

# Door King, Inc.

## ADDENDUM TEST REPORT FOR 90734-5

### Handheld Garage Door Type RF Transmitter 418 MHz, 8072A

Tested to the following standards:

FCC Part 15 Subpart C Section 15.231  
&  
RSS-210 Version 7

**DRAFT**  
Report No.: 90734-5A

Date of issue: July 2, 2010



TESTING  
CERT #803.01, 803.02,  
803.05, 803.06

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:**

Door King, Inc.  
120 Glasgow Avenue  
Inglewood, CA 90301

**REPORT PREPARED BY:**

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

REPRESENTATIVE: Patrick Kochie  
Customer Reference Number: 79234

Project Number: 90734

**DATE OF EQUIPMENT RECEIPT:****DATE(S) OF TESTING:**

April 26, 2010

April 26-27, 2010

### Revision History

Original: Testing of the Handheld Garage Door Type RF Transmitter 418 MHz, 8072A to FCC Part 15 Subpart C Section 15.231 and RSS-210.

Addendum A: To revise the test conditions on the Field Strength of Fundamental and Spurious Emissions.

### 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.



**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 92821

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## Site Registration & Accreditation Information

Location	JAPAN	CANADA	FCC
Brea A	R-301, C-314 & T-1572	3082D-1	90473

## SUMMARY OF RESULTS

### Standard / Specification: FCC Part 15 Subpart C Section 15.231

Description	Test Procedure/Method	Results
General Requirements for Momentary Equipment	FCC Part 15 Subpart C Section 15.231(a)(1)	Pass
Field Strength of Fundamental	FCC Part 15 Subpart C Section 15.231(b)	Pass
Field Strength of Spurious Emissions	FCC Part 15 Subpart C Section 15.231(b)	Pass
Occupied Bandwidth	FCC Part 15 Subpart C Section 15.231(c)	Pass

### Standard / Specification: RSS-210 Version 7

Description	Test Procedure/Method	Results
Occupied Bandwidth	RSS-210	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
None

## EQUIPMENT UNDER TEST (EUT)

### Handheld Garage Door Type RF Transmitter 418 MHz

Manuf: Door King, Inc.

Model: 8072A

Serial: NA

## PERIPHERAL DEVICES

The EUT was not tested with peripheral devices.

## FCC PART 15 SUBPART C

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.

### **Temperature And Humidity During Testing**

The temperature during testing was within +15°C and + 35°C.

The relative humidity was between 20% and 75%.

### **15.33(a) Frequency Ranges Tested**

15.231 Radiated Emissions: 9 kHz - 4.2 GHz

### **EUT Operating Frequency**

The EUT was operating at 418 MHz

## 15.231(a)(1) General Requirements for Momentary Equipment

Engineer Name: S. Hundal

Test Equipment				
Name	Serial	Cal Date	Cal Due	Asset
Oscilloscope	BO20532	3/17/2009	3/17/2011	02847

### Test Conditions

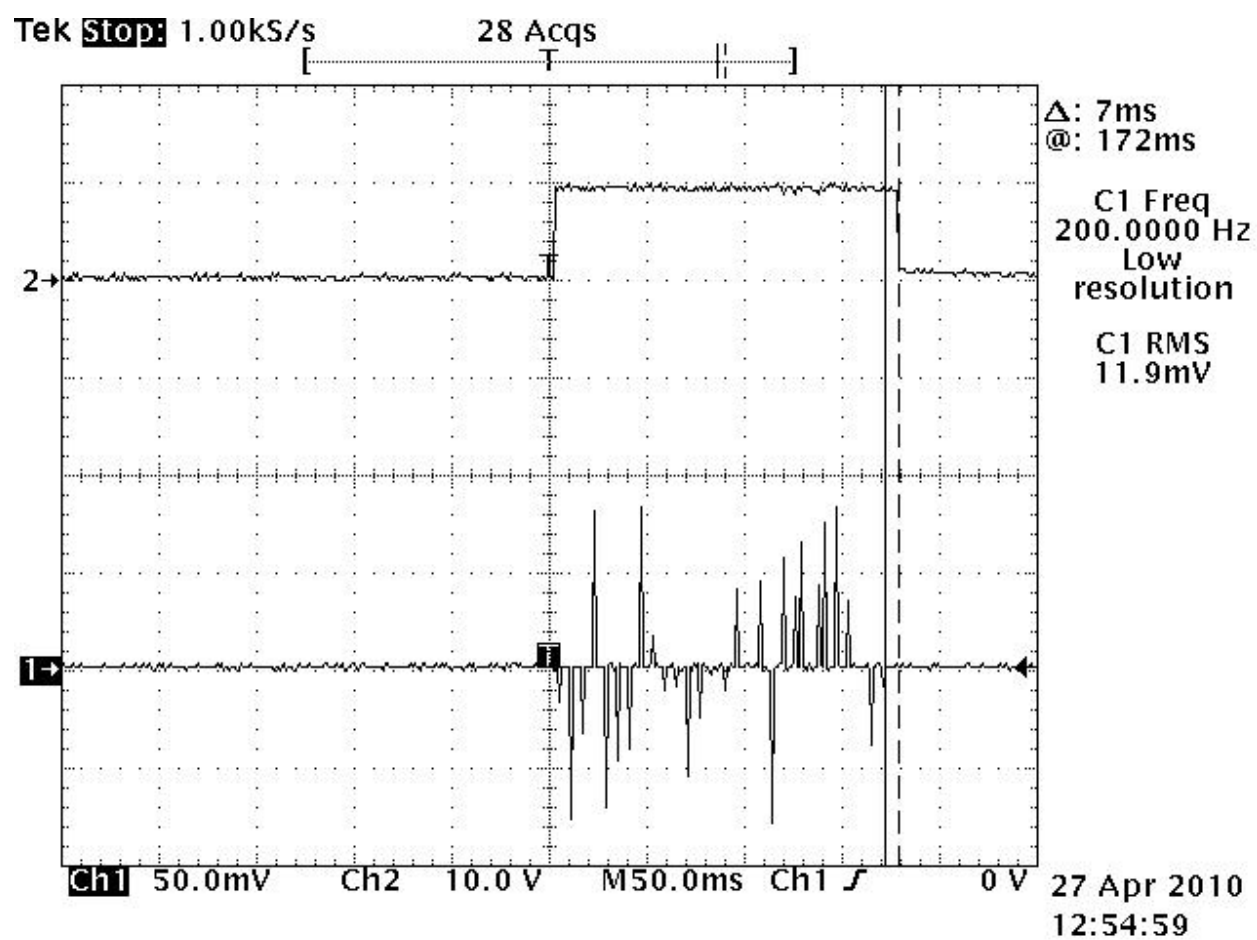
The EUT is placed on the test bench, in close proximity, Ch2 of a Oscilloscope is connected to trigger lead of the RF switch, a RF receiving wire element is connected to the CH1.

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.

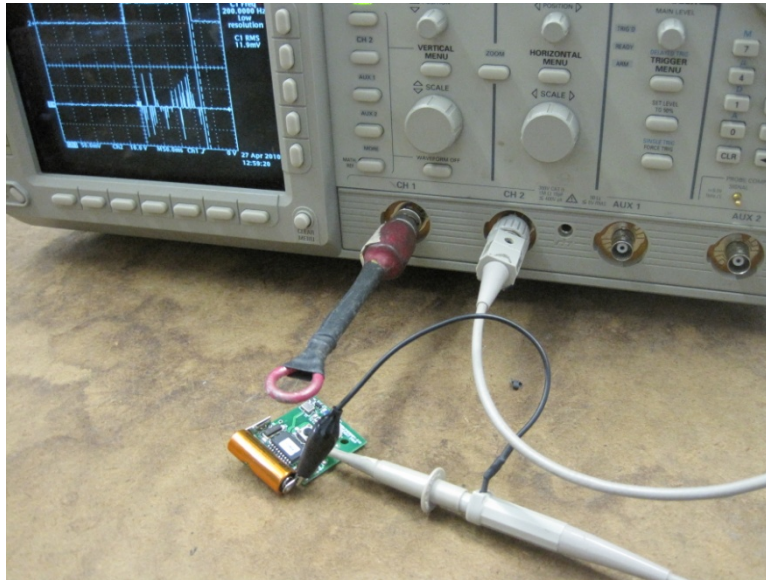
Measured capture time = 7 msec, meets requirement.

Test Plots





**Test Setup Photos**



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## 15.231(b) Field Strength of Fundamental

### Test Data Sheets

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 255 1476

Customer: **Door King, Inc.**

Specification: **15.231(b) Fundamental Field Strength**

Work Order #: **90734**

Date: 4/26/2010

Test Type: **Maximized Emissions**

Time: 16:48:31

Equipment: **Handheld Garage Door Type RF**

Sequence#: 1

**Transmitter 418 MHz**

Manufacturer: Door King, Inc.

Tested By: S. Hundal

Model: 8072A

S/N: NA

#### Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00309	Preamp	8447D	5/2/2008	5/2/2010
T2	AN01995	Biconilog Antenna	CBL6111G	3/8/2010	3/8/2012
T3	ANP05050	Cable	RG223/U	4/16/2009	4/16/2011
T4	ANP05198	Cable	8268	1/5/2009	1/5/2011
	AN02672	Spectrum Analyzer	E4446A	7/23/2008	7/23/2010

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

Function	Manufacturer	Model #	S/N
Handheld Garage Door Type RF Transmitter 418 MHz*	Door King, Inc.	8072A	NA

#### Support Devices:

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

The handheld, single channel EUT is placed on the wooden table with Styrofoam surface of 5 cm thickness. The RF switch is pressed

Emission was maximized by testing in three orthogonal orientation

Frequency range of measurement = 418MHz

Frequency 9 kHz - 150 kHz RBW=200 Hz, VBW=200 Hz; 150 kHz- 30 MHz RBW=9 kHz, VBW=9 kHz; 30 MHz- 1000 MHz RBW=120 kHz, VBW=120 kHz; 1000 MHz-10,000 MHz RBW=1 MHz, VBW=1 MHz.

Test was performed with a fresh battery installed

Temp - 21°C

Humidity - 55%

Pressure - 101kPa

Ext Attn: 0 dB

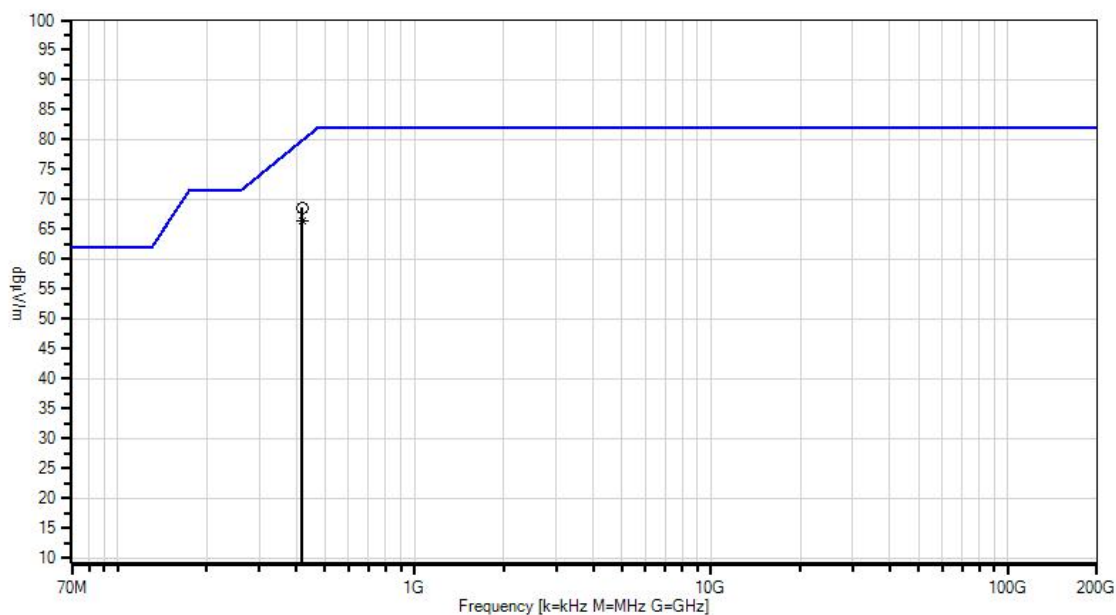
**Measurement Data:**

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBÂμV/ m	Spec dBÂμV/ m	Margin dB	Polar Ant
1	417.944M	75.7	-27.8	+16.6	+0.4	+3.7	+0.0	68.6	79.8	-11.2	Vert
2	417.965M	73.6	-27.8	+16.6	+0.4	+3.7	+0.0	66.5	79.8	-13.3	Horiz
Ave											
^	417.965M	89.6	-27.8	+16.6	+0.4	+3.7	+0.0	82.5	79.8	+2.7	Horiz

CKC Laboratories, Inc. Date: 4/26/2010 Time: 16:48:31 Door King, Inc. WO#: 90734  
15.231(b) Fundamental Field Strength Test Distance: 3 Meters Sequence#: 1 Ext ATTN: 0 dB



— Readings  
\* Average Readings  
○ Peak Readings  
▼ Ambient  
× QP Readings  
— 1 - 15.231(b) Fundamental Field Strength

**Test Setup Photos**



## 15.231(b) Field Strength of Spurious Emissions

### Test Data Sheets

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • (714) 255 1476

Customer: **Door King, Inc.**

Specification: **15.231(b) Spurious Field Strength (418 MHz Transmitter)**

Work Order #: **90734**

Date: 4/27/2010

Test Type: **Maximized Emissions**

Time: 09:33:54

Equipment: **Handheld Garage Door Type RF**

Sequence#: 1

**Transmitter 418 MHz**

Manufacturer: Door King, Inc.

Tested By: S. Hundal

Model: 8072A

S/N: NA

#### Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00309	Preamp	8447D	5/2/2008	5/2/2010
T2	AN01995	Biconilog Antenna	CBL6111G	3/8/2010	3/8/2012
T3	ANP05050	Cable	RG223/U	4/16/2009	4/16/2011
T4	ANP05198	Cable	8268	1/5/2009	1/5/2011
T5	ANP05198	Cable	8268	1/5/2009	1/5/2011
T6	AN00786	Preamp	83017A	7/28/2008	7/28/2010
T7	AN02948	Cable	32022-2-2909K-24TC	9/21/2009	9/21/2011
T8	ANP05565	Cable	ANDL-1-PNMN-54	9/4/2008	9/4/2010
T9	AN02752	High Pass Filter	6IH40-500/T3000-O/O	3/5/2010	3/5/2012
T10	AN01646	Horn Antenna	3115	6/6/2008	6/6/2010
	AN00314	Loop Antenna	6502	6/16/2008	6/16/2010

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

Function	Manufacturer	Model #	S/N
Handheld Garage Door Type RF Transmitter 418 MHz*	Door King, Inc.	8072A	NA

#### Support Devices:

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

The handheld, single channel EUT is placed on the wooden table with Styrofoam surface of 5 cm thickness. The RF switch is pressed

Emission was maximized by testing in three orthogonal orientation

Frequency range of measurement = 9kHz - 4.2GHz

Frequency 9 kHz - 150 kHz RBW=200 Hz, VBW=200 Hz; 150 kHz- 30 MHz RBW=9 kHz, VBW=9 kHz; 30 MHz- 1000 MHz RBW=120 kHz, VBW=120 kHz; 1000 MHz-10,000 MHz RBW=1 MHz, VBW=1 MHz.

Test was performed with a fresh battery installed

Temp - 21°C

Humidity - 55%

Pressure - 101kPa

Ext Attn: 0 dB

**Measurement Data:**

Reading listed by margin.

Test Distance: 3 Meters

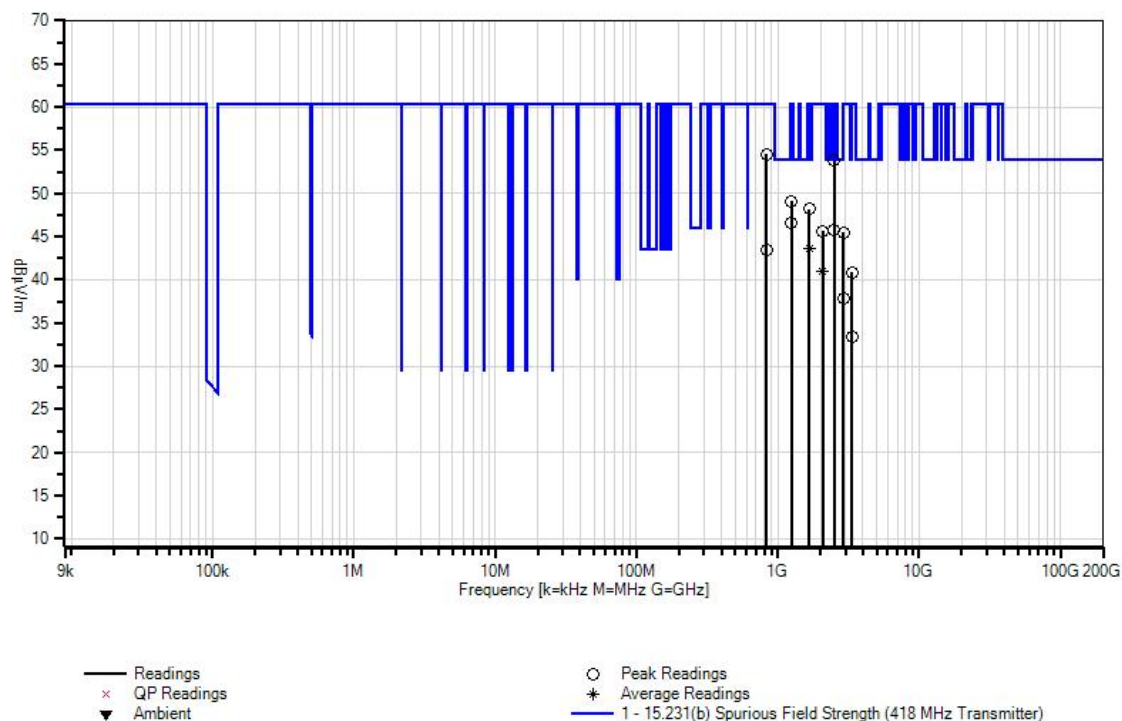
#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	dB	dB	dB	dB	Table	dBμV/m	dBμV/m	dB	Ant
1	835.904M	53.0	-27.1 +5.4 +0.0	+22.7 +0.0 +0.0	+0.6 +0.0 +0.0	+5.4 +0.0 +0.0	+0.0	54.6	60.3	-5.7	Horiz
2	1671.868M	56.9	+0.0 +0.0 +0.2	+0.0 -38.2 +25.9	+0.0 +0.4	+0.0 +3.0	+0.0	48.2	54.0	-5.8	Vert
3	2507.811M	58.7	+0.0 +0.0 +0.4	+0.0 -37.8 +28.2	+0.0 +0.5	+0.0 +3.8	+0.0	53.8	60.3	-6.5	Horiz
4	1671.873M Ave	52.4	+0.0 +0.0 +0.2	+0.0 -38.2 +25.9	+0.0 +0.4	+0.0 +3.0	+0.0	43.7	54.0	-10.3	Horiz
^	1671.873M	68.6	+0.0 +0.0 +0.2	+0.0 -38.2 +25.9	+0.0 +0.4	+0.0 +3.0	+0.0	59.9	54.0	+5.9	Horiz
6	1253.909M	60.4	+0.0 +0.0 +0.2	+0.0 -39.0 +24.6	+0.0 +0.3	+0.0 +2.6	+0.0	49.1	60.3	-11.2	Horiz
7	1253.913M	57.8	+0.0 +0.0 +0.2	+0.0 -39.0 +24.6	+0.0 +0.3	+0.0 +2.6	+0.0	46.5	60.3	-13.8	Vert
8	2507.826M	50.6	+0.0 +0.0 +0.4	+0.0 -37.8 +28.2	+0.0 +0.5	+0.0 +3.8	+0.0	45.7	60.3	-14.6	Vert
9	2089.855M	52.0	+0.0 +0.0 +0.2	+0.0 -37.9 +27.5	+0.0 +0.4	+0.0 +3.5	+0.0	45.7	60.3	-14.6	Vert
10	2925.771M	47.9	+0.0 +0.0 +0.5	+0.0 -37.7 +29.9	+0.0 +0.5	+0.0 +4.3	+0.0	45.4	60.3	-14.9	Horiz



11	835.888M	41.9	-27.1 +5.4 +0.0	+22.7 +0.0 +0.0	+0.6 +0.0 +0.0	+5.4 +0.0 +0.0	+0.0	43.5	60.3	-16.8	Vert
12	2089.831M Ave	47.3	+0.0 +0.0 +0.2	+0.0 -37.9 +27.5	+0.0 +0.4 +0.0	+0.0 +3.5 +0.0	+0.0	41.0	60.3	-19.3	Horiz
^	2089.850M	63.5	+0.0 +0.0 +0.2	+0.0 -37.9 +27.5	+0.0 +0.4 +0.0	+0.0 +3.5 +0.0	+0.0	57.2	60.3	-3.1	Horiz
14	3343.744M	42.7	+0.0 +0.0 +0.4	+0.0 -37.6 +30.2	+0.0 +0.6 +0.0	+0.0 +4.6 +0.0	+0.0	40.9	60.3	-19.4	Horiz
15	2925.790M	40.4	+0.0 +0.0 +0.5	+0.0 -37.7 +29.9	+0.0 +0.5 +0.0	+0.0 +4.3 +0.0	+0.0	37.9	60.3	-22.4	Vert
16	3343.790M	35.3	+0.0 +0.0 +0.4	+0.0 -37.6 +30.2	+0.0 +0.6 +0.0	+0.0 +4.6 +0.0	+0.0	33.5	60.3	-26.8	Vert



CKC Laboratories, Inc. Date: 4/27/2010 Time: 09:33:54 Door King, Inc. WO#: 90734  
15.231(b) Spurious Field Strength (418 MHz Transmitter) Test Distance: 3 Meters Sequence#: 1 Ext ATTN: 0 dB



**Test Setup Photos**





## 15.231(c) & RSS-210 Occupied Bandwidth

Engineer Name: S. Hundal

Test Equipment				
Name	Serial	Cal Date	Cal Due	Asset
Spectrum Analyzer	US44300438	7/23/2008	7/23/2010	02672

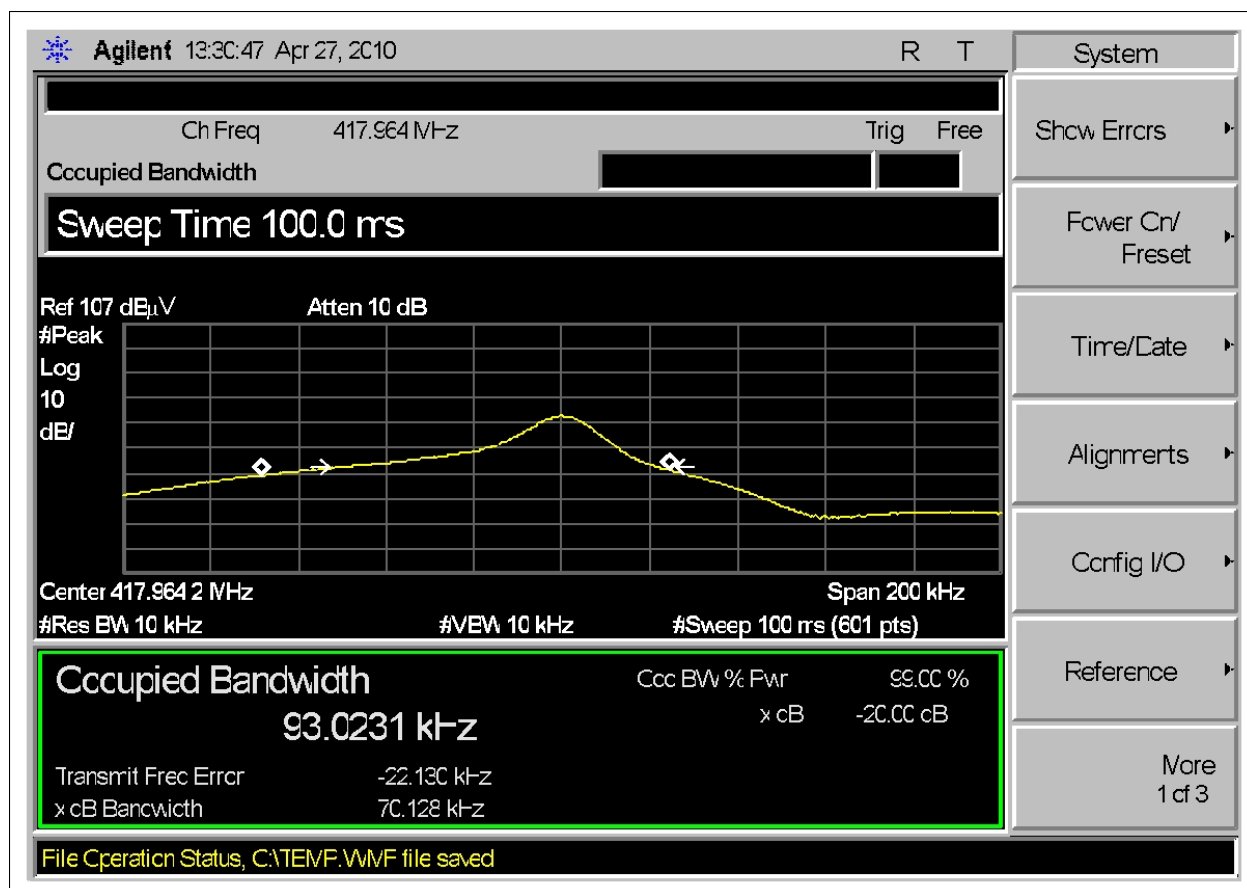
### Test Conditions

The EUT is placed on the test bench, in close proximity to the analyzer. The RF switch is depressed, continuously transmitting.

Occupied Bandwidth -20dBc= 70kHz

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### Test Plots



**Test Setup Photos**



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## 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 dB $\mu$ V/m, the spectrum analyzer reading in dB $\mu$ 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.

### 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 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.