UL International EMC Services
333 Pfingsten Road
Northbrook, Illinois 60062-2096
(800) 873-8536
Fax No. (847) 272-8864
http://www.ul.com/emc/

October 21, 2003

WAV, Inc.
Attn: Mr. Chuck D. Bolvin
245 West Roosevelt Road
Building 7, Suite 48
West Chicago, IL 60185

UL Reference: File MC1343, Project 03NK32115

Subject: EMC Test and Measurement Report for
Model SPT1700

Dear Mr. Bolvin:

We have provided with this letter your EMC Test Report for the above referenced model. The product was determined to comply with the requirements noted in the report.

Please review the attached report and direct any questions or comments to me. Samples were returned following testing.

We appreciate your interest in UL's EMC Services, and encourage you to contact us in the future should you need EMC test services. This closes Project 03NK32115.

Best regards,

Lou Madjarov (Ext 43957)
EMC Sr. Project Engineer
International EMC Services

Reviewed by:

Jack Steiner
Engineering Group Leader
International EMC Services

EMC – TEST REPORT

Issue Date: October 21, 2003

Ö **EMISSIONS**

IMMUNITY

Test Report File No.	:	MC1343
Project No.	:	03NK32115
Model / Type	:	**Model SPT1700**
Kind of Product	:	**Hand held data terminal with integrated Cisco Aironet AIR-LMC352 PCMCIA WLAN Module**
Applicant	:	WAV, Inc.
Address	:	245 West Roosevelt Road
	:	Building 7, Suite 48
	:	West Chicago, IL 60185
Manufacturer	:	Same as Applicant
Test Result	:	**COMPLIANT**

This report without appendices consists of 10 pages. Appendix A contains test photos, Appendix B contains original test data, Appendix C contains sample calculations and Appendix D contains an Block Diagram of the Measurement System.

The data contained in this report reflects only the items tested in the configurations and mode of operations described. An attempt has been made to arrange the EUT, with the equipment provided, into a test configuration which maximizes the observed emissions of the EUT while simulating, as close as practical, a typical end-use installation. The photos and data provided in this report document that configuration.

Underwriters Laboratories Inc. 333 Pfingsten Rd. Northbrook, IL 60062
Fax: (847) 272-8864

REPORT DIRECTORY

SECTION TITLE

GENERAL

EMISSIONS

IMMUNITY

CONCLUSION

APPENDICIES

1.0 GENERAL PRODUCT DESCRIPTION

The EUT is a hand held data terminal with integrated Cisco Aironet AIR-LMC352 PCMCIA WLAN Module, FCC ID: LDK102040.

1.0.1 Equipment Mobility:

Hand held

1.0.2 Test Voltage and Frequency:

Voltage (V)	Frequency (Hz)
3.6V	DC

1.1 MODEL DIFFERENCES

Any other model(s) represented by the models tested in this investigation will be documented by the manufacturer.

1.2 ENVIRONMENTAL CONDITIONS IN TEST LAB

Temperature:	**20-25 °C**
Relative Humidity:	**30-60% RH**
Atmospheric Pressure:	**860-1060 mbar**

1.3 CALIBRATION OF EQUIPMENT USED FOR MEASUREMENT

All test equipment and test accessories are calibrated on a regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less.

All test equipment calibrations are traceable to the National Institute of Standards and Technology (NIST), therefore, all test data recorded in this report is traceable to NIST.

1.4 EUT CONFIGURATION(s)

See Appendix A for individual set-up configuration(s). In addition to the EUT, the following peripheral devices and/or cables were connected during the measurement:

Device	Manufacturer	Model	Serial #	FCC ID
EUT	Symbol Technologies	SPT1700	S40a03K117	PB2SPT1700
Modular Transmitter	CISCO	AIR-LMC352	AMB072918FP	LDK102040

1.5 ANTENNA CONFIGURATIONS COVERED

Antenna	EUT Output Power	Antenna Gain	Total EIRP	Exposure Category
OMNI	20dBm (100mW)	0 dBi	20dBm (100mW)	Hand Held

1.6 EUT OPERATING MODE(s)

The equipment under test was operated during the measurements under the following conditions:

Continuous operation.

1.7 DEVICE MODIFICATIONS

The following modifications were necessary for compliance:

None.

2.0 EMISSIONS TEST REGULATIONS

47 CFR Part 15 Subpart B: 2002 + ANSI C63.4 – 1992

The device was evaluated to 15.247 of CFR 47, Part 15

Since the EUT is identical to a previously certified device except as noted in Section 1.0, only a limited test program was required. Testing was covered / required as noted below:

Test / Requirement	CFR 47, Part 15 Reference	Test Required	Notes
Conducted emission	15.207	Not Applicable	EUT is battery-operated device with no provision for direct connection to AC mains.
6dB Bandwidth	15.247(a)(2)	No	Considered covered by tests performed on previously certified device. (Cisco)
RF Conducted Peak Output Power	15.247(b)	No	Considered covered by tests performed on previously certified device. (Cisco)
Reduced output if directional gain exceeds 6dBi	15.247(b)(3)	No	Considered covered by tests performed on previously certified device. (Cisco)
RF Safety (SAR for portable devices)	15.247(b)(4)	No	**Per manufacturer's specifications there are no provisions to body –worn and it is only intended to be used as hand-held device.**
Spurious emissions (RF conducted & radiated)	15.247(c)	***Radiated Only**	Conducted spurious emissions considered covered by tests performed on previously certified device. **Radiated spurious measurements were performed as part of this investigation.**
Power spectral density	15.247(d)	No	Considered covered by tests performed on previously certified device.
Processing gain	15.247(e)	No	Considered covered by tests performed on previously certified device.

* - Since the transmitter operates over a frequency range greater than 10MHz, measurements must be performed on low, mid and high channels per 15.31(m).

RADIATED ELECTRIC FIELD EMISSIONS, 30 -1000MHz

Test Location
10 Meter Semi-Anechoic Chamber

UL Procedure
3014ANBK-LPG-002

Test Instruments

Spectrum Analyzer / Quasi-peak Adapter / Preamplifier / Preselector

Hewlett Packard Model 8566B Spectrum Analyzer
Model 85650A Quasi-peak Adapter
Miteq AM-3A-000110-N Preamp No. FCA4003, EMC4016, EMC4151
Model 85685A RF Preselector No. EMC4015
Last Cal. 1-15-03, Next Cal. 1-15-04

Antennas

Chase EMC Ltd., Biconical Antenna Model VBA6106A S/N 1246
Last Cal. 6-23-03, Next Cal. 6-23-04

Chase EMC Ltd., Log Periodic Antenna Model UPA6108 S/N 1120
Last Cal. 6-23-03, Next Cal. 6-23-04

Frequency Range of Measurement
30MHz-1000MHz

Measurement Distance
10 meters

Test Results

The requirements are:
MET

Remarks
See App. B for complete test results.

RADIATED ELECTRIC FIELD EMISSIONS, 1 TO 4 GHz

Test Location

10 Meter Semi-Anechoic Chamber

UL Procedure

3014ANBK-LPG-002A

Test Instruments

Spectrum Analyzer
Rhode & Schwarz, Model FSEK20, EMC No. 4182
Last Cal. 1-14-03, Next. Cal. 1-14-04

Antennas
EMCO, Double Ridged Guide Antenna Model 3115, S/N 88-0318
Last Cal. 6-10-03, Next Cal. 6-10-04

Frequency Range of Measurement

1 to 4 GHz

Measurement Distance

***2 meters**

Test Results

The requirements are:

MET

Remarks

See App. B for complete test results.

*To avoid overload in the transmit mode no preamplifier was used between 1 GHz and 4 GHz. Measurements were made at a 2 meter distance to allow an adequate margin between the measurement systems noise floor and the limit. The 2 meter limit was calculated as follows:

Limit above 960MHz per 15.209 is 500uV/m.
500uV/m * (3 meter / 2meters) = 750uV/m
20 log (750uV/m) = **57.5dBuV/m**

RADIATED ELECTRIC FIELD EMISSIONS, 4 TO 18 GHz

Test Location

10 Meter Semi-Anechoic Chamber

UL Procedure

3014ANBK-LPG-002A

Test Instruments

Spectrum Analyzer

Rhode & Schwarz, Model FSEK20, EMC No. 4182
Last Cal. 1-14-03, Next. Cal. 1-14-04

Antennas

EMCO, Double Ridged Guide Antenna Model 3115, S/N 88-0318
Last Cal. 6-10-03, Next Cal. 6-10-04

Filter/Amplifier Assembly,

Last Cal. 12-13-02, Next Cal. 12-13-02. Consists of the following:

Hewlett-Packard Step Attenuator, Model HP84904K (used for linearity check and gain control)

Cascaded 3.8GHz and 4.8GHz high pass filters, TTE Models H710-3.8G-50-A and H711-4.8G-50-A (attenuates fundamental 90dB)

Preamplifiers, MITEQ, Model ASF5-00501800-5, EMC No. 4194 and EMC No. 4195

Frequency Range of Measurement

4 to 18 GHz

Measurement Distance

3 meters

Test Results

The requirements are: MET

Remarks

See App. B for complete test results. To avoid overload in the transmit mode, two high pass filters were cascaded to attenuate the fundamental (2.4GHz) signal 90dB. These filters were located prior to the preamplifier stage to avoid overload of the preamplifiers. See Appendix D for a block diagram of the measurement system.

RADIATED ELECTRIC FIELD EMISSIONS, 18 TO 26.5 GHz

Test Location

10 Meter Semi-Anechoic Chamber

UL Procedure

3014ANBK-LPG-002A

Test Instruments

Spectrum Analyzer
Rhode & Schwarz, Model FSEK20, EMC No. 4182
Last Cal. 1-14-03, Next. Cal. 1-14-04

Antennas
ETS, Model 3160-09, EMC No. 4155

Filter/Amplifier Assembly,
Last Cal. 12-03-02, Next Cal. 12-03-03. Consists of the following:

Hewlett-Packard Step Attenuator, Model HP84904K (used for linearity check and gain control)

Preamplifiers, MITEQ, Models AFS44-00102650-40-10P-44 and AFS42-00102650-40-10P-42, EMC No. 4186 and EMC No. 4192

Frequency Range of Measurement

18 to 26.5 GHz

Measurement Distance

3 meters

Test Results

The requirements are:

MET

Remarks

See App. B for complete test results.

The attenuation of fundamental signal (2.4GHz) by the horn antenna is sufficient to avoid overload of the preamplifier stage. See Appendix D for a block diagram of the measurement system.

3.0 IMMUNITY TEST REGULATIONS

Immunity testing was not performed.

4.0 GENERAL REMARKS

Sample Receipt Date : October 17, 2003

Test Dates

Start : October 17, 2003
End : October 17, 2003

4.1 SUMMARY

The requirements according to the technical regulations are:

MET

Underwriters Laboratories Inc.
333 Pfingsten Road
Northbrook, IL 60062 USA

FCC Site Number: 31040/SIT 1300F2

Best regards,

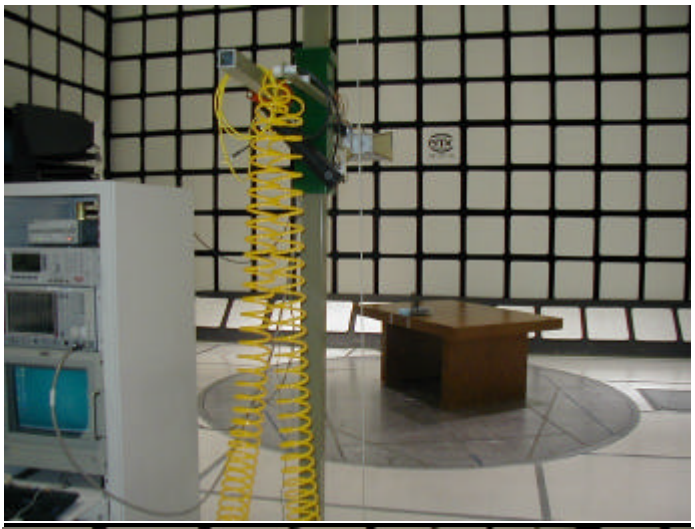
Lou Madjarov (Ext 43957)
EMC Sr. Project Engineer
International EMC Services

Reviewed by:

Jack Steiner
Engineering Group Leader
International EMC Services

APPENDIX A

PHOTOS



Radiated Emissions

Radiated Emissions
X-AXIS

Radiated Emissions
Y-AXIS

APPENDIX B

TEST DATA

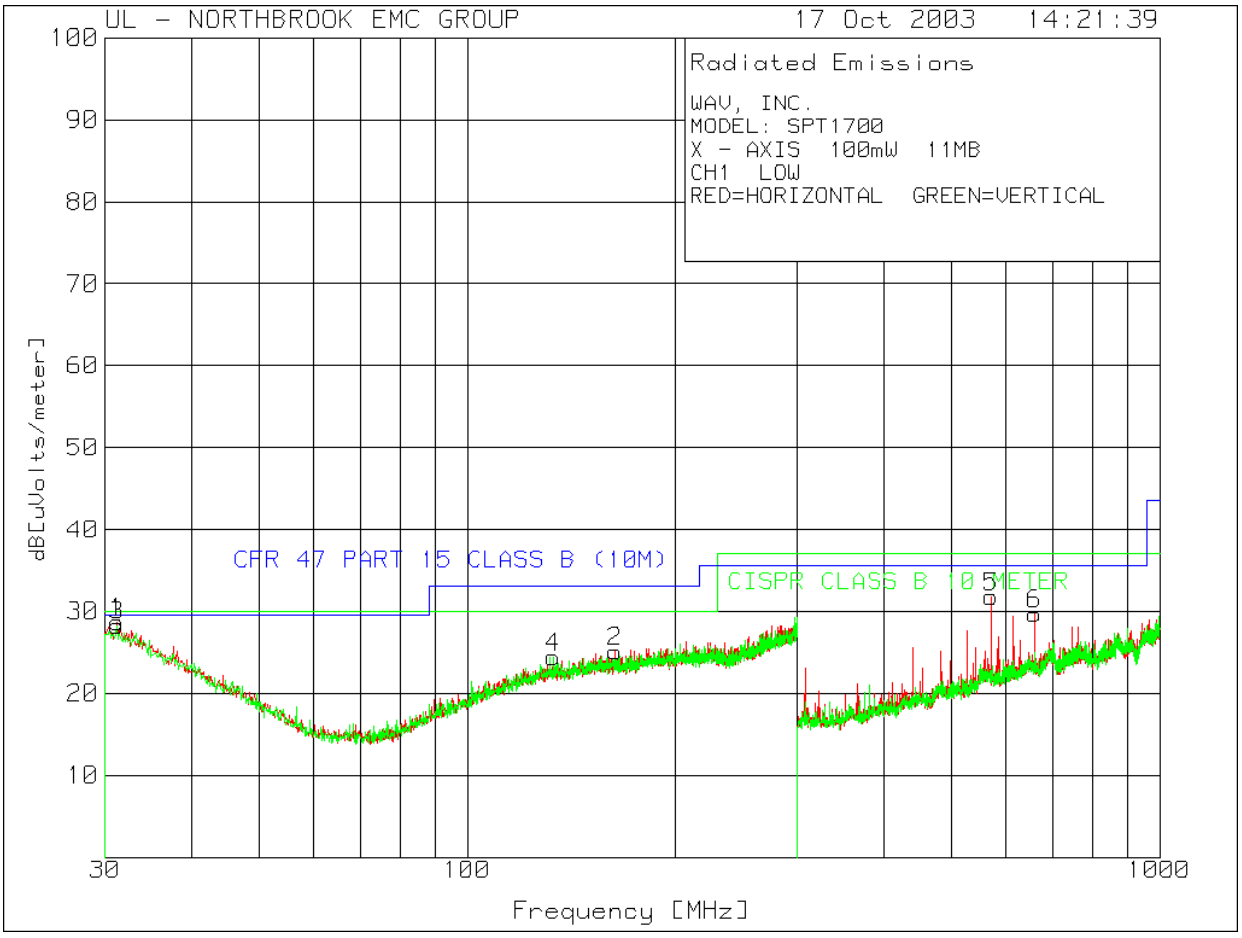
EMISSIONS

Radiated Electric Field Emissions

UNDERWRITERS LABORATORIES INC.
Radiated Emissions

Date Tested: 10-17-2003

Manufacturer	**:**	**WAV**
Equipment Under Test	**:**	**SPT1700**
Requirement	**:**	**CFR47 Part 15 B**
Detection Mode	**:**	**QP,**
Bandwidth	**:**	120 kHz
Measurement Distance	**:**	10 meter
Antenna Type	**:**	**30 - 300 MHz, Biconical** **300 - 1000 MHz, Log-Periodic**



```
 WAV, INC.
 MODEL: SPT1700
 X - AXIS  100mW  11MB
 CH1  LOW
 RED=HORIZONTAL  GREEN=VERTICAL

      Test     Meter     Gain/Loss  Transducer  Level  Limit:1      2       3       4
No. Frequency  Reading    Factor     Factor  dB[uVolts/meter]
     [MHz]     [dB(uV)]     [dB]      [dB]
================================================================================================
Range: 1 30 - 300MHz -------------------------------------------------------
1  31.2144      36.6 pk      -26.93    19.03     28.7             30              29.54
   Azimuth:141   Height:100 Horz     Margin [dB]                  -1.3            -.84
2  163.5832     36.57 pk     -26.52    15.05     25.1             30              33.1
   Azimuth:358   Height:100 Horz     Margin [dB]                  -4.9            -8

Range: 2 30 - 300MHz -------------------------------------------------------
3  31.2144      36.2 pk      -26.93    19.03     28.3             30              29.54
   Azimuth:1     Height:199 Vert     Margin [dB]                  -1.7            -1.24
4  133.0885     36.8 pk      -26.6     14.2      24.4             30              33.1
   Azimuth:349   Height:199 Vert     Margin [dB]                  -5.6            -8.7

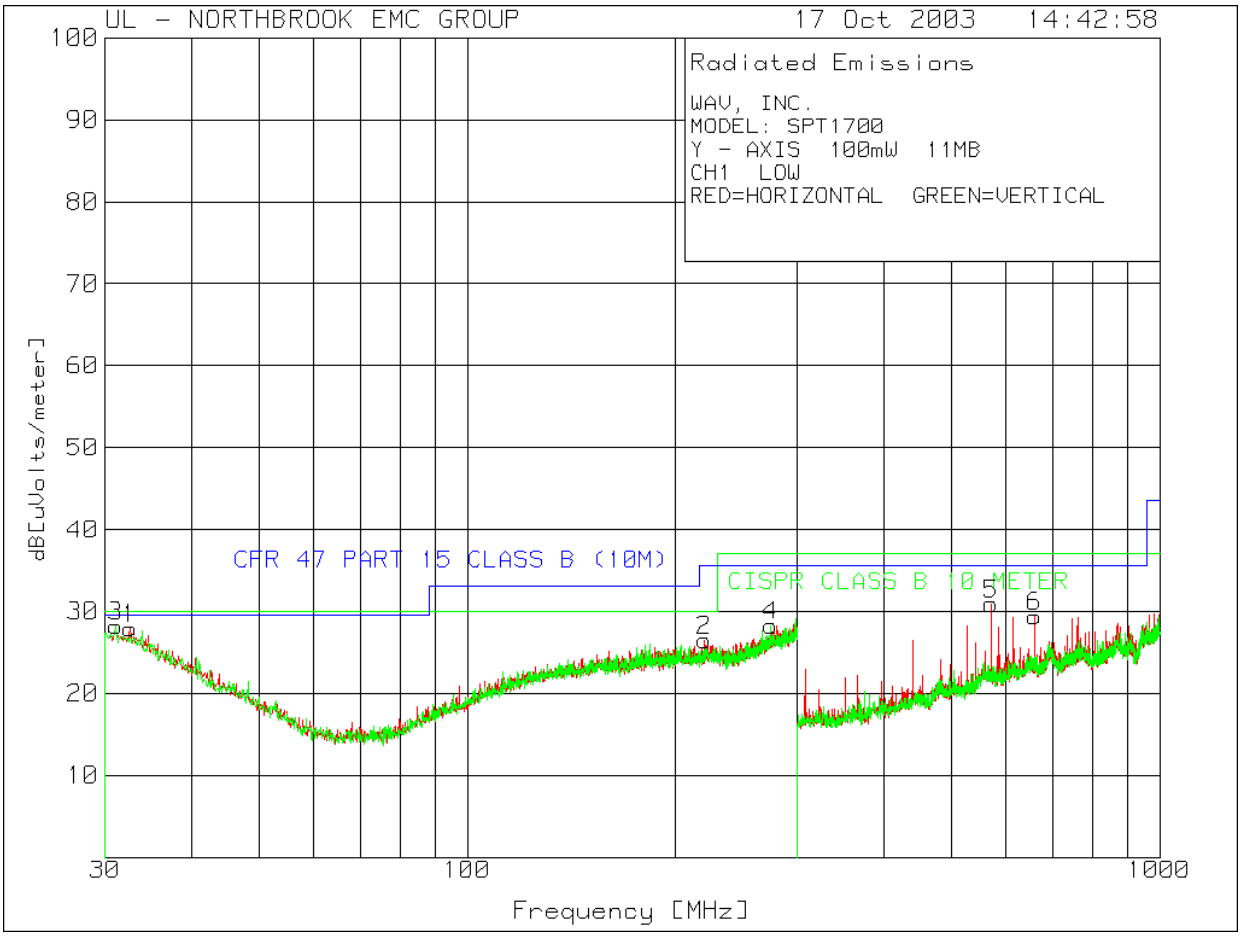
Range: 3 300 - 1000MHz -----------------------------------------------------
5  571.4643     44.29 pk     -31.68    19.19     31.8             37              35.56
   Azimuth:53    Height:198 Horz     Margin [dB]                  -5.2            -3.76
6  659.97       40.64 pk     -31.27    20.33     29.7             37              35.56
   Azimuth:107   Height:100 Horz     Margin [dB]                  -7.3            -5.86

  Test     Meter     Gain/Loss  Transducer  Level  Limit:1      2       3       4
Frequency  Reading    Factor     Factor  dB[uVolts/meter]
 [MHz]     [dB(uV)]     [dB]      [dB]
================================================================================================
Range: 1 30 - 300MHz
30.6481    28.69 qp      -26.9     19.2      20.99           30              29.5
Azimuth: 107  Height:320 Horz         Margin [dB]:           -9.01           -8.51


LIMIT 1: NONE
LIMIT 2: CISPR CLASS B 10 METER
LIMIT 3: NONE
LIMIT 4: CFR 47 PART 15 CLASS B (10M)

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - Average log detector

File: WAV SPT1700 30-1000 CH1 X.TXT
```


UL – NORTHBROOK EMC GROUP
17 Oct 2003 14:42:58
Radiated Emissions
WAV, INC.
MODEL: SPT1700
Y – AXIS 100mW 11MB
CH1 LOW
RED=HORIZONTAL GREEN=VERTICAL
FCC 47 PART 15 CLASS B (10M)
CISPR CLASS B 10 METER
dBµVolts/meter
Frequency [MHz]
100
90
80
70
60
50
40
30
20
10
30
100
1000

WAV, INC.
MODEL: SPT1700
Y - AXIS 100mW 11MB
CH1 LOW
RED=HORIZONTAL GREEN=VERTICAL

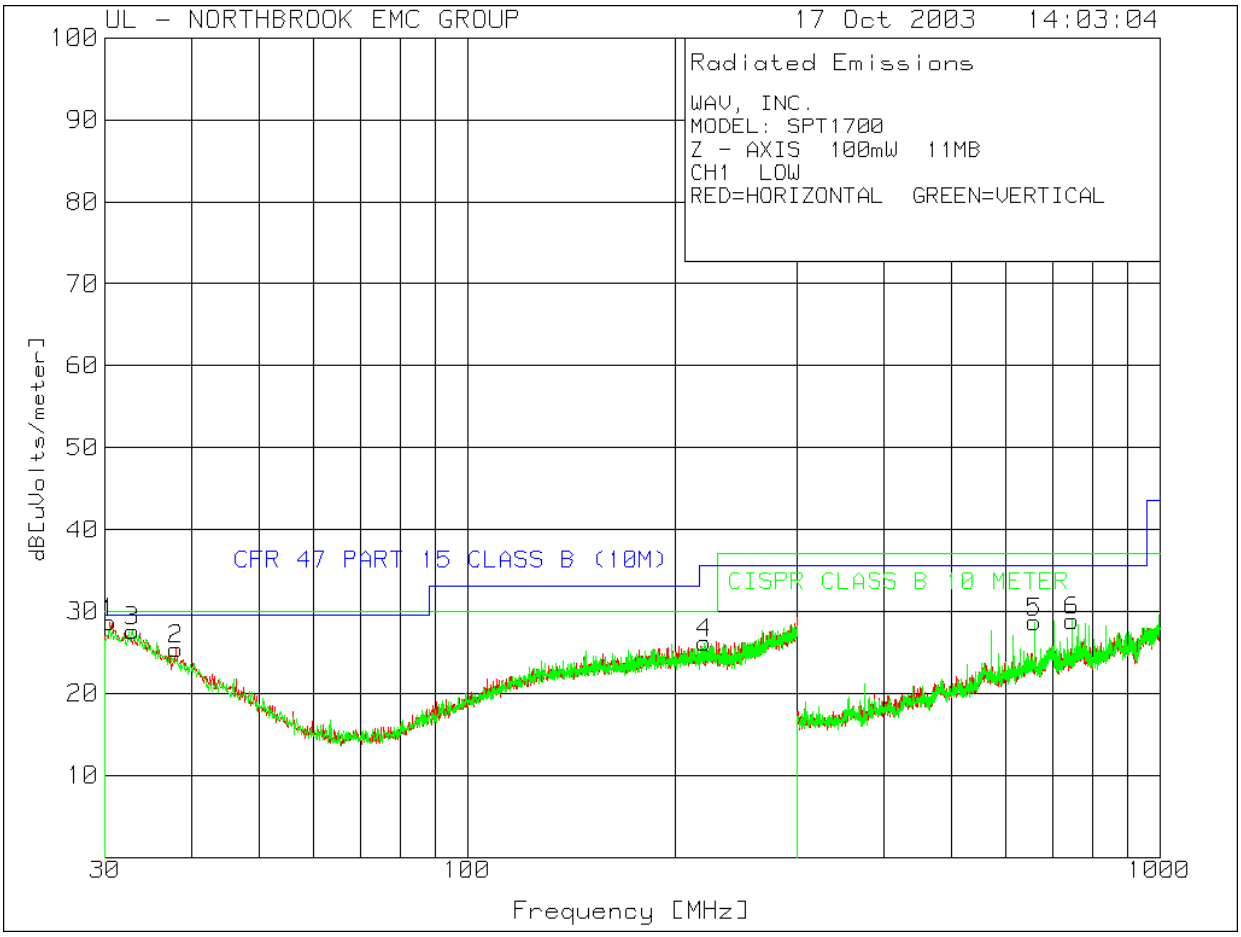
No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4
Range: 1 30 - 300MHz									
1	32.5637	36.08 pk	-26.93	18.75	27.9	30			29.54
	Azimuth:58	Height:200 Horz		Margin [dB]		-2.1			-1.64
2	220.2549	36.67 pk	-26.17	16	26.5	30			35.56
	Azimuth:137	Height:200 Horz		Margin [dB]		-3.5			-9.06
Range: 2 30 - 300MHz									
3	31.0795	36.03 pk	-26.93	19.1	28.2	30			29.54
	Azimuth:217	Height:100 Vert		Margin [dB]		-1.8			-1.34
4	274.6327	36.35 pk	-25.75	17.7	28.3	37			35.56
	Azimuth:217	Height:100 Vert		Margin [dB]		-8.7			-7.26
Range: 3 300 - 1000MHz									
5	571.4643	43.39 pk	-31.68	19.19	30.9	37			35.56
	Azimuth:17	Height:100 Horz		Margin [dB]		-6.1			-4.66
6	659.97	40.34 pk	-31.27	20.33	29.4	37			35.56
	Azimuth:160	Height:100 Horz		Margin [dB]		-7.6			-6.16

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6

LIMIT 1: NONE
LIMIT 2: CISPR CLASS B 10 METER
LIMIT 3: NONE
LIMIT 4: CFR 47 PART 15 CLASS B (10M)
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - Average log detector

File: WAV SPT1700 30-1000 CH1 Y.TXT


UL – NORTHBROOK EMC GROUP
17 Oct 2003 14:03:04
Radiated Emissions
WAV, INC.
MODEL: SPT1700
Z – AXIS 100mW 11MB
CH1 LOW
RED=HORIZONTAL GREEN=VERTICAL
CFR 47 PART 15 CLASS B (10M)
CISPR CLASS B 10 METER
dBµVolts/meter
Frequency [MHz]
100
90
80
70
60
50
40
30
20
10
30
100
1000

WAV, INC.
MODEL: SPT1700
Z - AXIS 100mW 11MB
CH1 LOW
RED=HORIZONTAL GREEN=VERTICAL

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4
Range: 1 30 - 300MHz									
1	30.4048	36.43 pk	-26.93	19.2	28.7	30		29.54	
	Azimuth:337	Height:200 Horz		Margin [dB]		-1.3		-.84	
2	37.961	36.35 pk	-26.88	15.93	25.4	30		29.54	
	Azimuth:219	Height:102 Horz		Margin [dB]		-4.6		-4.14	
Range: 2 30 - 300MHz									
3	32.8336	35.9 pk	-26.93	18.63	27.6	30		29.54	
	Azimuth:102	Height:200 Vert		Margin [dB]		-2.4		-1.94	
4	220.2549	36.37 pk	-26.17	16	26.2	30		35.56	
	Azimuth:42	Height:100 Vert		Margin [dB]		-3.8		-9.36	
Range: 4 300 - 1000MHz									
5	659.97	39.64 pk	-31.27	20.33	28.7	37		35.56	
	Azimuth:341	Height:198 Vert		Margin [dB]		-8.3		-6.86	
6	747.4263	38.84 pk	-31.41	21.47	28.9	37		35.56	
	Azimuth:359	Height:198 Vert		Margin [dB]		-8.1		-6.66	

Frequency [MHz]	Test	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4
Range: 1 30 - 300MHz									
31.7393		28.66 qp	-26.9	18.8	20.56	30		29.5	
Azimuth: 13		Height:100 Horz		Margin [dB]:		-9.44		-8.94	

LIMIT 1: NONE
LIMIT 2: CISPR CLASS B 10 METER
LIMIT 3: NONE
LIMIT 4: CFR 47 PART 15 CLASS B (10M)

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - Average log detector

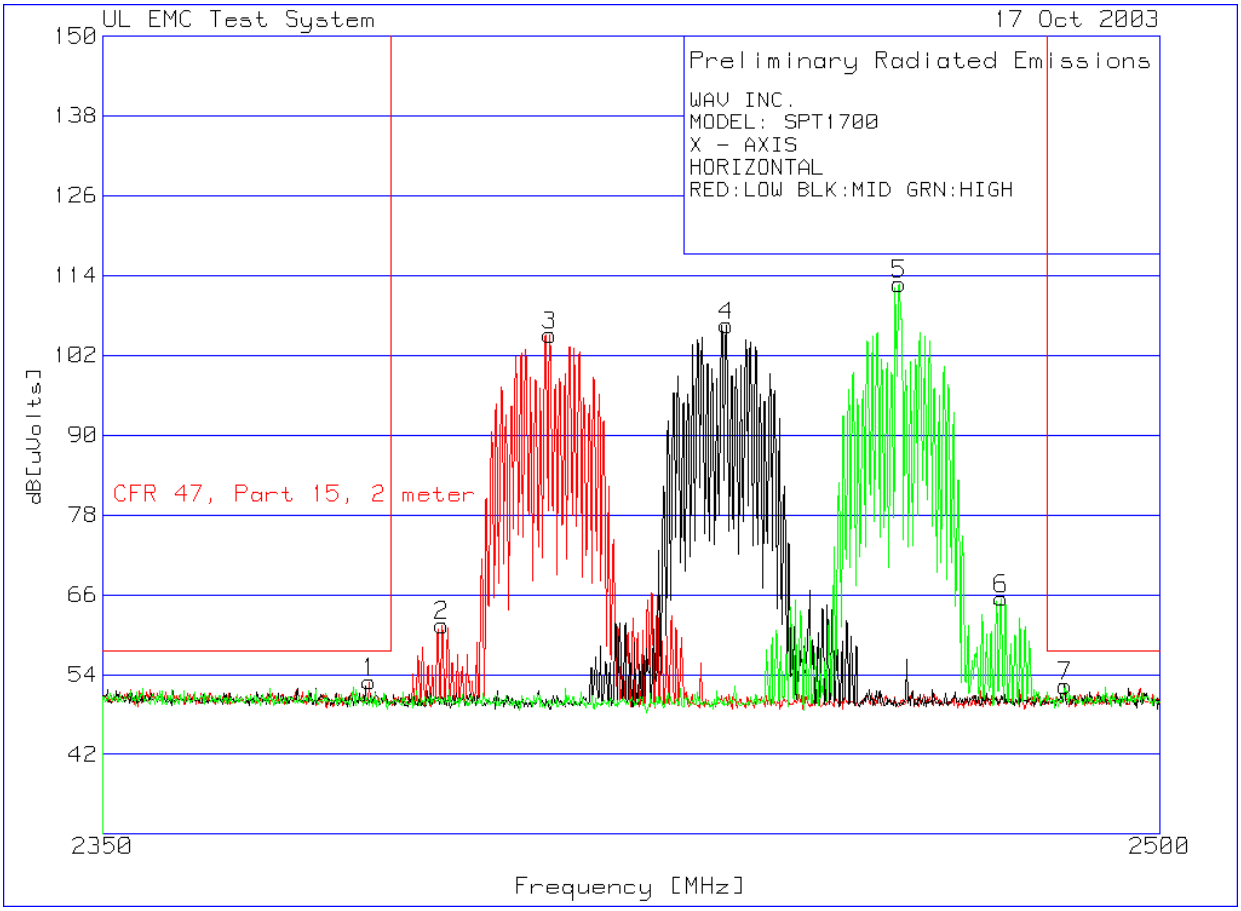
File: WAV SPT1700 30-1000 CH1 Z.TXT

UNDERWRITERS LABORATORIES INC.
Radiated Emissions

Date Tested: 10-17-2003

Manufacturer	**:**	**WAV**
Equipment Under Test	**:**	**SPT1700**
Requirement	**:**	**CFR47 Part 15**
Detection Mode	**:**	**Pk, Avg**
Bandwidth	**:**	**1MHz**
Measurement Distance	**:**	**1-4GHz , 2 meter, 4-26.5GHz, 3 meter**
Antenna Type	**:**	**1-18GHz, 18-26.5GHz – Horn Antennas**

Center Frequency and Band Edge Measurements



```
 WAV INC.
 MODEL: SPT1700
 X - AXIS
 HORIZONTAL
 RED:LOW BLK:MID GRN:HIGH
      Test     Meter     Gain/Loss  Transducer  Level  Limit:1
No. Frequency  Reading    Factor     Factor  dB[uVolts]
     [MHz]     [dB(uV)]     [dB]      [dB]
================================================================
Channel LOW 2350 - 2500MHz ------------------------------------------------
1  2386.937     21.71 pk     2.2       29        52.91   57.5
                 Height:101 Horz     Margin [dB]         -4.59
2  2397.147     30.26 pk     2.2       29        61.46   999
                 Height:101 Horz     Margin [dB]         -937.54
3  2412.312     73.88 pk     2.2       29        105.08  999
                 Height:101 Horz     Margin [dB]         -893.92

Channel MID 2350 - 2500MHz ------------------------------------------------
4  2437.387     75.33 pk     2.2       29        106.53  999
                 Height:101 Horz     Margin [dB]         -892.47

Channel HIGH 2350 - 2500MHz -----------------------------------------------
5  2462.162     81.48 pk     2.2       29.1      112.78  999
                 Height:101 Horz     Margin [dB]         -886.22
6  2476.877     34.17 pk     2.2       29.1      65.47   999
                 Height:101 Horz     Margin [dB]         -933.53
7  2486.186     21.02 pk     2.2       29.1      52.32   57.5
                 Height:101 Horz     Margin [dB]         -5.18

LIMIT 1: CFR 47, Part 15, 2 meter
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
avem - denotes EMI average detection
tm - Trace Math Result

File: SPT1700 BE H X.TXT
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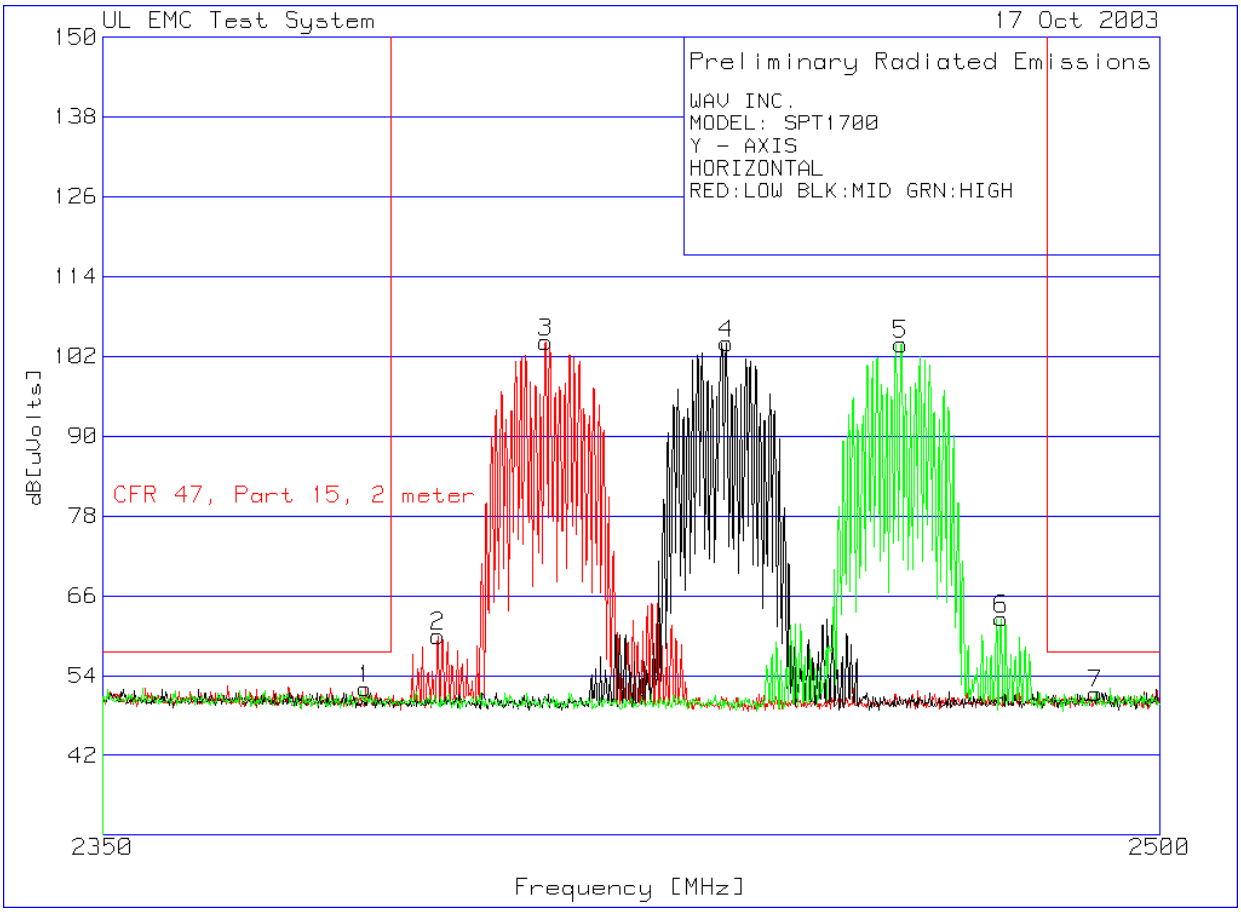

UL EMC Test System
17 Oct 2003
Preliminary Radiated Emissions
WAV INC.
MODEL: SPT1700
Y - AXIS
HORIZONTAL
RED:LOW BLK:MID GRN:HIGH
CFR 47, Part 15, 2 meter
dB[uVolts]
150
138
126
114
102
90
78
66
54
42
2350
2500
Frequency [MHz]
1
2
3
4
5
6
7

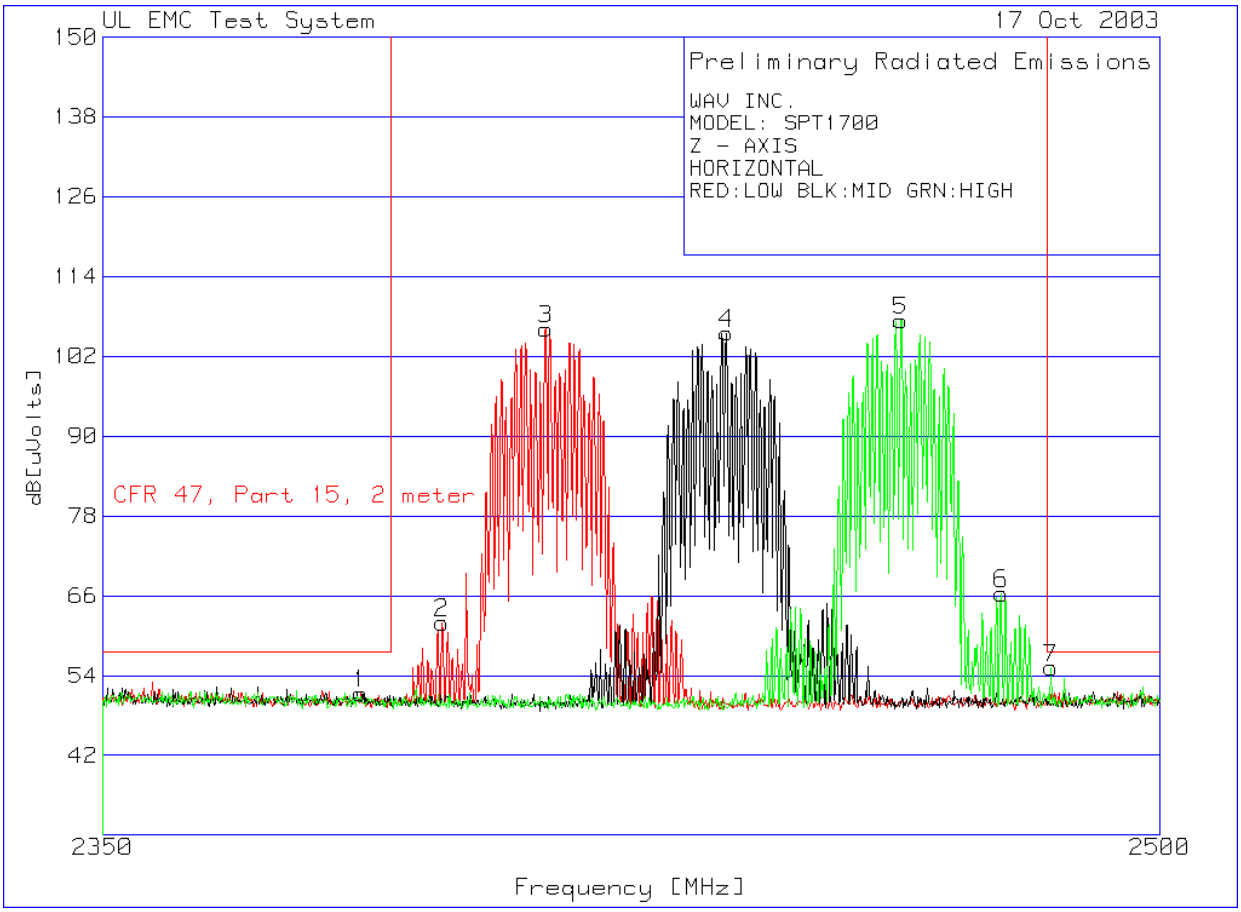
WAV INC.
MODEL: SPT1700
Y - AXIS
HORIZONTAL
RED:LOW BLK:MID GRN:HIGH

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit:1
Channel LOW 2350 - 2500MHz						
1	2386.336	20.83 pk	2.2	29	52.03	57.5
		Height:101 Horz	Margin [dB]			-5.47
2	2396.547	28.78 pk	2.2	29	59.98	999
		Height:101 Horz	Margin [dB]			-939.02
3	2411.712	72.97 pk	2.2	29	104.17	999
		Height:101 Horz	Margin [dB]			-894.83
Channel MID 2350 - 2500MHz						
4	2437.387	72.78 pk	2.2	29	103.98	999
		Height:101 Horz	Margin [dB]			-895.02
Channel HIGH 2350 - 2500MHz						
5	2462.387	72.56 pk	2.2	29.1	103.86	999
		Height:101 Horz	Margin [dB]			-895.14
6	2476.877	31.26 pk	2.2	29.1	62.56	999
		Height:101 Horz	Margin [dB]			-936.44
7	2490.541	19.96 pk	2.3	29.1	51.36	57.5
		Height:101 Horz	Margin [dB]			-6.14

LIMIT 1: CFR 47, Part 15, 2 meter
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
avem - denotes EMI average detection
tm - Trace Math Result

File: SPT1700 BE H Y.TXT


UL EMC Test System
17 Oct 2003
Preliminary Radiated Emissions
WAV INC.
MODEL: SPT1700
Z - AXIS
HORIZONTAL
RED:LOW BLK:MID GRN:HIGH
CFR 47, Part 15, 2 meter
dB[uVolts]
150
138
126
114
102
90
78
66
54
42
2350
2500
Frequency [MHz]
1
2
3
4
5
6
7

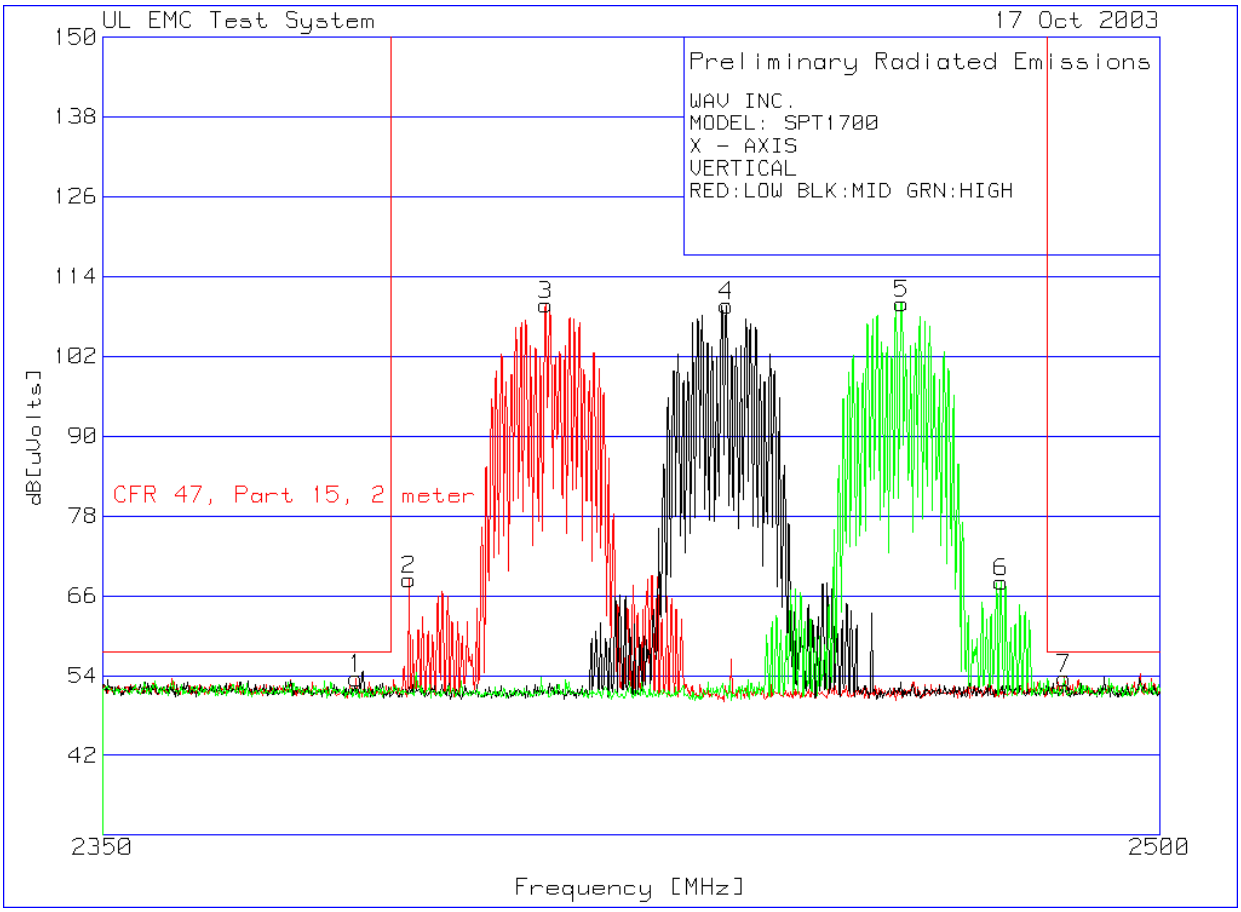
WAV INC.
MODEL: SPT1700
Z - AXIS
HORIZONTAL
RED:LOW BLK:MID GRN:HIGH

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit:1
Channel LOW 2350 - 2500MHz						
1	2385.736	20.14 pk	2.2	29	51.34	57.5
		Height:101 Horz	Margin [dB]			-6.16
2	2397.147	30.76 pk	2.2	29	61.96	999
		Height:101 Horz	Margin [dB]			-937.04
3	2411.712	74.94 pk	2.2	29	106.14	999
		Height:101 Horz	Margin [dB]			-892.86
Channel MID 2350 - 2500MHz						
4	2437.387	74.31 pk	2.2	29	105.51	999
		Height:101 Horz	Margin [dB]			-893.49
Channel HIGH 2350 - 2500MHz						
5	2462.387	76.05 pk	2.2	29.1	107.35	999
		Height:101 Horz	Margin [dB]			-891.65
6	2476.877	35.07 pk	2.2	29.1	66.37	999
		Height:101 Horz	Margin [dB]			-932.63
7	2484.084	23.9 pk	2.2	29.1	55.2	57.5
		Height:101 Horz	Margin [dB]			-2.3

LIMIT 1: CFR 47, Part 15, 2 meter
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
avem - denotes EMI average detection
tm - Trace Math Result

File: SPT1700 BE H Z.TXT


UL EMC Test System
17 Oct 2003
Preliminary Radiated Emissions
WAV INC.
MODEL: SPT1700
X - AXIS
VERTICAL
RED:LOW BLK:MID GRN:HIGH
CFR 47, Part 15, 2 meter
dB[uVolts]
150
138
126
114
102
90
78
66
54
42
2350
2500
Frequency [MHz]
1
2
3
4
5
6
7

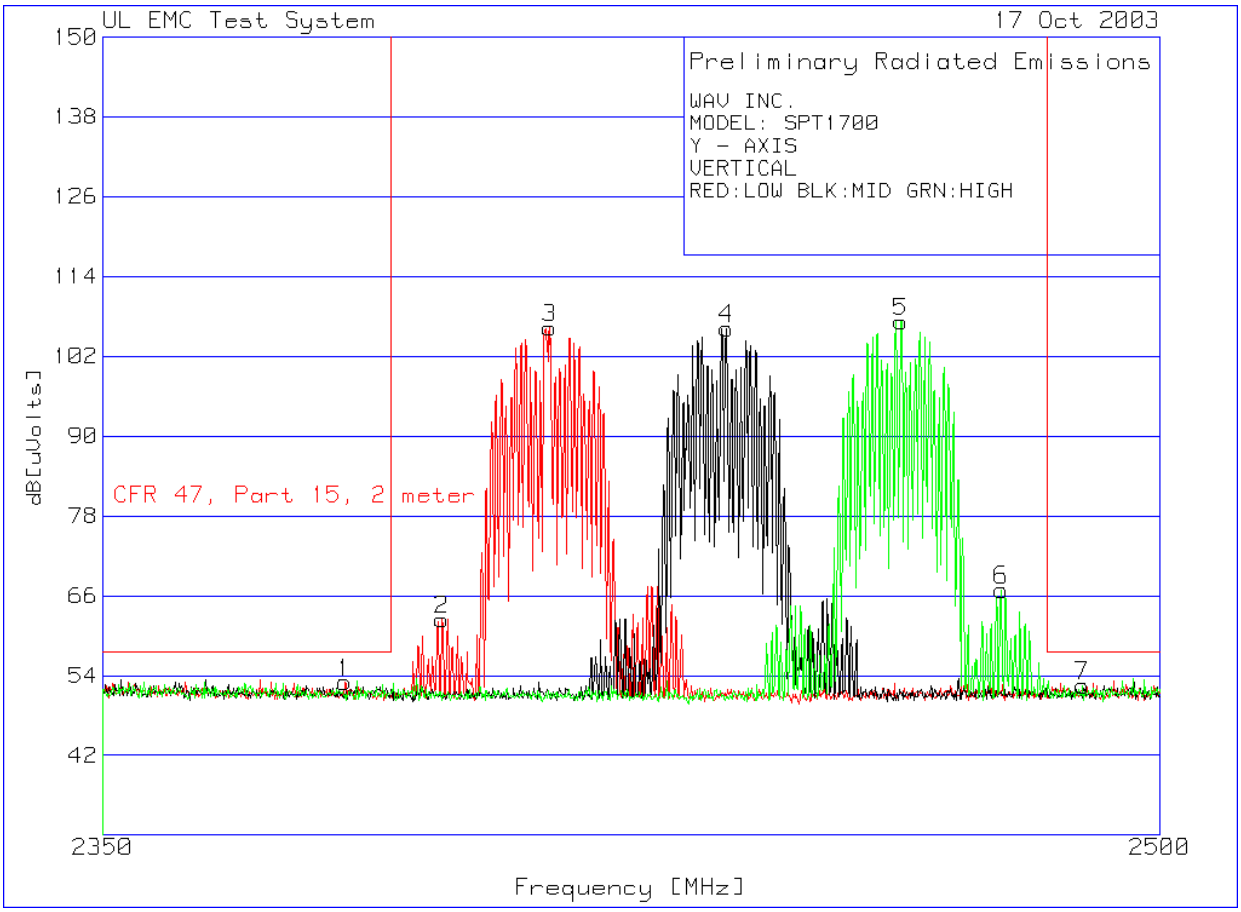
WAV INC.
MODEL: SPT1700
X - AXIS
VERTICAL
RED:LOW BLK:MID GRN:HIGH

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit:1
Channel LOW 2350 - 2500MHz						
1	2385.135	21.29 pk	2.2	30.1	53.59	57.5
		Height:0 Vert		Margin [dB]		-3.91
2	2392.492	36.03 pk	2.2	30.2	68.43	999
		Height:0 Vert		Margin [dB]		-930.57
3	2411.712	77.31 pk	2.2	30.2	109.71	999
		Height:0 Vert		Margin [dB]		-889.29
Channel MID 2350 - 2500MHz						
4	2437.387	77.18 pk	2.2	30.3	109.68	999
		Height:101 Vert		Margin [dB]		-889.32
Channel HIGH 2350 - 2500MHz						
5	2462.462	77.42 pk	2.2	30.3	109.92	999
		Height:101 Vert		Margin [dB]		-889.08
6	2476.877	35.57 pk	2.2	30.3	68.07	999
		Height:101 Vert		Margin [dB]		-930.93
7	2486.036	21.02 pk	2.2	30.4	53.62	57.5
		Height:101 Vert		Margin [dB]		-3.88

LIMIT 1: CFR 47, Part 15, 2 meter
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
avem - denotes EMI average detection
tm - Trace Math Result

File: SPT1700 BE V X.TXT


UL EMC Test System
17 Oct 2003
Preliminary Radiated Emissions
WAV INC.
MODEL: SPT1700
Y - AXIS
VERTICAL
RED:LOW BLK:MID GRN:HIGH
CFR 47, Part 15, 2 meter
dB[uVolts]
150
138
126
114
102
90
78
66
54
42
2350
2500
Frequency [MHz]
1
2
3
4
5
6
7

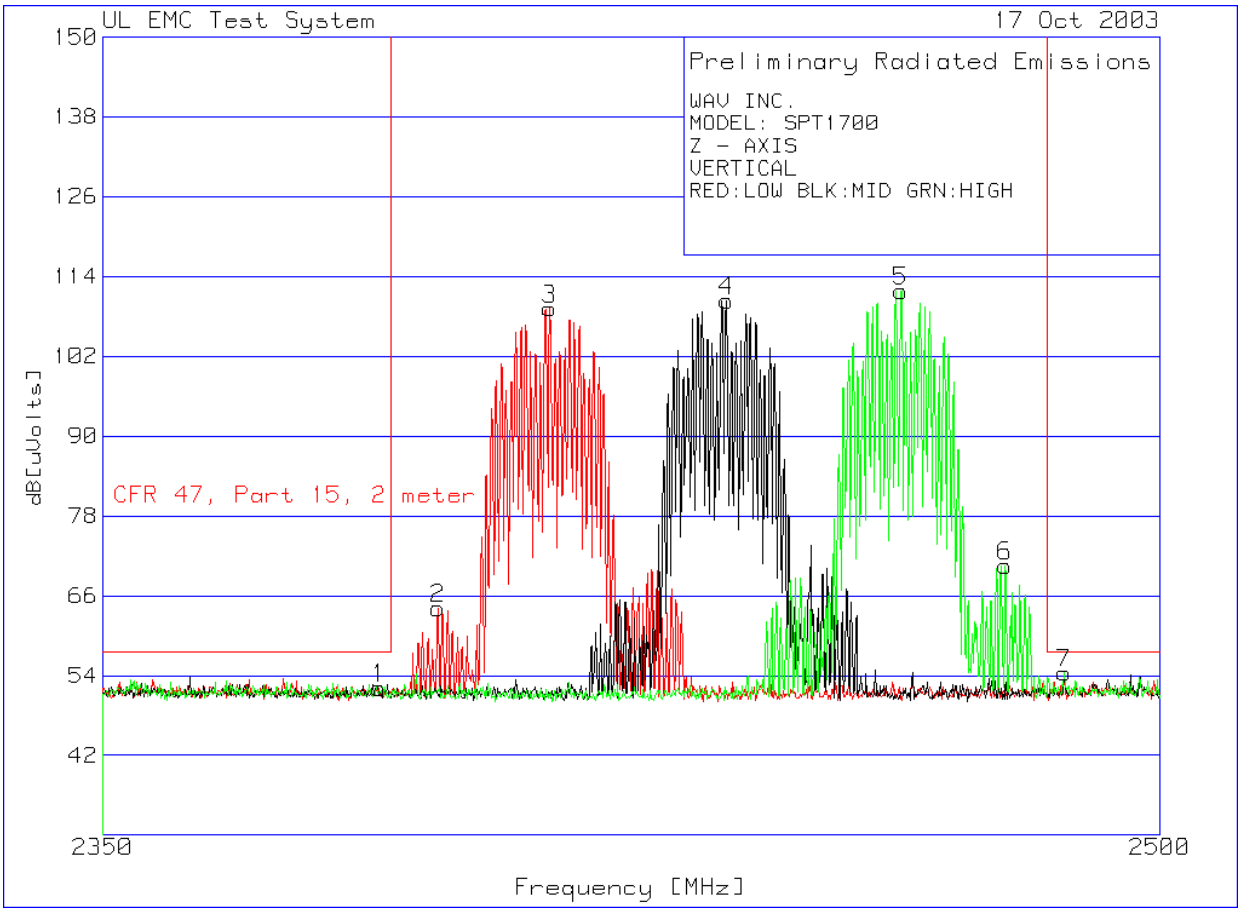
WAV INC.
MODEL: SPT1700
Y - AXIS
VERTICAL
RED:LOW BLK:MID GRN:HIGH

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit:1
Channel LOW 2350 - 2500MHz						
1	2383.483	20.71 pk	2.2	30.1	53.01	57.5
		Height:101 Vert	Margin [dB]			-4.49
2	2397.147	30.03 pk	2.2	30.2	62.43	999
		Height:101 Vert	Margin [dB]			-936.57
3	2412.312	73.89 pk	2.2	30.2	106.29	999
		Height:101 Vert	Margin [dB]			-892.71
Channel MID 2350 - 2500MHz						
4	2437.387	73.68 pk	2.2	30.3	106.18	999
		Height:101 Vert	Margin [dB]			-892.82
Channel HIGH 2350 - 2500MHz						
5	2462.387	74.74 pk	2.2	30.3	107.24	999
		Height:101 Vert	Margin [dB]			-891.76
6	2476.877	34.39 pk	2.2	30.3	66.89	999
		Height:101 Vert	Margin [dB]			-932.11
7	2488.739	19.79 pk	2.3	30.4	52.49	57.5
		Height:101 Vert	Margin [dB]			-5.01

LIMIT 1: CFR 47, Part 15, 2 meter
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
avem - denotes EMI average detection
tm - Trace Math Result

File: SPT1700 BE V Y.TXT


UL EMC Test System
17 Oct 2003
Preliminary Radiated Emissions
WAV INC.
MODEL: SPT1700
Z - AXIS
VERTICAL
RED:LOW BLK:MID GRN:HIGH
CFR 47, Part 15, 2 meter
dB[uVolts]
150
138
126
114
102
90
78
66
54
42
2350
2500
Frequency [MHz]
1
2
3
4
5
6
7

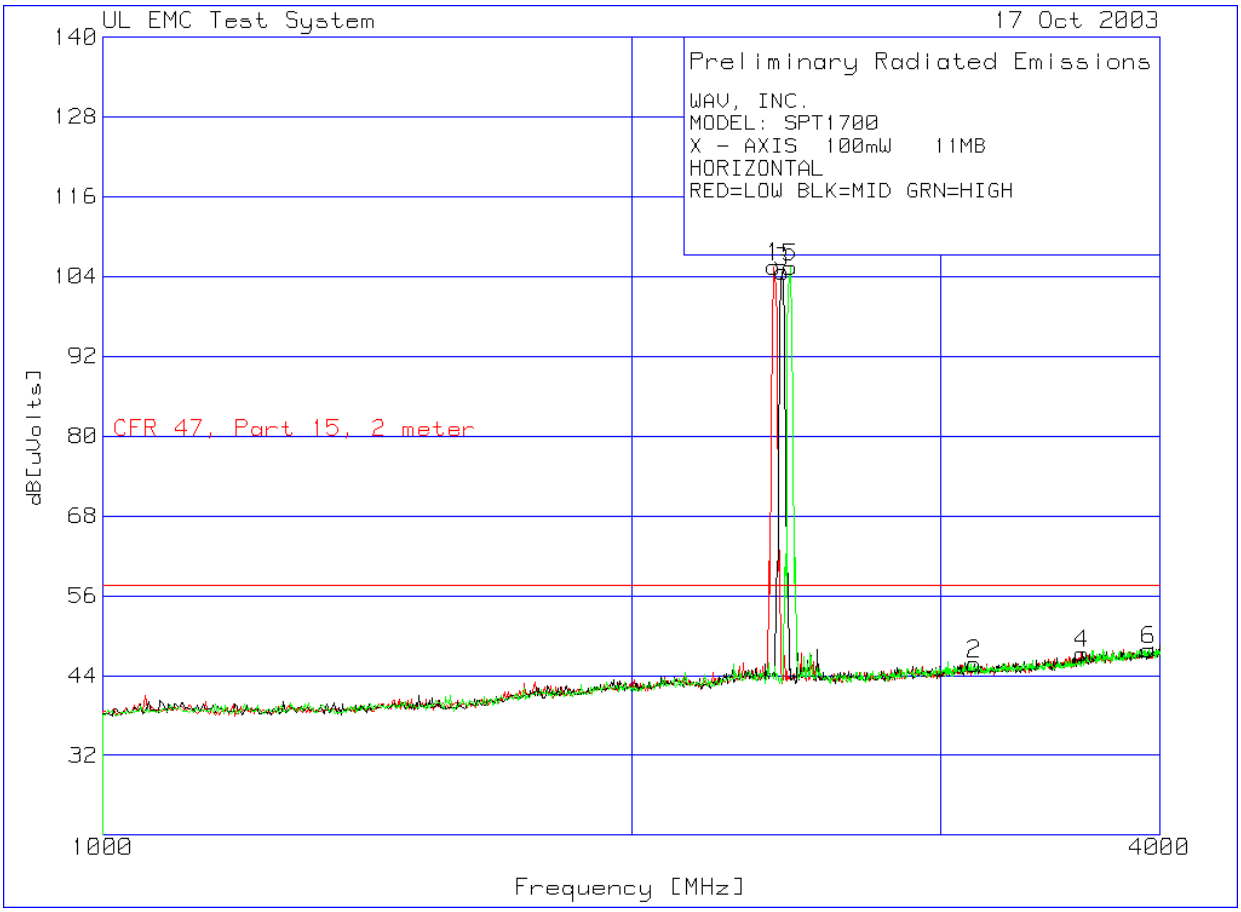
WAV INC.
MODEL: SPT1700
Z - AXIS
VERTICAL
RED:LOW BLK:MID GRN:HIGH

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit:1
Channel LOW 2350 - 2500MHz						
1	2388.288	19.74 pk	2.2	30.2	52.14	57.5
		Height:101 Vert		Margin [dB]		-5.36
2	2396.547	31.79 pk	2.2	30.2	64.19	999
		Height:101 Vert		Margin [dB]		-934.81
3	2412.312	76.76 pk	2.2	30.2	109.16	999
		Height:101 Vert		Margin [dB]		-889.84
Channel MID 2350 - 2500MHz						
4	2437.387	77.87 pk	2.2	30.3	110.37	999
		Height:101 Vert		Margin [dB]		-888.63
Channel HIGH 2350 - 2500MHz						
5	2462.387	79.32 pk	2.2	30.3	111.82	999
		Height:101 Vert		Margin [dB]		-887.18
6	2477.477	37.93 pk	2.2	30.4	70.53	999
		Height:101 Vert		Margin [dB]		-928.47
7	2486.036	21.83 pk	2.2	30.4	54.43	57.5
		Height:101 Vert		Margin [dB]		-3.07

LIMIT 1: CFR 47, Part 15, 2 meter
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
avem - denotes EMI average detection
tm - Trace Math Result

File: SPT1700 BE V Z.TXT


UL EMC Test System
17 Oct 2003
Preliminary Radiated Emissions
WAV, INC.
MODEL: SPT1700
X - AXIS 100mW 11MB
HORIZONTAL
RED=LOW BLK=MID GRN=HIGH
CFR 47, Part 15, 2 meter
dB[uVolts]
140
128
116
104
92
80
68
56
44
32
1000
4000
Frequency [MHz]
1
2
3
4
5
6

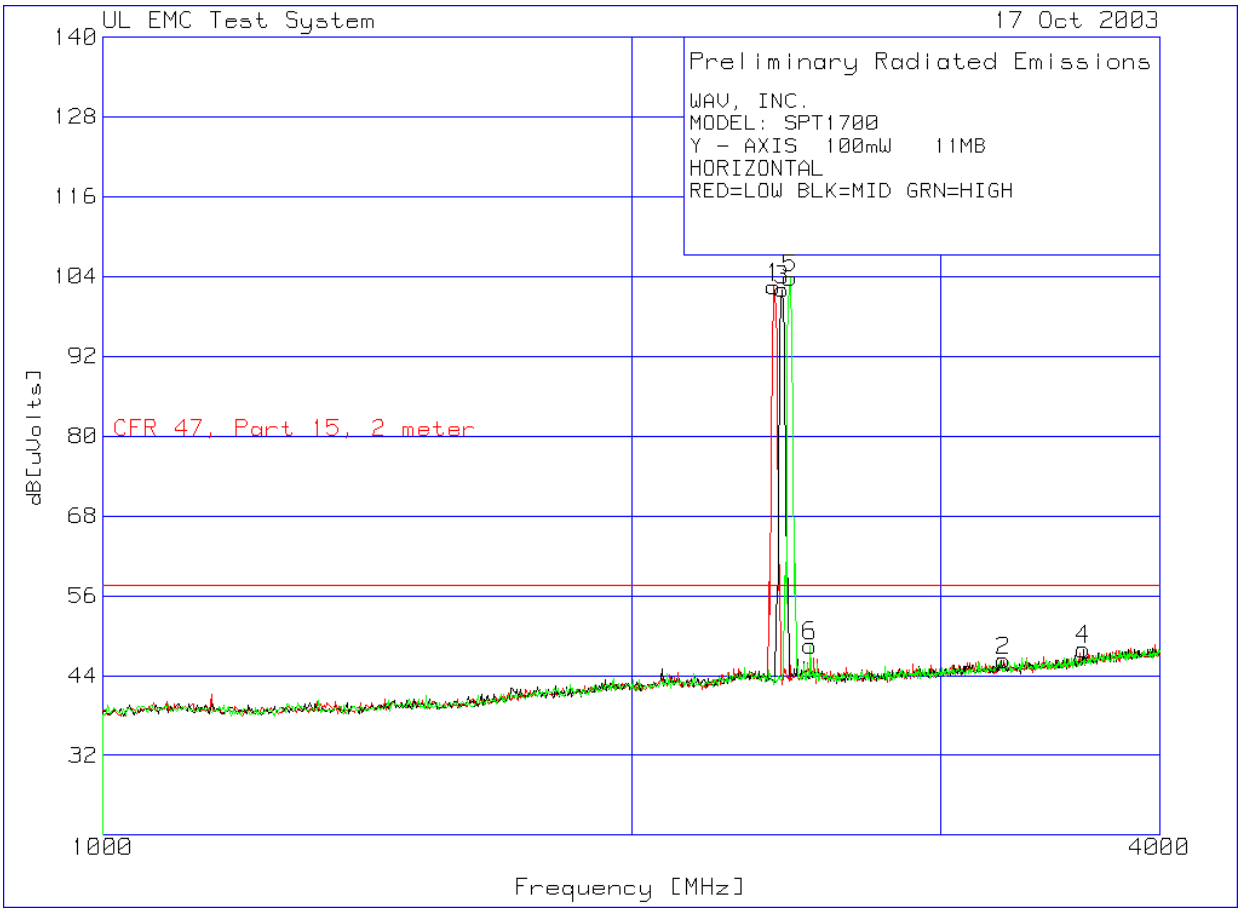
WAV, INC.
MODEL: SPT1700
X - AXIS 100mW 11MB
HORIZONTAL
RED=LOW BLK=MID GRN=HIGH

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit:1
CHANNEL LOW 1000 - 4000MHz						
1	2411.411	74.31 pk	2.2	29	105.51	57.5
		Height:101 Horz	Margin [dB]			48.01
2	3135.135	12.69 pk	2.5	30.6	45.79	57.5
		Height:200 Horz	Margin [dB]			-11.71
CHANNEL MID 1000 - 4000MHz						
3	2438.438	73.58 pk	2.2	29	104.78	57.5
		Height:101 Horz	Margin [dB]			47.28
4	3612.613	12.97 pk	2.7	31.7	47.37	57.5
		Height:200 Horz	Margin [dB]			-10.13
CHANNEL HIGH 1000 - 4000MHz						
5	2462.462	74.12 pk	2.2	29.1	105.42	57.5
		Height:101 Horz	Margin [dB]			47.92
6	3942.943	12.24 pk	2.9	32.7	47.84	57.5
		Height:101 Horz	Margin [dB]			-9.66

LIMIT 1: CFR 47, Part 15, 2 meter
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
avem - denotes EMI average detection
tm - Trace Math Result

file: 1-4GHz H X.TXT


UL EMC Test System
17 Oct 2003
Preliminary Radiated Emissions
WAV, INC.
MODEL: SPT1700
Y - AXIS 100mW 11MB
HORIZONTAL
RED=LOW BLK=MID GRN=HIGH
140
128
116
104
92
80
68
56
44
32
dB[uVolts]
CFR 47, Part 15, 2 meter
1000
4000
Frequency [MHz]

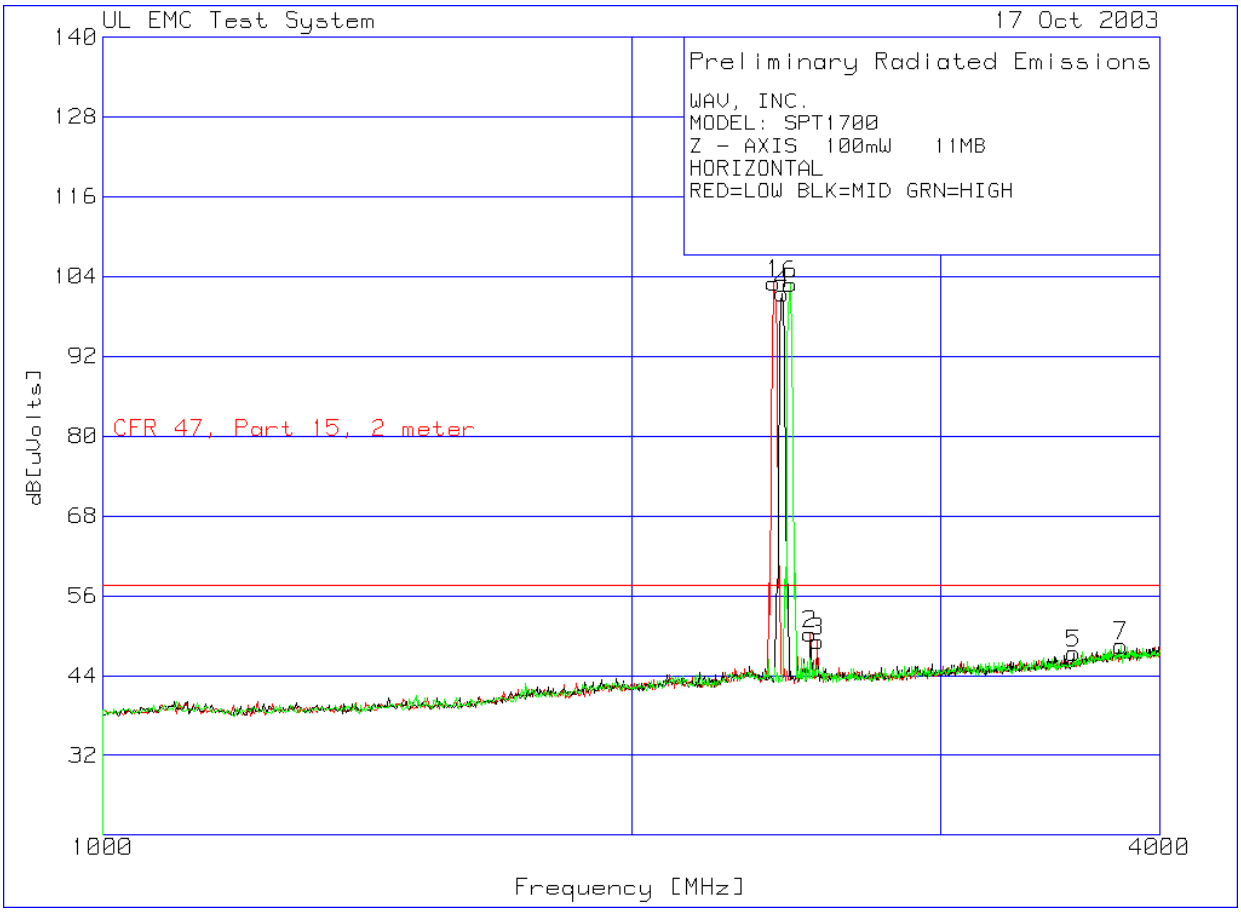
WAV, INC.
MODEL: SPT1700
Y - AXIS 100mW 11MB
HORIZONTAL
RED=LOW BLK=MID GRN=HIGH

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit:1
CHANNEL LOW 1000 - 4000MHz						
1	2411.411	71.23 pk	2.2	29	102.43	57.5
		Height:200 Horz	Margin [dB]			44.93
2	3258.258	12.79 pk	2.6	30.9	46.29	57.5
		Height:101 Horz	Margin [dB]			-11.21
CHANNEL MID 1000 - 4000MHz						
3	2438.438	70.86 pk	2.2	29	102.06	57.5
		Height:200 Horz	Margin [dB]			44.56
4	3615.616	13.58 pk	2.7	31.7	47.98	57.5
		Height:101 Horz	Margin [dB]			-9.52
CHANNEL HIGH 1000 - 4000MHz						
5	2462.462	72.49 pk	2.2	29.1	103.79	57.5
		Height:101 Horz	Margin [dB]			46.29
6	2528.529	16.99 pk	2.3	29.2	48.49	57.5
		Height:199 Horz	Margin [dB]			-9.01

LIMIT 1: CFR 47, Part 15, 2 meter
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
avem - denotes EMI average detection
tm - Trace Math Result

File: 1-4GHz H Y.TXT


UL EMC Test System
17 Oct 2003
Preliminary Radiated Emissions
WAV, INC.
MODEL: SPT1700
Z - AXIS 100mW 11MB
HORIZONTAL
RED=LOW BLK=MID GRN=HIGH
140
128
116
104
92
80
68
56
44
32
dB[uVolts]
CFR 47, Part 15, 2 meter
1000
4000
Frequency [MHz]

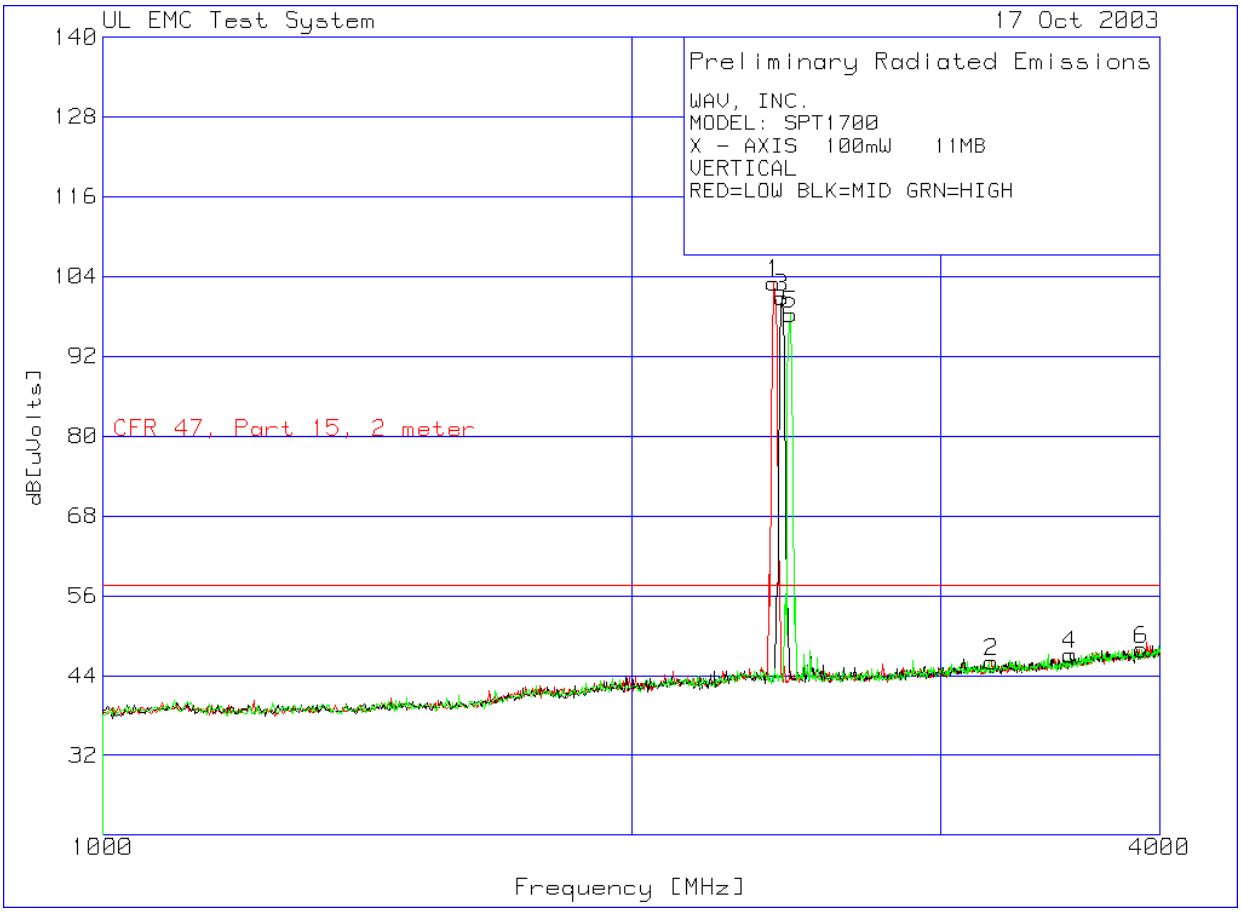
WAV, INC.
MODEL: SPT1700
Z - AXIS 100mW 11MB
HORIZONTAL
RED=LOW BLK=MID GRN=HIGH

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit:1
CHANNEL LOW 1000 - 4000MHz						
1	2411.411	71.81 pk	2.2	29	103.01	57.5
		Height:101 Horz	Margin [dB]			45.51
2	2528.529	18.77 pk	2.3	29.2	50.27	57.5
		Height:101 Horz	Margin [dB]			-7.23
3	2552.553	17.66 pk	2.3	29.2	49.16	57.5
		Height:101 Horz	Margin [dB]			-8.34
CHANNEL MID 1000 - 4000MHz						
4	2438.438	70.26 pk	2.2	29	101.46	57.5
		Height:101 Horz	Margin [dB]			43.96
5	3570.571	13.08 pk	2.7	31.6	47.38	57.5
		Height:101 Horz	Margin [dB]			-10.12
CHANNEL HIGH 1000 - 4000MHz						
6	2462.462	71.51 pk	2.2	29.1	102.81	57.5
		Height:101 Horz	Margin [dB]			45.31
7	3798.799	13.42 pk	2.8	32.3	48.52	57.5
		Height:101 Horz	Margin [dB]			-8.98

LIMIT 1: CFR 47, Part 15, 2 meter
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
avem - denotes EMI average detection
tm - Trace Math Result

File: 1-4GHz H Z.TXT


UL EMC Test System
17 Oct 2003
Preliminary Radiated Emissions
WAV, INC.
MODEL: SPT1700
X - AXIS 100mW 11MB
VERTICAL
RED=LOW BLK=MID GRN=HIGH
CFR 47, Part 15, 2 meter
dB[uVolts]
140
128
116
104
92
80
68
56
44
32
1000
4000
Frequency [MHz]

WAV, INC.
MODEL: SPT1700
X - AXIS 100mW 11MB
VERTICAL
RED=LOW BLK=MID GRN=HIGH

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit:1
CHANNEL LOW 1000 - 4000MHz						
1	2411.411	71.82 pk	2.2	29	103.02	57.5
		Height:101 Vert	Margin [dB]			45.52
2	3207.207	12.73 pk	2.5	30.8	46.03	57.5
		Height:199 Vert	Margin [dB]			-11.47
CHANNEL MID 1000 - 4000MHz						
3	2435.435	69.6 pk	2.2	29	100.8	57.5
		Height:101 Vert	Margin [dB]			43.3
4	3555.556	12.89 pk	2.7	31.6	47.19	57.5
		Height:200 Vert	Margin [dB]			-10.31
CHANNEL HIGH 1000 - 4000MHz						
5	2462.462	66.96 pk	2.2	29.1	98.26	57.5
		Height:101 Vert	Margin [dB]			40.76
6	3903.904	12.53 pk	2.8	32.6	47.93	57.5
		Height:101 Vert	Margin [dB]			-9.57

LIMIT 1: CFR 47, Part 15, 2 meter
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

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av - Average detector
avlg - denotes average log detection
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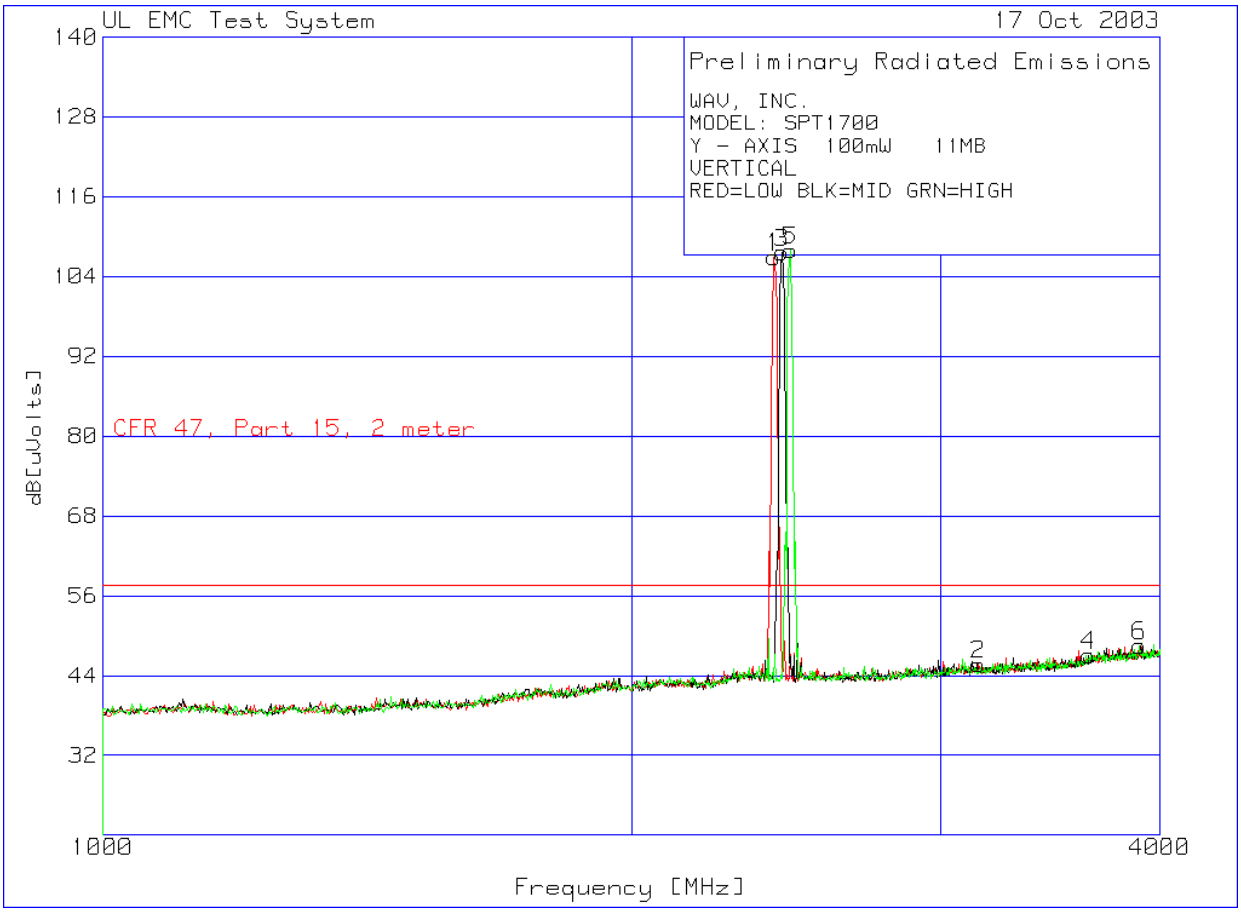
tm - Trace Math Result

File: 1-4GHz V X.TXT


UL EMC Test System
17 Oct 2003
Preliminary Radiated Emissions
WAV, INC.
MODEL: SPT1700
Y - AXIS 100mW 11MB
VERTICAL
RED=LOW BLK=MID GRN=HIGH
CFR 47, Part 15, 2 meter
dB[uVolts]
140
128
116
104
92
80
68
56
44
32
1000
4000
Frequency [MHz]

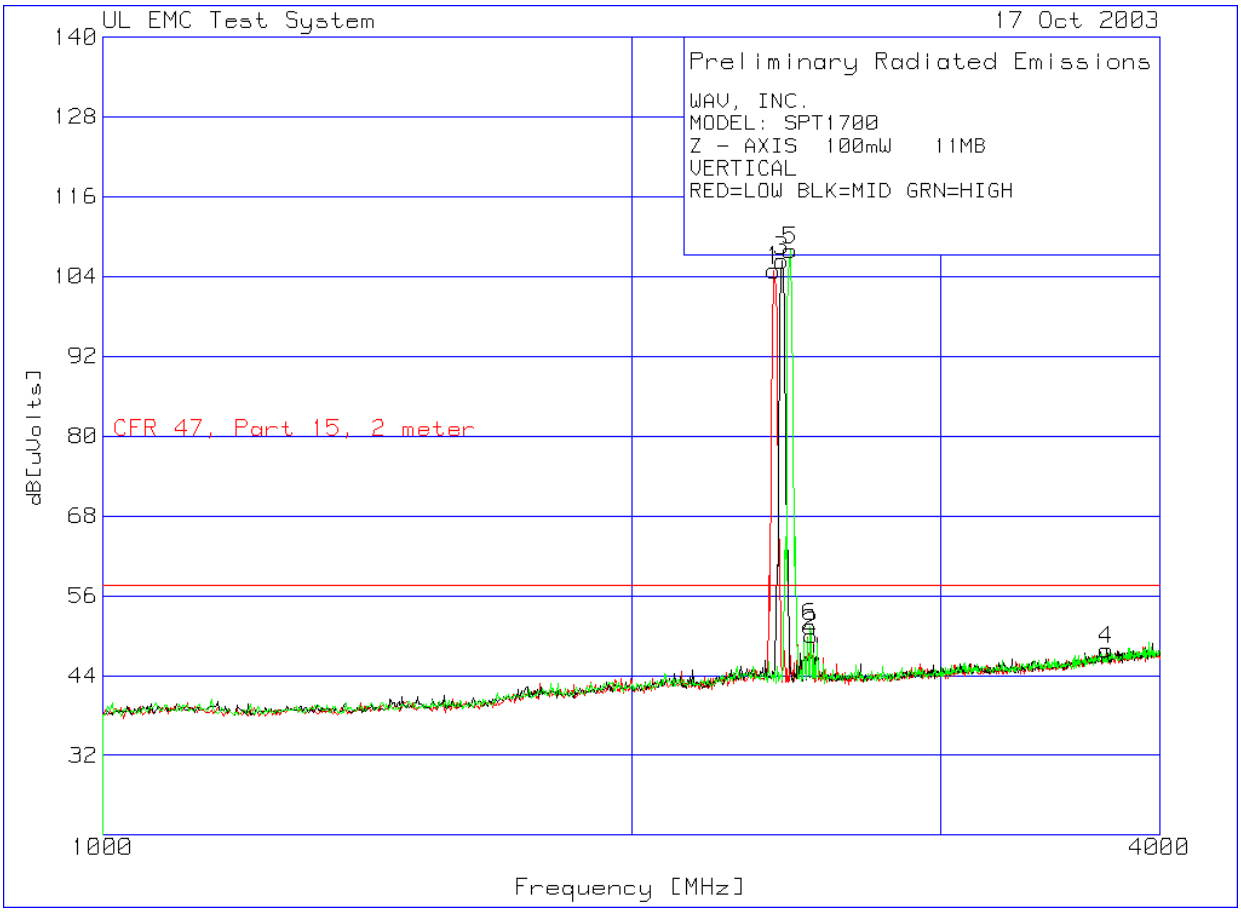
WAV, INC.
MODEL: SPT1700
Y - AXIS 100mW 11MB
VERTICAL
RED=LOW BLK=MID GRN=HIGH

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit:1
CHANNEL LOW 1000 - 4000MHz						
1	2411.411	75.73 pk	2.2	29	106.93	57.5
		Height:101 Vert	Margin [dB]			49.43
2	3153.153	12.6 pk	2.5	30.6	45.7	57.5
		Height:200 Vert	Margin [dB]			-11.8
CHANNEL MID 1000 - 4000MHz						
3	2435.435	76.42 pk	2.2	29	107.62	57.5
		Height:101 Vert	Margin [dB]			50.12
4	3642.643	12.57 pk	2.7	31.8	47.07	57.5
		Height:200 Vert	Margin [dB]			-10.43
CHANNEL HIGH 1000 - 4000MHz						
5	2462.462	76.64 pk	2.2	29.1	107.94	57.5
		Height:101 Vert	Margin [dB]			50.44
6	3894.895	13.1 pk	2.8	32.6	48.5	57.5
		Height:101 Vert	Margin [dB]			-9

LIMIT 1: CFR 47, Part 15, 2 meter
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
avem - denotes EMI average detection
tm - Trace Math Result

File: 1-4GHz V Y.TXT


UL EMC Test System
17 Oct 2003
Preliminary Radiated Emissions
WAV, INC.
MODEL: SPT1700
Z - AXIS 100mW 11MB
VERTICAL
RED=LOW BLK=MID GRN=HIGH
140
128
116
104
92
80
68
56
44
32
dB[uVolts]
CFR 47, Part 15, 2 meter
1000
4000
Frequency [MHz]

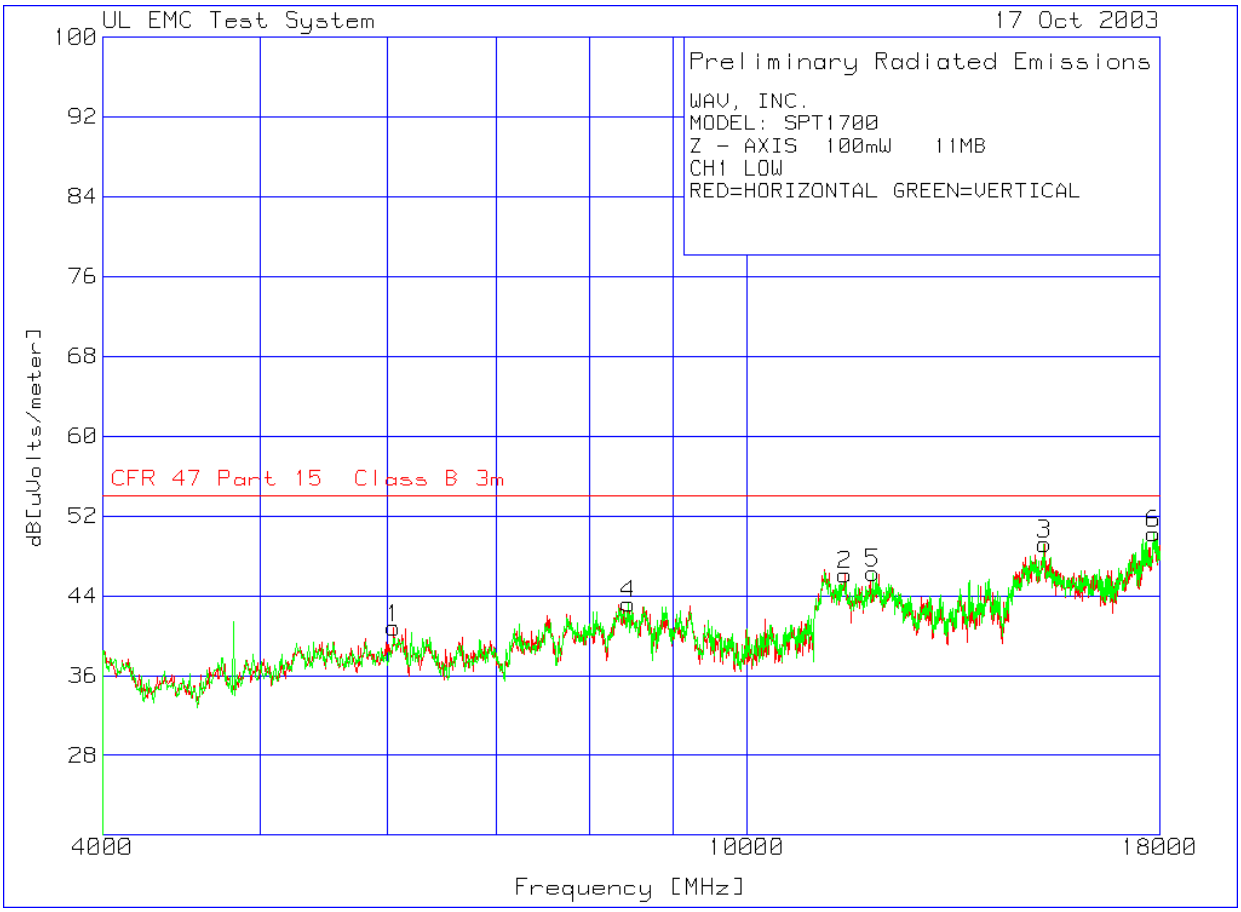
WAV, INC.
MODEL: SPT1700
Z - AXIS 100mW 11MB
VERTICAL
RED=LOW BLK=MID GRN=HIGH

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit:1
CHANNEL LOW 1000 - 4000MHz						
1	2411.411	73.73 pk	2.2	29	104.93	57.5
		Height:101 Vert	Margin [dB]			47.43
2	2531.532	18.51 pk	2.3	29.2	50.01	57.5
		Height:101 Vert	Margin [dB]			-7.49
CHANNEL MID 1000 - 4000MHz						
3	2435.435	75.2 pk	2.2	29	106.4	57.5
		Height:101 Vert	Margin [dB]			48.9
4	3726.727	13.06 pk	2.7	32.1	47.86	57.5
		Height:200 Vert	Margin [dB]			-9.64
CHANNEL HIGH 1000 - 4000MHz						
5	2462.462	76.66 pk	2.2	29.1	107.96	57.5
		Height:101 Vert	Margin [dB]			50.46
6	2528.529	19.9 pk	2.3	29.2	51.4	57.5
		Height:101 Vert	Margin [dB]			-6.1

LIMIT 1: CFR 47, Part 15, 2 meter
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
avem - denotes EMI average detection
tm - Trace Math Result

File: 1-4GHz V Z.TXT


UL EMC Test System
17 Oct 2003
Preliminary Radiated Emissions
WAV, INC.
MODEL: SPT1700
Z - AXIS 100mW 11MB
CH1 LOW
RED=HORIZONTAL GREEN=VERTICAL
CFR 47 Part 15 Class B 3m
dB[uVolts/meter]
100
92
84
76
68
60
52
44
36
28
4000
10000
18000
Frequency [MHz]
1
4
2
5
3
6

```
 WAV, INC.
 MODEL: SPT1700
 Z - AXIS  100mW   11MB
 CH1 LOW
 RED=HORIZONTAL GREEN=VERTICAL
      Test     Meter     Gain/Loss  Transducer  Level  Limit:1
No. Frequency  Reading    Factor     Factor  dB[uVolts/meter]
     [MHz]     [dB(uV)]     [dB]      [dB]
================================================================
Range: 1 4000 - 18000MHz ---------------------------------------------------
1  6052.026     51.61 pk     -47.3     36.5      40.81   54
                 Height:0 Horz       Margin [dB]         -13.19
2  11493.747    51.33 pk     -45.6     40.4      46.13   54
                 Height:0 Horz       Margin [dB]         -7.87
3  15275.638    47.11 pk     -40       42.1      49.21   54
                 Height:0 Horz       Margin [dB]         -4.79

Range: 2 4000 - 18000MHz ---------------------------------------------------
4  8454.227     52.08 pk     -46.7     37.8      43.18   54
                 Height:0 Vert       Margin [dB]         -10.82
5  11962.981    50.89 pk     -46.3     41.7      46.29   54
                 Height:0 Vert       Margin [dB]         -7.71
6  17831.916    43.32 pk     -39.4     46.3      50.22   54
                 Height:0 Vert       Margin [dB]         -3.78

LIMIT 1: CFR 47 Part 15  Class B 3m
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
avem - denotes EMI average detection
tm - Trace Math Result

File: 4-18GHz CH1 HV.TXT
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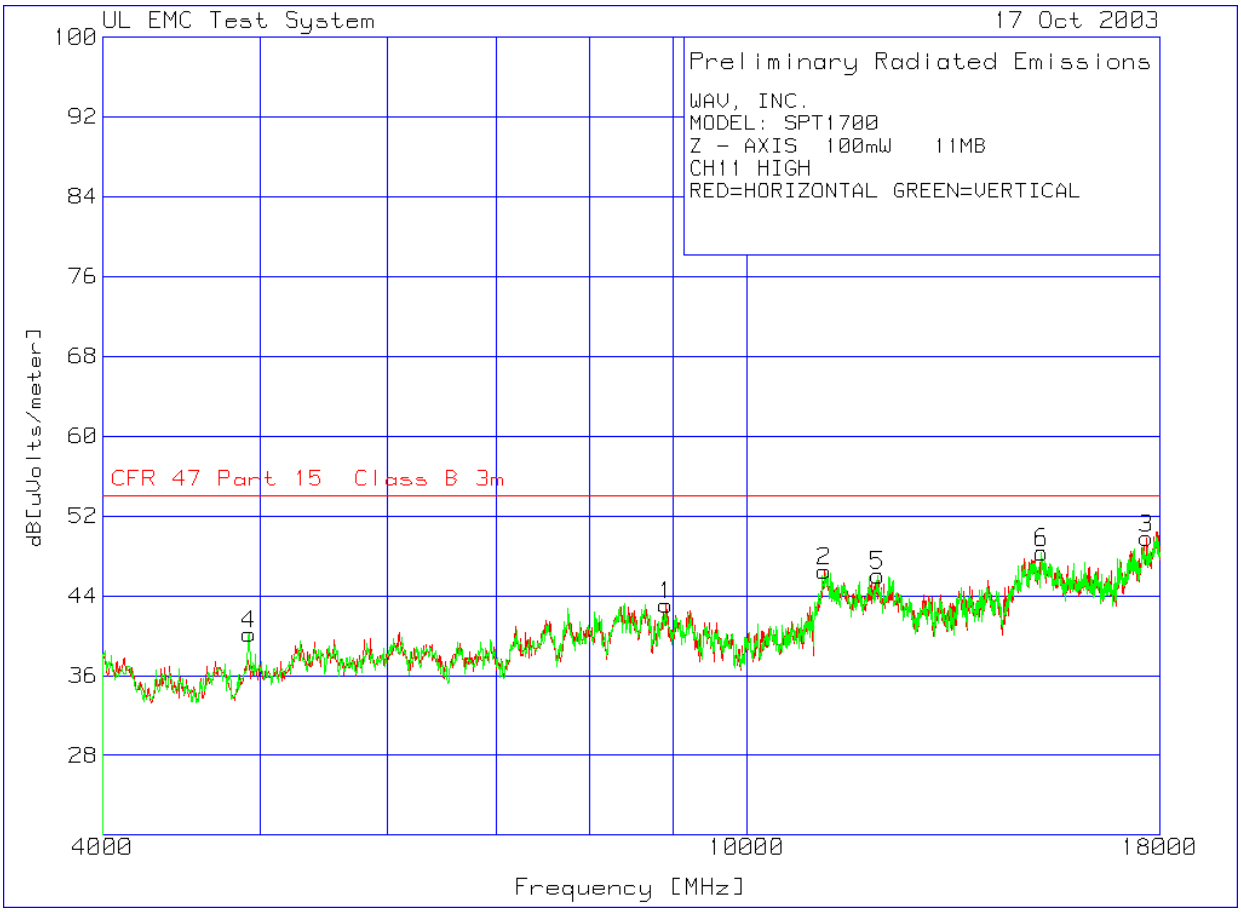
UL EMC Test System
17 Oct 2003
Preliminary Radiated Emissions
WAV, INC.
MODEL: SPT1700
Z - AXIS 100mW 11MB
CH11 HIGH
RED=HORIZONTAL GREEN=VERTICAL
CFR 47 Part 15 Class B 3m
dB[uVolts/meter]
100
92
84
76
68
60
52
44
36
28
4000
10000
18000
Frequency [MHz]

```
 WAV, INC.
 MODEL: SPT1700
 Z - AXIS  100mW   11MB
 CH11 HIGH
 RED=HORIZONTAL GREEN=VERTICAL
      Test     Meter     Gain/Loss  Transducer  Level  Limit:1
No. Frequency  Reading    Factor     Factor  dB[uVolts/meter]
     [MHz]     [dB(uV)]     [dB]      [dB]
================================================================
Range: 1 4000 - 18000MHz ---------------------------------------------------
1  8916.458     53.07 pk     -49.4     39.4      43.07   54
                 Height:200 Horz     Margin [dB]         -10.93
2  11164.582    51.46 pk     -44.9     39.9      46.46   54
                 Height:200 Horz     Margin [dB]         -7.54
3  17656.828    43.78 pk     -39.5     45.5      49.78   54
                 Height:200 Horz     Margin [dB]         -4.22

Range: 2 4000 - 18000MHz ---------------------------------------------------
4  4924.462     55.06 pk     -49.6     34.7      40.16   54
                 Height:101 Vert     Margin [dB]         -13.84
5  12047.024    50.67 pk     -46.3     41.7      46.07   54
                 Height:101 Vert     Margin [dB]         -7.93
6  15212.606    46.24 pk     -40       42.1      48.34   54
                 Height:101 Vert     Margin [dB]         -5.66

LIMIT 1: CFR 47 Part 15  Class B 3m
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
avem - denotes EMI average detection
tm - Trace Math Result

File: 4-18GHz CH11 HV.TXT
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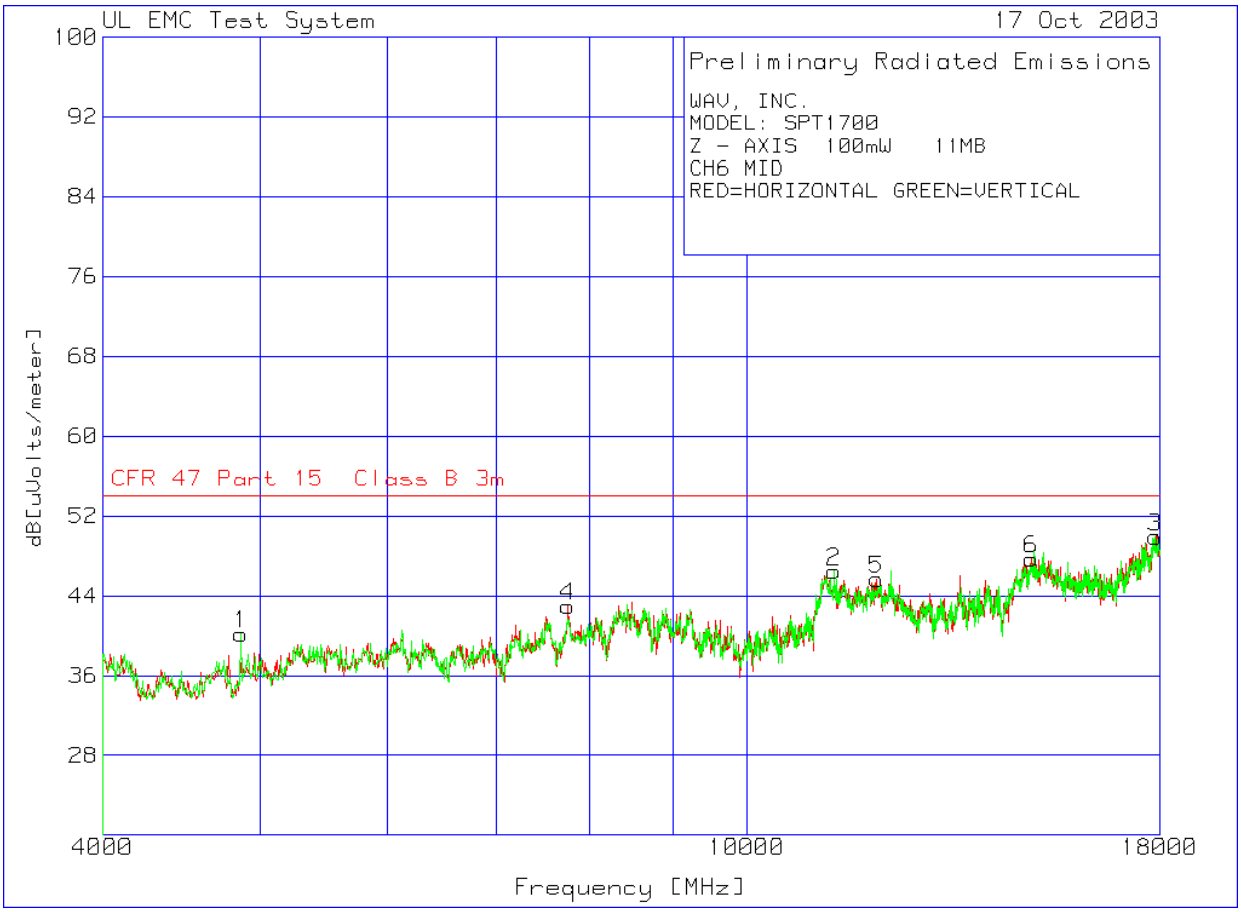

UL EMC Test System
17 Oct 2003
Preliminary Radiated Emissions
WAV, INC.
MODEL: SPT1700
Z - AXIS 100mW 11MB
CH6 MID
RED=HORIZONTAL GREEN=VERTICAL
CFR 47 Part 15 Class B 3m
dB[uVolts/meter]
100
92
84
76
68
60
52
44
36
28
4000
10000
18000
Frequency [MHz]
1
4
2
5
6

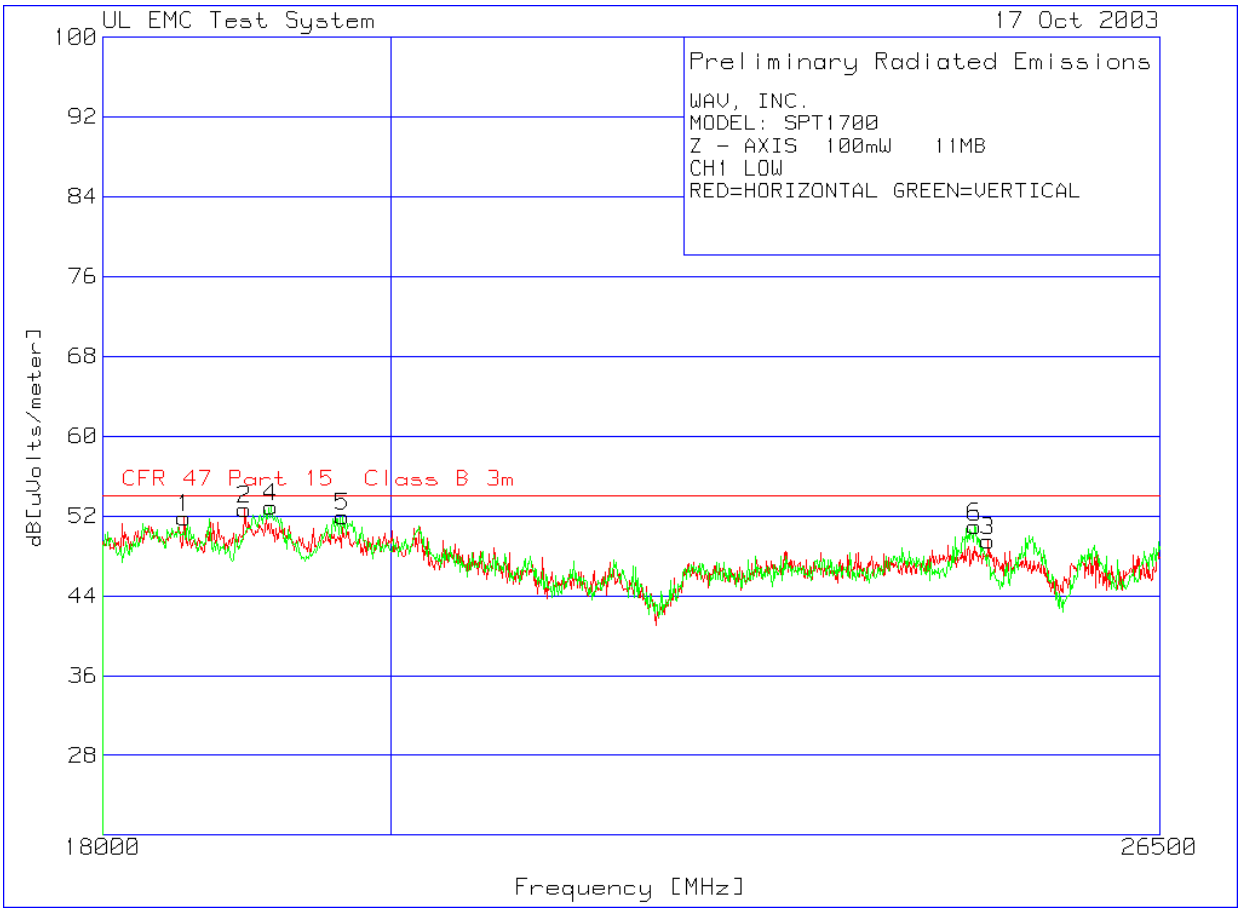
```
 WAV, INC.
 MODEL: SPT1700
 Z - AXIS  100mW   11MB
 CH6 MID
 RED=HORIZONTAL GREEN=VERTICAL
      Test     Meter     Gain/Loss  Transducer  Level  Limit:1
No. Frequency  Reading    Factor     Factor  dB[uVolts/meter]
     [MHz]     [dB(uV)]     [dB]      [dB]
================================================================
Range: 1 4000 - 18000MHz ---------------------------------------------------
4  7753.877     52.14 pk     -46.9     37.7      42.94   54
                 Height:200 Horz     Margin [dB]         -11.06
5  12026.013    50.26 pk     -46.4     41.8      45.66   54
                 Height:101 Horz     Margin [dB]         -8.34
6  14988.494    44.66 pk     -39.2     42.2      47.66   54
                 Height:101 Horz     Margin [dB]         -6.34

Range: 2 4000 - 18000MHz ---------------------------------------------------
1  4868.434     55.36 pk     -49.8     34.6      40.16   54
                 Height:101 Vert     Margin [dB]         -13.84
2  11318.659    51.24 pk     -44.9     40.1      46.44   54
                 Height:101 Vert     Margin [dB]         -7.56
3  17873.937    42.8 pk      -39.3     46.4      49.9    54
                 Height:199 Vert     Margin [dB]         -4.1

LIMIT 1: CFR 47 Part 15  Class B 3m
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
avem - denotes EMI average detection
tm - Trace Math Result

File: 4-18GHz CH6 HV.TXT
```


UL EMC Test System
17 Oct 2003
Preliminary Radiated Emissions
WAV, INC.
MODEL: SPT1700
Z - AXIS 100mW 11MB
CH1 LOW
RED=HORIZONTAL GREEN=VERTICAL
CFR 47 Part 15 Class B 3m
100
92
84
76
68
60
52
44
36
28
dB[uVolts/meter]
18000
26500
Frequency [MHz]

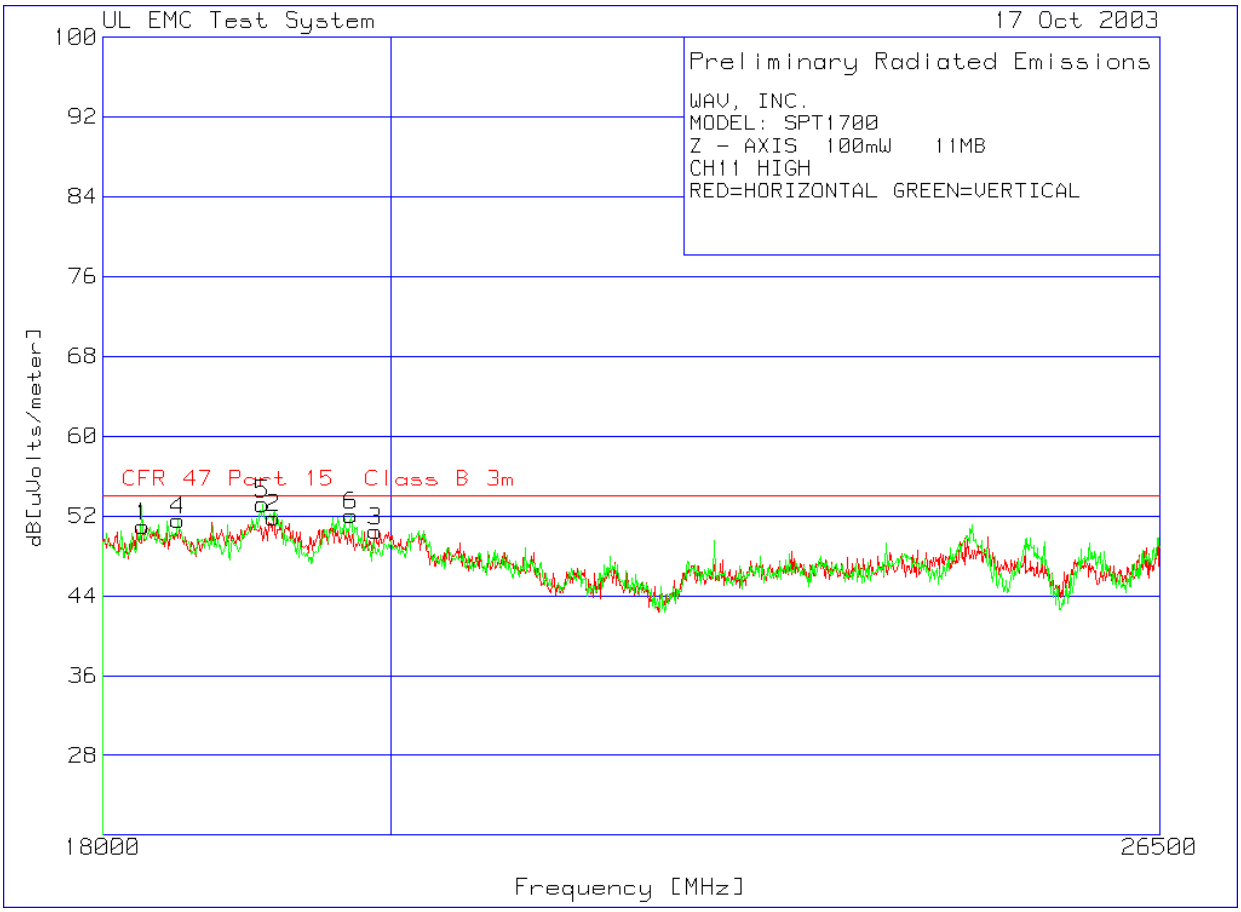
```
 WAV, INC.
 MODEL: SPT1700
 Z - AXIS  100mW   11MB
 CH1 LOW
 RED=HORIZONTAL GREEN=VERTICAL
      Test     Meter     Gain/Loss  Transducer  Level  Limit:1
No. Frequency  Reading    Factor     Factor  dB[uVolts/meter]
     [MHz]     [dB(uV)]     [dB]      [dB]
================================================================
Range: 1 18000 - 26500MHz ------------------------------------------------
1  18544.545    69.42 pk     -57.9     40.3      51.82   54
                 Height:101 Horz     Margin [dB]         -2.18
2  18961.461    70.36 pk     -58       40.3      52.66   54
                 Height:200 Horz     Margin [dB]         -1.34
3  24883.383    63.88 pk     -54.7     40.3      49.48   54
                 Height:101 Horz     Margin [dB]         -4.52

Range: 2 18000 - 26500MHz ------------------------------------------------
4  19140.14     70.58 pk     -58       40.3      52.88   54
                 Height:200 Vert     Margin [dB]         -1.12
5  19650.651    70.03 pk     -58.4     40.3      51.93   54
                 Height:200 Vert     Margin [dB]         -2.07
6  24764.264    65.73 pk     -55.1     40.3      50.93   54
                 Height:101 Vert     Margin [dB]         -3.07

LIMIT 1: CFR 47 Part 15  Class B 3m
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
avem - denotes EMI average detection
tm - Trace Math Result

File: 18-26_5GHz CH1 HV.TXT
```


UL EMC Test System
17 Oct 2003
Preliminary Radiated Emissions
WAV, INC.
MODEL: SPT1700
Z - AXIS 100mW 11MB
CH11 HIGH
RED=HORIZONTAL GREEN=VERTICAL
CFR 47 Part 15 Class B 3m
100
92
84
76
68
60
52
44
36
28
dB[uVolts/meter]
18000
26500
Frequency [MHz]

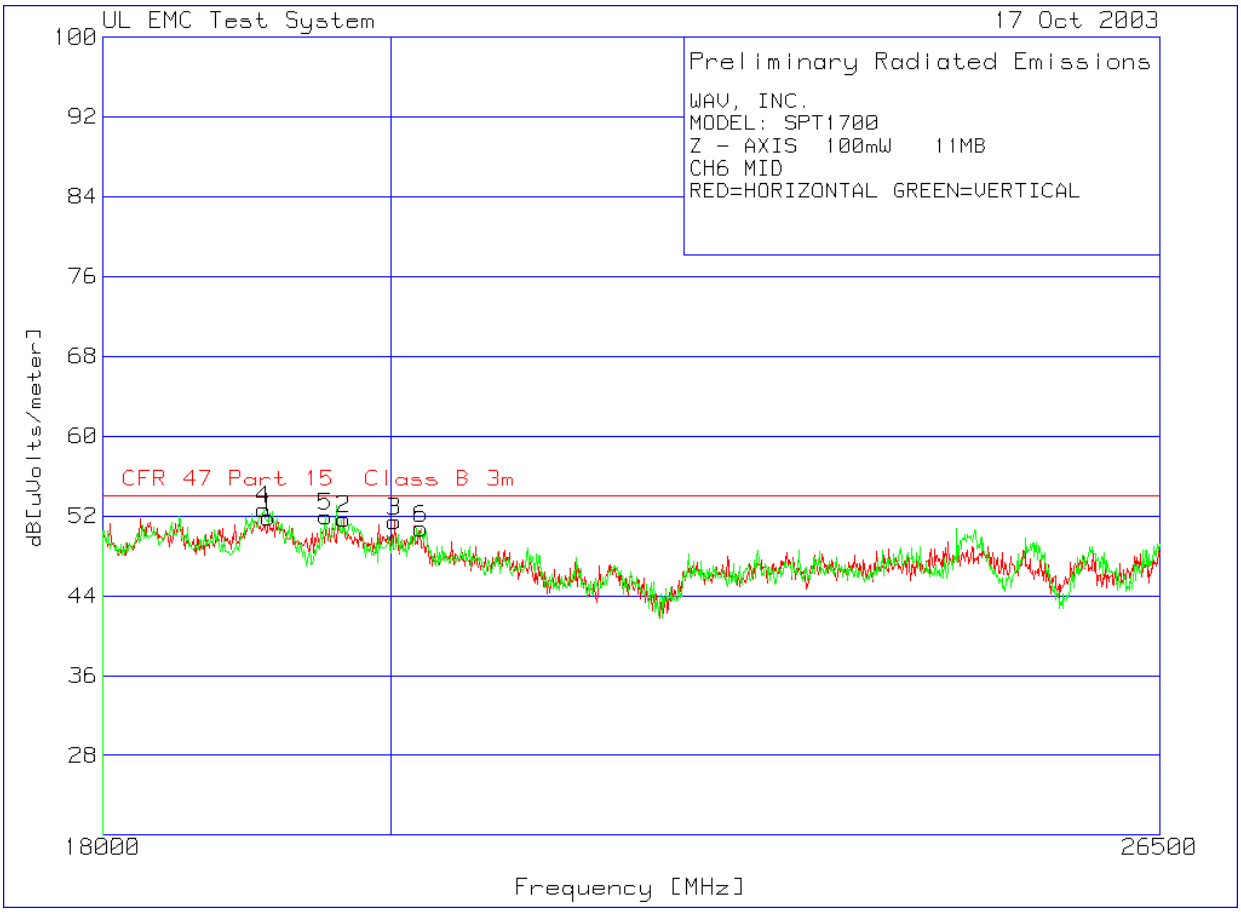
```
 WAV, INC.
 MODEL: SPT1700
 Z - AXIS  100mW   11MB
 CH11 HIGH
 RED=HORIZONTAL GREEN=VERTICAL
      Test     Meter     Gain/Loss  Transducer  Level  Limit:1
No. Frequency  Reading    Factor     Factor  dB[uVolts/meter]
     [MHz]     [dB(uV)]     [dB]      [dB]
================================================================
Range: 1 18000 - 26500MHz ---------------------------------------------------
1  18263.764    68.15 pk     -57.5     40.3      50.95   54
                 Height:200 Horz     Margin [dB]         -3.05
2  19157.157    69.52 pk     -58       40.3      51.82   54
                 Height:101 Horz     Margin [dB]         -2.18
3  19888.889    69 pk        -58.8     40.3      50.5    54
                 Height:200 Horz     Margin [dB]         -3.5

Range: 2 18000 - 26500MHz ---------------------------------------------------
4  18502.002    68.89 pk     -57.6     40.3      51.59   54
                 Height:200 Vert     Margin [dB]         -2.41
5  19080.581    70.89 pk     -58       40.3      53.19   54
                 Height:200 Vert     Margin [dB]         -.81
6  19710.21     70.27 pk     -58.5     40.3      52.07   54
                 Height:200 Vert     Margin [dB]         -1.93

LIMIT 1: CFR 47 Part 15  Class B 3m
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
avem - denotes EMI average detection
tm - Trace Math Result

File: 18-26_5GHz CH11 HV.TXT
```


UL EMC Test System
17 Oct 2003
Preliminary Radiated Emissions
WAV, INC.
MODEL: SPT1700
Z - AXIS 100mW 11MB
CH6 MID
RED=HORIZONTAL GREEN=VERTICAL
CFR 47 Part 15 Class B 3m
100
92
84
76
68
60
52
44
36
28
dB[uVolts/meter]
18000
26500
Frequency [MHz]

```
 WAV, INC.
 MODEL: SPT1700
 Z - AXIS  100mW   11MB
 CH6 MID
 RED=HORIZONTAL GREEN=VERTICAL
      Test     Meter     Gain/Loss  Transducer  Level  Limit:1
No. Frequency  Reading    Factor     Factor  dB[uVolts/meter]
     [MHz]     [dB(uV)]     [dB]      [dB]
================================================================
Range: 1 18000 - 26500MHz ------------------------------------------------
1  19123.123    69.58 pk     -58       40.3      51.88   54
                 Height:99 Horz      Margin [dB]         -2.12
2  19659.159    69.81 pk     -58.4     40.3      51.71   54
                 Height:199 Horz     Margin [dB]         -2.29
3  20025.025    69.93 pk     -58.8     40.3      51.43   54
                 Height:99 Horz      Margin [dB]         -2.57

Range: 2 18000 - 26500MHz ------------------------------------------------
4  19089.089    70.37 pk     -58       40.3      52.67   54
                 Height:101 Vert     Margin [dB]         -1.33
5  19531.532    70.26 pk     -58.6     40.3      51.96   54
                 Height:101 Vert     Margin [dB]         -2.04
6  20220.721    68.96 pk     -58.5     40.3      50.76   54
                 Height:101 Vert     Margin [dB]         -3.24

LIMIT 1: CFR 47 Part 15  Class B 3m
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
avem - denotes EMI average detection
tm - Trace Math Result

File: 18-26_5GHz CH6 HV.TXT
```

APPENDIX C

Sample Calculations of Field Strengths

Basic Equation:

The field strength is calculated by adding the Meter Reading, Cable Set Gain/Loss and Transducer (Antenna or LISN) Factor. The basic equation is as follows:

FS = MR + GL + TF

Where:

FS = Calculated Field Strength in dB(uV)/meter

MR = Meter Reading of receiver amplitude in dB(uV)

GL = Gain/Loss factor of cable set in dB
A negative Gain/Loss indicates signal amplification (gain)
A positive Gain/Loss indicates signal attenuation (loss)

TF = Transducer Factor of antenna or LISN in dB

Sample Calculation:

The measured receiver amplitude is 52.7 dB(uV).

The gain/loss factor is –30.2 dB (indicating a preamplifier is included in the cable set).

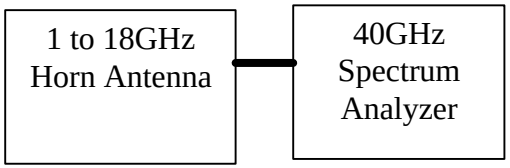
The transducer factor (antenna factor) is 6.6 dB.

These factors are added (52.7 + (-30.2) + 6.6) resulting in a calculated field strength of 29.1 dB(uV)/meter.

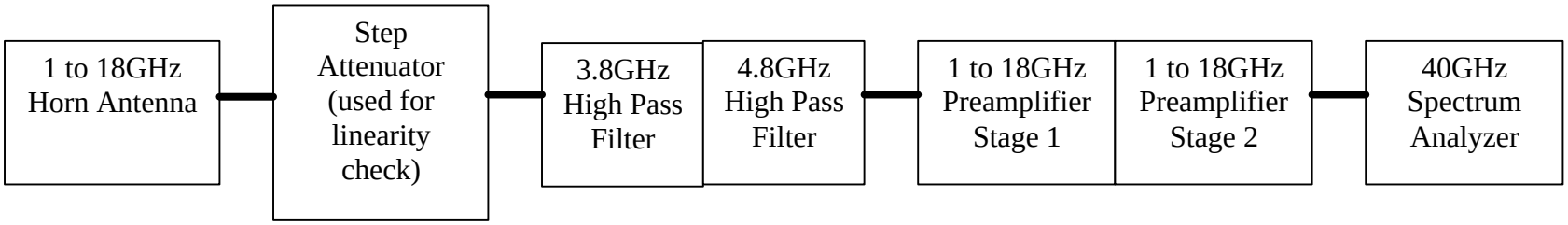
APPENDIX D

Block Diagram of Measurement System

1 to 4GHz Measurement System



4 to 18GHz Measurement System



18 to 26.5GHz Measurement System