

CERTIFICATE OF COMPLIANCE **FCC PART 22 CERTIFICATION**

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Applicant:

SEWON TELECOM
15Fl., Sewon Venture Town Bldg.,
705-18, Yeuksam-dong, Kangnam-gu
135-080, Seoul, Korea

FCC Classification:	Licensed Non-Broadcast Transmitter Held to Ear (TNE)
FCC Rule Part(s):	§22(H), §22.901(d), §2
FCC ID:	PFZSWC-2001W
Model(s):	SWC-2001W
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:	0.171 Watts ERP (AMPS) 0.146 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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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.

§2.1033(a) General Information

<u>APPLICANT:</u> SEWON TELECOM 15Fl., Sewon Venture Town Bldg., 705-18, Yeuksam-dong, Kangnam-gu 135-080, Seoul, Korea	
FCC ID	PFZSWC-2001W
Model(s)	SWC-2001W
EUT Type	Dual-Mode Cellular Phone
Classification	Licensed Non-Broadcast Transmitter Held to Ear (TNE)
Rule Part(s)	§22(H), §22.901(d), §2
Max. RF Output Power	0.171 Watts ERP (AMPS) 0.146 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 Standard

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.

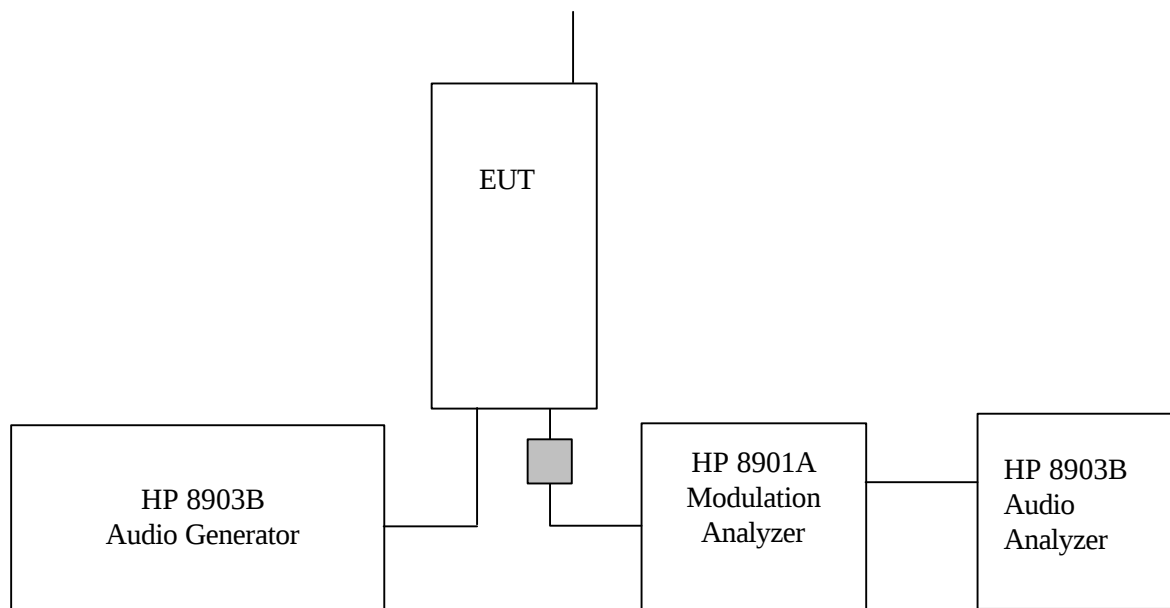
2.3 AUDIO LOW PASS FILTER FREQUENCY RESPONSE - §22.915(d)

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 (± 3.6 kHz 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 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 with the transmitter transmitting into a non-radiating load. 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

Minimum Standard:

The minimum frequency stability shall be +/- 0.00025% for FM modulation, and $\pm 0.00005\%$ ($\pm 300\text{Hz}$) for CDMA modulation, referenced to a received carrier frequency from a base station.

Measurement Method:

The frequency stability of the transmitter was measured by:

1. Temperature: The temperature was varied from -30°C to $+60^{\circ}\text{C}$ 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 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 was tested down to the battery endpoint.

Time Period and Procedure:

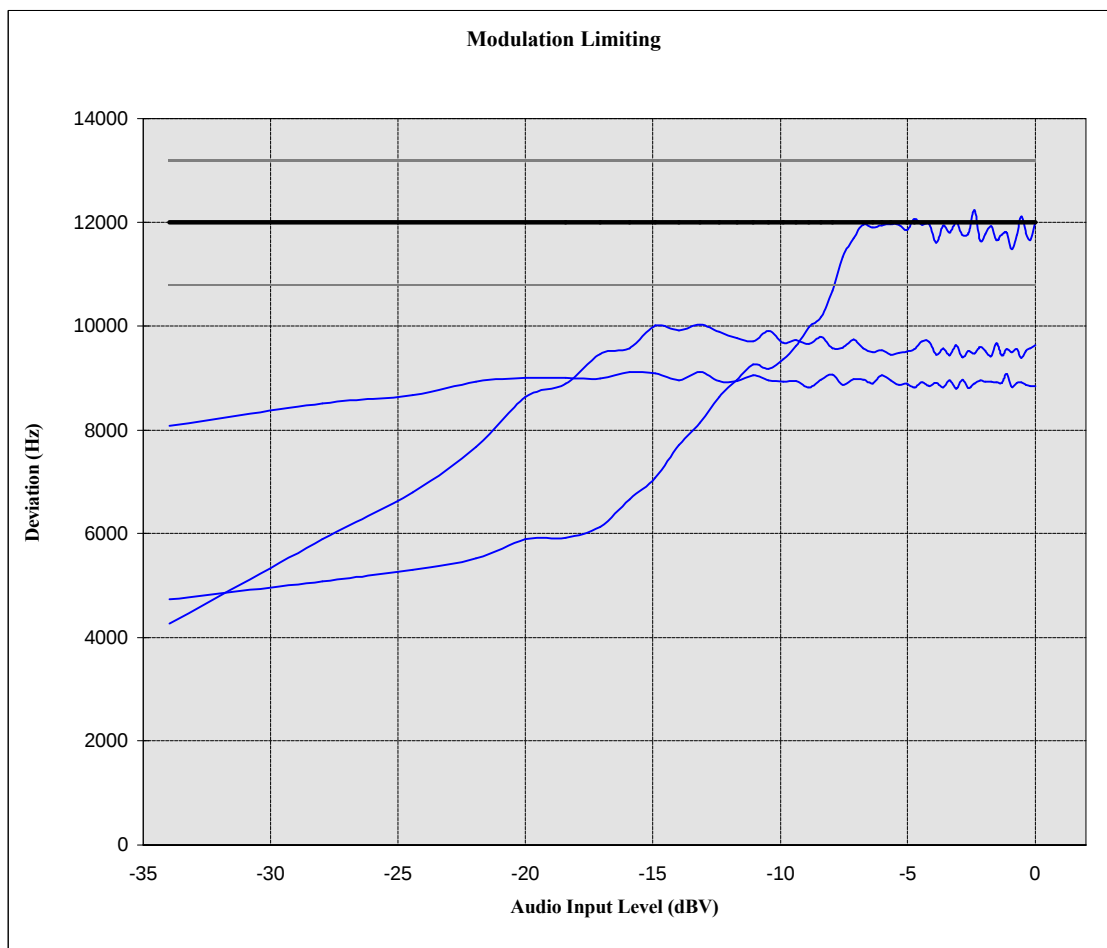
1. The carrier frequency of the transmitter was measured at room temperature (25°C to 27°C to provide a reference).
2. The equipment was subjected to an overnight "soak" at -30°C without any power applied.
3. After the overnight "soak" at -30°C , the measurement of the carrier frequency of the transmitter was made within a three-minute interval after applying power to the transmitter.
4. Frequency measurements were made at 10°C intervals up to $+60^{\circ}\text{C}$, then back to room temperature. A minimum period of one hour was 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: 02/21/01
EUT: SEWON TELECOM Dual-Mode AMPS/CDMA Cellular Phone
Model: SWC-2001W
FCC ID: PFZSWC-2001W

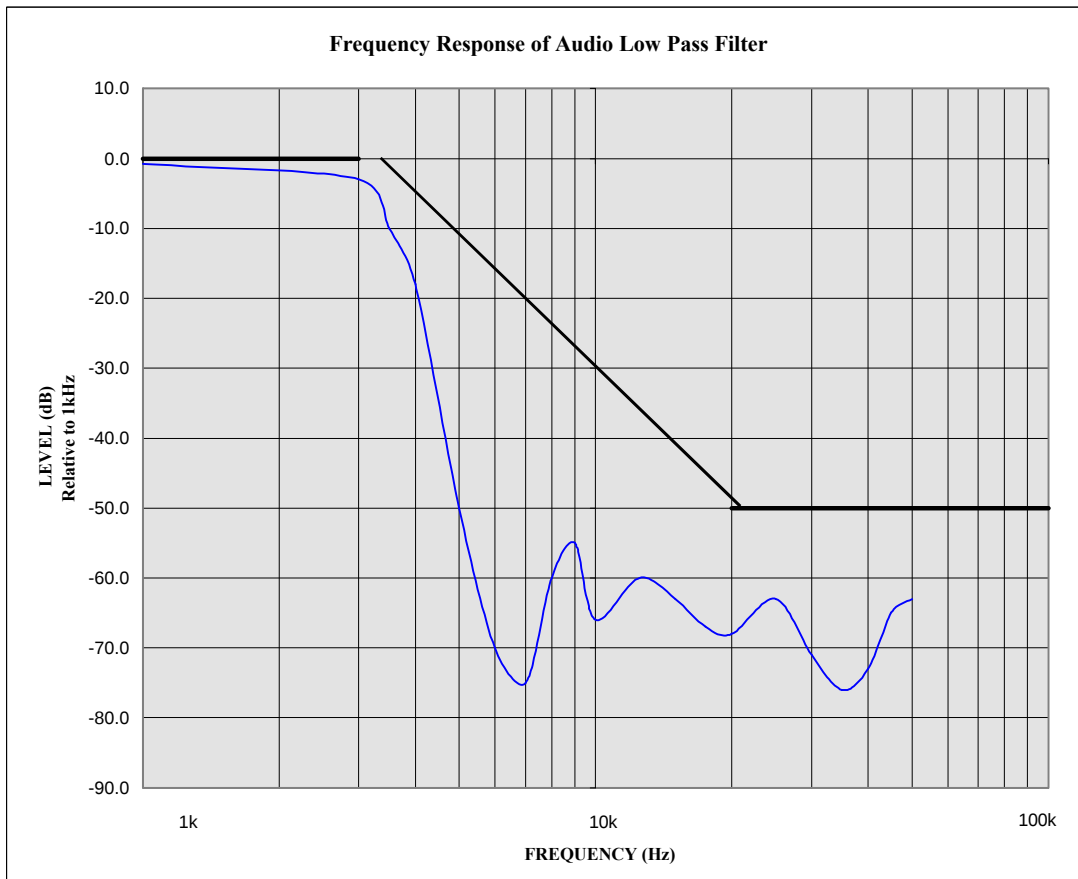
REFERENCE: 1 kHz = 0 dB



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

Test Date: 02/21/01
EUT: SEWON TELECOM Dual-Mode AMPS/CDMA Cellular Phone
Model: SWC-2001W
FCC ID: PFZSWC-2001W

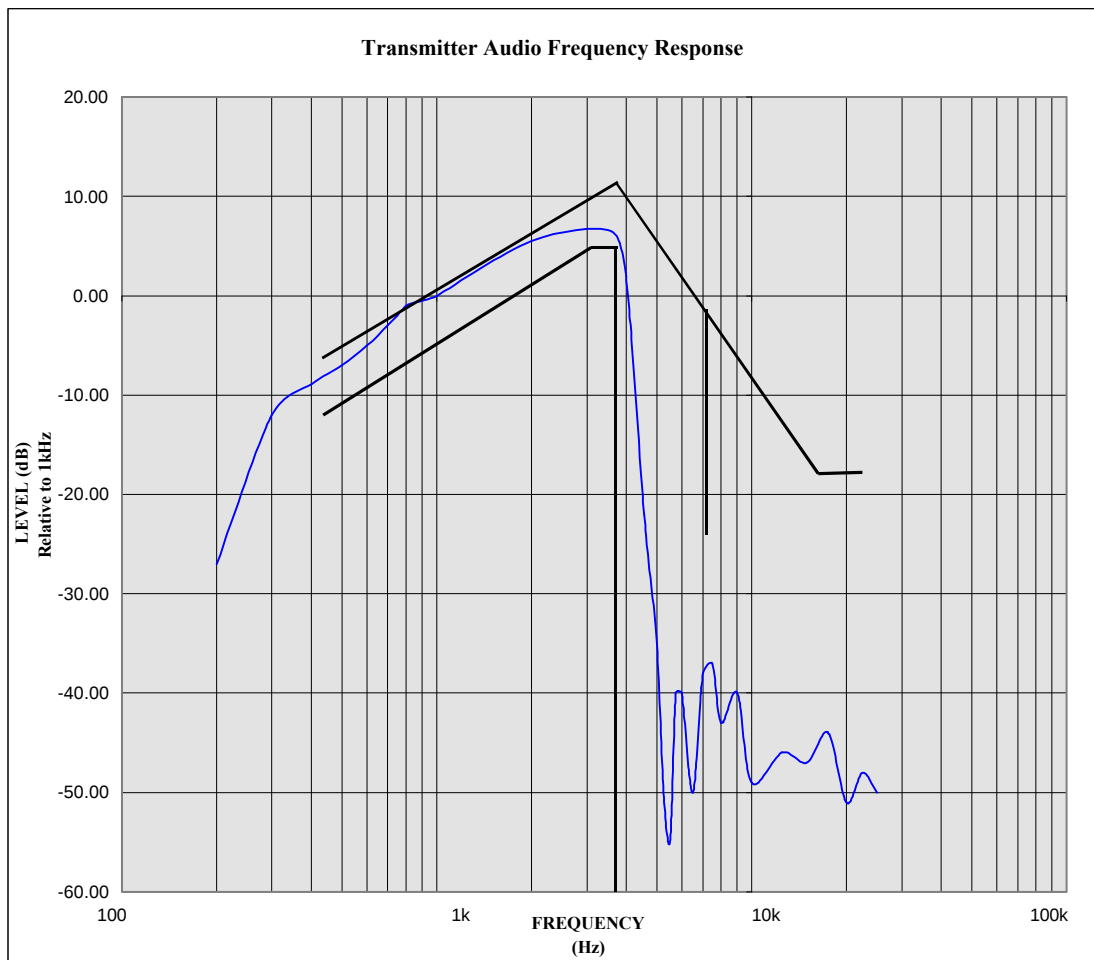
REFERENCE: 1 kHz = 0 dB



3.4 TRANSMITTER AUDIO FREQUENCY RESPONSE - §2.1047(a)

Test Date: 02/21/01
EUT: SEWON TELECOM Dual-Mode AMPS/CDMA Cellular Phone
Model: SWC-2001W
FCC ID: PFZSWC-2001W

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 (Fixed Antenna) (dBm)	Dipole Gain	Dipole Forward Conducted Power	ERP of EUT Dipole Gain + Dipole Forward Conducted Power	
(MHz)	(dBm)	H	(dBd)	(dBm)	(dBm)	(Watts)
824.04	27.0	-11.00	-1.44	23.76	22.32	0.171
836.49	27.5	-12.48	-1.34	23.54	22.20	0.166
848.97	27.5	-12.90	-1.24	22.89	21.65	0.146

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 (Fixed Antenna) (dBm)	Dipole Gain	Dipole Forward Conducted Power	ERP of EUT Dipole Gain + Dipole Forward Conducted Power	
(MHz)	(dBm)	H	(dBd)	(dBm)	(dBm)	(Watts)
824.70	26.0	-11.67	-1.44	23.09	21.65	0.146
835.89	26.0	-13.61	-1.34	22.41	21.07	0.128
848.31	26.0	-13.99	-1.24	21.80	20.56	0.114

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

AMPS MODE

Operating Frequency (MHz): 824.04
Channel: 991 (Low)
Measured Cond. Pwr. (dBm): 27
Measured ERP (dBm): 22.32
Modulation: ST (Signaling Tone)
Distance: 3 Meters
Limit: $43 + 10 \log (W) = 40.31 \text{ dBc}$

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	-75.08	-47.28	6.6	H	-40.68	-42.82	65.14
2472.12	-83.43	-53.63	7.8	H	-45.83	-47.97	70.29
3296.16	-103.04	-73.66	7.75	H	-65.91	-68.05	90.37
4120.20	-106.20	-77.18	7.6	H	-69.58	-71.72	94.04
4944.24	-106.63	-80.27	8.5	H	-71.77	-73.91	96.23
5768.28	-106.36	-75.48	8.8	H	-66.68	-68.82	91.14
6592.32	-105.55	-66.19	9.6	H	-56.59	-58.73	81.05
7416.36	-103.39	-65.25	9.0	H	-56.25	-58.39	80.71
8240.40	-102.43	-69.13	9.3	H	-59.83	-61.97	84.29

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 (MHz): 836.49
Channel: 383 (Mid)
Measured Cond. Pwr. (dBm): 27.5
Measured ERP (dBm): 22.2
Modulation: ST (Signaling Tone)
Distance: 3 Meters
Limit: $43 + 10 \log (W) = 40.31 \text{ dBc}$

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	-75.78	-47.99	6.6	H	-41.39	-43.53	65.73
2509.47	-84.13	-54.39	7.8	H	-46.59	-48.73	70.93
3345.96	-103.74	-74.33	7.75	H	-66.58	-68.72	90.92
4182.45	-106.90	-77.85	7.6	H	-70.25	-72.39	94.59
5018.94	-107.33	-80.95	8.5	H	-72.45	-74.59	96.79
5855.43	-107.06	-76.20	8.8	H	-67.40	-69.54	91.74
6691.92	-106.25	-66.91	9.6	H	-57.31	-59.45	81.65
7528.41	-104.09	-65.97	9.0	H	-56.97	-59.11	81.31
8364.90	-103.13	-69.85	9.3	H	-60.55	-62.69	84.89

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 (MHz): 848.97
Channel: 799 (High)
Measured Cond. Pwr. (dBm): 27.5
Measured ERP (dBm): 21.65
Modulation: ST (Signaling Tone)
Distance: 3 Meters
Limit: $43 + 10 \log (W) = 40.31 \text{ dBc}$

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	-76.66	-48.83	6.6	H	-42.23	-44.37	66.02
2546.91	-83.23	-56.32	7.8	H	-48.52	-50.66	72.31
3395.88	-102.84	-70.21	7.75	H	-62.46	-64.60	86.25
4244.85	-104.62	-75.64	7.6	H	-68.04	-70.18	91.83
5093.82	-105.45	-79.97	8.5	H	-71.47	-73.61	95.26
5942.79	-106.71	-80.45	8.8	H	-71.65	-73.79	95.44
6791.76	-105.13	-72.62	9.6	H	-63.02	-65.16	86.81
7640.73	-104.37	-67.88	9.0	H	-58.88	-61.02	82.67
8489.70	-103.95	-66.83	9.3	H	-57.53	-59.67	81.32

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 (MHz): 824.70
Channel: 1013 (Low)
Measured Cond. Pwr. (dBm): 26
Measured ERP (dBm): 21.65
Modulation: CDMA (Internal)
Distance: 3 Meters
Limit: $43 + 10 \log (W) = 38.13 \text{ dBc}$

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	-72.72	-44.92	6.6	H	-38.32	-40.46	62.11
2474.10	-81.07	-51.27	7.8	H	-43.47	-45.61	67.26
3298.80	-100.68	-71.30	7.75	H	-63.55	-65.69	87.34
4123.50	-103.84	-74.82	7.6	H	-67.22	-69.36	91.01
4948.20	-104.27	-77.91	8.5	H	-69.41	-71.55	93.20
5772.90	-104.00	-73.12	8.8	H	-64.32	-66.46	88.11
6597.60	-103.19	-63.83	9.6	H	-54.23	-56.37	78.02
7422.30	-101.03	-62.89	9.0	H	-53.89	-56.03	77.68
8247.00	-102.07	-66.77	9.3	H	-57.47	-59.61	81.26

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 (MHz): 835.89
Channel: 363 (Mid)
Measured Cond. Pwr. (dBm): 26
Measured ERP (dBm): 21.07
Modulation: CDMA (Internal)
Distance: 3 Meters
Limit: $43 + 10 \log (W) = 38.13 \text{ dBc}$

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	-73.30	-45.50	6.6	H	-38.90	-41.04	62.11
2507.67	-81.65	-51.85	7.8	H	-44.05	-46.19	67.26
3343.56	-101.26	-71.88	7.75	H	-64.13	-66.27	87.34
4179.45	-104.42	-75.40	7.6	H	-67.80	-69.94	91.01
5015.34	-104.85	-78.49	8.5	H	-69.99	-72.13	93.20
5851.23	-104.58	-73.70	8.8	H	-64.90	-67.04	88.11
6687.12	-103.77	-64.41	9.6	H	-54.81	-56.95	78.02
7523.01	-101.61	-63.47	9.0	H	-54.47	-56.61	77.68
8358.90	-102.65	-67.35	9.3	H	-58.05	-60.19	81.26

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 (MHz): 848.31
Channel: 777 (High)
Measured Cond. Pwr. (dBm): 26
Measured ERP (dBm): 20.56
Modulation: CDMA (Internal)
Distance: 3 Meters
Limit: $43 + 10 \log (W) = 38.13 \text{ dBc}$

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	-73.81	-46.01	6.6	H	-39.41	-41.55	62.11
2544.93	-82.16	-52.36	7.8	H	-44.56	-46.70	67.26
3393.24	-101.77	-72.39	7.75	H	-64.64	-66.78	87.34
4241.55	-104.93	-75.91	7.6	H	-68.31	-70.45	91.01
5089.86	-105.36	-79.00	8.5	H	-70.50	-72.64	93.20
5938.17	-105.09	-74.21	8.8	H	-65.41	-67.55	88.11
6786.48	-104.28	-64.92	9.6	H	-55.32	-57.46	78.02
7634.79	-102.12	-63.98	9.0	H	-54.98	-57.12	77.68
8483.10	-103.16	-67.86	9.3	H	-58.56	-60.70	81.26

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.

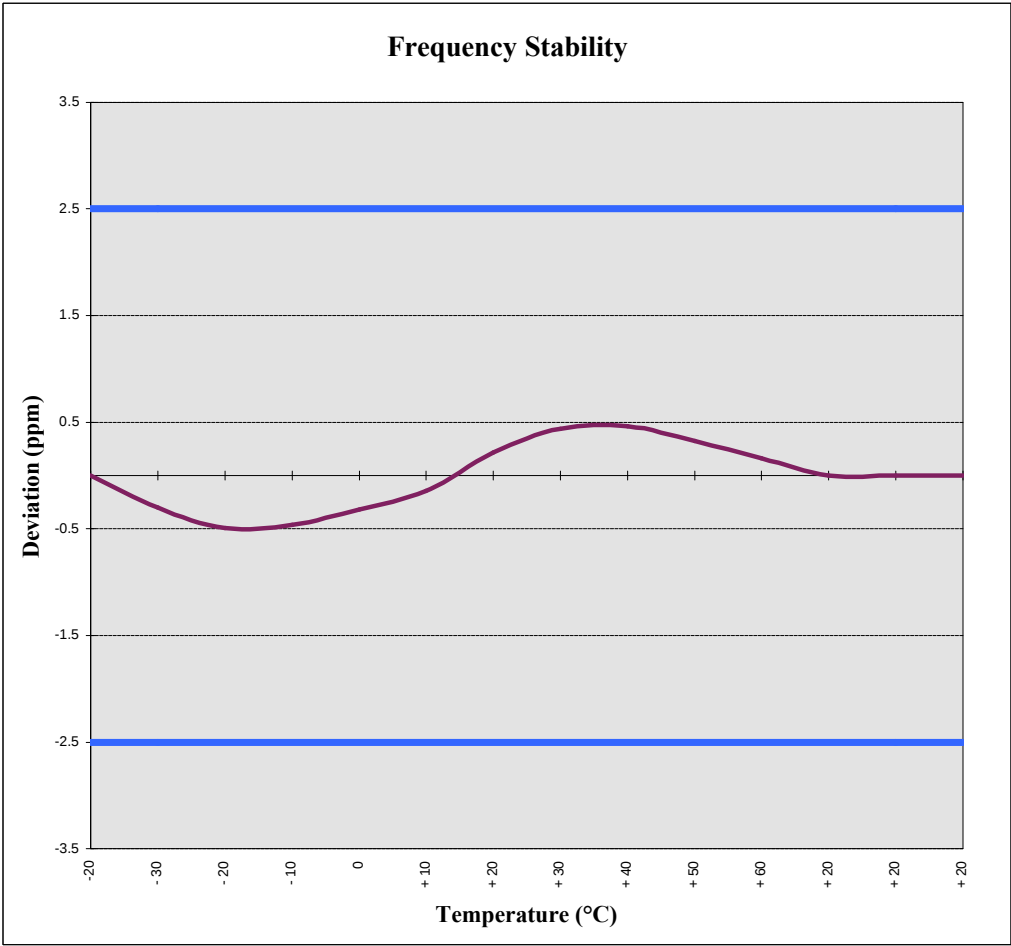
3.7 FREQUENCY STABILITY - § 2.1055

AMPS MODE

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 (°C)	FREQ. (Hz)	Deviation (%)
100 %	3.60	+ 20 (Ref)	836490000	0.00000000
100 %		- 30	836490254	-0.00000030
100 %		- 20	836490412	-0.00000049
100 %		- 10	836490388	-0.00000046
100 %		0	836490266	-0.00000032
100 %		+ 10	836490122	-0.00000015
100 %		+ 20	836489818	0.00000022
100 %		+ 30	836489632	0.00000044
100 %		+ 40	836489613	0.00000046
100 %		+ 50	836489729	0.00000032
100 %		+ 60	836489865	0.00000016
85 %	3.06	+ 20	836490000	0.00000000
115 %	4.14	+ 20	836490000	0.00000000
BATT. ENDPOINT	3.00	+ 20	836490000	0.00000000

FREQUENCY STABILITY - § 2.1055



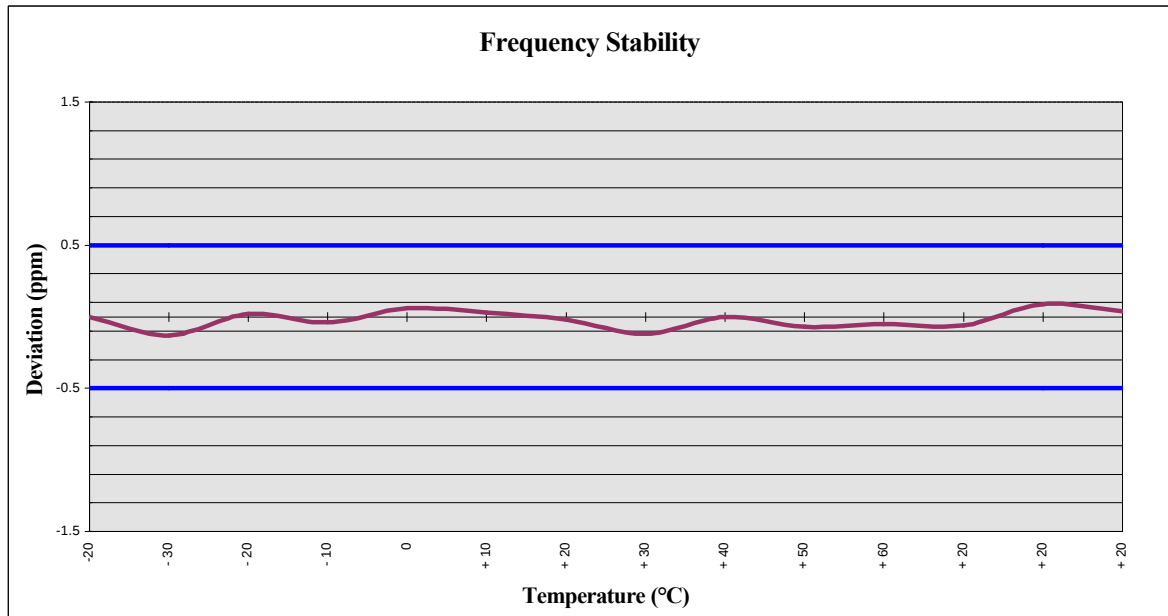
FREQUENCY STABILITY - § 2.1055

CDMA MODE

Operating Frequency: 835,890,000 Hz
Channel: 363
Reference Voltage: 3.6 VDC
Deviation Limit: ± 0.00005 % or 0.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQ. (Hz)	Deviation (%)
100 %	3.60	+ 20 (Ref)	835,890,000	0.000000
100 %		- 30	835,890,109	-0.000013
100 %		- 20	835,889,983	0.000002
100 %		- 10	835,890,033	-0.000004
100 %		0	835,889,950	0.000006
100 %		+ 10	835,889,975	0.000003
100 %		+ 20	835,890,017	-0.000002
100 %		+ 30	835,890,100	-0.000012
100 %		+ 40	835,890,000	0.000000
100 %		+ 50	835,890,059	-0.000007
100 %		+ 60	835,890,042	-0.000005
85 %	3.06	+ 20	835,890,050	-0.000006
115 %	4.14	+ 20	835,889,925	0.000009
BATT. ENDPOINT	3.00	+ 20	835,889,967	0.000004

FREQUENCY STABILITY - § 2.1055



4.1 TEST EQUIPMENT

<u>Type</u>	<u>Model</u>	<u>Calib. Date</u>	<u>Serial No.</u>
HP Signal Generator	8648D (9kHz-4.0GHz)	Nov 1999	3847A00611
Rohde & Schwarz Signal Generator	SMR40 (10MHz-40GHz)	Nov 2000	835537/022
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
CDMA Base Station Test Set	Agilent E8285A	N/A	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. 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 SEWON TELECOM Model: SWC-2001W Dual-Mode AMPS/CDMA Cellular Phone FCC ID: PFZSWC-2001W complies with all the requirements of Parts 2 and 22 of the FCC rules.

TEST PLOTS

15: 19: 17 FEB 20, 2001

SEWON DTMF + SAT

REF 27.0 dBm

AT 10 dB

PEAK

LOG

10

dB/

OFFST

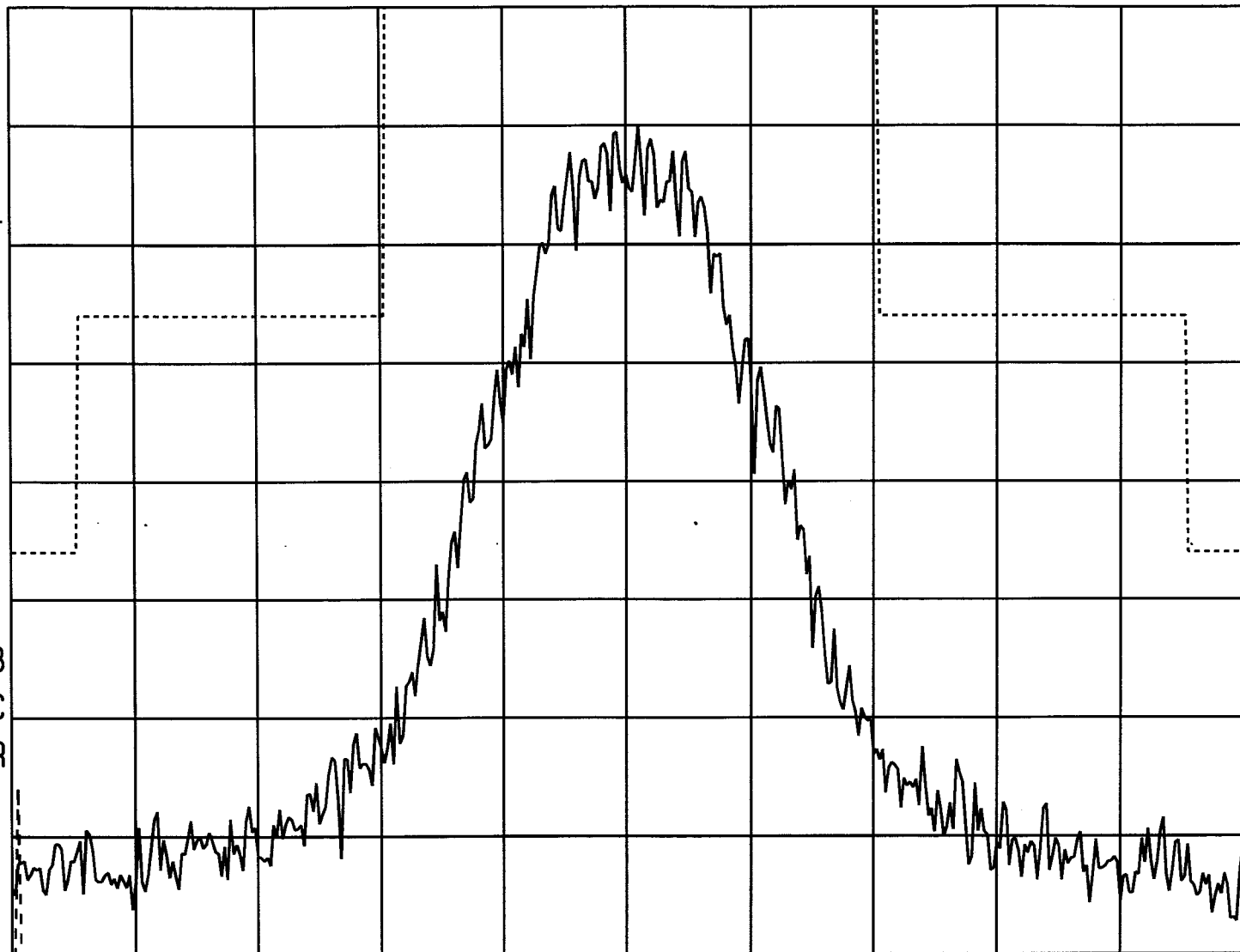
30.9

dB

WA SB

SC FC

CORR



CENTER 836.4895 MHz

SPAN 100.0 kHz

#RES BW 300 Hz

VBW 300 Hz

SWP 3.33 sec

15: 19: 48 FEB 20, 2001

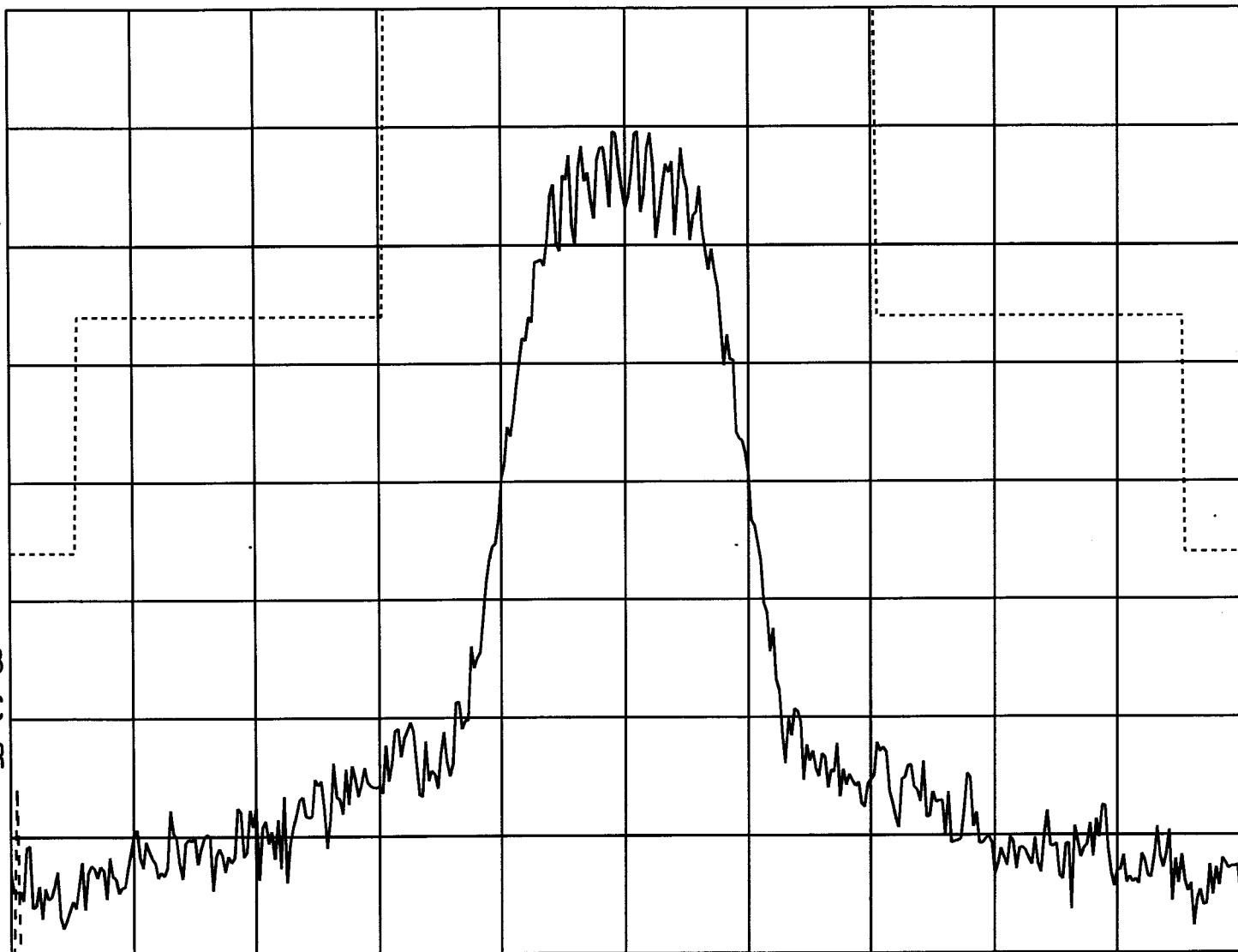
SEWON DTMF

REF 27.0 dBm

AT 10 dB

PEAK
LOG
10
dB/
OFFST
30.9
dB

WA SB
SC FC
CORR



CENTER 836.4895 MHz

SPAN 100.0 kHz

#RES BW 300 Hz

VBW 300 Hz

SWP 3.33 sec

13: 22: 24 FEB 20, 2001

SEWON UNMOD CARRIER

REF 27.0 dBm

AT 10 dB

PEAK

LOG

10

dB/

OFFST

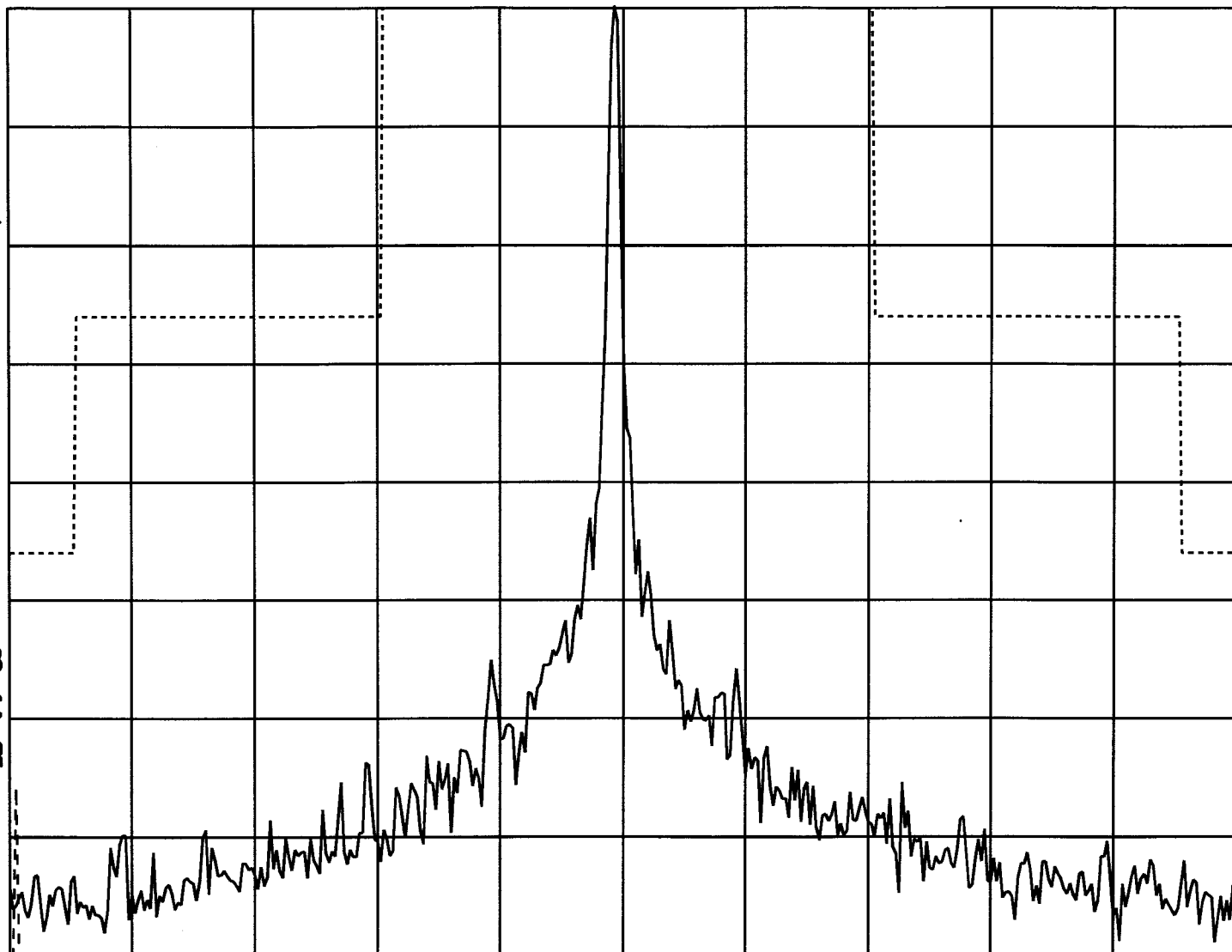
30.9

dB

WA SB

SC FC

CORR



CENTER 836.4895 MHz

SPAN 100.0 kHz

#RES BW 300 Hz

VBW 300 Hz

SWP 3.33 sec

13: 26: 12 FEB 20, 2001

hp SEWON SAT

REF 27.0 dBm

AT 10 dB

PEAK

LOG

10

dB/

OFFST

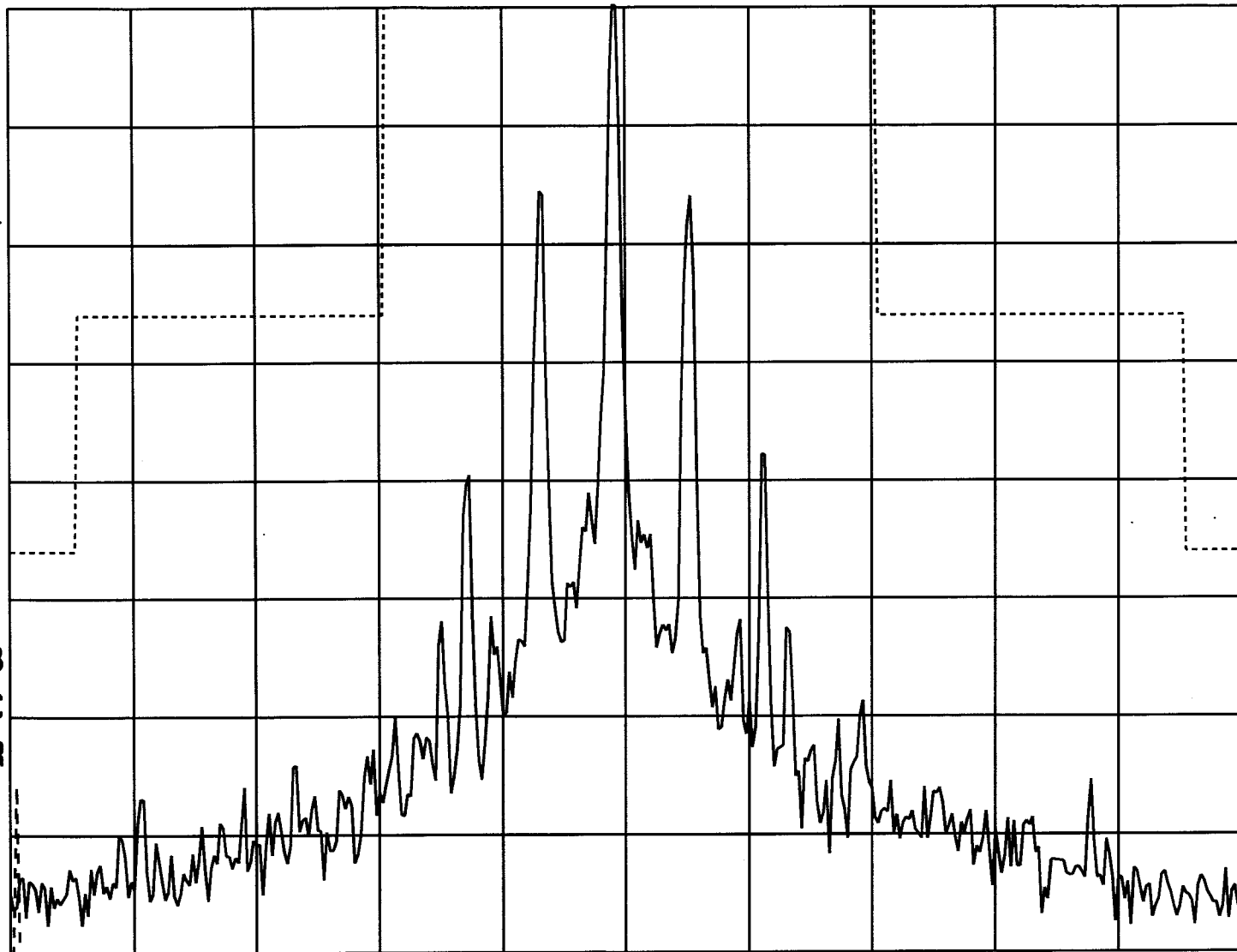
30.9

dB

WA SB

SC FC

CORR



CENTER 836.4895 MHz

SPAN 100.0 kHz

#RES BW 300 Hz

VBW 300 Hz

SWP 3.33 sec

13: 26: 45 FEB 20, 2001

SEWON SAT + ST

REF 27.0 dBm

AT 10 dB

PEAK

LOG

10

dB/

OFFST

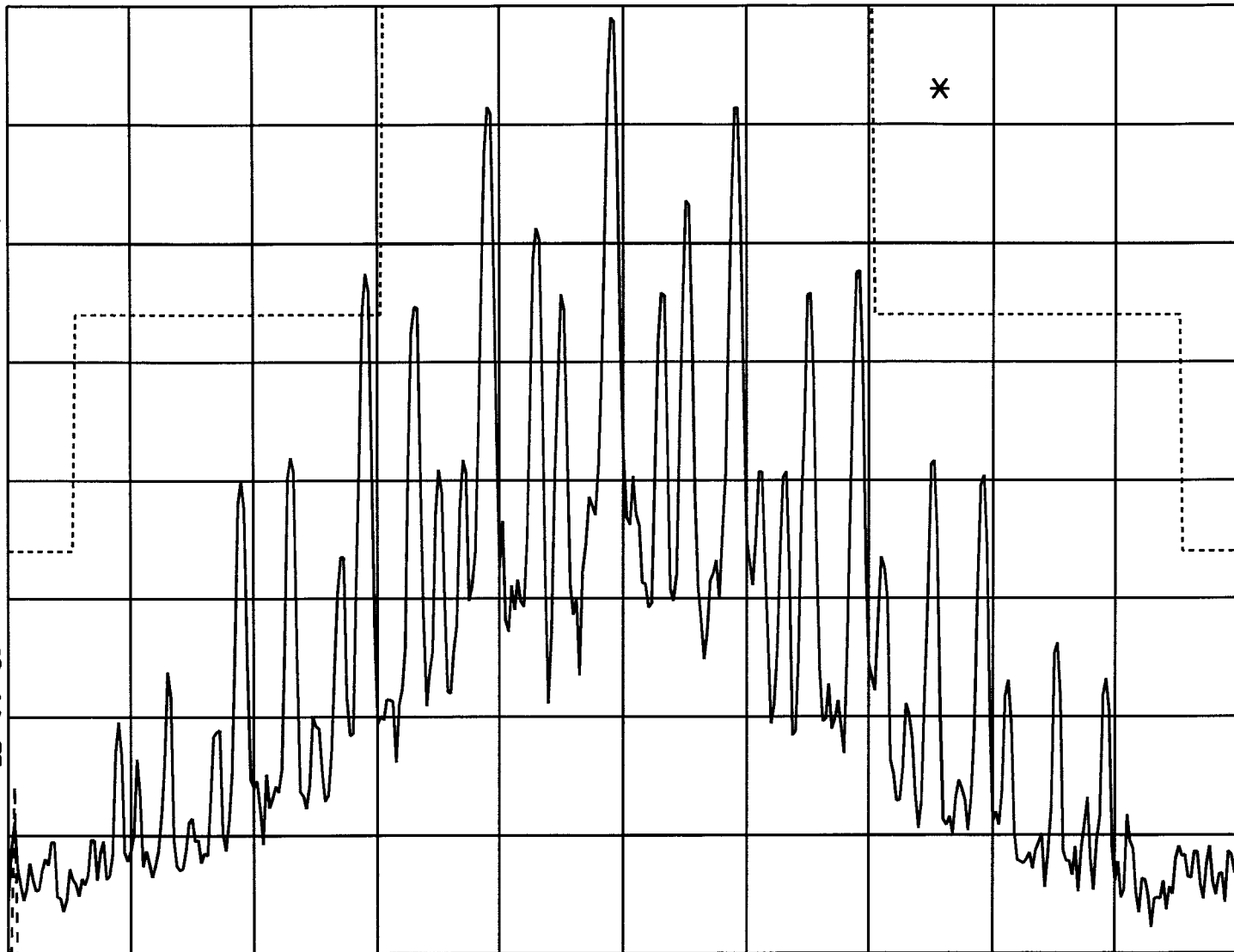
30.9

dB

WA SB

SC FC

CORR



CENTER 836.4895 MHz

SPAN 100.0 kHz

#RES BW 300 Hz

VBW 300 Hz

SWP 3.33 sec

13: 27: 40 FEB 20, 2001

SEWON WIDE BAND DATA

REF 27.0 dBm

AT 10 dB

PEAK

LOG

10

dB/

OFFST

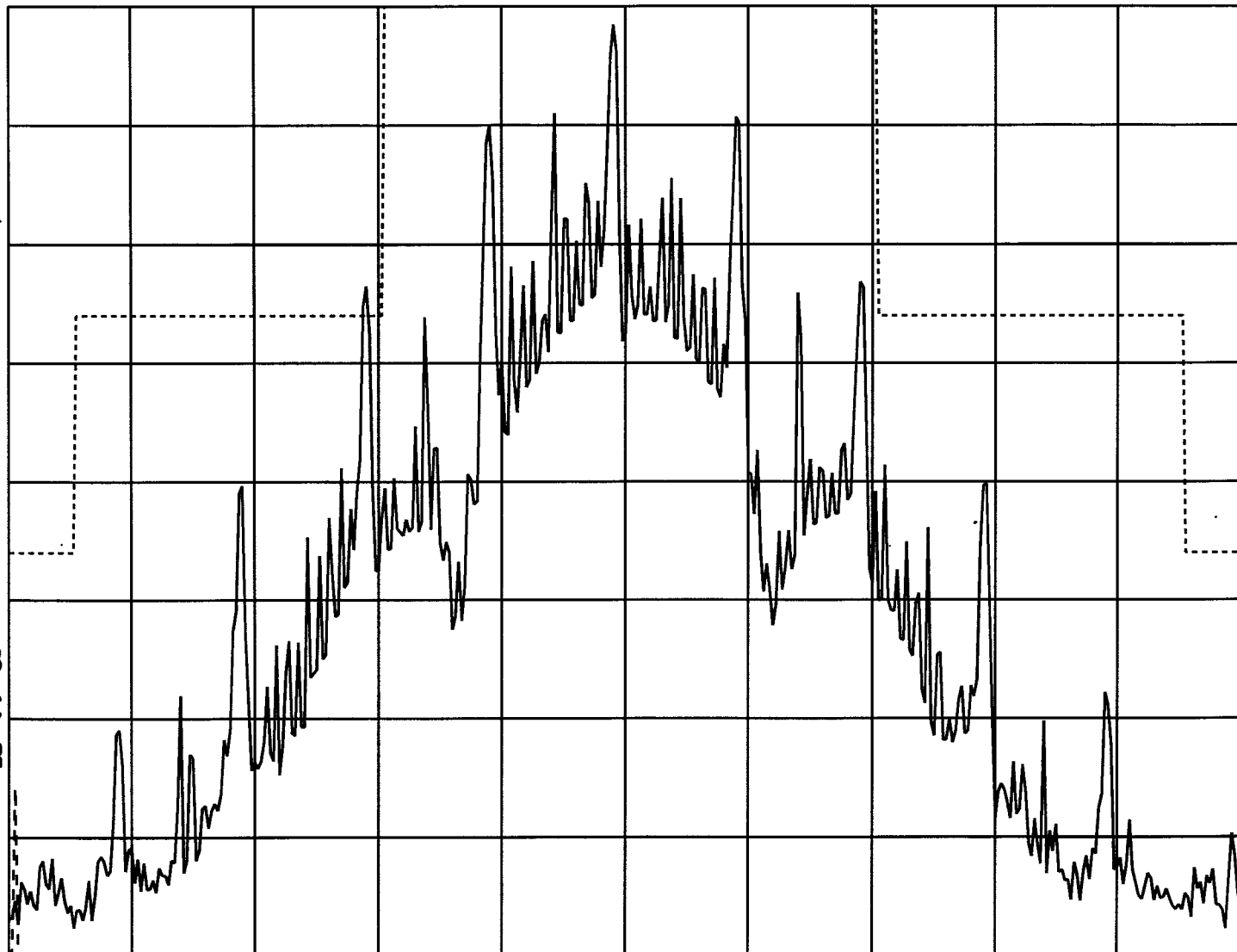
30.9

dB

WA SB

SC FC

CORR



CENTER 836.4895 MHz

SPAN 100.0 kHz

#RES BW 300 Hz

VBW 300 Hz

SWP 3.33 sec

15: 01: 04 FEB 20, 2001

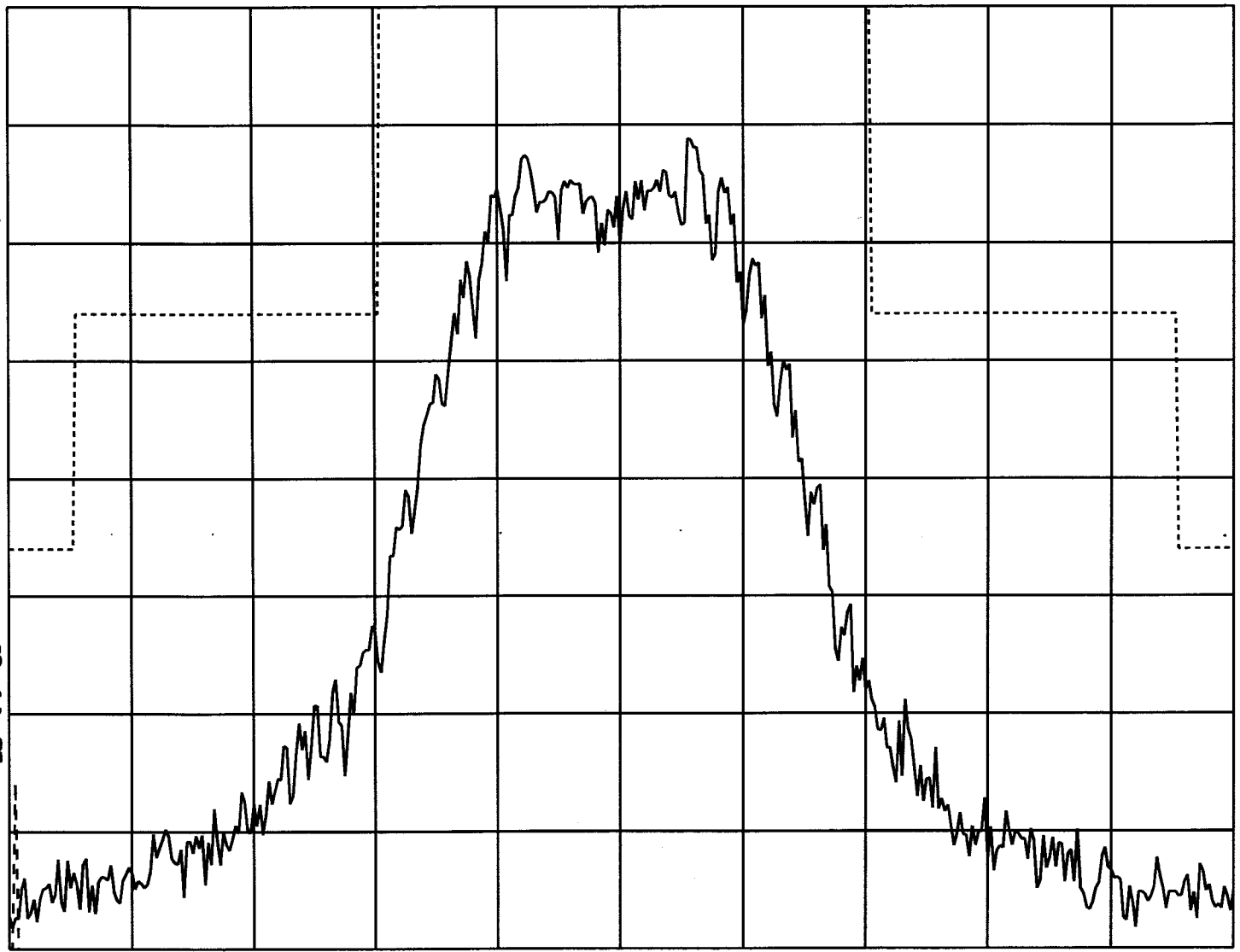
SEWON VOICE

REF 27.0 dBm

AT 10 dB

PEAK
LOG
10
dB/
OFFST
30.9
dB

WA SB
SC FC
CORR



CENTER 836.4895 MHz

SPAN 100.0 kHz

#RES BW 300 Hz

VBW 300 Hz

SWP 3.33 sec



15:24:35 Feb 20, 2001

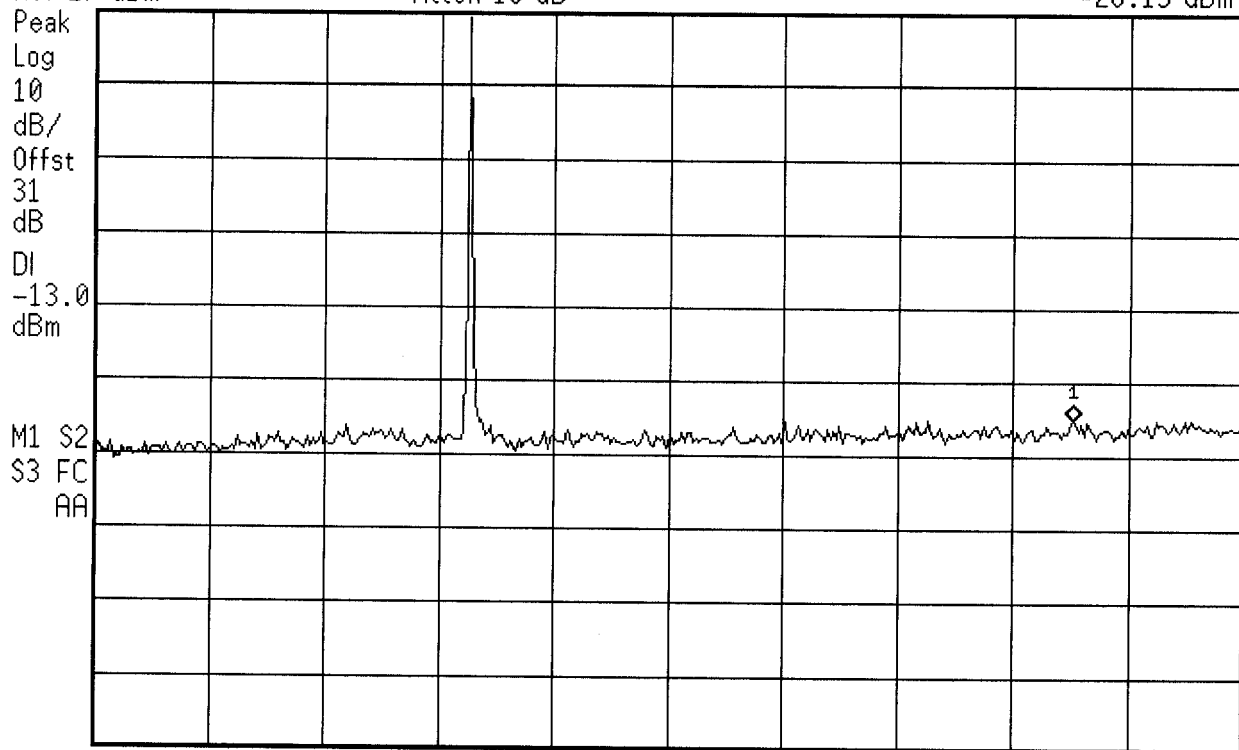
SEWON COND SPURS CH 991

Ref 27 dBm

Atten 10 dB

Mkr1 2.133 GHz

-28.13 dBm



Start 10 MHz

*Res BW 1 MHz

VBW 1 MHz

Stop 2.5 GHz

Sweep 6.225 ms

hp 15:26:11 Feb 20, 2001

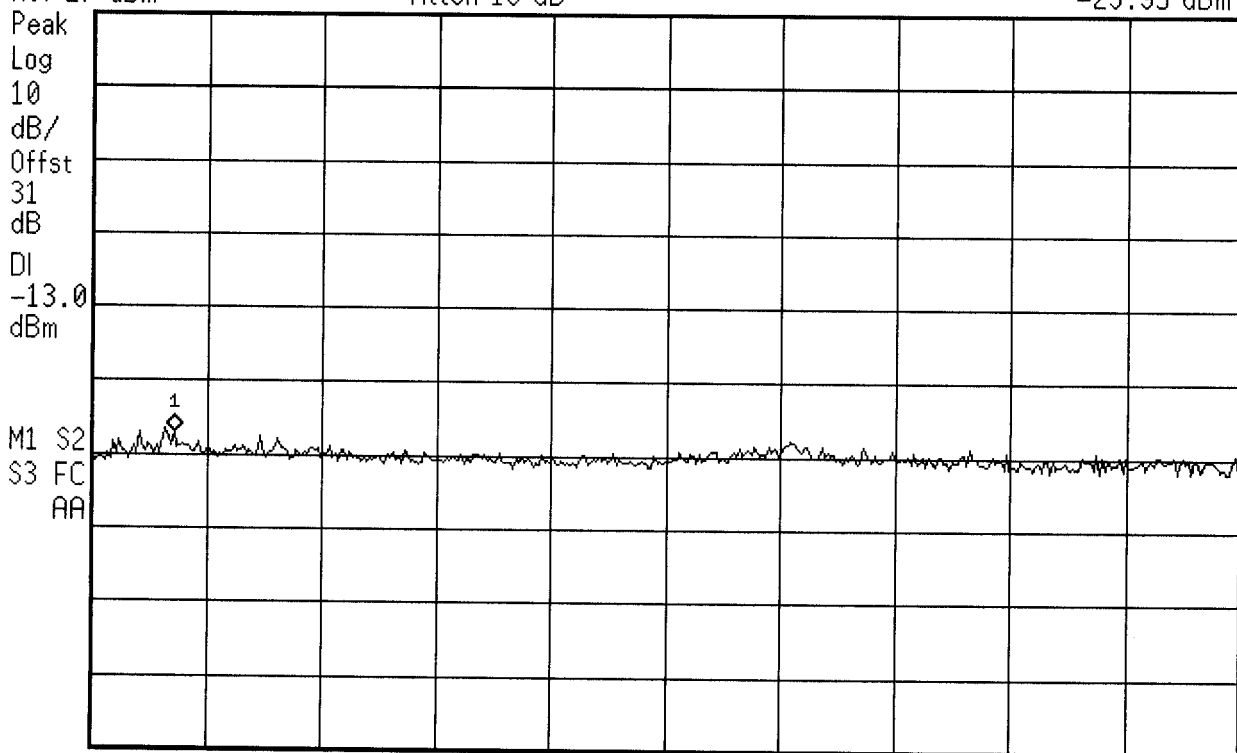
SEWON COND SPURS CH 991

Ref 27 dBm

Atten 10 dB

Mkr1 3.044 GHz

-29.95 dBm



Start 2.5 GHz

*Res BW 1 MHz

VBW 1 MHz

Stop 10 GHz

Sweep 18.75 ms



15:26:37 Feb 20, 2001

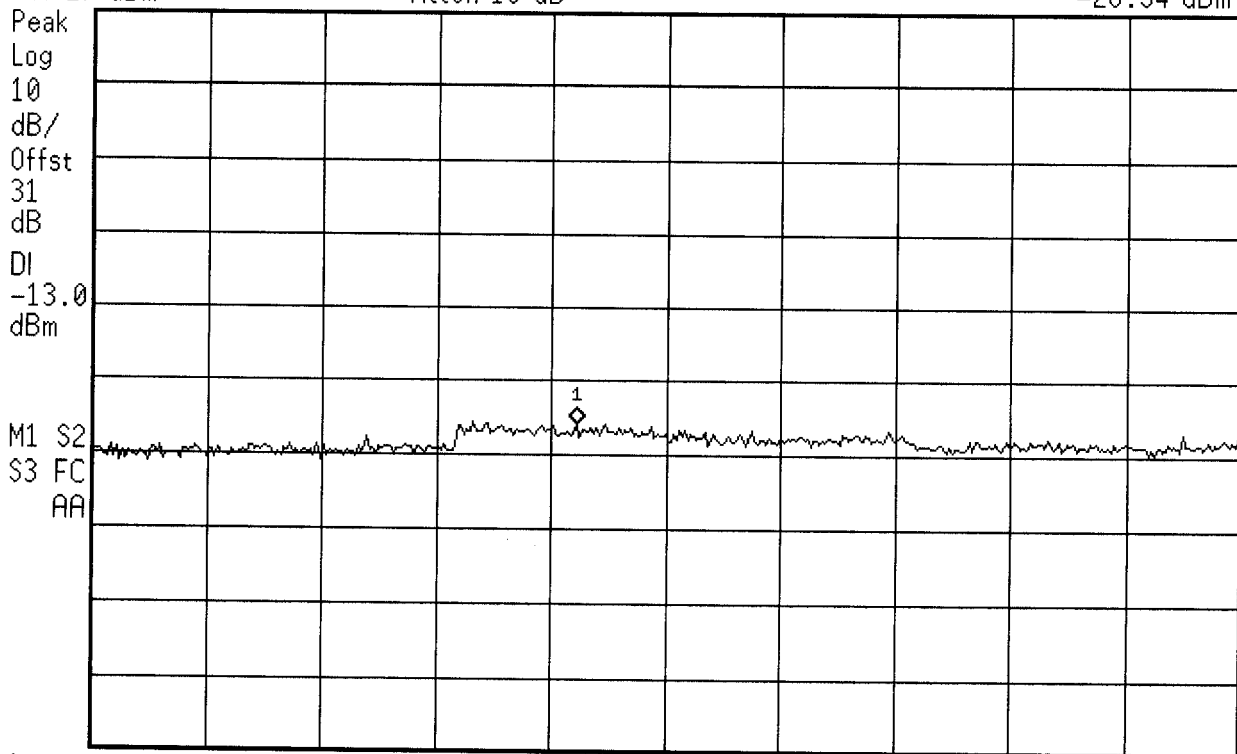
SEWON COND SPURS CH 991

Ref 27 dBm

Atten 10 dB

Mkr1 14.23 GHz

-28.94 dBm



Start 10 GHz

*Res BW 1 MHz

VBW 1 MHz

Stop 20 GHz

Sweep 100 ms



15:28:19 Feb 20, 2001

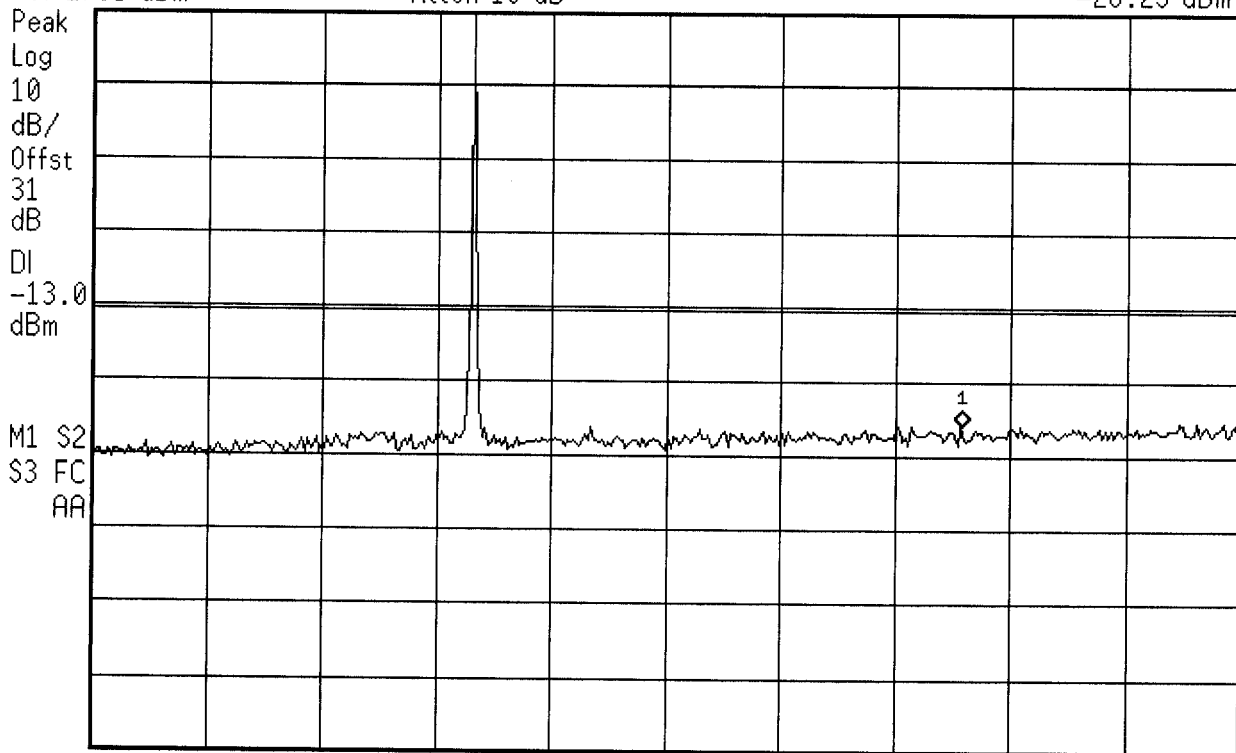
SEWON COND SPURS CH 383

Ref 27.5 dBm

Atten 10 dB

Mkr1 1.896 GHz

-28.29 dBm



Start 10 MHz

*Res BW 1 MHz

VBW 1 MHz

Stop 2.5 GHz

Sweep 6.225 ms



15:28:41 Feb 20, 2001

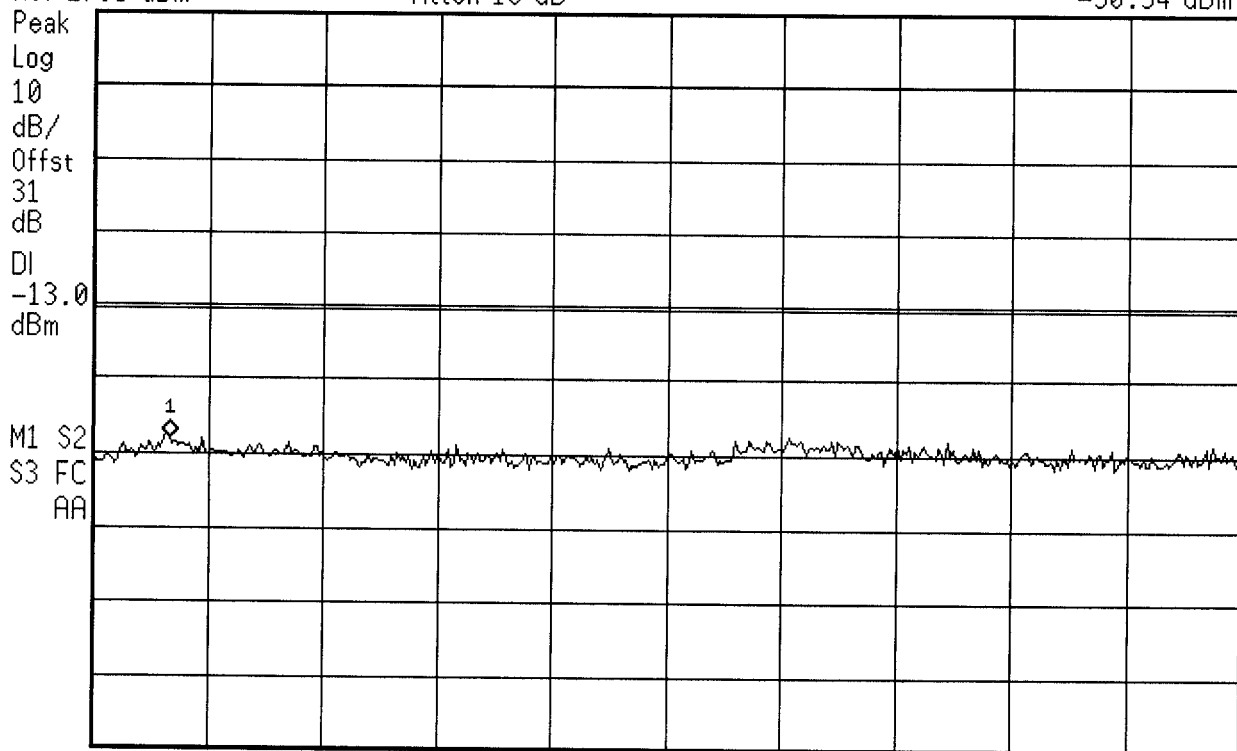
SEWON COND SPURS CH 383

Ref 27.5 dBm

Atten 10 dB

Mkr1 3.006 GHz

-30.34 dBm



Start 2.5 GHz

*Res BW 1 MHz

VBW 1 MHz

Stop 10 GHz

Sweep 18.75 ms



15:29:01 Feb 20, 2001

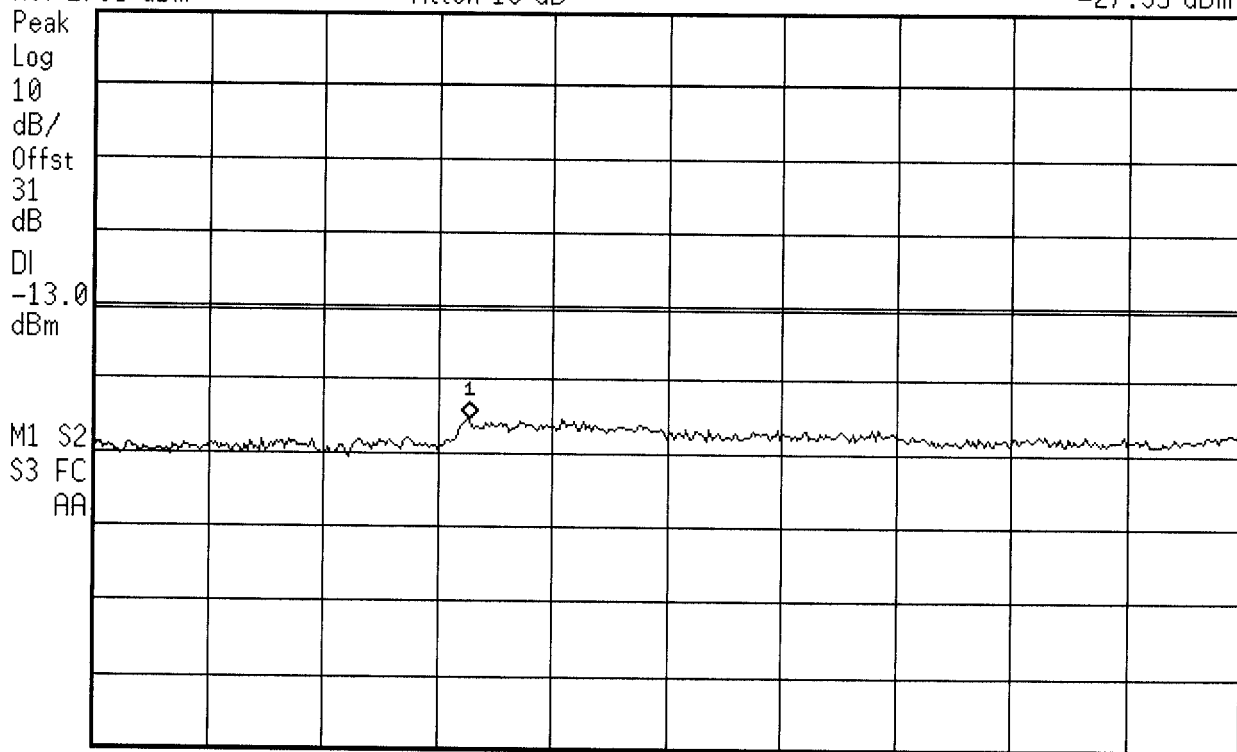
SEWON COND SPURS CH 383

Ref 27.5 dBm

Atten 10 dB

Mkr1 13.28 GHz

-27.95 dBm



Start 10 GHz
*Res BW 1 MHz

VBW 1 MHz

Stop 20 GHz
Sweep 100 ms



15:29:53 Feb 20, 2001

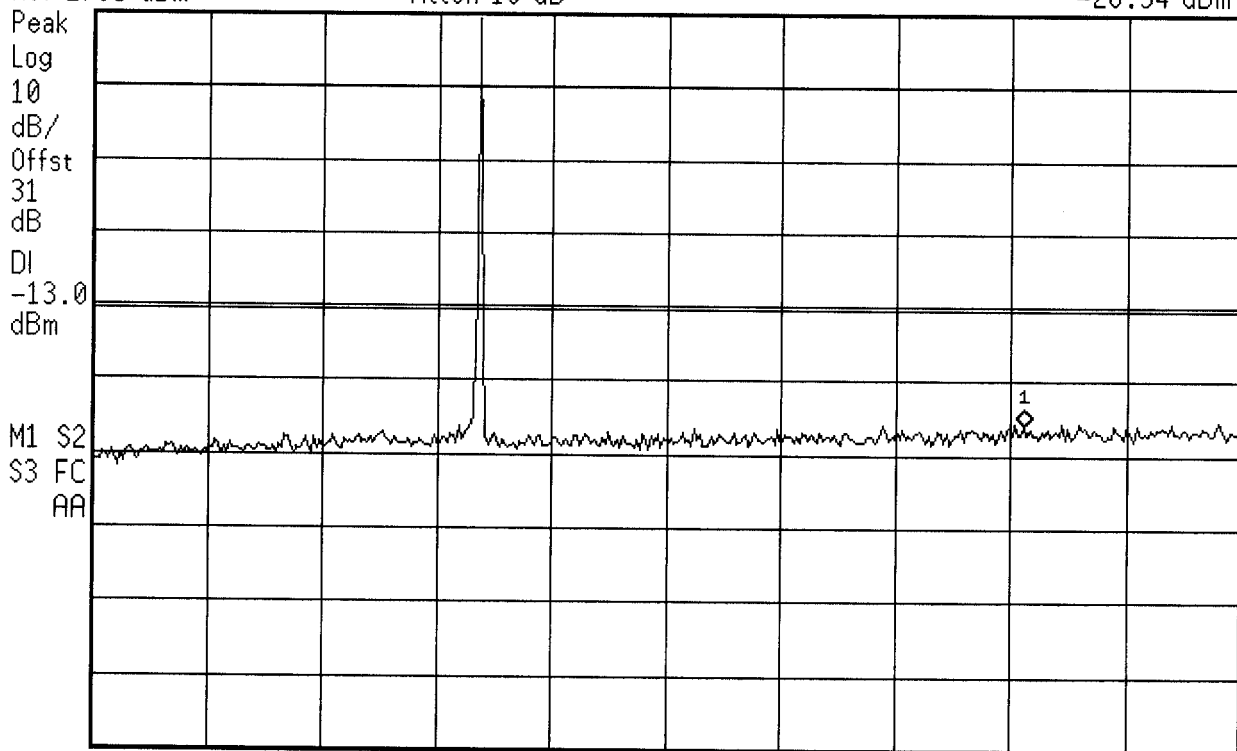
SEWON COND SPURS CH 799

Ref 27.5 dBm

Atten 10 dB

Mkr1 2.033 GHz

-28.34 dBm



Start 10 MHz

*Res BW 1 MHz

VBW 1 MHz

Stop 2.5 GHz

Sweep 6.225 ms

hp 15:30:13 Feb 20, 2001

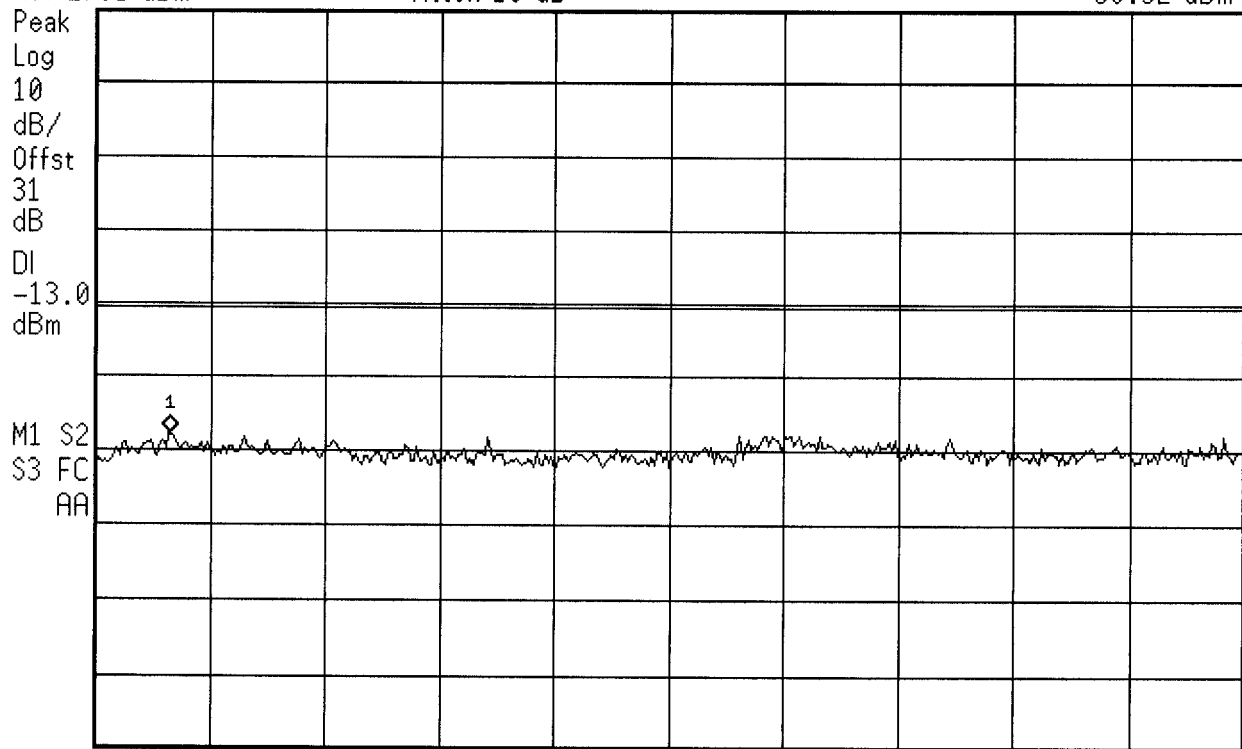
SEWON COND SPURS CH 799

Ref 27.5 dBm

Atten 10 dB

Mkr1 2.988 GHz

-30.32 dBm



Start 2.5 GHz

*Res BW 1 MHz

VBW 1 MHz

Stop 10 GHz

Sweep 18.75 ms

hp 15:30:30 Feb 20, 2001

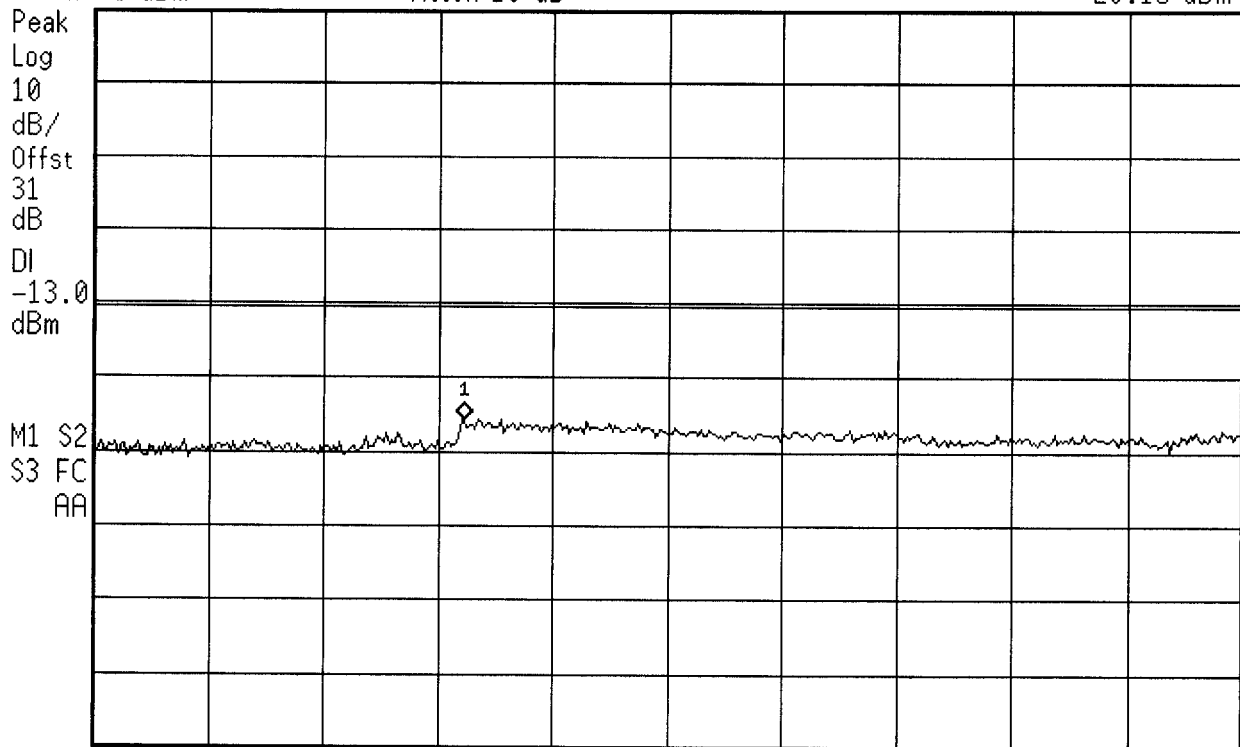
SEWON COND SPURS CH 799

Ref 27.5 dBm

Atten 10 dB

Mkr1 13.23 GHz

-28.15 dBm



Start 10 GHz

*Res BW 1 MHz

VBW 1 MHz

Stop 20 GHz

Sweep 100 ms

hp 15:38:15 Feb 20, 2001

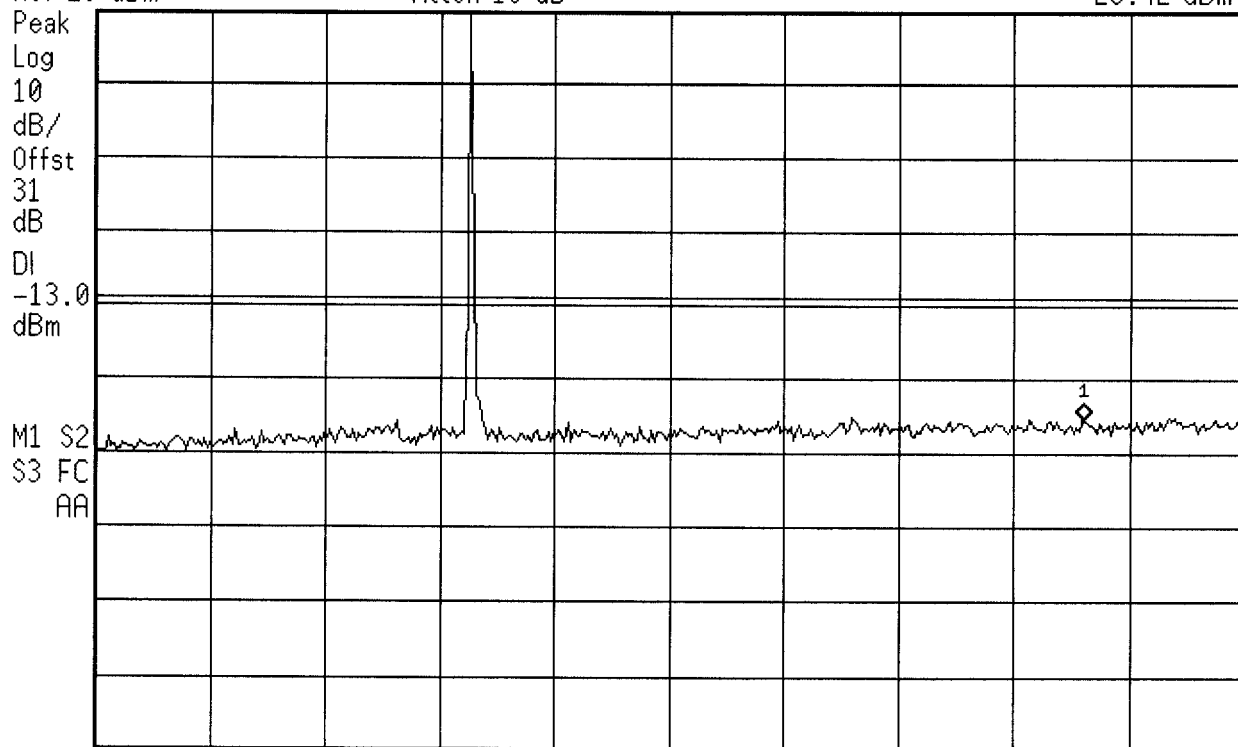
SEWON COND SPURS CH 1013

Ref 26 dBm

Atten 10 dB

Mkr1 2.151 GHz

-29.42 dBm



Start 10 MHz

#Res BW 1 MHz

VBW 1 MHz

Stop 2.5 GHz

Sweep 6.225 ms

hp 15:37:51 Feb 20, 2001

SEWON COND SPURS CH 1013

Mkr1 2.969 GHz

Ref 26 dBm

Atten 10 dB

-30.9 dBm

Peak

Log

10

dB/

Offst

31

dB

DI

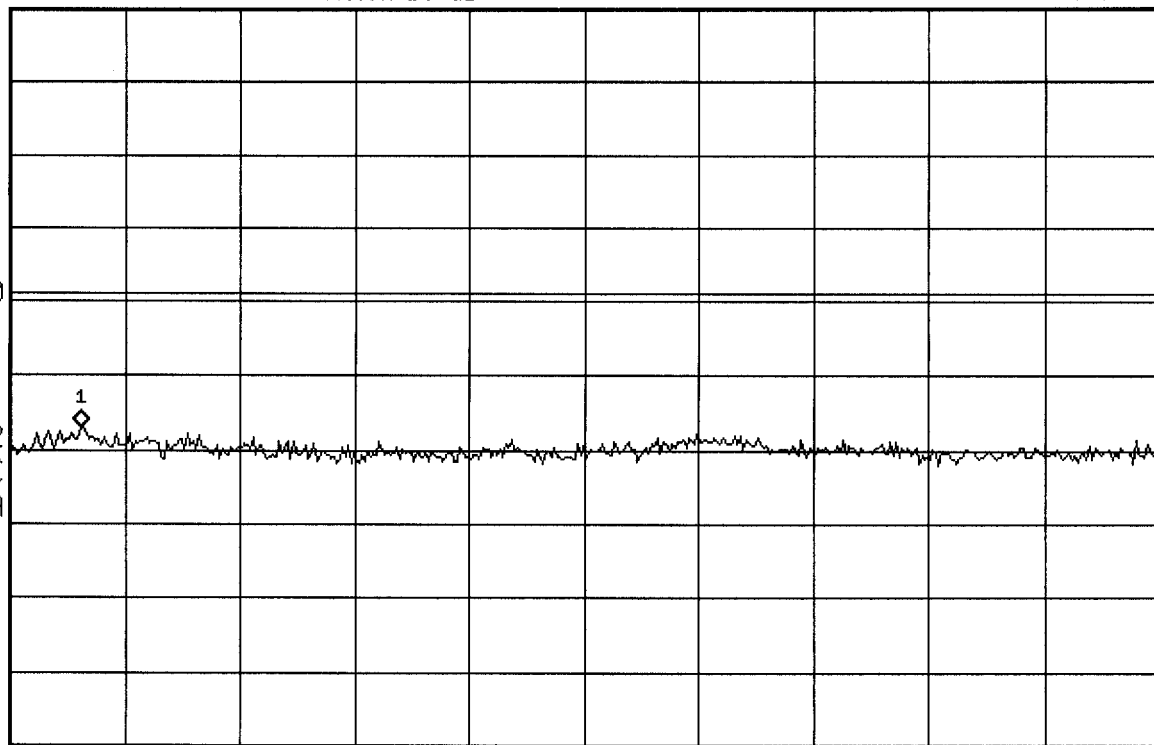
-13.0

dBm

M1 S2

S3 FC

AA



Start 2.5 GHz

#Res BW 1 MHz

VBW 1 MHz

Stop 10 GHz

Sweep 18.75 ms



15:37:30 Feb 20, 2001

SEWON COND SPURS CH 1013

Ref 26 dBm

Atten 10 dB

Mkr1 13.23 GHz

-29.51 dBm

Peak

Log

10

dB/

Offst

31

dB

DI

-13.0

dBm

M1 S2

S3 FC

AA

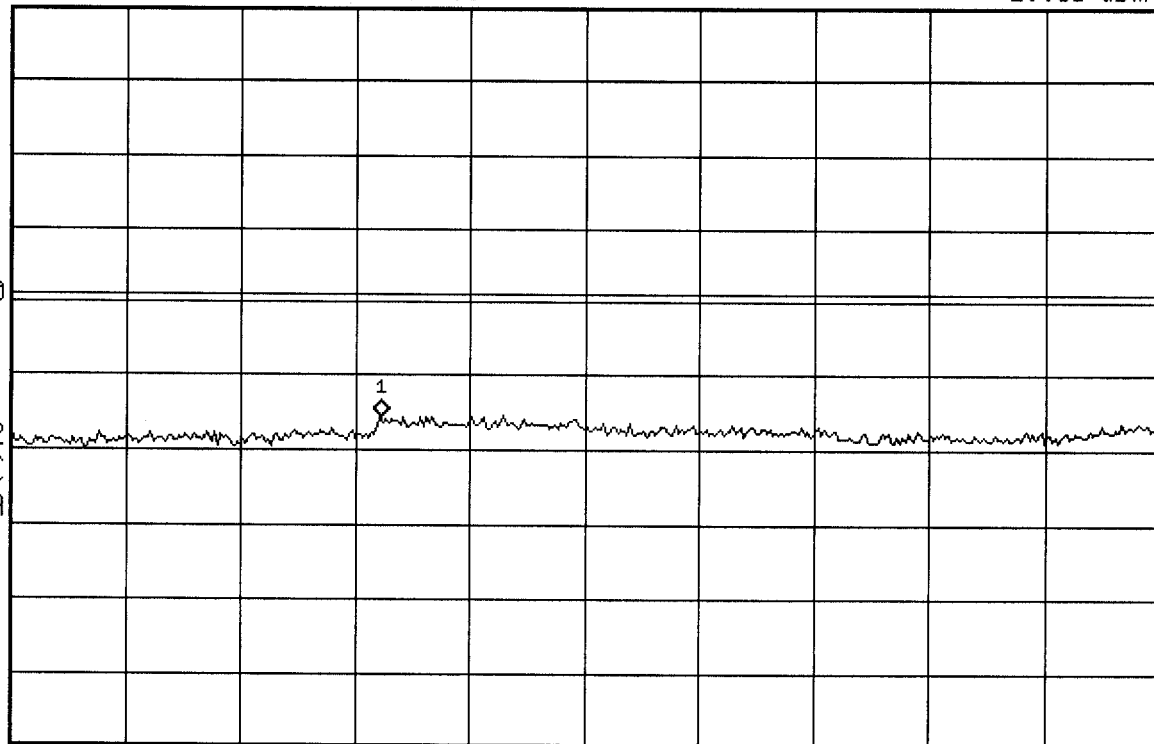
Start 10 GHz

*Res BW 1 MHz

VBW 1 MHz

Stop 20 GHz

Sweep 100 ms





15:35:53 Feb 20, 2001

SEWON COND SPURS CH 363

Ref 26 dBm

Atten 10 dB

Mkr1 2.425 GHz

-28.71 dBm

Peak

Log

10

dB/

Offst

31

dB

DI

-13.0

dBm

M1 S2

S3 FC

AA

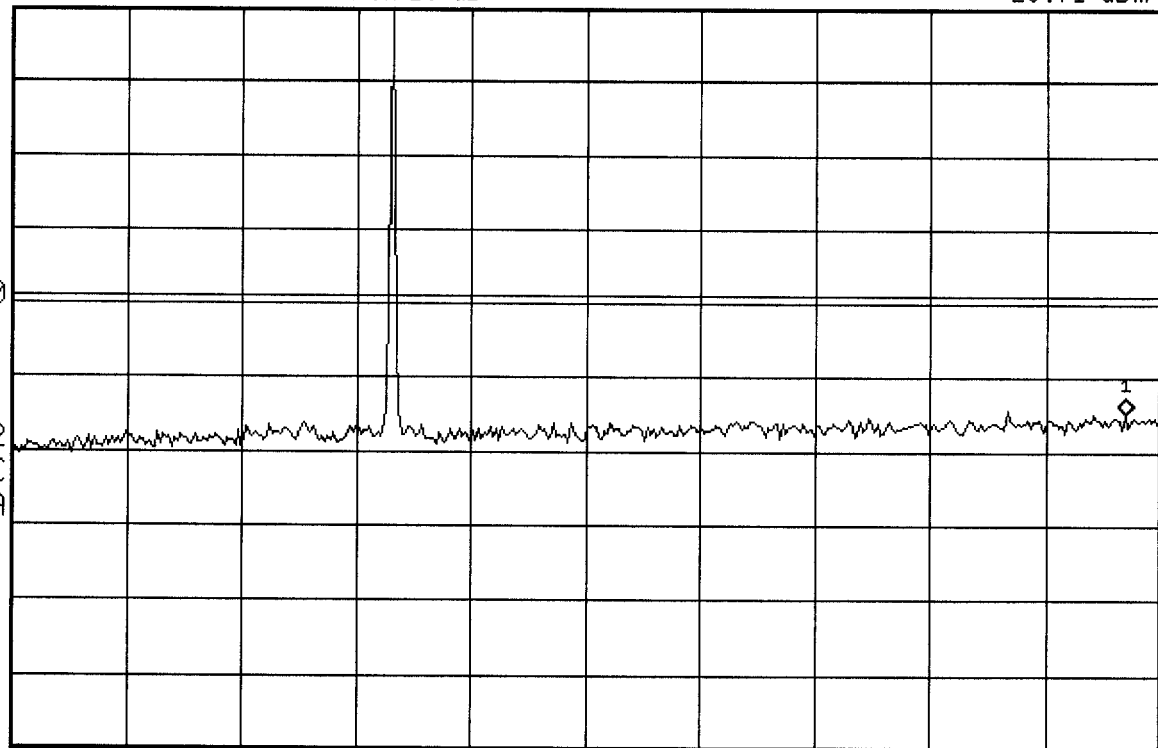
Start 10 MHz

#Res BW 1 MHz

VBW 1 MHz

Stop 2.5 GHz

Sweep 6.225 ms



hp 15:36:14 Feb 20, 2001

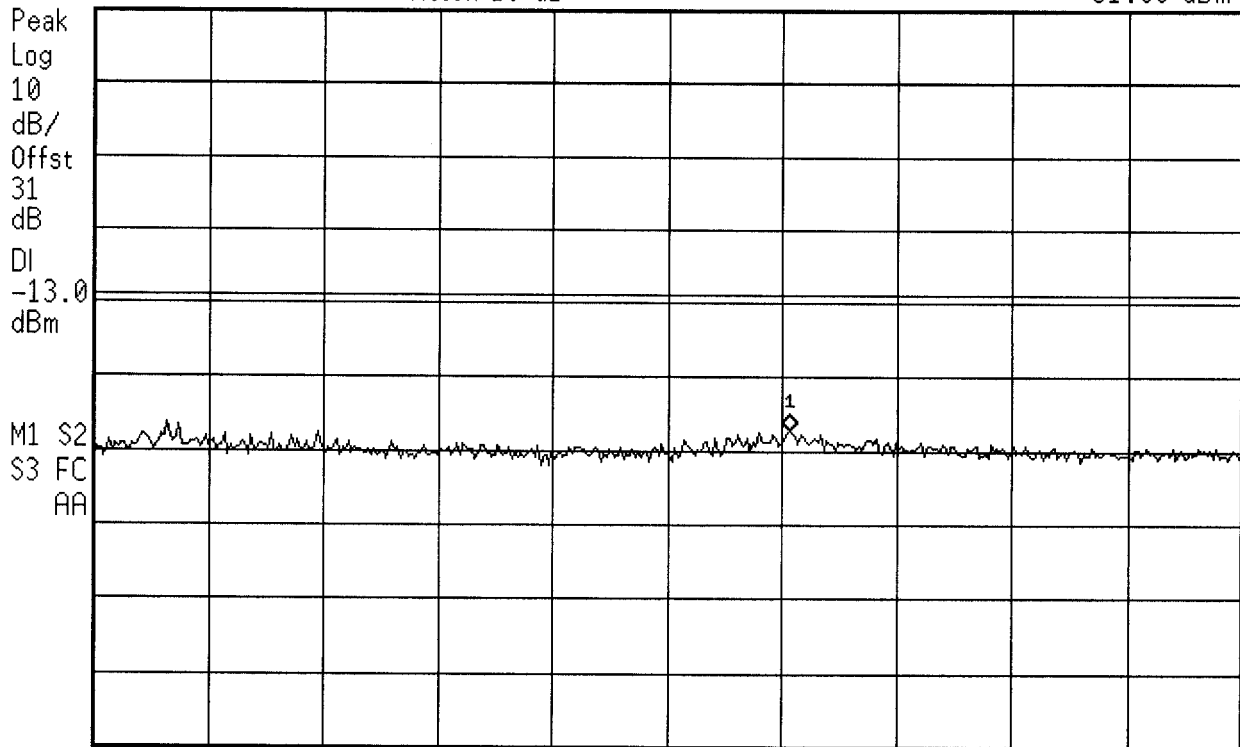
SEWON COND SPURS CH 363

Ref 26 dBm

Atten 10 dB

Mkr1 7.056 GHz

-31.06 dBm



Start 2.5 GHz

*Res BW 1 MHz

VBW 1 MHz

Stop 10 GHz

Sweep 18.75 ms

hp 15:36:33 Feb 20, 2001

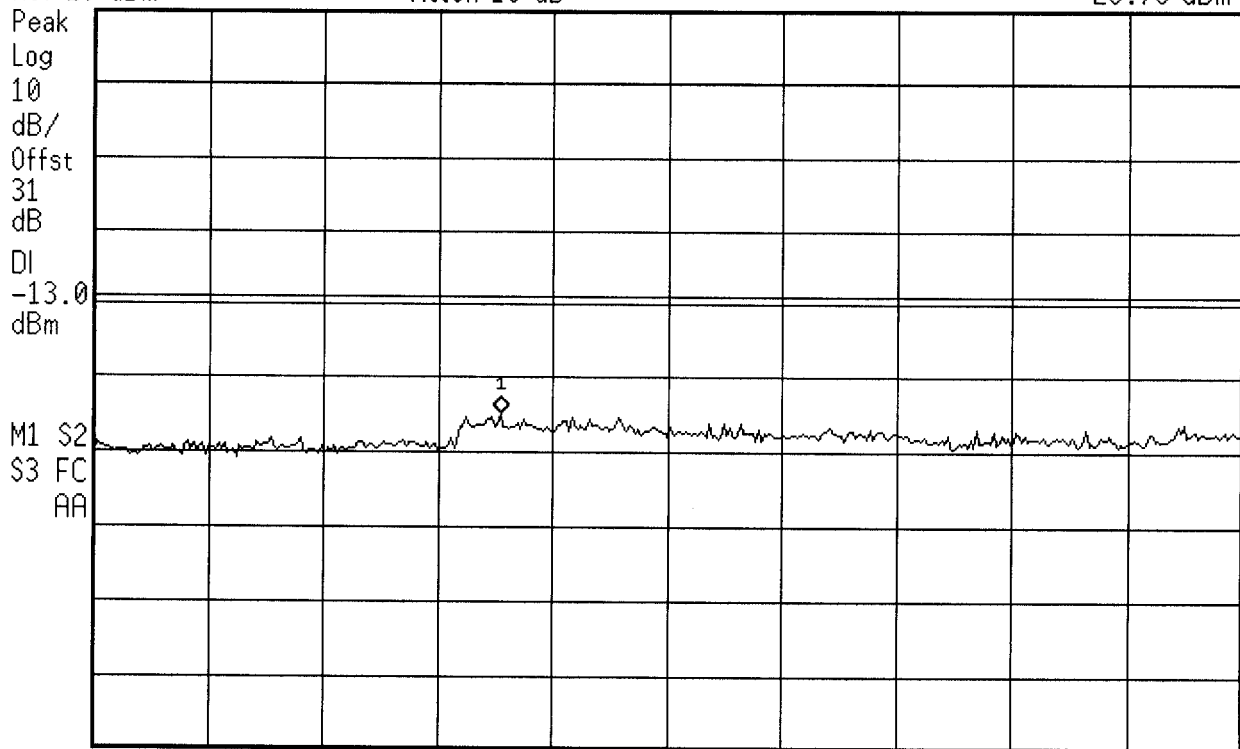
SEWON COND SPURS CH 363

Ref 26 dBm

Atten 10 dB

Mkr1 13.55 GHz

-28.76 dBm



Start 10 GHz

*Res BW 1 MHz

VBW 1 MHz

Stop 20 GHz

Sweep 100 ms

hp 15:39:12 Feb 20, 2001

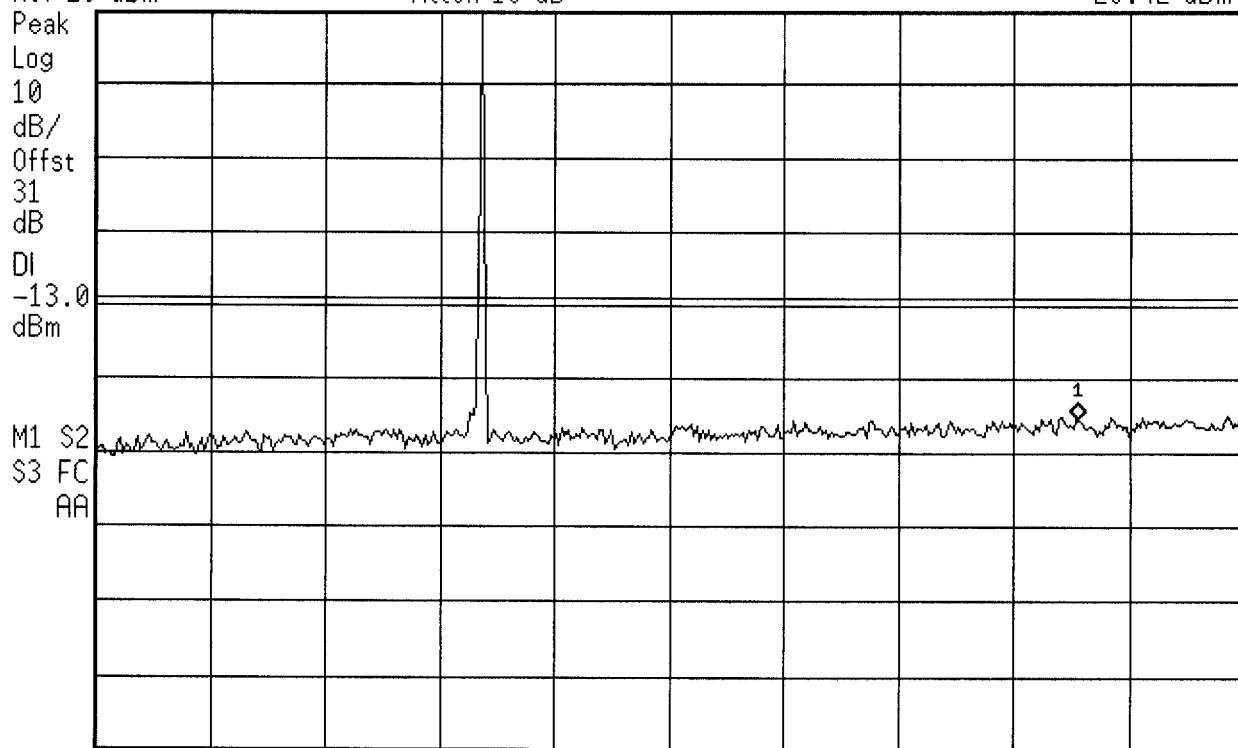
SEWON COND SPURS CH 777

Ref 26 dBm

Atten 10 dB

Mkr1 2.139 GHz

-29.42 dBm



Start 10 MHz

*Res BW 1 MHz

VBW 1 MHz

Stop 2.5 GHz

Sweep 6.225 ms



15:39:29 Feb 20, 2001

SEWON COND SPURS CH 777

Ref 26 dBm

Atten 10 dB

Mkr1 3.081 GHz

-31.32 dBm

Peak

Log

10

dB/

Offst

31

dB

DI

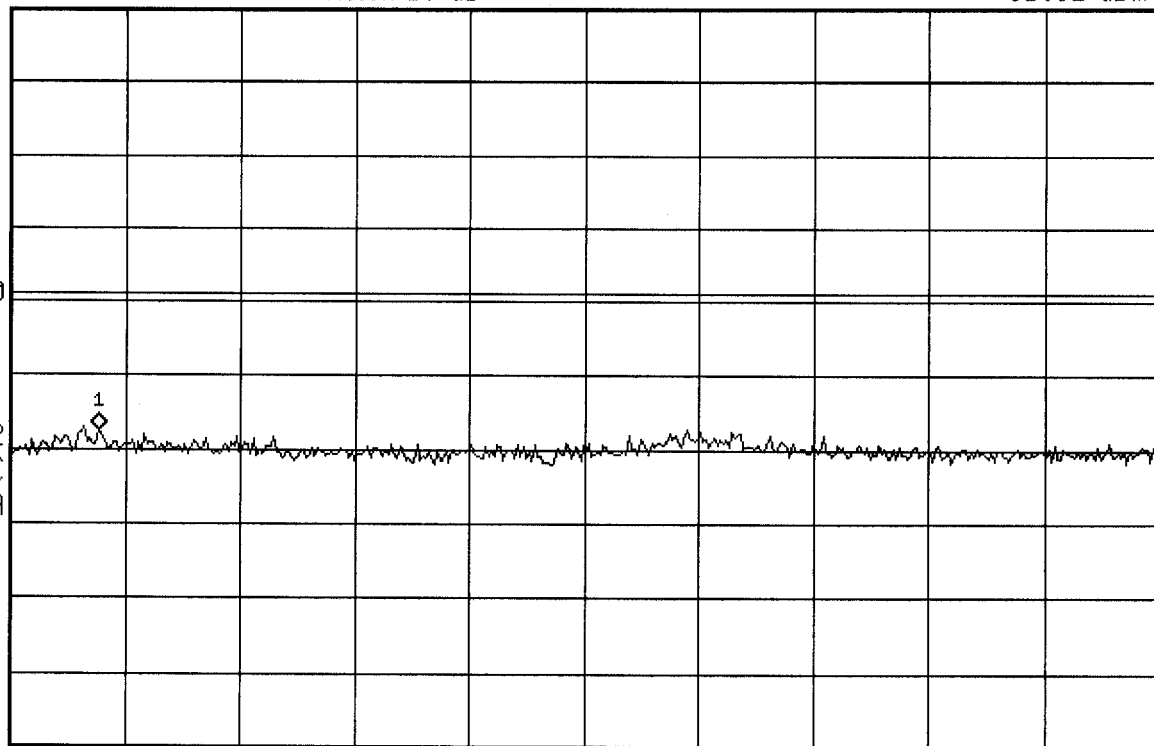
-13.0

dBm

M1 S2

S3 FC

AA



Start 2.5 GHz

#Res BW 1 MHz

VBW 1 MHz

Stop 10 GHz

Sweep 18.75 ms

hp 15:39:50 Feb 20, 2001

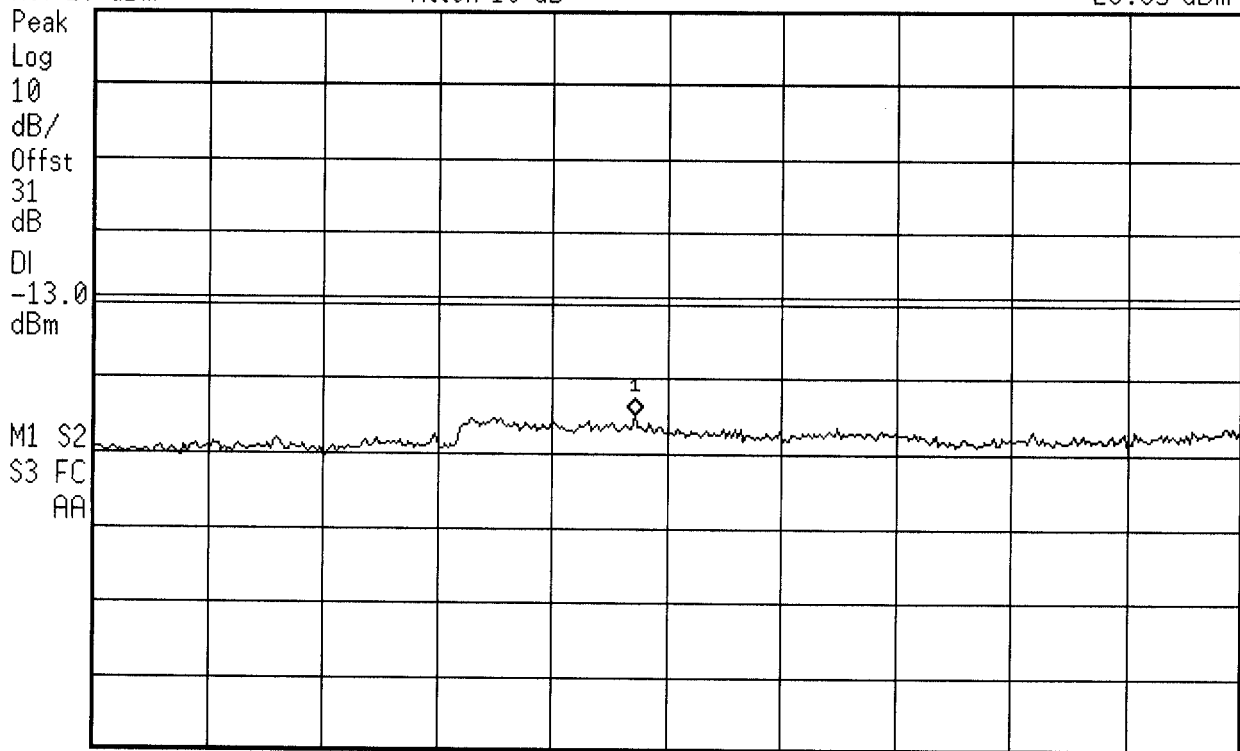
SEWON COND SPURS CH 777

Ref 26 dBm

Atten 10 dB

Mkr1 14.73 GHz

-28.85 dBm



Start 10 GHz

*Res BW 1 MHz

VBW 1 MHz

Stop 20 GHz

Sweep 100 ms



15:49:50 Feb 20, 2001

SEWON CDMA CH 1013

Ref 26 dBm

Atten 10 dB

Mkr1 824.563 MHz

16.66 dBm

Peak

Log

10

dB/

Offst

31

dB

DI

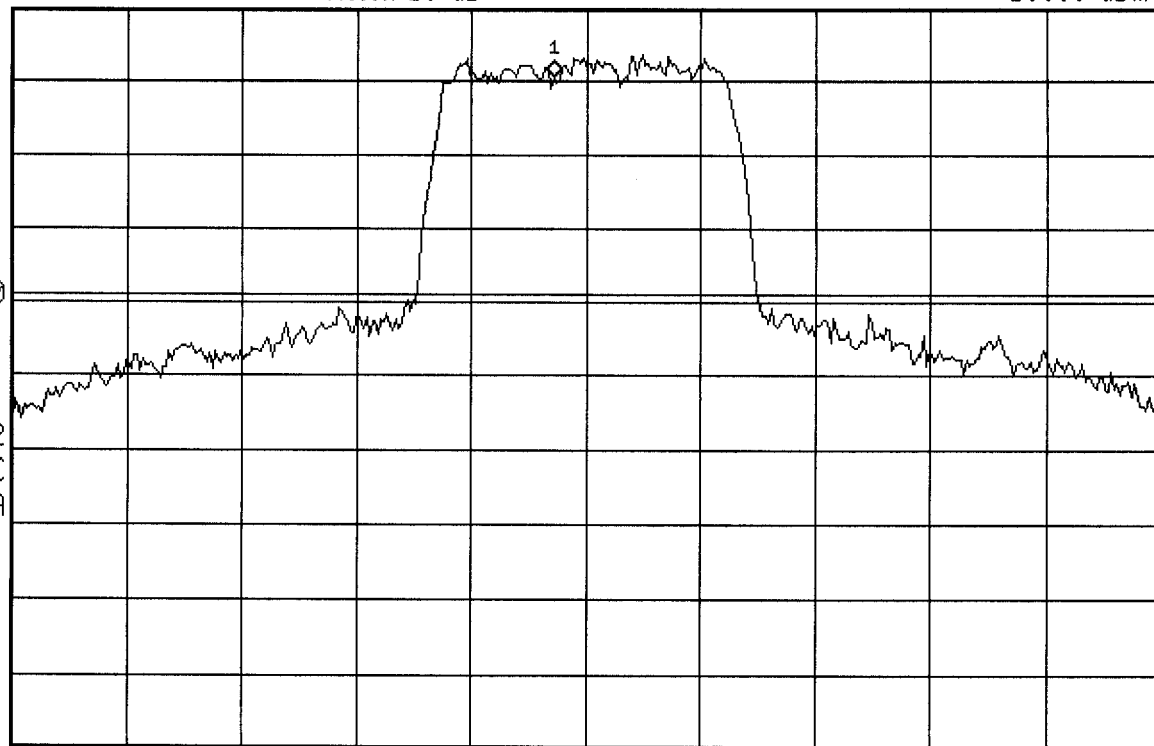
-13.0

dBm

M1 S2

S3 FC

AA



Center 824.7 MHz

*Res BW 30 kHz

VBW 30 kHz

Span 5 MHz

Sweep 13.89 ms

hp 15:48:34 Feb 20, 2001

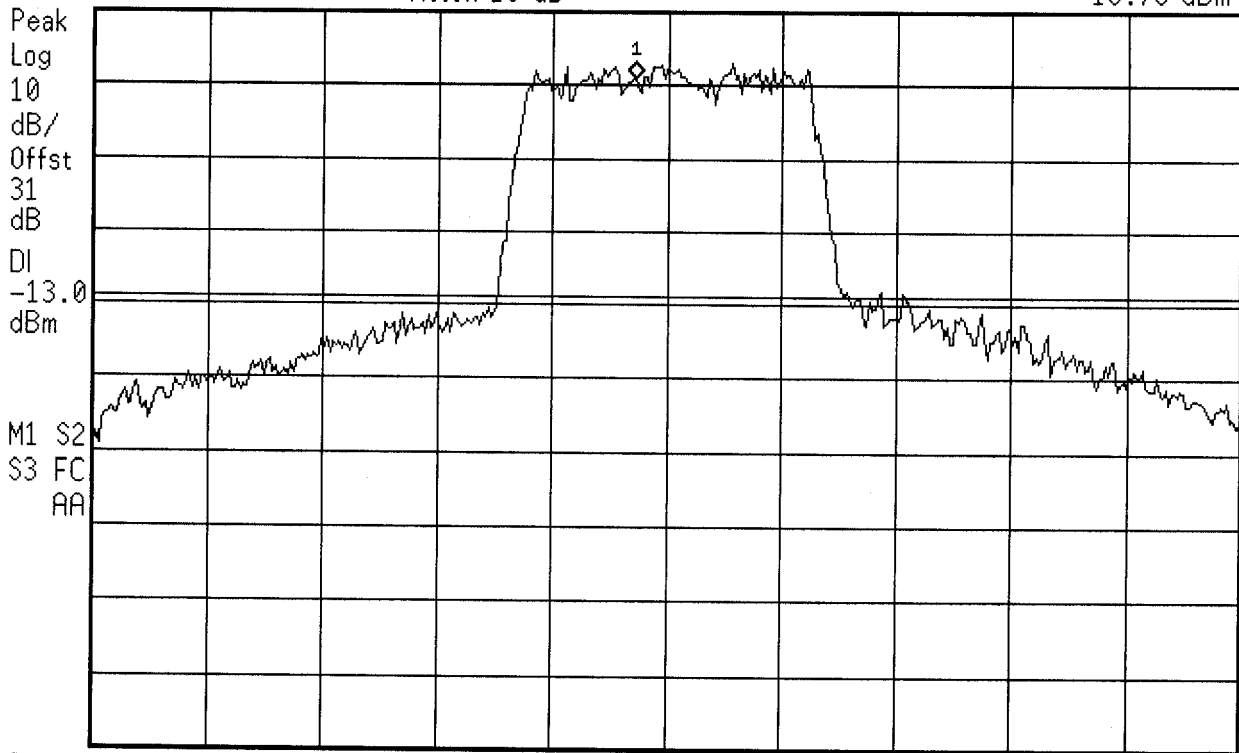
SEWON CDMA CH 363

Ref 26 dBm

Atten 10 dB

Mkr1 835.753 MHz

16.76 dBm



Center 835.9 MHz

#Res BW 30 kHz

VBW 30 kHz

Span 5 MHz

Sweep 13.89 ms

hp 15:49:15 Feb 20, 2001

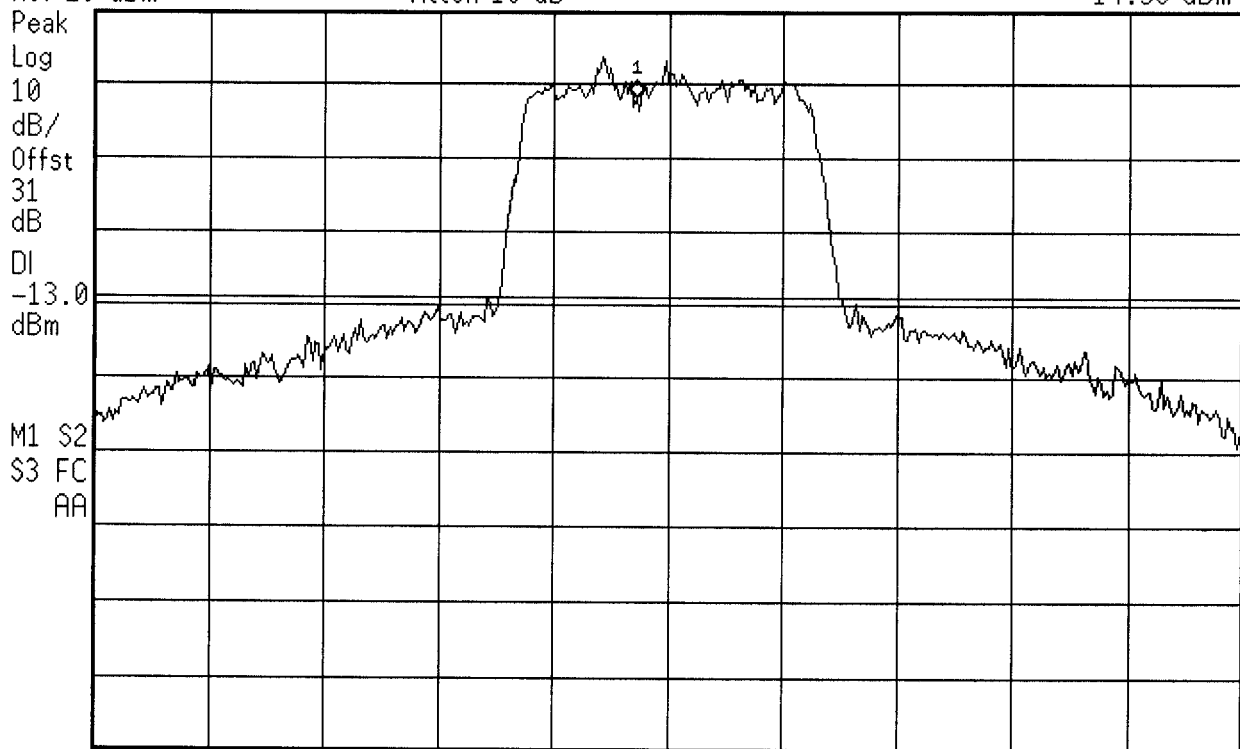
SEWON CDMA CH 777

Ref 26 dBm

Atten 10 dB

Mkr1 848.173 MHz

14.36 dBm



Center 848.3 MHz

*Res BW 30 kHz

VBW 30 kHz

Span 5 MHz

Sweep 13.89 ms



15:50:56 Feb 20, 2001

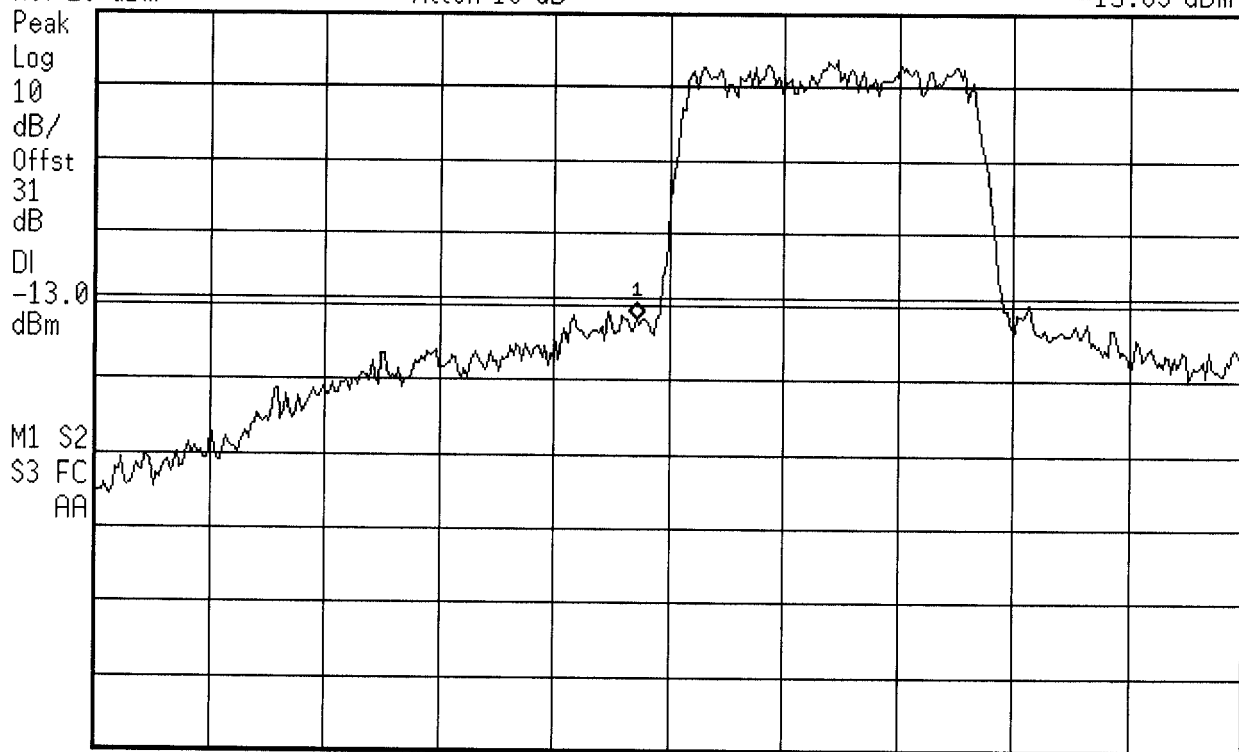
SEWON BAND EDGE LOW CH

Ref 26 dBm

Atten 10 dB

Mkr1 823.863 MHz

-15.89 dBm



Center 824 MHz

*Res BW 30 kHz

VBW 30 kHz

Span 5 MHz

Sweep 13.89 ms



15:51:50 Feb 20, 2001

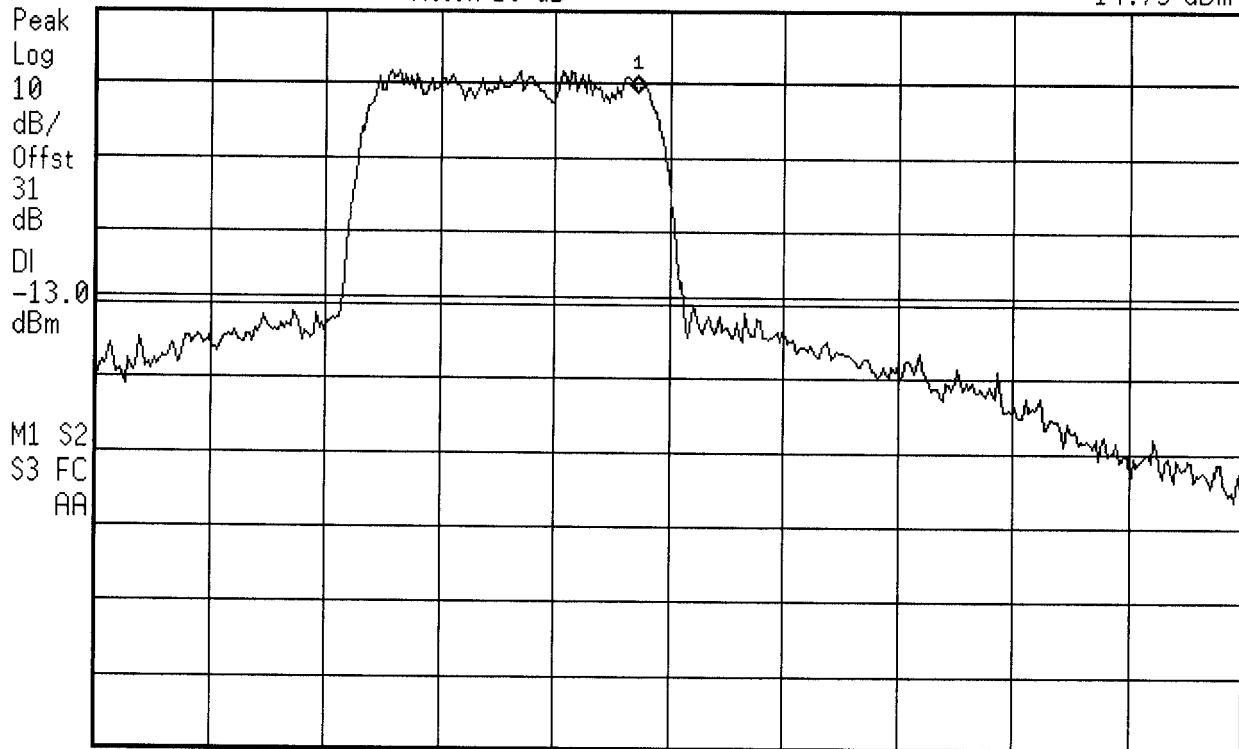
SEWON BAND EDGE HIGH CH

Ref 26 dBm

Atten 10 dB

Mkr1 848.863 MHz

14.73 dBm



Center 849 MHz

#Res BW 30 kHz

VBW 30 kHz

Span 5 MHz

Sweep 13.89 ms



11:17:33 Feb 21, 2001

SEWON 99% BAND WIDTH

Ref 26 dBm

Atten 10 dB

Samp

Log

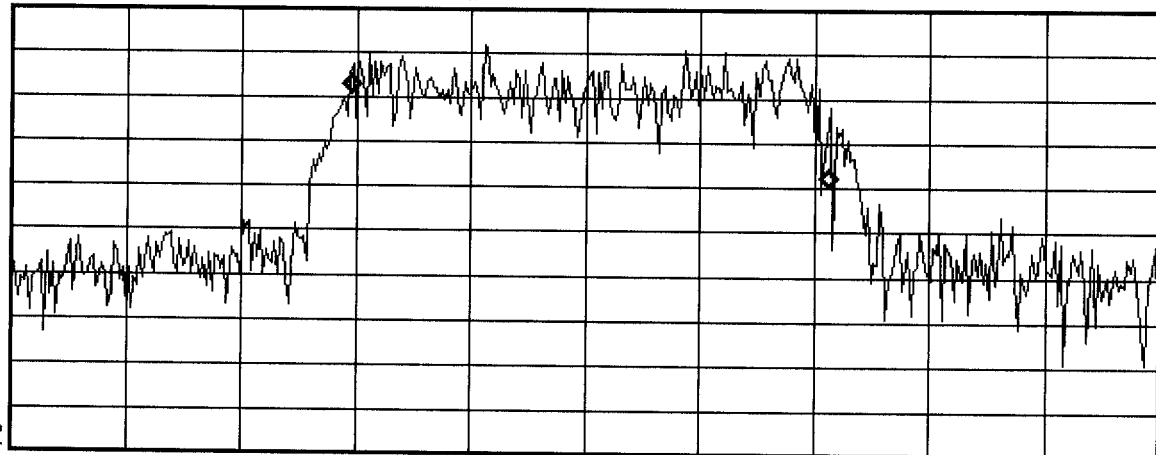
10

dB/

Offst

31

dB



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

Occ BW % Pwr 99.00 %

1.255 MHz

Transmit Freq Error 10.38 kHz