

Test Report

INTENTIONAL RADIATOR TESTS ACCORDING TO FCC PART 15 C and INDUSTRY CANADA REQUIREMENTS

Equipment Under Test: Transmitter Collar

Model: T60

Type: -

Manufacturer: Tracker Oy
Kauppiaantie 30
FI-90460 OULUNSALO
FINLAND


Customer: Tracker Oy
Kauppiaantie 30
FI-90460 OULUNSALO
FINLAND

FCC Rule Part: 15.247: 2008
FCC Public Notice DA 00-705
IC Rule Part RSS-210, Issue 7, 2007



Date: 30.04.2010

Issued by:


Niko Tolonen
RF Testing Engineer

Date: 30.04.2010

Checked by:


Jari Merikari
Technical Manager

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Equipment Under Test (EUT)

Transmitter Collar
Brand: Tracker Stealth
Model: T60
Type: -
Serial no: -
HW version: V1
SW version: Feb 19 2010
FCC ID number: YBW-T60
Industry Canada number: 8932A-T60

Description of the EUT

The EUT is a radio transmitter collar for hunting dogs to transmit a location signal for the hunter.

Classification of the device

Fixed device	<input type="checkbox"/>
Mobile Device (Human body distance > 20cm)	<input checked="" type="checkbox"/>
Portable Device (Human body distance < 20cm)	<input type="checkbox"/>

Modifications Incorporated in the EUT

No modifications were applied to the EUT during testing

Ratings and declarations

Operating Frequency Range (OFR): 902 – 916 MHz
Channels: 560
Channel separation: 25 kHz
Channel bandwidth: 16.43 kHz
Effective conducted power: 29.24 dBm
Transmission technique: Frequency Hopping
Modulation: 2FSK
Antenna type and gain: Coaxial Sleeve Antenna, Fixed, 1dBi

Power Supply

Rated voltage: 2 x 3 VDC batteries (CR123)

Mechanical Size of the EUT

Length: 49 mm Width: 76 mm Height: 48 mm
Dimensions without antenna and collar.

Length: 202 mm Width: 175 mm Height: 48 mm
Dimensions with antenna and collar.

Peripherals**Peripheral**

No peripherals were used
during the tests.

Samples

Sample No. 1: EUT uses its own external antenna.

Sample No. 2: External antenna was removed and measurement cable was connected to the EUT by using temporary antenna connector.

Disclaimer

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SUMMARY OF TESTING

Test Specification	Description of Test	Result
15.247(e) / RSS-210 A8.1	Hopping Channel Carrier Frequency Separation	PASS
§15.247(e) / RSS-210 A8.1	Number of Hopping Frequencies	PASS
§15.247(a) (1) (i) / RSS-210 A8.1	Average Time of Occupancy of Hopping Frequency	PASS
§15.247(b)(3) / RSS-210 A8.4	Maximum Peak Conducted Output Power	PASS
§15.247(a)(2) / RSS-210 A8.1	20 dB Bandwidth	PASS
§15.247(d) / RSS-210 A8.5	100 kHz Bandwidth of Frequency Band Edges and Conducted Spurious Emissions	PASS
§15.209(a) §15.247(d) / RSS-210 A8.5	Radiated Emissions	PASS

EUT Test Conditions During Testing

The EUT was in continuous transmit mode during all the tests.

Following channels were used during the tests when the hopping was stopped:

Channel LOW (CH) 0 = 902.0125 MHz

Channel MID (CH 280) = 909.0125 MHz

Channel HIGH (CH 559) = 915.9875 MHz

Description of Test Modes

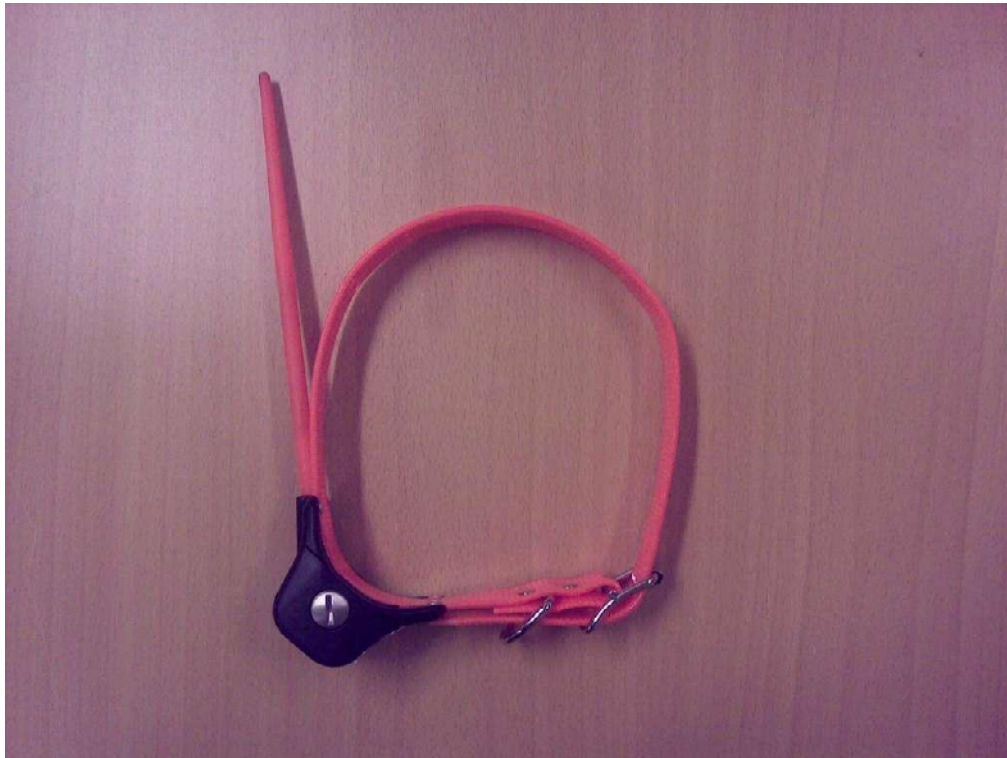
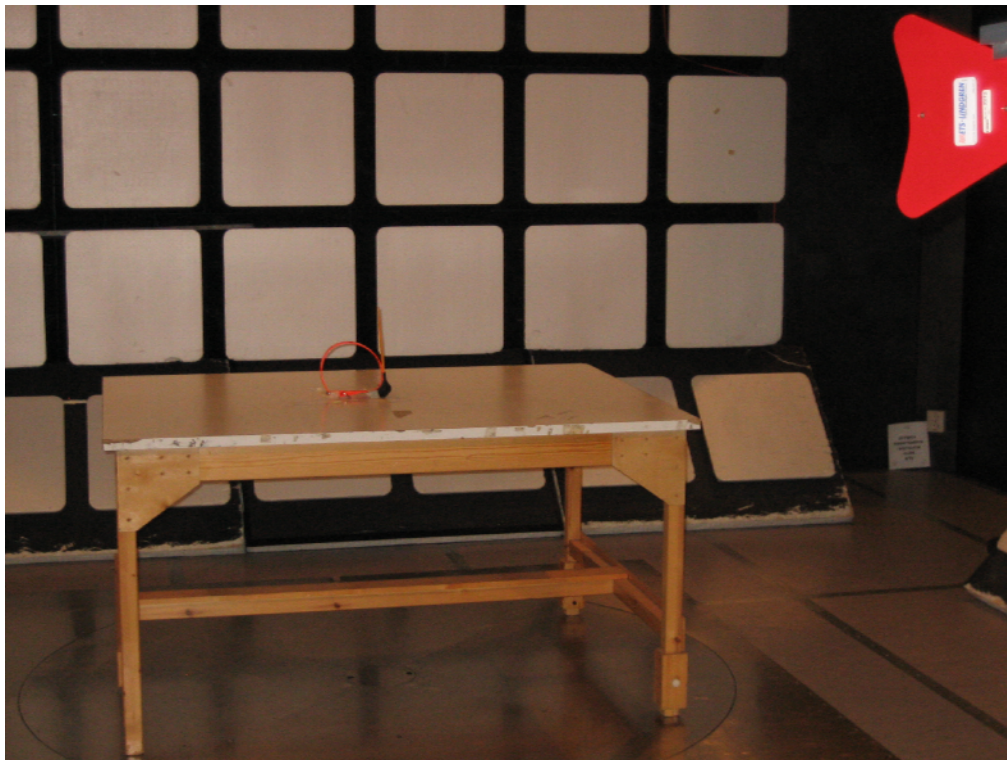
The sample is using Frequency Hopping transmission technique.
There are two testing modes in the test report.

Mode A: Frequency hopping stopped

Mode B: Frequency hopping enabled

Test Facility

<input type="checkbox"/> Testing Location / address: FCC registration number: 90598	SGS Fimko Ltd Särkiniementie 3 FI-00210, HELSINKI FINLAND
<input checked="" type="checkbox"/> Testing Location / address: FCC registration number: 178986 Industry Canada registration number: 8708A-2	SGS Fimko Ltd Karakaarenkuja 4 FI-02610, ESPOO FINLAND

Photograph of the EUT**Picture 1.** The EUT.**Picture 2.** The EUT and test set-up for radiated emission test

Maximum Peak Conducted Output Power

Standard: ANSI C63.4 (2003)
Tested by: JJM
Date: 3.3.2010
Humidity: 28 %
Temperature: 23 °C
Barometric pressure 997,2 mbar
Measurement uncertainty $\pm 2,87\text{dB}$ Level of confidence 95 % (k = 2)

FCC Rule: 15.247(b) (3)

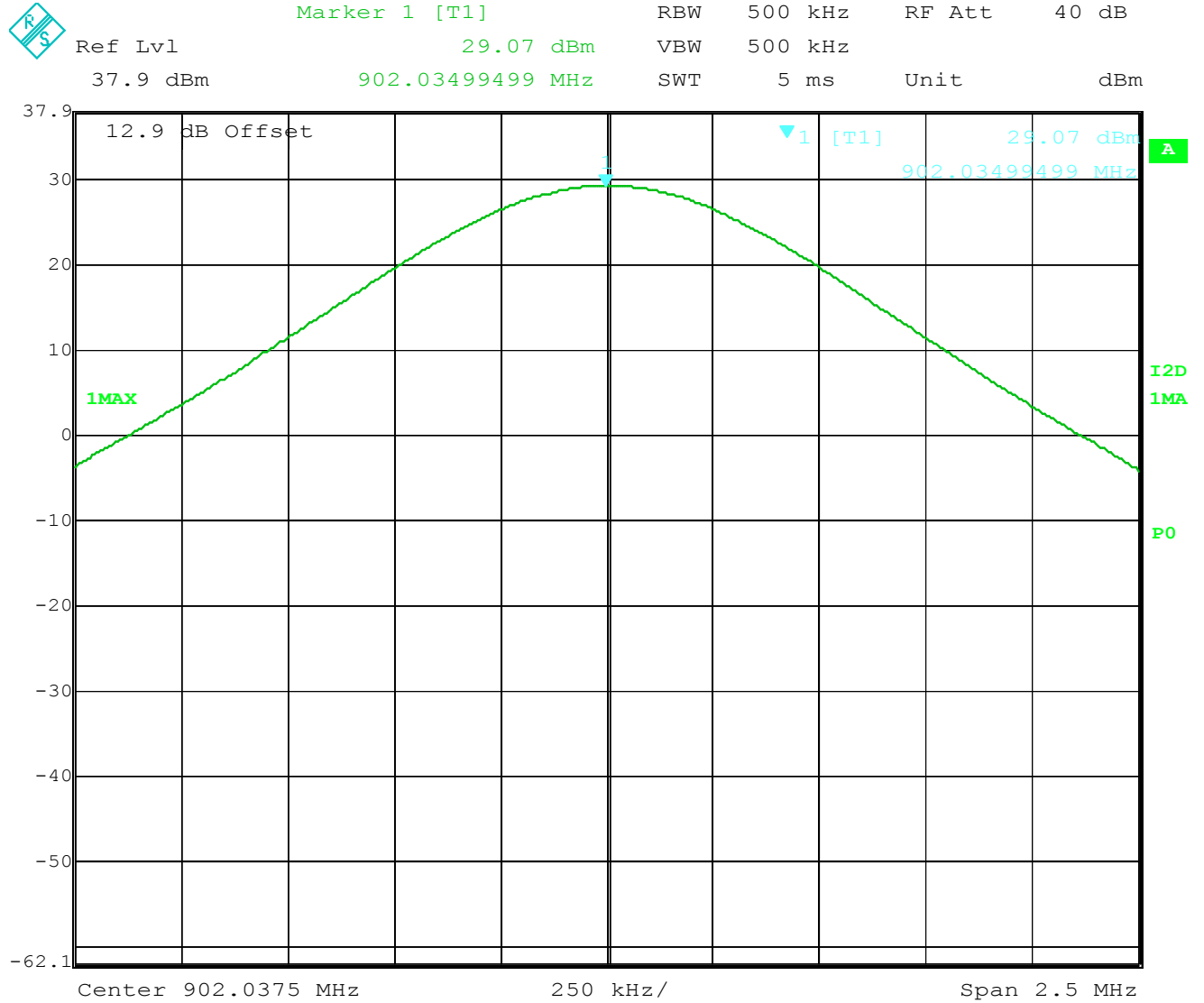
For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signalling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the *maximum conducted output power* is the highest total transmit power occurring in any mode.

Results: Mode A

Channel	Conducted Power [dBm]	Limit [dBm]	Margin [dBm]	Result
Low	29.07	30.0	0.93	PASS
Mid	29.24	30.0	0.78	PASS
High	27.53	30.0	2.47	PASS

The attenuation of the measurement cable and the attenuators were added as an offset 12.9 dB to correct the measurement result.

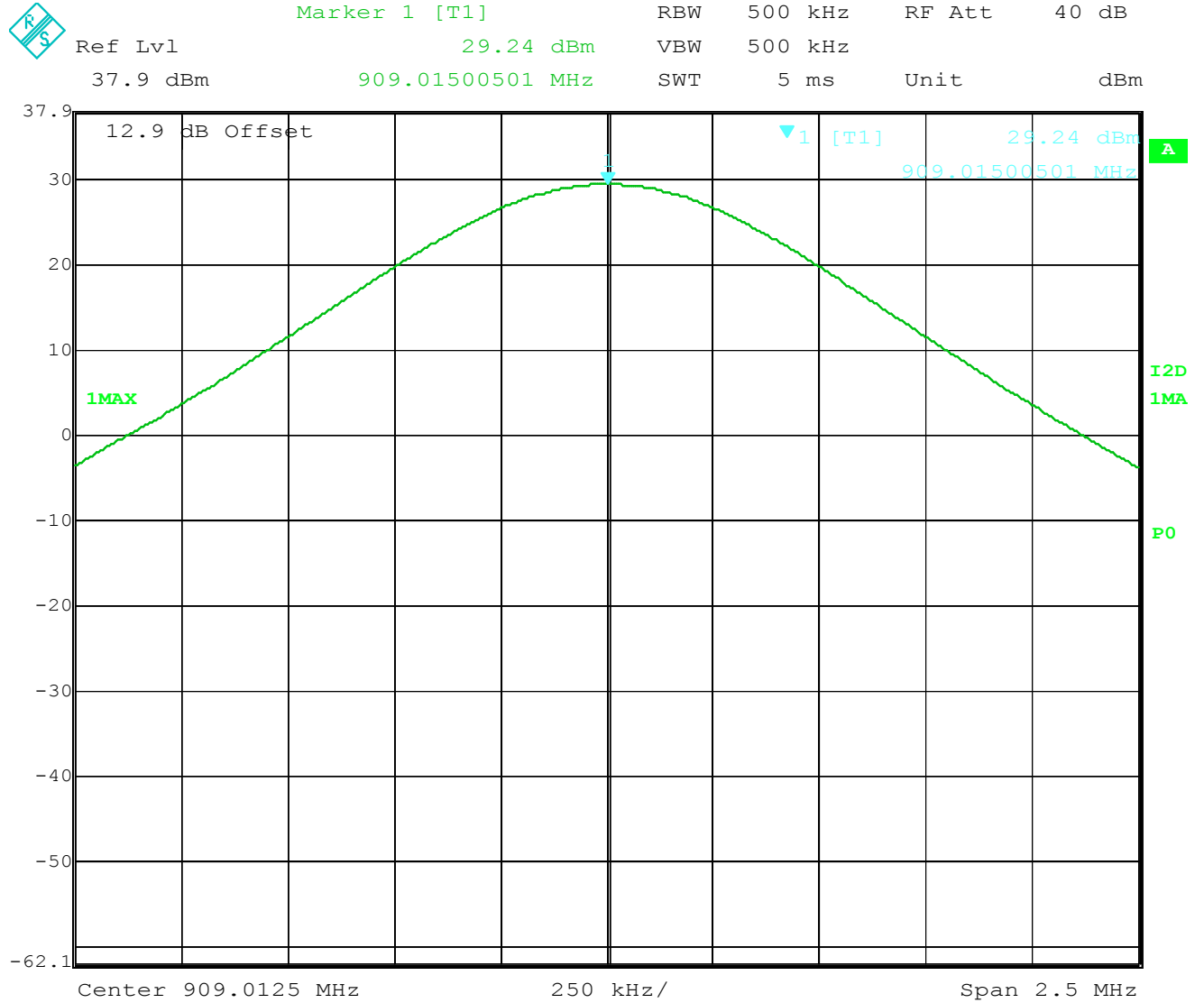
Conducted Output Power Test



Date: 3.MAR.2010 13:25:48

Figure 1. Mode A, Channel LOW.

Conducted Output Power Test



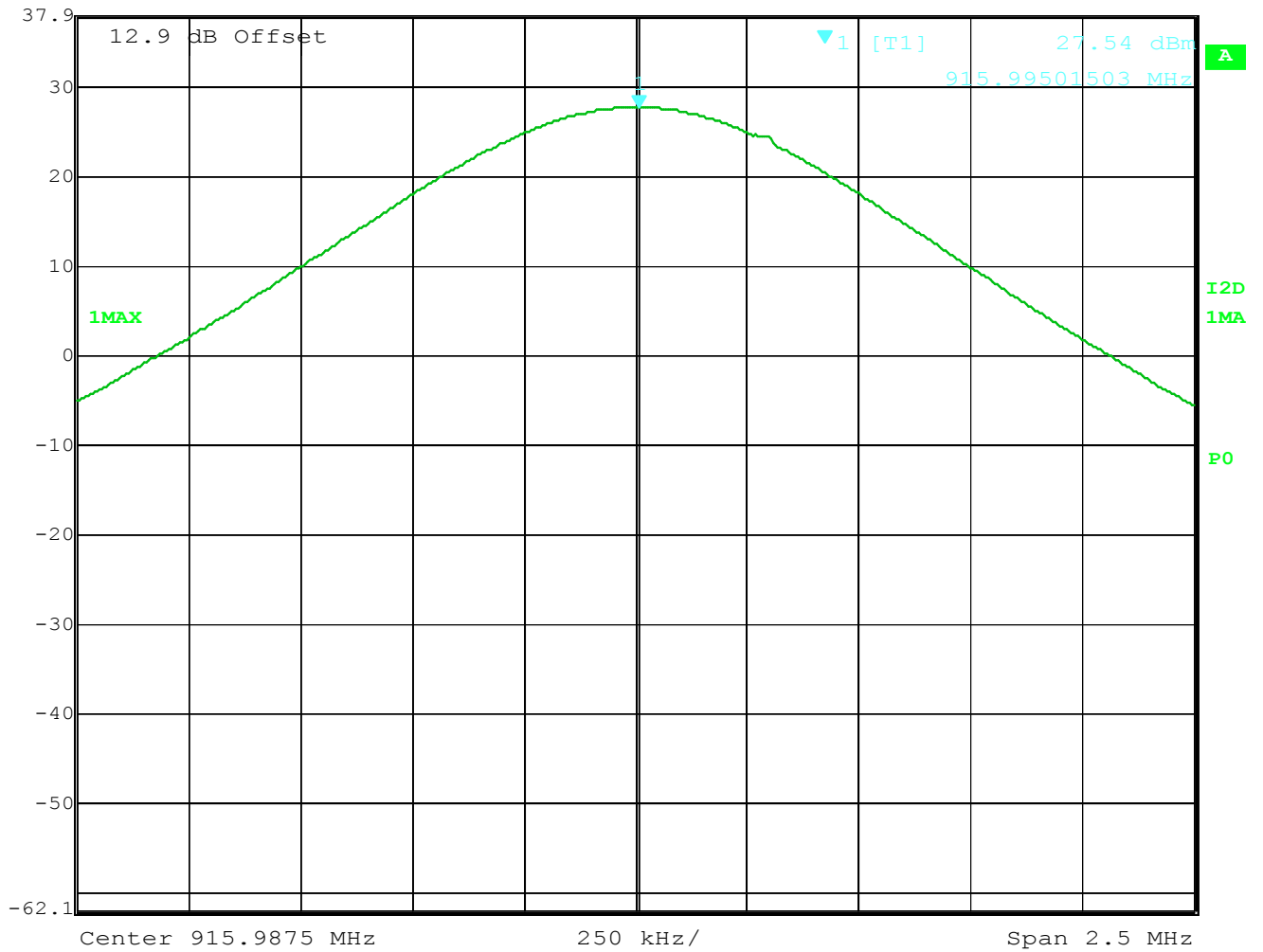
Date: 3.MAR.2010 13:27:48

Figure 2. Mode A, Channel MID.

Conducted Output Power Test



Marker 1 [T1] RBW 500 kHz RF Att 40 dB
Ref Lvl 27.54 dBm VBW 500 kHz
37.9 dBm 915.99501503 MHz SWT 5 ms Unit dBm



Date: 3.MAR.2010 13:30:57

Figure 3. Mode A, Channel HIGH.

Transmitter Radiated Emissions 30 – 1000 MHz

Standard:	ANSI C63.4	(2003)
Tested by:	NTO / JJM	
Date:	24 – 26.2.2010	
	1.3 – 2.3.2010	
Humidity:	40 – 42 %	
Temperature:	21.8 – 22.8 °C	
Barometric pressure	989 – 1011mbar	
Measurement uncertainty	± 4.51 dB	Level of confidence 95 % (k = 2)

FCC Rule: 15.247(d), 15.209(a)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

Mode A

Measured Peak Values In The Frequency Range 30 MHz - 1000 MHz.

FCC Part 15 Electric Field Strength below 1 GHz

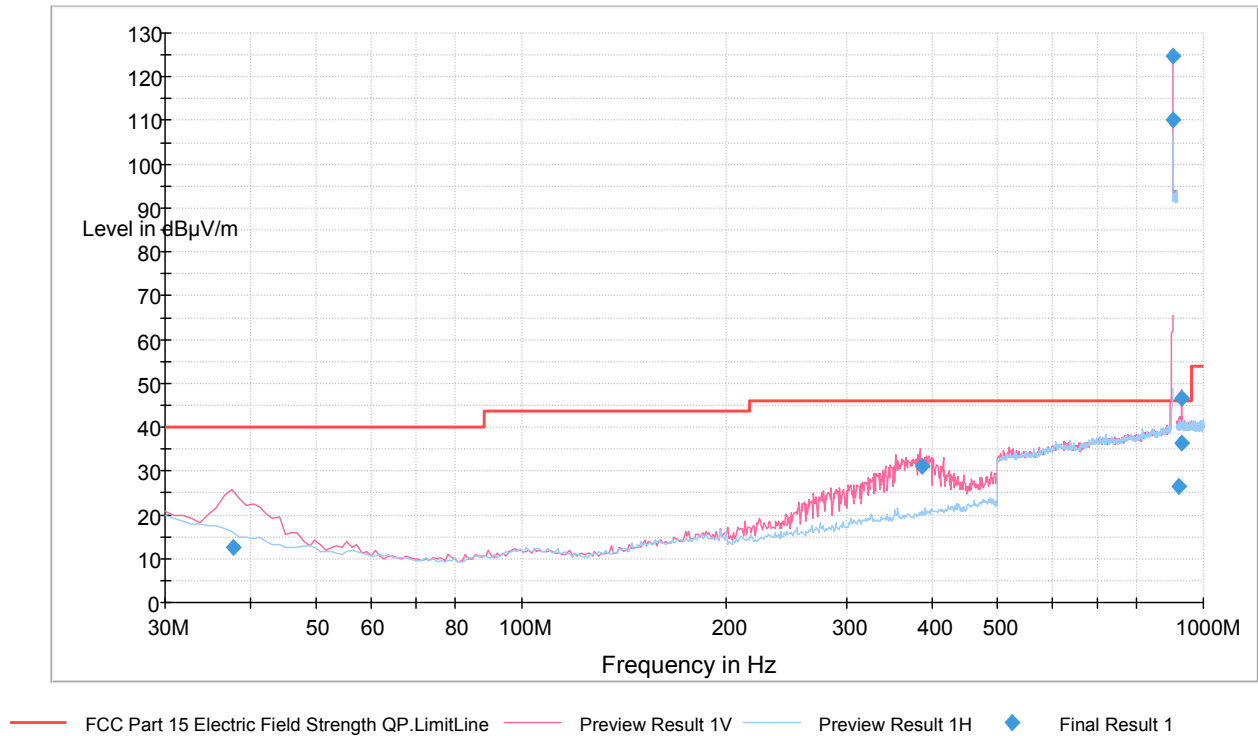


Figure 4. Measured curve with peak-detector. Channel LOW.

Final measurements from the worst frequencies

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
37.835070	12.5	1000.0	100.000	100.0	V	160.0	14.6	27.5	40.0	-
386.010180	31.2	1000.0	100.000	163.0	V	56.0	18.4	14.8	46.0	-
902.000000	124.5	1000.0	100.000	110.0	V	226.0	26.9	-78.5	46.0	Carrier
902.000000	110.1	1000.0	100.000	230.0	H	255.0	26.9	-64.1	46.0	Carrier
919.247621	26.3	1000.0	100.000	157.0	V	288.0	26.9	19.7	46.0	-
927.997824	46.7	1000.0	100.000	164.0	V	225.0	26.9	-0.7	46.0	-
930.698106	36.4	1000.0	100.000	172.0	V	235.0	26.9	9.6	46.0	-

Table 1. Final results.

Note: In the frequency 927.997824 MHz the emission exceeds the limit. Although this frequency is not in the restricted band and it complies with the -20 dBc requirement.

FCC Part 15 Electric Field Strength below 1 GHz

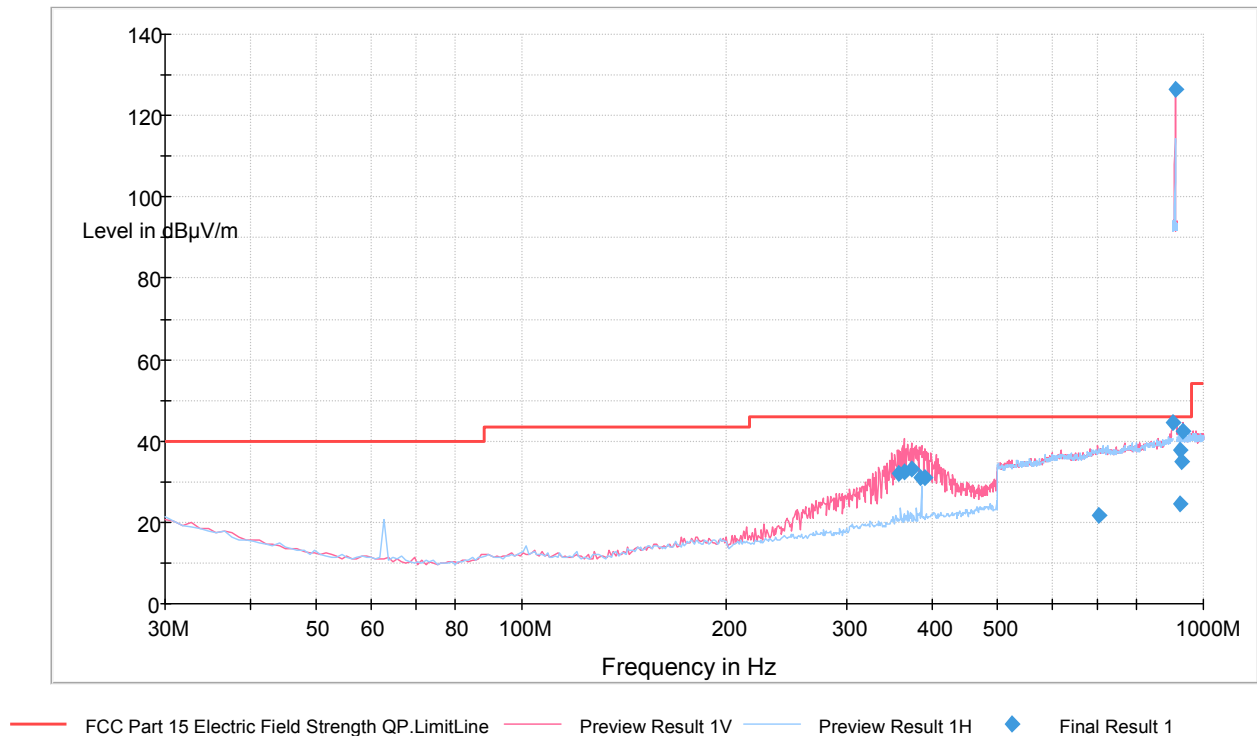


Figure 5. Measured curve with peak-detector. Channel MID.

Final measurements from the worst frequencies

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
358.395551	32.0	1000.0	100.000	163.0	V	98.0	17.8	14.0	46.0	-
365.088737	32.5	1000.0	100.000	163.0	V	31.0	17.9	13.5	46.0	-
373.645691	33.3	1000.0	100.000	149.0	V	78.0	18.1	12.7	46.0	-
385.132064	31.0	1000.0	100.000	151.0	V	294.0	18.4	15.0	46.0	-
389.839599	31.0	1000.0	100.000	138.0	V	333.0	18.4	15.0	46.0	-
701.701804	21.6	1000.0	100.000	100.0	V	52.0	24.6	24.4	46.0	-
902.000000	44.5	1000.0	100.000	158.0	V	229.0	26.9	1.5	46.0	-
909.014028	126.4	1000.0	100.000	175.0	V	229.0	27.0	-80.4	46.0	Carrier
923.965888	37.9	1000.0	100.000	175.0	V	25.0	26.9	8.1	46.0	-
926.361856	24.7	1000.0	100.000	100.0	H	301.0	26.9	21.3	46.0	-
927.166170	35.0	1000.0	100.000	158.0	V	97.0	26.9	11.0	46.0	-
935.003711	42.2	1000.0	100.000	167.0	V	187.0	26.8	3.8	46.0	-

Table 2. Final results.

FCC Part 15 Electric Field Strength below 1 GHz

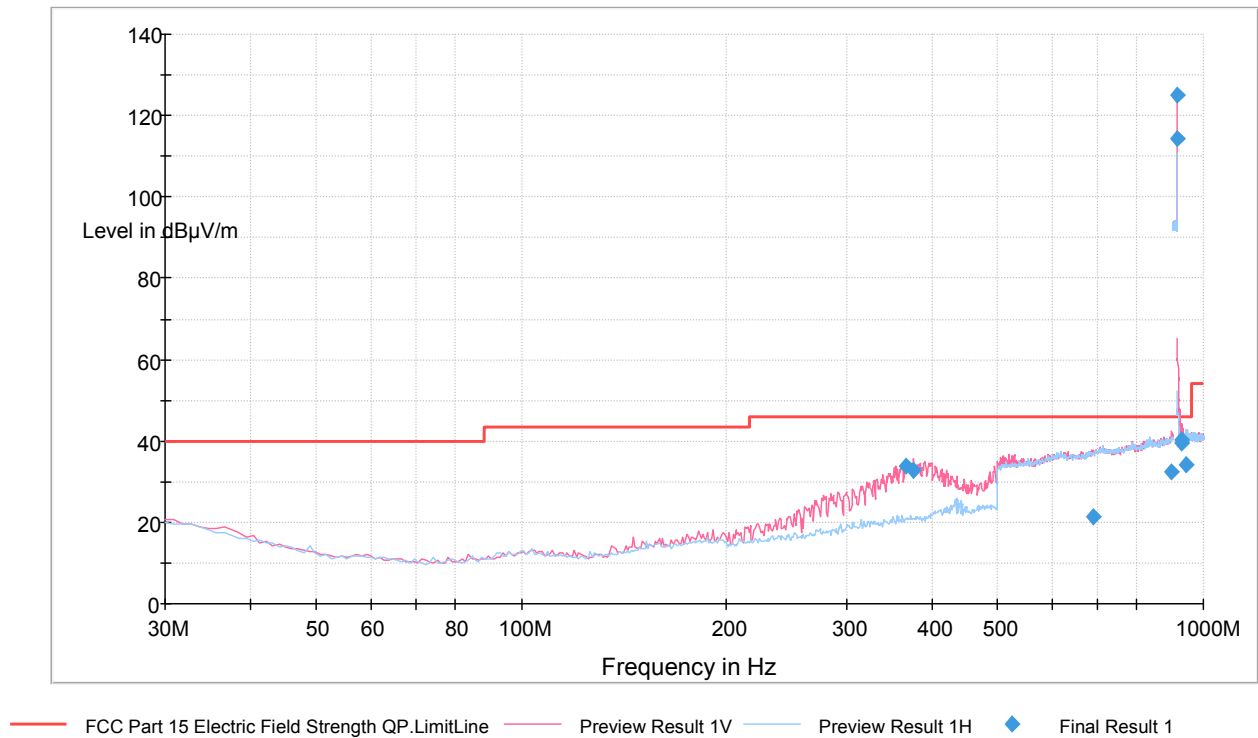


Figure 6. Measured curve with peak-detector. Channel HIGH.

Final measurements from the worst frequencies

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
367.054389	33.7	1000.0	100.000	158.0	V	335.0	18.0	12.3	46.0	-
375.631343	32.9	1000.0	100.000	172.0	V	119.0	18.1	13.1	46.0	-
687.860481	21.2	1000.0	100.000	273.0	V	208.0	24.3	24.8	46.0	-
899.732786	32.3	1000.0	100.000	110.0	V	182.0	26.9	13.7	46.0	-
915.980000	114.3	1000.0	100.000	109.0	H	164.0	26.9	-68.3	46.0	Carrier
915.980000	125.0	1000.0	100.000	174.0	V	231.0	26.9	-79.0	46.0	Carrier
928.993792	39.5	1000.0	100.000	186.0	V	79.0	26.9	6.5	46.0	-
928.995808	40.1	1000.0	100.000	100.0	V	231.0	26.9	5.9	46.0	-
942.861253	34.2	1000.0	100.000	146.0	H	18.0	26.8	11.8	46.0	-

Table 3. Final results.

Transmitter Radiated Emissions 1 000 – 10 000 MHz

Measured Peak and Average Values In The Frequency Range 1 000 MHz – 10 000 MHz.

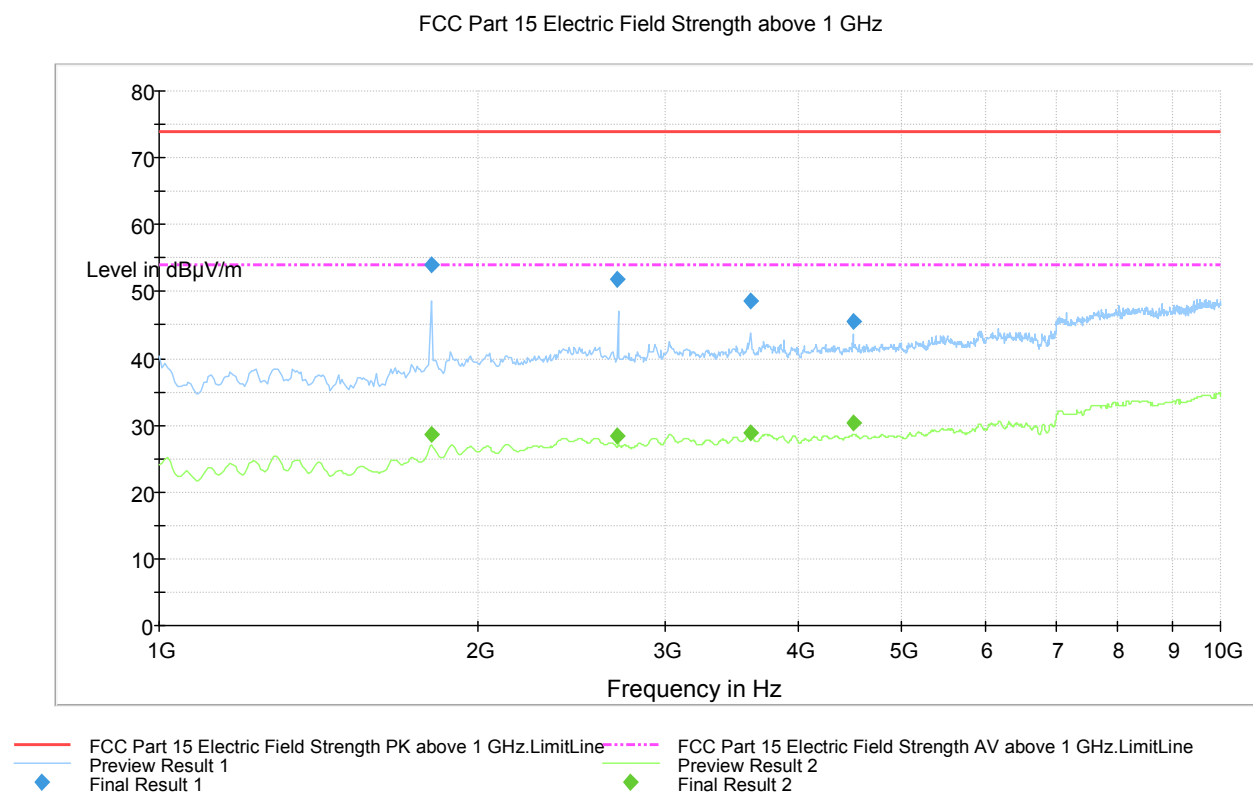


Figure 7. Measured curve with peak- and average detector. Channel LOW.

Final measurements from the worst frequencies

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
1804.011222	54.0	1000.0	1000.000	116.0	V	178.0	2.0	20.0	74.0	-
2706.014830	51.8	1000.0	1000.000	134.0	V	230.0	5.2	22.2	74.0	-
3608.018437	48.5	1000.0	1000.000	100.0	V	85.0	7.5	25.5	74.0	-
4510.222044	45.6	1000.0	1000.000	230.0	V	276.0	9.5	28.4	74.0	-

Table 4. Final Max Peak results.

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
1804.011222	28.7	1000.0	1000.000	116.0	V	171.0	2.0	25.3	54.0	-
2706.014830	28.3	1000.0	1000.000	110.0	V	238.0	5.2	25.7	54.0	-
3608.018437	28.9	1000.0	1000.000	100.0	V	1.0	7.5	25.1	54.0	-
4510.022044	30.4	1000.0	1000.000	237.0	V	276.0	9.5	23.6	54.0	-

Table 5. Final Average results..

FCC Part 15 Electric Field Strength above 1 GHz

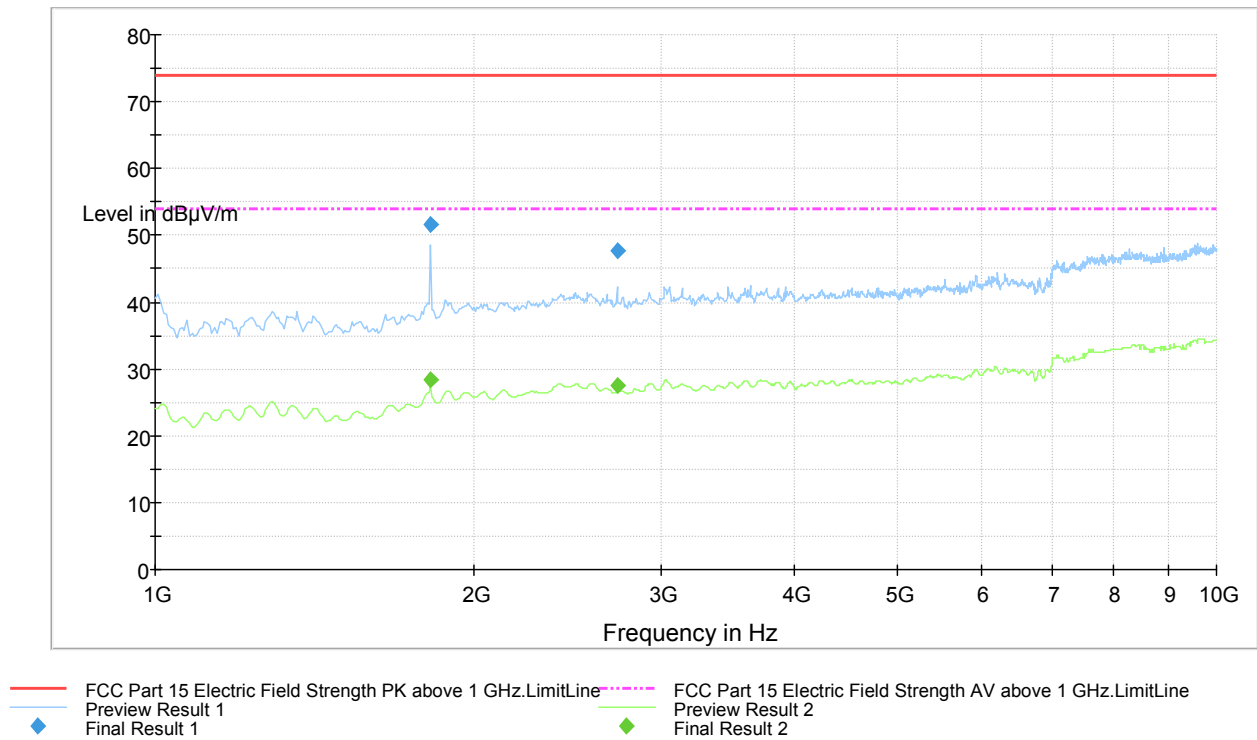


Figure 8. Measured curve with peak- and average detector. Channel MID.

Final measurements from the worst frequencies

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
1818.035271	51.7	1000.0	1000.000	116.0	V	183.0	2.2	22.3	74.0	-
2727.050902	47.8	1000.0	1000.000	100.0	V	237.0	5.2	26.2	74.0	-

Table 6. Final Max Peak results.

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
1818.035271	28.4	1000.0	1000.000	116.0	V	183.0	2.2	25.6	54.0	-
2727.050902	27.6	1000.0	1000.000	100.0	V	237.0	5.2	26.4	54.0	-

Table 7. Final Average results.

FCC Part 15 Electric Field Strength above 1 GHz

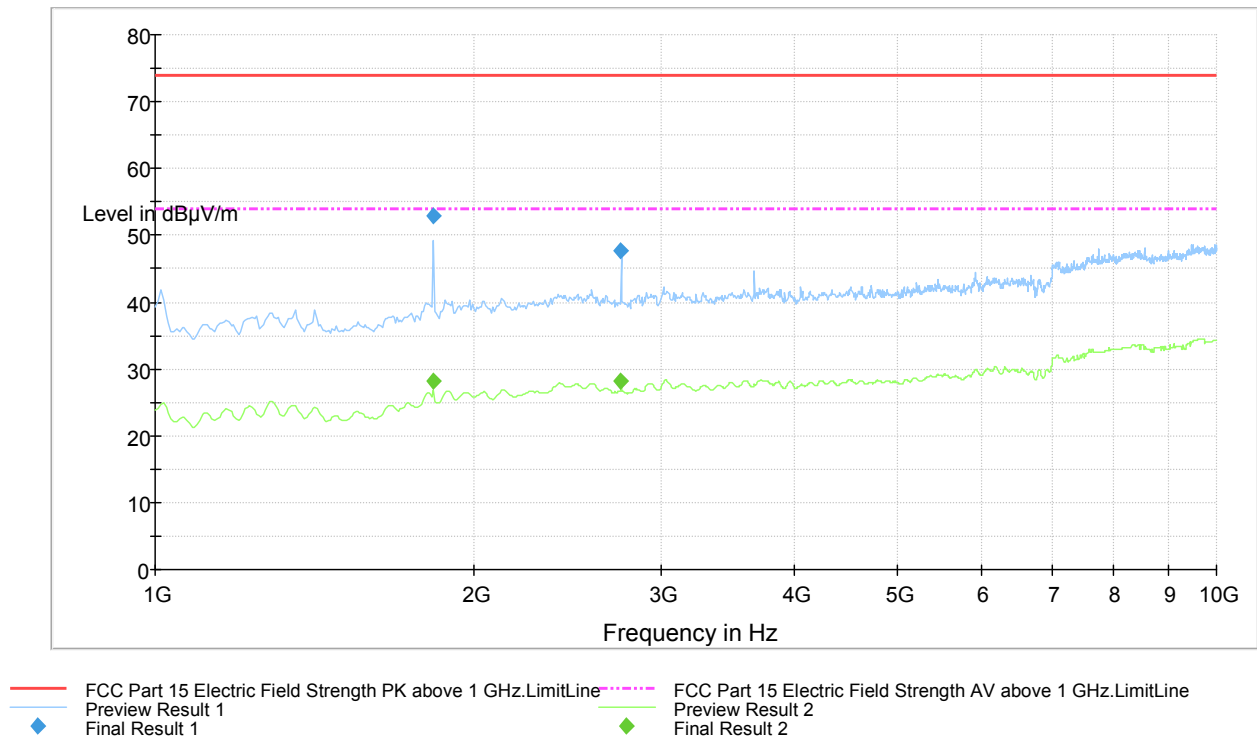


Figure 9. Measured curve with peak- and average detector. Channel HIGH.

Final measurements from the worst frequencies

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
1832.059319	52.8	1000.0	1000.000	111.0	V	185.0	2.3	21.2	74.0	-
2747.898998	47.6	1000.0	1000.000	100.0	V	109.0	5.1	26.4	74.0	-

Table 8. Final Max Peak results.

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
1832.059319	28.3	1000.0	1000.000	110.0	V	160.0	2.3	25.7	54.0	-
2747.898998	28.2	1000.0	1000.000	100.0	V	139.0	5.1	25.8	54.0	-

Table 9. Final Average results.

Transmitter Band Edge Measurement and Conducted Spurious Emissions

Transmitter Band Edge Measurement and Conducted Spurious Emissions

Standard:	ANSI C63.4	(2003)
Tested by:	JJM	
Date:	3.3.2010	
Humidity:	28 %	
Temperature:	23 °C	
Barometric pressure	997 mbar	
Measurement uncertainty	± 2.87 dB	Level of confidence 95 % (k = 2)

FCC Rule: 15.247(d), 15.209(a)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

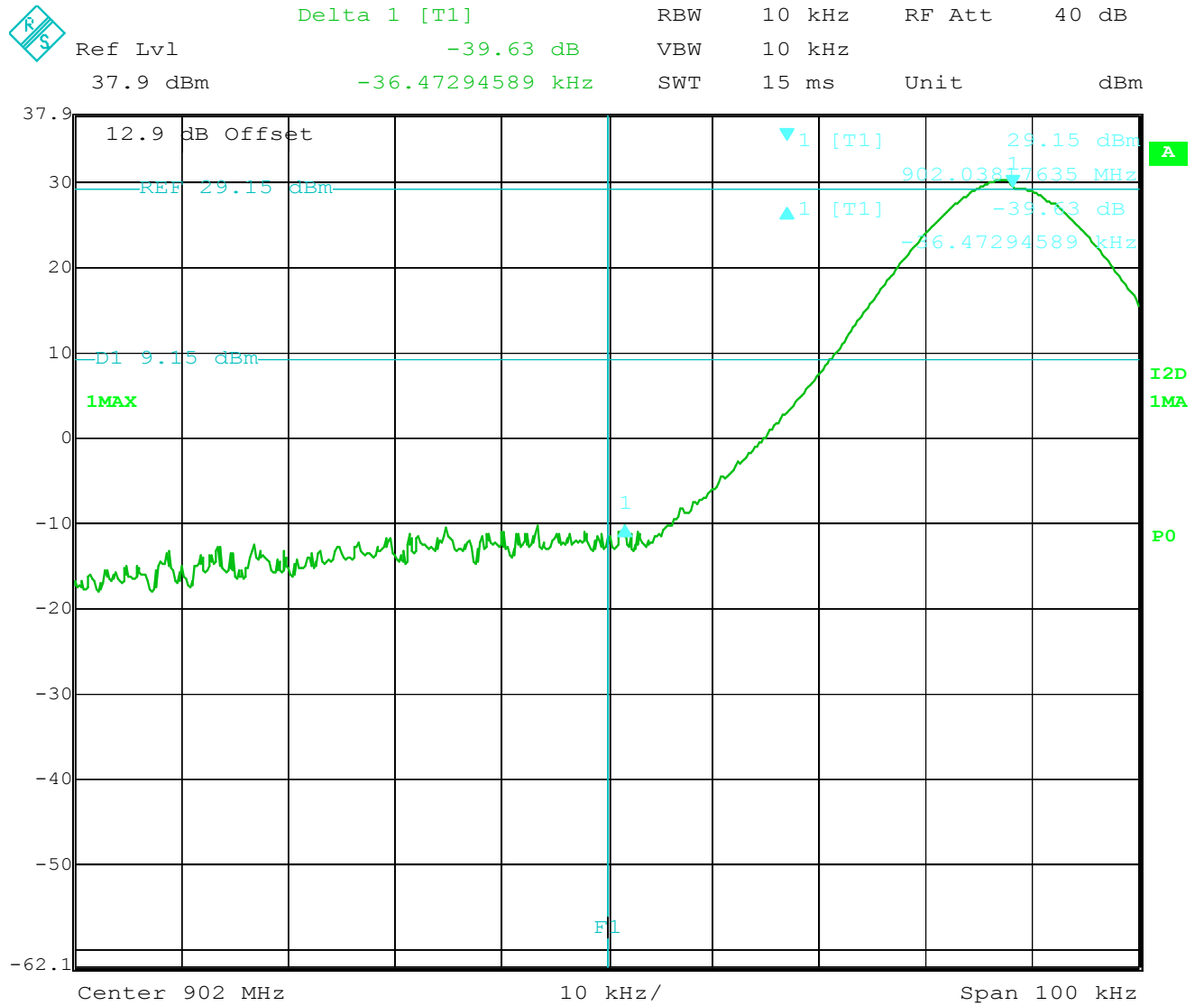
Band Edge Attenuation	
Lower Band Edge, Mode A	Upper Band Edge, Mode A
-39.63 dBc	-61.44 dBc
Lower Band Edge, Mode B	Upper Band Edge, Mode B
-47.13 dBc	-58.84 dBc
Limit: -20dBc	

Table 10. Band edge attenuation.

Conducted Spurious Emissions				
Channel	Measured Attenuation [dB]	Limit [dBc]	Margin [dB]	Result
Low	-55.26	-20.0	-35.26	PASS
Mid	-56.05	-20.0	-36.05	PASS
High	-55.12	-20.0	-35.12	PASS

Table 11. Conducted spurious emissions.

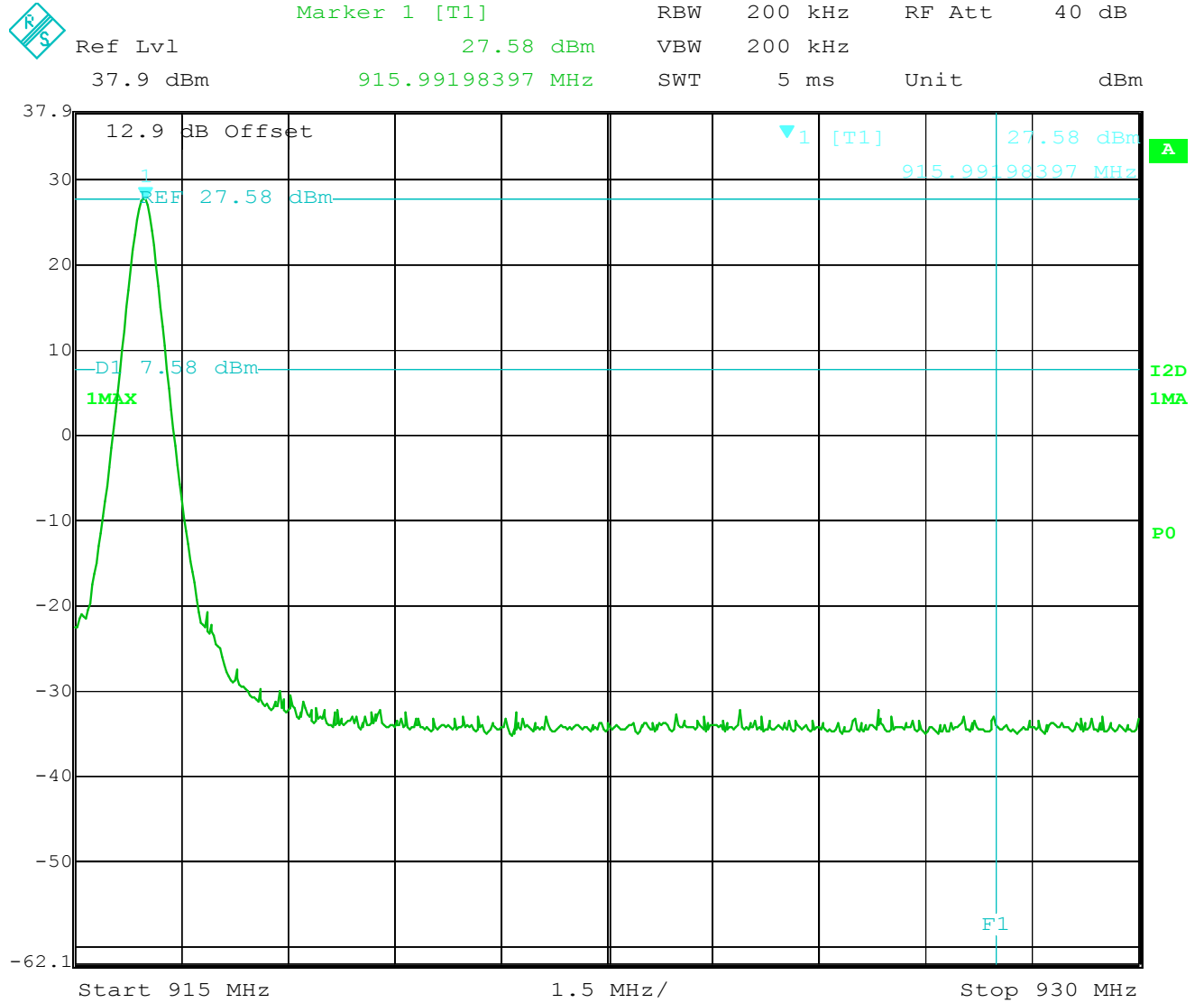
Transmitter Band Edge Measurement and Conducted Spurious Emissions



Date: 3.MAR.2010 13:43:32

Figure 10. Mode A, Lower Band Edge.

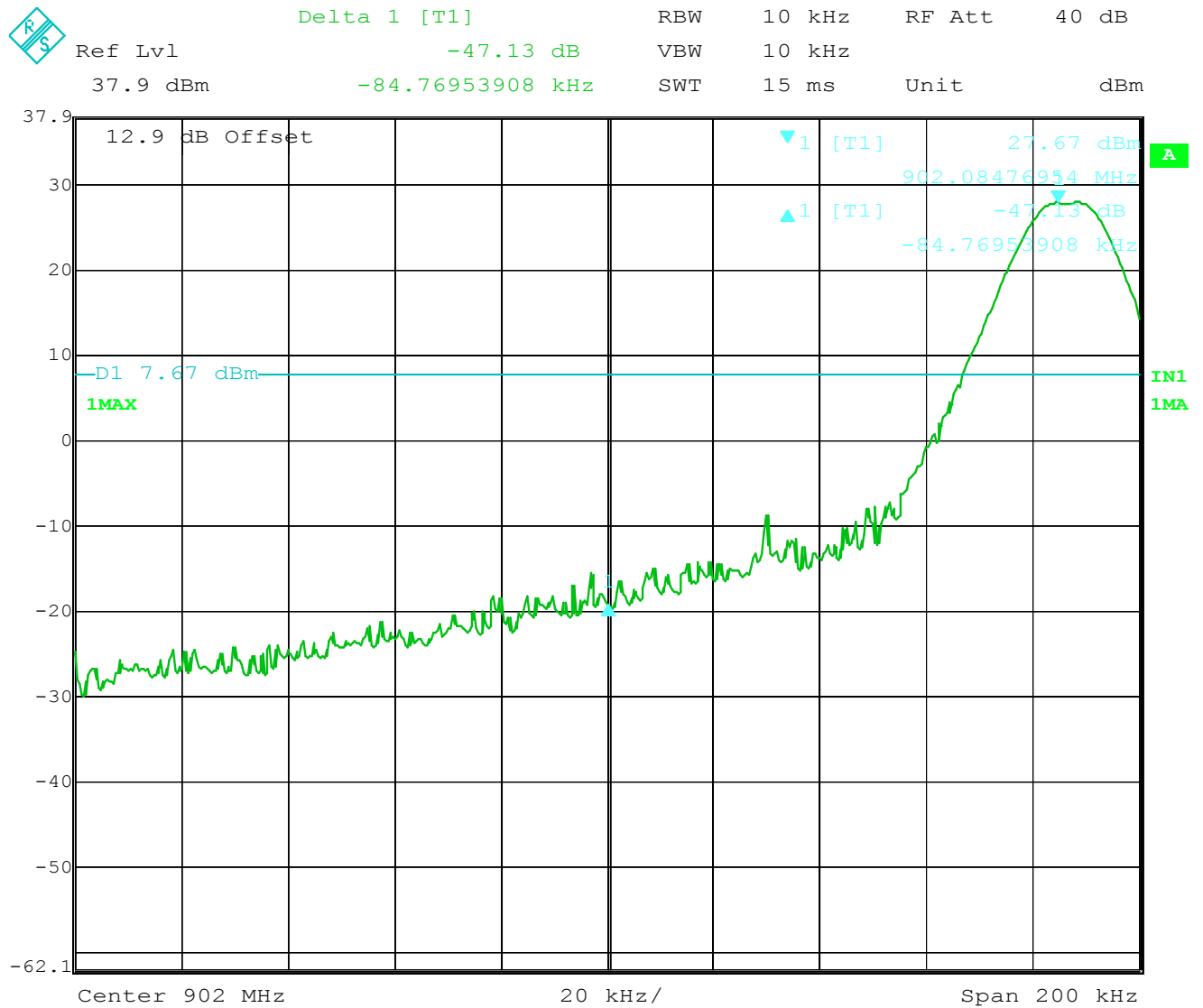
Transmitter Band Edge Measurement and Conducted Spurious Emissions



Date: 3.MAR.2010 13:50:11

Figure 11. Mode A, Upper Band Edge.

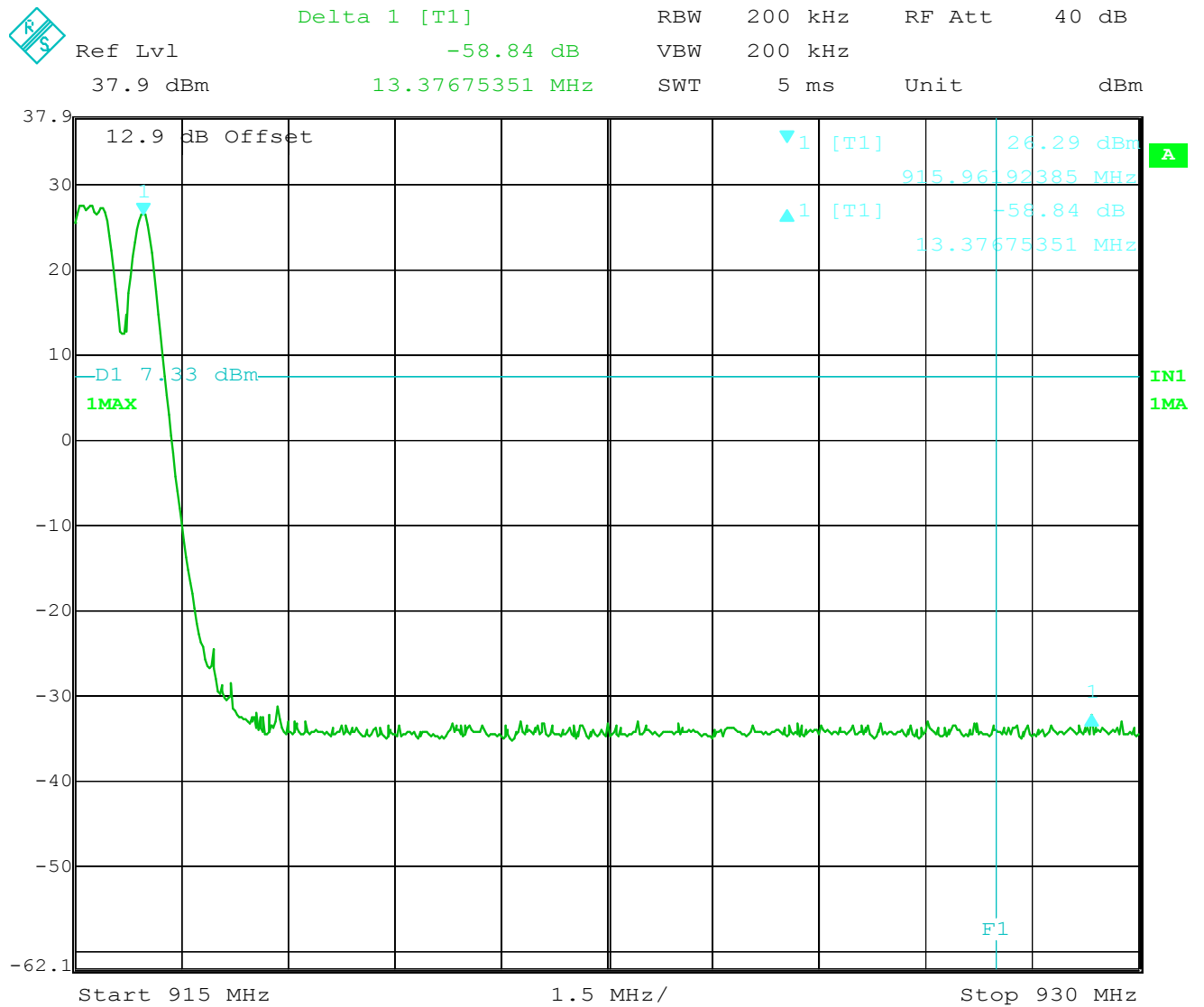
Transmitter Band Edge Measurement and Conducted Spurious Emissions



Date: 8.MAR.2010 15:08:32

Figure 12. Mode B, Lower Band Edge.

Transmitter Band Edge Measurement and Conducted Spurious Emissions



Date: 9.MAR.2010 08:03:05

Figure 13. Mode B, Upper Band Edge.

Transmitter Band Edge Measurement and Conducted Spurious Emissions

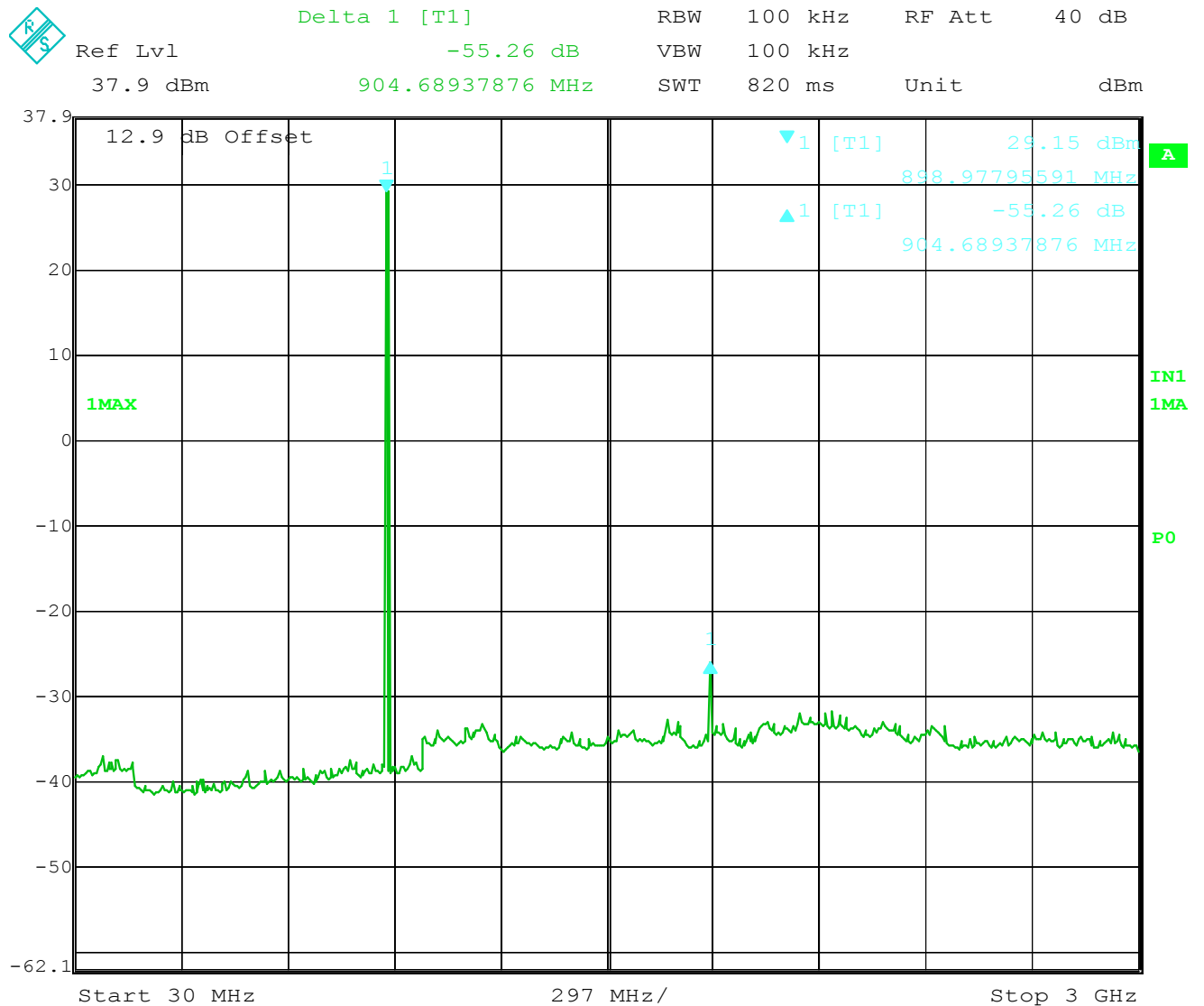
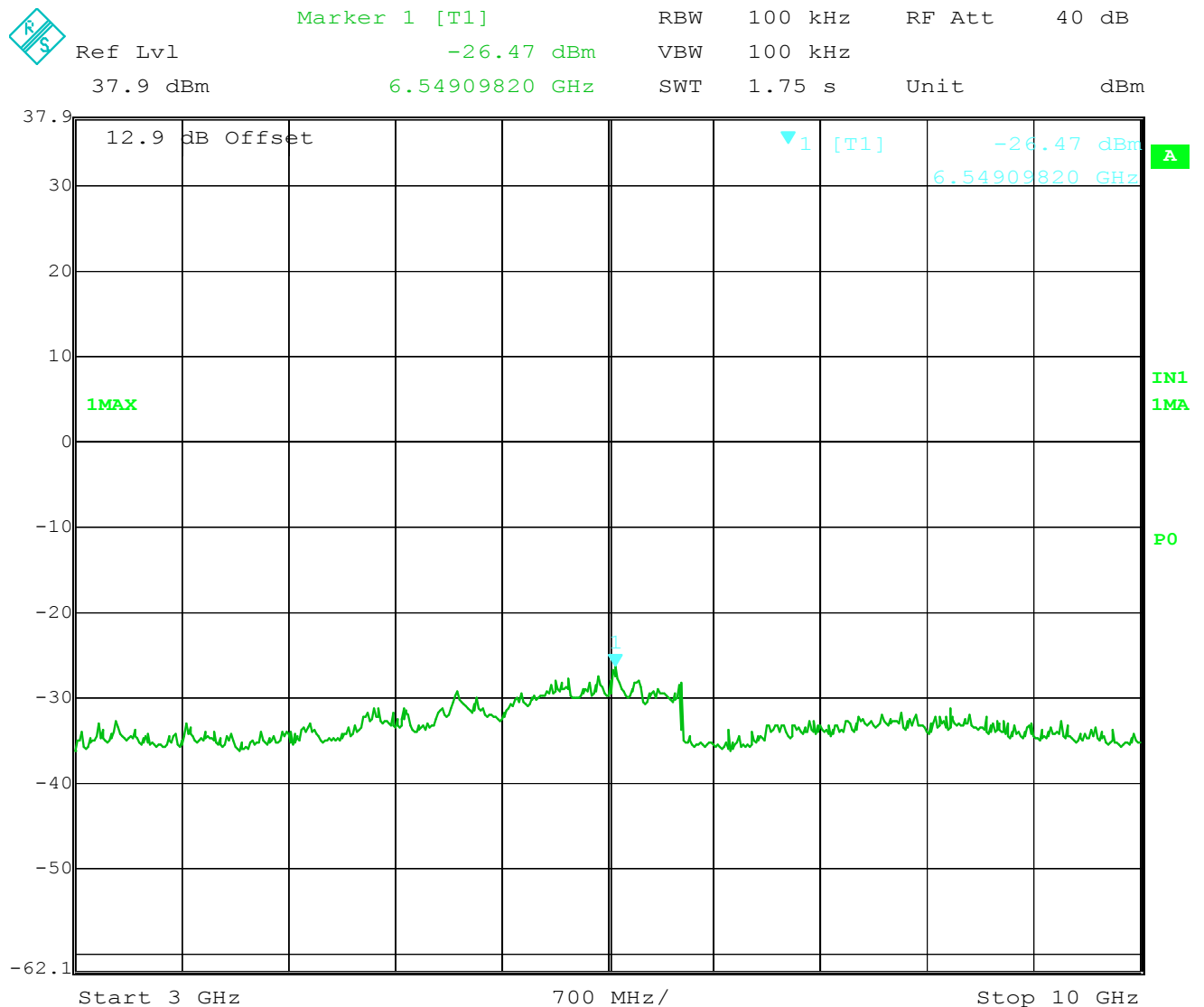


Figure 14. Conducted Spurious Emissions 30 – 3 000 MHz. Channel LOW.

Transmitter Band Edge Measurement and Conducted Spurious Emissions



Date: 3.MAR.2010 14:12:04

Figure 15. Conducted Spurious Emissions 3 000 – 10 000 MHz. Channel LOW.

Transmitter Band Edge Measurement and Conducted Spurious Emissions

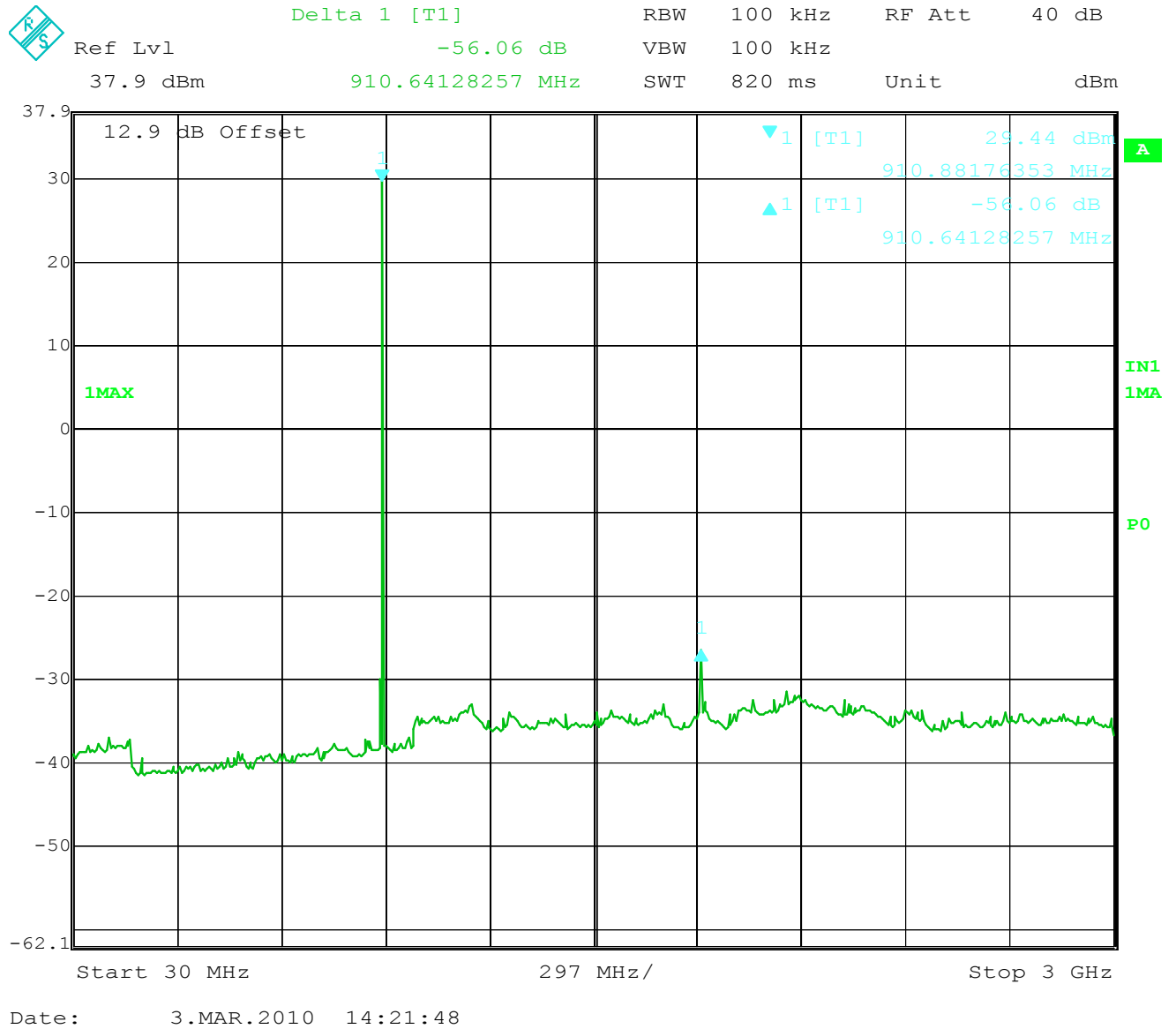
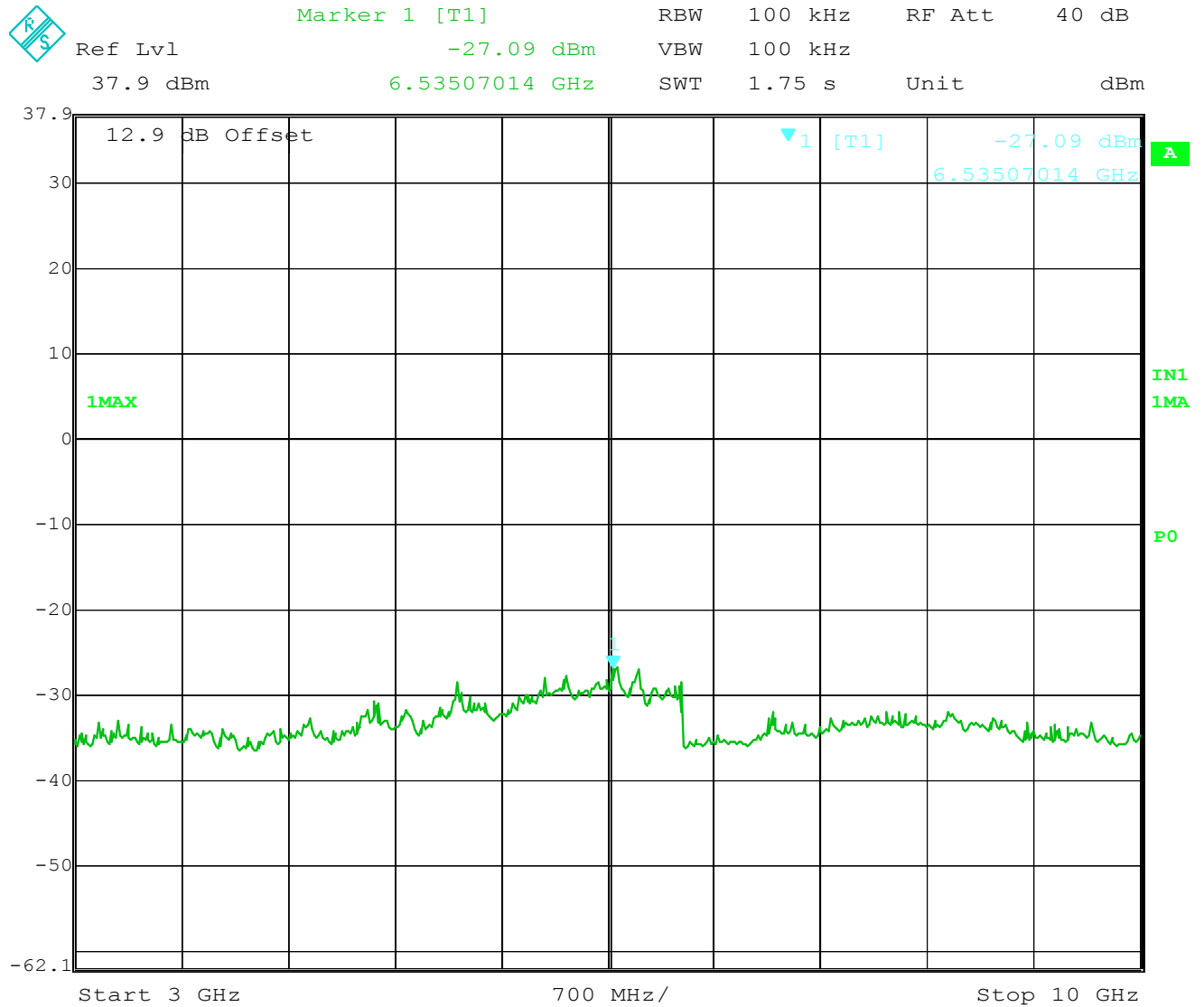


Figure 16. Conducted Spurious Emissions 30 – 3 000 MHz. Channel MID.

Transmitter Band Edge Measurement and Conducted Spurious Emissions



Date: 3.MAR.2010 14:24:23

Figure 17. Conducted Spurious Emissions 3 000 – 10 000 MHz. Channel MID.

Transmitter Band Edge Measurement and Conducted Spurious Emissions

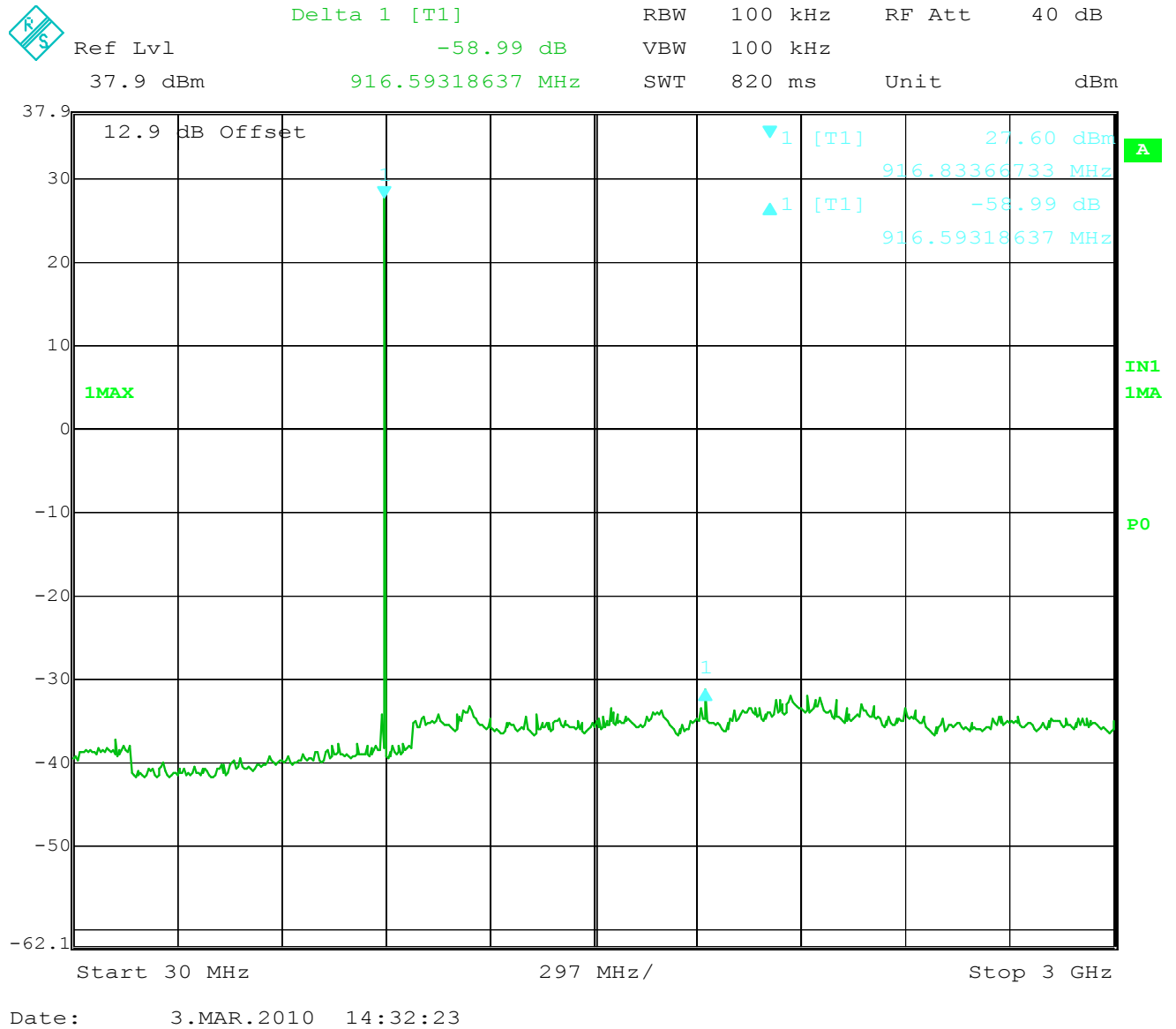
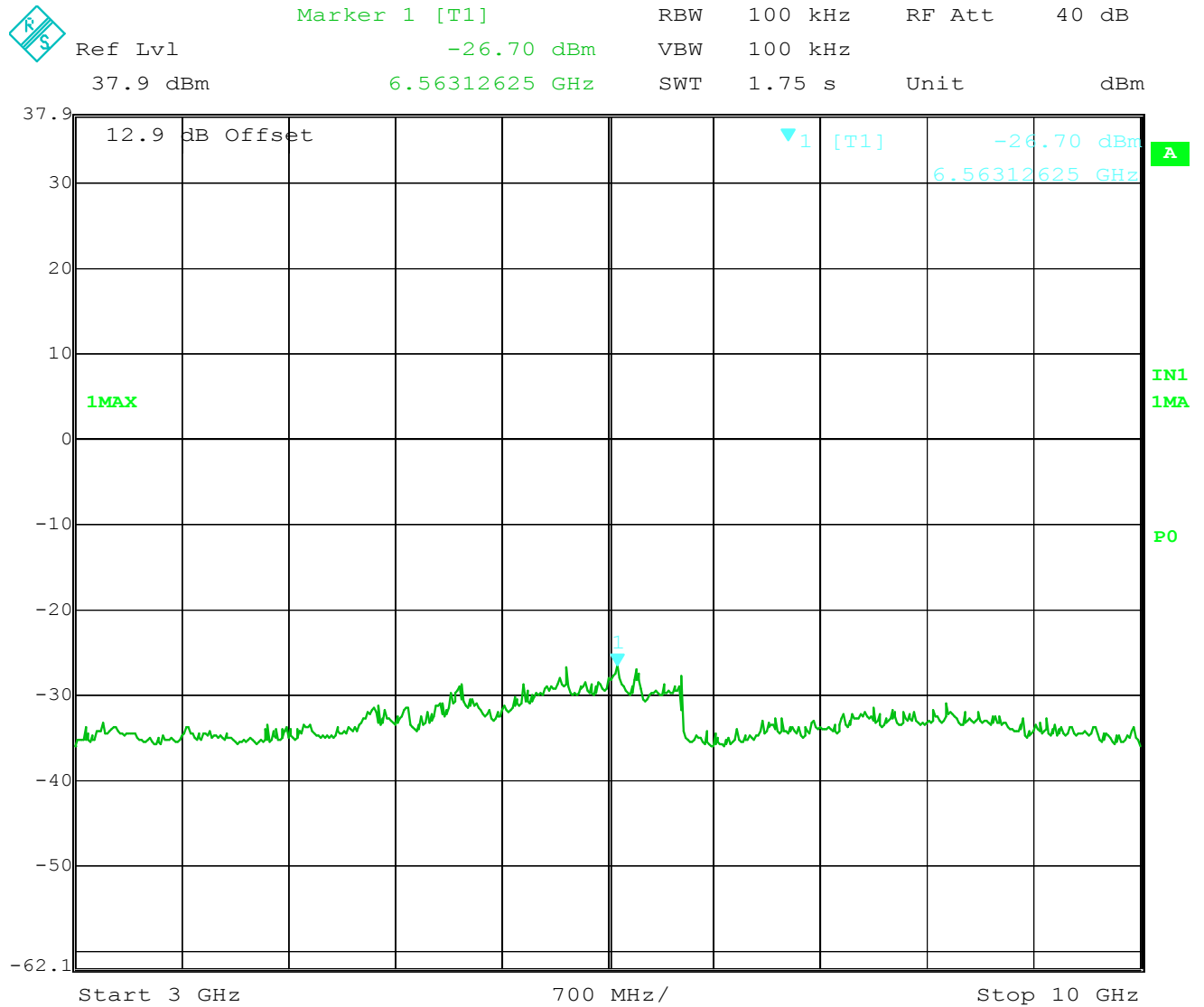


Figure 18. Conducted Spurious Emissions 30 – 3 000 MHz. Channel HIGH.

Transmitter Band Edge Measurement and Conducted Spurious Emissions



Date: 3.MAR.2010 14:29:54

Figure 19. Conducted Spurious Emissions 3 000 – 10 000 MHz. Channel HIGH.

20 dB Bandwidth of the Hopping Channel

Standard: ANSI C63.4 (2003)
Tested by: JJM
Date: 2.3.2010
Humidity: 42 %
Temperature: 21.8 °C
Barometric pressure 989 mbar

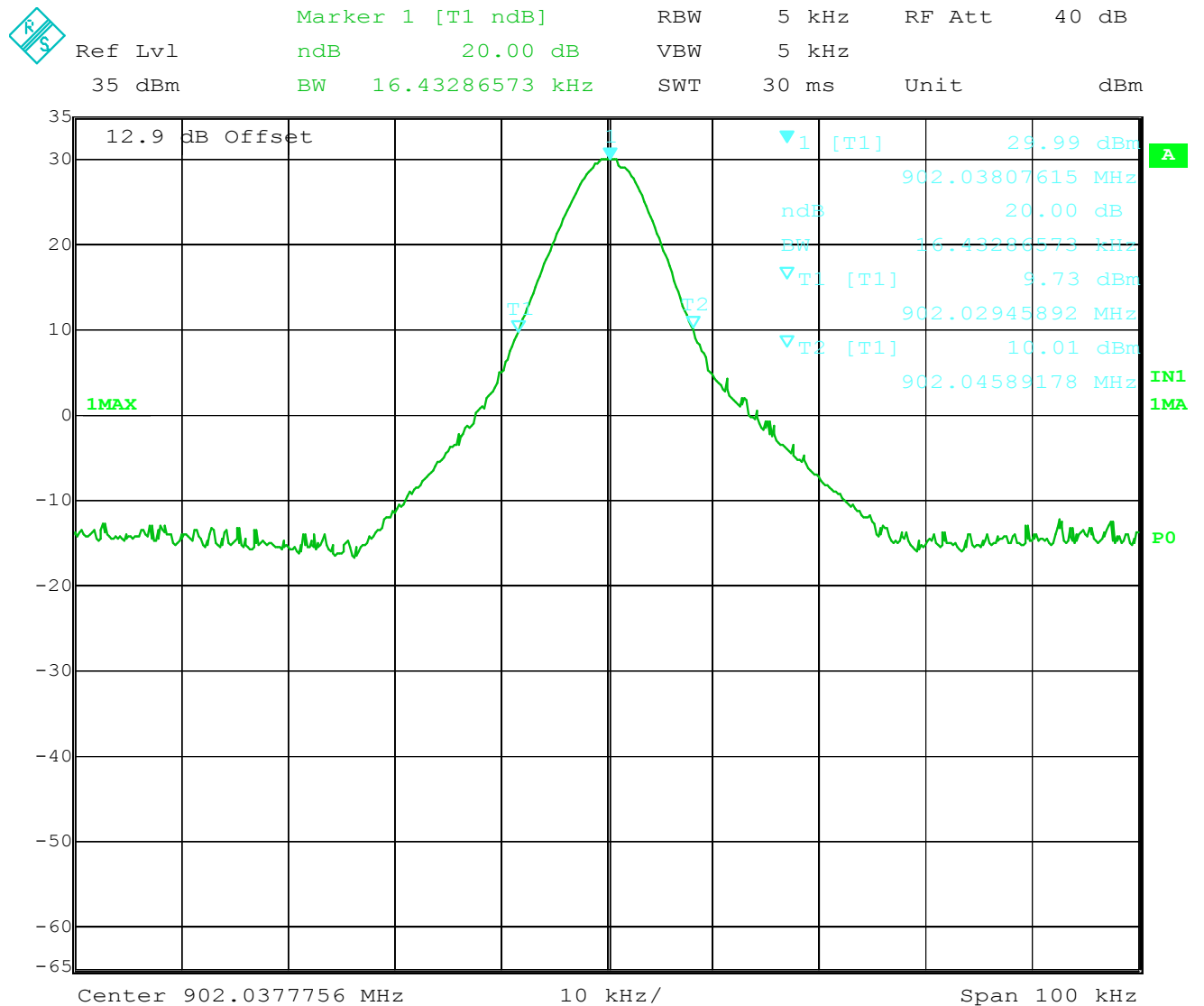
FCC Rule: 15.247(a)

Results: Mode A

Channel	20 dB BW [kHz]	Limit [kHz]	Margin [kHz]	Result
Low	16.432	500	483.568	PASS
Mid	16.432	500	483.568	PASS
High	16.432	500	483.568	PASS

Table 12. 20 dB bandwidth test results.

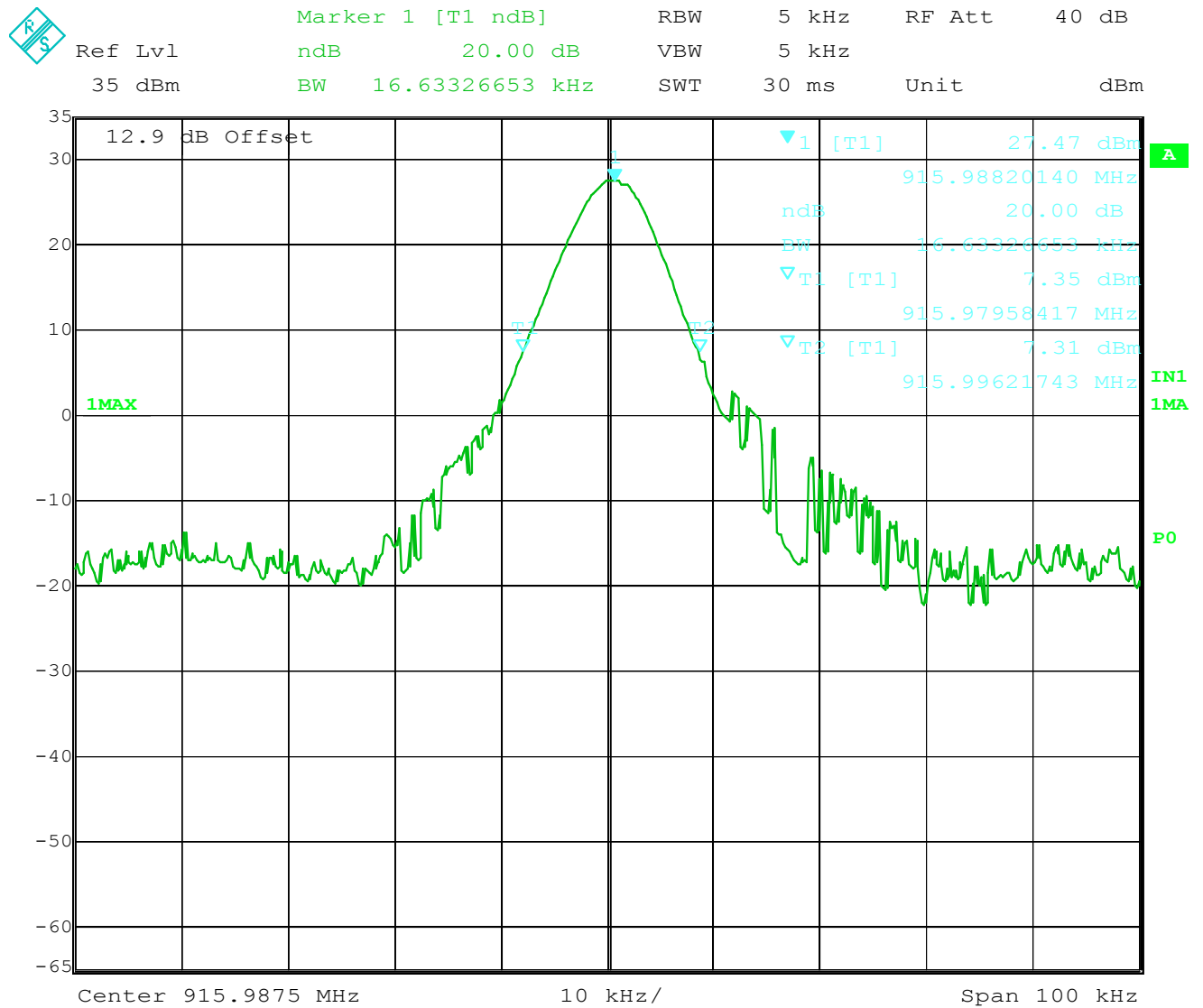
20dB Bandwidth of the Hopping Channel



Date: 5.MAR.2010 13:29:59

Figure 20. 20 dB channel BW. Channel LOW

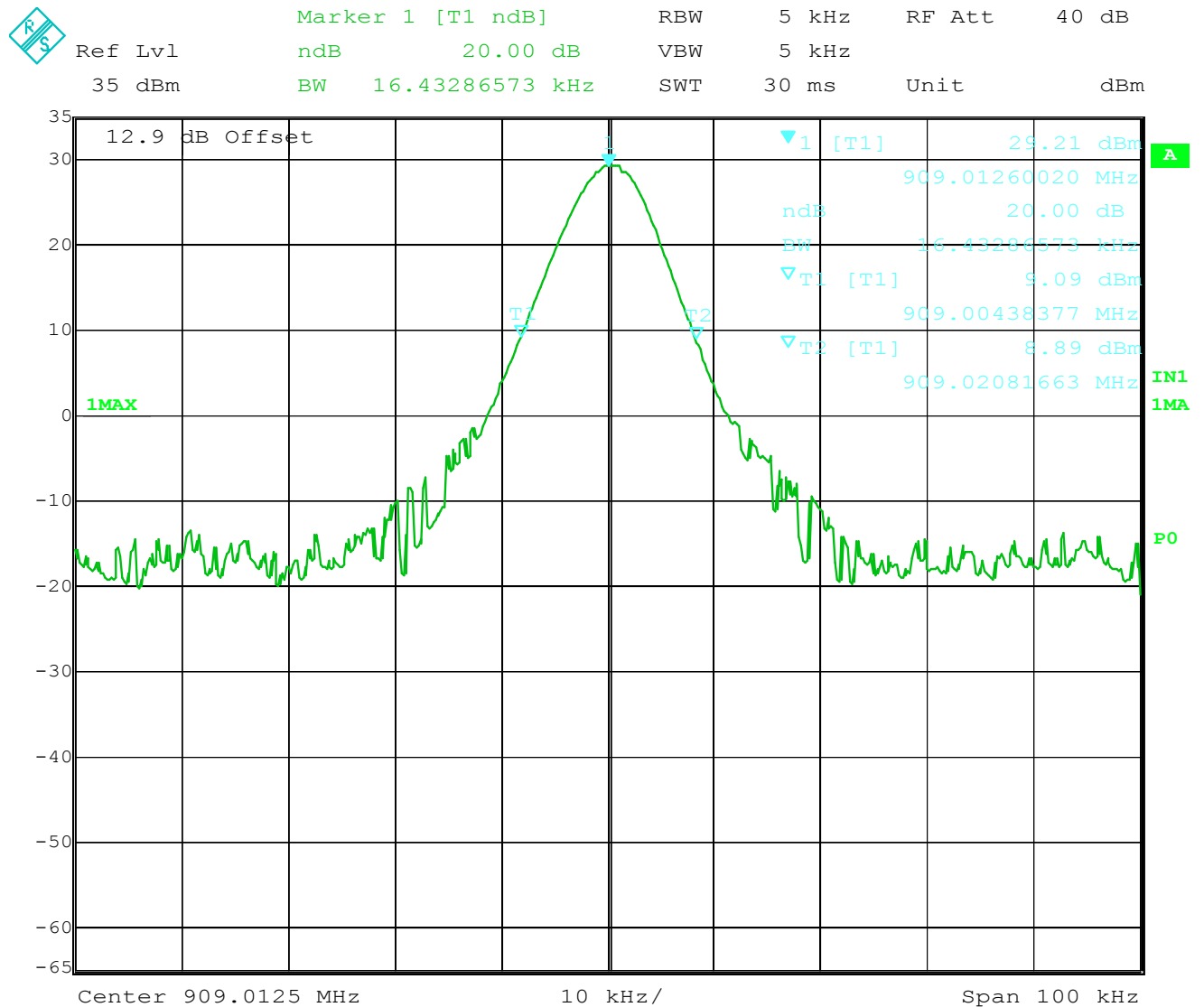
20dB Bandwidth of the Hopping Channel



Date: 5.MAR.2010 13:34:03

Figure 21. 20 dB channel BW. Channel MID.

20dB Bandwidth of the Hopping Channel



Date: 5.MAR.2010 13:35:58

Figure 22. 20 dB channel BW. Channel HIGH

Hopping Channel Carrier Frequencies Separation

Standard: ANSI C63.4 (2003)
Tested by: JJM
Date: 4.3.2010
Humidity: 20 %
Temperature: 23.5 °C
Barometric pressure 1004 mbar

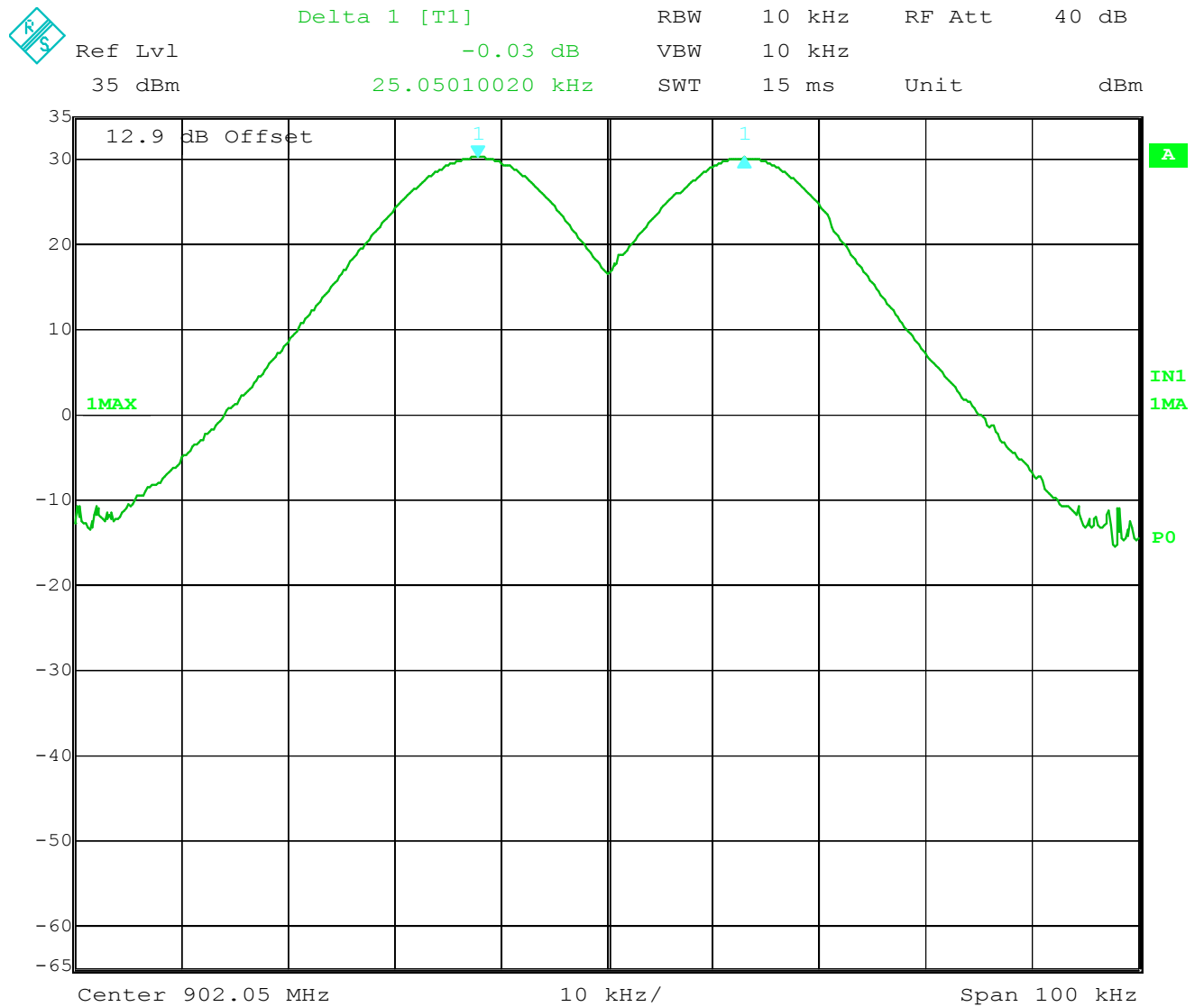
FCC Rule: 15.247(a) (1)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

Measured separation	Limit	Result
25.05 kHz	25 kHz	PASS

Table 13. Hopping channel carrier frequencies separation test result.

Hopping Channel Carrier Frequencies Separation



Date: 5.MAR.2010 12:36:01

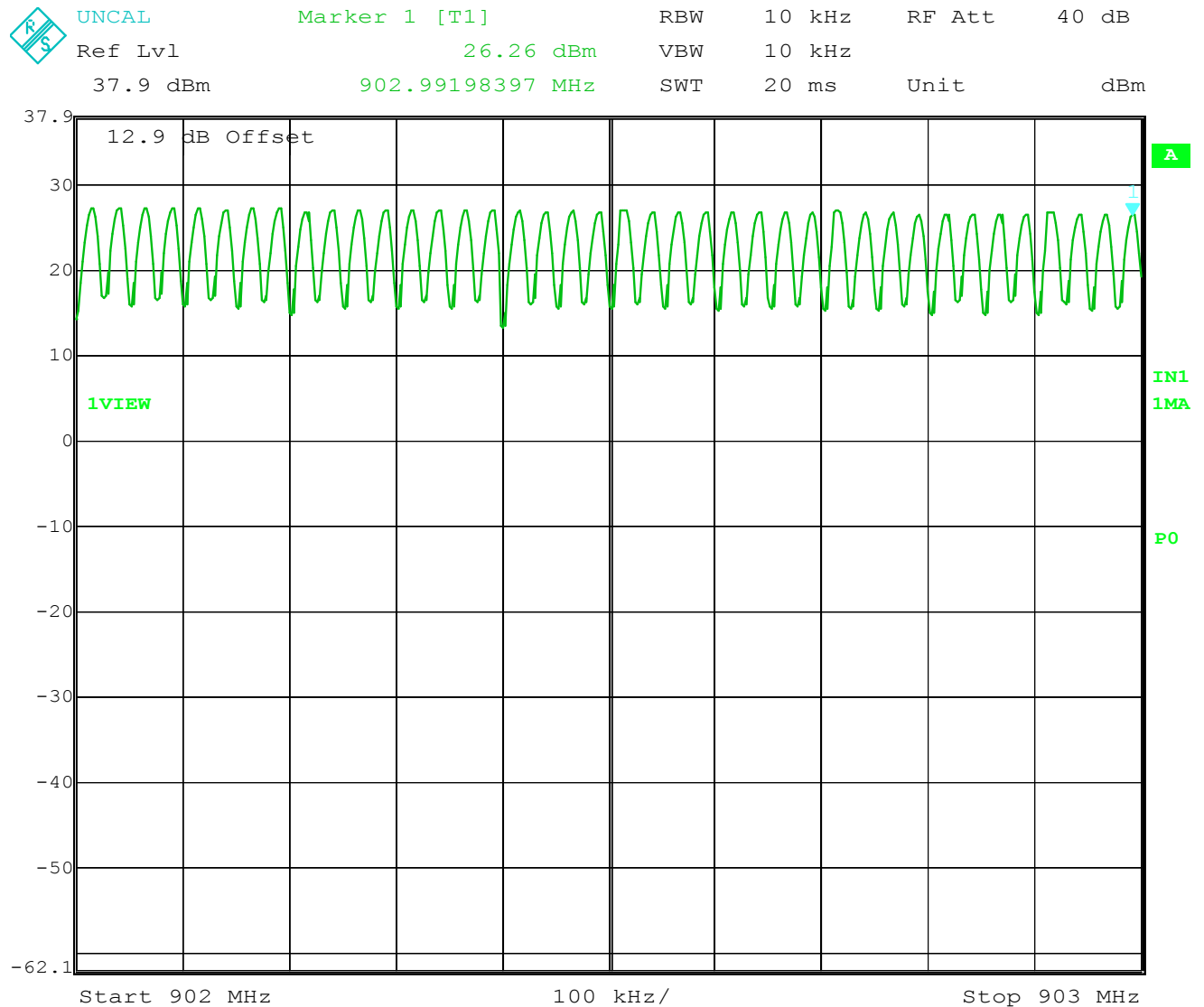
Figure 23. Measured hopping channels carrier frequency separation.

Number of Hopping Channels

Standard: ANSI C63.4 (2003)
Tested by: JJM / NTO
Date: 9.3 – 12.3.2010
Humidity: 20 – 21 %
Temperature: 22.0 - 23.5 °C
Barometric pressure 1003 – 1020 mbar

FCC Rule: 15.247(a) (1) (i)

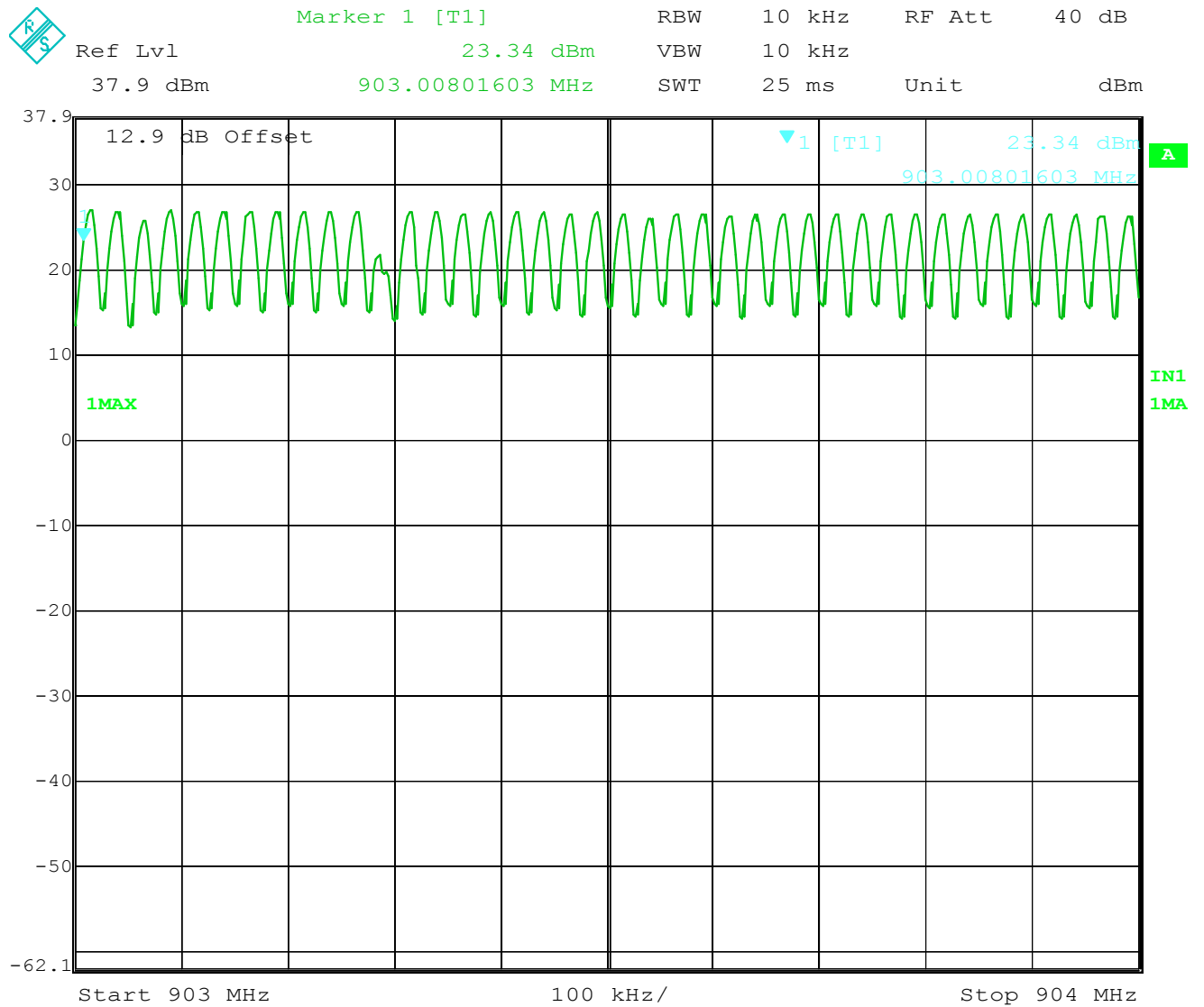
For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies.



Date: 4.MAR.2010 14:42:52

Figure 24. Frequency range 902 – 903 MHz. Total number of hopping channels is 40.

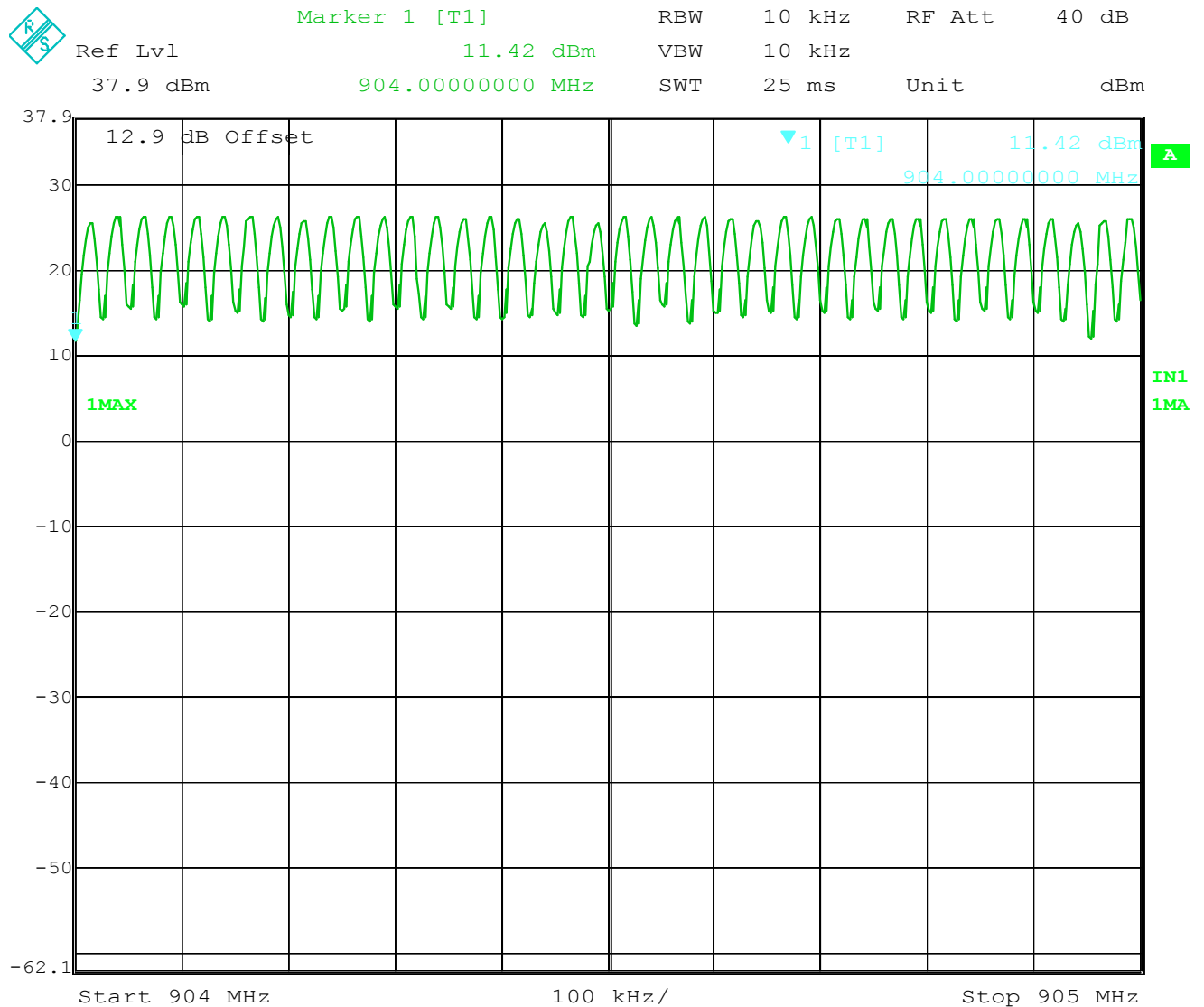
Number of Hopping Channels



Date: 9.MAR.2010 11:23:32

Figure 25. Frequency range 903 – 904 MHz. Total number of hopping channels is 40.

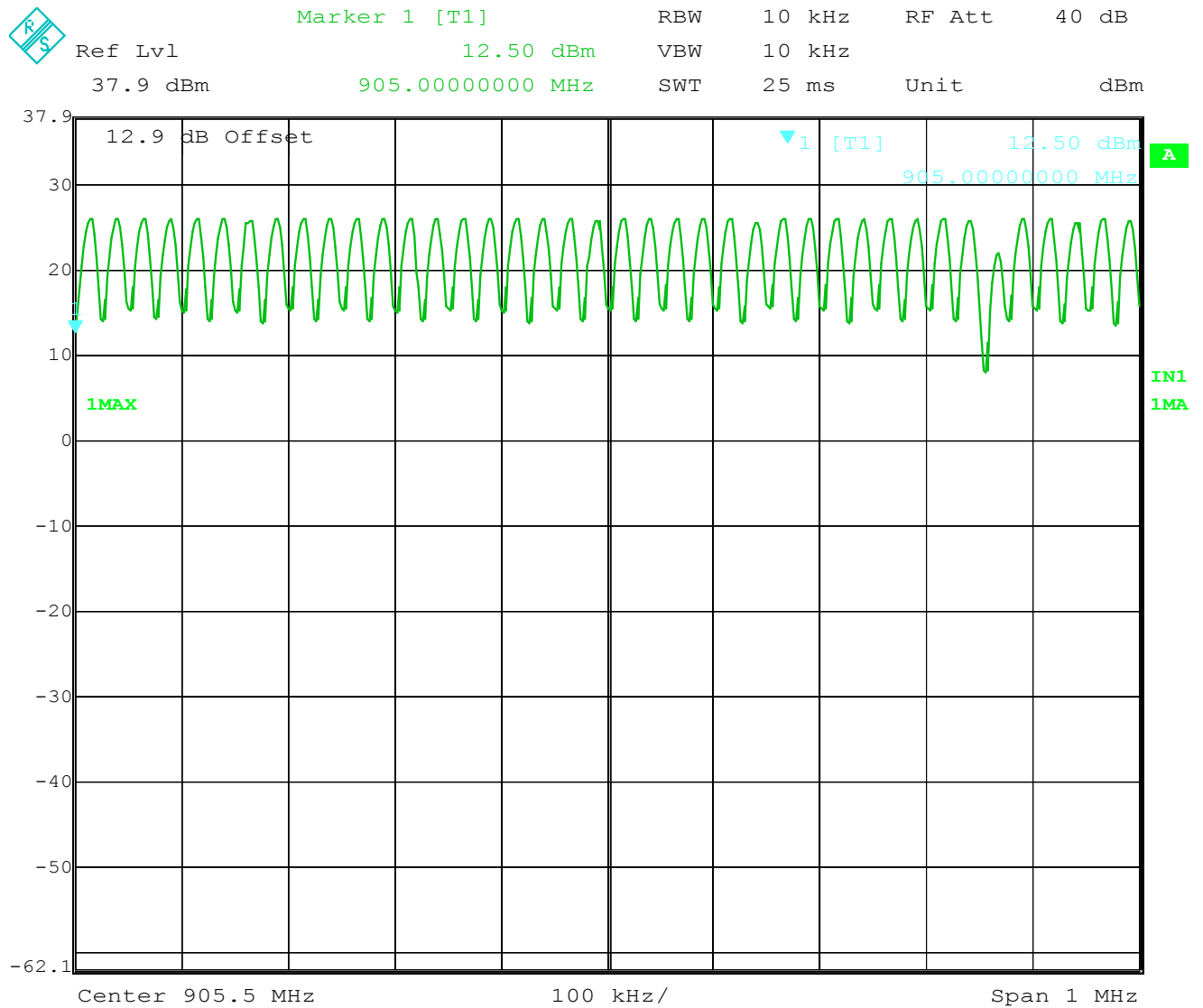
Number of Hopping Channels



Date: 9.MAR.2010 12:32:08

Figure 26. Frequency range 904 – 905 MHz. Total number of hopping channels is 40.

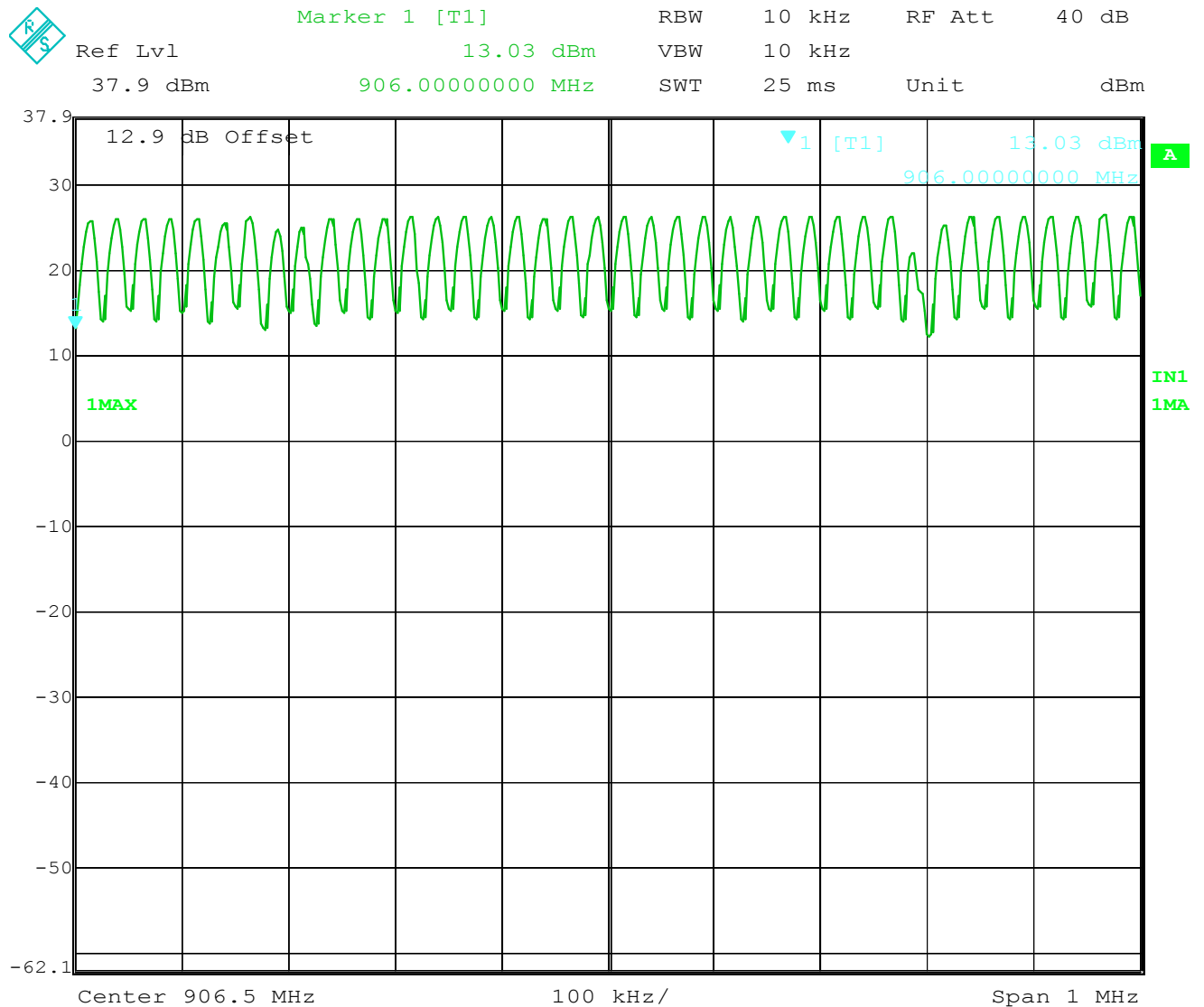
Number of Hopping Channels



Date: 9.MAR.2010 14:01:03

Figure 27. Frequency range 905 – 906 MHz. Total number of hopping channels is 40.

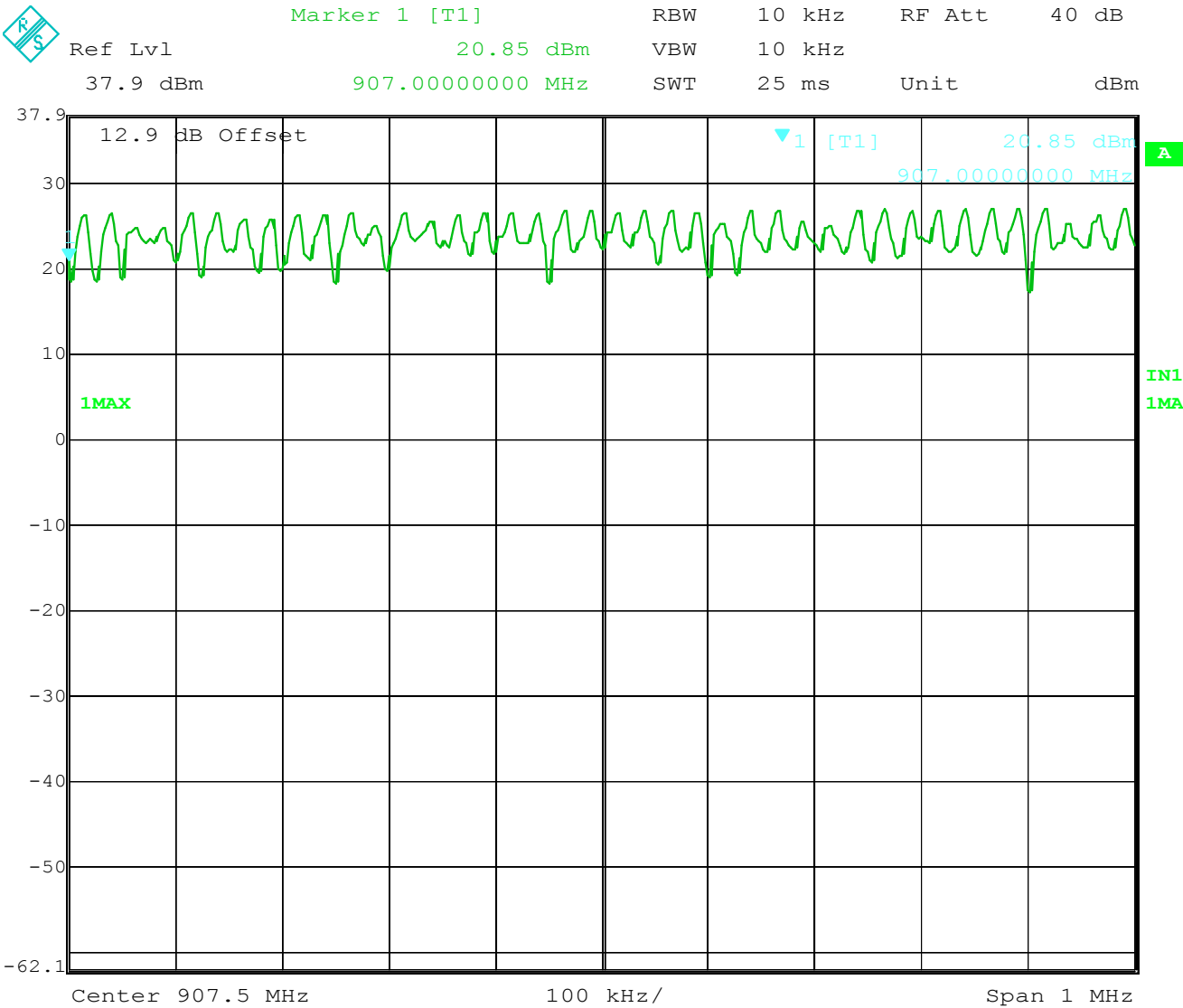
Number of Hopping Channels



Date: 9.MAR.2010 15:38:02

Figure 28. Frequency range 906 – 907 MHz. Total number of hopping channels is 40.

Number of Hopping Channels



Date: 10.MAR.2010 07:17:23

Figure 29. Frequency range 907 – 908 MHz. Total number of hopping channels is 40.

Number of Hopping Channels

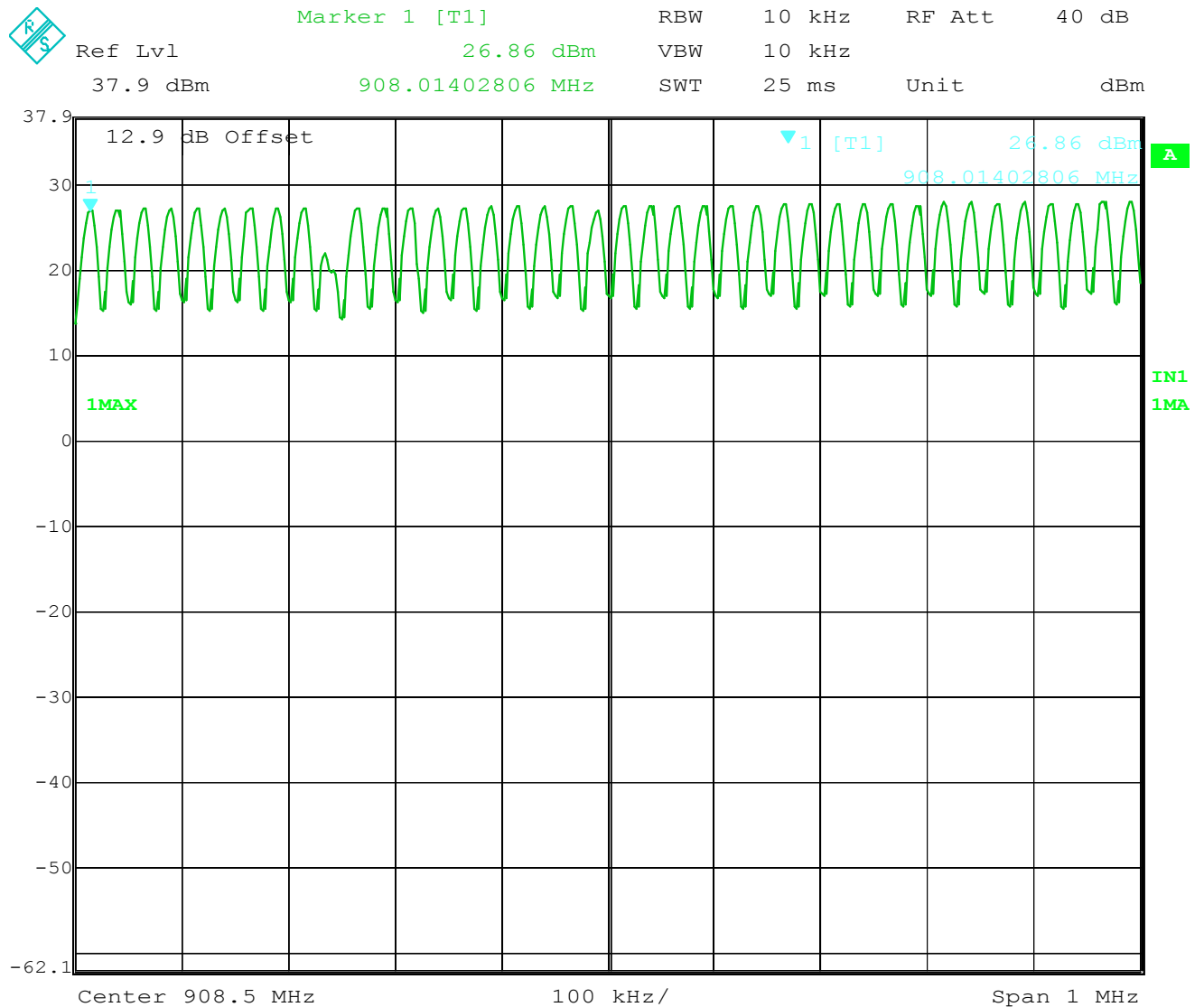


Figure 30. Frequency range 908 – 909 MHz. Total number of hopping channels is 40.

Number of Hopping Channels

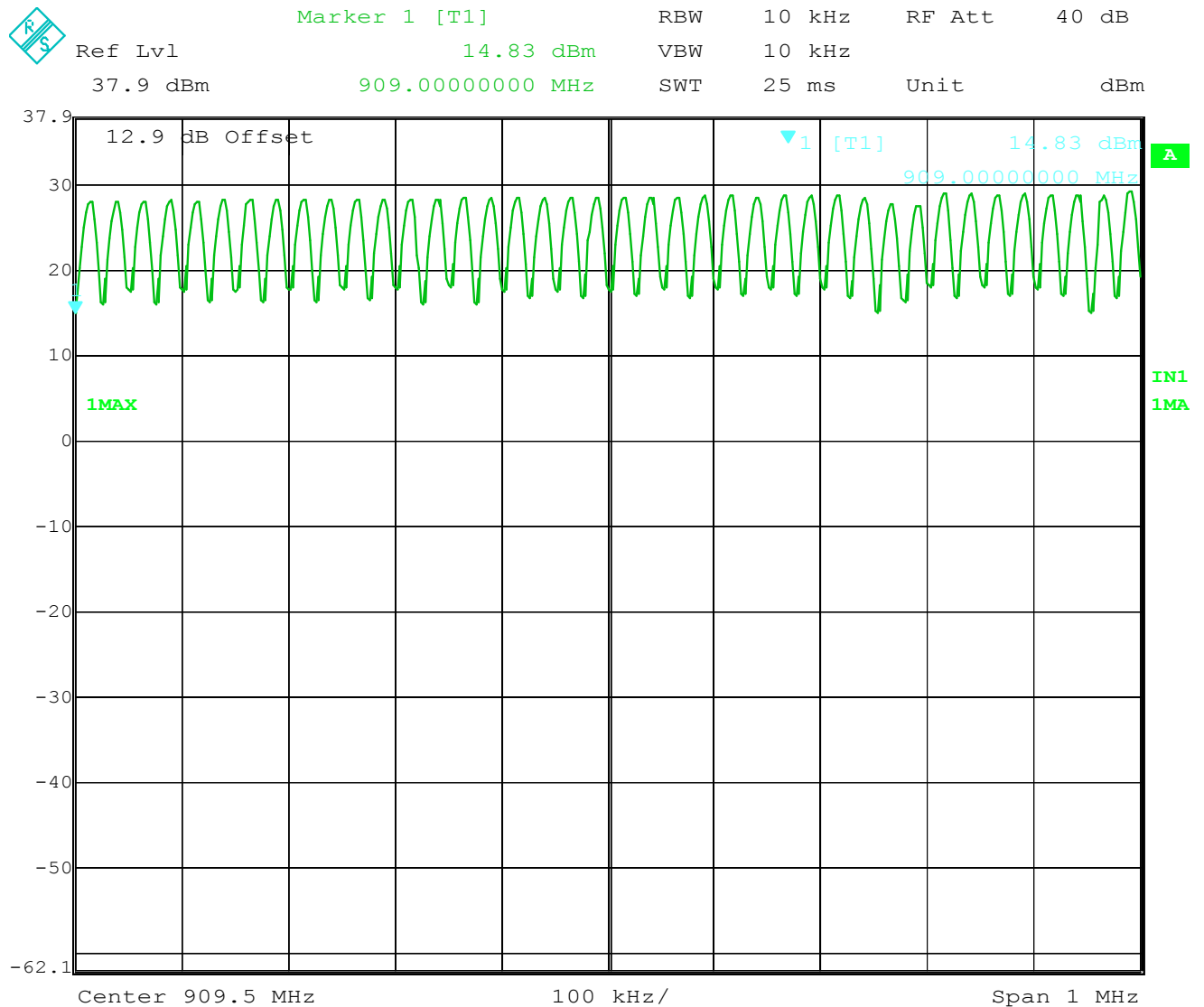
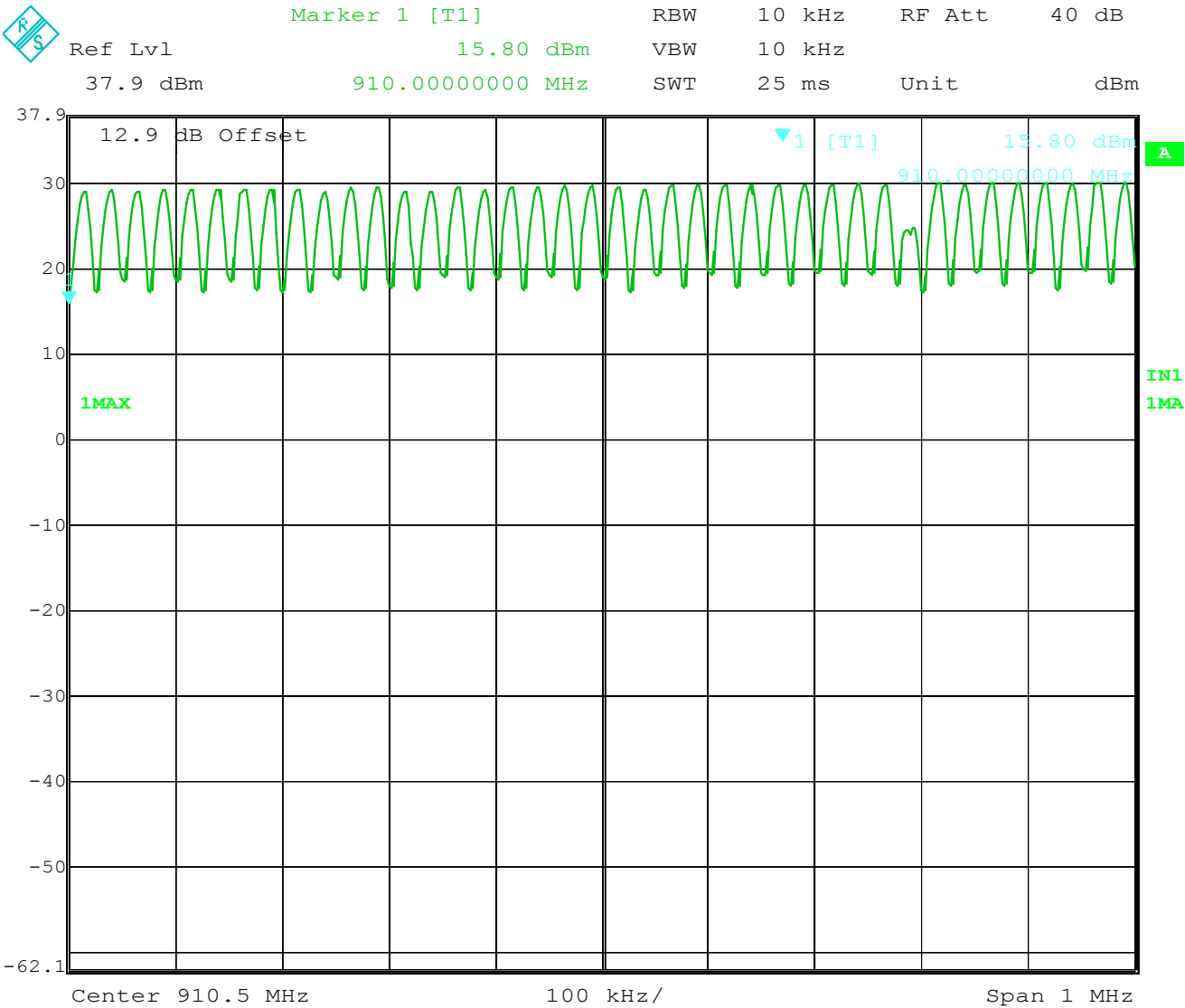


Figure 31. Frequency range 909 – 910 MHz. Total number of hopping channels is 40.



Date: 10.MAR.2010 13:28:19

Figure 32. Frequency range 910 – 911 MHz. Total number of hopping channels is 40.

Number of Hopping Channels

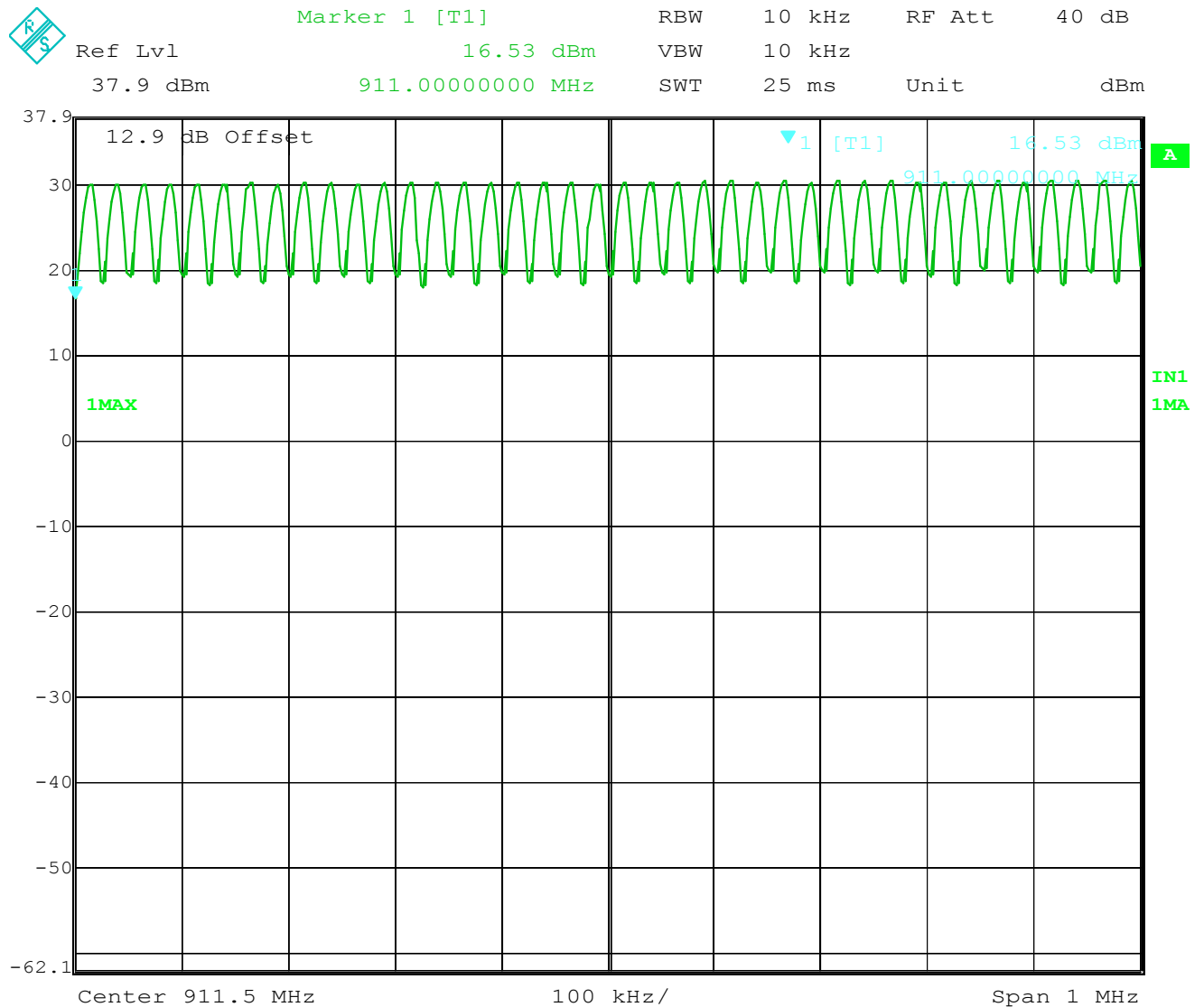
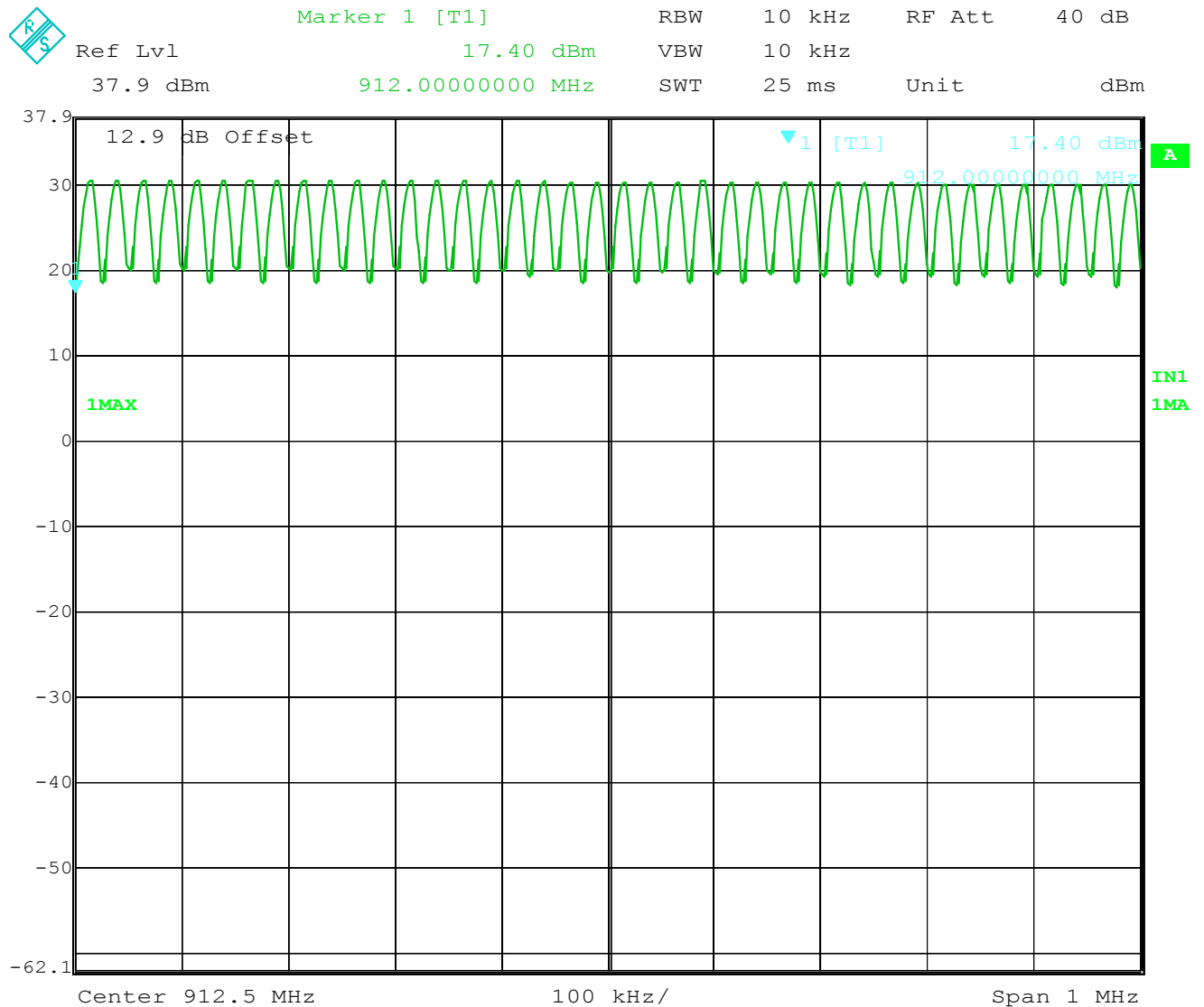


Figure 33. Frequency range 911 – 912 MHz. Total number of hopping channels is 40.

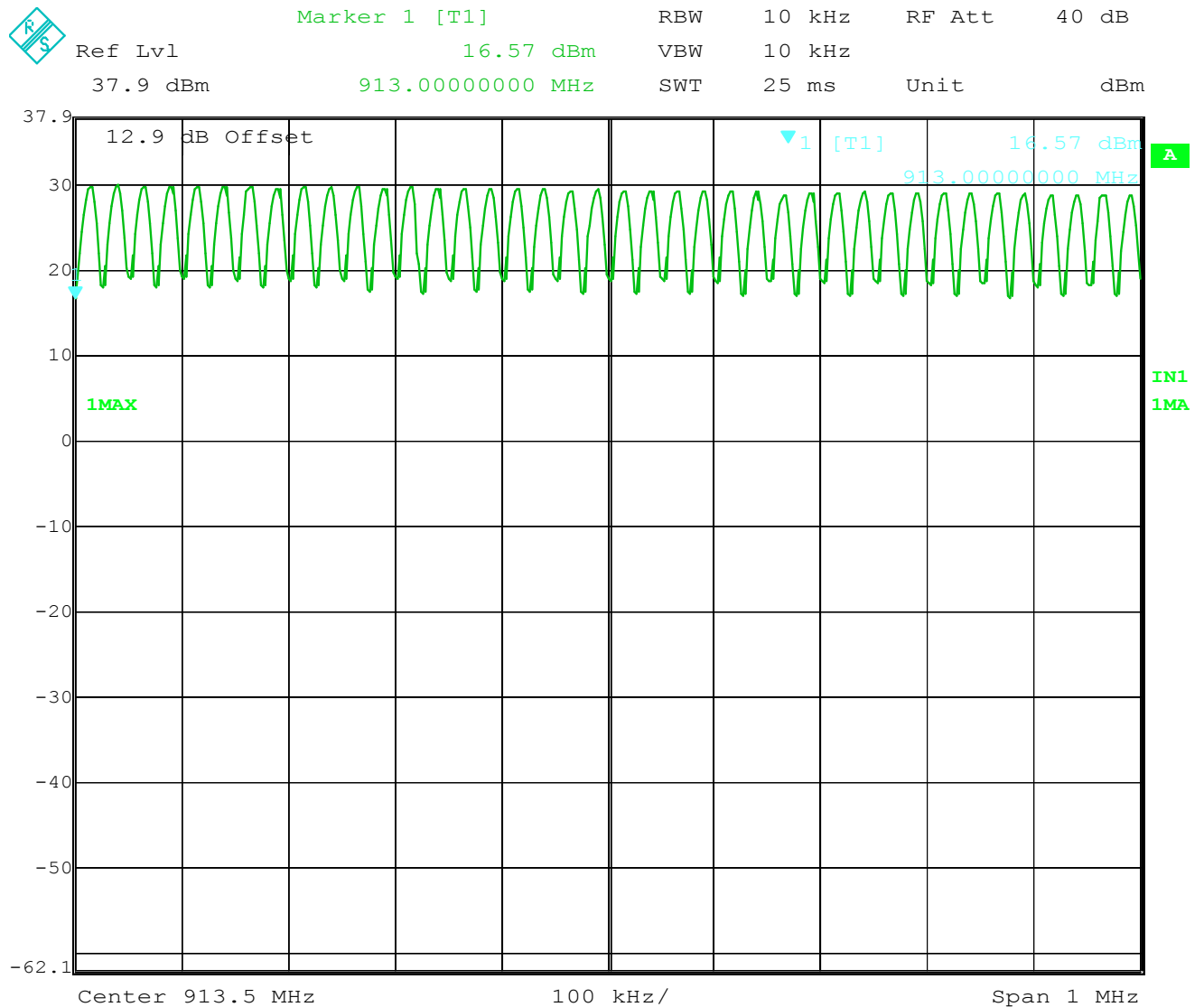
Number of Hopping Channels



Date: 11.MAR.2010 06:55:38

Figure 34. Frequency range 912 – 913 MHz. Total number of hopping channels is 40.

Number of Hopping Channels



Date: 12.MAR.2010 08:32:05

Figure 35. Frequency range 913 – 914 MHz. Total number of hopping channels is 40.

Number of Hopping Channels

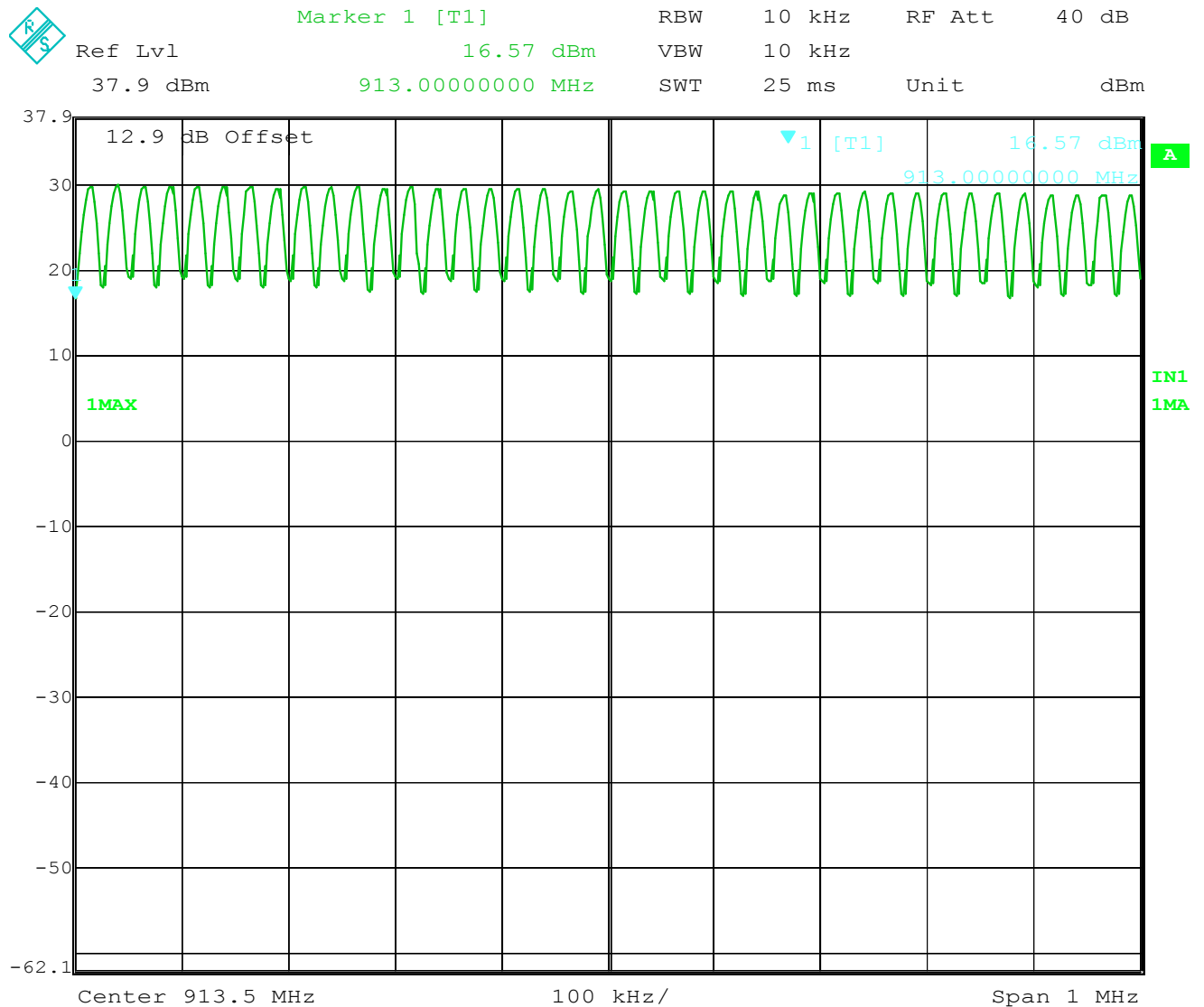


Figure 36. Frequency range 913 – 914 MHz. Total number of hopping channels is 40.

Number of Hopping Channels

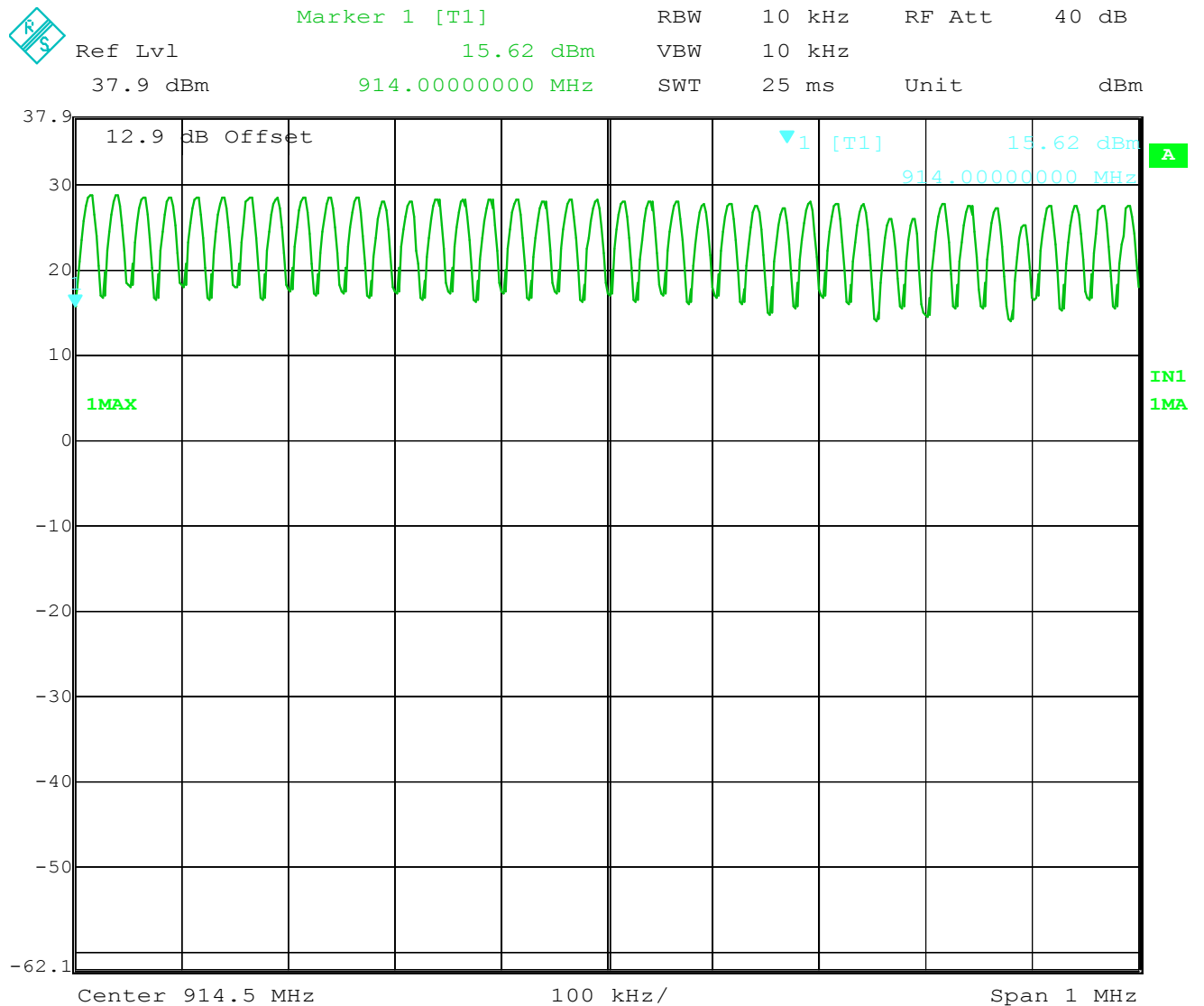


Figure 37. Frequency range 914 – 915 MHz. Total number of hopping channels is 40.

Number of Hopping Channels

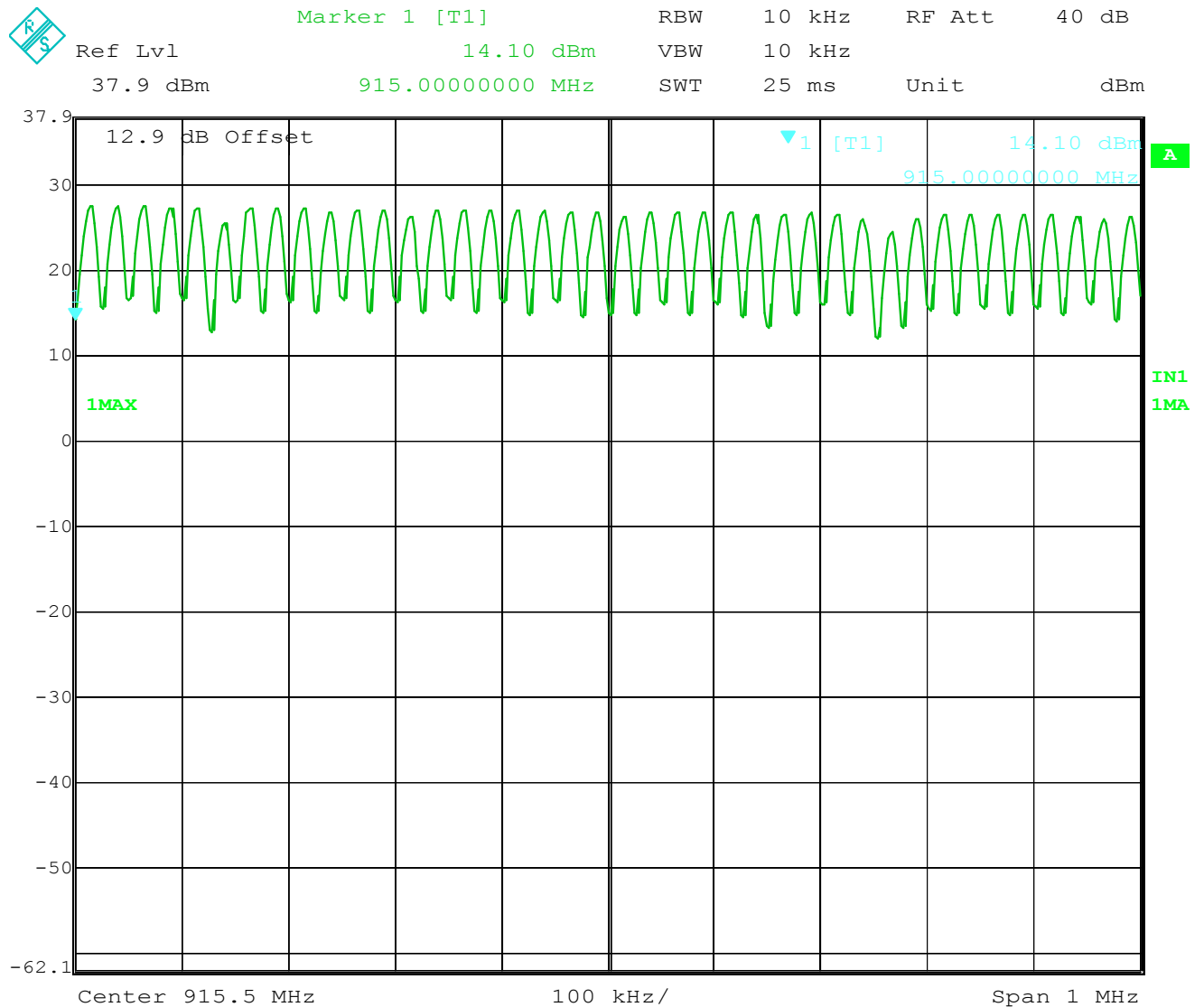


Figure 38. Frequency range 915 – 916 MHz. Total number of hopping channels is 40.

Average Time of Occupancy of Hopping Frequency

Standard:	ANSI C63.4	(2003)
Tested by:	JJM	
Date:	29.4.2010	
Humidity:	24 %	
Temperature:	23 °C	
Barometric pressure	1002 mbar	

FCC Rule: 15.247(a) (1) (i)

The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period.

Time of occupancy calculation:

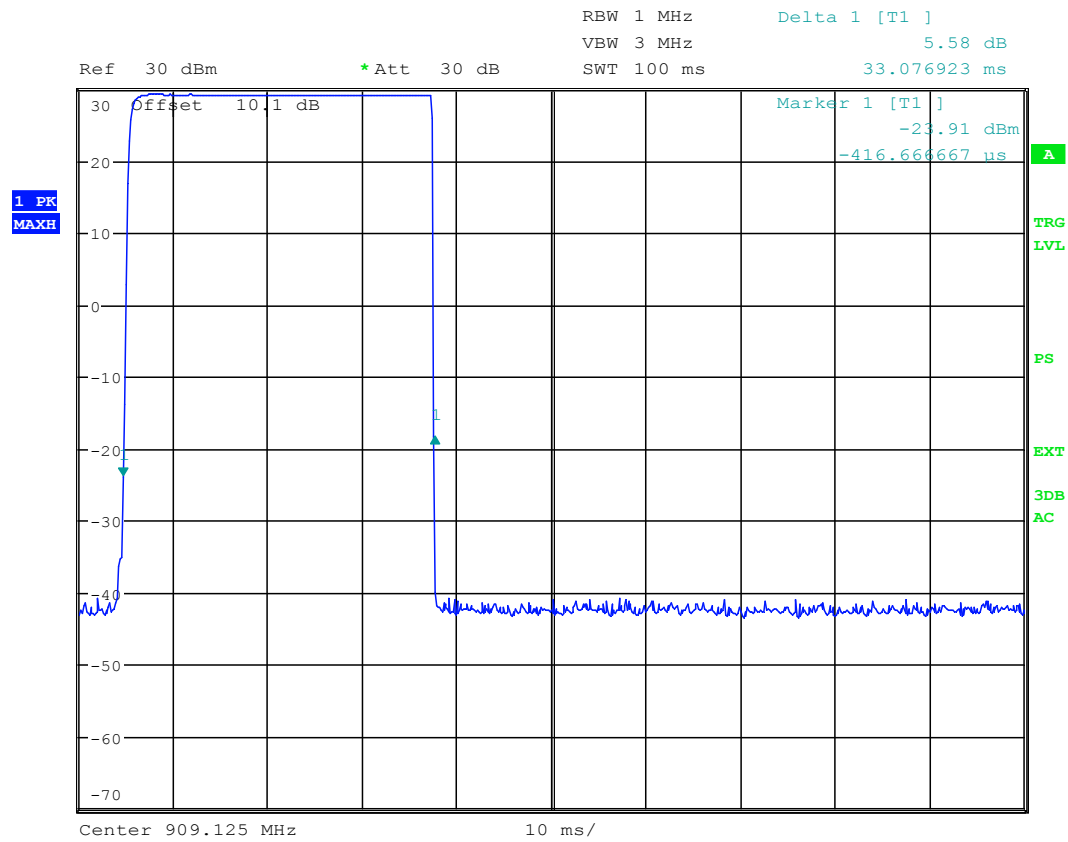
The minimum measured repetition of the channel occupancy (repetition) = 6 times in 20 sec

Single occupancy duration (single duration) = 33.1 ms

Period = 20 sec

Time of occupancy = (single duration) x (repetition) = 32.9ms x 1 times = 0.033 sec

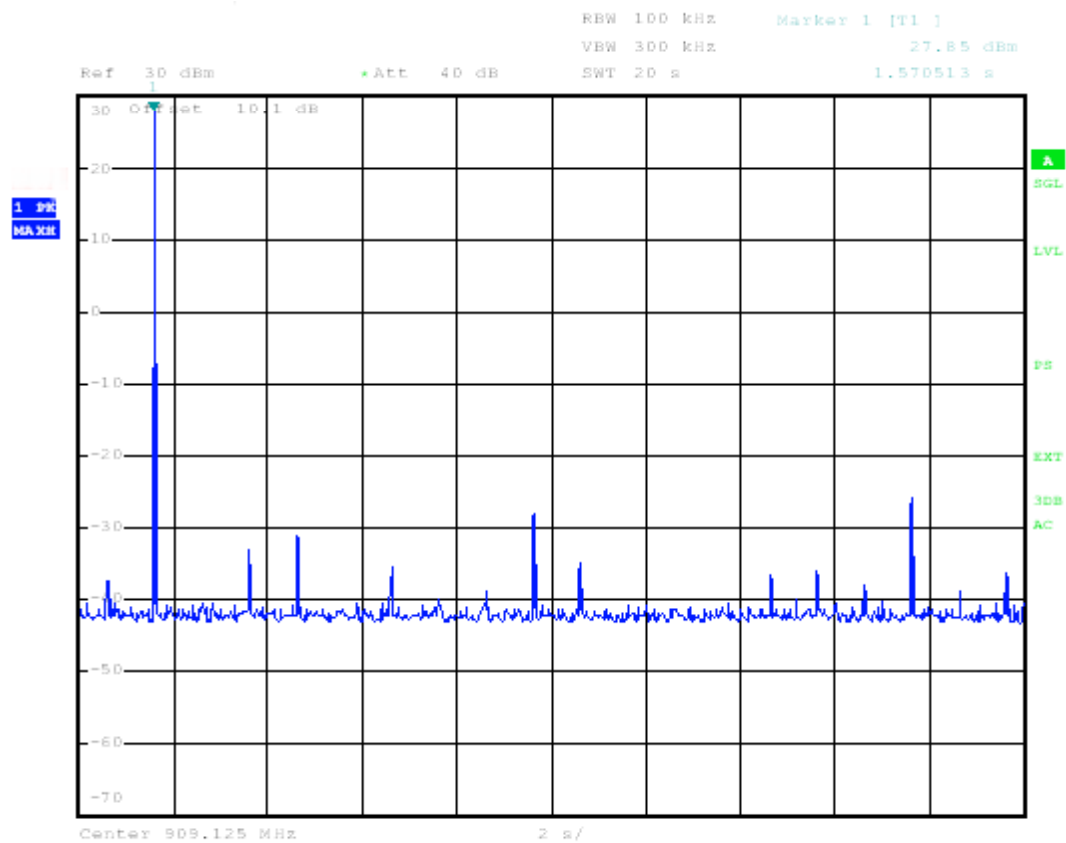
Average Time of Occupancy of Hopping Frequency



Date: 29.APR.2010 15:13:57

Figure 39. Measured single occupancy duration.

Average Time of Occupancy of Hopping Frequency



Date: 29.APR.2010 15:37:44

Figure 40. Measured repetition of the channel occupancy

List of test equipments

Manufacturer	Type	Serial no	Inv. no
ROHDE & SCHWARZ			
EMI Test receiver	ESIB 26	10093	5358
EMI Test receiver	ESU 26	100185	8453
Test software	EMC32	Ver. 8.30.0	-
DAVIS			
Weather station	Vantage Pro	-	5297
EMCO			
Antenna (30 MHz - 3 GHz)	3142C	00079895	7788
Antenna (1 - 18 GHz)	3117	29617	7293
HEWLETT- PACKARD			
Microwave amplifier	83017A	-	5226
HUBER-+ SUHNER			
Attenuator 6dB	6806.17B	-	-
DEISEL			
Antenna mast	MA 240 T	240/394/96	5017
Tilt option	KE 220	220/307/96	-
Controller	HD 100	100/413/96	5018
Turntable	DS 420	420/420/96	5015
WAINWRIGHT			
High Pass Filter	WHKX	10	8267