



**FCC CFR47 PART 15 SUBPART C**

**CERTIFICATION TEST REPORT**

**FOR**

**RFID READER**

**MODEL NUMBER: FREE30R**

**REPORT NUMBER: 1001408287**

**FCC ID: U5Z-FREE30R**

**ISSUE DATE: 2011-09-06**

*Prepared for*  
**JCM TECHNOLOGIES S A**  
**BISBE MORGADES, 46 BAIXOS**  
**VIC**  
**08500, SPAIN**

*Prepared by*  
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**NVLAP LAB CODE 100255-0**

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
--	2011-09-06	Initial Issue	B. DeLisi
--	2011-09-08	Updated Model number to Free30R.	B. DeLisi

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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** JCM TECHNOLOGIES S A  
BISBE MORGADES, 46 BAIXOS  
VIC 08500, SPAIN

**EUT DESCRIPTION:** RFID Reader

**MODEL:** FREE30R

**SERIAL NUMBER:** Non-serialized production unit

**DATE TESTED:** 2011-08-22 to 2011-08-26

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART C	Pass

Underwriters Laboratories Inc. tested the above equipment in accordance with the requirements set forth in the above standards, using test results reported in the test report documents referenced below and/or documentation furnished by the applicant. All indications of Pass/Fail in this report are opinions expressed by Underwriters Laboratories Inc. based on interpretations of these calculations. The results show that the equipment is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation, as described by the referenced documents. This document may not be altered or revised in any way unless done so by Underwriters Laboratories Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Underwriters Laboratories Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For UL By:

Tested By:



Joseph Danisi  
Sr. Project Engineer  
UL

Bob DeLisi  
Sr. Staff Engineer  
UL

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2009, FCC CFR 47 Part 2, FCC CFR 47 Part 15.

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 1285 Walt Whitman Rd. Melville, NY 11747, USA.

UL Melville is accredited by NVLAP, Laboratory Code 100255-0. The full scope of accreditation can be viewed at <http://ts.nist.gov/standards/scopes/1002550.htm>.

## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

### 4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamplifier Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

### 4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	± 3.3 dB
Radiated Disturbance, 30 to 1000 MHz	± 4.00 dB

Uncertainty figures are valid to a confidence level of 95%.

## **5. EQUIPMENT UNDER TEST**

### **5.1. DESCRIPTION OF EUT**

The EUT is a low power RFID intended for security systems.

### **5.2. DESCRIPTION OF AVAILABLE ANTENNAS**

The radio utilizes an integral loop antenna.

### **5.3. SOFTWARE AND FIRMWARE**

None

### **5.4. WORST-CASE CONFIGURATION AND MODE**

The EUT only has one mode of operation and the EUT only has one configuration

### **5.5. MODIFICATIONS**

No modifications were made during testing.

## 5.6. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

None

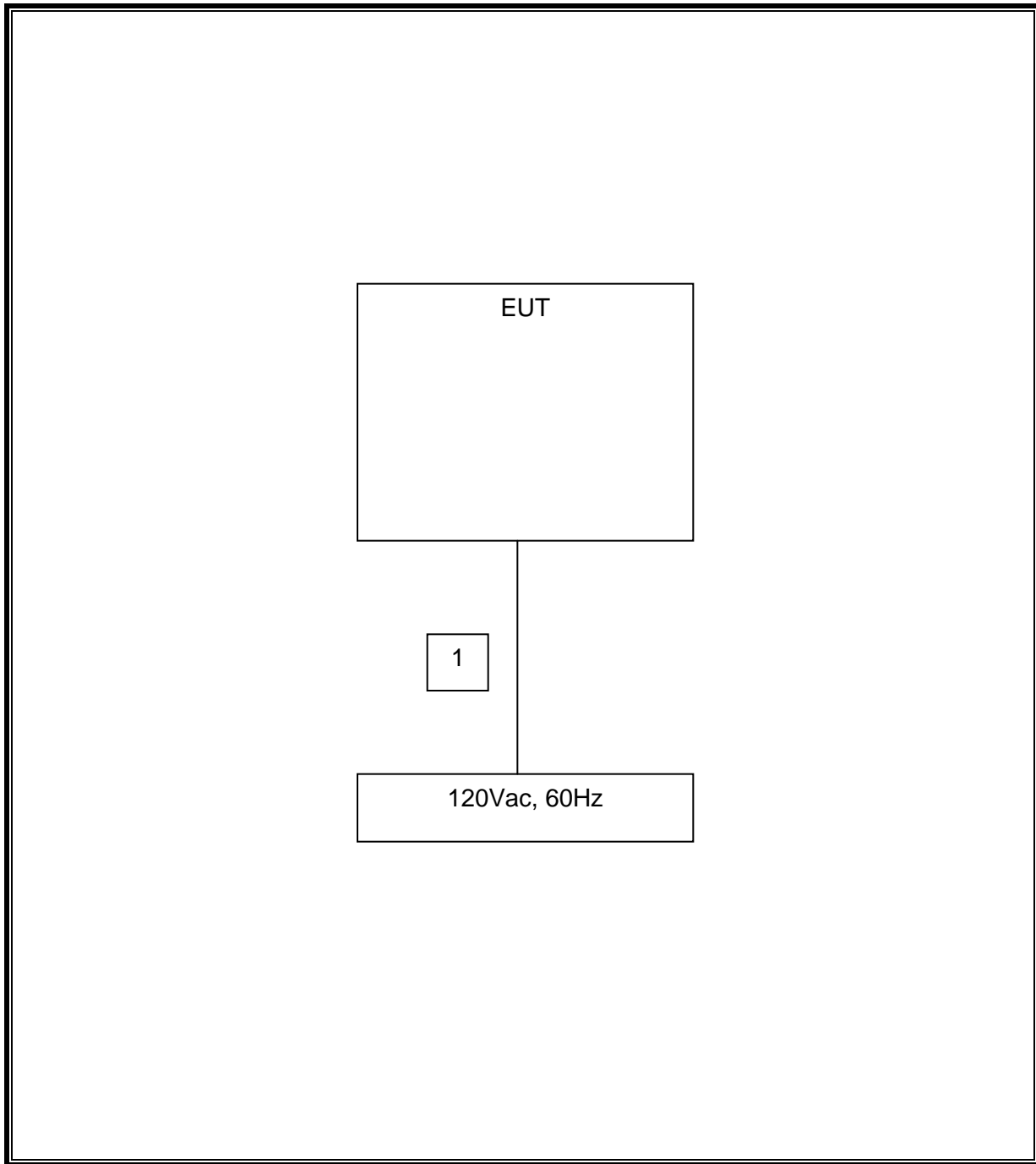
### I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	DC Power	1	AC/DC Adpater	Unshielded	1.8m	None

### TEST SETUP

The EUT was placed on a non-metallic support and mounted in a normal orientation.

**SETUP DIAGRAM FOR TESTS**





## 6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

### Radiated Emissions - 10-Meter Chamber

Test Equipment Used – Radiated Emissions					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
60Hz-30MHz					
EMI Receiver	Rohde & Schwarz	ESIB40	34968	2011-03-01	2012-03-01
Active Loop Antenna	EMCO	6507	ME5A-288	2010-10-19	2011-10-19
Switch Driver	HP	11713A	ME7A-627	N/A	N/A
System Controller	Sunol Sciences	SC99V	44396	N/A	N/A
Camera Controller	Panasonic	WV-CU254	44395	N/A	N/A
RF Switch Box	UL	1	44398	N/A	N/A
Measurement Software	UL	Version 9.3	44740	N/A	N/A
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268	2010-12-07	2012-12-07
Multimeter	Fluke	87V	64386	2011-02-02	2012-02-29
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
30-1000MHz					
EMI Receiver	Rohde & Schwarz	ESIB40	34968	2011-03-01	2012-03-01
Bicon Antenna	Schaffner	VBA6106A	54	2011-04-05	2012-04-05
Log-P Antenna	Schaffner	UPA6109	44067	2011-04-29	2012-04-29
Switch Driver	HP	11713A	ME7A-627	N/A	N/A
System Controller	Sunol Sciences	SC99V	44396	N/A	N/A
Camera Controller	Panasonic	WV-CU254	44395	N/A	N/A
RF Switch Box	UL	1	44398	N/A	N/A
Measurement Software	UL	Version 9.5	44740	N/A	N/A
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268	2010-12-07	2012-12-07
Multimeter	Fluke	87V	64386	2011-02-02	2012-02-29

Conducted Emissions / Occupied Bandwidth – Ground Plane 1

Test Equipment Used – Conducted Emissions					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
Conducted Emissions / Occupied Bandwidth – GP 1					
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081	2011-01-27	2012-01-31
LISN	Solar	9252-50-R-24-BNC	ME5A-636	2011-02-04	2012-02-28
Switch Driver	HP	11713A	44397	N/A	N/A
RF Switch Box	UL	4	44404	N/A	N/A
Measurement Software	UL	Version 9.5	44736	N/A	N/A
Active Loop Antenna	EMCO	6507	ME5A-288	2010-10-19	2011-10-19
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	43734	2010-03-08	2012-03-08
Multimeter	Fluke	87V	64386	2011-02-02	2012-02-29

## 7. RADIATED EMISSION TEST RESULTS

### 7.1. LIMITS AND PROCEDURE

#### LIMITS

FCC §15.209 (a)

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (m)
0.009–0.490	2400/F(kHz)	300
0.490–1.705	24000/F(kHz)	30
1.705–30.0	30	30
30–88	100	3
88 to 216	150	3
216 to 960	200	3
Above 960 MHz	500	3
Note: The lower limit shall apply at the transition frequency.		

#### TEST PROCEDURE

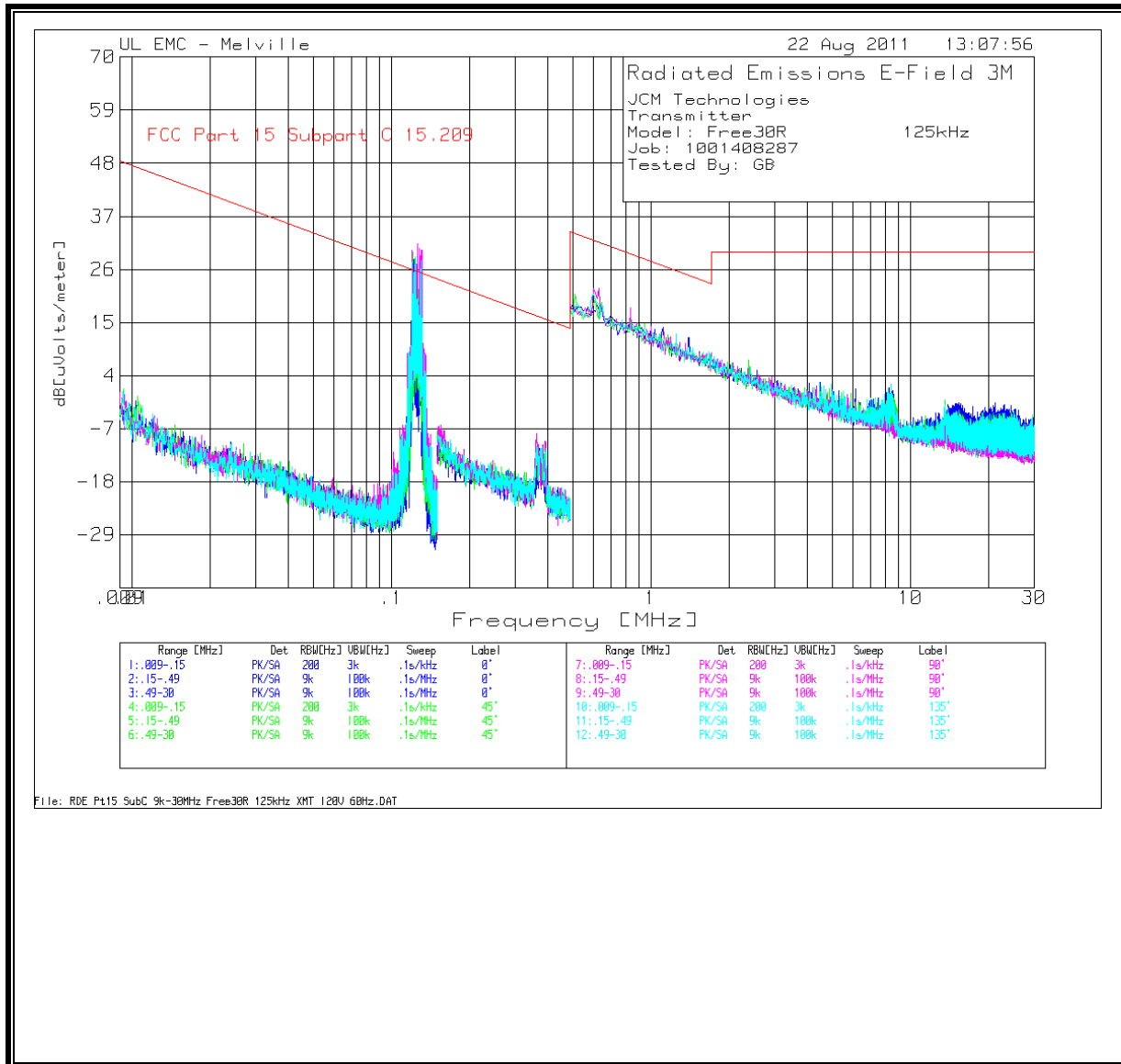
ANSI C63.4

The EUT is an intentional radiator that incorporates a digital device, the highest fundamental frequency generated or used in the device is 108 MHz, while the highest frequency generated or used in the device is 4 MHz; therefore testing was conducted to 1000 MHz.

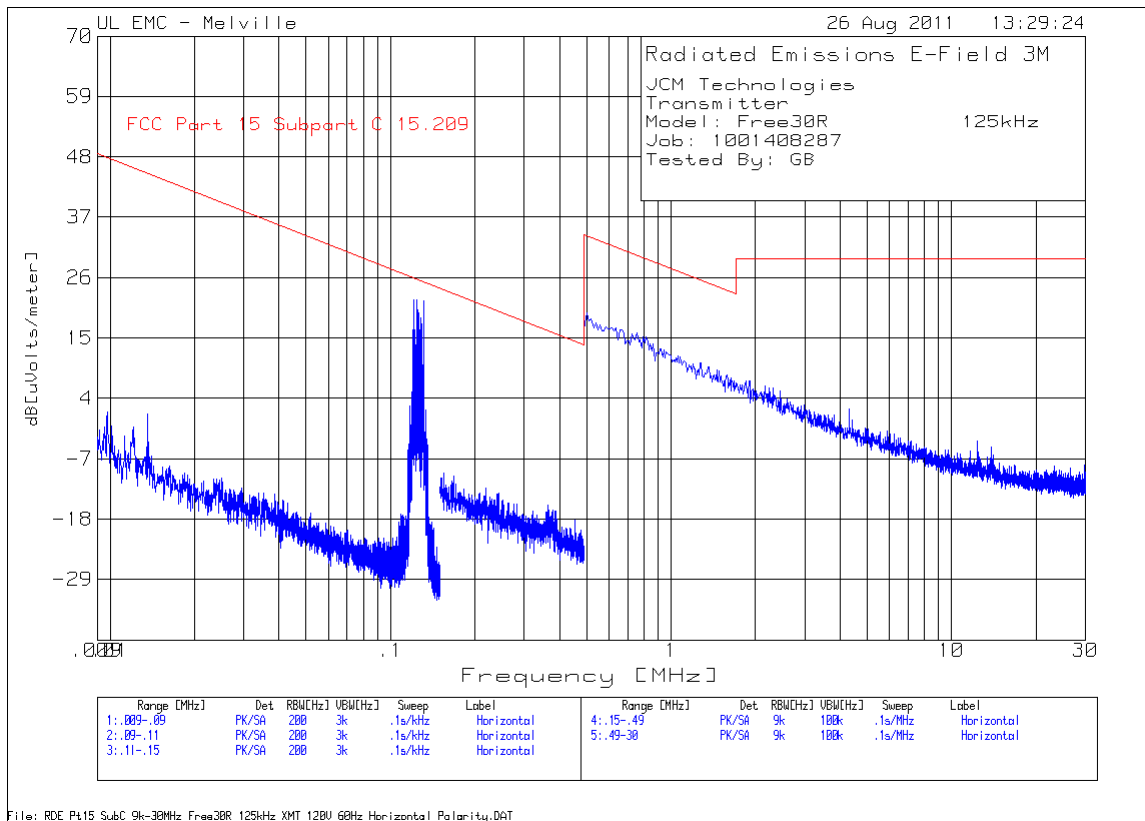
#### RESULTS

No non-compliance noted:

## 7.2. TX SPURIOUS EMISSIONS 0.15 TO 30 MHz

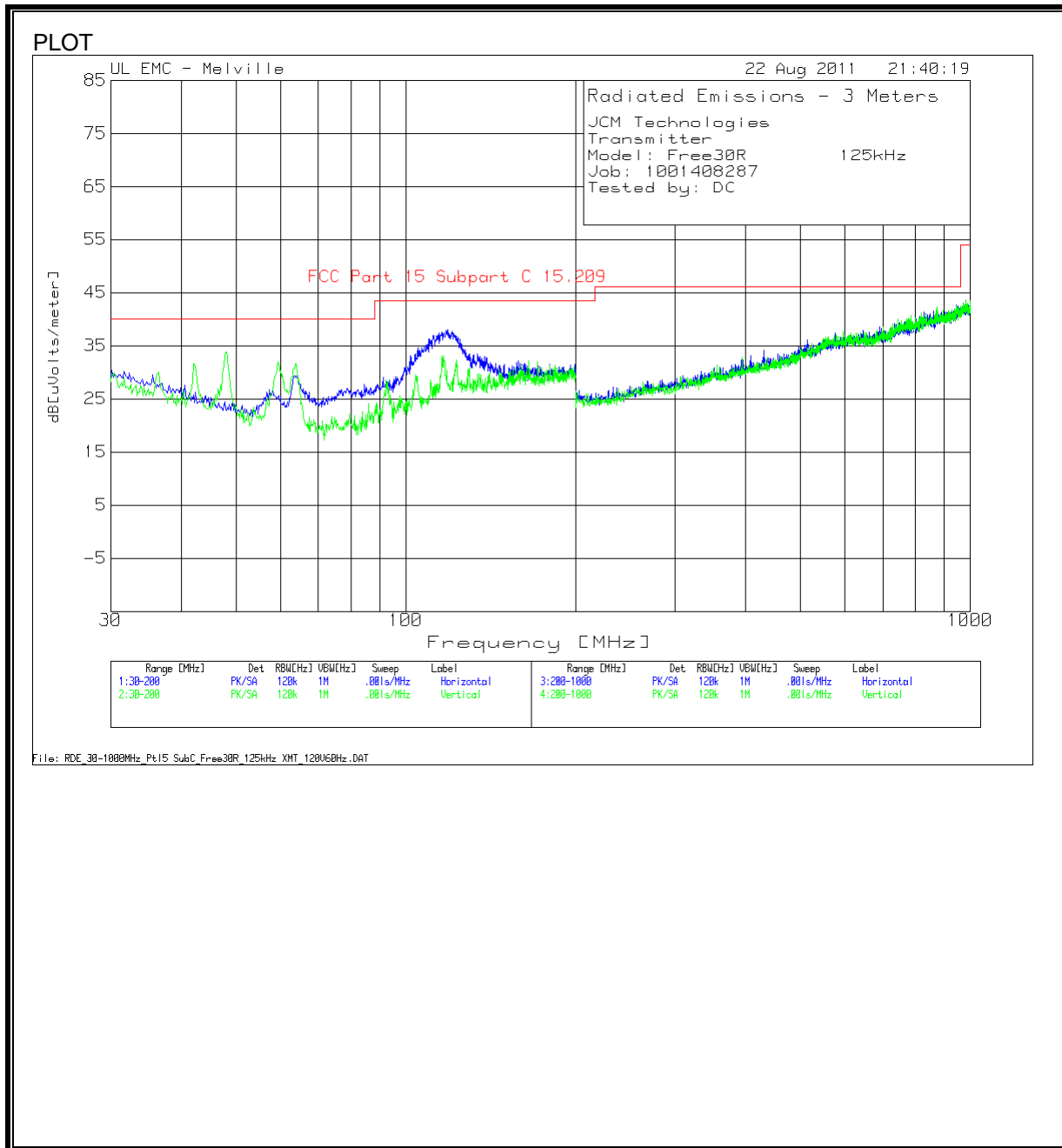


JCM Technologies											
Transmitter											
Model: Free30R		125kHz									
Job: 1001408287											
Tested By: GB											
Test Frequency	Meter Reading	Detector	ME5A-288 6507 EFlid 19Oct11 [dB]	3MLoc 9kHz-30MHz 03Feb12 [dB]	300M to 3M Offset [dB]	dB[uVolts/meter]	FCC Part 15.209 Subpart C	Margin	Azimuth [Degs]	Height [cm]	Polarity
0° .009 - .15MHz											
0.125	61.44	Av	17.5	0.1	-80	-0.96	25.7	-26.66	279	100	Horz
0.12303	72.12	Av	17.5	0.1	-80	9.72	25.8	-16.08	67	101	Horz
0.12173	85.8	Av	17.5	0.1	-80	23.4	25.9	-2.5	70	108	Horz
0.12286	54.43	Av	17.5	0.1	-80	-7.97	25.8	-33.77	360	108	Horz
0.12348	66.55	Av	17.5	0.1	-80	4.15	25.8	-21.65	139	108	Horz
0.12551	72.21	Av	17.5	0.1	-80	9.81	25.6	-15.79	100	108	Horz
0.12783	72.96	Av	17.5	0.1	-80	10.56	25.5	-14.94	252	108	Horz
0.129	74.98	Av	17.5	0.1	-80	12.58	25.4	-12.82	251	108	Horz
0° .49 - 30MHz											
0.498	38.16	QP	16.9	0.1	-40	15.16	33.7	-18.54	359	101	Horz
45° .009 - .15MHz											
0.125	59.58	Av	17.5	0.1	-80	-2.82	25.7	-28.52	277	115	Horz
0.121	57.68	Av	17.5	0.1	-80	-4.72	25.9	-30.62	256	119	Horz
0.122	72.84	Av	17.5	0.1	-80	10.44	25.9	-15.46	275	119	Horz
0.1232	70.57	Av	17.5	0.1	-80	8.17	25.8	-17.63	30	119	Horz
0.12659	67.02	Av	17.5	0.1	-80	4.62	25.5	-20.88	15	119	Horz
0.12825	68.99	Av	17.5	0.1	-80	6.59	25.4	-18.81	17	119	Horz
0.12946	71.41	Av	17.5	0.1	-80	9.01	25.4	-16.39	246	119	Horz
0.1307	72.91	Av	17.4	0.1	-80	10.41	25.3	-14.89	11	119	Horz
45° .49 - 30MHz											
0.49	-8.47	Av	16.9	0.1	-40	-31.47	13.8	-45.27	140	119	Horz
15.245	-0.96	QP	17.6	0.4	-40	-22.96	29.5	-52.46	354	124	Horz
90° .009 - .15MHz											
0.125	72.12	Av	17.5	0.1	-80	9.72	25.7	-15.98	65	128	Horz
0.11976	73.64	Av	17.5	0.1	-80	11.24	26	-14.76	238	128	Horz
0.12044	74.23	Av	17.5	0.1	-80	11.83	26	-14.17	0	128	Horz
0.12117	72.75	Av	17.5	0.1	-80	10.35	25.9	-15.55	0	128	Horz
0.12235	73.87	Av	17.5	0.1	-80	11.47	25.8	-14.33	60	143	Horz
0.12422	77.17	Av	17.5	0.1	-80	14.77	25.7	-10.93	164	143	Horz
0.12608	79.19	Av	17.5	0.1	-80	16.79	25.6	-8.81	354	143	Horz
0.12777	78.99	Av	17.5	0.1	-80	16.59	25.5	-8.91	1	143	Horz
0.12856	75.81	Av	17.5	0.1	-80	13.41	25.4	-11.99	329	143	Horz
0.13008	77.62	Av	17.4	0.1	-80	15.12	25.3	-10.18	19	143	Horz
0.13082	72.89	Av	17.4	0.1	-80	10.39	25.3	-14.91	222	143	Horz
90° .49 - 30MHz											
0.5395	1.67	QP	16.9	0.1	-40	-21.33	33	-54.33	354	143	Horz
135° .009 - .15MHz											
0.125	33.73	Av	17.5	0.1	-80	-28.67	25.7	-54.37	162	145	Horz
0.11968	17.56	Av	17.5	0.1	-80	-44.84	26	-70.84	22	156	Horz
0.11968	20.64	Av	17.5	0.1	-80	-41.76	26	-67.76	22	156	Horz
0.11968	47.56	PK	17.5	0.1	-80	-14.84	26	-40.84	22	156	Horz
0.12172	22.28	Av	17.5	0.1	-80	-40.12	25.9	-66.02	325	156	Horz
0.12172	22.52	Av	17.5	0.1	-80	-39.88	25.9	-65.78	325	156	Horz
0.12343	22.41	Av	17.5	0.1	-80	-39.99	25.8	-65.79	157	156	Horz
0.12903	64.57	Av	17.5	0.1	-80	2.17	25.4	-23.23	10	156	Horz
0.1302	19.78	Av	17.4	0.1	-80	-42.72	25.3	-68.02	174	156	Horz
135° .49 - 30MHz											
0.49988	1.28	QP	16.9	0.1	-40	-21.72	33.6	-55.32	60	156	Horz
PK - Peak detector											
QP - Quasi-Peak detector											
LnAv - Linear Average detector											
LgAv - Log Average detector											
Av - Average detector											
CAV - CISPR Average detector											
RMS - RMS detection											
CRMS - CISPR RMS detection											



JCM Technologies									
Transmitter									
Model: Free30R 125kHz									
Job: 1001408287									
Tested By: GB									
Horizontal .11 - .15MHz									
Test	Meter		ME5A- 288 6507 EFId 19Oct11	3MLoc 9kHz- 30MHz 03Feb12	300M to 3M Offset	dB[uVolts /meter]	FCC Part 15 Subpart C 15.209	Margin	Azimuth [Degs]
Frequency	Reading	Detector	[dB]	[dB]	[dB]				
0.12	83.27	Av	17.5	0.1	-80	20.87	26	-5.13	217
0.13075	67.45	Av	17.4	0.1	-80	4.95	25.3	-20.35	40
0.12388	69.52	Av	17.5	0.1	-80	7.12	25.7	-18.58	40
0.1254	68.53	Av	17.5	0.1	-80	6.13	25.6	-19.47	40
0.12598	70.49	Av	17.5	0.1	-80	8.09	25.6	-17.51	40
PK - Peak detector									
QP - Quasi-Peak detector									
LnAv - Linear Average detector									
LgAv - Log Average detector									
Av - Average detector									
CAV - CISPR Average detector									
RMS - RMS detection									
CRMS - CISPR RMS detection									

### 7.3. TX SPURIOUS EMISSION 30 TO 1000 MHz





DATA

JCM Technologies										
Transmitter										
Model: Free30R 125kHz										
Job: 1001408287										
Tested by: DC										
Horizontal 30 - 200MHz										
Test	Meter		3M Bicon	3MLoc 30-		FCC Part				
Frequency	Reading	Detector	54 Horz	1000MHz	dB[uVolts/	Subpart C	Margin	Azimuth	Height	Polarity
			05Apr12	02Feb12	meter]	15.209		[Degs]	[cm]	
63.5235	22.67	PK	5.9	0.8	29.37	40	-10.63	295	300	Horz
111.8519	23.76	PK	12.1	1.1	36.96	43.5	-6.54	113	300	Horz
117.978	24	PK	12.8	1.1	37.9	43.5	-5.6	358	300	Horz
123.7638	22	PK	13.4	1.2	36.6	43.5	-6.9	205	300	Horz
Vertical 30 - 200MHz										
42.0821	18.75	PK	12.2	0.7	31.65	40	-8.35	300	100	Vert
48.2082	22.94	PK	10.2	0.7	33.84	40	-6.16	149	100	Vert
59.4394	24.37	PK	6.9	0.7	31.97	40	-8.03	300	100	Vert
63.6937	24.91	PK	6	0.8	31.71	40	-8.29	89	100	Vert
116.6166	18.62	PK	13.4	1.1	33.12	43.5	-10.38	118	100	Vert
Horizontal 30 - 200MHz										
116.6325	16.32	QP	12.6	1.1	30.02	43.5	-13.48	16	263	Horz
Vertical 30 - 200MHz										
46.6269	12.53	QP	10.5	0.7	23.73	40	-16.27	230	100	Vert
Horizontal 200 - 1000MHz										
946.3075	9.15	QP	23.8	3.6	36.55	46	-9.45	336	144	Horz
Vertical 200 - 1000MHz										
875.3636	8.94	QP	23.3	3.4	35.64	46	-10.36	319	356	Vert
PK - Peak detector										
QP - Quasi-Peak detector										
LnAv - Linear Average detector										
LgAv - Log Average detector										
Av - Average detector										
CAV - CISPR Average detector										
RMS - RMS detection										
CRMS - CISPR RMS detection										

## 8. AC MAINS LINE CONDUCTED EMISSIONS

### LIMITS

§15.207 (a)

Frequency of emission (MHz)	Conducted Limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

\* Decreases with the logarithm of the frequency.

### TEST PROCEDURE

ANSI C63.4

### RESULTS

No non-compliance noted:

**CONDUCTED EMISSIONS**

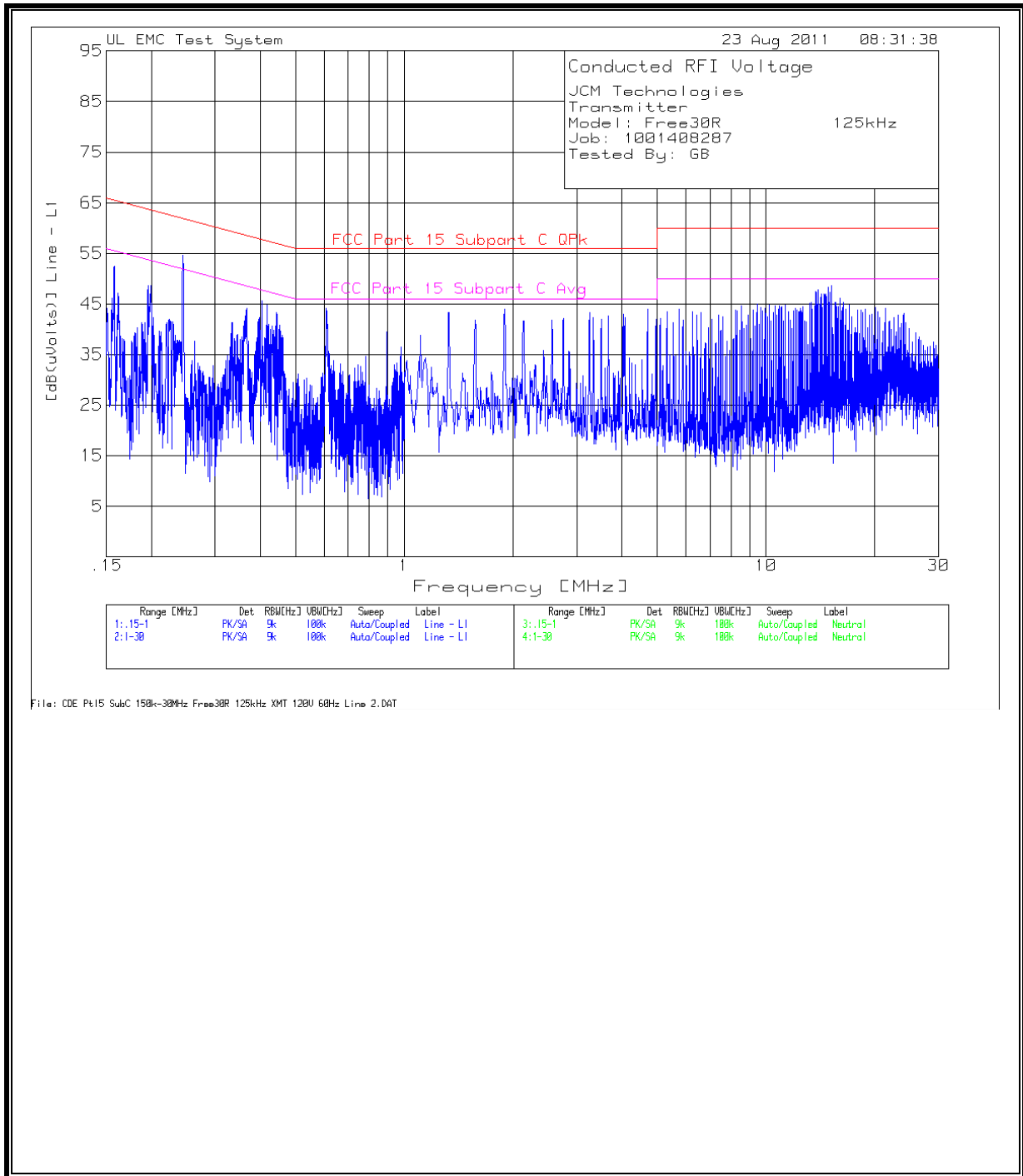
JCM Technologies											
Transmitter											
Model: Free30R		125kHz									
Job: 1001408287											
Tested By: GB											
Line - L1.15 - 1MHz											
Test Frequency	Meter Reading	Detector	5A636 with TI and Sw Line 1 [dB]	[dB(uVolts)]	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin			
0.15765	41.02	PK	11.5	52.52	65.6	-13.08	55.6	-3.08			
0.19557	37.47	PK	11.2	48.67	63.8	-15.13	53.8	-5.13			
0.2442	43.66	PK	10.9	54.56	62	-7.44	52	2.56			
0.36679	33.52	PK	10.6	44.12	58.6	-14.48	48.6	-4.48			
0.40471	34.98	PK	10.6	45.58	57.8	-12.22	47.8	-2.22			
0.41729	34.11	PK	10.6	44.71	57.5	-12.79	47.5	-2.79			
0.44382	32.85	PK	10.5	43.35	57	-13.65	47	-3.65			
0.60901	33.54	PK	10.5	44.04	56	-11.96	46	-1.96			
Line - L1 1 - 30MHz											
1.32487	32.93	PK	10.4	43.33	56	-12.67	46	-2.67			
1.89338	33.51	PK	10.4	43.91	56	-12.09	46	-2.09			
2.75195	31.7	PK	10.4	42.1	56	-13.9	46	-3.9			
3.25085	32.86	PK	10.4	43.26	56	-12.74	46	-2.74			
3.5061	31.55	PK	10.4	41.95	56	-14.05	46	-4.05			
3.66273	32.29	PK	10.4	42.69	56	-13.31	46	-3.31			
4.02821	32.58	PK	10.4	42.98	56	-13.02	46	-3.02			
4.71274	33.57	PK	10.4	43.97	56	-12.03	46	-2.03			
4.06881	31.84	PK	10.4	42.24	56	-13.76	46	-3.76			
4.96219	31.48	PK	10.4	41.88	56	-14.12	46	-4.12			
5.75115	33.54	PK	10.4	43.94	60	-16.06	50	-6.06			
8.57051	34.07	PK	10.5	44.57	60	-15.43	50	-5.43			
9.44649	34.49	PK	10.5	44.99	60	-15.01	50	-5.01			
9.69594	33.82	PK	10.5	44.32	60	-15.68	50	-5.68			
9.95699	33.69	PK	10.5	44.19	60	-15.81	50	-5.81			
10.20644	34.25	PK	10.5	44.75	60	-15.25	50	-5.25			
10.60092	34.07	PK	10.5	44.57	60	-15.43	50	-5.43			
10.85617	34.1	PK	10.6	44.7	60	-15.3	50	-5.3			
11.04181	33.89	PK	10.6	44.49	60	-15.51	50	-5.51			
11.27966	34.19	PK	10.6	44.79	60	-15.21	50	-5.21			
12.67193	33.83	PK	10.6	44.43	60	-15.57	50	-5.57			
13.18824	34.49	PK	10.6	45.09	60	-14.91	50	-4.91			
13.32166	34.64	PK	10.6	45.24	60	-14.76	50	-4.76			
13.74515	36.67	PK	10.6	47.27	60	-12.73	50	-2.73			
13.61752	34.01	PK	10.6	44.61	60	-15.39	50	-5.39			
13.95979	37.23	PK	10.6	47.83	60	-12.17	50	-2.17			
14.19764	36.28	PK	10.6	46.88	60	-13.12	50	-3.12			
14.45289	36.4	PK	10.6	47	60	-13	50	-3			
14.58052	36.33	PK	10.6	46.93	60	-13.07	50	-3.07			
14.70234	35.84	PK	10.6	46.44	60	-13.56	50	-3.56			
14.82997	37.52	PK	10.7	48.22	60	-11.78	50	-1.78			
14.95179	34.59	PK	10.7	45.29	60	-14.71	50	-4.71			
15.03301	36.55	PK	10.7	47.25	60	-12.75	50	-2.75			
15.15483	36.88	PK	10.7	47.58	60	-12.42	50	-2.42			
15.54931	34.54	PK	10.7	45.24	60	-14.76	50	-4.76			
PK - Peak detector											
QP - Quasi-Peak detector											
LnAv - Linear Average detector											
LgAv - Log Average detector											
Av - Average detector											
CAV - CISPR Average detector											
RMS - RMS detection											
CRMS - CISPR RMS detection											

JCM Technologies									
Transmitter									
Model: Free30R		125kHz							
Job: 1001408287									
Tested By: GB									
Line - L1 .15 - 1MHz									
Test Frequency	Meter Reading	Detector	5A636 with TI and Sw Line 1 [dB]	[dB(uVolts)]	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin	
0.15776	29.99	Av	11.5	41.49	65.58	-24.09	55.58	-14.09	
0.19578	29.34	Av	11.2	40.54	63.79	-23.25	53.79	-13.25	
0.24388	22.28	Av	10.9	33.18	61.96	-28.78	51.96	-18.78	
0.36702	24.55	Av	10.6	35.15	58.57	-23.42	48.57	-13.42	
0.40478	24.71	Av	10.6	35.31	57.75	-22.44	47.75	-12.44	
0.41699	25.13	Av	10.6	35.73	57.51	-21.78	47.51	-11.78	
0.44375	22.64	Av	10.5	33.14	56.99	-23.85	46.99	-13.85	
0.60909	20.63	Av	10.5	31.13	56	-24.87	46	-14.87	
Line - L1 1 - 30MHz									
1.32476	17.77	Av	10.4	28.17	56	-27.83	46	-17.83	
1.89405	19	Av	10.4	29.4	56	-26.6	46	-16.6	
2.75232	17.25	Av	10.4	27.65	56	-28.35	46	-18.35	
3.25134	17.47	Av	10.4	27.87	56	-28.13	46	-18.13	
3.50641	20.3	Av	10.4	30.7	56	-25.3	46	-15.3	
3.6634	16.68	Av	10.4	27.08	56	-28.92	46	-18.92	
4.02752	11.73	Av	10.4	22.13	56	-33.87	46	-23.87	
4.71269	22	Av	10.4	32.4	56	-23.6	46	-13.6	
4.06953	15.15	Av	10.4	25.55	56	-30.45	46	-20.45	
4.96178	18.6	Av	10.4	29	56	-27	46	-17	
5.75144	16.27	Av	10.4	26.67	60	-33.33	50	-23.33	
8.57034	18.73	Av	10.5	29.23	60	-30.77	50	-20.77	
9.44678	19.05	Av	10.5	29.55	60	-30.45	50	-20.45	
9.69555	19.91	Av	10.5	30.41	60	-29.59	50	-19.59	
9.95704	23.22	Av	10.5	33.72	60	-26.28	50	-16.28	
10.2069	22.92	Av	10.5	33.42	60	-26.58	50	-16.58	
10.6009	10.73	Av	10.5	21.23	60	-38.77	50	-28.77	
10.8561	22.99	Av	10.6	33.59	60	-26.41	50	-16.41	
11.0412	17.46	Av	10.6	28.06	60	-31.94	50	-21.94	
11.2797	22.55	Av	10.6	33.15	60	-26.85	50	-16.85	
12.672	21.94	Av	10.6	32.54	60	-27.46	50	-17.46	
13.1888	21.57	Av	10.6	32.17	60	-27.83	50	-17.83	
13.3218	25.01	Av	10.6	35.61	60	-24.39	50	-14.39	
13.7454	23.79	Av	10.6	34.39	60	-25.61	50	-15.61	
13.6178	23.05	Av	10.6	33.65	60	-26.35	50	-16.35	
13.9598	21.48	Av	10.6	32.08	60	-27.92	50	-17.92	
14.1975	22.14	Av	10.6	32.74	60	-27.26	50	-17.26	
14.4523	26.45	Av	10.6	37.05	60	-22.95	50	-12.95	
14.5799	21.53	Av	10.6	32.13	60	-27.87	50	-17.87	
14.7017	27.81	Av	10.6	38.41	60	-21.59	50	-11.59	
14.8296	22.61	Av	10.7	33.31	60	-26.69	50	-16.69	
14.9524	21.69	Av	10.7	32.39	60	-27.61	50	-17.61	
15.0324	27.71	Av	10.7	38.41	60	-21.59	50	-11.59	
15.1543	24.21	Av	10.7	34.91	60	-25.09	50	-15.09	
15.5497	25.71	Av	10.7	36.41	60	-23.59	50	-13.59	
PK - Peak detector									
QP - Quasi-Peak detector									
LnAv - Linear Average detector									
LgAv - Log Average detector									
Av - Average detector									
CAV - CISPR Average detector									
RMS - RMS detection									
CRMS - CISPR RMS detection									

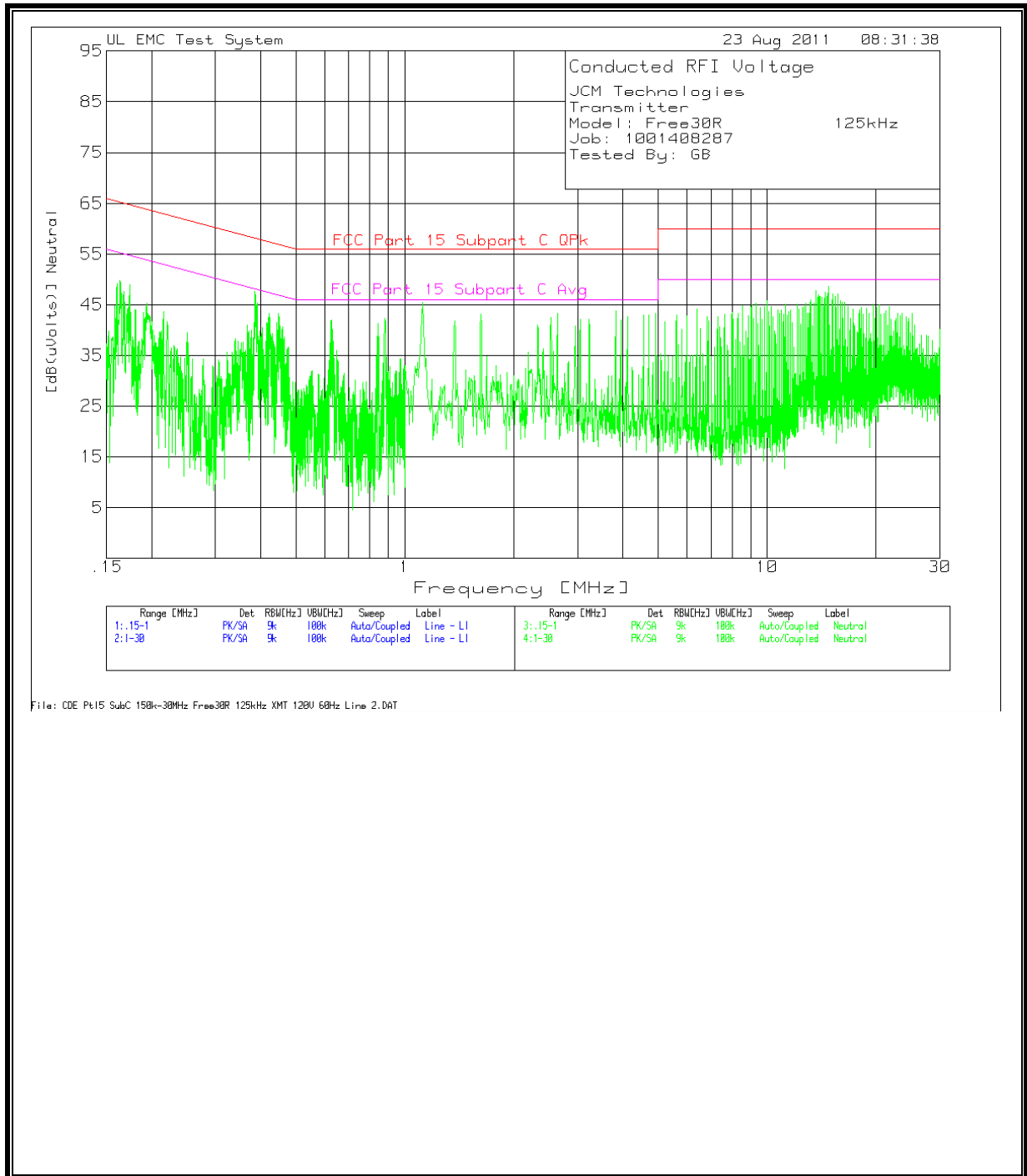
JCM Technologies Transmitter									
Model: Free30R		125kHz							
Job: 1001408287									
Tested By: GB									
Neutral .15 - 1MHz									
Test Frequency	Meter Reading	Detector	5A636 with TI and Sw Line 2 [dB]	[dB(uVolts)]	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin	
0.38599	25.95	PK	10.6	36.55	58.15	-21.6	48.15	-11.6	
0.42192	25.49	PK	10.6	36.09	57.41	-21.32	47.41	-11.32	
0.44765	22.37	PK	10.5	32.87	56.92	-24.05	46.92	-14.05	
0.626	22.76	PK	10.5	33.26	56	-22.74	46	-12.74	
0.87936	21.4	PK	10.4	31.8	56	-24.2	46	-14.2	
Neutral 1 - 30MHz									
1.12177	21.04	PK	10.4	31.44	56	-24.56	46	-14.56	
1.37088	19.56	PK	10.4	29.96	56	-26.04	46	-16.04	
1.62035	17.49	PK	10.4	27.89	56	-28.11	46	-18.11	
2.51993	19.15	PK	10.4	29.55	56	-26.45	46	-16.45	
2.64106	17.72	PK	10.4	28.12	56	-27.88	46	-17.88	
3.04139	16.67	PK	10.4	27.07	56	-28.93	46	-18.93	
4.56249	15.35	PK	10.4	25.75	56	-30.25	46	-20.25	
4.71209	18.7	PK	10.4	29.1	56	-26.9	46	-16.9	
4.93266	17.19	PK	10.4	27.59	56	-28.41	46	-18.41	
3.94721	18.2	PK	10.4	28.6	56	-27.4	46	-17.4	
4.12078	7.98	PK	10.4	18.38	56	-37.62	46	-27.62	
3.82457	17.07	PK	10.4	27.47	56	-28.53	46	-18.53	
2.96152	14.95	PK	10.4	25.35	56	-30.65	46	-20.65	
6.38983	17.25	PK	10.5	27.75	60	-32.25	50	-22.25	
7.99562	17.29	PK	10.5	27.79	60	-32.21	50	-22.21	
8.30305	16.67	PK	10.5	27.17	60	-32.83	50	-22.83	
8.55812	18.51	PK	10.5	29.01	60	-30.99	50	-20.99	
9.04605	-5.41	PK	10.6	5.19	60	-54.81	50	-44.81	
9.30665	20.95	PK	10.6	31.55	60	-28.45	50	-18.45	
9.56207	22.83	PK	10.6	33.43	60	-26.57	50	-16.57	
9.83549	20.53	PK	10.6	31.13	60	-28.87	50	-18.87	
9.98623	21.22	PK	10.6	31.82	60	-28.18	50	-18.18	
10.2465	22.06	PK	10.6	32.66	60	-27.34	50	-17.34	
10.7	20.64	PK	10.6	31.24	60	-28.76	50	-18.76	
19.6037	21.32	PK	10.9	32.22	60	-27.78	50	-17.78	
10.9485	22.47	PK	10.6	33.07	60	-26.93	50	-16.93	
11.216	23.66	PK	10.6	34.26	60	-25.74	50	-15.74	
12.1376	19.17	PK	10.6	29.77	60	-30.23	50	-20.23	
12.777	17.88	PK	10.7	28.58	60	-31.42	50	-21.42	
12.4926	19.93	PK	10.7	30.63	60	-29.37	50	-19.37	
13.1078	15.97	PK	10.7	26.67	60	-33.33	50	-23.33	
13.2226	21.23	PK	10.7	31.93	60	-28.07	50	-18.07	
13.5073	22.3	PK	10.7	33	60	-27	50	-17	
15.4045	20.85	PK	10.7	31.55	60	-28.45	50	-18.45	
13.769	18.2	PK	10.7	28.9	60	-31.1	50	-21.1	
20.3753	19.82	PK	11	30.82	60	-29.18	50	-19.18	
15.6708	24.51	PK	10.7	35.21	60	-24.79	50	-14.79	
14.157	26.51	PK	10.7	37.21	60	-22.79	50	-12.79	
14.3536	25.5	PK	10.7	36.2	60	-23.8	50	-13.8	
14.4876	20.67	PK	10.7	31.37	60	-28.63	50	-18.63	
15.9318	20.6	PK	10.7	31.3	60	-28.7	50	-18.7	
14.7372	21.54	PK	10.7	32.24	60	-27.76	50	-17.76	
15.0905	19.74	PK	10.7	30.44	60	-29.56	50	-19.56	
15.213	22.94	PK	10.7	33.64	60	-26.36	50	-16.36	
16.1066	15.49	PK	10.7	26.19	60	-33.81	50	-23.81	
PK - Peak detector									
QP - Quasi-Peak detector									
LnAv - Linear Average detector									
LgAv - Log Average detector									
Av - Average detector									
CAV - CISPR Average detector									
RMS - RMS detection									
CRMS - CISPR RMS detection									

JCM Technologies									
Transmitter									
Model: Free30R 125kHz									
Job: 1001408287									
Tested By: GB									
Neutral .15 - 1MHz									
Test Frequency	Meter Reading	Detector	5A636 with TI and Sw Line 2 [dB]	[dB(uVolts)]	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin	
0.38599	25.95	Av	10.6	36.55	58.15	-21.6	48.15	-11.6	
0.42192	25.49	Av	10.6	36.09	57.41	-21.32	47.41	-11.32	
0.44765	22.37	Av	10.5	32.87	56.92	-24.05	46.92	-14.05	
0.626	22.76	Av	10.5	33.26	56	-22.74	46	-12.74	
0.87936	21.4	Av	10.4	31.8	56	-24.2	46	-14.2	
Neutral 1 - 30MHz									
1.12177	21.04	Av	10.4	31.44	56	-24.56	46	-14.56	
1.37088	19.56	Av	10.4	29.96	56	-26.04	46	-16.04	
1.62035	17.49	Av	10.4	27.89	56	-28.11	46	-18.11	
2.51993	19.15	Av	10.4	29.55	56	-26.45	46	-16.45	
2.64106	17.72	Av	10.4	28.12	56	-27.88	46	-17.88	
3.04139	16.67	Av	10.4	27.07	56	-28.93	46	-18.93	
4.56249	15.35	Av	10.4	25.75	56	-30.25	46	-20.25	
4.71209	18.7	Av	10.4	29.1	56	-26.9	46	-16.9	
4.93266	17.19	Av	10.4	27.59	56	-28.41	46	-18.41	
3.94721	18.2	Av	10.4	28.6	56	-27.4	46	-17.4	
4.12078	7.98	Av	10.4	18.38	56	-37.62	46	-27.62	
3.82457	17.07	Av	10.4	27.47	56	-28.53	46	-18.53	
2.96152	14.95	Av	10.4	25.35	56	-30.65	46	-20.65	
6.38983	17.25	Av	10.5	27.75	60	-32.25	50	-22.25	
7.99562	17.29	Av	10.5	27.79	60	-32.21	50	-22.21	
8.30305	16.67	Av	10.5	27.17	60	-32.83	50	-22.83	
8.55812	18.51	Av	10.5	29.01	60	-30.99	50	-20.99	
9.04605	-5.41	Av	10.6	5.19	60	-54.81	50	-44.81	
9.30665	20.95	Av	10.6	31.55	60	-28.45	50	-18.45	
9.56207	22.83	Av	10.6	33.43	60	-26.57	50	-16.57	
9.83549	20.53	Av	10.6	31.13	60	-28.87	50	-18.87	
9.98623	21.22	Av	10.6	31.82	60	-28.18	50	-18.18	
10.2465	22.06	Av	10.6	32.66	60	-27.34	50	-17.34	
10.7	20.64	Av	10.6	31.24	60	-28.76	50	-18.76	
19.6037	21.32	Av	10.9	32.22	60	-27.78	50	-17.78	
10.9485	22.47	Av	10.6	33.07	60	-26.93	50	-16.93	
11.216	23.66	Av	10.6	34.26	60	-25.74	50	-15.74	
12.1376	19.17	Av	10.6	29.77	60	-30.23	50	-20.23	
12.777	17.88	Av	10.7	28.58	60	-31.42	50	-21.42	
12.4926	19.93	Av	10.7	30.63	60	-29.37	50	-19.37	
13.1078	15.97	Av	10.7	26.67	60	-33.33	50	-23.33	
13.2226	21.23	Av	10.7	31.93	60	-28.07	50	-18.07	
13.5073	22.3	Av	10.7	33	60	-27	50	-17	
15.4045	20.85	Av	10.7	31.55	60	-28.45	50	-18.45	
13.769	18.2	Av	10.7	28.9	60	-31.1	50	-21.1	
20.3753	19.82	Av	11	30.82	60	-29.18	50	-19.18	
15.6708	24.51	Av	10.7	35.21	60	-24.79	50	-14.79	
14.157	26.51	Av	10.7	37.21	60	-22.79	50	-12.79	
14.3536	25.5	Av	10.7	36.2	60	-23.8	50	-13.8	
14.4876	20.67	Av	10.7	31.37	60	-28.63	50	-18.63	
15.9318	20.6	Av	10.7	31.3	60	-28.7	50	-18.7	
14.7372	21.54	Av	10.7	32.24	60	-27.76	50	-17.76	
15.0905	19.74	Av	10.7	30.44	60	-29.56	50	-19.56	
15.213	22.94	Av	10.7	33.64	60	-26.36	50	-16.36	
16.1066	15.49	Av	10.7	26.19	60	-33.81	50	-23.81	
PK - Peak detector									
QP - Quasi-Peak detector									
LnAv - Linear Average detector									
LgAv - Log Average detector									
Av - Average detector									
CAV - CISPR Average detector									
RMS - RMS detection									
CRMS - CISPR RMS detection									

LINE 1 RESULTS



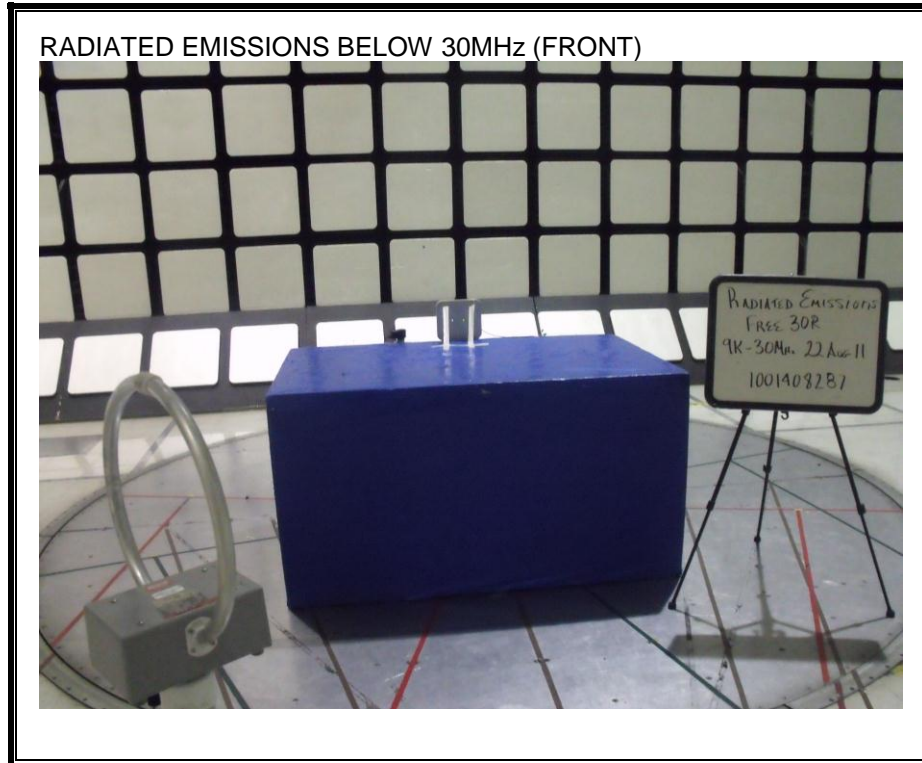
**LINE 2 RESULTS**

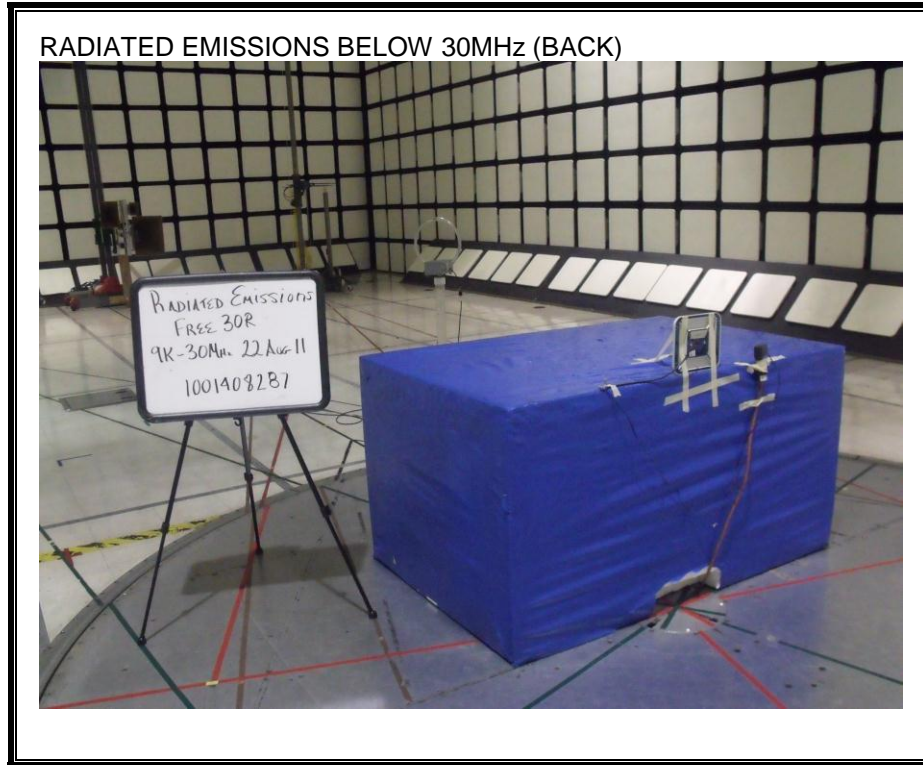




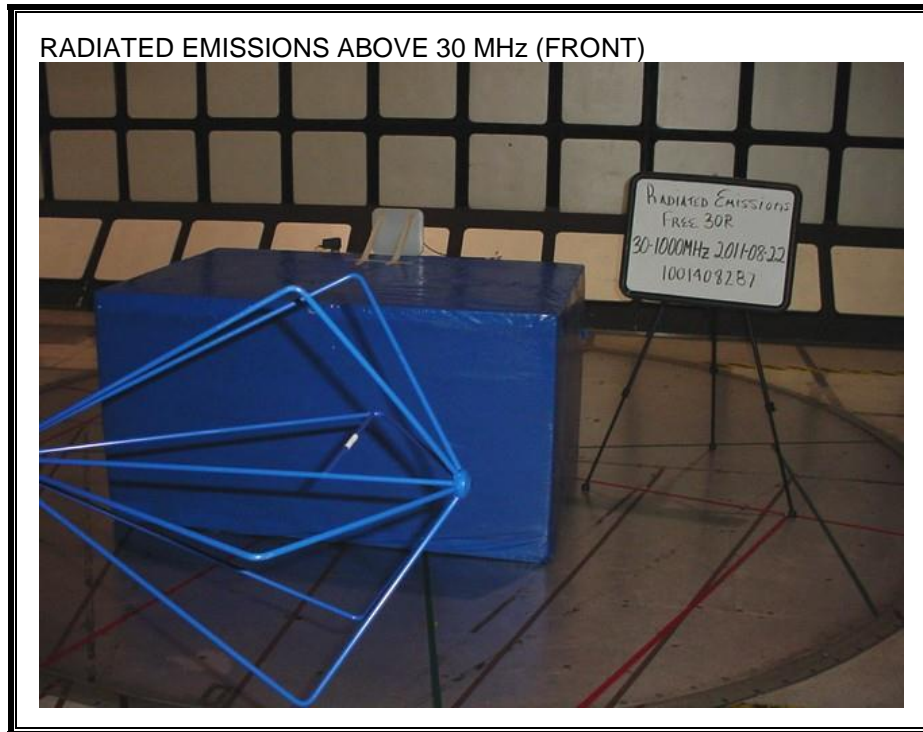
## 9. SETUP PHOTOS

### RADIATED EMISSION BELOW 30 MHz



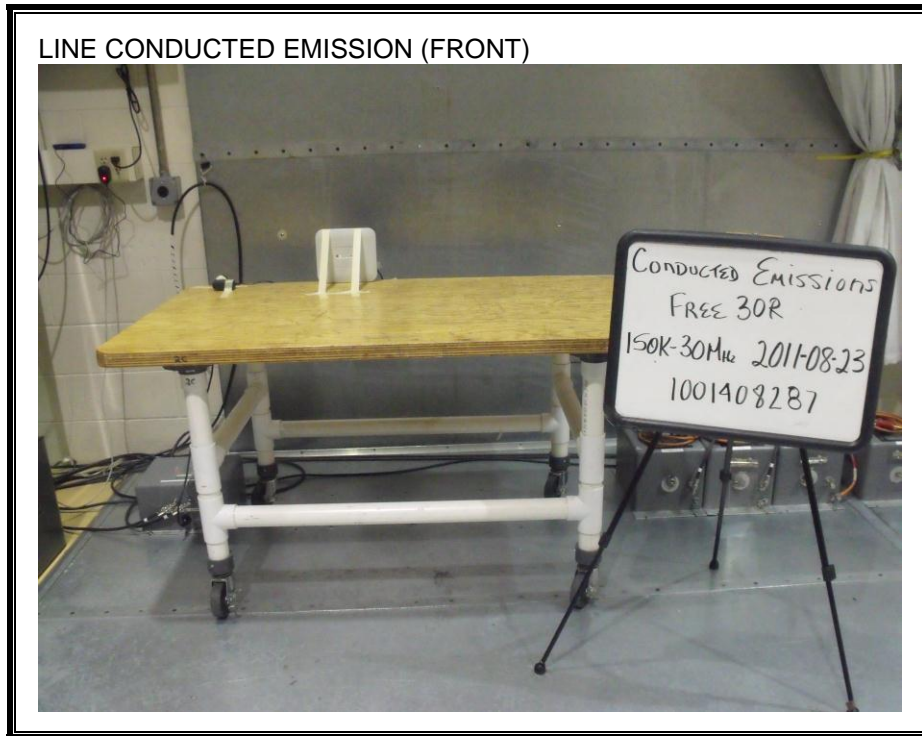


**RADIATED EMISSION ABOVE 30 MHz**

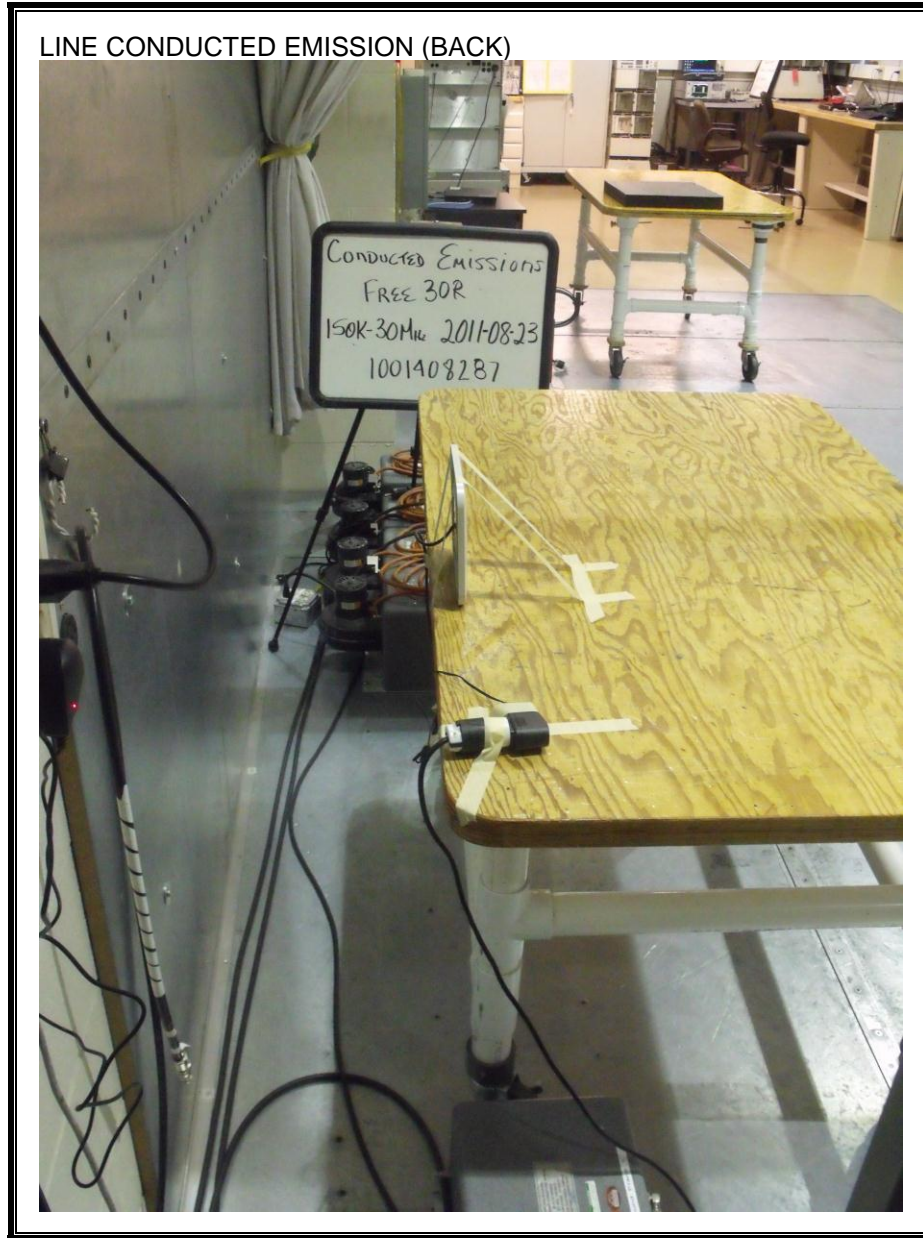




**AC MAINS LINE CONDUCTED EMISSION**







**END OF REPORT**