

# Export Management System, Inc.

ADDENDUM TEST REPORT TO 92009-4

Garage Transmitter, EZ Code-M300

Tested To The Following Standards:

FCC Part 15 Part 15.231

Report No.: 92009-4A

Date of issue: August 2, 2011



This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of EMC testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

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## ADMINISTRATIVE INFORMATION

### Test Report Information

**REPORT PREPARED FOR:**

Export Management System, Inc.  
13532 Hawthorne Blvd.  
Hawthorne, CA 90250

Representative: Calvin Joo  
Customer Reference Number: 91

**DATE OF EQUIPMENT RECEIPT:****DATE(S) OF TESTING:****REPORT PREPARED BY:**

Joyce Walker  
CKC Laboratories, Inc.  
5046 Sierra Pines Drive  
Mariposa, CA 95338

Project Number: 92009

July 1, 2011

July 1-5, 2011

### Revision History

**Original:** Testing of the Garage Transmitter, EZ Code-M300 to FCC Part 15 Part 15.231.

**Addendum A:** To add the duty cycle correction factor supporting data.

### Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the sample equipment tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.

A handwritten signature in black ink that reads "Steve Behm".

**Steve Behm**  
**Director of Quality Assurance & Engineering Services**  
**CKC Laboratories, Inc.**

## Test Facility Information



Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):  
CKC Laboratories, Inc.  
110 Olinda Place  
Brea, CA 92823

## Site Registration & Accreditation Information

Location	CB #	JAPAN	CANADA	FCC
Brea A	US0060	R-2945, C-3248 & T-1572	3082D-1	90473

## SUMMARY OF RESULTS

### Standard / Specification: FCC Part 15.231

Description	Test Procedure/Method	Results
Voltage Variations	FCC 15.31(e)	Pass
Release time	FCC Part 15 .231(a)(1) / 2.1055(a)	Pass
Fundamental Field Strength	FCC Part 15 .231(b) / 2.1046	Pass
Radiated Spurious Field Strength	FCC Part 15 .231(b) / 2.1053	Pass
-20dBc Occupied Bandwidth	FCC Part 15 .231(c) / 2.1049	Pass

## Conditions During Testing

This list is a summary of the conditions noted for or modifications made to the equipment during testing.

Summary of Conditions
The EUT was tested with a fresh battery.

## **EQUIPMENT UNDER TEST (EUT)**

### **EQUIPMENT UNDER TEST**

#### **Garage Transmitter**

Manuf: Export Management System, Inc.

Model: EZ Code-M300

Serial: NA

### **PERIPHERAL DEVICES**

The EUT was not tested with peripheral devices.

## FCC PART 15.231

This report contains EMC emissions test results under United States Federal Communications Commission (FCC) 47 CFR 15C requirements for Unlicensed Radio Frequency Devices, Subpart C - Intentional Radiators.

### 15.31(e) Voltage Variations

#### Test Conditions / Setup

The EUT is placed on Styrofoam table and operates in continuous transmitting mode. Emission profiles in three orthogonal orientations have been evaluated

Operating frequency: 300 MHz

Rated Power Output:-37dBm

Frequency range: 30-1000MHz, RBW: 120kHz, VBW: 120kHz

Temperature: 71°F, Relative Humidity: 45%

15.31(e) testing performed using a new battery.

Engineer Name: D. Nguyen

Test Equipment					
Asset/Serial #	Description	Model	Manufacturer	Cal Date	Cal Due
AN02672	Spectrum Analyzer	E4446A	Agilent	8/9/2010	8/9/2012
AN00309	Preamp	8447D	HP	5/7/2010	5/7/2012
ANP05050	Cable	RG223/U	Pasternack	3/21/2011	3/21/2013
ANP05198	Cable	8268	Belden	12/21/2010	12/21/2012
AN01995	Biconilog Antenna	CBL6111C	Chase	3/8/2010	3/8/2012
AN00849	Horn Antenna	3115	ETS	4/23/2010	4/23/2012
AN00786	Preamp	83017A	HP	8/5/2010	8/5/2012
AN02948	Cable	32022-2-2909K-24TC	AstroLab, Inc.	8/9/2010	8/9/2012
ANP05421	Cable	Sucoflex 104A	Huber & Suhner	5/7/2010	5/7/2012
ANP05563	Cable	E4446A	Andrews	3/21/2011	3/21/2013

**Test Setup Photos**



**X AXIS FRONT VIEW**



**X AXIS BACK VIEW**





**Y AXIS FRONT VIEW**



**Y AXIS BACK VIEW**



**Z AXIS FRONT VIEW**



**Z AXIS BACK VIEW**

## 15.231(a)(1) Release Time

### Test Conditions / Setup

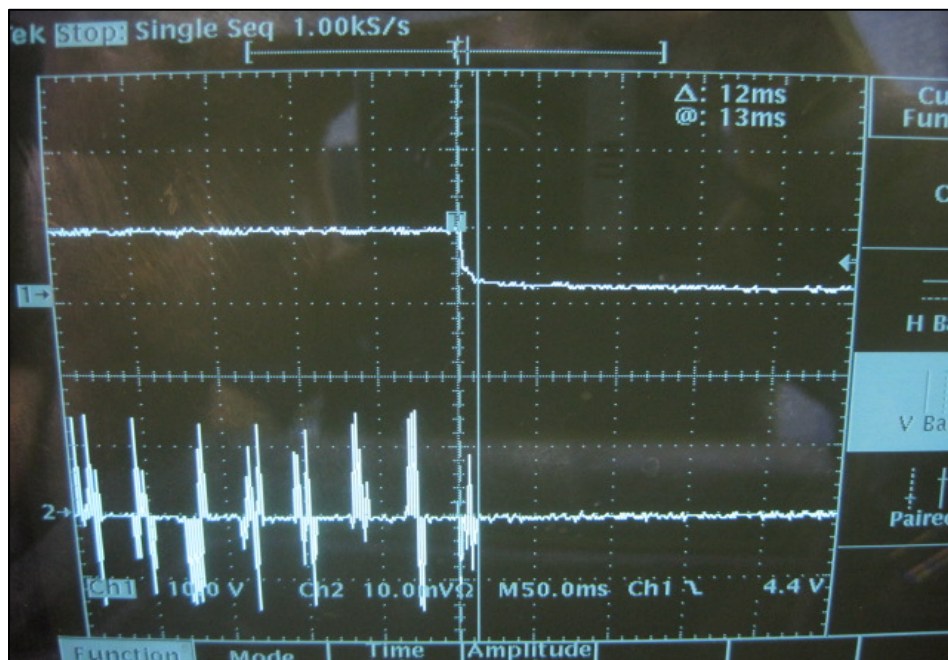
The EUT is placed on the test bench, in close proximity, Ch1 of an Oscilloscope is connected to trigger lead of the RF switch, a RF receiving wire element is connected to the CH2. With the Oscilloscope set to trigger on negative edge of the RF switch, a single sweep was captured with the RF switch of the EUT being released. The captured time between the RF witch being released and RF cessation of RF power is measured.

Measured capture time = 12 msec, meets requirement.

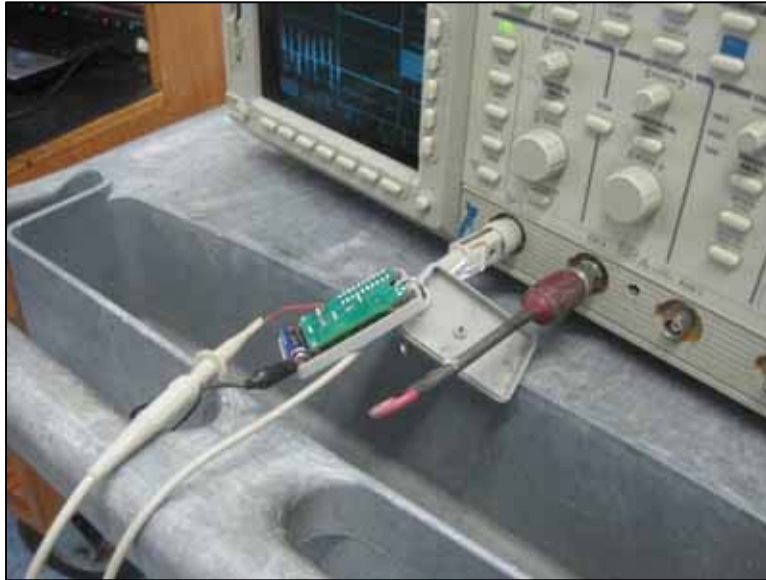
Engineer Name: D. Nguyen

Test Equipment					
Asset/Serial #	Description	Model	Manufacturer	Cal Date	Cal Due
02847	Oscilloscope	TDS 520B	Tektronix	3/23/2011	3/23/2013

### Test Data



**Test Setup Photos**



## 15.231(b) Fundamental Field Strength

### Test Data Sheets

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **Export Management System, Inc.**  
 Specification: **15.231(b) Fundamental Field Strength**  
 Work Order #: **92009** Date: 7/1/2011  
 Test Type: **Radiated Scan** Time: 09:59:09  
 Equipment: **Garage Transmitter** Sequence#: 2  
 Manufacturer: Export Management System, Inc. Tested By: Don Nguyen  
 Model: EZ Code-M300  
 S/N: NA

#### Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02672	Spectrum Analyzer	E4446A	8/9/2010	8/9/2012
T1	AN00309	Preamp	8447D	5/7/2010	5/7/2012
T2	ANP05050	Cable	RG223/U	3/21/2011	3/21/2013
T3	ANP05198	Cable	8268	12/21/2010	12/21/2012
T4	AN01995	Biconilog Antenna	CBL6111C	3/8/2010	3/8/2012

#### Equipment Under Test (\* = EUT):

Function	Manufacturer	Model #	S/N
Garage Transmitter	Export Management System, Inc.	EZ Code-M300	NA

#### Support Devices:

Function	Manufacturer	Model #	S/N
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#### Test Conditions / Notes:

EUT is placed on Styrofoam table and operates in continuous transmitting mode.  
 Emission profiles in three orthogonal orientations have been evaluated  
 Operating frequency: 300 MHz  
 Rated Power Output: -37dBm  
 Frequency range: 30-1000MHz, RBW: 120kHz, VBW:120kHz,  
 Temperature: 71°F, Relative Humidity: 45%  
 Tested with fresh battery installed in EUT.

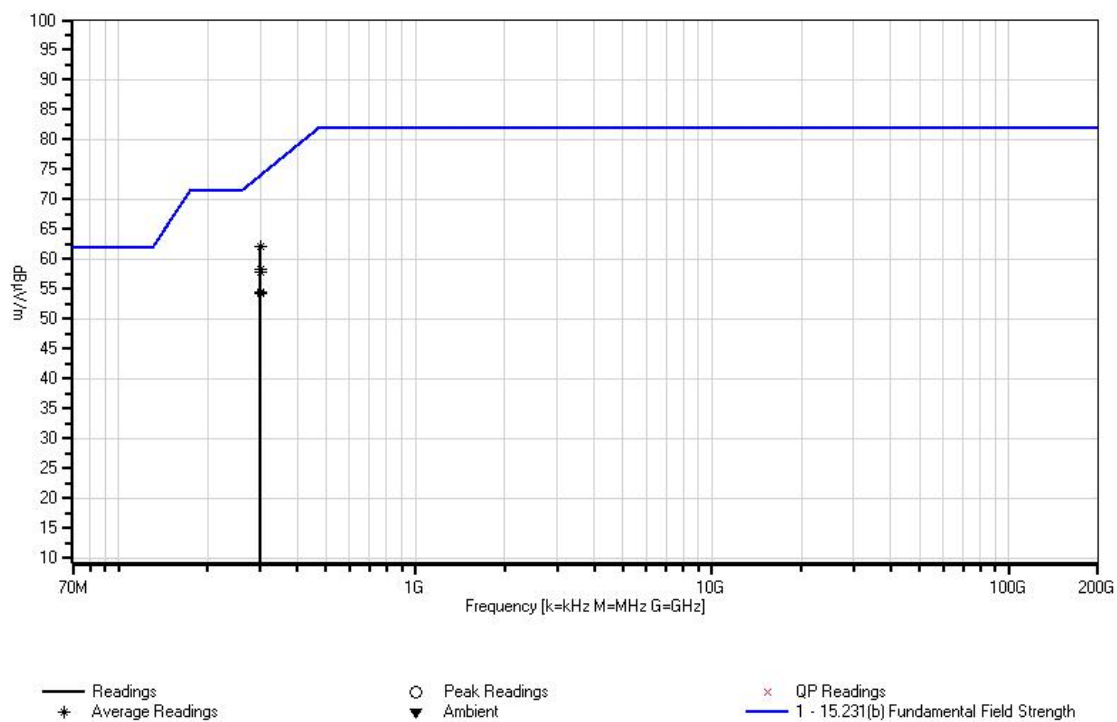
Ext Attn: 0 dB

**Measurement Data:** Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	300.000M Ave	73.4	-27.8	+0.2	+3.1	+13.3	+0.0	62.2	74.0 X axis	-11.8	Horiz
2	299.999M Ave	69.6	-27.8	+0.2	+3.1	+13.3	+0.0	58.4	74.0 Z axis	-15.6	Vert
3	299.999M Ave	69.1	-27.8	+0.2	+3.1	+13.3	+0.0	57.9	74.0 Y axis	-16.1	Vert
^	300.001M	87.9	-27.8	+0.2	+3.1	+13.3	+0.0	76.7	74.0 Z axis	+2.7	Vert

^	299.999M	87.4	-27.8	+0.2	+3.1	+13.3	+0.0	76.2	74.0	+2.2	Vert
									Y axis		
^	300.002M	71.5	-27.8	+0.2	+3.1	+13.3	+0.0	60.3	74.0	-13.7	Vert
									X axis		
7	299.999M	65.7	-27.8	+0.2	+3.1	+13.3	+0.0	54.5	74.0	-19.5	Horiz
	Ave								Z axis		
8	300.000M	65.4	-27.8	+0.2	+3.1	+13.3	+0.0	54.2	74.0	-19.8	Horiz
	Ave								Y axis		
^	299.998M	92.0	-27.8	+0.2	+3.1	+13.3	+0.0	80.8	74.0	+6.8	Horiz
									X axis		
^	299.996M	84.1	-27.8	+0.2	+3.1	+13.3	+0.0	72.9	74.0	-1.1	Horiz
									Z axis		
^	299.999M	83.6	-27.8	+0.2	+3.1	+13.3	+0.0	72.4	74.0	-1.6	Horiz
									Y axis		

CKC Laboratories, Inc. Date: 7/1/2011 Time: 09:59:09 Export Management System, Inc. WO#: 92009  
15.231(b) Fundamental Field Strength Test Distance: 3 Meters Sequence#: 2 Ext ATTN: 0 dB





**Test Setup Photos**



**X AXIS FRONT VIEW**



**X AXIS BACK VIEW**



**Y AXIS FRONT VIEW**



**Y AXIS BACK VIEW**





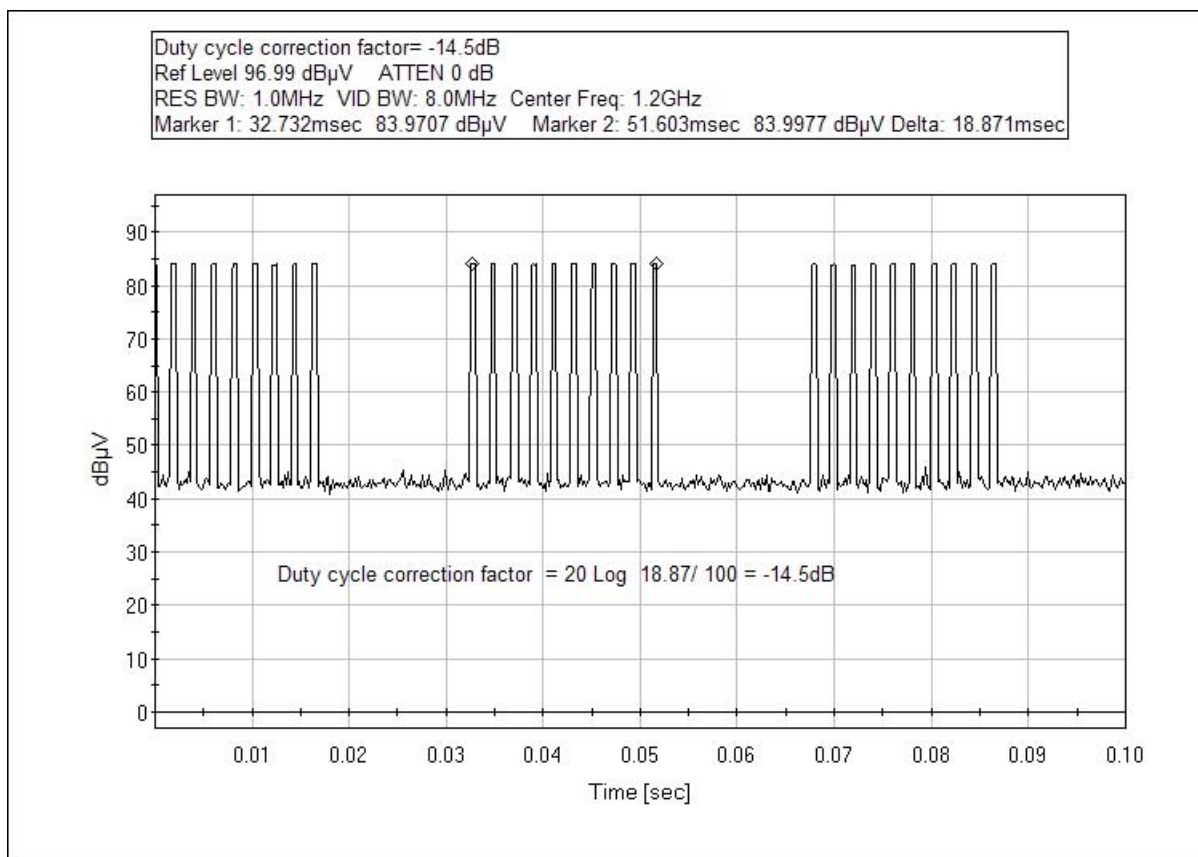
**Z AXIS FRONT VIEW**



**Z AXIS BACK VIEW**

## 15.231(b) Radiated Spurious Field Strength

### Duty Cycle Correction Factor Calculation



### Test Data Sheets

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **Export Management System, Inc.**  
 Specification: **15.231(b) Spurious Field Strength (300 MHz Transmitter)**  
 Work Order #: **92009** Date: 7/5/2011  
 Test Type: **Radiated Scan** Time: 13:50:16  
 Equipment: **Garage Transmitter** Sequence#: 3  
 Manufacturer: Export Management System, Inc. Tested By: Don Nguyen  
 Model: EZ Code-M300  
 S/N: NA

#### ***Test Equipment:***

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02672	Spectrum Analyzer	E4446A	8/9/2010	8/9/2012
	AN00309	Preamp	8447D	5/7/2010	5/7/2012
	ANP05050	Cable	RG223/U	3/21/2011	3/21/2013
	ANP05198	Cable	8268	12/21/2010	12/21/2012
	AN01995	Biconilog Antenna	CBL6111C	3/8/2010	3/8/2012
T2	AN00849	Horn Antenna	3115	4/23/2010	4/23/2012
T3	AN00786	Preamp	83017A	8/5/2010	8/5/2012
T4	AN02948	Cable	32022-2-2909K-24TC	9/21/2009	9/21/2011
T5	ANP05421	Cable	Sucoflex 104A	2/12/2010	2/12/2012
T6	ANP05563	Cable	ANDL-1-PNMN-48	9/3/2010	9/3/2012
T7	AN02752	High Pass Filter	6IH40-500/T3000-O/O	3/5/2010	3/5/2012
	AN00314	Loop Antenna	6502	6/30/2010	6/30/2012
T8	AN90000	Duty Cycle Correction Factor		No Cal Required	No Cal Required

#### ***Equipment Under Test (\* = EUT):***

Function	Manufacturer	Model #	S/N
Garage Transmitter	Export Management System, Inc.	EZ Code-M300	NA

#### ***Support Devices:***

Function	Manufacturer	Model #	S/N
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**Test Conditions / Notes:**

EUT is placed on Styrofoam table and operates in continuous transmitting mode.

Emission profiles in three orthogonal orientations have been evaluated.

Operating frequency: 300 MHz

Rated Power Output: -37dBm

Frequency range: 9kHz - 3GHz

9kHz-30MHz, RBW: 9kHz, VBW:9kHz,

30-1000MHz, RBW: 120kHz, VBW:120kHz,

1000-3000MHz, RBW: 1MHz, VBW: 1MHz.

Temperature: 71°F, Relative Humidity: 45%

Tested with fresh battery installed in EUT.

Duty cycle correction factor of  $20 \log 18.8/100 = -14.5\text{dB}$  applies as noted

Ext Attn: 0 dB

**Measurement Data:**

Reading listed by margin.

Test Distance: 3 Meters

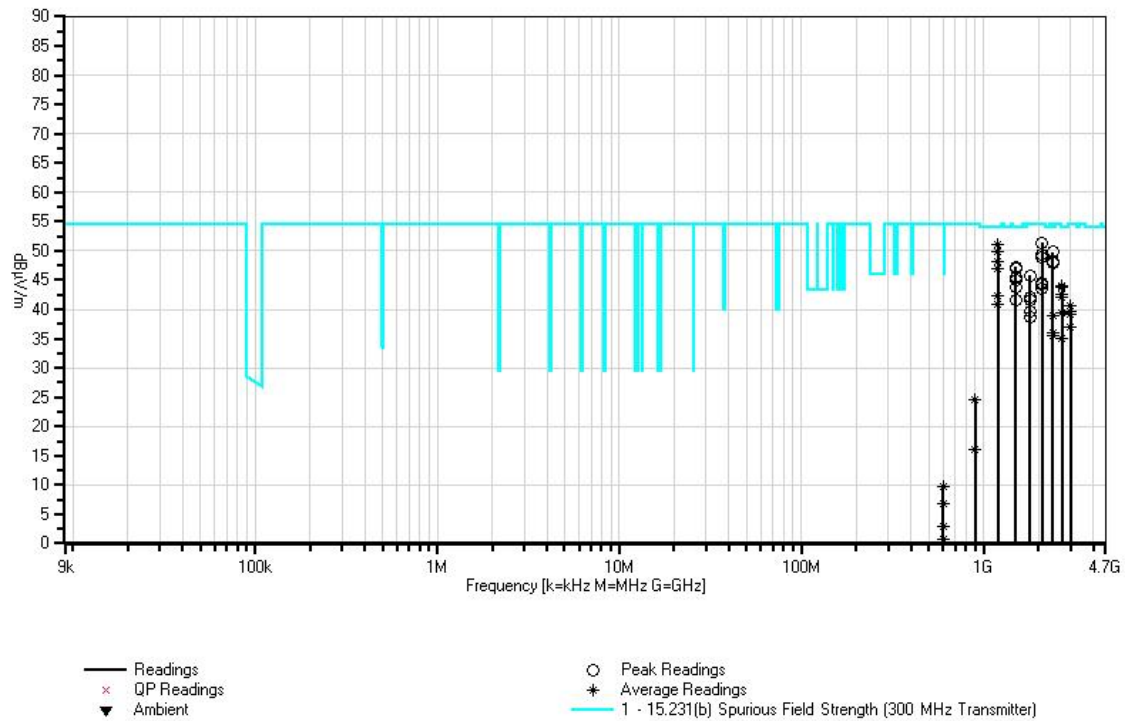
#	Freq MHz	Rdng dBμV	T1 T5 dB	T2 T6 dB	T3 T7 dB	T4 T8 dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	1200.050M Ave	62.2	+0.0 +0.8	+24.7 +2.1	-39.3 +0.2	+0.3 +0.0	+0.0	51.0	54.0 X axis	-3.0	Horiz
2	2100.017M	56.6	+0.0 +1.1	+28.1 +2.9	-37.9 +0.2	+0.4 +0.0	+0.0	51.4	54.7 Z axis	-3.3	Vert
3	1199.992M Ave	61.0	+0.0 +0.8	+24.7 +2.1	-39.3 +0.2	+0.3 +0.0	+0.0	49.8	54.0 Y axis	-4.2	Horiz
4	2399.942M	54.3	+0.0 +1.2	+28.4 +3.1	-38.0 +0.3	+0.5 +0.0	+0.0	49.8	54.7 Z axis	-4.9	Vert
5	2100.017M	54.7	+0.0 +1.1	+28.1 +2.9	-37.9 +0.2	+0.4 +0.0	+0.0	49.5	54.7 Y axis	-5.2	Horiz
6	1200.000M Ave	59.5	+0.0 +0.8	+24.7 +2.1	-39.3 +0.2	+0.3 +0.0	+0.0	48.3	54.0 Y axis	-5.7	Vert
7	2100.017M	54.1	+0.0 +1.1	+28.1 +2.9	-37.9 +0.2	+0.4 +0.0	+0.0	48.9	54.7 X axis	-5.8	Horiz
8	2400.060M	52.6	+0.0 +1.2	+28.4 +3.1	-38.0 +0.3	+0.5 +0.0	+0.0	48.1	54.7 Y axis	-6.6	Vert
9	1499.997M	56.5	+0.0 +0.9	+25.3 +2.4	-38.4 +0.2	+0.4 +0.0	+0.0	47.3	54.0 Z axis	-6.7	Vert
10	2400.031M	52.5	+0.0 +1.2	+28.4 +3.1	-38.0 +0.3	+0.5 +0.0	+0.0	48.0	54.7 X axis	-6.7	Vert
11	1200.000M Ave	58.2	+0.0 +0.8	+24.7 +2.1	-39.3 +0.2	+0.3 +0.0	+0.0	47.0	54.0 X axis	-7.0	Vert
12	1500.017M	56.0	+0.0 +0.9	+25.3 +2.4	-38.4 +0.2	+0.4 +0.0	+0.0	46.8	54.0 X axis	-7.2	Horiz
13	1499.992M	54.6	+0.0 +0.9	+25.3 +2.4	-38.4 +0.2	+0.4 +0.0	+0.0	45.4	54.0 Y axis	-8.6	Horiz
14	1800.000M	52.7	+0.0 +1.0	+27.0 +2.6	-38.2 +0.2	+0.4 +0.0	+0.0	45.7	54.7 Y axis	-9.0	Vert
15	1500.000M	54.1	+0.0 +0.9	+25.3 +2.4	-38.4 +0.2	+0.4 +0.0	+0.0	44.9	54.0 Y axis	-9.1	Vert
16	2700.011M Ave	47.1	+0.0 +1.4	+29.1 +3.3	-37.9 +0.4	+0.5 +0.0	+0.0	43.9	54.0 Z axis	-10.1	Horiz
17	2100.000M	49.8	+0.0 +1.1	+28.1 +2.9	-37.9 +0.2	+0.4 +0.0	+0.0	44.6	54.7 X axis	-10.1	Vert

18	1499.996M	52.9	+0.0	+25.3	-38.4	+0.4	+0.0	43.7	54.0	-10.3	Horiz
			+0.9	+2.4	+0.2	+0.0			Z axis		
19	2700.000M	46.9	+0.0	+29.1	-37.9	+0.5	+0.0	43.7	54.0	-10.3	Horiz
	Ave		+1.4	+3.3	+0.4	+0.0			Y axis		
20	2100.000M	49.6	+0.0	+28.1	-37.9	+0.4	+0.0	44.4	54.7	-10.3	Vert
			+1.1	+2.9	+0.2	+0.0			Y axis		
21	2099.996M	48.7	+0.0	+28.1	-37.9	+0.4	+0.0	43.5	54.7	-11.2	Horiz
			+1.1	+2.9	+0.2	+0.0			Z axis		
22	2700.015M	45.7	+0.0	+29.1	-37.9	+0.5	+0.0	42.5	54.0	-11.5	Vert
	Ave		+1.4	+3.3	+0.4	+0.0			Y axis		
23	1200.088M	53.6	+0.0	+24.7	-39.3	+0.3	+0.0	42.4	54.0	-11.6	Horiz
	Ave		+0.8	+2.1	+0.2	+0.0			Z axis		
^	1200.050M	80.0	+0.0	+24.7	-39.3	+0.3	+0.0	68.8	54.0	+14.8	Horiz
			+0.8	+2.1	+0.2	+0.0			X axis		
^	1199.992M	78.8	+0.0	+24.7	-39.3	+0.3	+0.0	67.6	54.0	+13.6	Horiz
			+0.8	+2.1	+0.2	+0.0			Y axis		
^	1200.009M	71.7	+0.0	+24.7	-39.3	+0.3	+0.0	60.5	54.0	+6.5	Horiz
			+0.8	+2.1	+0.2	+0.0			Z axis		
27	2700.017M	45.4	+0.0	+29.1	-37.9	+0.5	+0.0	42.2	54.0	-11.8	Horiz
	Ave		+1.4	+3.3	+0.4	+0.0			X axis		
^	2700.003M	63.8	+0.0	+29.1	-37.9	+0.5	+0.0	60.6	54.0	+6.6	Horiz
			+1.4	+3.3	+0.4	+0.0			Z axis		
^	2700.000M	63.7	+0.0	+29.1	-37.9	+0.5	+0.0	60.5	54.0	+6.5	Horiz
			+1.4	+3.3	+0.4	+0.0			Y axis		
^	2700.017M	63.4	+0.0	+29.1	-37.9	+0.5	+0.0	60.2	54.0	+6.2	Horiz
			+1.4	+3.3	+0.4	+0.0			X axis		
31	1500.000M	50.9	+0.0	+25.3	-38.4	+0.4	+0.0	41.7	54.0	-12.3	Vert
			+0.9	+2.4	+0.2	+0.0			X axis		
32	1800.017M	49.1	+0.0	+27.0	-38.2	+0.4	+0.0	42.1	54.7	-12.6	Horiz
			+1.0	+2.6	+0.2	+0.0			X axis		
33	1799.996M	48.7	+0.0	+27.0	-38.2	+0.4	+0.0	41.7	54.7	-13.0	Horiz
			+1.0	+2.6	+0.2	+0.0			Z axis		
34	1199.988M	66.6	+0.0	+24.7	-39.3	+0.3	+0.0	40.9	54.0	-13.1	Vert
	Ave		+0.8	+2.1	+0.2	-14.5			Z Axis _ duty cycle corrected -14.5dB		
^	1200.009M	84.2	+0.0	+24.7	-39.3	+0.3	+0.0	73.0	54.0	+19.0	Vert
			+0.8	+2.1	+0.2	+0.0			Z Axis		
^	1200.000M	77.4	+0.0	+24.7	-39.3	+0.3	+0.0	66.2	54.0	+12.2	Vert
			+0.8	+2.1	+0.2	+0.0			Y axis		
^	1200.000M	75.3	+0.0	+24.7	-39.3	+0.3	+0.0	64.1	54.0	+10.1	Vert
			+0.8	+2.1	+0.2	+0.0			X axis		
38	3000.017M	42.5	+0.0	+30.0	-37.8	+0.5	+0.0	40.7	54.7	-14.0	Horiz
	Ave		+1.6	+3.5	+0.4	+0.0			X axis		
39	2699.938M	42.5	+0.0	+29.1	-37.9	+0.5	+0.0	39.3	54.0	-14.7	Vert
	Ave		+1.4	+3.3	+0.4	+0.0			Z axis		
40	1800.000M	46.7	+0.0	+27.0	-38.2	+0.4	+0.0	39.7	54.7	-15.0	Vert
			+1.0	+2.6	+0.2	+0.0			X axis		
41	3000.033M	41.4	+0.0	+30.0	-37.8	+0.5	+0.0	39.6	54.7	-15.1	Horiz
	Ave		+1.6	+3.5	+0.4	+0.0			Y axis		
^	3000.017M	60.4	+0.0	+30.0	-37.8	+0.5	+0.0	58.6	54.7	+3.9	Horiz
			+1.6	+3.5	+0.4	+0.0			X axis		

^ 3000.033M	58.2	+0.0	+30.0	-37.8	+0.5	+0.0	56.4	54.7	+1.7	Horiz
		+1.6	+3.5	+0.4	+0.0			Y axis		
^ 3000.019M	51.8	+0.0	+30.0	-37.8	+0.5	+0.0	50.0	54.7	-4.7	Horiz
		+1.6	+3.5	+0.4	+0.0			Z axis		
45 1799.992M	46.6	+0.0	+27.0	-38.2	+0.4	+0.0	39.6	54.7	-15.1	Horiz
		+1.0	+2.6	+0.2	+0.0			Y axis		
46 3000.048M Ave	40.9	+0.0	+30.0	-37.8	+0.5	+0.0	39.1	54.7	-15.6	Vert
		+1.6	+3.5	+0.4	+0.0			Y axis		
47 2400.050M Ave	43.4	+0.0	+28.4	-38.0	+0.5	+0.0	38.9	54.7	-15.8	Horiz
		+1.2	+3.1	+0.3	+0.0			X axis		
48 1799.997M	45.7	+0.0	+27.0	-38.2	+0.4	+0.0	38.7	54.7	-16.0	Vert
		+1.0	+2.6	+0.2	+0.0			Z axis		
49 3000.038M Ave	38.8	+0.0	+30.0	-37.8	+0.5	+0.0	37.0	54.7	-17.7	Vert
		+1.6	+3.5	+0.4	+0.0			Z axis		
^ 3000.048M	58.0	+0.0	+30.0	-37.8	+0.5	+0.0	56.2	54.7	+1.5	Vert
		+1.6	+3.5	+0.4	+0.0			Y axis		
^ 3000.013M	54.9	+0.0	+30.0	-37.8	+0.5	+0.0	53.1	54.7	-1.6	Vert
		+1.6	+3.5	+0.4	+0.0			Z axis		
^ 2999.980M	52.0	+0.0	+30.0	-37.8	+0.5	+0.0	50.2	54.7	-4.5	Vert
		+1.6	+3.5	+0.4	+0.0			X axis		
53 2400.017M Ave	40.5	+0.0	+28.4	-38.0	+0.5	+0.0	36.0	54.7	-18.7	Horiz
		+1.2	+3.1	+0.3	+0.0			Y axis		
54 2699.997M Ave	38.2	+0.0	+29.1	-37.9	+0.5	+0.0	35.0	54.0	-19.0	Vert
		+1.4	+3.3	+0.4	+0.0			X axis		
^ 2700.015M	64.1	+0.0	+29.1	-37.9	+0.5	+0.0	60.9	54.0	+6.9	Vert
		+1.4	+3.3	+0.4	+0.0			Y axis		
^ 2700.017M	60.2	+0.0	+29.1	-37.9	+0.5	+0.0	57.0	54.0	+3.0	Vert
		+1.4	+3.3	+0.4	+0.0			Z axis		
^ 2699.997M	54.6	+0.0	+29.1	-37.9	+0.5	+0.0	51.4	54.0	-2.6	Vert
		+1.4	+3.3	+0.4	+0.0			X axis		
58 2400.088M Ave	40.1	+0.0	+28.4	-38.0	+0.5	+0.0	35.6	54.7	-19.1	Horiz
		+1.2	+3.1	+0.3	+0.0			Z axis		
^ 2400.017M	59.9	+0.0	+28.4	-38.0	+0.5	+0.0	55.4	54.7	+0.7	Horiz
		+1.2	+3.1	+0.3	+0.0			X axis		
^ 2399.996M	58.9	+0.0	+28.4	-38.0	+0.5	+0.0	54.4	54.7	-0.3	Horiz
		+1.2	+3.1	+0.3	+0.0			Z axis		
^ 2400.017M	56.6	+0.0	+28.4	-38.0	+0.5	+0.0	52.1	54.7	-2.6	Horiz
		+1.2	+3.1	+0.3	+0.0			Y axis		
62 900.000M Ave	40.5	+0.0	+22.4	-41.4	+0.3	+0.0	24.6	54.7	-30.1	Horiz
		+0.7	+1.8	+0.3	+0.0			X axis		
^ 900.000M	54.7	+0.0	+22.4	-41.4	+0.3	+0.0	38.8	54.7	-15.9	Horiz
		+0.7	+1.8	+0.3	+0.0			X axis		
^ 899.993M	47.6	+0.0	+0.0	-41.4	+0.3	+0.0	9.3	54.7	-45.4	Horiz
		+0.7	+1.8	+0.3	+0.0			Y axis		
^ 899.985M	43.5	+0.0	+0.0	-41.4	+0.3	+0.0	5.2	54.7	-49.5	Horiz
		+0.7	+1.8	+0.3	+0.0			Z axis		
66 900.000M Ave	32.0	+0.0	+22.4	-41.4	+0.3	+0.0	16.1	54.7	-38.6	Vert
		+0.7	+1.8	+0.3	+0.0			Y axis		
^ 900.000M	42.5	+0.0	+22.4	-41.4	+0.3	+0.0	26.6	54.7	-28.1	Vert
		+0.7	+1.8	+0.3	+0.0			X axis		
^ 899.997M	48.8	+0.0	+0.0	-41.4	+0.3	+0.0	10.5	54.7	-44.2	Vert
		+0.7	+1.8	+0.3	+0.0			Y axis		

^	899.985M	47.5	+0.0	+0.0	-41.4	+0.3	+0.0	9.2	54.7	-45.5	Vert
			+0.7	+1.8	+0.3	+0.0			Z axis		
70	600.007M	51.1	+0.0	+0.0	-44.4	+0.3	+0.0	9.7	54.7	-45.0	Horiz
	Ave		+0.6	+1.4	+0.7	+0.0			X axis		
71	599.990M	48.2	+0.0	+0.0	-44.4	+0.3	+0.0	6.8	54.7	-47.9	Vert
	Ave		+0.6	+1.4	+0.7	+0.0			Y axis		
72	600.000M	44.2	+0.0	+0.0	-44.4	+0.3	+0.0	2.8	54.7	-51.9	Horiz
	Ave		+0.6	+1.4	+0.7	+0.0			Y axis		
73	599.980M	42.2	+0.0	+0.0	-44.4	+0.3	+0.0	0.8	54.7	-53.9	Vert
	Ave		+0.6	+1.4	+0.7	+0.0			X axis		
74	600.000M	41.2	+0.0	+0.0	-44.4	+0.3	+0.0	-0.2	54.7	-54.9	Vert
	Ave		+0.6	+1.4	+0.7	+0.0			Z axis		
^	599.990M	64.9	+0.0	+0.0	-44.4	+0.3	+0.0	23.5	54.7	-31.2	Vert
			+0.6	+1.4	+0.7	+0.0			Y axis		
^	599.985M	61.4	+0.0	+0.0	-44.4	+0.3	+0.0	20.0	54.7	-34.7	Vert
			+0.6	+1.4	+0.7	+0.0			Z axis		
^	599.991M	56.4	+0.0	+0.0	-44.4	+0.3	+0.0	15.0	54.7	-39.7	Vert
			+0.6	+1.4	+0.7	+0.0			X axis		
78	599.993M	39.0	+0.0	+0.0	-44.4	+0.3	+0.0	-2.4	54.7	-57.1	Horiz
	Ave		+0.6	+1.4	+0.7	+0.0			Z axis		
^	599.993M	65.3	+0.0	+0.0	-44.4	+0.3	+0.0	23.9	54.7	-30.8	Horiz
			+0.6	+1.4	+0.7	+0.0			X axis		
^	599.994M	60.8	+0.0	+0.0	-44.4	+0.3	+0.0	19.4	54.7	-35.3	Horiz
			+0.6	+1.4	+0.7	+0.0			Y axis		
^	599.990M	56.0	+0.0	+0.0	-44.4	+0.3	+0.0	14.6	54.7	-40.1	Horiz
			+0.6	+1.4	+0.7	+0.0			Z axis		

CKC Laboratories, Inc. Date: 7/5/2011 Time: 13:50:16 Export Management System, Inc. WO#: 92009  
 15.231(b) Spurious Field Strength (300 MHz Transmitter) Test Distance: 3 Meters Sequence#: 3 Ext ATTN: 0 dB





**Test Setup Photos**



**X AXIS FRONT VIEW**



**X AXIS BACK VIEW**



**Y AXIS FRONT VIEW**



**Y AXIS BACK VIEW**



**Z AXIS FRONT VIEW**



**Z AXIS BACK VIEW**

## 15.231(c) -20dBc Occupied Bandwidth

### Test Conditions / Setup

EUT is placed on Styrofoam table and operates in continuous transmitting mode. Emission profiles in three orthogonal orientations have been evaluated

Operating frequency: 300 MHz

Rated Power Output: -37dBm

Frequency range: 30-1000MHz, RBW: 120kHz, VBW: 120kHz

Temperature: 71°F, Relative Humidity: 45%

The EUT was tested with a fresh battery.

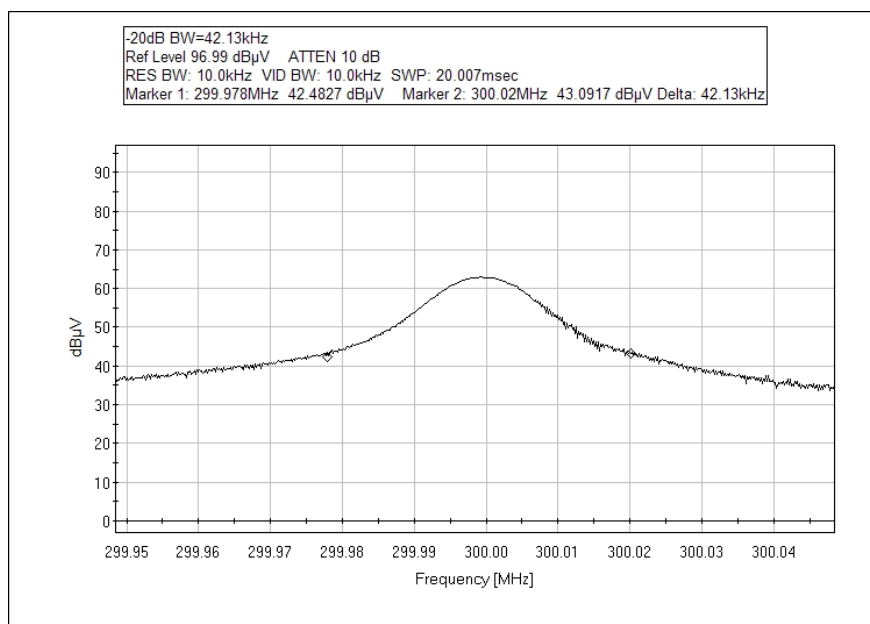
Measured -20dB BW=42.13kHz, < 0.25% of 300MHz.

Engineer Name: D. Nguyen

### Test Equipment

Asset/Serial #	Description	Model	Manufacturer	Cal Date	Cal Due
AN02672	Spectrum Analyzer	E4446A	Agilent	8/9/2010	8/9/2012
AN00309	Preamp	8447D	HP	5/7/2010	5/7/2012
ANP05050	Cable	RG223/U	Pasternack	3/21/2011	3/21/2013
ANP05198	Cable	8268	Belden	12/21/2010	12/21/2012
AN01995	Biconilog Antenna	CBL6111C	Chase	3/8/2010	3/8/2012

### Test Data



**Test Setup Photos**



**X AXIS FRONT VIEW**



**X AXIS BACK VIEW**



**Y AXIS FRONT VIEW**



**Y AXIS BACK VIEW**





**Z AXIS FRONT VIEW**



**Z AXIS BACK VIEW**

## SUPPLEMENTAL INFORMATION

### Measurement Uncertainty

Uncertainty Value	Parameter
4.73 dB	Radiated Emissions
3.34 dB	Mains Conducted Emissions
3.30 dB	Disturbance Power

The reported measurement uncertainties are calculated based on the worst case of all laboratory environments from CKC Laboratories, Inc. test sites. Only those parameters which require estimation of measurement uncertainty are reported. The reported worst case measurement uncertainty is less than the maximum values derived in CISPR 16-4-2. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ . Compliance is deemed to occur provided measurements are below the specified limits.

### Emissions Test Details

#### TESTING PARAMETERS

The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

#### CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in  $\text{dB}\mu\text{V}/\text{m}$ , the spectrum analyzer reading in  $\text{dB}\mu\text{V}$  was corrected by using the following formula. This reading was then compared to the applicable specification limit.



SAMPLE CALCULATIONS		
	Meter reading	(dB $\mu$ V)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dB $\mu$ V/m)

### TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used.

### SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "Peak" mode. Whenever a "Quasi-Peak" or "Average" reading is listed as one of the highest readings, this is indicated as a "QP" or an "Ave" on the appropriate rows of the data sheets. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

#### **Peak**

In this mode, the spectrum analyzer/receiver readings recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature of the measuring device called "peak hold," the measuring device had the ability to measure transients or low duty cycle transient emission peak levels. In this mode the measuring device made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

#### **Quasi-Peak**

When the true peak values exceeded or were within 2 dB of the specification limit, quasi-peak measurements were taken using the quasi-peak detector.

#### **Average**

For certain frequencies, average measurements may be made using the spectrum analyzer/receiver. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point the measuring device is set into the linear mode and the scan time is reduced.