

FCC PART 18  
TEST REPORT

For

**ZHEJIANG NVC LAMPS CO., LTD.**

NO. 201-16, TONGDA ROAD, SOUTH ZONE, HUSHAN DISTRICT,  
JIANGSHAN, ZHEJINAG, CHINA

**FCC ID: VVOESP13**

<b>Report Type:</b> Original Report	<b>Product Type:</b> CFL
<b>Test Engineer:</b> <u>Lebron Wang</u> <i>Lebron Wang</i>	
<b>Report Number:</b> <u>RSZ111213550-00 Rev. A</u>	
<b>Report Date:</b> <u>2012-02-16</u>	
<b>Reviewed By:</b> <u>EMC Engineer</u> <i>Lisa Zhu</i>	
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**Note:** This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP\*, or any agency of the Federal Government.

\* This report contains data that are not covered by the NVLAP accreditation and are marked with an asterisk "★" (Rev.2)

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## GENERAL INFORMATION

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### Product Description for Equipment under Test (EUT)

The ZHEJIANG NVC LAMPS CO., LTD's model: ESP-13W E12, ESP-13W E17 (FCC ID: VVOESP13) (the "EUT") in this report is a CFL, which measure approximately: 11.6 cm (H) x 5.0 cm (D) for model ESP-13W E12; 11.8 cm (H) x 5.0 cm (D) for model ESP-13W E17, rated input voltage: AC 120V/60Hz. The highest operating frequency is from 40 kHz to 50 kHz.

*Note: The serial products, model ESP-13W E12 and ESP-13W E17, they have the same circuit diagram and PCB layout inside, only difference in lamp cap and model No.. We selected model ESP-13W E12 to test, which was explained in the attached product similarity declaration letter.*

*\* All measurement and test data in this report was gathered from production sample serial number: 1112006 (Assigned by BACL, Shenzhen). The EUT was received on 2011-12-13*

### Objective

The following test report is prepared on behalf of ZHEJIANG NVC LAMPS CO., LTD in accordance with Part 2, Subpart J, and Part 18, Subparts A, B and C of the Federal Communication Commissions rules and regulations.

The objective of the manufacturer is to determine compliance with FCC Part 18 limits.

### Related Submittal(s)/Grant(s)

No related submittal(s).

### Test Methodology

All measurements contained in this report were conducted with MP-5, FCC Methods of Measurements of Radio Noise Emissions from ISM Equipment, February 1986. All measurement was performed at Bay Area Compliance Laboratories Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

### Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on December 06, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is an ISO/IEC 17025 accredited laboratory, and is accredited by National Voluntary Laboratory Accredited Program (Lab Code 200707-0).



The current scope of accreditations can be found at <http://ts.nist.gov/Standards/scopes/2007070.htm>

## SYSTEM TEST CONFIGURATION

### Justification

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

### EUT Exercise Software

No exercise software.

### Special Accessories

The special accessories were supplied by Bay Area Compliance Laboratories Corp.

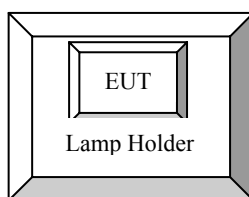
### Equipment Modifications

No modifications were made to the unit tested.

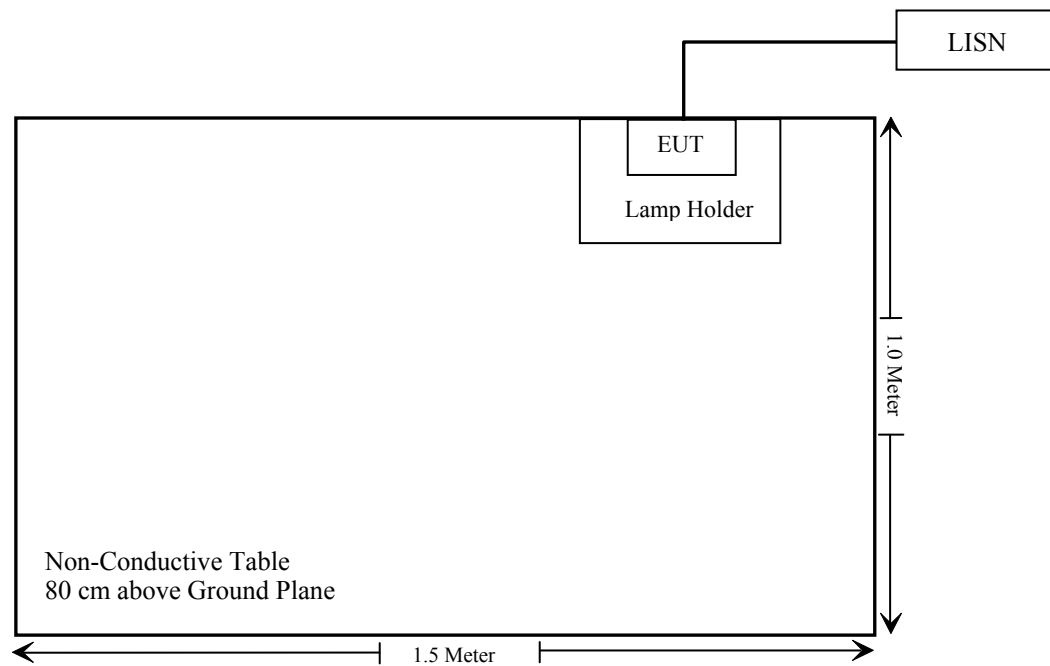
### External I/O Cable

Cable Description	Length (m)	From Port	To
Unshielded Detachable AC Power Cable	1.0	EUT	LISN

### Configuration of Test Setup



## Block Diagram of Test Setup



## FCC §18.307 - AC LINE CONDUCTED EMISSIONS

### Applicable Standard

Conduction limits. For the following equipment, when designed to be connected to the public utility (AC) power line the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies shall not exceed the limits in the following tables. Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN).

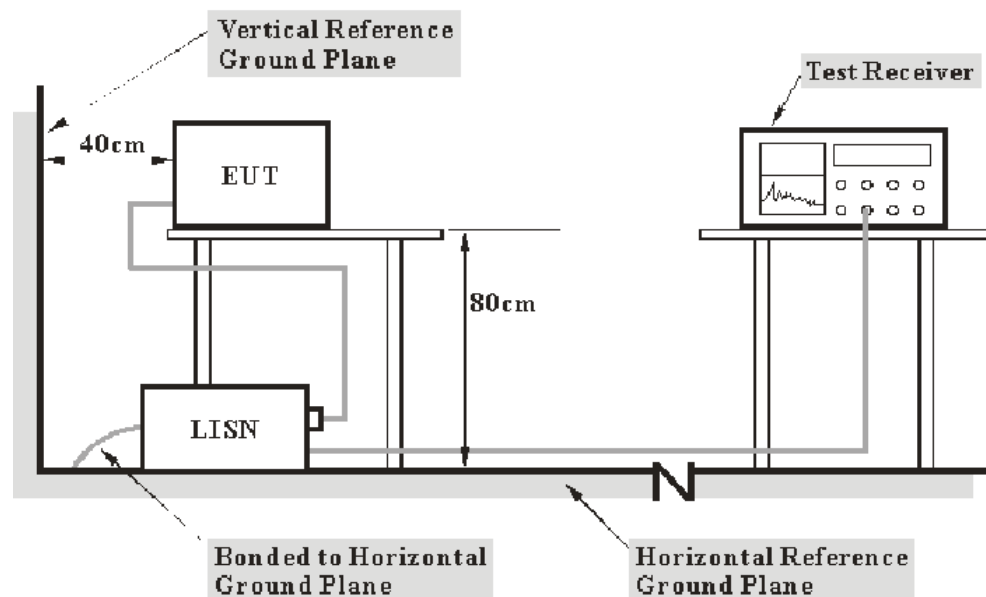
Frequency (MHz)	Maximum RF line voltage measured with a 50 $\mu$ H/50 ohm LISN (uV)
Non-consumer equipment:	
0.45 to 1.6	1,000
1.6 to 30	3,000
Consumer equipment:	
0.45 to 2.51	250
2.51 to 3.0	3,000
3.0 to 30	250

### Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on CISPR 16-4-2, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratories Corp. is 2.4 dB (k=2, 95% level of confidence).

### EUT Setup



- Note: 1. Support units were connected to second LISN.  
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with MP-5: 1986 measurement procedure. Specification used was with the FCC Part 18 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The EUT was connected to a 120 VAC/60 Hz power source.

### EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 450 kHz to 30 MHz.

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

<u>Frequency Range</u>	<u>IFBW</u>
450 kHz – 30 MHz	9 kHz

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	830245/006	2011-03-03	2012-03-02
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2011-03-09	2012-03-08
Rohde & Schwarz	Pulse limiter	ESH3Z2	DE25985	2011-07-08	2012-07-07

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

### Test Procedure

During the conducted emission test, the EUT was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-Peak detection mode.

### Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 18, with the worst margin reading of:

**10.28 dB at 0.535 MHz** in the **Neutral** conducted mode

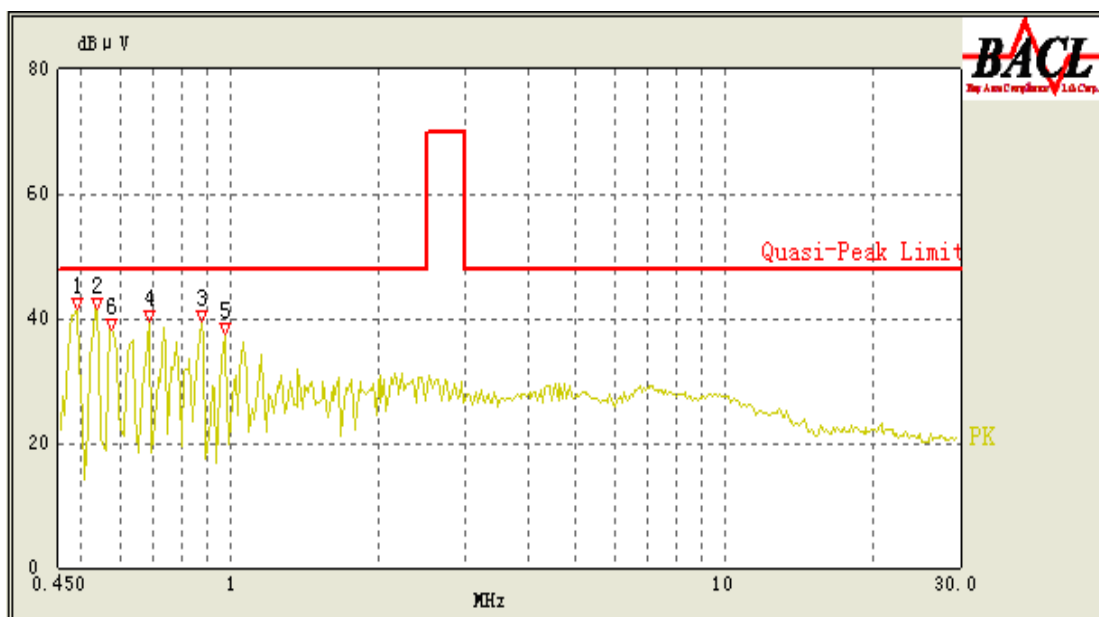


**Test Data****Environmental Conditions**

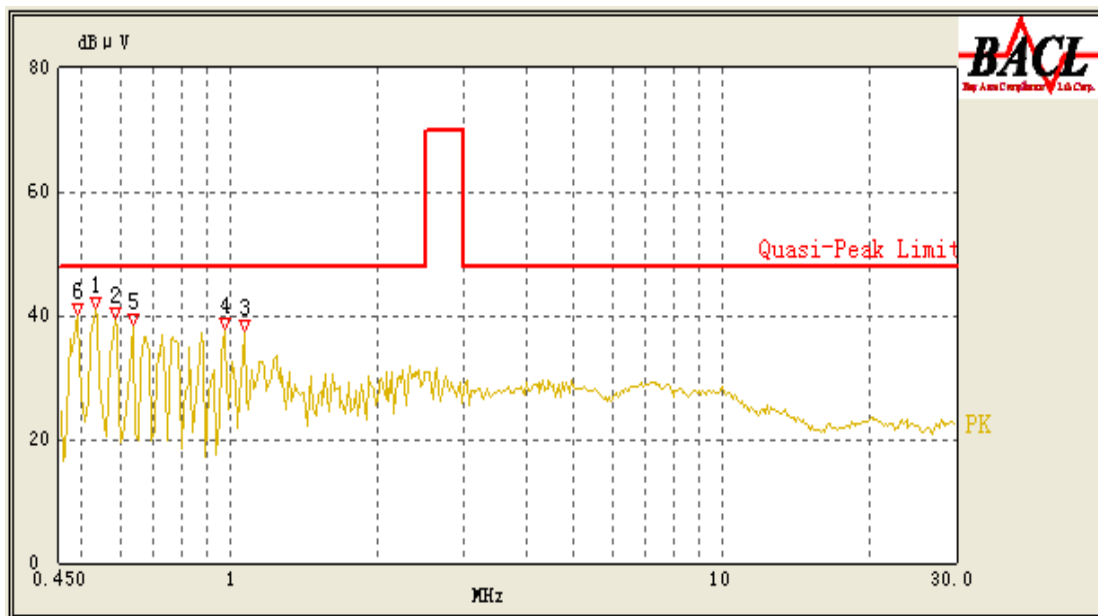
<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	48 %
<b>ATM Pressure:</b>	101.0 kPa

Testing was performed by Lebron Wang on 2012-01-04.

Test Mode: On

**AC 120V/60 Hz, Line:**

Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)
0.540	36.84	10.10	48.00	11.16
0.490	36.73	10.10	48.00	11.27
0.880	35.63	10.10	48.00	12.37
0.685	35.17	10.10	48.00	12.83
0.975	32.98	10.10	48.00	15.02
0.575	32.39	10.10	48.00	15.61

**AC 120V/ 60 Hz, Neutral:**

Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)
0.535	37.72	10.10	48.00	10.28
0.585	37.09	10.10	48.00	10.91
0.490	35.29	10.10	48.00	12.71
0.635	34.88	10.10	48.00	13.12
1.070	33.76	10.10	48.00	14.24
0.975	33.58	10.10	48.00	14.42

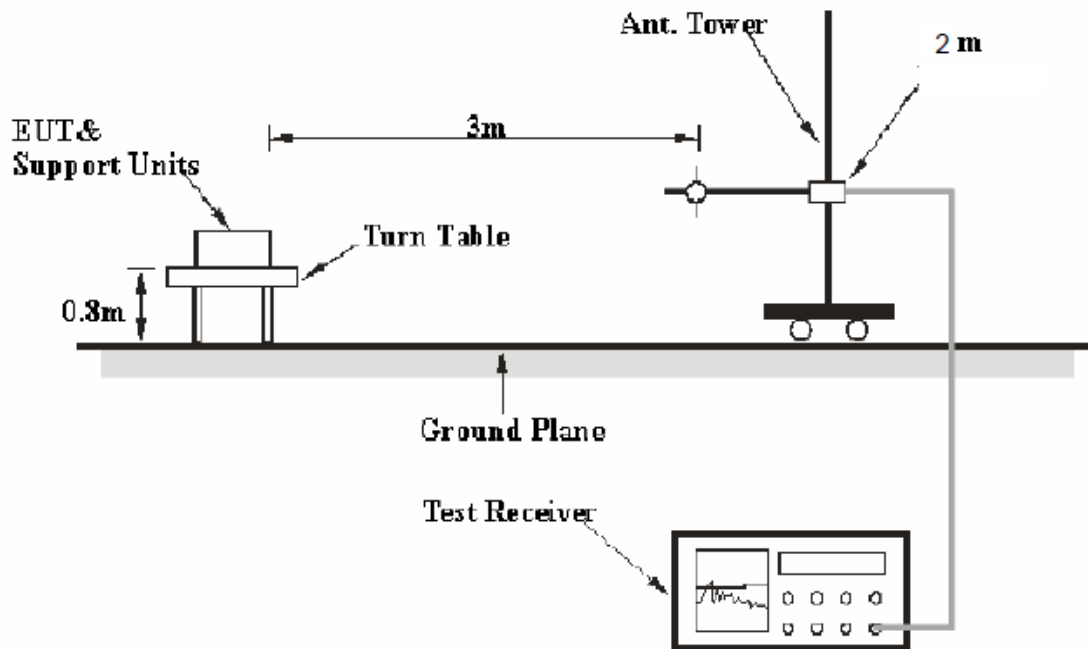
## FCC §18.305 – FIELD STRENGTH

### Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in 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 CISPR 16-4-2, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is 4.0 dB (k=2, 95% level of confidence).

### EUT Setup



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the FCC MP - 5.

The EUT was connected to 120 VAC/60 Hz power source.

## EMI Test Receiver Setup

The system was investigated from 9 kHz to 30 MHz.

During the radiated emission test, the EMI test receiver and Spectrum Analyzer were set with the following configurations:

<i>Frequency Range</i>	<i>R B/W</i>	<i>Video B/W</i>	<i>IF B/W</i>
9kHz– 150kHz	300 Hz	1 kHz	200Hz
150kHz– 30 MHz	100 kHz	300 kHz	9 kHz

## Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
ETS-LINDGREN	Passive Loop Antenna	6512	00029604	2011-07-14	2012-07-13
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2011-11-11	2012-11-10

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

## Test Procedure

For the radiated emissions test, the EUT was connected to the AC floor outlet.

Maximizing procedure was performed on the six (6) highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Quasi-peak detection mode from 9 kHz to 30 MHz.

## Corrected Amplitude Calculation

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

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss}$$

## Test Data

### Environmental Conditions

Temperature:	25 °C
Relative Humidity:	48 %
ATM Pressure:	101.0 kPa

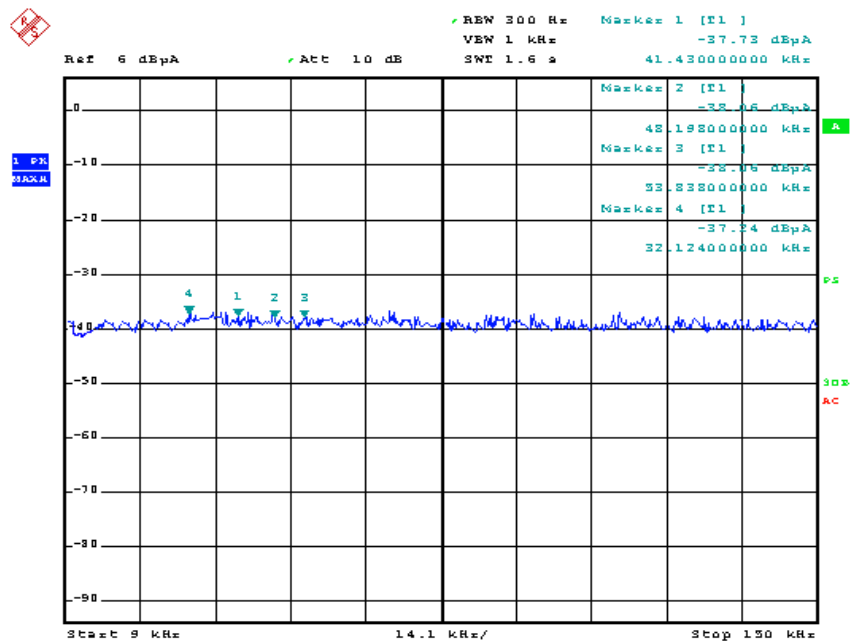
*The testing was performed by Lebron Wang on 2012-02-15.*

Test Mode: On

Frequency (MHz)	Detector		Direction (Degree)	Height (m)	Antenna Factor (dB S/m)	Cable Loss (dB)	Corrected Amplitude	
	(QP)	(PK)					(dBμA/m)	(dBμV/m)
0.04143	-39.1	-37.73	100	2	21.4	0.1	-17.6	33.9
0.04819	-42.5	-38.06	248	2	20.1	0.1	-22.3	29.2
0.05383	-41.1	-38.06	175	2	19.7	0.1	-21.3	30.2
0.03212	-42.1	-37.24	24	2	19.3	0.1	-22.7	28.8
9.82140	-29.2	-23.92	100	2	-19.3	0.1	-48.4	3.1
14.3586	-31.3	-25.29	100	2	-19.5	0.1	-50.7	0.8

Note: dBμV/m = dBμA/m+51.5 dB

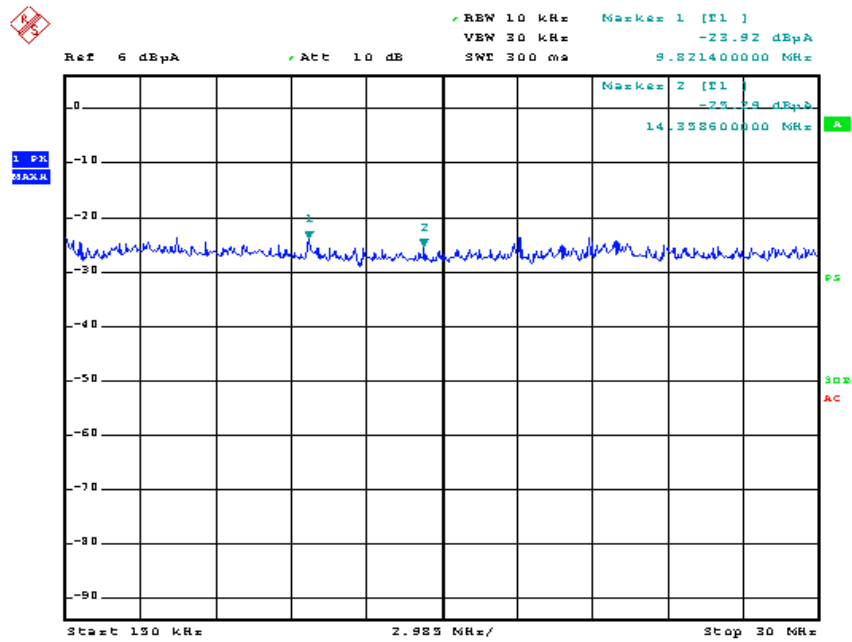
## 9 - 150 kHz



EUT

Date: 14.FEB.2012 18:04:10

# 150 kHz - 30 MHz



EUT

Date: 14.FEB.2012 18:07:07

**PRODUCT SIMILARTITY DECLARATION LETTER**

ZHEJIANG NVC LAMPS CO.,LTD

ADD: NO201-16,TONGDA ROAD,SOUTH ZONE,HUSHAN DISTRICT , JIANGSHAN,  
ZHEJINAG,China  
TEL: 0570-4221962  
FAX: 0570-4221029

**Different Declaration**

We, ZHEJIANG NVC LAMPS CO., LTD, declare that the CFL, The  
model No. ESP-13W E12 is tested by BACL. The model No.  
ESP-13W E17 and ESP-13W E12 have the same circuit diagram, PCB  
layout in side, and only different in the lamp cap. Their differences are  
described as the following form. Thank you!

Model name	lamp cap
ESP-13W E17	E17
ESP-13W E12	E12

Sincerely,

2011-12-16

Ma Jian Kun

Manager

*Ma Jian kun***\*\*\*\*\* END OF REPORT \*\*\*\*\***