Nemko Test Report:	43189RUS1
Applicant:	Wavetronix LLC 78 East 1700 South Building B Provo, UT 84606 USA
Equipment Under Test: (E.U.T.)	SS105V
FCC ID:	PCB-SS105V
In Accordance With:	**CFR 47 Part 15, Paragraph 15.245** Field Disturbance Sensors Operating in the Bands 902-928 MHz, 2435-2465 MHz, 5785-5815 MHz, 10.5-10.55 GHz and 24.075-24.175 GHz

TESTED BY: _____ **DATE:** **15 March 2010**
David Light, Senior Wireless Engineer

APPROVED BY: _____ **DATE:** **15 June 2010**
Tom Tidwell, Telecom Direct

Total Number of Pages: 18

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Section 1. Summary of Test Results

Manufacturer: Wavetronix LLC

Model No.: SS105V

Serial No.: None

General: **All measurements are traceable to national standards.**

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with CFR 47, Paragraph 15.245. All tests were conducted using measurement procedure ANSI C63.4-2003. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.

☒ New Submission ☐ Production Unit

☐ Class II Permissive Change ☒ Pre-Production Unit

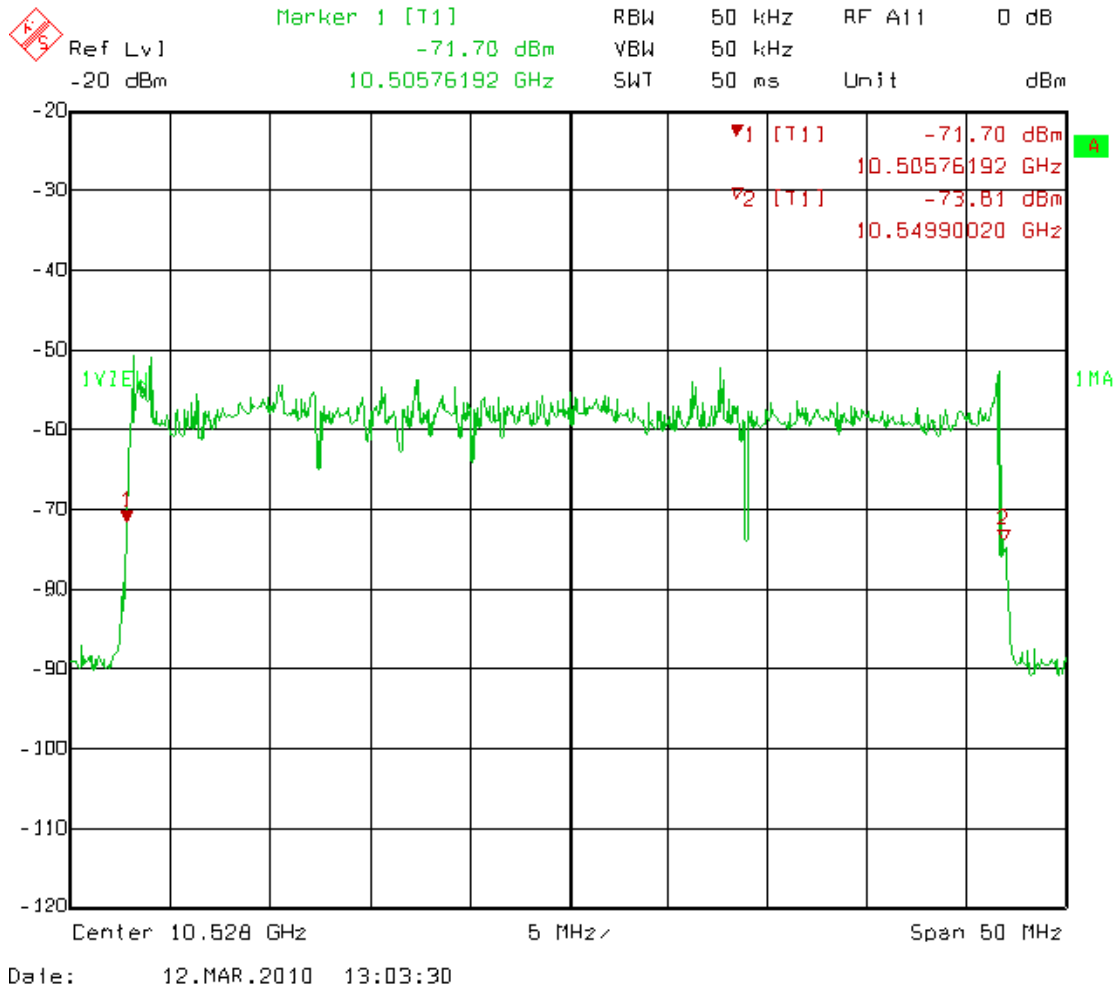
THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.
See " Summary of Test Data".

NVLAP Lab Code 100426-0

Summary Of Test Data

Name of Test	Paragraph Number	Results
Radiated Emissions	15.245	Complies
Powerline Conducted Emissions	15.207	Complies



Section 2. Equipment Under Test (E.U.T.)

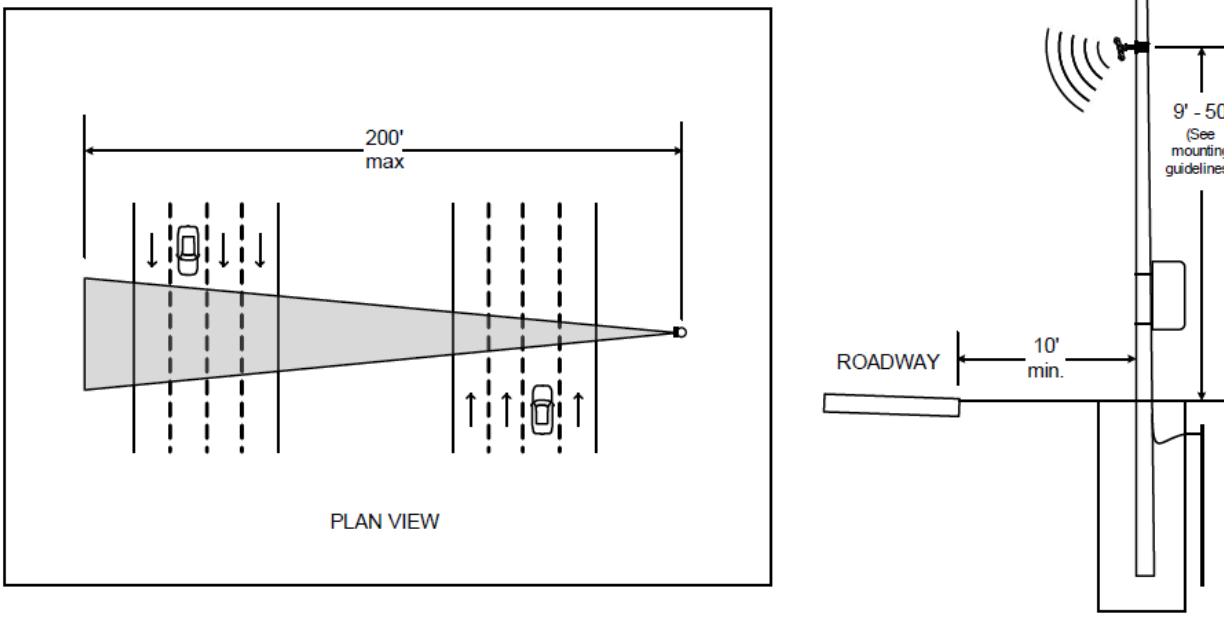
General Equipment Information

Frequency Range:	10.50 to 10.055 GHz
Operating Frequency(ies) of Sample:	10.50 to 10.55 GHz
Type of Emission:	FMCW
Emission Designator:	F0N

Description of E.U.T.

The SS105V provides true eight-lane detection of vehicle volume, occupancy and speed using patented Digital Wave Radar.

System Diagram



Section 3. Radiated Emissions

NAME OF TEST: Radiated Emissions	PARA. NO.: 15.245
TESTED BY: David Light	DATE: 12 March 2010

Test Results: Complies. The worst-case emission level is 115.5 dBμV/m @ 3m at 10.525 GHz. This is 12.5 dB below the average specification limit.

Test Data:

Meas. Freq. (MHz)	Ant. Pol. (H/V)	Atten. (dB)	Meter Reading (dBuV)	Antenna Factor (dB)	Path Loss (dB)	RF Gain (dB)	Corrected Reading (dBuV/m)	Spec. limit (dBuV/m)	CR/SL Diff. (dB)	Pass Fail Unc.	Comment
10.525	H	0	62	40.6	13.4	0.0	116.0	148.0	-32.0	Pass	Peak
10.525	H	0	61.5	40.6	13.4	0.0	115.5	128.0	-12.5	Pass	Average
10.525	V	0	42.1	40.6	13.4	0.0	96.1	148.0	-51.9	Pass	Peak
10.525	V	0	40.4	40.6	13.4	0.0	94.4	128.0	-33.6	Pass	Average

Between 1 GHz and 40 GHz a spectrum analyzer and low noise amplifier are used to measure emission levels. The spectrum analyzer resolution bandwidth was set to 1 MHz and video bandwidth was 1 MHz.

There were no emissions detected above the carrier. The spectrum was searched from 30 MHz to 100 GHz. All emissions detected within 20 dB of the specification limit are reported per 15.31(o).

Measurements <1000 MHz: RBW=VBW=100 kHz
Measurements >1000 MHz: RBW=VBW=1 MHz

Section 4. Powerline Conducted Emissions

NAME OF TEST: Powerline Conducted Emissions	PARA. NO.: 15.207
TESTED BY: David Light	DATE: 12 March 2010

Minimum Standard:

Frequency of Conducted Emission (MHz)	Limit (dBµV) Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

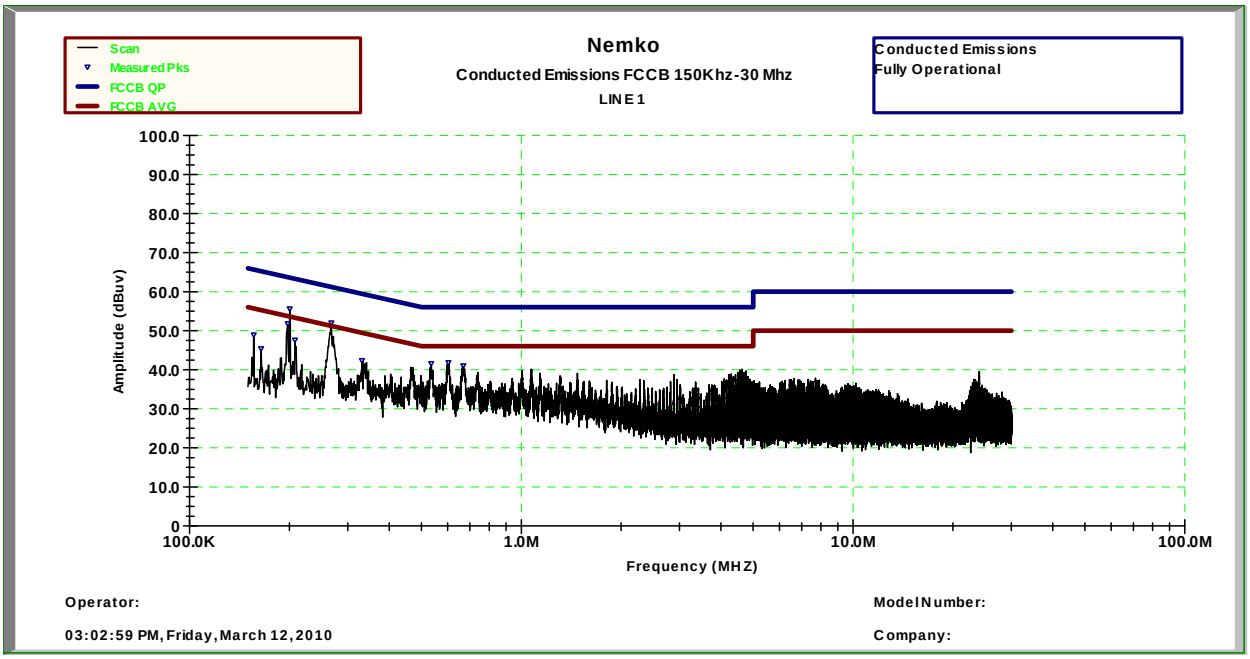
Test Results: Complies. The worst case emission is 47.5 dBµV at 268.5 kHz. This is 5.1 dB below the average limit.

Test Data: See attached table.

Method Of Measurement: (Procedure ANSI C63.4-2003)

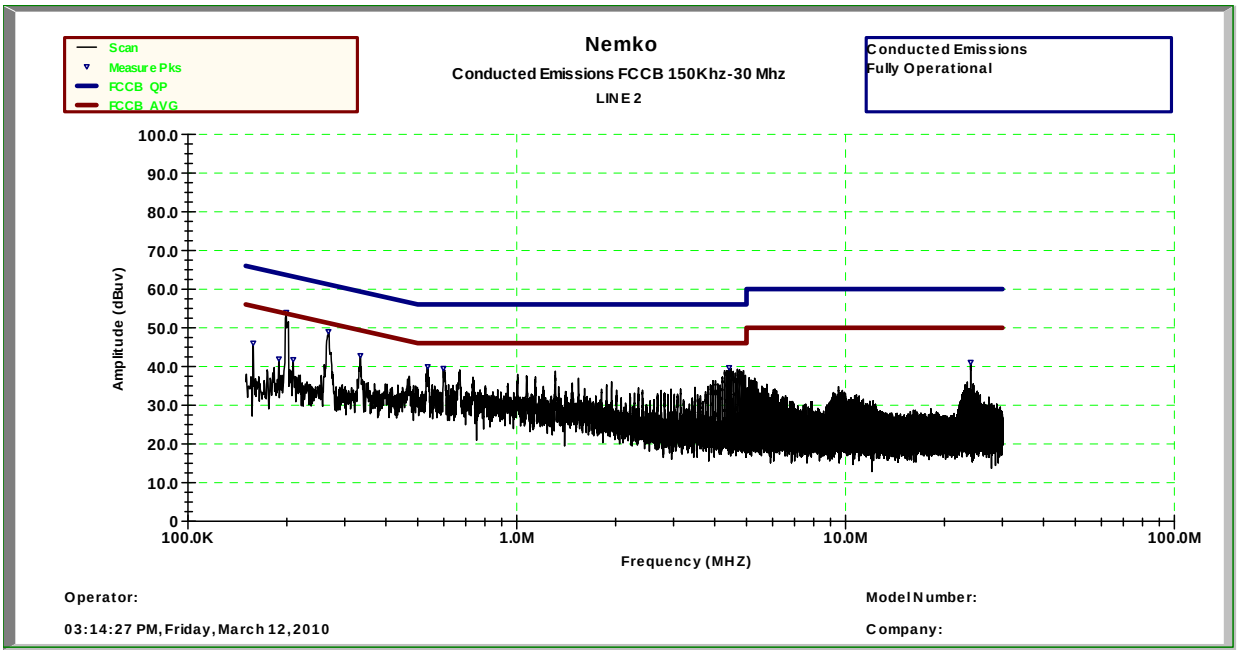
Measurements were made using a spectrum analyzer with 10 kHz RBW, Peak detector. Any emissions that are close to the limit are measured using a test receiver with 9 kHz bandwidth, CISPR Quasi-Peak detector.

Measurement Data:



RSS-General Limits						
Line 1 Final QP/AVG						
LINE 1						
03:05:32 PM, Friday, March 12, 2010						
Frequency	FCCB	FCCB	AVG	AVG	QP	QP
	QP LIMIT	AVG LIMIT	Meas	Margin	Meas	Margin
200.44 kHz	64.6	54.6	44.1	-10.4	53.5	-11.0
268.53 kHz	62.6	52.6	47.5	-5.1	49.6	-13.0

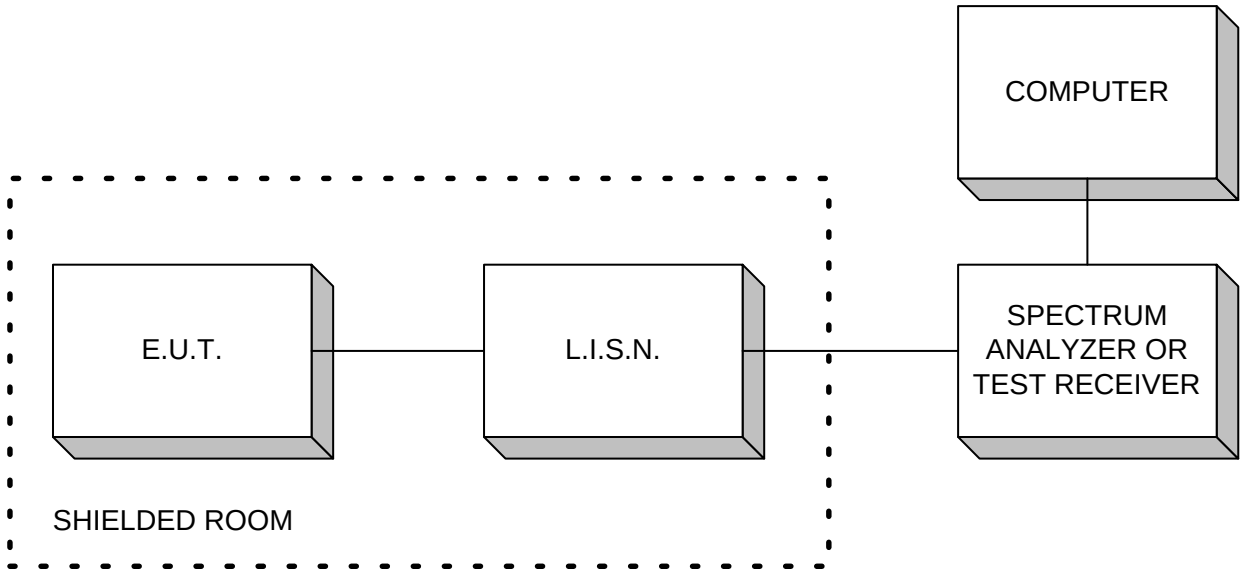
Measurement Data:



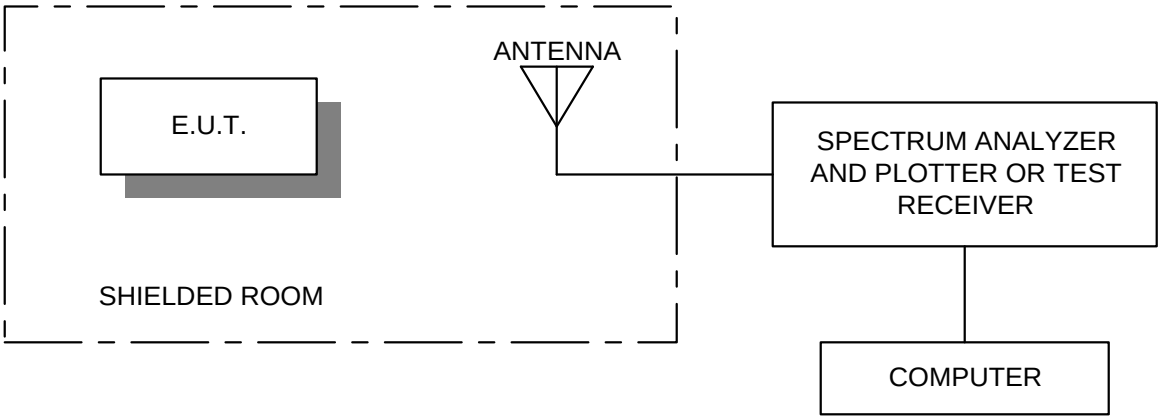
RSS-General Limits						
Line 2 Final QP/Avg						
Line 2						
Operator:						
03:16:02 PM, Friday, March 12, 2010						
Frequency	FCCB	FCCB	AVG	AVG	QP	QP
MHz	QP Limit	AVG Limit	Meas	Margin	Meas	Margin
201.14 KHz	64.5	54.5	43.5	-11.008	53.147	-11.392

Section 5. Block Diagrams

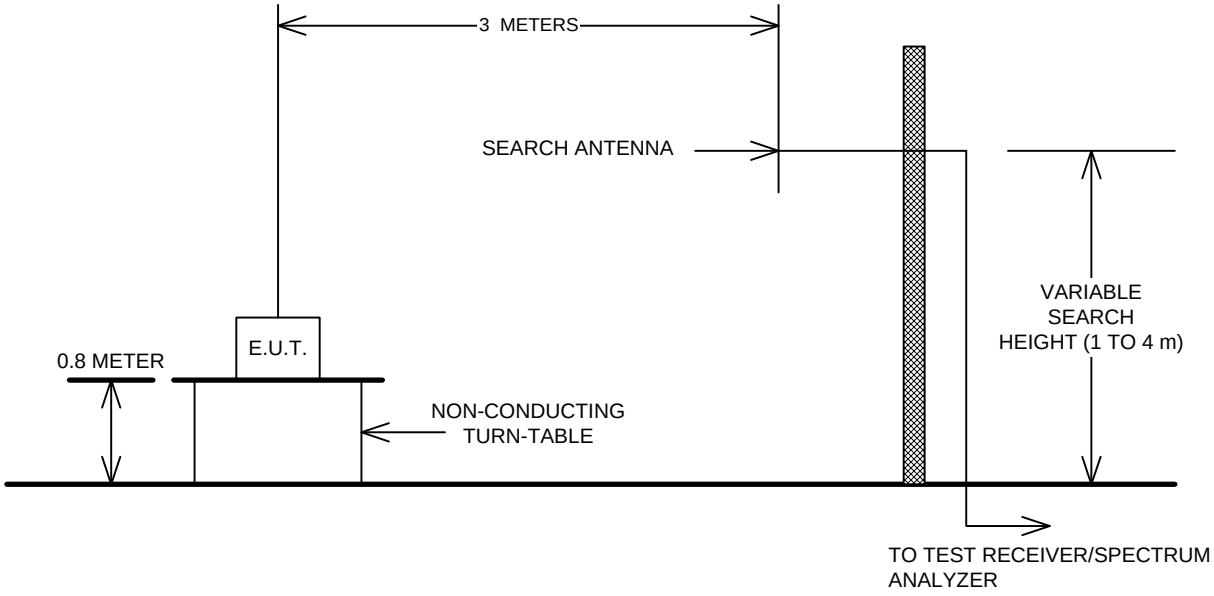
Conducted Emissions



Radiated Prescan



Test Site For Radiated Emissions



Section 6. Test Equipment List

Asset	Description	Mfgr.	Model	Serial #	Last Cal	Next Cal
984	Antenna, Horn	Millitech			N/R	
985	Antenna, Horn	Millitech			N/R	
986	Harmonic Mixer	HP	11970V	2521A01222	N/R	
987	Harmonic Mixer	HP	5356D	2521A00583	N/R	
988	Harmonic Mixer	HP	11970A	2332A01929	N/R	
989	Harmonic Mixer	HP	11970U	2332A00116	N/R	
990	Antenna, Horn	Millitech			N/R	
991	Antenna, Horn	EMCO	3160-10	9704-1049	N/R	
992	Antenna, Horn	EMCO	3160-09	9705-1079	N/R	
993	Antenna, Horn	A.H. Systems	SAS-200/571	162	09-Sep-2009	09-Sep-2011
1016	Preamplifier	HP	8449A	2749A00159	23-Jun-2009	23-Jun-2010
1763	Antenna, Bilog	Schaffner	CBL 6111D	22926	28-Jan-2010	28-Jan-2011
1767	Receiver	R&S	ESIB26	837491/0002	04-Nov-2009	04-Nov-2010
1783	Cable				29-Sep-2009	29-Sep-2010
791	PreAmp	Nemko			03-Aug-2009	03-Aug-2010

ANNEX A

RESTRICTED BANDS

15.205 Restricted Bands of Operation

(a) Except as shown in paragraph (d) of this section , only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42-16.423	399.9-410	4.5-5.15
0.49 - 0.51	16.69475-16.69525	608-614	5.35-5.46
2.1735 - 2.1905	16.80425-16.80475	960-1240	7.25-7.75
3.020 - 3.026	25.5-25.67	1300-1427	8.025-8.5
4.125 - 4.128	37.5-38.25	1435-1626.6	9.0-9.2
4.17725 - 4.17775	73-74.6	1645.5-1646.5	9.3-9.5
4.20725 - 4.20775	74.8-75.2	1660-1710	10.6-12.7
6.215 - 6.218	108-121.94	1718.8-1722.2	13.25-13.4
6.31175 - 6.31225	123-138	2220-2300	14.47-14.5
8.291 - 8.294	149.9-150.05	2310-2390	15.35-16.2
8.362 - 8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625 - 8.38675	156.7-156.9	2655-2900	22.01-23.12
8.41425 - 8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29 - 12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975 - 12.52025	240-285	3345.8-3358	36.43-36.5
12.57675 - 12.57725	322-335.4	3600-4400	Above 38.6
13.36 - 13.41			

ANNEX B

RADIATED EMISSION LIMITS

Radiated Emission Limits

§15.245 Operation within the bands 902-928 MHz, 2435-2465 MHz, 5785-5815 MHz, 10500-10550 MHz and 24075-24175 MHz.

(a) Operation under the provision of this section is limited to intentional radiators used as field disturbance sensors, excluding perimeter protection systems.

(b) The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency (MHz)	Field Strength Of Fundamental (millivolts/meter)	Field Strength of Harmonics (millitvolts/meter)
902-928	500	1.6
2435-2465	500	1.6
5785-5815	500	1.6
10500-10550	2500	25.0
24075-24175	2500	25.0

(1) Regardless of the limits shown in the above table, harmonic emissions in the restricted bands below 17.7 GHz, as specified in §15.205, shall not exceed the field strength limits shown in §15.209. Harmonic emissions in the restricted bands at and above 17.7 GHz shall not exceed the following field strength limits:

(i) For field disturbance sensors designed for use only within a building or to open building doors, 25 mV/m.

(ii) For all other field disturbance sensors, 7.5 mV/m.

(iii) Field disturbance sensors designed to be used in motor vehicles or aircraft must include features to prevent continuous operation unless their emissions in the restricted bands fully comply with the limits given in §15.209. Continuous operation of field disturbance sensors designed to be used in farm equipment; vehicles such as fork-lifts that are intended primarily for use indoors or for very specialized operations. Or railroad locomotives, railroad cars and other equipment which travel on fixed tracks is permitted. A field disturbance sensor will be considered not to be operating in a continuous mode if its operation is limited to specific activities of limited duration (e.g. putting a vehicle in reverse gear, activating a turn signal, etc.).

§15.245, continued

(2) Field strength limits are specified at a distance of 3 meters.

(3) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

(4) The emission limits shown above are based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

§15.209 Radiated Emission Limits, General Requirements

(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (millivolts/meter)	Measurement Distance (meters)
0.009-0.490	2400/F (kHz)	300
0.490-1.705	2400/F (kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3