Electromagnetic Compatibility Test Report

Tests Performed on a DCSI

Wireless Meter Reading System, Model EMTR, RMTR and HHTR

Radiometrics Document RP-5033

ACCREDITED
Certification # 1495.01

Product Detail:
FCC ID: PN3Y72148-1
Equipment type: Frequency Hopping 902 to 928 MHz Transciever

Test Standards:
US CFR Title 47, Chapter I, FCC Part 15 Subpart C
FCC Part 15 CFR Title 47: 2002
Industry Canada RSS-210, Issue 5 as required for Category I Equipment

This report concerns: Original Grant for Certification
FCC Part 15.247
RSS-210 (o) (a)

Tests Performed For:	*Test Facility:*
DCSI 5657 Campus Pkwy. Hazelwood, MO 63042 Phone: (314) 895-6505	**Radiometrics Midwest Corporation** 12 East Devonwood Romeoville, IL 60446 Phone: (815) 293-0772 e-mail: info@radiomet.com

Test Date(s): (Month-Day-Year)
May 14 to 16, 2003

Document RP-5033 Revisions:

Rev.	Issue Date	Affected Pages	Revised By	Authorized Signature for Revision
0	June 4, 2003			
1	June 23, 2003		Joseph Strzelecki	Joseph Strzelecki

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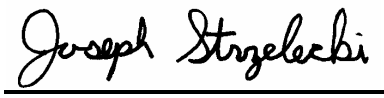
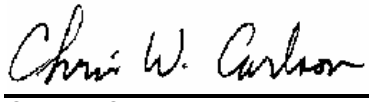
1 ADMINISTRATIVE DATA

Equipment Under Test: A DCSI, Wireless Meter Reading System Model: EMTR, RMTR and HHTR The EMTR has a Serial Number: 990473 This will be referred to as the EUT in this Report	
Date EUT Received at Radiometrics: (Month-Day-Year) May 14 2003	*Test Date(s): (Month-Day-Year)* May 14 to 16, 2003
Test Report Written By: Joseph Strzelecki Senior EMC Engineer	*Test Witnessed By:* Aaron Hook Navigation Corporation
Radiometrics' Personnel Responsible for Test:  Joseph Strzelecki Senior EMC Engineer NARTE EMC-000877-NE	*Test Report Approved By*  Chris W. Carlson Director of Engineering NARTE EMC-000921-NE

2 TEST SUMMARY AND RESULTS

The EUT (Equipment Under Test) is a Wireless Meter Reading System, Models EMTR, HHTR, and RMTR, manufactured by DCSI. The detailed test results are presented in a separate section. The following is a summary of the test results. This report is for a system of three transceivers.

In this report, the term EUT (Equipment Under Test) refers to all three devices. If a section refers to only one of the products, the test item will be referred to as EMTR, HHTR, or RMTR.

Spread Spectrum Transmitter Requirements

Environmental Phenomena	Frequency Range	FCC Section	RSS-210 Section	Test Result		
				EMTR	HHTR	RMTR
Carrier Frequency Separation	902-928 MHz	15.247 a	6.2.2 (o) (a)	Pass	Pass	Pass
Number of Hopping Frequencies	902-928 MHz	15.247 a	6.2.2 (o) (a)	Pass	Pass	Pass
Time of Occupancy (Dwell Time)	902-928 MHz	15.247 a	6.2.2 (o) (a)	Pass	Pass	Pass
20 dB Bandwidth Test	902-928 MHz	15.247 a	6.2.2 (o) (a)	Pass	Pass	Pass
Peak Output Power	902-928 MHz	15.247 b	6.2.2 (o) (a)	Pass	Pass	Pass
Band-edge Compliance of RF Conducted Emissions	902-928 MHz	15.247 c	6.2.2 (o) (e)	Pass	Pass	Pass
Spurious RF Conducted Emissions	30-9300 MHz	15.247 c	6.2.2 (o) (e)	Pass	Pass	Pass
Spurious Radiated Emissions	30-9300 MHz	15.247	6.2.2 (o) (a)	Pass	Pass	Pass
Conducted Emissions, AC Mains	0.45 - 30 MHz	15.207	6.6	Pass	N/R	Pass

N/R Not Required; No AC Power.

2.1 RF Exposure Compliance Requirements

Since the power output is less than 10 mW, the EUT meets the FCC requirement for RF exposure and it is exempt from RSS-102. There are no power level adjustments and the antenna is permanently attached.

3 EQUIPMENT UNDER TEST (EUT) DETAILS

3.1 EUT Description

The EUT is a Wireless Meter Reading System, Model EMTR, RMTR, and HHTR, manufactured by DCSI. The EUT was in good working condition during the tests, with no known defects.

The Antenna has a gain of less than 2 dBi.

A full description is in a separate document.

3.1.1 FCC Section 15.203 Antenna Requirements

The antenna is permanently attached to the PCB and the Antenna is internal on all three EUT's. Therefore it meets the 15.203 Requirement.

3.2 Related Submittals

DCSI is not submitting any other products simultaneously for equipment authorization related to the EUT.

4 TESTED SYSTEM DETAILS

4.1 Tested System Configuration

The system was configured for testing in a typical fashion. The EUT was placed on an 80-cm high, nonconductive test stand. The testing was performed in conditions as close as possible to installed conditions. Wiring was consistent with manufacturer's recommendations.

The identification for all equipment, plus descriptions of all cables used in the tested system, are:

Tested System Configuration List

Item	Description	Type*	Manufacturer	Model Number	Serial Number
1	Wireless Meter Reading System	E	DCSI	EMTR	990473
2	Wireless Meter Reading System	E	DCSI	HHTR	None
3	Wireless Meter Reading System	E	DCSI	RMTR	None
4	Water meter	P	Invensys	40020738	None

* Type: E = EUT, P = Peripheral,

List of System Cables

QTY	Length (m)	Cable Description	Connected to (Item #)	Shielded?
1	3	3 wire AC input Cable for EMTR	#1	No
1	3.5	2-wire AC Output Unterminated Cable	#1	No
1	1.8	DB15 Serial cable	#2	Yes
1	2	6 pin RJ Communication Cable	#2	No
1	1	Interface Cable to	#3 to #4	No

EMTR

The EMTR is installed in an electricity meter. The meter connects to a standard mount for households and businesses. Since the EMTR is wall mounted, it was placed in an upright configuration during the tests. Line and load cables were connected to the EUT as in a typical installation. The lengths were chosen to conform with ANSI C12.1: 2001. Power was supplied at 115 VAC, 60 Hz single-phase.

HHTR

The EUT was tested as a stand-alone device. The EUT was tested in two configurations. First it was tested with no cables connected since meter reader personnel in the field will use it with no cables connected. In the second configuration, power was supplied at 115 VAC, 60 Hz single-phase to its external power supply. Unterminated cables were connected to it. However the EUT will not transmit while connected to a computer. It will not be transmitting with the I/O cables connected.

The Radiated emissions were measured in both configurations. The worst-case emissions were reported. The AC Conducted emissions were tested in the second configuration.

Note that the HHTR as an unintentional radiator is not within the scope of this report. The HHTR fully complied with the FCC limits for unintentional radiators as well.

RMTR

The RMTR was connected to a water meter with one meter length cable. This is longest length it will be installed with. Power was supplied with a new battery.

4.2 Special Accessories

No special accessories were used during the tests in order to achieve compliance.

4.3 Equipment Modifications

No modifications were made to the EUT at Radiometrics' test facility in order to comply with the standards listed in this report.

5 TEST SPECIFICATIONS AND RELATED DOCUMENTS

Document	Date	Title
FCC CFR Title 47	2002	Code of Federal Regulations Title 47, Chapter 1, Federal Communications Commission, Part 15 - Radio Frequency Devices
ANSI C63.4-1992	1992	Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
IC RSS-210 Issue 5	2001	Low Power Licence-Exempt Radiocommunication Devices (All Frequency Bands)
IC RSS-212 Issue 1	1998	Test Methods For Radio Equipment
FCC DA 00-705	2000	Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems
ANSI C12.1	2001	Electricity Meters Code For Electricity Metering

The test procedures used are in accordance with the FCC DA 00-75, Industry Canada RSS-212 and ANSI document C63.4-1992, (July 17, 1992) "Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". The specific procedures are described herein. Radiated testing was performed at an antenna to EUT distance of 3 meters. The antenna was raised and lowered from 1 to 4 meters.

6 RADIOMETRICS' TEST FACILITIES

The results of these tests were obtained at Radiometrics Midwest Corp. in Romeoville, Illinois, USA. Radiometrics has been accredited by A2LA (American Association for Laboratory Accreditation) to conform to ISO/IEC 17025: 1999 "General Requirements for the Competence of Calibration and Testing Laboratories". Radiometrics' Lab Code is 121191 and Certification Number is 1495.01. Radiometrics' scope of accreditation includes all of the "basic standards" listed herein. A copy of the accreditation can be accessed on our web site (www.radiomet.com). Radiometrics accreditation status can be verified at A2LA's web site (www.a2la.org).

The following is a list of shielded enclosures located in Romeoville, Illinois:

Chamber A: Is an anechoic chamber that measures 24' L X 12' W X 12' H. The walls and ceiling are fully lined with ferrite absorber tiles. The floor has a 10' x 10' section of ferrite absorber tiles in the located in the center. Panashield of Rowayton, Connecticut manufactured the chamber. The enclosure is NAMAS certified.

Chamber B: Is a shielded enclosure that measures 24' L X 12' W X 8' H. Erik A. Lindgren & Associates of Chicago, Illinois manufactured the enclosure.

Chamber C: Is a shielded enclosure that measures 20' L X 10' W X 8' H. Lindgren RF Enclosures Inc. of Addison, Illinois manufactured the enclosure.

Chamber D: Is a fully anechoic chamber that measures 22' L X 10' W X 10' H. The walls, ceiling and floor are fully lined with ferrite absorber tiles. Braden Shielding Systems of Tulsa, Oklahoma manufactured the chamber.

A separate ten-foot long, brass plated, steel ground rod attached via a 6 inch copper braid grounds each of the above chambers. Each enclosure is also equipped with low-pass power line filters.

Open Area Test Site (OATS): Is located on 8625 Helmar Road in Newark, Illinois, USA and measures 56' L X 24' W X 17' H. The entire open field test site has a metal ground screen. The FCC has accepted these sites as test site number 31040/SIT 1300F2. The FCC test site Registration Number is 90897. Details of the site characteristics are on file with the Industry Canada as file number IC3124.

A complete list of the test equipment is provided herein. The calibration due dates are indicated on the equipment list. The equipment is calibrated in accordance to ANSI/NCSL Z540-1 with traceability to the National Institute of Standards and Technology (NIST).

7 DEVIATIONS AND EXCLUSIONS FROM THE TEST SPECIFICATIONS

There were no deviations or exclusions from the test specifications.

8 CERTIFICATION

Radiometrics Midwest Corporation certifies that the data contained herein was taken under conditions that meet or exceed the requirements of the test specification. The results relate only to the EUT listed herein. Any modifications made to the EUT subsequent to the indicated test date will invalidate the data and void this certification.

9 TEST EQUIPMENT TABLE

RMC ID	Manufacturer	Description	Model No.	Serial No.	Frequency Range	Cal Period	Cal Date
AMP-05	RMC/Celeritek	Pre-amplifier	MW110G	1001	1.0-12GHz	12 Mo.	11/29/02
AMP-12	MITEQ	Pre-amplifier	AM-1431	530935	0.01-1000MHz	12 Mo.	12/28/02
ANT-03	Tensor	Biconical Antenna	4104	2231	20-200MHz	24 Mo.	08/07/01
ANT-06	EMCO	Log-Periodic Ant.	3146	1248	200-1000MHz	24 mo	08/07/01
ANT-12	RMC	Dipole Antennas	HW1010	202	25-1000MHz	12 Mo.	07/12/02
ANT-13	EMCO	Horn Antenna	3115	2502	1.0-18GHz	24 Mo.	09/30/02
HPF-02	Microwave Cir.	High Pass Filter	H2G09G02	HPF-2	1.5-11 GHz	24 Mo.	05/01/03
LSN-01	Electrometrics	LISN	FCC/VDE 50/2	1001	0.01-30MHz	12 Mo.	1/10/03
REC-01	Hewlett Packard	Spectrum Analyzer	8566A	2106A02115, 2209A01349	30Hz-22GHz	12 Mo.	06/07/03
REC-07	Anritsu	Spectrum Analyzer	MS2601A	MT53067	0.01-2200MHz	12 Mo.	12/23/02
THM-01	Extech Inst.	Temp/Humid Meter	4465CF	001106557	N/A	12 Mo.	12/31/02

Note: All calibrated equipment is subject to periodic checks.
NCR – No Calibration Required. Device monitored by calibrated equipment. N/A: Not Applicable.

10 TEST SECTIONS

10.1 AC Conducted Emissions; Section 15.207

A computer-controlled analyzer was used to perform the conducted emissions measurements. The frequency range was divided into 500 subranges equally spaced on a logarithmic scale. The computer recorded the peak of each subrange. This data was then plotted on semi-log graph paper generated by the computer and plotter. Adjusting the positions of the cables and orientation of the test system then maximizes the highest emissions.

Mains Conducted emission measurements were performed using a 50 Ohm/50 uH Line Impedance Stabilization Network (LISN) as the pick-up device. Measurements were repeated on both leads within the power cord. If the EUT power cord exceeded 80 cm in length, the excess length of the power cord was made into a 30 to 40 cm bundle near the center of the cord. The LISN was placed on the floor at the base of the test platform and electrically bonded to the ground plane.

Broadband conducted emissions may exceed the following limits by no more than 13 dB. An emission is defined as broadband if the average detector amplitude is 6 dB or more under the quasi-peak detector amplitude.

FCC Limits of Conducted Emissions at the AC Mains Ports

Frequency Range (MHz)	Class B Limits (dBuV)	
	Quasi-Peak	Average
0.150 - 0.50*	66 - 56	56 - 46
0.5 – 5.0	56	46
5.0 - 30	60	50
* The limit decreases linearly with the logarithm of the frequency in this range.		

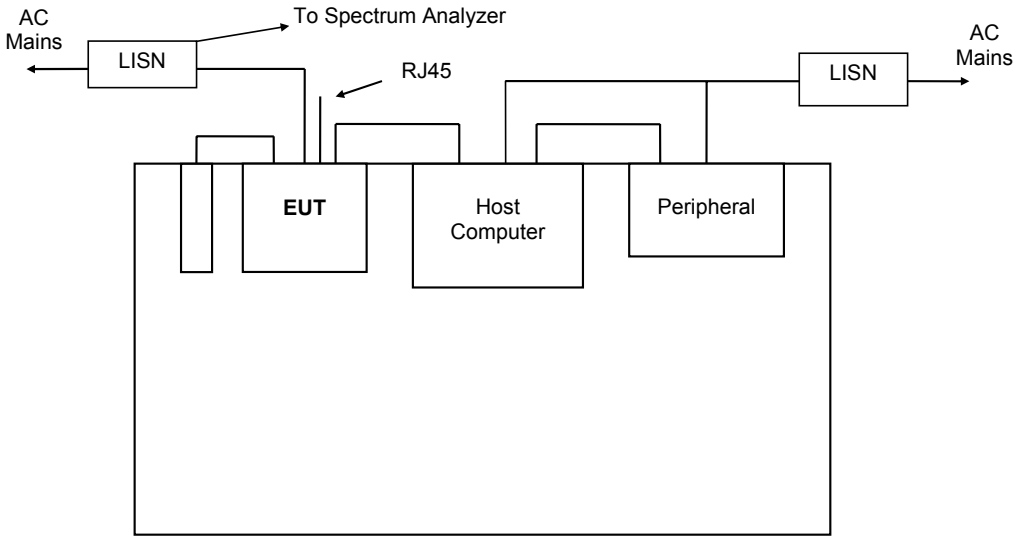
The initial step in collecting conducted data is a peak detector scan and the plotting of the measurement range. Significant peaks are then marked as shown on the following table, and these signals are then measured with the quasi-peak detector. The following represents the worst case emissions from the EMTR and the HHTR AC power cord, after testing all modes of operation.

Test Date: May 15, 2003
The Amplitude is the final corrected value with cable and LISN Loss.

EUT	Lead Tested	Frequency MHz	QP Amplitude	QP Limit	Average Amplitude	Average Limit
EMTR	AC Neutral	0.15	38.6	66.0	33.5	56.0
EMTR	AC Neutral	2.58	30.2	56.0	24.5	46.0
EMTR	AC Neutral	22.58	31.1	60.0	25.2	50.0
EMTR	AC Neutral	27.78	31.3	60.0	25.5	50.0
EMTR	AC Hot	0.15	38.8	66.0	33.5	56.0
EMTR	AC Hot	4.68	31.4	56.0	25.6	46.0
EMTR	AC Hot	18.95	31.6	60.0	25.9	50.0
EMTR	AC Hot	26.83	30.7	60.0	25.8	50.0
HHTR	AC Neutral	0.15	46.0	65.8	34.3	55.8
HHTR	AC Neutral	0.29	39.7	60.5	28.9	50.5
HHTR	AC Neutral	0.79	31.1	56.0	25.6	46.0
HHTR	AC Neutral	24.56	30.8	60.0	25.8	50.0
HHTR	AC Hot	0.15	47.5	65.8	35.6	55.8
HHTR	AC Hot	0.22	44.9	62.9	31.2	52.9
HHTR	AC Hot	0.38	37.8	58.4	35.2	48.4
HHTR	AC Hot	0.78	35.8	56.0	25.6	46.0

The above are the worst case results with three frequencies test for each EUT.
Judgment: Passed by 13.1 dB

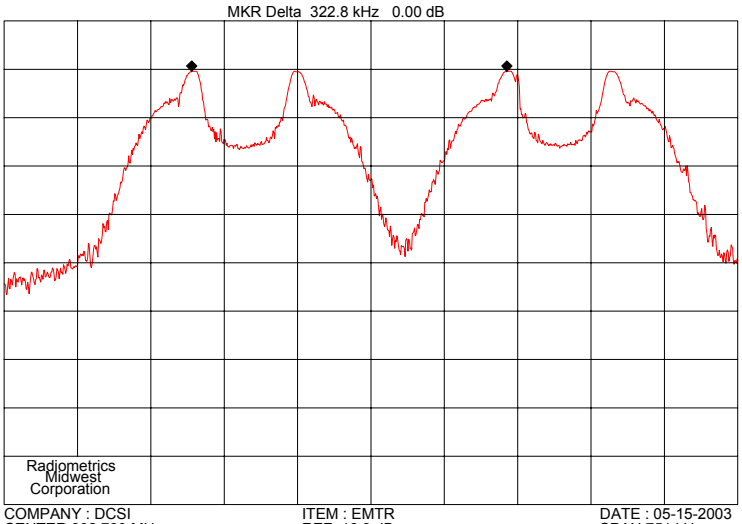
Figure 1. Conducted Emissions Test Setup



Notes:
- LISN's at least 80 cm from EUT chassis
- Vertical conductive plane 40 cm from rear of table top
- EUT power cord bundled

10.2 Carrier Frequency Separation

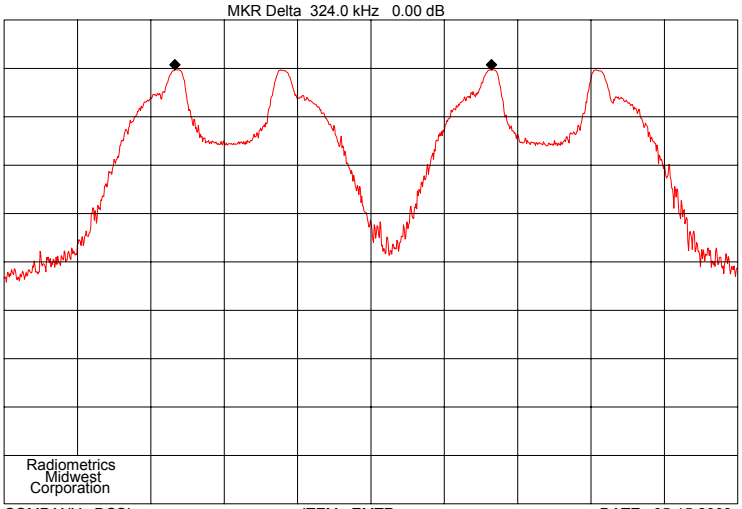
The EUT has its hopping function enabled. The spectrum analyzer was set to the MAX HOLD mode to read peak emissions. The sweep was set to AUTO. The trace was allowed to stabilize. The marker-delta function was used to determine the separation between the peaks of the adjacent channels. Since the three products share the same RF Section only one test was performed for this section.



COMPANY : DCSI
CENTER 902.790 MHz
RES BW 10 kHz
10 dB/
NOTES : FCC 15.247 (a), Freq. Separation; Ch 1 & 2

ITEM : EMTR
REF 18.3 dBm
VBW 30 kHz
TIME : 09:49

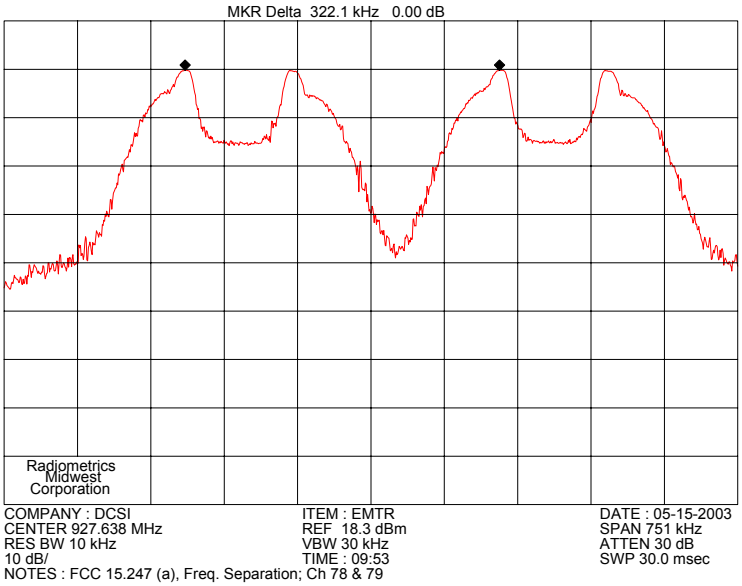
DATE : 05-15-2003
SPAN 751 kHz
ATTEN 30 dB
SWP 30.0 msec



COMPANY : DCSI
CENTER 915.064 MHz
RES BW 10 kHz
10 dB/
NOTES : FCC 15.247 (a), Freq. Separation; Ch 39 & 40

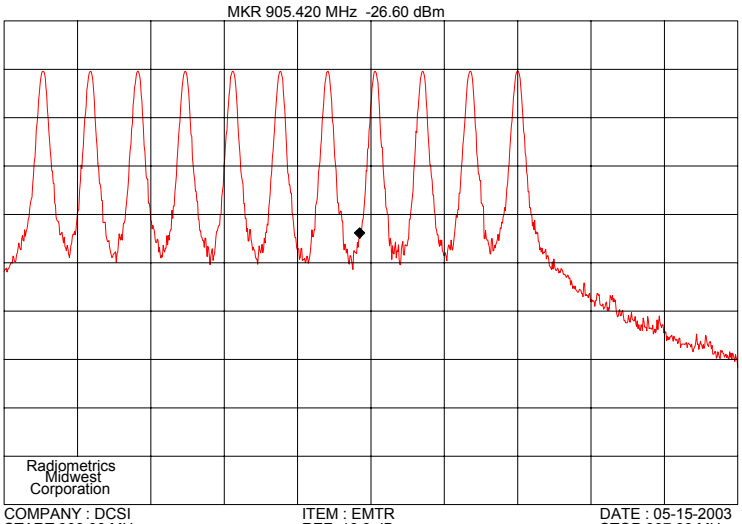
ITEM : EMTR
REF 18.3 dBm
VBW 30 kHz
TIME : 09:47

DATE : 05-15-2003
SPAN 750 kHz
ATTEN 30 dB
SWP 30.0 msec

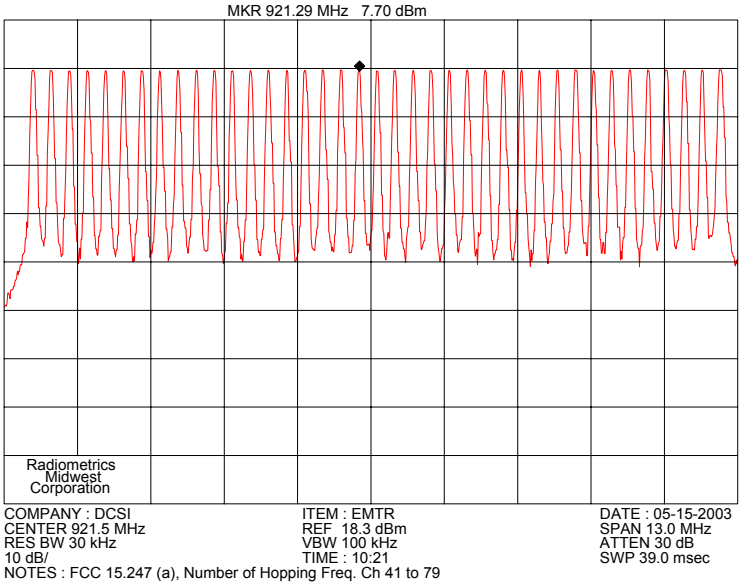


10.3 Number of Hopping Frequencies

The EUT has its hopping function enabled. The spectrum analyzer was set to the MAX HOLD mode to read peak emissions. The sweep was set to AUTO. The trace was allowed to stabilize. Since the three products share the same RF Section only one test was performed for this section.



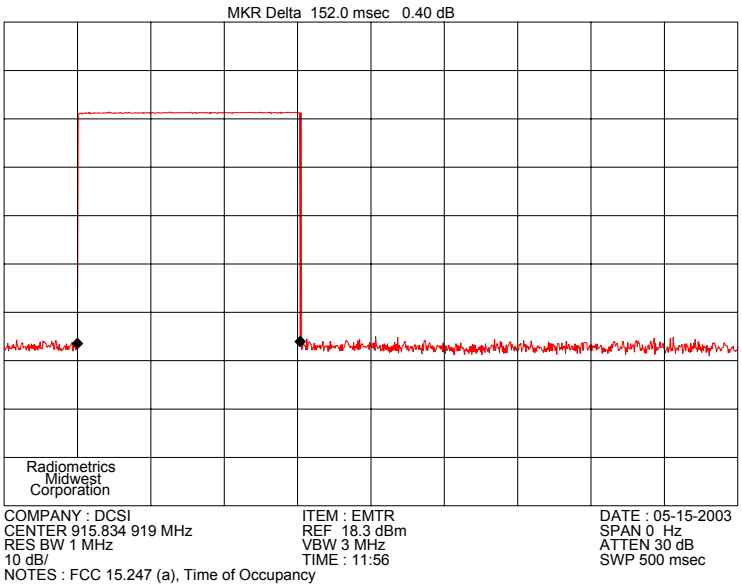
This Shows 11 Channels



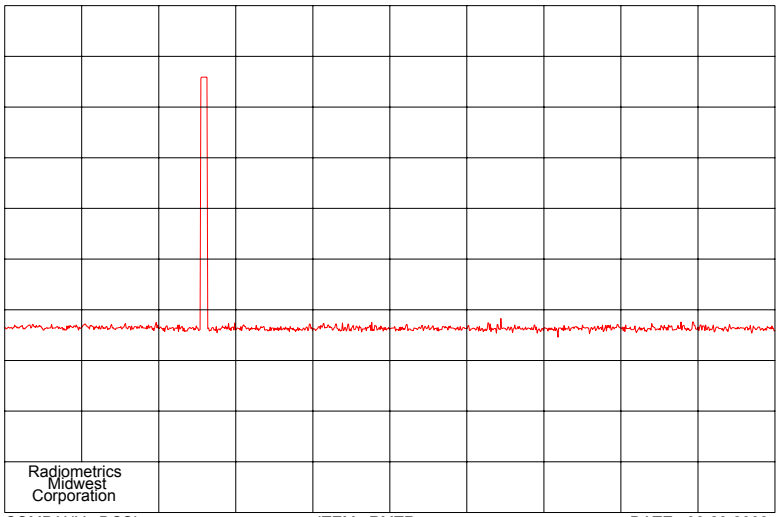
This Shows 39 Channels

10.4 Time of Occupancy (Dwell Time)

The EUT has its hopping function enabled. The spectrum analyzer was set to the MAX HOLD mode to read peak emissions. The span was set to zero. The marker-delta function to determine the dwell time. Since the three products share the same RF Section only one test was performed for this section.



To show compliance to 15.247 (a)(1)(i), the spectrum analyzer was set to the MAX HOLD mode to read peak emissions and a sweep time of 20 seconds. The span was set to zero. This shows that the EUT will not be at any frequency for more than 152 mS per 20 seconds.



COMPANY : DCSI
CENTER 915.834 000 MHz
RES BW 3 MHz
10 dB/
NOTES : Time of Occupancy Test, FCC 15.247(a)

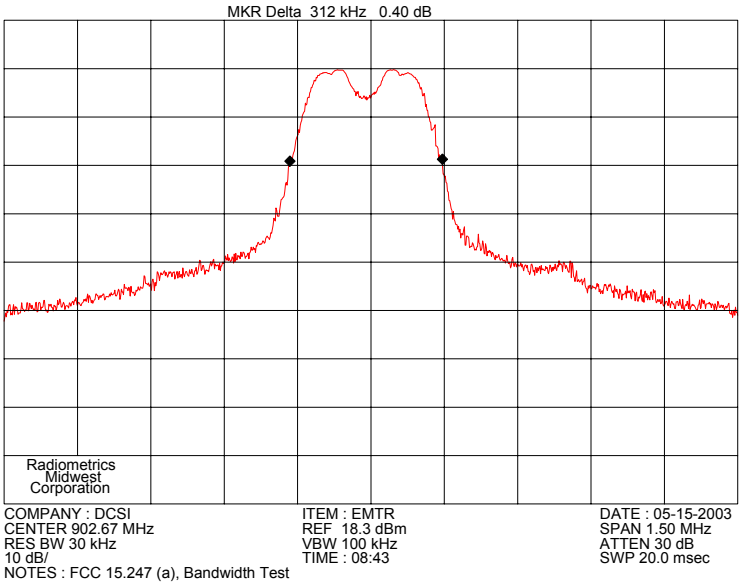
ITEM : RMTR
REF 20.0 dBm
VBW 3 MHz
TIME : 15:16

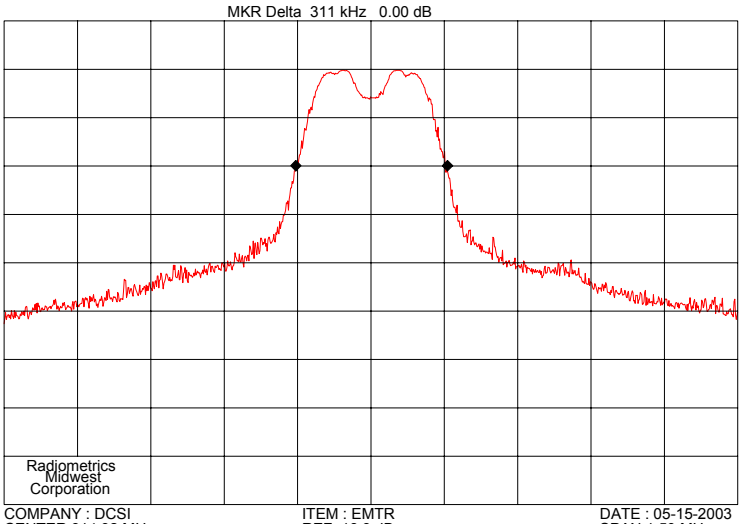
DATE : 06-23-2003
SPAN 0 Hz
ATTEN 30 dB
SWP 20.0 sec

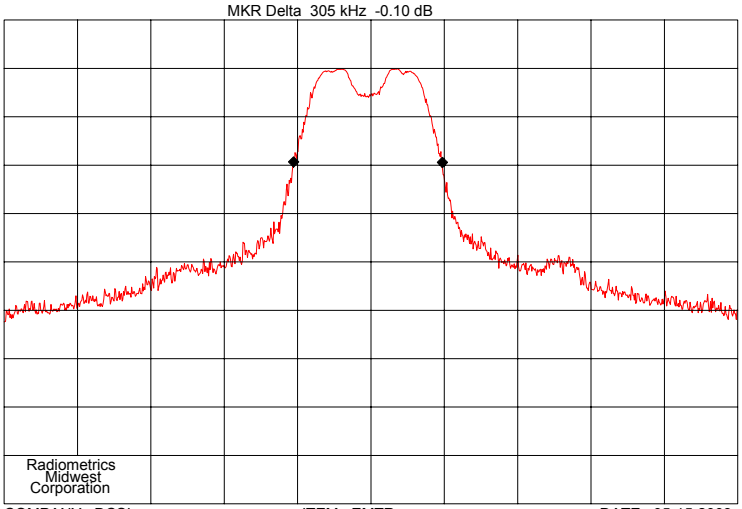
10.5 Occupied Bandwidth (20 dB)

The spectrum analyzer was set to the MAX HOLD mode to record the worst case of the modulation. The EUT was transmitting at its maximum data rate. The trace was allowed to stabilize. Since the three products share the same RF Section only one test was performed for this section.

The marker-to-peak function was set to the peak of the emission. Then the marker-delta function was used to measure 20 dB down one side of the emission. The marker-delta function was reset and then moved to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission.







10.6 Peak Output Power

The spectrum analyzer was set to the following settings:

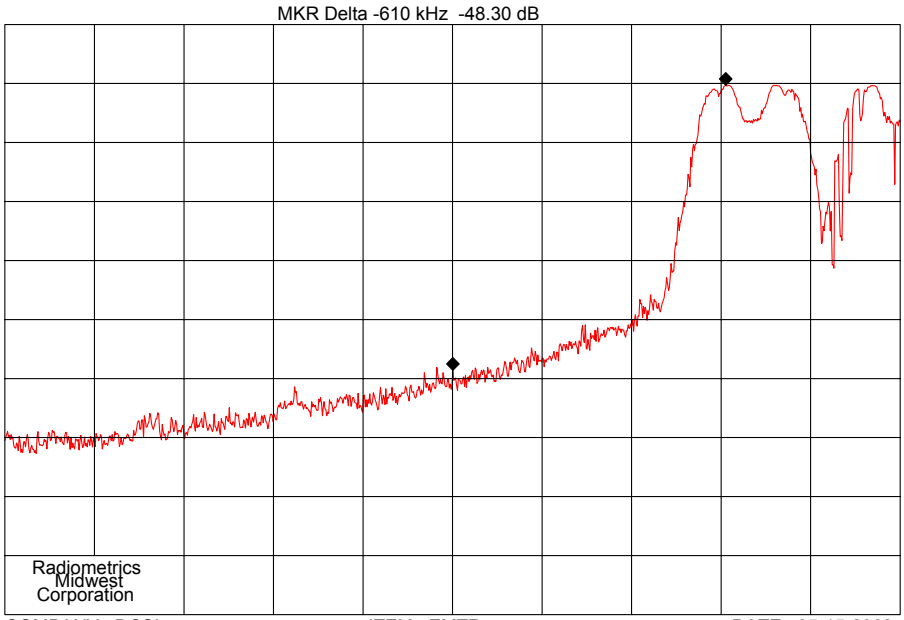
Span = 50 kHz (approximately 5 times the 20 dB bandwidth, centered on a hopping channel)
RBW = 100 kHz (> the 20 dB bandwidth of the emission being measured)
VBW = 300 kHz
Sweep = auto
Detector function = peak
Trace = max hold

The trace was allowed to stabilize. The marker-to-peak function was used to measure the peak of the emission. The indicated level is the peak output power. Note 30 dBm = 1 watt. Since the gain of the antenna is always less than 6dB, the limit is not reduced. Since the three products share the same RF Section only one test was performed for this section.

% of Nominal input Voltage	Frequency (MHz)	Reading (dBm)	Cable Loss (dB)	Total Power		Limit (dBm)
				dBm	Watts	
85	902.68	-2.7	0.1	-2.6	0.00055	30
85	914.89	-5.7	0.1	-5.6	0.00028	30
85	927.79	-8.5	0.1	-8.4	0.00015	30
100	902.68	8.1	0.1	8.2	0.0066	30
100	914.89	8.2	0.1	8.3	0.0067	30
100	927.79	8.2	0.1	8.3	0.0067	30
115	902.68	8.1	0.1	8.2	0.0066	30
115	914.89	8.2	0.1	8.3	0.0067	30
115	927.79	8.2	0.1	8.3	0.0067	30

10.7 Band-edge Compliance of RF Conducted Emissions

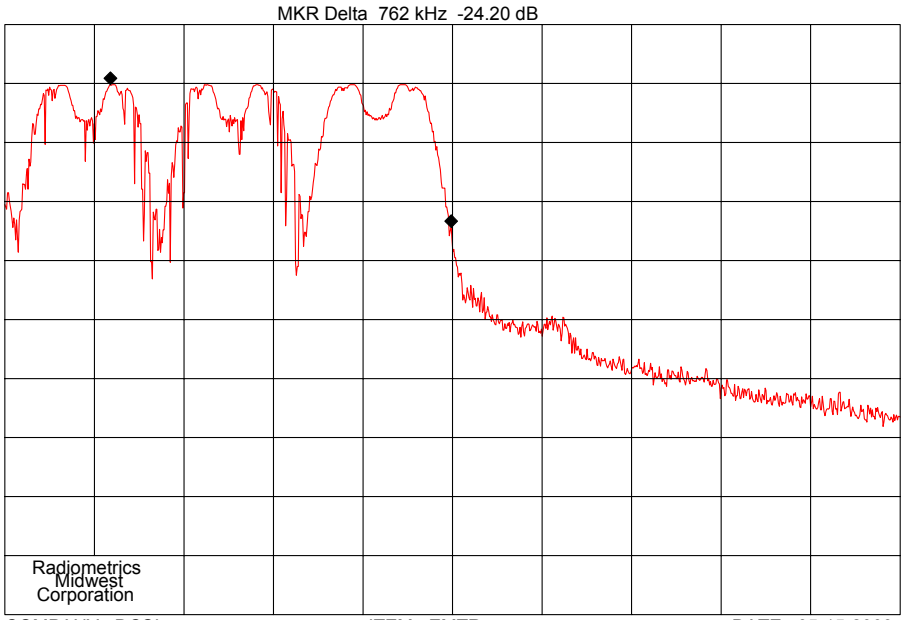
The spectrum analyzer was set to the MAX HOLD mode to record the worst case of the modulation at the band-edge, with the EUT set to the lowest frequency. The trace was allowed to stabilize. Since the three products share the same RF Section only one test was performed for this section.



COMPANY : DCSI
CENTER 902.00 MHz
RES BW 30 kHz
10 dB/
NOTES : FCC 15.247 (c), Band-edge Test; Low end

ITEM : EMTR
REF 18.3 dBm
VBW 100 kHz
TIME : 11:09

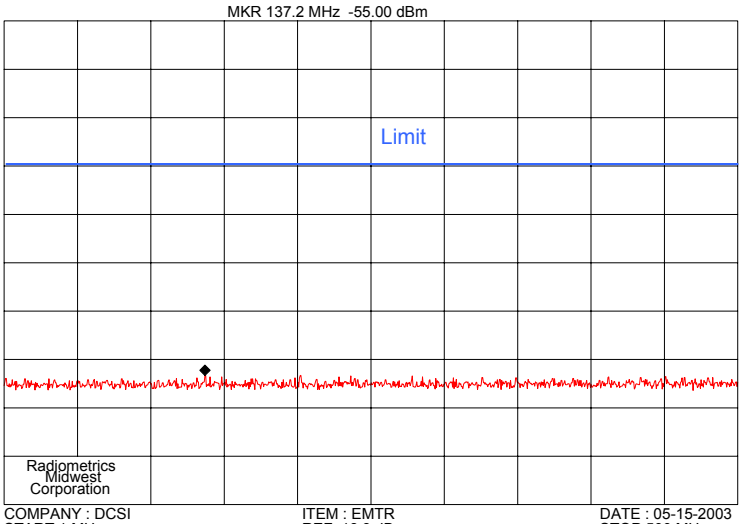
DATE : 05-15-2003
SPAN 2.00 MHz
ATTEN 30 dB
SWP 20.0 msec



10.8 Spurious RF Conducted Emissions

The spectrum analyzer was set to the MAX HOLD mode to record all spurious emissions from the lowest frequency generated in the EUT up through the 10th harmonic. The trace was allowed to stabilize. The first two plots were made while stepping through three frequencies (Low middle and high). Each frequency was on for 30 seconds. The last two plots were made with hopping enabled. Since the three products share the same RF Section only one test was performed for this section.

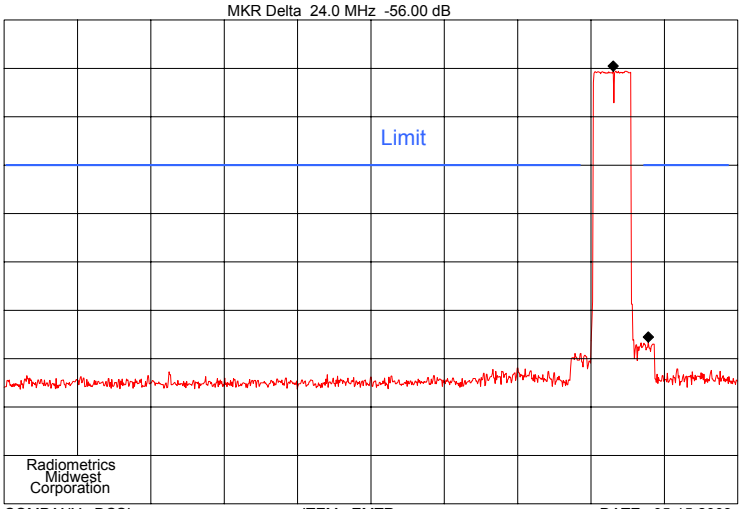
The reference level of the following plots represents the full power of the transmitter. No external attenuator was used on the spectrum analyzer.



COMPANY : DCSI
START 1 MHz
RES BW 100 kHz
10 dB/
NOTES : FCC 15.247 (c), Spurious Cond em

ITEM : EMTR
REF 18.3 dBm
VBW 300 kHz
TIME : 11:16

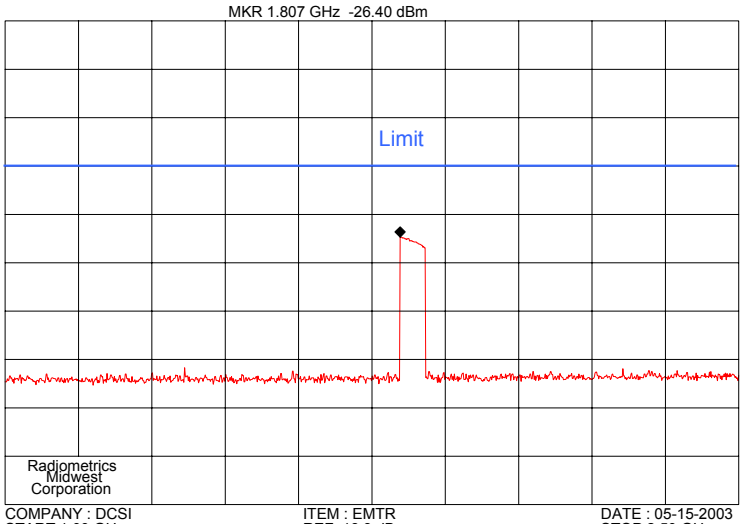
DATE : 05-15-2003
STOP 500 MHz
ATTEN 30 dB
SWP 150 msec



COMPANY : DCSI
START 500 MHz
RES BW 100 kHz
10 dB/
NOTES : FCC 15.247 (c), Spurious Cond em

ITEM : EMTR
REF 18.3 dBm
VBW 300 kHz
TIME : 11:19

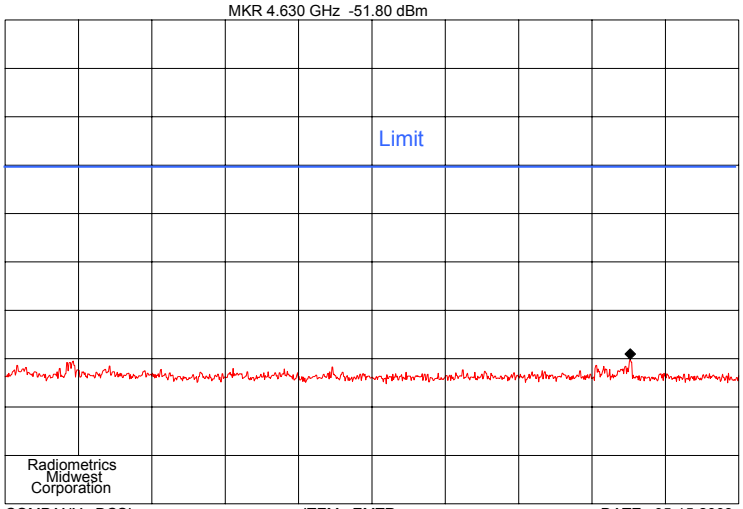
DATE : 05-15-2003
STOP 1.000 GHz
ATTEN 30 dB
SWP 150 msec



COMPANY : DCSI
START 1.00 GHz
RES BW 100 kHz
10 dB/
NOTES : FCC 15.247 (c), Spurious Cond em

ITEM : EMTR
REF 18.3 dBm
VBW 300 kHz
TIME : 11:23

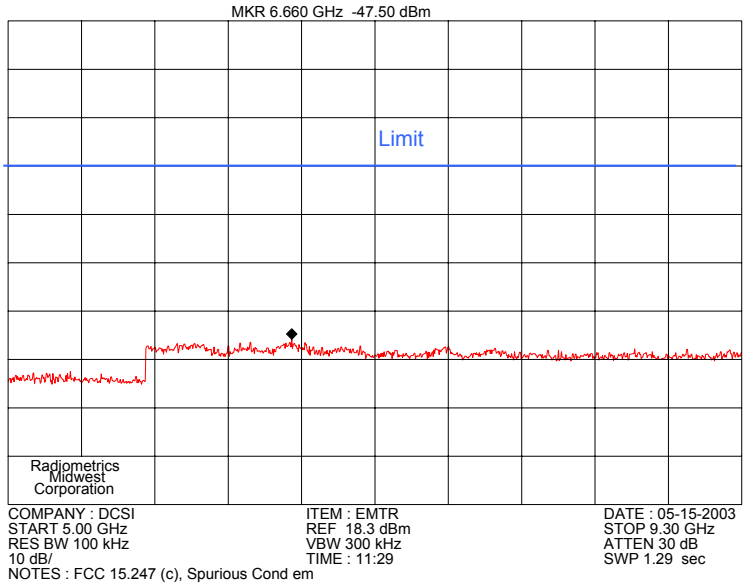
DATE : 05-15-2003
STOP 2.50 GHz
ATTEN 30 dB
SWP 450 msec



COMPANY : DCSI
START 2.50 GHz
RES BW 100 kHz
10 dB/
NOTES : FCC 15.247 (c), Spurious Cond em

ITEM : EMTR
REF 18.3 dBm
VBW 300 kHz
TIME : 11:26

DATE : 05-15-2003
STOP 5.00 GHz
ATTEN 30 dB
SWP 750 msec



10.9 Spurious Radiated Emissions

Radiated emission measurements in the Restricted bands were performed with linearly polarized broadband antennas. The results obtained with these antennas can be correlated with results obtained with a tuned dipole antenna. Below 1 GHz, when a radiated emission is detected approaching the specification limit, the measurement of the emission is repeated using a tuned dipole antenna with a Roberts Balun. A 10 dB linearity check is performed prior to start of testing in order to determine if an overload condition exists.

From 30 to 1000 MHz, an Anritsu Spectrum analyzer and a MITEQ AM-1431 amplifier with a 10 dB attenuator connected to the input were used. The out of band emissions and the ambient emissions were below the level of input overload (80 dBuV).

For tests from 1 to 9.3 GHz, an HP8566A spectrum analyzer was used with a Celeritek uWave amplifier. The out of band emissions and the ambient emissions were below the level of input overload (72 dBuV). In addition, a high pass filter was used to reduce the fundamental emission.

Radiated emission measurements are performed with linearly polarized broadband antennas. Measurements were performed using two antenna polarizations, (vertical and horizontal). The worst case emissions were recorded.

Final radiated emissions measurements were performed in the open area test site at a test distance of 3 meters. The entire frequency range from 30 to 9300 MHz was slowly scanned and the emissions in the restricted frequency bands were recorded. Measurements were performed using the peak detector function. The detected emission levels were maximized by rotating the EUT, adjusting the positions of all cables, and by scanning the measurement antenna from 1 to 4 meters above the ground. The open area test site used to collect the radiated data is located on 8625 Helmar Road in Newark, Illinois. The open field test site has a metal ground screen. All other tests are performed at 12 East Devonwood Ave. Romeoville, Illinois EMI test lab.

The following statement applies to the HHTR and the EMTR only. The was device was rotated through three orthogonal axis as per 13.1.4.1 of ANSI C63.4 during the prescans and during final radiated tests.

10.9.1 Radiated Emissions Field Strength Sample Calculation

The field strength is calculated by adding the Antenna Factor and Cable Loss, and by subtracting the Amplifier Gain from the measured reading. The basic equation with a sample calculation is as follows:

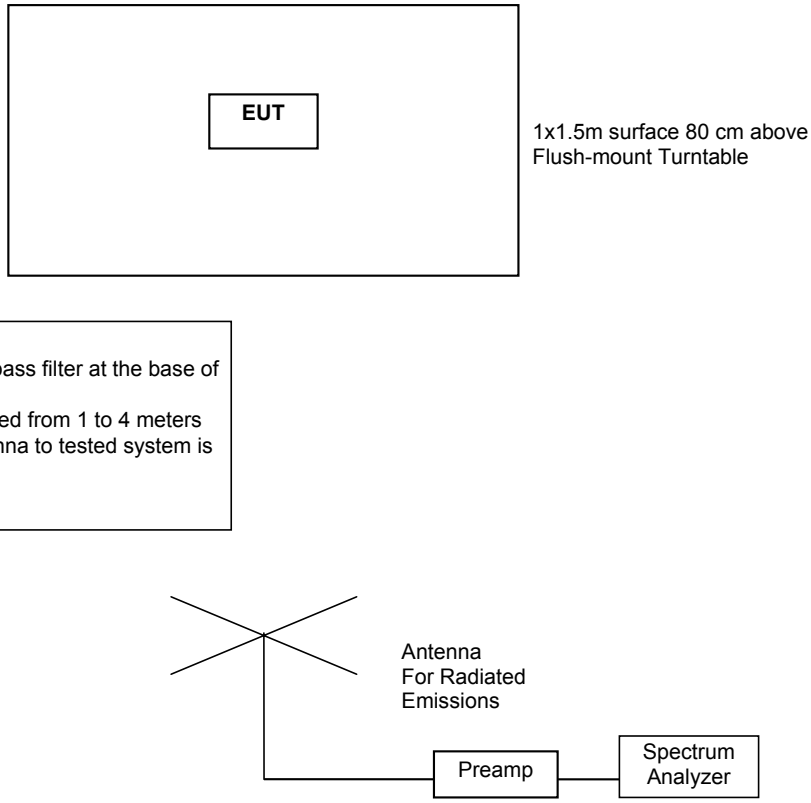
FS = RA + AF + CF - AG

Where: FS = Field Strength
RA = Receiver Amplitude
AF = Antenna Factor
CF = Cable Attenuation Factor
AG = Amplifier Gain

Assume a receiver reading of 49.5 dBuV is obtained. The Antenna Factor of 8.1 and a Cable Factor of 1.7 is added. The Amplifier Gain of 23.3 dB is subtracted, giving a field strength of 36 dBuV/m. The 36 dBuV/m can be mathematically converted to its corresponding level in uV/m.

FS = 49.5 + 8.1 + 1.7 - 23.3 = 36.0 dBuV/m
Level in uV/m = Common Antilogarithm [(36 dBuV/m)/20] = 63.1 uV/m

Figure 2. Drawing of Radiated Emissions Setup



10.9.2 Spurious Radiated Emissions Test Results (Restricted Band)

The following spectrum analyzer settings were used:
Span = wide enough to fully capture the emission being measured
RBW = 1 MHz for f ≥ 1 GHz, 120 kHz for f < 1 GHz
VBW = 1 kHz for Average Measurements
VBW = 3 MHz for Peak Measurements
Sweep = auto
Detector function = peak
Trace = max hold

The peak emissions did not exceed the average by more than 20 dB.

Manufacturer	DCSI	Specification	FCC Part 15 Subpart C & RSS-210
Model	EMTR; HHTR; RMTR	Test Date	May 14 & 15, 2003
Serial Number	None	Test Distance	3 Meters
Abbreviations	Pol = Antenna Polarization; Vert = Vertical; Horz = Horizontal; QP = Quasi-Peak		
Antennas used	30 to 200 MHz Biconical (ANT-3); 200 to 1000 MHz Log-Periodic (ANT-6) 1 to 18 GHz Double Ridged Guide Horn (ANT-13)		
Notes	The Amplitude is the final corrected value with cable and high pass filter loss added and the preamp gain subtracted.		

EUT	Tx Freq	EUT Orientation	Ant Pol.	Detector Function	Emission Freq. MHz	dBuV/m	Limit	Margin under limit
RMTR	902.7	On Back	Horz	Ave	2708.0	45.9	54.0	8.1
RMTR	902.7	On Back	Horz	Ave	3610.7	43.4	54.0	10.6
RMTR	902.7	On Back	Horz	Ave	4513.4	40.7	54.0	13.3
RMTR	902.7	On Back	Horz	Ave	5416.1	42.2	54.0	11.8
RMTR	902.7	On Back	Horz	Ave	8124.1	45.5	54.0	8.5
RMTR	902.7	On Back	Vert	Ave	2708.0	46.1	54.0	7.9
RMTR	902.7	On Back	Vert	Ave	3610.7	43.5	54.0	10.5
RMTR	902.7	On Back	Vert	Ave	4513.4	40.0	54.0	14.0
RMTR	902.7	On Back	Vert	Ave	5416.1	46.7	54.0	7.3
RMTR	902.7	On Back	Vert	Ave	8124.1	45.6	54.0	8.4
RMTR	902.7	On Side	Horz	Ave	2708.0	42.2	54.0	11.8
RMTR	902.7	On Side	Horz	Ave	3610.7	42.6	54.0	11.4
RMTR	902.7	On Side	Horz	Ave	4513.4	41.5	54.0	12.5
RMTR	902.7	On Side	Horz	Ave	5416.1	42.6	54.0	11.4
RMTR	902.7	On Side	Horz	Ave	8124.1	45.2	54.0	8.8
RMTR	902.7	On Side	Vert	Ave	2708.0	45.4	54.0	8.6
RMTR	902.7	On Side	Vert	Ave	3610.7	43.3	54.0	10.7
RMTR	902.7	On Side	Vert	Ave	4513.4	40.7	54.0	13.3
RMTR	902.7	On Side	Vert	Ave	5416.1	46.0	54.0	8.0
RMTR	902.7	On Side	Vert	Ave	8124.1	45.1	54.0	8.9
RMTR	902.7	Up Right	Horz	Ave	2708.0	49.3	54.0	4.7
RMTR	902.7	Up Right	Horz	Ave	3610.7	45.0	54.0	9.0
RMTR	902.7	Up Right	Horz	Ave	4513.4	42.7	54.0	11.3
RMTR	902.7	Up Right	Horz	Ave	5416.1	46.5	54.0	7.5
RMTR	902.7	Up Right	Horz	Ave	8124.1	45.5	54.0	8.5
RMTR	902.7	Up Right	Vert	Ave	2708.0	45.2	54.0	8.8
RMTR	902.7	Up Right	Vert	Ave	3610.7	42.2	54.0	11.8
RMTR	902.7	Up Right	Vert	Ave	4513.4	41.0	54.0	13.0
RMTR	902.7	Up Right	Vert	Ave	5416.1	46.1	54.0	7.9
RMTR	902.7	Up Right	Vert	Ave	8124.1	45.1	54.0	8.9
RMTR	914.9	On Back	Horz	Ave	2744.66	43.2	54.0	10.8
RMTR	914.9	On Back	Horz	Ave	3659.54	46.8	54.0	7.2
RMTR	914.9	On Back	Horz	Ave	4574.43	42.5	54.0	11.5
RMTR	914.9	On Back	Horz	Ave	7319.09	44.6	54.0	9.4
RMTR	914.9	On Back	Horz	Ave	8233.97	46.7	54.0	7.3
RMTR	914.9	On Back	Vert	Ave	2744.66	41.9	54.0	12.1
RMTR	914.9	On Back	Vert	Ave	3659.54	45.9	54.0	8.1
RMTR	914.9	On Back	Vert	Ave	4574.43	43.3	54.0	10.7

EUT	Tx Freq	EUT Orientation	Ant Pol.	Detector Function	Emission Freq. MHz	dBuV/m	Limit	Margin under limit
RMTR	914.9	On Back	Vert	Ave	7319.09	44.9	54.0	9.1
RMTR	914.9	On Back	Vert	Ave	8233.97	46.0	54.0	8.0
RMTR	914.9	On Side	Horz	Ave	2744.66	41.6	54.0	12.4
RMTR	914.9	On Side	Horz	Ave	3659.54	46.7	54.0	7.3
RMTR	914.9	On Side	Horz	Ave	4574.43	42.3	54.0	11.7
RMTR	914.9	On Side	Horz	Ave	7319.09	44.7	54.0	9.3
RMTR	914.9	On Side	Horz	Ave	8233.97	46.5	54.0	7.5
RMTR	914.9	On Side	Vert	Ave	2744.66	44.1	54.0	9.9
RMTR	914.9	On Side	Vert	Ave	3659.54	45.8	54.0	8.2
RMTR	914.9	On Side	Vert	Ave	4574.43	44.1	54.0	9.9
RMTR	914.9	On Side	Vert	Ave	7319.09	44.9	54.0	9.1
RMTR	914.9	On Side	Vert	Ave	8233.97	45.9	54.0	8.1
RMTR	914.9	Up Right	Horz	Ave	2744.66	46.6	54.0	7.4
RMTR	914.9	Up Right	Horz	Ave	3659.54	48.2	54.0	5.8
RMTR	914.9	Up Right	Horz	Ave	4574.43	45.4	54.0	8.6
RMTR	914.9	Up Right	Horz	Ave	7319.09	45.1	54.0	8.9
RMTR	914.9	Up Right	Horz	Ave	8233.97	45.5	54.0	8.5
RMTR	914.9	Up Right	Vert	Ave	2744.66	44.3	54.0	9.7
RMTR	914.9	Up Right	Vert	Ave	3659.54	45.8	54.0	8.2
RMTR	914.9	Up Right	Vert	Ave	4574.43	42.8	54.0	11.2
RMTR	914.9	Up Right	Vert	Ave	7319.09	44.8	54.0	9.2
RMTR	914.9	Up Right	Vert	Ave	8233.97	45.5	54.0	8.5
RMTR	927.8	On Back	Horz	Ave	2783.37	41.6	54.0	12.4
RMTR	927.8	On Back	Horz	Ave	3711.16	45.1	54.0	8.9
RMTR	927.8	On Back	Horz	Ave	4638.95	44.6	54.0	9.4
RMTR	927.8	On Back	Horz	Ave	7422.31	44.7	54.0	9.3
RMTR	927.8	On Back	Horz	Ave	8350.10	46.3	54.0	7.7
RMTR	927.8	On Back	Vert	Ave	2783.37	43.7	54.0	10.3
RMTR	927.8	On Back	Vert	Ave	3711.16	44.9	54.0	9.1
RMTR	927.8	On Back	Vert	Ave	4638.95	44.2	54.0	9.8
RMTR	927.8	On Back	Vert	Ave	7422.31	44.7	54.0	9.3
RMTR	927.8	On Back	Vert	Ave	8350.10	46.4	54.0	7.6
RMTR	927.8	On Side	Horz	Ave	2783.37	43.3	54.0	10.7
RMTR	927.8	On Side	Horz	Ave	3711.16	47.3	54.0	6.7
RMTR	927.8	On Side	Horz	Ave	4638.95	44.2	54.0	9.8
RMTR	927.8	On Side	Horz	Ave	7422.31	44.7	54.0	9.3
RMTR	927.8	On Side	Horz	Ave	8350.10	46.5	54.0	7.5
RMTR	927.8	On Side	Vert	Ave	2783.37	43.9	54.0	10.1
RMTR	927.8	On Side	Vert	Ave	3711.16	46.7	54.0	7.3
RMTR	927.8	On Side	Vert	Ave	4638.95	44.0	54.0	10.0
RMTR	927.8	On Side	Vert	Ave	7422.31	44.7	54.0	9.3
RMTR	927.8	On Side	Vert	Ave	8350.10	46.6	54.0	7.4
RMTR	927.8	Up Right	Horz	Ave	2783.37	44.7	54.0	9.3
RMTR	927.8	Up Right	Horz	Ave	3711.16	47.7	54.0	6.3
RMTR	927.8	Up Right	Horz	Ave	4638.95	43.4	54.0	10.6
RMTR	927.8	Up Right	Horz	Ave	7422.31	44.7	54.0	9.3
RMTR	927.8	Up Right	Horz	Ave	8350.10	46.3	54.0	7.7

EUT	Tx Freq	EUT Orientation	Ant Pol.	Detector Function	Emission Freq. MHz	dBuV/m	Limit	Margin under limit
RMTR	927.8	Up Right	Vert	Ave	2783.37	43.4	54.0	10.6
RMTR	927.8	Up Right	Vert	Ave	3711.16	46.8	54.0	7.2
RMTR	927.8	Up Right	Vert	Ave	4638.95	44.5	54.0	9.5
RMTR	927.8	Up Right	Vert	Ave	7422.31	44.7	54.0	9.3
RMTR	927.8	Up Right	Vert	Ave	8350.10	45.3	54.0	8.7
RMTR	902.7	Up Right	Horz	Peak	2708.0	54.5	74.0	19.5
RMTR	902.7	Up Right	Horz	Peak	3610.7	50.4	74.0	23.6
RMTR	902.7	Up Right	Horz	Peak	4513.4	48.2	74.0	25.8
RMTR	902.7	Up Right	Horz	Peak	5416.1	52.1	74.0	21.9
RMTR	902.7	Up Right	Horz	Peak	8124.1	51.1	74.0	22.9
RMTR	902.7	Up Right	Vert	Peak	2708.0	51.0	74.0	23.0
RMTR	902.7	Up Right	Vert	Peak	3610.7	47.3	74.0	26.7
RMTR	902.7	Up Right	Vert	Peak	4513.4	46.4	74.0	27.6
RMTR	902.7	Up Right	Vert	Peak	5416.1	51.3	74.0	22.7
RMTR	902.7	Up Right	Vert	Peak	8124.1	50.5	74.0	23.5

Judgment: RMTR Passed by 4.7 dB

EUT	Tx Freq	EUT Orientation	Ant Pol.	Detector Function	Emission Freq. MHz	dBuV/m	Limit	Margin under limit
HHTR	902.7	On Back	Horz	Ave	2708.0	42.0	54.0	12.0
HHTR	902.7	On Back	Horz	Ave	3610.7	43.6	54.0	10.4
HHTR	902.7	On Back	Horz	Ave	4513.4	44.6	54.0	9.4
HHTR	902.7	On Back	Horz	Ave	5416.1	43.7	54.0	10.3
HHTR	902.7	On Back	Horz	Ave	8124.1	46.8	54.0	7.2
HHTR	902.7	On Back	Vert	Ave	2708.0	43.0	54.0	11.0
HHTR	902.7	On Back	Vert	Ave	3610.7	42.7	54.0	11.3
HHTR	902.7	On Back	Vert	Ave	4513.4	48.1	54.0	5.9
HHTR	902.7	On Back	Vert	Ave	5416.1	44.0	54.0	10.0
HHTR	902.7	On Back	Vert	Ave	8124.1	47.4	54.0	6.6
HHTR	902.7	On Side	Horz	Ave	2708.0	43.1	54.0	10.9
HHTR	902.7	On Side	Horz	Ave	3610.7	43.7	54.0	10.3
HHTR	902.7	On Side	Horz	Ave	4513.4	48.6	54.0	5.4
HHTR	902.7	On Side	Horz	Ave	5416.1	44.3	54.0	9.7
HHTR	902.7	On Side	Horz	Ave	8124.1	47.5	54.0	6.5
HHTR	902.7	On Side	Vert	Ave	2708.0	43.8	54.0	10.2
HHTR	902.7	On Side	Vert	Ave	3610.7	42.6	54.0	11.4
HHTR	902.7	On Side	Vert	Ave	4513.4	43.4	54.0	10.6
HHTR	902.7	On Side	Vert	Ave	5416.1	45.1	54.0	8.9
HHTR	902.7	On Side	Vert	Ave	8124.1	47.0	54.0	7.0
HHTR	902.7	Up Right	Horz	Ave	2708.0	44.0	54.0	10.0
HHTR	902.7	Up Right	Horz	Ave	3610.7	43.0	54.0	11.0
HHTR	902.7	Up Right	Horz	Ave	4513.4	48.0	54.0	6.0
HHTR	902.7	Up Right	Horz	Ave	5416.1	43.3	54.0	10.7
HHTR	902.7	Up Right	Horz	Ave	8124.1	46.7	54.0	7.3
HHTR	902.7	Up Right	Vert	Ave	2708.0	44.9	54.0	9.1
HHTR	902.7	Up Right	Vert	Ave	3610.7	43.1	54.0	10.9
HHTR	902.7	Up Right	Vert	Ave	4513.4	46.9	54.0	7.1

EUT	Tx Freq	EUT Orientation	Ant Pol.	Detector Function	Emission Freq. MHz	dBuV/m	Limit	Margin under limit
HHTR	902.7	Up Right	Vert	Ave	5416.1	43.3	54.0	10.7
HHTR	902.7	Up Right	Vert	Ave	8124.1	46.3	54.0	7.7
HHTR	914.9	On Back	Horz	Ave	2744.7	42.9	54.0	11.1
HHTR	914.9	On Back	Horz	Ave	3659.5	43.9	54.0	10.1
HHTR	914.9	On Back	Horz	Ave	4574.4	44.1	54.0	9.9
HHTR	914.9	On Back	Horz	Ave	8234.0	46.0	54.0	8.0
HHTR	914.9	On Back	Vert	Ave	2744.7	43.7	54.0	10.3
HHTR	914.9	On Back	Vert	Ave	3659.5	44.9	54.0	9.1
HHTR	914.9	On Back	Vert	Ave	4574.4	44.4	54.0	9.6
HHTR	914.9	On Back	Vert	Ave	8234.0	46.7	54.0	7.3
HHTR	914.9	On Side	Horz	Ave	2744.7	42.2	54.0	11.8
HHTR	914.9	On Side	Horz	Ave	3659.5	44.3	54.0	9.7
HHTR	914.9	On Side	Horz	Ave	4574.4	43.9	54.0	10.1
HHTR	914.9	On Side	Horz	Ave	8234.0	46.5	54.0	7.5
HHTR	914.9	On Side	Vert	Ave	2744.7	44.2	54.0	9.8
HHTR	914.9	On Side	Vert	Ave	3659.5	44.3	54.0	9.7
HHTR	914.9	On Side	Vert	Ave	4574.4	48.0	54.0	6.0
HHTR	914.9	On Side	Vert	Ave	8234.0	45.5	54.0	8.5
HHTR	914.9	Up Right	Horz	Ave	2744.7	44.1	54.0	9.9
HHTR	914.9	Up Right	Horz	Ave	3659.5	43.7	54.0	10.3
HHTR	914.9	Up Right	Horz	Ave	4574.4	48.1	54.0	5.9
HHTR	914.9	Up Right	Horz	Ave	8234.0	45.4	54.0	8.6
HHTR	914.9	Up Right	Vert	Ave	2744.7	44.3	54.0	9.7
HHTR	914.9	Up Right	Vert	Ave	3659.5	44.3	54.0	9.7
HHTR	914.9	Up Right	Vert	Ave	4574.4	44.9	54.0	9.1
HHTR	914.9	Up Right	Vert	Ave	8234.0	46.5	54.0	7.5
HHTR	927.8	On Back	Horz	Ave	2783.4	41.2	54.0	12.8
HHTR	927.8	On Back	Horz	Ave	3711.2	44.2	54.0	9.8
HHTR	927.8	On Back	Horz	Ave	4638.9	46.3	54.0	7.7
HHTR	927.8	On Back	Horz	Ave	8350.1	46.5	54.0	7.5
HHTR	927.8	On Back	Vert	Ave	2783.4	44.4	54.0	9.6
HHTR	927.8	On Back	Vert	Ave	3711.2	44.1	54.0	9.9
HHTR	927.8	On Back	Vert	Ave	4638.9	46.4	54.0	7.6
HHTR	927.8	On Back	Vert	Ave	8350.1	47.7	54.0	6.3
HHTR	927.8	On Side	Horz	Ave	2783.4	41.5	54.0	12.5
HHTR	927.8	On Side	Horz	Ave	3711.2	43.5	54.0	10.5
HHTR	927.8	On Side	Horz	Ave	4638.9	46.7	54.0	7.3
HHTR	927.8	On Side	Horz	Ave	8350.1	46.2	54.0	7.8
HHTR	927.8	On Side	Vert	Ave	2783.4	42.5	54.0	11.5
HHTR	927.8	On Side	Vert	Ave	3711.2	44.1	54.0	9.9
HHTR	927.8	On Side	Vert	Ave	4638.9	49.6	54.0	4.4
HHTR	927.8	On Side	Vert	Ave	8350.1	47.9	54.0	6.1
HHTR	927.8	Up Right	Horz	Ave	2783.4	43.7	54.0	10.3
HHTR	927.8	Up Right	Horz	Ave	3711.2	44.0	54.0	10.0
HHTR	927.8	Up Right	Horz	Ave	4638.9	49.7	54.0	4.3
HHTR	927.8	Up Right	Horz	Ave	8350.1	45.2	54.0	8.8

EUT	Tx Freq	EUT Orientation	Ant Pol.	Detector Function	Emission Freq. MHz	dBuV/m	Limit	Margin under limit
HHTR	927.8	Up Right	Vert	Ave	2783.4	44.2	54.0	9.8
HHTR	927.8	Up Right	Vert	Ave	3711.2	44.2	54.0	9.8
HHTR	927.8	Up Right	Vert	Ave	4638.9	47.6	54.0	6.4
HHTR	927.8	Up Right	Vert	Ave	8350.1	47.9	54.0	6.1
HHTR	927.8	On Side	Vert	Peak	2783.4	47.8	74.0	26.2
HHTR	927.8	On Side	Vert	Peak	3711.2	49.4	74.0	24.6
HHTR	927.8	On Side	Vert	Peak	4638.9	55.3	74.0	18.7
HHTR	927.8	On Side	Vert	Peak	8350.1	53.2	74.0	20.8
HHTR	927.8	Up Right	Horz	Peak	2783.4	49.6	74.0	24.4
HHTR	927.8	Up Right	Horz	Peak	3711.2	49.4	74.0	24.6
HHTR	927.8	Up Right	Horz	Peak	4638.9	55.3	74.0	18.7
HHTR	927.8	Up Right	Horz	Peak	8350.1	50.6	74.0	23.4

Judgment: HHTR Passed by 4.4 dB

EUT	Tx Freq	EUT Orientation	Ant Pol.	Detector Function	Emission Freq. MHz	dBuV/m	Limit	Margin under limit
EMTR	902.7	Up Right	Horz	QP	171.4	21.9	43.5	21.6
EMTR	902.7	Up Right	Horz	QP	276.8	23.8	46.0	22.2
EMTR	902.7	Up Right	Vert	QP	113.3	25.1	43.5	18.4
EMTR	902.7	Up Right	Vert	QP	121.5	24.7	43.5	18.8
EMTR	914.9	Up Right	Horz	QP	113.30	24.1	43.5	19.4
EMTR	914.9	Up Right	Horz	QP	170.10	23.7	43.5	19.8
EMTR	914.9	Up Right	Vert	QP	113.30	27.5	43.5	16.0
EMTR	914.9	Up Right	Vert	QP	130.00	29.3	43.5	14.2
EMTR	927.8	Up Right	Horz	QP	113.30	22.2	43.5	21.3
EMTR	927.8	Up Right	Horz	QP	130.00	20.8	43.5	22.7
EMTR	927.8	Up Right	Horz	QP	327.50	23.0	46.0	23.0
EMTR	927.8	Up Right	Vert	QP	113.30	29.5	43.5	14.0
EMTR	927.8	Up Right	Vert	QP	130.00	32.6	43.5	10.9
EMTR	927.8	Up Right	Vert	QP	245.40	23.9	46.0	22.1
EMTR	902.7	Up Right	Horz	Ave	2708.0	50.6	54.0	3.4
EMTR	902.7	Up Right	Horz	Ave	3610.7	43.3	54.0	10.7
EMTR	902.7	Up Right	Horz	Ave	4513.4	49.6	54.0	4.4
EMTR	902.7	Up Right	Horz	Ave	5416.1	44.4	54.0	9.6
EMTR	902.7	Up Right	Horz	Ave	8124.1	45.6	54.0	8.4
EMTR	902.7	Up Right	Vert	Ave	2708.0	44.1	54.0	9.9
EMTR	902.7	Up Right	Vert	Ave	3610.7	43.4	54.0	10.6
EMTR	902.7	Up Right	Vert	Ave	4513.4	47.3	54.0	6.7
EMTR	902.7	Up Right	Vert	Ave	5416.1	43.3	54.0	10.7
EMTR	902.7	Up Right	Vert	Ave	8124.1	46.7	54.0	7.3
EMTR	914.9	Up Right	Horz	Ave	2744.66	51.3	54.0	2.7
EMTR	914.9	Up Right	Horz	Ave	3659.54	45.4	54.0	8.6
EMTR	914.9	Up Right	Horz	Ave	4574.43	50.1	54.0	3.9
EMTR	914.9	Up Right	Horz	Ave	7319.09	45.8	54.0	8.2
EMTR	914.9	Up Right	Horz	Ave	8233.97	46.1	54.0	7.9
EMTR	914.9	Up Right	Vert	Ave	2744.66	44.6	54.0	9.4

EUT	Tx Freq	EUT Orientation	Ant Pol.	Detector Function	Emission Freq. MHz	dBuV/m	Limit	Margin under limit
EMTR	914.9	Up Right	Vert	Ave	3659.54	45.1	54.0	8.9
EMTR	914.9	Up Right	Vert	Ave	4574.43	47.0	54.0	7.0
EMTR	914.9	Up Right	Vert	Ave	7319.09	44.9	54.0	9.1
EMTR	914.9	Up Right	Vert	Ave	8233.97	46.5	54.0	7.5
EMTR	927.8	Up Right	Horz	Ave	2783.37	52.0	54.0	2.0
EMTR	927.8	Up Right	Horz	Ave	3711.16	45.4	54.0	8.6
EMTR	927.8	Up Right	Horz	Ave	4638.95	48.5	54.0	5.5
EMTR	927.8	Up Right	Horz	Ave	7422.31	46.8	54.0	7.2
EMTR	927.8	Up Right	Horz	Ave	8350.10	46.2	54.0	7.8
EMTR	927.8	Up Right	Vert	Ave	2783.37	45.4	54.0	8.6
EMTR	927.8	Up Right	Vert	Ave	3711.16	45.4	54.0	8.6
EMTR	927.8	Up Right	Vert	Ave	4638.95	47.4	54.0	6.6
EMTR	927.8	Up Right	Vert	Ave	7422.31	47.1	54.0	6.9
EMTR	927.8	Up Right	Vert	Ave	8350.10	45.8	54.0	8.2
EMTR	927.8	Up Right	Horz	Peak	2783.37	57.6	74.0	16.4
EMTR	927.8	Up Right	Horz	Peak	3711.16	50.6	74.0	23.4
EMTR	927.8	Up Right	Horz	Peak	4638.95	54.1	74.0	19.9
EMTR	927.8	Up Right	Horz	Peak	7422.31	52.4	74.0	21.6
EMTR	927.8	Up Right	Horz	Peak	8350.10	52.0	74.0	22.0
EMTR	927.8	Up Right	Vert	Peak	2783.37	51.2	74.0	22.8
EMTR	927.8	Up Right	Vert	Peak	3711.16	51.1	74.0	22.9
EMTR	927.8	Up Right	Vert	Peak	4638.95	52.4	74.0	21.6
EMTR	927.8	Up Right	Vert	Peak	7422.31	52.4	74.0	21.6
EMTR	927.8	Up Right	Vert	Peak	8350.10	51.3	74.0	22.7

Judgment: EMTR Passed by 2.0 dB