TEST REPORT

Report Number: 3126456ATL-001

June 29, 2007

Product Designation: Model 203, Universal Transmitter 433 Mhz

Standard: 47 CFR Part 15, Subpart C (15.231 - Periodic operation in the band 40.66-40.70 MHz and above 70 MHz)

Tested by:
Intertek Testing Services NA Inc.
1950 Evergreen Blvd., Suite 100
Duluth, GA 30096

Client:
American Medical Alert Corp
3636 33rd Street 103
Suite B100
Long Island City, NY 11106
Contact: John Collins
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Tests performed by:

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Report reviewed by:

David J. Schramm
EMC Department Manager

1.0 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 3.0. The remaining test sections are the verbatum text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product tested complies with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested.

2.0 Test Summary

Section	Test Full Name	Test Date	Result
4.0	System setup including cable interconnection details, support equipment and simplified block diagram. (System Setup)		
5.0	Overview of EUT (Low Power Transmitters) (FCC 15C - EUT Overview)		
6.0	Restrictions (FCC 15C - 15.231(a))	06/20/2007	PASS
7.0	Duty Cycle Determination (FCC 15A - 15.35(c))	06/19/2007	PASS
8.0	Radiated Emissions (FCC 15C - 15.231(b))	06/19/2007	PASS
9.0	Bandwidth Requirements (FCC 15C - 15.231(c))	06/19/2007	PASS

3.0 Description of Equipment Under Test

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
Universal Transmitter 433 Mhz	American Medical Alert Inc.	203	Not labeled

EUT receive date:	6-17-2007
EUT receive condition:	Good

Description of EUT provided by Client:
The Model 203 Universal Transmitter is a 433Mhz transmitter for use with American Medical Alert's line of Personal Emergency Response Units (PERS).

Description of EUT exercising:
The EUT was placed in a continuous transmit mode during the emissions portion of the testing and in a normal operating state during the duty cycle measurements.

4.0 System setup including cable interconnection details, support equipment and simplified block diagram. (System Setup)

Method:

Record the details of EUTcabling, document the support equipment, and show the interconnections in a block diagram.

Photo:

Setup photograph

4.0 System setup including cable interconnection details, support equipment and simplified block diagram. (System Setup)

Data:

EUT Cabling						
					Connection	
ID	Description	Length	Shielding	Ferrites	From	To
	None					

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
Pressure switch	AMAC	Not labeled	Not labeled

5.0 Overview of EUT (Low Power Transmitters) (FCC 15C - EUT Overview)

Method:

Complete the overview spreadsheet.

Related Submittal(s) Grants: This report is for use with an application for certification of a low power transmitter. One transmitter is included in the application.

Data:

Applicant	American Medical Alert Incorporated
	3636 33rd St.
	Long Island City, NY 11106
Trade Name & Model No.	PERs 850XL W/ 9V Transmitter
FCC Identifier	
Use of product	production planned.
Transmitter activation	☐ Manual and automatically deactivate within 5 seconds of being released
	☑ Periodic transmissions
Frequency Range (MHz)	433
Antenna Type (15.203)	Intergrated - permanently attached
Manufacturer name & address	American Medical Alert Incorporated
	3636 33rd St.
	Long Island City, NY 11106

Related Submittals and Grants:	This report is for use with an application for certification of a low power transmitter. One transmitter is included in the application.
Additions, deviations and exclusions from standards	None

6.0 Restrictions (FCC 15C - 15.231(a))

Method:

15.231(a) The provisions of this section are restricted to periodic operation within the band 40.66-40.70 MHz and above 70 MHz. Except as shown in paragraph (e) of this section, the intentional radiator is restricted to the transmission of a control signal such as those used with alarm systems, door openers, remote switches, etc. Continuous transmissions, voice, video and the radio control of toys are not permitted. Data is permitted to be sent with a control signal. The following conditions shall be met to comply with the provisions for this periodic operation:

(1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

(2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.

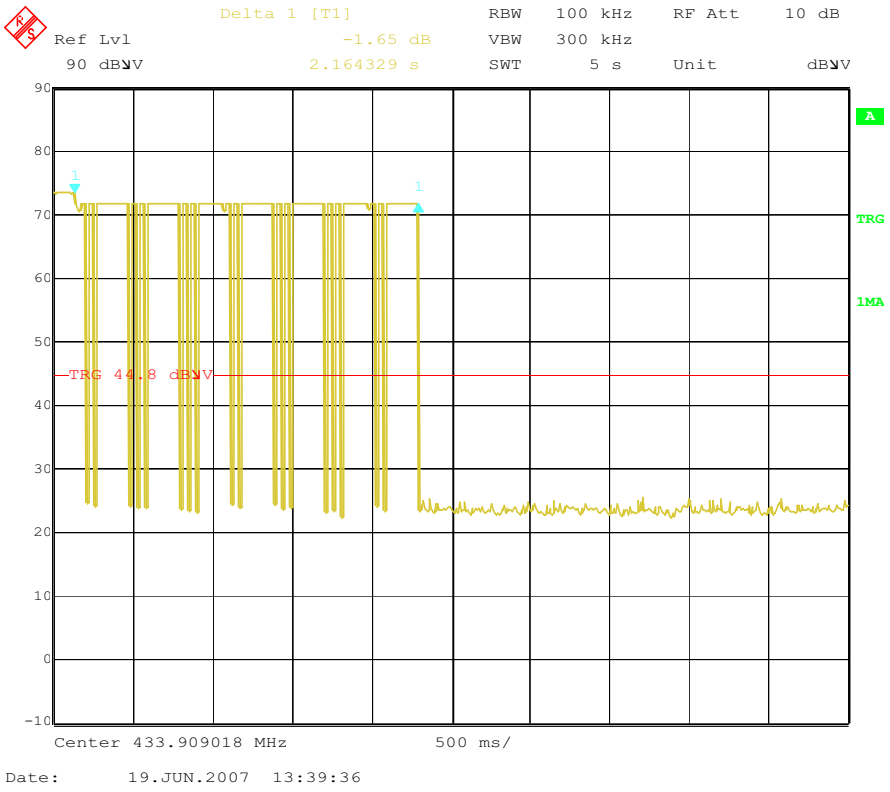
(3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.

(4) Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition

(5) Transmission of set-up information for security systems may exceed the transmission duration limits in paragraphs (a)(1) and (a)(2) of this section, provided such transmissions are under the control of a professional installer and do not exceed ten seconds after a manually operated switch is released or a transmitter is activated automatically. Such set-up information may include data.

Results: The sample tested was found to Comply.

Plot:



5 Second deactivation plot

6.0 Restrictions (FCC 15C - 15.231(a))

Data:

15.231(a)	Response	Requirement
Frequency Range (Mhz, max)	433	40.66-40.70 MHz and > 70MHz
Frequency Range (MHz, min)	433	40.66-40.70 MHz and > 70MHz
Transmit only control signal?	Yes	Only control signal allowed
Continuous transmission?	No	No
Voice transmission?	No	No
Video transmission?	No	No
Radio control of toy?	No	No

15.231(a)(1)		
Manually operated?	N/A	
Deactivates within 5 seconds?	N/A	Yes
Show plot (10 second sweep)	N/A	

15.231(a)(2)		
Automatically operated?	Yes	
Deactivates within 5 seconds?	Yes	Yes
Show plot (10 second sweep)	Yes	

15.231(a)(3)		
Periodically transmits at predetermined intervals?	No	No
Polling signals?	No	Allowed, with restrictions
Polling rate and timing	No	< 2 seconds per hour

15.231(a)(4)		
For Emergency Use?	Yes	Allowed

15.231(a)(5)		
Exceed 15.231(a)(1) or (a)(2) requirements?	No	Allowed for professional install

7.0 Duty Cycle Determination (FCC 15A - 15.35(c))

Method:

(c) Unless otherwise specified, e.g. §15.255(b), when the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value. The exact method of calculating the average field strength shall be submitted with any application for certification or shall be retained in the measurement data file for equipment subject to notification or verification.

Determine the period of the pulse train, T, in mSec and record the results. T is defined as the time from the beginning of one pulse train to the beginning of the next pulse train.

Count the number of different types of pulses, N and record the results.

For each of the different types of pulses, count the number of occurrences within one pulse train.

Use the Duty Cycle Correction Factor, DCCF, from the results table and use it to adjust the field strength measurements recorded for radiated emissions.

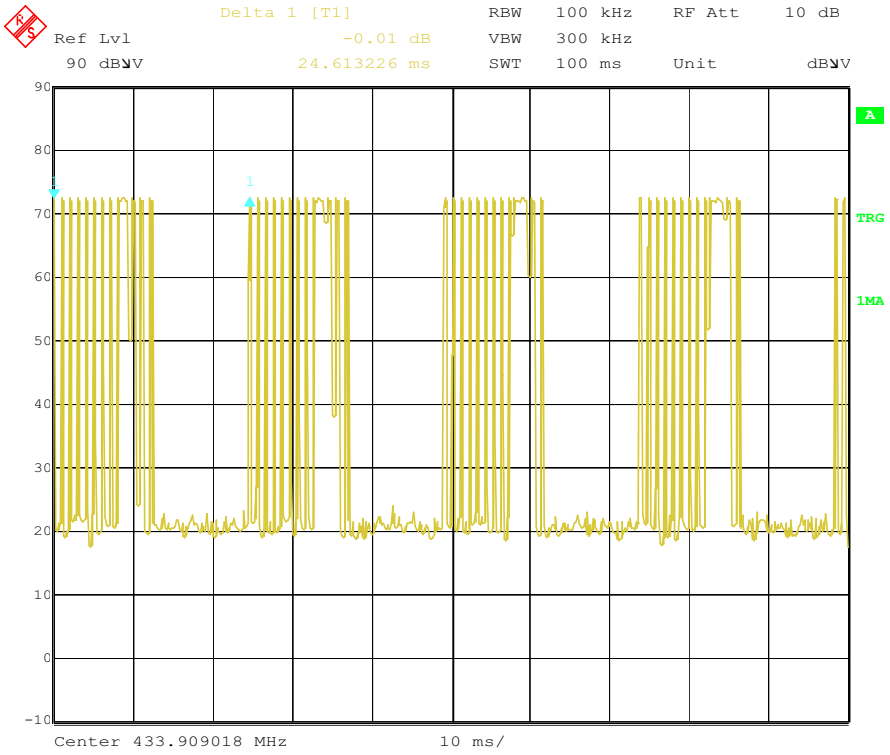
Results: The sample tested was found to Comply.

Photo:

Test set up

7.0 Duty Cycle Determination (FCC 15A - 15.35(c))

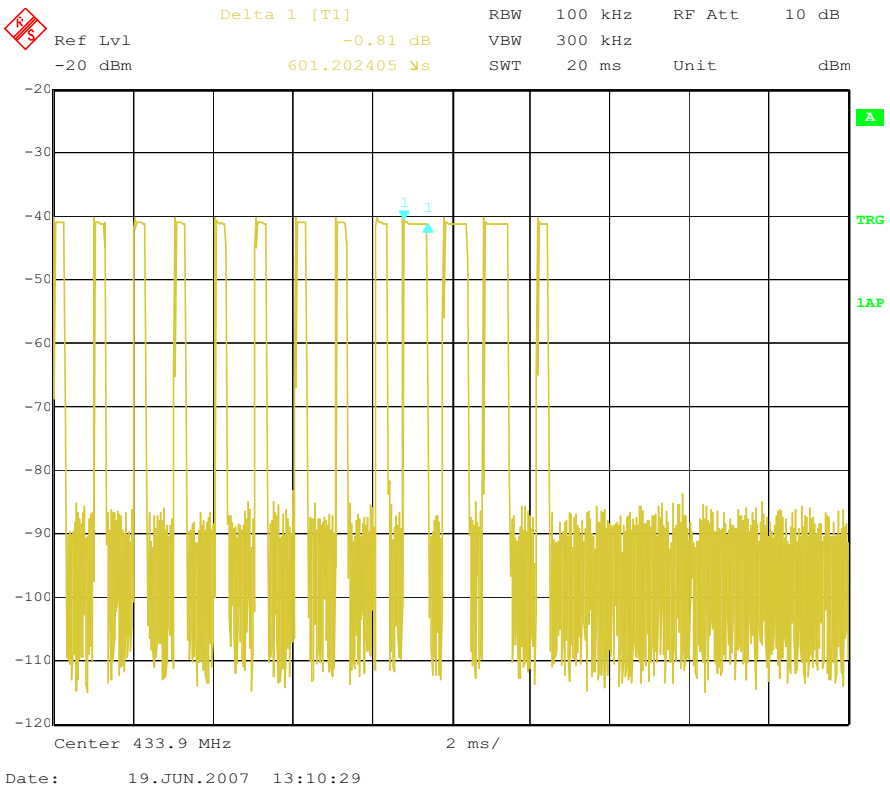
Plot:



Pulse to pulse time

7.0 Duty Cycle Determination (FCC 15A - 15.35(c))

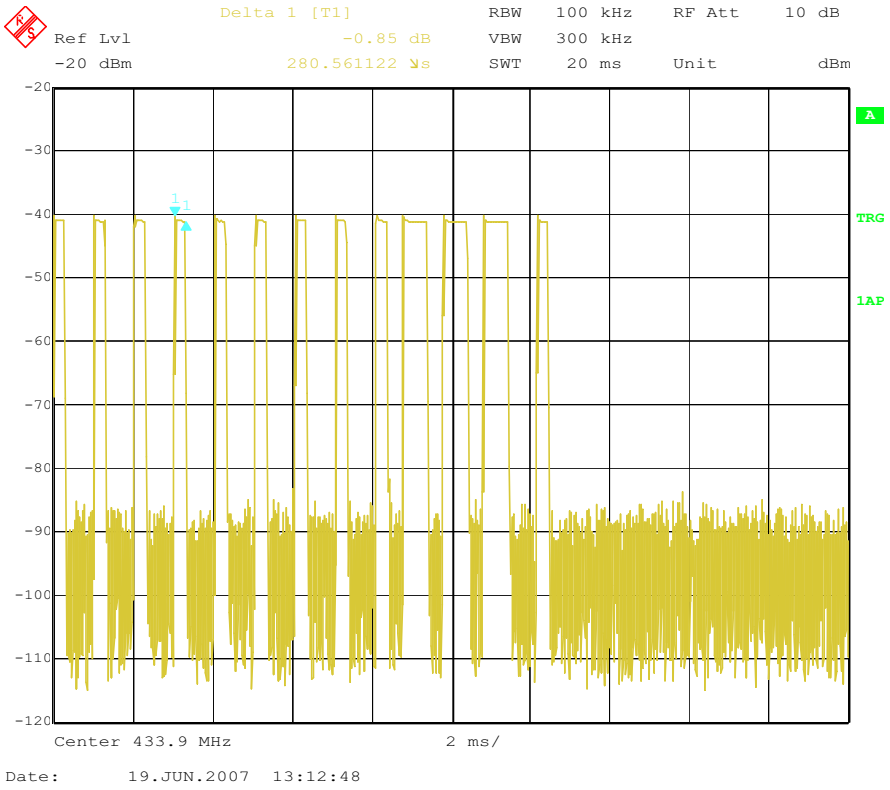
Plot:



Long pulse duration

7.0 Duty Cycle Determination (FCC 15A - 15.35(c))

Plot:



Short pulse duration

7.0 Duty Cycle Determination (FCC 15A - 15.35(c))

Data:

Duration of Pulse Train, T (mSec):	24.61
Averaging Interval, A_I (mSec):	24.61
Number of different Pulses, N:	2

	Number ($\#P_x$)	Pulse Width, mSec (PW_x)	Product ($\#P_x$)*(PW_x)
Pulse Width 1	3	0.6012	1.8036
Pulse Width 2	10	0.2806	2.806
Pulse Width 3			
Pulse Width 4			
Pulse Width 5			
Pulse Width 6			
Pulse Width 7			
Pulse Width 8			
Pulse Width 9			
Pulse Width 10			

Duty Cycle:	0.187305973
Duty Cycle Correction Factor, dB:	-14.5

$$T_{on} = (PW_1 * \#P)_1 + (PW_{2*} * \#P_2) + \cdots + (PW_n * \#P_n)$$

$$DutyCycle = T_{on} \div A_I$$

$$DCCF = 20 * Log_{10}(DutyCycle)$$

8.0 Radiated Emissions (FCC 15C - 15.231(b))

Method:

(b) In addition to the provisions of §15.205, the field strength of emissions from intentional radiators operated under this section shall not exceed the limits specified in FCC Part 15.231(b).

Intentional radiators operating under the provisions of this section shall demonstrate compliance with the limits on the field strength of emissions, as shown in the above table, based on the average value of the measured emissions. As an alternative, compliance with the limits in the above table may be based on the use of measurement instrumentation with a CISPR quasi-peak detector. The specific method of measurement employed shall be specified in the application for equipment authorization. If average emission measurements are employed, the provisions in §15.35 for averaging pulsed emissions and for limiting peak emissions apply. Further, compliance with the provisions of §15.205 shall be demonstrated using the measurement instrumentation specified in that section.

The limits on the field strength of the spurious emissions in the above table are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in §15.209, whichever limit permits a higher field strength.

For radiated emission measurements, the EUT is attached to a styro-foam block and placed on a non-conductive table whose top is 80cm above the ground plane. If the EUT is handheld, the signal shall be aximized through rotation and placement in the three orthogonal axes.

During the test the EUT is rotated and the antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters.

Radiated emissions are taken at 3 meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance. All readings are extrapolated back to the equivalent 3-meter reading using inverse scaling with distance.

Radiated emission measurements were performed from 30 MHz to 10 times the highest frequency generated in the EUT.

Analyzer resolution is:
100 kHz or greater for frequencies 1000 MHz and below,
1 MHz for frequencies above 1000 MHz.

The Peak value of the Field Strength was measured. The Average value was obtained from the Peak by subtracting the Duty Cycle Correction Factor.

Test Equipment Used:

Description:	Manufacturer:	Model:	Asset Number:	Cal Date:	Cal Due:
Antenna, Bilog (20MHz to 2GHz)	Chase	CBL6112B	211386	08/29/2006	08/29/2007
Cable E01, <18GHz	Pasternack	RG214/U	E01	05/10/2007	05/10/2008
Cable E05, <18GHz	Huber-Suhner	Sucoflex 104PEA	E05	05/10/2007	05/10/2008
Cable, 18 GHz, N, 10m	Megaphase	G919-NKNK-394	MP3	05/10/2007	05/10/2008
Coaxial Cable, 7m, N-N, 18 GHz	Storm Products Co.	PR90-206-7MTR	ST1	01/11/2007	01/11/2008
EMI Receiver	Hewlett Packard	8546A	211388	08/04/2006	08/04/2007
EMI Receiver, Preselector section	Hewlett Packard	85460A	211389	08/04/2006	08/04/2007
Excel spreadsheet for radiated emissions	Software	Excel - RE Worksh	SW004	08/01/2006	08/01/2007
High Pass Filter, 1 GHz	Filtek	HP12/1000-5AB	213156a	03/14/2007	03/14/2008
Preamplifier, 10 MHz to 2000 MHz, 27 dB gain	Mini-Circuits	ZKL-2	200074	02/08/2007	02/08/2008
Preamplifier, 20 MHz to 18 GHz, 40 dB	A.H. Systems	PAM-0118	200108	03/21/2007	03/21/2008
Spectrum Analyzer, 20 Hz to 40 GHz	Rohde & Schwarz	FSEK30	200062	03/12/2007	03/12/2008

Results: The sample tested was found to Comply.

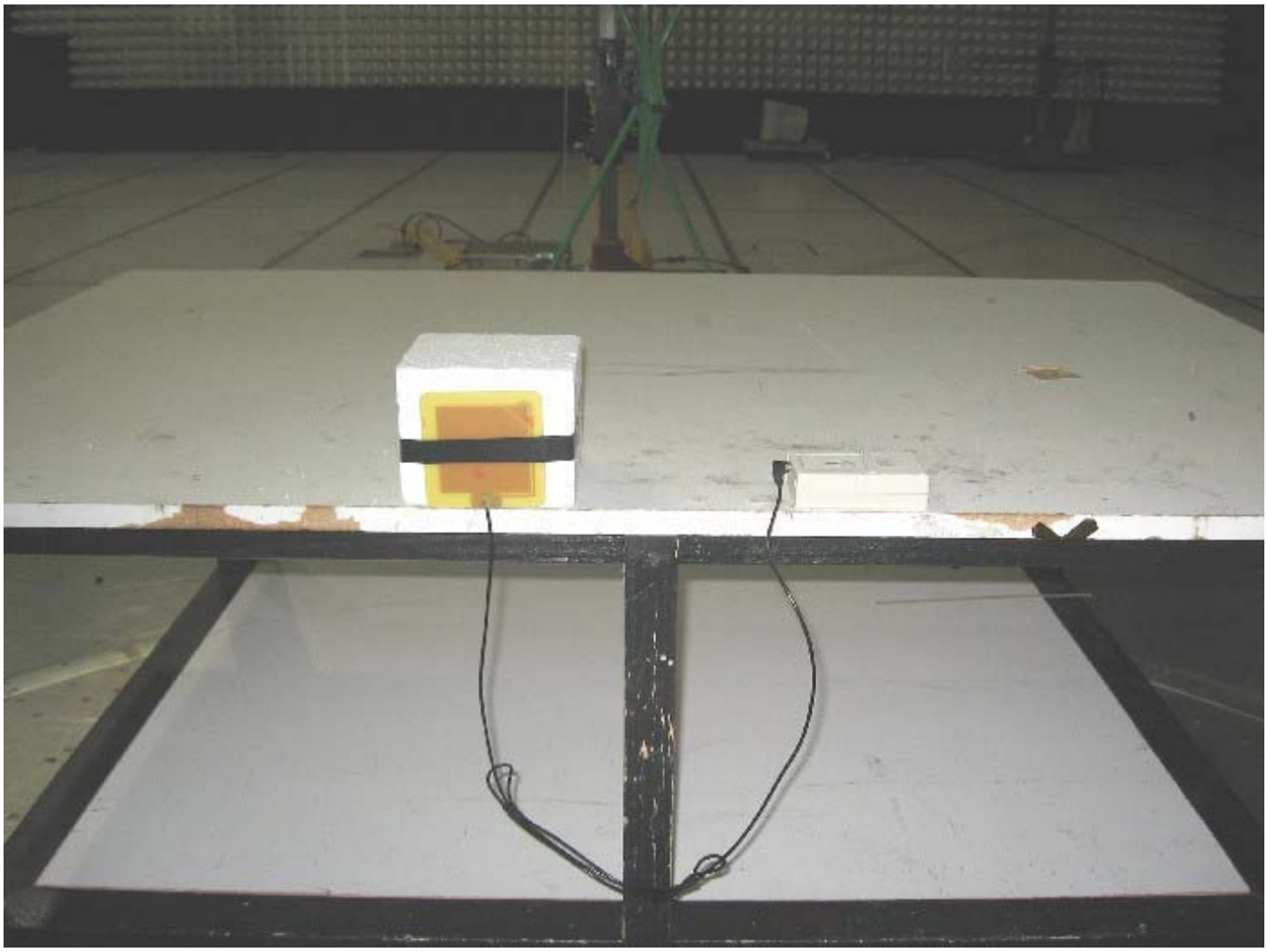
8.0 Radiated Emissions (FCC 15C - 15.231(b))

Photo:

Test set up front

8.0 Radiated Emissions (FCC 15C - 15.231(b))

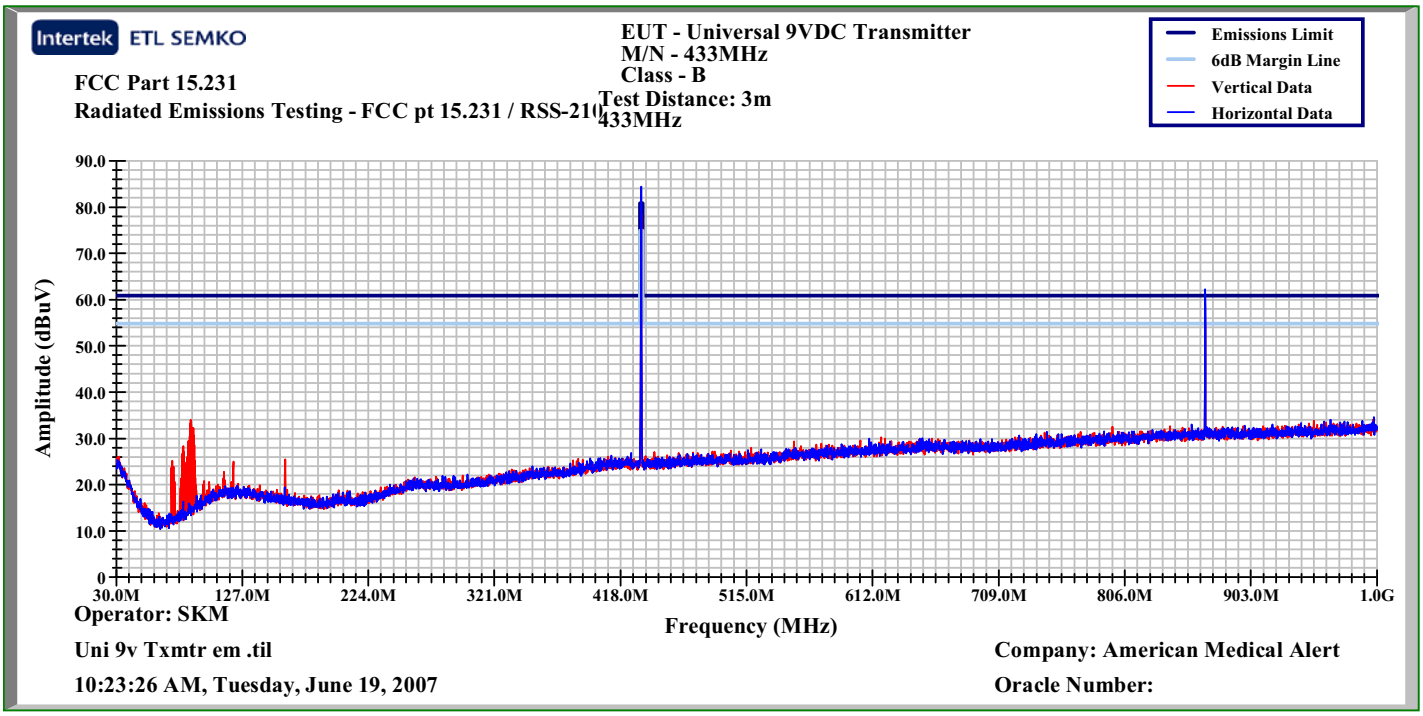
Photo:



Test set up rear

8.0 Radiated Emissions (FCC 15C - 15.231(b))

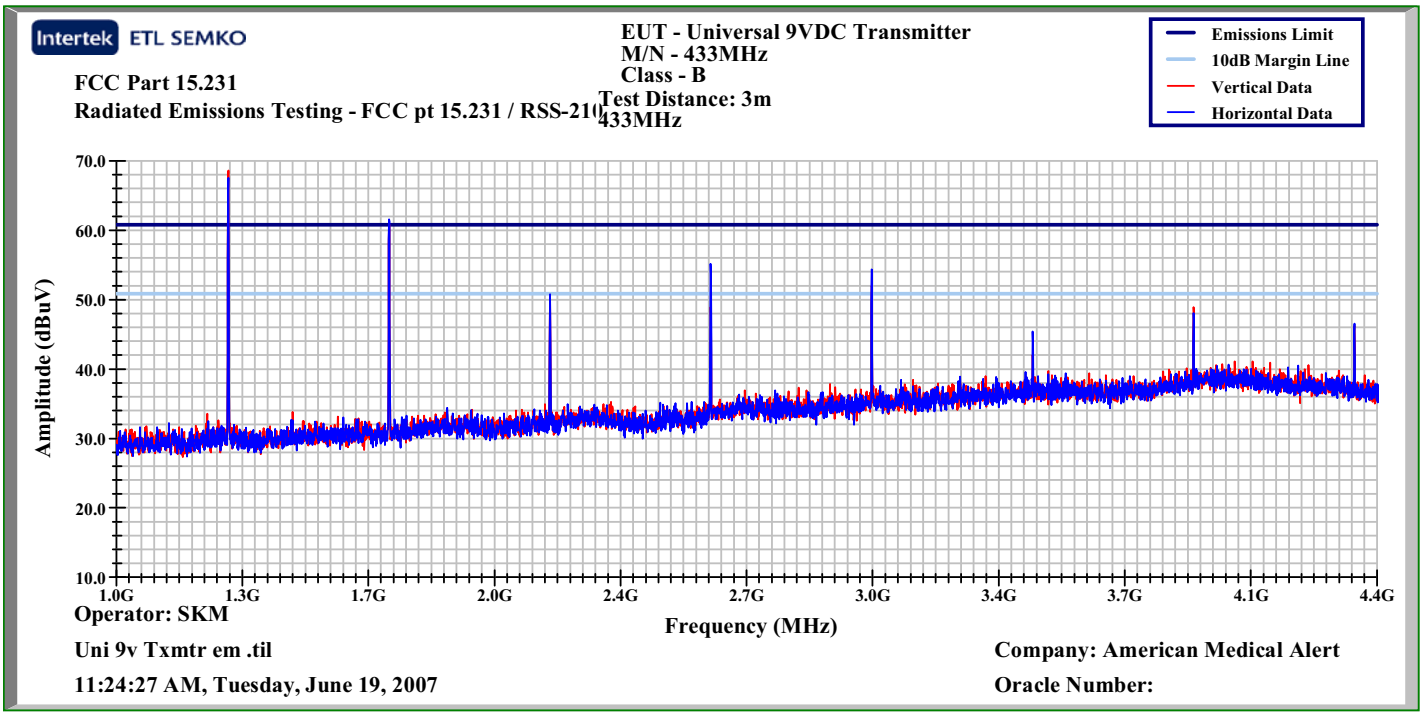
Plot:



Scan plot 30 to 1000MHz

8.0 Radiated Emissions (FCC 15C - 15.231(b))

Plot:



Scan plot 1 to 5GHz

8.0 Radiated Emissions (FCC 15C - 15.231(b))

Data:

Frequency Range (MHz): 30to1000 **Test Distance (m):** 3
Input power: 9VDC **Limit:** 15.231
Modifications for compliance (y/n): n

A	B	C	D	E	F1	F2	G	H	I	J
Ant. Pol. (V/H)	**Frequency MHz**	**Reading dB(uV)**	**Antenna Factor dB(1/m)**	**Cable Loss dB**	**Pre-amp Factor dB**	**Duty Cycle Factor dB**	**Net dB(uV/m)**	**Limit dB(uV/m)**	**Margin dB**	**Detectors / Bandwidths Det/RBW/VBW**
Peak measurements										
H	433.900	93.8	17.2	4.2	27.5	0.0	87.7	100.8	-13.1	Pk 120K/300K
H	867.833	60.0	21.4	6.1	27.1	0.0	60.4	80.8	-20.4	Pk 120K/300K
Average Measurements - using peak measurements with duty cycle correction										
H	433.900	93.8	17.2	4.2	27.5	14.5	73.2	80.8	-7.6	Pk 120K/300K
H	867.833	60.0	21.4	6.1	27.1	14.5	45.9	60.8	-14.9	Pk 120K/300K
Calculations		G=C+D+E-F1-F2		I=G-H						

Note: All three axes were examined. The highest of the three is reported in this table.

Data 30 to 1000MHz

8.0 Radiated Emissions (FCC 15C - 15.231(b))

Data:

Frequency Range (GHz): 1 to 5 **Test Distance (m):** 3
Input power: 9VDC **Limit:** 15
Modifications for compliance (y/n): N

A	B	C	D	E	F1	F2	G	H	I	J
Ant. Pol. (V/H)	**Frequency MHz**	**Reading dB(uV)**	**Antenna Factor dB(1/m)**	**Cable Loss dB**	**Pre-amp Factor dB**	**Duty Cycle Factor dB**	**Net dB(uV/m)**	**Limit dB(uV/m)**	**Margin dB**	**Detectors / Bandwidths Det/RBW/VBW**
Peak measurements										
h	1302.000	78.7	24.2	5.8	40.4	0.0	68.3	80.8	-12.5	Pk 1M/3M
h	1735.000	70.7	25.7	5.8	40.4	0.0	61.8	80.8	-19.0	Pk 1M/3M
h	2603.000	58.2	28.6	7.1	40.6	0.0	53.3	80.8	-27.5	Pk 1M/3M
h	3037.000	53.4	30.1	9.8	40.8	0.0	52.6	80.8	-28.2	Pk 1M/3M
Average Measurements (using peak reading with duty cycle correction)										
h	1302.000	78.7	24.2	5.8	40.4	14.5	53.8	60.8	-7.0	Pk 1M/3M
h	1735.000	70.7	25.7	5.8	40.4	14.5	47.3	60.8	-13.5	Pk 1M/3M
h	2603.000	58.2	28.6	7.1	40.6	14.5	38.8	60.8	-22.0	Pk 1M/3M
h	3037.000	53.4	30.1	9.8	40.8	14.5	38.1	60.8	-22.7	Pk 1M/3M
Calculations		G=C+D+E-F1-F2		I=G-H						

Note: All three axes were examined. The highest of the three is reported in this table.

Data 1 to 5GHz

9.0 Bandwidth Requirements (FCC 15C - 15.231(c))

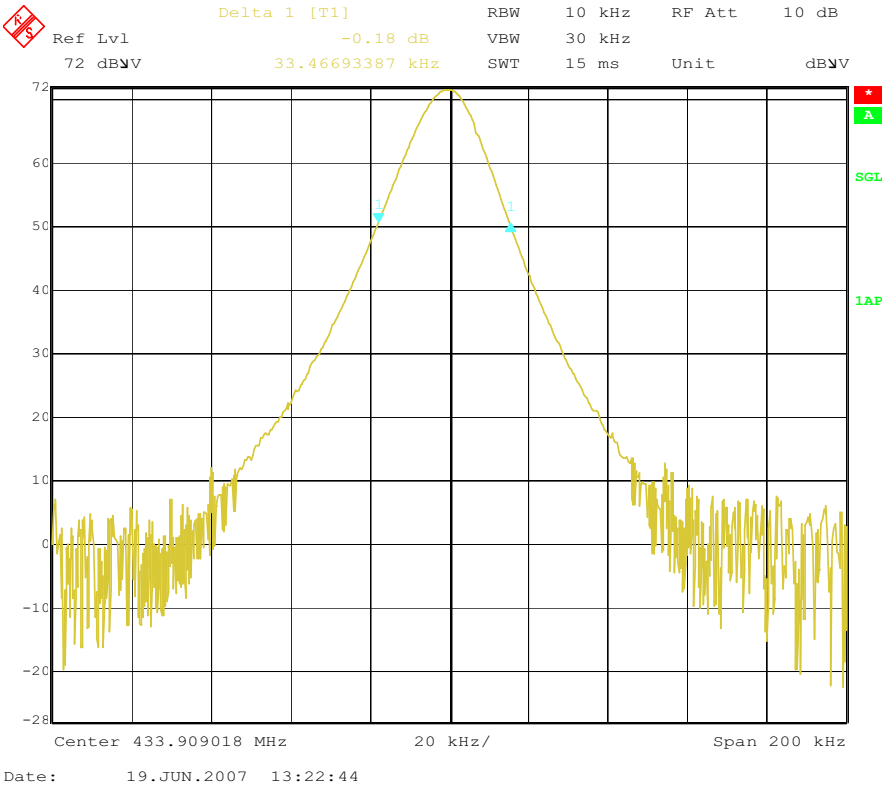
Method:

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

- Center Frequency is set to the fundamental of transmitter.
- Resolution Bandwidth is set to approximately 1% of the emission bandwidth.
- Video Bandwidth is set greater than or equal to the Resolution Bandwidth.

Results: The sample tested was found to Comply.

Plot:



Bandwidth Plot

9.0 Bandwidth Requirements (FCC 15C - 15.231(c))

Data:

Fundamental Frequency MHz	Measured Bandwidth MHz	Bandwidth Limit MHz
433	0.03346	1.0825

Suggested Instrument Settings	
RBW (kHz):	10
VBW (kHz):	30
Span (MHz):	1.080
Sweep time (s):	>1