

FCC CFR47 PART 15 SUBPART C
CERTIFICATION
TEST REPORT

FOR

TOEC Technology Co., Ltd.

Portable Wireless Rechargeable Tattoo Power Supply

Model No.: TPS-02

Prepared for : TOEC Technology Co., Ltd.
Address : No.6, Taishan Road, Hexi District, Tianjin, China

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.
Address : Xingyuan Industrial Park, Tongda Road, Bao' an Blvd,
Bao' an District, Shenzhen, Guangdong, China

Date of receipt of test sample : October 26, 2011
Number of tested samples : 1
Serial number : Prototype
Date of Test : October 26, 2011 – November 20, 2011
Date of Report : November 20, 2011

TEST REPORT
FCC CFR 47 PART 15 C(15.231)

Report Reference No. : **LCS1110262797F**

Date of issue : November 20, 2011

Testing Laboratory Name : **Shenzhen LCS Compliance Testing Laboratory Ltd.**

Address : Xingyuan Industrial Park, Tongda Road, Bao'an Blvd., Bao'an District, Shenzhen, Guangdong, China

Testing location/ procedure : Full application of Harmonised standards
Partial application of Harmonised standards
Other standard testing method

Applicant's name : **TOEC Technology Co., Ltd.**

Address : No.6, Taishan Road, Hexi District, Tianjin, China

Test specification

Standard : FCC CFR 47 PART 15 Subpart C: 2011, ANSI C63.4-2009

Test Report Form No. : LCSEMC-1.0

TRF Originator : Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF : Dated 2011-03

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Test item description : **Portable Wireless Rechargeable Tattoo Power Supply**

Trade Mark : N/A

Manufacturer : TOEC Technology Co., Ltd.

Model/Type reference : TPS-02

Ratings : DC 12V/433.92MHz, ASK

Result : **Positive**

Compiled by:



Bobo Li/ File administrators

Supervised by:



Vito Cao/ Technique principal

Approved by:



Gavin Liang/ Manager

EMC -- TEST REPORT

Test Report No. : LCS1110262797F	<u>November 20, 2011</u> Date of issue
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Type / Model..... : TPS-02

EUT..... : Portable Wireless Rechargeable Tattoo Power Supply

Applicant..... : TOEC Technology Co., Ltd.

Address..... : No.6, Taishan Road, Hexi District, Tianjin, China

Telephone..... : /

Fax..... : /

Contact..... : /

Manufacturer..... : TOEC Technology Co., Ltd.

Address..... : No.6, Taishan Road, Hexi District, Tianjin, China

Telephone..... : /

Fax..... : /

Contact..... : /

Factory..... : /

Address..... : /

Telephone..... : /

Fax..... : /

Contact..... : /

Test Result according to the standards on page 5: **Positive**

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1. GENERAL INFORMATION

1.1 Description of Device (EUT)

Applicant	TOEC Technology Co., Ltd.
Address	No.6, Taishan Road, Hexi District, Tianjin, China
EUT	Portable Wireless Rechargeable Tattoo Power Supply
Model Number	TPS-02
Power Supply	DC 12V
Frequency Range	433.92MHz
Transmit Power	57.67 (dB μ V/m)
Modulation Technique	ASK
Antenna Gain	3 dBi

1.2 Objective

This document is a test report based on the Electromagnetic Interference (EMI) tests performed on the EUT. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4-2009.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.209 and 15.231 rules.

1.3 Test Methodology

All measurements contained in this report were conducted with 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 40 GHz. All radiated and conducted emissions measurement was performed at Shenzhen LCS Compliance Testing Laboratory Ltd. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

1.4 Facilities

All measurement facilities used to collect the measurement data are located at Xingyuan Industrial Park, Tongda Road, Bao'an Blvd, Bao'an District, Shenzhen, Guangdong, China. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

1.5 External I/O Cable

N/A

1.6 Test Facility

Site

Description

EMC Lab.

: Accredited by CNAS, June 04, 2010
The Certificate Registration Number. is L4595.

Accredited by FCC, July 14, 2011
The Certificate Registration Number. is 899208.

Accredited by Industry Canada, May. 02, 2011
The Certificate Registration Number. is 9642A-1

Name of Firm : SHENZHEN LCS COMPLIANCE TESTING LABORATORY LTD.

Site Location : Xingyuan Industrial Park, Tongda Road, Bao'an Blvd,
Bao'an District, Shenzhen, Guangdong, China

1.7 Measurement Uncertainty

Radiation Uncertainty (30M~1GHz) : Ur = ± 4.26 dB

Radiation Uncertainty (1G~3GHz) : Ur = ± 2.66 dB

Radiation Uncertainty (3G~18GHz) : Ur = ± 2.83 dB

Conduction Uncertainty : Uc = ± 2.61 dB

2. SYSTEM TEST CONFIGURATION

2.1 Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

2.2 EUT Exercise Software

N/A.

2.3 Special Accessories

The special accessories were supplied by Shenzhen LCS Compliance Testing Laboratory Ltd.

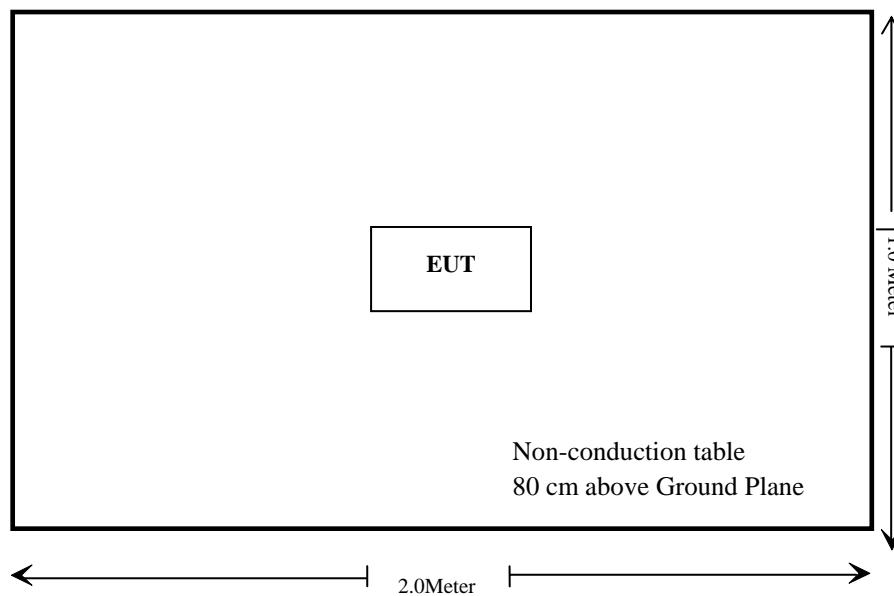
2.4 Block Diagram/Schematics

Please refer to the report.

2.5 Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

2.6 Configuration of Test Setup



3. SUMMARY OF TEST RESULTS

Rules	Description of test	Result
§15.203	Antenna Requirement	Compliant
§15.205	Restricted Band	Compliant
§15.209	General Requirement	Compliant
§15.231 (b)	Radiated Emissions	Compliant
§15.231 (c)	20dB Band Width Testing	Compliant
§15.231 (a)(1)	Deactivation Testing	Compliant
§15.231	Duty cycle Factor	Compliant

4. §15.203-ANTENNA REQUIREMENT

4.1 Standard Applicable

According to §15.203, Antenna requirement.

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

4.2 Antenna Connected Construction

The directional gains of antenna used for transmitting is 3 dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Please see EUT photo for details.

Result: Compliance.

5. §15.205 §15.209(a) §15.231(b)-RADIATED EMISSIONS

5.1 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 for frequency ranges 130 - 174 MHz and 260 - 470 MHz.

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

5.2 Test Procedures

5.2.1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.

5.2.2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.

5.2.3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.

5.2.4. For each suspected emissions, the antenna tower was scan (from 1 m to 4 m) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.

5.2.5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.

5.2.6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.

5.2.7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.

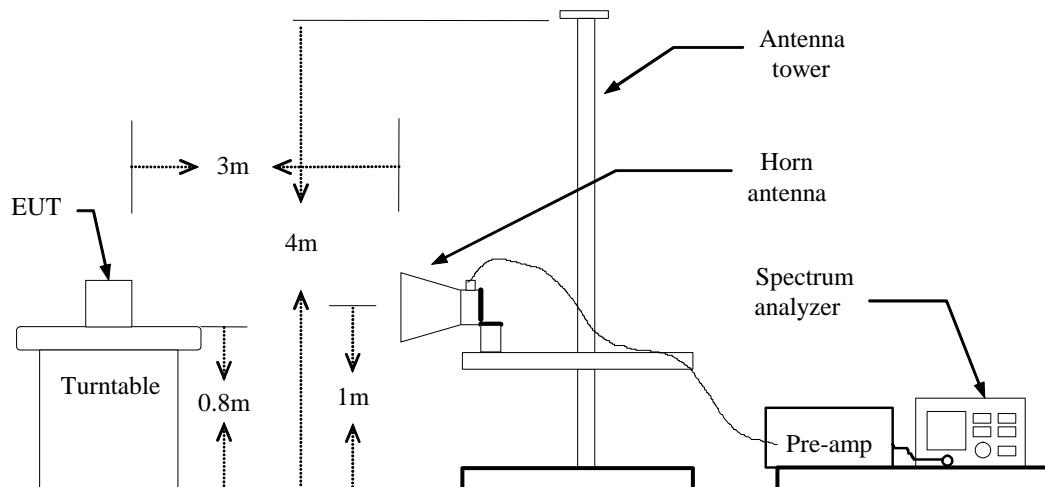
5.2.8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.

5.2.9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

5.3 Test Equipment List and Details

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	1166.5950.03	2011/06
2	EMI Test Receiver	ROHDE & SCHWARZ	ESPI	1164.6407.03	2011/06
3	Log per Antenna	ROHDE & SCHWARZ	VULB9163	9163-470	2011/06
4	Amplifier	SCHWARZBECK	PAP-0001	21002	2011/06

5.4 Test Setup

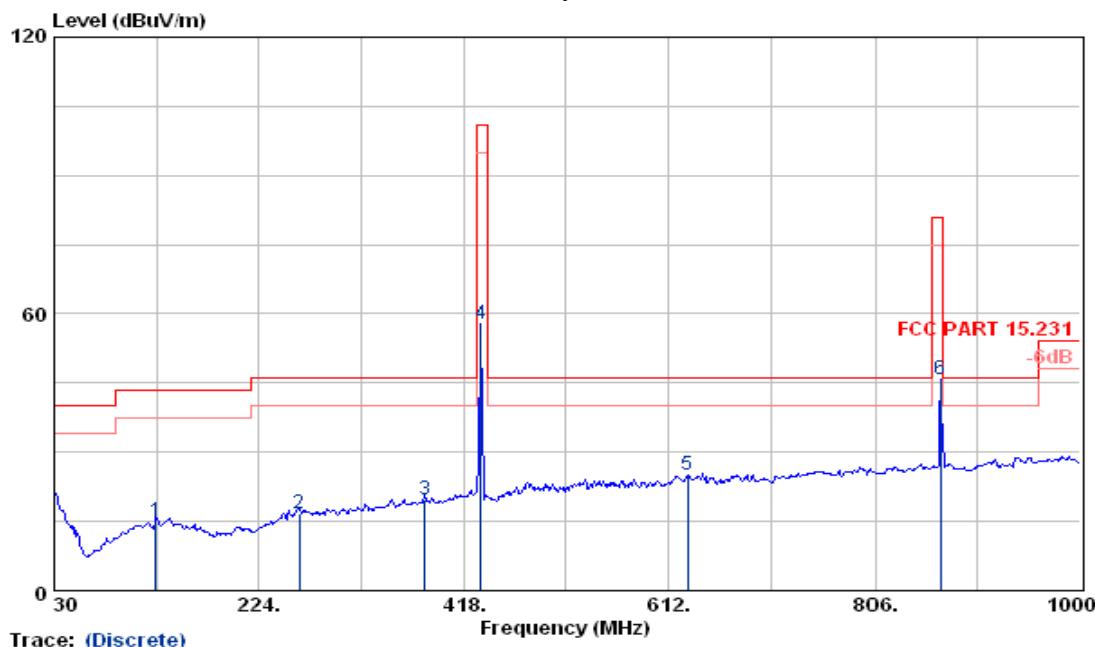


5.5 Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50%
ATM Pressure:	100.0 kPa
Test Data:	2011-11-07
Test By:	Willis

Antenna Polarity: Vertical

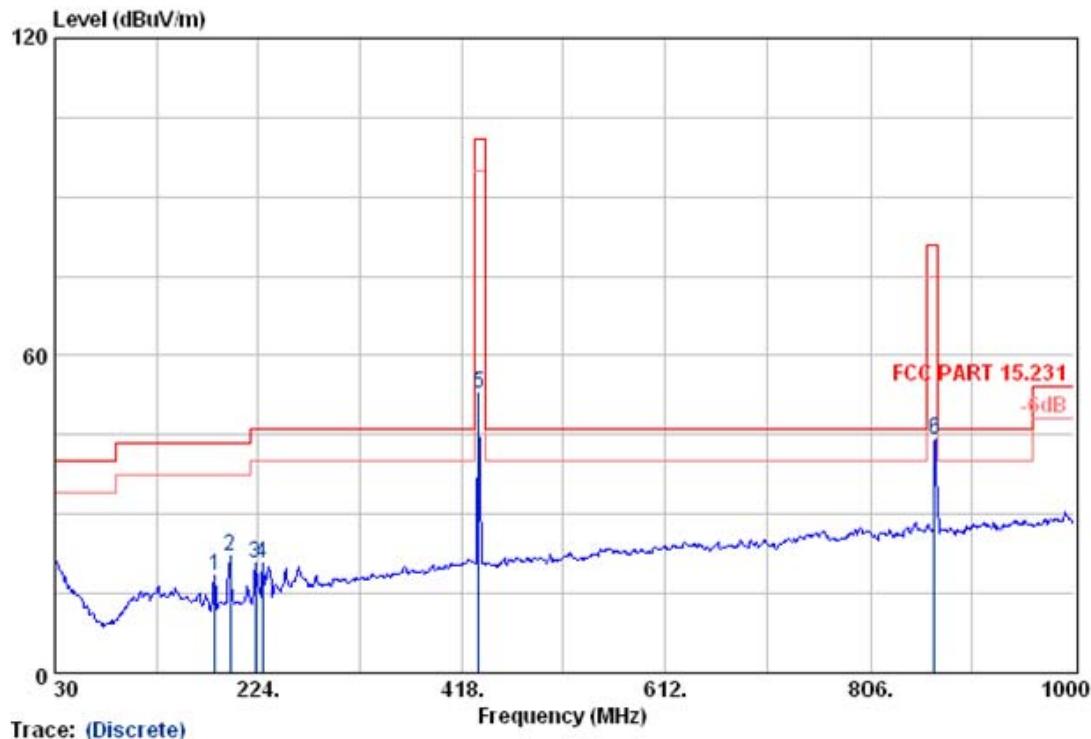


Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Emission				Margin (dB)	Remark
			Reading (dBuV)	Level (dBuV/m)	Limits (dBuV/m)			
1	126.03	11.86	1.12	1.94	14.92	43.50	28.58	QP
2	261.83	13.98	1.55	1.21	16.74	46.00	29.26	QP
3	381.14	15.92	1.80	1.95	19.67	46.00	26.33	QP
4	433.92	17.00	1.96	38.72	57.68	100.80	43.12	Peak
5	630.43	20.00	2.36	2.58	24.94	46.00	21.06	QP
6	868.08	22.86	2.65	20.45	45.96	80.80	34.84	Peak

Remarks: 1. Emission Level = Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Fundamental and Harmonics Average Result					
Freq(MHz)	Peak Level (dB μ V/m)	AV Factor(dB μ V/m) (see Section 8)	Average Level (dB μ V/m)	Limit(dB μ V/m) (average)	Conclusion
433.92	57.68	-7.55	50.13	80.80	PASS
868.08	45.96	-7.55	38.41	60.80	PASS

Antenna Polarity: Horizontal

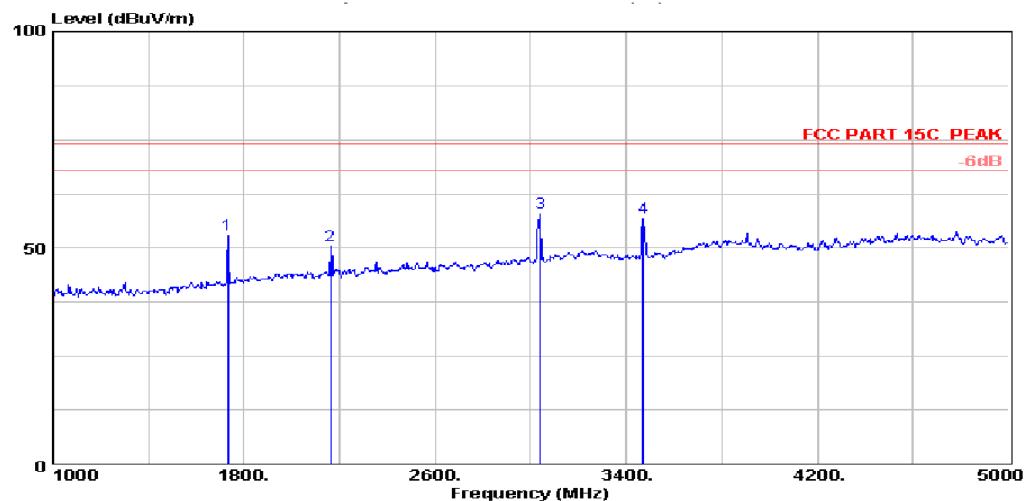


Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Emission				Margin (dB)	Remark
			Reading (dB μ V)	Level (dB μ V/m)	Limits (dB μ V/m)			
1 182.29	9.26	1.30	7.79	18.35	43.50	25.15	QP	
2 196.84	9.92	1.34	10.90	22.16	43.50	21.34	QP	
3 221.09	10.38	1.42	9.06	20.86	46.00	25.14	QP	
4 227.88	10.88	1.40	8.58	20.86	46.00	25.14	QP	
5 433.92	17.00	1.96	33.91	52.87	100.80	47.93	Peak	
6 867.08	22.84	2.65	18.57	44.06	80.80	36.74	Peak	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

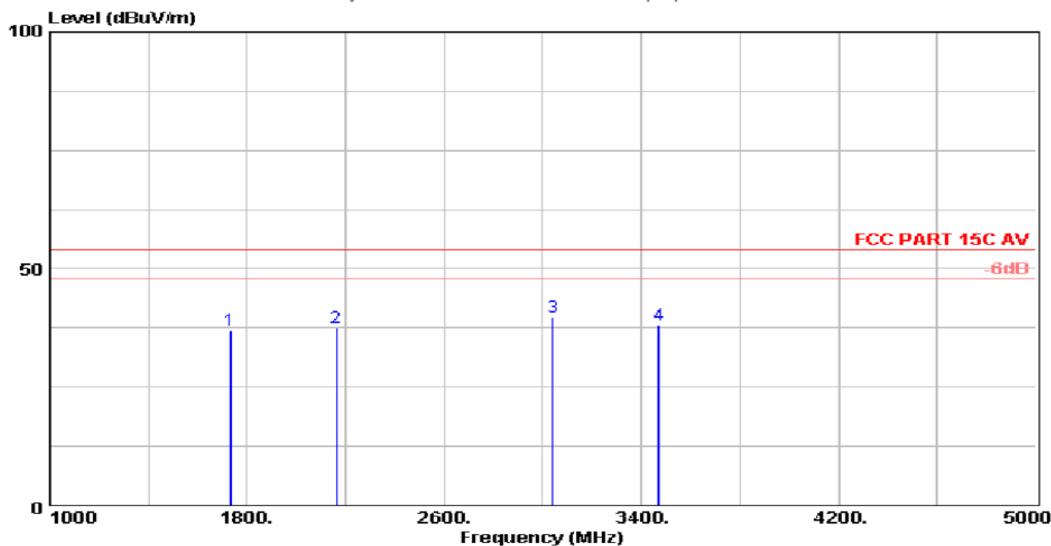
Fundamental and Harmonics Average Result					
Freq(MHz)	Peak Level (dB μ V/m)	AV Factor(dB μ V/m) (see Section 8)	Average Level (dB μ V/m)	Limit(dB μ V/m) (average)	Conclusion
433.92	52.87	-7.55	45.32	80.80	PASS
867.08	44.06	-7.55	36.51	60.80	PASS

Antenna Polarity: Vertical



Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Emission				Margin (dB)	Remark
				Reading (dB _{UV})	Level (dB _{UV} /m)	Limits (dB _{UV} /m)			
1 1732.00	26.63	5.71	35.55	56.98	53.17	74.00	20.83	Peak	
2 2164.00	28.42	6.42	35.25	51.18	50.77	74.00	23.23	Peak	
3 3040.00	31.09	7.78	34.99	54.26	58.14	74.00	15.86	Peak	
4 3472.00	32.28	8.72	34.86	50.93	57.07	74.00	16.93	Peak	

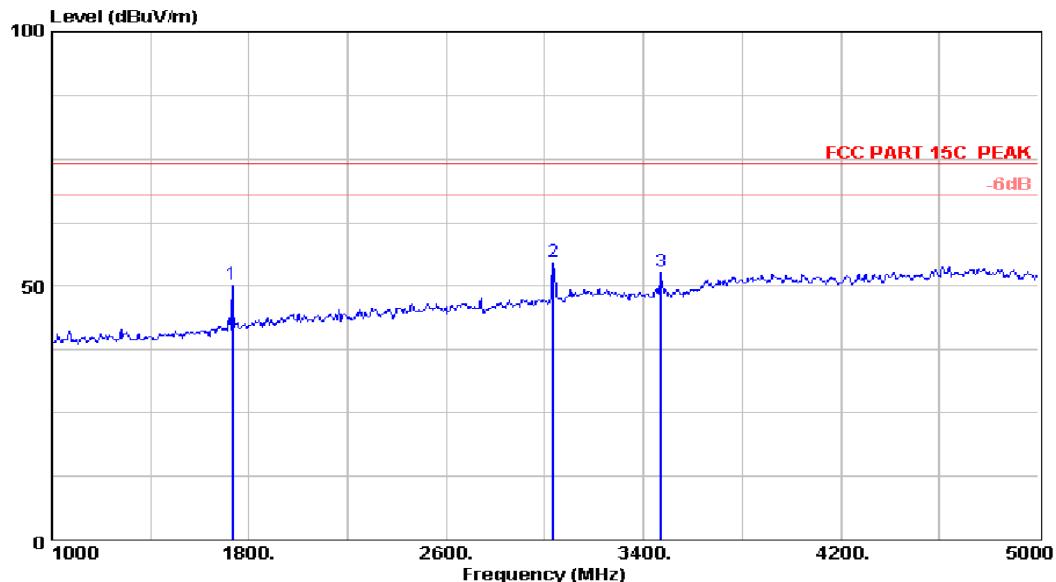
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



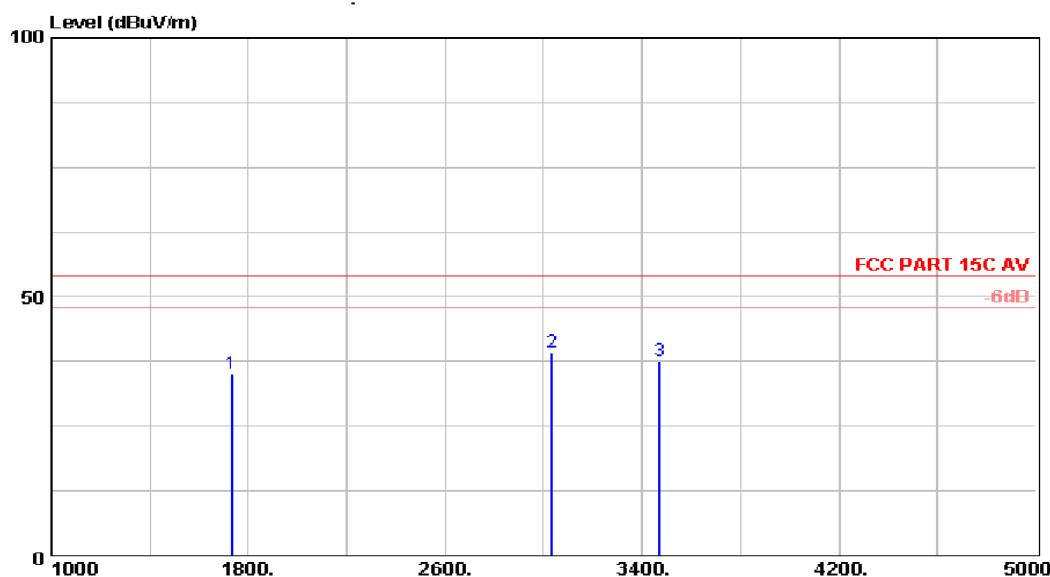
Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Emission				Margin (dB)	Remark
				Reading (dB _{UV})	Level (dB _{UV} /m)	Limits (dB _{UV} /m)			
1 1732.00	26.63	5.71	35.55	40.17	36.96	54.00	17.04	Average	
2 2164.00	28.42	6.42	35.25	37.97	37.56	54.00	16.44	Average	
3 3040.00	31.09	7.78	34.99	36.05	39.93	54.00	14.07	Average	
4 3472.00	32.28	8.72	34.86	32.10	38.24	54.00	15.76	Average	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Antenna Polarity: Horizontal



Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1 1732.00	26.63	5.71	35.55	38.19	34.98	54.00	19.02	Average
2 3032.00	31.09	7.76	34.99	35.31	39.17	54.00	14.83	Average
3 3472.00	32.28	8.72	34.86	31.50	37.64	54.00	16.36	Average

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

6. §15.231(C) - 20DB BANDWIDTH TESTING

6.1 Limit

Per 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. Bandwidth is determined at the points 20 dB down from the modulated carrier.

6.2 Test Procedure

With the EUT's antenna attached, the EUT's 20dB Bandwidth power was received by the test antenna which was connected to the spectrum analyzer with the START and STOP frequencies set to the EUT's operation band.

6.3 Test Equipment List and Details

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Spectrum	Agilent	E4407B	MY41440292	2011/06
2	Log per Antenna	ROHDE & SCHWARZ	VULB9163	9163-470	2011/06
3	Antenna	EMCO	3115	9607-4877	2011/06
4	Amplifier	SCHWARZBECK	PAP-0001	21002	2011/06

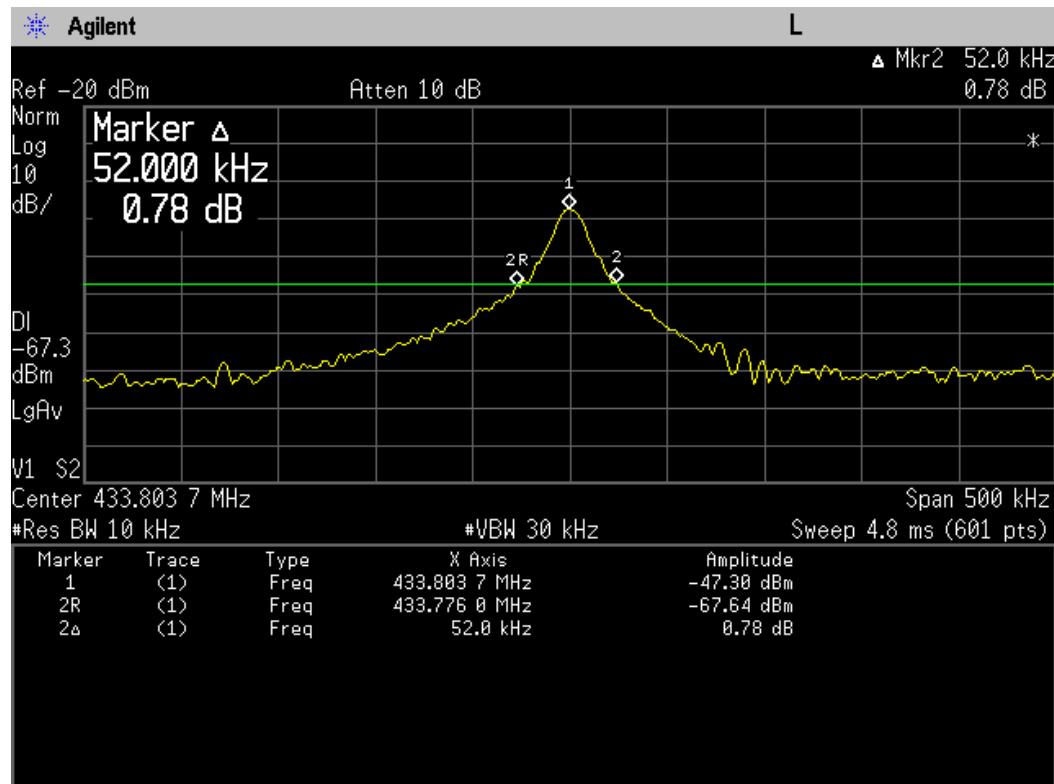
6.4 Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50%
ATM Pressure:	100.0 kPa
Test Data:	2011-11-07
Test By:	Willis

Test Mode: Transmitting

Frequency (MHz)	20 dB Bandwidth (kHz)	Limit(kHz): No wider than 0.25% of the center frequency	Conclusion
433.92	52.0	433.92*0.25%=1.08MHz	PASS



7. §15.231(A) - DEACTIVATION TESTING

7.1 Limit

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

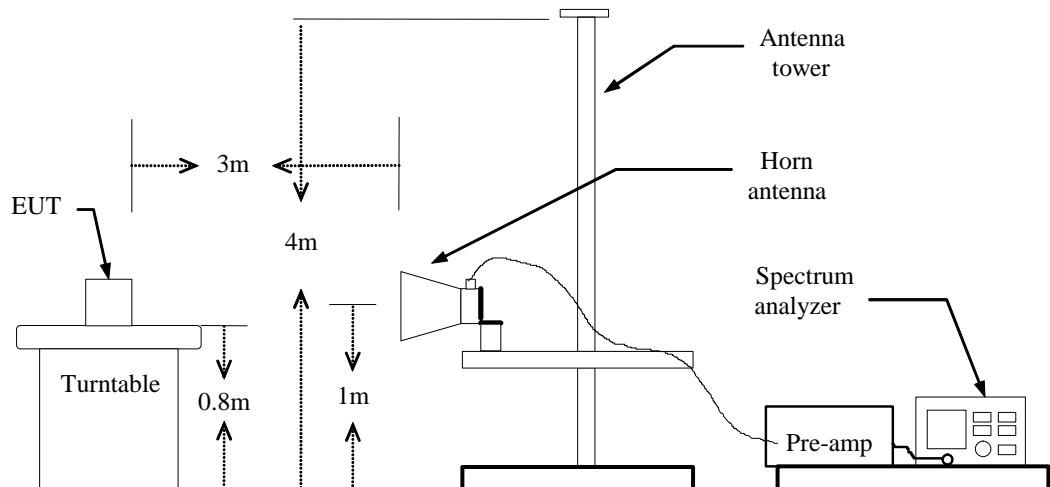
7.2 Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

7.3 Test Equipment List and Details

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Spectrum	Agilent	E4407B	MY41440292	2011/06
2	Log per Antenna	ROHDE & SCHWARZ	VULB9163	9163-470	2011/06
3	Antenna	EMCO	3115	9607-4877	2011/06
4	Amplifier	SCHWARZBECK	PAP-0001	21002	2011/06

7.4 Test Setup



The deactivation test was performed in the 3 meters chamber B test site, using the setup accordance with the ANSI C63.4 - 2009. The specification used was the FCC 15.231(a) limits.

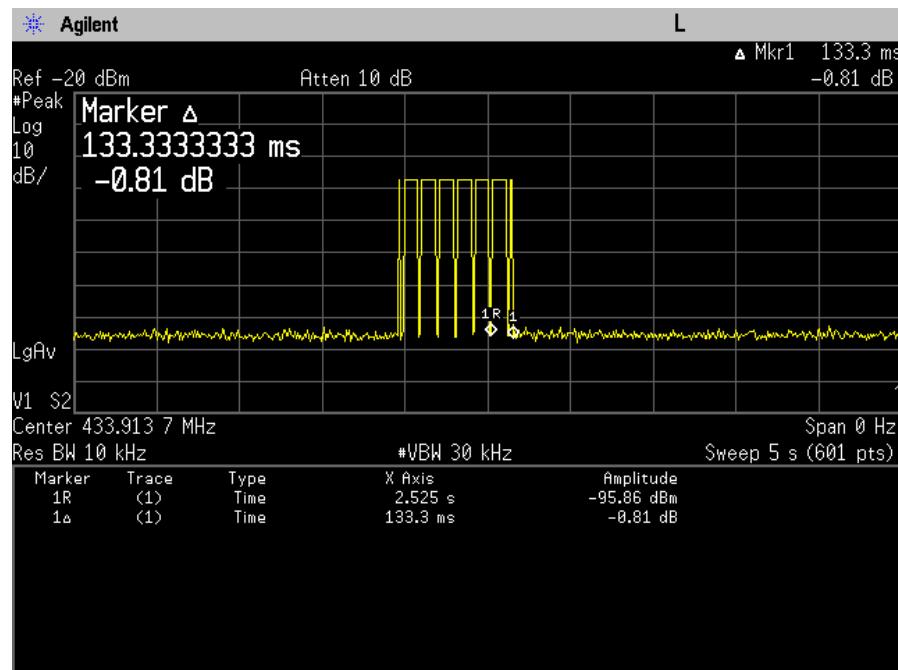
7.5 Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	50%
ATM Pressure:	100.0 kPa
Test Data:	2011-11-07
Test By:	Willis

Set the spectrum to zero span, activated the EUT by manually, And then, we could see the transmitting wave in the spectrum, when the time marker went to “1R”, released the button, After 133.33ms, we could see the EUT stop transmitting.

Frequency (MHz)	Stop Transmitting Time	Limit: not more than 5 seconds of being released	Conclusion
433.92	133.33ms	5s	PASS



8. §15.231- DUTY CYCLE

8.1 Limit

No dedicated limit specified in the Rules.

8.2 Test Procedure

- 8.2.1. Place the EUT on the table and set it in transmitting mode.
- 8.2.2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 8.2.3. Set centre frequency of spectrum analyzer=operating frequency.
- 8.2.4. Set the spectrum analyzer as RBW=10kHz, VBW=300KHz, Span=0Hz, Adjust Sweep=100ms.
- 8.2.5. Repeat above procedures until all frequency measured was complete.

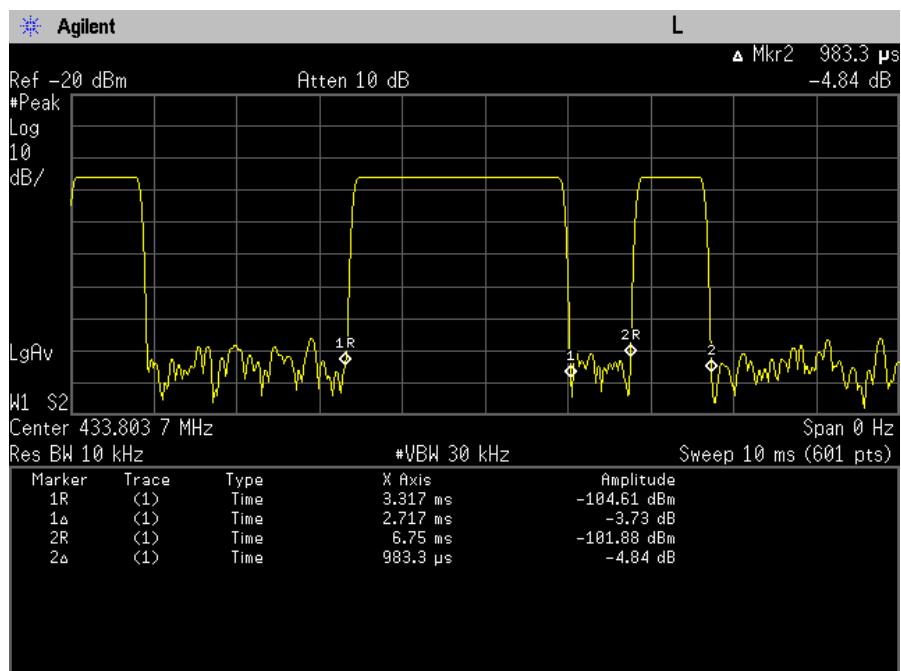
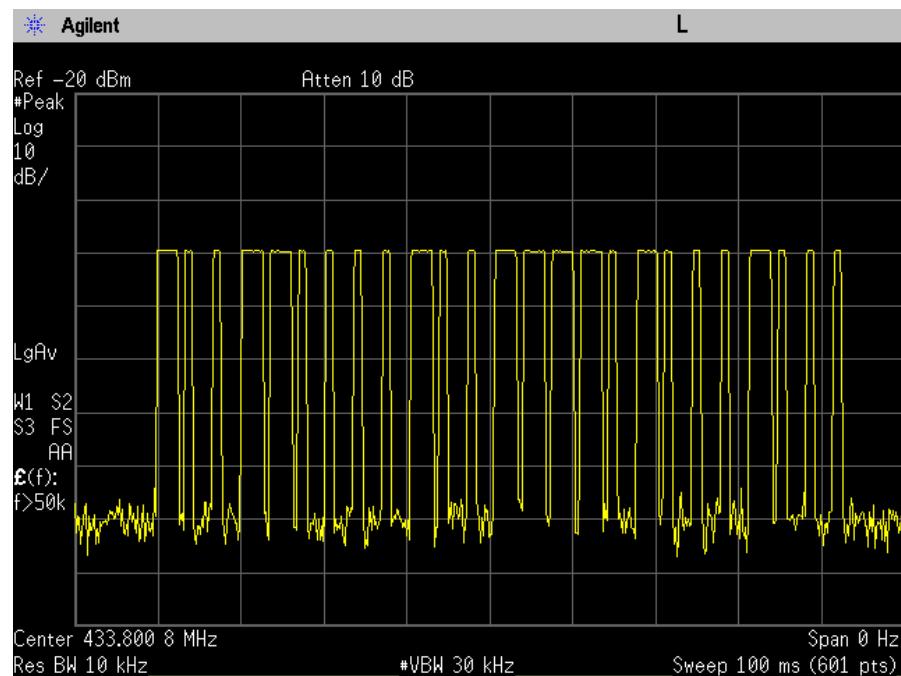
8.3 Test Equipment List and Details

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Spectrum	Agilent	E4407B	MY41440292	2011/06
2	Log per Antenna	ROHDE & SCHWARZ	VULB9163	9163-470	2011/06
3	Antenna	EMCO	3115	9607-4877	2011/06
4	Amplifier	SCHWARZBECK	PAP-0001	21002	2011/06

8.4 Test Data

$$\text{Duty cycle} = T_{\text{ontime}} / 100\text{ms} = (10 * 2.717 + 15 * 0.9833) / 100 = 0.42$$
$$\text{Average factor} = 20 * \log(\text{Duty cycle}) = 20 * \log(0.42) = -7.55$$

Note: The signal bandwidth was measured and less than 100kHz RBW so PDCF factor is not required to correct the fundamental signal peak result.



9. MANUFACTURER/ APPROVAL HOLDER DECLARATION

The following identical model(s):

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Belong to the tested device:

Product description : Portable Wireless Rechargeable Tattoo Power Supply
Model name : TPS-02

No additional models were tested.

-----END OF TEST REPORT-----