

TEST REPORT

Report Number: 3154319ATL-001

February 26, 2009

Product Designation: SS-5500 Clock Radio

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:

HoMedics
3000 Pontiac Trail
Commerce, MI 48390
Contact: Mark Straight
Phone: 248.863.3000
Fax: 248.863.3100

Tests performed by:



Richard C. Bianco
EMC Project Engineer

Report reviewed by:



Jeremy O. Pickens
EMC Department Manager

All services undertaken are subject to the following general policy: This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to copy or distribute this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program. This report must not be used to claim product endorsement by A2LA, NIST, or any agency of the US Government.

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 verbatim 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)	02/25/2009	
6.0	Restrictions (FCC 15C - 15.231(a))	02/25/2009	PASS
7.0	Duty Cycle Determination (FCC 15A - 15.35(c))	02/25/2009	PASS
8.0	Radiated Emissions (FCC 15C - 15.231(b))	02/25/2009	PASS
9.0	Conducted emissions on AC power lines (Conducted Emissions)	06/25/2008	PASS
10.0	Bandwidth Requirements (FCC 15C - 15.231(c))	02/25/2009	PASS
NA	Conducted Emissions for Intentional Radiators (FCC 15C - 15.207) was waived due to is not applicable.		

3.0 Description of Equipment Under Test

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
Clock Radio	Homedics	SS-5500	Not Labeled

EUT receive date:	06-04-2008
EUT receive condition:	Good

Description of EUT provided by Client:

The SS-5500 is an illuminated, in-home Clock-Radio that has an overhead time display for easy night viewing. The unit also has a transmitter function that is triggered by the alarm. When the alarm sounds, a low-power 434MHz signal is transmitted to an adjacent receptacle switch/receiver that activates a selected lamp.

Description of EUT exercising:

The Clock-Radio unit was set to receive a 97.1MHz FM radio station. The unit was at full illumination. The alarm was set and triggered to transmit the 434MHz signal. The receptacle switch/receiver is in its normal operational mode as soon as it is plugged in to a receptacle.

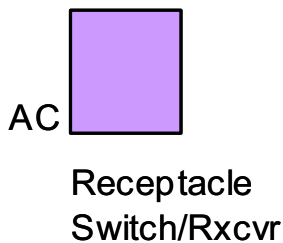
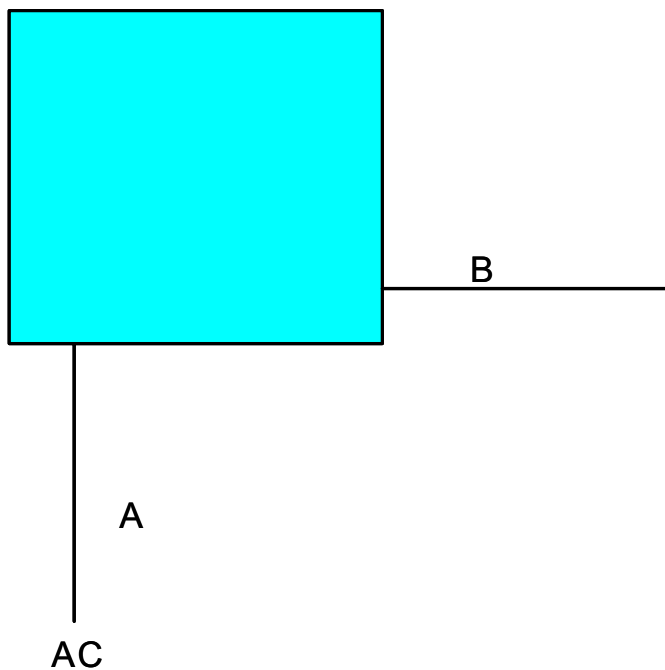
4.0 System setup including cable interconnection details, support equipment and simplified block diagram. (System Setup)

Method:

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

Drawing:

Clock Radio/Txmtr



System Block Diagram

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

Data:

EUT Cabling						
ID	Description	Length	Shielding	Ferrites	Connection	
					From	To
A	AC Power Line	2.0m	no	no	AC Source	Clock Radio EUT
B	Antenna line	1.0m	no	no	Clock Radio EUT	Unterminated

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
None			

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	Homedics, Inc.
	3000 Pontiac Trail
	Commerce, MI 48390
Trade Name & Model No.	SS 5500 Clock Radio & Receiver Adaptor
FCC Identifier	TG3-SS5500TX
Frequency Range (MHz)	434
Antenna Type (15.203)	Permenently Connected
Manufacturer name & address	Homedics, Inc.
	3000 Pontiac Trail
	Commerce, MI 48390

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:

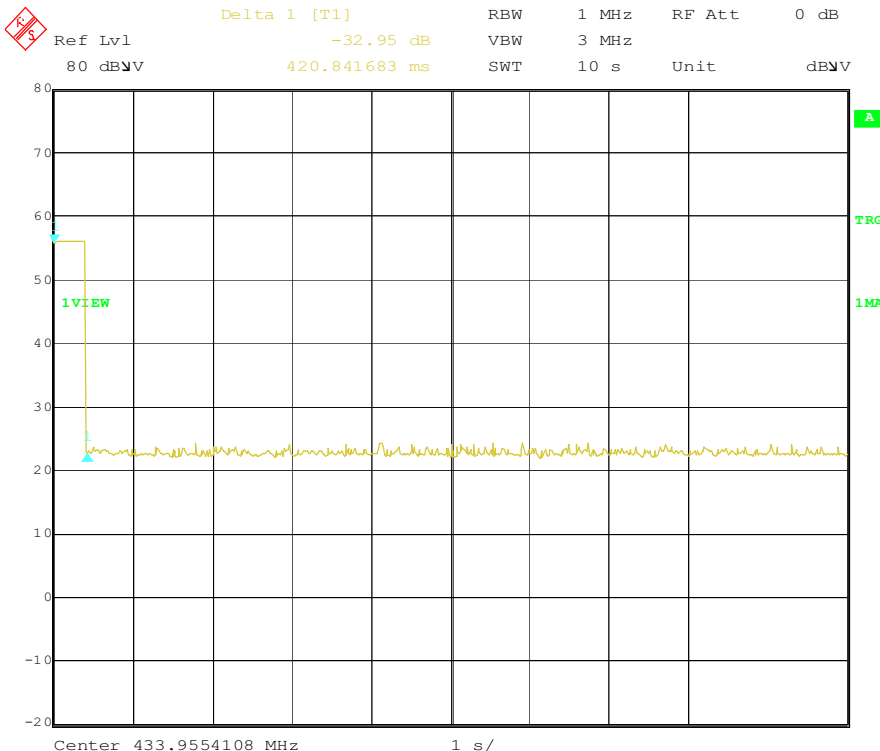
- (1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.
- (2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.
- (3) Periodic transmissions at regular 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.

Test Equipment Used:

Description:	Manufacturer:	Model:	Asset Number:	Cal Date:	Cal Due:
Cable E05, <18GHz	Huber-Suhner	Sucoflex 104PEA	E05	05/05/2008	05/05/2009
Spectrum Analyzer, 20Hz-40GHz	Rohde & Schwarz	FSEK30	200062	10/10/2008	10/10/2009

Results: The sample tested was found to Comply.

Plot:

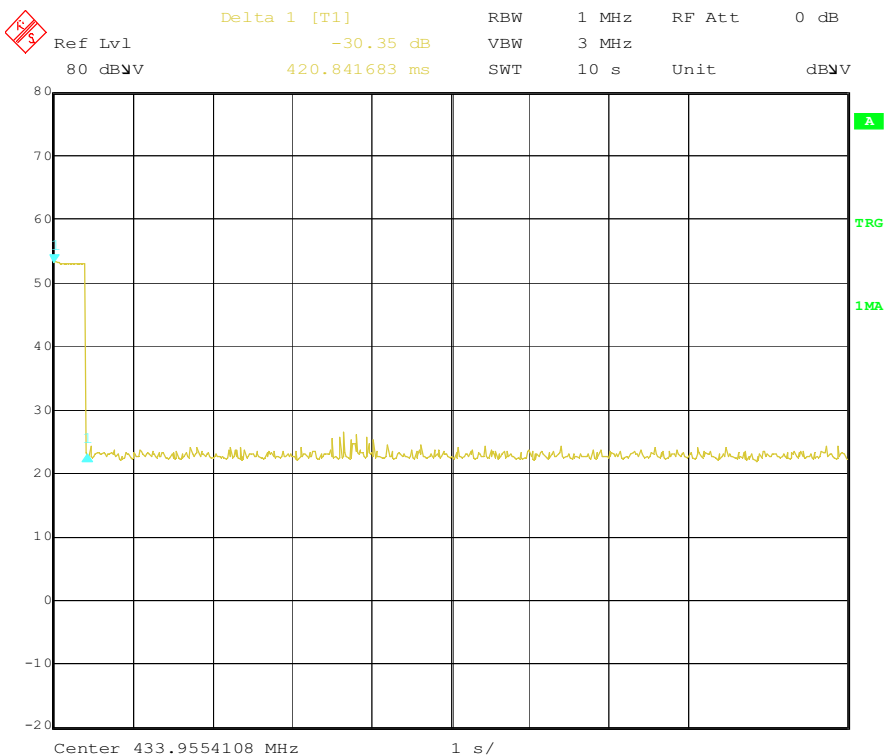


Date: 25.FEB.2009 11:14:00

Manually Activated Transmission Shutoff Time

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

Plot:



Date: 25.FEB.2009 11:17:27

Automatically Activated Transmission Shutoff Time

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

Data:

15.231(a)	Response	Requirement
Frequency Range (Mhz, max)	434	40.66-40.70 MHz and > 70MHz
Frequency Range (MHz, min)	434	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?	Yes	
Deactivates within 5 seconds?	Yes	Yes
Show plot (10 second sweep)	Yes	

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
--	----	----

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.

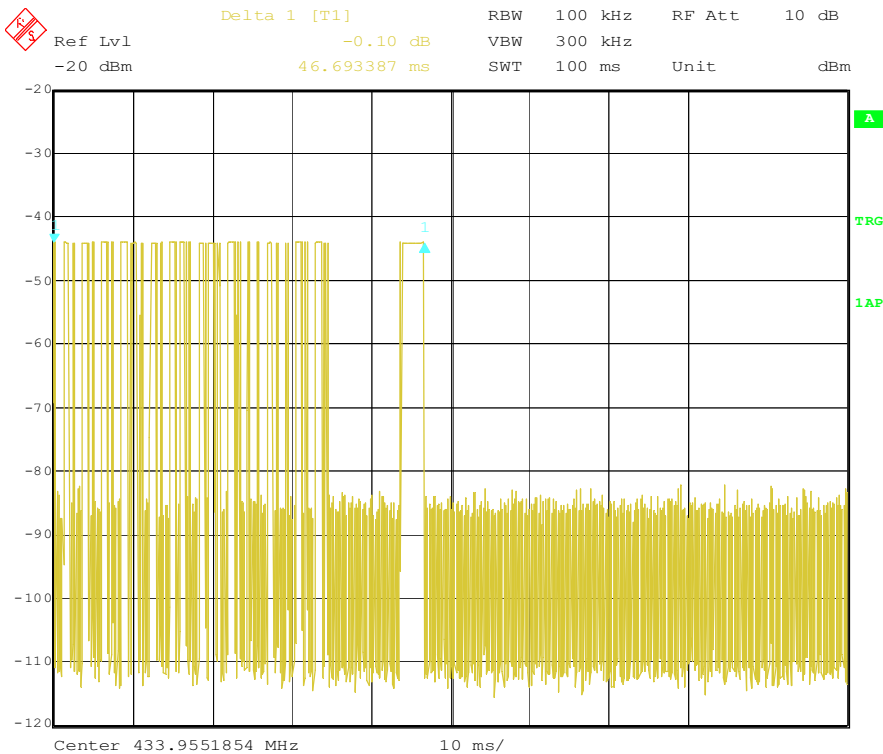
Use the Duty Cycle Correction Factor, DCCF, from the results table and use it to adjust the field strength measurements recorded for radiated emissions.

Test Equipment Used:

Description:	Manufacturer:	Model:	Asset Number:	Cal Date:	Cal Due:
Cable E05, <18GHz	Huber-Suhner	Sucoflex 104PEA	E05	05/05/2008	05/05/2009
Spectrum Analyzer, 20Hz-40GHz	Rohde & Schwarz	FSEK30	200062	10/10/2008	10/10/2009

Results: The sample tested was found to Comply.

Plot:

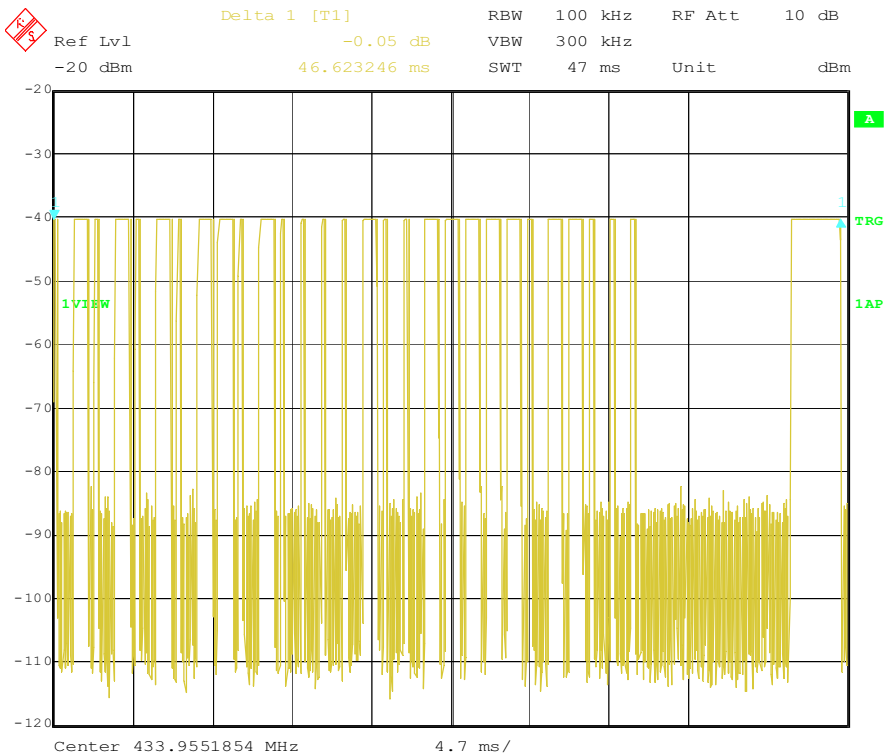


Date: 25.FEB.2009 11:47:39

100ms Sweep

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

Plot:

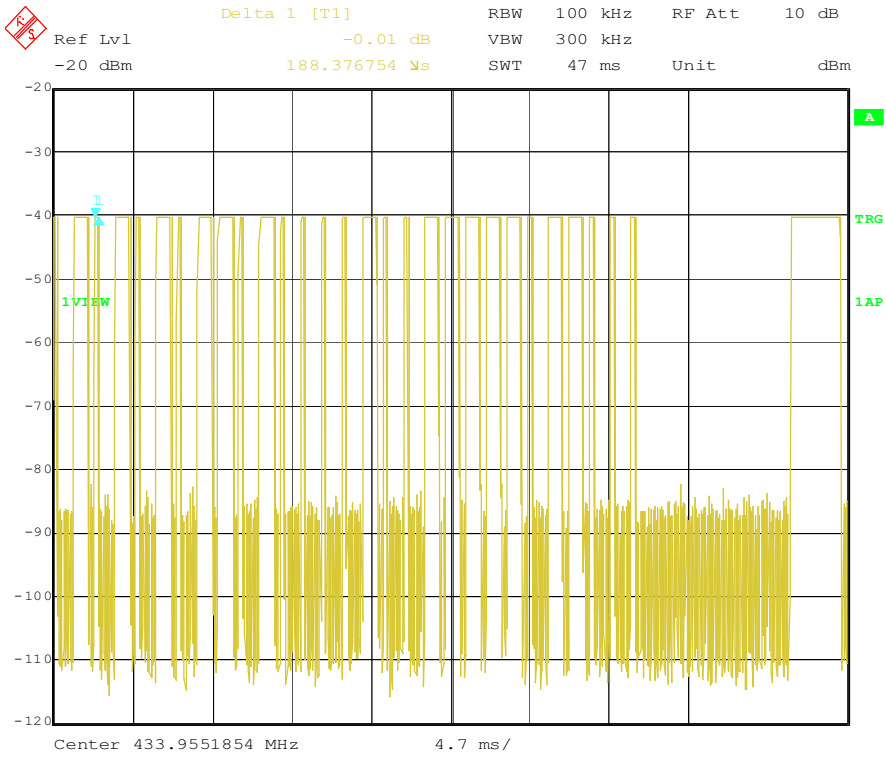


Date: 25.FEB.2009 11:53:56

47ms Sweep

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

Plot:

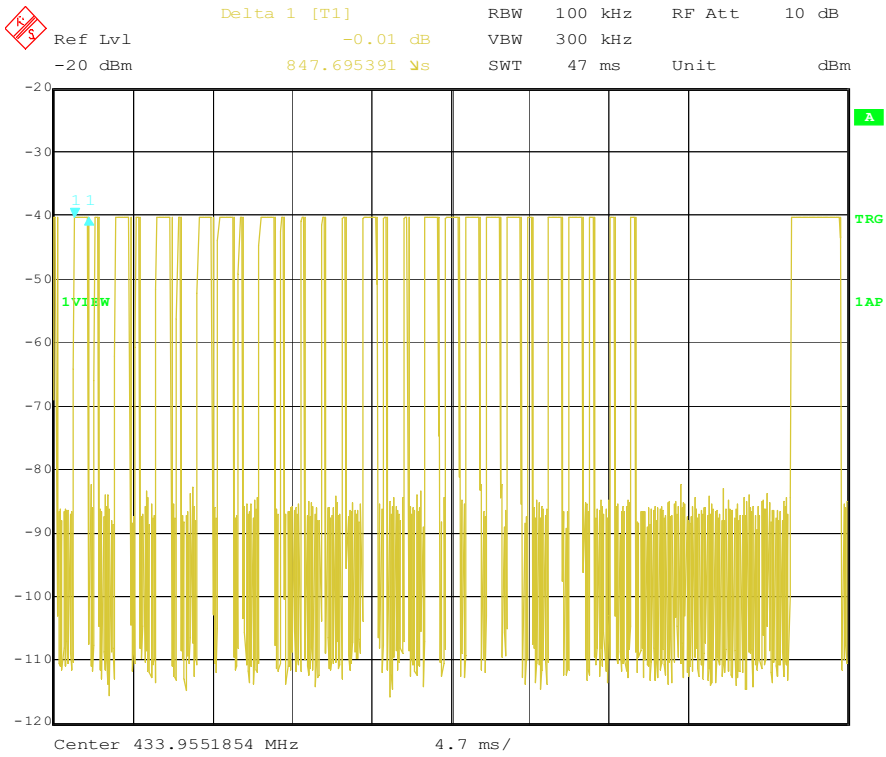


Date: 25.FEB.2009 11:55:13

0.188376ms Pulse

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

Plot:

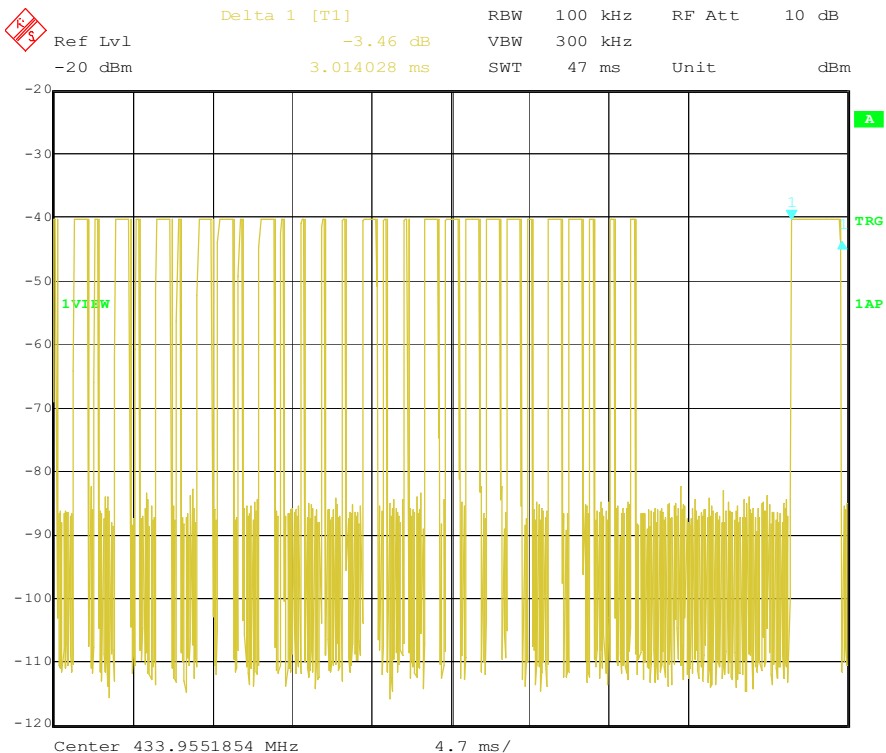


Date: 25.FEB.2009 11:57:00

0.847695ms Pulse

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

Plot:



Date: 25.FEB.2009 11:58:17

3.014028ms Pulse

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

Data:

Duration of Pulse Train, T (mSec):	100
Averaging Interval, A _I (mSec):	100
Number of different Pulses, N:	3

	Number (#P _x)	Pulse Width, mSec (PW _x)	Product (#P _x)*(PW _x)
Pulse Width 1	15	0.188376	2.82564
Pulse Width 2	14	0.847695	11.86773
Pulse Width 3	1	3.01402	3.01402
Pulse Width 4			
Pulse Width 5			
Pulse Width 6			
Pulse Width 7			
Pulse Width 8			
Pulse Width 9			
Pulse Width 10			

Duty Cycle:	0.1770739
Duty Cycle Correction Factor, dB:	-15.0

$$T_{on} = (PW_1 * \#P_1) + (PW_2 * \#P_2) + \dots + (PW_n * \#P_n)$$

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

$$DCCF = 20 * \text{Log}_{10}(DutyCycle)$$

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, 20-2000MHz	Chase	CBL6112B	211386	09/26/2008	09/26/2009
Antenna, Horn, <18 GHz	EMCO	3115	213061	04/18/2008	04/18/2009
Cable E01, <18GHz	Pasternack	RG214/U	E01	05/05/2008	05/05/2009
Cable E201, 18 GHz, N, 3m	Megaphase	TM18 NKNK 118	E201	01/29/2009	01/29/2010
Cable MP3, 18 GHz, N, 10m	Megaphase	G919-NKNK-394	MP3	05/05/2008	05/05/2009
Cable ST1, 7m, N-N, 18 GHz	Storm Products Co.	PR90-206-7MTR	ST1	01/23/2009	01/23/2010
Cable TT1, 6ft, N(Male) to N(Male)	Mini-Circuits	CBL-6FT-NMNM	TT1	05/05/2008	05/05/2009
EMI Receiver	Hewlett Packard	8546A	213109	09/29/2008	09/29/2009
EMI Receiver, Preselector section	Hewlett Packard	85460A	213108	09/29/2008	09/29/2009
Excel spreadsheet for radiated emissions	Software	Excel - RE Worksh	SW004	12/08/2008	12/08/2009
Preamplifier, 10 MHz to 2000 MHz, 27 dB gain	Mini-Circuits	ZKL-2	200074	10/20/2008	10/20/2009
Preamplifier, 20 MHz to 18 GHz, 40 dB	A.H. Systems	PAM-0118	200108	03/27/2008	03/27/2009
Spectrum Analyzer, 20Hz-40GHz	Rohde & Schwarz	FSEK30	200062	10/10/2008	10/10/2009
Tile - software profile for radiated and conducted emissions testing.	Software	Tile - Emissions	SW006	12/08/2008	12/08/2009

Results: The sample tested was found to Comply.

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

Photo:



Test Setup - Front View

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

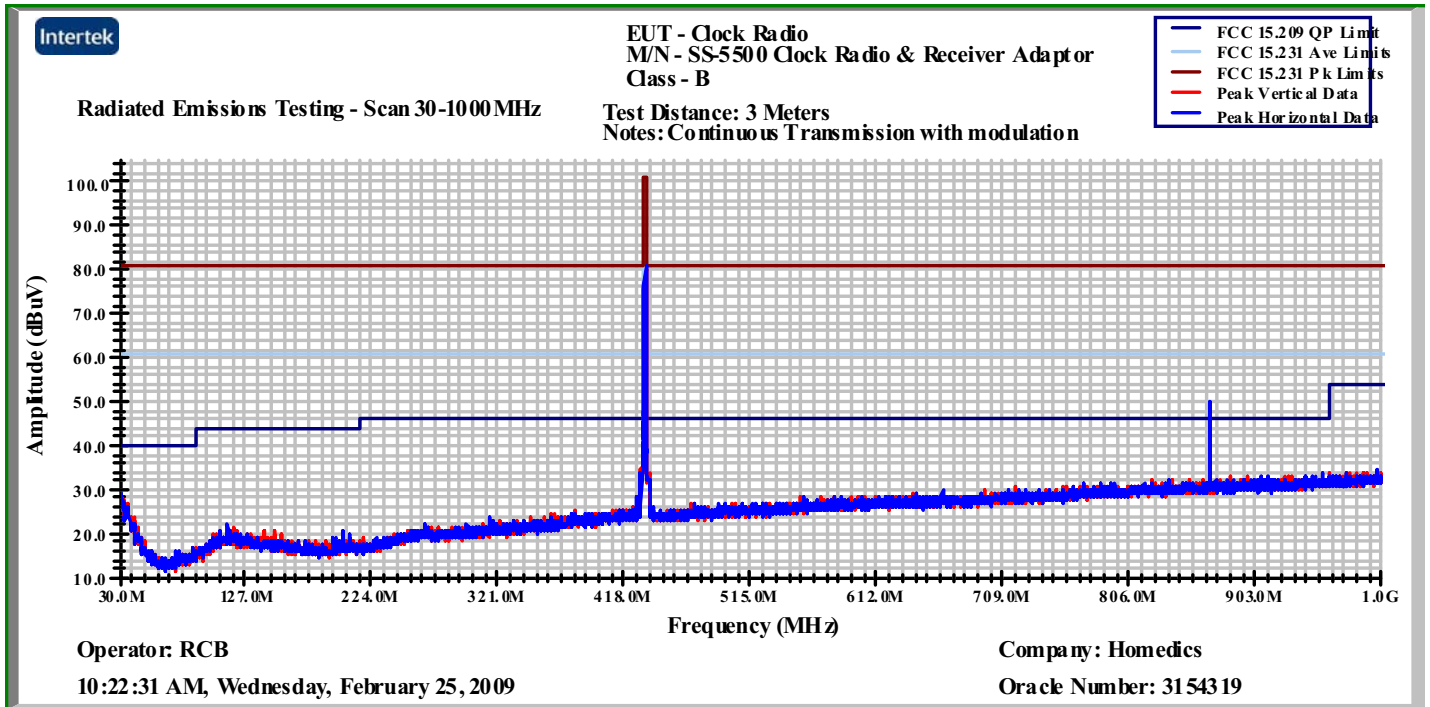
Photo:



Test Setup - Rear View

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

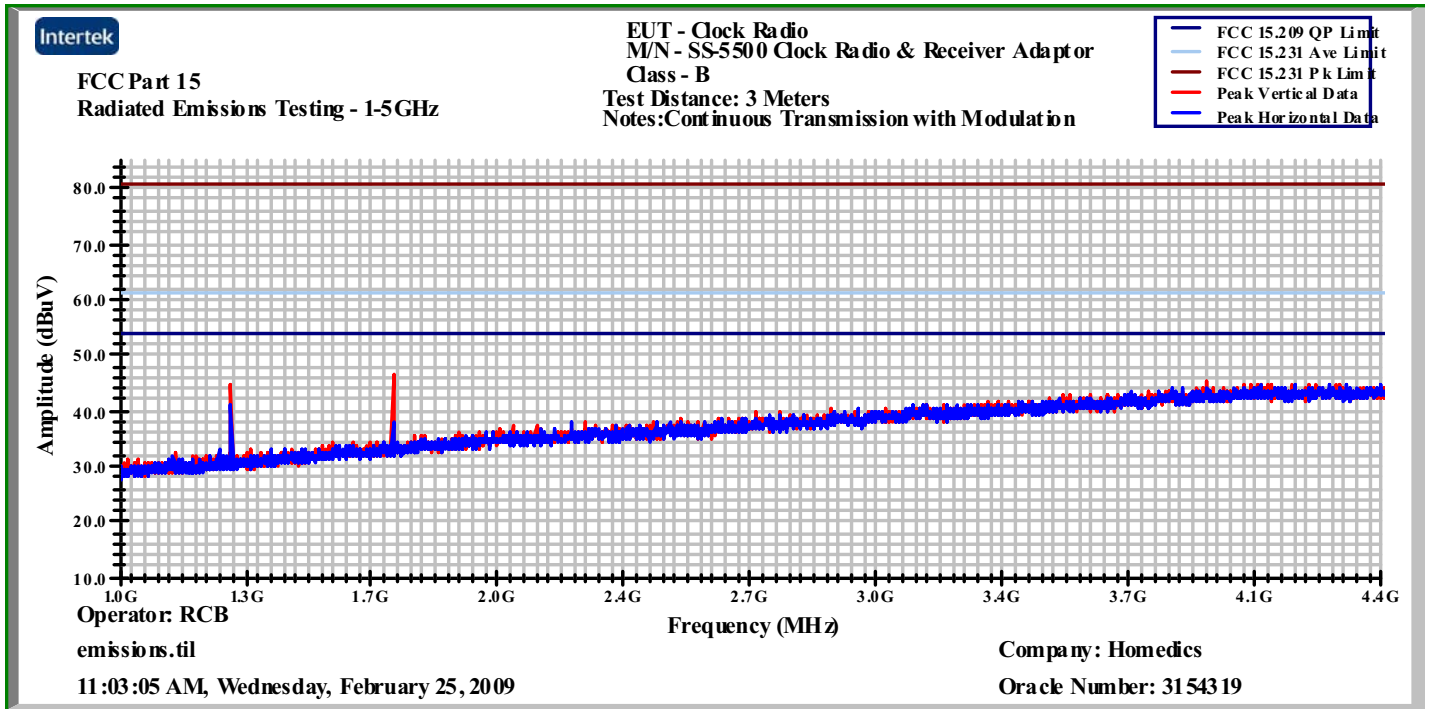
Plot:



Radiated Emissions 30-1000MHz

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

Plot:



Radiated Emissions 1000-5000MHz

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

Data:

Frequency Range (MHz): 30 to 5000

Test Distance (m): 3

Input power: 120VAC/60Hz

Modifications for compliance (y/n): n

Notes:

A	B	C	D	E	F	G	H	I	J	K
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)	3m Limit dB(uV/m)	Margin dB	Axis / Detector
V	433.967	91.8	18.3	4.4	27.9	0.0	86.6	100.8	-14.2	Peak
V	433.967	91.8	18.3	4.4	27.9	15.0	71.6	80.8	-9.2	Peak
H	433.967	86.6	17.4	4.4	27.9	0.0	80.6	100.8	-20.2	Peak
H	433.967	86.6	17.4	4.4	27.9	15.0	65.6	80.8	-15.2	Peak
V	867.925	45.5	21.8	6.3	27.5	0.0	46.1	80.8	-34.7	Peak
V	867.925	45.5	21.8	6.3	27.5	15.0	31.1	60.8	-29.7	Peak
H	867.925	52.0	20.6	6.3	27.5	0.0	51.5	80.8	-29.3	Peak
H	867.925	52.0	20.6	6.3	27.5	15.0	36.5	60.8	-24.3	Peak
V	1301.889	62.2	23.8	0.9	40.6	0.0	46.3	80.8	-34.5	Peak
V	1301.889	62.2	23.8	0.9	40.6	15.0	31.3	60.8	-29.5	Peak
H	1301.889	60.0	24.0	0.9	40.6	0.0	44.3	80.8	-36.5	Peak
H	1301.889	60.0	24.0	0.9	40.6	15.0	29.3	60.8	-31.5	Peak
V	1735.836	61.1	25.6	0.9	40.7	0.0	46.9	80.8	-33.9	Peak
V	1735.836	61.1	25.6	0.9	40.7	15.0	31.9	60.8	-28.9	Peak
H	1735.836	56.9	25.6	0.9	40.7	0.0	42.7	80.8	-38.1	Peak
H	1735.836	56.9	25.6	0.9	40.7	15.0	27.7	60.8	-33.1	Peak
Calculations		G=C+D+E-F		I=G-H						

9.0 Conducted emissions on AC power lines (Conducted Emissions)

Method:

Equipment setup for conducted disturbance tests shall follow the guidelines of ANSI C63.4:2003.

Measurements in the frequency range of 150kHz to 30 MHz shall be performed with a quasi-peak or average detector instrument that meets the requirements of Section One of CISPR 16. An AMN shall be used to provide a defined impedance at high frequencies across the power feed at the point of measurement of terminal voltage and also to provide isolation of the circuit under test from the ambient noise on the power lines. An AMN defined in CISPR 16 shall be used.

In the frequency range of 150 kHz to 30 MHz, a resolution/video bandwidth of 9kHz/30kHz or greater shall be used.

The EUT shall be located so that the distance between the boundary of the EUT and the closest surface of the AMN is 0.8m.

If a flexible mains cord is provided by the manufacturer that is in excess of 1m, the excess cable shall be folded back and forth as far as possible to form a bundle not exceeding 0.4m in length.

The EUT shall be arranged and connected with cables terminated in accordance with the product specification.

Conducted disturbance shall be measured between each current carrying conductor and the reference ground. Each measured values shall be reported.

If EUT is intended for tabletop use, the EUT shall be placed on a table whose top is 0.8m above the ground plane. A vertical, metal reference plane is placed 0.4m from the EUT. The vertical metal reference-plane is at least 2m by 2m. The EUT shall be kept at least 0.8m from any other metal surface or other ground plane not being part of the EUT. The table shall be constructed of non-conductive materials. Its dimensions are at least 1m by 1.5m, but may be extended for larger EUT.

If EUT is floor standing, the floor standing EUT shall be placed on a horizontal metal ground plane and isolated from the ground plane by up to 12 mm of insulating material. The metal ground plane shall extend at least 0.5m beyond the boundaries of the EUT and had minimum dimensions of 2m by 2m.

TEST SITE

The test site for conducted emissions is located at 1950 Evergreen Blvd, Suite 100, Duluth, Georgia 30096. The VCCI Registration Number for this site is C-2818.

MEASUREMENT UNCERTAINTY

Compliance of the product is based on the measured value. However, the measurement uncertainty is included for informational purposes. The values given are the measurement uncertainty values with an expanded uncertainty of k=2.

150 kHz to 30 MHz: +/- 2.8 dB

Test Equipment Used:

Description:	Manufacturer:	Model:	Asset Number:	Cal Date:	Cal Due:
Cable TT1, 6ft, N(Male) to N(Male)	Mini-Circuits	CBL-6FT-NMNM	TT1	05/05/2008	05/05/2009
Cable TT4	Andrews	Cable TT4	TT4 211404	05/05/2008	05/05/2009
EMI Receiver	Hewlett Packard	8546A	213109	09/29/2008	09/29/2009
EMI Receiver, Preselector section	Hewlett Packard	85460A	213108	09/29/2008	09/29/2009
LISN (TT4)	Fischer Custom Comm	FCC-LISN-50-50-M	211406	10/18/2008	10/18/2009
Spectrum Analyzer, 20Hz-40GHz	Rohde & Schwarz	FSEK30	200062	10/10/2008	10/10/2009
Transient Limiter	Hewlett Packard	11947A	213100	08/05/2008	08/05/2009

Results: The sample tested was found to Comply.

9.0 Conducted emissions on AC power lines (Conducted Emissions)

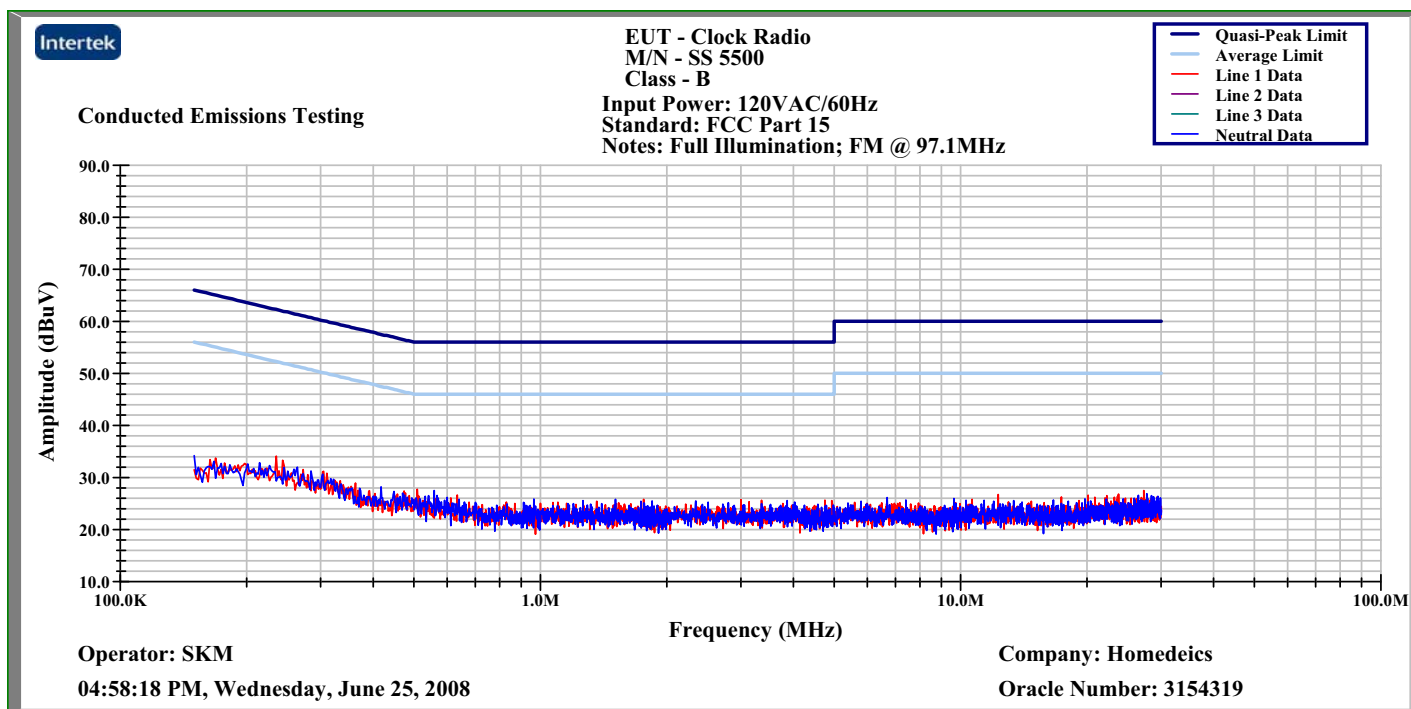
Photo:



Test Setup

9.0 Conducted emissions on AC power lines (Conducted Emissions)

Plot:



Conducted Emissions @ 120VAC/60Hz

9.0 Conducted emissions on AC power lines (Conducted Emissions)

Data:

Frequency Range (MHz): 30 to 1000

Limit: CISPR Class B

Input power: 120VAC/60Hz

Modifications for compliance (y/n): N

A	B	C	D	E	F	G	H	I
LISN Number 1,2	Detector (P,QP, A)	Frequency MHz	Reading dBuV	Cable Loss dB	LISN Ins. Loss dB	Net dBuV	Limit dBuV	Margin dB
Full illumination, Radio set to FM 97.1MHz								
1	P	0.170	26.6	0.3	6.1	33.0	55.0	-22.1
1	P	0.273	26.4	0.3	6.1	32.8	51.1	-18.4
1	P	0.340	24.1	0.3	6.1	30.5	49.2	-18.8
1	P	0.426	22.3	0.3	6.0	28.6	47.3	-18.8
2	P	0.168	26.2	0.3	6.1	32.6	55.2	-22.7
2	P	0.242	27.1	0.3	6.1	33.5	52.1	-18.7
2	P	0.318	24.2	0.3	6.1	30.6	49.8	-19.3
2	P	0.440	21.4	0.3	6.0	27.7	47.1	-19.5
Calculations		G=D+E+F		I=G-H				

Note: Peak measurements are compared to the average limit.

10.0 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.

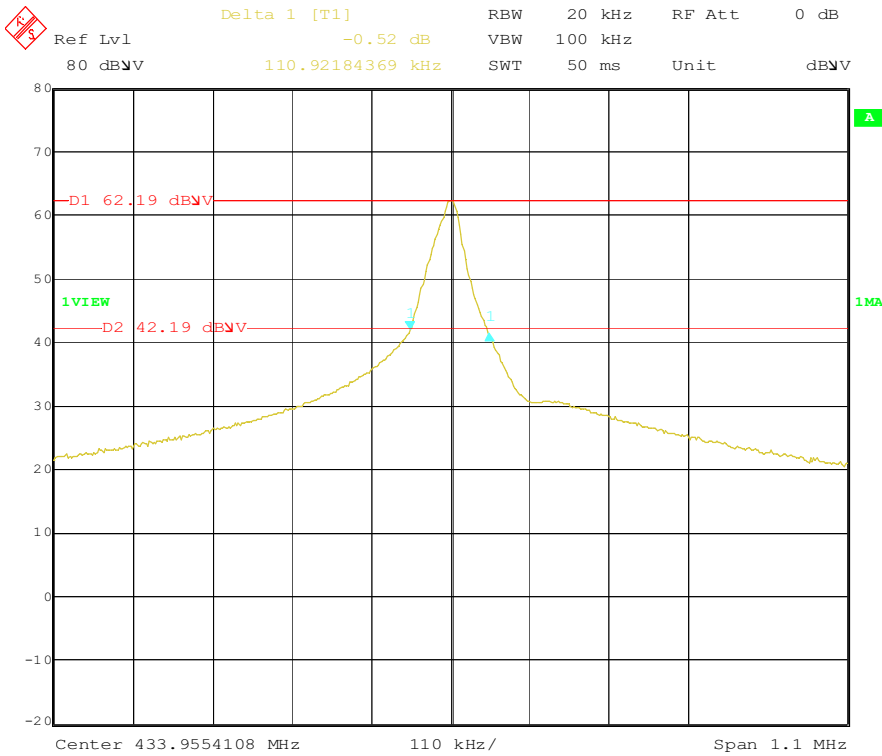
- Center Frequency is set to the fundamental of transmitter.
- Resolution Bandwidth is set to approximately 1% of the emission bandwidth.
- Video Bandwidth is set greater than or equal to the Resolution Bandwidth.

Test Equipment Used:

Description:	Manufacturer:	Model:	Asset Number:	Cal Date:	Cal Due:
Cable E05, <18GHz	Huber-Suhner	Sucoflex 104PEA	E05	05/05/2008	05/05/2009
Spectrum Analyzer, 20Hz-40GHz	Rohde & Schwarz	FSEK30	200062	10/10/2008	10/10/2009

Results: The sample tested was found to Comply.

Plot:



Date: 25.FEB.2009 11:02:56

99% Occupied Bandwidth

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

Data:

Fundamental Frequency MHz	Measured Bandwidth MHz	Bandwidth Limit MHz
433.955	0.110921	1.0848875

Suggested Instrument Settings	
RBW (kHz):	11
VBW (kHz):	33
Span (MHz):	1.085
Sweep time (s):	>1