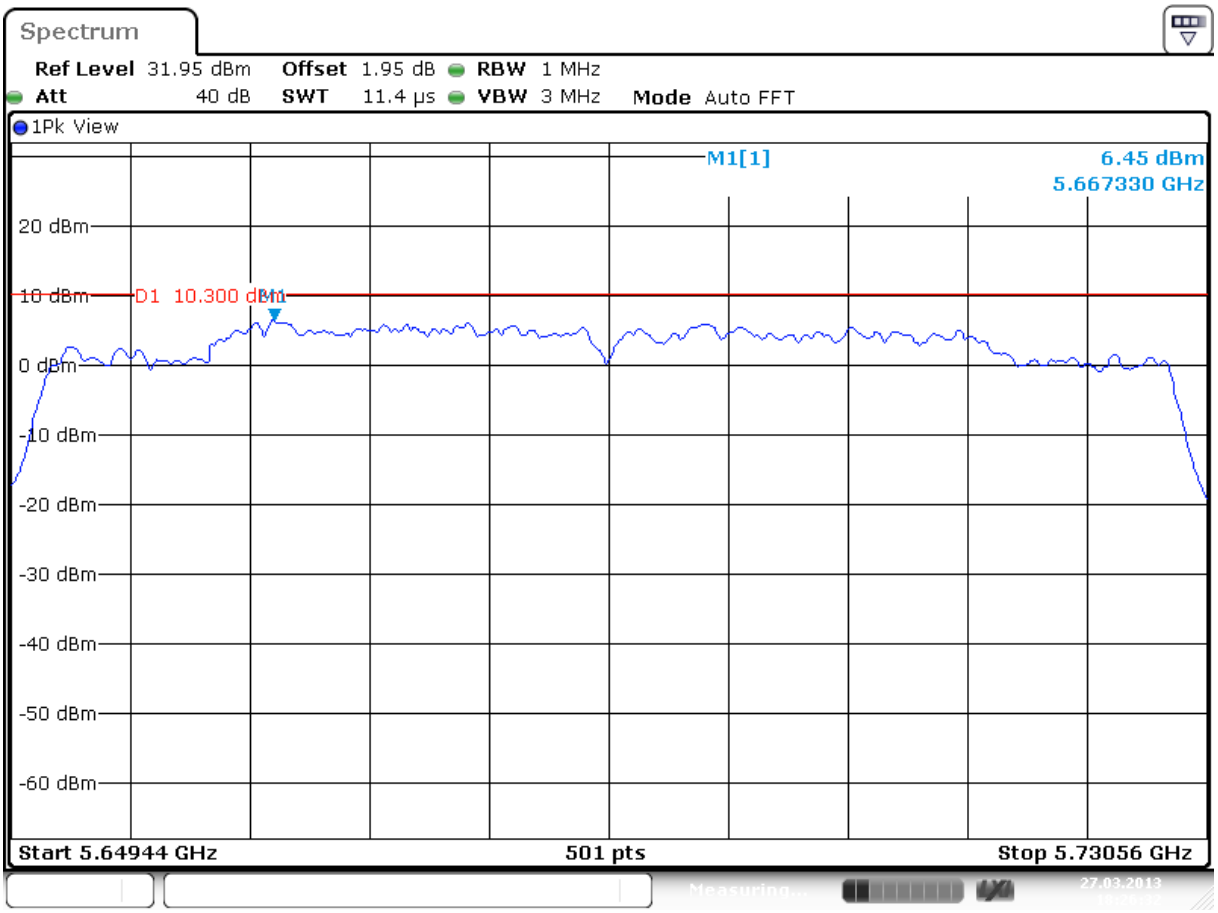
Operation mode: VHT6 80 MHz Ch138, Antenna 1+2

Frequency [MHz]	Peak of spectrum Antenna1/Antenna2 [dBm]	PPSD/MHz [dBm]	Peak excursion Antenna1/Antenna2 [dB]	Limit [dB]	Result
5690	5.62 / 6.45	-2.98 / -2.65	8.6 / 9.1	13	Pass



Date: 27.MAR.2013 18:20:14

Peak of Spectrum, Antenna 1



Date: 27.MAR.2013 18:26:32

Peak of Spectrum, Antenna 2

7.2.4 Undesirable Emissions

RESULT: Pass

Date of testing: 2013-01-12 / 2013-03-27

Requirements:

Section 15.407 Subclause (b) (1) / RSS-210 A.9.2. (1).

For transmitters operating in the 5.47–5.725 GHz band: all emissions outside of the 5.47–5.725 GHz band shall not exceed an EIRP of –27 dBm/MHz (68.23 dBµV/m at 3 m distance). Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)):

Frequency Range (MHz)	Field strength (µV/m)	Field strength (dBµV/m)	Detector	Measurement distance (m)
0.009-0.490	2400/F(kHz)	43.5 > 13.8	Average	300
0.490-1.705	24000/F(kHz)	33.8 > 22.9	Average	300
1.705 - 30.0	30	29.5	Quasi peak	30
30 - 88	100	40.0	Quasi peak	3
88 - 216	150	43.5	Quasi peak	3
216 - 960	200	46.0	Quasi peak	3
960 - 40000	500	54.0	Average	3

The emission limits shown in the above table are based on measurements employing CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector. For average radiated emission measurements above 1000 MHz, there is also a limit corresponding to 20 dB above the indicated values in the table is specified when measuring with peak detector function.

Test procedure:

ANSI C63.10-2009
KDB Publication No.789033 D01 v01r02 9/26/2012 .
KDB Publication No. 644545 D01 and D02.

The EUT was placed on a nonconductive turntable 0.8m above the ground plane. Before final measurements of radiated emissions were performed, the EUT was scanned to determine its emission spectrum profile. The physical arrangement of the test system, the associated cabling and the EUT orientation (X, Y, Z) were varied in order to ensure that maximum emission amplitudes were attained.

The situation and orientation was varied to find the maximum radiated emission. It was also rotated 360º to find the maximum radiated emission. Measurements were made in both horizontal and vertical planes of polarization. All tests were performed in a semi-anechoic chamber at a distance of 3m for the frequency range 1 GHz-40 GHz. The field strength is calculated by adding correction factor to the measured level from the spectrum analyzer. This correction factor includes antenna factor, cable loss and pre-amplifiers gain.
The equipment transmits continuously in the selected channel so it is not necessary a duty cycle correction factor.Measurements were performed using a spectrum analyzer with a suitable span and using the following settings: RBW = 1MHz, VBW = 3MHz (smaller if required for near band edge measurements).

The highest emission amplitudes relative to the appropriate limit were measured and recorded in this report.

Results:
See the tables on the following pages.

Frequency range 30 MHz-1 GHz

The spurious signals detected do not depend on either the operating channel or the modulation mode.

Freq. [MHz]	Antenna Orientation	Level QP [dBµV/m]	Limit [dBµV/m]	Margin QP [dB]
66.86	Vertical	20.5	40.0	19.5
111.48	Vertical	25.0	43.5	18.5
253.10	Vertical	27.9	46.0	18.1
774.96	Vertical	39.5	46.0	6.5
844.80	Vertical	41.4	46.0	4.6
922.40	Vertical	43.0	46.0	3.0

Notes:

1. Field strength values of radiated emissions at frequencies not listed in the table above are more than 20 dB below the applicable limit.
2. Measurement uncertainty is ±5.0dB.
3. The EUT was varied in three positions, the measuring antenna was varied in horizontal and vertical orientations and also around it's axis and height. The reported value is the worst case found at the reported frequency.
4. Tested with EUT in operation modes as described in section 4.2, worst case values noted.
5. A Quasi-peak detector was used with a bandwidth of 120 kHz.

Frequency range 1 GHz-40 GHz

The results in the next tables show the maximum measured levels in the 1-40 GHz range including the restricted band 4.5-5.15 GHz. For OFDM modulation modes (802.11g, 802.11n20, 802.11n40 and 802.11ac80), a preliminary measurement in the central channel in the range 1-18 GHz was performed to determine the worst case.
The lowest channel was measured for out-of-band emissions for the worst case (802.11a). The highest channel was measured for out-of-band emissions for channel 144 (ac20 mode 5720 MHz) since the adjusted transmit power is higher than channel 140 (802.11a mode 5700 MHz) in both SISO and MIMO modes.
The field strength at the band edges was evaluated for each mode and on each chain individually on the lowest and highest channels at the rated power for the channel under test. Where the power at the edge channels was lower than the power at the center channels additional measurements were made at the adjacent channels. Single transmission at each chain and simultaneous transmission at both chains modes were fully evaluated.
Spurious signals with peak levels above the average limit (54 dBµV/m at 3 m) are measured with average detector for checking compliance with the average limit, where applicable.

Radiated Emission, 1 - 40GHz, Horizontal and Vertical Antenna Orientations, 6 Mb OFDM – Antenna 1 at 5500 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11000	Vertical	Pk	35.20	68.23
16500	Horizontal	Pk	35.20	68.23
22641	Vertical	Pk	39.51	68.23
22913	Vertical	Pk	39.29	68.23
23797	Vertical	Pk	43.81	68.23
24443	Vertical	Pk	40.62	68.23

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 – 40 GHz, Horizontal and Vertical Antenna Orientations, 6 Mb OFDM – Antenna 2 at 5500 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11000	Vertical	Pk	35.20	68.23
16500	Horizontal	Pk	35.20	68.23
18459	Vertical	Pk	36.38	68.23
21553	Vertical	Pk	37.51	68.23
22012	Vertical	Pk	41.22	68.23
23664	Vertical	Pk	42.08	68.23

Note:
- Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 - 40GHz, Horizontal and Vertical Antenna Orientations, 6 Mb OFDM – Antenna 1 at 5600 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11200	Vertical	Pk	35.20	68.23
16800	Vertical	Pk	36.00	68.23
18680	Vertical	Pk	36.73	68.23
21740	Vertical	Pk	39.38	68.23
24018	Horizontal	Pk	43.57	68.23
24307	Vertical	Pk	41.67	68.23

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 – 40 GHz, Horizontal and Vertical Antenna Orientations, 6 Mb OFDM – Antenna 2 at 5600 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11200	Vertical	Pk	35.20	68.23
16800	Vertical	Pk	36.00	68.23
18340	Vertical	Pk	35.52	68.23
21859	Vertical	Pk	39.97	68.23
22233	Horizontal	Pk	40.17	68.23
24103	Vertical	Pk	43.16	68.23

Note:
- Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 - 40GHz, Horizontal and Vertical Antenna Orientations, 6 Mb OFDM – Antenna 1 at 5700 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11400	Vertical	Pk	38.70	68.23
17100	Horizontal	Pk	37.00	68.23
18646	Vertical	Pk	35.87	68.23
21468	Horizontal	Pk	38.23	68.23
22097	Vertical	Pk	40.86	68.23
24205	Vertical	Pk	42.55	68.23

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 – 40 GHz, Horizontal and Vertical Antenna Orientations, 6 Mb OFDM – Antenna 2 at 5700 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11400	Vertical	Pk	38.70	68.23
17100	Horizontal	Pk	37.00	68.23
18748	Vertical	Pk	36.02	68.23
20261	Vertical	Pk	35.55	68.23
22148	Vertical	Pk	40.67	68.23
24103	Vertical	Pk	43.93	68.23

Note:
- Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 - 40GHz, Horizontal and Vertical Antenna Orientations, HT4 20 MHz – Antenna 1 at 5500 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11000	Vertical	Pk	35.20	68.23
16500	Horizontal	Pk	36.50	68.23
18391	Vertical	Pk	36.37	68.23
21179	Horizontal	Pk	36.48	68.23
21961	Vertical	Pk	40.94	68.23
24409	Vertical	Pk	40.89	68.23

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 – 40 GHz, Horizontal and Vertical Antenna Orientations, HT4 20 MHz – Antenna 2 at 5500 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11000	Vertical	Pk	35.70	68.23
16500	Horizontal	Pk	36.30	68.23
18884	Vertical	Pk	36.61	68.23
21196	Horizontal	Pk	37.12	68.23
24103	Vertical	Pk	43.36	68.23
25463	Vertical	Pk	41.83	68.23

Note:
- Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 - 40GHz, Horizontal and Vertical Antenna Orientations, HT4 20 MHz – Antenna 1 at 5600 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11200	Vertical	Pk	36.80	68.23
16800	Horizontal	Pk	39.60	68.23
18969	Vertical	Pk	35.67	68.23
22046	Vertical	Pk	40.83	68.23
23763	Vertical	Pk	43.23	68.23
24103	Vertical	Pk	44.12	68.23

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 – 40 GHz, Horizontal and Vertical Antenna Orientations, HT4 20 MHz – Antenna 2 at 5600 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11200	Vertical	Pk	35.40	68.23
16800	Horizontal	Pk	39.40	68.23
19105	Vertical	Pk	35.48	68.23
21162	Vertical	Pk	36.48	68.23
24647	Vertical	Pk	39.38	68.23
24851	Vertical	Pk	39.72	68.23

Note:
- Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 - 40GHz, Horizontal and Vertical Antenna Orientations, HT4 20 MHz – Antenna 1 at 5700 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11400	Vertical	Pk	40.90	68.23
17100	Vertical	Pk	38.10	68.23
18493	Vertical	Pk	35.71	68.23
21859	Vertical	Pk	40.90	68.23
24018	Vertical	Pk	43.61	68.23
26024	Vertical	Pk	41.26	68.23

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 – 40 GHz, Horizontal and Vertical Antenna Orientations, HT4 20 MHz – Antenna 2 at 5700 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11400	Vertical	Pk	39.90	68.23
17100	Vertical	Pk	38.20	68.23
22199	Vertical	Pk	40.94	68.23
22284	Vertical	Pk	40.30	68.23
24477	Horizontal	Pk	39.97	68.23
26245	Vertical	Pk	38.95	68.23

Note:
- Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 - 40GHz, Horizontal and Vertical Antenna Orientations, HT8 20 MHz – Antenna 1 at 5500 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11000	Vertical	Pk	34.75	68.23
16500	Horizontal	Pk	35.50	68.23
18391	Vertical	Pk	36.00	68.23
21179	Horizontal	Pk	36.50	68.23
21961	Vertical	Pk	41.50	68.23
24409	Vertical	Pk	41.50	68.23

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 – 40 GHz, Horizontal and Vertical Antenna Orientations, HT8 20 MHz – Antenna 1+2 at 5700 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11400	Vertical	Pk	39.50	68.23
17100	Vertical	Pk	38.00	68.23
22199	Vertical	Pk	40.00	68.23
22284	Vertical	Pk	42.25	68.23
24477	Horizontal	Pk	42.25	68.23
26245	Vertical	Pk	41.25	68.23

Note:
- Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 - 40GHz, Horizontal and Vertical Antenna Orientations, HT8 20 MHz – Antenna 1+2 at 5580 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11200	Vertical	Pk	35.00	68.23
16800	Horizontal	Pk	39.25	68.23
18969	Vertical	Pk	34.75	68.23
22046	Vertical	Pk	35.50	68.23
23763	Vertical	Pk	40.00	68.23
24103	Vertical	Pk	41.50	68.23

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 – 40 GHz, Horizontal and Vertical Antenna Orientations, HT4 40 MHz – Antenna 1 at 5510 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11020	Vertical	Pk	44.10	68.23
16530	Horizontal	Pk	36.60	68.23
18459	Vertical	Pk	35.46	68.23
22131	Vertical	Pk	40.64	68.23
24052	Horizontal	Pk	43.73	68.23
25599	Vertical	Pk	43.85	68.23

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 – 40 GHz, Horizontal and Vertical Antenna Orientations, HT4 40 MHz – Antenna 2 at 5510 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11020	Vertical	Pk	42.70	68.23
16530	Horizontal	Pk	35.90	68.23
18578	Vertical	Pk	36.00	68.23
22199	Horizontal	Pk	40.30	68.23
23899	Vertical	Pk	43.55	68.23
25803	Vertical	Pk	42.29	68.23

Note:
- Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 - 40GHz, Horizontal and Vertical Antenna Orientations, HT4 40 MHz – Antenna 1 at 5590 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11180	Vertical	Pk	39.90	68.23
16770	Vertical	Pk	34.60	68.23
18663	Vertical	Pk	35.46	68.23
21808	Vertical	Pk	40.64	68.23
23644	Vertical	Pk	43.73	68.23
25548	Vertical	Pk	43.85	68.23

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 – 40 GHz, Horizontal and Vertical Antenna Orientations, HT4 40 MHz – Antenna 2 at 5590 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11180	Vertical	Pk	39.20	68.23
16770	Vertical	Pk	33.90	68.23
18510	Vertical	Pk	37.02	68.23
20448	Horizontal	Pk	36.25	68.23
24069	Vertical	Pk	43.37	68.23
26194	Vertical	Pk	39.70	68.23

Note:
- Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 - 40GHz, Horizontal and Vertical Antenna Orientations, HT4 40 MHz – Antenna 1 at 5670 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11340	Vertical	Pk	44.10	68.23
17010	Horizontal	Pk	36.20	68.23
18442	Vertical	Pk	35.55	68.23
21927	Vertical	Pk	41.23	68.23
24001	Horizontal	Pk	43.75	68.23
24511	Vertical	Pk	39.75	68.23

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 – 40 GHz, Horizontal and Vertical Antenna Orientations, HT4 40 MHz – Antenna 2 at 5670 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11340	Vertical	Pk	42.80	68.23
17010	Horizontal	Pk	34.80	68.23
18085	Vertical	Pk	34.74	68.23
20482	Vertical	Pk	36.41	68.23
23372	Vertical	Pk	41.38	68.23
24120	Vertical	Pk	41.31	68.23

Radiated Emission, 1 – 40 GHz, Horizontal and Vertical Antenna Orientations, HT8 40 MHz – Antenna 1+2 at 5510 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11020	Vertical	Pk	42.70	68.23
16530	Horizontal	Pk	35.90	68.23
18578	Vertical	Pk	36.00	68.23
22199	Horizontal	Pk	40.30	68.23
23899	Vertical	Pk	43.55	68.23
25803	Vertical	Pk	42.29	68.23

Note:
- Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 – 40 GHz, Horizontal and Vertical Antenna Orientations, HT4 40 MHz – Antenna 1+2 at 5590 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11180	Vertical	Pk	41.25	68.23
16770	Vertical	Pk	37.25	68.23
18510	Vertical	Pk	37.25	68.23
20448	Horizontal	Pk	42.50	68.23
24069	Vertical	Pk	44.75	68.23
26194	Vertical	Pk	42.50	68.23

Note:
- Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 – 40 GHz, Horizontal and Vertical Antenna Orientations, HT4 40 MHz – Antenna 2 at 5670 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11340	Vertical	Pk	42.80	68.23
17010	Horizontal	Pk	34.80	68.23
18085	Vertical	Pk	34.74	68.23
20482	Vertical	Pk	36.41	68.23
23372	Vertical	Pk	41.38	68.23
24120	Vertical	Pk	41.31	68.23

Note:

- Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 – 40 GHz, Horizontal and Vertical Antenna Orientations, VHT6 80 MHz – Antenna 1 at 5530 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11220	Vertical	Pk	40.75	68.23
16830	Horizontal	Pk	37.50	68.23
18646	Vertical	Pk	33.50	68.23
22131	Vertical	Pk	37.95	68.23
23355	Vertical	Pk	40.00	68.23
24103	Vertical	Pk	42.50	68.23

Note:
- Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 – 40 GHz, Horizontal and Vertical Antenna Orientations, VHT6 80 MHz – Antenna 1 at 5610 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11220	Vertical	Pk	41.50	68.23
16830	Horizontal	Pk	39.25	68.23
18646	Vertical	Pk	35.50	68.23
22131	Vertical	Pk	39.75	68.23
23355	Vertical	Pk	41.25	68.23
24103	Vertical	Pk	42.50	68.23

Note:
- Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 – 40 GHz, Horizontal and Vertical Antenna Orientations, VHT6 80 MHz – Antenna 2 at 5530 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11220	Vertical	Pk	42.25	68.23
16830	Horizontal	Pk	37.50	68.23
18646	Vertical	Pk	35.00	68.23
22131	Vertical	Pk	40.00	68.23
23355	Vertical	Pk	40.50	68.23
24103	Vertical	Pk	42.50	68.23

Note:
- Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 – 40 GHz, Horizontal and Vertical Antenna Orientations, VHT6 80 MHz – Antenna 2 at 5610 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11220	Vertical	Pk	42.75	68.23
16830	Horizontal	Pk	39.00	68.23
18646	Vertical	Pk	37.25	68.23
22131	Vertical	Pk	41.25	68.23
23355	Vertical	Pk	42.50	68.23
24103	Vertical	Pk	42.50	68.23

Note:
- Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 – 40 GHz, Horizontal and Vertical Antenna Orientations, VHT6 80 MHz – Antenna 1+2 at 5530 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11220	Vertical	Pk	40.50	68.23
16830	Horizontal	Pk	37.75	68.23
18646	Vertical	Pk	35.25	68.23
22131	Vertical	Pk	40.00	68.23
23355	Vertical	Pk	40.25	68.23
24103	Vertical	Pk	42.50	68.23

Note:
- Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 – 40 GHz, Horizontal and Vertical Antenna Orientations, VHT6 80 MHz – Antenna 1+2 at 5610 MHz.

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]
11220	Vertical	Pk	42.10	68.23
16830	Horizontal	Pk	39.60	68.23
18646	Vertical	Pk	35.84	68.23
22131	Vertical	Pk	40.84	68.23
23355	Vertical	Pk	40.89	68.23
24103	Vertical	Pk	44.62	68.23

Note:
- Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
- Peak detector used with a bandwidth of 1 MHz.

7.2.5 Radiated Spurious Emissions of Transmitter in restricted bands

RESULT: PASS

Date of testing: 2013-01-28 to 2013-03-25

Frequency range: 5.35-5.46 GHz

Requirements:

FCC 15.205, FCC 15.209 and FCC 15.247(d) and RSS-Gen

Radiated emissions which fall in the restricted bands, as defined in FCC 15.205(a), must comply with the radiated emission limits specified in FCC 15.209(a).

Test procedure:

ANSI C63.10-2009
KDB Publication No.789033 D01 v01r02 9/26/2012 .
KDB Publication No. 644545 D01 and D02.

The EUT was placed on a nonconductive turntable 0.8m above the ground plane. Before final measurements of radiated emissions were performed, the EUT was scanned to determine its emission spectrum profile. The physical arrangement of the test system, the associated cabling and the EUT orientation (X, Y, Z) were varied in order to ensure that maximum emission amplitudes were attained.

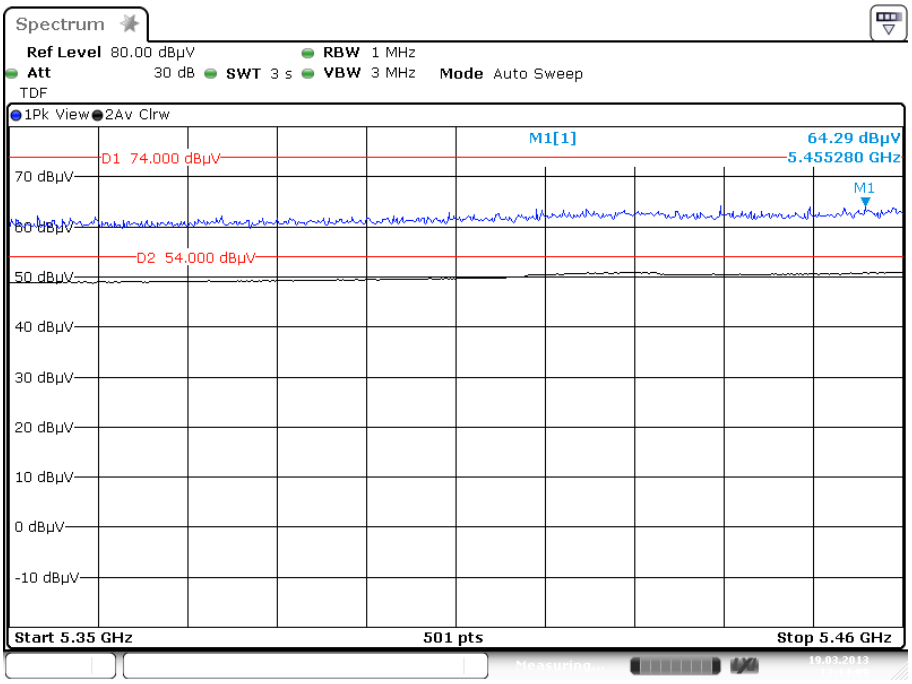
The spectrum was examined from 5.35 to 5.46 GHz. Final radiated emission measurements were made at 3m distance.

At each frequency where a spurious emission was found, the EUT was rotated 360° and the antenna was raised and lowered from 1 to 4m in order to determine the emission's maximum level. Measurements were taken using both horizontal and vertical antenna polarizations.

The highest emission amplitudes relative to the appropriate limit were recorded in this report. Field strength values of radiated emissions at frequencies not listed in the tables are more than 20 dB below the applicable limit.

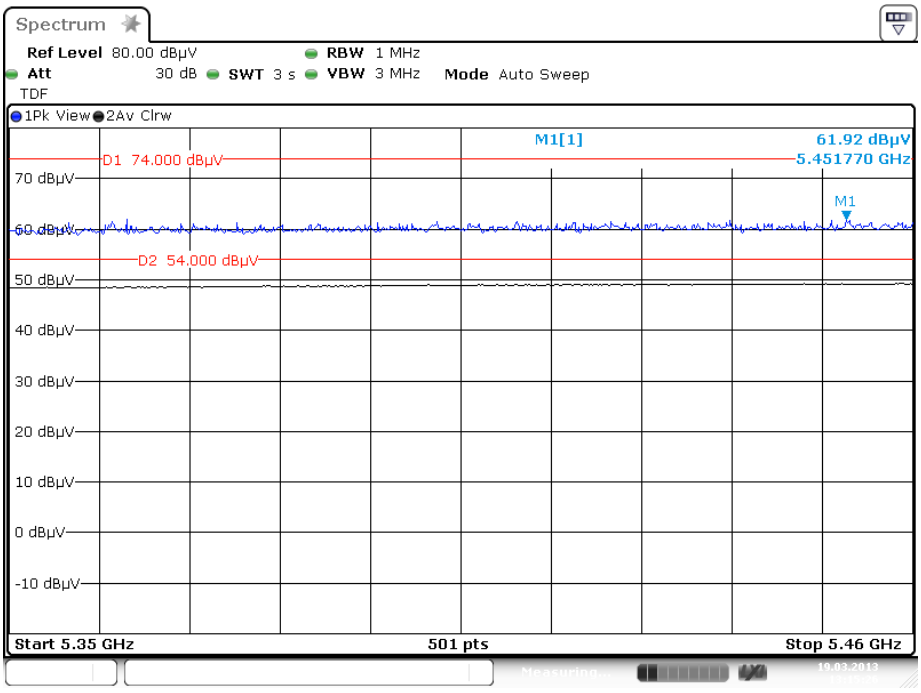
Correction factors are incorporated in the spectrum analyzers as an automated function.
Refer to section 4.2 for the power settings and modes.
Correction factors includes: antenna factor, cable loss and pre-amplifier gain.

The plots on the following pages show the limit line D1 (74 dBµV/m for Peak and 54 dBµV/m for Average values). The worst case from Antenna1, Antenna2 and Antenna1+Antenna2 is shown.



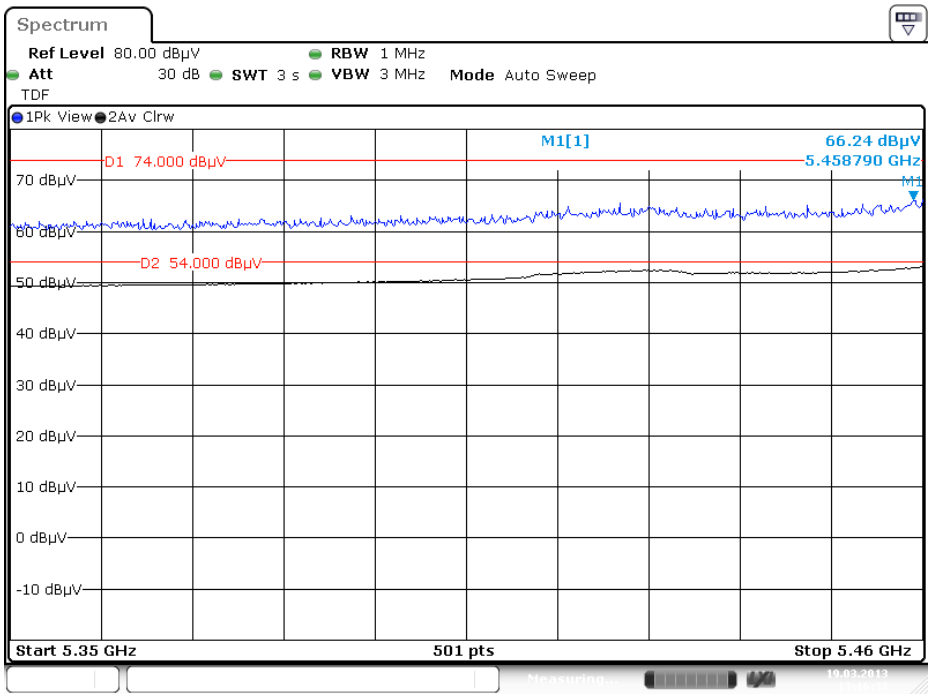
Date: 19.MAR.2013 13:14:09

Emissions in restricted band 5.35-5.46 GHz, 6Mb OFDM, Antenna 1, 5500 MHz



Date: 19.MAR.2013 13:15:26

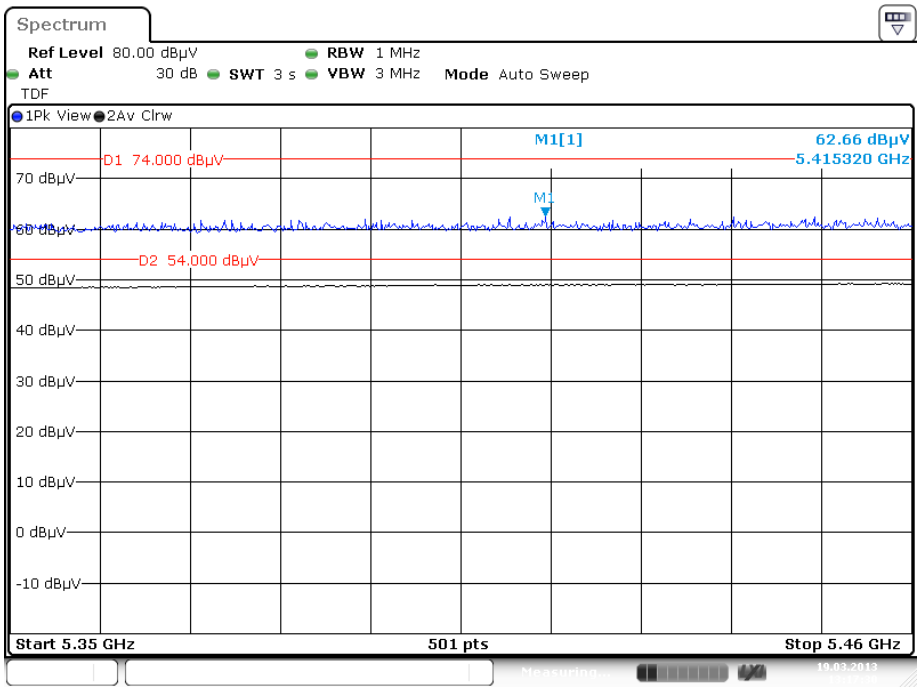
Emissions in restricted band 5.35-5.46 GHz, 6Mb OFDM, Antenna 2, 5500 MHz



Date: 19.MAR.2013 13:16:34

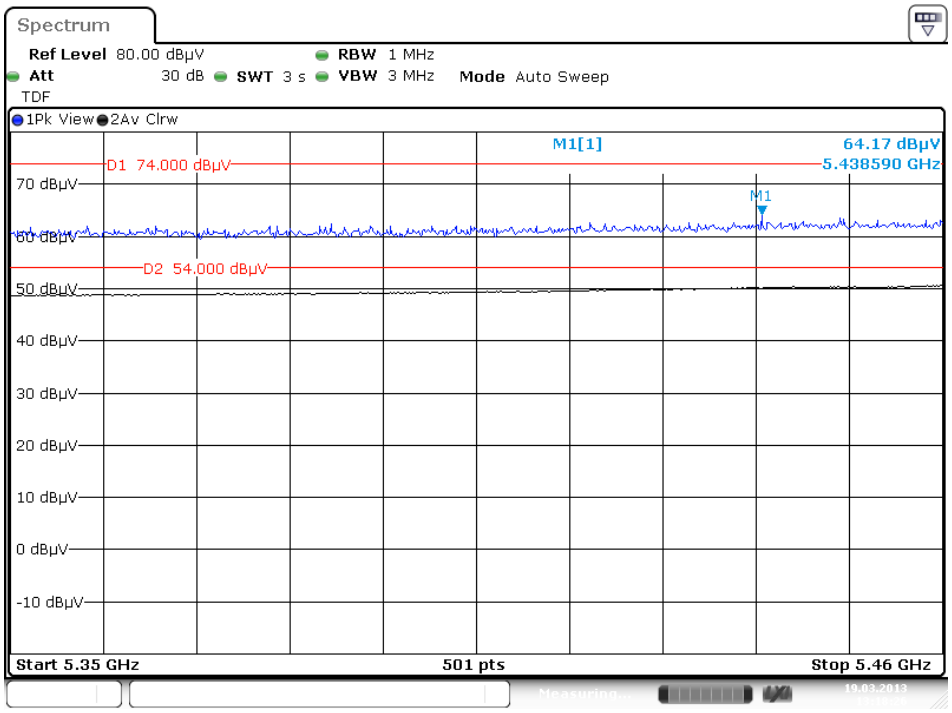
Emissions in restricted band 5.35-5.46 GHz, Peak value, HT4 20 MHz, 5500 MHz

Valid for Antenna 1 and Antenna 2



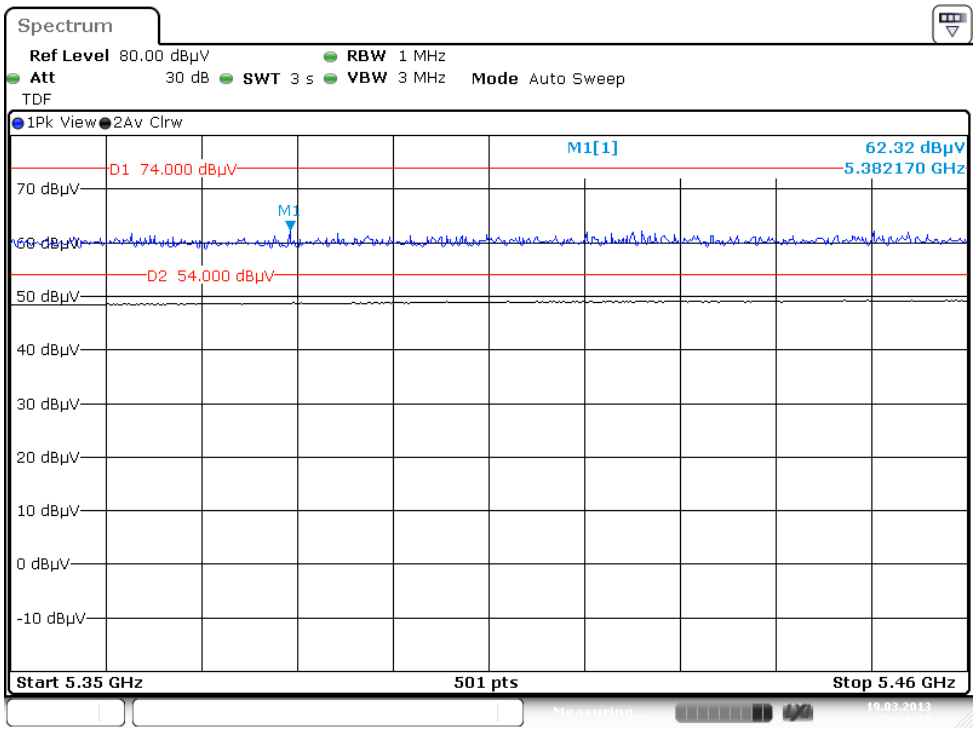
Date: 19.MAR.2013 13:17:30

Emissions in restricted band 5.35-5.46 GHz, Average value, HT8 20 MHz, Antenna 1+2, 5500 MHz



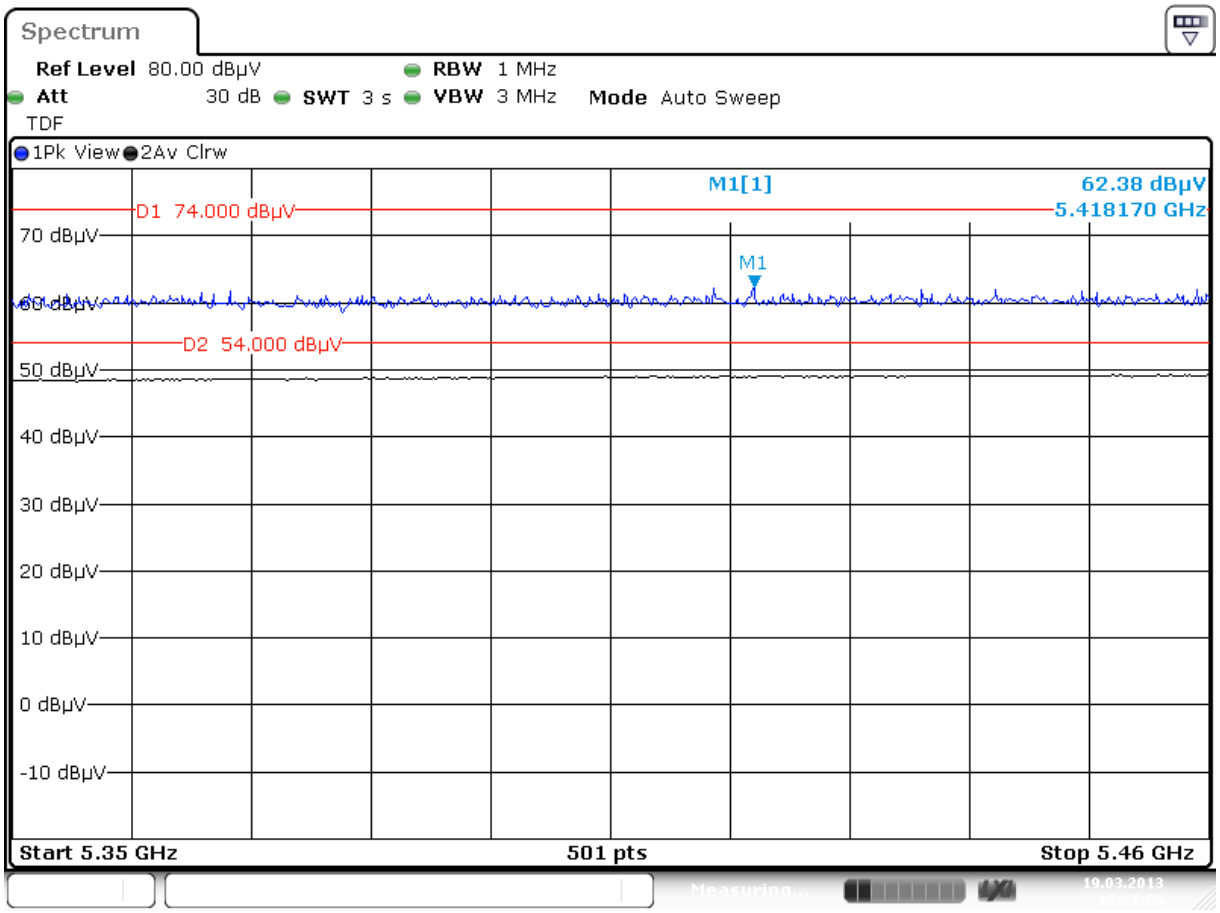
Date: 19.MAR.2013 13:18:27

Emissions in restricted band 5.35-5.46 GHz, Peak value, HT4 40 MHz, 5510 MHz
Valid for Antenna 1 and Antenna 2



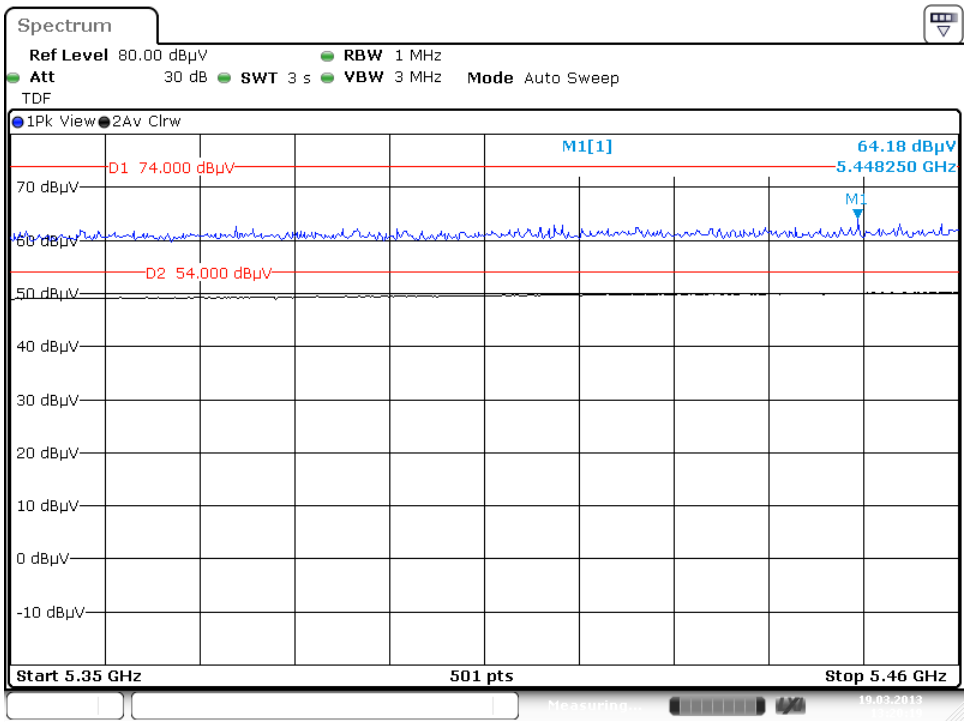
Date: 19.MAR.2013 13:19:09

Emissions in restricted band 5.35-5.46 GHz, Peak value, HT8 40 MHz, Antenna 1+2 ,5510 MHz



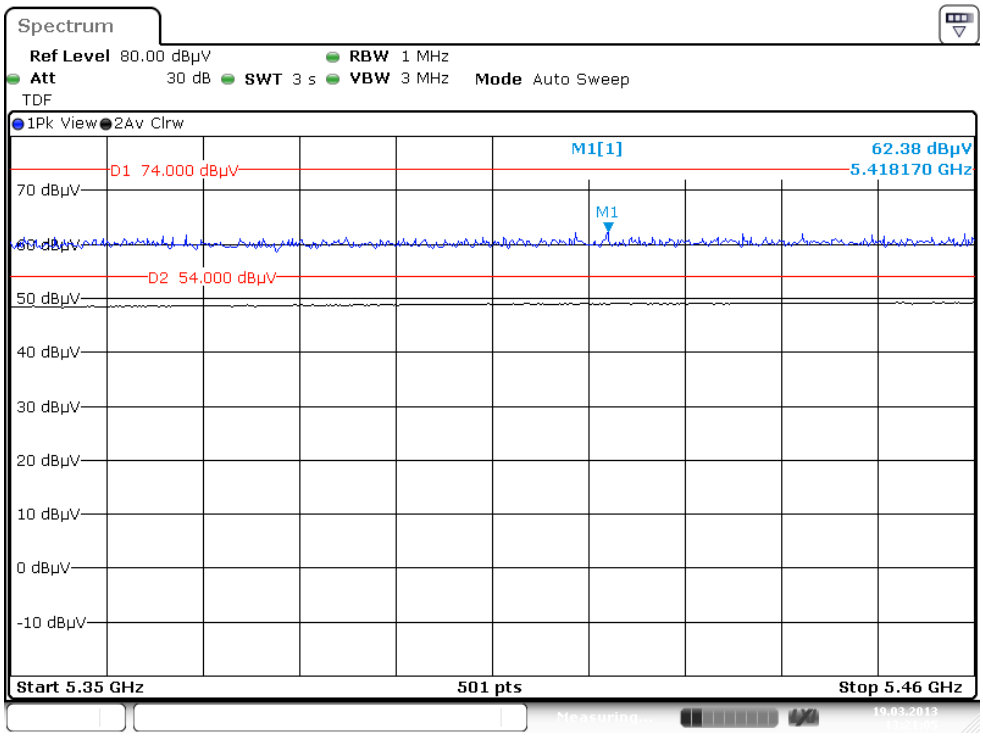
Date: 19.MAR.2013 13:21:05

Emissions in restricted band 5.35-5.46 GHz, Peak value, VHT6 80 MHz, 5530 MHz
Valid for Antenna1, Antenna2 and Antenna 1+2.



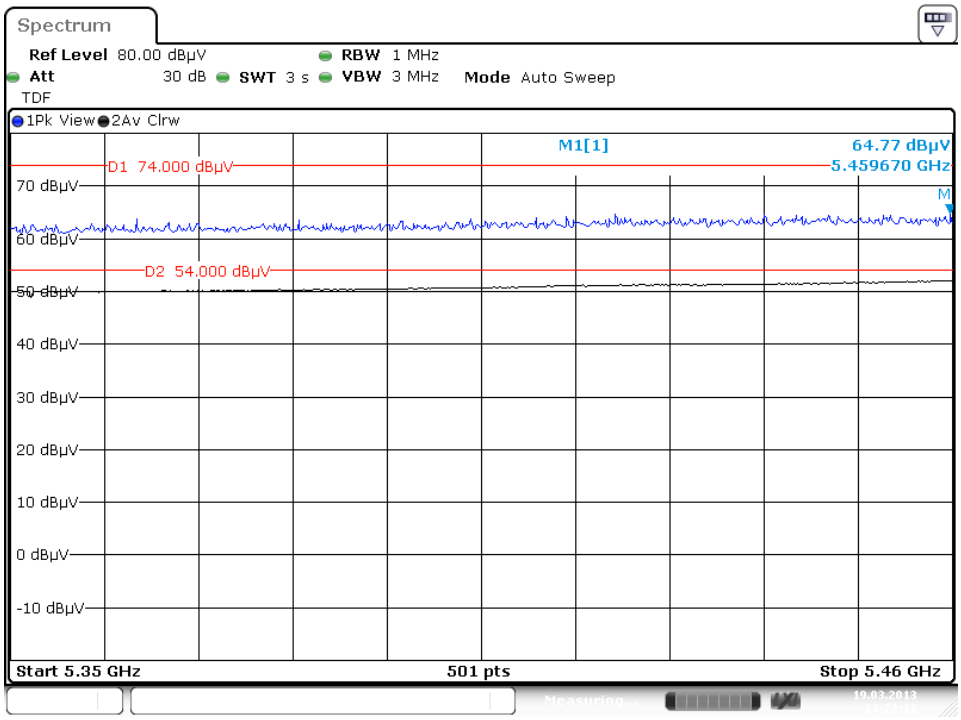
Date: 19.MAR.2013 13:20:19

Emissions in restricted band 5.35-5.46 GHz, 6Mb OFDM, Antenna 1 , 5580 MHz



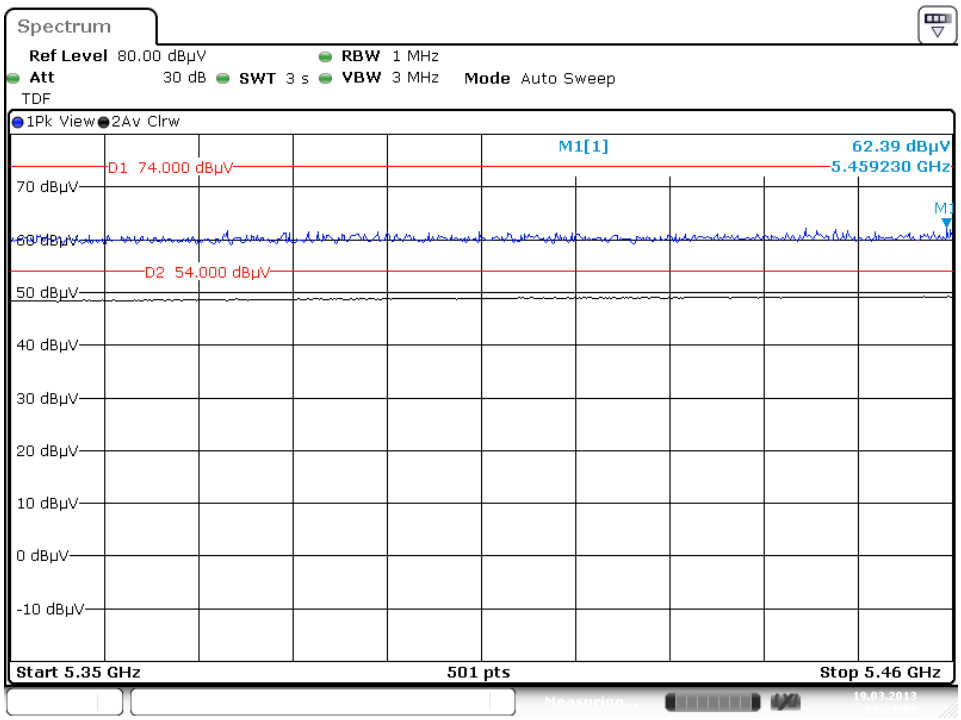
Date: 19.MAR.2013 13:21:05

Emissions in restricted band 5.35-5.46 GHz, 6Mb OFDM, Antenna 2, 5580 MHz



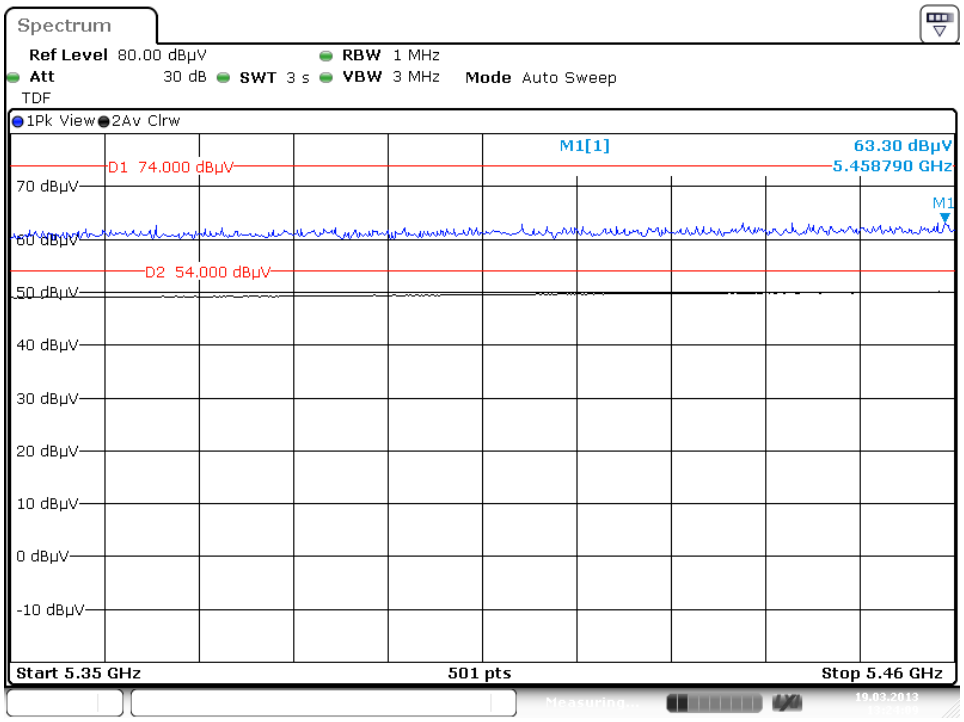
Date: 19.MAR.2013 13:22:11

Emissions in restricted band 5.35-5.46 GHz, Peak value, HT4 20 MHz, 5580 MHz
Valid for Antenna1 and Antenna2



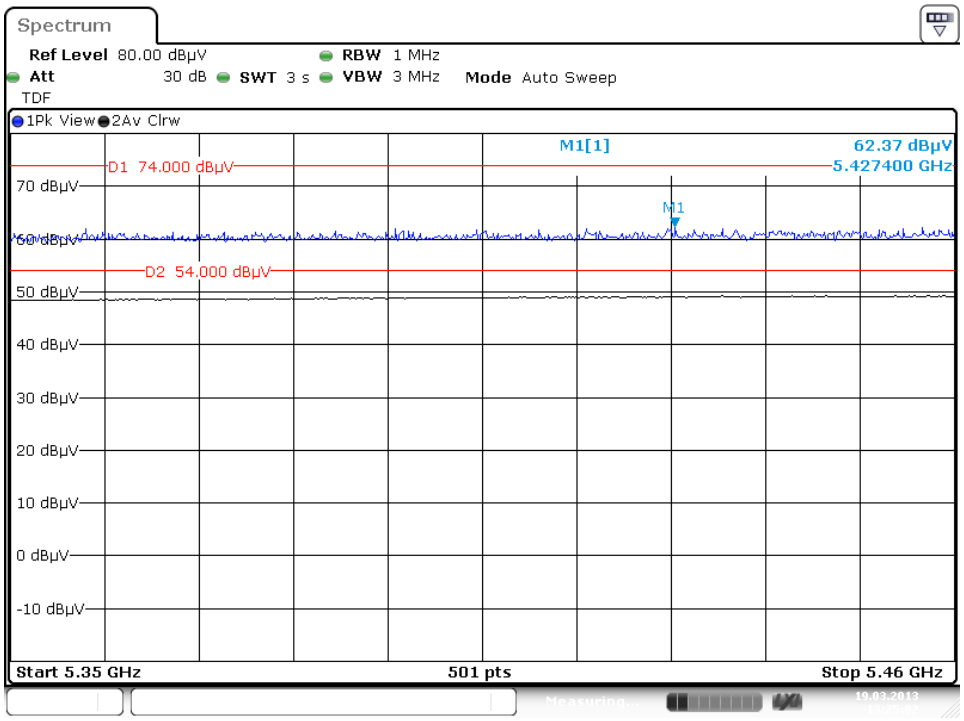
Date: 19.MAR.2013 13:23:09

Emissions in restricted band 5.35-5.46 GHz, Peak value, HT8 20 MHz, Antenna 1+2, 5580 MHz



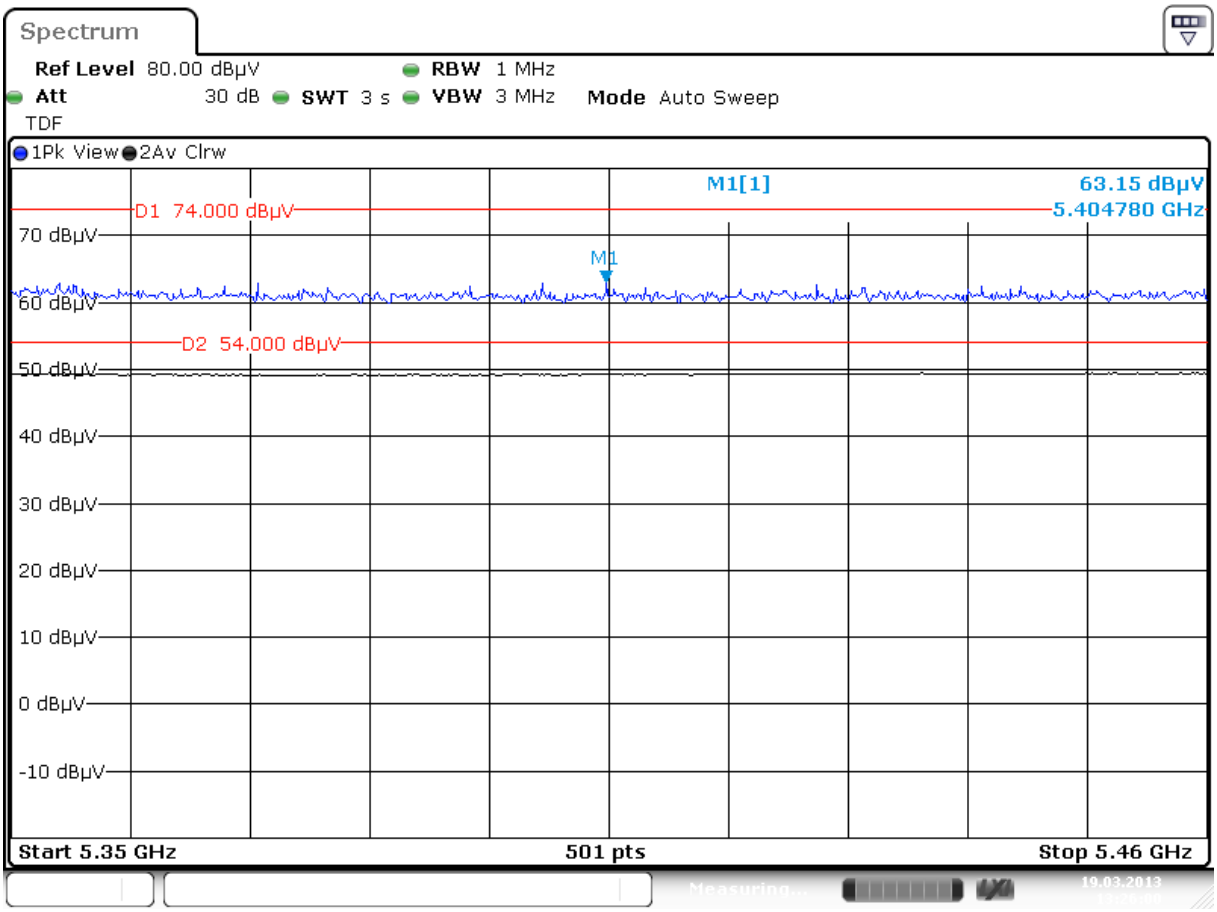
Date: 19.MAR.2013 13:24:09

Emissions in restricted band 5.35-5.46 GHz, Peak value, HT4 40 MHz, 5590 MHz
Valid for Antenna1 and Antenna2



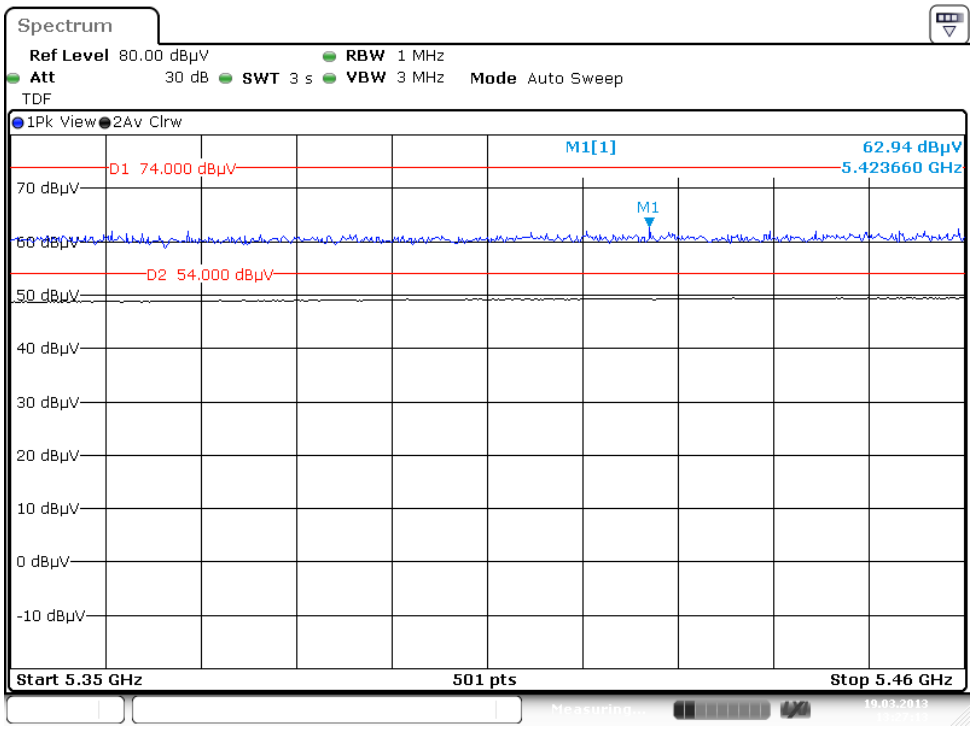
Date: 19.MAR.2013 13:25:02

Emissions in restricted band 5.35-5.46 GHz, Peak value, HT8 40 MHz, Antenna 1+2, 5590 MHz



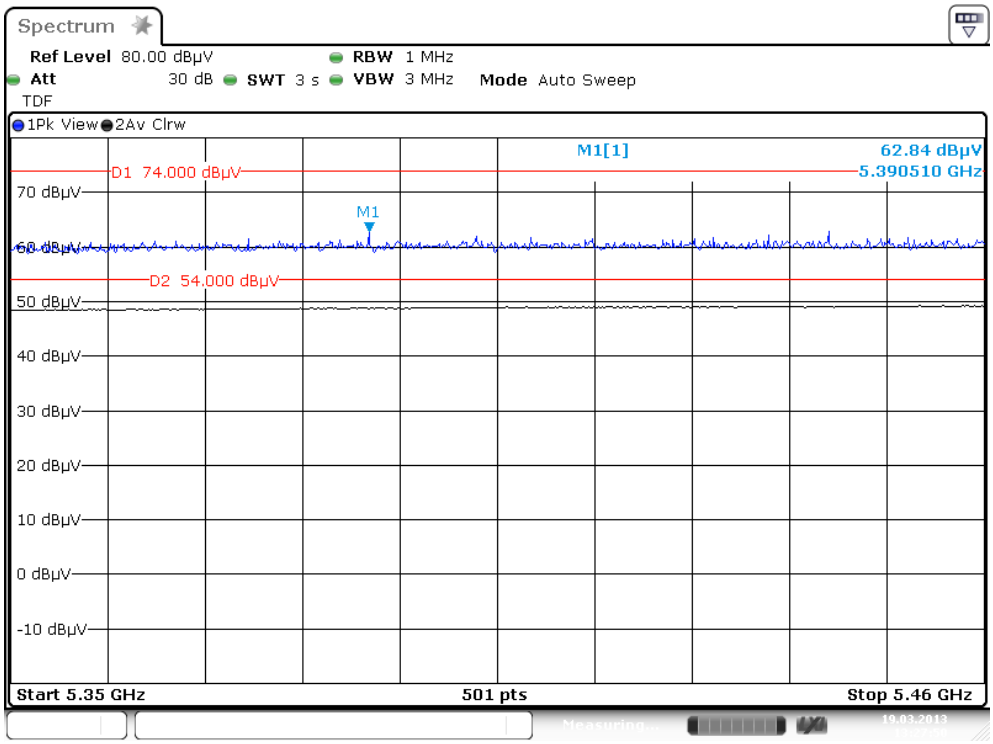
Date: 19.MAR.2013 13:26:00

Emissions in restricted band 5.35-5.46 GHz, VHT6 80 MHz, 5610 MHz
Valid for Antenna1 and Antenna2 and Antenna1+Antenna2



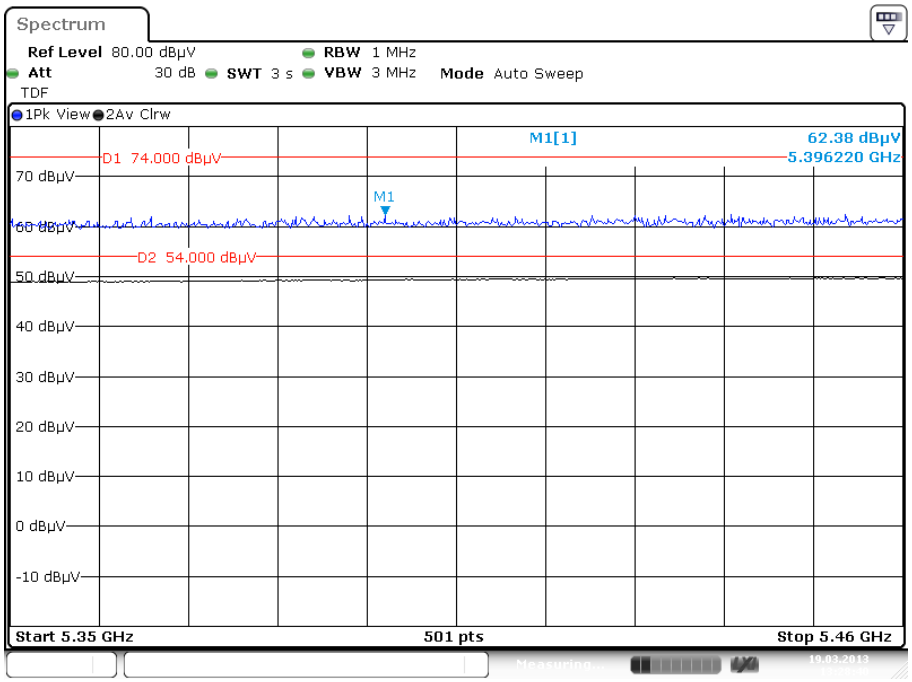
Date: 19.MAR.2013 13:27:13

Emissions in restricted band 5.35-5.46 GHz, 6Mb OFDM, Antenna 1, 5700 MHz



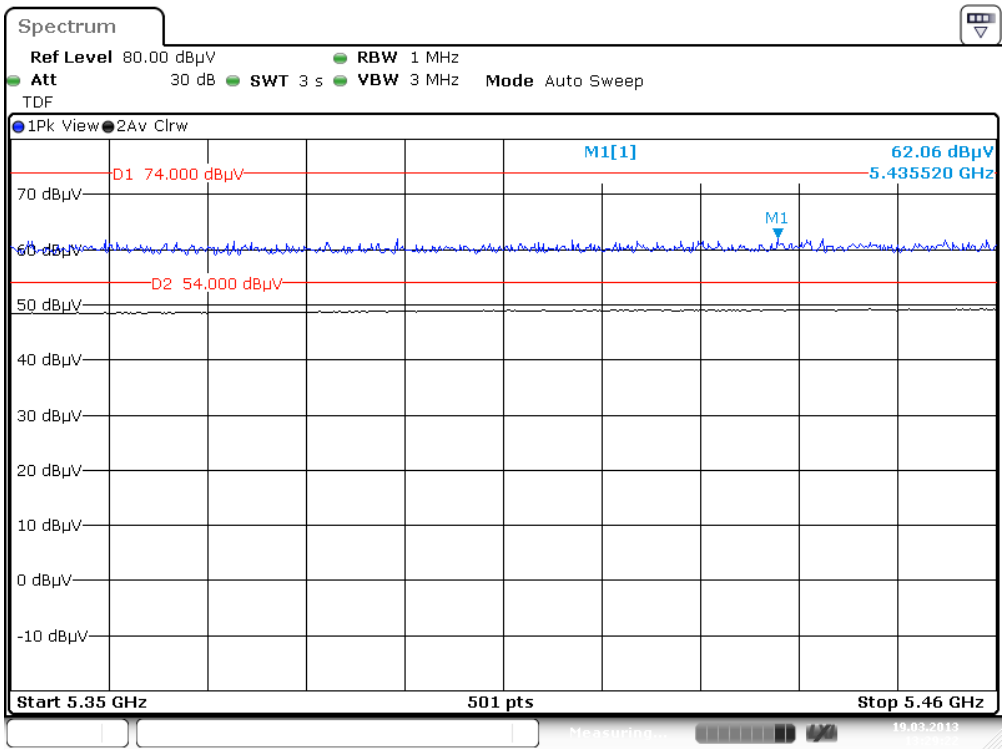
Date: 19.MAR.2013 13:27:50

Emissions in restricted band 5.35-5.46 GHz, 6Mb OFDM, Antenna 2, 5700 MHz



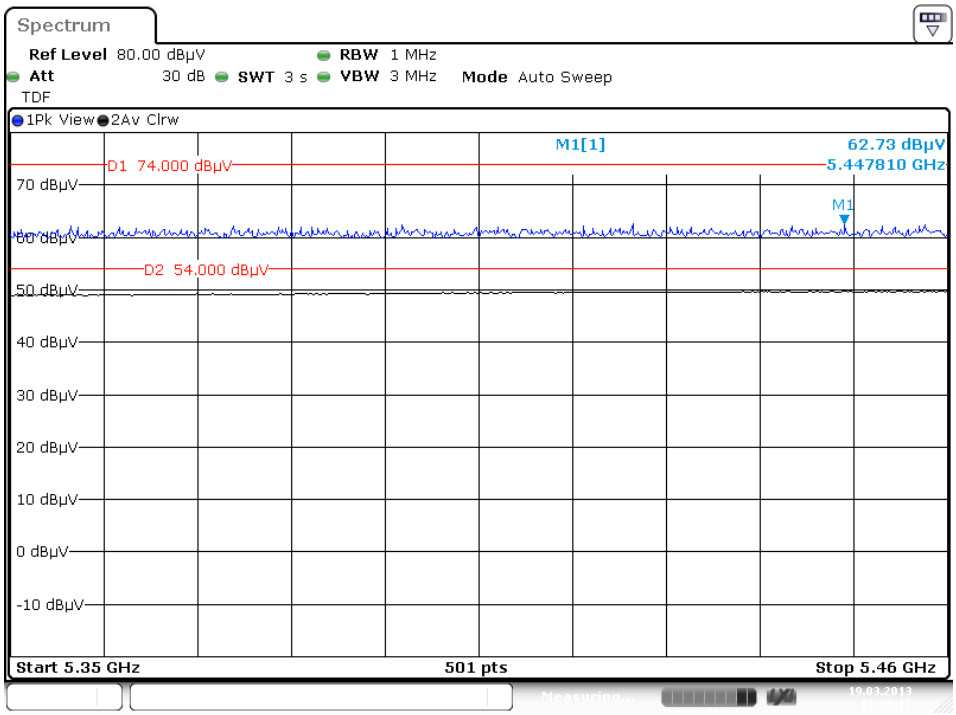
Date: 19.MAR.2013 13:28:40

Emissions in restricted band 5.35-5.46 GHz, Peak value, HT4 20 MHz, 5700 MHz
Valid for Antenna1 and Antenna2



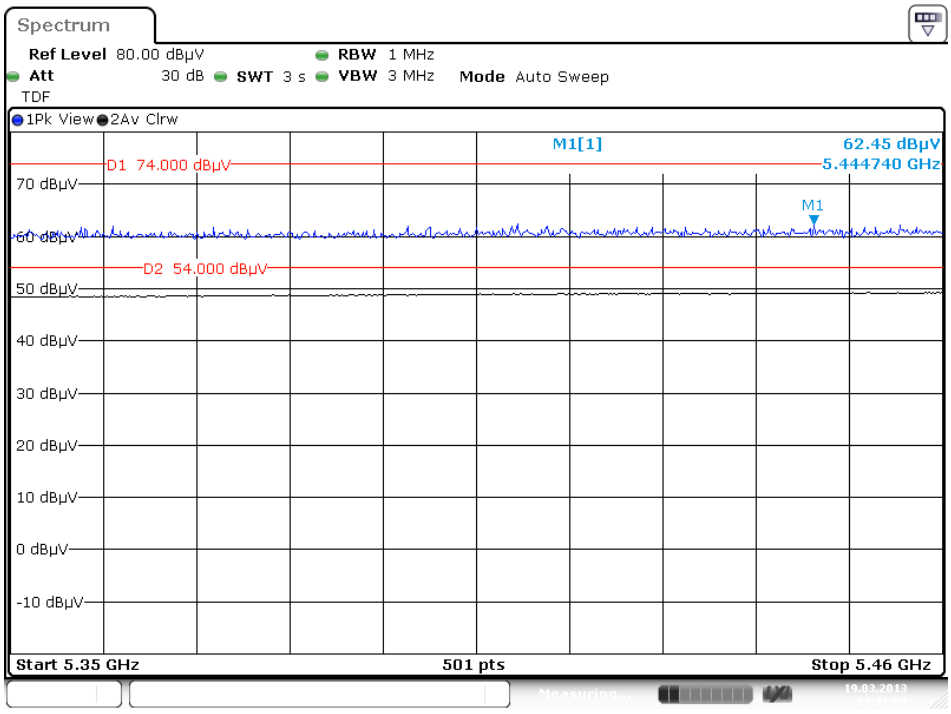
Date: 19.MAR.2013 13:29:23

Emissions in restricted band 5.35-5.46 GHz, Peak value, HT8 20 MHz, Antenna 1+2, 5700 MHz



Date: 19.MAR.2013 13:30:17

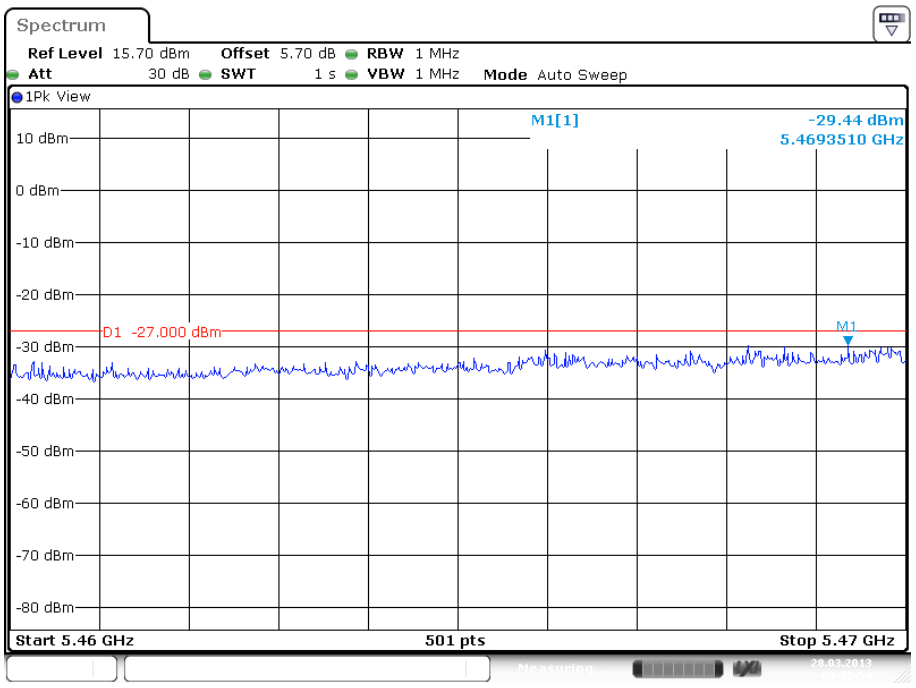
Emissions in restricted band 5.35-5.46 GHz, Peak value, HT4 40 MHz, 5670 MHz
Valid for Antenna 1 and Antenna 2



Date: 19.MAR.2013 13:31:09

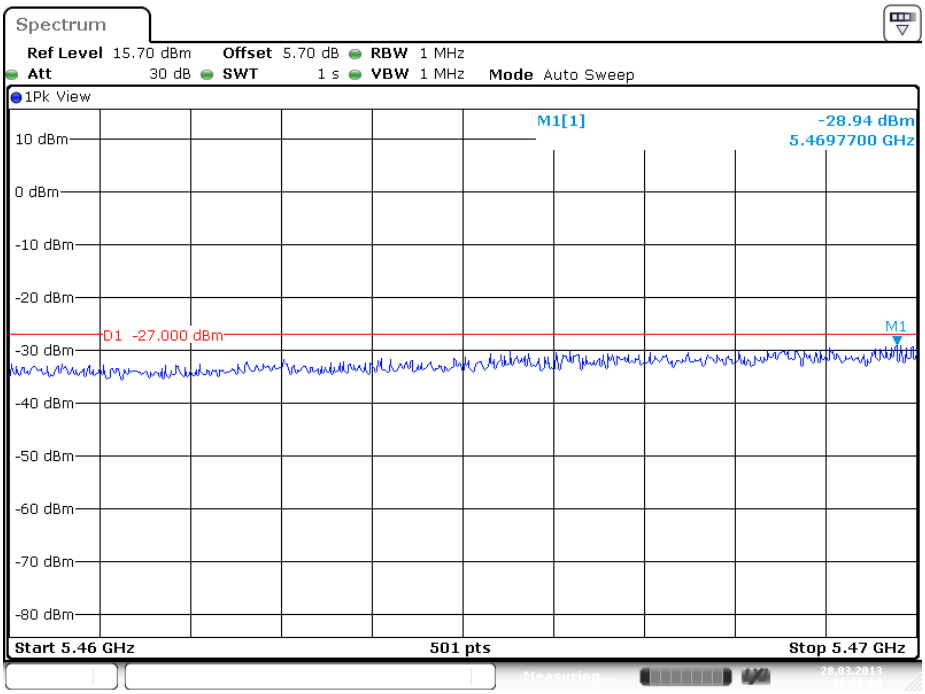
Emissions in restricted band 5.35-5.46 GHz, Peak value, HT8 40 MHz, Antenna 1+2, 5670 MHz

Emissions in the band 5.46-5.47 GHz



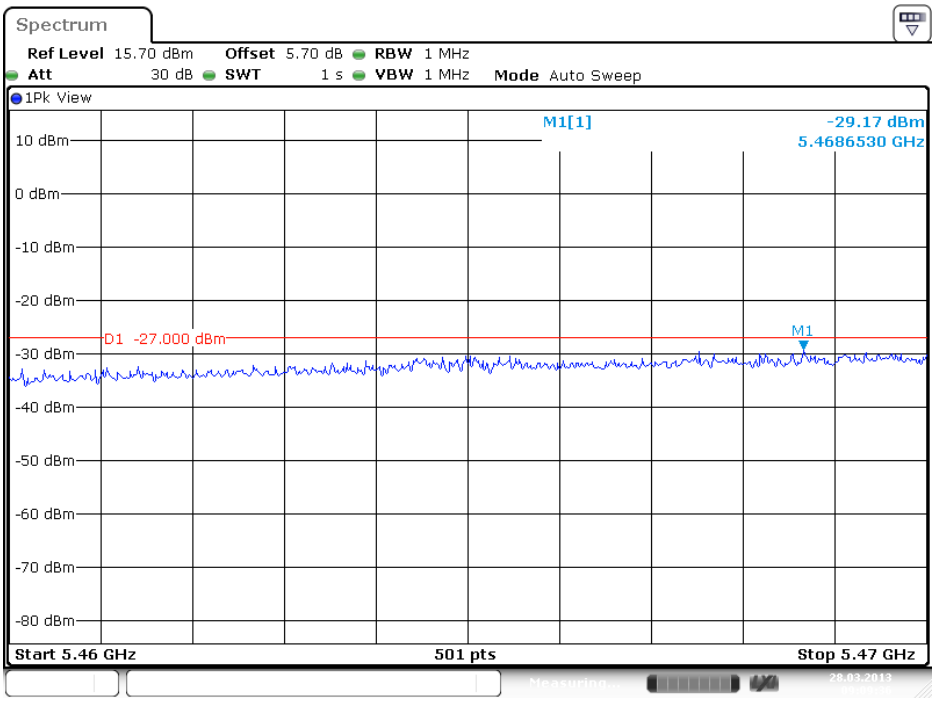
Date: 28.MAR.2013 09:05:54

Emissions in the band 5.46 -5.47 GHz, Peak value, 6 Mb OFDM, Antenna 1, 5500 MHz



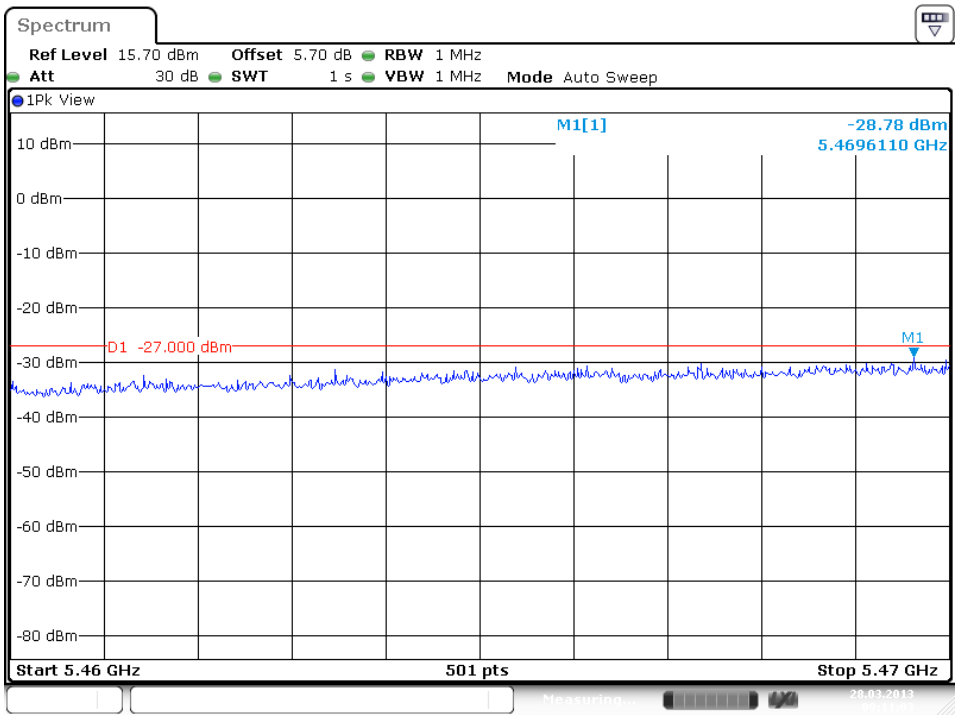
Date: 28.MAR.2013 09:07:05

Emissions in the band 5.46 -5.47 GHz, Peak value, 6 Mb OFDM, Antenna 2, 5500 MHz



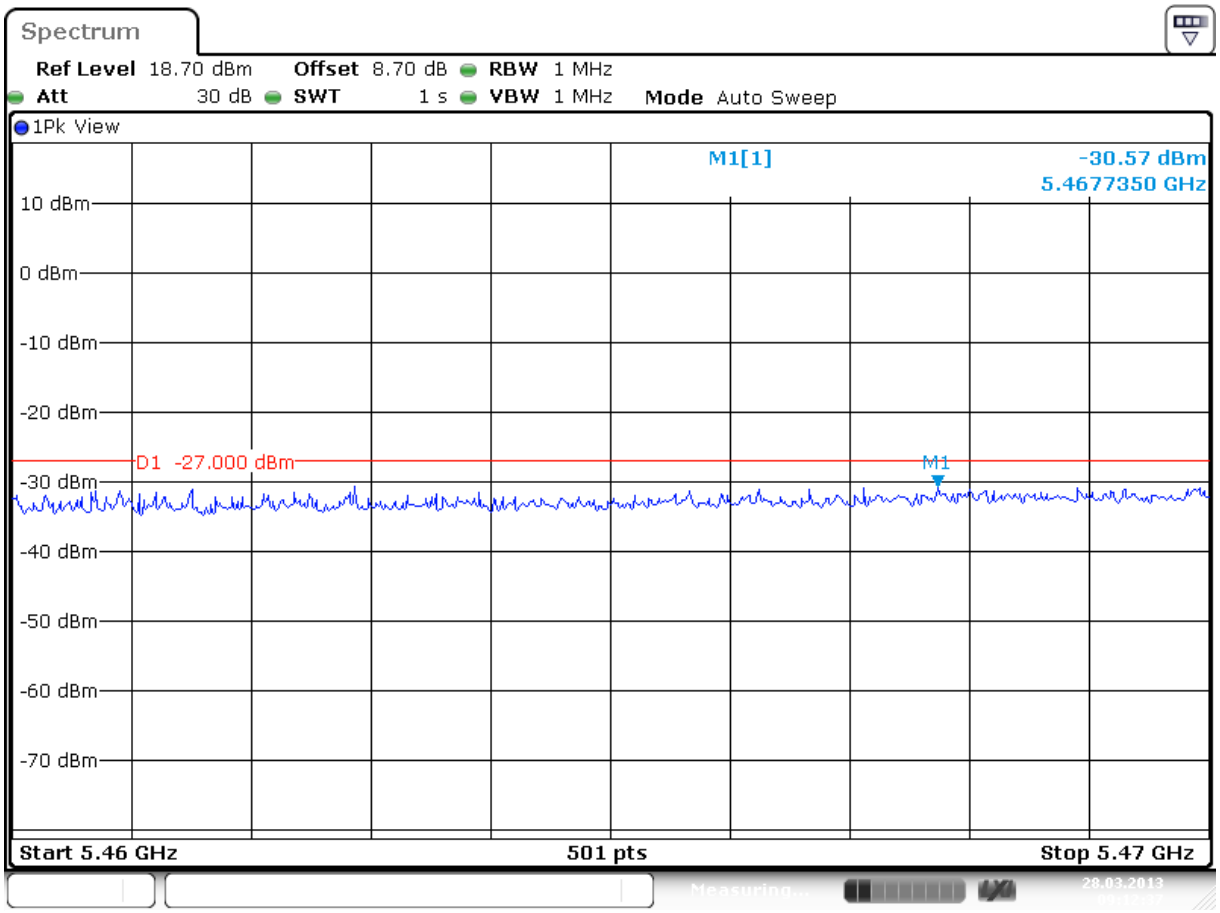
Date: 28.MAR.2013 09:09:36

Emissions in the band 5.46 -5.47 GHz, Peak value, HT4 20 MHz, Antenna 1, 5500 MHz



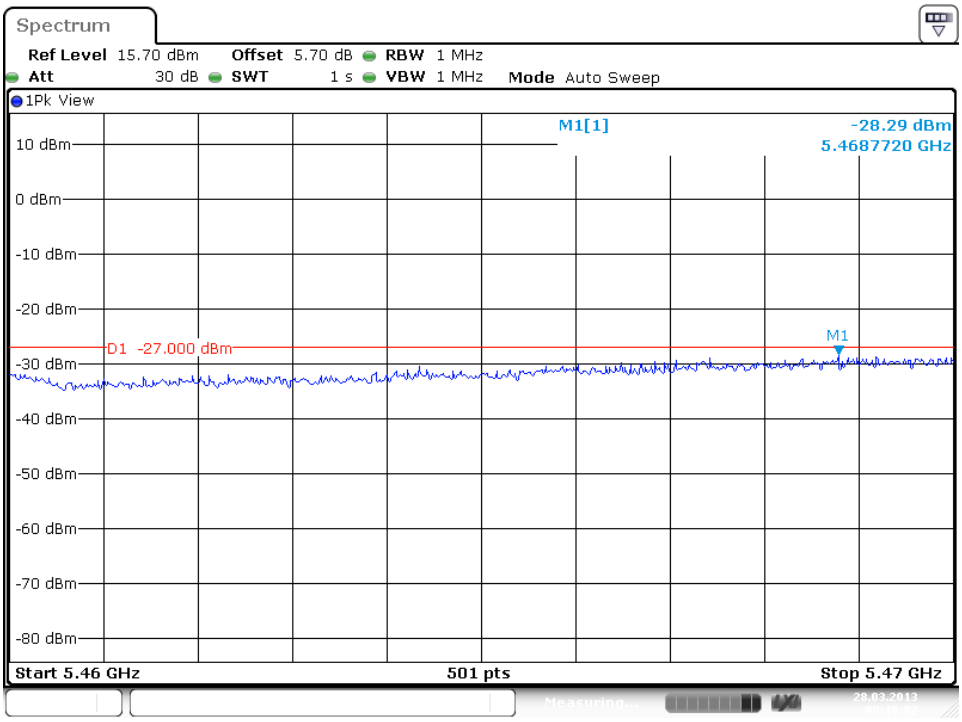
Date: 28.MAR.2013 09:11:03

Emissions in the band 5.46 -5.47 GHz, Peak value, HT4 20 MHz, Antenna 1, 5500 MHz



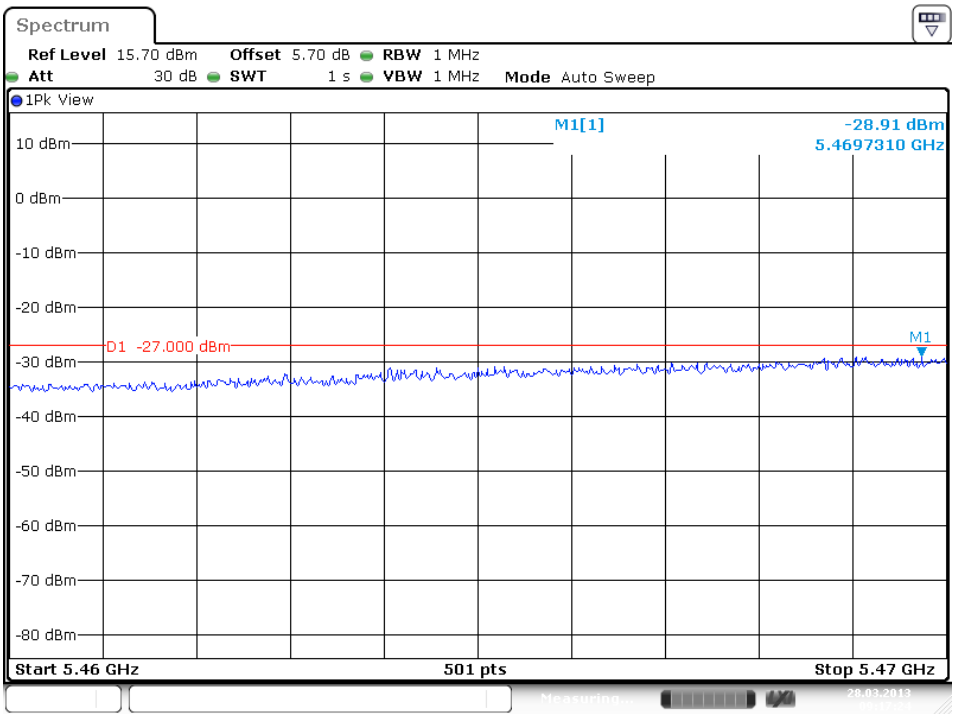
Date: 28.MAR.2013 09:12:37

Emissions in the band 5.46 -5.47 GHz, Peak value, HT8 20 MHz, Antenna 1+2, 5500 MHz



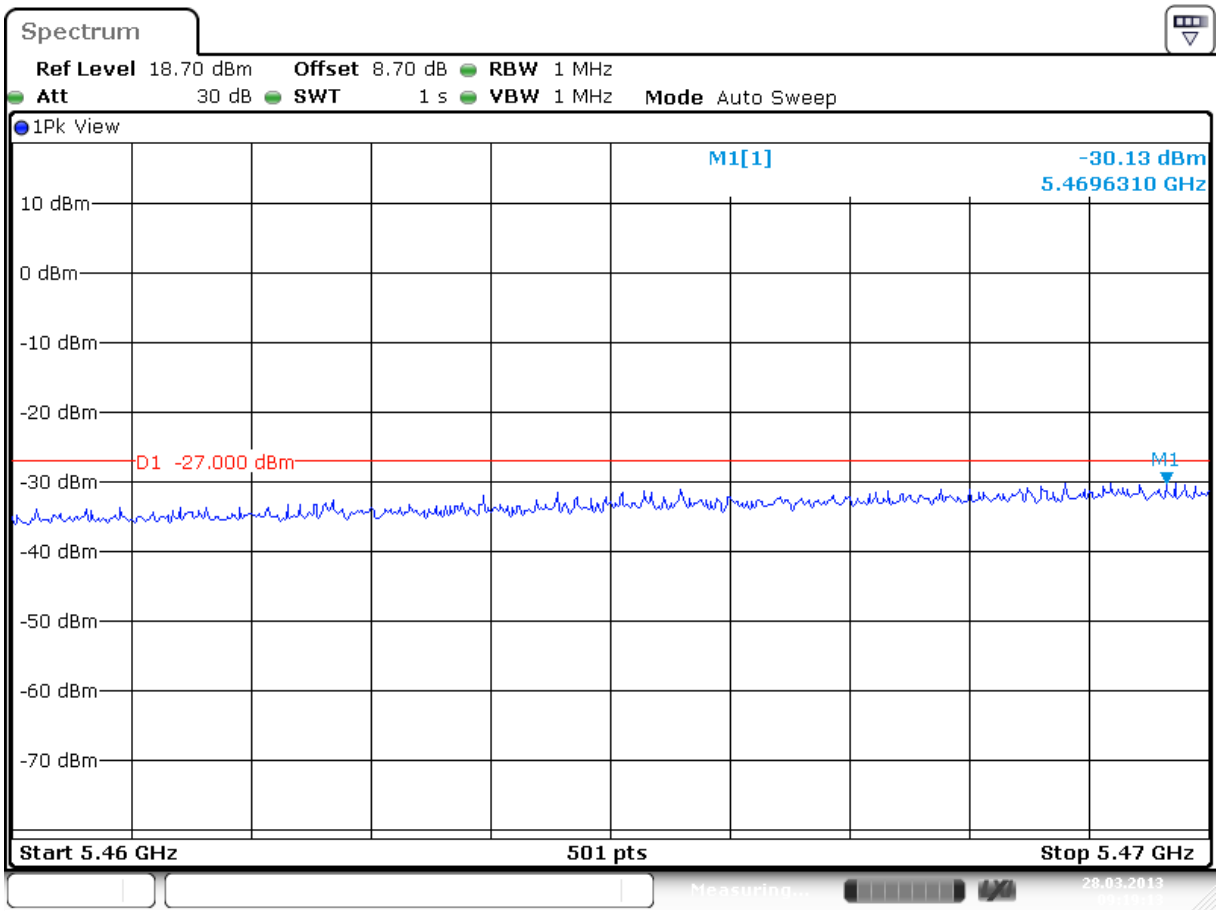
Date: 28.MAR.2013 09:16:02

Emissions in the band 5.46 -5.47 GHz, Peak value, HT4 40 MHz, Antenna 1, 5510 MHz



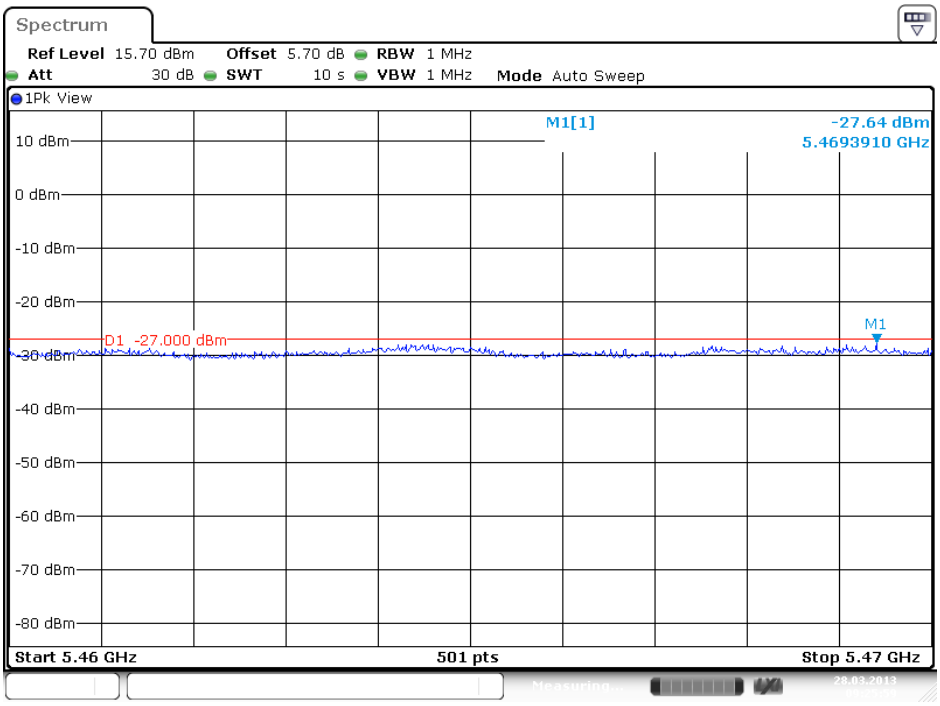
Date: 28.MAR.2013 09:17:24

Emissions in the band 5.46 -5.47 GHz, Peak value, HT4 40 MHz, Antenna 2, 5510 MHz



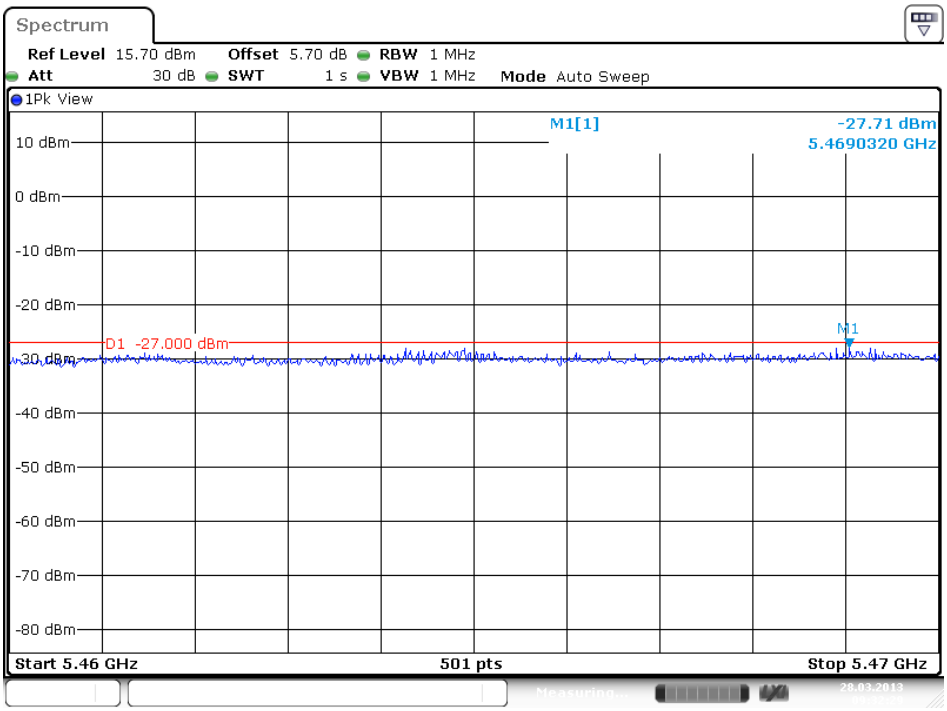
Date: 28.MAR.2013 09:19:13

Emissions in the band 5.46 -5.47 GHz, Peak value, HT8 40 MHz, Antenna 1+2, 5510 MHz



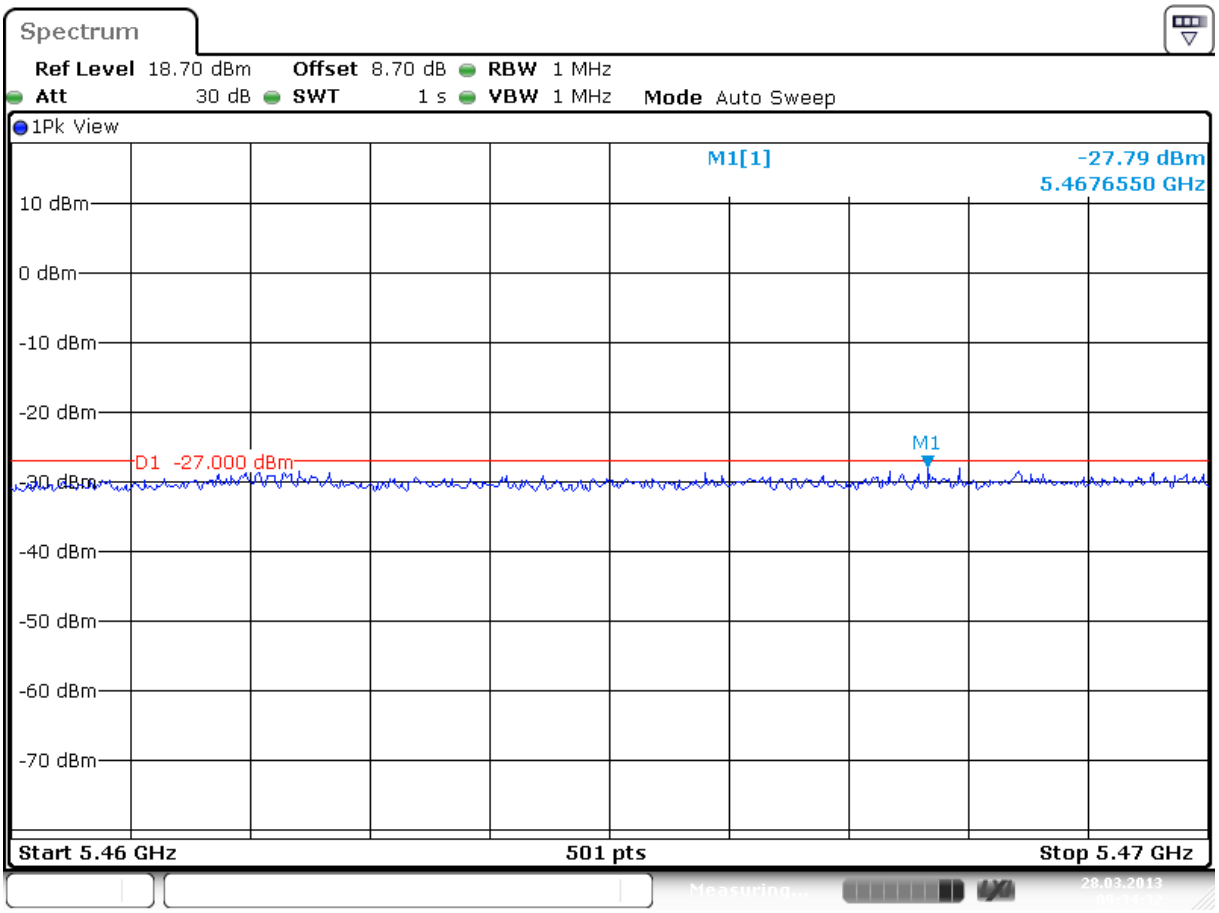
Date: 28.MAR.2013 09:25:59

Emissions in the band 5.46-5.47 GHz, Peak value, VHT6 80 MHz, Antenna 1, 5530 MHz



Date: 28.MAR.2013 09:32:30

Emissions in the band 5.46-5.47 GHz, Peak value, VHT6 80 MHz, Antenna 2, 5530 MHz



Date: 28.MAR.2013 09:34:33

Emissions in the band 5.46-5.47 GHz, Peak value, VHT6 80 MHz, Antenna 1+2, 5530 MHz

7.2.6 Frequency Stability

RESULT: PASS

Date of testing: 2013-01-11 / 2013-01-15

Requirements:

FCC 15.407(6)(g)

Test procedure:

The EUT was placed inside the climat chamber and a range of temperature and supply voltages according to table on the next page was set. The climat chamber was stabilized for at least 30 minutes for every temperature required. The supply voltage was then adjusted on the EUT from 85% to 115%. The spectrum analyzer and Power supply regulator were placed outside of the climat chamber. The EUT's antenna port 1 was connected to the spectrum analyzer.

Test results Frequency stability

Operation temperature range according to the EUT"s User Guide is 0° - 80°C.

Tested in operation mode: 6Mb OFDM, Antenna 1, 5600 MHz

Temperature (°C)	Power supply (Vac)	Frequency (MHz)	Deviation from reference (ppm)
21	120	5599.977	-4.1
0	102	5600.020	3.6
0	138	5600.020	3.6
80	102	5599.995	-0.89
80	138	5599.995	-0.89

Measurement uncertainty: ±257 Hz

The reference frequency is the channel frequency of 5600.000 MHz

End of report