

FCC TEST REPORT

FCC ID : ZV4-EX32Q7

Applicant : Shangyu Beisite Electrical Appliance Co., Ltd.

Address : Xiaoyue Town, Shangyu City 312300 Zhejiang Province, China

Equipment Under Test (EUT) :

Product Name : Electronic Ballast

Model No. : E232Q7, E332Q7, E432Q7

Standards : FCC CFR47 Part 18 Section 18.305:2009

Date of Test : July 26, 2011 ~ July 28, 2011

Date of Issue : August 5, 2011

Test Engineer : Hunk yan

Hunk yan

Reviewed By : Philo zhong

Philo zhong

Test Result	: PASS
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Prepared By:

Waltek Services (Shenzhen) Co., Ltd.

1/F, Fukangtai Building, West Baima Rd., Songgang Street, Baoan District,
Shenzhen 518105, China

Tel :+86-755-27553488

Fax:+86-755-27553868

◊ The sample detailed above has been tested to the requirements of Council Directives ANSI C63.4:2003. The test results have been reviewed against the Directives above and found to meet their essential requirements.

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Reference No.: WT10041445-N-E-F

2 Test Summary

Test Item	Test Requirement	Class / Severity	Result
Radiated Emission (30MHz to 1GHz)	FCC CFR47 Part 18 Section 18.305	Class B	PASS
Conducted Emission (450KHz to 30MHz)	FCC CFR47 Part 18 Section 18.307	Class B	PASS

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4 General Information

4.1 Client Information

Applicant : Shangyu Beisite Electrical Appliance Co., Ltd.
Address of Applicant : Xiaoyue Town, Shangyu City 312300 Zhejiang Province, China

Manufacturer : Shangyu Beisite Electrical Appliance Co., Ltd.
Address of Manufacturer : Xiaoyue Town, Shangyu City 312300 Zhejiang Province, China

4.2 General Description of E.U.T.

Product Name : Electronic Ballast
Model No. : E232Q7, E332Q7, E432Q7
Difference Description : All the models have the similar constructions, key components, materials, construction of transformers and electrical connections. Difference among these models : secondary winding of transformer and the parameters of resistor/diode/capacitor in secondary circuit are different to obtain required current. Those have minor influence in respect of the EMC. On the basis of these we choose the model E432Q7 which power is max as the test sample, and the data showing in the report is that model's only, but this report is also applicable to the other models.

4.3 Details of E.U.T.

Technical Data:

Model	Input Voltage	Open Circuit Voltage	Max Output Power
E232Q7	120VAC, 60Hz	600V	65W
E332Q7	120VAC, 60Hz	600V	90W
E432Q7	120VAC, 60Hz	600V	115W

4.4 Description of Support Units

The EUT has been tested as an independent unit. All the test was performed in the condition of DC 5.0V input.

4.5 Standards Applicable for Testing

The customer requested FCC tests for a Electronic Ballast. The standards used were FCC CFR47 Part 18 Section 18.305 and Section 18.307.

4.6 Test Facility

The test facility has a test site registered with the following organizations:

- **IC – Registration No.: IC7760A**

Waltek Services(Shenzhen) Co., Ltd. has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration IC7760A, August 3, 2010.

- **FCC – Registration No.: 880581**

Waltek Services(Shenzhen) 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 880581, May 26, 2011.

4.7 Test Location

All the tests were performed at:-

Waltek Services(Shenzhen) Co., Ltd. at 1/F, Fukangtai Building, West Baima Rd., Songgang Street, Baoan District, Shenzhen, China

5 Equipment Used during Test

Equipment Name	Manufacturer Model	Equipment No	Internal No	Specification	Cal. Date	Due Date	Cert. No	Uncertainty
EMC Analyzer	Agilent/ E7405A	MY45114 943	W2008001	9k-26.5GHz	Aug-2010	Aug-2011	Wws20 081596	±1dB
Trilog Broadband Antenne	SCHWARZB ECK MESS-ELEKTROM/VULB9163	336	W2008002	30-3000 MHz	Aug-2010	Aug-2011	-	±1dB
Broad-band Horn Antenna	SCHWARZB ECK MESS-ELEKTROM/BBHA9120D	667	W2008003	1-18GHz	Aug-2010	Aug-2011	-	f<10 GHz: ±1dB 10GHz<f <18 GHz: ±1.5dB
Broadband Preamplifier 0.5-18 GHz	SCHWARZB ECK MESS-ELEKTROM/BBV 9718	9718-148	W2008004	0.5-18GHz	Aug-2010	Aug-2011	-	±1.2dB
10m Coaxial Cable with N-male Connectors	SCHWARZB ECK MESS-ELEKTROM/AK 9515 H	-	-	-	Aug-2010	Aug-2011	-	-
10m 50 Ohm Coaxial Cable with N-plug, individual length	SCHWARZB ECK MESS-ELEKTROM/AK 9513	-	-	-	Aug-2010	Aug-2011	-	-
Positioning Controller	C&C LAB/CC-C-IF	-	-	-	N/A	N/A	-	-
Color Monitor	SUNSPO/SP-14C	-	-	-	N/A	N/A	-	-
Test Receiver	ROHDE&SC HWARZ/ESPI	101155	W2005001	9k-3GHz	Aug-2010	Aug-2011	Wws20 080942	±1dB
EMI Receiver	Beijingkehuan	KH3931	-	9k-1GHz	Aug-2010	Aug-2011	-	-
Two-Line V-Network	ROHDE&SC HWARZ/ENV216	100115	W2005002	50Ω/50μ H	Aug-2010	Aug-2011	Wws20 080941	±10%
V-LISN	SCHWARZB ECK MESS-ELEKTRONIK	NSLK 8128	8128-259	9k-30MHz	Aug-2010	Aug-2011	-	-

6 Conducted Emission Data

Test Requirement:	FCC CFR47 Part 18 Section 18.307
Test Method:	Based on ANSI C63.4:2003
Frequency Range:	450kHz to 30MHz
Class:	Class B
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth) Quasi-Peak & Average if maximised peak within 6dB of Average Limit

6.1 Test Equipment

Please refer to Section 5 this report.

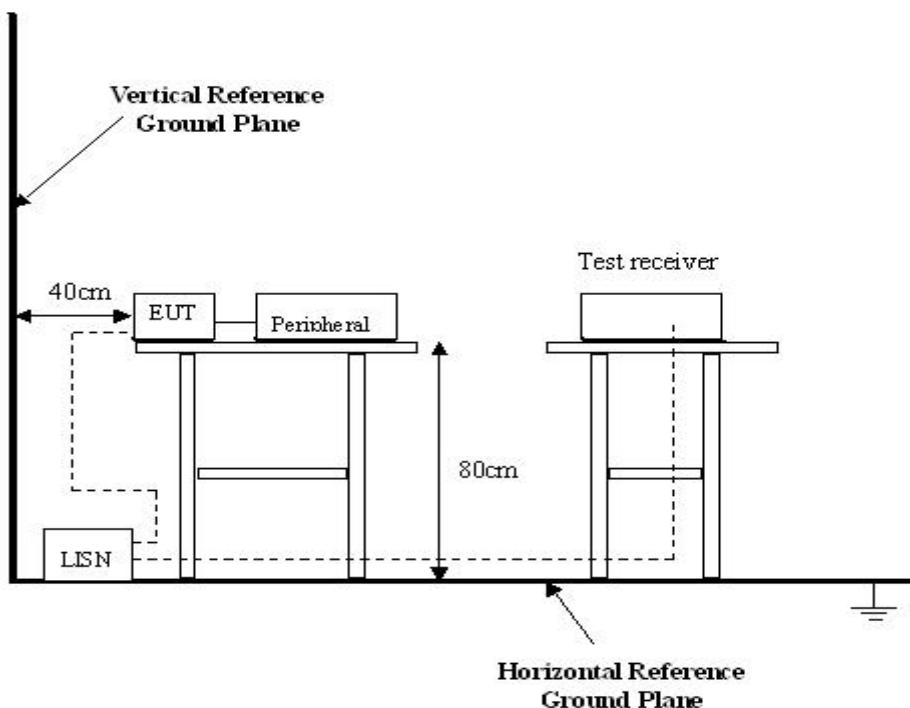
6.2 Test Procedure

1. During the conducted emission test, the power cord of the EUT is connected to the auxiliary outlet of the LISN.
2. The EUT was tested according to FCC MP-5. The frequency spectrum from 450kHz to 30MHz was investigated.
3. The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

6.3 Conducted Test Setup

The conducted emission tests were performed using the setup accordance with the FCC MP-5 measurement procedure.

The power supply used by the EUT is connected to a 120VAC / 60Hz power source.

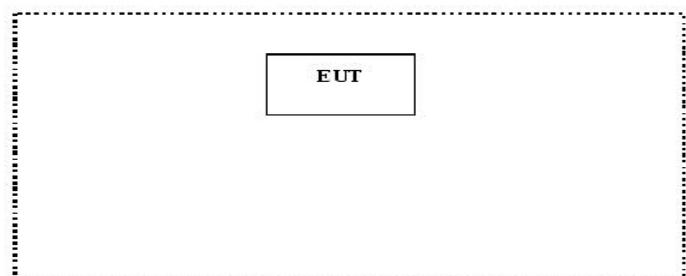


The EUT was placed on the test table in ON mode.

6.4 EUT Operating Condition

Operating condition is according to FCC MP-5.

- A. Setup the EUT and simulators as shown on follow.
- B. Enable RF signal and confirm EUT active.
- C. Modulate output capacity of EUT up to specification.



6.5 Conducted Emission Limits

Frequency of Emission (MHz)	Conducted Limit (dBuV)- Quasi-peak
0.45— 2.51	48
2.51 — 3.0	69.54
3.0 — 30	48

Note: In the above limits, the tighter limit applies at the band edges.

6.6 Spectrum Analyzer

The spectrum analyzer is configured during the conduction test is as follows:

Start Frequency 450 kHz
 Stop Frequency 30 MHz
 Sweep Speed Auto
 IF Bandwidth 9 kHz
 Video Bandwidth 100 kHz
 Quasi-Peak Adaptor Bandwidth 9 kHz
 Quasi-Peak Adaptor Mode Normal

6.7 Conducted Emission Test Result

Test Item: Conducted Emission Test
 Test Voltage: 120VAC / 60Hz
 Test Mode: Normal
 Temperature: 25.5 °C
 Humidity: 51%RH
 Test Result: PASS

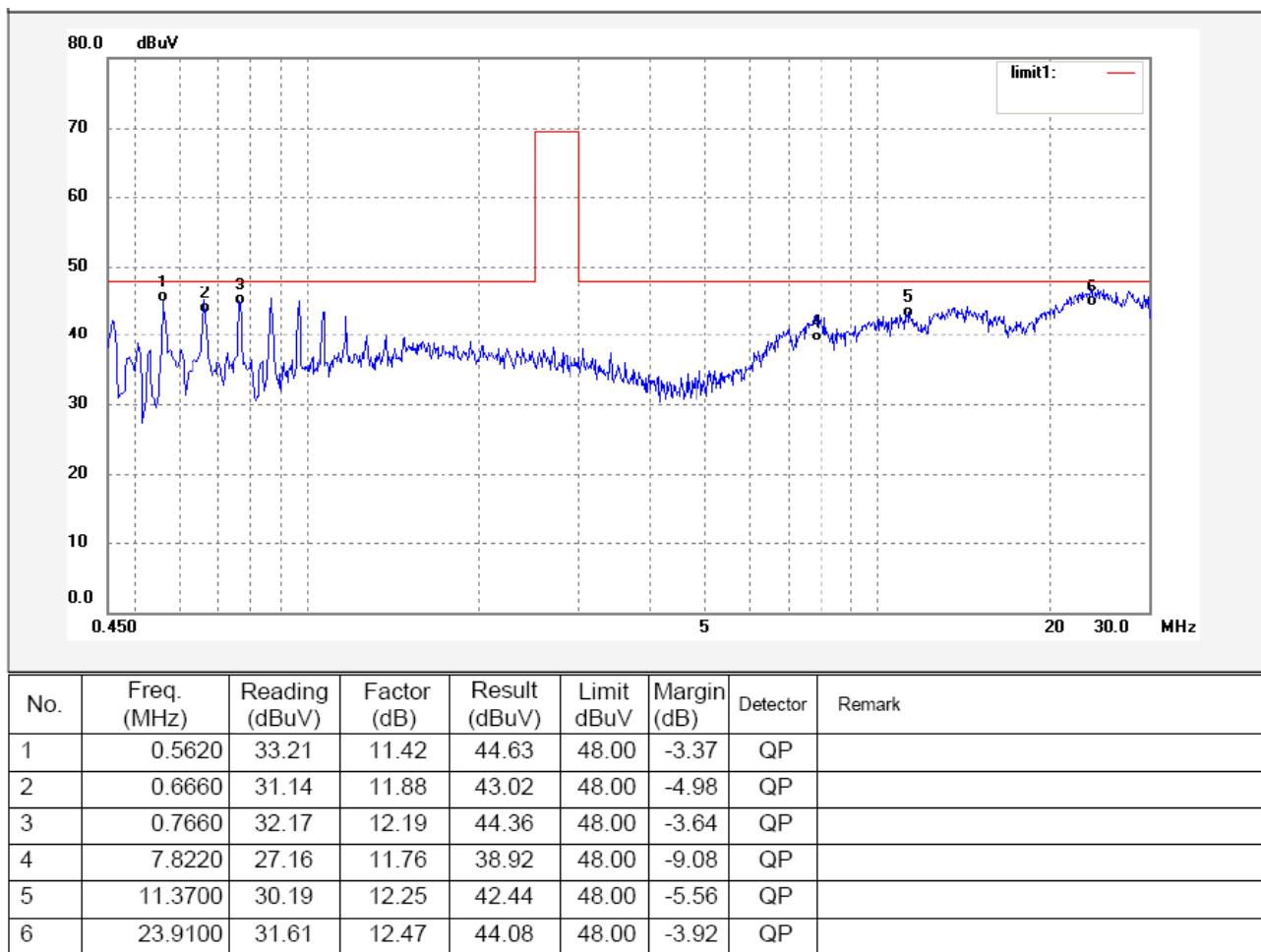
6.8 Measurement Data

An initial pre-scan was performed on the live and neutral lines.

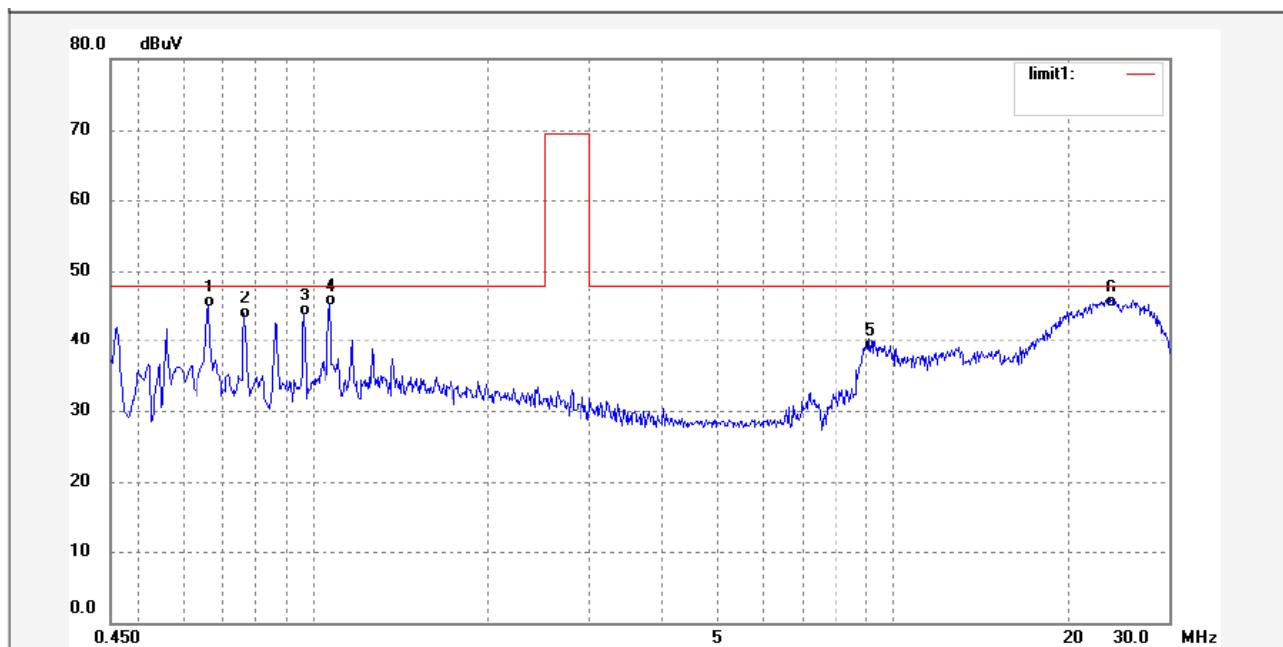
No further quasi-peak or average measurements were performed since no peak emissions were detected within 10dB line below the average limit.

Please refer to the following peak scan graph for reference.

Live line:



Neutral line:

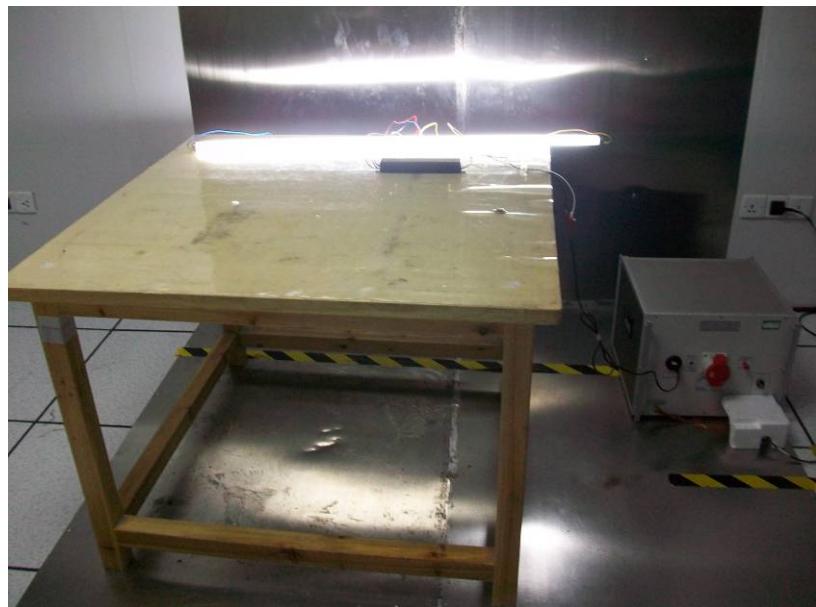


No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.6660	32.84	11.88	44.72	48.00	-3.28	QP	
2	0.7660	31.00	12.19	43.19	48.00	-4.81	QP	
3	0.9700	31.72	11.88	43.60	48.00	-4.40	QP	
4	1.0740	32.76	12.19	44.95	48.00	-3.05	QP	
5	9.1780	26.62	11.89	38.51	48.00	-9.49	QP	
6	23.9100	32.31	12.47	44.78	48.00	-3.22	QP	

WALTEK SERVICES

Reference No.: WT10041445-N-E-F

6.9 Photograph –Conducted Emission Test Setup



7 Radiation Emission Data

Test Requirement: FCC CFR47 Part 18 Section 18.305
Test Method: ANSI C63.4:2003
Test Result: PASS
Frequency Range: 30MHz to 1GHz
Measurement Distance: 3m
Class: Class B
Limit:
40.0 dB μ V/m between 30MHz & 88MHz
43.5 dB μ V/m between 88MHz & 216MHz
46.0 dB μ V/m between 216MHz & 1000MHz
Detector:
Peak for pre-scan (120kHz resolution bandwidth)
Quasi-Peak if maximised peak within 6dB of limit
EUT Operation :
Compliance test was performed in ON mode.

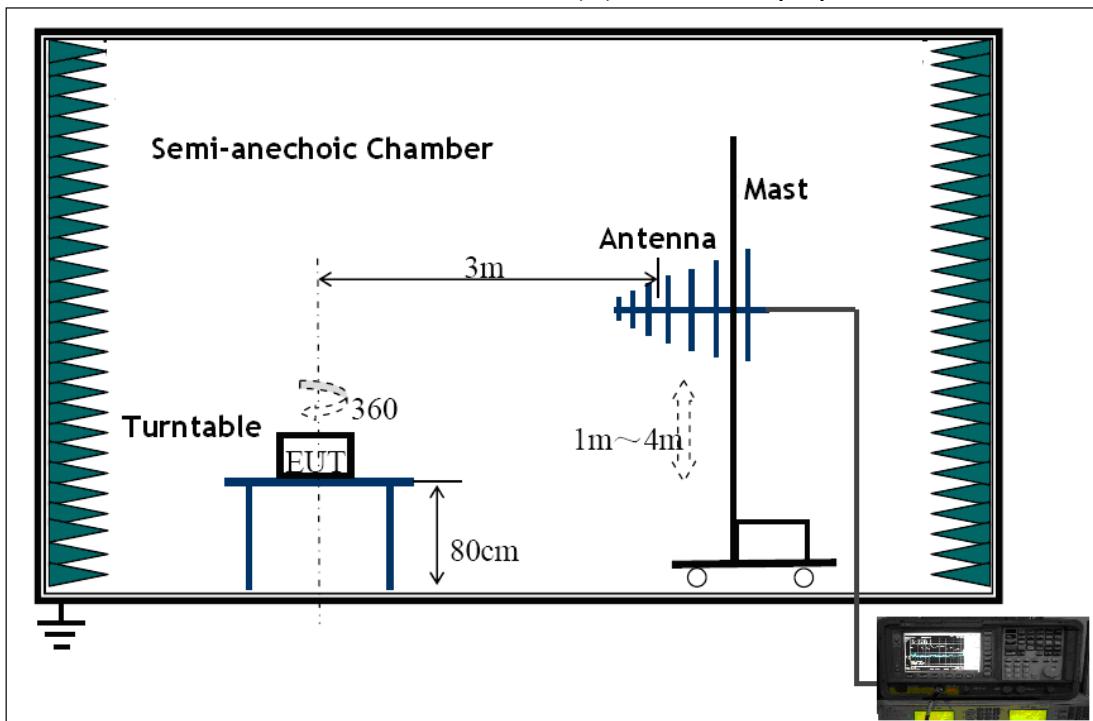
7.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on ANSI C63.4:2003, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Waltek Lab is ± 5.03 dB.

7.2 EUT Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4:2003, The specification used in this report was the FCC CFR47 Part 18 Section 18.305 (C) Consumer equipment limits.



The EUT was placed on the test table in shielding room.

7.3 Spectrum Analyzer Setup

According to FCC CFR47 Part 18 Section 18.305 Rules, the system was tested 30 to 1000MHz.

Start Frequency.....	30 MHz
Stop Frequency	1000MHz
Sweep Speed Auto	
IF Bandwidth.....	120 KHz
Video Bandwidth.....	100KHz
Quasi-Peak Adapter Bandwidth	120 KHz
Quasi-Peak Adapter Mode	Normal
Resolution Bandwidth	100KHz

7.4 Test Procedure

For the radiated emissions test, maximizing procedure was performed on the six (6) highest emissions to ensure EUT is compliant with all installation combinations.

All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB μ V of specification limits), and are distinguished with a "Qp" in the data table.

The EUT was under normal mode during the final qualification test and the configuration was used to represent the worst case results.

7.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

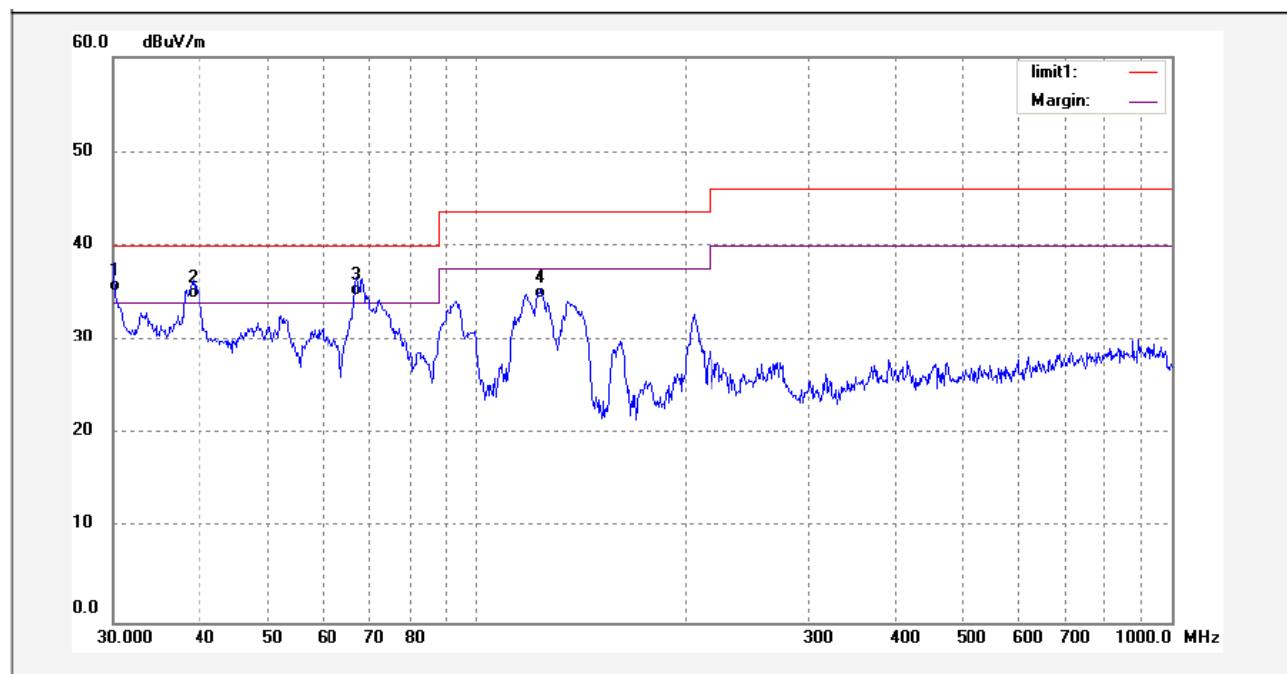
The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB μ V means the emission is 7dB μ V below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Class B Limit}$$

7.6 Summary of Test Results

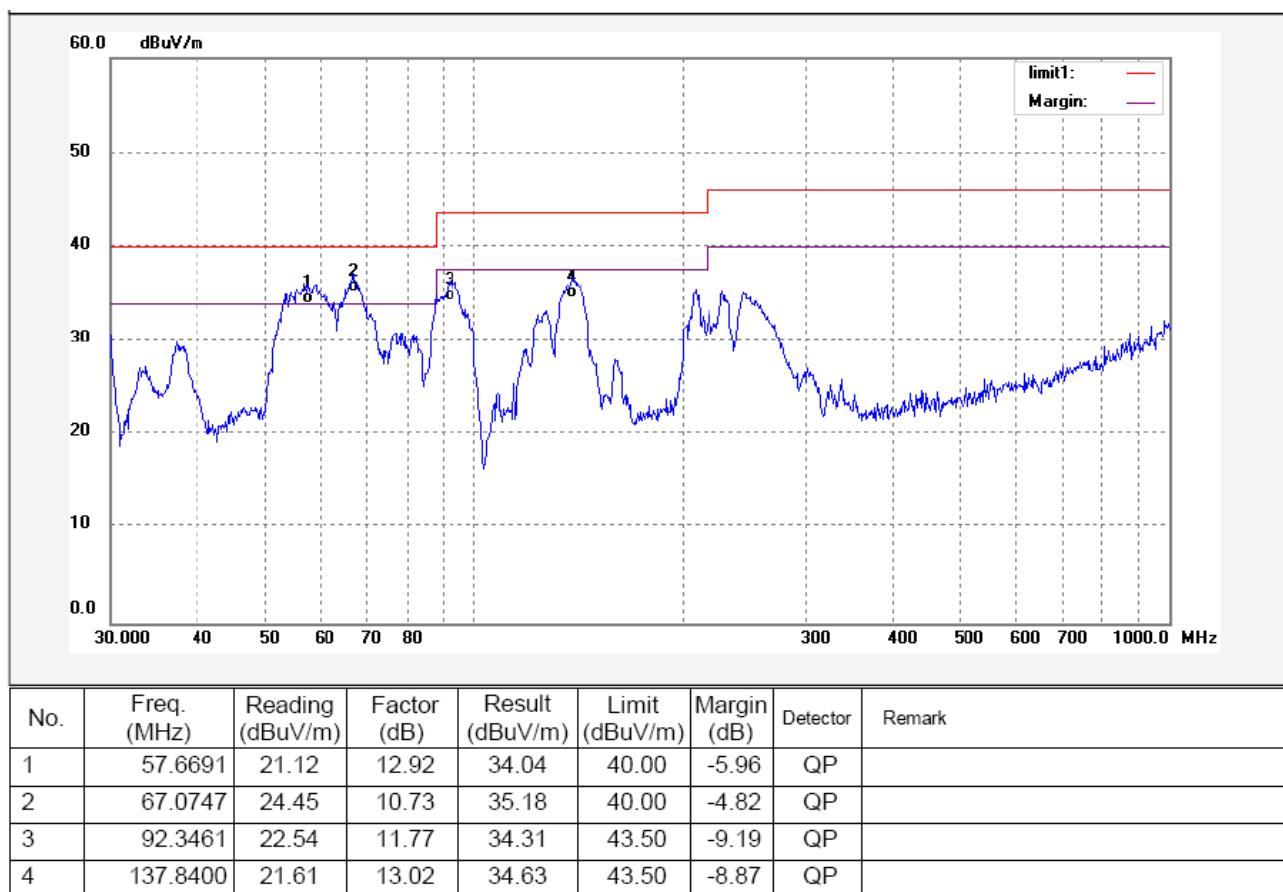
According to the data in this section, the EUT complied with the FCC CFR47 Part 18 standards.

Antenna polarization: Vertical

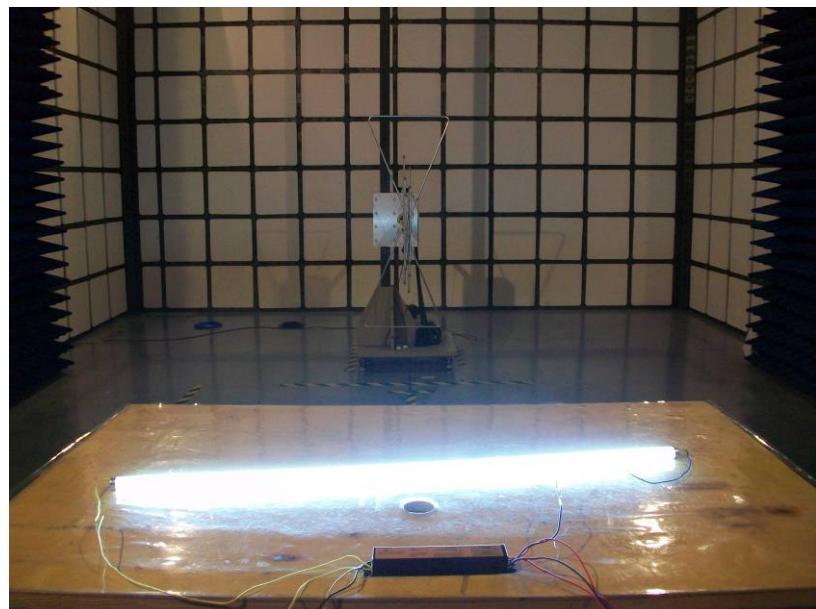


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	30.0000	18.68	16.50	35.18	40.00	-4.82	QP	
2	39.0449	18.30	16.08	34.38	40.00	-5.62	QP	
3	67.3109	24.32	10.41	34.73	40.00	-5.27	QP	
4	123.6149	21.67	12.74	34.41	43.50	-9.09	QP	

Antenna polarization: Horizontal



7.7 Photograph – Radiation Emission Test Setup

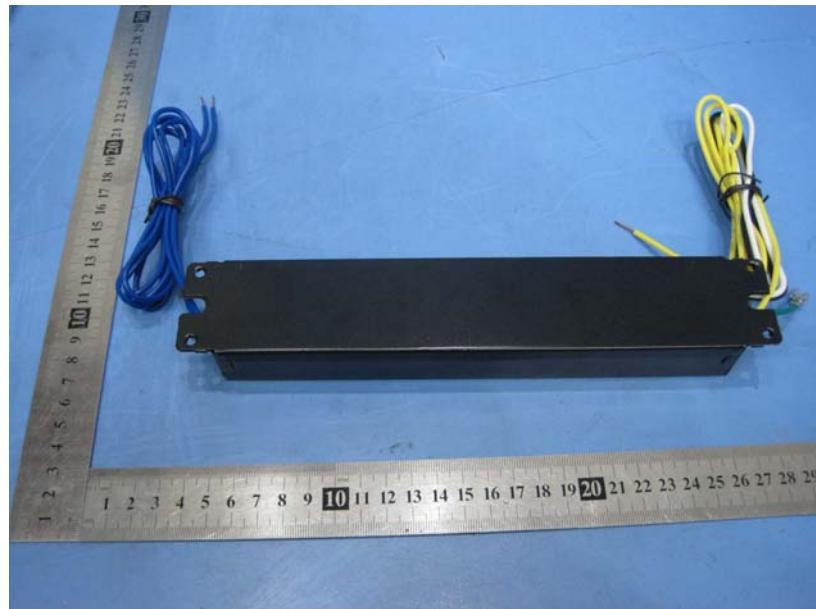


8 Photographs - Constructional Details

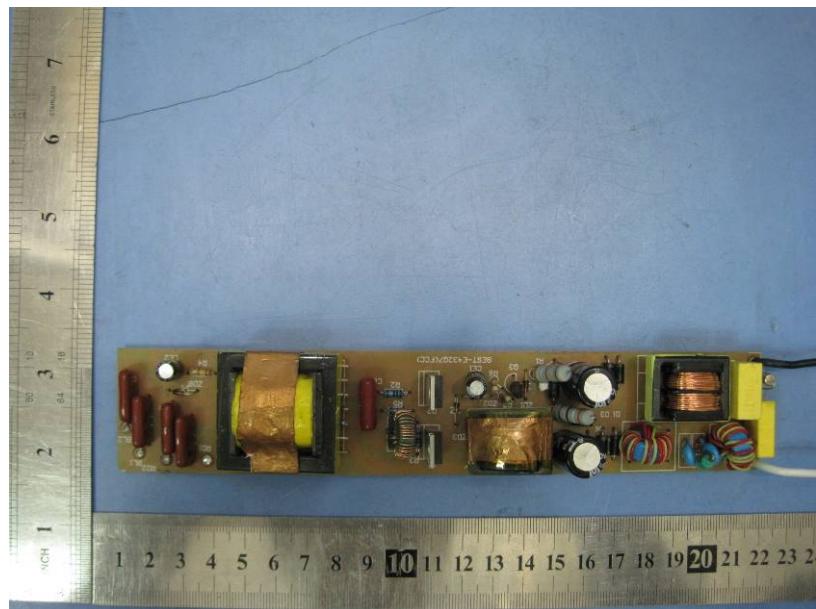
8.1 EUT – Front View



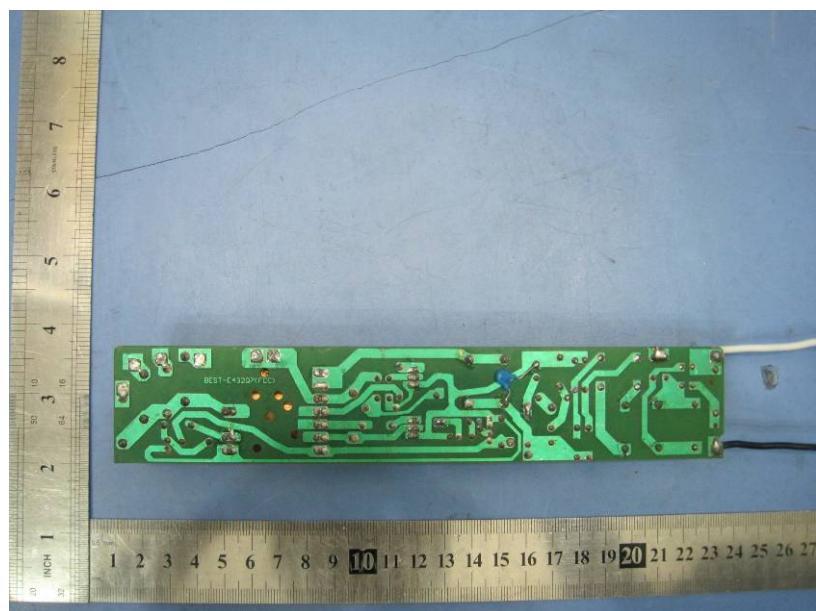
8.2 EUT – Back View



8.3 PCB – Front View



8.4 PCB – Back View



9 FCC Label

This device complies with Part 18 of the FCC Rules. This product may cause interference to radio equipment and should not be installed near maritime safety communications equipment or other critical navigation or communication equipment operating between 0.45–30 MHz.

The Label must not be a stick-on paper. The Label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

