



FCC CFR47 CERTIFICATION

PART 22H and 24E

TEST REPORT

FOR

CDMA2000 WIRELESS BASESTATION

MODEL: WAVE2000 BS PLUS

FCC ID: OEW-AGBB

REPORT NUMBER: 02U1580-1

ISSUE DATE: OCTOBER 20, 2002

Prepared for
**INTERWAVE COMMUNICATIONS, INC.
312 CONSTITUTION DRIVE
MENLO PARK, CA 94025**

Prepared by
**COMPLIANCE CERTIFICATION SERVICES
561F MONTEREY ROAD, ROUTE 2
MORGAN HILL, CA 95037, USA
TEL: (408) 463-0885
FAX: (408) 463-0888**

TABLE OF CONTENT

1. TEST RESULT CERTIFICATION	3
2. EUT DESCRIPTION	4
3. TEST METHODOLOGY	4
4. TEST FACILITY	4
5. ACCREDITATION AND LISTING	4
6. MEASURING INSTRUMENT CALIBRATION.....	4
7. APPLICABLE RULES	5
8. TEST SETUP, PROCEDURE AND RESULT	7
8.1. SECTION 2.1046: RF POWER OUTPUT.....	7
8.2. SECTION 2.1047: MODULATION CHARACTERISTICS	14
8.3. SECTION 2.1049: OCCUPIED BANDWIDTH.....	14
8.4. SECTION 2.1051: SPURIOUS EMISSION AT ANTENNA TERMINAL	21
8.5. SECTION 2.1053: FIELD STRENGTH OF SPURIOUS RADIATION.....	38
8.6. SECTION 2.1055: FREQUENCY STABILITY.....	43
8.7. CONDUCTED & RADIATED EMISSIONS: PART 15.207 & 15.209.....	46
9. ATTACHMENT	47
9.1. EUT SETUP PHOTOS.....	47
9.2. EUT PHOTOGRAPHS	49
9.3. INSTALLATION AND SERVICE MANUAL	49
9.4. SCHEMATIC, PART LISTS AND BLOCK DIAGRAM	49
9.5. PROPOSED FCC ID LABEL FORMAT	49

1. TEST RESULT CERTIFICATION

COMPANY NAME: INTERWAVE COMMUNICATIONS, INC.
312 CONSTITUTION DRIVE
MENLO PARK, CA 94025

CONTACT PERSON: RON ALLEN / PURCHASING MANAGER

TELEPHONE NO: (650) 838-3208

EUT DESCRIPTION: CDMA2000 WIRELESS BASESTATION

MODEL NAME: WAVE2000 BS PLUS

BRAND NAME INTERWAVE COMMUNICATIONS

DATE TESTED: OCTOBER 20, 2002

TYPE OF EQUIPMENT	INTENTIONAL RADIATOR
EQUIPMENT TYPE	824 – 869 MHz (22) & 1930-1990 MHz (24) Base Station
MEASUREMENT PROCEDURE	ANSI 63.4 / 1992, TIA/EIA 603
PROCEDURE	CERTIFICATION
FCC RULE	CFR 47 PART 22 Subpart H and 24 Subpart E

Compliance Certification Services, Inc. tested the above equipment for compliance with the requirement set forth in CFR 47, PART 22 Subpart H-Cellular Radiotelephone Service and 24 Subpart E-Broadband PCS. The equipment in the configuration described in this report, shows the measured emission levels emanating from the equipment do not exceed the specified limit.

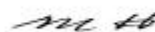
Note : This document reports conditions under which testing was conducted and results of tests performed. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document.

Test By:



THU CHAN
SENIOR EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

Released For CCS By:



MICHAEL HECKROTTE
CHIEF ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. EUT DESCRIPTION

The microcell BSS is intended for high capacity and flexible power output applications. It has two receive connections per radio, for main and diversity reception. A single transmit connection per is used. The transmit output power at the radio is adjustable, but is in the ~5dBm range (3.16mW). Radios are available for 800MHz cellular (band 0) or 1900MHz PCS (band 1) frequency operation.

3. TEST METHODOLOGY

Both conducted and radiated testing were performed according to the procedures documented on chapter 13 of ANSI C63.4 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057.

4. TEST FACILITY

The open area test sites and conducted measurement facilities used to collect the radiated data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

5. ACCREDITATION AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code: 200065-0 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government. In addition, the test facilities are listed with Federal Communications Commission (reference no: 31040/SIT (1300B3) and 31040/SIT (1300F2))

6. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

7. APPLICABLE RULES

§22.913 & 24.232- POWER LIMIT

22.913(a): Maximum ERP. The effective radiated power (ERP) of base station transmitters and cellular repeater must not exceed 500 Watts. The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

24.232(a): Maximum Peak output power for base station transmitters should not exceed 100 Watts conducted and 1640W EIRP if antenna height up to 300 meters for Base Station, 2W EIRP for Mobile / Portable.

§22.355 & 24.235- FREQUENCY STABILITY

The frequency stability shall be sufficient to ensure that the fundamental emission stays within ± 2.5 ppm.

§22.917 & 24.238- EMISSION LIMITS

22.917(e): Out-of-band emissions. The mean power of emissions must be attenuated below the mean power of the un-modulated carrier (P) on any frequency twice or more than twice the fundamental frequency by:
at least $43 + 10 \log P$ dB (-13dBm)

24.238(a): The magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under conditions specified in the instruction manual and/or alignment procedure, shall not be less than $43 + 10 \log$ (mean output power in watts) dBc below the mean power output outside a licensee's frequency block (-13dBm).

24.238(b) & (c);

- (1) Compliance with the out-of-band emissions requirement is based on test being performed with 1MHz analyzer RES BW.
- (2) At block edges, RES BW may be adjusted to a level at least as large as 1% of emission bandwidth. The emissions bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. For the EUT this is at least:

§2.1057- SPECTRUM RANGE TO BE INVESTIGATED

Lowest radio frequency signal generated in the equipment, without going below 9 kHz, up to at least the frequency shown below:

(1) If the equipment operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

(2) If the equipment operates at or above 10 GHz and below 30 GHz:
to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.

(3) If the equipment operates at or above 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 200 GHz, whichever is lower.

(b) Particular attention should be paid to harmonics and sub-harmonics of the carrier frequency as well as to those frequencies removed from the carrier by multiples of the oscillator frequency.

Radiation at the frequencies of multiplier stages should also be checked.

(c) The amplitude of spurious emissions, which are attenuated more than 20 dB below the permissible value, need not be reported.

(d) Unless otherwise specified, measurements above 40 GHz shall be performed using a minimum resolution bandwidth of 1 MHz.

Spec limit: Frequency investigation range from 15M to tenth harmonic (i.e. 20 GHz).

§PART 15 RADIATED EMISSION

NOT APPLICABLE. The accompany digital port is designed for using in set up only, not for daily operation and after set up no cable will be attached to this port.

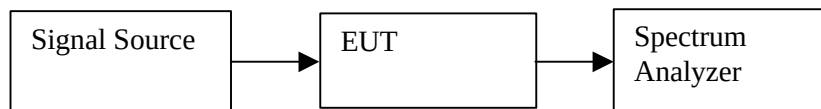
8. TEST SETUP, PROCEDURE AND RESULT

8.1. SECTION 2.1046: RF POWER OUTPUT

INSTRUMENTS LIST

EQUIPMENT	MANUFACTURE	MODEL NO.	CAL. DUE DATE
EMI Receiver	HP	8593EM	6/11/03

TEST SETUP



TEST PROCEDURE

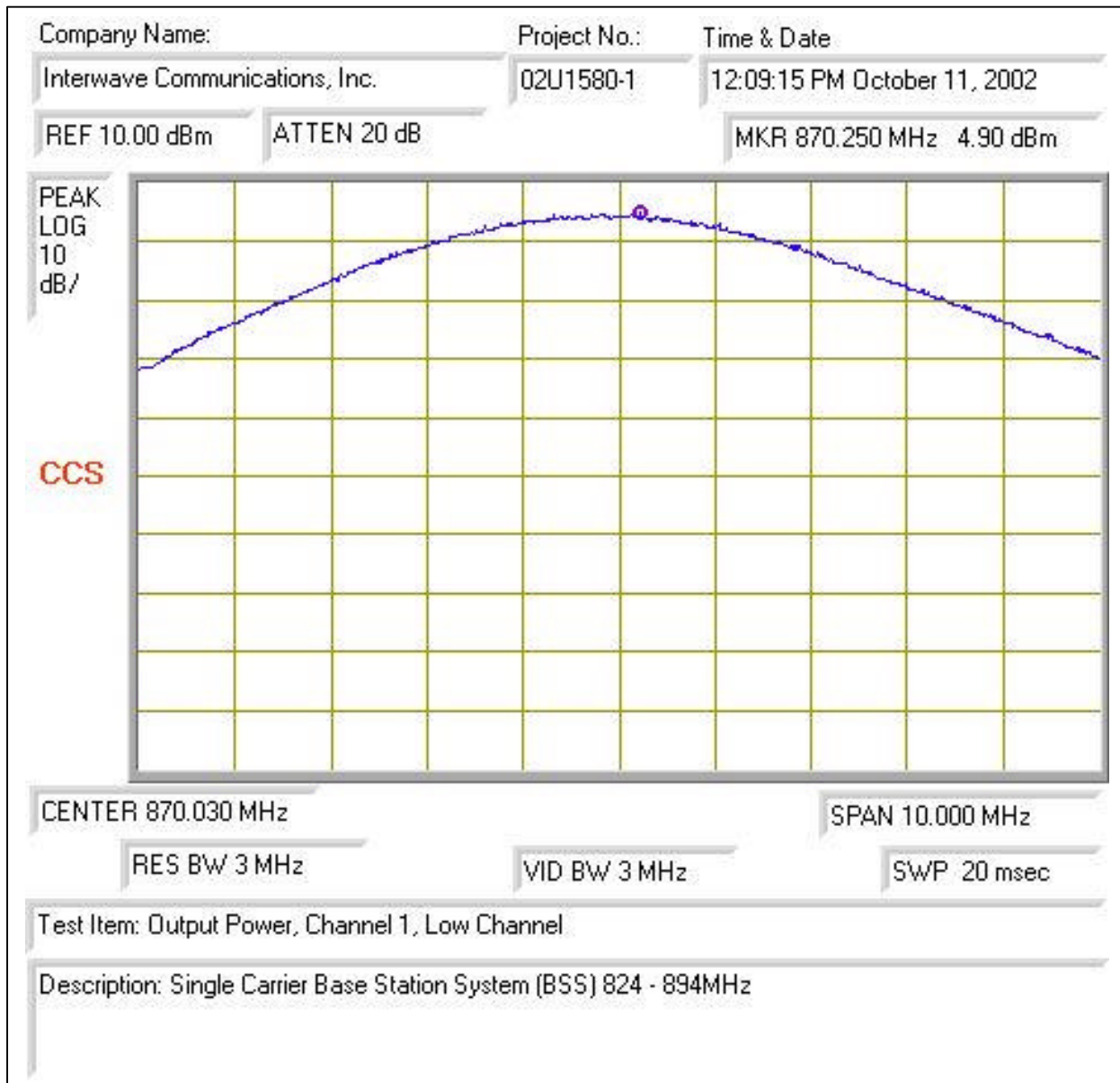
The EUT was set to maximum output power (maximum gain). RF output power was measured with Spectrum Analyzer.

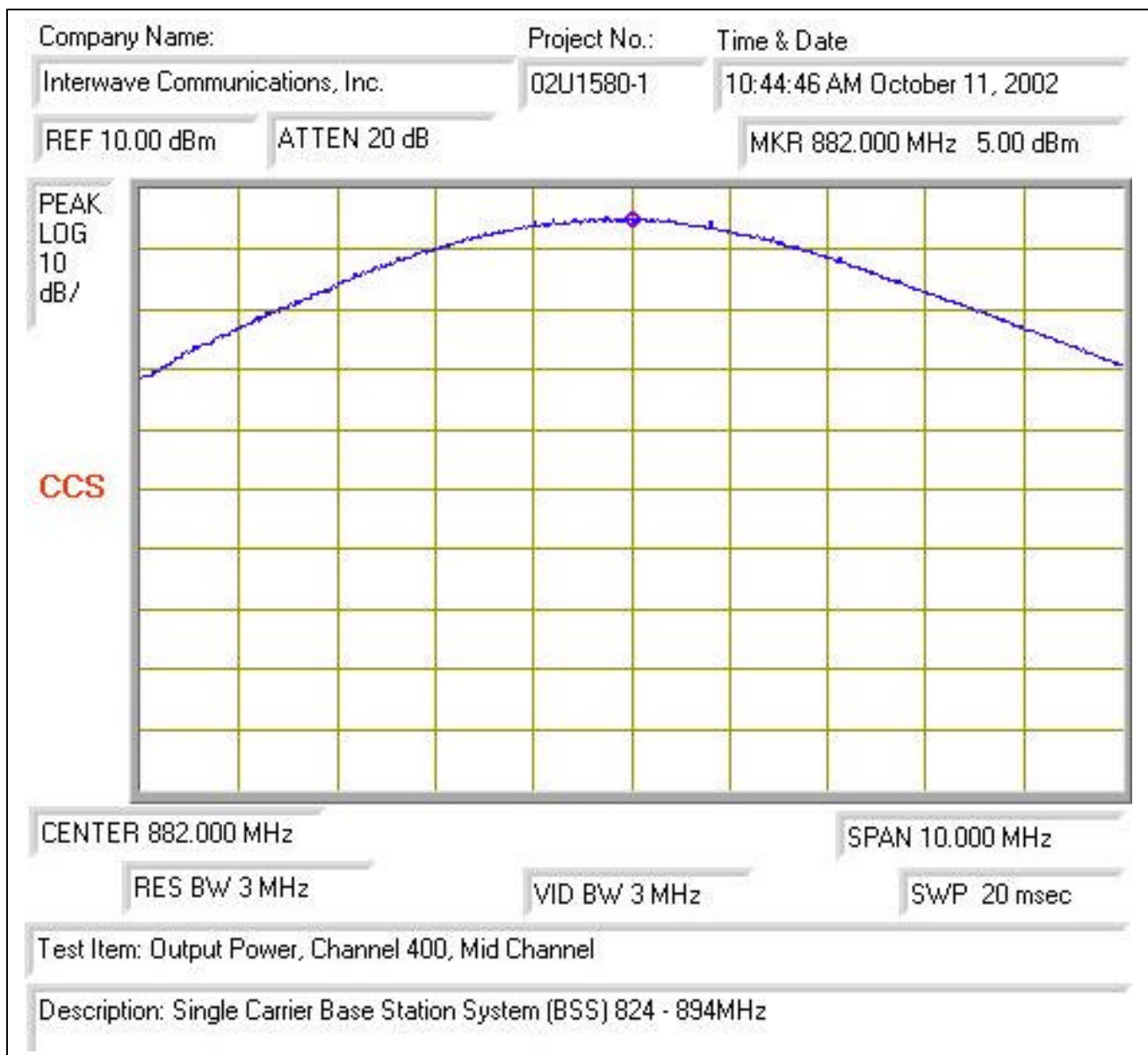
RESULT

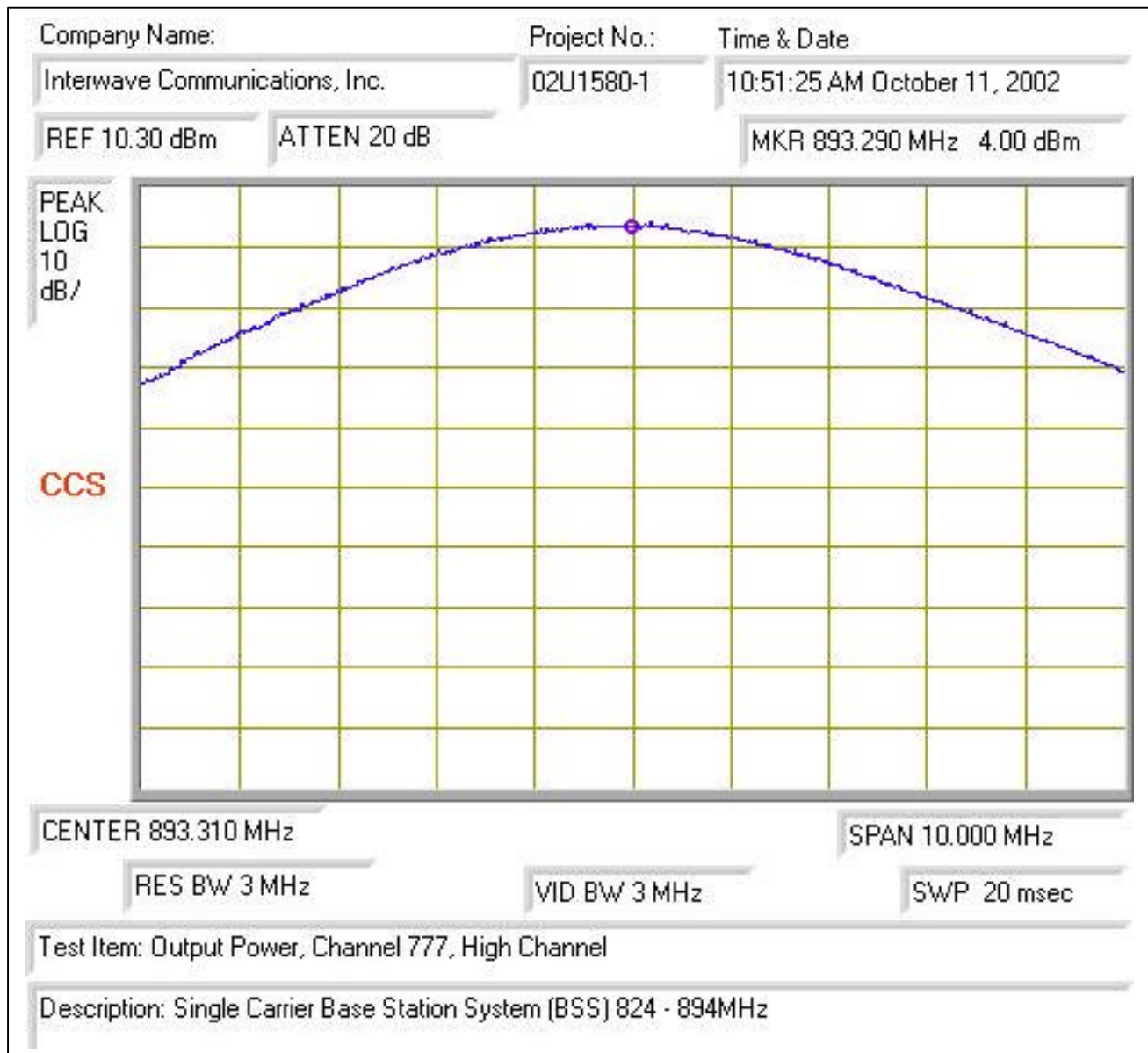
Measured with Spectrum Analyzer. Set the power amplifier to the maximum output gain.

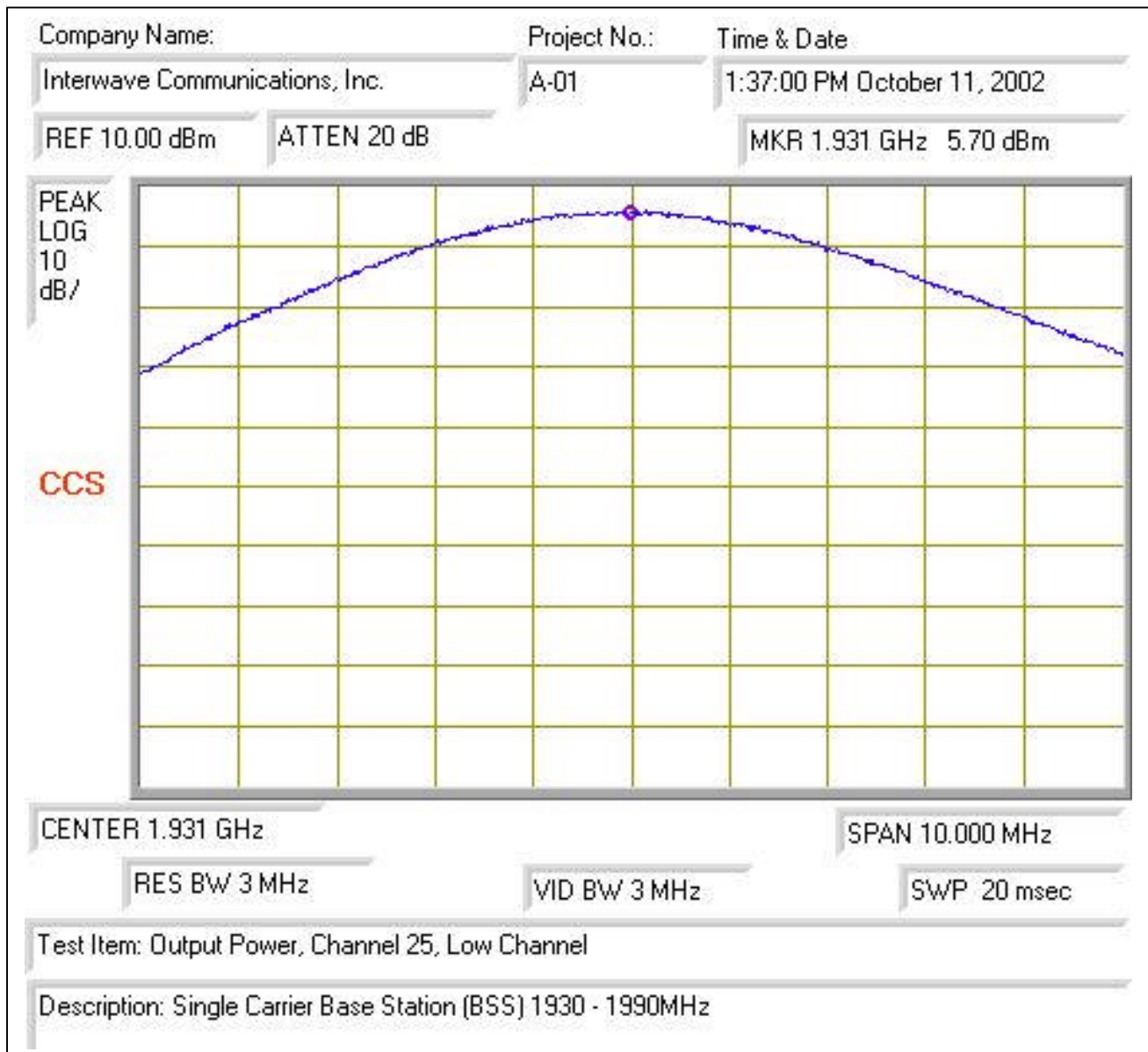
Test result:

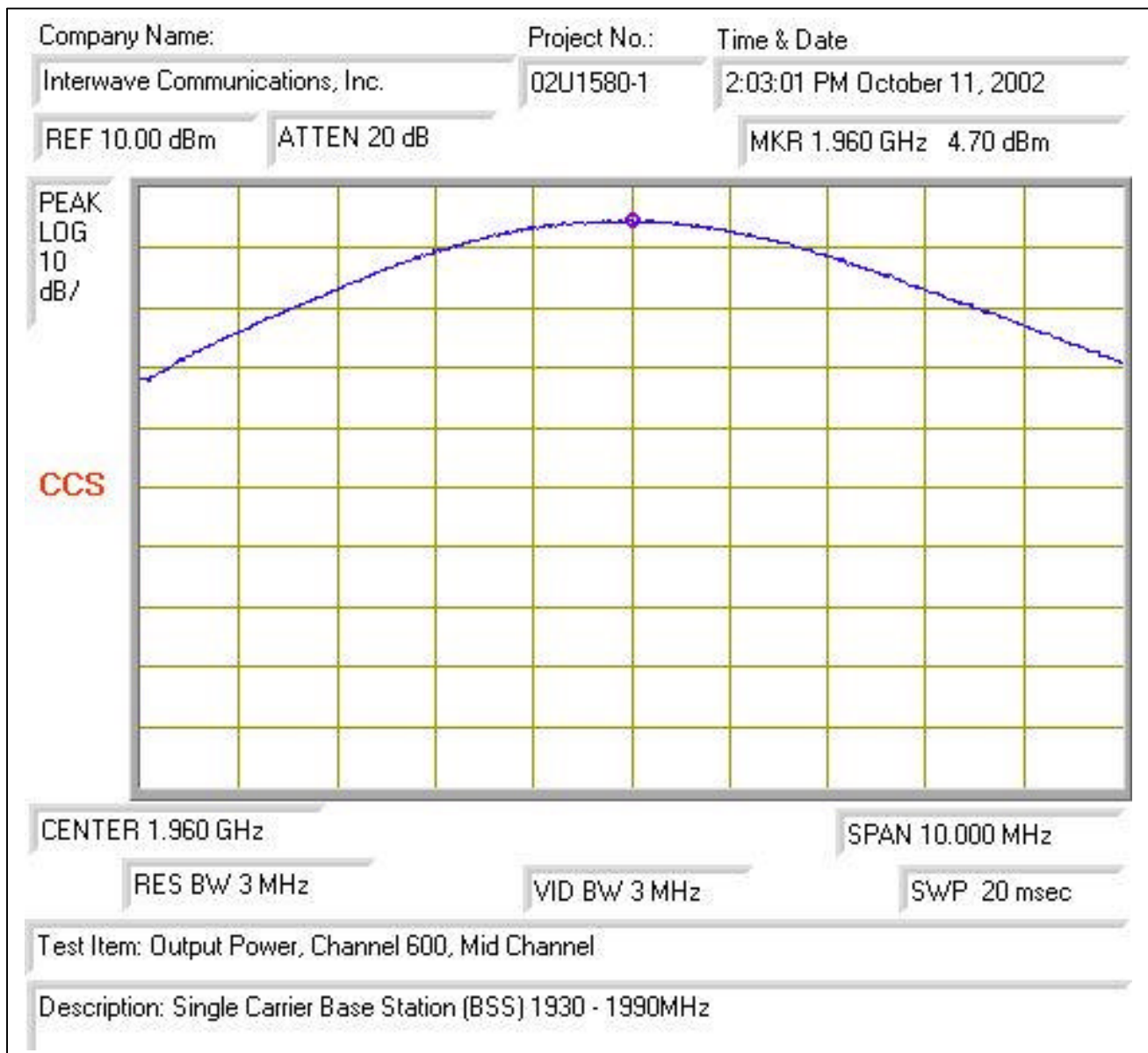
<i>Modulation</i>	<i>Max Output Power (dBm)</i>	<i>Max Output Power (mW)</i>
<i>CDMA 800MHz</i>	<i>5.00</i>	<i>3.16</i>
<i>CDMA 1900MHz</i>	<i>5.70</i>	<i>3.72</i>

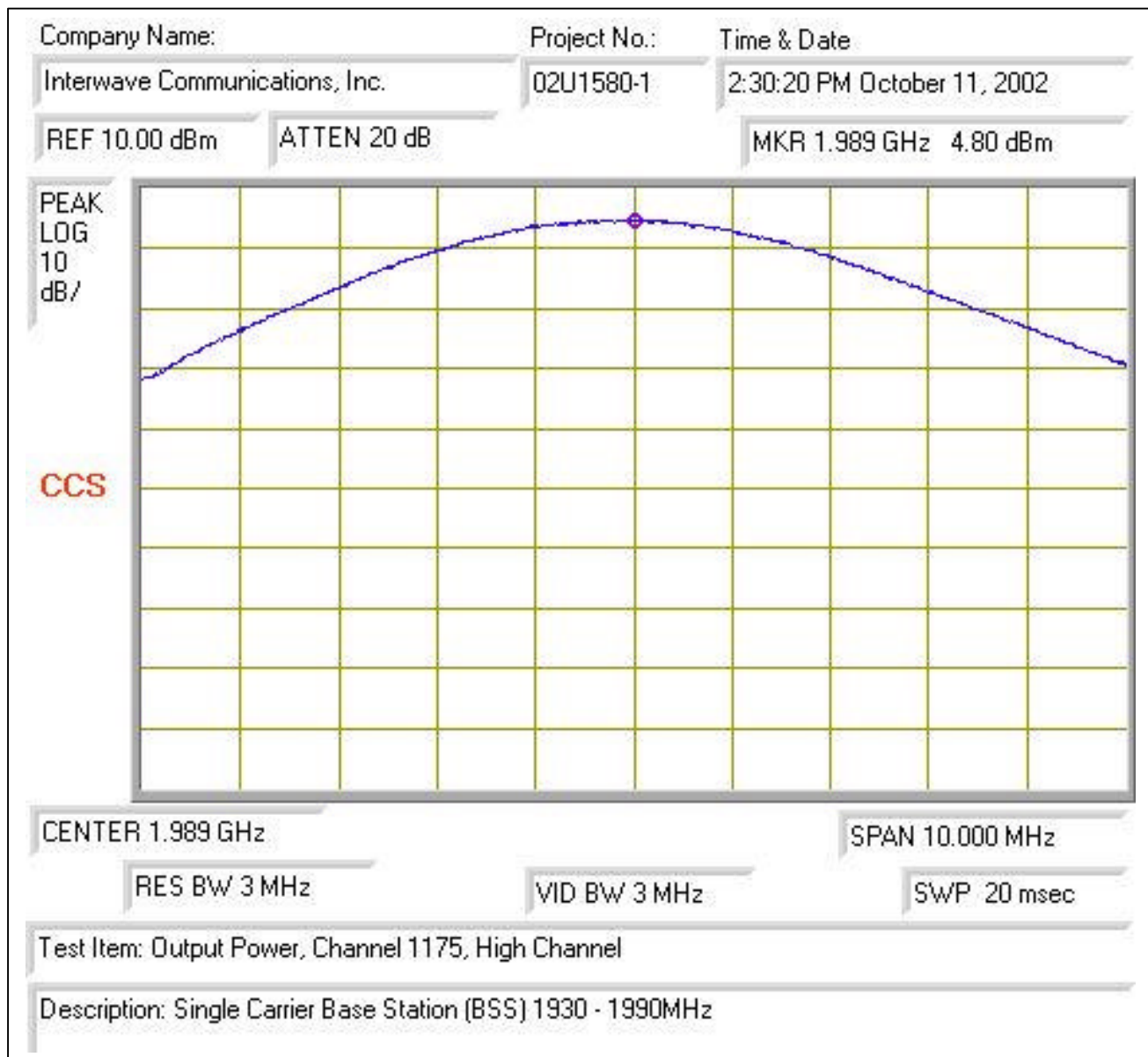
800MHz CDMA:





CDMA 1900MHz:





8.2. SECTION 2.1047: MODULATION CHARACTERISTICS

(NOT APPLICABLE TO THIS REPEATER, THE EUT DOESN'T HAVE A FREQUENCY TRANSLATOR OR MODULATOR INSIDE OF EUT. THE EUT IS AN AMPLIFIER TYPE REPEATER.)

8.3. SECTION 2.1049: OCCUPIED BANDWIDTH

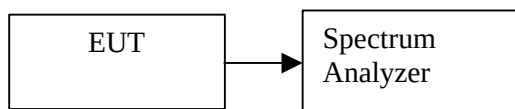
SECTION 2.1049(i)

Transmitters designed for other types of modulation – when modulated by an appropriate signal of sufficient amplitude to be representative of the type of service in which used. A description of the input signal should be supplied.

INSTRUMENTS LIST

EQUIPMENT	MANUFACTURE	MODEL NO.	CAL. DUE DATE
EMI Receiver	HP	8593EM	6/11/03

TEST SETUP

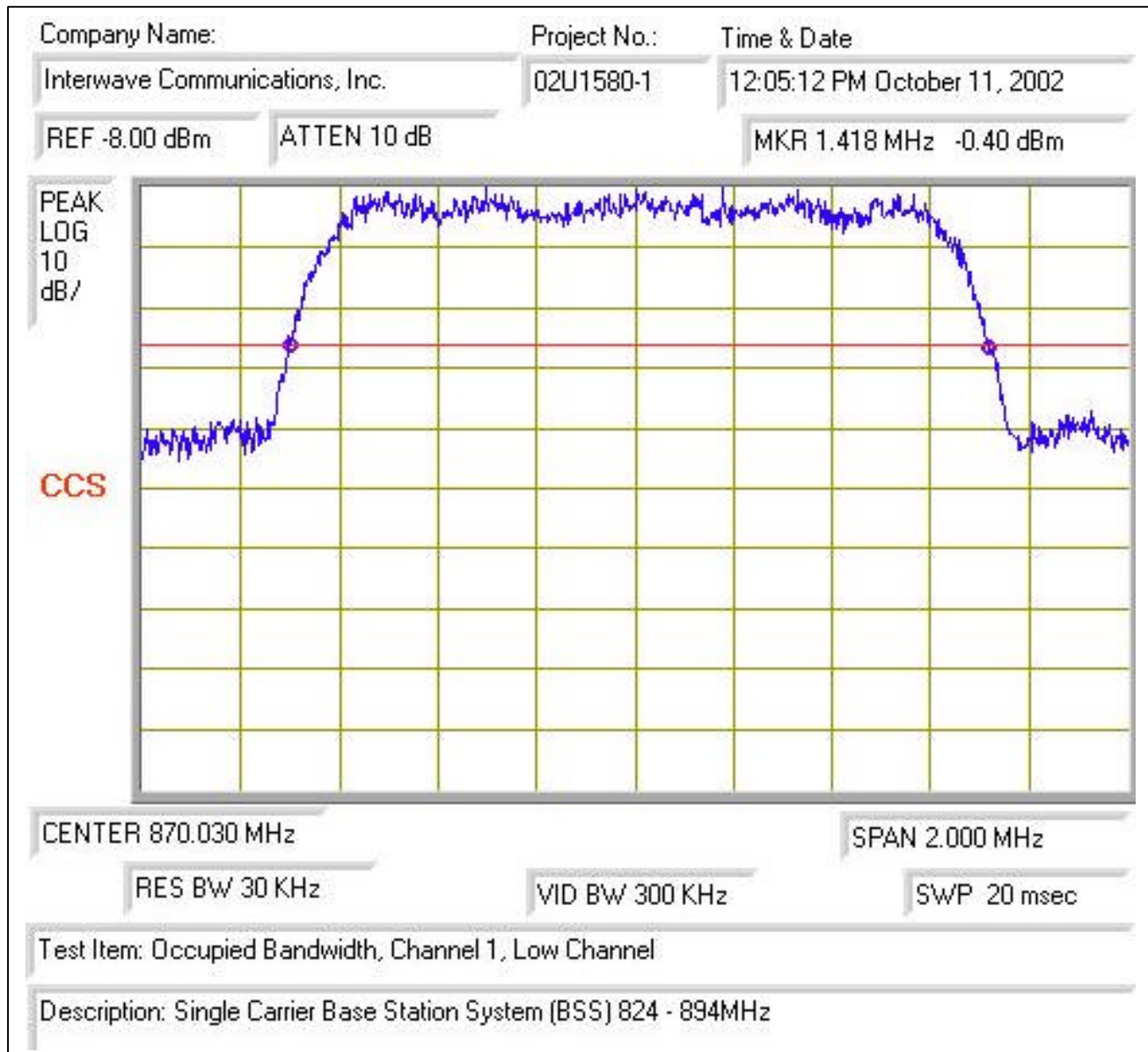


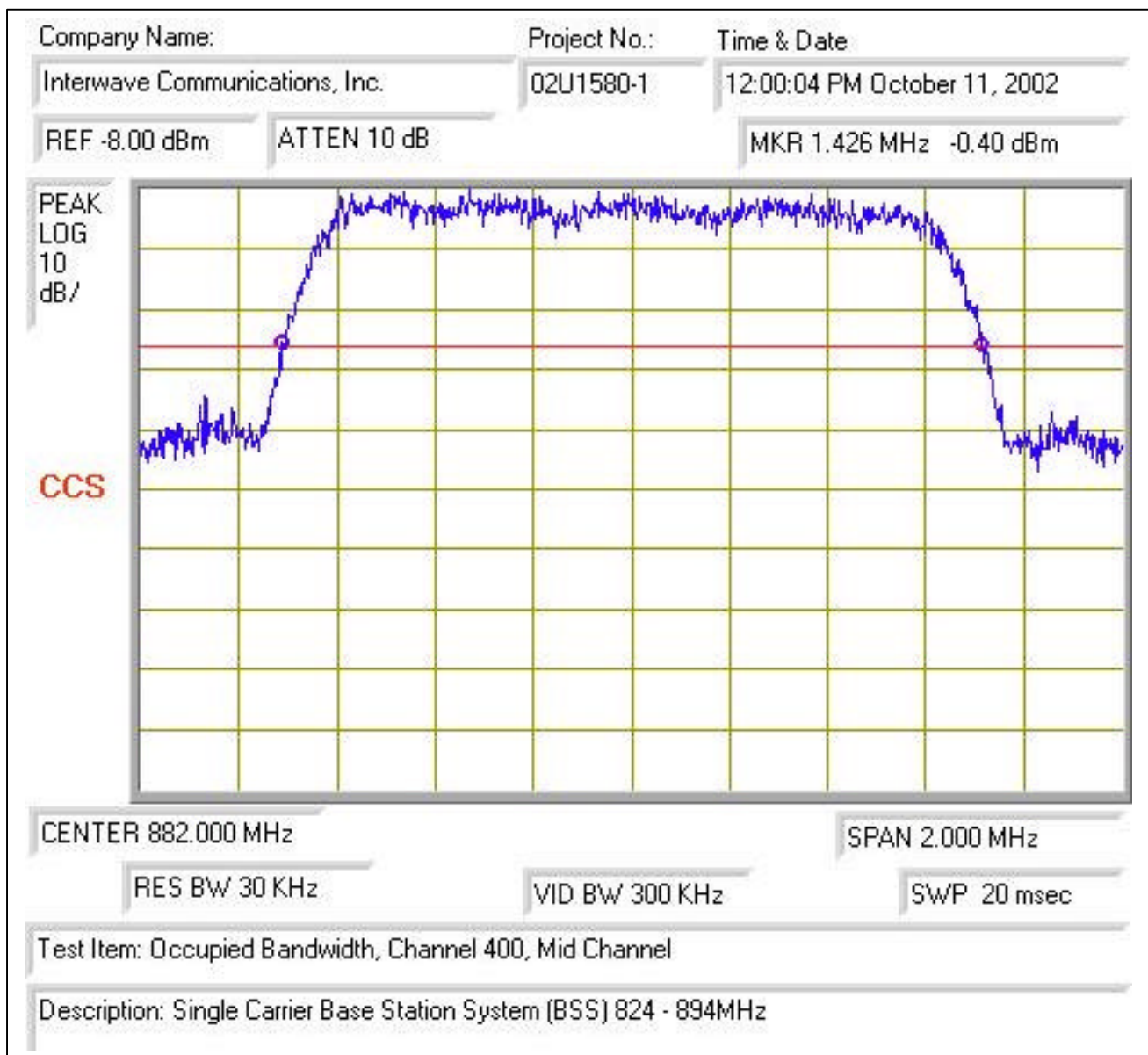
TEST PROCEDURE

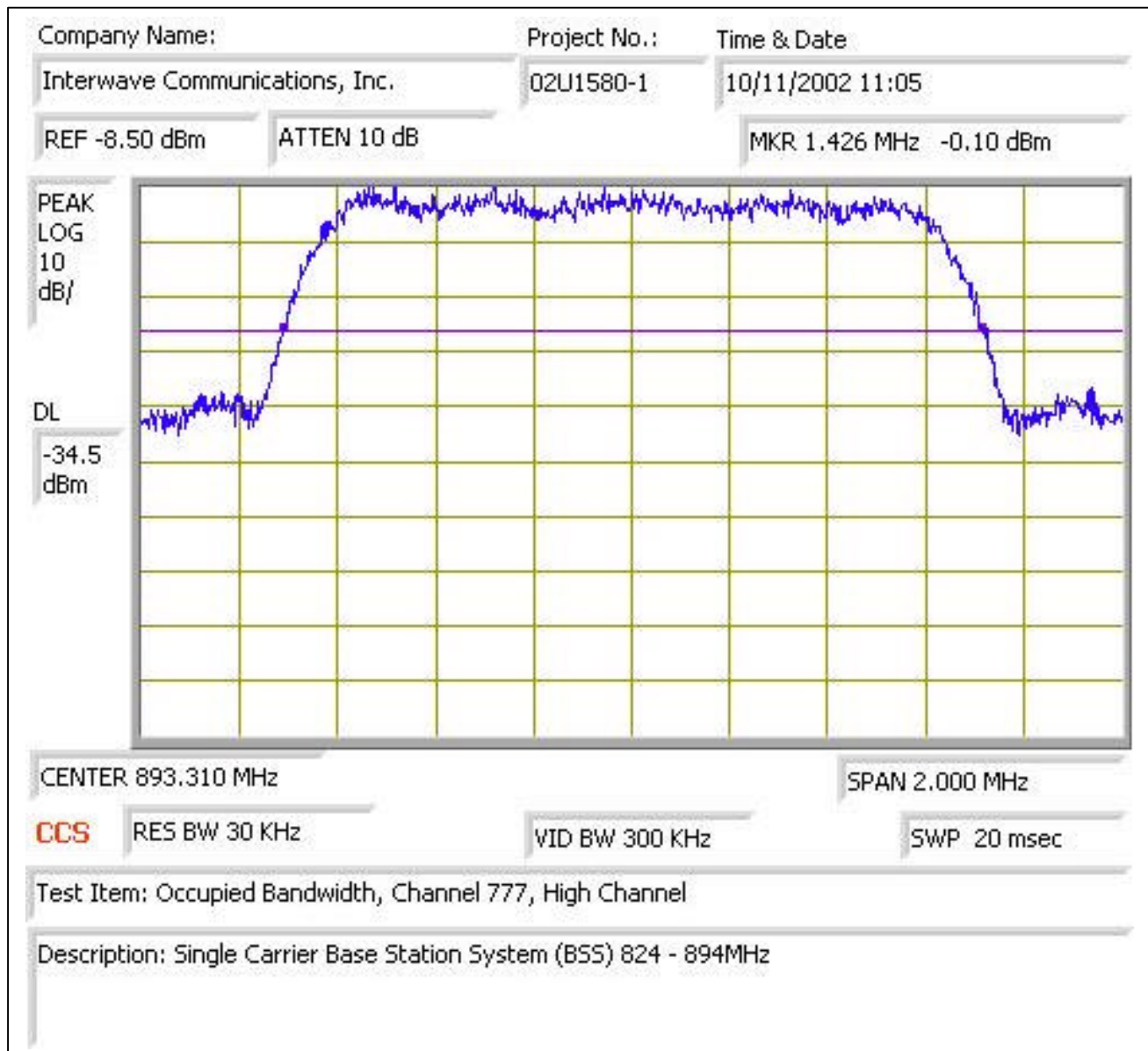
The EUT's occupied bandwidth output plot is compared with the input source plot to check that no distortion is created when the input signal is amplified by the EUT. Identical bandwidths, spans and center frequencies are used for both plots. Reference levels and attenuation are adjusted.

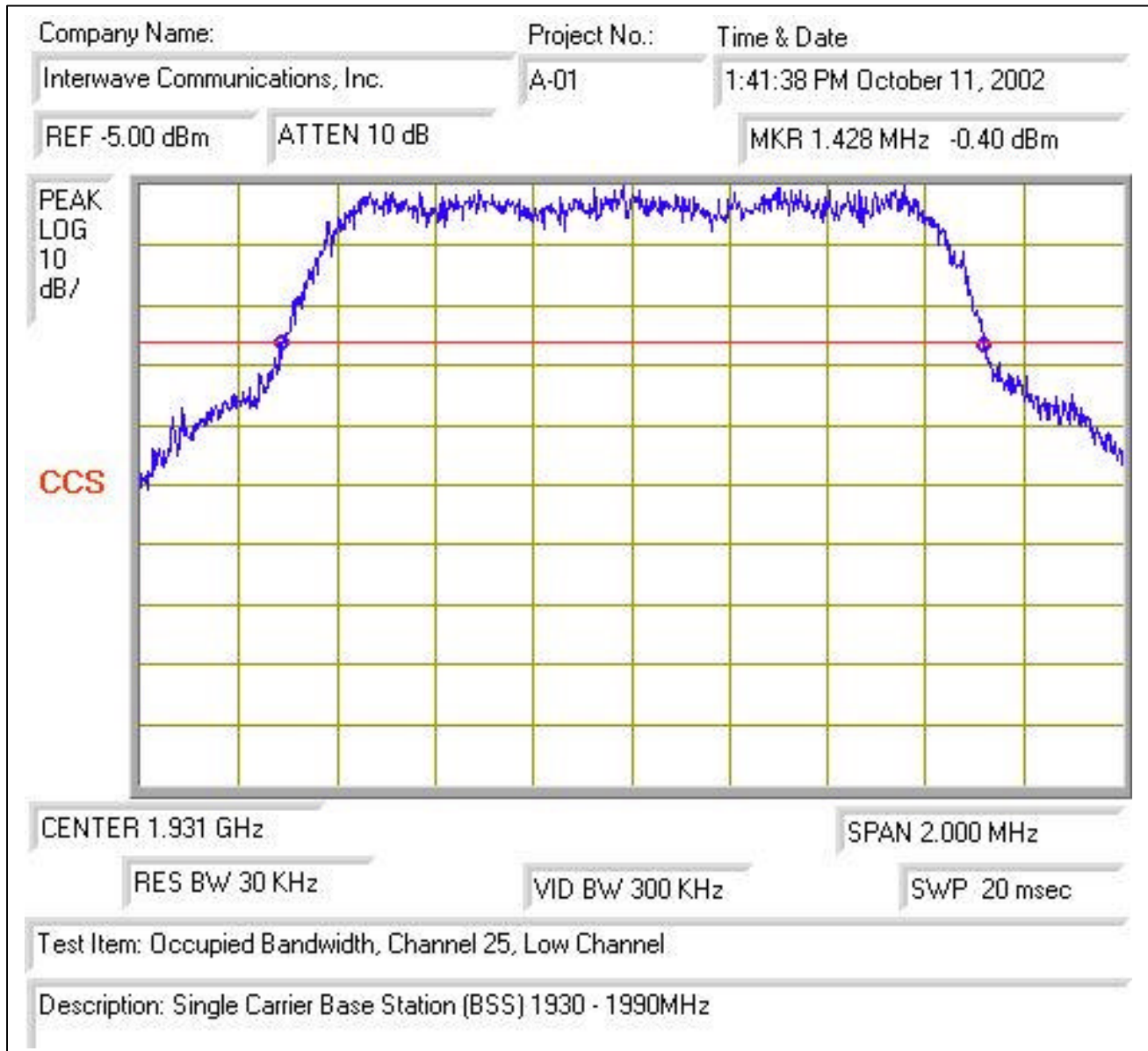
RESULT

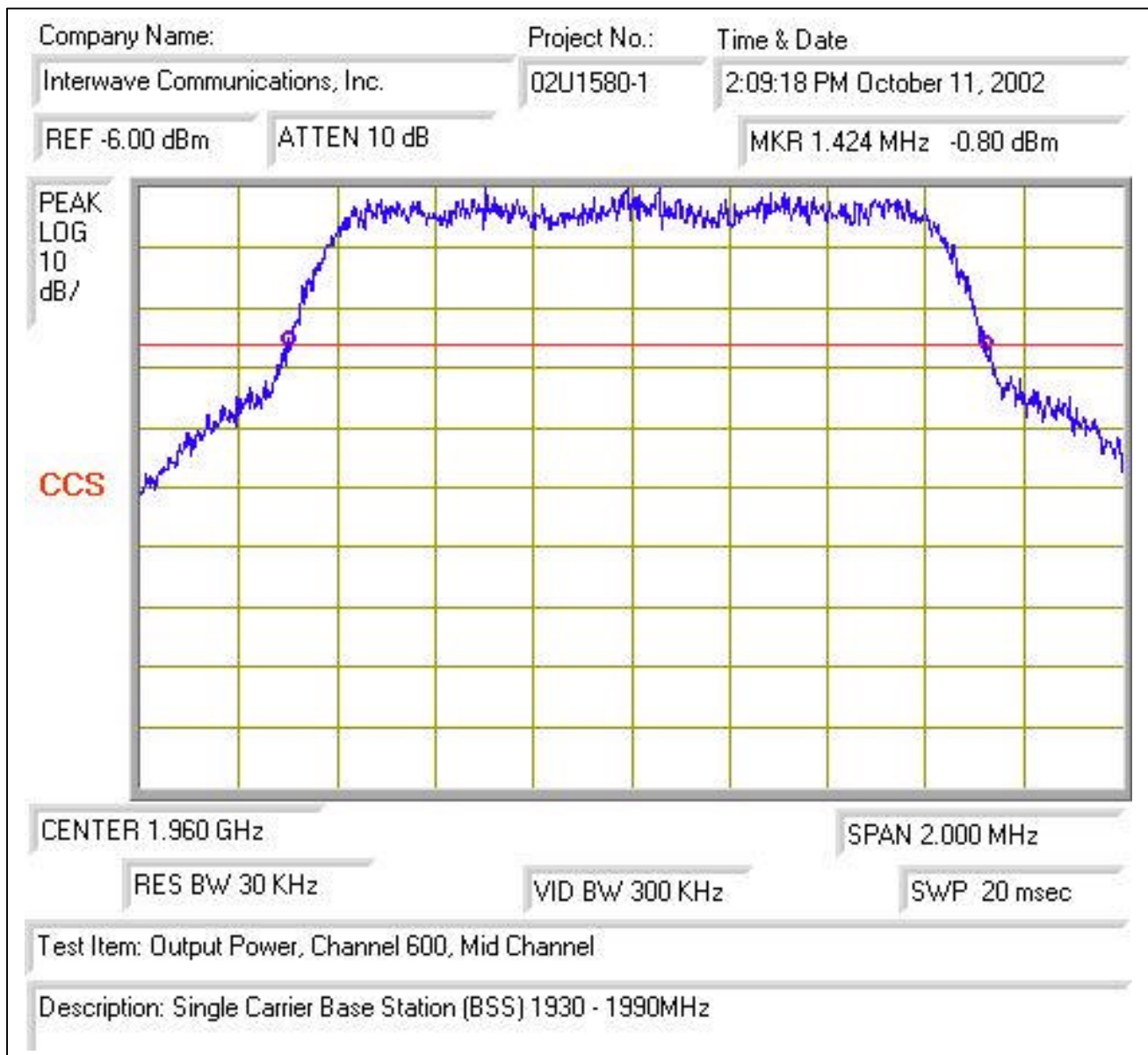
No non-compliance noted as shown below.

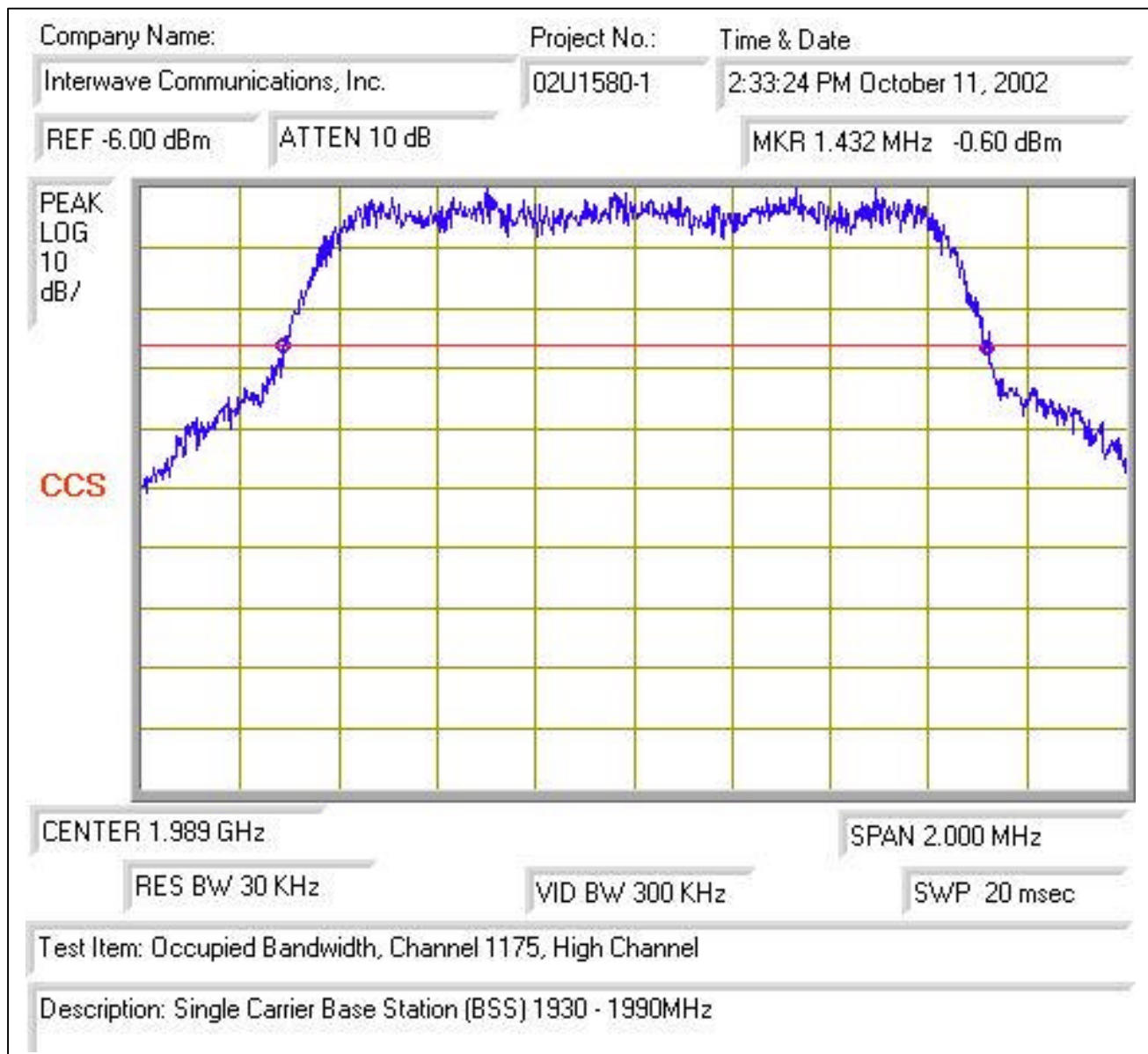
800MHz CDMA:





CDMA 1900MHz:



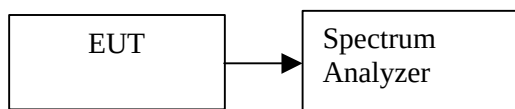


8.4. SECTION 2.1051: SPURIOUS EMISSION AT ANTENNA TERMINAL

INSTRUMENTS LIST

EQUIPMENT	MANUFACTURE	MODEL NO.	CAL. DUE DATE
EMI Receiver	HP	8593EM	6/20/02

TEST SETUP

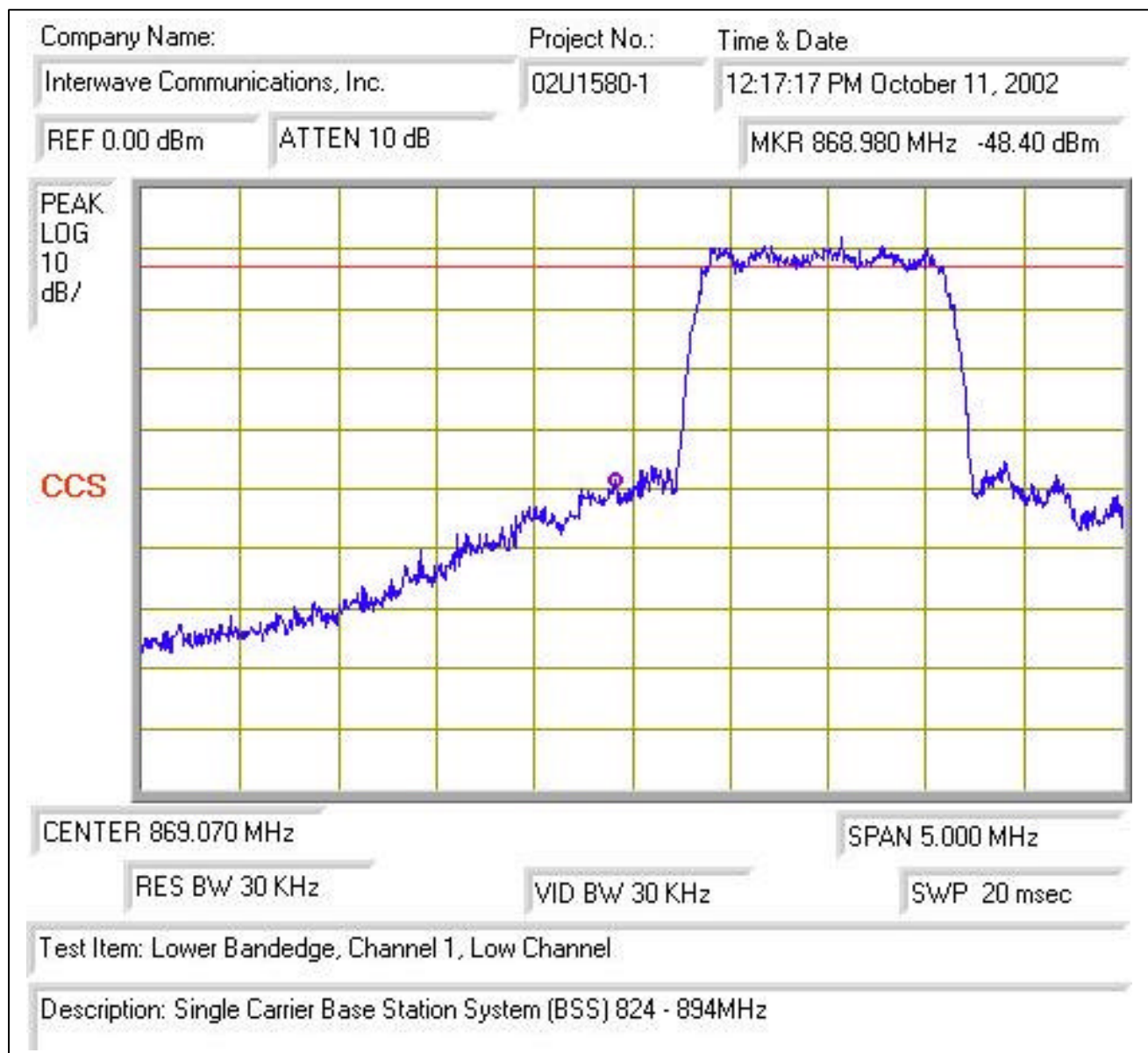


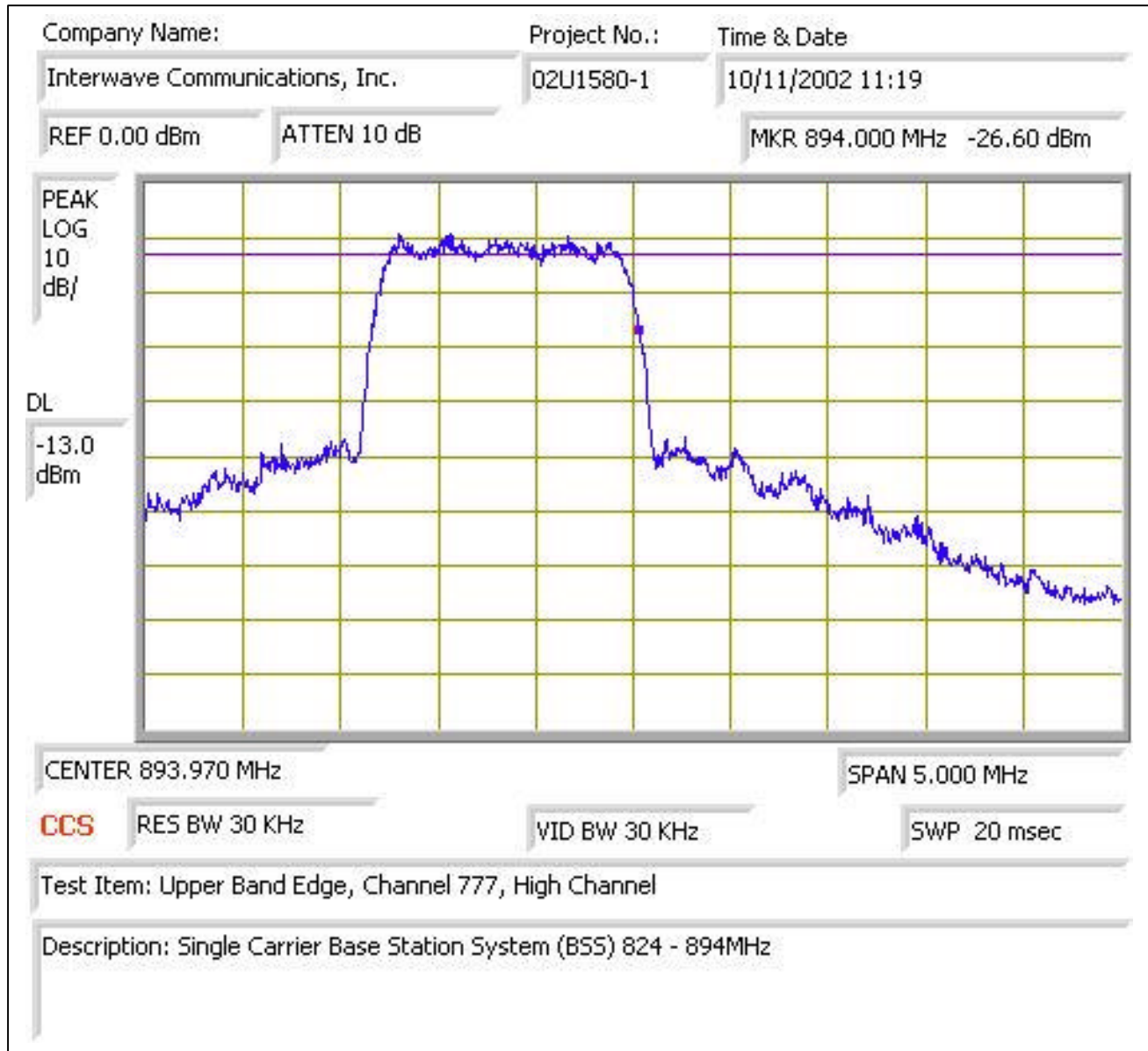
TEST PROCEDURE

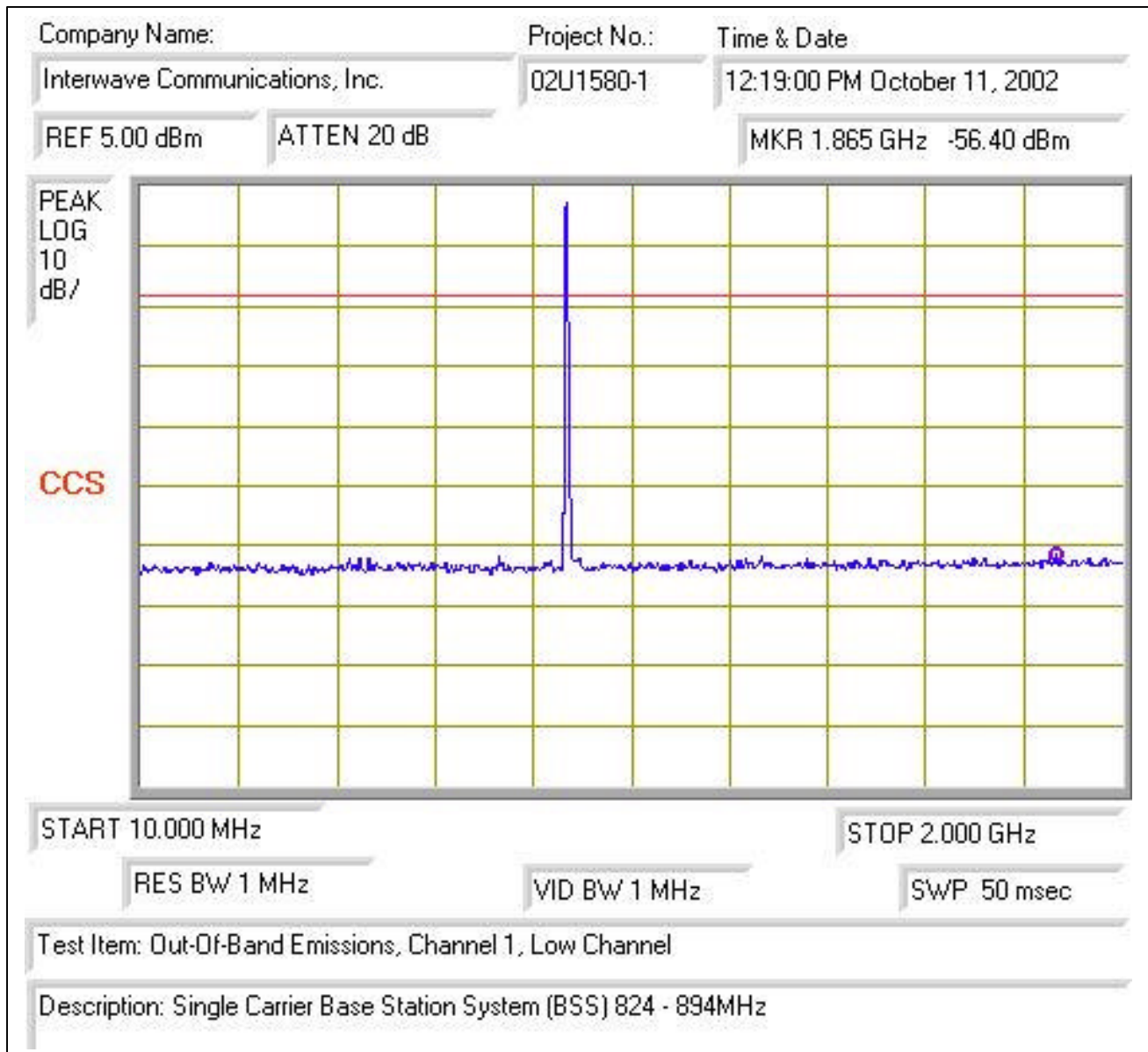
- 1) RF signal was applied to the RF input. Set the RES BW to 1% of the emission bandwidth to show compliance with the -13dBm limit, in the 1 MHz bands immediately outside and adjacent to the top and bottom edges of the frequency block.
- 2) For the Out-of-Band measurements a 1 MHz RES BW was used to scan from 10 MHz to $10 \times f_o$ of the fundamental carrier for all frequency block. A display line was placed at -13dBm to show compliance for spurious, and harmonics emissions
- 3) 24.318(b) and also outside of which all emissions are attenuated at least 26 dB below the transmitter power.

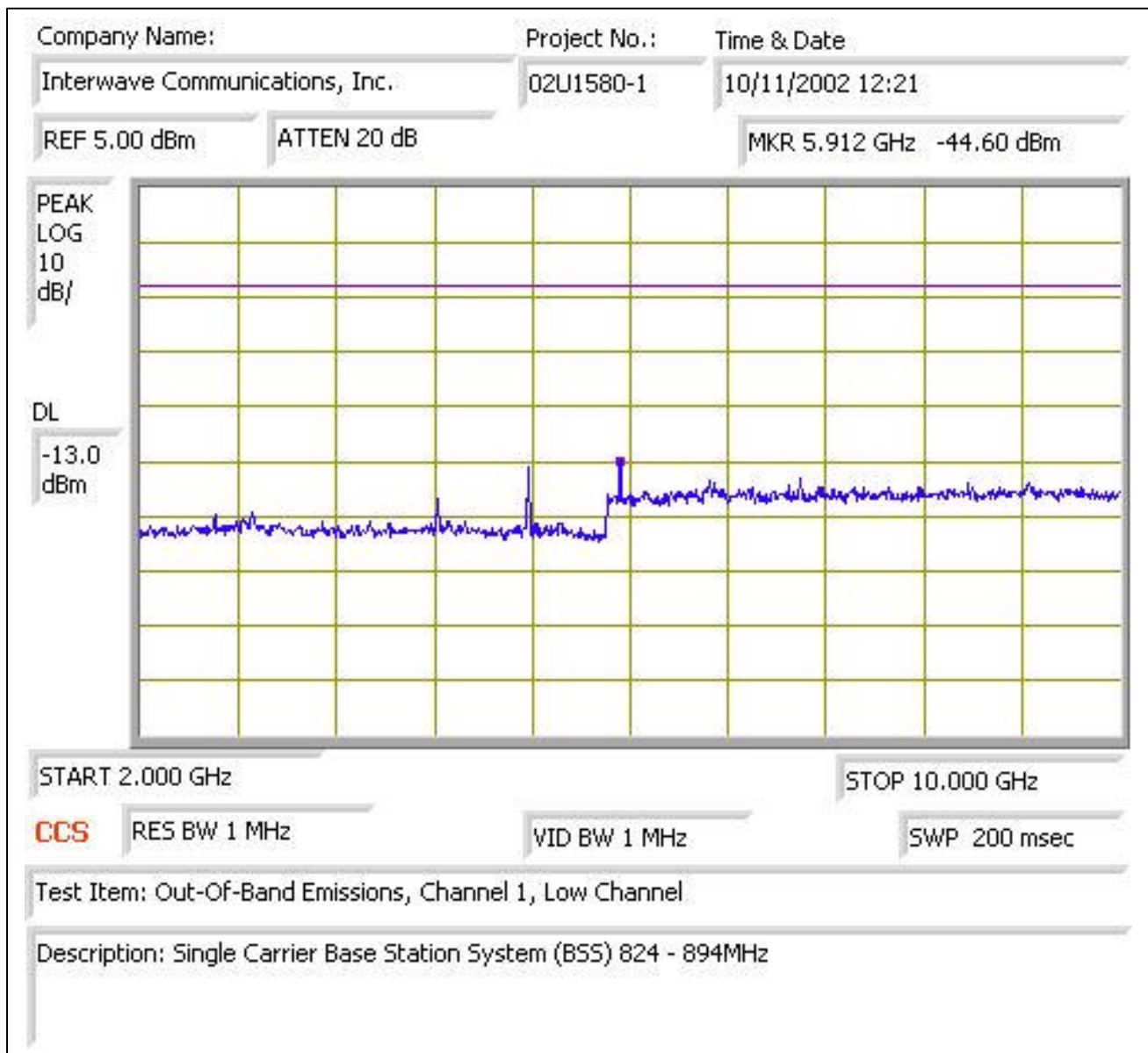
RESULT

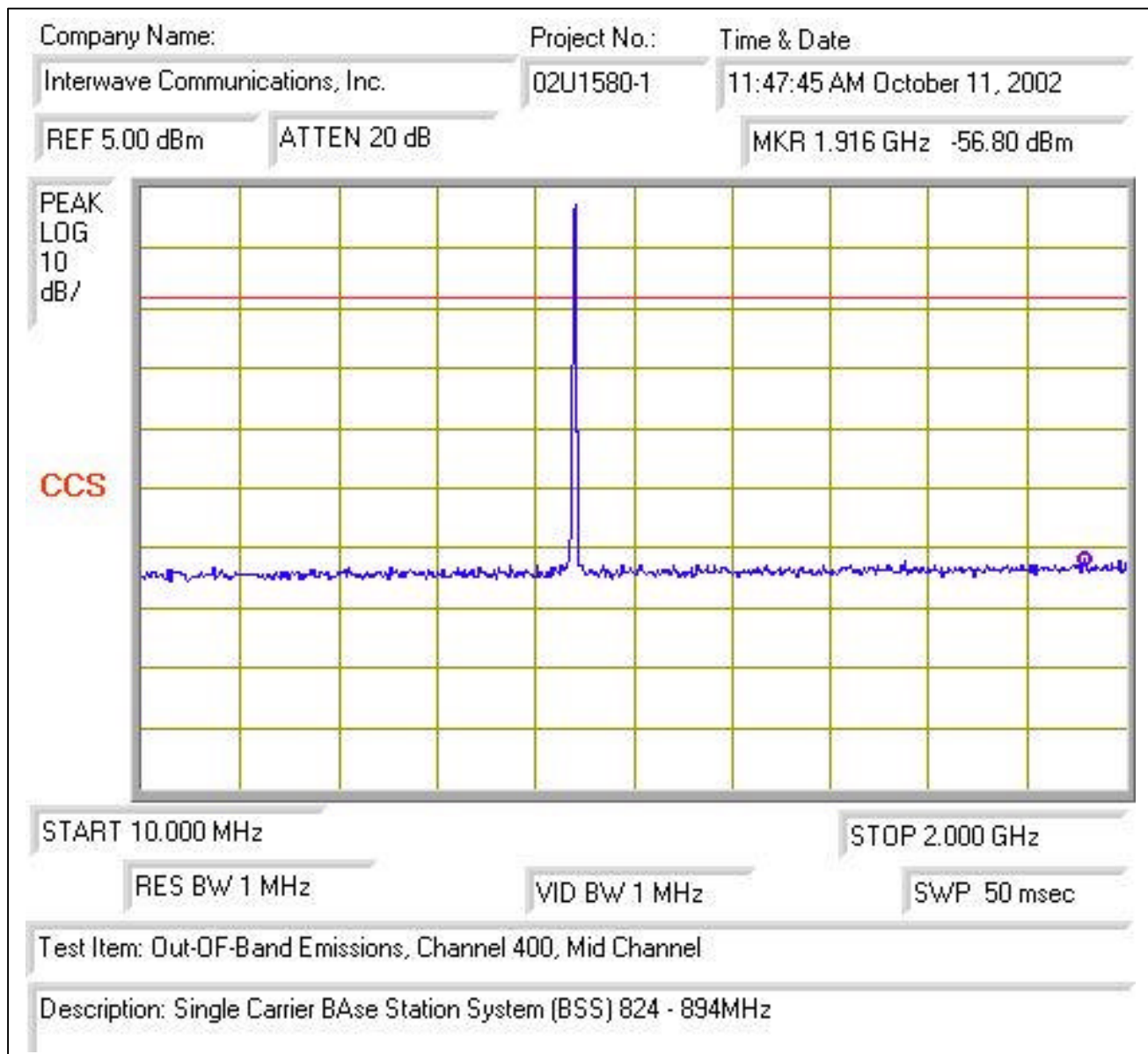
No non-compliance noted as shown below.

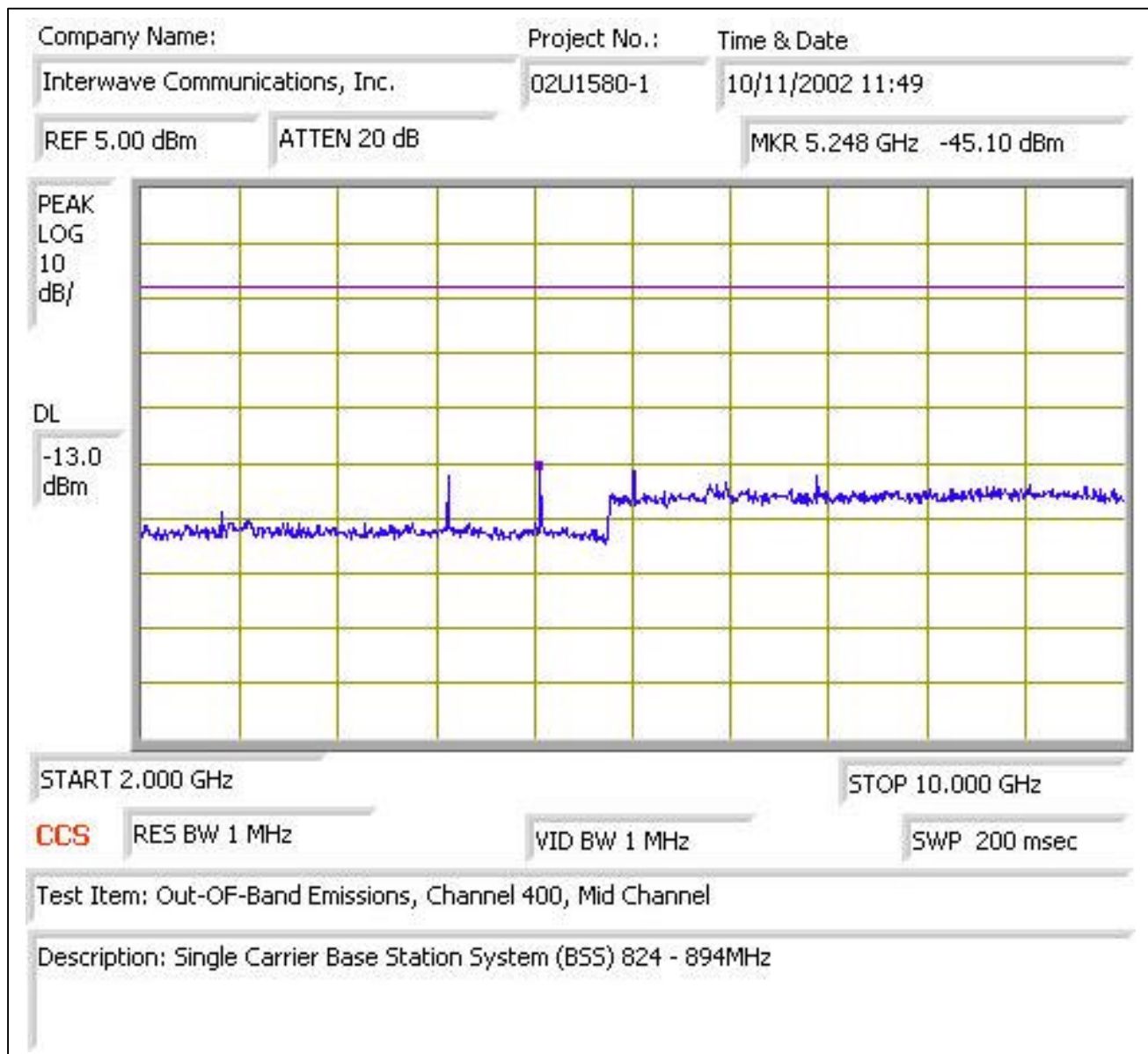
800MHz CDMA, Lower Band Edge:

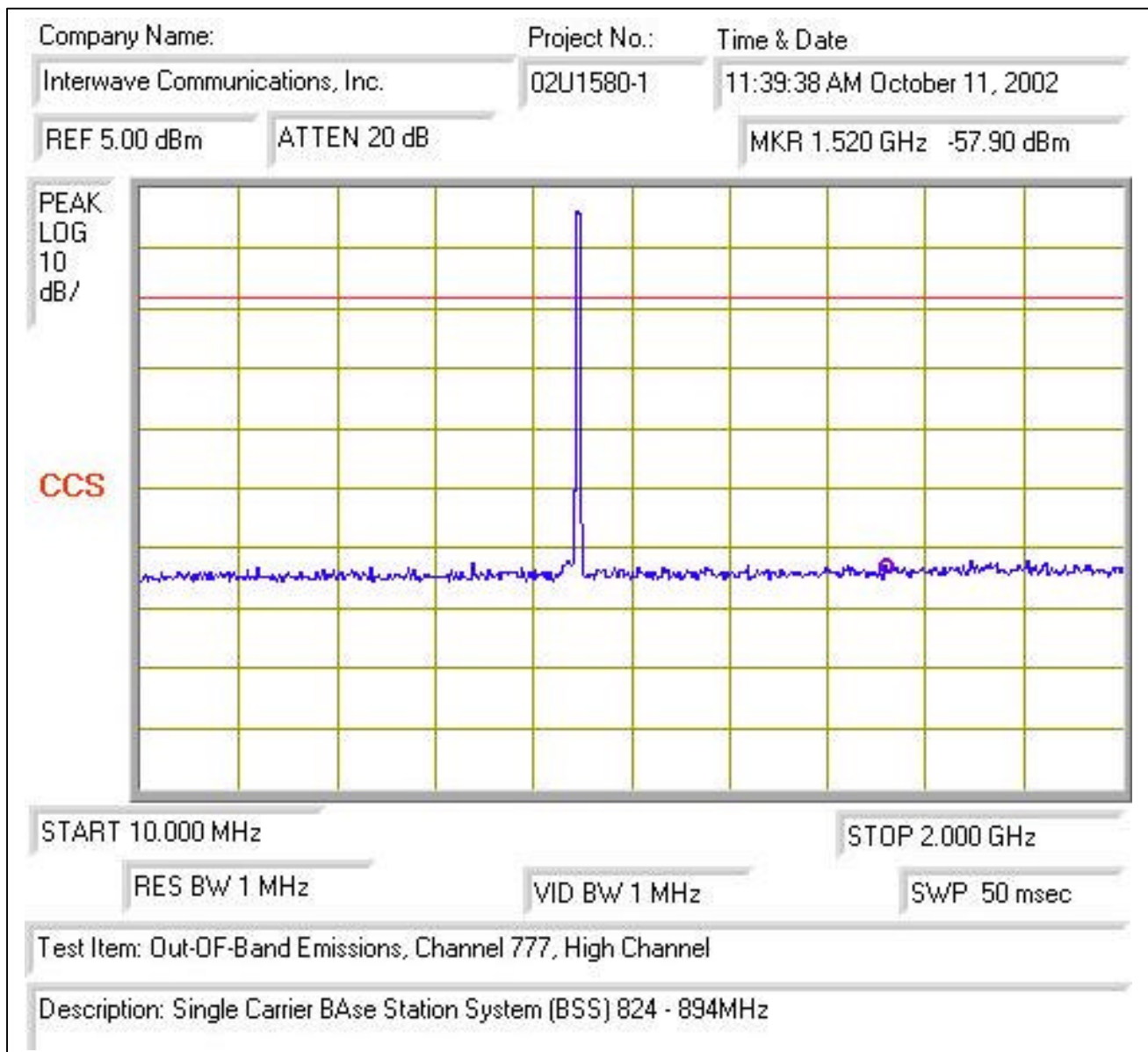
800MHz CDMA, Upper Band Edge:

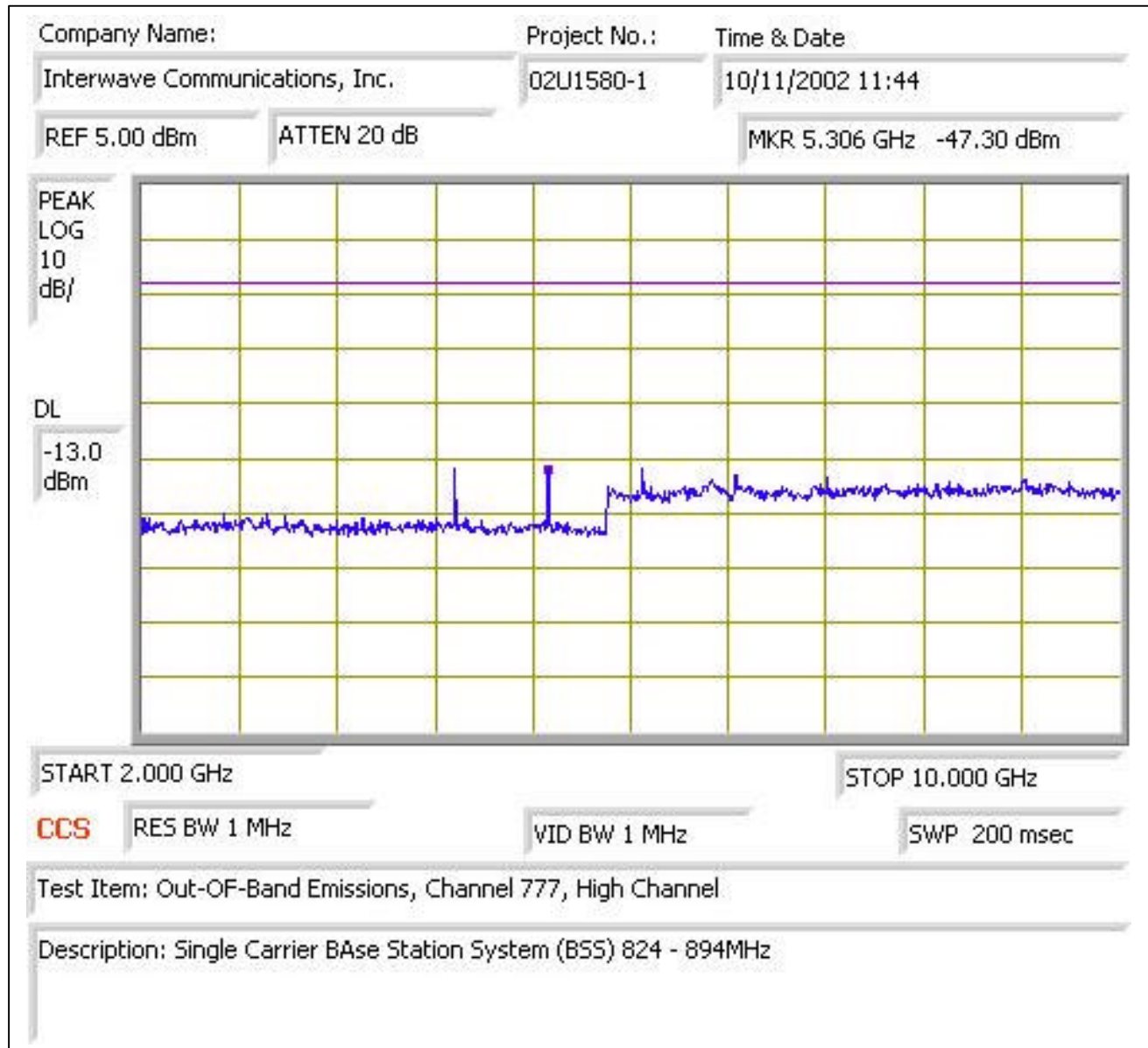
CDMA 800MHz, Out-Of-Band Emissions:

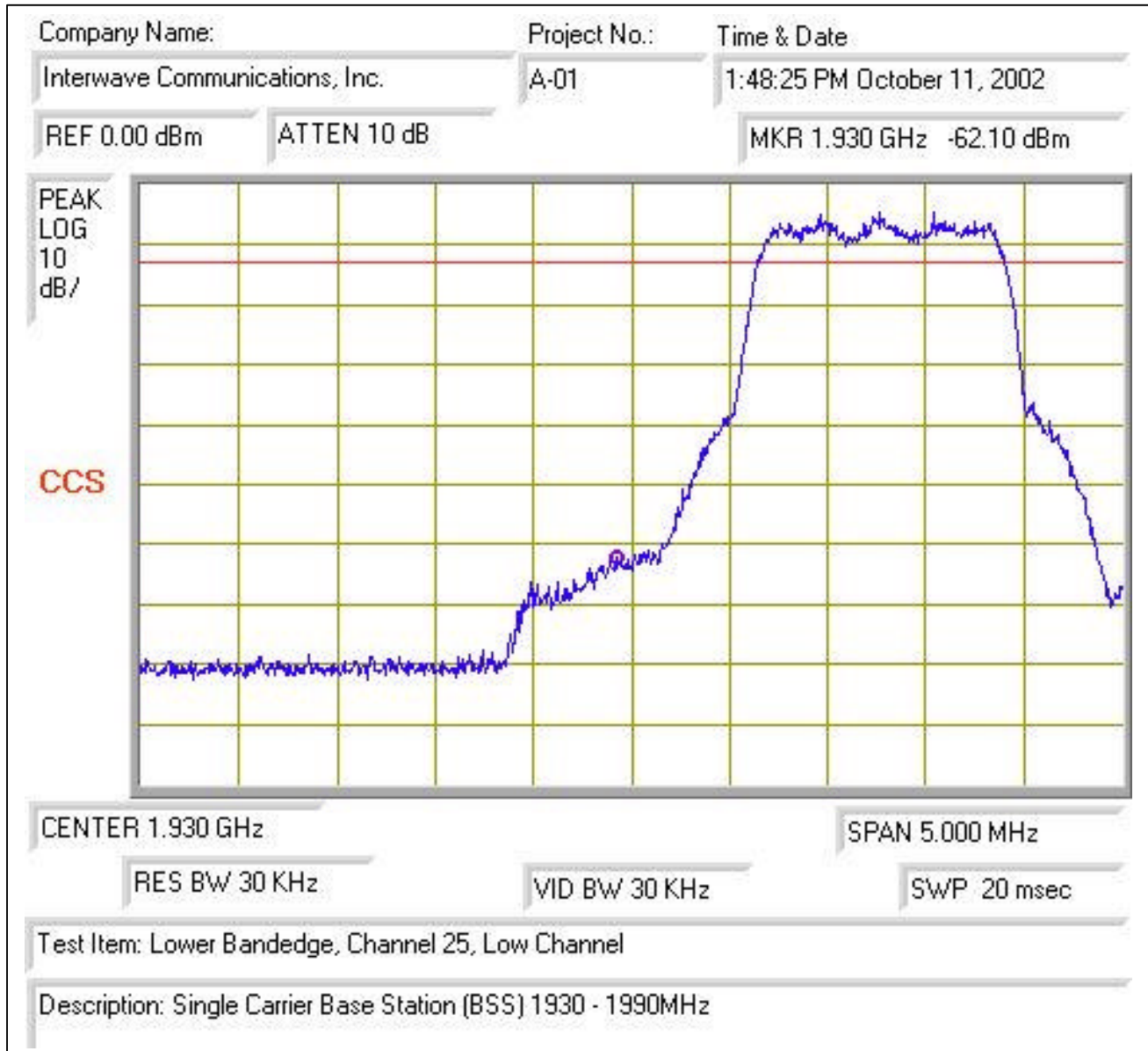


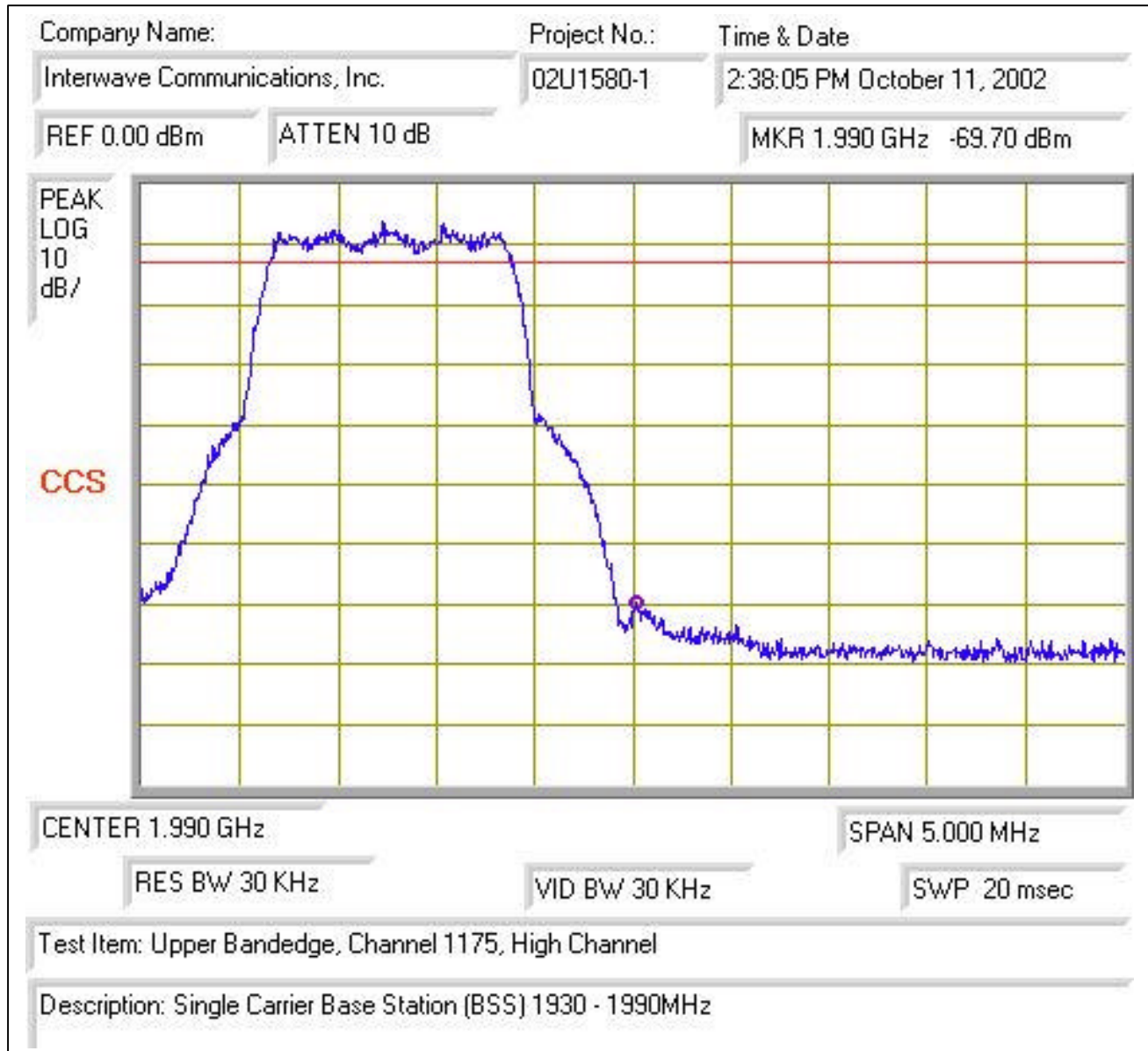


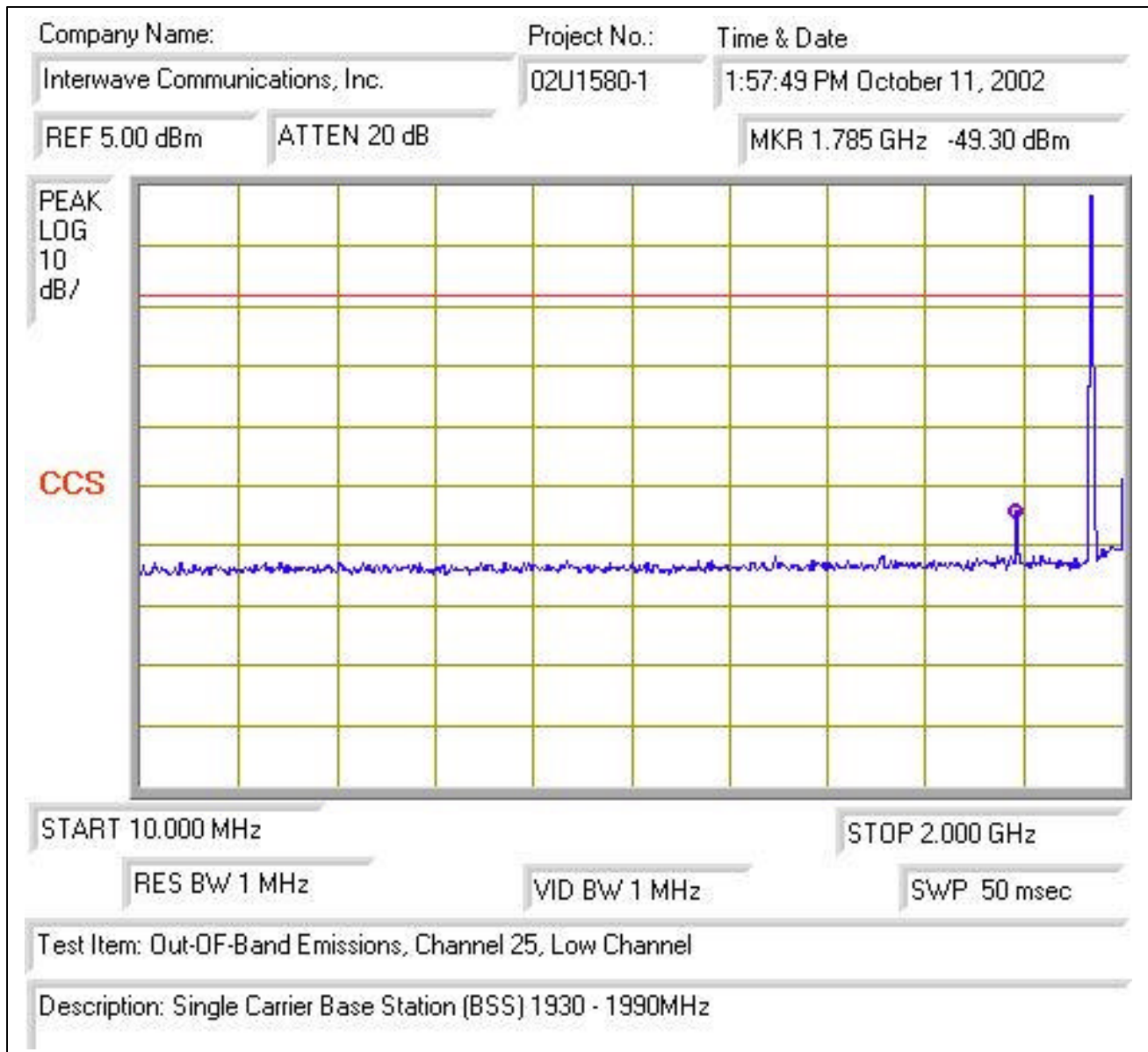


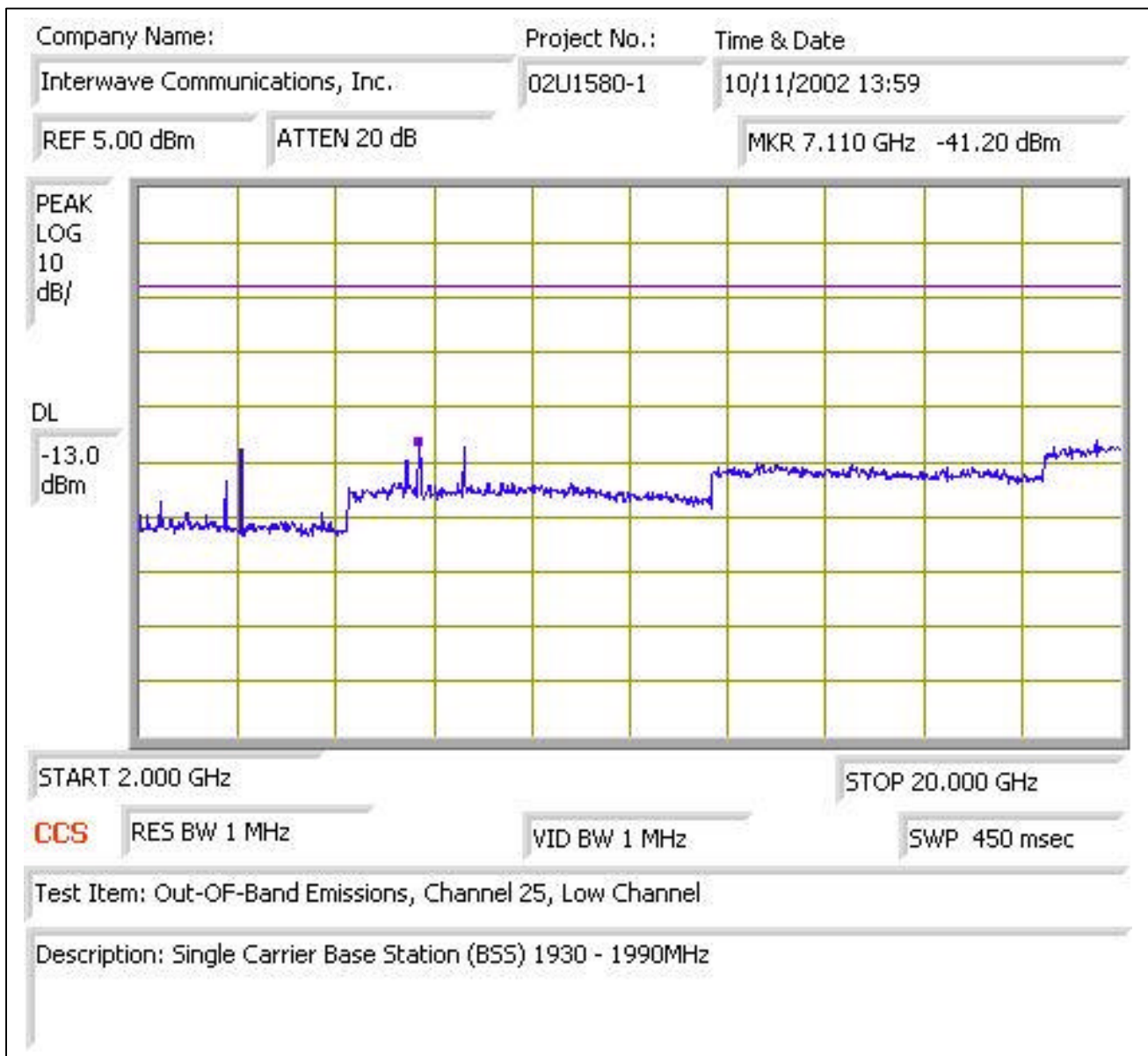


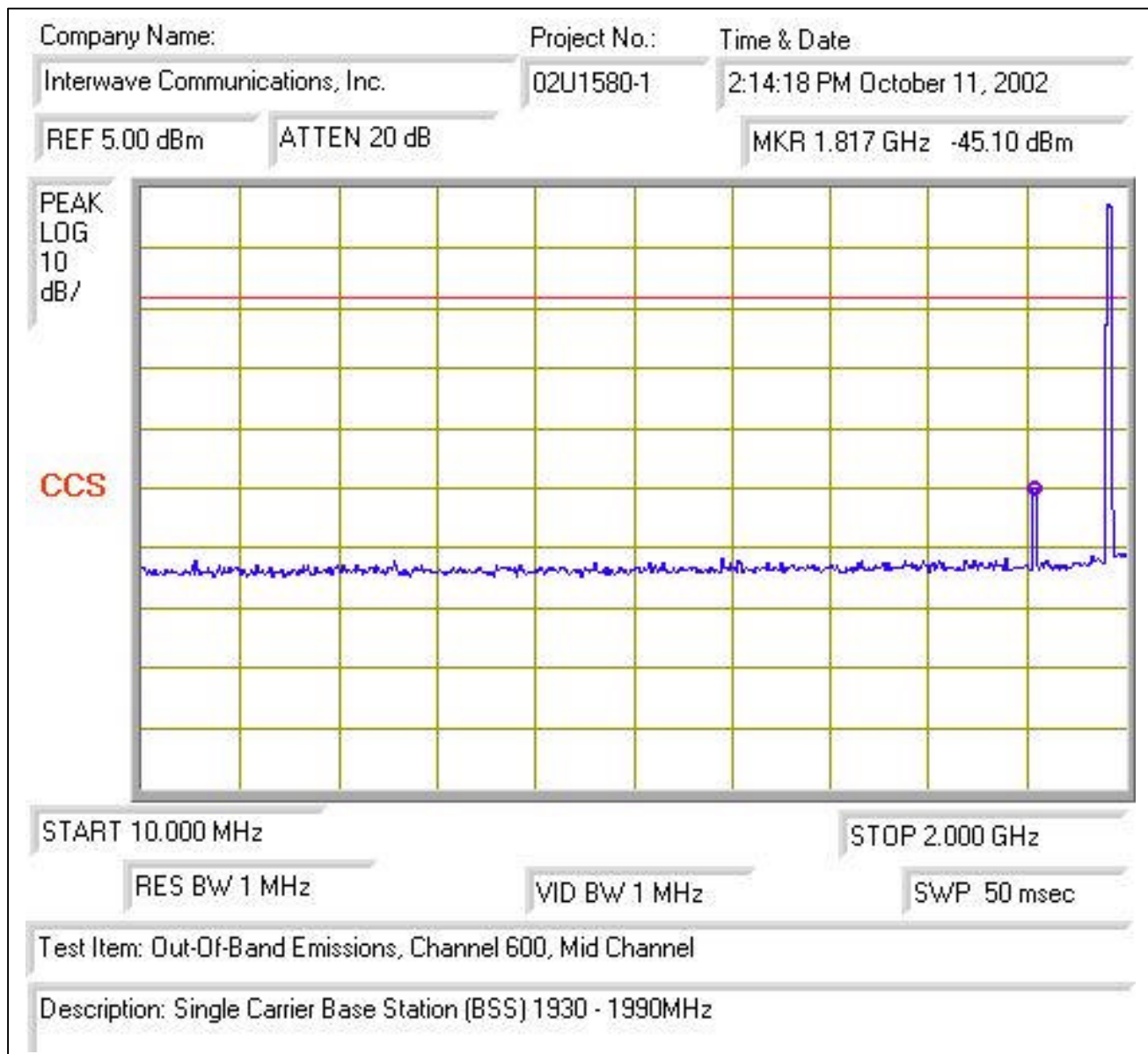


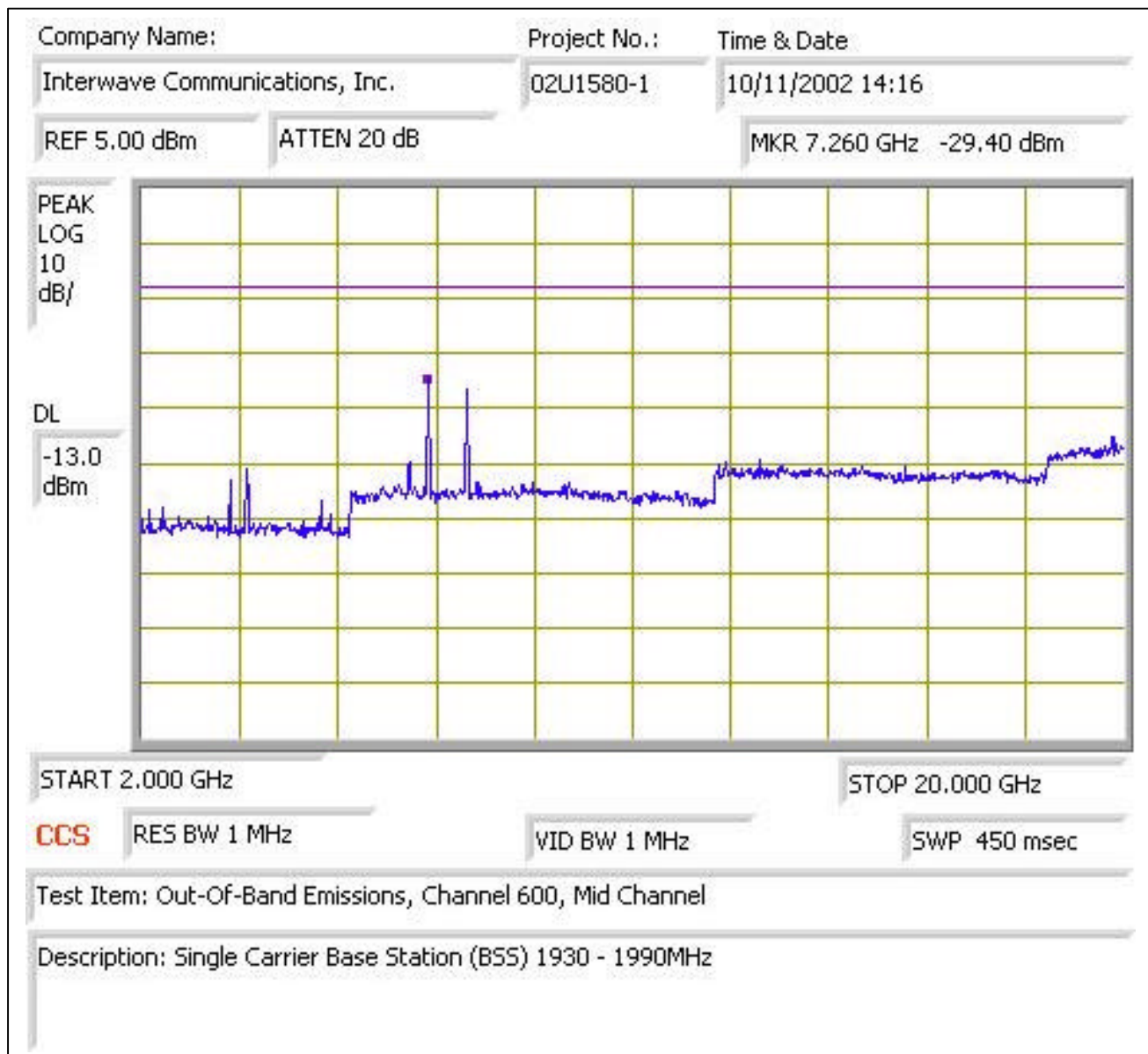
1900MHz CDMA, Lower Band Edge:

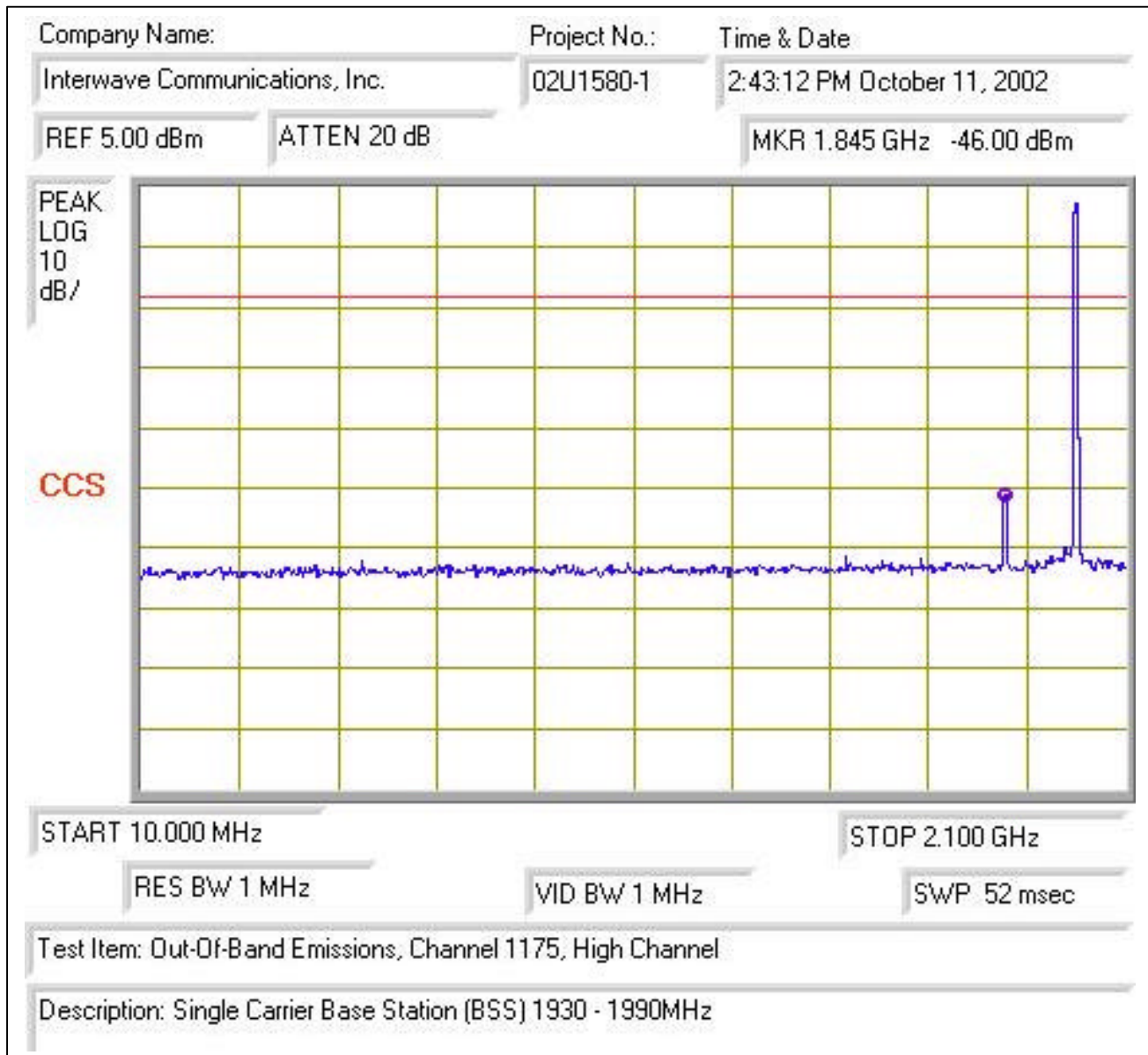
1900MHz CDMA, Upper Band Edge:

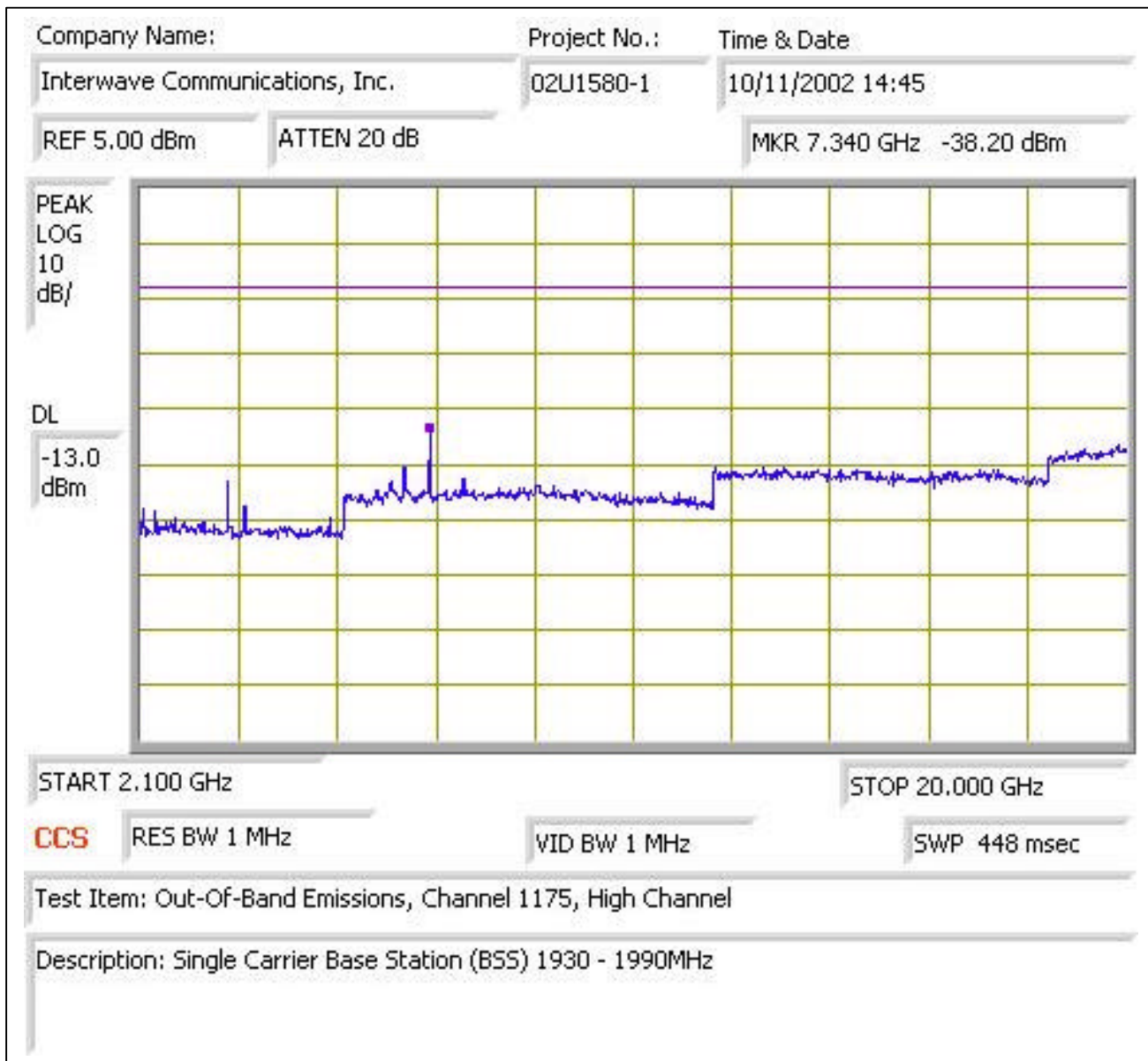
CDMA 1900MHz, Out-Of-Band Emissions:











8.5. SECTION 2.1053: FIELD STRENGTH OF SPURIOUS RADIATION

INSTRUMENTS LIST

EQUIPMENT	MANUFACTURE	MODEL NO.	CAL. DUE DATE
Spectrum Analyzer	HP	8593EM	6/11/03
Amplifier	MITEQ	NSP2600-44	4/26/03
Tx Horn Antenna	EMCO	3115	1/31/03
Rx Horn Antenna	EMCO	3115	1/31/03
50 ohm terminator	N/A	N/A	N/A

Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
Above 1000	☒ Peak ☐ Average	☒ 1 MHz ☐ 1 MHz	☒ 1 MHz ☐ 10 Hz

TEST SETUP

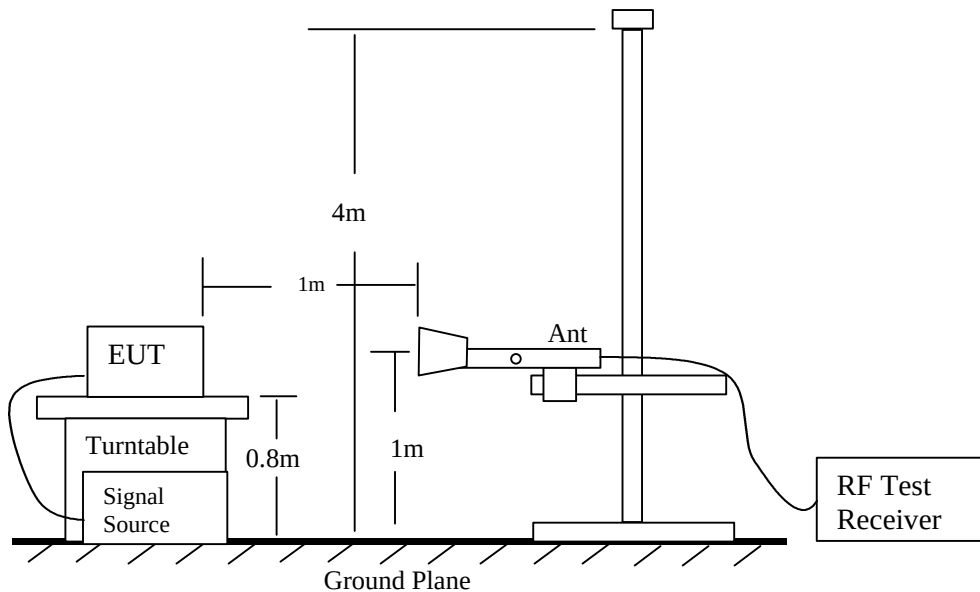


Fig 1: Radiated Emission Measurement

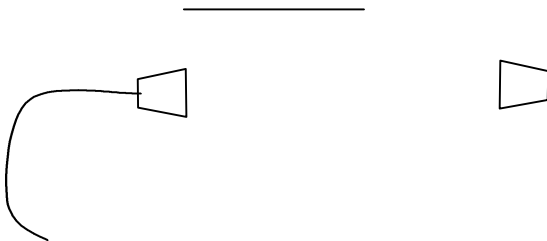


Fig 2: Radiated Emission – Substitution Method set-up

TEST PROCEDURE

- 1). On a test site, the EUT shall be placed on a turntable, and in the position closest to the normal use as declared by the user.
- 2). The test antenna shall be oriented initially for vertical polarization located 1m from the EUT to correspond to the frequency of the transmitter.
- 3). The output of the test antenna shall be connected to the measuring receiver and either a peak or average detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
- 4). The transmitter shall be switched on, if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
- 5). The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
- 6). The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- 7). The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
- 8). The maximum signal level detected by the measuring receiver shall be noted.
- 9). The transmitter shall be replaced by a substitution antenna.
- 10). The substitution antenna shall be oriented for vertical polarization.
- 11). The substitution antenna shall be connected to a calibrated signal generator.
- 12). If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- 13). The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.

14). The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.

15). The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.

16). The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.

17). The measure of the effective radiated power is the larger of the two levels recorded, at the input to the substitution antenna, corrected for the gain of the substitution antenna if necessary.

RESULT

No non-compliance noted, as shown below

10/14/2002

FCC Measurement**Compliance Certification Services, Morgan Hill Open Field Site**

Test Engr: William & Thu
Project #: 02U1580-1
Company: Interwave Communications, Inc.
EUT Descrip.: Single Carrier Base Station System (BSS) 824 - 894MHz
EUT M/N: GB Micro BSS
Test Target: FCC 22
Mode Oper: Low / Mid / High Channel

Frequency (GHz)	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Lo Channel:									
1.74	44.20	-67.00	1.10	8.10	5.95	-62.15	-13.00	-49.15	V
2.61	46.83	-65.50	1.32	9.00	6.85	-59.97	-13.00	-46.97	V (Noise Floor)
3.48	45.33	-65.00	1.54	8.90	6.75	-59.79	-13.00	-46.79	V (Noise Floor)
4.35	45.33	-63.00	1.79	9.50	7.35	-57.44	-13.00	-44.44	V (Noise Floor)
5.22	45.30	-63.00	2.01	9.90	7.75	-57.26	-13.00	-44.26	V (Noise Floor)
6.09	44.67	-65.00	2.22	10.40	8.25	-58.97	-13.00	-45.97	V (Noise Floor)
6.96	44.20	-65.00	2.37	10.60	8.45	-58.92	-13.00	-45.92	V (Noise Floor)
7.83	46.50	-64.00	2.52	10.30	8.15	-58.37	-13.00	-45.37	V (Noise Floor)
8.70	45.00	-64.00	2.67	10.50	8.35	-58.32	-13.00	-45.32	V (Noise Floor)
1.74	44.20	-67.00	1.10	8.10	5.95	-62.15	-13.00	-49.15	H
2.61	44.50	-67.50	1.32	9.00	6.85	-61.97	-13.00	-48.97	H (Noise Floor)
3.48	45.00	-65.00	1.54	8.90	6.75	-59.79	-13.00	-46.79	H (Noise Floor)
4.35	44.83	-64.00	1.79	9.50	7.35	-58.44	-13.00	-45.44	H (Noise Floor)
5.22	44.60	-65.00	2.01	9.90	7.75	-59.26	-13.00	-46.26	H (Noise Floor)
6.09	45.00	-65.00	2.22	10.40	8.25	-58.97	-13.00	-45.97	H (Noise Floor)
6.96	46.00	-65.00	2.37	10.60	8.45	-58.92	-13.00	-45.92	H (Noise Floor)
7.83	45.50	-64.00	2.52	10.30	8.15	-58.37	-13.00	-45.37	H (Noise Floor)
8.70	45.33	-64.00	2.67	10.50	8.35	-58.32	-13.00	-45.32	H (Noise Floor)
Mid Channel									
1.76	44.30	-67.00	1.11	8.20	6.05	-62.06	-13.00	-49.06	V
1.76	44.00	-67.00	1.11	8.20	6.05	-62.06	-13.00	-49.06	H
2.65	46.83	-65.50	1.33	9.00	6.85	-59.98	-13.00	-46.98	V (Noise Floor)
3.53	45.33	-65.00	1.56	8.90	6.75	-59.81	-13.00	-46.81	V (Noise Floor)
High Channel									
1.79	44.50	-67.00	1.11	8.20	6.05	-62.06	-13.00	-49.06	V
1.79	44.00	-67.00	1.11	8.20	6.05	-62.06	-13.00	-49.06	H
2.68	46.80	-65.50	1.34	9.00	6.85	-59.99	-13.00	-46.99	V (Noise Floor)
3.57	45.50	-65.00	1.57	8.90	6.75	-59.82	-13.00	-46.82	V (Noise Floor)

Note: Completed scan from 30MHz to 10 GHz.

EPR = SG reading - CL + Gain (dBd)

Gain (dBd) = Gain (dBi) - 2.15

Margin = EPR - Limit

SA: Spectrum Analyzer, HP 8593EM, S/N: 3710A00205

CL: cable loss (5ft), FLEXCO

SG: Signal Generator, HP 83732B, S/N: US34490599

Pre-Amp: Miteq NSP2600 -44, S/N: 646456

TX Antenna: Dipole, Compliance Design, Roberts, S/N: 116

RX Antenna: Bicon, Eston 94455-1, S/N: 1214

Horn, EMCO 3115, S/N: 6717

LP, EMCO 3146, S/N: 3163

Horn, EMCO 3115, S/N: 6739

10/14/2002 FCC Measurement

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: William & Thu
Project #: 02U1580-1
Company: Interwave Communications, Inc.
EUT Descrip.: Single Carrier Base Station System (BSS) 1930 - 1990MHz
EUT M/N: GB Micro BSS
Test Target: FCC 24
Mode Oper: Low / Mid / High Channel

Frequency (GHz)	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Lo Channel:									
3.86	45.33	-63.00	1.66	8.90	0.00	-55.76	-13.00	-42.76	V
5.79	44.00	-64.00	2.15	10.30	0.00	-55.85	-13.00	-42.85	V (Noise Floor)
7.72	46.00	-63.00	2.50	10.30	0.00	-55.20	-13.00	-42.20	V (Noise Floor)
9.66	45.67	-63.00	2.84	10.10	0.00	-55.74	-13.00	-42.74	V (Noise Floor)
11.59	46.17	-59.00	3.10	12.00	0.00	-50.10	-13.00	-37.10	V (Noise Floor)
13.52	47.83	-56.00	3.42	11.90	0.00	-47.52	-13.00	-34.52	V (Noise Floor)
15.45	48.33	-53.00	3.79	15.10	0.00	-41.69	-13.00	-28.69	V (Noise Floor)
17.38	47.67	-50.00	4.18	10.00	0.00	-44.18	-13.00	-31.18	V (Noise Floor)
19.31	46.50	-57.00	1.66	8.90	0.00	-49.76	-13.00	-36.76	H
3.86	45.00	-63.00	2.15	10.30	0.00	-54.85	-13.00	-41.85	H (Noise Floor)
5.79	44.17	-64.00	2.50	10.30	0.00	-56.20	-13.00	-43.20	H (Noise Floor)
7.72	46.17	-63.00	2.84	10.10	0.00	-55.74	-13.00	-42.74	H (Noise Floor)
9.66	45.67	-59.00	3.10	12.00	0.00	-50.10	-13.00	-37.10	H (Noise Floor)
11.59	46.17	-56.00	3.42	11.90	0.00	-47.52	-13.00	-34.52	H (Noise Floor)
13.52	47.83	-53.00	3.79	15.10	0.00	-41.69	-13.00	-28.69	H (Noise Floor)
15.45	48.50	-50.00	4.18	10.00	0.00	-44.18	-13.00	-31.18	H (Noise Floor)
17.38	47.50	-53.00	3.79	15.10	0.00	-41.69	-13.00	-28.69	H (Noise Floor)
19.31	46.67	-50.00	4.18	10.00	0.00	-44.18	-13.00	-31.18	H (Noise Floor)
Mid Channel									
3.92	45.83	-63.00	1.11	8.20	0.00	-55.91	-13.00	-42.91	V
3.92	45.33	-63.00	1.11	8.20	0.00	-55.91	-13.00	-42.91	H
5.88	44.50	-65.00	1.33	9.00	0.00	-57.33	-13.00	-44.33	V (Noise Floor)
7.84	45.83	-64.00	1.56	8.90	0.00	-56.66	-13.00	-43.66	V (Noise Floor)
High Channel									
3.98	45.85	-63.00	1.11	8.20	0.00	-55.91	-13.00	-42.91	V
3.98	45.67	-63.00	1.11	8.20	0.00	-55.91	-13.00	-42.91	H
5.97	43.83	-65.00	1.34	9.00	0.00	-57.34	-13.00	-44.34	V (Noise Floor)
7.96	46.33	-64.00	1.57	8.90	0.00	-56.67	-13.00	-43.67	V (Noise Floor)

Note: Completed scan from 30MHz to 20 GHz.

EIPR = SG reading - CL + Gain (dBi)

Margin = EIPR - Limit

SA: Spectrum Analyzer, HP 8593EM, S/N: 3710A00205

SG: Signal Generator, HP 83732B, S/N: US34490599

TX Antenna: Dipole, Compliance Design, Roberts, S/N: 116
Horn, EMCO 3115, S/N: 6717

CL: cable loss (5ft), FLEXCO

Pre-Amp: Miteq NSP2600 -44, S/N: 646456

RX Antenna: Bicon, Eston 94455-1, S/N: 1214
LP, EMCO 3146, S/N: 3163
Horn, EMCO 3115, S/N: 6739

8.6 SECTION 2.1055: FREQUENCY STABILITY

INSTRUMENTS LIST

EQUIPMENT	MANUFACTURE	MODEL NO.	CAL. DUE DATE
EMI Receiver	HP	8593EM	6/11/03
Environmental Chamber	Thermotron	SE 600-10-10	4/26/03

Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
Above 1000	Peak	300 Hz	300 Hz

TEST SETUP

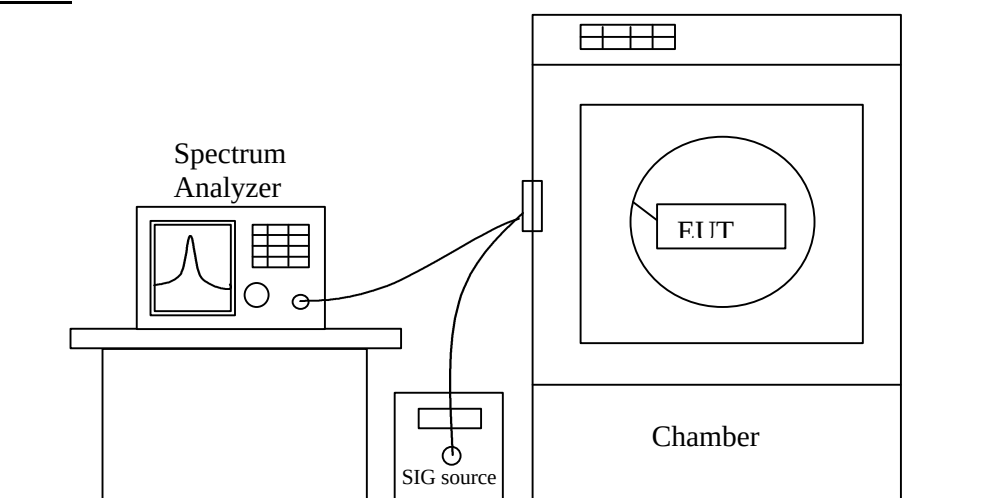


Fig. 3: Frequency Stability Setup

TEST PROCEDURE

• Frequency stability versus environmental temperature

- 1). Setup the configuration per figure 6 for frequencies measurement inside the environmental chamber. Set the temperature of the chamber to 25°C. Set SA Resolution Bandwidth low enough to obtain the desired frequency resolution and measure the EUT 25°C operating frequency as reference frequency.
- 2). Turn EUT off and set Chamber temperature to -20°C (as manual specified.)
- 3). Allow sufficient time (approximately 20 to 30 minus after chamber reach the assigned temperature) for EUT to stabilize. Turn on EUT and measure the EUT operating frequency. Turn off EUT after the measurement.
- 4). Repeat step 3 with a 10°C increased per stage until the highest temperature of +50°C reached, record all measured frequencies on each temperature step.

- **Frequency stability versus AC input voltage**

- 1). Setup the configuration per figure 6 and set chamber temperature to 25°C. Use a variable AC power supply to power the EUT and set AC output voltage to EUT nominal input AC voltage. Set SA Resolution Bandwidth low enough to obtain the desired frequency resolution and measure the EUT 25°C operating frequency as reference frequency.
- 2). Slowly reduce the EUT input voltage to specified extreme voltage variation ($\pm 15\%$) and record the maximum frequency change.

RESULT

No non-compliance noted, as shown below

Reference Frequency: CDMA Mid Channel 881.998225 MHz @ 25°C				
Limit: to stay ± 2.5 ppm = 2204.996 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
2.70	50	881.996235	2.256	± 2.5
2.70	40	881.998175	0.057	± 2.5
2.70	30	881.997130	1.241	± 2.5
2.70	25	881.998225	0	± 2.5
2.70	20	881.998715	-0.556	± 2.5
2.70	10	881.999760	-1.740	± 2.5
2.70	0	881.999910	-1.910	± 2.5
2.70	-10	881.999240	-1.151	± 2.5
2.70	-20	881.998570	-0.391	± 2.5
20.00	25°C	881.998220	0.006	± 2.5
35.00	25°C	881.999475	-1.417	± 2.5
17.80	End Point Voltage	881.998215	0.011	± 2.5

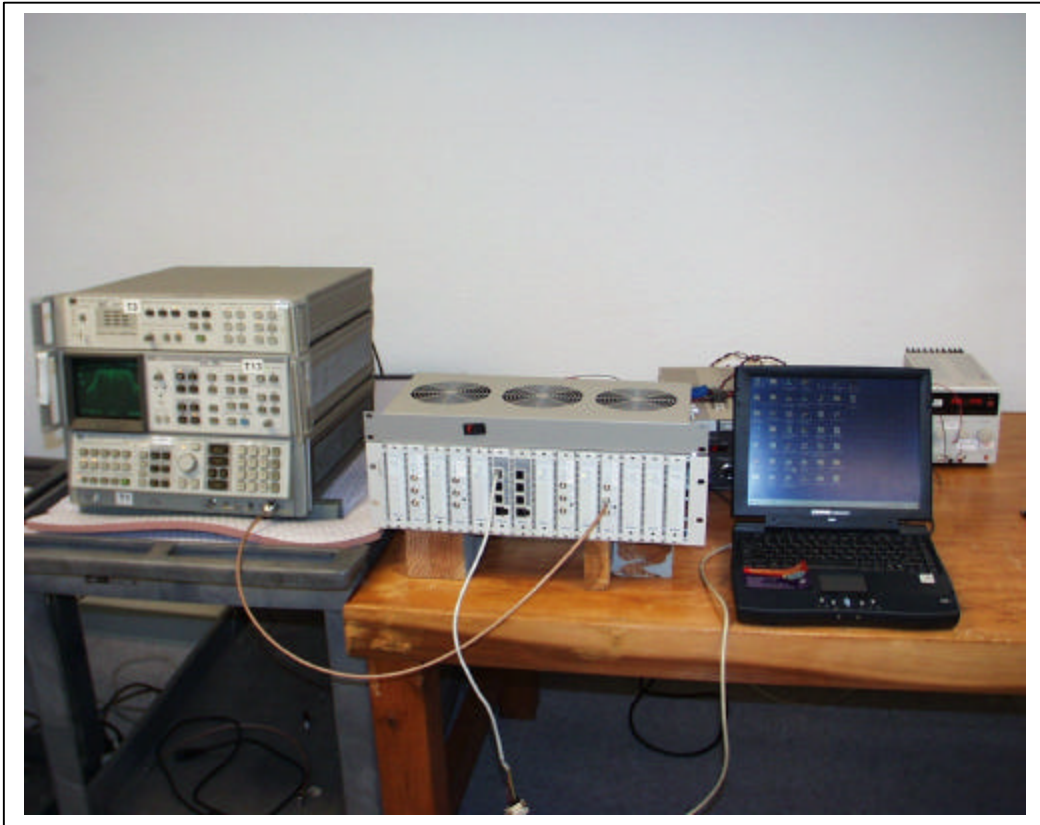
Reference Frequency: CDMA Mid Channel 1959.1904MHz @ 25°C				
Limit: to stay ± 2.5 ppm = 4897.976 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
27.00	50	1959.1919	-0.766	± 2.5
27.00	40	1959.1919	-0.766	± 2.5
27.00	30	1959.1909	-0.255	± 2.5
27.00	25	1959.1904	0	± 2.5
27.00	20	1959.1909	-0.255	± 2.5
27.00	10	1959.1929	-1.276	± 2.5
27.00	0	1959.1934	-1.531	± 2.5
27.00	-10	1959.1924	-1.021	± 2.5
27.00	-20	1959.1909	-0.255	± 2.5
20.00	25	1959.1902	0.102	± 2.5
35.00	25	1959.1899	-1.557	± 2.5
17.70	End Point Voltage	1959.1899	0.255	± 2.5

8.7 CONDUCTED & RADIATED EMISSIONS: part 15.207 & 15.209

NOT APPLICABLE. The unit is ran on DC voltage & accompany digital port is designed for using in set up only, not for daily operation, and after the set up no cable will be attached to this port.

9. ATTACHMENT

9.1. EUT SETUP PHOTOS



CONDUCTED MEASUREMENT



RADIATED & SUBSTITUTION MEASUREMENTS

9.2 EUT PHOTOGRAPHS

9.3 INSTALLATION AND SERVICE MANUAL

9.4 SCHEMATIC, PART LISTS AND BLOCK DIAGRAM

9.5 PROPOSED FCC ID LABEL FORMAT

END OF REPORT