CERTIFICATE OF COMPLIANCE
FCC PART 22 CERTIFICATION

Test Lab:	**Applicant:**
CELLTECH RESEARCH INC. Testing and Engineering Services 1955 Moss Court Kelowna, B.C. Canada V1Y 9L3 Phone: 250 - 860-3130 Fax: 250 - 860-3110 e-mail: info@celltechlabs.com web site: www.celltechlabs.com	**WITHUS IT CO., LTD.** 2F. DongNam Bldg. 448-16 Shingil-5Dong, YongDungPo-Ku, Seoul, Korea

FCC Classification:	**Licensed Non-Broadcast Transmitter Held to Ear (TNE)**
FCC Rule Part(s):	**§22(H), §22.901(d), §2**
FCC ID:	**POQWCE-200**
Model(s):	**WCE-200**
Equipment Type:	**Dual-Mode AMPS/CDMA Cellular Phone**
Tx Frequency Range:	**824.04 - 848.97 MHz (AMPS)** **824.70 - 848.31 MHz (CDMA)**
Rx Frequency Range:	**869.04 - 893.97 MHz (AMPS)** **869.70 - 893.31 MHz (CDMA)**
Max. RF Output Power:	**0.473 Watts ERP (AMPS)** **0.320 Watts ERP (CDMA)**
Frequency Tolerance(s):	**± 0.00025 % (AMPS)** **± 300 Hz (CDMA)**
Emission Designator(s):	**40K0F8W, 40K0F1D, 1M25F9W**

This equipment is shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947 of FCC Rules.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

This test report shall not be reproduced partially, or in full, without the prior written approval of Celltech Research Inc. The results and statements contained in this report pertain only to the device(s) evaluated.

Shawn McMillen
General Manager
Celltech Research Inc.

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FCC PART 22 MEASUREMENT REPORT

1.1 SCOPE

Measurement and determination of electromagnetic emissions (EME) from radio frequency devices for compliance with the technical rules and regulations of the Federal Communications Commission.

1.2 GENERAL INFORMATION §2.1033(a)

APPLICANT:

WITHUS IT CO., LTD.
2F. DongNam Bldg. 448-16
Shingil-5Dong, YongDungPo-Ku,
Seoul, Korea

FCC ID	**POQWCE-200**
Model(s)	**WCE-200**
EUT Type	**Single-Band Dual-Mode Cellular Phone**
Classification	**Licensed Non-Broadcast Transmitter Held to Ear (TNE)**
Rule Part(s)	**§22(H), §22.901(d), §2**
Modulation(s)	**AMPS / CDMA**
Max. RF Output Power	**0.473 Watts ERP (AMPS) 0.320 Watts ERP (CDMA)**
Tx Freq. Range	**824.04 - 848.97 MHz (AMPS) 824.70 - 848.31 MHz (CDMA)**
Rx Freq. Range	**869.04 - 893.97 MHz (AMPS) 869.70 - 893.31 MHz (CDMA)**
Emission Designator(s)	**40K0F8W, 40K0F1D, 1M25F9W**
Antenna Type	**Retractable Whip (1/4l)**
Battery Type(s)	**3.7V 950mAh Lithium-Ion Standard Battery 3.7V 1700mAh Lithium-Ion Extended Battery**

2.1 MEASUREMENT PROCEDURES

2.2 TRANSMITTER AUDIO FREQUENCY RESPONSE - §2.1047(a)

The frequency response of the audio modulating circuit over the frequency range 100–5000 Hz is measured. The audio signal generator is connected to the audio input circuit/microphone of the EUT. The audio signal input is adjusted to obtain 50% modulation at 1kHz and this point is taken as the 0dB reference. With the input held constant and below the limit at all frequencies, the audio signal generator is varied from 100 to 50 kHz.

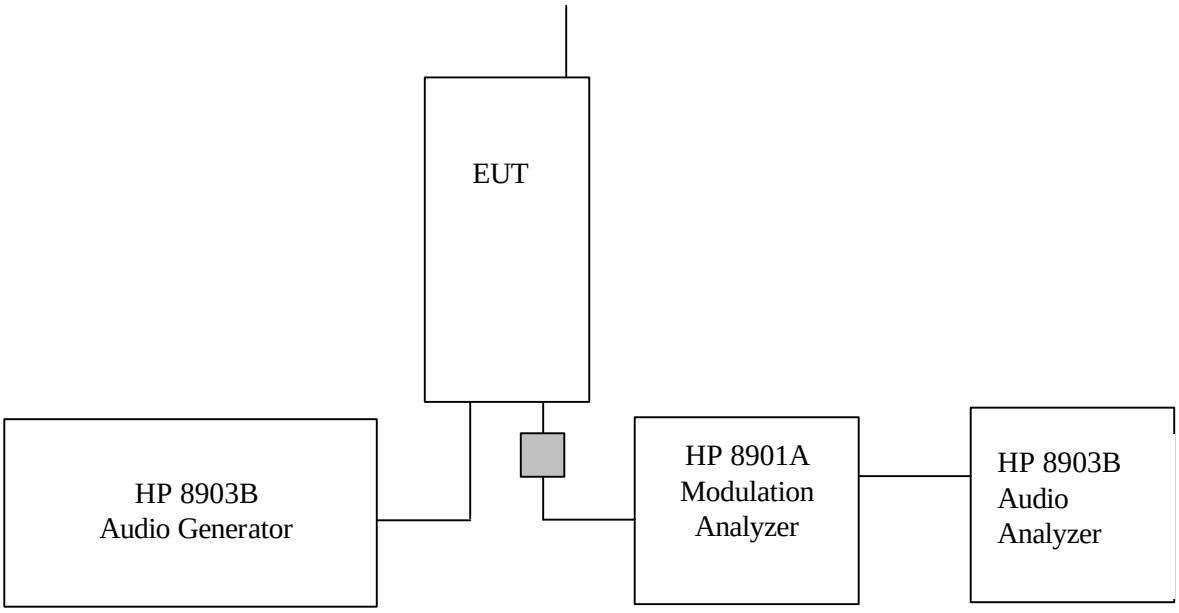
2.3 AUDIO LOW PASS FILTER FREQUENCY RESPONSE - §22.915(d)

The response in dB relative to 1kHz is measured using the HP8901 Modulation Analyzer. For the frequency response of the audio low-pass filter, the audio input is connected at the input to the modulation limiter and the modulated stage. The audio output is connected at the output of the modulated stage.

2.4 MODULATION LIMITING - §2.1047(b), §22.915(b)

The audio signal generator is connected to the audio input circuit/microphone of the EUT. The modulation response is measured for each of the three modulating frequencies (300Hz, 1000Hz, and 3000Hz), and the input voltage is varied from 30% modulation (±3.6kHz deviation) to at least 20dB higher than the saturation point. Measurements of modulation and test plots are attached. Measurements were performed for ST, SAT, and wide-band data modulations.

Note: ST, SAT, & Wide-Band data were internally generated by the EUT.



Transmitter Audio Frequency & Tone Modulation Test Setup

2.5 RF OUTPUT POWER - §2.1046

The conducted power was measured using a Gigatronics 8650A Universal Power Meter in modulated average power mode. An offset value in dB was entered into the power meter to correct for the losses of the attenuator and cable installed before the sensor input. The transmitter terminal was coupled to the power meter and the EUT was placed into test mode via keypad access at a full data rate in the "always up" power control mode. All subsequent tests were performed using the same tune up procedures.

2.6 OCCUPIED BANDWIDTH - §2.1049(c)

The antenna output terminal of the EUT was connected to the input of a 50Ω spectrum analyzer through a matched 30dB attenuator. The radio transmitter was operating at maximum output power. 100% of the in-band modulation was below the specified mask per §22.917.

Specified Limits:

(a) On any frequency removed from the assigned carrier frequency by more than 20kHz, up to and including 45kHz, the sideband was at least 26dB below the carrier.
(b) On any frequency removed from the assigned carrier frequency by more than 45kHz, up to and including 90kHz, the sideband was at least 45dB below the carrier.
(c) On any frequency removed from the assigned carrier frequency by more than 90kHz, up to the first multiple of the carrier frequency, the sideband was at least 60dB below the carrier of 40 + $\log_{10}$ (mean power output in Watts) dB, whichever was the smaller attenuation.

2.7 SPURIOUS EMISSIONS AT ANTENNA TERMINAL - §2.1051

The level of the carrier and the various conducted spurious frequencies were measured by means of a calibrated spectrum analyzer. The spectrum was scanned from 10MHz to 20GHz. The antenna output terminal of the EUT was connected to the input of a 50Ω spectrum analyzer through a matched 30dB attenuator and coaxial cable.

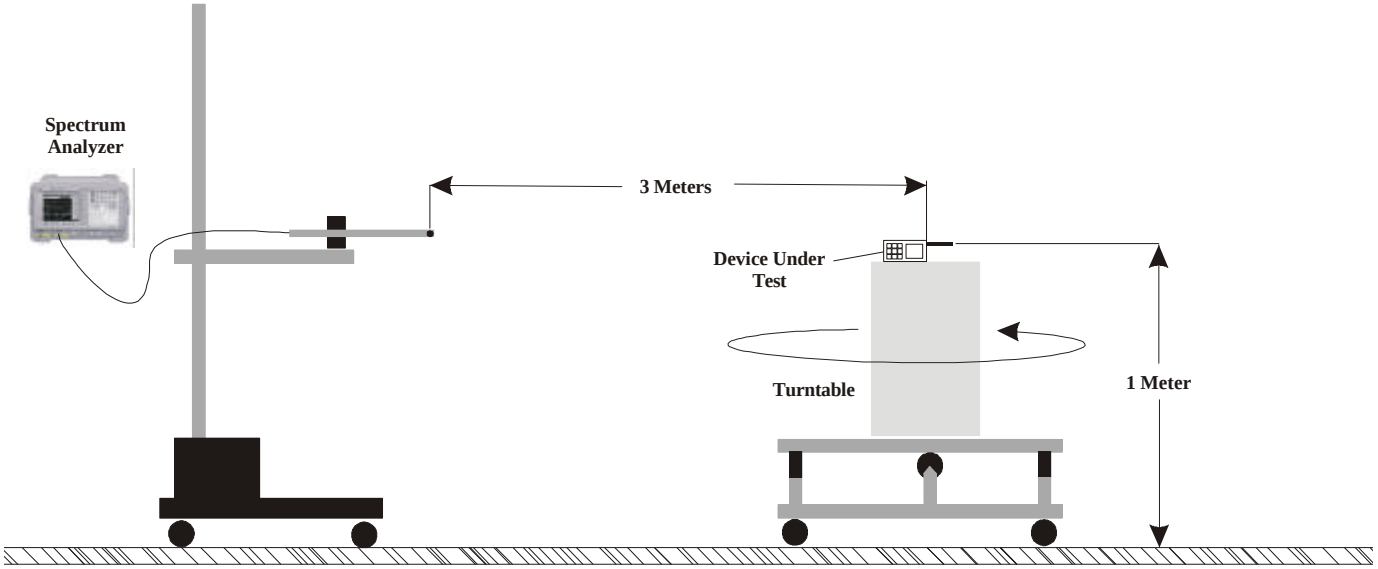
2.8 FIELD STRENGTH OF SPURIOUS RADIATION - §2.1053

Radiated and harmonic emissions were measured on a 3-meter outdoor site. The EUT was placed on the turntable with the transmitter transmitting into a non-radiating load. A receiving antenna located 3 meters from the turntable received any signal radiated from the transmitter and its operating accessories. The receiving antenna was varied in height from 1 to 4 meters and the polarization was varied (horizontal and vertical) to determine the worst-case emission level.

2.9 EMISSION DESIGNATOR - §2.202

2M + 2DK
CDMA BW = 1.25 MHz
F = Frequency Modulation
9 = Composite Digital Info
W = Combination (Audio/Data)

3.0 RADIATED MEASUREMENT TEST SETUP



Radiated Measurement Test Setup Diagram

Radiated Measurement Test Setup Photograph

3.1 FREQUENCY STABILITY / TEMPERATURE VARIATION - §2.1055

The minimum frequency stability for analog mode shall be ±0.000075% referenced to a received carrier frequency from a base station. This meets the requirement for operational accuracy of 0.00025% in analog mode. The minimum frequency stability for digital mode shall be ±300Hz referenced to a received carrier frequency from a base station. This meets the requirement for operational accuracy of 0.00005% in digital mode. A base station simulator was used to measure the error in the frequency.

Measurement Method:

The frequency stability of the transmitter was measured by:

1. Temperature: The temperature was varied from -30°C to +60°C at intervals no more than 10°C throughout the temperature range using an environmental chamber. A period of time sufficient to stabilize all of the components in the equipment shall be allowed prior to each frequency measurement.

2. Primary Supply Voltage: The primary supply voltage was set at the specified nominal rating and reduced to the battery operating endpoint specified by the manufacturer. When the battery voltage reaches its endpoint the device switches off. The voltage was measured at the terminals of the power supply or at the input to the cable normally provided with the equipment.

Time Period and Procedure:

1. The carrier frequency of the transmitter was measured at room temperature (25°C to 27°C to provide a reference).
2. The equipment was subjected to an overnight “soak” at -30°C without any power applied.
3. After the overnight “soak” at -30°C, the measurement of the carrier frequency of the transmitter was made within a three-minute interval after applying power to the transmitter.

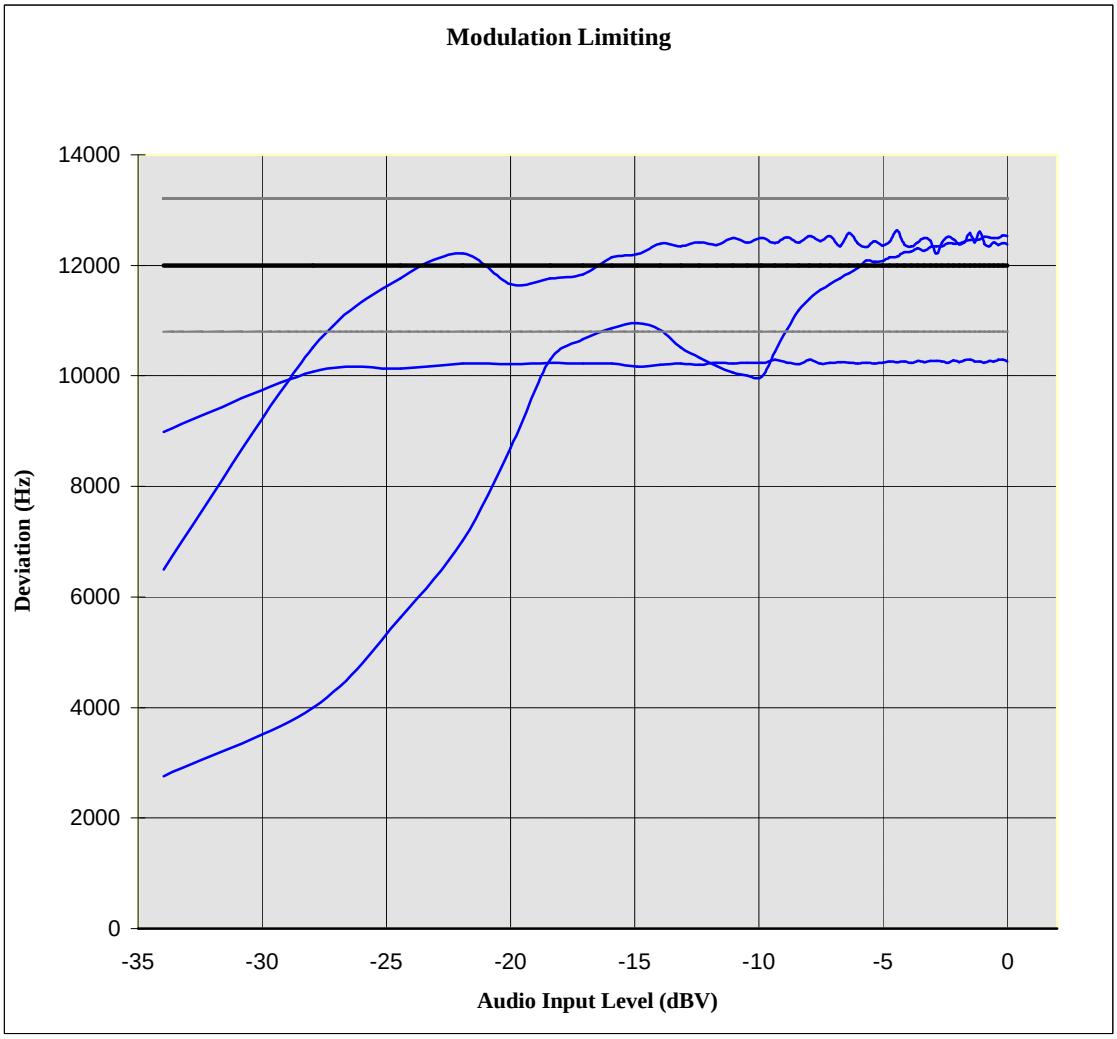
Frequency measurements were made at 10°C intervals up to +60°C, then back to room temperature. A minimum period of one hour was provided to allow stabilization of the equipment at each temperature level.

4.1 TEST DATA

4.2 MODULATION LIMITING - §2.1047(b), §22.915(b)

Test Date: 01/07/02
FCC ID: POQWCE-200
Model: WCE-200
Mode: AMPS (Analog)

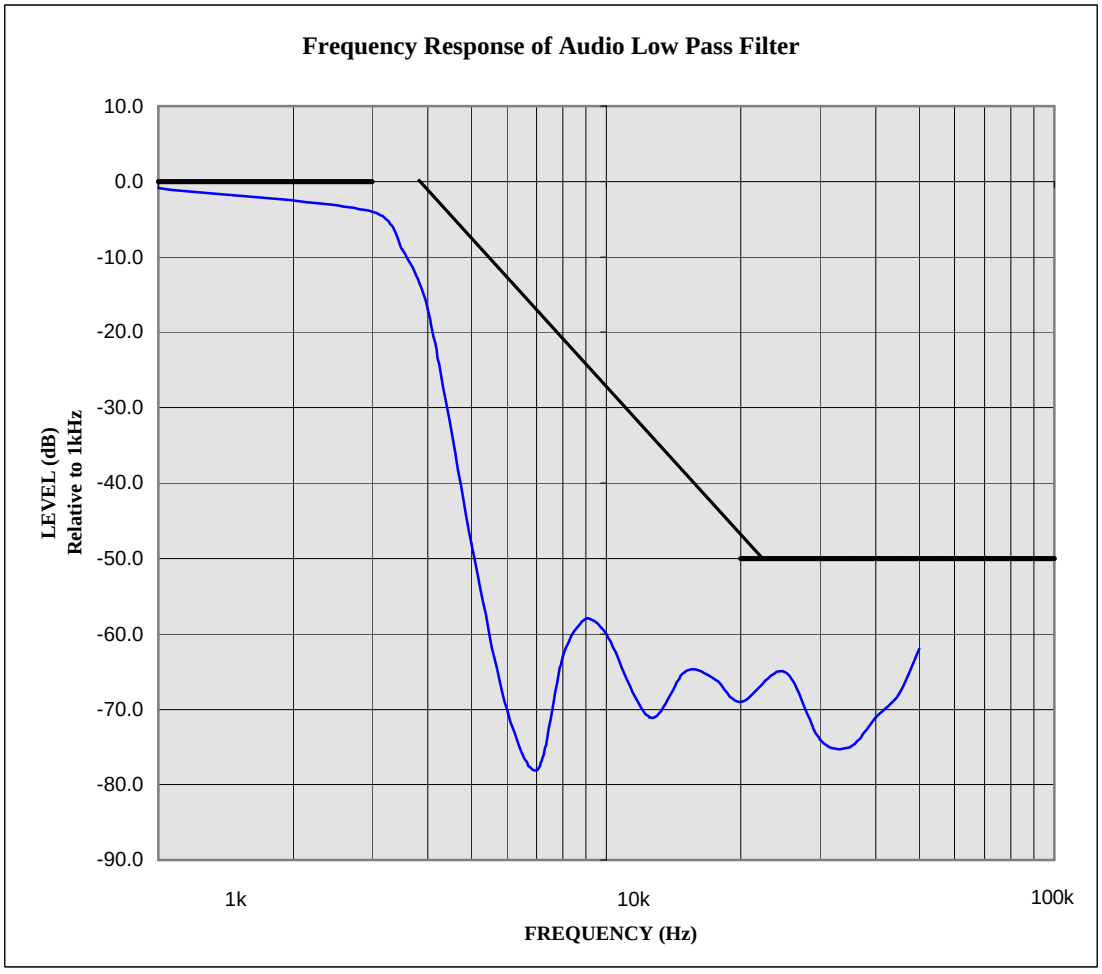
REFERENCE: 1 kHz = 0 dB



4.3 FREQUENCY RESPONSE OF AUDIO LOW PASS FILTER - §22.915(d)

Test Date: 01/07/02
FCC ID: POQWCE-200
Model: WCE-200
Mode: AMPS (Analog)

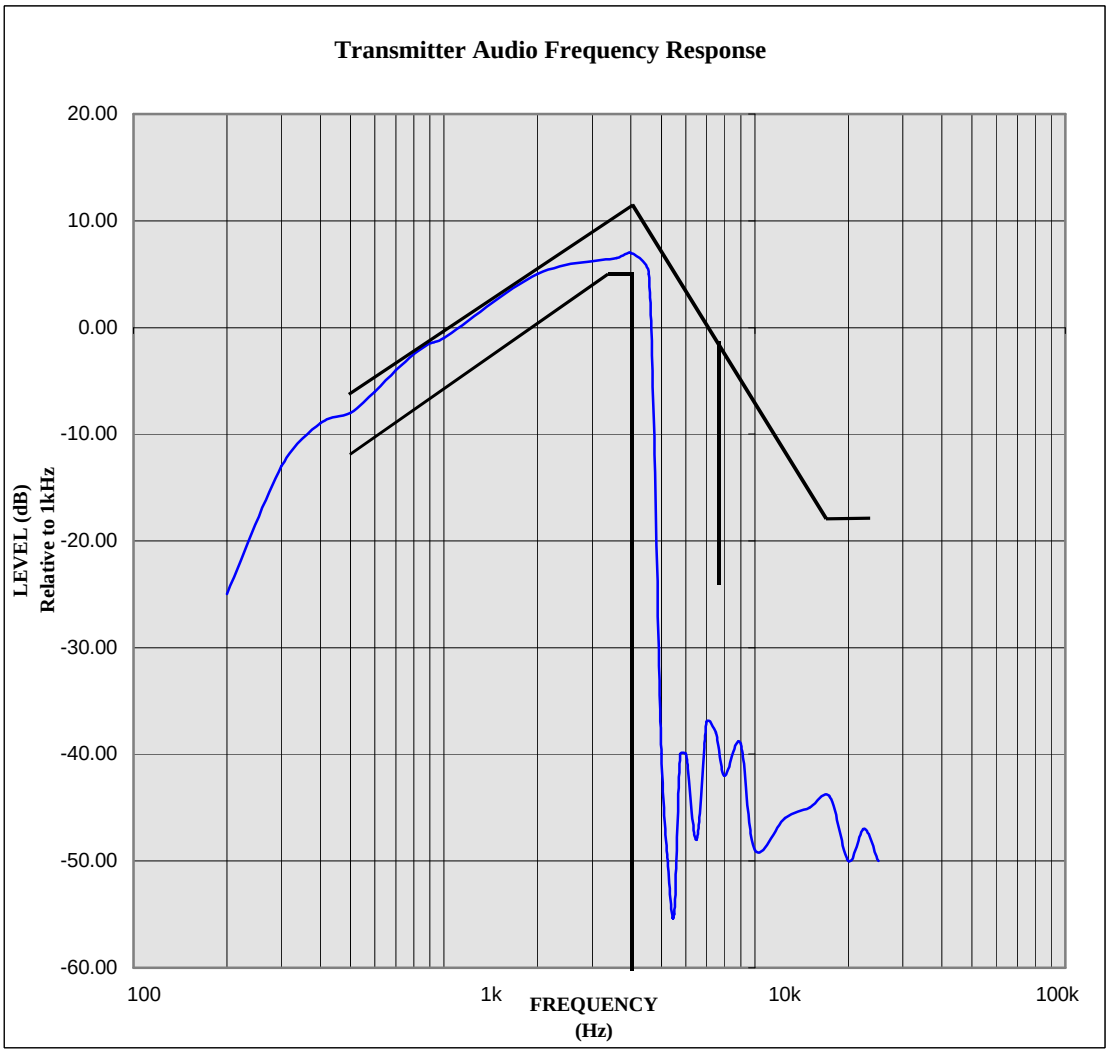
REFERENCE: 1 kHz = 0 dB



4.4 TRANSMITTER AUDIO FREQUENCY RESPONSE - §2.1047(a)

Test Date: 01/07/02
FCC ID: POQWCE-200
Model: WCE-200
Mode: AMPS (Analog)

REFERENCE: 1 kHz = 0 dB



4.5 EFFECTIVE RADIATED POWER OUTPUT - §2.1046

AMPS MODE

Freq. Tuned	EUT Conducted Power	Max. Field Strength of EUT (Horiz. Polar.) Antenna Extended	Dipole Gain	Dipole Forward Conducted Power	ERP of EUT Dipole Gain + Dipole Forward Conducted Power	
(MHz)	(dBm)	(dBm)	(dBd)	(dBm)	(dBm)	(Watts)
824.04	26.70	- 8.99	- 1.34	27.13	25.79	0.379
836.49	26.70	- 9.05	- 1.19	26.81	25.62	0.365
848.97	26.70	- 8.21	- 1.04	27.79	26.75	0.473
848.97	26.70	-8.53	- 1.04	27.58	26.54	0.451*

Notes:

1. ERP Measurements by Substitution Method:

The EUT was placed on a turntable 3-meters from the receive antenna. The field of maximum intensity was found by rotating the EUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters. The field strength was recorded from a calibrated spectrum analyzer for each channel being tested. A half-wave dipole was substituted in place of the EUT. A CW signal with the same bandwidth as the EUT was generated, amplified, and fed through a directional coupler. The height and direction of the dipole was adjusted in order to give the field of maximum intensity. The power to the dipole was adjusted in order to give the same field strength reading as previously recorded for the EUT. The power at the coupler port was recorded at this point. The feed point for the dipole was then connected to a calibrated power meter and the power adjusted to read the same as the coupler port previously recorded, this is to account for any mismatch in impedance, which may occur at the dipole antenna. The conducted power at the antenna feed point was recorded. The ERP level was determined by adding the dipole forward conducted power and the dipole gain in dB. For readings above 1GHz the above method is repeated using standard gain horn antennas.

2. ERP measurements were performed using the standard battery and *extended battery.

EFFECTIVE RADIATED POWER OUTPUT - §2.1046

CDMA MODE

Freq. Tuned	EUT Conducted Power	Max. Field Strength of EUT (Horiz. Polar.) Antenna Extended	Dipole Gain	Dipole Forward Conducted Power	ERP of EUT Dipole Gain + Dipole Forward Conducted Power	
(MHz)	(dBm)	(dBm)	(dBd)	(dBm)	(dBm)	(Watts)
824.70	25.0	- 10.76	- 1.34	25.43	24.09	0.256
835.89	25.0	- 10.82	- 1.19	25.11	23.92	0.247
848.31	25.0	- 9.98	- 1.04	26.09	25.05	0.320
848.31	25.0	-10.24	- 1.04	25.85	24.81	0.303*

Notes:

1. ERP Measurements by Substitution Method:

The EUT was placed on a turntable 3-meters from the receive antenna. The field of maximum intensity was found by rotating the EUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters. The field strength was recorded from a calibrated spectrum analyzer for each channel being tested. A half-wave dipole was substituted in place of the EUT. A CDMA signal with the same bandwidth as the EUT was generated, amplified, and fed through a directional coupler. The height and direction of the dipole was adjusted in order to give the field of maximum intensity. The power to the dipole was adjusted in order to give the same field strength reading as previously recorded for the EUT. The power at the coupler port was recorded at this point. The feed point for the dipole was then connected to a calibrated power meter and the power adjusted to read the same as the coupler port previously recorded, this is to account for any mismatch in impedance, which may occur at the dipole antenna. The conducted power at the antenna feed point was recorded. The ERP level was determined by adding the dipole forward conducted power and the dipole gain in dB. For readings above 1GHz the above method is repeated using standard gain horn antennas.

2. ERP measurements were performed using the standard battery and *extended battery.

4.6 FIELD STRENGTH OF SPURIOUS RADIATION - § 2.1053

AMPS MODE

Operating Frequency (MHz): **824.04**
Channel: 991 (Low)
Measured Cond. Pwr. (dBm): 26.70
Measured ERP (dBm): 25.79
Modulation: ST (Signaling Tone)
Distance: 3 Meters
Limit: 43 + 10 log (W) = 40.31 dBc

Frequency (MHz)	Field Strength of Spurious Radiation (dBm)	Horn Forward Cond. Pwr. (dBm)	Standard Gain Horn Antenna Gain (dBi)	POL (H/V)	EIRP (dBm)	ERP (dBm)	dBc
1648.08	-96.43	-71.54	6.6	H	-64.94	-67.08	92.87
2472.12	-97.07	-68.27	7.8	H	-60.47	-62.61	88.40
3296.16	-98.61	-71.03	7.75	H	-63.28	-65.42	91.21
4120.20	-99.73	-72.71	7.6	H	-65.11	-67.25	93.04
4944.24	-100.47	-73.11	8.5	H	-64.61	-66.75	92.54
5768.28	-101.16	-72.28	8.8	H	-63.48	-65.62	91.41
6592.32	-101.32	-72.44	9.6	H	-62.84	-64.98	90.77
7416.36	-102.32	-74.79	9.0	H	-65.79	-67.93	93.72
8240.40	-102.93	-77.72	9.3	H	-68.42	-70.56	96.35

Radiated Measurements by Substitution Method:

The EUT was placed on a turntable 3-meters from the receive antenna. The field of maximum intensity was found by rotating the EUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters. The field strength was recorded from a calibrated spectrum analyzer for each channel being tested. A standard gain horn antenna was substituted in place of the EUT. The antenna was fed through a directional coupler and the power at the coupler port was monitored. A signal generator and power amplifier controlled the antenna, and the input level of the antenna was adjusted to the same field strength level as the EUT. The feed point for the antenna was then connected to a calibrated power meter and the power adjusted to read the same as the coupler port previously recorded, this is to account for any mismatch in impedance, which may occur at the horn antenna. The conducted power at the antenna feed point was recorded. The forward conducted power for the horn antenna was then determined and the EIRP level was determined by adding the horn forward conducted power and the antenna gain in dB.

Notes:
1. All other spurious emissions were found to be below the magnitude of each harmonic.
2. Spurious emissions more than 20 dB below the limit are reported, though not required per §2.1051.

FIELD STRENGTH OF SPURIOUS RADIATION - § 2.1053

AMPS MODE

Operating Frequency (MHz): **836.49**
Channel: 383 (Mid)
Measured Cond. Pwr. (dBm): 26.70
Measured ERP (dBm): 25.62
Modulation: ST (Signaling Tone)
Distance: 3 Meters
Limit: 43 + 10 log (W) = 40.31 dBc

Frequency (MHz)	Field Strength of Spurious Radiation (dBm)	Horn Forward Cond. Pwr. (dBm)	Standard Gain Horn Antenna Gain (dBi)	POL (H/V)	EIRP (dBm)	ERP (dBm)	dBc
1672.98	-97.01	-72.12	6.6	H	-65.52	-67.66	93.28
2509.47	-97.55	-68.75	7.8	H	-60.95	-63.09	88.71
3345.96	-98.33	-70.75	7.75	H	-63.00	-65.14	90.76
4182.45	-99.74	-72.72	7.6	H	-65.12	-67.26	92.88
5018.94	-100.52	-73.16	8.5	H	-64.66	-66.80	92.42
5855.43	-101.89	-73.01	8.8	H	-64.21	-66.35	91.97
6691.92	-102.53	-73.65	9.6	H	-64.05	-66.19	91.81
7528.41	-102.97	-75.44	9.0	H	-66.44	-68.58	94.20
8364.90	-103.68	-78.47	9.3	H	-69.17	-71.31	96.93

Radiated Measurements by Substitution Method:

The EUT was placed on a turntable 3-meters from the receive antenna. The field of maximum intensity was found by rotating the EUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters. The field strength was recorded from a calibrated spectrum analyzer for each channel being tested. A standard gain horn antenna was substituted in place of the EUT. The antenna was fed through a directional coupler and the power at the coupler port was monitored. A signal generator and power amplifier controlled the antenna, and the input level of the antenna was adjusted to the same field strength level as the EUT. The feed point for the antenna was then connected to a calibrated power meter and the power adjusted to read the same as the coupler port previously recorded, this is to account for any mismatch in impedance, which may occur at the horn antenna. The conducted power at the antenna feed point was recorded. The forward conducted power for the horn antenna was then determined and the EIRP level was determined by adding the horn forward conducted power and the antenna gain in dB.

Notes:
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FIELD STRENGTH OF SPURIOUS RADIATION - § 2.1053

AMPS MODE

Operating Frequency (MHz): **848.97**
Channel: 799 (High)
Measured Cond. Pwr. (dBm): 26.70
Measured ERP (dBm): 26.75
Modulation: ST (Signaling Tone)
Distance: 3 Meters
Limit: 43 + 10 log (W) = 40.31 dBc

Frequency (MHz)	Field Strength of Spurious Radiation (dBm)	Horn Forward Cond. Pwr. (dBm)	Standard Gain Horn Antenna Gain (dBi)	POL (H/V)	EIRP (dBm)	ERP (dBm)	dBc
1697.94	-98.16	-73.27	6.6	H	-66.67	-68.81	95.56
2546.91	-98.87	-70.07	7.8	H	-62.27	-64.41	91.16
3395.88	-99.33	-71.75	7.75	H	-64.00	-66.14	92.89
4244.85	-100.05	-73.03	7.6	H	-65.43	-67.57	94.32
5093.82	-100.60	-73.24	8.5	H	-64.74	-66.88	93.63
5942.79	-101.41	-72.53	8.8	H	-63.73	-65.87	92.62
6791.76	-101.92	-73.04	9.6	H	-63.44	-65.58	92.33
7640.73	-102.46	-74.93	9.0	H	-65.93	-68.07	94.82
8489.70	-103.15	-77.94	9.3	H	-68.64	-70.78	97.53

Radiated Measurements by Substitution Method:

The EUT was placed on a turntable 3-meters from the receive antenna. The field of maximum intensity was found by rotating the EUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters. The field strength was recorded from a calibrated spectrum analyzer for each channel being tested. A standard gain horn antenna was substituted in place of the EUT. The antenna was fed through a directional coupler and the power at the coupler port was monitored. A signal generator and power amplifier controlled the antenna, and the input level of the antenna was adjusted to the same field strength level as the EUT. The feed point for the antenna was then connected to a calibrated power meter and the power adjusted to read the same as the coupler port previously recorded, this is to account for any mismatch in impedance, which may occur at the horn antenna. The conducted power at the antenna feed point was recorded. The forward conducted power for the horn antenna was then determined and the EIRP level was determined by adding the horn forward conducted power and the antenna gain in dB.

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FIELD STRENGTH OF SPURIOUS RADIATION - § 2.1053

CDMA MODE

Operating Frequency (MHz): **824.70**
Channel: 1013 (Low)
Measured Cond. Pwr. (dBm): 25.00
Measured ERP (dBm): 24.09
Modulation: CDMA
Distance: 3 Meters
Limit: 43 + 10 log (W) = 38.13 dBc

Frequency (MHz)	Field Strength of Spurious Radiation (dBm)	Horn Forward Cond. Pwr. (dBm)	Standard Gain Horn Antenna Gain (dBi)	POL (H/V)	EIRP (dBm)	ERP (dBm)	dBc
1649.40	-95.83	-70.94	6.6	H	-64.34	-66.48	90.57
2474.10	-96.88	-68.08	7.8	H	-60.28	-62.42	86.51
3298.80	-97.54	-69.96	7.75	H	-62.21	-64.35	88.44
4123.50	-98.15	-71.13	7.6	H	-63.53	-65.67	89.76
4948.20	-98.79	-71.43	8.5	H	-62.93	-65.07	89.16
5772.90	-99.67	-70.79	8.8	H	-61.99	-64.13	88.22
6597.60	-100.22	-71.34	9.6	H	-61.74	-63.88	87.97
7422.30	-101.36	-73.83	9.0	H	-64.83	-66.97	91.06
8247.00	-102.41	-77.20	9.3	H	-67.90	-70.04	94.13

Radiated Measurements by Substitution Method:

The EUT was placed on a turntable 3-meters from the receive antenna. The field of maximum intensity was found by rotating the EUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters. The field strength was recorded from a calibrated spectrum analyzer for each channel being tested. A standard gain horn antenna was substituted in place of the EUT. The antenna was fed through a directional coupler and the power at the coupler port was monitored. A signal generator and power amplifier controlled the antenna, and the input level of the antenna was adjusted to the same field strength level as the EUT. The feed point for the antenna was then connected to a calibrated power meter and the power adjusted to read the same as the coupler port previously recorded, this is to account for any mismatch in impedance, which may occur at the horn antenna. The conducted power at the antenna feed point was recorded. The forward conducted power for the horn antenna was then determined and the EIRP level was determined by adding the horn forward conducted power and the antenna gain in dB.

Notes:
1. All other spurious emissions were found to be below the magnitude of each harmonic.
2. Spurious emissions more than 20 dB below the limit are reported, though not required per §2.1051.

FIELD STRENGTH OF SPURIOUS RADIATION - § 2.1053

CDMA MODE

Operating Frequency (MHz): **835.89**
Channel: 363 (Mid)
Measured Cond. Pwr. (dBm): 25.00
Measured ERP (dBm): 23.92
Modulation: CDMA
Distance: 3 Meters
Limit: 43 + 10 log (W) = 38.13 dBc

Frequency (MHz)	Field Strength of Spurious Radiation (dBm)	Horn Forward Cond. Pwr. (dBm)	Standard Gain Horn Antenna Gain (dBi)	POL (H/V)	EIRP (dBm)	ERP (dBm)	dBc
1671.78	-96.43	-71.54	6.6	H	-64.94	-67.08	91.00
2507.67	-97.89	-69.09	7.8	H	-61.29	-63.43	87.35
3343.56	-98.66	-71.08	7.75	H	-63.33	-65.47	89.39
4179.45	-98.91	-71.89	7.6	H	-64.29	-66.43	90.35
5015.34	-99.47	-72.11	8.5	H	-63.61	-65.75	89.67
5851.23	-99.89	-71.01	8.8	H	-62.21	-64.35	88.27
6687.12	-100.76	-71.88	9.6	H	-62.28	-64.42	88.34
7523.01	-101.54	-74.01	9.0	H	-65.01	-67.15	91.07
8358.90	-102.32	-77.11	9.3	H	-67.81	-69.95	93.87

Radiated Measurements by Substitution Method:

The EUT was placed on a turntable 3-meters from the receive antenna. The field of maximum intensity was found by rotating the EUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters. The field strength was recorded from a calibrated spectrum analyzer for each channel being tested. A standard gain horn antenna was substituted in place of the EUT. The antenna was fed through a directional coupler and the power at the coupler port was monitored. A signal generator and power amplifier controlled the antenna, and the input level of the antenna was adjusted to the same field strength level as the EUT. The feed point for the antenna was then connected to a calibrated power meter and the power adjusted to read the same as the coupler port previously recorded, this is to account for any mismatch in impedance, which may occur at the horn antenna. The conducted power at the antenna feed point was recorded. The forward conducted power for the horn antenna was then determined and the EIRP level was determined by adding the horn forward conducted power and the antenna gain in dB.

Notes:
1. All other spurious emissions were found to be below the magnitude of each harmonic.
2. Spurious emissions more than 20 dB below the limit are reported, though not required per §2.1051.

FIELD STRENGTH OF SPURIOUS RADIATION - § 2.1053

CDMA MODE

Operating Frequency (MHz): **848.31**
Channel: 777 (High)
Measured Cond. Pwr. (dBm): 25.00
Measured ERP (dBm): 25.05
Modulation: CDMA
Distance: 3 Meters
Limit: 43 + 10 log (W) = 38.13 dBc

Frequency (MHz)	Field Strength of Spurious Radiation (dBm)	Horn Forward Cond. Pwr. (dBm)	Standard Gain Horn Antenna Gain (dBi)	POL (H/V)	EIRP (dBm)	ERP (dBm)	dBc
1696.62	-97.18	-72.29	6.6	H	-65.69	-67.83	92.88
2544.93	-98.24	-69.44	7.8	H	-61.64	-63.78	88.83
3393.24	-98.83	-71.25	7.75	H	-63.50	-65.64	90.69
4241.55	-99.48	-72.46	7.6	H	-64.86	-67.00	92.05
5089.86	-100.50	-73.14	8.5	H	-64.64	-66.78	91.83
5938.17	-101.16	-72.28	8.8	H	-63.48	-65.62	90.67
6786.48	-101.92	-73.04	9.6	H	-63.44	-65.58	90.63
7634.79	-102.45	-74.92	9.0	H	-65.92	-68.06	93.11
8483.10	-103.33	-78.12	9.3	H	-68.82	-70.96	96.01

Radiated Measurements by Substitution Method:

The EUT was placed on a turntable 3-meters from the receive antenna. The field of maximum intensity was found by rotating the EUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters. The field strength was recorded from a calibrated spectrum analyzer for each channel being tested. A standard gain horn antenna was substituted in place of the EUT. The antenna was fed through a directional coupler and the power at the coupler port was monitored. A signal generator and power amplifier controlled the antenna, and the input level of the antenna was adjusted to the same field strength level as the EUT. The feed point for the antenna was then connected to a calibrated power meter and the power adjusted to read the same as the coupler port previously recorded, this is to account for any mismatch in impedance, which may occur at the horn antenna. The conducted power at the antenna feed point was recorded. The forward conducted power for the horn antenna was then determined and the EIRP level was determined by adding the horn forward conducted power and the antenna gain in dB.

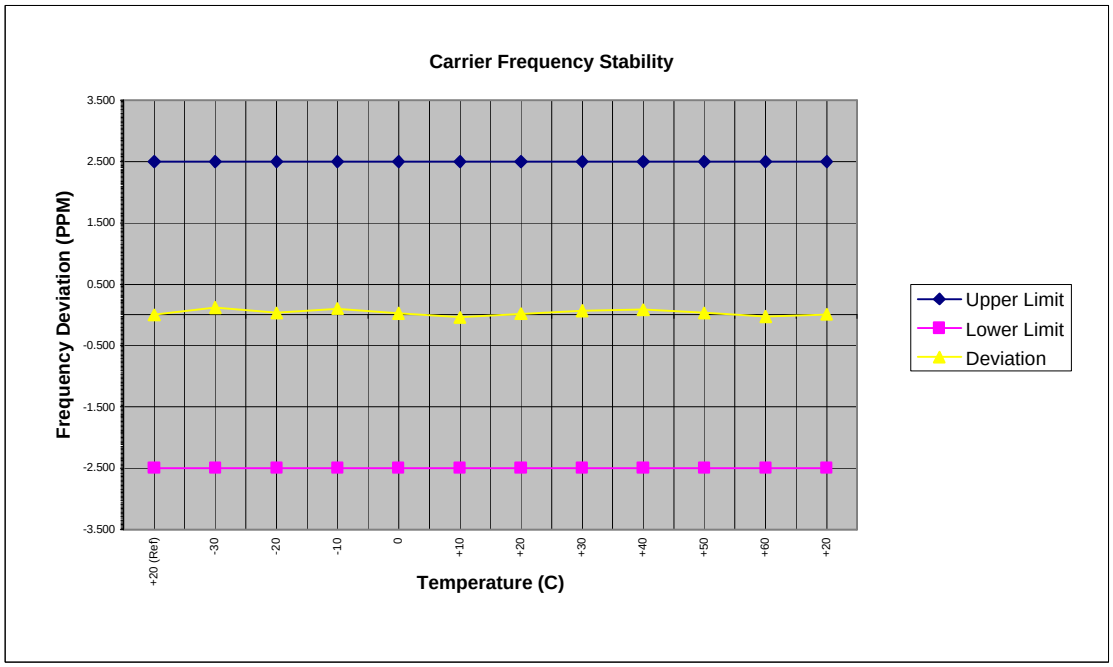
Notes:
1. All other spurious emissions were found to be below the magnitude of each harmonic.
2. Spurious emissions more than 20 dB below the limit are reported, though not required per §2.1051.

4.7 FREQUENCY STABILITY - § 2.1055

AMPS Mode

Carrier Frequency (MHz): 836.49
Channel: 383
Mode: AMPS (Analog)
Deviation Limit (PPM): 2.5

Temperature	Voltage	Power	Carrier Frequency Deviation		Specification	
(C)	(%)	(VDC)	(Hz)	(PPM)	Lower Limit (PPM)	Upper Limit (PPM)
+20 (Ref)	100	3.7	0.00	0.000	2.500	-2.500
-30	100	3.7	100.00	0.120	2.500	-2.500
-20	100	3.7	27.00	0.032	2.500	-2.500
-10	100	3.7	87.00	0.104	2.500	-2.500
0	100	3.7	23.00	0.027	2.500	-2.500
+10	100	3.7	-33.00	-0.039	2.500	-2.500
+20	100	3.7	14.00	0.017	2.500	-2.500
+30	100	3.7	56.00	0.067	2.500	-2.500
+40	100	3.7	72.00	0.086	2.500	-2.500
+50	100	3.7	27.00	0.032	2.500	-2.500
+60	100	3.7	-21.00	-0.025	2.500	-2.500
+20	Battery Endpoint	3.3	8.00	0.010	2.500	-2.500

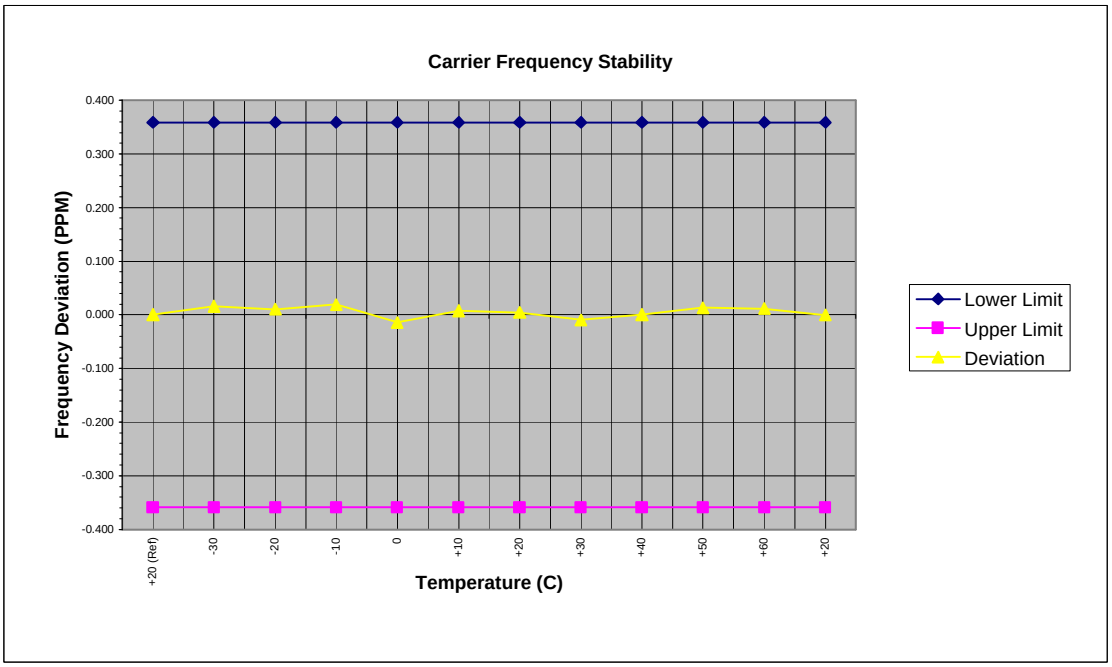


FREQUENCY STABILITY - § 2.1055

CDMA Mode

Carrier Frequency (MHz): 835.89
Channel: 363
Mode: CDMA (Digital)
Deviation Limit (PPM): 0.359

Temperature	Voltage	Power	Carrier Frequency Deviation		Specification	
(C)	(%)	(VDC)	(Hz)	(PPM)	Lower Limit (PPM)	Upper Limit (PPM)
+20 (Ref)	100	3.7	0.36	0.000	0.359	-0.359
-30	100	3.7	13.40	0.016	0.359	-0.359
-20	100	3.7	8.50	0.010	0.359	-0.359
-10	100	3.7	16.30	0.020	0.359	-0.359
0	100	3.7	-11.90	-0.014	0.359	-0.359
+10	100	3.7	6.50	0.008	0.359	-0.359
+20	100	3.7	3.80	0.005	0.359	-0.359
+30	100	3.7	-7.60	-0.009	0.359	-0.359
+40	100	3.7	0.57	0.001	0.359	-0.359
+50	100	3.7	10.90	0.013	0.359	-0.359
+60	100	3.7	9.60	0.011	0.359	-0.359
+20	Battery Endpoint	3.3	-0.47	-0.001	0.359	-0.359



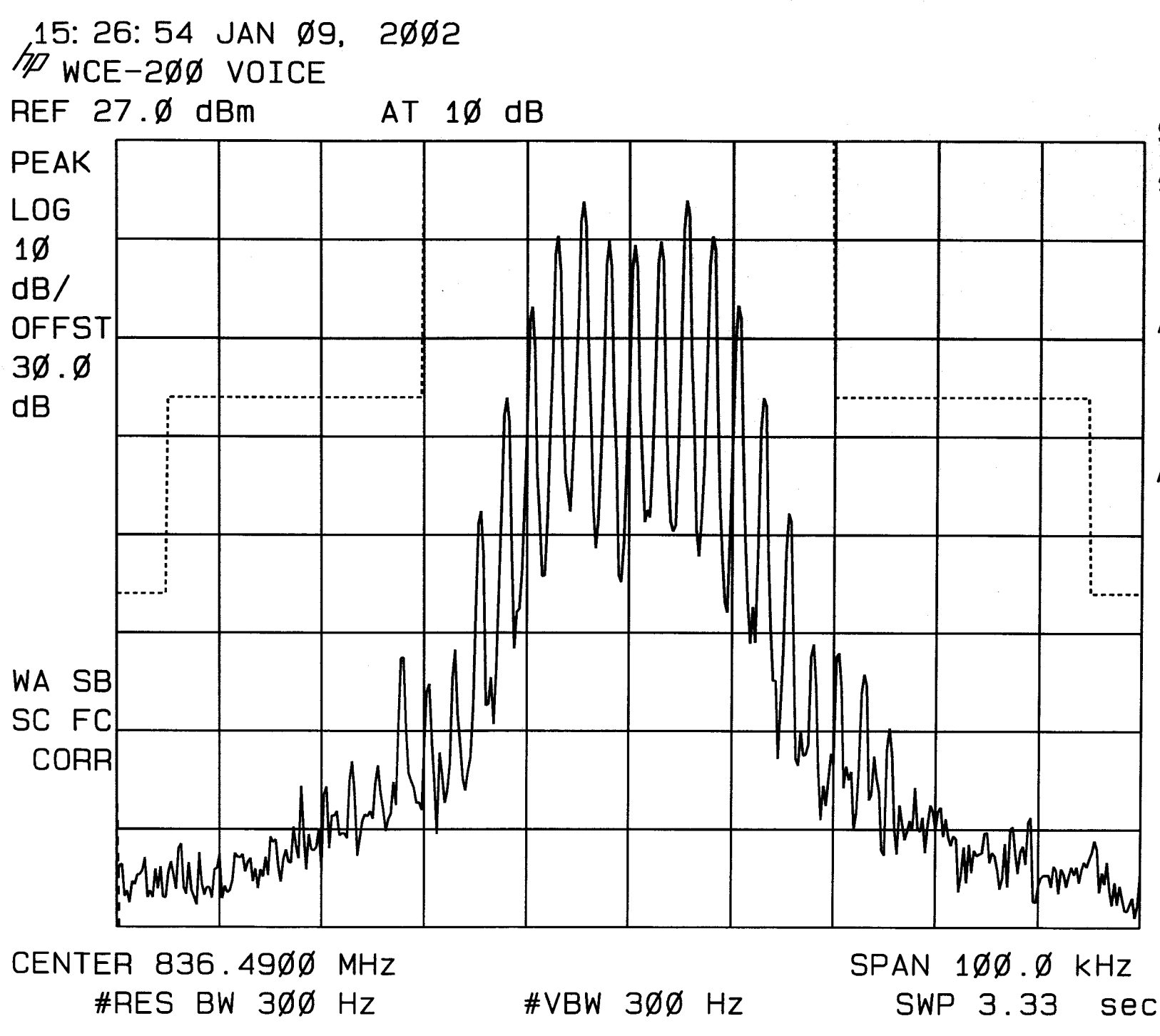
5.1 TEST EQUIPMENT

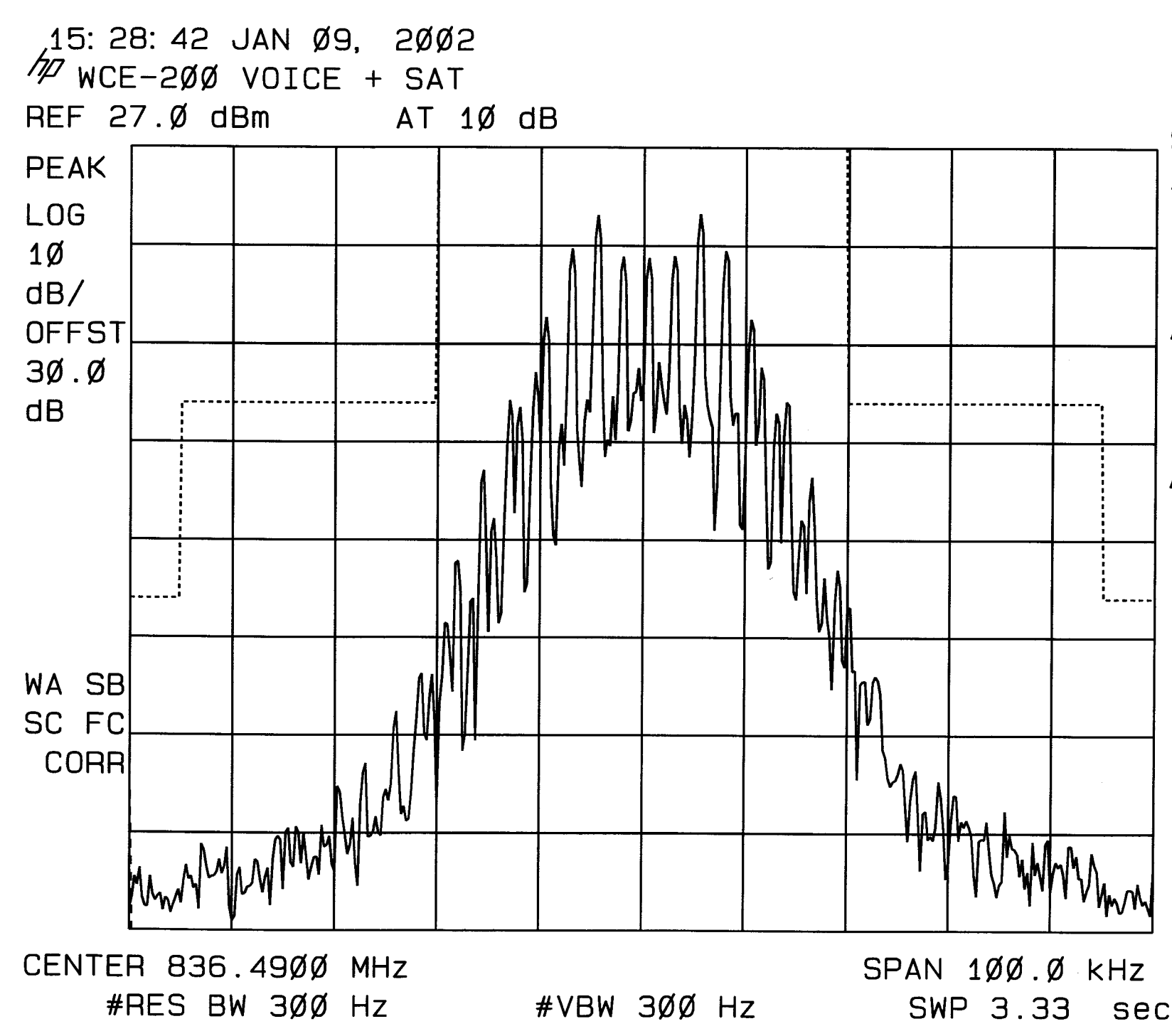
Type	Model	Calib. Due Date	Serial No.
HP Signal Generator	8648D (9kHz-4.0GHz)	Nov 2002	3847A00611
Rohde & Schwarz Signal Generator	SMR40 (10MHz-40GHz)	Nov 2002	835537/022
Gigatronics Power Meter	8652A	Oct 2002	1835272
Gigatronics Power Sensor	80701A (0.05-18GHz)	Sept. 2002	1833535
Gigatronics Power Sensor	80701A (0.05-18GHz)	Sept. 2002	1833542
Amplifier Research Power Amp.	5S1G4 (5W, 800MHz-4.2GHz)	N/A	26235
Microwave System Amplifier	HP 83017A (0.5-26.5GHz)	N/A	3123A00587
Network Analyzer	HP 8753E (30kHz-3GHz)	Nov 2002	US38433013
Audio Analyzer	HP 8903B	Nov 2002	3729A18691
Modulation Analyzer	HP 8901A	July 2002	3749A07154
Frequency Counter	HP 53181A (3GHz)	May 2002	3736A05175
DC Power Supply	HP E3611A	N/A	KR83015294
CDMA Base Station Simulator	Agilent E8285A	Feb. 2002	US40332926
Multi-Device Controller	EMCO 2090	N/A	9912-1484
Mini Mast	EMCO 2075	N/A	0001-2277
Turntable	EMCO 2080-1.2/1.5	N/A	0002-1002
Double Ridged Horn Antenna	ETS 3115 (1-18GHz)	Oct. 2002	6267
Double Ridged Horn Antenna	ETS 3115 (1-18GHz)	Oct. 2002	6276
Horn Antenna	Chase BBHA 9120-A (0.7-4.8GHz)	Sept 2002	9120A-239
Horn Antenna	Chase BBHA 9120-A (0.7-4.8GHz)	Sept 2002	9120A-240
Roberts Dipole	ETS DB-4 (400MHz-1GHz)	June 2002	1474
Spectrum Analyzer	HP 8594E	March 2002	3543A02721
Spectrum Analyzer	HP E4408B	Nov 2002	US39240170
Shielded Screen Room	Lindgren R.F. 18W-2/2-0	N/A	16297
Environmental Chamber	ESPEC ECT-2 (Temperature/Humidity)	Feb 2002	0510154-B

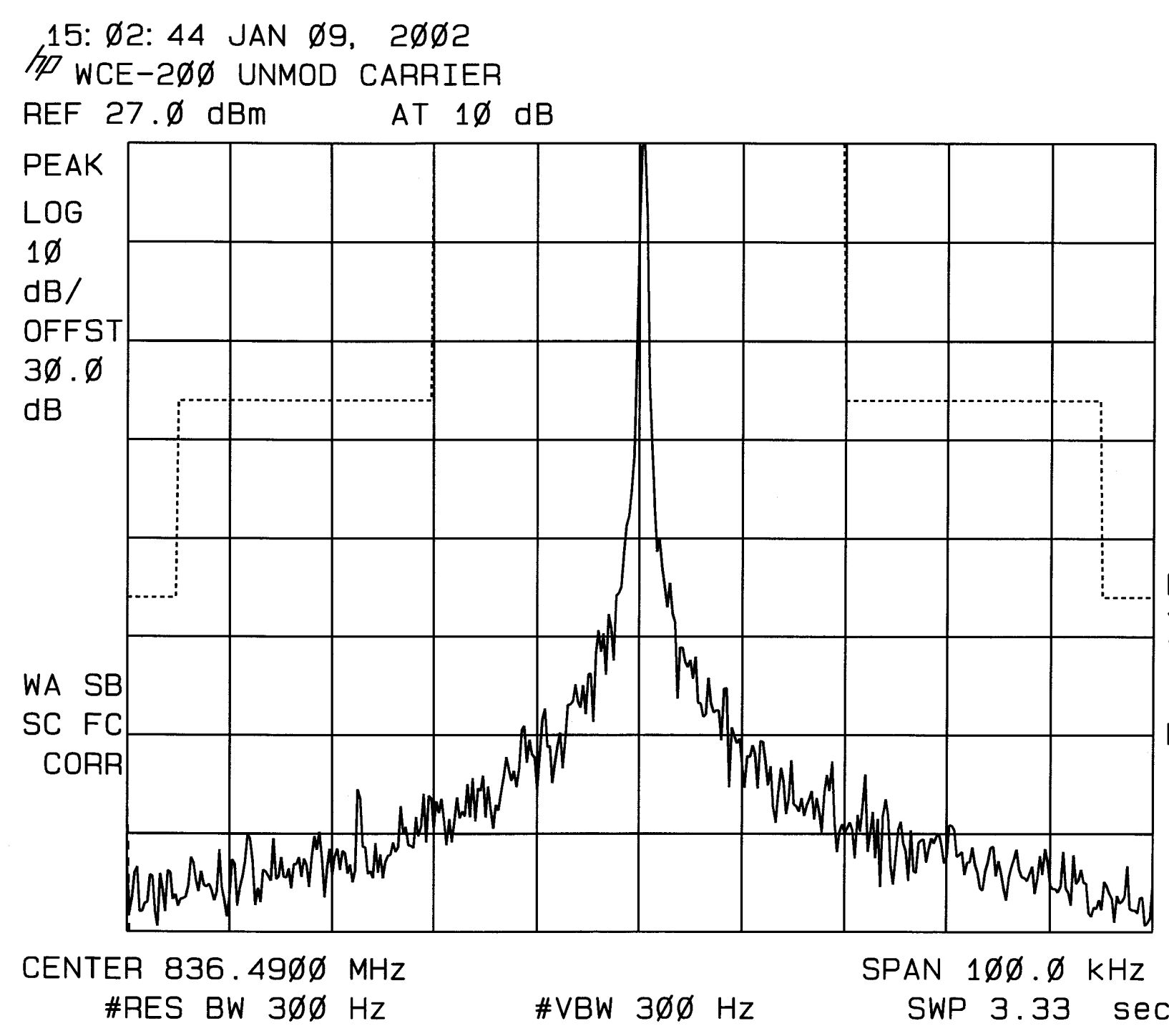
6.1 CONCLUSION

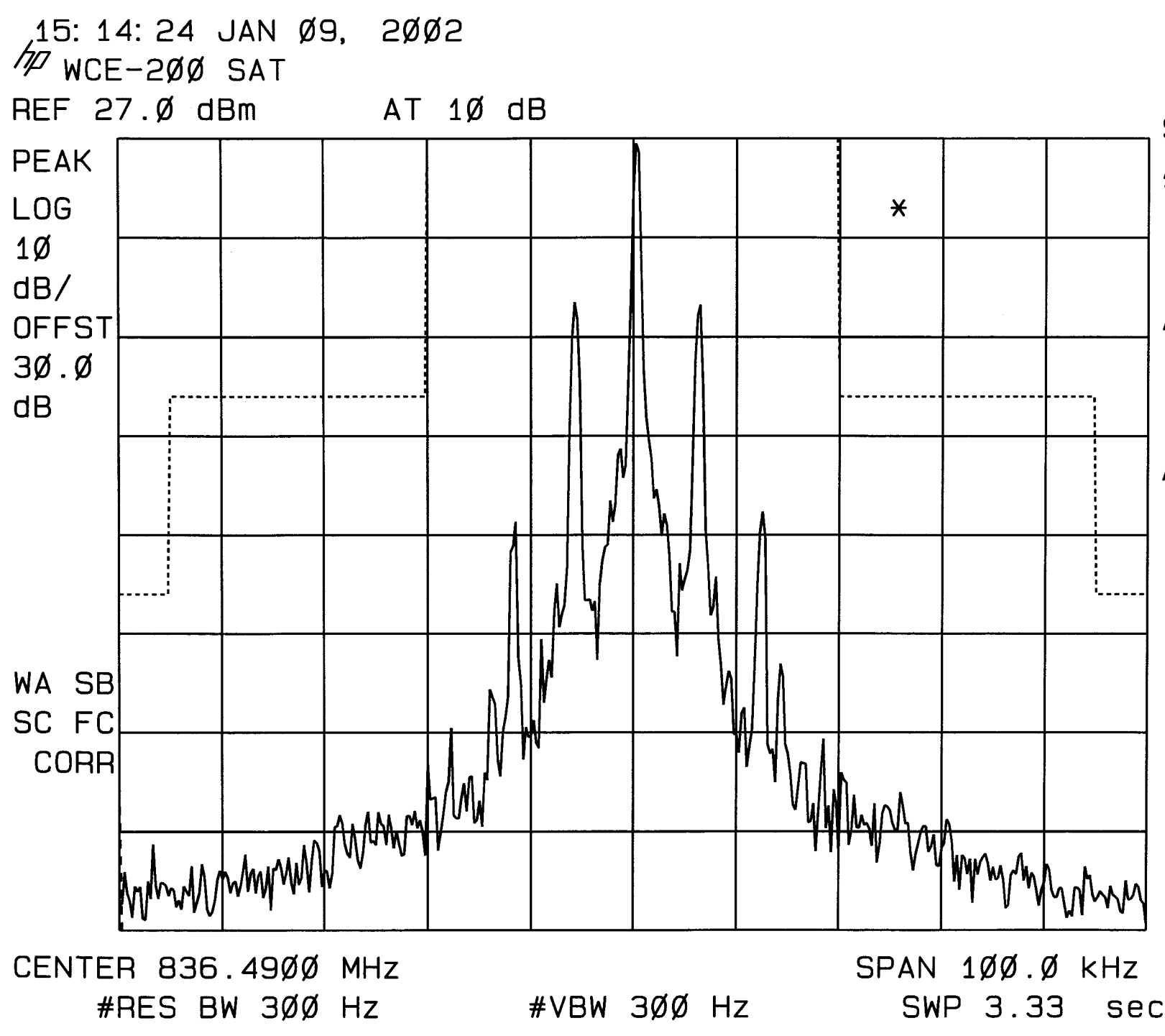
The data collected shows that the WITHUS IT CO., LTD. Model: WCE-200 Dual-Mode AMPS/CDMA Cellular Phone FCC ID: POQWCE-200 complies with all the requirements of Parts 2 and 22 of the FCC rules.

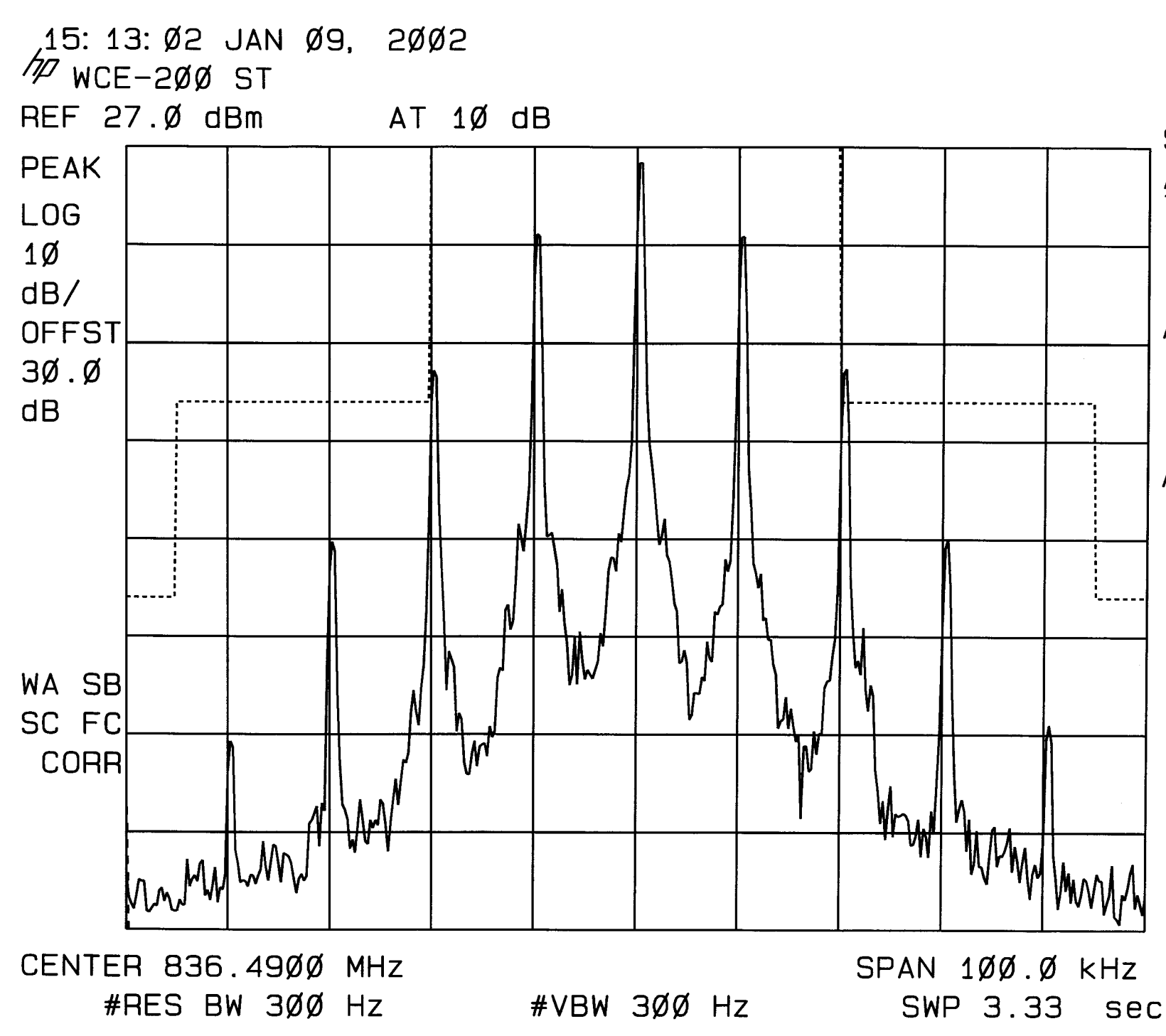
TEST PLOTS

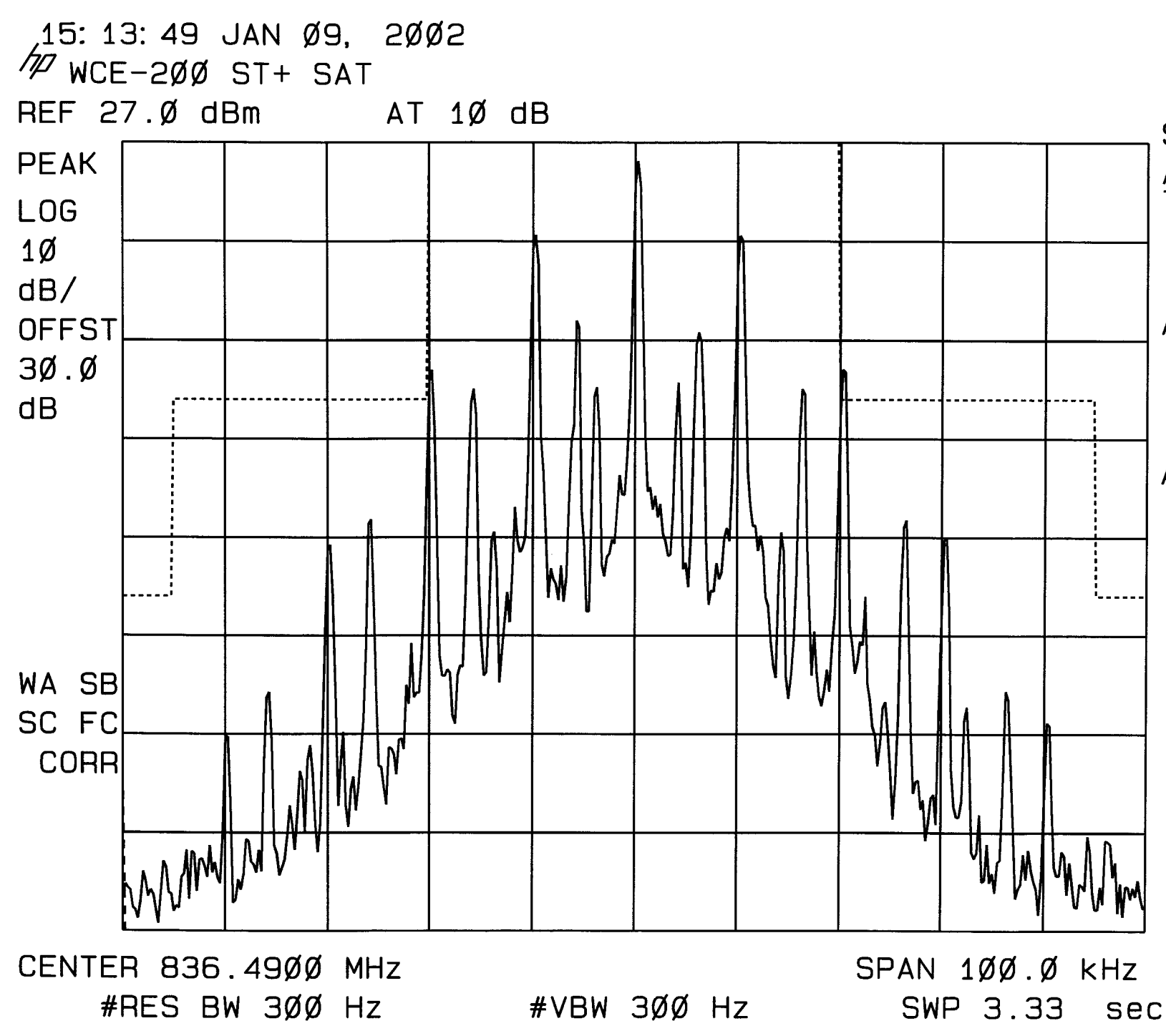

15: 26: 54 JAN Ø9, 2ØØ2
WCE-2ØØ VOICE
REF 27.Ø dBm
AT 1Ø dB
PEAK
LOG
1Ø
dB/
OFFST
3Ø.Ø
dB
WA SB
SC FC
CORR
CENTER 836.49ØØ MHz
SPAN 1ØØ.Ø kHz
#RES BW 3ØØ Hz
#VBW 3ØØ Hz
SWP 3.33 sec

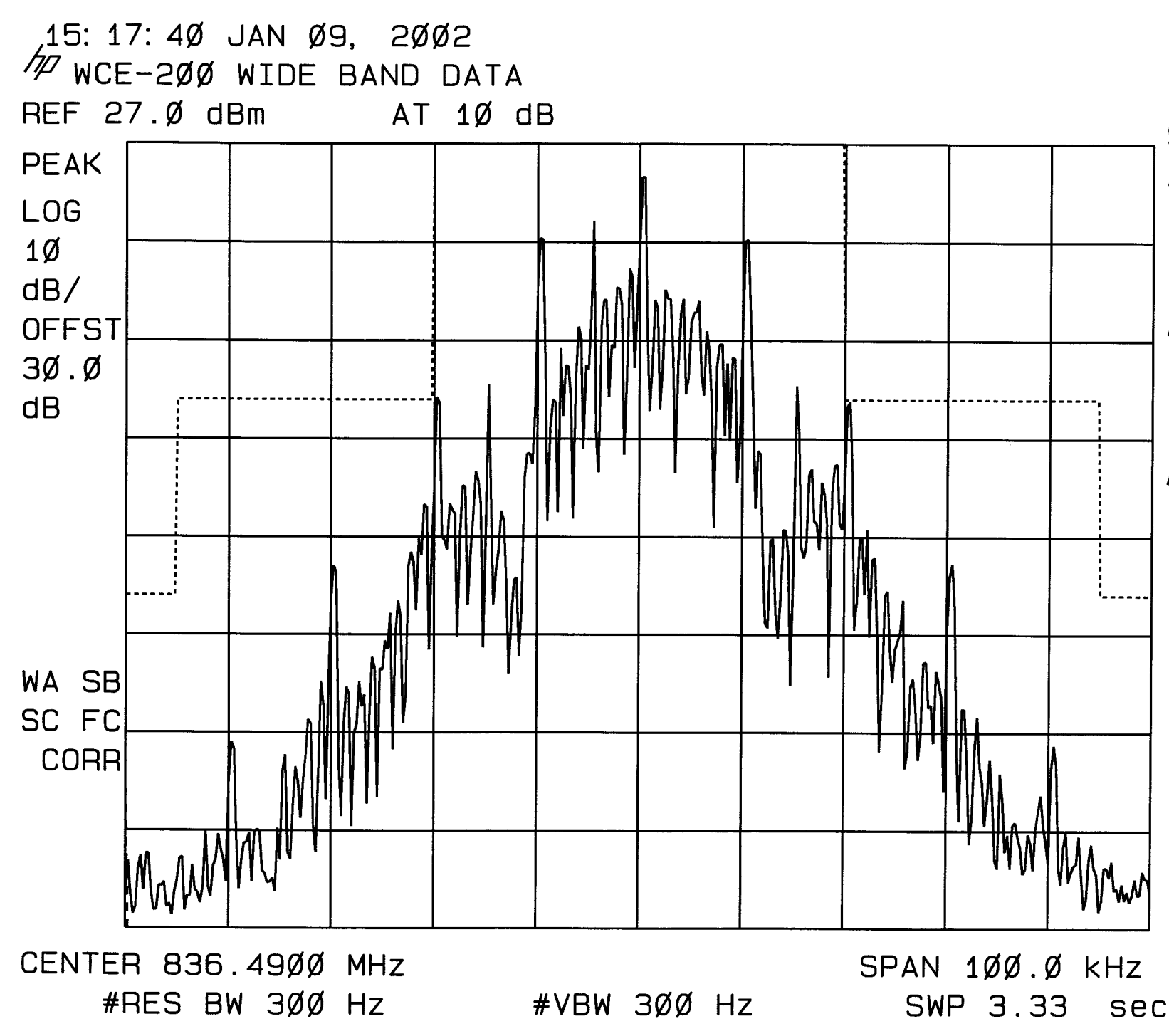

15: 28: 42 JAN Ø9, 2ØØ2
WCE-2ØØ VOICE + SAT
REF 27.Ø dBm
AT 1Ø dB
PEAK
LOG
1Ø
dB/
OFFST
3Ø.Ø
dB
WA SB
SC FC
CORR
CENTER 836.49ØØ MHz
SPAN 1ØØ.Ø kHz
#RES BW 3ØØ Hz
#VBW 3ØØ Hz
SWP 3.33 sec

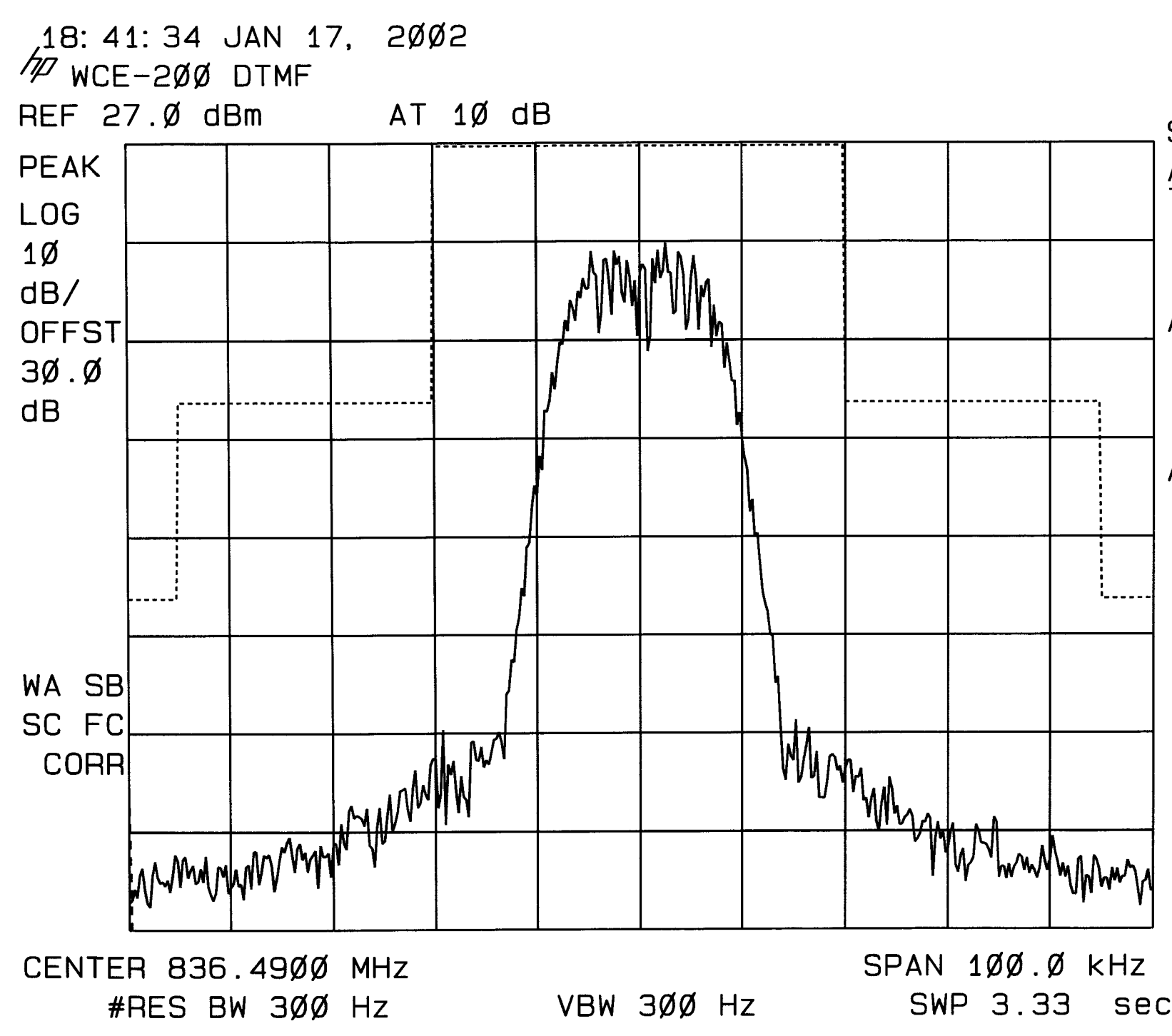

15: Ø2: 44 JAN Ø9, 2ØØ2
WCE-2ØØ UNMOD CARRIER
REF 27.Ø dBm
AT 1Ø dB
PEAK
LOG
1Ø
dB/
OFFST
3Ø.Ø
dB
WA SB
SC FC
CORR
CENTER 836.49ØØ MHz
SPAN 1ØØ.Ø kHz
#RES BW 3ØØ Hz
#VBW 3ØØ Hz
SWP 3.33 sec

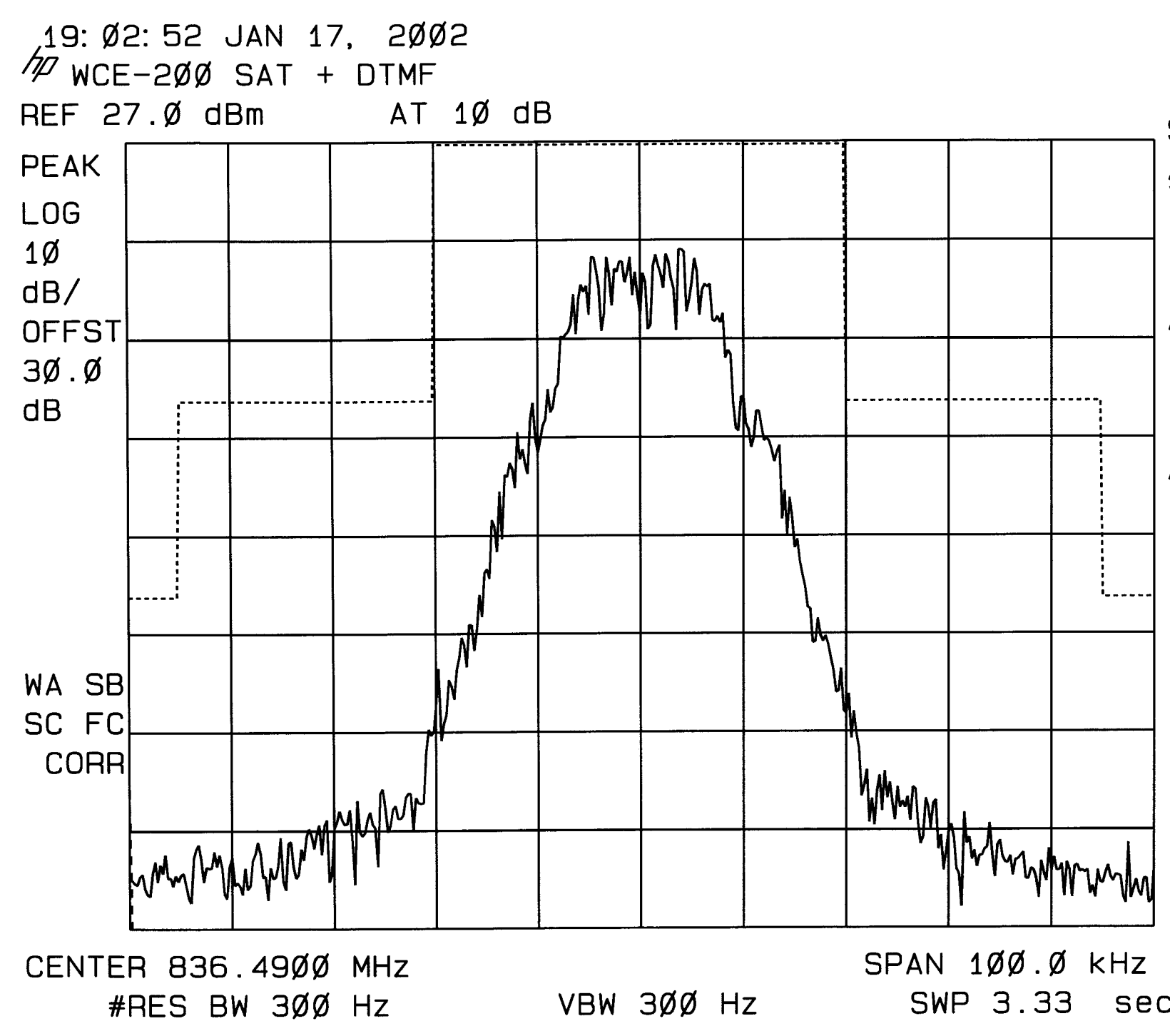

15: 14: 24 JAN Ø9, 2ØØ2
WCE-2ØØ SAT
REF 27.Ø dBm
AT 1Ø dB
PEAK
LOG
1Ø
dB/
OFFST
3Ø.Ø
dB
WA SB
SC FC
CORR
CENTER 836.49ØØ MHz
SPAN 1ØØ.Ø kHz
#RES BW 3ØØ Hz
#VBW 3ØØ Hz
SWP 3.33 sec

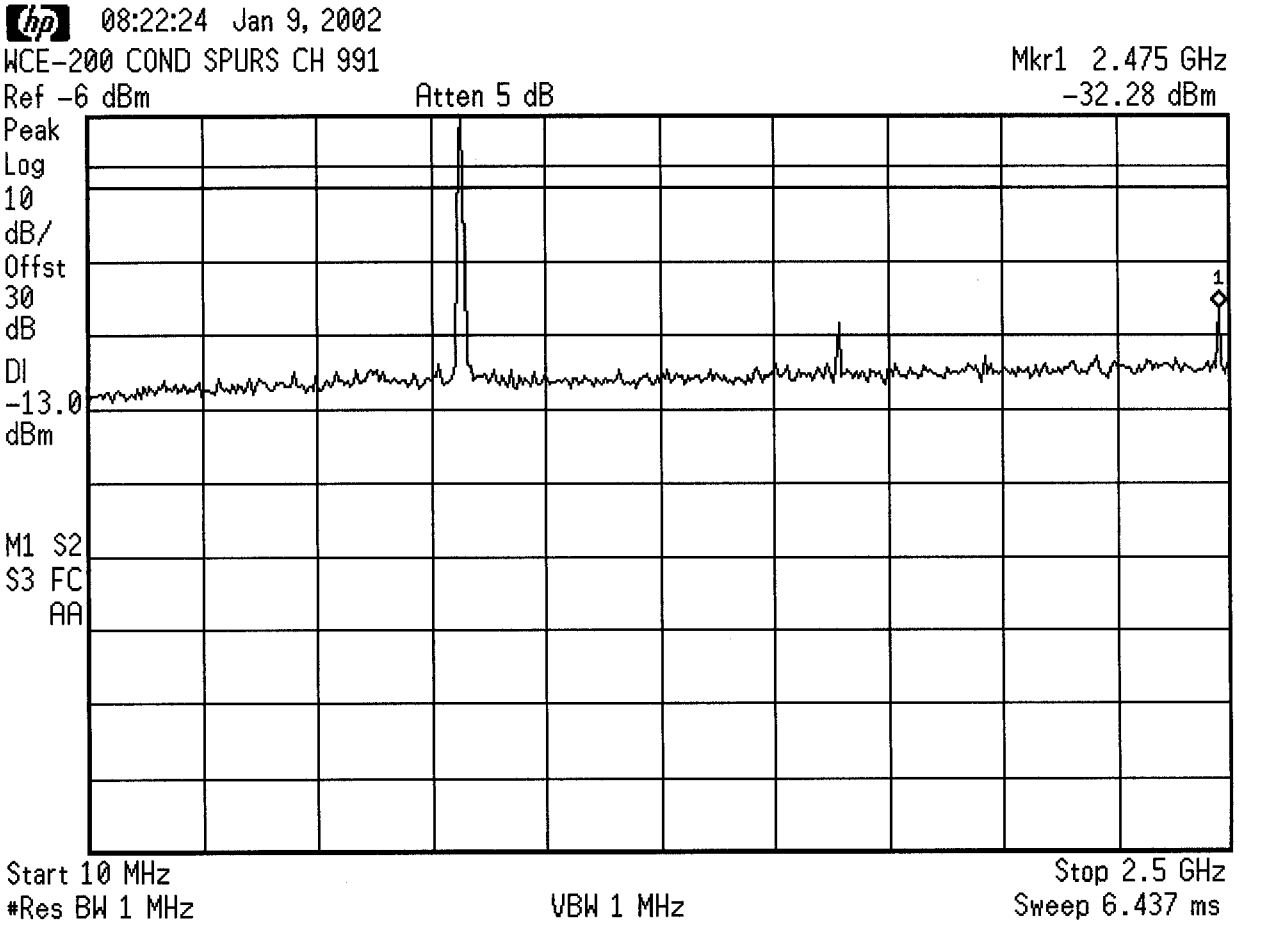

15: 13: Ø2 JAN Ø9, 2ØØ2
WCE-2ØØ ST
REF 27.Ø dBm
AT 1Ø dB
PEAK
LOG
1Ø
dB/
OFFST
3Ø.Ø
dB
WA SB
SC FC
CORR
CENTER 836.49ØØ MHz
SPAN 1ØØ.Ø kHz
#RES BW 3ØØ Hz
#VBW 3ØØ Hz
SWP 3.33 sec

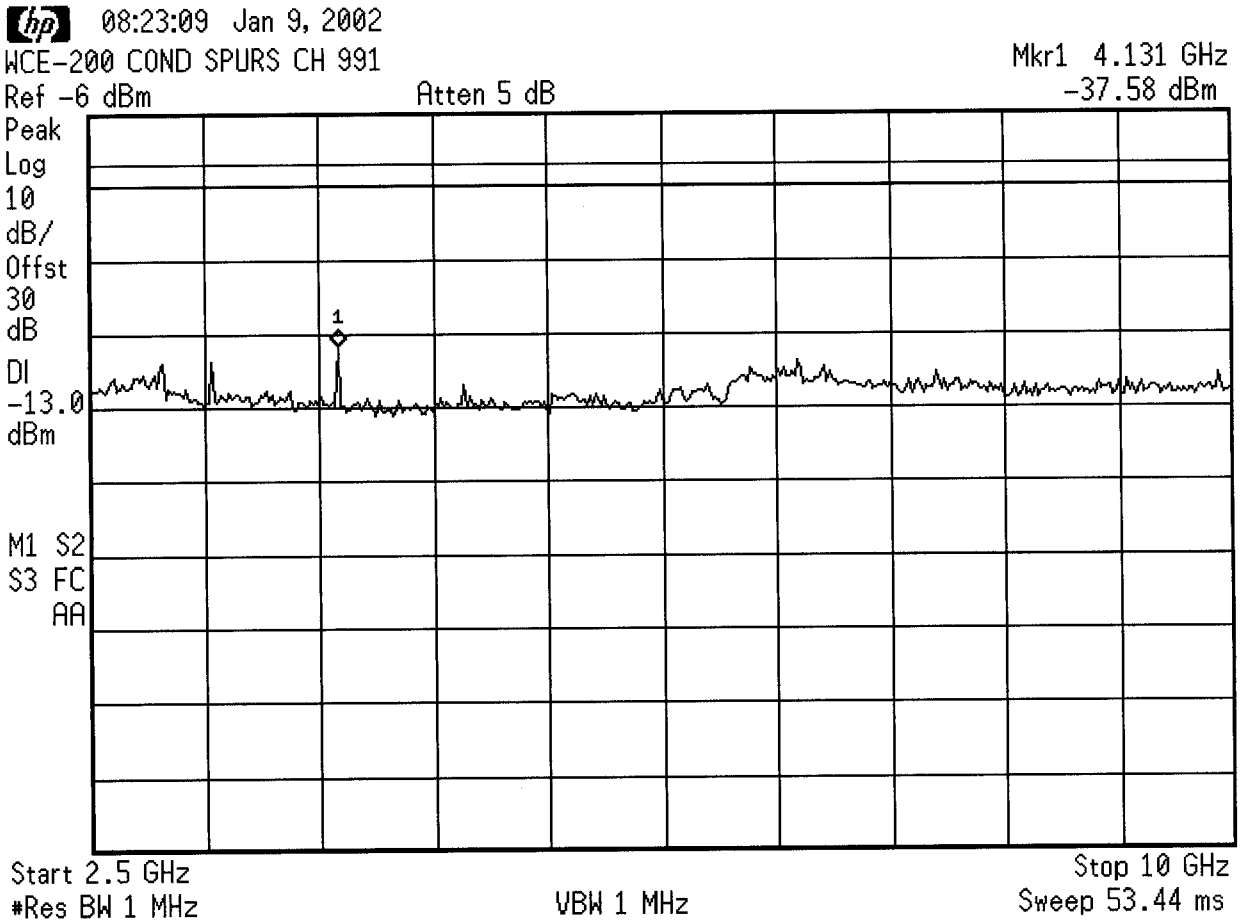

15: 13: 49 JAN Ø9, 2ØØ2
WCE-2ØØ ST+ SAT
REF 27.Ø dBm
AT 1Ø dB
PEAK
LOG
1Ø
dB/
OFFST
3Ø.Ø
dB
WA SB
SC FC
CORR
CENTER 836.49ØØ MHz
SPAN 1ØØ.Ø kHz
#RES BW 3ØØ Hz
#VBW 3ØØ Hz
SWP 3.33 sec

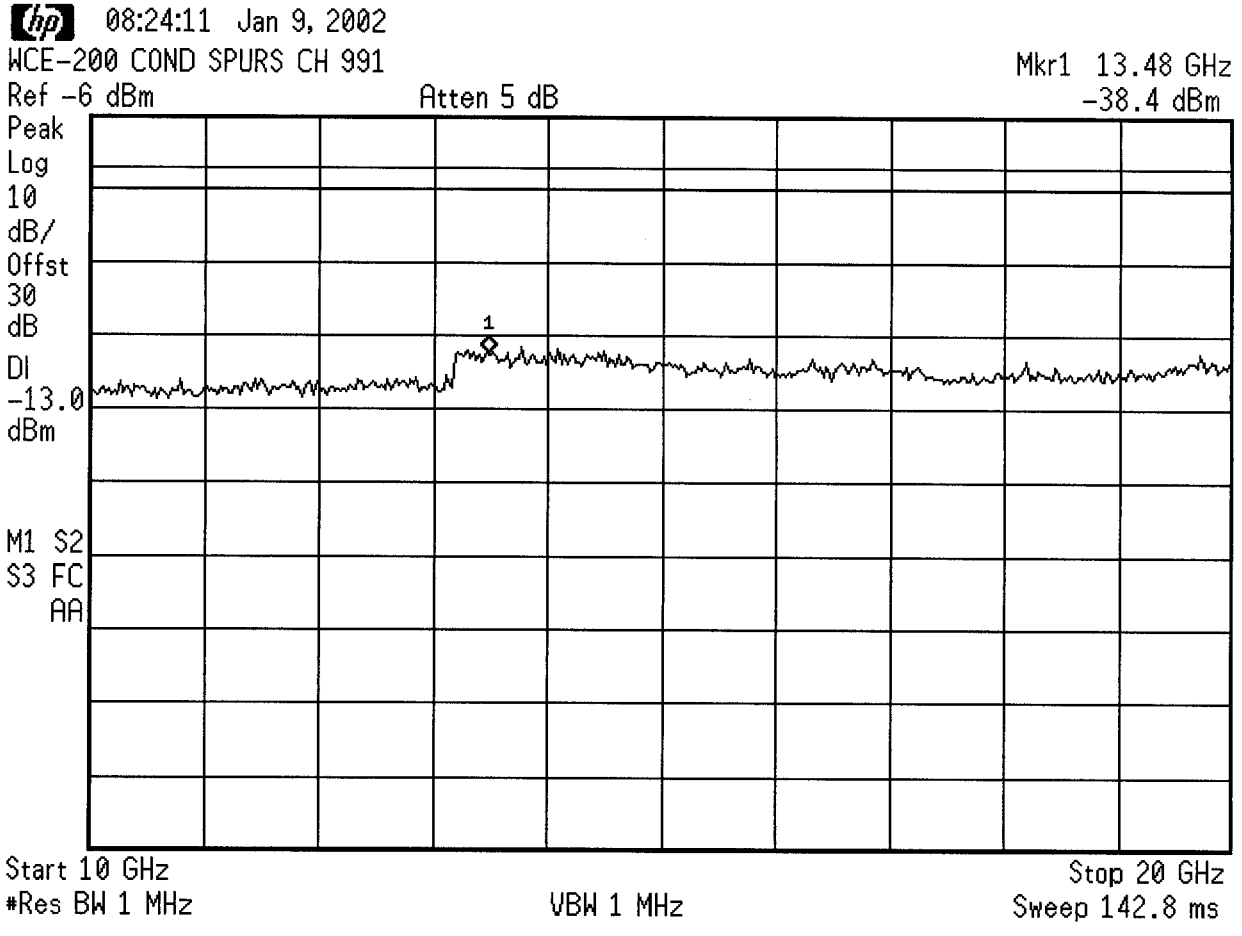

15: 17: 4Ø JAN Ø9, 2ØØ2
WCE-2ØØ WIDE BAND DATA
REF 27.Ø dBm
AT 1Ø dB
PEAK
LOG
1Ø
dB/
OFFST
3Ø.Ø
dB
WA SB
SC FC
CORR
CENTER 836.49ØØ MHz
SPAN 1ØØ.Ø kHz
#RES BW 3ØØ Hz
#VBW 3ØØ Hz
SWP 3.33 sec

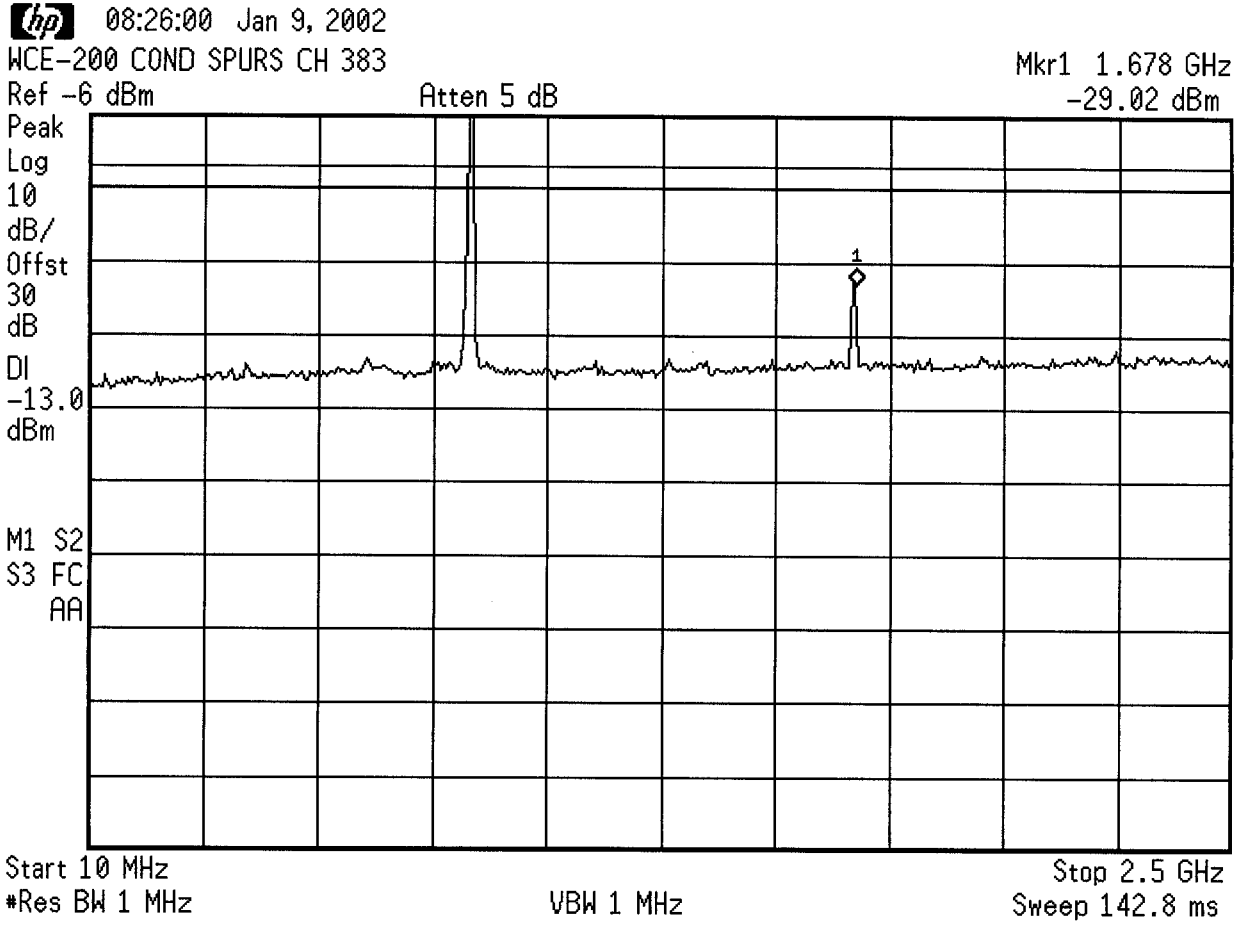

18: 41: 34 JAN 17, 2ØØ2
WCE-2ØØ DTMF
REF 27.Ø dBm
AT 1Ø dB
PEAK
LOG
1Ø
dB/
OFFST
3Ø.Ø
dB
WA SB
SC FC
CORR
CENTER 836.49ØØ MHz
SPAN 1ØØ.Ø kHz
#RES BW 3ØØ Hz
VBW 3ØØ Hz
SWP 3.33 sec

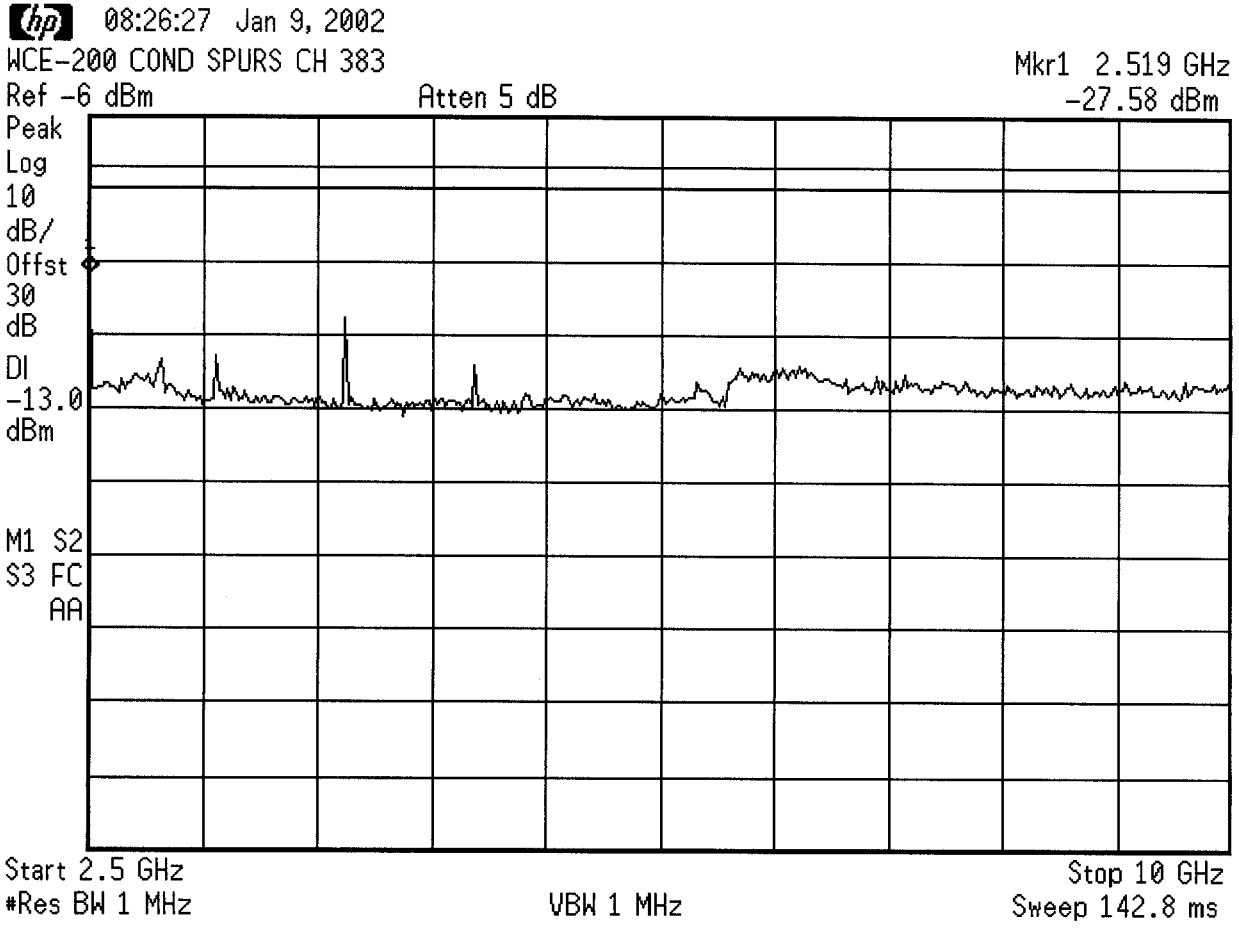

19: Ø2: 52 JAN 17, 2ØØ2
WCE-2ØØ SAT + DTMF
REF 27.Ø dBm
AT 1Ø dB
PEAK
LOG
1Ø
dB/
OFFST
3Ø.Ø
dB
WA SB
SC FC
CORR
CENTER 836.49ØØ MHz
SPAN 1ØØ.Ø kHz
#RES BW 3ØØ Hz
VBW 3ØØ Hz
SWP 3.33 sec

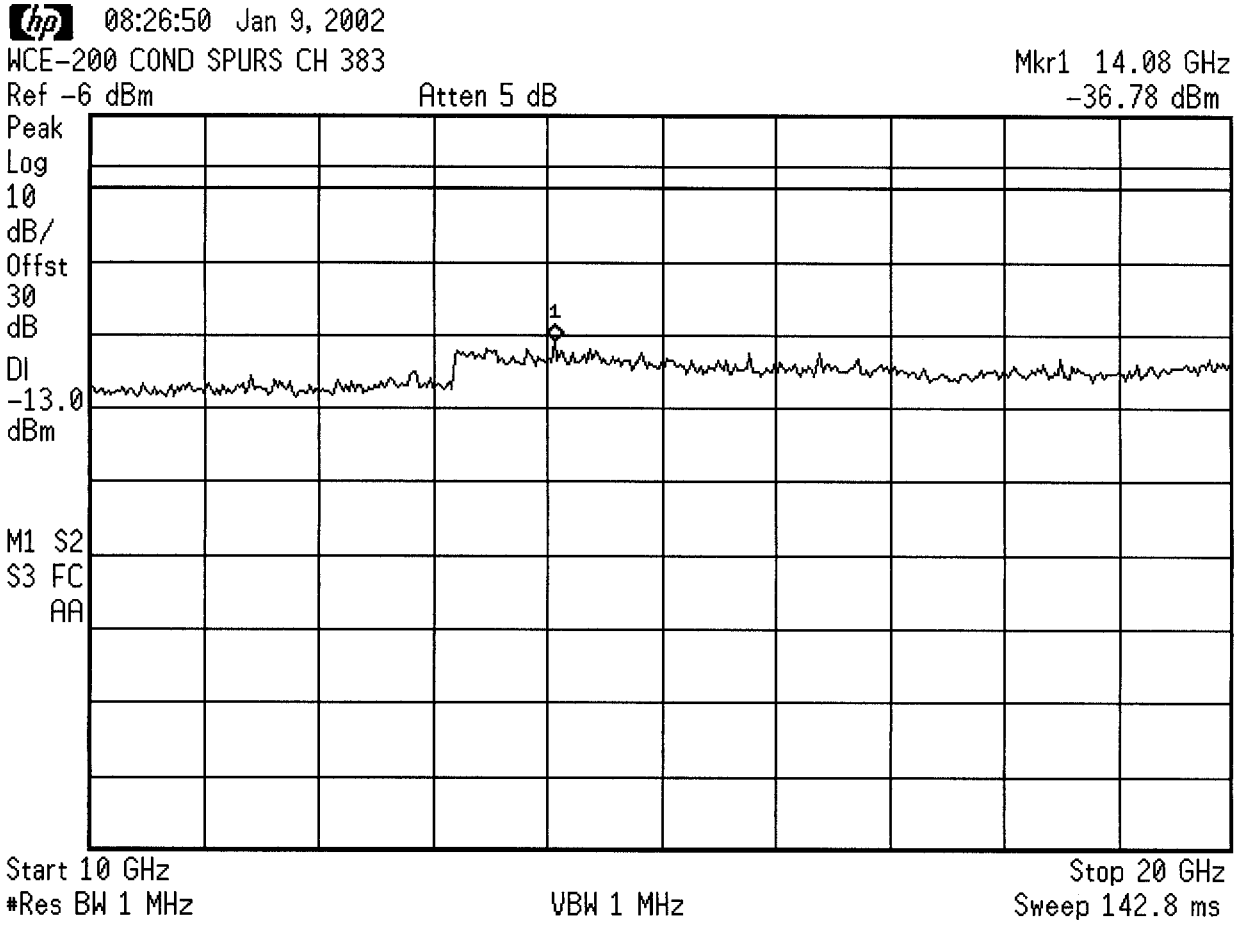

08:22:24 Jan 9, 2002
WCE-200 COND SPURS CH 991
Mkr1 2.475 GHz
Ref -6 dBm
Atten 5 dB
-32.28 dBm
Peak
Log
10
dB/
Offst
30
dB
Dl
-13.0
dBm
1
M1 S2
S3 FC
AA
Start 10 MHz
Stop 2.5 GHz
#Res BW 1 MHz
VBW 1 MHz
Sweep 6.437 ms

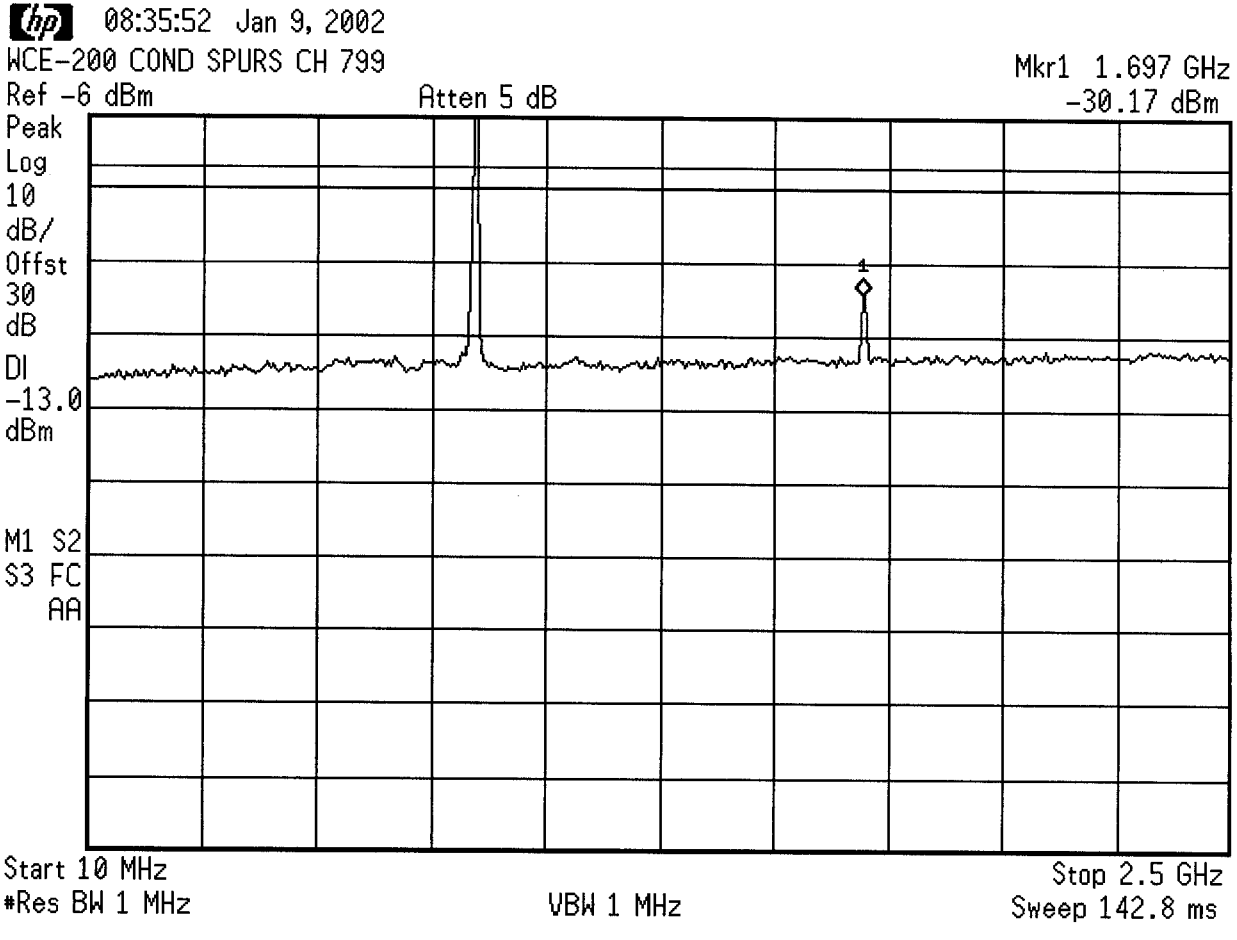

08:23:09 Jan 9, 2002
WCE-200 COND SPURS CH 991
Ref -6 dBm
Atten 5 dB
Mkr1 4.131 GHz
-37.58 dBm
Peak
Log
10
dB/
Offst
30
dB
Dl
-13.0
dBm
1
M1 S2
S3 FC
AA
Start 2.5 GHz
#Res BW 1 MHz
VBW 1 MHz
Stop 10 GHz
Sweep 53.44 ms

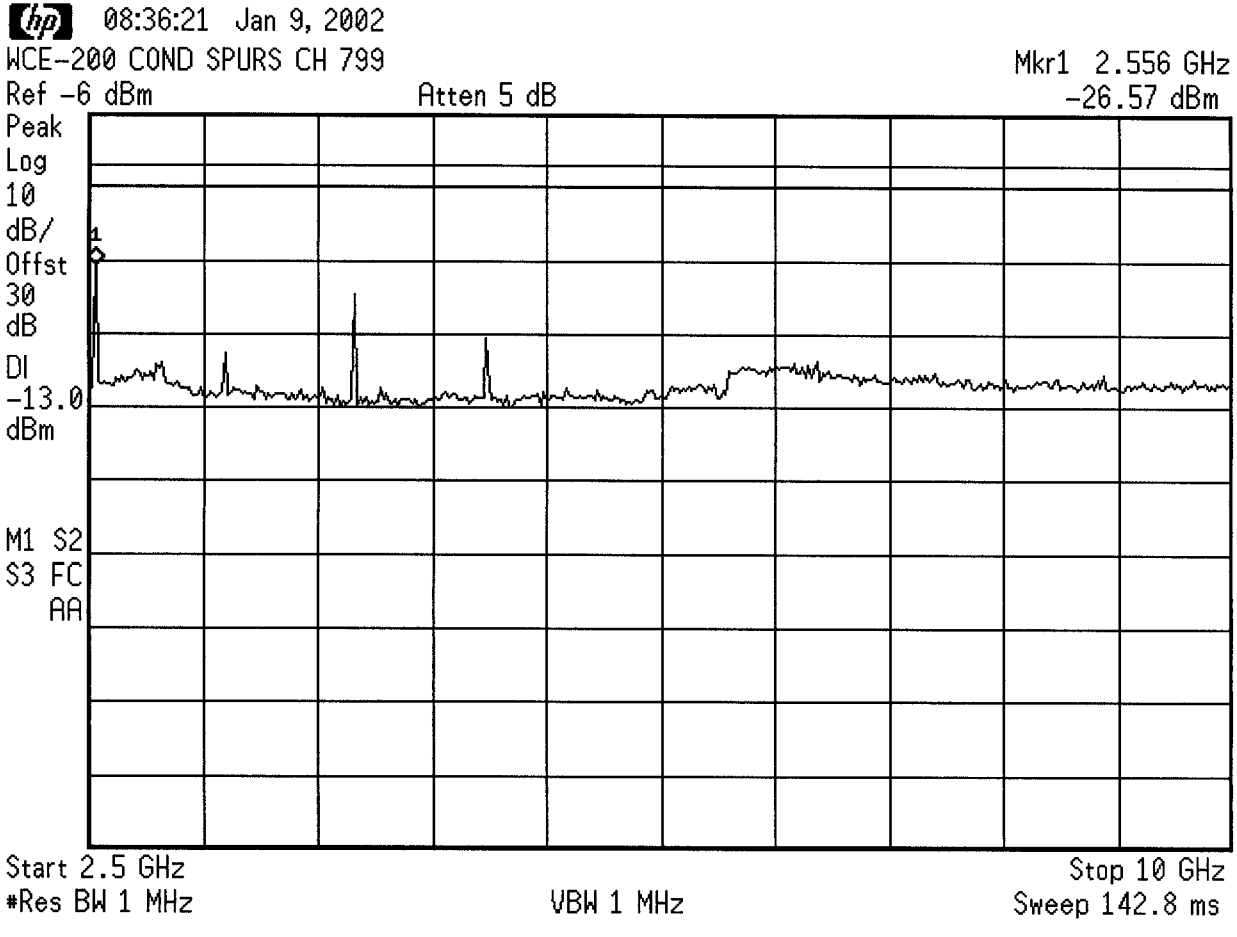

08:24:11 Jan 9, 2002
WCE-200 COND SPURS CH 991
Ref -6 dBm
Atten 5 dB
Mkr1 13.48 GHz
-38.4 dBm
Peak
Log
10
dB/
Offst
30
dB
Dl
-13.0
dBm
1
M1 S2
S3 FC
AA
Start 10 GHz
#Res BW 1 MHz
VBW 1 MHz
Stop 20 GHz
Sweep 142.8 ms

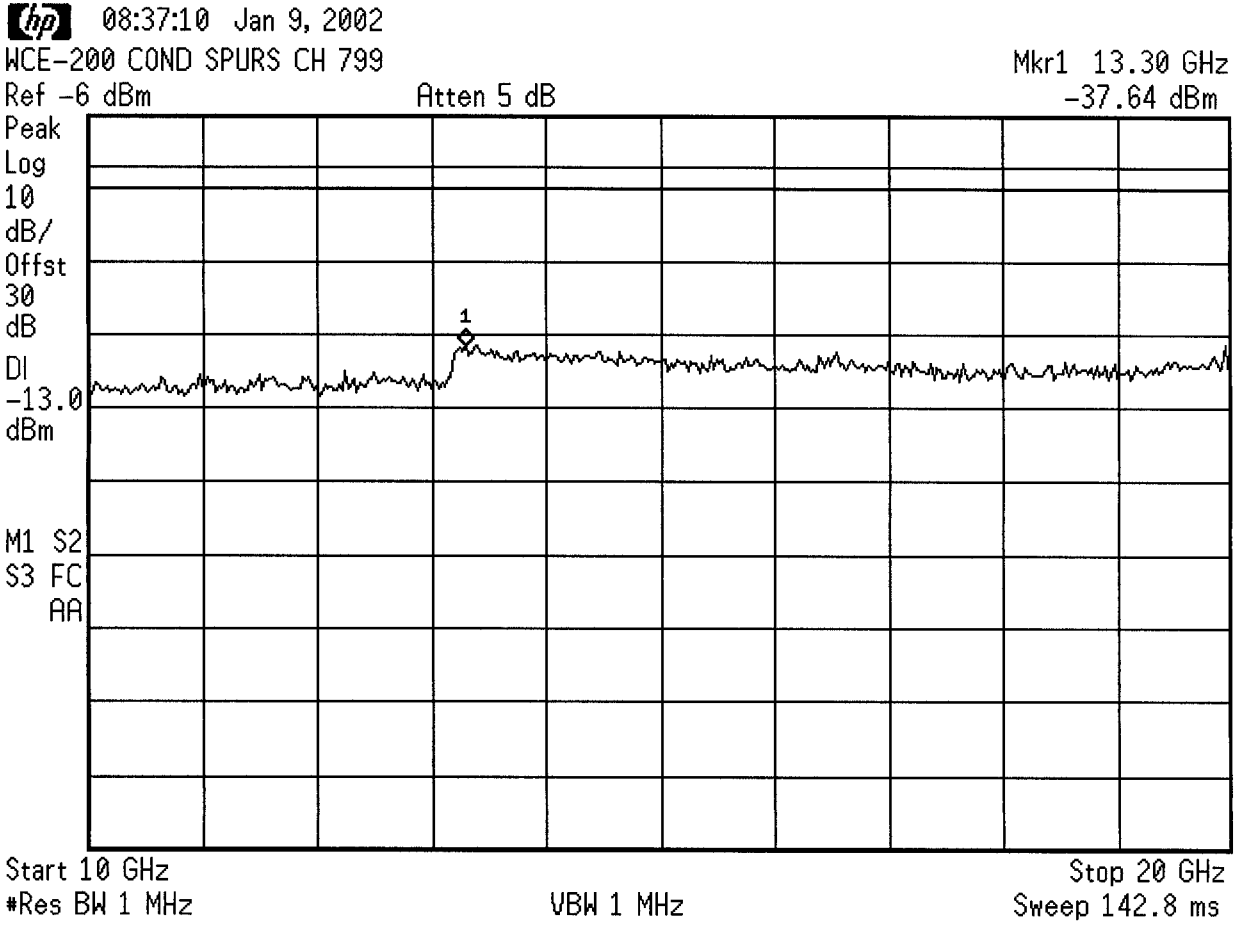

08:26:00 Jan 9, 2002
WCE-200 COND SPURS CH 383
Ref -6 dBm
Atten 5 dB
Mkr1 1.678 GHz
-29.02 dBm
Peak
Log
10
dB/
Offst
30
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
1
Start 10 MHz
*Res BW 1 MHz
VBW 1 MHz
Stop 2.5 GHz
Sweep 142.8 ms

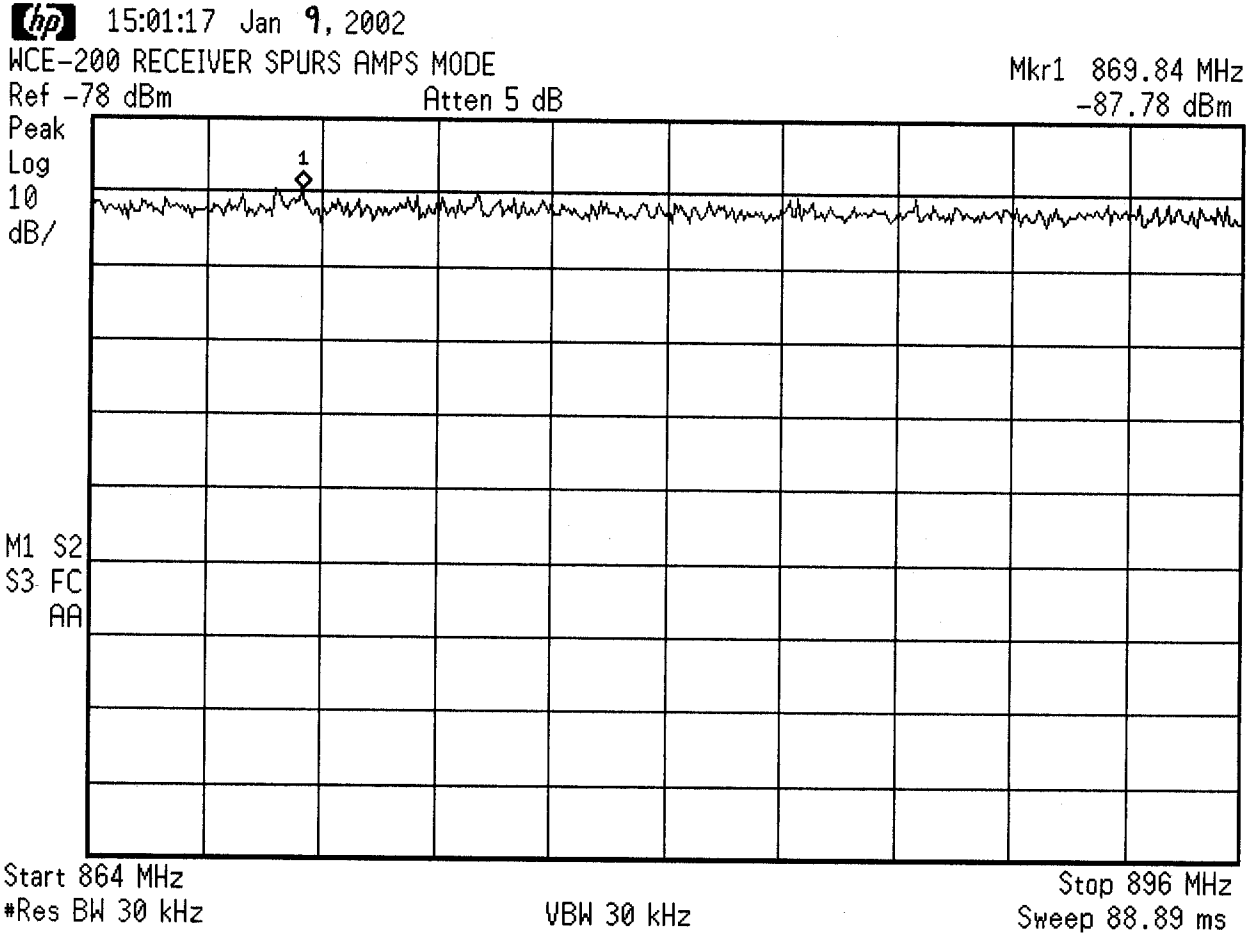

08:26:27 Jan 9, 2002
WCE-200 COND SPURS CH 383
Ref -6 dBm
Atten 5 dB
Mkr1 2.519 GHz
-27.58 dBm
Peak
Log
10
dB/
Offst
30
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
Start 2.5 GHz
#Res BW 1 MHz
VBW 1 MHz
Stop 10 GHz
Sweep 142.8 ms

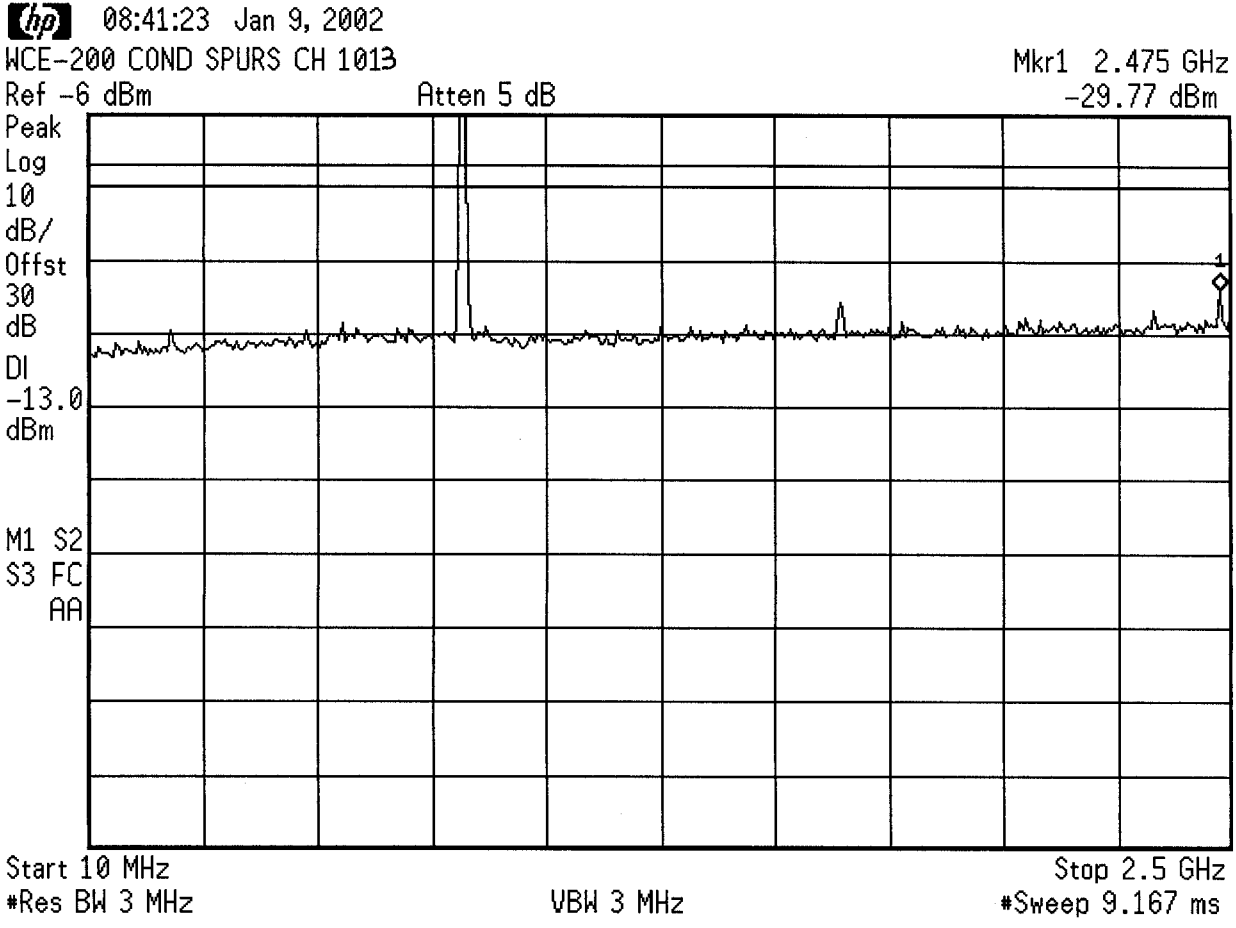

08:26:50 Jan 9, 2002
WCE-200 COND SPURS CH 383
Mkr1 14.08 GHz
Ref -6 dBm
Atten 5 dB
-36.78 dBm
Peak
Log
10
dB/
Offst
30
dB
Dl
-13.0
dBm
1
M1 S2
S3 FC
AA
Start 10 GHz
Stop 20 GHz
#Res BW 1 MHz
VBW 1 MHz
Sweep 142.8 ms

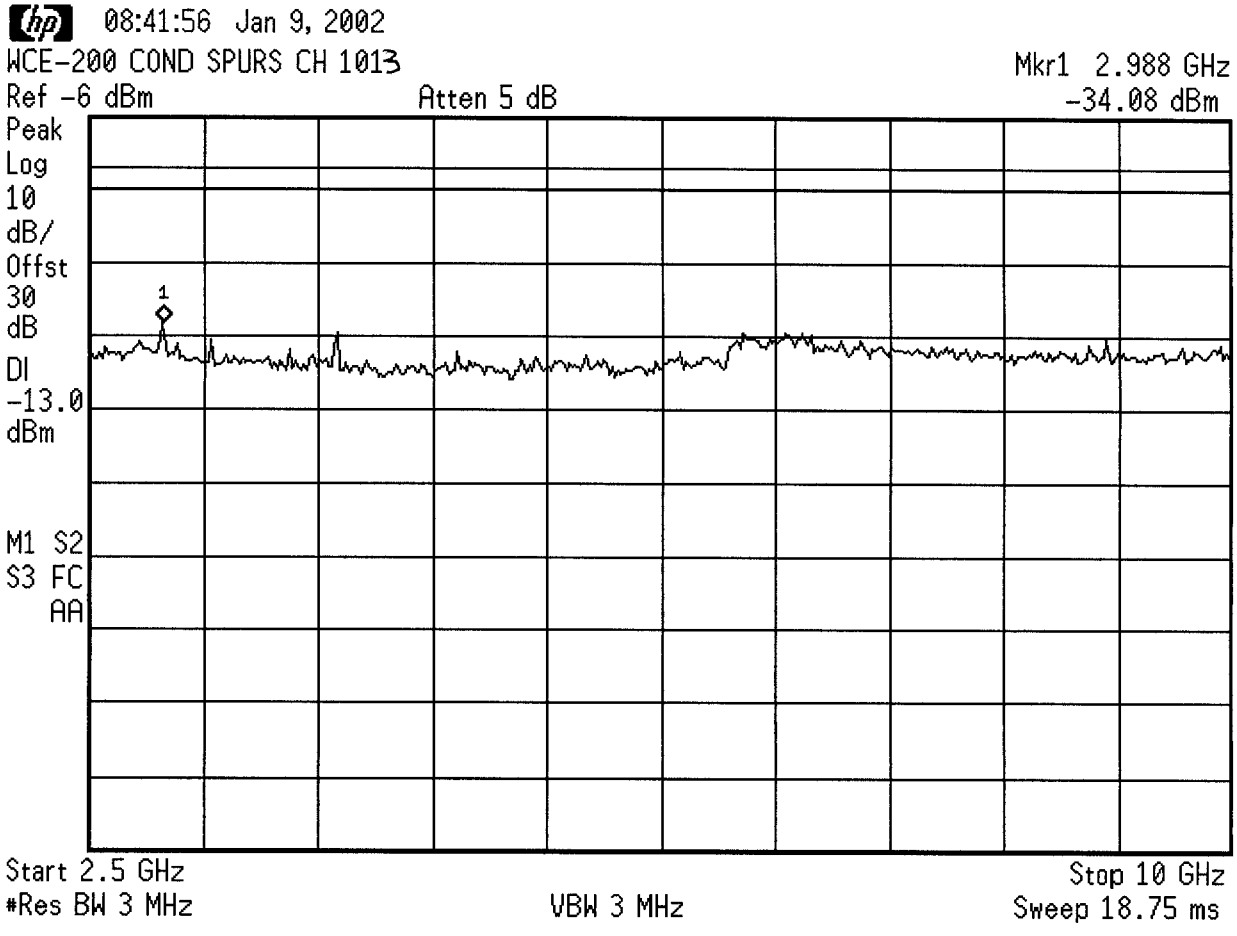

08:35:52 Jan 9, 2002
WCE-200 COND SPURS CH 799
Ref -6 dBm
Atten 5 dB
Mkr1 1.697 GHz
-30.17 dBm
Peak
Log
10
dB/
Offst
30
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
1
Start 10 MHz
#Res BW 1 MHz
VBW 1 MHz
Stop 2.5 GHz
Sweep 142.8 ms

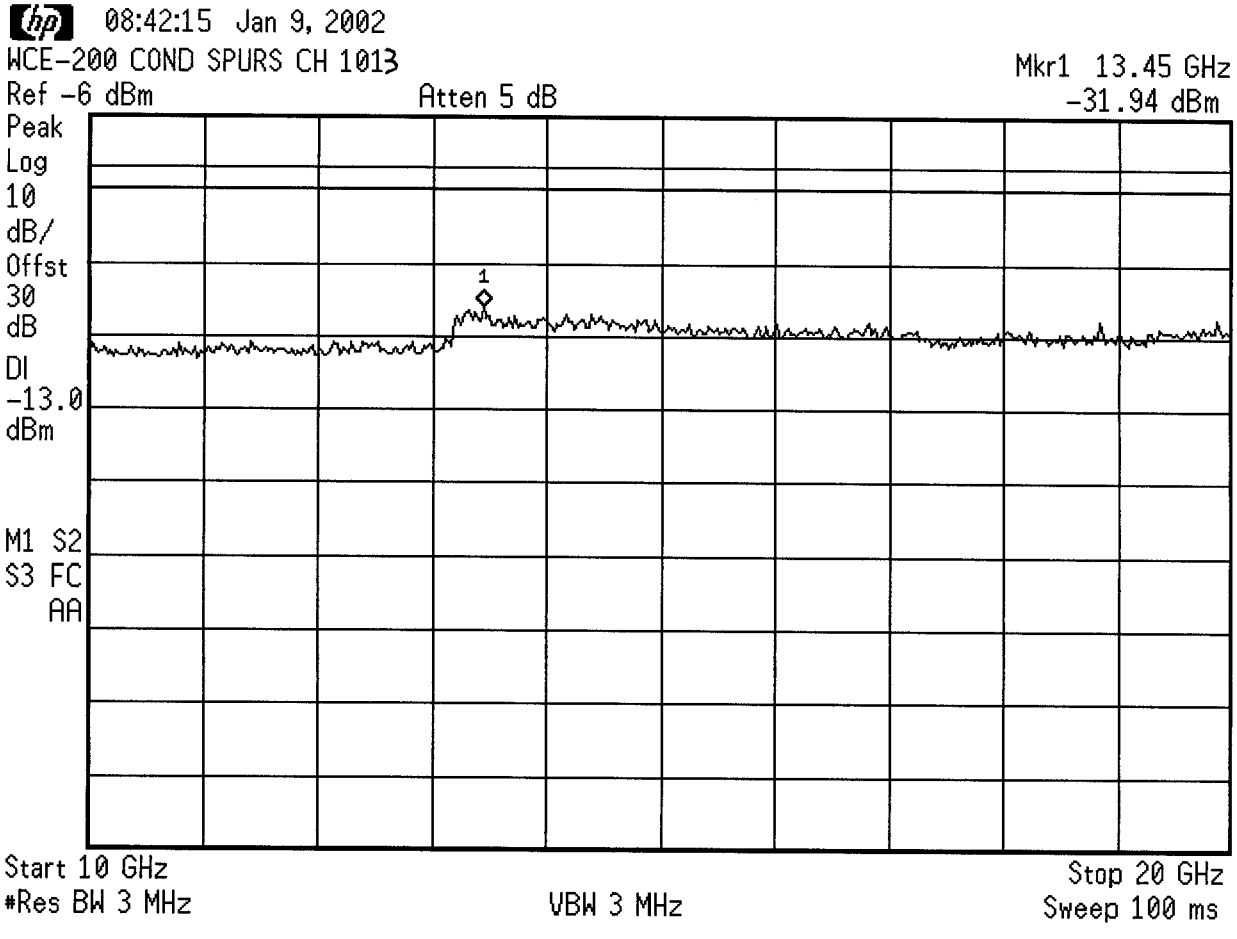

08:36:21 Jan 9, 2002
WCE-200 COND SPURS CH 799
Ref -6 dBm
Atten 5 dB
Mkr1 2.556 GHz
-26.57 dBm
Peak
Log
10
dB/
Offst
30
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
Start 2.5 GHz
#Res BW 1 MHz
VBW 1 MHz
Stop 10 GHz
Sweep 142.8 ms

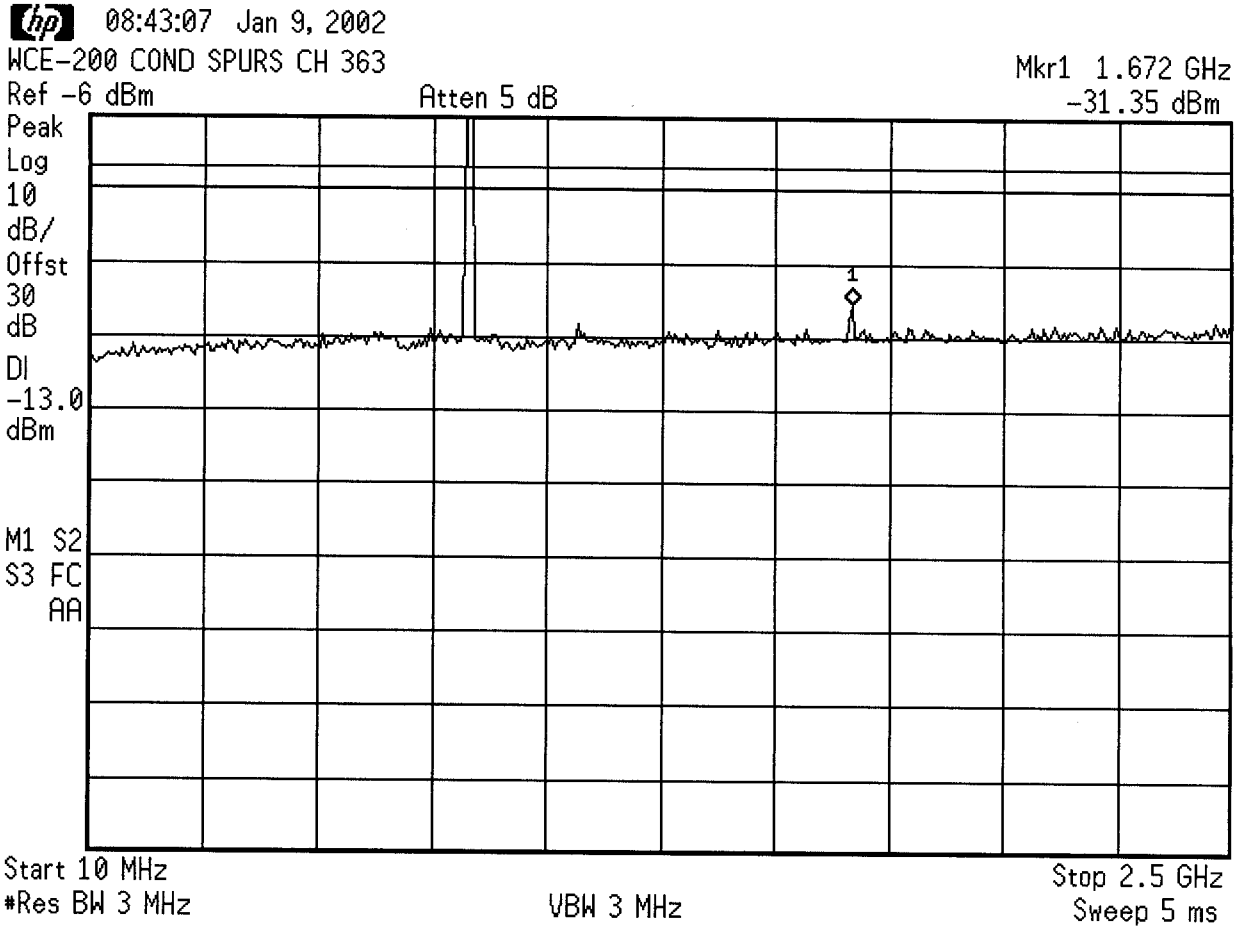

08:37:10 Jan 9, 2002
WCE-200 COND SPURS CH 799
Mkr1 13.30 GHz
Ref -6 dBm
Atten 5 dB
-37.64 dBm
Peak
Log
10
dB/
Offst
30
dB
Dl
-13.0
dBm
1
M1 S2
S3 FC
AA
Start 10 GHz
Stop 20 GHz
#Res BW 1 MHz
VBW 1 MHz
Sweep 142.8 ms

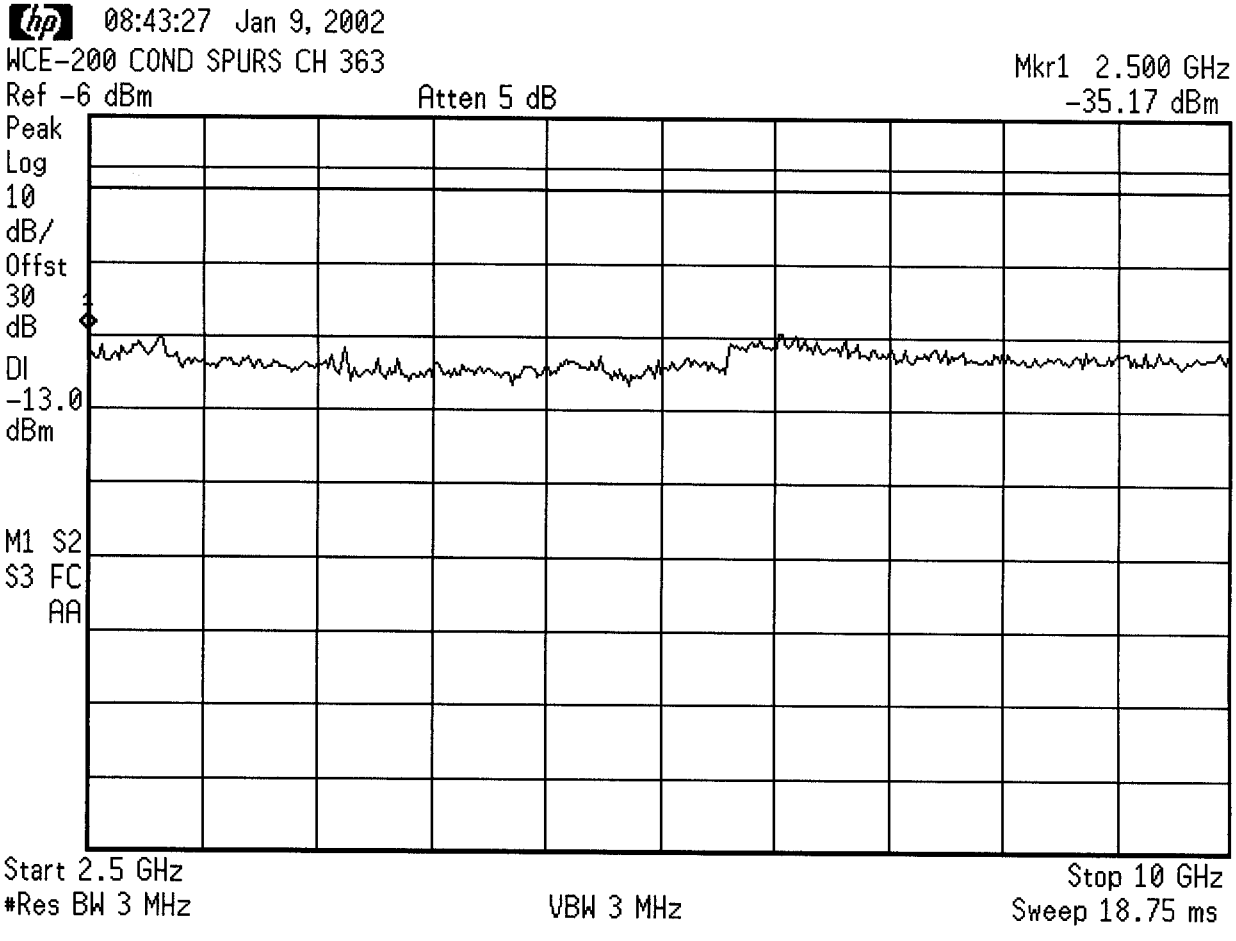

15:01:17 Jan 9, 2002
WCE-200 RECEIVER SPURS AMPS MODE
Ref -78 dBm
Atten 5 dB
Mkr1 869.84 MHz
-87.78 dBm
Peak
Log
10
dB/
1
M1 S2
S3 FC
AA
Start 864 MHz
#Res BW 30 kHz
VBW 30 kHz
Stop 896 MHz
Sweep 88.89 ms

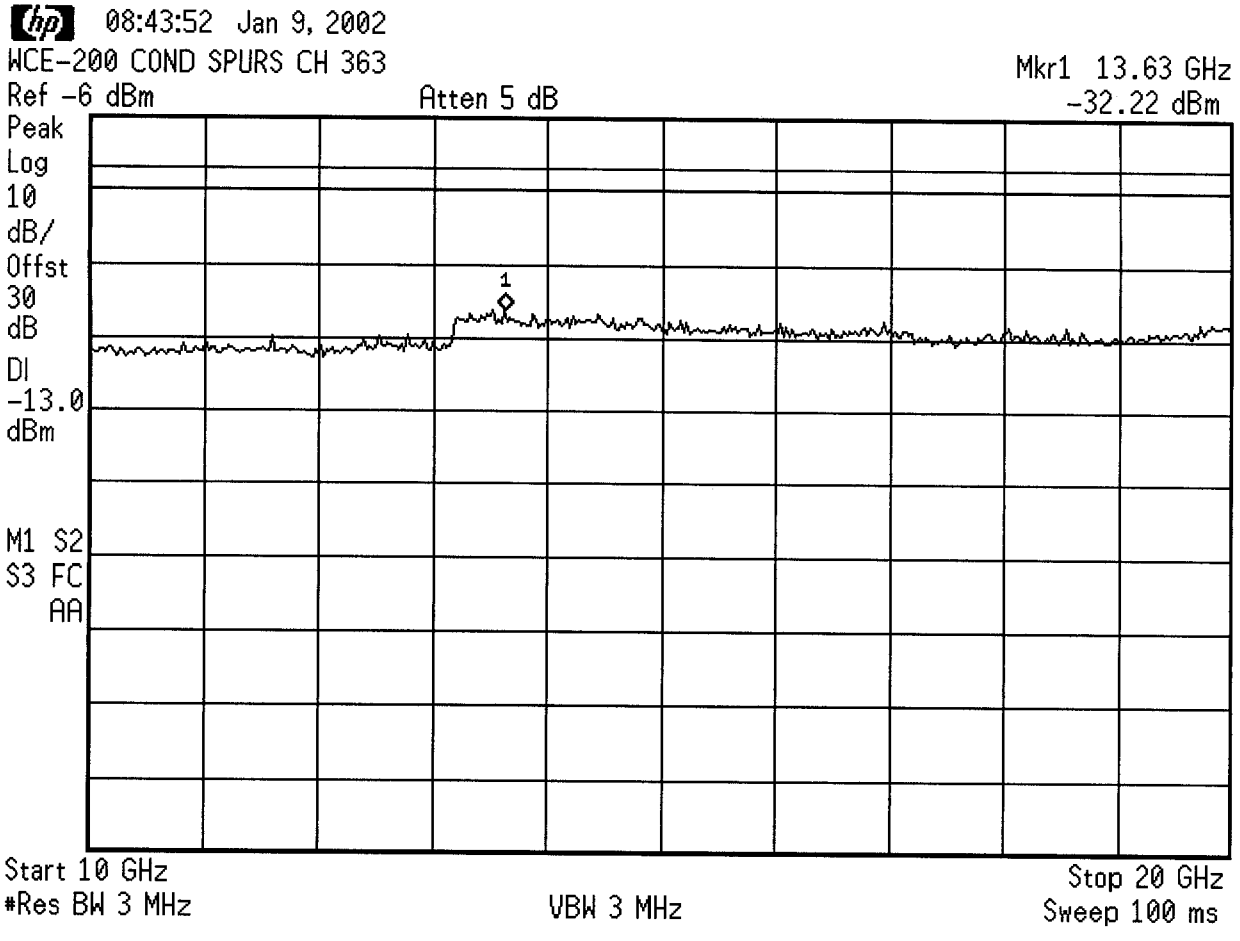

08:41:23 Jan 9, 2002
WCE-200 COND SPURS CH 1013
Ref -6 dBm
Atten 5 dB
Mkr1 2.475 GHz
-29.77 dBm
Peak
Log
10
dB/
Offst
30
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
Start 10 MHz
#Res BW 3 MHz
VBW 3 MHz
Stop 2.5 GHz
#Sweep 9.167 ms

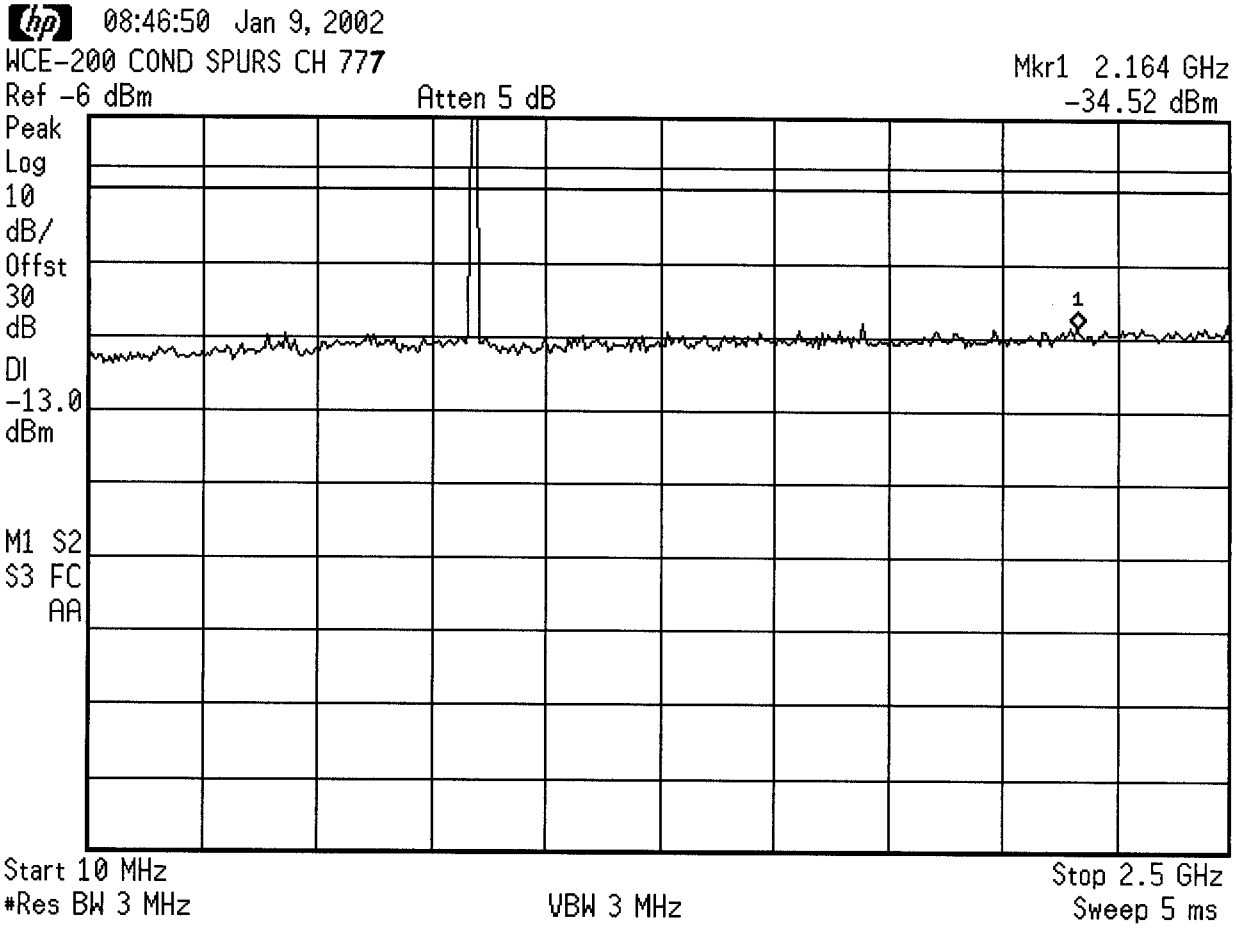

08:41:56 Jan 9, 2002
WCE-200 COND SPURS CH 1013
Mkr1 2.988 GHz
Ref -6 dBm
Atten 5 dB
-34.08 dBm
Peak
Log
10
dB/
Offst
30
dB
Dl
-13.0
dBm
1
M1 S2
S3 FC
AA
Start 2.5 GHz
Stop 10 GHz
#Res BW 3 MHz
VBW 3 MHz
Sweep 18.75 ms

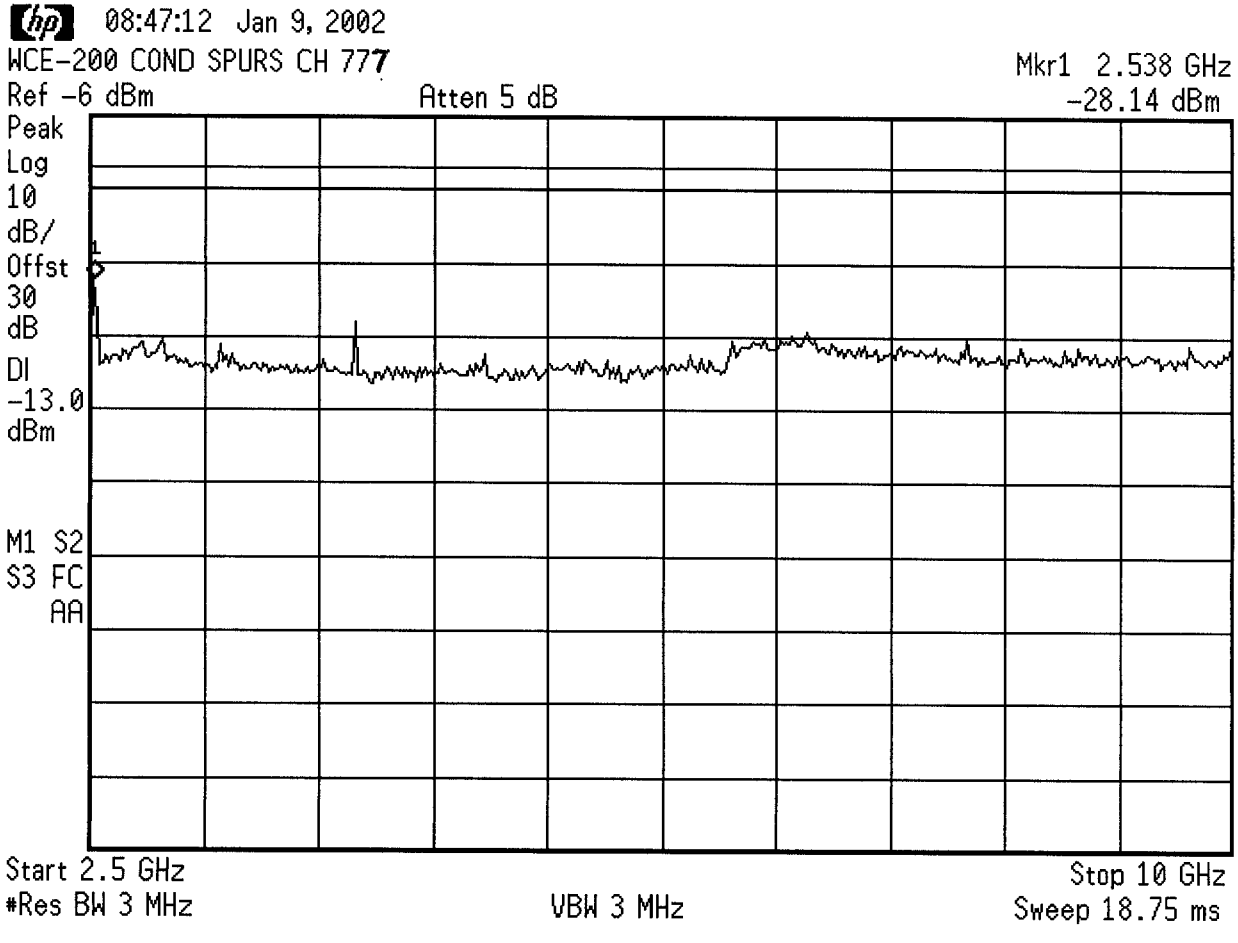

08:42:15 Jan 9, 2002
WCE-200 COND SPURS CH 1013
Ref -6 dBm
Atten 5 dB
Mkr1 13.45 GHz
-31.94 dBm
Peak
Log
10
dB/
Offst
30
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
1
Start 10 GHz
#Res BW 3 MHz
VBW 3 MHz
Stop 20 GHz
Sweep 100 ms

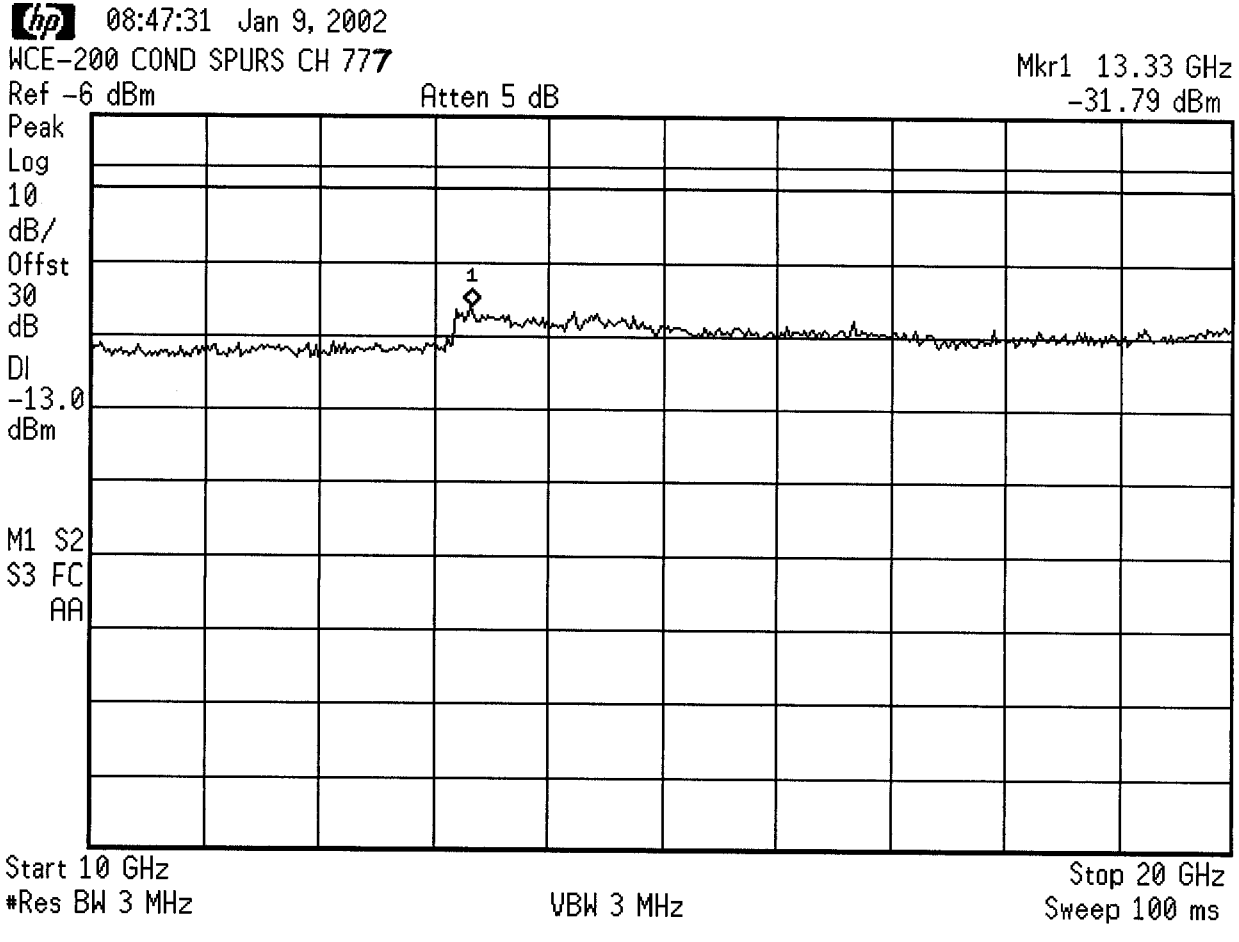

08:43:07 Jan 9, 2002
WCE-200 COND SPURS CH 363
Ref -6 dBm
Atten 5 dB
Mkr1 1.672 GHz
-31.35 dBm
Peak
Log
10
dB/
Offst
30
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
1
Start 10 MHz
#Res BW 3 MHz
VBW 3 MHz
Stop 2.5 GHz
Sweep 5 ms

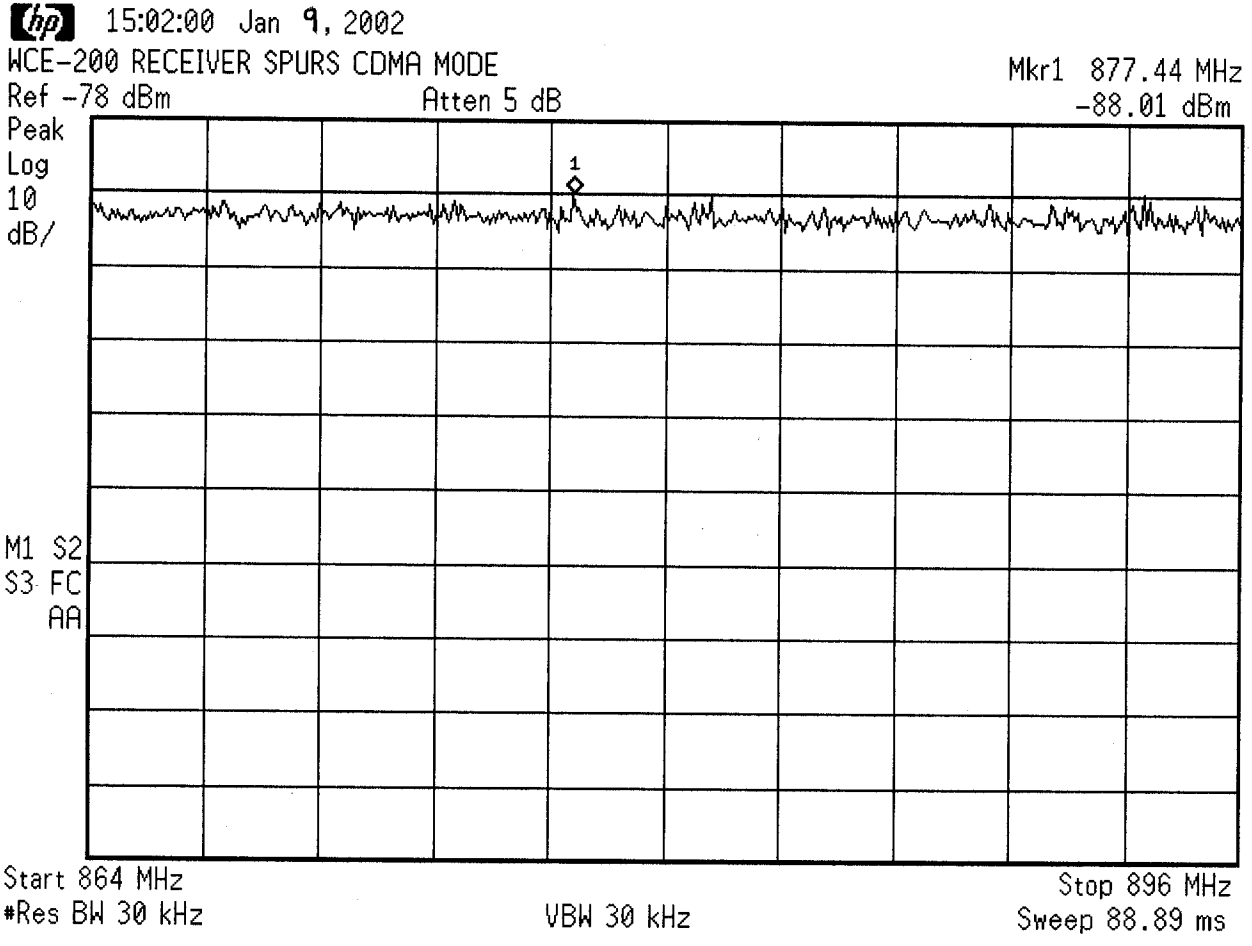

08:43:27 Jan 9, 2002
WCE-200 COND SPURS CH 363
Ref -6 dBm
Atten 5 dB
Mkr1 2.500 GHz
-35.17 dBm
Peak
Log
10
dB/
Offst
30
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
Start 2.5 GHz
#Res BW 3 MHz
VBW 3 MHz
Stop 10 GHz
Sweep 18.75 ms

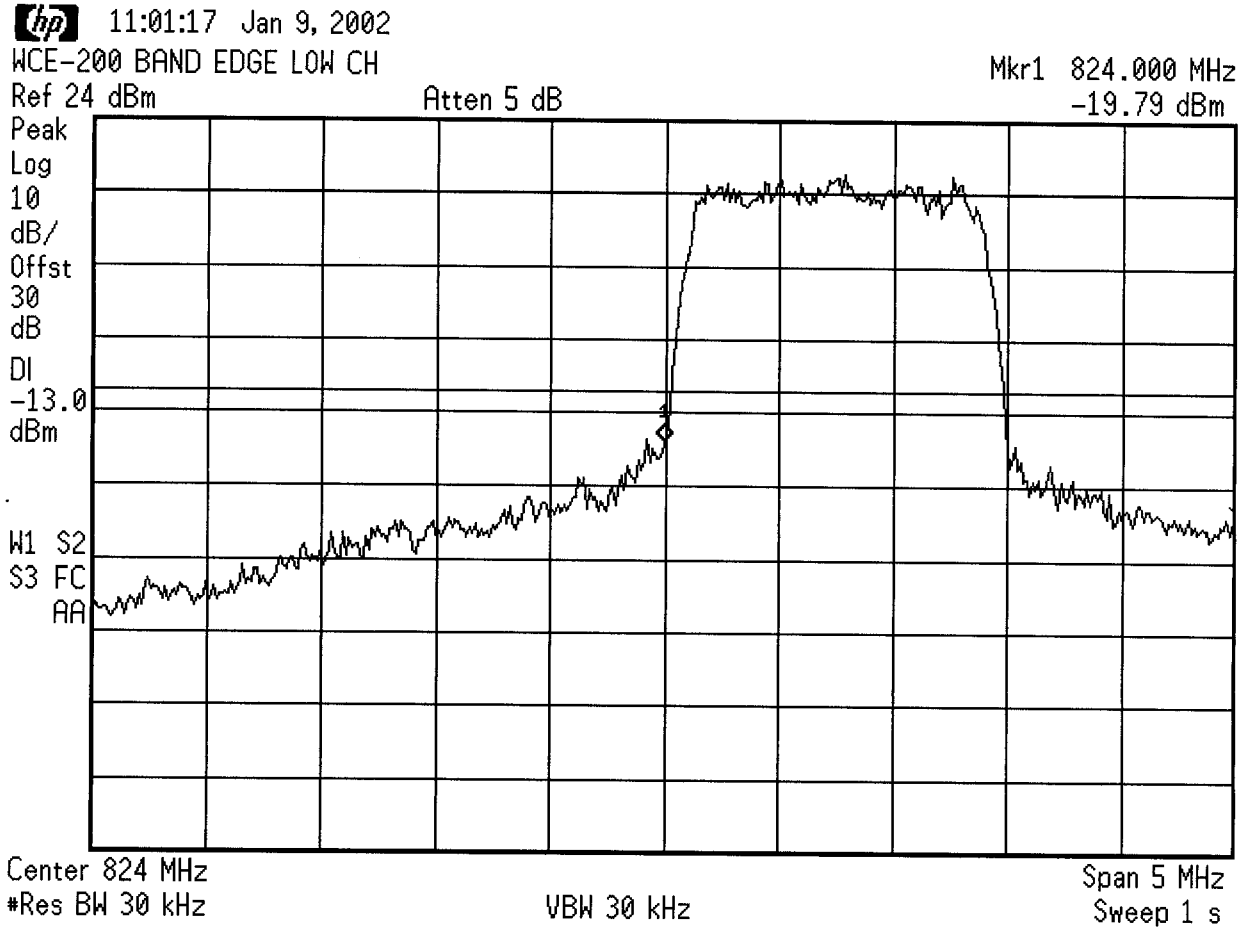

08:43:52 Jan 9, 2002
WCE-200 COND SPURS CH 363
Ref -6 dBm
Atten 5 dB
Mkr1 13.63 GHz
-32.22 dBm
Peak
Log
10
dB/
Offst
30
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
1
Start 10 GHz
#Res BW 3 MHz
VBW 3 MHz
Stop 20 GHz
Sweep 100 ms

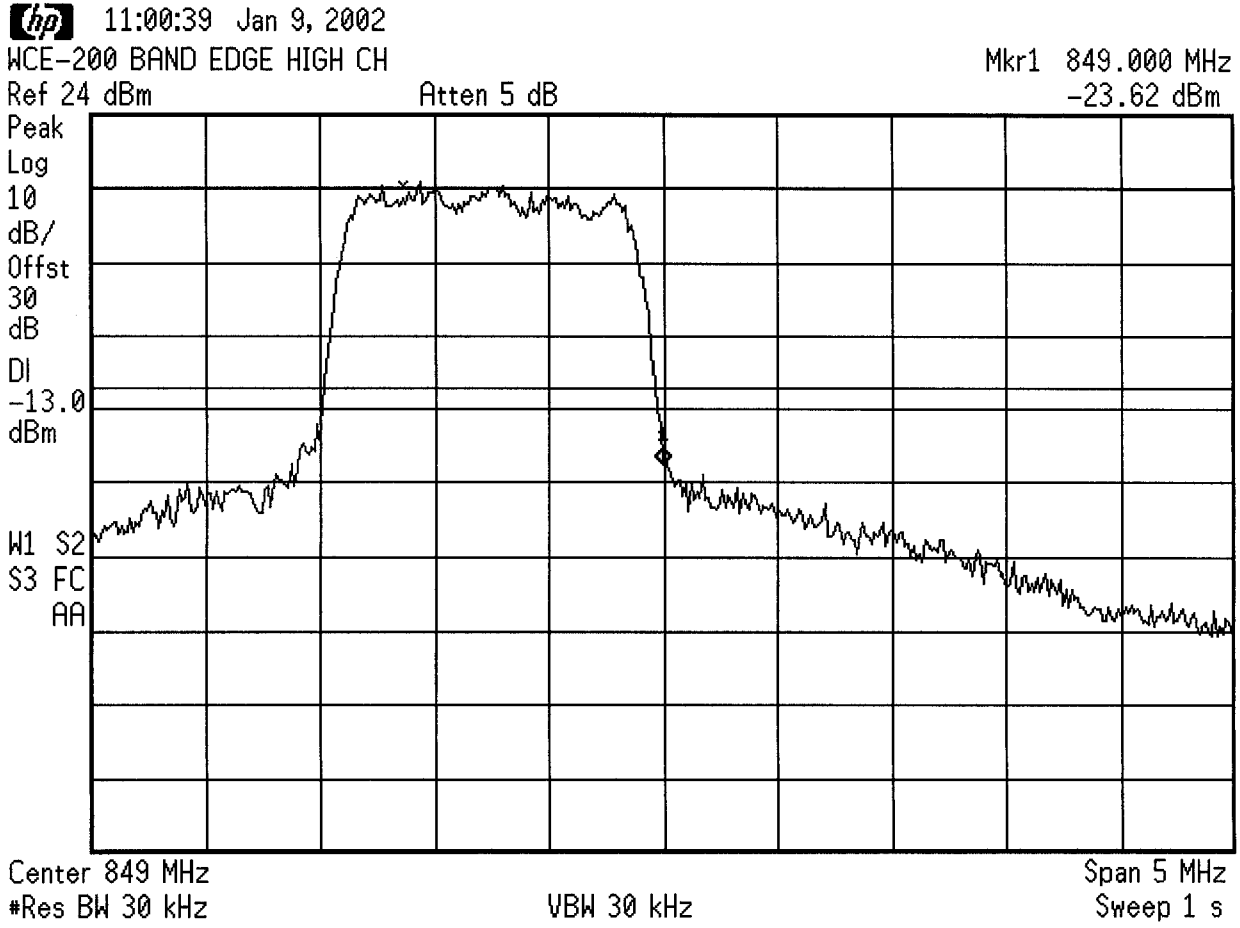

08:46:50 Jan 9, 2002
WCE-200 COND SPURS CH 777
Ref -6 dBm
Atten 5 dB
Mkr1 2.164 GHz
-34.52 dBm
Peak
Log
10
dB/
Offst
30
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
1
Start 10 MHz
#Res BW 3 MHz
VBW 3 MHz
Stop 2.5 GHz
Sweep 5 ms

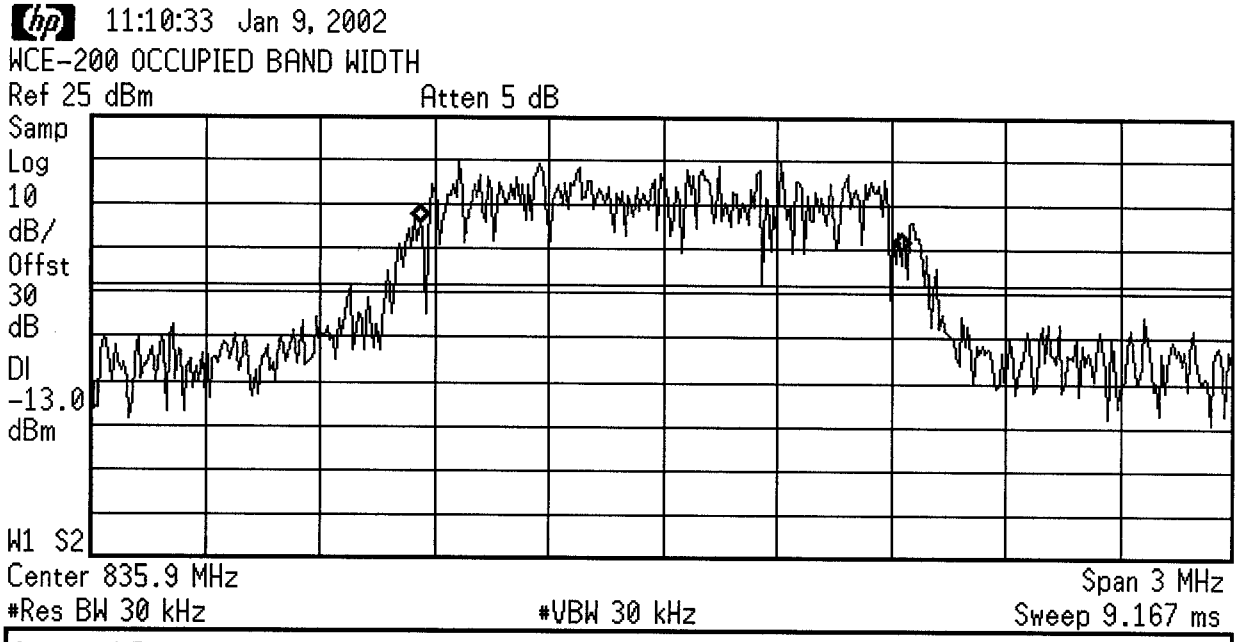

08:47:12 Jan 9, 2002
WCE-200 COND SPURS CH 777
Ref -6 dBm
Atten 5 dB
Mkr1 2.538 GHz
-28.14 dBm
Peak
Log
10
dB/
Offst
30
dB
Dl
-13.0
dBm
M1 S2
S3 FC
AA
Start 2.5 GHz
#Res BW 3 MHz
VBW 3 MHz
Stop 10 GHz
Sweep 18.75 ms


08:47:31 Jan 9, 2002
WCE-200 COND SPURS CH 777
Ref -6 dBm
Atten 5 dB
Mkr1 13.33 GHz
-31.79 dBm
Peak
Log
10
dB/
Offst
30
dB
Dl
-13.0
dBm
1
M1 S2
S3 FC
AA
Start 10 GHz
#Res BW 3 MHz
VBW 3 MHz
Stop 20 GHz
Sweep 100 ms


15:02:00 Jan 9, 2002
WCE-200 RECEIVER SPURS CDMA MODE
Ref -78 dBm
Atten 5 dB
Mkr1 877.44 MHz
-88.01 dBm
Peak
Log
10
dB/
1
M1 S2
S3 FC
AA
Start 864 MHz
#Res BW 30 kHz
VBW 30 kHz
Stop 896 MHz
Sweep 88.89 ms


11:01:17 Jan 9, 2002
WCE-200 BAND EDGE LOW CH
Ref 24 dBm
Atten 5 dB
Mkr1 824.000 MHz
-19.79 dBm
Peak
Log
10
dB/
Offst
30
dB
Dl
-13.0
dBm
W1 S2
S3 FC
AA
Center 824 MHz
#Res BW 30 kHz
VBW 30 kHz
Span 5 MHz
Sweep 1 s


11:00:39 Jan 9, 2002
WCE-200 BAND EDGE HIGH CH
Mkr1 849.000 MHz
Ref 24 dBm
Atten 5 dB
-23.62 dBm
Peak
Log
10
dB/
Offst
30
dB
Dl
-13.0
dBm
W1 S2
S3 FC
AA
Center 849 MHz
#Res BW 30 kHz
VBW 30 kHz
Span 5 MHz
Sweep 1 s



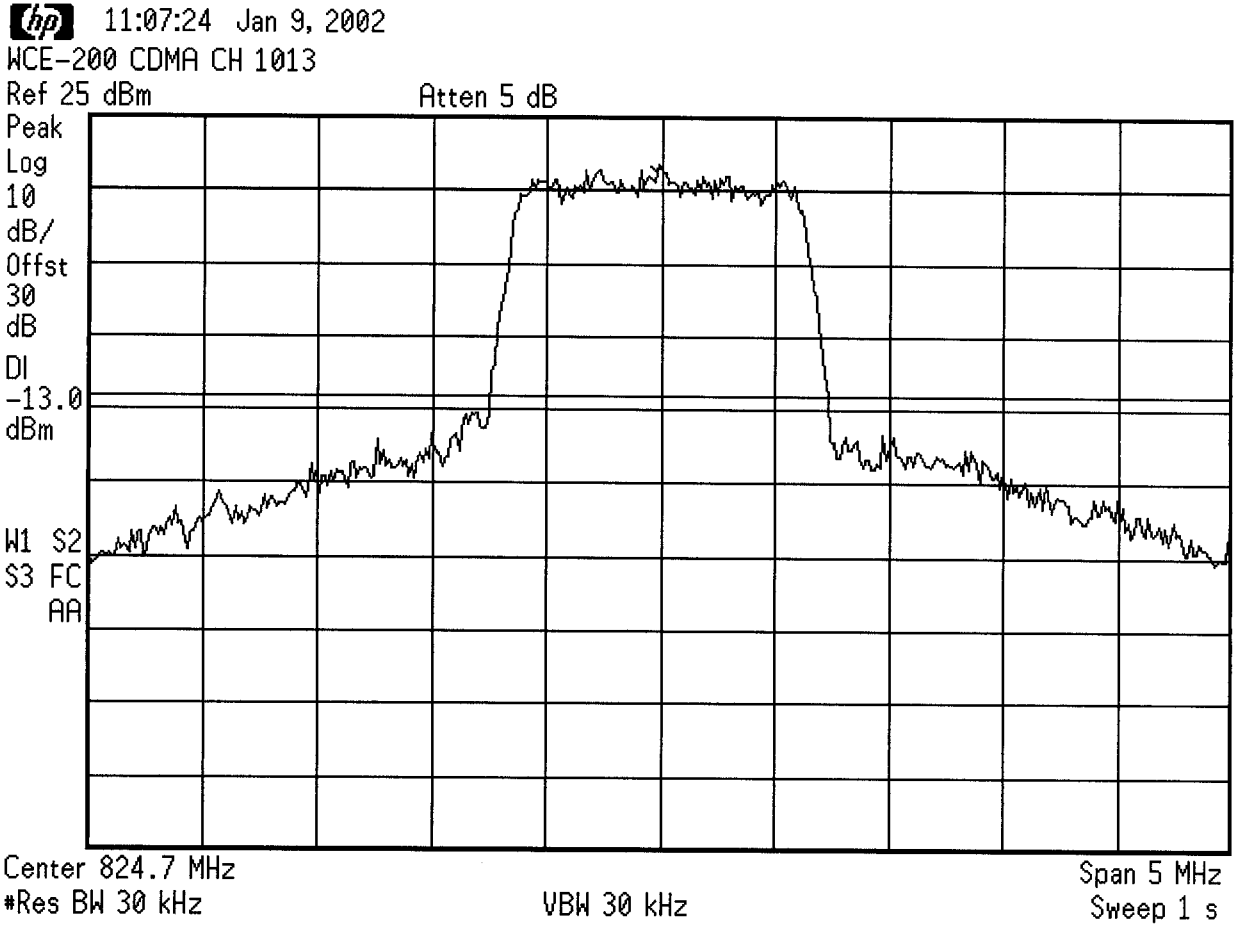
Occupied Bandwidth Results (measuring..)

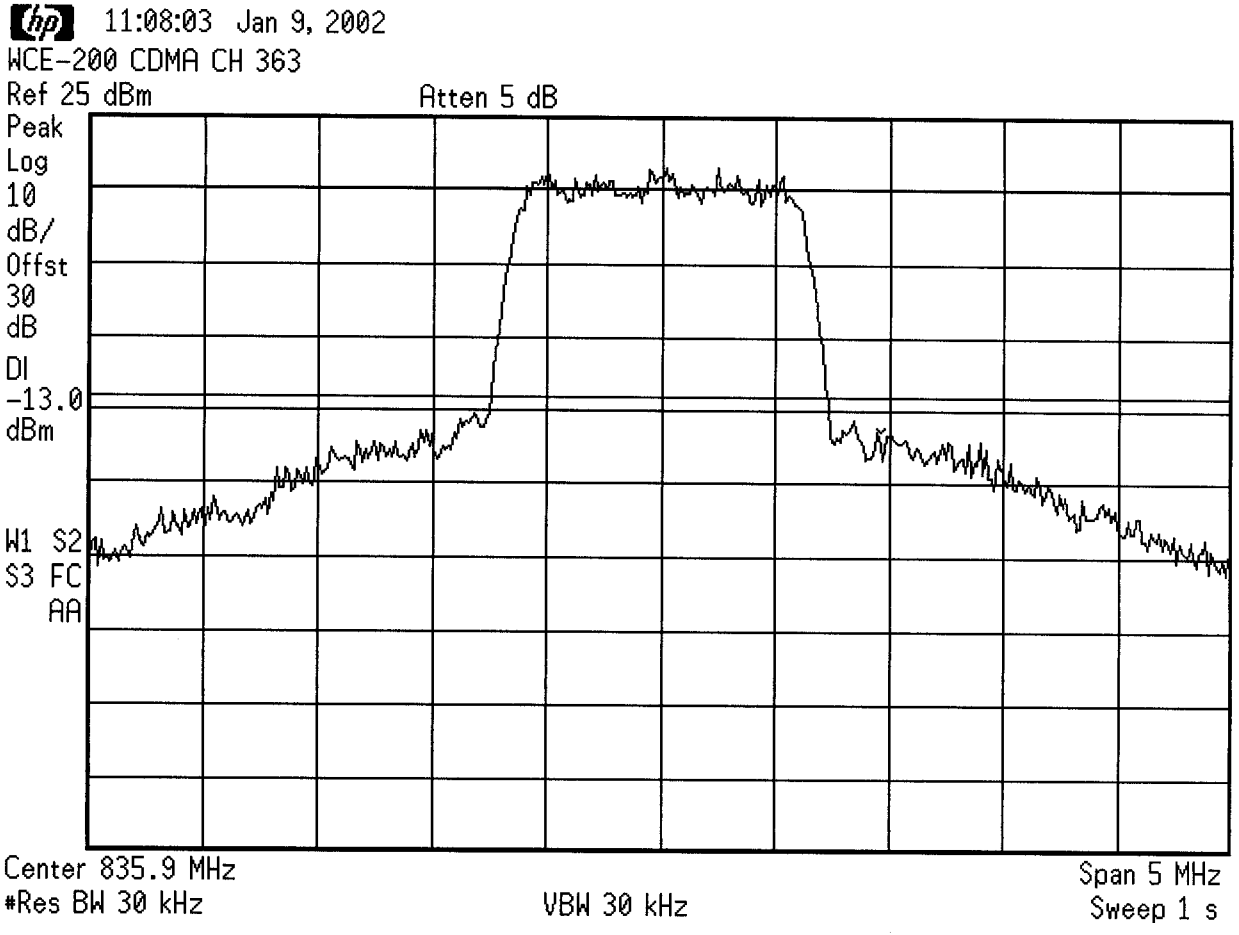
Occupied Bandwidth

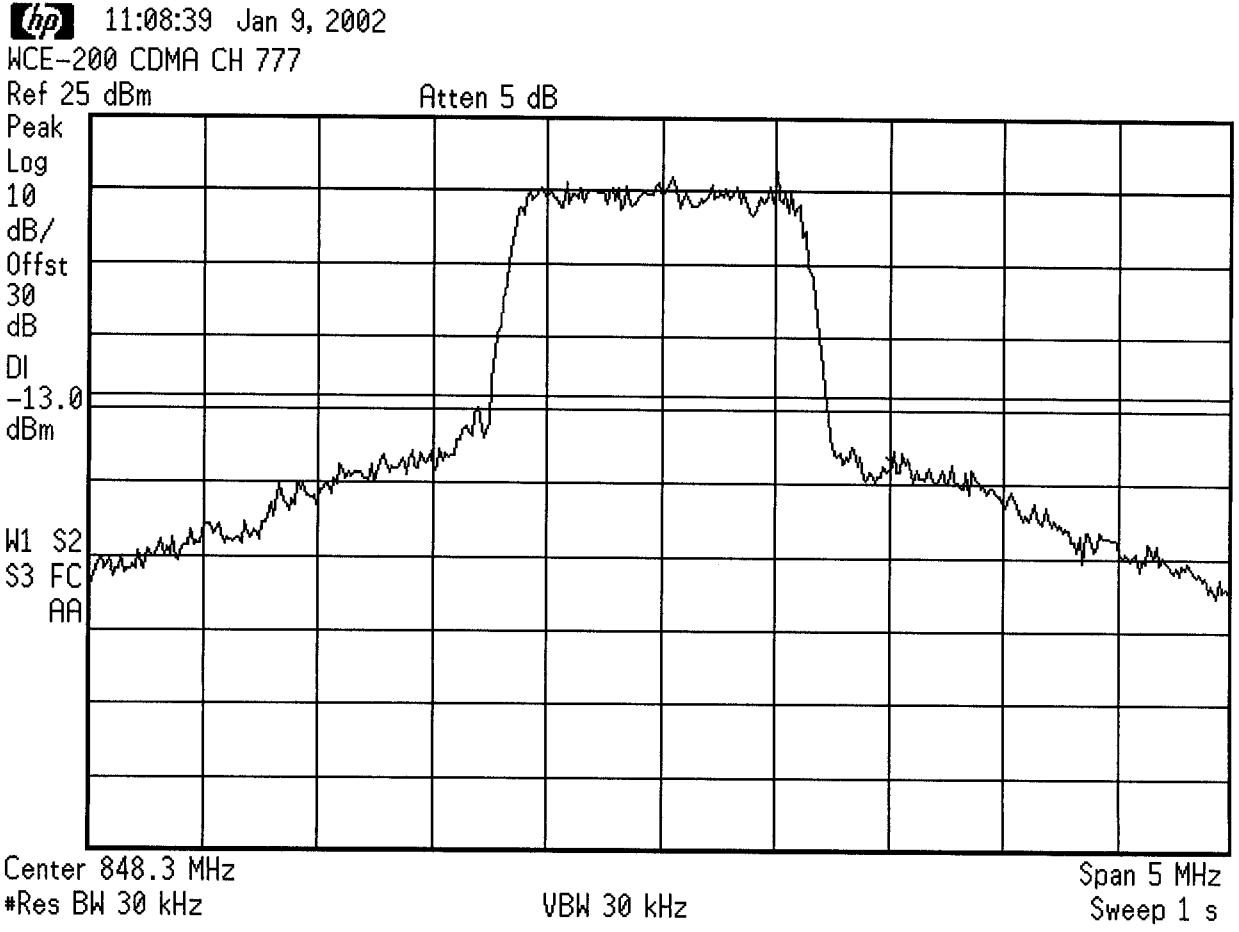
1.270 MHz

Occ BW % Pwr 99.00 %

Transmit Freq Error -1.700 kHz


11:07:24 Jan 9, 2002
WCE-200 CDMA CH 1013
Ref 25 dBm
Atten 5 dB
Peak
Log
10
dB/
Offst
30
dB
Dl
-13.0
dBm
W1 S2
S3 FC
AA
Center 824.7 MHz
#Res BW 30 kHz
VBW 30 kHz
Span 5 MHz
Sweep 1 s


11:08:03 Jan 9, 2002
WCE-200 CDMA CH 363
Ref 25 dBm
Atten 5 dB
Peak
Log
10
dB/
Offst
30
dB
Dl
-13.0
dBm
W1 S2
S3 FC
AA
Center 835.9 MHz
#Res BW 30 kHz
VBW 30 kHz
Span 5 MHz
Sweep 1 s


11:08:39 Jan 9, 2002
WCE-200 CDMA CH 777
Ref 25 dBm
Atten 5 dB
Peak
Log
10
dB/
Offst
30
dB
Dl
-13.0
dBm
W1 S2
S3 FC
AA
Center 848.3 MHz
#Res BW 30 kHz
VBW 30 kHz
Span 5 MHz
Sweep 1 s