1601 North A.W. Grimes Blvd., Suite B
Round Rock, TX 78665
e-mail: info@ptitest.com
(512) 244-3371 Fax: (512) 244-1846

April 19, 2011

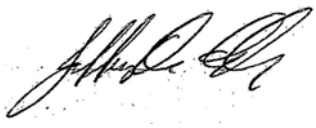
Don McLane
Alert Technologies, Inc.
16441 Space Center Blvd.
Bldg. D-500
Houston, Texas 77058

Dear Don:

Enclosed is the Wireless Test Report for Easy Assist Call Button by Alert Technologies, Inc. This report can be used to demonstrate compliance with FCC requirements for wireless devices in the United States.

If you have any questions, please contact me.

Sincerely,



Jeffrey A. Lenk
President

Enclosure

Project 12116-10

Alert Technologies, Inc.
Easy Assist Call Button

Wireless Certification Report

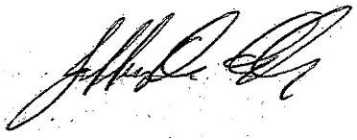
Prepared for:
Alert Technologies, Inc.
16441 Space Center Blvd.
Bldg. D-500
Houston, Texas 77058

By

Professional Testing (EMI), Inc.
1601 N. A.W. Grimes Blvd., Suite B
Round Rock, Texas 78665

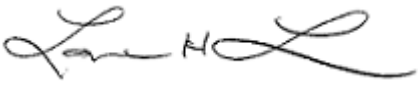
April 6, 2011
Revised April 19, 2011

Reviewed by



Jeffrey A. Lenk
President

Written by



Layne Lueckemeyer
Product Development Engineer

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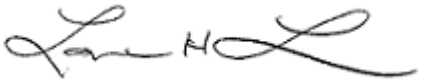
Certificate of Compliance

Applicant:	Alert Technologies, Inc.
Applicant's Address:	16441 Space Center Blvd., Bldg. D-500 Houston, Texas 77058
FCC ID:	Y5JEA1103
Project Number:	12116-10
Test Dates:	January 27, 2011; February 8 & 10, April 15, 2011

The **Alert Technologies Easy Assist Call Button** was tested to and found to be in compliance with FCC 47 CFR Part 90.

I, Layne Lueckemeyer, for Professional Testing (EMI), Inc., being familiar with the FCC rules and test procedures have reviewed the test setup, measured data, and this report. I believe them to be true and accurate.



Layne Lueckemeyer
Product Development Engineer

This report has been reviewed and accepted by Alert Technologies, Inc. The undersigned is responsible for ensuring that this device will continue to comply with the FCC and IC rules.

_____
Representative of Alert Technologies, Inc.

1.0 Introduction

1.1 Scope

This report describes the extent to which the equipment under test (EUT) conformed to the intentional radiator requirements of the United States.

Professional Testing (EMI), Inc. (PTI), follows the guidelines of NIST for all uncertainty calculations, estimates, and expressions thereof for EMC testing. The procedure of ANSI C63.4: 2009 were utilized for making all emissions measurements.

1.2 EUT Description

The EUT is the Easy Assist Call Button, a customer accessible, battery-operated call box designed to allow a customer needing assistance in a specific area of a retail store to send a message over the existing store's radio network. The EUT was tested while in a continuous transmit mode. The EUT was tuned to the transmit frequency 464.5 MHz to perform power, occupied bandwidth, spurious and harmonic tests, and frequency stability tests. The EUT continuously transmitted at maximum power. The system tested consisted of the following:

Manufacturer	Model	FCC ID Number
Alert Technologies, Inc.	Easy Assist Call Button	Y5JEA1103

The following rules apply to the operation of the EUT:

Guidelines	FCC Rules	Test Method	Required	Result
Output Power	90.205	2.1046	Y	Pass
Modulation Characteristics	90.207	2.1047	N	--
Occupied Bandwidth	90.209	2.1049	Y	Pass
Radiated Spurious Emissions	90.210	2.1053	Y	Pass
Frequency Stability	90.213	2.1055	Y	Pass
Radiated Emission	15.109	Class B	Y	Pass
Transient Frequency Behavior	90.214	TIA/EIA 603 2.2.19	Y	Pass

1.3 Modifications

No modifications were made to the EUT during the performance of the test program.

1.4 Test Site

Measurements were made at the PTI semi-anechoic facility designated Site 45 (FCC 459644, IC 3036B-1) in Austin, Texas. This site is registered with the FCC under Section 2.948 and Industry Canada per RS-212, and is subsequently confirmed by laboratory accreditation (NVLAP). The test site is located at 11400 Burnet Road, Austin, Texas, 78758, while the main office is located at 1601 N. A.W. Grimes Blvd., Suite B, Round Rock, Texas, 78665.

1.5 Applicable Documents

Document	Title	Release
ANSI C63.4	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low Voltage Electrical and Electronic Equipment	2009
ANSI C63.10	American National Standard for Testing Unlicensed Wireless Devices	2009
47 CFR	Part 90 – Private Land Mobile Radio Services	

2.0 Radiated Output Power Measurements

Radiated output power measurements were made on the selected fundamental transmit frequency of the EUT. Tests of the radiated output power of the EUT also determined the worse case polarization of the device. The emissions of the device were measured with the EUT in three orthogonal axes.

2.1 Test Procedure

On the test site, the EUT was placed on a turntable and in the position closest to the normal use, as declared by the user. The test antenna was oriented initially for vertical polarization located 3m from the EUT to correspond to the transmitter. The output of the antenna was connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement, as indicated on the report. The detector selection was based on how closely the emission level approached the limit.

The transmitter was switched on; if possible, without the modulation, and the measurement receiver was tuned to the frequency of the transmitter under test. The test antenna was raised and lowered through the specified range of height until the measuring receiver detected a maximum signal level. The transmitter was then rotated 360° in the horizontal plane, until the maximum signal level was detected by the measuring receiver.

The test antenna was raised and lowered again through the specified range of height until the measuring receiver detected a maximum signal level. The maximum signal level detected by the measuring receiver was noted. The measurement was repeated with the test antenna set to horizontal polarization. The antenna was replaced with a proper antenna (substitution antenna). The substitution antenna was oriented for vertical polarization and, if necessary, the length of the substitution antenna was adjusted to correspond to the frequency of transmitting. The substitution antenna was connected to a calibrated signal generator.

If necessary, the input attenuator setting of the measuring receiver was adjusted in order to increase the sensitivity of the measuring receiver. The test antenna was raised and lowered through the specified range of the height to ensure that the maximum signal was received. The input signal to substitution antenna was adjusted to the level that produced a level detected by the measuring receiver, that is, equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.

The input level to the substitution antenna was recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver. The measurement was repeated with the test antenna and the substitution antenna oriented for horizontal polarization. A diagram showing the test setup is given as Figure 2.1.1.

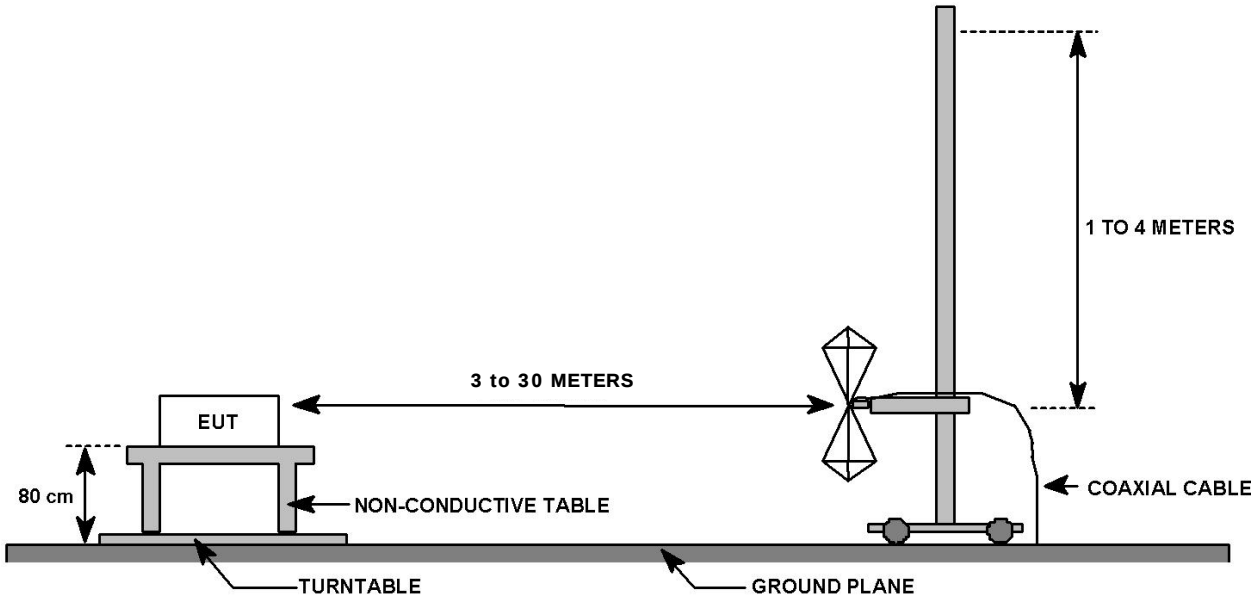


Figure 2.1.1: Radiated Emission Test Setup

2.2 Test Criteria

According to CFR 47 section 90.205, maximum ERP is dependent on the station's antenna HAAT and required service area.

2.3 Test Results

Radiated output power measurements for the EUT were taken on February 8, 2011, and the EUT was found to be in compliance with applicable requirements.

Table 2.3.1: Radiated Emissions Test Equipment

Asset #	Manufacturer	Model #	Description	Calibration Due
0085	HP	85650A	Quasi-peak Adapter (high band)	July 28, 2011
0949	HP	85662A	Spectrum Analyzer Display (high band)	NCR
1841	HP	8566B	Spectrum Analyzer (high band)	June 8, 2011
0990	HP	85685A	RF Preselector (high band)	March 24, 2011
1281	HP	85650A	Quasi-peak Adapter (low band)	January 20, 2012
1834	HP	85662A	Spectrum Analyzer Display (low band)	NCR
1145	HP	8568B	Spectrum Analyzer (low band)	July 28, 2011
1035	HP	85685A	RF Preselector (low band)	April 3, 2011
1454	HP	8447D	RF Preamplifier	July 06, 2011
1497	Emco	3108	Biconical Antenna	August 4, 2011
1486	Emco	3147	Log Periodic Dipole Array Antenna	August 4, 2011
C026	none	none	Coaxial Cable (low band)	August 02, 2011
C027	none	none	Coaxial Cable (high band)	August 02, 2011

Table 2.3.2: Microwave Radiated Emissions Test Equipment

Asset #	Manufacturer	Model #	Description	Calibration Due
1780	ETS-Lindgren	3117	Ridge Guide Antenna	November 11, 2011
1529	Miteq	Antenna Mounted	Microwave Preamplifier (preamp 1)	July 16, 2011
1841	HP	8566B	Spectrum Analyzer	June 8, 2011
0949	HP	85662A	Spectrum Analyzer Display	NCR
1530	Miteq	None	Microwave Preamplifier (preamp 2)	July 16, 2011
C030	None	None	Coaxial Cable (MRE band)	March 22, 2011

Asset #	Manufacturer	Model #	Description	Calibration Due
XXXX	Pasternack	LLS	2 sections, total 12ft	Cal Before Use
0819	EMCO	3115	Ridge Guide Antenna	October 15, 2011
0897	Miteq	AFS44-00102650	Microwave Preamplifier (preamp 1)	July 14, 2011
(Rental unit)	Rohde & Schwarz	FSQ	Spectrum Analyzer	August 24, 2011
1542	A.H. Systems	SAS 572	Antenna, Horn 18-26.5GHz	NCR

Table 2.3.3: Radiated Output Power Test Results

Project #	Date	Rule	Distance	Antenna	RBW	VBW	Detector
12116-10	February 8, 2011	90.205	10m	Tuned Dipole	1 MHz	1 MHz	Peak
COMMENT	Transmitting						

Radiated Output Power (Signal Substitution Tuned Dipole Antenna)

Frequency Measured (MHz)	Antenna Polarity (H/V)	Reading (dBm)	Signal Generator Output (dBm)	Path Loss (dB)	Antenna Gain (dB)	E.R.P. (dBm)
464.5	H	-7.09	17.8	1.5	1.12	17.42
464.5	V	-8.99	15.9	1.5	1.12	15.52

Note: E.R.P(dBm) = SG output power (dBm) - Path Loss (dB) + Antenna Gain (dB)

3.0 Occupied Bandwidth

Occupied bandwidth measurements were performed on the EUT to determine compliance with FCC 90.209 and FCC 2.1049.

3.1 Test Procedure

The EUT was placed on a turntable, which is 0.8 m above ground plane. The EUT was set for normal operation, and the following additional settings were applied:

- SPA center frequency = fundamental frequency
- RBW = 10 KHz
- VBW = 30 KHz
- Spectrum analyzer set to Max Hold
- Peak marked at -20dB

A diagram showing the test setup is given as Figure 2.1.1.

3.2 Test Criteria

According to FCC CFR 47 Part 90, Section 90.209, for other types of emissions, the maximum authorized bandwidth shall not be more than that normally authorized for voice operations.

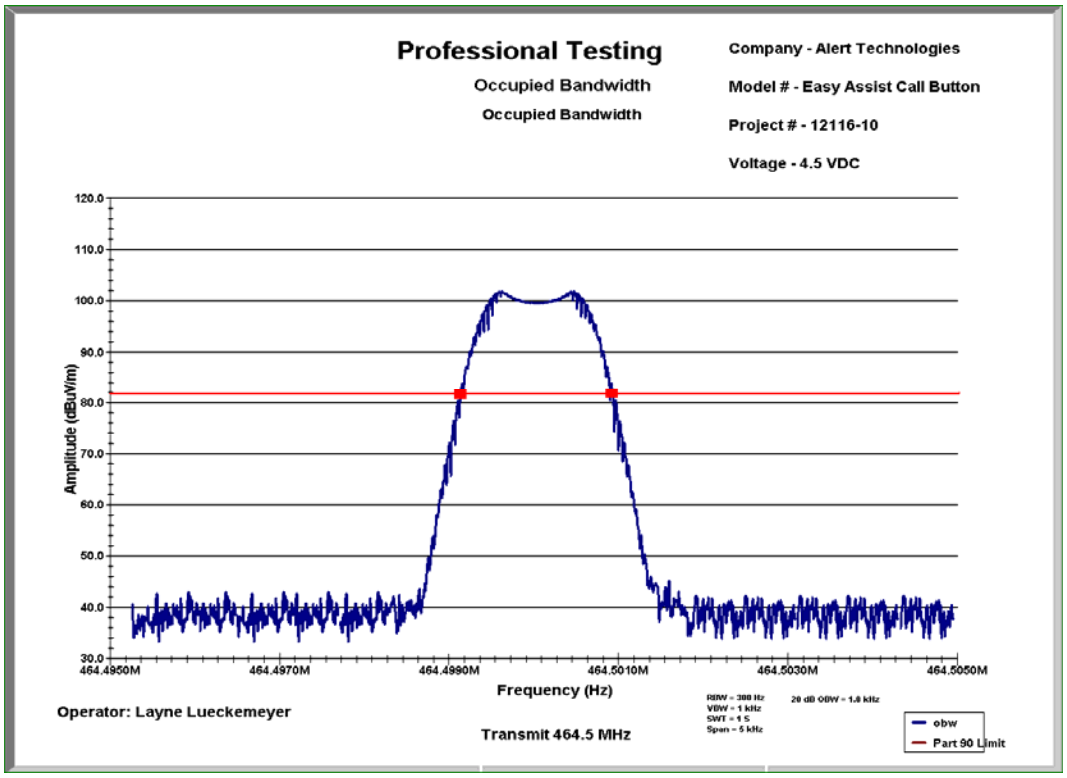
3.3 Test Results

Occupied bandwidth measurements were taken on February 10, 2011, and the EUT was found to be in compliance with applicable requirements. Test equipment used to perform this test is given in Table 2.3.1.

Table 3.3.1: Occupied Bandwidth Test Results, Data Sheet 1

Project #	Date	Rule	Distance	Antenna	RBW	VBW	Detector
12116-10	February 10, 2011	90.209	1 m	Log Periodical	300 Hz	1 kHz	Peak
COMMENT	Transmitting 20 dB Bandwidth – 1.8 kHz						

20 dB



Result = Pass

4.0 Emission Mask

Occupied bandwidth measurements were performed on the EUT to determine compliance with FCC 90.209, and FCC 2.1049.

4.1 Test Procedure

On the test site, the EUT was placed on a turntable and in the position closest to the normal use, as declared by the user. The test antenna was oriented initially for vertical polarization located 3m from the EUT to correspond to the transmitter. The output of the antenna was connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement, as indicated on the report. The detector selection was based on how closely the emission level approached the limit.

The transmitter was switched on; if possible, without the modulation, and the measurement receiver was tuned to the frequency of the transmitter under test. The test antenna was raised and lowered through the specified range of height until the measuring receiver detected a maximum signal level. The transmitter was then rotated 360° in the horizontal plane, until the maximum signal level was detected by the measuring receiver.

The test antenna was raised and lowered again through the specified range of height until the measuring receiver detected a maximum signal level. The maximum signal level detected by the measuring receiver was noted. The measurement was repeated with the test antenna set to horizontal polarization. The antenna was replaced with a proper antenna (substitution antenna). The substitution antenna was oriented for vertical polarization and, if necessary, the length of the substitution antenna was adjusted to correspond to the frequency of transmitting. The substitution antenna was connected to a calibrated signal generator.

If necessary, the input attenuator setting of the measuring receiver was adjusted in order to increase the sensitivity of the measuring receiver. The test antenna was raised and lowered through the specified range of the height to ensure that the maximum signal was received. The input signal to substitution antenna was adjusted to the level that produced a level detected by the measuring receiver, that is, equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.

The input level to the substitution antenna was recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver. The measurement was repeated with the test antenna and the substitution antenna oriented for horizontal polarization. A diagram showing the test setup is given as Figure 2.1.1.

4.2 Test Criteria

According to CFR 47 section 90.210, the mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule.

Part 90.210(e) Emission Mask E – 6.25 kHz channel BW equipment.
For transmitters designed to operate with a 6.25 kHz bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

1. On any frequency from the center of the authorized bandwidth f0 to 3.0 kHz removed from f0: Zero dB.
2. On any frequency from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 3.0 kHz but no more than 4.6 kHz: At least 30 + 16.67(fd – 3.0 kHz) or 55 + 10 Log(P) or 65, whichever is the lesser attenuation.
3. On any frequency removed from the center of the authorized bandwidth by more than 4.6kHz: At least 55 + 10log(P) dB or 65 dB, whichever is the lesser attenuation.

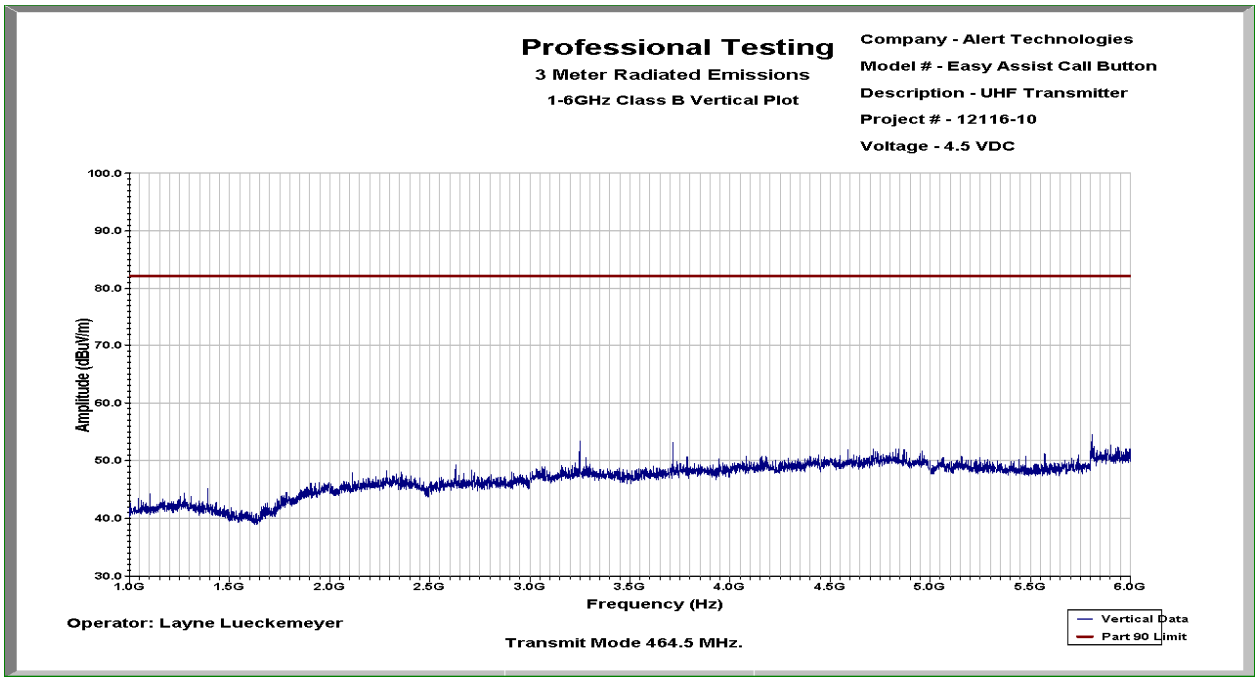
4.3 Test Results

Emission mask measurements were taken on February 10, 2011, and the EUT was found to be in compliance with applicable requirements. Test equipment used to perform this test is given in Table 2.3.1.

Table 4.3.1: Emission Mask Test Results, Data Sheet 1

Project #	Date	Rule	Distance	Antenna	RBW	VBW	Detector
12116-10	February 10, 2011	90.209	3 m	Log Periodical	300 Hz	1 kHz	Peak
COMMENT	Transmitting						

Frequency Measured (MHz)	Antenna Polarity (H/V)	Signal Generator (dBm)	Path Loss (dB)	Antenna Gain (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
929	V	-17.5	12.5	8.31	-21.69	-13	-8.69
1393.5	V	--	--	--	--	-13	<10dB
1858	V	--	--	--	--	-13	<10dB
2322.5	V	--	--	--	--	-13	<10dB

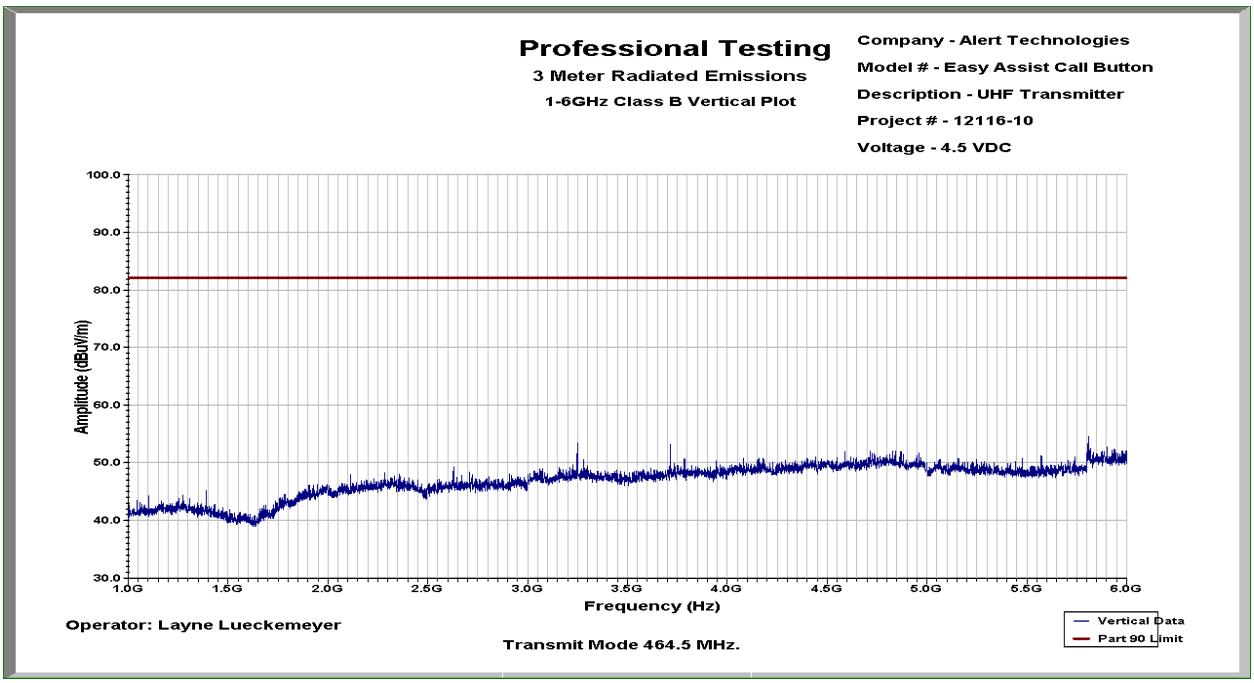

Professional Testing
3 Meter Radiated Emissions
1-6GHz Class B Vertical Plot
Company - Alert Technologies
Model # - Easy Assist Call Button
Description - UHF Transmitter
Project # - 12116-10
Voltage - 4.5 VDC
Amplitude (dBuV/m)
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
1.0G
1.5G
2.0G
2.5G
3.0G
3.5G
4.0G
4.5G
5.0G
5.5G
6.0G
Frequency (Hz)
Operator: Layne Lueckemeyer
Transmit Mode 464.5 MHz.
Vertical Data
Part 90 Limit

Result = Pass

Table 4.3.2: Emission Mask Test Results, Data Sheet 2

Project #	Date	Rule	Distance	Antenna	RBW	VBW	Detector
12116-10	February 10, 2011	90.209	3 m	Log Periodical	300 Hz	1 kHz	Peak
COMMENT	Transmitting						

Frequency Measured (MHz)	Antenna Polarity (H/V)	Signal Generator (dBm)	Path Loss (dB)	Antenna Gain (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
929	H	-21.5	12.5	8.31	-25.69	-13	-12.69
1393.5	H	--	--	--	--	-13	<10dB
1858	H	--	--	--	--	-13	<10dB
2322.5	H	--	--	--	--	-13	<10dB



Notes:

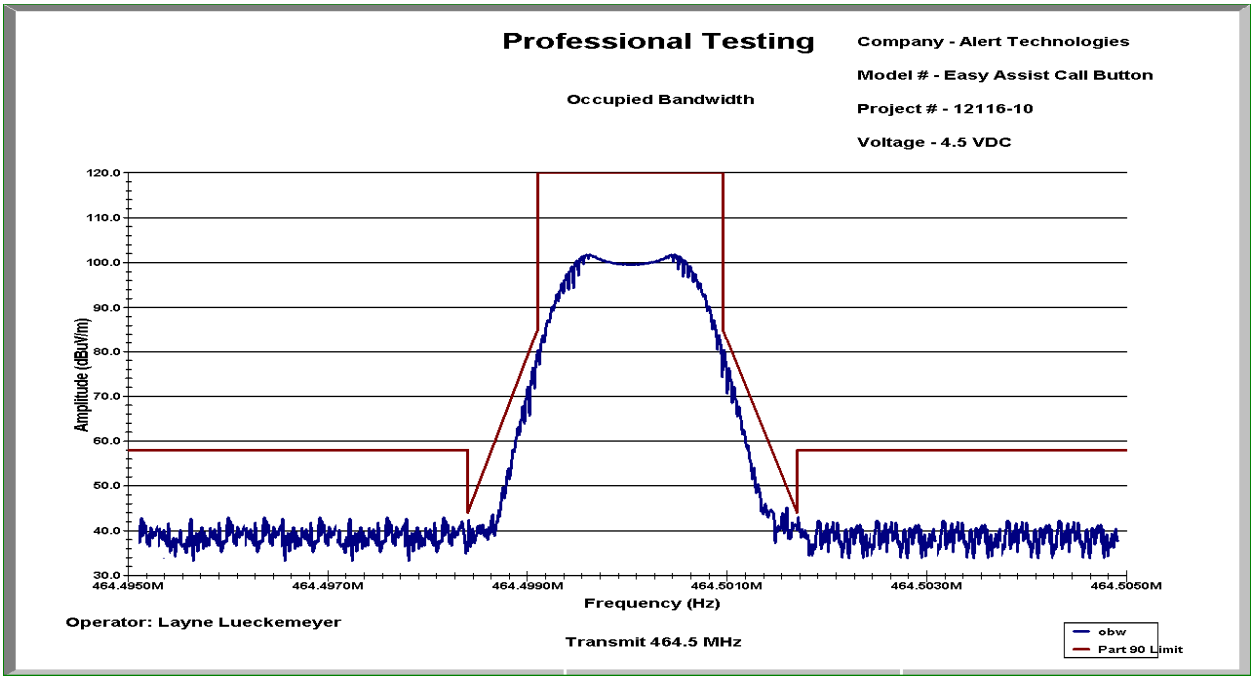
1. "--" in the tables above indicates that the emissions are too small to be measured and are at least 10 dB below the limit.
2. Emission Level = Signal generator output power (dBm) – Cable loss (db) + Antenna Gain (dBi)

Limit calculation explanations:

Maximum Transmitter Power (P) 17.4 dBm
Required attenuation 43 + 10log10 (0.055) = 30.4 dB
Emission Limits P – [43+10log10 (0.055)] = –13 dBm

Table 4.3.3: Emission Mask Test Results, Data Sheet 3

Project #	Date	Rule	Distance	Antenna	RBW	VBW	Detector
12116-10	February 10, 2011	90.209	1 m	Log Periodical	300 Hz	1 kHz	Peak
COMMENT	Transmitting						



Result = Pass

5.0 Frequency Stability Versus Temperature

Frequency stability measurements were performed on the EUT to determine compliance to FCC sections 90.213 and 2.1055.

5.1 Test Procedure

The temperature stability of the frequency-generating components of the transmitter was observed. The transmitter was placed in a temperature chamber with a programming coil that enables a transmission to be requested from outside the chamber. A receiving antenna outside the chamber picked up the transmitted signal, which was fed to the spectrum analyzer. With the transmitter programmed to transmit at 464.5 MHz, the chamber temperature was set to 20° C.

After reaching the set temperature, the transmitter was allowed to stabilize. The transmitted signal was captured by the spectrum analyzer, and the frequency was determined. The temperature in the chamber was then increased to 30° C. At each temperature, at least 20 minutes were allowed for stabilization of the transmitter, a transmission was made, and the frequency determined.

The temperature was increased in 10° C intervals to +50° C. The temperature was then returned to 20° C, stabilized, and then decreased to -30° C in 10° intervals. The temperature was stabilized at each 10° interval before a reading was made. The frequency at each temperature was recorded, compared to the 464.5 MHz tuned frequency, and recorded in Table 4.3.1. As evidenced by the data in the table, all readings are within the deviation limit of ±2.5 ppm at 464.5 MHz.

5.2 Test Criteria

According to FCC Part 2, Section 2.1055(a)(1), the frequency stability shall be measured with variation of ambient temperature from –30ºC to +50 ºC.

5.3 Test Results

Frequency stability measurements were taken on January 27, 2011, and the EUT was found to be in compliance with applicable requirements.

Table 4.3.1: Out of Band Spurious Emissions Test Results, 30 MHz to 1 GHz, Horizontal Polarization

Project #	Date	Rule	Distance	Antenna	RBW	VBW	Detector
12116-10	January 27, 2011	90.213	Direct	Direct	300 Hz	1 kHz	Peak
COMMENT	Reference Frequency = 464.503792 MHz						

Temperature (ºC)	Measured Frequency (MHz)	Deviation (Hz)	Deviation (PPM)
-30	464.503773	19	.041
-20	464.503666	126	.271
-10	464.503.568	224	.482
0	464.503.595	197	.424
10	464.503.744	48	.103
20	464.503.792	0	0
30	464.503.575	217	.467
40	464.503.343	449	.967
50	464.502.692	1100	2.36

Result = Pass

6.0 Out of Band Spurious Emissions

Out of band spurious/harmonic emissions measurements were performed on the EUT to determine compliance to FCC sections 15.109.

6.1 Test Procedure

The EUT was placed on a non-conductive table 0.8 meters above the ground plane. The table was centered on a rotating turntable at a distance of 10 meters from the measurement antenna.

For spurious emissions below 1 GHz, quasi-peak detection was used with a resolution bandwidth of 120 kHz. All measurements below 1 GHz were normalized to 3 meters using a 20 dB/decade distance extrapolation. The emissions were maximized by rotating the EUT and raising and lowering the measurement antenna from 1 to 4 meters.

Spurious/harmonic emissions above 1 GHz peak were measured with average and peak detection with a resolution bandwidth of 1 MHz and measured at a distance of 1 meter. Average detection was used to determine compliance of the EUT if the peak did not meet the average limit. Non-harmonic emissions must satisfy the average limit and the peak limit (20 dB above average). A diagram showing the test setup is given as Figure 2.1.1. Above 1 GHz, testing was completed at the transmit frequency to determine compliance.

6.2 Test Criteria

The radiated limits of FCC 15.209 are shown below. The limits specified are at 3 meters. The limits are quasi-peak for emissions below 1 GHz and average for emissions above 1 GHz. Also above 1 GHz, the peak limit is 20 dB above the average limit.

Frequency MHz	Specification Distance (Meters)	Field Strength (dBuV/m)	Test Distance (Meters)	Field Strength (dBuV/m)
30 to 88	3	40.0	10	29.5
88 to 216	3	43.5	10	33
216 to 960	3	46.0	10	35.5
Above 960	3	54.0	1	63.5

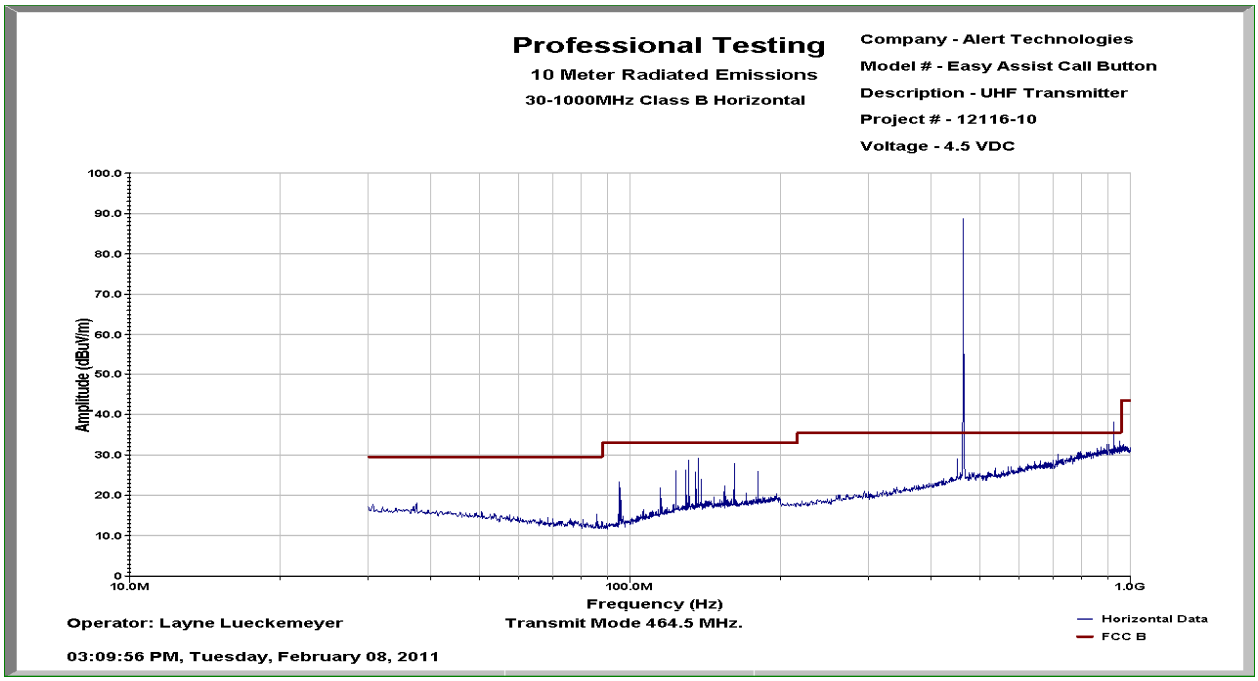
6.3 Test Results

Out of band spurious emissions measurements were taken on February 8, 2011, and the EUT was found to be in compliance with applicable requirements. Test equipment used to perform this test is given in Tables 2.3.1 and 2.3.2.

Table 6.3.1: Out of Band Spurious Emissions Test Results, 30 MHz to 1 GHz, Horizontal Polarization

Project #	Date	Class	Distance	Antenna	RBW	VBW	Detector
12116-10	February 8, 2011	FCC B	10 m	Bicon | Log	CISPR 120 kHz	1 MHz	Quasi Peak
COMMENT	Transmitting						

Frequency Measured (MHz)	Test Distance (Meters)	EUT Direction (Degrees)	Antenna Height (Meters)	Detector Function	Recorded Amplitude (dBµV)	Corrected Level (dBµV/m)	Limit Level (dBµV/m)	Margin (dB)
95.11	10	1	4	Quasi-Peak	23.4	7.5	33.0	-25.5
123.5	10	1	4	Quasi-Peak	25.9	13.6	33.0	-19.4
131.15	10	1	4	Quasi-Peak	28.7	16.9	33.0	-16.1
136.93	10	128	4	Quasi-Peak	29.2	17.7	33.0	-15.3
161.58	10	192	4	Quasi-Peak	27.9	17.1	33.0	-15.9
929	10	101	4	Quasi-Peak	33.1	32.9	35.5	-2.6

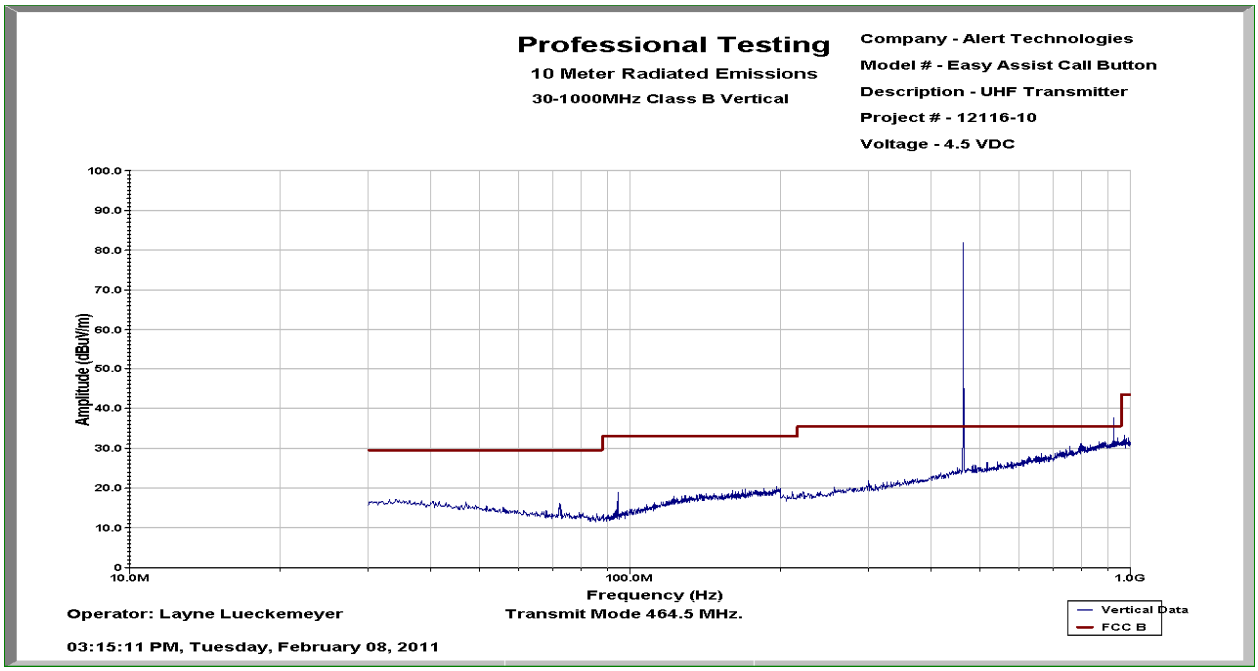


Result = Pass

Table 6.3.2: Out of Band Spurious Emissions Test Results, 30 MHz to 1 GHz, Vertical Polarization

Project #	Date	Class	Distance	Antenna	RBW	VBW	Detector
12116-10	February 8, 2011	FCC B	10 m	Bicon | Log	CISPR 120 kHz	1 MHz	Quasi-Peak
COMMENT	Transmitting						

Frequency Measured (MHz)	Test Distance (Meters)	EUT Direction (Degrees)	Antenna Height (Meters)	Detector Function	Recorded Amplitude (dBµV)	Corrected Level (dBµV/m)	Limit Level (dBµV/m)	Margin (dB)
94.668	10	197	1	Quasi-Peak	30.2	14.2	29.5	-15.3
156.31	10	Noise	Floor	Quasi-Peak	21.6	10.7	33.0	-22.3
199.83	10	Noise	Floor	Quasi-Peak	21.4	12.1	33.0	-20.9
566.4	10	Noise	Floor	Quasi-Peak	26.8	20.3	35.5	-15.2
841.6	10	Noise	Floor	Quasi-Peak	26.1	24.6	35.5	-10.9
929.1	10	126	1	Quasi-Peak	32.6	32.4	35.5	-3.1

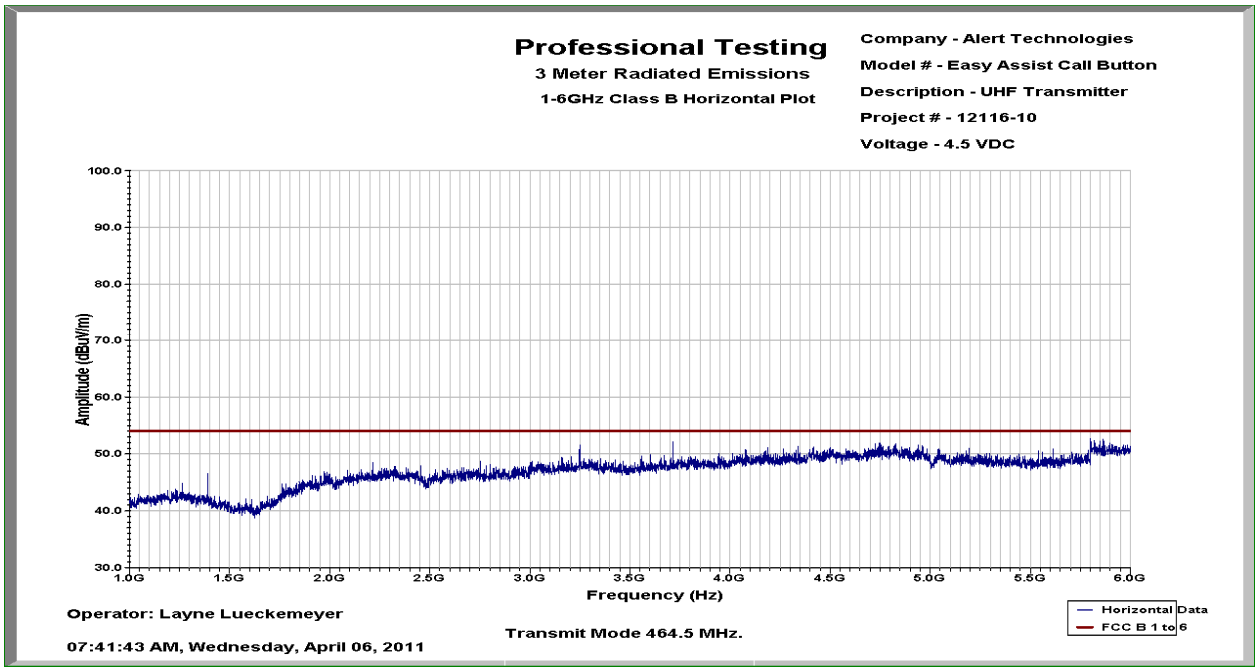


Result = Pass

Table 6.3.3: Out of Band Spurious Emissions Test Results, 1 GHz to 6 GHz, Horizontal Polarization

Project #	Date	Class	Distance	Antenna	RBW	VBW	Detector
12116-10	February 8, 2011	FCC B	3 m	Horn	1 MHz	1 MHz	Average
COMMENT	Transmitting						

Frequency Measured (MHz)	Test Distance (Meters)	EUT Direction (Degrees)	Antenna Height (Meters)	Detector Function	Recorded Amplitude (dBµV)	Corrected Level (dBµV/m)	Limit Level (dBµV/m)	Margin (dB)
1392	3	245	1	Average	40.5	35.0	54.0	-19.0
2214	3	126	1	Average	42.5	41.7	54.0	-12.3
3251	3	118	1	Average	46.7	47.5	54.0	-6.5
3714	3	201	1	Average	47.3	48.4	54.0	-5.6
5801	3	97	1	Average	48.6	50.4	54.0	-3.5
5870	3	221	1	Average	47.2	49.1	54.0	-4.8

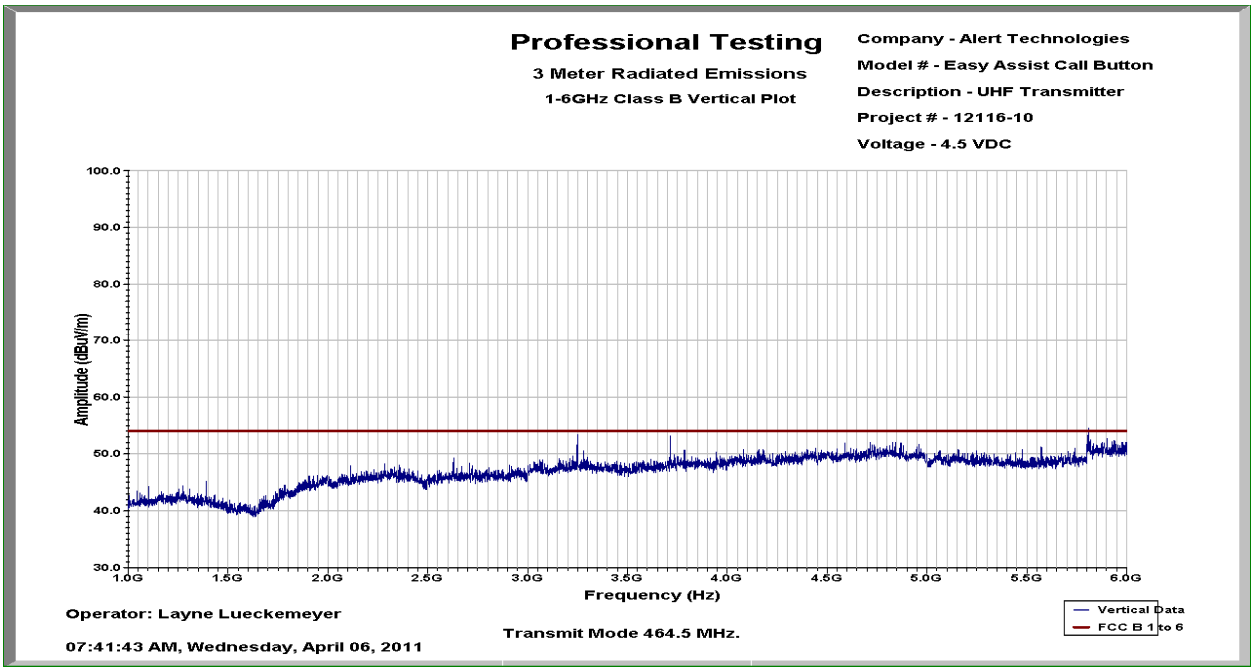


Result = Pass

Table 6.3.4: Out of Band Spurious Emissions Test Results, 1 GHz to 6 GHz, Vertical Polarization

Project #	Date	Class	Distance	Antenna	RBW	VBW	Detector
12116-10	February 8, 2011	FCC B	3 m	Horn	1 MHz	1 MHz	Average
COMMENT	Transmitting						

Frequency Measured (MHz)	Test Distance (Meters)	EUT Direction (Degrees)	Antenna Height (Meters)	Detector Function	Recorded Amplitude (dBµV)	Corrected Level (dBµV/m)	Limit Level (dBµV/m)	Margin (dB)
1392	3	109	1	Average	40.1	34.6	54.0	-19.4
2629	3	235	1	Average	42.3	41.9	54.0	-12.0
3250	3	16	1	Average	48.4	49.2	54.0	-4.8
3714	3	96	1	Average	47.2	48.3	54.0	-5.7
5573	3	149	1	Average	46.2	47.2	54.0	-6.8
5810	3	203	1	Average	49.5	51.3	54.0	-2.6

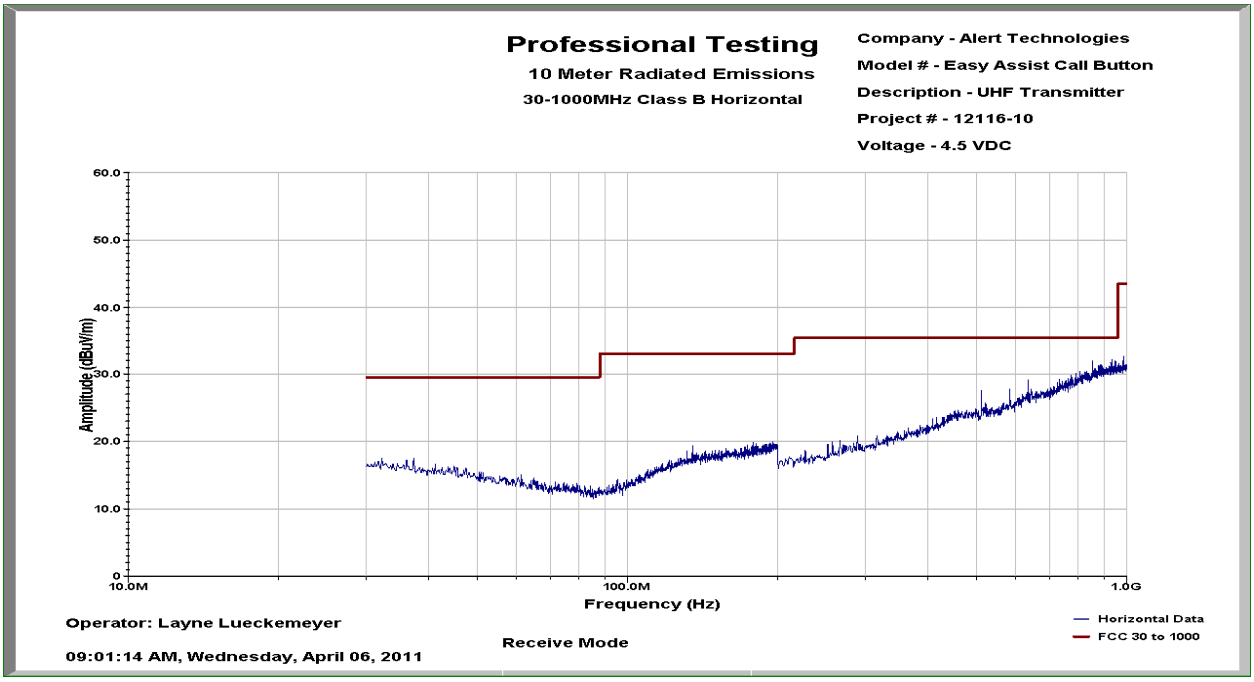


Result = Pass

Table 6.3.5: Out of Band Spurious Emissions Test Results, 30 MHz to 1 GHz, Horizontal Polarization

Project #	Date	Class	Distance	Antenna	RBW	VBW	Detector
12116-10	February 8, 2011	FCC B	10 m	Bicon | Log	CISPR 120 kHz	1 MHz	Quasi-Peak
COMMENT	Receive Mode						

Frequency Measured (MHz)	Test Distance (Meters)	EUT Direction (Degrees)	Antenna Height (Meters)	Detector Function	Recorded Amplitude (dBµV)	Corrected Level (dBµV/m)	Limit Level (dBµV/m)	Margin (dB)
512	10	242	4	Quasi-Peak	27.6	20.1	35.5	-15.4
583.2	10	195	4	Quasi-Peak	27.7	21.5	35.5	-14.0
636	10	89	4	Quasi-Peak	29.2	24.3	35.5	-11.2

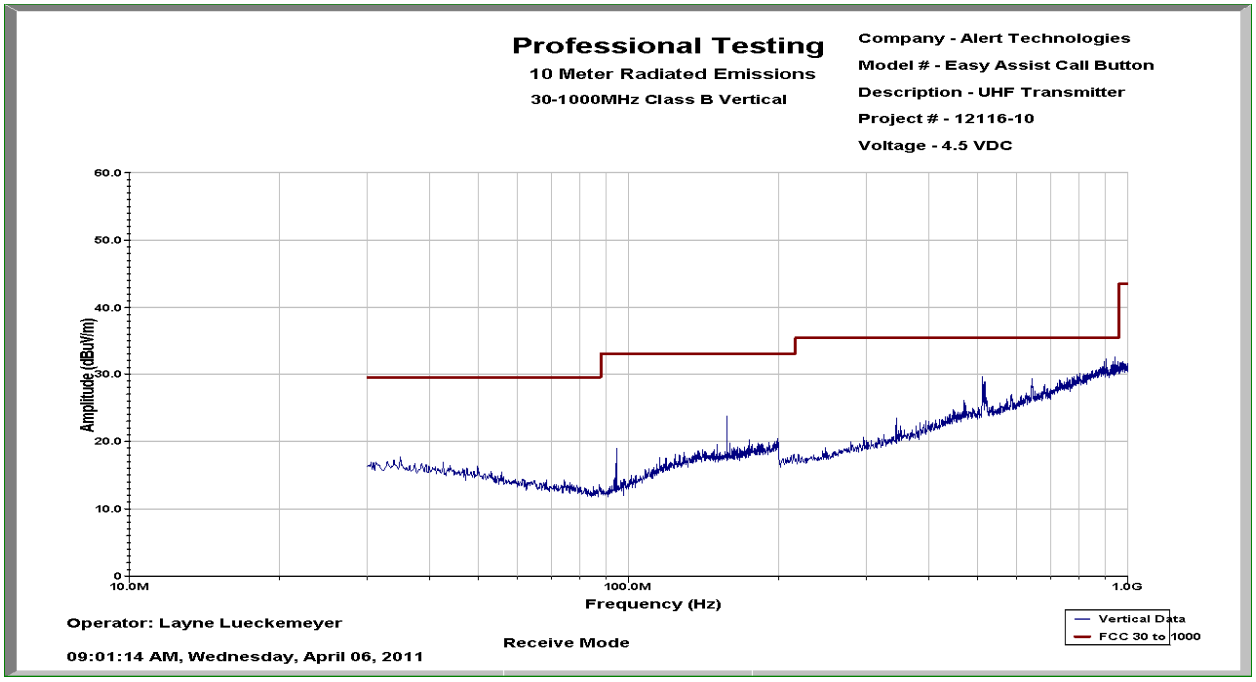


Result = Pass

Table 6.3.6: Out of Band Spurious Emissions Test Results, 30 MHz to 1 GHz, Vertical Polarization

Project #	Date	Class	Distance	Antenna	RBW	VBW	Detector
12116-10	February 8, 2011	FCC B	10 m	Bicon | Log	CISPR 120 kHz	1 MHz	Quasi Peak
COMMENT	Transmitting						

Frequency Measured (MHz)	Test Distance (Meters)	EUT Direction (Degrees)	Antenna Height (Meters)	Detector Function	Recorded Amplitude (dBµV)	Corrected Level (dBµV/m)	Limit Level (dBµV/m)	Margin (dB)
94.77	10	107	1	Quasi-Peak	18.9	2.9	29.5	-26.6
157.67	10	28	1	Quasi-Peak	23.8	12.9	33.0	-20.1
512	10	119	1	Quasi-Peak	29.6	22.1	35.5	-13.4

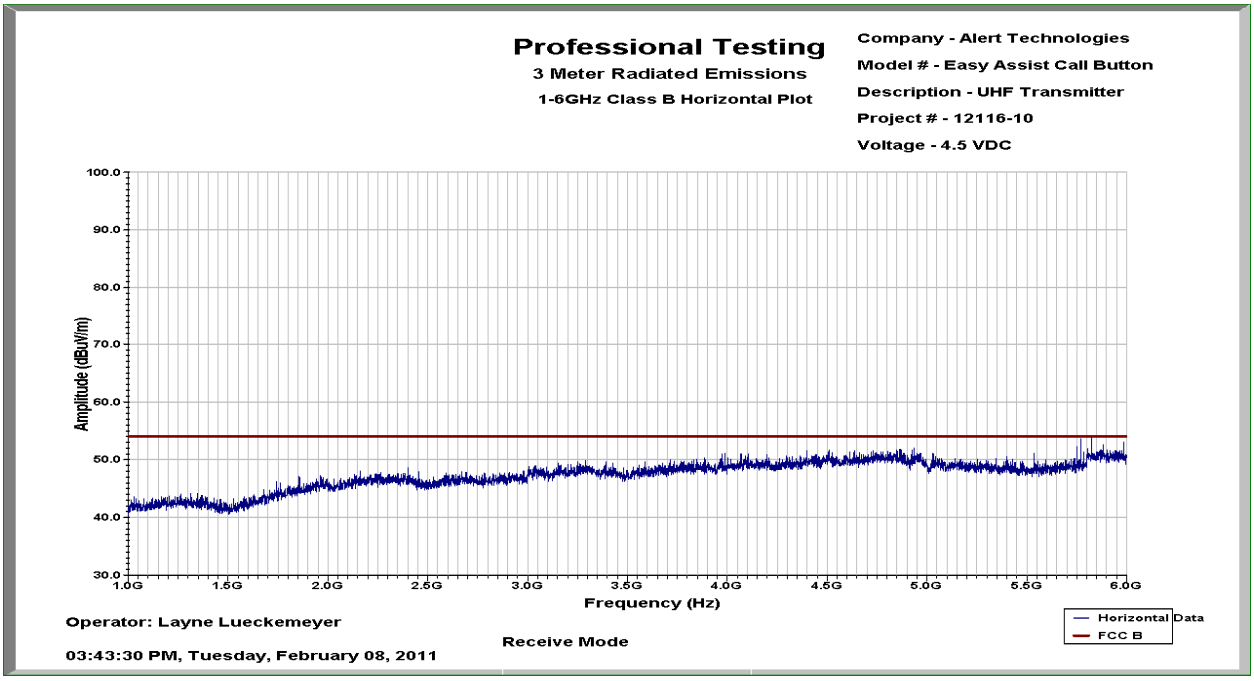


Result = Pass

Table 6.3.7: Out of Band Spurious Emissions Test Results, 1 GHz to 6 GHz, Horizontal Polarization

Project #	Date	Class	Distance	Antenna	RBW	VBW	Detector
12116-10	February 8, 2011	FCC B	3 m	Horn	1 MHz	1 MHz	Average
COMMENT	Transmitting						

Frequency Measured (MHz)	Test Distance (Meters)	EUT Direction (Degrees)	Antenna Height (Meters)	Detector Function	Recorded Amplitude (dBµV)	Corrected Level (dBµV/m)	Limit Level (dBµV/m)	Margin (dB)
5778.51	3	1	1	Average	36.5	38.3	54.0	-15.7
5812.76	3	173	1	Average	39.2	41.0	54.0	-12.9

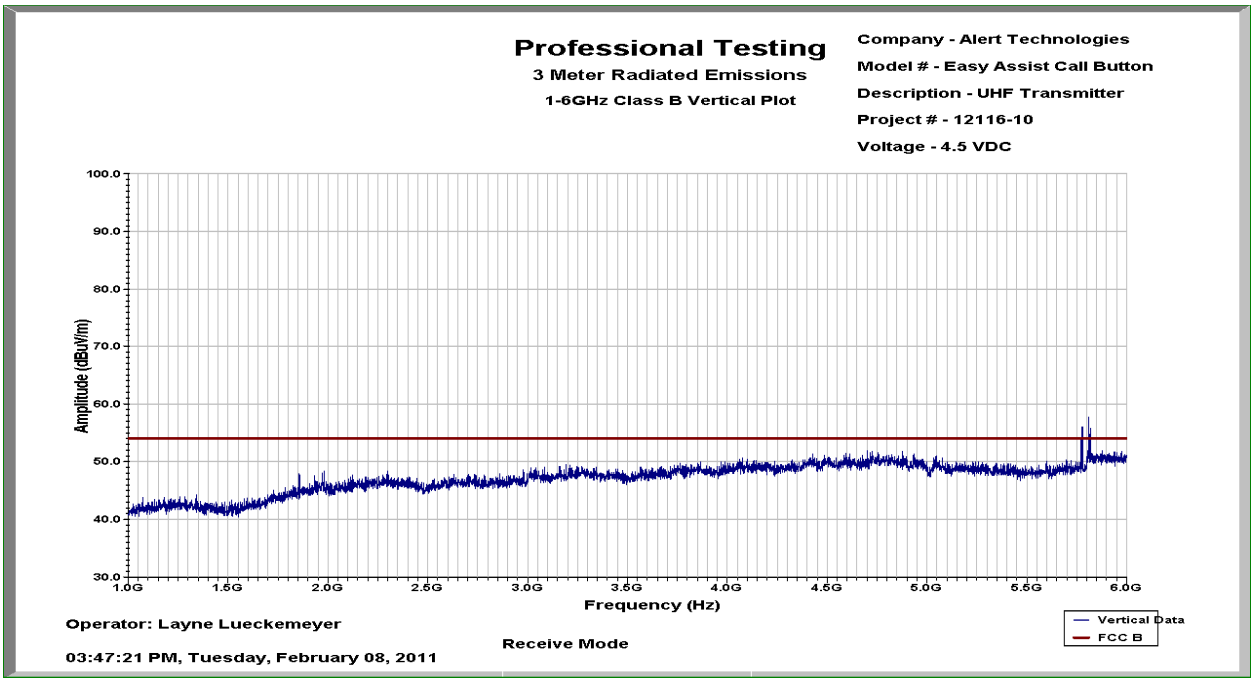


Result = Pass

Table 6.3.8: Out of Band Spurious Emissions Test Results, 1 GHz to 6 GHz, Vertical Polarization

Project #	Date	Class	Distance	Antenna	RBW	VBW	Detector
12116-10	February 8, 2011	FCC B	3 m	Horn	1 MHz	1 MHz	Average
COMMENT	Transmitting						

Frequency Measured (MHz)	Test Distance (Meters)	EUT Direction (Degrees)	Antenna Height (Meters)	Detector Function	Recorded Amplitude (dBµV)	Corrected Level (dBµV/m)	Limit Level (dBµV/m)	Margin (dB)
5778.51	3	257	1	Average	37.6	39.4	54.0	-14.6
5812.76	3	159	1	Average	40.1	41.9	54.0	-12.0



Result = Pass

7.0 Transient Frequency Behavior

Transient frequency behavior measurements were performed on the EUT to determine compliance with FCC 90.214.

7.1 Test Procedure

The EUT was tested for transient frequency behavior using the test method outlined in TIA/EIA-603 paragraph 2.2.19.

7.2 Test Criteria

According to FCC CFR 47 Part 90, Section 90.214, Transmitters designed to operate in the 150–174 MHz and 421–512 MHz frequency bands must maintain transient frequencies within the maximum frequency difference limits during the time intervals indicated:

Time intervals[1,2]	Maximum frequency difference[3]	All equipment	
		150 to 174 MHz	421 to 512 MHz
Transient Frequency Behavior for Equipment Designed to Operate on 25 kHz Channels			
t_1[4]	±25.0 kHz	5.0 ms	10.0 ms
t_2	±12.5 kHz	20.0 ms	25.0 ms
t_3[4]	±25.0 kHz	5.0 ms	10.0 ms
Transient Frequency Behavior for Equipment Designed to Operate on 12.5 kHz Channels			
t_1[4]	±12.5 kHz	5.0 ms	10.0 ms
t_2	±6.25 kHz	20.0 ms	25.0 ms
t_3[4]	±12.5 kHz	5.0 ms	10.0 ms
Transient Frequency Behavior for Equipment Designed to Operate on 6.25 kHz Channels			
t_1[4]	±6.25 kHz	5.0 ms	10.0 ms
t_2	±3.125 kHz	20.0 ms	25.0 ms
t_3[4]	±6.25 kHz	5.0 ms	10.0 ms

[1] $_{on}$ is the instant when a 1 kHz test signal is completely suppressed, including any capture time due to phasing.

t_1 is the time period immediately following t_{on}.

t_2 is the time period immediately following t_1.

t_3 is the time period from the instant when the transmitter is turned off until t_{off}.

t_{off} is the instant when the 1 kHz test signal starts to rise.

[2]During the time from the end of $t_2$to the beginning of t_3, the frequency difference must not exceed the limits specified in §90.213.

[3]Difference between the actual transmitter frequency and the assigned transmitter frequency.

[4]If the transmitter carrier output power rating is 6 watts or less, the frequency difference during this time period may exceed the maximum frequency difference for this time period.

7.3 Test Results

Transient frequency behavior measurements were taken on April 15, 2011, and the EUT was found to be in compliance with applicable requirements. Test equipment used to perform this test is given in Table 2.3.1, 2.3.2, and 7.3.1.

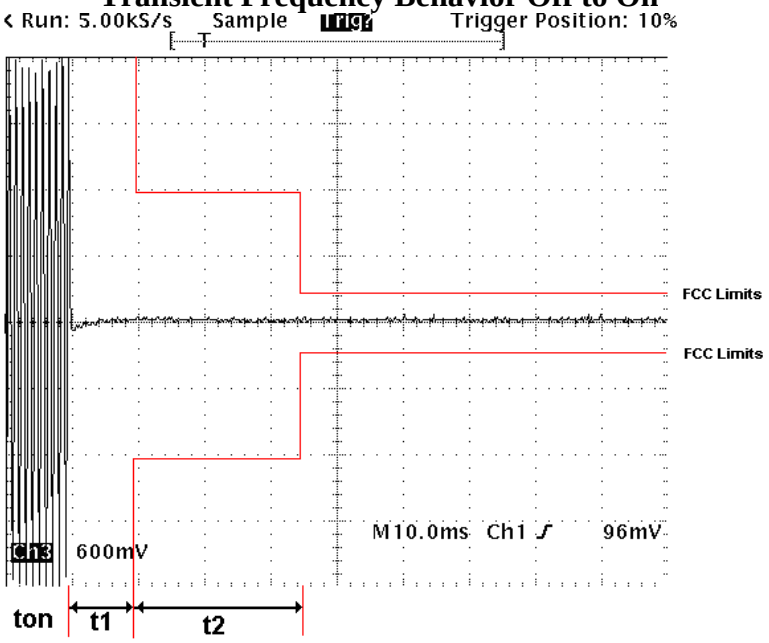
Table 7.3.1 Transient Frequency Behavior Test Equipment

Asset #	Manufacturer	Model #	Description	Calibration Due
0475	Tektronix	TDS680B	Oscilloscope, Digital	June 14, 2011
1840	HP	8657D	Signal Generator	July 2, 2011

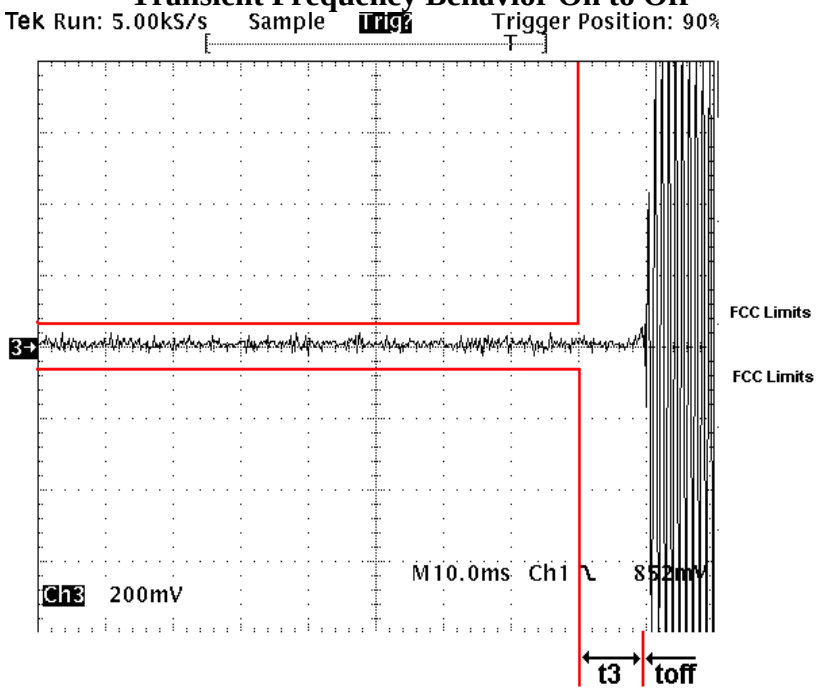
Table 7.3.2: Transient Frequency Behavior Test Results, Data Sheet 1

Project #	Date	Rule	Distance	Antenna	RBW	VBW	Detector
12116-10	April 15, 2011	90.214	N/A	N/A	N/A	N/A	N/A

Transient Frequency Behavior Off to On



Transient Frequency Behavior On to Off



End of Report

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