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 Toll Free: 1-877-545-6287 e-mail: celltech@globuswireless.com web site: www.globuswireless.com	**WIDE TELECOM INC.** 3551 Voyager St., Suite 103 Torrance, CA 90503 Attn: Matt Park, Sales Manager Tel. 310-921-9737 Fax 310-921-9686

FCC Classification:	**Licensed Non-Broadcast Transmitter Held to Ear (TNE)**
FCC Rule Part(s):	**§22(H), §22.901(d), §2**
FCC ID:	**NPWWSH-200**
Model(s):	**WSH-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:	**0.502 Watts ERP (AMPS)**
	0.280 Watts ERP (CDMA)
Frequency Tolerance:	**2.5 PPM**
Emission Designator(s):	**40K0F8W, 40K0F1D, 1M25F9W**

This equipment has been 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.

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.

Celltech Research Inc. certifies that no party to this application has been denied FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 853(a).

Shawn McMillen
General Manager
Celltech Research Inc.

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MEASUREMENT REPORT - FCC PART 22

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.

§2.1033(a) General Information

APPLICANT:

WIDE TELECOM INC.
3551 Voyager St., Suite 103
Torrance, CA 90503
Attn: Matt Park, Sales Manager

FCC ID	**NPWWSH-200**
Model(s)	**WSH-200**
EUT Type	**Dual-Mode AMPS/CDMA Cellular Phone**
Classification	**Licensed Non-Broadcast Transmitter Held to Ear (TNE)**
Rule Part(s)	**§22(H), §22.901(d), §2**
Max. RF Output Power	**0.502 Watts ERP (AMPS) 0.280 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**
Modulation(s)	**AMPS / CDMA**
Battery Type(s)	**3.6V Li-Hydrogen Standard Battery**

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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.

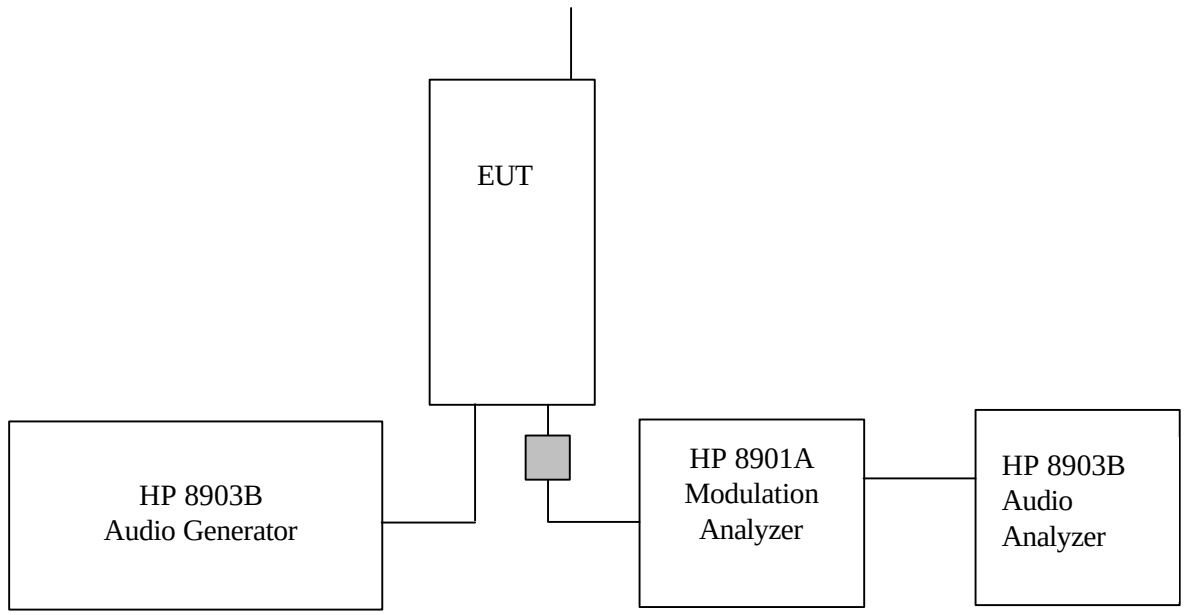
2.3 AUDIO LOW PASS FILTER FREQUENCY RESPONSE - §22.915(d)

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, 1000 Hz, 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 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 with and without internal data modulation. 100% of the in-band modulation is 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 is 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 is 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 is at least 60dB below the carrier of 40 + $\log_{10}$ (mean power output in Watts) dB, whichever is the smaller attenuation.

2.6 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL - §2.1051

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from 10MHz to 20GHz. The transmitter is modulated with a 2500Hz tone at a level of 16dB greater than that required to provided 50% modulation. 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. The transmitter was operating at maximum power with internal data modulation.

2.7 RADIATED SPURIOUS AND HARMONIC EMISSIONS - §2.1053

Radiated and harmonic emissions above 1 GHz were measured at our 3-meter outdoor site. The EUT is placed on the turntable and loaded with the integral antenna. A receiving antenna located 3 meters from the turntable receives any signal radiated from the transmitter and its operating accessories. The receiving antenna is varied from 1 to 4 meters and the polarization is varied (horizontal and vertical) to determine the worst-case emission level.

2.8 FREQUENCY STABILITY/TEMPERATURE VARIATION - §2.1055

The frequency stability of the transmitter is measured by:

a) Temperature: The temperature is varied from -30°C to +60°C using an environmental chamber.

b) Primary Supply Voltage: The primary supply voltage is varied from 85% to 115% of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied. The EUT is tested down to the battery endpoint.

Specification – The minimum frequency stability shall be +/- 0.00025% at any time during normal operation.

Time Period and Procedure:

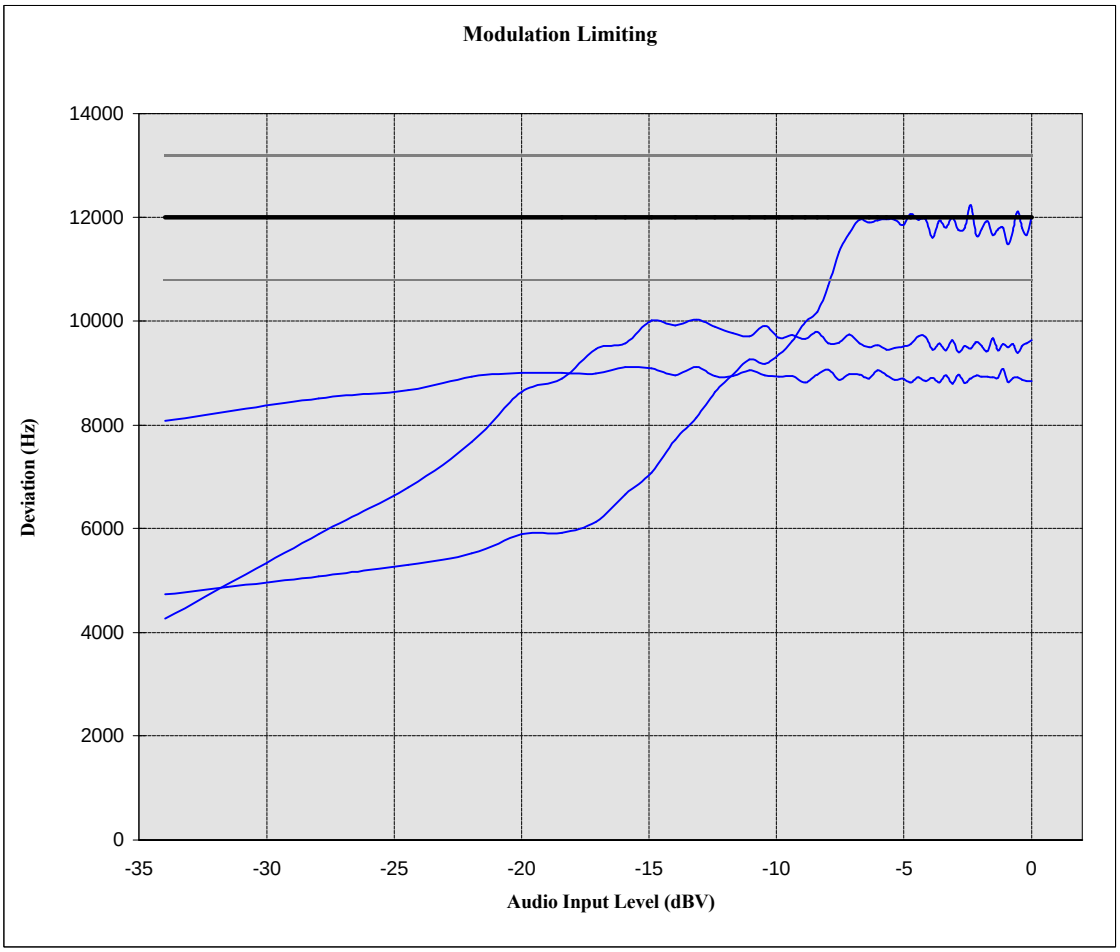
1. The carrier frequency of the transmitter and the individual oscillators is measured at room temperature (25°C to 27°C to provide a reference).
2. The equipment is subjected to an overnight "soak" at -30°C without any power applied.
3. After the overnight "soak" at -30°C (usually 14-16 hours), the equipment is turned on in a "standby" condition for one minute before applying power to the transmitter. Measurement of the carrier frequency of the transmitter and the individual oscillators is made within a three-minute interval after applying power to the transmitter.
4. Frequency measurements were made at 10°C intervals up to +60°C, then back to room temperature. A minimum period of one and one half-hour is provided to allow stabilization of the equipment at each temperature level.

3.1 TEST DATA

3.2 MODULATION LIMITING - §2.1047(b) & §22.915(b)

Test Date: 12/21/00
EUT: WIDE TELECOM Dual-Mode AMPS/CDMA Cellular Phone
Model: WSH-200
FCC ID: NPWWSH-200

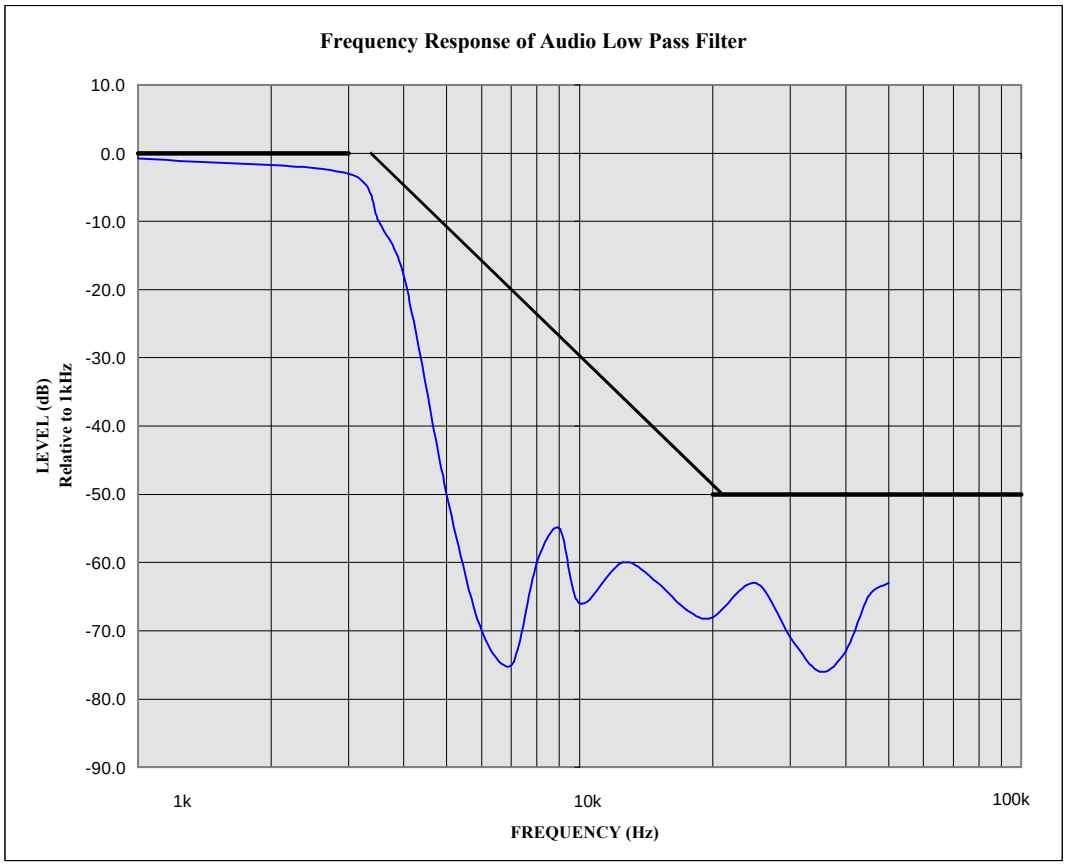
REFERENCE: 1 kHz = 0 dB



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

Test Date: 12/21/00
EUT: WIDE TELECOM Dual-Mode AMPS/CDMA Cellular Phone
Model: WSH-200
FCC ID: NPWWSH-200

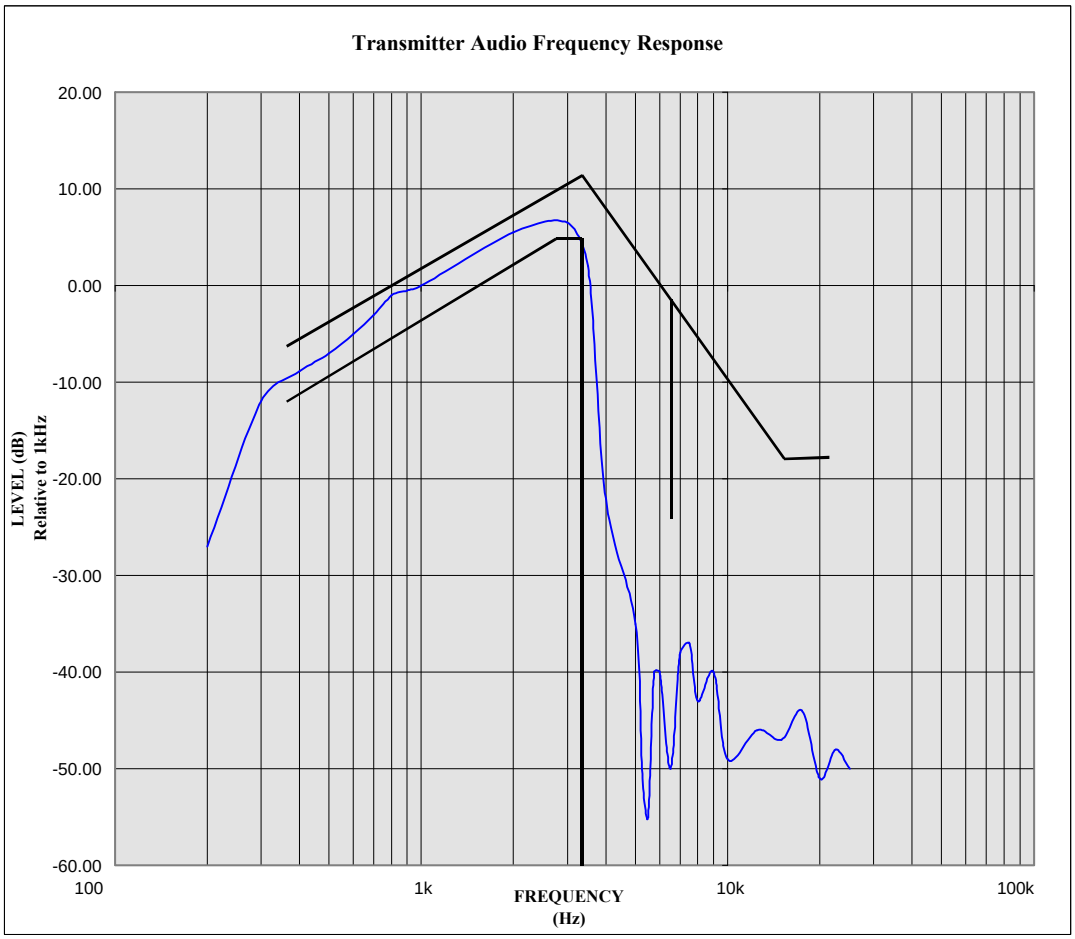
REFERENCE: 1 kHz = 0 dB



3.4 TRANSMITTER AUDIO FREQUENCY RESPONSE - §2.1047(a)

Test Date: 12/21/00
EUT: WIDE TELECOM Dual-Mode AMPS/CDMA Cellular Phone
Model: WSH-200
FCC ID: NPWWSH-200

REFERENCE: 1 kHz = 0 dB



3.5 EFFECTIVE RADIATED POWER OUTPUT - §2.1046

AMPS MODE

Frequency Tuned	**EUT Conducted Power**	**Max. Field Strength of EUT (antenna extended)** (dBm)		**Dipole Gain**	**Dipole Forward Conducted Power**	**ERP of EUT Dipole Gain + Dipole Forward Conducted Power**	
(MHz)	(dBm)	V	H	(dBd)	(dBm)	(dBm)	(Watts)
824.04	27.0	- 11.64	- 8.14	- 1.44	28.11	26.67	0.465
836.49	27.0	- 11.82	- 8.40	- 1.34	28.35	27.01	0.502
848.97	27.0	- 11.86	- 8.26	- 1.24	28.24	27.00	0.501

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. The dipole was fed through a directional coupler and the power at the coupler port was monitored. A signal generator and power amplifier controlled the dipole, and the input level of the dipole was adjusted to the same field strength level as the EUT. 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 forward power for the dipole was then determined and the ERP level was determined by adding the forward dipole 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, which is the only battery option for this phone.

CDMA MODE

Frequency Tuned	EUT Conducted Power	Max. Field Strength of EUT (antenna extended) (dBm)		Dipole Gain	Dipole Forward Conducted Power	ERP of EUT Dipole Gain + Dipole Forward Conducted Power	
(MHz)	(dBm)	V	H	(dBd)	(dBm)	(dBm)	(Watts)
824.70	24.0	13.74	- 10.28	- 1.44	25.57	24.13	0.259
835.89	24.0	14.28	- 10.80	- 1.34	25.81	24.47	0.280
848.31	24.0	14.00	- 10.40	- 1.24	25.70	24.46	0.279

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 spectrum analyzer was set to measure channel power for CDMA mode. 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. The dipole was fed through a directional coupler and the power at the coupler port was monitored. A signal generator and power amplifier controlled the dipole, and the input level of the dipole was adjusted to the same field strength level as the EUT. 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 forward power for the dipole was then determined and the ERP level was determined by adding the forward dipole 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, which is the only battery option for this phone.

3.6 FIELD STRENGTH OF SPURIOUS RADIATION - §2.1053

Operating Frequency: 824.04 MHz
Channel: 991 (Low)
Measured Conducted Power: 27.0 dBm
Modulation: ST (Signaling Tone)
Distance: 3 meters
Limit: 43 + 10 $\log_{10}$ (W) = 40.31 dBc

AMPS MODE

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	≤ - 71.79	- 44.01	6.6	H	- 35.27	- 37.41	64.08
2472.12	≤ - 83.13	- 53.33	7.8	H	- 43.39	- 45.53	72.20
3296.16	≤ - 91.92	- 65.34	7.75	H	- 55.45	- 57.59	84.26
4120.20	≤ - 105.01	- 75.99	7.6	H	- 66.25	- 68.39	95.06
4944.24	≤ - 107.43	- 81.07	8.5	H	- 70.43	- 72.57	99.24
5768.28	≤ - 105.35	- 74.47	8.8	H	- 63.53	- 65.67	92.34
6592.32	≤ - 103.53	- 64.17	9.6	H	- 52.43	- 54.57	81.24
7416.36	≤ - 105.37	- 67.23	9.0	H	- 56.09	- 58.23	84.90
8240.40	≤ - 106.21	- 70.23	9.3	H	- 58.79	- 60.93	87.60

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 power for the antenna was then determined and the EIRP level was determined by adding the forward power and the antenna gain in dB.

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AMPS MODE

Operating Frequency:	836.49 MHz
Channel:	383 (Mid)
Measured Conducted Power:	27.0 dBm
Modulation:	ST (Signaling Tone)
Distance:	3 meters
Limit:	43 + 10 $\log_{10}$ (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	≤ - 75.81	- 48.03	6.6	H	- 39.29	- 41.43	68.44
2509.47	≤ - 84.26	- 54.46	7.8	H	- 44.52	- 46.66	73.67
3345.96	≤ - 96.80	- 70.22	7.75	H	- 60.33	- 62.47	89.48
4182.45	≤ - 102.70	- 73.68	7.6	H	- 63.94	- 66.08	93.09
5018.94	≤ - 104.04	- 77.68	8.5	H	67.04	- 69.18	96.19
5855.43	≤ - 105.53	- 74.65	8.8	H	- 63.71	- 65.85	92.86
6691.92	≤ - 105.64	- 66.28	9.6	H	- 54.54	- 56.68	83.69
7528.41	≤ - 103.08	- 64.13	9.0	H	- 52.99	- 55.13	82.14
8364.90	≤ - 106.36	- 70.38	9.3	H	- 58.94	- 61.08	88.09

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 power for the antenna was then determined and the EIRP level was determined by adding the forward power and the antenna gain in dB.

AMPS MODE

Operating Frequency: 848.97 MHz
Channel: 799 (High)
Measured Conducted Power: 27.0 dBm
Modulation: ST (Signaling Tone)
Distance: 3 meters
Limit: 43 + 10 $\log_{10}$ (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	≤ - 73.10	- 45.32	6.6	H	- 36.58	- 38.72	65.72
2546.91	≤ - 84.87	- 55.07	7.8	H	- 45.13	- 47.27	74.27
3395.88	≤ - 91.72	- 65.14	7.75	H	- 55.25	- 57.39	84.39
4244.85	≤ - 104.95	- 75.93	7.6	H	- 66.19	- 68.33	95.33
5093.82	≤ - 103.40	- 77.04	8.5	H	- 66.40	- 68.54	95.54
5942.79	≤ - 105.17	- 74.29	8.8	H	- 63.35	- 65.49	92.49
6791.76	≤ - 105.87	- 66.51	9.6	H	- 54.77	- 56.91	83.91
7640.73	≤ - 104.83	- 66.69	9.0	H	- 55.55	- 57.69	84.69
8489.70	≤ - 103.11	- 67.13	9.3	H	- 55.69	- 57.83	84.83

Radiated Measurements by Substitution Method: construed

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 power for the antenna was then determined and the EIRP level was determined by adding the forward power and the antenna gain in dB.

CDMA MODE

Operating Frequency: 824.70 MHz
Channel: 1013 (Low)
Measured Conducted Power: 24.0 dBm
Modulation: CDMA (Internal)
Distance: 3 meters
Limit: 43 + 10 $\log_{10}$ (W) = 37.48 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	≤ - 76.11	- 48.33	6.6	H	- 39.59	- 41.73	65.86
2474.10	≤ - 84.16	- 54.36	7.8	H	- 44.42	- 46.56	70.69
3298.80	≤ - 96.13	- 69.55	7.75	H	- 59.66	- 61.80	85.93
4123.50	≤ - 102.06	- 73.04	7.6	H	- 63.30	- 65.44	41.31
4948.20	≤ - 106.67	- 80.31	8.5	H	- 69.67	- 71.81	95.94
5772.90	≤ - 105.39	- 74.51	8.8	H	- 63.57	- 65.71	89.84
6597.60	≤ - 103.14	- 63.78	9.6	H	- 52.04	- 54.18	78.31
7422.30	≤ - 104.08	- 65.94	9.0	H	- 54.80	- 56.94	81.07
8247.00	≤ - 103.68	- 67.70	9.3	H	- 56.26	- 58.40	82.53

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 power for the antenna was then determined and the EIRP level was determined by adding the forward power and the antenna gain in dB.

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CDMA MODE

Operating Frequency: 835.89 MHz
Channel: 363 (Mid)
Measured Conducted Power: 24.0 dBm
Modulation: CDMA (Internal)
Distance: 3 meters
Limit: 43 + 10 $\log_{10}$ (W) = 37.48 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	≤ - 74.31	- 46.52	6.6	H	- 37.78	- 39.92	64.39
2507.67	≤ - 79.26	- 49.46	7.8	H	- 39.52	- 41.66	66.13
3343.56	≤ - 95.70	- 69.12	7.75	H	- 59.23	- 61.37	85.84
4179.45	≤ - 102.04	- 73.02	7.6	H	- 63.28	- 65.42	89.89
5015.34	≤ - 106.77	- 80.41	8.5	H	- 69.77	- 71.91	96.38
5851.23	≤ - 103.92	- 73.08	8.8	H	- 62.14	- 64.28	88.75
6687.12	≤ - 106.32	- 66.96	9.6	H	- 55.22	- 57.36	81.83
7523.01	≤ - 100.78	- 62.64	9.0	H	- 51.50	- 53.64	78.11
8358.90	≤ - 104.60	- 68.62	9.3	H	- 57.18	- 59.32	83.79

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 power for the antenna was then determined and the EIRP level was determined by adding the forward power and the antenna gain in dB.

CDMA MODE

Operating Frequency: 848.31 MHz
Channel: 777 (High)
Measured Conducted Power: 24.0 dBm
Modulation: CDMA (Internal)
Distance: 3 meters
Limit: 43 + 10 $\log_{10}$ (W) = 37.48 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
1697.40	≤ - 75.38	- 47.60	6.6	H	- 38.86	- 41.00	65.46
2546.10	≤ - 82.82	- 53.02	7.8	H	- 43.08	- 45.22	69.68
3394.80	≤ - 93.83	- 67.25	7.75	H	- 57.36	- 59.50	83.96
4243.50	≤ - 104.30	- 75.28	7.6	H	- 65.54	- 67.68	92.14
5092.20	≤ - 108.67	- 82.31	8.5	H	- 71.67	- 73.81	98.27
5940.90	≤ - 107.33	- 76.25	8.8	H	- 65.31	- 67.45	91.91
6789.60	≤ - 102.06	- 62.70	9.6	H	- 50.96	- 53.10	77.56
7638.30	≤ - 102.94	- 64.80	9.0	H	- 53.66	- 55.80	80.26
8487.00	≤ - 105.98	- 70.00	9.3	H	- 58.56	- 60.70	85.16

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 power for the antenna was then determined and the EIRP level was determined by adding the forward power and the antenna gain in dB.

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3.7 FREQUENCY STABILITY - § 2.1055

Operating Frequency: 836,490,000 Hz

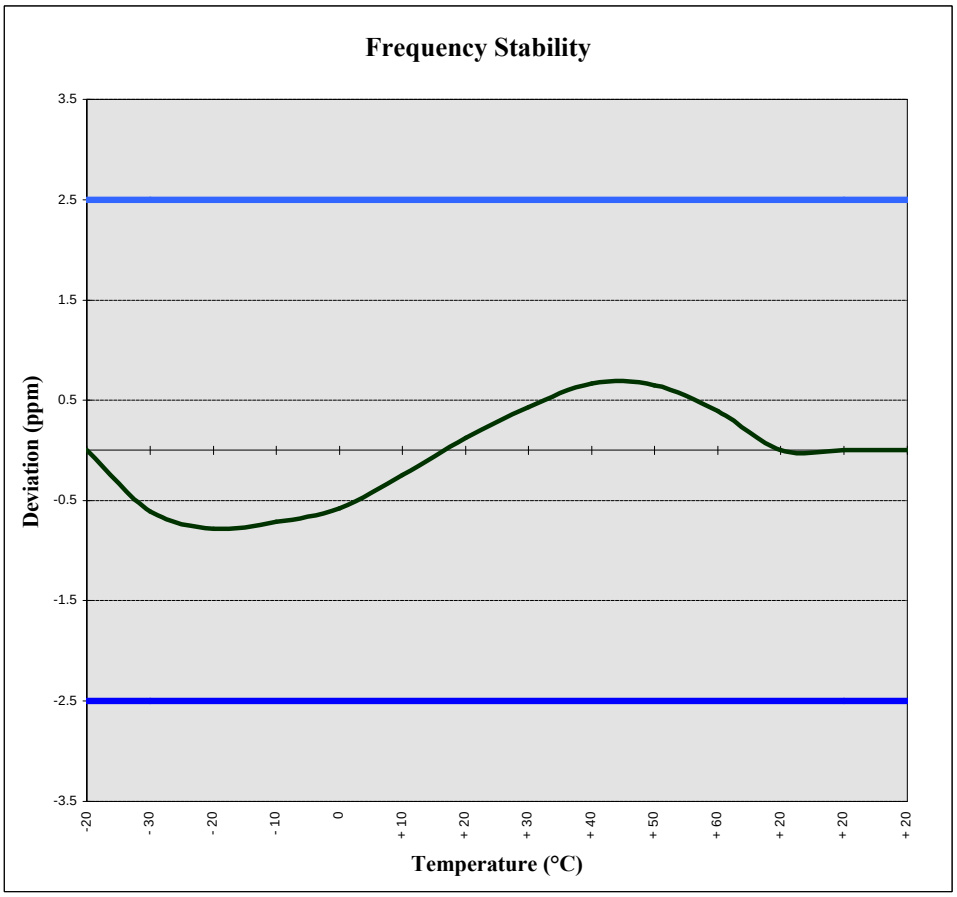
Channel: 383

Reference Voltage: 3.6 VDC

Deviation Limit: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (ºC)	FREQ. (Hz)	Deviation (%)
100 %	3.60	+ 20 (Ref)	836490000	0.00000000
100 %		- 30	836490508	-0.00000061
100 %		- 20	836490653	-0.00000078
100 %		- 10	836490598	-0.00000071
100 %		0	836490482	-0.00000058
100 %		+ 10	836490208	-0.00000025
100 %		+ 20	836489897	0.00000012
100 %		+ 30	836489639	0.00000043
100 %		+ 40	836489443	0.00000067
100 %		+ 50	836489456	0.00000065
100 %		+ 60	836489672	0.00000039
85 %	3.06	+ 20	836490000	0.00000000
115 %	4.14	+ 20	836490000	0.00000000
BATT. ENDPOINT	2.88	+ 20	836490000	0.00000000

FREQUENCY STABILITY - § 2.1055



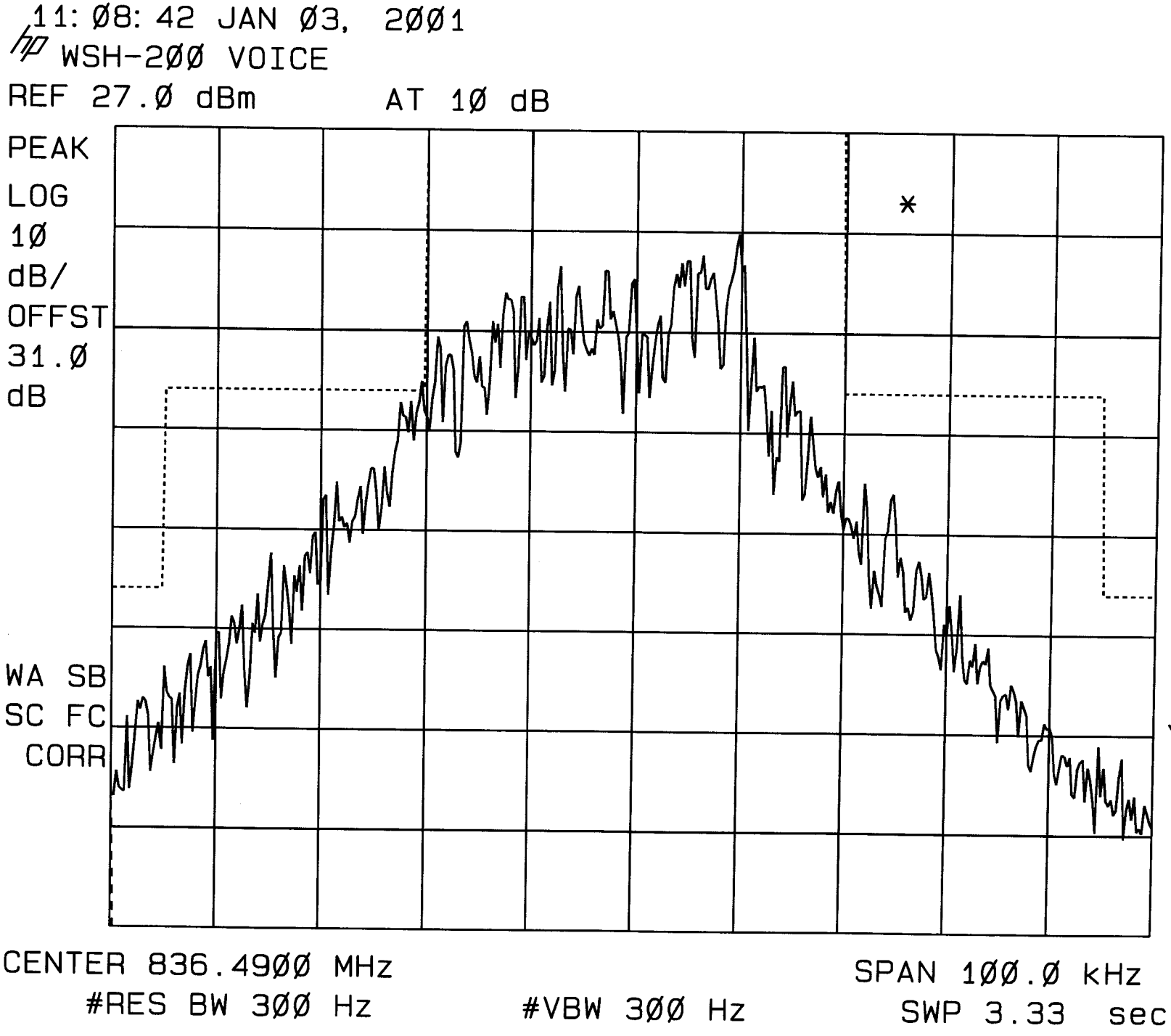
4.1 TEST EQUIPMENT

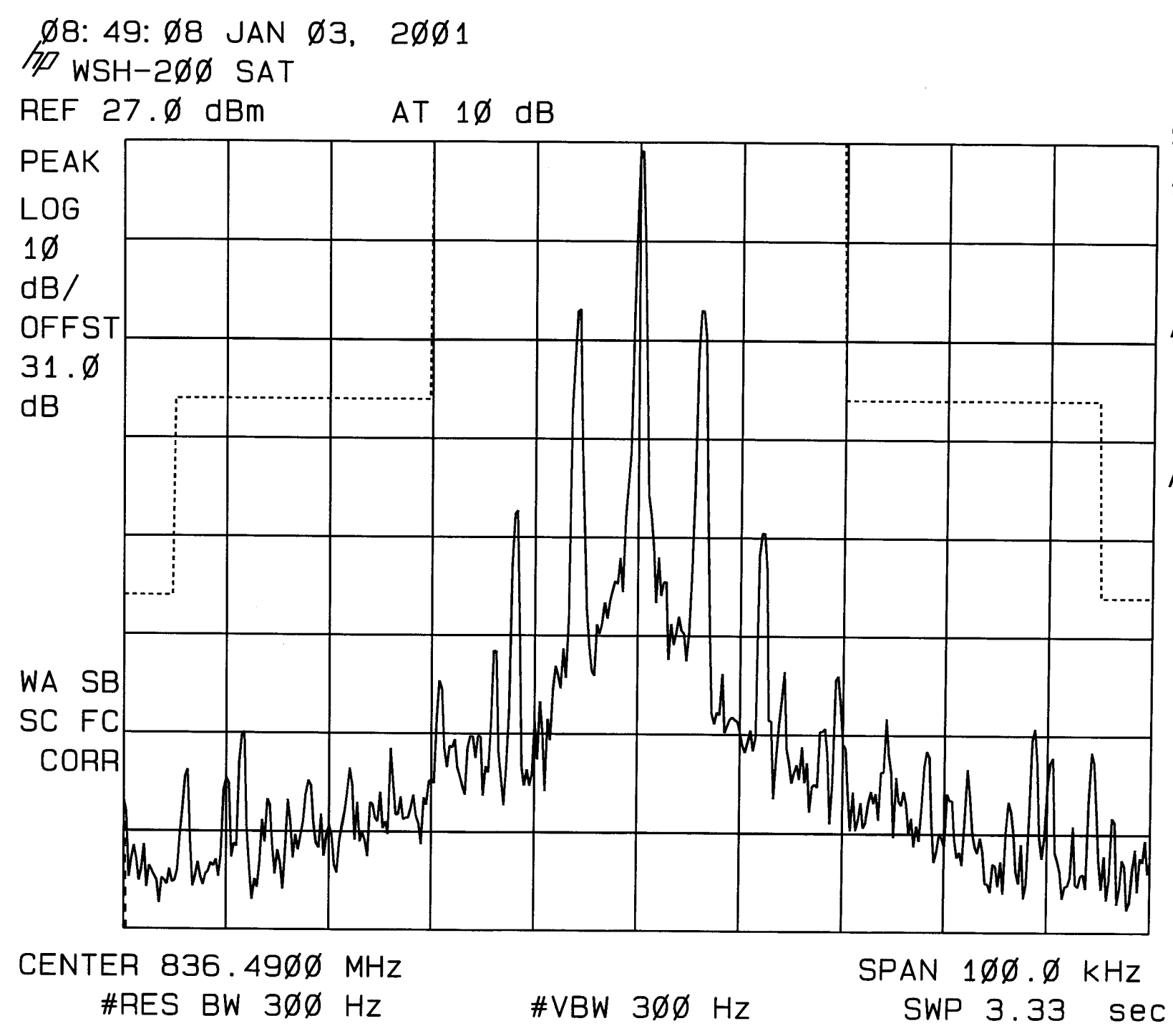
Type	Model	Calib. Date	Serial No.
Signal Generator	HP 8648D (9kHz-4.0GHz)	Nov 1999	3847A00611
Gigatronics Power Meter	8652A	Oct 1999	1835272
Gigatronics Power Sensor (2)	80701A (0.05-18GHz)	Oct 1999	1833535, 1833542
Amplifier Research Power Amp.	5S1G4 (5W, 800MHz-4.2GHz)	N/A	26235
Microwave System Amplifier	HP 83017A (0.5-26.5GHz)	N/A	3123A00587
Network Analyzer	HP 8753E (30kHz-3GHz)	Nov 1999	US38433013
Audio Analyzer	HP 8903B	March 1999	3729A18691
Modulation Analyzer	HP 8901A	March 1999	3749A07154
Frequency Counter	HP 53181A (3GHz)	May 1999	3736A05175
DC Power Supply	HP E3611A	N/A	KR83015294
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. 2000	6267
Double Ridged Horn Antenna	ETS 3115 (1-18GHz)	Oct. 2000	6276
Horn Antenna	Chase BBHA 9120-A (0.7-4.8GHz)	Sept 1998	9120A-239
Horn Antenna	Chase BBHA 9120-A (0.7-4.8GHz)	Sept 1998	9120A-240
Roberts Dipoles	Compliance Design (2 sets) 3121C	June 2000	
Spectrum Analyzer	HP 8594E	March 2000	3543A02721
Spectrum Analyzer	HP E4408B	Nov 1999	US39240170
Shielded Screen Room	Lindgren R.F. 18W-2/2-0	N/A	16297
Environmental Chamber	ESPEC ECT-2 (Temperature/Humidity)	Feb 2000	0510154-B

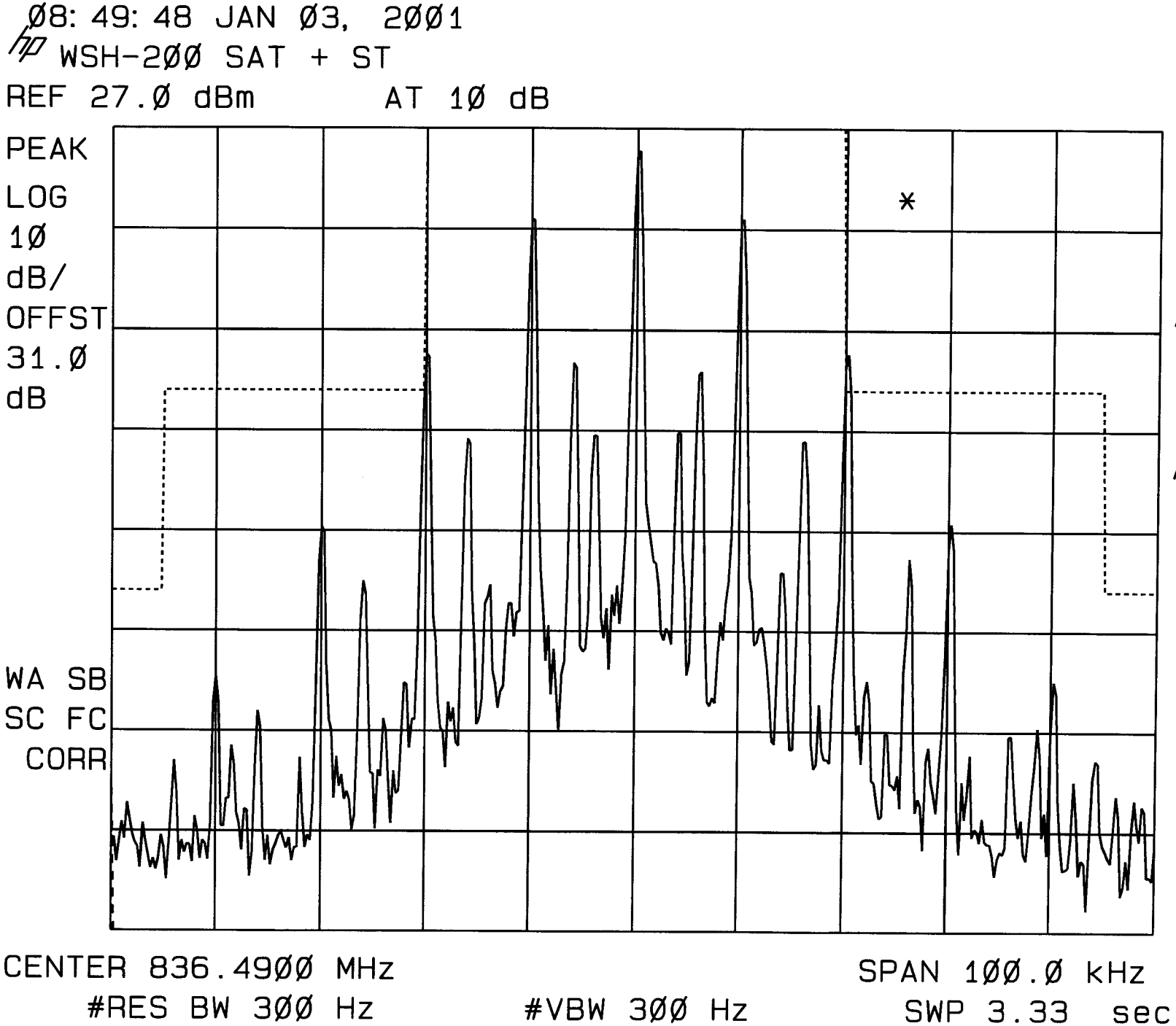
5.1 CONCLUSION

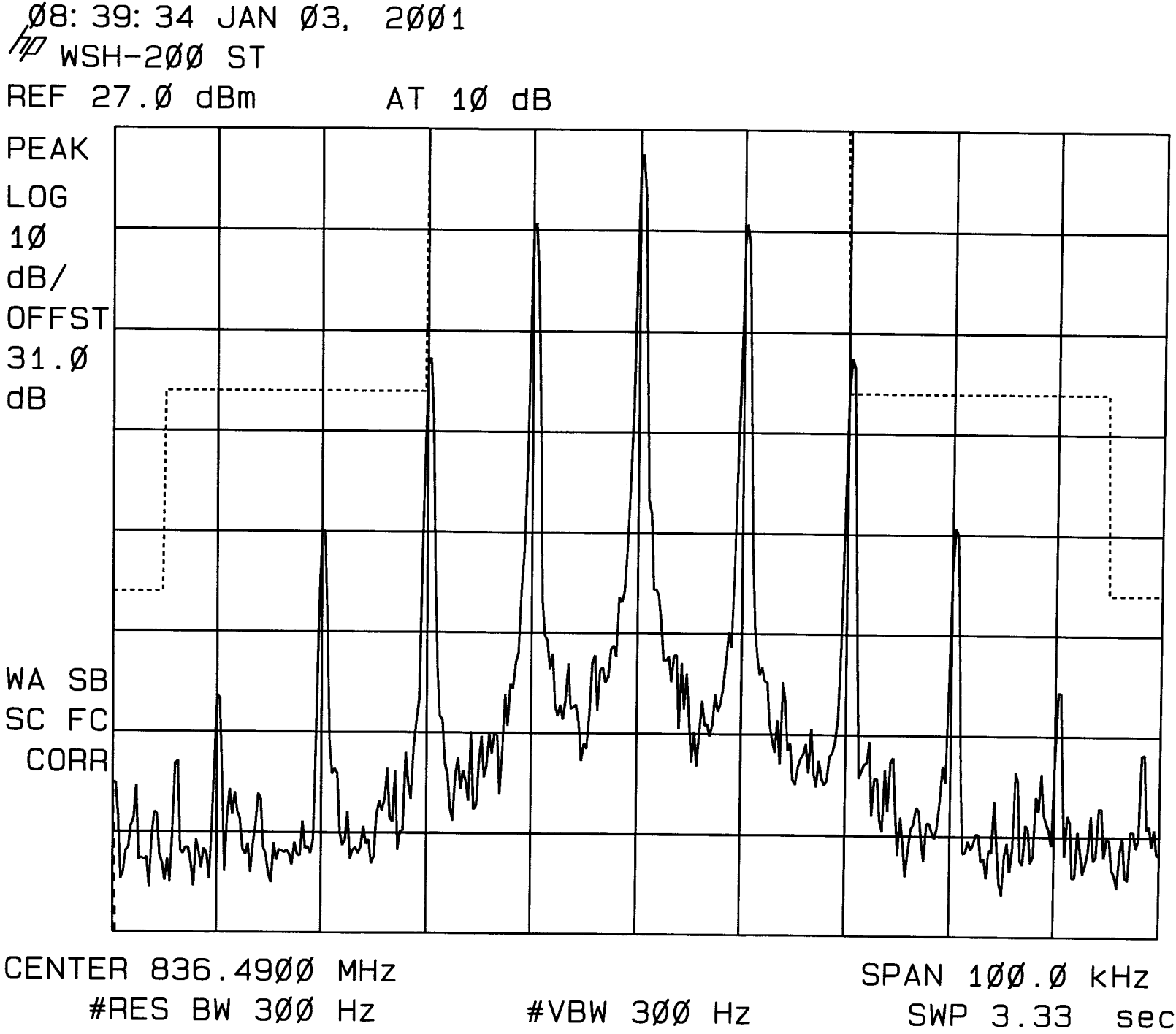
The data collected shows that the WIDE TELECOM INC. Model: WSH-200 Dual-Mode AMPS/CDMA Cellular Phone FCC ID: NPWWSH-200 complies with all the requirements of Parts 2 and 22 of the FCC rules.

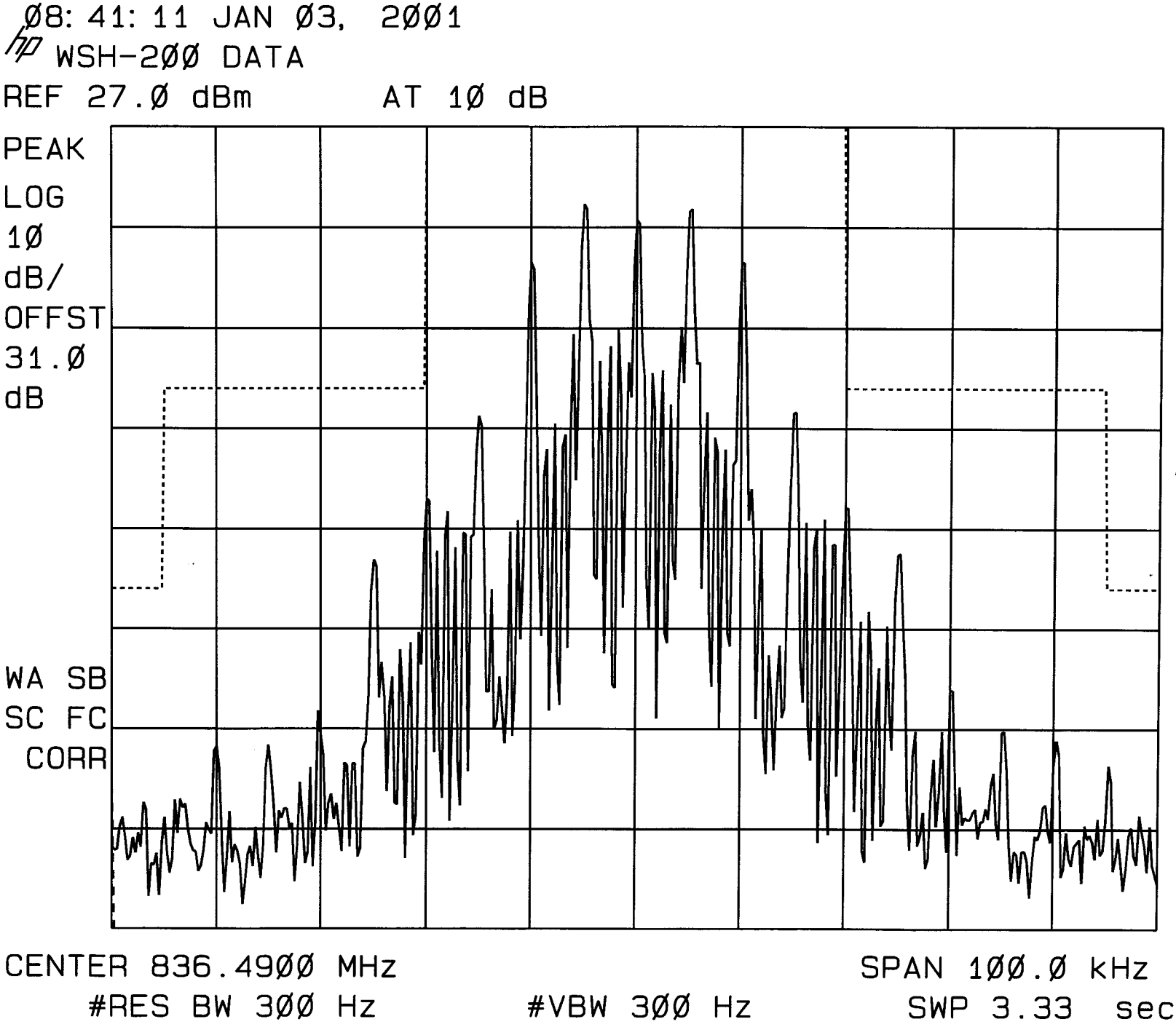
TEST PLOTS

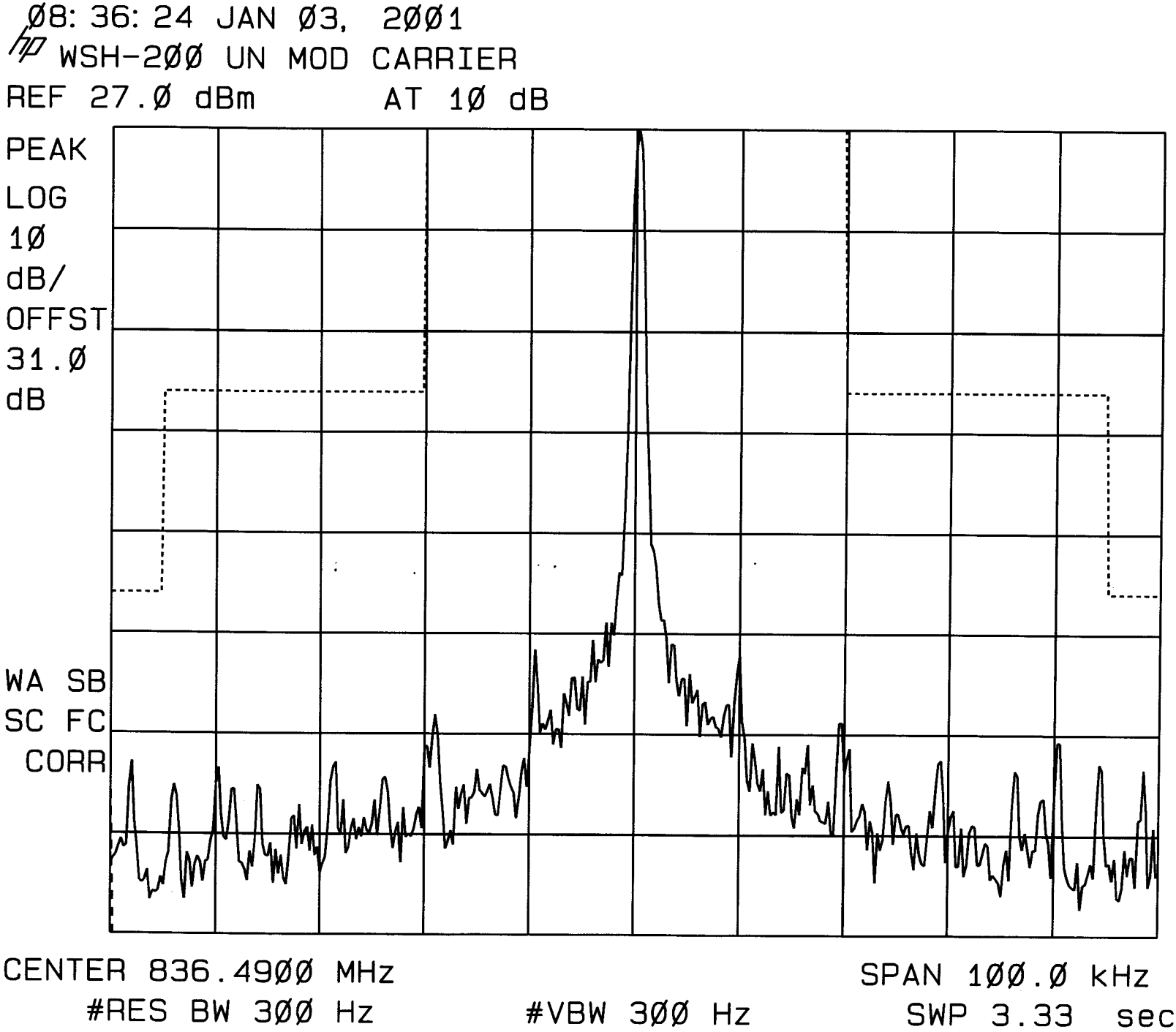

11: Ø8: 42 JAN Ø3, 2ØØ1
WSH-2ØØ VOICE
REF 27.Ø dBm
AT 1Ø dB
PEAK
LOG
1Ø
dB/
OFFST
31.Ø
dB
WA SB
SC FC
CORR
CENTER 836.49ØØ MHz
#RES BW 3ØØ Hz
#VBW 3ØØ Hz
SPAN 1ØØ.Ø kHz
SWP 3.33 sec

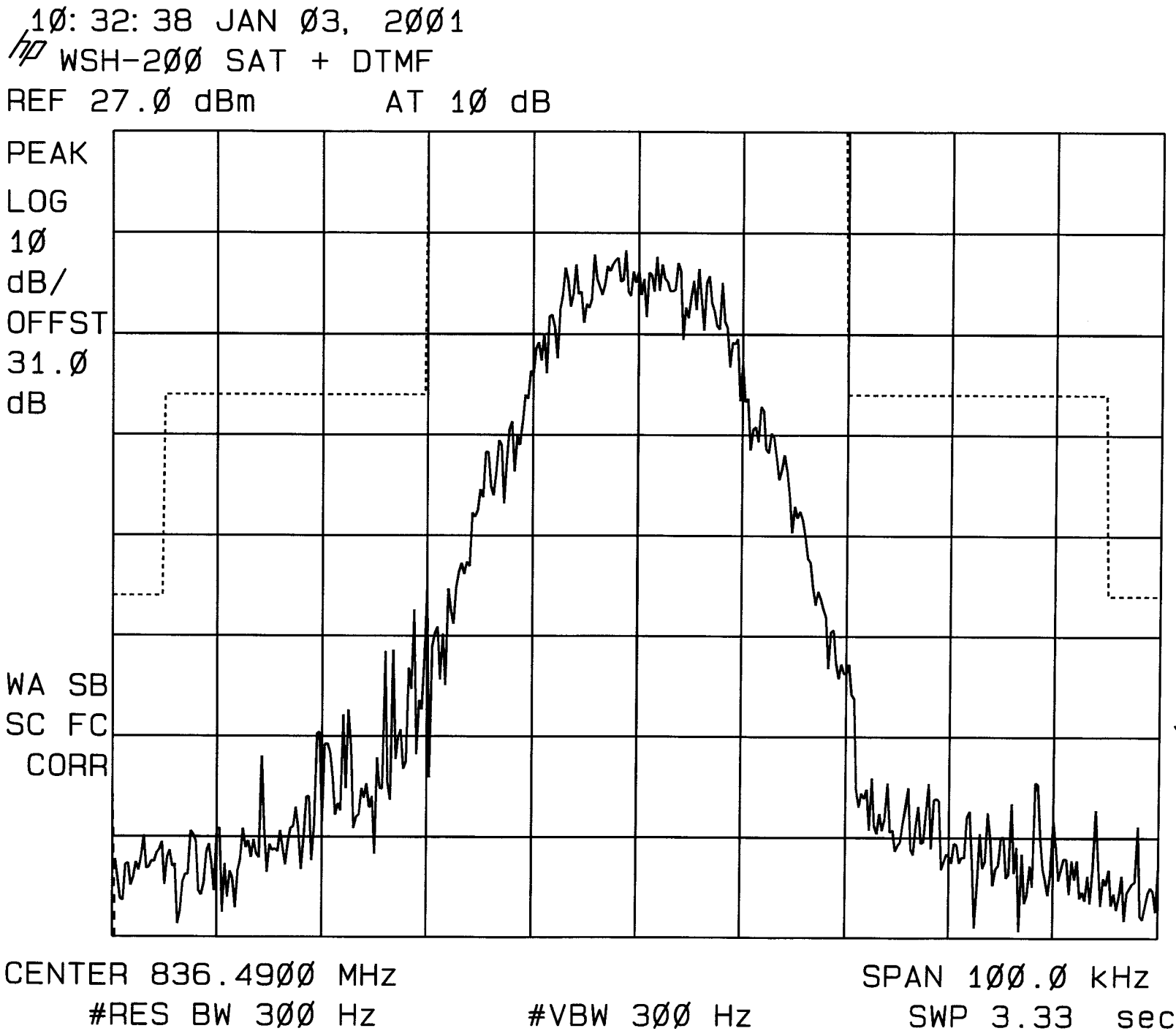

Ø8: 49: Ø8 JAN Ø3, 2ØØ1
WSH-2ØØ SAT
REF 27.Ø dBm
AT 1Ø dB
PEAK
LOG
1Ø
dB/
OFFST
31.Ø
dB
WA SB
SC FC
CORR
CENTER 836.49ØØ MHz
#RES BW 3ØØ Hz
#VBW 3ØØ Hz
SPAN 1ØØ.Ø kHz
SWP 3.33 sec


08: 49: 48 JAN 03, 2001
WSH-200 SAT + ST
REF 27.0 dBm
AT 10 dB
PEAK
LOG
10
dB/
OFFST
31.0
dB
WA SB
SC FC
CORR
CENTER 836.4900 MHz
#RES BW 300 Hz
#VBW 300 Hz
SPAN 100.0 kHz
SWP 3.33 sec


08: 39: 34 JAN 03, 2001
WSH-200 ST
REF 27.0 dBm
AT 10 dB
PEAK
LOG
10
dB/
OFFST
31.0
dB
WA SB
SC FC
CORR
CENTER 836.4900 MHz
#RES BW 300 Hz
#VBW 300 Hz
SPAN 100.0 kHz
SWP 3.33 sec


08: 41: 11 JAN 03, 2001
WSH-200 DATA
REF 27.0 dBm
AT 10 dB
PEAK
LOG
10
dB/
OFFST
31.0
dB
WA SB
SC FC
CORR
CENTER 836.4900 MHz
SPAN 100.0 kHz
#RES BW 300 Hz
#VBW 300 Hz
SWP 3.33 sec


08: 36: 24 JAN 03, 2001
WSH-200 UN MOD CARRIER
REF 27.0 dBm
AT 10 dB
PEAK
LOG
10
dB/
OFFST
31.0
dB
WA SB
SC FC
CORR
CENTER 836.4900 MHz
SPAN 100.0 kHz
#RES BW 300 Hz
#VBW 300 Hz
SWP 3.33 sec


10: 32: 38 JAN 03, 2001
WSH-200 SAT + DTMF
REF 27.0 dBm
AT 10 dB
PEAK
LOG
10
dB/
OFFST
31.0
dB
WA SB
SC FC
CORR
CENTER 836.4900 MHz
SPAN 100.0 kHz
#RES BW 300 Hz
#VBW 300 Hz
SWP 3.33 sec

11: Ø5: 35 JAN Ø3, 2ØØ1

WSH-2ØØ DTMF

REF 27.Ø dBm AT 1Ø dB

PEAK

LOG

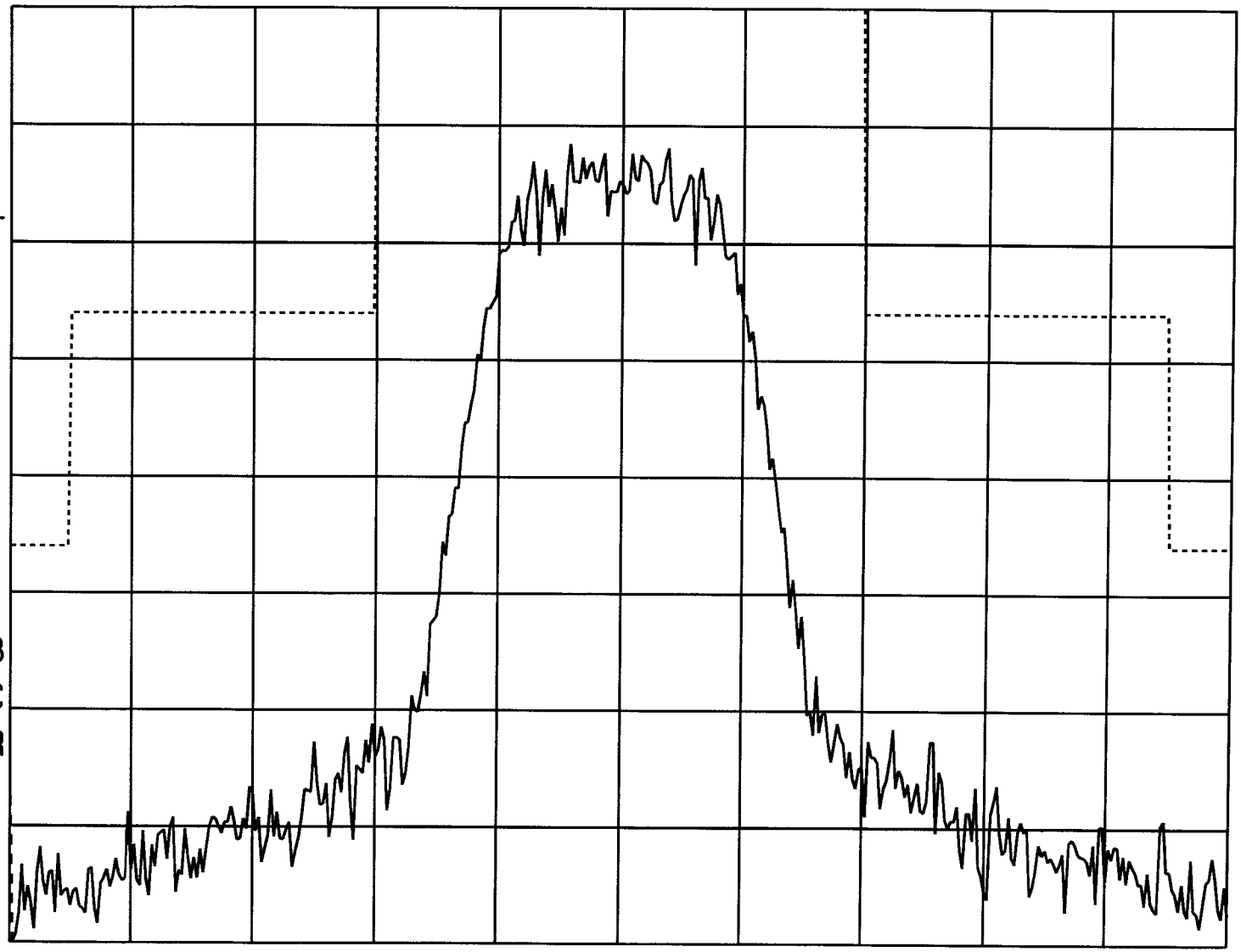
1Ø

dB/

OFFST

31.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

15:02:19 Dec 21, 2000

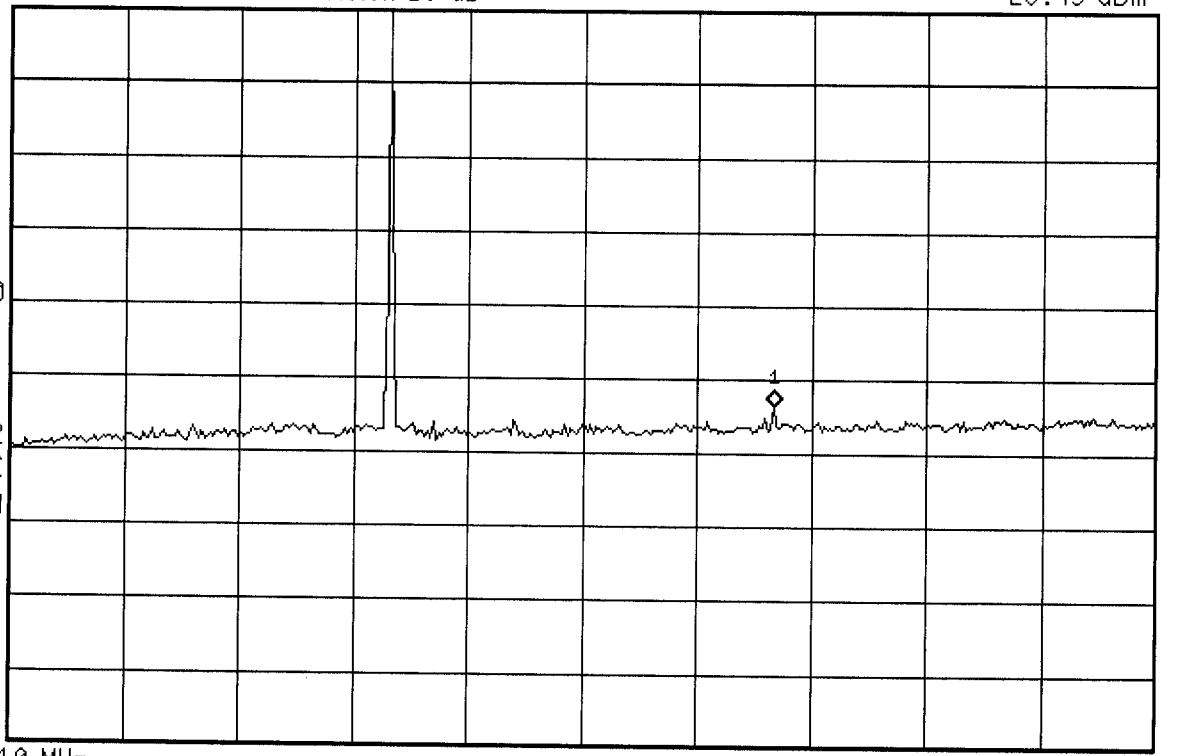
WSH-200 COND SPURS CH 991

Mkr1 1.672 GHz

Ref 27 dBm

Atten 10 dB

-26.43 dBm



Peak
Log
10
dB/
Offst
31
dB

DI
-13.0
dBm

M1 S2
S3 FC
AA

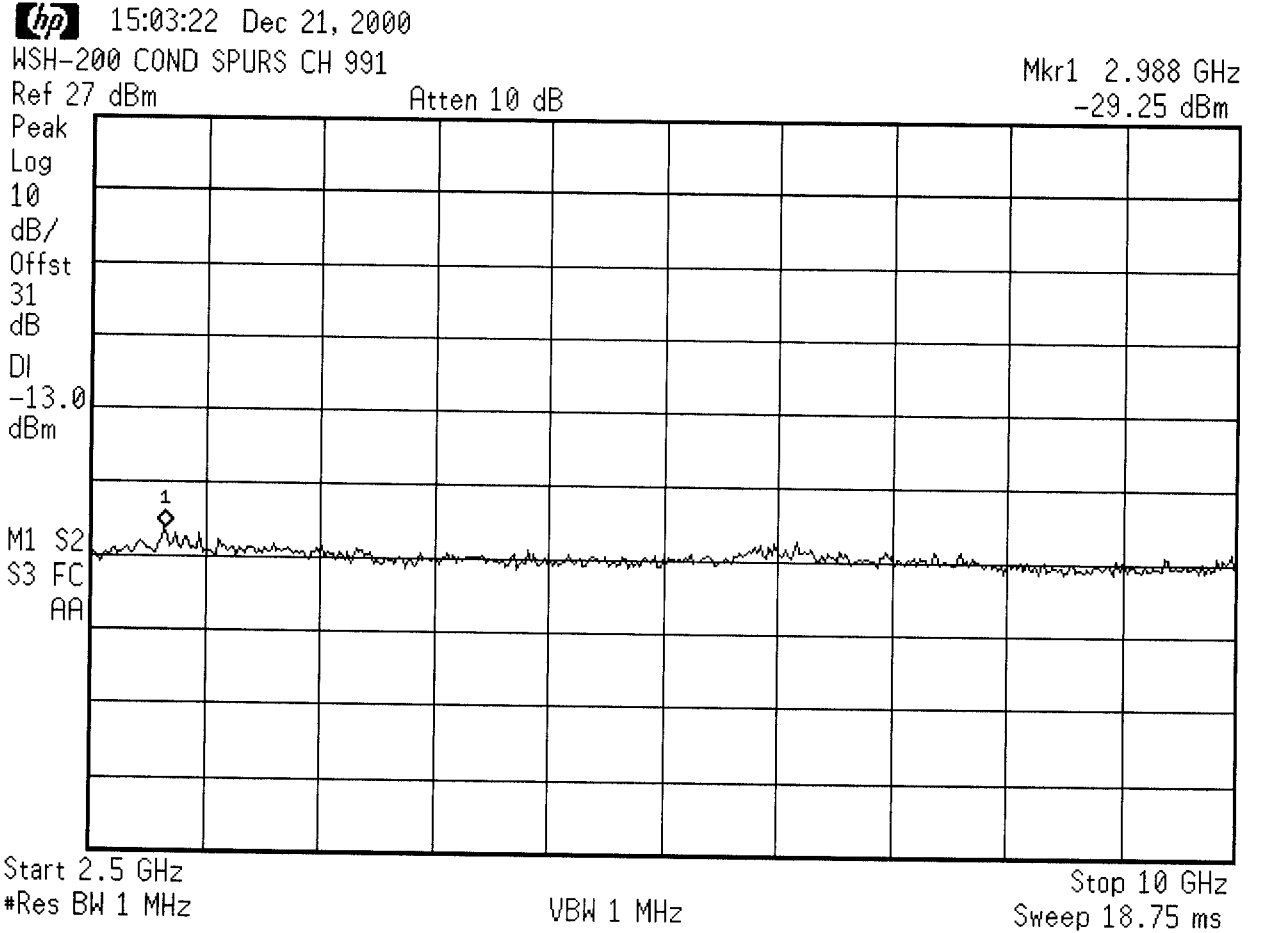
Start 10 MHz

#Res BW 1 MHz

VBW 1 MHz

Stop 2.5 GHz

Sweep 6.225 ms


15:03:22 Dec 21, 2000
WSH-200 COND SPURS CH 991
Ref 27 dBm
Atten 10 dB
Mkr1 2.988 GHz
-29.25 dBm
Peak
Log
10
dB/
Offst
31
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 18.75 ms

15:08:22 Dec 21, 2000

WSH-200 COND SPURS CH 991

Mkr1 13.23 GHz

Ref 27 dBm

Atten 10 dB

-28.76 dBm

Peak

Log

10

dB/

Offst

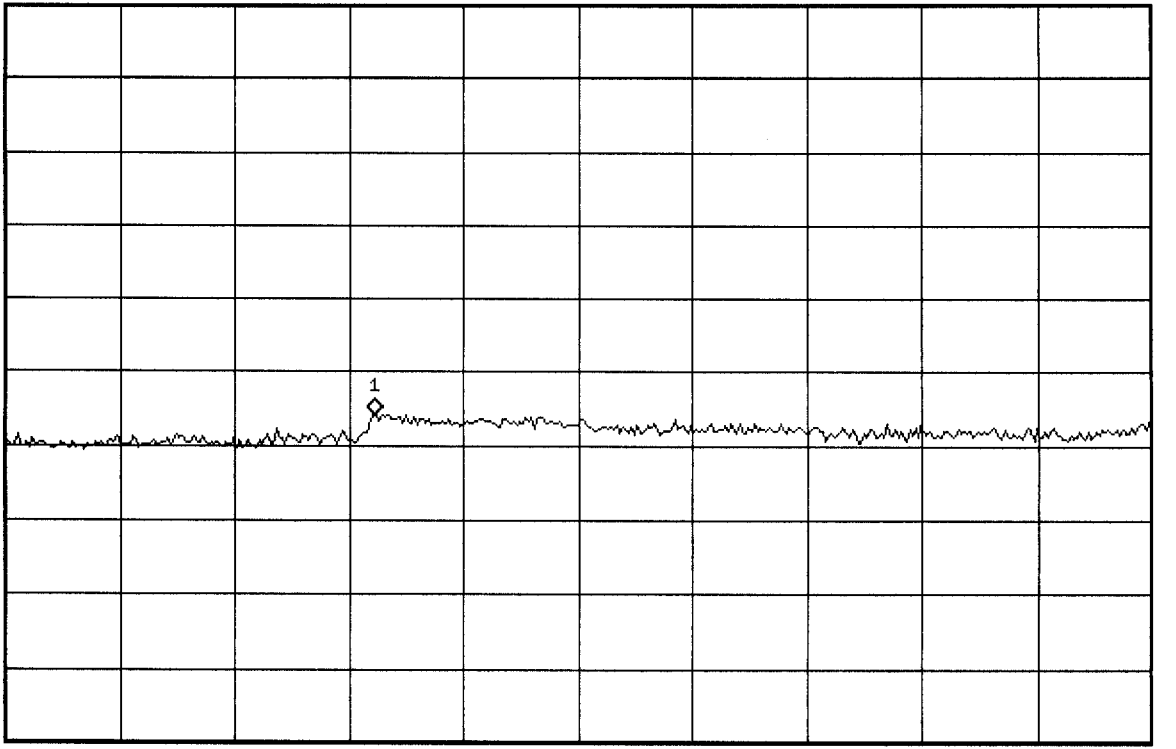
31

dB

DI

-13.0

dBm



M1 S2

S3 FC

AA

Start 10 GHz

Stop 20 GHz

#Res BW 1 MHz

VBW 1 MHz

Sweep 100 ms

15:06:10 Dec 21, 2000

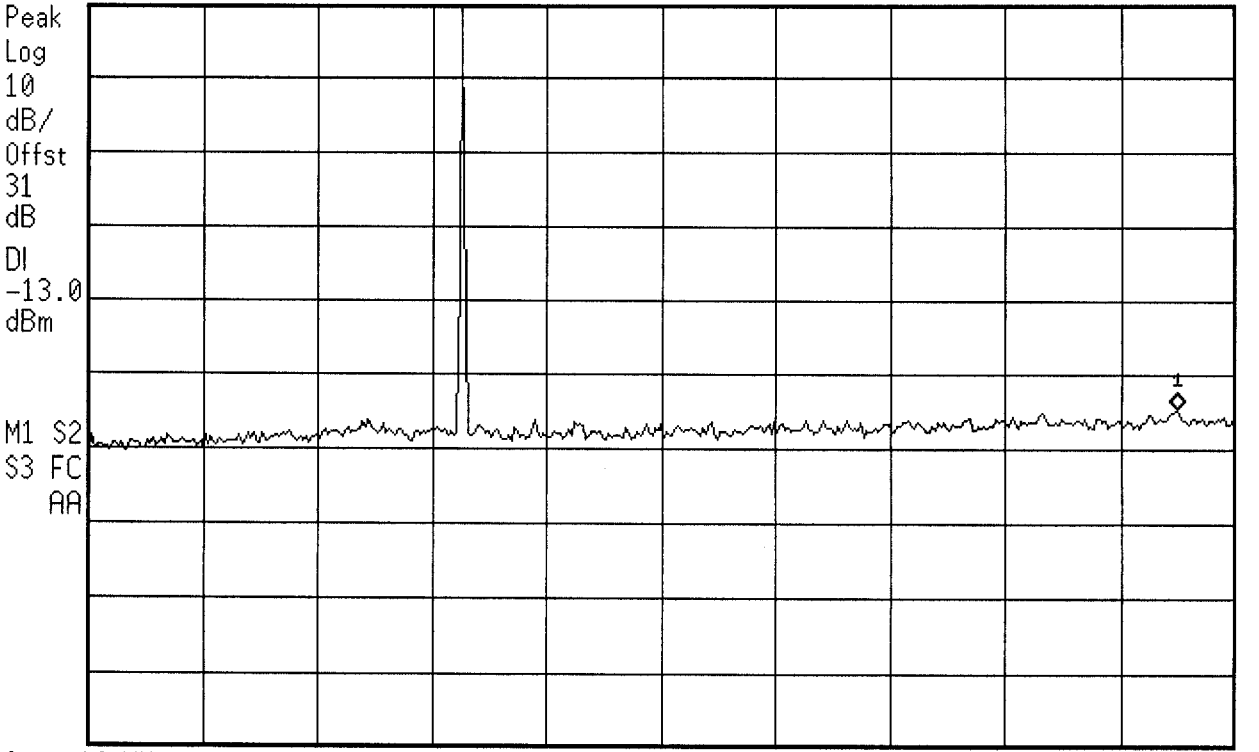
WSH-200 COND SPURS CH 383

Mkr1 2.376 GHz

Ref 27 dBm

Atten 10 dB

-27.54 dBm



Start 10 MHz

Stop 2.5 GHz

#Res BW 1 MHz

VBW 1 MHz

Sweep 6.225 ms

15:06:51 Dec 21, 2000

WSH-200 COND SPURS CH 383

Mkr1 2.988 GHz

Ref 27 dBm

Atten 10 dB

-29.92 dBm

Peak

Log

10

dB/

Offst

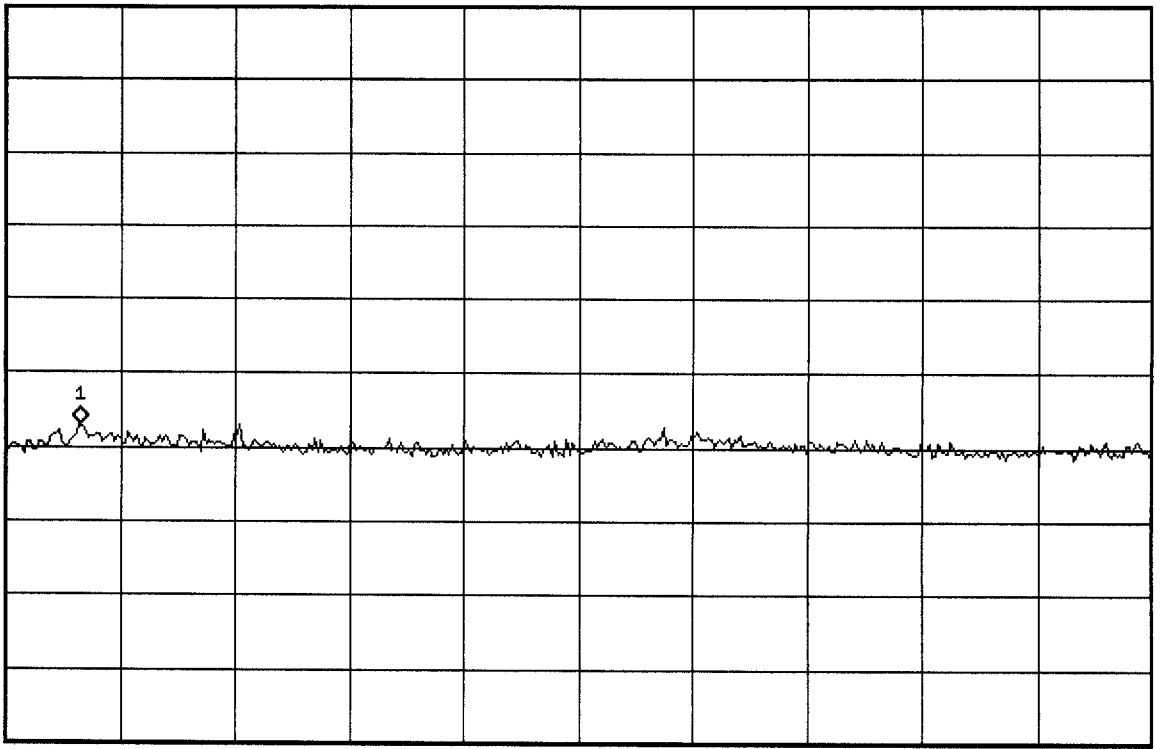
31

dB

Dl

-13.0

dBm



M1 S2

S3 FC

AA

Start 2.5 GHz

Stop 10 GHz

#Res BW 1 MHz

VBW 1 MHz

Sweep 18.75 ms

15:07:12 Dec 21, 2000

WSH-200 COND SPURS CH 383

Mkr1 13.33 GHz

Ref 27 dBm

Atten 10 dB

-28 dBm

Peak

Log

10

dB/

Offst

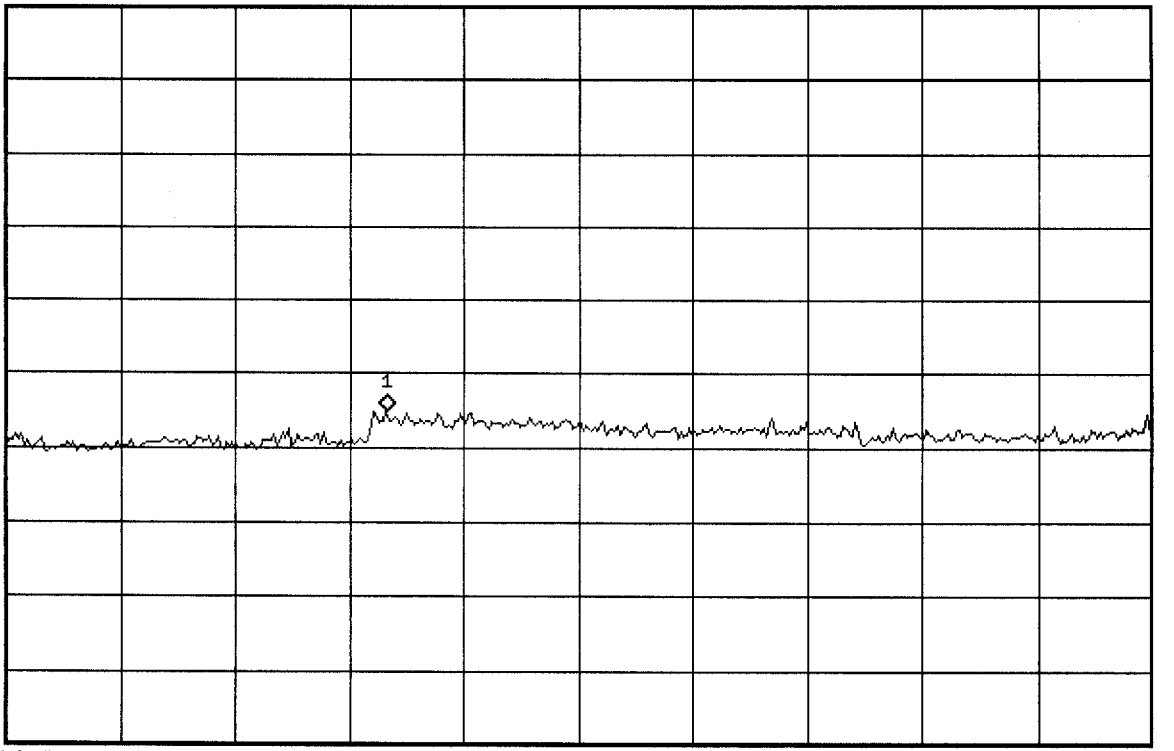
31

dB

Dl

-13.0

dBm



M1 S2

S3 FC

AA

Start 10 GHz

Stop 20 GHz

#Res BW 1 MHz

VBW 1 MHz

Sweep 100 ms

15:09:59 Dec 21, 2000

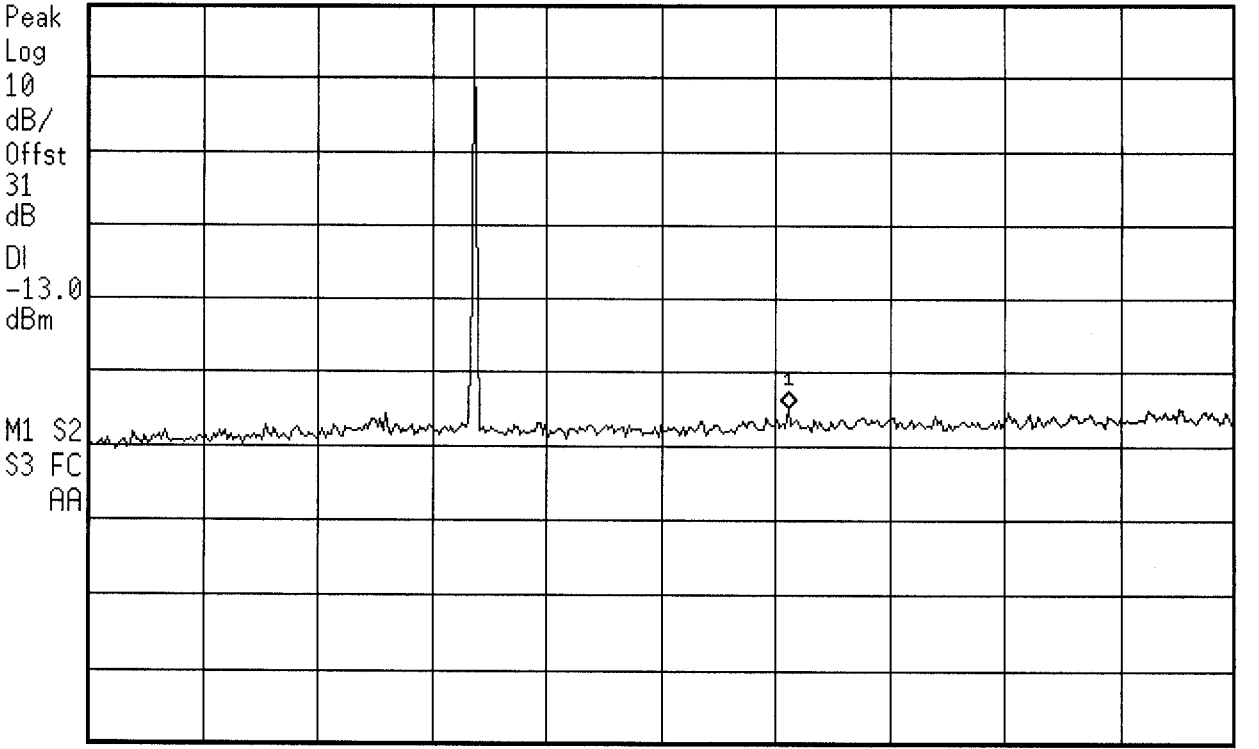
WSH-200 COND SPURS CH 799

Mkr1 1.535 GHz

Ref 27 dBm

Atten 10 dB

-27.94 dBm



Start 10 MHz

Stop 2.5 GHz

#Res BW 1 MHz

VBW 1 MHz

Sweep 6.225 ms

15:10:18 Dec 21, 2000

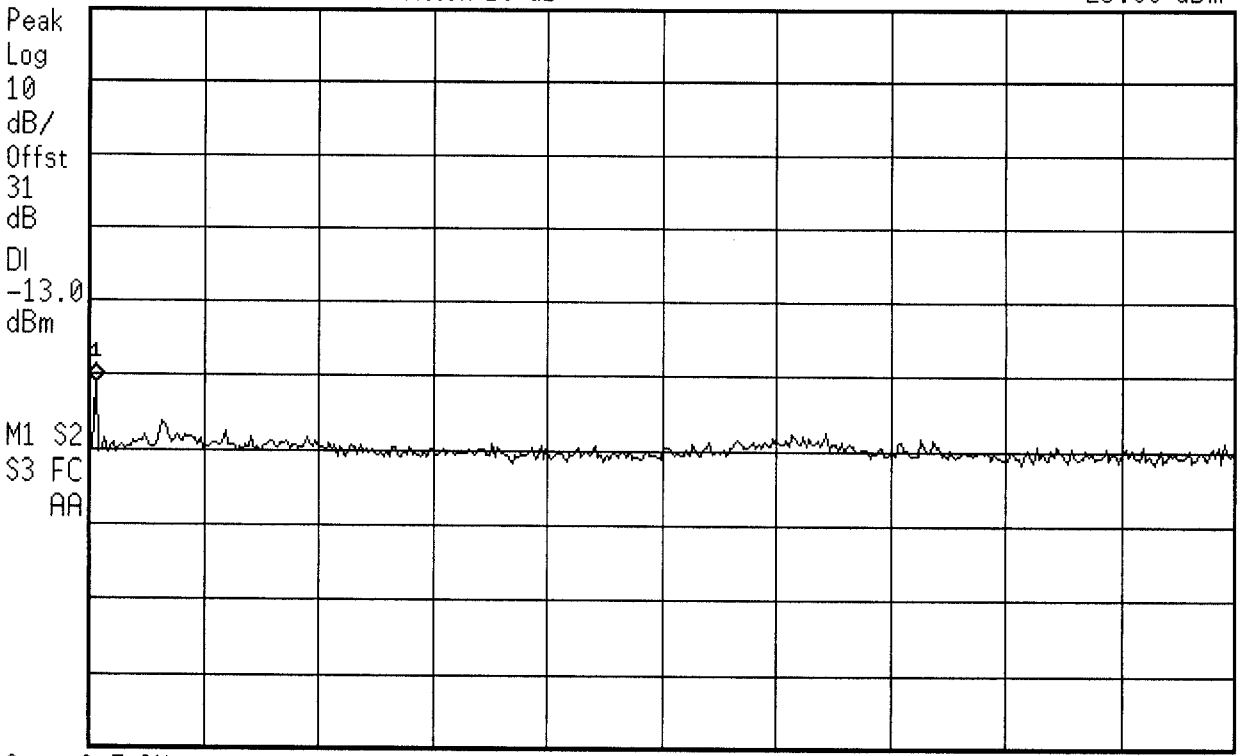
WSH-200 COND SPURS CH 799

Mkr1 2.556 GHz

Ref 27 dBm

Atten 10 dB

-23.99 dBm



Start 2.5 GHz

Stop 10 GHz

#Res BW 1 MHz

VBW 1 MHz

Sweep 18.75 ms

15:10:49 Dec 21, 2000

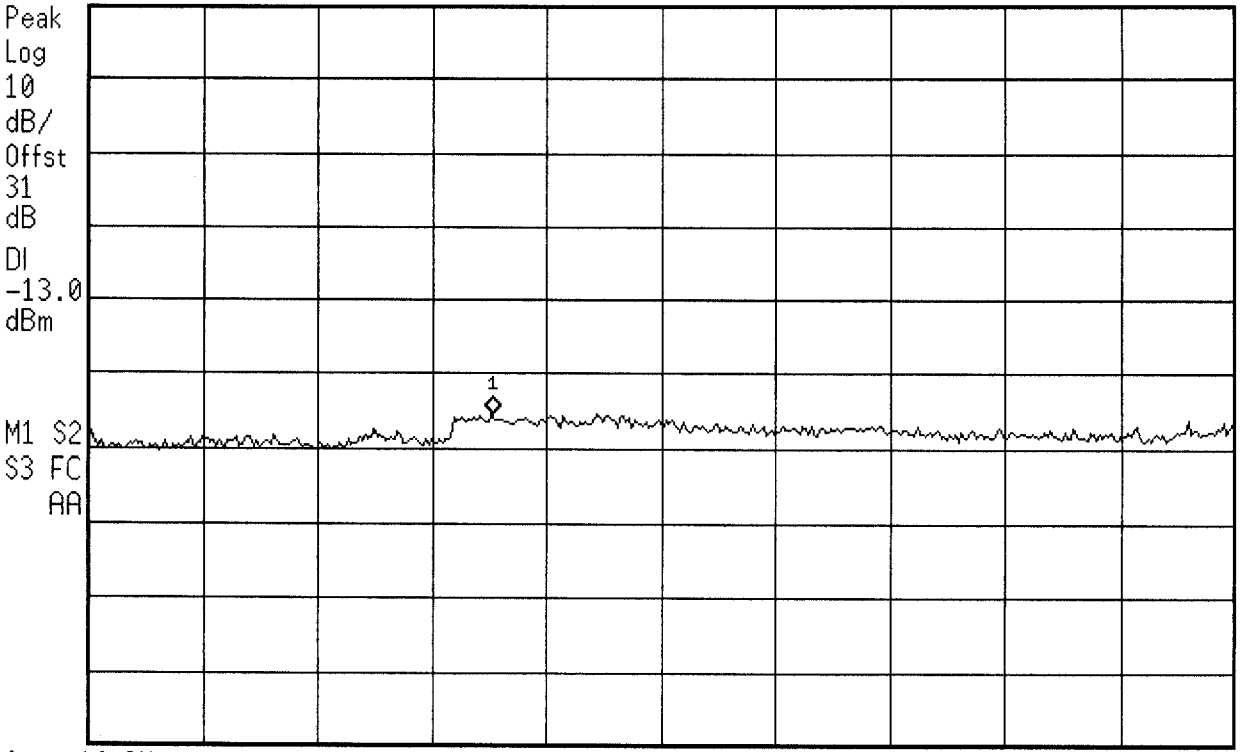
WSH-200 COND SPURS CH 799

Mkr1 13.53 GHz

Ref 27 dBm

Atten 10 dB

-28.44 dBm



Start 10 GHz

Stop 20 GHz

#Res BW 1 MHz

VBW 1 MHz

Sweep 100 ms

15:16:01 Dec 21, 2000

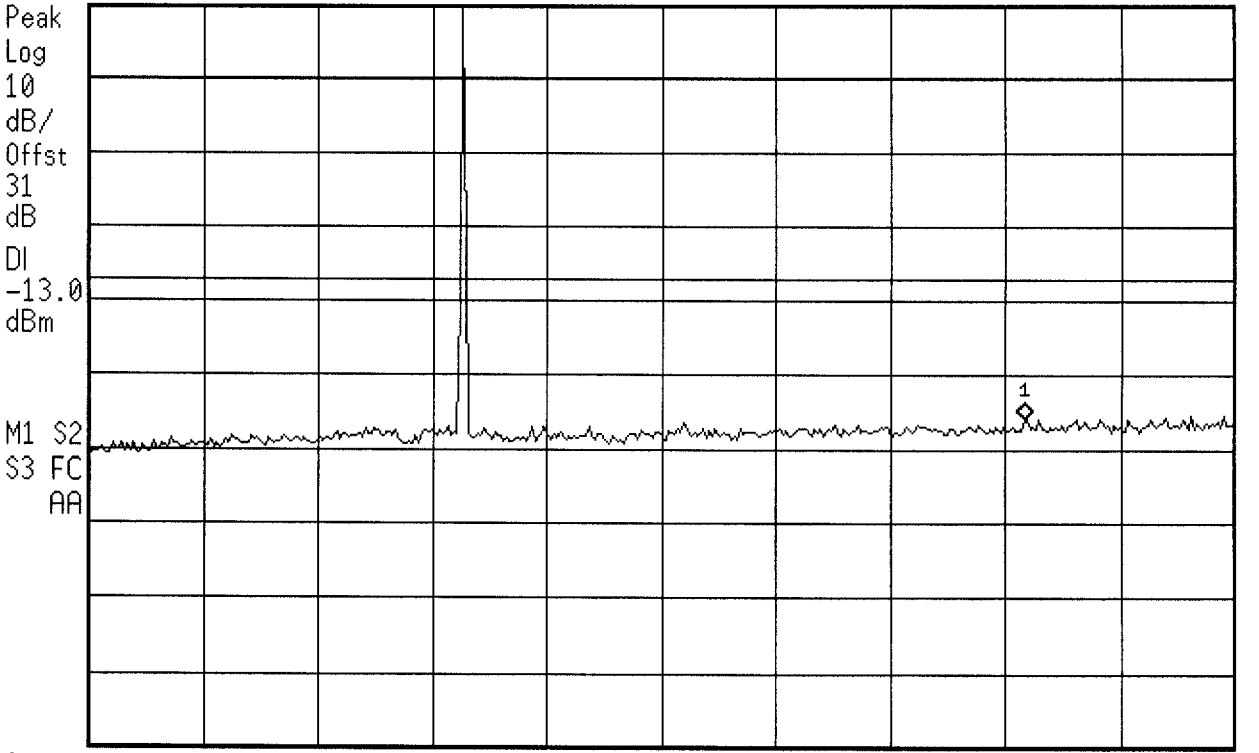
WSH-200 COND SPURS CH 1013

Mkr1 2.046 GHz

Ref 24 dBm

Atten 5 dB

-31.88 dBm



Start 10 MHz

Stop 2.5 GHz

#Res BW 1 MHz

VBW 1 MHz

Sweep 6.225 ms

15:16:21 Dec 21, 2000

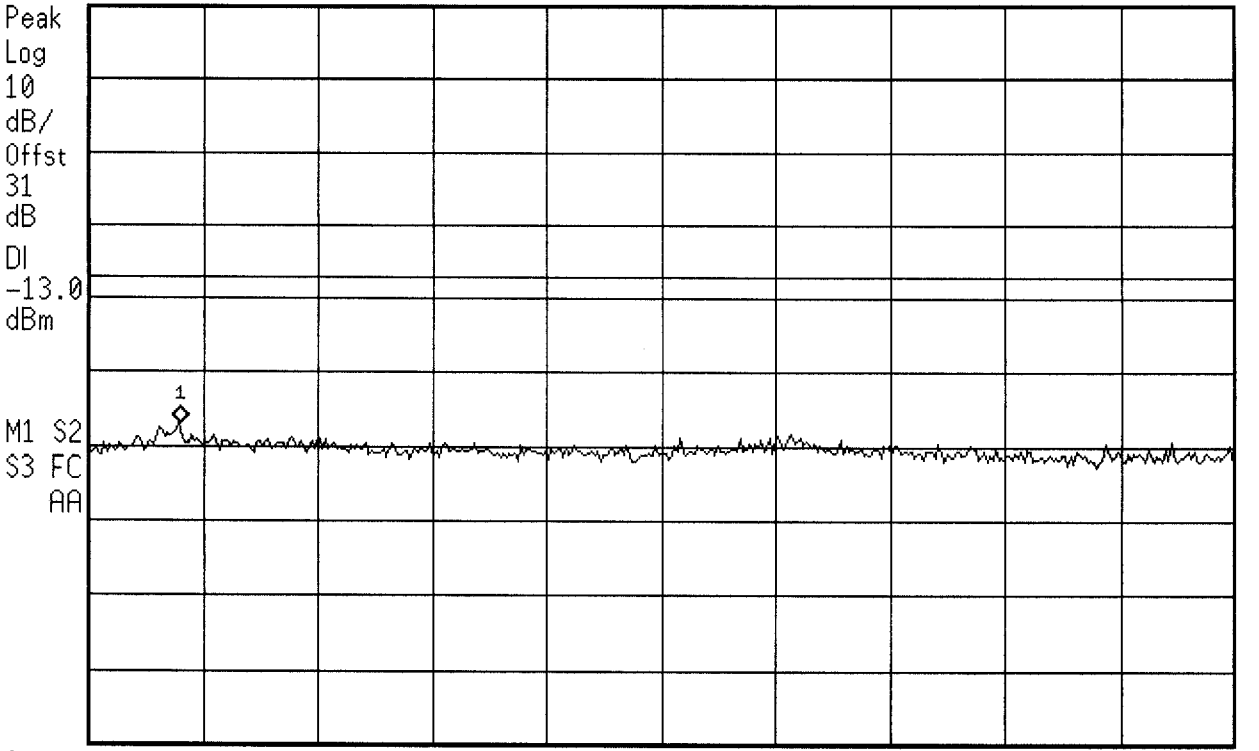
WSH-200 COND SPURS CH 1013

Mkr1 3.100 GHz

Ref 24 dBm

Atten 5 dB

-32.86 dBm



Start 2.5 GHz

Stop 10 GHz

#Res BW 1 MHz

VBW 1 MHz

Sweep 18.75 ms

15:16:42 Dec 21, 2000

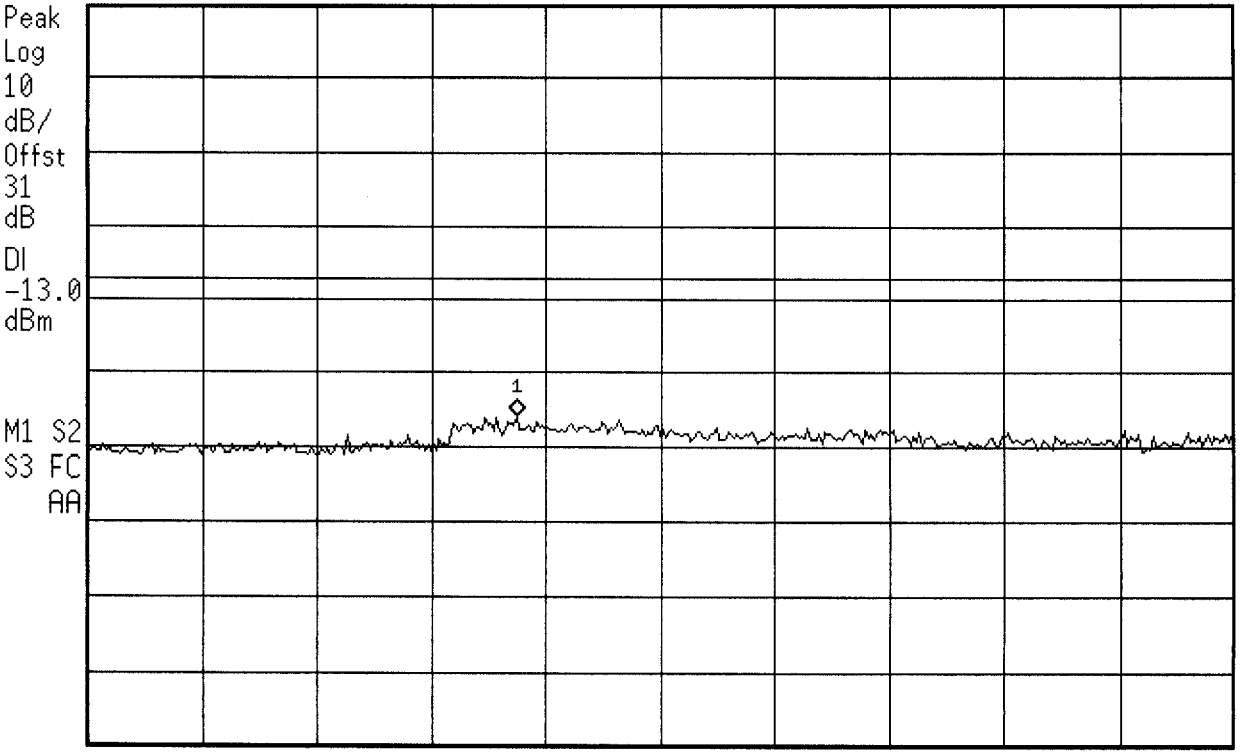
WSH-200 COND SPURS CH 1013

Mkr1 13.75 GHz

Ref 24 dBm

Atten 5 dB

-31.84 dBm



Start 10 GHz

Stop 20 GHz

#Res BW 1 MHz

VBW 1 MHz

Sweep 100 ms

15:17:36 Dec 21, 2000

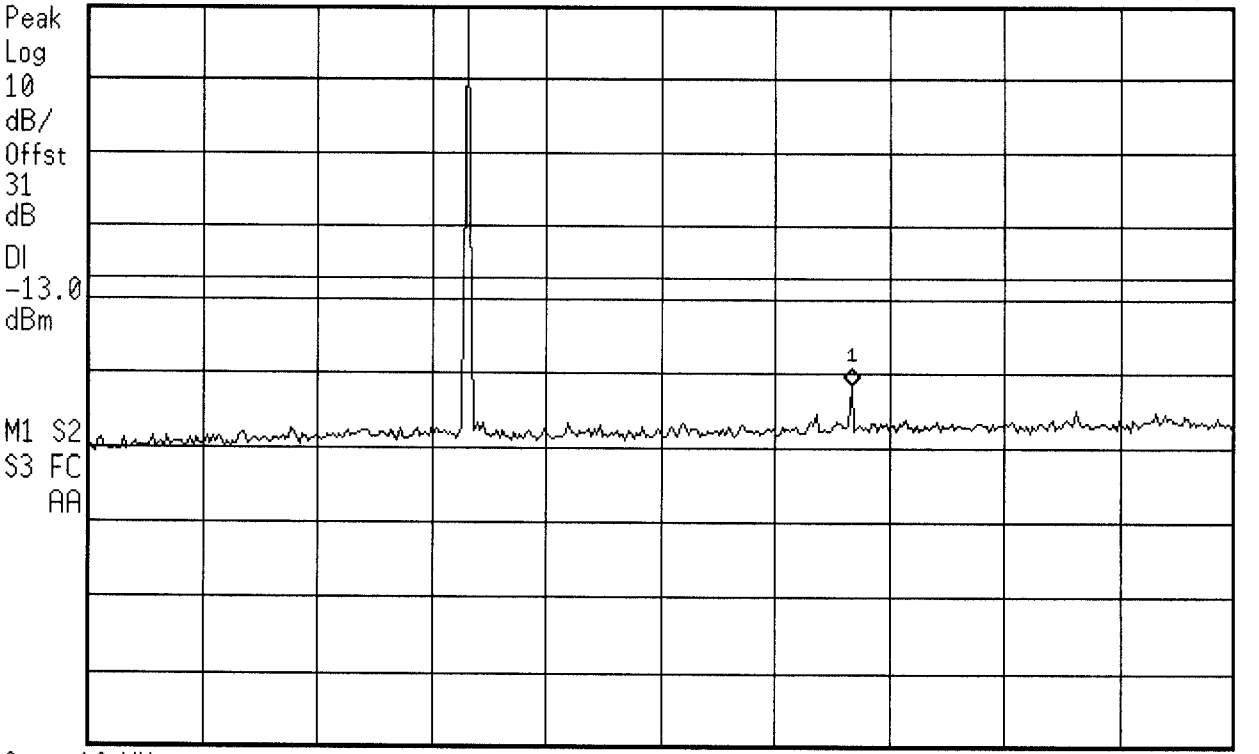
WSH-200 COND SPURS CH 363

Mkr1 1.672 GHz

Ref 24 dBm

Atten 5 dB

-27.42 dBm



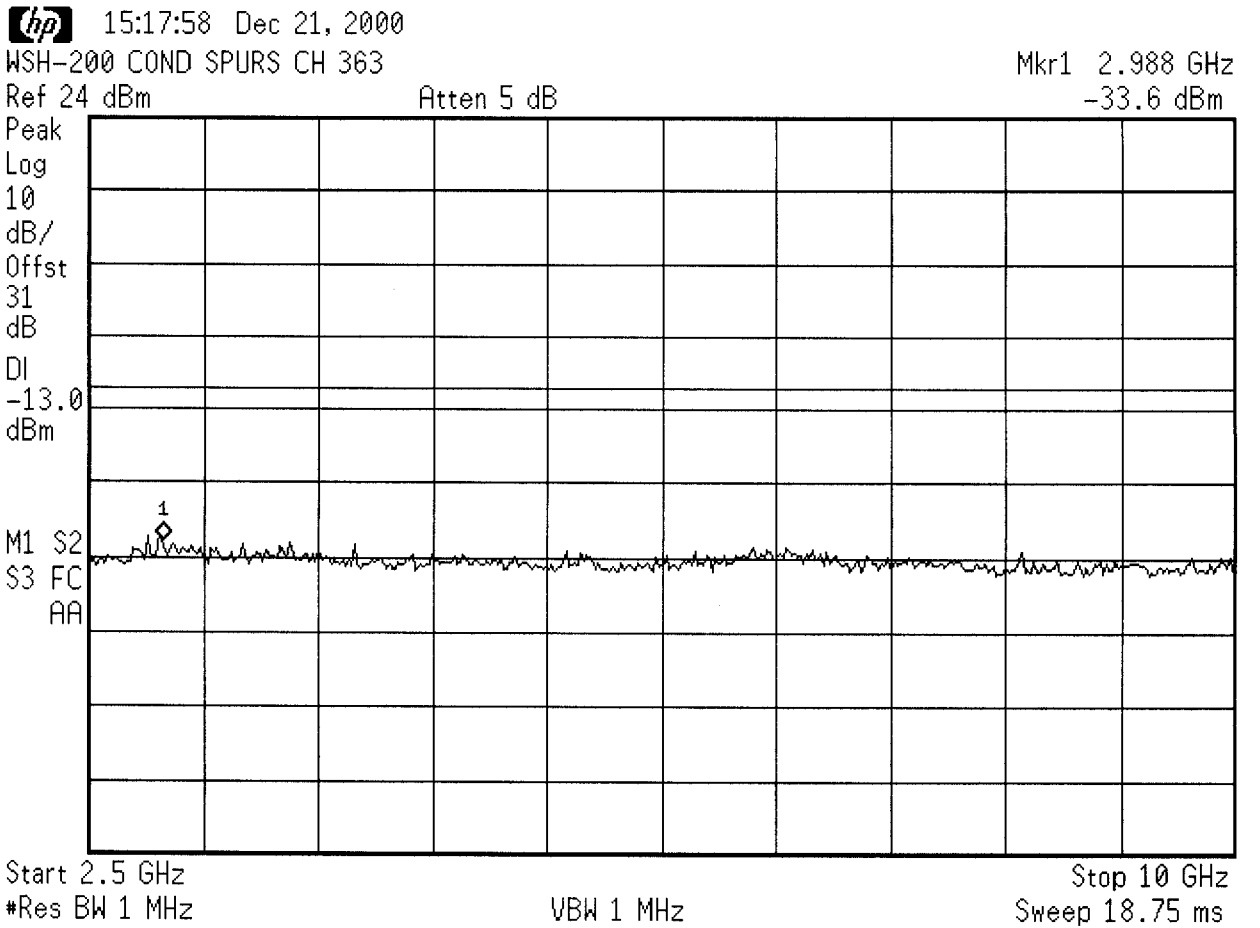
Start 10 MHz

Stop 2.5 GHz

#Res BW 1 MHz

VBW 1 MHz

Sweep 6.225 ms


15:17:58 Dec 21, 2000
WSH-200 COND SPURS CH 363
Mkr1 2.988 GHz
Ref 24 dBm
Atten 5 dB
-33.6 dBm
Peak
Log
10
dB/
Offst
31
dB
Dl
-13.0
dBm
1
M1 S2
S3 FC
AA
Start 2.5 GHz
Stop 10 GHz
#Res BW 1 MHz
VBW 1 MHz
Sweep 18.75 ms

15:18:22 Dec 21, 2000

WSH-200 COND SPURS CH 363

Mkr1 14.65 GHz

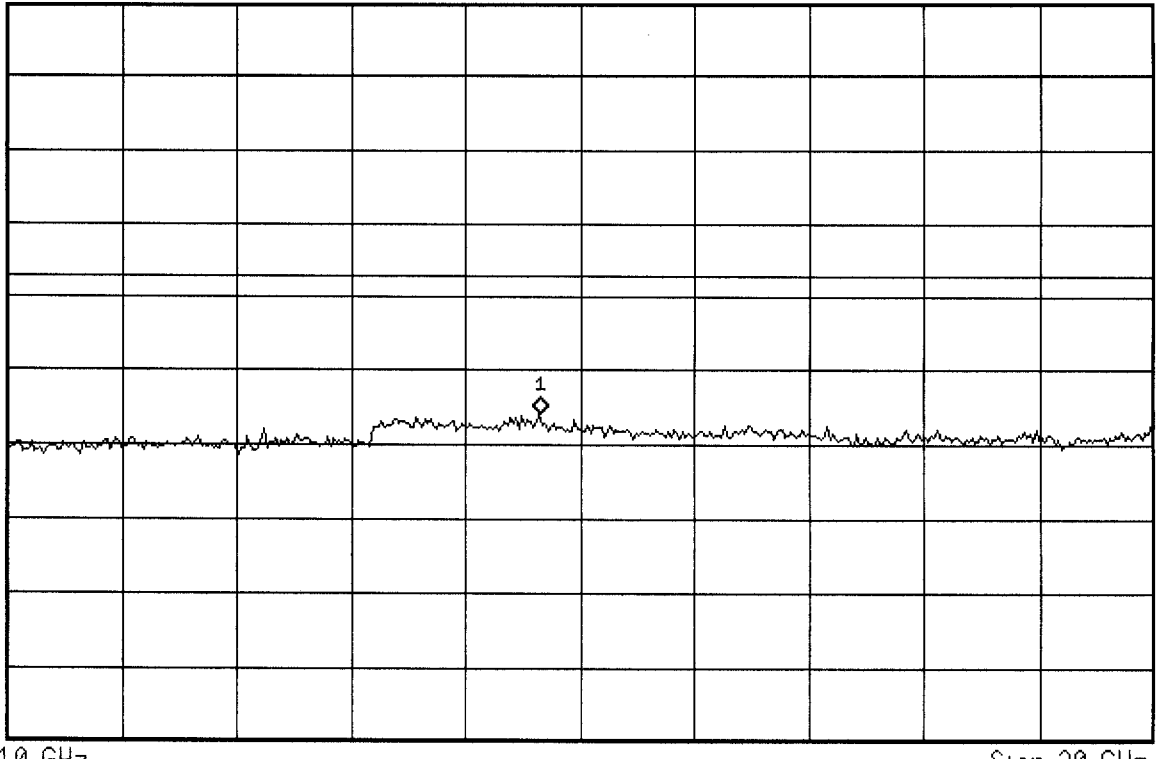
Ref 24 dBm

Atten 5 dB

-31.94 dBm

Peak
Log
10
dB/
Offst
31
dB

DI
-13.0
dBm



M1 S2
S3 FC
AA

Start 10 GHz

Stop 20 GHz

#Res BW 1 MHz

VBW 1 MHz

Sweep 100 ms

15:19:02 Dec 21, 2000

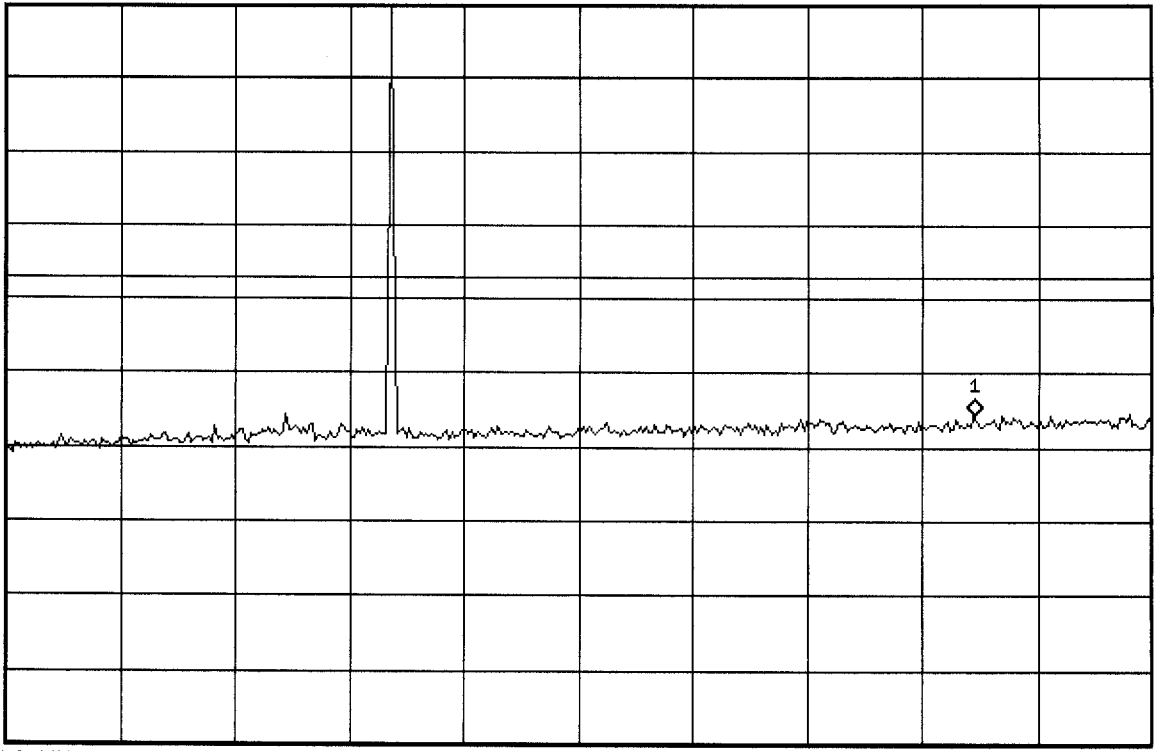
WSH-200 COND SPURS CH 777

Mkr1 2.114 GHz

Ref 24 dBm

Atten 5 dB

-31.65 dBm



Start 10 MHz

Stop 2.5 GHz

#Res BW 1 MHz

VBW 1 MHz

Sweep 6.225 ms

15:19:21 Dec 21, 2000

WSH-200 COND SPURS CH 777

Mkr1 2.969 GHz

Ref 24 dBm

Atten 5 dB

-33.01 dBm

Peak

Log

10

dB/

Offst

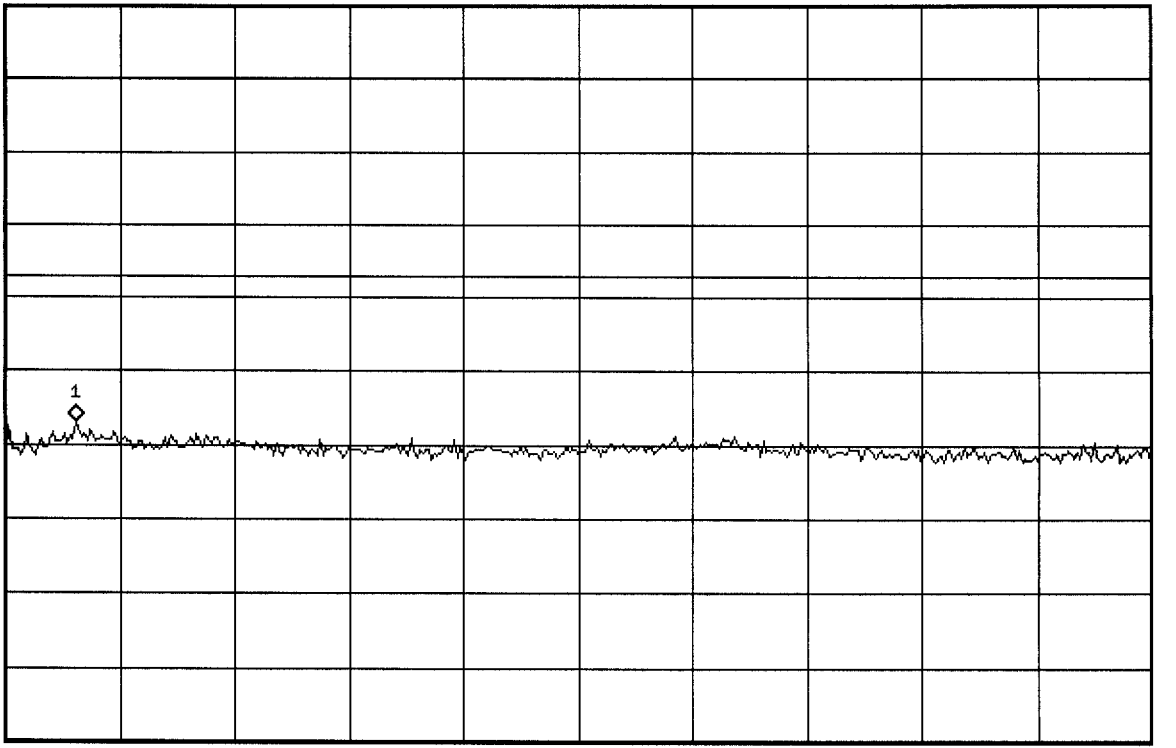
31

dB

Dl

-13.0

dBm



M1 S2

S3 FC

AA

Start 2.5 GHz

Stop 10 GHz

#Res BW 1 MHz

VBW 1 MHz

Sweep 18.75 ms

15:19:40 Dec 21, 2000

WSH-200 COND SPURS CH 777

Mkr1 14.45 GHz

Ref 24 dBm

Atten 5 dB

-31.22 dBm

Peak

Log

10

dB/

Offst

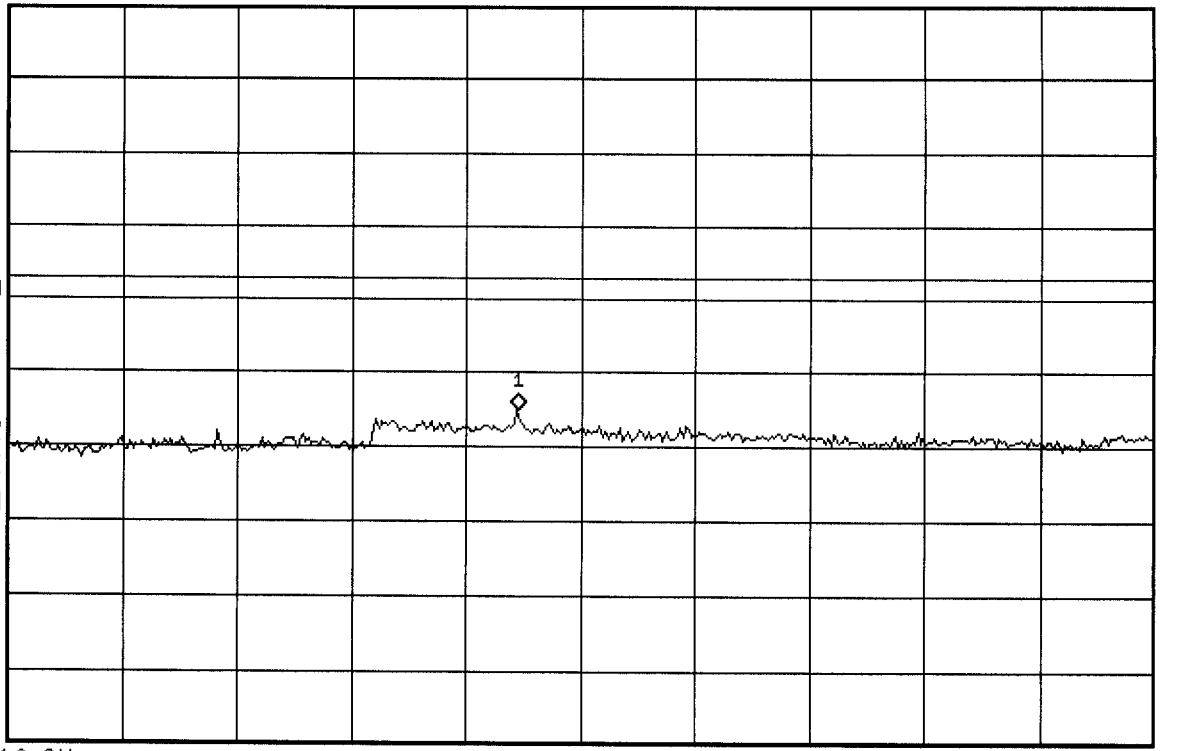
31

dB

Dl

-13.0

dBm



M1 S2

S3 FC

AA

Start 10 GHz

Stop 20 GHz

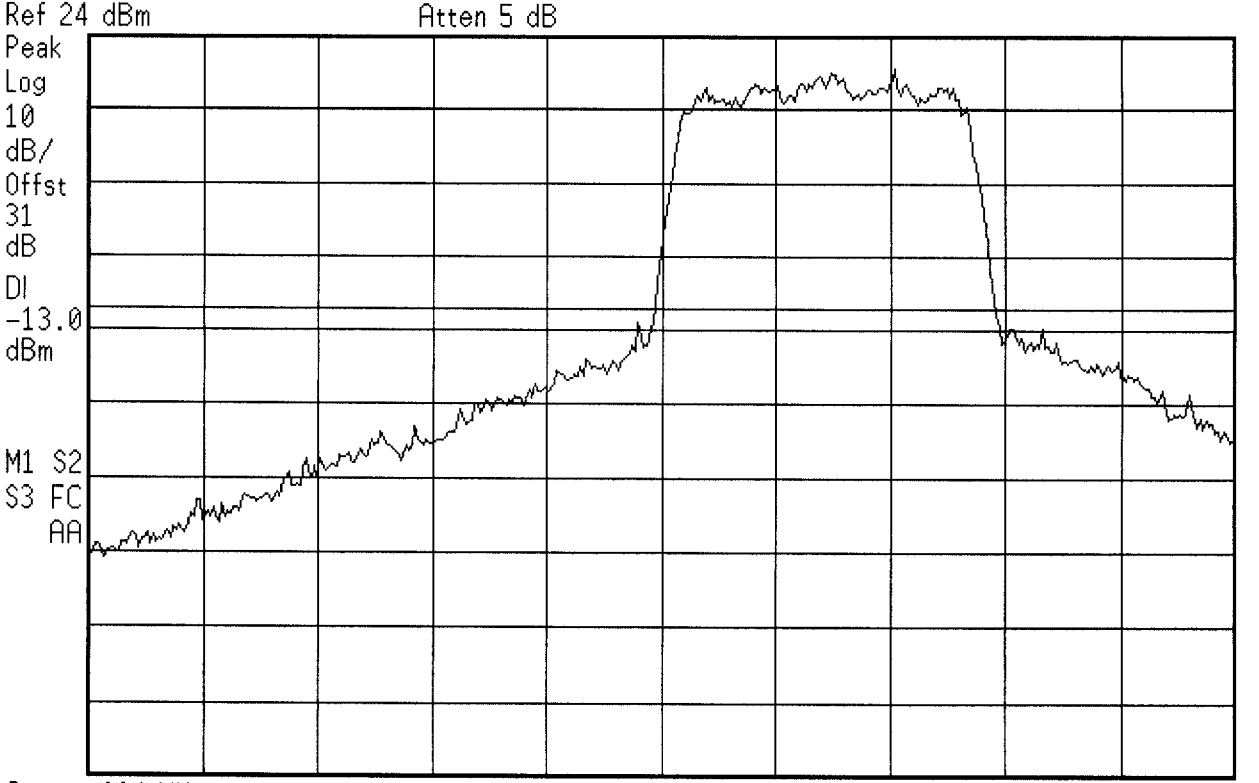
#Res BW 1 MHz

VBW 1 MHz

Sweep 100 ms

15:32:15 Dec 21, 2000

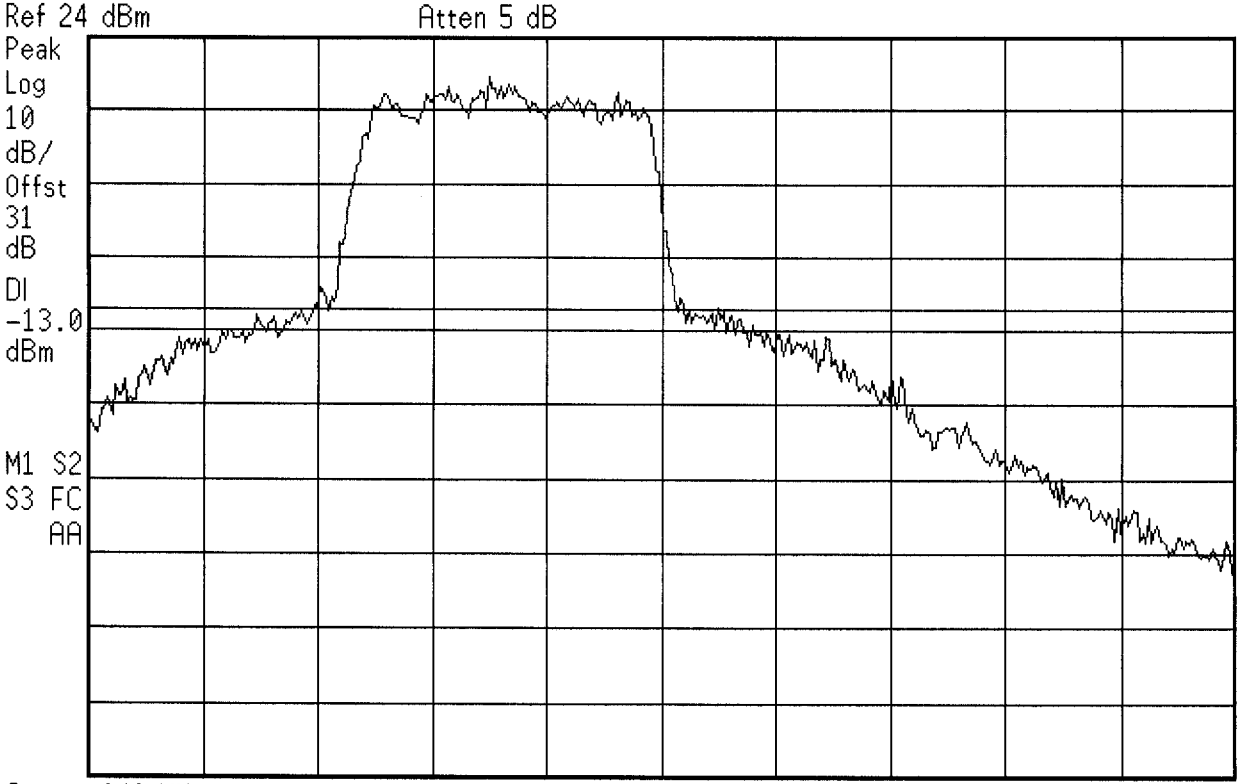
WSH-200 CDMA MODE BAND EDGE LOW CH



Center 824 MHz
#Res BW 30 kHz
VBW 30 kHz
Span 5 MHz
Sweep 13.89 ms

15:31:06 Dec 21, 2000

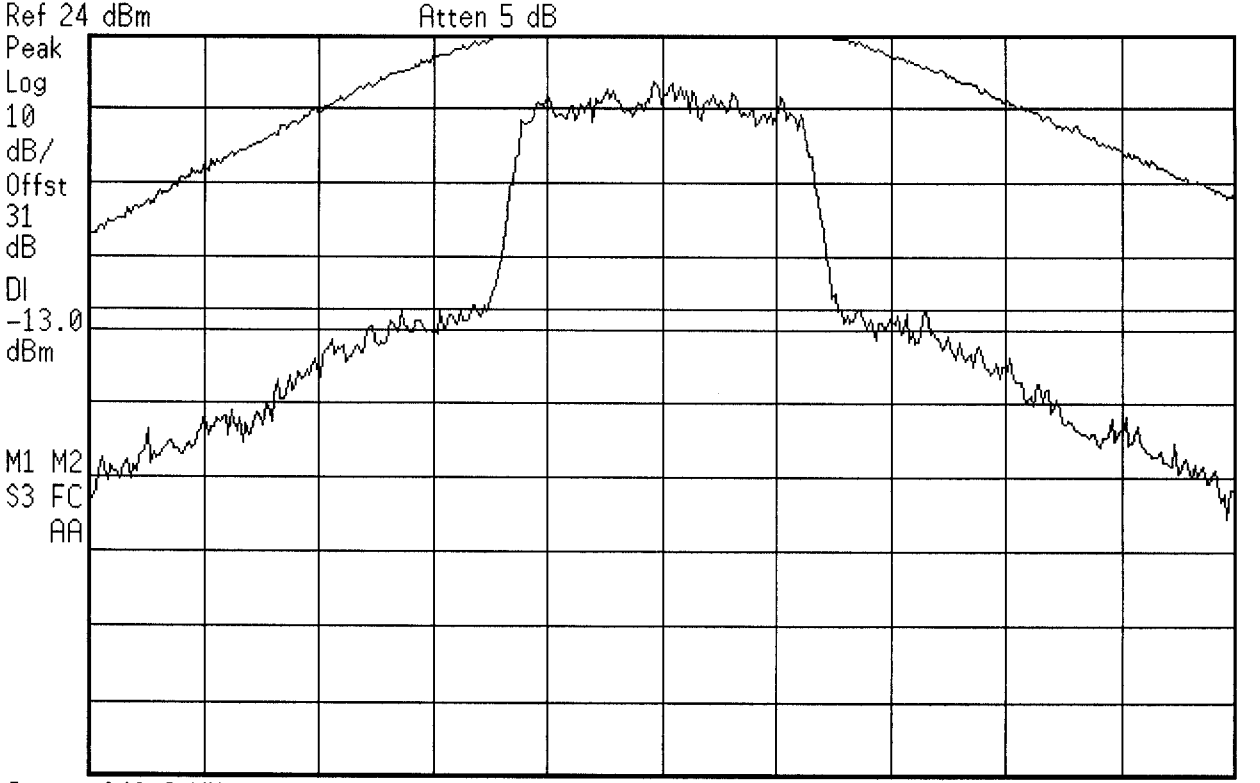
WSH-200 CDMA MODE BAND EDGE HIGH CH



Center 849 MHz
#Res BW 30 kHz
VBW 30 kHz
Span 5 MHz
Sweep 13.89 ms

15:29:16 Dec 21, 2000

WSH-200 CDMA MODE CH 777



Center 848.3 MHz

Span 5 MHz

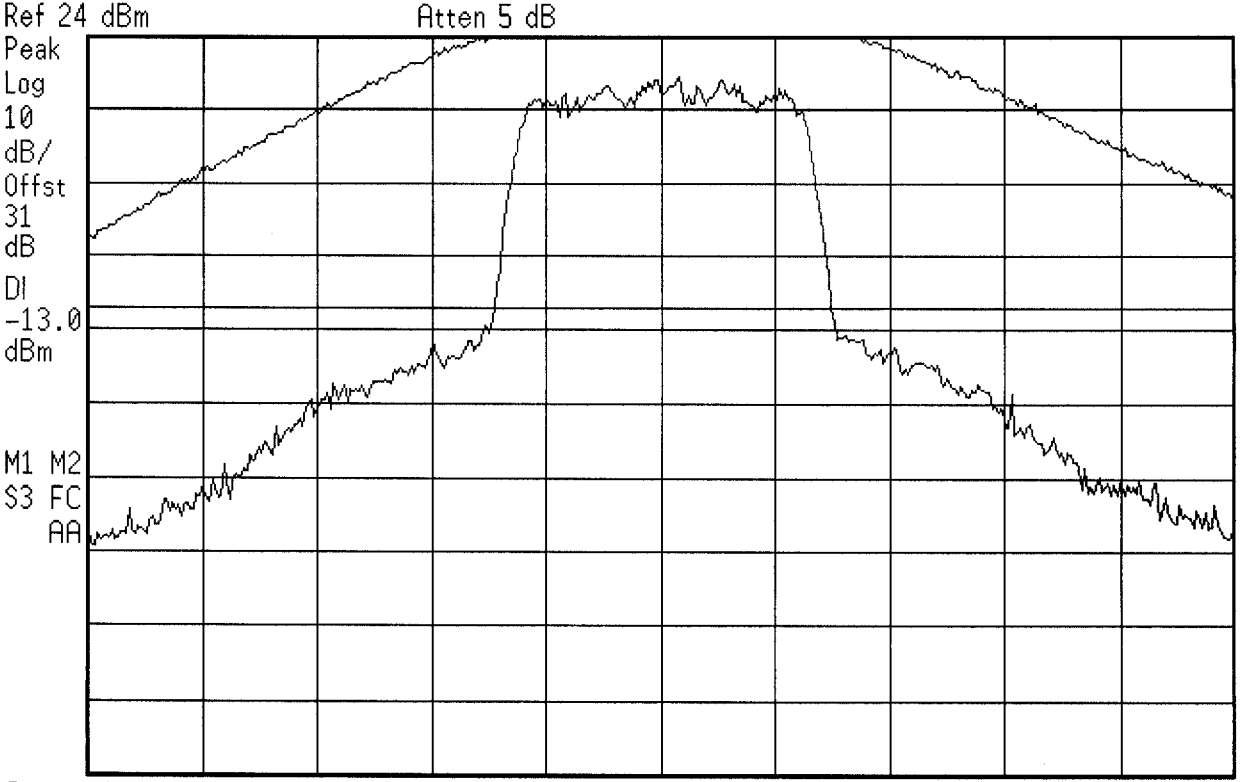
#Res BW 30 kHz

VBW 30 kHz

Sweep 13.89 ms

15:27:18 Dec 21, 2000

WSH-200 CDMA MODE CH 363



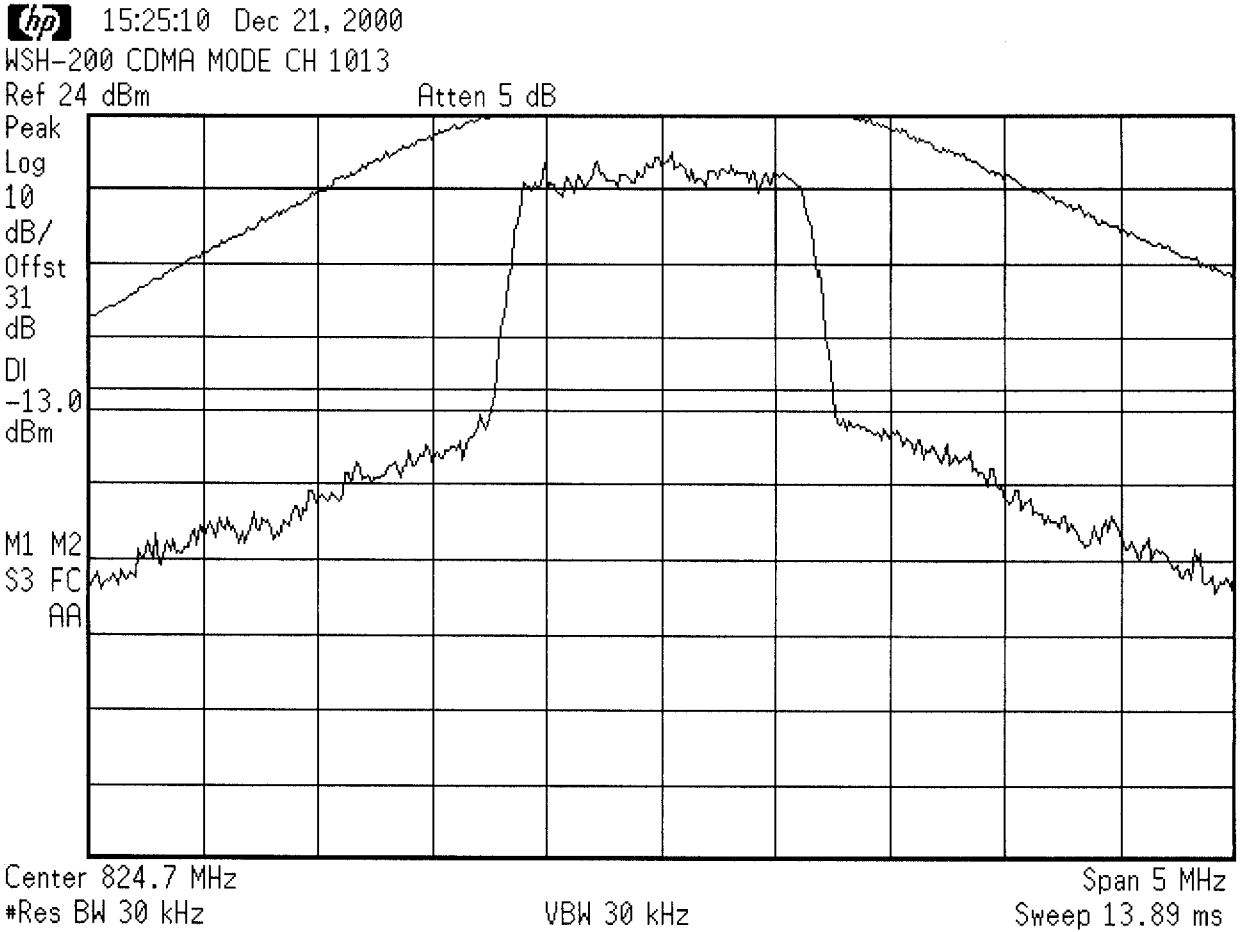
Center 835.9 MHz

Span 5 MHz

#Res BW 30 kHz

VBW 30 kHz

Sweep 13.89 ms

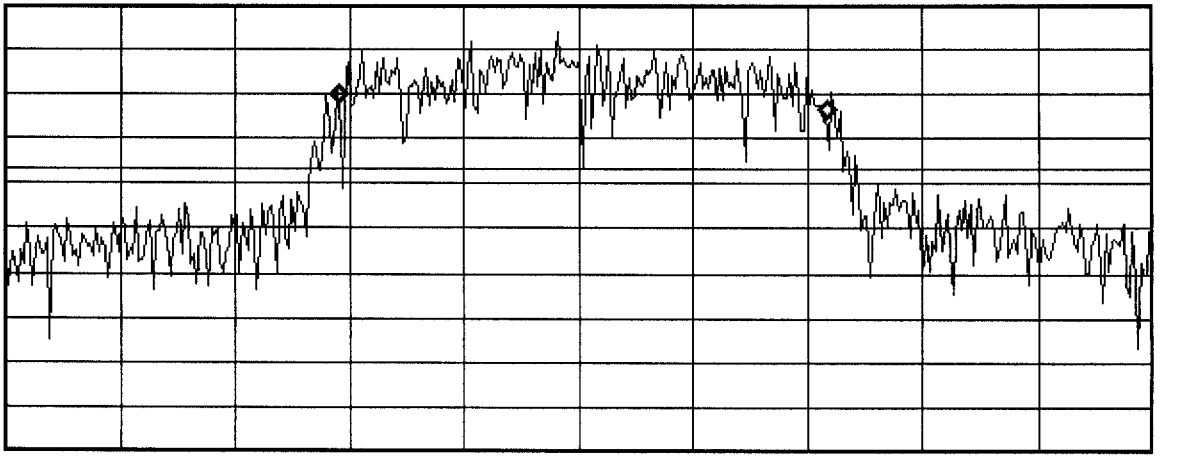

15:25:10 Dec 21, 2000
WSH-200 CDMA MODE CH 1013
Ref 24 dBm
Atten 5 dB
Peak
Log
10
dB/
Offst
31
dB
Dl
-13.0
dBm
M1 M2
S3 FC
AA
Center 824.7 MHz
#Res BW 30 kHz
VBW 30 kHz
Span 5 MHz
Sweep 13.89 ms

15:45:11 Dec 21, 2000

WSH-200 CDMA MODE 99% BAND WIDTH

Ref 24 dBm Atten 5 dB

Samp
Log
10
dB/
Offst
31
dB
Dl
-13.0
dBm



W1 S2

Center 835.9 MHz Span 3 MHz

#Res BW 30 kHz #VBW 300 kHz Sweep 9.167 ms

Occupied Bandwidth Results (measuring..)

Occupied Bandwidth

1.277 MHz

Occ BW % Pwr 99.00 %

Transmit Freq Error 10.58 kHz