

Testing Tomorrow's Technology

**Radio Systems Corporation
FCC Part 15, Certification Application
PetSafe PAC00-11045 Low Power Transmitter**

**UST Project: 07-0036
Issue Date: June 21, 2007**

**3505 Francis Circle Alpharetta, GA 30004
PH: 770-740-0717 Fax: 770-740-1508
www.ustech-lab.com**

MEASUREMENT/TECHNICAL REPORT

COMPANY NAME: Radio Systems Corporation

MODEL: PetSafe PAC00-11045

FCC ID: KE3-320084

DATE: June 21, 2007

This report concerns (check one): Original grant X
Class II change _____

Equipment type: Low Power 433.92 MHz Transmitter

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? yes _____ No X

If yes, defer until: _____
date

N.A. agrees to notify the Commission by N.A.
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Report prepared by:

United States Technologies, Inc.
3505 Francis Circle
Alpharetta, GA 30004

Phone Number: (770) 740-0717
Fax Number: (770) 740-1508

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SECTION 1

GENERAL INFORMATION

GENERAL INFORMATION

1.1 Product Description

The Equipment Under Test (EUT) is an Radio Systems Corporation, Model PetSafe PAC00-11045 Low Power Transmitter. The EUT is a 433.92 MHz Low Power Transmitter is to be used with the PPA111079 (large), PPA11-710 (medium), and PPA11-10711 (small) SmartDoor electronic pet door receiver products.

1.2 Related Submittal(s)/Grant(s)

The EUT will be used to send data. The Low Frequency Transmitter presented in this report will be used with the PPA111079 (large), PPA11-710 (medium), and PPA11-10711 (small) SmartDoor electronic pet door receiver products:

The EUT is subject to the following authorizations:

- a) Certification as a low power Frequency Transmitter under 15.209
- b) Verification as a digital device

The information contained in this report is presented for the certification & verification authorization(s) for the EUT.

SECTION 2

TESTS AND MEASUREMENTS

TEST AND MEASUREMENTS

2.1 Configuration of Tested System

The sample was tested per ANSI C63.4, Methods of Measurement from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (2003). Conducted and radiated emissions data were taken with the test receiver or spectrum analyzer's resolution bandwidth adjusted to 9 kHz and 120 kHz, respectively. All measurements are peak unless stated otherwise. The video filter associated with the spectrum analyzer was off throughout the evaluation process. Block diagrams of the tested systems are shown in Figures 1. Test configuration photographs for spurious and fundamental emissions are shown in Figure 2a -g.

The sample used for testing was received by U.S. Technologies on March 23, 2007 in good condition.

2.2 Test Facility

Testing was performed at US Tech's measurement facility at 3505 Francis Circle, Alpharetta, GA. This site has been fully described and submitted to the FCC, and accepted in their letter marked 31040/SIT. Additionally this site has also been fully described and submitted to Industry Canada (IC), and has been approved under file number IC2982.

2.3 Test Equipment

Table 2 describes test equipment used to evaluate this product.

2.4 Modifications

No modifications were made by US Tech to bring the EUT into compliance with FCC Part 15, Class B Limits for the transmitter portion of the EUT or the Class B Digital Device Requirements.

Radio Systems provided a modification to reduce Spurious emissions. A 0.5 pf capacitor was added to the EUT as signified in the Schematics.

**FIGURE 1
TEST CONFIGURATION**

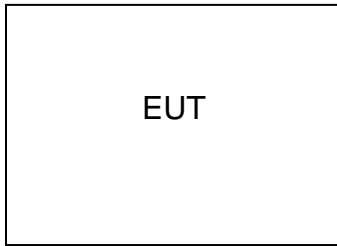


TABLE 1

Test Date: March 29, 2007
UST Project: 07-0036
Customer: Radio Systems Corporation
Model: PetSafe PAC00-11045

EUT and Peripherals

PERIPHERAL MANU.	MODEL NUMBER	SERIAL NUMBER	FCC ID:	CABLES P/D
Radio Systems Corporation (EUT)	PetSafe PAC00- 11045	None	None	None

**TABLE 2
TEST INSTRUMENTS**

EQUIPMENT	MODEL NUMBER	MANUFACTURER	SERIAL NUMBER	DATE OF LAST CALIBRATION
SPECTRUM ANALYZER	8558B	HEWLETT-PACKARD	2332A10055	3/28/07
SPECTRUM ANALYZER	8593E	HEWLETT-PACKARD	3205A00124	7/3/06
SIGNAL GENERATOR	8648B	HEWLETT-PACKARD	3642U01679	10/13/06
RF PREAMP	8447D	HEWLETT-PACKARD	2944A06291	Dailey Calibration
BICONICAL ANTENNA	3110B	EMCO	9307-1431	10/11/06
LOG PERIODIC	3146	EMCO	3110-3236	9/15/05 2 Yr.
HORN ANTENNA	3115	EMCO	9107-3723	10/16/06 2 Yr.
PREAMP	8449B	HEWLETT PACKARD	3008A00480	8/10/06
CALCULATION PROGRAM	N/A	N/A	Ver. 6.0	N/A

Note: The calibration interval of the above test instruments is 12 months unless stated otherwise and all calibrations are traceable to NIST/USA.

2.5 Antenna Description (Paragraph 15.203)

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

Radio Systems Corporation will sell the Model PetSafe PAC00-11045 with a trace antenna integrally mounted on the pwb.

2.6 Fundamental, Peak, and Average Radiated Spurious Emissions in the Frequency Range 30 -25000 MHz (FCC Section 15.209)

The EUT was placed into a continuous transmit mode of operation. A preliminary scan was performed on the EUT to determine frequencies that were caused by the transmitter portion of the product. Significant emissions that fell within restricted bands were then measured on an OATS site. Radiated measurements below 1 GHz were tested with a RBW = 120 kHz. Radiated measurements above 1 GHz were measured using a RBW = VBW = 1 MHz. The results of peak radiated fundamental frequencies and spurious emissions falling within restricted bands are given in Table 3a –3b and Figure 3a – 3b.

Average values were not calculated since peak values met average limits

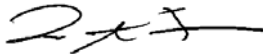
Table 3a. PEAK FUNDAMENTAL EMISSIONS

Radiated Emissions										
					Client:	Radio Systems Corporation				
L.F.	Project:	07-0036		Class:						
					Model:	PetSafe PAC00-11045				
Frequency	Test Data	AF	Test Data	AF+CA -AMP	Results	Limits	Distance /	Margin	PK = n	
(MHz)	(dBm)	Table	(dBuV)	(dB)	(uV/m)	(uV/m)	Polarity	(dB)	/ QP	
433.858	-83.1	2lp3mh	23.9	20.5	166.2	200.0	3m./HORZ	1.6	QP	
433.863	-83.4	2lp3mv	23.6	20.1	153.5	200.0	3m./VERT	2.3	QP	

SAMPLE CALCULATION:

RESULTS (uV/m @ 3m) = Antilog ((-83.1 + 20.5 + 107)/20) = 166.2

CONVERSION FROM dBm TO dBuV = 107 dB

Tester
Signature: 

Name: Louis A. Feudi

Figure 3a
Peak Radiated Emission 15.209(c) Fundamental

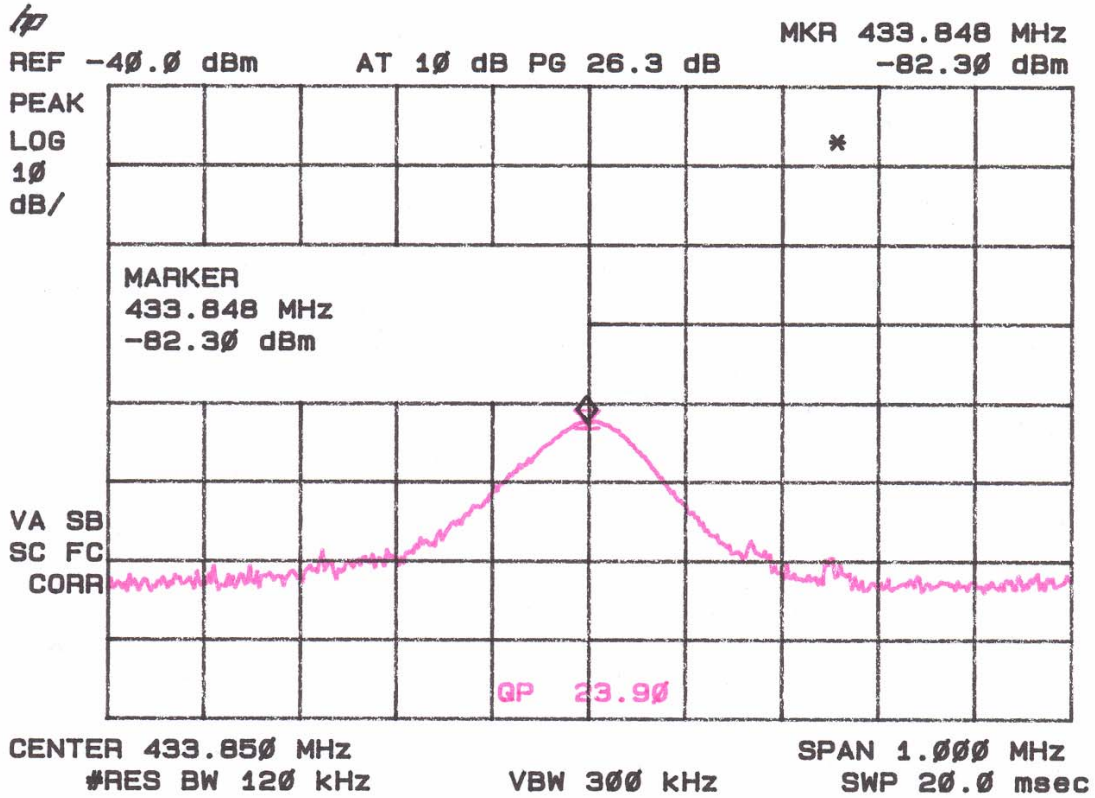


Table 3b. PEAK RADIATED SPURIOUS EMISSIONS

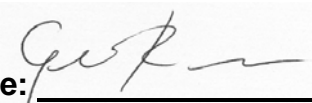
Radiated Emissions									
G.R..					Client: Radio Systems Corporation				
Project:		07-0036		Class:	Model: PetSafe PAC00-11045				
Frequency	Test Data	AF	Test Data	AF+CA-AMP	Results	Limits	Distance /	Margin	PK = n
(MHz)	(dBm)	Table	(dBuV)	(dB)	(uV/m)	(uV/m)	Polarity	(dB)	/ QP
866.87	-95.4	21p3mh	11.6	28.5	100.9	166.0	3m. /HORZ	4.3	PK
1301.5	-58.8	1HN3mv	48.2	-6.9	116.4	166.0	3m. /VERT	3.1	PK
1735.405	-66.6	1HN3mv	40.4	-5.0	58.8	166.0	3m. /VERT	9.0	PK

Limit set at fundamental to illustrate harmonics do not exceed fundamental field strength.

SAMPLE CALCULATION:

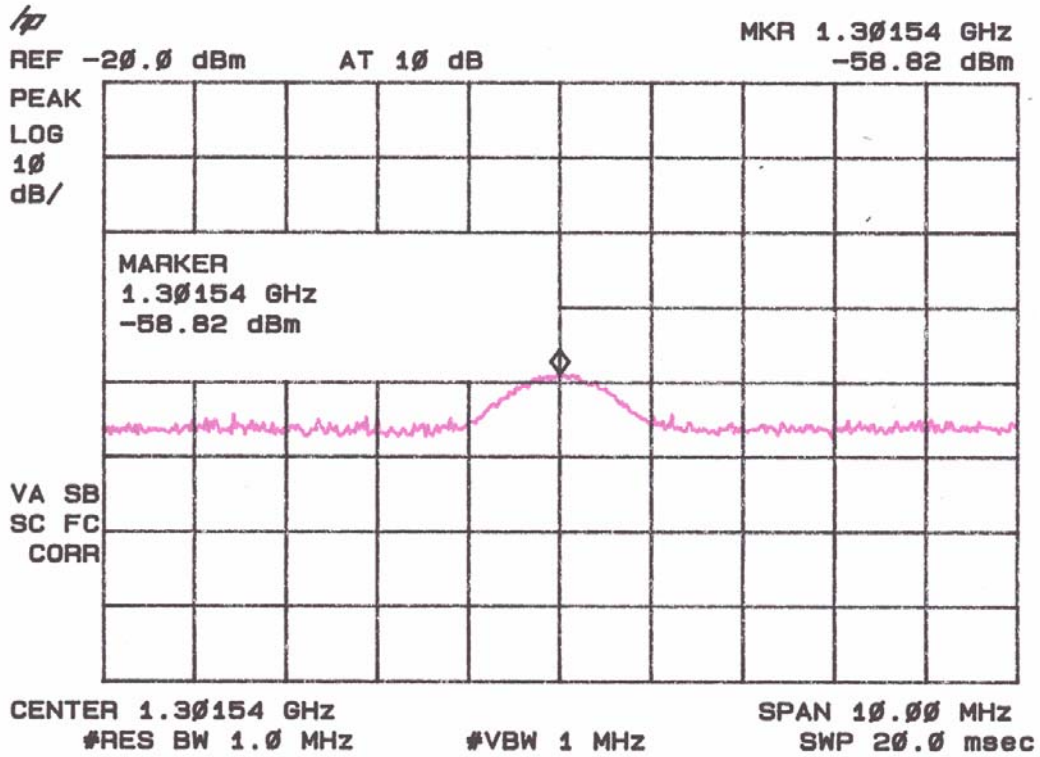
RESULTS (uV/m @ 3m) = Antilog ((-95.4 + 11.6 + 107)/20) = 100.9

CONVERSION FROM dBm TO dBuV = 107 dB

Tester
Signature:  _____

Name: Gersop Riera

Figure 3b
Peak Radiated Spurious Emission 15.209(c)
Worst Case Harmonic



2.8 20 dB Bandwidth per FCC Section 15.209(a)(1)(ii)

The antenna port was connected to a spectrum analyzer that was set for a 50 Ω impedance with the RBW > approximately 1/100 of the manufacturers claimed RBW & VBW > RBW. The results of this test are given in Table 4 and Figure 5.

TABLE 4
20 dB Bandwidth

Test Date: March 29, 2007
UST Project: 07-0036
Customer: Radio Systems Corporation
Model: PetSafe PAC00-11045

Frequency (GHz)	20 dB Bandwidth (MHz)	MAXIMUM FCC LIMIT (MHz)
433.843	0.320	1.0

Tester
Signature: 

Name: Louis A. Feudi

2.9 Power Line Conducted Emissions for Transmitter FCC Section 15.207

The conducted voltage measurements have been carried out in accordance with FCC Section 15.207, with a spectrum analyzer connected to a LISN and the EUT placed into a continuous mode of transmit. The results are given in Table 5a.

2.10 Radiated Emissions for Digital Device & Receiver (47 CFR 15.109a)

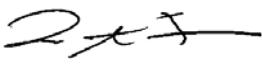
Radiated emissions were evaluated from 30 to 14500 MHz while the EUT was placed into a Receive mode of operation. Measurements were made with the analyzer's bandwidth set to 120 kHz measurements made less than 1 GHz and 1 MHz for measurements made greater than or equal to 1 GHz. The results for less than 1 GHz are shown in Table 6.

**TABLE 6 RADIATED EMISSIONS DATA
(Digital Device & Receiver)**

CLASS B

Test Date: March 29, 2007
UST Project: 07-0036
Customer: Radio Systems Corporation
Product: PetSafe PAC00-11045

Radiated Emissions								
						Client:	Radio Systems Corporation	
L.A.F.	Project:	07-0036		Class:	B	Model:	PetSafe PAC00-11045	
Frequency	Test Data	AF	Test Data	AF+CA-AMP	Results	Limits	Margin	PK = n
(MHz)	(dBm)	Table	(dBuV)	(dB)	(uV/m)	(uV/m)	(dB)	/ QP
No emissions seen within 20 dB of the FCC Limit.								

Tester
Signature: 

Name: Louis A. Feudi

**2.11 Power Line Conducted Emissions for Digital Device and Receiver
FCC Section 15.107**

The conducted voltage measurements have been carried out in accordance with FCC Section 15.107, with a spectrum analyzer connected to a LISN and the EUT placed into an idle condition or a continuous mode of receive. Similar results were seen as compared to the EUT in a transmit mode of operation.

Therefore, please refer to the results as shown in Table 5.