Wireless2000 RF & UWB Technologies
RBS
Repeater Broadcast Station

Composite Transmitter Intentional Radiator
Test Report of Measurements per standards:

Industry Canada: **ICES-003**

FCC: **47CFR Part 15/B 07-10-08**

Testing body:
Tranzeo EMC Labs Inc.
19473 Fraser Way
Pitt Meadows
BC, Canada
V3Y 2V4

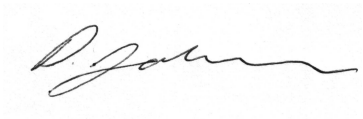
Client:
Wireless2000 RF & UWB Technologies
2421 Alpha Ave.
Burnaby
British Columbia, Canada
V5C 5L2

Contact: **Vlad Goldenberg**
Email: **vgoldenberg@wireless2000.com**
Phone: **604-298-8471**

Project Number: **WIR019004**
Revision 1.0
June 19, 2009

Type of test: Testing of electromagnetic disturbances characteristics

Date of test: February 04, 2009 to February 19, 2009



EMC Manager: Bruce Balston EMC Engineer: David Johanson

Revision History

Rev: 0.0 16Mar2009 Original Draft

Rev: 1.0 19Jun2009 Final Release with Text mod's per email 21May2009

Table of Contents

Section 1 General Information

EUT Description and Setup

Manufacturer	Wireless2000 RF & UWB Technologies Ltd.
Product Name	Door Module
FCC ID:	WHQ20000110
IC No.:	7819A-RBS01
Model No.	20000110
Serial No.	25
Product Software/Firmware Revision	N/A

Auxiliary Equipment

24Vdc Power Adapter	Manufacturer: Circuit-Test
	Input: AC 100-240Vac 47-63Hz
	Output: 24 Vdc, 0.8A
	Model: STD-2400BU
48Vdc Power Adapter	Manufacturer: I.T.E. Power Supply
	Input: AC 100-250Vac 50-60Hz
	Output: 48 Vdc, 0.35A
	Model: PW180KB 4800FOI
Laptop/PC	Manufacturer: Fujitsu Lifebook C Series
	Serial Number: R2907449
	Operating System: Windows XP Home Edition SP3
	Application Software: Python GUI_RBS_FWTEST.PY

Related Test Reports

Composite Transmitter Verification	WIR019004_COMP_Rev1.0.pdf
2.4GHz Transmitter Verification	WIR019004_15.249_Rev1.0.pdf
125kHz Transmitter Verification	WIR019004_15.209_Rev1.0.pdf
Maxstream 2.4GHz Transmitter Module	FCC ID: MCQ-XBEEPRO2 with Ant: A24-C1
Radiotronix 915MHz Transmitter Module	FCC ID: Q7V-3F090003X With Ant: ANT-915-A40

Cabling

Description	Connectors	Length	Shielding	Ferrites
24V Power Cord	8mm Barrel	0.5Meter	None	Yes
48V Cat5e Power Cord	RJ-45	0.2Meter	None	None

Operational Description

The RBS Module (EUT) is an electronic device that has a Maxstream 2.4-2.4835GHz Transceiver Module (2.4GHz), a Radiotronix 902-928MHz Transceiver Module (902MHz), a 125kHz Transmitter (125kHz) and a 423.225MHz Receiver (423MHz) that is part of the Wireless2000 "Preventa Vital" and the "Preventa Track" systems. The 902MHz Transceiver is used as part of a proprietary network. The 2.4GHz Transceiver is used as part of a second proprietary network. The 125kHz Transmitter and the 423MHz Receiver are used as an ID/Asset Tag tracking system. When a Tag enters the 125kHz field, the Tag will transmit it's unique code number at 423.225MHz which the EUT will then pass on using one of the proprietary networks.

EUT Setup and Testing Configuration

For the purpose of compliance testing, the EUT was powered using the AC Power Adapter since it was decided that this was the worst-case scenario. The EUT was tested in various modes of operation as well as Continuous Transmit mode of operation, depending on the test. For the Continuous Transmit mode of operation, the EUT was in constant communications with the Computer. The Computer was used to setup the EUT into various modes of transmission by adjusting the transmit channels of the 902MHz and 2.4GHz Transceivers. The EUT also had a 4 pole dip switch added to it that allows for the control of the 125kHz (switch 1), 2.4GHz (switch2) and 902MHz (switch3) transmitters. The Switch 4 is not used with this product.

The EUT was tested in the following modes of operation:

- Continuous Transmit operation was used for Radiated Spurious and AC Mains Conducted Emissions. The 125kHz , 902MHz and 2.4GHz transmitters were set to the highest power transmission channel.
- Quiescent mode of operation was used to verify the digital circuitry emissions. These tests were done with the transmitters turned OFF by the dip switch and with the 423MHz receiver turned ON. We were not able to disable the receiver function.
- 125kHz mode of operation was used to verify the 125kHz transmission frequency and verify compliance with the 15.209 standard. It was tested on its own with no other transmitter operating to ensure compliance. There is only 1 frequency to be tested in this mode. It was also tested with all Transmitters ON to ensure compliance with Composite Device transmitter requirements.

EUT Modifications

No modifications were necessary for this unit to comply with the standards noted in the "Standards used to ensure Compliance" section listed below.

Test Facilities

Tranzeo EMC Labs
19473 Fraser Way
Pitt Meadows, BC V3Y 2V4
Canada

Phone: (604) 460-6002
Fax: (604) 460-6005

FCC registration number: 960532
Industry Canada Number: 5238A

Test Equipment List

Emissions OATS

Manufacturer	Model	Description	Serial No.	Cal Due Date
Sunol Sciences	SM46C	Turntable	051204-2	N/R
Sunol Sciences	Custom	Mast Motor	TREML0001	N/R
Sunol Sciences	JB3	Antenna 20MHz-3GHz	A042004	07-Dec-2009
AH Systems	SAS-562B	Loop Antenna 10kHz-30MHz	#252	02-Feb-2011
Com-Power	LI-115	LISN	241037	11-Feb-2011
Thurlby Thandar	AC1000	Low Distortion Power Source		
Thurlby Thandar	HA1600	Power and Harmonics Analyzer		
Rohde & Schwarz	ESCI	EMI Receiver	100123	06-Jun-2009

Emissions Chamber

Manufacturer	Model	Description	Serial No.	Cal Due Date
ETS Lindgren	S201	5M Chamber 40GHz	1030	N/R
ETS Lindgren	Custom	Mast with Motor	N/R	N/R
ETS Lindgren	Custom	Turntable	N/R	N/R
Sunol Sciences	JB3	Antenna 20MHz-3GHz	A120106	28-Oct-2010
Sunol Sciences	DRH-118	Antenna 1-18GHz	A050905	04-Dec-2009
AH Systems	PAM0118	Pre-Amp 0.1-18GHz	189	04-Dec-2009
Com-Power	LI-115	LISN	241036	11-Feb-2011
Rohde & Schwarz	ESU	EMI Receiver	100011	29-Mar-2010

Standards used to ensure Compliance

Canada

Industry Canada (IC) ICES-003

United States

Federal Communications Commission (FCC) CFR Title 47 Part 15/B

Test Results

The EUT complies with the above “Standards used to ensure Compliance”. Refer to the other test reports for results on the Radio Modules and Composite Transmitter results.

Report of Measurements Test Procedure

Radiation Interference:

The measurement was made per ANSI C63.4-2003, CISPR 22:2008 and CISPR 16 equipment and procedures as appropriate, using a Rohde and Schwartz ESCI and ESU EMI Receiver with the appropriate antennas. The Receiver is calibrated in dB above a microvolt (dBµV) at the output of the antenna. The resolution bandwidth (RBW) was 120kHz with an appropriate sweep speed and video bandwidth for frequencies 30MHz to 1GHz. The RBW was 9kHz for frequencies 150kHz to 30MHz. The RBW was 1MHz for frequencies above 1GHz. When an emission was found, the table was rotated to produce the maximum, signal strength. The antenna was placed in both the horizontal and vertical planes and the worse case emissions were measured. The final Measurement was performed using an Average Detector for frequencies 150kHz to 30MHz and for frequencies above 1GHz. A Quasi-Peak detector was used for frequencies 30MHz to 1GHz.

The EUT was placed in a horizontal orientation, laying flat, on top of a table 80 cm high with dimensions of 1m by 1.5m. The EUT was placed in the center of the table (1.m side). The table used for radiated measurements is capable of continuous rotation.
When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m and a final measurement was performed using the appropriate RBW and Detector.

The fundamental frequencies of the transmitters were measured on an Open Air Test Site (OATS) at 3meters, using the appropriate antenna, on a tabletop 0.8meters above the horizontal ground-plane as required. The Spurious Emissions were measured on the OATS at 3meters and if required due to low field strength, at 1meter up to 3GHz. If the levels were unreadable the Spurious Emissions were then measured in a 5meter semi-anechoic chamber at 3meters and 1meter up to 25GHz to ensure compliance.

Formula of Conversion Factors:

The EUT was pre-scanned and measured at the required distance. The field strength (FS) at 10m was established by adding the meter reading of the EMI Receiver (which is set to read in units of dBµV) to the antenna correction factor (ACF) supplied by the antenna calibration laboratory and then added the Cable Loss (CL) as measured at our facility. The antenna and cable correction factors are stated in terms of dB.

Example:

Freq (MHz)	Meter Reading	+ACF	+CL	= FS
330	20 dBµV	+10.36 dB	+0.5	= 30.86 dBµV/m @ 10m

Where the field strength was too low to get an accurate reading at the required distance, the Antenna was moved closer to 3 or 1 meter. The resulting measurement was distance corrected for 10 meters by using the formula:
(measured distance result) – (20Log(measured distance/required distance)) = (10 meter result)

Example for a 3meter measurement:
3 meter result + distance correction = 10 meter result
54.5 dBµV + -10.45dB = 44.05 dBµV

As per 15.31(f)(2), for the measurements of frequencies below 30 MHz, Limit Line was distance corrected by 40dB/Decade for 30 or 3 meters by using the formula:
Where Required Measurement Distance is 300m and actual measurement distance was 3m –
(300m limit line) + 40dB (for measurement at 30m) + 40dB (for measurement at 3m)= (3 meter limit line)

Example for a 3meter measurement for 125kHz:
300 meter requirement + distance correction = 3 meter result
20 log (2400/125) + 40dB +40dB = 20Log(19.2) +40dB +40dB = 105.67 dBµV

Occupied Bandwidth:

The measurements were made with the spectrum analyzer's RBW, VBW and the span was set as shown on the appropriate plot.

AC Mains Power Conducted Interference:

The equipment and procedures used was ANSI C63.4-2003, CISPR 22:2008 and CISPR 16 as appropriate using a 50µH LISN. Both lines were observed. The bandwidth of the spectrum analyzer was 9kHz with an appropriate sweep speed. The spectrum was scanned from 0.15 to 30MHz. The measurement was performed on an Open Air Test Site at 0.8meters and 0.4 meters above the horizontal ground-plane as required.

ANSI C63.4-2003 Section 8.2.1, Magnetic Field Measurement procedures:

The EUT was placed on a non-conducting table 0.8meters above the ground plane with the EUT located in the center of the table. The EUT was placed at 3meters distance from the antenna in the vertical orientation. When an emission was found, the table was rotated and the Antenna was pivoted and elevated to produce the maximum signal strength. The emission was also evaluated with the antenna in the Horizontal position at 1meter height above the ground plane and the table rotated to produce the maximum signal strength. The EUT was evaluated in 3 orthogonal planes. The frequency was scanned from 9.0kHz to 1.0 GHz.

Section 2 Report of Measurements per IC ICES-003

Testing was performed pursuant to Industry Canada ICES-003 issue 4. Since the product may be located in a residential environment, it was decided that this EUT must comply with Class B requirements. Radiated emissions were performed at 3meters on a 10meter Open Air Test Site.

Test	Standard	Description	Result
Conducted Emissions subclause 8.3	ICES-003 Issue 4 Class B Limits	The Conducted Emissions are measured on the phase and Neutral Power lines in the 0.15 - 30.0MHz range.	Complies
Radiated Emissions subclause 8.2	ICES-003 Issue 4 Class B Limits	The radiated emissions are measured in the 30-1000MHz range	Complies

AC Mains Conducted Emission Testing

DATE: February 19, 2009

TEST STANDARD: ICES-003 Issue 4

TEST VOLTAGE: 120Vac 60Hz, 24 and 48Vdc adapters

TESTED BY: David Johanson

TEST CONDITIONS: Outdoor, Temperature and Humidity: 2°C, 62%

MINIMUM STANDARD: Class B Limit:

Frequency (MHz)	**Conducted Limit (dBµV)**	
	Quasi-Peak	**Average**
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50
Note 1 The lower limit shall apply at the transition frequencies Note 2 The limit decreases linearly with the logarithm of the frequency in the reange 0.15 MHz to 0.50 MHz		

TEST SETUP: The EUT was connected to the AC Mains Conducted Emissions LISN apparatus. The equipment was operated and tested using 120Vac 60Hz while in continuous transmission mode of operation with only the 125kHz Transmitter operating. It was also tested with all Transmitters operating. The EUT was also tested in each mode using the 2 power options of being powered by a 24Vdc power supply connected to the DC Voltage connector and 48Vdc Power-Over-Ethernet power supply connected to the RJ-45 Connector.

MEASUREMENT METHOD: Measurements were made using an EMI Receiver with 9kHz RBW, CISPR Average detector.

DEVICE DESCRIPTIONS: As described in the above EUT description and setup Section.

EMISSIONS DATA: Since there was no discernable difference between the various transmitters, only the data for all Transmitters ON and OFF is being reported. See Tables 1-8 and Plots 1-8 in Appendix B for corresponding data.

OBSERVATIONS: The EUT performed as expected.

PERFORMANCE: Complies.

Radiated Emission Testing

DATE: February 10, 2009

TEST STANDARD: ICES-003 Issue 4

TEST VOLTAGE: 120Vac 60Hz , 24Vdc adapter

TESTED BY: David Johanson

TEST CONDITIONS: Outdoor, Temperature and Humidity: 5°C, 70%

MINIMUM STANDARD: Class B Limit:

Frequency (MHz)	Maximum Field Strength dBµV/m at 10 m
30 - 230	30.0
230 - 1000	37.0
Note 1. The lower limit shall apply at the transition frequency Note 2. Additional provisions may be required for cases where interference occurs	

MEASUREMENT METHOD: The equipment was set up on the 10meter Open Air Test Site. Tests were performed at 3 meters. The required Measured Field Strength was modified to compensate as per procedures for short range as documented above in the "Report of Measurements Test Procedures" section. All cables used were as supplied with the product. Any cable over 1 meter in length were bundled at 1 meter and retained from the floor. A typical application was tested.

All transmitters were OFF for this test. See the above "EUT Setup and Testing Configuration" section.

DEVICE DESCRIPTIONS: As described in the above EUT Description Section.

EMISSIONS DATA: See Table A in Appendix B for corresponding data. Some power supply noise was found near 45MHz. No other emissions were detectable. Measured results are noise floor measurements at 3m.

OBSERVATIONS: The EUT performed as expected. Since no emissions were detectable on the Open Area Test Site, the product was rescanned at 1meter in our 5meter Semi-Anechoic chamber to verify that there were no emissions hidden by ambient emissions. There are no detectable emissions from this products digital circuitry.

PERFORMANCE: Complies.

Section 3 Report of Measurements per FCC CFR Title 47 Part 15/B

Testing was performed pursuant to FCC CFR47 Part 15/B 07-10-08. Since the product may be located in a residential environment, it was decided that this EUT must comply with Class B requirements. Radiated emissions were performed at 3meters on a 10meter Open Air Test Site.

Test	Standard	Description	Result
Conducted Emissions Section 15.107	Part15/B Class B Limits	The Conducted Emissions are measured on the phase and Neutral Power lines in the 0.15 - 30.0MHz range.	Complies
Radiated Emissions Section 15.109	Part 15/B Class B Limits	The radiated emissions are measured in the 30-1000MHz range	Complies

AC Mains Conducted Emission Testing

DATE: February 19, 2009

TEST STANDARD: FCC CFR47, Part 15, Subpart B Section 15.107

TEST VOLTAGE: 120Vac 60Hz, 24 and 48Vdc adapters

TESTED BY: David Johanson

TEST CONDITIONS: Outdoor, Temperature and Humidity: 2°C, 62%

MINIMUM STANDARD: Class B Limit:

Frequency (MHz)	**Conducted Limit (dBµV)**	
	Quasi-Peak	**Average**
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50
Note 1 The lower limit shall apply at the transition frequencies Note 2 The limit decreases linearly with the logarithm of the frequency in the reange 0.15 MHz to 0.50 MHz		

TEST SETUP: The EUT was connected to the AC Mains Conducted Emissions LISN apparatus. The equipment was operated and tested using 120Vac 60Hz while in continuous transmission mode of operation with only the 125kHz Transmitter operating. It was also tested with all Transmitters operating. The EUT was also tested in each mode using the 2 power options of being powered by a 24Vdc power supply connected to the DC Voltage connector and 48Vdc Power-Over-Ethernet power supply connected to the RJ-45 Connector.

MEASUREMENT METHOD: Measurements were made using an EMI Receiver with 9kHz RBW, CISPR Average detector.

DEVICE DESCRIPTIONS: As described in the above EUT description and setup Section.

EMISSIONS DATA: Since there was no discernable difference between the various transmitters, only the data for all Transmitters ON and OFF is being reported. See Tables 1-8 and Plots 1-8 in Appendix B for corresponding data.

OBSERVATIONS: The EUT performed as expected.

PERFORMANCE: Complies.

Radiated Emission Testing

DATE: February 10, 2009

TEST STANDARD: FCC CFR47, Part 15, Subpart B Section 15.109

TEST VOLTAGE: 120Vac 60Hz , 24Vdc adapter

TESTED BY: David Johanson

TEST CONDITIONS: Outdoor, Temperature and Humidity: 5°C, 70%

MINIMUM STANDARD: Class B Limits:

Frequency (MHz)	Field Strength	
	uV/m @ 3-m	dBµV/m at 3m
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
960 - 1000	500	54.0

MEASUREMENT METHOD: The equipment was set up on the 10meter Open Air Test Site. Tests were performed at 3 meters. The required Measured Field Strength was modified to compensate as per procedures for short range as documented above in the "Report of Measurements Test Procedures" section. All cables used were as supplied with the product. Any cable over 1 meter in length were bundled at 1 meter and retained from the floor. A typical application was tested.

All transmitters were OFF for this test. See the above "EUT Setup and Testing Configuration" section.

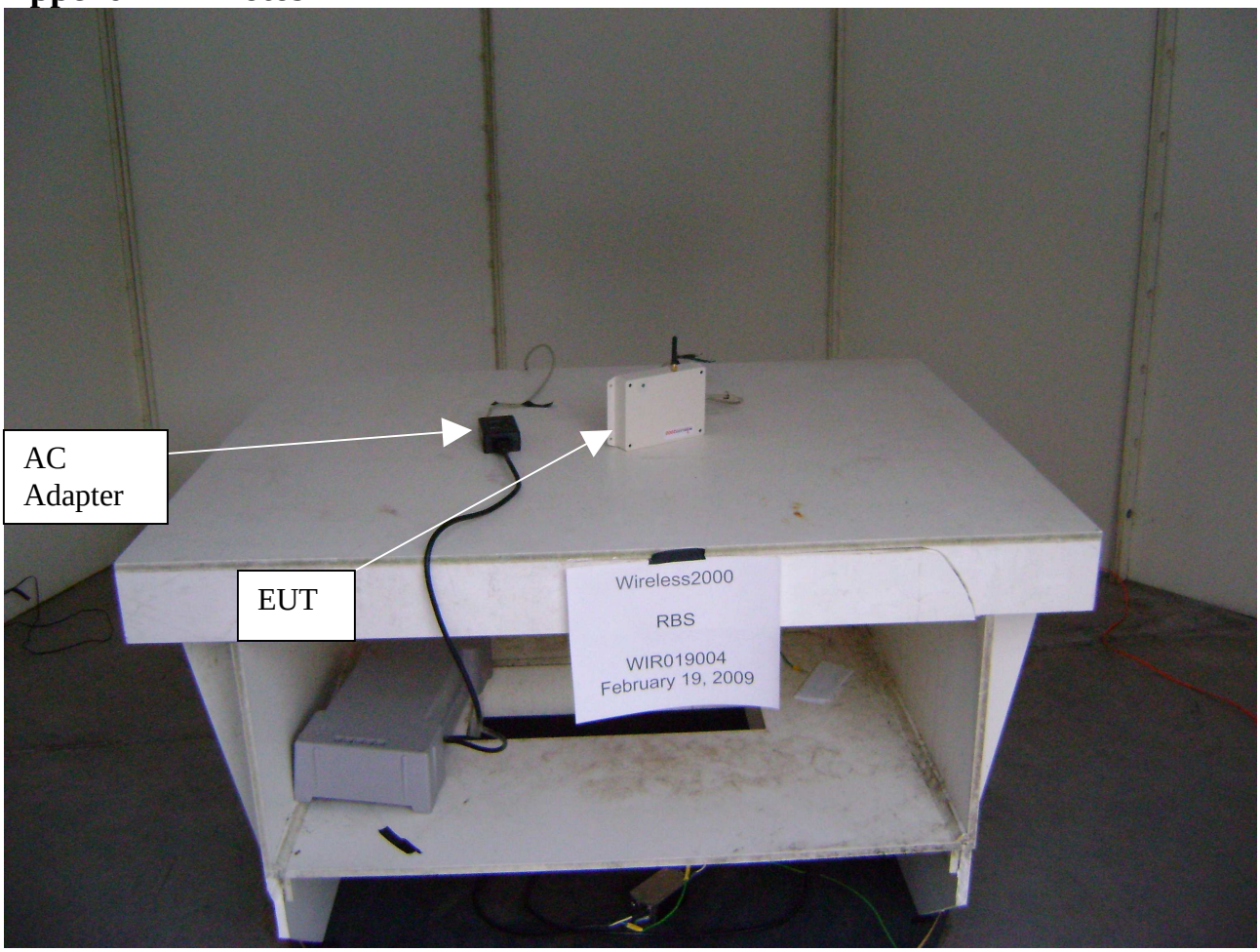
DEVICE DESCRIPTIONS: As described in the above EUT Description Section.

EMISSIONS DATA: See Table B in Appendix B for corresponding data. Some power supply noise was found near 45MHz. No other emissions were detectable. Measured results are noise floor measurements at 3m.

OBSERVATIONS: The EUT performed as expected. Since no emissions were detectable on the Open Area Test Site, the product was rescanned at 1meter in our 5meter Semi-Anechoic chamber to verify that there were no emissions hidden by ambient emissions. There are no detectable emissions from this products digital circuitry.

PERFORMANCE: Complies.

Appendix A Photos



Radiated Emissions Test Setup

Conducted Radiated Emissions Test Setup

Appendix B Measurement Data and Plots

Radiated Emissions

Criteria: FCC/IC/CE Class B – 3/10/10meters
Final Test Performed at 3m.
The IC and CE Limit Lines have been adjusted accordingly.

Table A: IC/CE Emissions Class B 3-m

Frequency (MHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corrected QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)
44.52	100.0	V	0	25.65	40.5	14.85
44.52	100.0	H	0	25.50	40.5	15.00
45.48	100.0	V	0	24.98	40.5	15.52
45.48	100.0	H	0	24.92	40.5	15.58
69.50	100.0	V	0	23.31	40.5	17.19
69.50	100.0	H	0	23.35	40.5	17.15
100.866	100.0	V	0	27.31	40.5	13.19
100.866	100.0	H	0	25.55	40.5	14.95
299.974	100.0	V	0	29.68	47.5	17.82
299.974	100.0	H	0	29.68	47.5	17.82
700.07	100.0	V	0	37.92	47.5	9.58
700.07	100.0	H	0	37.92	47.5	9.58

Table B: FCC Emissions Class B 3-m

Frequency (MHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corrected QuasiPeak (dBµV/m)	QuasiPeak Limit (dBµV/m)	Margin (dB)
44.52	100.0	V	0	25.65	40.0	14.35
44.52	100.0	H	0	25.50	40.0	14.50
45.48	100.0	V	0	24.98	40.0	15.02
45.48	100.0	H	0	24.92	40.0	15.08
69.50	100.0	V	0	23.31	40.0	16.69
69.50	100.0	H	0	23.35	40.0	16.65
100.866	100.0	V	0	27.31	43.5	16.91
100.866	100.0	H	0	25.55	43.5	17.95
299.974	100.0	V	0	29.68	46.0	16.32
299.974	100.0	H	0	29.68	46.0	16.32
700.07	100.0	V	0	37.92	46.0	8.08
700.07	100.0	H	0	37.92	46.0	8.08

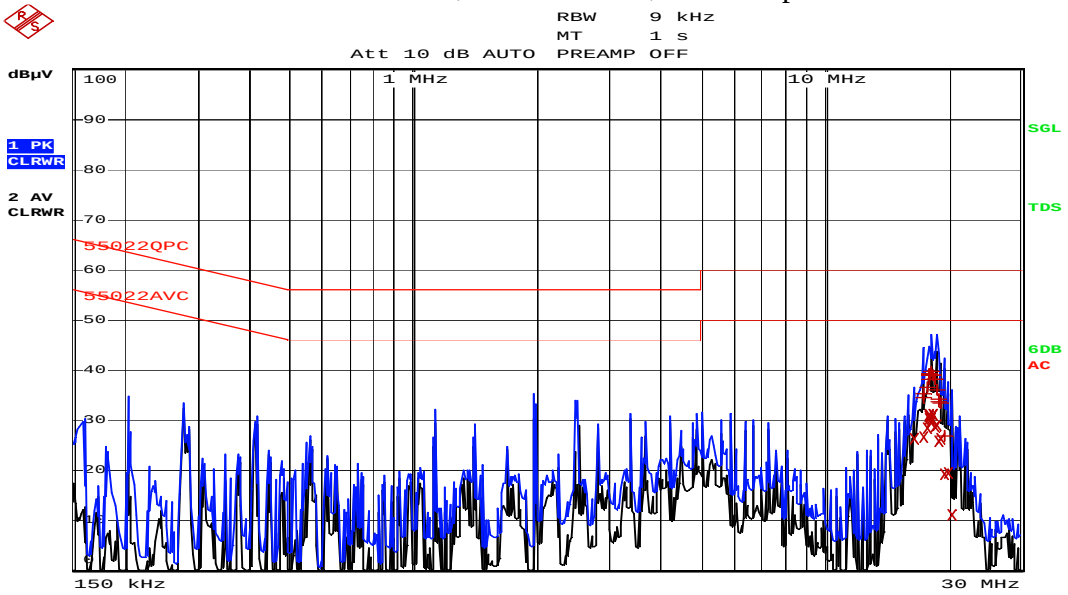
AC Mains Conducted Emissions

Criteria: FCC/IC/CE Class B

Table 1: Line – All Transmitters ON, 120Vac 60Hz, 24Vdc Option

Frequency (MHz)	Corrected Average Measurement (dBuV)	Average Limit Line Delta (dB)
18.545	31.20	-18.79
18.018	31.05	-18.94
18.406	31.01	-18.98
18.046	30.85	-19.14
18.070	30.79	-19.20
18.086	30.72	-19.27

Plot 1: Line – All Transmitters ON, 120Vac 60Hz, 24Vdc Option



Date: 19.FEB.2009 16:37:58

Table 2: Neutral – All Transmitters ON, 120Vac 60Hz, 24Vdc Option

Frequency (MHz)	Corrected Average Measurement (dBuV)	Average Limit Line Delta (dB)
18.838	43.68	-6.31
18.278	41.40	-8.59
19.122	40.31	-9.68
19.682	40.07	-9.92
17.994	39.41	-10.58
17.434	37.39	-12.60

Plot 2: Neutral – All Transmitters ON, 120Vac 60Hz, 24Vdc Option

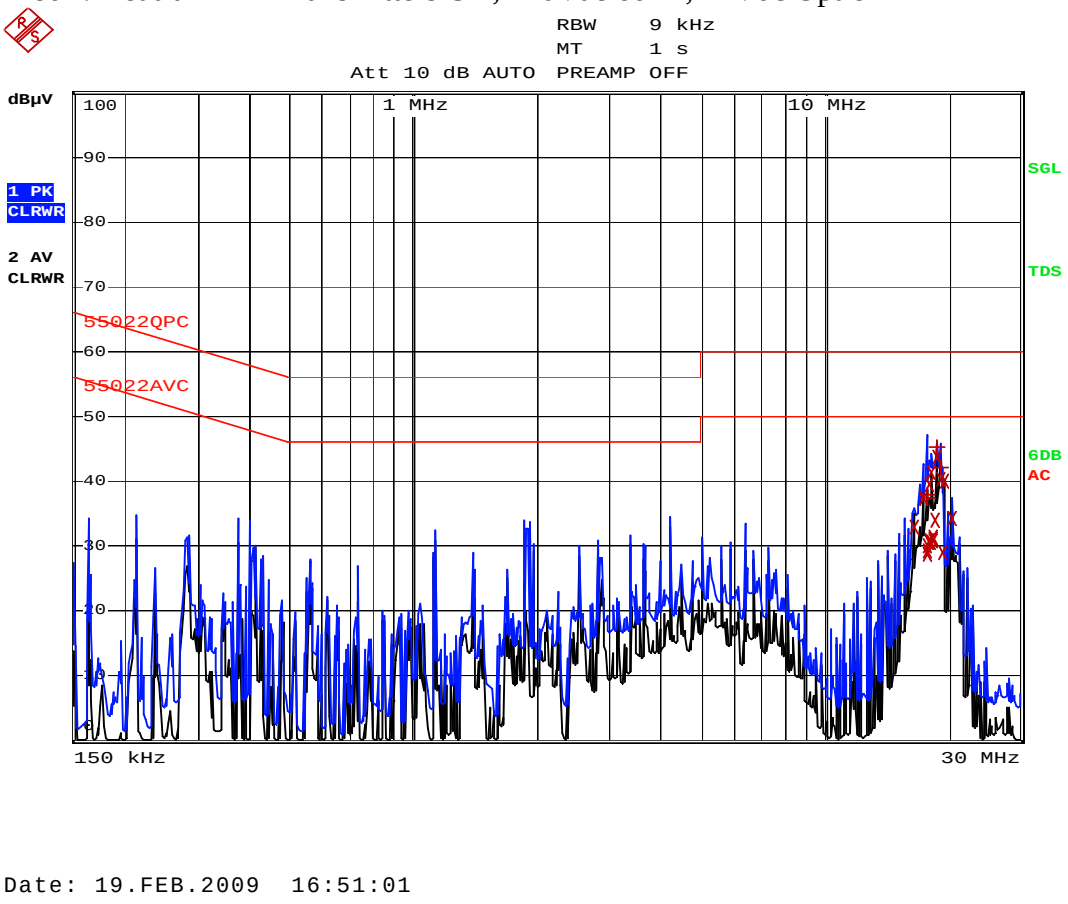
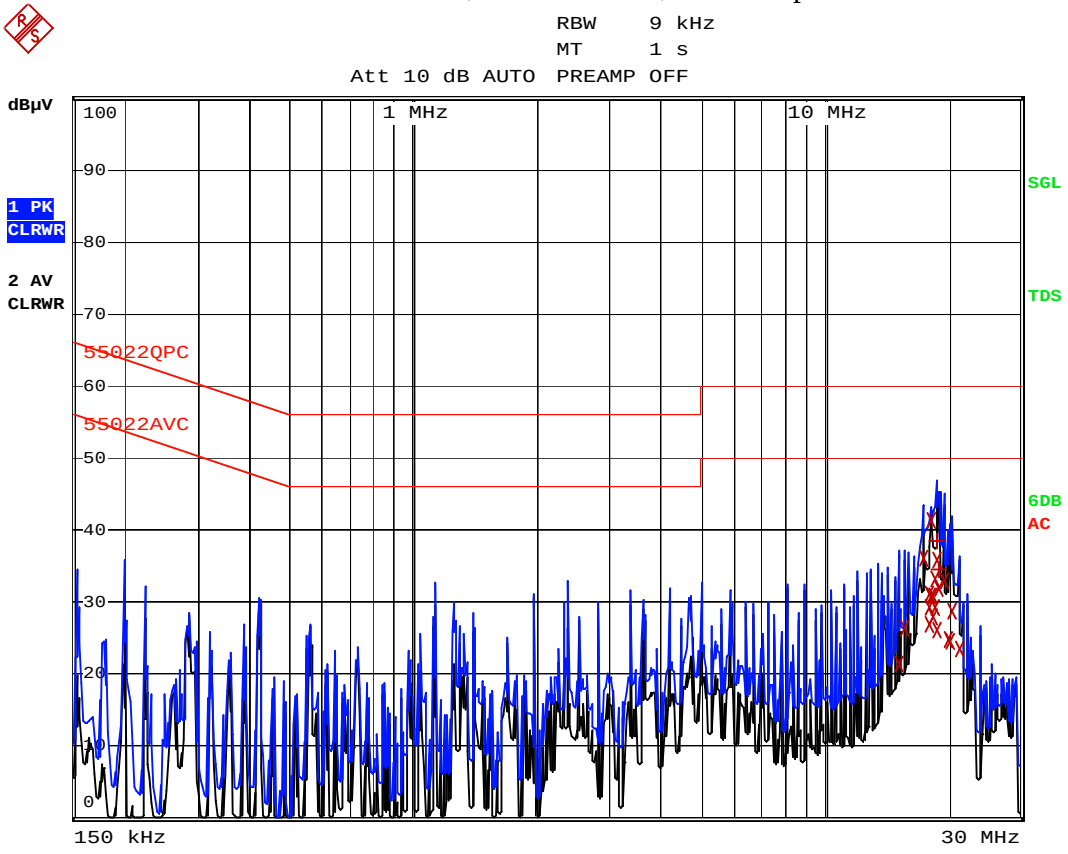


Table 3: Line – All Transmitters OFF, 120Vac 60Hz, 24Vdc Option

Frequency (MHz)	Corrected Average Measurement (dBuV)	Average Limit Line Delta (dB)
18.878	41.22	-8.77
17.434	36.11	-13.88
18.838	35.80	-14.19
18.558	33.32	-16.67
19.682	32.98	-17.01
19.118	31.90	-18.09

Plot 3: Line – All Transmitters OFF, 120Vac 60Hz, 24Vdc Option

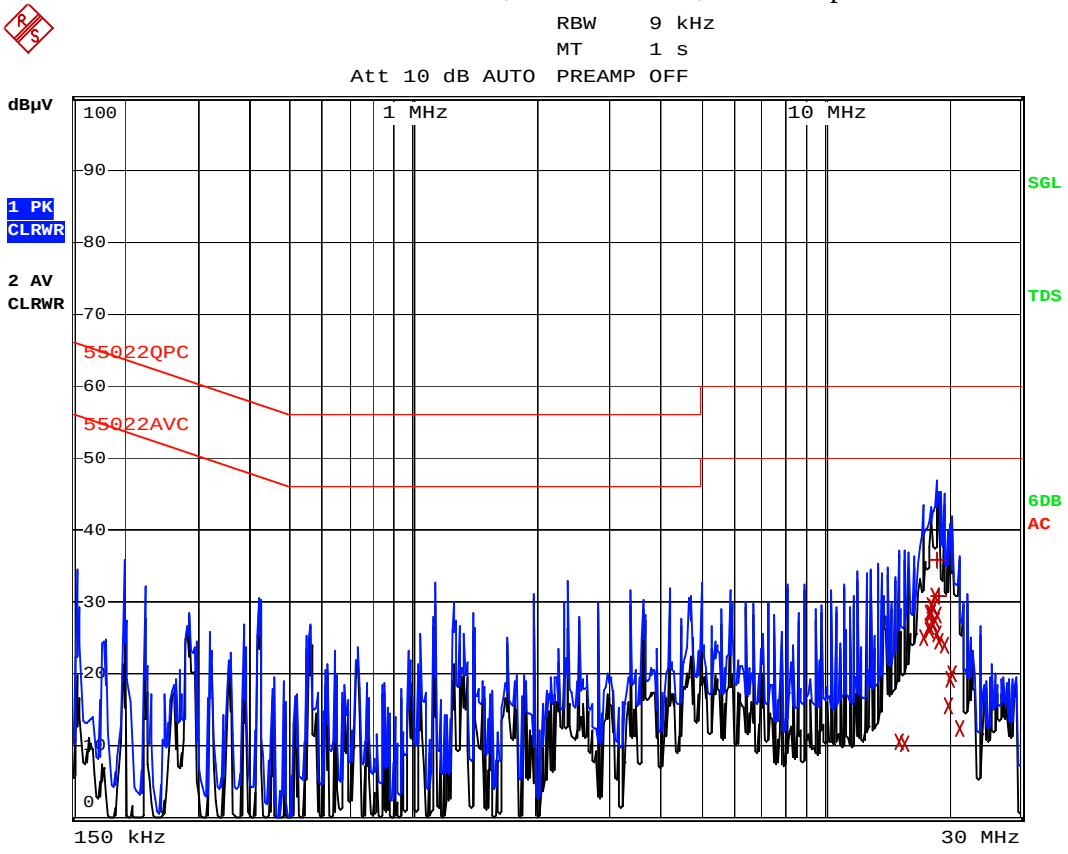


Date: 19.FEB.2009 17:20:06

Table 4: Neutral – All Transmitters OFF, 120Vac 60Hz, 24Vdc Option

Frequency (MHz)	Corrected Average Measurement (dBuV)	Average Limit Line Delta (dB)
18.558	30.73	-19.26
18.198	29.57	-20.42
18.466	29.30	-20.69
18.278	28.57	-21.42
18.054	28.38	-21.61
18.838	28.14	-21.85

Plot 4: Neutral – All Transmitters OFF, 120Vac 60Hz, 24Vdc Option

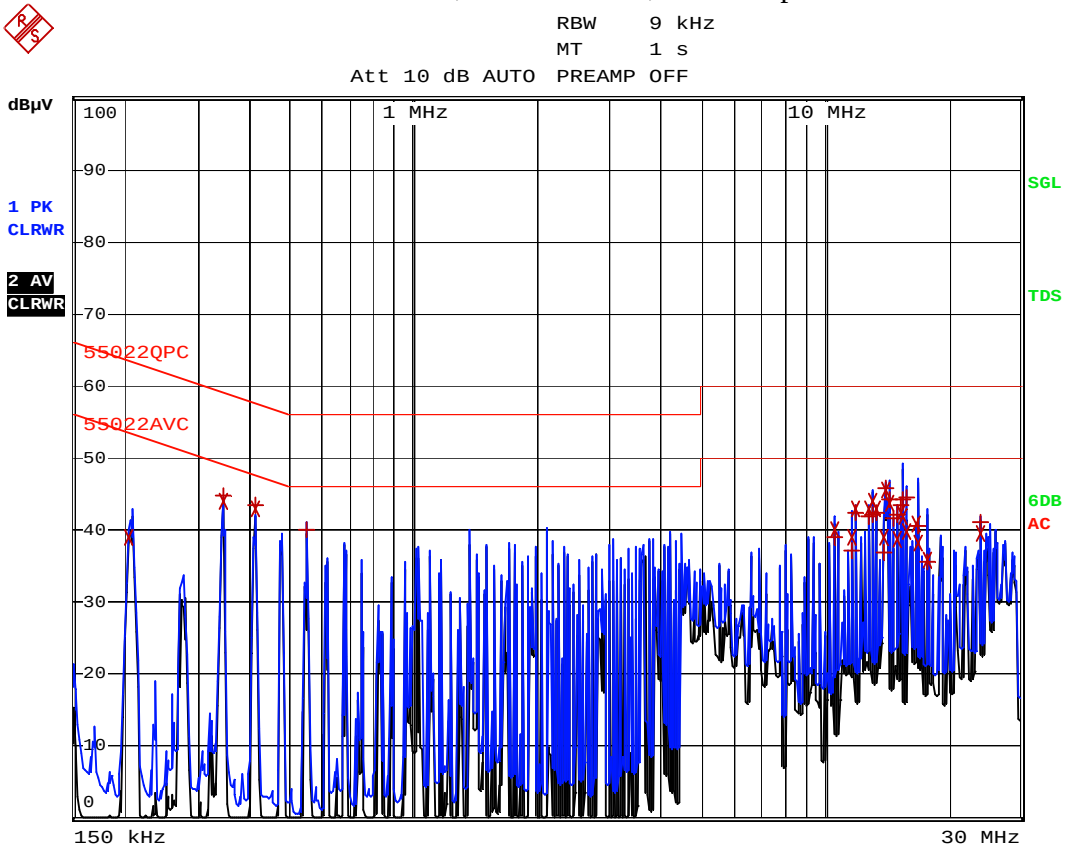


Date: 19.FEB.2009 17:26:50

Table 5: Line – All Transmitters ON, 120Vac 60Hz, 48Vdc Option

Frequency (MHz)	Corrected Average Measurement (dBuV)	Average Limit Line Delta (dB)
14.206	45.51	-4.48
0.410	42.78	-4.86
0.342	43.86	-5.28
13.094	43.94	-6.05
14.486	43.75	-6.24
11.978	42.91	-7.08

Plot 5: Line – All Transmitters ON, 120Vac 60Hz, 48Vdc Option



Date: 19.FEB.2009 13:37:07

Table 6: Neutral – All Transmitters ON, 120Vac 60Hz, 48Vdc Option

Frequency (MHz)	Corrected Average Measurement (dBuV)	Average Limit Line Delta (dB)
13.086	45.09	-4.90
14.478	44.50	-5.49
0.410	42.05	-5.59
15.314	44.33	-5.66
14.198	44.21	-5.78
0.342	42.79	-6.35

Plot 6: Neutral – All Transmitters ON, 120Vac 60Hz, 48Vdc Option

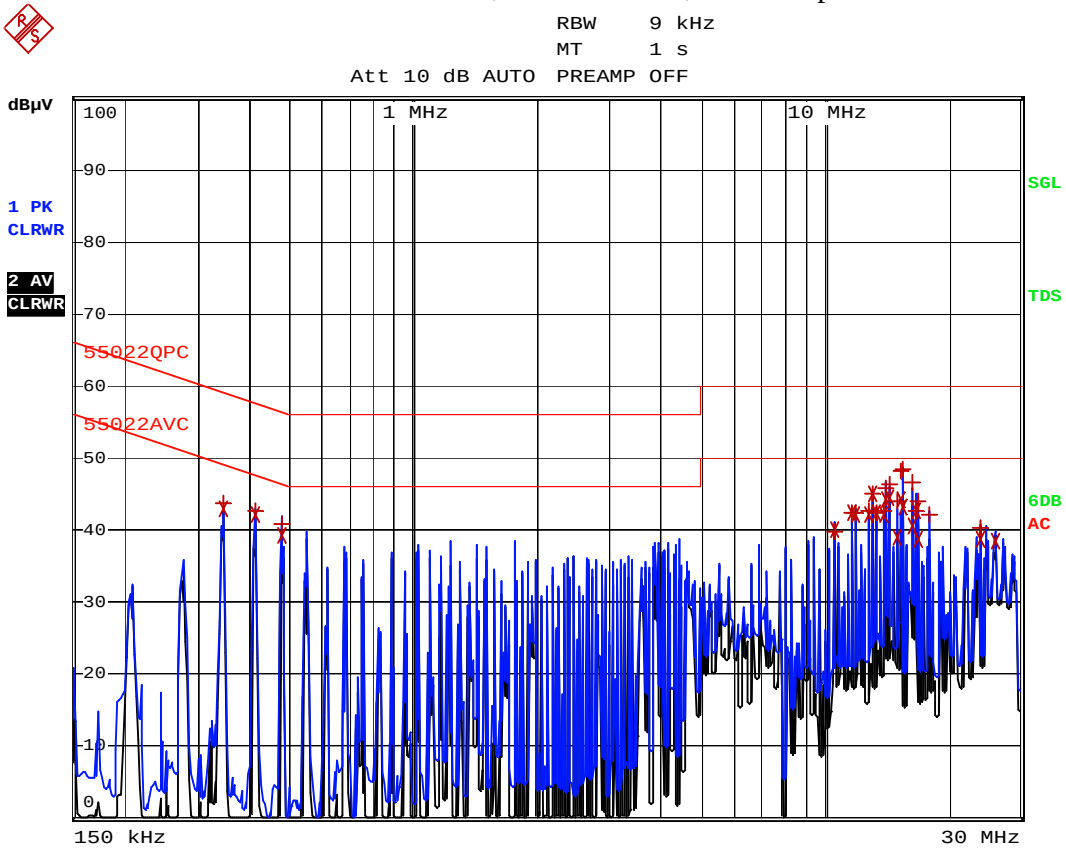
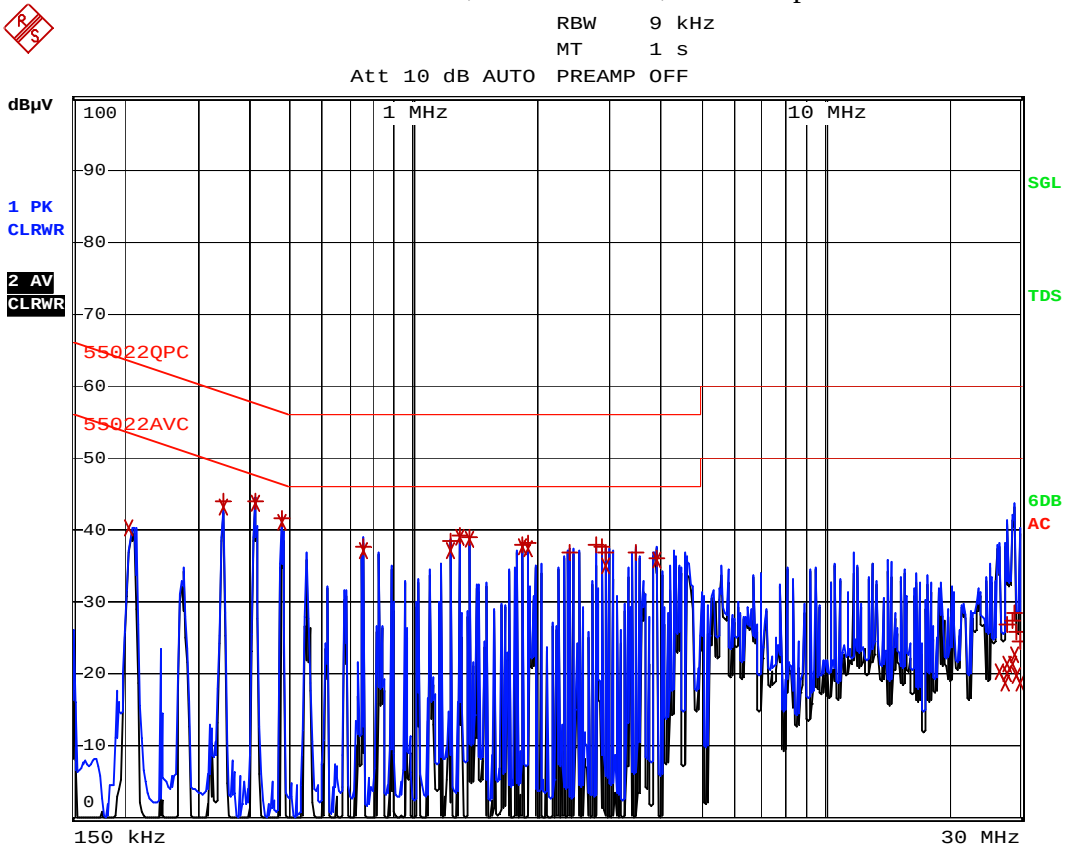


Table 7: Line – All Transmitters OFF, 120Vac 60Hz, 48Vdc Option

Frequency (MHz)	Corrected Average Measurement (dBuV)	Average Limit Line Delta (dB)
0.410	43.74	-3.9
0.478	41.17	-5.19
0.342	43.21	-5.94
1.298	38.94	-7.05
1.366	38.69	-7.30
1.846	37.68	-8.31

Plot 7: Line – All Transmitters OFF, 120Vac 60Hz, 48Vdc Option

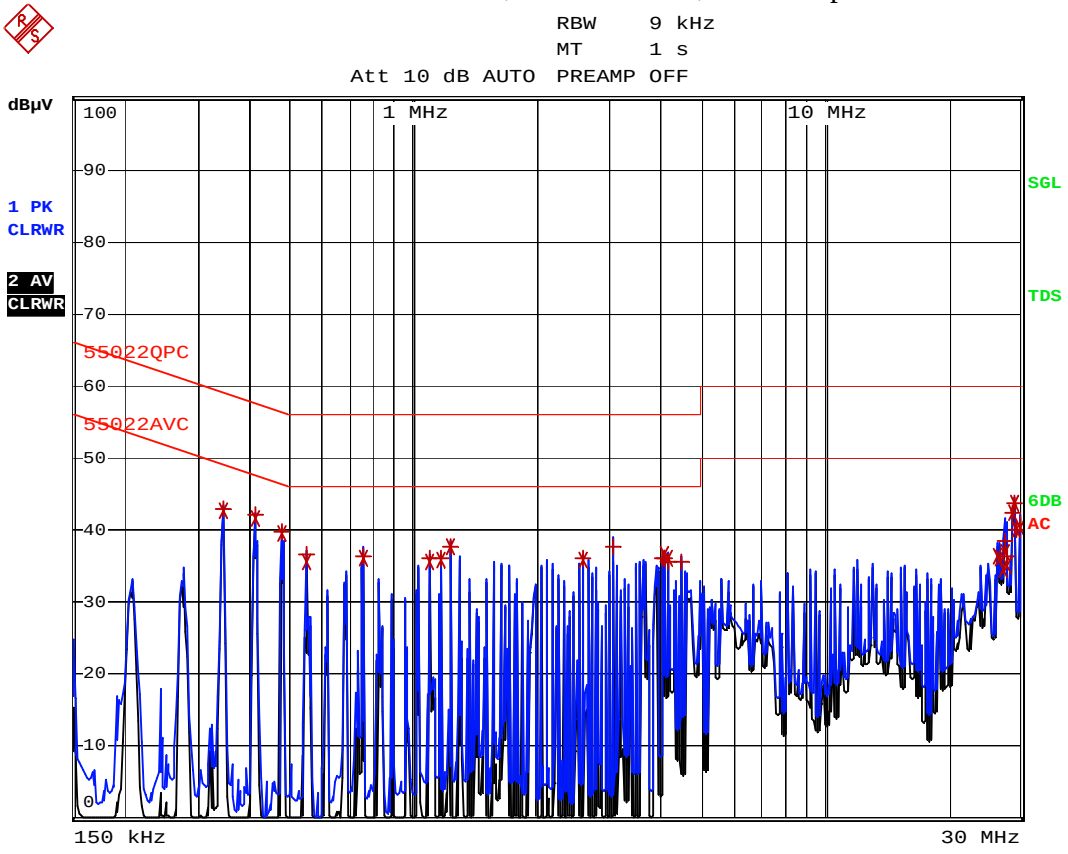


Date: 19.FEB.2009 10:45:42

Table 8: Neutral – All Transmitters OFF, 120Vac 60Hz, 48Vdc Option

Frequency (MHz)	Corrected Average Measurement (dBuV)	Average Limit Line Delta (dB)
0.410	41.16	-6.03
29.086	43.68	-6.31
0.342	42.72	-6.42
0.478	39.58	-6.78
28.806	42.45	-7.54
1.23	37.65	-8.34

Plot 8: Neutral – All Transmitters OFF, 120Vac 60Hz, 48Vdc Option



Date: 19.FEB.2009 11:03:16