UTC Fire and Security

60-807-95R Motion Sensor PIR

Report # UTCF0022.2

NVLAP Lab Code: 200881-0

CERTIFICATE OF TEST

WTD 13.9.30

Last Date of Test: September 17, 2014
UTC Fire and Security
Model: 60-807-95R Motion Sensor PIR

Emissions

Standards

Specification	Method
FCC 15.109:2014 Class B	ANSI C63.4:2009
ICES-003:2010 Class B	ANSI C63.4:2009

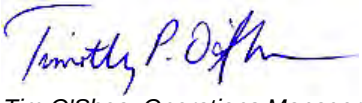
Results

Test Description	Applied	Results	Comments
Radiated Emissions	Yes	Pass	
Radiated Emission High Frequency	Yes	Pass	

Deviations From Test Standards

None

Approved By:



Tim O'Shea, Operations Manager

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test.

NORTHWEST EMC
REV 2012.08.02

REVISION HISTORY

Revision Number	Description	Date	Page Number
00	None		

Barometric Pressure

The recorded barometric pressure has been normalized to sea level.

NORTHWEST EMC

REV 2014.08.11

ACCREDITATIONS AND AUTHORIZATIONS

United States

FCC - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

A2LA - Accredited by A2LA to ISO / IEC Guide 65 as a product certifier. This allows Northwest EMC to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

IC - Recognized by Industry Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with IC.

European Union

European Commission – Validated by the European Commission as a Conformity Assessment Body (CAB) under the EMC directive and as a Notified Body under the R&TTE Directive.

Australia/New Zealand

ACMA - Recognized by ACMA as a CAB for the acceptance of test data.

Korea

MSIP / RRA - Recognized by KCC's RRA as a CAB for the acceptance of test data.

Japan

VCCI - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

Taiwan

BSMI – Recognized by BSMI as a CAB for the acceptance of test data.

NCC - Recognized by NCC as a CAB for the acceptance of test data.

Singapore

IDA – Recognized by IDA as a CAB for the acceptance of test data.

Israel

MOC – Recognized by MOC as a CAB for the acceptance of test data.

Hong Kong

OFTA – Recognized by OFTA as a CAB for the acceptance of test data.

Vietnam

MIC – Recognized by MIC as a CAB for the acceptance of test data.

SCOPE

For details on the Scopes of our Accreditations, please visit:
http://www.nwemc.com/accreditations/

Measurement Uncertainty

When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution.

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found included as part of the applicable test description page. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-1 as applicable), and are available upon request.

Measurement Bandwidths

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

Measurements were made using the bandwidths and detectors specified. No video filter was used.

Sample Calculations

Radiated Emissions:

Field Strength		Measured Level		Antenna Factor		Cable Factor		Amplifier Gain		Distance Adjustment Factor		External Attenuation
33.5	=	42.6	+	28.6	+	3.1	-	40.8	+	0.0	+	0.0

Conducted Emissions:

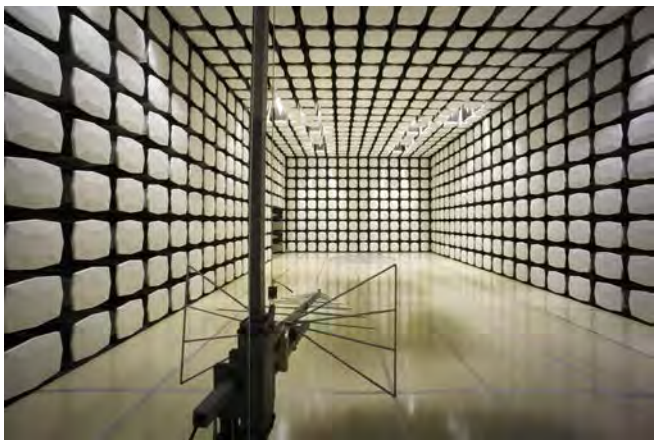
Adjusted Level		Measured Level		Transducer Factor		Cable Factor		External Attenuation
47.1	=	26.7	+	0.3	+	0.1	+	20.0

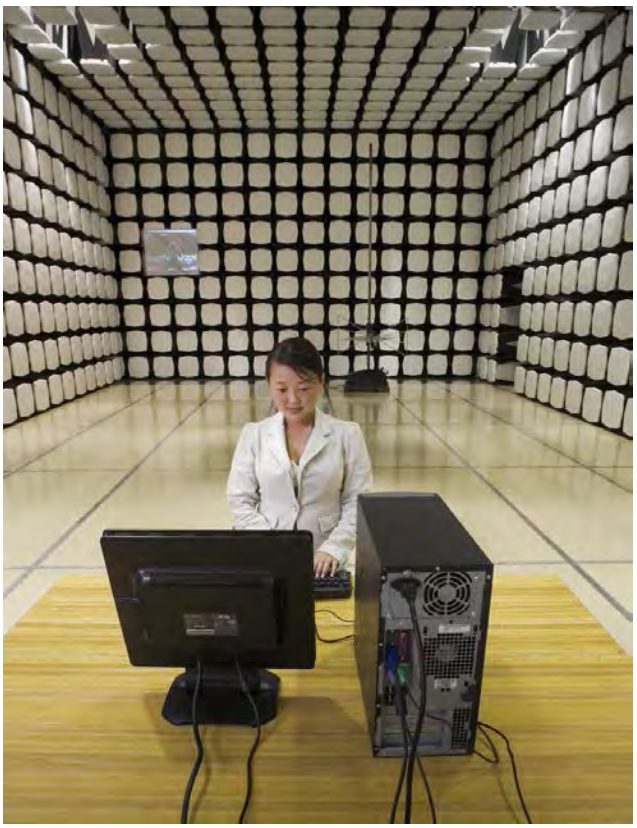
NORTHWEST EMC

REV 2013.06.28

FACILITIES

Oregon Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	**California** Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	**New York** Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 685-0796	**Minnesota** Labs MN01-08 9349 W Broadway Ave. Brooklyn Park, MN 55445 (763) 425-2281	**Washington** Labs NC01-05,SU02,SU07 19201 120th Ave. NE Bothell, WA 98011 (425) 984-6600
VCCI				
A-0108	A-0029		A-0109	A-0110
Industry Canada				
2834D-1, 2834D-*2*	2834B-1, 2834B-2, 2834B-3		2834E-1	2834F-1
NVLAP				
NVLAP Lab Code: 200630-0	NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200761-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200629-0





PRODUCT DESCRIPTION

Client and Equipment Under Test (EUT) Information

Company Name:	UTC Fire and Security
Address:	1275 Red Fox Road
City, State, Zip:	Arden Hills, MN 55112
Test Requested By:	Paul Price
Model:	60-807-95R Motion Sensor
First Date of Test:	September 11, 2014
Last Date of Test:	September 11, 2014
Receipt Date of Samples:	September 11, 2014
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT:

PIR Motion Sensor

Highest frequency generated or used in the device:

Assumes > 108 MHz and < 3.6 GHz

Testing Objective:

Provide the EMC testing required to demonstrate compliance with the requirements for the countries and markets specified by the customer.

EUT Photo

CONFIGURATIONS

Configuration UTCF0022- 2

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
PIR Motion Sensor	UTC Fire and Security	60-807-95R	TXID 043515E DL 5E5143

MODIFICATIONS

WTD 13.9.30

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	9/11/2014	Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	9/11/2014	Radiated Emissions High Frequency	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

RADIATED EMISSIONS

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, a final radiated emissions test was performed. The frequency range investigated (scanned), is also noted in this report. Radiated emissions measurements were made at the EUT azimuth and antenna height such that the maximum radiated emissions level was detected. This required the use of a turntable and an antenna positioner. The preferred method of a continuous azimuth search was utilized for frequency scans of the EUT field strength with both polarities of the measuring antenna. A calibrated, linearly polarized antenna was positioned at the specified distance from the periphery of the EUT. Tests were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna was varied in height above the conducting ground plane to obtain the maximum signal strength. Though specified in the report, the measurement distance was 3 meters or 10 meters. At any measurement distance, the antenna height was varied from 1 meter to 4 meters. These height scans apply for both horizontal and vertical polarization, except that for vertical polarization the minimum height of the center of the antenna was increased so that the lowest point of the bottom of the antenna cleared the ground surface by at least 25 cm.

The EUT arrangement is configured as equivalent to that occurring in normal use. Tabletop equipment is placed on a 0.8 meter high non-conductive table & for Floor-standing equipment, it is placed on, but insulated from a ground reference plane by the use of its own rollers or stand-off supports. If measurements above 1 GHz were required, the test setup was modified to meet the regulatory requirements for higher frequency measurements. If required, RF absorber was placed on the floor between the measurement antenna and EUT.

The diameter of the illumination area is the dimension of the line tangent to the EUT formed by 3 dB beamwidth of the measurement antenna at the measurement distance. At a 3 meter test distance, the diameter of the illumination area was 3.8 meters at 1 GHz and greater than 2.1 meters up to 6 GHz. Above 1 GHz, when required by the measurement standard, the antenna is pointed for both azimuth and elevation to maintain the receive antenna within the cone of radiation from the EUT. The specified measurement detectors were used for comparison of the emissions to the peak and average specification limits.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	N9010A	AFI	01/27/2013	24 mo
Antenna, Biconilog	Teseq	CBL 6141B	AYD	12/17/2013	24 mo
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	03/14/2014	12 mo
Pre-Amplifier	Miteq	AM-1616-1000	PAD	03/14/2014	12 mo

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	3.9 dB	-3.9 dB

FREQUENCY RANGE INVESTIGATED

30 MHz TO 1000 MHz

POWER INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

UTCF0022-2

MODES INVESTIGATED

Idle Mode

RADIATED EMISSIONS

WTD.2013.12.04, PSA-ESCI 2014.06.19, EmiR5 2014.07.09

EUT:	60-807-95R Motion Sensor PIR	Work Order:	UTCF0022
Serial Number:	TXID 043515E DL 5E5143	Date:	09/11/2014
Customer:	UTC Fire and Security	Temperature:	21.8°C
Attendees:	Renee Christian	Relative Humidity:	44.9%
Customer Project:	None	Bar. Pressure:	1026.7 mb
Tested By:	Dustin Sparks	Job Site:	MN05
Power:	Battery	Configuration:	UTCF0022-2

TEST SPECIFICATIONS

Specification: Equipment Class B	Method:
FCC 15.109:2014	ANSI C63.4:2009
ICES-003:2010	ANSI C63.4:2009

TEST PARAMETERS

Run #:	3	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

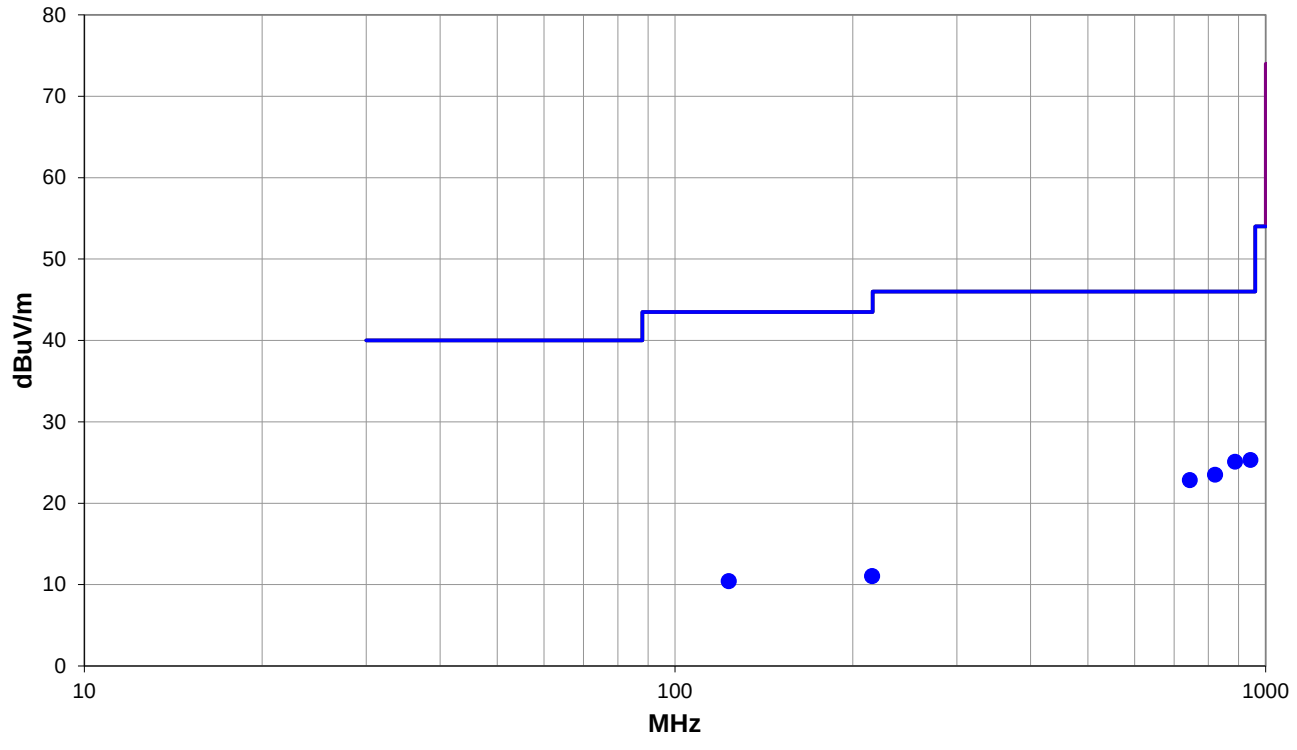
None

EUT OPERATING MODES

Idle Mode

DEVIATIONS FROM TEST STANDARD

None



Run #: 3 ■ PK ◆ AV ● QP

RADIATED EMISSIONS

RESULTS - Run #3

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Ant. Height (m)	Azimuth (deg.)	Test Dist. (m)	Ext. Atten. (dB)	Polar. Trans. Type	Detect.	Dist. Adjust. (dB)	Adj. (dBuV/m)	Spec. Limit (dBuV/m)	Margin. (dB)
942.335	15.1	10.2	4.0	127.0	3.0	0.0	Horz	QP	0.0	25.3	46.0	-20.7
887.394	15.3	9.8	1.0	78.0	3.0	0.0	Horz	QP	0.0	25.1	46.0	-20.9
820.967	15.2	8.3	3.5	236.0	3.0	0.0	Horz	QP	0.0	23.5	46.0	-22.5
744.002	15.1	7.7	2.8	109.0	3.0	0.0	Vert	QP	0.0	22.8	46.0	-23.2
215.546	15.7	-4.7	2.0	329.0	3.0	0.0	Horz	QP	0.0	11.0	43.5	-32.5
123.306	15.4	-5.0	2.5	143.0	3.0	0.0	Horz	QP	0.0	10.4	43.5	-33.1

CONCLUSION

Pass

Tested By

RADIATED EMISSIONS

RADIATED EMISSIONS HIGH FREQUENCY

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, a final radiated emissions test was performed. The frequency range investigated (scanned), is also noted in this report. Radiated emissions measurements were made at the EUT azimuth and antenna height such that the maximum radiated emissions level was detected. This required the use of a turntable and an antenna positioner. The preferred method of a continuous azimuth search was utilized for frequency scans of the EUT field strength with both polarities of the measuring antenna. A calibrated, linearly polarized antenna was positioned at the specified distance from the periphery of the EUT. Tests were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna was varied in height above the conducting ground plane to obtain the maximum signal strength. Though specified in the report, the measurement distance was 3 meters or 10 meters. At any measurement distance, the antenna height was varied from 1 meter to 4 meters. These height scans apply for both horizontal and vertical polarization, except that for vertical polarization the minimum height of the center of the antenna was increased so that the lowest point of the bottom of the antenna cleared the ground surface by at least 25 cm.

The EUT arrangement is configured as equivalent to that occurring in normal use. Tabletop equipment is placed on a 0.8 meter high non-conductive table & for Floor-standing equipment, it is placed on, but insulated from a ground reference plane by the use of its own rollers or stand-off supports. If measurements above 1 GHz were required, the test setup was modified to meet the regulatory requirements for higher frequency measurements. If required, RF absorber was placed on the floor between the measurement antenna and EUT.

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TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	N9010A	AFI	01/27/2013	24 mo
Antenna, Horn	ETS	3160-07	AXP	NCR	0 mo
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVV	03/14/2014	12 mo
MN05 Cables	ESM Cable Corp.	Standard Gain Horn Cables	MNJ	03/14/2014	12 mo

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	3.2 dB	-3.2 dB

FREQUENCY RANGE INVESTIGATED

1000 MHz TO 8200 MHz

POWER INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

UTCF0022-2

MODES INVESTIGATED

Idle mode

RADIATED EMISSIONS HIGH FREQUENCY

WTD.2013.12.04, PSA-ESCI 2014.06.19, EmiR5 2014.07.09

EUT:	60-807-95R Motion Sensor PIR	Work Order:	UTCF0022
Serial Number:	TXID 043515E DL 5E5143	Date:	09/11/2014
Customer:	UTC Fire and Security	Temperature:	21.8°C
Attendees:	Renee Christian	Relative Humidity:	44.9%
Customer Project:	None	Bar. Pressure:	1026.7 mb
Tested By:	Dustin Sparks	Job Site:	MN05
Power:	Battery	Configuration:	UTCF0022-2

TEST SPECIFICATIONS

Specification: Equipment Class B	Method:
FCC 15.109:2014	ANSI C63.4:2009
ICES-003:2010	ANSI C63.4:2009

TEST PARAMETERS

Run #:	6	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)

COMMENTS

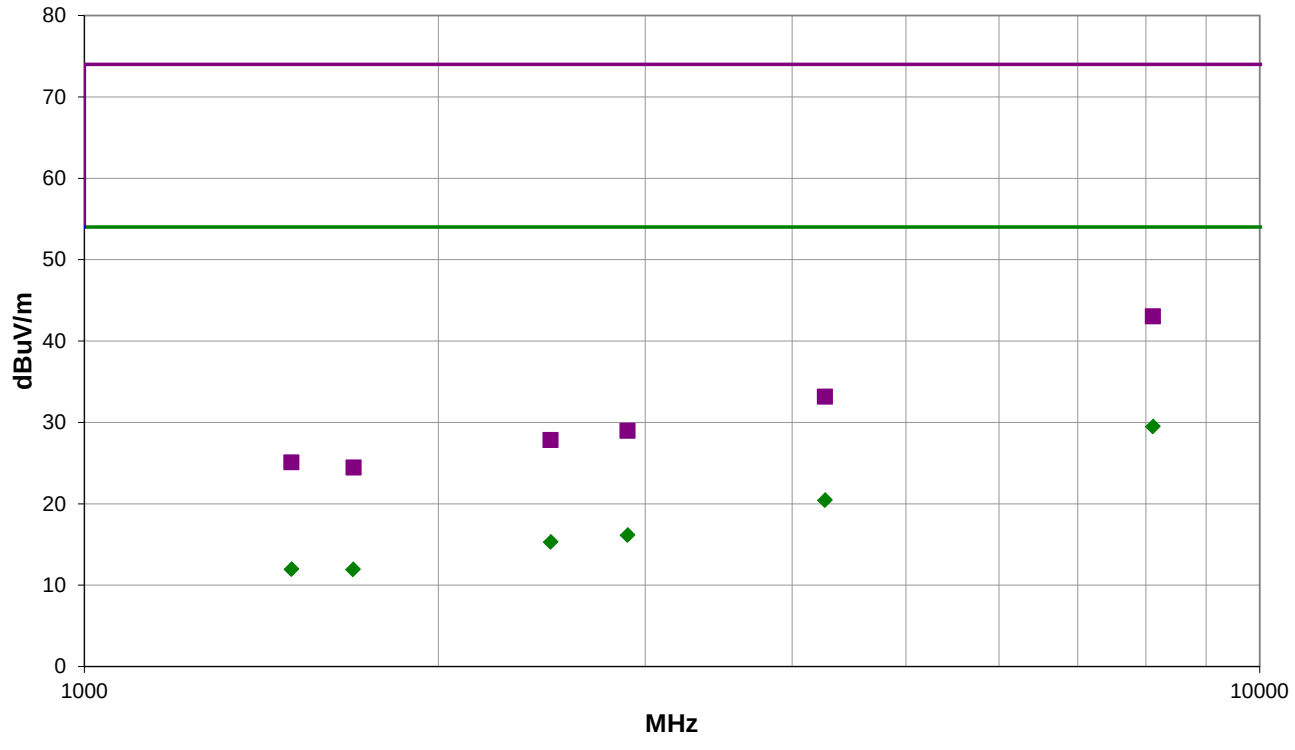
None

EUT OPERATING MODES

Idle mode

DEVIATIONS FROM TEST STANDARD

None



Run #: 6 ■ PK ◆ AV ● QP

RADIATED EMISSIONS HIGH FREQUENCY

RESULTS - Run #6

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Ant. Height (m)	Azimuth (deg.)	Test Dist. (m)	Ext. Atten. (dB)	Polar. Trans. Type	Detect.	Dist. Adjust. (dB)	Adj. (dBuV/m)	Spec. Limit (dBuV/m)	Margin. (dB)
8107.675	16.1	13.4	1.2	324.0	3.0	0.0	Horz	AV	0.0	29.5	54.0	-24.5
8109.550	29.6	13.4	1.2	324.0	3.0	0.0	Horz	PK	0.0	43.0	74.0	-31.0
4264.560	17.2	3.3	1.2	323.0	3.0	0.0	Vert	AV	0.0	20.5	54.0	-33.5
2896.850	18.9	-2.7	1.2	13.0	3.0	0.0	Horz	AV	0.0	16.2	54.0	-37.8
2491.730	18.3	-3.0	1.2	18.0	3.0	0.0	Vert	AV	0.0	15.3	54.0	-38.7
4265.410	29.9	3.3	1.2	323.0	3.0	0.0	Vert	PK	0.0	33.2	74.0	-40.8
1499.515	17.3	-5.3	2.2	19.0	3.0	0.0	Horz	AV	0.0	12.0	54.0	-42.0
1691.695	17.3	-5.3	3.6	266.0	3.0	0.0	Horz	AV	0.0	12.0	54.0	-42.0
2897.910	31.7	-2.7	1.2	13.0	3.0	0.0	Horz	PK	0.0	29.0	74.0	-45.0
2492.105	30.8	-3.0	1.2	18.0	3.0	0.0	Vert	PK	0.0	27.8	74.0	-46.2
1500.010	30.4	-5.3	2.2	19.0	3.0	0.0	Horz	PK	0.0	25.1	74.0	-48.9
1694.035	29.8	-5.3	3.6	266.0	3.0	0.0	Horz	PK	0.0	24.5	74.0	-49.5

CONCLUSION

Pass

Tested By

RADIATED EMISSIONS HIGH FREQUENCY