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INDUSTRY CANADA RSS-131 AND FCC PART 22H AND PART 24E TEST REPORT

Applicant	Wilson Electronics, Inc.
Address	3301 E. Deseret Drive St. George, Utah 84790 USA
FCC ID	PWO2B1225
IC Label	IC: 4726A-2B1225
Model Number	2B1225
Product Description	Dual-Band Bi-Directional Wireless Amplifier
Date Sample Received	1/4/2011
Date Tested	1/5/2011
Tested By	Nam Nguyen
Approved By	Mario de Aranzeta
Report No.	25AUT11TestReport.pdf
Test Results	☒ PASS ☐ FAIL

ACCREDITED
Test Certificate #0955-01

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ATTESTATION STATEMENT

Summary

The device under test does:
☒ fulfill the general approval requirements as identified in this test report
☐ not fulfill the general approval requirements as identified in this test report

This equipment has been tested in accordance with the standards identified in this test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report. All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025:2005 requirements.

ACCREDITED
Certificate # 0955-01

I attest that the necessary measurements were made, under my supervision, at TIMCO ENGINEERING, INC. located at 849 N.W. State Road 45, Newberry, Florida 32669.

Authorized Signatory:

TIMCO ENGINEERING INC.

Signature:

Mario de Aranzeta
Function: Engineer/Lab Supervisor

Date: February 4, 2011

REPORT SUMMARY

Disclaimer	The test results relate only to the items tested.
Report Purpose	To demonstrate the DUT comply with FCC Part 22H and Pt 24 and Industry Canada RS-131 requirements for a dual band signal amplifier.
Applicable Rule Part(s)	Pt 22, Pt 24, Pt 15.109, RSS-131
Test Procedure(s)	ANSI/TIA-603-C: 2004

TEST ENVIRONMENT

Test Facilities	All tests were performed by Timco Engineering Inc. located at 849 NW State Road 45 Newberry, FL 32669.
Test Conditions	Temperature: 26°C Relative Humidity: 50%

TEST SETUP

Deviation to the rules	There was no deviation from the test standards.
Modification to the DUT	No modification was made to the DUT.
Test Exercise (e.g. software description, test signal, etc.)	The DUT was placed in continuous transmit mode of operation.

DEVICE UNDER TEST INFORMATION

Manufactured by	Wilson Electronics
DUT Description	Dual-Band Bi-directional Wireless Amplifier
FCC ID	PWO2B1225
IC Label	IC: 4726A-2B1225
Model Name	2B1225
Operating Frequency	Uplink 824 – 849 MHz Downlink 869 – 894 MHz Uplink 1850 – 1910 MHz Downlink 1930 – 1990 MHz
Emission Designators	F9W (CDMA & WCDMA), GXW (GSM), G7W (EDGE)
Modulation(s)	CDMA, WCDMA, GSM, EDGE, HSPA, EVDO
User Power Range & Control	There are NO user power controls
Test Item	Pre-Production
DC Voltage and Current into final amplifier	Power Into Final Amplifier (uplink) Vcc = 4.5 Vdc, 0.8 A Power Input (downlink) Vcc= 4.5 Vdc, 0.2A
Type of Equipment	Fixed and Mobile

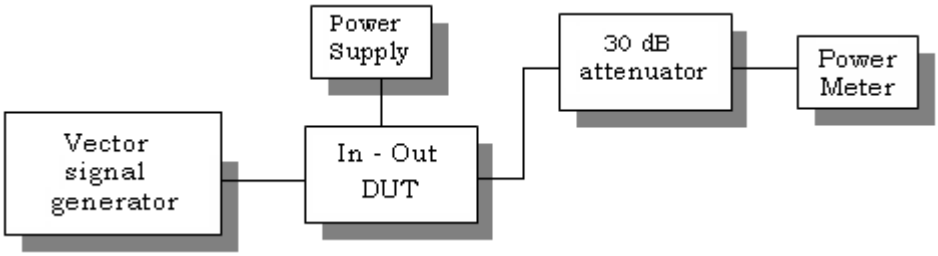
EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
3-Meter Semi-Anechoic Chamber	Panashield	N/A	N/A	Listed 3/10/10	3/10/12
AC Voltmeter	HP	400FL	2213A14499	CAL 3/23/09	3/23/11
Antenna: Dipole Kit	Electro-Metrics	TDA-30/1-4	153	CHAR 6/10/09	6/10/11
Frequency Counter	HP	5385A	3242A07460	CAL 5/26/09	5/26/11
Hygro-Thermometer	Extech	445703	0602	CAL 1/30/09	1/30/11
Modulation Analyzer	HP	8901A	3435A06868	CAL 5/26/09	5/26/11
Digital Multimeter	Fluke	FLUKE-77-3	79510405	CAL 5/18/09	5/18/11
Analyzer Tan Tower Preamplifier	HP	8449B-H02	3008A00372	CAL 11/21/09	11/21/11
Analyzer Tan Tower Quasi-Peak Adapter	HP	85650A	3303A01690	CAL 11/22/09	11/22/11
Analyzer Tan Tower RF Preselector	HP	85685A	3221A01400	CAL 11/21/09	11/21/11
Analyzer Tan Tower Spectrum Analyzer	HP	8566B Opt 462	3138A07786 3144A20661	CAL 11/24/09	11/24/11
Temperature Chamber	Tenney Engineering	TTRC	11717-7	CHAR 4/25/10	4/25/12

TEST PROCEDURE

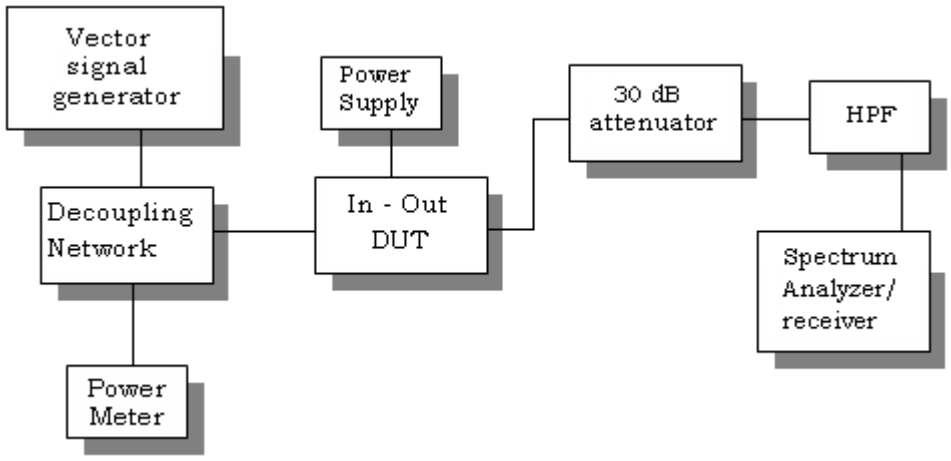
RF Power Output
RF power is measured by connecting a 50-ohm, resistive wattmeter to the RF output connector. With a nominal voltage and the amplifier properly adjusted the RF output measures.

RF Output Power Test Setup Diagram



Input/Output Modulated Amplitude Comparison and Band-Edges Compliance
On the following plot, the reference level was calibrated using a resolution bandwidth wider than the emission bandwidth. First the gain was measured for the maximum output power. Then for each frequency and type of modulation, an attenuation equals to the gain of the amplifier was added on the measurement side of the amplifier, as to overlay the input versus output modulated envelope.

Test Setup Diagram



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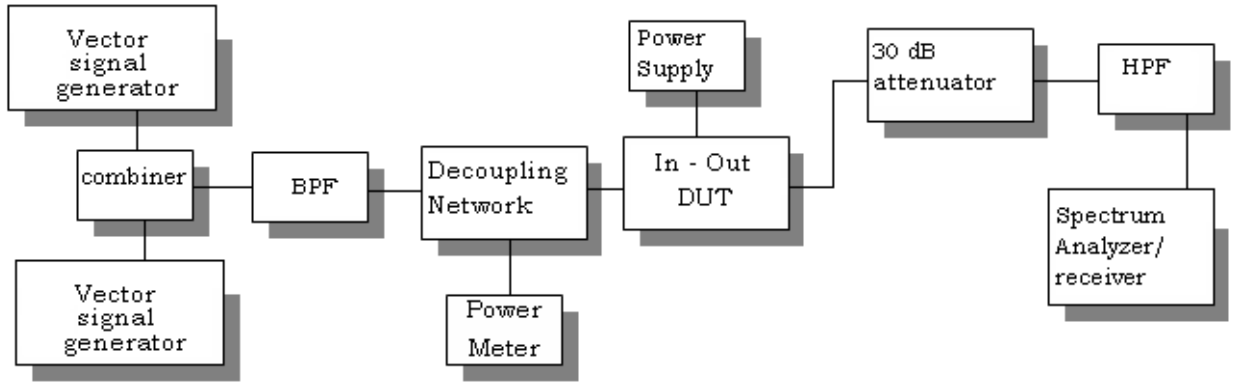
Intermodulation Product Spurious Emissions
The procedure used was ANSI/TIA-603-C: 2004. The spectrum was scanned from 9 kHz to at least the tenth harmonic of the fundamental using a HP 8566B spectrum analyzer.

The modulation type was tested using the two-tone / three tone test method. The input power to the amplifier was set at maximum drive level by combining the two tones. The two tones were chosen in such a way (1) the third order intermodulation product frequencies are located within the pass band of the DUT and (2) they produce the worst-case emissions out of band.

Setup Diagram

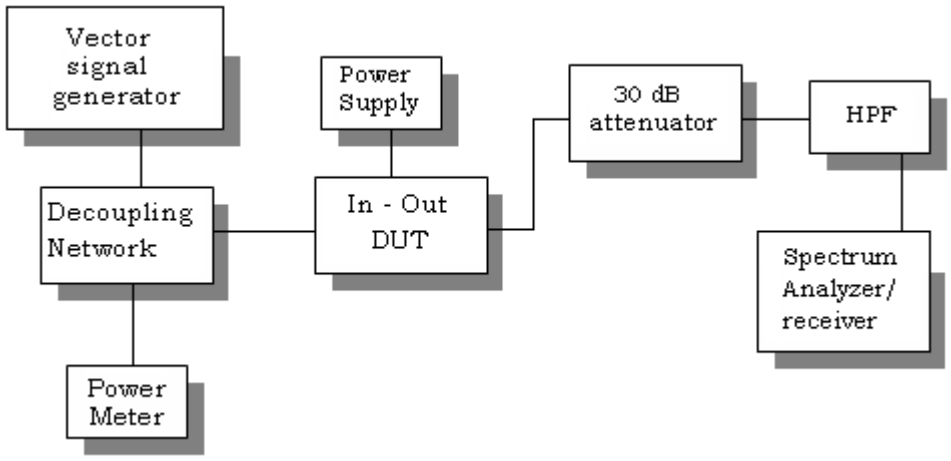


Spurious Emissions at Antenna Terminals
The procedure used was ANSI/TIA-603-C: 2004. The spectrum was scanned from 9 kHz to at least the tenth harmonic of the fundamental using a HP model 8566B spectrum analyzer.

Data on the following page shows the level of conducted spurious responses. For analog modulation, the carrier was modulated 100% using a 2500 Hz tone. For digital modulation, the carrier is modulated to its maximum extent. The spectrum was scanned from 9 kHz to at least the 10th harmonic of the fundamental. The measurements were made in accordance with standard ANSI/TIA-603-C: 2004. The maximum input power was set for each test.

[Continued]

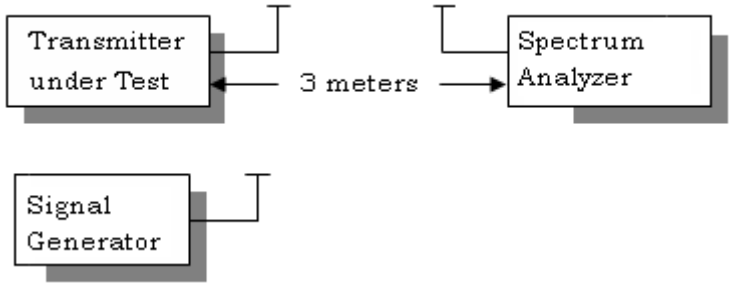
Conducted Spurious Emissions Test Setup Diagram



Radiated Spurious Emissions

The spectrum was scanned from 30 MHz to at least the tenth harmonic of the fundamental. The CW signal was used to perform this test. This test was conducted per ANSI/TIA-603-C: 2004 using the substitution method.

Radiated Spurious Emissions Test Setup Diagram



Equipment placed 80 cm above ground on a rotating table platform.

RF POWER OUTPUT (CONDUCTED)

Rule Part(s) No.: Pt 2.1046(a)

Requirements: Pt 2.1046(a)

Test Result: As the following table indicates. Notes: the maximum power output value was obtained with CDMA modulation at 1868MHz and 1940MHz.

Test Data Table 1 – Output Power – CDMA 1900 – Uplink/Downlink

Tuned Frequency (MHz)	Power Input (dBm)	Power Output (dBm)	Power Output (mW)	Tuned Frequency (MHz)	Power Input (dBm)	Power Output (dBm)	Power Output (mW)
1851.25	7.8	31.9	1549	1931.25	-19.3	0.2	1.0
1880.00	9.9	32.7	1862	1960.00	-20.9	0.7	1.2
1908.75	6.9	31.9	1549	1988.75	-19.3	1.5	1.4

Test Data Table 2 – Output Power – EDGE 1900 – Uplink/Downlink

Tuned Frequency (MHz)	Power Input (dBm)	Power Output (dBm)	Power Output (mW)	Tuned Frequency (MHz)	Power Input (dBm)	Power Output (dBm)	Power Output (mW)
1850.20	9.1	27.7	589	1930.20	-20.9	-2.9	0.5
1880.00	8.4	28.9	776	1960.00	-22.1	-1.5	0.7
1909.80	9.2	28.3	676	1989.80	-22.1	-2.4	0.6

Test Data Table 3 – Output Power – GSM 1900 – Uplink/Downlink

Tuned Frequency (MHz)	Power Input (dBm)	Power Output (dBm)	Power Output (mW)	Tuned Frequency (MHz)	Power Input (dBm)	Power Output (dBm)	Power Output (mW)
1850.20	10.4	27.9	617	1930.20	-21.1	-3.2	0.5
1880.00	8.1	29.0	794	1960.00	-21.7	-1.5	0.7
1909.80	9.2	28.5	708	1989.80	-21.3	-1.9	0.6

Test Data Table 4 – Output Power – WCDMA 1900 – Uplink/Downlink

Tuned Frequency (MHz)	Power Input (dBm)	Power Output (dBm)	Power Output (mW)	Tuned Frequency (MHz)	Power Input (dBm)	Power Output (dBm)	Power Output (mW)
1852.80	6.2	30.6	1148	1932.80	-26.5	-2.9	0.5
1880.00	6.2	32.4	1738	1960.00	-26.6	-2.0	0.6
1907.20	5.8	32.0	1585	1987.20	-26.7	-2.0	0.6

[Continued]

Test Data Table 5 – Output Power – CDMA 800 – Uplink/Downlink

Tuned Frequency (MHz)	Power Input (dBm)	Power Output (dBm)	Power Output (mW)
825.25	7.4	29.9	977
836.50	7.0	30.0	1000
847.75	8.4	29.1	813

Tuned Frequency (MHz)	Power Input (dBm)	Power Output (dBm)	Power Output (mW)
870.25	-21.6	-3.5	0.4
881.50	-21.2	-3.2	0.5
892.75	-22.1	-3.2	0.5

Test Data Table 6 – Output Power – EDGE 800 – Uplink/Downlink

Tuned Frequency (MHz)	Power Input (dBm)	Power Output (dBm)	Power Output (mW)
824.20	7.7	28.0	631
836.50	7.6	28.3	676
848.80	9.5	27.9	617

Tuned Frequency (MHz)	Power Input (dBm)	Power Output (dBm)	Power Output (mW)
869.20	-21.3	-4.0	0.4
881.50	-22.2	-3.9	0.4
893.80	-21.5	-3.3	0.5

Test Data Table 7 – Output Power – GSM 800 – Uplink/Downlink

Tuned Frequency (MHz)	Power Input (dBm)	Power Output (dBm)	Power Output (mW)
824.20	5.8	28.4	692
836.50	8.4	29.4	871
848.80	7.7	28.8	759

Tuned Frequency (MHz)	Power Input (dBm)	Power Output (dBm)	Power Output (mW)
869.20	-21.0	-3.1	0.5
881.50	-21.2	-3.2	0.5
893.80	-21.0	-2.4	0.6

Test Data Table 8 – Output Power – WCDMA 800 – Uplink/Downlink

Tuned Frequency (MHz)	Power Input (dBm)	Power Output (dBm)	Power Output (mW)
826.80	5.3	30.7	1175
836.50	6.2	31.5	1413
846.20	6.5	29.6	912

Tuned Frequency (MHz)	Power Input (dBm)	Power Output (dBm)	Power Output (mW)
871.80	-24.9	-4.0	0.4
881.50	-23.9	-3.8	0.4
891.20	-24.0	-3.9	0.4

INPUT/OUTPUT MODULATED AMPLITUDE COMPARISON AND BAND-EDGES COMPLIANCE

Rule Parts No.: Pt 2.1049, Pt 2.1051, 22H, 24E

Requirements: The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

Test Data: The DUT appears to meet the requirements.

Bandedge compliance: Measurements were performed in accordance with Part 24.238

The Reference level on the following plots was calibrated using a 3MHz RBW=VBW.

Compensating for RBW (1%) using 10 log (12.5/3) = 6.2 dB we get the following amplitudes at the bandedge:

Test Data Table 9 – CDMA/EVDO 1900 – Uplink/Downlink

Channel (MHz)	Bandedge Frequency (MHz)	Amplitude bandedge (dBm)	Limit (dBm)	Margin (dB)
1851.25	**1849.95**	**-16.29**	**-13**	**3.29**
1908.75	**1910.08**	**-17.64**	**-13**	**4.64**
1931.25	**1929.95**	**-44.01**	**-13**	**31.01**
1988.75	**1990.14**	**-44.87**	**-13**	**31.87**

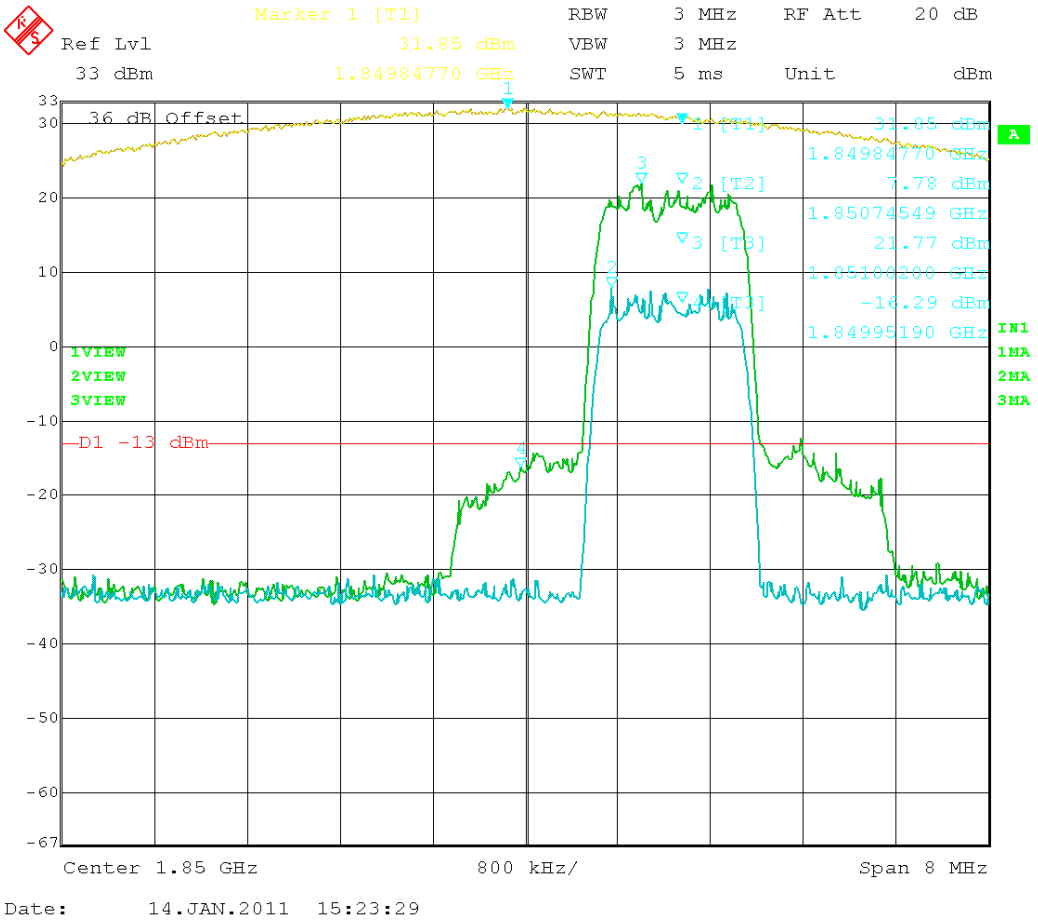


Figure 1: CDMA – In vs. Out 1851.25MHz

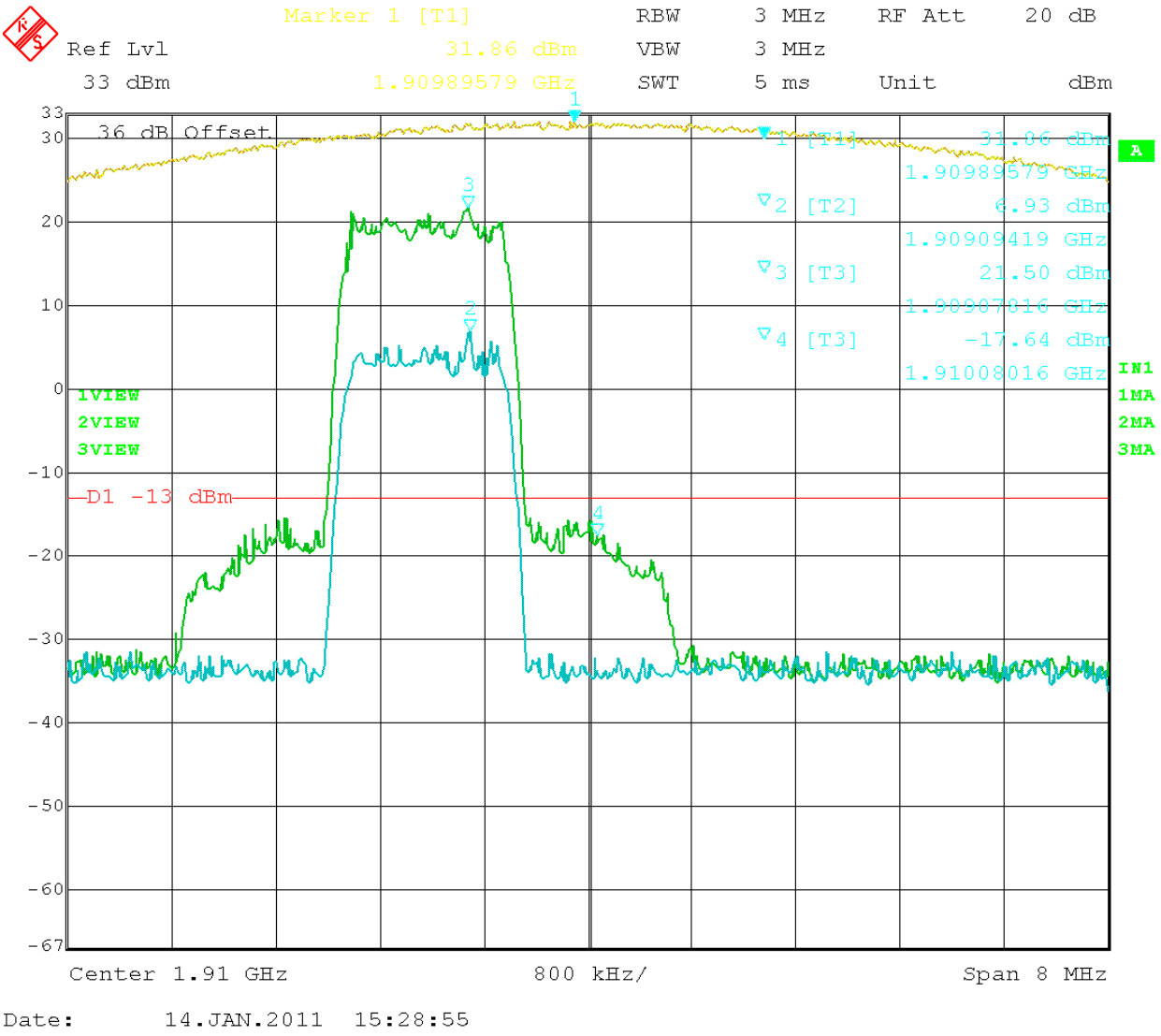


Figure 2: CDMA – In vs. Out 1908.75MHz

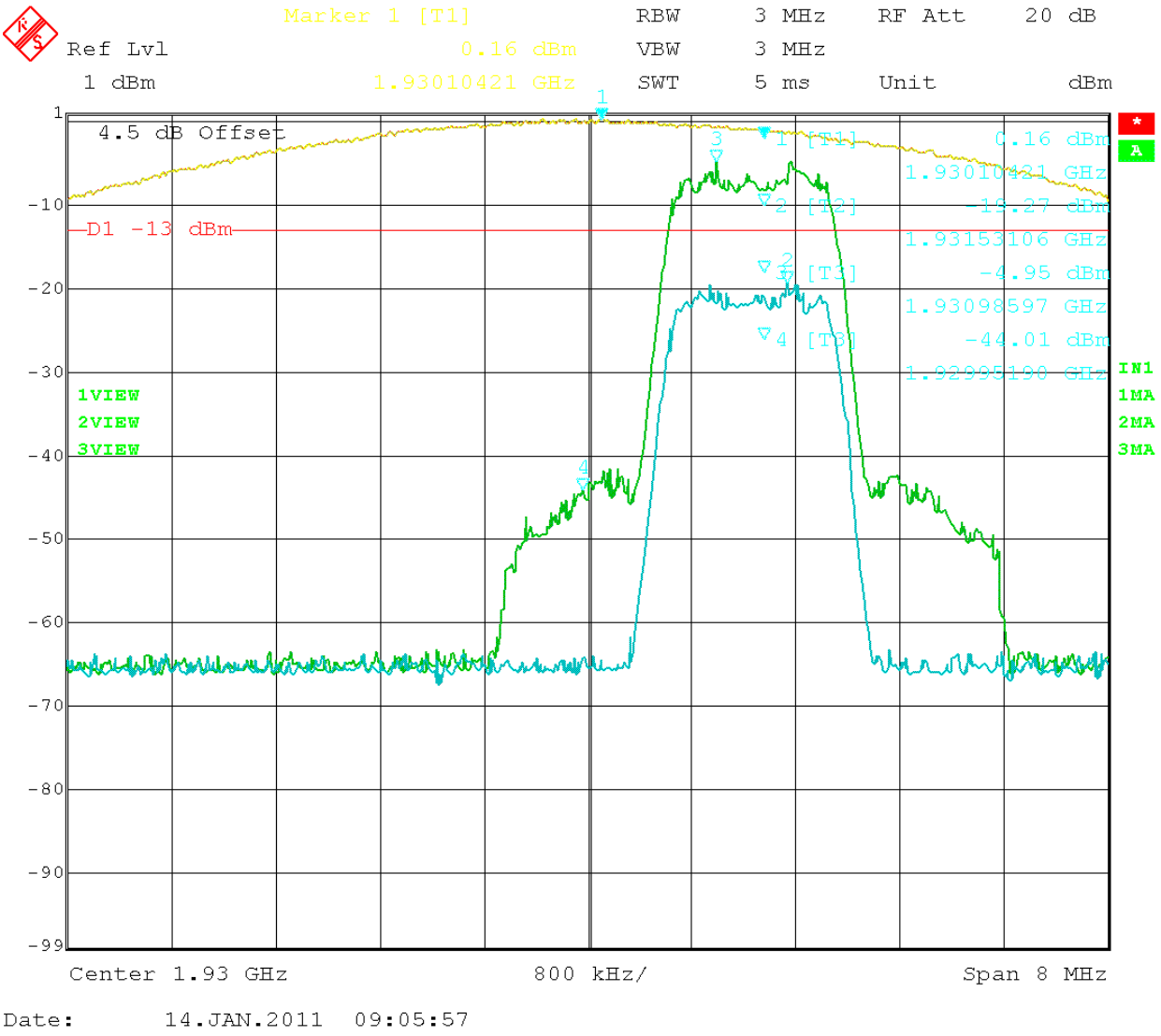


Figure 3: CDMA – In vs. Out 1931.25MHz

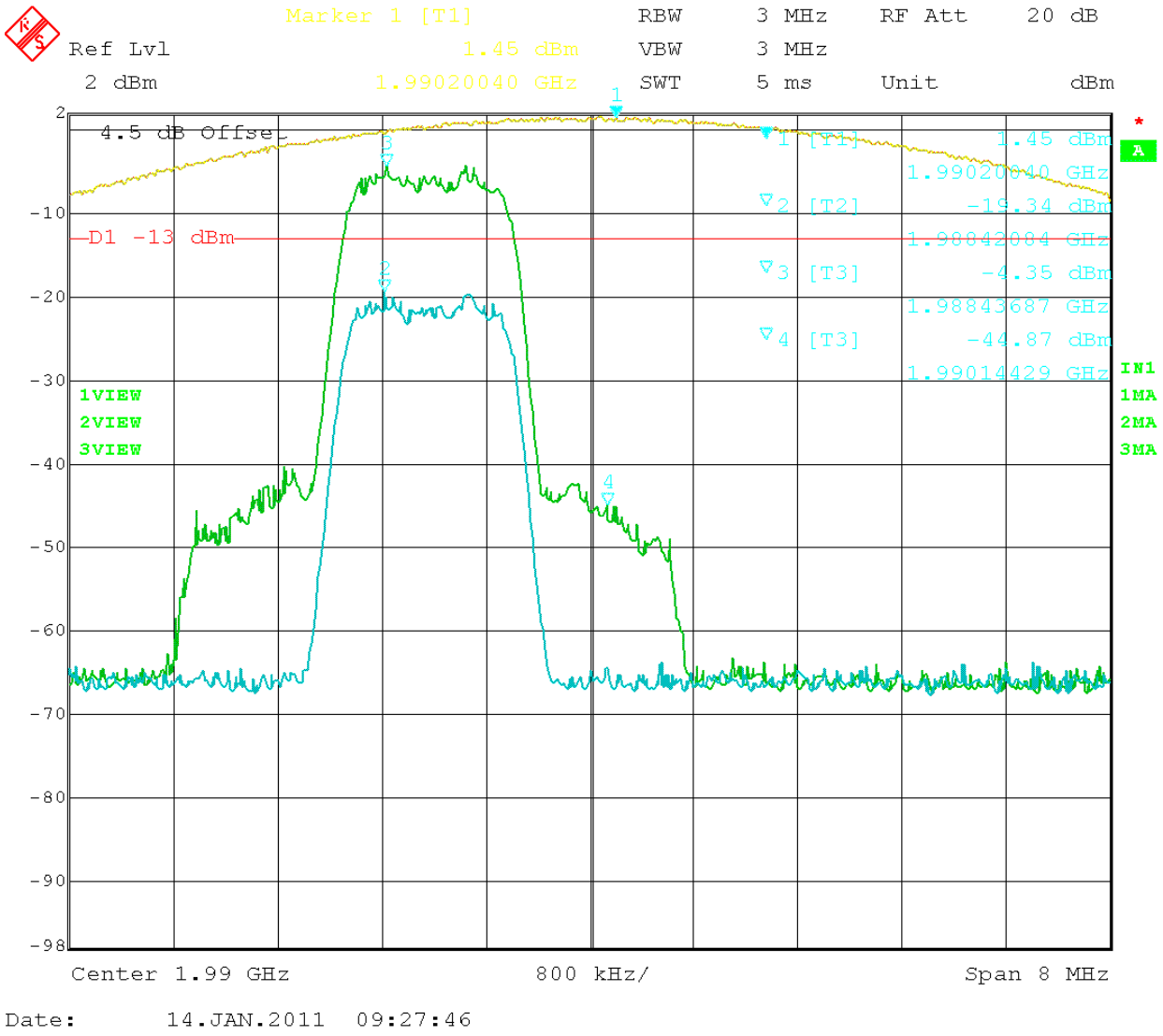


Figure 4: CDMA – In vs. Out 1988.75MHz

Test Data Table 10 – WCDMA/HSPA 1900 – Uplink/Downlink

Channel (MHz)	Bandedge Frequency (MHz)	Amplitude bandedge (dBm)	Limit (dBm)	Margin (dB)
1852.8	1849.62	-14.87	-13	1.87
1907.2	1910.80	-14.06	-13	1.06
1932.8	1929.96	-47.61	-13	34.61
1987.2	1990.28	-48.04	-13	35.04

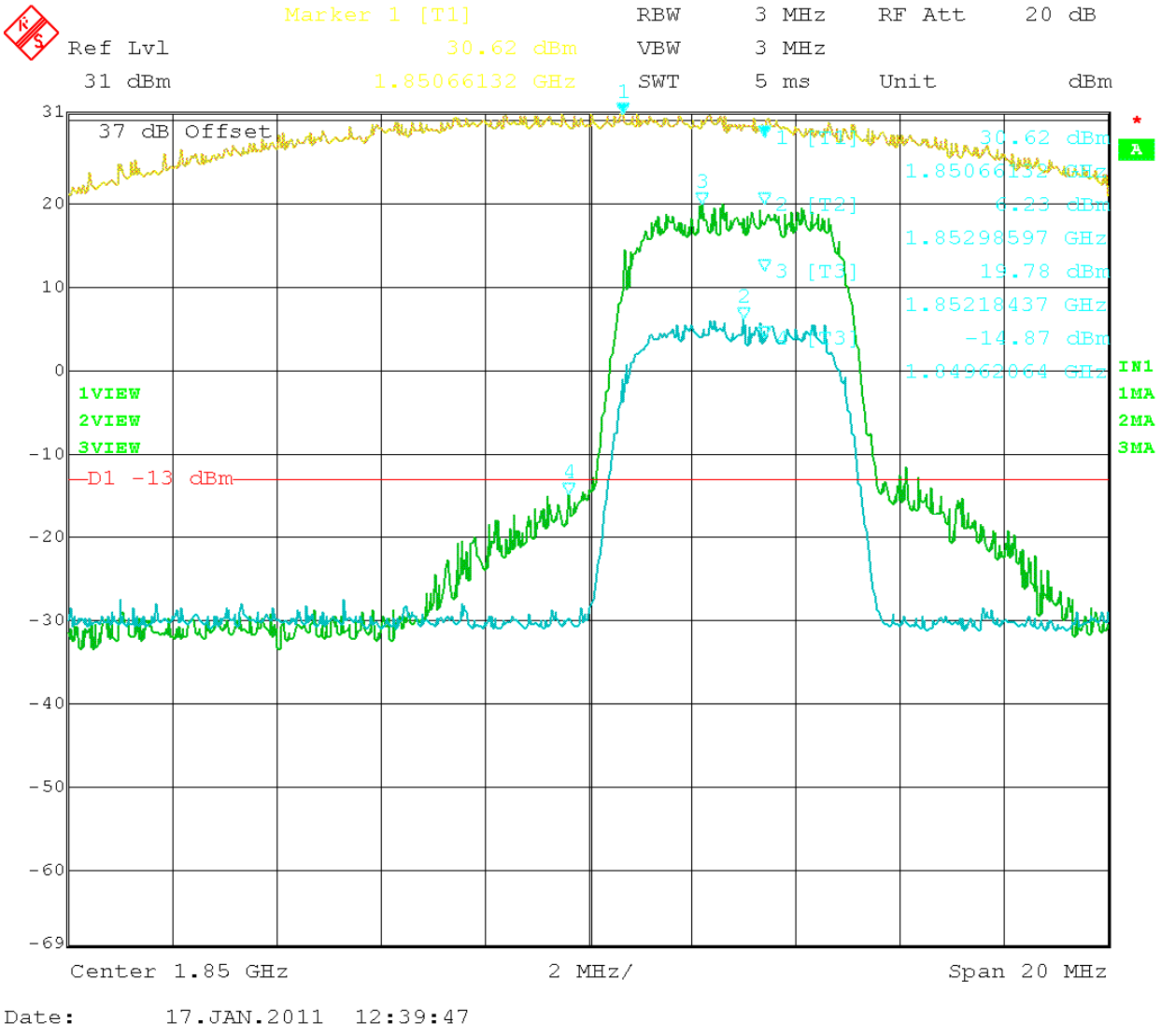


Figure 5: WCDMA – In vs. Out 1852.80 MHz

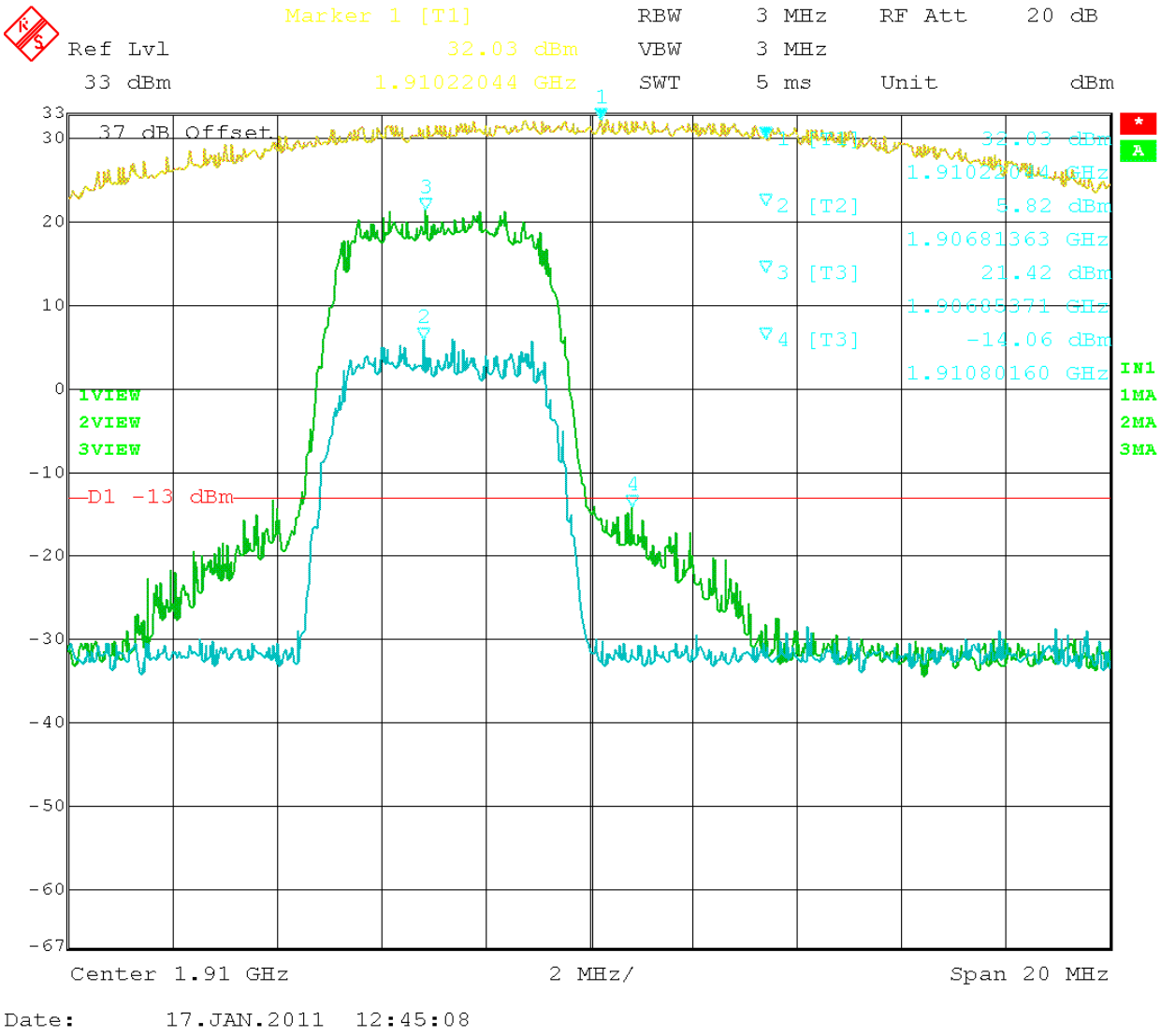


Figure 6: WCDMA – In vs. Out 1907.20 MHz

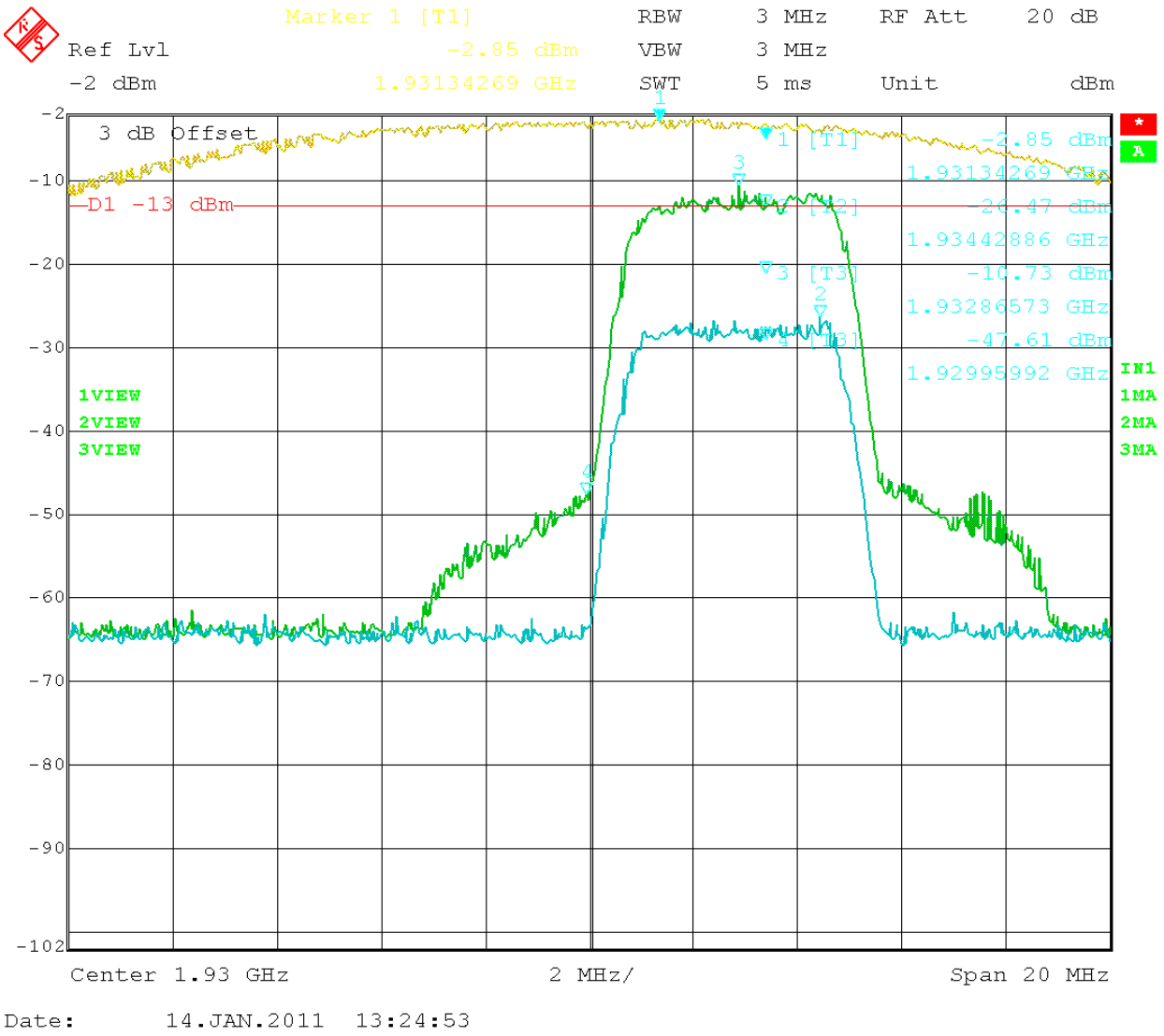


Figure 7: WCDMA – In vs. Out 1932.80 MHz

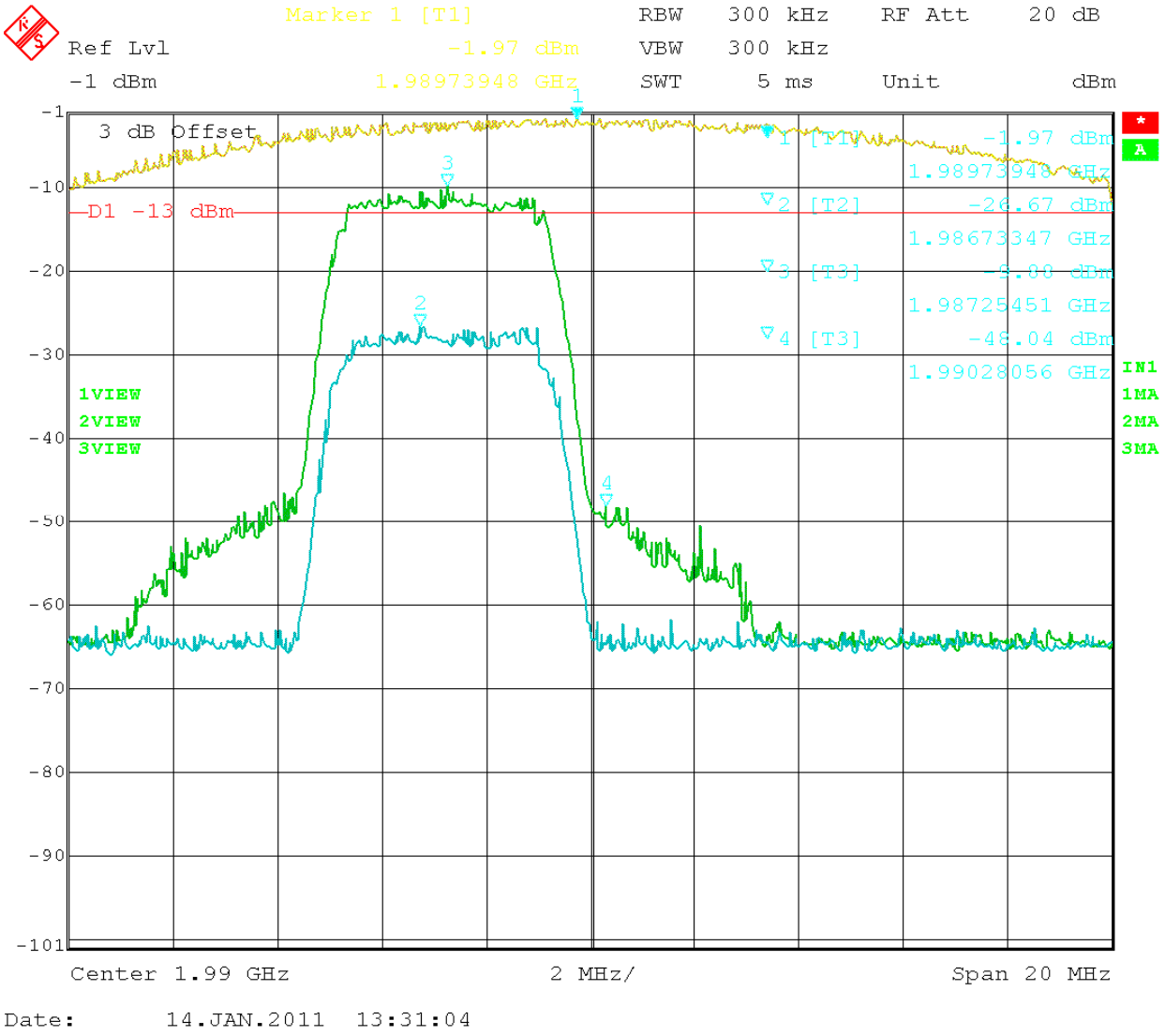


Figure 8: WCDMA – In vs. Out 1977.20 MHz

Test Data Table 11 – EDGE 1900 – Uplink/Downlink

Channel (MHz)	Band-edge Frequency (MHz)	Amplitude level at the band-edge (dBm)	Limit (dBm)	Margin (dB)
1850.2	**1849.98**	**-13.43**	**-13**	**0.43**
1909.8	**1910.02**	**-15.26**	**-13**	**2.26**
1930.2	**1929.98**	**-44.95**	**-13**	**31.95**
1989.8	**1990.02**	**-48.38**	**-13**	**35.38**

The Reference level on the following plots was calibrated using a 3MHz RBW=VBW.

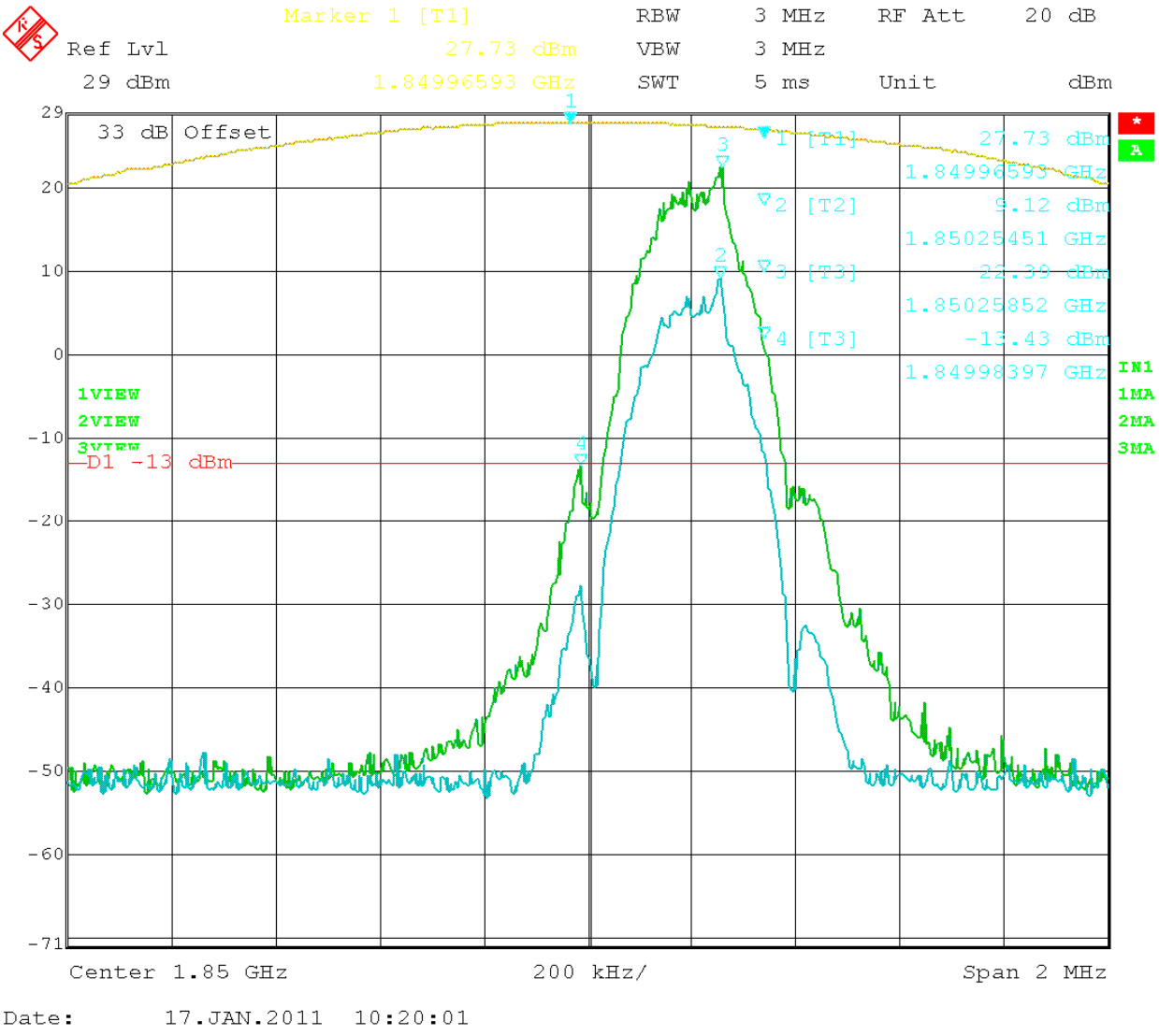


Figure 9: EDGE – In vs. Out 1850.20MHz

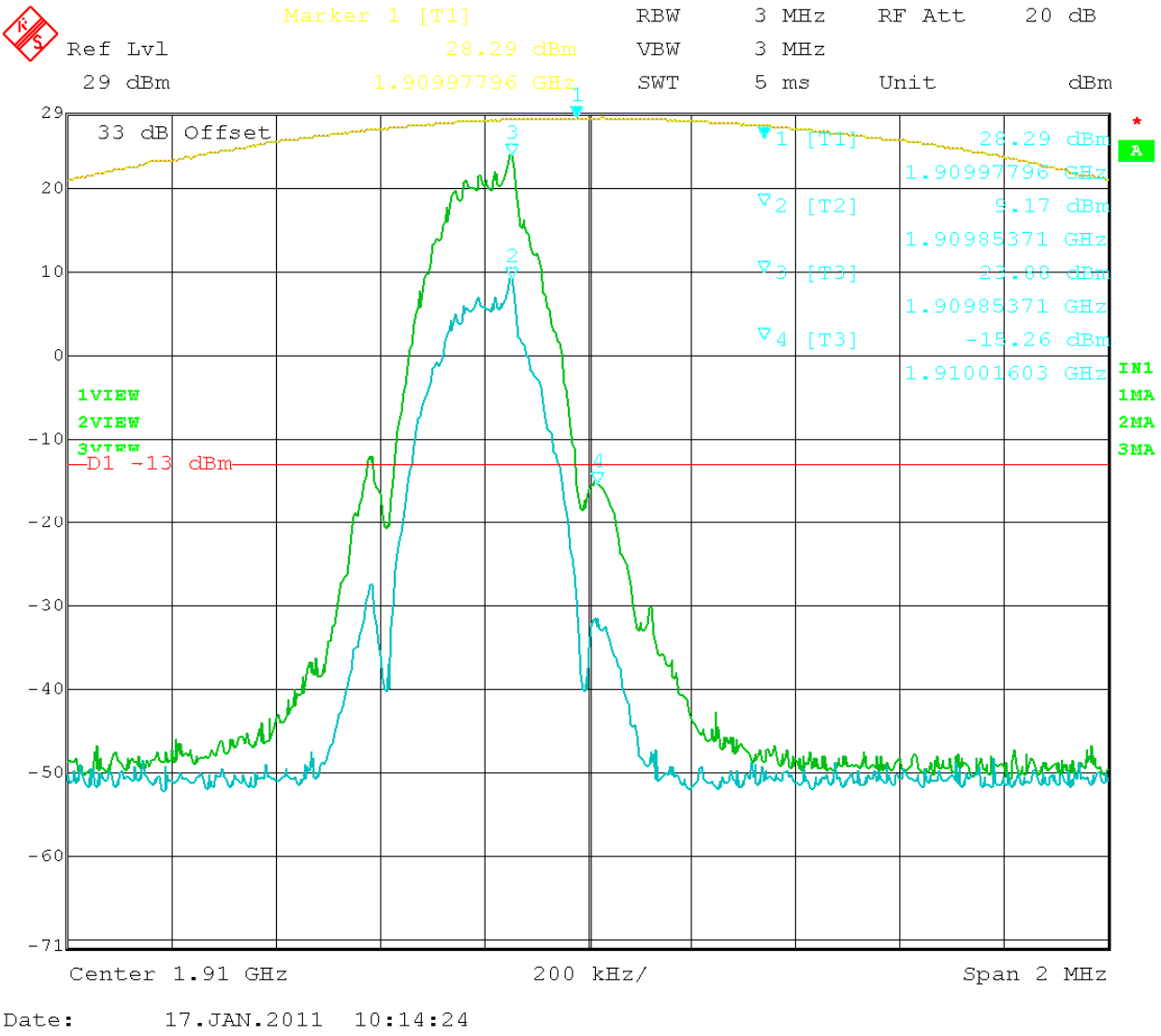


Figure 10: EDGE – In vs. Out 1909.80MHz

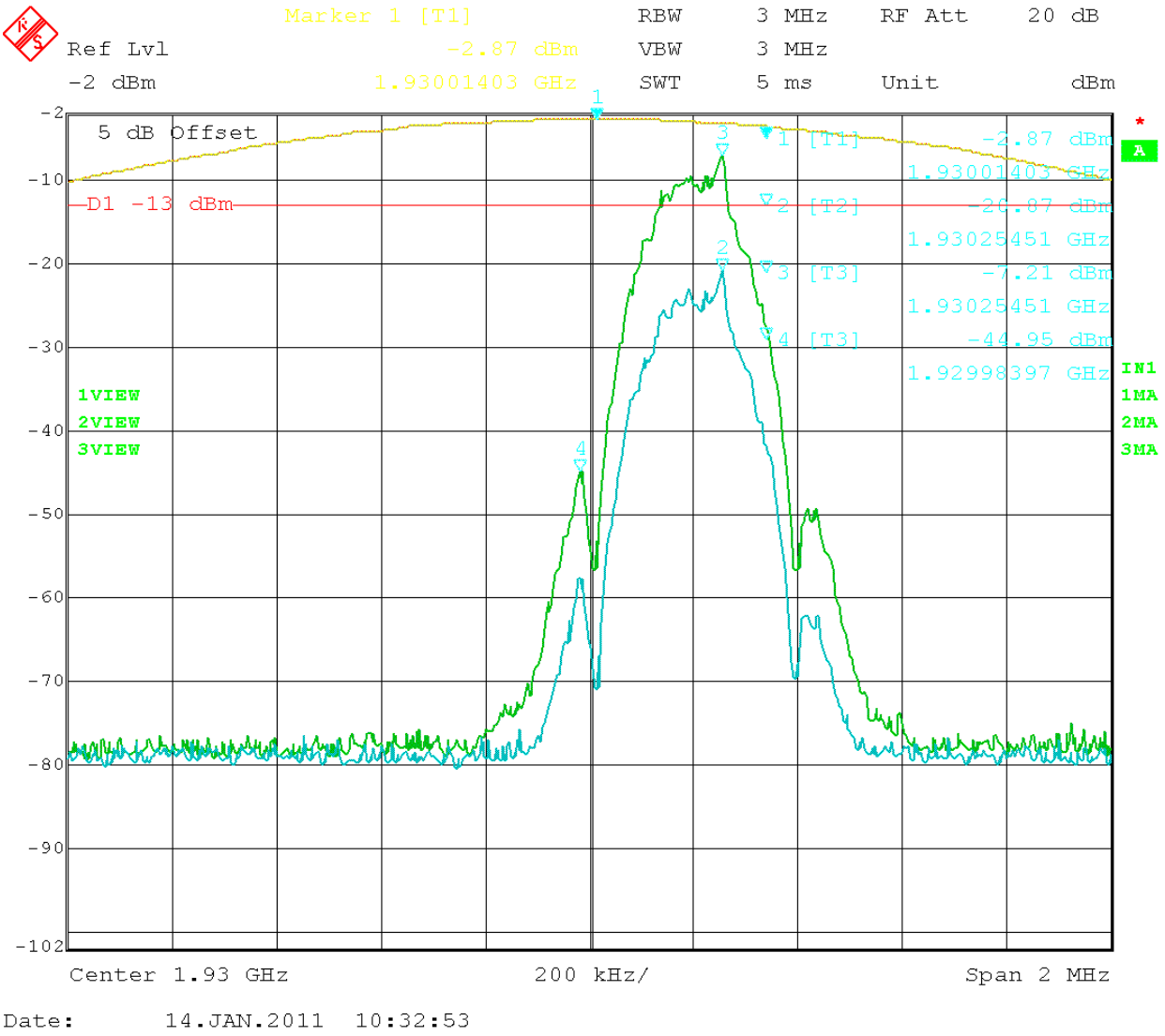


Figure 11: EDGE – In vs. Out 1930.20MHz

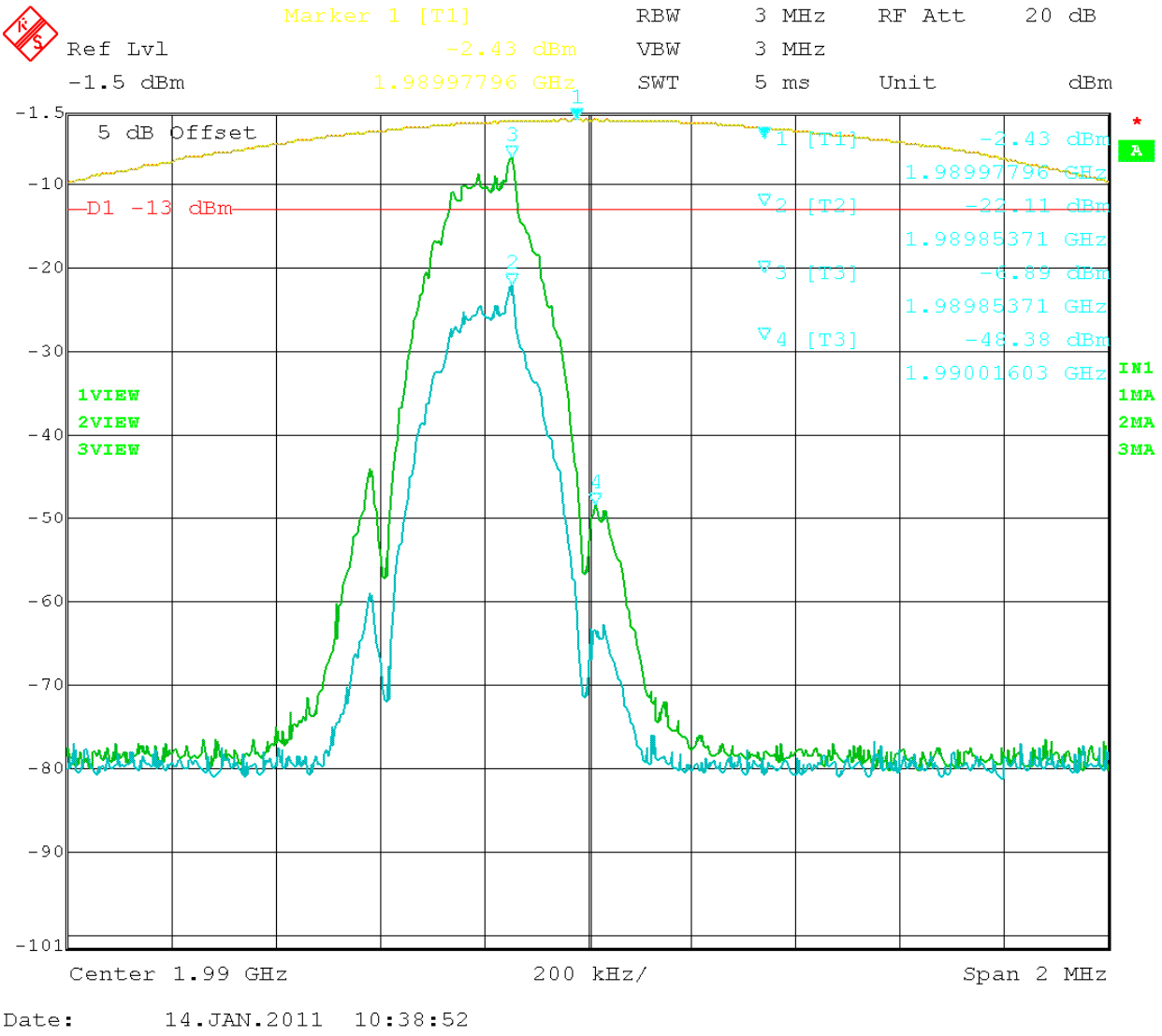


Figure 12: EDGE – In vs. Out 1989.80MHz

Test Data Table 12 –GSM 1900 – Uplink/Downlink

Channel (MHz)	Band-edge Frequency (MHz)	Amplitude level at the band-edge (dBm)	Limit (dBm)	Margin (dB)
1850.2	**1849.98**	**-13.78**	**-13**	**0.78**
1909.8	**1910.02**	**-14.5**	**-13**	**1.5**
1930.2	**1929.98**	**-44.65**	**-13**	**31.65**
1989.8	**1990.02**	**-44.21**	**-13**	**31.21**

The Reference level on the following plots was calibrated using a 3MHz RBW=VBW.

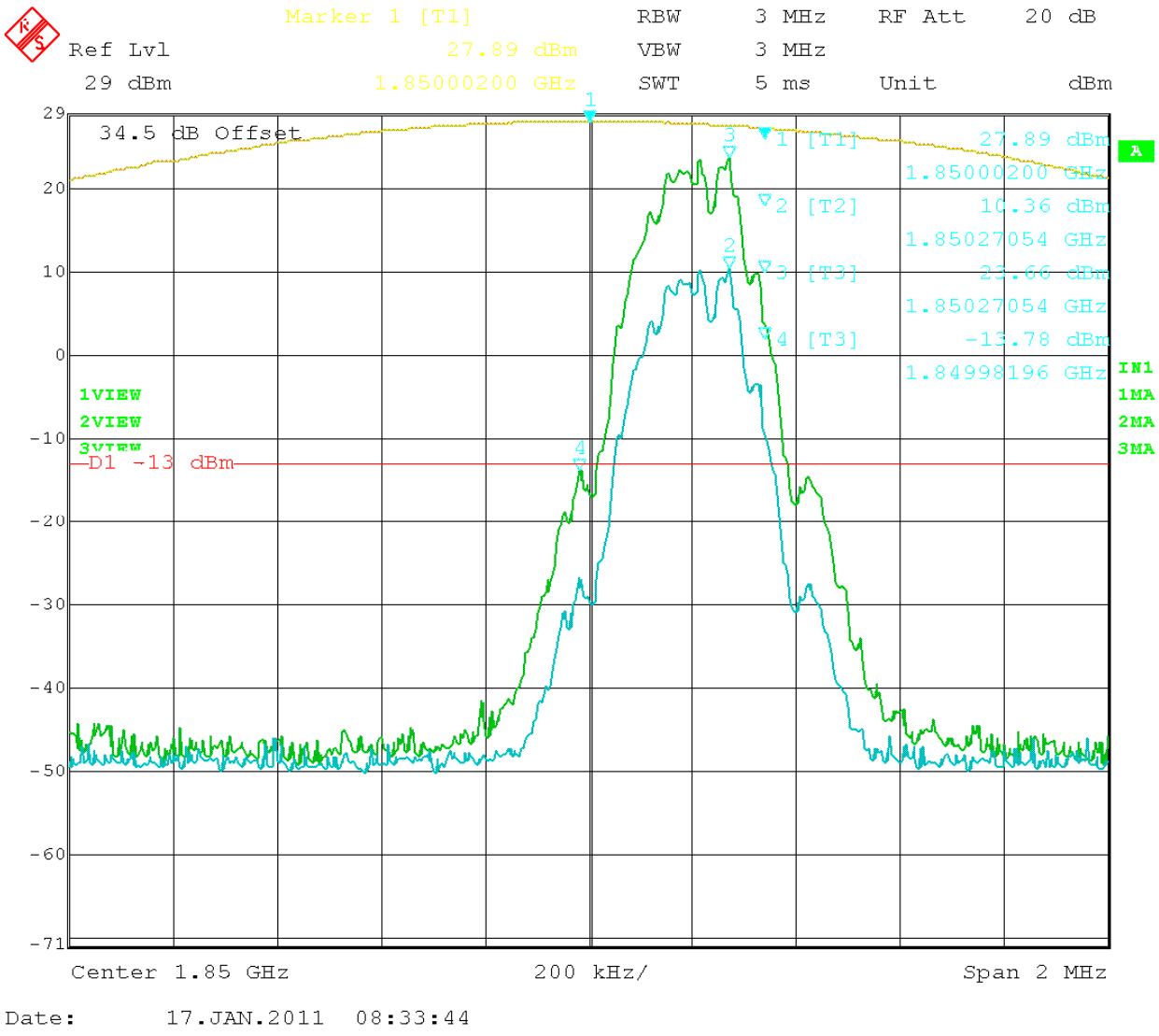


Figure 13: GSM – In vs. Out 1850.20MHz

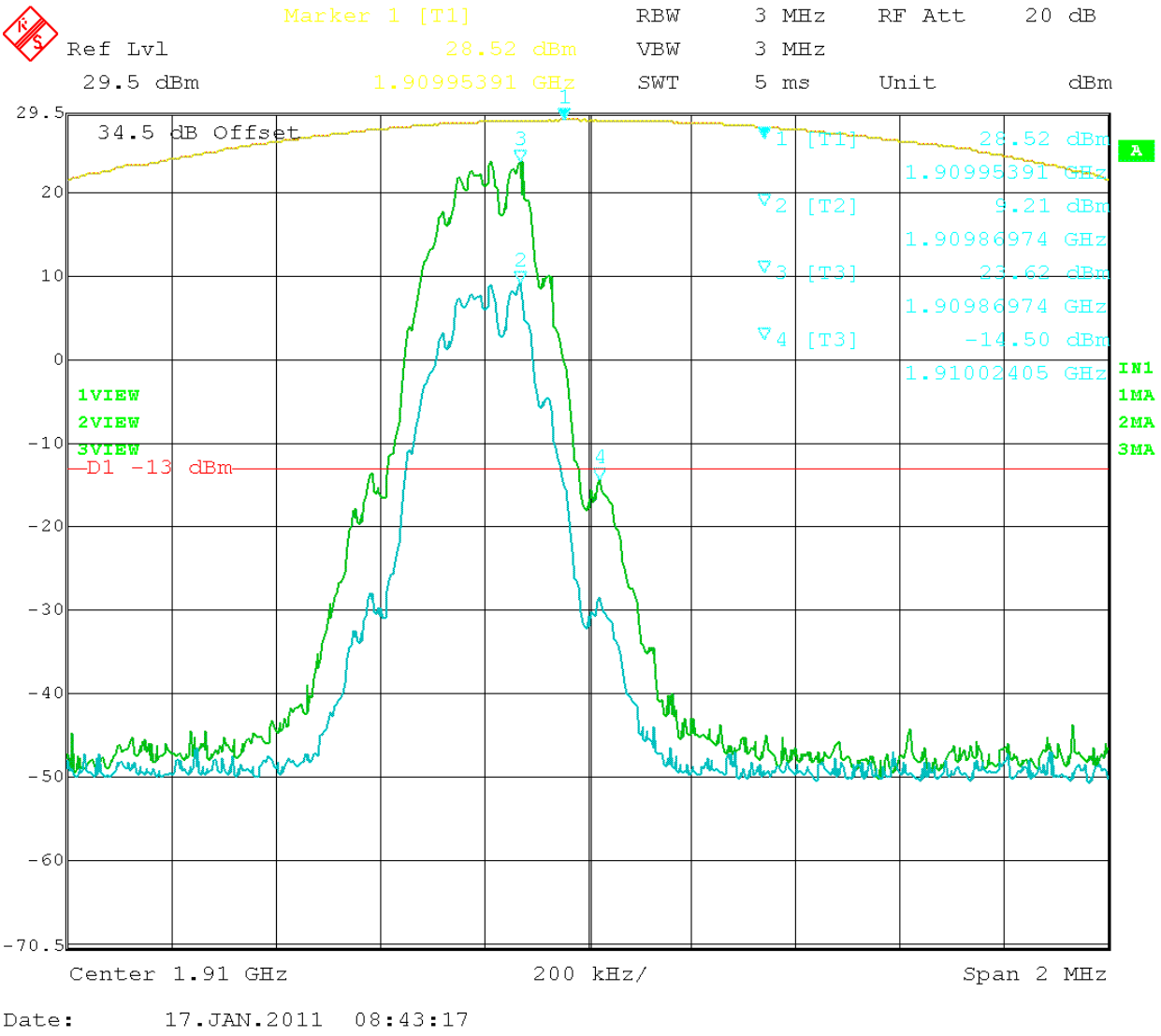


Figure 14: GSM – In vs. Out 1909.80MHz

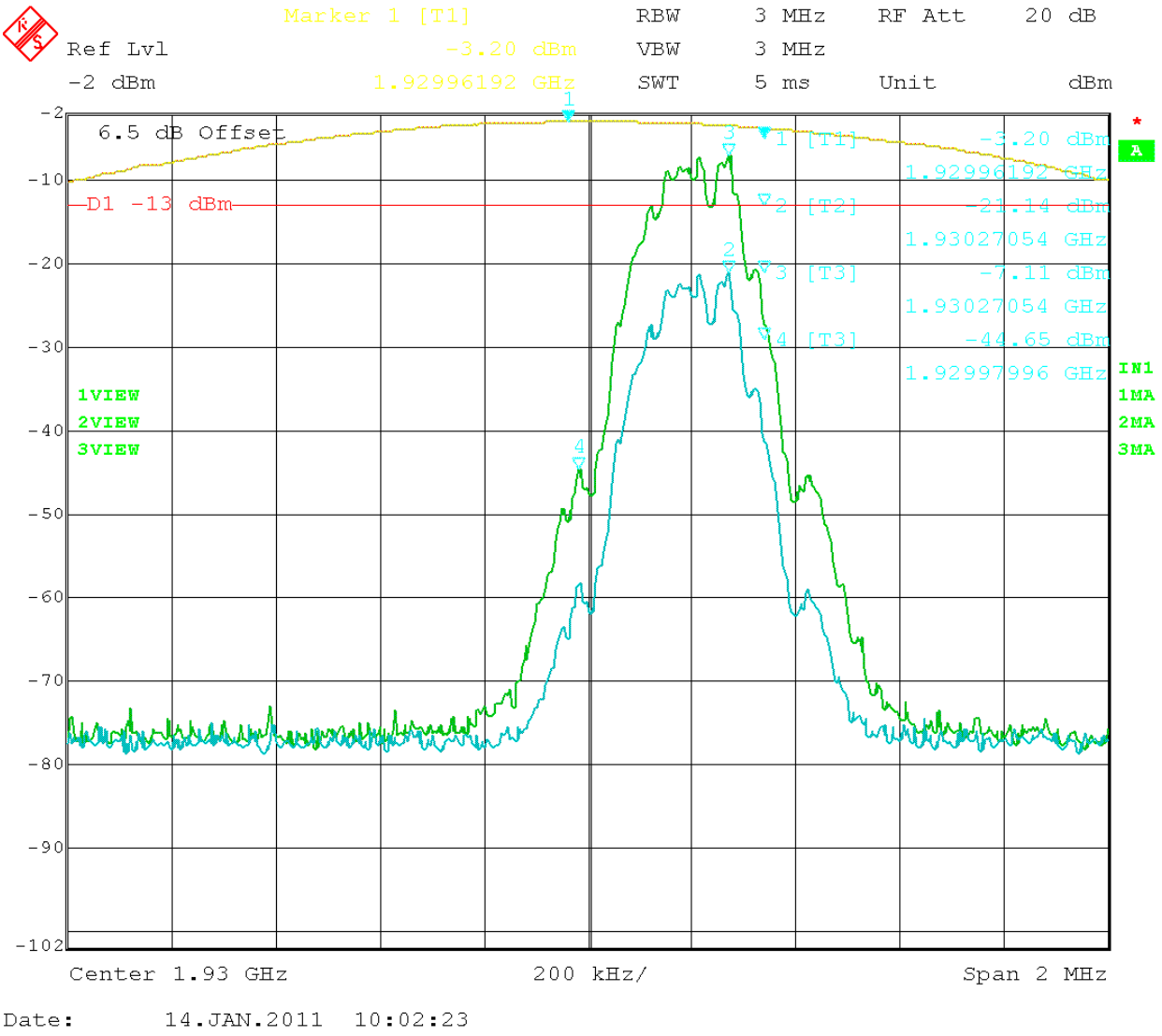


Figure 15: GSM – In vs. Out 1930.20MHz

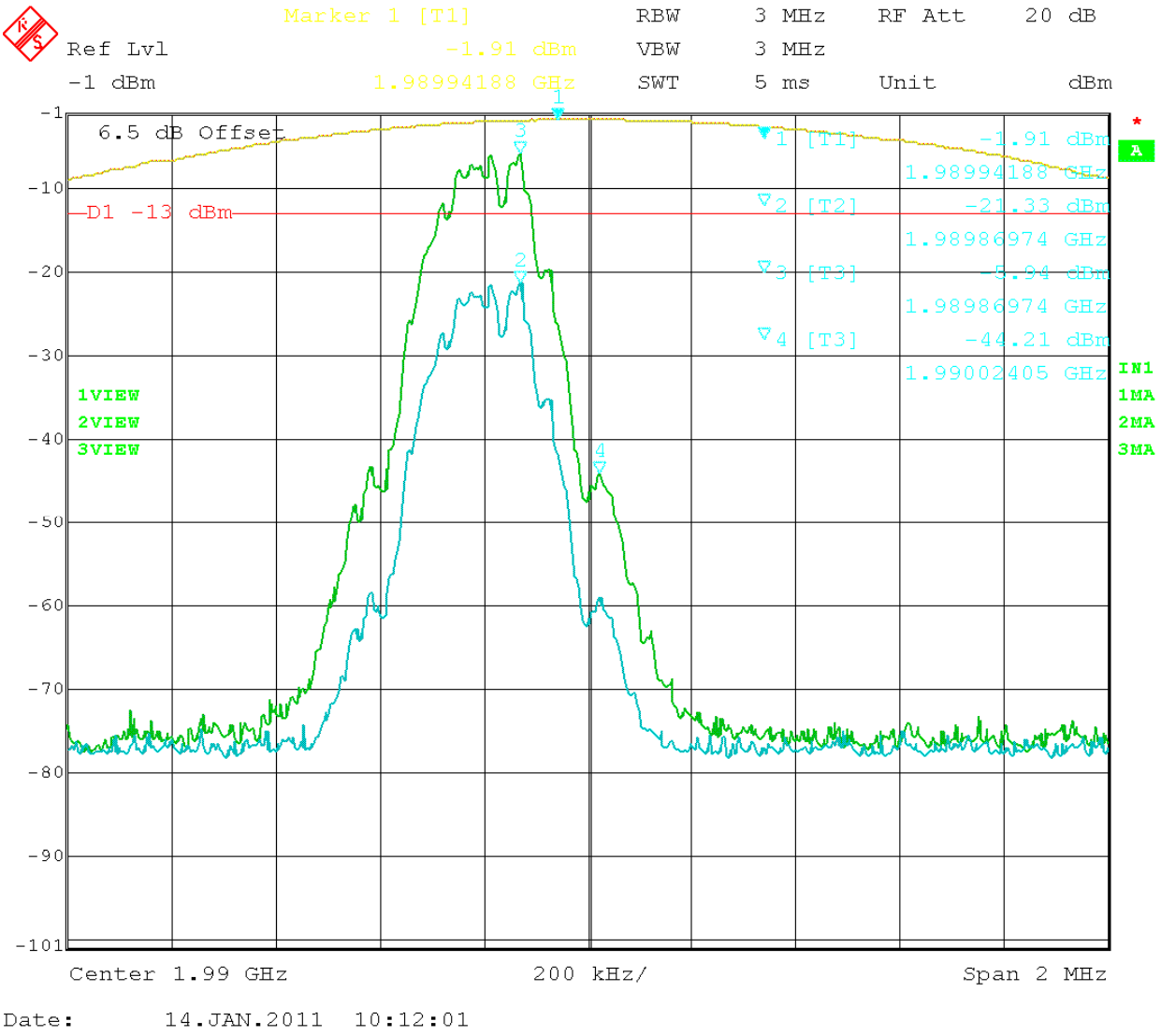


Figure 16: GSM – In vs. Out 1989.80MHz

Compensating for RBW (1%) using 10 log (12.5/3)= 6.2 dB we get the following amplitudes at the bandedge:

Test Data Table 13 – CDMA/EVDO 800 – Uplink/Downlink

Channel (MHz)	Bandedge Frequency (MHz)	Amplitude level at the band-edge (dBm)	Limit (dBm)	Margin (dB)
825.25	823.98	-27.34	-13	14.34
847.75	849.13	-26.6	-13	13.6
870.25	868.94	-37.54	-13	24.54
892.75	894.8	-36.81	-13	23.81

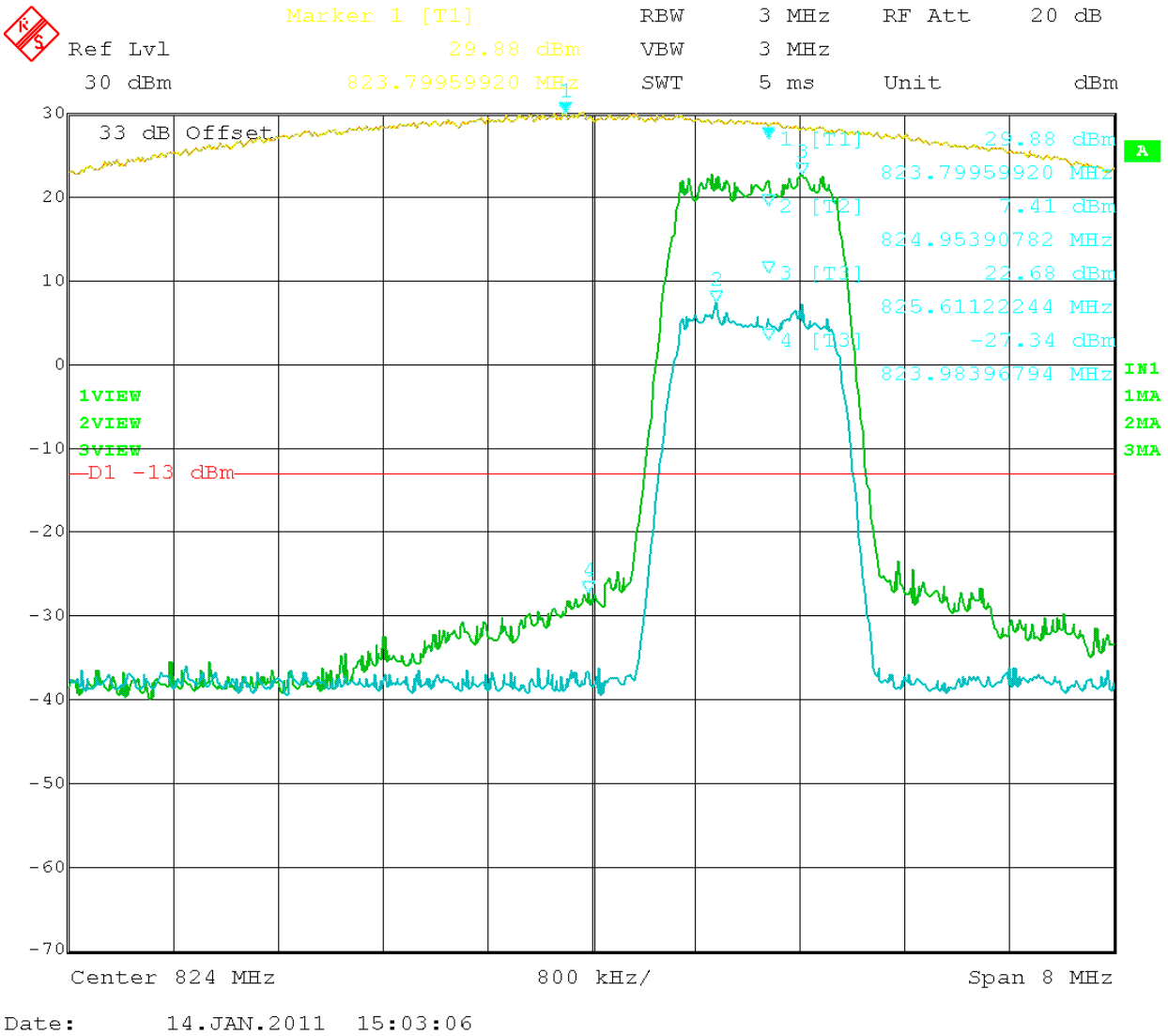


Figure 17: CDMA – In vs. Out 825.25MHz

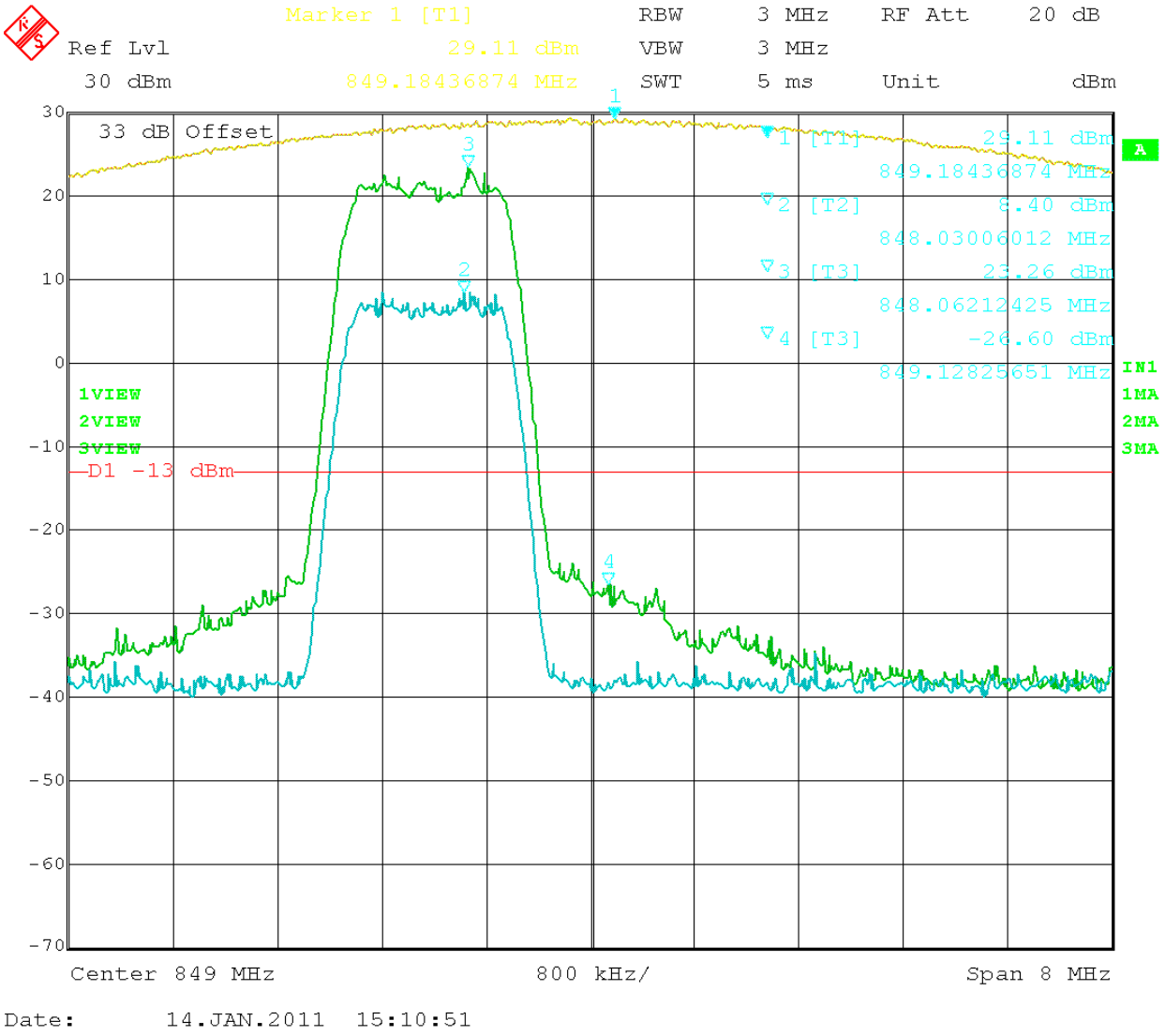


Figure 18: CDMA – In vs. Out 847.75 MHz

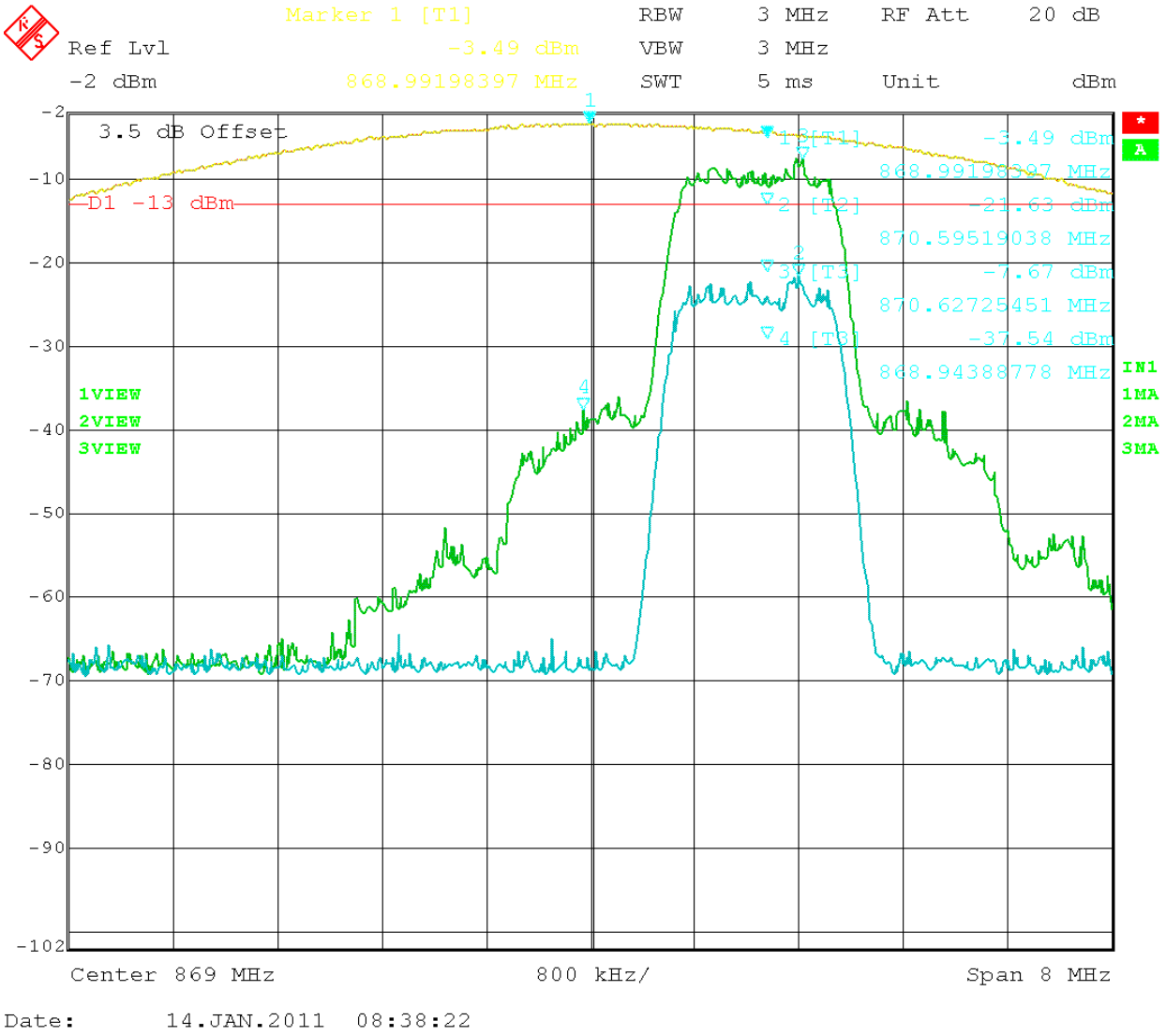


Figure 19: CDMA – In vs. Out 870.25 MHz

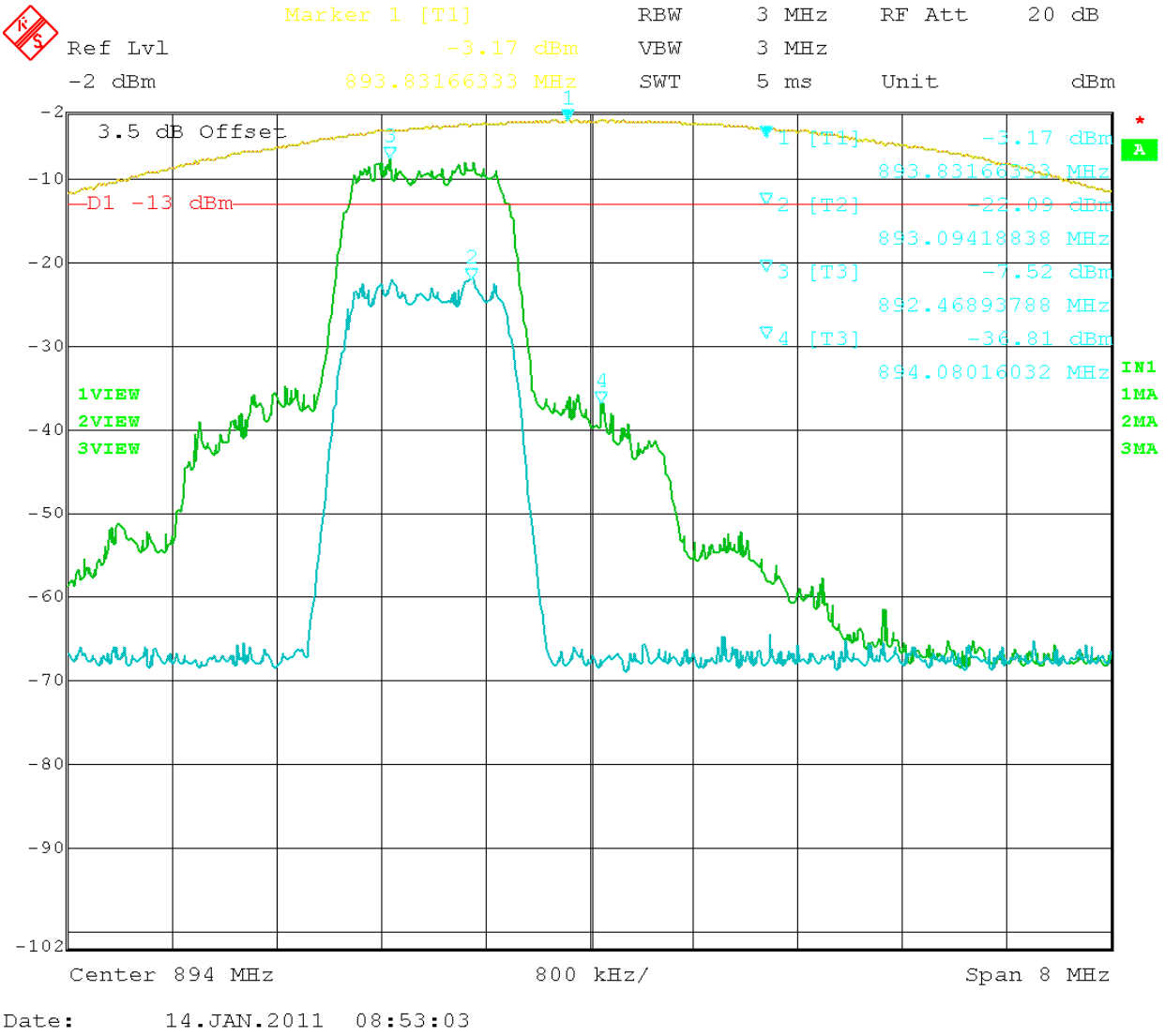


Figure 20: CDMA – In vs. Out 892.75 MHz

Test Data Table 14 – WCDMA/HSPA 800 – Uplink/Downlink

Channel (MHz)	Bandedge Frequency (MHz)	Amplitude level at the band-edge (dBm)	Limit (dBm)	Margin (dB)
826.80	823.96	-14.65	-13	1.65
846.20	849.16	-21.28	-13	8.28
871.80	868.88	-32.32	-13	19.32
891.20	894.28	-32.09	-13	19.09

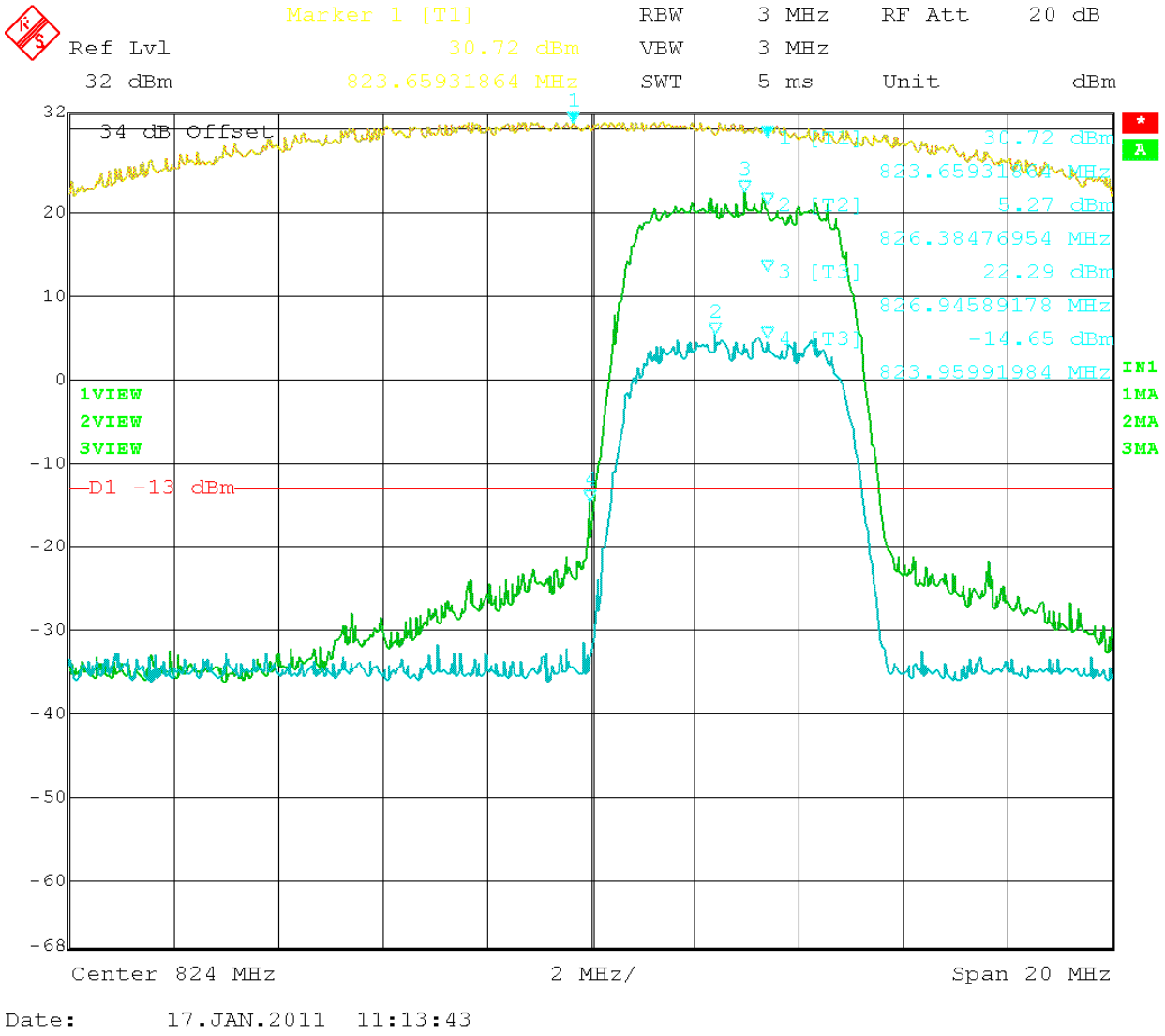


Figure 21: WCDMA – In vs. Out 826.80 MHz

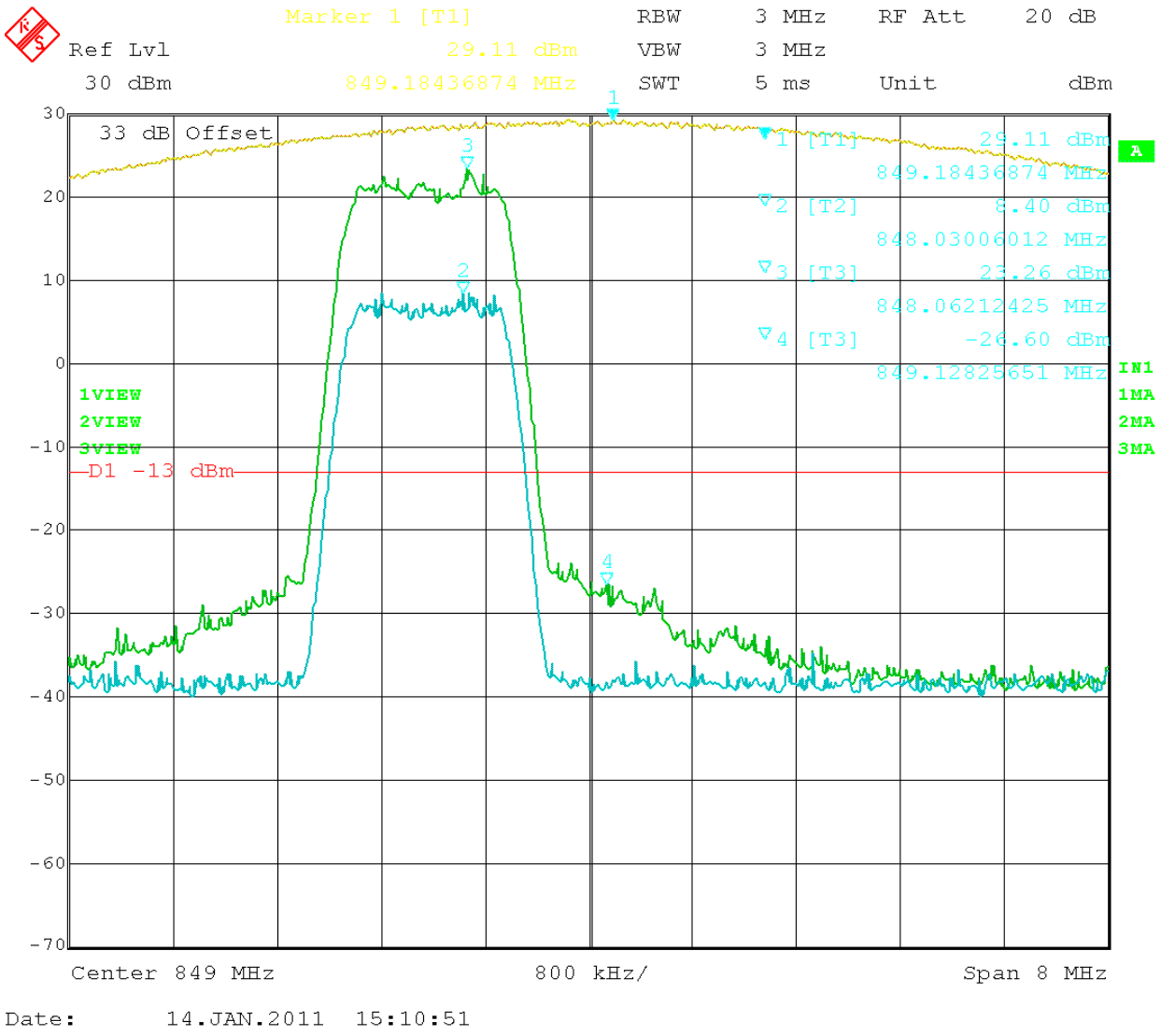


Figure 22: WCDMA – In vs. Out 846.20 MHz

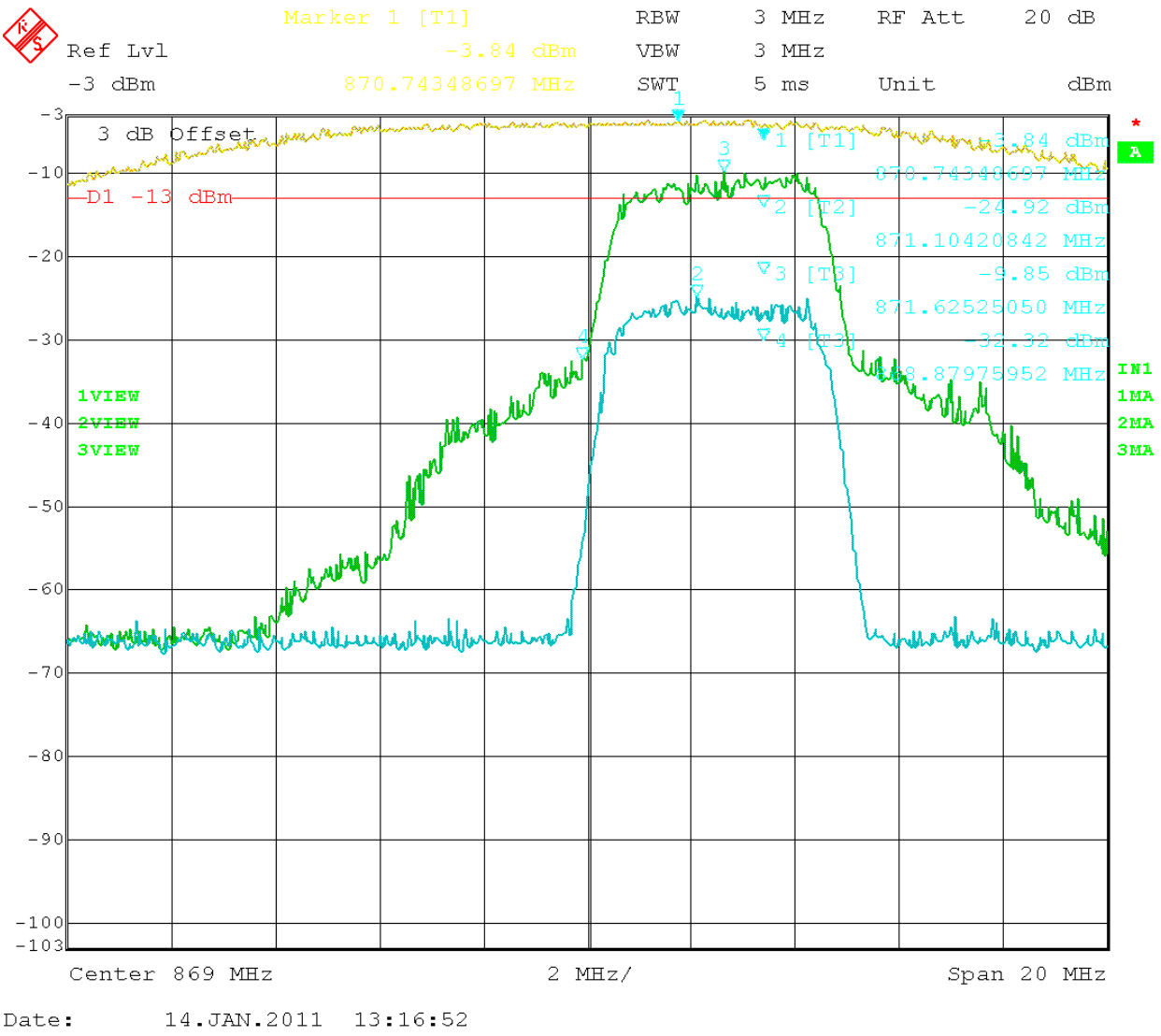


Figure 23: WCDMA – In vs. Out 871.80 MHz

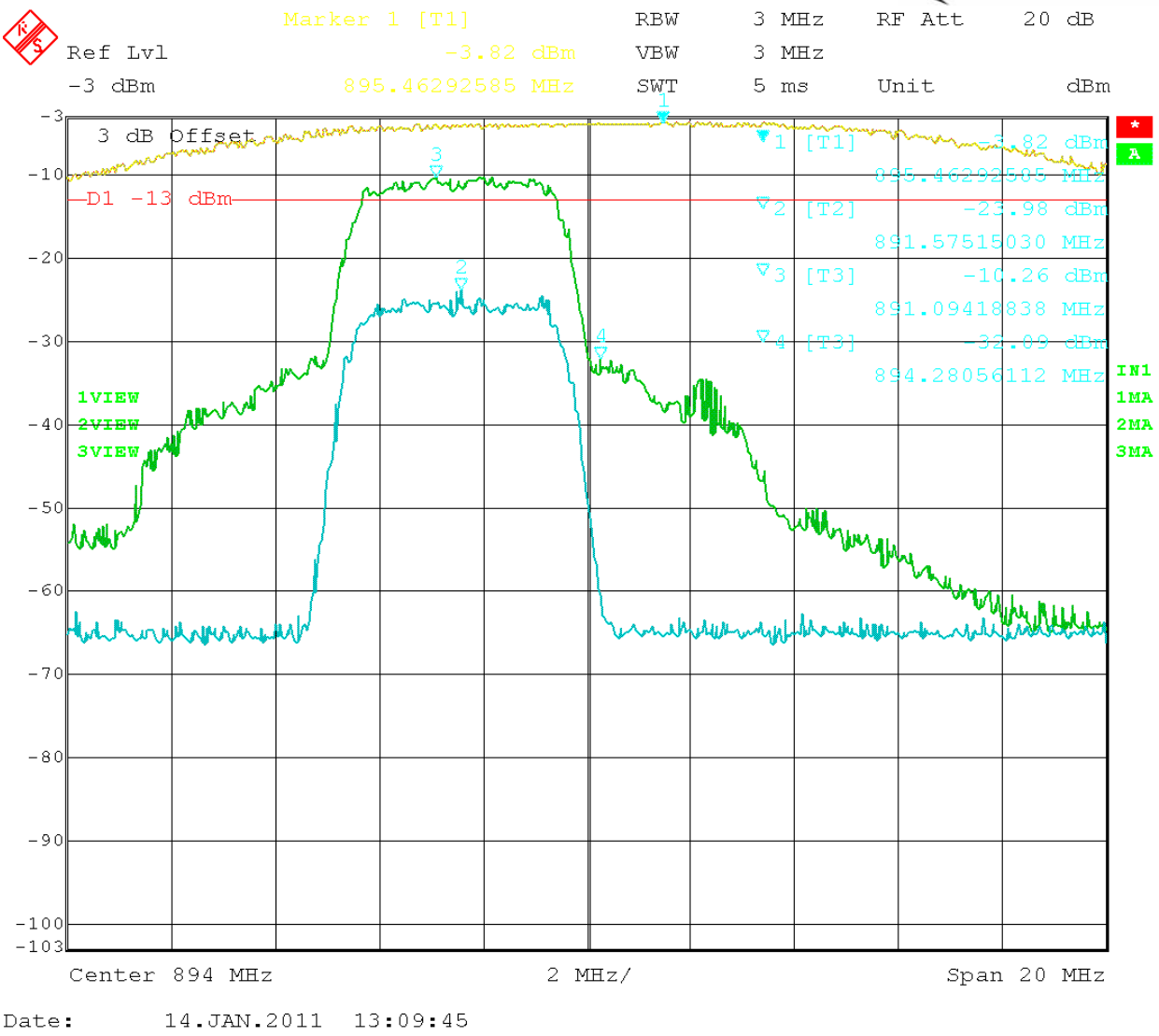


Figure 24: WCDMA – In vs. Out 891.20 MHz

Test Data Table 15 – EDGE 800 – Uplink/Downlink

Channel (MHz)	Band-edge Frequency (MHz)	Amplitude level at the band-edge (dBm)	Limit (dBm)	Margin (dB)
824.2	823.98	-14.43	-13	1.43
848.8	849.02	-19.9	-13	6.9
869.2	868.98	-45.9	-13	32.9
893.8	894.02	-48.88	-13	35.88

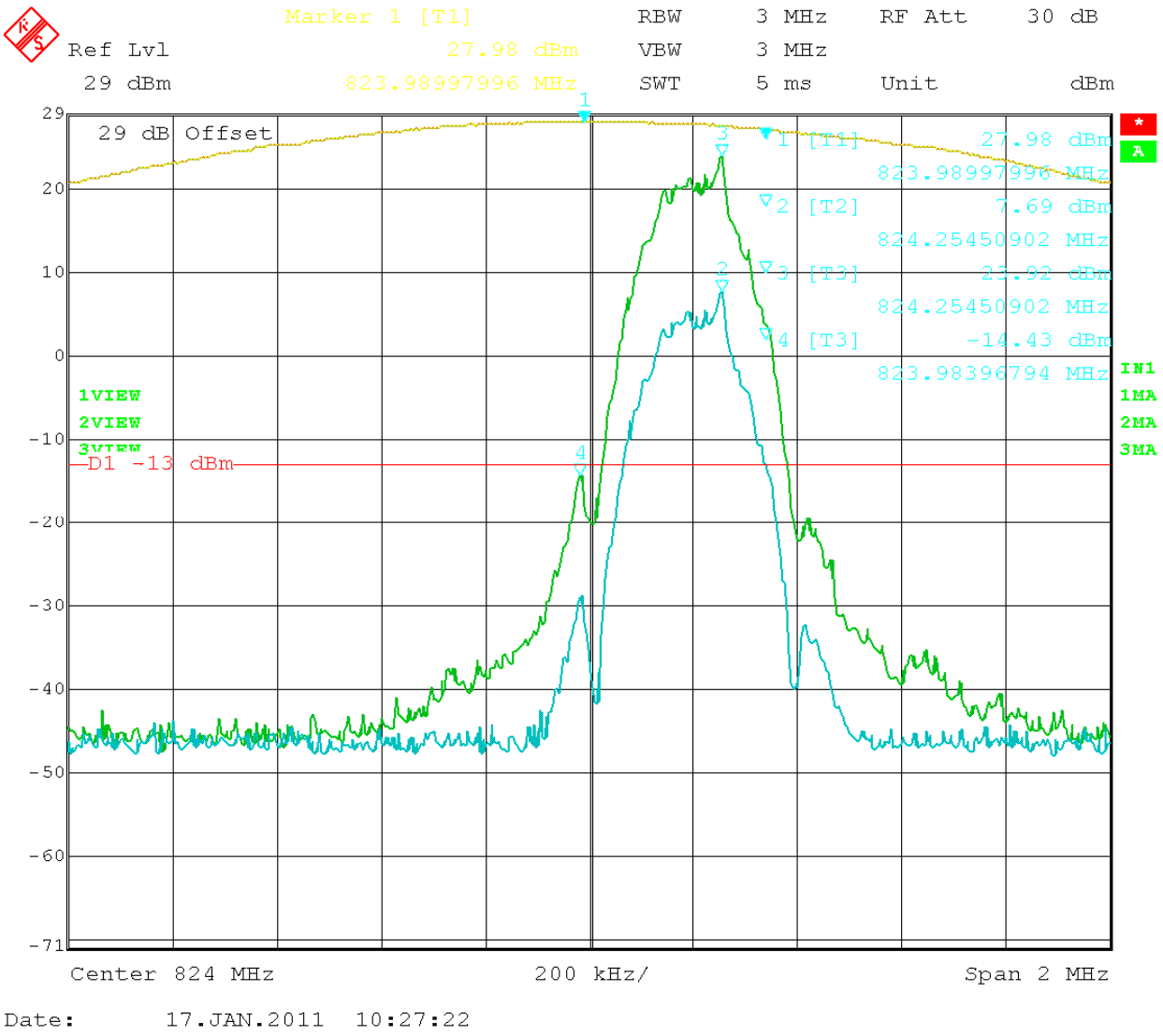


Figure 25: EDGE – In vs. Out 824.20 MHz

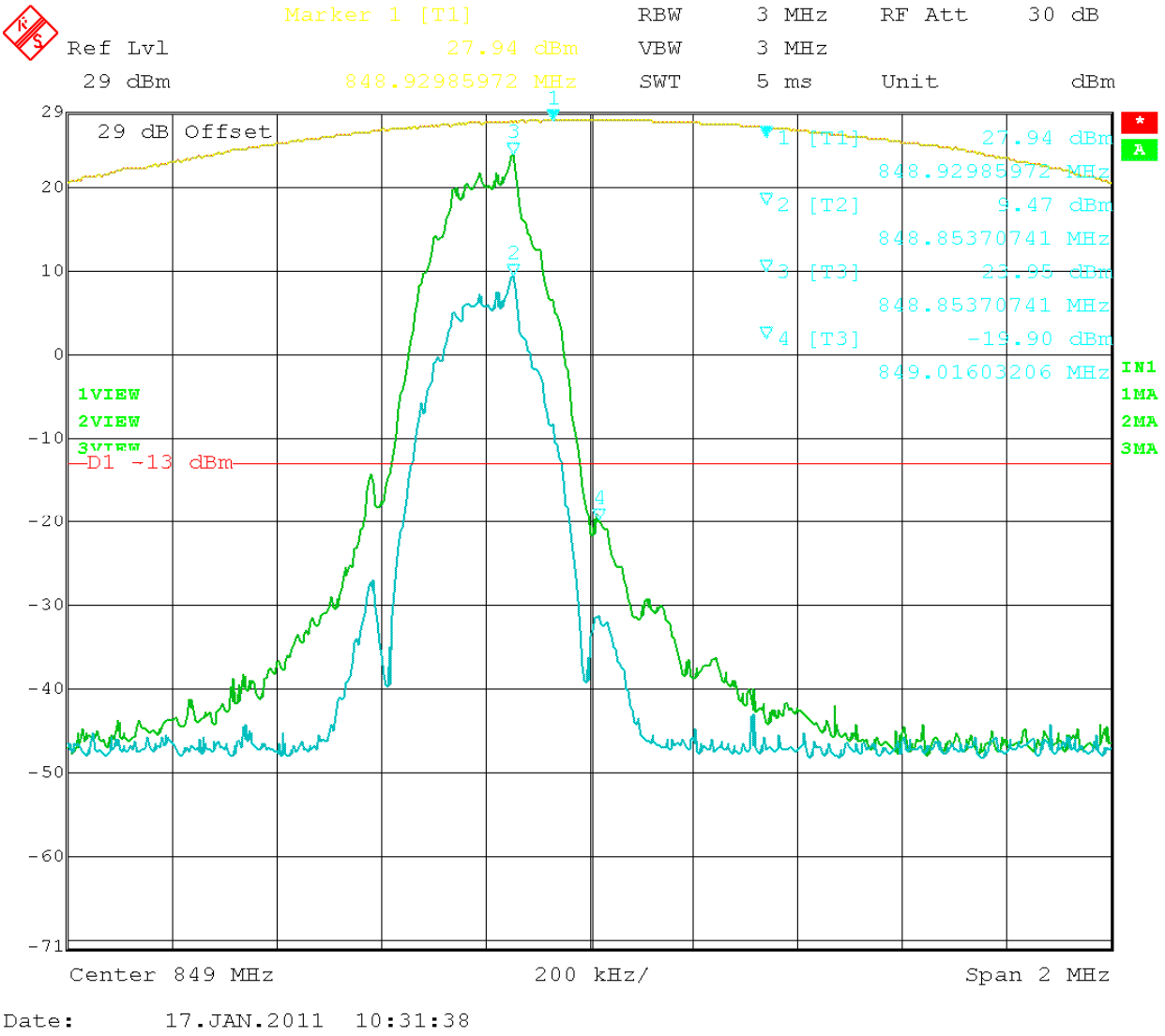


Figure 26: EDGE – In vs. Out 848.80 MHz

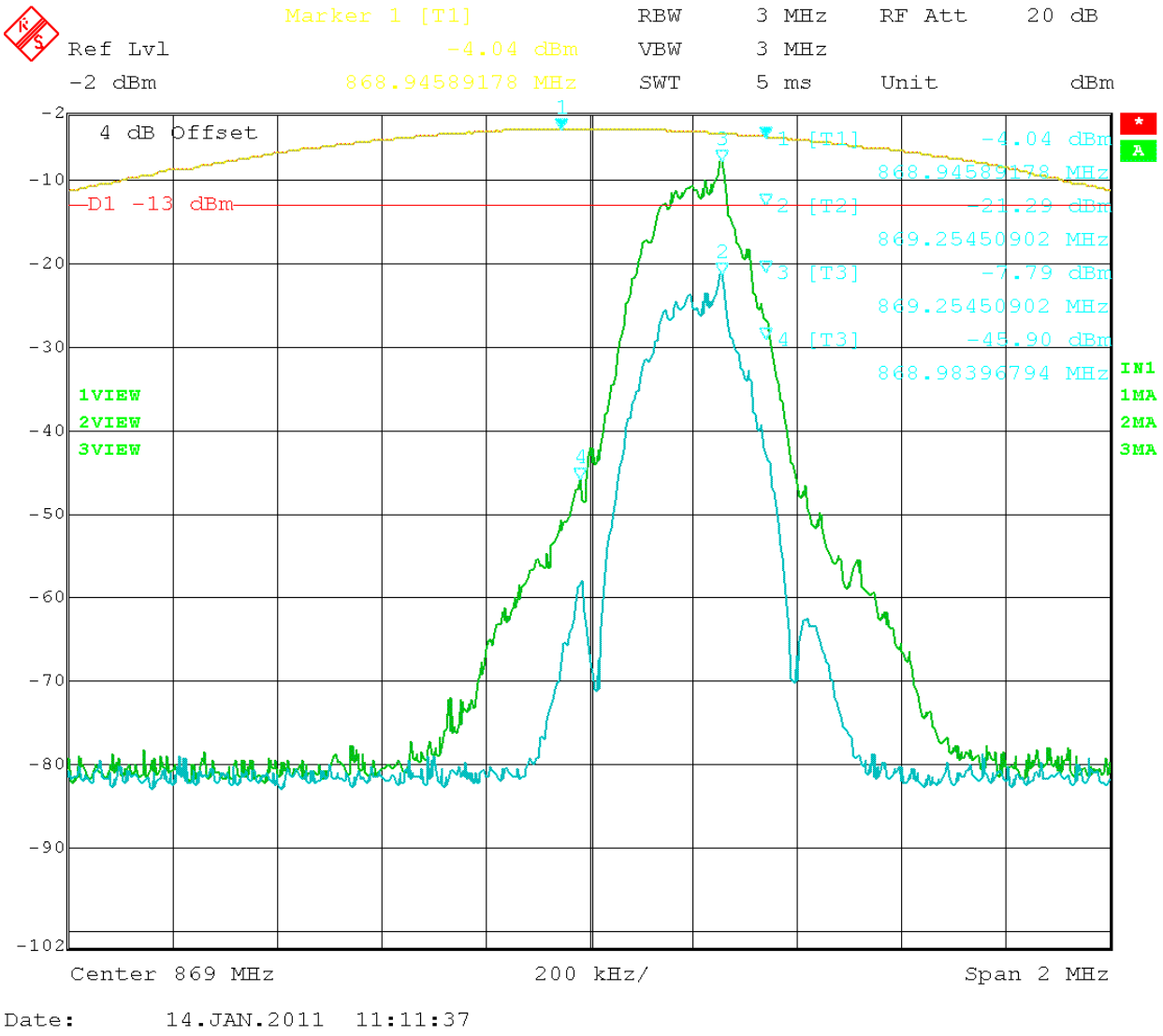


Figure 27: EDGE – In vs. Out 869.20 MHz

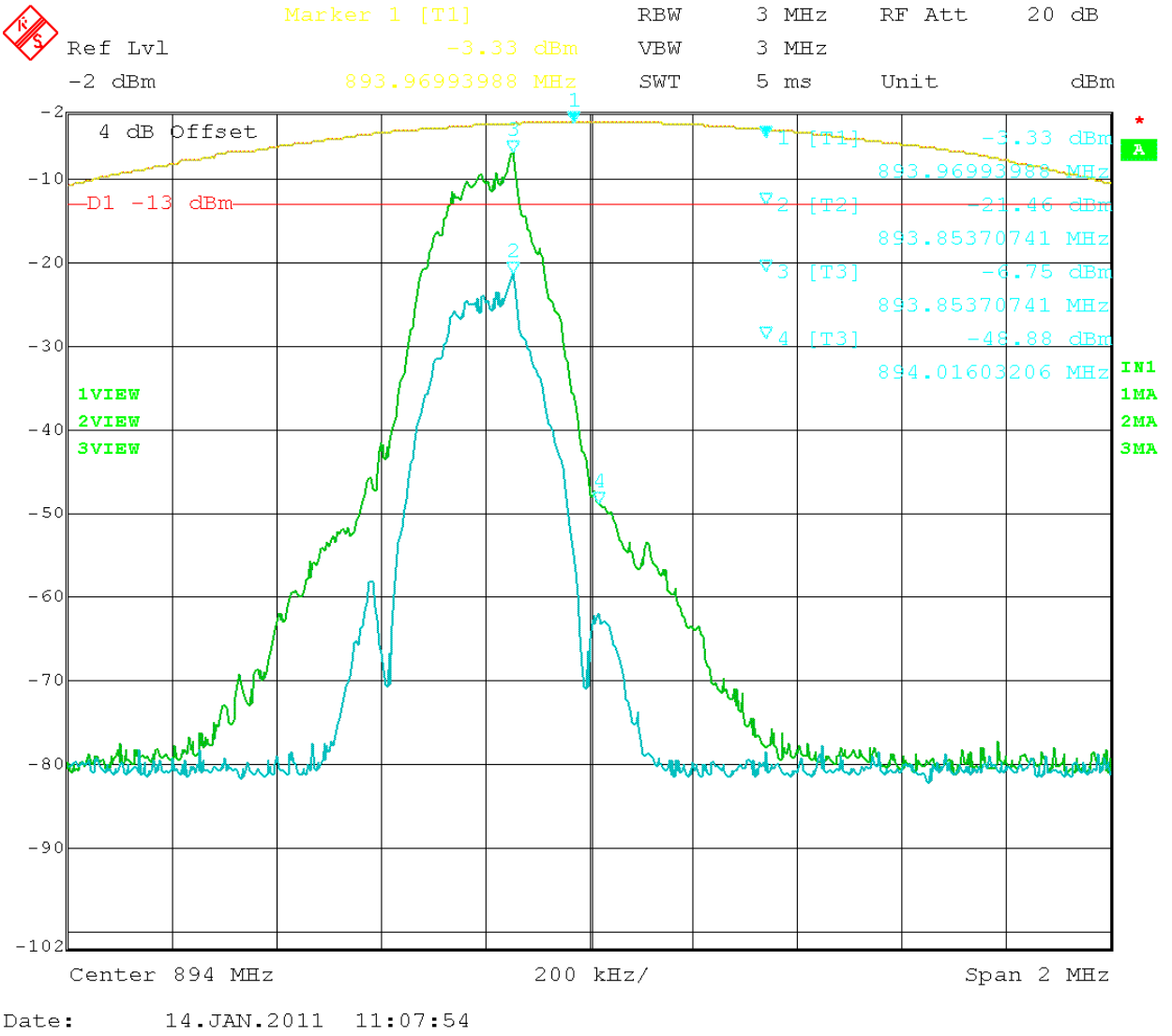


Figure 28: EDGE – In vs. Out 893.80 MHz

Test Data Table 16 – GSM 800 – Uplink/Downlink

Channel (MHz)	Band-edge Frequency (MHz)	Amplitude level at the band-edge (dBm)	Limit (dBm)	Margin (dB)
824.2	823.98	-14.96	-13	1.96
848.8	849.02	-15.2	-13	2.2
869.2	868.98	-44.4	-13	31.4
893.8	894.02	-44.51	-13	31.51

The Reference level on the following plots was calibrated using a 3MHz RBW=VBW.

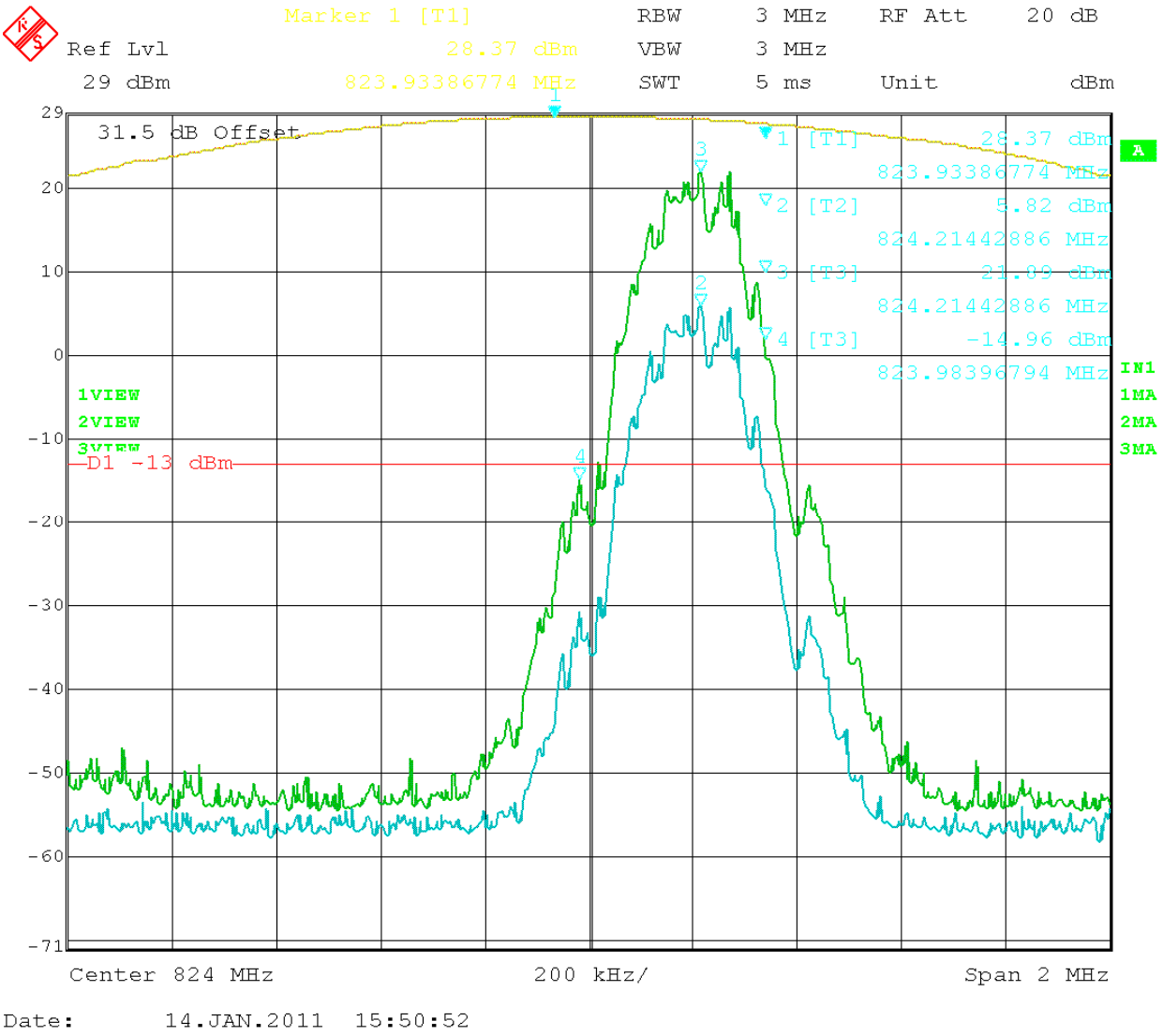


Figure 29: GSM – In vs. Out 824.2 MHz

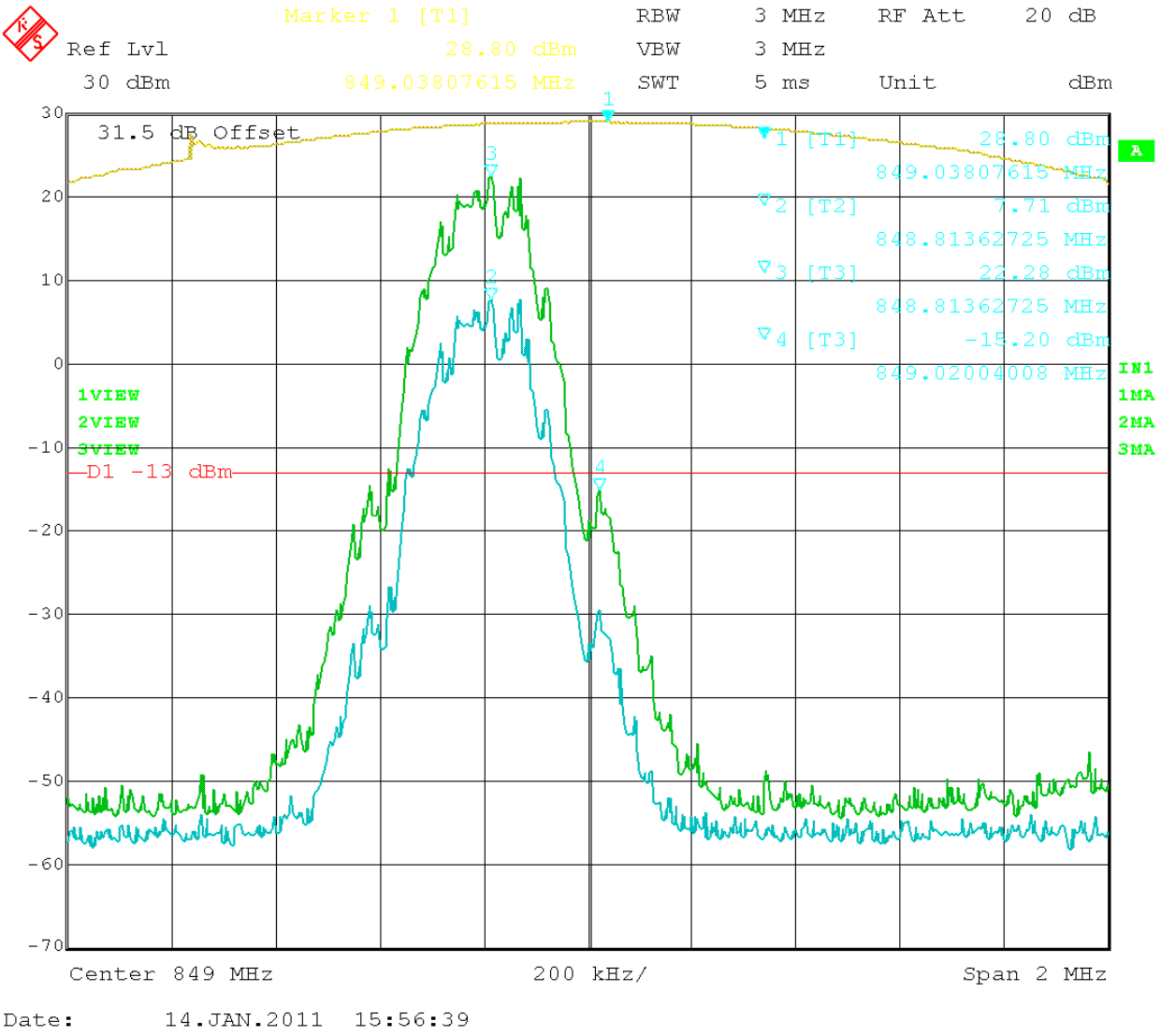


Figure 30: GSM – In vs. Out 848.8 MHz

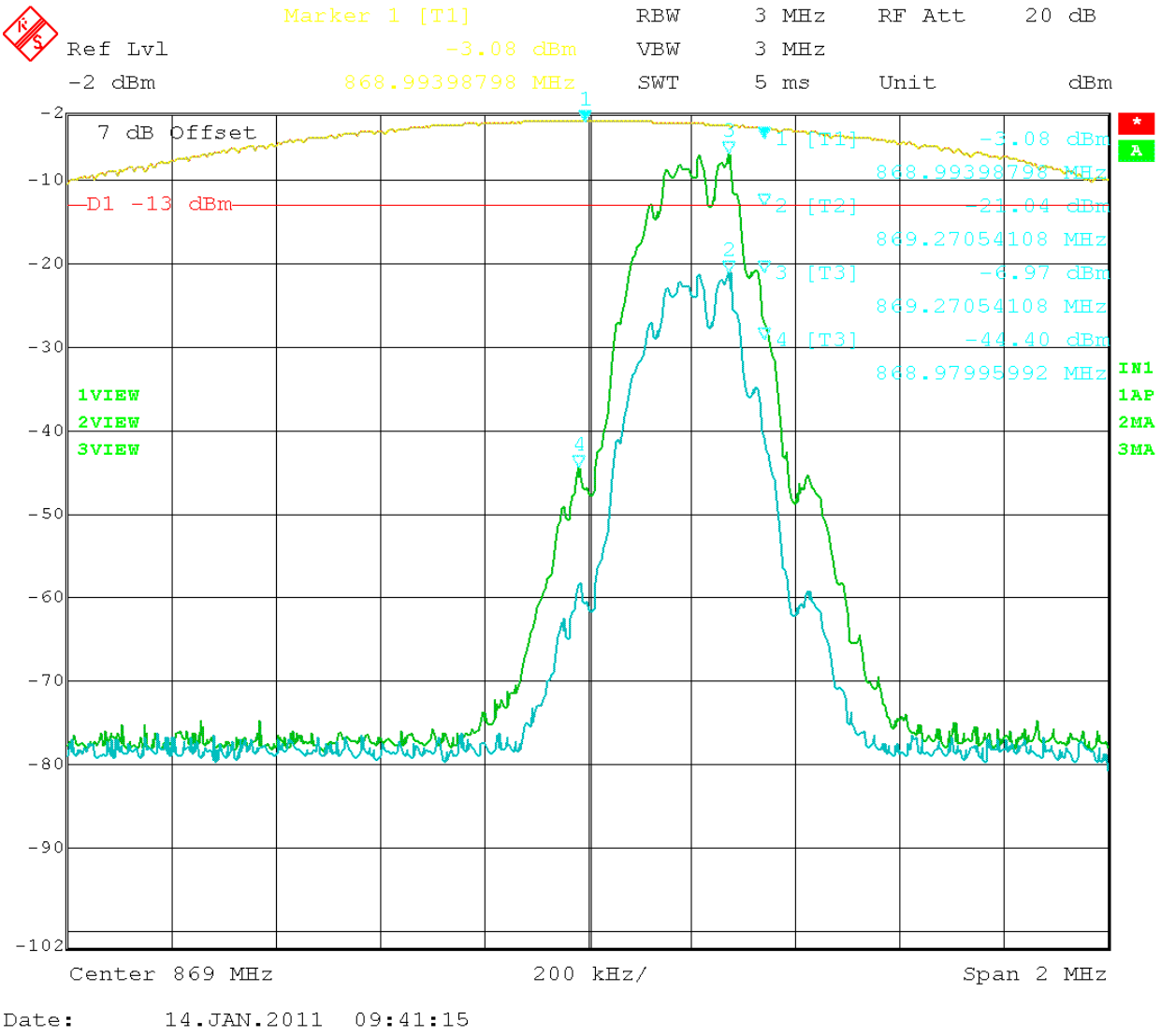


Figure 31: GSM – In vs. Out 869.2MHz

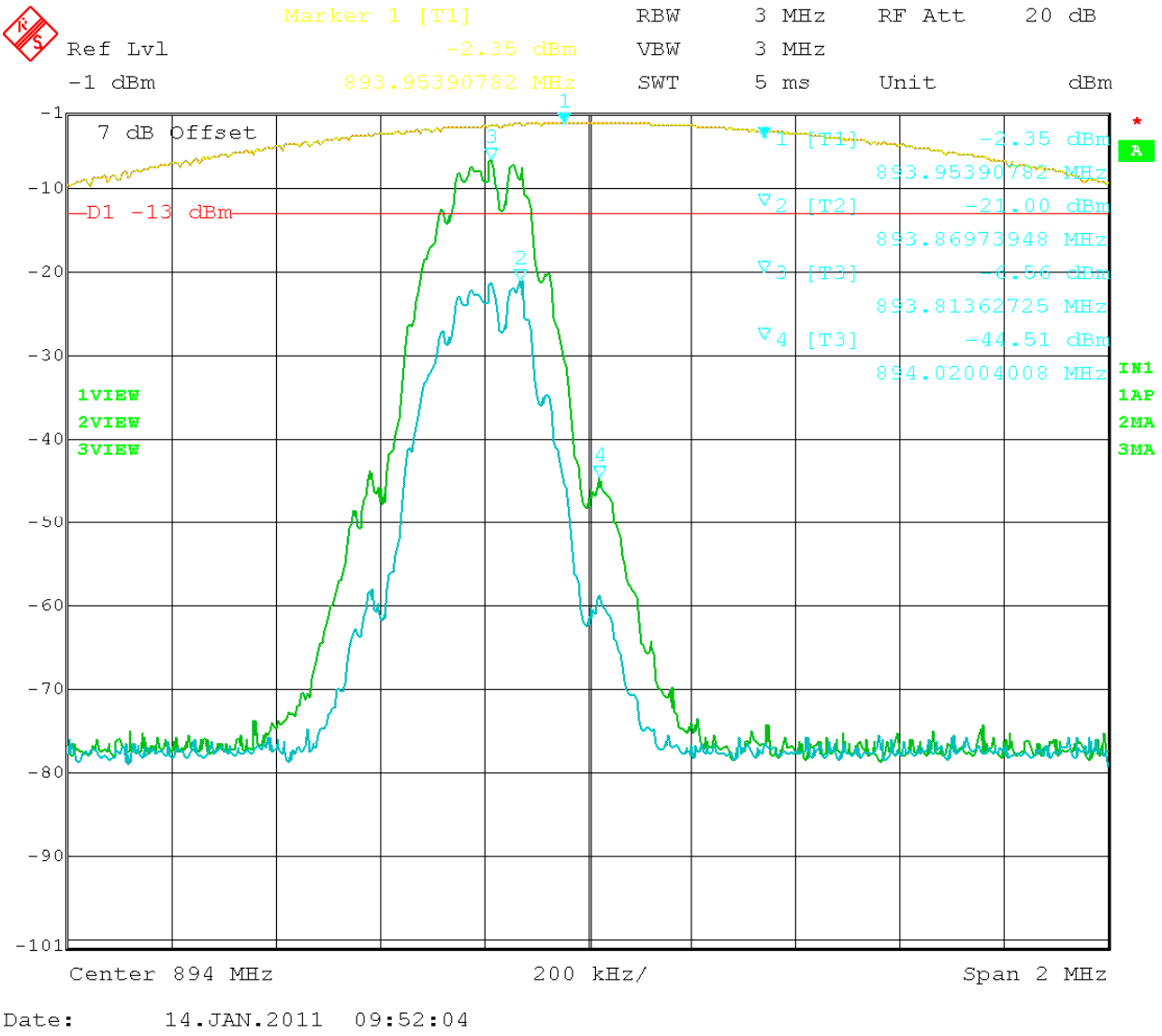


Figure 32: GSM – In vs. Out 893.8MHz

INTERMODULATION PRODUCT SPURIOUS EMISSIONS

Rule Parts No.: Pt 2.1051

Requirements: Emissions must be 43 + 10 log (Po) dB below the mean power output of the transmitter or below the –13dBm

All the modulation types were tested using the three tone test method. A CW signal was use instead of GSM, EDGE, and F1D modulations. EDGE and GSM provided the same test results and only GSM data are presented in this report. The input power to the amplifier was set at maximum drive level by combining the three tones. The three tones were chosen in such a way (1)the third order intermodulation product frequencies are located within the pass band of the DUT and (2) they produce the worst-case emissions out of band.

Test Data: The DUT appears to meet the requirements.

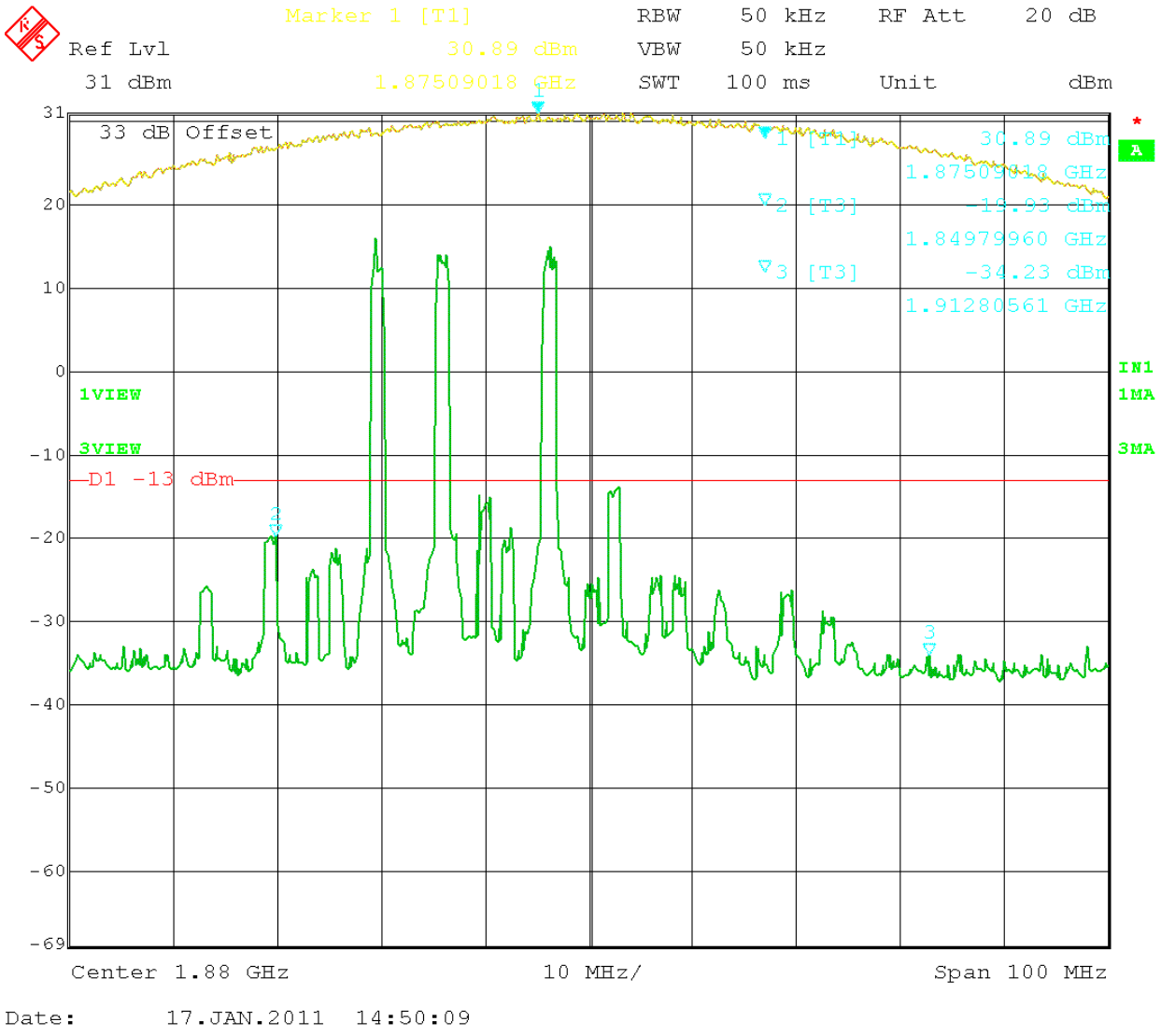


Figure 33: CDMA 3 tones intermodulation - (1850 – 1910) MHz.

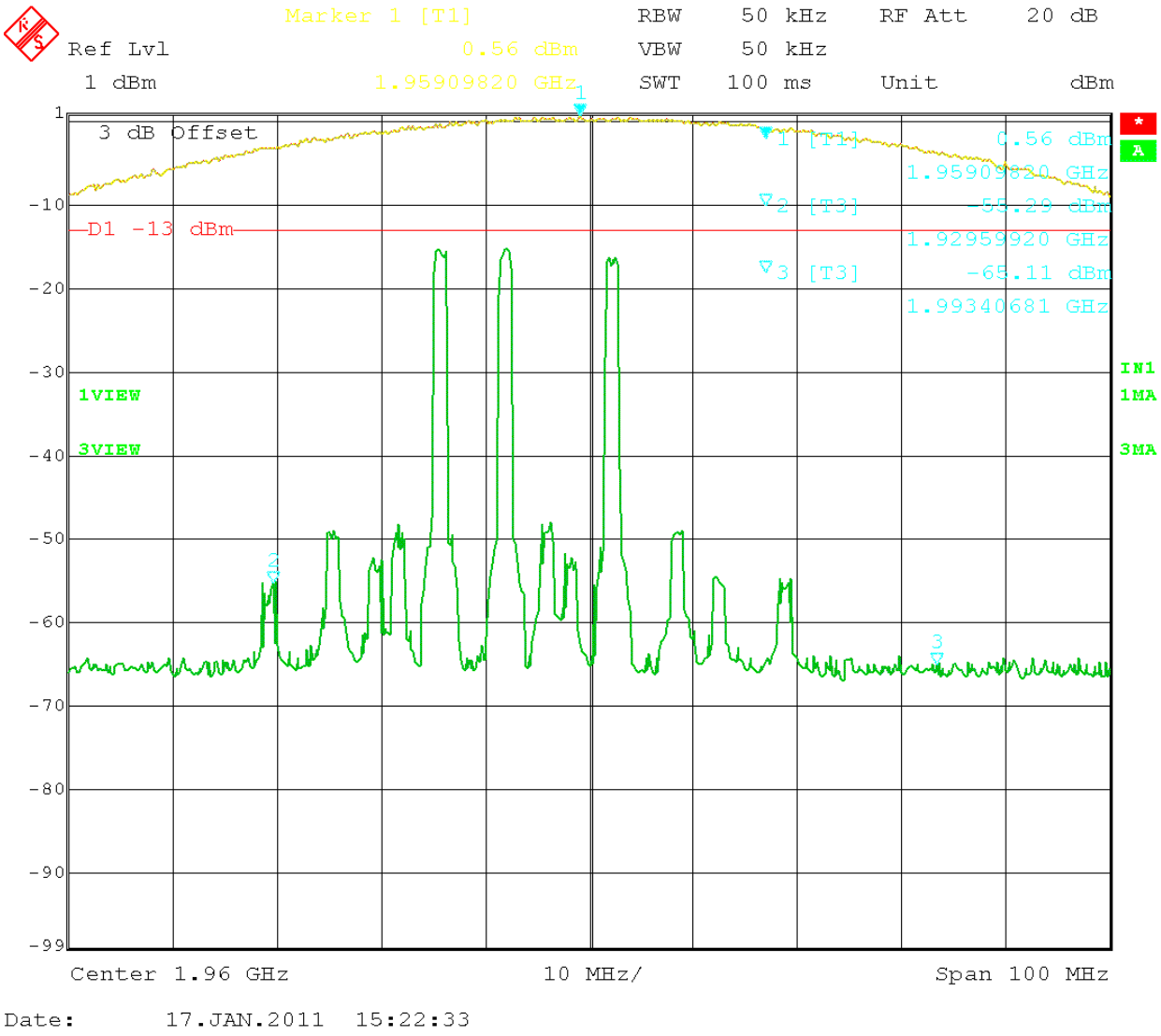


Figure 34: CDMA 3 tones intermodulation - (1930 – 1990) MHz.

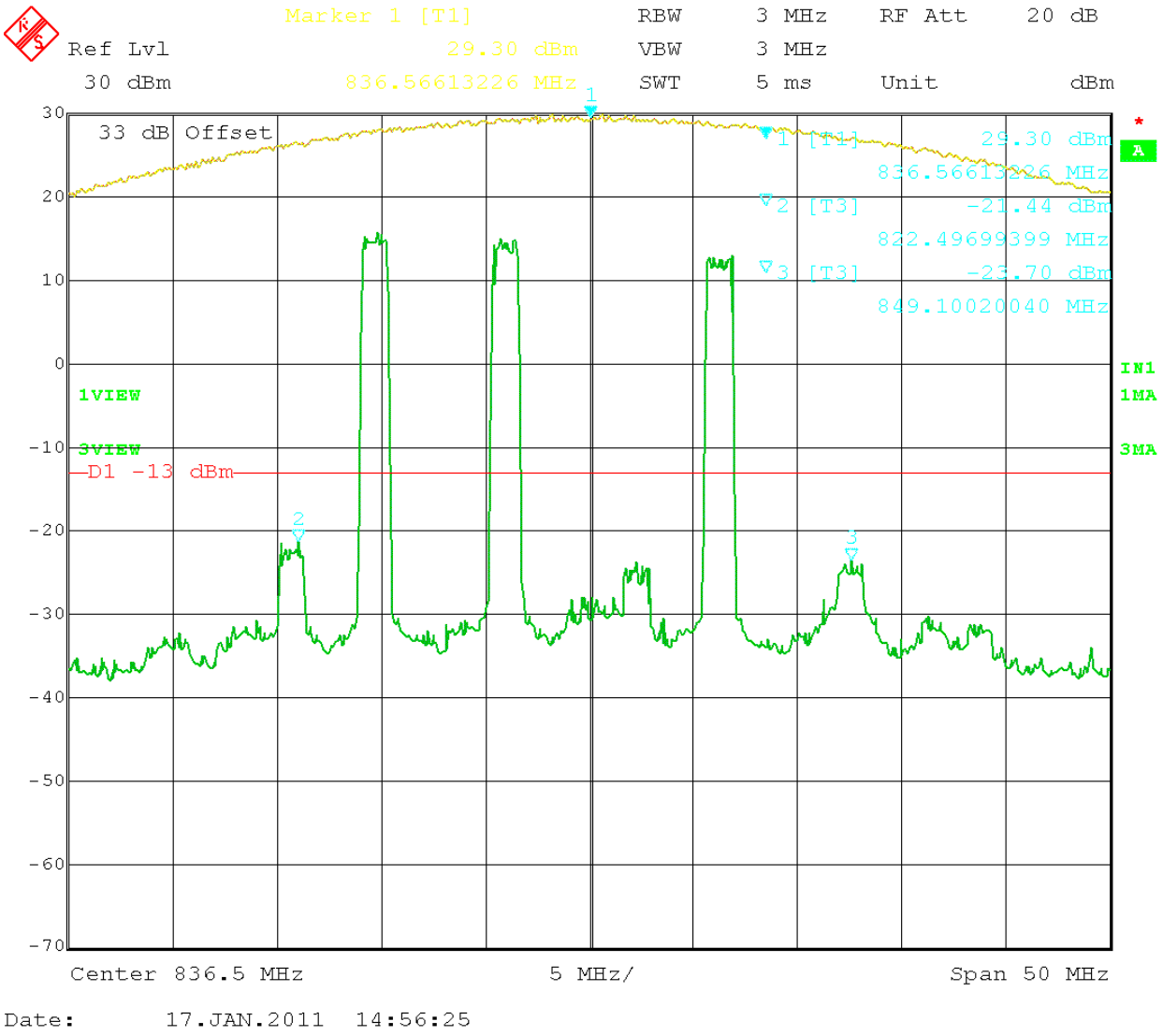


Figure 35: CDMA 3 tones intermodulation – (824 – 849) MHz.

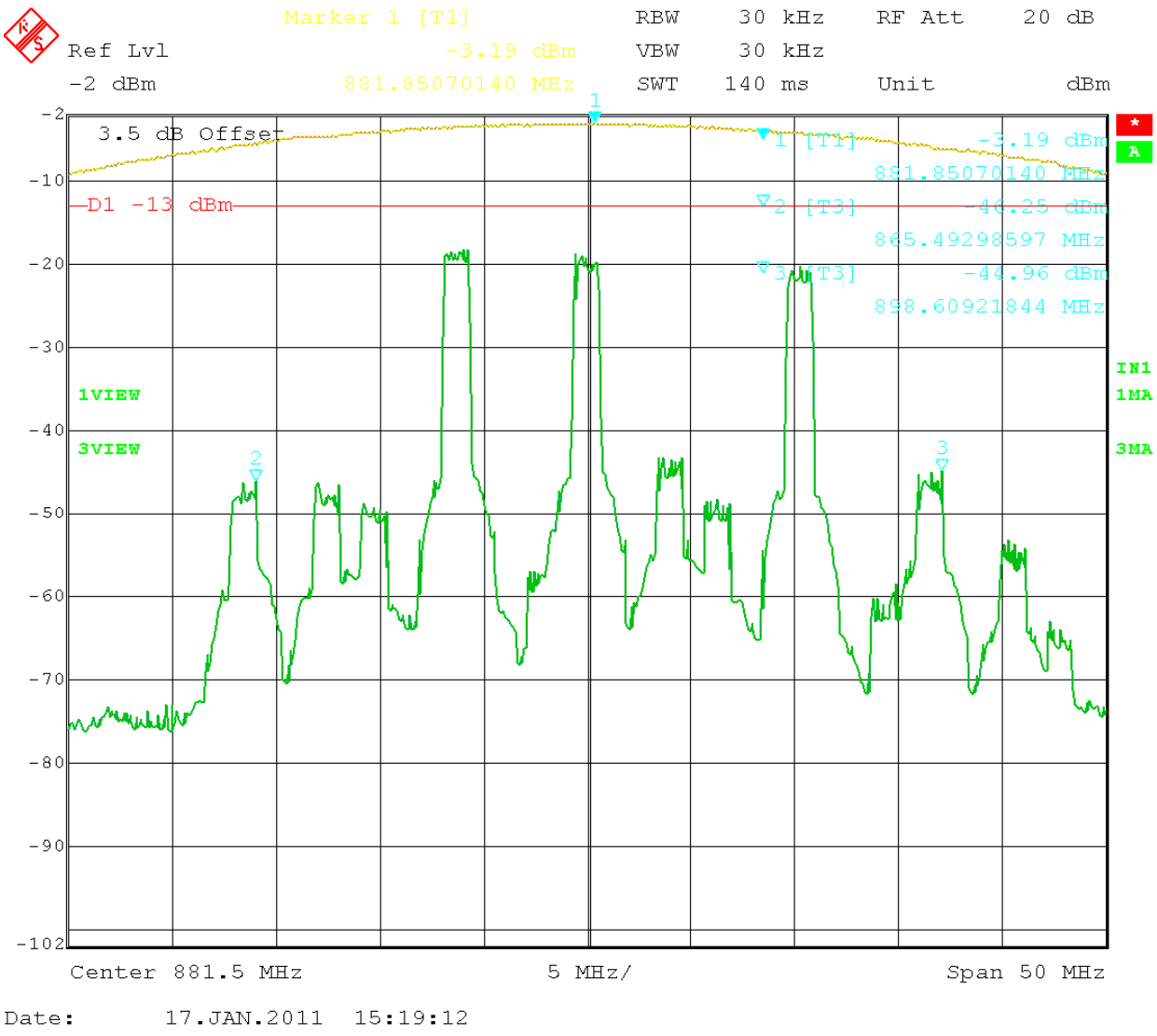


Figure 36: CDMA 3 tones intermodulation - (869 – 894) MHz.

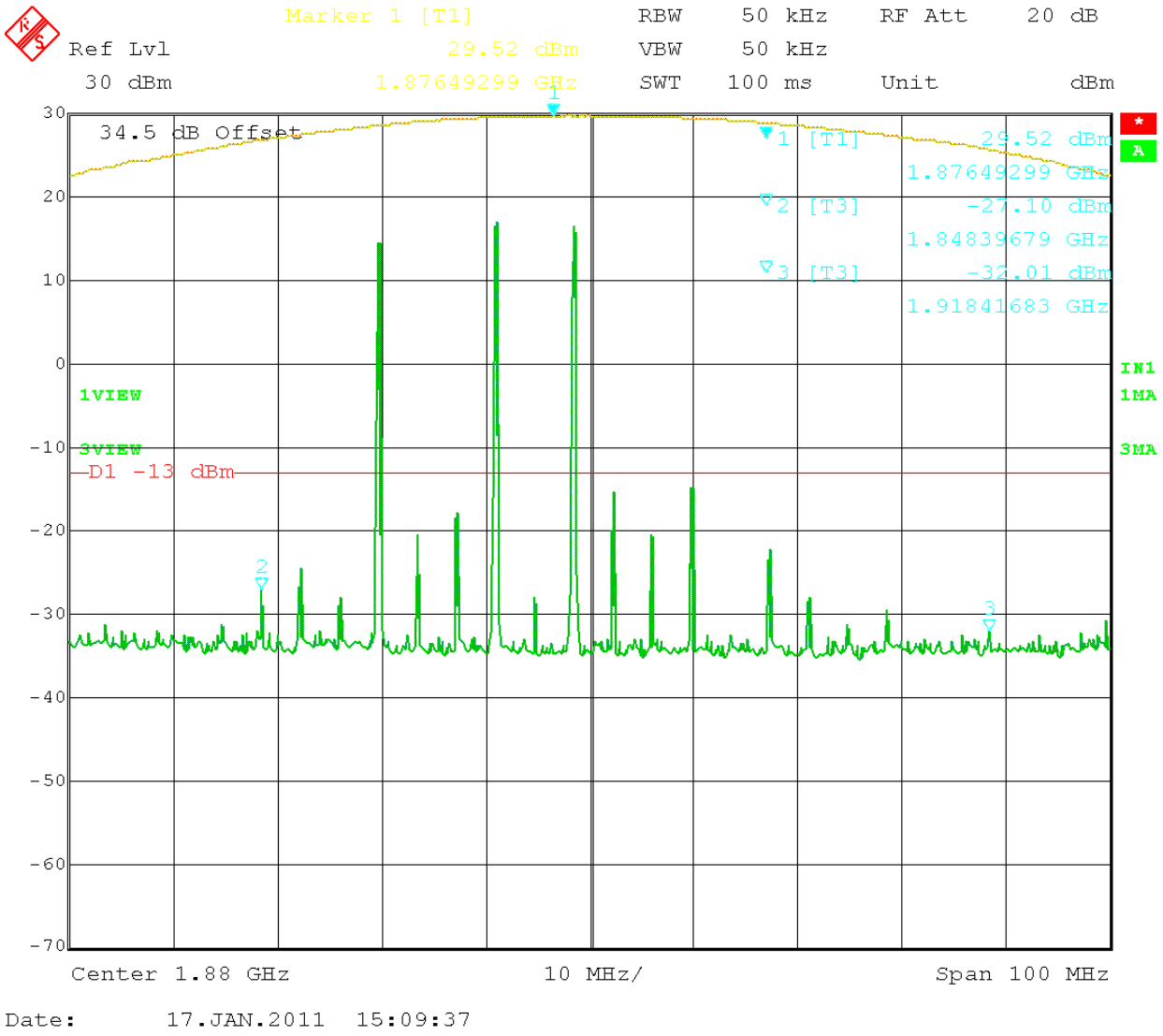


Figure 37: GSM 3 tones intermodulation - (1850 – 1910) MHz

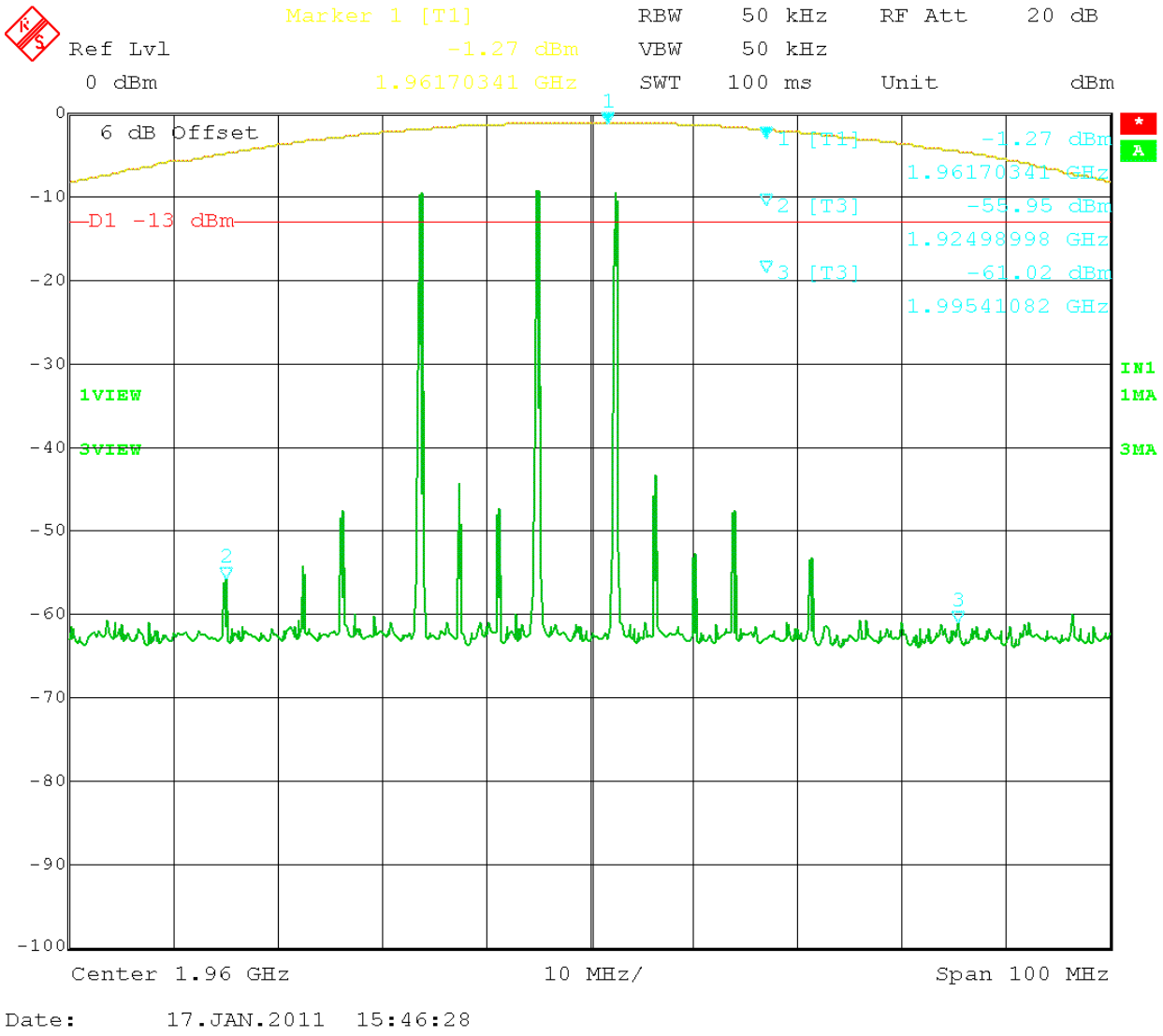


Figure 38: GSM 3 tones intermodulation - (1930 – 1990) MHz

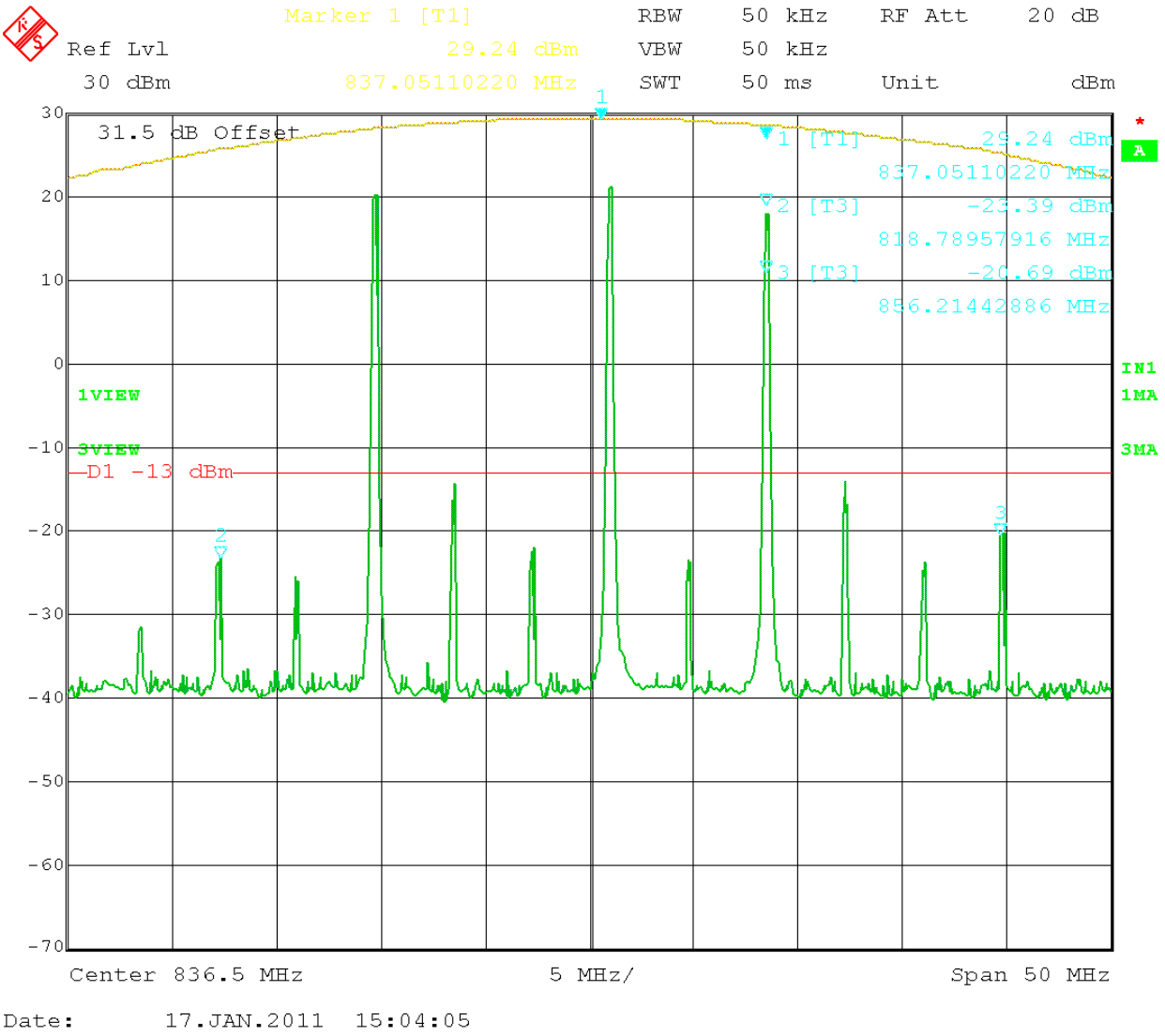


Figure 39: GSM 3 tones intermodulation - (824 – 849) MHz

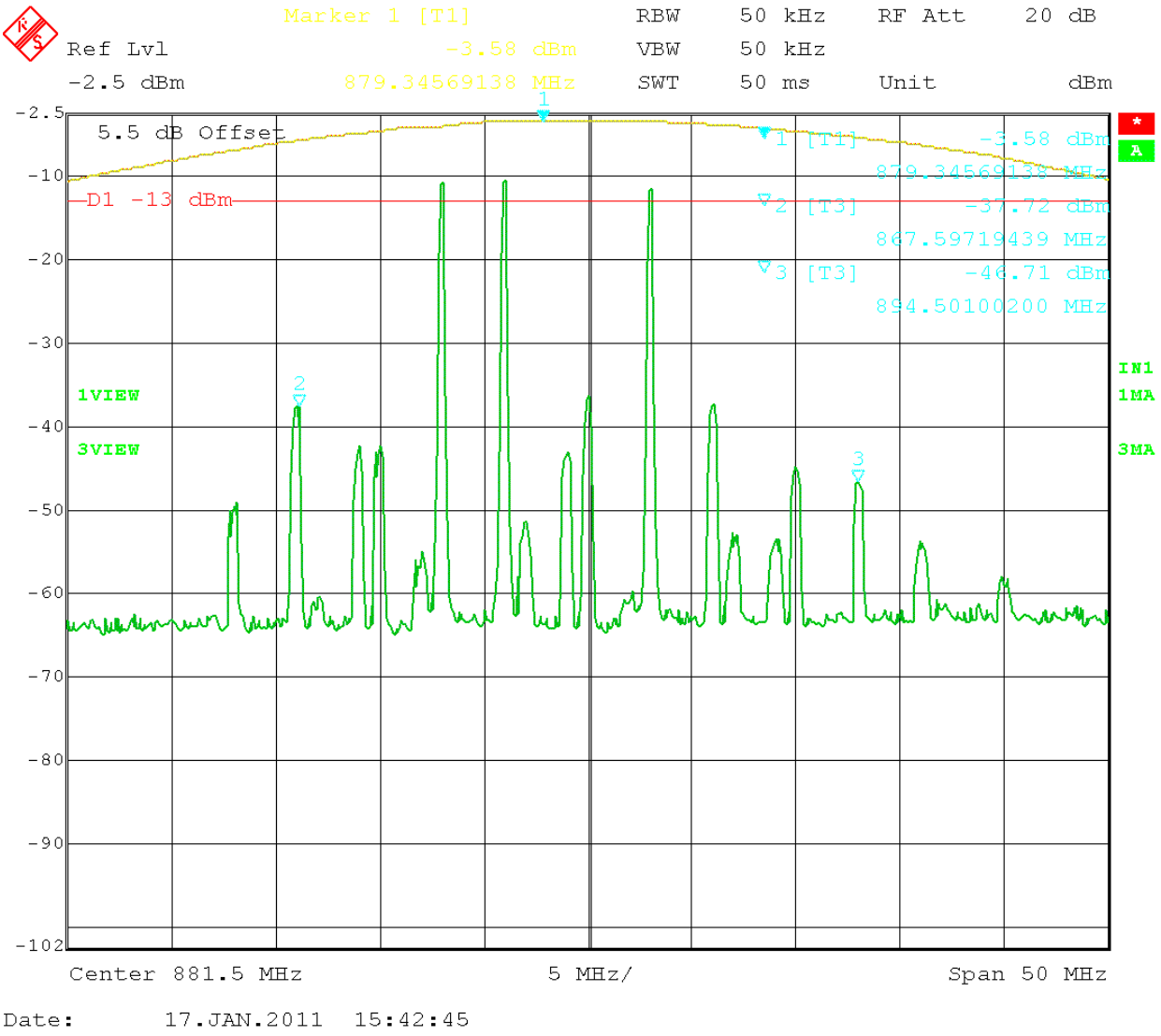


Figure 40: GSM 3 tones intermodulation - (869 – 894) MHz

SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Rule Parts No.: Pt 2.1051

Requirements: Emissions must be 43 +10log (Po) dB below the mean power output of the transmitter:

43 + 10log (1.86) = 45.7 dBc (Uplink)
43 + 10log (0.01) = 23 dBc (Downlink)

Test Result: The DUT meets the requirements.

Test Data Table 17 – Conducted Emissions – CDMA 1900 – Uplink

Emission Frequency MHz	dB Below Carrier (dBc)	Emission Frequency MHz	dB Below Carrier (dBc)	Emission Frequency MHz	dB Below Carrier (dBc)
1851.25	0	1880.00	0	1908.75	0
3702.50	64.8	3760.00	55.7	3817.50	51.8
5553.75	74.8	5640.00	76.9	5726.25	75.5
7405.00	67.7	7520.00	69.0	7635.00	68.6
9256.25	67.5	9400.00	69.2	9543.75	67.5
11107.50	>62.0	11280.00	>62.0	11452.50	>62.0
12958.75	>62.0	13160.00	>62.0	13361.25	>62.0
14810.00	>62.0	15040.00	>62.0	15270.00	>62.0
16661.25	>62.0	16920.00	>62.0	17178.75	>62.0
18512.50	>62.0	18800.00	>62.0	19087.50	>62.0

Test Data Table 18 – Conducted Emissions – CDMA 1900 – Downlink

Emission Frequency MHz	dB Below Carrier (dBc)	Emission Frequency MHz	dB Below Carrier (dBc)	Emission Frequency MHz	DB Below Carrier (dBc)
1931.25	0	1960.00	0	1988.75	0
3862.50	45.5	3920.00	46.8	3977.50	50.9
5793.75	50.8	5880.00	51.9	5966.25	50.8
7725.00	50.7	7840.00	52.7	7955.00	51.7
9656.25	50.7	9800.00	53.6	9943.75	51.8
11587.50	>60.0	11760.00	>60.0	11932.50	>60.0
13518.75	>60.0	13720.00	>60.0	13921.25	>60.0
15450.00	>60.0	15680.00	>60.0	15910.00	>60.0
17381.25	>60.0	17640.00	>60.0	17898.75	>60.0
19312.50	>60.0	19600.00	>60.0	19887.50	>60.0

Test Data Table 19 – Conducted Emissions – GSM 1900 - Uplink

Emission Frequency MHz	dB Below Carrier (dBc)	Emission Frequency MHz	dB Below Carrier (dBc)	Emission Frequency MHz	dB Below Carrier (dBc)
1850.20	0	1880.00	0	1909.80	0
3700.40	62.0	3760.00	52.8	3819.60	47.3
5550.60	72.8	5640.00	75.1	5729.40	71.5
7400.80	65.8	7520.00	67.7	7639.20	65.5
9251.00	65.4	9400.00	68.0	9549.00	95.2
11101.20	>58.0	11280.00	>58.0	11458.80	>58.0
12951.40	>58.0	13160.00	>58.0	13368.60	>58.0
14801.60	>58.0	15040.00	>58.0	15278.40	>58.0
16651.80	>58.0	16920.00	>58.0	17188.20	>58.0
18502.00	>58.0	18800.00	>58.0	19098.00	>58.0

Test Data Table 20 – Conducted Emissions – GSM 1900 - Downlink

Emission Frequency MHz	dB Below Carrier (dBc)	Emission Frequency MHz	dB Below Carrier (dBc)	Emission Frequency MHz	dB Below Carrier (dBc)
1930.20	0	1960.00	0	1989.80	0
3860.40	45.8	3920.00	46.9	3979.60	48.5
5790.60	45.7	5880.00	48.0	5969.40	46.8
7720.80	47.3	7840.00	48.8	7959.20	47.7
9651.00	46.5	9800.00	49.2	9949.00	47.9
11581.20	>56.0	11760.00	>56.0	11938.80	>56.0
13511.40	>56.0	13720.00	>56.0	13928.60	>56.0
15441.60	>56.0	15680.00	>56.0	15918.40	>56.0
17371.80	>56.0	17640.00	>56.0	17908.20	>56.0
19302.00	>56.0	19600.00	>56.0	19898.00	>56.0

Test Data Table 21 – Conducted Emissions – CDMA 800 - Uplink

Emission Frequency MHz	dB Below Carrier (dBc)	Emission Frequency MHz	dB Below Carrier (dBc)	Emission Frequency MHz	dB Below Carrier (dBc)
825.25	0	836.50	0	847.75	0
1650.50	68.0	1673.00	68.8	1695.50	67.6
2475.75	49.7	2509.50	49.2	2543.25	50.7
3301.00	57.9	3346.00	57.0	3391.00	59.0
4126.25	69.2	4182.50	68.8	4238.75	68.1
4951.50	>62.0	5019.00	>62.0	5086.50	>62.0
5776.75	>62.0	5855.50	>62.0	5934.25	>62.0
6602.00	>62.0	6692.00	>62.0	6782.00	>62.0
7427.25	>62.0	7528.50	>62.0	7629.75	>62.0
8252.50	>62.0	8365.00	>62.0	8477.50	>62.0

Test Data Table 22 – Conducted Emissions – CDMA 800 - Downlink

Emission Frequency MHz	dB Below Carrier (dBc)	Emission Frequency MHz	dB Below Carrier (dBc)	Emission Frequency MHz	dB Below Carrier (dBc)
870.25	0	881.50	0	892.75	0
1740.50	46.7	1763.00	47.9	1785.50	48.1
2610.75	47.4	2644.50	47.4	2678.25	48.6
3481.00	45.3	3526.00	46.6	3571.00	46.2
4351.25	47.6	4407.50	48.5	4463.75	48.1
5221.50	>60.0	5289.00	>60.0	5356.50	>60.0
6091.75	>60.0	6170.50	>60.0	6249.25	>60.0
6962.00	>60.0	7052.00	>60.0	7142.00	>60.0
7832.25	>60.0	7933.50	>60.0	8034.75	>60.0
8702.50	>60.0	8815.00	>60.0	8927.50	>60.0

Test Data Table 23 – Conducted Emissions – GSM 800 – Uplink

Emission Frequency MHz	dB Below Carrier (dBc)	Emission Frequency MHz	dB Below Carrier (dBc)	Emission Frequency MHz	dB Below Carrier (dBc)
824.20	0	836.50	0	848.80	0
1648.40	71.9	1673.00	74.3	1697.60	71.9
2472.60	53.1	2509.50	53.8	2546.40	53.1
3296.80	61.6	3346.00	60.2	3395.20	60.6
4121.00	73.3	4182.50	74.9	4244.00	72.8
4945.20	>58.0	5019.00	>58.0	5092.80	>58.0
5769.40	>58.0	5855.50	>58.0	5941.60	>58.0
6593.60	>58.0	6692.00	>58.0	6790.40	>58.0
7417.80	>58.0	7528.50	>58.0	7639.20	>58.0
8242.00	>58.0	8365.00	>58.0	8488.00	>58.0

Test Data Table 24 – Conducted Emissions – GSM 800 - Downlink

Emission Frequency MHz	dB Below Carrier (dBc)	Emission Frequency MHz	dB Below Carrier (dBc)	Emission Frequency MHz	dB Below Carrier (dBc)
869.20	0	881.50	0	893.80	0
1738.40	47.6	1763.00	66.11	1787.60	48.2
2607.60	49.0	2644.50	64.3	2681.40	49.4
3476.80	47.1	3526.00	68.42	3575.20	49.6
4346.00	49.3	4407.50	68.27	4469.00	49.2
5215.20	>56.0	5289.00	>56.0	5362.80	>56.0
6084.40	>56.0	6170.50	>56.0	6256.60	>56.0
6953.60	>56.0	7052.00	>56.0	7150.40	>56.0
7822.80	>56.0	7933.50	>56.0	8044.20	>56.0
8692.00	>56.0	8815.00	>56.0	8938.00	>56.0

OUT OF BAND REJECTION: FREQUENCY RESPONSE

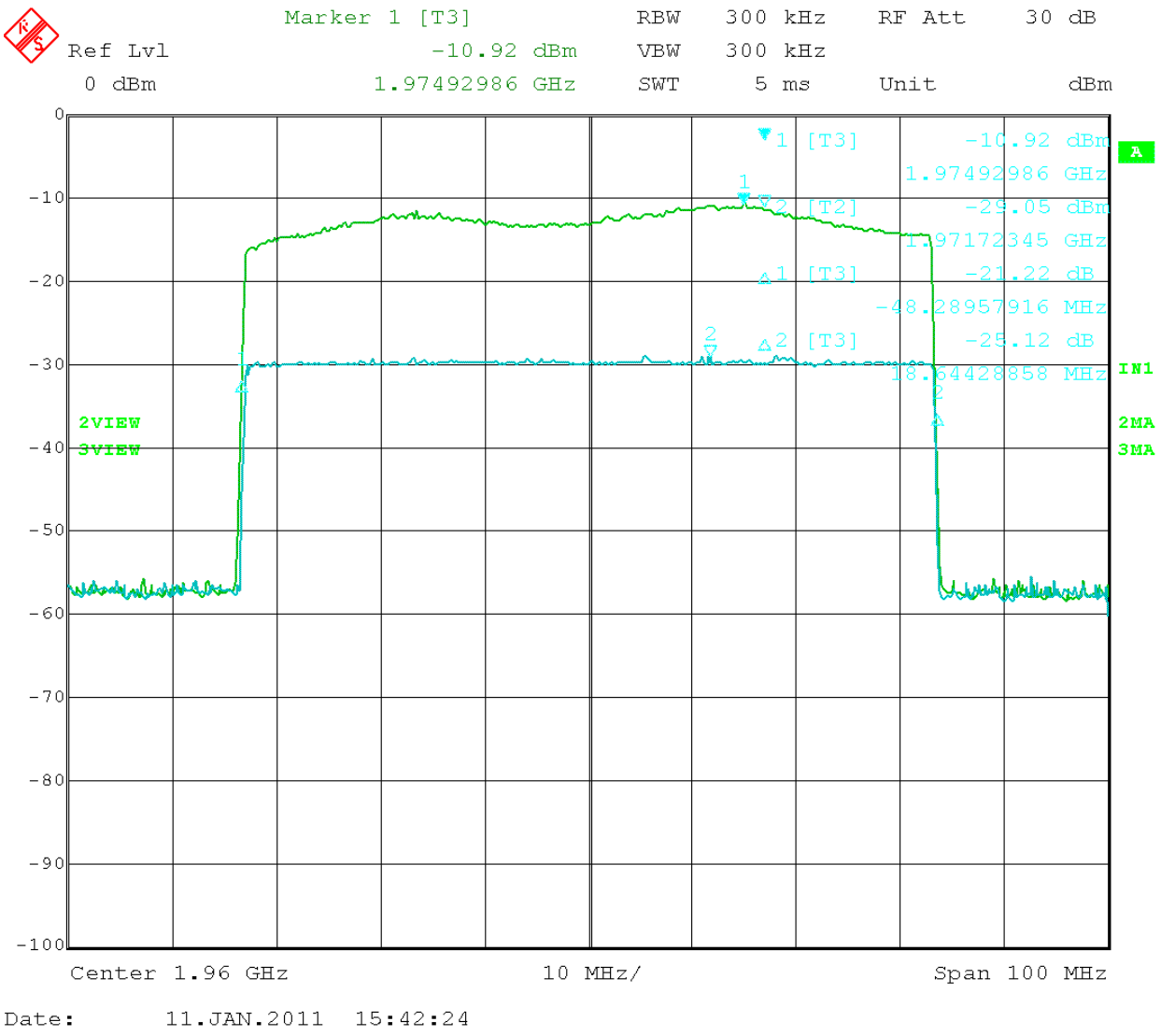


Figure 41. Frequency response (1850 – 1910) MHz band

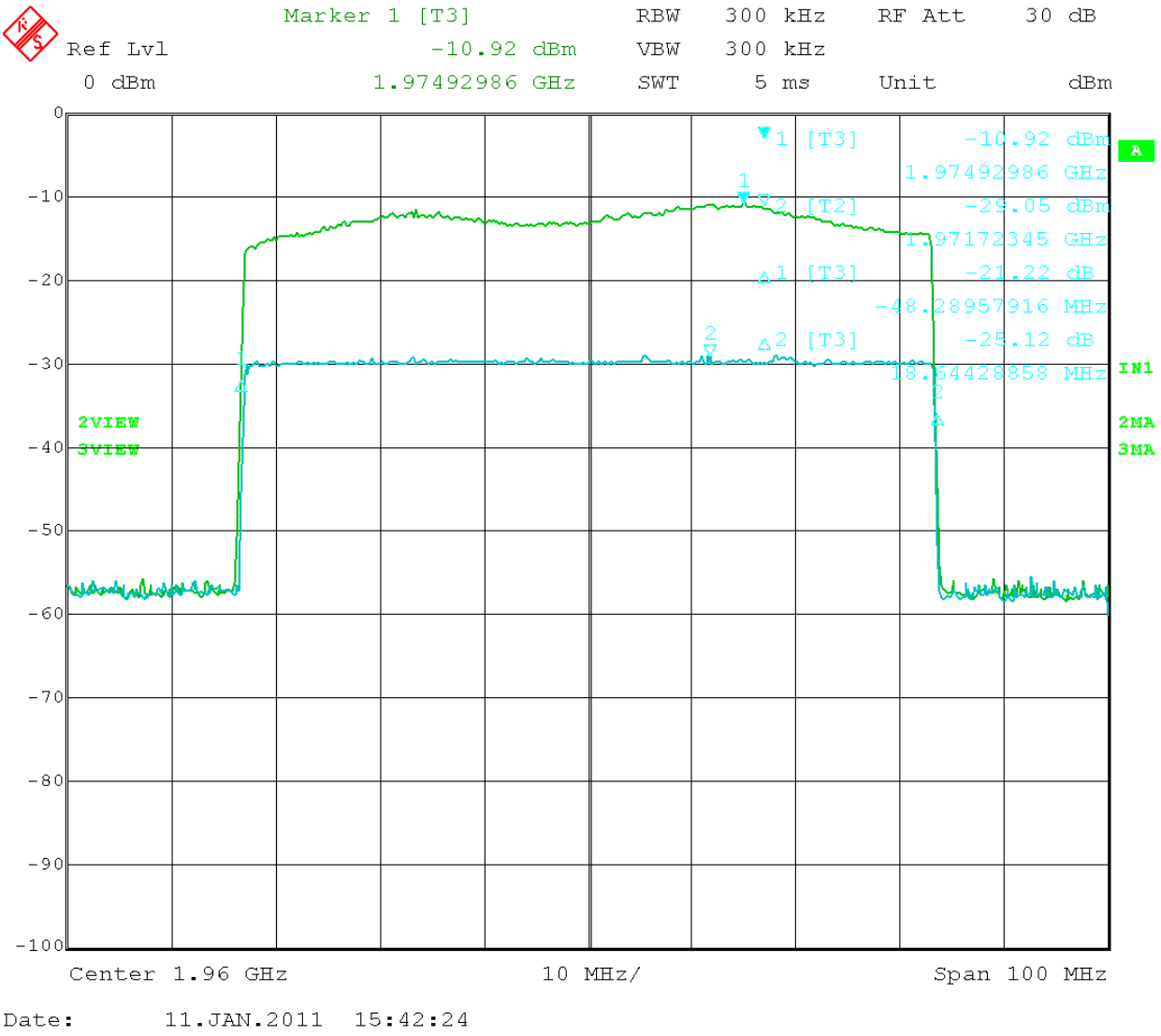


Figure 42. Frequency response (1930 – 1990) MHz band

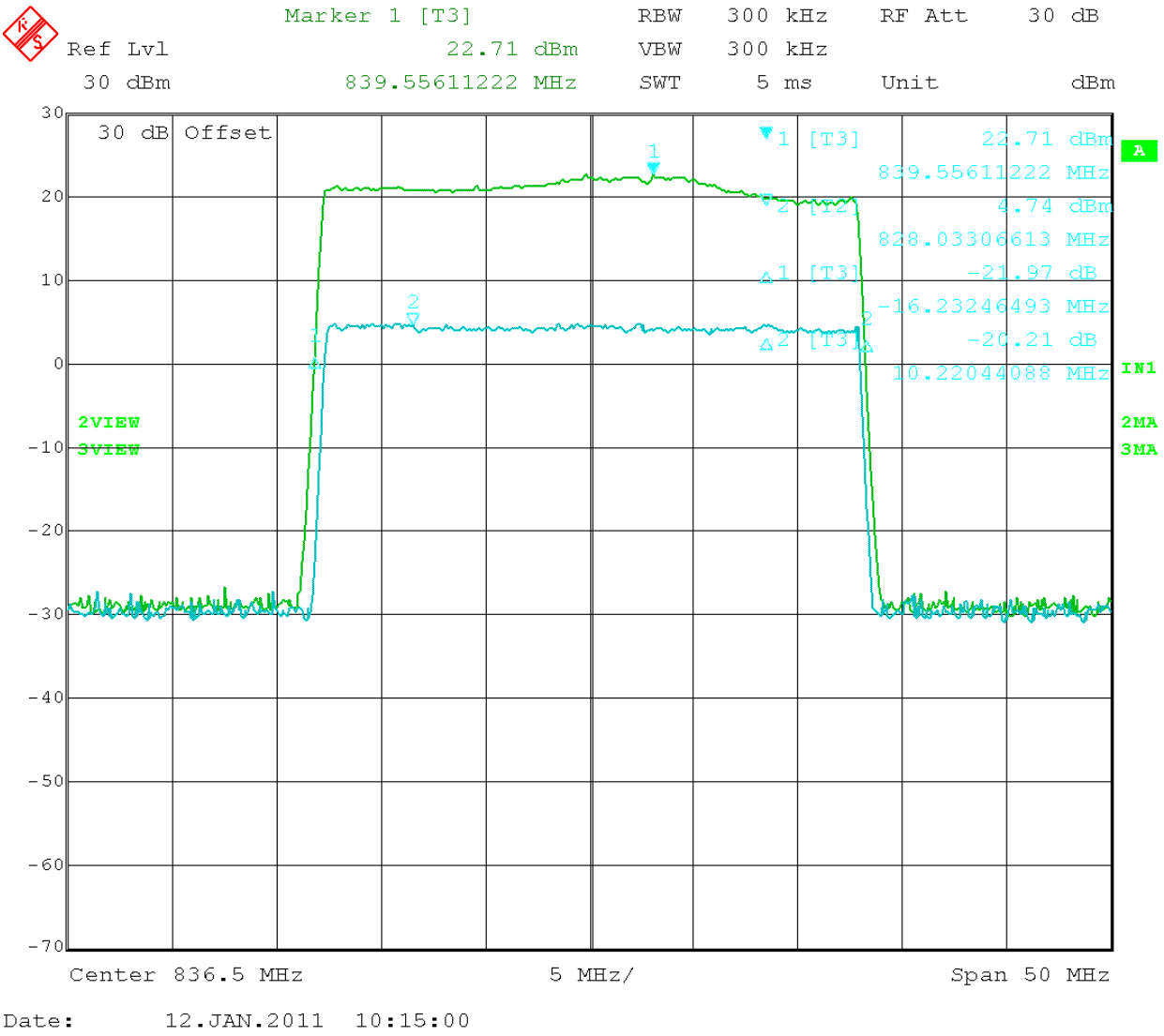


Figure 43. Frequency response (824 – 849) MHz band

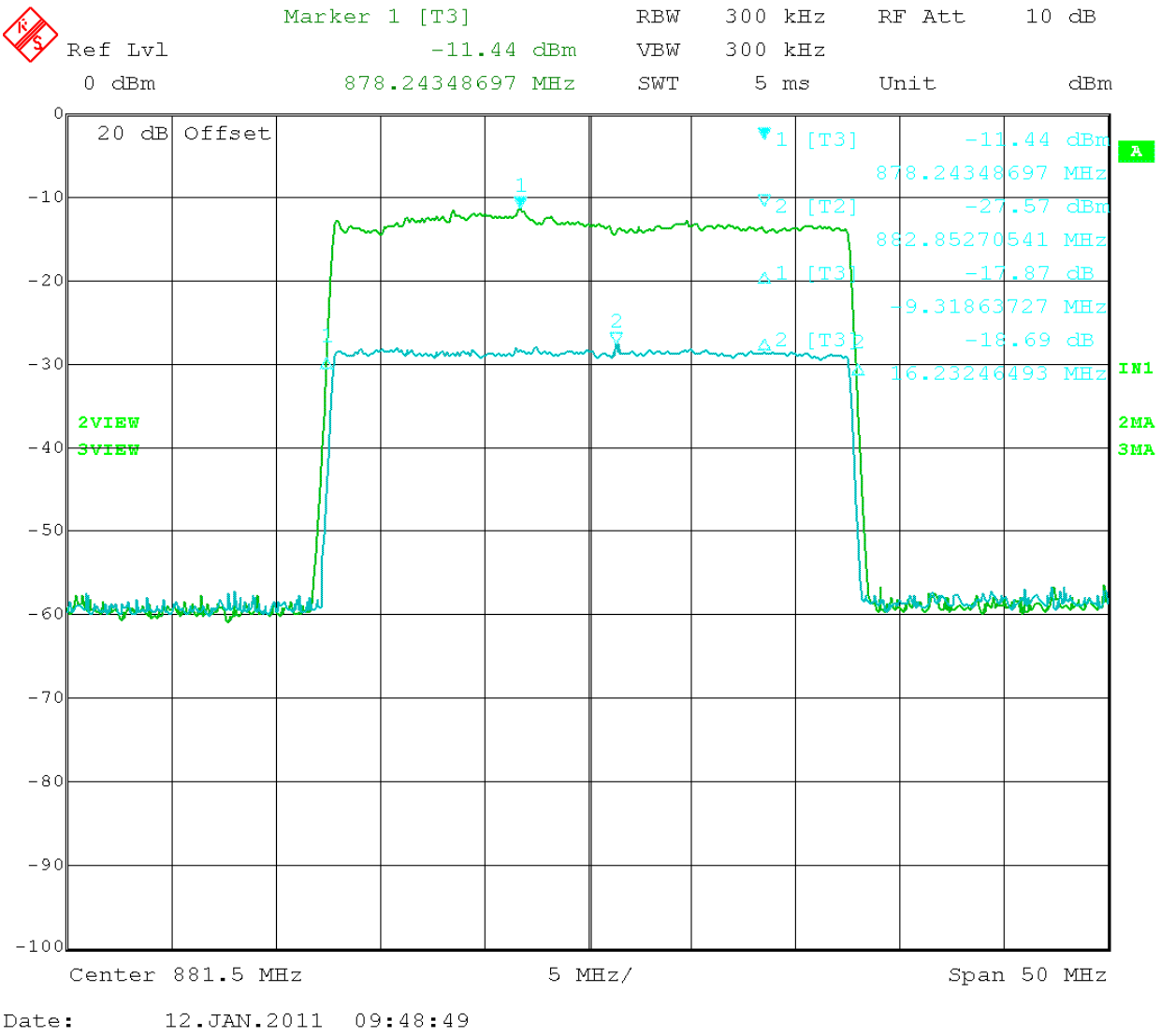


Figure 44. Frequency response (869 – 894) MHz band

FIELD STRENGTH OF SPURIOUS EMISSIONS

Rule Parts No.: Pt 2.1053

Requirements: Emissions must be 43+10log(Po) dB below the mean power output of the amplifier:

43 + 10log(1.86) = 45.7 dB
43 + 10log(0.01) = 23.0 dB

Test Result: The test data indicates the DUT meets the requirements

Test Data Table 25 – Radiated Emissions - CW

Emission Frequency (MHz)	Ant. Polarity (V/H)	Corrected DUT Signal Reading	Coax Loss (dB)	Substitution Antenna (dBd)	dB Below Carrier (dBc)
1880.00		30.00	0	0	0
3760.00	V	-53.2	1.42	7.55	77.1
5640.00	V	-55.5	1.73	8.42	78.8
7520.00	V	-60.7	2.04	8.47	84.3
9400.00	V	-58.8	2.36	9.2	81.9
11280.00	V/H	*	*	*	*
13160.00	V/H	*	*	*	*
15040.00	V/H	*	*	*	*
16920.00	V/H	*	*	*	*
18800.00	V/H	*	*	*	*

[Continued]

Test Data Table 26 – Radiated Emissions - CW

Emission Frequency (MHz)	Ant. Polarity (V/H)	Corrected DUT Signal Reading	Coax Loss (dB)	Substitution Antenna (dBd)	dB Below Carrier (dBc)
836.50		30.0	0	0	0
1673.00	V	-54.4	1.10	5.1	80.3
2509.50	V	-40.6	1.25	7.0	64.8
3346.00	V	-41.9	1.40	7.5	65.7
4182.50	V	-56.8	1.55	8.3	80.0
5019.00	V/H	*	*	*	*
5855.50	V/H	*	*	*	*
6692.00	V/H	*	*	*	*
7528.50	V/H	*	*	*	*
8365.00	V/H	*	*	*	*

Notes: *No other emissions were found up to the 10th harmonics - NOISE FLOOR

Test Data Table 27 – Radiated Emissions - CW

Emission Frequency (MHz)	Ant. Polarity (V/H)	Corrected DUT Signal Reading	Coax Loss (dB)	Substitution Antenna (dBd)	dB Below Carrier (dBc)
1960.00		10.0	0	0	0
3920.00	V	-62.5	1.46	7.5	61.4
5880.00	V	-54.8	1.79	8.9	52.7
7840.00	V	-56.2	2.12	7.8	55.5
9800.00	V	-55.1	2.45	9.3	53.2
11760.00	V/H	*	*	*	*
13720.00	V/H	*	*	*	*
15680.00	V/H	*	*	*	*
17640.00	V/H	*	*	*	*
19600.00	V/H	*	*	*	*

[Continued]

Test Data Table 28 – Radiated Emissions – CW

Emission Frequency (MHz)	Ant. Polarity (V/H)	Corrected DUT Signal Reading	Coax Loss (dB)	Substitution Antenna (dBd)	dB Below Carrier (dBc)
881.50		10.0	0	0	0
1763.00	V	-53.6	1.10	5.1	54.6
2644.50	V	-58.6	1.25	7.0	57.8
3526.00	V	-58.7	1.40	7.5	57.5
4407.50	V	-57.5	1.55	8.3	55.7
5289.00	V/H	*	*	*	*
6170.50	V/H	*	*	*	*
7052.00	V/H	*	*	*	*
7933.50	V/H	*	*	*	*
8815.00	V/H	*	*	*	*

Notes: *No other emissions were found up to the 10th harmonics - NOISE FLOOR

MEAN OUTPUT POWER FOR MULTI-CHANNEL ENHANCER (FOR IC ONLY)

Rule Part(s) No.: RSS-131 Issue 2 Para.4.3.1

Requirements: For enhancers rated 500 watts or less: Raise the input level to the DUT until the greater level of the intermodulation products at the enhancer output terminals, Po3 or Po4, equals -43 dBW.

For enhancers rated over 500 watts: Raise the input level to the DUT until the greater level of the intermodulation products at the enhancer output terminals, Po3 or Po4, is 67 dB below the level of either output tone level, Po1 or Po2.

Record all signal levels and their frequencies. Calculate the mean output power (Pmean) under this testing condition using Pmean = Po1 + 3 dB.

Test Result: As the following table indicates.

Test Data Table 29 – Mean Output Power (800 MHz)		
Channel	Freq (MHz)	dBm
F1	833.544	22.25
F2	837.853	22.45
F3	829.235	-13.15
F4	842.161	-13.52
Mean		25.45
F1	878.544	-10.92
F2	885.558	-10.79
F3	871.530	-25.81
F4	892.572	-26.06
Mean		-7.79

[Continued]

Test Data Table 30 – Mean Output Power (1900 MHz)		
Channel	Freq (MHz)	dBm
F1	1874.289	18.33
F2	1876.493	17.15
F3	1872.084	-13.12
F4	1878.697	-13.10
Mean		21.33
F1	1952.885	-5.24
F2	1964.709	-5.79
F3	1941.061	-23.46
F4	1976.533	-23.65
Mean		-2.24

PASSBAND GAIN AND BANDWIDTH (FOR IC ONLY)

Rule Part No.: RSS-131 Issue 2 Para 4.2

Requirements: RSS-131 Issue 2 Para 4.2

Test Data: See plots

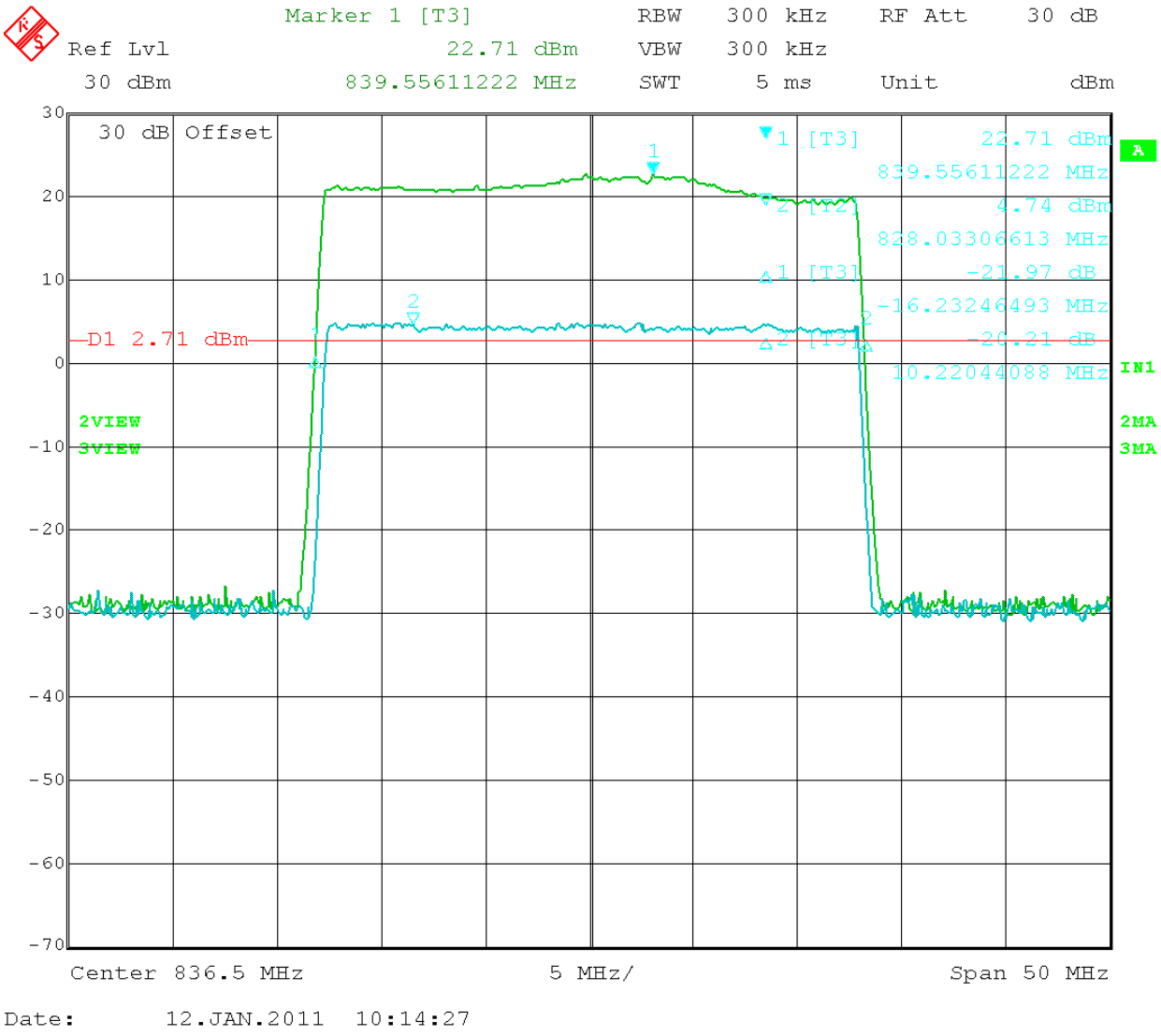


Figure 45: Passband Gain and Bandwidth (uplink 800 MHz)

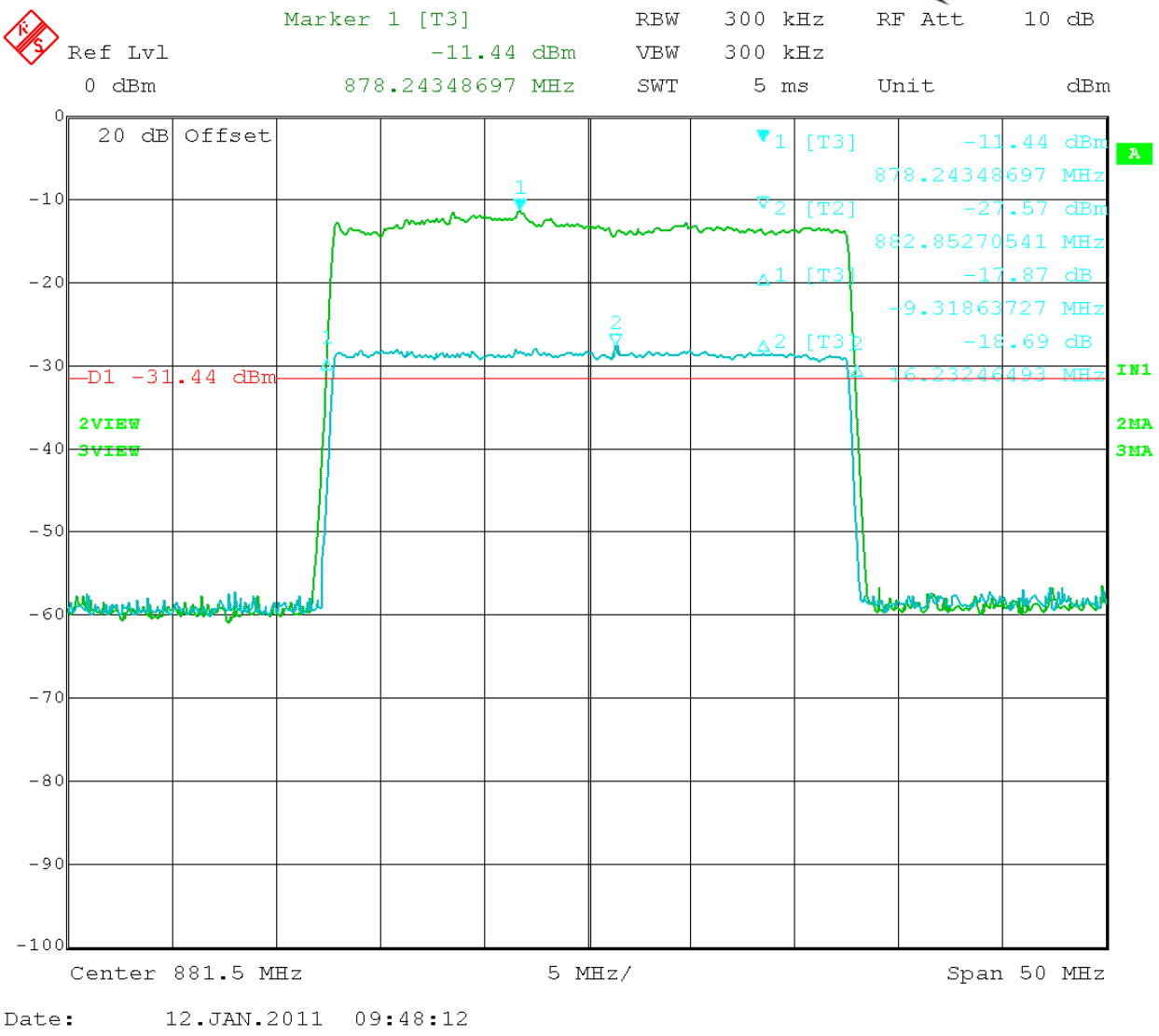


Figure 46: Passband Gain and Bandwidth (downlink 800 MHz)

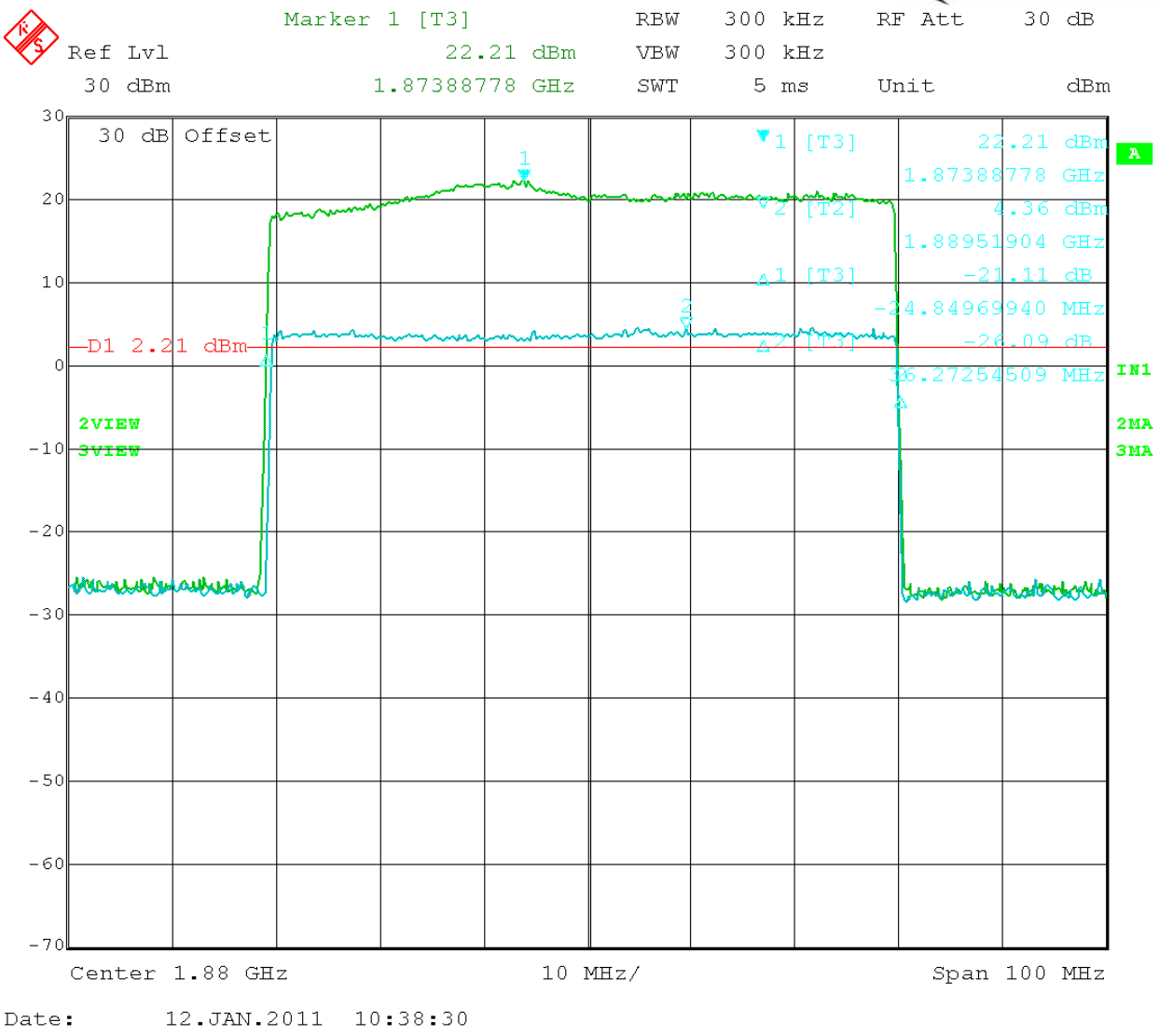


Figure 47: Passband Gain and Bandwidth (uplink 1900 MHz)

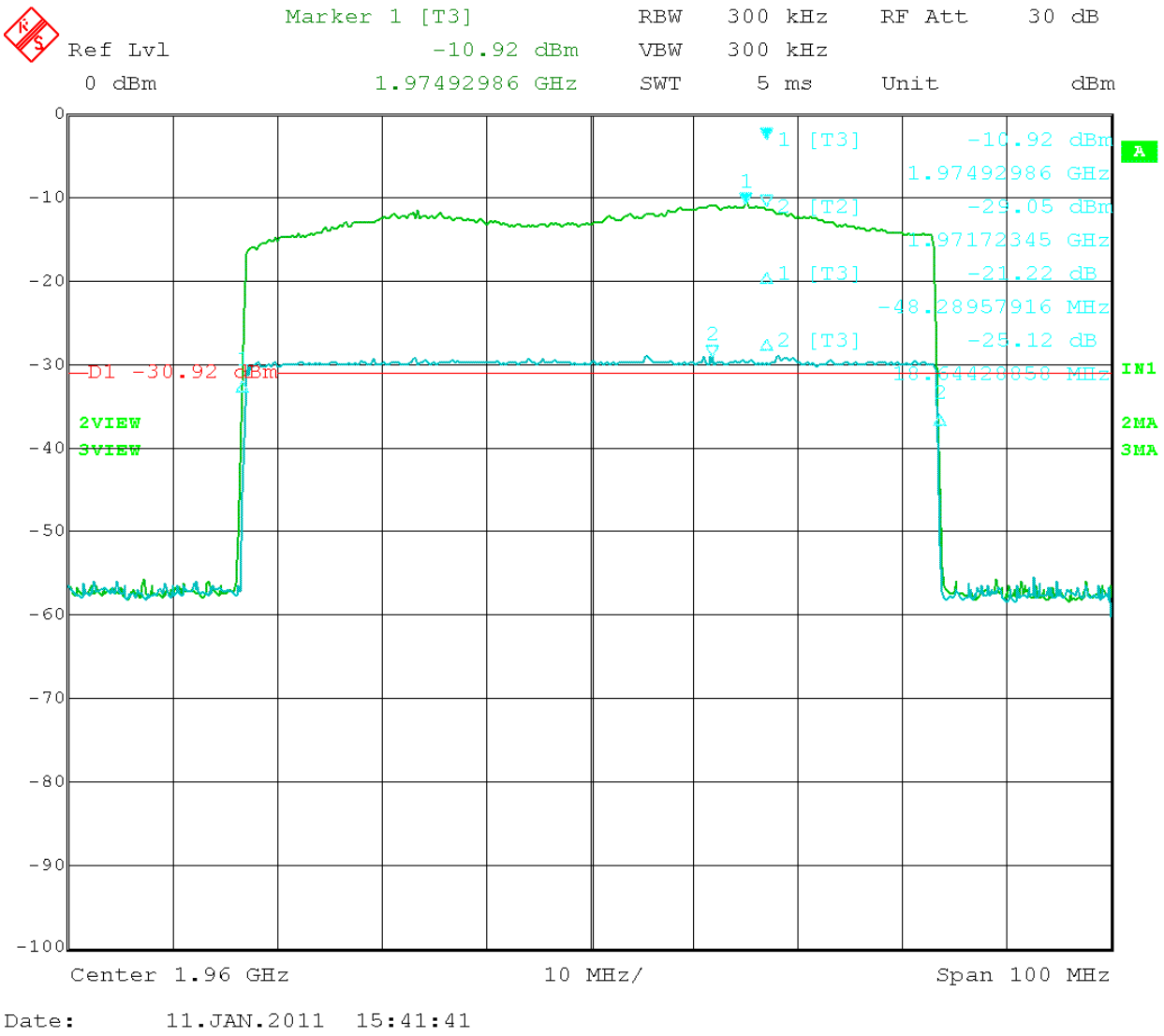


Figure 48: Passband Gain and Bandwidth (downlink 1900 MHz)