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FCC PART 22H AND PART 24E TEST REPORT

Applicant	WILSON ELECTRONICS, INC.
Address	3301 E. DESERET DRIVE ST. GEORGE UTAH 84790 USA
FCC ID	PWO277280
Model Number	277280
Product Description	DUAL-BAND WIRELESS CHANNELIZED SIGNAL BOOSTER
Date Sample Received	2/13/2012
Date Tested	3/1/2012
Tested By	Nam Nguyen
Approved By	Mario de Aranzeta
Report No.	342AUT12TestReport_Rev.doc
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.

A2LA 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 Name: Mario de Aranzeta

Signature:

Function: Engineer

Date: 4/12/2012

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
Test Procedure(s)	ANSI/TIA-603-C: 2004

TEST ENVIRONMENT

Test Facilities	All required tests were performed by Timco Engineering Inc. that is 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, INC.
DUT Description	DUAL-BAND CHANNELIZED SIGNAL BOOSTER
FCC ID	PWO277280
Model Name	277280
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), G7D(LTE)
Modulation(s)	CDMA, WCDMA, GSM, EDGE, HSPA, EVDO, LTE
User Power Range & Control	There are NO user power controls
Test Item	Pre-Production
DC Voltage and Current into final amplifier	Uplink: Vcc = 4.5Vdc,0.6 A Downlink: Vcc= 4.5Vdc,0.6 A
Type of Equipment	Fixed

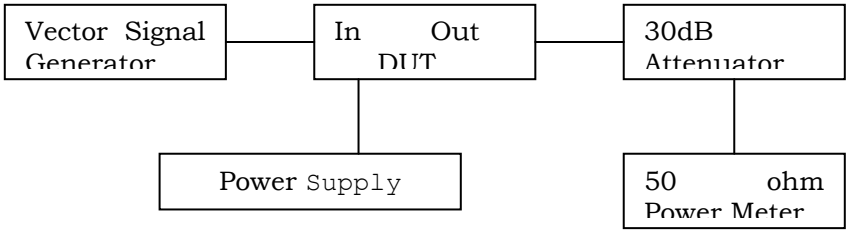
EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
3-Meter Semi-Anechoic Chamber	Panashield	N/A	N/A	Listed 5/10/10	5/10/12
AC Voltmeter	HP	400FL	2213A14499	CAL 6/12/11	6/12/13
Antenna: Active Loop	ETS-Lindgren	6502	00062529	CAL 9/23/10	9/23/12
Frequency Counter	HP	5385A	2730A03025	CAL 8/17/11	8/17/13
Hygro-Thermometer	Extech	445703	0602	CAL 6/15/11	6/15/13
Modulation Analyzer	HP	8901A	3435A06868	CAL 7/18/11	7/18/13
Digital Multimeter	Fluke	FLUKE-77	35053830	CAL 9/9/11	9/9/13
Power Meter	Boonton Electronics	4531	11793	CAL 11/12/2010	11/12/2012
EMI Receiver	Rohde & Schwarz	ESIB40	100274	CAL 3/16/2012	3/16/2014
Analyzer Tan Tower Preamplifier	HP	8449B-H02	3008A00372	CAL 10/28/11	10/28/13
Analyzer Tan Tower Quasi-Peak Adapter	HP	85650A	3303A01690	CAL 10/28/11	10/28/13
Analyzer Tan Tower RF Preselector	HP	85685A	3221A01400	CAL 10/28/11	10/28/13
Analyzer Tan Tower Spectrum Analyzer	HP	8566B Opt 462	3138A07786 3144A20661	CAL 10/28/11	10/28/13
Antenna	ETS	3117	35923	12/7/2011	12/7/2013
Antenna	Electro metrics	LPA-25	1122	5/04/2011	5/04/2013
Antenna	Electro metrics	BIA-25	1096	5/04/2011	5/04/2013

TEST PROCEDURE

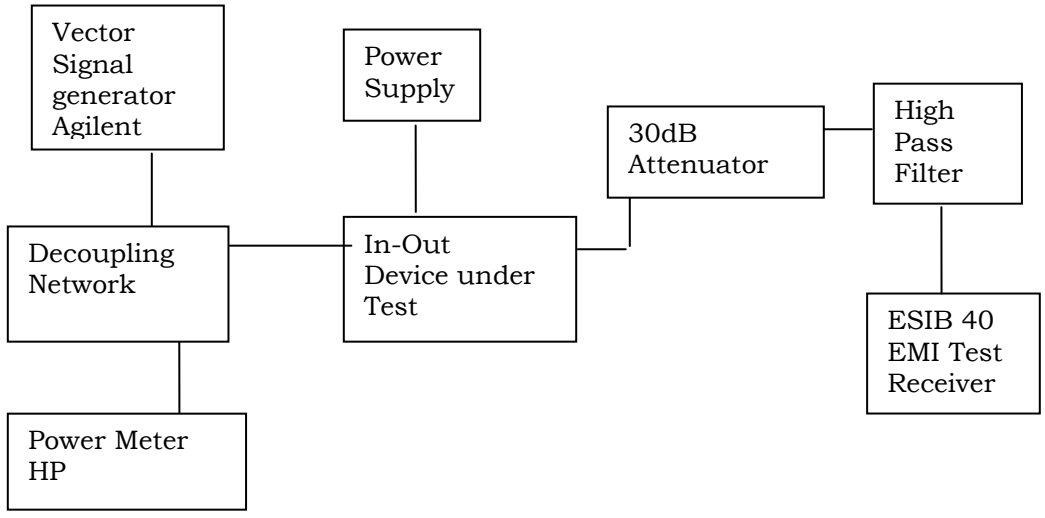
RF Power Output
RF power is measured by connecting a 50-ohm, resistive wattmeter to the RF output connector. With a nominal voltage and the amplifier properly adjusted the RF output measures.

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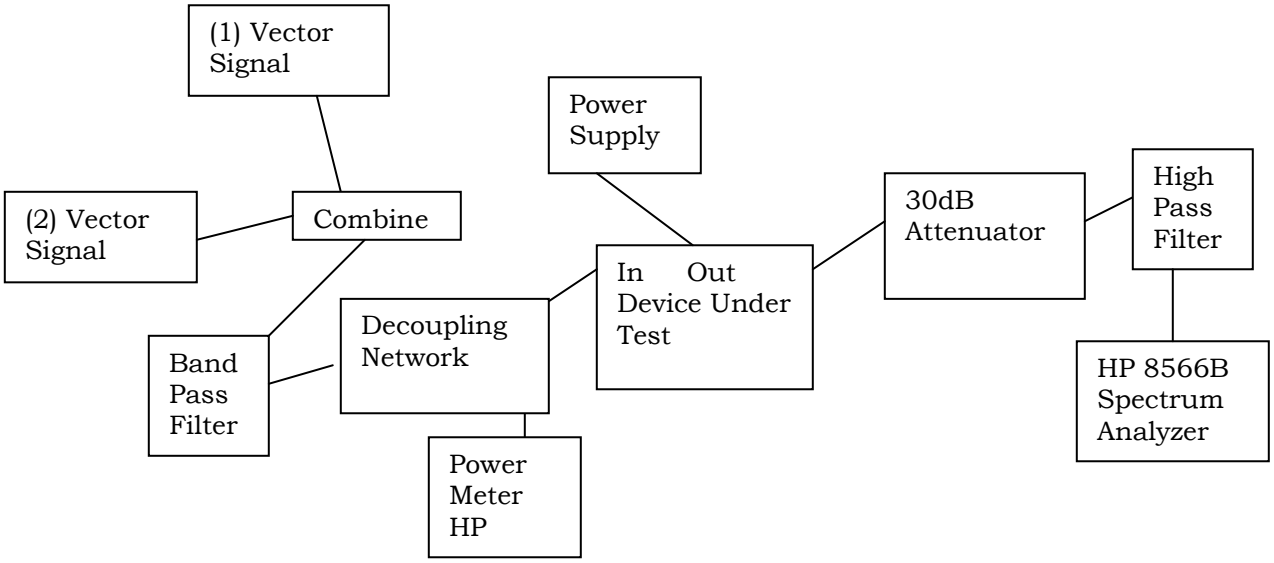
Intermodulation Product Spurious Emissions
The procedure used was ANSI/TIA-603-C: 2004. The spectrum was scanned from 9kHz to at least the tenth harmonic of the fundamental using a HP 8566B spectrum analyzer.

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

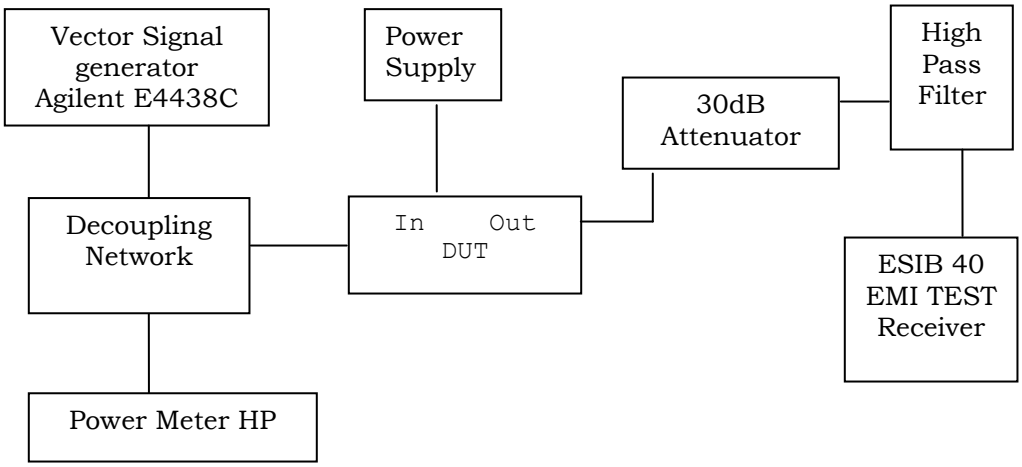


Spurious Emissions at Antenna Terminals
The procedure used was ANSI/TIA-603-C: 2004. The spectrum was scanned from 9kHz to at least the tenth harmonic of the fundamental using a HP model 8566B spectrum analyzer.

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.

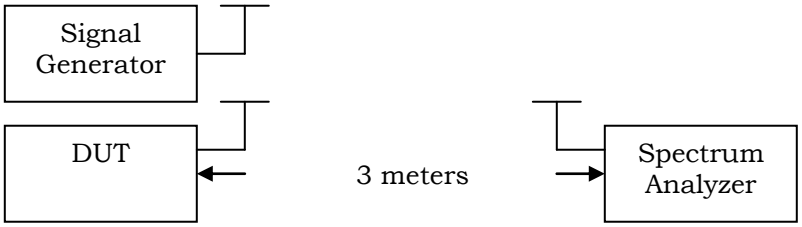
[Continued]

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

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	-40.0	27.1	513	1931.25	-46.0	21.5	141
1880.00	-46.0	27.2	525	1960.00	-52.0	21.9	155
1908.75	-40.0	21.2	132	1988.75	-41.0	19.7	93

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)
1852.50	-44.0	23.1	204	1932.50	-44.0	20.6	115
1880.00	-49.0	24.8	302	1960.00	-50.0	21.2	132
1907.50	-41.0	21.2	132	1987.50	-40.0	17.2	52

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)
1852.50	-42.0	23.7	234	1932.50	-43.0	21.7	148
1880.00	-48.0	25.1	324	1960.00	-49.0	21.6	145
1907.50	-40.0	21.5	141	1987.50	-40.0	19.2	83

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)
1852.50	-41.0	24.4	275	1932.50	-45.0	20.9	123
1880.00	-47.0	26.4	437	1960.00	-51.0	20.9	123
1907.50	-40.0	21.5	141	1987.50	-40.0	19.5	89

[Continued]

Test Data Table 5 – Output Power – LTE 1900 – Uplink/Downlink

Tuned Frequency (MHz)	Power Input (dBm)	Power Output (dBm)	Power Output (mW)
1855.00	-42.0	23.1	204
1880.00	-47.0	26.5	447
1905.00	-40.0	23.0	200

Tuned Frequency (MHz)	Power Input (dBm)	Power Output (dBm)	Power Output (mW)
1935.00	-45.0	22.3	170
1960.00	-51.0	21.3	135
1985.00	-41.0	20.2	105

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

Tuned Frequency (MHz)	Power Input (dBm)	Power Output (dBm)	Power Output (mW)
825.25	-43.0	27.0	501
836.50	-45.0	27.6	575
847.75	-44.0	27.1	513

Tuned Frequency (MHz)	Power Input (dBm)	Power Output (dBm)	Power Output (mW)
870.25	-57.0	17.9	62
881.50	-56.0	19.3	85
892.75	-57.0	17.8	60

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

Tuned Frequency (MHz)	Power Input (dBm)	Power Output (dBm)	Power Output (mW)
824.20	-40.0	23.9	245
836.50	-44.0	27.5	562
848.80	-43.0	26.6	457

Tuned Frequency (MHz)	Power Input (dBm)	Power Output (dBm)	Power Output (mW)
869.20	-48.0	17.9	62
881.50	-54.0	18.7	74
893.80	-56.0	16.9	49

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

Tuned Frequency (MHz)	Power Input (dBm)	Power Output (dBm)	Power Output (mW)
824.20	-41.0	23.1	204
836.50	-44.0	27.6	575
848.80	-43.0	26.7	468

Tuned Frequency (MHz)	Power Input (dBm)	Power Output (dBm)	Power Output (mW)
869.20	-45.0	20.8	120
881.50	-53.0	21.8	151
893.80	-54.0	19.2	83

Test Data Table 9 – Output Power – WCDMA 800 – Uplink/Downlink

Tuned Frequency (MHz)	Power Input (dBm)	Power Output (dBm)	Power Output (mW)
826.50	-44.0	26.3	427
836.50	-44.0	26.9	490
846.50	-43.0	26.3	427

Tuned Frequency (MHz)	Power Input (dBm)	Power Output (dBm)	Power Output (mW)
871.50	-57.0	18.0	63
881.50	-56.0	18.5	71
891.50	-55.0	18.0	63

Test Data Table 10 – Output Power – LTE 800 – Uplink/Downlink

Tuned Frequency (MHz)	Power Input (dBm)	Power Output (dBm)	Power Output (mW)
829.00	-44.0	26.6	457
836.50	-44.0	26.1	407
844.00	-44.0	26.8	479

Tuned Frequency (MHz)	Power Input (dBm)	Power Output (dBm)	Power Output (mW)
874.00	-55.0	21.5	141
881.50	-53.0	20.0	100
889.00	-53.0	21.1	129

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 meets 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 11 – CDMA 1900 – Uplink/Downlink

Channel (MHz)	Bandedge Frequency (MHz)	Amplitude bandedge (dBm)	Limit (dBm)	Margin (dB)
1851.25	1849.91	-25.2	-13	12.2
1908.75	1910.04	-27.44	-13	14.44
1931.25	1929.78	-34.98	-13	21.98
1988.75	1990.06	-27.23	-13	14.23

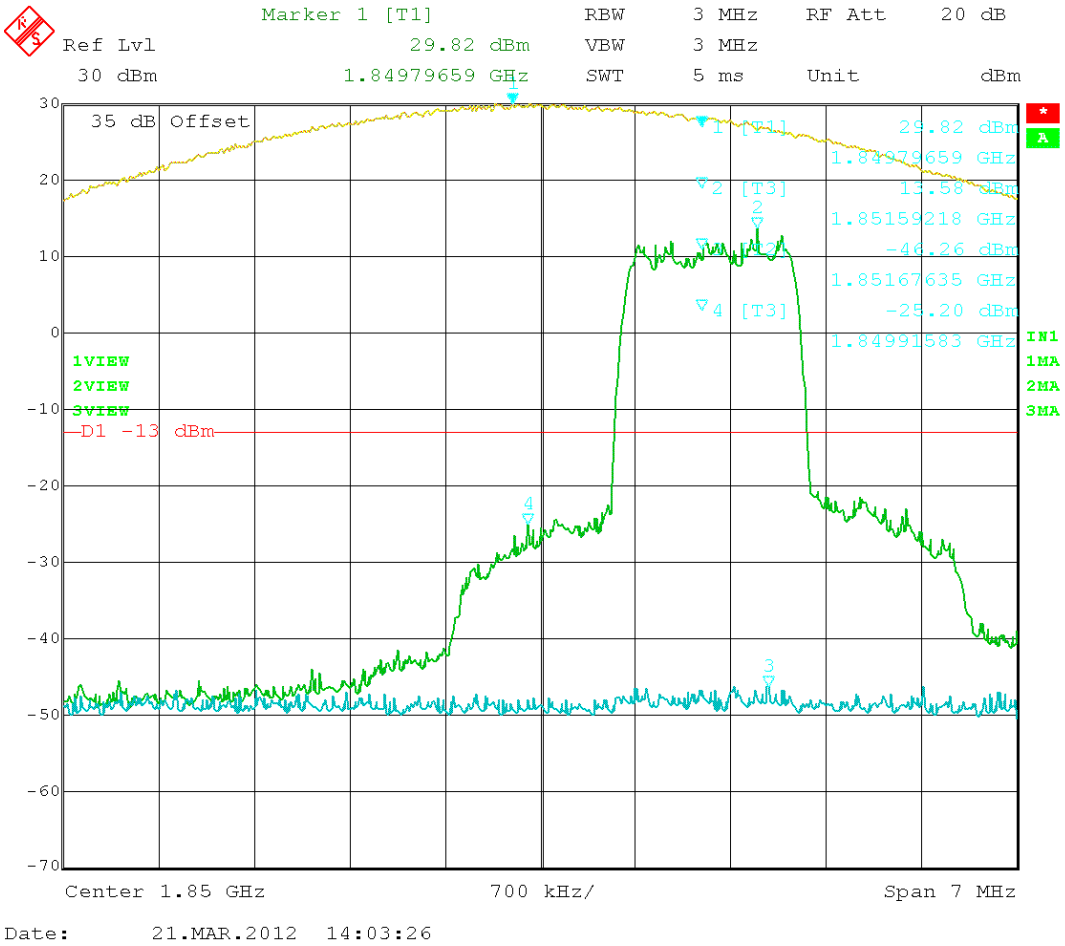


Figure 1: CDMA – In vs. Out 1851.25MHz

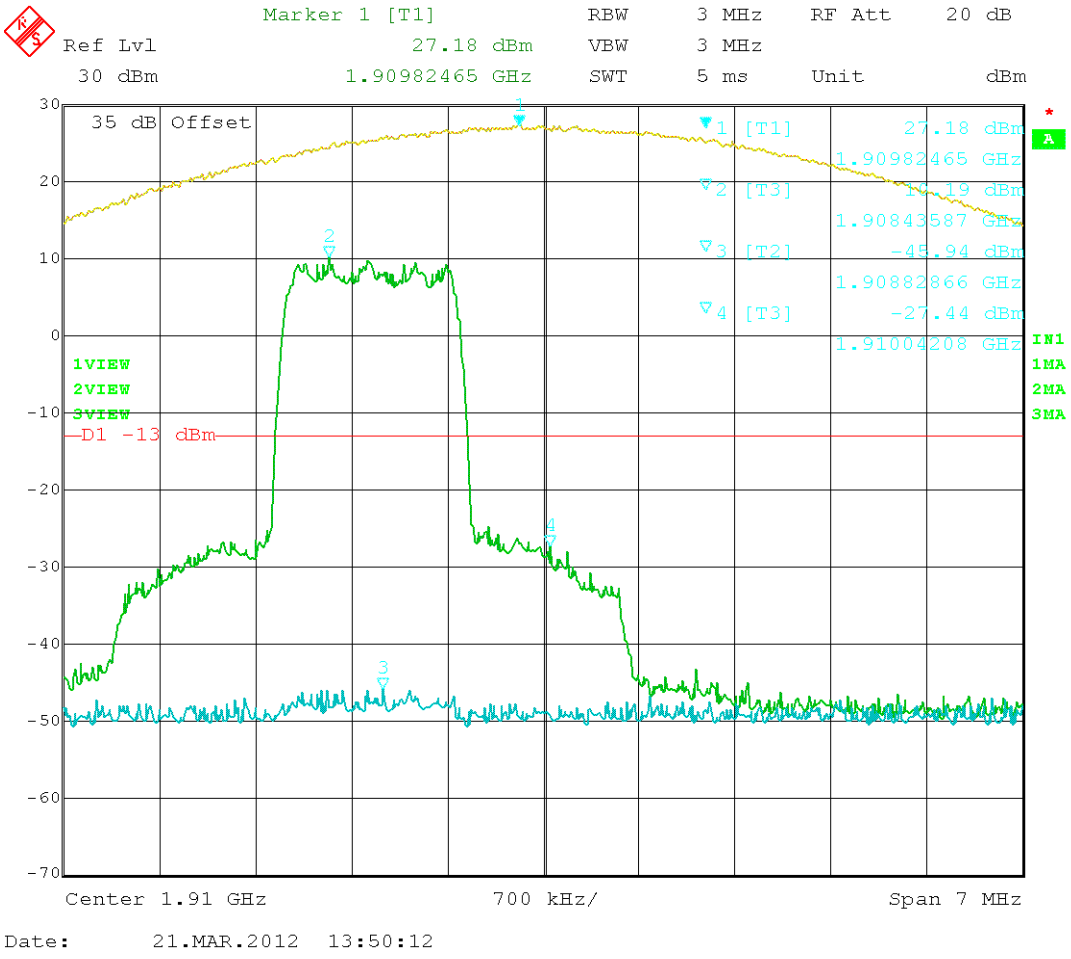


Figure 2: CDMA – In vs. Out 1908.75MHz

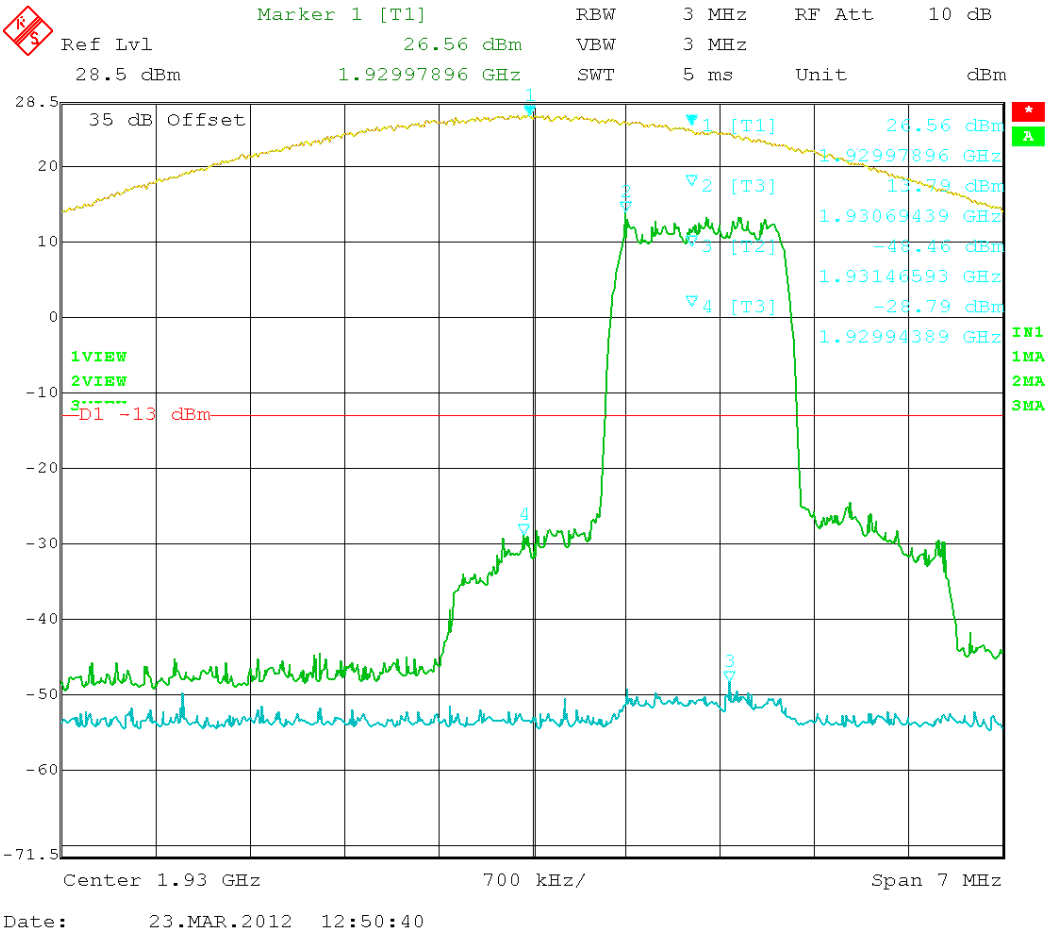


Figure 3: CDMA – In vs. Out 1931.25MHz

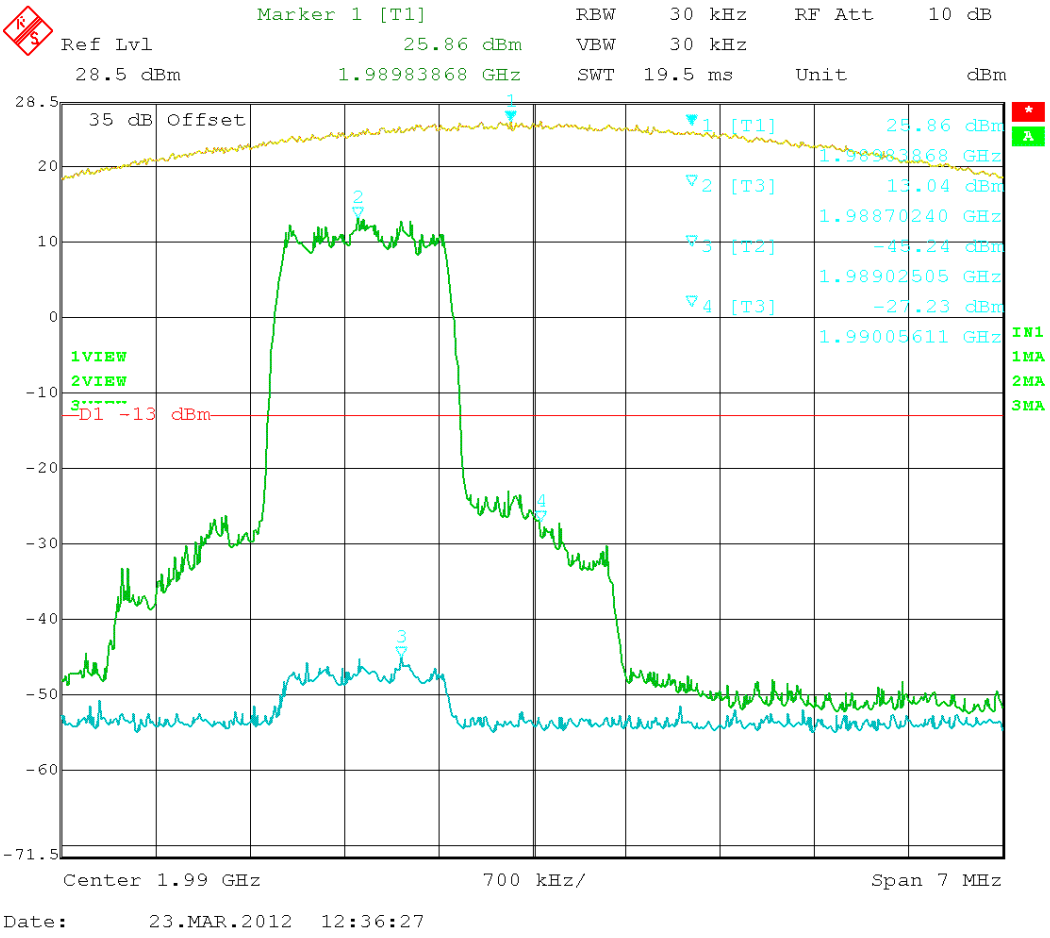


Figure 4: CDMA – In vs. Out 1988.75MHz

Test Data Table 12 – WCDMA 1900 – Uplink/Downlink

Channel (MHz)	Bandedge Frequency (MHz)	Amplitude bandedge (dBm)	Limit (dBm)	Margin (dB)
1852.5	**1849.88**	**-27.35**	**-13**	**14.35**
1907.5	**1910.12**	**-27.93**	**-13**	**14.93**
1932.5	**1929.78**	**-34.98**	**-13**	**21.98**
1987.5	**1990.68**	**-31.86**	**-13**	**18.86**

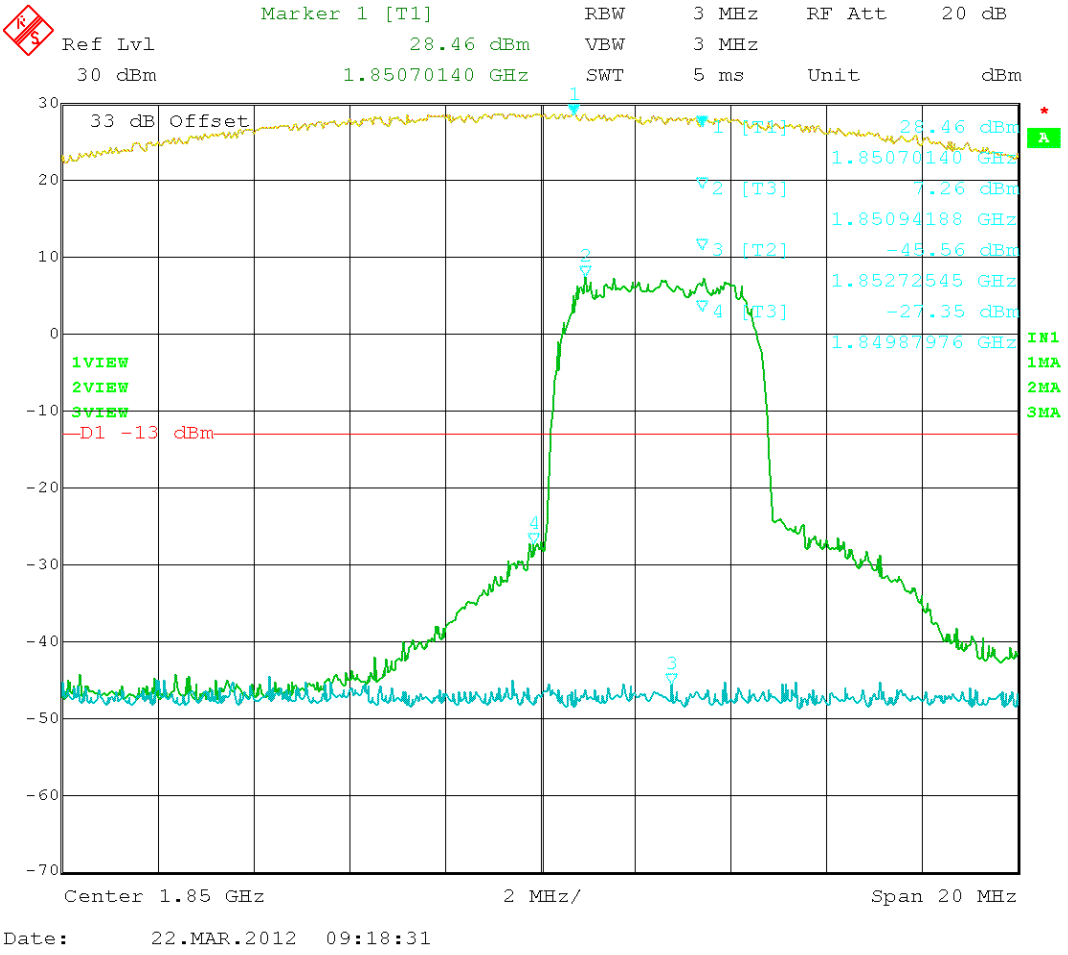


Figure 5: WCDMA – In vs. Out 1852.50 MHz

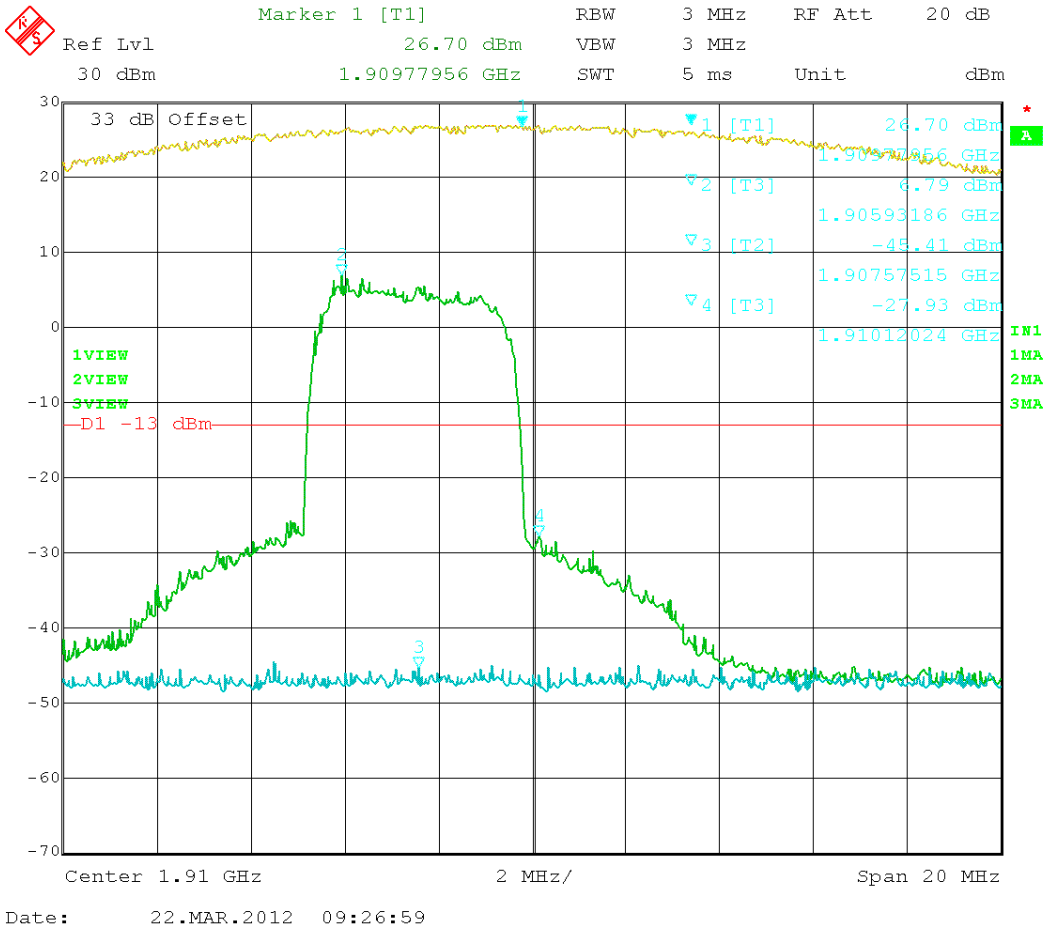


Figure 6: WCDMA – In vs. Out 1907.50 MHz

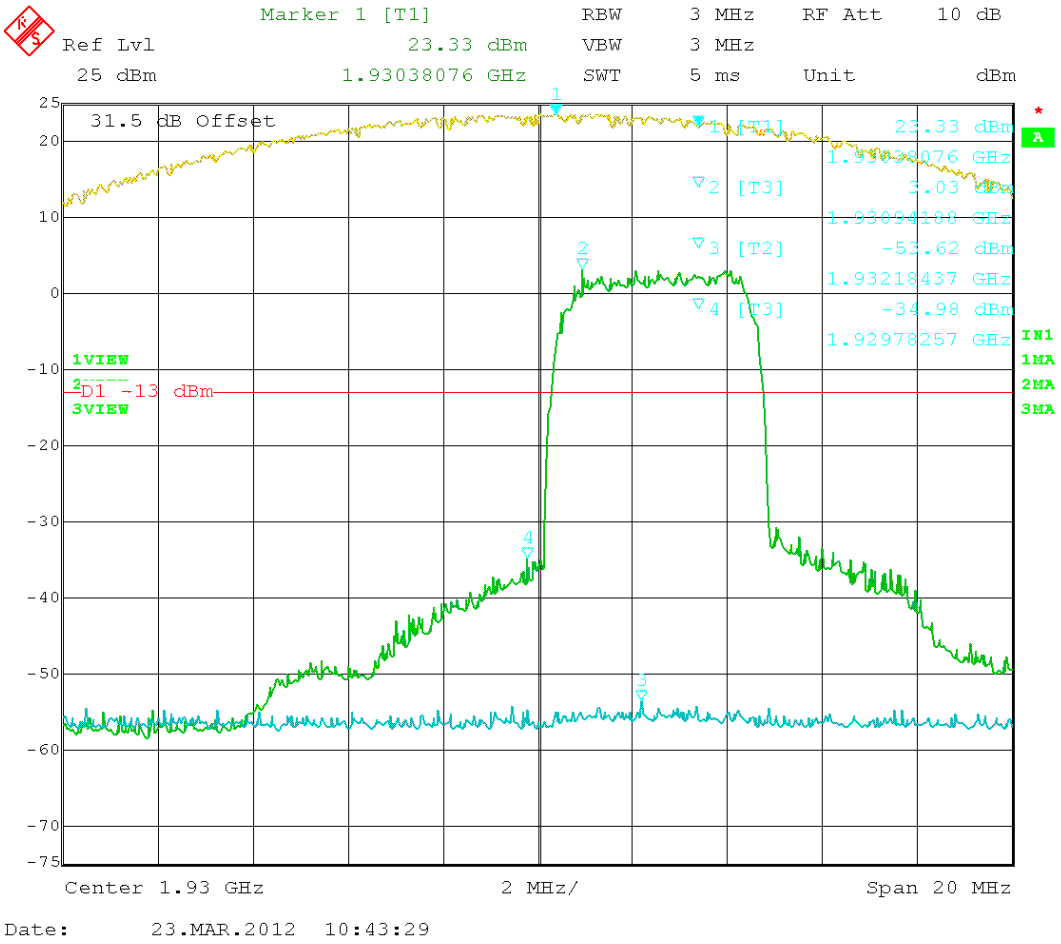


Figure 7: WCDMA – In vs. Out 1932.50 MHz

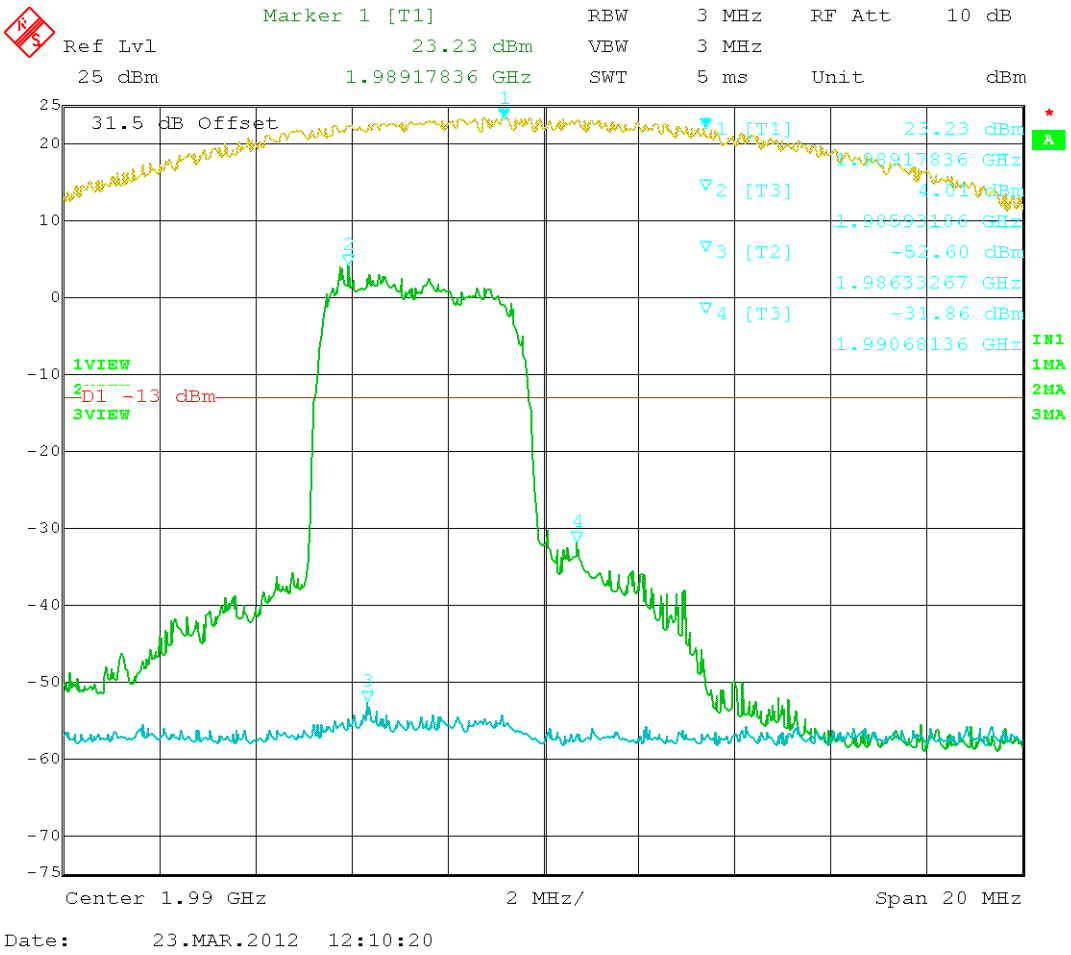


Figure 8: WCDMA – In vs. Out 1987.50 MHz

Test Data Table 13 – LTE 1900 – Uplink/Downlink

Channel (MHz)	Bandedge Frequency (MHz)	Amplitude bandedge (dBm)	Limit (dBm)	Margin (dB)
1851.5	**1849.97**	**-18.92**	**-13**	**5.92**
1908.5	**1910.12**	**-22.85**	**-13**	**9.85**
1931.5	**1929.93**	**-31.06**	**-13**	**18.06**
1988.5	**1990.12**	**-32.97**	**-13**	**19.97**

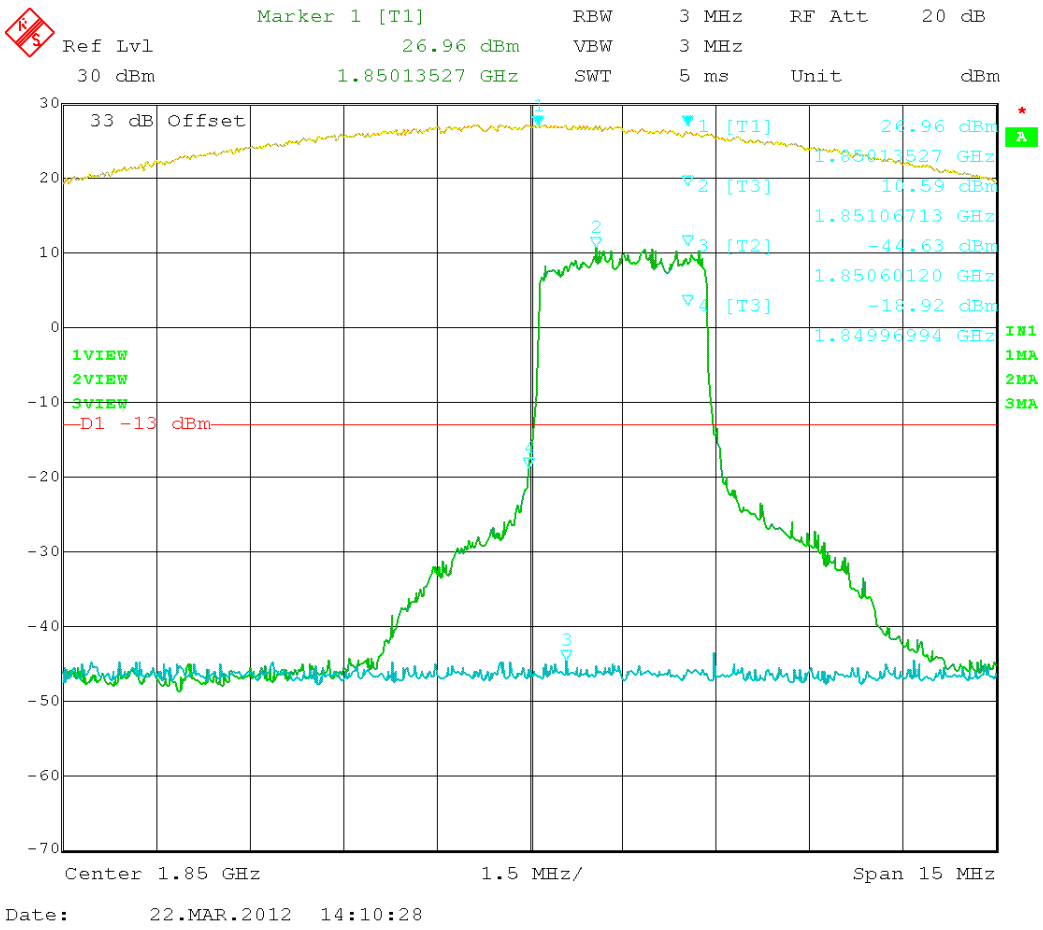


Figure 9: LTE – In vs. Out 1851.5MHz

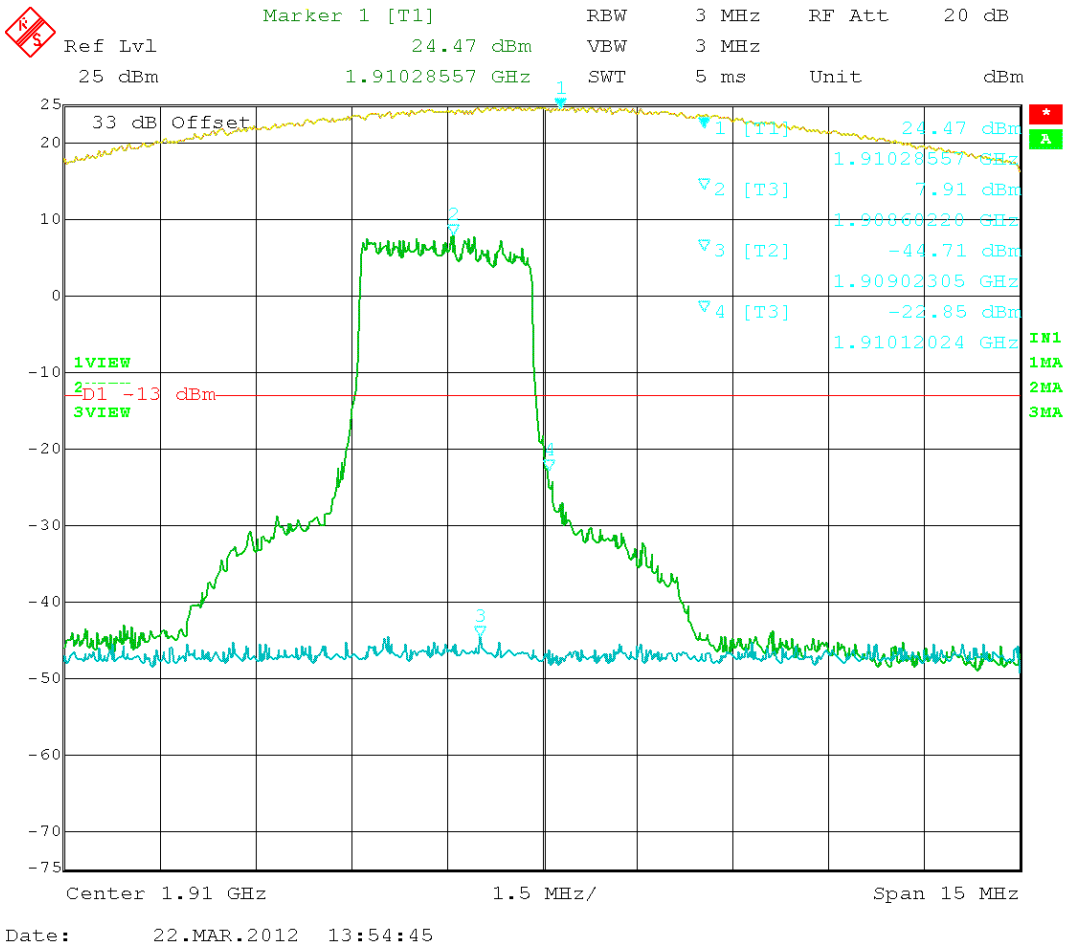


Figure 10: LTE – In vs. Out 1908.5MHz

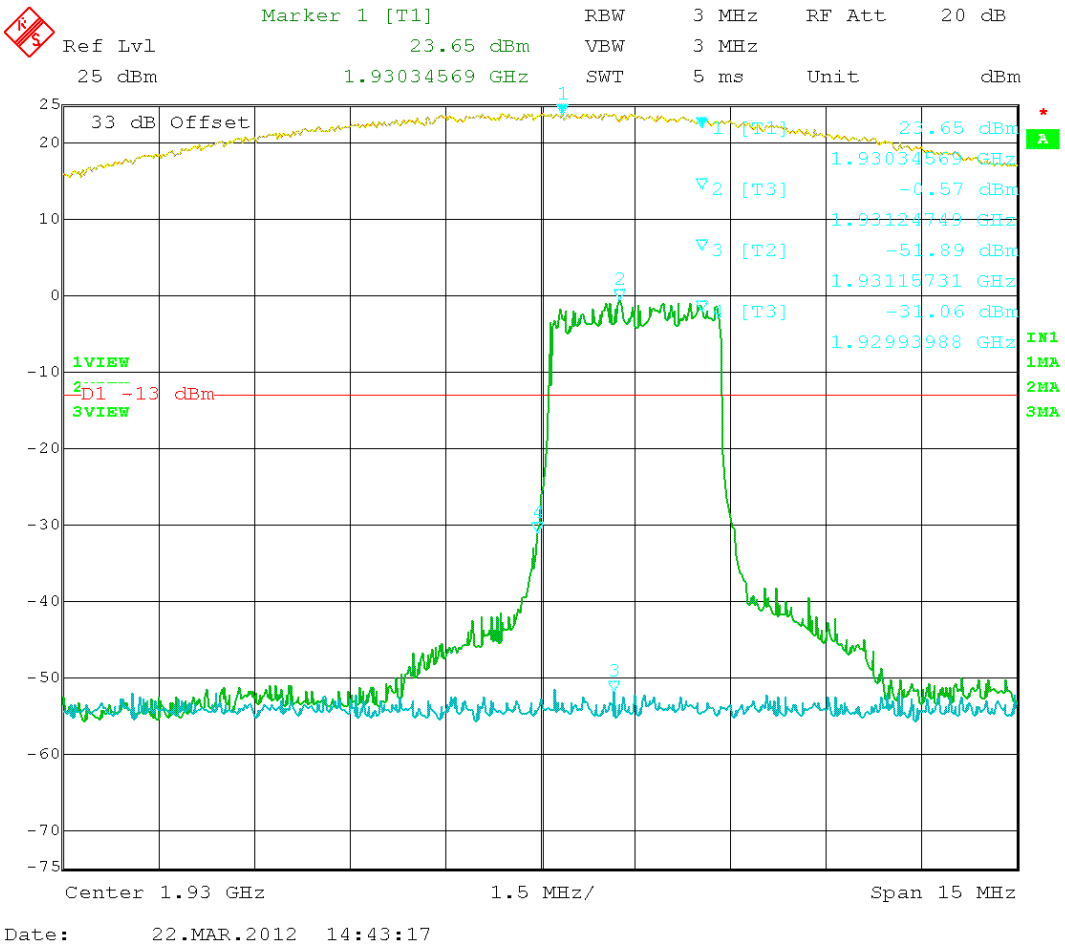


Figure 11: LTE – In vs. Out 1931.5MHz

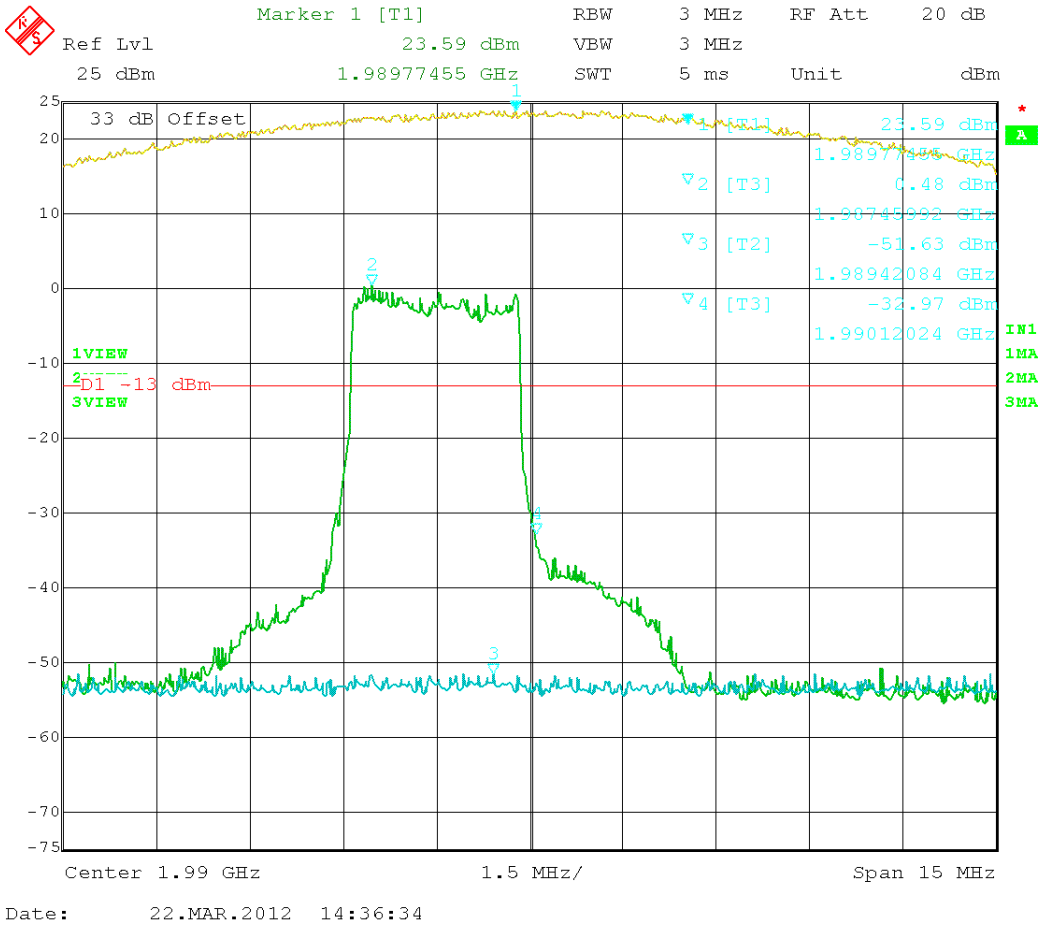


Figure 12: LTE – In vs. Out 1988.5MHz

Test Data Table 14 – 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	-16.53	-13	3.53
1909.8	1910.01	-20.95	-13	7.95
1930.2	1929.98	-20.13	-13	7.13
1989.8	1990.02	-24.45	-13	11.45

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

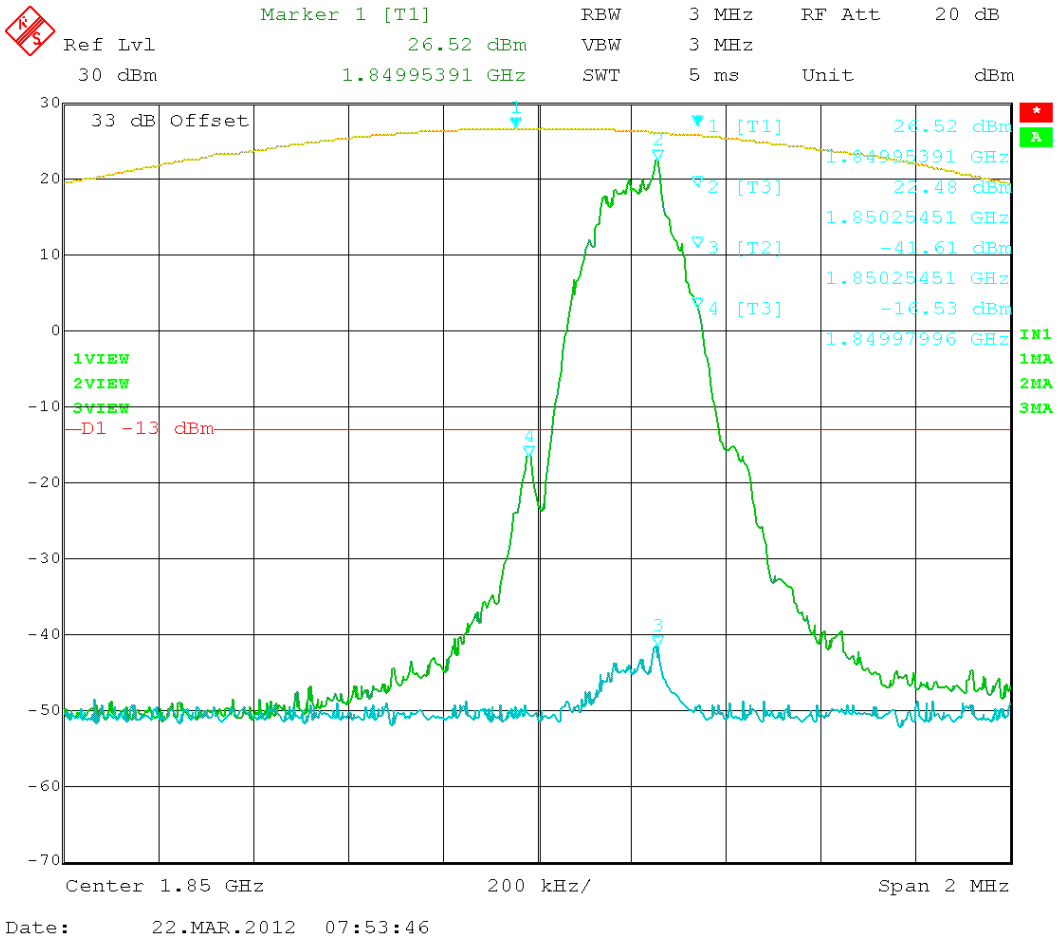


Figure 13: EDGE – In vs. Out 1850.20MHz

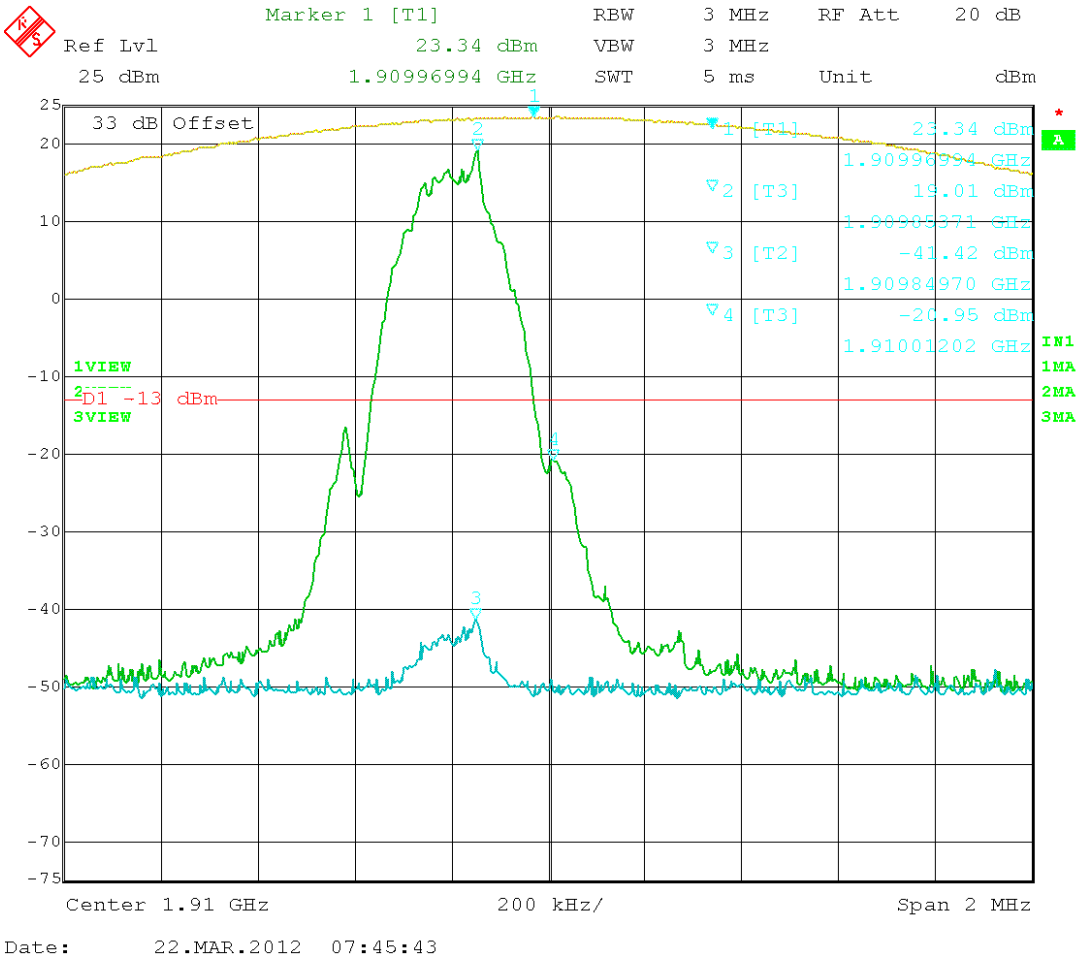


Figure 14: EDGE – In vs. Out 1909.80MHz

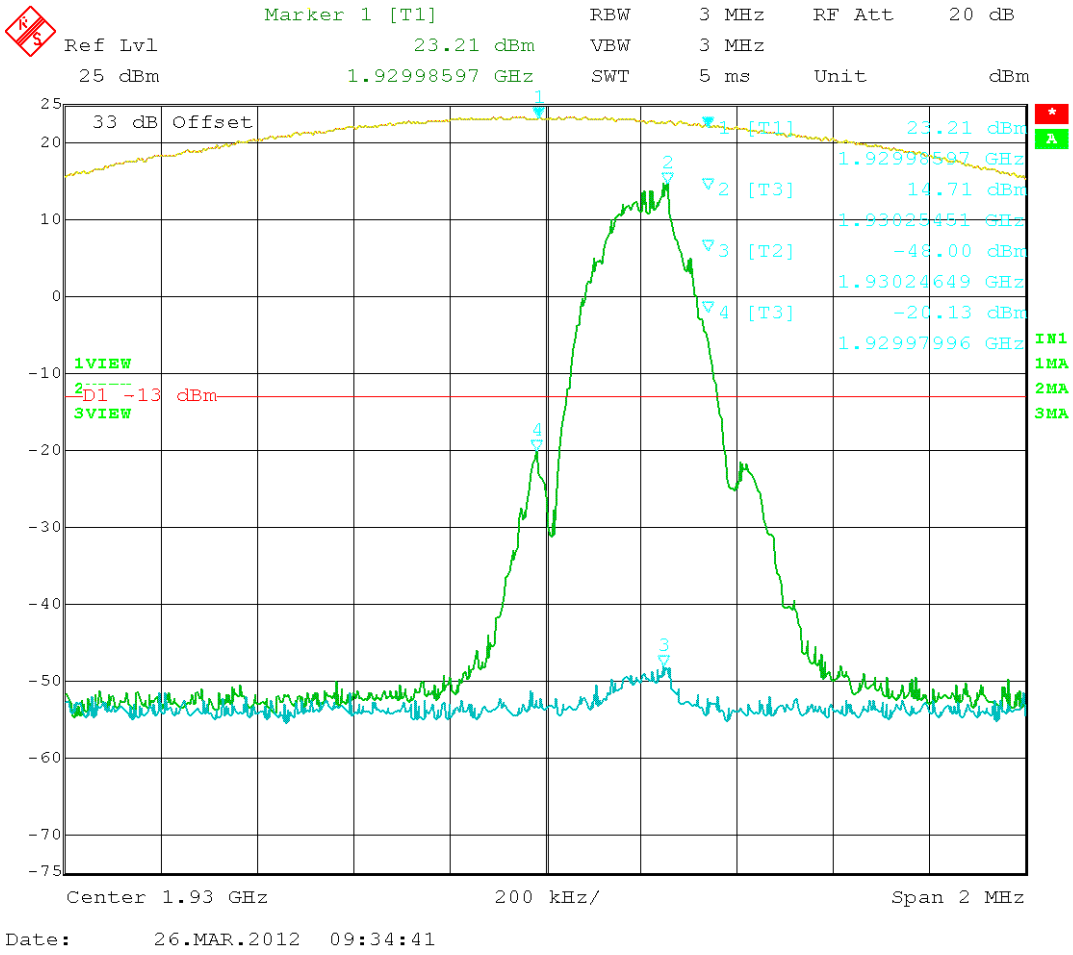


Figure 15: EDGE – In vs. Out 1930.20MHz

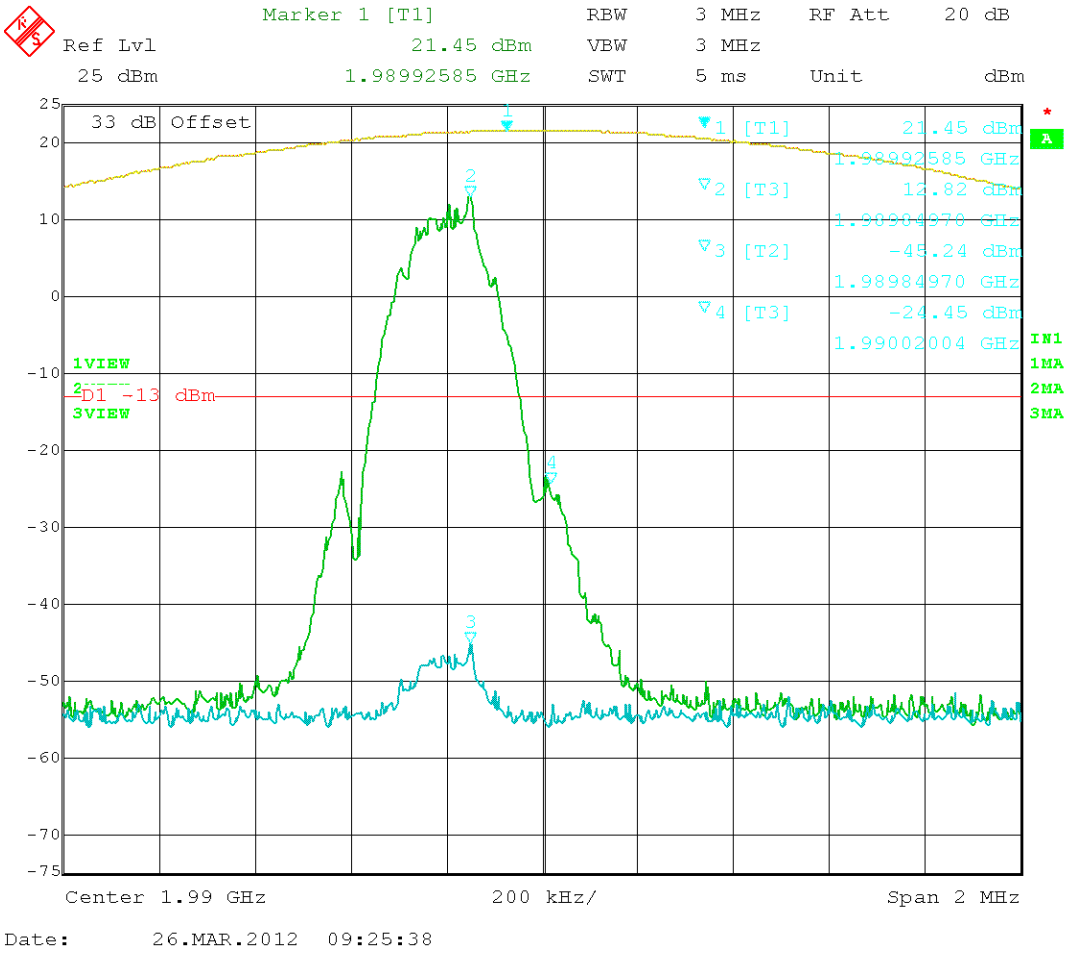


Figure 16: EDGE – In vs. Out 1989.80MHz

Test Data Table 15 –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	-15.6	-13	2.6
1909.8	1910.02	-18.75	-13	5.75
1930.2	1929.98	-21.39	-13	8.39
1989.8	1990.02	-24.44	-13	11.44

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

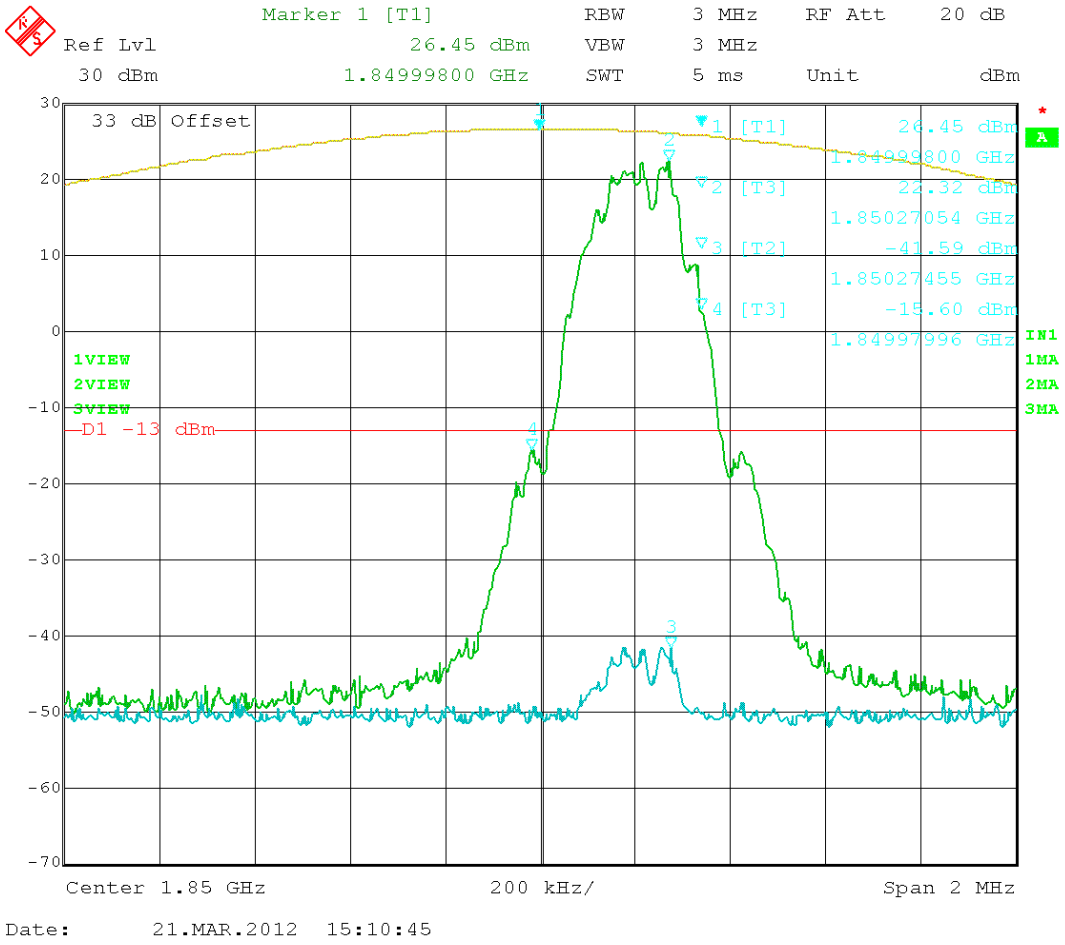


Figure 17: GSM – In vs. Out 1850.20MHz

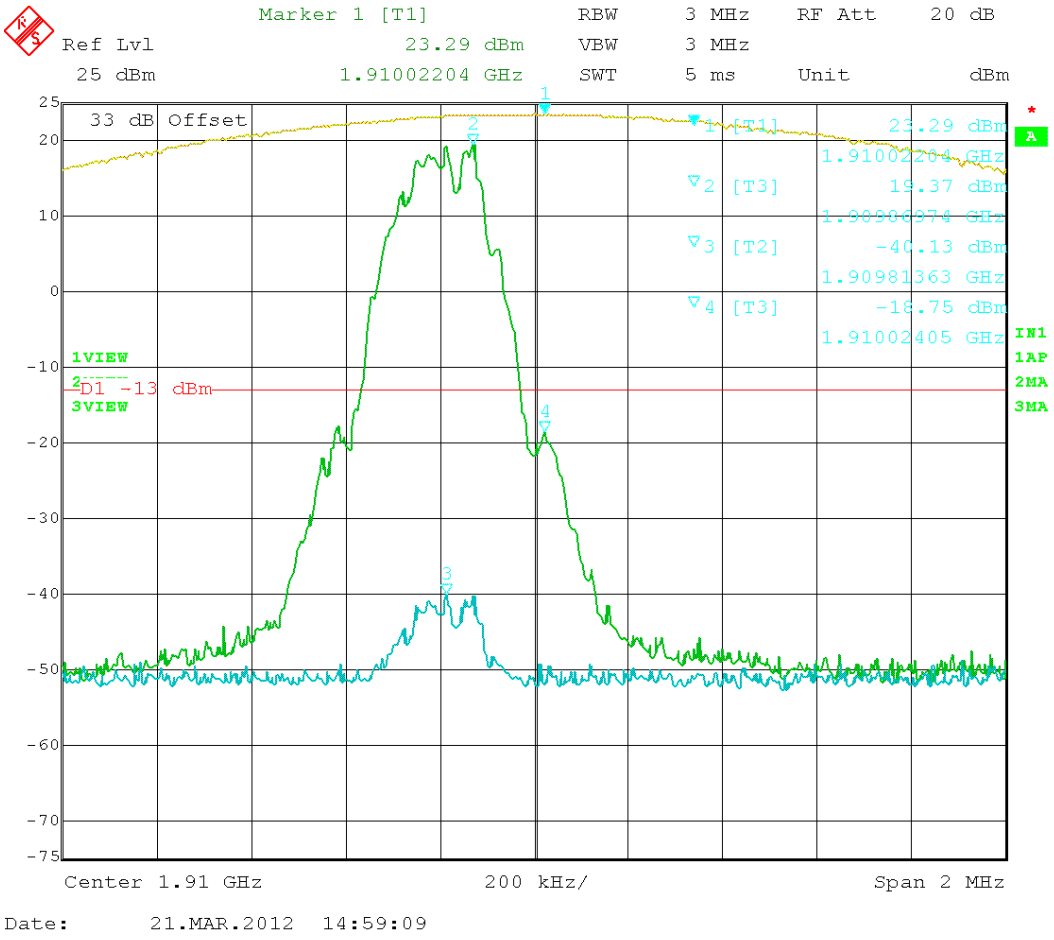


Figure 18: GSM – In vs. Out 1909.80MHz

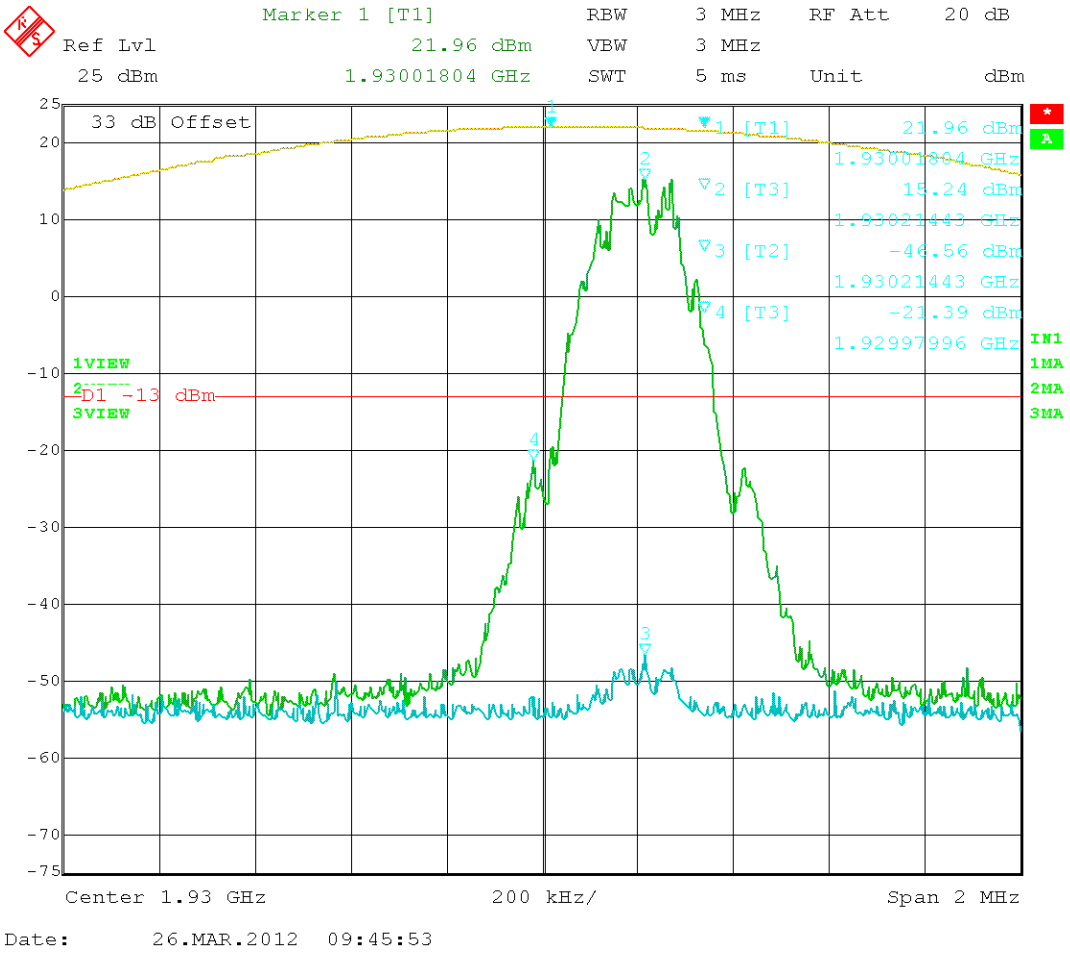


Figure 19: GSM – In vs. Out 1930.20MHz

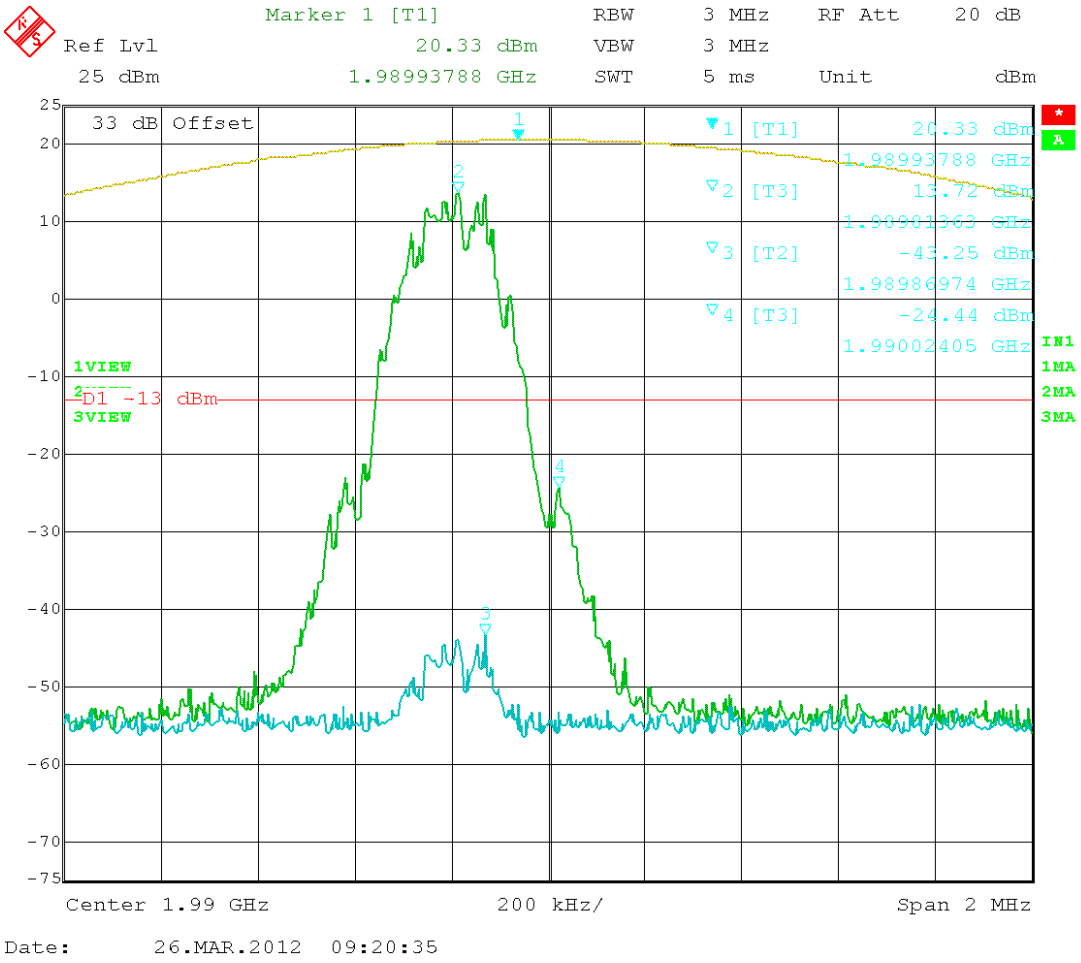


Figure 20: GSM – In vs. Out 1989.80MHz

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

Test Data Table 16 – CDMA 800 – Uplink/Downlink

Channel (MHz)	Bandedge Frequency (MHz)	Amplitude level at the band-edge (dBm)	Limit (dBm)	Margin (dB)
825.25	823.97	-21.53	-13	8.53
847.75	849.11	-17.62	-13	4.62
870.25	868.96	-37.97	-13	24.97
892.75	894.06	-33.12	-13	20.12

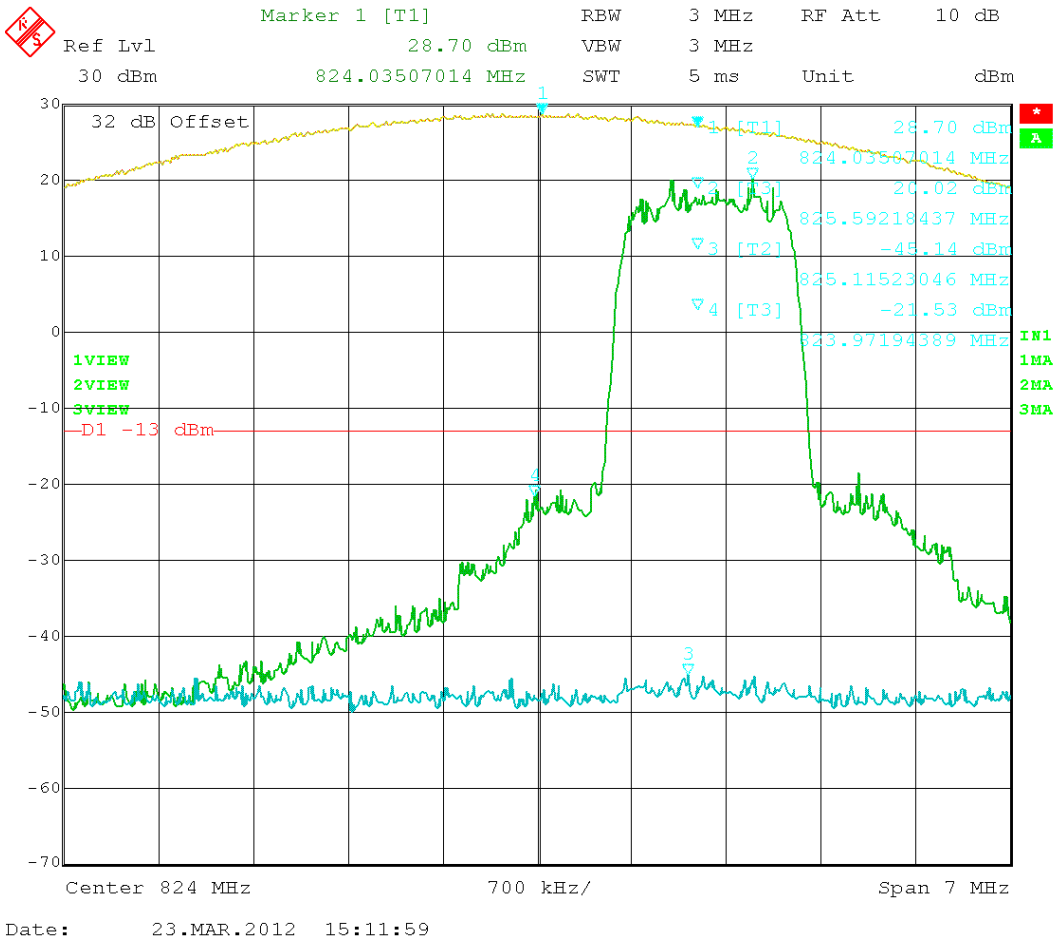


Figure 21: CDMA – In vs. Out 825.25MHz

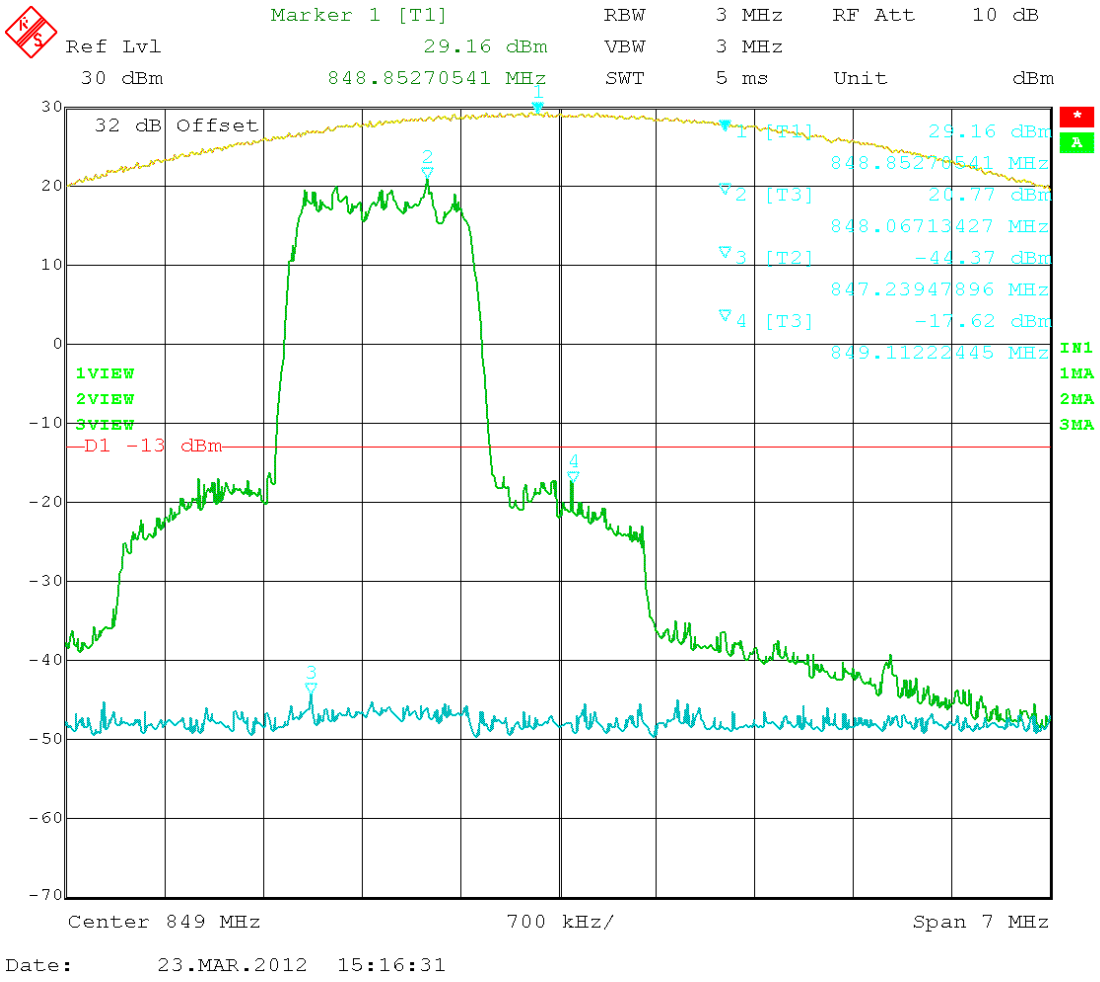


Figure 22: CDMA – In vs. Out 847.75 MHz

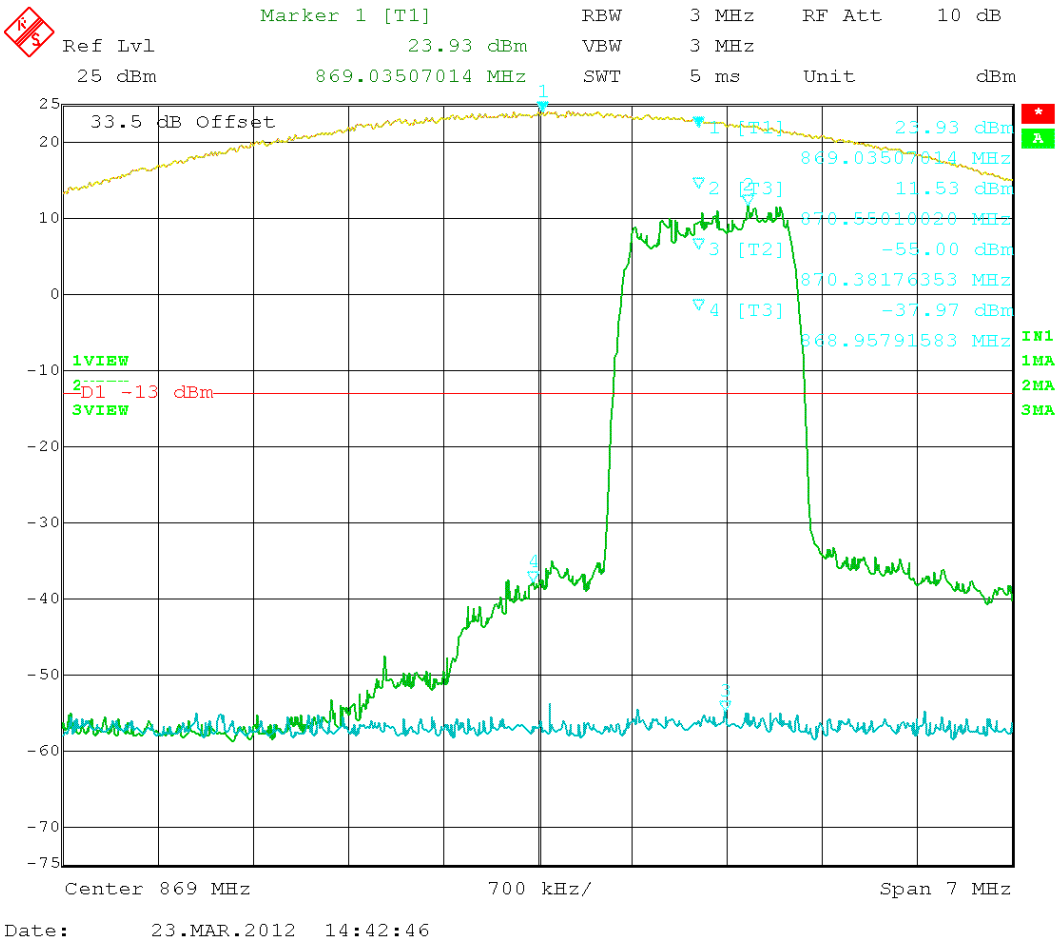


Figure 23: CDMA – In vs. Out 870.25 MHz

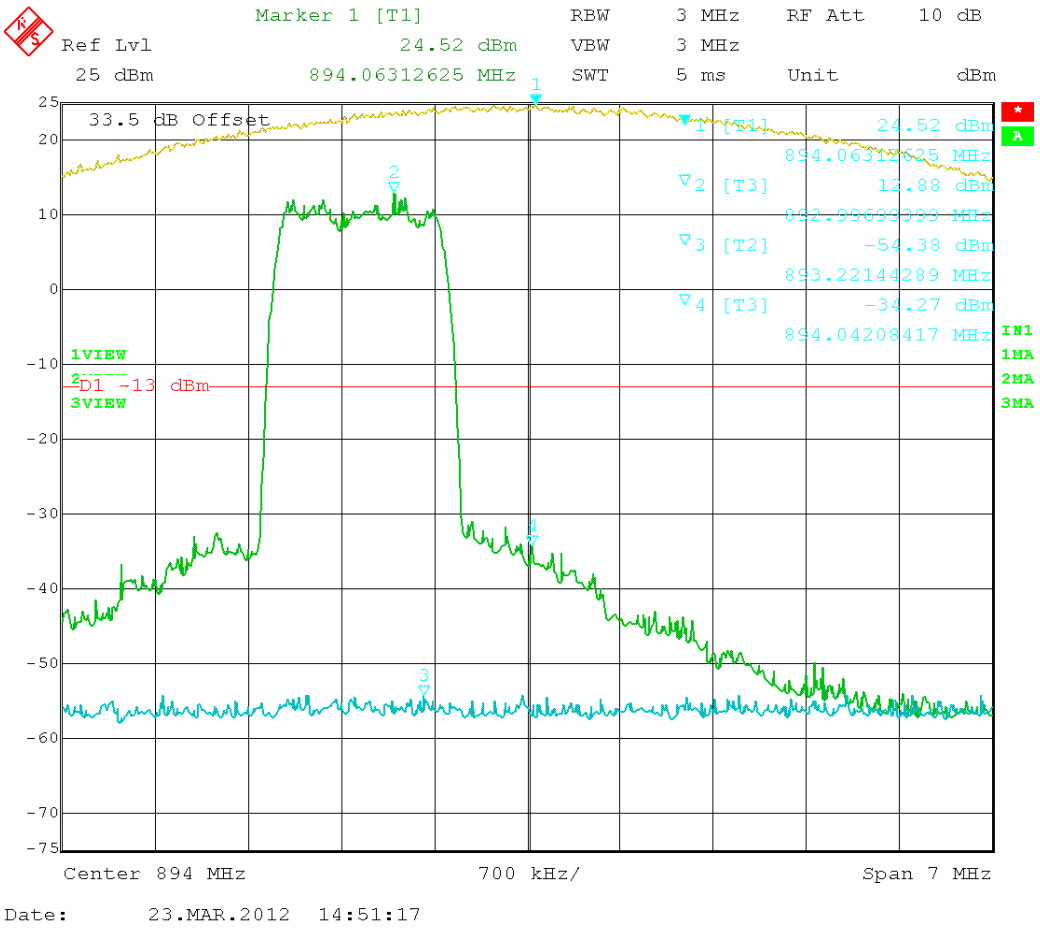


Figure 24: CDMA – In vs. Out 892.75 MHz

Test Data Table 17 – WCDMA 800 – Uplink/Downlink

Channel (MHz)	Bandedge Frequency (MHz)	Amplitude level at the band-edge (dBm)	Limit (dBm)	Margin (dB)
826.5	823.85	-33.26	-13	20.26
846.5	850.52	-35.08	-13	22.08
871.5	868.86	-39.39	-13	26.39
891.5	894.16	-37.77	-13	24.77

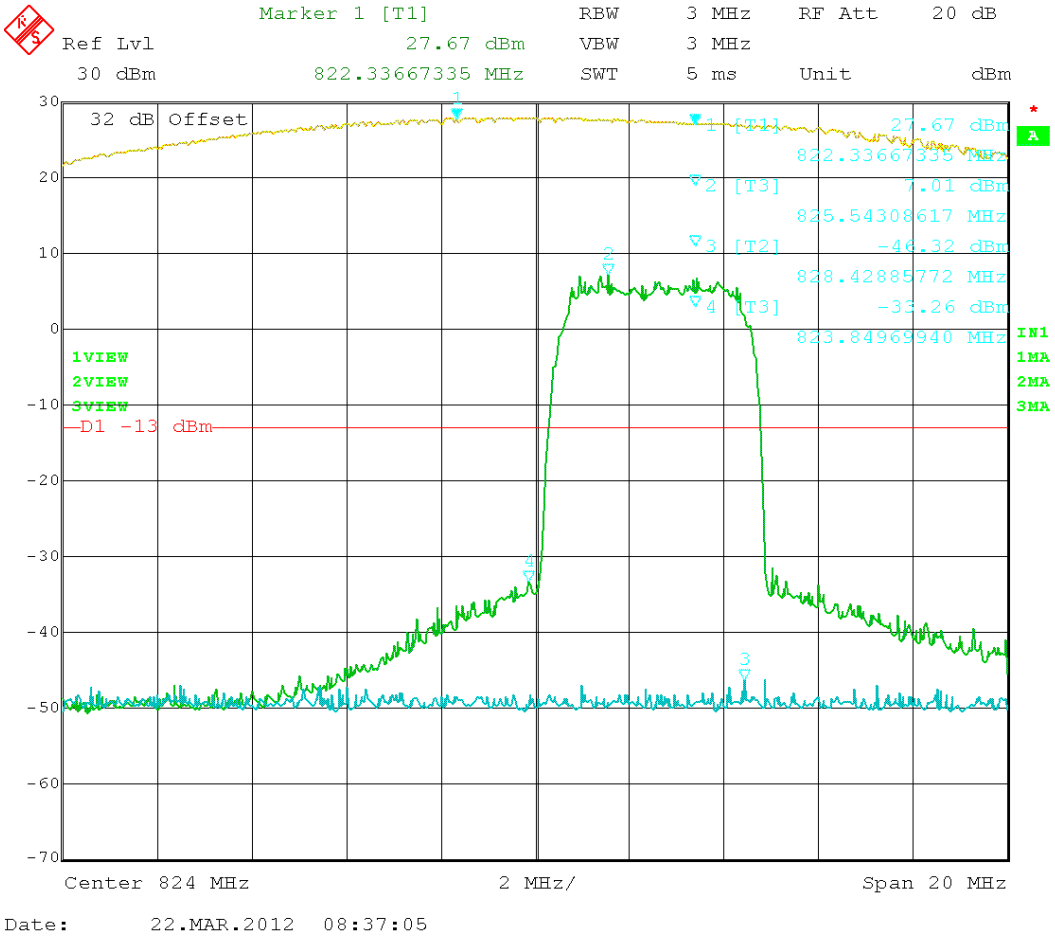


Figure 25: WCDMA – In vs. Out 826.50 MHz

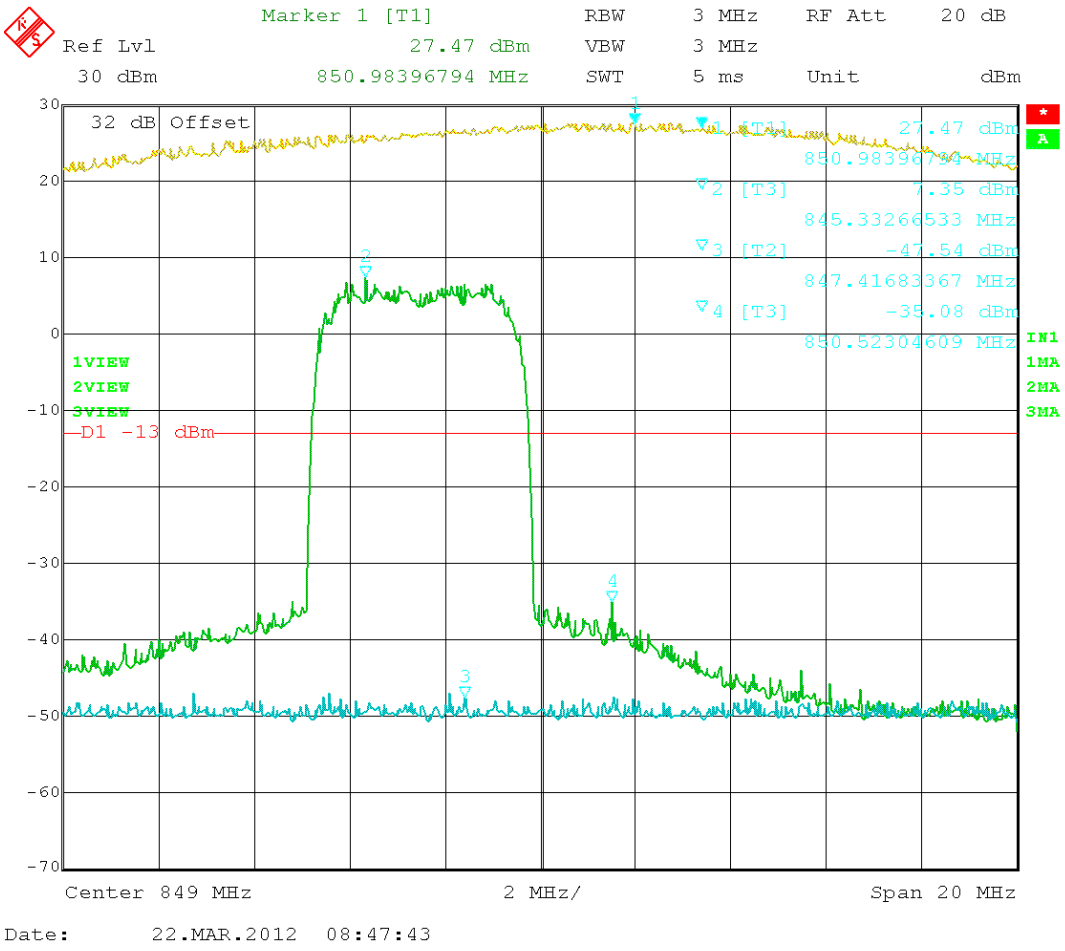


Figure 26: WCDMA – In vs. Out 846.50 MHz

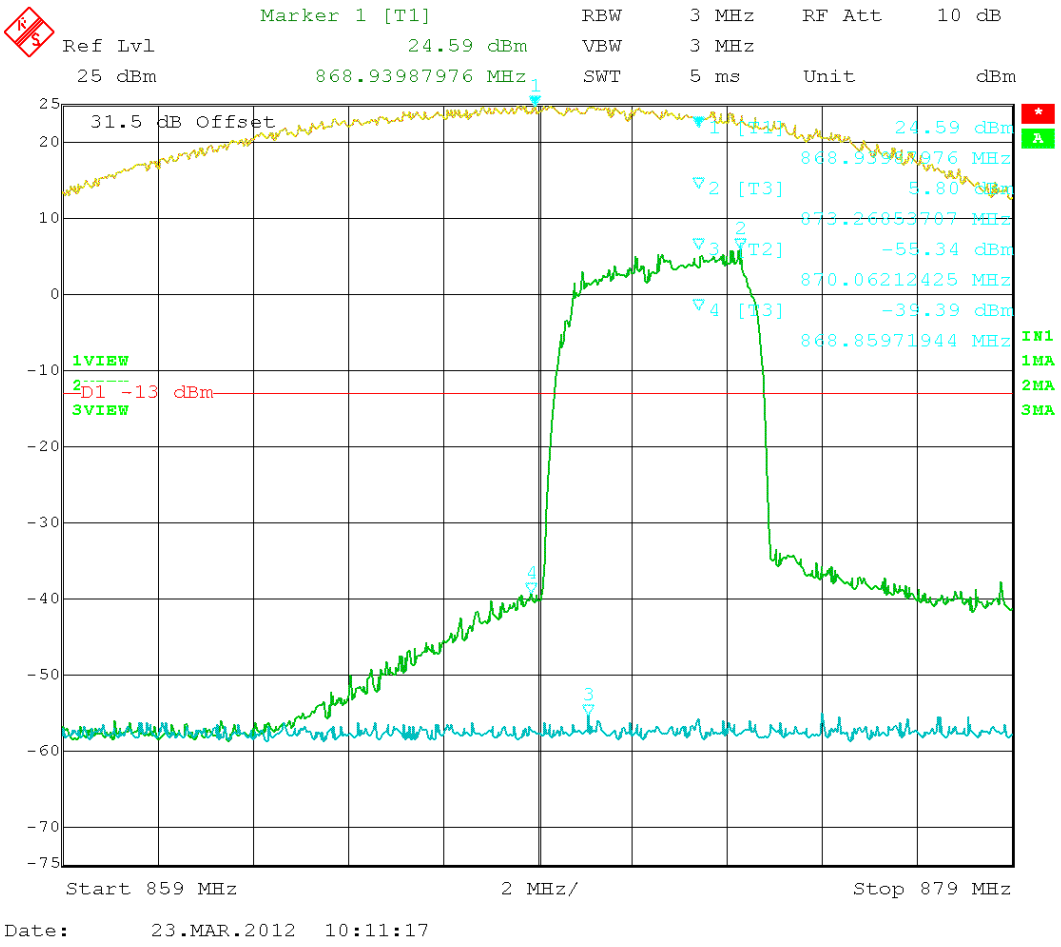


Figure 27: WCDMA – In vs. Out 871.50 MHz

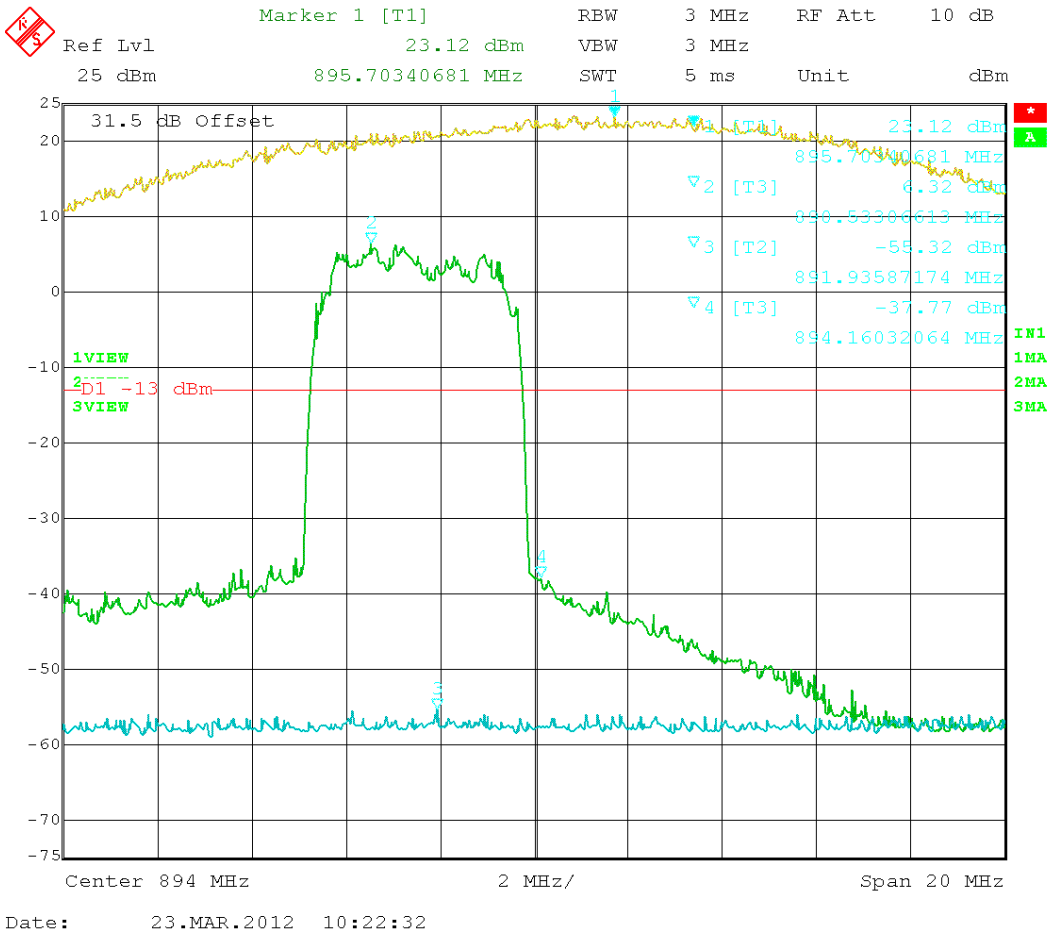


Figure 28: WCDMA – In vs. Out 891.50 MHz

Test Data Table 18 –LTE 800 – Uplink/Downlink

Channel (MHz)	Band-edge Frequency (MHz)	Amplitude level at the band-edge (dBm)	Limit (dBm)	Margin (dB)
825.5	823.91	-26.94	-13	13.94
847.5	849.12	-19.40	-13	6.4
870.5	868.97	-34.75	-13	21.75
892.5	894.12	-29.71	-13	16.71

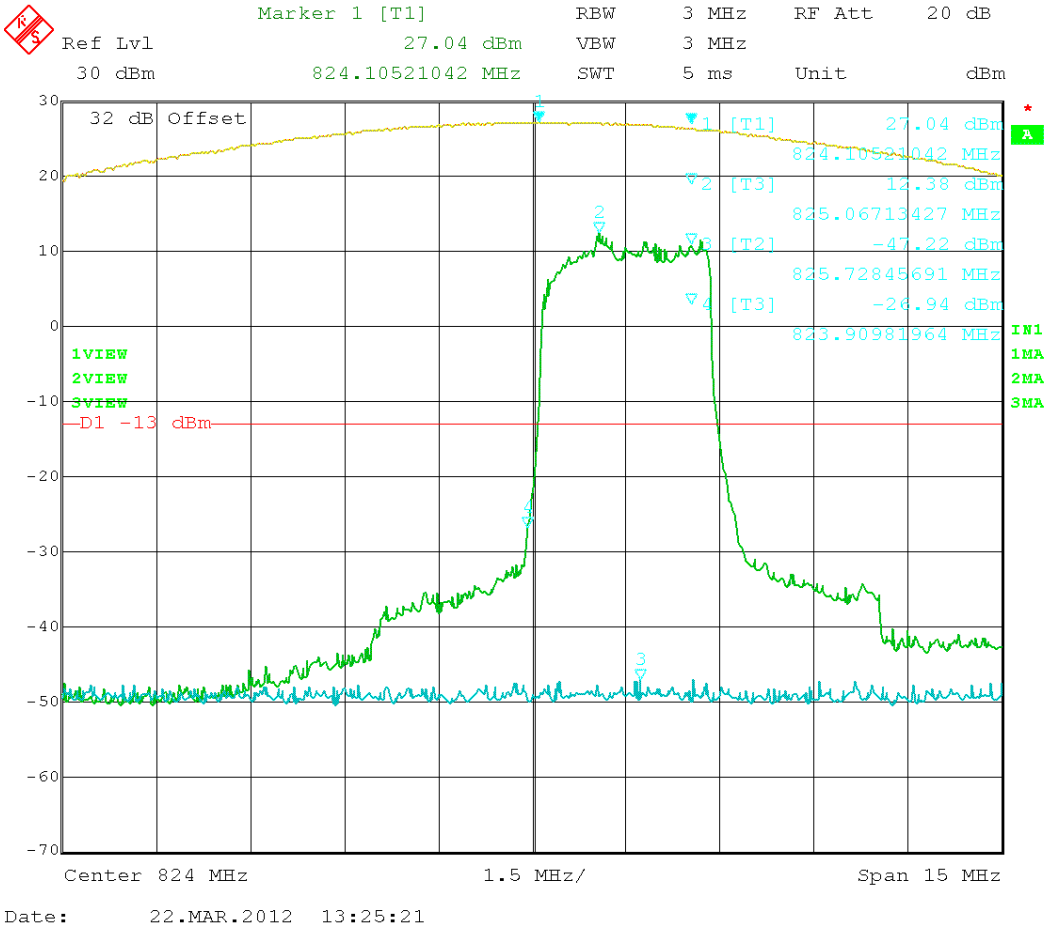


Figure 29: LTE – In vs. Out 825.50 MHz

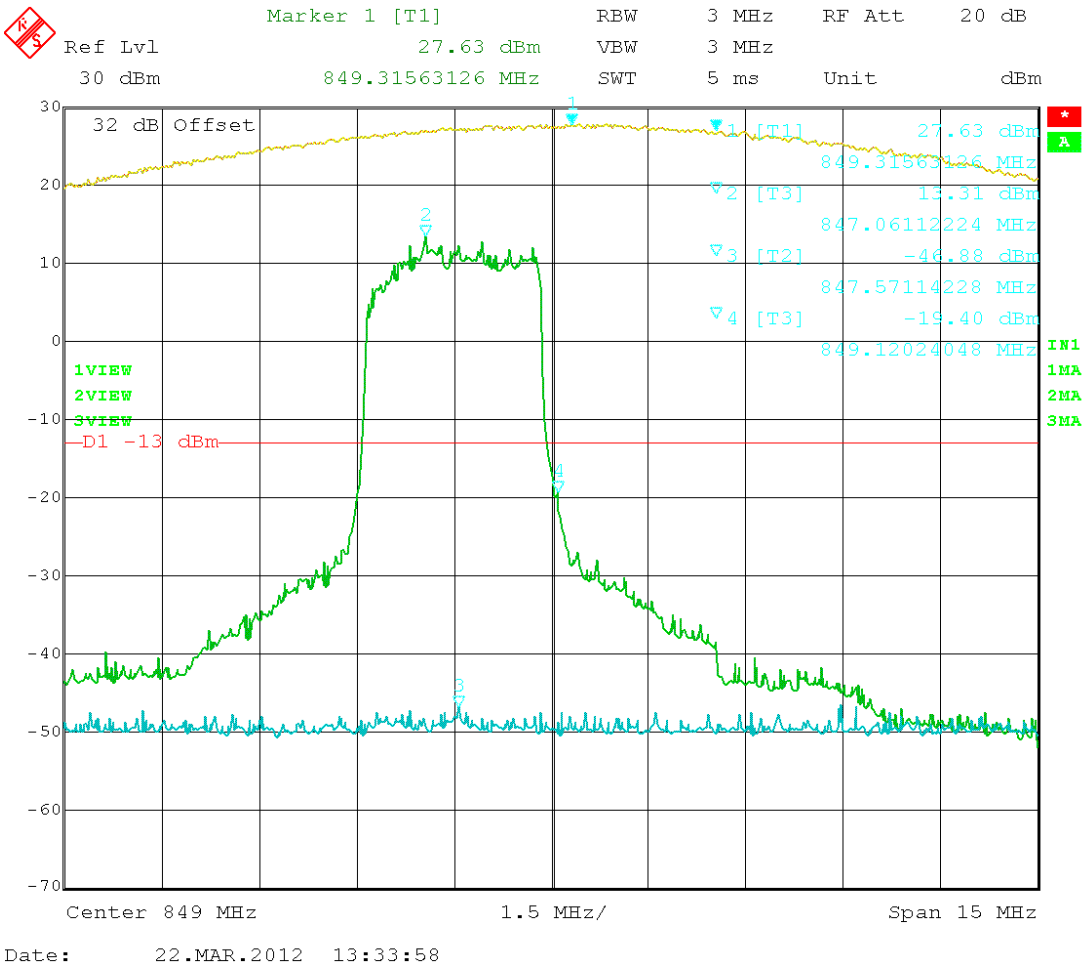


Figure 30: LTE – In vs. Out 847.50 MHz

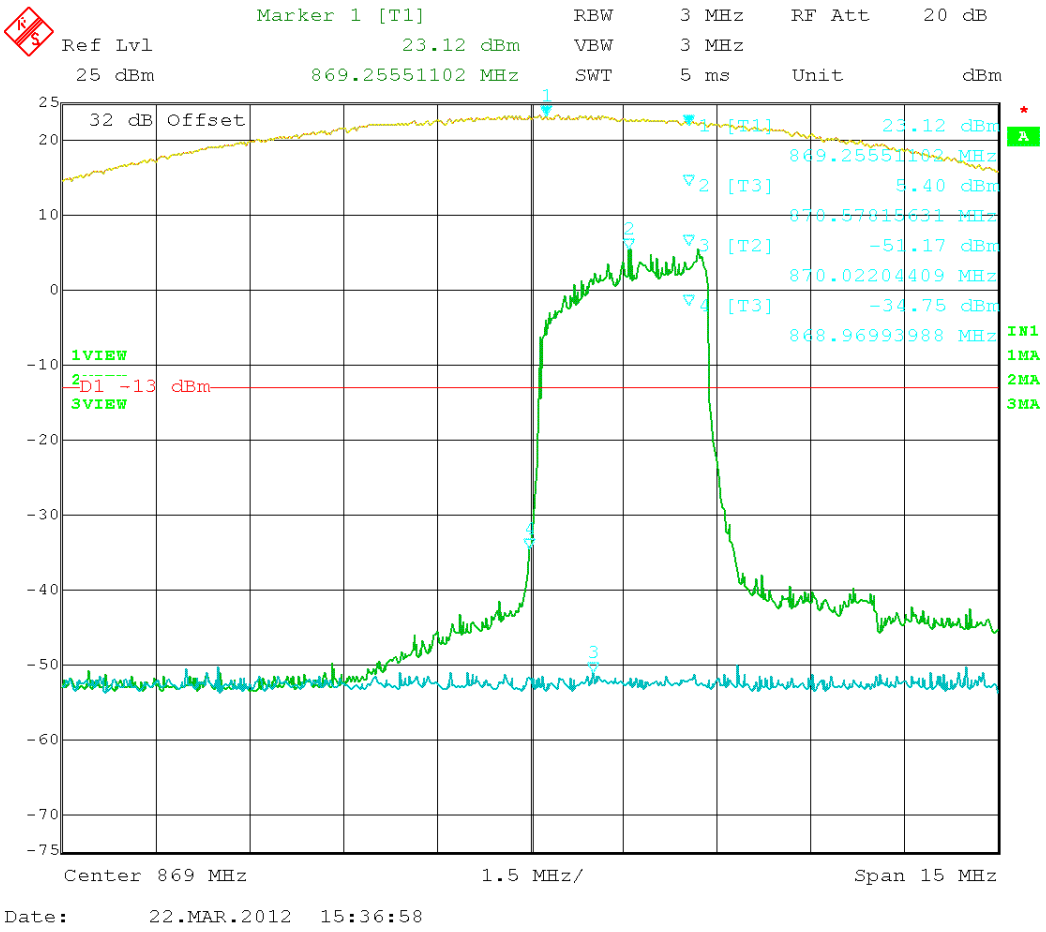


Figure 31: LTE – In vs. Out 870.50 MHz

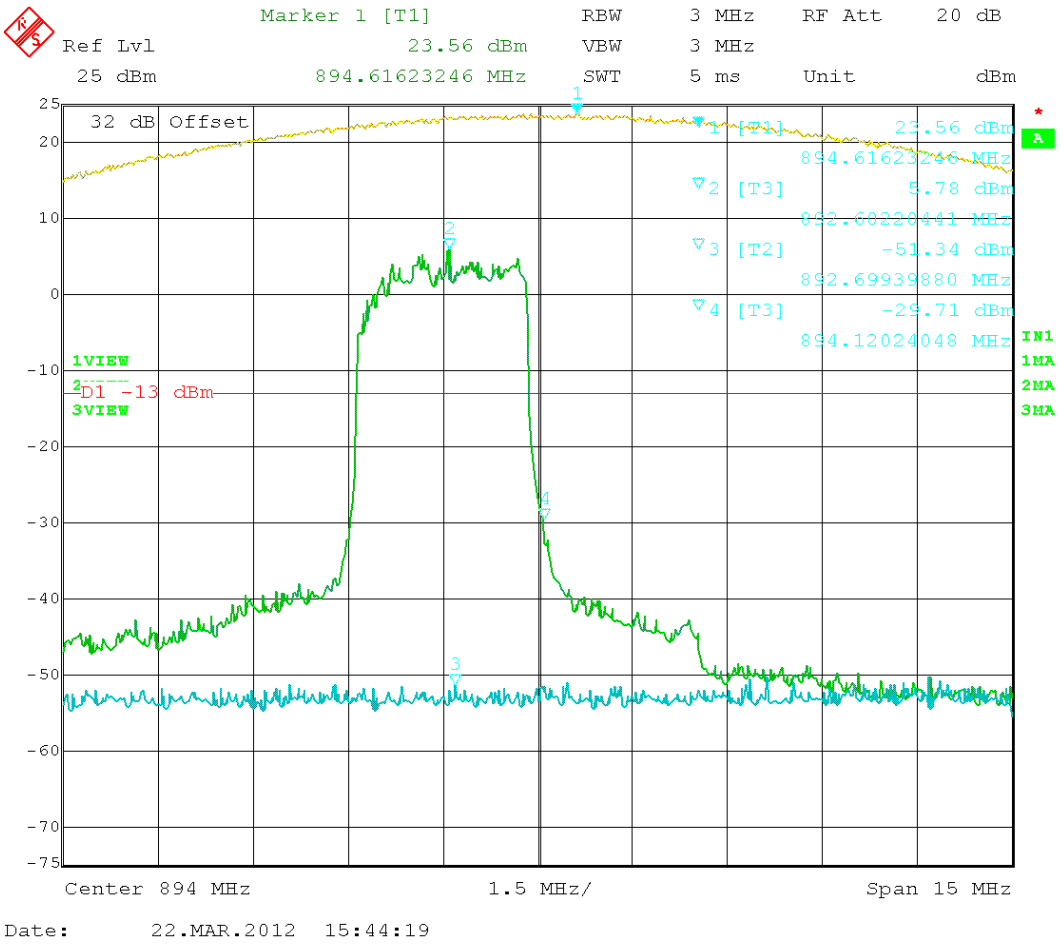


Figure 32: LTE – In vs. Out 892.50 MHz

Test Data Table 19 – 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	-20.31	-13	7.31
848.8	849.02	-20.62	-13	7.62
869.2	868.98	-27.53	-13	14.53
893.8	894.02	-30.18	-13	17.18

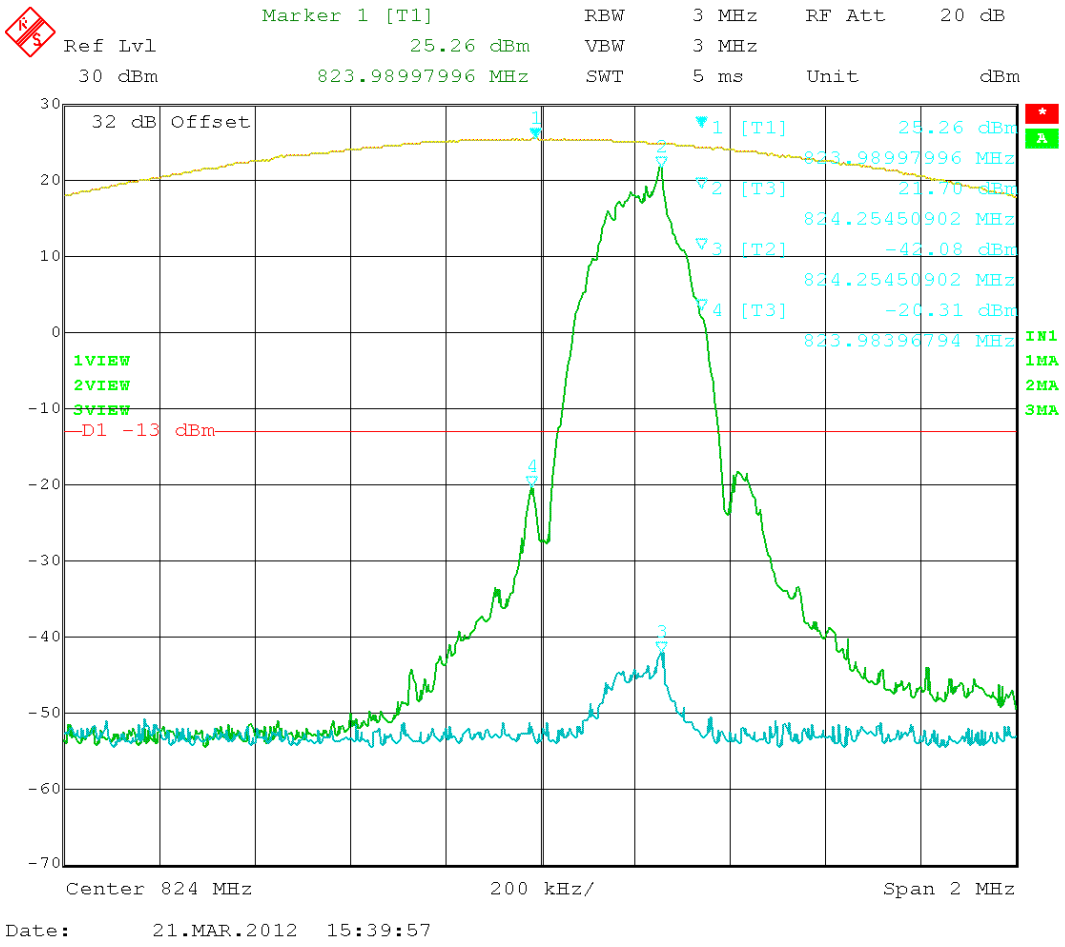


Figure 33: EDGE – In vs. Out 824.20 MHz

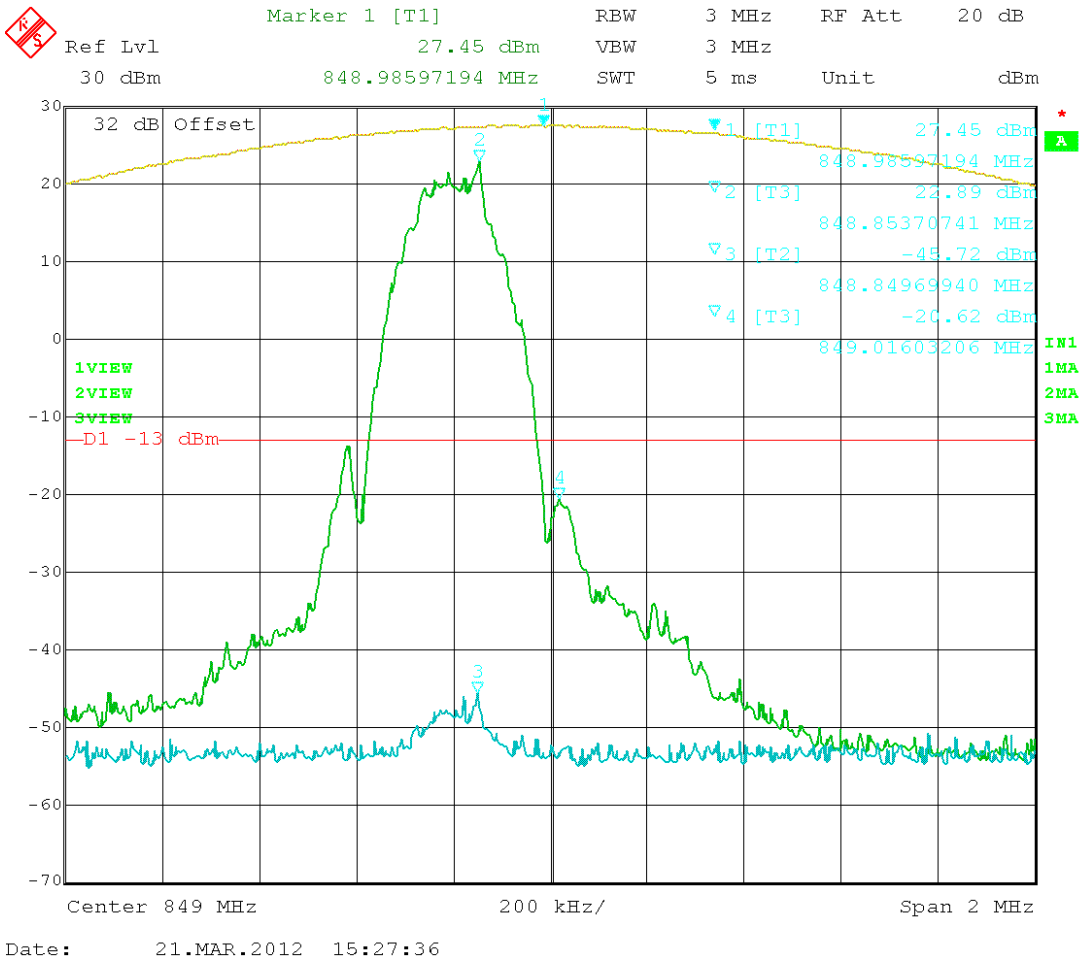


Figure 34: EDGE – In vs. Out 848.80 MHz

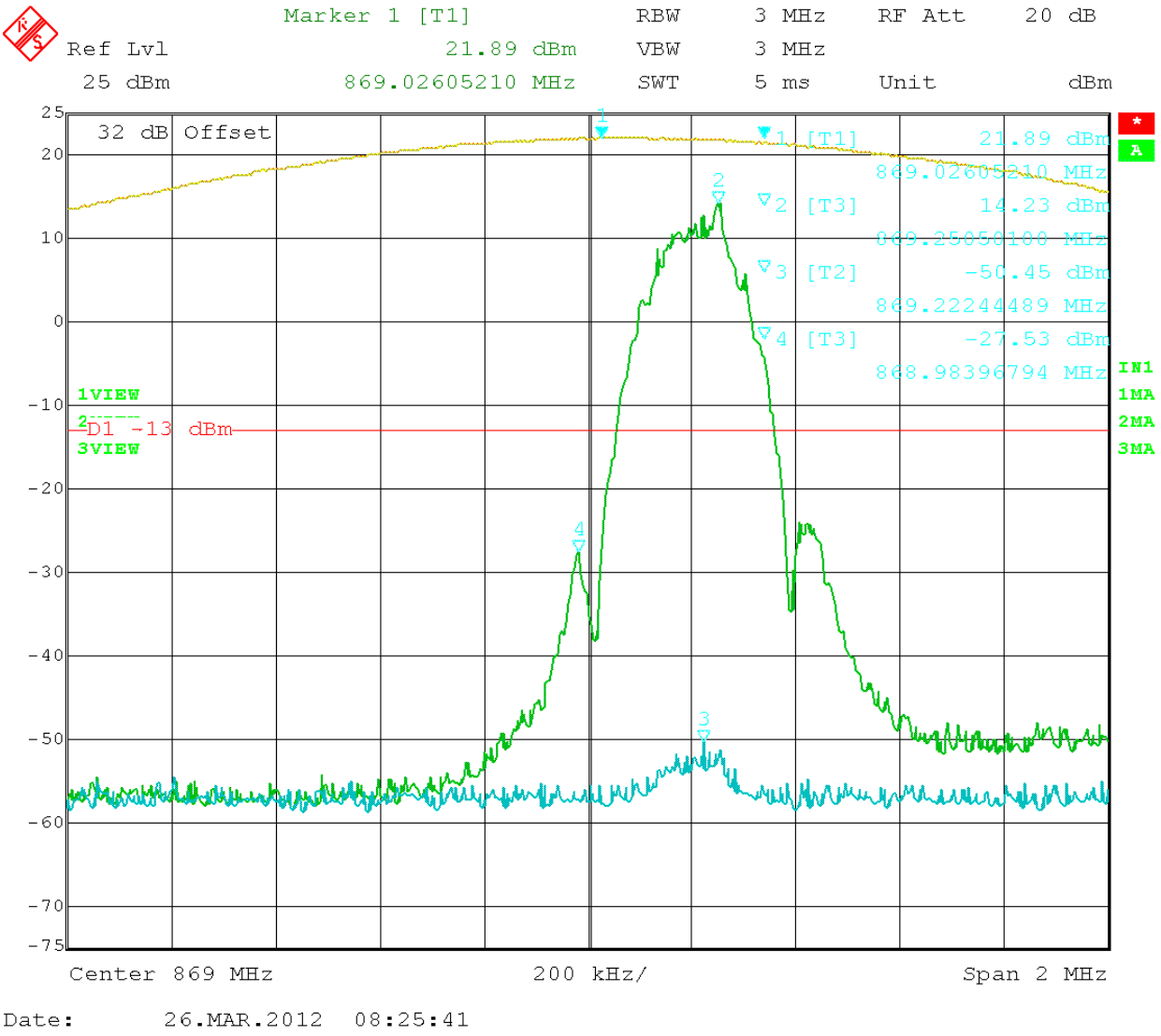


Figure 35: EDGE – In vs. Out 869.20 MHz

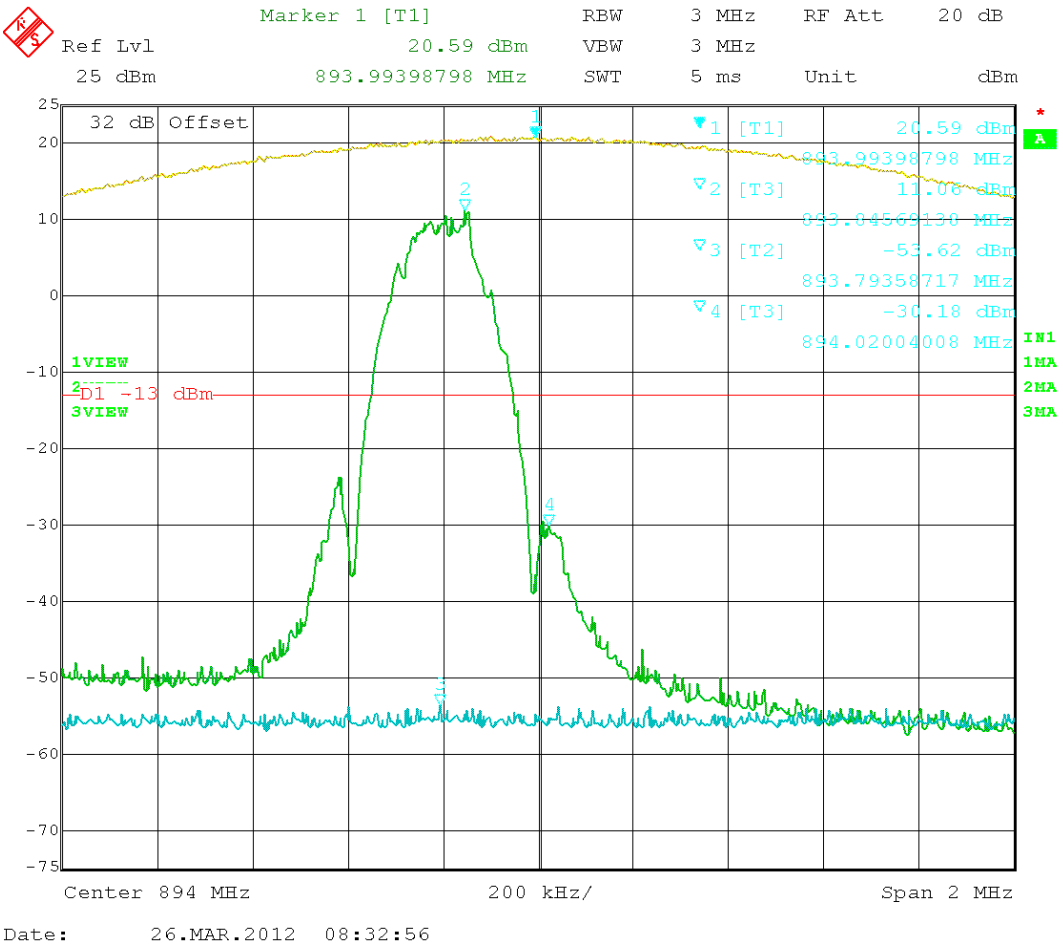


Figure 36: EDGE – In vs. Out 893.80 MHz

Test Data Table 20 – 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	-22.33	-13	9.33
848.8	849.02	-15.7	-13	2.7
869.2	868.98	-26.97	-13	13.97
893.8	894.02	-25.08	-13	12.08

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

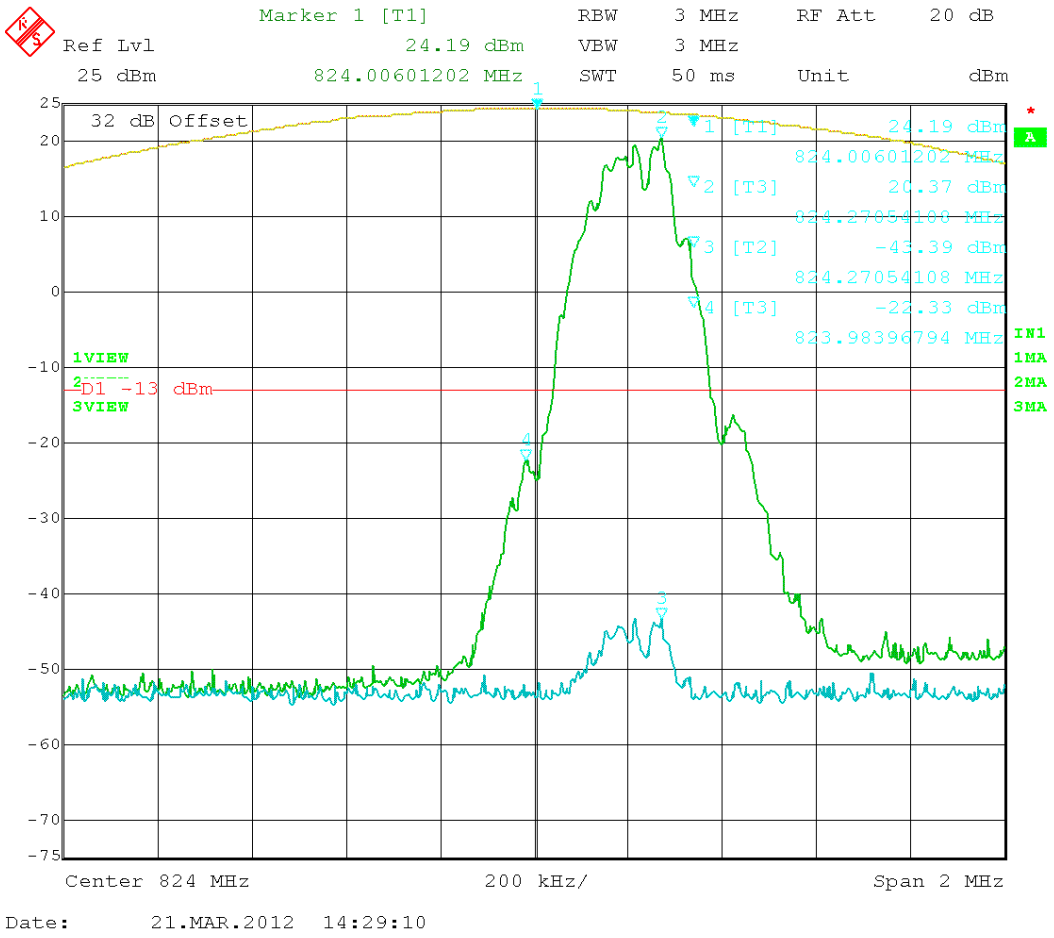


Figure 37: GSM – In vs. Out 824.2 MHz

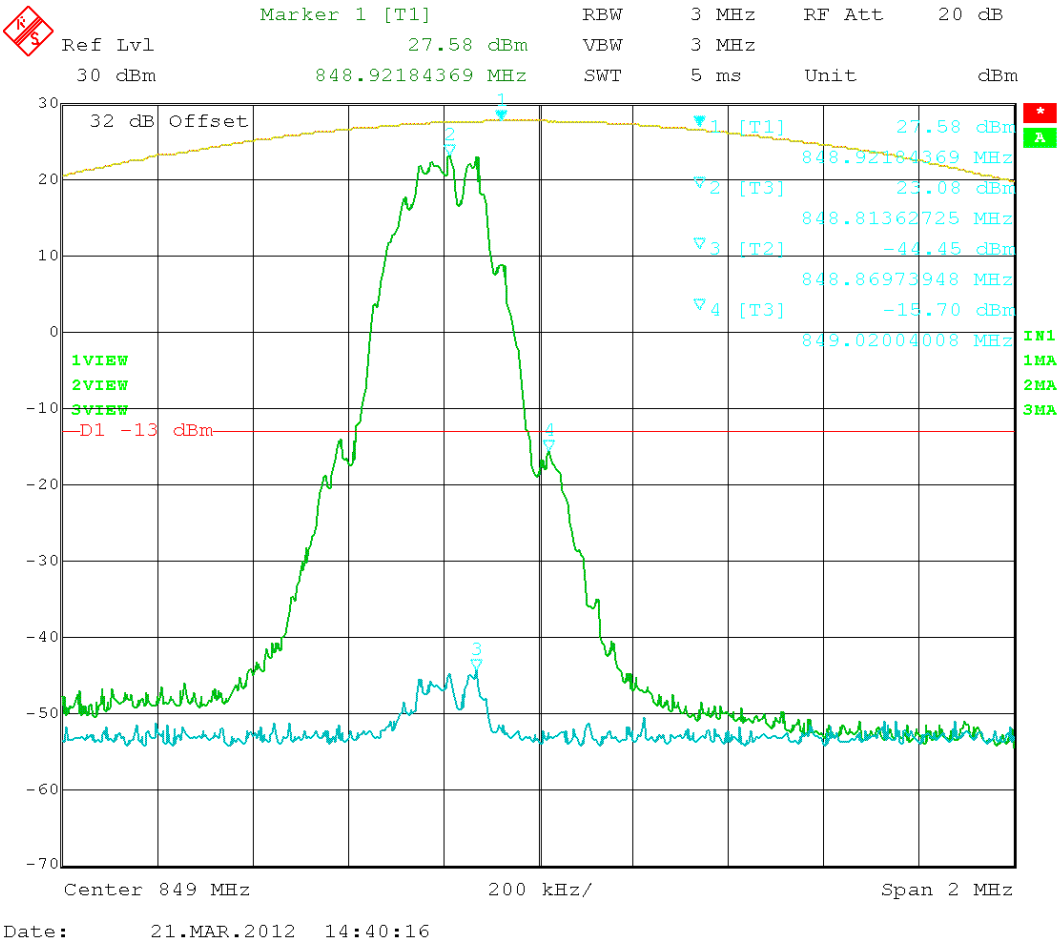


Figure 38: GSM – In vs. Out 848.8 MHz

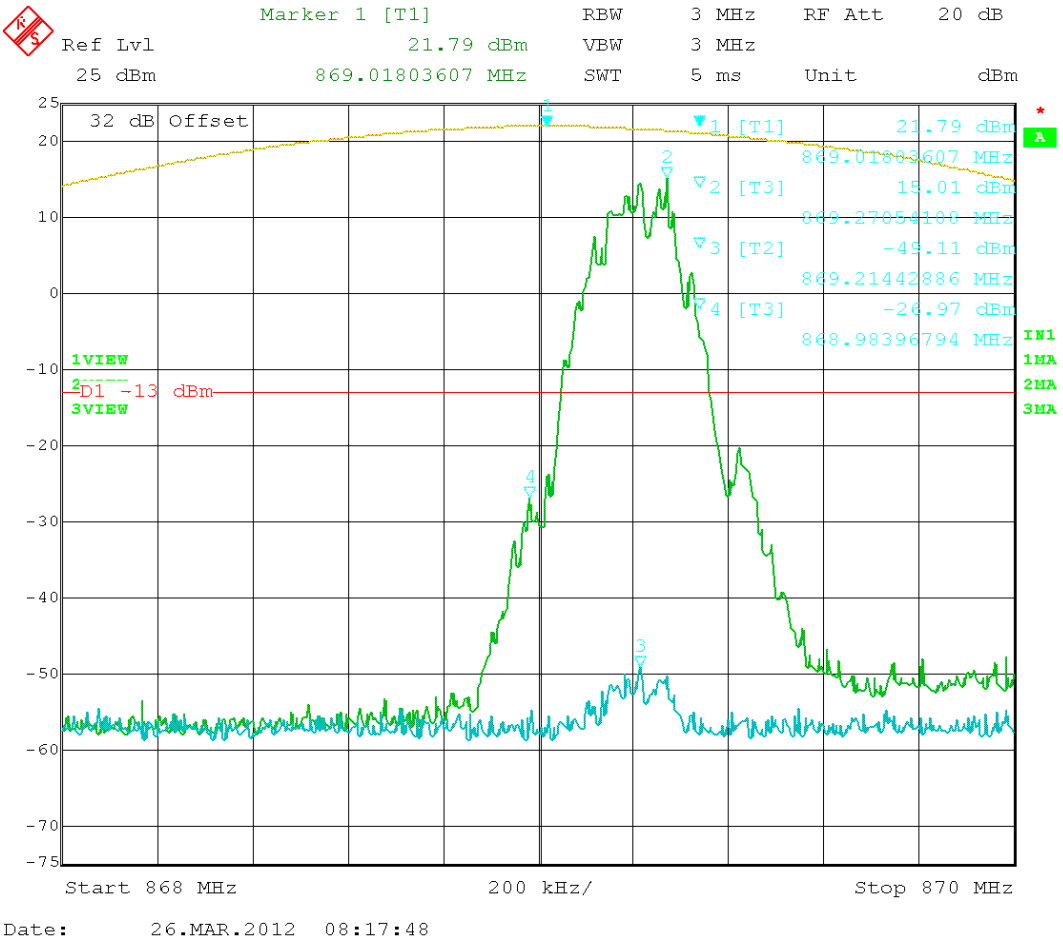


Figure 39: GSM – In vs. Out 869.2MHz

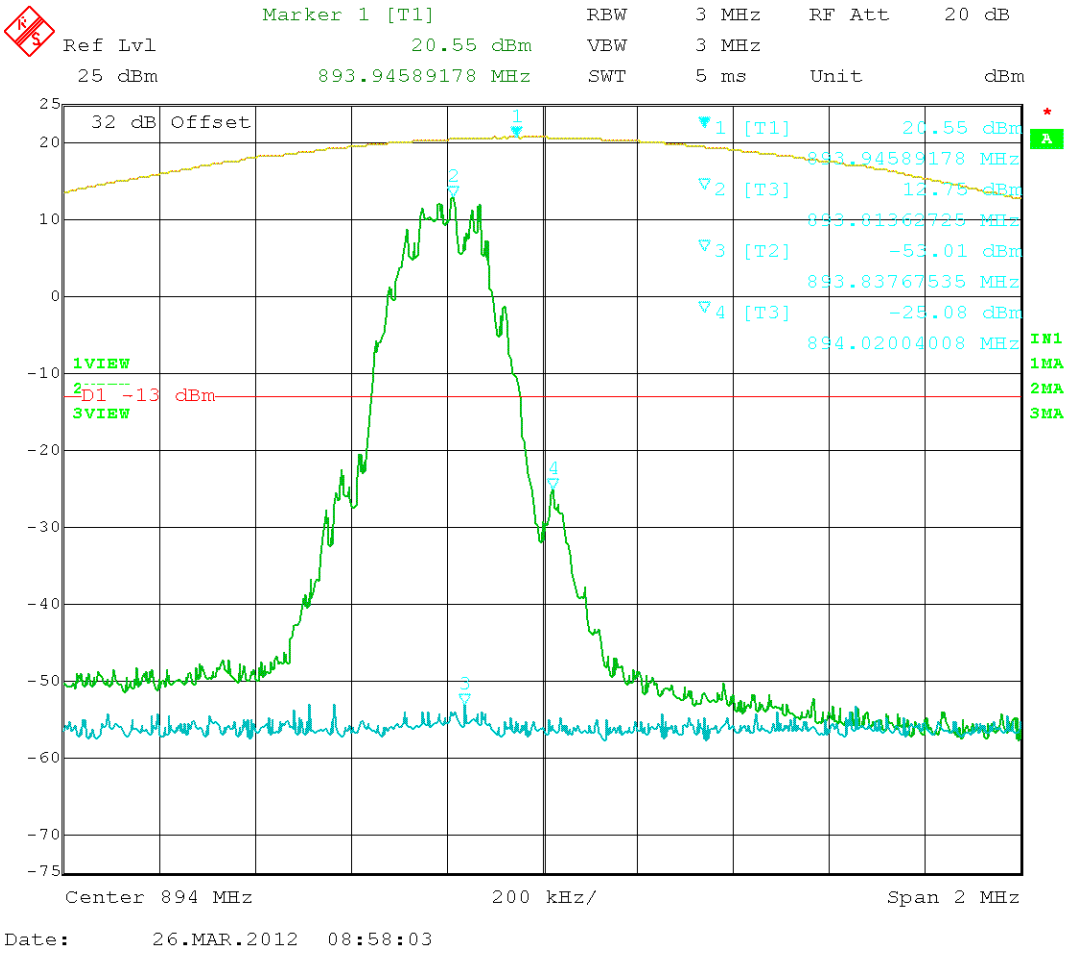


Figure 40: GSM – In vs. Out 893.8MHz

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 meets the requirements.

In the 800 MHz band, all of the channel combinations have been tested, the plots of worst cases are below.

In the 1900 MHz band, all of the 5 or 15 MHz pass band have been tested, and the worst cases are displayed below.

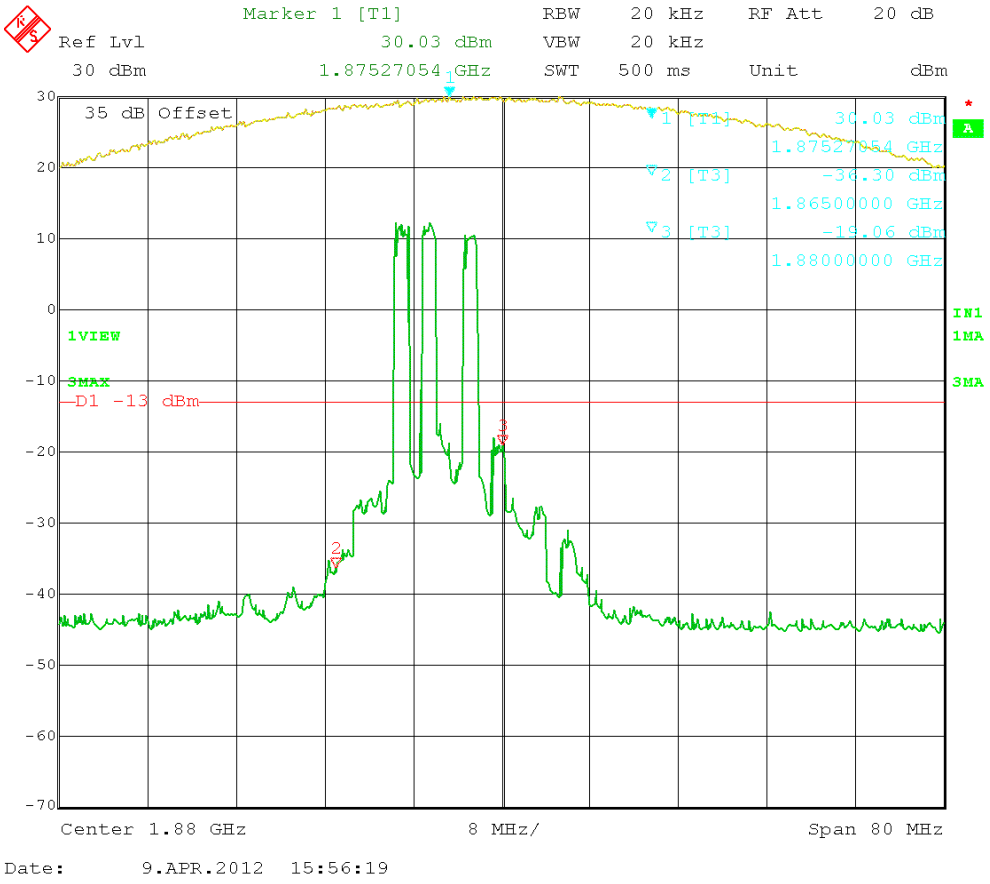


Figure 41: CDMA 3 tones intermodulation - (1850 – 1910) MHz.

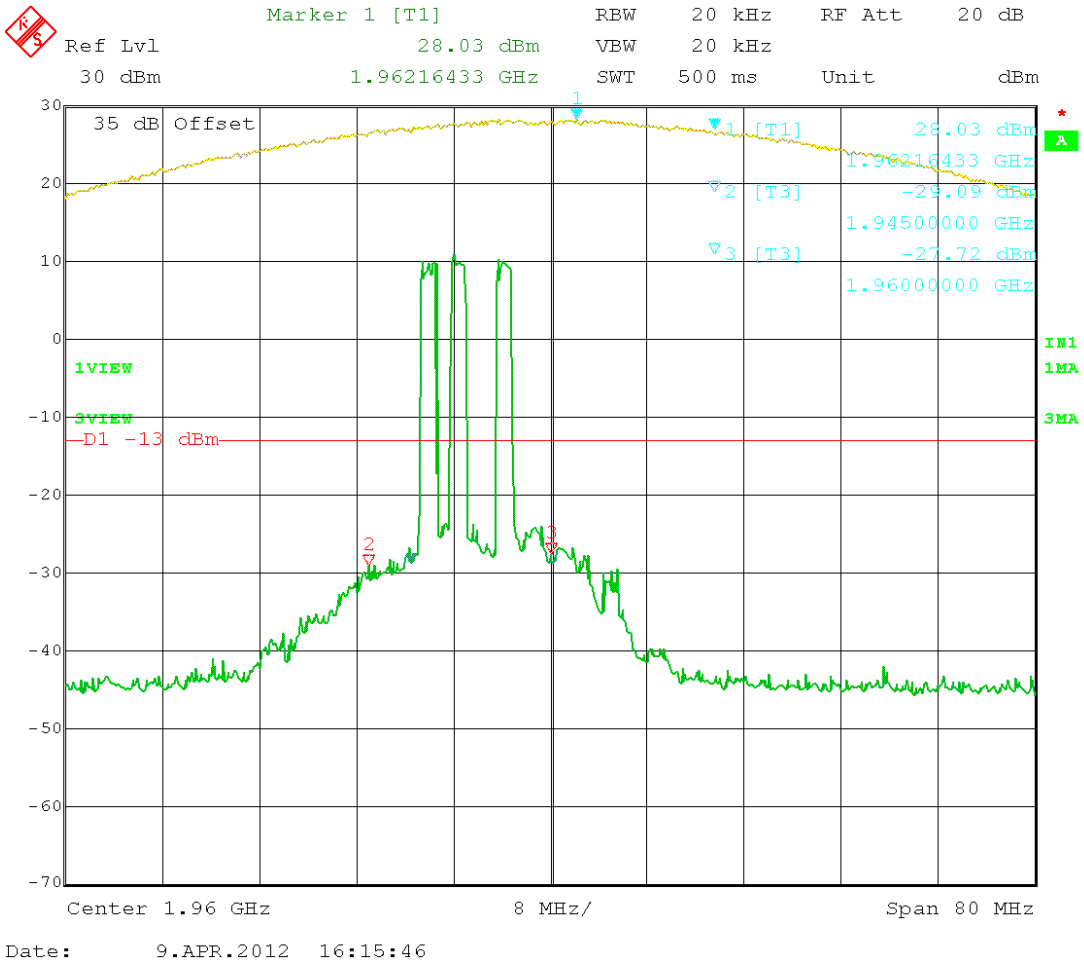


Figure 42: CDMA 3 tones intermodulation - (1930 – 1990) MHz.

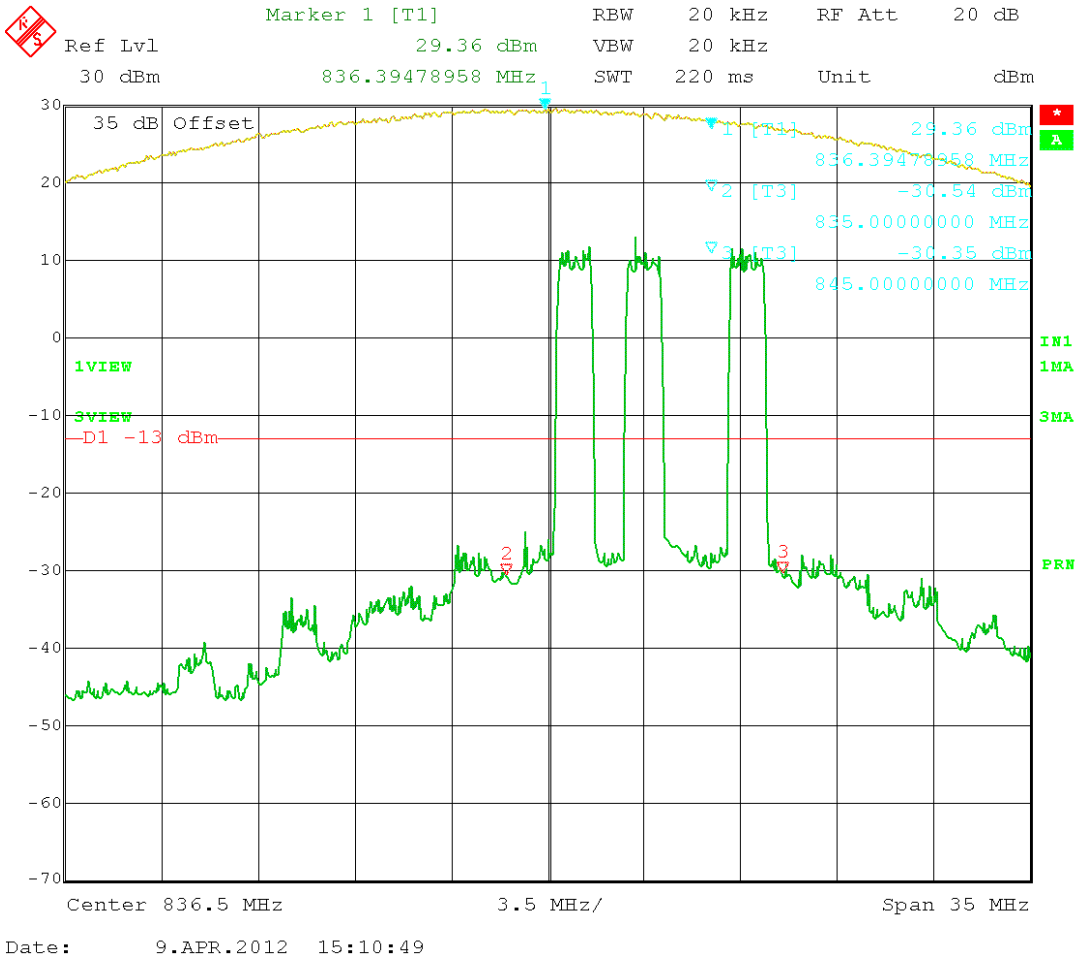


Figure 43: CDMA 3 tones intermodulation – (824 – 849) MHz.

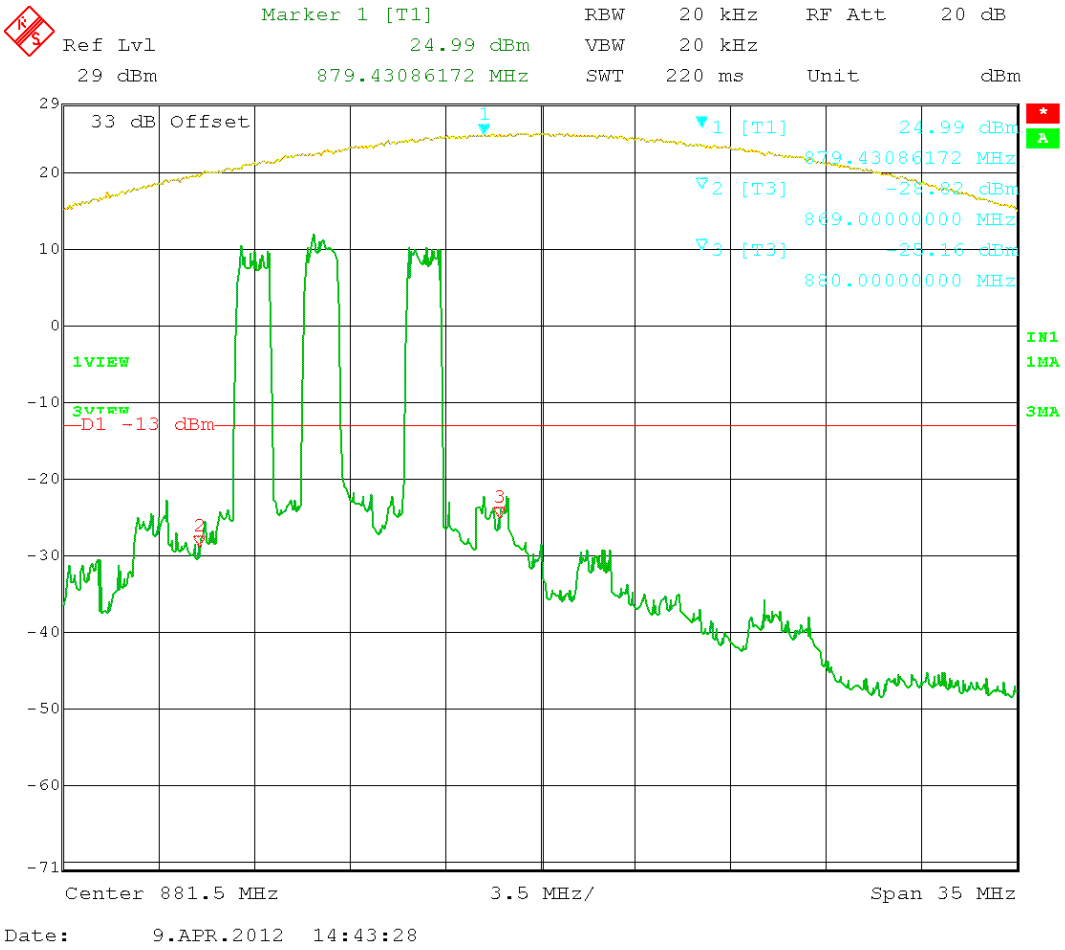


Figure 44: CDMA 3 tones intermodulation - (869 – 894) MHz.

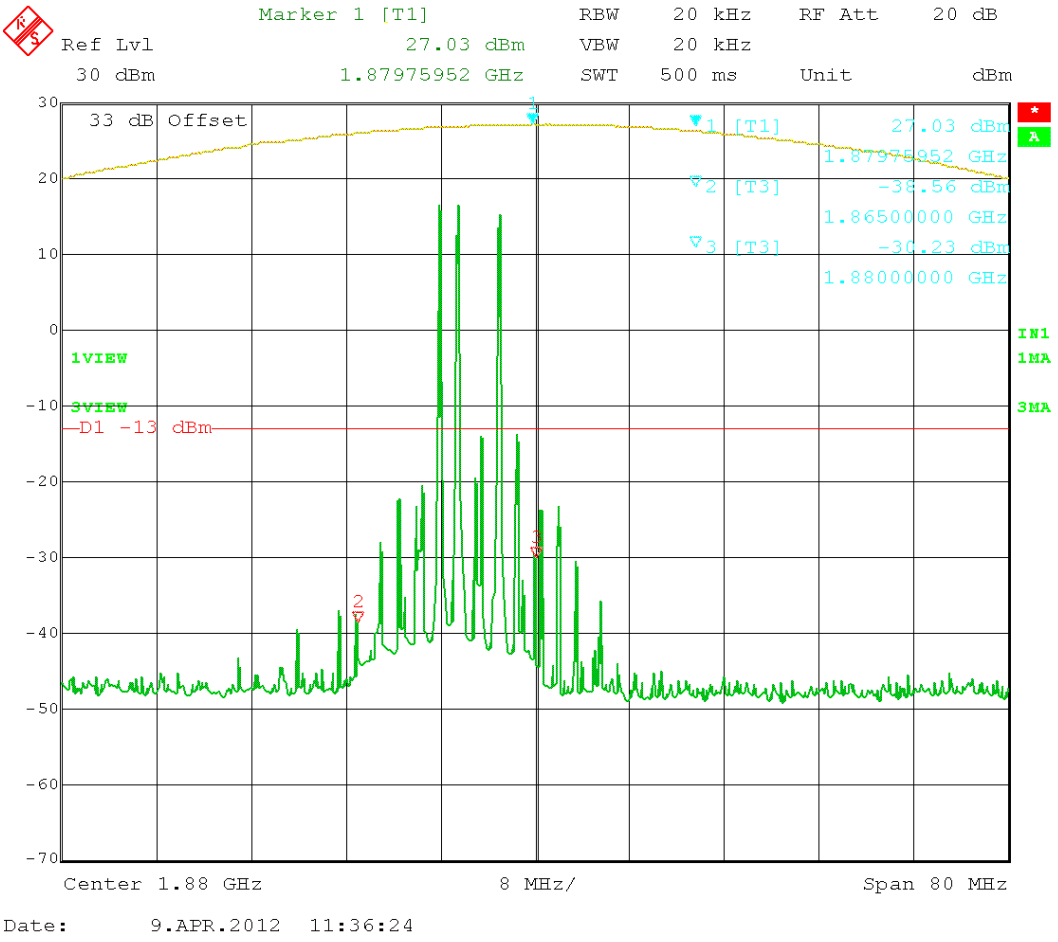


Figure 45: GSM 3 tones intermodulation - (1850 – 1910) MHz

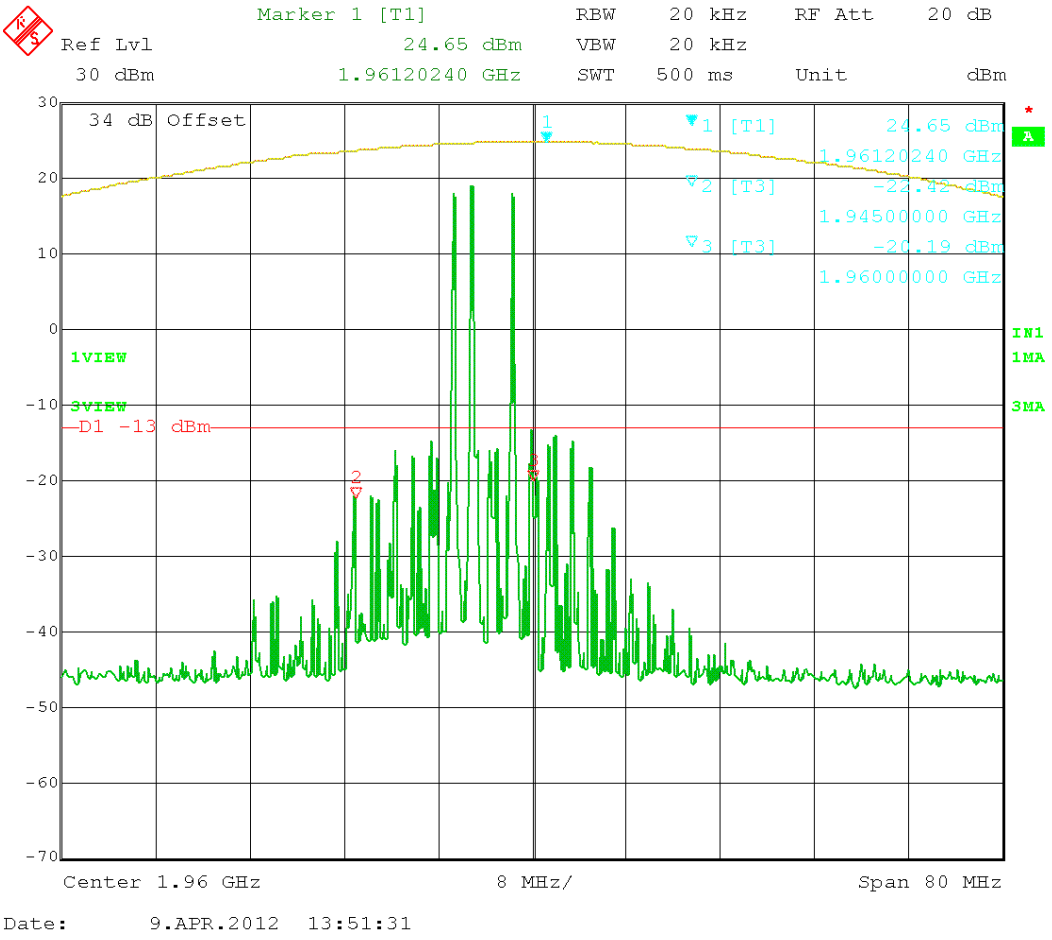


Figure 46: GSM 3 tones intermodulation - (1930 – 1990) MHz

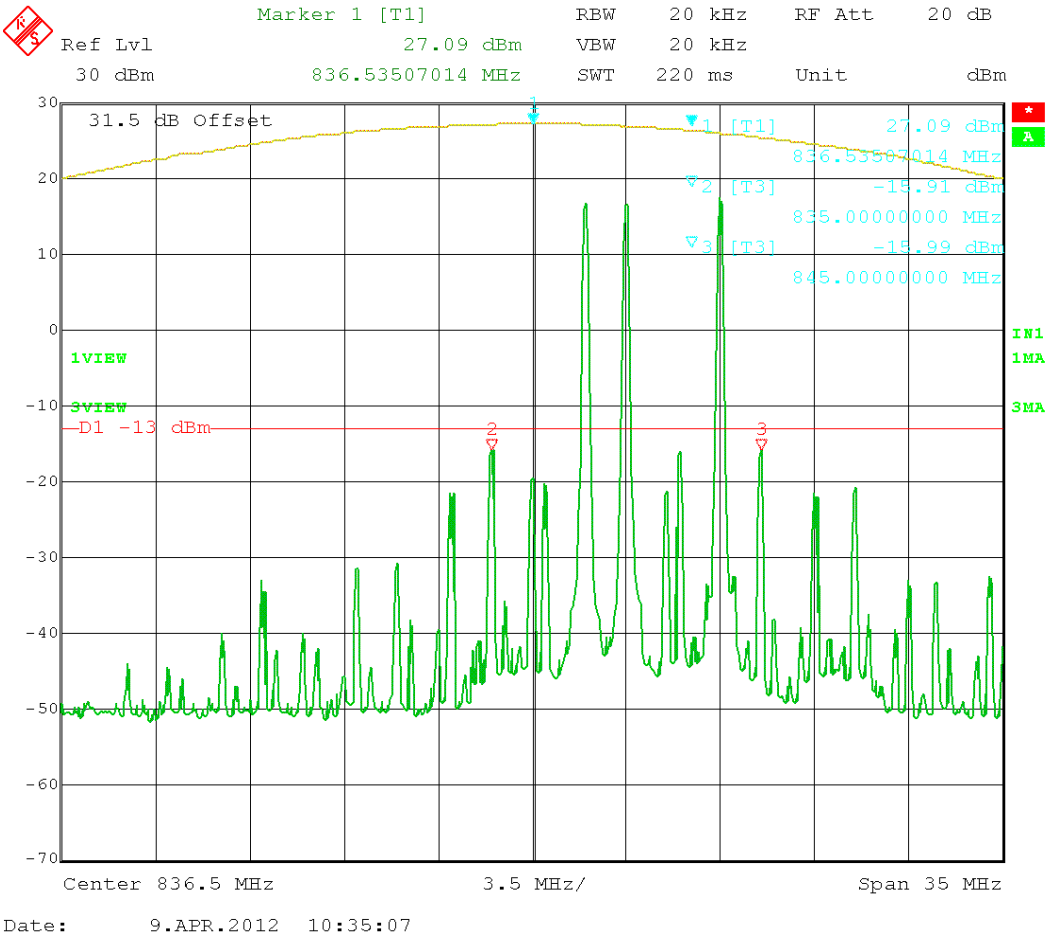


Figure 47: GSM 3 tones intermodulation - (824 – 849) MHz

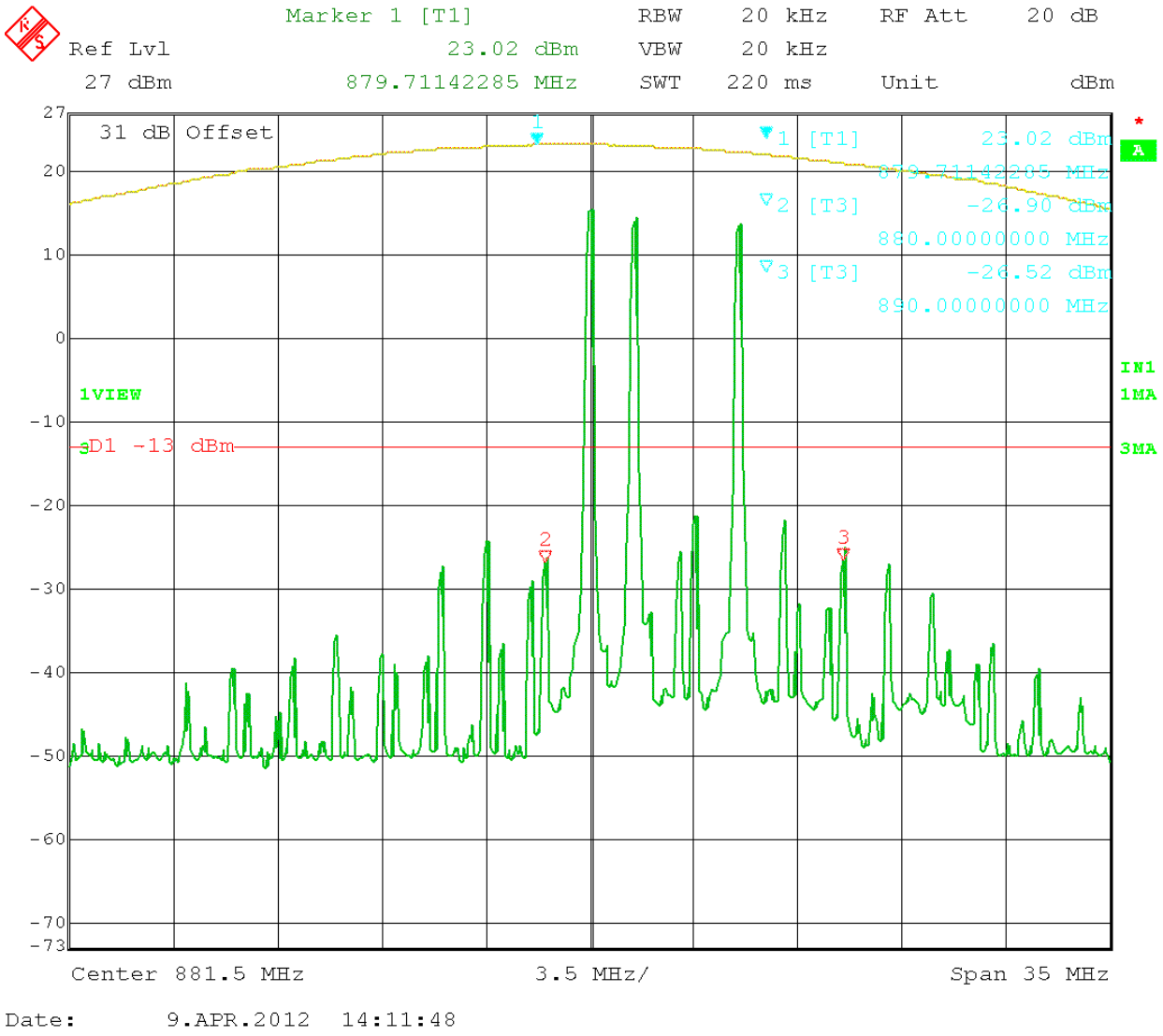


Figure 48: GSM 3 tones intermodulation - (869 – 894) MHz

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:

1850 – 1910 MHz: 43 + 10log (1.00) = 43 dBc
1930 – 1990 MHz: 43 + 10log (0.30) = 38 dBc

Test Result: The DUT meets the requirements.

Test Data Table 21 – 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		1880.00		1908.75	
3702.50	76.4	3760.00	75.7	3817.50	67.5
5553.75	78.3	5640.00	81.2	5726.25	81.3
7405.00	80.1	7520.00	82.5	7635.00	81.9
9256.25	80.4	9400.00	83.2	9543.75	82.7
11107.50	NF	11280.00	NF	11452.50	NF
12958.75	NF	13160.00	NF	13361.25	NF
14810.00	NF	15040.00	NF	15270.00	NF
16661.25	NF	16920.00	NF	17178.75	NF
18512.50	NF	18800.00	NF	19087.50	NF

Test Data Table 22 – 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		1960.00		1988.75	
3862.50	74.9	3920.00	79.3	3977.50	78.9
5793.75	84.5	5880.00	86.0	5966.25	81.1
7725.00	86.0	7840.00	84.7	7955.00	81.9
9656.25	84.5	9800.00	86.1	9943.75	81.8
11587.50	NF	11760.00	NF	11932.50	NF
13518.75	NF	13720.00	NF	13921.25	NF
15450.00	NF	15680.00	NF	15910.00	NF
17381.25	NF	17640.00	NF	17898.75	NF
19312.50	NF	19600.00	NF	19887.50	NF

Test Data Table 23 – 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		1880.00		1909.80	
3700.40	75.5	3760.00	77.8	3819.60	83.6
5550.60	84.8	5640.00	83.6	5729.40	72.4
7400.80	85.1	7520.00	85.6	7639.20	80.6
9251.00	84.5	9400.00	86.7	9549.00	81.1
11101.20	NF	11280.00	NF	11458.80	NF
12951.40	NF	13160.00	NF	13368.60	NF
14801.60	NF	15040.00	NF	15278.40	NF
16651.80	NF	16920.00	NF	17188.20	NF
18502.00	NF	18800.00	NF	19098.00	NF

Test Data Table 24 – 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		1960.00		1989.80	
3860.40	66.5	3920.00	80.1	3979.60	78.6
5790.60	80.4	5880.00	82.0	5969.40	78.6
7720.80	79.5	7840.00	82.1	7959.20	79.1
9651.00	80.5	9800.00	82.9	9949.00	78.8
11581.20	NF	11760.00	NF	11938.80	NF
13511.40	NF	13720.00	NF	13928.60	NF
15441.60	NF	15680.00	NF	15918.40	NF
17371.80	NF	17640.00	NF	17908.20	NF
19302.00	NF	19600.00	NF	19898.00	NF

Test Data Table 25 – 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		836.50		847.75	
1650.50	88.8	1673.00	88.7	1695.50	90.6
2475.75	86.0	2509.50	81.9	2543.25	83.8
3301.00	85.3	3346.00	89.9	3391.00	89.9
4126.25	89.0	4182.50	90.4	4238.75	89.7
4951.50	89.3	5019.00	NF	5086.50	NF
5776.75	NF	5855.50	NF	5934.25	85.2
6602.00	NF	6692.00	NF	6782.00	NF
7427.25	NF	7528.50	NF	7629.75	NF
8252.50	NF	8365.00	NF	8477.50	NF

Test Data Table 26 – 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		881.50		892.75	
1740.50	79.2	1763.00	79.6	1785.50	78.9
2610.75	80.2	2644.50	80.6	2678.25	79.6
3481.00	79.0	3526.00	76.8	3571.00	79.8
4351.25	79.6	4407.50	79.6	4463.75	80.0
5221.50	79.0	5289.00	79.0	5356.50	77.7
6091.75	NF	6170.50	NF	6249.25	NF
6962.00	NF	7052.00	NF	7142.00	NF
7832.25	NF	7933.50	NF	8034.75	NF
8702.50	NF	8815.00	NF	8927.50	NF

Test Data Table 27 – 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		836.50		848.80	
1648.40	83.6	1673.00	86.4	1697.60	86.2
2472.60	79.7	2509.50	80.0	2546.40	76.5
3296.80	78.9	3346.00	81.7	3395.20	84.7
4121.00	84.1	4182.50	87.2	4244.00	86.4
4945.20	NF	5019.00	87.0	5092.80	84.5
5769.40	NF	5855.50	83.8	5941.60	77.3
6593.60	NF	6692.00	NF	6790.40	81.7
7417.80	NF	7528.50	83.1	7639.20	NF
8242.00	NF	8365.00	84.2	8488.00	NF

Test Data Table 28 – 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		881.50		893.80	
1738.40	78.9	1763.00	79.7	1787.60	79.7
2607.60	80.5	2644.50	82.0	2681.40	80.5
3476.80	76.5	3526.00	77.1	3575.20	79.3
4346.00	80.2	4407.50	80.9	4469.00	80.4
5215.20	80.8	5289.00	80.4	5362.80	78.9
6084.40	NF	6170.50	NF	6256.60	NF
6953.60	NF	7052.00	NF	7150.40	NF
7822.80	NF	7933.50	NF	8044.20	NF
8692.00	NF	8815.00	NF	8938.00	NF

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(1.390) = 44 dB
43 + 10log(0.032) = 28 dB

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

Test Data Table 29 – Radiated Emissions – CW (1900 MHz) – Uplink /Downlink

Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)	Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
1880.00	0	0	1960.00	0	0
3760.00	H	76.6	3920.00	H	67.6
5640.00	H	79.0	5880.00	H	73.5
7520.00	H	79.8	7840.00	H	71.9
9400.00	H	76.8	9800.00	H	63.9
11280.00	H	74.1	11760.00	H	64.3
13160.00	H	62.6	13720.00	H/V	NF
15040.00	H/V	NF	15680.00	H/V	NF
16920.00	H/V	NF	17640.00	H/V	NF
18800.00	H/V	NF	19600.00	H/V	NF

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

Test Data Table 30 – Radiated Emissions – CW (800 MHz) – Uplink /Downlink

Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
836.50	0	0
1673.00	H	87.0
2509.50	V	68.3
3346.00	H	69.9
4182.50	H	76.6
5019.00	V	74.0
5855.50	H	78.0
6692.00	H/V	NF
7528.50	H/V	NF
8365.00	H/V	NF

Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
881.50	0	0
1763.00	H	77.0
2644.50	V	62.1
3526.00	H	70.4
4407.50	H	71.9
5289.00	H	72.5
6170.50	H	66.3
7052.00	H/V	NF
7933.50	H/V	NF
8815.00	H/V	NF

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

OUT OF BAND REJECTION: FREQUENCY RESPONSE

In the 800 MHz band, the bandpass is one of three channel combinations:

1. A + A'
2. B + B'
3. B

In accordance with the following table:

Channel	Uplink or Downlink	Lower Band Edge MHz	Upper Band Edge MHz
A	Uplink	824	835
A'	Uplink	845	846.5
B	Uplink	835	845
B'	Uplink	846.5	849
A	Downlink	869	880
A'	Downlink	890	891.5
B	Downlink	880	890
B'	Downlink	891.5	894

In the 1900 MHz band, the bandpass is selected in any 5 or 15 MHz in 2.5 MHz increments from 1850 – 1910 MHz on uplink and 1930 – 1990 MHz on downlink.

800 MHz band (Uplink)
CH: A + A'

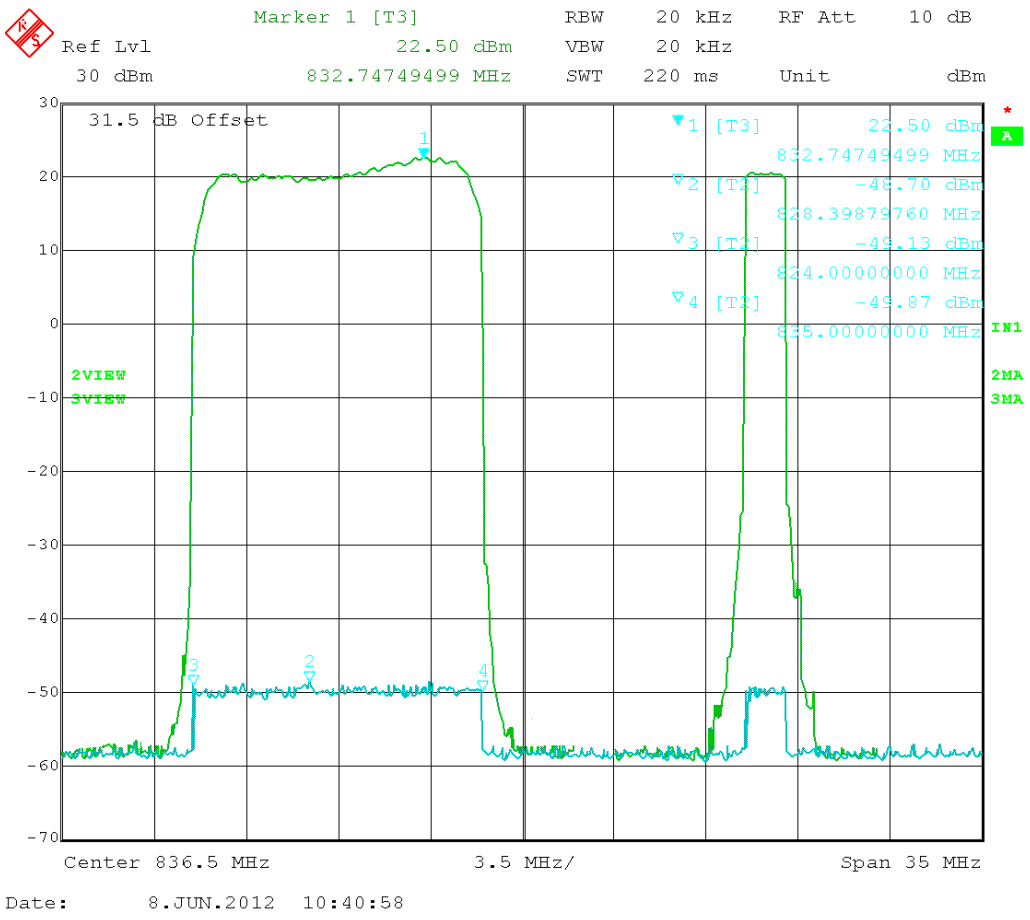


Figure 49: Frequency response (824 – 835) MHz and (845 – 846.5) MHz band

CH A:

Input	-48.7
Output	22.5
Pass Band Gain	71.2

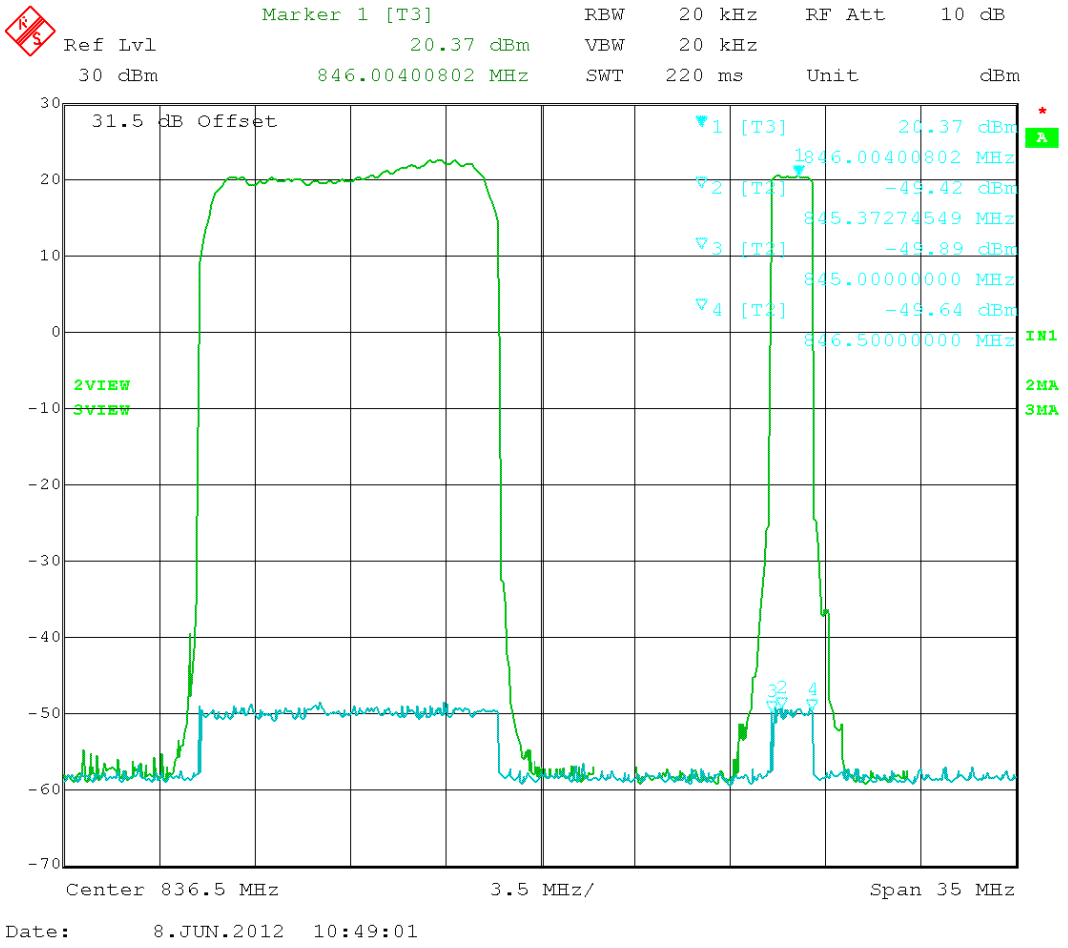


Figure 50: Frequency response (824 – 835) MHz and (845 – 846.5) MHz band

CH A':

Input	-49.4
Output	20.4
Pass Band Gain	69.8

CH: B + B’

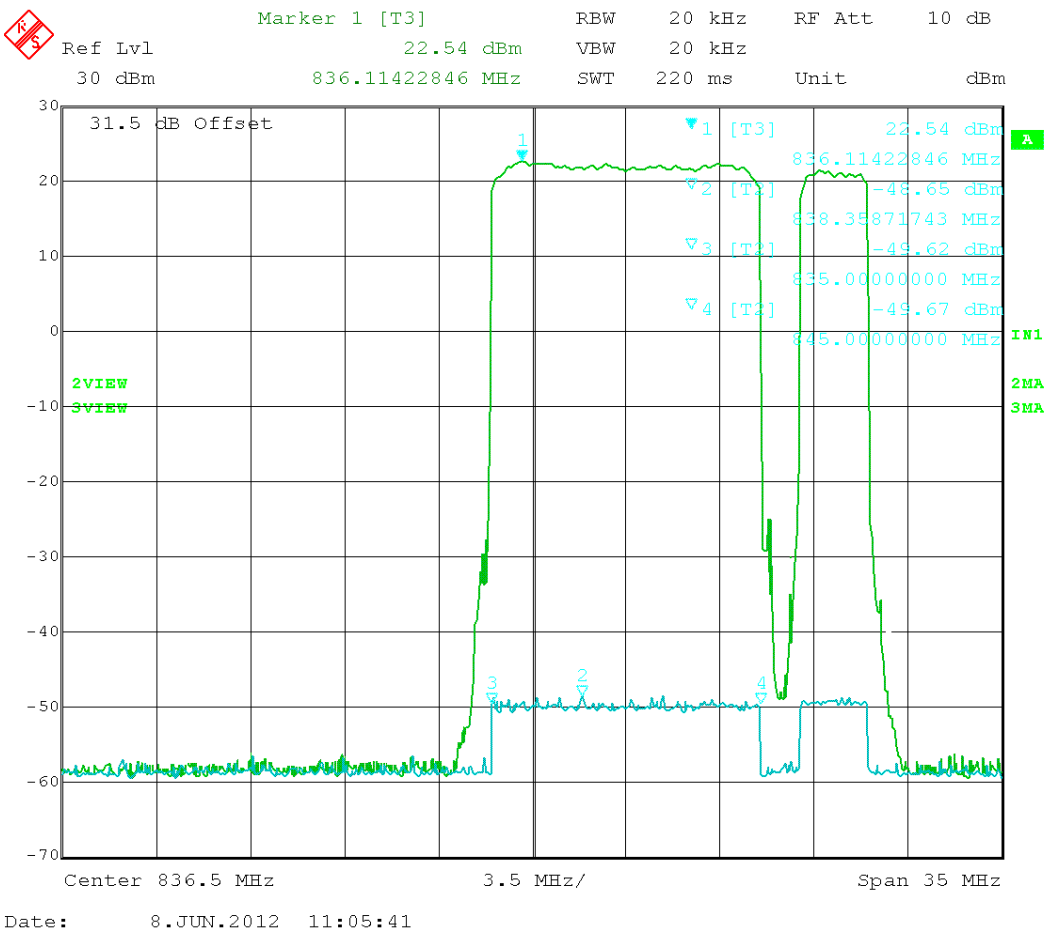


Figure 51: Frequency response (835 – 845) MHz and (846.5 – 849) MHz band

CH B:

Input	-48.7
Output	22.5
Pass Band Gain	71.2

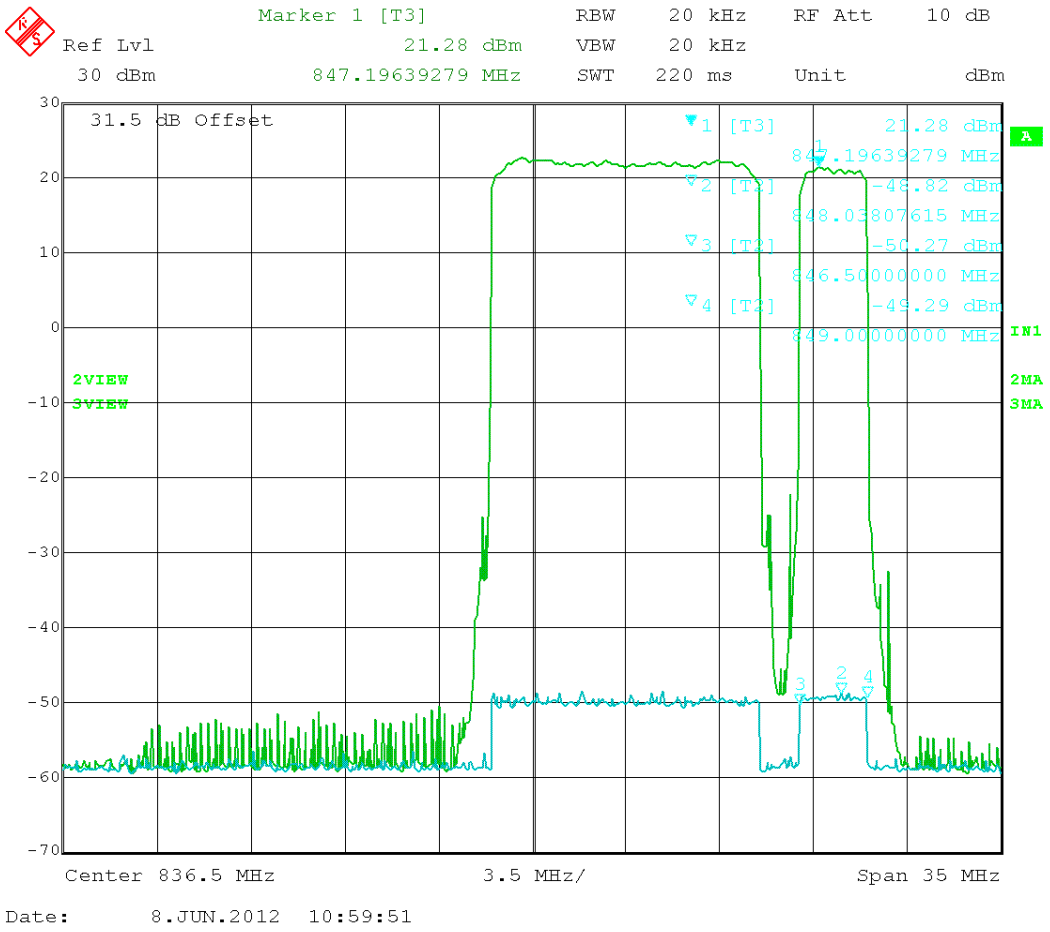


Figure 52: Frequency response (835 – 845) MHz and (846.5 – 849) MHz band

CH B':

Input	-48.8
Output	21.3
Pass Band Gain	70.1

800 MHz band (Downlink)
CH: A + A'

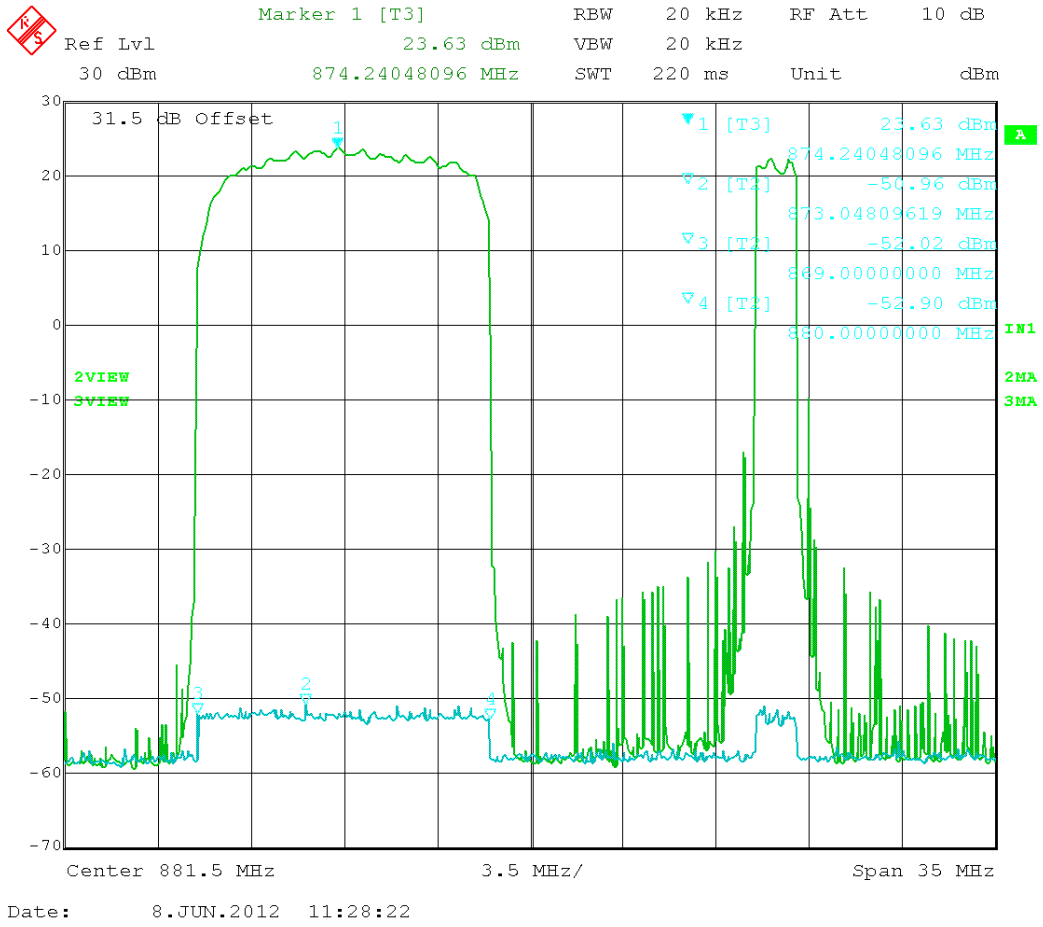


Figure 53: Frequency response (869 – 880) MHz and (890 – 891.5) MHz band

CH A:

Input	-51.0
Output	23.6
Pass Band Gain	74.6

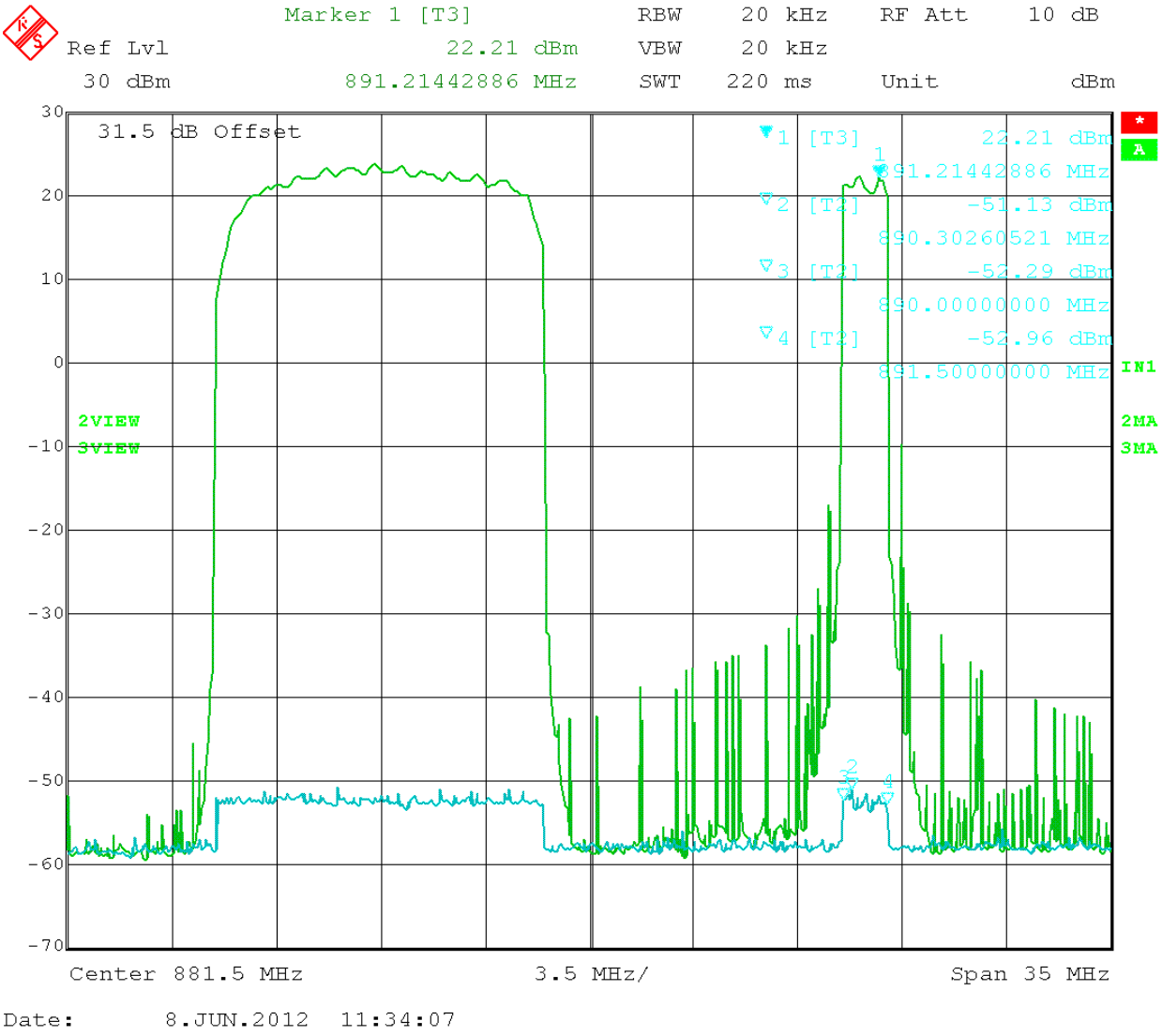


Figure 54: Frequency response (869 – 880) MHz and (890 – 891.5) MHz band

CH A':

Input	-51.0
Output	22.2
Pass Band Gain	73.3

CH: B + B’

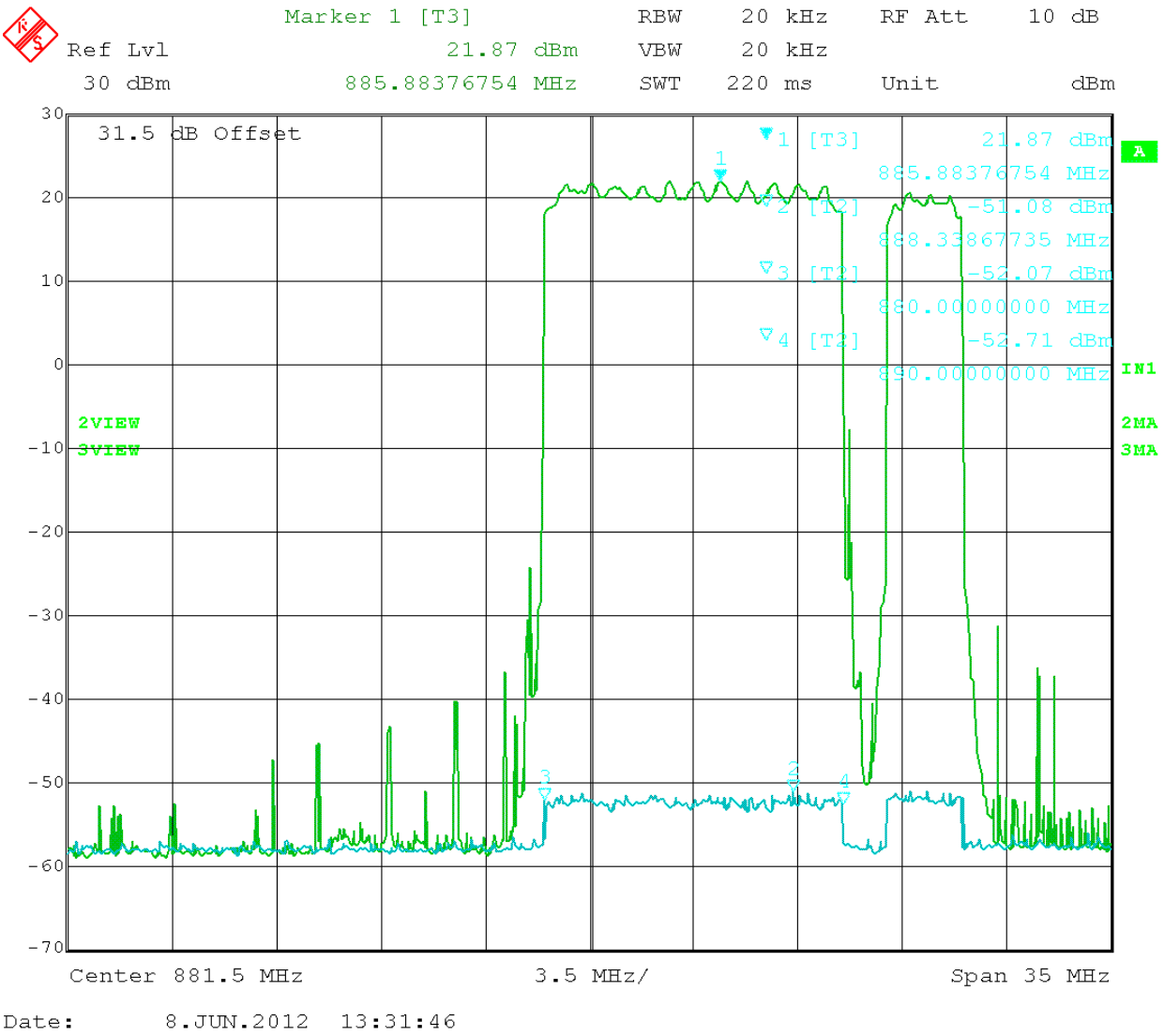


Figure 55: Frequency response (880 – 890) MHz and (891.5 – 894) MHz band

CH B:

Input	-51.1
Output	21.9
Pass Band Gain	73.0

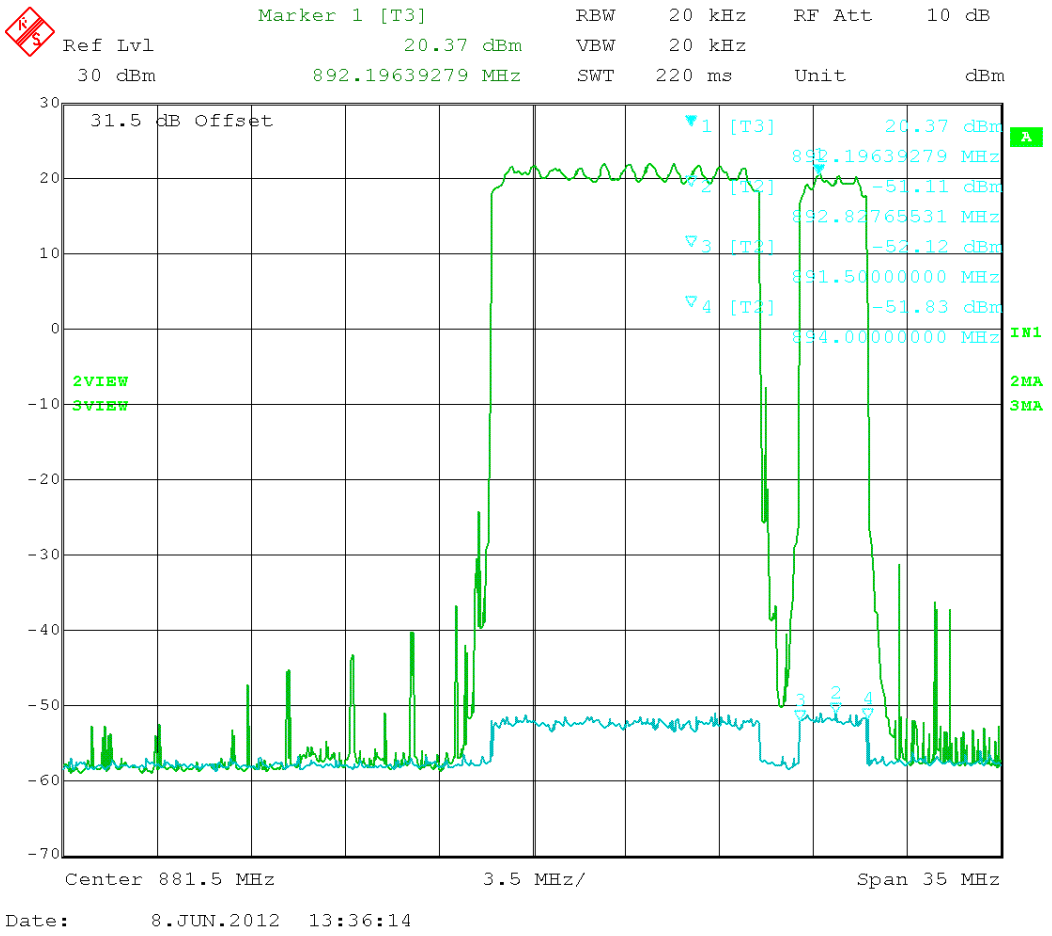


Figure 56: Frequency response (880 – 890) MHz and (891.5 – 894) MHz band

CH B':

Input	-51.1
Output	20.4
Pass Band Gain	71.5

1900 MHz band (Uplink)
Four channels: (1857.5, 1872.5, 1887.5, and 1902.5 MHz) have been selected to cover the uplink frequency range 1850 – 1910 MHz.

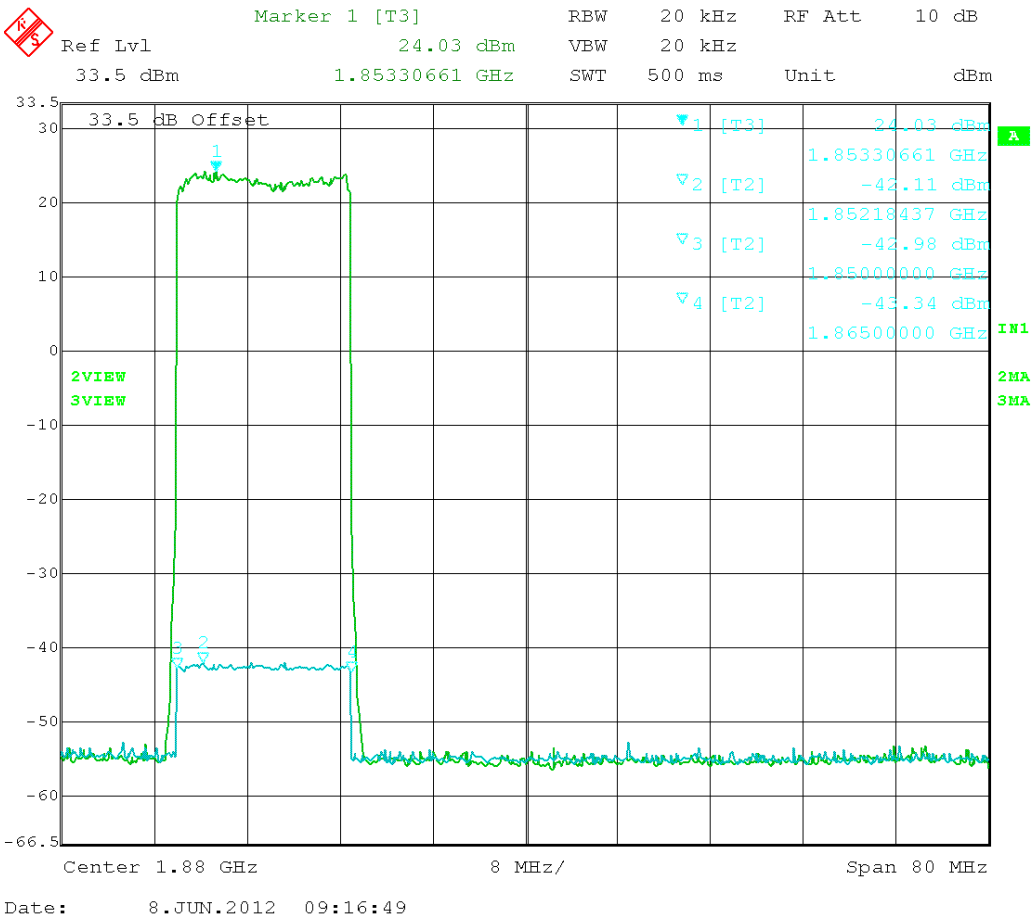


Figure 57: Frequency response 1857.5 MHz band

Input	-42.1
Output	24.0
Pass Band Gain	66.1

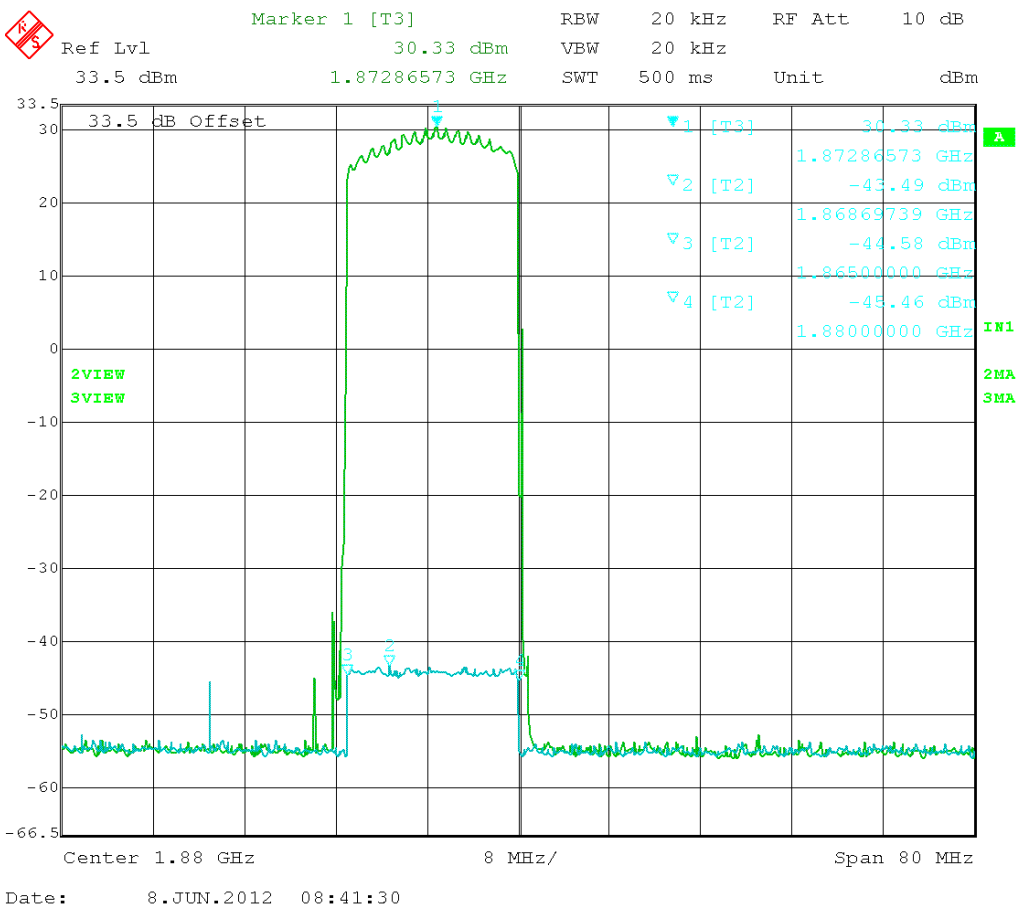


Figure 58: Frequency response 1872.5 MHz band

Input	-43.5
Output	30.3
Pass Band Gain	73.8

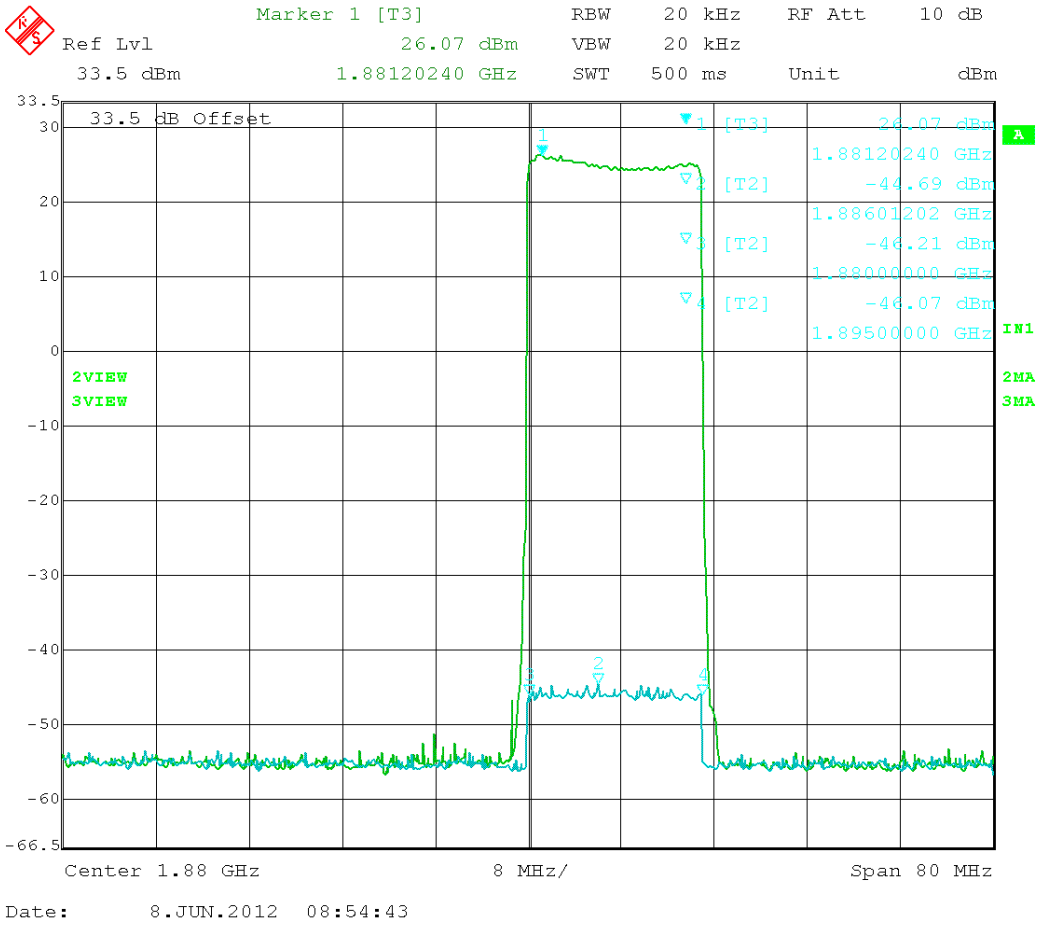


Figure 59: Frequency response 1887.5 MHz band

Input	-44.7
Output	26.1
Pass Band Gain	70.8

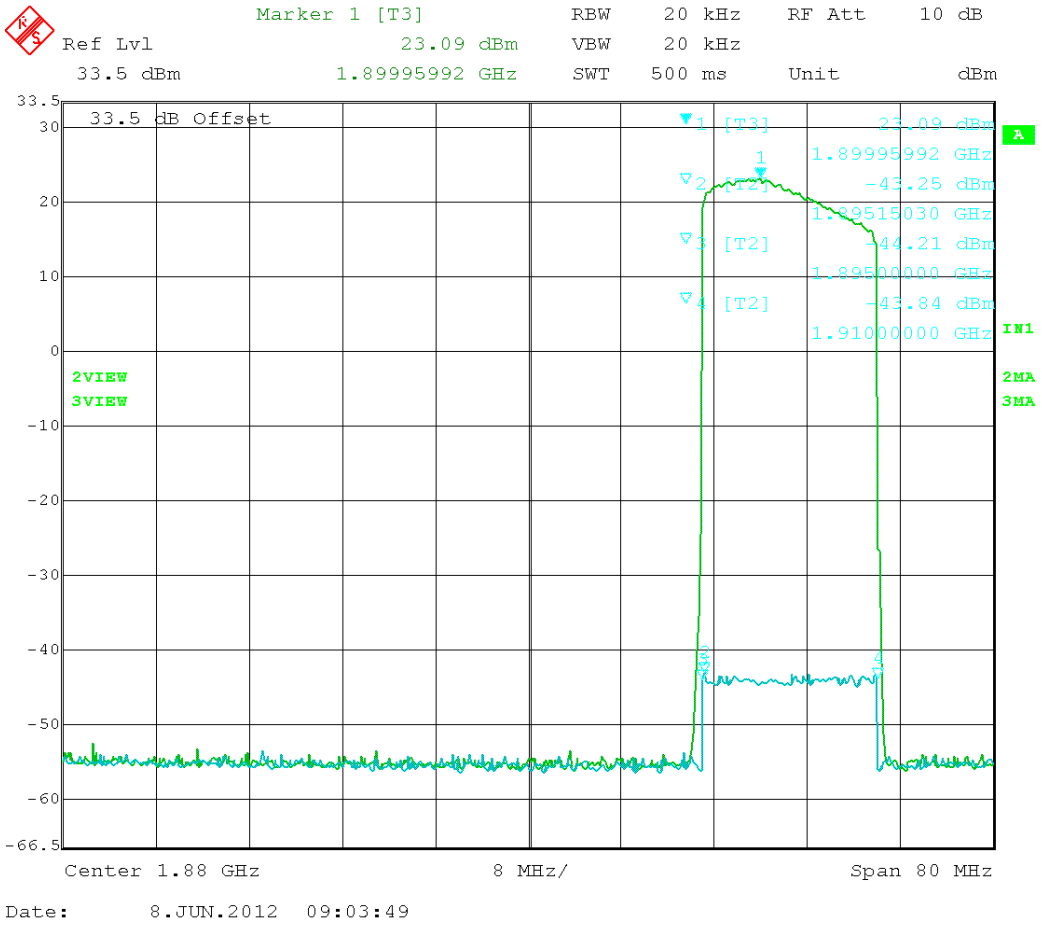


Figure 60: Frequency response 1902.5 MHz band

Input	-43.8
Output	23.1
Pass Band Gain	66.9

1900 MHz band (Downlink)
Four channels: (1937.5, 1952.5, 1967.5, and 1982.5 MHz) have been selected to cover the uplink frequency range 1930 – 1990 MHz.

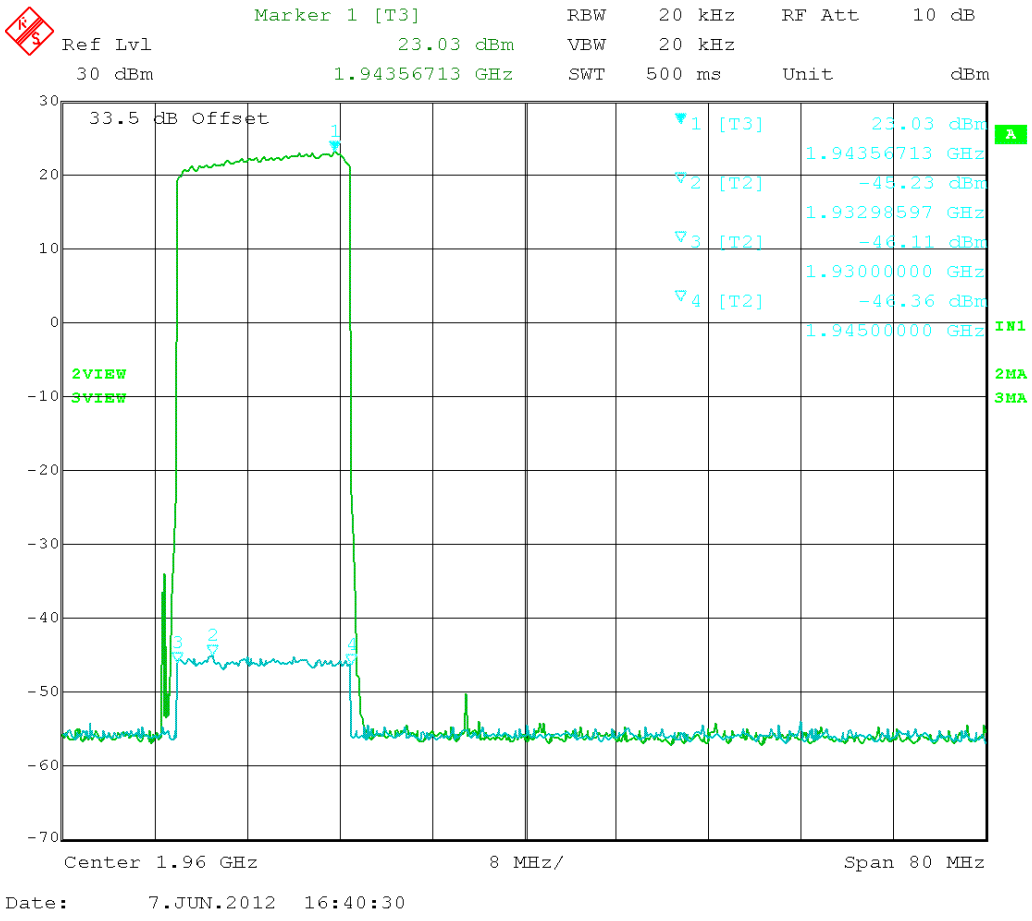


Figure 61: Frequency response 1937.5 MHz band

Input	-45.2
Output	23.0
Pass Band Gain	68.3

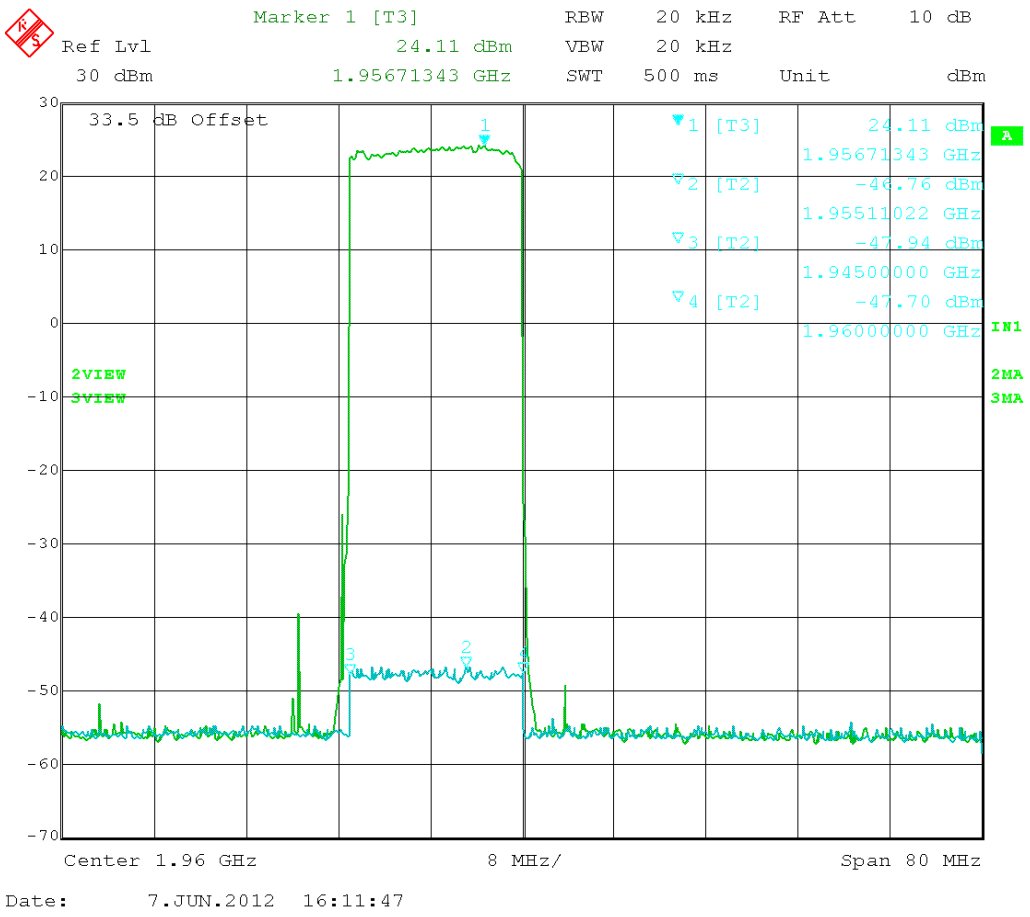


Figure 62: Frequency response 1952.5 MHz band

Input	-46.8
Output	24.1
Pass Band Gain	70.9

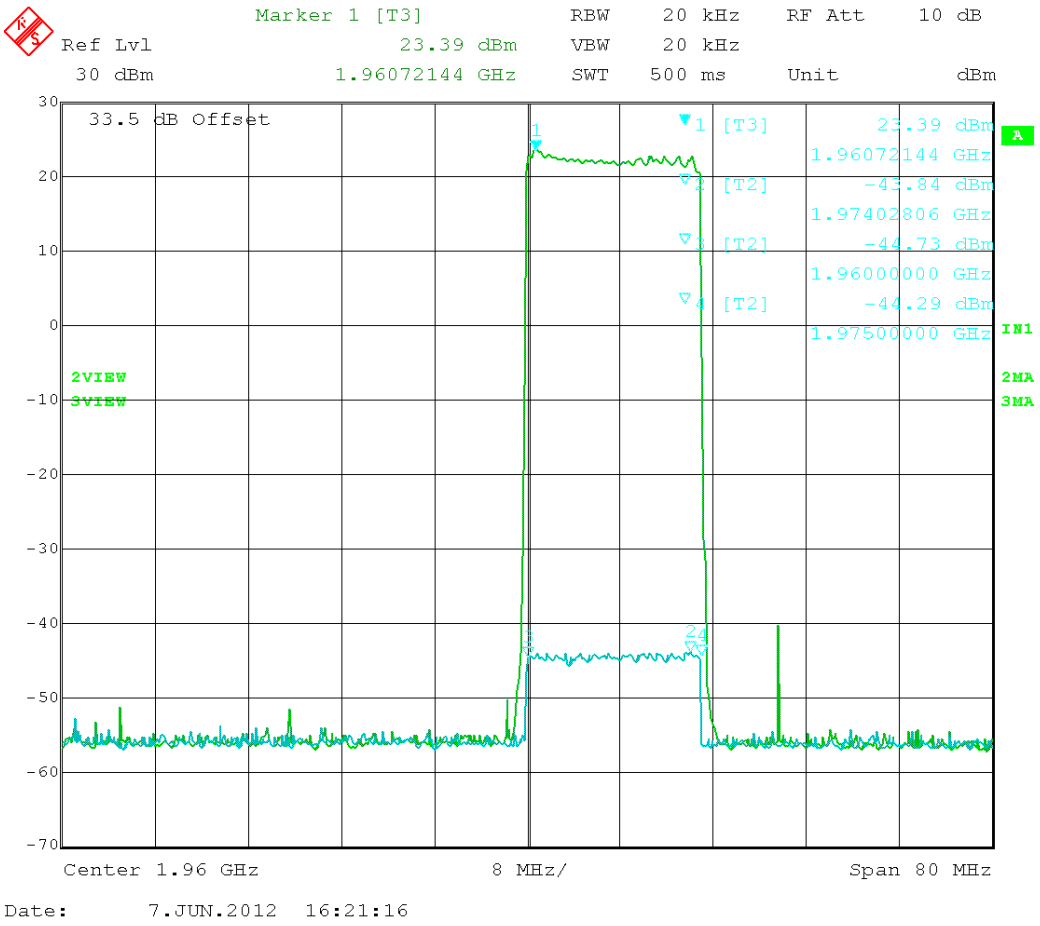


Figure 63: Frequency response 1967.5 MHz band

Input	-43.8
Output	23.4
Pass Band Gain	67.2

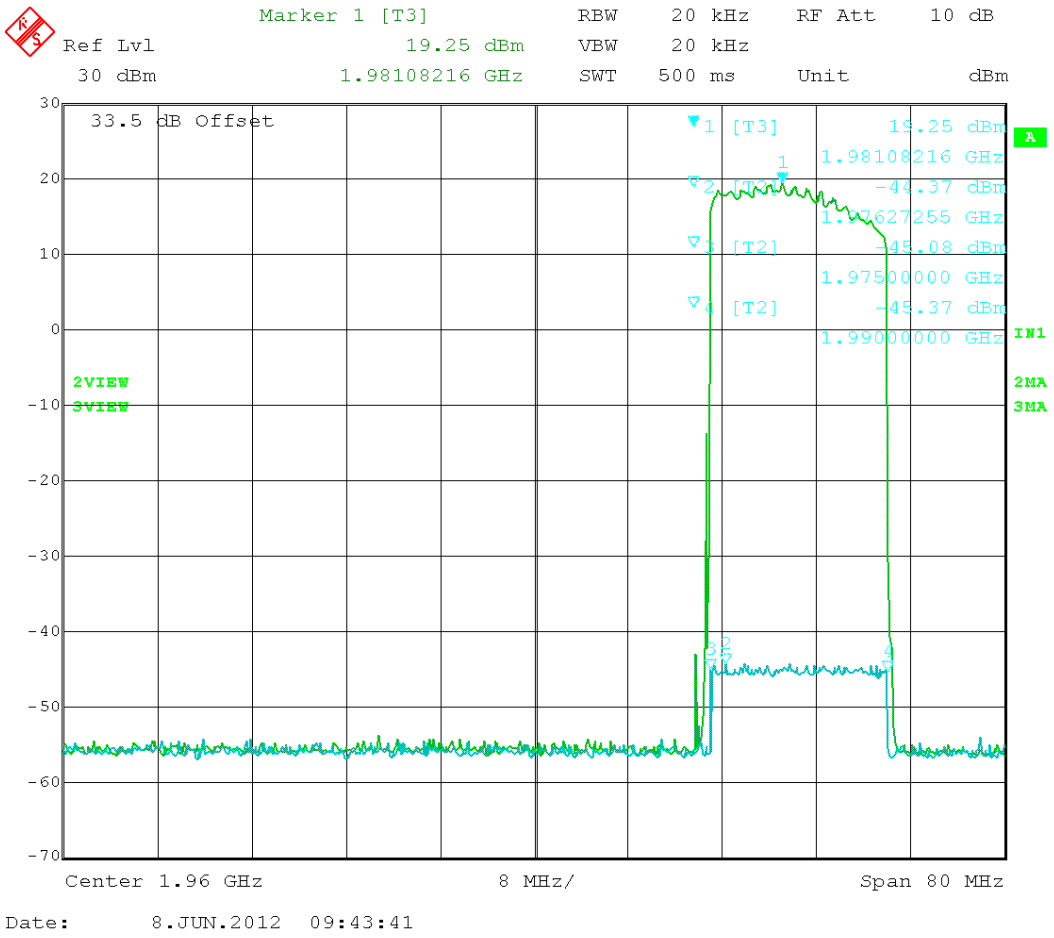


Figure 64: Frequency response 1982.5 MHz band

Input	-44.4
Output	19.3
Pass Band Gain	63.6