



# **EXHIBIT 2C**

## **Test Report Provided by Nortel Networks**

**Applicant: Nortel Networks**

**For Class II Permissive Change  
Certification on:**

**AB6NT800SFRM**



---

## Test Report for FCC Equipment Authorization

FCC ID AB6NT800SFRM

**Document:** FCC ID AB6NT800SFRM  
**Stream:** 00  
**Issue:** 1.00  
**Document Status:** Approved  
**Issue Date:** July 9, 2004  
**Security Status:** Nortel Networks Confidential  
**Author:** Fan Zhang

---

© 2004 Nortel Networks Limited

### Disclaimer

The master of this document is stored on an electronic database and "write protected". The protection can be altered by authorized persons only. Viewing of the master document electronically ensures access to the current issue. Any hardcopies must be regarded as uncontrolled copies.

### Security Warning

The information disclosed herein is proprietary to Nortel Networks and not to be used by or disclosed by unauthorized persons without the written consent of Nortel Networks. The recipient of this document shall respect the security status of the information.

---

PAGE INTENTIONALLY LEFT BLANK

## Table of Contents

<b>Publication History .....</b>	<b>9</b>
List of Consultants .....	9
Decision Maker .....	10
Decision Ratifier .....	10
Revision History .....	10
<b>Acronyms and Abbreviations .....</b>	<b>11</b>
<b>1 Introduction.....</b>	<b>13</b>
1.1 Required Tests .....	13
<b>2 Engineering Declaration.....</b>	<b>14</b>
<b>3 Equipment Authorization Application Requirements .....</b>	<b>15</b>
3.1 Standard Test Conditions and Test Equipment.....	15
3.2 EUT Identification List.....	15
3.3 Test Equipment List.....	16
<b>4 Transmitter Tests.....</b>	<b>17</b>
4.1 RF Power Output .....	17
4.1.1 RF Power Output Requirements .....	17
4.1.1 FCC Part 2.1046 Measurements required: RF power output.....	17
4.1.2 Test Method .....	17
4.1.3 Test Setup .....	17
4.1.4 DOM .....	17
4.1.5 RF Output Power Test Results.....	19
4.2 Occupied Bandwidth.....	20
4.2.1 Occupied Bandwidth Requirements .....	20
4.2.1 FCC Part 2.1049 .....	20
4.2.2 Test Method .....	20
4.2.3 Test Setup .....	20
4.2.4 Test Result .....	21
4.3 Spurious Emissions at Antenna Terminals .....	22
4.3.1 Spurious Emissions Requirements.....	22
4.3.1 FCC Part 2.1051 .....	22
4.3.1 FCC Part 2.1057 - Frequency Spectrum to be investigated.....	22
4.3.1 FCC Part 22.917 Limit.....	22
4.3.2 Test Method .....	23
4.3.2.1 Adjacent 1MHz to indicated cellular band (Upper and Lower) .....	23
4.3.2.2 All other Spurious Emissions up to 10 GHz.....	24
4.3.3 Test Requirements .....	24
4.3.4 Test Setup .....	25
4.3.5 Test Results .....	26
4.4 Frequency Stability .....	27
4.4.1 Frequency Stability Requirements.....	27
4.4.1 FCC Part 2.1055 .....	27

---

4.4.2 Frequency Stability Test .....	28
<b>5 Appendix - Single Carrier IS-856 Spurious Emission .....</b>	<b>29</b>
5.1 Channel 17 IS856 Spurious Emissions at the 800MHz SFRM (CR SCLPA) Ant. Port ...	29
5.2 Channel 283 IS856 Spurious Emissions at the 800MHz SFRM (CR SCLPA) Ant. Port .	33
5.3 Channel 384 IS856 Spurious Emissions at the 800MHz SFRM (CR SCLPA) Ant. Port .	39
5.4 Channel 616 IS856 Spurious Emissions at the 800MHz SFRM (CR SCLPA) Ant. Port .	44
<b>References.....</b>	<b>51</b>

---

## List of Figures

Figure 1 : Test Setup for RF Power Output Measurement .....	18
Figure 2 : Test Setup for Occupied Bandwidth Measurement.....	21
Figure 3 : Test Setup for Spurious Emissions Measurement.....	25
Figure 4 : Occupied Bandwidth Channel 17 .....	29
Figure 5 : A''+A Band Ch 17 IS856 Adjacent 1 MHz Lower emissions 868-869 MHz .....	30
Figure 6 : A''+A Band Ch 17 IS856 Adjacent 1 MHz Upper emissions 880-881 MHz.....	31
Figure 7 : A''+A Band Channel 17 IS856 Conducted Spurious Emission 10kHz - 868MHz ....	32
Figure 8 : A''+A Band Channel 17 IS856 Conducted Spurious Emission 881Hz - 10GHz .....	33
Figure 9 : Occupied Bandwidth Channel 283.....	34
Figure 10 : A''+A Band Ch 283 IS856 Adjacent 1 MHz Lower emissions 868-869 MHz .....	35
Figure 11 : A''+A Band Ch 283 IS856 Adjacent 1 MHz Upper emissions 880-881 MHz.....	36
Figure 12 : A''+A Band Channel 283 IS856 Conducted Spurious Emission 10kHz - 868MHz	37
Figure 13 : A''+A Band Channel 283 IS856 Conducted Spurious Emission 881MHz - 1GHz .38	
Figure 14 : A''+A Band Channel 283 IS856 Conducted Spurious Emission 1GHz - 10GHz ....	39
Figure 15 : Occupied Bandwidth Channel 384.....	40
Figure 16 : A''+A Band Ch 384 IS856 Adjacent 1 MHz Lower emissions 879-880 MHz .....	41
Figure 17 : B Band Ch 384 IS856 Adjacent 1 MHz Upper emissions 890-891 MHz.....	42
Figure 18 : B Band Channel 384 IS856 Conducted Spurious Emission 10kHz - 879MHz .....	43
Figure 19 : B Band Channel 384 IS856 Conducted Spurious Emission 891MHz - 10GHz.....	44
Figure 20 : Occupied Bandwidth Channel 616.....	45
Figure 21 : A''+A Band Ch 616 IS856 Adjacent 1 MHz Lower emissions 879-880 MHz .....	46
Figure 22 : B Band Ch 616 IS856 Adjacent 1 MHz Upper emissions 890-891 MHz.....	47
Figure 23 : B Band Channel 616 IS856 Conducted Spurious Emission 10kHz - 879MHz .....	48
Figure 24 : B Band Channel 616 IS856 Conducted Spurious Emission 891MHz - 1GHz.....	49
Figure 25 : B Band Channel 616 IS856 Conducted Spurious Emission 1GHz - 10GHz .....	50



---

## List of Tables

Table 1 : Required Tests .....	13
Table 2 : EUT Identification List.....	15
Table 3 : Test Equipment List.....	16
Table 4 : RF Output Power SFRM 800 MHz Radio Module with CR SCLPA .....	19
Table 5 : Measured Occupied Bandwidth SFRM 800 MHz Radio with CR SCLPA .....	21
Table 7 : All other Emission Spectrum Analyze Settings .....	24
Table 8 : Spurious Emissions Requirements .....	24
Table 9 : Spurious Emissions at the SFRM 800 MHz Radio Module with CR SCLPA .....	26





## Publication History

The latest controlled release of this document is located in Livelink at the following location:

<http://livelink-ott.ca.nortel.com/livelink/livelink.exe?func=ll&objId=9195516&objAction=browse&sort=name>

All other soft and hard copies are uncontrolled. It is the responsibility of the reader to ensure that the latest release of this document is being used.

## List of Consultants

The following people have reviewed this document prior to its release and have recommended its approval:

Printed Name	Function	Department
Doug Pilmoor	RF Hardware & System	2M83
Fan Zhang	BTS Hardware & System	2M83
Borislav Todorov	BTS RF System	2M64
Thomas Wong	CDMA/TDMA Regulatory Prime	2U40
James Loo	BTS RF Systems	2M64
Ryan Santa	BTS System	2S42
Hanli Wang	BTS System	2S42
Norma Hammond	BTS System	2S40

## Decision Maker

Decision Maker's Name	Signature	Date
Thomas Wong		

## Decision Ratifier

The release of this document has been reviewed and approved for distribution and use by the following:

Ratifier's Name	Signature	Date
Doug Pilmoor		

## Revision History

<b>Stream/Issue</b>	<b>Revision Date</b>	<b>Reason for Change</b>	<b>Author</b>
00/00.01	28/06/2004	Draft release of test Report	Fan Zhang
00/00.02	02/07/2004	Updated Release after First Review	Fan Zhang
00/1.00	09/07/2004	Approved Version	Fan Zhang

Change bars will not be used in this document.

---

## Acronyms and Abbreviations

BPF	Bandpass Filter
BTS	Base Station Transceiver Subsystem
BW	Bandwidth
CDMA	Code Division Multiple Access
CEM	Channel Enhancement Module
CM	Control Module
CR	Cost Reduced
DE	Digital Encloser
DOM	Data Only Module
DPM	Duplexer Preselector Module
FAM	Fan and Alarm Module
GPSTM	Global Position System Timing Module
LO	Local Oscillator
SFRM	Single-Carrier Flexible Radio Module
PAM	Power Amplifier Module
TRM	Transmitter and Receiver Module
PA	Power Amplifier
RBW	Resolution BandWidth
RM	Radio Module
RMS	Root Mean Square
RF	Radio Frequency
SA	Spectrum Analyzer
TBD	To Be Determined



# 1 Introduction

This test report supports FCC filing for DOM on SFRM 800 MHz Radio with CR SCLPA. This test report will be used as a filing for FCC part 22. This filing includes single carrier mode for the 800MHz cellular band. The following test results include RF Power Output, Occupied Bandwidth and Spurious Emissions at Antenna Terminals, and Transmitter Test (1xEV-DO Mode Transmitter). Emissions testing was conducted at -48VDC at room temperature. The IS856 modulation schemes will be included in this report.

This test report is 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' SFRM 800 MHz Radio .

The SFRM 800 MHz Radio 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]*
- *“Recommended Minimum Performance Standards for cdma200 High Rate Packet Data Access Network”, 3GPP2, C.S0032 Version 2.0, Dec.12, 2003 [4]*

## 1.1 Required Tests

Table 1 summarizes the required tests for the MFRM 800 MHz Radio.

**Table 1 : Required Tests**

<b>FCC Measurement Specification</b>	<b>FCC Limit Specification</b>	<b>Description</b>	<b>Test to be Performed?</b>
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	No
2.1055	22.355	Frequency Stability	No

## 2 Engineering Declaration

Wireless Access


**NORTEL  
NETWORKS™**


 Test Report for FCC Equipment  
 Authorization  
 Test Report for FCC Equipment Authoriza-

### 2 Engineering Declaration

The CDMA 800MHz SFRM Radio 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:  
 Fen Zheng  
 BTS Systems Test Prime  
 Nortel Networks  
 Ottawa Canada

  
 Signature

July 09, 2004  
 Date

Reviewed by:  
 Thomas Wong  
 CDMA/TDMA Regulatory  
 Emissions Prime  
 Nortel Networks  
 Calgary Canada

  
 Signature

July 09, 2004  
 Date

Approved by:  
 Doug Pilmoor  
 BTS System Manager  
 Nortel Networks  
 Ottawa Canada

  
 Signature

9 July 2004  
 Date

Page 14

00.02  
 Stream 00.02 Issue 00.02

00.02  
 00.02

### 3 Equipment Authorization Application Requirements

#### 3.1 Standard Test Conditions and Test Equipment

The SFRM 800 MHz Radio 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
- Input modulation 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**

<b>Equipment Description</b>	<b>Model / Part Number</b>	<b>Release Number</b>	<b>Serial Number</b>
800MHz TRM Module	NTGS85BA	02	NNTM533WMTK5
800MHz CR PAM Module	NTGS8660	P8	NNTM532RPUYF
800MHz DPM	NTGS89DB	06	CLWVMM1009G3
DOM Module	NTBW99DO	00	ARVN21710007
CM Module	NTGS40AA	67	NNTM5357GNUG
CORE Module	NTGS30AA	50	NNTM5359V1FW
GPSTM Module	NTGS50AA	09	NNTM74TM2CDA



### 3.3 Test Equipment List

Table 3 shows the identification of the test equipment required.

**Table 3 : Test Equipment List**

<b>Description</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Serial Number</b>	<b>Cal. Due Date</b>
3Hz to 26.5GHz Spectrum Analyzer	Agilent	E4440A	MY44022812	New Equipment under warranty
PSA Series Transmitter Tester	Agilent	E4440A	MY44022812	New Equipment under warranty
RF Power Meter	HP	EPM-442A	US37480249	03 FEB 2005
RF Power Sensor Head	HP	8482A	US37293538	03 FEB 2005
30dB Attenuator (DC-18GHz, 150W)	Weinschel	66-30-34	BP1502	n/a
RF Cable	Nortel	A0731864	n/a	n/a
RF Cable	Nortel	A0783567	n/a	n/a

## 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

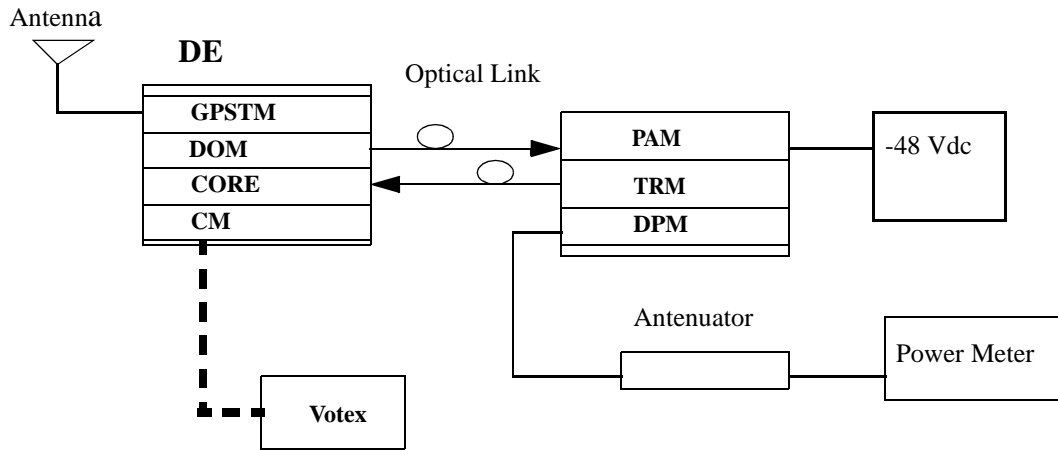
Setup the DE via the BTS controller to enable the SFRM 800 MHz Radio to transmit at the rated power for one carrier in the Baseband modulation formats IS-856 (16 QAM). Measurements will be made on channels at the bottom and top of the operator bands with the SFRM 800 MHz Radio operating with -48Vdc. The RF output power will be measured using the power meter.

#### 4.1.3 Test Setup

The set-up required for the SFRM 800 MHz Radio 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 SFRM 800 MHz Radio, with IS-856 (1xEV DO) waveforms were tested at maximum power. Transmitters operating with IS856 are tested at +42.9dBm for A'+A Band and +43.2dBm for B Band.



**Figure 1 : Test Setup for RF Power Output Measurement**

#### 4.1.5 RF Output Power Test Results

**Table 4 : RF Output Power SFRM 800 MHz Radio Module with CR SCLPA**

Channel Number (Band)	Frequency (MHz)	Measured RF Output Power (dBm)	Typical Maximum Rated Power (dBm)
17 (A'+A)	870.51	42.55	42.9
283 (A'+A)	878.49	42.84	42.9
384 (B)	881.52	42.87	43.2
616 (B)	888.48	42.93	43.2

## 4.2 Occupied Bandwidth

### 4.2.1 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.*

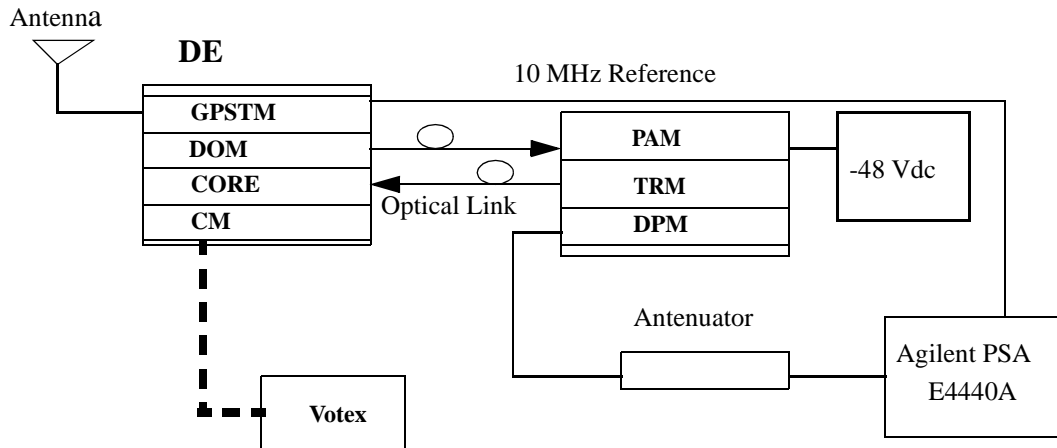
### 4.2.2 Test Method

Setup the DE via the BTS controller to enable the SFRM 800 MHz Radio to transmit at maximum rated power for one carrier in the Baseband modulation format IS-856. Measurements will be made on channels at the bottom and top of each of the operator bands.

A reference level is established by first using a resolution bandwidth that exceeds the signal bandwidth. RBW is then set to 1% of the estimated emission bandwidth and the video bandwidth is set to 3 times the resolution bandwidth. The markers are now moved to the -20 dB points (from the previously established reference level) on either side of centre frequency.

### 4.2.3 Test Setup

The set-up required for the SFRM 800 MHz Radio Occupied bandwidth test is illustrated in Figure 2.



**Figure 2 : Test Setup for Occupied Bandwidth Measurement**

**4.2.4 Test Result**

**Table 5 : Measured Occupied Bandwidth SFRM 800 MHz Radio with CR SCLPA**

Channel Number (Band)	Frequency (MHz)	Measured Occupied Bandwidth (MHz)
17 (A''+A)	870.51	1.2546
283 (A''+A)	878.49	1.2466
384 (B)	881.52	1.247
616 (B)	888.48	1.2487

## 4.3 Spurious Emissions at Antenna Terminals

### 4.3.1 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*

### 4.3.2 Test Method

Configure the BTS via the BTS controller to enable the SFRM 800 MHz Radio to transmit at maximum rated power for one carrier in the Baseband modulation format IS-856. 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:

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

**Table 6: Adjacent 1MHz Spectrum Analyze Settings**

Setting	1 Carrier
Resolution Bandwidth:	30 kHz
Video Bandwidth (3x RBW) <sup>a</sup>	(3x RBW)
Span	Set accordingly
Detector	RMS
Attenuation <sup>b</sup>	30 dB
Ref. Level Offset	29.8-30 dB

- a. If the spectrum analyzer cannot be set to the specified Video Bandwidth the next highest Video Bandwidth should be used.
- b. 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.



### 4.3.2.2 All other Spurious Emissions up to 10 GHz

**Table 7 : All other Emission Spectrum Analyze Settings**

Setting	1 Carrier
Resolution Bandwidth	100 kHz
Video Bandwidth (3x RBW)	300 kHz
Span	Set accordingly
Detector	RMS
Attenuation <sup>a</sup>	30 dB
Ref. Level Offset	29.8-30 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<sup>th</sup> harmonic of the fundamental emission) as per FCC Part 22.

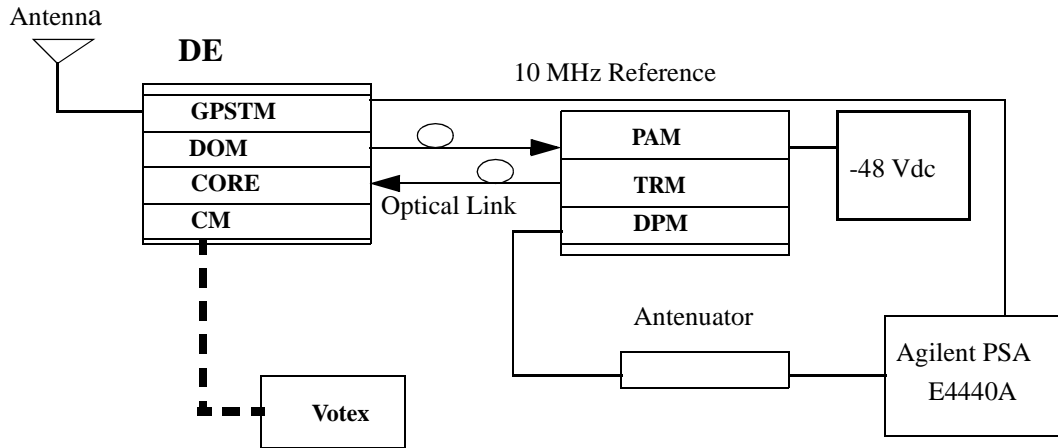
### 4.3.3 Test Requirements

**Table 8 : Spurious Emissions Requirements**

Frequency	1 Carrier
Offset +/- 1MHz	< -13dBm/30KHz
10K-10G (outside 1M)	< -13 dBm/100KHz

### 4.3.4 Test Setup

The set-up required for the SFRM 800 MHz Radio Antenna Port (DPM) Spurious Emission test is illustrated in Figure 3.



**Figure 3 : Test Setup for Spurious Emissions Measurement**

### 4.3.5 Test Results

**Table 9 : Spurious Emissions at the SFRM 800 MHz Radio Module with CR SCLPA**

<b>Frequency (MHz)</b>	<b>Spurious Emissions Level (dBm)</b>	<b>Margin to FCC Limit of -13 dBm (dB)</b>
869 MHz (Lower edge of band A''+A) Ch 17 (RBW=30 kHz)	-21.833	8.833
880 MHz (Upper edge of band A''+A) Ch 17 (RBW=30 kHz)	-37.868	24.868
869 MHz (Lower edge of band A''+A) Ch 283 (RBW=30 kHz)	-40.175	27.175
880 MHz (Upper edge of band A''+A) Ch 283 (RBW=30 kHz)	-23.16	10.16
880 MHz (Lower edge of band B) Ch 384 (RBW=30 kHz)	-21.987	8.987
890 MHz (Upper edge of band B) Ch 384 (RBW=30 kHz)	-39.338	26.338
880 MHz (Lower edge of band B) Ch 616 (RBW=30 kHz)	-37.972	24.972
890 MHz (Upper edge of band B) Ch 616 (RBW=30 kHz)	-23.227	10.227
10K - 868MHz (A''+A Band) Ch 17 (RBW=100 kHz)	-25.144	12.144
881MHz - 10GHz (A''+A Band) Ch 17 (RBW=100 kHz)	-32.947	19.947
10K - 868MHz (A''+A Band) Ch 283 (RBW=100 kHz)	-34.899	21.899
881MHz - 10GHz (A''+A Band) Ch 283 (RBW=100 kHz)	-26.22	13.22
10K - 879MHz (B Band) Ch 384 (RBW=100 kHz)	-24.531	11.531
891MHz - 10GHz (B Band) Ch 384 (RBW=100 kHz)	-32.35	19.35
10K - 879MHz (B Band) Ch 616 (RBW=100 kHz)	-33.277	20.277
891MHz - 10GHz (B Band) Ch 616 (RBW=100 kHz)	-26.03	13.03

## 4.4 Frequency Stability

### 4.4.1 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 (22.355)*

---

#### **4.4.2 Frequency Stability Test**

The DE incorporates a GPS module from Trimble Navigation. This 10MHz GPS reference is used to synchronize the entire Base Station. The GPS module has a frequency stability of 0.8 ppm over the range of -5C to 70C. The Base Station complies with the requirement as the GPS module is maintained at temperature higher than -5 degree C.

## 5 Appendix - Single Carrier IS-856 Spurious Emission

### 5.1 Channel 17 IS856 Spurious Emissions at the 800MHz SFRM (CR SCLPA) Ant. Port

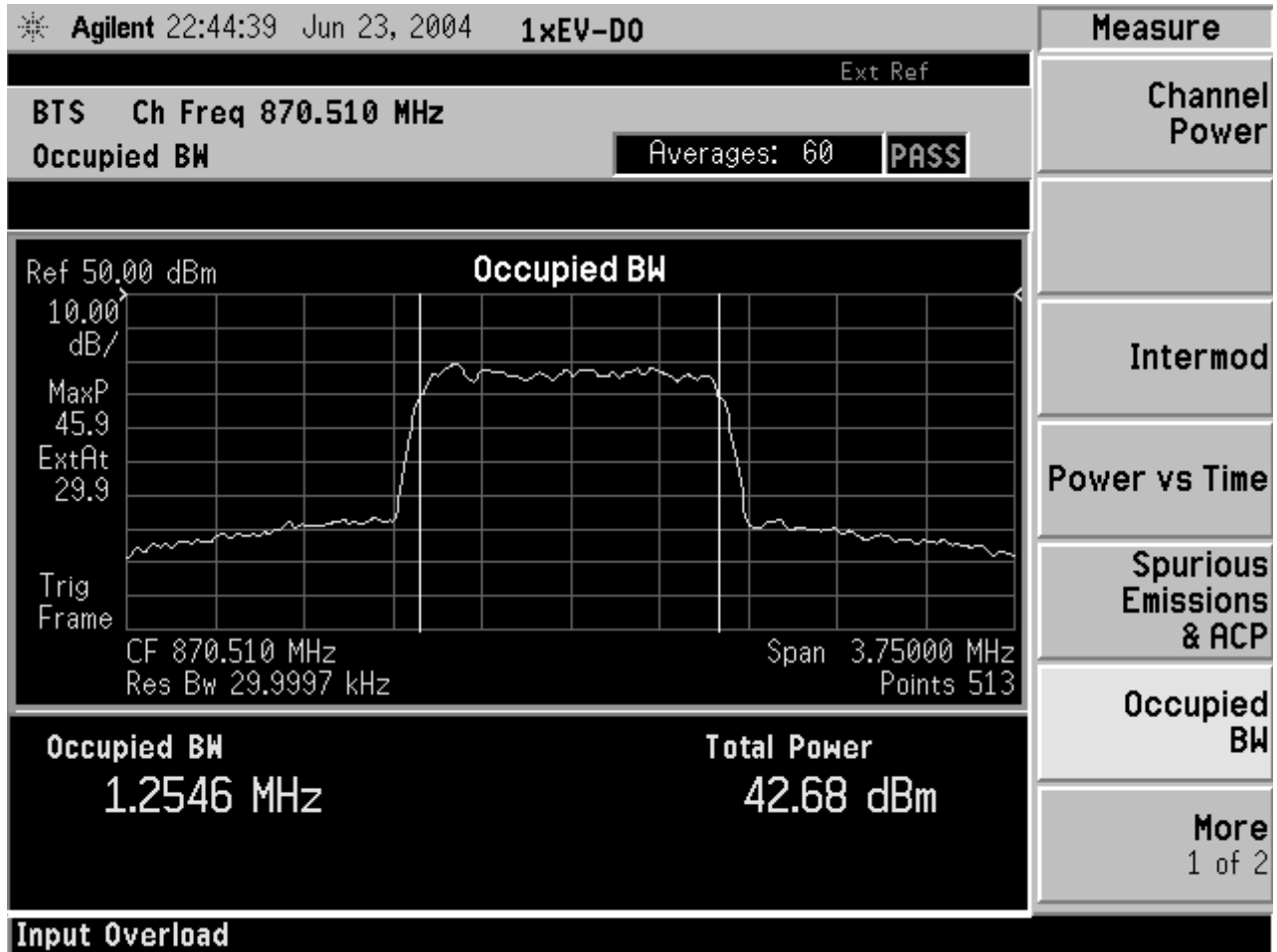


Figure 4 : Occupied Bandwidth Channel 17

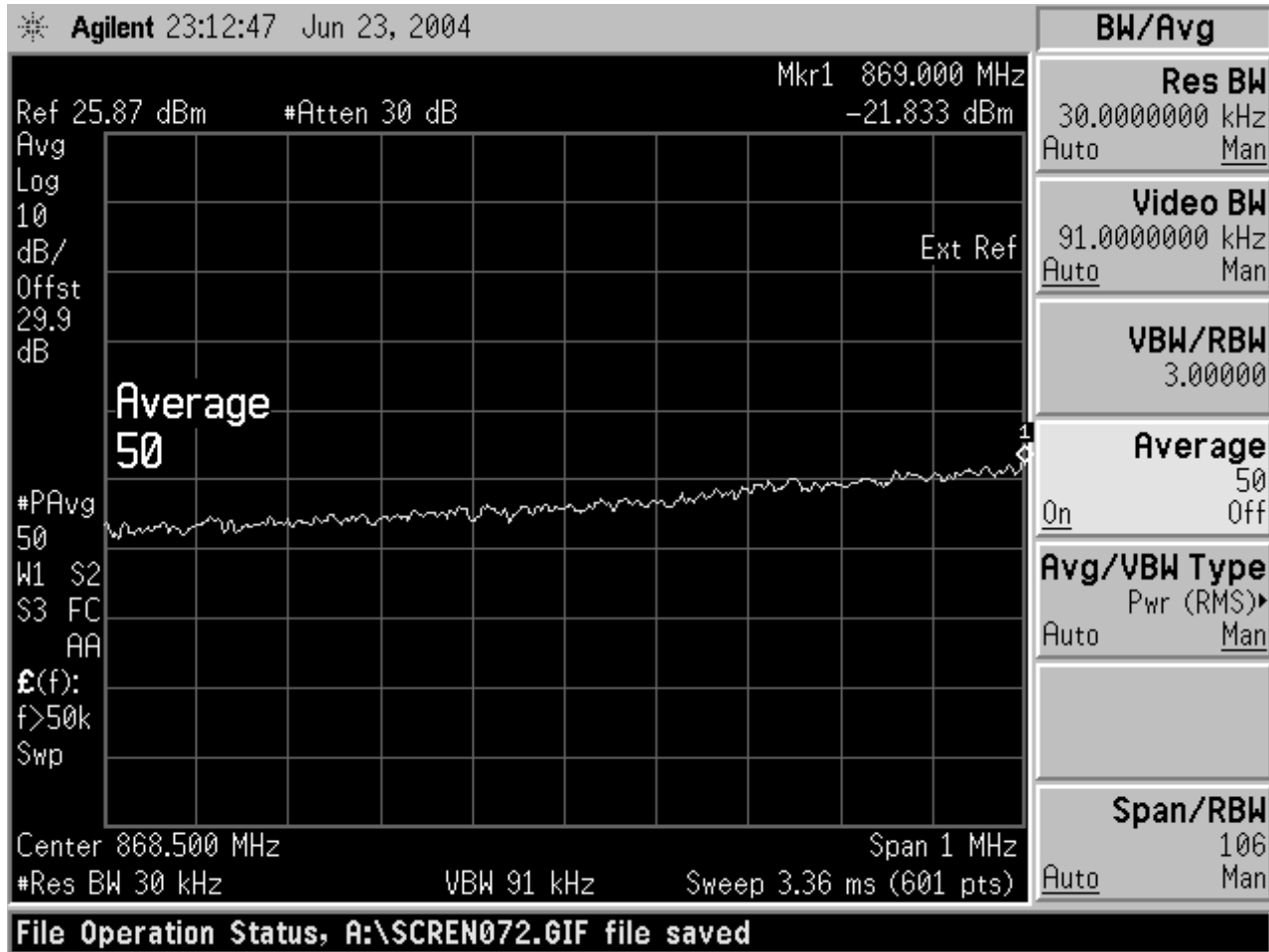
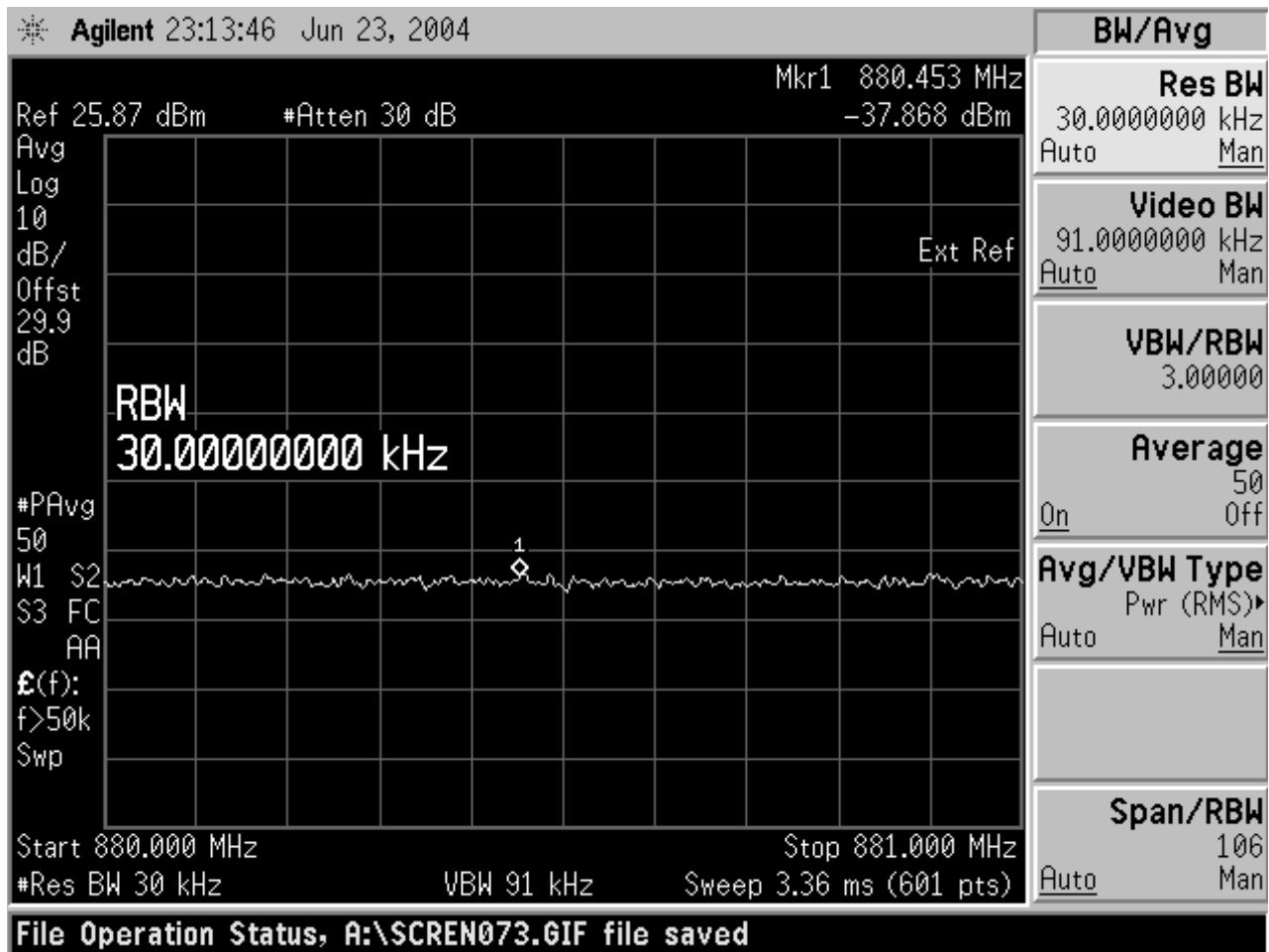
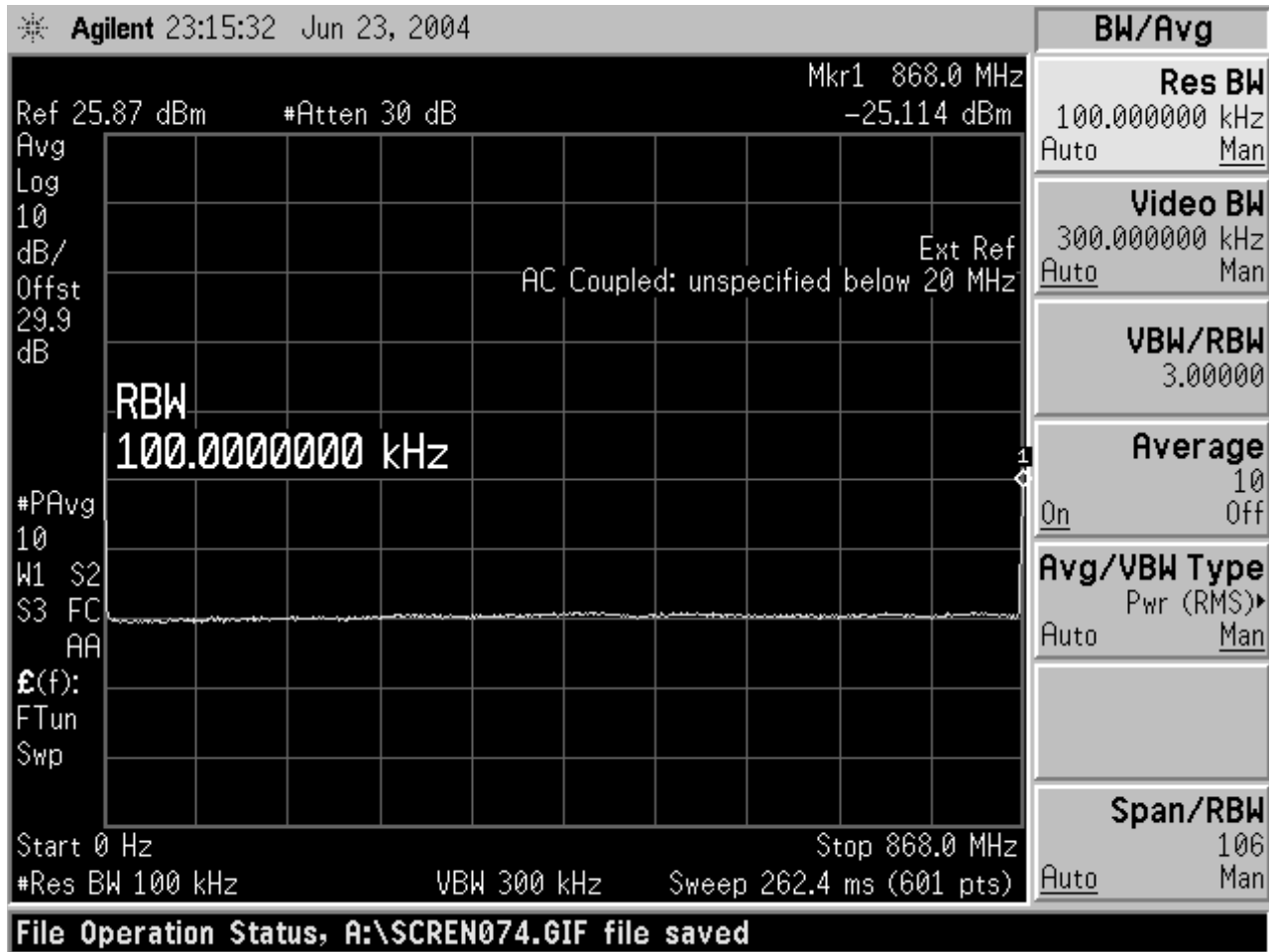


Figure 5 : A ”+A Band Ch 17 IS856 Adjacent 1 MHz Lower emissions 868-869 MHz



**Figure 6 : A ”+A Band Ch 17 IS856 Adjacent 1 MHz Upper emissions 880-881 MHz**





**Figure 7 : A”+A Band Channel 17 IS856 Conducted Spurious Emission 10kHz - 868MHz**

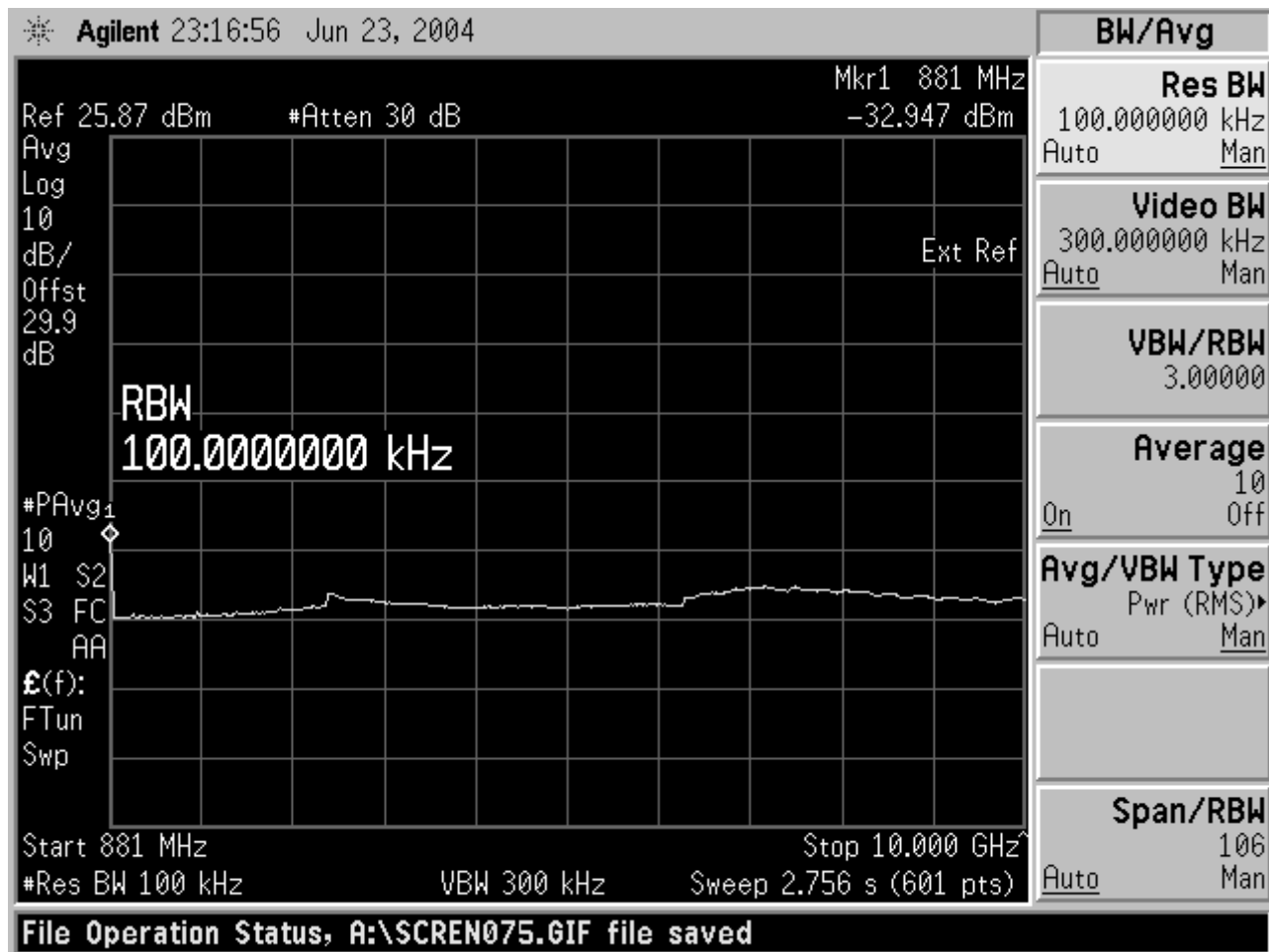


Figure 8 : A”+A Band Channel 17 IS856 Conducted Spurious Emission 881Hz - 10GHz

## 5.2 Channel 283 IS856 Spurious Emissions at the 800MHz SFRM (CR SCLPA) Ant. Port

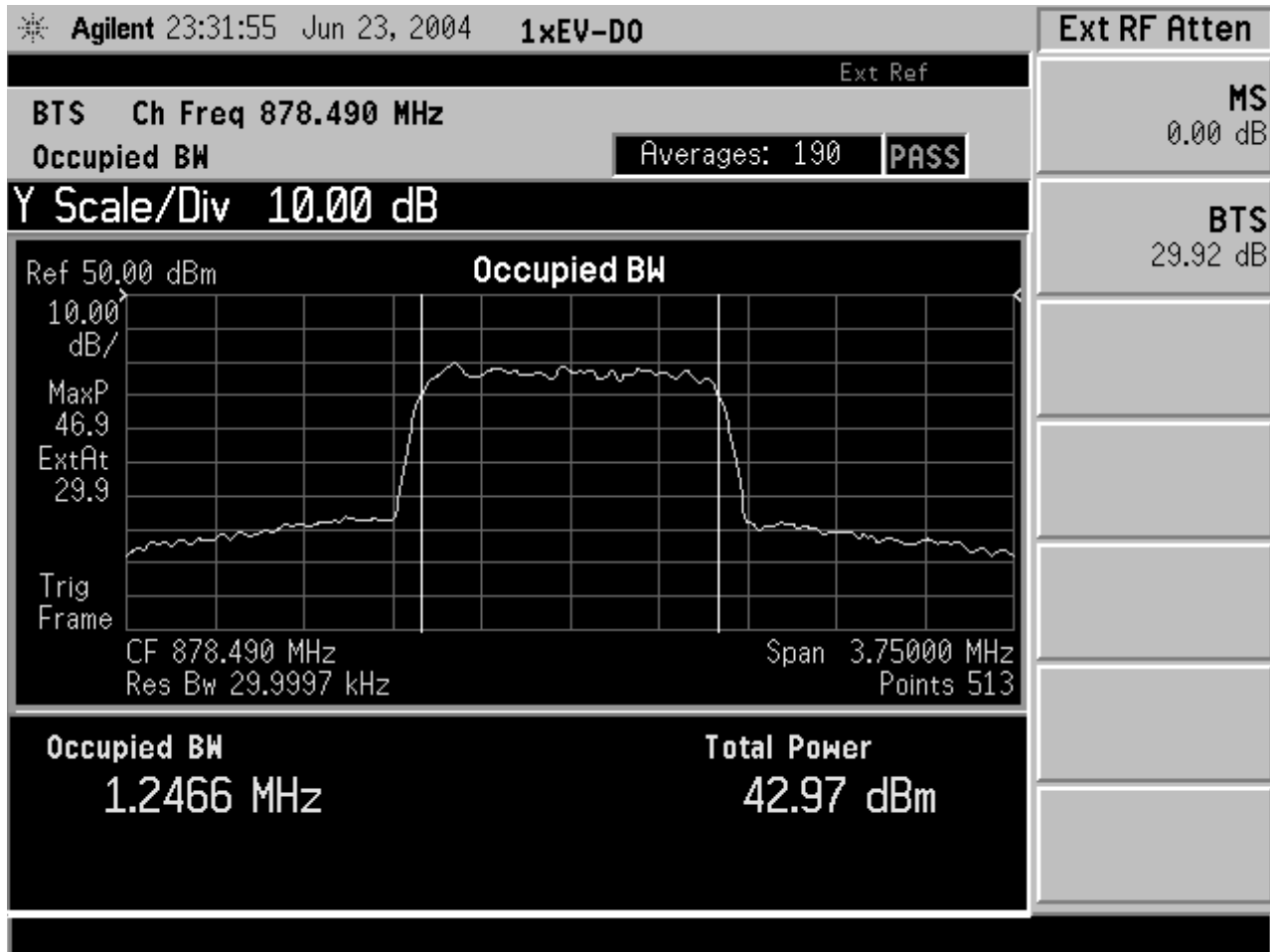


Figure 9 : Occupied Bandwidth Channel 283

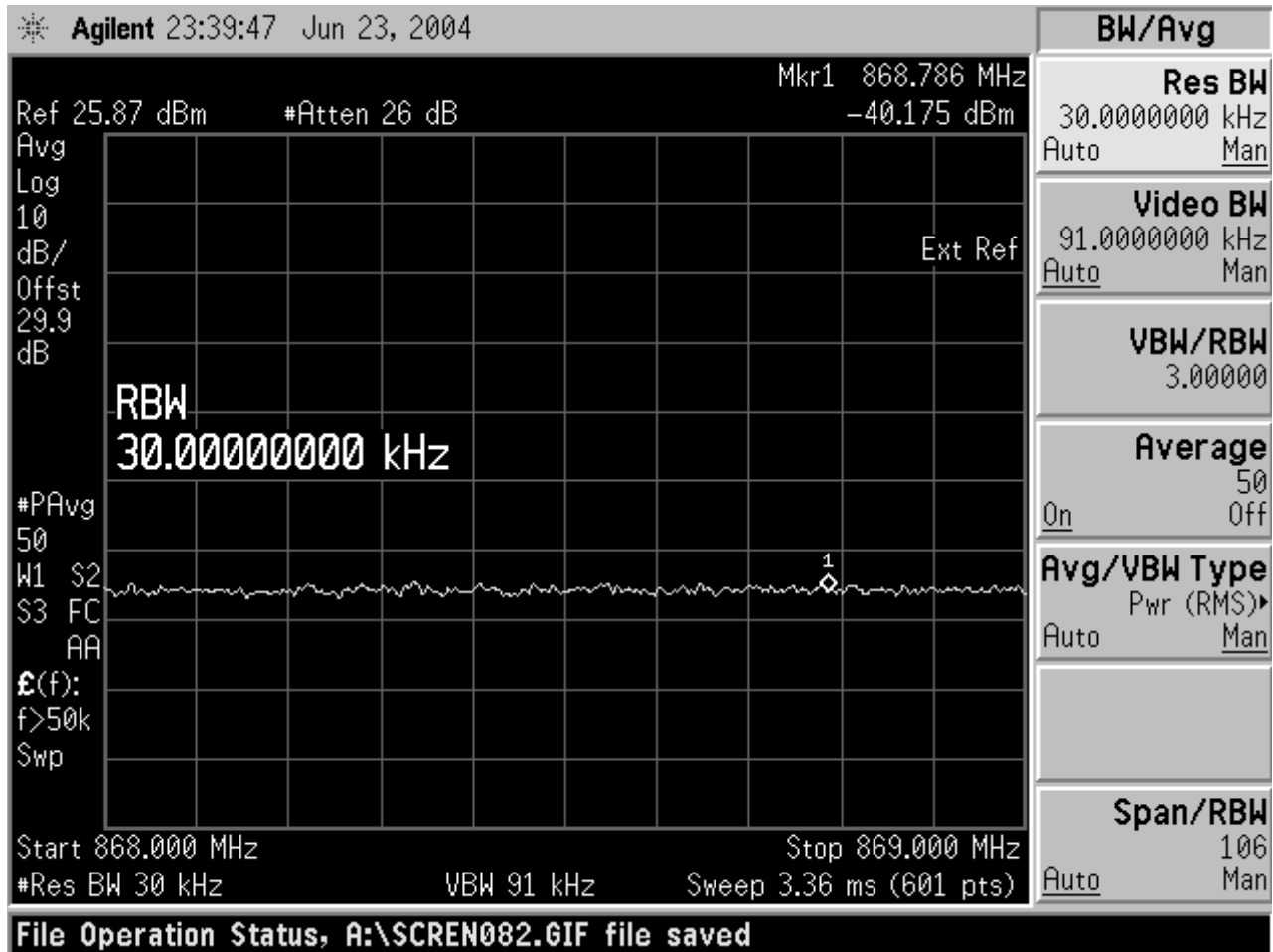


Figure 10 : A ”+A Band Ch 283 IS856 Adjacent 1 MHz Lower emissions 868-869 MHz

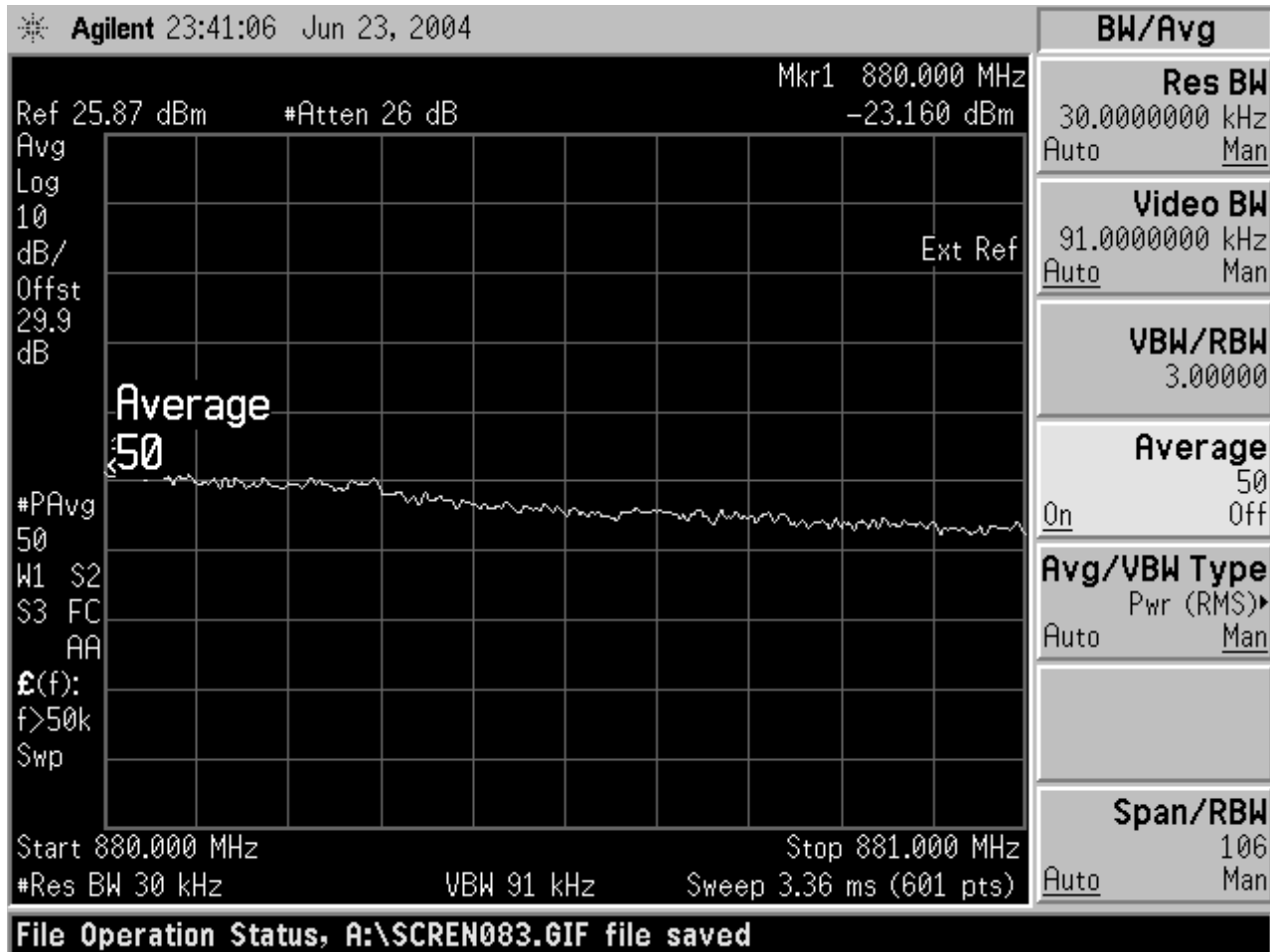


Figure 11 : A ”+A Band Ch 283 IS856 Adjacent 1 MHz Upper emissions 880-881 MHz

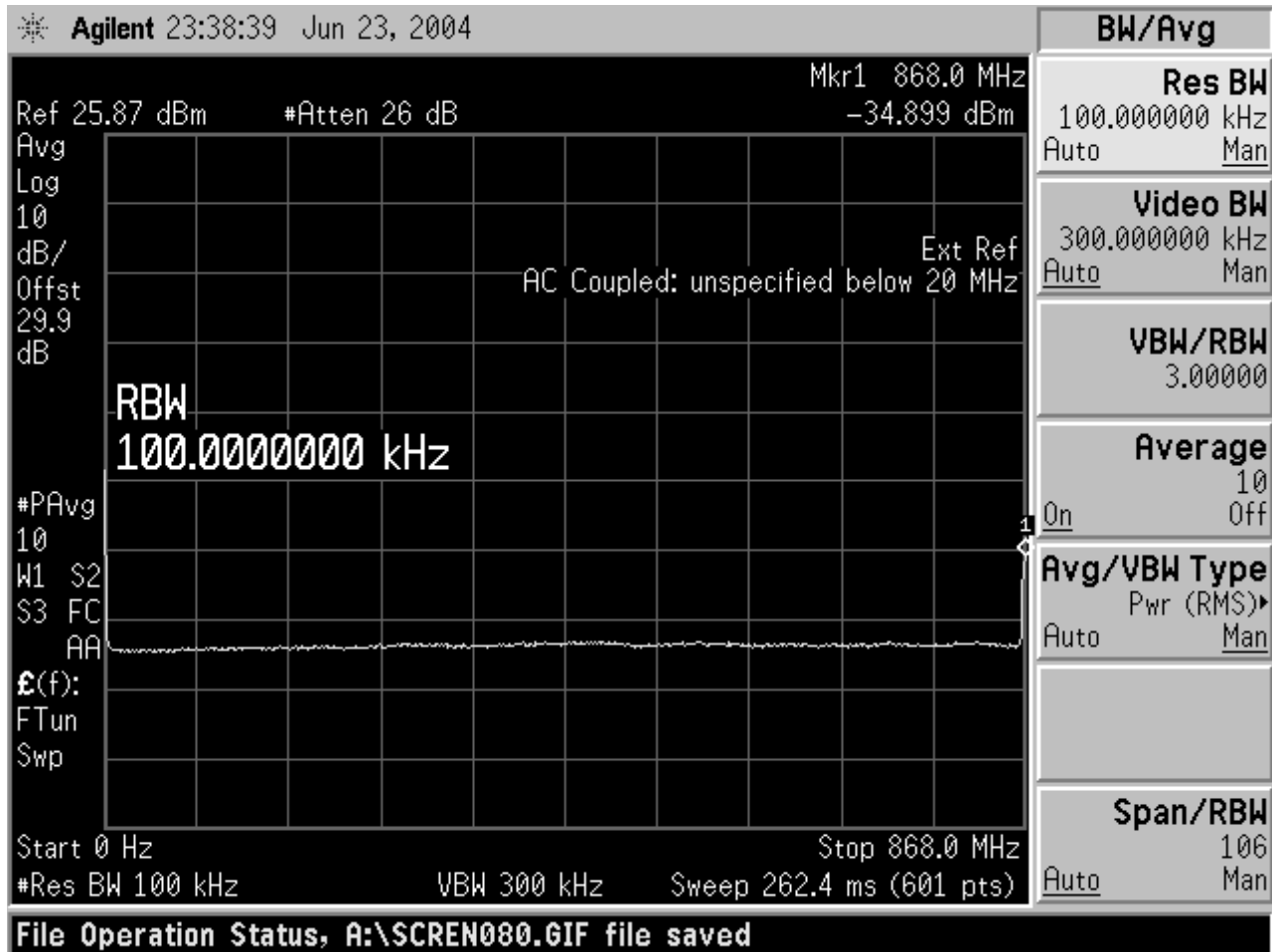


Figure 12 : A”+A Band Channel 283 IS856 Conducted Spurious Emission 10kHz - 868MHz

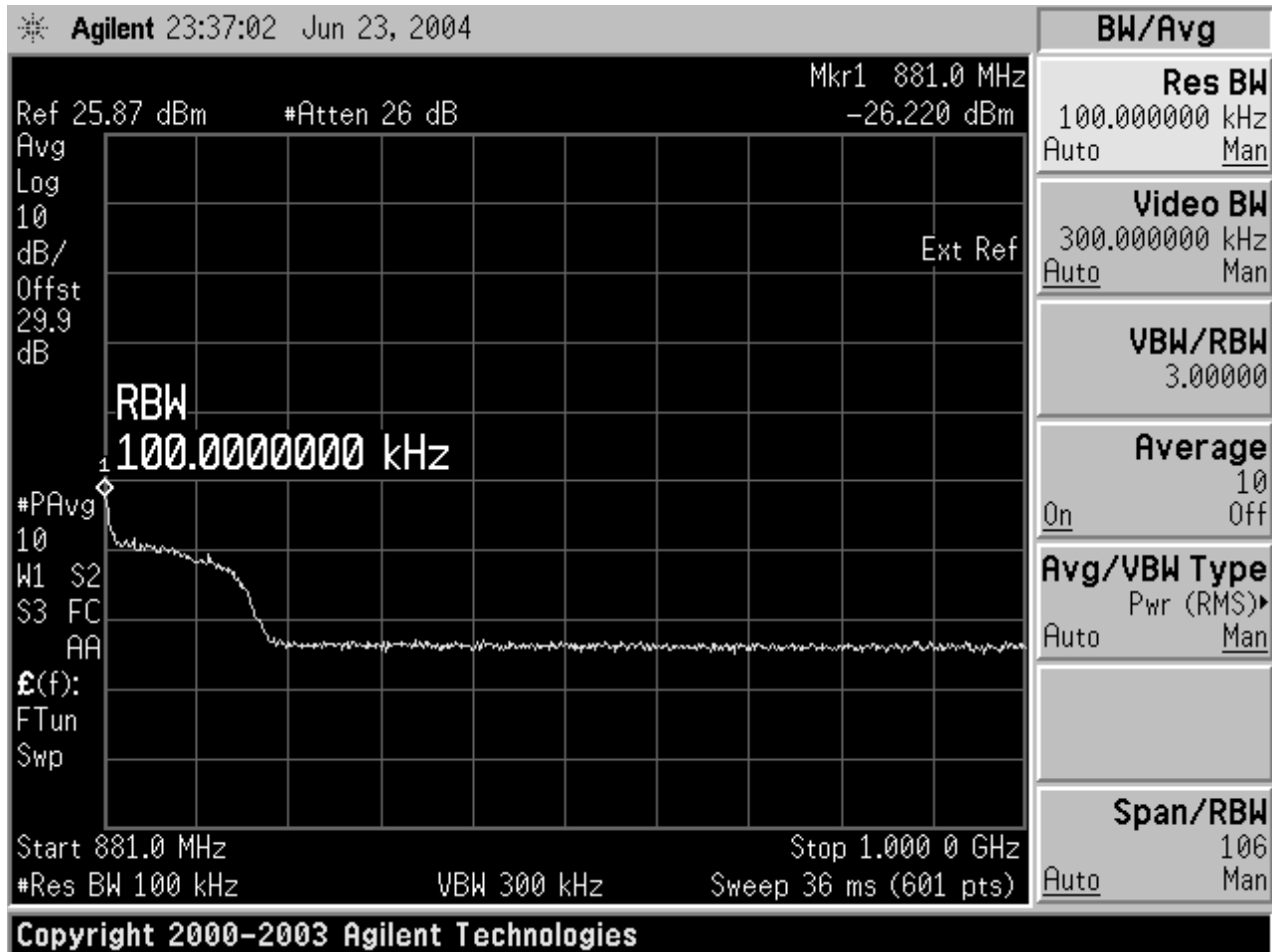


Figure 13 : A”+A Band Channel 283 IS856 Conducted Spurious Emission 881MHz - 1GHz

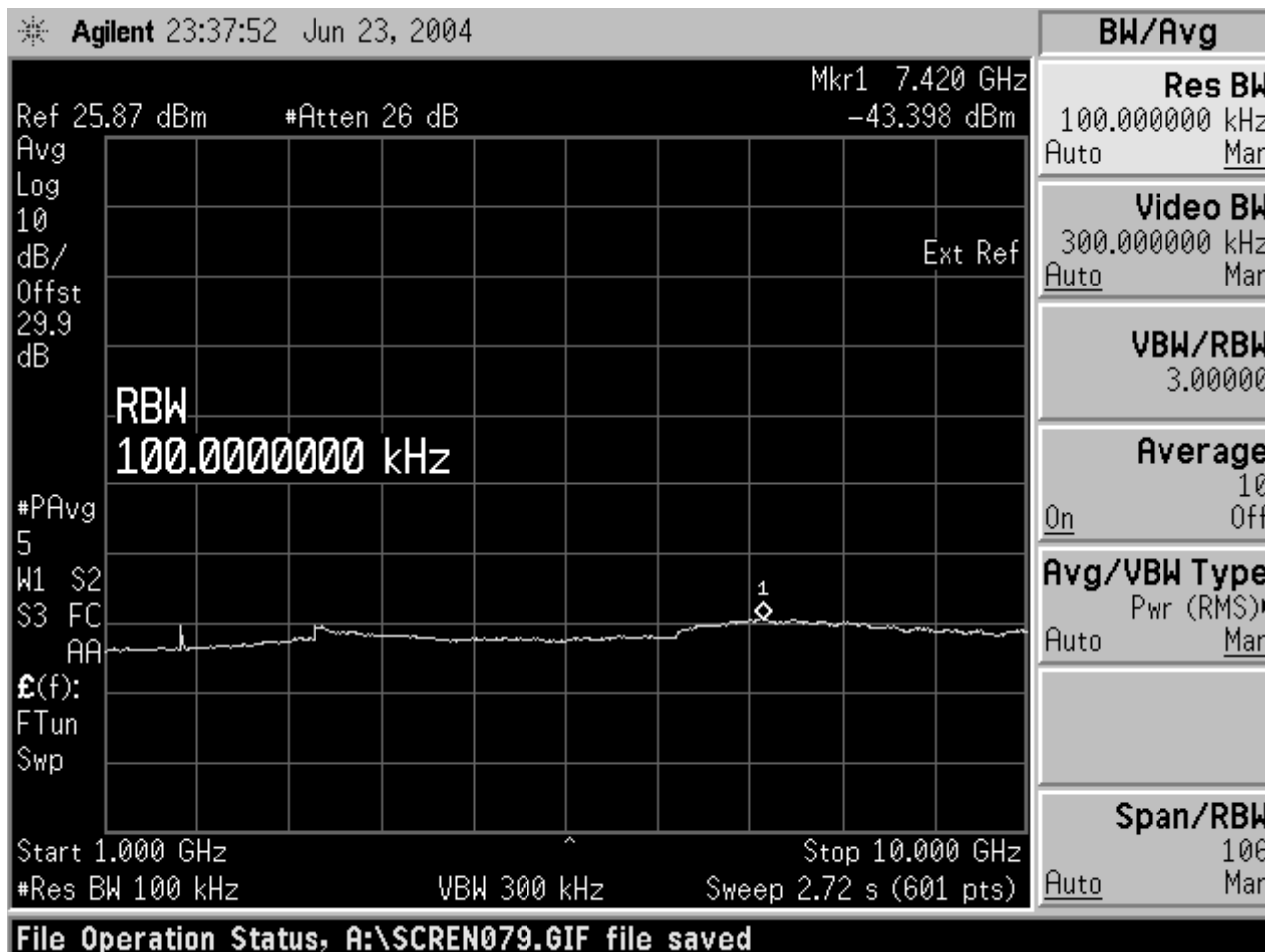


Figure 14 : A”+A Band Channel 283 IS856 Conducted Spurious Emission 1GHz - 10GHz

### 5.3 Channel 384 IS856 Spurious Emissions at the 800MHz SFRM (CR SCLPA) Ant. Port



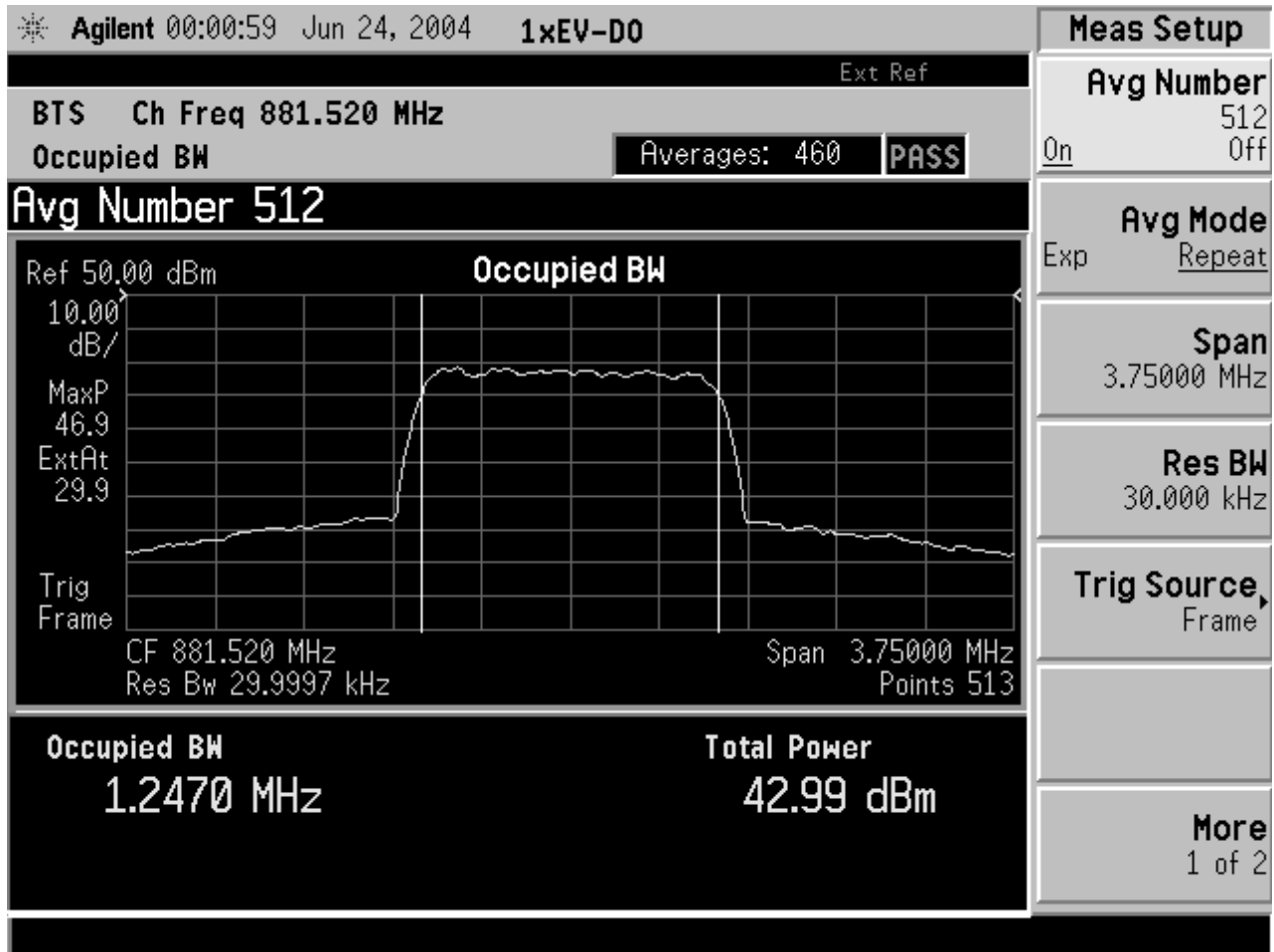


Figure 15 : Occupied Bandwidth Channel 384

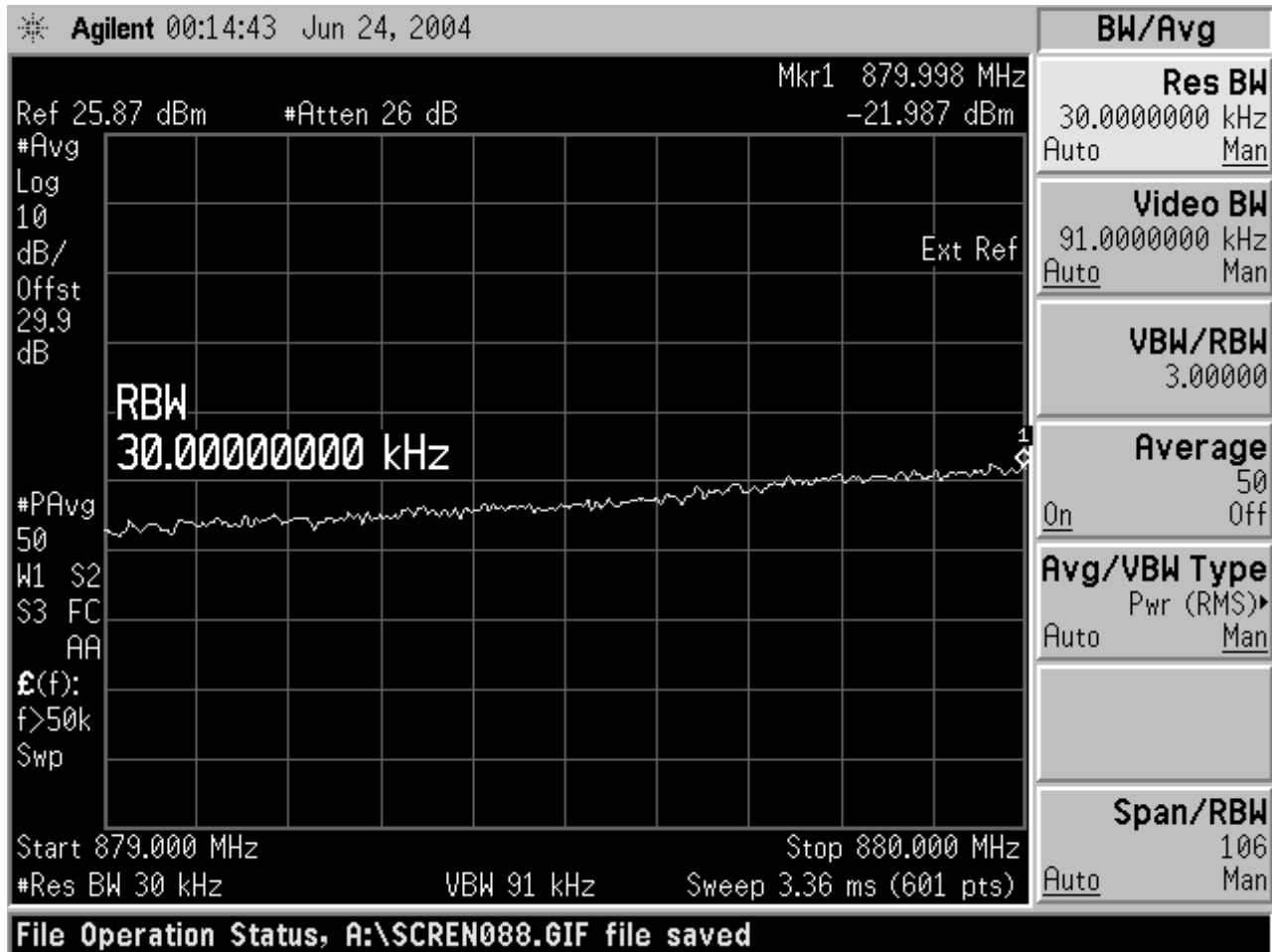


Figure 16 : A ”+A Band Ch 384 IS856 Adjacent 1 MHz Lower emissions 879-880 MHz

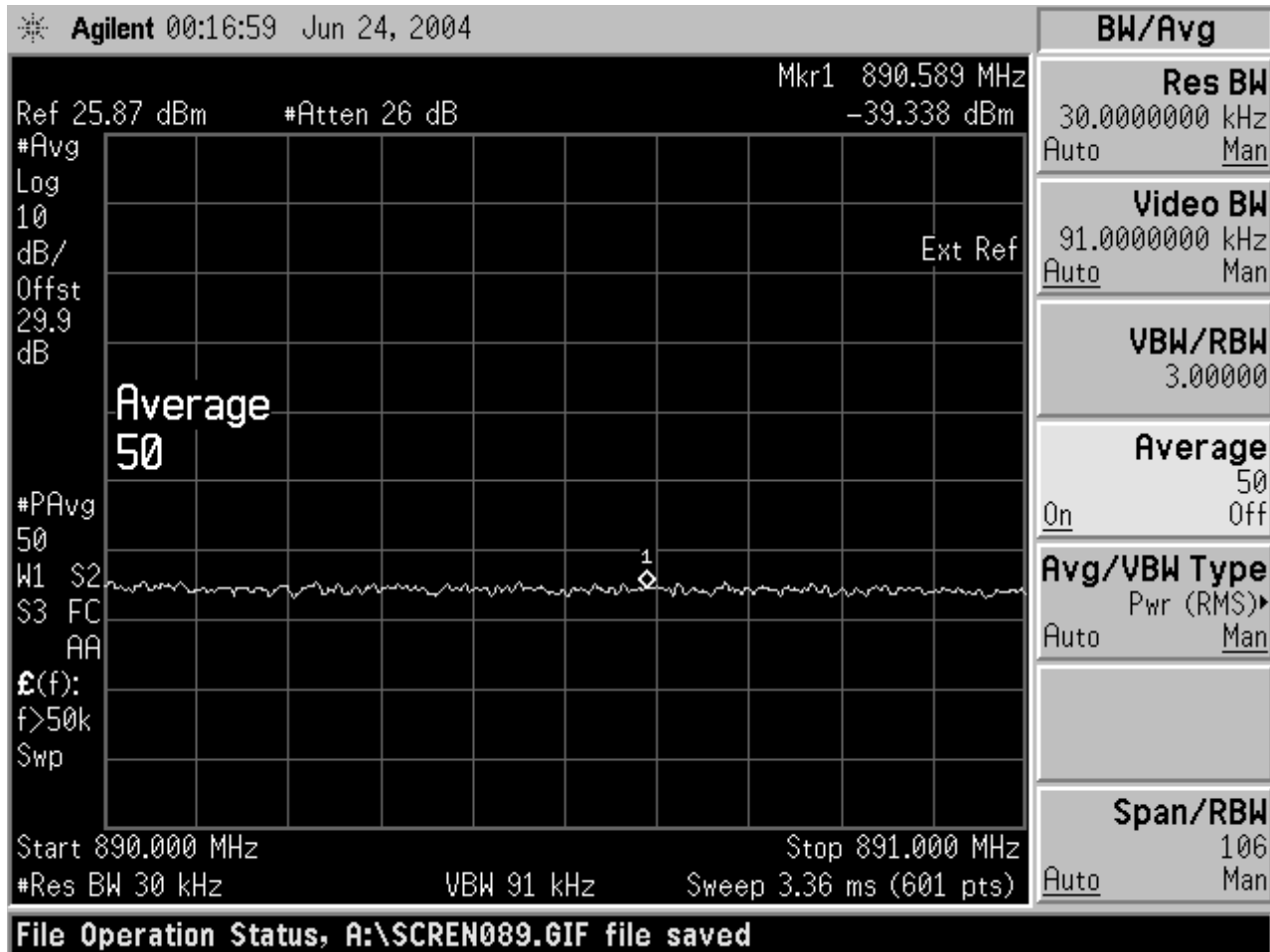
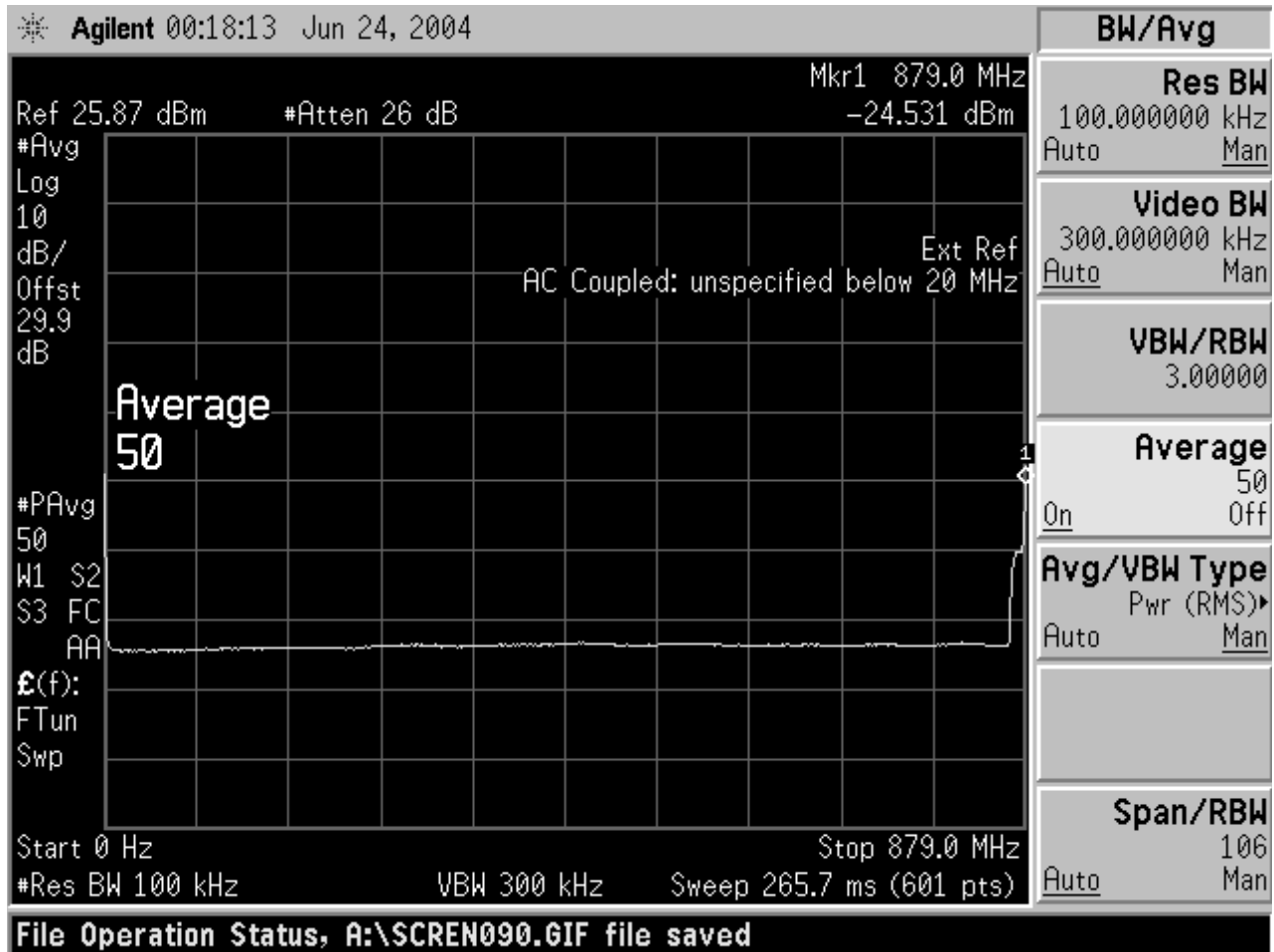
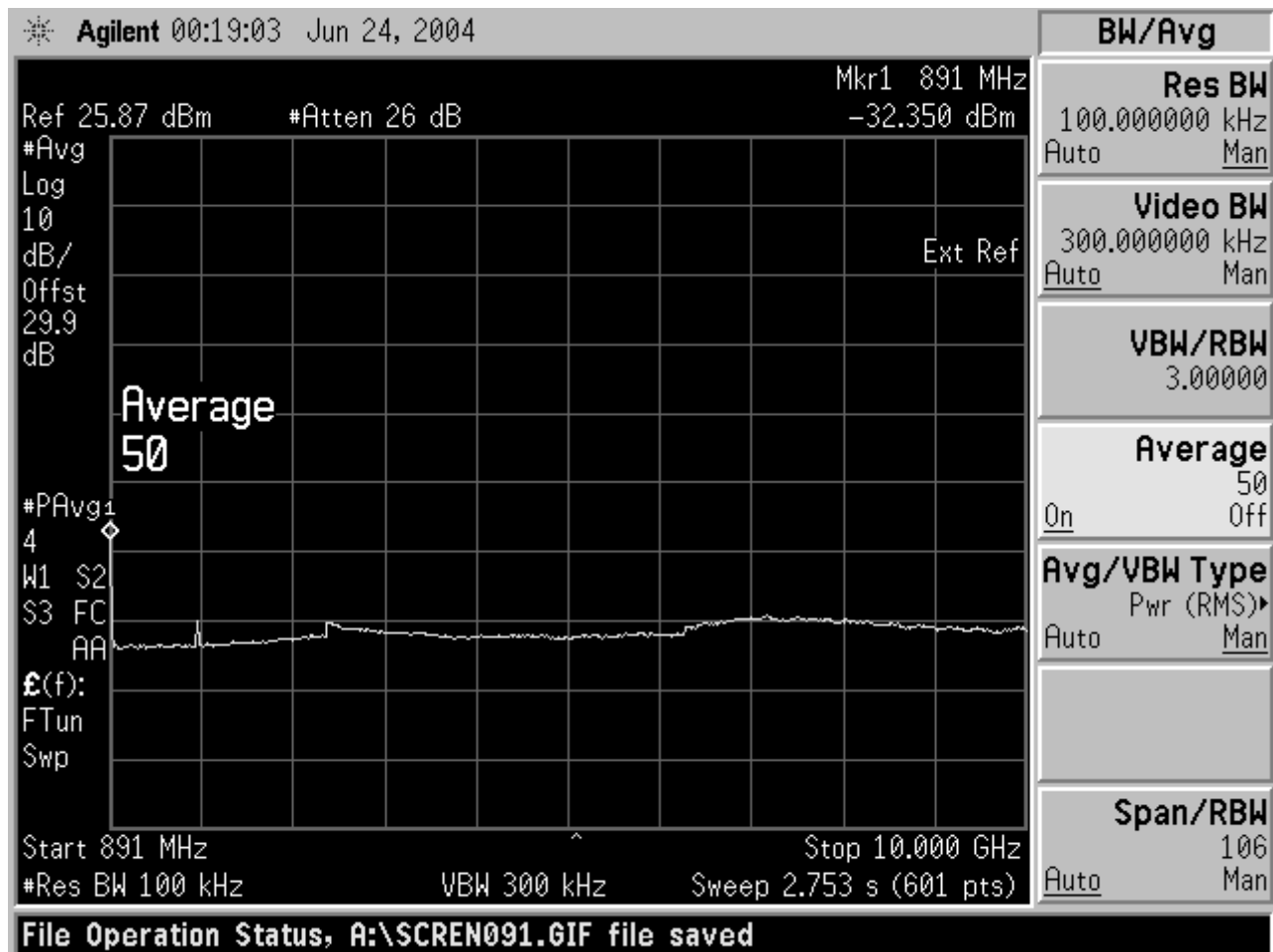


Figure 17 : B Band Ch 384 IS856 Adjacent 1 MHz Upper emissions 890-891 MHz

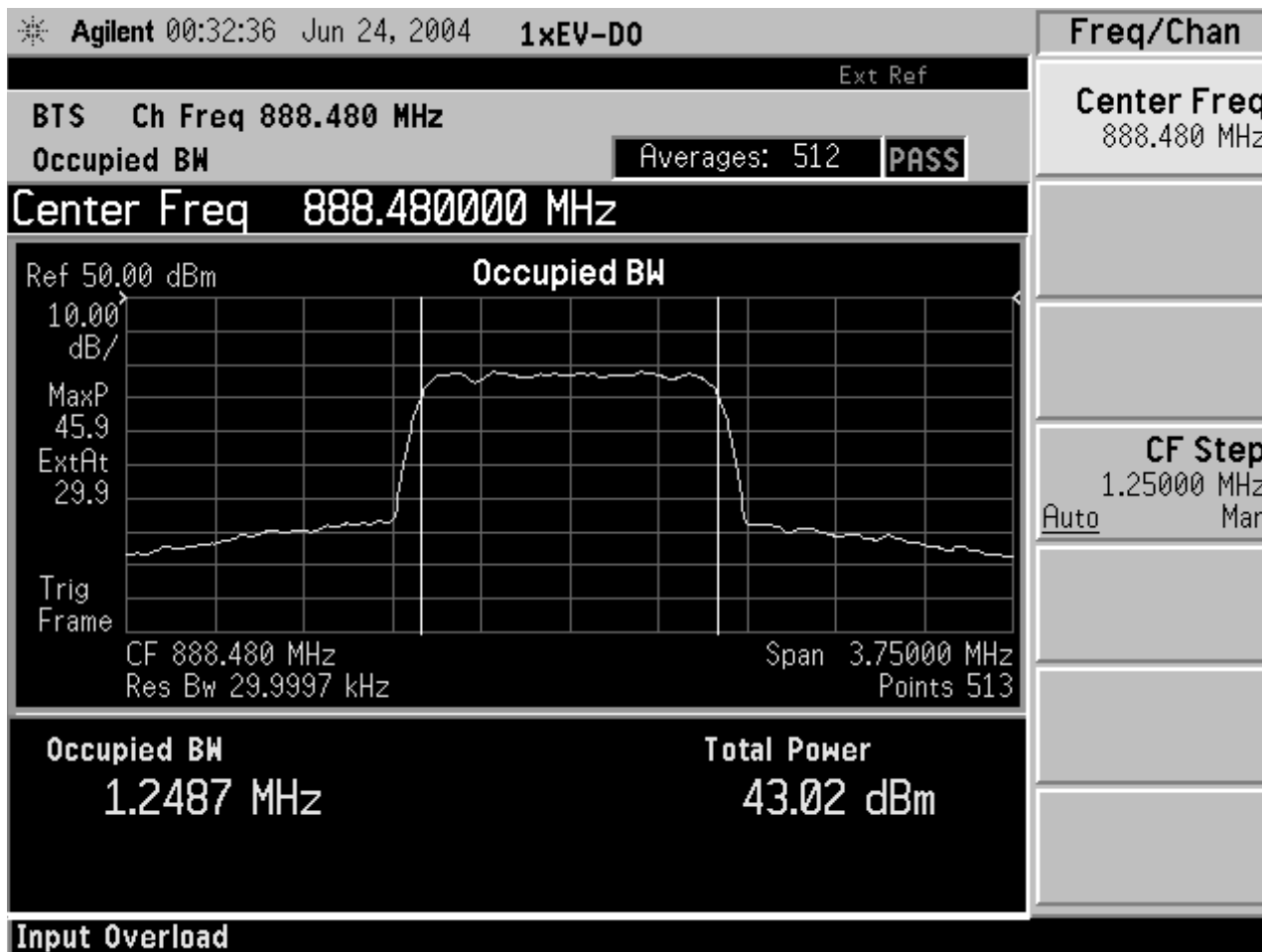


**Figure 18 : B Band Channel 384 IS856 Conducted Spurious Emission 10kHz - 879MHz**



**Figure 19 : B Band Channel 384 IS856 Conducted Spurious Emission 891MHz - 10GHz**

## 5.4 Channel 616 IS856 Spurious Emissions at the 800MHz SFRM (CR SCLPA) Ant. Port



**Figure 20 : Occupied Bandwidth Channel 616**

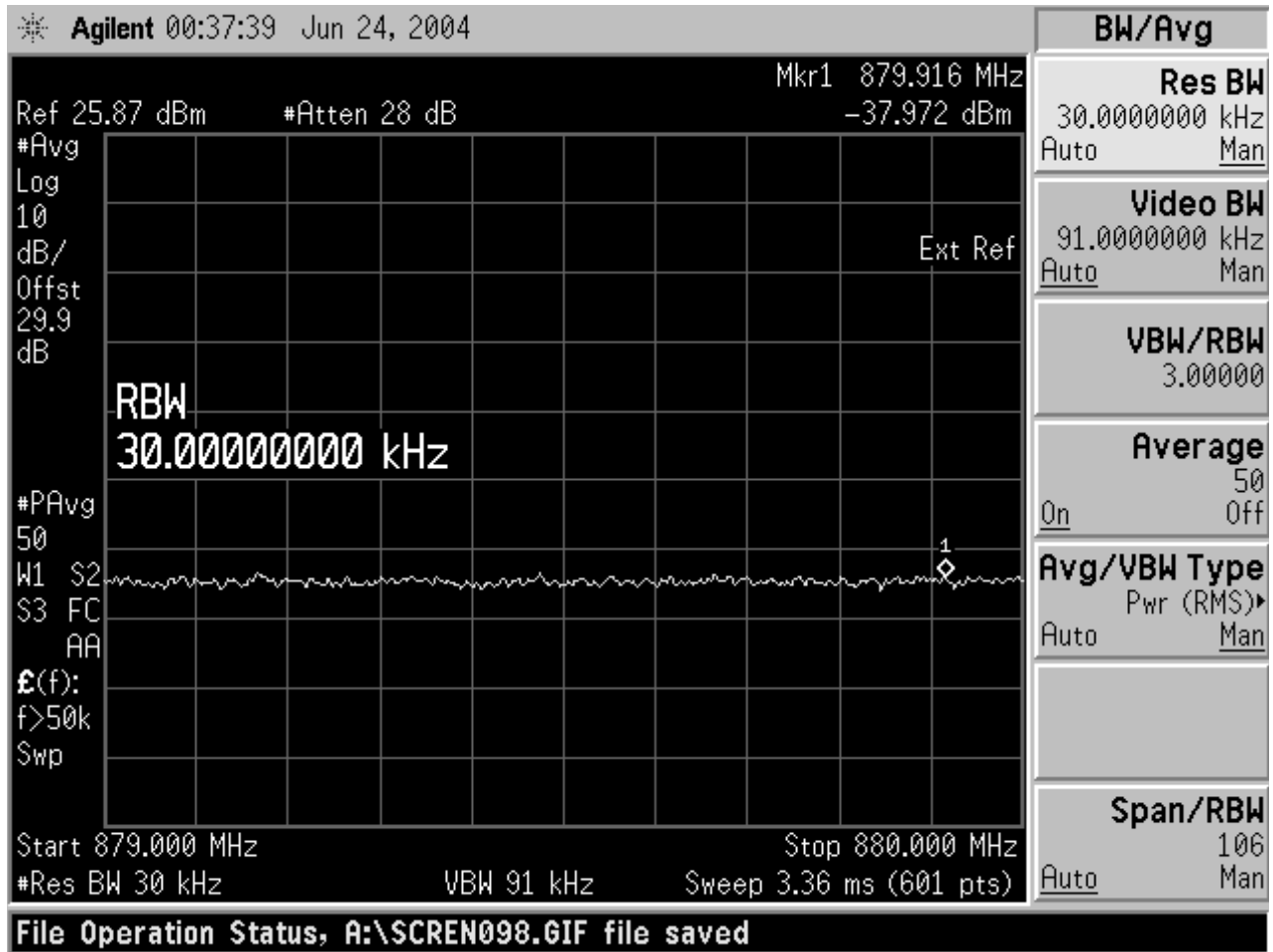


Figure 21 : A ”+A Band Ch 616 IS856 Adjacent 1 MHz Lower emissions 879-880 MHz

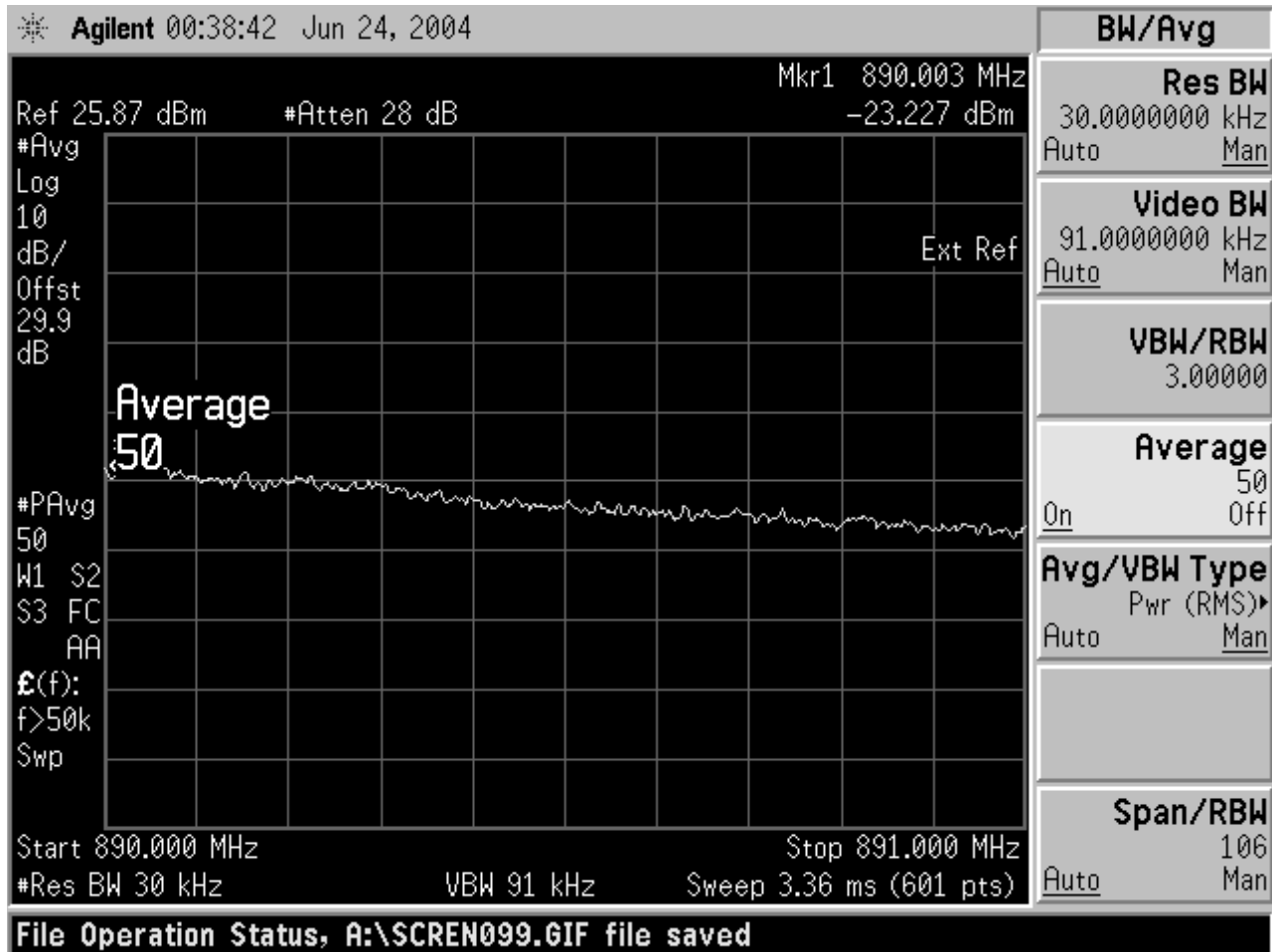
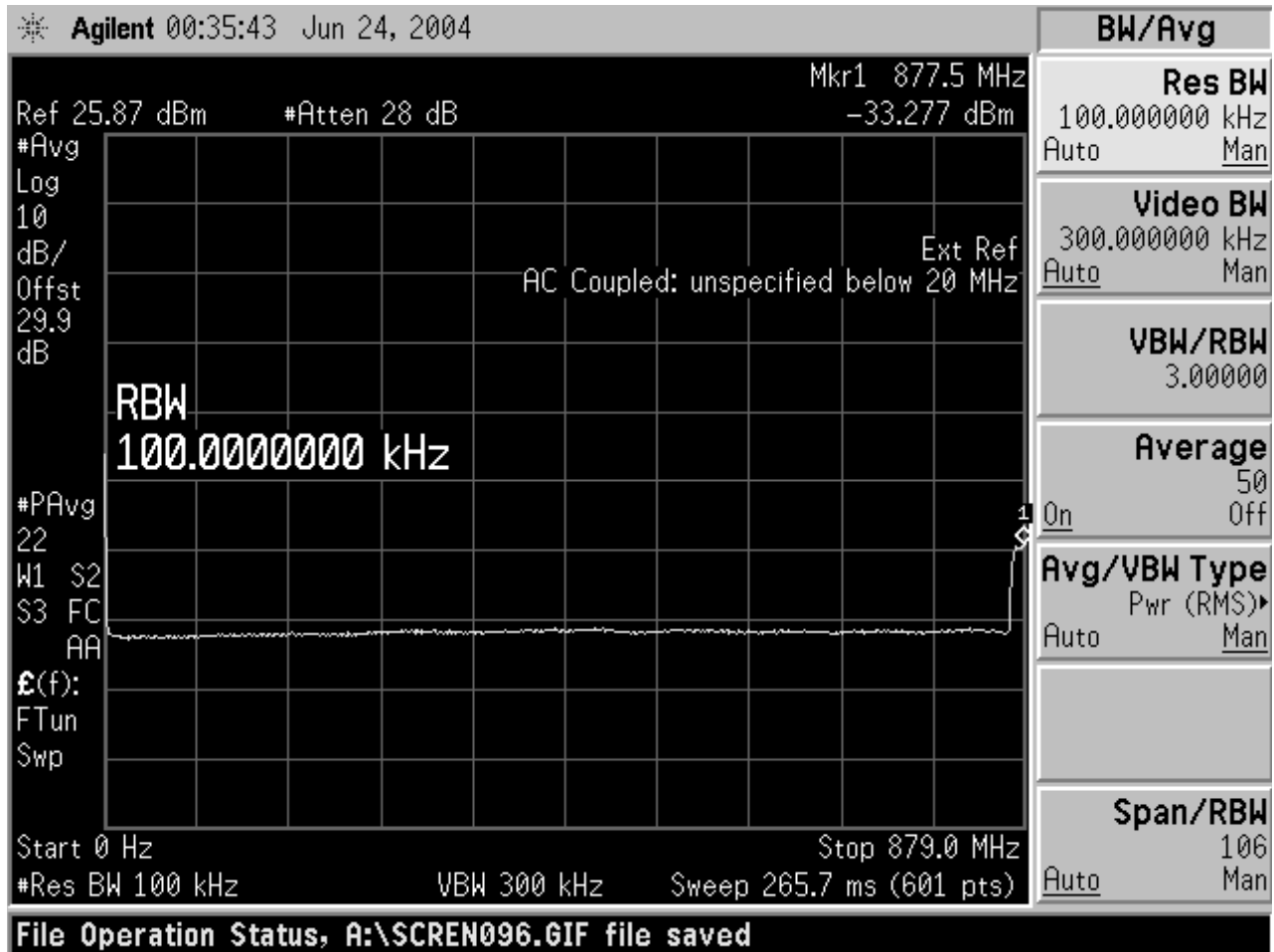
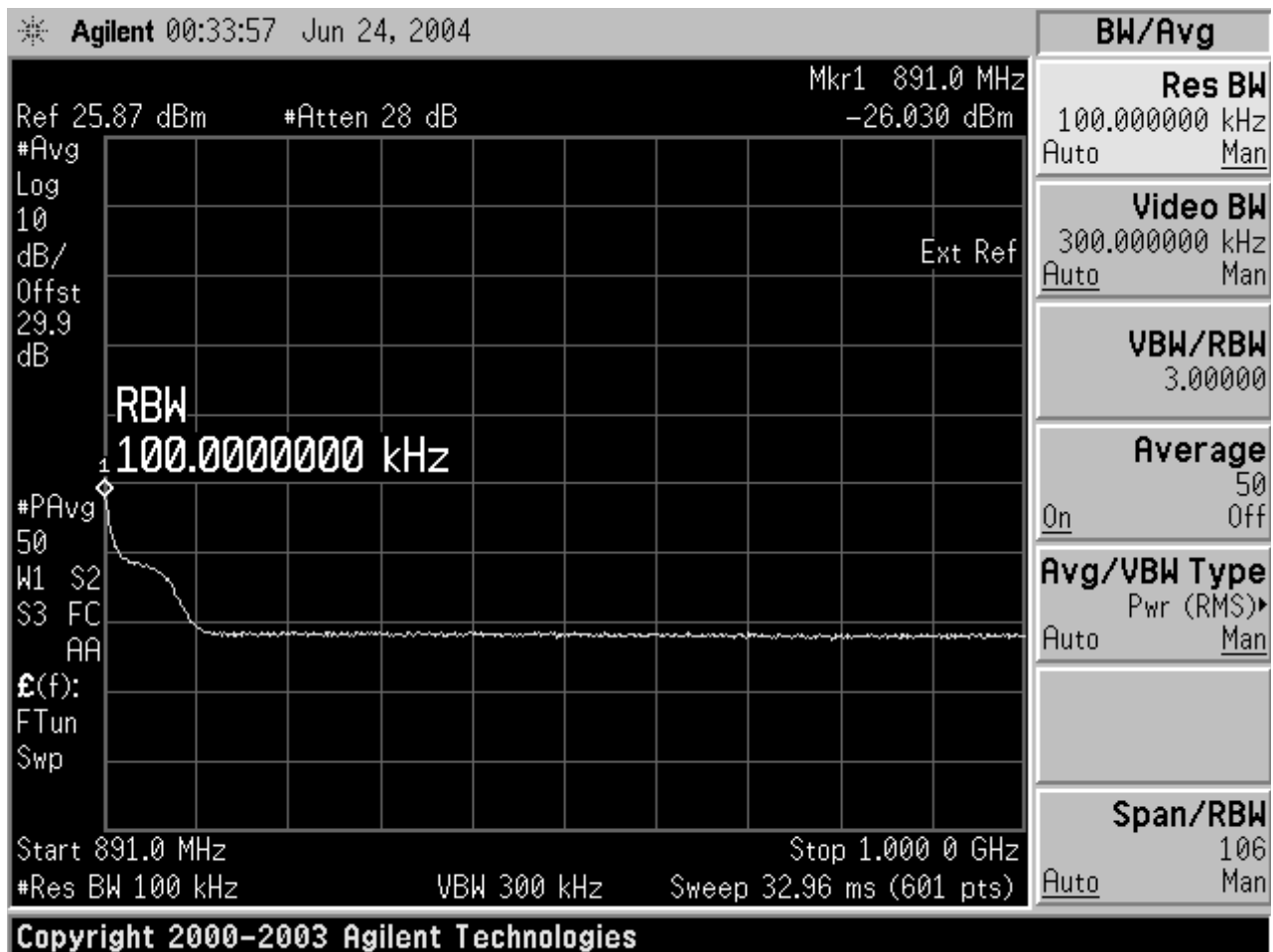


Figure 22 : B Band Ch 616 IS856 Adjacent 1 MHz Upper emissions 890-891 MHz

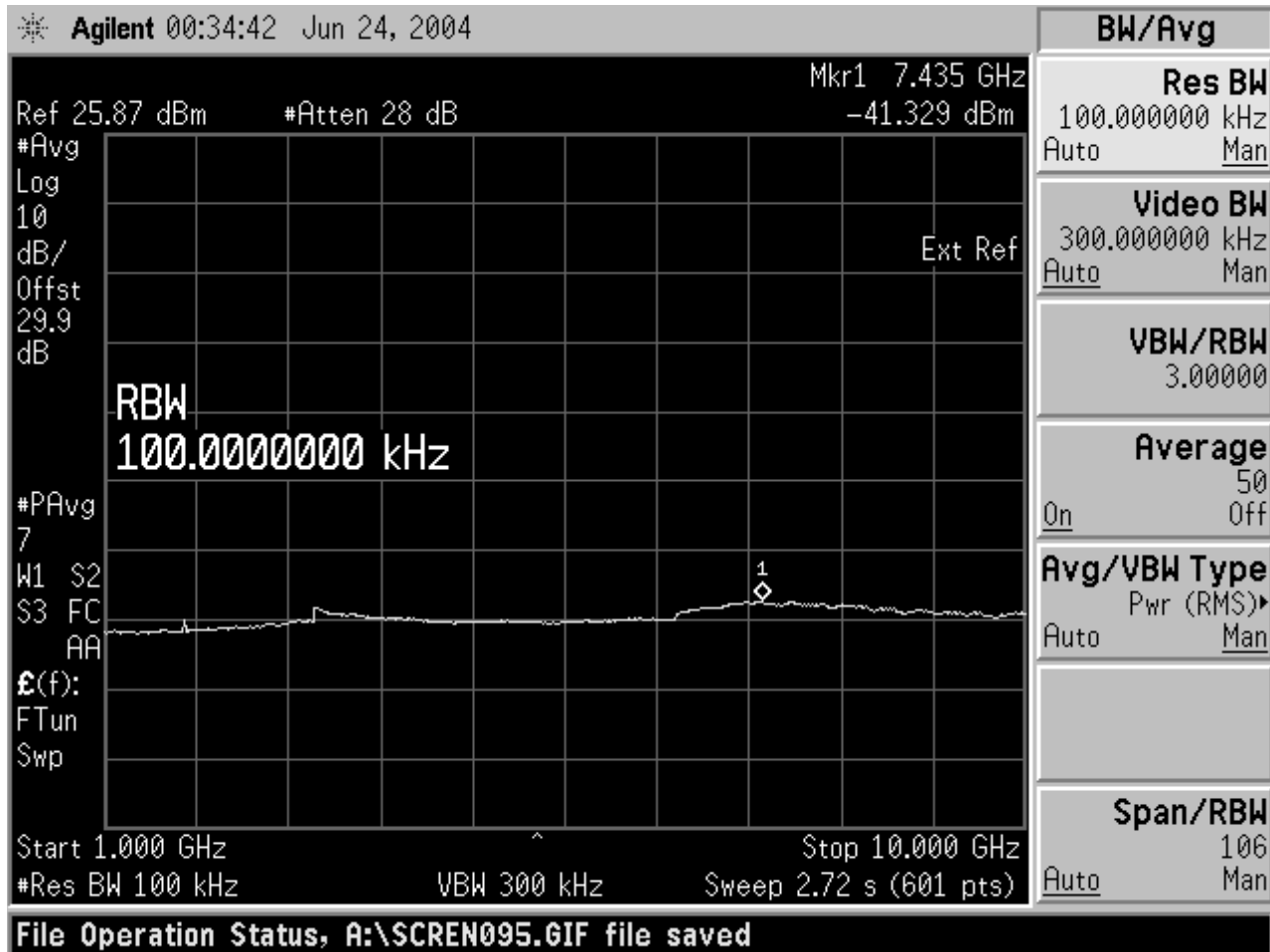




**Figure 23 : B Band Channel 616 IS856 Conducted Spurious Emission 10kHz - 879MHz**



**Figure 24 : B Band Channel 616 IS856 Conducted Spurious Emission 891MHz - 1GHz**



**Figure 25 : B Band Channel 616 IS856 Conducted Spurious Emission 1GHz - 10GHz**

---

## References

- [1] FCC Part 22 Subpart H, “Public Mobile Services”, [http://www.access.gpo.gov/nara/cfr/waisidx\\_01/47cfr22\\_01.html](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](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-D “Recommended Minimum Performance Standards for Base Stations Supporting Dual Mode Spread Spectrum Systems”, June 2001
- [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](http://strategis.ic.gc.ca/epic/internet/inceb-bhst.nsf/vwapj/occupied-bandwidth.pdf/$FILE/occupied-bandwidth.pdf)
- [6] CTP\_AB6NT800MFRM2\_8\_and\_9th\_carrier. [http://livelink-ott.ca.nortel.com/livelink.exe/8153812/FCC\\_22\\_8th\\_and\\_9th\\_carrier\\_Test\\_Plan.pdf?func=doc.Fetch&nodedid=8153812](http://livelink-ott.ca.nortel.com/livelink.exe/8153812/FCC_22_8th_and_9th_carrier_Test_Plan.pdf?func=doc.Fetch&nodedid=8153812)

END OF DOCUMENT