

Delta Controls Inc.

eM410R4

EMC Directive Compliance Test Report

Per

FCC CFR47 Part 15 Subpart C §15.247
&
IC RSS-210

FCC ID: YRR-EM410R4
IC ID: 9100A-EM410R4

Revision 1.0

Nov 3, 2010

Approval		
Checked By:	<u>Amandeep Singh</u> Amandeep Singh, Eng.	Nov 3, 2010 Date

Protocol Data Systems Inc, EMC Lab,
Abbotsford BC, Canada.
SCC ISO/17025 (CAN-P-4E) Accredited Laboratory No. 612
FCC O.A.T.S. Registration Number 96437
Industry Canada O.A.T.S. Registration Number IC3384

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Index

Section I:	Report of Measurements Testing Information.....	3
Section II:	Report of Measurements Test Procedure	5
Section III:	Maximum peak conducted output power	7
Section IV:	Measurements of Power Spectral Density	8
Section V:	Measurement of 6dB Bandwidth	9
Section VI:	Measurement of Band Edges.....	10
Section VII:	Restricted Bands of Operation	11
Section VIII:	Measurements of Spurious Emissions	12
Section IX:	Measurements to Power Line Conducted Emissions	13
Appendix A:	Measurement Plots.....	14
Appendix B:	Measurement Data.....	22
Appendix C:	Test Set-Up Pictures	25

Section I: Report of Measurements Testing Information

GENERAL INFORMATION:

Applicant Company Name	Delta Controls Inc.
Address	17850 56 th Ave
	Surrey, British Columbia V3S 1C7 Canada
	Phone: 604-574-9444
	Fax: 6048887642
Contact Person	Mr. Alan Zhou
Email	azhou@deltacontrols.com
Product Name	eM410R4
FRN	0019662998
Applicable Standard	FCC Part 15.247 & IC RSS-210
Test Results	Pass
Related Report/s Approval	03498_Rev 1.0.pdf
Statement of Compliance	This equipment has been tested in accordance with the standards identified in the referenced test report. To the best of our knowledge and belief, these tests were performed using the measurement procedures described in this report and demonstrate that the equipment complies with the appropriate standards. – Signature on Front Cover Page.

EQUIPMENT UNDER TEST SPECIFICATIONS:

Manufacturer	Delta Controls Inc.
Product Description	Zig bee
FCC ID	YRR-EM410R4
IC Number	9100A-EM410R4
Model Number	eM410 R4V30
Name	eM410 R4V30
Operating Frequency	2.410- 2465 GHz
Emission Designator	760KK7D
EUT Power Source	120Vac/60Hz and 230Vac/50Hz
Test Item	Production Unit
Type of Equipment	Fixed
Antennas	Monopole Antenna
Antenna Connector	RP-SMA RA Connector
Test Voltage	120Vac/60Hz and 230Vac/50Hz

TEST DATA:

Test Facility	Protocol Data Systems Inc.
	28945 McTavish Road
	Abbotsford, BC V4X 2E7
	Phone: 604-607-0012
	Fax: 604-607-0019
	Email: info@protocol-emc.com
	Website: www.protocol-emc.com
Test Facility ID's	SCC ISO/17025 (CAN-P-4E) Accredited Laboratory No. 612
	FCC O.A.T.S. Registration Number 96437
	Industry Canada O.A.T.S. Registration Number IC3384
Date Tested	2 nd July 2010
Tested By	Amandeep Singh Jathaul

TEST SET-UP

Test Supporting Equipment	
Test Exercise E.g. software description, test signal, etc.	The EUT was set for continuous transmit mode of operation. It only has 1 frequency. The options were for a CW and modulated frequency.
Deviation from Standard/s	No deviation from Standard
Modification to the EUT	No modifications were made.

TEST EQUIPMENT LIST

Manufacturer	Model	Equipment Description	Serial No.	Next Cal
HP	85650A	CDN Quasi-Peak Adapter	2811A01080	12/08/11
HP	85662A	Spectrum Analyzer Display	2152A03569	11/08/11
HP	8566B	Spectrum Analyzer RF Section	2241A02102	11/08/11
HP	85685A	RF-Preselector	3107A01222	11/08/11
EMCO	3146	Ant Log Periodic 200-1000MHZ	9611-4699	08/08/11
EMCO	3110B	Ant Biconical 20-300MHz	9401-1850	08/08/11
EMCO	3115	Horn Antenna 1-18GHz	9403-4251	20/08/11
EMCO	3825/2	LISN	2470	20/07/11
Rhientech	Custom	Antenna Mast	N/A	N/A
Protocol EMC	Custom	Turntable	N/A	N/A

MEASUREMENT UNCERTAINTY

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-5}$
Total RF power, conducted	$\pm 1,5$ dB
RF power density, conducted	± 3 dB
Spurious emissions, conducted	± 3 dB
All emissions, radiated	± 3 dB
Temperature	$\pm 1 \square C$
Humidity	± 5 %
DC and low frequency voltages	± 3 %

EQUIPMENT UNDER TEST:**TEST SYSTEM:**

NAME: Delta Controls Inc.

ADDRESS: 17850 56th Ave. Surrey BC
V3S 1C7 Canada

CONTACT PERSON: Mr. Alan Zhou

EMAIL: azhou@deltacontrols.com

PHONE NUMBER: 6045749444 ext. 8358

FAX: 6045747793

Equipment Under Test

THE TEST SYSTEM: EUT 1: eM-410R4
 Manufacturer: Delta Controls Inc.
 Serial Number: 55572/0025
 Part Number: 698246

CABLING:

Cable	Pins	Connector	Load/Termination?	Shielded?	Ferrite's?
18AWG	IP1	2/3 Pin Connector	0-10V	No	No
18AWG	IP2	2/3 Pin Connector	100Ω	No	No
18AWG	IP3	2/3 Pin Connector	0Ω (Short CCT)	No	No
18AWG	IP4	2/3 Pin Connector	ON/OFF	No	No
18AWG	OP1	2/3 Pin Connector	0-10V	No	No
18AWG	OP2	2/3 Pin Connector	100Ω	No	No
18AWG	OP3	2/3 Pin Connector	100Ω	No	No
18AWG	OP4-5	2/3 Pin Connector	ON/OFF	No	No

Section II: Report of Measurements Test Procedure

RADIATION INTERFERENCE:

The measurement was made per ANSI C63.4-2003 using an Agilent model 8566B spectrum analyzer, a model 85685A Preselector, a model 85650A quasi-peak adapter, and the appropriate antenna. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was 100kHz with an appropriate sweep speed and the video bandwidth was 300kHz up to 1GHz and 1MHz with a VBW greater than or equal to the RBW 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 reported. The EUT was re-positioned to produce the highest emission level. The spectrum was searched to at least the tenth (10) harmonic of the fundamental.

FORMULA OF CONVERSION FACTORS:

The field strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of $\text{dB}\mu\text{V}$) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB. The gain of the Preselector was accounted for in the spectrum analyzer meter reading.

Example:

$$\begin{array}{lllll} \text{Freq (MHz)} & \text{Meter Reading} & +\text{ACF} & +\text{CL} & = \text{FS} \\ 330 & 20 \text{ dB}\mu\text{V} & +10.36 \text{ dB} & +0.5 & = 30.86 \text{ dB}\mu\text{V/m} @ 3\text{m} \end{array}$$

Where the field strength was too low to get an accurate reading at the required distance of 3meters, the Antenna was moved closer to 1 meter. The resulting measurement was distance corrected for 3 meters by using the formula:

$$(1 \text{ meter result}) - (20\text{Log(measured distance/required distance)}) = (3 \text{ meter result})$$

Example:

$$1 \text{ meter result} + \text{distance correction} = 3 \text{ meter result}$$

$$54.5 \text{ dB}\mu\text{V} + -9.54\text{dB} = 45 \text{ dB}\mu\text{V}$$

POWER LINE CONDUCTED INTERFERENCE:

The procedure used was ANSI C63.4-2003 using a $50\mu\text{H}$ LISN. Both lines were observed. The bandwidth of the spectrum analyzer was 10kHz 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 above the horizontal ground plane.

OCCUPIED BANDWIDTH:

A sample of the transmitter output detected by an antenna was fed into the spectrum analyzer and the attached plot was printed. The vertical scale is set to 10dB per division.

ANSI C63.4-2003 MEASUREMENT PROCEDURES:

The EUT was placed in a horizontal orientation, lying flat, on top of a table 80 cm high and 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. The antenna was placed in both the horizontal and vertical planes.

Due to the construction of the EUT, the EUT was also placed in a vertical orientation and rotated on its axis and the emissions were maximized again to identify the highest emission level.

Frequencies less than 1GHz were measured using the Quasi-Peak receiver. Frequencies equal to and greater than 1GHz were measured using the Average receiver

Section III: Maximum peak conducted output power

TEST DATE: July 7th 2010

TEST STANDARD: FCC Part 15.247(b)(3) and IC RSS-210 Annex 8: A8.4 (4)

REQUIREMENTS: The maximum peak conducted output power of the intentional radiator shall not exceed the following:

- For systems using digital modulation operating in the 2400 - 2 483.5 MHz band: 1 watt.

TEST DATA:

Channel	Frequency (MHz)	Output Power (dBm)	Limit
Low	2410	13.8	<30 dBm
Mid	2440	13.1	
High	2465	12.1	

MEASUREMENT PLOTS: See Appendix A for Plots 1-3.

MODIFICATIONS: No modifications were made to pass this test.

PERFORMANCE: Maximum Peak conducted output power for Low, Mid and High channels complies with standard requirement since the output power is less than 1 watt (30dBm)

Section IV: Measurements of Power Spectral Density

TEST DATE: July 7th 2010

TEST STANDARD: FCC Part 15.247(e) and IC RSS-210 Annex 8: A8.2 (2)

REQUIREMENTS: For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

TEST DATA:

Channel	Frequency (MHz)	PSD (dBm)	Limit
Low	2410	0.4	8 dBm
Mid	2440	0.70	
High	2465	1.10	

MODIFICATIONS: No modifications were made to the EUT to pass this test.

MEASUREMENTS PLOTS: See Appendix A for Plots 4-6.

PERFORMANCE: Power Spectral Density of Low, Mid and High channel complies with the requirement as per FCC Part 15.247(e) and IC RSS-210 Annex 8: A8.2 (2).

Section V: Measurement of 6dB Bandwidth

TEST DATE: July 8th 2010

TEST STANDARD: FCC Part 15.247(a)(2) and IC RSS-210 Annex 8: A8.2 (1)

REQUIREMENTS: Maximum 6 dB bandwidth for systems using digital modulation operating in the 2400 - 2483.5 MHz band: shall be at least 500 kHz.

TEST DATA:

Channel	Frequency (MHz)	6dB Bandwidth (kHz)	Limit
Low	2410	725	> 500 kHz
Mid	2440	755	
High	2465	760	

MODIFICATIONS: No modifications were made to the EUT to pass this test.

MEASUREMENTS PLOTS: See Appendix A for Plots 7-9.

PERFORMANCE: 6dB bandwidth of Low, Mid and High channel complies with the requirement as per FCC Part 15.247(e) and IC RSS-210 Annex 8: A8.2 (1).

Section VI: Measurement of Band Edges

TEST DATE: July 8th 2010

TEST STANDARD: FCC Part 15.247(d) and IC RSS-210 Annex 8: A8.5

REQUIREMENTS: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

TEST DATA: See Appendix A Table 4 for emissions in the restricted band

MEASUREMENTS PLOTS: See Appendix A for Plots 12-15.

MODIFICATIONS: No modifications were made to the EUT to pass this test.

PERFORMANCE: Complies with the requirement as per FCC Part 15.247(e) and IC RSS-210 Annex 8: A8.5. and radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), also complies with the radiated emission limits specified in Section 15.209(a).

Section VII: Restricted Bands of Operation

TEST DATE: July 6th 2010

TEST STANDARD: FCC Part 15 Subpart C, §15.205 and IC RSS-210

REQUIREMENTS: §15.205 Restricted Bands of Operation

(a) Except as shown in paragraph (d) of this section, only spurious emission are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	²)
13.36 - 13.41			

¹Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

MODIFICATIONS: No modifications were made to the EUT to pass this test.

TEST DATA: See Appendix B Table-4 for radiated emissions falling in restricted bands.

PERFORMANCE: The radiated emissions for the EUT meet the requirements for FCC 15.205 restricted bands of operation. There were no measurable emissions in the restricted bands other than those recorded in this report. Other emissions were present with amplitudes at least 20 dB below the required limits.

Section VIII: Measurements of Spurious Emissions

TEST DATE: July 5th 2010

TEST STANDARD: FCC Part 15.247(d) and IC RSS-210

REQUIREMENTS: (d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Frequency	Field Strength of Fundamental (μ V/m)	Measurement Distance (meters)
9 to 490 kHz	2400/F(kHz)	300
490 to 1705 kHz	24000/F(kHz)	30
1705 to 30 MHz	30	30
30 – 88 MHz	100	3
80 – 216 MHz	150	3
216 – 960 MHz	200	3
Above 960 MHz	500	3

TEST DATA: See Appendix B Table 1-3 for spurious radiated emissions.

MODIFICATIONS: No modifications were made to the EUT to pass this test.

PERFORMANCE: Complies with the requirement as per FCC Part 15.247(e) and IC RSS-210.

Section IX: Measurements to Power Line Conducted Emissions

TEST STANDARD: FCC Part 15 Subpart C §15.207

REQUIREMENTS: (a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency	Quasi Peak Limits	Average Limits
MHz	dB μ V	dB μ V
0.15 – 0.5	66 – 56	56 – 46
0.5 – 5.0	56	46
5.0 – 30	60	50

TEST DATA: See Appendix B Table-5 for Conducted emissions data.

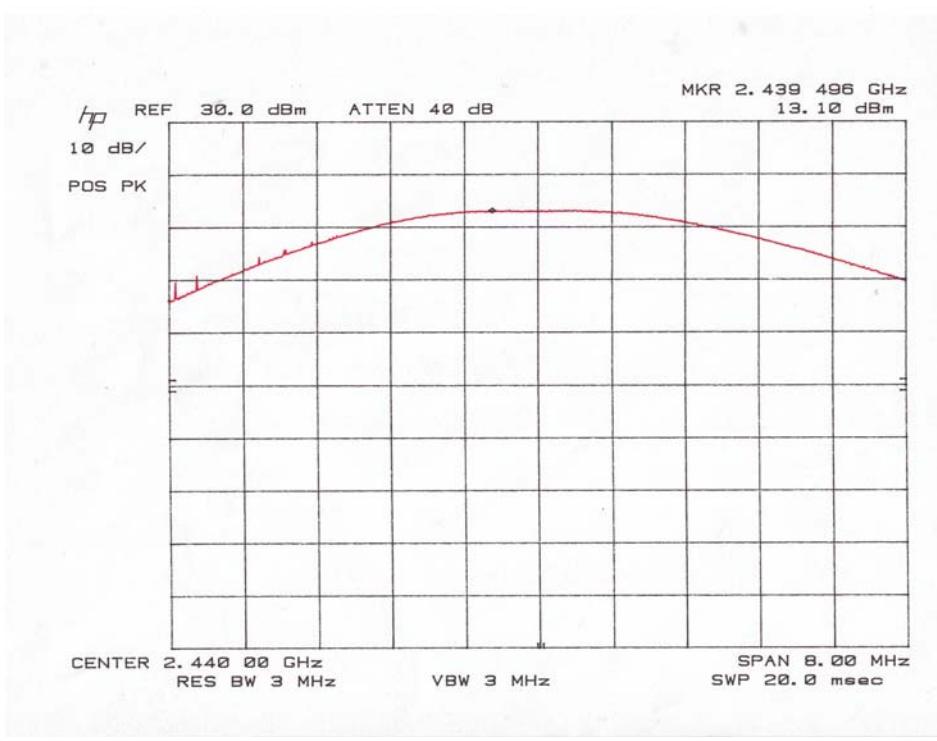
MODIFICATIONS: No modifications were made to the EUT to pass this test.

PERFORMANCE: Complies with the requirement as per FCC Part 15.247 and IC RSS-210.

Appendix A: Measurement Plots



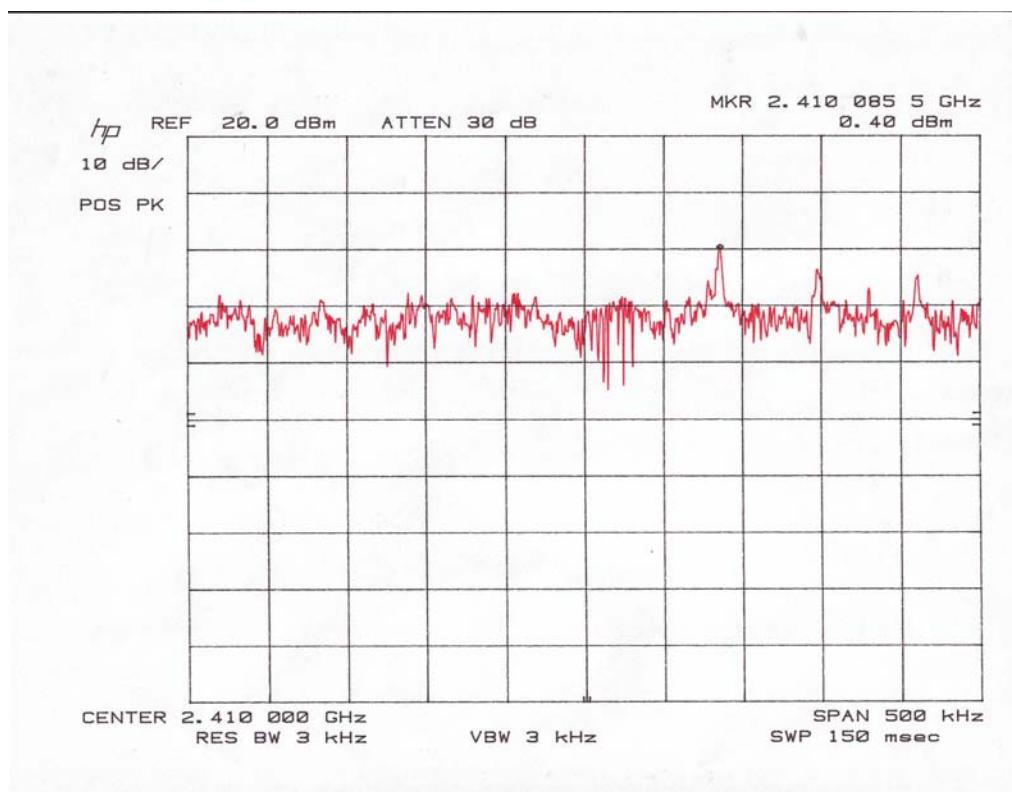
Plot 1: Low Channel (2410 MHz) Maximum Peak Conducted Output Power

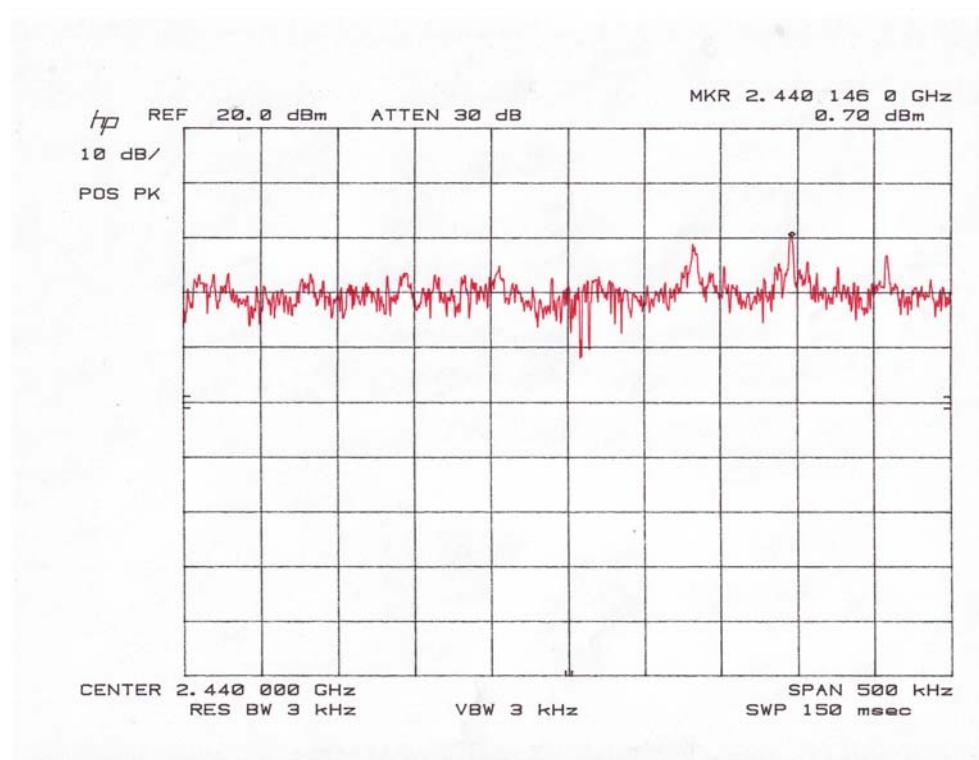


Plot 2: Mid Channel (2440 MHz) Maximum Peak Conducted Output Power

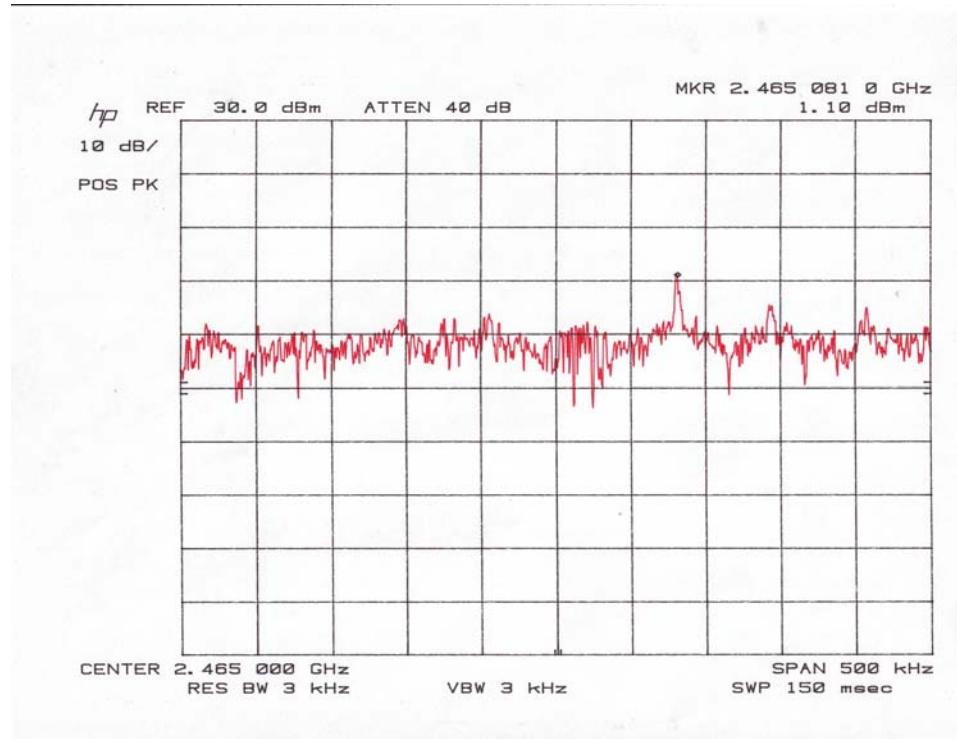


Plot 3: High Channel (2465 MHz) Maximum Peak Conducted Output Power

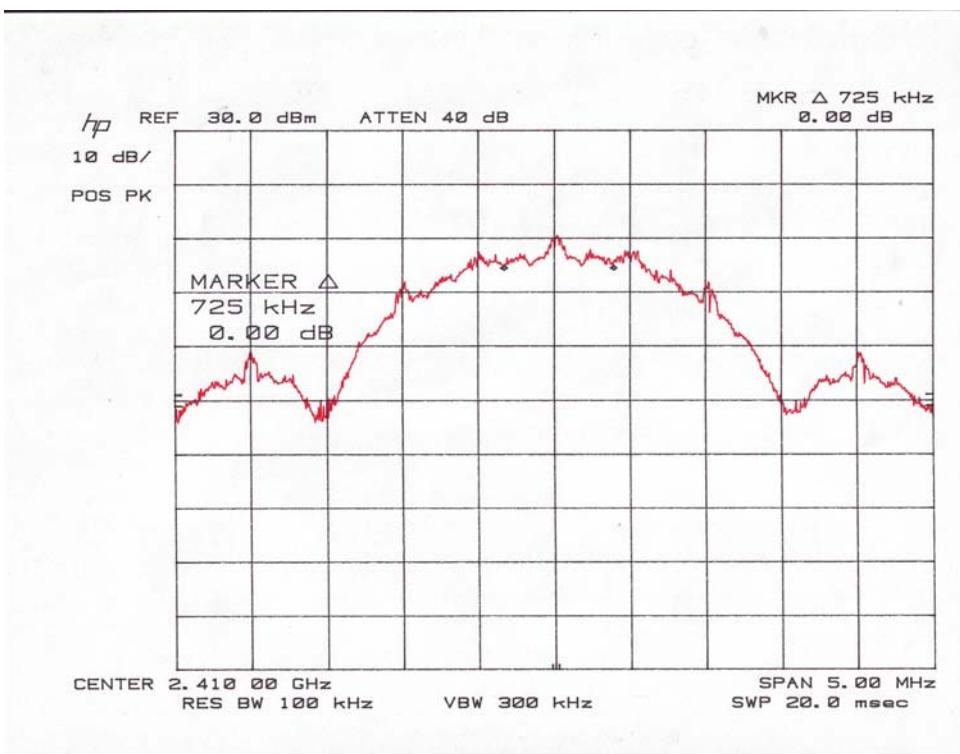




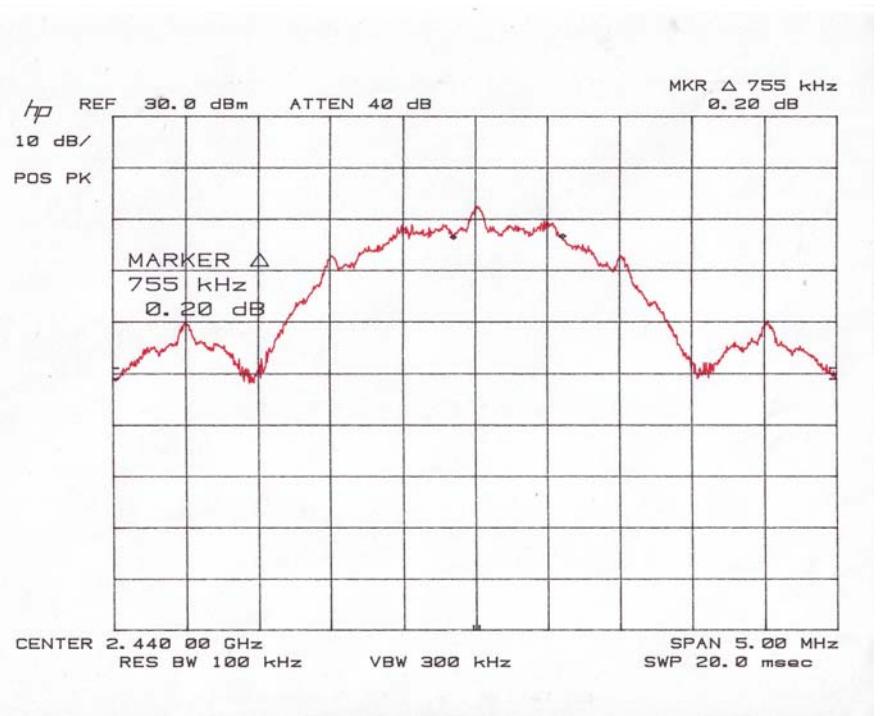
Plot 5: Mid Channel (2440 MHz) Power Spectral Density



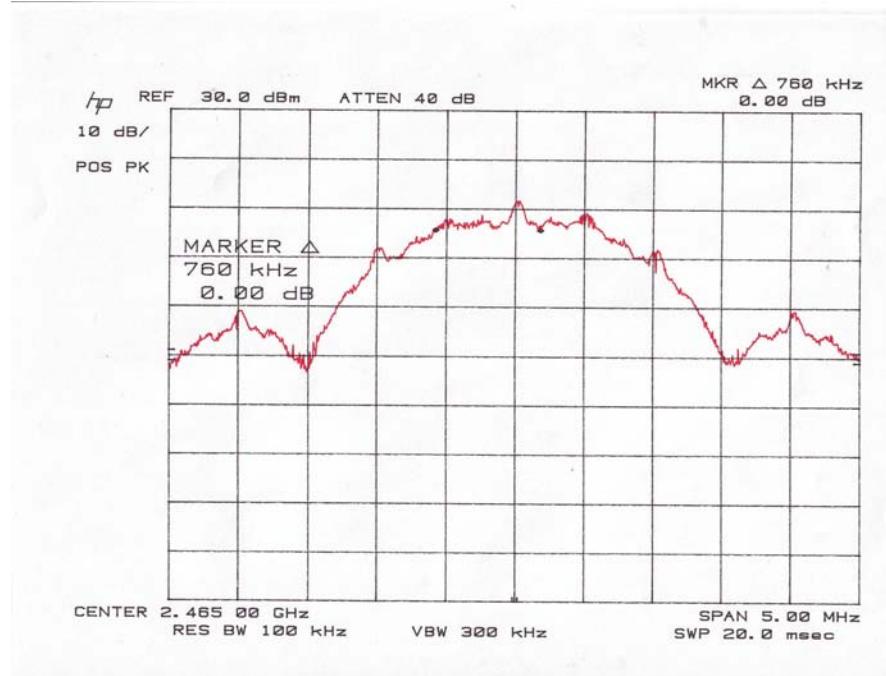
Plot 6: High Channel (2465 MHz) Power Spectral Density



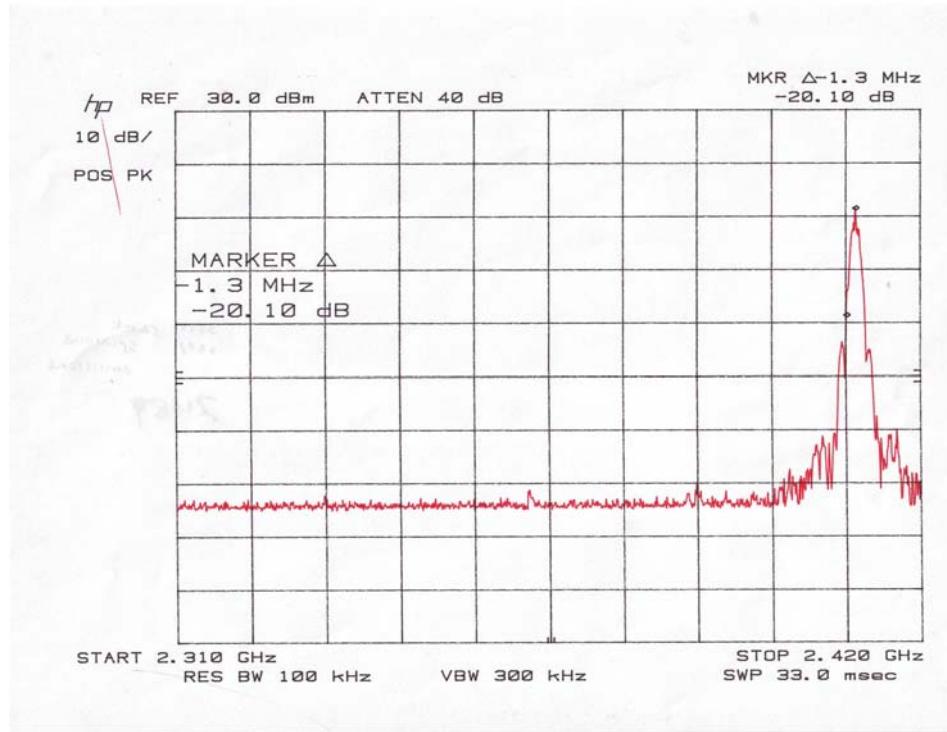
Plot 7: Low Channel (2410 MHz) 6 dB Bandwidth



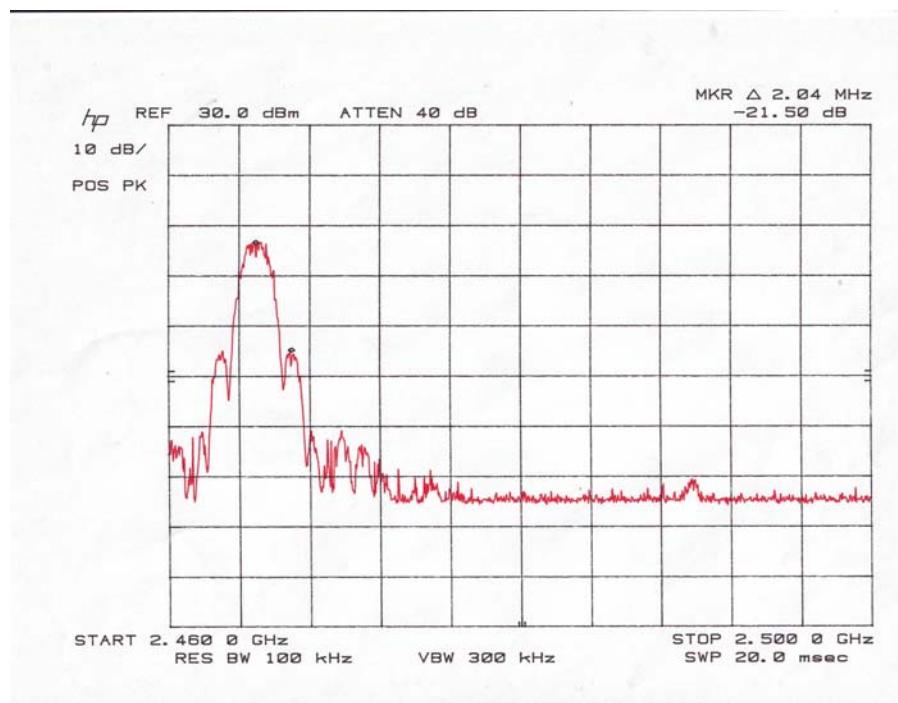
Plot 8: Mid Channel (2440 MHz) 6 dB Bandwidth



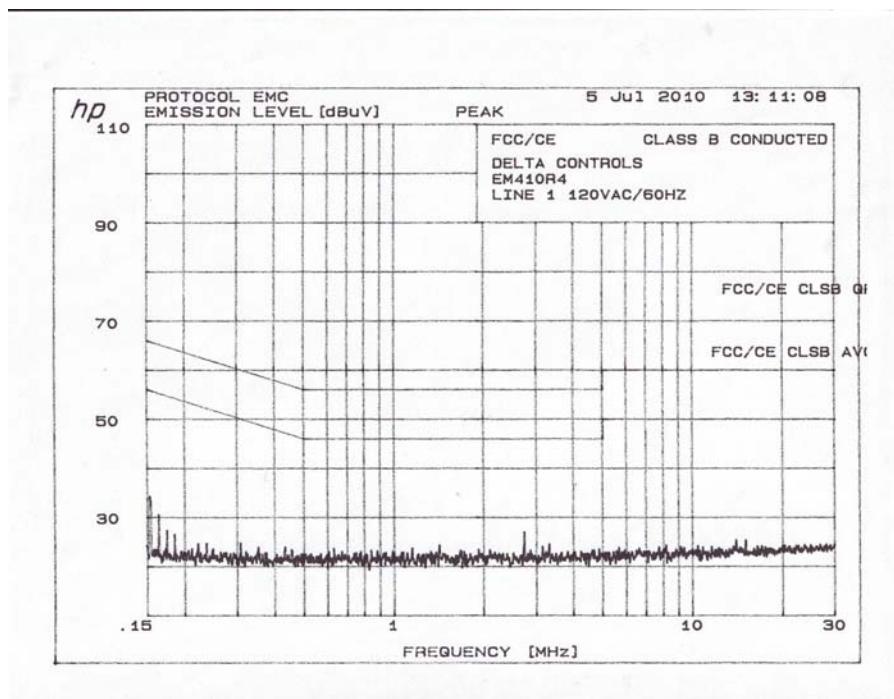
Plot 9: High Channel (2465 MHz) 6 dB Bandwidth



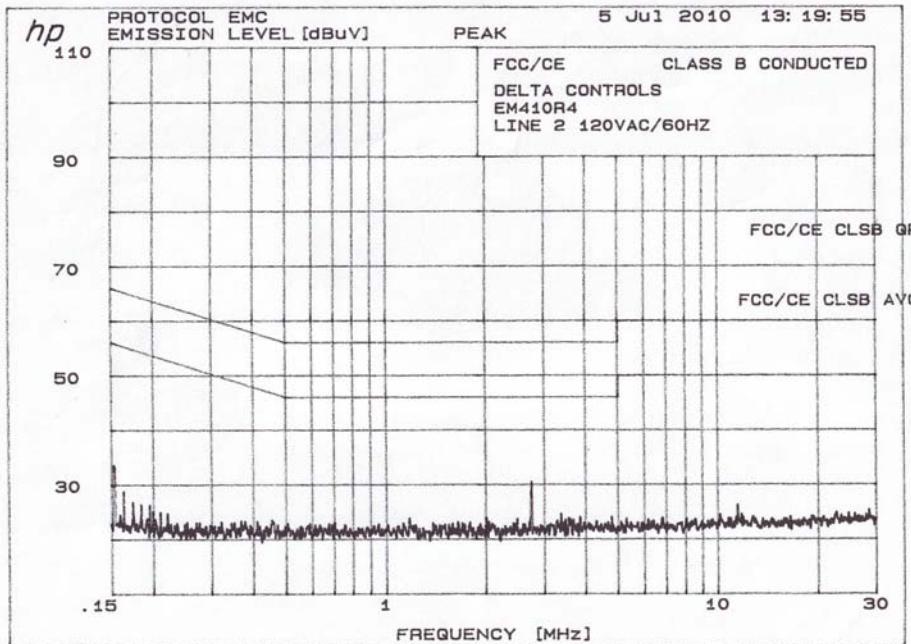
Plot 10: Lower Band Edge



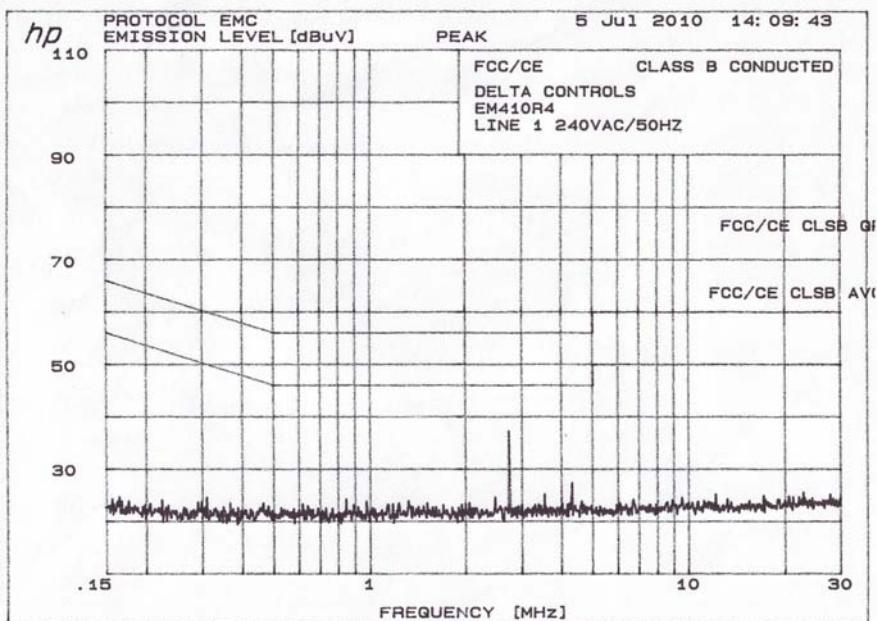
Plot 11: Upper Bandedge



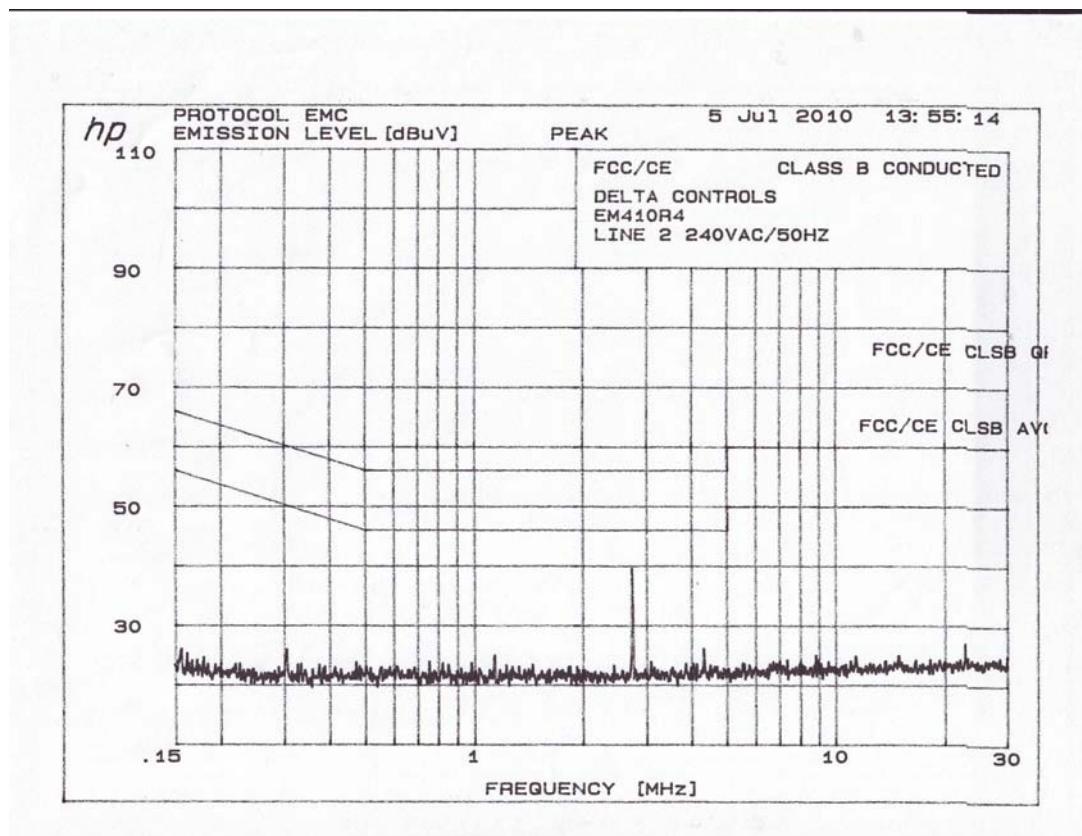
Pic 12: Conducted Emissions Line1 120Vac/60Hz



Pic 13: Conducted Emissions Line 2 120Vac/60Hz



Pic 14: Conducted Emissions Line1 240Vac/50Hz



Pic 15: Conducted Emissions Line2 240Vac/50Hz

Appendix B: Measurement Data

Spurious Radiated Emissions:

Table 1: Low Channel 2410 MHz

Frequency (GHz)	Ant. Pol. (V/H)	Total Correction Factor	Measured peak Value (dBuV/m)	Measured Average (dBuV/m)	Corrected Value (dBuV/m)	Corrected Average Value (dBuV/m)	Average Limit dB(uV/m) at 3m	Peak Margin	Average Margin
4.8208	H	12.2	57.2	27.1	69.4	39.3	54.0	15.4	-14.7
7.3299	H	7.8	38.6	22.9	46.4	30.7	54.0	-7.6	-23.3
9.63793	H	20.7	51.1	25.4	71.8	46.1	54.0	17.8	-7.9
12.0473	H	19.8	41.8	23.6	61.6	43.4	54.0	7.6	-10.6

Frequency	Ant. Pol. (V/H)	Total Correction Value	Measured peak Value (dBuV/m)	Measured Average (dBuV/m)	Corrected Value (dBuV/m)	Corrected Average Value (dBuV/m)	Average Limit dB(uV/m) at 3m	Peak Margin	Average Margin
4.8208	V	36.6	31.7	10.6	68.3	47.2	54.0	14.3	-6.8
7.318835	V	37.7	33.3	15.3	71.0	53.0	54.0	17.0	-1.0
9.63793	V	19.8	52.8	27.7	72.6	47.5	54.0	18.6	-6.5
12.04738	V	19.8	51.6	25.9	71.4	45.7	54.0	17.4	-8.3
14.4579	V	24.8	47.4	24.5	72.2	49.3	54.0	18.2	-4.7
16868.6	V	27.4	37.5	20.8	64.9	48.2	54.0	10.9	-5.8

Table 2: Mid Channel 2440 MHz

Frequency (GHz)	Ant. Pol. (V/H)	Total Correction Value	Measured peak Value (dBuV/m)	Measured Average (dBuV/m)	Corrected Value (dBuV/m)	Corrected Average Value (dBuV/m)	Average Limit dB(uV/m) at 3m	Peak Margin	Average Margin
4.87978	H	36.9	30.5	10.3	67.4	47.2	54.0	13.4	-6.8
7.318835	H	36.5	33.4	15.1	69.9	51.6	54.0	15.9	-2.4
9.75809	H	20.7	50.6	24.3	71.3	45.0	54.0	17.3	-9.0
12.1967	H	19.8	44.4	25.2	64.2	45.0	54.0	10.2	-9.0
14.64308	H	26.9	41.4	22	68.3	48.9	54.0	14.3	-5.1
17.07691	H	28.5	39.6	19.6	68.1	48.1	54.0	14.1	-5.9

Frequency (GHz)	Ant. Pol. (V/H)	Total Correction Value	Measured Peak Value (dBuV/m)	Measured Average Value (dBuV/m)	Corrected Peak Value (dBuV/m)	Corrected Average Value (dBuV/m)	Average Limit dB(uV/m) at 3m	Peak Margin	Average Margin
4.87978	V	36.6	32.4	10.9	69.0	47.5	54.0	15.0	-6.5
7.318835	V	37.7	31.5	14.6	69.2	52.3	54.0	15.2	-1.7
9.75809	V	19.8	52.9	25.6	72.7	45.4	54.0	18.7	-8.6
12.1967	V	19.8	51.4	27.3	71.2	47.1	54.0	17.2	-6.9
14.64308	V	24.8	48.4	25.8	73.2	50.6	54.0	19.2	-3.4
17.07691	V	27.4	42.5	22.5	69.9	49.9	54.0	15.9	-4.1

Table 3: High Channel 2465 MHz:

Frequency	Ant. Pol. (V/H)	Total Correction Value	Measured peak Value (dBuV/m)	Measured Average (dBuV/m)	Corrected Value (dBuV/m)	Corrected Average Value (dBuV/m)	Average Limit dB(uV/m) at 3m	Peak Margin	Average Margin
4.931045	H	37.2	28.2	9.5	65.4	46.7	54.0	11.4	-7.3
7.39341	H	36.7	33.3	15.3	70.0	52.0	54.0	16.0	-2.0
9.85809	H	19.6	52.1	24.3	71.7	43.9	54.0	17.7	-10.1
12.322	H	20.7	48.9	24.2	69.6	44.9	54.0	15.6	-9.1
14.7872	H	27.4	37.7	21.3	65.1	48.7	54.0	11.1	-5.3

Frequency	Ant. Pol. (V/H)	Total Correction Value	Measured peak Value (dBuV/m)	Measured Average (dBuV/m)	Corrected Value (dBuV/m)	Corrected Average Value (dBuV/m)	Average Limit dB(uV/m) at 3m	Peak Margin	Average Margin
4.931045	2.8	37.2	30.2	11.7	67.4	48.9	54.0	13.4	-5.1
7.39341	3.4	36.7	29.8	14.5	66.5	51.2	54.0	12.5	-2.8
9.85809	18.6	19.6	53.4	24.9	73.0	44.5	54.0	19.0	-9.5
12.322	18.9	20.7	50.6	24.5	71.3	45.2	54.0	17.3	-8.8
14.7872	14.2	27.4	38.4	21.6	65.8	49.0	54.0	11.8	-5.0

Table 4: Radiated Emissions Falling in Restricted Bands

Frequency (GHz)	Ant. Pol. (V/H)	Total Correction Value	Measured peak Value (dBuV/m)	Measured Average (dBuV/m)	Corrected Peak Value (dBuV/m)	Corrected Average Value (dBuV/m)	Average Limit dB(uV/m) at 3m	Peak Margin	Average Margin
4.931045	H	37.2	28.2	9.5	65.4	46.7	54.0	11.4	-7.3
7.39341	H	36.7	33.3	15.3	70.0	52.0	54.0	16.0	-2.0
12.322	H	20.7	48.9	24.2	69.6	44.9	54.0	15.6	-9.1
4.931045	V	37.2	30.2	11.7	67.4	48.9	54.0	13.4	-5.1
7.39341	V	36.7	29.8	14.5	66.5	51.2	54.0	12.5	-2.8
12.322	V	20.7	50.6	24.5	71.3	45.2	54.0	17.3	-8.8
4.87978	H	36.9	30.5	10.3	67.4	47.2	54.0	13.4	-6.8
7.318835	H	36.5	33.4	15.1	69.9	51.6	54.0	15.9	-2.4
12.1967	H	19.8	44.4	25.2	64.2	45.0	54.0	10.2	-9.0
4.87978	V	36.6	32.4	10.9	69.0	47.5	54.0	15.0	-6.5
7.318835	V	37.7	31.5	14.6	69.2	52.3	54.0	15.2	-1.7
12.1967	V	19.8	51.4	27.3	71.2	47.1	54.0	17.2	-6.9
4.8208	H	12.2	57.2	27.1	69.4	39.3	54.0	15.4	-14.7
7.3299	H	7.8	38.6	22.9	46.4	30.7	54.0	-7.6	-23.3
12.04738	H	19.8	41.8	23.6	61.6	43.4	54.0	7.6	-10.6
4.8208	V	36.6	31.7	10.6	68.3	47.2	54.0	14.3	-6.8
7.318835	V	37.7	33.3	15.3	71.0	53.0	54.0	17.0	-1.0
12.04738	V	19.8	51.6	25.9	71.4	45.7	54.0	17.4	-8.3
14.4579	V	24.8	47.4	24.5	72.2	49.3	54.0	18.2	-4.7
2362.1	V	32.3	31.6	13.4	63.9	45.7	54.0	9.9	-8.3
2486.7	V	32.3	38.3	14.4	70.6	46.7	54.0	16.6	-7.3
2338.1	V	32.3	29.3	11.4	61.6	43.7	54.0	7.6	-10.3
2489.9	V	32.3	39	15.3	71.3	47.6	54.0	17.3	-6.4

Conducted Emissions Data

Table 5: Line 1 AC Mains 120Vac, 60Hz Peaks

Frequency (MHz)	Peak (dB μ V)	DeLLim-Pk (dB)
2.728	27.1	-18.9
0.1532	34.4	21.4
-	-	-

Table 6: Line 2 AC Mains 120Vac, 60Hz Peaks

Frequency (MHz)	Peak (dB μ V)	DeLLim-Pk (dB)
2.742	30.5	-15.5
0.1532	33.6	-22.2
0.1641	28.8	-26.4

Table 8: Line 1 AC Mains 230Vac, 50Hz Peaks

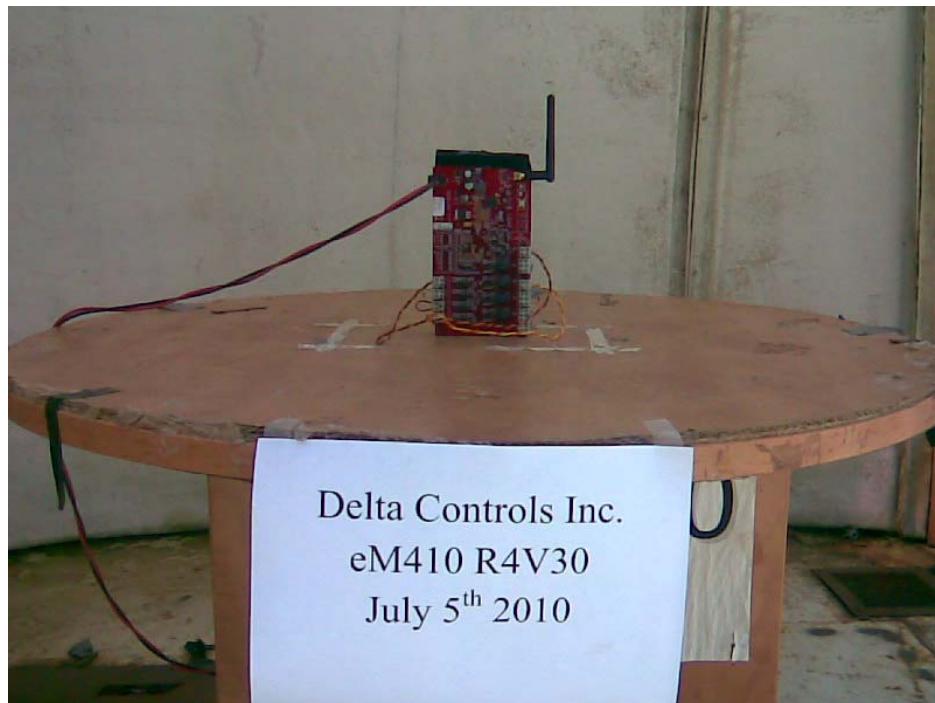
Frequency (MHz)	Peak (dB μ V)	DeLLim-Pk (dB)
2.728	37.3	-8.7
4.3	27.4	-18.6
-	-	-
-	-	-

Table 8: Line 2 AC Mains 230Vac, 50Hz Peaks

Frequency (MHz)	Peak (dB μ V)	DeLLim-Pk (dB)
2.742	39.6	-6.4
4.3	26.2	-19.8
1.139	25	-21.0
3.081	24	-22.0

Note: No other measureable conducted emissions above -20 dB.

Appendix C: Test Set-Up Pictures



Pic 1: Test Setup for Radiated Emissions



Pic 2 :Test Setup for Conducted Emissions



Pic 3: Test Setup for Radiated Emissions



Pic 4: Test Setup for Radiated Emissions