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Job Number:	1001299229
Project Number:	10CA53025
File Number:	MC16722
Date:	2011-02-22
Date:	2011-03-24
Model:	RBAND/UMS
FCC ID:	U5Z-RBAND-UMS

Electromagnetic Compatibility Test Report

For

JCM TECHNOLOGIES S A

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quality service for over 100 years**

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Job Number: 1001299229 File Number: MC16722
Model Number: RBAND/UMS
Client Name: JCM TECHNOLOGIES S A

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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**

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Test Report Date: **2011-02-22**
Test Report Revision Date: **2011-03-24**

Product Type: **Periodic Transmitter for security applications**

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

Model Number: **RBAND/UMS**

Sample Serial Number: **Not Available**

EUT Category: **Periodic Low Power Transmitter**

Testing Start Date: **2010-10-10**

Date Testing Complete: **2011-01-07**

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	Original	-	-
2011-03-24	Corrected FCC ID on cover page	B. DeLisi	None required.

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/UMS	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	DC	N	N	Powered by 12Vdc from external control panel isolated from AC mains.
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:

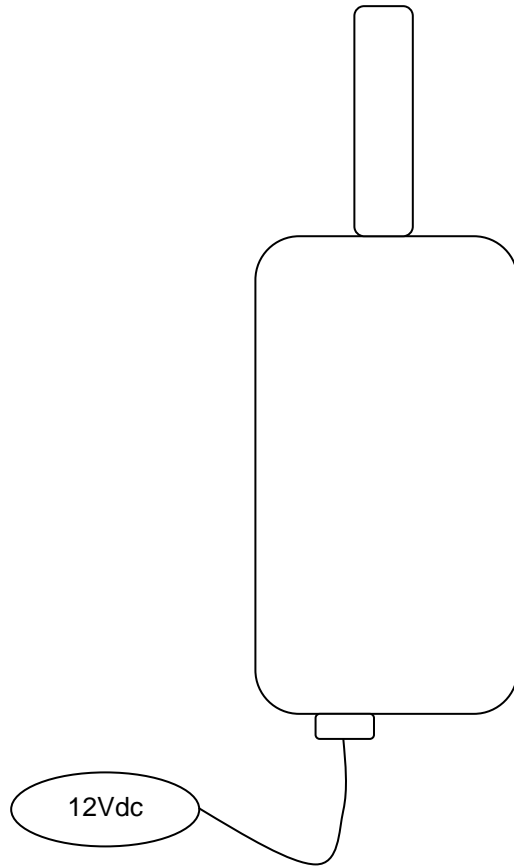
Frequency (MHz)	Description
868.32-869.82	Transmitter frequency band
433.90	Transmitter frequency band

1.3.4 Power Interface:

Mode # /Rated	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Phases (#)	Comments
Rated	12/16VDC	-	-	DC	-	None
1	12	-	-	DC	-	None

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

None

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)*
Occupied Bandwidth	Compliant
Pulse Train - Averaging Factor	Compliant
Radiated Emissions - Unintentional	Compliant
Fundamental Radiated Emissions	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
Code of Federal Regulations Title 47	Part 15, Subpart C, Radio Frequency Devices

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	
Occupied Bandwidth Limits		
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	99
Supplementary information: None		

Table 3 Occupied Bandwidth Test Equipment

Test Equipment Used					
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

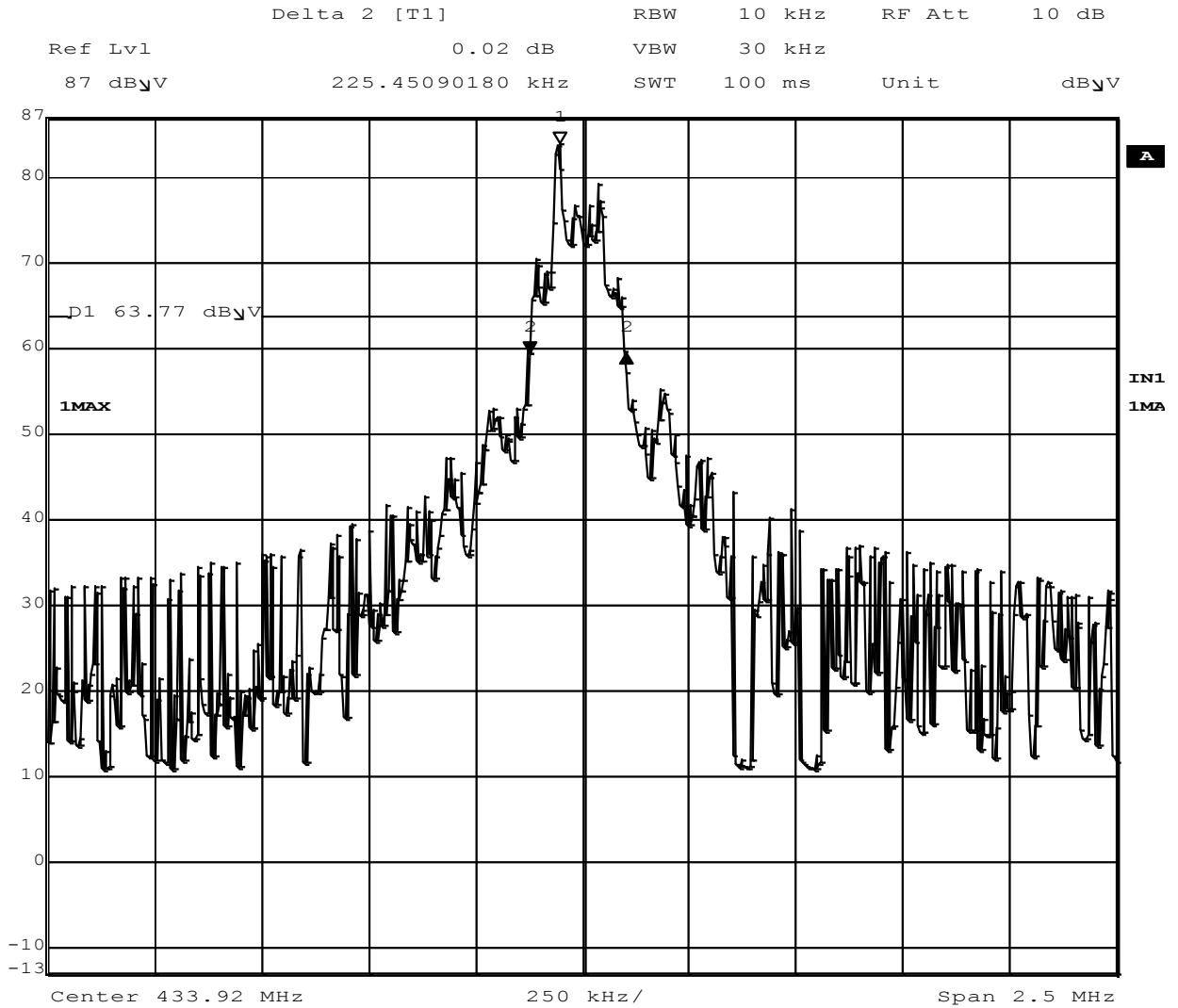
Figure 1 Test Setup for Occupied Bandwidth



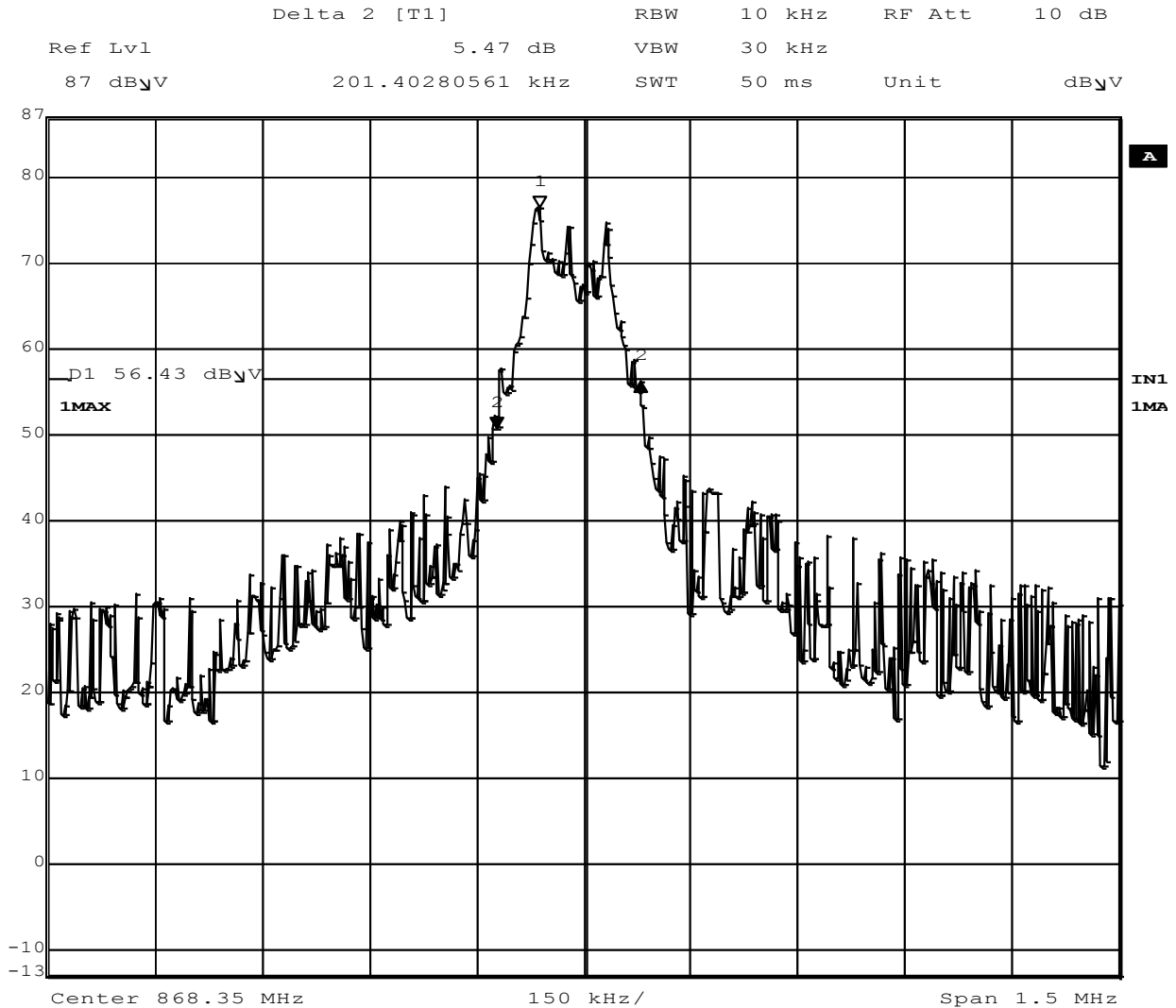
Table 4 Occupied Bandwidth Test Results

Frequency (MHz)	Measured OBW (kHz)	Limit (MHz)	Results
868.35	174.35	2.17	Pass
868.92	201.4	2.17	Pass
433.90	225.45	1.08	Pass

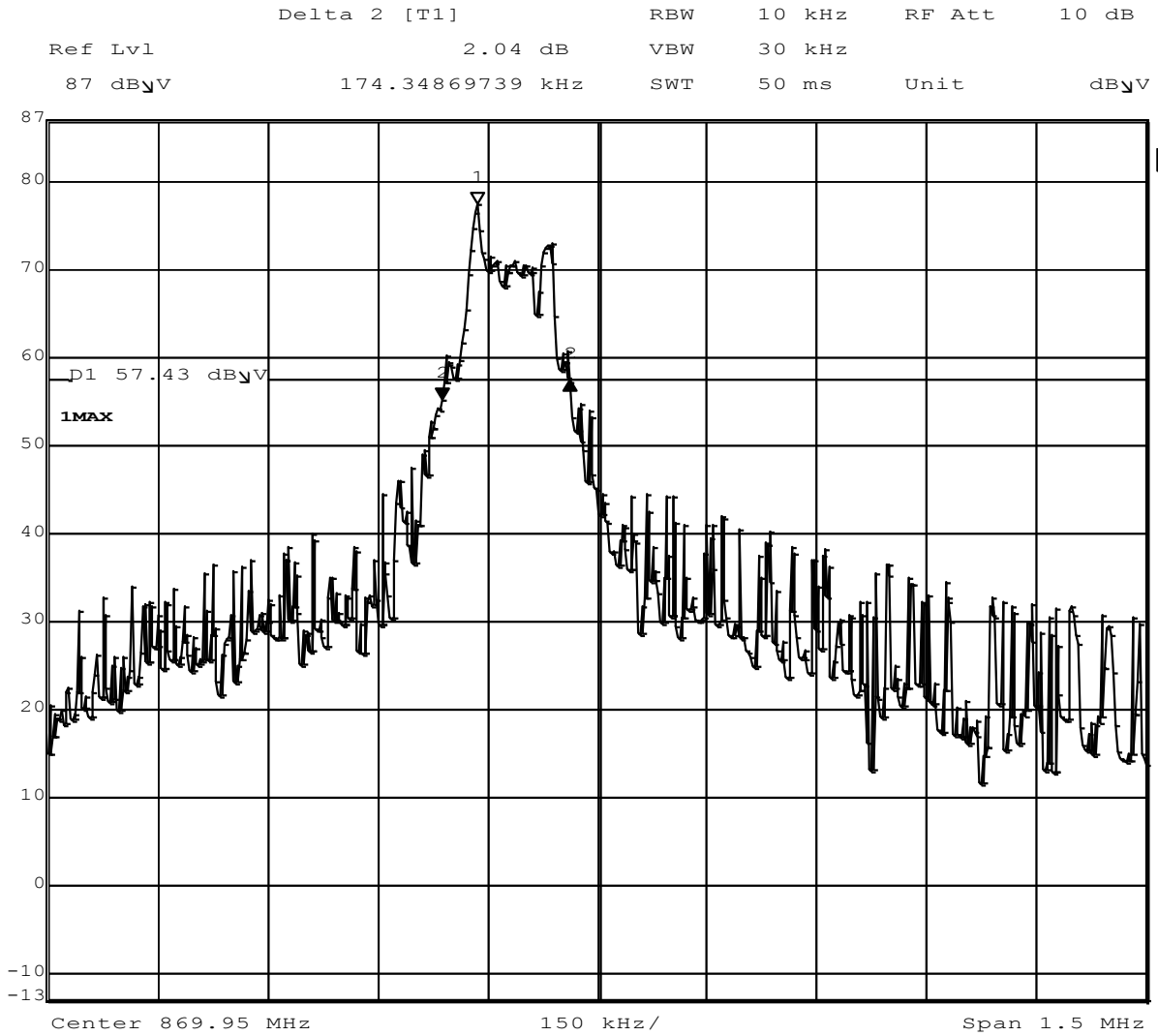
Figure 2 Occupied Bandwidth Graph – 433MHz, 868.35MHz and 869.92MHz



Date: 7.JAN.2011 09:11:19



Date: 7.JAN.2011 08:58:11



Date: 7.JAN.2011 08:27:08

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)	
Pulse Train Limits		
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.		
Polling Signal Limits		
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: polling only conducted at one channel, polling scheme is the same for all channels.		

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

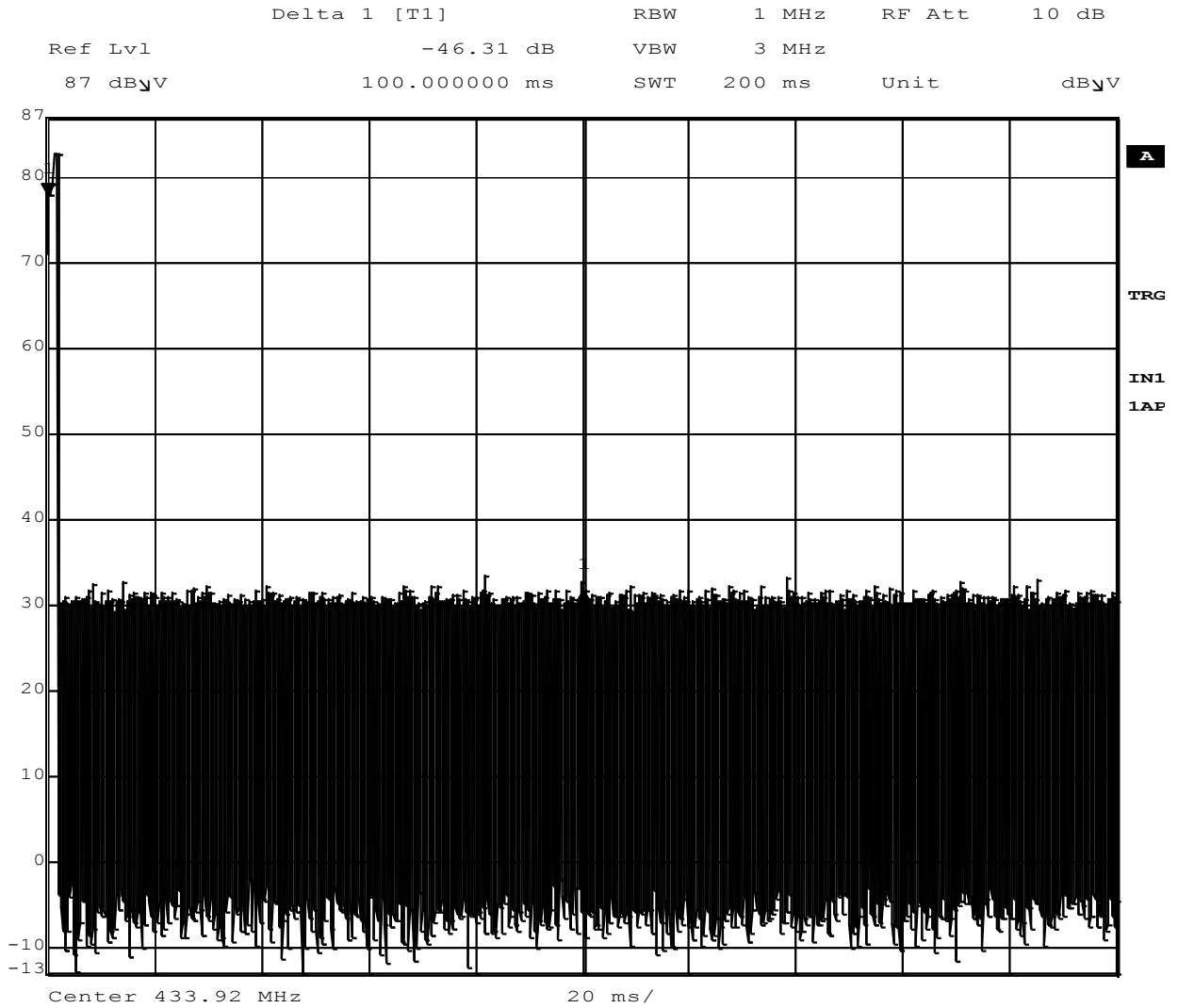
Table 8 Pulse Train Test Equipment

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due
Spectrum Analyzer	Agilent	E4446A	70728	2011-02-05	2012-02-05
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

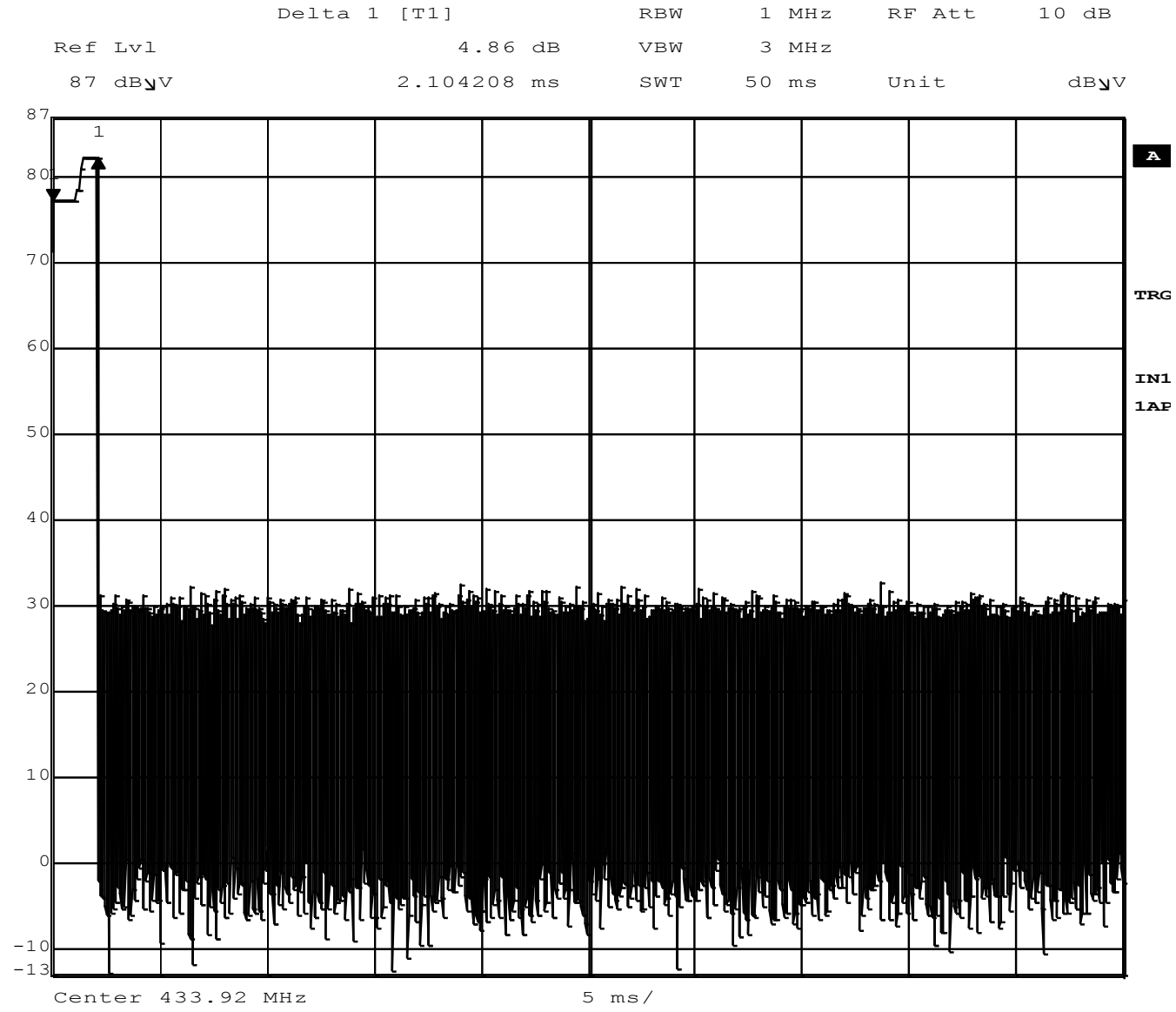
Figure 3 Test Setup for Pulse Train



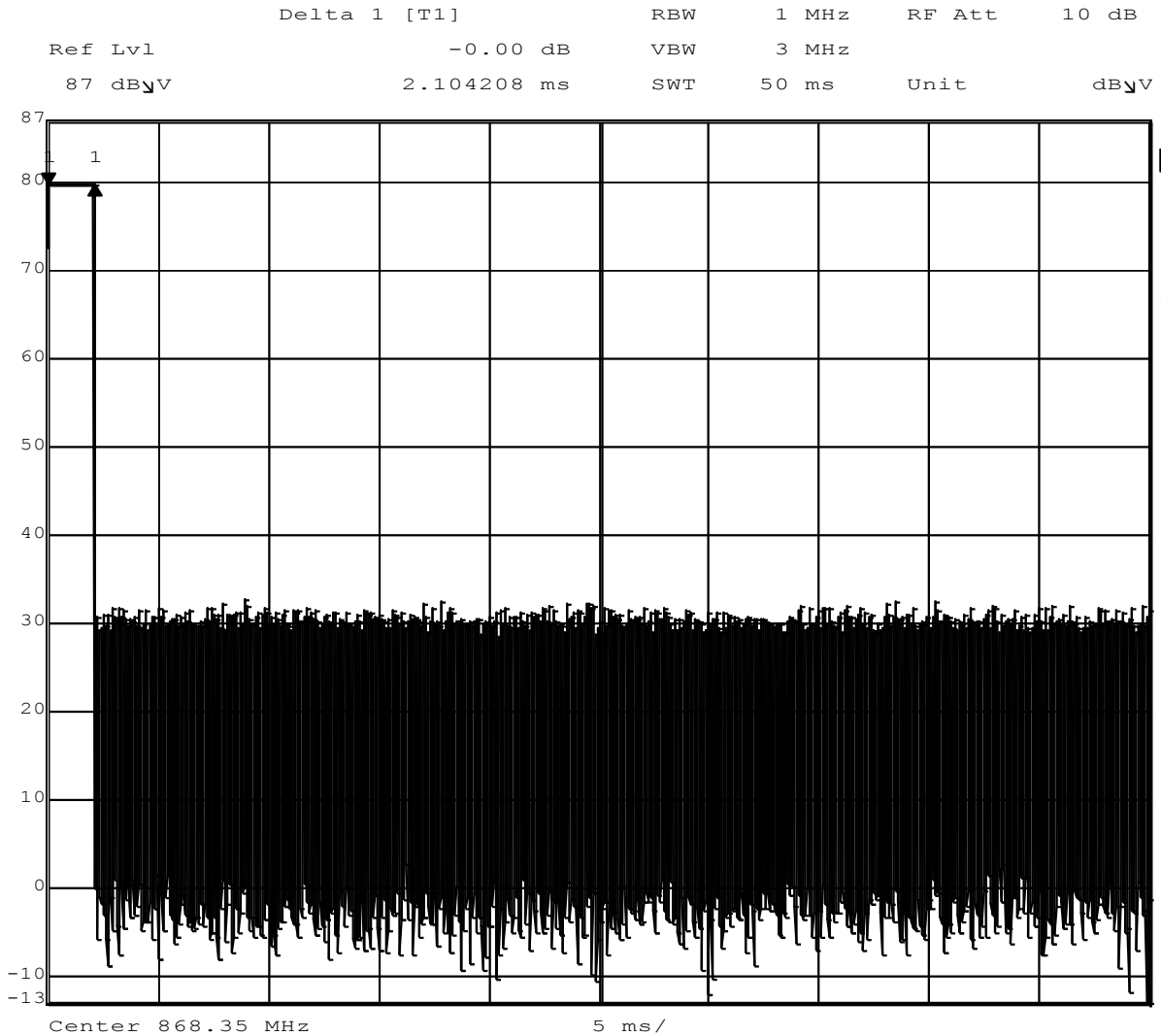
Figure 4 Pulse Train Graph – 433.92MHz and 868.35MHz



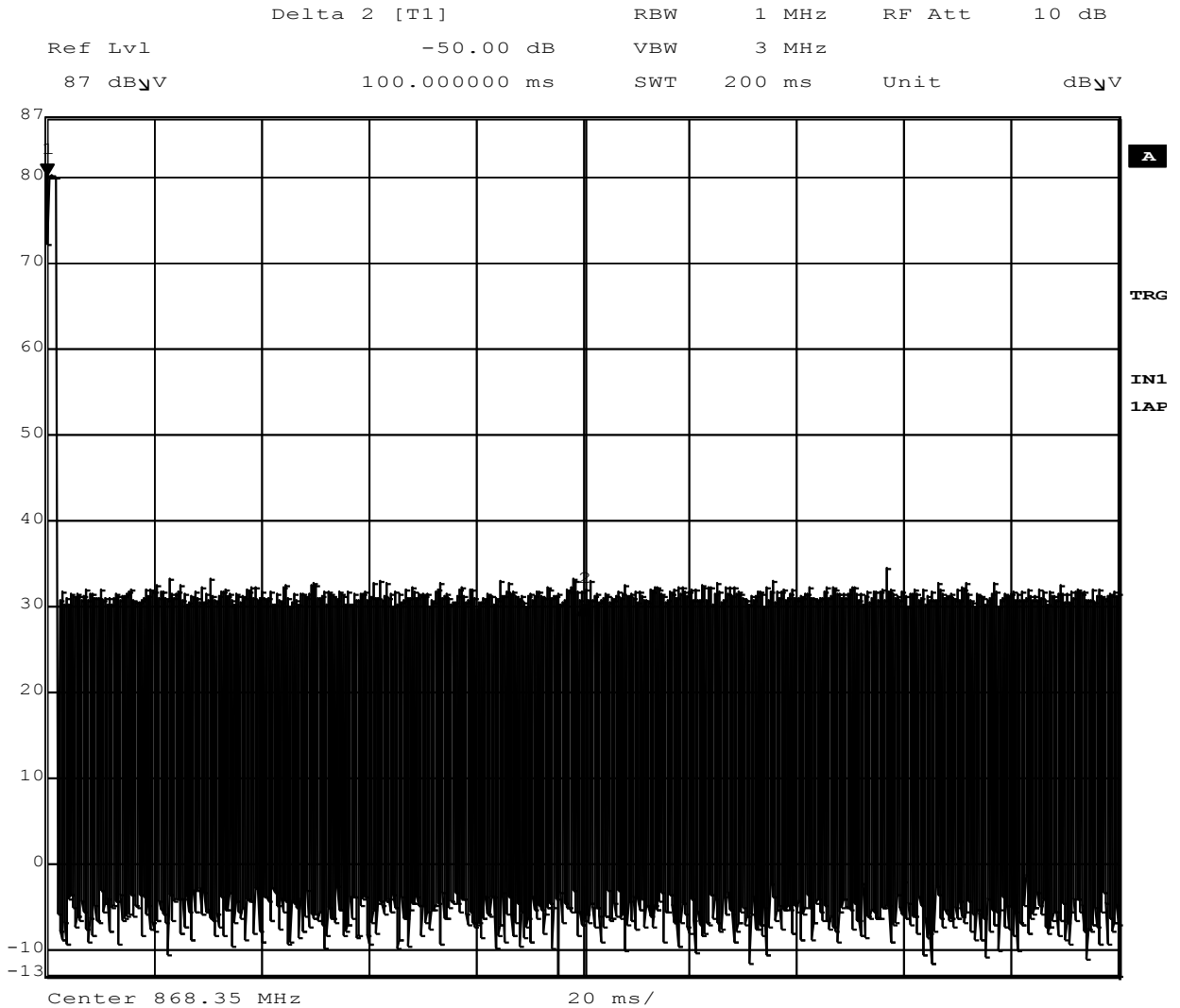
Date: 7.JAN.2011 09:13:53



Date: 7.JAN.2011 09:14:25



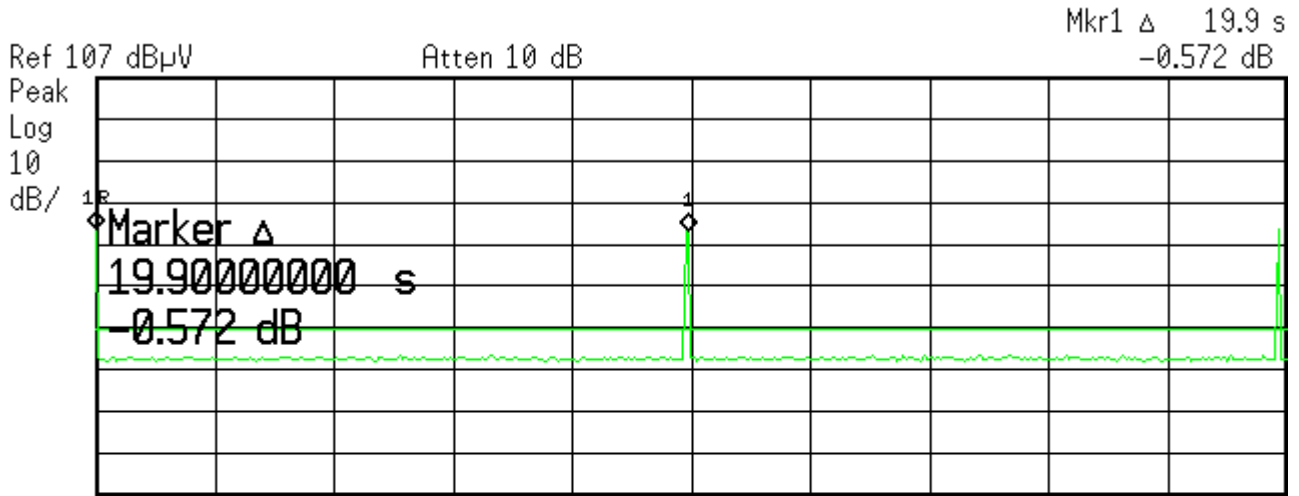
Date: 7.JAN.2011 09:00:47



Date: 7.JAN.2011 08:59:24

Figure 5 Polling Signals

Agilent 11:02:25 Jan 24, 2011



Center 868.9 MHz Span 0 Hz
 Res BW 120 kHz VBW 300 kHz Sweep 40 s (401 pts)

Marker	Trace	Type	X Axis	Amplitude
1R	(1)	Time	0 s	70.69 dBμV
1Δ	(1)	Time	19.9 s	-0.572 dB

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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	
Cease Operation Limits		
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		

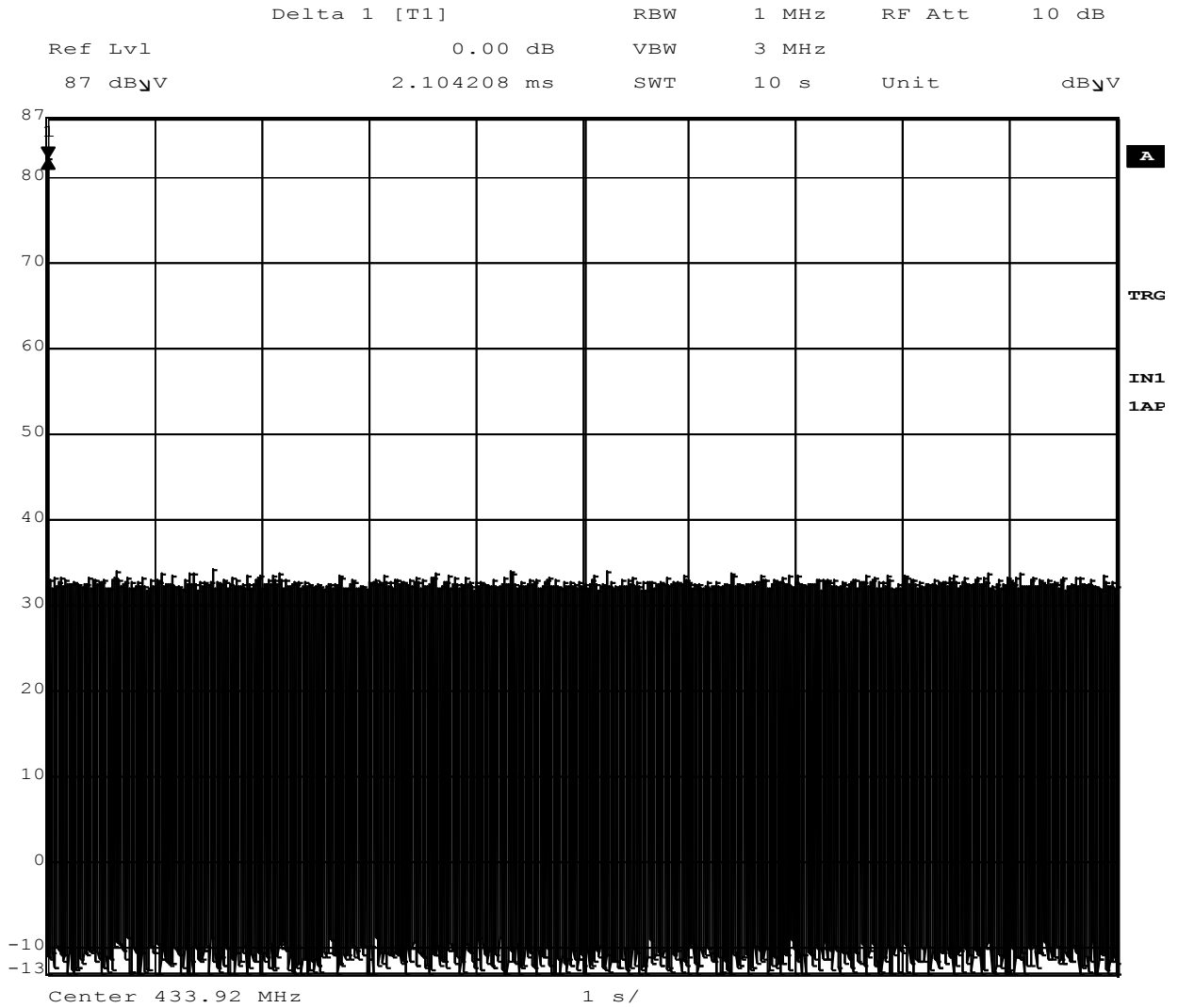
Table 10 Cease Operation Test Equipment

Test Equipment Used					
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

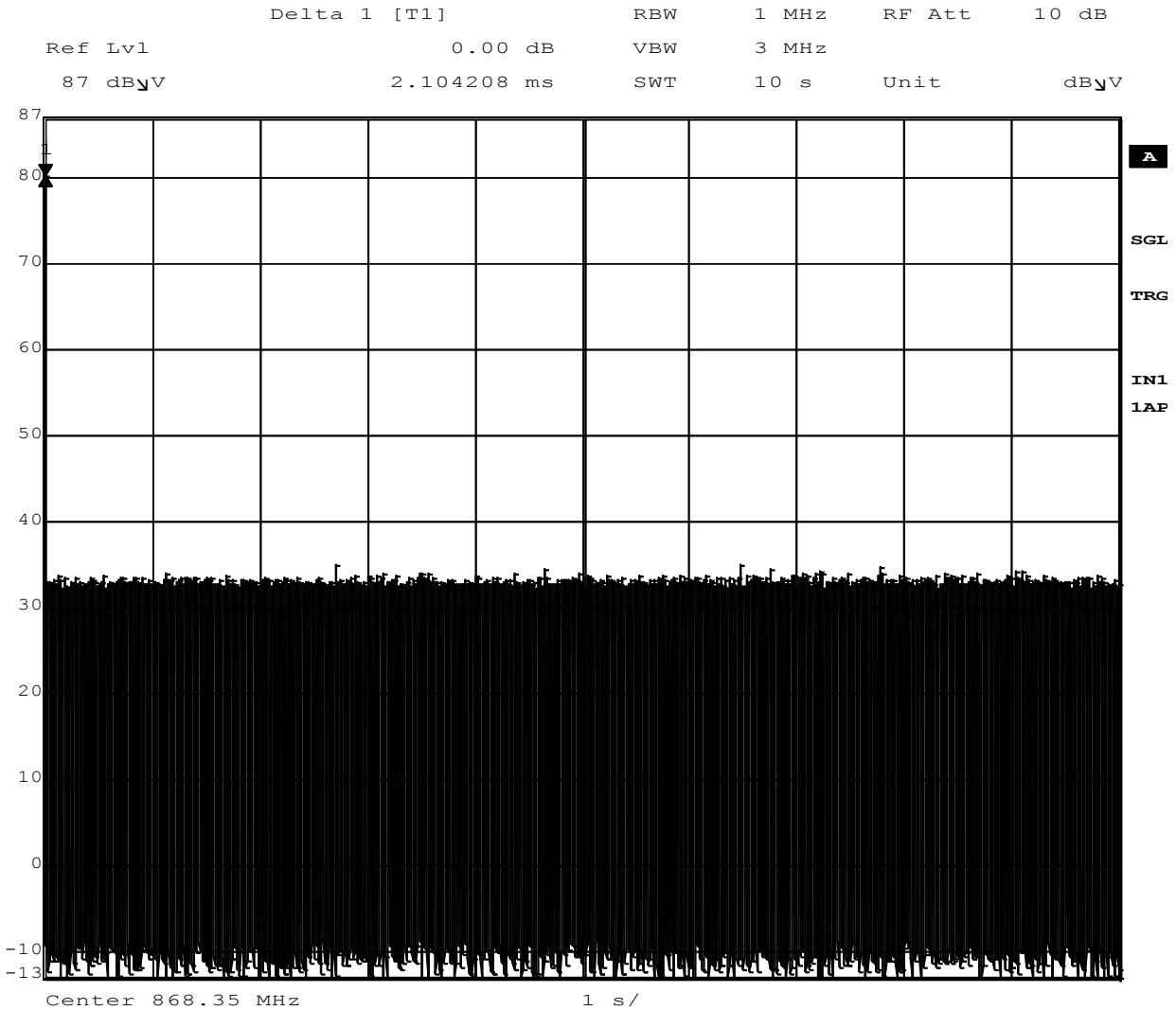
Figure 6 Test Setup for Cease Operation



Figure 7 Cease Operation Graph – 433.92MHz and 869.35MHz



Date: 7.JAN.2011 09:15:13



Date: 7.JAN.2011 09:02:10

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)	
Limits - Class 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:		

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
Log-P Antenna	Schaffner	UPA6109	44068	2010-04-05	2011-04-05
Bicon Antenna	Schaffner	VBA6106A	54	2010-04-05	2011-04-05
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
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.

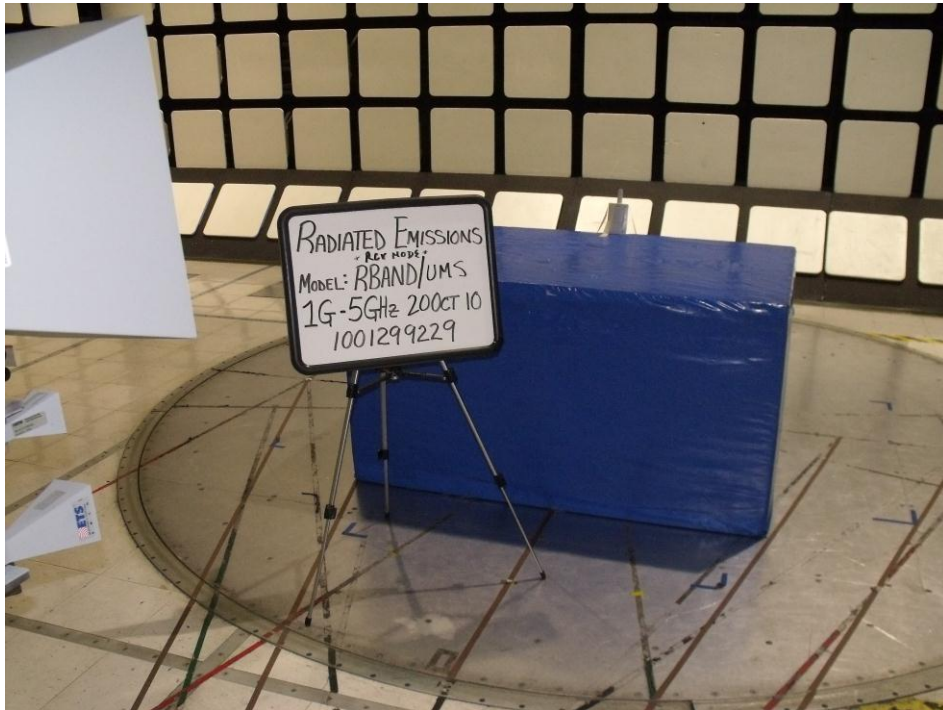
Figure 8 Test setup for Radiated Emissions – Receive Mode



Front View



Rear View



Note: Same setup used for 433MHz above 1GHz from 1-2GHz.

Figure 9 Radiated Emissions Graph – Receiver 433MHz 30-1000MHz

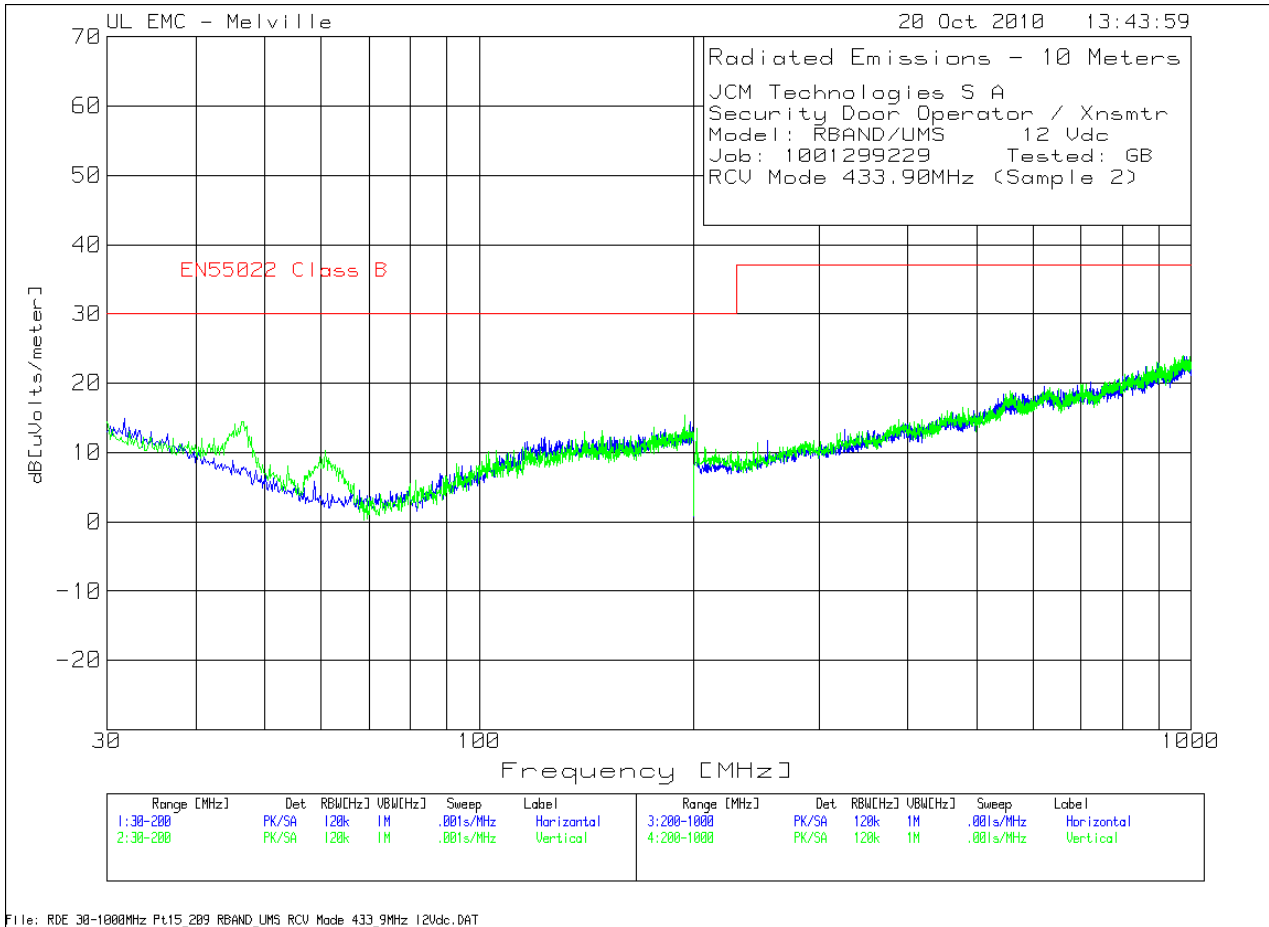


Table 13 Radiated Emissions Data Points – Receiver 433MHz 30-1000MHz

JCM Technologies S A
 Security Door Operator / Xnsmttr
 Model: RBAND/UMS 12 Vdc
 Job: 1001299229 Tested: GB
 RCV Mode 433.90MHz (Sample 2)

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	31.7017	33.78 pk	-36	17.1	14.88	30	-	-	-	-	-
	Azimuth:345	Height:100	Horz	Margin [dB]		-15.12	-	-	-	-	-
2	36.4665	33.12 pk	-35.8	15.3	12.62	30	-	-	-	-	-
	Azimuth:94	Height:251	Horz	Margin [dB]		-17.38	-	-	-	-	-
Vertical 30 - 200MHz -----											
3	46.5065	39.4 pk	-35.9	11	14.5	30	-	-	-	-	-
	Azimuth:0	Height:100	Vert	Margin [dB]		-15.5	-	-	-	-	-
4	60.8008	39.31 pk	-35.8	6.8	10.31	30	-	-	-	-	-
	Azimuth:296	Height:100	Vert	Margin [dB]		-19.69	-	-	-	-	-
5	140.6106	34.08 pk	-35.4	14.4	13.08	30	-	-	-	-	-
	Azimuth:166	Height:100	Vert	Margin [dB]		-16.92	-	-	-	-	-
6	194.2142	34.22 pk	-35.3	16.4	15.32	30	-	-	-	-	-
	Azimuth:166	Height:100	Vert	Margin [dB]		-14.68	-	-	-	-	-

LIMIT 1: EN55022 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 868.35MHz 30-1000MHz

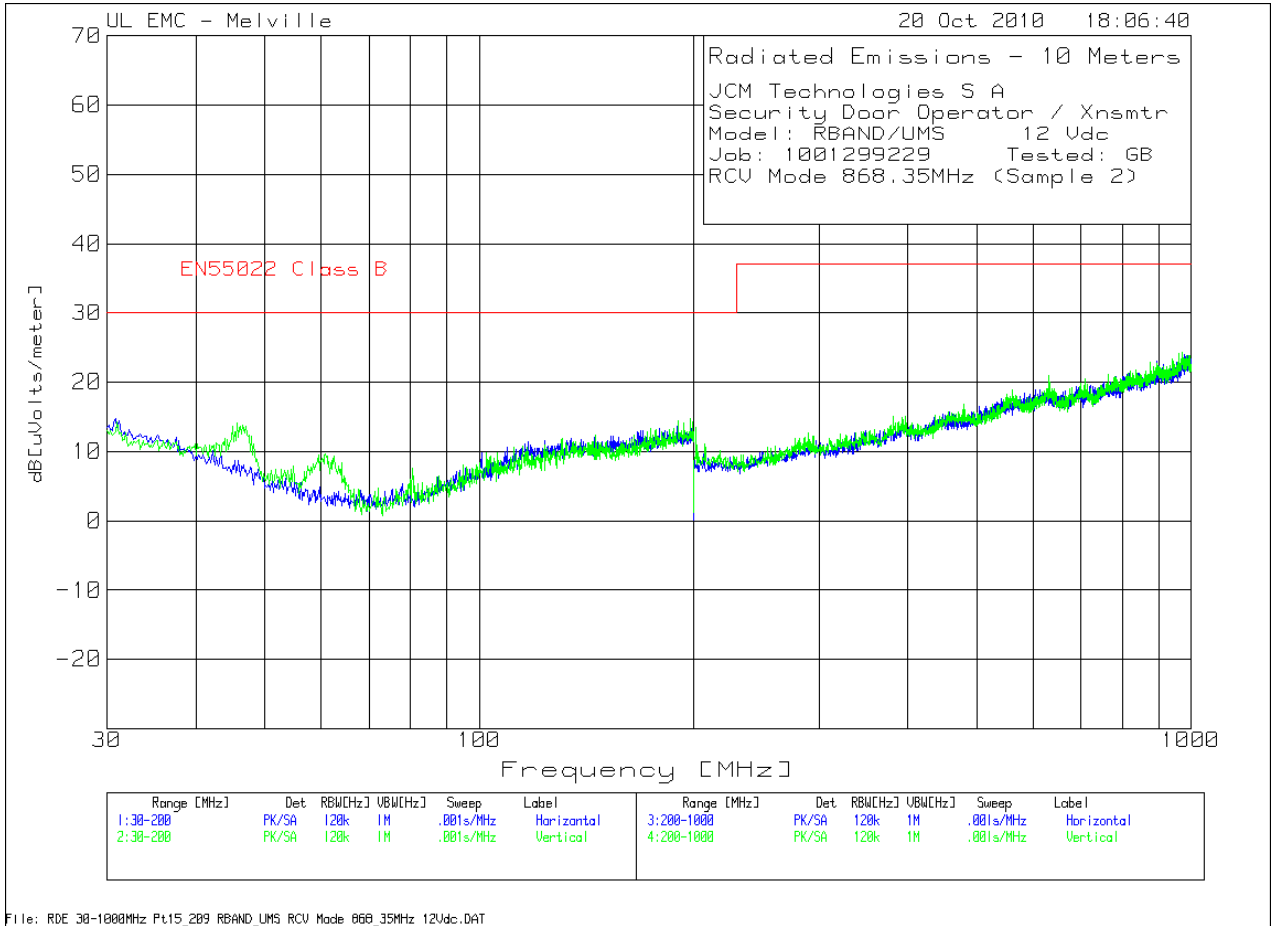


Table 14 Radiated Emissions Data Points – Receiver 868.35MHz 30-1000MHz

JCM Technologies S A
 Security Door Operator / Xnsmtr
 Model: RBAND/UMS 12 Vdc
 Job: 1001299229 Tested: GB
 RCV Mode 868.35MHz (Sample 2)

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	30.8509	33.27 pk	-36	17.5	14.77	30	-	-	-	-	-
	Azimuth:2	Height:100	Horz	Margin [dB]		-15.23	-	-	-	-	-
2	168.5185	33.35 pk	-35.2	14.9	13.05	30	-	-	-	-	-
	Azimuth:196	Height:250	Horz	Margin [dB]		-16.95	-	-	-	-	-
Vertical 30 - 200MHz -----											
3	45.6557	38.88 pk	-35.9	11.2	14.18	30	-	-	-	-	-
	Azimuth:260	Height:100	Vert	Margin [dB]		-15.82	-	-	-	-	-
4	60.8008	38.67 pk	-35.8	6.8	9.67	30	-	-	-	-	-
	Azimuth:33	Height:100	Vert	Margin [dB]		-20.33	-	-	-	-	-
Horizontal 200 - 1000MHz -----											
5	450.5253	31.15 pk	-32.8	16.9	15.25	37	-	-	-	-	-
	Azimuth:288	Height:199	Horz	Margin [dB]		-21.75	-	-	-	-	-
6	896.3482	32.11 pk	-31.8	22.8	23.11	37	-	-	-	-	-
	Azimuth:171	Height:99	Horz	Margin [dB]		-13.89	-	-	-	-	-
Vertical 200 - 1000MHz -----											
7	630.6153	32.31 pk	-31.9	20.6	21.01	37	-	-	-	-	-
	Azimuth:1	Height:300	Vert	Margin [dB]		-15.99	-	-	-	-	-
8	960.7804	31.86 pk	-31.6	23.9	24.16	37	-	-	-	-	-
	Azimuth:16	Height:100	Vert	Margin [dB]		-12.84	-	-	-	-	-

LIMIT 1: EN55022 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 869.85MHz 30-1000MHz

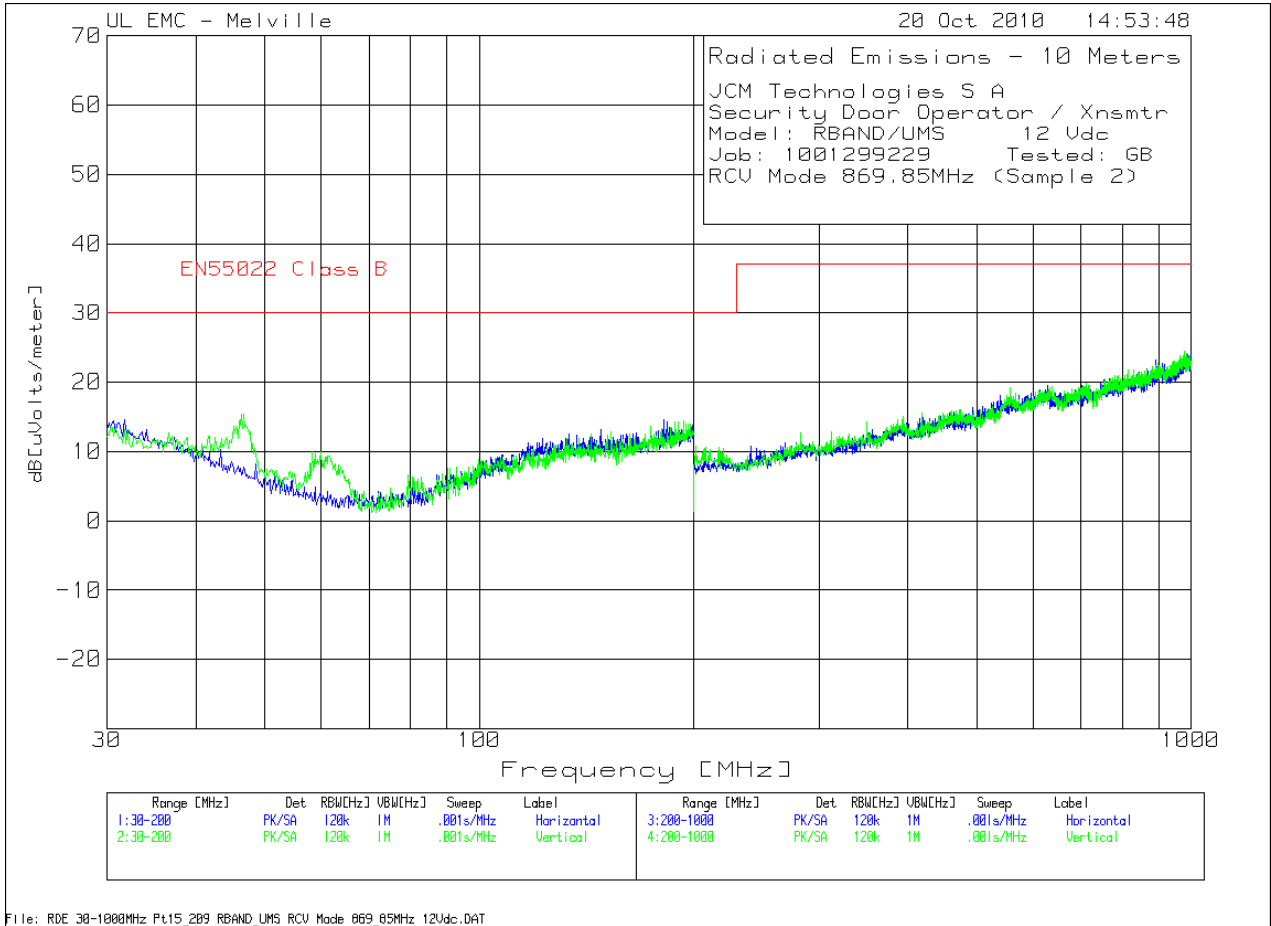


Table 15 Radiated Emissions Data Points – Receiver 869.85MHz 30-1000MHz

JCM Technologies S A
 Security Door Operator / Xnsmtr
 Model: RBAND/UMS 12 Vdc
 Job: 1001299229 Tested: GB
 RCV Mode 869.85MHz (Sample 2)

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	31.7017	33.43 pk	-36	17.1	14.53	30	-	-	-	-	-
	Azimuth:358	Height:100	Horz	Margin [dB]		-15.47	-	-	-	-	-
2	181.6216	34.28 pk	-35.2	15.5	14.58	30	-	-	-	-	-
	Azimuth:294	Height:249	Horz	Margin [dB]		-15.42	-	-	-	-	-
Vertical 30 - 200MHz -----											
3	46.3363	40.21 pk	-35.9	11.1	15.41	30	-	-	-	-	-
	Azimuth:98	Height:100	Vert	Margin [dB]		-14.59	-	-	-	-	-
4	59.95	38.96 pk	-35.8	6.8	9.96	30	-	-	-	-	-
	Azimuth:98	Height:100	Vert	Margin [dB]		-20.04	-	-	-	-	-
Horizontal 200 - 1000MHz -----											
5	240.4202	33.89 pk	-34.4	11.3	10.79	37	-	-	-	-	-
	Azimuth:49	Height:200	Horz	Margin [dB]		-26.21	-	-	-	-	-
6	540.1701	31.23 pk	-32.3	19.1	18.03	37	-	-	-	-	-
	Azimuth:7	Height:400	Horz	Margin [dB]		-18.97	-	-	-	-	-
Vertical 200 - 1000MHz -----											
7	781.0905	31.39 pk	-32	21.6	20.99	37	-	-	-	-	-
	Azimuth:207	Height:400	Vert	Margin [dB]		-16.01	-	-	-	-	-
8	976.7884	31.37 pk	-31.5	24.6	24.47	37	-	-	-	-	-
	Azimuth:188	Height:400	Vert	Margin [dB]		-12.53	-	-	-	-	-

LIMIT 1: EN55022 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 433MHz 1-2GHz

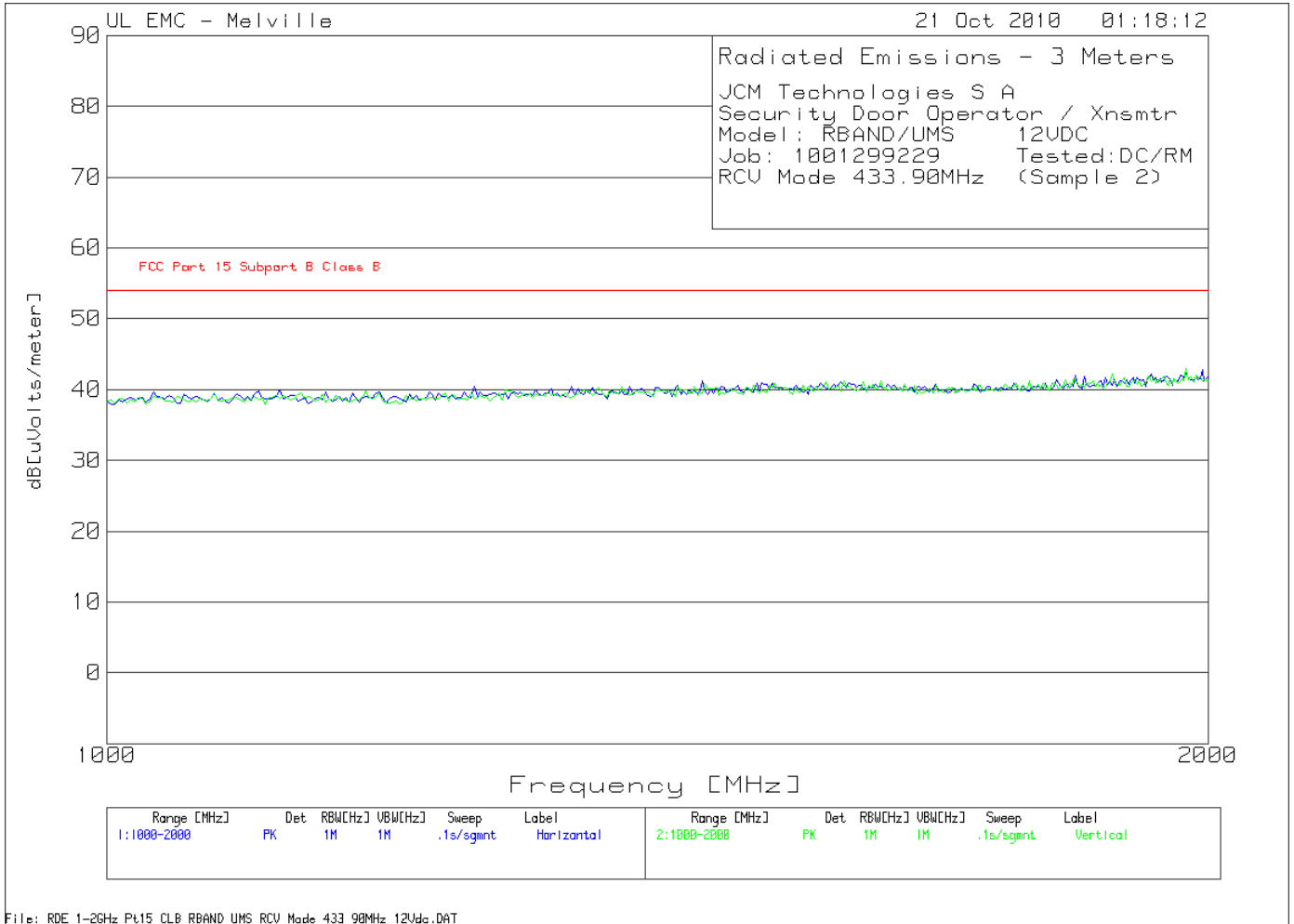


Table 16 Radiated Emissions Data Points – Receiver 433MHz 1-2GHz

JCM Technologies S A
 Security Door Operator / Xnsmttr
 Model: RBAND/UMS 12VDC
 Job: 1001299229 Tested:DC/RM
 RCV Mode 433.90MHz (Sample 2)

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	1115	65.18 pk	-45.22	20	39.96	54	-	-	-	-	-
		Height:100 Horz		Margin [dB]		-14.04	-	-	-	-	-
2	1455	65.25 pk	-44.88	20.8	41.17	54	-	-	-	-	-
		Height:100 Horz		Margin [dB]		-12.83	-	-	-	-	-
3	1992.5	64.34 pk	-43.79	22.2	42.75	54	-	-	-	-	-
		Height:100 Horz		Margin [dB]		-11.25	-	-	-	-	-
Vertical 1000 - 2000MHz -----											
4	1177.5	65.14 pk	-45.13	19.8	39.81	54	-	-	-	-	-
		Height:250 Vert		Margin [dB]		-14.19	-	-	-	-	-
5	1610	64.44 pk	-44.54	21.2	41.1	54	-	-	-	-	-
		Height:100 Vert		Margin [dB]		-12.9	-	-	-	-	-
6	1972.5	64.8 pk	-43.85	22	42.95	54	-	-	-	-	-
		Height:250 Vert		Margin [dB]		-11.05	-	-	-	-	-

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 868.35MHz 1-5GHz

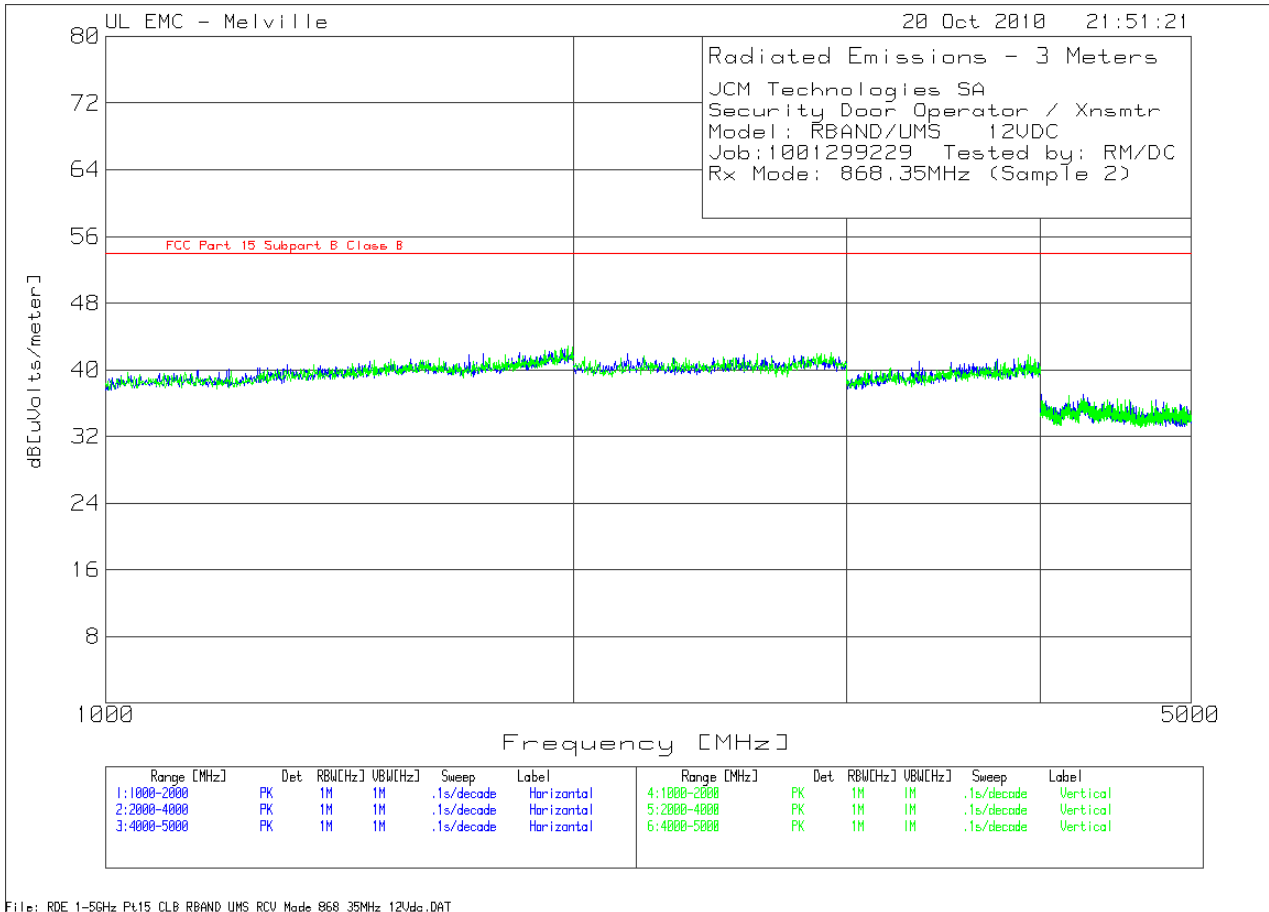


Table 17 Radiated Emissions Data Points – Receiver 868.35MHz 1-5GHz

JCM Technologies SA
 Security Door Operator / Xnsmttr
 Model: RBAND/UMS 12VDC
 Job:1001299229 Tested by: RM/DC
 Rx Mode: 868.35MHz (Sample 2)

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

1	1846.442	64.94 pk	-44.15	21.3	42.09	54	-	-	-	-	-
		Height:249	Horz	Margin [dB]		-11.91	-	-	-	-	-

2	2167.291	64.64 pk	-44.14	21.4	41.9	54	-	-	-	-	-
		Height:100	Horz	Margin [dB]		-12.1	-	-	-	-	-

3	4274.542	60.54 pk	-52.75	27.8	35.59	54	-	-	-	-	-
		Height:100	Horz	Margin [dB]		-18.41	-	-	-	-	-

4	1983.77	64.72 pk	-43.97	22.1	42.85	54	-	-	-	-	-
		Height:100	Vert	Margin [dB]		-11.15	-	-	-	-	-

5	2931.336	63.42 pk	-43.24	21.9	42.08	54	-	-	-	-	-
		Height:100	Vert	Margin [dB]		-11.92	-	-	-	-	-

6	4170.549	62.39 pk	-53.27	27.8	36.92	54	-	-	-	-	-
		Height:100	Vert	Margin [dB]		-17.08	-	-	-	-	-

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 14 Radiated Emissions Graph – Receiver 869.85MHz 1-5GHz

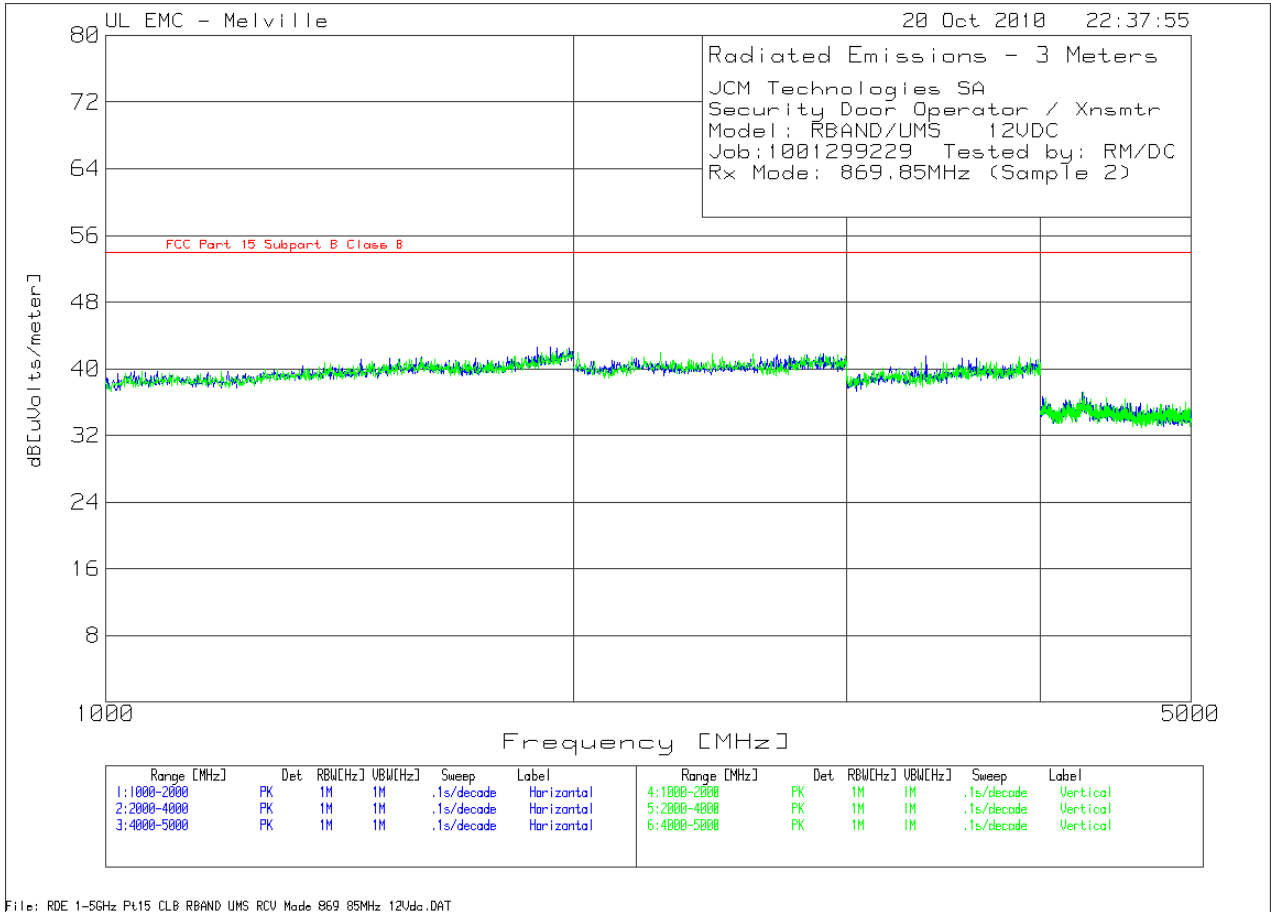


Table 18 Radiated Emissions Data Points – Receiver 869.85MHz 1-5GHz

JCM Technologies SA
 Security Door Operator / Xnsmttr
 Model: RBAND/UMS 12VDC
 Job:1001299229 Tested by: RM/DC
 Rx Mode: 869.85MHz (Sample 2)

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	1524.345	65.04 pk	-44.69	20.9	41.25	54	-	-	-	-	-
		Height:250	Horz	Margin [dB]		-12.75	-	-	-	-	-
Horizontal 2000 - 4000MHz -----											
2	3375.78	62.38 pk	-42.91	22.1	41.57	54	-	-	-	-	-
		Height:250	Horz	Margin [dB]		-12.43	-	-	-	-	-
Horizontal 4000 - 5000MHz -----											
3	4254.576	62.18 pk	-52.85	27.8	37.13	54	-	-	-	-	-
		Height:100	Horz	Margin [dB]		-16.87	-	-	-	-	-
Vertical 1000 - 2000MHz -----											
4	1833.958	64.5 pk	-44.18	21.2	41.52	54	-	-	-	-	-
		Height:250	Vert	Margin [dB]		-12.48	-	-	-	-	-
Vertical 2000 - 4000MHz -----											
5	2459.426	64 pk	-43.72	21.5	41.78	54	-	-	-	-	-
		Height:249	Vert	Margin [dB]		-12.22	-	-	-	-	-
Vertical 4000 - 5000MHz -----											
6	4534.942	62.55 pk	-53.44	27.3	36.41	54	-	-	-	-	-
		Height:249	Vert	Margin [dB]		-17.59	-	-	-	-	-

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)		
Limits			
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
869.85	-	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.			

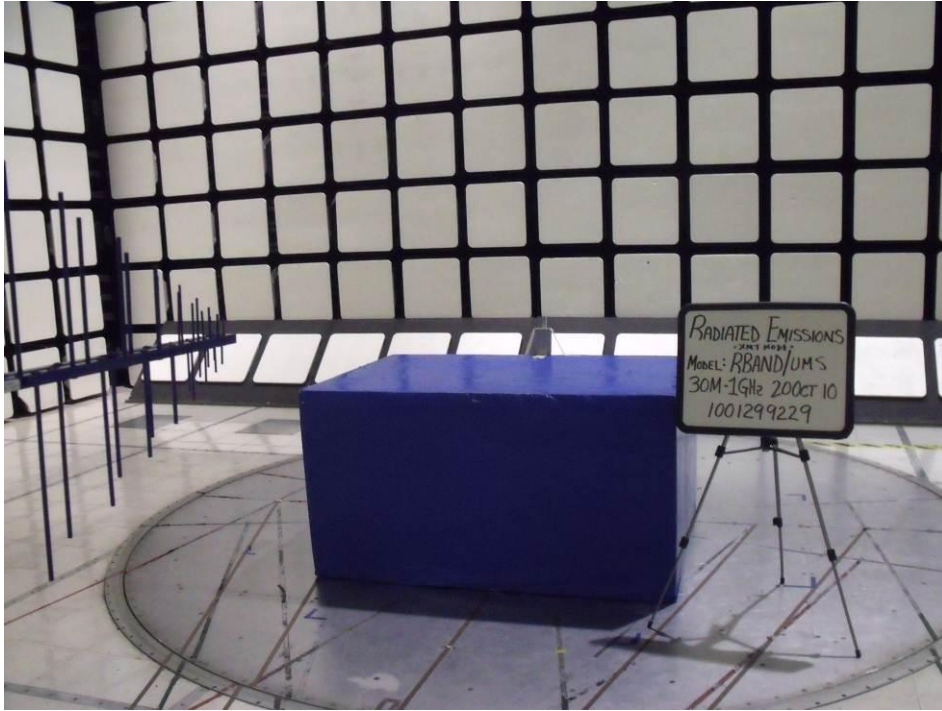
Table 19 Radiated Emissions EUT Configuration Settings

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

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

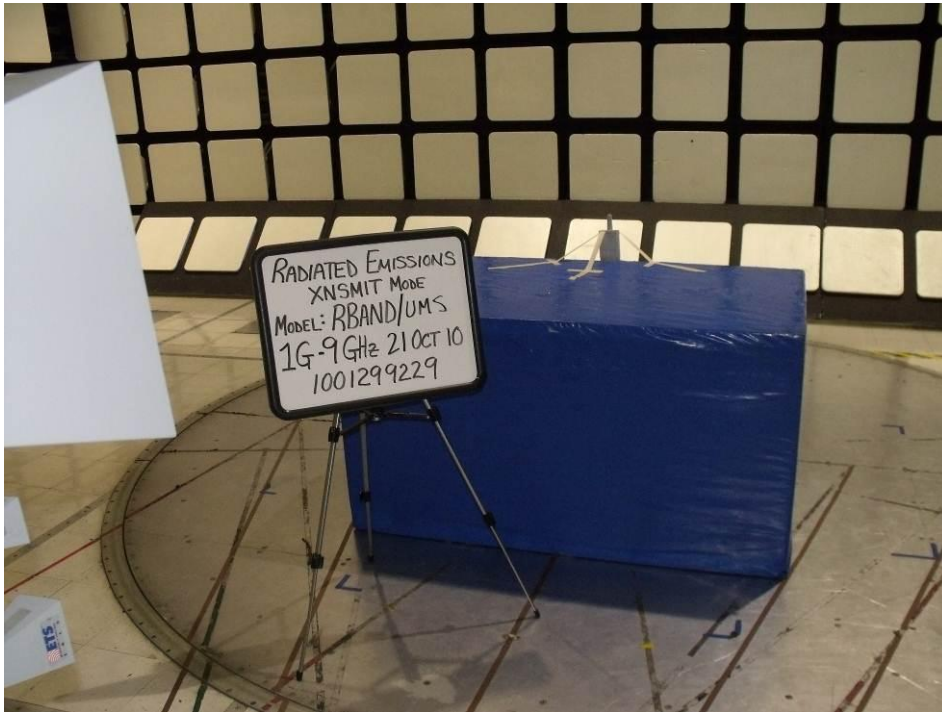
Figure 15 Test setup for Radiated Emissions – Transmitter



Front View



Rear View



Front View



Rear View

Figure 16 Radiated Emissions Graph – Transmitter 433MHz

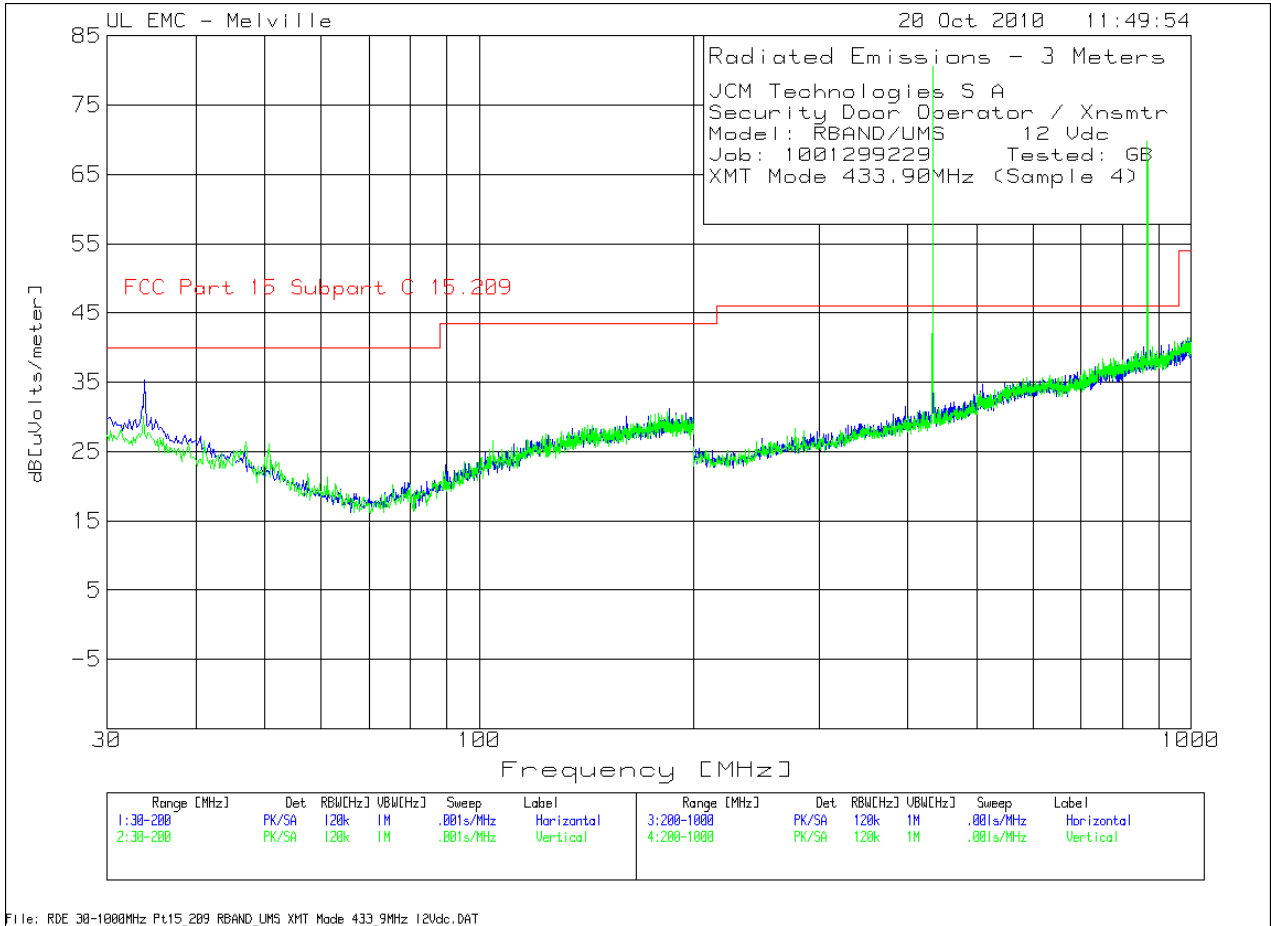


Table 21 Radiated Emissions Data Points – Transmitter 433MHz

JCM Technologies S A
 Security Door Operator / Xnsmtr
 Model: RBAND/UMS 12 Vdc
 Job: 1001299229 Tested: GB
 XMT Mode 433.90MHz (Sample 4)

Test	Meter	Gain/Loss	Transducer	Level	Limit:1	2	3	4	5	6
Frequency [MHz]	Reading [dB(uV)]	Factor [dB]	Factor [dB]	dB[uVolts/meter]						
Horizontal 30 - 200MHz										
33.9	6.3 QP	.3	17.1	23.7	40	-	-	-	-	-
Azimuth: 288		Height:269	Horz		Margin [dB]:	-16.3	-	-	-	-
33.0523	6.16 QP	.4	17.7	24.26	40	-	-	-	-	-
Azimuth: 116		Height:283	Horz		Margin [dB]:	-15.74	-	-	-	-
Horizontal 200 - 1000MHz										
433.8617	54.49 PK	1.2	16.9	72.59	-	80.8	-	-	-	-
Azimuth: 209		Height:220	Horz		Margin [dB]:	-8.11	-	-	-	-
867.7285	35.78 PK	1.6	23.1	60.48	-	60.8	-	-	-	-
Azimuth: 16		Height:132	Horz		Margin [dB]:	-0.32	-	-	-	-
Vertical 200 - 1000MHz										
867.7289	49.01 PK	1.6	23.1	40.15*	-	60.8	-	-	-	-
Azimuth: 271		Height:119	Vert		Margin [dB]:	-20.65	-	-	-	-
867.7289	49.01 PK	1.6	23.1	73.71	-	-	80.8	-	-	-
Azimuth: 271		Height:119	Vert		Margin [dB]:	-	-7.09	-	-	-
433.8741	63.63 PK	1.2	16.5	47.77*	-	80.8	-	-	-	-
Azimuth: 86		Height:112	Vert		Margin [dB]:	-33.03	-	-	-	-
433.8741	63.63 PK	1.2	16.5	81.33	-	-	100.8	-	-	-
Azimuth: 86		Height:112	Vert		Margin [dB]:	-	-19.47	-	-	-

***Duty Cycle Correction Factor of -33.56 applied (See section 4.2 for calculations)**

LIMIT 1: FCC Part 15 Subpart C 15.209
 LIMIT 2: FCC Part 15 Subpart C 15.231
 LIMIT 3: Peak above Average Limit
 LIMIT 4: NONE
 LIMIT 5: NONE
 LIMIT 6: NONE

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 868.35MHz

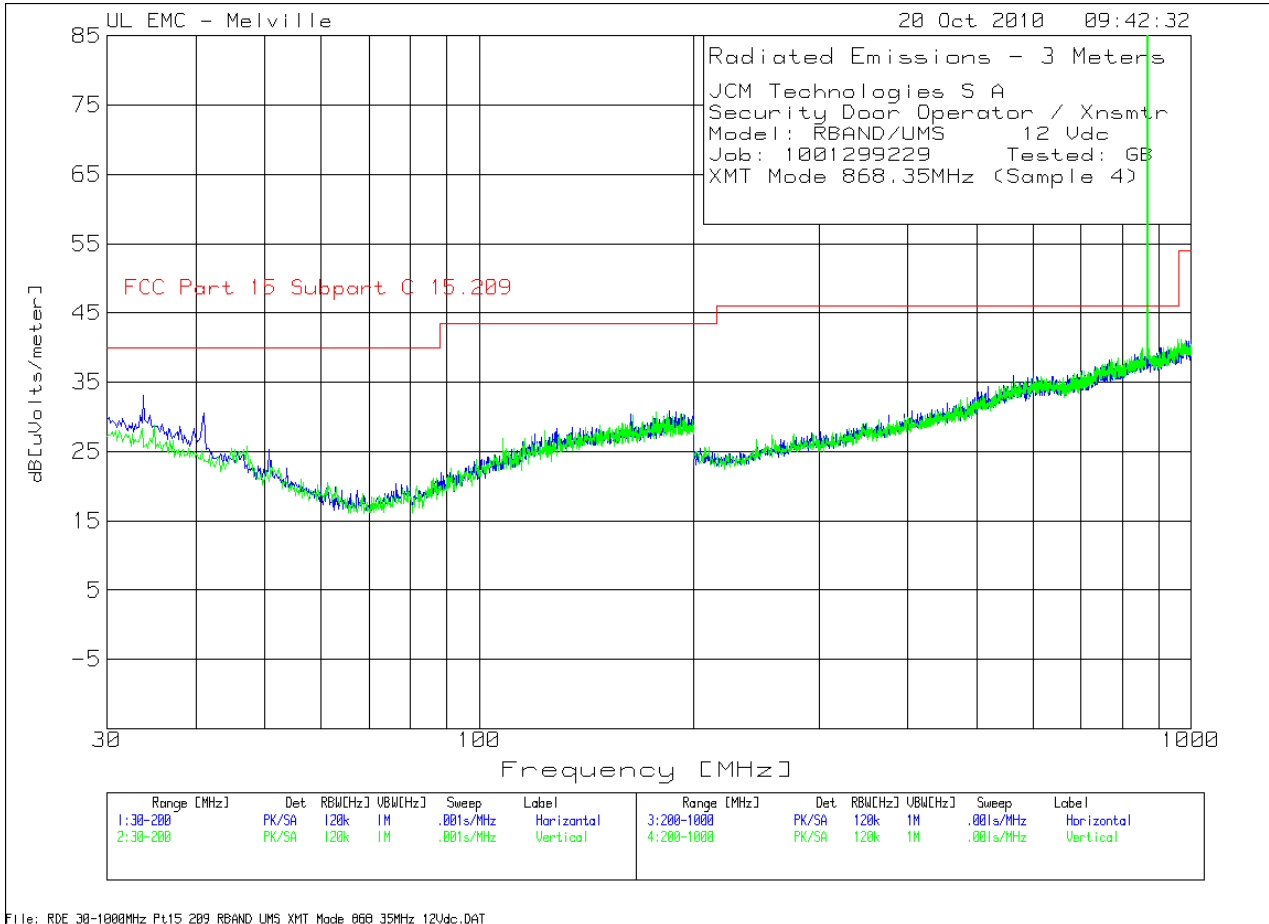


Table 22 Radiated Emissions Data Points – Transmitter 868.35MHz 30-1000MHz

JCM Technologies S A
 Security Door Operator / Xnsmtr
 Model: RBAND/UMS 12 Vdc
 Job: 1001299229 Tested: GB
 XMT Mode 868.35MHz (Sample 4)

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										
868.3532	60.74 PK	1.6	23.1	51.88*	-	81.9	-	-	-	-
Azimuth: 259 Height:151 Horz					Margin [dB]:	-	-30.02	-	-	-
868.3532	60.74 PK	1.6	23.1	85.44	-	-	101.9	-	-	-
Azimuth: 259 Height:151 Horz					Margin [dB]:	-	-16.46	-	-	-
Vertical 200 - 1000MHz										
868.2991	69.05 PK	1.6	23.1	60.19*	-	81.9	-	-	-	-
Azimuth: 4 Height:122 Vert					Margin [dB]:	-	-21.71	-	-	-
868.2991	69.05 PK	1.6	23.1	93.75	-	-	101.9	-	-	-
Azimuth: 4 Height:122 Vert					Margin [dB]:	-	-8.15	-	-	-

***Duty Cycle Correction Factor of -33.56 applied (See section 4.2 for calculations)**

LIMIT 1: FCC Part 15 Subpart C 15.209
 LIMIT 2: FCC Part 15 Subpart C 15.231
 LIMIT 3: Peak above Average Limit

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 18 Radiated Emissions Graph – Transmitter 869.85MHz

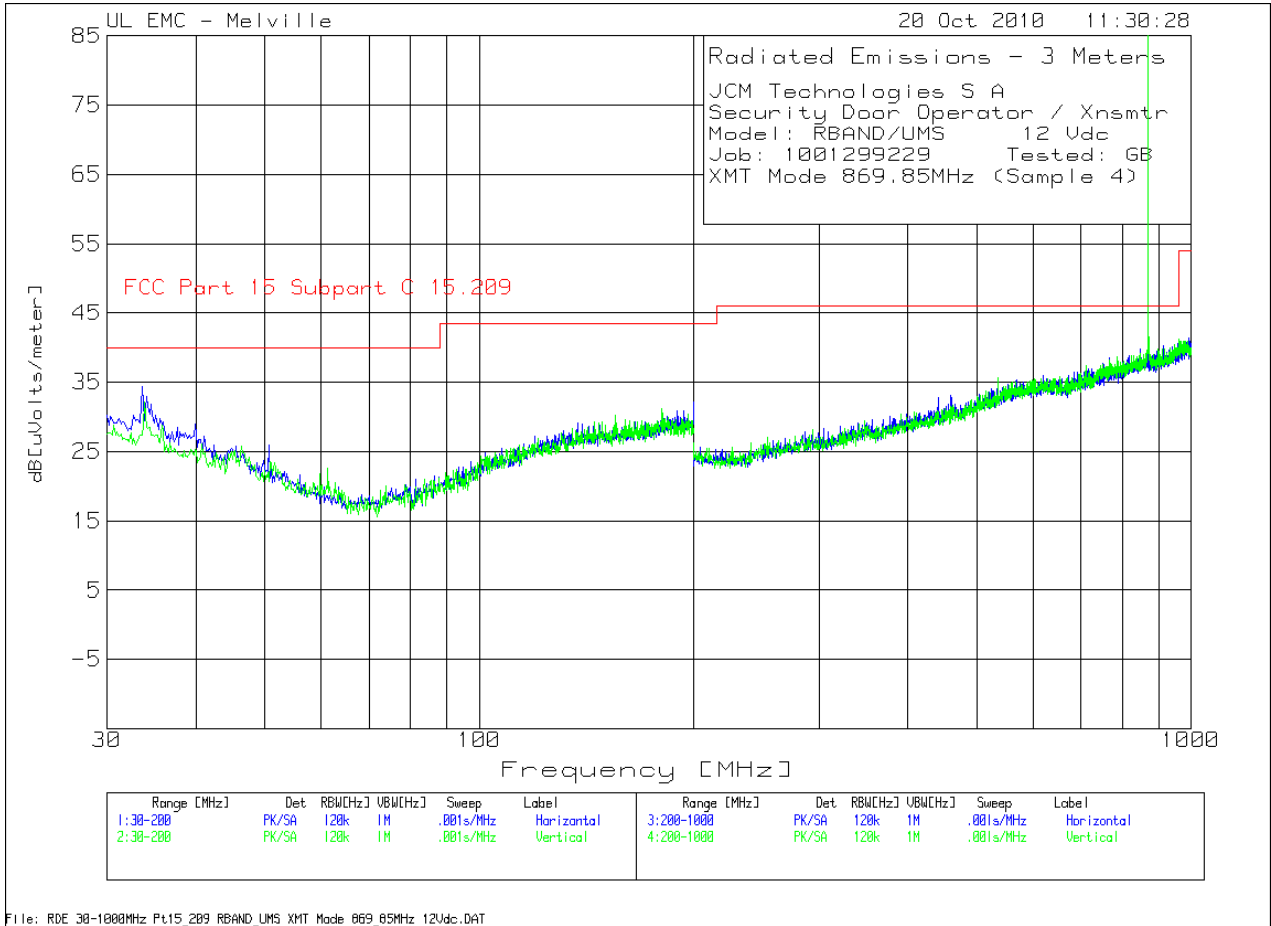


Table 23 Radiated Emissions Data Points – Transmitter 869.85MHz 30-1000MHz

JCM Technologies S A
 Security Door Operator / Xnsmttr
 Model: RBAND/UMS 12 Vdc
 Job: 1001299229 Tested: GB
 XMT Mode 869.85MHz (Sample 4)

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]	[dB]						
=====										
Horizontal 30 - 200MHz										
33.6	6.65 QP	.3	17.3	24.25	40	-	-	-	-	-
Azimuth: 63 Height:325 Horz					Margin [dB]:	-15.75	-	-	-	-
Horizontal 200 - 1000MHz										
869.8477	38.85 PK	1.6	23.1	63.55	-	81.9	-	-	-	-
Azimuth: 42 Height:213 Horz					Margin [dB]:	-	-18.35	-	-	-
Vertical 200 - 1000MHz										
869.8559	52.2 PK	1.6	23.2	77	-	81.9	-	-	-	-
Azimuth: 145 Height:136 Vert					Margin [dB]:	-	-4.9	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209
 LIMIT 2: FCC Part 15 Subpart C 15.231
 LIMIT 3: Peak above Average Limit

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 19 Radiated Emissions Graph – Transmitter 433MHz

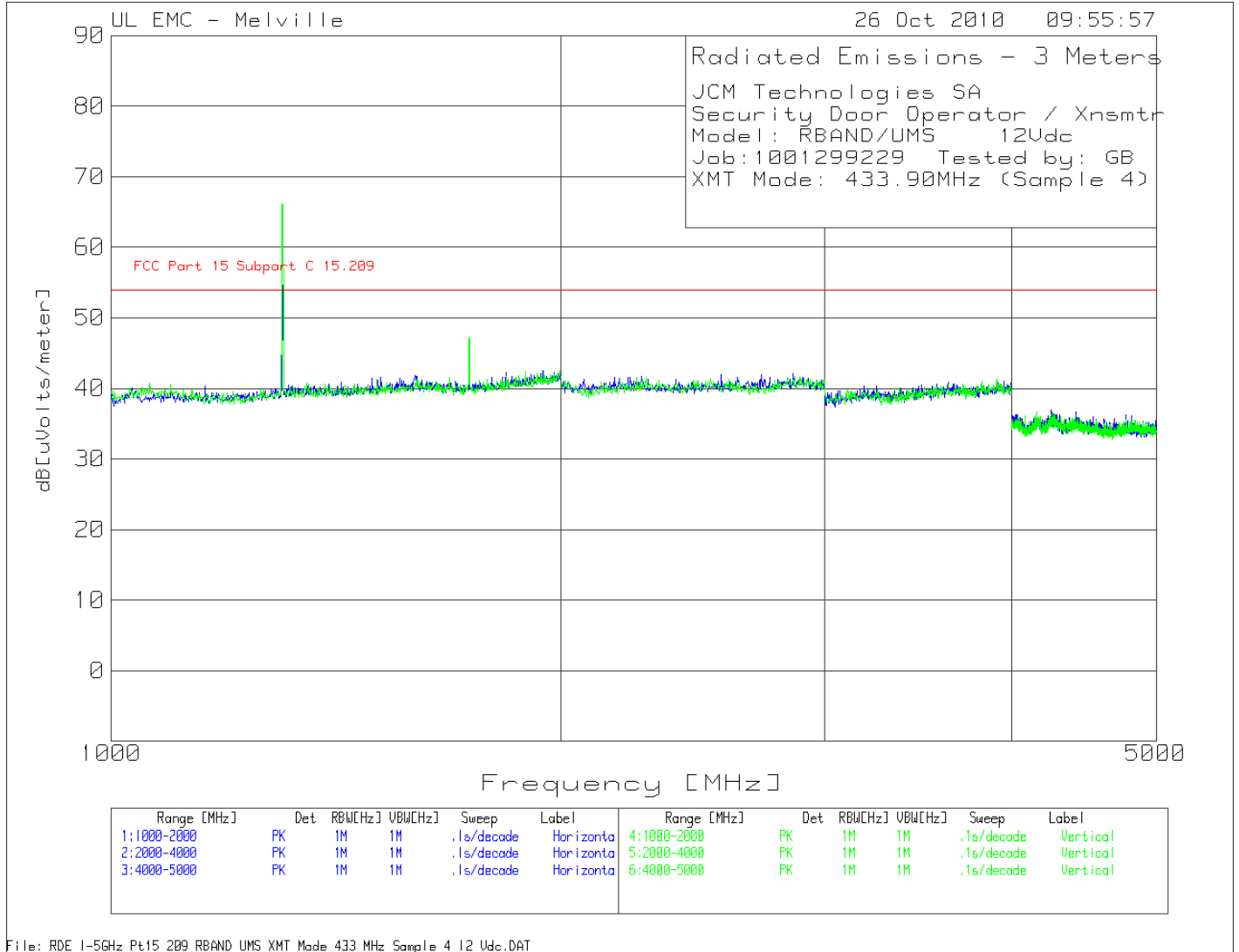


Table 24 Radiated Emissions Data Points – Transmitter 433MHz

JCM Technologies SA
 Security Door Operator / Xnsmtr
 Model: RBAND/UMS 12Vdc
 Job:1001299229 Tested by: GB
 XMT Mode: 433.90MHz (Sample 4)

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										
1301.95	79.84 PK	-45.08	20.5	21.7*	54	-	-	-	-	-
Azimuth: 283 Height:266 Horz					Margin [dB]:	-32.3	-	-	-	-
1301.95	79.84 PK	-45.08	20.5	55.26	-	-	74	-	-	-
Azimuth: 283 Height:266 Horz					Margin [dB]:	-	-18.74	-	-	-
1735.925	71.11 PK	-44.39	20.8	47.52	54	-	-	-	-	-
Azimuth: 348 Height:298 Horz					Margin [dB]:	-6.48	-	-	-	-
Vertical 1000 - 2000MHz										
1301.775	90.59 PK	-45.09	20.5	32.44*	54	-	-	-	-	-
Azimuth: 325 Height:286 Vert					Margin [dB]:	-21.56	-	-	-	-
1301.775	90.59 PK	-45.09	20.5	66	-	-	74	-	-	-
Azimuth: 325 Height:286 Vert					Margin [dB]:	-	-8	-	-	-
1735.4125	72.4 PK	-44.39	20.8	48.81	54	-	-	-	-	-
Azimuth: 318 Height:127 Vert					Margin [dB]:	-5.19	-	-	-	-

***Duty Cycle Correction Factor of -33.56 applied (See section 4.2 for calculations)**

LIMIT 1: FCC Part 15 Subpart C 15.209
 LIMIT 2: FCC Part 15 Subpart C 15.231
 LIMIT 3: Peak above Average Limit

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 20 Radiated Emissions Graph – Transmitter 868.35MHz 1-9GHz

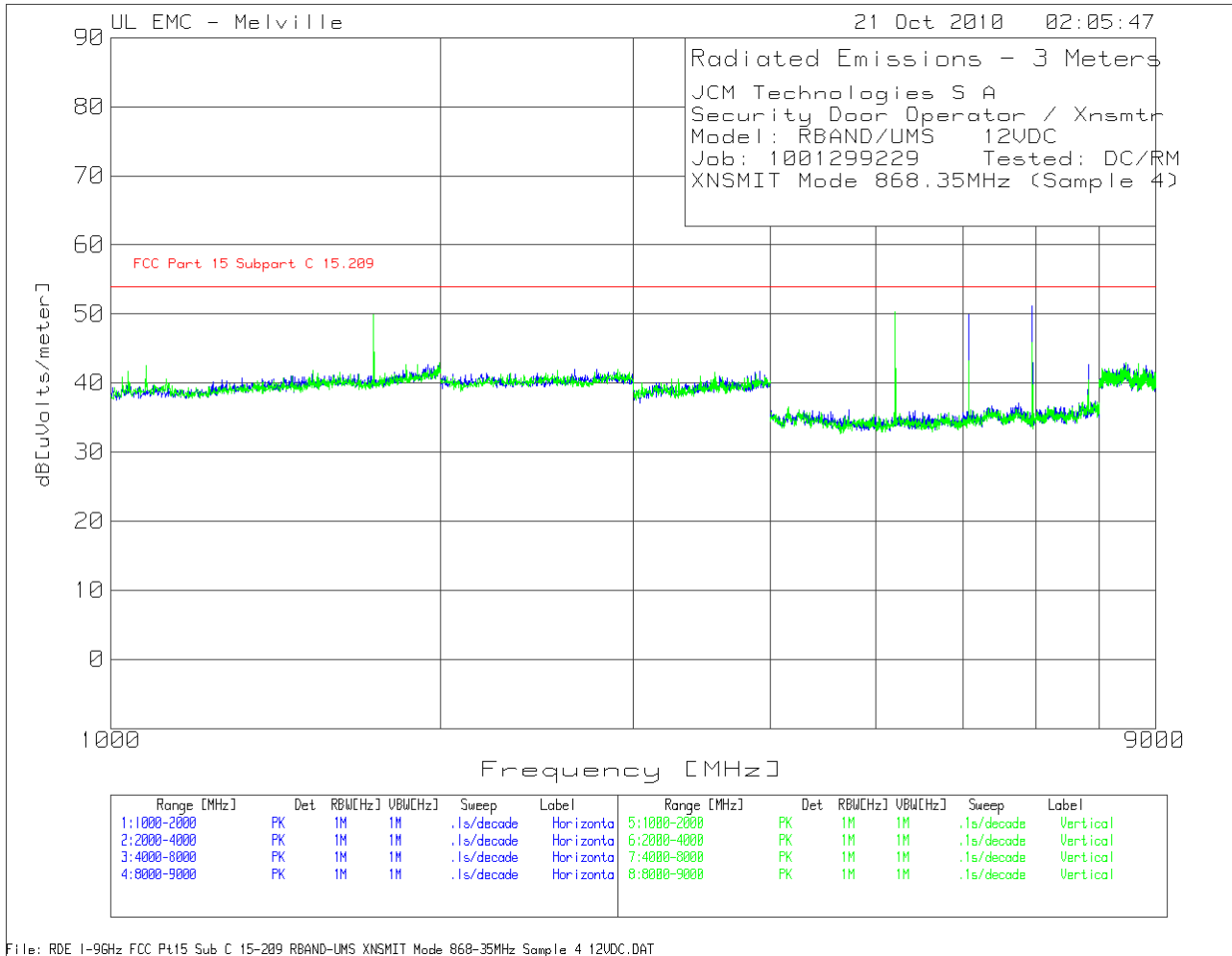


Table 25 Radiated Emissions Data Points – Transmitter 868.35MHz

JCM Technologies S A
 Security Door Operator / Xnsmttr
 Model: RBAND/UMS 12VDC
 Job: 1001299229 Tested: DC/RM
 XNSMIT Mode 868.35MHz (Sample 4)

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										
1736.7	73.52 PK	-44.4	20.8	49.92	54	-	-	-	-	-
Azimuth: 163 Height:218 Horz					Margin [dB]:	-4.08	-	-	-	-
Horizontal 4000 - 8000MHz										
5210.0375	74.98 PK	-53.06	27.3	49.22	54	-	-	-	-	-
Azimuth: 74 Height:338 Horz					Margin [dB]:	-4.78	-	-	-	-
6078.405	75.94 PK	-52.1	27.5	51.34	54	-	-	-	-	-
Azimuth: 40 Height:112 Horz					Margin [dB]:	-2.66	-	-	-	-
6946.75	77.47 PK	-52.67	27.9	52.7	54	-	-	-	-	-
Azimuth: 40 Height:344 Horz					Margin [dB]:	-1.3	-	-	-	-
7815.125	67.73 PK	-51.41	28.6	44.92	54	-	-	-	-	-
Azimuth: 356 Height:393 Horz					Margin [dB]:	-9.08	-	-	-	-
Vertical 1000 - 2000MHz										
1736.7	73.34 PK	-44.4	20.8	49.74	54	-	-	-	-	-
Azimuth: 358 Height:305 Vert					Margin [dB]:	-4.26	-	-	-	-
Vertical 4000 - 8000MHz										
5210.0625	78.31 PK	-53.06	27.3	52.55	54	-	-	-	-	-
Azimuth: 62 Height:188 Vert					Margin [dB]:	-1.45	-	-	-	-
6078.44	70.39 PK	-52.1	27.4	45.69	54	-	-	-	-	-
Azimuth: 155 Height:324 Vert					Margin [dB]:	-8.31	-	-	-	-
6946.75	76.15 PK	-52.67	27.8	51.28	54	-	-	-	-	-
Azimuth: 217 Height:278 Vert					Margin [dB]:	-2.72	-	-	-	-
7815.09	65.9 PK	-51.41	29.1	43.59	54	-	-	-	-	-
Azimuth: 149 Height:267 Vert					Margin [dB]:	-10.41	-	-	-	-

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

Figure 21 Radiated Emissions Graph – Transmitter 869.85MHz

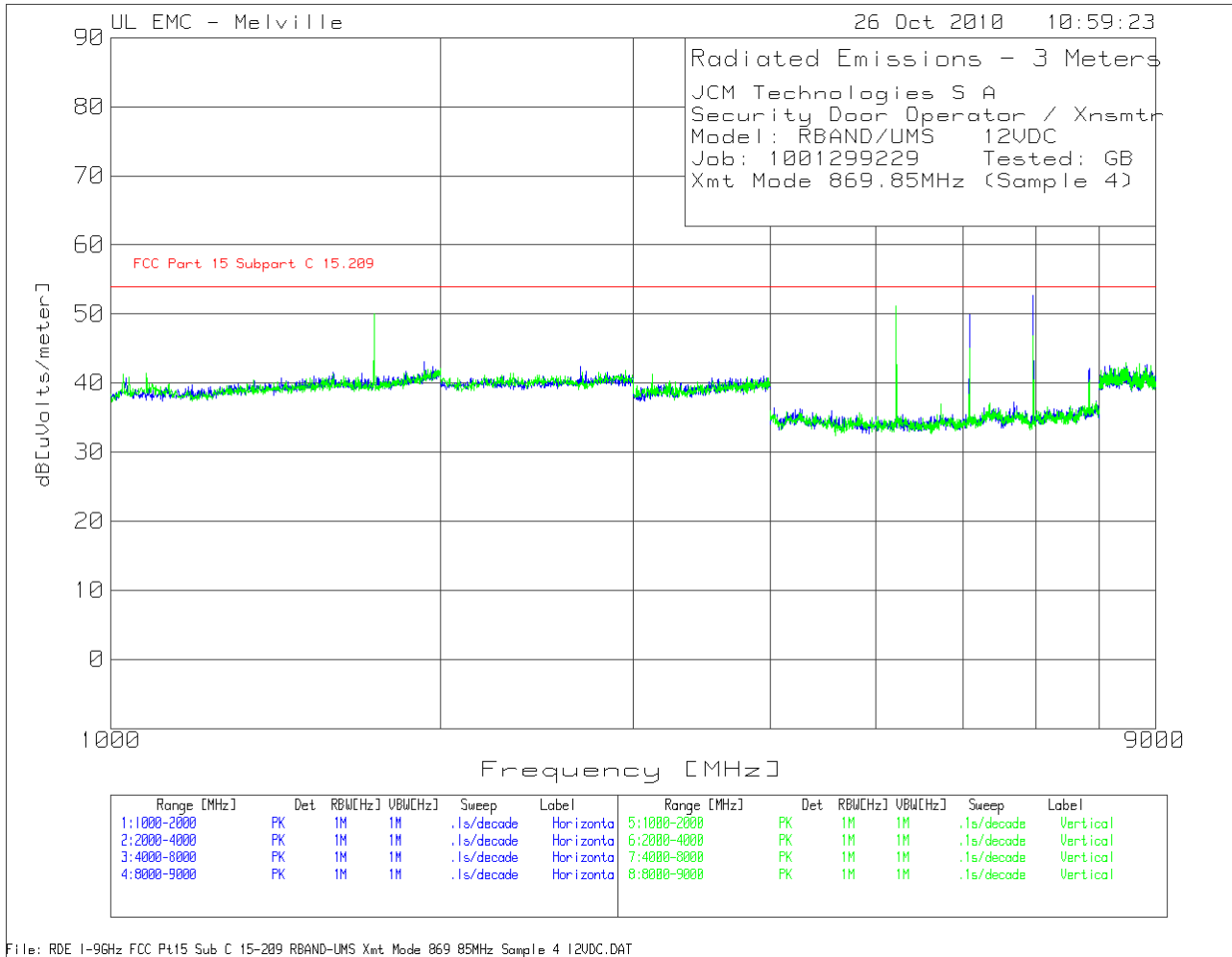


Table 26 Radiated Emissions Data Points – Transmitter 869.85MHz

JCM Technologies S A
 Security Door Operator / Xnsmtr
 Model: RBAND/UMS 12VDC
 Job: 1001299229 Tested: GB
 Xmt Mode 869.85MHz (Sample 4)

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										
1739.725	74.85 PK	-44.4	20.8	51.25	54	-	-	-	-	-
Azimuth: 360 Height:295 Horz					Margin [dB]:	-2.75	-	-	-	-
Horizontal 4000 - 8000MHz										
5218.75	73.01 PK	-53.17	27.3	47.14	54	-	-	-	-	-
Azimuth: 90 Height:286 Horz					Margin [dB]:	-6.86	-	-	-	-
6089.15	73.86 PK	-52.06	27.5	49.3	54	-	-	-	-	-
Azimuth: 68 Height:386 Horz					Margin [dB]:	-4.7	-	-	-	-
6959.0625	77.99 PK	-52.71	27.9	53.18	54	-	-	-	-	-
Azimuth: 12 Height:314 Horz					Margin [dB]:	-.82	-	-	-	-
7828.7	67.03 PK	-51.37	28.7	44.36	54	-	-	-	-	-
Azimuth: 6 Height:351 Horz					Margin [dB]:	-9.64	-	-	-	-
Vertical 1000 - 2000MHz										
1739.6725	75.99 PK	-44.4	20.8	52.39	54	-	-	-	-	-
Azimuth: 341 Height:204 Vert					Margin [dB]:	-1.61	-	-	-	-
Vertical 4000 - 8000MHz										
5219.125	78.46 PK	-53.17	27.3	52.59	54	-	-	-	-	-
Azimuth: 42 Height:182 Vert					Margin [dB]:	-1.41	-	-	-	-
6088.9625	69.85 PK	-52.07	27.4	45.18	54	-	-	-	-	-
Azimuth: 307 Height:245 Vert					Margin [dB]:	-8.82	-	-	-	-
6958.95	75.09 PK	-52.71	27.9	50.28	54	-	-	-	-	-
Azimuth: 239 Height:354 Vert					Margin [dB]:	-3.72	-	-	-	-
7828.3	64.61 PK	-51.38	29.1	42.33	54	-	-	-	-	-
Azimuth: 131 Height:386 Vert					Margin [dB]:	-11.67	-	-	-	-

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

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. 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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