



**Nemko Test Report:** 33837RUS1


**Applicant:** Axxess International, Inc  
16650 westgrove Drive  
Addison, TX 75075  
USA

**FCC ID.:** N6E-433NUDOT09

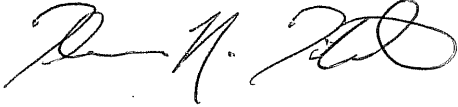
**Equipment Under Test:  
(E.U.T.)** DOT-433

**In Accordance With:** **FCC Part 15, Subpart C**  
For Low Power Transmitters Operating Periodically  
In The Band 40.66 - 40.77 MHz And Above 70 MHz

**Tested By:** Nemko USA, Inc.  
802 N. Kealy  
Lewisville, TX 75057-3136

**TESTED BY:**   
\_\_\_\_\_  
David Light, Senior Wireless Engineer

**DATE:** 23 November 2009

**APPROVED BY:**   
\_\_\_\_\_  
Tom Tidwell, Telecom Direct

**DATE:** 9 December 2009

**Total Number of Pages:** 17

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**Section 1. Summary of Test Results**

Manufacturer: Axxess International, Inc.

Model No.: DOT-433

Serial No.: None

General: **All measurements are traceable to national standards.**

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, Subpart C, Paragraph 15.231. All tests were conducted using measurement procedure ANSI C63.4-2003. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.

- |                                     |                            |                                     |                     |
|-------------------------------------|----------------------------|-------------------------------------|---------------------|
| <input checked="" type="checkbox"/> | New Submission             | <input type="checkbox"/>            | Production Unit     |
| <input type="checkbox"/>            | Class II Permissive Change | <input checked="" type="checkbox"/> | Pre-Production Unit |

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.

See " Summary of Test Data".



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This report applies only to the items tested.

**Summary of Test Data**

<b>Name of Test</b>	<b>Paragraph No.</b>	<b>Results</b>
Transmission Requirements	15.231(a)	Complies
Radiated Emissions	15.231(b)	Complies
Occupied Bandwidth	15.231(c)	Complies
Frequency Tolerance	15.231(d)	Complies
Alternate Field Strength Requirements	15.231(e)	Complies
Powerline Conducted Emissions	15.207	NA

**Footnotes:**

This device is battery powered.

## Section 2. Equipment Under Test (E.U.T.)

### General Equipment Information

Frequency Range:	433.92 MHz
Operating Frequency(ies) of Sample:	433.92 MHz
Type of Emission:	GFSK, OOK
Supply Power Requirement:	3 Vdc
Duty Cycle Correction Factor:	-15.1 dB

### Description of E.U.T.

The NuDOT is an RFID (Radio Frequency Identification) tag that is used for tracking items including but not limited to personnel, vehicles, assets and other products.

The RFID tag can be awakened by a transmitter operating at 126KHz or 433MHz or can wake up and beacon at 433MHz at a factory settable rate; but no less than 10 second intervals. Normal operation of the tag is to be awakened by a localized 126KHz OOK signal which provides an identifier to the tag. The tag then adds this information to its own ID along with any sensor data it might have collected prior to transmitting a 433MHz signal back to a local receiver.

The mode in which the NuDOT operates is set at the factory. Power is lowered in beacon mode to ensure compliance with the lower radiated emissions limits specified in the rules 15.231(e). The user cannot change the tag operating mode from that set at the factory.

### Section 3. Transmission Requirements

NAME OF TEST: Transmission Requirements	PARA. NO.: 15.231(a)
TESTED BY: David Light	DATE: 19 November 2009

**Minimum Standard:** 15.231(a) Continuous transmissions such as voice, video or data transmissions are not permitted.

15.231(a)(1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds after being released.

15.231(a)(2) A transmitter activated automatically shall cease transmission within 5 seconds of activation.

15.231(a)(3) Periodic transmissions at regular pre-determined intervals are not permitted. However polling or supervisory transmissions to determine system integrity of transmitters used in security or safety applications are allowed if the periodic rate of transmission does not exceed one transmission of not more than one second duration per hour for each transmitter.

15.231(a)(4) Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm.

**Test Results:** [Complies.](#)

**Test Data:** [Compliance was determined by verification of technical specifications and a functional test on the equipment.](#)

#### Rationale for Compliance with Transmission Requirements

15.231(a)(1)	<input checked="" type="checkbox"/> Manual activation	TX deactivation time: 200 msec.
15.231(a)(2) :	<input type="checkbox"/> Automatic activation	
15.231(a)(3) :	<input checked="" type="checkbox"/> Regular, predetermined transmissions	TX rate and duration: 35 msec. in 10.9 sec.
	<input type="checkbox"/> Polling or supervisory transmissions	
15.231(a)(4) :	<input type="checkbox"/> Alarm device operating during the pendency of alarm condition	
	<input checked="" type="checkbox"/> Non-alarm device	



**Section 4. Radiated Emissions**

NAME OF TEST: Radiated Emissions	PARA. NO.: 15.231(b)
TESTED BY: David Light	DATE: 19 November 2009

**Minimum Standard:**

**Permissible Field Strength Limits (Manually Operated Devices)**

Fundamental Frequency (MHz)	Field Strength of Fundamental Microvolts/Meter at 3 meters; (watts)	Field Strength of Unwanted Emissions Microvolts/Meter at 3 meters; (watts)
40.66 - 40.70	2,250	225
70-130	1, 250	125
130-174	1,250 to 3,750*	125 to 375
174-260 (note 1)	3,750	375
260-470 (note 1)	3,750 to 12,500*	375 to 1,250
Above 470	12,500	1,250

**Permissible Field Strength Limits (Operation at Periodic Rate)**

Fundamental Frequency (MHz)	Field Strength of Fundamental Microvolts/Meter at 3 meters; (watts)	Field Strength of Unwanted Emissions Microvolts/Meter at 3 meters; (watts)
40.66 - 40.70	1000	100
70-130	500	50
130-174	500 to 1500	50 to 150
174-260 (note 1)	1500	150
260-470 (note 1)	1500 to 5000	150 to 500
Above 470	5000	500

**Notes:**

# Use quasi-peak or averaging meter.	For 130 - 174 MHz: FS (microvolts/m) = (56.82 x F) - 6136
* Linear interpolation with frequency F in MHz	For 260 - 470 MHz: FS (microvolts/m) = (41.67 x F) - 7083

Any emissions that fall within the restricted bands of 15.205 shall not exceed the following limits:

Frequency (MHz)	Field Strength (µV/m @ 3m)	Field Strength (dB @ 3m)
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

**Test Results:**

Complies. The worst-case emission level is 77.2 dBµV/m @ 3m at 433.92 MHz. This is 3.6 dB below the specification limit.



**Test Data - Radiated Emissions**

Manual mode

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

Freq MHz	Rdng dBµV	Cable Duty dB	Cable Pre-A dB	BiLog Horn dB	Pre-a dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
433.92	74.0	+0.5	+1.0	+16.8	+0.0	+0.0	77.2	80.8	-3.6	Vert
Ave		-15.1	+0.0	+0.0						
433.92	74.0	+0.5	+1.0	+16.8	+0.0	+0.0	92.3	100.8	-8.5	Vert
Peak		+0.0	+0.0	+0.0						
433.92	62.8	+0.5	+1.0	+16.8	+0.0	+0.0	66.0	80.8	-14.8	Horiz
Ave		-15.1	+0.0	+0.0						
433.92	62.8	+0.5	+1.0	+16.8	+0.0	+0.0	81.1	100.8	-19.7	Horiz
Peak		+0.0	+0.0	+0.0						
867.84	53.5	+0.4	+1.4	+23.1	-24.5	+0.0	53.9	60.8	-6.9	Vert
Peak		+0.0	+0.0	+0.0						
867.84	40.8	+0.4	+1.4	+23.1	-24.5	+0.0	41.2	60.8	-19.6	Horiz
Peak		+0.0	+0.0	+0.0						

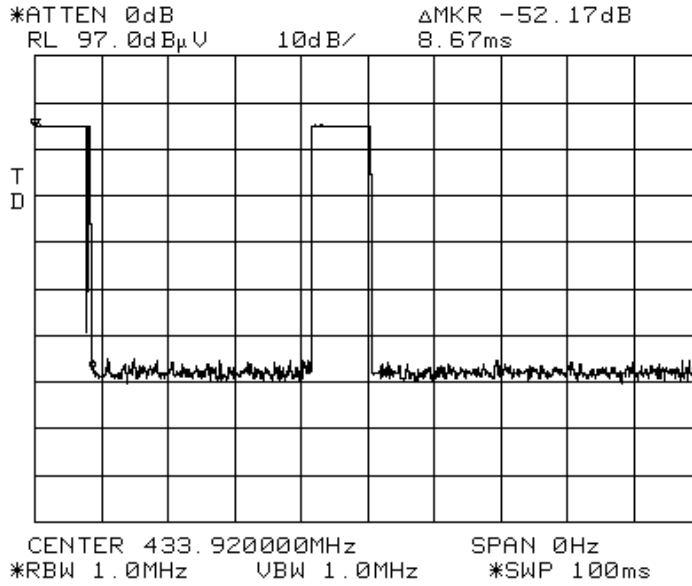
Beacon Mode

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

Freq MHz	Rdng dBµV	Cable dB	Cable dB	BiLog Duty dB	Pre-a dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
433.92	87.3	+0.5	+1.0	+16.8	-24.2	+0.0	81.4	92.9	-11.5	Vert
Peak				+0.0						
433.92	87.3	+0.5	+1.0	+16.8	-24.2	+0.0	66.3	72.9	-6.6	Vert
Average				-15.1						
433.92	76.5	+0.5	+1.0	+16.8	-24.2	+0.0	70.6	92.9	-22.3	Horiz
Peak				+0.0						
433.92	76.5	+0.5	+1.0	+16.8	-24.2	+0.0	55.5	72.9	-17.4	Horiz
Average				-15.1						

The spectrum was searched from 30 MHz to 5 GHz.  
 All emissions within 20 dB of the specification limit are reported.

Worst case duty cycle



$20 \log (17.5/100) = -15.1 \text{ dB}$

The duty cycle is consistent for both modes

**Section 5. Occupied Bandwidth**

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 15.231(c)
TESTED BY: David Light	DATE: 19 November 2009

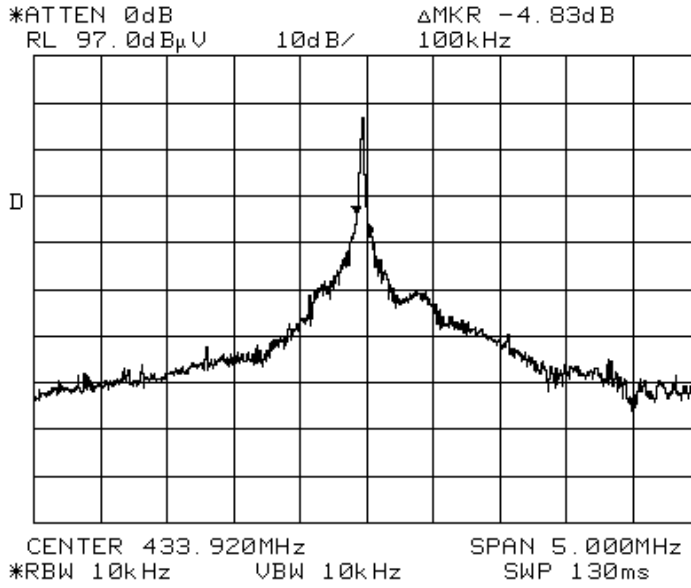
**Minimum Standard:** 15.231(c) The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

**Test Results:** [Complies. See attached graph.](#)

**Test Data:** See attached graph.

Test Data – Occupied Bandwidth

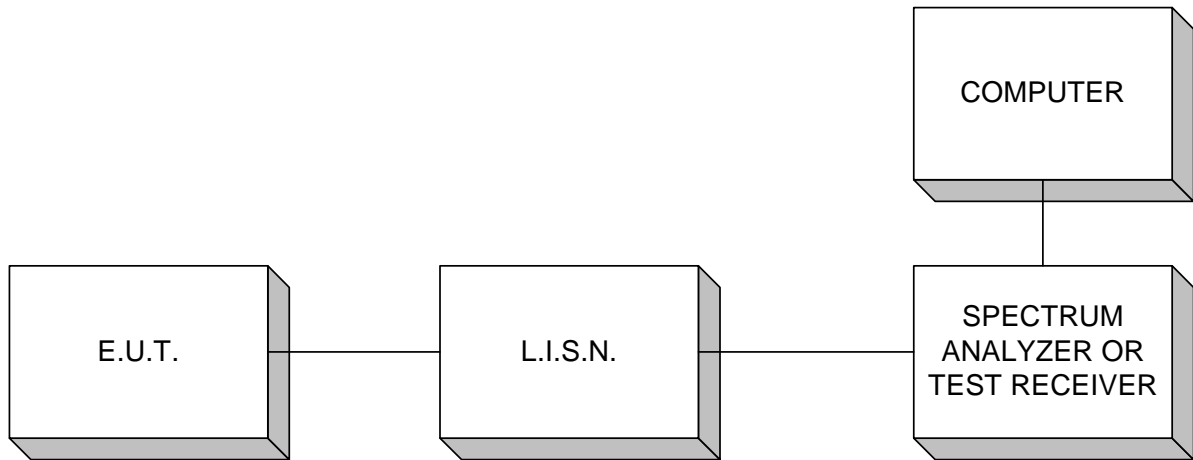
20 dB Bandwidth



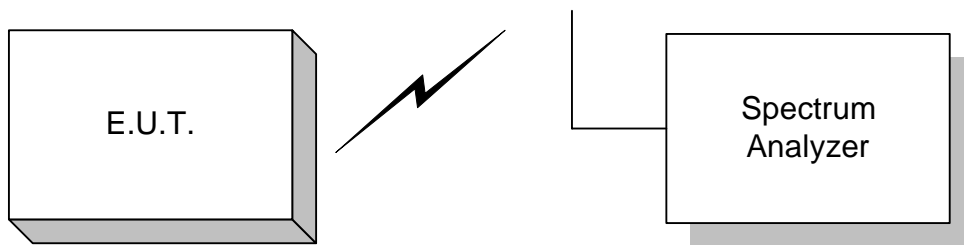
Limit = 0.25% of 433.92 = 1.1 MHz

## Section 6. Block Diagrams

### Conducted Emissions



### Occupied Bandwidth, Duty Cycle

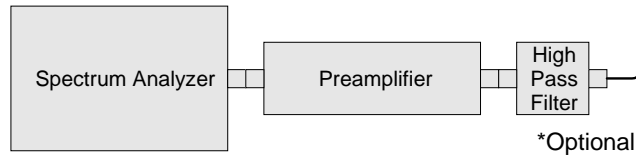
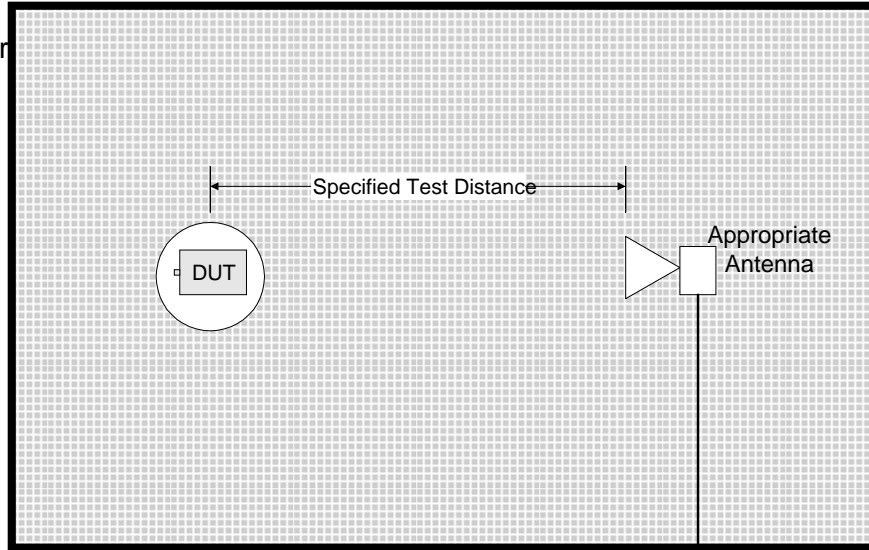


Test Site For Radiated Emissions

Radiated Emissions 30 MHz - 1 GHz

The spectr

ency of operation.



**Section 7. Test Equipment List**

Nemko ID	Description	Manufacturer Model Number	Serial Number	Calibration Date	Calibration Due
1480	Bilog Antenna	Schaffner-Chase CBL6111C	2572	10/17/09	10/17/10
1484	Cable	Storm PR90-010-072	N/A	06/23/09	06/23/10
1485	Cable	Storm PR90-010-216	N/A	06/23/09	06/23/10
1016	Pre-Amp	HEWLETT PACKARD 8449A	2749A00159	06/23/09	06/23/10
791	PREAMP, 25dB	Nemko USA, Inc. LNA25	398	05/28/09	05/28/10
993	Hom antenna	A.H. Systems SAS-200/571	XXX	08/31/09	08/31/11

**Nemko USA, Inc.**

FCC PART 15, SUBPART C

PERIODICALLY OPERATED LOW POWER TRANSMITTERS

EQUIPMENT: **DOT-433**

TEST REPORT NO.: **33837RUS1**

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## **ANNEX A - RESTRICTED BANDS**



**Annex A                      Restricted Bands of Operation**

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

<b>MHz</b>	<b>MHz</b>	<b>MHz</b>	<b>GHz</b>
0.090 - 0.110	16.42-16.423	399.9-410	4.5-5.15
0.49 - 0.51	16.69475-16.69525	608-614	5.35-5.46
2.1735 - 2.1905	16.80425-16.80475	960-1240	7.25-7.75
3.020 - 3.026	25.5-25.67	1300-1427	8.025-8.5
4.125 - 4.128	37.5-38.25	1435-1626.6	9.0-9.2
4.17725 - 4.17775	73-74.6	1645.5-1646.5	9.3-9.5
4.20725 - 4.20775	74.8-75.2	1660-1710	10.6-12.7
6.215 - 6.218	108-121.94	1718.8-1722.2	13.25-13.4
6.31175 - 6.31225	123-138	2220-2300	14.47-14.5
8.291 - 8.294	149.9-150.05	2310-2390	15.35-16.2
8.362 - 8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625 - 8.38675	156.7-156.9	2655-2900	22.01-23.12
8.41425 - 8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29 - 12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975 - 12.52025	240-285	3345.8-3358	36.43-36.5
12.57675 - 12.57725	322-335.4	3600-4400	Above 38.6
13.36 - 13.41			