Test Report for FCC Equipment Authorization:

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Publication History

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Revision History

Stream/Issue	Revision Date	Reason for Change	Author
00/01	11/24/2004	Initial Release	R.Nathoo, 2M64
00/02	12/08/2004	Updated per reviewer comments - updated OBW measurement procedure - updated Table 1 test limit specification - move Table 4 to Sec. 4, added RBW	R.Nathoo, 2M64
1.0/00	01/04/2005	Document Approved	R.Nathoo, 2M64

Change bars will not be used in this document..

Acronyms and Abbreviations

ASIC	Application Specific Integrated Circuit
BBW	Breathing, Blossoming and Wilting
BPF	Bandpass Filter
BTS	Base Station Transceiver Subsystem
BW	Bandwidth
CDMA	Code Division Multiple Access
CR	Cost Reduced
dBFS	dB relative to Full Scale
DDS	Direct Digital Synthesizer
DPM	Duplexer Preselector Module
EEPROM	Electrically Erasable and Programmable ROM
EC	Engineering Change
ERLCE	Excess Reverse Link Capacity Estimate
HSSPC	High-Speed Serial Protocol Controller
HW	Hardware
IF	Intermediate Frequency
IIC	Inter-Integrated Circuit Bus
IS	Interim Standard
LO	Local Oscillator
LPF	Lowpass Filter
MFRM-2	Multi-Carrier Flexible Radio Module
MTRM	Multi-Carrier Transmitter Receiver Module
NF	Noise Figure
OCNS	Orthogonal Channel Noise Source
OH	OverHead
PA	Power Amplifier
PC	Personal Computer
PPR	Peak Power Reduction
PSA	Product Specification Agreement
RBW	Resolution BandWidth

RF	Radio Frequency
Rx	Receive
SA	Spectrum Analyzer
SFRM	Single Carrier Flexible Radio Module
SW	Software
TBD	To Be Determined
TM	Triplexer Module
TPTL	Transmit Power Tracking Loop
TRM	Transmitter Receiver Module
Tx	Transmit
uP	Microprocessor
XCVR	Transceiver

1 Introduction

This test report supports FCC filing for MFRM-2 800 Cost-Reduction; This test report will be used as a class II permissive change for FCC part 22. This filing shall include single, two and three carrier modes for the 800MHz cellular band. The following test results will include; RF Power Output, Occupied Bandwidth, Spurious Emissions at Antenna Terminals, and Transmitter Test (CDMA Mode Transmitter). Frequency over voltage and temperature test results will be included. Emissions testing shall be conducted at -48VDC at room temperature. Both IS95 and IS856 modulation schemes will be included in this report.

This test report will be submitted in accordance with the FCC Rules and Regulations, Part 2, Subpart J, Sections 2.1046 through 2.1057 for equipment authorization of Nortel Networks' CDMA 800 MHz Multi carrier Flexible Radio Module 2 (MFRM2).

The 800 MHz MFRM2 is intended for use in the Domestic Public Cellular Radio Telecommunications Service and is designed in accordance with the following standards:

- *CFR 47, Part 22, Subpart H, Cellular Radiotelephone Service [1]*
- *CFR 47, Part 2, Subpart J, Equipment Authorization Procedures - Equipment Authorization[2]*
- *IC RSS-129,Issue 2, 800 MHz Dual-Mode CDMA Cellular Telephones [3]*
- *TIA/EIA-97-E, Recommended Minimum Performance Standards for Base Stations Supporting Dual Mode Spread Spectrum Systems [4]*
- *Recommended Minimum Performance Standards for cdma2000 High Rate Packet Data Access Network C.S0032-0, Version 2.0 [7]*

1.1 Required Tests

Table 1 summarizes the required tests for the CDMA 800 MHz MFRM-2.

Table 1 : Required Tests

FCC Measurement Specification	FCC Limit Specification	Description	Test to be Performed?
2.1033		PA current specification	Yes
2.1046	22.913	RF Power Output	Yes
2.1049	22.917	Occupied Bandwidth	Yes
2.1051, 2.1057	22.917	Spurious Emissions at Antenna Terminals	Yes
2.1053, 2.1057	22.917	Field Strength of Spurious Emissions	Yes[a]
2.1055	22.355	Frequency Stability	Yes

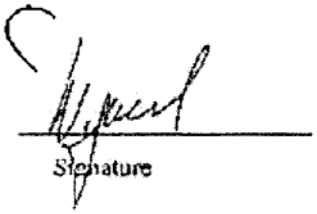
a. Field strength of spurious emissions testing will be performed by TDB.

2 Engineering Declaration

The CDMA 800MHz Multi carrier Flexible Radio Module2 has been tested in accordance with the requirements contained in the Federal Communications Commission Rules and Regulations Part 2 and 22.

To the best of my knowledge, these tests were performed in accordance with good engineering practices using measurement procedures consistent with industry or commission standards or previous Commission correspondence or guidance and demonstrate that this equipment complies with the appropriate standards. All tests were conducted on a representative sample of the equipment for which equipment authorization is sought.

Tested By:
Peter Goussev
System Test Prime
Nortel Networks
Ottawa, Canada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29-Nov. 2004
Date

Report Editor:
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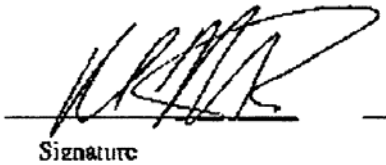
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Reviewed By:
Thomas Wong
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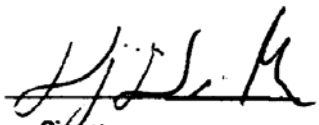
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Approved By
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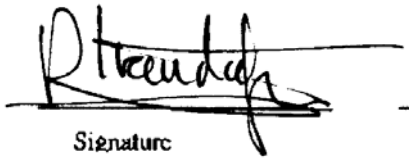
Ottawa, Canada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Date

3 Equipment Authorization Application Requirements

3.1 Standard Test Conditions and Test Equipment

The MFRM2 will be tested under the following standard test conditions unless otherwise noted:

- Ambient Temperature: 20 to 35 degrees C
- Ambient Humidity: 20 to 40%
- DC Supply Voltage: -48 Vdc (nominal)
- Input modulation IS-95 and IS-856 (16 QAM)

3.2 EUT Identification List

Table 2 shows the identification of the components required for testing.

Table 2 : EUT Identification List

Equipment Description	Model / Part Number	Release Number	Serial Number
800 MHz Multi carrier Flexible Radio Module	NPGY30AA	P5	NNTM536G12RM
800 DPM	NTGS89DB	06	CLWVPP201T4T
800 FAM	NTGY60AHN1		NTM533GR6YL
DPM Power/Data Cable	NTGS8027	N/A	N/A
DPM to RX0 Cable	NTGS8063	N/A	N/A
DPM to RX1 Cable	NTGS8016	N/A	N/A

3.3 Test Equipment List

Table 3 shows the identification of the test equipment required.

Table 3 : Test Equipment List

Description	Manufacturer	Model	Serial Number	Cal. Due Date
9kHz to 26.5 GHz Spectrum Analyzer	Rhode & Schwarz	FSEM - 30	826246 001	13 Nov. 2005
RF Power Meter	HP	438A	2502A01645	22 Jan. 2005
RF Power Sensor Head	HP	8481A	3318A98524	7 Apr. 2005
30dB Attenuator (>100W)	Weinschel	66-30-01		verified
RF Cables				verified

4 Transmitter Tests

4.1 RF Power Output

4.1.1 RF Power Output Requirements

FCC Part 2.1046 Measurements required: RF power output

§(a) For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in §2.1033(c)(8). The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.

(c) For measurements conducted pursuant to paragraphs (a) and (b) of this section, all calculations and methods used by the applicant for determining carrier power or peak envelope power, as appropriate, on the basis of measured power in the radio frequency load attached to the transmitter output terminals shall be shown. Under the test conditions specified, no components of the emission spectrum shall exceed the limits specified in the applicable rule parts as necessary for meeting occupied bandwidth or emission limitations.

4.1.2 Test Method

Setup the DE via the BTS controller to enable the MFRM2 to transmit at the rated power for each of the carrier configurations one, two and three carrier in each of the Baseband modulation formats IS-95 and IS-856 (16 QAM). Measurements will be made on channels at the bottom and top of the operator bands with the MFRM-2 operating with -48Vdc. The RF output power will be measured using the power meter.

4.1.3 Test Setup

The set-up required for the MFRM2 RF output power test is illustrated in Figure 1. RF output power measurements will be referenced to the antenna port of the DPM

4.1.4 DOM

The conducted spurious emissions of the MFRM-2, with IS-856 (1xEV DO) waveforms will be tested at maximum power. Transmitters operating with IS856 are tested at 47.3 dBm.

4.1.5 Noise Floor

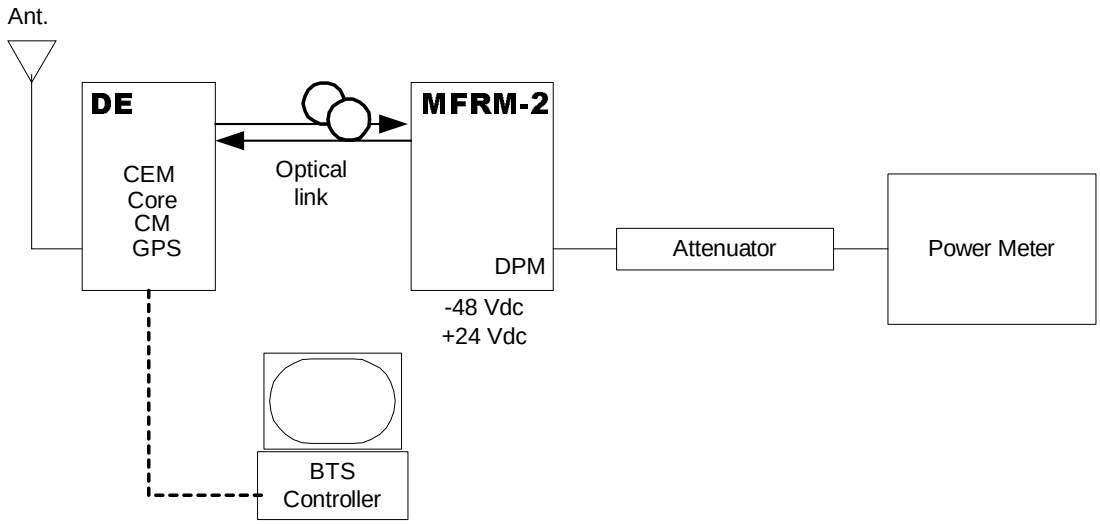


Figure 1 : Test Setup for RF Power Output Measurement

4.1.6 RF Output Power Test Results

Table 4 : RF Output Power 800 MHz MFRM2 1-Carrier IS95

Channel Number (Band)	Frequency (MHz)	Measured RF Output Power (dBm)	Typical Maximum Rated Power (dBm)
1015 (A'')	869.76	47.44	47.3
308 (A)	879.24	47.52	47.3
358 (B)	880.74	47.47	47.3
642 (B)	889.26	47.54	47.3
692 (A')	890.76	47.49	47.3
742 (B')	892.26	47.54	47.3
775 (B')	893.25	47.56	47.3

Table 5 : RF Output Power 800 MHz MFRM2 2-Carrier IS95

Channel Number (Band)	Frequency (MHz)	Measured RF Output Power (dBm)	Typical Maximum Rated Power (dBm)
358, 399 (B)	880.74, 881.97	47.46	47.3
601, 642 (B)	888.03, 889.26	47.50	47.3

Table 6 : RF Output Power of 800 MHz MFRM2 3-Carrier IS95

Channel Number (Band)	Frequencies (MHz)	Measured RF Output Power (dBm)	Typical Maximum Rated Power (dBm)
1015, 33, 74 (A'', A)	869.76, 870.99, 872.22	47.37	47.3
226, 267, 308 (A)	876.78, 878.01, 879.24	47.52	47.3
358, 399, 440 (B)	880.74, 881.97, 883.20	47.45	47.3

Table 6 : RF Output Power of 800 MHz MFRM2 3-Carrier IS95

Channel Number (Band)	Frequencies (MHz)	Measured RF Output Power (dBm)	Typical Maximum Rated Power (dBm)
560, 601, 642 (B)	886.8, 888.03, 889.26	47.43	47.3

Table 7 : RF Output Power 800 MHz MFRM2 1-Carrier IS856

Channel Number (Band)	Frequency (MHz)	Measured RF Output Power (dBm) 16-QAM	Typical Maximum Rated Power (dBm)
358 (B)	880.74	47.12	47.3
642 (B)	889.26	47.18	47.3

Table 8 : RF Output Power of 800 MHz MFRM2 3-Carrier IS856

Channel Number (Band)	Frequencies (MHz)	Measured RF Output Power (dBm) 16-QAM	Typical Maximum Rated Power (dBm)
358, 399, 440 (B)	880.74, 881.97, 883.2	47.31	47.3
560, 601, 642 (B)	886.8, 888.03, 889.26	47.29	47.3

Table 9: RF Output Power 800 MHz MFRM2 Combination 3-Carrier: IS856 16-QAM and IS95

Channel Number (Band)	Frequencies (MHz)	Measured RF Output Power (dBm) 16-QAM and IS95	Typical Maximum Rated Power (dBm)
358, 399, 440* (B)	880.74, 881.97, 883.2	47.35	47.3
560, 601, 642* (B)	886.8, 888.03, 889.26	47.35	47.3

Note: Fist 2 channels in the 3X mode is configured with 16-QAM modulation. Third channel (*) indicates carrier is configured with IS-95.

4.2 Certification Requirements

4.2.1 Application for certification

FCC Part 2.1033 Application for certification.

(c) Applications for equipment other than that operating under parts 15 and 18 of the rules shall be accompanied by a technical report containing the following information:

(8) The dc voltages applied to and dc currents into the several elements of the final radio frequency amplifying device for normal operation over the power range.

4.2.2 Test Method

This information required for this section is available from:

Title: 800 MHz Cost Reduced Power Amplifier for MFRM-2 Verification Notice
Dataset Name: VNGY37EB
Document Status: Approved
Stream: 01 Issue: 01
Issue Date: November 2004
Document Prime: Scott Jacobsen

4.2.3 Test Setup

See above document as well as XSGY37EB and VPGY37EB.

4.2.4 Test Results

Table 10 : Average Current Values @ Pout = 48.45 dBm

Average Current Values @ Pout = 48.45 dBm				
	22.5 °C			
	Q4	Q5	Q6	Q7
Mean	3.0	3.0	3.0	3.0

4.3 Occupied Bandwidth

4.3.1 Occupied Bandwidth Requirements

FCC Part 2.1049

The OBW, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured under the following conditions as applicable:

(g) Transmitter in which the modulating baseband comprises not more than three independent channels - when modulated by the full complement of signals for which the transmitter is rated. The level of modulation for each channel should be set to that prescribed in rule parts applicable to the services for which the transmitter is intended. If specific modulation levels are not set forth in the rules, the tests should provide the manufacturer's maximum rated condition.

(h) Transmitters employing digital modulation techniques - when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated. The signal shall be applied through any filter networks, pseudo-random generators or other devices required in normal service. Additionally, the occupied bandwidth shall be shown for operation with any devices used for modifying the spectrum when such devices are optional at discretion of the user.

4.3.2 Test Method

Setup the DE via the BTS controller to enable the MFRM2 to transmit at maximum rated power for each of the carrier configurations one, two and three carrier in each of the Baseband modulation formats IS-95 and IS-856 (16 QAM). Measurements will be made on channels at the bottom and top of each of the sub bands.

The Occupied Bandwidth is measured using the 99% channel power feature of the spectrum analyzer.

4.3.3 Test Setup

The set-up required for the MFRM2 Occupied bandwidth test is illustrated in Figure 2.

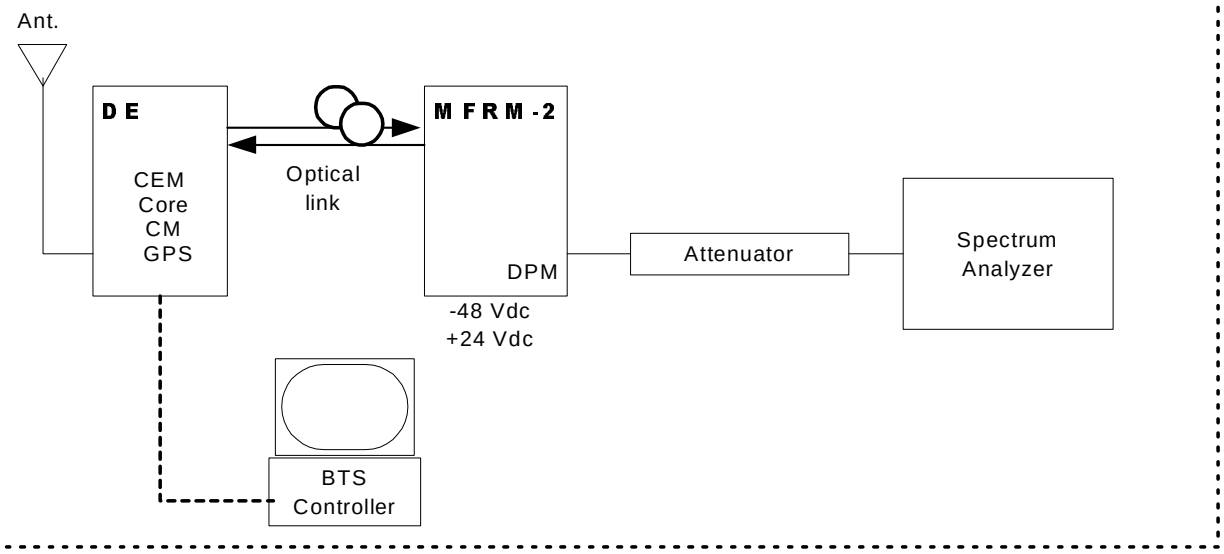


Figure 2 : Test Setup for Occupied Bandwidth Measurement

4.3.4 Test Result

Table 11 : Measured Occupied Bandwidth 800 MHz MFRM2 1-Carrier IS95

Channel Number (Band)	Frequency (MHz)	Measured Occupied Bandwidth (MHz) (1-Carrier)
1015 (A'')	869.76	1.257
308 (A)	879.24	1.257
358 (B)	880.74	1.257
642 (B)	889.26	1.263
692 (A')	890.76	1.263
742 (B')	892.26	1.269
775 (B')	893.25	1.269

Table 12 : Measured Occupied Bandwidth800 MHz MFRM2 2-Carrier IS95

Channel Number (Band)	Frequency (MHz)	Measured Occupied Bandwidth (MHz)
358, 399 (B)	880.74, 881.97	2.489
601, 642 (B)	888.03, 889.26	2.489

Table 13 : Measured Occupied Bandwidth of 800 MHz MFRM2 3-Carrier IS95

Channel Number (Band)	Frequencies (MHz)	Measured Occupied Bandwidth (kHz)
1015, 33, 74 (A'', A)	869.76, 870.99, 872.22	3.703
226, 267, 308 (A)	876.78, 878.01, 879.24	3.703
358, 399, 440 (B)	880.74, 881.97, 883.20	3.703
560, 601, 642 (B)	886.8, 888.03, 889.26	3.714

Table 14 : Measured Occupied Bandwidth 800 MHz MFRM2 1-Carrier IS856 16-QAM

Channel Number (Band)	Frequency (MHz)	Measured Occupied Bandwidth (kHz)
358 (B)	880.74	1.257
642 (B)	889.26	1.257

Table 15 : Measured Occupied Bandwidth 800 MHz MFRM2 3-Carrier IS856 16-QAM

Channel Number (Band)	Frequencies (MHz)	Measured Occupied Bandwidth (kHz)
358, 399, 440 (B)	880.74, 881.97, 883.2	3.714
560, 601, 642 (B)	886.8, 888.03, 889.26	3.714

Table 16: Measured Occupied Bandwidth 800 MHz MFRM2 Combination 3-Carrier IS856 16-QAM IS95

Channel Number (Band)	Frequencies (MHz)	Measured Occupied Bandwidth (kHz)
358, 399, 440* (B)	880.74, 881.97, 883.2	3.703
560, 601, 642* (B)	886.8, 888.03, 889.26	3.714

Note: Fist 2 channels in the 3X mode is configured with 16-QAM modulation. Third channel (*) indicates carrier is configured with IS-95.

Figure 3 : Occupied Bandwidth, Single Carrier, Channel 1015 IS-95

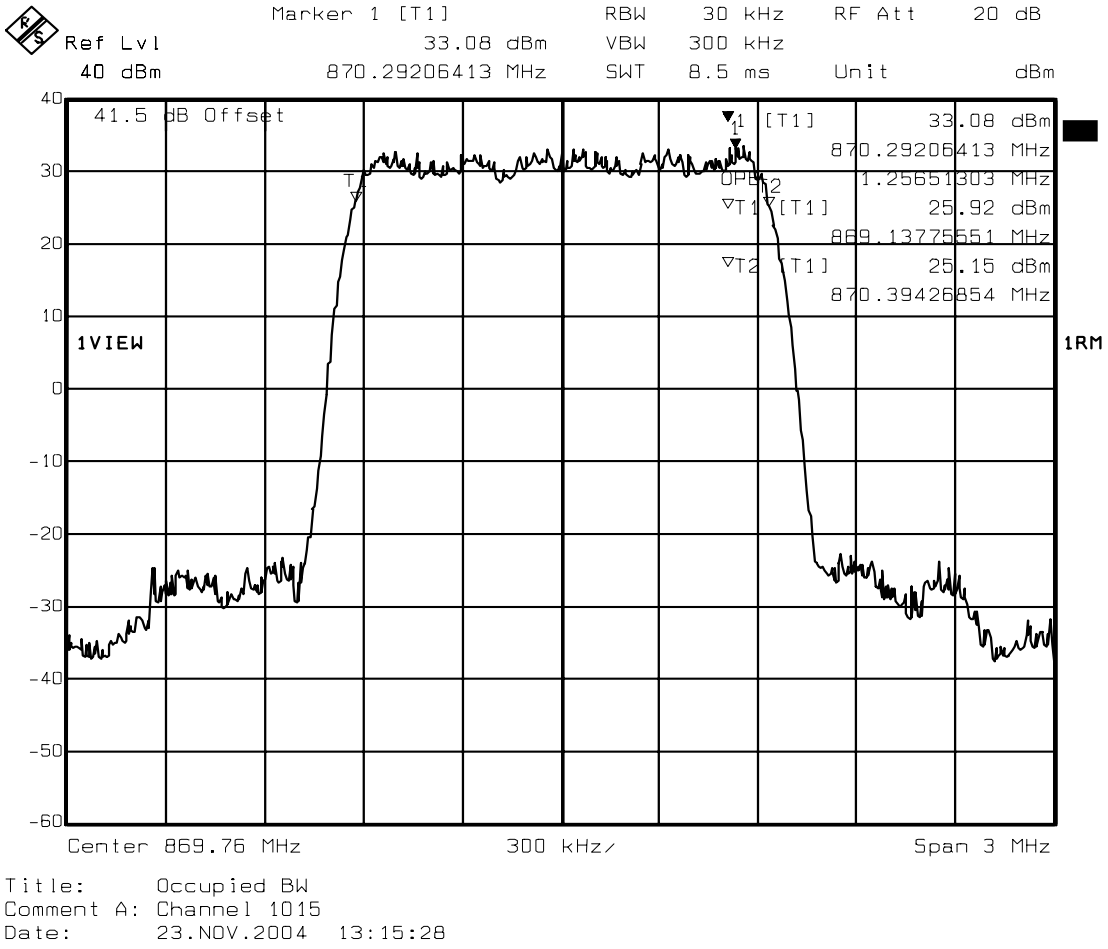


Figure 4 : Occupied Bandwidth, 2X, Channel 358, 399, IS-95

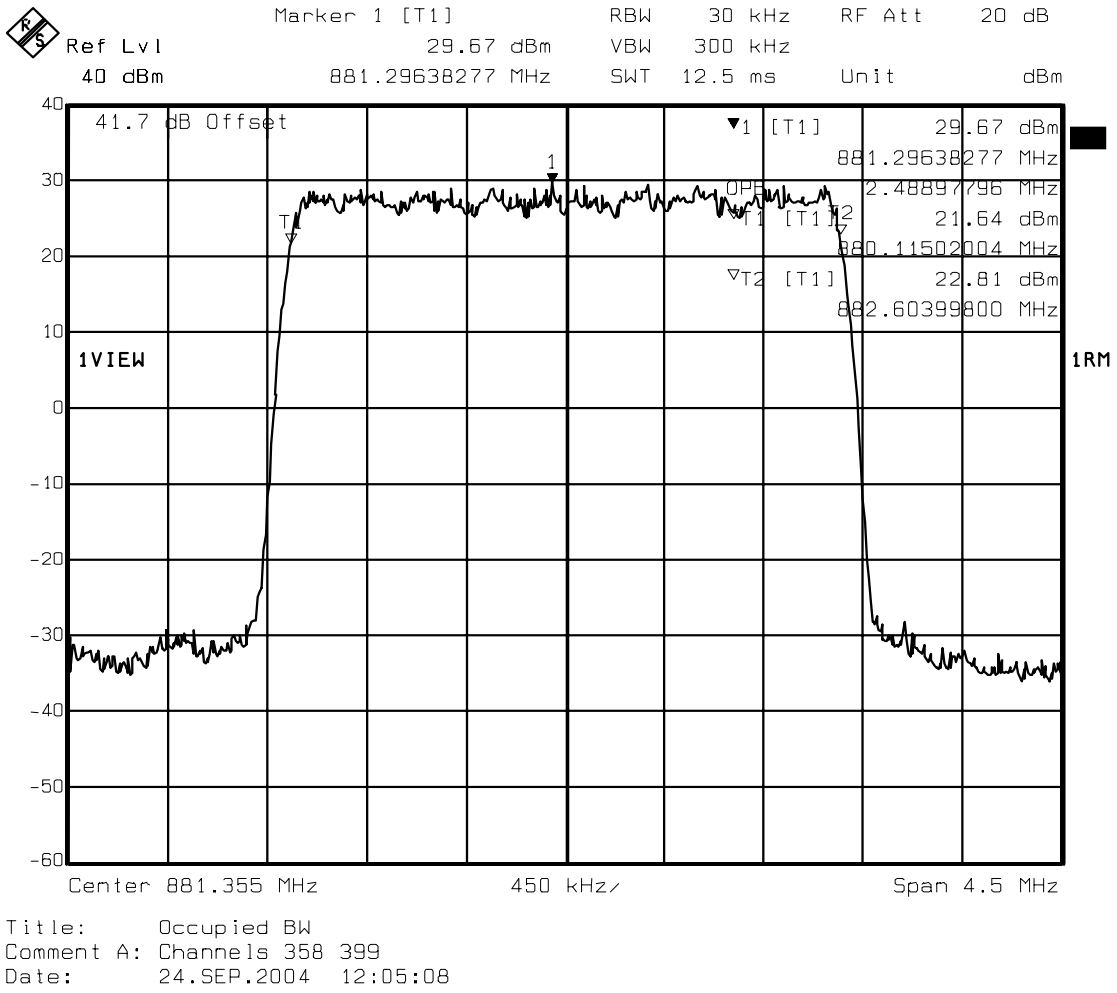


Figure 5 : Occupied Bandwidth, 3X, Channel 1015, 33, 74, IS-95

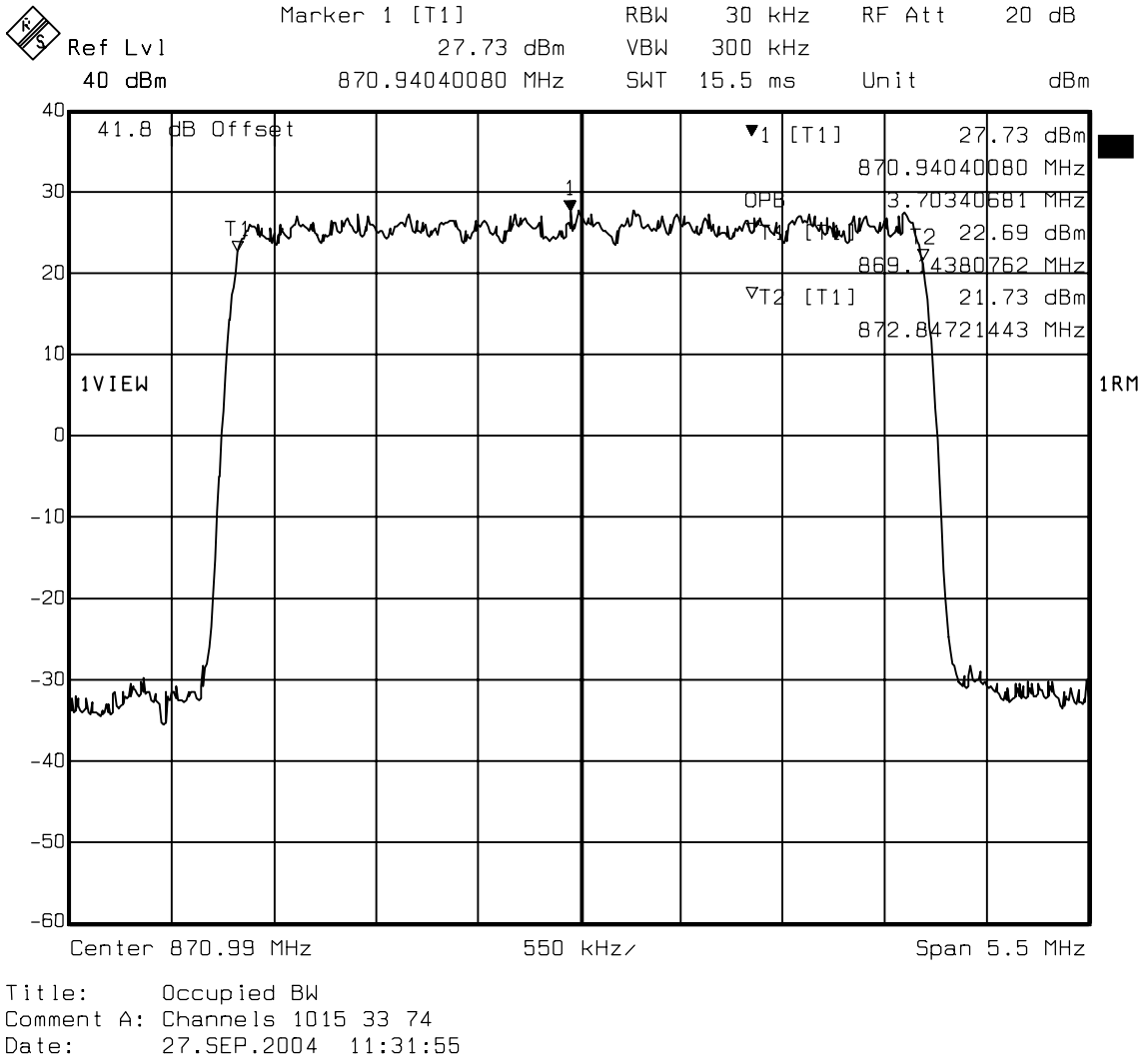


Figure 6 : Occupied Bandwidth, 1X, Channel 358, IS-856

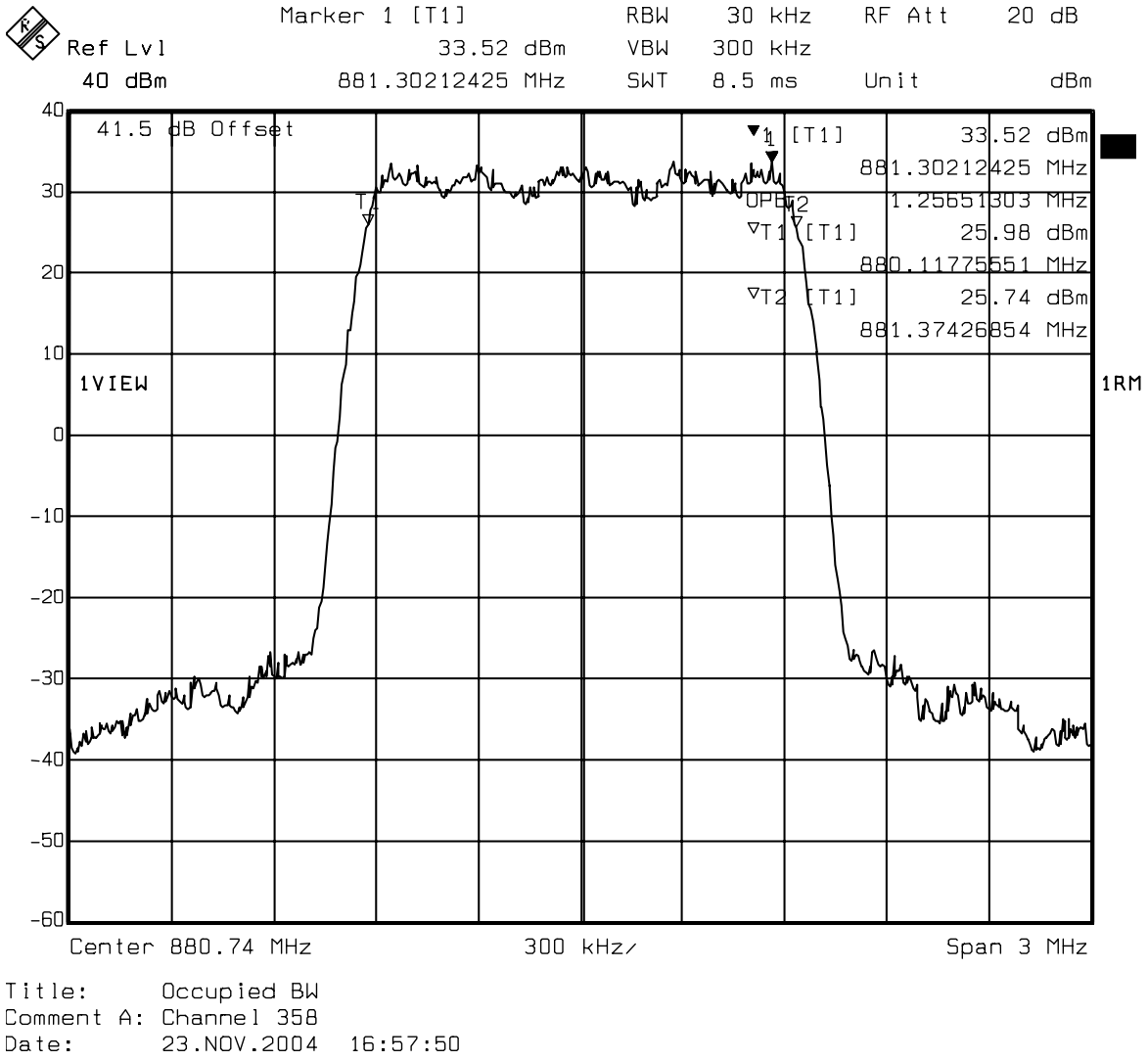


Figure 7 : Occupied Bandwidth, 3X, Channel 358, 399, 440, IS-856

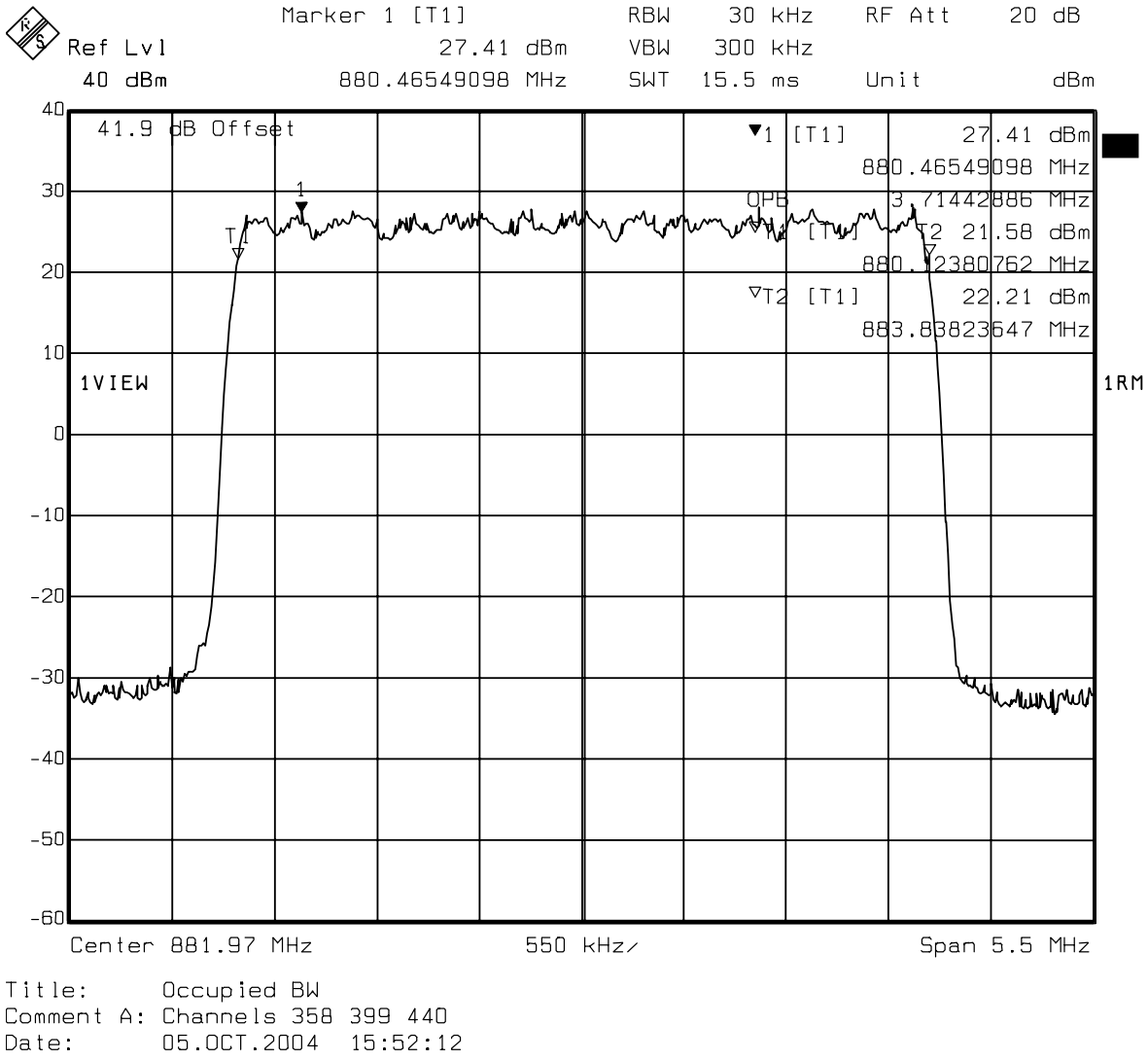
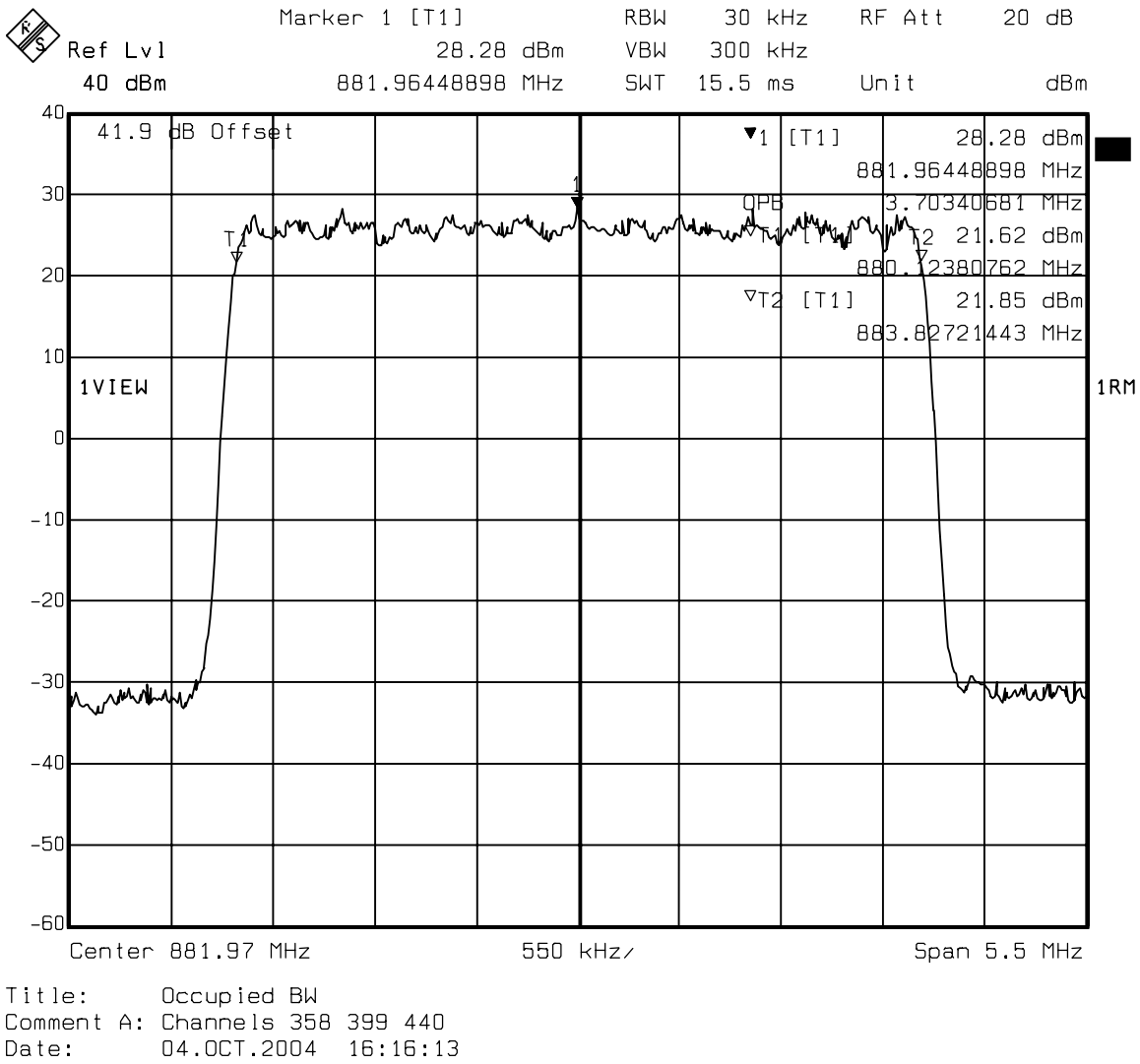


Figure 8 : Occupied Bandwidth, 3X, Channels 358, 399 (IS-856), & 440 (IS-95)



4.4 Spurious Emissions at Antenna Terminals

4.4.1 Spurious Emissions Requirements

FCC Part 2.1051

The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

FCC Part 2.1057 - Frequency Spectrum to be investigated

The spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency or to the highest frequency practicable in the present state of the art of measuring techniques, whichever is lower. Particular attention should be paid to harmonics and subharmonics of the carrier frequency. Radiation at the frequencies of multiplier stages should be checked. The amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported.

FCC Part 22.917 Limit

Out of band emissions. 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.

Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

Alternative out of band emission limit. Licensees in this service may establish an alternative out of band emission limit to be used at specified band edge(s) in specified geographical areas, in lieu of that set forth in this section, pursuant to a private contractual arrangement of all affected licensees and applicants. In this event, each party to such contract shall maintain a copy of the contract in their station files and disclose it to prospective assignees or transferees and, upon request, to the FCC.

Interference caused by out of band emissions. If any emission from a transmitter operating in this service results in interference to users of another radio service, the FCC may require a greater attenuation of that emission than specified in this section

4.4.2 Test Method

Configure the BTS via the BTS controller to enable the MFRM2 to transmit at maximum rated power for each of the carrier configurations one, two and three carrier in each of the Baseband modulation formats IS-95, and IS-856 (16 QAM). Measurements will be made on channels at the bottom and top of the operator bands. The following spectrum analyzer settings are to be used for the measurement of the antenna port (DPM) spurious emissions:

4.4.2.1 Noise Floor

Table 17 lists the noise floor of the measurement system with no signal present.

Table 17: Spectrum Analyzer Noise Floor - RBW=100 kHz

Start MHz	Stop MHz	Level (dBm)
0.01	400	-39.6
400	1000	-37.5
1000	2000	-33.6
2000	3000	-32.8
3000	4000	-32.9
4000	5000	-33.2
5000	6000	-37.2
6000	7000	-34.2
7000	8000	-39.9
8000	9000	-40.2
9000	10000	-39.3

4.4.2.2 Adjacent 1MHz to indicated cellular band (Upper and Lower)

Table 18: Adjacent 1MHZ Spectrum Analyze Settings

Setting	1 Carrier	2 Carrier	3 Carrier
Resolution Bandwidth[a]:	12.5 kHz	25 kHz	37.5 kHz
Video Bandwidth (3x RBW)[b]	(3x RBW)	(3x RBW)	(3x RBW)
Video Average	10 Averages	10 Averages	10 Averages
Span	Set accordingly	Set accordingly	Set accordingly

Table 18: Adjacent 1MHZ Spectrum Analyze Settings

Setting	1 Carrier	2 Carrier	3 Carrier
Detector	RMS	RMS	RMS
Attenuation[c]	30 dB	30 dB	30 dB
Ref. Level	35 dBm	35 dBm	35 dBm
Ref. Level Offset	31-34 dB	31-34 dB	31-34 dB

a. If the spectrum analyze cannot be set to the specified RBW the next highest RBW should be used and all measurements corrected to the specified RBW
b. If the spectrum analyze cannot be set to the specified Video Bandwidth the next highest Video Bandwidth should be used.
c. The lowest value of attenuator should be used to improve measurement accuracy, without overdriving the Spectrum Analyzer.

All spectrum analyzer settings were coupled as per the manufacturers recommendations to improve measurement time, without compromising data.

4.4.2.3 All other Spurious Emissions up to 10 GHz

Table 19 : All other Emission Spectrum Analyzer Settings

Setting	1 Carrier	2 Carrier	3 Carrier
Resolution Bandwidth	100 kHz	100 kHz	100 kHz
Video Bandwidth (3x RBW)	300 kHz	300 kHz	300 kHz
Video Average	10 Averages	10 Averages	10 Averages
Span	Set accordingly	Set accordingly	Set accordingly
Detector	RMS	RMS	RMS
Attenuation[a]	30 dB	30 dB	30 dB
Ref. Level	35 dBm	35 dBm	35 dBm
Ref. Level Offset	31-34 dB	31-34 dB	31-34 dB

a. The lowest value of attenuator should be used to improve measurement accuracy, without overdriving the Spectrum Analyzer.

The emissions will be investigated up to 10 GHz (the 10^{th} harmonic of the fundamental emission) for all carrier configurations (1, 2, 3) as per FCC Part 22.

4.4.3 Test Requirements

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Table 20: Spurious Emissions Requirements

Frequency Offset	1 Carrier	2 Carrier	3 Carrier
+/- 740 kHz	< -13 dBm/12.5KHz	< -13 dBm/25 KHz	< -13 dBm/37.5 KHz

4.4.4 Test Setup

The set-up required for the MFRM2 Antenna Port (DPM) Spurious Emission test is illustrated in Figure 9.

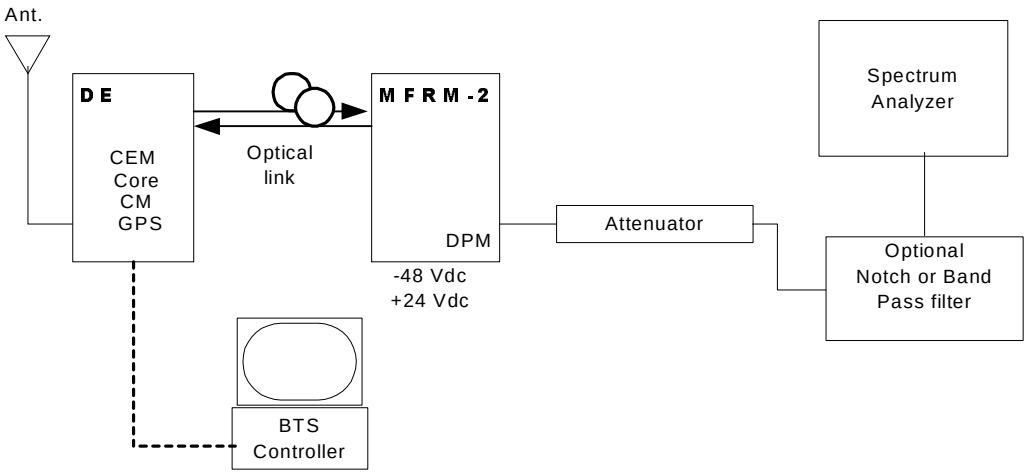


Figure 9 : Test Setup for Spurious Emissions Measurement

4.4.5 Test Results IS95

Table 21 : Spurious Emissions at the 800 MHz MFRM2 Ant. Port one Carrier band A and A" IS95

Frequency (MHz)	Spurious Emissions Level (dBm)	Margin to FCC Limit of -13 dBm (dB)
	1Carrier IS-95	1Carrier
869 MHz (Lower edge of band A") Ch 1015 (RBW=12.5 kHz)	-24.7	11.7
880 MHz (Upper edge of band A) Ch 308 (RBW=12.5 kHz)	-26.3	13.3
9 kHz to (Lower Edge of band A" - 1 MHz) (RBW=100KHz)	-32.0	19.0
(Upper Edge of A band + 1 MHz) to 5 GHz (RBW=100kHz)	-30.8	17.8
5 GHz to 10 GHz (RBW=100 kHz)	-34.2	21.2

Table 22: Spurious Emissions at the 800 MHz MFRM2 Ant. Port two Carrier band B IS95

Frequency (MHz)	Spurious Emissions Level (dBm)	Margin to FCC Limit of -13 dBm (dB)
	2Carrier IS-95	2Carrier
880 MHz (Lower edge of band B) Ch 358, 399 (RBW=25kHz)	-22.4	9.4
890 MHz (upper edge of band B) Ch 601, 642 (RBW=25kHz)	-22.9	9.9
9 kHz to (Lower Edge of band A" - 1 MHz) (RBW=100KHz)	-28.7	15.7
(Upper Edge of A band + 1 MHz) to 5 GHz (RBW=100kHz)	-30.1	17.1
5 GHz to 10 GHz (RBW=100 kHz)	-34.1	21.1

Table 23 : Spurious Emissions at the 800 MHz MFRM2 Ant. Port Three Carrier band A and A'' IS-95

Frequency (MHz)	Spurious Emissions Level (dBm)	Margin to FCC Limit of -13 dBm (dB)
	3Carrier IS-95	3Carrier
869 MHz (Lower edge of band A'') Ch 1015, 33, 74 (RBW=37.5 kHz)	-24.7	11.7
880 MHz (Upper edge of band A) Ch 226, 267, 308 (RBW=37.5 kHz)	-25.5	12.5
9 kHz to (Lower Edge of band A" - 1 MHz) (RBW=100KHz)	-25.5	12.5
(Upper Edge of A band + 1 MHz) to 5 GHz (RBW=100kHz)	-26.2	13.2
5 GHz to 10 GHz (RBW=100 kHz)	-34.1	21.1

Table 24 : Spurious Emissions at the 800 MHz MFRM2 Ant. Port One Carrier band B IS-95

Frequency (MHz)	Spurious Emissions Level (dBm)	Margin to FCC Limit of -13 dBm (dB)
	1Carrier IS-95	1Carrier
880 MHz (Lower edge of band B) Ch 358 (RBW=12.5kHz)	-23.9	10.9
890 MHz (Upper edge of band B) Ch 642 (RBW=12.5kHz)	-24.0	11.0
9 kHz to (Lower Edge of band B - 1 MHz) (RBW=100KHz)	-32.2	19.2
(Upper Edge of B band + 1 MHz) to 5 GHz (RBW=100kHz)	-31.5	18.5
5 GHz to 10 GHz (RBW=100 kHz)	-34.1	21.1

Table 25 : Spurious Emissions at the 800 MHz MFRM2 Ant. Port Three Carrier band B IS-95

Frequency (MHz)	Spurious Emissions Level (dBm)	Margin to FCC Limit of -13 dBm (dB)
	3Carrier IS-95	3Carrier
880 MHz (Lower edge of band B) Ch 358, 399, 440 (RBW=37.5 kHz)	-22.8	-9.8
890 MHz (Upper edge of band B) Ch 560, 601, 642 (RBW=37.5 kHz)	-23.6	10.6
9 kHz to (Lower Edge of band B - 1 MHz) (RBW=100KHz)	-25.3	12.3
(Upper Edge of B band + 1 MHz) to 5 GHz (RBW=100kHz)	-26.6	13.6
5 GHz to 10 GHz (RBW=100 kHz)	-34.2	21.2

Table 26 : Spurious Emissions at the 800 MHz MFRM2 Ant. Port One Carrier band A' IS-95

Frequency (MHz)	Spurious Emissions Level (dBm)	Margin to FCC Limit of -13 dBm (dB)
	1Carrier IS-95	1Carrier
890 Mhz (Lower edge of band A') Ch 692 (RBW=12.5 kHz)	-24.8	11.8
891.5 MHz (upper edge of band A') Ch 692 (RBW=12.5kHz)	-23.7	10.7
9 kHz to (Lower Edge of band A' - 1 MHz) (RBW=100KHz)	-32.5	19.5
(Upper Edge of A' band + 1 MHz) to 5 GHz (RBW=100kHz)	-31.5	18.5
5 GHz to 10 GHz (RBW=100 kHz)	-34.1	21.1

Table 27 : Spurious Emissions at the 800 MHz MFRM2 Ant. Port One Carrier band B' IS95

Frequency (MHz)	Spurious Emissions Level (dBm)	Margin to FCC Limit of -13 dBm (dB)
	1Carrier IS-95	1Carrier
894 MHz (upper edge of band B') Ch 775 (RBW=12.5kHz)	-25.7	12.7
891.5 MHz (lower edge of band B') Ch 742 (RBW=12.5kHz)	-25.6	12.6
9 kHz to (Lower Edge of band B' - 1 MHz) (RBW=100KHz)	-32.8	19.8
(Upper Edge of B' band + 1 MHz) to 5 GHz (RBW=100kHz)	-25.1	12.1
5 GHz to 10 GHz (RBW=100 kHz)	-34.1	21.1

4.4.6 Test Results IS856

Table 28 : Spurious Emissions at the 800 MHz MFRM2 Ant. Port One Carrier Band B IS856 (16QAM)

Frequency (MHz)	Spurious Emissions Level (dBm)	Margin to FCC Limit of -13 dBm (dB)
	1Carrier	1Carrier
880 (Lower edge of band B) Ch 358 (RBW=12.5kHz)	-24.8	11.8
890 (Upper edge of band B) Ch 642 (RBW=12.5kHz)	-24.5	11.5
9 kHz to (Lower Edge of band B - 1 MHz) (RBW=100KHz)	-33.4	20.4
(Upper Edge of B band + 1 MHz) to 5 GHz (RBW=100kHz)	-32.2	19.2
5 GHz to 10 GHz (RBW=100 kHz)	-34.2	21.2

Table 29: Spurious Emissions at the 800 MHz MFRM2 Ant. Port Three Carrier Band B IS856 (16QAM)

Frequency (MHz)	Spurious Emissions Level (dBm)	Margin to FCC Limit of -13 dBm (dB)
	3Carrier 16-QAM	3Carrier
880 (Lower edge of band B) Ch 358, 399, 440 (RBW=37.5 kHz)	-23.5	10.5
890 (Upper edge of band B) Ch 560, 601, 642 (RBW=37.5 kHz)	-23.8	10.8
9 kHz to (Lower Edge of band B - 1 MHz) (RBW=100KHz)	-25.6	12.6
(Upper Edge of B band + 1 MHz) to 5 GHz (RBW=100kHz)	-27.6	14.6
5 GHz to 10 GHz (RBW=100 kHz)	-34.2	21.2

Table 30: Spurious Emissions at the 800 MHz MFRM2 Ant. Port Three Carrier B ' Combined IS856 (Ch 358 and 399) and IS95 (Ch 440), and Ch 560, 601 (IS-856), 642 (IS-95)

Frequency (MHz)	Spurious Emissions Level (dBm)	Margin to FCC Limit of -13 dBm (dB)
	3Carrier 16-QAM	3Carrier
880 (Lower edge of band B) Ch 358, 399, 440 (RBW=37.5 kHz)	-22.4	9.4
890 (Upper edge of band B) Ch 560, 601, 642 (RBW=37.5 kHz	-23.8	10.8
9 kHz to (Lower Edge of band B - 1 MHz) (RBW=100KHz)	-26.4	13.4
(Upper Edge of B band + 1 MHz) to 5 GHz (RBW=100kHz)	-27.0	14.0
5 GHz to 10 GHz (RBW=100 kHz)	-34.2	21.2

4.5 Transmitter Tests (CDMA Mode)

Unwanted Emissions

Unwanted emissions are emissions on a frequency or frequencies outside the necessary bandwidth which result from the modulation process, from spurious emissions and harmonics.

IC RSS-129

(1) Suppression inside cellular band: For all base station transmit frequencies allocated to the same operator system, the total spurious emissions in any 30 kHz band shall be attenuated below the mean output power level in accordance with the following schedule:

(a) for all offset frequencies greater than 750 kHz from the CDMA centre frequency, at least 45 dB. 800 MHz Dual-Mode CDMA Cellular Telephones RSS-129.

(b) for all offset frequencies greater than 1.98 MHz from the CDMA centre frequency, at least 60 dB.

(c) for all offset frequencies not allocated to the same operator system, at least 60 dB or -13 dBm, whichever is less stringent.

(2) In any 30 kHz outside the cellular band, the attenuation shall be at least 43+10 Log10 (mean output power in watts) or 70, dB, whichever is the less stringent.

4.5.1 Test Method

Configure the BTS via the BTS controller to enable the MFRM2 to transmit at maximum rated power for each of the carrier configurations one, two and three carrier in each of the Baseband modulation formats IS-95, and IS-856 (16 QAM). Measurements will be made on channels at the bottom and top of the duplexer band. The following spectrum analyzer settings are to be used for the measurement of the antenna port (DPM) spurious emissions:

4.5.1.1 Adjacent 1MHz to indicated cellular band (Upper and Lower)

Table 31: Adjacent 750 KHz and 1.98 MHZ Spectrum Analyze Settings

Setting	1 Carrier	2 Carrier	3 Carrier
Resolution Bandwidth[a]:	30 kHz	30 kHz	30 kHz
Video Bandwidth (3x RBW)	100 kHz	100 kHz	100 kHz
Video Average	10 Averages	10 Averages	10 Averages
Span	Set accordingly	Set accordingly	Set accordingly
Detector	RMS	RMS	RMS
Attenuation	30 dB	30 dB	30 dB
Ref. Level	35 dBm	35 dBm	35 dBm
Ref. Level Offset	31-34 dB	31-34 dB	31-34 dB

a. If the spectrum analyze can not be set to the specified RBW the next highest RBW should be used and all measurements corrected to the specified RBW

All spectrum analyzer settings were coupled as per the manufacturers recommendations to improve measurement time, without compromising data.

4.5.2 Test Setup

The set-up required for the MFRM2 Antenna Port (DPM) Spurious Emission test is illustrated in Figure 9. An optional filter may be used to improve the measurement set-up. If a filter is used it must be clearly stated in the test results, and the frequency response of the filter must also be recorded and presented in the results data.

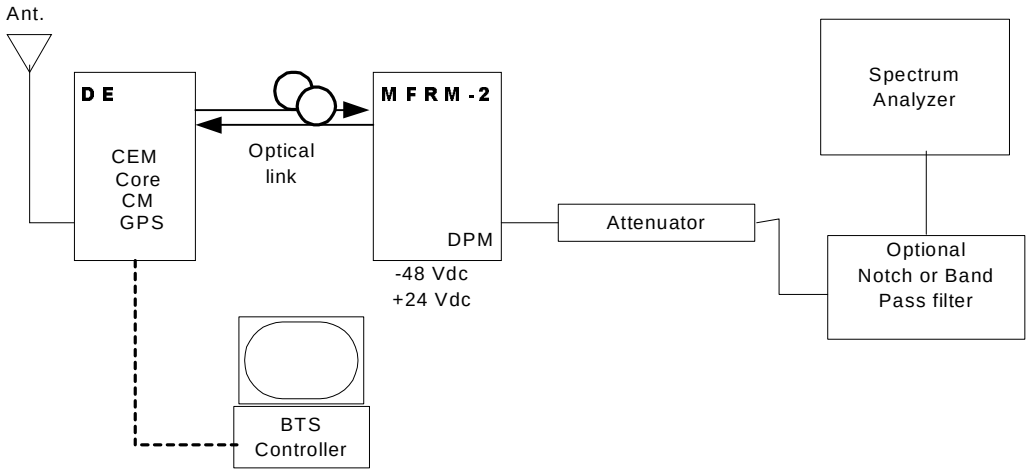


Figure 10 : Test Setup for Spurious Emissions Measurement

4.5.3 Test Results

Table 32 : Industry Canada Suppression inside cellular band 800 MHz MFRM2 Antenna Port IS95, 1 Carrier band A"

Frequency (MHz)	Spurious Emissions Level (dBm)	Limit for 45 dBc/ 30KHz (dBm)	Margin to IC Limit of 45 dBc/ 30KHz (dB)
	1Carrier IS-95	1Carrier	
Ch1015 750KHz offset at lower band edge	-21.8	2.3	24.1
Ch1015 750KHz offset at upper band edge	-20.5	2.3	22.8
		Limit for 60 dBc/ 30KHz (dBm)	**Margin to IC Limit of 60 dBc/ 30KHz (dB)**
Ch1015 1.98MHz offset at lower band edge	-39.8	-12.7	27.1
Ch1015 1.98MHz offset at upper band edge	-40.1	-12.7	27.4

Table 33 : Industry Canada Suppression inside cellular band 800 MHz MFRM2 Antenna Port IS95, 3 Carrier band A" and A

Frequency (MHz)	**Spurious Emissions Level (dBm)**	**Limit for 45 dBc/ 30KHz (dB)**	**Margin to IC Limit of 45 dBc/ 30KHz (dB)**
	3Carrier IS-95	3Carrier	3Carrier
Ch1015, 33, 74 750KHz offset at lower band edge	-24.4	2.3	26.7
Ch1015, 33, 74 750KHz offset at upper band edge	-25.8	2.3	28.1
		Limit for 60 dBc/ 30KHz (dB)	**Margin to IC Limit of 60 dBc/ 30KHz (dB)**
Ch1015, 33, 74 1.98MHz offset at lower band edge	-31.1	-12.7	18.4
Ch1015, 33, 74 1.98MHz offset at upper band edge	-29.4	-12.7	16.7

Table 34 : Industry Canada Suppression inside cellular band 800 MHz MFRM2 Antenna Port IS856, 1 Carrier band A'

Frequency (MHz)	**Spurious Emissions Level (dBm)**	**Limit for 45 dBc/ 30KHz (dBm)**	**Margin to IC Limit of 45 dBc/ 30KHz (dB)**
	1Carrier **IS856** 16-QAM	1Carrier	1Carrier
Ch 358 750KHz offset at lower band edge	-18.9	2.3	21.2
Ch 358 750KHz offset at upper band edge	-18.3	2.3	20.6
		Limit for 60 dBc/ 30KHz (dBm)	**Margin to IC Limit of 60 dBc/ 30KHz (dB)**
Ch 358 1.98MHz offset at lower band edge	-41.0	-12.7	28.3
Ch 358 1.98MHz offset at upper band edge	-40.9	-12.7	28.2

Table 35 : Industry Canada Suppression inside cellular band 800 MHz MFRM2 Antenna Port IS95, 1 Carrier band B'

Frequency (MHz)	**Spurious Emissions Level (dBm)**	**Limit for 45 dBc/ 30KHz (dBm)**	**Margin to IC Limit of 45 dBc/ 30KHz (dB)**
	1Carrier IS-95	1Carrier	1Carrier
Ch 742 750KHz offset at lower band edge	-20.8	2.3	23.1
Ch 742 750KHz offset at upper band edge	-21.4	2.3	23.7
		Limit for 60 dBc/ 30KHz (dB)	**Margin to IC Limit of 60 dBc/ 30KHz (dB)**
Ch 742 1.98MHz offset at lower band edge	-40.5	-12.7	27.8
Ch 742 1.98MHz offset at upper band edge	-40.3	-12.7	27.6

Table 36 : Industry Canada Suppression inside cellular band 800 MHz MFRM2 Antenna Port Combination IS856(358,399) and IS95 (440) 3 Carrier band A and A"

Frequency (MHz)	**Spurious Emissions Level (dBm)**	**Limit for 45 dBc/ 30KHz (dBm)**	**Margin to IC Limit of 45 dBc/ 30KHz (dB)**
	1Carrier IS-95	1Carrier	1Carrier
Ch 358, 399, 440 750KHz offset at lower band edge	-21.6	2.3	23.9
Ch 358, 399, 440 750KHz offset at upper band edge	-25.3	2.3	27.6
		Limit for 60 dBc/ 30KHz (dB)	**Margin to IC Limit of 60 dBc/ 30KHz (dB)**
Ch 1015, 33, 74 1.98MHz offset at lower band edge	-32.3	-12.7	19.6
Ch 1015, 33, 74 1.98MHz offset at upper band edge	-29.8	-12.7	17.1

4.6 Frequency Stability

4.6.1 Frequency Stability Requirements

FCC Part 2.1055

(a) The frequency stability shall be measured with variation of ambient temperature as follows:

(1) From -30 to +50 centigrade for all equipment except that specified in subparagraphs (2) and (3) of this paragraph.

(b) Frequency measurements shall be made at the extremes of the specified temperature range and at intervals of not more than 10 centigrade through the range. A period of time sufficient to stabilize all of the components of the oscillator circuit at each temperature level shall be allowed prior to frequency measurement. The short term transient effects on the frequency of the transmitter due to keying (except for broadcast transmitters) and any heating element cycling normally occurring at each ambient temperature level also shall be shown. Only the portion or portions of the transmitter containing the frequency determining and stabilizing circuitry need be subjected to the temperature variation test.

(d) The frequency stability shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.
(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.
(3) The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided. Effects on frequency of transmitter keying (except for broadcast transmitters) and any heating element cycling at the nominal supply voltage and at each extreme also shall be shown.

(e) When deemed necessary, the Commission may require tests of frequency stability under conditions in addition to those specifically set out in paragraphs (a), (b), (c) and (d) of this section. (For example, measurements showing the effect of proximity to large metal objects, or of various types of antennas, may be required for portable equipment.)

FCC Part 22.355 Frequency Tolerance

The carrier frequency of each transmitter in the 821-896 MHz Frequency range, must be maintained within 1.5ppm tolerance, according to table C-1 of this section stability

4.6.2 Test Procedure

The test equipment was configured as shown in figure 11.

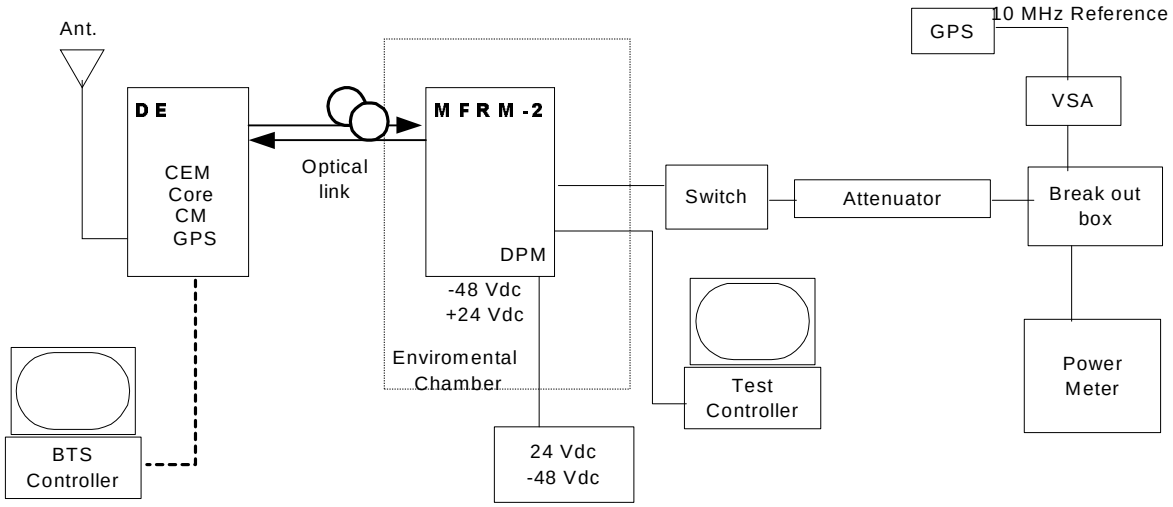


Figure 11 : Test configuration for Frequency Stability

4.6.3 Frequency Results

Table 37 : Test results for Frequency Stability versus Power supply Voltage

Voltage (Vdc)	Maximum Carrier Frequency Deviation (PPM)	Maximum Carrier Frequency Deviation (Hz)
40	0.0025	-2.2
48 nominal	0.0034	-3
56	0.0053	4.6
20	0.0029	2.5
24 nominal	0.0013	1.2

Table 37 : Test results for Frequency Stability versus Power supply Voltage

Voltage (Vdc)	Maximum Carrier Frequency Deviation (PPM)	Maximum Carrier Frequency Deviation (Hz)
28	0.0015	1.33

Table 38 : Test results for Frequency Stability versus Temperature at -48V operation

Temperature (ºC)	Maximum Carrier Frequency Deviation (PPM)	Maximum Carrier Frequency Deviation (Hz)
-30	0.0027	-2.31
-20	0.0038	3.27
-10	0.0044	-3.85
0	0.0065	-5.68
10	.0044	4.29
20	0.0049	3.11
30	0.0036	3.12
40	0.0036	5.06
50	0.0058	-1.41

Table 39 : Test results for Frequency Stability versus Temperature at 24V operation

Temperature (ºC)	Maximum Carrier Frequency Deviation (PPM)	Maximum Carrier Frequency Deviation (Hz)
-30	0.0063	-5.47
-20	0.0031	2.67
-10	0.0058	5.07
0	0.0044	3.86
10	0.0048	4.17
20	0.0007	-0.65
30	0.0036	-3.11
40	0.0023	-1.99
50	0.0049	-4.25

References

[1] FCC Part 22 Subpart H, “Public Mobile Services”, http://www.access.gpo.gov/nara/cfr/waisidx_01/47cfr22_01.html

[2] FCC Part 2 Subpart J, “Frequency allocations and radio treaty matters; general rules and regulations”, http://www.access.gpo.gov/nara/cfr/waisidx_01/47cfr2_01.html

[3] Industry Canada RSS-129, “800 MHz Dual-Mode CDMA Cellular Telephones”, http://strategis.ic.gc.ca/SSG/sf01324e.html

[4] TIA/EIA-97-E “Recommended Minimum Performance Standards for Base Stations Supporting Dual Mode Spread Spectrum Systems”,

[5] Industry Canada “Information on the 99% Bandwidth measurement” Author Brain Kasper. http://strategis.ic.gc.ca/epic/internet/inceb-bhst.nsf/vwapj/occupied-bandwidth.pdf/$FILE/occupied-bandwidth.pdf

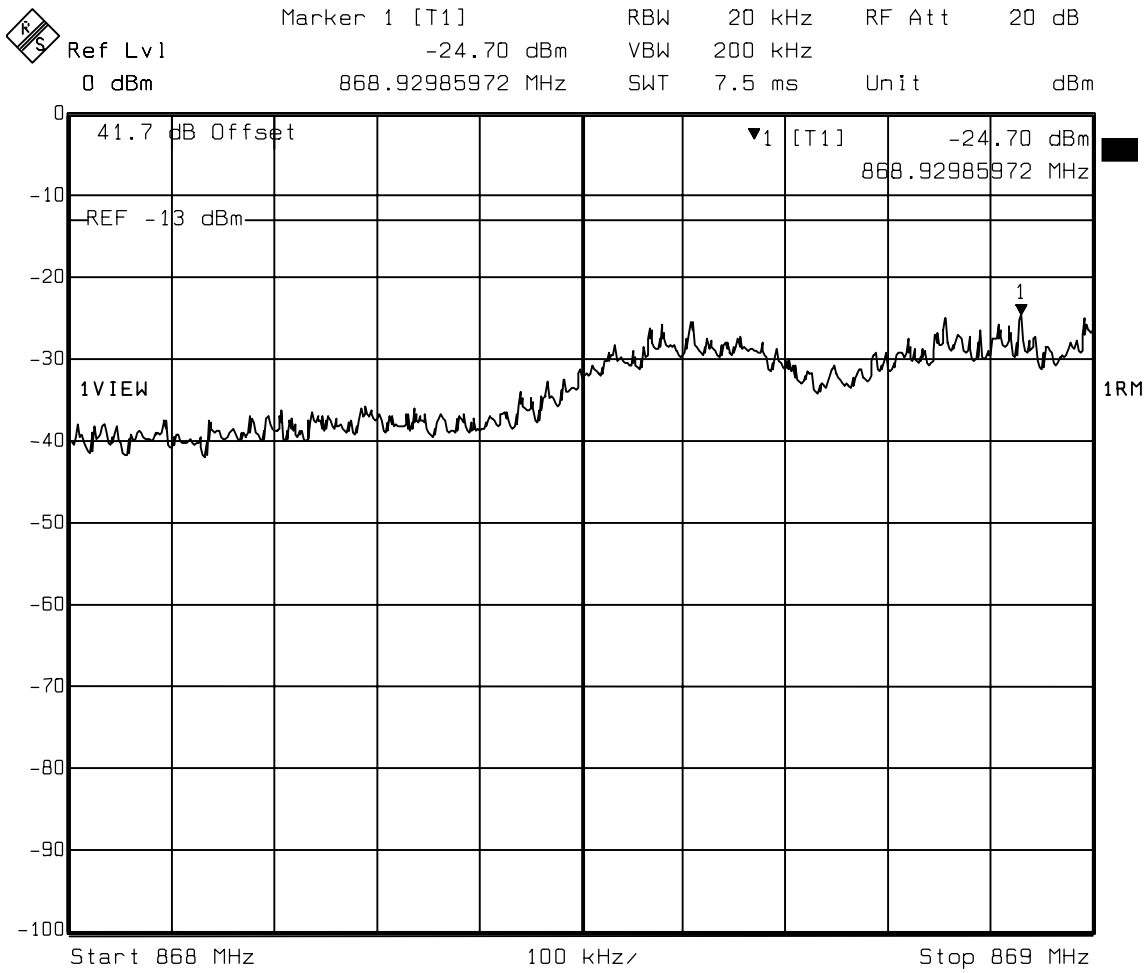
[6] CDMA BTS Developmen, MFRM-2 800 MHz Power Amplifier Assembly Beta Cycle Verification Report, Dataset Name: NTGY37AA, Document Status: Ratified, Stream: 02 Issue: 02, Issue Date: March 12, 2003, Document Prime: Neil Claxton, 2M23

[7] Recommended Minimum Performance Standards for cdma2000 High Rate Packet Data Access Network, C.S0032-0, Version 2.0, 12 December 2003

APPENDIX PLOTS

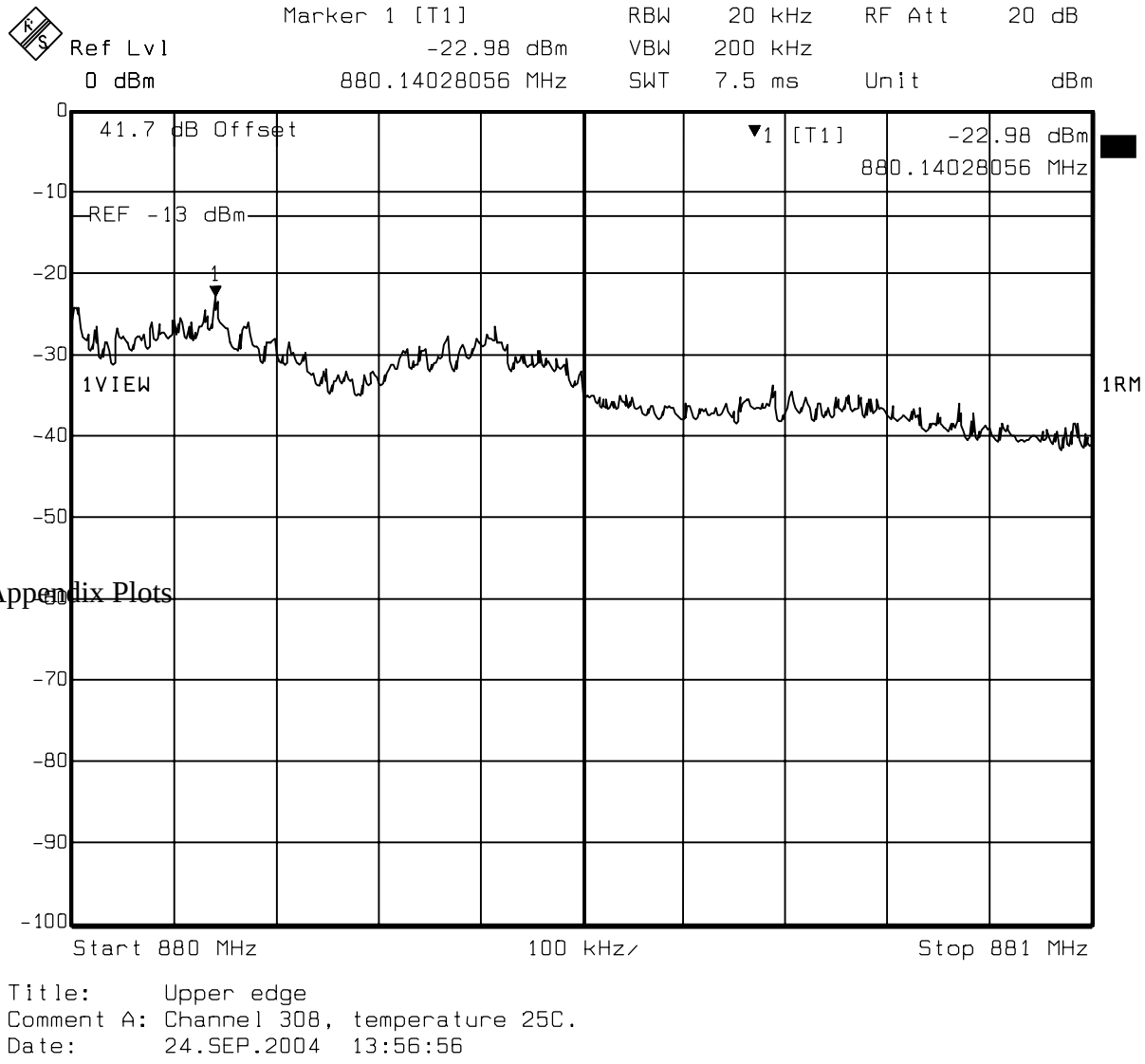
Conducted Spurious Emissions Plots - FCC Test Results

Figure 1 : Conducted Spurious Emissions, A and A" band 1-Carrier, Lower 1MHz Adjacent emissions



Title: Low edge
Comment A: Channel 1015, temperature 25C.
Date: 24.SEP.2004 13:20:30

Figure 2 : Conducted Spurious Emissions, A and A" band 1-Carrier, IS-95, Upper 1MHz Adjacent emissions



Appendix Plots

Figure 3 : Conducted Spurious Emissions, A and A" band Upper Adjacent 1 MHz Channel Power Measurement, 1Carrier, IS-95

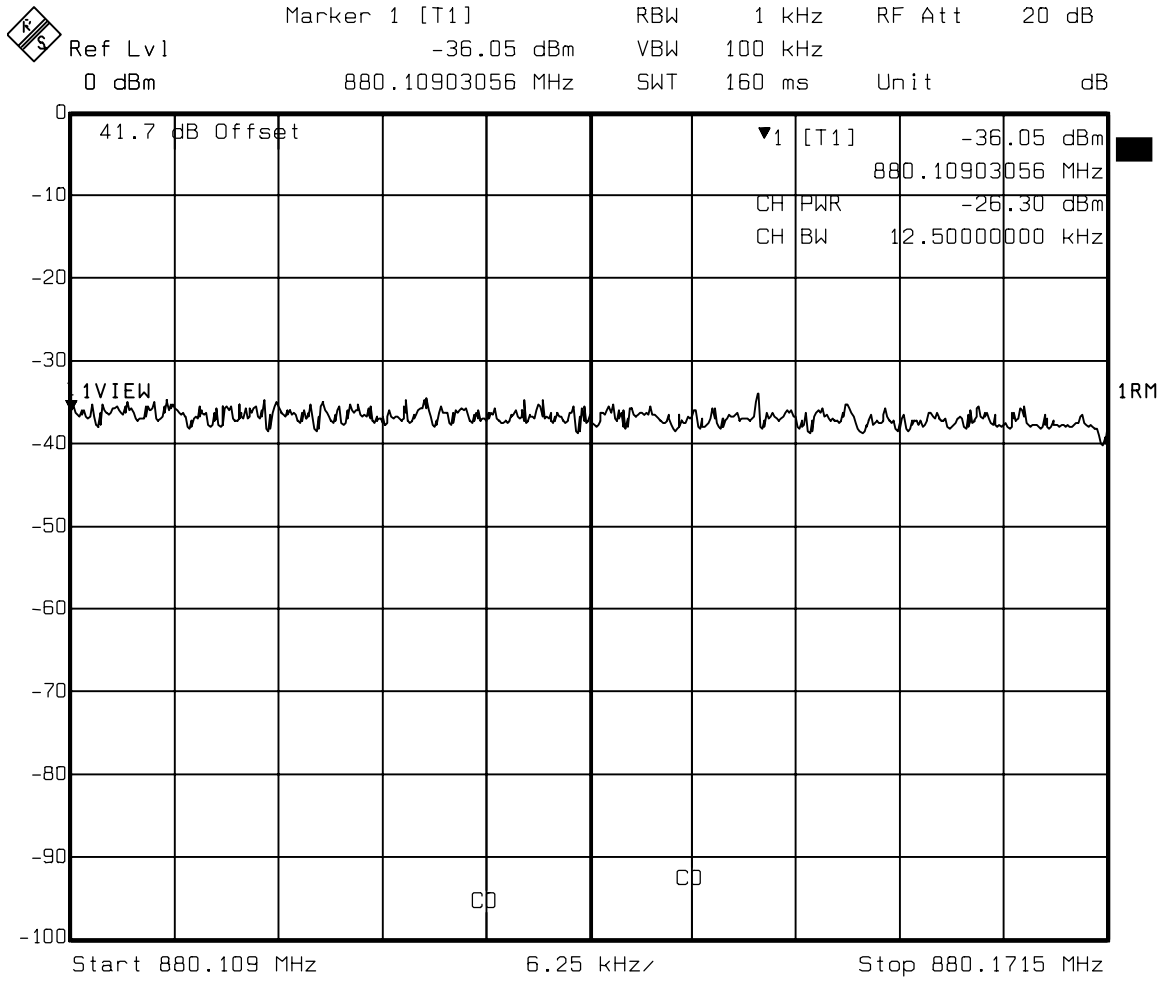


Figure 4 : Conducted Spurious Emissions, A and A" band 9kHz to Lower Adjacent 1 MHz 1-Carrier, IS-95

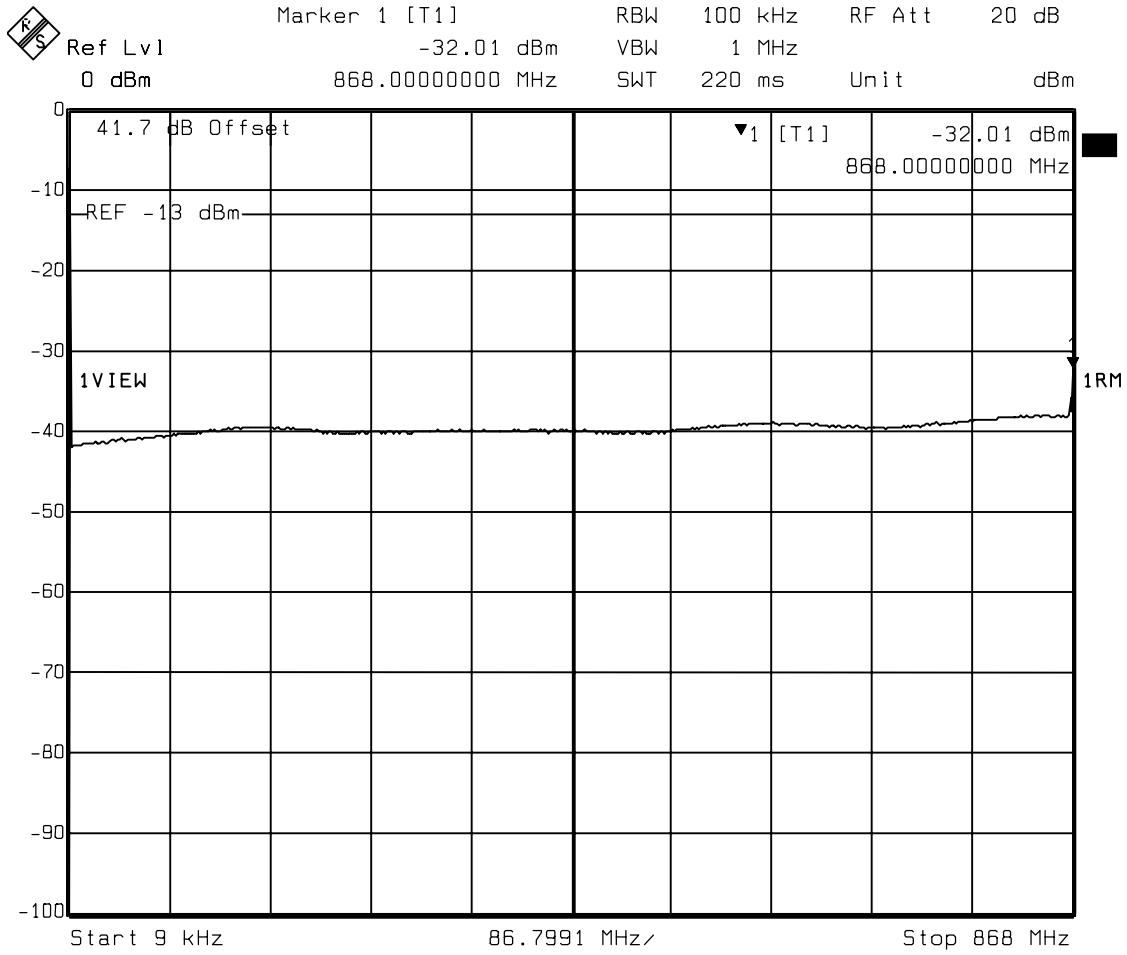


Figure 5 : Conducted Spurious Emissions, A and A" band, 1 carrier, IS-95 Upper Adjacent 1MHz to 5 GHz range

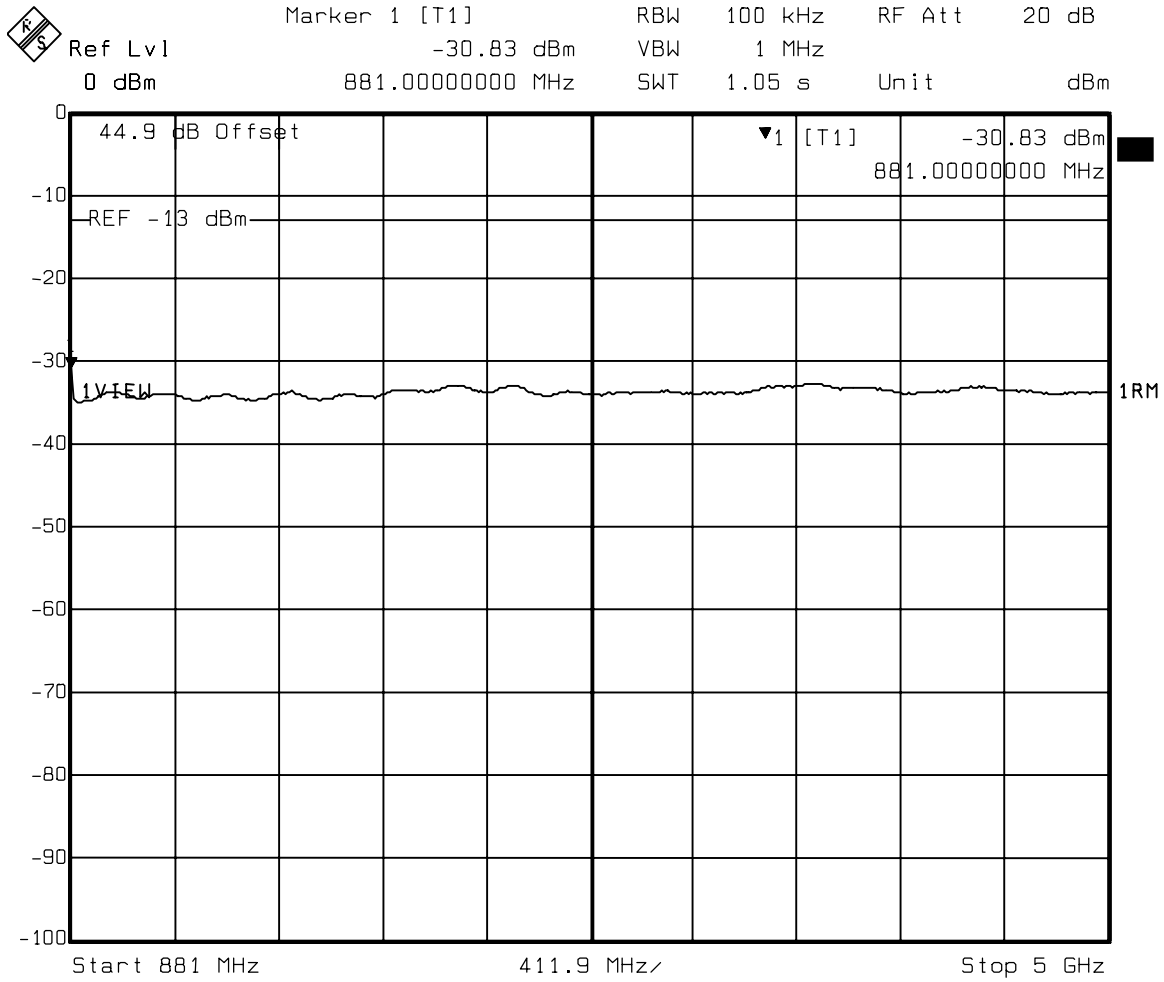


Figure 6 : Conducted Spurious Emissions, A and A" band, 1-carrier, IS-95, 5 GHz to 10 GHz range

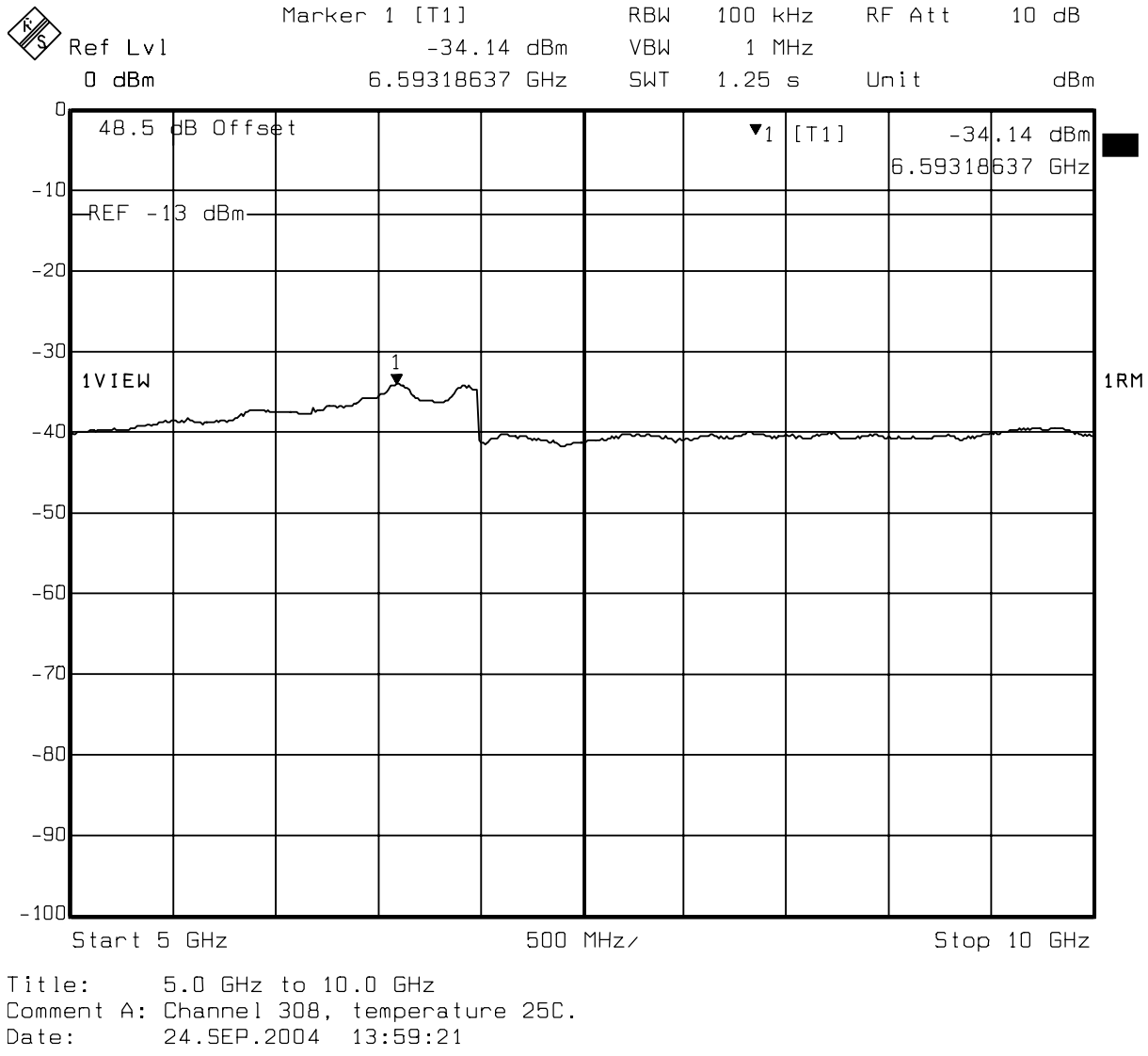


Figure 7 : Conducted Spurious Emissions, B band 2-Carrier, Lower 1MHz Adjacent emissions

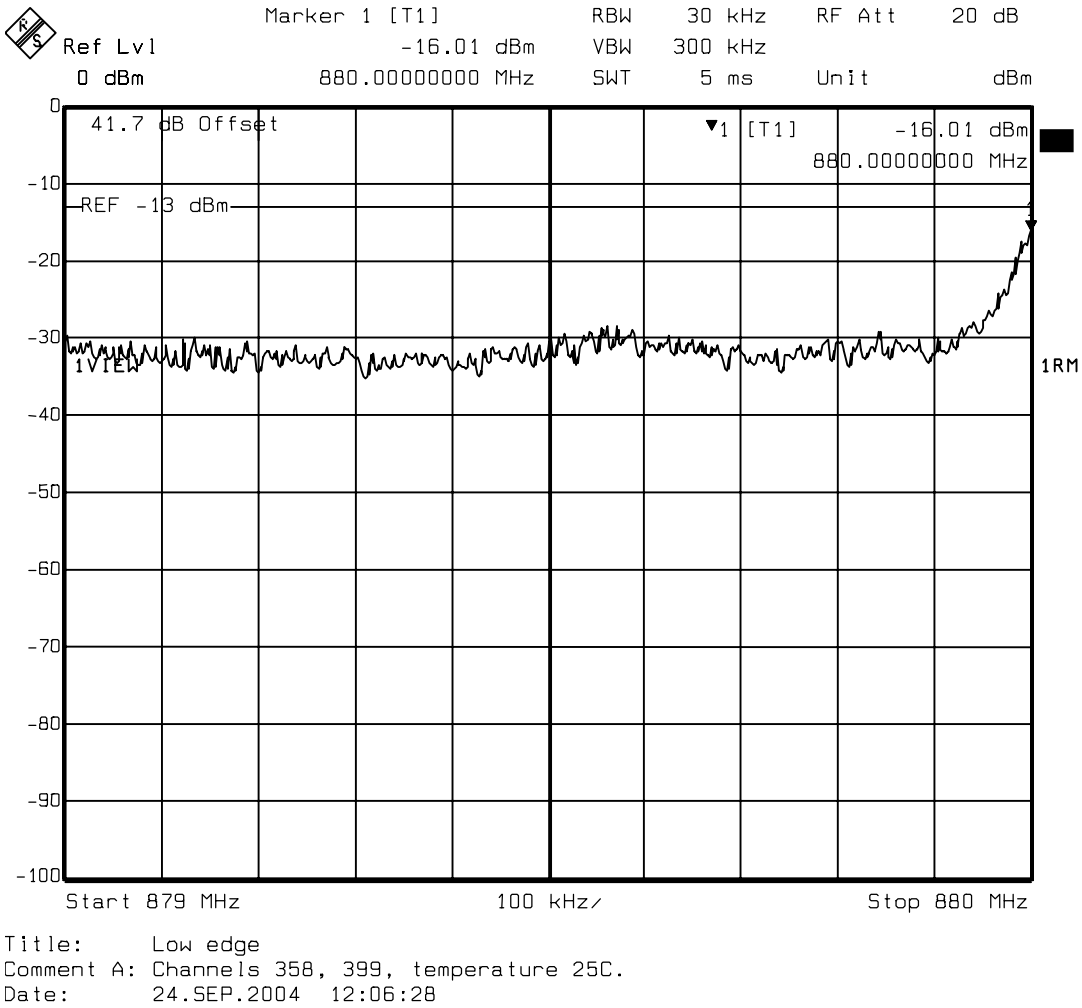


Figure 8 : Conducted Spurious Emissions, B band 2-Carrier, Lower 1MHz Adjacent emissions - Channel Power Measurement

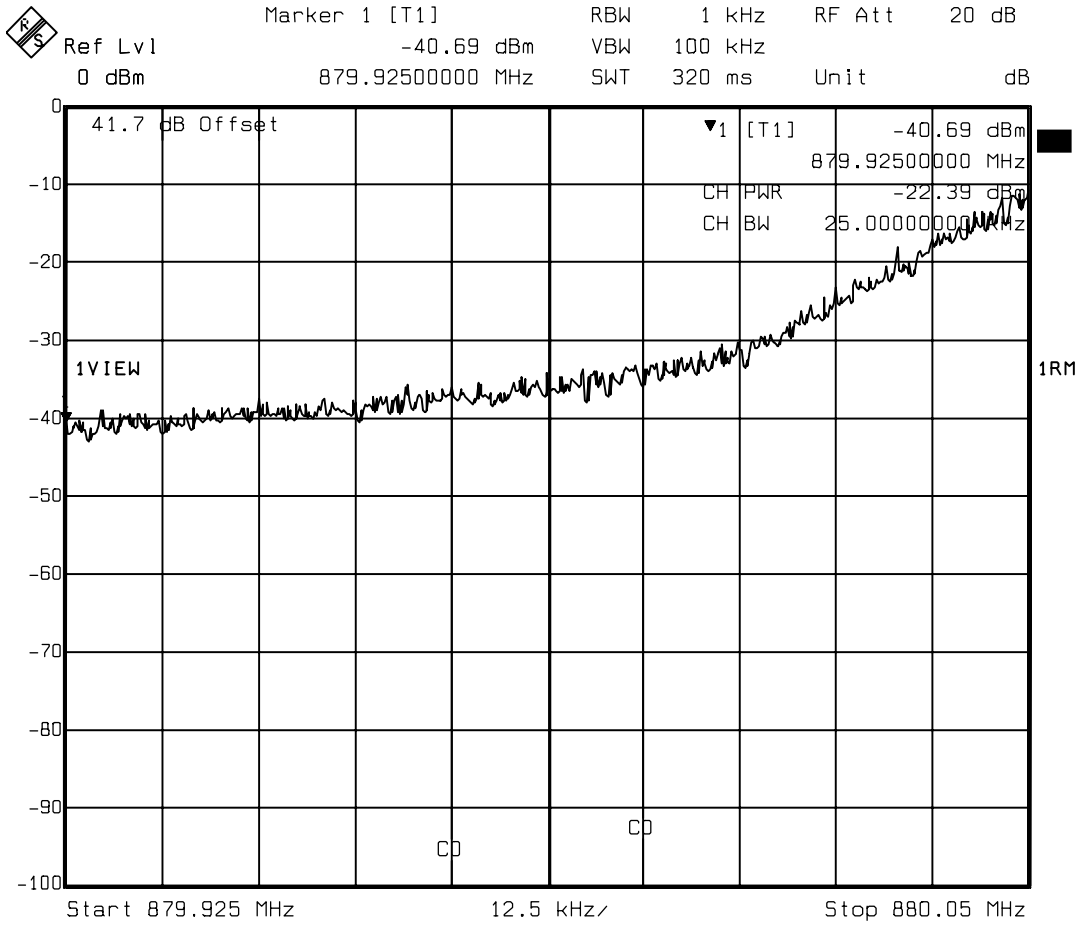
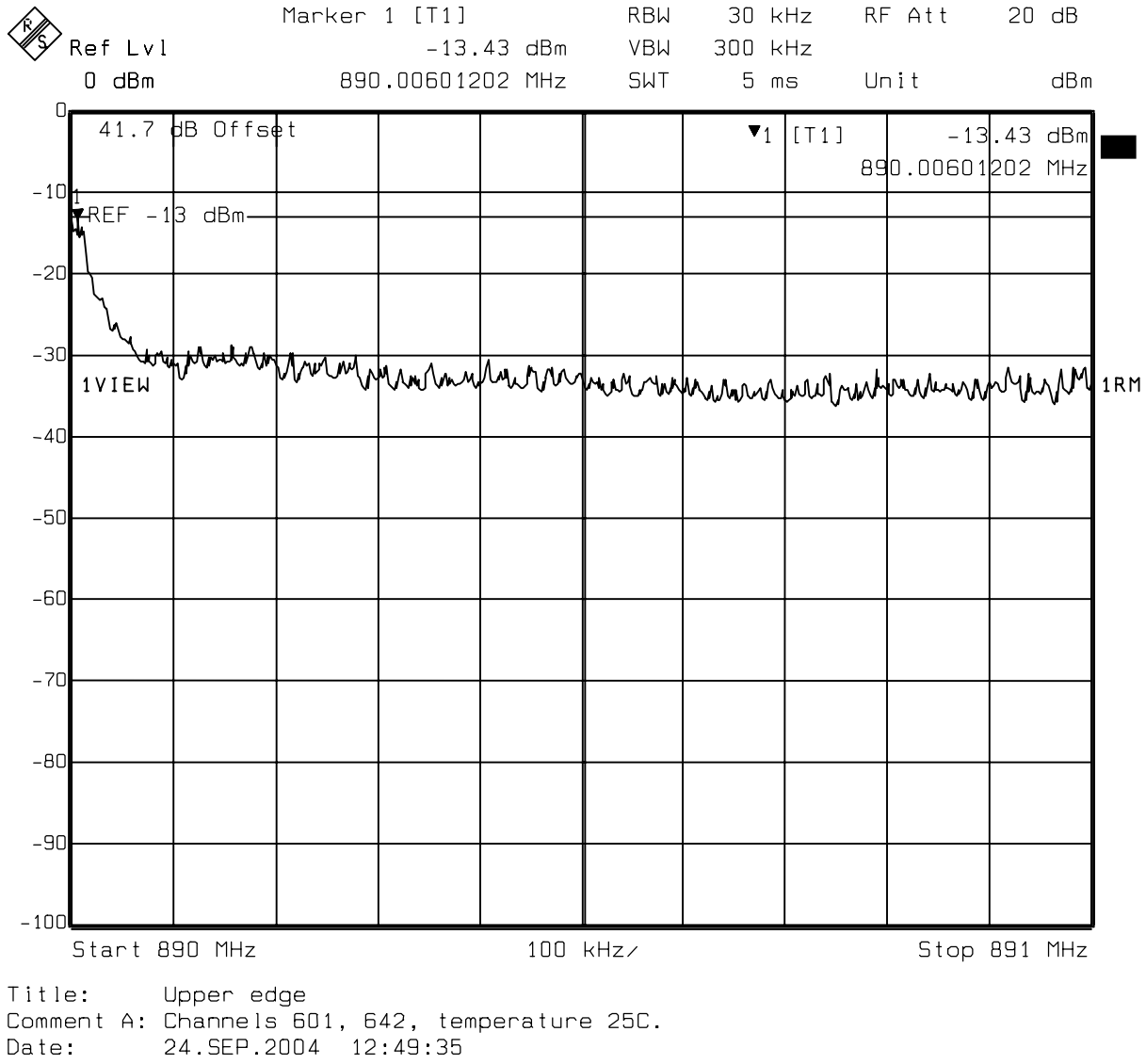


Figure 9 : Conducted Spurious Emissions, B band 2-Carrier, Upper 1MHz Adjacent emissions



Title: Upper edge
Comment A: Channels 601, 642, temperature 25C.
Date: 24.SEP.2004 12:49:35

Figure 10 : Conducted Spurious Emissions, B band 2-Carrier, Upper 1MHz Adjacent emissions - Channel Power Measurement

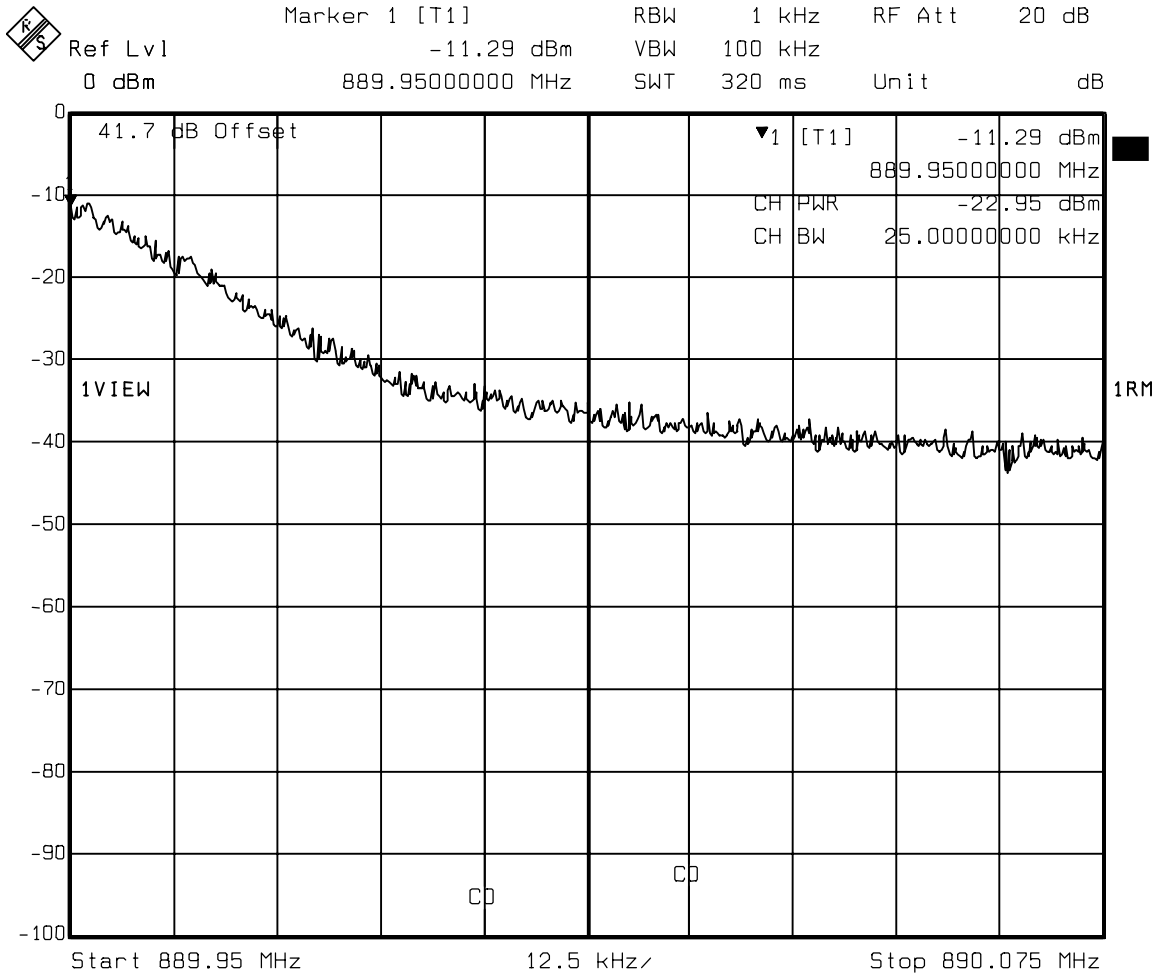


Figure 11 : Conducted Spurious Emissions, B band 2-Carrier, 9kHz to Lower Adjacent 1 MHz 1-Carrier, IS-95

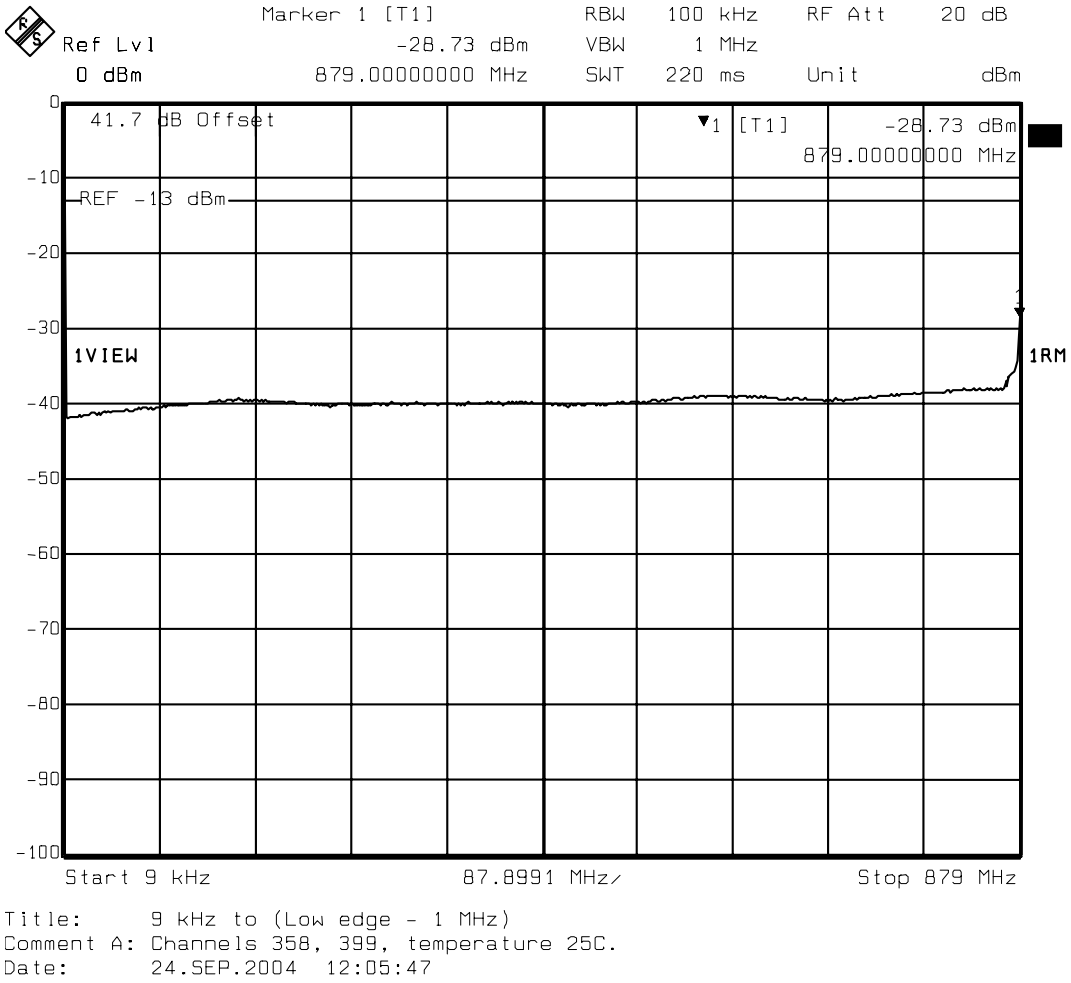


Figure 12 : Conducted Spurious Emissions, B band 2-Carrier, IS-95, Upper Adjacent 1MHz to 5 GHz range

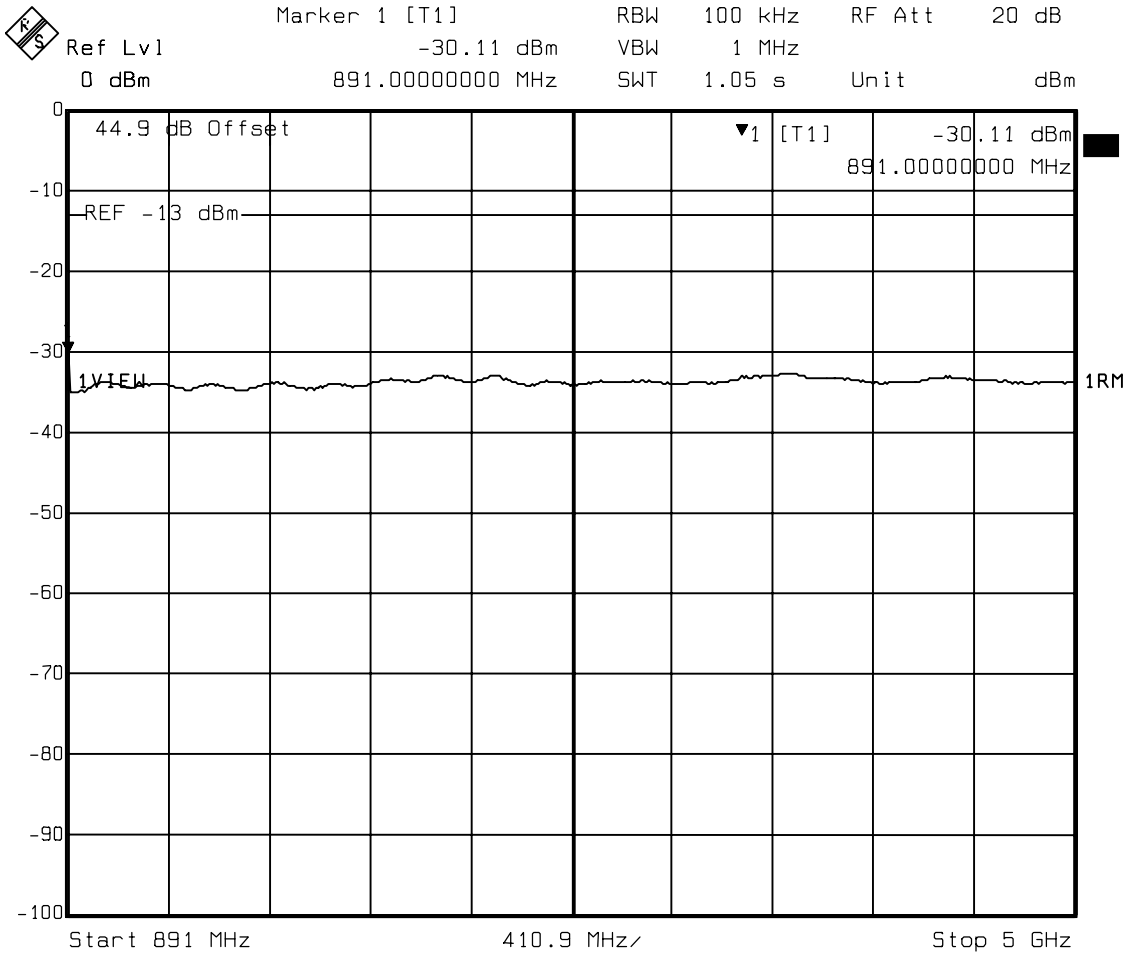
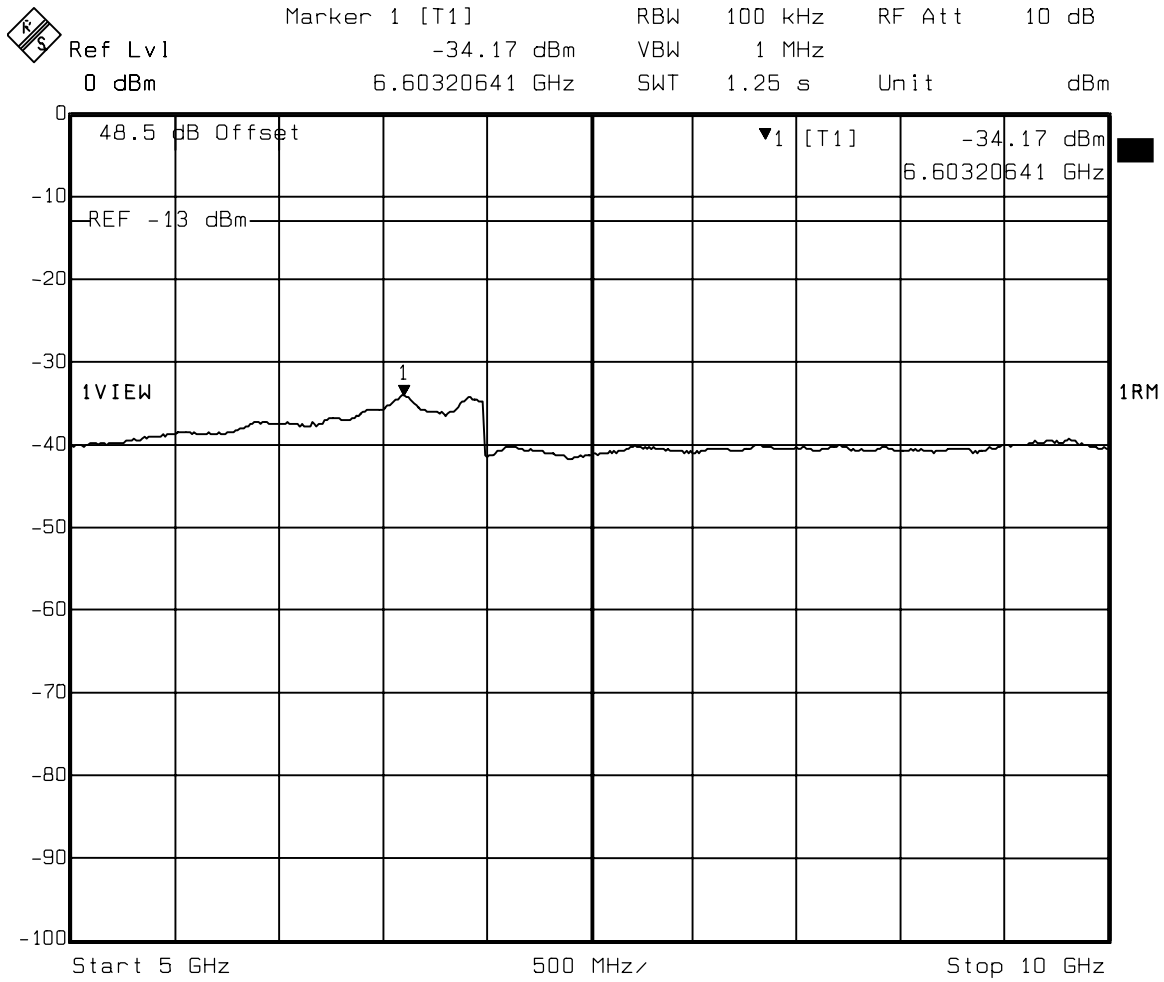
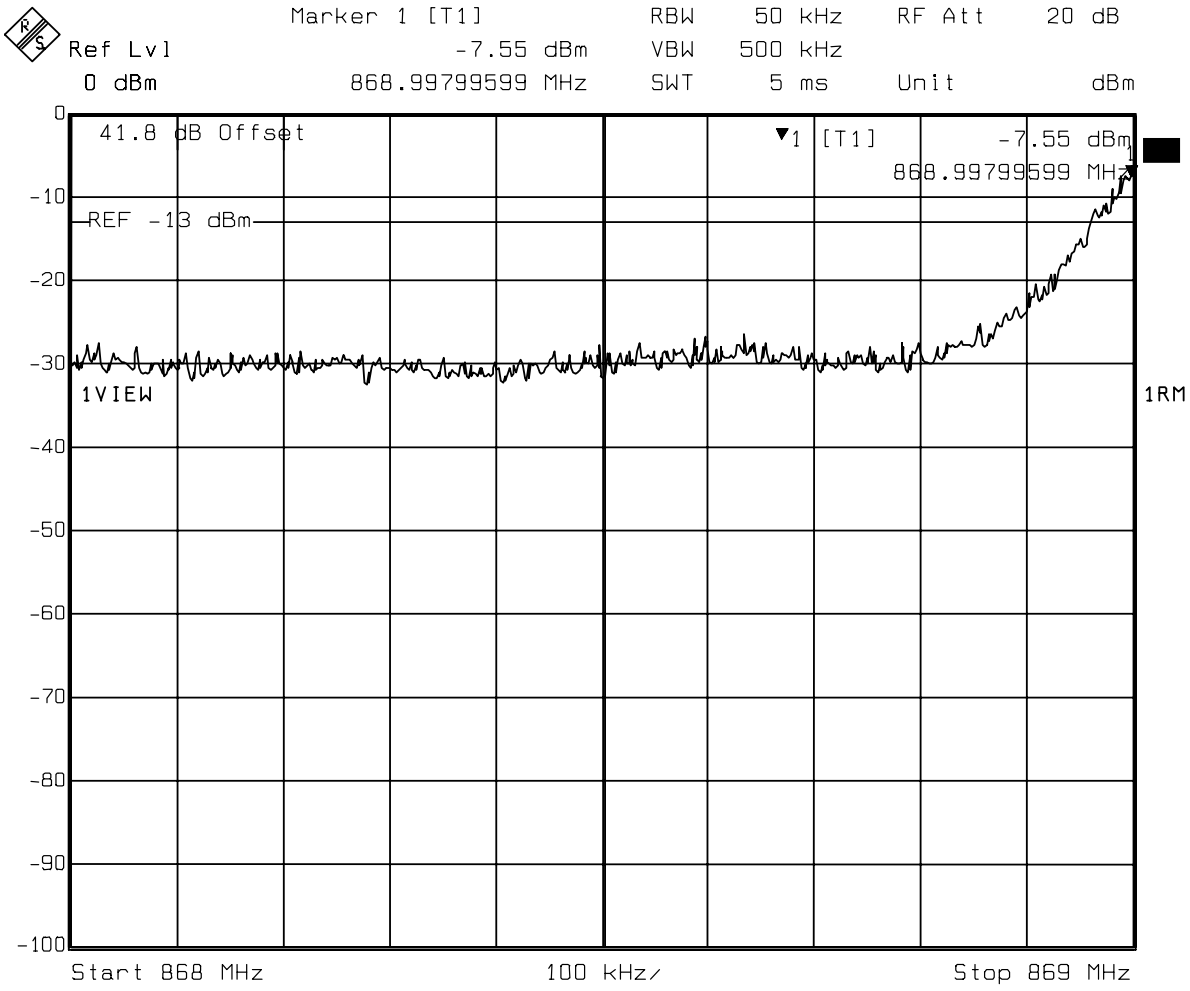


Figure 13 : Conducted Spurious Emissions, B band 2-Carrier, IS-95 5 GHz to 10 GHz range



Title: 5.0 GHz to 10.0 GHz
Comment A: Channels 601, 642, temperature 25C.
Date: 24.SEP.2004 12:51:59

Figure 14 : Conducted Spurious Emissions, A and A" band 3-Carrier, Lower IS-95,1MHz Adjacent emissions



Title: Low edge
Comment A: Channels 1015, 33, 74, temperature 25C.
Date: 27.SEP.2004 11:33:14

Figure 15 : Conducted Spurious Emissions, A and A" band 3-Carrier, Lower IS-95,1MHz Adjacent emissions - Channel Power Verification

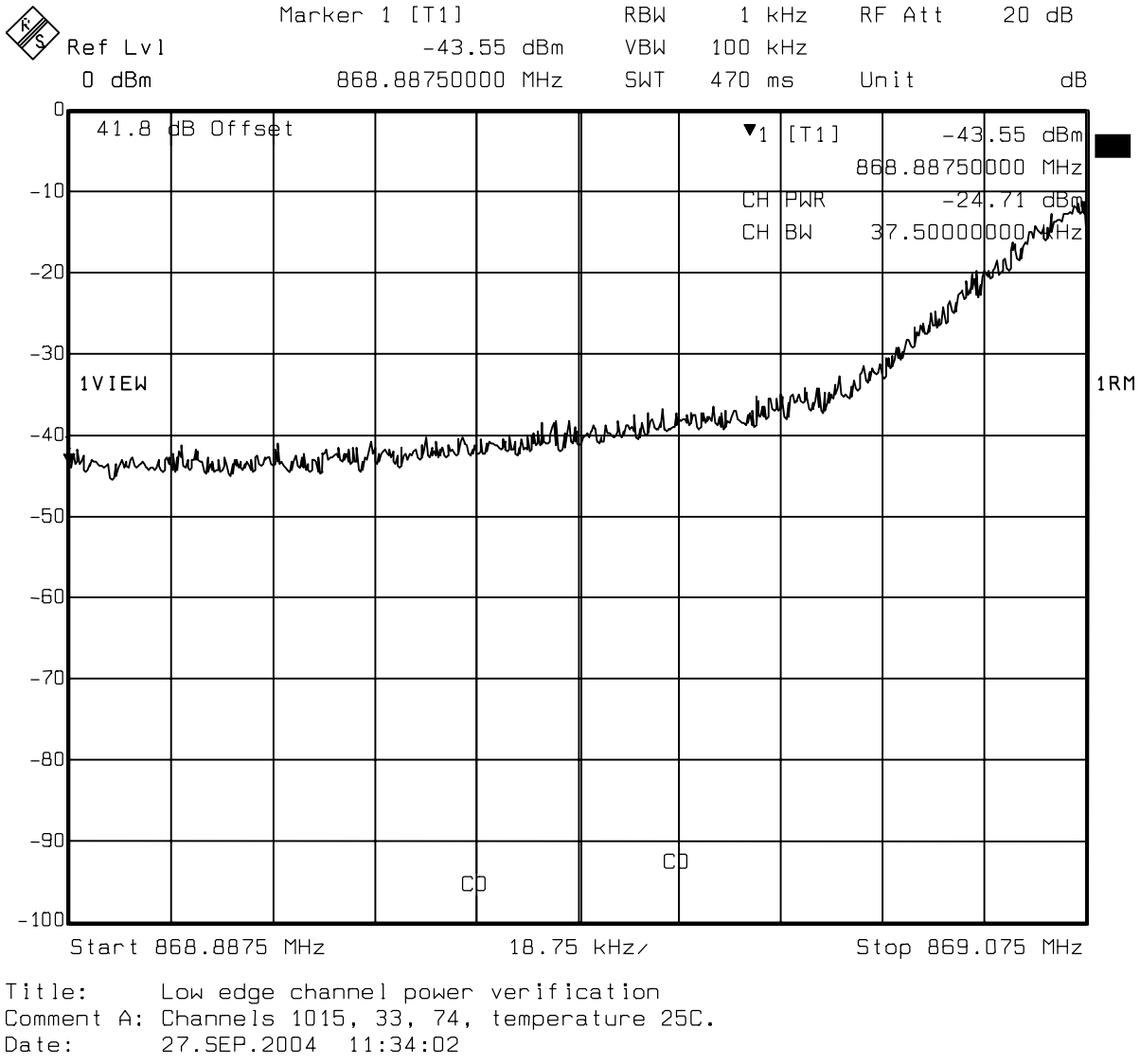
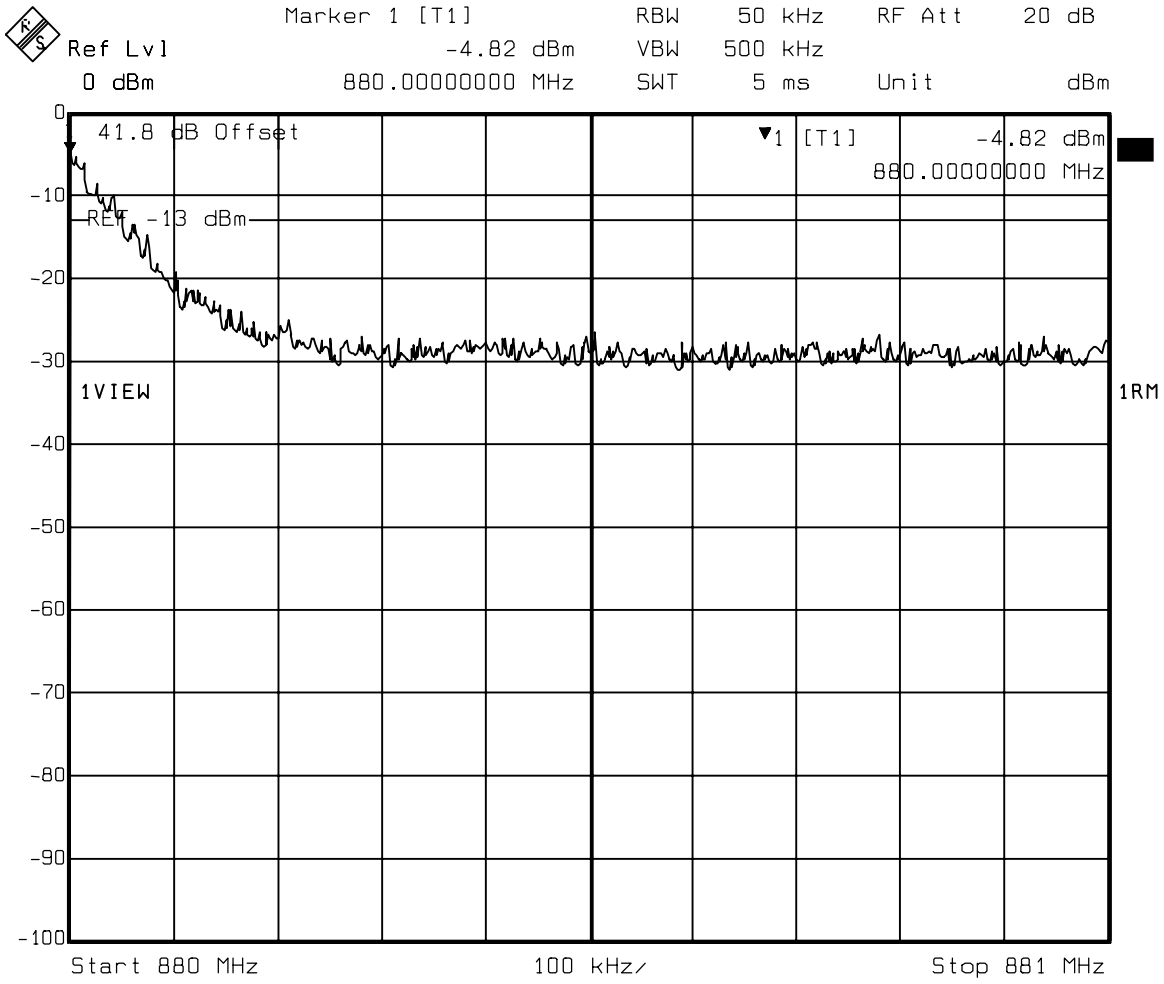


Figure 16 : Conducted Spurious Emissions, A and A" band 3-Carrier, IS-95, Upper 1MHz Adjacent emissions



Title: Upper edge
Comment A: Channels 226, 267, 308, temperature 25C.
Date: 27.SEP.2004 12:04:03

Figure 17 : Conducted Spurious Emissions, A and A" band 3-Carrier, IS-95, Upper 1MHz Adjacent emissions - Channel Power Measurement

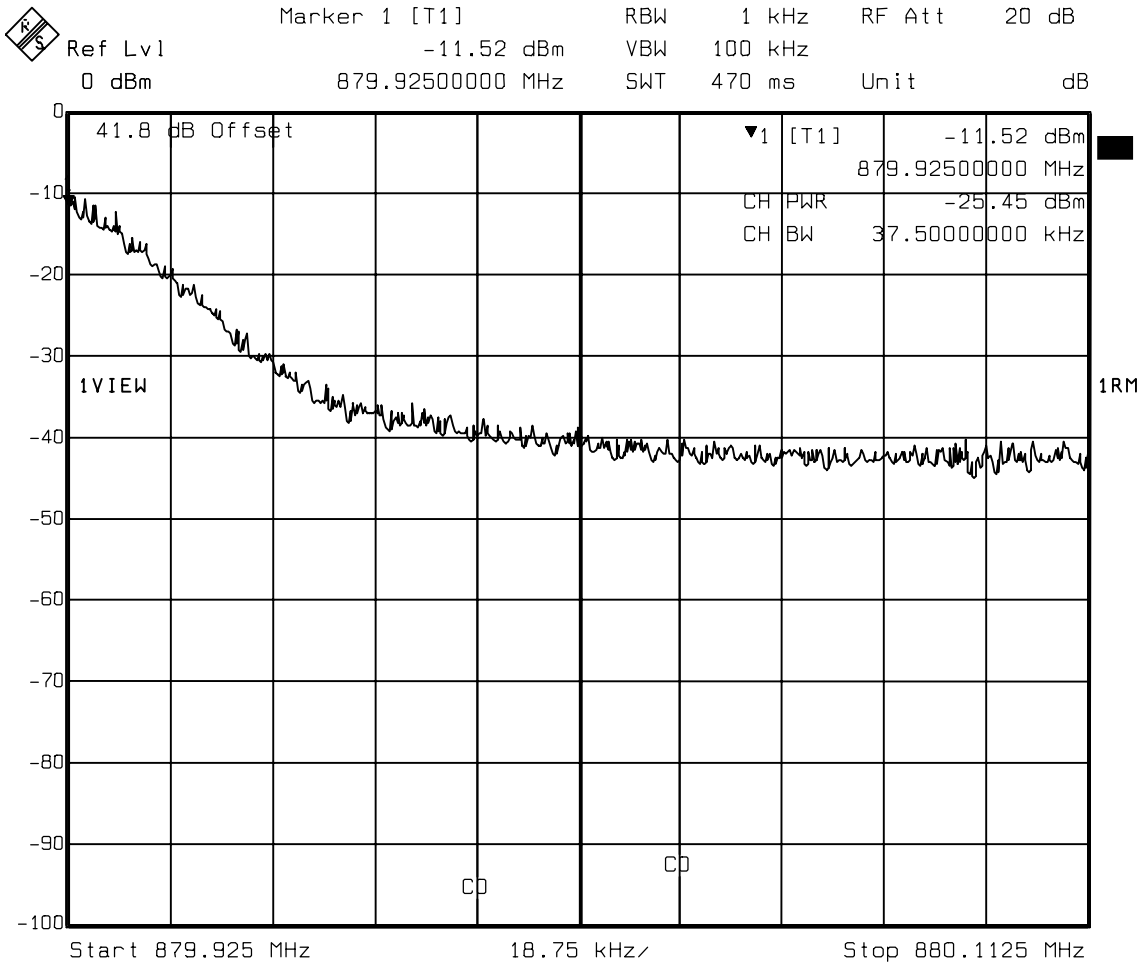
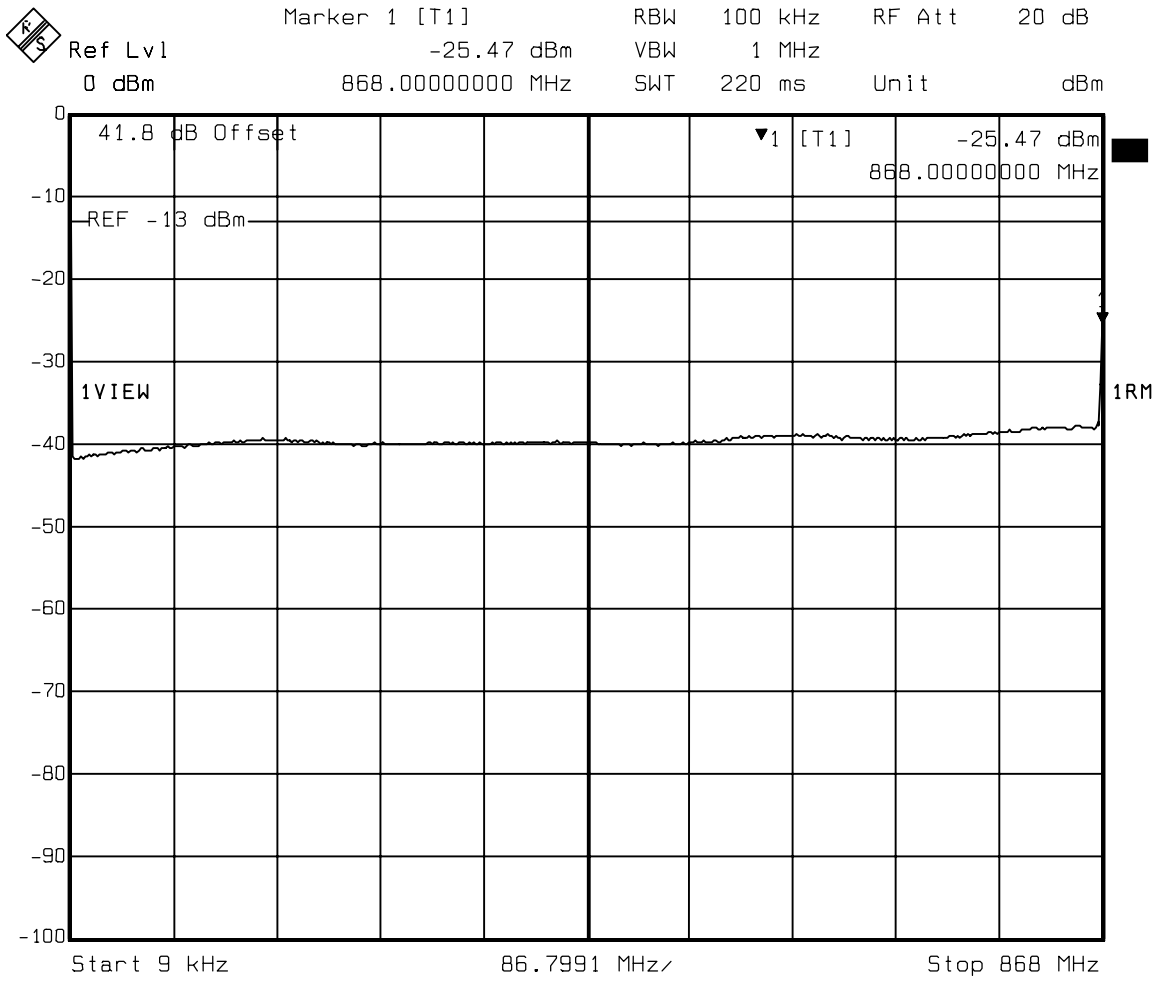


Figure 18 : Conducted Spurious Emissions, A and A" band 9kHz to Lower Adjacent 1 MHz 3-Carrier, IS-95



Title: 9 kHz to (Low edge - 1 MHz)
Comment A: Channels 1015, 33, 74, temperature 25C.
Date: 27.SEP.2004 11:32:33

Figure 19 : Conducted Spurious Emissions, A and A" band, IS-95 Upper Adjacent 1MHz to 5 GHz range

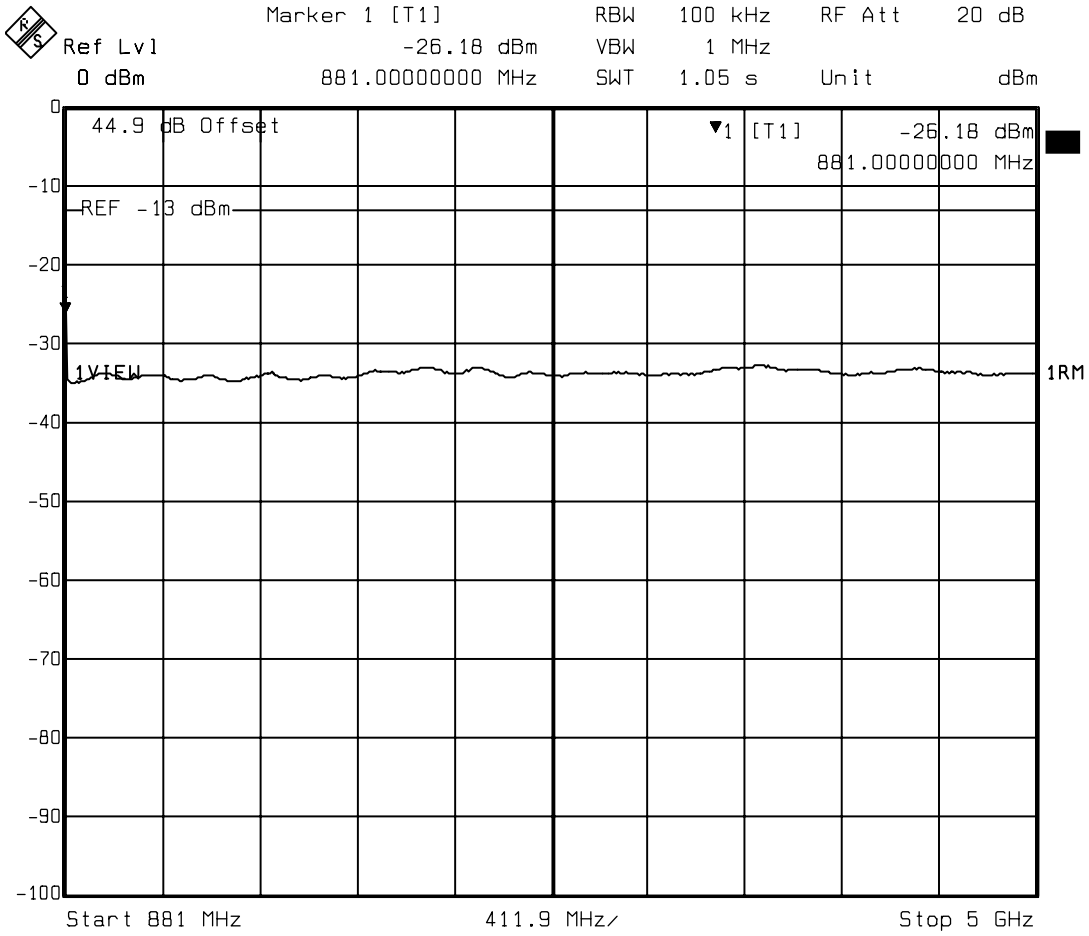


Figure 20 : Conducted Spurious Emissions, A and A" band, IS-95, 5 GHz to 10 GHz range

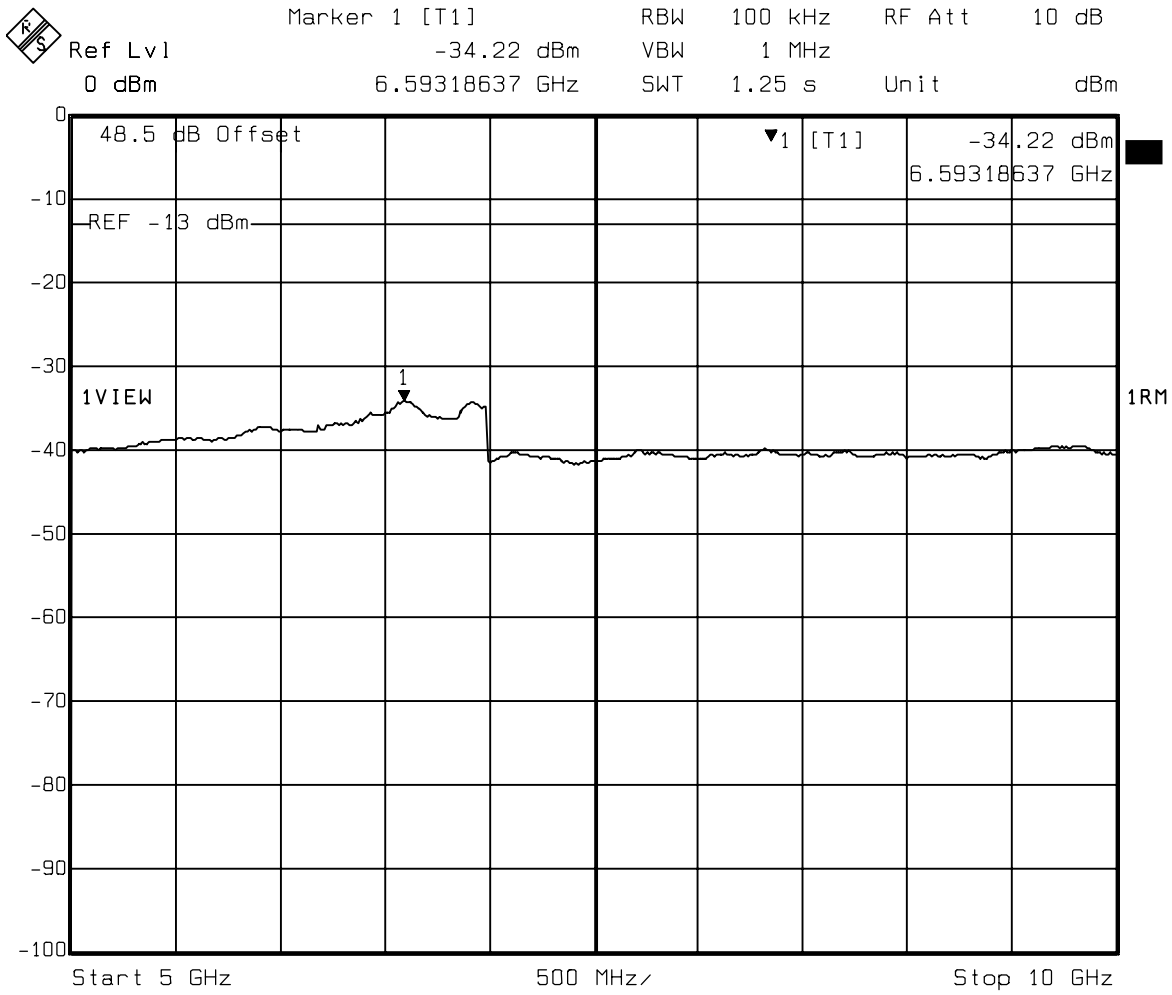


Figure 21 : Conducted Spurious Emissions, B band 1-Carrier IS-856, Lower 1MHz Adjacent emissions

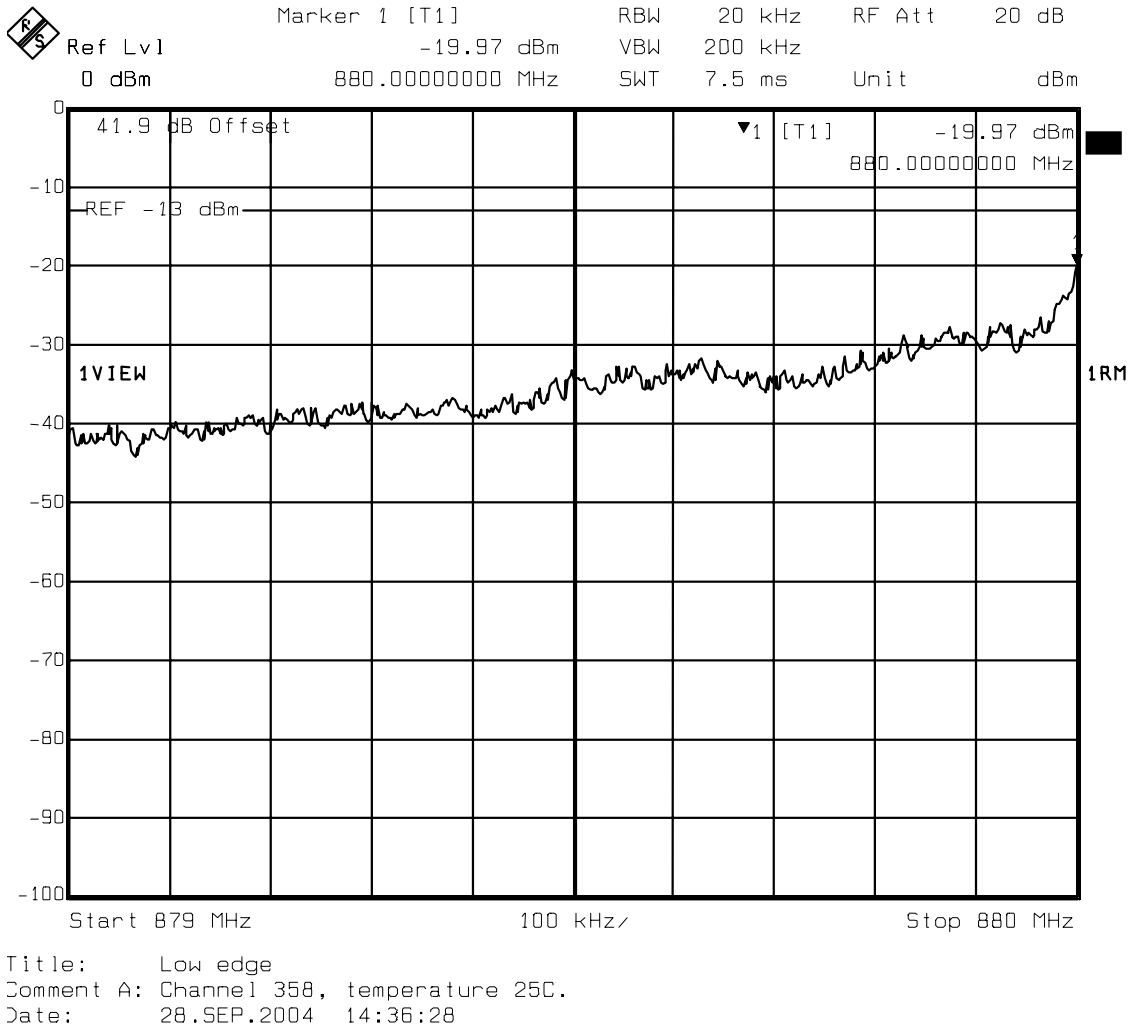


Figure 22 : Conducted Spurious Emissions, B band 1-Carrier IS-856, Lower 1MHz Adjacent emissions - Channel Power Measurement

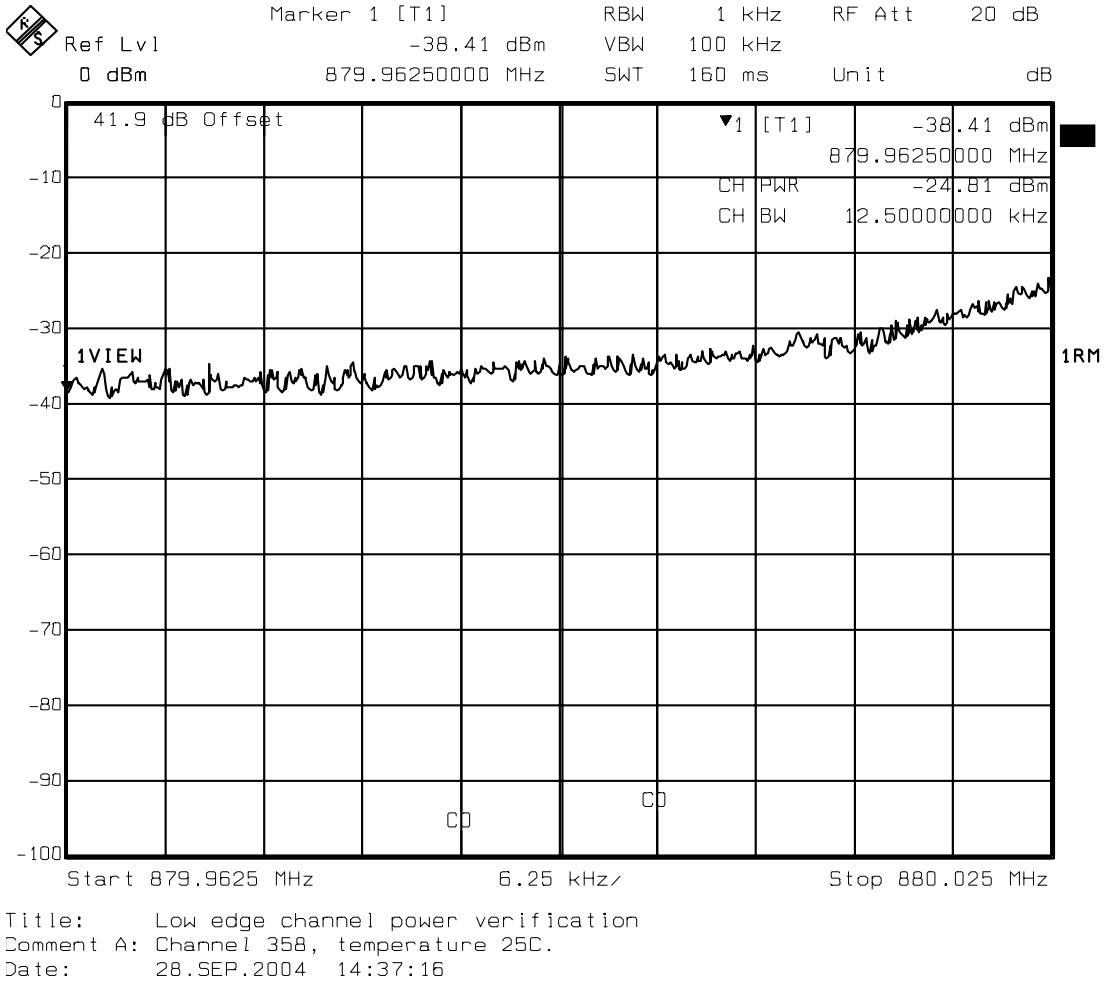


Figure 23 : Conducted Spurious Emissions, B band 1-Carrier, IS-856, Upper 1MHz Adjacent emissions

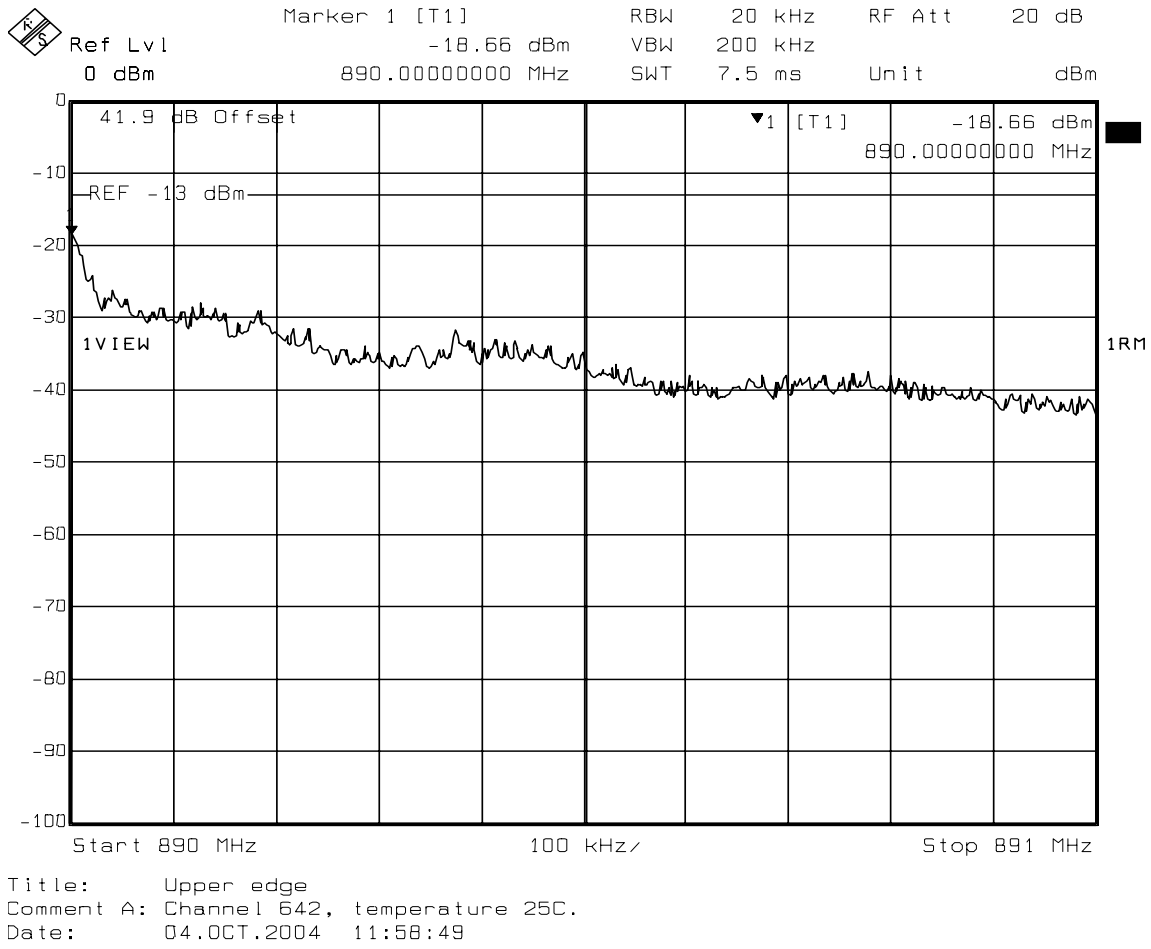


Figure 24 : Conducted Spurious Emissions, B band 1-Carrier, IS-856, Upper 1MHz Adjacent emissions - Channel Power Measurement

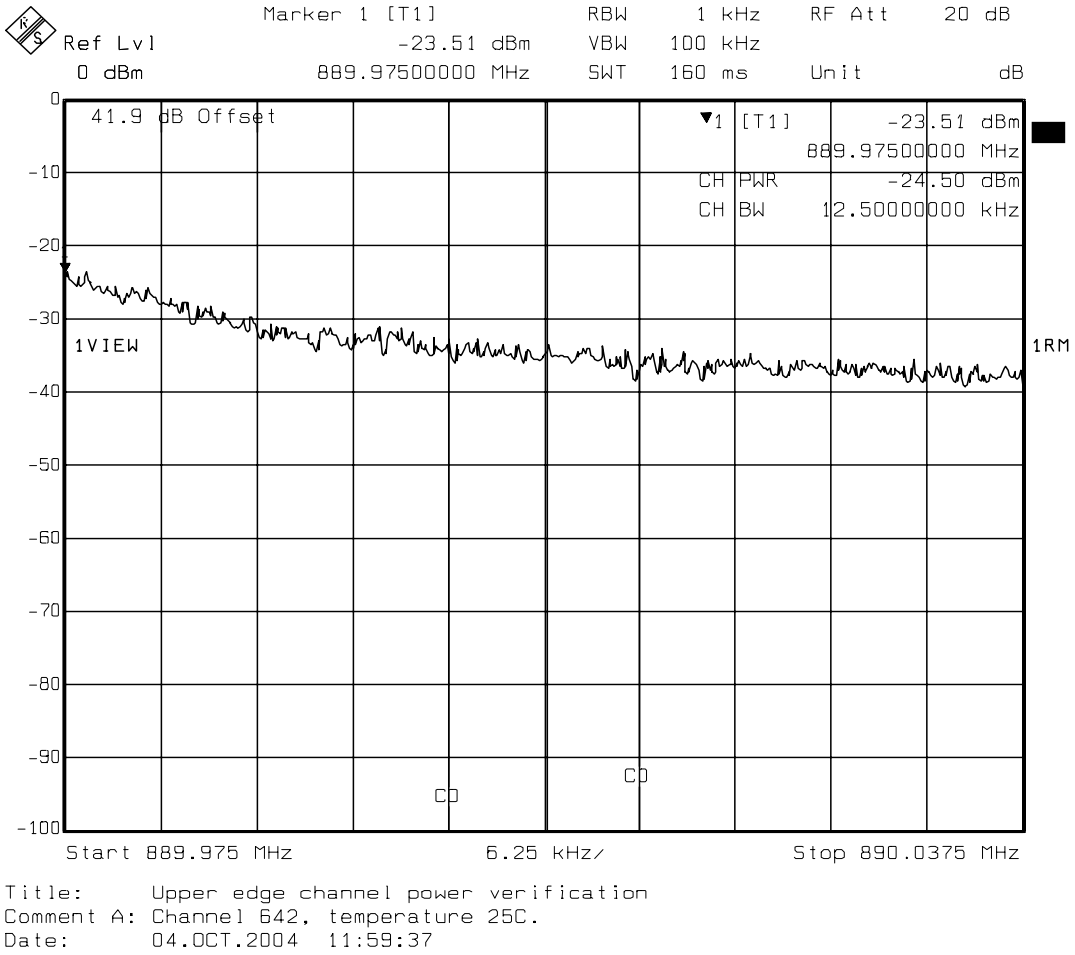


Figure 25 : Conducted Spurious Emissions, B band 9kHz to Lower Adjacent 1 MHz 1-Carrier, IS-856

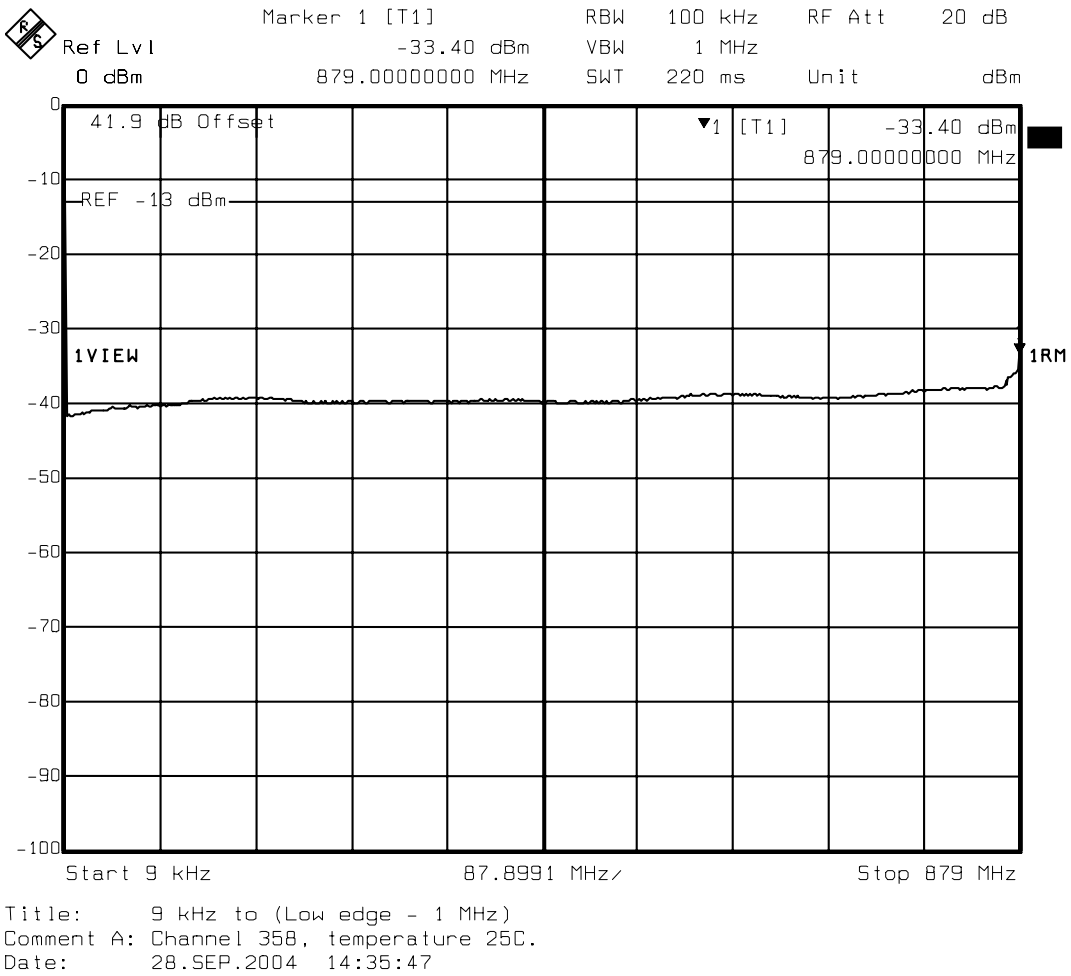


Figure 26 : Conducted Spurious Emissions, B band, Upper Adjacent 1MHz to 5 GHz range 1 -Carrier IS-856

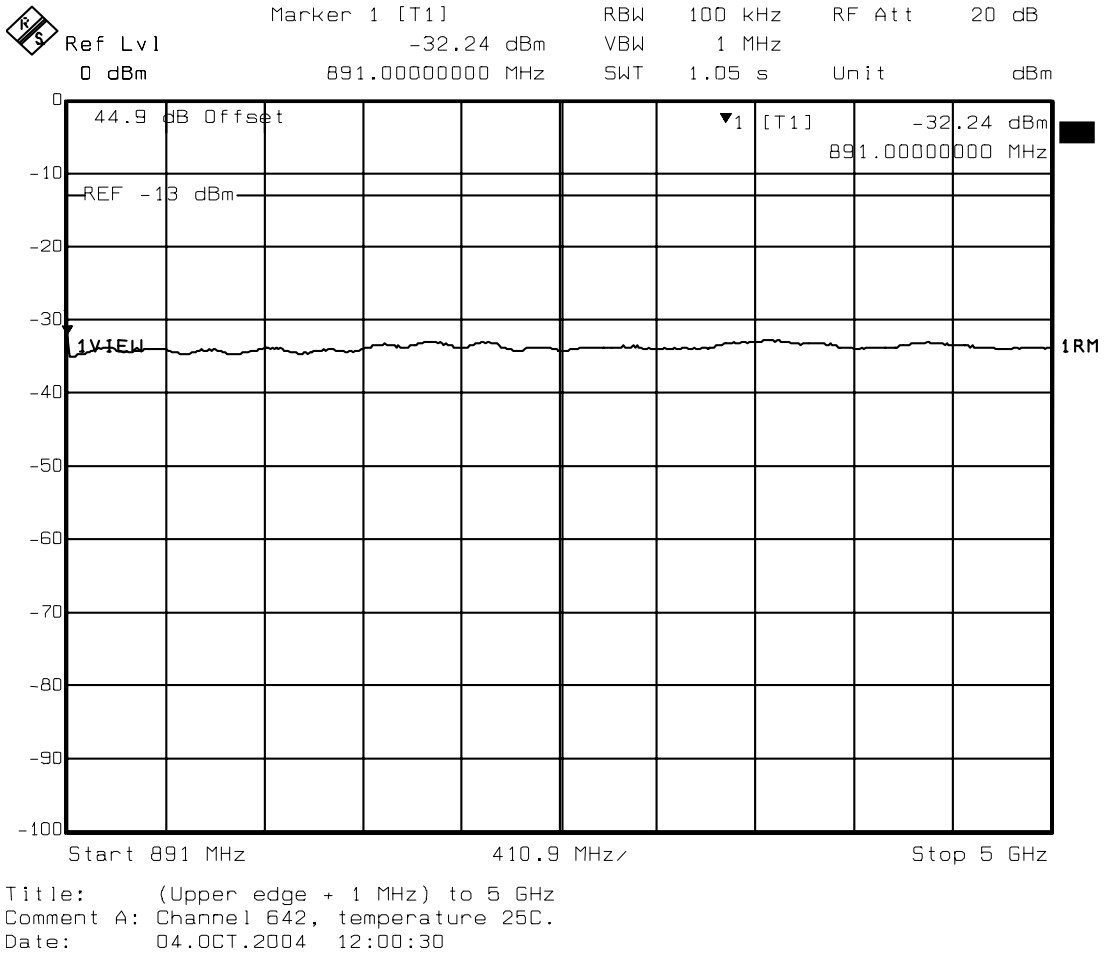


Figure 27 : Conducted Spurious Emissions, B band, 5 GHz to 10 GHz range 1-Carrier IS-856

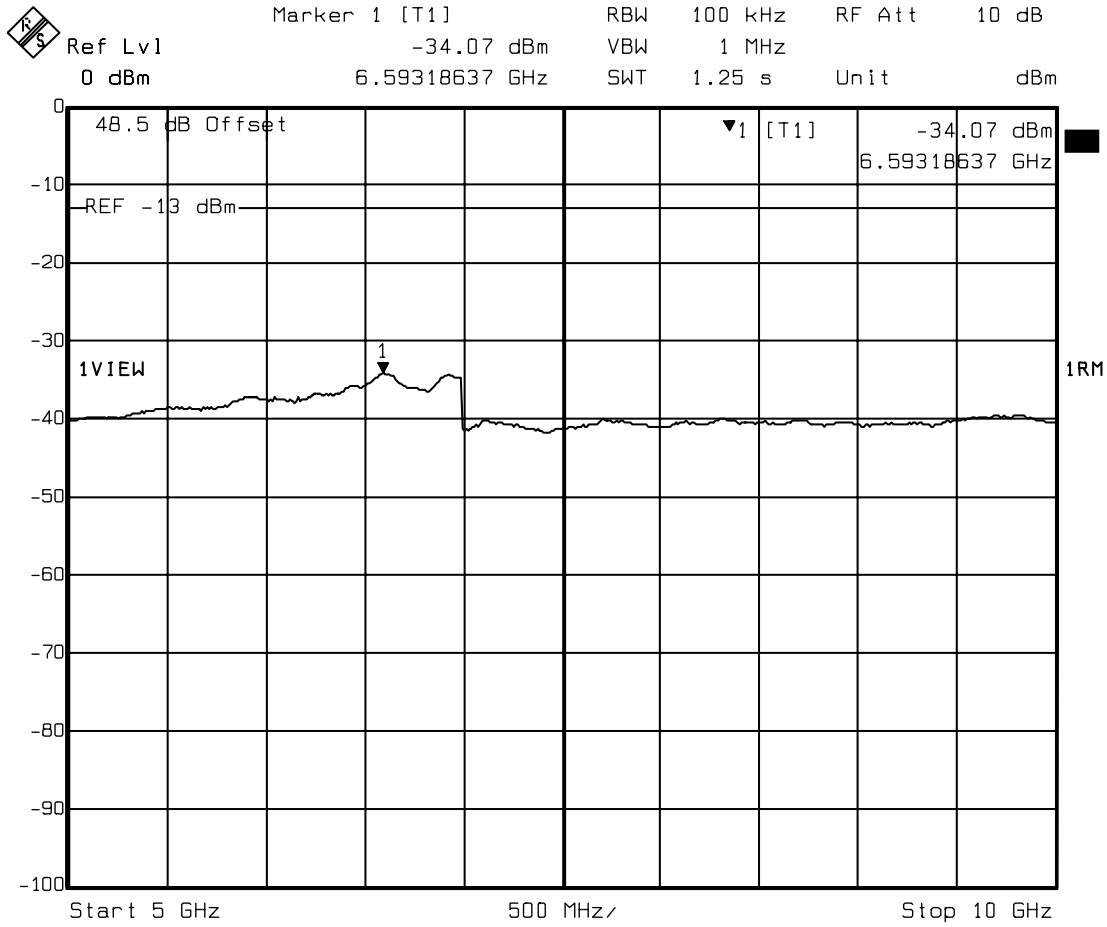


Figure 28 : Conducted Spurious Emissions, B band 3-Carrier IS-856, Lower 1MHz Adjacent emissions

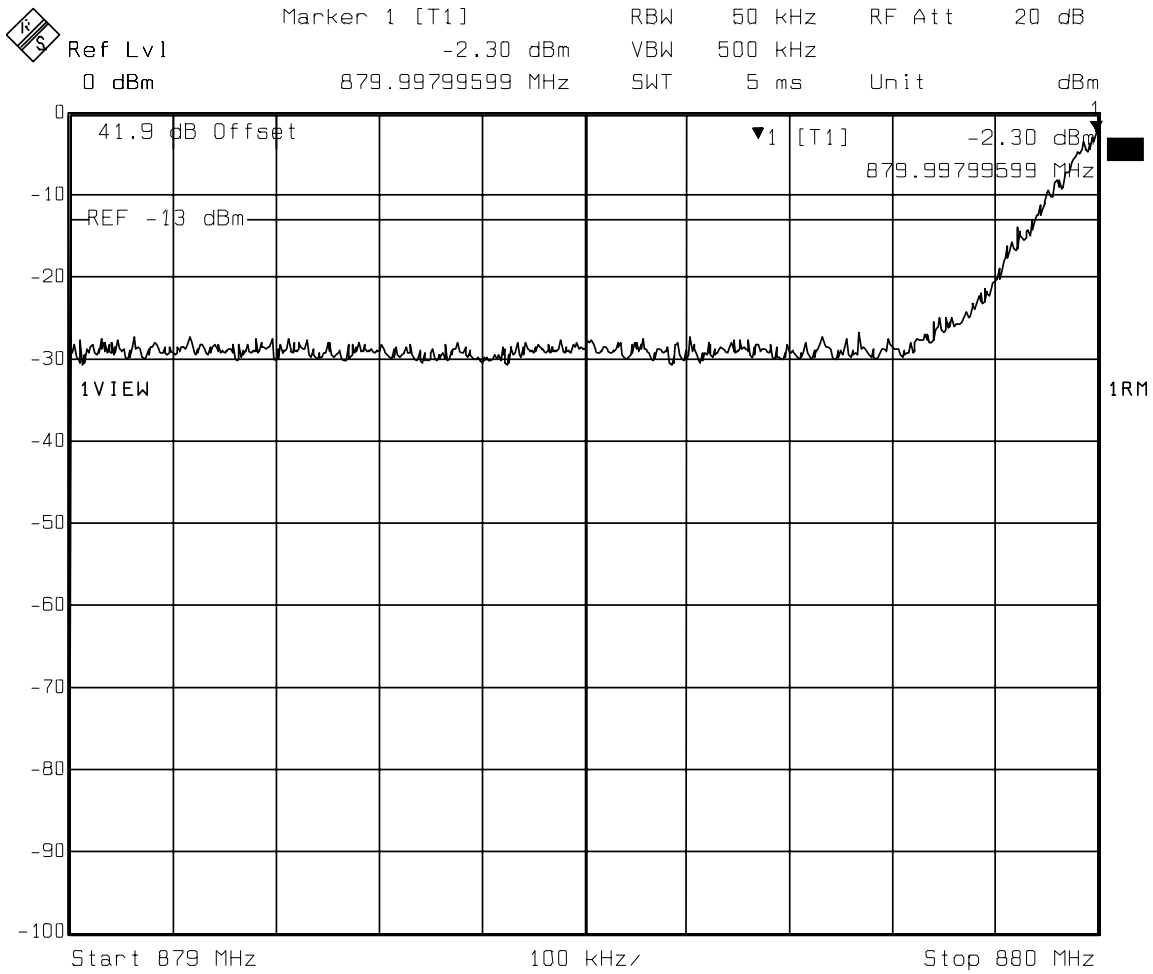


Figure 29 : Conducted Spurious Emissions, B band 3-Carrier IS-856, Lower 1MHz Adjacent emissions - Channel Power Measurement

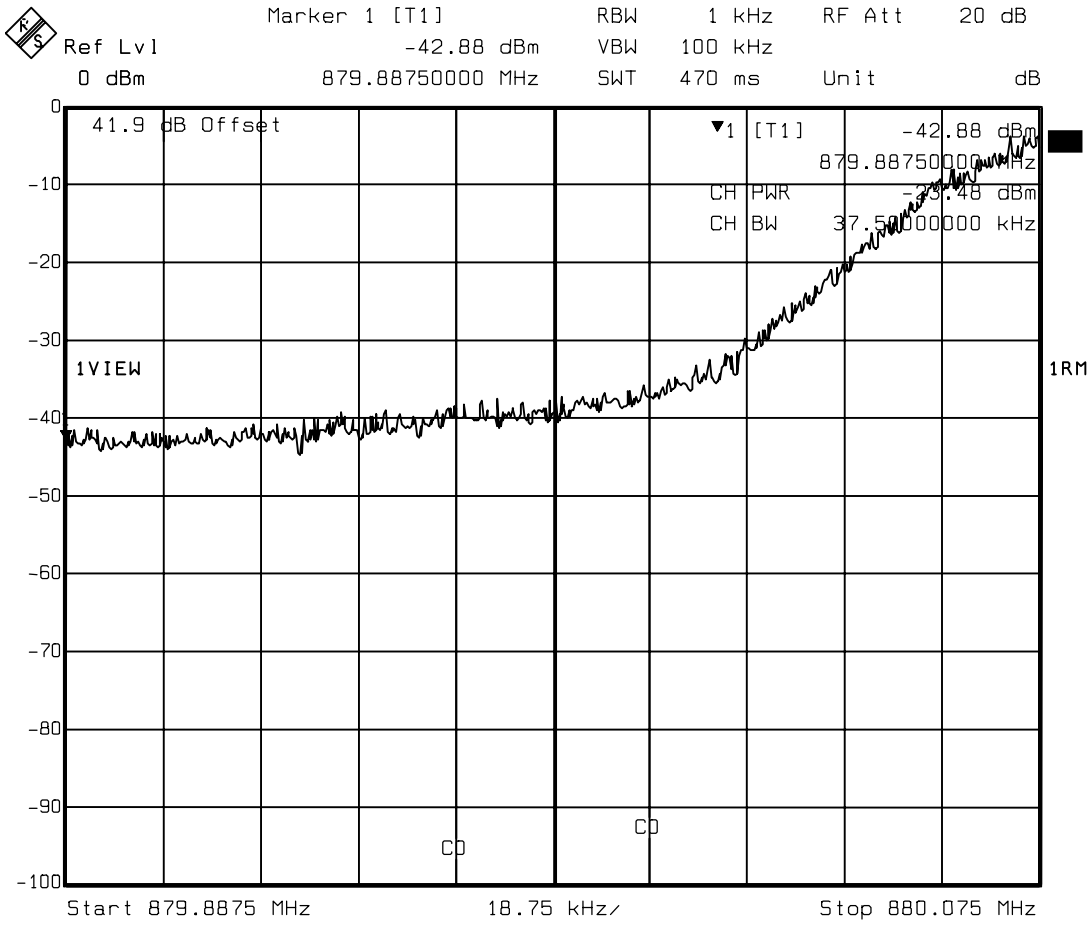
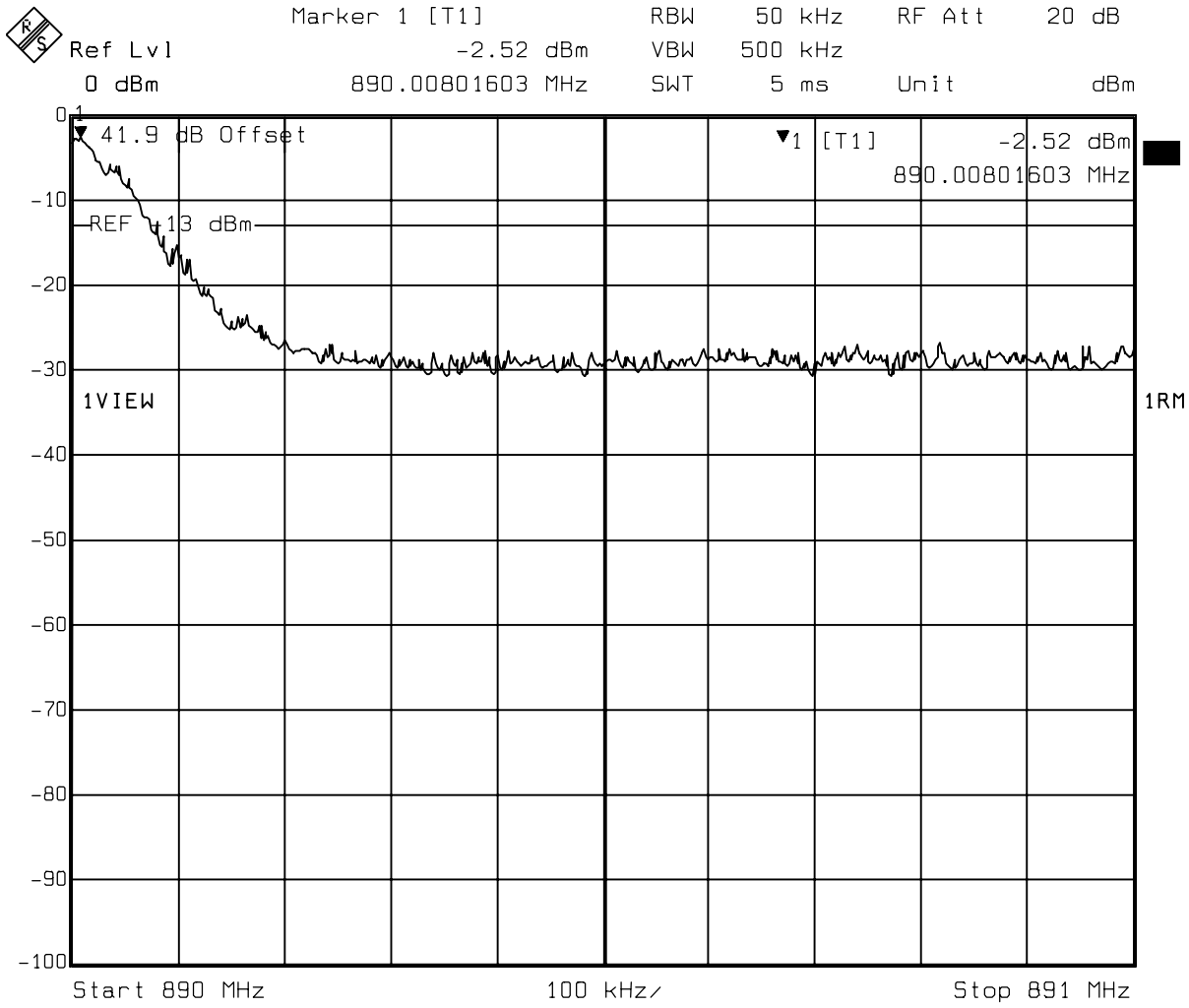


Figure 30 : Conducted Spurious Emissions, B band 3-Carrier, IS-856, Upper 1MHz Adjacent emission



Title: Upper edge
Comment A: Channels 560, 601, 642, temperature 25C.
Date: 04.OCT.2004 14:59:14

Figure 31 : Conducted Spurious Emissions, B band 3-Carrier, IS-856, Upper 1MHz Adjacent emissions - Channel Power Measurement

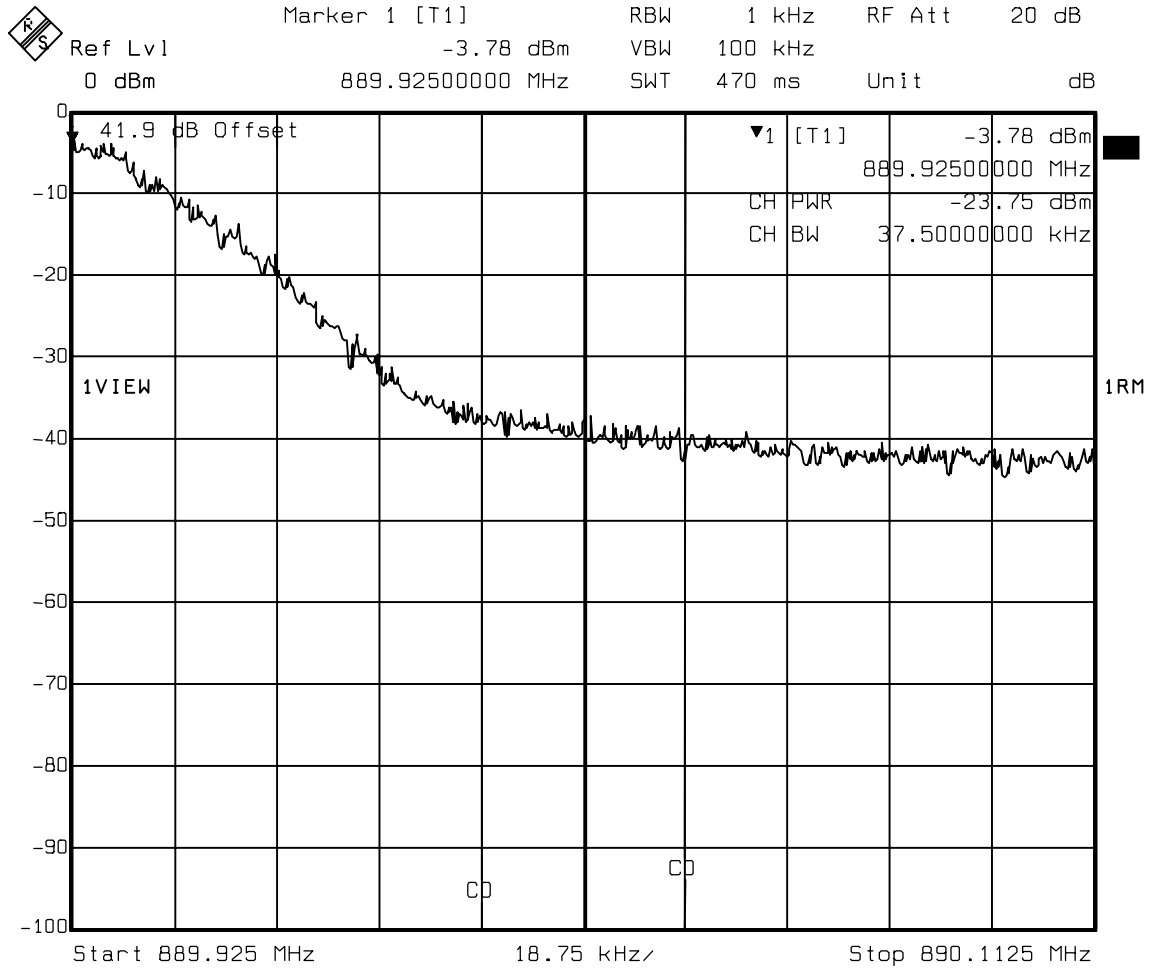


Figure 32 : Conducted Spurious Emissions, B band 9kHz to Lower Adjacent 1 MHz 3-Carrier, IS-856

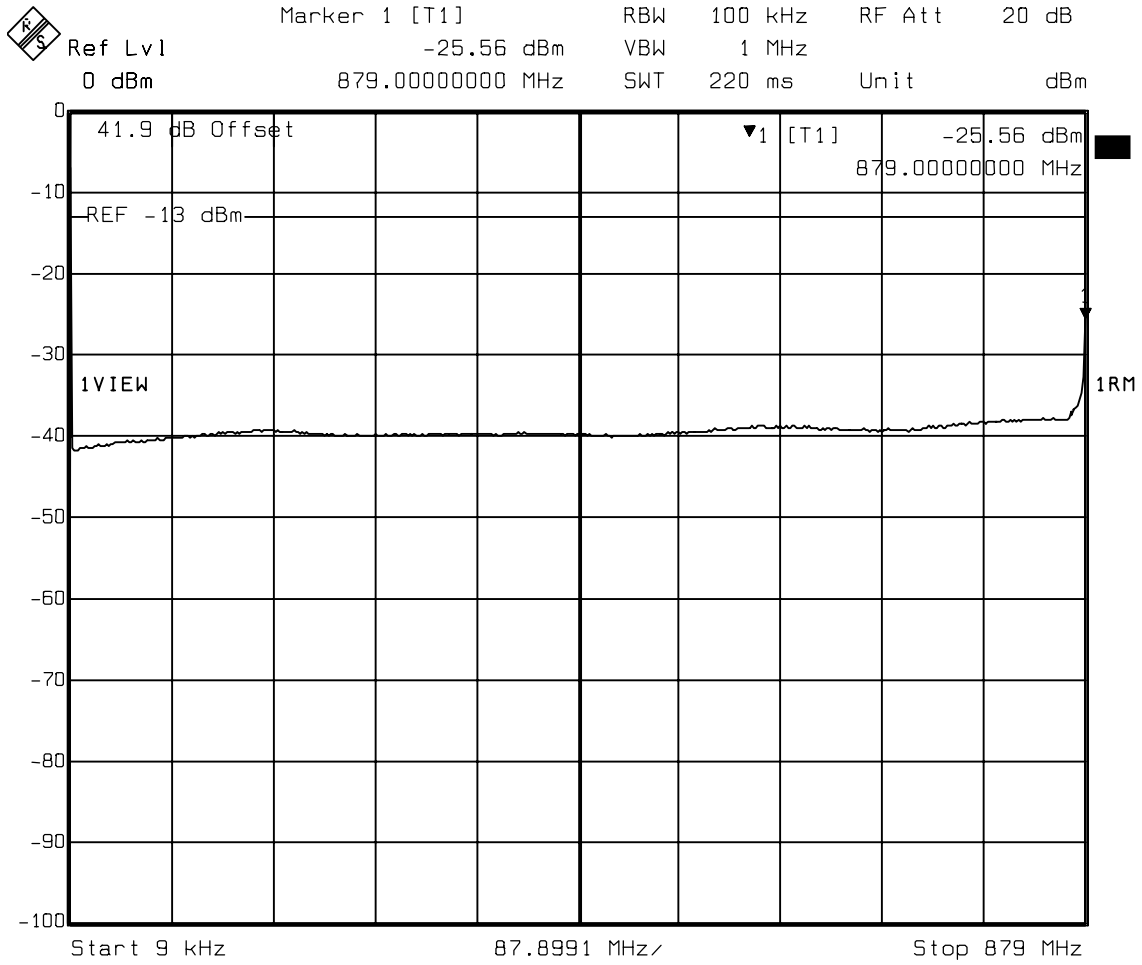


Figure 33 : Conducted Spurious Emissions, B band, Upper Adjacent 1MHz to 5 GHz range 3 -Carrier IS-856

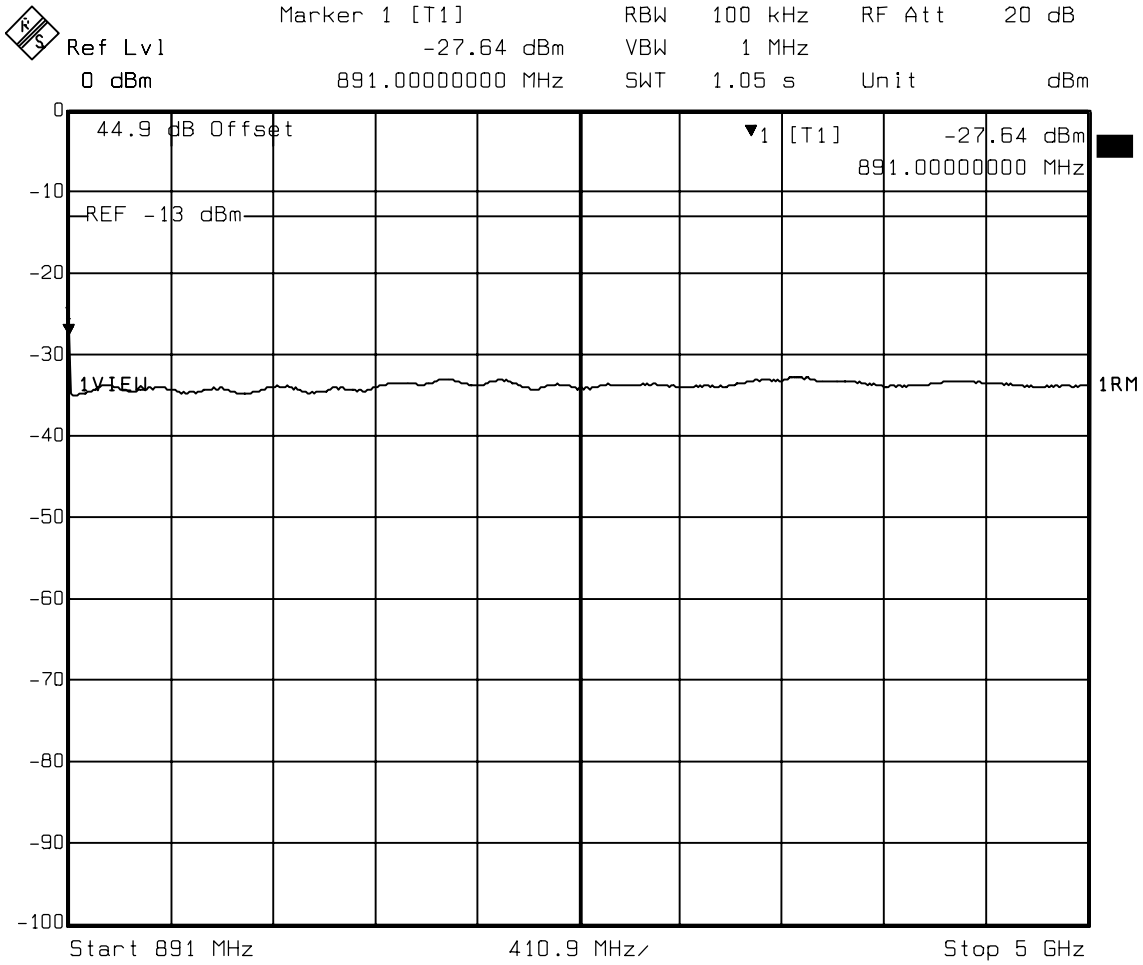


Figure 34 : Conducted Spurious Emissions, B band, 5 GHz to 10 GHz range 3-Carrier IS-856

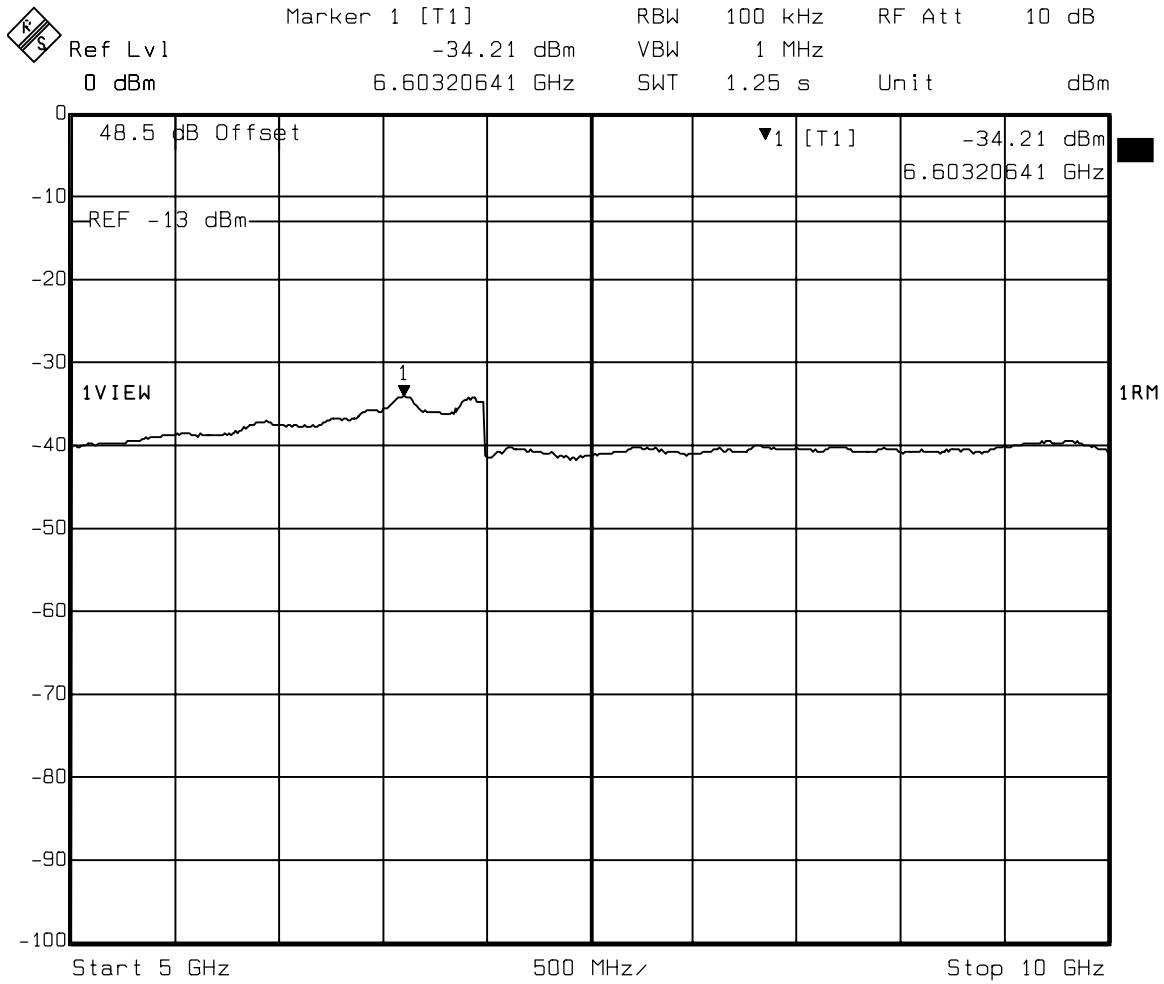


Figure 35 : Conducted Spurious Emissions, B band 3-Carrier, Lower 1MHz Adjacent emissions IS-856 (Left & Centre Carriers) and IS-95 (Right Carrier)

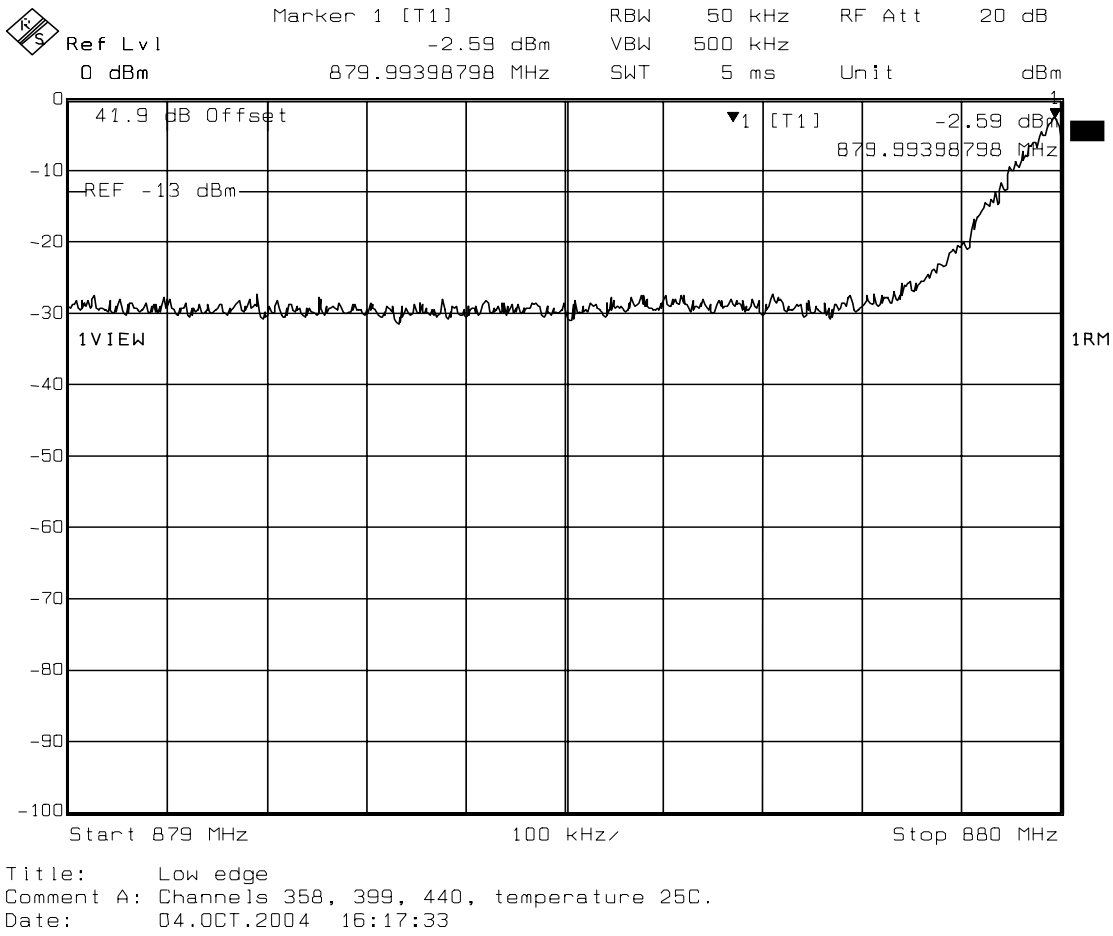


Figure 36 : Conducted Spurious Emissions, B band 3-Carrier Lower 1MHz Adjacent emissions - hannel Power Measurement IS-856 (Left & Centre Carriers) and IS-95 (Right Carrier)

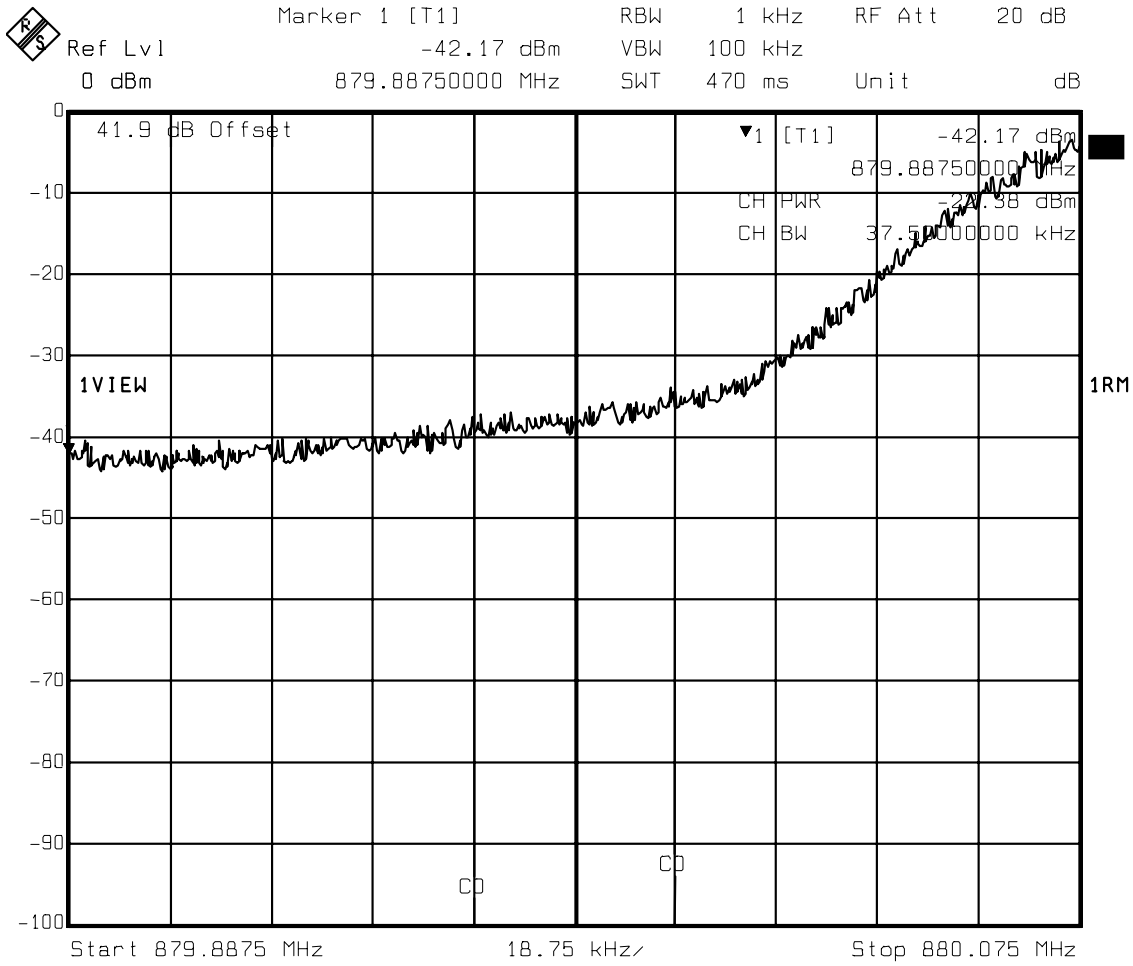
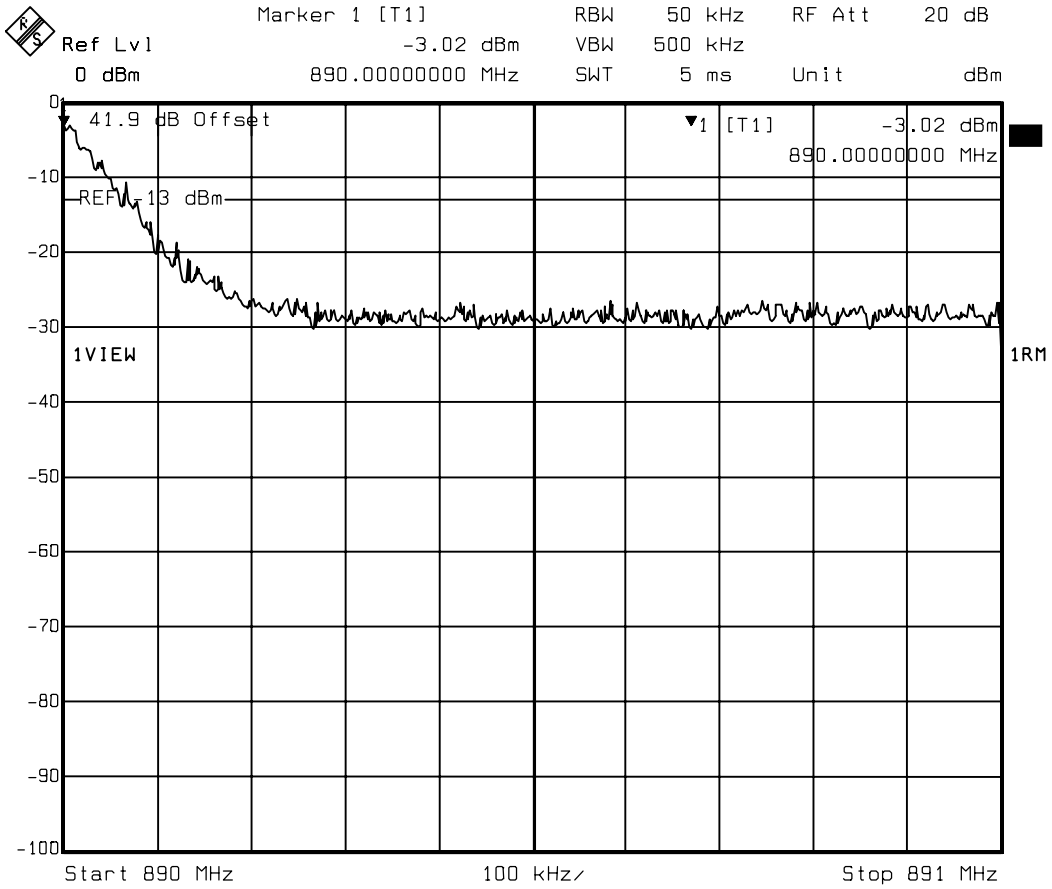


Figure 37 : Conducted Spurious Emissions, B band 3-Carrier, Upper 1MHz Adjacent emission IS-856 (Left & Centre Carriers) and IS-95 (Right Carrier)



Title: Upper edge
Comment A: Channels 560, 601, 642, temperature 25C.
Date: 04.OCT.2004 15:30:01

Figure 38 : Conducted Spurious Emissions, B band 3-Carrier, Upper 1MHz Adjacent emissions - Channel Power MeasurementI IS-856 (Left & Centre Carriers) and IS-95 (Right Carrier)

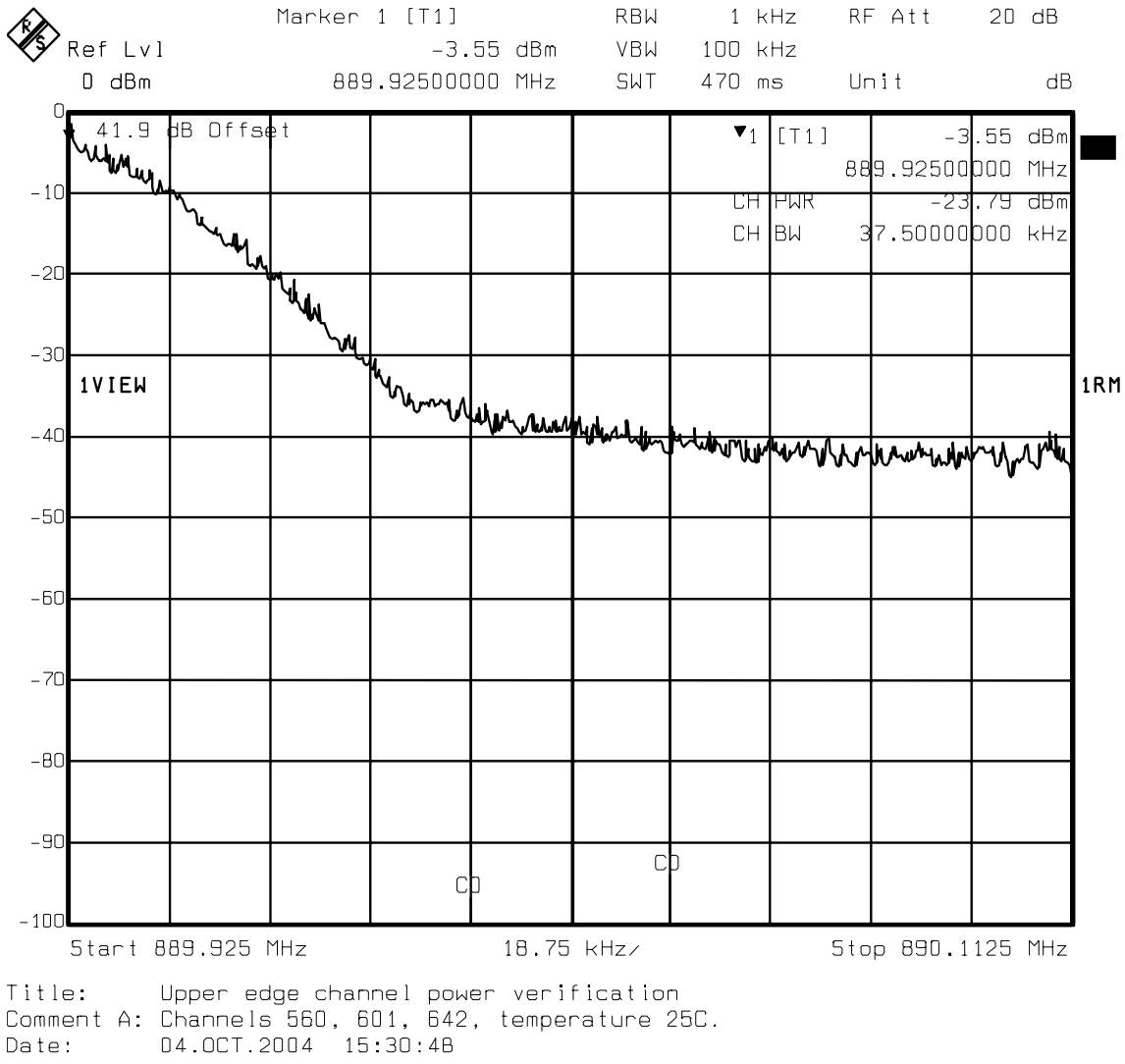


Figure 39 : Conducted Spurious Emissions, B band 9kHz to Lower Adjacent 1 MHz 3-Carrier, IS-856 (Left & Centre Carriers) and IS-95 (Right Carrier)

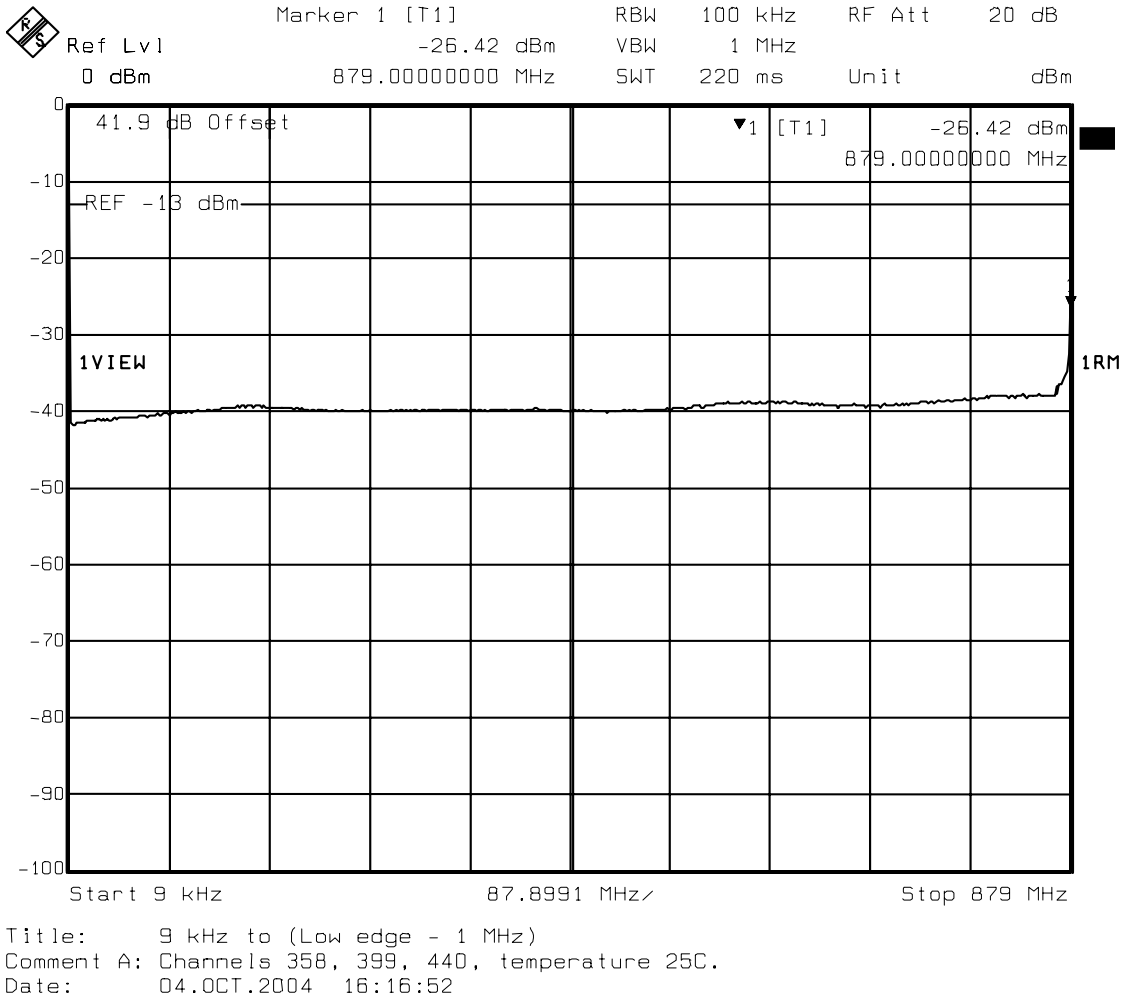


Figure 40 : Conducted Spurious Emissions, B band, Upper Adjacent 1MHz to 5 GHz range 3 -Carrier IS-856 (Left & Centre Carriers) and IS-95 (Right Carrier)

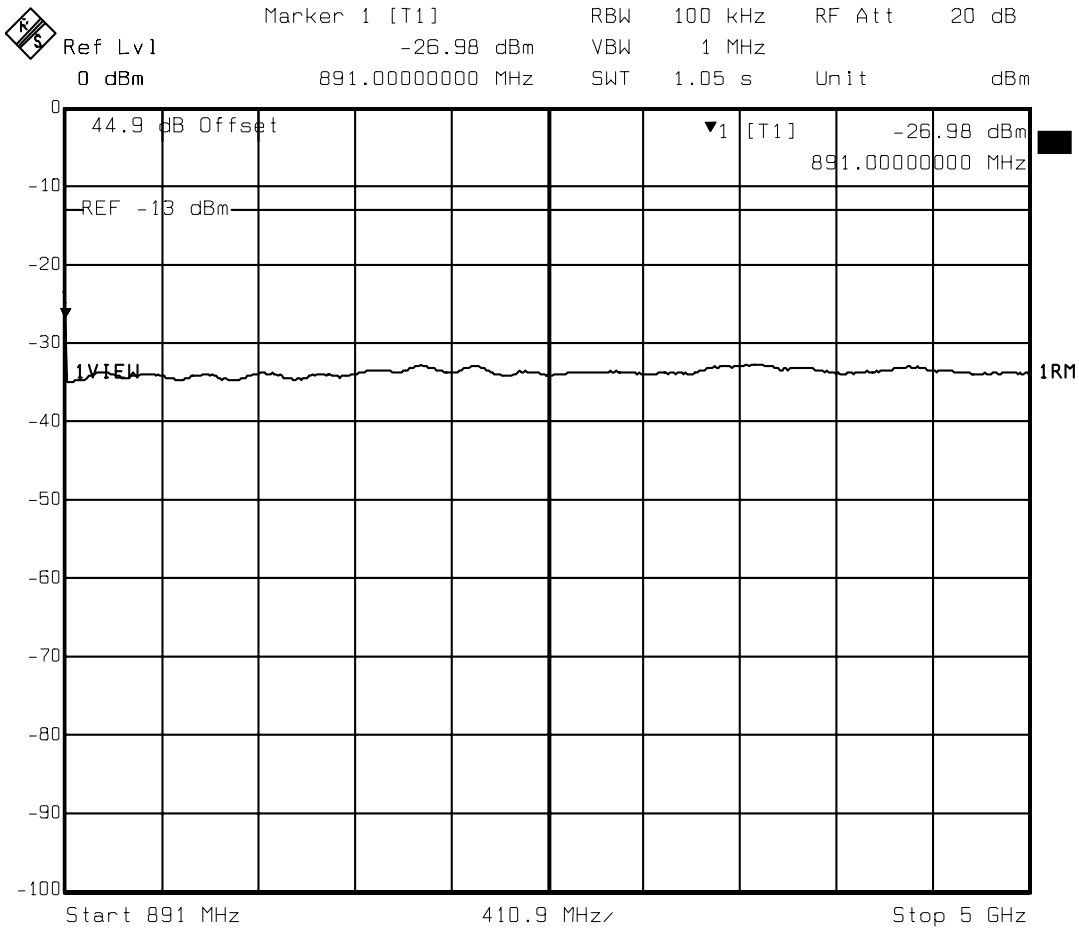


Figure 41 : Conducted Spurious Emissions, B band, 5 GHz to 10 GHz range 3-Carrier IS-856 and IS-95 Combination

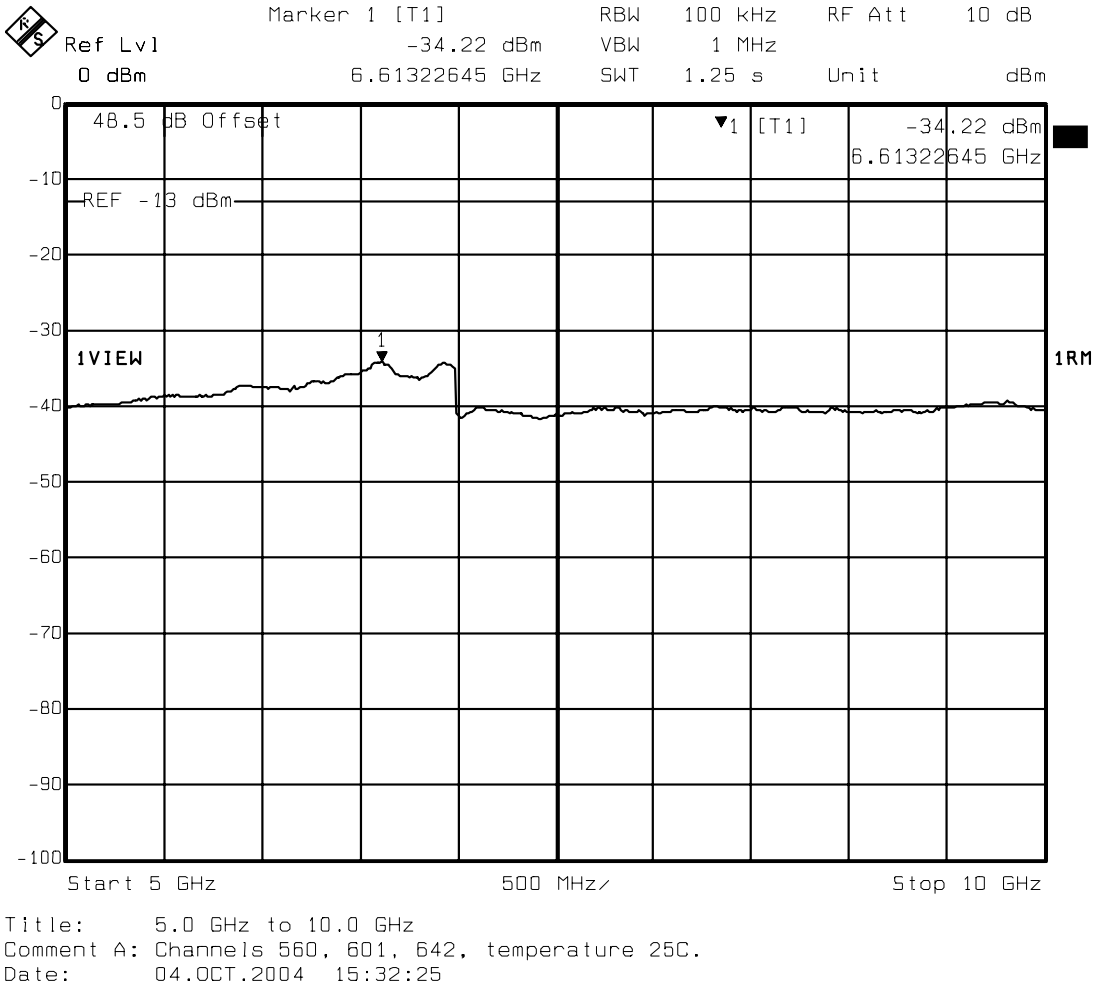


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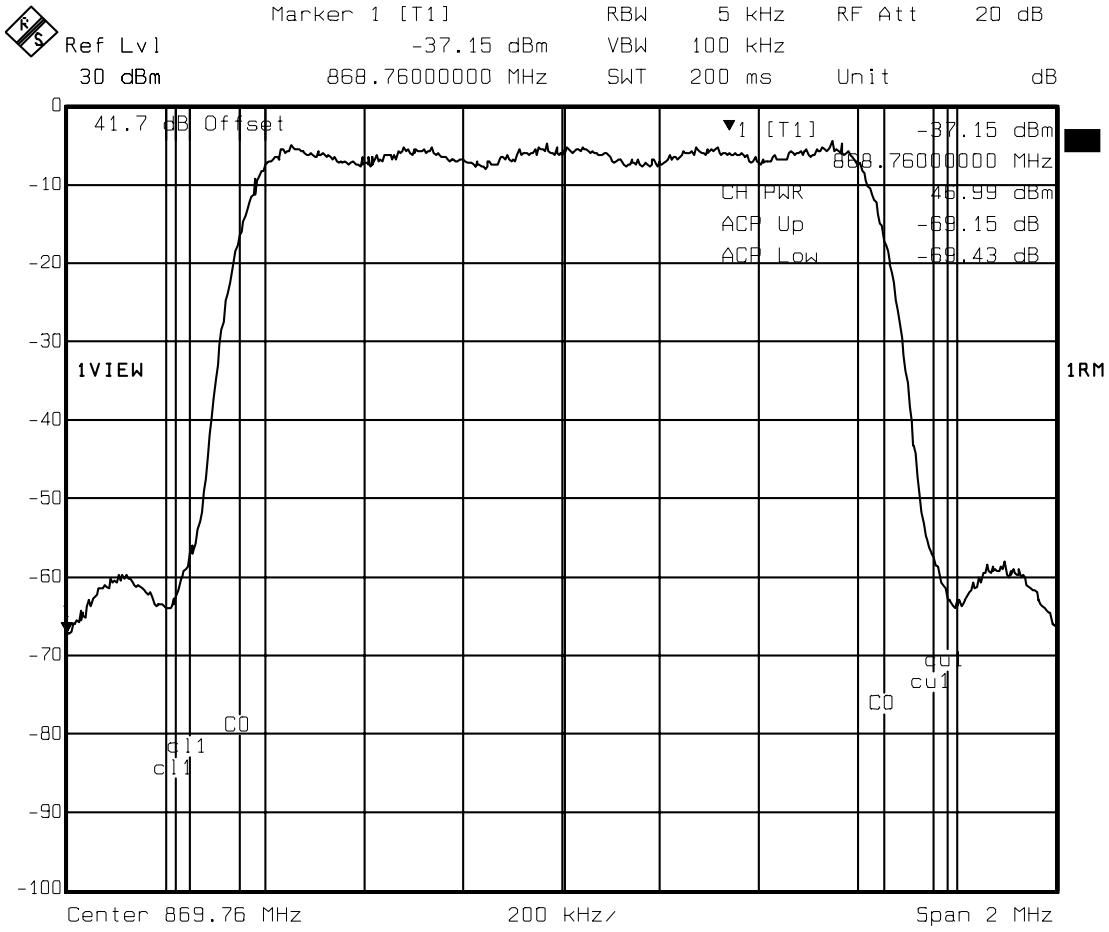
Figure 42 : 750 kHz offsets single-carrier, channel 1015



Title: RS-129, +/- 0.75 MHz offsets
Comment A: 800MHz, ch 1015
Date: 24.SEP.2004 13:24:46

Figure 43 : 1.98 MHz offsets single-carrier, channel 1015

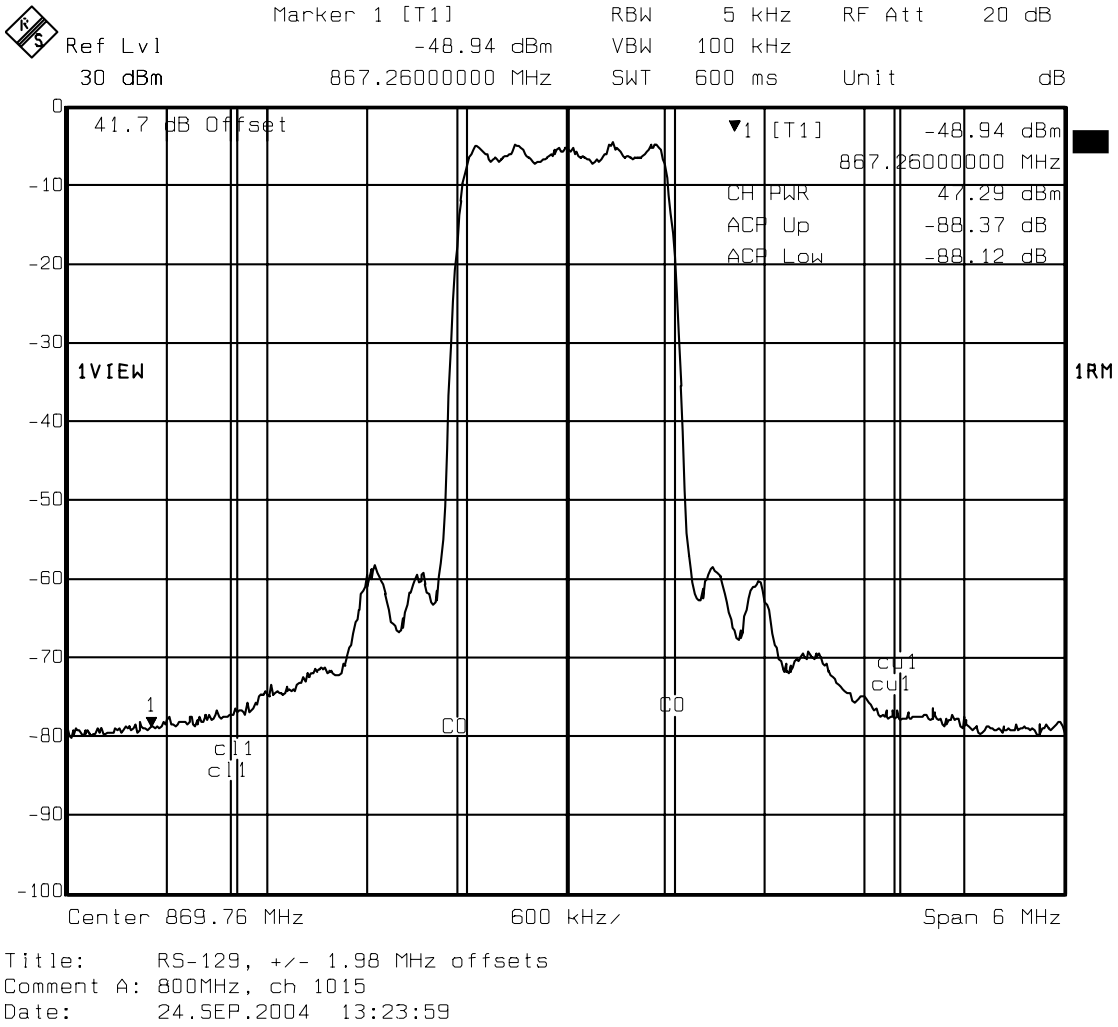


Figure 44 : 750 kHz offsets 3-carrier, channel 1015-33-74, IS-95

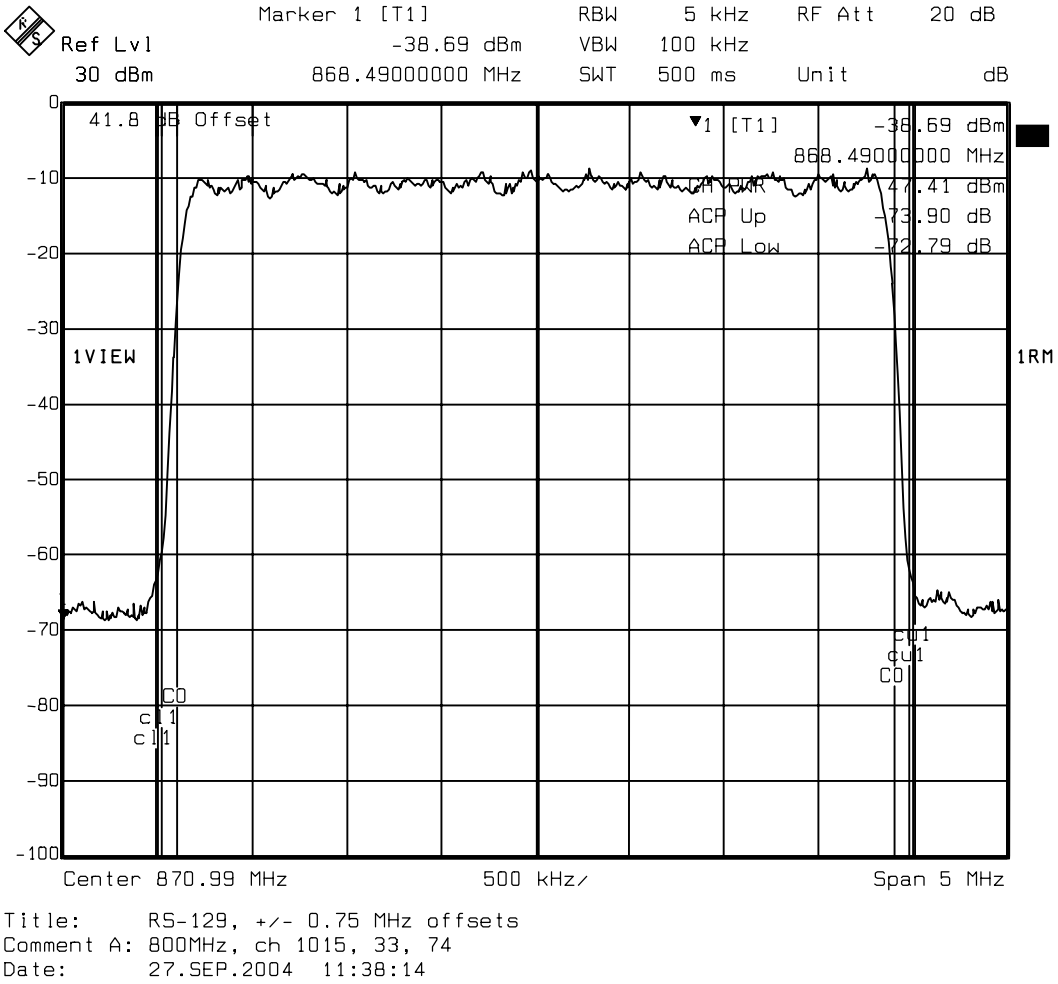


Figure 45 : 1.98 MHz offsets 3-carrier, channel 1015-33-74, IS-95

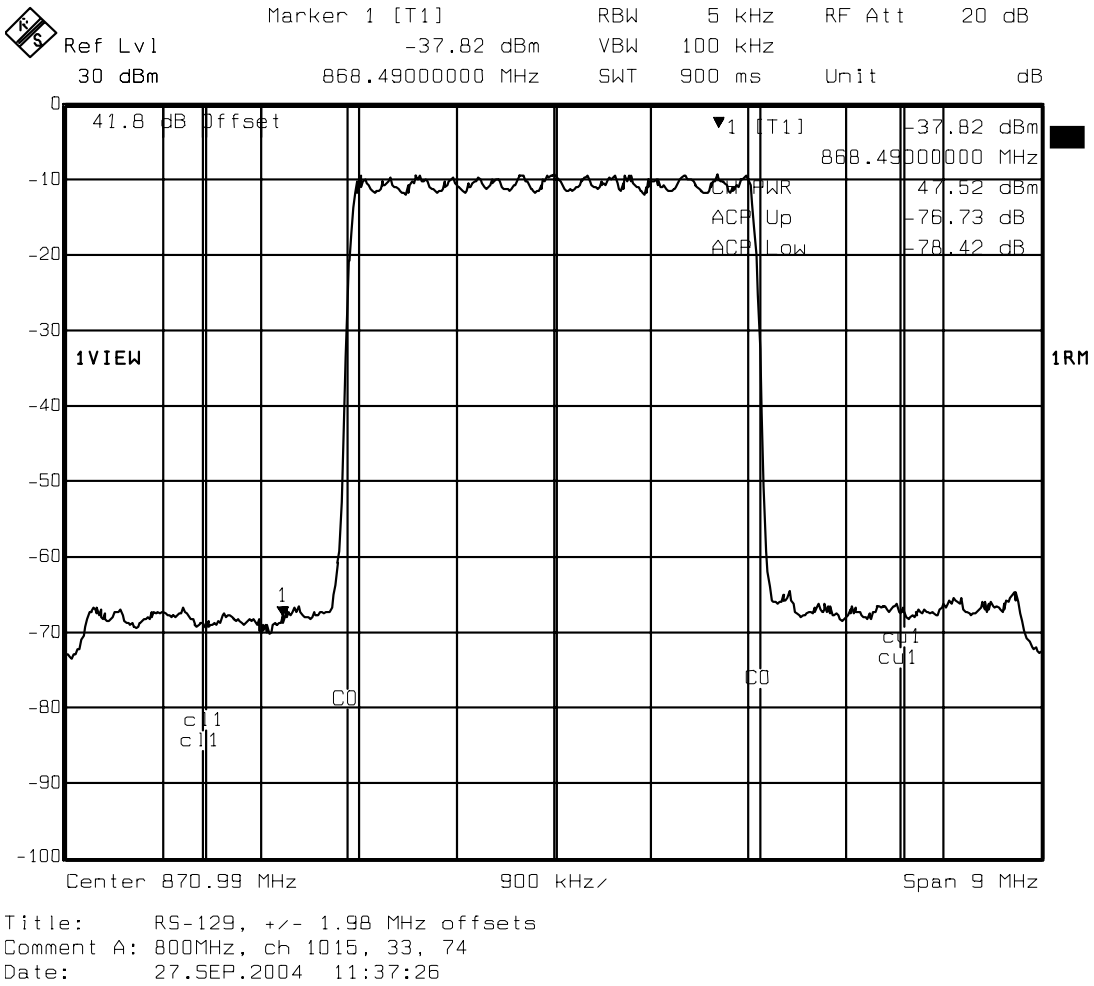


Figure 46 : 750 kHz offsets single-carrier, channel 358, IS-856

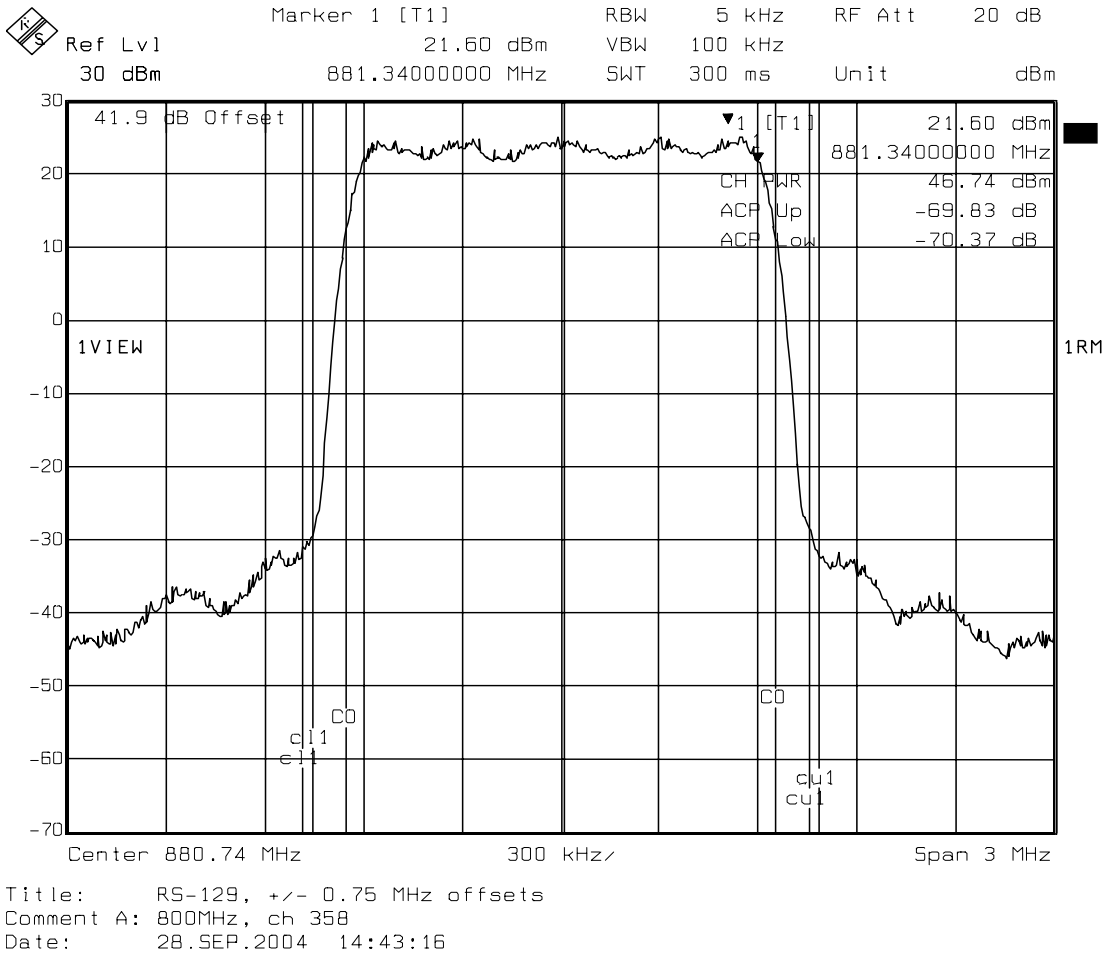


Figure 47 : 1.98 MHz offsets single-carrier, channel 358, IS-856

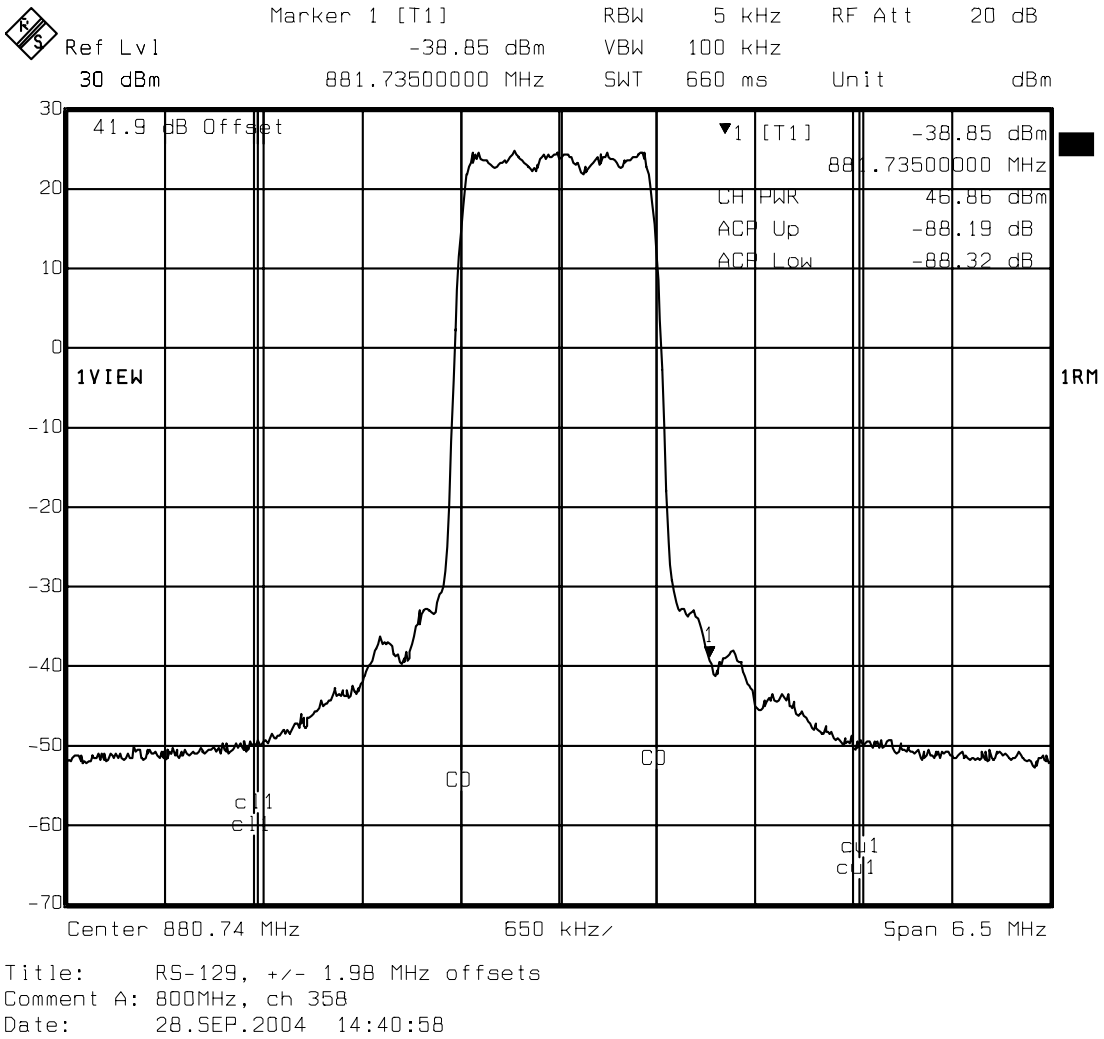


Figure 48 : 750 kHz offsets 3-carrier, channel 358-399-440, IS-856

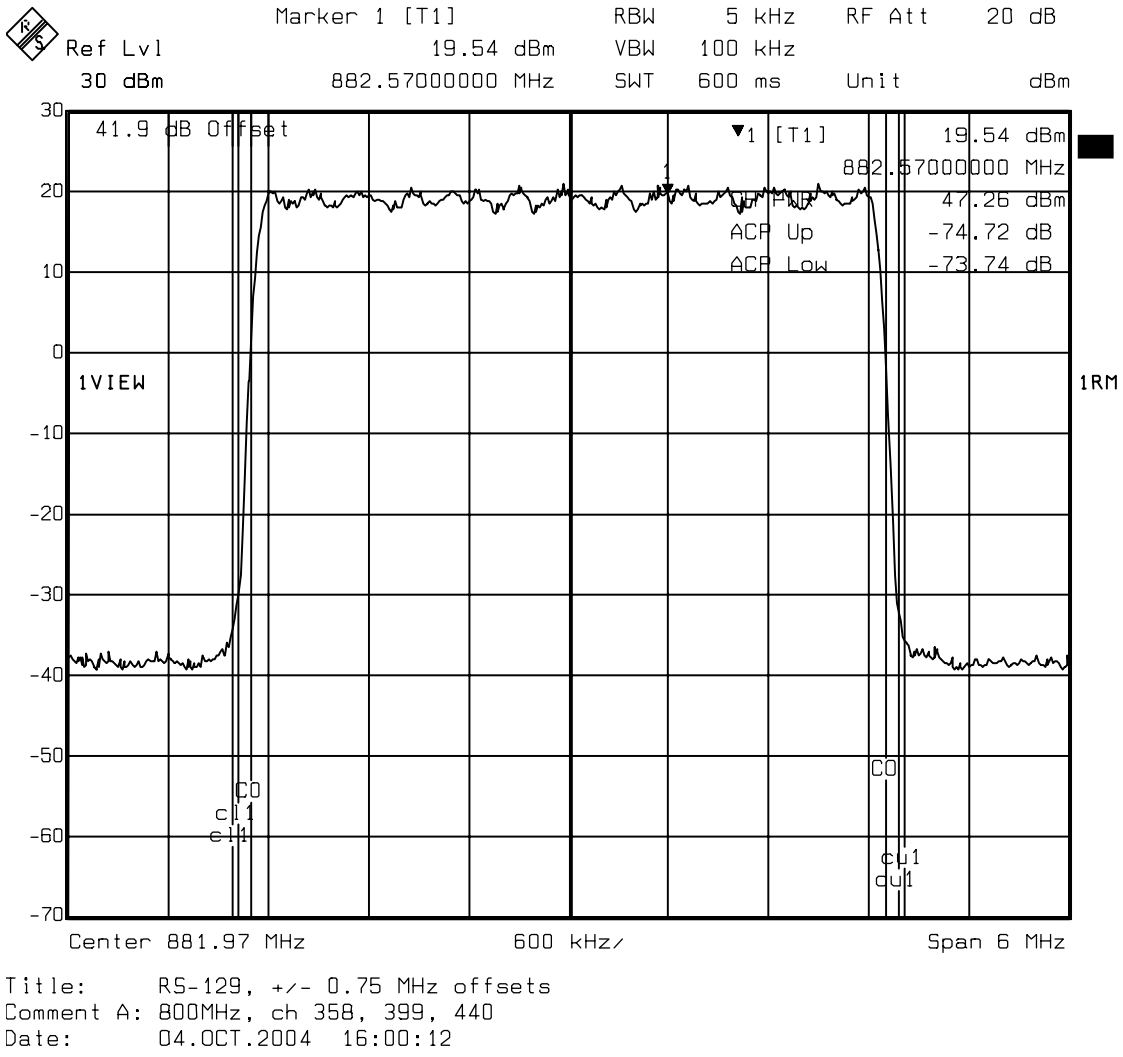


Figure 49 : 1.98MHz offsets 3-carrier, channel 358-399-440, IS-856

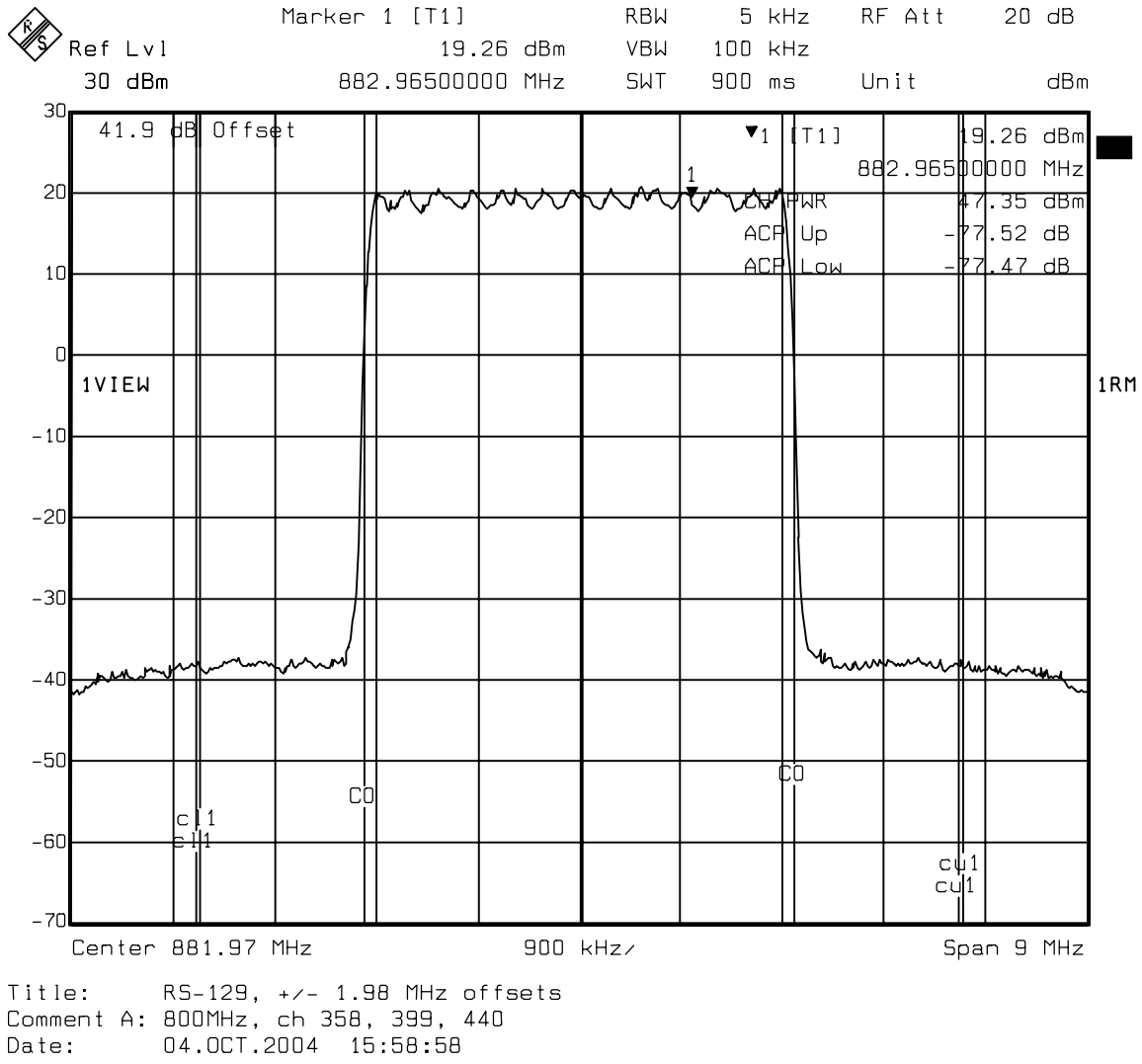
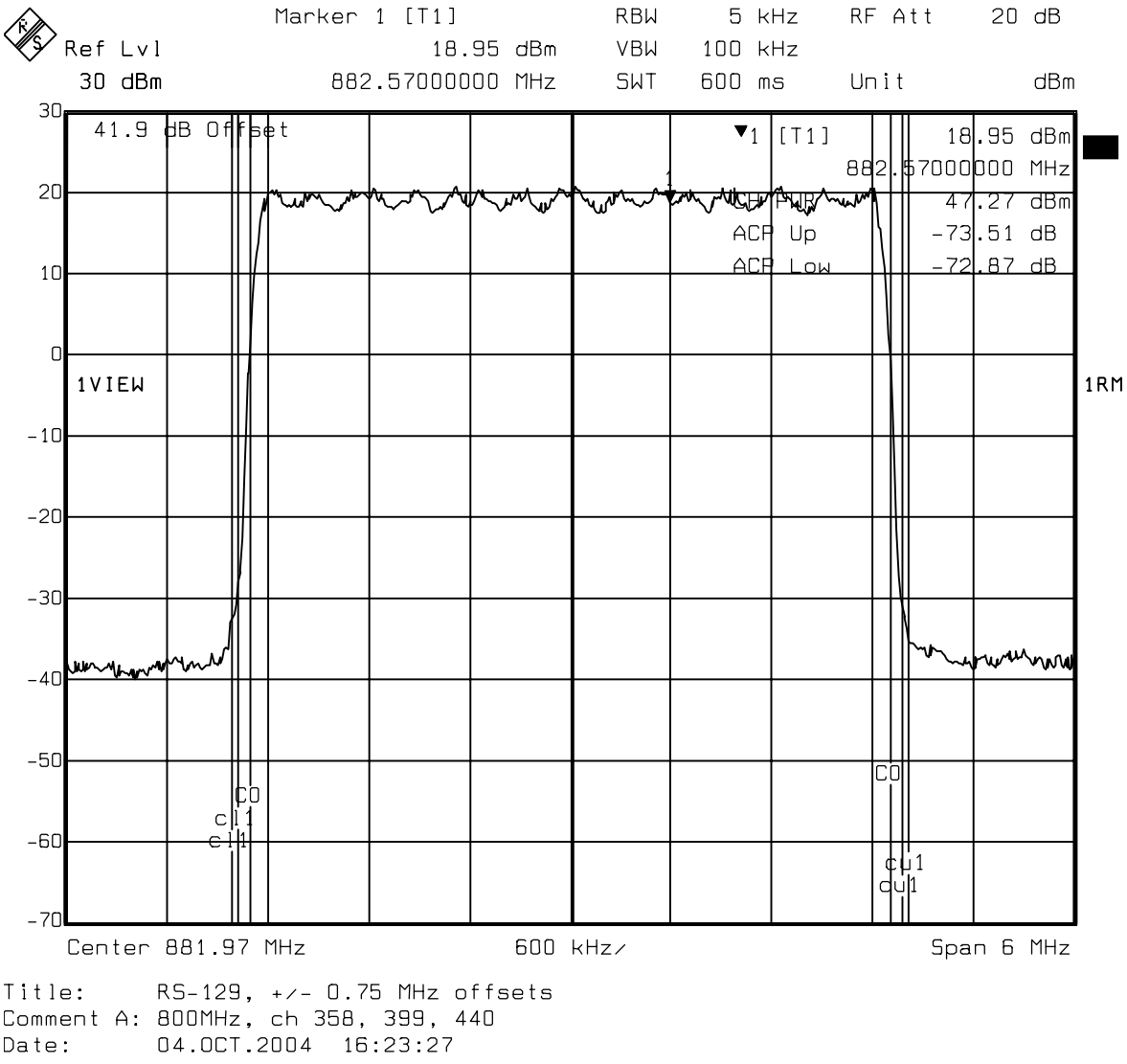
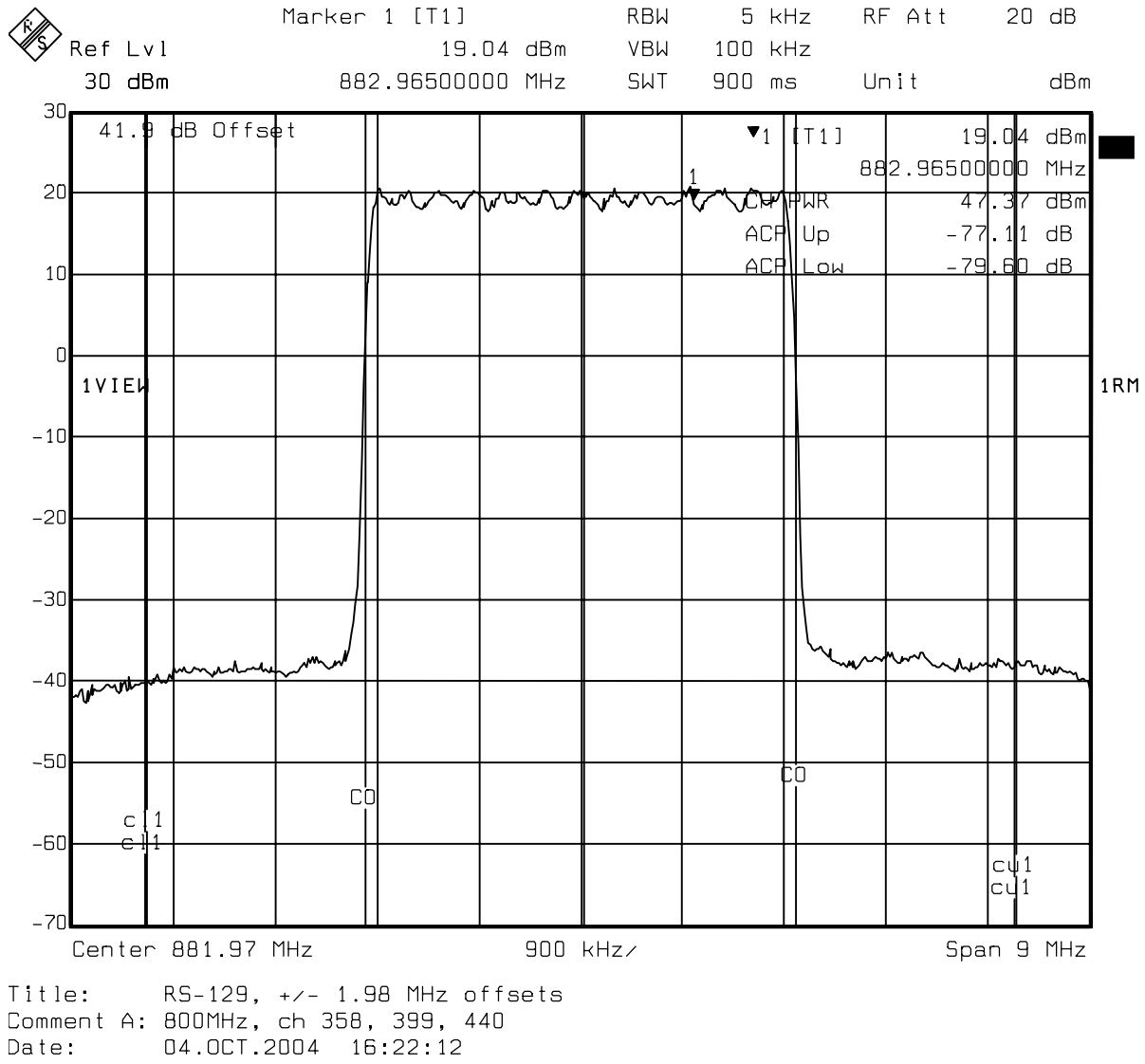


Figure 50 : 750 kHz offsets 3-carrier, channel 358-399 (IS-856) and 440 (IS-95)



Title: RS-129, +/- 0.75 MHz offsets
Comment A: 800MHz, ch 358, 399, 440
Date: 04.OCT.2004 16:23:27

Figure 51 : 1.98 MHz offsets 3-carrier, channel 358-399 (IS-856) and 440 (IS-95)



Title: RS-129, +/- 1.98 MHz offsets
Comment A: 800MHz, ch 358, 399, 440
Date: 04.OCT.2004 16:22:12