



FCC TEST REPORT

47 CFR FCC Part 15 Subpart C & 15.231

FCC ID	L5C0790-4TX
Report Reference No.	WE11050004
Compiled by (position+printed name+signature)..:	File administrators Wenliang Li 
Supervised by (position+printed name+signature)..:	Test Engineer Tim Zhang 
Approved by (position+printed name+signature)..:	Manager Jeffrey Lu 
Date of issue.....	May 27, 2011
Testing Laboratory Name	Shenzhen Huatongwei International Inspection Co., Ltd
Address	Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China
Applicant's name	Ansen Electronics Company
Address	ROOM 73-78,2/F., SINO INDUSTRIAL PLAZA, 9 KAL CHEUNG ROAD, KOWLOON BAY, KOWLOON, HONG KONG
Manufacturer's name	Ansen Electronics Company
Address	Chen Tung Industrial Zone, Ning Tau Administrative District, Qiao Tau Zhen, Dongguan, Guangdong
Test specification:	
Standard	47 CFR FCC Part 15 Subpart C & 15.231 ANSI C63.10: 2009
TRF Originator	Shenzhen Huatongwei International Inspection CO., Ltd
Master TRF	Dated 2006-06
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Equipment Under Test	Driveway Patrol(TX)
Trade Mark	/
Model/Type reference.....	0790-4
Listed Models	/
Result.....	Complied

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1. TEST STANDARDS

The tests were performed according to following standards:

[47 CFR FCC Part 15 Subpart C & 15.231](#) – Intentional Radiators & Periodic operation in the band 40.66–40.70 MHz and above 70 MHz

[ANSI C63.10: 2009](#) – American National Standard for Testing Unlicensed Wireless Devices

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample : May 08, 2011

Testing commenced on : May 08, 2011

Testing concluded on : May 27, 2011

2.2. Equipment under test power supply

Power supply voltage : 120V / 60 Hz 115V / 60Hz
 12 V DC 24 V DC
 Other (specified in blank below)

DC 9V from battery

2.3. Short description of the Equipment under Test (EUT)

Product Name : Driveway Patrol(TX)

Model Number : 0790-4

Operation Frequency : 433.92MHz

Modulation Technology : ASK

Transmitter Type : Periodic Transmitter

Sample Type : Prototype

I/O Port : /

For more details, refer to the user's manual of the EUT.

2.4. EUT operation mode

The EUT has been tested under typical operating condition.

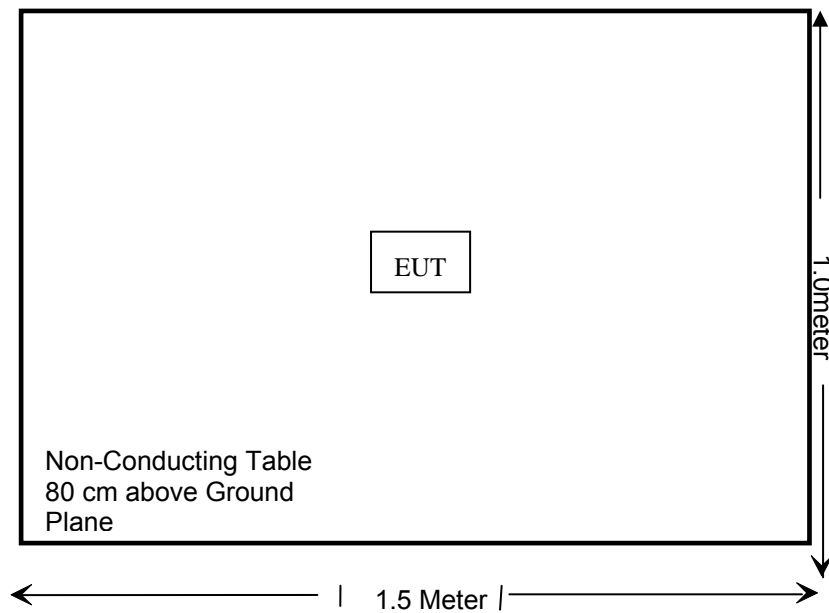
2.5. Related submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **L5C0790-4TX** filing to comply with the FCC Part 15, Subpart C Rules.

2.6. Modifications

No modifications were implemented to meet testing criteria.

2.7. Block Diagram of Test Setup



Note: For actual sample please see test setup photos and EUT external photos.

2.8. Summary of standards and result

FCC Rules	Description of Test	Result
§15.207 (a)	Conducted Emissions	N/A
§15.205, §15.209, 15.35 (c), §15.231 (b)	Radiated Emissions	Compliant
§15.231(a)	Deactivation Testing	Compliant
§15.231(c)	20 dB Band Width Testing	Compliant
§15.203	Antenna Requirement	Compliant

NOTE: 1) The detailed test result please see section 4.
 2) The test report merely corresponds to the test sample.
 3) It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen Huatongwei International Inspection Co., Ltd
Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China
Phone: 86-755-26715686 Fax: 86-755-26748089

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2009) and CISPR Publication 22.

3.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L1225

Shenzhen Huatongwei International Inspection Co., Ltd has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories, Date of Registration: August 02, 2007. Valid time is until March 29, 2012.

A2LA-Lab Cert. No. 2243.01

Shenzhen Huatongwei International Inspection Co., Ltd, EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing. Valid time to Sep 30, 2011.

FCC-Registration No.: 662850

Shenzhen Huatongwei International Inspection Co., Ltd, EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 662850, Renewal date July 01, 2009.

IC-Registration No.: 5377

The 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377 on Jan 24th, 2014.

ACA

Shenzhen Huatongwei International Inspection Co., Ltd, EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

NEMKO-Aut. No.: ELA125

Shenzhen Huatongwei International Inspection Co., Ltd has been assessed the quality assurance system, the testing facilities, qualifications and testing practices of the relevant parts of the organization. The quality assurance system of the Laboratory has been validated against ISO/IEC 17025:2005 or equivalent. The laboratory also fulfils the conditions described in Nemko Document NLA-10, the Authorization is valid through July 07, 2011.

VCCI

The 3m Semi-anechoic chamber (12.2m×7.95m×6.7m) and Shielded Room (8m×4m×3m) of Shenzhen Huatongwei International Inspection Co., Ltd has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2484. Date of Registration: December 20, 2009. Valid time is until December 19, 2012.

Main Ports Conducted Interference Measurement of Shenzhen Huatongwei International Inspection Co., Ltd has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: C-2726. Date of Registration: December 20, 2009. Valid time is until December 19, 2012.

DNV

Shenzhen Huatongwei International Inspection Co Ltd has been found to comply with the requirements of DNV towards subcontractor of EMC and safety testing services in conjunction with the EMC and Low voltage Directives and in the voluntary field. The acceptance is based on a formal quality Audit and follow-ups according to relevant parts of ISO/IEC Guide 17025(2005), in accordance with the requirements of the DNV Laboratory Quality Manual towards subcontractors. Valid time is until 24 Aug, 2013.

3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	<u>22 ° C</u>
Humidity:	<u>65 %</u>
Atmospheric pressure:	<u>950-1050mbar</u>

3.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Huatongwei laboratory is reported:

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	0.15~30MHz	3.85dB	(1)
Radiated Emission	30~1000MHz	4.22dB	(1)
Radiated Emission	1~12.75GHz	4.35dB	(1)
20dB Bandwidth	/	0.25dB	(1)
Deactivation Time	/	0.5ms	(1)

- (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3.5. Equipments Used during the Test

Conducted Emissions					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	100106	2010/10/24
2	Artificial Mains	ROHDE & SCHWARZ	ESH2-Z5	100028	2010/10/24
3	Pulse Limiter	ROHDE & SCHWARZ	ESHSZ2	100044	2010/10/24
4	EMI Test Software	ROHDE & SCHWARZ	ESK1	N/A	2010/10/24

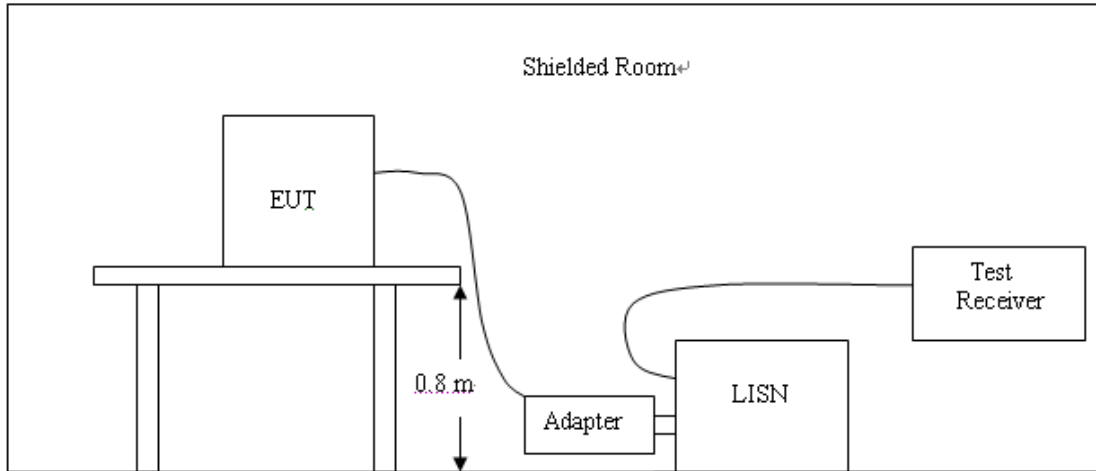
Radiated Emissions					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ULTRA-BROADBAND ANTENNA	ROHDE & SCHWARZ	HL562	100015	2010/10/24
2	Amplifier	Sonoma	310 N	291722	2010/10/24
3	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESI 26	100009	2010/10/24
4	RF TEST PANEL	ROHDE & SCHWARZ	TS / RSP	335015/ 0017	2010/10/24
5	TURNTABLE	ETS	2088	2149	2010/10/24
6	ANTENNA MAST	ETS	2075	2346	2010/10/24
7	EMI TEST SOFTWARE	ROHDE & SCHWARZ	ESK1	N/A	2010/10/24
8	Double-Ridged-Waveguide Horn Antenna	ROHDE & SCHWARZ	HF906	100039	2010/10/24
9	Amplifier	ROHDE & SCHWARZ	HF906 (1-18)GMZ	00101800-28-5A	2010/10/24
10	Loop Antenna	ROHDE & SCHWARZ	HFH2-Z2	100020	2010/10/24

20dB Bandwidth & Deactivation Time & Duty Cycle					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	100106	2010/10/24

4. TEST CONDITIONS AND RESULTS

4.1. AC Conducted Emission

TEST CONFIGURATION



TEST PROCEDURE

- 1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
- 2 Support equipment, if needed, was placed as per ANSI C63.10.
- 3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
- 4 The EUT received DC 5V from PC input 120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5 All support equipments received AC power from a second LISN, if any.
- 6 The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
- 8 During the above scans, the emissions were maximized by cable manipulation.

CONDUCTED LIMIT

According to FCC Subpart 15 B § 15.207 AC Conducted Emission Limits is as following :

Frequency fange (MHz)	Conducted limit (dBµV)	
	Quasi-peak	Average
0.1~ 0.5	66 to 56*	56 to 46*
0.5 ~ 5	56	46
5 ~ 30	60	50
* Decreasing linearly with the logarithm of the frequency		

TEST RESULTS

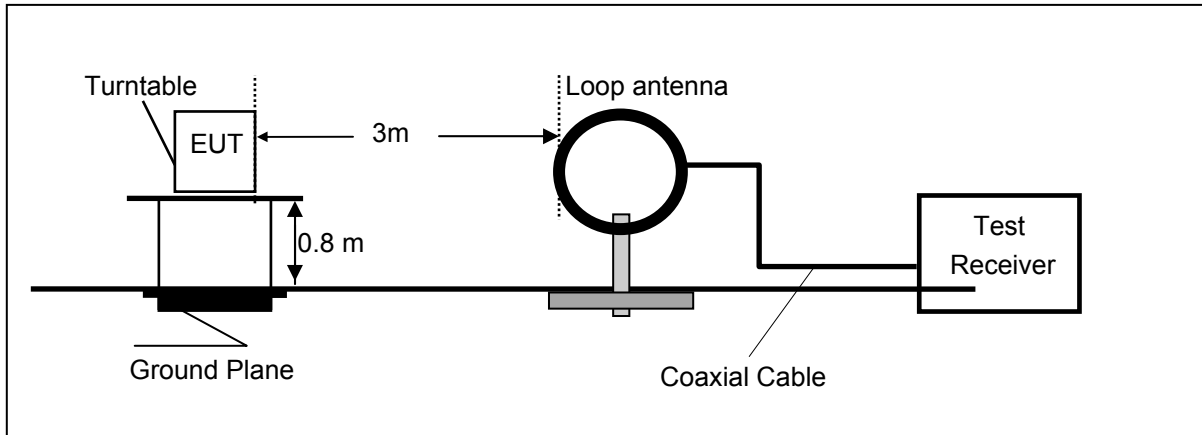
Not applicable to this device (because the equipment without any AC port)

4.2. Radiated Emission

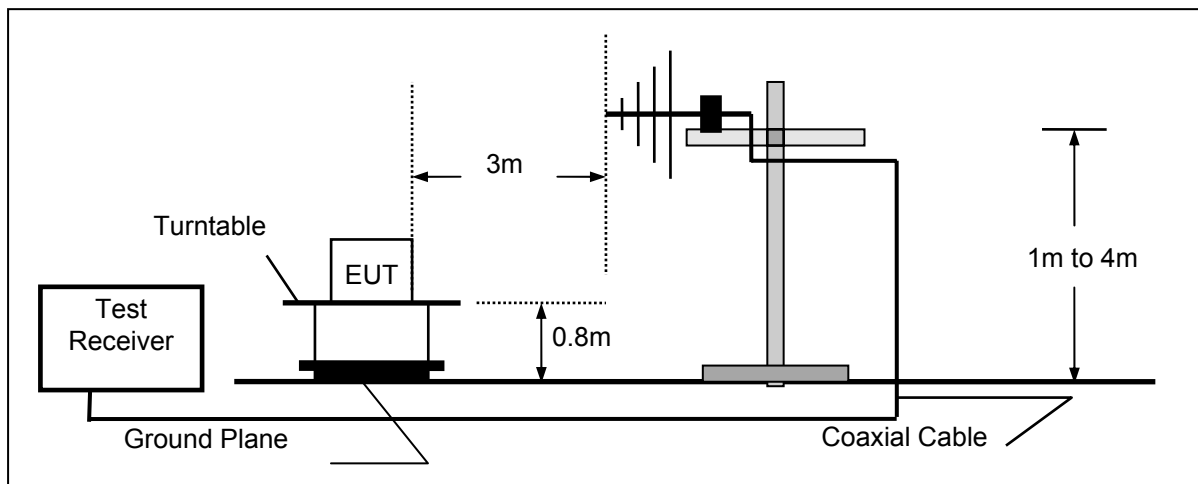
TEST CONFIGURATION

Radiated Emission Test Set-Up

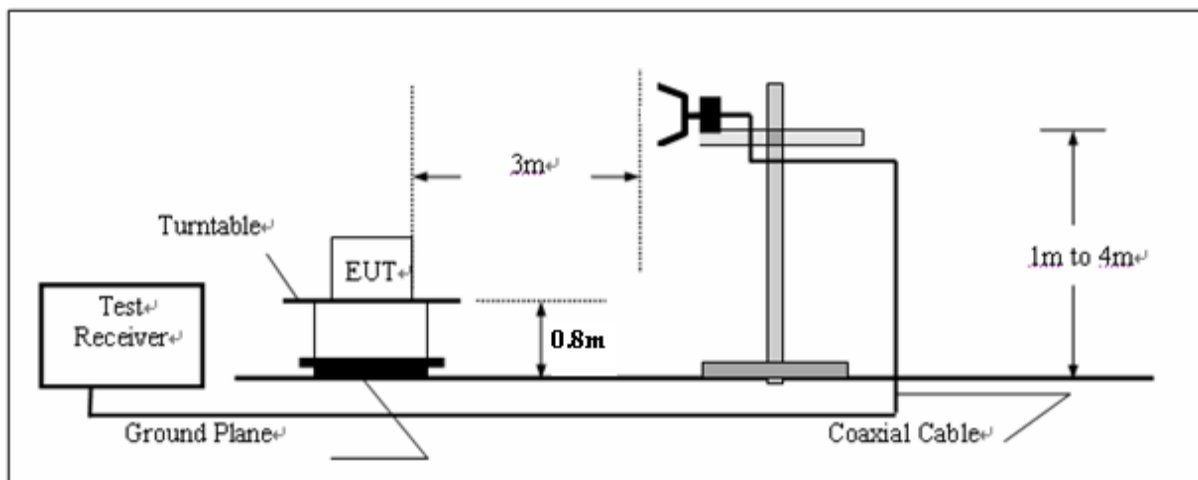
Frequency range 9KHz – 30MHz



Frequency range 30MHz – 1000MHz



Frequency range 1GHz – 5GHz



TEST PROCEDURE

- 1, The EUT was placed on a turn table which is 0.8m above ground plane, Put the battery into the EUT and the EUT will transmit automatic at 433.92MHz.
- 2, Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0 ° to 360 ° to acquire the highest emissions from EUT., each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 3, Repeat above procedures until all frequency measurements have been completed.

EMI Test Receiver Setup

The system was investigated from 9 KHz to 5 GHz.

During the radiated emission test, the test receiver was set with the following configurations:

Frequency Range	RBW	VBW	Dectector
9kHz– 150kHz	200 Hz	1 kHz	QP
150kHz– 30 MHz	9 KHz	30 KHz	QP
30MHz – 1000 MHz	100 kHz	300 kHz	QP
1000 MHz – 5 GHz	1 MHz	3 MHz	PK
1000 MHz – 5 GHz	1 MHz	10 Hz	AV

Note: The measurement employ AV detector for the frequency bands 9KHz-90KHz and 110KHz-490KHz .

RADIATION LIMIT

According to §15.231 (b), the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Fundamental frequency (MHz)	Field Strength of Fundamental (Microvolts /meter)	Field Strength of spurious emissions ((Microvolts /meter)
40.66-40.70	2,250	225
70-130	1,250	125
130-174	1,250 to 3,370 *	125 to 375 *
174-260	3,750	375
260-470	3,750 to 12, 500*	375 to 1,250*
Above 470	12,500	1,250

*Linear interpolations.

Note: The above field strength limits are specified at a distance of 3-meters the tighter limits apply at the band edges.

FCC Part 15B § 15.209, all spurious emissions shall comply with the limits of table as follow:

Frequency (MHz)	Distance (Meters)	Field strength(microvolts/meter)
0.009-0.490	300	2400/F(KHz)
0.490-1.705	30	24000/F(KHz)
1.705-30.0	30	30
30-88	3	100
88-216	3	150
216-960	3	200
Above 960	3	500

Note: 1.The spurious emissions shall be attenuated to the average limits shown in above table or to the general limits shown in section 15.209, which limit permits a higher field strength.

TEST RESULTS

Radiated emission of fundamental emission

Frequency (MHz)	Corrected Reading (dB μ V/m)@3m	FCC Limit (dB μ V/m) @3m	Margin (dB)	Detector	Polarization
433.92	69.52	100.83	31.31	PK	Horizontal
433.92	57.99	80.83	22.84	AV	Horizontal
433.92	80.68	100.83	20.15	PK	Vertical
433.92	69.15	80.83	11.68	AV	Vertical

Spurious radiated emission

Frequency (MHz)	Corrected Reading (dB μ V/m)@3m	FCC Limit (dB μ V/m)@3m	Margin (dB)	Detector	Polarization
0.16	54.94	83.52	28.58	PK	/
0.16	43.41	63.52	20.11	AV	/
10.74	35.13	49.54	14.41	QP	/
231.80	31.30	46.00	14.7	QP	Horizontal
375.30	29.90	46.00	16.1	QP	Horizontal
867.84	59.2	80.8	21.6	PK	Horizontal
867.84	47.67	60.8	13.13	AV	Horizontal
1301.71	55.90	74.00	18.1	PK	Horizontal
1301.71	44.37	54.00	9.63	AV	Horizontal
3037.39	63.60	80.80	17.2	PK	Horizontal
3037.39	52.07	60.80	8.73	AV	Horizontal
47.49	26.90	40.00	13.1	QP	Vertical
375.30	31.70	46.00	14.3	QP	Vertical
867.84	59.90	80.8	20.9	PK	Vertical
867.84	48.37	60.8	12.43	AV	Vertical
1301.71	55.30	74.00	18.7	PK	Vertical
1301.71	43.77	54.00	10.23	AV	Vertical
3037.39	61.20	80.8	19.6	PK	Vertical
3037.39	49.67	60.8	11.13	AV	Vertical

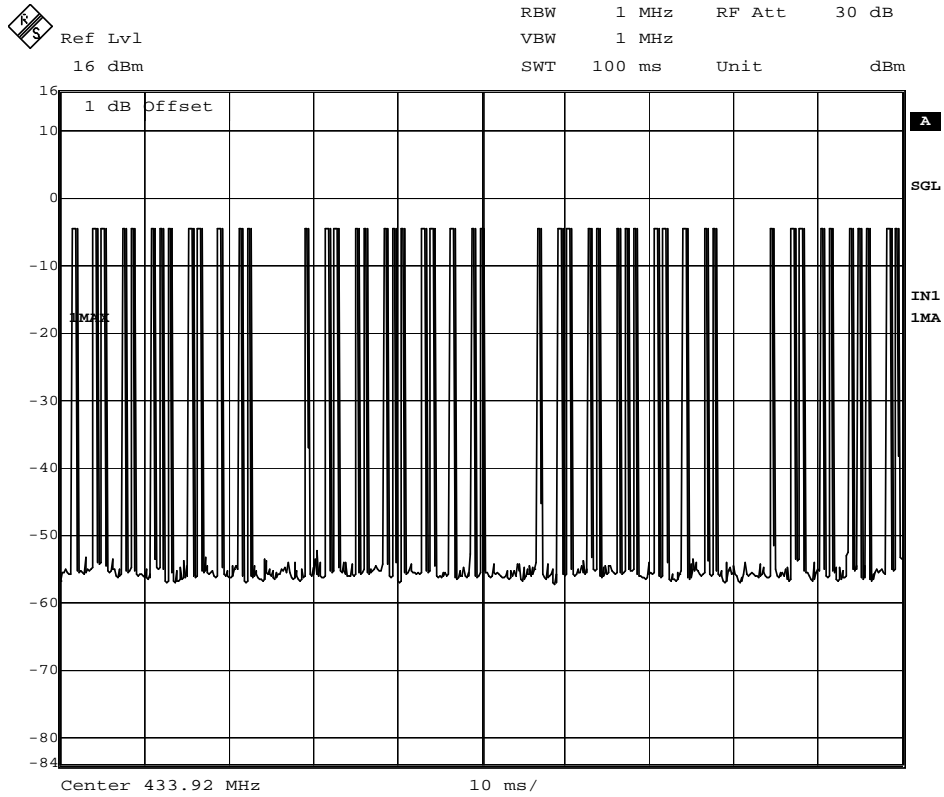
Note1: According to section 15.35(b), when average radiated emission measurements are specified, including emission measurement below 1000MHz, there also is limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated.

Note 2: Average Result =Peak Field Strength+Duty Cycle Correction Factor.

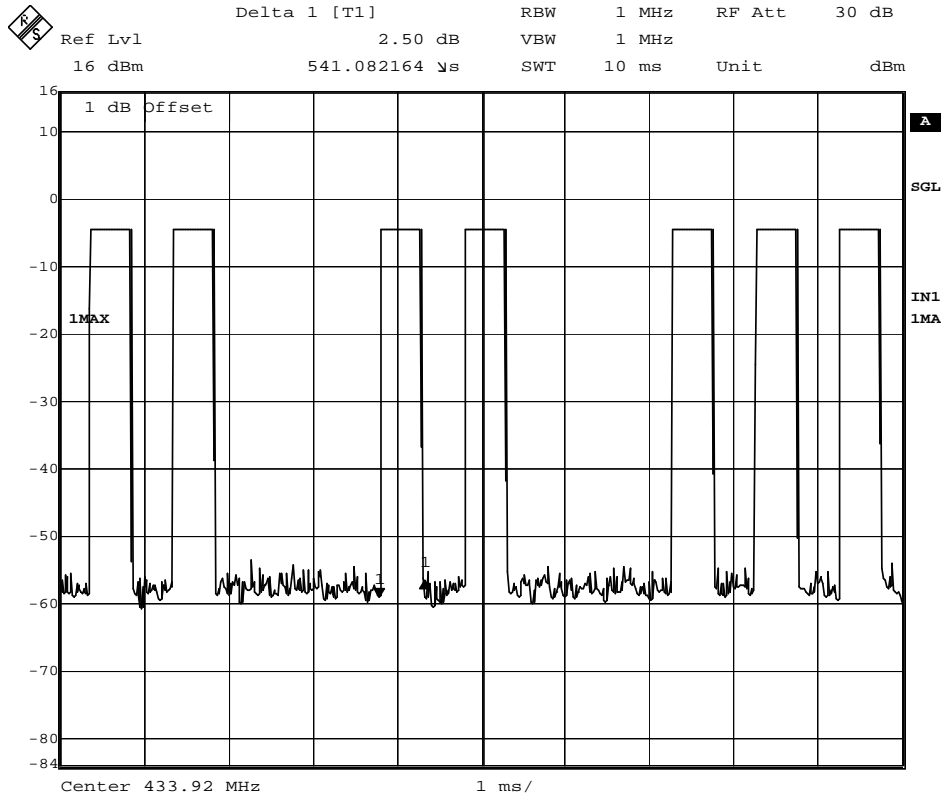
Note3: Duty Cycle Correction Factor value refers to below.

Duty Cycle Correction Factor

Total pulse on time:0.541 millisecond
Duty Cycle = TX on/100ms X 100% = 0.541*49 ms/100ms X 100% =26.51%
Duty Cycle Correction Factor = 20log (Duty Cycle) = -11.53



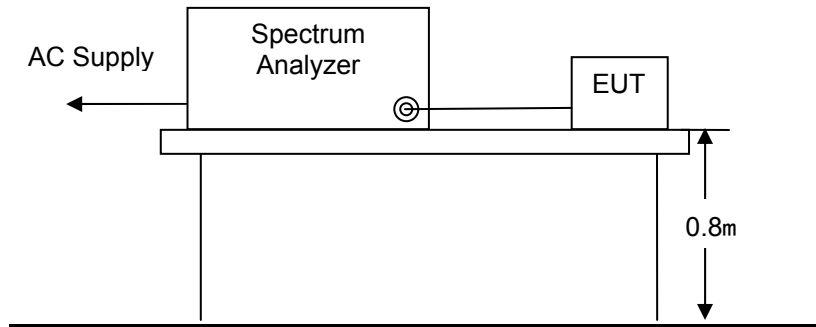
Date: 24.MAY.2011 20:39:32



Date: 24.MAY.2011 20:41:26

4.3. Deactivation Time

TEST CONFIGURATION



TEST PROCEDURE

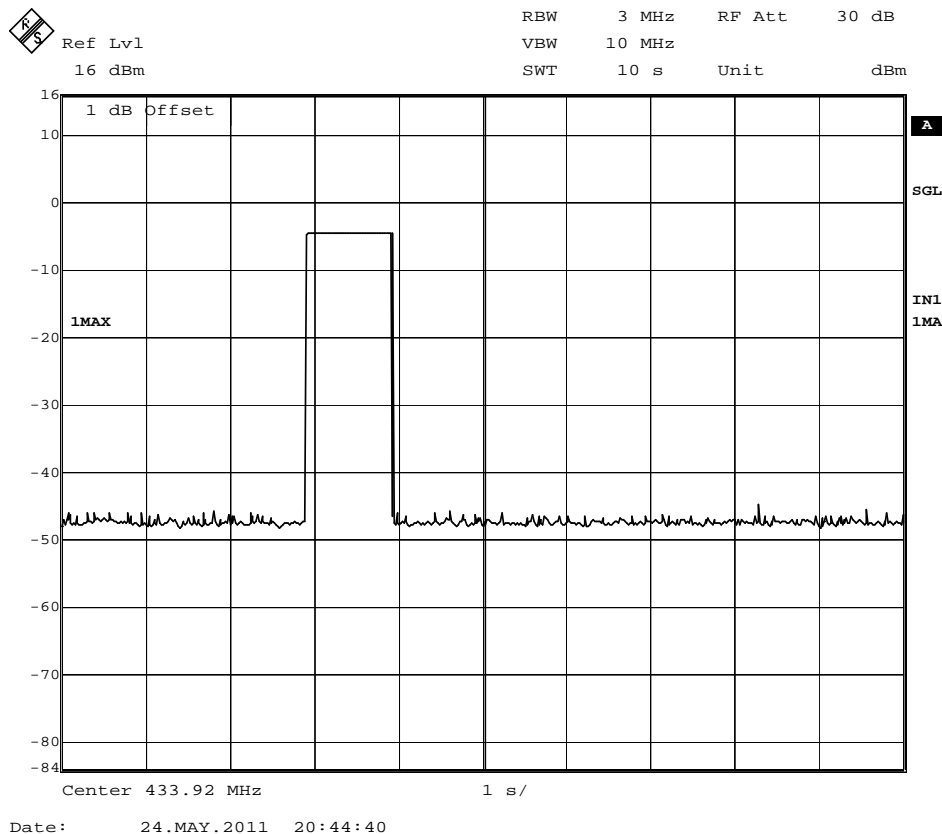
- 1 The EUT was placed on a wooded table which is 0.8m height and close to receiver antenna of spectrum analyzer.
- 2 The spectrum analyzer resolution bandwidth was set to 3 MHz and video bandwidth was set to 10 MHz to encompass all significant spectral components during the test. The spectrum analyzer was operated in linear scale and zero span mode after tuning to the transmitter carrier frequency.

Limit

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

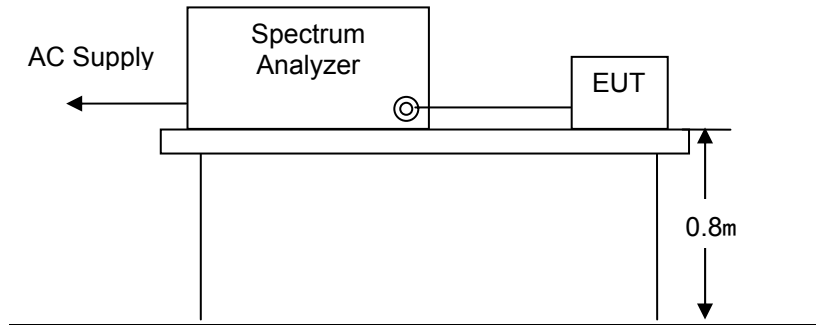
TEST RESULTS

EUT statement: The transmitter was automatically activated, and the carrier frequency 433.92MHz:



4.4. 20dB Bandwidth

TEST CONFIGURATION



TEST PROCEDURE

- 1 The EUT was placed on a wooded table which is 0.8m height and close to receiver antenna of spectrum analyzer.
- 2 The spectrum analyzer resolution bandwidth was set to 10 kHz and video bandwidth was set to 30 kHz to encompass all significant spectral components during the test. The detector was set to peak and hold mode to clearly observe the components.

Limit

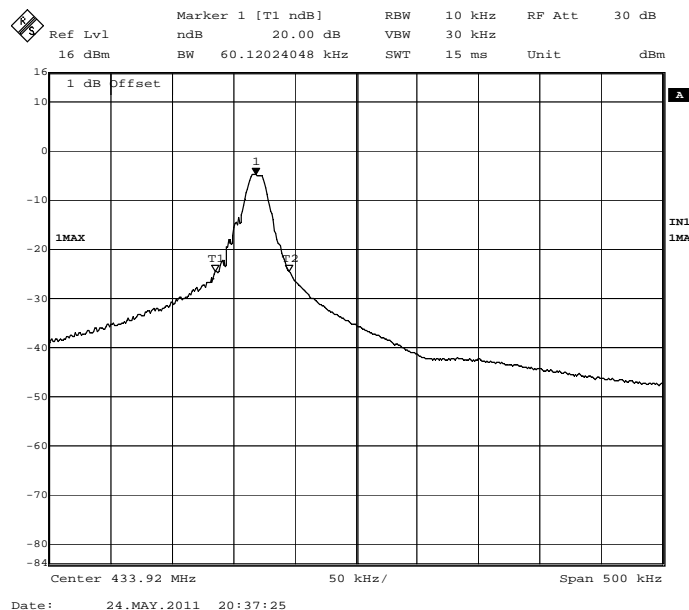
According to FCC Part 15C § 15.231(c)

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz.

TEST RESULTS

Frequency (MHz)	20dB Bandwidth Measurement Bandwidth (KHz)	Limit (kHz)	Result
433.92	60.12	1084.80	Pass

20dB Bandwidth



4.5. Antenna Requirement

According to FCC Part 15C § 15.203,

- a), An intentional radiator shall be de-signed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.
- b), The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

The EUT use of a Integral antenna. Please refer to the EUT Internal photos.

The EUT complied the antenna requirement.



5. Test Setup Photos of the EUT

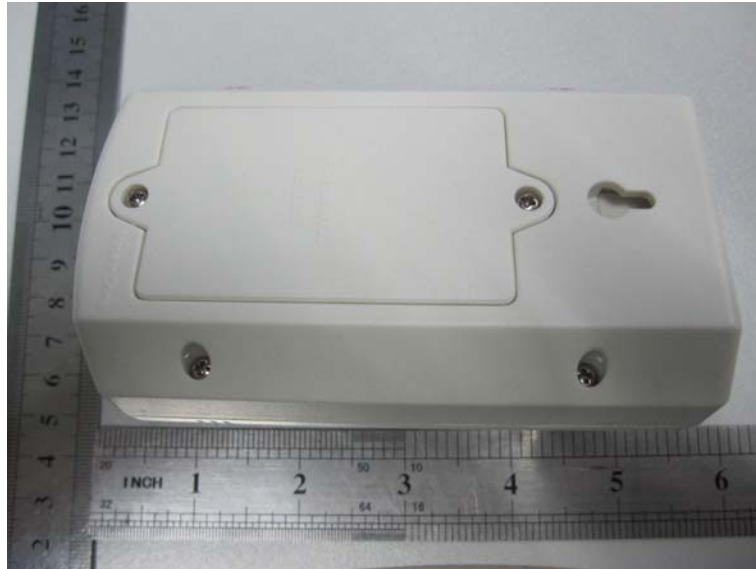
Radiated emission test photo





6. External and Internal Photos of the EUT

External Photos&antenna photo



antenna

Internal Photos



