



Underwriters Laboratories Inc.  
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Melville, NY 11747

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Job Number:	1001299229
Project Number:	10CA53025
File Number:	MC16722
Date:	2011-03-31
Model:	RBAND/OS
FCC ID	U5Z-RBAND-OS

## Electromagnetic Compatibility Test Report

For

### JCM TECHNOLOGIES S A

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Underwriters Laboratories Inc.  
1285 Walt Whitman Rd.  
Melville, NY 11747

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Tel: (631) 271-6200 Fax: (631) 439-6095

Job Number: 1001299229 File Number: MC16722 Page 2 of 69  
Model Number: RBAND/OS  
Client Name: JCM TECHNOLOGIES S A  
FCC ID: U5Z-RBAND-OS

## Test Report Details

Tests Performed By: **Underwriters Laboratories Inc.  
1285 Walt Whitman Rd.  
Melville, NY 11747**

Tests Performed For: **JCM TECHNOLOGIES S A  
BISBE MORGADES, 46 BAIXOS  
VIC, 08500**

Applicant Contact: **GEMMA REVERTER**  
Phone: **+34938833231**  
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Test Report Date: **2011-03-31**

Product Type: **Security Door Operator**

Product standards: **FCC Part 15, Subpart C, 15.231**

Model Number: **RBAND/OS**

Sample Serial Number: **Not Available**

EUT Category: **Periodic Low Power Transmitter**

Testing Start Date: **2011-10-05**

Date Testing Complete: **2011-03-31**

**Overall Results: Compliant**

Underwriters Laboratories Inc. reports apply only to the specific samples tested under stated test conditions. All samples tested were in good operating condition throughout the entire test program. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. Underwriters Laboratories Inc. shall have no liability for any deductions, inferences or generalizations drawn by the client or others from Underwriters Laboratories Inc. issued reports. This report shall not be used to claim, constitute or imply product certification, approval, or endorsement by NVLAP, NIST, A2LA, or any agency of the US government.

This report may contain test results that are not covered by the NVLAP or A2LA accreditation. The scope of accreditation is limited to the specific tests that are listed on the NVLAP and/or A2LA websites referenced at the end of this report.

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Report Revision History

Revision Date	Description	Revised By	Revision Reviewed By
None			

**1.0 GENERAL - Product Description**

**1.1 Equipment Description**

The RadioBand system is designed of Industrial, Commercial and Domestic door and gate applications where a safety edge is used. The system provides a wireless system replacing spiral cables or energy chain systems to provide the safety signal to the door or gate control panel. The receiver monitors the status of transmitters connected to it.

Up to three transmitters per output can be connected to the receiver. There are two outputs on each receiver. The system is compatible with 8K2 monitored safety edges, opto safety edges and volt free safety contacts. Two inputs available in the transmitter.

Per FCC Part 2.1093 (C) this device is not required to undergo testing for radio-frequency radiation exposure.

Antenna description: Permanently attached to the RF circuit board and the transmit antenna type is a wire antenna.

**1.2 Equipment Marking Plate**

Not available.

**1.3 Device Configuration During Test**

**1.3.1 Equipment Used During Test:**

Use	Product Type	Manufacturer	Model	Comments
EUT	Security Door Operator	JCM TECHNOLOGIES S A	RBAND/OS	None
Note: EUT - Equipment Under Test, AE - Auxiliary/Associated Equipment, or SIM - Simulator (Not Subjected to Test)				

**1.3.2 Input/Output Ports:**

Port #	Name	Type*	Cable Max. >3m (Y/N)	Cable Shielded (Y/N)	Comments
0	Enclosure	N/E	—	—	None
1	Mains	Bat	N	N	Powered by 2 1.5V AA Batteries
Note: AC = AC Power Port      DC = DC Power Port      N/E = Non-Electrical I/O = Signal Input or Output Port (Not Involved in Process Control)      Bat = Battery TP = Telecommunication Ports					

**1.3.3 EUT Internal Operating Frequencies:**

Frequency (MHz)	Description
16	Microcontroller
26	External oscillator
868.32-869.82	Transmitter frequency band
433.90	Transmitter frequency band

**1.3.4 Power Interface:**

Mode # /Rated	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Phases (#)	Comments
Rated	3	-	-	DC	-	Battery Operated
1	3	-	-	DC	-	Powered by two 1.5Vdc AA Batteries

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**1.4 Block Diagram:**

The diagram below illustrates the configuration of the equipment above.



### 1.5 EUT Configurations

Mode #	Description
1	Stand-alone

### 1.6 EUT Operation Modes

Mode #	Description
1	Constantly transmitting 868.32MHz
2	Constantly transmitting 869.82MHz
3	Constantly transmitting 433.90MHz
4	Normal Operation 868.32MHz
5	Normal Operation 433.90MHz
6	Rx Mode 868.32MHz
7	Rx Mode 869.82MHz
8	Rx Mode 433.90MHz



## 2.0 Summary

The tests listed in the Summary of Testing section of this report have been performed and the results recorded by Underwriters Laboratories Inc. in accordance with the procedures stated in each test requirement and specification. The applicant determined the list of tests performed were applicable to the Equipment Under Test. As a result, the subject product has been verified to comply or not comply as noted in the Summary of Testing with each test specification. The test results relate only to the items tested.

### 2.1 Deviations from standard test methods

None

### 2.2 Device Modifications Necessary for Compliance

A second filter stage has been added to the 433MHz transmission to filter the harmonics.

**2.3 Reference Standards**

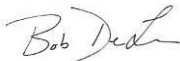
Standard Number	Standard Name	Standard Date
FCC Part 15, Subpart C, 15.231	Code of Federal Regulations, Part 15, Radio Frequency Devices	2011

**2.4 Results Summary**

This product is considered Periodic Transmitter and Class B Receiver

Requirement – Test	Result (Compliant / Non-Compliant)*
Cease Operation	Compliant
Occupied Bandwidth	Compliant
Pulse Train - Averaging Factor	Compliant
Radiated Emissions - Unintentional	Compliant
Fundamental Radiated Emissions	Compliant
Polling/Supervision Signal	Compliant

Test Engineer:



Bob DeLisi (Ext.22452)  
 Senior Staff Engineer  
 International EMC Services  
 Conformity Assessment Services-

Reviewer:



Mike Antola(Ext.23053)  
 Senior Project Engineer  
 International EMC Services  
 Conformity Assessment Services

Any information and documentation involving UL Mark services are provided on behalf of Underwriters Laboratories Inc. (UL) or any authorized licensee of UL.

### 3.0 Calibration of Equipment Used for Measurement

All test equipment and test accessories are calibrated on a regular basis. The maximum time between calibrations is one year or the manufacturers' recommendation, whichever is less.

All test equipment calibrations are traceable to the National Institute of Standards and Technology (NIST); therefore, all test data recorded in this report is traceable to NIST.

### 4.0 Emissions Test Results

The emissions tests were performed according to following regulations:

----- United States -----

Code of Federal Regulations Title 47	Part 15, Subpart B, Radio Frequency Devices
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Unless specified otherwise in the individual Methods, the tests shall be conducted under the following ambient conditions. Confirmation of these conditions shall be verified at the time the test is conducted.

Ambient Temperature, °C	22.5 ± 2.5	Relative Humidity, %	45 ± 15	Barometric Pressure, mBar	950 ± 150
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#### Sample Calculations

Radiated Field Strength and Conducted Emissions data contained within this report is calculated on the following basis:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Meter Reading (dBuV)} + \text{AF (dB/m)} - \text{Gain (dB)} + \text{Cable Loss (dB)} \\ \text{Conducted Voltage (dBuV)} &= \text{Meter Reading (dBuV)} + \text{Cable Loss (dB)} + \text{LISN IL (dB)} \\ \text{Conducted Current (dBuA)} &= \text{Meter Reading (dBuV)} + \text{Cable Loss (dB)} - \text{Transducer Factor (dBohms)} \end{aligned}$$

**4.1 Test Conditions and Results – Occupied Bandwidth**

Test Description	Measurements were made in the laboratory environment. A Dipole antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The device was operated and the spectrum analyzer resolution bandwidth set per the appropriate standard.	
Basic Standard	FCC Part 15.231	
<b>Occupied Bandwidth Limits</b>		
0.25%Fo		

**Table 1 Occupied Bandwidth Configuration Settings**

Power Interface Mode	EUT Configurations Mode	EUT Operation Mode
1	1	4
1	1	5
Supplementary information: None		

**Table 2 Occupied Bandwidth Spectrum Analyzer Settings**

Resolution Bandwidth (MHz)	Occupied Bandwidth Requirements	
	dBc	%
10kHz	-20	NA
Supplementary information: None		

**Table 3 Occupied Bandwidth Test Equipment**

<b>Test Equipment Used</b>					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081	2010-01-12	2011-01-12
Dipole Antenna	EMCO	3121C	3359	2010-12-08	2011-12-08
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268	2010-12-07	2012-12-07

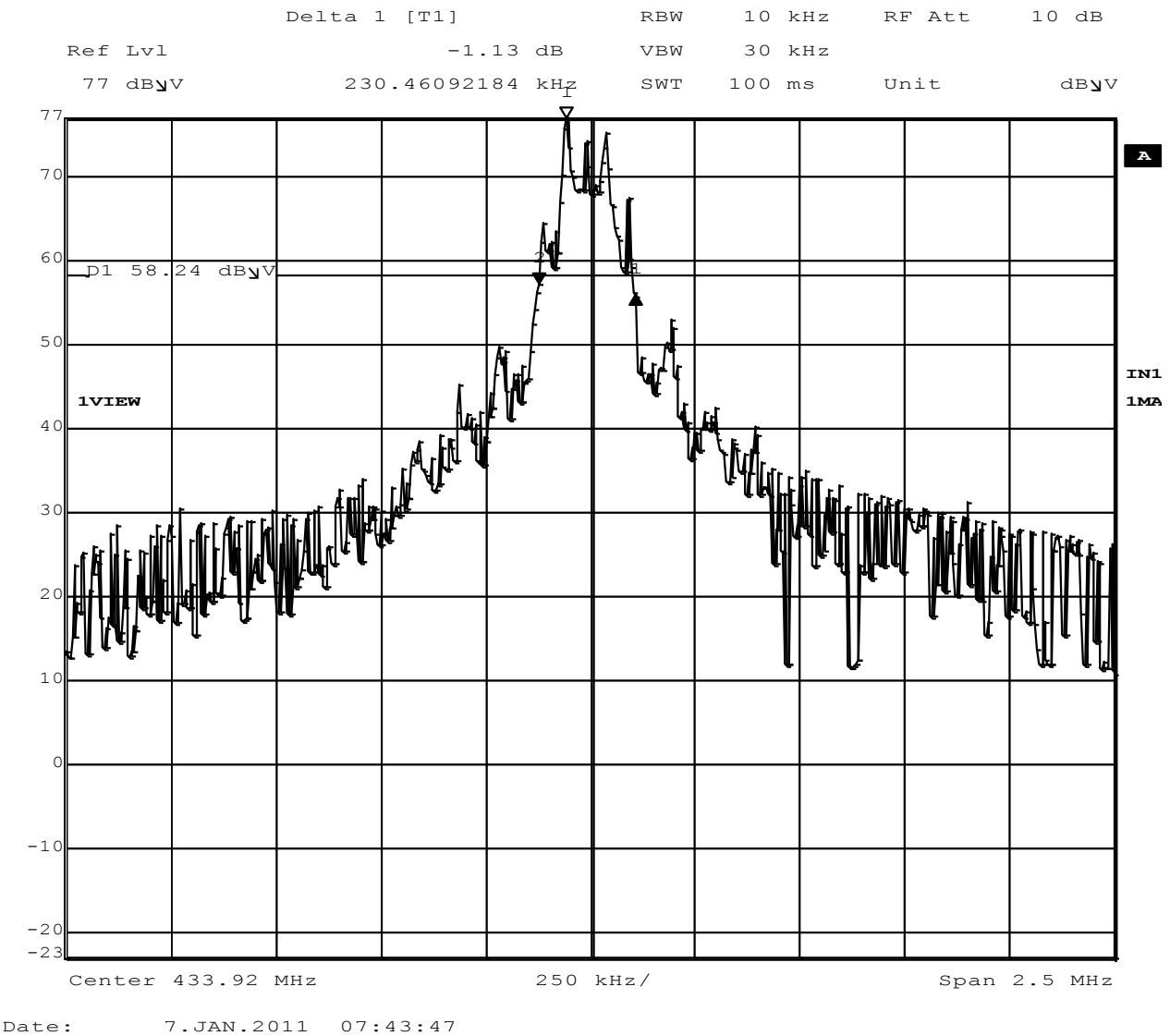
Figure 1 Test Setup for Occupied Bandwidth



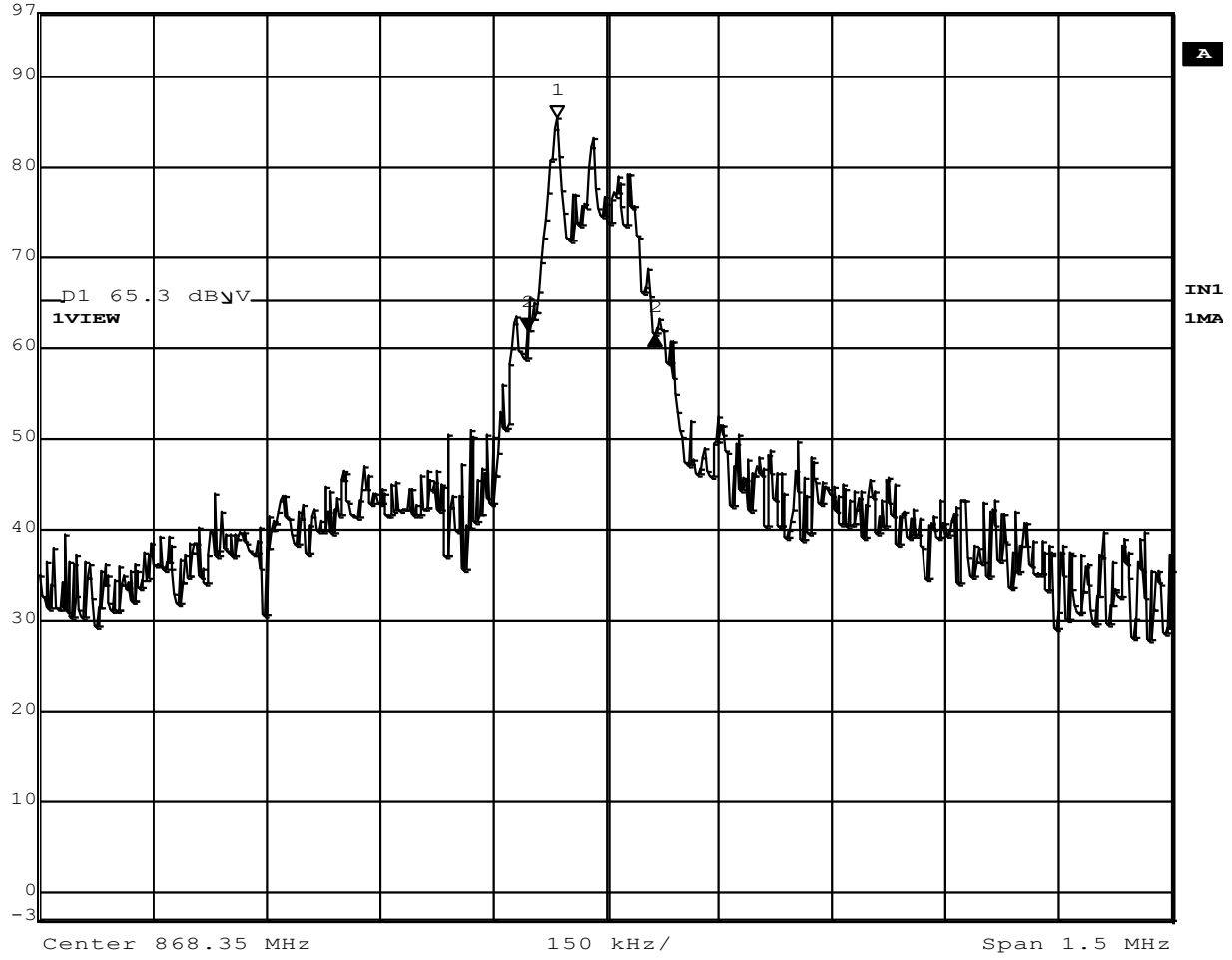
**Table 4 Occupied Bandwidth Test Results**

Frequency (MHz)	Measured OBW (kHz)	Limit (MHz)	Results
868.35	168.3	2.17	Pass
868.92	159.3	2.17	Pass
433.90	230.5	1.08	Pass

**Figure 2 Occupied Bandwidth Graph – 433MHz, 868.35MHz and 869.92MHz**

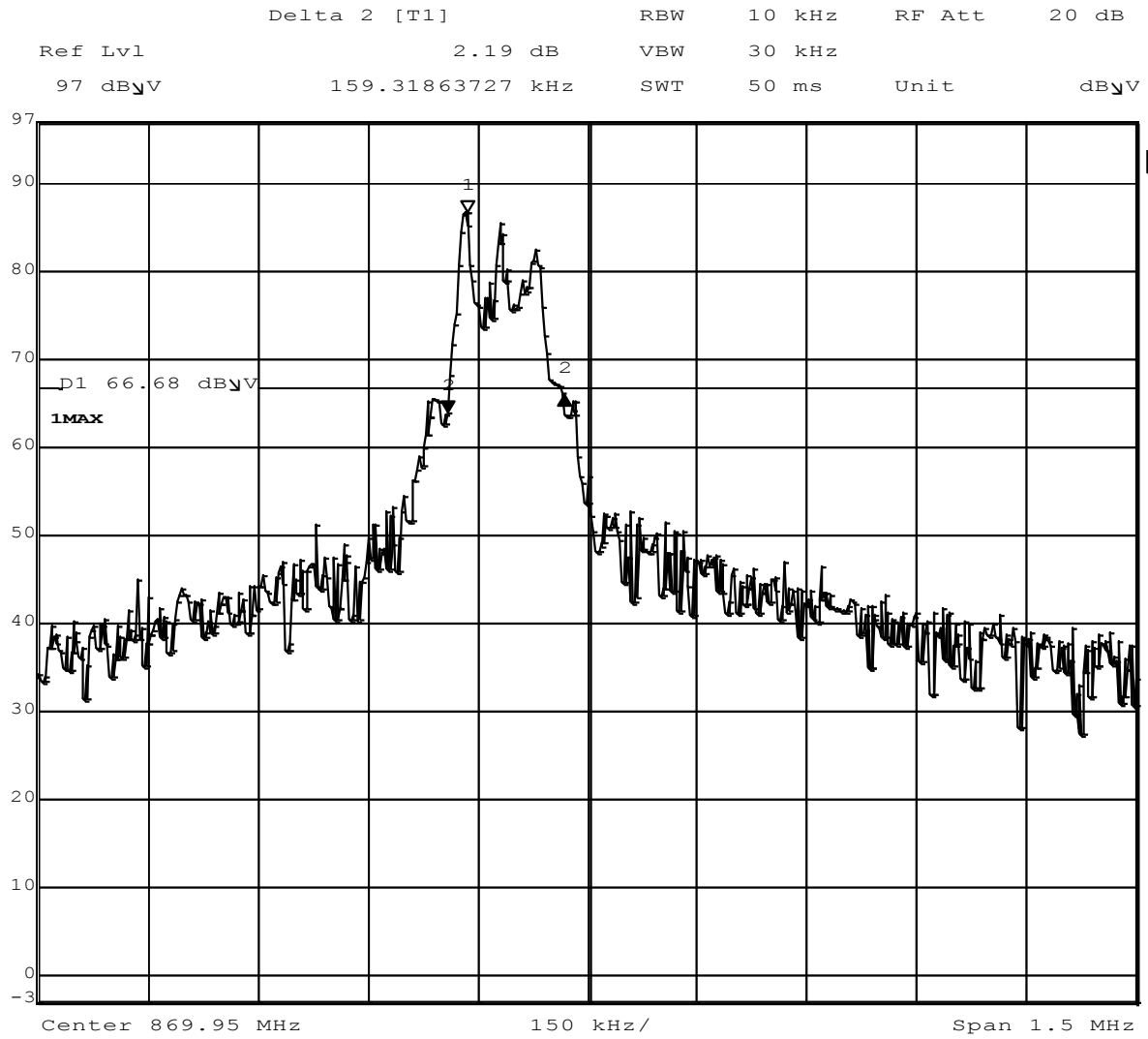


Delta 2 [T1] RBW 10 kHz RF Att 20 dB  
 Ref Lvl -0.48 dB VBW 30 kHz  
 97 dBμV 168.33667335 kHz SWT 100 ms Unit dBμV



Date: 7.JAN.2011 08:01:48

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Date: 7.JAN.2011 08:12:19



**4.2 Test Conditions and Results – Pulse Train and Polling Signals**

Test Description	Measurements were made in the laboratory environment. A Dipole antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The pulse train was measured with the spectrum analyzer set to zero span at the fundamental frequency. Polling signals were measured to ensure that there are no more than 2
Basic Standard	FCC Part 15 Subpart A, 15.35, 15.231(a)(3)
<b>Pulse Train Limits</b>	
There are no limits for this test. This data is used to calculate the averaging correction factor that is applied to the measured peak radiated emissions results.	
<b>Polling Signal Limits</b>	
Total transmission time does not exceed two seconds per hour	

**Table 5 Pulse Train Configuration Settings**

Power Interface Mode	EUT Configurations Mode	EUT Operation Mode
1	1	4
1	1	5
Supplementary information: None		

**Table 6 Pulse Train Calculation**

Frequency	Pulse Width (mS)	Total Transmission time or 100ms which ever is lesser	Average Correction Factor (dB) $20 \log \left( \frac{PulseWidth}{TotalTransmissionTime} \right)$
433.92	2.1	100	-33.56
868.35	2.1	100	-33.56

**Table 7 Polling Signals**

Pulse Width (mS)	Number of transmissions in 60 seconds	Transmission time in a 1hr period
2.1	6	756mS

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**Table 8 Pulse Train Test Equipment**

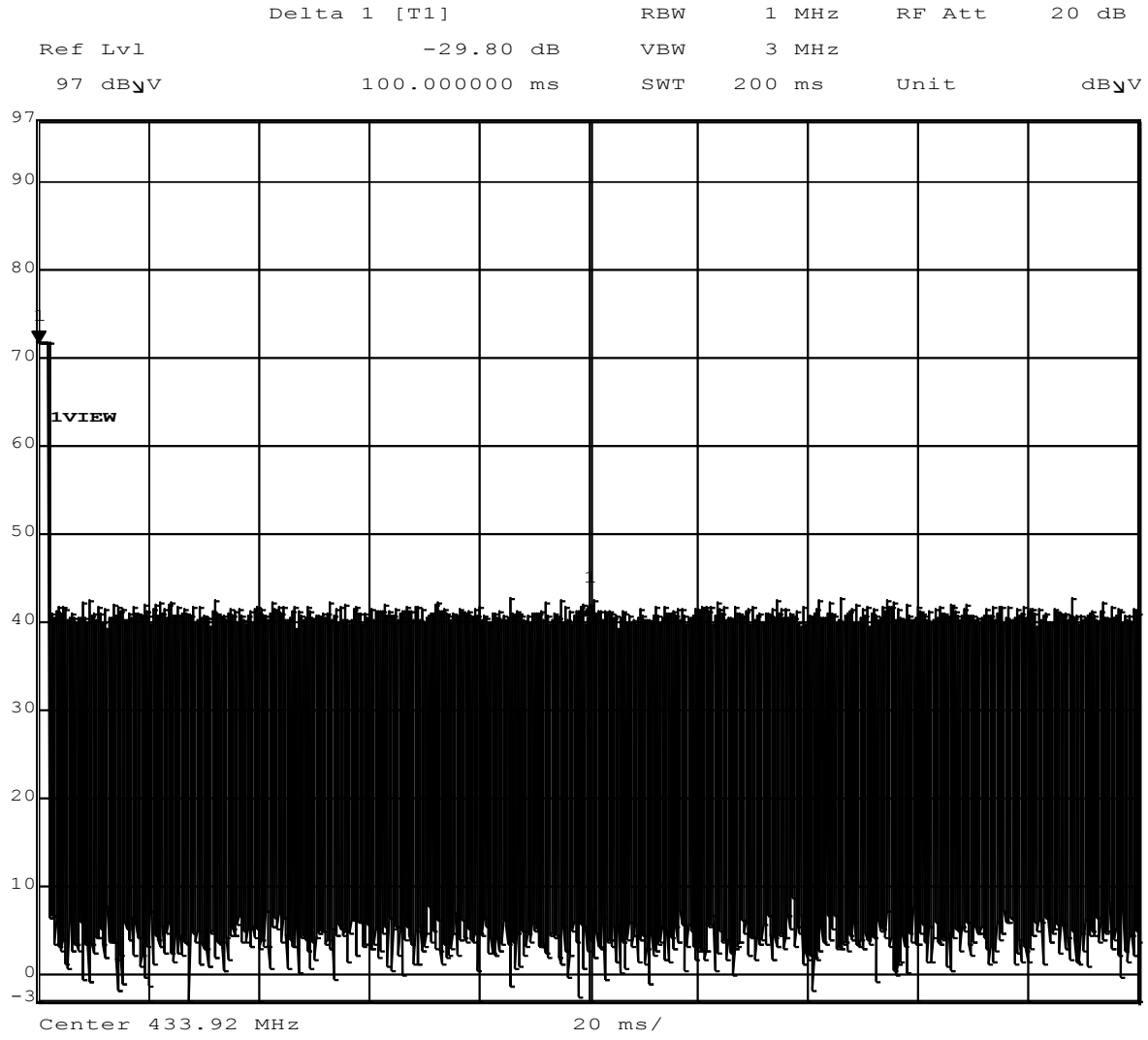
<b>Test Equipment Used</b>					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081	2010-01-12	2011-01-12
Dipole Antenna	EMCO	3121C	3359	2010-12-08	2011-12-08
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268	2010-12-07	2012-12-07

**Figure 3 Test Setup for Pulse Train**

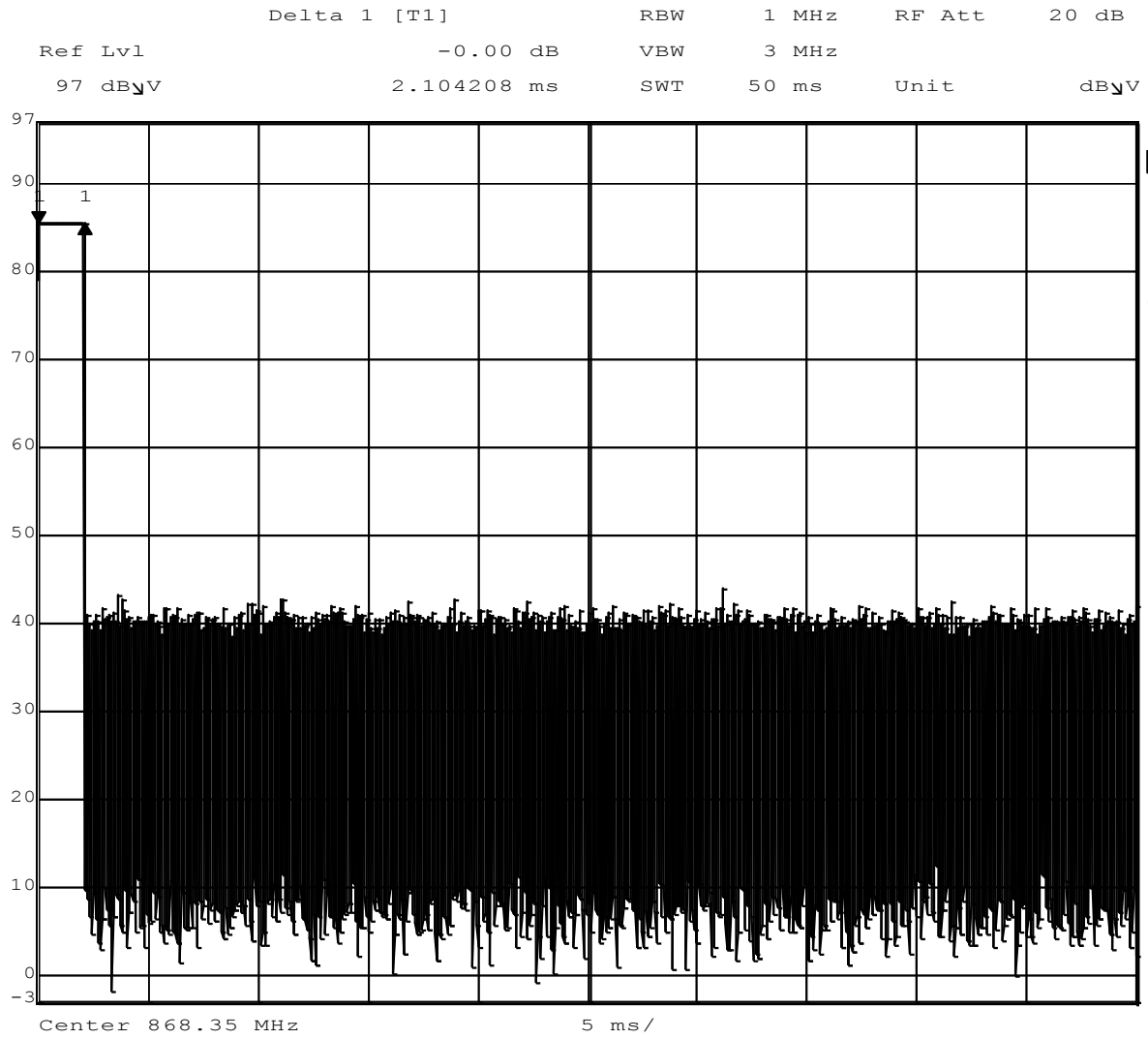




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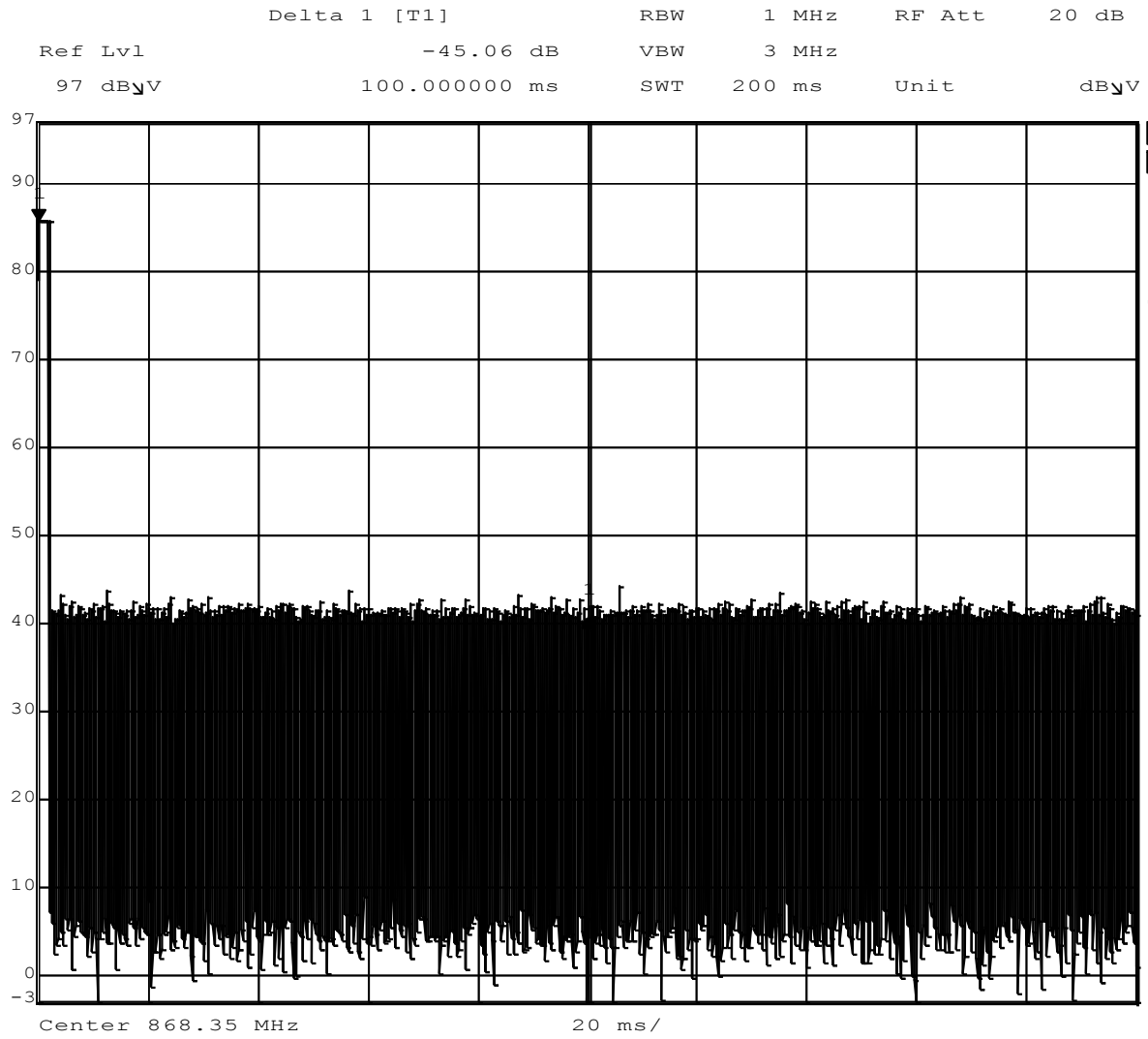


Date: 7.JAN.2011 07:45:38



Date: 7.JAN.2011 08:03:36

Job Number: 1001299229 File Number: MC16722 Page 23 of 69  
Model Number: RBAND/OS  
Client Name: JCM TECHNOLOGIES S A  
FCC ID: U5Z-RBAND-OS



Date: 7.JAN.2011 08:03:00

**4.3 Test Conditions and Results – Cease Operation**

Test Description	Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The device was operated and the transmission time measured with the spectrum analyzer set to zero span at the fundamental frequency.	
Basic Standard	FCC Part 15.231	
<b>Cease Operation Limits</b>		
The transmissions shall stop within 5 seconds of either a button being released or if automatically controlled transmissions shall be stopped 5 seconds after transmissions begin.		

**Table 9 Cease Operation Configuration Settings**

Power Interface Mode	EUT Configurations Mode	EUT Operation Mode
1	1	4
1	1	5
Supplementary information: None		

**Table 10 Cease Operation Test Equipment**

<b>Test Equipment Used</b>					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081	2010-01-12	2011-01-12
Dipole Antenna	EMCO	3121C	3359	2010-12-08	2011-12-08
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268	2010-12-07	2012-12-07

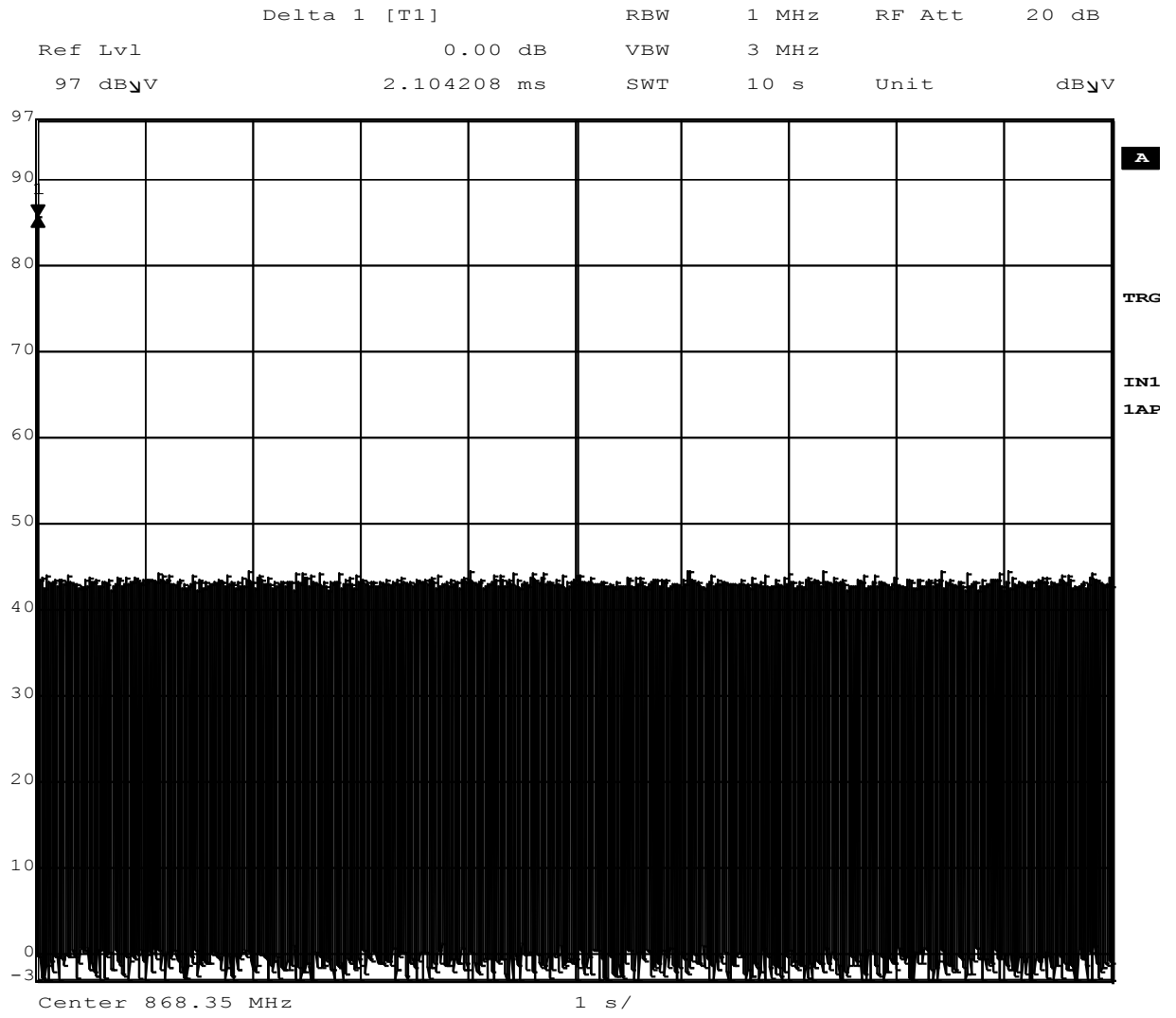


**Figure 5 Test Setup for Cease Operation**





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Model Number: RBAND/OS  
Client Name: JCM TECHNOLOGIES S A  
FCC ID: U5Z-RBAND-OS



Date: 7.JAN.2011 08:04:25

**4.4 Test Conditions and Results – RADIATED EMISSIONS (Unintentional)**

Test Description	Measurements were made in a 10-meter semi-anechoic chamber that complies to CISPR 16/ANSI C63.4. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10-meter. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in both horizontal and vertical polarities. Final measurements (quasi-peak or average as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.	
Basic Standard	FCC Part 15, Subpart C, 15.231	
UL LPG	80-EM-S0029	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	30MHz – 1GHz	(10 meter measurement distance)
Fully configured sample scanned over the following frequency range	1GHz – 5GHz (868MHz)	(3 meter measurement distance)
	1GHz – 2GHz (433MHz)	
<b>Limits - Class B</b>		
Frequency (MHz)	Limit (dBµV/m)	
	Quasi-Peak	Average
30-230	30	NA
230-1000	37	NA
Above 1000	NA	54 (at 3-meter)
Supplementary information: None		

**Table 11 Radiated Emissions EUT Configuration Settings**

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	6
1	1	7
1	1	8
Supplementary information: None		

**Table 12 Radiated Emissions Test Equipment**

Test Equipment Used					
30-1000MHz					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due
EMI Receiver	Rohde & Schwarz	ESIB40	34968	2010-02-22	2011-02-22
Bicon Antenna	Schaffner	VBA6106A	43441	2010-09-09	2011-09-09
Log-P Antenna	Schaffner	UPA6109	44067	2010-04-26	2011-04-26
Switch Driver	HP	11713A	ME7A-627	N/A	N/A
Bias Tee	Miteq	AM-1523-7687	44392	N/A	N/A
Bias Tee	Miteq	AM-1523-7687	44393	N/A	N/A
Preamp	Miteq	AM-3A-000110-7687	44391	N/A	N/A
Preamp	Miteq	AM-3A-000110-7687	44394	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	2009-11-11	2010-11-11
Multimeter	Fluke	83IV	43443	2010-02-02	2011-02-02
Above 1GHz (Band Optimized System)					
Spectrum Analyzer	Agilent	E7405A	19695	2010-02-01	2011-02-01
Horn Antenna (1-2 GHz)	ETS	3161-01	51442	2008-03-28	See * below
Horn Antenna (2-4 GHz)	ETS	3161-02	48107	2007-09-27	See * below
Horn Antenna (4-8 GHz)	ETS	3161-03	48106	2007-09-27	See * below
Signal Path Controller	HP	11713A	50250	N/A	N/A
Gain Controller	HP	11713A	50251	N/A	N/A
RF Switch / Preamp Fixture	UL	BOMS1	50249	N/A	N/A
System Controller	UL	BOMS2	50252	N/A	N/A
Measurement Software	UL	Version 9.3	44740	N/A	N/A
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268	2009-11-11	2010-11-11
Multimeter	Fluke	83V	43443	2010-02-02	2011-02-02

\* Note: As allowed by the calibration standard ANSI C63.4 Section 4.4.2, standard gain horns need only a one-time calibration. Only if physical damage occurs will the horn antenna require re-calibration. Gain standard horn antennas (sometimes called standard gain horn antennas) need not be calibrated beyond that which is provided by the manufacturer unless they are damaged or deterioration is suspected, or they are used at a distance closer than  $2D^2/\lambda$ . Gain standard horn antennas have gains that are fixed by their dimensions and dimensional tolerances.

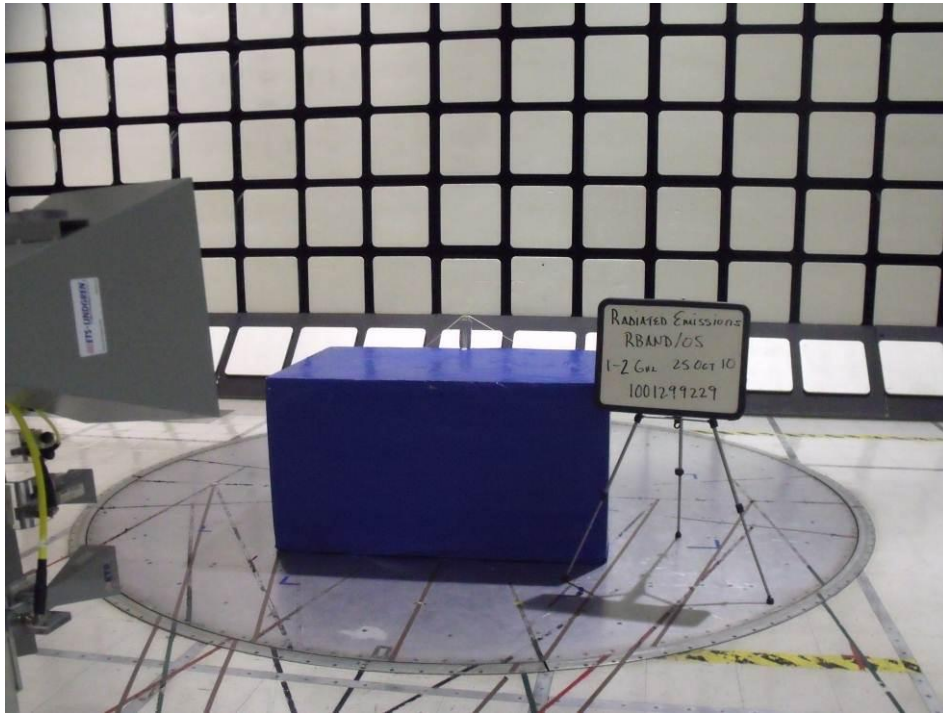
**Figure 7 Test setup for Radiated Emissions – Receive Mode**



**Front View**



**Rear View**



Front View



Rear View



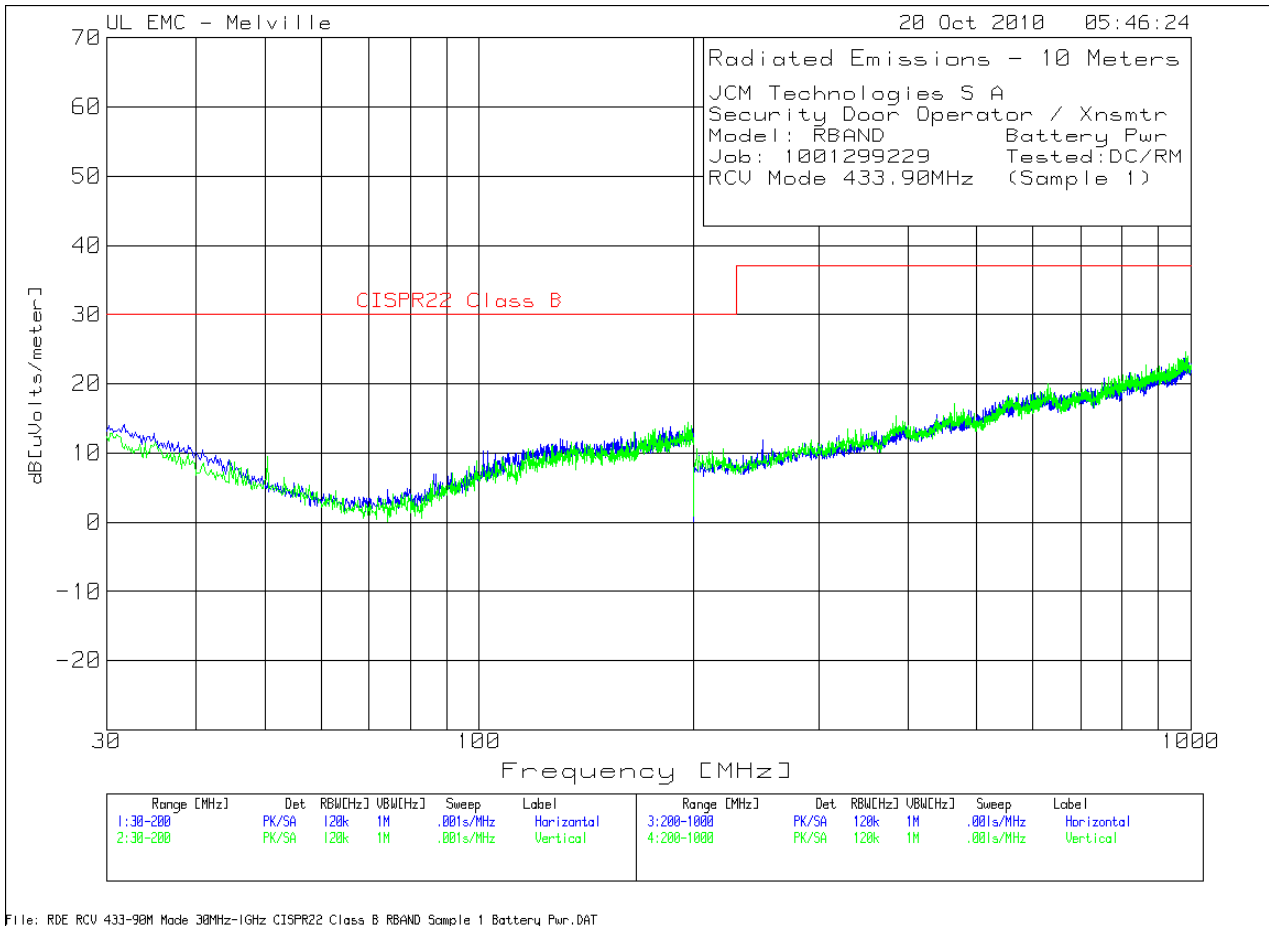
Front View



Rear View



**Figure 8 Radiated Emissions Graph – Receiver Mode 433.90MHz**



**Table 13 Radiated Emissions Data Points – Receiver 433.90MHz**

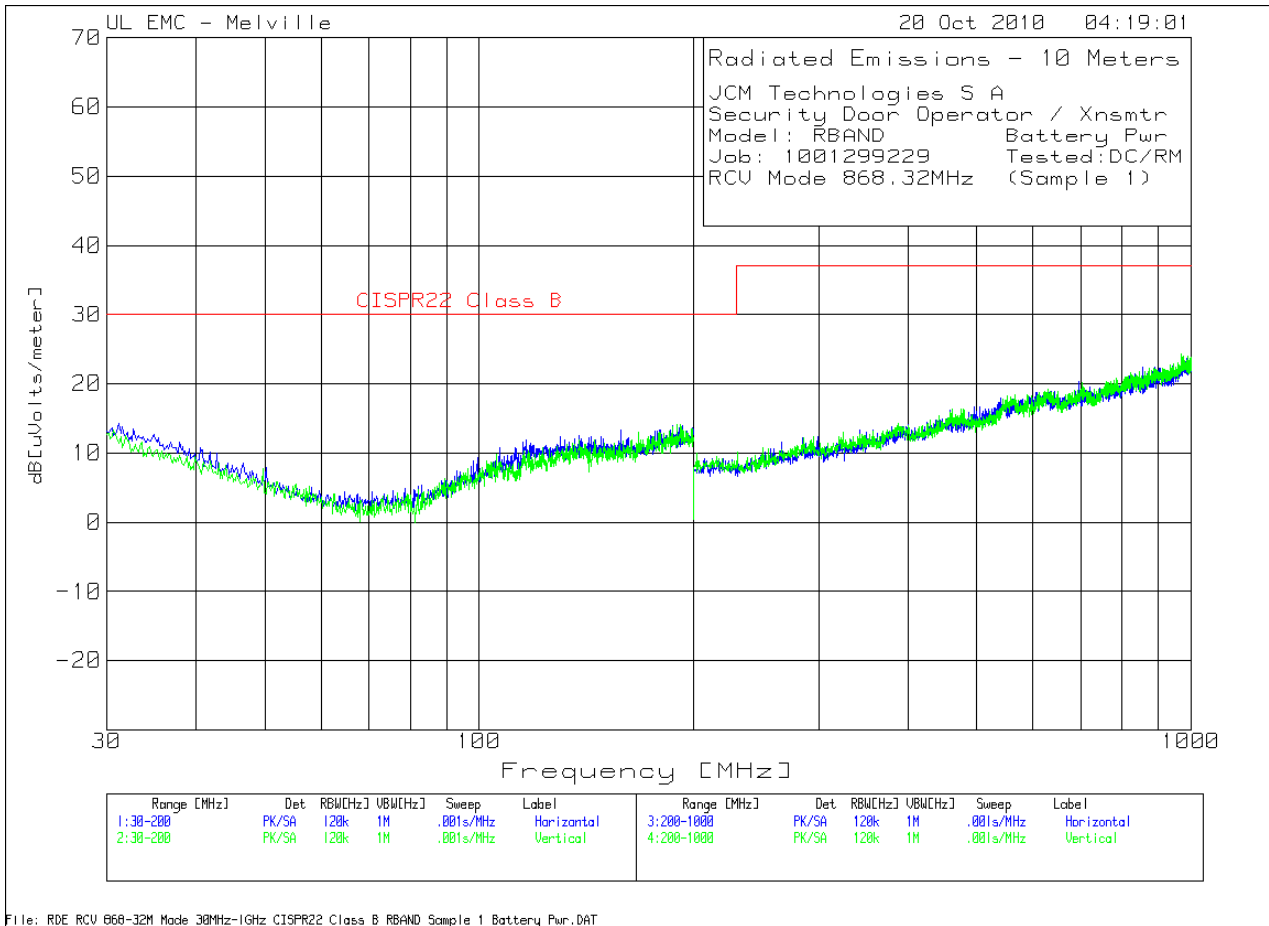
JCM Technologies S A  
 Security Door Operator / Xnsmtr  
 Model: RBAND Battery Pwr  
 Job: 1001299229 Tested:DC/RM  
 RCV Mode 433.90MHz (Sample 1)

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Horizontal 30 - 200MHz -----											
1	34.9349	32.69 pk	-35.9	16	12.79	30	-	-	-	-	-
	Azimuth:295	Height:100	Horz	Margin [dB]		-17.21	-	-	-	-	-
2	101.4715	35.02 pk	-35.7	11	10.32	30	-	-	-	-	-
	Azimuth:68	Height:250	Horz	Margin [dB]		-19.68	-	-	-	-	-
Vertical 30 - 200MHz -----											
3	50.4204	35.71 pk	-35.9	9.7	9.51	30	-	-	-	-	-
	Azimuth:35	Height:100	Vert	Margin [dB]		-20.49	-	-	-	-	-
4	176.3463	33 pk	-35.2	15.7	13.5	30	-	-	-	-	-
	Azimuth:1	Height:100	Vert	Margin [dB]		-16.5	-	-	-	-	-
Horizontal 200 - 1000MHz -----											
5	250.025	34.26 pk	-34.3	12	11.96	37	-	-	-	-	-
	Azimuth:116	Height:99	Horz	Margin [dB]		-25.04	-	-	-	-	-
6	755.8779	31.83 pk	-32.1	21.1	20.83	37	-	-	-	-	-
	Azimuth:135	Height:200	Horz	Margin [dB]		-16.17	-	-	-	-	-
Vertical 200 - 1000MHz -----											
7	464.9325	32.6 pk	-32.8	17.3	17.1	37	-	-	-	-	-
	Azimuth:287	Height:199	Vert	Margin [dB]		-19.9	-	-	-	-	-
8	981.991	31.36 pk	-31.3	24.6	24.66	37	-	-	-	-	-
	Azimuth:19	Height:101	Vert	Margin [dB]		-12.34	-	-	-	-	-

LIMIT 1: CISPR22 Class B

PK - Peak detector  
 QP - Quasi-Peak detector  
 av - Linear average detector  
 avlg - Average log detector  
 AV - Average detector  
 CAV - CISPR Average detector  
 RMS - RMS detection  
 CRMS - CISPR RMS detection

**Figure 9 Radiated Emissions Graph – Receiver Mode 868.32MHz**



**Table 14 Radiated Emissions Data Points – Receiver 868.32MHz**

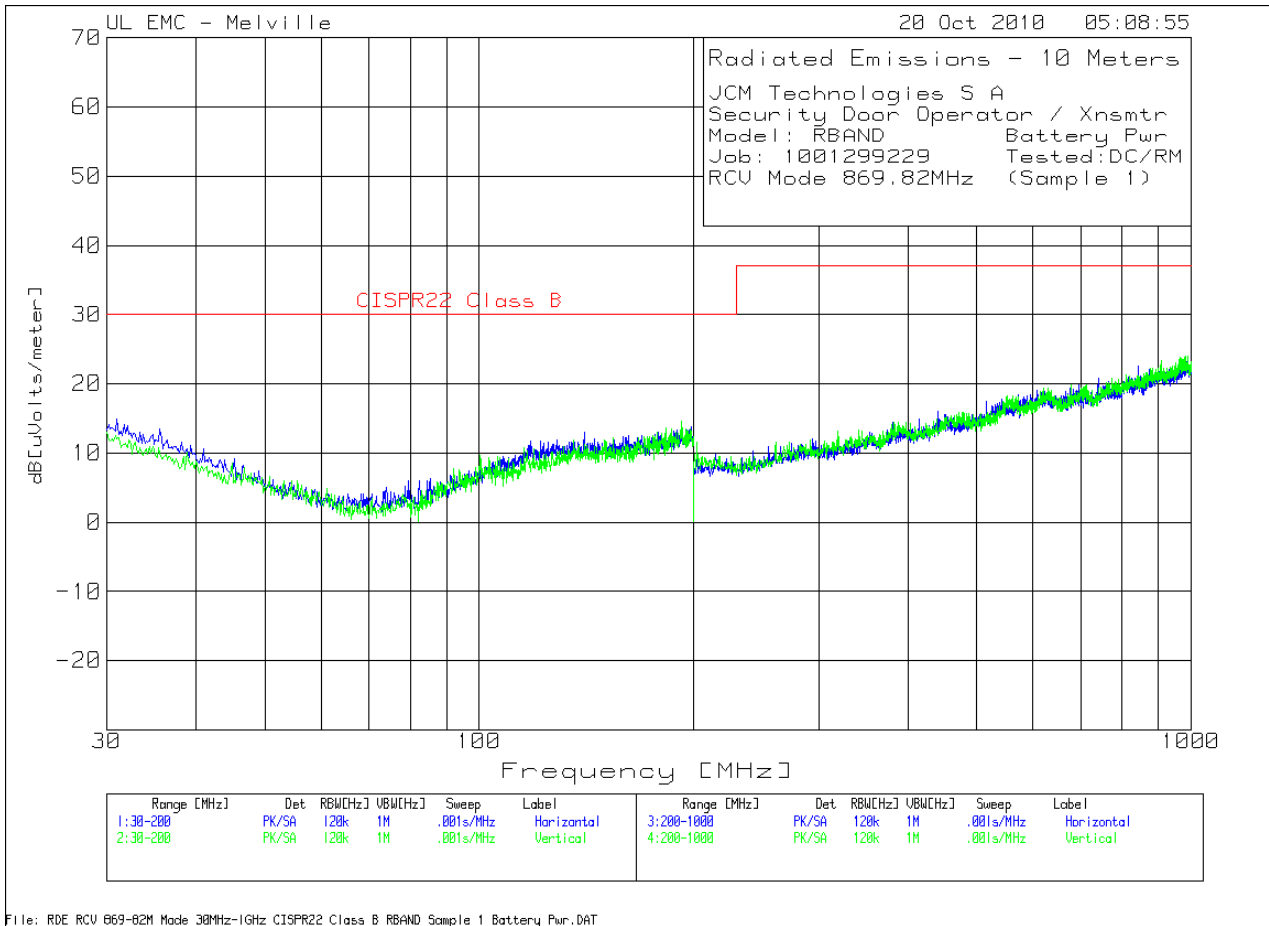
JCM Technologies S A  
 Security Door Operator / Xnsmt  
 Model: RBAND Battery Pwr  
 Job: 1001299229 Tested:DC/RM  
 RCV Mode 868.32MHz (Sample 1)

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Horizontal 30 - 200MHz -----											
1	31.1912	32.75 pk	-35.9	17.4	14.25	30	-	-	-	-	-
	Azimuth:66	Height:250	Horz	Margin [dB]		-15.75	-	-	-	-	-
2	116.6166	34.44 pk	-35.6	13	11.84	30	-	-	-	-	-
	Azimuth:194	Height:400	Horz	Margin [dB]		-18.16	-	-	-	-	-
Vertical 30 - 200MHz -----											
3	49.7397	33.8 pk	-35.8	9.8	7.8	30	-	-	-	-	-
	Azimuth:261	Height:100	Vert	Margin [dB]		-22.2	-	-	-	-	-
4	189.7898	33.13 pk	-35.3	16.3	14.13	30	-	-	-	-	-
	Azimuth:32	Height:100	Vert	Margin [dB]		-15.87	-	-	-	-	-
Horizontal 200 - 1000MHz -----											
5	284.4422	33.08 pk	-34	13.2	12.28	37	-	-	-	-	-
	Azimuth:223	Height:100	Horz	Margin [dB]		-24.72	-	-	-	-	-
6	855.928	32.71 pk	-32.1	21.8	22.41	37	-	-	-	-	-
	Azimuth:189	Height:100	Horz	Margin [dB]		-14.59	-	-	-	-	-
Vertical 200 - 1000MHz -----											
7	475.7379	31.42 pk	-32.7	17.7	16.42	37	-	-	-	-	-
	Azimuth:288	Height:200	Vert	Margin [dB]		-20.58	-	-	-	-	-
8	968.3842	31.44 pk	-31.6	24.4	24.24	37	-	-	-	-	-
	Azimuth:354	Height:300	Vert	Margin [dB]		-12.76	-	-	-	-	-

LIMIT 1: CISPR22 Class B

PK - Peak detector  
 QP - Quasi-Peak detector  
 av - Linear average detector  
 avlg - Average log detector  
 AV - Average detector  
 CAV - CISPR Average detector  
 RMS - RMS detection  
 CRMS - CISPR RMS detection

**Figure 10 Radiated Emissions Graph – Receiver Mode 869.82MHz**



**Table 15 Radiated Emissions Data Points – Receiver 869.82MHz**

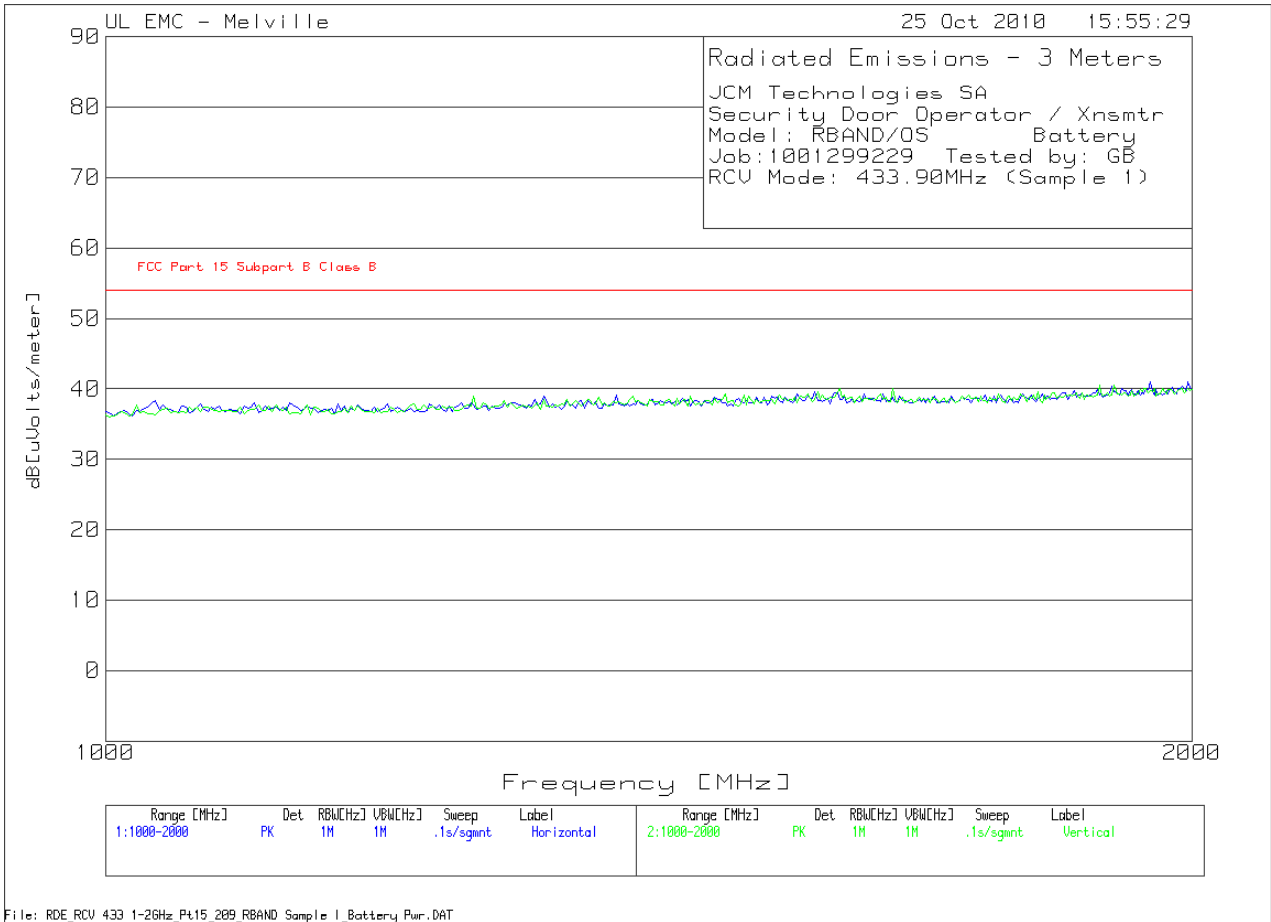
JCM Technologies S A  
 Security Door Operator / Xnsmttr  
 Model: RBAND Battery Pwr  
 Job: 1001299229 Tested:DC/RM  
 RCV Mode 869.82MHz (Sample 1)

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Horizontal 30 - 200MHz -----											
1	35.6156	33.62 pk	-35.8	15.6	13.42	30	-	-	-	-	-
	Azimuth:18	Height:400	Horz	Margin [dB]		-16.58	-	-	-	-	-
2	140.4404	34.05 pk	-35.4	14.3	12.95	30	-	-	-	-	-
	Azimuth:3	Height:400	Horz	Margin [dB]		-17.05	-	-	-	-	-
Vertical 30 - 200MHz -----											
3	100.1101	33.6 pk	-35.6	11.7	9.7	30	-	-	-	-	-
	Azimuth:133	Height:100	Vert	Margin [dB]		-20.3	-	-	-	-	-
4	192.3423	33.35 pk	-35.3	16.6	14.65	30	-	-	-	-	-
	Azimuth:295	Height:100	Vert	Margin [dB]		-15.35	-	-	-	-	-
Horizontal 200 - 1000MHz -----											
5	515.7579	31.81 pk	-32.4	18.1	17.51	37	-	-	-	-	-
	Azimuth:218	Height:200	Horz	Margin [dB]		-19.49	-	-	-	-	-
6	843.922	32.14 pk	-32	22.5	22.64	37	-	-	-	-	-
	Azimuth:323	Height:99	Horz	Margin [dB]		-14.36	-	-	-	-	-
Vertical 200 - 1000MHz -----											
7	628.6143	30.8 pk	-31.9	20.5	19.4	37	-	-	-	-	-
	Azimuth:206	Height:400	Vert	Margin [dB]		-17.6	-	-	-	-	-
8	907.954	31.84 pk	-31.8	23.3	23.34	37	-	-	-	-	-
	Azimuth:289	Height:200	Vert	Margin [dB]		-13.66	-	-	-	-	-

LIMIT 1: CISPR22 Class B

PK - Peak detector  
 QP - Quasi-Peak detector  
 av - Linear average detector  
 avlg - Average log detector  
 AV - Average detector  
 CAV - CISPR Average detector  
 RMS - RMS detection  
 CRMS - CISPR RMS detection

**Figure 11 Radiated Emissions Graph – Receiver Mode 433MHz 1-2GHz**



**Table 16 Radiated Emissions Data Points – Receiver 433MHz 1-2GHz**

JCM Technologies SA  
 Security Door Operator / Xnsmttr  
 Model: RBAND/OS Battery  
 Job:1001299229 Tested by: GB  
 RCV Mode: 433.90MHz (Sample 1)

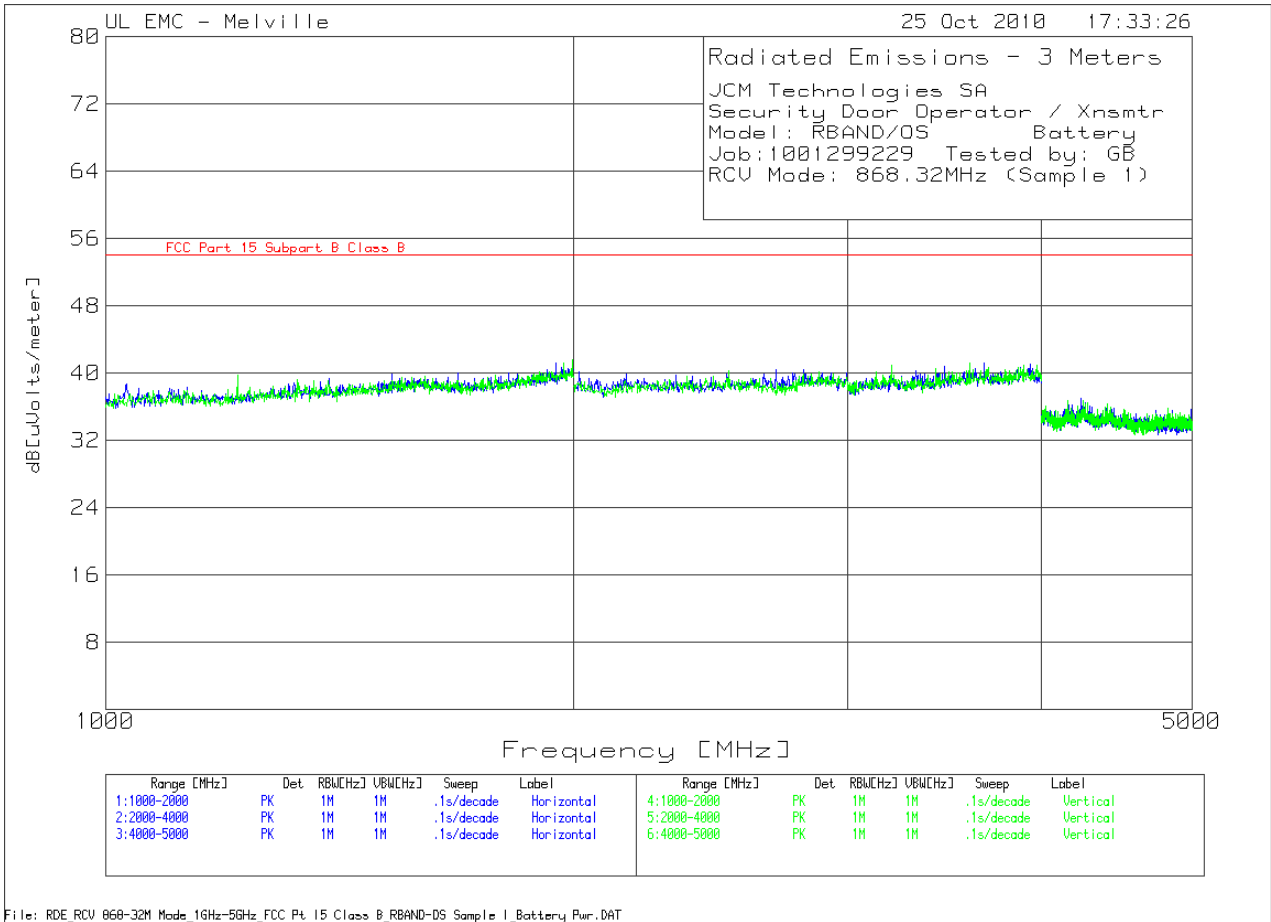
No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Horizontal 1000 - 2000MHz -----											
1	1032.5	63.99 pk	-45.21	19.5	38.28	54	-	-	-	-	-
		Height:100	Horz	Margin [dB]		-15.72	-	-	-	-	-
2	1100	63.25 pk	-45.21	20	38.04	54	-	-	-	-	-
		Height:100	Horz	Margin [dB]		-15.96	-	-	-	-	-
3	1322.5	63.51 pk	-45.11	20.5	38.9	54	-	-	-	-	-
		Height:100	Horz	Margin [dB]		-15.1	-	-	-	-	-
4	1385	63.53 pk	-45.04	20.7	39.19	54	-	-	-	-	-
		Height:100	Horz	Margin [dB]		-14.81	-	-	-	-	-
Vertical 1000 - 2000MHz -----											
5	1597.5	63.39 pk	-44.53	21.2	40.06	54	-	-	-	-	-
		Height:100	Vert	Margin [dB]		-13.94	-	-	-	-	-
6	1652.5	63.57 pk	-44.46	20.9	40.01	54	-	-	-	-	-
		Height:249	Vert	Margin [dB]		-13.99	-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart B Class B

PK - Peak detector  
 QP - Quasi-Peak detector  
 av - Linear average detector  
 avlg - Average log detector  
 AV - Average detector  
 CAV - CISPR Average detector  
 RMS - RMS detection  
 CRMS - CISPR RMS detection



**Figure 12 Radiated Emissions Graph – Receiver Mode 868.32MHz**



**Table 17 Radiated Emissions Data Points – Receiver 868.32MHz**

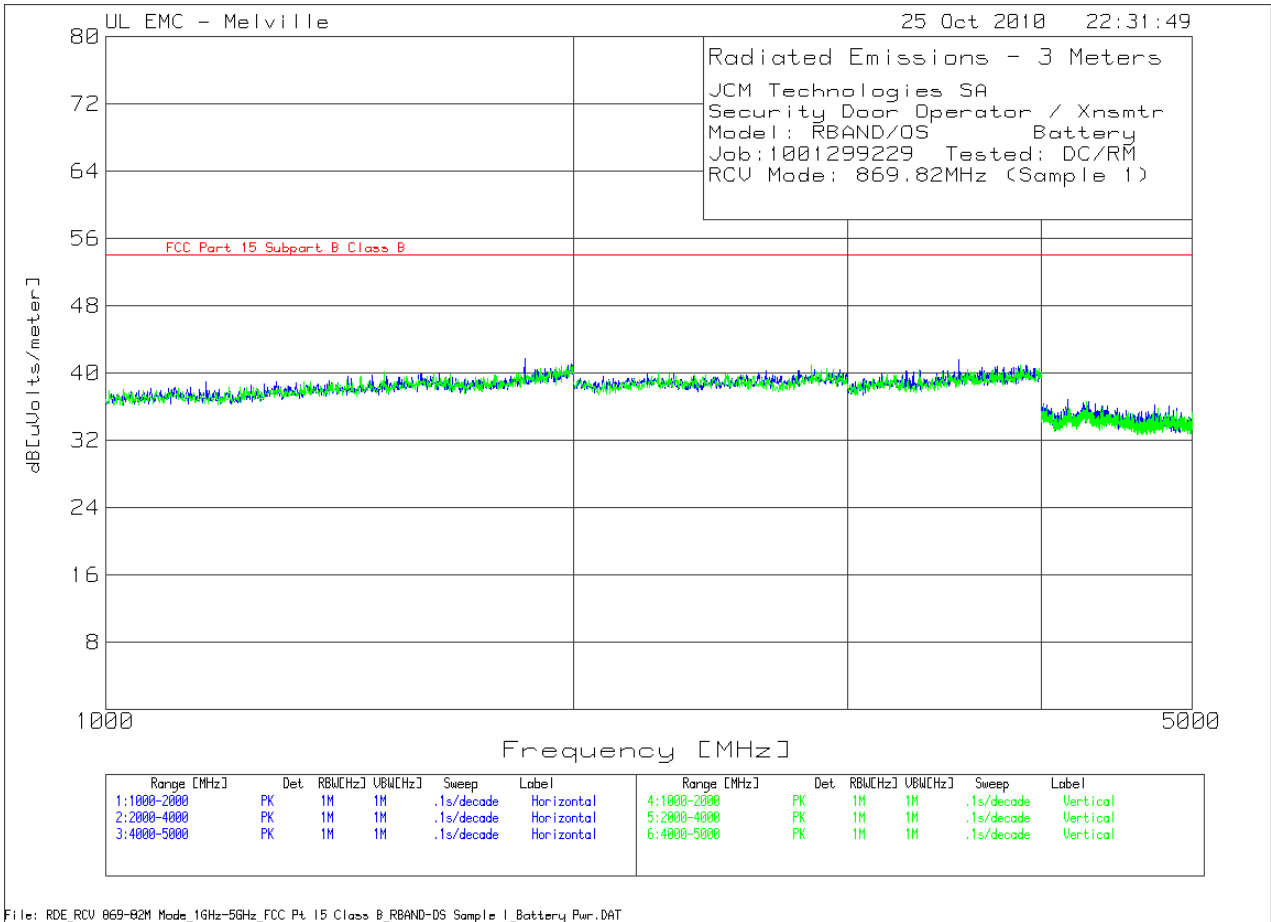
JCM Technologies SA  
 Security Door Operator / Xnsmttr  
 Model: RBAND/OS Battery  
 Job:1001299229 Tested by: GB  
 RCV Mode: 868.32MHz (Sample 1)

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Horizontal 1000 - 2000MHz -----											
1	1031.211	64.49 pk	-45.23	19.5	38.76	54	-	-	-	-	-
		Height:100	Horz	Margin [dB]		-15.24	-	-	-	-	-
2	1947.566	63.22 pk	-43.92	21.9	41.2	54	-	-	-	-	-
		Height:100	Horz	Margin [dB]		-12.8	-	-	-	-	-
Horizontal 2000 - 4000MHz -----											
3	2699.126	62.37 pk	-43.56	21.6	40.41	54	-	-	-	-	-
		Height:100	Horz	Margin [dB]		-13.59	-	-	-	-	-
4	3675.406	61.77 pk	-42.84	22.3	41.23	54	-	-	-	-	-
		Height:250	Horz	Margin [dB]		-12.77	-	-	-	-	-
Horizontal 4000 - 5000MHz -----											
5	4243.76	62.14 pk	-52.94	27.8	37	54	-	-	-	-	-
		Height:249	Horz	Margin [dB]		-17	-	-	-	-	-
Vertical 1000 - 2000MHz -----											
6	1215.98	65.06 pk	-45.13	19.9	39.83	54	-	-	-	-	-
		Height:100	Vert	Margin [dB]		-14.17	-	-	-	-	-
Vertical 2000 - 4000MHz -----											
7	2519.351	62.32 pk	-43.66	21.7	40.36	54	-	-	-	-	-
		Height:249	Vert	Margin [dB]		-13.64	-	-	-	-	-
8	3203.496	61.96 pk	-43.13	22.1	40.93	54	-	-	-	-	-
		Height:249	Vert	Margin [dB]		-13.07	-	-	-	-	-
9	3595.506	61.87 pk	-42.86	22.2	41.21	54	-	-	-	-	-
		Height:100	Vert	Margin [dB]		-12.79	-	-	-	-	-
Vertical 4000 - 5000MHz -----											
10	4407.654	61.73 pk	-53	27.7	36.43	54	-	-	-	-	-
		Height:249	Vert	Margin [dB]		-17.57	-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart B Class B

PK - Peak detector  
 QP - Quasi-Peak detector  
 av - Linear average detector  
 avlg - Average log detector  
 AV - Average detector  
 CAV - CISPR Average detector  
 RMS - RMS detection  
 CRMS - CISPR RMS detection

**Figure 13 Radiated Emissions Graph – Receiver Mode 869.82MHz**



**Table 18 Radiated Emissions Data Points – Receiver 869.82MHz**

JCM Technologies SA  
 Security Door Operator / Xnsmtr  
 Model: RBAND/OS Battery  
 Job:1001299229 Tested: DC/RM  
 RCV Mode: 869.82MHz (Sample 1)

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Horizontal 1000 - 2000MHz -----											
1	1161.049	64.33 pk	-45.25	19.9	38.98	54	-	-	-	-	-
		Height:250	Horz	Margin [dB]		-15.02	-	-	-	-	-
2	1861.423	64.47 pk	-44.08	21.4	41.79	54	-	-	-	-	-
		Height:100	Horz	Margin [dB]		-12.21	-	-	-	-	-
Horizontal 2000 - 4000MHz -----											
3	3540.574	62.32 pk	-42.97	22.3	41.65	54	-	-	-	-	-
		Height:100	Horz	Margin [dB]		-12.35	-	-	-	-	-
Horizontal 4000 - 5000MHz -----											
4	4158.902	62.08 pk	-53.16	28	36.92	54	-	-	-	-	-
		Height:100	Horz	Margin [dB]		-17.08	-	-	-	-	-
Vertical 1000 - 2000MHz -----											
5	1510.612	64.05 pk	-44.71	20.8	40.14	54	-	-	-	-	-
		Height:249	Vert	Margin [dB]		-13.86	-	-	-	-	-
6	1996.255	62.42 pk	-43.83	22.2	40.79	54	-	-	-	-	-
		Height:100	Vert	Margin [dB]		-13.21	-	-	-	-	-
Vertical 2000 - 4000MHz -----											
7	2846.442	62.46 pk	-43.36	21.8	40.9	54	-	-	-	-	-
		Height:249	Vert	Margin [dB]		-13.1	-	-	-	-	-
Vertical 4000 - 5000MHz -----											
8	4278.702	61.5 pk	-52.68	27.8	36.62	54	-	-	-	-	-
		Height:249	Vert	Margin [dB]		-17.38	-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart B Class B

PK - Peak detector  
 QP - Quasi-Peak detector  
 av - Linear average detector  
 avlg - Average log detector  
 AV - Average detector  
 CAV - CISPR Average detector  
 RMS - RMS detection  
 CRMS - CISPR RMS detection

**4.5 Test Conditions and Results – RADIATED EMISSIONS (Intentional)**

Test Description	Measurements were made in a 10-meter semi-anechoic chamber that complies to CISPR 16/ANSI C63.4:2003. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10-meter. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in both horizontal and vertical polarities. Final measurements (quasi-peak or average as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.		
Basic Standard	FCC Part 15.231		
UL LPG	80-EM-S0029		
	Frequency range	Measurement Point	
Fully configured sample scanned over the following frequency range	30 MHz – 1GHz	(3 meter measurement distance)	
Fully configured sample scanned over the following frequency range	1GHz – 9GHz (868MHz)	(3 meter measurement distance)	
	1GHz-5GHz (433MHz)		
<b>Limits</b>			
Frequency (MHz)	Limit (dBµV/m)		
	Quasi-Peak		
	General Emissions	Fundamental	Spurious
0.009 – 0.490	128.5 – 93.8	-	-
0.490 – 1.705	73.8 – 63	-	-
1.705 – 30	69.5	-	-
30 – 88	40	-	-
88 – 216	43.5	-	-
216-960	46	-	-
960-1000	54	-	-
1000-10000	-	-	54
868.32	-	81.9	61.9
869.82	-	81.9	61.9
433.90	-	80.8	60.8
Supplementary information: Spurious limits are only applied against products of the transmitter. All other emissions must meet the general limits.			

**Table 19 Radiated Emissions EUT Configuration Settings**

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	1
1	1	2
1	1	3
Supplementary information: None		

**Table 20 Radiated Emissions Test Equipment for tests conducted prior to 2011-03-31**

Test Equipment Used					
30-1000MHz					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due
EMI Receiver	Rohde & Schwarz	ESIB40	34968	2010-02-22	2011-02-22
Bicon Antenna	Schaffner	VBA6106A	43441	2010-09-09	2011-09-09
Log-P Antenna	Schaffner	UPA6109	44067	2010-04-26	2011-04-26
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	2009-11-11	2010-11-11
Multimeter	Fluke	83IV	43443	2010-02-02	2011-02-02
Above 1GHz (Band Optimized System)					
Spectrum Analyzer	Agilent	E7405A	19695	2010-02-01	2011-02-01
Horn Antenna (1-2 GHz)	ETS	3161-01	51442	2008-03-28	See * below
Horn Antenna (2-4 GHz)	ETS	3161-02	48107	2007-09-27	See * below
Horn Antenna (4-8 GHz)	ETS	3161-03	48106	2007-09-27	See * below
Horn Antenna (8-12 GHz)	ETS	3160-07	8933	2008-11-24	See * below
Signal Path Controller	HP	11713A	50250	N/A	N/A
Gain Controller	HP	11713A	50251	N/A	N/A
RF Switch / Preamp Fixture	UL	BOMS1	50249	N/A	N/A
System Controller	UL	BOMS2	50252	N/A	N/A
Measurement Software	UL	Version 9.3	44740	N/A	N/A
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268	2009-11-11	2010-11-11
Multimeter	Fluke	83V	43443	2010-02-02	2011-02-02

\* Note: As allowed by the calibration standard ANSI C63.4 Section 4.4.2, standard gain horns need only a one-time calibration. Only if physical damage occurs will the horn antenna require re-calibration. Gain standard horn antennas (sometimes called standard gain horn antennas) need not be calibrated beyond that which is provided by the manufacturer unless they are damaged or deterioration is suspected, or they are used at a distance closer than  $2D^2/\lambda$ . Gain standard horn antennas have gains that are fixed by their dimensions and dimensional tolerances.

**Table 21 Radiated Emissions Test Equipment for tests conducted on 2011-03-31**

Test Equipment Used					
30-1000MHz					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due
EMI Receiver	Rohde & Schwarz	ESIB40	34968	2011-03-01	2012-03-01
Bicon Antenna	Schaffner	VBA6106A	43441	2010-09-09	2011-09-09
Log-P Antenna	Schaffner	UPA6109	44067	2010-04-26	2011-04-26
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	83IV	43443	2011-02-01	2012-02-29
Above 1GHz (Band Optimized System)					
Spectrum Analyzer	Agilent	E7405A	19695	2011-02-01	2012-02-29
Horn Antenna (1-2 GHz)	ETS	3161-01	51442	2008-03-28	See * below
Horn Antenna (2-4 GHz)	ETS	3161-02	48107	2007-09-27	See * below
Horn Antenna (4-8 GHz)	ETS	3161-03	48106	2007-09-27	See * below
Horn Antenna (8-12 GHz)	ETS	3160-07	8933	2008-11-24	See * below
Signal Path Controller	HP	11713A	50250	N/A	N/A
Gain Controller	HP	11713A	50251	N/A	N/A
RF Switch / Preamp Fixture	UL	BOMS1	50249	N/A	N/A
System Controller	UL	BOMS2	50252	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	83V	43443	2011-02-01	2012-02-29

\* Note: As allowed by the calibration standard ANSI C63.4 Section 4.4.2, standard gain horns need only a one-time calibration. Only if physical damage occurs will the horn antenna require re-calibration. Gain standard horn antennas (sometimes called standard gain horn antennas) need not be calibrated beyond that which is provided by the manufacturer unless they are damaged or deterioration is suspected, or they are used at a distance closer than  $2D^2/\lambda$ . Gain standard horn antennas have gains that are fixed by their dimensions and dimensional tolerances.

**Figure 14 Test setup for Radiated Emissions – Transmitter**



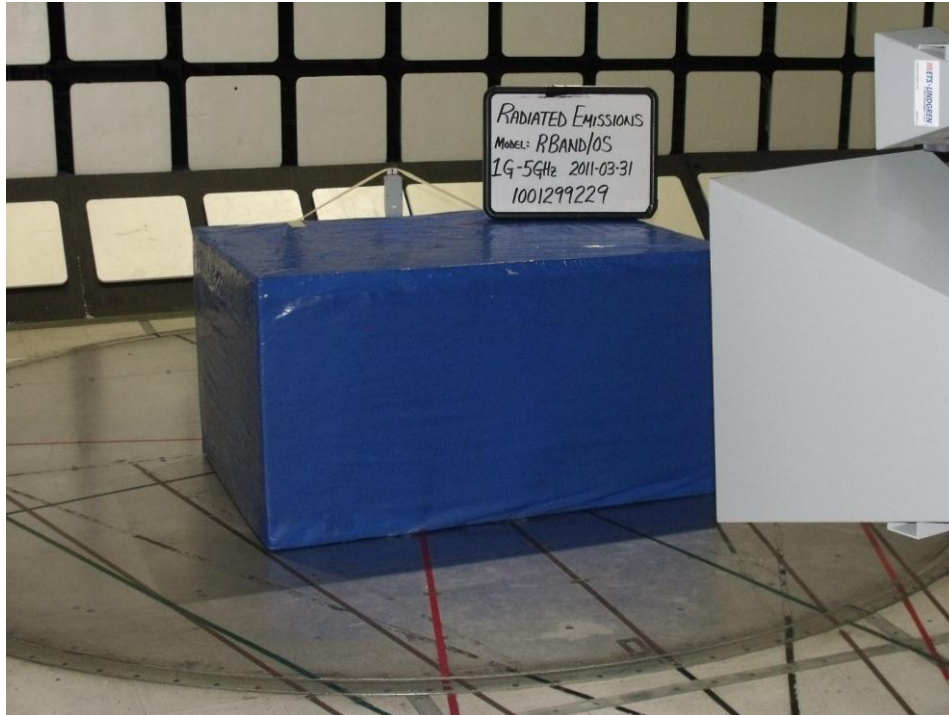
**Front View**



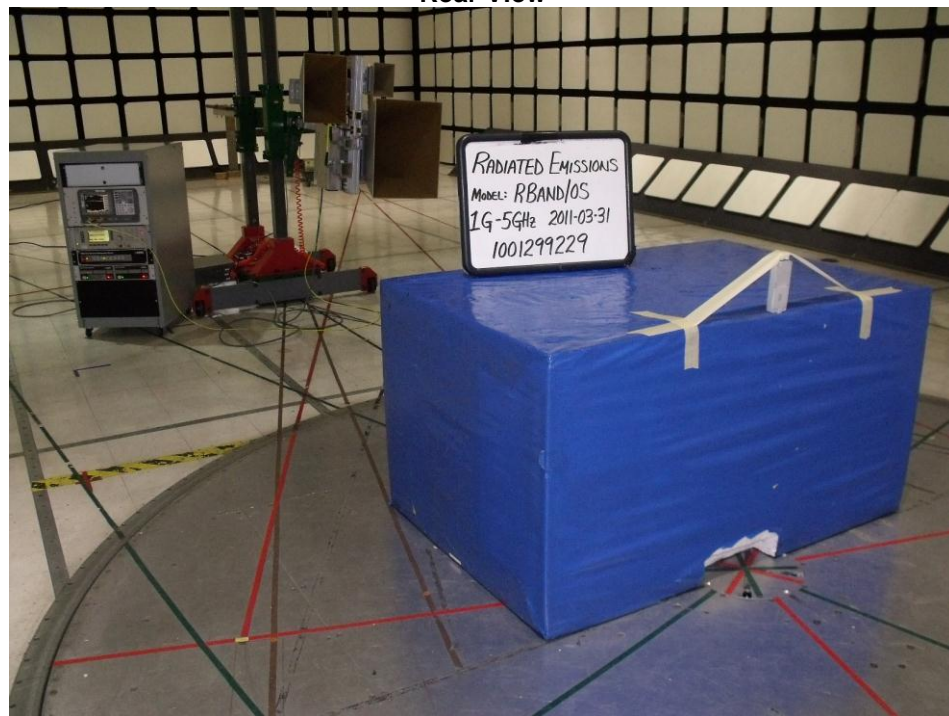
**Rear View**

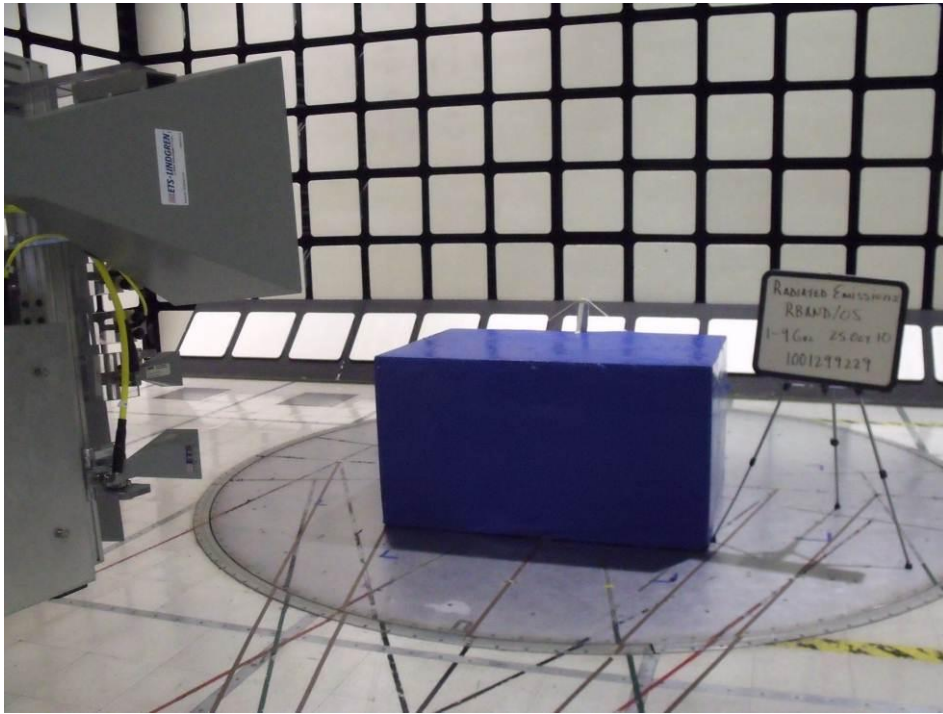


Front View

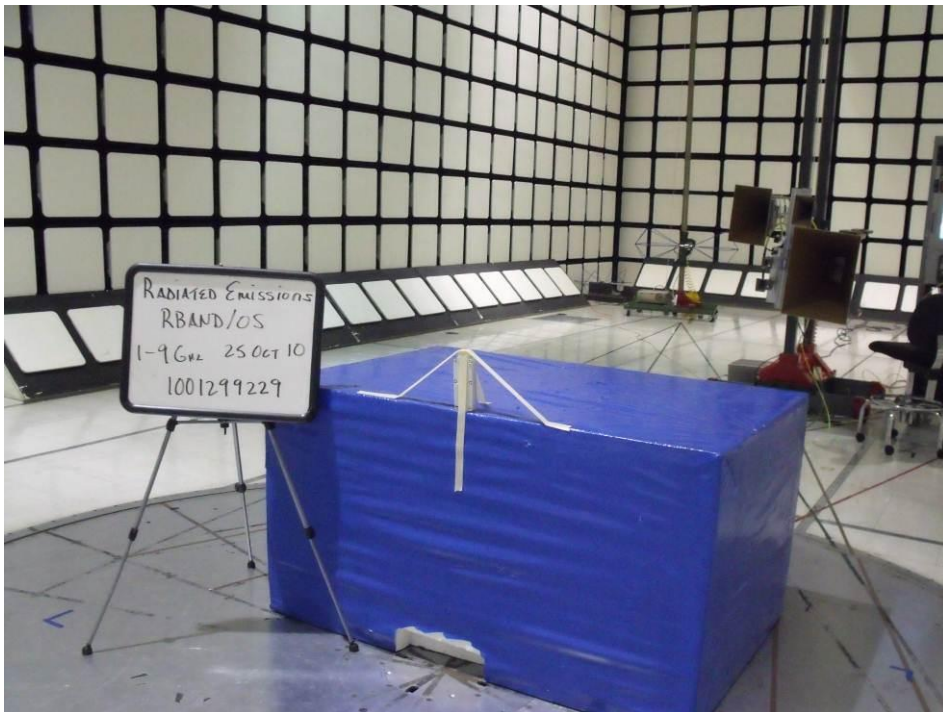


Rear View



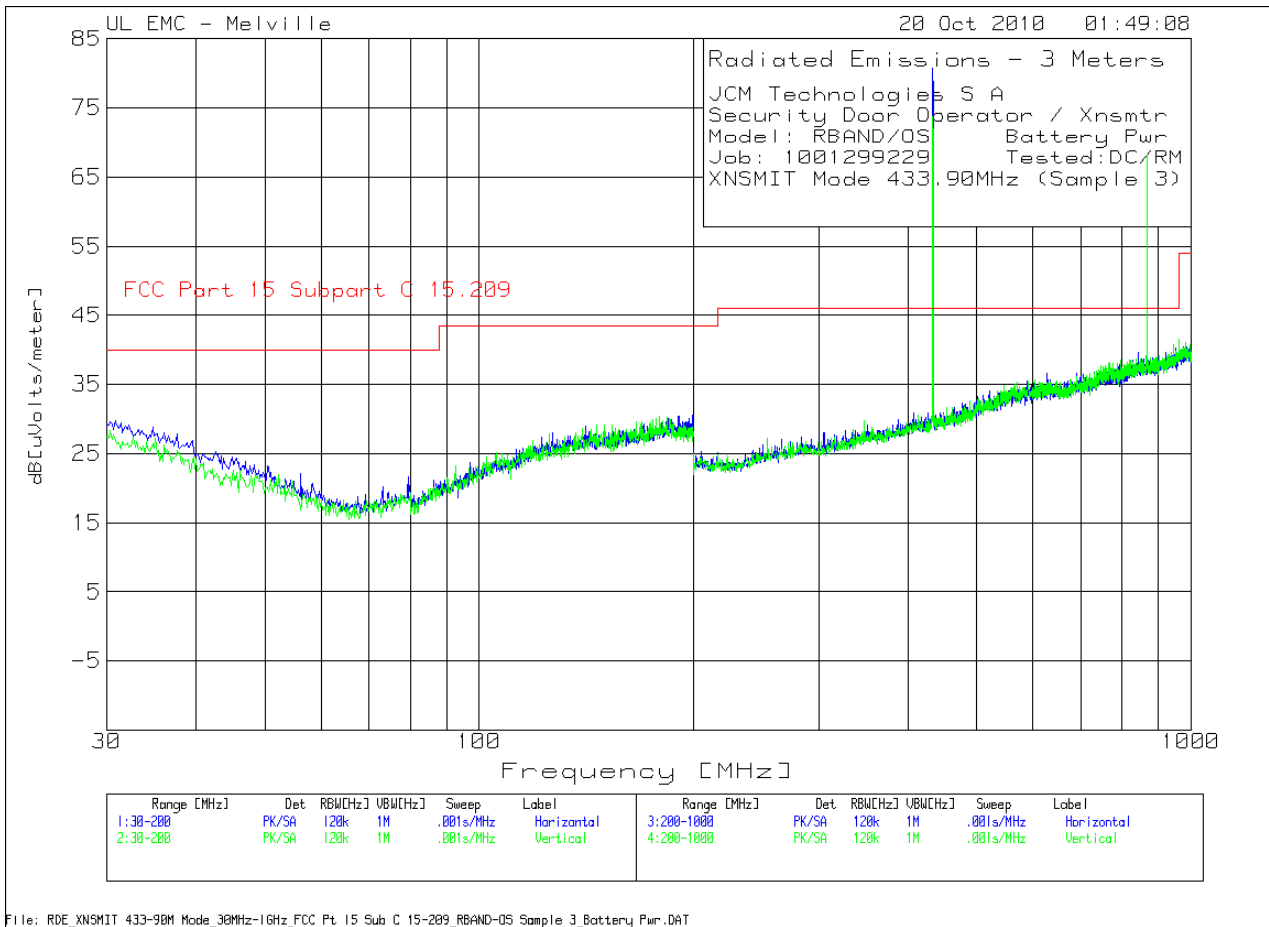


Front View



Rear View

**Figure 15 Radiated Emissions Graph – Transmitter 433MHz 30MHz-1GHz**



**Table 22 Radiated Emissions Data Points – Transmitter 433MHz 30MHz-1GHz**

JCM Technologies S A  
 Security Door Operator / Xnsmtr  
 Model: RBAND/OS Battery Pwr  
 Job: 1001299229 Tested:DC/RM  
 XNSMIT Mode 433.90MHz (Sample 3)

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Horizontal 30 - 200MHz -----											
1	56.2062	13.48 pk	.4	8.2	22.08	40	-	-	-	-	-
	Azimuth:262	Height:300	Horz	Margin [dB]		-17.92	-	-	-	-	-
2	141.2913	13.68 pk	.8	14.5	28.98	43.5	-	-	-	-	-
	Azimuth:262	Height:100	Horz	Margin [dB]		-14.52	-	-	-	-	-
Vertical 30 - 200MHz -----											
3	92.6226	12.5 pk	.6	10.1	23.2	43.5	-	-	-	-	-
	Azimuth:322	Height:100	Vert	Margin [dB]		-20.3	-	-	-	-	-
4	179.2392	13.07 pk	.8	16.5	30.37	43.5	-	-	-	-	-
	Azimuth:352	Height:100	Vert	Margin [dB]		-13.13	-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209

PK - Peak detector  
 QP - Quasi-Peak detector  
 av - Linear average detector  
 avlg - Average log detector  
 AV - Average detector  
 CAV - CISPR Average detector  
 RMS - RMS detection  
 CRMS - CISPR RMS detection

Job Number: 1001299229 File Number: MC16722 Page 53 of 69  
 Model Number: RBAND/OS  
 Client Name: JCM TECHNOLOGIES S A  
 FCC ID: U5Z-RBAND-OS

JCM Technologies S A  
 Security Door Operator / Xnsmt  
 Model: RBAND/OS Battery Pwr  
 Job: 1001299229 Tested:DC/RM  
 XNSMIT Mode 433.90MHz (Sample 3)

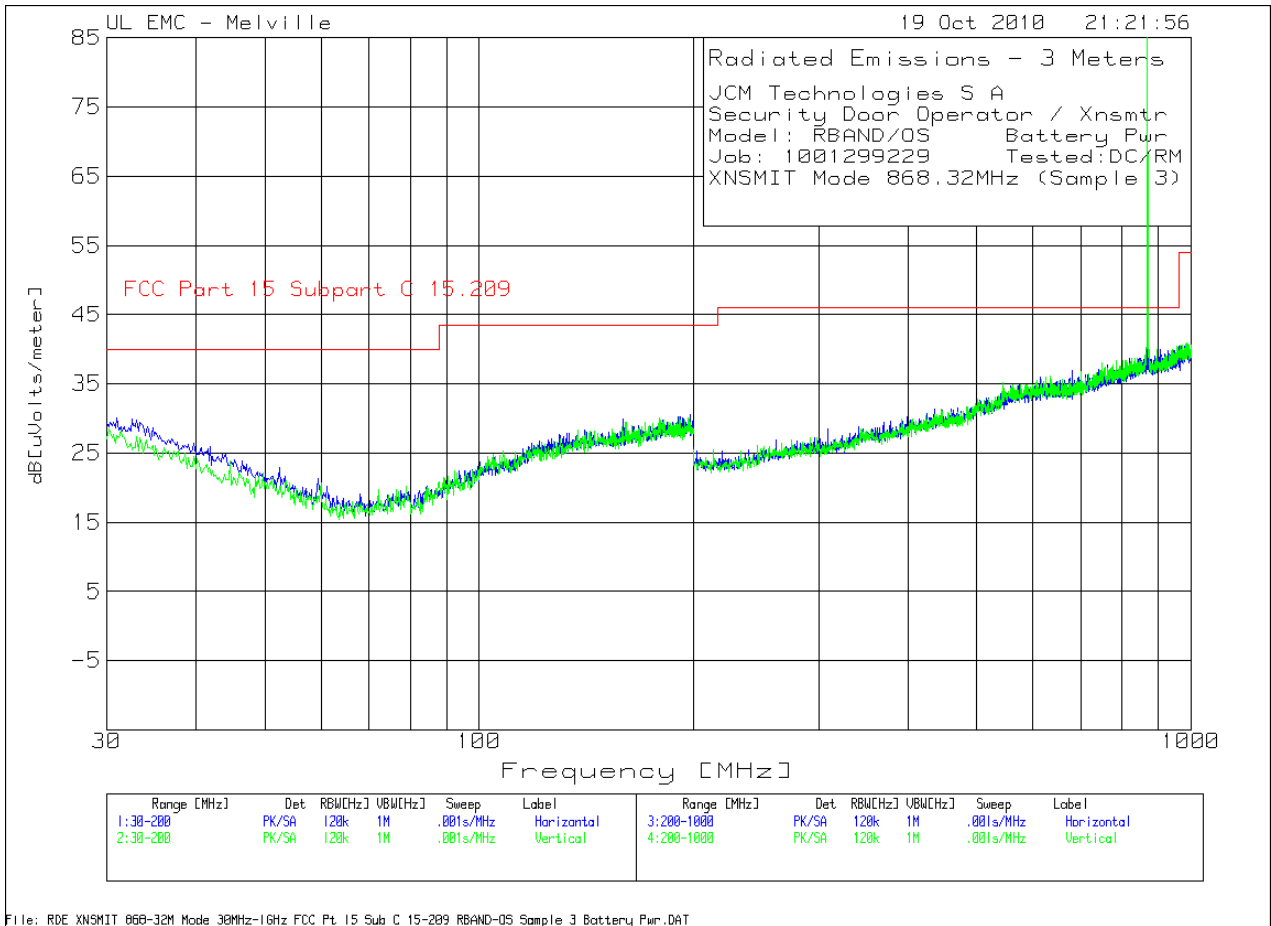
Test	Meter	Gain/Loss	Transducer	Level	Limit:1	2	3	4	5	6
Frequency	Reading	Factor	Factor	dB[uVolts/meter]						
[MHz]	[dB(uV)]	[dB]	[dB]							
=====										
Horizontal 200 - 1000MHz										
433.8557	62.42 PK	1.2	16.9	80.52	-	80.9	-	-	-	-
Azimuth: 163 Height:208 Horz					Margin [dB]:	-0.28	-	-	-	-
867.7096	36.53 PK	1.6	23.1	61.23	-	61.9	-	-	-	-
Azimuth: 347 Height:150 Horz					Margin [dB]:	-0.67	-	-	-	-
Vertical 200 - 1000MHz										
433.8547	54.74 PK	1.2	16.5	72.44	-	80.9	-	-	-	-
Azimuth: 116 Height:240 Vert					Margin [dB]:	-8.46	-	-	-	-
867.7131	12.17PK*	1.6	23.1	36.87	-	61.9	-	-	-	-
Azimuth: 228 Height:130 Vert					Margin [dB]:	-25.03	-	-	-	-

**\*Duty Cycle Correction Factor of 33.6 applied to the peak reading (see section 4.4 for calculation of duty cycle correction factor).**

LIMIT 1: FCC Part 15 Subpart C 15.209  
 LIMIT 2: FCC Part 15 Subpart C 15.231

PK - Peak detector (Maximized)  
 QP - Quasi-Peak detector  
 av - Linear average detector  
 avlg - Average log detector  
 AV - Average detector  
 CAV - CISPR Average detector  
 RMS - RMS detection  
 CRMS - CISPR RMS detection

**Figure 16 Radiated Emissions Graph – Transmitter 868.32MHz 30-1GHz**



**Table 23 Radiated Emissions Data Points – Transmitter 868.32MHz 30MHz-1GHz**

JCM Technologies S A  
 Security Door Operator / Xnsmt  
 Model: RBAND/OS Battery Pwr  
 Job: 1001299229 Tested:DC/RM  
 XNSMIT Mode 868.32MHz (Sample 3)

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Horizontal 30 - 200MHz -----											
1	59.4394	13.77 pk	.4	7.2	21.37	40	-	-	-	-	-
	Azimuth:146	Height:100	Horz	Margin [dB]		-18.63	-	-	-	-	-
2	159.3293	14.36 pk	.8	14.8	29.96	43.5	-	-	-	-	-
	Azimuth:292	Height:300	Horz	Margin [dB]		-13.54	-	-	-	-	-
Vertical 30 - 200MHz -----											
3	107.9379	11.99 pk	.7	12.6	25.29	43.5	-	-	-	-	-
	Azimuth:203	Height:100	Vert	Margin [dB]		-18.21	-	-	-	-	-
4	160.5205	12.95 pk	.8	15.7	29.45	43.5	-	-	-	-	-
	Azimuth:343	Height:100	Vert	Margin [dB]		-14.05	-	-	-	-	-
Horizontal 200 - 1000MHz -----											
5	681.4407	14.52 pk	1.5	20.9	36.92	46	-	-	-	-	-
	Azimuth:326	Height:100	Horz	Margin [dB]		-9.08	-	-	-	-	-
Vertical 200 - 1000MHz -----											
7	784.6923	14.61 pk	1.6	22.2	38.41	46	-	-	-	-	-
	Azimuth:266	Height:200	Vert	Margin [dB]		-7.59	-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209

PK - Peak detector  
 QP - Quasi-Peak detector  
 av - Linear average detector  
 avlg - Average log detector  
 AV - Average detector  
 CAV - CISPR Average detector  
 RMS - RMS detection  
 CRMS - CISPR RMS detection

Job Number: 1001299229 File Number: MC16722 Page 56 of 69  
 Model Number: RBAND/OS  
 Client Name: JCM TECHNOLOGIES S A  
 FCC ID: U5Z-RBAND-OS

JCM Technologies S A  
 Security Door Operator / Xnsmtr  
 Model: RBAND/OS Battery Pwr  
 Job: 1001299229 Tested:DC/RM  
 XNSMIT Mode 868.32MHz (Sample 3)

Test	Meter	Gain/Loss	Transducer	Level	Limit:1	2	3	4	5	6
Frequency	Reading	Factor	Factor	dB[uVolts/meter]						
[MHz]	[dB(uV)]	[dB]	[dB]							
=====										
Horizontal 200 - 1000MHz										
868.2867	30.22 PK*	1.6	23.1	54.92	-	81.9	-	-	-	-
Azimuth: 186	Height:153	Horz	Margin [dB]:		-	-26.98	-	-	-	-
Vertical 200 - 1000MHz										
868.2858	38.45 PK*	1.6	23.1	63.15	-	81.9	-	-	-	-
Azimuth: 239	Height:130	Vert	Margin [dB]:		-	-18.75	-	-	-	-

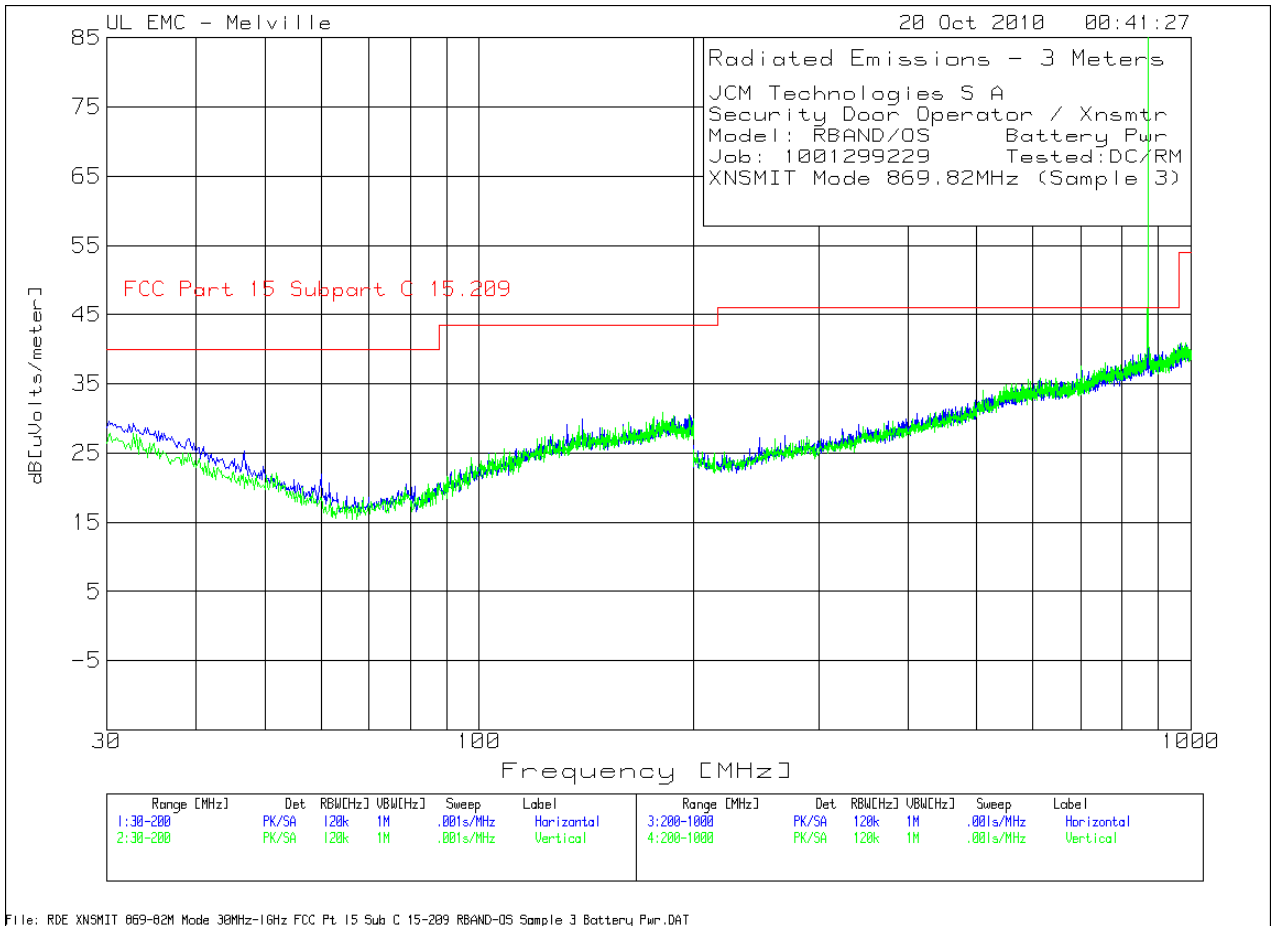
**\*Duty Cycle Correction Factor of 33.6 applied to the peak reading (see section 4.4 for calculation of duty cycle correction factor).**

LIMIT 1: FCC Part 15 Subpart C 15.209  
 LIMIT 2: FCC Part 15 Subpart C 15.231

PK - Peak detector (Maximized)  
 QP - Quasi-Peak detector  
 av - Linear average detector  
 avlg - Average log detector  
 AV - Average detector  
 CAV - CISPR Average detector  
 RMS - RMS detection  
 CRMS - CISPR RMS detection



**Figure 17 Radiated Emissions Graph – Transmitter 869.82MHz 30MHz-1GHz**



**Table 24 Radiated Emissions Data Points – Transmitter 869.82MHz 30MHz-1GHz**

JCM Technologies S A  
 Security Door Operator / Xnsmttr  
 Model: RBAND/OS Battery Pwr  
 Job: 1001299229 Tested:DC/RM  
 XNSMIT Mode 869.82MHz (Sample 3)

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
-----											
Horizontal 30 - 200MHz -----											
1	46.8468	12.93 pk	.4	11.9	25.23	40	-	-	-	-	-
	Azimuth:58	Height:300	Horz	Margin [dB]		-14.77	-	-	-	-	-
2	139.7598	14.87 pk	.7	14.4	29.97	43.5	-	-	-	-	-
	Azimuth:10	Height:400	Horz	Margin [dB]		-13.53	-	-	-	-	-
-----											
Vertical 30 - 200MHz -----											
3	97.3874	12.86 pk	.7	10.8	24.36	43.5	-	-	-	-	-
	Azimuth:343	Height:100	Vert	Margin [dB]		-19.14	-	-	-	-	-
4	181.2813	13.49 pk	.8	16.6	30.89	43.5	-	-	-	-	-
	Azimuth:316	Height:100	Vert	Margin [dB]		-12.61	-	-	-	-	-
-----											
Horizontal 200 - 1000MHz -----											
5	412.1061	13.05 pk	1.1	16.5	30.65	46	-	-	-	-	-
	Azimuth:313	Height:400	Horz	Margin [dB]		-15.35	-	-	-	-	-
-----											
Vertical 200 - 1000MHz -----											
7	701.0505	15.05 pk	1.5	21	37.55	46	-	-	-	-	-
	Azimuth:357	Height:100	Vert	Margin [dB]		-8.45	-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209

PK - Peak detector  
 QP - Quasi-Peak detector  
 av - Linear average detector  
 avlg - Average log detector  
 AV - Average detector  
 CAV - CISPR Average detector  
 RMS - RMS detection  
 CRMS - CISPR RMS detection

Job Number: 1001299229 File Number: MC16722 Page 59 of 69  
 Model Number: RBAND/OS  
 Client Name: JCM TECHNOLOGIES S A  
 FCC ID: U5Z-RBAND-OS

JCM Technologies S A  
 Security Door Operator / Xnsmtr  
 Model: RBAND/OS Battery Pwr  
 Job: 1001299229 Tested:DC/RM  
 XNSMIT Mode 869.82MHz (Sample 3)

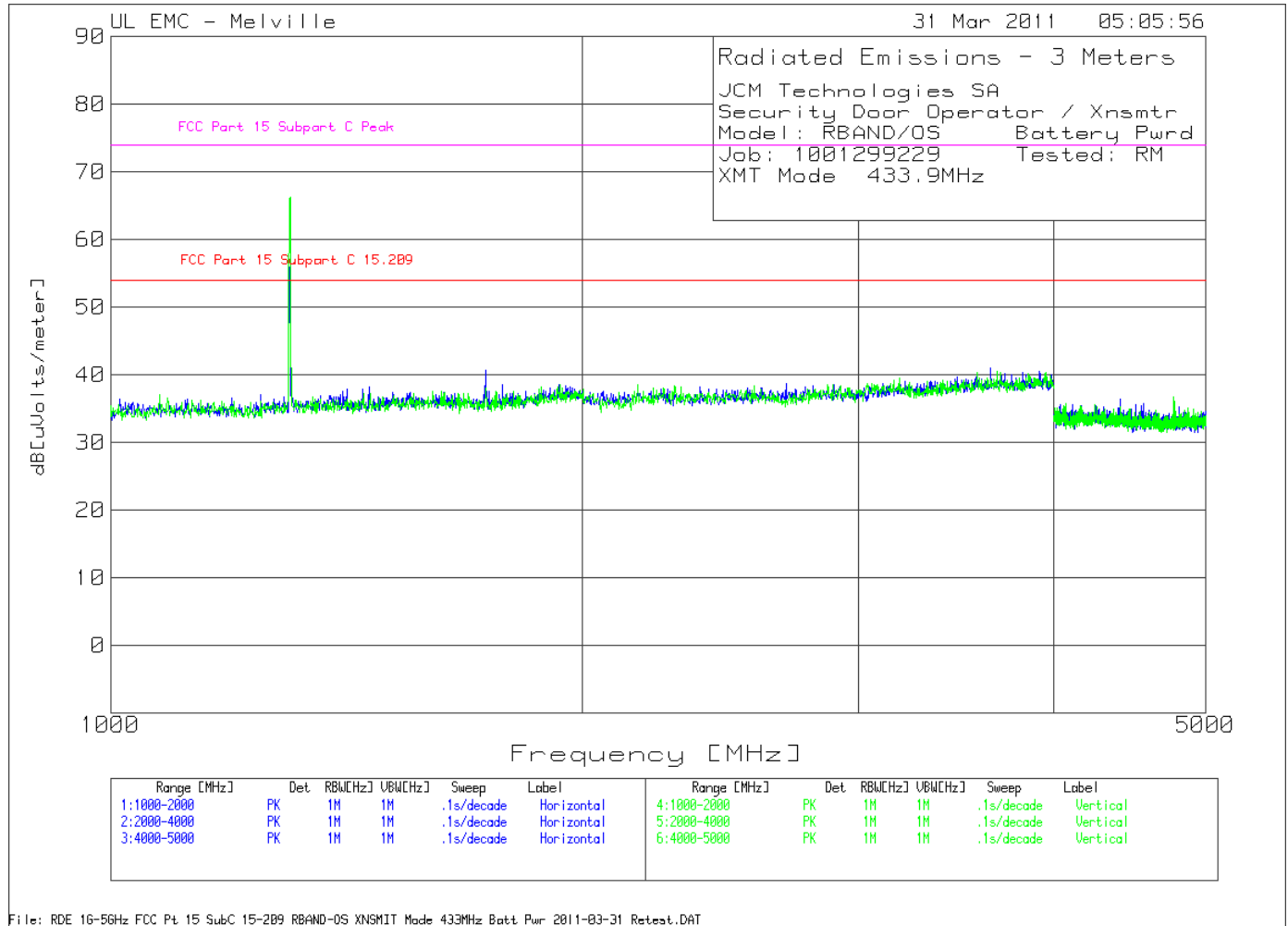
Test	Meter	Gain/Loss	Transducer	Level	Limit:1	2	3	4	5	6
Frequency	Reading	Factor	Factor	dB[uVolts/meter]						
[MHz]	[dB(uV)]	[dB]	[dB]							
=====										
Horizontal 200 - 1000MHz										
869.7853	30.34 PK*	1.6	23.1	55.04	-	81.9	-	-	-	-
Azimuth: 153 Height:158 Horz					Margin [dB]:	-	-26.86	-	-	-
Vertical 200 - 1000MHz										
869.7858	37.84 PK*	1.6	23.2	62.74	-	81.9	-	-	-	-
Azimuth: 252 Height:125 Vert					Margin [dB]:	-	-19.16	-	-	-

**\*Duty Cycle Correction Factor of 33.6 applied to the peak reading (see section 4.4 for calculation of duty cycle correction factor).**

LIMIT 1: FCC Part 15 Subpart C 15.209  
 LIMIT 2: FCC Part 15 Subpart C 15.231

PK - Peak detector (maximized)  
 QP - Quasi-Peak detector  
 av - Linear average detector  
 avlg - Average log detector  
 AV - Average detector  
 CAV - CISPR Average detector  
 RMS - RMS detection  
 CRMS - CISPR RMS detection

**Figure 18 Radiated Emissions Graph – Transmitter 433MHz 1-5GHz**



**Table 25 Radiated Emissions Data Points – Transmitter 433MHz 1-5GHz**

JCM Technologies SA  
 Security Door Operator / Xnsmtr  
 Model: RBAND/OS Battery Pwrdr  
 Job: 1001299229 Tested: RM  
 XMT Mode 433.9MHz

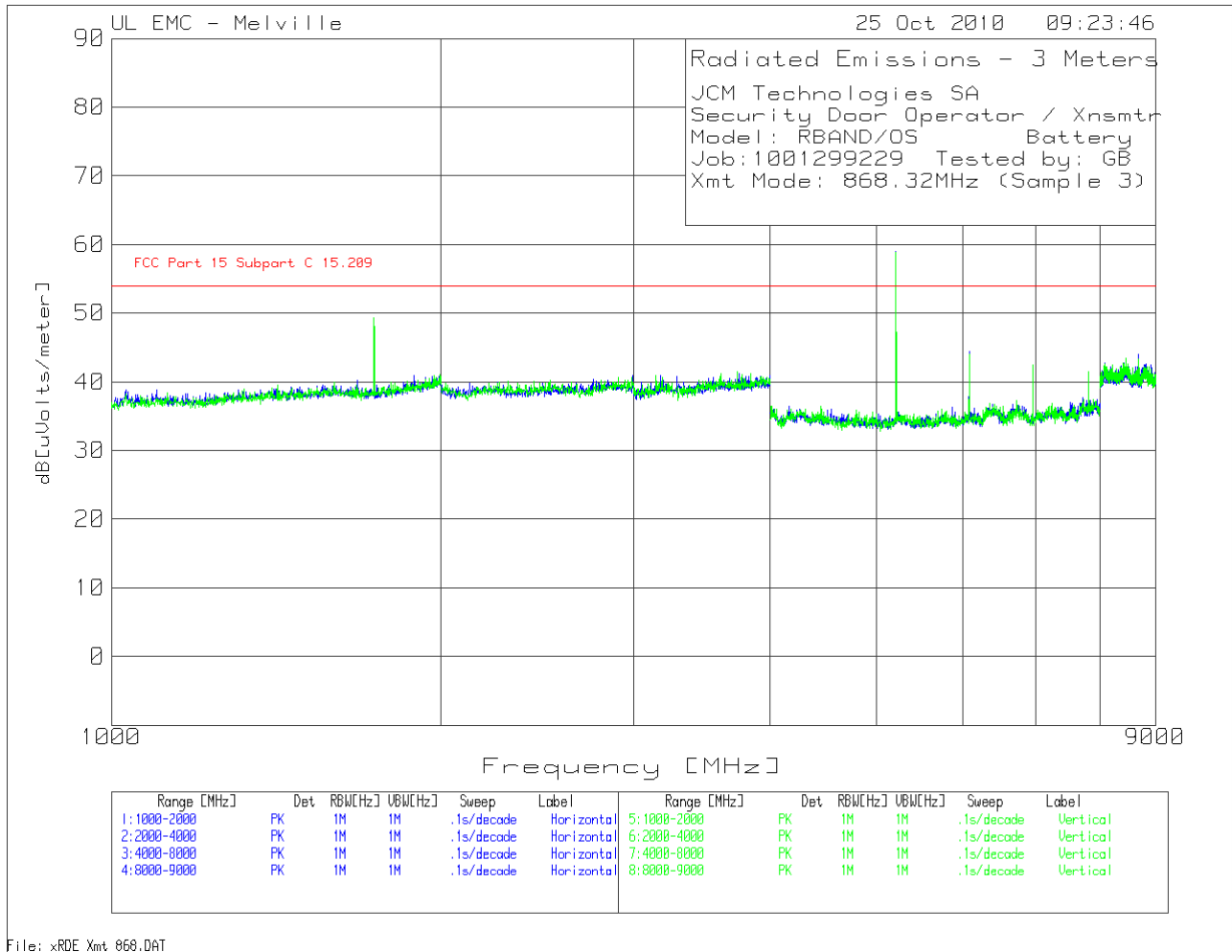
Test	Meter	Detector	Gain/Loss	Transducer	Level	DCF	Corrected Level	Limit 1	Margin 1[dB]	Limit 2	Margin 2[dB]	Azimuth [degs]	Height [cm]	Polarity
Frequency [MHz]	Reading [dB(uV)]	Type	Factor [dB]	Factor [dB]	dB[uVolts/m eter]	[dB]	dB[uVolts/m eter]							
Horizontal 1000 - 2000MHz														
1301.6125	80.59	PK	-44.35	20.5	56.74	-33.6	23.14	54	-30.86	74	-17.26	18	373	Horz
1735.5375	67.66	PK	-44.15	20.8	44.31	-	-	54	-9.69	74	-29.69	358	298	Horz
Vertical 1000 - 2000MHz														
1301.575	86.93	PK	-44.35	20.5	63.08	-33.6	29.48	54	-24.52	74	-10.92	337	333	Vert
1735.775	64.15	PK	-44.16	20.8	40.79	-	-	54	-13.21	74	-33.21	261	253	Vert
Vertical 2000 - 4000MHz														
2169.775	61.84	PK	-43.22	21.1	39.72	-	-	54	-14.28	74	-34.28	118	214	Vert
Vertical 4000 - 5000MHz														
4772.6375	66.21	PK	-52.46	27.2	40.95	-	-	54	-13.05	74	-33.05	320	368	Vert
4773.6875	66.29	PK	-52.48	27.2	41.01	-	-	54	-12.99	74	-32.99	320	368	Vert

Note: Limit 1 is applied to the Corrected Level. Limit 2 is applied to the Peak Level.

LIMIT 1: FCC Part 15 Subpart C 15.209 / 15.231  
 LIMIT 2: FCC Part 15 Subpart C Peak

PK - Peak detector (Maximized)  
 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

**Figure 19 Radiated Emissions Graph – Transmitter 868.32MHz 1-9GHz**



Job Number: 1001299229 File Number: MC16722 Page 63 of 69  
 Model Number: RBAND/OS  
 Client Name: JCM TECHNOLOGIES S A  
 FCC ID: U5Z-RBAND-OS

**Table 26 Radiated Emissions Data Points – Transmitter 868.32MHz 1-9GHz**

JCM Technologies SA  
 Security Door Operator / Xnsmt  
 Model: RBAND/OS Battery  
 Job:1001299229 Tested by: GB  
 Xmt Mode: 868.32MHz (Sample 3)

Test	Meter	Gain/Loss	Transducer	Level	Limit:1	2	3	4	5	6
Frequency	Reading	Factor	Factor	dB[uVolts/meter]						
[MHz]	[dB(uV)]	[dB]	[dB]							
Horizontal 1000 - 2000MHz										
1737.85	72.59 PK	-44.4	20.8	48.99	-	61.9	-	-	-	-
Azimuth: 360	Height:249	Horz		Margin [dB]:	-	-12.01	-	-	-	-
Horizontal 4000 - 8000MHz										
5213.275	85.1 PK	-53.05	27.3	59.35	-	61.9	-	-	-	-
Azimuth: 339	Height:382	Horz		Margin [dB]:	-	-2.55	-	-	-	-
6082.2	72.89 PK	-52.12	27.5	48.27	-	61.9	-	-	-	-
Azimuth: 118	Height:350	Horz		Margin [dB]:	-	-13.63	-	-	-	-
6951	67.64 PK	-52.71	27.9	42.83	-	61.9	-	-	-	-
Azimuth: 119	Height:212	Horz		Margin [dB]:	-	-19.07	-	-	-	-
7820.209	64.73 PK	-51.43	28.6	41.9	-	61.9	-	-	-	-
Azimuth: 0	Height:400	Horz		Margin [dB]:	-	-20	-	-	-	-
Horizontal 8000 - 9000MHz										
8688.8	61.52 PK	-52.23	33.1	42.39	-	61.9	-	-	-	-
Azimuth: 18	Height:241	Horz		Margin [dB]:	-	-19.51	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209  
 LIMIT 2: FCC Part 15 Subpart C 15.231

PK - Peak detector (maximized)  
 QP - Quasi-Peak detector  
 av - Linear average detector  
 avlg - Average log detector  
 AV - Average detector  
 CAV - CISPR Average detector  
 RMS - RMS detection  
 CRMS - CISPR RMS detection

Job Number: 1001299229 File Number: MC16722 Page 64 of 69  
 Model Number: RBAND/OS  
 Client Name: JCM TECHNOLOGIES S A  
 FCC ID: U5Z-RBAND-OS

JCM Technologies SA  
 Security Door Operator / Xnsmttr  
 Model: RBAND/OS Battery  
 Job:1001299229 Tested by: GB  
 Xmt Mode: 868.32MHz (Sample 3)

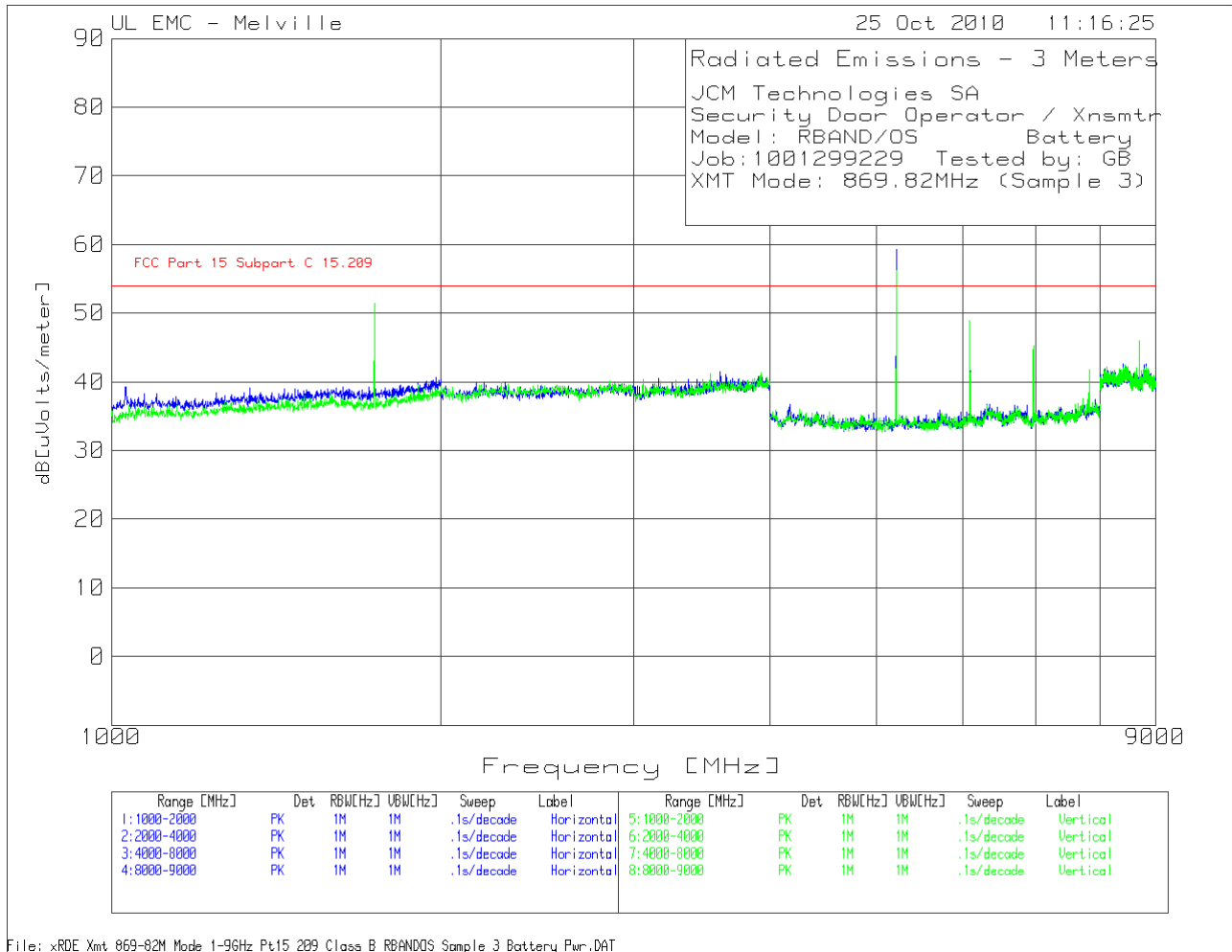
Test	Meter	Gain/Loss	Transducer	Level	Limit:1	2	3	4	5	6
Frequency	Reading	Factor	Factor	dB[uVolts/meter]						
[MHz]	[dB(uV)]	[dB]	[dB]							
=====										
Vertical 1000 - 2000MHz										
1737.775	79.38 PK	-44.4	20.8	55.78	-	61.9	-	-	-	-
Azimuth: 281	Height:168	Vert	Margin [dB]:		-	-6.12	-	-	-	-
Vertical 4000 - 8000MHz										
5213.2	85.23 PK	-53.05	27.3	59.48	-	61.9	-	-	-	-
Azimuth: 310	Height:168	Vert	Margin [dB]:		-	-2.42	-	-	-	-
6082.425	74.83 PK	-52.12	27.4	50.11	-	61.9	-	-	-	-
Azimuth: 99	Height:198	Vert	Margin [dB]:		-	-11.79	-	-	-	-
6950.8125	72.45 PK	-52.71	27.9	47.64	-	61.9	-	-	-	-
Azimuth: 342	Height:138	Vert	Margin [dB]:		-	-14.26	-	-	-	-
7819.775	66.68 PK	-51.43	29.1	44.35	-	61.9	-	-	-	-
Azimuth: 224	Height:113	Vert	Margin [dB]:		-	-17.55	-	-	-	-
Vertical 8000 - 9000MHz										
8688.65	64.96 PK	-52.23	33.2	45.93	-	61.9	-	-	-	-
Azimuth: 280	Height:102	Vert	Margin [dB]:		-	-15.97	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.231

PK - Peak detector (maximized)  
 QP - Quasi-Peak detector  
 av - Linear average detector  
 avlg - Average log detector  
 AV - Average detector  
 CAV - CISPR Average detector  
 RMS - RMS detection  
 CRMS - CISPR RMS detection



**Figure 20 Radiated Emissions Graph – Transmitter 869.82MHz 1-9GHz**



**Table 27 Radiated Emissions Data Points – Transmitter 869.82MHz 1-9GHz**

JCM Technologies SA  
 Security Door Operator / Xsmtr  
 Model: RBAND/OS Battery  
 Job:1001299229 Tested by: GB  
 XMT Mode: 869.82MHz (Sample 3)

Test	Meter	Gain/Loss	Transducer	Level	Limit:1	2	3	4	5	6
Frequency	Reading	Factor	Factor	dB[uVolts/meter]						
[MHz]	[dB(uV)]	[dB]	[dB]							
=====										
Horizontal 1000 - 2000MHz										
1739.75	73.52 PK	-44.4	20.8	49.92	54	-	-	-	-	-
Azimuth: 10 Height:247 Horz					Margin [dB]:	-4.08	-	-	-	-
Horizontal 4000 - 8000MHz										
5219.25	86.06 PK	-53.17	27.3	60.19	-	61.9	-	-	-	-
Azimuth: 339 Height:104 Horz					Margin [dB]:	-	-1.71	-	-	-
6088.59	72.33 PK	-52.08	27.5	47.75	54	-	-	-	-	-
Azimuth: 334 Height:390 Horz					Margin [dB]:	-6.25	-	-	-	-
6958.82	70.42 PK	-52.71	27.9	45.61	54	-	-	-	-	-
Azimuth: 239 Height:340 Horz					Margin [dB]:	-8.39	-	-	-	-
7828.4975	65.2 PK	-51.37	28.7	42.53	54	-	-	-	-	-
Azimuth: 87 Height:380 Horz					Margin [dB]:	-11.47	-	-	-	-
Horizontal 8000 - 9000MHz										
8698.65	62.08 PK	-52.12	33.1	43.06	54	-	-	-	-	-
Azimuth: 309 Height:315 Horz					Margin [dB]:	-10.94	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209  
 LIMIT 1: FCC Part 15 Subpart C 15.231

PK - Peak detector  
 QP - Quasi-Peak detector  
 av - Linear average detector  
 avlg - Average log detector  
 AV - Average detector  
 CAV - CISPR Average detector  
 RMS - RMS detection  
 CRMS - CISPR RMS detection

Job Number: 1001299229 File Number: MC16722 Page 67 of 69  
 Model Number: RBAND/OS  
 Client Name: JCM TECHNOLOGIES S A  
 FCC ID: U5Z-RBAND-OS

JCM Technologies SA  
 Security Door Operator / Xnsmttr  
 Model: RBAND/OS Battery  
 Job:1001299229 Tested by: GB  
 XMT Mode: 869.82MHz (Sample 3)

Test	Meter	Gain/Loss	Transducer	Level	Limit:1	2	3	4	5	6
Frequency	Reading	Factor	Factor	dB[uVolts/meter]						
[MHz]	[dB(uV)]	[dB]	[dB]							
=====										
Vertical 1000 - 2000MHz										
1739.725	79.06 PK	-44.4	20.8	55.46	-	61.9	-	-	-	-
Azimuth: 262	Height:179	Vert		Margin [dB]:	-	-6.44	-	-	-	-
Vertical 4000 - 8000MHz										
5219.125	83.7 PK	-53.17	27.3	57.83	-	61.9	-	-	-	-
Azimuth: 69	Height:211	Vert		Margin [dB]:	-	-4.07	-	-	-	-
6088.765	77.63 PK	-52.07	27.4	52.96	54	-	-	-	-	-
Azimuth: 18	Height:212	Vert		Margin [dB]:	-1.04	-	-	-	-	-
6958.825	69.93 PK	-52.71	27.9	45.12	54	-	-	-	-	-
Azimuth: 4	Height:354	Vert		Margin [dB]:	-8.88	-	-	-	-	-
7828.9375	62.4 PK	-51.37	29.1	40.13	54	-	-	-	-	-
Azimuth: 356	Height:128	Vert		Margin [dB]:	-13.87	-	-	-	-	-
Vertical 8000 - 9000MHz										
8698.5	64.89 PK	-52.12	33.2	45.97	54	-	-	-	-	-
Azimuth: 217	Height:195	Vert		Margin [dB]:	-8.03	-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209  
 LIMIT 1: FCC Part 15 Subpart C 15.231

PK - Peak detector  
 QP - Quasi-Peak detector  
 av - Linear average detector  
 avlg - Average log detector  
 AV - Average detector  
 CAV - CISPR Average detector  
 RMS - RMS detection  
 CRMS - CISPR RMS detection

## Appendix A

### Accreditations and Authorizations



NVLAP Lab code: 100255-0

NVLAP: The National Institute of Standards and Technology (NIST) administers the National Voluntary Laboratory Accreditation Program (NVLAP). NVLAP is comprised of laboratory accreditation programs (LAPs) which are established on the basis of requests and demonstrated need. Each LAP includes specific calibration and/or test standards and related methods and protocols assembled to satisfy the unique needs for accreditation in a field of testing or calibration. NVLAP accredits public and private laboratories based on evaluation of their technical qualifications and competence to carry out specific calibrations or tests. Accreditation criteria are established in accordance with the U.S. Code of Federal Regulations (CFR, Title 15, Part 285), NVLAP Procedures and General Requirements, and encompass the requirements of ISO/IEC 17025. For a full scope listing see <http://ts.nist.gov/ts/htdocs/210/214/scopes/1002550.htm>



FCC: Details of the measurement facilities used for these tests have been filed with the Federal Communications Commission's Laboratory in Columbia, Maryland (Ref. No. 91040).



Industry Canada Industrie Canada

Industry of Canada: Accredited by Industry Canada for performance of radiated measurements. Our test site complies with RSP 100, Issue 7, Section 3.3. File #: IC 2181



VCCI: Accepted as an Associate Member to the VCCI. The measurement facilities detailed in this test report have been registered in accordance with Regulations for Voluntary Control Measures, Article 8.

Job Number: 1001299229 File Number: MC16722 Page 69 of 69  
Model Number: RBAND/OS  
Client Name: JCM TECHNOLOGIES S A  
FCC ID: U5Z-RBAND-OS

Registration Nos.: (Radiated Emissions) R-797, (Conducted Emissions) C-832, C-83400, and C-81879 and (Conducted Emissions - Telecommunications Ports) T-1582 and T-1583.



ICASA: ICASA (Independent Communications Authority of South Africa) has appointed UL as a Designated Test Laboratory to test Telecommunications equipment for type approval in compliance with CISPR 22 to assist in fulfilling its mandate under section 54(1) of the Telecommunications Act, 1996 (Act 103 of 1996).



NIST/CAB: Validated by the European Commission as a U.S. Conformity Assessment Body (CAB) of the U.S.-EU Mutual Recognition Agreement (MRA) for the Electromagnetic Compatibility - Council Directive 2004/108/EC, Annex III (2-3). Also validated for the Telecommunication Equipment-Council Directive 99/5/EC, Annex III and IV, Identification Number: 0983.

NIST/CAB: Provisioned to act as a U.S. Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the Asia Pacific Economic Cooperation (APEC) MRA between the American Institute in Taiwan (AIT) and the United States. Our laboratory is considered qualified to test equipment subject to the applicable EMC regulations of the Chinese Taipei Bureau of Standards, Metrology and Inspection (BSMI) which require testing to CNS 13438 (CISPR 22).

NIST/CAB: Recognized by the Infocomm Development Authority of Singapore (IDA) under the Asia Pacific Economic Cooperation Mutual Recognition Agreement (APEC MRA). Our laboratory is provisionally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA. Our scope of designation includes IDA TS EMC (CISPR 22), IEC 61000-4-2, -4-3, -4-4, -4-5, and -4-6

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