# FCC PART 24 TYPE APPROVAL
# EMI MEASUREMENT AND TEST REPORT

For

## High Tech Computer, Corp.

23, Hsin-Hua Rd.,
Taoyuan, 330, Taiwan

**FCC ID: NM8VOYAGER**

2003-08-22

| **This Report Concerns:** | **Equipment Type:** |
|---|---|
| ☒ Original Report | SmartPhone |

| | |
|---|---|
| **Test Engineer:** | Ling Zhang / |
| **Report No.:** | R0307183 |
| **Test Date:** | 2003-08-04 |
| **Reviewed By:** | Ming Jing / |
| **Prepared By:** | Bay Area Compliance Laboratory Corporation<br>230 Commercial Street<br>Sunnyvale, CA 94085<br>Tel: (408) 732-9162<br>Fax: (408) 732 9164 |

**Note**: This test report is specially limited to the above client company and the product model only. It may not be duplicated without prior written consent of Bay Area Compliance Laboratory Corporation. This report **must not** be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.

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# 1 - GENERAL INFORMATION

## 1.1 Product Description for Equipment Under Test (EUT)

The *High Tech Computer, Corp.'s* product, model no.:SV10A/SV10B or the "EUT" as referred to this report is a buletooth smartphone which is measured approximately 4.75"L x 1.9"W x 0.9"H. The difference between SV10A and SV10B is the material of the bezel. The bezel of SV10A contains matallic and the bezel of SV10B is plastic material.

** The test data gathered are from typical production samples provided by the manufacturer.*

## 1.2 Objective

This type approval report is prepared on behalf of *High Tech Computer, Corp.* in accordance with Part 2, Subpart J, Part 15, Subparts A and B, and Part 24 Subpart E, of the Federal Communication Commissions rules.

The objective of the manufacturer is to demonstrate compliance with FCC Part 2, Part 15 and Part 24.

## 1.3 Related Submittal(s)/Grant(s)

No Related Submittals

## 1.4 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-1992 and TIA/EIA 603A, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted emissions measurement was performed by Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

## 1.5 Test Facility

The Open Area Test site used by BACL to collect radiated and conducted emission measurement data is located in the back parking lot of the building at 230 Commercial Street, Sunnyvale, California, USA.

Test site at BACL has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-1992.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The scope of the accreditation covers the FCC Method – 47 CFR Part – Digital Devices, CISPER 22: 1997: Electromagnetic Interference – Limits and Methods of Measurement of Information Technology Equipment test methods.

## 1.6 Test Equipment List

| Manufacturer | Description | Model | Serial Number | Cal. Due Date |
|---|---|---|---|---|
| HP | Spectrum Analyzer | 8568B | 2517A01610 | 2003-10-30 |
| HP | Spectrum Analyzer | 8593A | 29190A00242 | 2004-05-01 |
| HP | Amplifier | 8447E | 1937A01054 | 2004-05-01 |
| HP | Quasi-Peak Adapter | 85650A | 2521A00718 | 2004-05-01 |
| Com-Power | Biconical Antenna | AB-100 | 14012 | 2004-05-01 |
| Com-Power | Log Periodic Antenna | AL-100 | 16091 | 2004-05-01 |
| Com-Power | Log Periodic Antenna | AB-900 | 15049 | 2004-05-01 |
| Agilent | Spectrum Analyzer (9KHz – 40GHz) | 8564E | 08303 | 2004-08-01 |
| Agilent | Spectrum Analyzer (9KHz – 50GHz) | 8565EC | 06042 | 2004-05-03 |
| HP | Amplifier (1-26.5GHz) | 8449B | 3147A00400 | 2004-03-14 |
| A.H.System | Horn Antenna (700MHz-18GHz) | SAS-200/571 | 261 | 2004-05-31 |

*** Statement of Traceability: Bay Area Compliance Laboratory Corp.** certifies that all calibration has been performed using suitable standards traceable to the NIST.

## 1.7 Local Support Equipment List and Details

| Manufacturer | Description | Model | Serial Number | FCC ID |
|---|---|---|---|---|
| DELL | Notebook PC | Latitude D600 | 37357573321 | DOC |
| HP | Printer | 2225C | N/A | DOC |

## 1.8 External I/O Cabling List and Details

| Cable Description | Length (M) | Port/From | To |
|---|---|---|---|
| Shielded Cable | 1.0 | EUT | Notebook PC |
| Shielded Printer | 2.0 | Parallel Port/Notebook PC | Printer |

## 1.9 Power Supply Information

| Manufacturer | Description | Model | Serial Number | FCC ID |
|---|---|---|---|---|
| DELTA | AC Adapter | ADP-10SB | SMW0322298719 | DOC |
| PHIHONG | AC Adapter | PSC05R-050 | EAFA136V002987 | DOC |

## 1.10 Accessories Information

| Manufacturer | Description | Model |
|---|---|---|
| HTC | USB Cradle | SV15 |
| HTC | RS-232 Cradle | SV15 |
| Eacetech | Earphone | TS168 |
| HTC | USB Cable | N/A |
| HTC | RS-232 Cable | N/A |
| HTC | Pouch | N/A |

# 2 - SYSTEM TEST CONFIGURATION

## 2.1 Justification

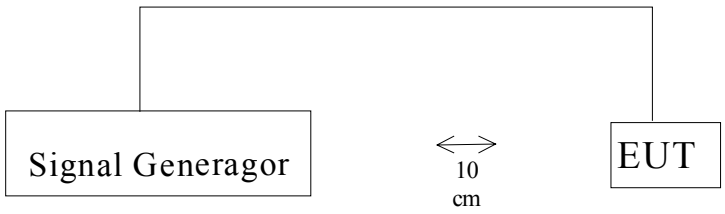
The EUT was configured for testing in a typical fashion (as normally used in a typical application).

The final qualification test was performed with the EUT operating at normal mode.

## 2.2 Schematics/Block Diagram

Please refer to Exhibit D.

## 2.3 Test Setup Block Diagram




## 2.4 Equipment Modifications

No modifications were necessary for the EUT to comply with the applicable standard and limit.

# 3 - SUMMARY OF TEST RESULTS

| FCC RULE | DESCRIPTION OF TEST | Measured | Result |
|---|---|---|---|
| § 2.1049<br>§ 24.238 | Emission Bandwidth | Section 5 | Compliant |
| 2.1051<br>§ 24.238(a) | Spurious emissions at antenna terminals | Section 6 | Compliant |
| 2.1053<br>§ 24.238 (a) | Field strength of spurious radiation | Section 7 | Compliant |
| § 2.1055 (a)<br>§ 2.1055 (d)<br>§ 24.235 | Frequency stability vs. temperature<br>Frequency stability vs. voltage | Section 9 | Compliant |
| § 2.1093<br>§ 24.52 | RF Exposure Requirement | SAR report | Compliant |

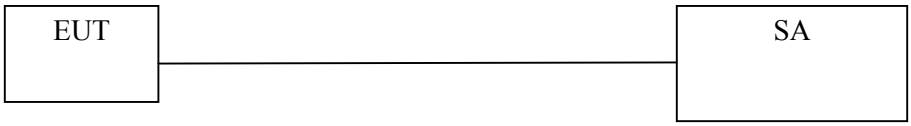
# 4 - CONDUCTED OUTPUT POWER MEASUREMENT

## 4.1 Standard Applicable

According to § 2.1046 (a) for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in §2.1033(c)(8).

## 4.2 Measurement Procedure

1. Place the EUT on a bench and set it in transmitting mode.
2. Add a correction factor to the display.




Note: The antenna is integrated with the EUT. The conducted output power may not be measured exactly.

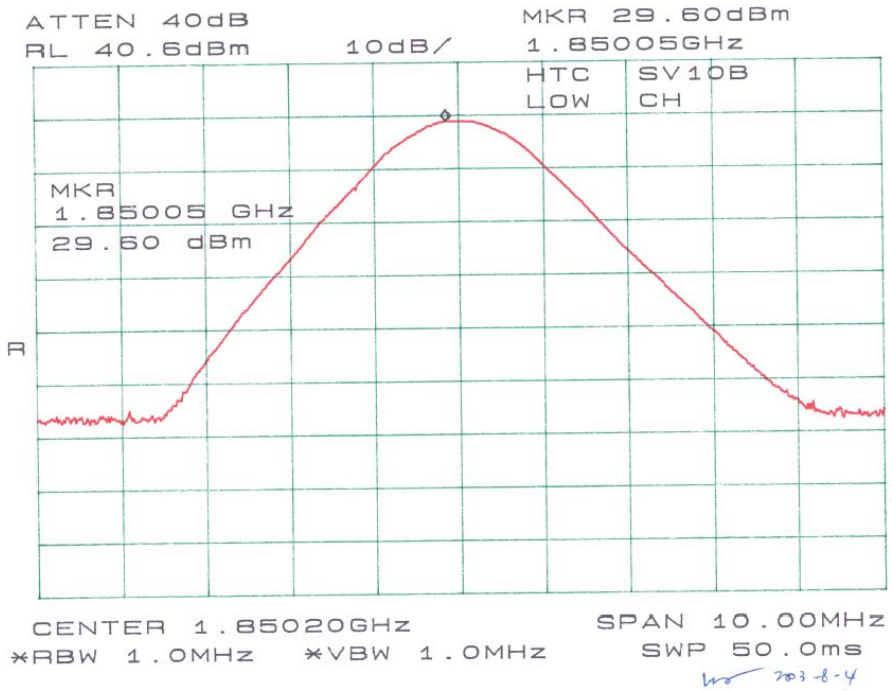
## 4.3 Measurement Result

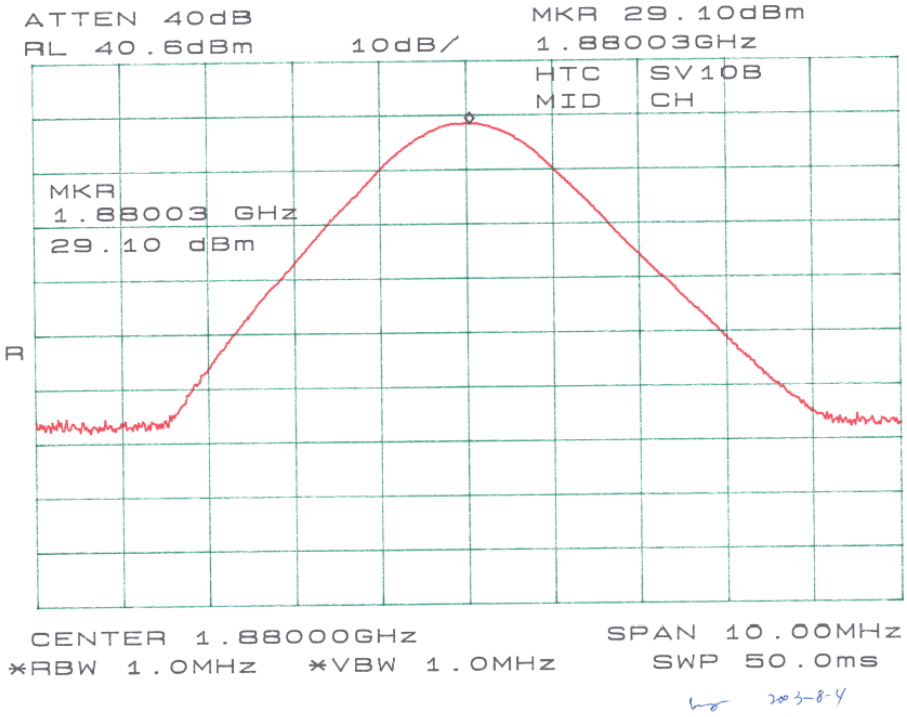
Please refer to the attached pictures for more information.

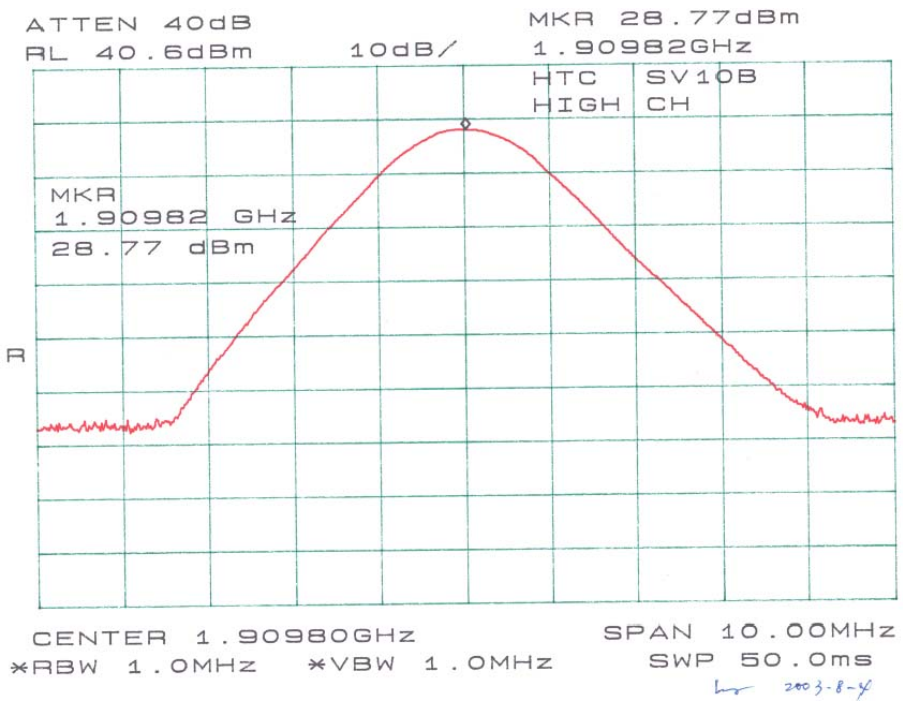
| Frequency | Output Power (dBm) | Output Power (W) | Result |
|---|---|---|---|
| Low | 29.60 | 0.912 | Compliant |
| Middle | 29.10 | 0.813 | Compliant |
| High | 28.77 | 0.753 | Compliant |

## 4.4 Test Equipment

| Manufacturer | Model No. | Serial No. | Calibration Due Date |
|---|---|---|---|
| HP | 8568B | 2610A02165 | 2003-12-06 |
| HP | 8593B | 2919A0242 | 2003-12-06 |


ATTEN 40dB
RL 40.6dBm
10dB/
MKR 29.60dBm
1.85005GHz
HTC LOW SV10B CH
MKR
1.85005 GHz
29.60 dBm
R
CENTER 1.85020GHz
SPAN 10.00MHz
*RBW 1.0MHz
*VBW 1.0MHz
SWP 50.0ms
2003-8-4


ATTEN 40dB
RL 40.6dBm
10dB/
MKR 29.10dBm
1.88003GHz
HTC MID SV10B CH
MKR
1.88003 GHz
29.10 dBm
R
CENTER 1.88000GHz
SPAN 10.00MHz
*RBW 1.0MHz
*VBW 1.0MHz
SWP 50.0ms
2003-8-4


ATTEN 40dB
RL 40.6dBm
10dB/
MKR 28.77dBm
1.90982GHz
HTC SV10B
HIGH CH
MKR
1.90982 GHz
28.77 dBm
R
CENTER 1.90980GHz
SPAN 10.00MHz
*RBW 1.0MHz
*VBW 1.0MHz
SWP 50.0ms
2003-8-4

# 5 - RF POWER OUTPUT

## 5.1 Applicable Standard

According to FCC §2.1046 and §24.232 (1), mobile/portable stations are limited to 2 watts EIRP.

## 5.2 Test Procedure

1. On a test site, the EUT shall be placed at 1.5m height on a turn table, and in the position closest to normal use as declared by the applicant.
2. The test antenna shall be oriented initially for vertical polarization located 3m from EUT to correspond to the frequency of the transmitter.
3. The output of the test antenna shall be connected to the measuring receiver and the quasi-peak detector is used for the measurement.
4. The transmitter shall be switched on, if possible, without modulation and the measuring 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 the 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 horn (substitution antenna).
10. The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
11. The substitution antenna shall be connected to a calibrated signal generator.
12. In 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 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 received, which is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator 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 orientated for horizontal polarization.

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

## 5.3 Test Results

*For Model SV10B:*

| FREQUENCY (MHZ) | SUBSTITUTION READING (dBm) | SUBSTITUTION ANTENNA GAIN | SUBSTITUTION CALBE LOSTS (dbm) | OUTPUT POWER (dBm) |
|---|---|---|---|---|
| 1850.2 | 22.10 | 6.7 | 0.1 | 28.70 |
| 1880.0 | 21.67 | 6.7 | 0.1 | 28.27 |
| 1909.8 | 20.90 | 6.7 | 0.1 | 27.50 |

*For Model SV10A:*

| FREQUENCY (MHZ) | SUBSTITUTION READING (dBm) | SUBSTITUTION ANTENNA GAIN | SUBSTITUTION CALBE LOSTS (dbm) | OUTPUT POWER (dBm) |
|---|---|---|---|---|
| 1850.2 | 22.00 | 6.7 | 0.1 | 28.60 |
| 1880.0 | 21.45 | 6.7 | 0.1 | 28.05 |
| 1909.8 | 21.10 | 6.7 | 0.1 | 27.70 |

Sample calculation:

Absolute level = substitution reading + antenna gain - cable loss

For example:

22.1+6.7-0.1=28.7

# 6 - EMISSION BANDWIDTH

## 6.1 Applicable Standards

According to FCC §2.1049 and §24.238 (b), the emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.

## 6.2 Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set at 3 KHz and the spectrum was recorded.

## 6.3 Test Equipment

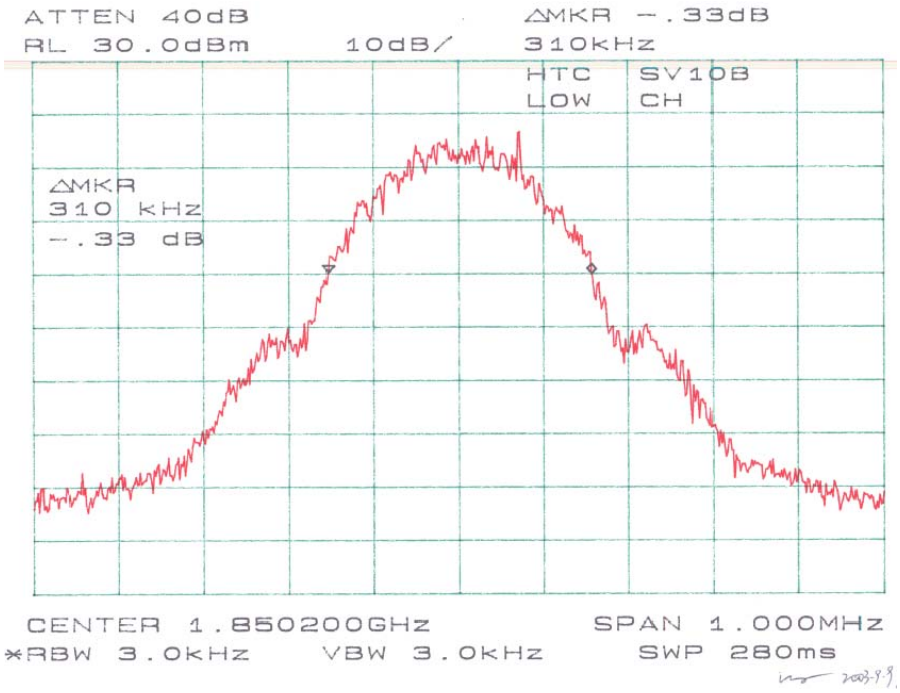
Agilent 8565EC Spectrum Analyzer
Hewlett Packard HP 7470A Plotter
Hewlett Packard 8449 Amplifier
A.H. Systems, Inc SAS-200/571 Horn Antenna

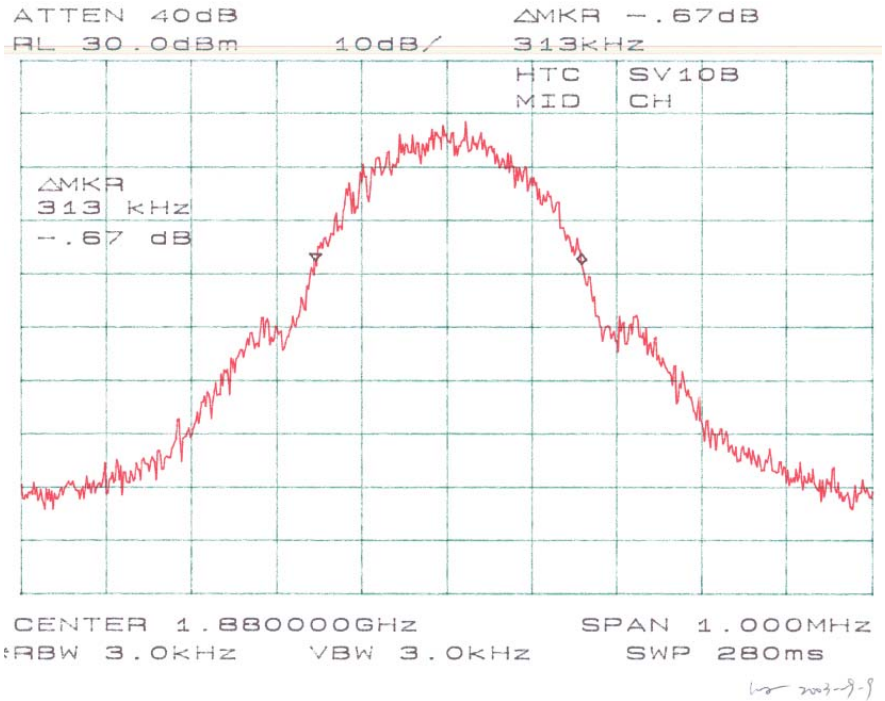
## 6.4 Plots of Occupied Bandwidth

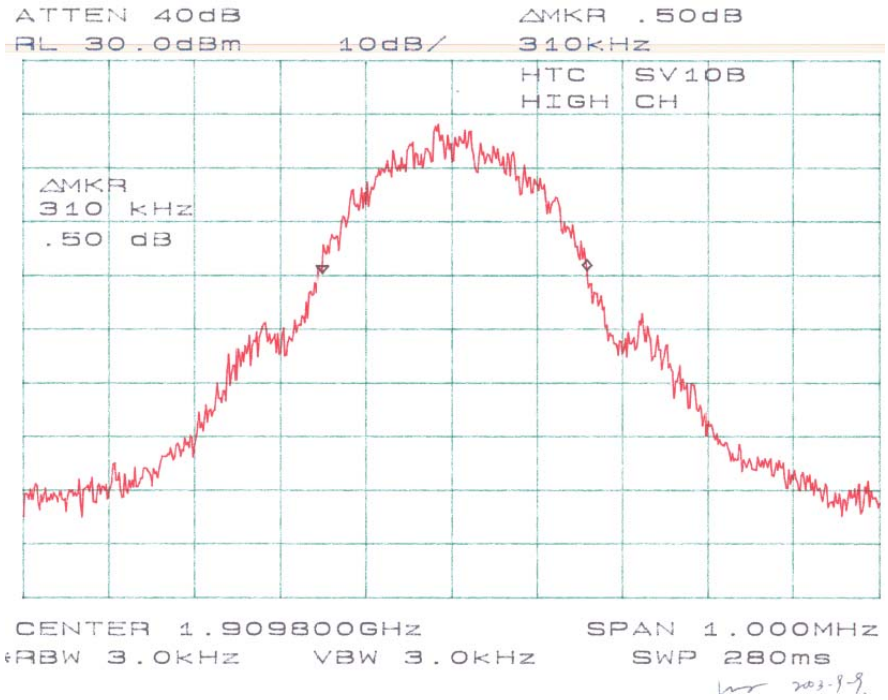
Please refer to plots hereinafter.

Test Data Summary

| Channel | Emission Bandwidth in kHz |
|---|---|
| Low | 310 |
| Mid | 313 |
| High | 310 |


ATTEN 40dB
RL 30.0dBm
10dB/
ΔMKR -.33dB
310kHz
HTC SV10B
LOW CH
ΔMKR
310 kHz
-.33 dB
CENTER 1.850200GHz
SPAN 1.000MHz
*RBW 3.0kHz
VBW 3.0kHz
SWP 280ms


ATTEN 40dB
RL 30.0dBm
10dB/
ΔMKR -.67dB
313kHz
HTC SV10B
MID CH
ΔMKR
313 kHz
-.67 dB
CENTER 1.880000GHz
SPAN 1.000MHz
*RBW 3.0kHz
VBW 3.0kHz
SWP 280ms


ATTEN 40dB
RL 30.0dBm
10dB/
ΔMKR .50dB
310kHz
HTC SV10B
HIGH CH
ΔMKR
310 kHz
.50 dB
CENTER 1.909800GHz
SPAN 1.000MHz
RBW 3.0kHz
VBW 3.0kHz
SWP 280ms
2003-9-9

# 7 - OUT OF BAND EMISSIONS AT ANTENNA TERMINALS

## 7.1 Applicable Standards

According to FCC §2.1049 and §24.238, on any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB.

## 7.2 Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1 MHz. Sufficient scans were taken to show any out of band emissions up to 10$^{th}$ harmonic.

## 7.3 Test Equipment

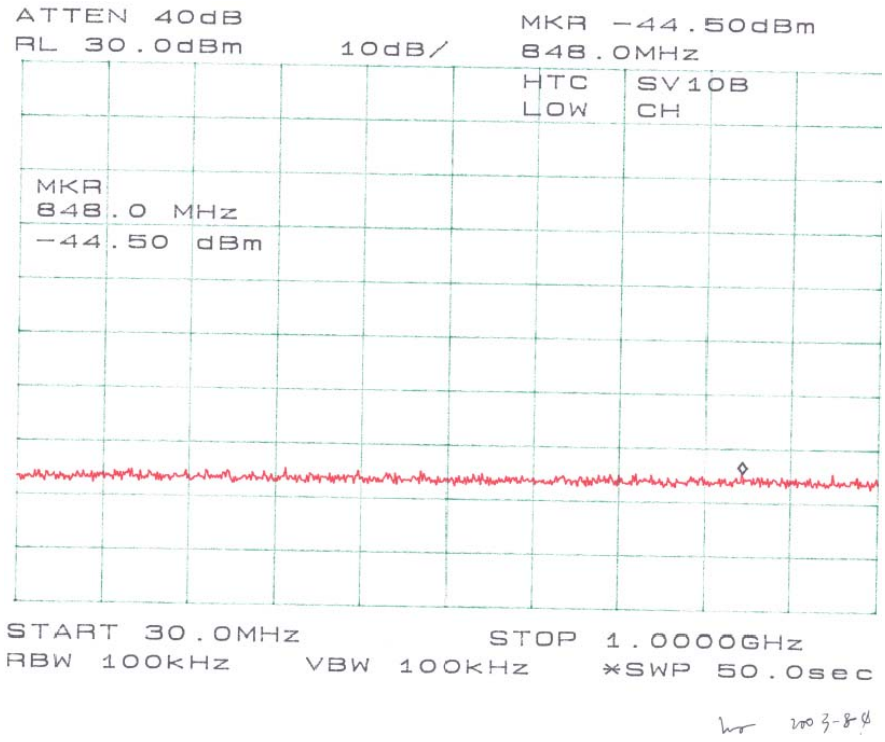
Agilent 8565EC Spectrum Analyzer
HP 7470A Plotter
Hewlett Packard HP8566B Spectrum Analyzer
Hewlett Packard HP 7470A Plotter
Hewlett Packard 8449 Amplifier
A.H. Systems, Inc SAS-200/571 Horn Antenna

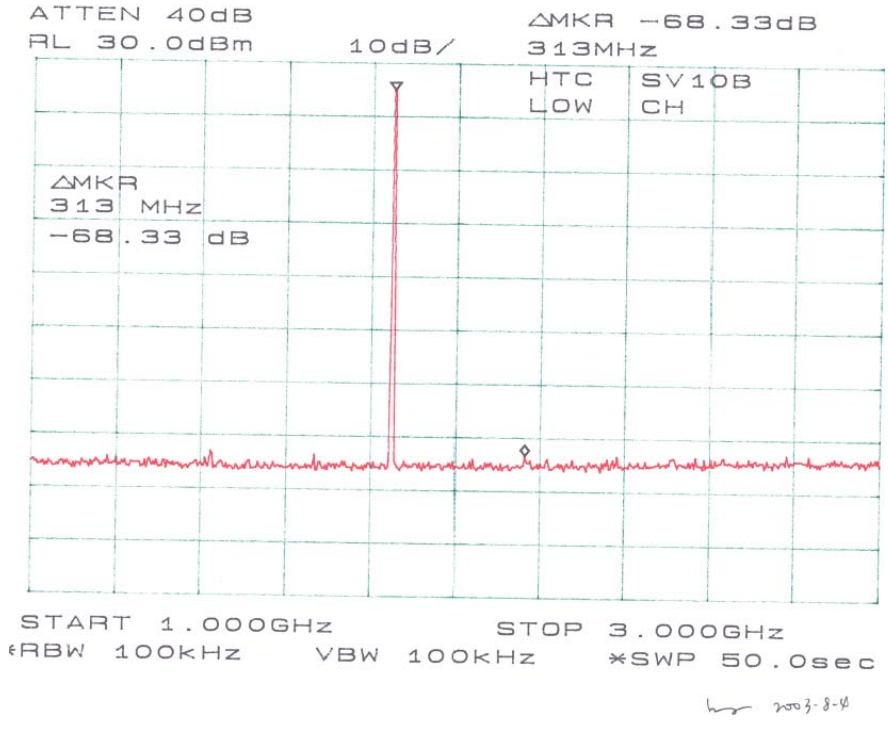
## 7.4 Test Results

| Channel | Measured |
|---|---|
| Low | < -13dBm |
| Mid | < -13dBm |
| High | < -13dBm |

## 6.5 Plots of Out-of-Band Emissions at Antenna Terminal

Please refer to plots hereinafter.


ATTEN 40dB
RL 30.0dBm
10dB/
MKR -44.50dBm
848.0MHz
HTC SV10B
LOW CH
MKR
848.0 MHz
-44.50 dBm
START 30.0MHz
STOP 1.0000GHz
RBW 100kHz
VBW 100kHz
*SWP 50.0sec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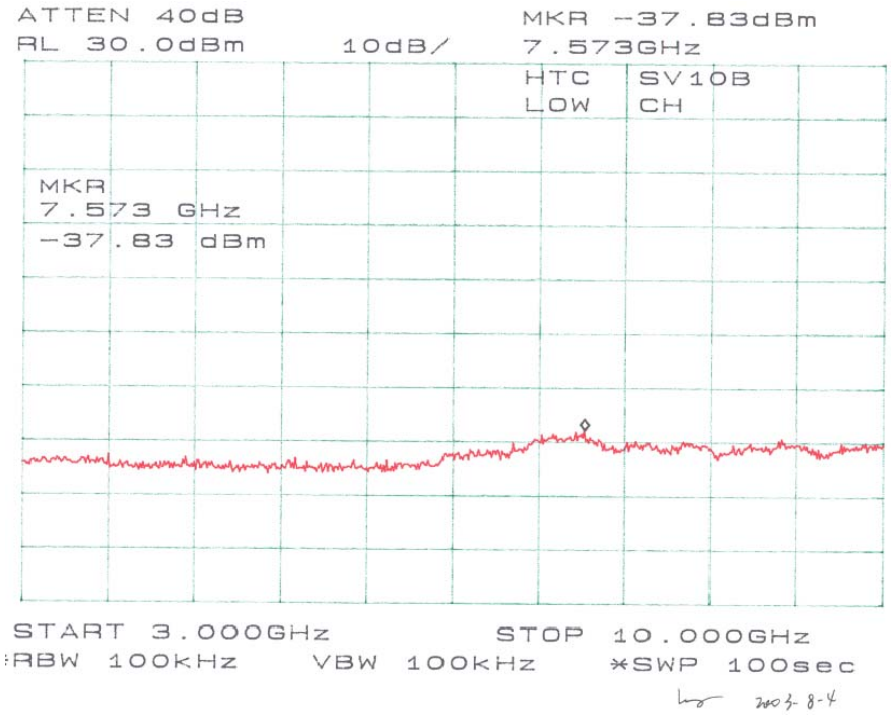
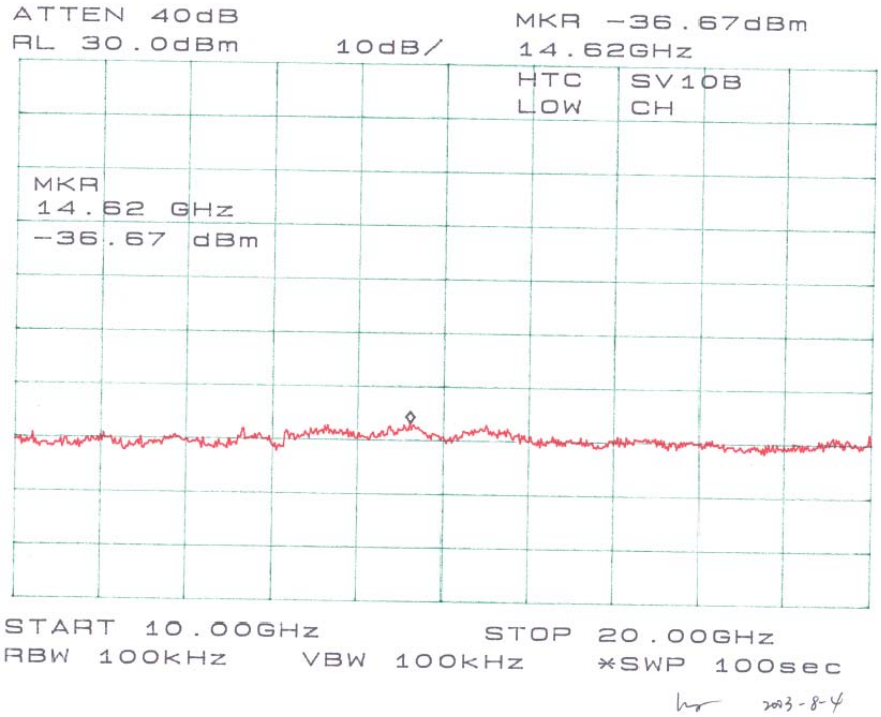
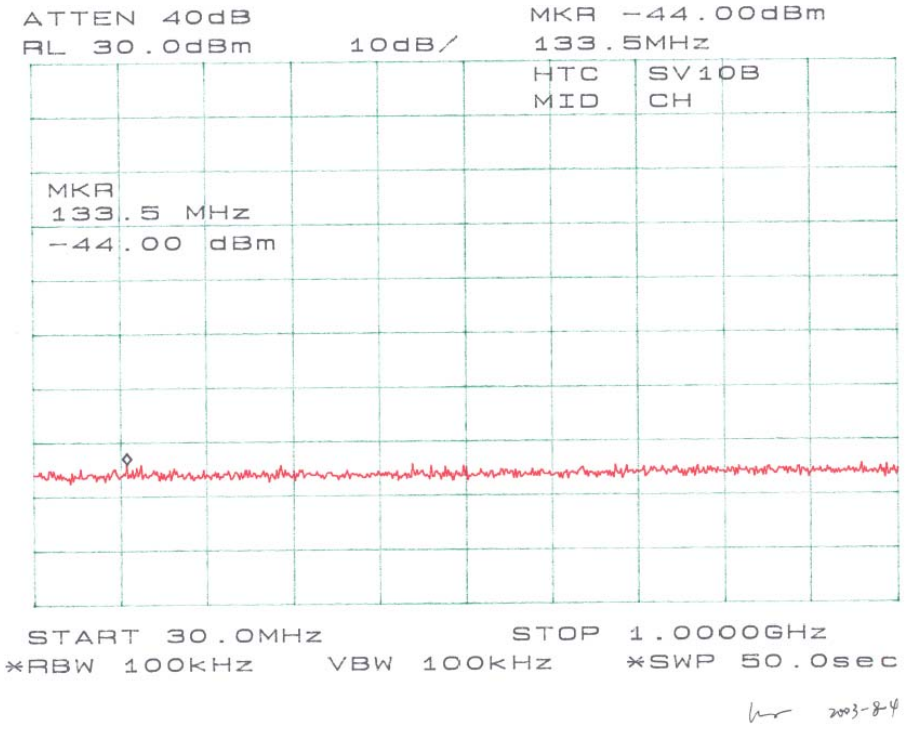
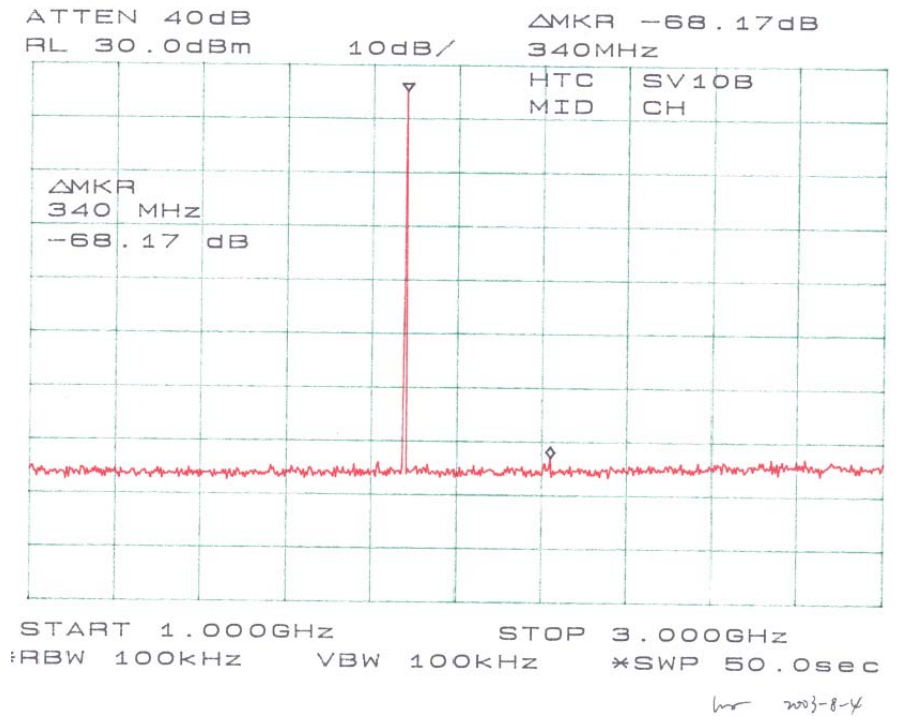
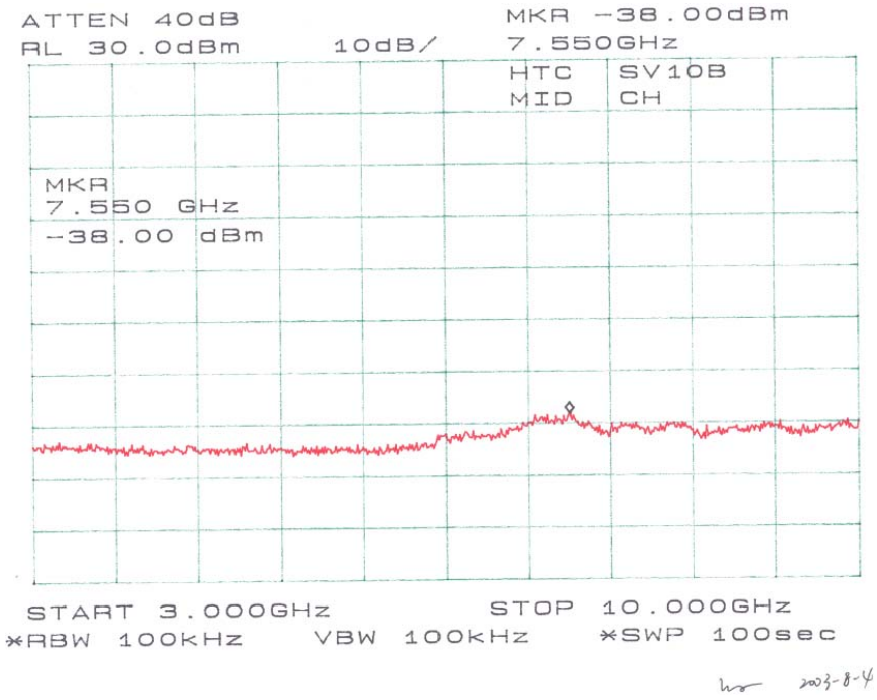
RL 30.0dBm
10dB/
ΔMKR -68.33dB
313MHz
HTC SV10B
LOW CH
ΔMKR
313 MHz
-68.33 dB
START 1.000GHz
STOP 3.000GHz
*RBW 100kHz
VBW 100kHz
*SWP 50.0sec

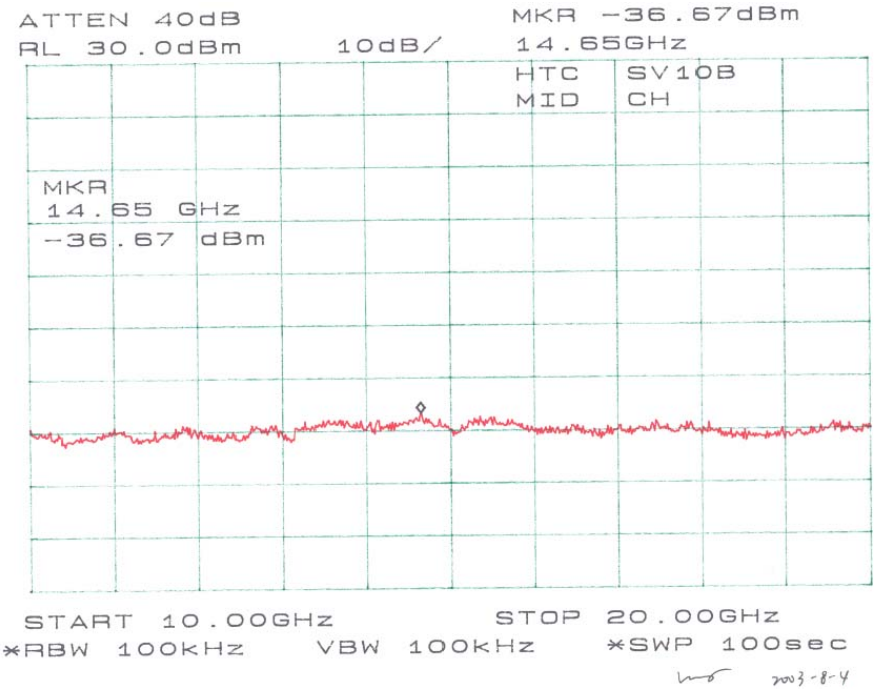

ATTEN 40dB
RL 30.0dBm
10dB/
MKR -37.83dBm
7.573GHz
HTC SV10B
LOW CH
MKR
7.573 GHz
-37.83 dBm
START 3.000GHz
STOP 10.000GHz
RBW 100kHz
VBW 100kHz
*SWP 100sec
2003-8-4

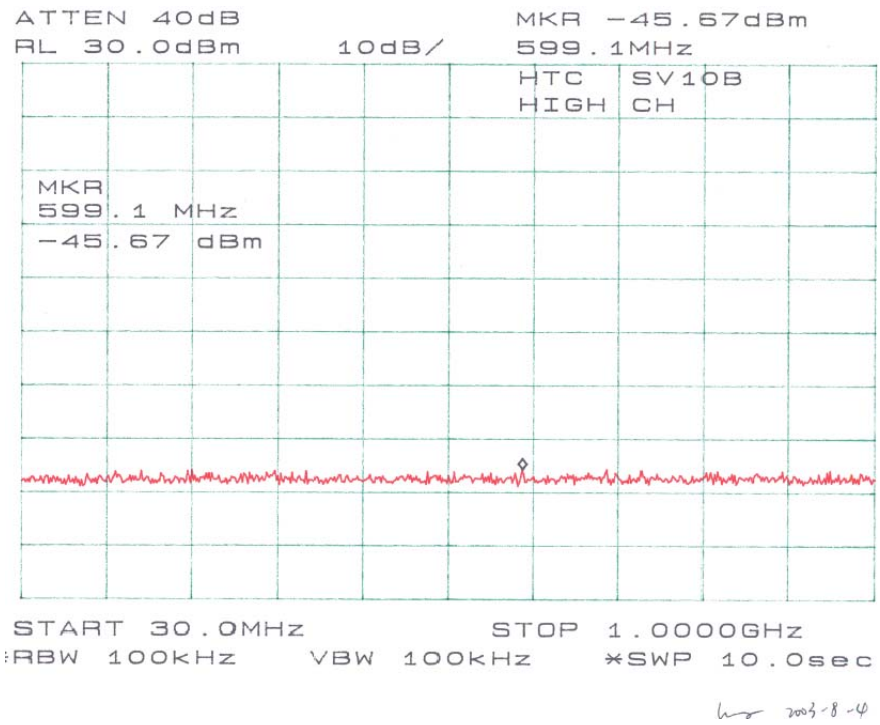

ATTEN 40dB
RL 30.0dBm
10dB/
MKR -36.67dBm
14.62GHz
HTC SV10B
LOW CH
MKR
14.62 GHz
-36.67 dBm
START 10.00GHz
STOP 20.00GHz
RBW 100kHz
VBW 100kHz
*SWP 100sec
2003-8-4

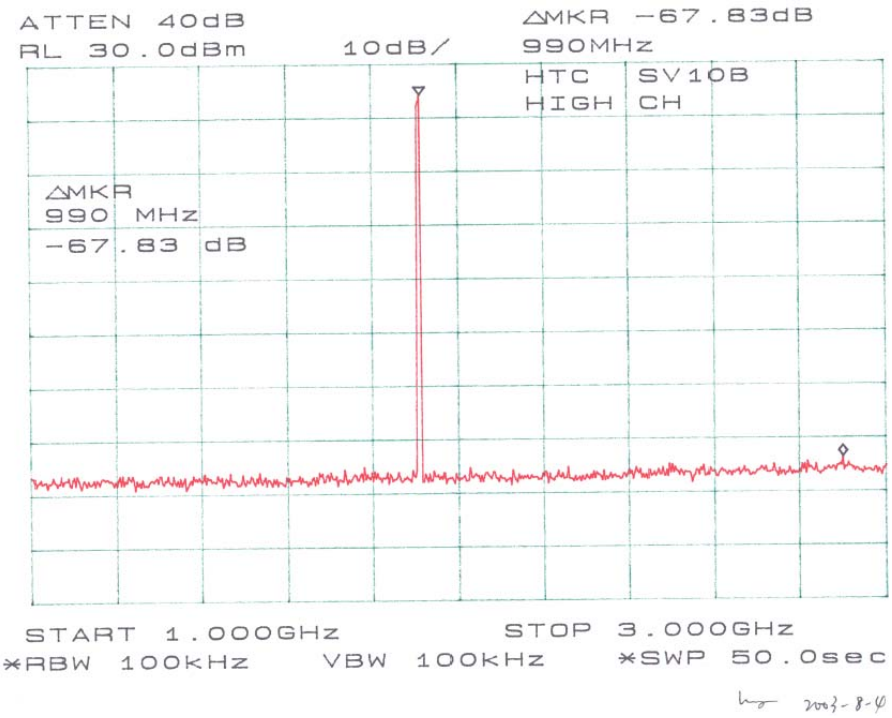

ATTEN 40dB
RL 30.0dBm
10dB/
MKR -44.00dBm
133.5MHz
HTC SV10B
MID CH
MKR
133.5 MHz
-44.00 dBm
START 30.0MHz
STOP 1.0000GHz
*RBW 100kHz
VBW 100kHz
*SWP 50.0sec
2003-8-4

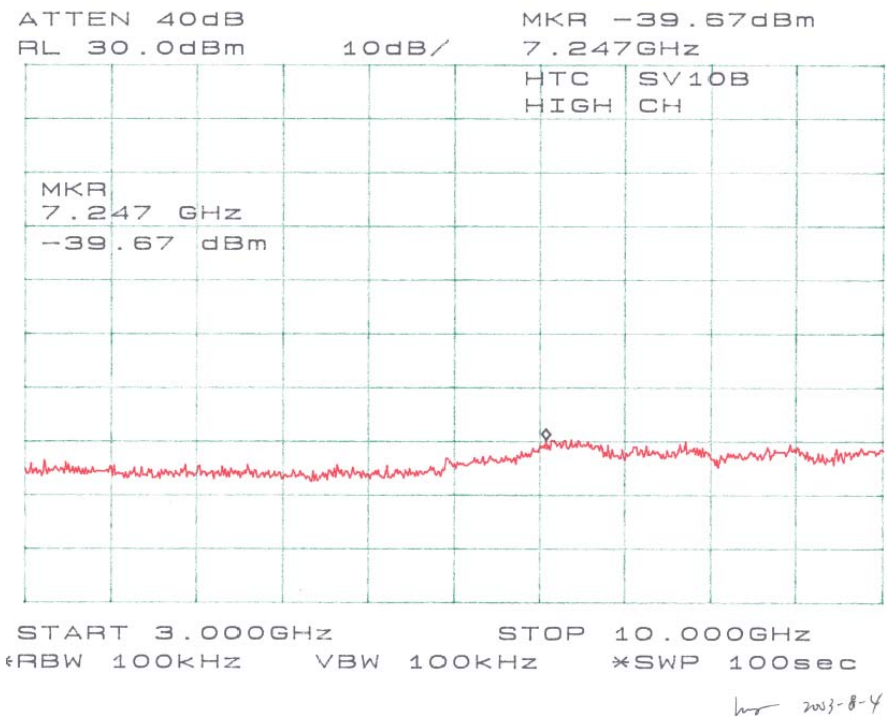

ATTEN 40dB
RL 30.0dBm
10dB/
ΔMKR -68.17dB
340MHz
HTC SV10B
MID CH
ΔMKR
340 MHz
-68.17 dB
START 1.000GHz
STOP 3.000GHz
*RBW 100kHz
VBW 100kHz
*SWP 50.0sec
2003-8-4

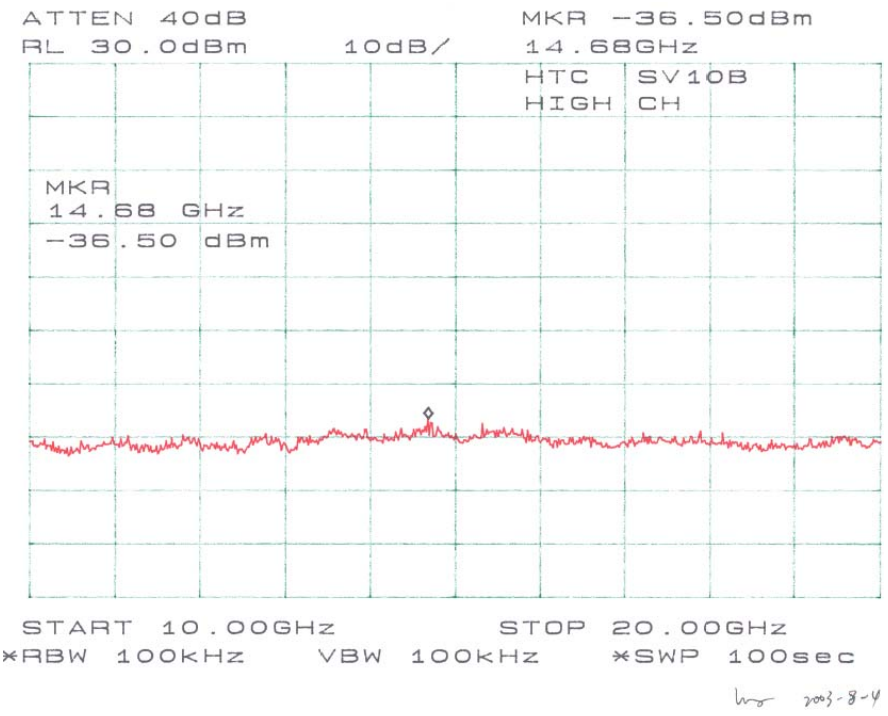

ATTEN 40dB
RL 30.0dBm
10dB/
MKR -38.00dBm
7.550GHz
HTC SV10B
MID CH
MKR
7.550 GHz
-38.00 dBm
START 3.000GHz
STOP 10.000GHz
*RBW 100kHz
VBW 100kHz
*SWP 100sec
2003-8-4


ATTEN 40dB
RL 30.0dBm
10dB/
MKR -36.67dBm
14.65GHz
HTC SV10B
MID CH
MKR
14.65 GHz
-36.67 dBm
START 10.00GHz
STOP 20.00GHz
*RBW 100kHz
VBW 100kHz
*SWP 100sec
2003-8-4


ATTEN 40dB
RL 30.0dBm
10dB/
MKR -45.67dBm
599.1MHz
HTC SV10B
HIGH CH
MKR
599.1 MHz
-45.67 dBm
START 30.0MHz
STOP 1.0000GHz
RBW 100kHz
VBW 100kHz
*SWP 10.0sec
2003-8-4


ATTEN 40dB
RL 30.0dBm
10dB/
ΔMKR -67.83dB
990MHz
HTC SV10B
HIGH CH
ΔMKR
990 MHz
-67.83 dB
START 1.000GHz
STOP 3.000GHz
*RBW 100kHz
VBW 100kHz
*SWP 50.0sec
2003-8-4


ATTEN 40dB
RL 30.0dBm
10dB/
MKR -39.67dBm
7.247GHz
HTC SV10B
HIGH CH
MKR
7.247 GHz
-39.67 dBm
START 3.000GHz
STOP 10.000GHz
#RBW 100kHz
VBW 100kHz
*SWP 100sec
2003-8-4


ATTEN 40dB
RL 30.0dBm
10dB/
MKR -36.50dBm
14.68GHz
HTC SV10B
HIGH CH
MKR
14.68 GHz
-36.50 dBm
START 10.00GHz
STOP 20.00GHz
*RBW 100kHz
VBW 100kHz
*SWP 100sec
2003-8-4

# 8 - FIELD STRENGTH OF SPURIOUS RADIATION

## 8.1 Test Procedure

Requirements: CFR 47, § 2.1053, § 22.917 and § 24.238 (a).

## 8.2 Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = 10 lg (TXpwr in Watts/0.001) – the absolute level

Spurious attenuation limit in dB = 43 + 10 $Log_{10}$ (power out in Watts)

## 8.3 Test Equipment

CDI B100/200/300 Biconical Antennas
EMCO Bi-logcon Antenna
EMCO 3115 Horn Antenna
HP 8566B Spectrum Analyzer
Preamplifiers
HP8640 Generator
Non-radiating Load

## 8.4 Test Result

For Model: SV10B

Low Channel: -14.73 dBm at 3700.4 MHz
Middle Channel: -16.33 dBm at 3760 MHz
High Channel: -12.5 dBm at 3819.6 MHz

For Model: SV10A

Low Channel: -10.83 dBm at 3700.4 MHz
Middle Channel: -12.3 dBm at 3760 MHz
High Channel: -9.7 dBm at 3819.6 MHz

### 8.4.1 Test Data for Model: SV10B

| EUT | | | | | Generator | | | | | | Standard | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicated | | Table | Test Antenna | | Substitution | | | Antenna | Cable | Absolute | FCC | FCC |
| Frequency MHz | Ampl. dBuV/m | Angle Degree | Height Meter | Polar H/V | Frequency MHz | Level dBm | Polar H/V | Gain Corrected | Loss dBm | Level dB | Limit dBm | Margin DBm |
| Low Channel | | | | | | | | | | | | |
| 1850.2 | 120.3 | 250 | 2.2 | V | 1850.2 | 22.1 | V | 6.7 | 0.1 | 28.7 | | |
| 1850.2 | 114 | 90 | 1.8 | H | 1850.2 | 16.05 | H | 6.7 | 0.1 | 22.65 | | |
| 3700.4 | 50.17 | 150 | 2.5 | V | 3700.4 | -36.2 | V | 8.8 | 0.3 | -27.73 | -13 | -14.73 |
| 3700.4 | 48.33 | 90 | 1.5 | H | 3700.4 | -38.3 | H | 8.8 | 0.3 | -29.83 | -13 | -16.83 |
| 5550.6 | 42.67 | 30 | 2 | V | 5550.6 | -42.2 | V | 9.1 | 0.5 | -33.57 | -13 | -20.57 |
| 5550.6 | 42.17 | 60 | 1.8 | H | 5550.6 | -43.7 | H | 9.1 | 0.5 | -35.07 | -13 | -22.07 |
| Middle Channel | | | | | | | | | | | | |
| 1880 | 119.5 | 0 | 2.2 | V | 1880 | 21.67 | V | 6.7 | 0.1 | 28.27 | | |
| 1880 | 113.8 | 150 | 2 | H | 1880 | 15.8 | H | 6.7 | 0.1 | 22.4 | | |
| 3760 | 49.5 | 270 | 2 | V | 3760 | -37.8 | V | 8.8 | 0.3 | -29.33 | -13 | -16.33 |
| 3760 | 46.33 | 150 | 2 | H | 3760 | -40.7 | H | 8.8 | 0.3 | -32.17 | -13 | -19.17 |
| 5640 | 44.33 | 30 | 1.5 | V | 5640 | -42 | V | 9.1 | 0.5 | -33.4 | -13 | -20.4 |
| 5640 | 43 | 45 | 1.7 | H | 5640 | -43.3 | H | 9.1 | 0.5 | -34.7 | -13 | -21.7 |
| High Channel | | | | | | | | | | | | |
| 1909.8 | 118.7 | 300 | 2 | V | 1909.8 | 20.9 | V | 6.7 | 0.1 | 27.5 | | |
| 1909.8 | 112.7 | 300 | 1.8 | H | 1909.8 | 15.25 | H | 6.7 | 0.1 | 21.85 | | |
| 3819.6 | 52.67 | 270 | 1.8 | V | 3819.6 | -34 | V | 8.8 | 0.3 | -25.5 | -13 | -12.5 |
| 3819.6 | 50.5 | 300 | 2.2 | H | 3819.6 | -36.2 | H | 8.8 | 0.3 | -27.7 | -13 | -14.7 |
| 5729.4 | 44.5 | 0 | 2.2 | V | 5729.4 | -41.8 | V | 9.1 | 0.5 | -33.23 | -13 | -20.23 |
| 5729.4 | 43.33 | 200 | 1.7 | H | 5729.4 | -42.7 | H | 9.1 | 0.5 | -34.07 | -13 | -21.07 |

Sample calculation:

Absolute level = substitution level + antenna gain – cable loss

For example:

22.1+6.7-0.1 = 28.7
21.67+6.7-0.1 = 28.27
20.9+6.7-0.1 = 27.5

### 8.4.2 Test Data for Model: SV10A

| EUT | | | | | Generator | | | | | | Standard | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicated | | Table | Test Antenna | | Substitution | | | Antenna | Cable | Absolute | FCC | FCC |
| Frequency MHz | Ampl. dBuV/m | Angle Degree | Height Meter | Polar H/V | Frequency MHz | Level dBm | Polar H/V | Gain Corrected | Loss dBm | Level dB | Limit dBm | Margin DBm |
| Low Channel | | | | | | | | | | | | |
| 1850.2 | 120 | 300 | 2 | V | 1850.2 | 22 | V | 6.7 | 0.1 | 28.6 | | |
| 1850.2 | 113.1 | 30 | 1.8 | H | 1850.2 | 15.1 | H | 6.7 | 0.1 | 21.7 | | |
| 3700.4 | 53.33 | 180 | 1.8 | H | 3700.4 | -32.3 | H | 8.8 | 0.3 | -23.83 | -13 | -10.83 |
| 3700.4 | 53.67 | 90 | 2.2 | V | 3700.4 | -32.7 | V | 8.8 | 0.3 | -24.17 | -13 | -11.17 |
| 5550.6 | 47.33 | 60 | 2 | V | 5550.6 | -38.5 | V | 9.1 | 0.5 | -29.9 | -13 | -16.9 |
| 5550.6 | 43.83 | 270 | 1.9 | H | 5550.6 | -44 | H | 9.1 | 0.5 | -35.4 | -13 | -22.4 |
| Middle Channel | | | | | | | | | | | | |
| 1880 | 119.3 | 0 | 2 | V | 1880 | 21.45 | V | 6.7 | 0.1 | 28.05 | | |
| 1880 | 113.3 | 90 | 1.8 | H | 1880 | 15.3 | H | 6.7 | 0.1 | 21.9 | | |
| 3760 | 52.5 | 90 | 2.3 | V | 3760 | -33.8 | V | 8.8 | 0.3 | -25.3 | -13 | -12.3 |
| 3760 | 50.17 | 150 | 2 | H | 3760 | -35.1 | H | 8.8 | 0.3 | -26.6 | -13 | -13.6 |
| 5640 | 49.33 | 150 | 2 | V | 5640 | -37.5 | V | 9.1 | 0.5 | -28.9 | -13 | -15.9 |
| 5640 | 44.17 | 60 | 2.2 | H | 5640 | -42.3 | H | 9.1 | 0.5 | -33.7 | -13 | -20.7 |
| High Channel | | | | | | | | | | | | |
| 1909.8 | 118.9 | 0 | 2.2 | V | 1909.8 | 21.1 | V | 6.7 | 0.1 | 27.7 | | |
| 1909.8 | 112.7 | 270 | 2 | H | 1909.8 | 14.75 | H | 6.7 | 0.1 | 21.35 | | |
| 3819.6 | 54.7 | 0 | 2.3 | V | 3819.6 | -31.2 | V | 8.8 | 0.3 | -22.7 | -13 | -9.7 |
| 3819.6 | 53.67 | 300 | 2.2 | H | 3819.6 | -32.4 | H | 8.8 | 0.3 | -23.9 | -13 | -10.9 |
| 5729.4 | 47.83 | 330 | 2.5 | V | 5729.4 | -40.8 | V | 9.1 | 0.5 | -32.23 | -13 | -19.23 |
| 5729.4 | 45.17 | 0 | 1.8 | H | 5729.4 | -43.3 | H | 9.1 | 0.5 | -34.7 | -13 | -21.7 |

Sample calculation:

Absolute level = substitution level + antenna gain – cable loss

For example:

22+6.7-0.1 = 28.6
21.45+6.7-0.1 = 28.05
21.1+6.7-0.1 = 27.7

# 9 – BAND EDGE TEST

## 9.1 Applicable Standards

According to FCC §2.1049 and §24.238, when measuring the emission limits, carrier frequency shall be adjusted as close to the frequency block edges, both upper and lower.

## 9.2 Test Procedure

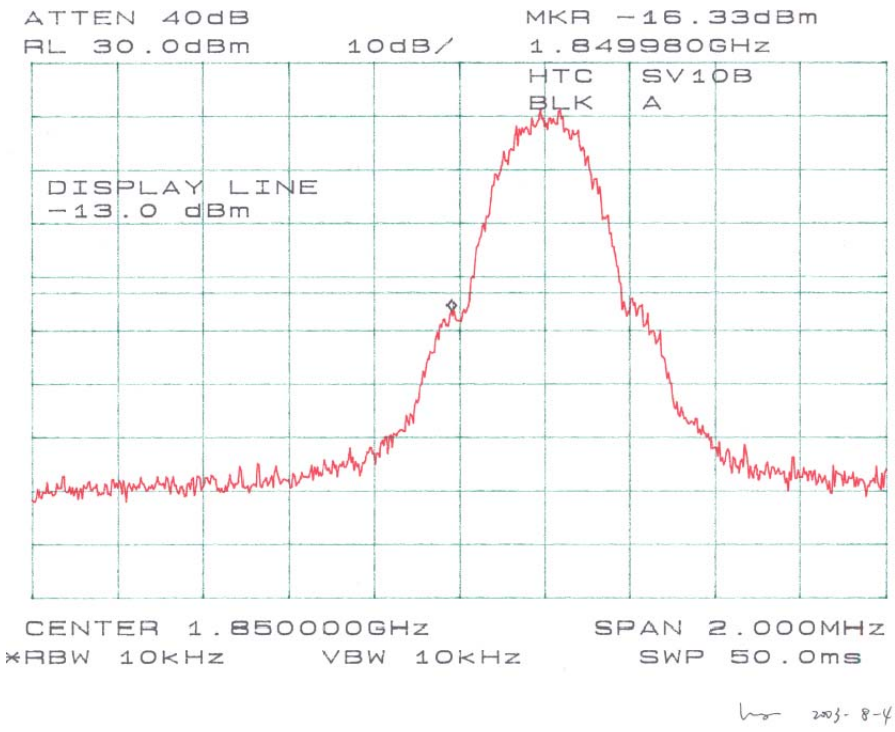
The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. Adjust the carrier frequency as close to the frequency block edges both upper and lower. Sufficient scans were taken to show any out of band-edge emission.

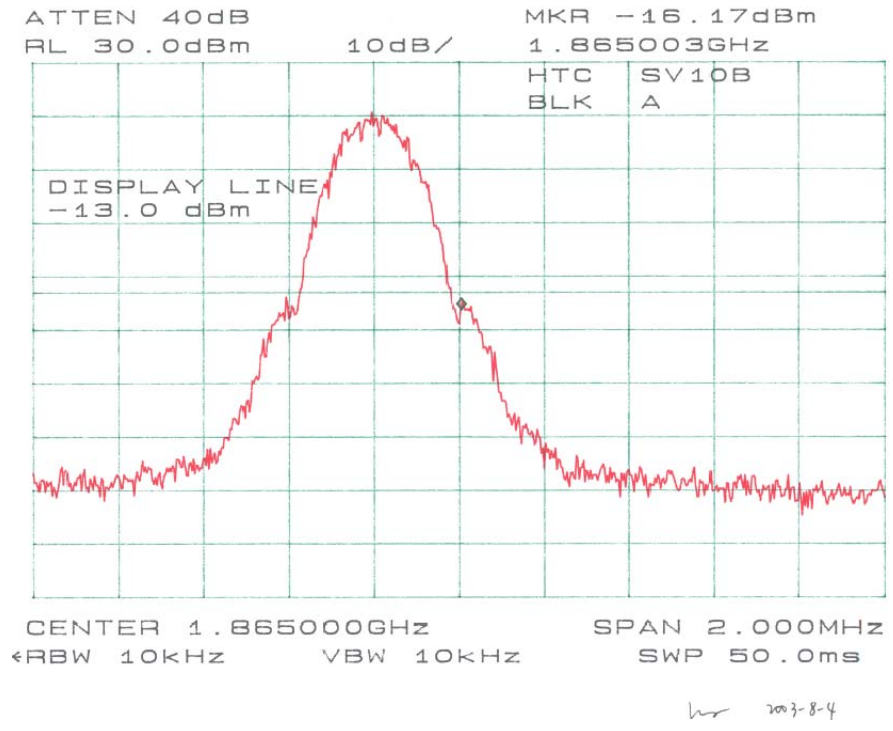
## 9.3 Test Equipment

Agilent 8565EC Spectrum Analyzer
HP 7470A Plotter
Hewlett Packard HP8566B Spectrum Analyzer
Hewlett Packard HP 7470A Plotter
Rohde & Schwarz SMIQ03B Signal Generator
Rohde & Schwarz AMIQ I/Q Modulation Generator
Hewlett Packard 8449 Amplifier
A.H. Systems, Inc SAS-200/571 Horn Antenna

## 9.4 Plots of Out-of-Band-Edge Emissions at Antenna Terminal

Please refer to plots hereinafter.


ATTEN 40dB
RL 30.0dBm
10dB/
MKR -16.33dBm
1.849980GHz
HTC SV10B
BLK A
DISPLAY LINE
-13.0 dBm
CENTER 1.850000GHz
SPAN 2.000MHz
*RBW 10kHz
VBW 10kHz
SWP 50.0ms
2003-8-4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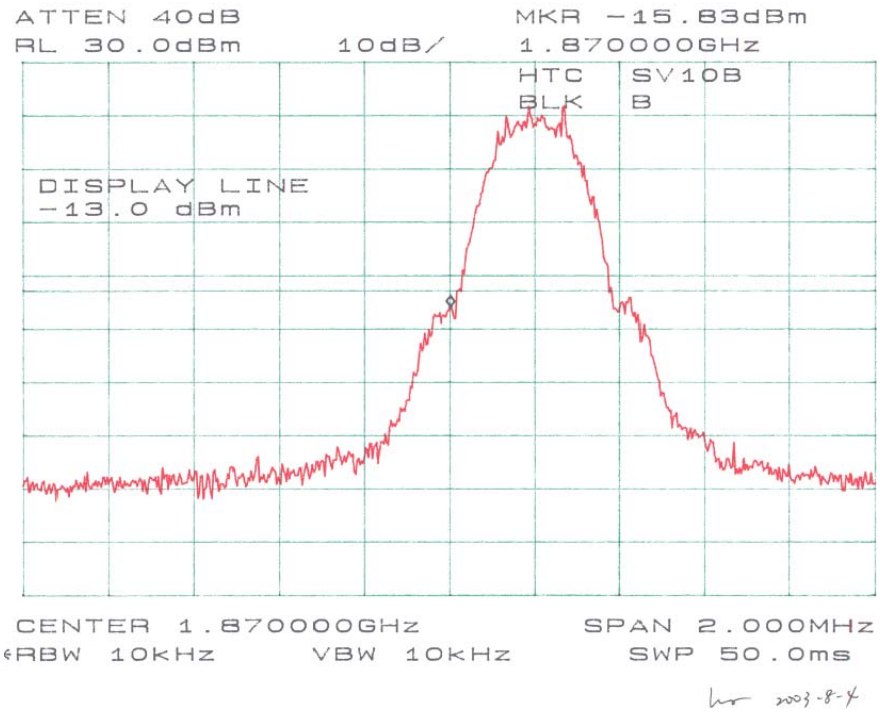
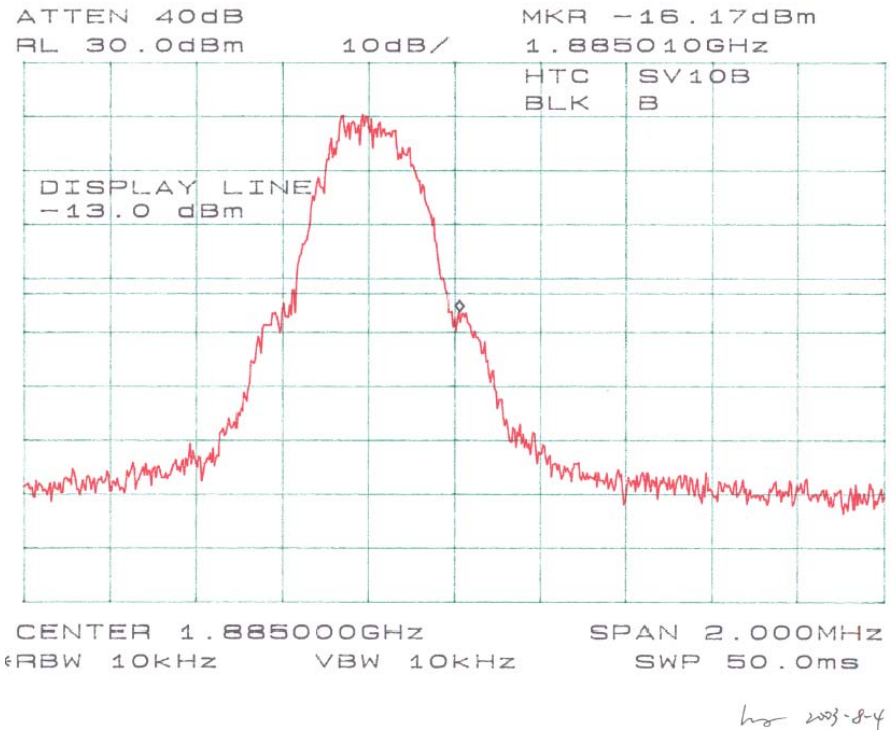
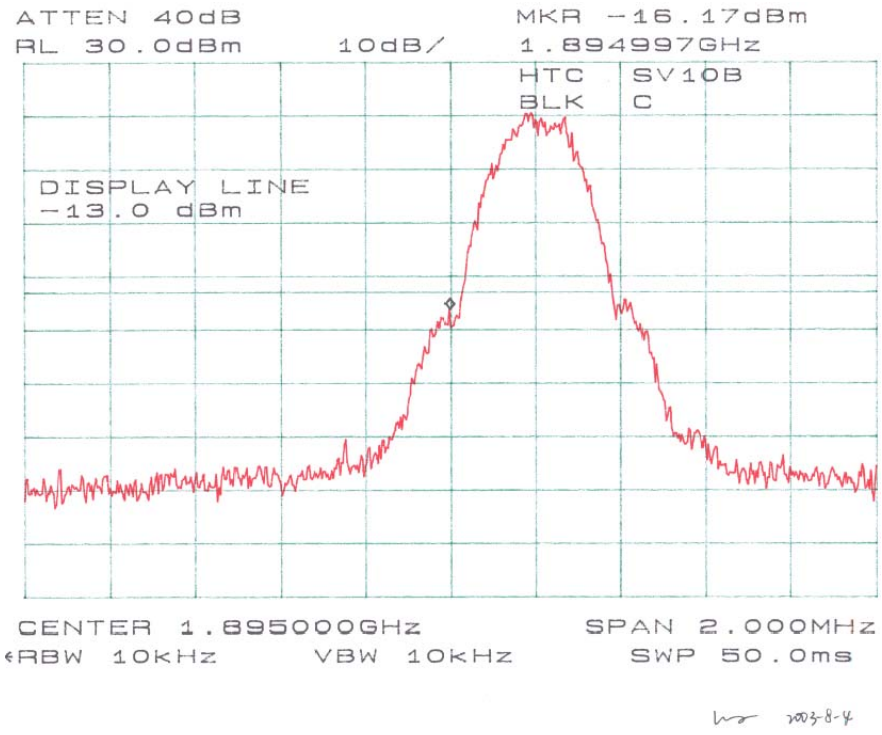
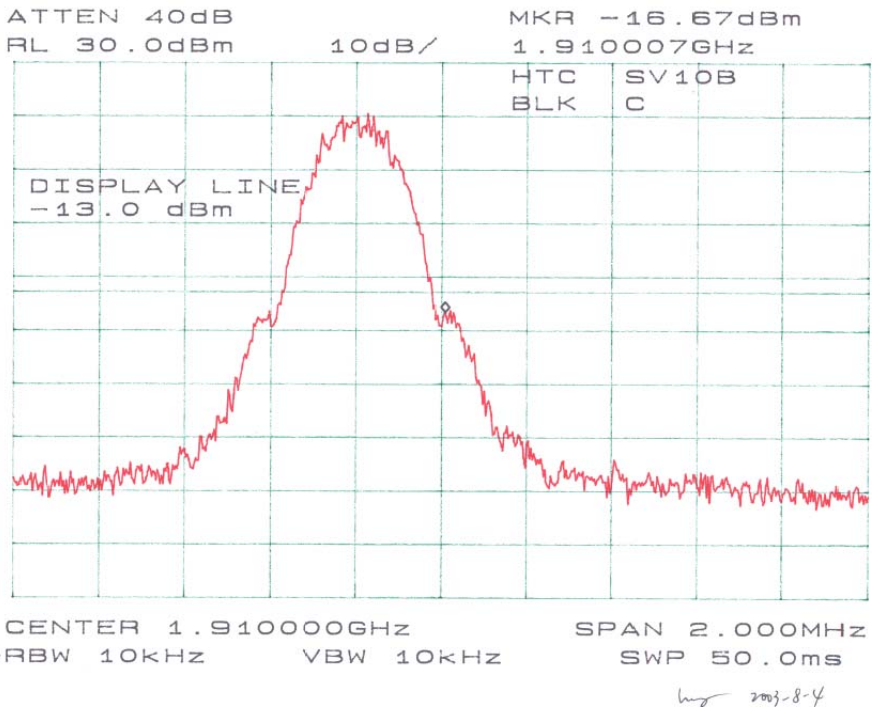
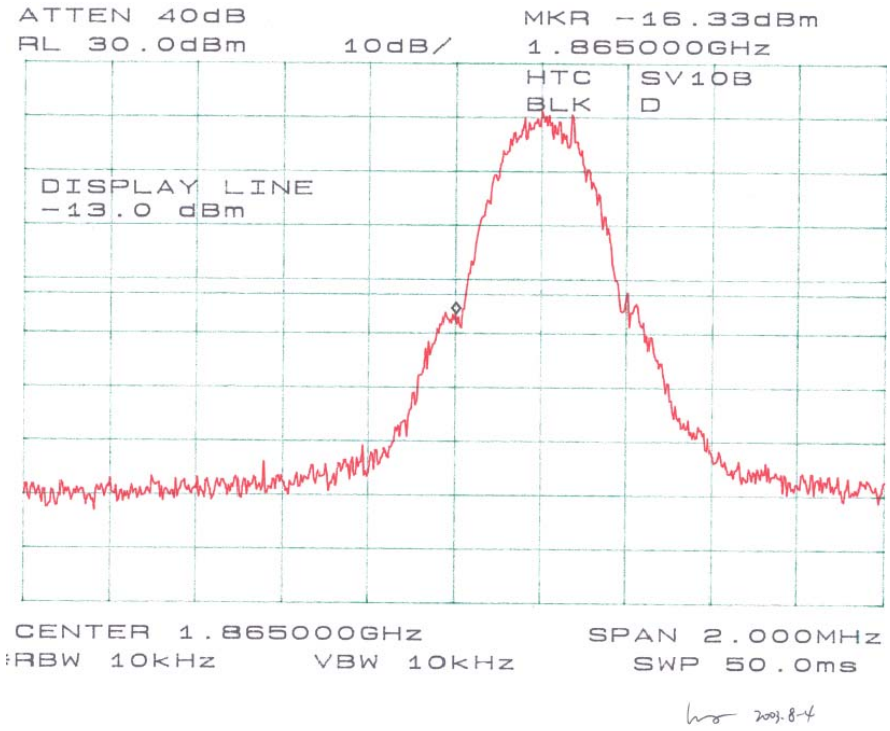
RL 30.0dBm
10dB/
MKR -16.17dBm
1.865003GHz
HTC SV10B
BLK A
DISPLAY LINE
-13.0 dBm
CENTER 1.865000GHz
SPAN 2.000MHz
*RBW 10kHz
VBW 10kHz
SWP 50.0ms
2003-8-4

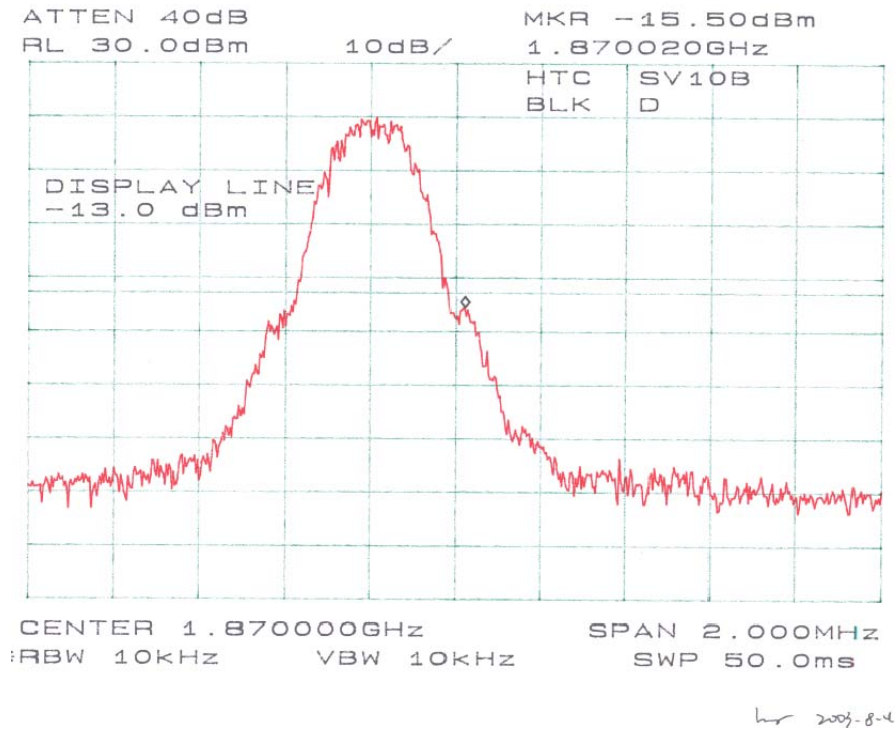

ATTEN 40dB
RL 30.0dBm
10dB/
MKR -15.83dBm
1.870000GHz
HTC SV10B
BLK B
DISPLAY LINE
-13.0 dBm
CENTER 1.870000GHz
SPAN 2.000MHz
RBW 10kHz
VBW 10kHz
SWP 50.0ms
2003-8-4

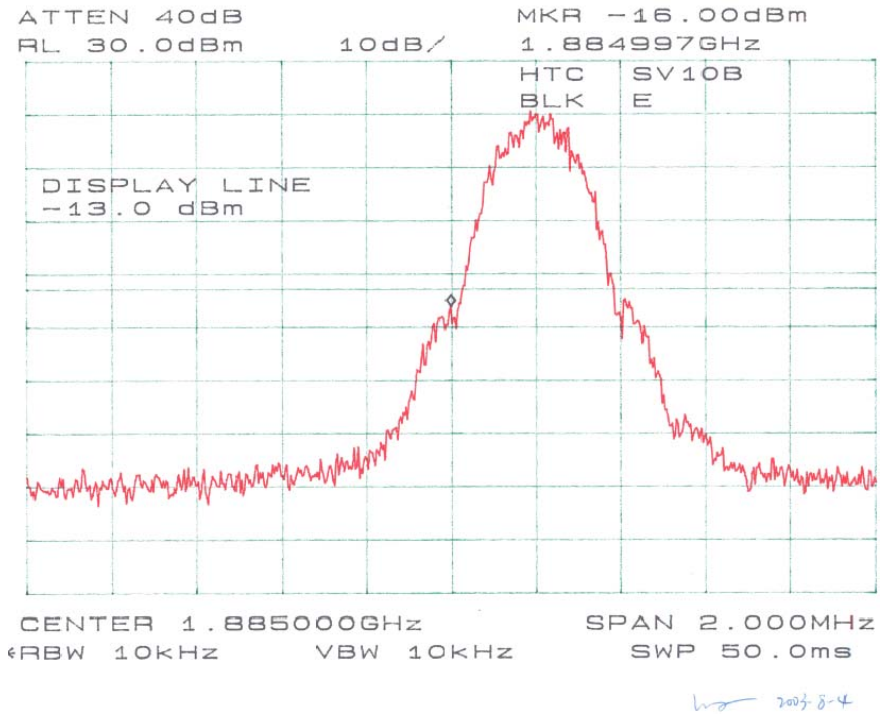

ATTEN 40dB
RL 30.0dBm
10dB/
MKR -16.17dBm
1.885010GHz
HTC SV10B
BLK B
DISPLAY LINE
-13.0 dBm
CENTER 1.885000GHz
SPAN 2.000MHz
RBW 10kHz
VBW 10kHz
SWP 50.0ms
2003-8-4

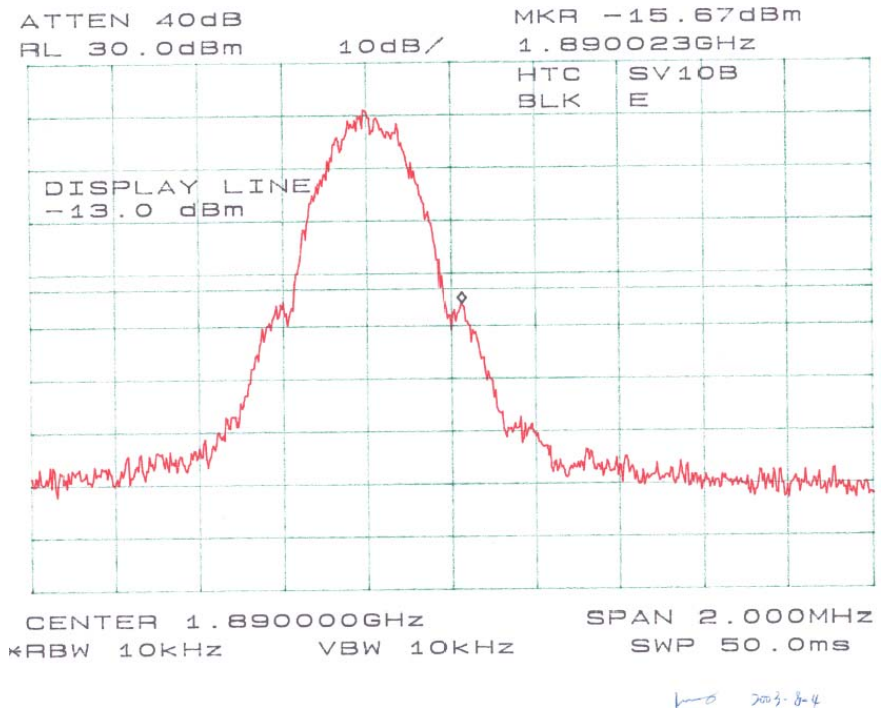

ATTEN 40dB
RL 30.0dBm
10dB/
MKR -16.17dBm
1.894997GHz
HTC SV10B
BLK C
DISPLAY LINE
-13.0 dBm
CENTER 1.895000GHz
SPAN 2.000MHz
RBW 10kHz
VBW 10kHz
SWP 50.0ms
2003-8-4

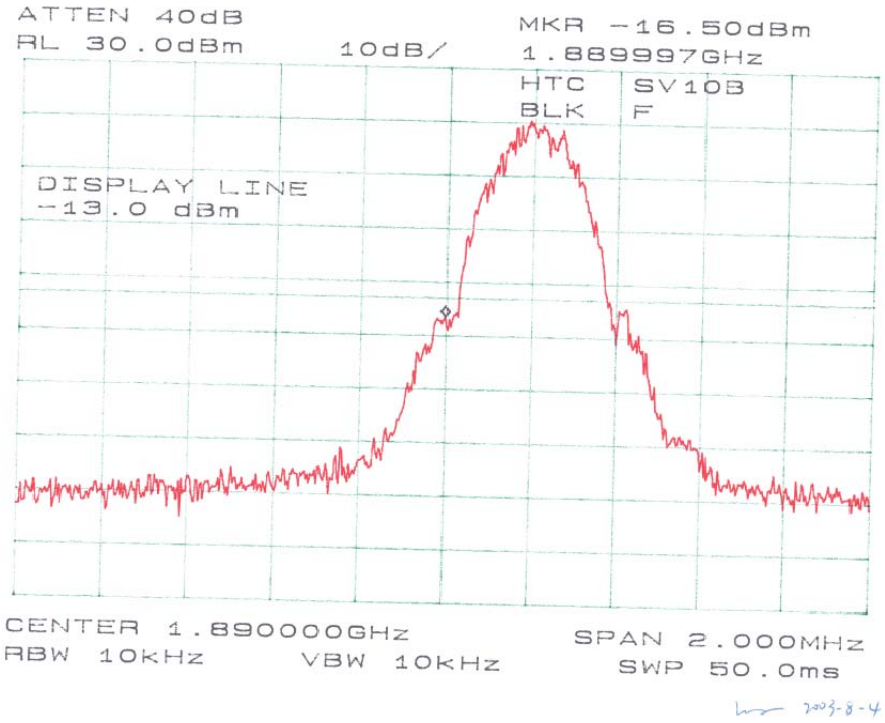

ATTEN 40dB
RL 30.0dBm
10dB/
MKR -16.67dBm
1.910007GHz
HTC SV10B
BLK C
DISPLAY LINE
-13.0 dBm
CENTER 1.910000GHz
SPAN 2.000MHz
RBW 10kHz
VBW 10kHz
SWP 50.0ms
2003-8-4


ATTEN 40dB
RL 30.0dBm
10dB/
MKR -16.33dBm
1.865000GHz
HTC SV10B
BLK D
DISPLAY LINE
-13.0 dBm
CENTER 1.865000GHz
SPAN 2.000MHz
RBW 10kHz
VBW 10kHz
SWP 50.0ms
2003.8-4


ATTEN 40dB
RL 30.0dBm
10dB/
MKR -15.50dBm
1.870020GHz
HTC SV10B
BLK D
DISPLAY LINE
-13.0 dBm
CENTER 1.870000GHz
SPAN 2.000MHz
RBW 10kHz
VBW 10kHz
SWP 50.0ms
2003-8-4


ATTEN 40dB
RL 30.0dBm
10dB/
MKR -16.00dBm
1.884997GHz
HTC SV10B
BLK E
DISPLAY LINE
-13.0 dBm
CENTER 1.885000GHz
SPAN 2.000MHz
RBW 10KHz
VBW 10KHz
SWP 50.0ms


ATTEN 40dB
RL 30.0dBm
10dB/
MKR -15.67dBm
1.890023GHz
HTC SV10B
BLK E
DISPLAY LINE
-13.0 dBm
CENTER 1.890000GHz
SPAN 2.000MHz
RBW 10KHz
VBW 10KHz
SWP 50.0ms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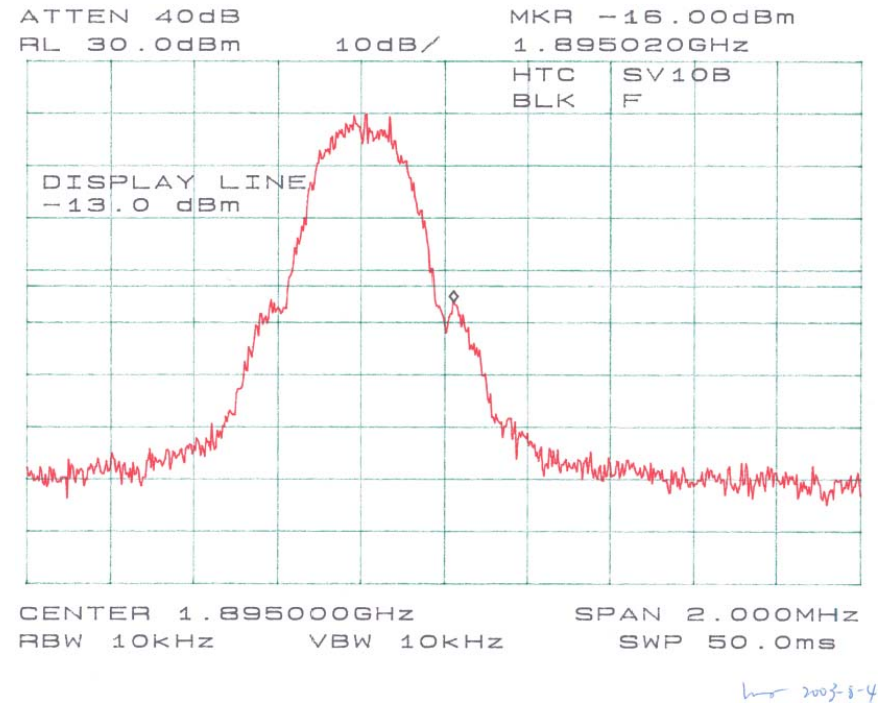
RL 30.0dBm
10dB/
MKR -16.50dBm
1.889997GHz
HTC SV10B
BLK F
DISPLAY LINE
-13.0 dBm
CENTER 1.890000GHz
RBW 10kHz
VBW 10kHz
SPAN 2.000MHz
SWP 50.0ms
2003-8-4


ATTEN 40dB
RL 30.0dBm
10dB/
MKR -16.00dBm
1.895020GHz
HTC SV10B
BLK F
DISPLAY LINE
-13.0 dBm
CENTER 1.895000GHz
RBW 10kHz
VBW 10kHz
SPAN 2.000MHz
SWP 50.0ms
2003-8-4

# 10 - FREQUENCY STABILITY

Frequency Stability vs Temperature

| Reference Frequency: 1880 MHz | | |
|---|---|---|
| Temperature (°C) | MHz | % |
| 50 | 1880.004 | 0.00021% |
| 40 | 1880.002 | 0.00011% |
| 30 | 1880.002 | 0.00011% |
| 20 | 1880.00 | 0.00000% |
| 10 | 1879.999 | -0.00005% |
| 0 | 1880.001 | 0.00005% |
| -10 | 1879.997 | -0.00016% |
| -20 | 1879.997 | -0.00016% |

Frequency Stability vs Battery Voltage

| Reference Frequency: 1880 MHz | | |
|---|---|---|
| Power Supplied (Vdc) | MHz | % |
| 3.6 | 1880.001 | 0.00005% |
| 4.2 | 1880.002 | 0.00011% |