FCC CFR47 CERTIFICATION

PART 24

TEST REPORT

FOR

1900 MHz CDMA Pocket PC (Sprint)

MODEL NUMBER: PDT8138

FCC ID: H9PPDT8138

REPORT NUMBER: 03U2131-1

ISSUE DATE: AUGUST 1, 2003

Prepared for
SYMBOL TECHNOLOGIES, INC.
ONE SYMBOL PLAZA
HOLTSVILLE, NEW YORK 11742
USA

Prepared by
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COMPLIANCE CERTIFICATION SERVICES DOCUMENT NO: CCSUP4031A
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1. TEST RESULT CERTIFICATION

COMPANY NAME: SYMBOL TECHNOLOGIES C/O TOLT TECHNOLOGIES
ONE SYMBOL PLAZA
HOLTSVILLE, NEW YORK 11742, USA

EUT DESCRIPTION: 1900MHz CDMA Pocket PC (Sprint)

MODEL NAME: PDT8138

DATE TESTED: AUGUST 1, 2003

TYPE OF EQUIPMENT	INTENTIONAL RADIATOR
EQUIPMENT TYPE	LICENSED TX MODULE IN MOBILE APPLICATION
MEASUREMENT PROCEDURE	ANSI 63.4 / 2001, TIA/EIA 603
PROCEDURE	CERTIFICATION
FCC RULE	CFR 47 PART 24 Subpart E

Compliance Certification Services, Inc. tested the above equipment for compliance with the requirement set forth in CFR 47, PART 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.

Tested By:

WILLIAM ZHUANG
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

Released For CCS By:

THU CHAN
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

2. EUT DESCRIPTION

The EUT is a single mode portable mobile station of which the frequency range is 1850 – 1910 MHz. The EUT has an output power of 27.2 dBm / 524.8 mW (EIRP) and has an internal antenna with a gain of 0.36 dBi.

3. FACILITIES, LABORATORY AND ACCREDITATION

3.1. Facilities

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 16.

3.2. Laboratory Accreditation

The laboratory and associated 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. In addition, the test facilities are listed with Federal Communications Commission (reference no: 31040/SIT (1300B3) and 31040/SIT (1300F2)).

No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government.

3.3. List of Accreditations

Country	Agency	Scope of Accreditation	Logo
USA	NVLAP*	FCC Part 15, CISPR 22, AS/NZS 3548,IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11, CNS 13438	200065-0
USA	FCC	3/10 meter Open Area Test Sites to perform FCC Part 15/18 measurements	1300
Japan	VCCI	CISPR 22 Two OATS and one conducted Site	R-1014, R-619, C-640
Norway	NEMKO	EN50081-1, EN50081-2, EN50082-1, EN50082-2, IEC61000-6-1, IEC61000-6-2, EN50083-2, EN50091-2, EN50130-4, EN55011, EN55013, EN55014-1, EN55104, EN55015, EN61547, EN55022, EN55024, EN61000-3-2, EN61000-3-3, EN60945, EN61326-1	ELA 117
Norway	NEMKO	EN60601-1-2 and IEC 60601-1-2, the Collateral Standards for Electro-Medical Products. MDD, 93/42/EEC, AIMD 90/385/EEC	ELA-171
Taiwan	BSMI	CNS 13438	SL2-IN-E-1012
Canada	Industry Canada	RSS210 Low Power Transmitter and Receiver	IC2324 A,B,C, and F

*No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government.

4. CALIBRATION, METHODOLOGY AND UNCERTAINTY

4.1. Equipment 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.

4.2. Test Methodology

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.

Receiving equipment (i.e., receiver, analyzer, quasi-peak adapter, pre-selector) and LISNs conform to CISPR specifications for “Radio Interference Measuring Apparatus and Measurement Methods,” Publication 16.

4.3. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Radiated Emission	
30MHz – 200 MHz	+/- 3.3dB
200MHz – 1000MHz	+4.5/-2.9dB
1000MHz – 2000MHz	+4.6/-2.2dB
Power Line Conducted Emission	
150kHz – 30MHz	+/-2.9

Any results falling within the above values are deemed to be marginal.

4.4. Test and Measurement Equipment

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Name of Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Due Date**
Quasi-Peak Adaptor	HP	85650A	2811A01155	5/16/04
SA Display Section 2	HP	85662A	2816A16696	5/16/04
SA RF Section, 1.5 GHz	HP	85680B	2732A03661	5/16/04
Preamplifier, 1300 MHz	HP	8447D	2944A06589	8/22/03
Antenna, Bilog	Chase	CBL6112B	2586	3/28/04
Preamplifier, 1 ~ 26 GHz	Miteq	NSP10023988	646456	4/26/04
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6717	2/4/04
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	9001-3245	2/4/04
Spectrum Analyzer	Agilent	E4407B	US40241238	1/27/04
Spectrum Analyzer	Agilent	E4446A	US42070220	1/13/04
Signal Generator	HP	83732B	US34490599	4/4/04
Power Meter	Agilent	E4416A	GB41291160	8/9/03
Power Sensor	Agilent	E9327A	US40440755	9/5/03
DC Power Supply	KRM	AEEC-350	9712154746	N.C.R
EMI Receiver	HP	8542E	3942A00280	11/20/03
RF Filter Section	HP	8542E	3705A00256	11/20/03
Multimeter	Fluke	26111	74380619	N.C.R
Environmental Chamber	Thermotron	SE-600-10-10	29800	4/26/04

5. APPLICABLE RULES

5.1. RF POWER OUTPUT §2.1046

§ 24.232- POWER LIMIT

§24.232(a) Maximum Peak output power for base station transmitters should not exceed
100 Watts EIRP (equivalent isotropically radiated power).

§24.232(b) Mobile stations are limited to 2 Watts EIRP.

5.2. MODULATION CHARACTERISTICS §2.1047

Not applicable.

5.3. OCCUPIED BANDWIDTH §2.1049

§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.

5.4. SPURIOUS EMISSIONS AT ANTENNA TERMINALS §2.1051

§ 24.238- EMISSION LIMITS

§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).

5.5 FIELD STRENGTH OF SPURIOUS RADIATION §2.1053

§ 24.238- EMISSION LIMITS

§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).

5.6. FREQUENCY STABILITY §2.1055

§24.235 The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

5.7. FREQUENCY RANGE TO BE INVESTIGATED §2.1057

§2.1057(a) In all of the measurements set forth in §2.1051 and §2.1053, the spectrum shall be investigated from the 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.

§2.1057(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.

§2.1057(c) The amplitude of spurious emissions, which are attenuated more than 20 dB below the permissible value, need not be reported.

§2.1057(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 10 MHz to 20 GHz.

6. TEST SETUP, PROCEDURE AND RESULT

6.1. RF POWER OUTPUT

INSTRUMENTS LIST

EQUIPMENT	MANUFACTURE	MODEL NO.	CAL. DUE DATE
Spectrum Analyzer	Agilent	E4446A	1/13/04
Amplifier	MITEQ	NSP2600-44	4/25/04
Horn Antenna	EMCO	3115 SN: 6739	02/04/04
Horn Antenna	EMCO	3115 SN: 6717	02/04/04

MEASUREMENT 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 3m 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 quasi-peak 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 than 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 EUT was moved throughout the X, Y, and Z planes to maximize emissions received by the search antenna, if necessary.

10). The transmitter shall be replaced by a tuned dipole (substitution antenna).

11). The substitution antenna shall be oriented for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.

12). The substitution antenna shall be connected to a calibrated signal generator.

13). If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.

14). The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.

15). 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.

16). 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.

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

18). 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.

Test result:

Modulation	***Max Output Power(dBm)***	***Max Output Power(mW)***
CDMA 1900MHz	***27.2 (EIRP)***	***524.8***

X-Position

Y-Position

Z-Position

Conducted Output Power Measurement:

	Ch.#	Freq. (MHz)	Pwr_Ave (dBm)	Pwr_Pk (dBm)
Low Ch.	25	1851.25	24.06	26.20
Mid Ch.	600	1880	25.87	27.86
High Ch.	1175	1908.75	23.12	25.54

Cable+Attn Loss: 10.3 dB

CDMA 1900MHz Output Power (EIRP)

07/25/03 **High Frequency Substitution Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr:William Zhuang
Project #:03U2131
Company:Tolt Technologies
EUT Descrip.:1900MHz CDMA Pocket PC (Sprint)
EUT M/N:PDT8138 (FCC ID:H9PPDT8138;IC ID:154DPDT8138)
Test Target:FCC Part 24
Mode Oper:CDMA Transmit

Test Equipment:

EMCO Horn 1-18GHz	Pre-amplifer 1-26GHz	Spectrum Analyzer	Horn > 18GHz	Limit
T73; S/N: 6717 @1n		Agilent E4446A Analyzer		FCC 24

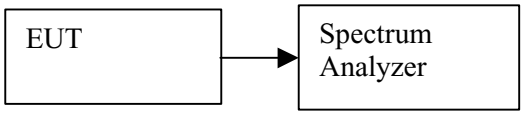
Hi Frequency Cables
☐ (2 ft) ☐ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☑ (12 ft)

Peak Measurements:
Fundamental: RBW>99% or 26dB Emissions BW, VBW=RBW
Bandedge: RBW=>1% Emissions BW, VBW=> 3*RBW
Spurious: RBW=1MHz, VBW=1MHz

f GHz	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
RBW=VBW=3MHz, @ Z Worst Position:									
1.851	81.2	20.7	2.2	7.4	5.3	25.9	33.0	-7.1	Z Position, V, Fund
1.851	80.1	17.3	2.2	7.4	5.3	22.5	33.0	-10.5	Z Position, H, Fund
1.880	82.5	22.0	2.2	7.4	5.3	27.2	33.0	-5.8	Z Position, V, Fund
1.880	81.8	18.5	2.2	7.4	5.3	23.7	33.0	-9.3	Z Position, H, Fund
1.909	81.0	20.5	2.2	7.5	5.3	25.8	33.0	-7.2	Z Position, V, Fund
1.909	79.9	17.1	2.2	7.5	5.3	22.4	33.0	-10.6	Z Position, H, Fund

6.2. OCCUPIED BANDWIDTH

TEST SETUP

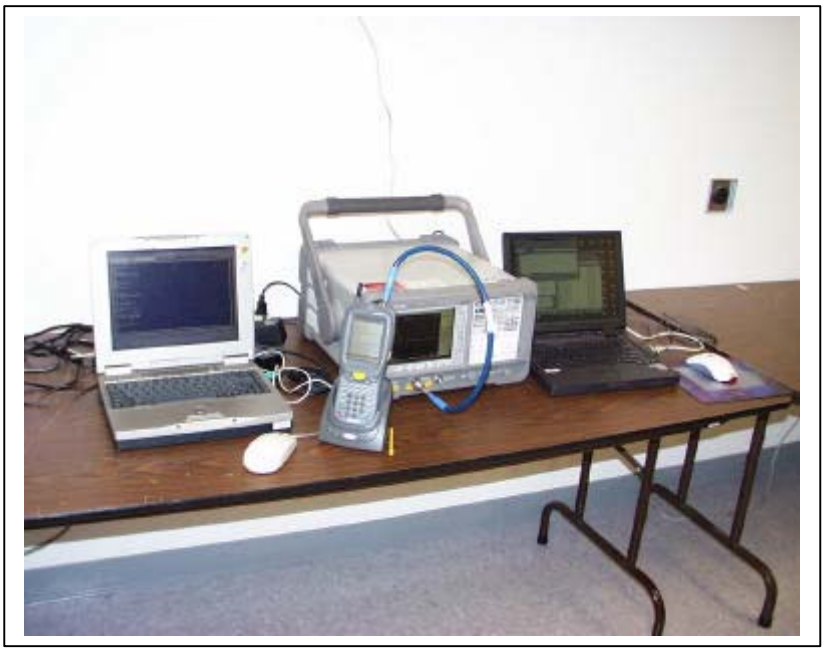


TEST PROCEDURE

The EUT's output RF connector (made solely for the purpose of the test) was connected with a short cable to the spectrum analyzer, RES BW was set to about 1% of 99 %emission BW , the occupied BW is the delta frequency between the two points.

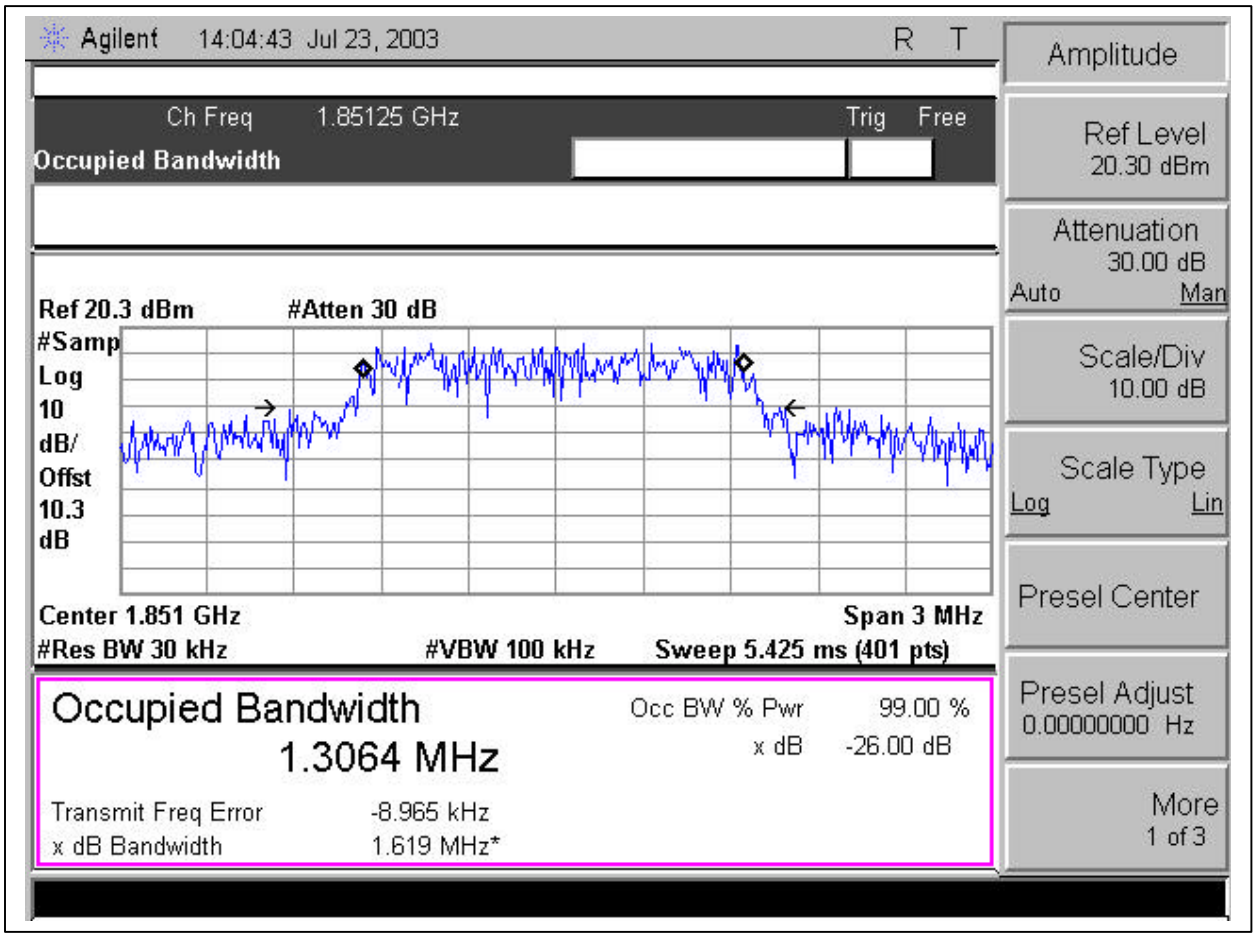
RESULT

No non-compliance noted.

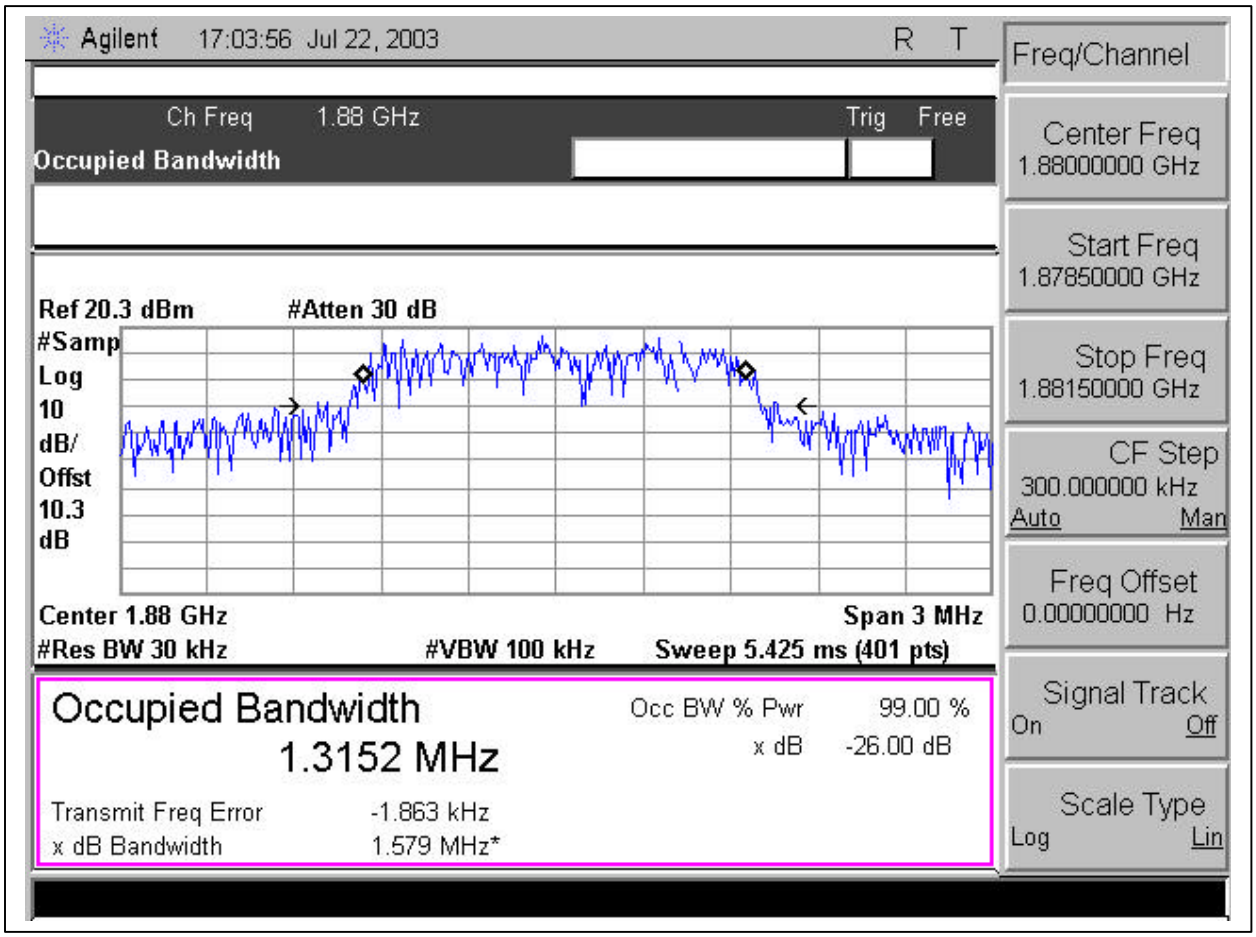


FREQUENCY	BANDWIDTH
(GHz)	(MHz)
1.85125	1.619
1.88000	1.579
1.90875	1.462

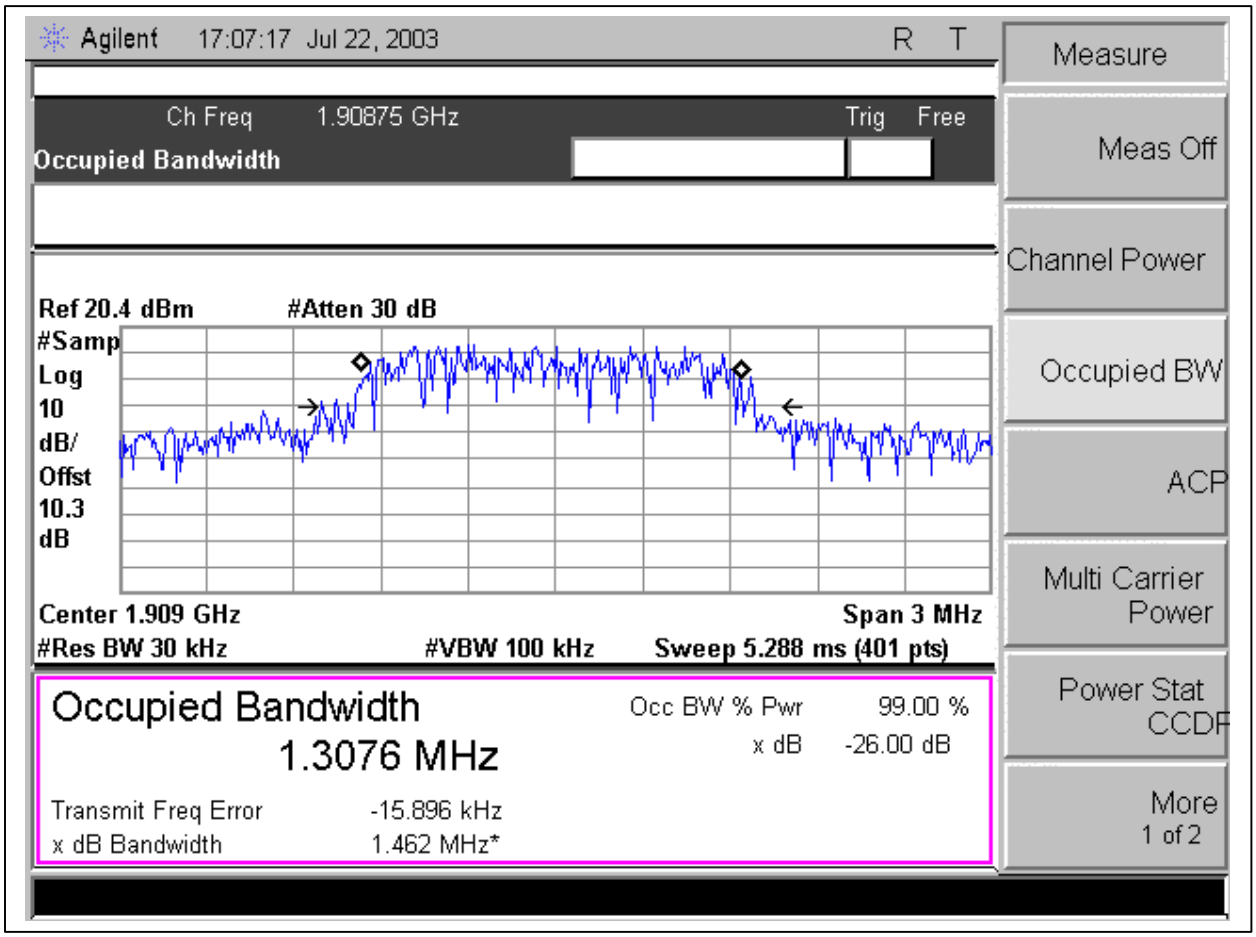
LOW CHANNEL



MIDDLE CHANNEL

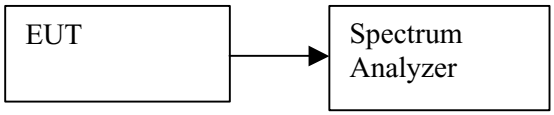


HIGH CHANNEL



6.3. SPURIOUS EMISSION AT ANTENNA TERMINAL

TEST SETUP



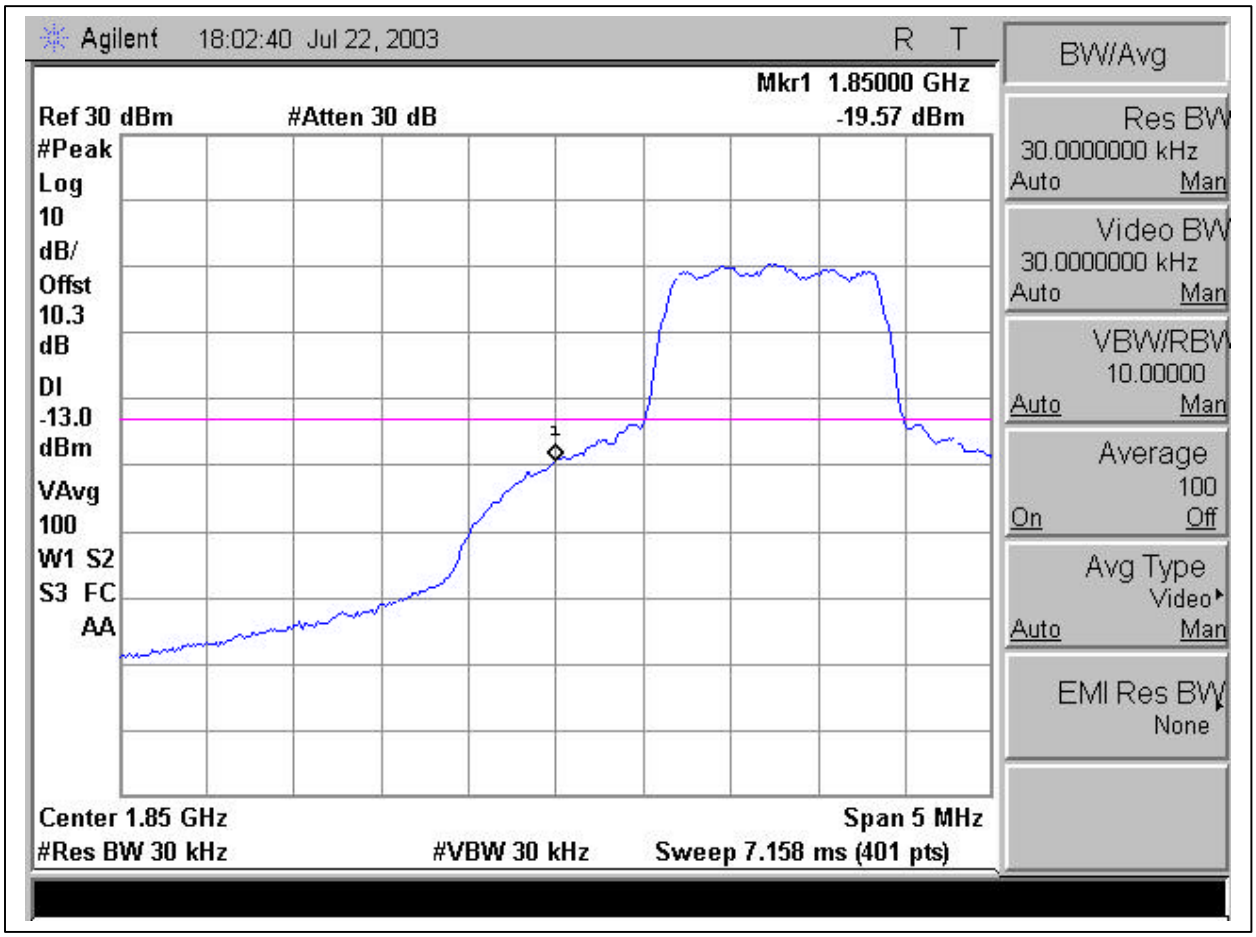
TEST PROCEDURE

EUT's RF output connector (made solely for the purpose of the test) is connected to the spectrum analyzer, RBW was set to 1MHz and VBW to 1MHz, the spectrum of 10MHz to 20GHz was investigated for any spurious emissions, a close up investigation for band edges for the low and high channels was also investigated with RBW=3KHz and VBW RBW.

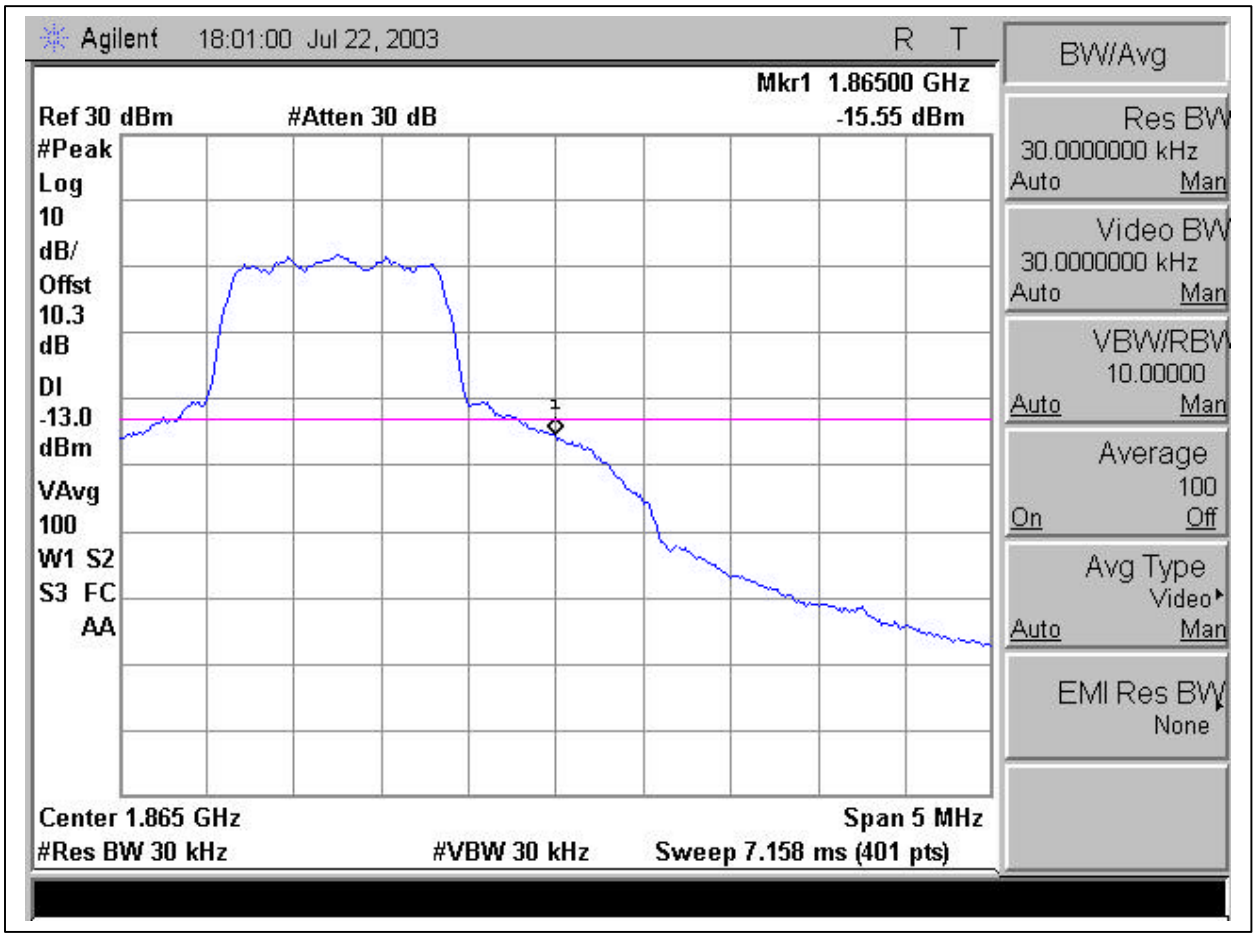
RESULT

No non-compliance noted.

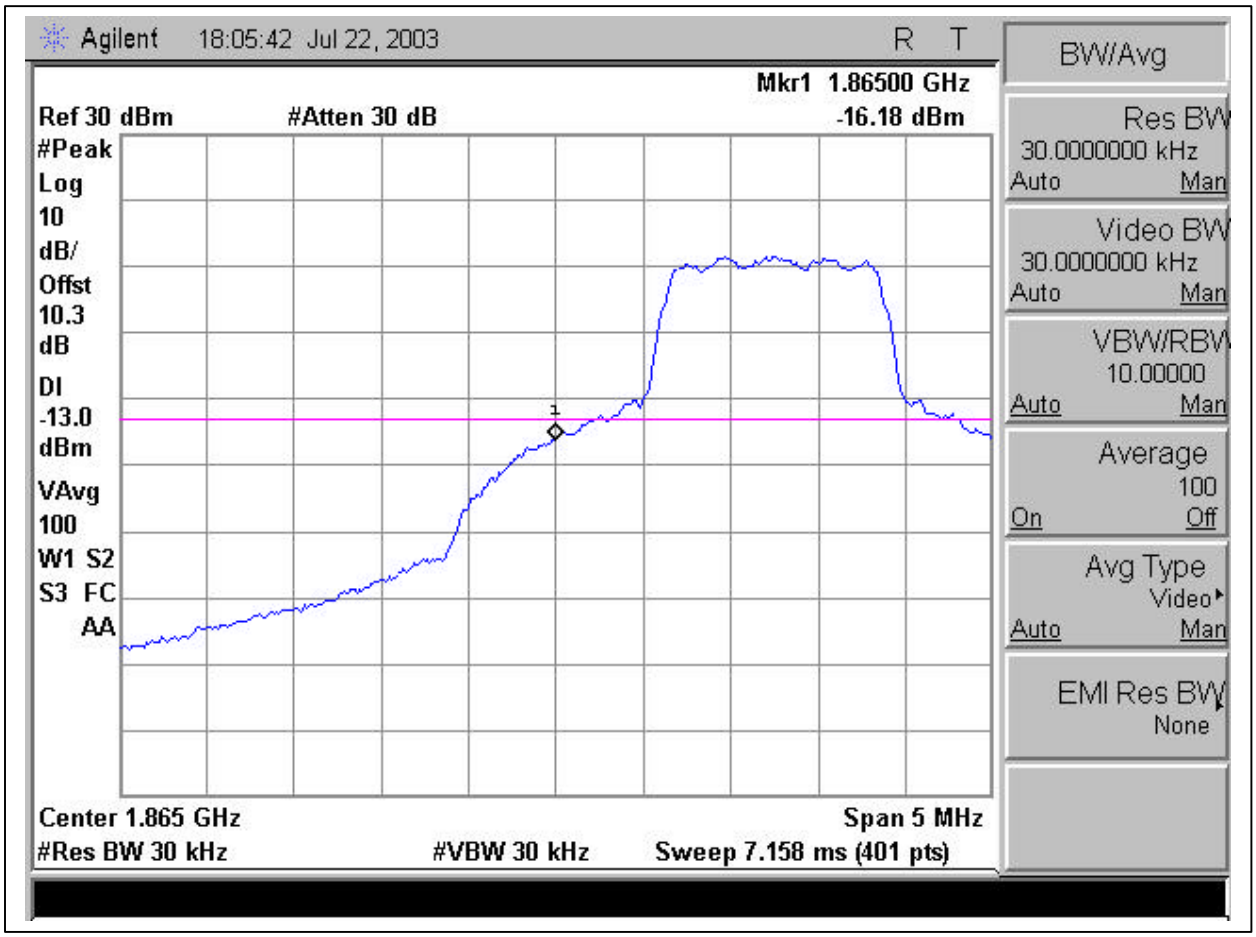
LOW BANDEDGE-CHANNEL 25



HIGH BANDEDGE-CHANNEL 275



LOW BANDEDGE-CHANNEL 325



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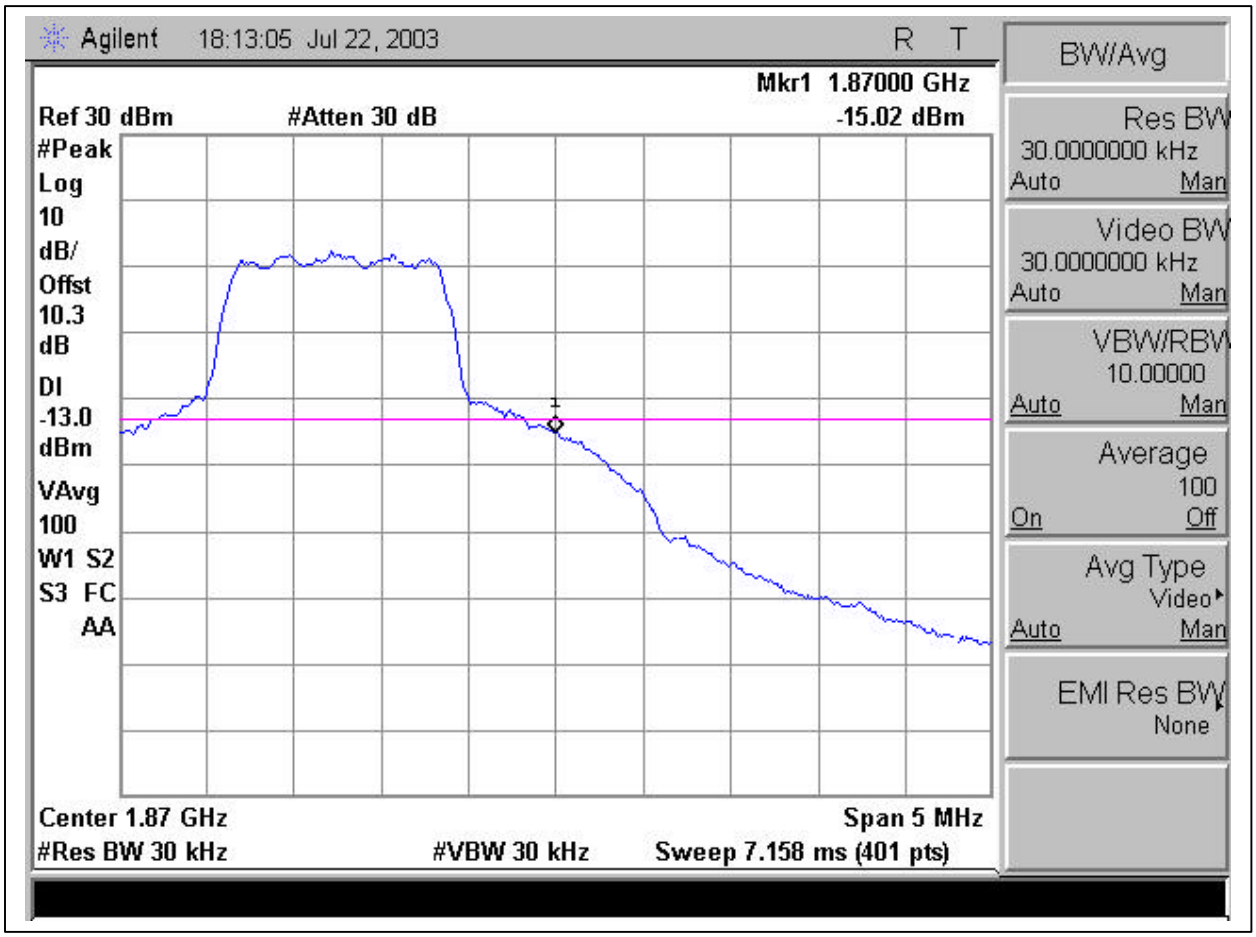
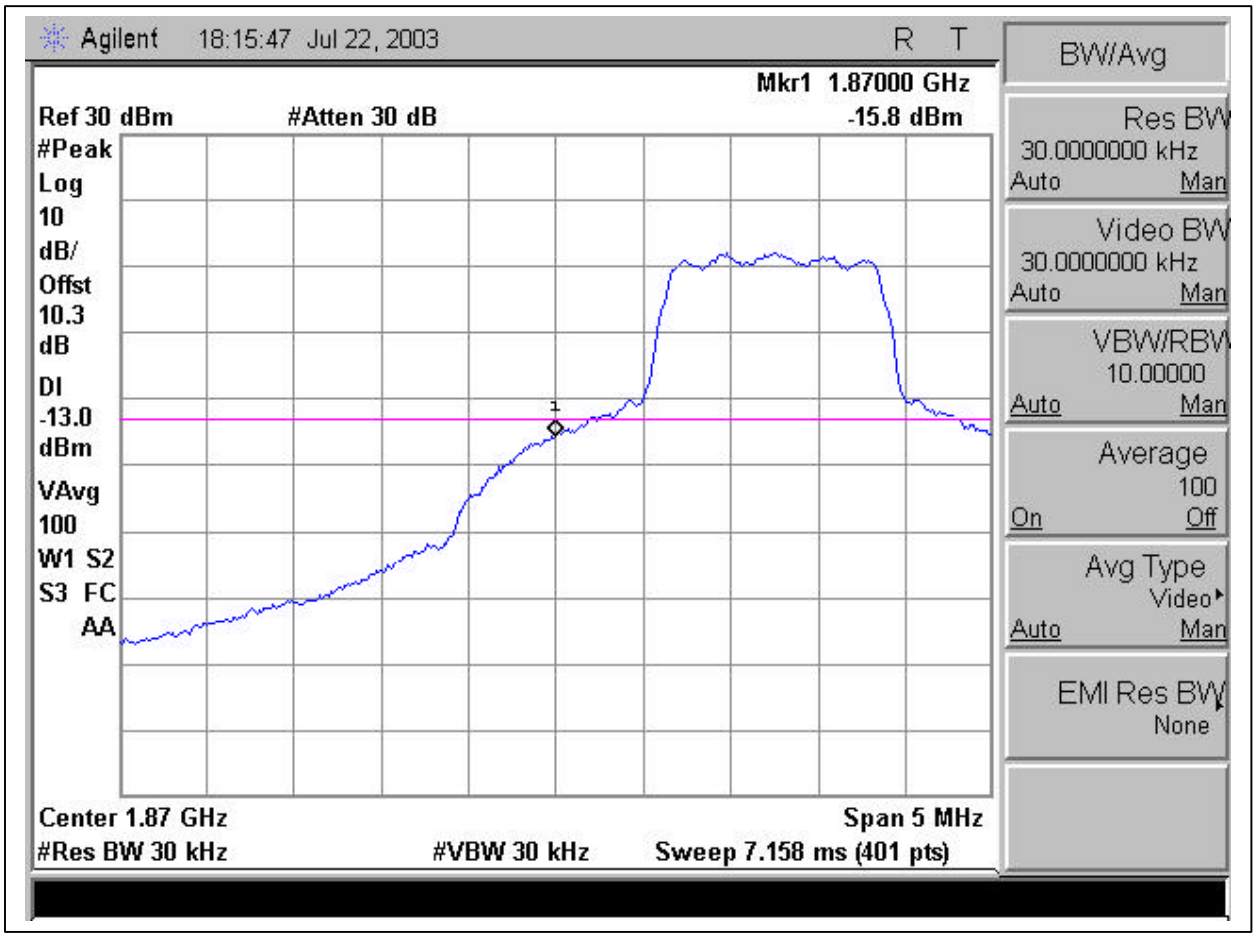
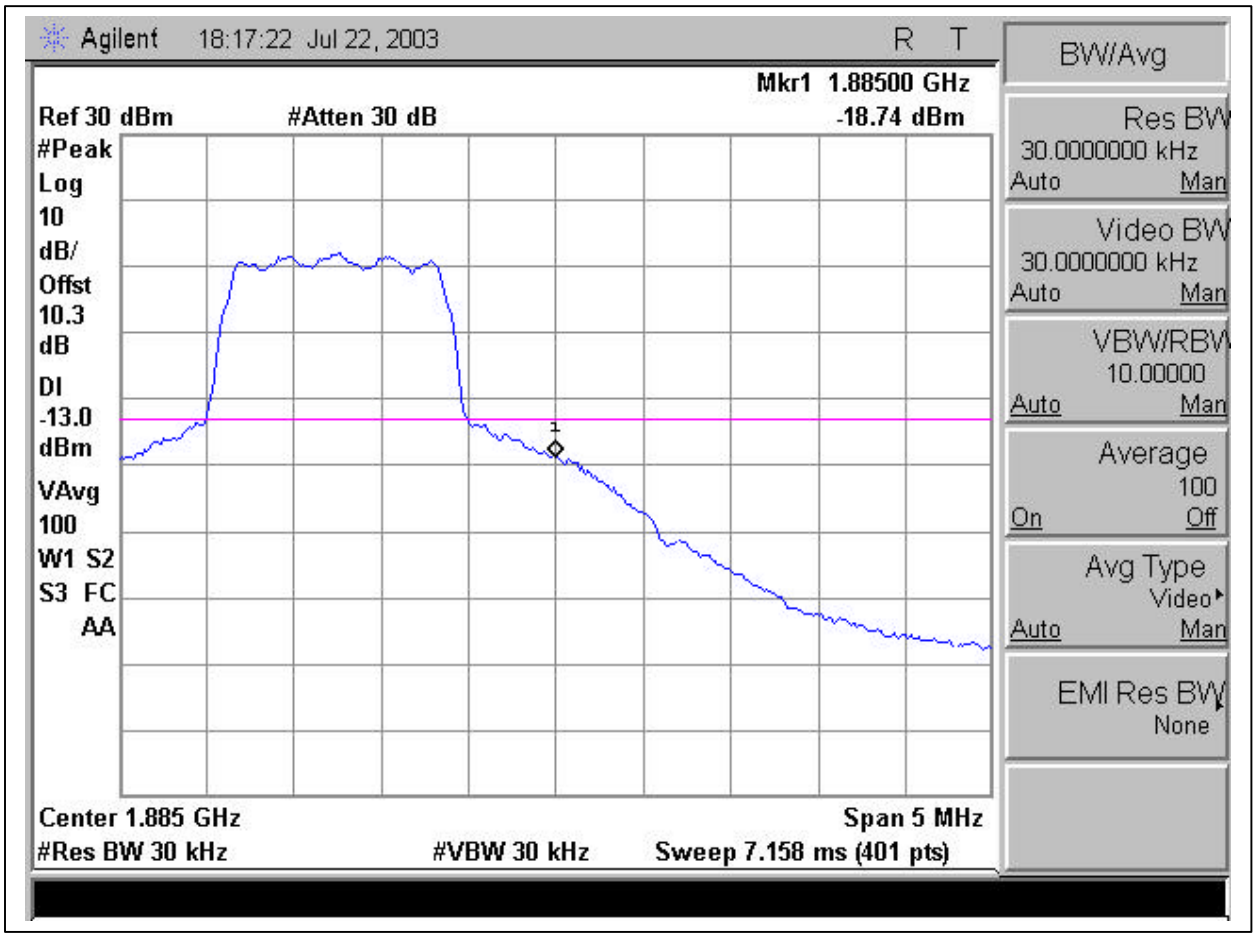


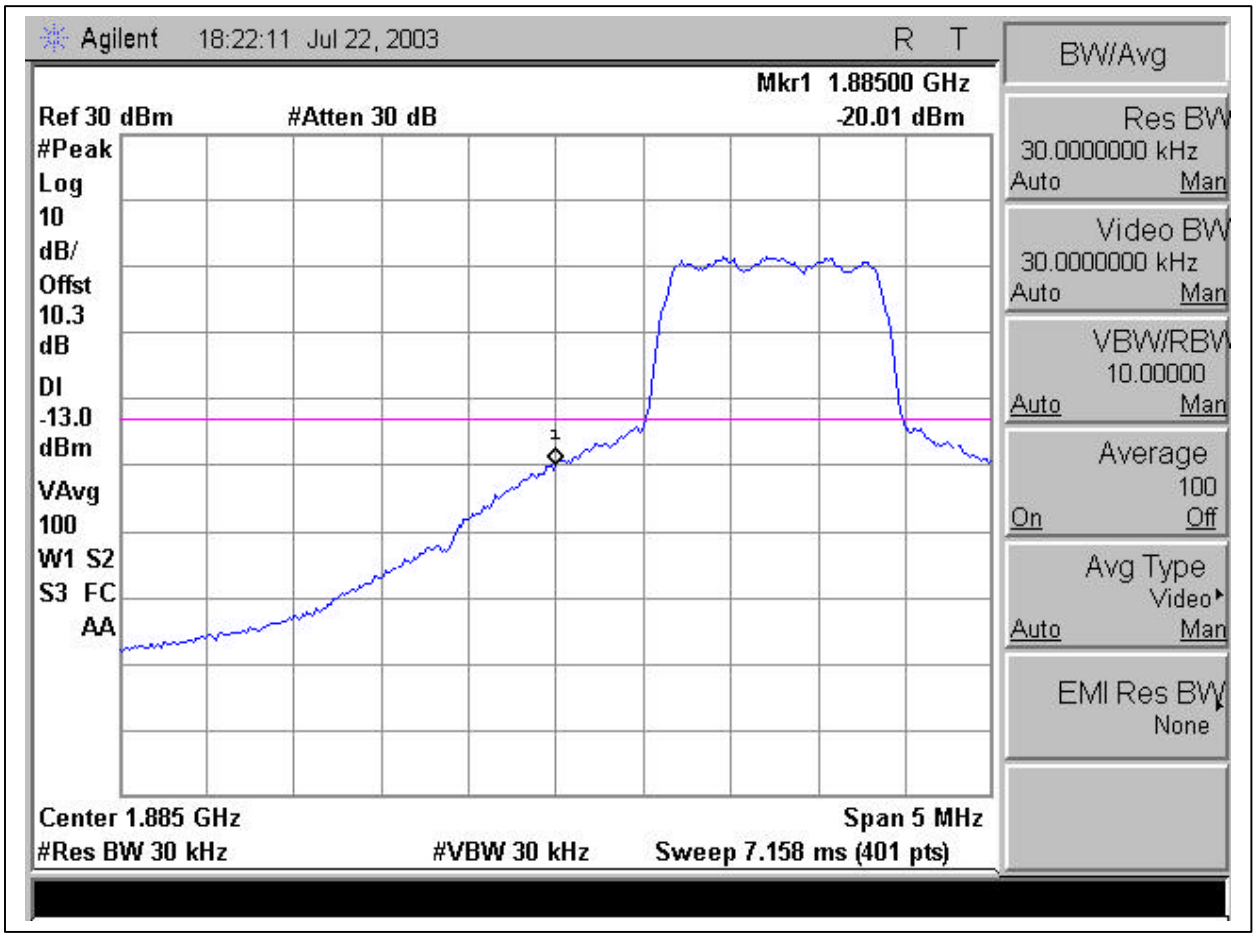
LOW BANDEDGE-CHANNEL 425



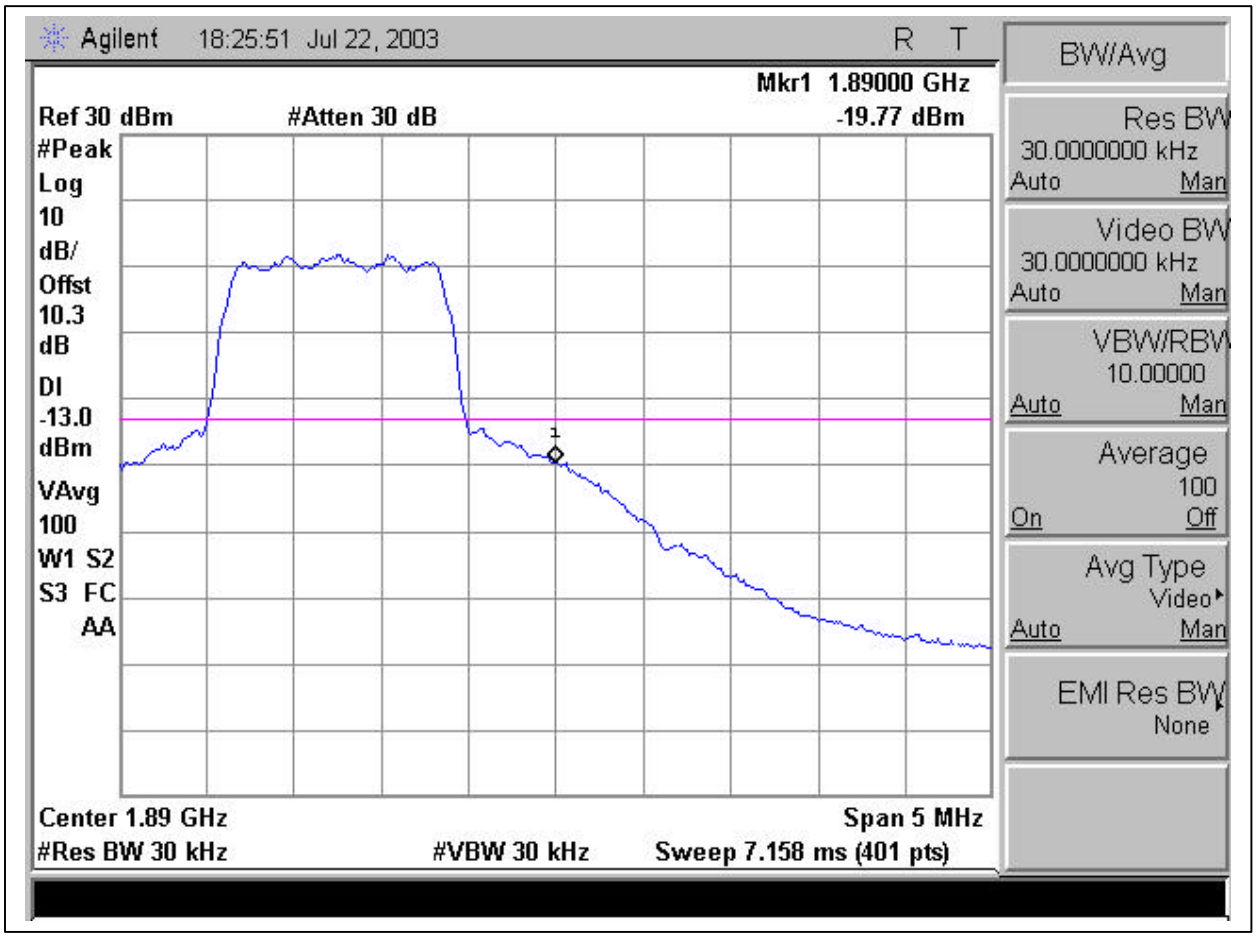
HIGH BANDEDGE-CHANNEL 675



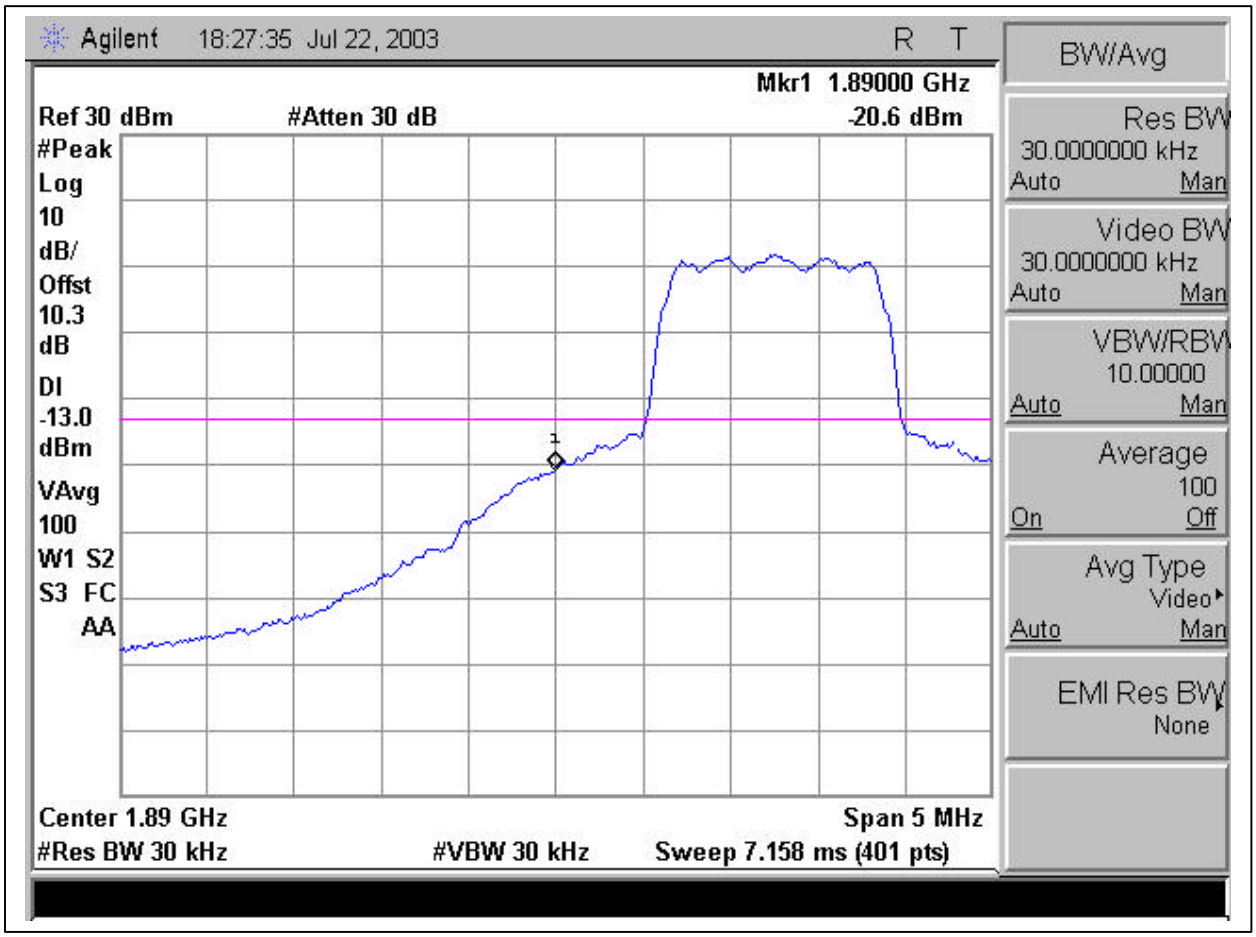
LOW BANDEDGE-CHANNEL 725



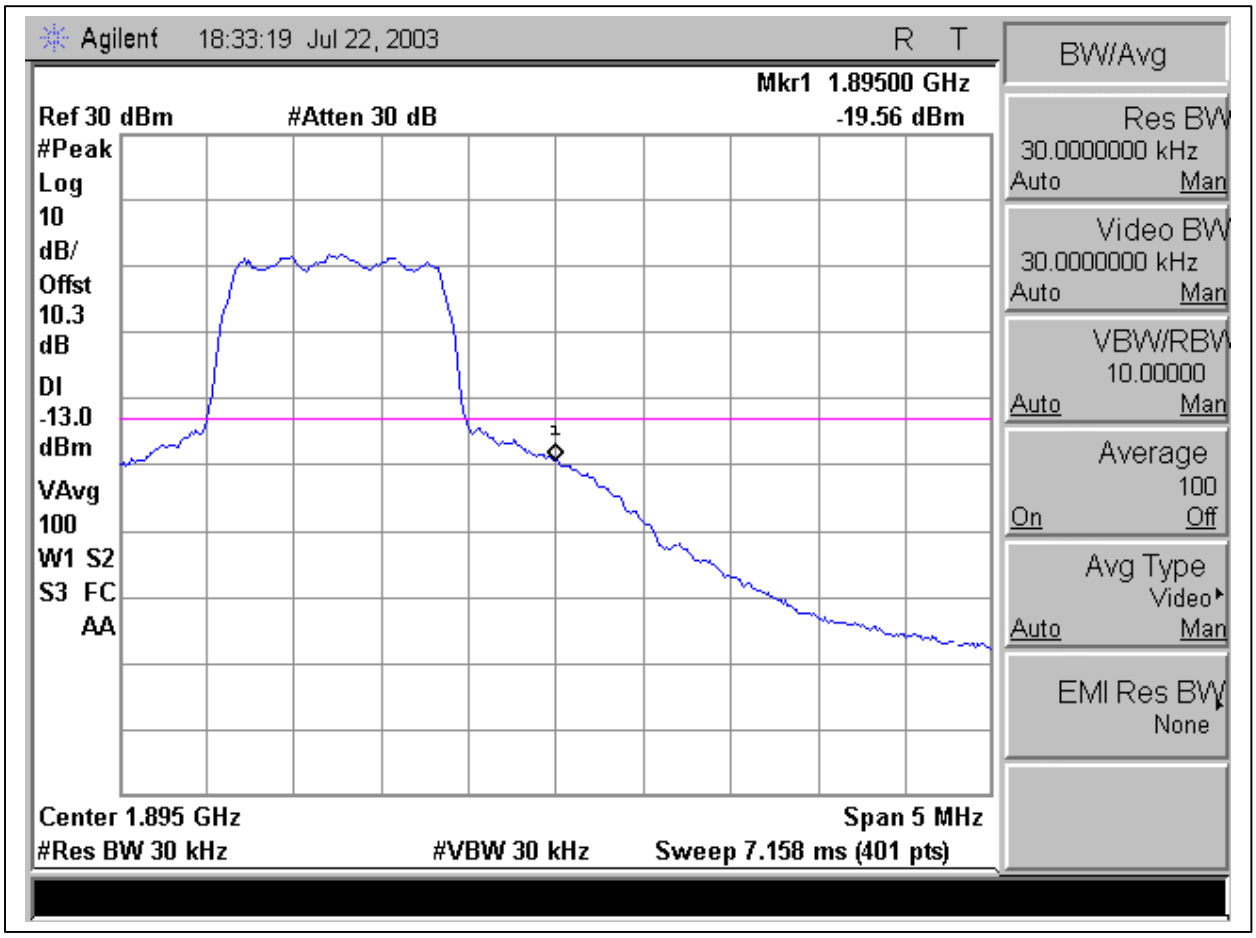
HIGH BANDEDGE-CHANNEL 775



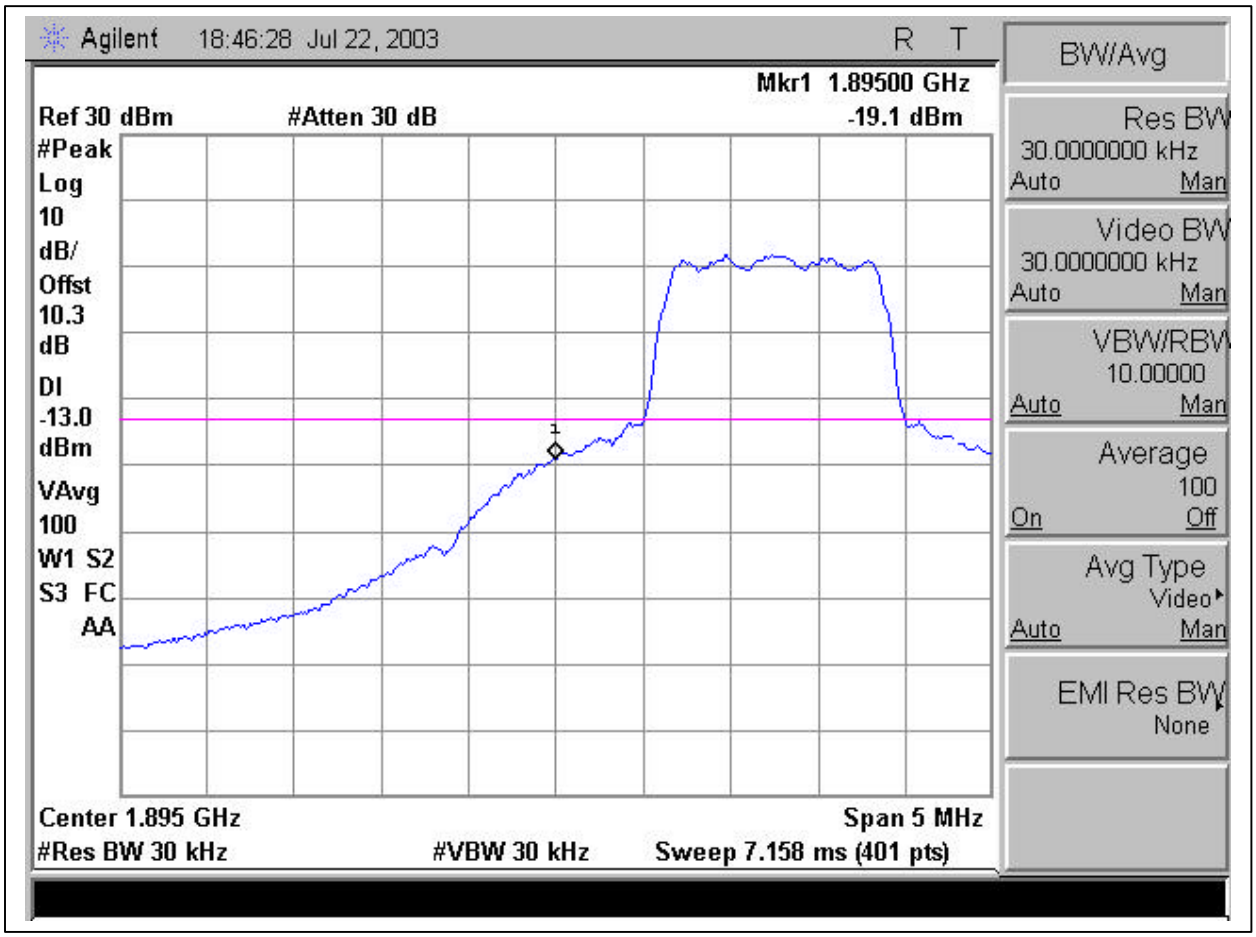
LOW BANDEDGE-CHANNEL 825



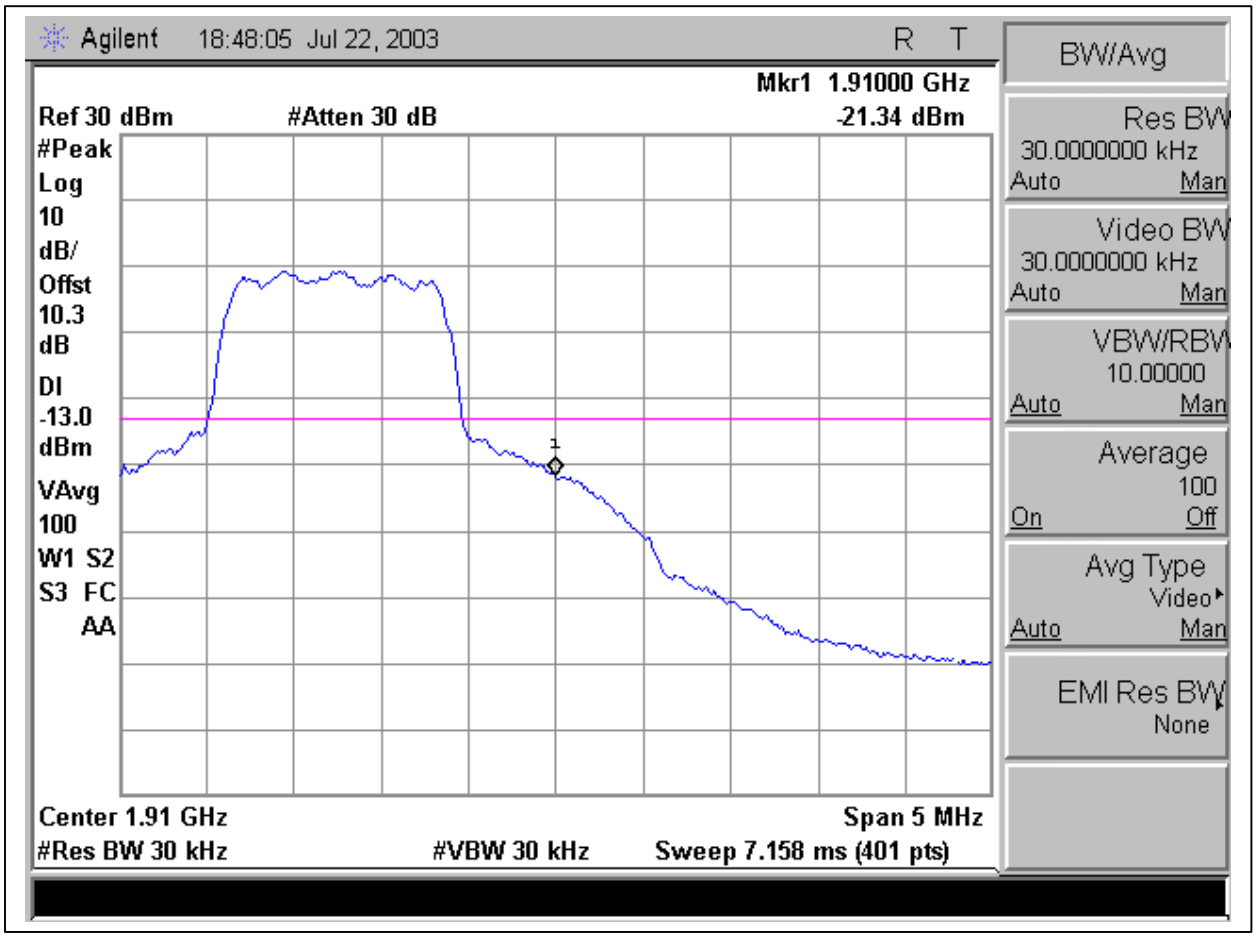
HIGH BANDEDGE-CHANNEL 875



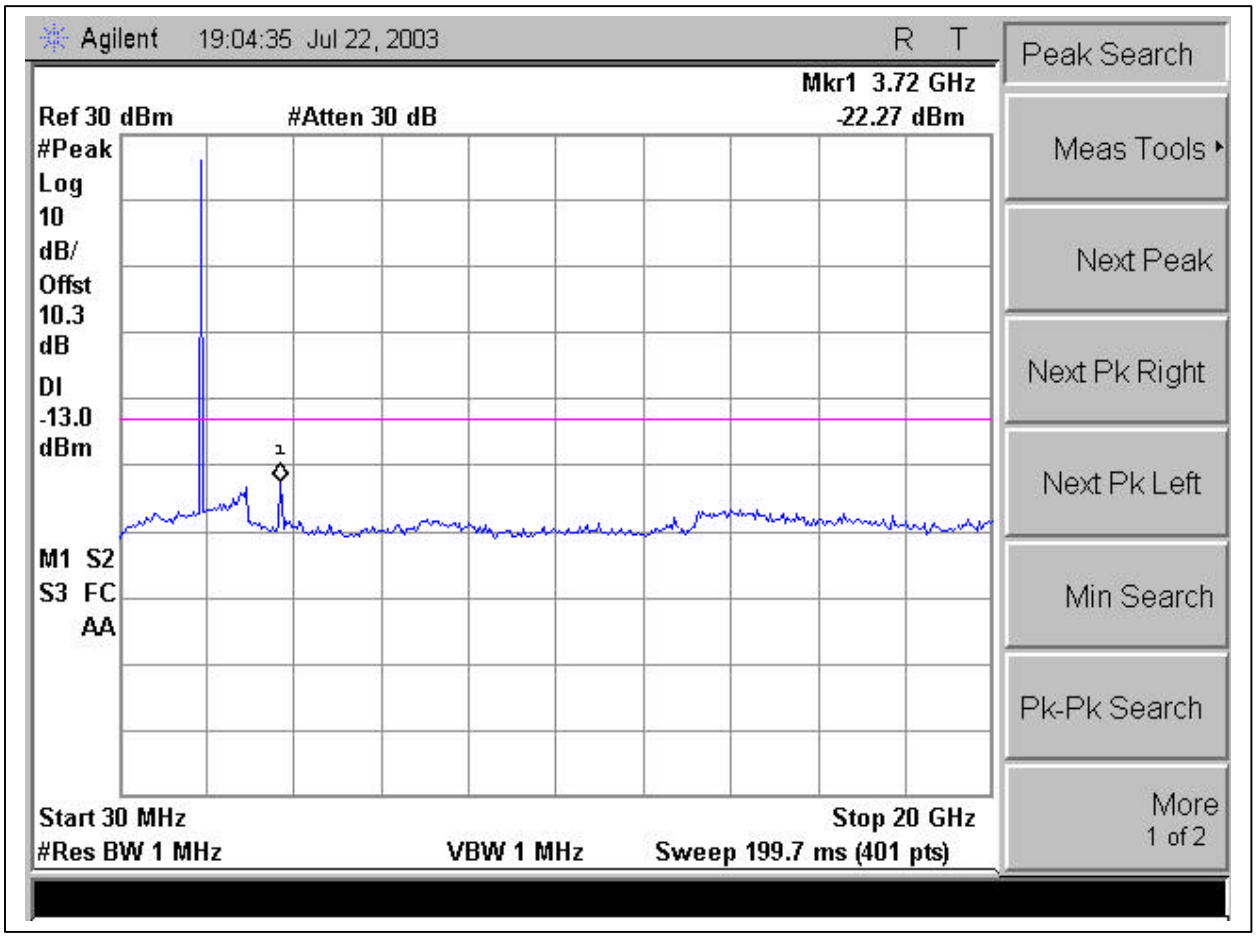
LOW BANDEDGE-CHANNEL 925



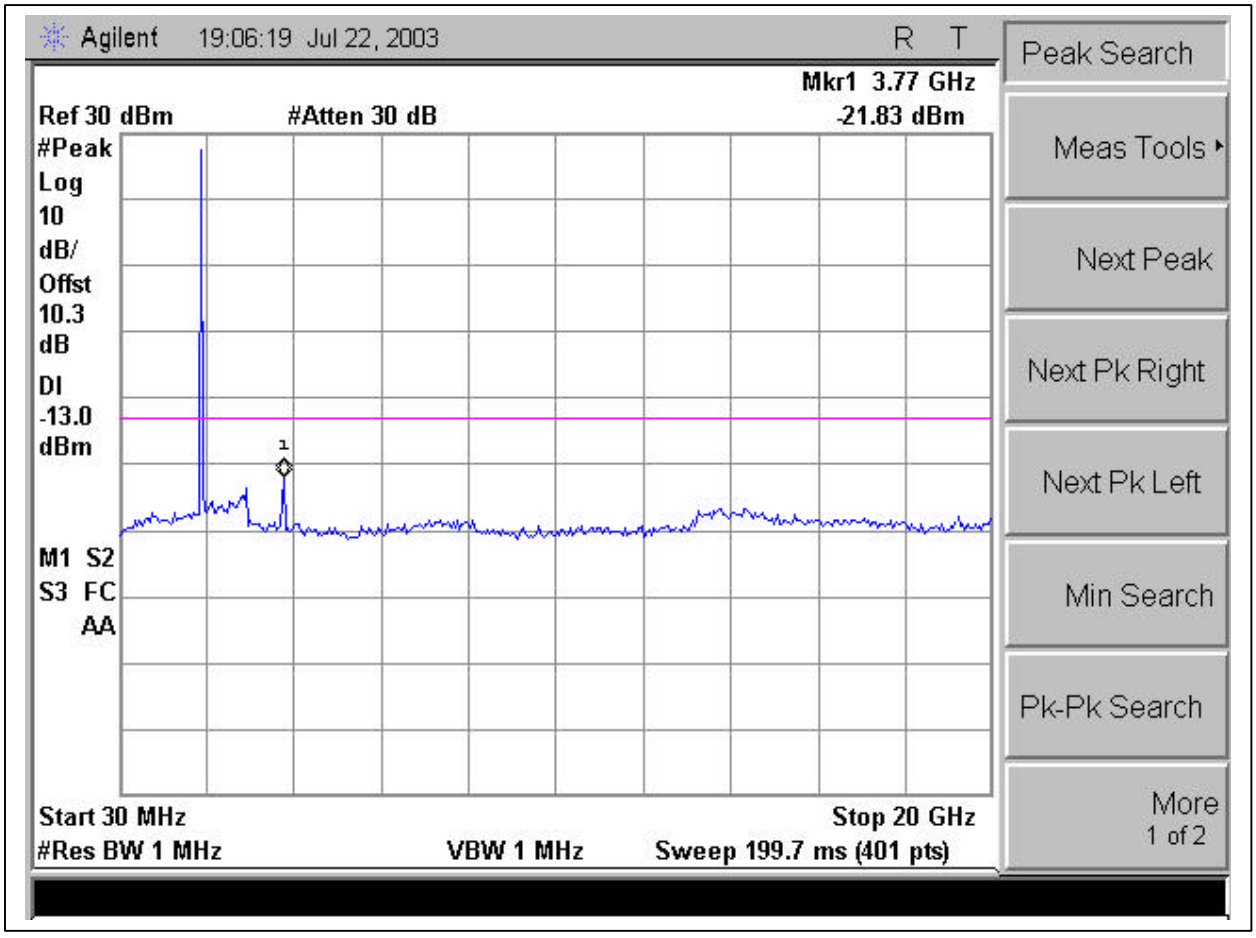
HIGH BANDEDGE-CHANNEL 1175



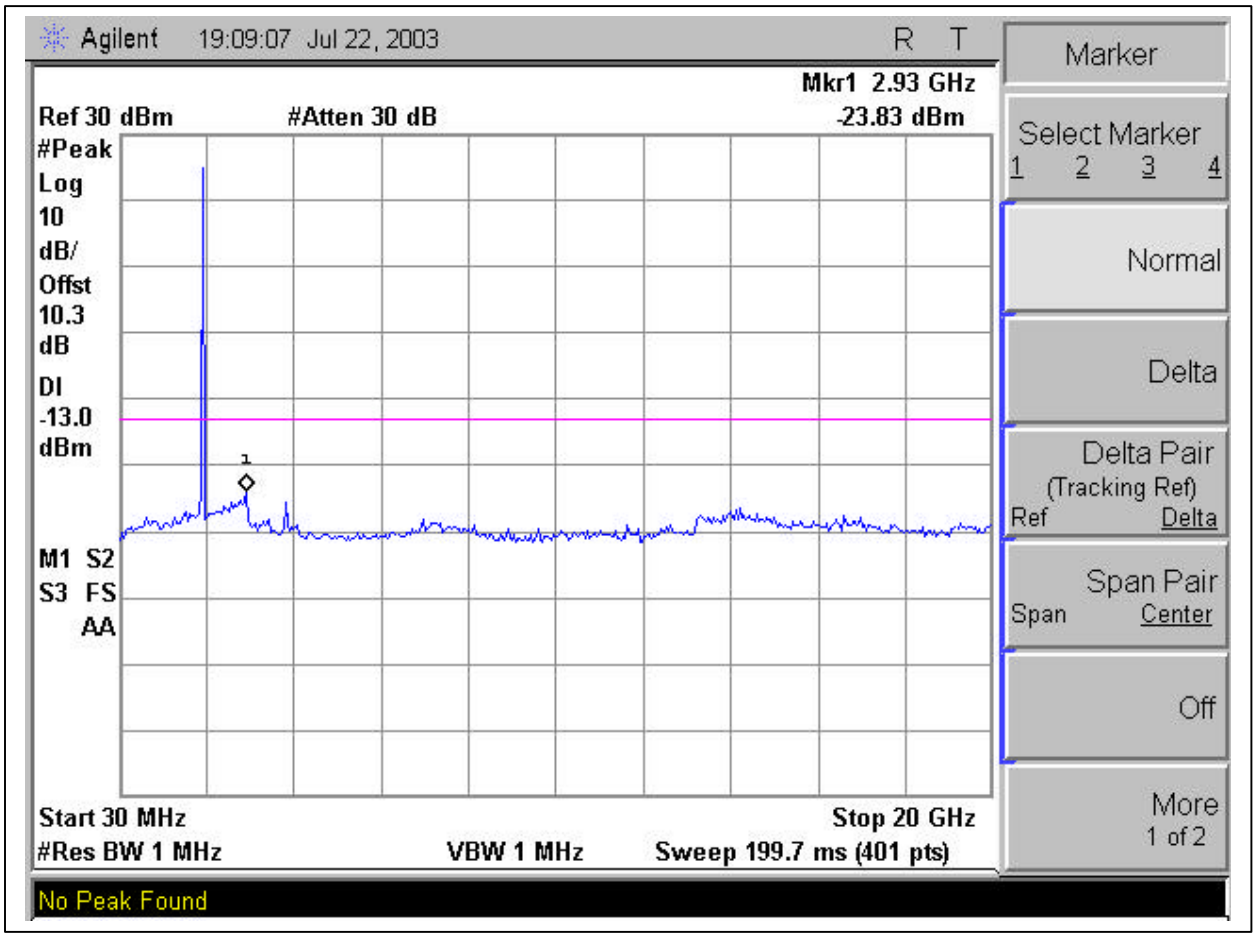
LOW CHANNEL



MIDDLE CHANNEL



HIGH CHANNEL



6.4. FIELD STRENGTH OF SPURIOUS RADIATION

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

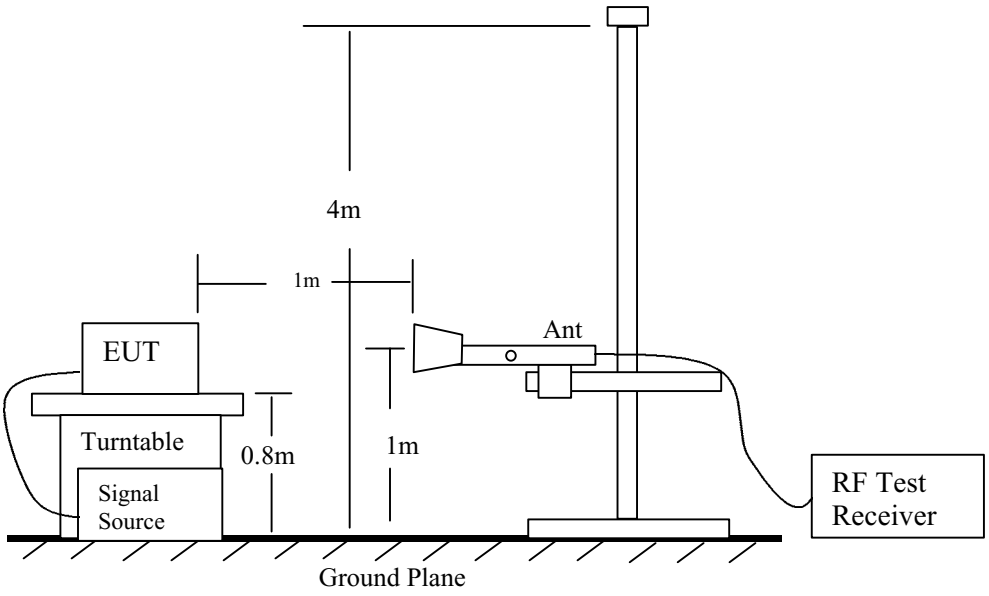


Fig 1: Radiated Emission Measurement

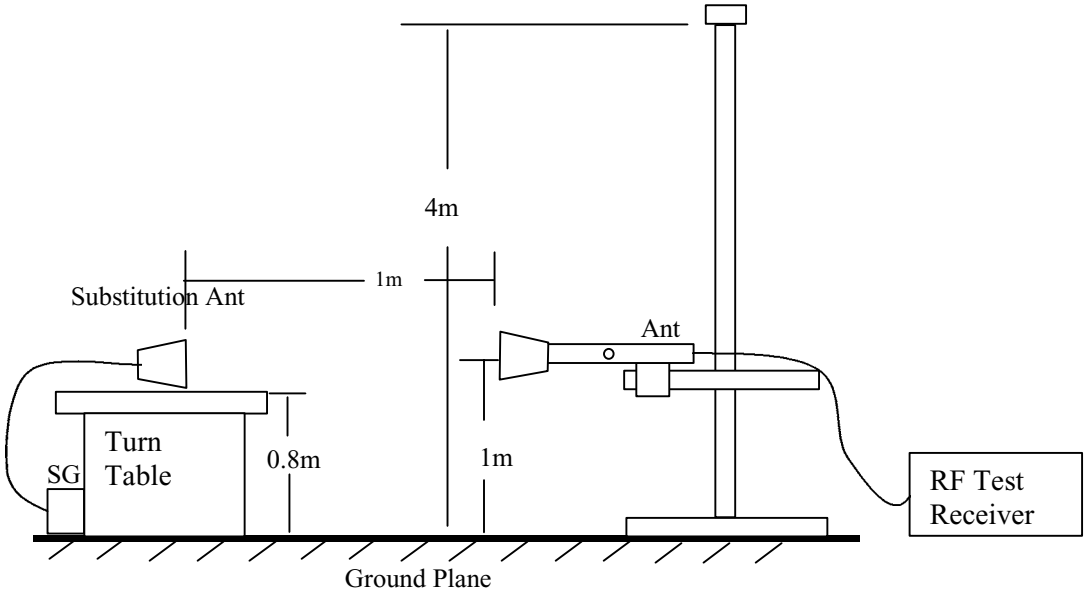


Fig 2: Radiated Emission – Substitution Method set-up

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 than 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:

07/25/03 **High Frequency Substitution Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr:William Zhuang
Project #:03U2131
Company:Tolt Technologies
EUT Descrip.:1900MHz CDMA Pocket PC (Sprint)
EUT M/N:PDT8138 (FCC ID:H9PPDT8138;IC ID:154DPDT8138)
Test Target:FCC Part 24;RSS-133
Mode Oper:CDMA Transmit

Test Equipment:

EMCO Horn 1-18GHz	Pre-amplifer 1-26GHz	Spectrum Analyzer	Horn > 18GHz	Limit
T73; S/N: 6717 @1m	T87 Miteq 924342	Agilent E4446A Analyzer		FCC 24

Hi Frequency Cables
☑ (2 ft) ☐ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☑ (12 ft)

Peak Measurements:
Fundamental: RBW>99% or 26dB Emissions BW, VBW=RBW
Bandedge: RBW=>1% Emissions BW, VBW=> 3*RBW
Spurious: RBW=1MHz, VBW=1MHz

f GHz	SA reading (dBm)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
3.703	-59.7	-64.6	3.4	8.7	6.6	-59.3	-13.0	-46.3	Low Ch, V, Noise Floor
3.703	-58.9	-64.9	3.4	8.7	6.6	-59.5	-13.0	-46.5	Low Ch, H, Noise Floor
3.760	-58.9	-63.9	3.4	8.8	6.6	-58.5	-13.0	-45.5	Mid Ch, V, Noise Floor
3.760	-55.5	-61.5	3.4	8.8	6.6	-56.1	-13.0	-43.1	Mid Ch, H
5.640	-58.2	-63.4	4.2	10.3	8.1	-57.3	-13.0	-44.3	Mid Ch, V, Noise Floor
5.640	-58.1	-61.9	4.2	10.3	8.1	-55.9	-13.0	-42.9	Mid Ch, H, Noise Floor
3.818	-59.8	-64.8	3.4	8.8	6.7	-59.4	-13.0	-46.4	High Ch, V, Noise Floor
3.818	-59.9	-65.5	3.4	8.8	6.7	-60.1	-13.0	-47.1	High Ch, H, Noise Floor
No more signal found between 4GHz and 20GHz									

6.5.FREQUENCY STABILITY

TEST SETUP

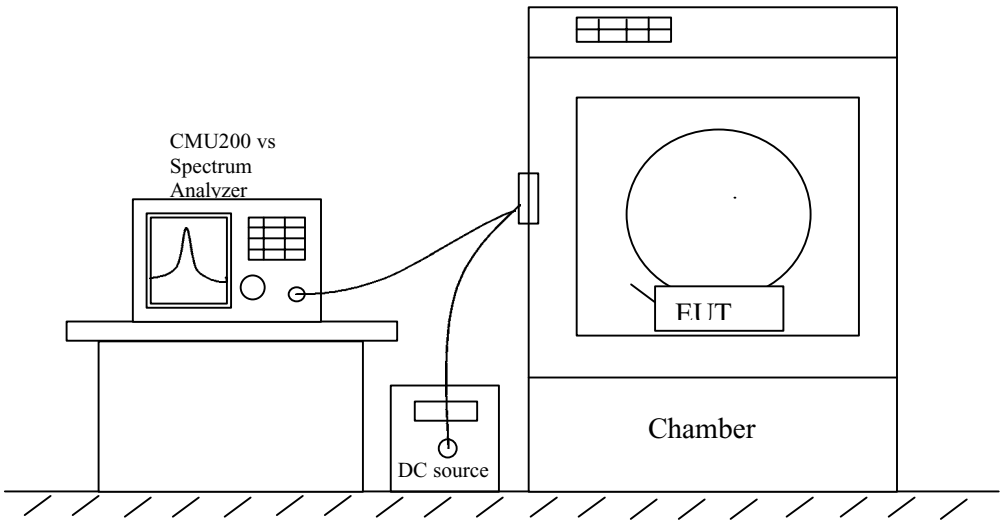


Fig. 3: Frequency Stability Setup

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 -30°C.

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 Ac Voltage

1). Setup the configuration per figure 6 and set chamber temperature to 25°C. Use a variable DC power supply to power the EUT and set DC output voltage to EUT nominal input DC 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 and record the maximum frequency change.

RESULT
No non-compliance noted.

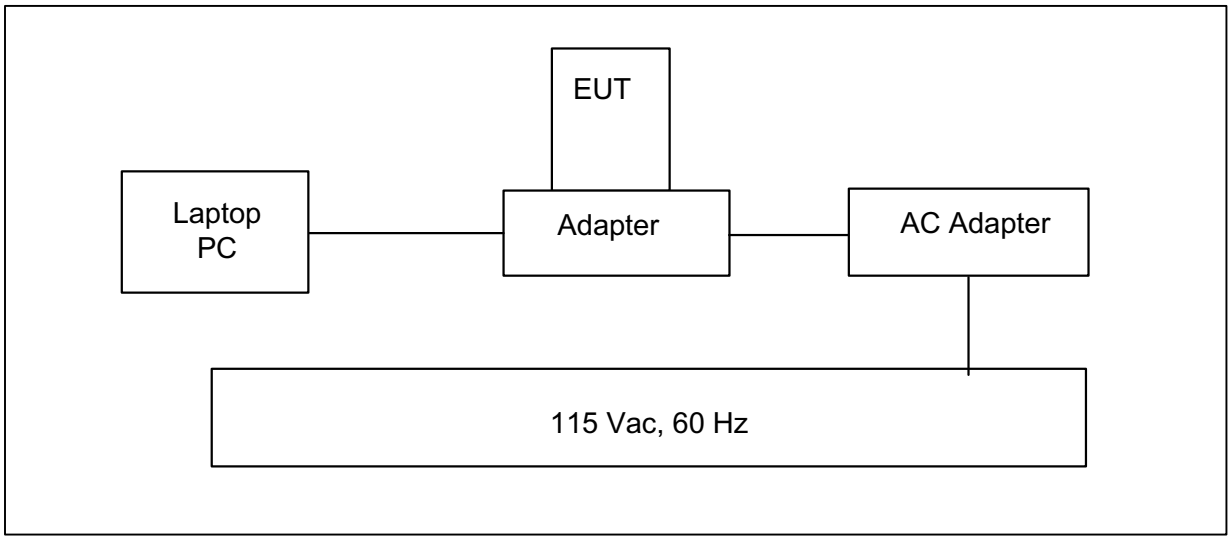
Reference Frequency: PCS Mid Channel 1880.00003MHz @ 25ºC Limit: to stay ± 2.5 ppm = 4701.655 Hz				
Power Supply (Vdc)	**Environment Temperature (ºC)**	**Frequency Deviation Measureed with Time Elapse**		
		(MHz)	**Delta (ppm)**	**Limit (ppm)**
5.00	50	1880.65892	1.627	± 2.5
5.00	40	1880.65912	1.521	± 2.5
5.00	30	1880.65922	1.468	± 2.5
5.00	***25***	***1880.66198***	***0***	***± 2.5***
5.00	20	1880.66203	-0.027	± 2.5
5.00	10	1880.66211	-0.069	± 2.5
5.00	0	1880.66214	-0.085	± 2.5
5.00	-10	1880.66221	-0.122	± 2.5
5.00	-20	1880.66421	-1.186	± 2.5
5.00	-30	1880.66422	-1.191	± 2.5
4.00 (end point)	25	1880.65929	1.430	± 2.5
4	25	1880.65929	1.430	± 2.5
6	25	1880.66607	-2.175	± 2.5

6.6 RADIATED EMISSION

Detector Setting of Spectrum Analyzer

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
30 to 1000	☒ Peak ☒ Quasi Peak	☒ 100 KHz ☒ 1 MHz	☒ 100 KHz ☒ 1 MHz

TEST SETUP



TEST PROCEDURE

1. The EUT was placed on the turn table 0.8 meter above ground inside 3 meter Anechoic Chamber.
2. Set the resolution bandwidth to 120KHz in the test receiver and select Peak function to scan the frequency below 1 GHz.
3. Shift the interference-receiving antenna located in antenna tower upwards and downwards between 1 and 4 meters above ground and find out the local peak emission on frequency domain.
4. Locate the interference-receiving antenna at the position where the local peak reach the maximum emission.
5. Rotate the turn table and stop at the angle where the measurement device has maximum reading
6. Shift the interference-receiving antenna again to detect the maximum emission of the local peak
7. If the reading of the local peak under Peak function is lower than limit by 6dB, then Quasi Peak detection is not needed and this reading should be recorded. And if it is higher than Peak limit, then the test is fail. Others, switch the receiver to Quasi Peak function, set the resolution bandwidth to 100kHz and repeat the procedures (3)~(6). If the reading is lower than limit, this reading should be recorded, otherwise, the test is fail.

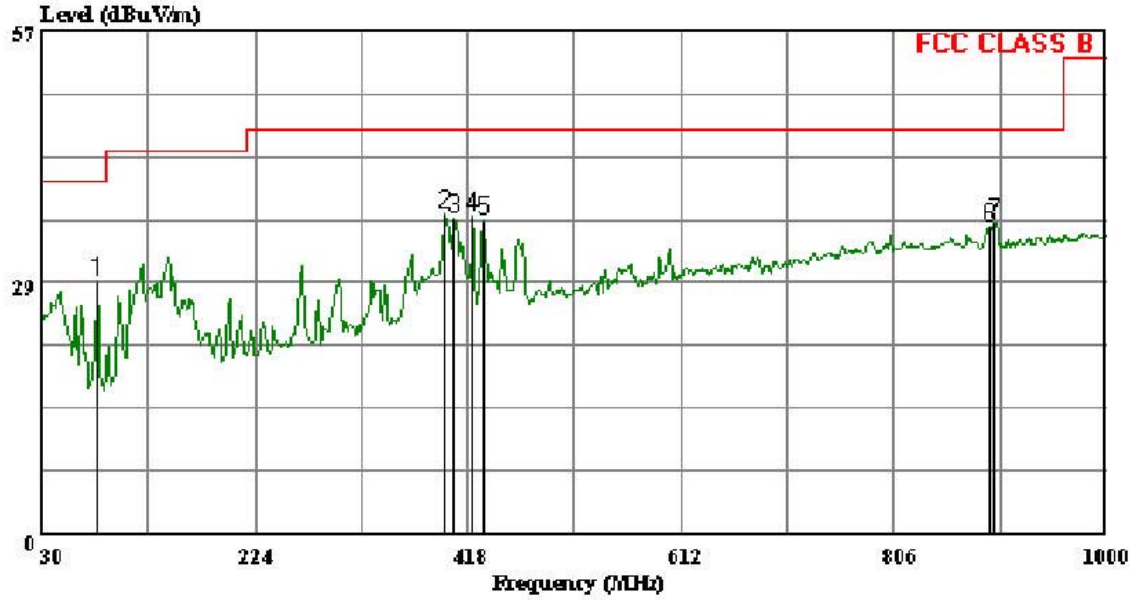
MEASUREMENT RESULT

No non-compliance noted, as shown below.

Low Channel Horizontal:

COMPLIANCE Engineering Services, Inc.
561F Monterey Road
Morgan Hill, CA 95037, U.S.A.
Tel: (408) 463-0885
Fax:(408) 463-0888

Data#: 8 File#: Tolt-Emi.EMI Date: 07-24-2003 Time: 18:16:16



(Audix ATC)

Trace: 7 Ref Trace:

Condition: FCC CLASS B 3m CHAMBER 030306 1185 HORIZONTAL
Company : Tolt Technologies
EUT Description : 1900MHz CDMA Pocket PC (Sprint)
Model Number : PDT8138
Test Configurtion: EUT with cradle and power charger
Tester : William Zhuang
Test Target : FCC Part 24/RSS-133
Mode of Operation: CDMA Low Ch Transmit
Project No : 03U2131

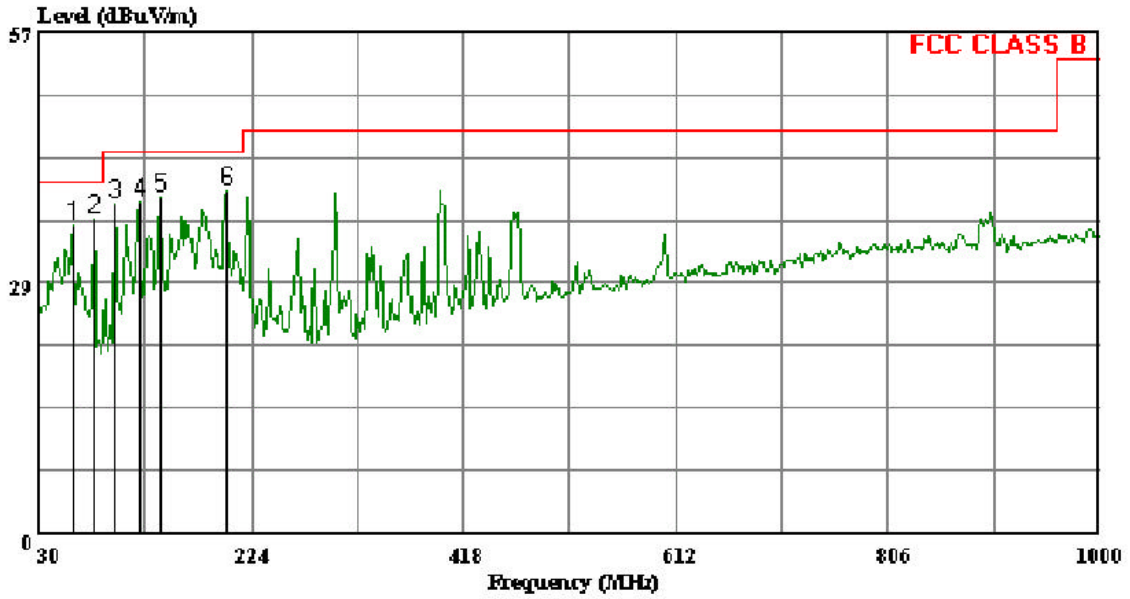
Page: 1

	Freq	Read Level	Probe Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	80.440	21.18	6.52	0.82	0.00	28.52	40.00	-11.48	Peak
2	397.630	19.75	14.39	2.01	0.00	36.15	46.00	-9.85	Peak
3	405.390	19.24	14.58	2.01	0.00	35.83	46.00	-10.17	Peak
4	421.880	18.90	14.95	2.10	0.00	35.95	46.00	-10.05	Peak
5	431.580	18.14	15.16	2.15	0.00	35.45	46.00	-10.55	Peak
6	892.330	11.07	20.53	3.25	0.00	34.85	46.00	-11.15	Peak
7	897.180	11.53	20.56	3.25	0.00	35.34	46.00	-10.66	Peak

Low Channel Vertical:

COMPLIANCE Engineering Services, Inc.
561F Monterey Road
Morgan Hill, CA 95037, U.S.A.
Tel: (408) 463-0885
Fax:(408) 463-0888

Data#: 6 File#: Tolt-Emi.EMI Date: 07-24-2003 Time: 18:08:06



(Audix ATC)

Trace: 5 Ref Trace:

Condition: FCC CLASS B 3m CHAMBER 030306 1185 VERTICAL
Company : Tolt Technologies
EUT Description : 1900MHz CDMA Pocket PC (Sprint)
Model Number : PDT8138
Test Configurtion: EUT with cradle and power charger
Tester : William Zhuang
Test Target : FCC Part 24/RSS-133
Mode of Operation: CDMA Low Ch Transmit
Project No : 03U2131

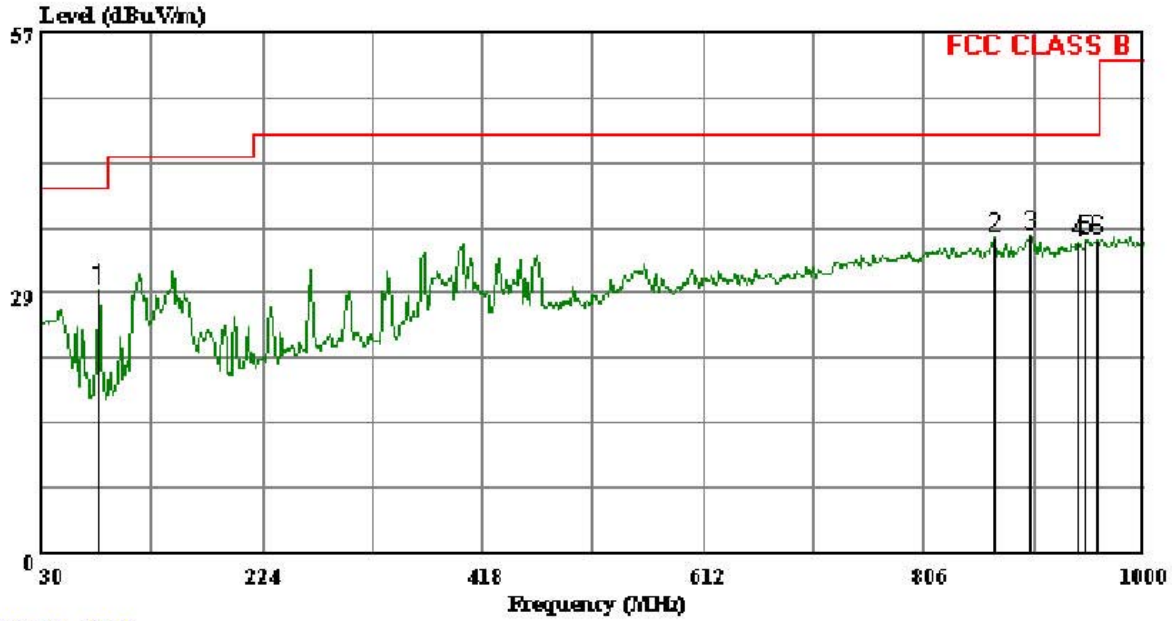
Page: 1

	Freq	Read Level	Probe Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	61.040	23.16	11.10	0.72	0.00	34.98	40.00	-5.02	Peak
2	80.440	28.37	6.52	0.82	0.00	35.71	40.00	-4.29	Peak
3	99.840	27.80	8.84	0.96	0.00	37.60	43.50	-5.90	Peak
4	121.180	26.25	10.50	1.03	0.00	37.78	43.50	-5.72	Peak
5	140.580	28.20	8.83	1.13	0.00	38.16	43.50	-5.34	Peak
6	201.690	28.42	9.08	1.38	0.00	38.88	43.50	-4.62	Peak

Mid Channel Horizontal:

COMPLIANCE Engineering Services, Inc.
561F Monterey Road
Morgan Hill, CA 95037, U.S.A.
Tel: (408) 463-0885
Fax: (408) 463-0888

Data#: 2 File#: Tolt-Emi.EMI Date: 07-24-2003 Time: 17:41:23



(Audix ATC)

Trace: 1 Ref Trace:

Condition: FCC CLASS B 3m CHAMBER 030306 1185 HORIZONTAL
Company : Tolt Technologies
EUT Description : 1900MHz CDMA Pocket PC (Sprint)
Model Number : PDT8138
Test Configurtion: EUT with cradle and power charger
Tester : William Zhuang
Test Target : FCC Part 24/RSS-133
Mode of Operation: CDMA MidCh Transmit
Project No : 03U2131

Page: 1

	Freq	Read Level	Probe Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	80.440	21.48	6.52	0.82	0.00	28.82	40.00	-11.18	Peak
2	868.080	11.00	20.34	3.12	0.00	34.46	46.00	-11.54	Peak
3	900.090	10.87	20.59	3.25	0.00	34.71	46.00	-11.29	Peak
4	940.830	9.98	20.85	3.33	0.00	34.16	46.00	-11.84	Peak
5	948.590	10.10	20.90	3.38	0.00	34.38	46.00	-11.62	Peak
6	958.290	9.93	20.96	3.35	0.00	34.24	46.00	-11.76	Peak

Mid Channel Vertical:

COMPLIANCE Engineering Services, Inc.
561F Monterey Road
Morgan Hill, CA 95037, U.S.A.
Tel: (408) 463-0885
Fax:(408) 463-0888

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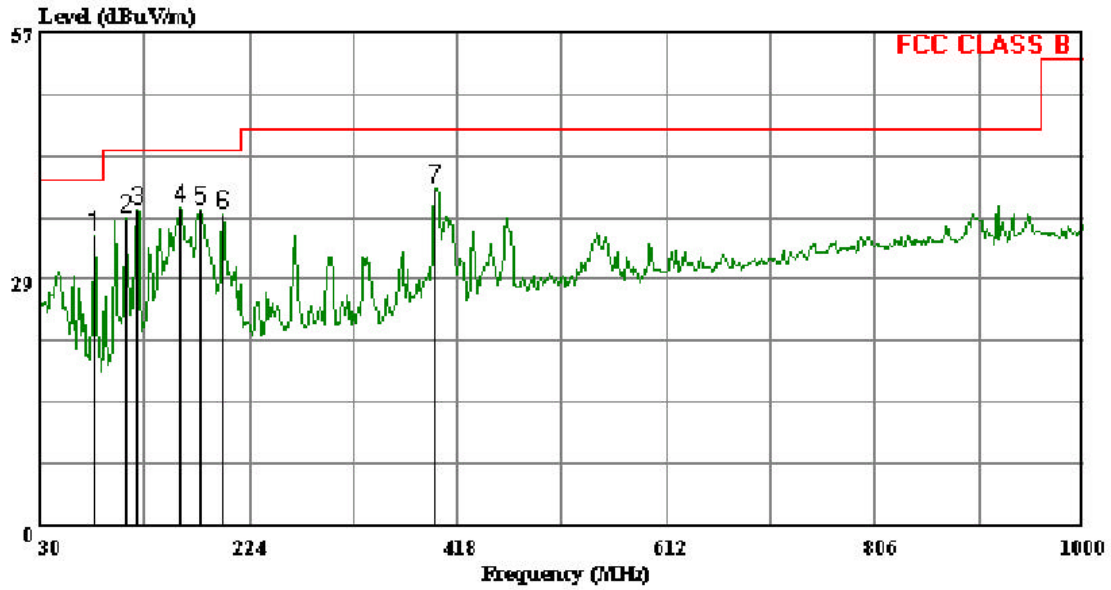

(Audix ATC)

Trace: 3 Ref Trace:

Condition: FCC CLASS B 3m CHAMBER 030306 1185 VERTICAL
Company : Tolt Technologies
EUT Description : 1900MHz CDMA Pocket PC (Sprint)
Model Number : PDT8138
Test Configurtion: EUT with cradle and power charger
Tester : William Zhuang
Test Target : FCC Part 24/RSS-133
Mode of Operation: CDMA Mid Ch Transmit
Project No : 03U2131

Page: 1

	Freq	Read Level	Probe Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	80.440	26.28	6.52	0.82	0.00	33.62	40.00	-6.38	Peak
2	109.540	24.93	9.71	1.01	0.00	35.65	43.50	-7.85	Peak
3	120.210	24.80	10.58	1.03	0.00	36.41	43.50	-7.10	Peak
4	159.980	26.96	8.60	1.23	0.00	36.79	43.50	-6.71	Peak
5	179.380	26.56	8.65	1.30	0.00	36.51	43.50	-6.99	Peak
6	198.780	25.69	9.04	1.38	0.00	36.11	43.50	-7.39	Peak
7	397.630	22.66	14.39	2.01	0.00	39.06	46.00	-6.94	Peak

High Channel Horizontal:

COMPLIANCE Engineering Services, Inc.
561F Monterey Road
Morgan Hill, CA 95037, U.S.A.
Tel: (408) 463-0885
Fax:(408) 463-0888

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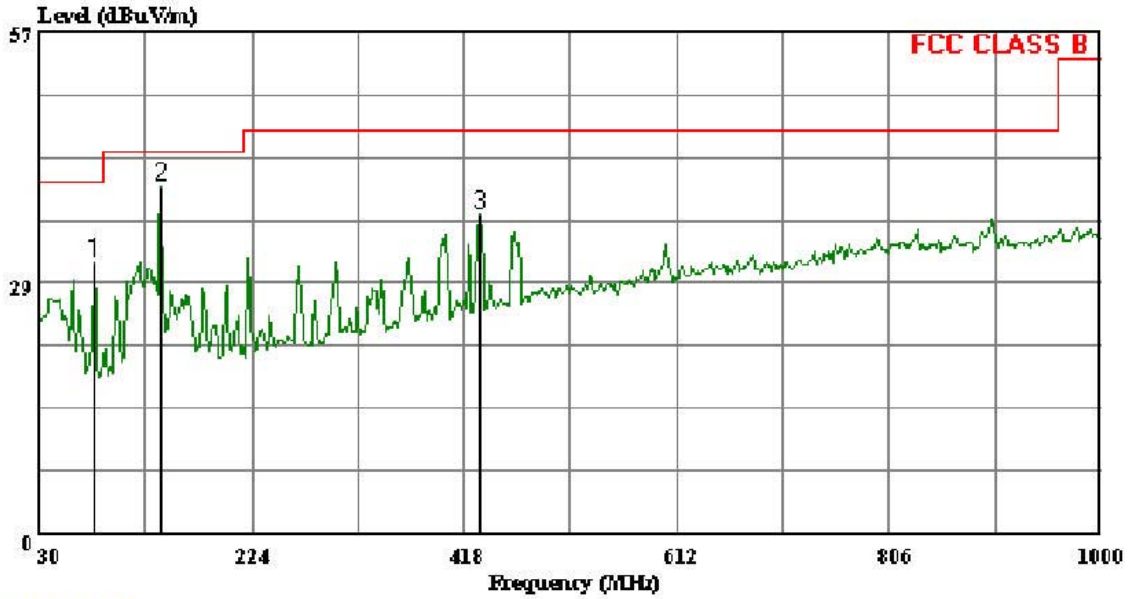


(Audix ATC)

Trace: 9 Ref Trace:

Condition: FCC CLASS B 3m CHAMBER 030306 1185 HORIZONTAL
Company : Tolt Technologies
EUT Description : 1900MHz CDMA Pocket PC (Sprint)
Model Number : PDT8138
Test Configurtion: EUT with cradle and power charger
Tester : William Zhuang
Test Target : FCC Part 24/RSS-133
Mode of Operation: CDMA High Ch Transmit
Project No : 03U2131

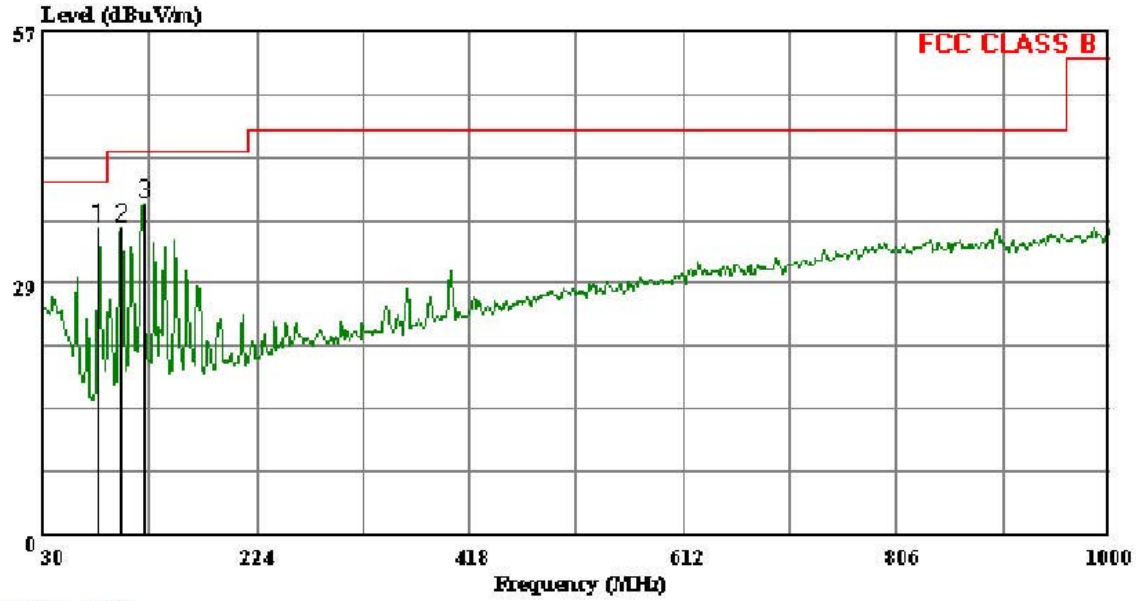
Page: 1

	Freq	Read Level	Probe Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	80.440	23.59	6.52	0.82	0.00	30.93	40.00	-9.07	Peak
2	140.580	29.40	8.83	1.13	0.00	39.36	43.50	-4.14	Peak
3	431.580	18.92	15.16	2.15	0.00	36.23	46.00	-9.77	Peak

High Channel Vertical:

COMPLIANCE Engineering Services, Inc.
561F Monterey Road
Morgan Hill, CA 95037, U.S.A.
Tel: (408) 463-0885
Fax:(408) 463-0888

Data#: 12 File#: Tolt-Emi.EMI Date: 07-24-2003 Time: 18:36:41



(Audix ATC)

Trace: 11 Ref Trace:

Condition: FCC CLASS B 3m CHAMBER 030306 1185 VERTICAL
Company : Tolt Technologies
EUT Description : 1900MHz CDMA Pocket PC (Sprint)
Model Number : PDT8138
Test Configurtion: EUT with cradle and power charger
Tester : William Zhuang
Test Target : FCC Part 24/RSS-133
Mode of Operation: CDMA High Ch Transmit
Project No : 03U2131

Page: 1

	Freq	Read Level	Probe Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	80.440	27.34	6.52	0.82	0.00	34.68	40.00	-5.32	Peak
2	101.780	24.91	9.01	0.93	0.00	34.85	43.50	-8.65	Peak
3	121.180	25.86	10.50	1.03	0.00	37.39	43.50	-6.11	Peak

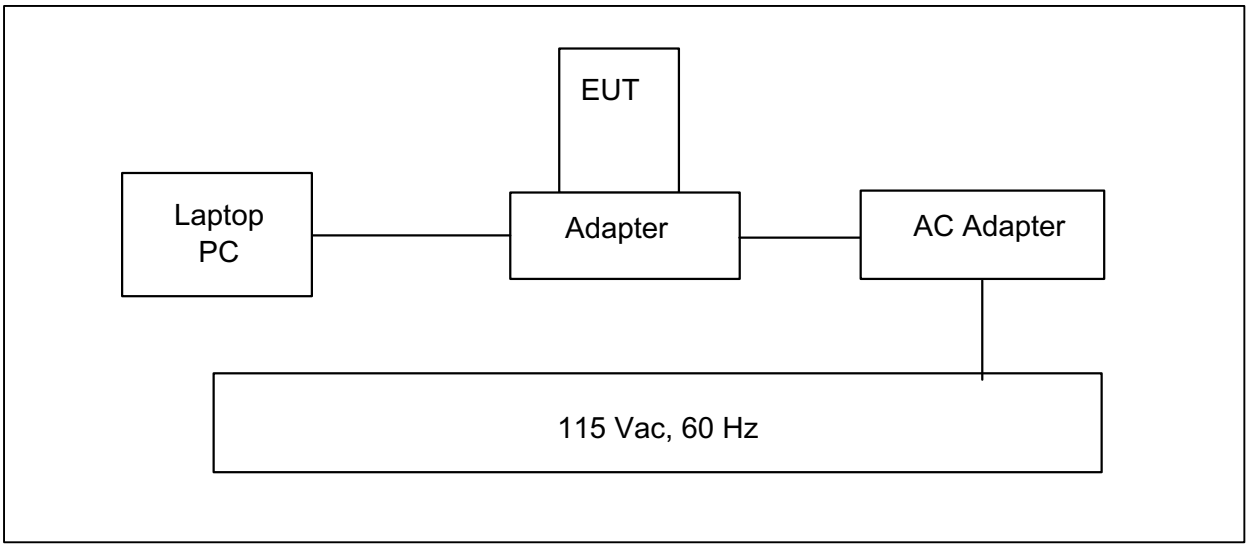
Radiated Emission photos

6.7 POWER LINE CONDUCTED EMISSION

Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
150 KHz to 30 MHz	☒ Peak ☐ CISPR Quasi Peak	☒ 9 KHz	☒ 9 KHz

TEST SETUP



TEST PROCEDURE

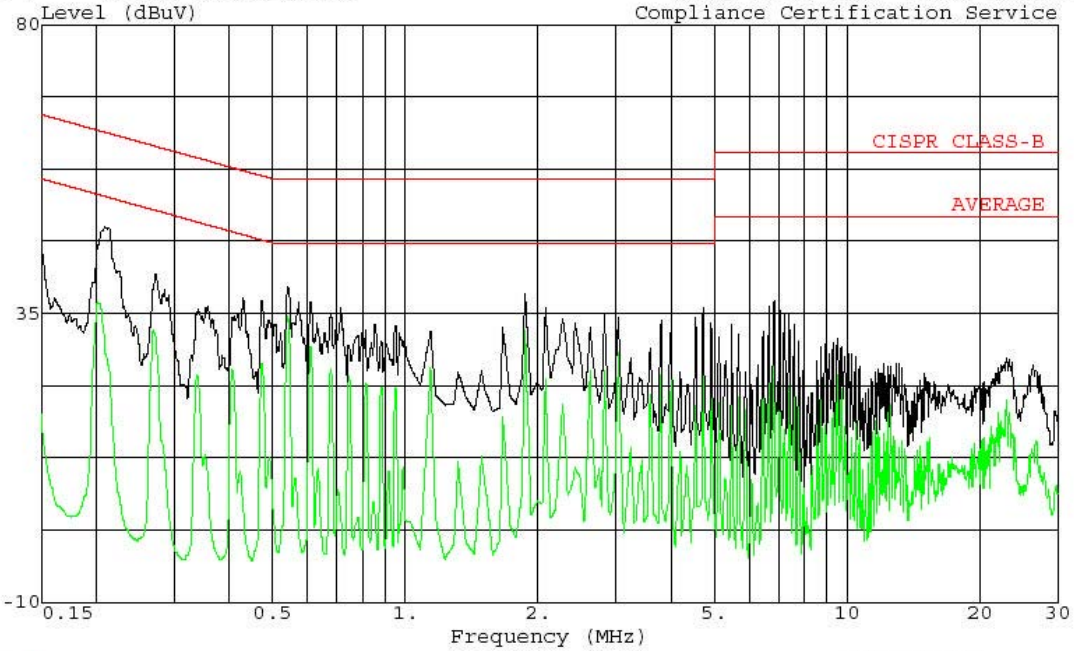
1. The EUT was placed on a wooden table 40 cm from a vertical ground plane and approximately 80 cm above the horizontal ground plane on the floor. The EUT was set to transmit in a continuous mode.

2. Line conducted data was recorded for both NEUTRAL and HOT lines.

MEASUREMENT RESULT

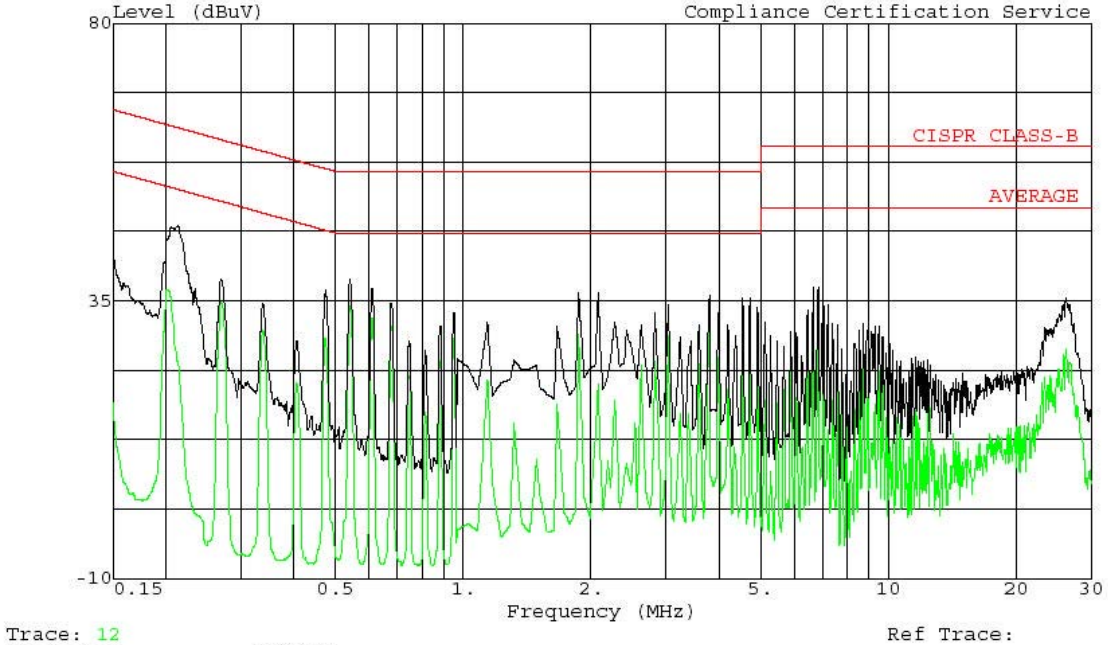
COMPLIANCE Engineering Services, Inc.
561F Monterey Road,
San Jose, CA 95037 USA
Tel: (408) 463-0885
Fax: (408) 463-0888

Data#: 7 File#: TOLT2131.EMI Date: 07-25-2003 Time: 15:20:15



Trace: 5 Ref Trace:
Project # : 03U2131
Test Engineer : William Zhuang
Company : Tolt Technologies
EUT : 1900MHz CDMA Pocket PC (Sprint)
Model : PDT8138
Configuration : EUT/AC-DC Adaptor
Mode of Operation: Tx tranmit
Target of Test : FCC CLASS B
: L1: PK(Black); Ave(Green)
: 115Vac, 60Hz

COMPLIANCE Engineering Service, Inc.
561F Monterey Road,
San Jose, CA 95037 USA
Tel: (408) 463-0885
Fax: (408) 463-0888



Trace: 12 Ref Trace:
Project # : 03U2131
Test Engineer : William Zhuang
Company : Tolt Technologies
EUT : 1900MHz CDMA Pocket PC (Sprint)
Model : PDT8138
Configuration : EUT/AC-DC Adaptor
Mode of Operation: Tx tranmit
Target of Test : FCC CLASS B
: L2: PK(Black); Ave(Green)
: 115Vac, 60Hz

CONDUCTED EMISSIONS DATA

Freq.	Reading			Closs	Limit	EN_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.21	48.44	--	28.80	0.00	64.31	54.31	-15.87	-25.51	L1
0.15	44.86	--	19.24	0.00	66.00	56.00	-21.14	-36.76	L1
0.27	41.14	--	30.76	0.00	62.49	52.49	-21.35	-21.73	L1
0.21	46.80	--	32.33	0.00	64.37	54.37	-17.57	-22.04	L2
0.15	43.32	--	18.43	0.00	66.00	56.00	-22.68	-37.57	L2
0.54	38.54	--	34.21	0.00	56.00	46.00	-17.46	-11.79	L2
6 Worst Data									

END OF REPORT