

EMISSIONS TEST REPORT

Report Number: 3151120BOX-001

Project Number: 3151120

Testing performed on the

Toyota Mirror

Model: 590L Homelink

To

CFR47 Telecommunications
FCC Part 15 Subpart C 15.231
IC RSS-210 Annex 1

For

Gentex Corporation

Test Performed by:
Intertek – ETL SEMKO
70 Codman Hill Road
Boxborough, MA 01719

Test Authorized by:
Gentex Corporation
600 North Centennial
Zeeland, MI 49464

Prepared by:



Nicholas Abbondante

Date: 05/29/2008

Reviewed by:



Michael F. Murphy

Date: 05/29/2008

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1.0 Job Description

1.1 Client Information

This EUT has been tested at the request of:

Company: Gentex Corporation
600 North Centennial
Zeeland, MI 49464
Contact: Mr. Chris Kemperman
Telephone: (616) 772-1590 x4148
Fax: N/A
Email: Chris.Kemperman@Gentex.com

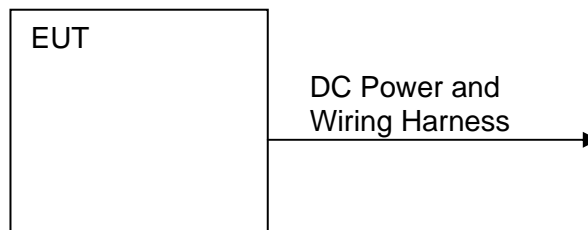
1.2 Equipment Under Test

Equipment Type: Toyota Mirror
Model Number(s): 590L Homelink
Serial number(s): Sample #1
Manufacturer: Gentex Corporation
EUT receive date: 04/21/2008
EUT received condition: Prototype in Good Condition
Test start date: 04/21/2008
Test end date: 05/28/2008

1.3 Test Plan Reference: Tested according to the standards listed, DA-02-2850 "Learned Mode Transmitters", and ANSI C63.4:2003.

1.4 Test Configuration

1.4.1 Block Diagram



1.4.2. Cables:

Cable	Shielding	Connector	Length (m)	Qty.
DC Power	None	Plastic/Wire	2	3
Cable Harness	None	Plastic/Wire	2	3

1.4.3. Support Equipment:

Name: None
Model No.:
Serial No.:

1.5 Mode(s) of Operation:

The EUT was activated from nominal 12VDC powered from a freshly charged car battery. The EUT is capable of tuning over the range from 288 MHz to 418 MHz, excluding restricted bands. During testing, it was programmed to learn operation at 288, 310, 340, 365, 390, and 418 MHz, with 30%, 50%, and 80% duty cycle, using a signal generator pulsed with a 100 Hz PRF and 3 ms, 5 ms, and 8 ms pulse widths and a transmit antenna. All three duty cycles were tested for compliance, as the peak field strength is increased to compensate for the duty cycle reduction, so 30% duty cycle is actually worst-case operation. If the device is presented with a duty cycle lower than 30%, it uses 30% instead.

1.6 Floor Standing Equipment: Applicable:_____ Not Applicable: X

For floor standing equipment, 40cm RFI field uniformity data is located in the chamber equipment folder.

2.0 Test Summary

TEST STANDARD	RESULTS	
CFR47 Telecommunications FCC Part 15 Subpart C 15.231 IC RSS-210 Annex 1		
SUB-TEST	TEST PARAMETER	COMMENT
Radiated Emissions FCC 15.205(a-b), 15.209(a-c, e), 15.231(b) IC RSS-210 A1.1.2	The field strength of the fundamental and spurious emissions must not exceed the limits in FCC 15.231(b) and IC RSS-210 Table 4 or the general limits of FCC 15.209 and IC RSS-210 Table 2, whichever is the less stringent limit. Spurious emissions which occur in the restricted bands of operation of FCC 15.205 and IC RSS-210 Table 1 must meet the general limits of FCC 15.209 and IC RSS-210 Table 2, respectively.	Pass
Operation in Restricted Bands FCC 15.205(a), DA-02-2850	The transmitter must not be capable of operating in the restricted bands of operation of FCC 15.205 and IC RSS-210 Table 1.	Pass

REVISION SUMMARY – The following changes have been made to this Report:

<u>Date</u>	<u>Project</u> <u>No.</u>	<u>Project</u> <u>Handler</u>	<u>Page(s)</u>	<u>Item</u>	<u>Description of Change</u>
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3.0 Sample Calculations

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG$$

Where
 FS = Field Strength in dB μ V/m
 RA = Receiver Amplitude (including preamplifier) in dB μ V
 CF = Cable Attenuation Factor in dB
 AF = Antenna Factor in dB
 AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dB μ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

$$\begin{aligned} RA &= 52.0 \text{ dB}\mu\text{V} \\ AF &= 7.4 \text{ dB/m} \\ CF &= 1.6 \text{ dB} \\ AG &= 29.0 \text{ dB} \\ FS &= 32 \text{ dB}\mu\text{V/m} \end{aligned}$$

$$\text{Level in } \mu\text{V/m} = [10(32 \text{ dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m}$$

The following is how net line-conducted readings were determined:

$$NF = RF + LF + CF + AF$$

Where NF = Net Reading in dB μ V
 RF = Reading from receiver in dB μ V
 LF = LISN Correction Factor in dB
 CF = Cable Correction Factor in dB
 AF = Attenuator Loss Factor in dB

To convert from dB μ V to μ V or mV the following was used:

$$UF = 10^{(NF / 20)} \text{ where UF = Net Reading in } \mu\text{V}$$

Example:

$$\begin{aligned} NF &= RF + LF + CF + AF = 28.5 + 0.2 + 0.4 + 20.0 = 49.1 \text{ dB}\mu\text{V} \\ UF &= 10^{(49.1 \text{ dB}\mu\text{V} / 20)} = 254 \mu\text{V/m} \end{aligned}$$

3.1 Measurement Uncertainty

Compliance of the product is based on the measured value. However, the measurement uncertainty is included for informational purposes.

The expanded uncertainty ($k = 2$) for radiated emissions from 30 to 1000 MHz has been determined to be:

± 3.5 dB at 10m, ± 3.8 dB at 3m

The expanded uncertainty ($k = 2$) for mains conducted emissions from 150 kHz to 30 MHz has been determined to be:

± 2.6 dB

The expanded uncertainty ($k = 2$) for telecom port conducted emissions from 150 kHz to 30 MHz has been determined to be:

± 3.2 for ISN and voltage probe measurements

± 3.1 for current probe measurements

3.2 Site Description

Test Site(s): 2

Our OATS are 3m and 10m sheltered emissions measurement ranges located in a light commercial environment in Boxborough, Massachusetts. They meet the technical requirements of ANSI C63.4-2003 and CISPR 22:1993/EN 55022:1994 for radiated and conducted emission measurements. The shelter structure is entirely fiberglass and plastic, with outside dimensions of 33 ft x 57 ft. The structure resembles a quonset hut with a center ceiling height of 16.5 ft.

The testing floor is covered by a galvanized sheet metal groundplane that is earth-grounded via copper rods around the perimeter of the site. The joints between individual metal sheets are bridged with a 2 inch wide metal strips to provide low RF impedance contact throughout. The sheets are screwed in place with stainless steel, round-head screws every three inches. Site illumination and HVAC are provided from beneath the ground reference plane through flush entry ports, the port covers are electrically bonded to the ground plane.

A flush metal turntable with 12 ft. diameter and 5000 lb. load capacity (12,000 lb. in Site 3) is provided for floor-standing equipment. A wooden table 80 cm high is used for table-top equipment. The turntable is electrically connected to the ground plane with three copper straps. The straps are connected to the turntable at the center of it with ground braid. The copper strap is directly connected to the groundplane at the edges of the turntable. The turntable is located on the south end of the structure and the antennas are mounted 3 and 10 meters away to the north. The antenna mast is a non-conductive with remote control of antenna height and polarization. The antenna height is adjustable from 1 to 4 meters.

All final radiated emission measurements are performed with the testing personnel and measurement equipment located below the ground reference plane. The site has a full basement underneath the turntable where support equipment may be remotely located. Operation of the antenna, turntable and equipment under test is controlled by remote controls that manipulate the antenna height and polarization and with a turntable control. Test personnel are located below the ellipse when measurements are performed, however the site maintains the ability of having personnel manipulate cables while monitoring test equipment. Ambient radiated emissions are 6 dB or more below the relevant FCC emission limits.

AC mains power is brought to the equipment under test through a power line filter, to remove ambient conducted noise. 50 Hz (240 VAC single phase), 60 Hz power (120 VAC single phase, 208 VAC three phase), and 60 Hz (480 VAC three phase) are available. Conducted emission measurements are performed with a Line Impedance Stabilization Network (LISN) or Artificial Mains Network (AMN) bonded to the ground reference plane. A removable vertical groundplane (2 meter X 2 meter area) is used for line-conducted measurements for table top equipment. The vertical groundplane is electrically connected to the reference groundplane.

The EMC Lab has two Semi-anechoic Chambers and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference groundplanes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

Test Results: Pass

Test Standard: FCC Part 15 Subpart C 15.231, IC RSS-210 Annex 1

Test: Radiated Emissions

Performance Criterion: The field strength of the fundamental and spurious emissions must not exceed the limits in FCC 15.231(b) and IC RSS-210 Table 4 or the general limits of FCC 15.209 and IC RSS-210 Table 2, whichever is the less stringent limit. Spurious emissions which occur in the restricted bands of operation of FCC 15.205 and IC RSS-210 Table 1 must meet the general limits of FCC 15.209 and IC RSS-210 Table 2, respectively.

Limits for the fundamental and spurious emissions outside restricted bands were determined to be:

Frequency of Operation (MHz)	Fundamental Emission		Spurious Emissions	
	Peak (dBuV/m)	Average (dBuV/m)	Peak (dBuV/m)	Average (dBuV/m)
288	93.8	73.8	74.0	54.0
310	95.3	75.3	75.3	55.3
340	97.0	77.0	77.0	57.0
365	98.2	78.2	78.2	57.2
390	99.2	79.2	79.2	59.2
418	100.3	80.3	80.3	60.3

Test Environment:

Environmental Conditions During Testing:	Ambient (°C):	See Tables	Humidity (%):	See Tables	Pressure (hPa):	See Tables
Pretest Verification Performed	Yes		Equipment under Test:		590L Homelink	
Test Engineer(s):	Nicholas Abbondante		EUT Serial Number:		Sample #1	

Software Utilized:

Name	Manufacturer	Version
EXCEL 2000	Microsoft Corporation	9.0.6926 SP-3
EMI BOXBOROUGH	Intertek	3/07/07 Revision

Test Equipment Used:

TEST EQUIPMENT LIST					
Item	Equipment Type	Make	Model No.	Serial No.	Next Cal. Due
1	Digital 4 Line Barometer	Mannix	0ABA116	BAR2	05/20/2008*
2	9kHz to 3GHz EMI Test Receiver	Rohde & Schwartz	ESCI 1166.5950K03	100067	01/25/2009
3	ANTENNA	EMCO	3142	9711-1225	06/05/2008
4	3 Meter In floor cable for site 2	ITS	RG214B/U	S2 3M FLR	09/17/2008
5	HORN ANTENNA	EMCO	3115	9602-4675	09/24/2008
6	High Frequency Cable 40GHz	Megaphase	TM40 K1K1 197	CBL027	12/06/2008
7	High Frequency Cable 40GHz	Megaphase	TM40 K1K1 197	CBL028	12/06/2008
8	PREAMPLIFIER 1- 40 GHz	MITEQ	NSP4000-NF	507145	11/09/2008
9	1GHz High Pass Filter	Reactel, Inc	7HS-1G/10G-S11	06-1	09/18/2008
10	Synthesized Sweep Generator	Hewlett Packard	83620A	3213A01244	02/06/2009
11	BROADBAND ANTENNA	Compliance Design	B200	1850	09/13/2008
12	40 GHz Cable	Megaphase	TM40-K1K1-80	7030802 002	05/23/2008**
13	Spectrum Analyzer 20Hz - 40 GHz	Rohde & Schwartz	FSEK-30	100225	11/26/2008

* - Used only on 5/20/08 and before

** - Used only to program the mirror

Test Results:

Notes: Average values for the fundamental and harmonic emissions were determined by applying a duty cycle averaging factor based on a 30%, 50%, and 80% duty cycle. The factors were calculated to be:

Duty cycle factor (dB) = $20 \cdot \text{LOG}(\text{on-time}/(\text{on-time}+\text{off-time}))$

Duty cycle factor 30% (dB) = -10.46 dB = $20 \cdot \text{LOG}(0.3)$

Duty cycle factor 50% (dB) = -6.02 dB = $20 \cdot \text{LOG}(0.5)$

Duty cycle factor 80% (dB) = -1.94 dB = $20 \cdot \text{LOG}(0.8)$

Data for the fundamental and harmonics is presented with all three duty cycles. Spurious emissions data was measured using a peak and an average detector and only worst-case data is shown.

Special Radiated Emissions

Company: Gentex Corporation
 Model #: 590L HL
 Serial #: Sample 1
 Engineers: Nicholas Abbondante
 Project #: 3151120
 Standard: FCC Part 15 Subpart C 15.231/IC RSS-210 Annex 1
 Receiver: R&S ESCI (ROS002)
 PreAmp: NONE
 Antenna & Cables: N Bands: N, LF, HF, SHF
 Antenna: LOG4 06-05-08 V3.txt LOG4 06-05-08 H3.txt
 Cable(s): S2 3M FLR 9-17-08.txt NONE
 Barometer: BAR2
 Location: Site 2
 Date(s): 04/24/08
 Temp/Humidity/Pressure: 21c 29% 1050mB
 Limit Distance (m): 3
 Test Distance (m): 3
 PreAmp Used? (Y or N): N Voltage/Frequency: Fresh 12V Battery Frequency Range: Frequencies Shown
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/BW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth
Note: 80%/50%/30% Duty Cycle; Scale Settings 12EB, 13EA, 12EB, 12EB, 11EC, 11EC; Sample 1; retrained sample											
PK	V	288.000	55.9	13.4	2.2	0.0	0.0	71.5	93.8	-22.3	120/300 kHz
PK	V	288.000	59.9	13.4	2.2	0.0	0.0	75.5	93.8	-18.3	120/300 kHz
PK	V	288.000	64.9	13.4	2.2	0.0	0.0	80.5	93.8	-13.3	120/300 kHz
AVG	V	288.000	54.0	13.4	2.2	0.0	0.0	69.6	73.8	-4.3	120/300 kHz
AVG	V	288.000	53.9	13.4	2.2	0.0	0.0	69.5	73.8	-4.3	120/300 kHz
AVG	V	288.000	54.5	13.4	2.2	0.0	0.0	70.1	73.8	-3.8	120/300 kHz
PK	V	310.000	57.1	14.0	2.3	0.0	0.0	73.4	95.3	-22.0	120/300 kHz
PK	V	310.000	62.1	14.0	2.3	0.0	0.0	78.4	95.3	-17.0	120/300 kHz
PK	V	310.000	66.1	14.0	2.3	0.0	0.0	82.4	95.3	-12.9	120/300 kHz
AVG	V	310.000	55.1	14.0	2.3	0.0	0.0	71.4	75.3	-3.9	120/300 kHz
AVG	V	310.000	56.1	14.0	2.3	0.0	0.0	72.3	75.3	-3.0	120/300 kHz
AVG	V	310.000	55.7	14.0	2.3	0.0	0.0	72.0	75.3	-3.4	120/300 kHz
PK	V	340.000	58.5	15.0	2.4	0.0	0.0	75.9	97.0	-21.1	120/300 kHz
PK	V	340.000	62.8	15.0	2.4	0.0	0.0	80.2	97.0	-16.8	120/300 kHz
PK	V	340.000	67.0	15.0	2.4	0.0	0.0	84.4	97.0	-12.6	120/300 kHz
AVG	V	340.000	56.6	15.0	2.4	0.0	0.0	74.0	77.0	-3.0	120/300 kHz
AVG	V	340.000	56.8	15.0	2.4	0.0	0.0	74.2	77.0	-2.8	120/300 kHz
AVG	V	340.000	56.5	15.0	2.4	0.0	0.0	73.9	77.0	-3.1	120/300 kHz
PK	V	365.000	59.6	15.4	2.5	0.0	0.0	77.5	98.2	-20.7	120/300 kHz
PK	V	365.000	63.0	15.4	2.5	0.0	0.0	80.9	98.2	-17.3	120/300 kHz
PK	V	365.000	67.3	15.4	2.5	0.0	0.0	85.2	98.2	-13.0	120/300 kHz
AVG	V	365.000	57.6	15.4	2.5	0.0	0.0	75.6	78.2	-2.6	120/300 kHz
AVG	V	365.000	57.0	15.4	2.5	0.0	0.0	74.9	78.2	-3.3	120/300 kHz
AVG	V	365.000	56.8	15.4	2.5	0.0	0.0	74.7	78.2	-3.5	120/300 kHz
PK	V	390.000	61.0	15.4	2.6	0.0	0.0	79.0	99.2	-20.2	120/300 kHz
PK	V	390.000	64.8	15.4	2.6	0.0	0.0	82.8	99.2	-16.4	120/300 kHz
PK	V	390.000	68.5	15.4	2.6	0.0	0.0	86.5	99.2	-12.7	120/300 kHz
AVG	V	390.000	59.1	15.4	2.6	0.0	0.0	77.0	79.2	-2.2	120/300 kHz
AVG	V	390.000	58.8	15.4	2.6	0.0	0.0	76.8	79.2	-2.4	120/300 kHz
AVG	V	390.000	58.0	15.4	2.6	0.0	0.0	76.0	79.2	-3.2	120/300 kHz
PK	V	418.000	60.5	15.9	2.7	0.0	0.0	79.2	100.3	-21.1	120/300 kHz
PK	V	418.000	65.2	15.9	2.7	0.0	0.0	83.9	100.3	-16.4	120/300 kHz
PK	V	418.000	69.4	15.9	2.7	0.0	0.0	88.1	100.3	-12.2	120/300 kHz
AVG	V	418.000	58.6	15.9	2.7	0.0	0.0	77.3	80.3	-3.0	120/300 kHz
AVG	V	418.000	59.2	15.9	2.7	0.0	0.0	77.9	80.3	-2.4	120/300 kHz
AVG	V	418.000	58.9	15.9	2.7	0.0	0.0	77.6	80.3	-2.7	120/300 kHz

FCC IC

Special Radiated Emissions

Company: Gentex Corporation
 Model #: 590L HL
 Serial #: Sample 1
 Engineers: Nicholas Abbondante
 Project #: 3151120
 Standard: FCC Part 15 Subpart C 15.231/IC RSS-210 Annex 1
 Receiver: R&S ESCI (ROS002)
 PreAmp: PRE8 11-09-08.txt
 Date(s): 05/12/08
 Location: Site 2
 Antenna & Cables: N Bands: N, LF, HF, SHF
 Antenna: LOG4 06-05-08 V3.txt LOG4 06-05-08 H3.txt
 Cable(s): S2 3M FLR 9-17-08.txt NONE.
 Barometer: BAR2
 Temp/Humidity/Pressure: 19c 34% 1050mB
 Limit Distance (m): 3
 Test Distance (m): 3
 PreAmp Used? (Y or N): N Voltage/Frequency: Fresh 12VDC Battery Frequency Range: 30-1000 MHz
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC	IC
Note: 80%/50%/30% Duty Cycle; Scale Settings 12EB, 13EA, 12EB, 12EB, 11EC, 11EC; Sample 1; 288 MHz													
PK	H	576.000	30.5	19.1	3.5	0.0	0.0	53.0	73.8	-20.8	120/300 kHz		
PK	H	576.000	34.9	19.1	3.5	0.0	0.0	57.5	73.8	-16.3	120/300 kHz		
PK	H	576.000	38.8	19.1	3.5	0.0	0.0	61.4	73.8	-12.4	120/300 kHz		
AVG	H	576.000	28.5	19.1	3.5	0.0	0.0	51.1	53.8	-2.7	120/300 kHz		
AVG	H	576.000	28.9	19.1	3.5	0.0	0.0	51.5	53.8	-2.3	120/300 kHz		
AVG	H	576.000	28.4	19.1	3.5	0.0	0.0	50.9	53.8	-2.9	120/300 kHz		
PK	V	864.000	13.6	23.5	4.5	0.0	0.0	41.6	73.8	-32.2	120/300 kHz		
PK	V	864.000	14.9	23.5	4.5	0.0	0.0	42.9	73.8	-30.9	120/300 kHz		
PK	V	864.000	18.2	23.5	4.5	0.0	0.0	46.3	73.8	-27.5	120/300 kHz		
AVG	V	864.000	11.6	23.5	4.5	0.0	0.0	39.7	53.8	-14.1	120/300 kHz		
AVG	V	864.000	8.8	23.5	4.5	0.0	0.0	36.9	53.8	-16.9	120/300 kHz		
AVG	V	864.000	7.8	23.5	4.5	0.0	0.0	35.8	53.8	-18.0	120/300 kHz		
PK	H	240.000	9.6	12.0	2.0	0.0	0.0	23.6	46.0	-22.4	120/300 kHz	RB	RB
AVG	H	240.000	2.6	12.0	2.0	0.0	0.0	16.6	46.0	-29.4	120/300 kHz	RB	RB
PK	H	271.600	3.7	12.8	2.1	0.0	0.0	18.6	46.0	-27.4	120/300 kHz	RB	RB
AVG	H	271.600	-6.0	12.8	2.1	0.0	0.0	8.9	46.0	-37.1	120/300 kHz	RB	RB
PK	H	360.000	5.1	15.9	2.5	0.0	0.0	23.5	73.8	-50.3	120/300 kHz		
AVG	H	360.000	-4.6	15.9	2.5	0.0	0.0	13.8	53.8	-40.0	120/300 kHz		
PK	H	395.200	5.4	16.4	2.6	0.0	0.0	24.3	73.8	-49.5	120/300 kHz		
AVG	H	395.200	-5.4	16.4	2.6	0.0	0.0	13.6	53.8	-40.2	120/300 kHz		

Special Radiated Emissions

Company: Gentex Corporation
 Model #: 590L HL
 Serial #: Sample 1
 Engineers: Nicholas Abbondante
 Project #: 3151120
 Standard: FCC Part 15 Subpart C 15.231/IC RSS-210 Annex 1
 Receiver: R&S FSEK-30 (ROS001)
 PreAmp: PRE8 11-09-08.txt
 Date(s): 05/22/08
 Location: Site 2
 Temp/Humidity/Pressure: 20c 54% 987mB
 Antenna & Cables: HF Bands: N, LF, HF, SHF
 Antenna: Horn2 V1m 9-24-2008.txt
 Cable(s): CBL027 12-06-08.txt CBL028 12-06-08.txt
 Barometer: MAN1 Filter: REA003
 Limit Distance (m): 3
 Test Distance (m): 3
 PreAmp Used? (Y or N): Y Voltage/Frequency: Fresh Battery Frequency Range: 1-2.88 GHz
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC	IC
Note: 80%/50%/30% Duty Cycle; Scale Settings 12EB, 13EA, 12EB, 12EB, 11EC, 11EC; 288 MHz													
PK	H	1152.000	31.5	25.5	4.0	20.6	0.0	40.4	74.0	-33.6	1/3 MHz	RB	RB
PK	H	1152.000	31.6	25.5	4.0	20.6	0.0	40.5	74.0	-33.5	1/3 MHz	RB	RB
PK	H	1152.000	32.2	25.5	4.0	20.6	0.0	41.2	74.0	-32.8	1/3 MHz	RB	RB
AVG	H	1152.000	29.5	25.5	4.0	20.6	0.0	38.5	54.0	-15.5	1/3 MHz	RB	RB
AVG	H	1152.000	25.5	25.5	4.0	20.6	0.0	34.5	54.0	-19.5	1/3 MHz	RB	RB
AVG	H	1152.000	21.8	25.5	4.0	20.6	0.0	30.7	54.0	-23.3	1/3 MHz	RB	RB
PK	V	1440.000	31.1	25.3	4.6	20.7	0.0	40.2	74.0	-33.8	1/3 MHz	RB	RB
PK	V	1440.000	32.0	25.3	4.6	20.7	0.0	41.2	74.0	-32.8	1/3 MHz	RB	RB
PK	V	1440.000	35.5	25.3	4.6	20.7	0.0	44.7	74.0	-29.3	1/3 MHz	RB	RB
AVG	V	1440.000	29.1	25.3	4.6	20.7	0.0	38.3	54.0	-15.7	1/3 MHz	RB	RB
AVG	V	1440.000	26.0	25.3	4.6	20.7	0.0	35.2	54.0	-18.8	1/3 MHz	RB	RB
AVG	V	1440.000	25.1	25.3	4.6	20.7	0.0	34.3	54.0	-19.7	1/3 MHz	RB	RB
PK	H	1728.000	31.3	26.6	5.1	20.8	0.0	42.2	74.0	-31.8	1/3 MHz		
PK	H	1728.000	32.3	26.6	5.1	20.8	0.0	43.2	74.0	-30.8	1/3 MHz		
PK	H	1728.000	33.6	26.6	5.1	20.8	0.0	44.5	74.0	-29.5	1/3 MHz		
AVG	H	1728.000	29.3	26.6	5.1	20.8	0.0	40.2	54.0	-13.8	1/3 MHz		
AVG	H	1728.000	26.2	26.6	5.1	20.8	0.0	37.1	54.0	-16.9	1/3 MHz		
AVG	H	1728.000	23.1	26.6	5.1	20.8	0.0	34.1	54.0	-19.9	1/3 MHz		
PK	H	2016.000	30.5	28.0	5.6	20.8	0.0	43.3	74.0	-30.7	1/3 MHz		
PK	H	2016.000	31.0	28.0	5.6	20.8	0.0	43.7	74.0	-30.3	1/3 MHz		
PK	H	2016.000	31.0	28.0	5.6	20.8	0.0	43.8	74.0	-30.2	1/3 MHz		
AVG	H	2016.000	28.6	28.0	5.6	20.8	0.0	41.4	54.0	-12.6	1/3 MHz		
AVG	H	2016.000	24.9	28.0	5.6	20.8	0.0	37.7	54.0	-16.3	1/3 MHz		
AVG	H	2016.000	20.5	28.0	5.6	20.8	0.0	33.3	54.0	-20.7	1/3 MHz		
PK	V	2304.000	30.3	28.5	6.1	20.9	0.0	43.9	74.0	-30.1	1/3 MHz		
PK	V	2304.000	30.2	28.5	6.1	20.9	0.0	43.9	74.0	-30.1	1/3 MHz		
PK	V	2304.000	30.3	28.5	6.1	20.9	0.0	43.9	74.0	-30.1	1/3 MHz		
AVG	V	2304.000	28.4	28.5	6.1	20.9	0.0	42.0	54.0	-12.0	1/3 MHz		
AVG	V	2304.000	24.2	28.5	6.1	20.9	0.0	37.8	54.0	-16.2	1/3 MHz		
AVG	V	2304.000	19.8	28.5	6.1	20.9	0.0	33.5	54.0	-20.5	1/3 MHz		
PK	V	2592.000	30.7	29.1	6.6	21.1	0.0	45.3	74.0	-28.7	1/3 MHz		
PK	V	2592.000	30.9	29.1	6.6	21.1	0.0	45.5	74.0	-28.5	1/3 MHz		
PK	V	2592.000	30.8	29.1	6.6	21.1	0.0	45.4	74.0	-28.6	1/3 MHz		
AVG	V	2592.000	28.8	29.1	6.6	21.1	0.0	43.4	54.0	-10.6	1/3 MHz		
AVG	V	2592.000	24.9	29.1	6.6	21.1	0.0	39.5	54.0	-14.5	1/3 MHz		
AVG	V	2592.000	20.3	29.1	6.6	21.1	0.0	34.9	54.0	-19.1	1/3 MHz		
PK	V	2880.000	31.3	30.2	6.9	21.2	0.0	47.2	74.0	-26.8	1/3 MHz	RB	RB
PK	V	2880.000	31.4	30.2	6.9	21.2	0.0	47.2	74.0	-26.8	1/3 MHz	RB	RB
PK	V	2880.000	31.4	30.2	6.9	21.2	0.0	47.2	74.0	-26.8	1/3 MHz	RB	RB
AVG	V	2880.000	29.3	30.2	6.9	21.2	0.0	45.2	54.0	-8.8	1/3 MHz	RB	RB
AVG	V	2880.000	25.3	30.2	6.9	21.2	0.0	41.2	54.0	-12.8	1/3 MHz	RB	RB
AVG	V	2880.000	20.9	30.2	6.9	21.2	0.0	36.8	54.0	-17.2	1/3 MHz	RB	RB

Special Radiated Emissions

Company: Gentex Corporation
 Model #: 590L HL
 Serial #: Sample 1
 Engineers: Nicholas Abbondante
 Project #: 3151120
 Standard: FCC Part 15 Subpart C 15.231/IC RSS-210 Annex 1
 Receiver: R&S ESCI (ROS002)
 PreAmp: PRE8 11-09-08.txt
 Date(s): 05/12/08
 Location: Site 2
 Antenna & Cables: N Bands: N, LF, HF, SHF
 Antenna: LOG4 06-05-08 V3.txt LOG4 06-05-08 H3.txt
 Cable(s): S2 3M FLR 9-17-08.txt NONE.
 Barometer: BAR2
 Temp/Humidity/Pressure: 19c 34% 1050mB
 Limit Distance (m): 3
 Test Distance (m): 3
 PreAmp Used? (Y or N): N Voltage/Frequency: Fresh 12VDC Battery Frequency Range: 30-1000 MHz
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC	IC
Note: 80%/50%/30% Duty Cycle; Scale Settings 12EB, 13EA, 12EB, 12EB, 11EC, 11EC; Sample 1; 310 MHz													
PK	H	620.000	19.7	20.6	3.5	0.0	0.0	43.8	75.3	-31.5	120/300 kHz		
PK	H	620.000	25.2	20.6	3.5	0.0	0.0	49.4	75.3	-25.9	120/300 kHz		
PK	H	620.000	33.7	20.6	3.5	0.0	0.0	57.9	75.3	-17.4	120/300 kHz		
AVG	H	620.000	17.7	20.6	3.5	0.0	0.0	41.9	55.3	-13.4	120/300 kHz		
AVG	H	620.000	19.2	20.6	3.5	0.0	0.0	43.4	55.3	-11.9	120/300 kHz		
AVG	H	620.000	23.2	20.6	3.5	0.0	0.0	47.4	55.3	-7.9	120/300 kHz		
PK	V	930.000	3.0	23.3	4.6	0.0	0.0	31.0	75.3	-44.3	120/300 kHz		
PK	V	930.000	4.0	23.3	4.6	0.0	0.0	32.0	75.3	-43.3	120/300 kHz		
PK	V	930.000	7.7	23.3	4.6	0.0	0.0	35.7	75.3	-39.6	120/300 kHz		
AVG	V	930.000	1.1	23.3	4.6	0.0	0.0	29.0	55.3	-26.3	120/300 kHz		
AVG	V	930.000	-2.0	23.3	4.6	0.0	0.0	25.9	55.3	-29.4	120/300 kHz		
AVG	V	930.000	-2.8	23.3	4.6	0.0	0.0	25.2	55.3	-30.1	120/300 kHz		
PK	H	240.000	7.4	12.0	2.0	0.0	0.0	21.4	46.0	-24.6	120/300 kHz	RB	RB
AVG	H	240.000	0.2	12.0	2.0	0.0	0.0	14.2	46.0	-31.8	120/300 kHz	RB	RB
PK	H	280.000	4.3	13.0	2.2	0.0	0.0	19.5	46.0	-26.5	120/300 kHz	RB	RB
AVG	H	280.000	-5.4	13.0	2.2	0.0	0.0	9.8	46.0	-36.2	120/300 kHz	RB	RB
PK	H	361.600	5.5	15.9	2.5	0.0	0.0	23.9	75.3	-51.4	120/300 kHz		
AVG	H	361.600	-4.4	15.9	2.5	0.0	0.0	14.0	55.3	-41.3	120/300 kHz		
PK	H	395.200	2.1	16.4	2.6	0.0	0.0	21.1	75.3	-54.2	120/300 kHz		
AVG	H	395.200	-5.7	16.4	2.6	0.0	0.0	13.3	55.3	-42.0	120/300 kHz		

Special Radiated Emissions

Company: Gentex Corporation
 Model #: 590L HL
 Serial #: Sample 1
 Engineers: Nicholas Abbondante
 Project #: 3151120
 Standard: FCC Part 15 Subpart C 15.231/IC RSS-210 Annex 1
 Receiver: R&S FSEK-30 (ROS001)
 PreAmp: PRE8 11-09-08.txt
 PreAmp Used? (Y or N): Y
 Antenna & Cables: HF
 Antenna: Horn2 V1m 9-24-2008.txt
 Cable(s): CBL027 12-06-08.txt
 Barometer: MAN1
 Bands: N, LF, HF, SHF
 Horn2 H1m 9-24-2008.txt
 CBL028 12-06-08.txt
 Filter: REA003
 Location: Site 2
 Date(s): 05/22/08
 Temp/Humidity/Pressure: 20c 54% 987mB
 Limit Distance (m): 3
 Test Distance (m): 3
 Voltage/Frequency: Fresh Battery
 Frequency Range: 1-3.1 GHz
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC	IC	
Note: 80%/50%/30% Duty Cycle; Scale Settings 12EB, 13EA, 12EB, 12EB, 11EC, 11EC; 310 MHz														
PK	H	1240.000	31.1	25.5	4.2	20.6	0.0	40.1	74.0	-33.9	1/3 MHz	RB	RB	
PK	H	1240.000	31.2	25.5	4.2	20.6	0.0	40.3	74.0	-33.7	1/3 MHz	RB	RB	
PK	H	1240.000	31.2	25.5	4.2	20.6	0.0	40.3	74.0	-33.7	1/3 MHz	RB	RB	
AVG	H	1240.000	29.1	25.5	4.2	20.6	0.0	38.2	54.0	-15.8	1/3 MHz	RB	RB	
AVG	H	1240.000	25.2	25.5	4.2	20.6	0.0	34.2	54.0	-19.8	1/3 MHz	RB	RB	
AVG	H	1240.000	20.8	25.5	4.2	20.6	0.0	29.8	54.0	-24.2	1/3 MHz	RB	RB	
PK	V	1550.000	32.2	25.6	4.8	20.7	0.0	41.8	74.0	-32.2	1/3 MHz	RB	RB	
PK	V	1550.000	33.2	25.6	4.8	20.7	0.0	42.8	74.0	-31.2	1/3 MHz	RB	RB	
PK	V	1550.000	33.7	25.6	4.8	20.7	0.0	43.3	74.0	-30.7	1/3 MHz	RB	RB	
AVG	V	1550.000	30.3	25.6	4.8	20.7	0.0	39.9	54.0	-14.1	1/3 MHz	RB	RB	
AVG	V	1550.000	27.1	25.6	4.8	20.7	0.0	36.8	54.0	-17.2	1/3 MHz	RB	RB	
AVG	V	1550.000	23.3	25.6	4.8	20.7	0.0	32.9	54.0	-21.1	1/3 MHz	RB	RB	
PK	V	1860.000	30.9	27.2	5.3	20.8	0.0	42.7	75.3	-32.6	1/3 MHz			
PK	V	1860.000	30.7	27.2	5.3	20.8	0.0	42.5	75.3	-32.8	1/3 MHz			
PK	V	1860.000	31.5	27.2	5.3	20.8	0.0	43.3	75.3	-32.0	1/3 MHz			
AVG	V	1860.000	29.0	27.2	5.3	20.8	0.0	40.8	55.3	-14.5	1/3 MHz			
AVG	V	1860.000	24.7	27.2	5.3	20.8	0.0	36.5	55.3	-18.8	1/3 MHz			
AVG	V	1860.000	21.1	27.2	5.3	20.8	0.0	32.8	55.3	-22.5	1/3 MHz			
PK	V	2170.000	30.8	28.3	5.9	20.9	0.0	44.1	75.3	-31.2	1/3 MHz			
PK	V	2170.000	31.4	28.3	5.9	20.9	0.0	44.7	75.3	-30.6	1/3 MHz			
PK	V	2170.000	31.9	28.3	5.9	20.9	0.0	45.1	75.3	-30.2	1/3 MHz			
AVG	V	2170.000	28.9	28.3	5.9	20.9	0.0	42.1	55.3	-13.2	1/3 MHz			
AVG	V	2170.000	25.4	28.3	5.9	20.9	0.0	38.7	55.3	-16.6	1/3 MHz			
AVG	V	2170.000	21.4	28.3	5.9	20.9	0.0	34.7	55.3	-20.6	1/3 MHz			
PK	V	2480.000	30.8	28.8	6.4	21.0	0.0	45.0	75.3	-30.3	1/3 MHz			
PK	V	2480.000	31.1	28.8	6.4	21.0	0.0	45.3	75.3	-30.0	1/3 MHz			
PK	V	2480.000	31.4	28.8	6.4	21.0	0.0	45.5	75.3	-29.8	1/3 MHz			
AVG	V	2480.000	28.9	28.8	6.4	21.0	0.0	43.1	55.3	-12.2	1/3 MHz			
AVG	V	2480.000	25.1	28.8	6.4	21.0	0.0	39.2	55.3	-16.1	1/3 MHz			
AVG	V	2480.000	20.9	28.8	6.4	21.0	0.0	35.1	55.3	-20.2	1/3 MHz			
PK	V	2790.000	31.5	29.8	6.8	21.2	0.0	47.0	74.0	-27.0	1/3 MHz	RB	RB	
PK	V	2790.000	31.5	29.8	6.8	21.2	0.0	47.0	74.0	-27.0	1/3 MHz	RB	RB	
PK	V	2790.000	31.5	29.8	6.8	21.2	0.0	47.0	74.0	-27.0	1/3 MHz	RB	RB	
AVG	V	2790.000	29.5	29.8	6.8	21.2	0.0	45.0	54.0	-9.0	1/3 MHz	RB	RB	
AVG	V	2790.000	25.5	29.8	6.8	21.2	0.0	41.0	54.0	-13.0	1/3 MHz	RB	RB	
AVG	V	2790.000	21.0	29.8	6.8	21.2	0.0	36.5	54.0	-17.5	1/3 MHz	RB	RB	
PK	V	3100.000	30.8	30.8	7.2	21.3	0.0	47.5	75.3	-27.8	1/3 MHz			
PK	V	3100.000	30.7	30.8	7.2	21.3	0.0	47.4	75.3	-27.9	1/3 MHz			
PK	V	3100.000	30.8	30.8	7.2	21.3	0.0	47.5	75.3	-27.8	1/3 MHz			
AVG	V	3100.000	28.8	30.8	7.2	21.3	0.0	45.5	55.3	-9.8	1/3 MHz			
AVG	V	3100.000	24.7	30.8	7.2	21.3	0.0	41.4	55.3	-13.9	1/3 MHz			
AVG	V	3100.000	20.3	30.8	7.2	21.3	0.0	37.0	55.3	-18.3	1/3 MHz			

Special Radiated Emissions

Company: Gentex Corporation
 Model #: 590L HL
 Serial #: Sample 1
 Engineers: Nicholas Abbondante
 Project #: 3151120
 Standard: FCC Part 15 Subpart C 15.231/IC RSS-210 Annex 1
 Receiver: R&S ESCI (ROS002)
 PreAmp: PRE8 11-09-08.txt
 Antenna & Cables: N Bands: N, LF, HF, SHF
 Antenna: LOG4 06-05-08 V3.txt LOG4 06-05-08 H3.txt
 Cable(s): S2 3M FLR 9-17-08.txt NONE.
 Barometer: BAR2
 Location: Site 2
 Date(s): 05/13/08
 Temp/Humidity/Pressure: 21c 30% 1050mB
 Limit Distance (m): 3
 Test Distance (m): 3
 PreAmp Used? (Y or N): N Voltage/Frequency: Fresh 12VDC Battery Frequency Range: 30-1000 MHz
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(μV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(μV/m)	Limit dB(μV/m)	Margin dB	Bandwidth	FCC	IC
Note: 80%/50%/30% Duty Cycle; Scale Settings 12EB, 13EA, 12EB, 12EB, 11EC, 11EC; Sample 1; 340 MHz													
PK	H	680.000	14.9	21.7	3.8	0.0	0.0	40.4	77.0	-36.6	120/300 kHz		
PK	H	680.000	21.7	21.7	3.8	0.0	0.0	47.1	77.0	-29.9	120/300 kHz		
PK	H	680.000	28.8	21.7	3.8	0.0	0.0	54.3	77.0	-22.7	120/300 kHz		
AVG	H	680.000	12.9	21.7	3.8	0.0	0.0	38.4	57.0	-18.6	120/300 kHz		
AVG	H	680.000	15.6	21.7	3.8	0.0	0.0	41.1	57.0	-15.9	120/300 kHz		
AVG	H	680.000	18.3	21.7	3.8	0.0	0.0	43.8	57.0	-13.2	120/300 kHz		
PK	V	224.200	8.8	12.1	1.9	0.0	0.0	22.8	77.0	-54.2	120/300 kHz		
AVG	V	224.200	0.2	12.1	1.9	0.0	0.0	14.2	57.0	-42.8	120/300 kHz		
PK	H	240.000	6.7	12.0	2.0	0.0	0.0	20.7	46.0	-25.3	120/300 kHz		
AVG	H	240.000	0.4	12.0	2.0	0.0	0.0	14.4	46.0	-31.6	120/300 kHz		
PK	H	286.800	5.1	13.3	2.2	0.0	0.0	20.6	77.0	-56.4	120/300 kHz		
AVG	H	286.800	-5.1	13.3	2.2	0.0	0.0	10.4	57.0	-46.6	120/300 kHz		
PK	H	359.600	5.4	15.8	2.5	0.0	0.0	23.7	77.0	-53.3	120/300 kHz		
AVG	H	359.600	-5.0	15.8	2.5	0.0	0.0	13.4	57.0	-43.6	120/300 kHz		
PK	H	393.200	6.5	16.3	2.6	0.0	0.0	25.4	77.0	-51.6	120/300 kHz		
AVG	H	393.200	-4.6	16.3	2.6	0.0	0.0	14.3	57.0	-42.7	120/300 kHz		

Special Radiated Emissions

Company: Gentex Corporation
 Model #: 590L HL
 Serial #: Sample 1
 Engineers: Nicholas Abbondante
 Project #: 3151120
 Standard: FCC Part 15 Subpart C 15.231/IC RSS-210 Annex 1
 Receiver: R&S FSEK-30 (ROS001)
 PreAmp: PRE8 11-09-08.txt
 PreAmp Used? (Y or N): Y
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Antenna & Cables: HF
 Antenna: Horn2 V1m 9-24-2008.txt
 Cable(s): CBL027 12-06-08.txt
 Barometer: MAN1
 Bands: N, LF, HF, SHF
 Horn2 H1m 9-24-2008.txt
 CBL028 12-06-08.txt
 Filter: REA003

Location: Site 2
 Date(s): 05/27/08
 Temp/Humidity/Pressure: 22c 62% 998mB

Limit Distance (m): 3
 Test Distance (m): 3
 Voltage/Frequency: Fresh Battery
 Frequency Range: 1-3.4 GHz

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC	IC
Note: 80%/50%/30% Duty Cycle; Scale Settings 12EB, 13EA, 12EB, 12EB, 11EC, 11EC; 340 MHz													
PK	V	1020.000	31.8	25.3	3.8	20.6	0.0	40.3	74.0	-33.7	1/3 MHz	RB	RB
PK	V	1020.000	31.9	25.3	3.8	20.6	0.0	40.4	74.0	-33.6	1/3 MHz	RB	RB
PK	V	1020.000	32.9	25.3	3.8	20.6	0.0	41.4	74.0	-32.6	1/3 MHz	RB	RB
AVG	V	1020.000	29.9	25.3	3.8	20.6	0.0	38.4	54.0	-15.6	1/3 MHz	RB	RB
AVG	V	1020.000	25.9	25.3	3.8	20.6	0.0	34.3	54.0	-19.7	1/3 MHz	RB	RB
AVG	V	1020.000	22.4	25.3	3.8	20.6	0.0	30.9	54.0	-23.1	1/3 MHz	RB	RB
PK	V	1360.000	31.0	25.3	4.4	20.7	0.0	40.1	74.0	-33.9	1/3 MHz	RB	RB
PK	V	1360.000	31.2	25.3	4.4	20.7	0.0	40.3	74.0	-33.7	1/3 MHz	RB	RB
PK	V	1360.000	31.4	25.3	4.4	20.7	0.0	40.5	74.0	-33.5	1/3 MHz	RB	RB
AVG	V	1360.000	29.1	25.3	4.4	20.7	0.0	38.2	54.0	-15.8	1/3 MHz	RB	RB
AVG	V	1360.000	25.2	25.3	4.4	20.7	0.0	34.3	54.0	-19.7	1/3 MHz	RB	RB
AVG	V	1360.000	21.0	25.3	4.4	20.7	0.0	30.0	54.0	-24.0	1/3 MHz	RB	RB
PK	V	1700.000	33.5	26.4	5.1	20.8	0.0	44.2	74.0	-29.8	1/3 MHz	RB	RB
PK	V	1700.000	33.7	26.4	5.1	20.8	0.0	44.4	74.0	-29.6	1/3 MHz	RB	RB
PK	V	1700.000	36.7	26.4	5.1	20.8	0.0	47.4	74.0	-26.6	1/3 MHz	RB	RB
AVG	V	1700.000	31.6	26.4	5.1	20.8	0.0	42.2	54.0	-11.8	1/3 MHz	RB	RB
AVG	V	1700.000	27.7	26.4	5.1	20.8	0.0	38.4	54.0	-15.7	1/3 MHz	RB	RB
AVG	V	1700.000	26.3	26.4	5.1	20.8	0.0	36.9	54.0	-17.1	1/3 MHz	RB	RB
PK	V	2040.000	31.0	28.1	5.6	20.8	0.0	43.8	77.0	-33.2	1/3 MHz		
PK	V	2040.000	31.2	28.1	5.6	20.8	0.0	44.1	77.0	-32.9	1/3 MHz		
PK	V	2040.000	31.3	28.1	5.6	20.8	0.0	44.1	77.0	-32.9	1/3 MHz		
AVG	V	2040.000	29.0	28.1	5.6	20.8	0.0	41.9	57.0	-15.1	1/3 MHz		
AVG	V	2040.000	25.2	28.1	5.6	20.8	0.0	38.1	57.0	-18.9	1/3 MHz		
AVG	V	2040.000	20.8	28.1	5.6	20.8	0.0	33.7	57.0	-23.3	1/3 MHz		
PK	V	2380.000	30.8	28.6	6.2	21.0	0.0	44.7	74.0	-29.3	1/3 MHz	RB	RB
PK	V	2380.000	31.0	28.6	6.2	21.0	0.0	44.9	74.0	-29.1	1/3 MHz	RB	RB
PK	V	2380.000	31.2	28.6	6.2	21.0	0.0	45.1	74.0	-28.9	1/3 MHz	RB	RB
AVG	V	2380.000	28.9	28.6	6.2	21.0	0.0	42.8	54.0	-11.2	1/3 MHz	RB	RB
AVG	V	2380.000	25.0	28.6	6.2	21.0	0.0	38.9	54.0	-15.1	1/3 MHz	RB	RB
AVG	V	2380.000	20.7	28.6	6.2	21.0	0.0	34.6	54.0	-19.4	1/3 MHz	RB	RB
PK	V	2720.000	31.1	29.6	6.7	21.1	0.0	46.3	74.0	-27.7	1/3 MHz	RB	RB
PK	V	2720.000	31.3	29.6	6.7	21.1	0.0	46.5	74.0	-27.5	1/3 MHz	RB	RB
PK	V	2720.000	31.4	29.6	6.7	21.1	0.0	46.5	74.0	-27.5	1/3 MHz	RB	RB
AVG	V	2720.000	29.2	29.6	6.7	21.1	0.0	44.4	54.0	-9.6	1/3 MHz	RB	RB
AVG	V	2720.000	25.3	29.6	6.7	21.1	0.0	40.5	54.0	-13.5	1/3 MHz	RB	RB
AVG	V	2720.000	20.9	29.6	6.7	21.1	0.0	36.1	54.0	-17.9	1/3 MHz	RB	RB
PK	V	3060.000	31.4	30.7	7.1	21.3	0.0	48.0	77.0	-29.0	1/3 MHz		
PK	V	3060.000	31.5	30.7	7.1	21.3	0.0	48.1	77.0	-28.9	1/3 MHz		
PK	V	3060.000	31.6	30.7	7.1	21.3	0.0	48.1	77.0	-28.9	1/3 MHz		
AVG	V	3060.000	29.4	30.7	7.1	21.3	0.0	46.0	57.0	-11.0	1/3 MHz		
AVG	V	3060.000	25.5	30.7	7.1	21.3	0.0	42.1	57.0	-14.9	1/3 MHz		
AVG	V	3060.000	21.1	30.7	7.1	21.3	0.0	37.7	57.0	-19.3	1/3 MHz		
PK	V	3400.000	30.9	31.4	7.6	21.4	0.0	48.5	77.0	-28.5	1/3 MHz		
PK	V	3400.000	30.9	31.4	7.6	21.4	0.0	48.5	77.0	-28.5	1/3 MHz		
PK	V	3400.000	31.1	31.4	7.6	21.4	0.0	48.7	77.0	-28.3	1/3 MHz		
AVG	V	3400.000	28.9	31.4	7.6	21.4	0.0	46.6	57.0	-10.4	1/3 MHz		
AVG	V	3400.000	24.9	31.4	7.6	21.4	0.0	42.5	57.0	-14.5	1/3 MHz		
AVG	V	3400.000	20.6	31.4	7.6	21.4	0.0	38.2	57.0	-18.8	1/3 MHz		

Special Radiated Emissions

Company: Gentex Corporation
 Model #: 590L HL
 Serial #: Sample 1
 Engineers: Nicholas Abbondante
 Project #: 3151120
 Standard: FCC Part 15 Subpart C 15.231/IC RSS-210 Annex 1
 Receiver: R&S ESCI (ROS002)
 PreAmp: PRE8 11-09-08.txt
 PreAmp Used? (Y or N): N
 Antenna & Cables: N Bands: N, LF, HF, SHF
 Antenna: LOG4 06-05-08 V3.txt LOG4 06-05-08 H3.txt
 Cable(s): S2 3M FLR 9-17-08.txt NONE.
 Barometer: BAR2
 Location: Site 2
 Date(s): 05/13/08 05/14/08
 Temp/Humidity/Pressure: 21c 30% 1050mB
 Limit Distance (m): 3
 Test Distance (m): 3
 Voltage/Frequency: Fresh 12VDC Battery Frequency Range: 30-1000 MHz
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(μV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(μV/m)	Limit dB(μV/m)	Margin dB	Bandwidth	FCC	IC
Note: 80%/50%/30% Duty Cycle; Scale Settings 12EB, 13EA, 12EB, 12EB, 11EC, 11EC; Sample 1; 365 MHz													
PK	H	730.000	13.5	21.9	3.9	0.0	0.0	39.3	78.2	-38.9	120/300 kHz		
PK	H	730.000	19.3	21.9	3.9	0.0	0.0	45.1	78.2	-33.1	120/300 kHz		
PK	H	730.000	25.7	21.9	3.9	0.0	0.0	51.6	78.2	-26.6	120/300 kHz		
AVG	H	730.000	11.6	21.9	3.9	0.0	0.0	37.4	58.2	-20.8	120/300 kHz		
AVG	H	730.000	13.3	21.9	3.9	0.0	0.0	39.1	58.2	-19.1	120/300 kHz		
AVG	H	730.000	15.3	21.9	3.9	0.0	0.0	41.1	58.2	-17.1	120/300 kHz		
PK	V	224.000	9.2	12.1	1.9	0.0	0.0	23.2	78.2	-55.0	120/300 kHz		
AVG	V	224.000	-0.3	12.1	1.9	0.0	0.0	13.7	58.2	-44.5	120/300 kHz		
PK	H	240.000	7.4	12.0	2.0	0.0	0.0	21.4	46.0	-24.6	120/300 kHz		
AVG	H	240.000	-1.4	12.0	2.0	0.0	0.0	12.6	46.0	-33.4	120/300 kHz	RB	RB
PK	H	279.900	4.8	13.0	2.2	0.0	0.0	20.0	46.0	-26.0	120/300 kHz	RB	RB
AVG	H	279.900	-4.8	13.0	2.2	0.0	0.0	10.4	46.0	-35.6	120/300 kHz	RB	RB
PK	H	314.700	4.9	14.4	2.3	0.0	0.0	21.6	78.2	-56.6	120/300 kHz		
AVG	H	314.700	-5.6	14.4	2.3	0.0	0.0	11.0	58.2	-47.2	120/300 kHz		
PK	H	330.700	4.4	15.0	2.4	0.0	0.0	21.8	46.0	-24.2	120/300 kHz		
AVG	H	330.700	-4.5	15.0	2.4	0.0	0.0	12.9	46.0	-33.1	120/300 kHz		
PK	H	399.100	6.1	16.4	2.6	0.0	0.0	25.1	78.2	-53.1	120/300 kHz		
AVG	H	399.100	-4.2	16.4	2.6	0.0	0.0	14.8	58.2	-43.4	120/300 kHz		

Special Radiated Emissions

Company: Gentex Corporation
 Model #: 590L HL
 Serial #: Sample 1
 Engineers: Nicholas Abbondante
 Project #: 3151120
 Standard: FCC Part 15 Subpart C 15.231/IC RSS-210 Annex 1
 Receiver: R&S FSEK-30 (ROS001)
 PreAmp: PRE8 11-09-08.txt
 PreAmp Used? (Y or N): Y
 Antenna & Cables: HF Bands: N, LF, HF, SHF
 Antenna: Horn2 V1m 9-24-2008.txt Horn2 H1m 9-24-2008.txt
 Cable(s): CBL027 12-06-08.txt CBL028 12-06-08.txt
 Barometer: MAN1 Filter: REA003
 Location: Site 2
 Date(s): 05/27/08
 Temp/Humidity/Pressure: 22c 62% 998mB
 Limit Distance (m): 3
 Test Distance (m): 3
 Voltage/Frequency: Fresh Battery Frequency Range: 1-3.65 GHz
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC	IC
Note: 80%/50%/30% Duty Cycle; Scale Settings 12EB, 13EA, 12EB, 12EB, 11EC, 11EC; 365 MHz													
PK	V	1095.000	31.6	25.3	3.9	20.6	0.0	40.2	74.0	-33.8	1/3 MHz	RB	RB
PK	V	1095.000	31.7	25.3	3.9	20.6	0.0	40.3	74.0	-33.7	1/3 MHz	RB	RB
PK	V	1095.000	34.7	25.3	3.9	20.6	0.0	43.3	74.0	-30.7	1/3 MHz	RB	RB
AVG	V	1095.000	29.7	25.3	3.9	20.6	0.0	38.3	54.0	-15.7	1/3 MHz	RB	RB
AVG	V	1095.000	25.6	25.3	3.9	20.6	0.0	34.2	54.0	-19.8	1/3 MHz	RB	RB
AVG	V	1095.000	24.3	25.3	3.9	20.6	0.0	32.9	54.0	-21.1	1/3 MHz	RB	RB
PK	V	1460.000	31.6	25.3	4.6	20.7	0.0	40.8	74.0	-33.2	1/3 MHz	RB	RB
PK	V	1460.000	32.3	25.3	4.6	20.7	0.0	41.5	74.0	-32.5	1/3 MHz	RB	RB
PK	V	1460.000	32.7	25.3	4.6	20.7	0.0	42.0	74.0	-32.0	1/3 MHz	RB	RB
AVG	V	1460.000	29.7	25.3	4.6	20.7	0.0	38.9	54.0	-15.1	1/3 MHz	RB	RB
AVG	V	1460.000	26.3	25.3	4.6	20.7	0.0	35.5	54.0	-18.5	1/3 MHz	RB	RB
AVG	V	1460.000	22.3	25.3	4.6	20.7	0.0	31.5	54.0	-22.5	1/3 MHz	RB	RB
PK	V	1825.000	32.4	27.1	5.3	20.8	0.0	43.9	78.2	-34.3	1/3 MHz	RB	RB
PK	V	1825.000	32.6	27.1	5.3	20.8	0.0	44.2	78.2	-34.0	1/3 MHz	RB	RB
PK	V	1825.000	35.0	27.1	5.3	20.8	0.0	46.5	78.2	-31.7	1/3 MHz	RB	RB
AVG	V	1825.000	30.4	27.1	5.3	20.8	0.0	42.0	58.2	-16.2	1/3 MHz	RB	RB
AVG	V	1825.000	26.6	27.1	5.3	20.8	0.0	38.1	58.2	-20.1	1/3 MHz	RB	RB
AVG	V	1825.000	24.5	27.1	5.3	20.8	0.0	36.1	58.2	-22.1	1/3 MHz	RB	RB
PK	H	2190.000	31.3	28.3	5.9	20.9	0.0	44.6	78.2	-33.6	1/3 MHz	RB	RB
PK	H	2190.000	31.6	28.3	5.9	20.9	0.0	44.9	78.2	-33.3	1/3 MHz	RB	RB
PK	H	2190.000	31.5	28.3	5.9	20.9	0.0	44.8	78.2	-33.4	1/3 MHz	RB	RB
AVG	H	2190.000	29.4	28.3	5.9	20.9	0.0	42.7	58.2	-15.5	1/3 MHz	RB	RB
AVG	H	2190.000	25.6	28.3	5.9	20.9	0.0	38.9	58.2	-19.3	1/3 MHz	RB	RB
AVG	H	2190.000	21.0	28.3	5.9	20.9	0.0	34.3	58.2	-23.9	1/3 MHz	RB	RB
PK	V	2555.000	30.8	29.0	6.5	21.0	0.0	45.2	78.2	-33.0	1/3 MHz	RB	RB
PK	V	2555.000	31.1	29.0	6.5	21.0	0.0	45.6	78.2	-32.6	1/3 MHz	RB	RB
PK	V	2555.000	31.2	29.0	6.5	21.0	0.0	45.6	78.2	-32.6	1/3 MHz	RB	RB
AVG	V	2555.000	28.8	29.0	6.5	21.0	0.0	43.3	58.2	-14.9	1/3 MHz	RB	RB
AVG	V	2555.000	25.1	29.0	6.5	21.0	0.0	39.6	58.2	-18.6	1/3 MHz	RB	RB
AVG	V	2555.000	20.7	29.0	6.5	21.0	0.0	35.2	58.2	-23.0	1/3 MHz	RB	RB
PK	V	2920.000	31.0	30.3	7.0	21.2	0.0	47.1	78.2	-31.1	1/3 MHz	RB	RB
PK	V	2920.000	31.4	30.3	7.0	21.2	0.0	47.4	78.2	-30.8	1/3 MHz	RB	RB
PK	V	2920.000	31.5	30.3	7.0	21.2	0.0	47.6	78.2	-30.6	1/3 MHz	RB	RB
AVG	V	2920.000	29.1	30.3	7.0	21.2	0.0	45.1	58.2	-13.1	1/3 MHz	RB	RB
AVG	V	2920.000	25.3	30.3	7.0	21.2	0.0	41.4	58.2	-16.8	1/3 MHz	RB	RB
AVG	V	2920.000	21.1	30.3	7.0	21.2	0.0	37.1	58.2	-21.1	1/3 MHz	RB	RB
PK	V	3285.000	31.1	31.2	7.4	21.3	0.0	48.3	78.2	-29.9	1/3 MHz	RB	RB
PK	V	3285.000	31.3	31.2	7.4	21.3	0.0	48.5	78.2	-29.7	1/3 MHz	RB	RB
PK	V	3285.000	31.3	31.2	7.4	21.3	0.0	48.6	78.2	-29.6	1/3 MHz	RB	RB
AVG	V	3285.000	29.1	31.2	7.4	21.3	0.0	46.4	58.2	-11.8	1/3 MHz	RB	RB
AVG	V	3285.000	25.2	31.2	7.4	21.3	0.0	42.5	58.2	-15.7	1/3 MHz	RB	RB
AVG	V	3285.000	20.9	31.2	7.4	21.3	0.0	38.1	58.2	-20.1	1/3 MHz	RB	RB
PK	V	3650.000	31.3	32.0	7.9	21.5	0.0	49.7	74.0	-24.3	1/3 MHz	RB	RB
PK	V	3650.000	31.5	32.0	7.9	21.5	0.0	49.9	74.0	-24.1	1/3 MHz	RB	RB
PK	V	3650.000	31.5	32.0	7.9	21.5	0.0	49.9	74.0	-24.1	1/3 MHz	RB	RB
AVG	V	3650.000	29.3	32.0	7.9	21.5	0.0	47.7	54.0	-6.3	1/3 MHz	RB	RB
AVG	V	3650.000	25.4	32.0	7.9	21.5	0.0	43.8	54.0	-10.2	1/3 MHz	RB	RB
AVG	V	3650.000	21.1	32.0	7.9	21.5	0.0	39.5	54.0	-14.5	1/3 MHz	RB	RB

Special Radiated Emissions

Company: Gentex Corporation
 Model #: 590L HL
 Serial #: Sample 1
 Engineers: Nicholas Abbondante
 Project #: 3151120
 Standard: FCC Part 15 Subpart C 15.231/IC RSS-210 Annex 1
 Receiver: R&S ESCI (ROS002)
 PreAmp: PRE8 11-09-08.txt
 PreAmp Used? (Y or N): N
 Date(s): 05/14/08 05/15/08
 Location: Site 2
 Limit Distance (m): 3
 Test Distance (m): 3
 Voltage/Frequency: Fresh 12VDC Battery
 Frequency Range: 30-1000 MHz
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Antenna & Cables: N Bands: N, LF, HF, SHF
 Antenna: LOG4 06-05-08 V3.txt LOG4 06-05-08 H3.txt
 Cable(s): S2 3M FLR 9-17-08.txt NONE.
 Barometer: BAR2
 Temp/Humidity/Pressure: 21c 30% 1050mB
 20c 37% 1050mB

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC	IC
Note: 80%/50%/30% Duty Cycle; Scale Settings 12EB, 13EA, 12EB, 12EB, 11EC, 11EC; Sample 1; 390 MHz													
PK	H	780.000	10.8	22.8	4.1	0.0	0.0	37.6	79.2	-41.7	120/300 kHz		
PK	H	780.000	15.6	22.8	4.1	0.0	0.0	42.4	79.2	-36.8	120/300 kHz		
PK	H	780.000	22.5	22.8	4.1	0.0	0.0	49.3	79.2	-29.9	120/300 kHz		
AVG	H	780.000	8.8	22.8	4.1	0.0	0.0	35.6	59.2	-23.6	120/300 kHz		
AVG	H	780.000	9.6	22.8	4.1	0.0	0.0	36.4	59.2	-22.8	120/300 kHz		
AVG	H	780.000	12.0	22.8	4.1	0.0	0.0	38.9	59.2	-20.4	120/300 kHz		
PK	V	224.400	9.2	12.1	1.9	0.0	0.0	23.3	79.2	-56.0	120/300 kHz		
AVG	V	224.400	0.1	12.1	1.9	0.0	0.0	14.1	59.2	-45.1	120/300 kHz		
PK	V	240.000	7.5	12.5	2.0	0.0	0.0	22.0	46.0	-24.0	120/300 kHz	RB	RB
AVG	V	240.000	-2.0	12.5	2.0	0.0	0.0	12.5	46.0	-33.5	120/300 kHz	RB	RB
PK	H	279.900	6.5	13.0	2.2	0.0	0.0	21.7	46.0	-24.3	120/300 kHz	RB	RB
AVG	H	279.900	-3.6	13.0	2.2	0.0	0.0	11.6	46.0	-34.4	120/300 kHz	RB	RB
PK	H	329.200	6.0	15.0	2.4	0.0	0.0	23.3	46.0	-22.7	120/300 kHz	RB	RB
AVG	H	329.200	-4.3	15.0	2.4	0.0	0.0	13.0	46.0	-33.0	120/300 kHz	RB	RB
PK	H	353.600	5.6	15.7	2.5	0.0	0.0	23.8	79.2	-55.4	120/300 kHz		
AVG	H	353.600	-4.1	15.7	2.5	0.0	0.0	14.1	59.2	-45.1	120/300 kHz		
PK	H	404.800	4.3	16.4	2.6	0.0	0.0	23.3	46.0	-22.7	120/300 kHz	RB	RB
AVG	H	404.800	-5.0	16.4	2.6	0.0	0.0	14.1	46.0	-31.9	120/300 kHz	RB	RB

Special Radiated Emissions

Company: Gentex Corporation
 Model #: 590L HL
 Serial #: Sample 1
 Engineers: Nicholas Abbondante
 Project #: 3151120
 Standard: FCC Part 15 Subpart C 15.231/IC RSS-210 Annex 1
 Receiver: R&S FSEK-30 (ROS001)
 PreAmp: PRE8 11-09-08.txt
 Date(s): 05/27/08
 Location: Site 2
 Barometer: MAN1
 Temp/Humidity/Pressure: 22c 62% 998mB
 Antenna & Cables: HF
 Antenna: Horn2 V1m 9-24-2008.txt
 Cable(s): CBL027 12-06-08.txt
 Bands: N, LF, HF, SHF
 Horn2 H1m 9-24-2008.txt
 CBL028 12-06-08.txt
 Filter: REA003
 Limit Distance (m): 3
 Test Distance (m): 3
 PreAmp Used? (Y or N): Y
 Voltage/Frequency: Fresh Battery
 Frequency Range: 1-3.9 GHz
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC	IC
Note: 80%/50%/30% Duty Cycle; Scale Settings 12EB, 13EA, 12EB, 12EB, 11EC, 11EC; 390 MHz													
PK	V	1170.000	31.7	25.3	4.1	20.6	0.0	40.5	74.0	-33.5	1/3 MHz	RB	RB
PK	V	1170.000	31.8	25.3	4.1	20.6	0.0	40.5	74.0	-33.5	1/3 MHz	RB	RB
PK	V	1170.000	32.3	25.3	4.1	20.6	0.0	41.0	74.0	-33.0	1/3 MHz	RB	RB
AVG	V	1170.000	29.8	25.3	4.1	20.6	0.0	38.5	54.0	-15.5	1/3 MHz	RB	RB
AVG	V	1170.000	25.8	25.3	4.1	20.6	0.0	34.5	54.0	-19.5	1/3 MHz	RB	RB
AVG	V	1170.000	21.8	25.3	4.1	20.6	0.0	30.6	54.0	-23.4	1/3 MHz	RB	RB
PK	H	1560.000	31.9	25.7	4.8	20.7	0.0	41.7	74.0	-32.3	1/3 MHz	RB	RB
PK	H	1560.000	32.4	25.7	4.8	20.7	0.0	42.2	74.0	-31.8	1/3 MHz	RB	RB
PK	H	1560.000	33.2	25.7	4.8	20.7	0.0	43.0	74.0	-31.0	1/3 MHz	RB	RB
AVG	H	1560.000	30.0	25.7	4.8	20.7	0.0	39.7	54.0	-14.3	1/3 MHz	RB	RB
AVG	H	1560.000	26.4	25.7	4.8	20.7	0.0	36.2	54.0	-17.8	1/3 MHz	RB	RB
AVG	H	1560.000	22.8	25.7	4.8	20.7	0.0	32.6	54.0	-21.4	1/3 MHz	RB	RB
PK	V	1950.000	ambient	27.7	5.5	20.8	0.0	-	-	-	1/3 MHz		
PK	V	2340.000	31.2	28.5	6.2	21.0	0.0	44.9	74.0	-29.1	1/3 MHz	RB	RB
PK	V	2340.000	31.2	28.5	6.2	21.0	0.0	44.9	74.0	-29.1	1/3 MHz	RB	RB
PK	V	2340.000	31.0	28.5	6.2	21.0	0.0	44.8	74.0	-29.2	1/3 MHz	RB	RB
AVG	V	2340.000	29.2	28.5	6.2	21.0	0.0	43.0	54.0	-11.0	1/3 MHz	RB	RB
AVG	V	2340.000	25.1	28.5	6.2	21.0	0.0	38.9	54.0	-15.1	1/3 MHz	RB	RB
AVG	V	2340.000	20.6	28.5	6.2	21.0	0.0	34.3	54.0	-19.7	1/3 MHz	RB	RB
PK	V	2730.000	31.3	29.6	6.7	21.1	0.0	46.5	74.0	-27.5	1/3 MHz	RB	RB
PK	V	2730.000	31.3	29.6	6.7	21.1	0.0	46.5	74.0	-27.5	1/3 MHz	RB	RB
PK	V	2730.000	31.5	29.6	6.7	21.1	0.0	46.7	74.0	-27.3	1/3 MHz	RB	RB
AVG	V	2730.000	29.3	29.6	6.7	21.1	0.0	44.6	54.0	-9.4	1/3 MHz	RB	RB
AVG	V	2730.000	25.3	29.6	6.7	21.1	0.0	40.5	54.0	-13.5	1/3 MHz	RB	RB
AVG	V	2730.000	21.0	29.6	6.7	21.1	0.0	36.3	54.0	-17.7	1/3 MHz	RB	RB
PK	V	3120.000	31.3	30.8	7.2	21.3	0.0	48.1	79.2	-31.2	1/3 MHz		
PK	V	3120.000	31.3	30.8	7.2	21.3	0.0	48.1	79.2	-31.1	1/3 MHz		
PK	V	3120.000	32.4	30.8	7.2	21.3	0.0	49.2	79.2	-30.0	1/3 MHz		
AVG	V	3120.000	29.3	30.8	7.2	21.3	0.0	46.1	59.2	-13.1	1/3 MHz		
AVG	V	3120.000	25.3	30.8	7.2	21.3	0.0	42.1	59.2	-17.1	1/3 MHz		
AVG	V	3120.000	22.0	30.8	7.2	21.3	0.0	38.7	59.2	-20.5	1/3 MHz		
PK	V	3510.000	31.5	31.6	7.7	21.4	0.0	49.5	74.0	-24.5	1/3 MHz		RB
PK	V	3510.000	31.6	31.6	7.7	21.4	0.0	49.6	74.0	-24.4	1/3 MHz		RB
PK	V	3510.000	31.9	31.6	7.7	21.4	0.0	49.8	74.0	-24.2	1/3 MHz		RB
AVG	V	3510.000	29.6	31.6	7.7	21.4	0.0	47.5	54.0	-6.5	1/3 MHz		RB
AVG	V	3510.000	25.6	31.6	7.7	21.4	0.0	43.6	54.0	-10.4	1/3 MHz		RB
AVG	V	3510.000	21.4	31.6	7.7	21.4	0.0	39.4	54.0	-14.6	1/3 MHz		RB
PK	V	3900.000	31.7	32.6	8.2	21.7	0.0	50.9	74.0	-23.1	1/3 MHz	RB	RB
PK	V	3900.000	31.9	32.6	8.2	21.7	0.0	51.1	74.0	-22.9	1/3 MHz	RB	RB
PK	V	3900.000	31.9	32.6	8.2	21.7	0.0	51.1	74.0	-22.9	1/3 MHz	RB	RB
AVG	V	3900.000	29.8	32.6	8.2	21.7	0.0	49.0	54.0	-5.1	1/3 MHz	RB	RB
AVG	V	3900.000	25.9	32.6	8.2	21.7	0.0	45.1	54.0	-9.0	1/3 MHz	RB	RB
AVG	V	3900.000	21.5	32.6	8.2	21.7	0.0	40.6	54.0	-13.4	1/3 MHz	RB	RB

Special Radiated Emissions

Company: Gentex Corporation
 Model #: 590L HL
 Serial #: Sample 1
 Engineers: Nicholas Abbondante
 Project #: 3151120
 Standard: FCC Part 15 Subpart C 15.231/IC RSS-210 Annex 1
 Receiver: R&S ESCI (ROS002)
 PreAmp: PRE8 11-09-08.txt
 Antenna & Cables: N Bands: N, LF, HF, SHF
 Antenna: LOG4 06-05-08 V3.txt LOG4 06-05-08 H3.txt
 Cable(s): S2 3M FLR 9-17-08.txt NONE
 Barometer: BAR2
 Location: Site 2
 Date(s): 05/15/08
 Temp/Humidity/Pressure: 20c 37% 1050mB
 Limit Distance (m): 3
 Test Distance (m): 3
 PreAmp Used? (Y or N): N Voltage/Frequency: Fresh 12VDC Battery Frequency Range: 30-1000 MHz
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC	IC
Note: 80%/50%/30% Duty Cycle; Scale Settings 12EB, 13EA, 12EB, 12EB, 11EC, 11EC; Sample 1; 418 MHz													
PK	H	836.000	12.2	22.6	4.4	0.0	0.0	39.2	80.3	-41.1	120/300 kHz		
PK	H	836.000	18.2	22.6	4.4	0.0	0.0	45.2	80.3	-35.1	120/300 kHz		
PK	H	836.000	26.6	22.6	4.4	0.0	0.0	53.7	80.3	-26.6	120/300 kHz		
AVG	H	836.000	10.2	22.6	4.4	0.0	0.0	37.3	60.3	-23.0	120/300 kHz		
AVG	H	836.000	12.2	22.6	4.4	0.0	0.0	39.2	60.3	-21.1	120/300 kHz		
AVG	H	836.000	16.2	22.6	4.4	0.0	0.0	43.2	60.3	-17.1	120/300 kHz		
PK	V	224.400	9.9	12.1	1.9	0.0	0.0	23.9	80.3	-56.4	120/300 kHz		
AVG	V	224.400	2.6	12.1	1.9	0.0	0.0	16.6	60.3	-43.7	120/300 kHz		
PK	V	240.000	7.0	12.5	2.0	0.0	0.0	21.5	46.0	-24.5	120/300 kHz	RB	RB
AVG	V	240.000	-1.3	12.5	2.0	0.0	0.0	13.2	46.0	-32.8	120/300 kHz	RB	RB
PK	H	280.000	5.7	13.0	2.2	0.0	0.0	20.9	46.0	-25.1	120/300 kHz	RB	RB
AVG	H	280.000	-4.9	13.0	2.2	0.0	0.0	10.3	46.0	-35.7	120/300 kHz	RB	RB
PK	H	326.400	6.4	14.9	2.4	0.0	0.0	23.7	46.0	-22.3	120/300 kHz	RB	RB
AVG	H	326.400	-3.0	14.9	2.4	0.0	0.0	14.2	46.0	-31.8	120/300 kHz	RB	RB
PK	H	352.400	5.6	15.7	2.5	0.0	0.0	23.8	80.3	-56.5	120/300 kHz		
AVG	H	352.400	-4.6	15.7	2.5	0.0	0.0	13.6	60.3	-46.7	120/300 kHz		
PK	H	378.800	7.4	16.3	2.6	0.0	0.0	26.2	80.3	-54.1	120/300 kHz		
AVG	H	378.800	-3.0	16.3	2.6	0.0	0.0	15.9	60.3	-44.4	120/300 kHz		
PK	H	392.000	5.6	16.3	2.6	0.0	0.0	24.5	80.3	-55.8	120/300 kHz		
AVG	H	392.000	-3.0	16.3	2.6	0.0	0.0	16.0	60.3	-44.3	120/300 kHz		
PK	H	438.800	3.7	16.8	2.9	0.0	0.0	23.3	80.3	-57.0	120/300 kHz		
AVG	H	438.800	-5.7	16.8	2.9	0.0	0.0	14.0	60.3	-46.3	120/300 kHz		

Special Radiated Emissions

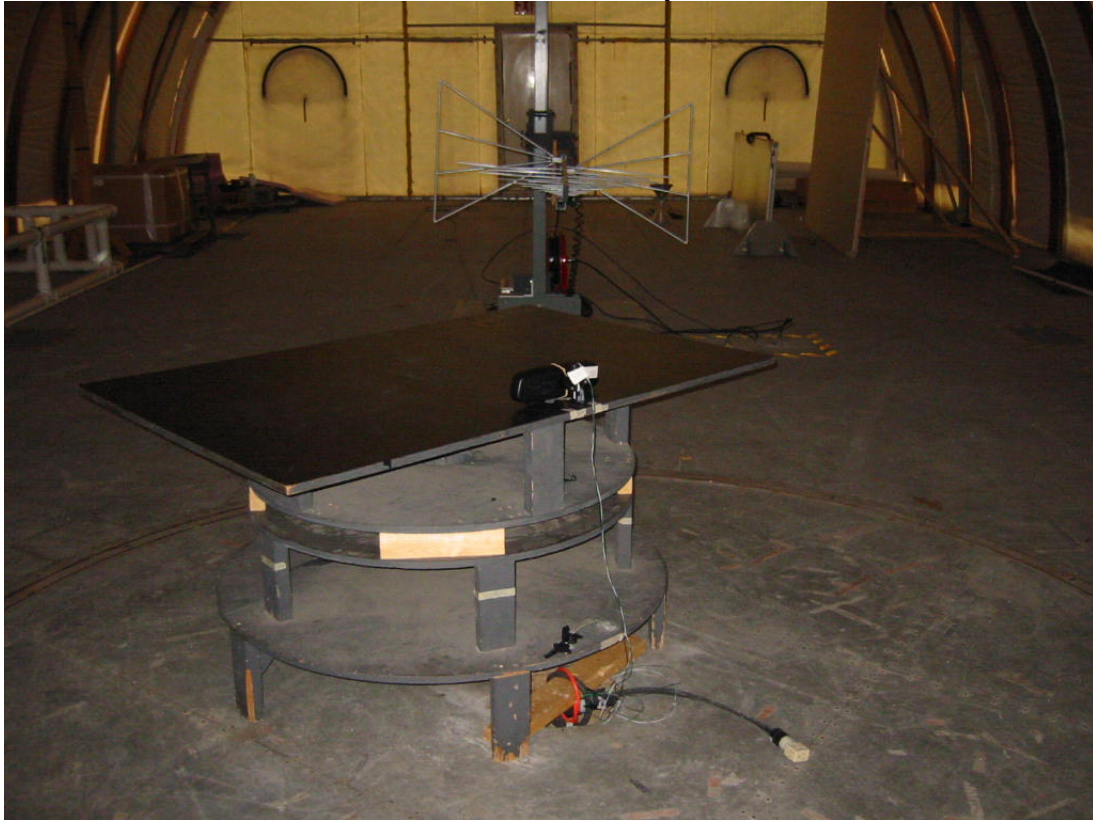
Company: Gentex Corporation
 Model #: 590L HL
 Serial #: Sample 1
 Engineers: Nicholas Abbondante
 Project #: 3151120
 Standard: FCC Part 15 Subpart C 15.231/IC RSS-210 Annex 1
 Receiver: R&S FSEK-30 (ROS001)
 PreAmp: PRE8 11-09-08.txt
 PreAmp Used? (Y or N): Y
 Date(s): 05/27/08
 Location: Site 2
 Temp/Humidity/Pressure: 22c 62% 998mB
 Antenna & Cables: HF
 Antenna: Horn2 V1m 9-24-2008.txt
 Cable(s): CBL027 12-06-08.txt
 Barometer: MAN1
 Bands: N, LF, HF, SHF
 Horn2 H1m 9-24-2008.txt
 CBL028 12-06-08.txt
 Filter: REA003
 Frequency Range: 1-3.9 GHz
 Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC	IC
Note: 80%/50%/30% Duty Cycle; Scale Settings 12EB, 13EA, 12EB, 12EB, 11EC, 11EC; 418 MHz													
PK	V	1254.000	30.3	25.3	4.2	20.6	0.0	39.2	74.0	-34.8	1/3 MHz		RB
PK	V	1254.000	31.1	25.3	4.2	20.6	0.0	40.0	74.0	-34.0	1/3 MHz		RB
PK	V	1254.000	32.5	25.3	4.2	20.6	0.0	41.4	74.0	-32.6	1/3 MHz		RB
AVG	V	1254.000	28.4	25.3	4.2	20.6	0.0	37.3	54.0	-16.7	1/3 MHz		RB
AVG	V	1254.000	25.1	25.3	4.2	20.6	0.0	34.0	54.0	-20.0	1/3 MHz		RB
AVG	V	1254.000	22.1	25.3	4.2	20.6	0.0	30.9	54.0	-23.1	1/3 MHz		RB
PK	H	1672.000	33.6	26.3	5.0	20.8	0.0	44.1	74.0	-29.9	1/3 MHz	RB	RB
PK	H	1672.000	34.5	26.3	5.0	20.8	0.0	45.0	74.0	-29.0	1/3 MHz	RB	RB
PK	H	1672.000	38.0	26.3	5.0	20.8	0.0	48.5	74.0	-25.5	1/3 MHz	RB	RB
AVG	H	1672.000	31.6	26.3	5.0	20.8	0.0	42.2	54.0	-11.8	1/3 MHz	RB	RB
AVG	H	1672.000	28.4	26.3	5.0	20.8	0.0	39.0	54.0	-15.0	1/3 MHz	RB	RB
AVG	H	1672.000	27.5	26.3	5.0	20.8	0.0	38.1	54.0	-15.9	1/3 MHz	RB	RB
PK	H	2090.000	30.6	28.1	5.7	20.9	0.0	43.6	80.3	-36.7	1/3 MHz		
PK	H	2090.000	30.7	28.1	5.7	20.9	0.0	43.7	80.3	-36.6	1/3 MHz		
PK	H	2090.000	30.9	28.1	5.7	20.9	0.0	43.9	80.3	-36.4	1/3 MHz		
AVG	H	2090.000	28.6	28.1	5.7	20.9	0.0	41.6	60.3	-18.7	1/3 MHz		
AVG	H	2090.000	24.6	28.1	5.7	20.9	0.0	37.6	60.3	-22.7	1/3 MHz		
AVG	H	2090.000	20.4	28.1	5.7	20.9	0.0	33.4	60.3	-26.9	1/3 MHz		
PK	V	2508.000	30.3	28.8	6.5	21.0	0.0	44.5	80.3	-35.8	1/3 MHz		
PK	V	2508.000	30.3	28.8	6.5	21.0	0.0	44.6	80.3	-35.7	1/3 MHz		
PK	V	2508.000	30.5	28.8	6.5	21.0	0.0	44.8	80.3	-35.5	1/3 MHz		
AVG	V	2508.000	28.3	28.8	6.5	21.0	0.0	42.6	60.3	-17.7	1/3 MHz		
AVG	V	2508.000	24.3	28.8	6.5	21.0	0.0	38.5	60.3	-21.8	1/3 MHz		
AVG	V	2508.000	20.1	28.8	6.5	21.0	0.0	34.3	60.3	-26.0	1/3 MHz		
PK	V	2926.000	29.8	30.3	7.0	21.2	0.0	45.9	80.3	-34.4	1/3 MHz		
PK	V	2926.000	29.7	30.3	7.0	21.2	0.0	45.8	80.3	-34.5	1/3 MHz		
PK	V	2926.000	30.0	30.3	7.0	21.2	0.0	46.1	80.3	-34.2	1/3 MHz		
AVG	V	2926.000	27.9	30.3	7.0	21.2	0.0	44.0	60.3	-16.3	1/3 MHz		
AVG	V	2926.000	23.7	30.3	7.0	21.2	0.0	39.8	60.3	-20.5	1/3 MHz		
AVG	V	2926.000	19.6	30.3	7.0	21.2	0.0	35.7	60.3	-24.6	1/3 MHz		
PK	H	3344.000	30.3	31.4	7.5	21.3	0.0	47.8	80.3	-32.5	1/3 MHz		
PK	H	3344.000	30.5	31.4	7.5	21.3	0.0	48.0	80.3	-32.3	1/3 MHz		
PK	H	3344.000	30.7	31.4	7.5	21.3	0.0	48.2	80.3	-32.1	1/3 MHz		
AVG	H	3344.000	28.4	31.4	7.5	21.3	0.0	45.9	60.3	-14.4	1/3 MHz		
AVG	H	3344.000	24.4	31.4	7.5	21.3	0.0	42.0	60.3	-18.3	1/3 MHz		
AVG	H	3344.000	20.2	31.4	7.5	21.3	0.0	37.7	60.3	-22.6	1/3 MHz		
PK	V	3762.000	30.4	32.3	8.0	21.6	0.0	49.2	74.0	-24.8	1/3 MHz	RB	RB
PK	V	3762.000	30.5	32.3	8.0	21.6	0.0	49.2	74.0	-24.8	1/3 MHz	RB	RB
PK	V	3762.000	31.3	32.3	8.0	21.6	0.0	50.0	74.0	-24.0	1/3 MHz	RB	RB
AVG	V	3762.000	28.5	32.3	8.0	21.6	0.0	47.2	54.0	-6.8	1/3 MHz	RB	RB
AVG	V	3762.000	24.4	32.3	8.0	21.6	0.0	43.2	54.0	-10.8	1/3 MHz	RB	RB
AVG	V	3762.000	20.8	32.3	8.0	21.6	0.0	39.6	54.0	-14.4	1/3 MHz	RB	RB
PK	V	4180.000	30.0	32.9	8.6	21.9	0.0	49.5	74.0	-24.5	1/3 MHz	RB	RB
PK	V	4180.000	30.2	32.9	8.6	21.9	0.0	49.8	74.0	-24.2	1/3 MHz	RB	RB
PK	V	4180.000	30.7	32.9	8.6	21.9	0.0	50.3	74.0	-23.7	1/3 MHz	RB	RB
AVG	V	4180.000	28.0	32.9	8.6	21.9	0.0	47.6	54.0	-6.4	1/3 MHz	RB	RB
AVG	V	4180.000	24.2	32.9	8.6	21.9	0.0	43.8	54.0	-10.2	1/3 MHz	RB	RB
AVG	V	4180.000	20.2	32.9	8.6	21.9	0.0	39.8	54.0	-14.2	1/3 MHz	RB	RB

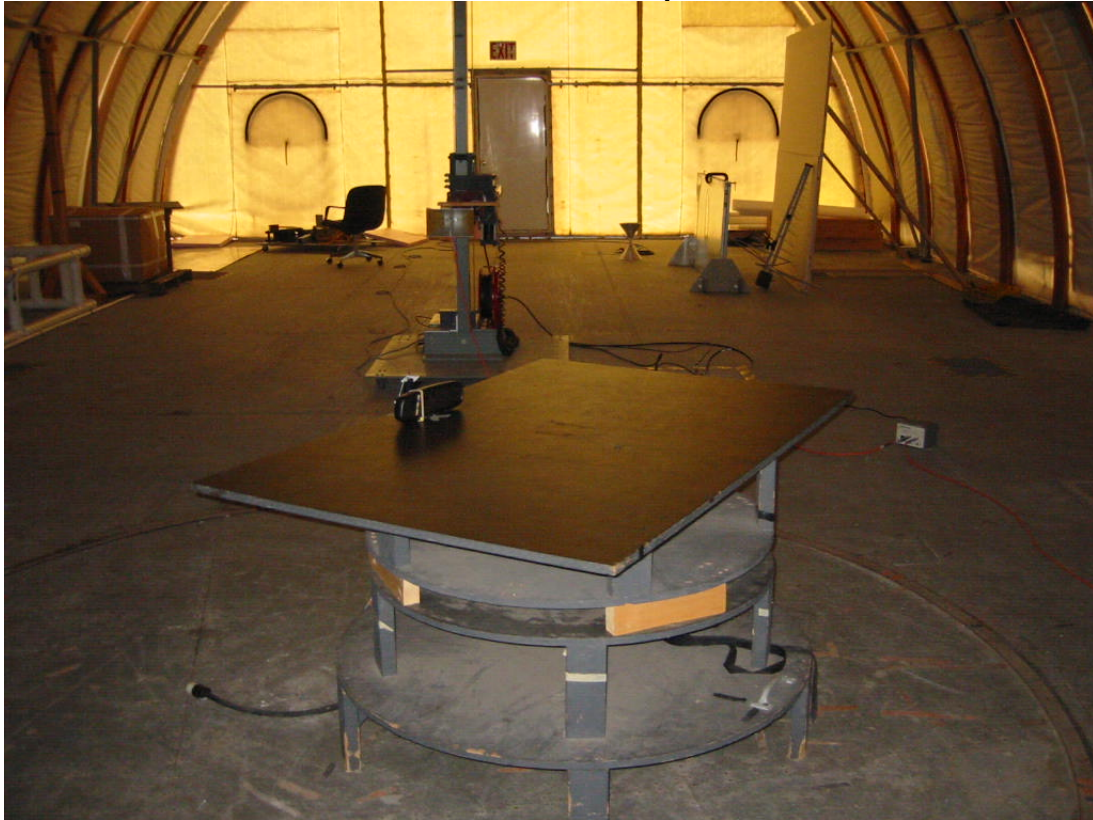
Radiated Emissions Setup Photos



Radiated Emissions Setup Photos



Radiated Emissions Setup Photos



Radiated Emissions Setup Photos



Test Results: Pass

Test Standard: FCC Part 15 Subpart C 15.231, IC RSS-210 Annex 1

Test: Operation in Restricted Bands

Performance Criterion: The transmitter must not be capable of operating in the restricted bands of operation of FCC 15.205 and IC RSS-210 Table 1.

Test Environment:

Environmental Conditions During Testing:	Ambient (°C):	N/A	Humidity (%):	N/A	Pressure (hPa):	N/A
Pretest Verification Performed	Yes		Equipment under Test:	590L Homelink		
Test Engineer(s):	Nicholas Abbondante		EUT Serial Number:	Sample #1		

Test Equipment Used:

TEST EQUIPMENT LIST					
Item	Equipment Type	Make	Model No.	Serial No.	Next Cal. Due
1	Synthesized Sweep Generator	Hewlett Packard	83620A	3213A01244	02/06/2009
2	BROADBAND ANTENNA	Compliance Design	B200	1850	09/13/2008
3	40 GHz Cable	Megaphase	TM40-K1K1-80	7030802 002	05/23/2008
4	9kHz to 3GHz EMI Test Receiver	Rohde & Schwartz	ESCI 1166.5950K03	100067	01/25/2009
5	3 Meter In floor cable for site 2	ITS	RG214B/U	S2 3M FLR	09/17/2008
6	ANTENNA	EMCO	3142	9711-1225	06/05/2008

Test Details:

The EUT was put into learning mode and a signal generator was used to generate pulsed operation at frequencies on the edge of and within the restricted bands located between 288 MHz and 418 MHz. There are two restricted bands within this range, 322-335.4 MHz and 399.9-410 MHz. First, the signal generator was tuned to a frequency outside the restricted bands and it was demonstrated that the EUT was capable of learning the frequency and duty cycle. Then, using the same setup, the signal generator was tuned to 322 MHz, 330 MHz, 335.4 MHz, 399.9 MHz, 405 MHz, and 410 MHz. It was observed that the EUT was unable to learn any of these frequencies.