

CERTIFICATE OF COMPLIANCE **FCC PART 22 CERTIFICATION**

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Applicant:

WIDE TELECOM INC.
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Torrance, CA 90503
Attn: Matt Park, Sales Manager
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FCC Classification:	Licensed Non-Broadcast Transmitter Held to Ear (TNE)
FCC Rule Part(s):	§22(H), §22.901(d), §2
FCC ID:	NPWWSH-100
Model(s):	WSH-100
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:	0.204 Watts ERP (AMPS) 0.190 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.



TABLE OF CONTENTS

1.1 GENERAL INFORMATION	1
2.1 MEASUREMENT PROCEDURES	2
Transmitter Audio Frequency Response (2.1047)	2
Audio Low Pass Filter Frequency Response (22.915)	2
Modulation Limiting (2.1047, 22.915)	2
Occupied Bandwidth (2.1049)	3
Spurious/Harmonic Emissions at Antenna Terminal (2.1051)	3
Radiated Spurious & Harmonic Emissions (2.1053)	3
Frequency Stability/Temperature Variation (2.1055)	4
3.1 TEST DATA	5
Modulation Characteristics	5-7
Effective Radiated Power Output	8-9
Field Strength of Spurious Radiation	10-15
Frequency Stability	16-17
4.1 SAMPLE CALCULATIONS	18
5.1 LIST OF TEST EQUIPMENT	19
6.1 CONCLUSION	20

ATTACHMENT A:	COVER LETTER(S)
ATTACHMENT B:	ATTESTATION STATEMENT(S)
ATTACHMENT C:	TEST REPORT
ATTACHMENT D:	TEST PLOTS
ATTACHMENT E:	FCC ID LABEL & LOCATION
ATTACHMENT F:	TEST SETUP PHOTOGRAPHS
ATTACHMENT G:	EXTERNAL EUT PHOTOGRAPHS
ATTACHMENT H:	INTERNAL EUT PHOTOGRAPHS
ATTACHMENT I:	BLOCK DIAGRAM(S)
ATTACHMENT J:	CIRCUIT DIAGRAMS / DESCRIPTION
ATTACHMENT K:	PARTS LIST / TUNE UP PROCEDURE
ATTACHMENT L:	OPERATIONAL DESCRIPTION
ATTACHMENT M:	USER'S MANUAL
ATTACHMENT N:	SAR MEASUREMENT REPORT

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

<u>APPLICANT:</u> WIDE TELECOM INC. 3551 Voyager St., Suite 103 Torrance, CA 90503 Attn: Matt Park, Sales Manager	
FCC ID	NPWWSH-100
Model(s)	WSH-100
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	0.204 Watts ERP (AMPS) 0.190 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-ion Standard Model: B1-LPS or 3.7V Li-ion Extended Model: B1-L1M

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.

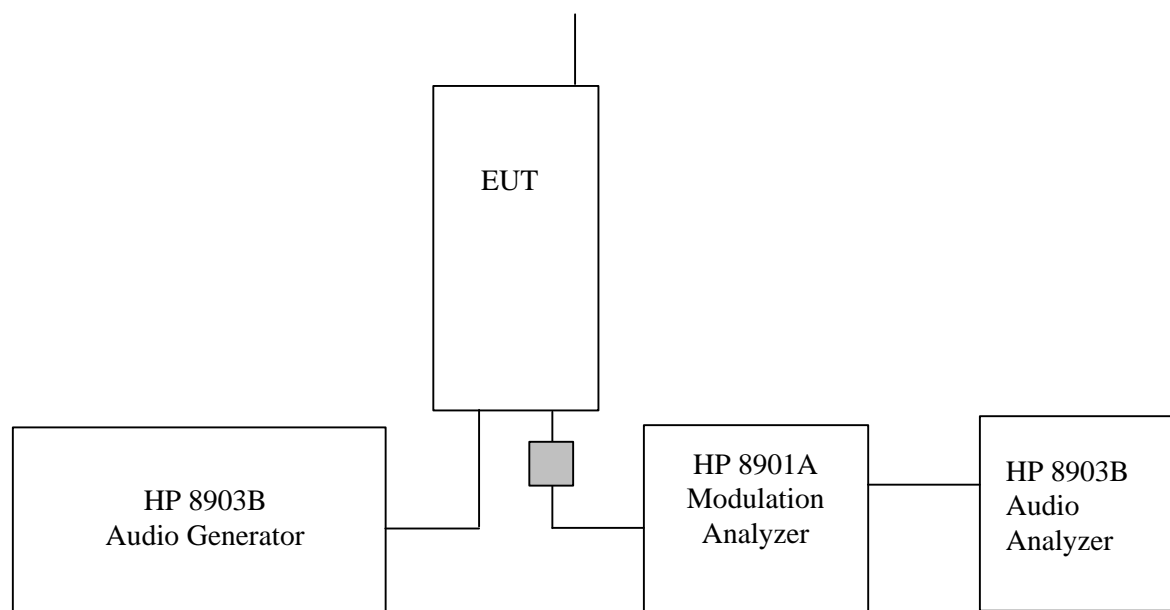
2.3 AUDIO LOW PASS FILTER FREQUENCY RESPONSE - §22.915(d)

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 (± 3.6 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 50 Ω 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 provide 50% modulation. The antenna output terminal of the EUT was connected to the input of a 50 Ω 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:

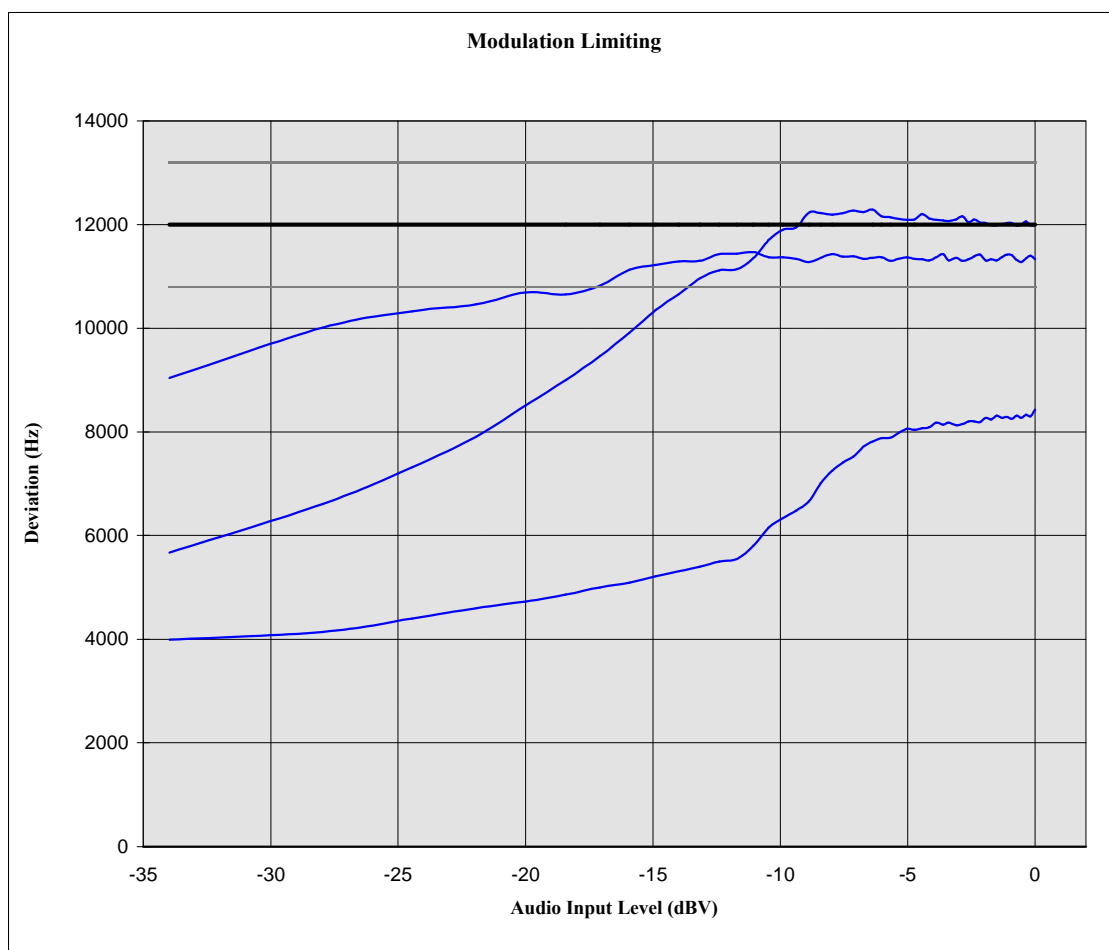
1. The carrier frequency of the transmitter and the individual oscillators is measured at room temperature (25°C to 27°C to provide a reference).
2. The equipment is subjected to an overnight “soak” at -30°C without any power applied.
3. After the overnight “soak” at -30°C (usually 14-16 hours), the 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)

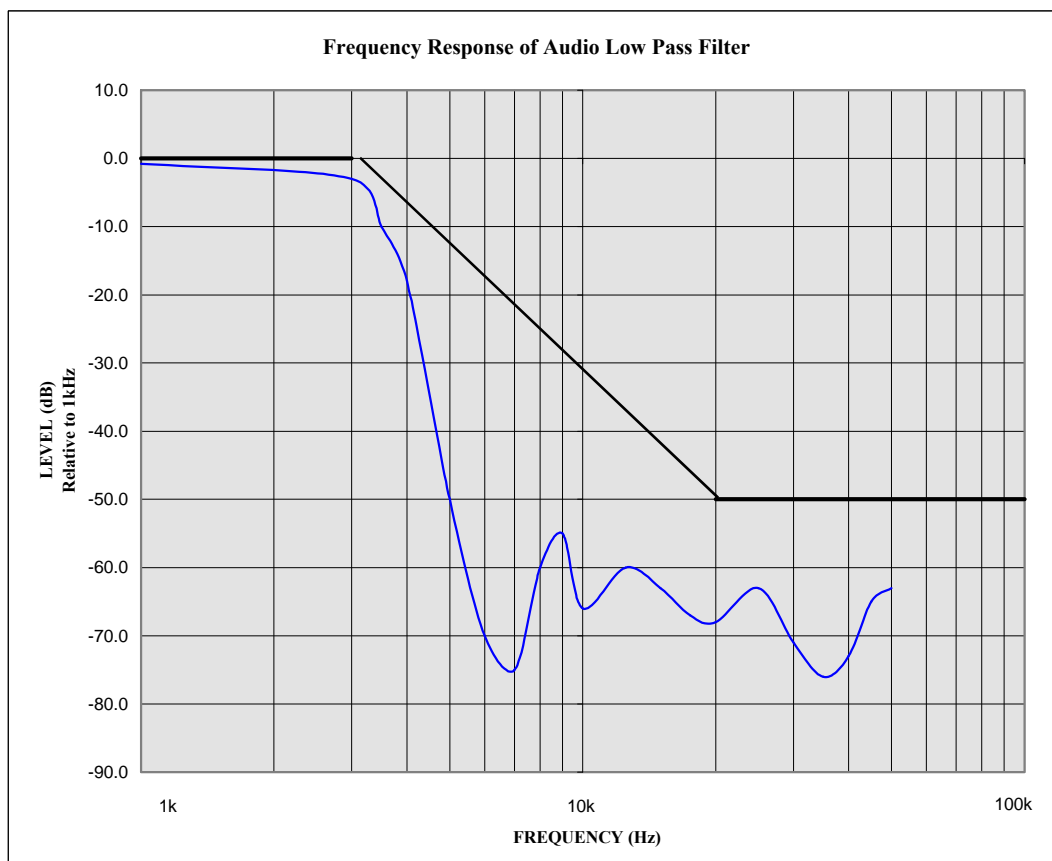
Test Date: 11/24/2000
EUT: WIDE TELECOM Dual-Mode Cellular Phone
Model: WSH-100
FCC ID: NPWWSH-100

REFERENCE: 1 kHz = 0 dB



Test Date: 11/24/2000
EUT: WIDE TELECOM Dual-Mode Cellular Phone
Model: WSH-100
FCC ID: NPWWSH-100

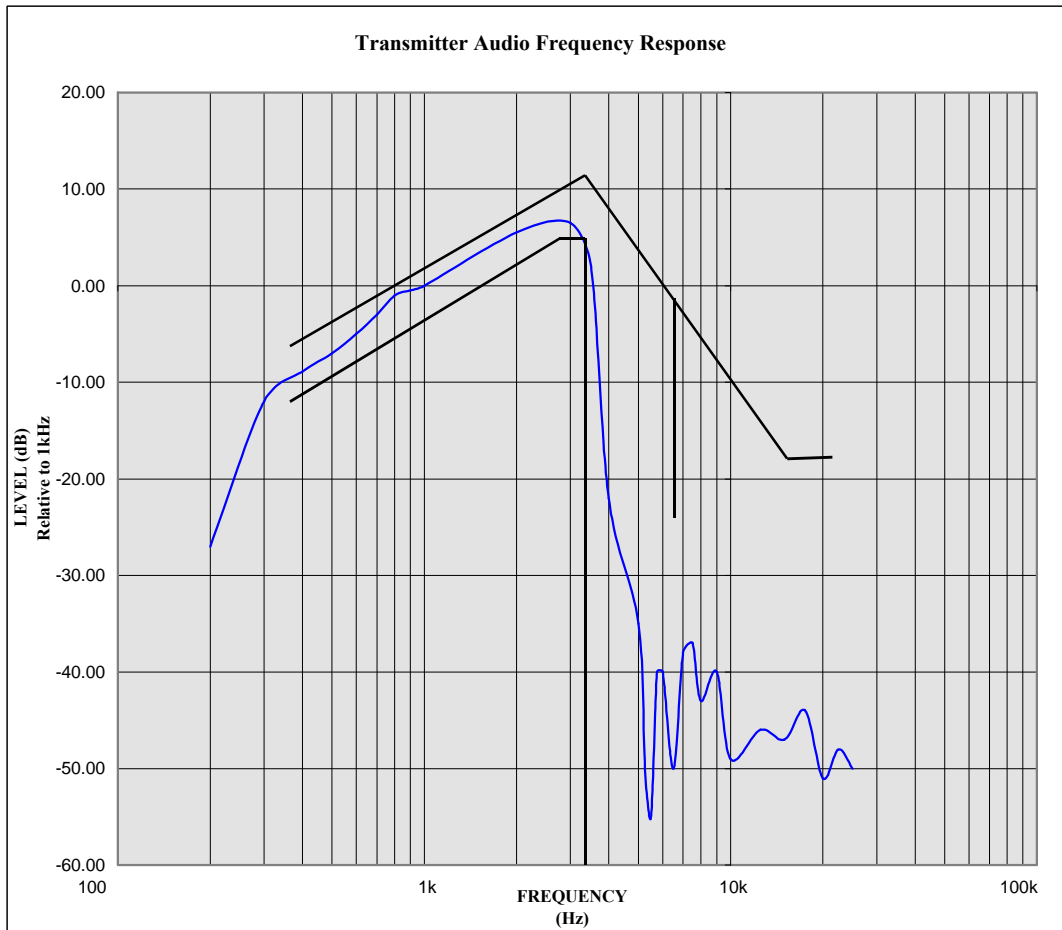
REFERENCE: 1 kHz = 0 dB



3.4 TRANSMITTER AUDIO FREQUENCY RESPONSE - §2.1047(a)

Test Date: 11/24/2000
EUT: WIDE TELECOM Dual-Mode Cellular Phone
Model: WSH-100
FCC ID: NPWWSH-100

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	
		V	H			(dBm)	(Watts)
824.04	24.0	- 13.67	- 12.43	- 1.44	24.54	23.10	0.204
836.49	24.0	- 15.88	- 14.64	- 1.34	23.68	22.34	0.171
848.97	23.7	- 14.48	- 13.21	- 1.24	23.36	22.12	0.163
824.04*	24.0	- 14.16	- 12.88	- 1.44	24.32	22.88	0.194

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, except for * using the extended battery.

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	23.7	- 14.55	- 12.43	- 1.44	24.22	22.78	0.190
835.89	23.7	- 16.08	- 15.15	- 1.34	23.49	22.15	0.164
848.31	23.6	- 15.21	- 14.66	- 1.24	22.93	21.69	0.148
824.70*	23.7	- 15.30	-13.18	- 1.44	23.98	22.54	0.179

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, except for * using the extended battery.

3.6 FIELD STRENGTH OF SPURIOUS RADIATION - §2.1053

Operating Frequency: 824.04 MHz
Channel: 991 (Low)
Measured Conducted Power: 24.0 dBm
Modulation: ST (Signaling Tone)
Distance: 3 meters
Limit: $43 + 10 \log_{10} (W) = 40.31 \text{ dBc}$

AMPS MODE

Frequency (MHz)	Level (dBm)	Horn Forward Cond. Pwr. (dBm)	Standard-Gain Horn Antenna Gain (dBi)	POL (H/V)	EIRP (dBm)	ERP (dBm)	dBc
1648.08	≤ -72.54	-44.76	6.6	H	-36.02	-38.16	61.26
2472.12	≤ -81.03	-51.23	7.8	H	-41.29	-43.43	66.53
3296.16	≤ -94.52	-67.94	7.75	H	-58.05	-60.19	83.29
4120.20	≤ -106.21	-77.19	7.6	H	-67.45	-69.59	92.69
4944.24	≤ -105.73	-79.37	8.5	H	-68.73	-70.87	93.97
5768.28	≤ -104.95	-74.07	8.8	H	-63.13	-65.27	88.37
6592.32	≤ -105.83	-66.47	9.6	H	-54.73	-56.87	79.97
7416.36	≤ -103.77	-65.63	9.0	H	-72.49	-74.63	97.73
8240.40	≤ -103.81	-67.83	9.3	H	-56.39	-58.53	81.63

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: 836.49 MHz
Channel: 383 (Mid)
Measured Conducted Power: 24.0 dBm
Modulation: ST (Signaling Tone)
Distance: 3 meters
Limit: $43 + 10 \log_{10} (W) = 40.31 \text{ dBc}$

Frequency (MHz)	Level (dBm)	Horn Forward Cond. Pwr. (dBm)	Standard-Gain Horn Antenna Gain (dBi)	POL (H/V)	EIRP (dBm)	ERP (dBm)	dBc
1672.98	≤ -75.01	-47.23	6.6	H	-38.49	-40.63	62.97
2509.47	≤ -82.86	-53.06	7.8	H	-43.12	-45.26	67.60
3345.96	≤ -94.50	-67.92	7.75	H	-58.03	-60.17	82.51
4182.45	≤ -104.80	-75.78	7.6	H	-66.04	-68.18	90.52
5018.94	≤ -106.84	-80.48	8.5	H	-69.84	-71.98	94.32
5855.43	≤ -104.23	-73.35	8.8	H	-62.41	-64.55	86.89
6691.92	≤ -103.24	-63.88	9.6	H	-52.14	-54.28	76.62
7528.41	≤ -103.78	-64.83	9.0	H	-53.69	-55.83	78.17
8364.90	≤ -104.76	-68.78	9.3	H	-57.34	-59.48	81.82

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: 23.7 dBm
Modulation: ST (Signaling Tone)
Distance: 3 meters
Limit: $43 + 10 \log_{10} (W) = 40.31 \text{ dBc}$

Frequency (MHz)	Level (dBm)	Horn Forward Cond. Pwr. (dBm)	Standard-Gain Horn Antenna Gain (dBi)	POL (H/V)	EIRP (dBm)	ERP (dBm)	dBc
1697.94	≤ -72.72	-44.94	6.6	H	-36.20	-38.34	60.46
2546.91	≤ -81.87	-52.07	7.8	H	-42.13	-44.27	66.39
3395.88	≤ -94.42	-67.84	7.75	H	-57.95	-60.09	82.21
4244.85	≤ -106.25	-77.23	7.6	H	-67.49	-69.63	91.75
5093.82	≤ -105.50	-79.14	8.5	H	-68.50	-70.64	92.76
5942.79	≤ -105.87	-74.99	8.8	H	-64.05	-66.19	88.31
6791.76	≤ -103.47	-64.41	9.6	H	-52.37	-54.51	76.63
7640.73	≤ -103.33	-65.19	9.0	H	-54.05	-56.19	78.31
8489.70	≤ -103.79	-67.81	9.3	H	-56.37	-58.51	80.63

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: 23.7 dBm
Modulation: CDMA (Internal)
Distance: 3 meters
Limit: $43 + 10 \log_{10} (W) = 37.48 \text{ dBc}$

Frequency (MHz)	Level (dBm)	Horn Forward Cond. Pwr. (dBm)	Standard-Gain Horn Antenna Gain (dBi)	POL (H/V)	EIRP (dBm)	ERP (dBm)	dBc
1649.40	$\leq - 74.91$	- 47.13	6.6	H	- 38.39	- 40.53	63.31
2474.10	$\leq - 83.16$	- 53.36	7.8	H	- 43.42	- 45.56	68.34
3298.80	$\leq - 94.03$	- 67.45	7.75	H	- 57.56	- 59.70	82.48
4123.50	$\leq - 104.36$	- 75.34	7.6	H	- 65.60	- 67.74	90.52
4948.20	$\leq - 104.56$	- 79.81	8.5	H	- 69.17	- 71.31	94.09
5772.90	$\leq - 105.23$	- 74.35	8.8	H	- 63.41	- 65.55	88.33
6597.60	$\leq - 105.04$	- 65.68	9.6	H	- 53.94	- 56.08	78.86
7422.30	$\leq - 102.28$	- 64.14	9.0	H	- 53.00	- 55.14	77.92
8247.00	$\leq - 104.38$	- 68.40	9.3	H	- 56.96	- 59.10	81.88

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: 835.89 MHz
Channel: 363 (Mid)
Measured Conducted Power: 23.7 dBm
Modulation: CDMA (Internal)
Distance: 3 meters
Limit: $43 + 10 \log_{10} (W) = 37.48 \text{ dBc}$

Frequency (MHz)	Level (dBm)	Horn Forward Cond. Pwr. (dBm)	Standard-Gain Horn Antenna Gain (dBi)	POL (H/V)	EIRP (dBm)	ERP (dBm)	dBc
1671.78	$\leq - 72.91$	- 45.12	6.6	H	- 36.38	- 38.52	60.67
2507.67	$\leq - 81.46$	- 51.66	7.8	H	- 41.72	- 43.86	66.01
3343.56	$\leq - 93.60$	- 67.02	7.75	H	- 57.13	- 59.27	81.42
4179.45	$\leq - 104.34$	- 75.32	7.6	H	- 65.58	- 67.72	89.87
5015.34	$\leq - 105.27$	- 78.91	8.5	H	- 68.27	- 70.41	92.56
5851.23	$\leq - 104.56$	- 73.68	8.8	H	- 62.74	- 64.88	87.03
6687.12	$\leq - 103.92$	- 64.56	9.6	H	- 52.82	- 54.96	77.11
7523.01	$\leq - 101.58$	- 63.44	9.0	H	- 52.30	- 54.44	76.59
8358.90	$\leq - 103.70$	- 67.72	9.3	H	- 56.28	- 58.42	80.57

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: 23.6 dBm
Modulation: CDMA (Internal)
Distance: 3 meters
Limit: $43 + 10 \log_{10} (W) = 37.48 \text{ dBc}$

Frequency (MHz)	Level (dBm)	Horn Forward Cond. Pwr. (dBm)	Standard-Gain Horn Antenna Gain (dBi)	POL (H/V)	EIRP (dBm)	ERP (dBm)	dBc
1697.40	≤ -75.08	- 47.30	6.6	H	- 38.56	- 40.70	62.39
2546.10	≤ -81.42	- 51.62	7.8	H	- 41.68	- 43.82	65.51
3394.80	≤ -96.03	- 69.45	7.75	H	- 59.56	- 61.70	83.39
4243.50	≤ -106.60	- 77.58	7.6	H	- 67.84	- 69.98	91.67
5092.20	≤ -107.37	- 81.01	8.5	H	- 70.37	- 72.51	94.20
5940.90	≤ -104.83	- 73.75	8.8	H	- 63.01	- 65.15	86.84
6789.60	≤ -102.96	- 63.60	9.6	H	- 51.86	- 54.00	75.69
7638.30	≤ -101.54	- 63.40	9.0	H	- 52.26	- 54.40	76.09
8487.00	≤ -103.58	- 67.60	9.3	H	- 56.16	- 58.30	79.99

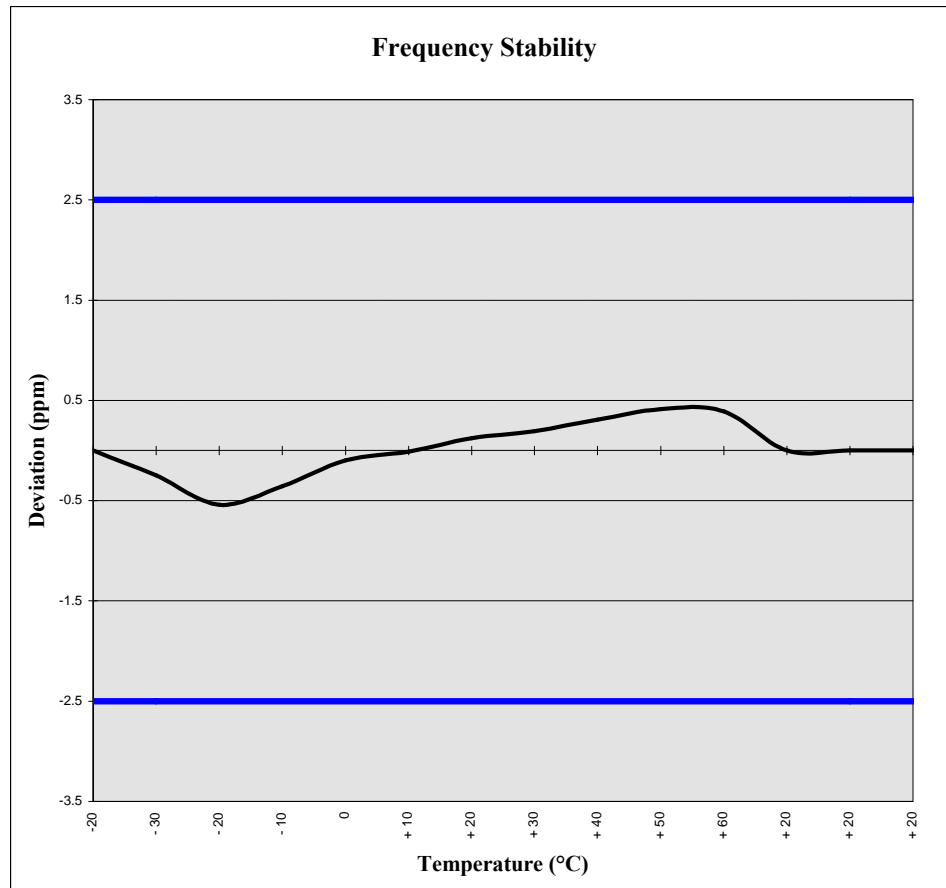
Radiated Measurements by Substitution Method:

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

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	836490208	-0.00000025
100 %		- 20	836490453	-0.00000054
100 %		- 10	836490298	-0.00000036
100 %		0	836490082	-0.00000010
100 %		+ 10	836490008	-0.00000001
100 %		+ 20	836489897	0.00000012
100 %		+ 30	836489839	0.00000019
100 %		+ 40	836489743	0.00000031
100 %		+ 50	836489656	0.00000041
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



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
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-100 Dual-Mode AMPS/CDMA Cellular Phone FCC ID: NPWWSH-100 complies with all the requirements of Parts 2 and 22 of the FCC rules.

TEST PLOTS

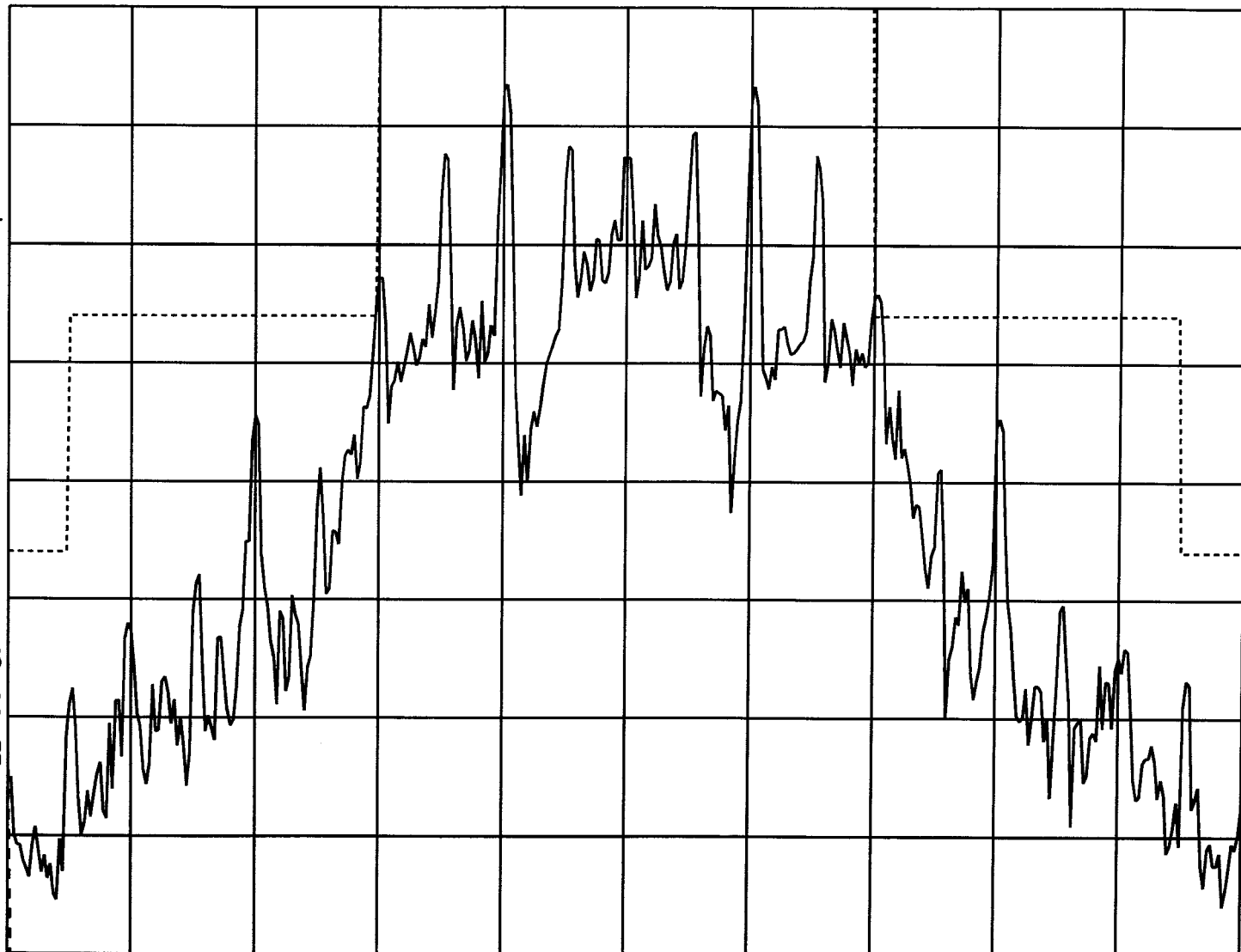
14: 12: 21 DEC 18, 2000

HP WSH-100 DATA

REF 24.0 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

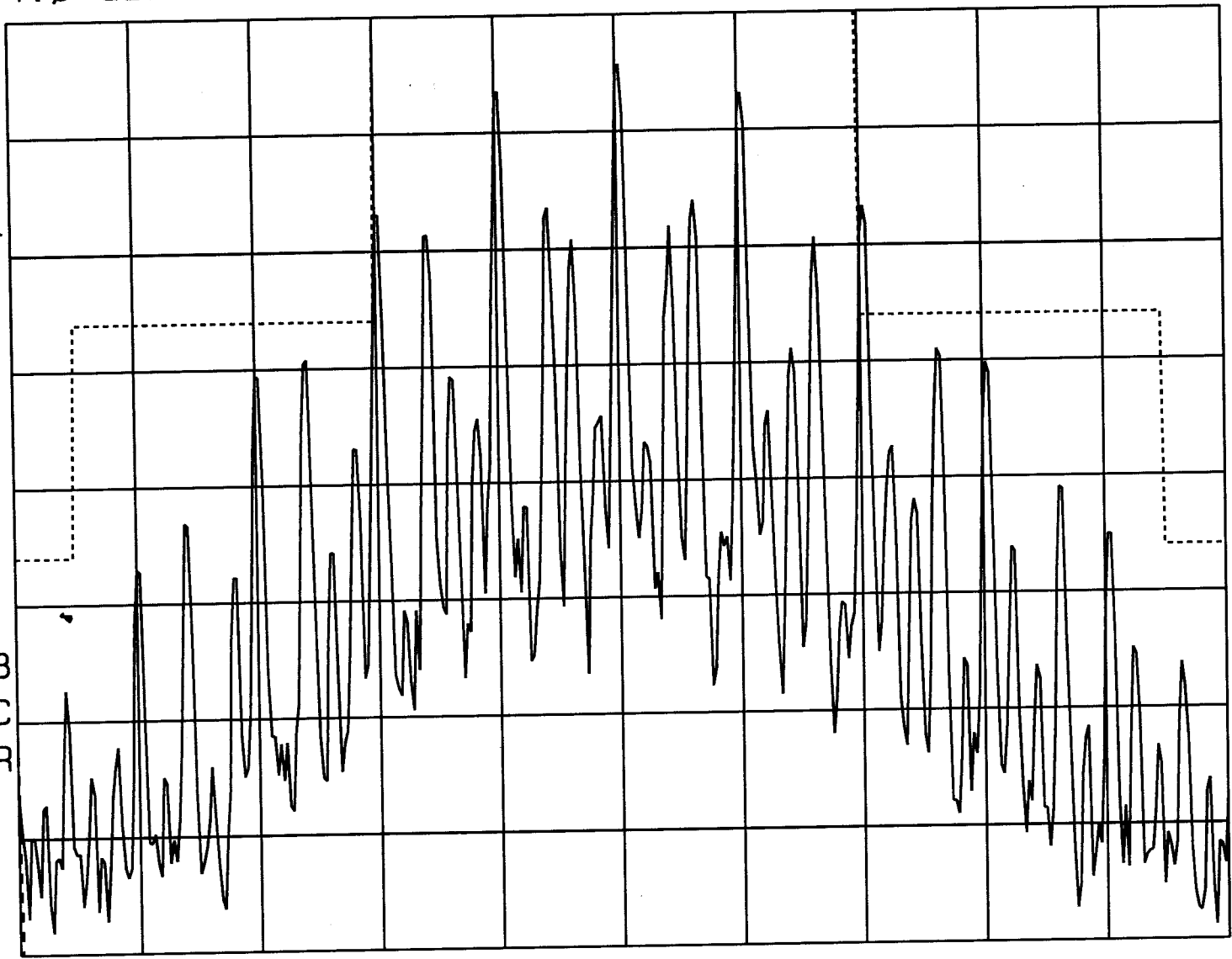
#RES BW 300 Hz

#VBW 300 Hz

SWP 3.33 sec

14:10:34 DEC 18, 2000
WSH-100 ST + SAT
REF 24.0 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

14:08:23 DEC 18, 2000

WSH-100 ST

REF 24.0 dBm

AT 10 dB

PEAK

LOG

10

dB/

OFFST

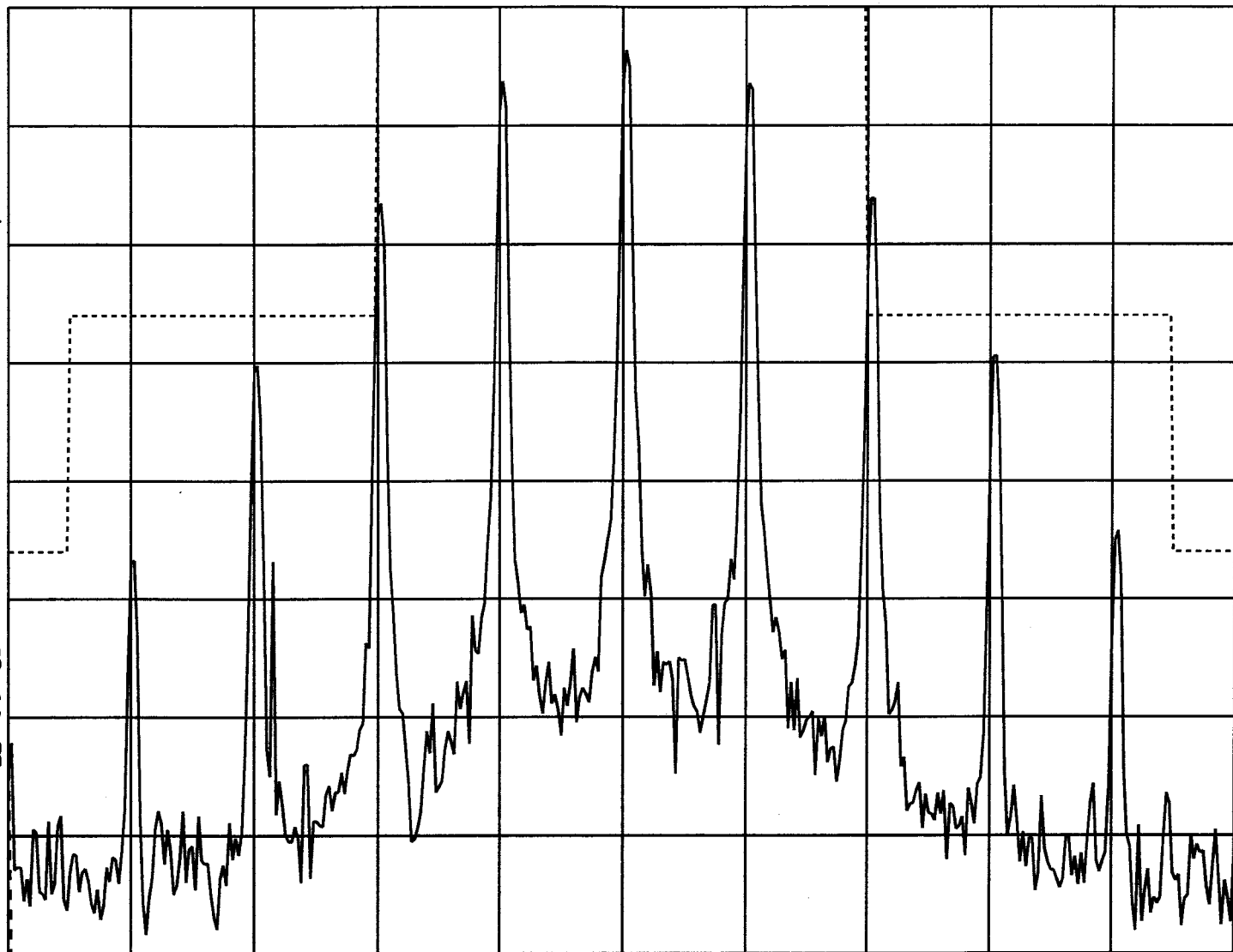
31.0

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

14: 07: 38 DEC 18, 2000

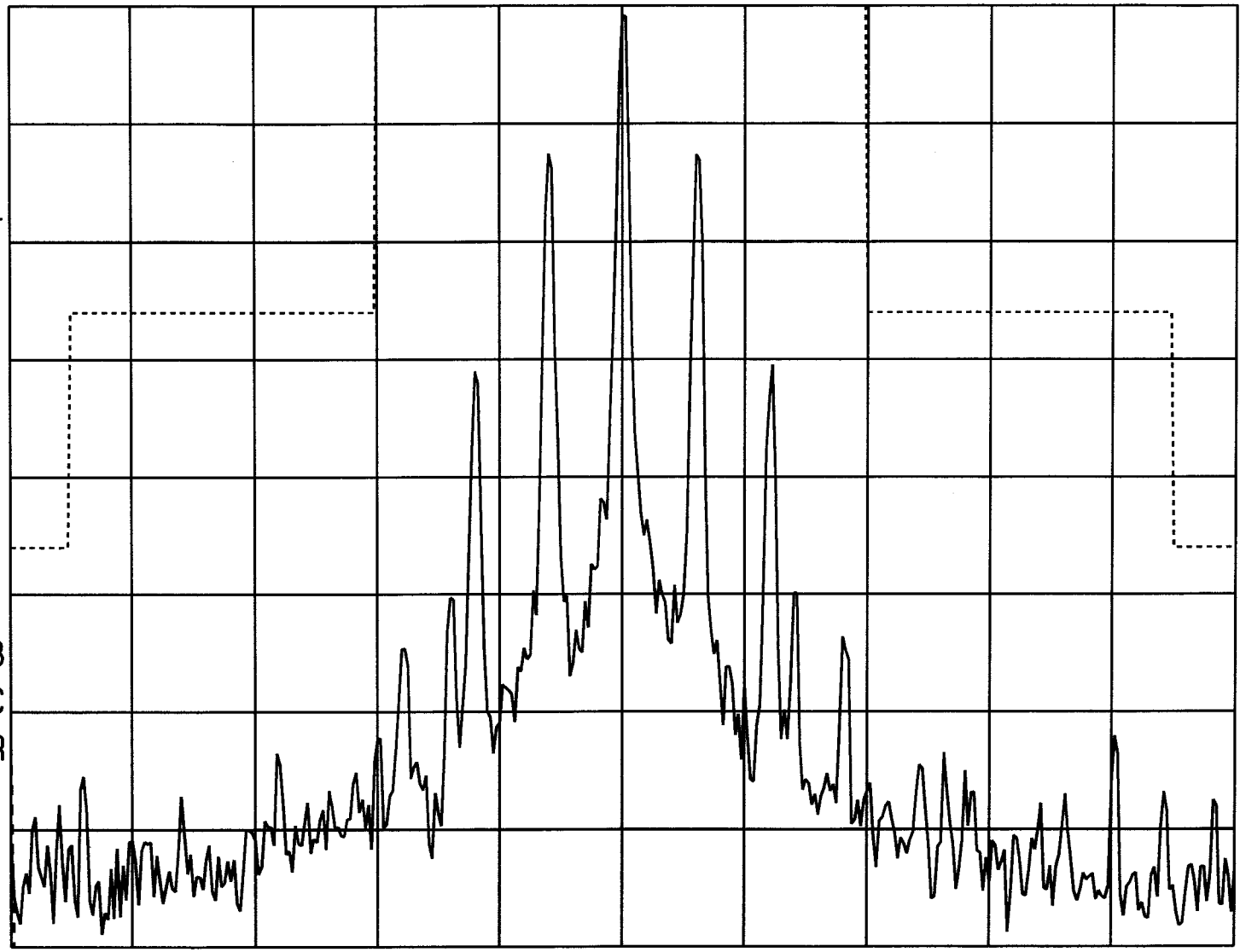
WSH-100 SAT

REF 24.0 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

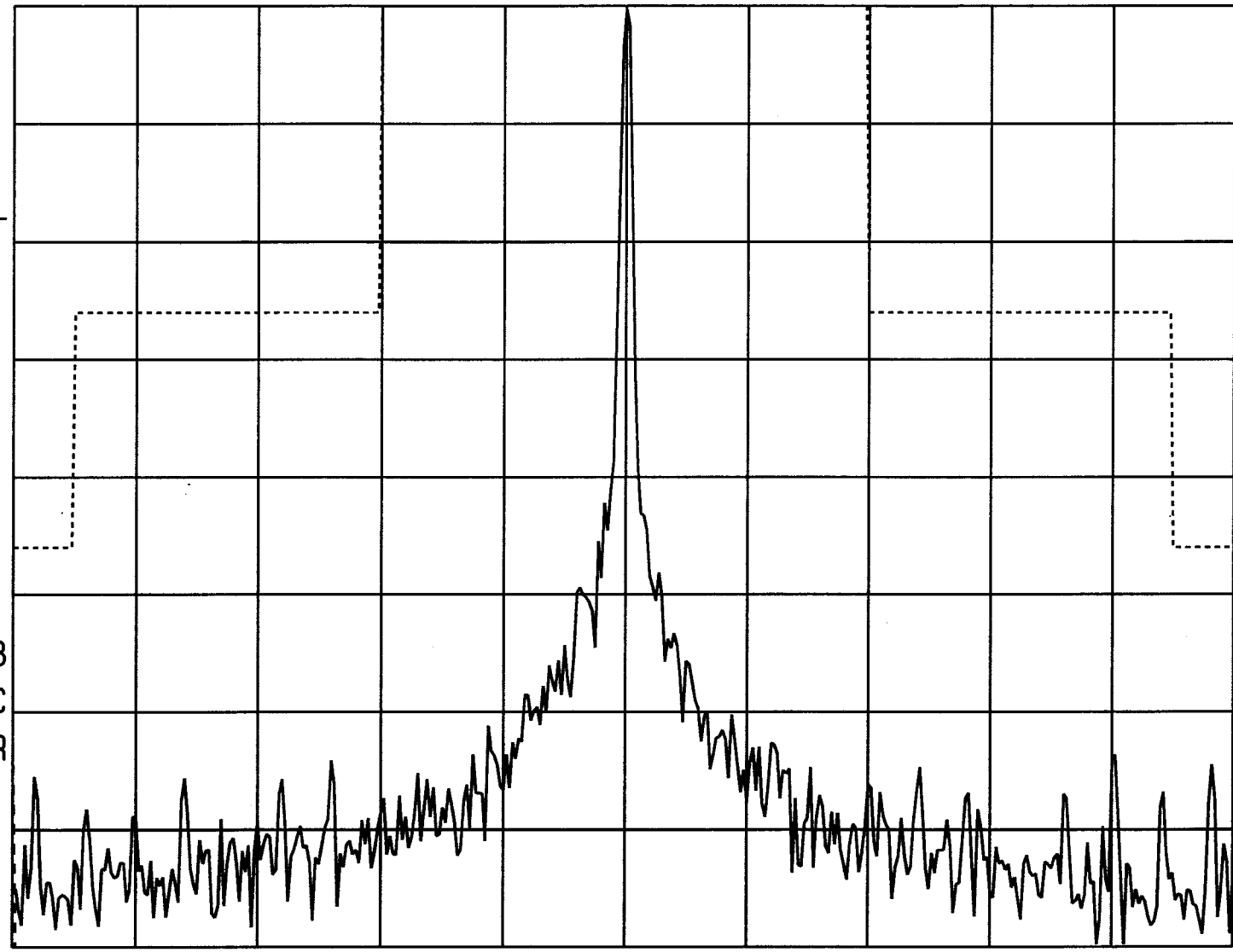
#VBW 300 Hz

SWP 3.33 sec

14:05:56 DEC 18, 2000
WSH-100 UN MOD CARRIER
REF 24.0 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

hp 16:04:07 Nov 23, 2000

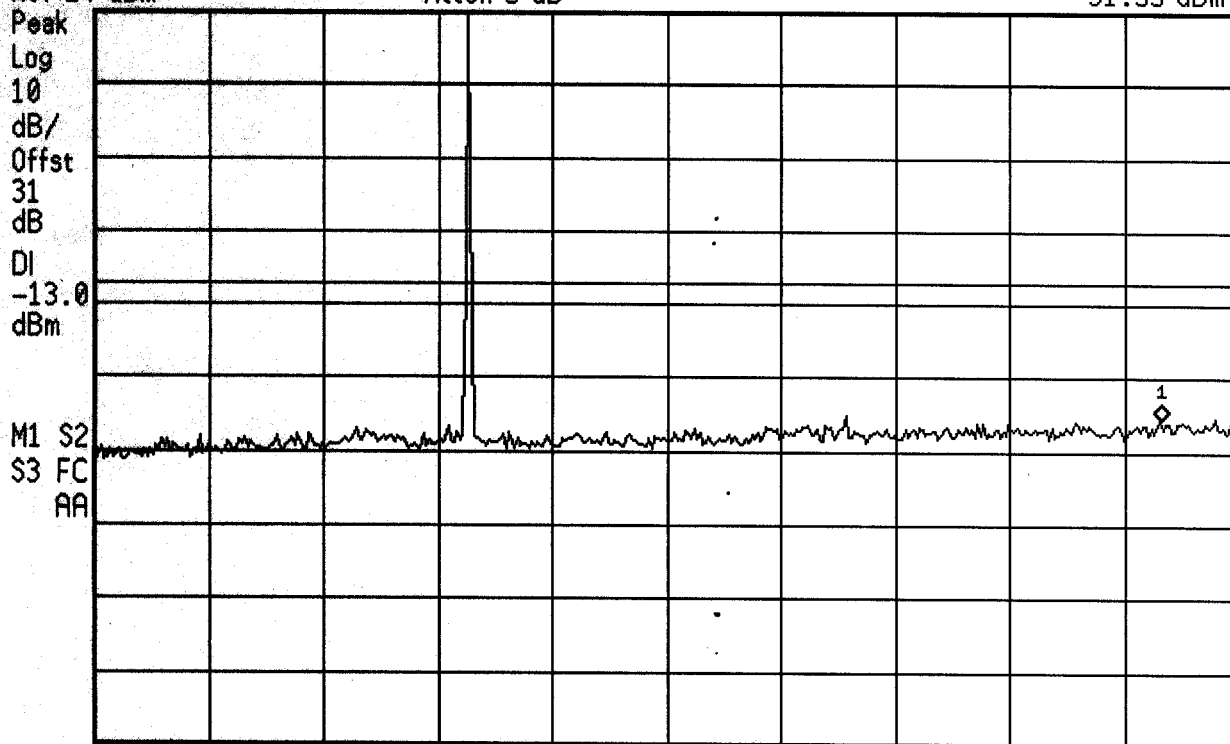
WIDE TELECOM COND SPURS CH 991

Ref 24 dBm

Atten 5 dB

Mkr1 2.332 GHz

-31.55 dBm



Start 10 MHz

*Res BW 1 MHz

VBW 1 MHz

Stop 2.5 GHz

Sweep 6.225 ms

hp 16:03:39 Nov 23, 2000

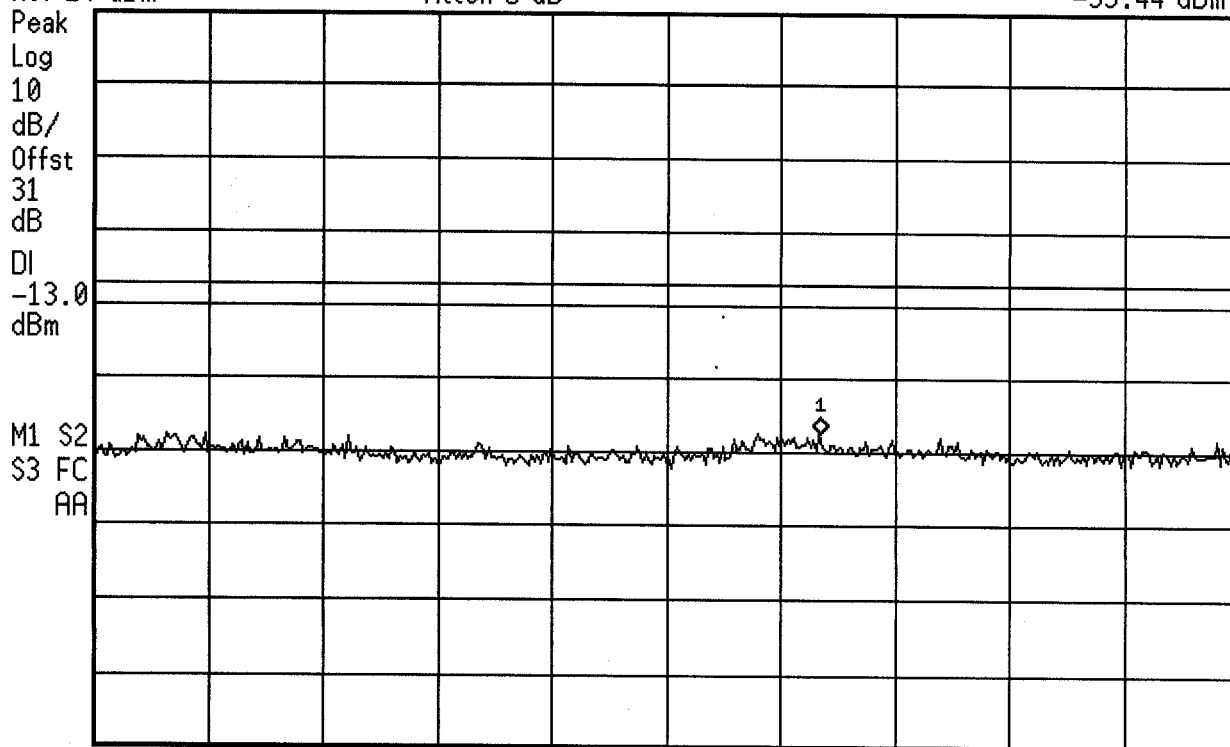
WIDE TELECOM COND SPURS CH 991

Ref 24 dBm

Atten 5 dB

Mkr1 7.263 GHz

-33.44 dBm



Start 2.5 GHz

*Res BW 1 MHz

VBW 1 MHz

Stop 10 GHz

Sweep 18.75 ms



16:03:18 Nov 23, 2000

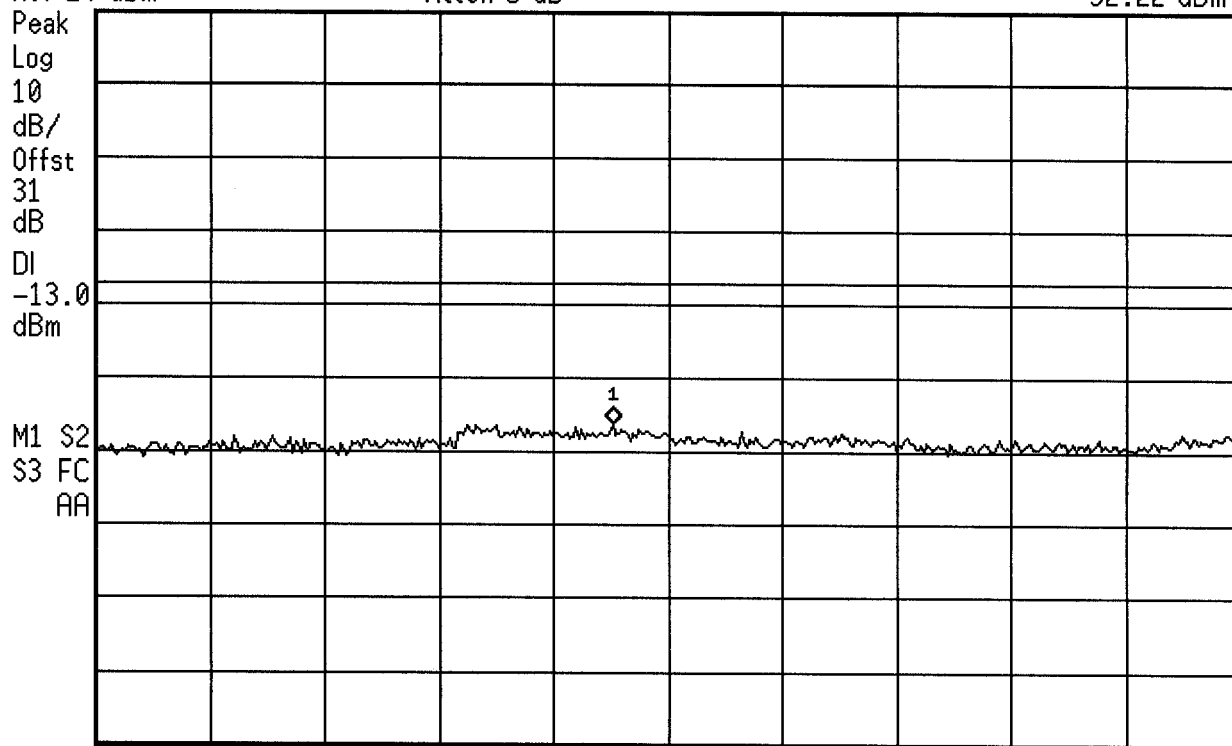
WIDE TELECOM COND SPURS CH 991

Ref 24 dBm

Atten 5 dB

Mkr1 14.53 GHz

-32.22 dBm



Start 10 GHz

*Res BW 1 MHz

VBW 1 MHz

Stop 20 GHz

Sweep 100 ms



16:01:38 Nov 23, 2000

WIDE TELECOM COND SPURS CH 383

Ref 24 dBm

Atten 5 dB

Mkr1 2.270 GHz

-30.99 dBm

Peak

Log

10

dB/

Offst

31

dB

DI

-13.0

dBm

M1 S2

S3 FC

AA

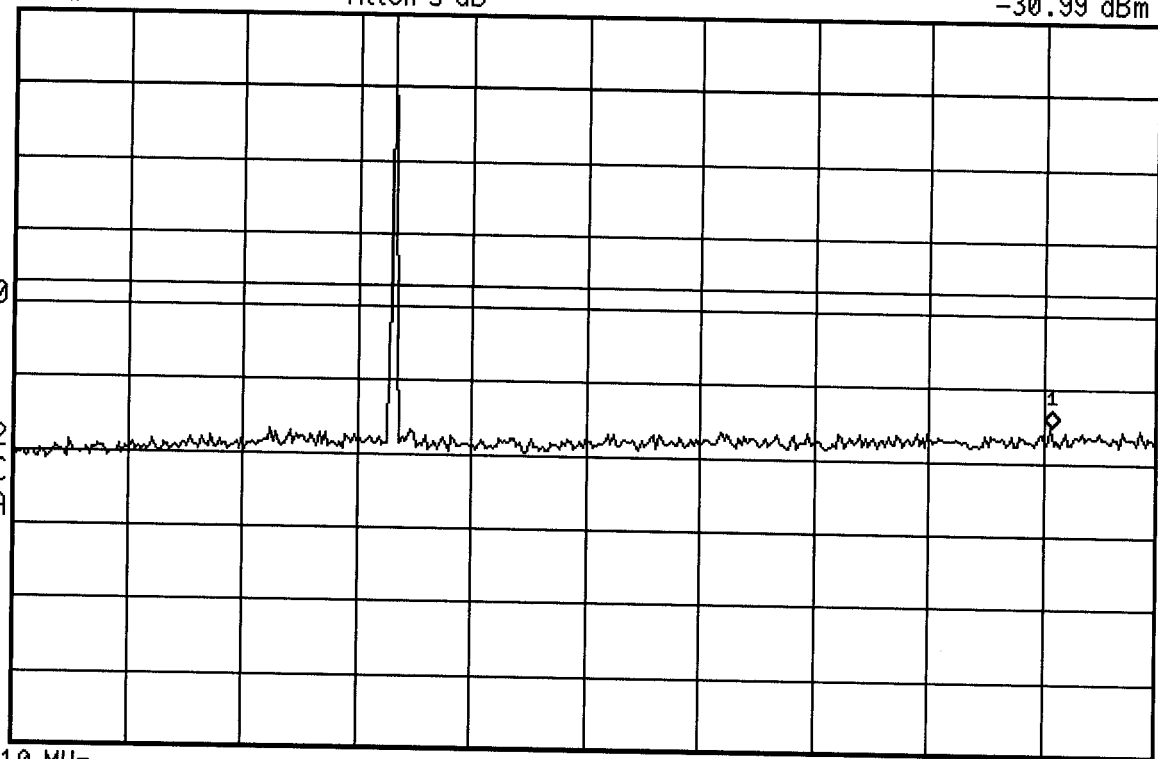
Start 10 MHz

*Res BW 1 MHz

VBW 1 MHz

Stop 2.5 GHz

Sweep 6.225 ms



hp 16:01:59 Nov 23, 2000

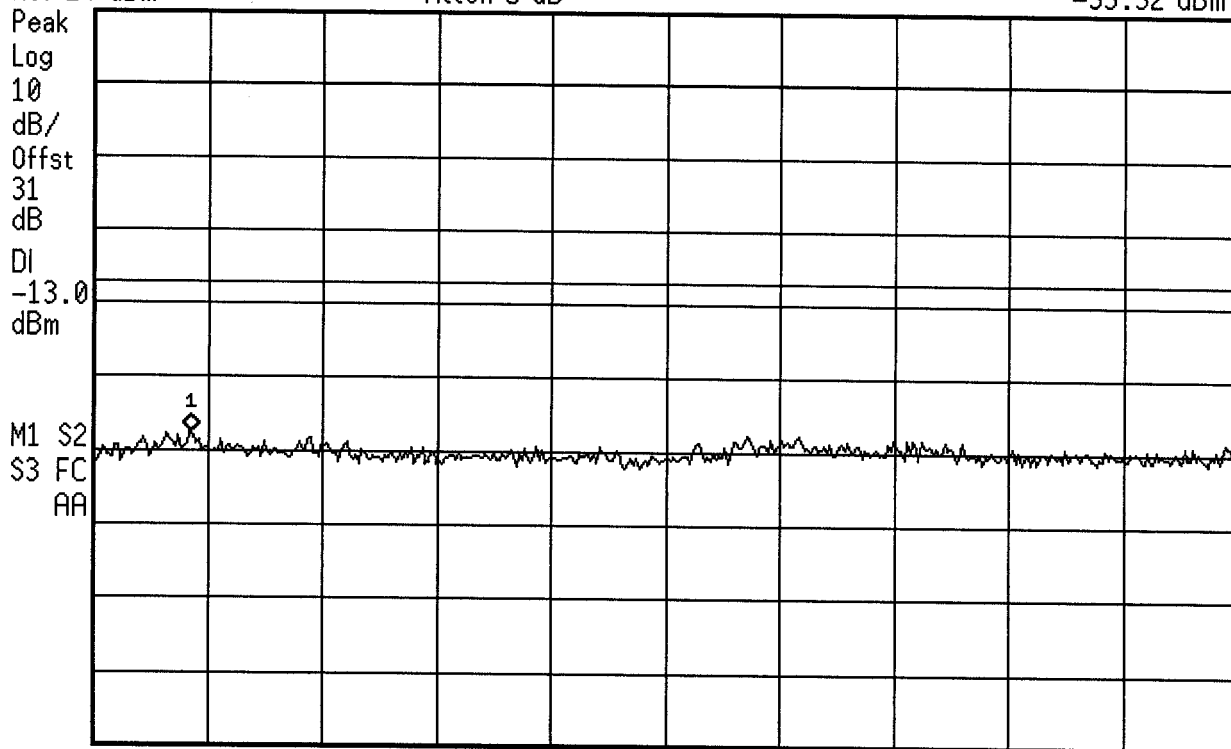
WIDE TELECOM COND SPURS CH 383

Ref 24 dBm

Atten 5 dB

Mkr1 3.138 GHz

-33.32 dBm



Start 2.5 GHz

*Res BW 1 MHz

VBW 1 MHz

Stop 10 GHz

Sweep 18.75 ms



16:02:17 Nov 23, 2000

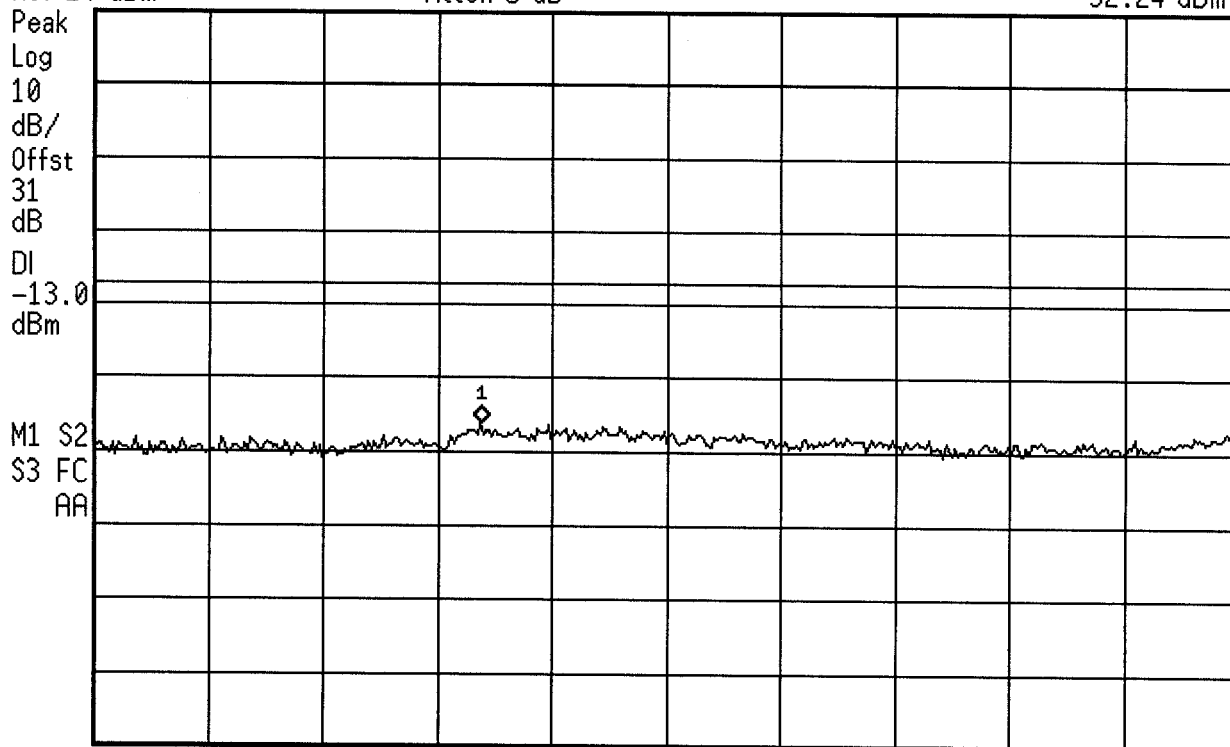
WIDE TELECOM COND SPURS CH 383

Ref 24 dBm

Atten 5 dB

Mkr1 13.38 GHz

-32.24 dBm



Start 10 GHz

*Res BW 1 MHz

VBW 1 MHz

Stop 20 GHz

Sweep 100 ms

hp 15:55:57 Nov 23, 2000

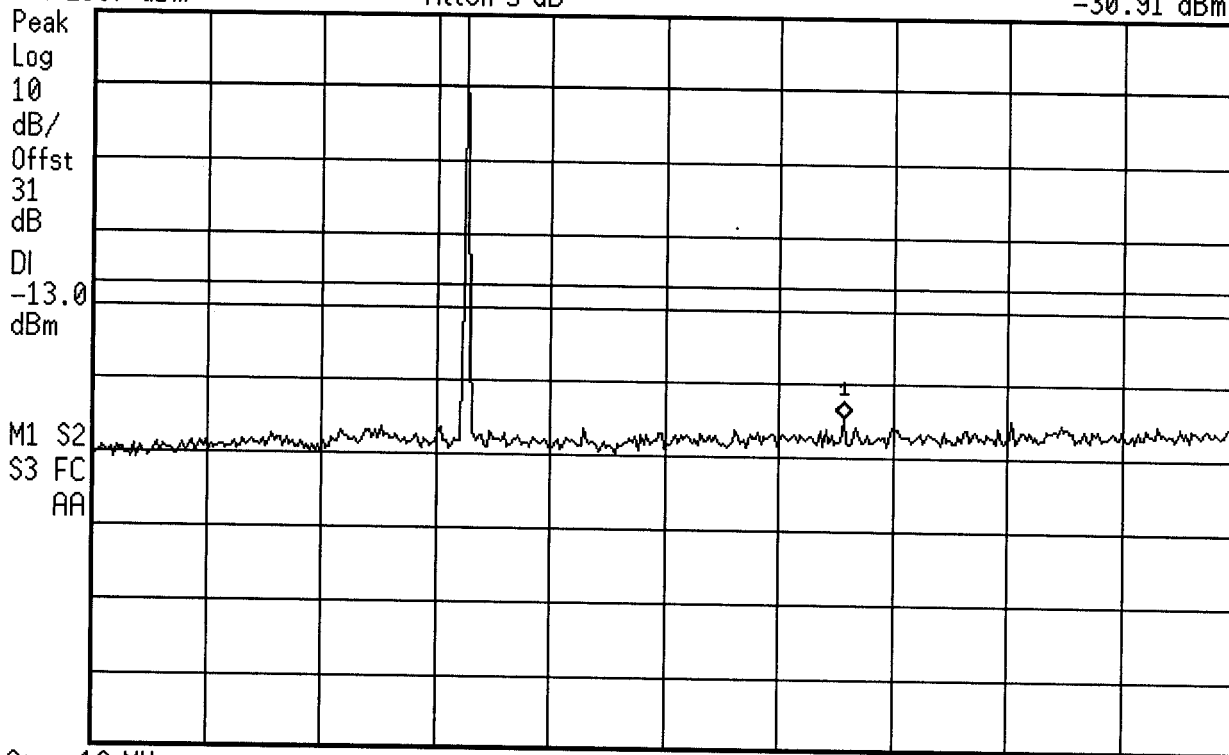
WIDE TELECOM COND SPURS CH 799

Ref 23.7 dBm

Atten 5 dB

Mkr1 1.647 GHz

-30.91 dBm



Start 10 MHz
*Res BW 1 MHz

VBW 1 MHz

Stop 2.5 GHz
Sweep 6.225 ms

hp 15:56:23 Nov 23, 2000

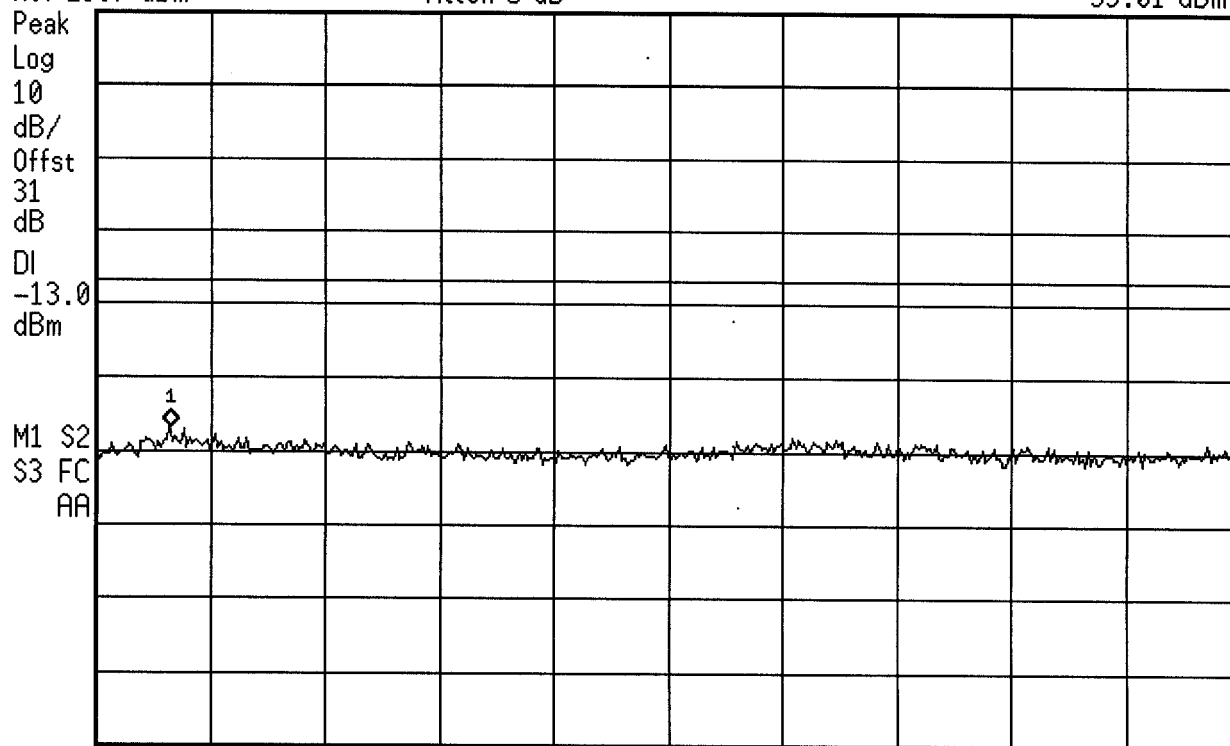
WIDE TELECOM COND SPURS CH 799

Ref 23.7 dBm

Atten 5 dB

Mkr1 2.988 GHz

-33.01 dBm



Start 2.5 GHz

*Res BW 1 MHz

VBW 1 MHz

Stop 10 GHz

Sweep 18.75 ms

hp 15:55:29 Nov 23, 2000

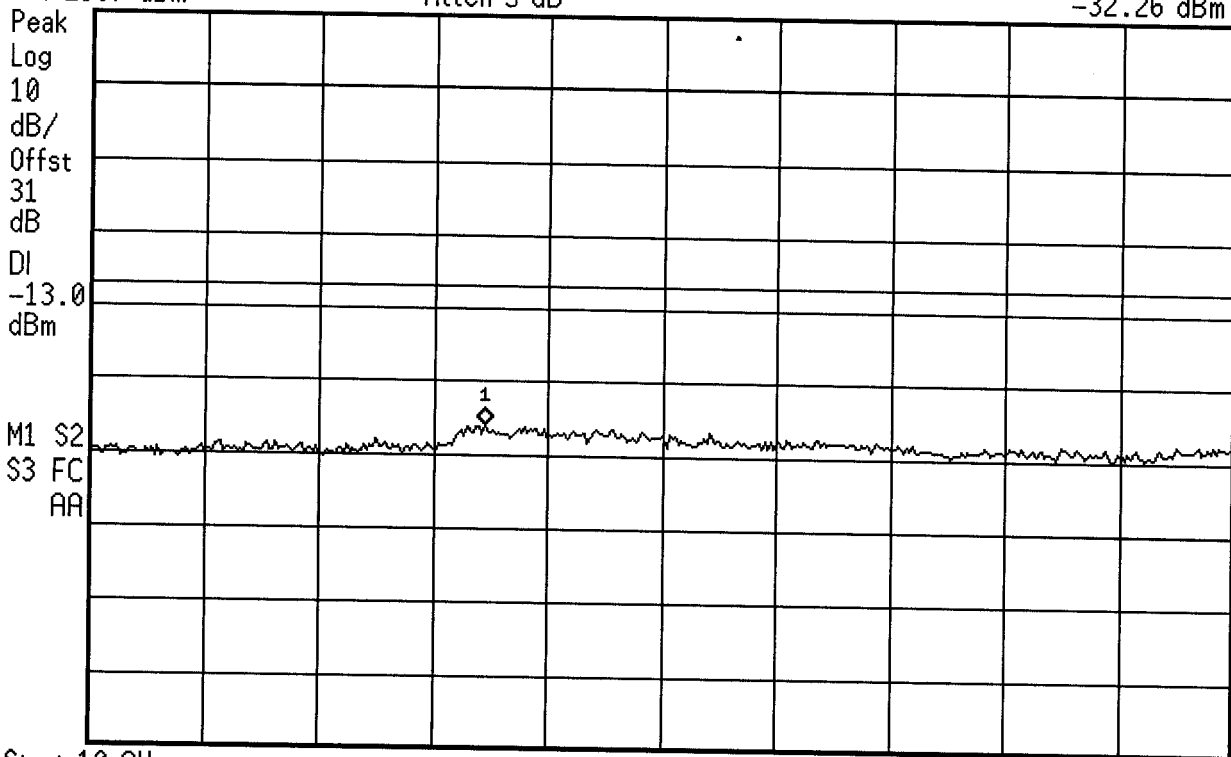
WIDE TELECOM COND SPURS CH 799

Ref 23.7 dBm

Atten 5 dB

Mkr1 13.45 GHz

-32.26 dBm



Start 10 GHz

*Res BW 1 MHz

VBW 1 MHz

Stop 20 GHz

Sweep 100 ms

hp 16:25:02 Nov 23, 2000

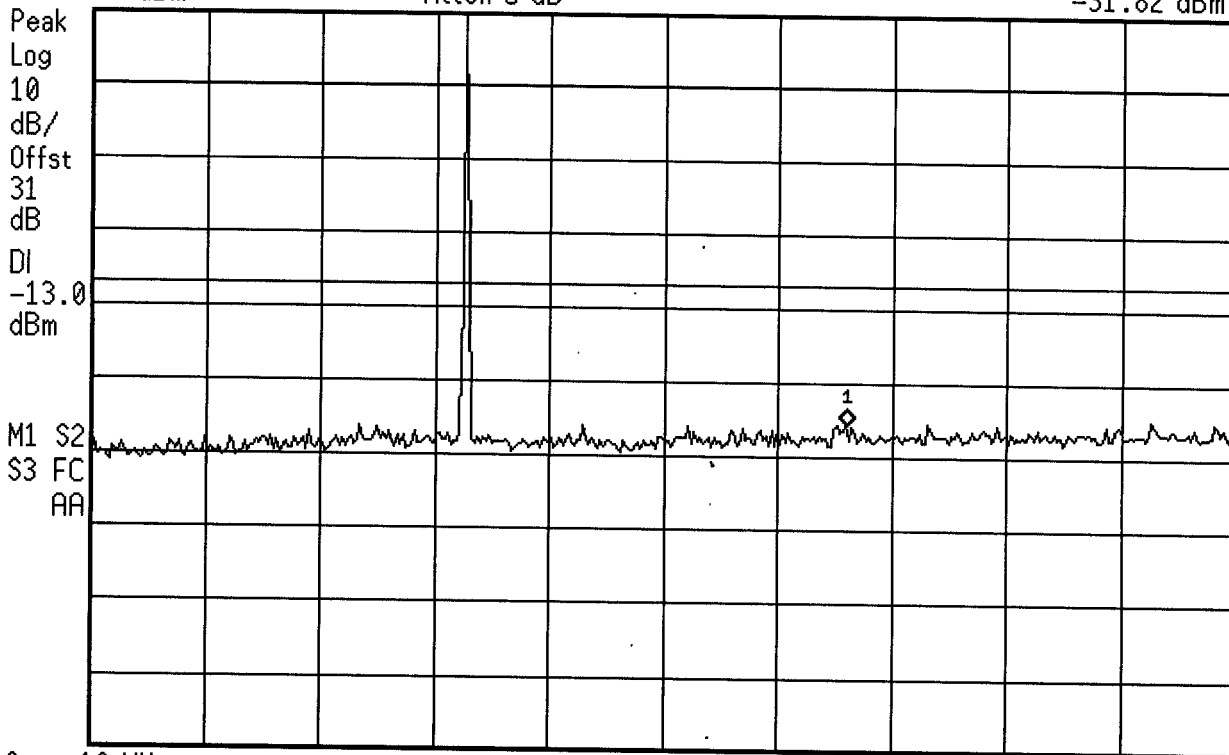
WIDE TELECOM COND SPURS CH 1013

Ref 23.7 dBm

Atten 5 dB

Mkr1 1.653 GHz

-31.82 dBm



Start 10 MHz
*Res BW 1 MHz

VBW 1 MHz

Stop 2.5 GHz
Sweep 6.225 ms

hp 16:25:24 Nov 23, 2000

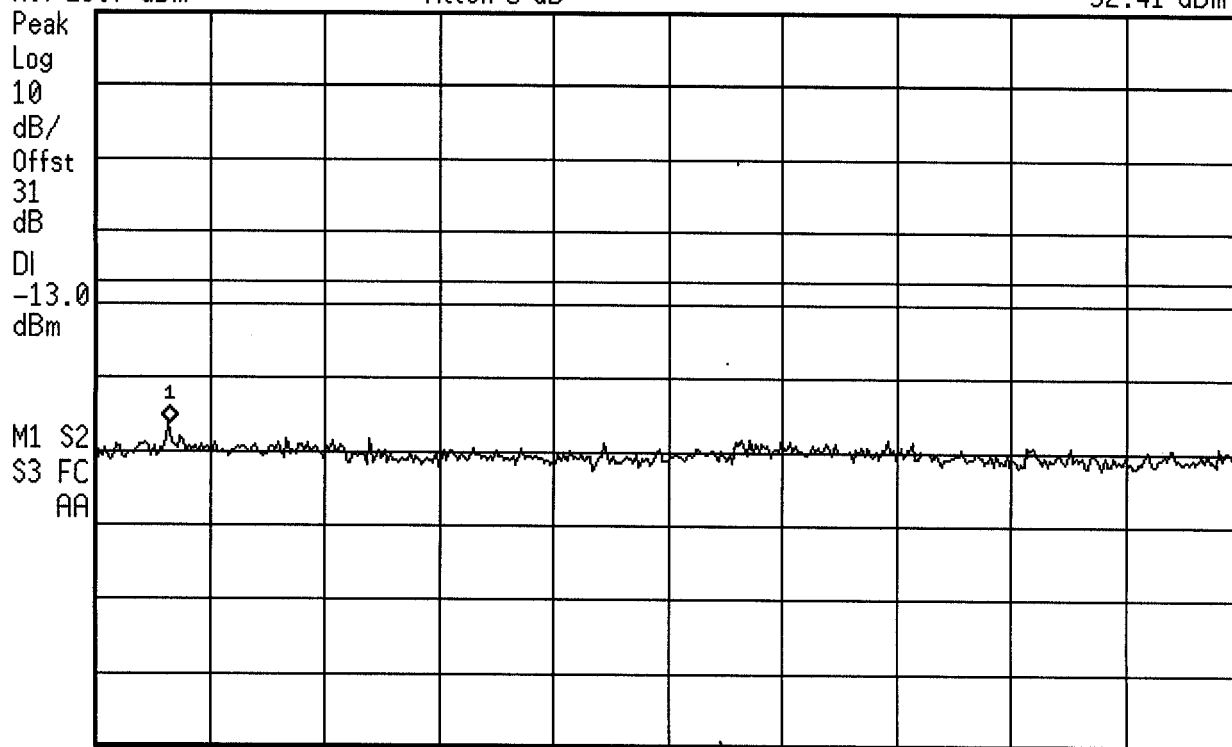
WIDE TELECOM COND SPURS CH 1013

Ref 23.7 dBm

Atten 5 dB

Mkr1 2.988 GHz

-32.41 dBm



Start 2.5 GHz

*Res BW 1 MHz

VBW 1 MHz

Stop 10 GHz

Sweep 18.75 ms



16:26:00 Nov 23, 2000

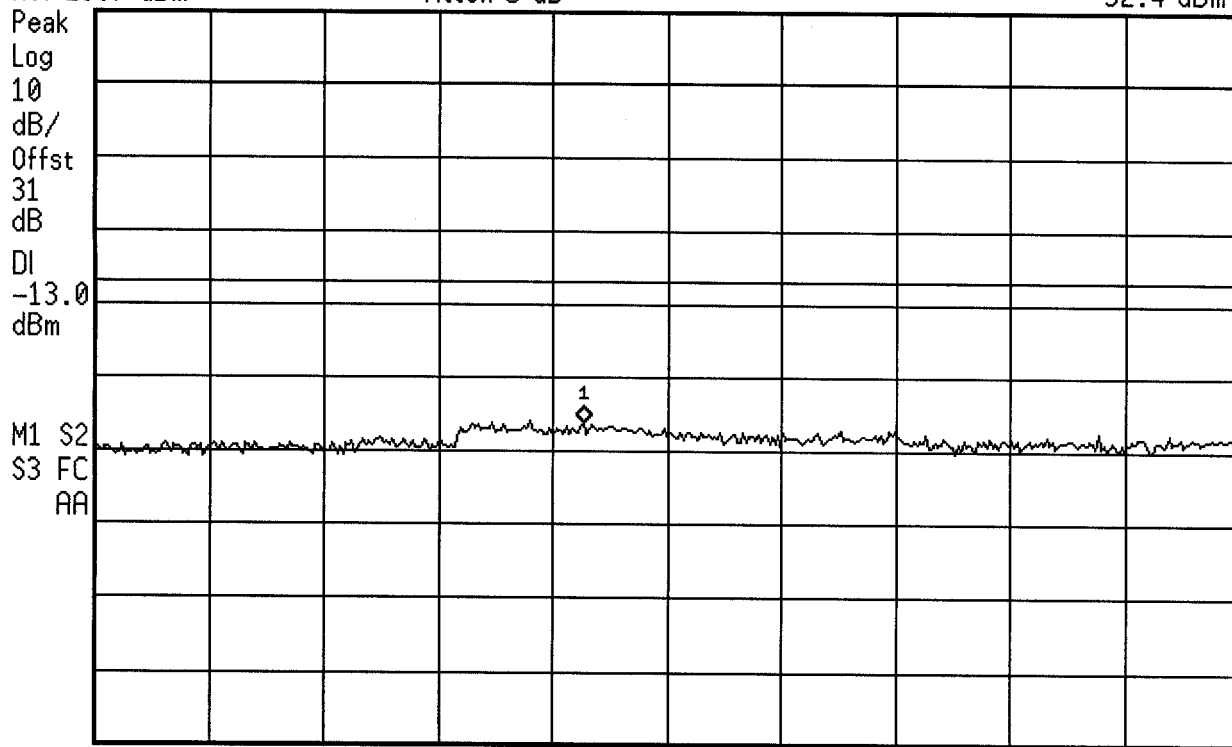
WIDE TELECOM COND SPURS CH 1013

Ref 23.7 dBm

Atten 5 dB

Mkr1 14.28 GHz

-32.4 dBm



Start 10 GHz

*Res BW 1 MHz

VBW 1 MHz

Stop 20 GHz

Sweep 100 ms



16:32:02 Nov 23, 2000

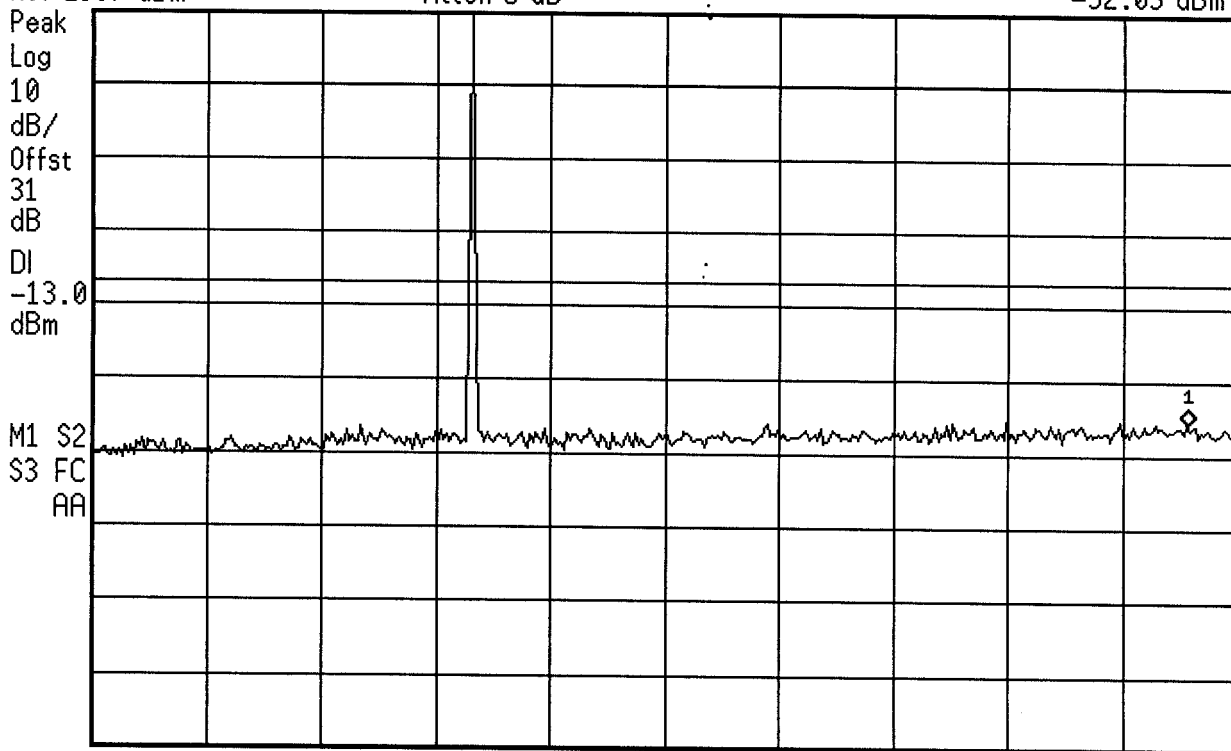
WIDE TELECOM COND SPURS CH 363

Ref 23.7 dBm

Atten 5 dB

Mkr1 2.394 GHz

-32.03 dBm



Start 10 MHz

*Res BW 1 MHz

VBW 1 MHz

Stop 2.5 GHz

Sweep 6.225 ms



16:31:18 Nov 23, 2000

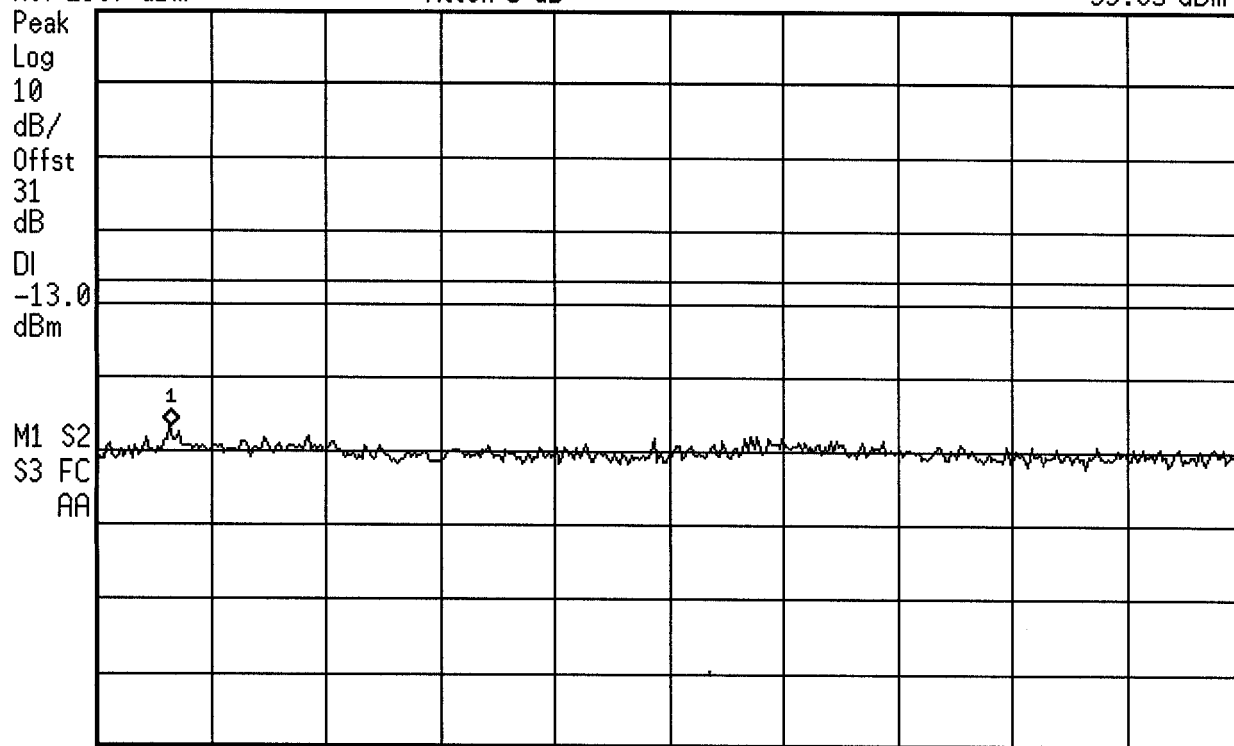
WIDE TELECOM COND SPURS CH 363

Ref 23.7 dBm

Atten 5 dB

Mkr1 2.988 GHz

-33.05 dBm



Start 2.5 GHz

*Res BW 1 MHz

VBW 1 MHz

Stop 10 GHz

Sweep 18.75 ms

hp 16:30:56 Nov 23, 2000

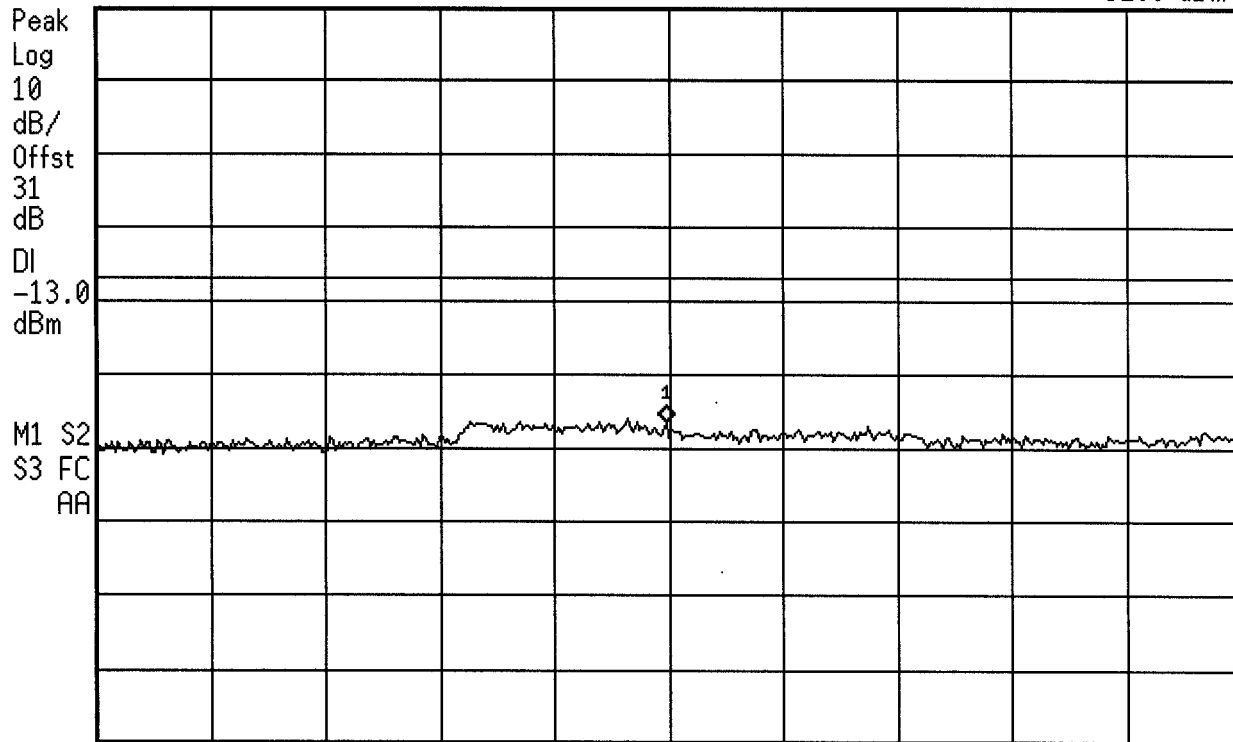
WIDE TELECOM COND SPURS CH 363

Ref 23.7 dBm

Atten 5 dB

Mkr1 14.98 GHz

-32.6 dBm



Start 10 GHz

*Res BW 1 MHz

VBW 1 MHz

Stop 20 GHz

Sweep 100 ms

hp 16:35:34 Nov 23, 2000

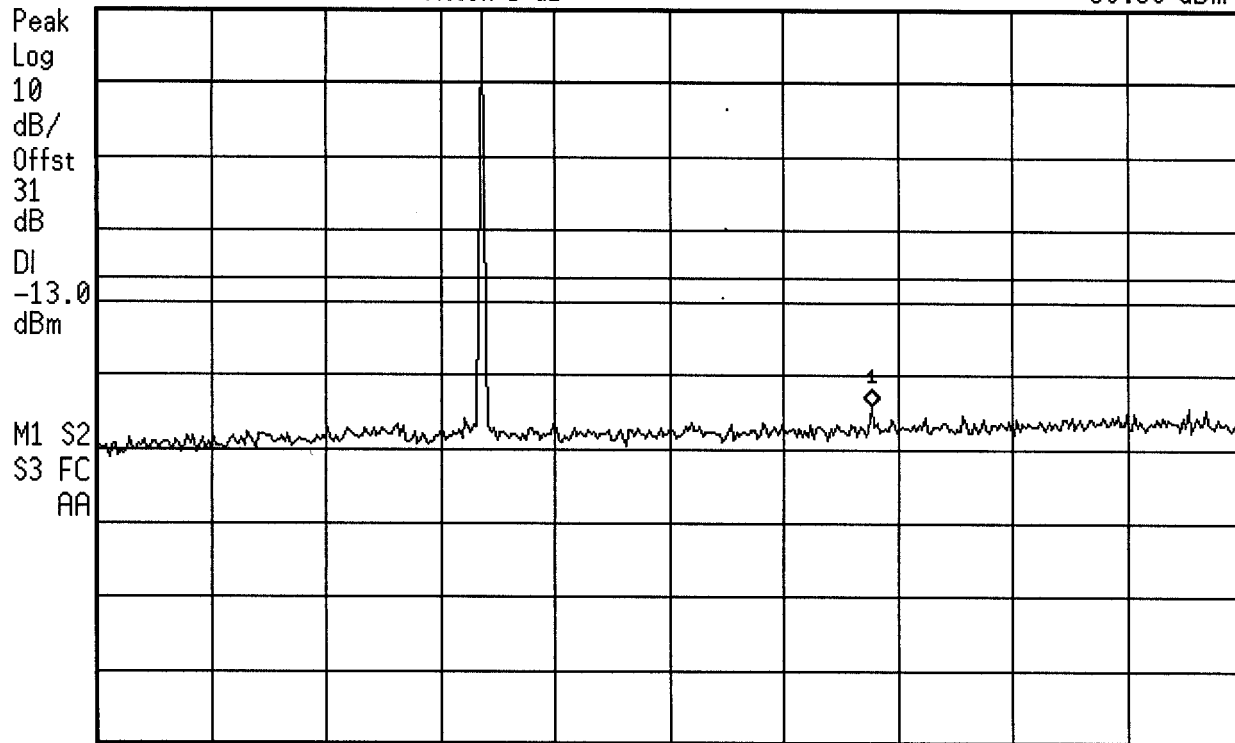
WIDE TELECOM COND SPURS CH 777

Ref 23.6 dBm

Atten 5 dB

Mkr1 1.697 GHz

-30.36 dBm



Start 10 MHz

*Res BW 1 MHz

VBW 1 MHz

Stop 2.5 GHz

Sweep 6.225 ms

hp 16:35:09 Nov 23, 2000

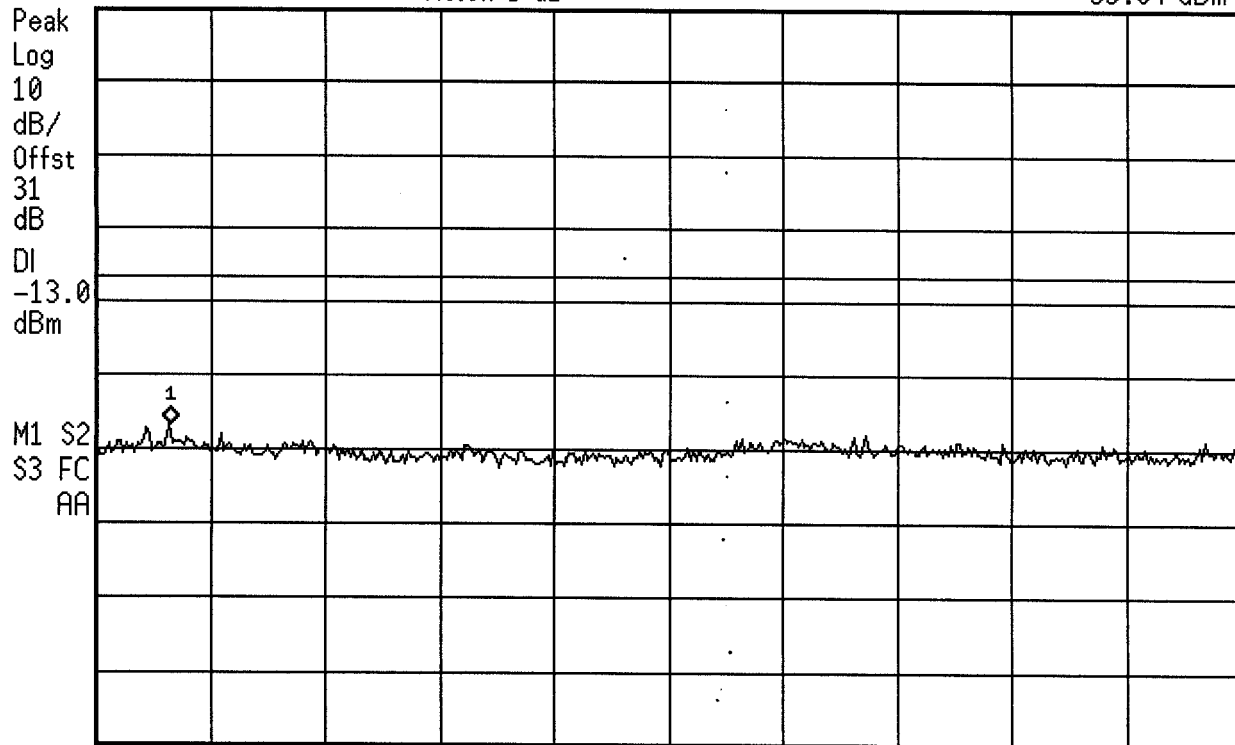
WIDE TELECOM COND SPURS CH 777

Ref 23.6 dBm

Atten 5 dB

Mkr1 2.988 GHz

-33.04 dBm



Start 2.5 GHz

*Res BW 1 MHz

VBW 1 MHz

Stop 10 GHz

Sweep 18.75 ms

hp 16:34:48 Nov 23, 2000

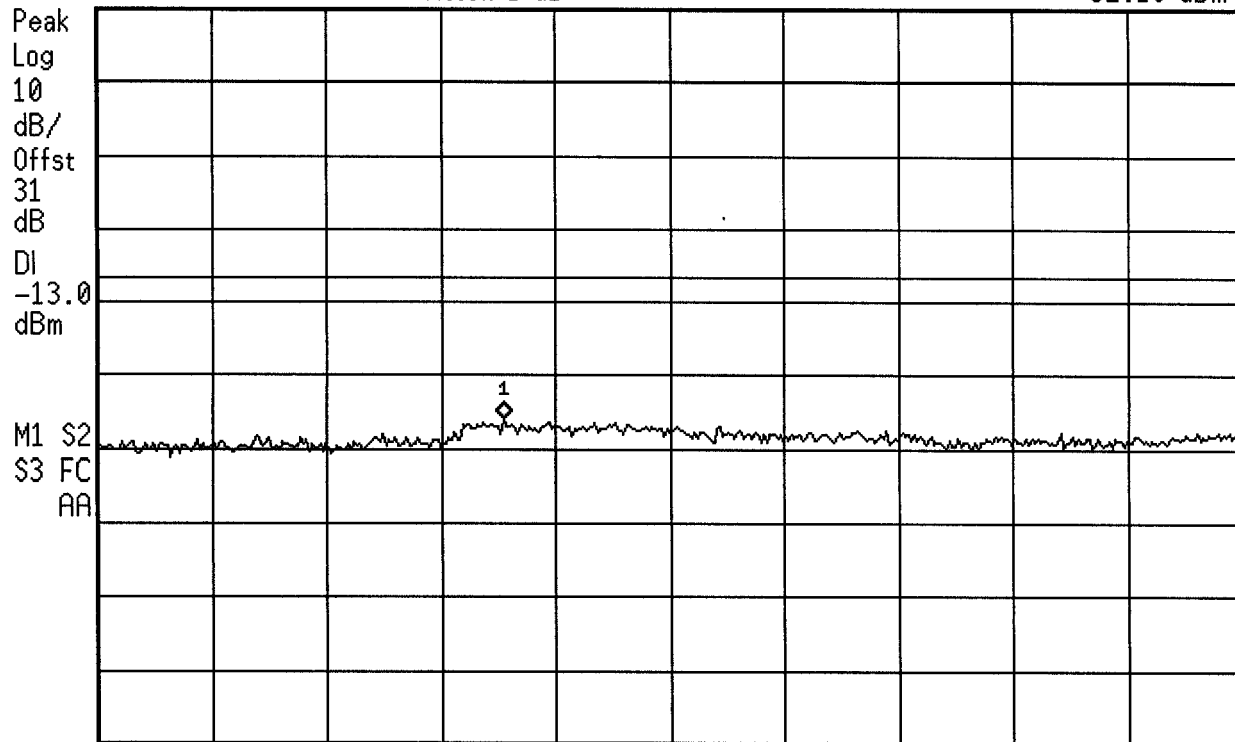
WIDE TELECOM COND SPURS CH 777

Ref 23.6 dBm

Atten 5 dB

Mkr1 13.55 GHz

-32.16 dBm



Start 10 GHz

*Res BW 1 MHz

VBW 1 MHz

Stop 20 GHz

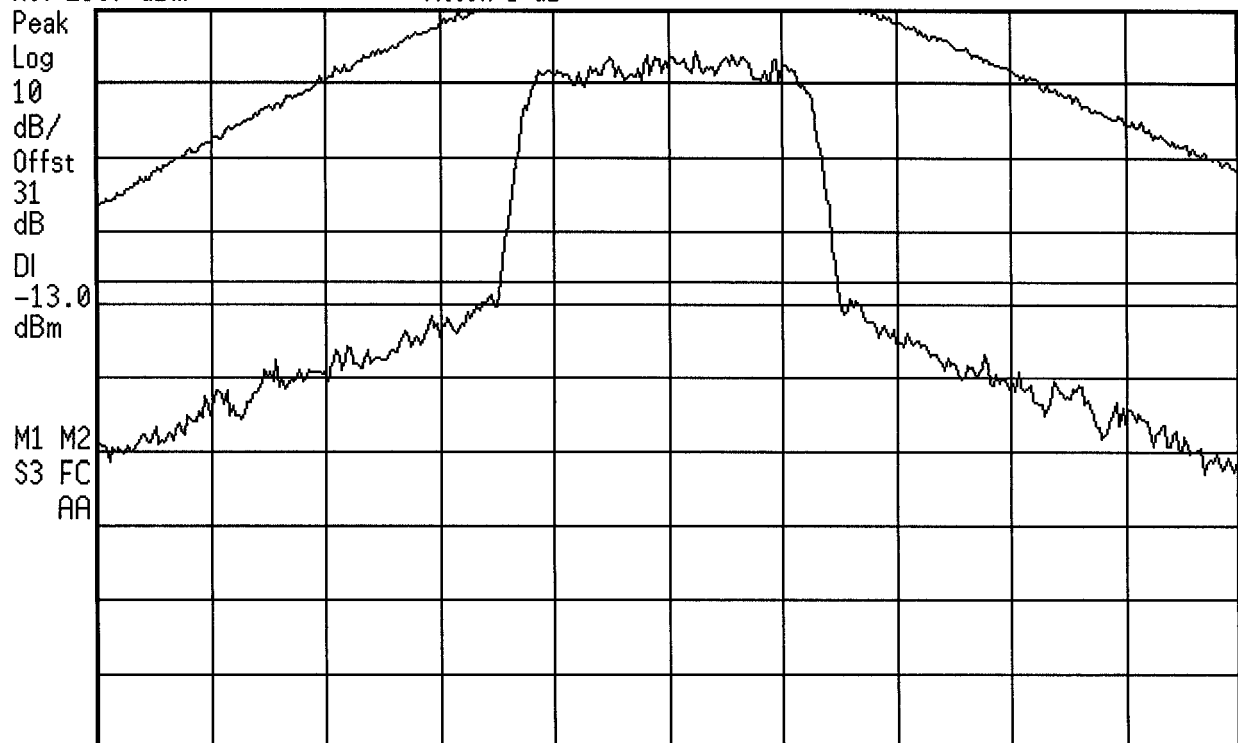
Sweep 100 ms

HP 09:12:15 Nov 24, 2000

WIDE TELECOM CDMA CH 1013

Ref 23.7 dBm

Atten 5 dB



Center 824.7 MHz

*Res BW 30 kHz

VBW 30 kHz

Span 5 MHz

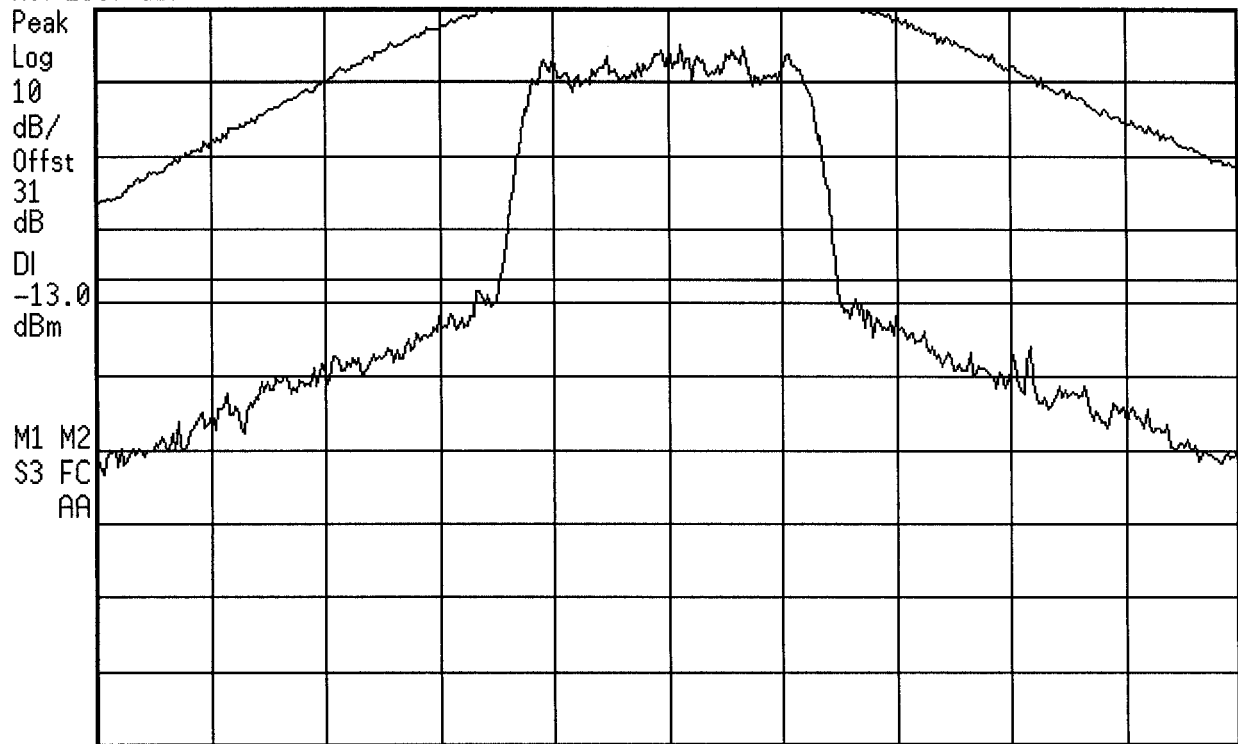
Sweep 13.89 ms

hp 09:14:27 Nov 24, 2000

WIDE TELECOM CDMA CH 363

Ref 23.7 dBm

Atten 5 dB



Center 835.9 MHz

*Res BW 30 kHz

VBW 30 kHz

Span 5 MHz

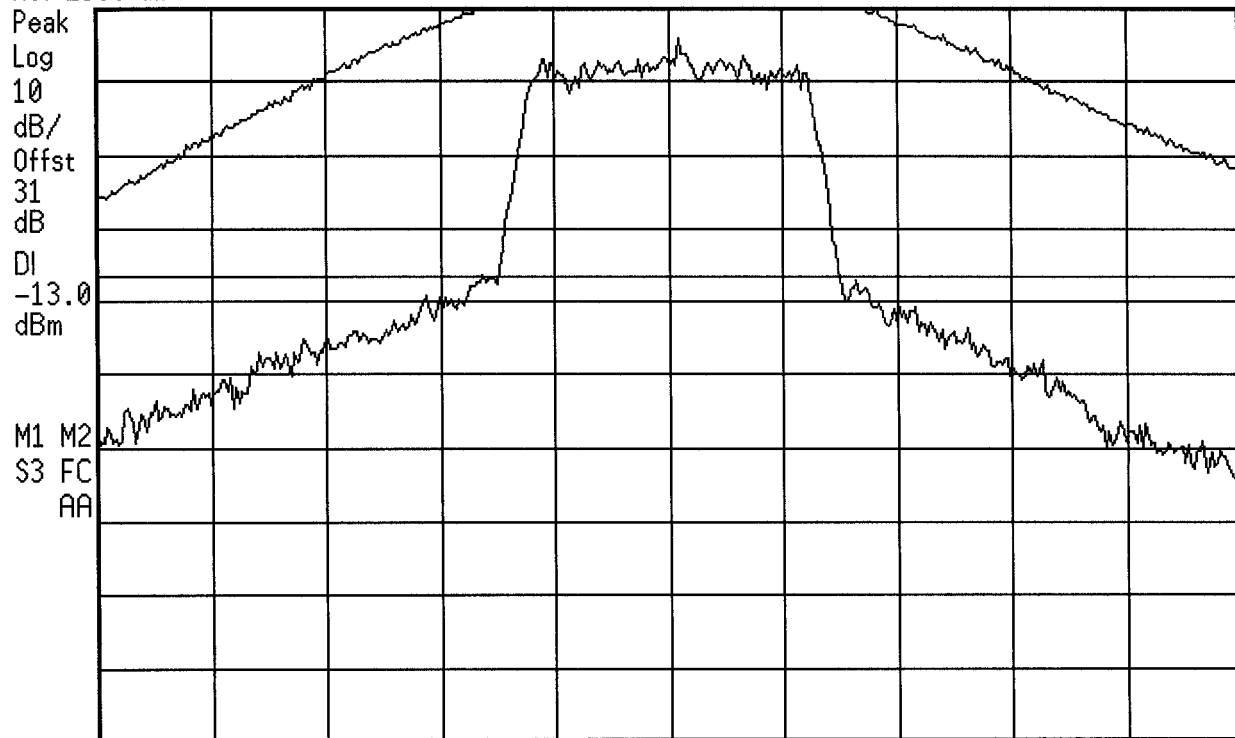
Sweep 13.89 ms

hp 09:16:03 Nov 24, 2000

WIDE TELECOM CDMA CH 777

Ref 23.6 dBm

Atten 5 dB



Center 848.3 MHz

*Res BW 30 kHz

VBW 30 kHz

Span 5 MHz

Sweep 13.89 ms



09:19:38 Nov 24, 2000

WIDE TELECOM CDMA BAND EDGE LOW CH

Ref 23.7 dBm

Atten 5 dB

Peak

Log

10

dB/

Offst

31

dB

DI

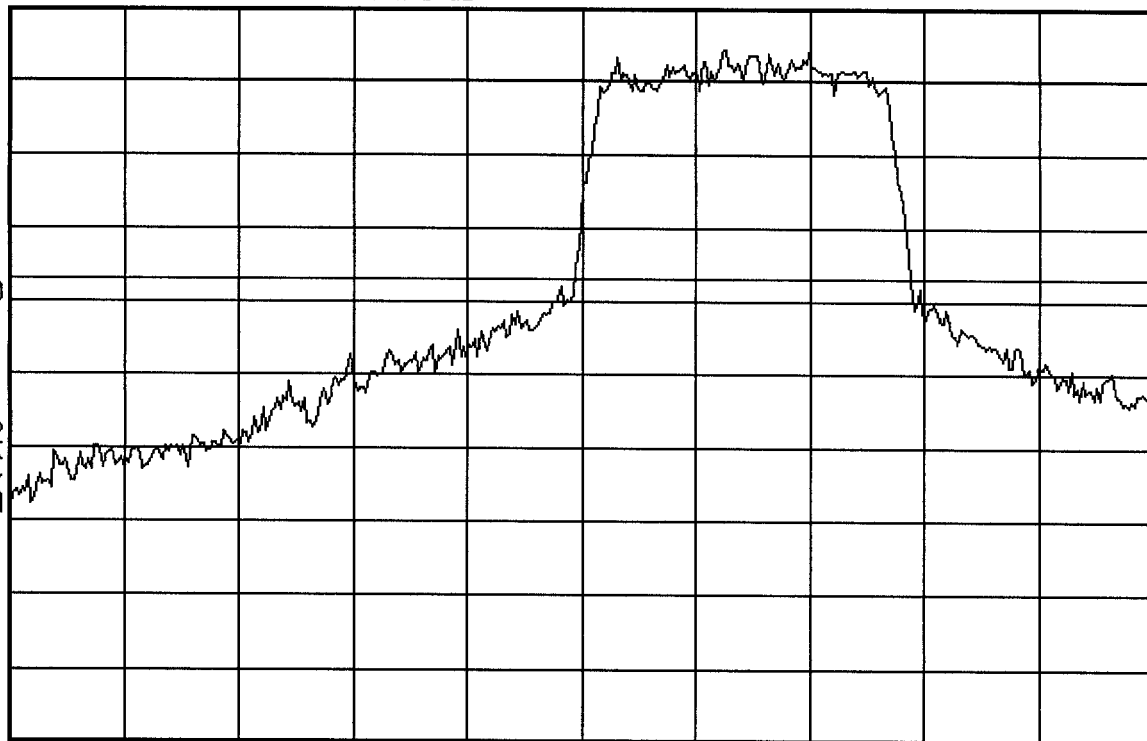
-13.0

dBm

M1 S2

S3 FC

AA



Center 824 MHz

*Res BW 30 kHz

VBW 30 kHz

Span 5 MHz

Sweep 13.89 ms

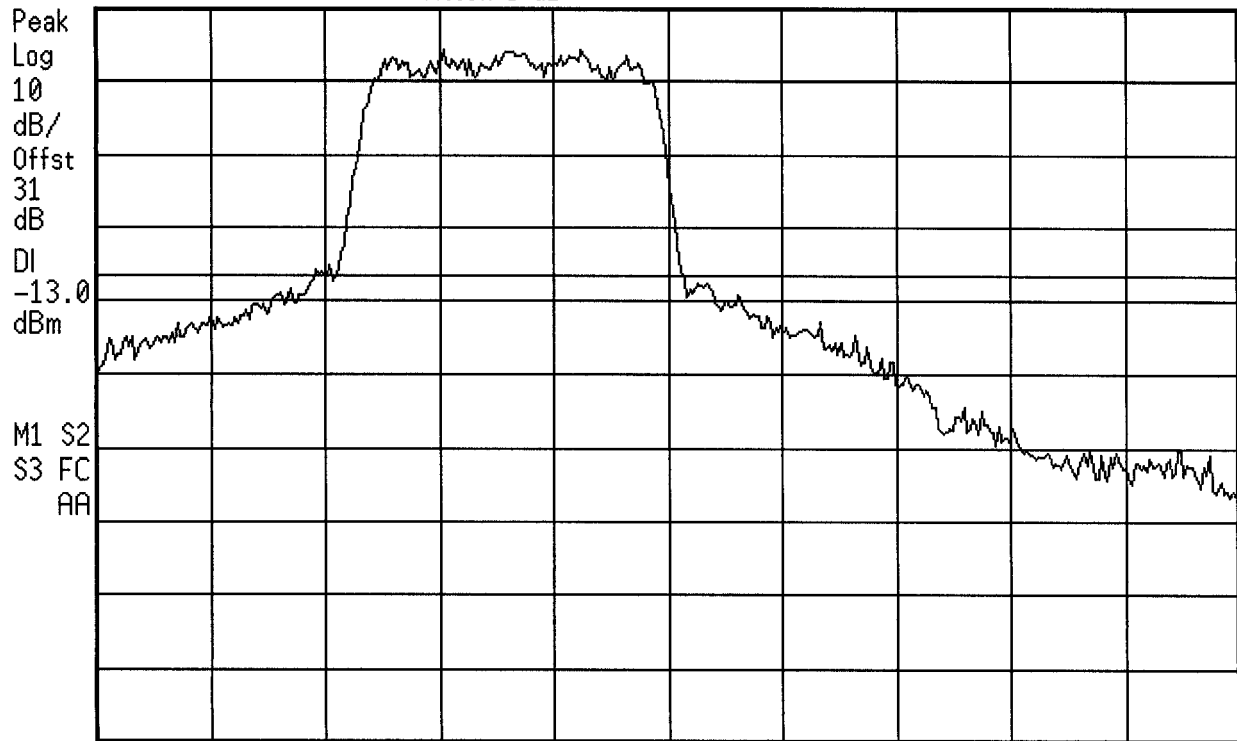


09:18:16 Nov 24, 2000

WIDE TELECOM CDMA BAND EDGE HIGH CH

Ref 23.6 dBm

Atten 5 dB



Center 849 MHz

*Res BW 30 kHz

VBW 30 kHz

Span 5 MHz

Sweep 13.89 ms



09:22:50 Nov 24, 2000

WIDE TELECOM CDMA 99% BAND WIDTH

Ref 23.7 dBm

Atten 5 dB

Samp

Log

10

dB/

Offst

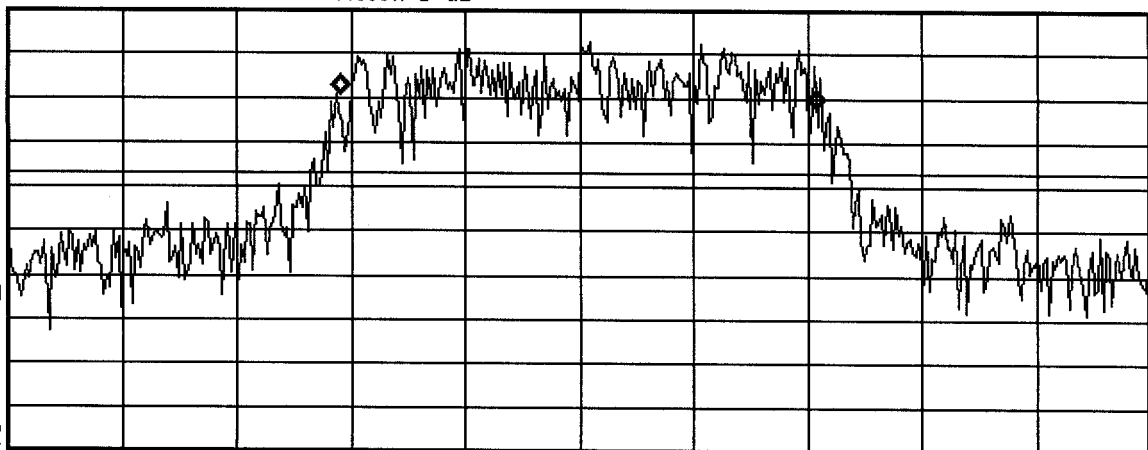
31

dB

DI

-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

Occ BW % Pwr 99.00 %

1.255 MHz

Transmit Freq Error -2.456 kHz