



**SGS-CSTC Standards
Technical Services
(Shanghai) Co., Ltd.**

588 West Jindu Road, Songjiang District, Shanghai, China

Telephone: +86 (0) 21 6191 5666
Fax: +86 (0) 21 6191 5655
ee.shanghai@sgs.com

Report No.: SHEM111200165201
Page: 1 of 18

TEST REPORT

Application No. : SHEM111200165201
Applicant: Jiangsu Tianying Environmental Protection Technology Co.,Ltd
FCC ID: A8N-GT-200-ULSF
Fundamental Frequency : 49.86 MHz
Equipment Under Test (EUT):
Marking: N/A
Name: Light Fountain Show
Model No.: GT-200-ULSF
Type of EUT: Transmitter
Standards: FCC PART 15 SUBPART C, Section 15.235
Date of Receipt: January 6, 2011
Date of Test: January 9, 2012 to January 21, 2012
Date of Issue: January 21, 2012
Test Result : **PASS ***

* In the configuration tested, the EUT complied with the standards specified above.

E&E Section Manager
SGS-CSTC(Shanghai) Co., Ltd.

E&E Project Engineer
SGS-CSTC(Shanghai) Co., Ltd.

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2 Test Summary

TEST ITEM	FCC REFERANCE	RESULT
Transmitter Field Strength and Bandwidth Requirement	15.235	Pass
Antenna Requirement	15.203	Compliance

Noted: “-” means not require in the rules.



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4 General Information

4.1 Client Information

Applicant :	Jiangsu Tianying Environmental Protection Technology Co.,Ltd
Applicant Address:	No.268, Huanghai Road(West) , Hai'an Town, Nantong City , Jiangsu Province, China
Manufacturer:	KIRIN OPTO- ELECTRONICS(JIANGSU)CO.,LTD
Manufacturer Address:	No.268, Huanghai Road(West), Hai'an Town, Nantong City , Jiangsu Province, China

4.2 Details of E.U.T.

Marking:	N/A
Name:	Light Fountain Show
Model No.:	GT-200-ULSF
Power Supply:	DC battery:9V
Frequency	49.86MHz
Product Description	The Equipment Under Test (EUT) is a floating fountain with light(transmitter portion) operating at 49.86MHz. The EUT is powered by 1x9v "9V-size" battery. As a transmitter, it transmits commands to a receiver for ON/OFF,different lighting and fountain combinations on the receiver.
Antenna Type:	External, Intergral

4.3 Description of Support Units

Name	Model No.	Remark
N/A	N/A	N/A

4.4 Test Location

Tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.
No.588 West Jindu Road, Songjiang District, Shanghai, China. 201612.

Tel: +86 21 6191 5666 Fax: +86 21 6191 5655

No tests were sub-contracted.

4.5 Other Information Requested by the Customer

None.



4.6 Test Facility

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

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2014-07-26.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2012-03-17.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2014-09-20.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3172 and C-3514 respectively. Date of Registration: 2009-11-30. Date of Expiry: 2012-03-17.



Test Results

4.7 Test Instruments

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	EMI test receiver	Rohde & Schwarz	ESU40	100109	2011-6-3	2012-6-1
2	Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-679	2011-6-3	2012-6-1
3	Horn Antenna	Rohde & Schwarz	HF906	100284	2011-3-12	2012-3-10
4	ANTENNA	SCHWARZBECK	VULB9168	9168-313	2011-6-3	2012-6-1
5	Ultra broadband antenna	Rohde & Schwarz	HL562	100227	2011-11-7	2012-11-5
6	Atmosphere pressure meter	Shanghai ZhongXuan Electronic Co;Ltd	BY-2009P	--	2011-12-13	2011-12-11
7	CLAMP METER	FLUKE	316	86080010	2011-04-22	2012-04-20
8	Thermo-Hygrometer	ZHICHEN	ZC1-2	01050033	2012-01-5	2013-01-3
9	High-low temperature cabinet	Shanghai YuanZhen	GW2050	--	2011-6-17	2012-6-16
11	Tunable Notch Filter	Wainwright instruments GmbH	WRCT1800.0/2000.0-0.2/40-5SSK	11	2011-1-26	2012-1-25
12	Tunable Notch Filter	Wainwright instruments GmbH	WRCT800.0/880.0-0.2/40-5SSK	9	2011-1-26	2012-1-25
13	High pass Filter	FSCW	HP 12/2800-5AA2	19A45-02	2011-4-8	2012-4-7
14	Low nosie amplifier	TESEQ	LNA6900	70133	2011-7-5	2012-7-4
15	EMI test receiver	Rohde & Schwarz	ESCS30	100086	2011-06-04	2012-06-03

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16	Line impedance stabilization network	SCHWARZBECK	NSLK8127	8127-490	2011-05-07	2012-05-06
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4.8 E.U.T. Operation

Input voltage: 9V DC Battery

Operating Environment:

Temperature: 25.0 °C

Humidity: 45 % RH

Atmospheric Pressure: 1010 mbar

EUT Operation: The EUT has been tested under operating condition.

4.9 Test Procedure & Measurement Data

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4.9.1 Radiated Spurious Emission

Test Requirement: FCC §15.235 , §15.209

Test date: January. 18, 2011

Standard Applicable ANSI C63.10:2009

Test Procedures:

1. Test Procedures for emission from 30 MHz to 1000 MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.

b. During performing radiated emission below 1 GHz, the EUT was set 3 meters away from the interference receiving antenna, which was mounted on the top of a variable-height antenna tower. During performing radiated emission above 1 GHz, the EUT was set 1 meter away from the interference-receiving antenna.

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

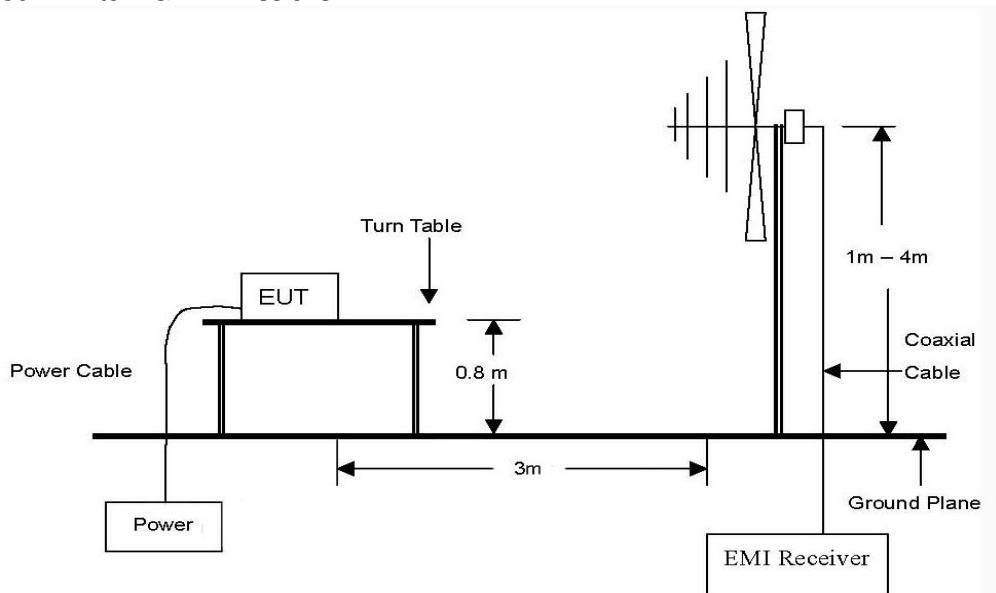
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

EUT Setup:

The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz Emissions.





Measurement Result

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.

Radiated Spurious Emissions Limits

(a) The field strength of any emission within this band shall not exceed 10,000 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in Section 15.35 for limiting peak emissions apply.

(b) The field strength of any emissions appearing between the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 26 dB below the level of the unmodulated carrier or to the general limits in Section 15.209, whichever permits the higher emission levels. The field strength of any emissions removed by more than 10 kHz from the band edges shall not exceed the general radiated emission limits in Section 15.209. All signals exceeding 20 microvolts/meter at 3 meters shall be reported in the application for certification.

Radiated Emission Test Data, Fundamental Frequency

15.235 Operation within the band 49.82 - 49.90 MHz.

(a) The field strength of any emissions within the band 49.82 - 49.90 MHz shall not exceed 10,000 microvolts/meter (= 80 dB_uV/m) at 3 meters.

Measurement Result

The following table shows the highest levels of radiated emissions on polarizations of horizontal and vertical.

Radiated Emissions			Ant	Correction Factors	Total	FCC Limit	
Frequency (MHz)	Reading (dB _u V)	Detect Mode	Pol.	Ant.(dB/m)	Emission Level (dB _u V/m)	Peak Limit at 3m (dB _u V/m)	Margin (dB)
49.86	70.51	Peak	V	-9.3	61.21	100	-38.79

1. Peak Limit=Averager Limit + 20= 20log(10000)+20=100dB_uV/m

2. Correction Factors=Antenna Factor + Cable Factor -Preamplifier Factor

Frequency (MHz)	Ant.Pol. (H/V)	Peak Result (dB _u V/m)	Duty Cycle (dB)	AVG Result (dB _u V/m)	AVG Limit at 3m (dB _u V/m)	Margin (dB)
49.86	V	61.21	-5.84	55.37	80	-24.63

Avg Result=Peak Result+Duty Cycle

1. 3m Average Limit(dB_uV/m) = 20log(10000)=80dB_uV/m

Remark:

To get a maximum emission level from the EUT, the EUT was moved throughout the XY, XZ and YZ Planes and set the length of antenna to the maximum. The worst emission was found in stand up position(XY axis) and the worst case was recorded.



Radiated Emission

FCC 15.235(b)&15.209

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

30MHz~1GHz

Radiated Emissions			Ant	Correction Factors	Total	FCC Limit	
Frequency (MHz)	Reading (dBuV)	Detect Mode	Pol.	Ant.(dB/m)	Emission Level (dB μ V/m)	Limit at 3m (dBuV/m)	Margin (dB)
99.45	47.87	Peak	V	-12.4	35.47	43.5	8.03
149.504	45.2	Peak	V	-8.1	37.10	43.5	6.4
199.556	42.8	Peak	V	-12.0	30.80	43.5	12.7
249.220	41.53	Peak	V	-10.1	31.43	46	14.57
299.272	33.99	Peak	V	-8.6	25.39	46	20.61
349.153	32.62	Peak	V	-7.3	25.32	46	20.68
398.916	39.42	Peak	V	-6.3	33.12	46	12.88
448.652	41.63	Peak	V	-4.9	36.73	46	9.27
498.704	39.36	Peak	V	-4.2	35.16	46	10.84

Correction Factors=Antenna Factor + Cable Factor –Preamplifier Factor

Remark:

To get a maximum emission level from the EUT, the EUT was moved throughout the XY, XZ and YZ planes and set the length of antenna to the maximum. The worst emission was found in standup position(XY axis) and the worst case was recorded.

Note: 1. Other Spurious Emission Frequencies were not detected up to 1000 MHz.



Duty cycle

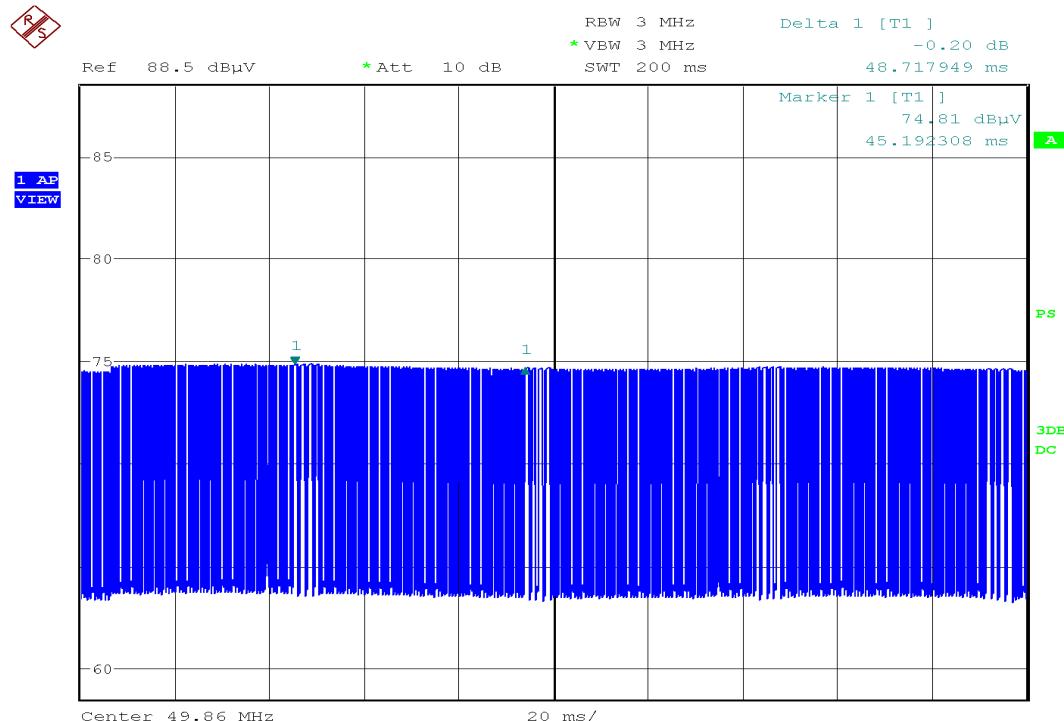
Measurement Result:

Ton = $1.122 \times 4 + 0.3526 \times 58 = 24.9388$ ms

Tp = 48.878ms

Factor = $20 \times \log(Ton/Tp) = 20 \times \log (24.9388/48.878) = -5.84$ dB

Test Plot:

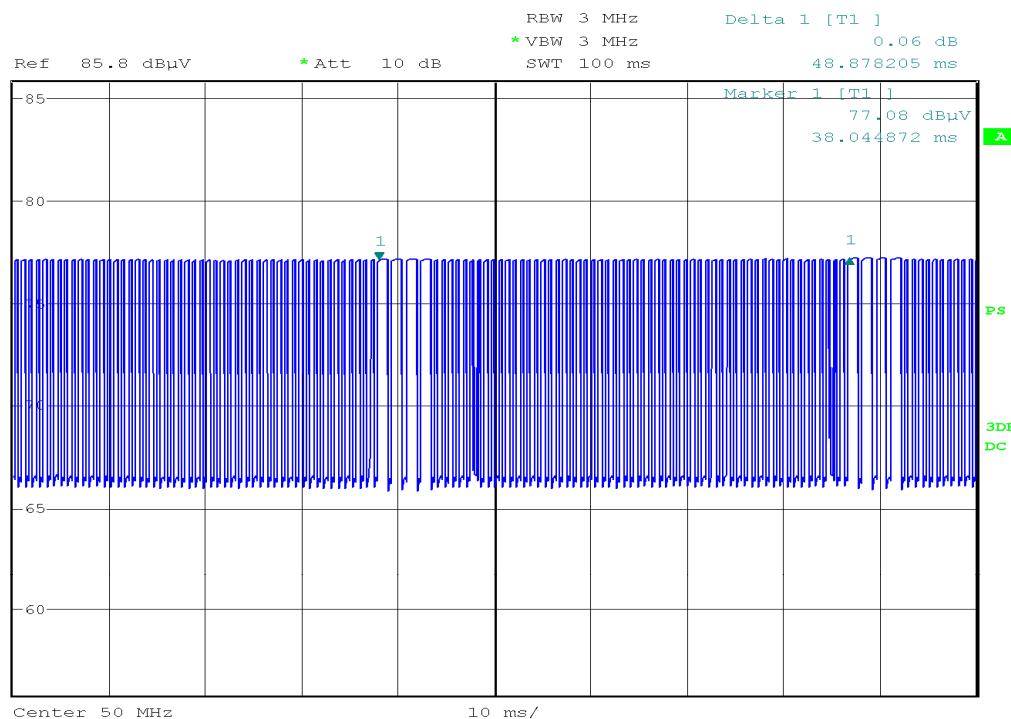




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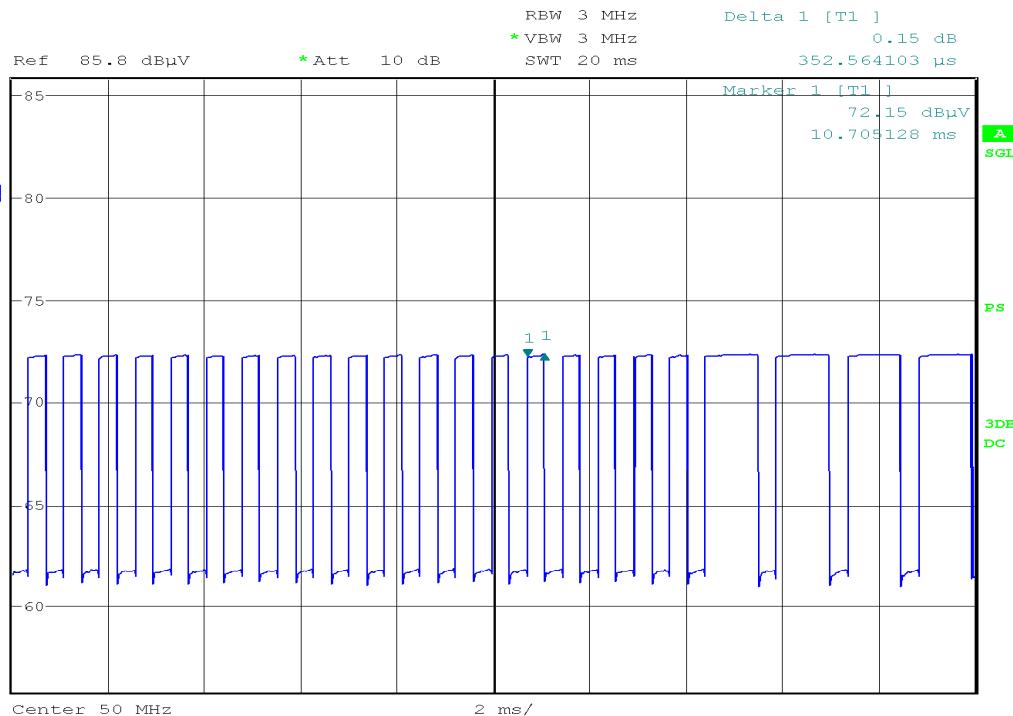
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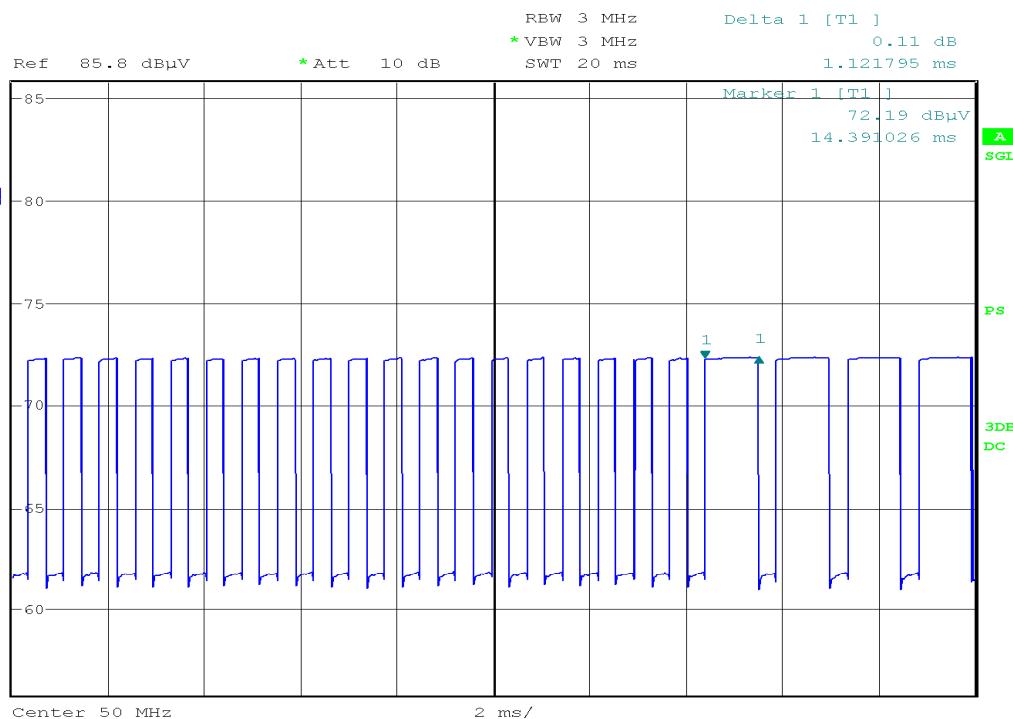
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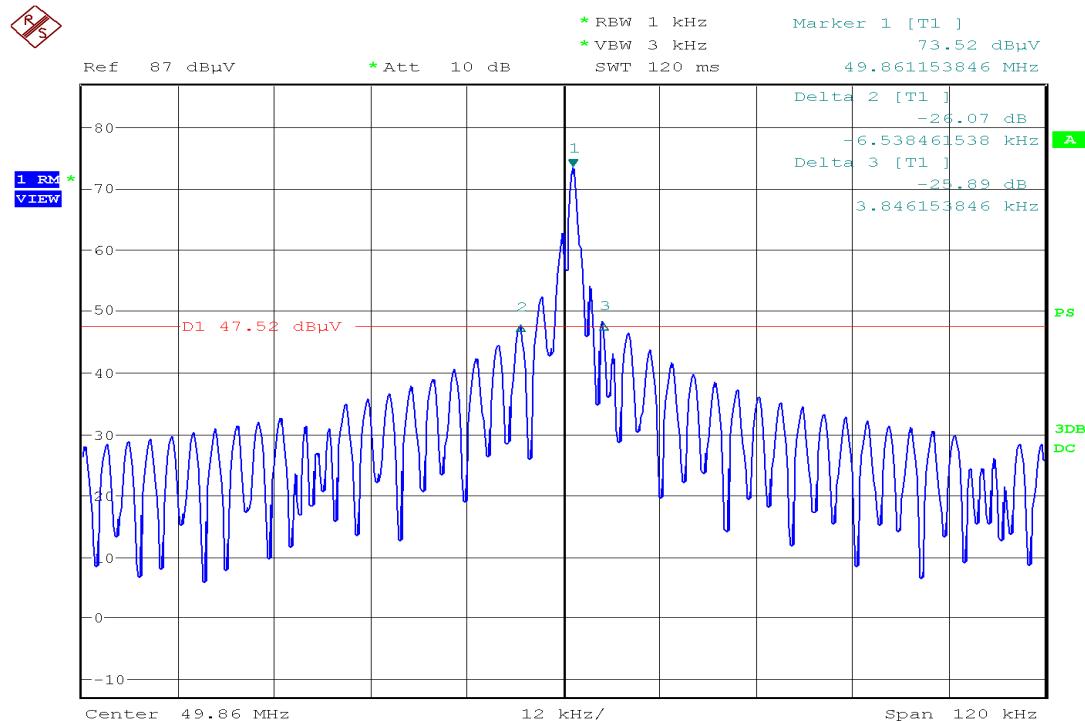
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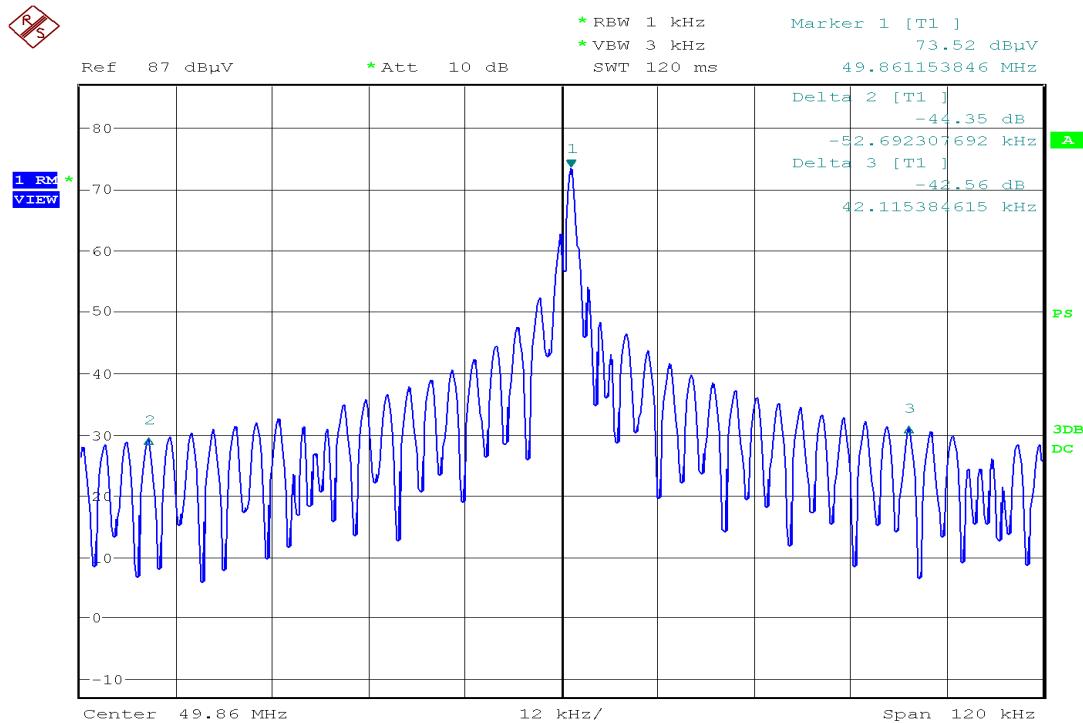
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Bandwidth Test Plot:




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4.9.2 Antenna Requirement

Test Requirement: FCC Part15 15.203

5.3.7.1 Standard 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.

5.3.7.2 Antenna Connected Construction

The antenna connector is designed with permanent attachment and no consideration of replacement. Please see EUT photo for details.

5.3.7.3 Result

The EUT uses a permanently attached antenna which, in accordance to section 15.203, is considered sufficient to comply with the provisions of this section.

4.9.3 EUT Constructional Details

Front View





Back View



For the test setup photos and EUT photos please refer to the setup photo.pdf and internal photos.pdf.

End of the Report

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