EXHIBIT 2A

Test Report Provided by Nortel Networks

Applicant: Nortel Networks

For Original Equipment Certification on:

AB6NT800SFRM

Test Report for FCC Equipment Authorization

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Author:	Fabian Wong

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Publication History

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List of Consultants

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

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Thomas Wong	CDMA/TDMA Regulatory Emission Prime	2U40

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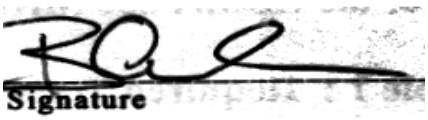
The release of this document has been reviewed and approved for distribution and use by the following:

Ratifier's Name	Signature	Date
Brad Carlson		Nov 26, 2002

Revision History

Stream/ issue	Revision Date	Reason for Change	Author
00/00.01	23/10/2002	Initial draft of test plan	Aurel Serghi/ Dept. 2M64
00/00.02	04/11/2002	Following additions and changes were done upon document review feedback: 1) Section 3.2 - EUT Identifcation List: - added Notes in Table 2; 2) Section 3.3 - Test Equipment List: - added Note in Table 3; 3) Section 4.1 - RF Power Output requirements: - changed channel numbers in Table 4; - added Note in Table 4; 4) Section 4.2 - Occupied Bandwidth: - changed channel numbers in Table 5. 5) Section 4.3.1- Spurious Emissions Require-ments: - replaced FCC Part 22.917 with 24.238 Limit; - added FCC Part 22.901 d) requirements; - changed channel numbers in Table 6. 6) Section 4.4.1 - Frequency stability require-ments: - replaced FCC Part 22.913 with Part 22.355; - added Note that results from GPS testing should be included for FCC filing.	Aurel Serghi/ Dept. 2M64
00/01	12/11/2002	Document approved.	Aurel Serghi/ Dept. 2M64
00/02	18/11/2002	Updated document with test results.	Fabian Wong/ Dept. 2U41

Change bars are not used in this document.

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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
MCPA	Multi-Carrier Power Amplifier
MFRM	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 plan 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' CDMA 800 MHz Single carrier Flexible Radio Module (SFRM).

The 800 MHz SFRM 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, 800 MHz Dual-Mode CDMA Cellular Telephones [3]*
- *TIA/EIA-97-D, Recommended Minimum Performance Standards for Base Stations Supporting Dual Mode Spread Spectrum Systems [4]*

1.1 Required Tests

Table 1 summarizes the required tests for the CDMA 800 MHz SFRM.

Table 1 : Required Tests

FCC Measurement Specification	FCC Limit Specification	Description	Test to be Performed?
2.1046	22.913	RF Power Output	Yes
2.1047	22.915	Modulation Characteristics	No
2.1049		Occupied Bandwidth	Yes
2.1051, 2.1057	24.238	Spurious Emissions at Antenna Terminals	Yes
2.1053, 2.1057	24.238	Field Strength of Spurious Emissions	Yes
2.1055	22.355	Frequency Stability	No

2 Engineering Declaration

The CDMA 800MHz Single carrier Flexible Radio Module 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.

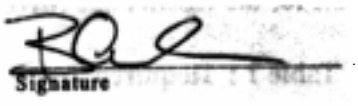
Tested By:

Fabian Wong
Production Design Control
Nortel Networks
Calgary, Canada

_____ Signature

___Nov 26, 2002_____ Date

Reviewed By:



Brad Carlson
Production Design Control Manager
Nortel Networks
Calgary, Canada

___Nov 26, 2002_____ Date

Approved By:

Thomas Wong
Regulatory Prime
Nortel Networks
Calgary, Canada

___Nov 26, 2002_____ Date

3 Equipment Authorization Application Requirements

3.1 Standard Test Conditions and Test Equipment

The SFRM 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)

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 Single carrier Flexible Radio Module (comprised of the main modules below)	N/A	N/A	N/A
a) 800 TRM	NTGY85AA	54	NNTM533MH2M3
b) 800 PAM	NPGS8660	P8	NNTM532RPUR9
i) 800 SCPA	NTGS86AB	P3	NNTM74PC5J7W
c) DPM	NTGS89DB	FDPM-H	NNTM74000007

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
20Hz to 40GHz Spectrum Analyzer	Rohde&Schwarz	FSEK	827886/03	Sept 30, 2003
9kHz to 50GHz Spectrum Analyzer	HP	8565E	3846A01193	Feb 17, 2003
RF Power Meter	HP	EPM-442A	GB37170386	May 12, 2004
RF Power Sensor Head	HP	8482A	3318A29942	May 22, 2004
Network Analyzer	HP	8722ES	US39175059	Feb 5, 2003
30dB Attenuator (100W)[a]	Weinschel Corp	48-30-43	BJ6055	NA
10 dB Attenuator (100W)	Weinschel Corp	48-10-34	BE6292	NA
RF Cable 1	Suhner	NTGS8016	NA	NA
RF Cable 2	Suhner	NTGS8017	NA	NA

a. VERY IMPORTANT: All attenuators and RF cables should exhibit flat response over the frequency range of investigation.

4 Transmitter Tests

4.1 RF Power Output

4.1.1 RF Power Output Requirements

FCC Part 2.1046

(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 2.983(d)(5). The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.

FCC Limit (Part 22.913)

The maximum effective radiated power (ERP) of base transmitters and cellular transmitters must not exceed 500 Watts.

4.1.2 Test Method

Setup the DE via the BTS controller to enable the SFRM to transmit at maximum power. Measurements will be made on channels at the bottom and top of the duplexer bands. The RF output power will be measured using the power meter.

4.1.3 Test Setup

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

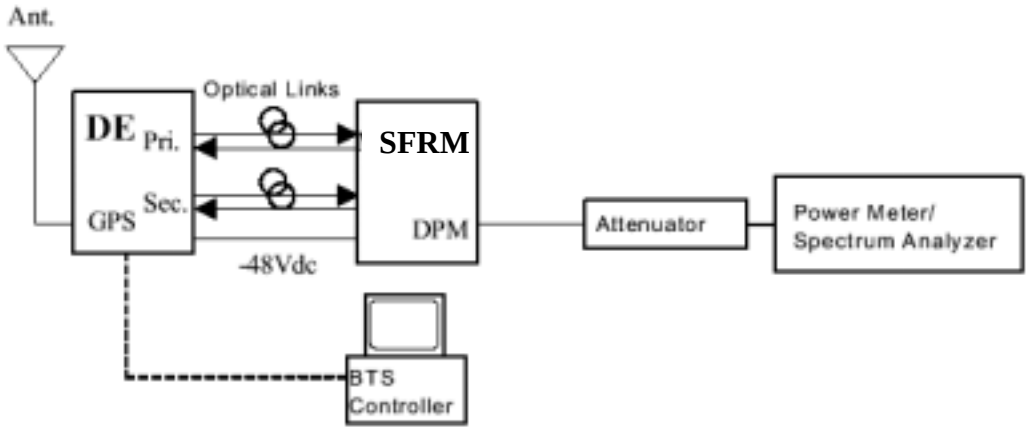


Figure 1 : Test Setup for RF Power Output Measurement

4.1.4 Test Results

Table 4 : RF Output Power of 800 MHz SFRM

Channel Number (Band)	Frequency (MHz)	Measured RF Output Power (dBm)	Average Maximum Rated Power (dBm)	FCC Limit (dBm)
18 (A)	870.54	42.89	43.05	50
283 (A)	878.49	42.98	43.05	50
384 (B)	881.52	43.12	43.05	50
616 (B)	888.48	43.20	43.05	50

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 to transmit at maximum power. Measurements will be made on channels at the bottom and top of each of the A and B sub-bands that

are supported by Nortel's radio. The occupied bandwidth will be measured using the 99% channel power feature of the spectrum analyzer.

4.2.3 Test Setup

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

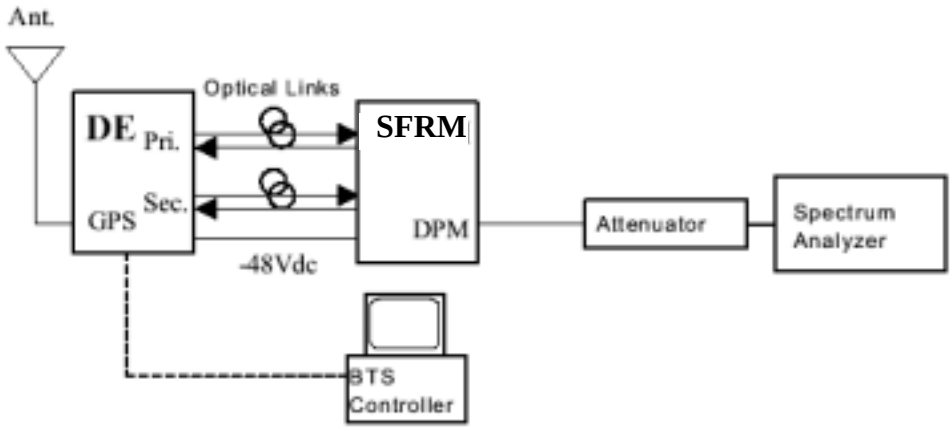


Figure 2 : Test Setup for Occupied Bandwidth Measurement

4.2.4 Test Results

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Table 5 : Occupied Bandwidth Measurements 800 MHz SFRM

Channel Number (Band)	Frequency (MHz)	Measured Occupied Bandwidth (kHz)
18 (A)	870.54	1262.525
283 (A)	878.49	1252.505
384 (B)	881.52	1262.525
616 (B)	888.48	1272.545

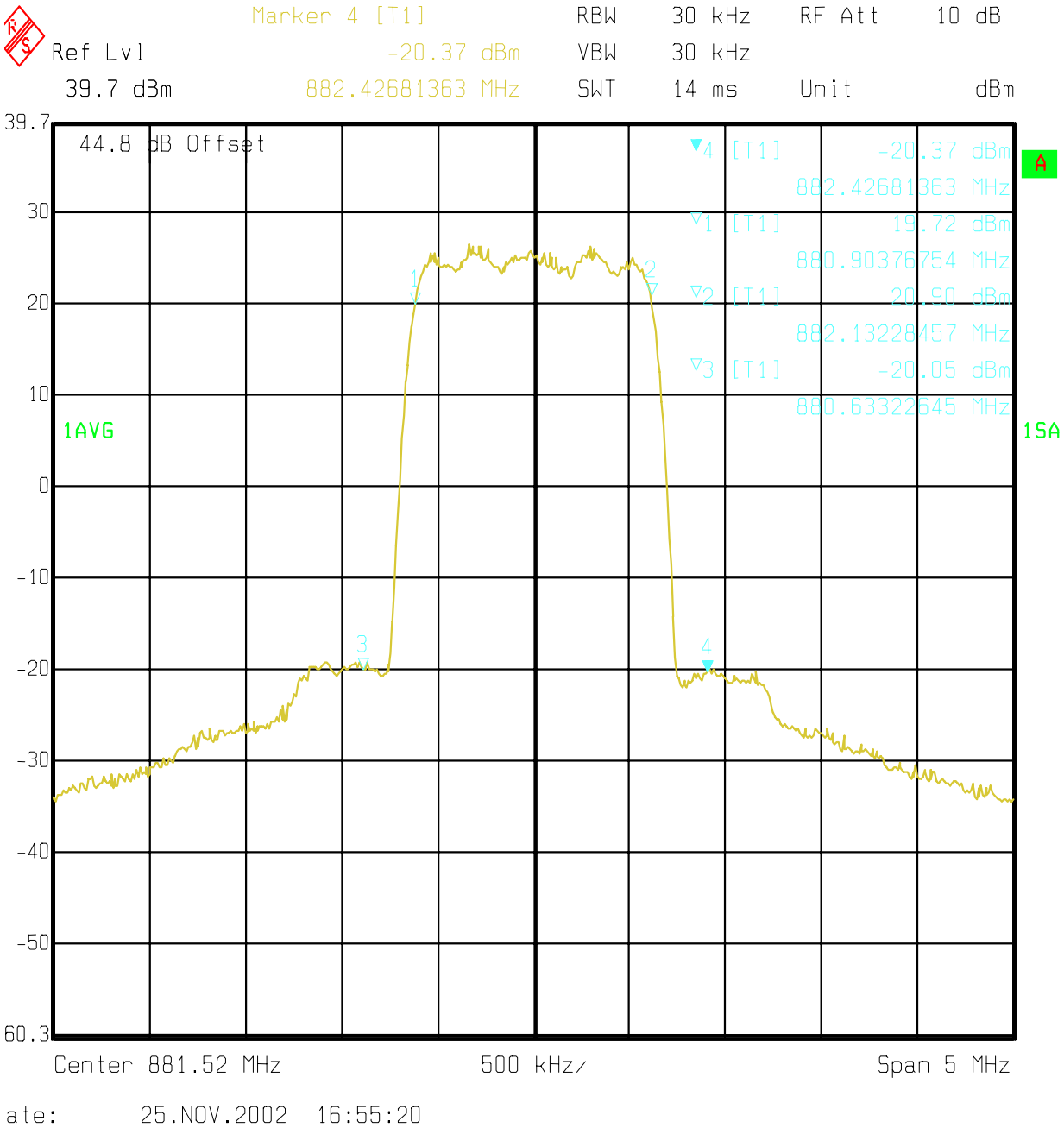

Figure 3 : Occupied Bandwidth - Channel 384 (B)

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 22.901 d) - Alternative Technologies and co-primary services

Licensees of cellular may use alternative cellular technologies and/or provide fixed services on a co-primary basis with their mobile offerings, including personal communications services (as defined in Part 24 of this chapter) on the spectrum within their assigned block.

FCC Part 24.238 Limit

a) On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmit power (P) by at least 43+10 log (P) dB.

b) Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, 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. The emission bandwidth is defined as the width of the signal between two points, one below the carrier frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.

c) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.

d) The measurements of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

4.3.2 Test Method

Configure the BTS digital enclosure via the BTS controller to enable the SFRM to transmit at maximum power. Measurements will be made on channels at the bottom and top of each of the A and B sub-bands. The following spectrum analyzer settings are to be used for the measurement of the antenna port (DPM) spurious emissions:

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

Resolution Bandwidth:	30 kHz
Video Bandwidth:	30 kHz
Video Average:	100 Averages
Span:	1 MHz
Attenuation:	10 dB
Ref. Level:	44.8 dBm
Ref. Level Offset:	44.8 dB

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

All other Spurious Emissions up to 10 GHz

Resolution Bandwidth:	1 MHz
Video Bandwidth:	1 MHz
Video Average:	50 Averages
Span:	1GHz
Attenuation:	10 dB
Ref. Level:	Various depending on loss
Ref. Level Offset:	Various depending on loss

The emissions will be investigated up to 10 GHz (the 10^{th} harmonic of the fundamental emission) as per FCC Part 22.

4.3.3 Test Setup

The set-up required for the SFRM Antenna Port (DPM) Spurious Emission test is illustrated in Figure 4.

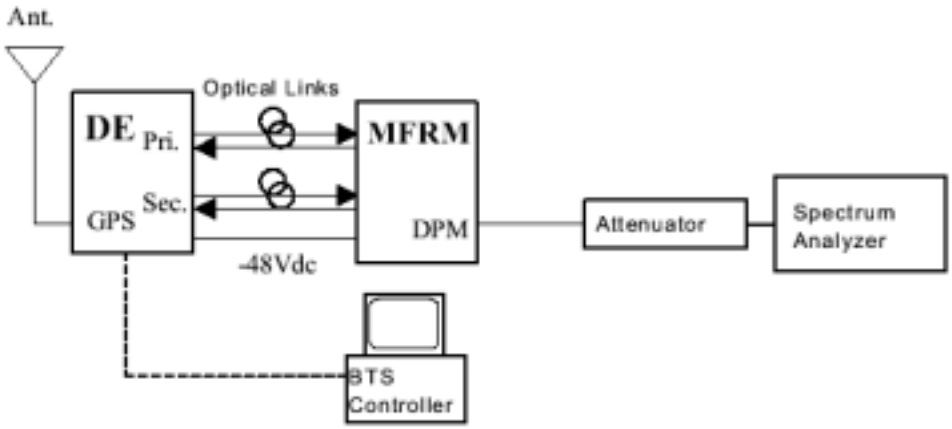

Figure 4 : Test Setup for Spurious Emissions Measurement

4.3.4 Test Results

The frequency spectrum from DC to 10GHz was scanned for emissions using the spectrum analyzer settings outlined in the test method (Section 4.3.2). This SFRM complies with the FCC limit of -13 dBm. Table 6 shows the spurious emissions at the antenna port of the SFRM and only the highest level among the 4 channels measured.

Table 6 : Spurious Emissions at the 800 MHz SFRM Antenna Port

Frequency (MHz)	Spurious Emissions Level (dBm)	Margin to FCC Limit of -13 dBm (dB)
869.04 (lower edge of Ch. 18)	-26.43	13.43
879.99 (upper edge of Ch. 283)	-26.77	13.77
880.02 (lower edge of Ch. 384)	-26.27	13.27
889.98 (upper edge of Ch. 616)	-26.60	13.60
DC-1000	-31.87 @0.77GHz Ch283	18.87
1000-2000	-30.87 @1.76GHz Ch283	17.87
2000-3000	-30.3 @2.64GHz Ch283	17.3
3000-4000	-31.67 @3.2GHz Ch616	18.67
4000-5000	-31.67 @4.08GHz Ch384	18.67
5000-6000	-30.83 @5.01GHz Ch283	17.83
6000-7000	-28.17 @6.47GHz Ch616	15.17

Frequency (MHz)	Spurious Emissions Level (dBm)	Margin to FCC Limit of -13 dBm (dB)
7000-8000	-28.83 @7.61GHz Ch283	15.83
8000-9000	-28.47 @8.32GHz Ch283	15.47
9000-10000	-28.57 @9.27GHz Ch283	15.57

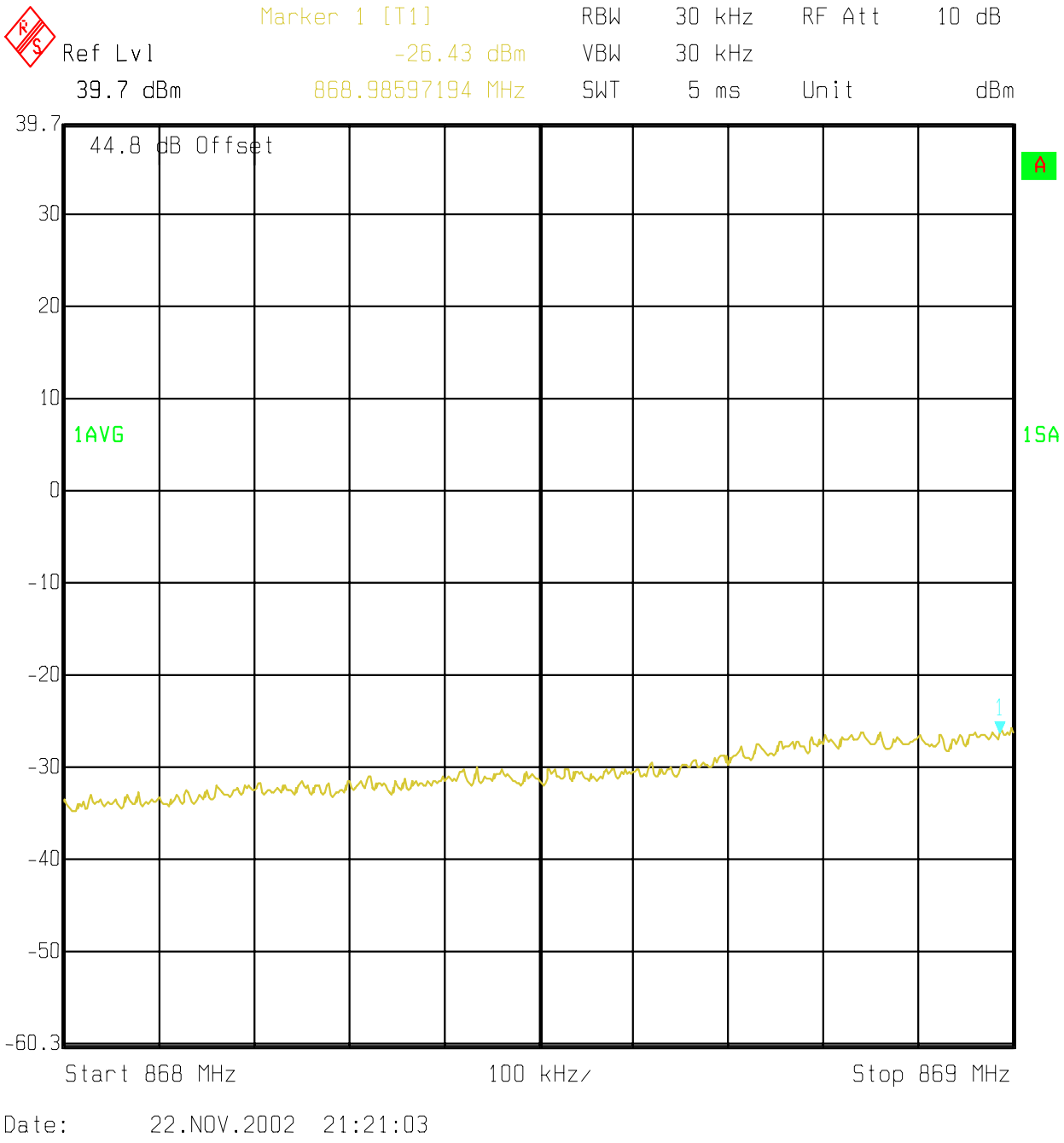

Figure 5 : Conducted Spurious Emissions - Channel 18 (A) Lower Adjacent 1MHz

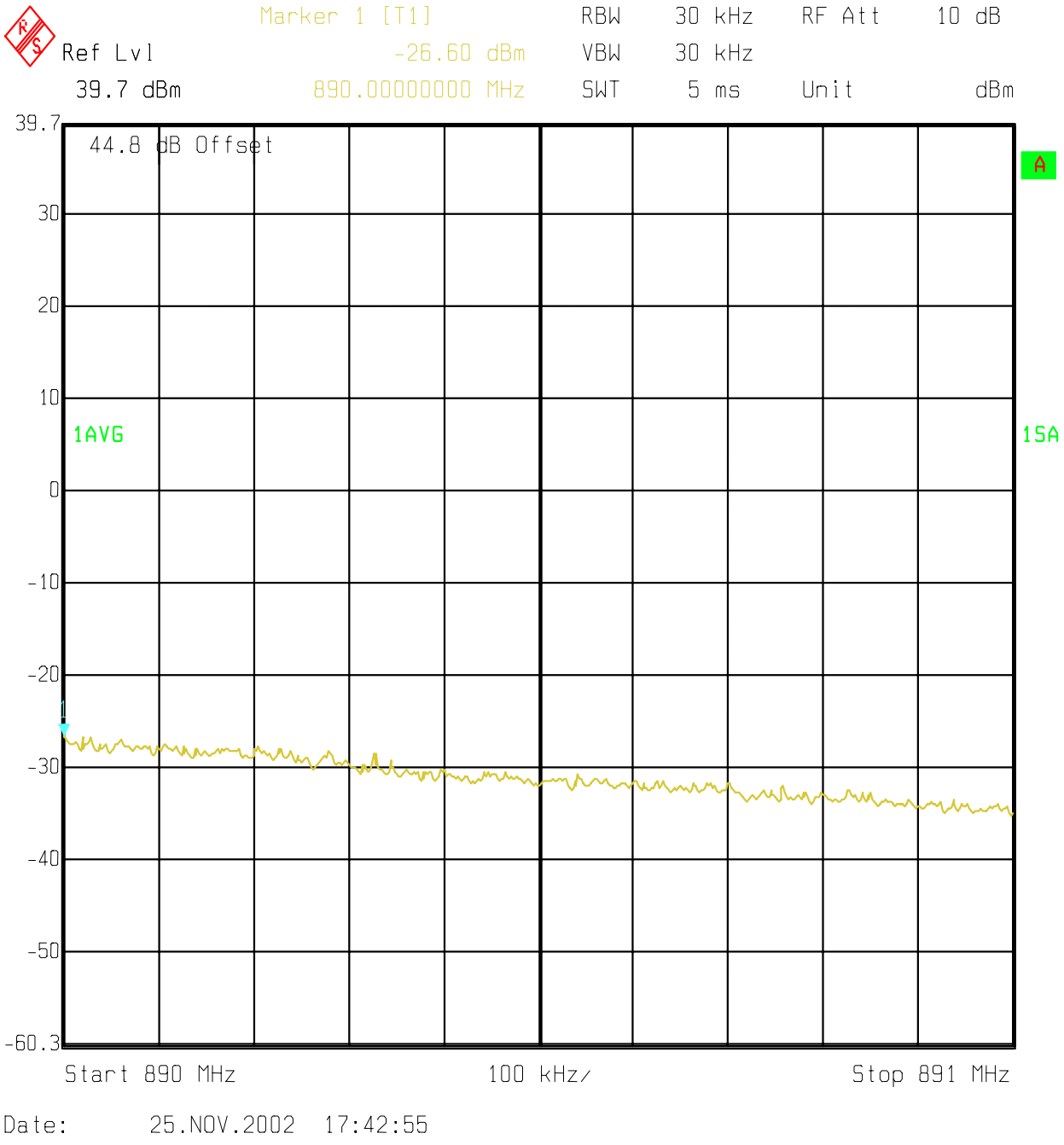

Figure 6 : Conducted Spurious Emissions - Channel 616 (B) Upper Adjacent 1MHz

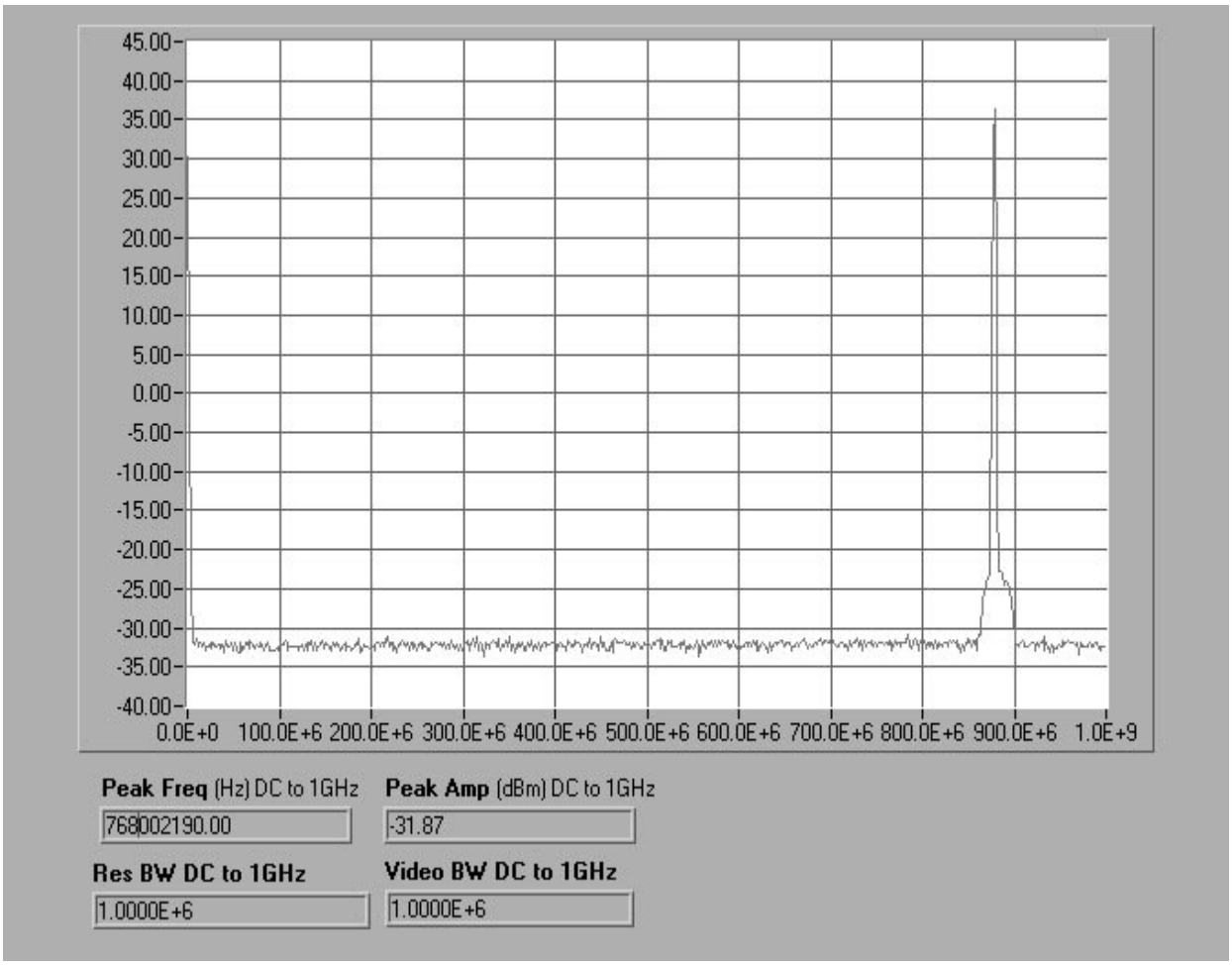

Figure 7 : Conducted Spurious Emissions - Channel 283 (A) DC-1GHz

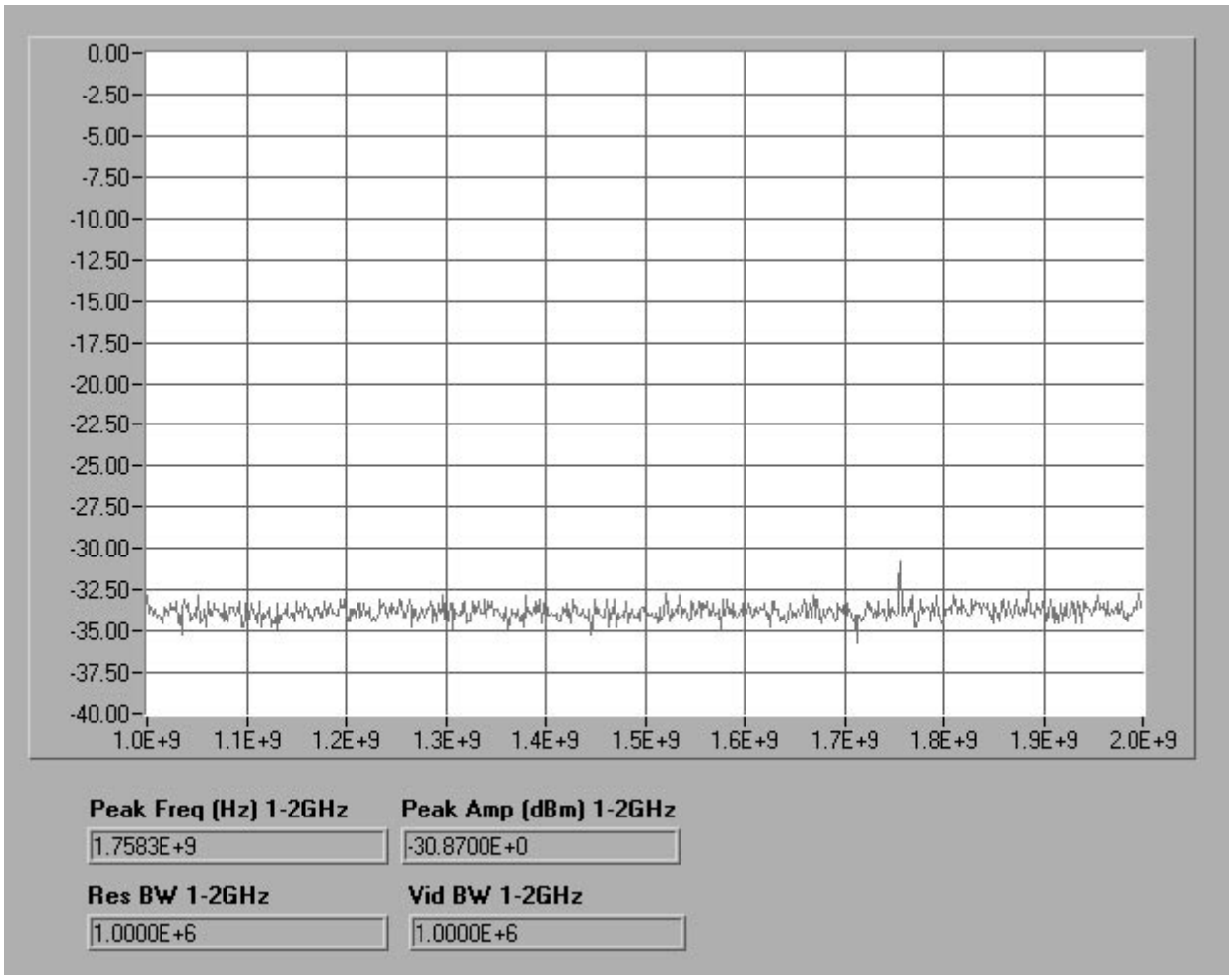

Figure 8 : Conducted Spurious Emissions - Channel 283 (A) 1-2GHz

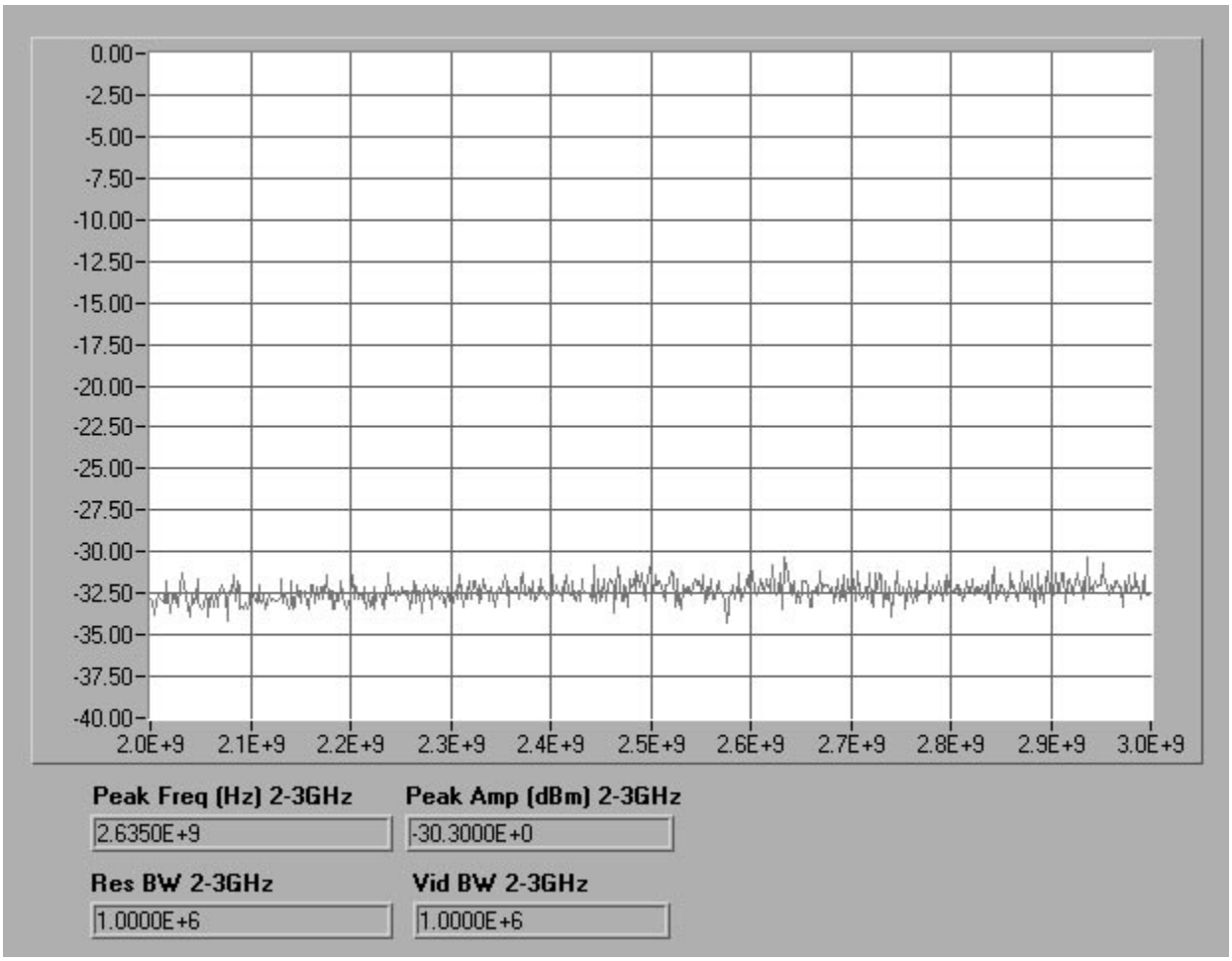

Figure 9 : Conducted Spurious Emissions - Channel 283 (A) 2-3GHz

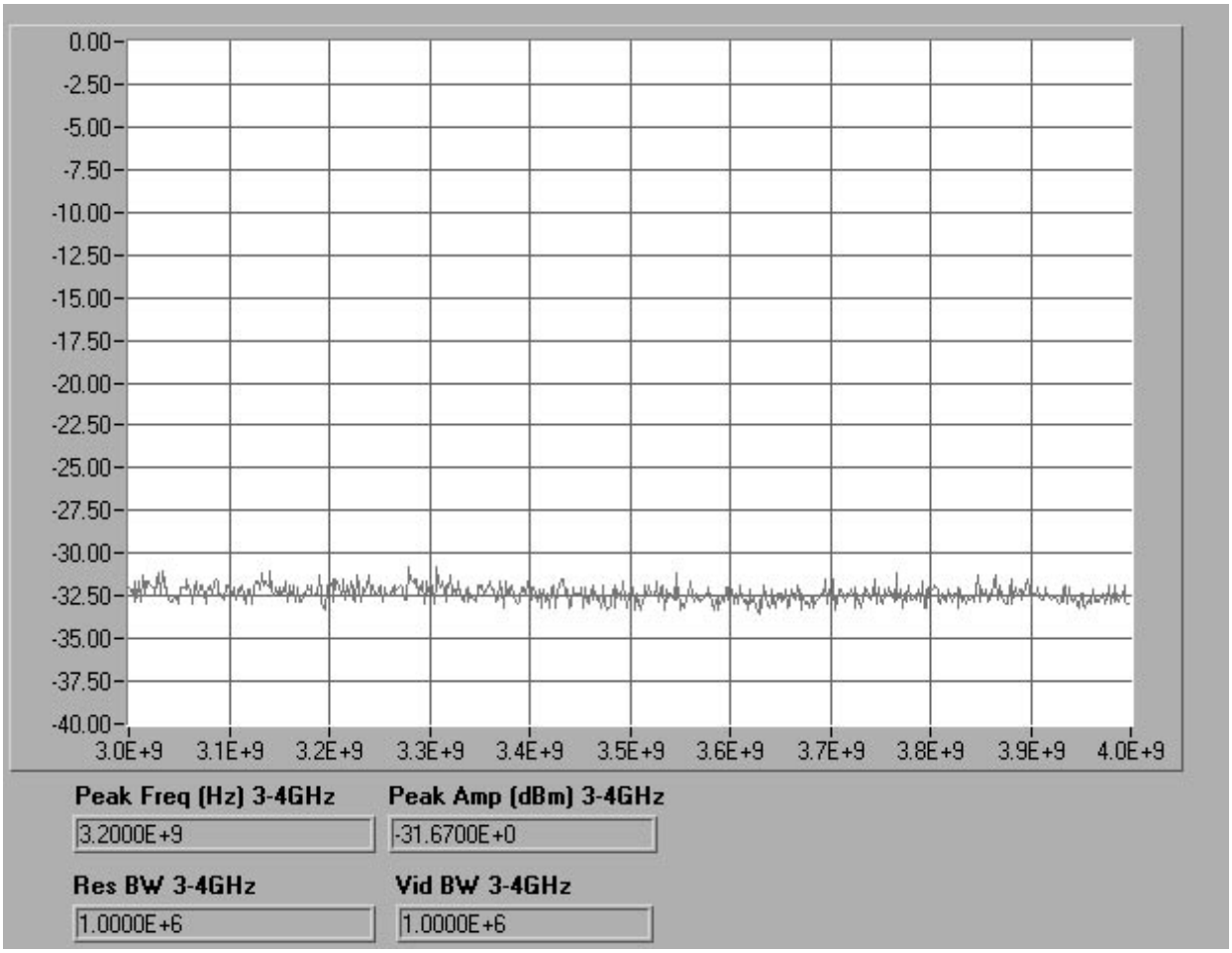

Figure 10 : Conducted Spurious Emissions - Channel 616 (B) 3-4GHz

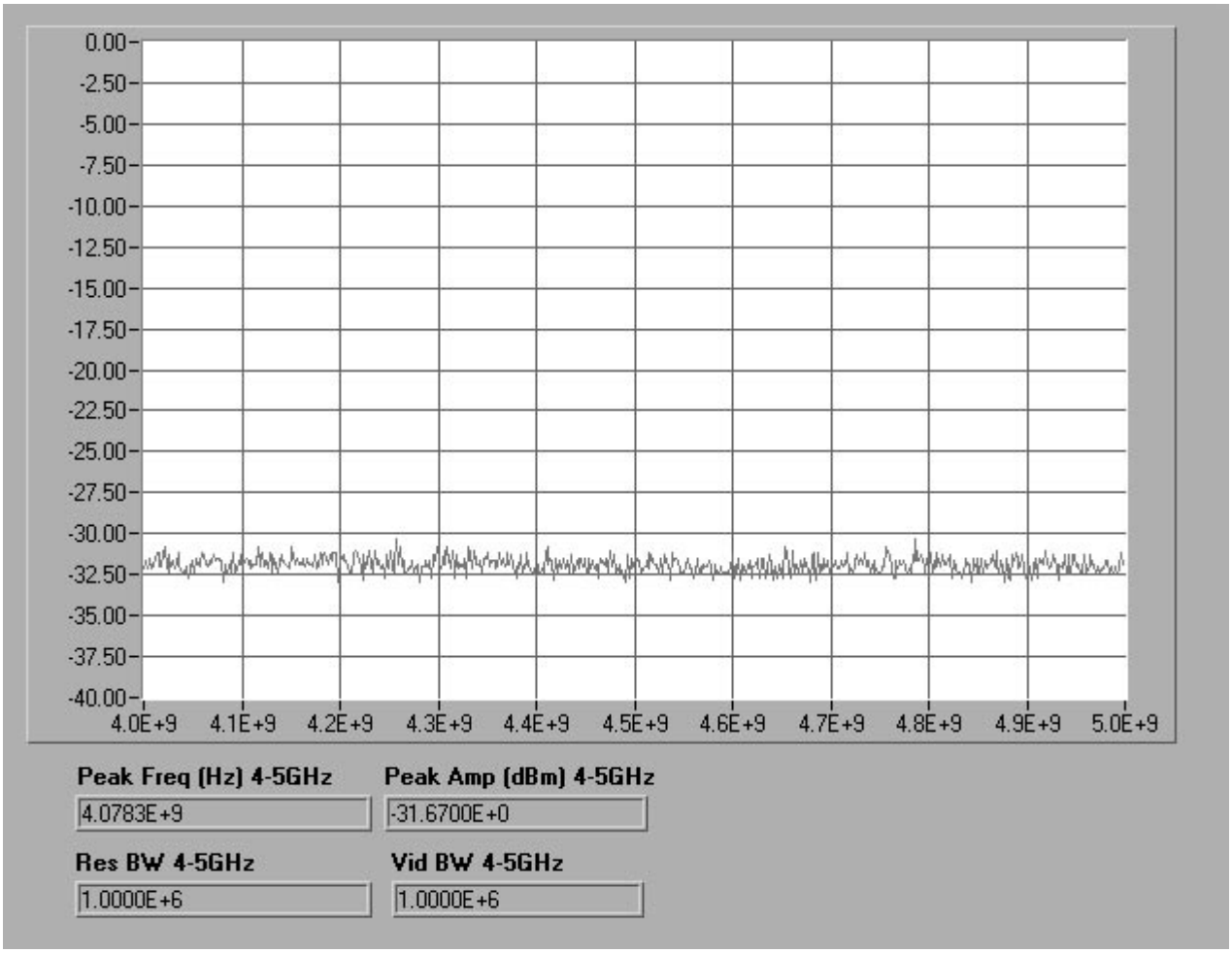

Figure 11 : Conducted Spurious Emissions - Channel 384 (B) 4-5GHz

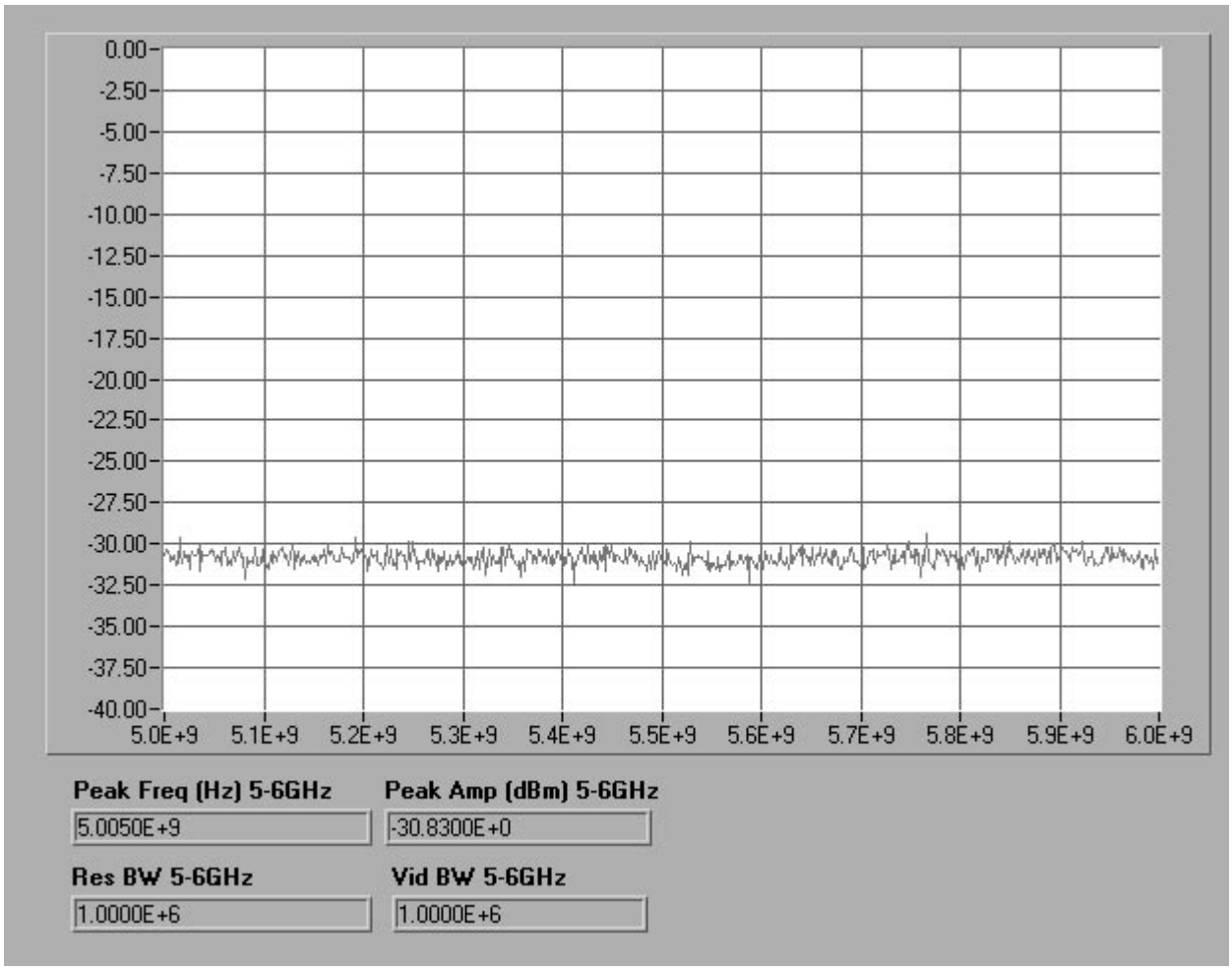

Figure 12 : Conducted Spurious Emissions - Channel 283 (A) 5-6GHz

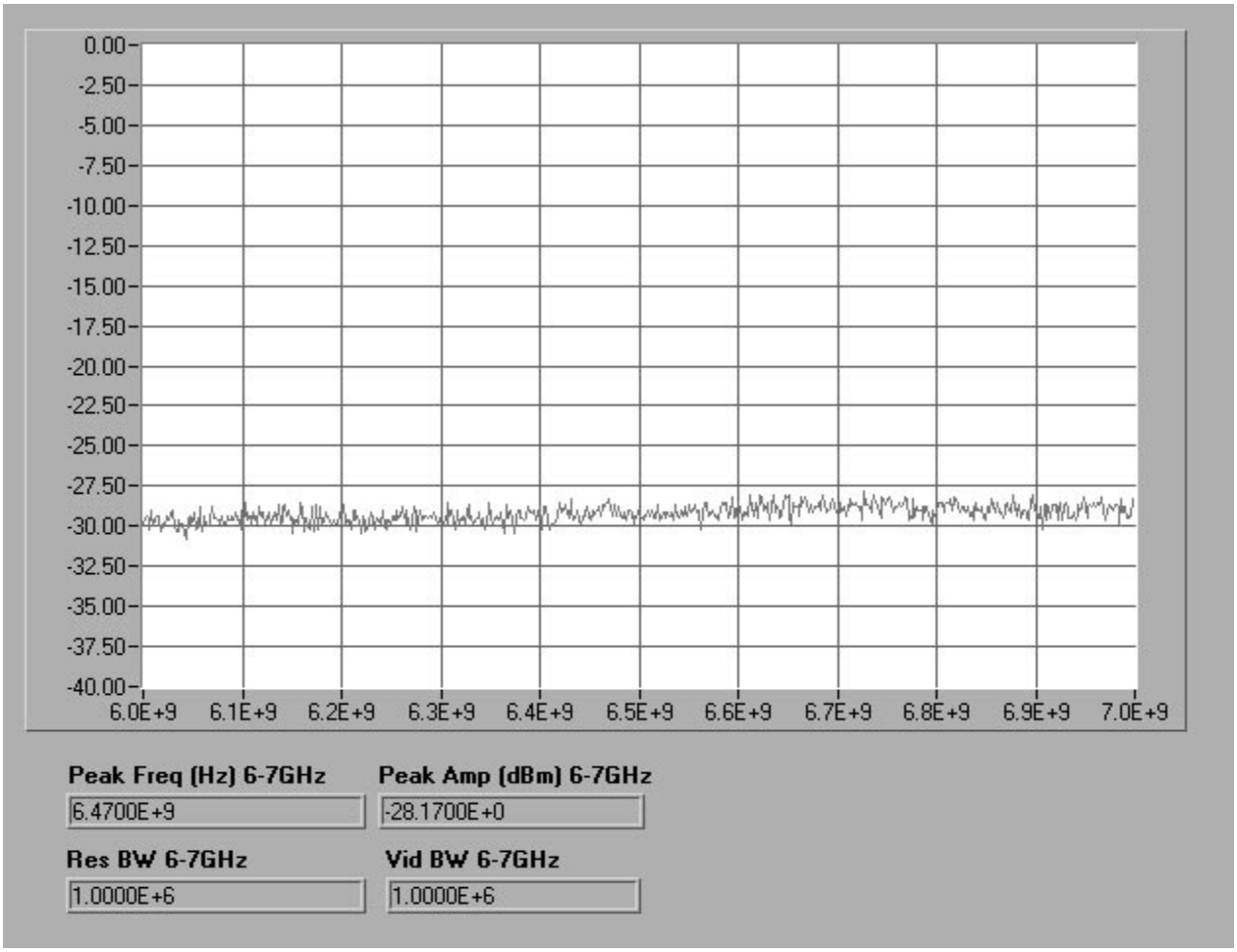

Figure 13 : Conducted Spurious Emissions - Channel 616 (B) 6-7GHz

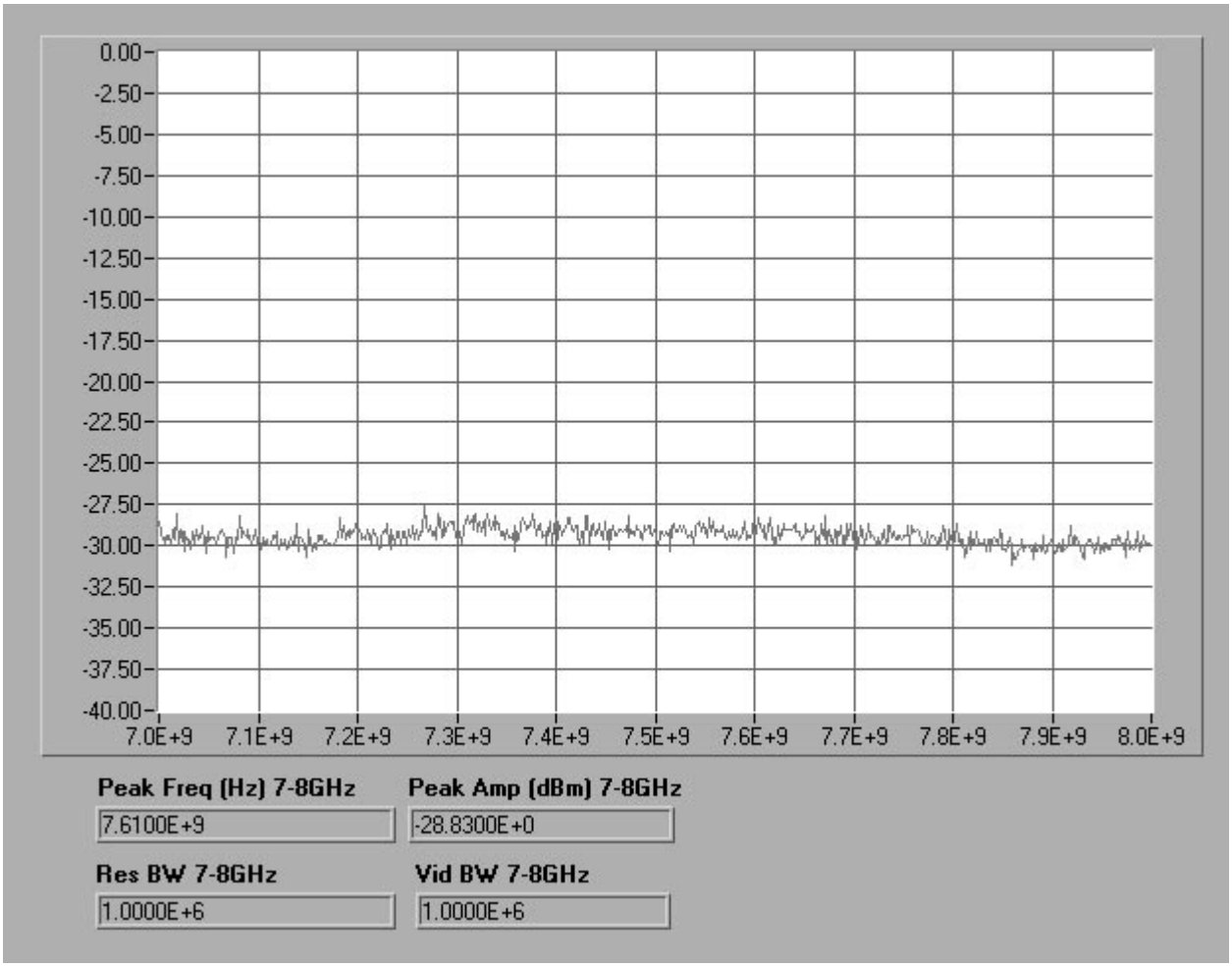

Figure 14 : Conducted Spurious Emissions - Channel 283 (A) 7-8GHz

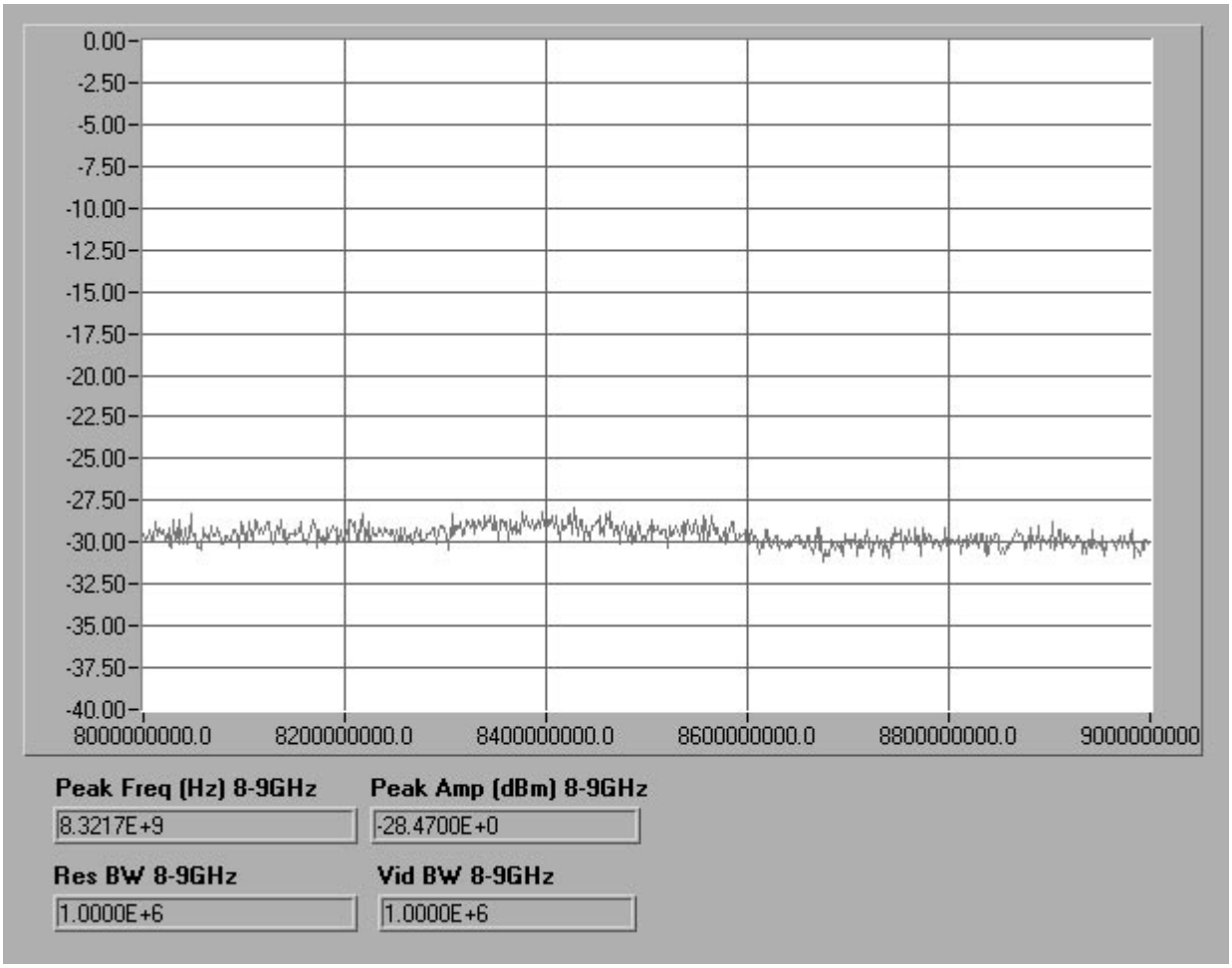

Figure 15 : Conducted Spurious Emissions - Channel 384 (B) 8-9GHz

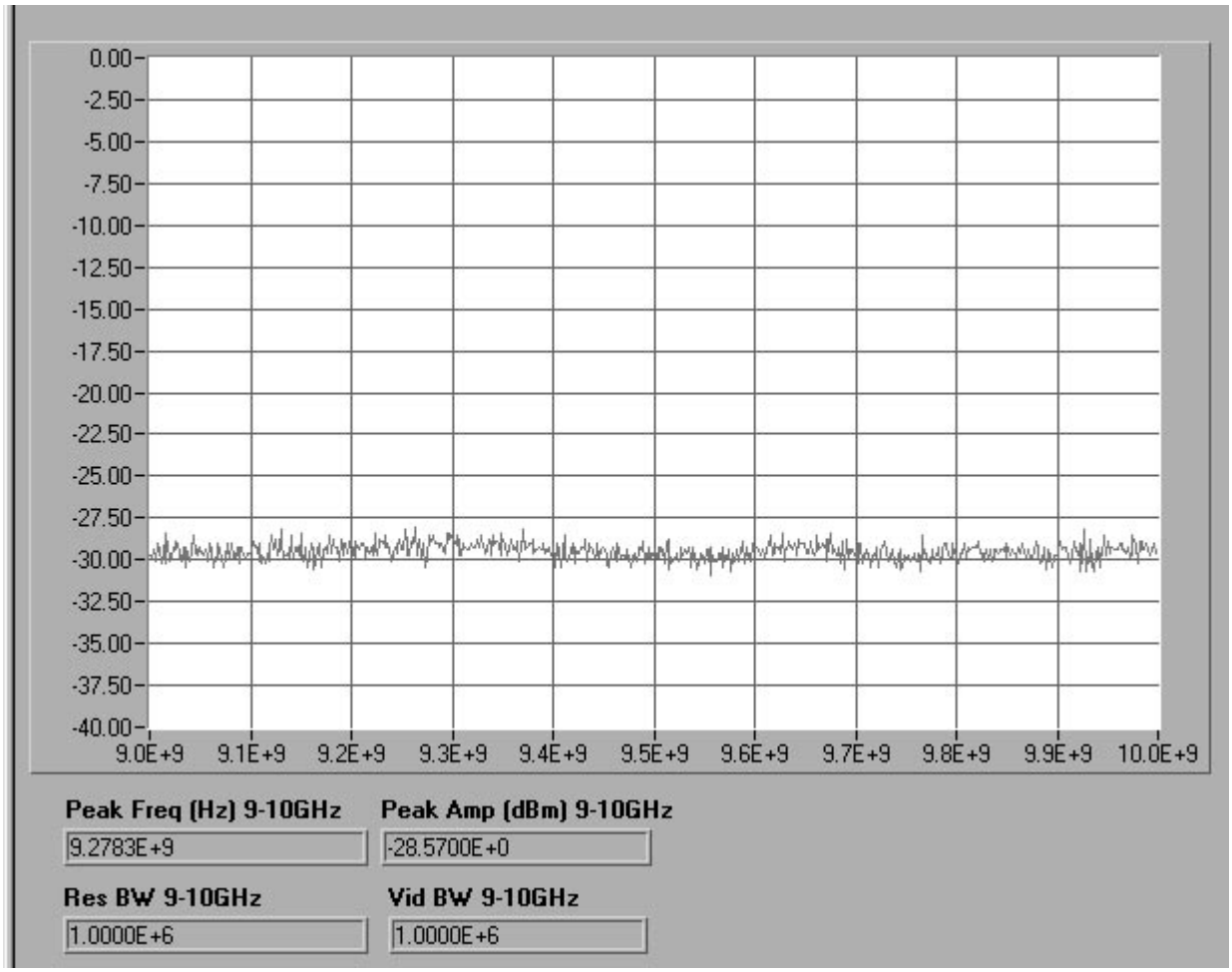

Figure 16 : Conducted Spurious Emissions - Channel 283 (A) 9-10GHz

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 821-896MHz Frequency range, must be maintained within 1.5ppm tolerance, according to Table C-1 of this section.

4.4.2 Results

The Base station 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 ppb over the range of -5C to 70C. The Base Station complies with the requirement. Should this reference frequency vary by more than 5ppb, the complete transmit chain will be disabled by the BTS software.

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-D “Recommended Minimum Performance Standards for Base Stations Supporting Dual Mode Spread Spectrum Systems”, June 2001

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