



FCC TEST REPORT

Part 15 Subpart C

FCC ID: **TWNZF02-U**

Report Reference No.: **WE10020002**

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Date of issue.....: Feb 10, 2010

Testing Laboratory Name: **Shenzhen Huatongwei International Inspection Co., Ltd**

Address: Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China

Applicant's name: **Pro-Lite, Inc.**

Address: 3505 Cadillac Ave. Building D

Manufacturer's name: **NINGBO YOUWON TECHNOLOGY ELECTRONICS CO., LTD**

Address: #928, XUEYUAN ROAD, LUGANG VILLAGE, GAOQIAO TOWN, NINGBO

Test specification:

Standard: **FCC Part Subpart 15C 2008 – Intentional Radiators**

ANSI C63.4 - 2003

TRF Originator: Shenzhen Huatongwei International Inspection CO., Ltd

Master TRF: Dated 2006-06

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Equipment Under Test: **Wireless Module**

Trade Mark: /

Model/Type reference: ZF02-U

Listed Models: /

Result: **Complied**

TEST REPORT

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SUMMARY OF STANDARDS AND RUSELT

No.	Test Item	Test Standards and Procedure	Result
1	AC Conducted Emission	FCC Subpart 15C § 15.207	Complied
2	Radiated Emission	FCC Subpart 15C § 15.209 FCC Subpart 15C § 15.231(e) ANSI C63.4-2003 section 13.1.4	Complied
3	Deactivation Time	FCC Subpart 15C § 15.231(e)	Complied
4	20dB Bandwidth	FCC Subpart 15C § 15.231(c) ANSI C63.4-2003 section 13.1.7	Complied
5	Antenna Requirement	FCC Subpart 15C § 15.203	Complied

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.

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1. TEST STANDARDS

The tests were performed according to following standards:

FCC Rules Part 15 Subpart C (2008) – Intentional Radiators

ANSI C63.4 (2003) – American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40GHz

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample : Feb 02, 2010

Testing commenced on : Feb 02, 2010

Testing concluded on : Feb 10, 2010

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 5V from PC (USB port)

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

Product Name : Wireless Module

Model Number : ZF02-U

Operation Frequency : 433.05 MHz

Modulation Technology : GFSK

Transmitter Type : Periodic Transmitter

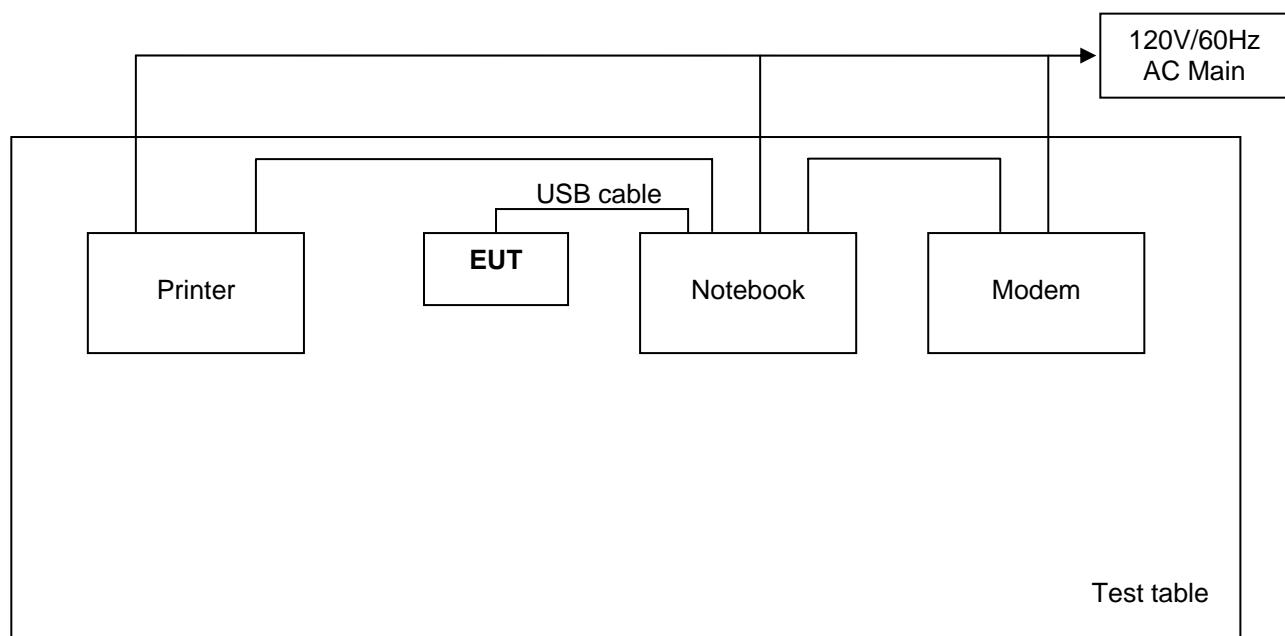
Sample Type : Prototype

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

2.4. EUT operation mode

The EUT has been tested under typical operating mode (TX mode).

2.5. Configuration of Tested System



Equipment Used in Tested System

No.	Equipment	Manufacturer	Model No.	Serial No.
1	Notebook	AUSU	I9100L	59NP009727
2	Printer	HP	Laserjet 1000 series	/
3	Modem	D-Link	DSL-300	/

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

2.6. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **TWNZF02-U** filing to comply with the FCC Part 15 Subpart C 15.231(e) Rules 2008.

2.7. Modifications

No modifications were implemented to meet testing criteria.

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 (2003) 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 is from Aug 24, 2005 to Sept 30, 2009.

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 September, 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 November 28th, 2005.

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 fulfills the conditions described in Nemko Document NLA-10, the Authorization is valid through April 25, 2009.

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 09 July, 2010.

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	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	2009/11
2	Artificial Mains	ROHDE & SCHWARZ	ESH2-Z5	100028	2009/11
3	Pulse Limiter	ROHDE & SCHWARZ	ESHSZ2	100044	2009/11
4	EMI Test Software	ROHDE & SCHWARZ	ESK1	N/A	2009/11
5	Single Balanced Telecom Pair ISN	FCC	FCC-TLISN-T2-02	20371	2009/11
6	Two Balanced Telecom Pairs ISN	FCC	FCC-TLISN-T4-02	20373	2009/11

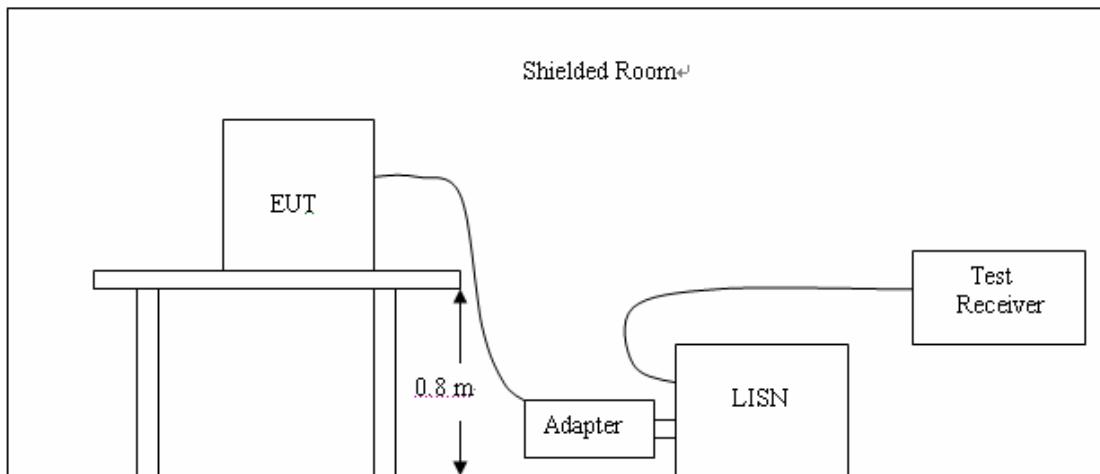
Radiated Emissions					
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ULTRA-BROADBAND ANTENNA	ROHDE & SCHWARZ	HL562	100015	2009/11
2	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESI 26	100009	2009/11
3	RF TEST PANEL	ROHDE & SCHWARZ	TS / RSP	335015/ 0017	2009/11
4	TURNTABLE	ETS	2088	2149	2009/11
5	ANTENNA MAST	ETS	2075	2346	2009/11
6	EMI TEST SOFTWARE	ROHDE & SCHWARZ	ESK1	N/A	2009/11
7	HORN ANTENNA	ROHDE & SCHWARZ	HF906	N/A	2009/06

20dB Bandwidth & Deactivation Time & Duty Cycle					
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESCI	100106	2009/11
2	RECEIVER ANTENNA	/	/	/	/

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 C63.4.
- 2 Support equipment, if needed, was placed as per ANSI C63.4.
- 3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- 4 The EUT received DC 6V from adaptor 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

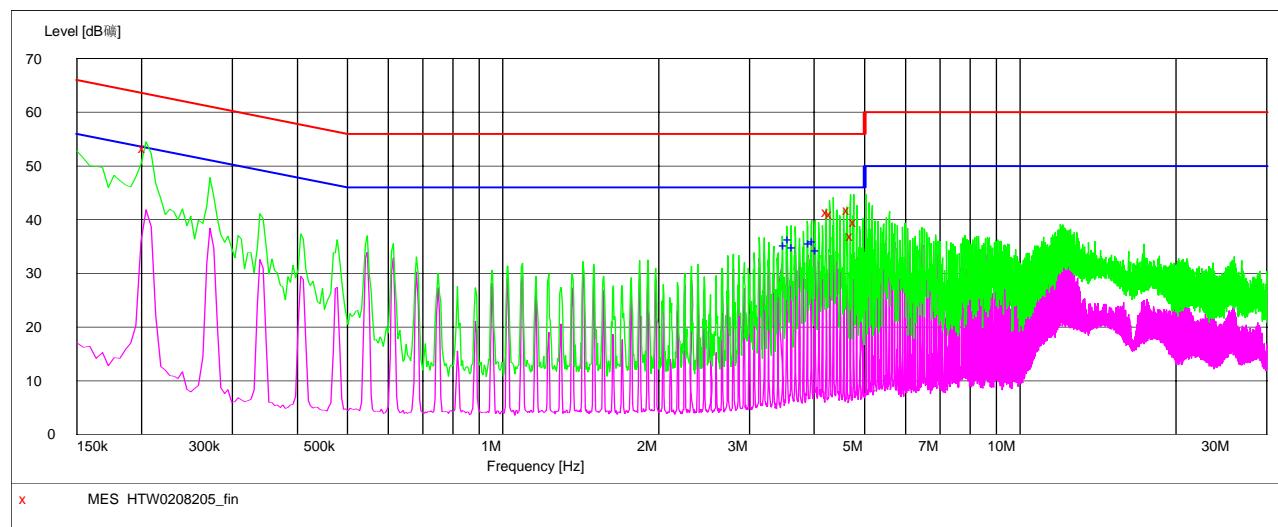
According to FCC Subpart 15 B § 15.207 AC Conducted Emission Limits is as following :

Frequency range (MHz)	Conducted limit (dB μ V)	
	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***SCAN TABLE: "Voltage (9K-30M) FIN"***

Short Description: 150K-30M Voltage

***MEASUREMENT RESULT: "HTW0208305_fin"***

2/8/2010 12:35PM

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.204000	53.30	10.2	63	10.1	QP	N	GND
4.285500	41.40	10.2	56	14.6	QP	N	GND
4.353000	41.00	10.2	56	15.0	QP	N	GND
4.695000	41.70	10.2	56	14.3	QP	N	GND
4.767000	37.00	10.2	56	19.0	QP	N	GND
4.830000	39.50	10.2	56	16.5	QP	N	GND

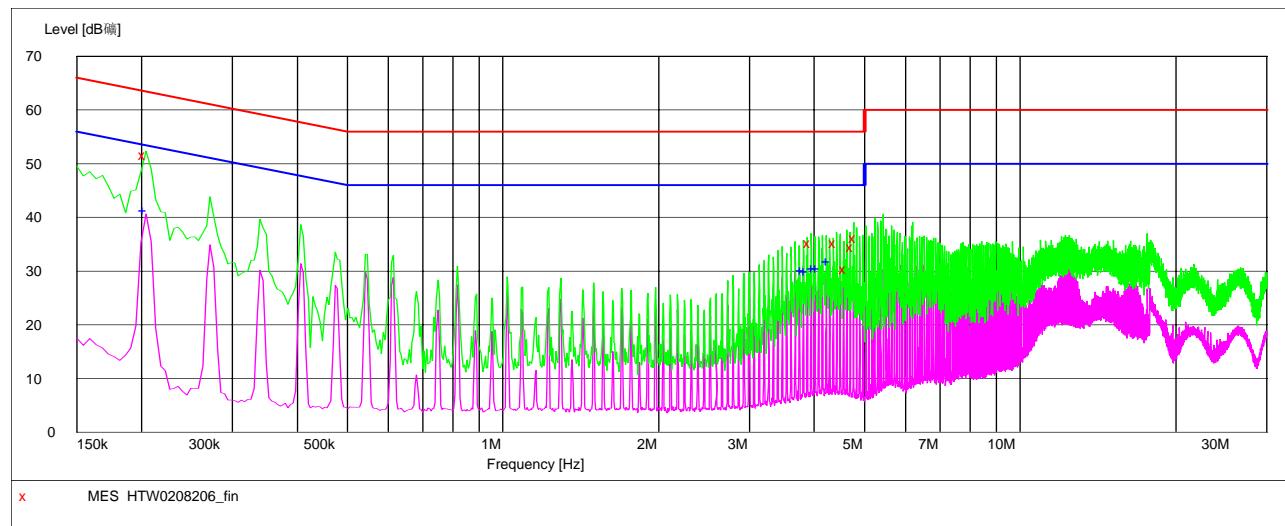
MEASUREMENT RESULT: "HTW0208305_fin2"

2/8/2010 12:35PM

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
3.538500	35.20	10.2	46	10.8	AV	N	GND
3.606000	36.30	10.2	46	9.7	AV	N	GND
3.673500	35.00	10.2	46	11.0	AV	N	GND
3.948000	35.60	10.2	46	10.4	AV	N	GND
4.015500	36.10	10.2	46	9.9	AV	N	GND
4.083000	34.40	10.2	46	11.6	AV	N	GND

SCAN TABLE: "Voltage (9K-30M) FIN"

Short Description: 150K-30M Voltage

**MEASUREMENT RESULT: "HTW0208306_fin"**

2/8/2010 12:47PM

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.204000	51.70	10.2	63	11.7	QP	L1	GND
3.943500	35.30	10.2	56	20.7	QP	L1	GND
4.420500	35.20	10.2	56	20.8	QP	L1	GND
4.618500	30.40	10.2	56	25.6	QP	L1	GND
4.762500	34.40	10.2	56	21.6	QP	L1	GND
4.825500	36.10	10.2	56	19.9	QP	L1	GND

MEASUREMENT RESULT: "HTW0208306_fin2"

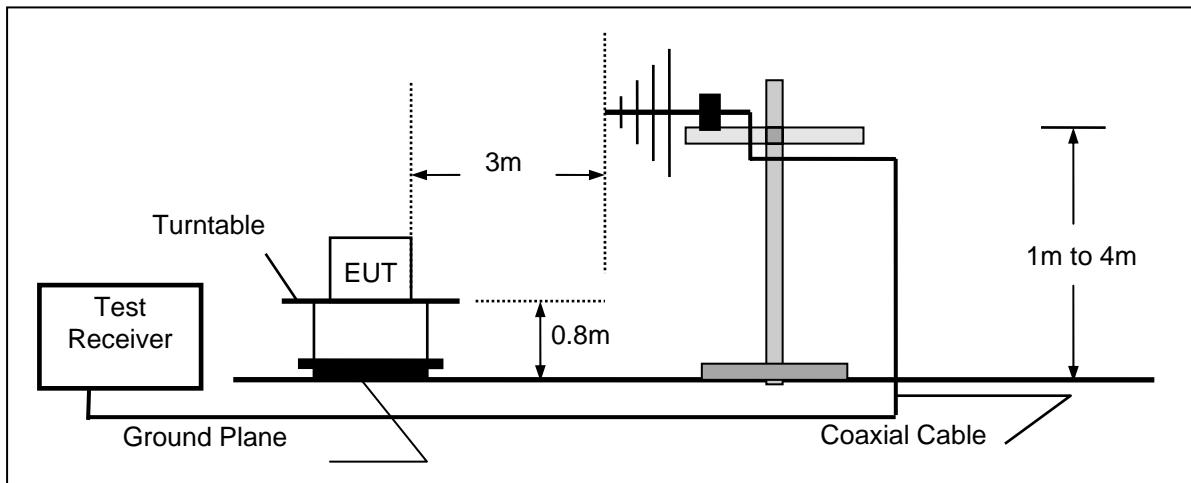
2/8/2010 12:47PM

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.204000	41.30	10.2	53	12.1	AV	L1	GND
3.808500	30.30	10.2	46	15.7	AV	L1	GND
3.876000	30.10	10.2	46	15.9	AV	L1	GND
4.011000	30.60	10.2	46	15.4	AV	L1	GND
4.083000	30.50	10.2	46	15.5	AV	L1	GND
4.285500	31.90	10.2	46	14.1	AV	L1	GND

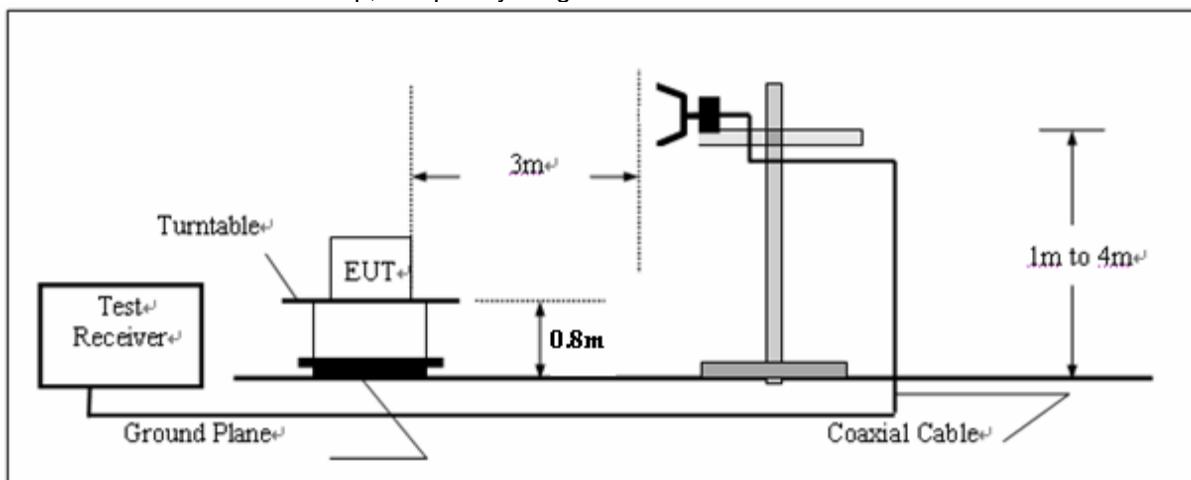
4.2. Radiated Emission

TEST CONFIGURATION

Radiated Emission Test Set-Up, Frequency range 30 - 1000MHz



Radiated Emission Test Set-Up, Frequency range 1GHz - 5GHz



TEST PROCEDURE

- 1, The EUT was placed on a turn table which is 0.8m above ground plane.
- 2, Connect the EUT to the USB port of Notebook, and EUT will transmit automatic at 433.05MHz.
- 3, Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0°C to 360°C to acquire the highest emissions from EUT.
- 4, And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 5, Repeat above procedures until all frequency measurements have been completed.

RADIATION LIMIT

For periodic transmitter, according to § 15.231(e), the field strength of fundamental from device at a distance of 3 meters shall not exceed the following values:

Fundamental frequency (MHz)	Distance (Meters)	Field strength of fundamental (dB μ V/m)	
		AV	Peak
433.05	3	72.84	92.84
Note: For the band 260-470MHz, μ V/m at 3 meters = $16.6667(F) - 2833.333$ Where F is fundamental frequency 433.05MHz			

For periodic transmitter, according to § 15.231(e), the field strength radiated emissions from device at a distance of 3 meters shall not exceed the following values:

Fundamental frequency (MHz)	Distance (Meters)	Field strength of spurious emission	
		(μ V/m)	(dB μ V/m)
40.66-40.70	3	100	40
70-130	3	50	34
130-174	3	50 to 150	34 to 43.5
174-260	3	150	43.5
260-470	3	150 to 500	43.5 to 54
Above 470	3	500	54
Note: 1, For other bands limit pls refer 15.209 2, The limit below 1GHz based CISPR quasi-peak detector, the limit above 1GHz based average detector and peak limit is 74dB μ V/m.			

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

Frequency (MHz)	Distance (Meters)	Radiated (μ V/m)	Radiated (dB μ V/m)
30-88	3	100	40.0
88-216	3	150	43.5
216-960	3	200	46.0
Above 960	3	500	54.0

Note: 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

The emissions from 1GHz to 5GHz are peak measured peak and average level, below 1GHz measured QLevel, detailed test data please see the following pages.

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

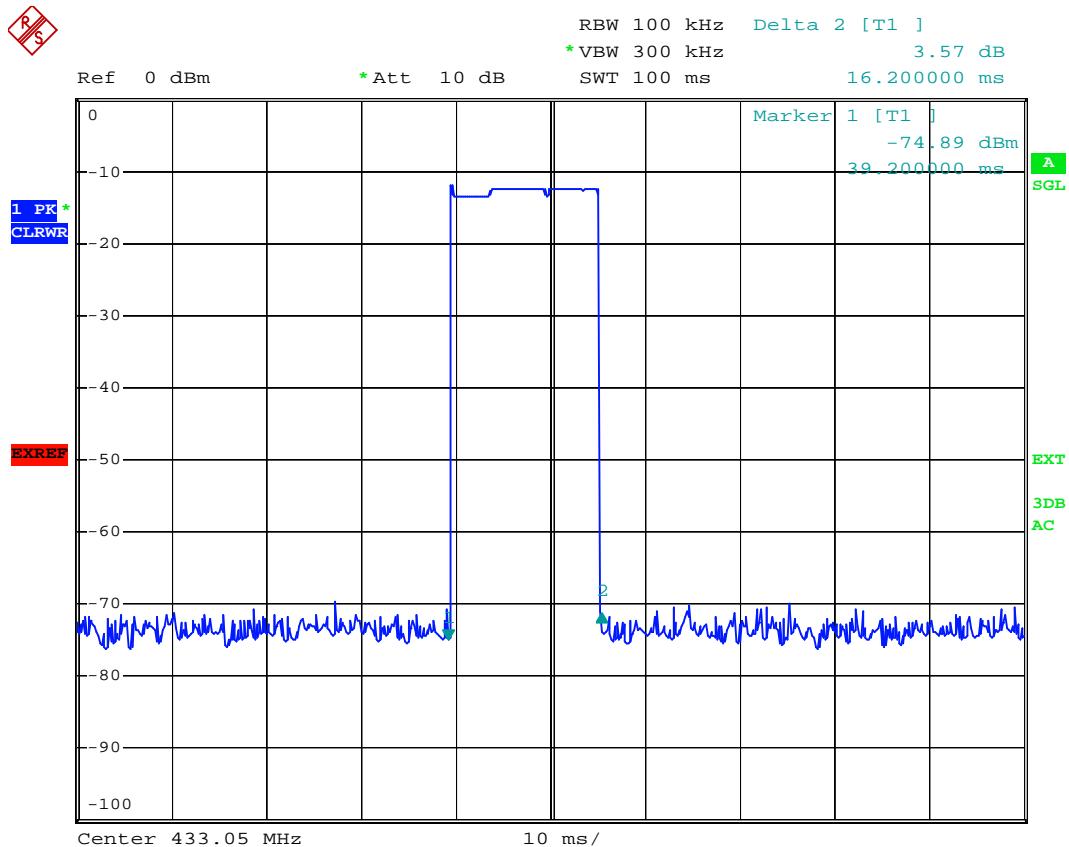
Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

Duty Cycle Correction Factor

Duty Cycle = TX on/100ms X 100% = 16.2 ms/100ms X 100% = 16.2%

Duty Cycle Correction Factor = $20\log(\text{Duty Cycle}) = -15.8$

The pulses of 100ms = 1 times

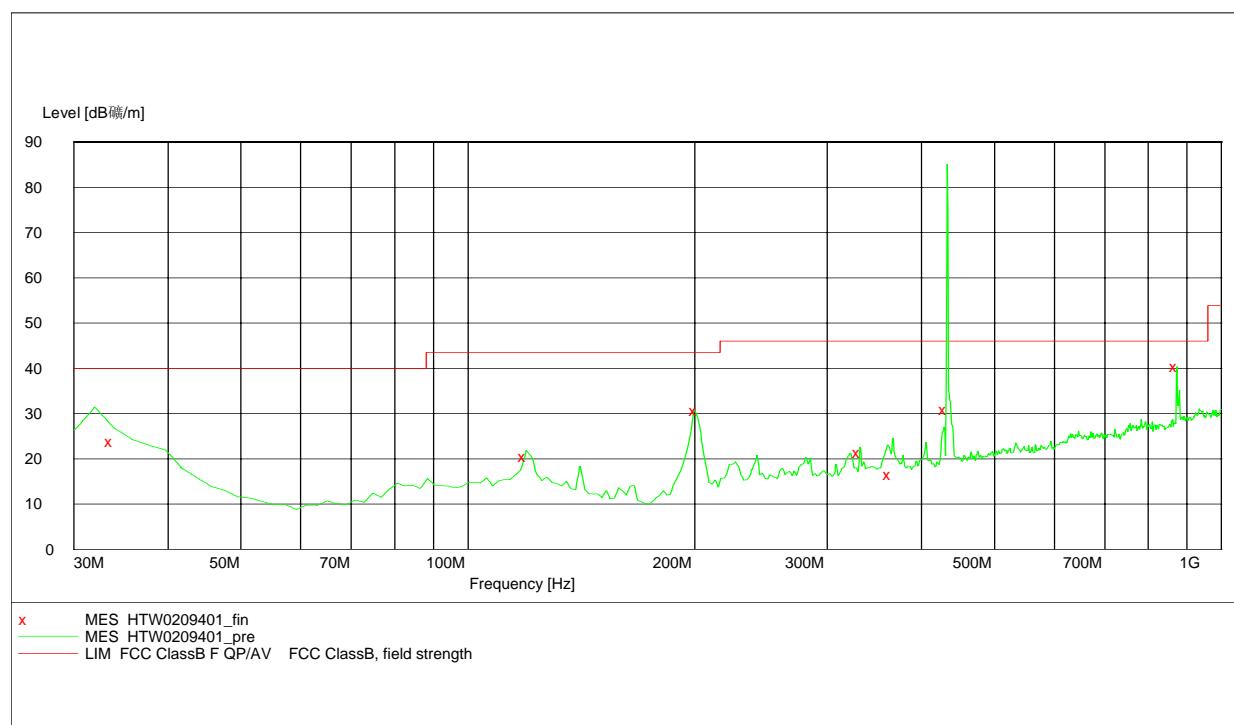


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Time of a pulse = 16.2ms

30MHz to 1GHz Test Data***SCAN TABLE: "test Field (30M-1G) QP"***

Short Description:		Field Strength (30M-1G)				
Start Frequency	Stop Frequency	Step Width	Detector	Meas.	IF Time	Transducer
30.0 MHz	1.0 GHz	60.0 kHz	QuasiPeak	1.0 s	120 kHz	HL562 09

***MEASUREMENT RESULT: "HTW0209401_fin"***

2/9/2010 9:49AM

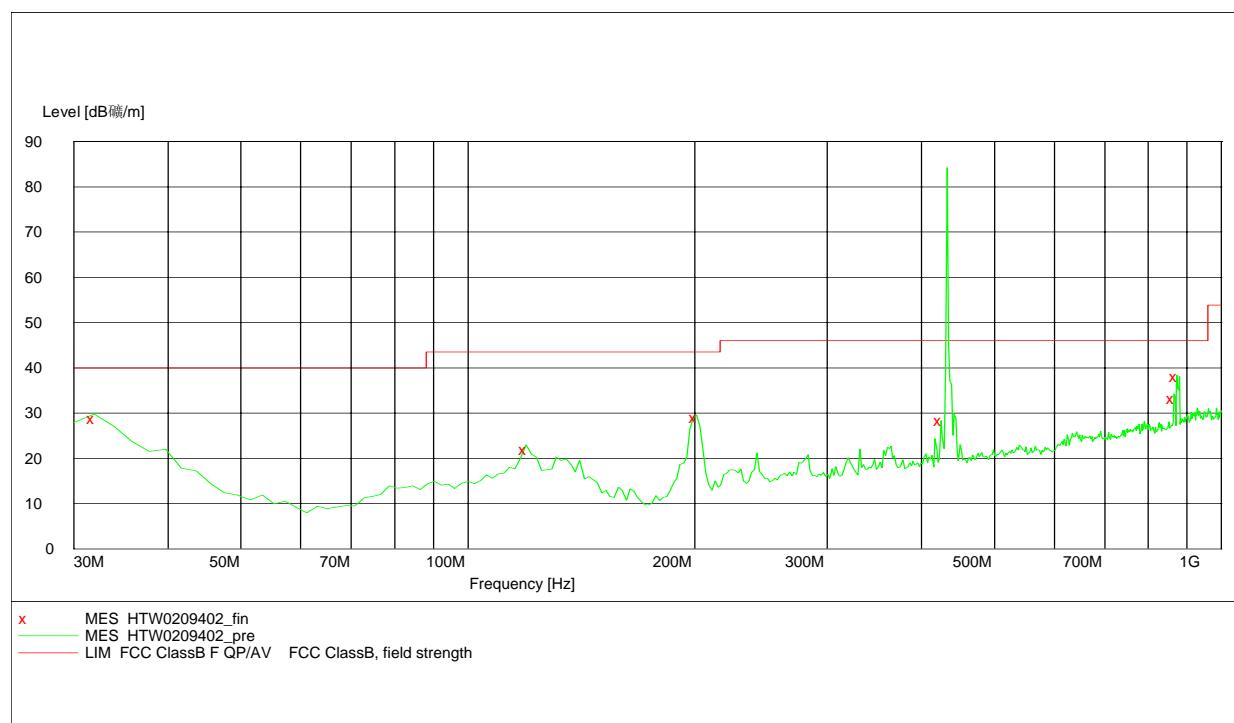
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
33.720000	23.80	-6.8	40.0	16.2	QP	100.0	73.00	HORIZONTAL
119.220000	20.50	-12.8	43.5	23.0	QP	312.0	166.00	HORIZONTAL
201.180000	30.60	-14.9	43.5	12.9	QP	297.0	1.00	HORIZONTAL
331.500000	21.40	-10.8	46.0	24.6	QP	150.0	337.00	HORIZONTAL
363.960000	16.50	-9.4	46.0	29.5	QP	276.0	92.00	HORIZONTAL
431.340000	30.90	-8.6	46.0	15.1	QP	100.0	220.00	HORIZONTAL
872.640000	40.30	0.4	46.0	5.7	QP	250.0	356.00	HORIZONTAL

Frequency (MHz)	Field strength (dBµV/m)	Limit (dBµV/m)	Duty Cycle Correction Factor	Result (dB)	Margin (dB)	Det.
433.92	85.2	92.84	/	85.2	7.64	Peak
	85.2	72.84	-15.8	69.4	3.44	AV

Note: Result = Field Strength + Duty Cycle Correction Factor

SCAN TABLE: "test Field (30M-1G) QP"

Short Description: Field Strength (30M-1G)
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 30.0 MHz 1.0 GHz 60.0 kHz QuasiPeak 1.0 s 120 kHz HL562 09



MEASUREMENT RESULT: "HTW0209402_fin"

2/9/2010 9:56AM

Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Det. QP	Height cm	Azimuth deg	Polarization
31.940000	28.80	-5.8	40.0	11.2	QP	109.0	57.00	VERTICAL
119.420000	22.00	-12.8	40.0	18.0	QP	150.0	165.00	VERTICAL
201.060000	29.00	-15.0	43.5	14.5	QP	100.0	116.00	VERTICAL
424.610000	28.40	-8.6	46.0	17.6	QP	125.0	350.00	VERTICAL
865.870000	33.30	0.1	46.0	12.7	QP	100.0	210.00	VERTICAL
873.660000	38.00	0.5	46.0	8.0	QP	107.0	359.00	VERTICAL

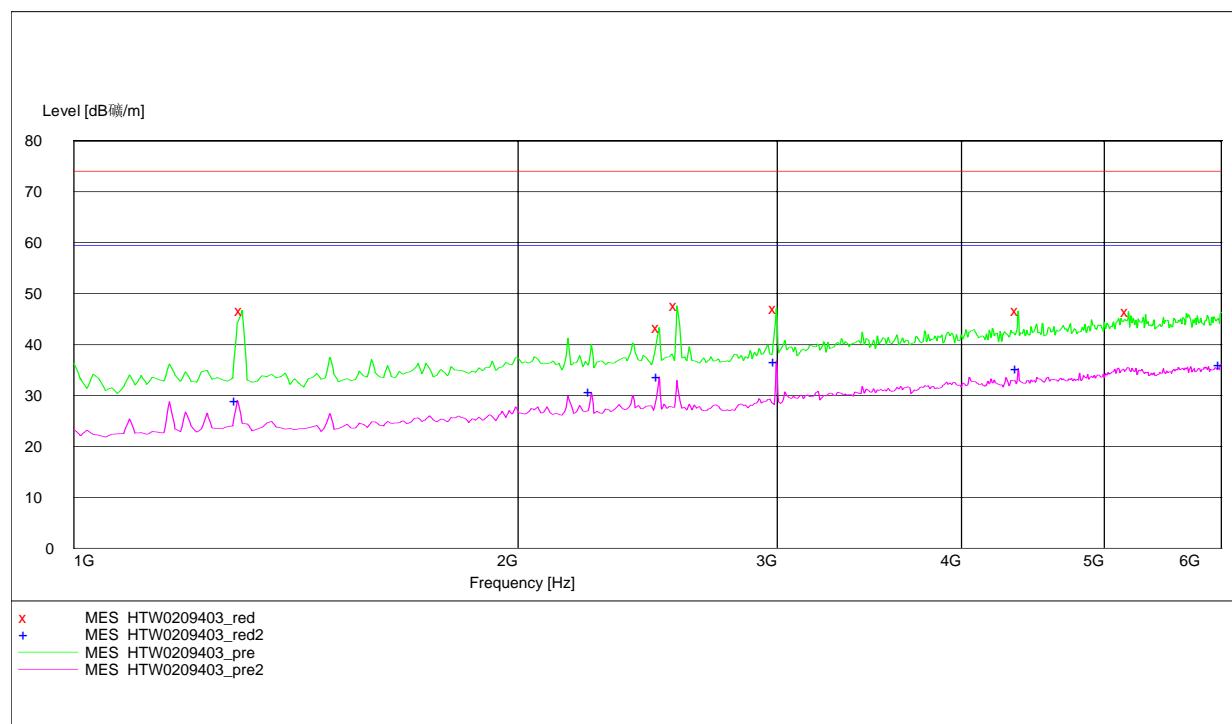
Frequency (MHz)	Field strength (dB μ V/m)	Limit (dB μ V/m)	Duty Cycle Correction Factor	Result (dB)	Margin (dB)	Det.
433.05	84.5	92.84	/	84.5	8.34	Peak
	84.5	72.84	-15.8	68.7	4.14	AV

Note: Result = Field Strength + Duty Cycle Correction Factor

1GHz to 5GHz Test Data

SWEEP TABLE: "test (1G-18G) P"

Short Description: EN 55022 Field Strength
 Start Stop Detector Meas. IF Transducer
 Frequency Frequency Time Bandw.
 1.0 GHz 18.0 GHz MaxPeak Coupled 1 MHz HF906 (2009)
 Average



MEASUREMENT RESULT: "HTW0209403_red"

2/9/2010 9:56AM

Frequency MHz	Level dB _μ V/m	Transd dB	Limit dB _μ V/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1300.601202	46.70	-8.0	74.0	27.3	Peak	100.0	209.00	HORIZONTAL
2492.985972	43.30	-3.3	74.0	30.7	Peak	100.0	229.00	HORIZONTAL
2563.126253	47.60	-3.2	74.0	26.4	Peak	100.0	229.00	HORIZONTAL
2993.987976	47.10	-1.7	74.0	26.9	Peak	100.0	290.00	HORIZONTAL
4366.733467	46.60	2.2	74.0	27.4	Peak	100.0	219.00	HORIZONTAL
5188.376754	46.40	4.6	74.0	27.6	Peak	100.0	320.00	HORIZONTAL

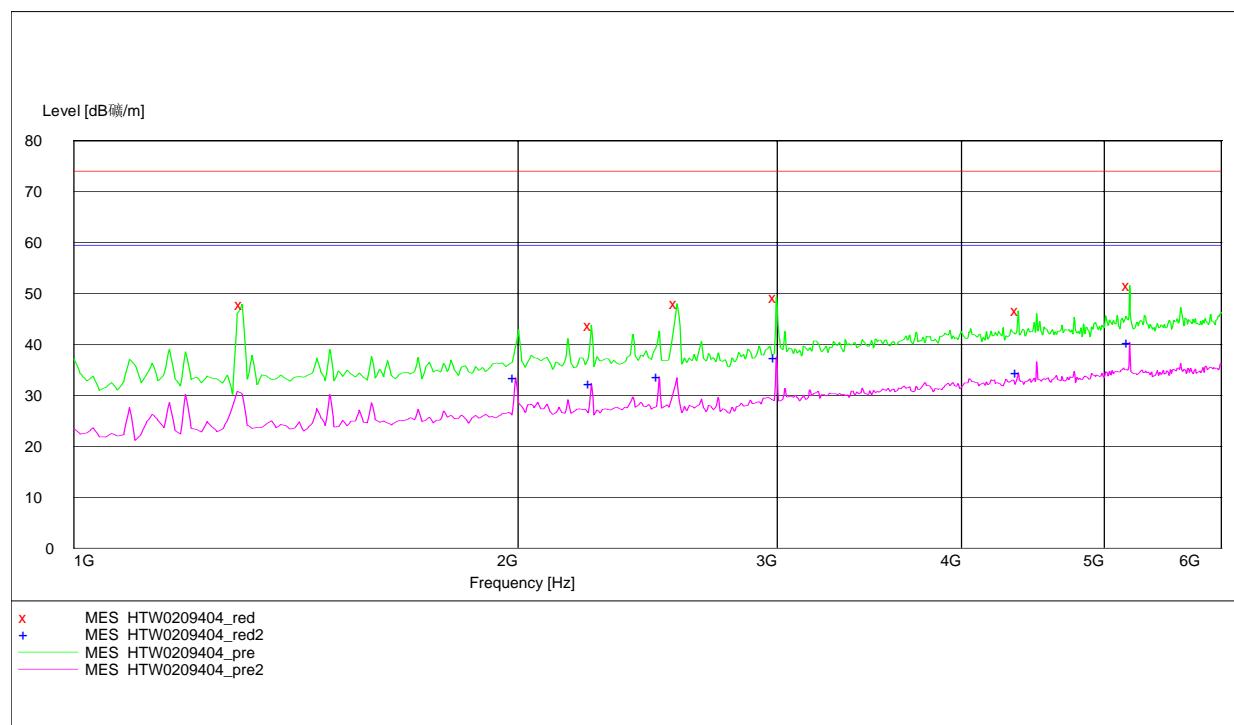
MEASUREMENT RESULT: "HTW0209403_red2"

2/9/2010 9:56AM

Frequency MHz	Level dB _μ V/m	Transd dB	Limit dB _μ V/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1290.581162	29.00	-8.1	59.5	30.5	AV	100.0	219.00	HORIZONTAL
2242.484970	30.70	-4.2	59.5	28.8	AV	100.0	49.00	HORIZONTAL
2492.985972	33.70	-3.3	59.5	25.8	AV	100.0	219.00	HORIZONTAL
2993.987976	36.70	-1.7	59.5	22.8	AV	100.0	300.00	HORIZONTAL
4366.733467	35.30	2.2	59.5	24.2	AV	100.0	219.00	HORIZONTAL
6000.000000	36.10	6.2	59.5	23.4	AV	100.0	20.00	HORIZONTAL

SWEEP TABLE: "test (1G-18G) P"

Short Description: EN 55022 Field Strength
 Start Stop Detector Meas. IF Transducer
 Frequency Frequency Time Bandw.
 1.0 GHz 18.0 GHz MaxPeak Coupled 1 MHz HF906 (2009)
 Average



MEASUREMENT RESULT: "HTW0209404_red"

2/9/2010 9:58AM

Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1300.601202	47.90	-8.0	74.0	26.1	Peak	100.0	161.00	VERTICAL
2242.484970	43.80	-4.2	74.0	30.2	Peak	100.0	326.00	VERTICAL
2563.126253	48.00	-3.2	74.0	26.0	Peak	100.0	194.00	VERTICAL
2993.987976	49.20	-1.7	74.0	24.8	Peak	100.0	326.00	VERTICAL
4366.733467	46.60	2.2	74.0	27.4	Peak	100.0	346.00	VERTICAL
5198.396794	51.60	4.6	74.0	22.4	Peak	100.0	119.00	VERTICAL

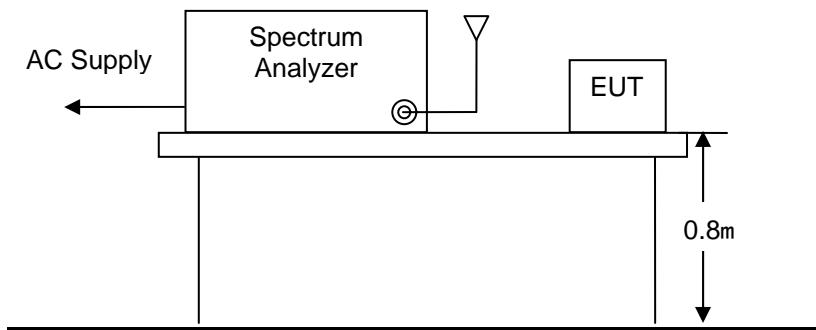
MEASUREMENT RESULT: "HTW0209404_red2"

2/9/2010 9:58AM

Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1991.983968	33.50	-4.7	59.5	26.0	AV	100.0	26.00	VERTICAL
2242.484970	32.40	-4.2	59.5	27.1	AV	100.0	326.00	VERTICAL
2492.985972	33.70	-3.3	59.5	25.8	AV	100.0	14.00	VERTICAL
2993.987976	37.50	-1.7	59.5	22.0	AV	100.0	346.00	VERTICAL
4366.733467	34.50	2.2	59.5	25.0	AV	100.0	205.00	VERTICAL
5198.396794	40.40	4.6	59.5	19.1	AV	100.0	119.00	VERTICAL

4.3. Deactivation Time

TEST CONFIGURATION



TEST PROCEDURE

- 1 The EUT was placed on a wooden table which is 0.8m height and close to receiver antenna of spectrum analyzer.
- 2 The spectrum analyzer resolution bandwidth was set to 100 kHz and video bandwidth was set to 300 kHz 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

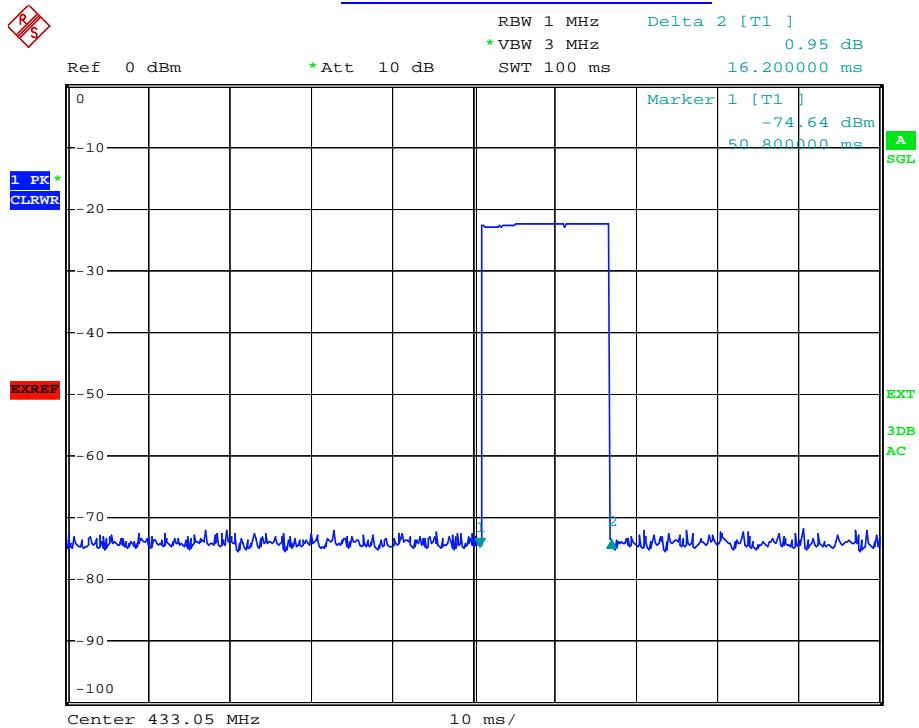
For periodic transmitter, according to FCC Part 15C § 15.231(e)

Item	Limit (second)
One transmission time	not greater than 1 second
Transmission period	at least 30 times the duration of the transmission but in no case less than 10 second

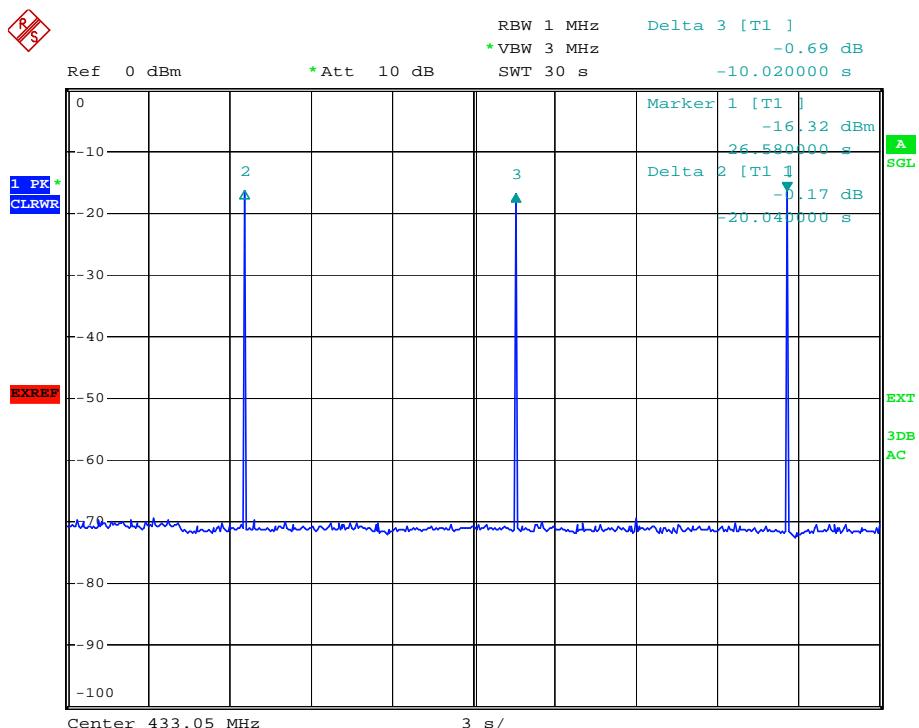
TEST RESULTS

EUT statement: The transmitter was automatically activated, and the carrier frequency 433.05MHz:

Frequency (MHz)	One transmission time (second)	Transmission period (second)	Result
433.05	0.0162	10.02	Pass

The time of one transmission

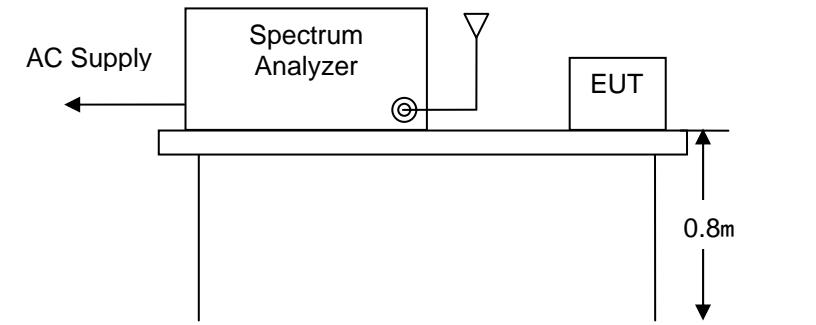
Date: 8.FEB.2010 16:56:08

The time of transmission period

Date: 8.FEB.2010 16:53:34

4.4. 20dB Bandwidth

TEST CONFIGURATION



TEST PROCEDURE

- 1 The EUT was placed on a wooden table which is 0.8m height and close to receiver antenna of spectrum analyzer.
- 2 The spectrum analyzer resolution bandwidth was set to 100 kHz and video bandwidth was set to 300 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

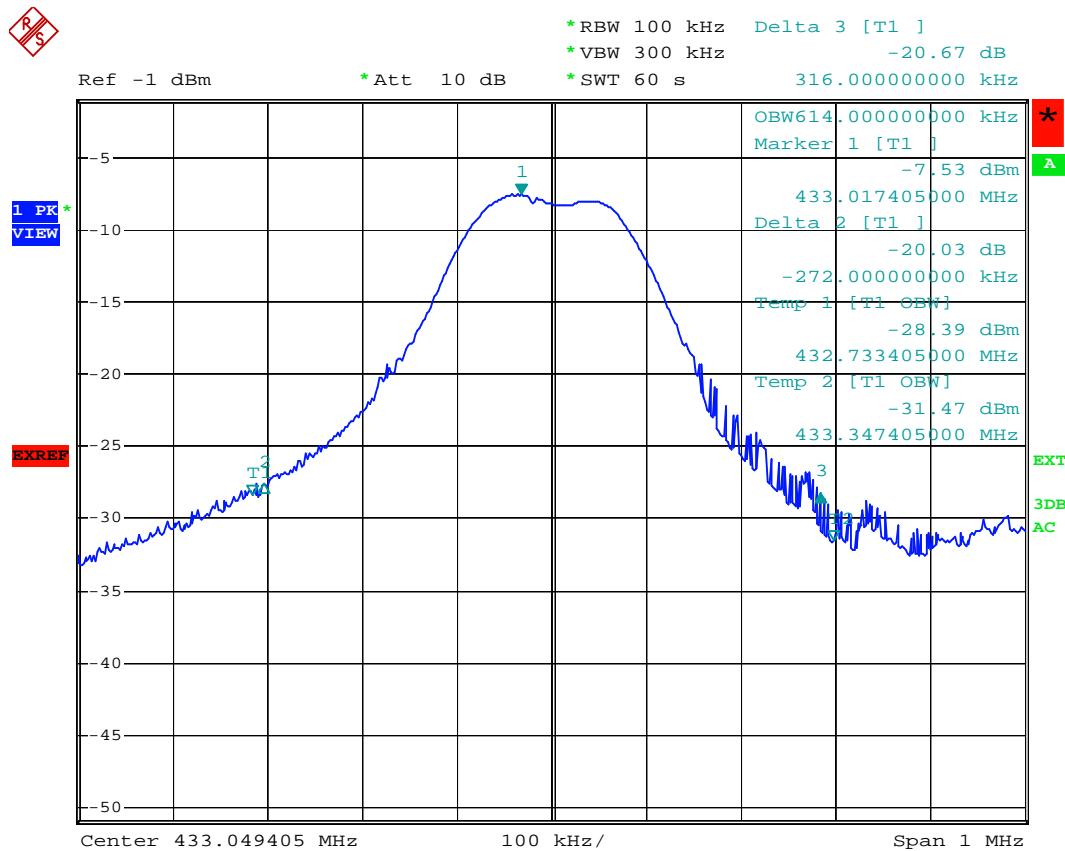
According to FCC Part 15C § 15.231(c)

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)	99% Bandwidth Measurement Bandwidth (KHz)	Limit (kHz)	Result
433.05	614	1082.63	Pass

Frequency (MHz)	20dB Bandwidth Measurement Bandwidth (KHz)	Limit (kHz)	Result
433.05	588	1082.63	Pass

20dB Bandwidth

Date: 8.FEB.2010 16:30:10

4.5. Antenna Requirement

According to FCC Part 15C § 15.203,

- a), An intentional radiator shall be designed 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 nonstandard antenna connector (SMA-B), so the EUT meets the requirements of antenna. Detial please see the photos as following:

