



**CENTRE OF TESTING SERVICE
INTERNATIONAL**

OPERATE ACCORDING TO ISO/IEC 17025

FCC ID/IC TEST REPORT

TEST REPORT NUMBER : CGZ3120605-00426-EFI



CENTRE OF TESTING SERVICE CO., LTD.

Building F, Dachuang industrial park, No.379, Zhongshan Dadao,
Guangzhou, China.



TEST REPORT For FCC ID/IC

Report Reference No. CGZ3120605-00426-EFI

Date of issue..... 08 November 2012

Testing Laboratory Name CENTRE OF TESTING SERVICE CO., LTD.

Address..... Building F, Dachuang industrial park, No.379, Zhongshan Dadao, Guangzhou, China.

Testing location/ procedure Full application of Harmonised standards ☒

Partial application of Harmonised standards ☐

Other standard testing method ☐

Applicant's name..... VIRGINIA OPTOELECTRONICS, INC.

Address..... 1405 Ashford Court, Blacksburg, VA 24060, USA

Test specification

Standard 47 CFR PART 15 OCT, 2011, ANSI C63.4-2009

RSS-210 Issue 8, RSS-Gen Issue 3

Test Report Form No. CTSEMC-1.0

TRF Originator..... CENTRE OF TESTING SERVICE CO., LTD.

Master TRF..... Dated 2009-01

CENTRE OF TESTING SERVICE CO., LTD. All rights reserved.

This publication may be reproduced in whole or in part for non-commercial purposes as long as the CENTRE OF TESTING SERVICE CO., LTD is acknowledged as copyright owner and source of the material. CENTRE OF TESTING SERVICE CO., LTD takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

Test item description RGB Controller

Trade Mark VAOPTO

Manufacturer..... VIRGINIA OPTOELECTRONICS, INC.

Model/Type reference..... VO-24-CTL

Ratings..... Battery 4.5V(TX)

Operating Frequency..... 433.92MHz

Result PASSED

Compiled by:

Kate zhang / File administrators

Supervised by:

Duke yang / Technique principal

Approved by:

Vincent.Yao / Manager

Copyright of this report is owned by Centre of Testing Service and may not be reproduced other than in full except with the written approval of the issuing Company.

CENTRE OF TESTING SERVICE CO., LTD.

Building F, Dachuang industrial park, No.379, Zhongshan Dadao, Guangzhou, China

Tel: +86-20-85543113 (32 lines)

Fax: +86-20-38780406

Complaint line: +86-20-85533471

E-mail: cts@cts-lab.com.cn

See Reverse For Terms And Conditions of Service



FCC ID -- T E S T R E P O R T

Test Report No. :	CGZ3120605-00426-EFI	<u>08 November 2012</u> Date of issue
--------------------------	-----------------------------	--

Type / Model.....	VO-24-CTL
EUT.....	RGB Controller
Applicant.....	VIRGINIA OPTOELECTRONICS, INC.
Address.....	1405 Ashford Court, Blacksburg, VA 24060, USA
Telephone.....	+1-702-517-5789
Fax.....	+1-702-979-3582
Contact.....	Charles Li
Manufacturer.....	VIRGINIA OPTOELECTRONICS, INC.
Address.....	1405 Ashford Court, Blacksburg, VA 24060, USA
Telephone.....	+1-702-517-5789
Fax.....	+1-702-979-3582
Contact.....	Charles Li
Factory	VIRGINIA OPTOELECTRONICS, INC.
Address.....	1405 Ashford Court, Blacksburg, VA 24060, USA
Telephone.....	+1-702-517-5789
Fax.....	+1-702-979-3582
Contact.....	Charles Li

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.

Copyright of this report is owned by Centre of Testing Service and may not be reproduced other than in full except with the written approval of the issuing Company.

CENTRE OF TESTING SERVICE CO., LTD.

Building F, Dachuang industrial park, No.379, Zhongshan Dadao, Guangzhou, China

Tel: +86-20-85543113 (32 lines)

Fax: +86-20-38780406

Complaint line: +86-20-85533471

E-mail: cts@cts-lab.com.cn

See Reverse For Terms And Conditions of Service



TABLE OF CONTENTS

Description	Page
1. TEST STANDARDS.....	5
2. SUMMARY	5
2.1 GENERAL REMARKS.....	5
2.2 FINAL ASSESSMENT	5
3. EQUIPMENT UNDER TEST.....	6
3.1 POWER SUPPLY SYSTEM UTILISED	6
3.2 SHORT DESCRIPTION OF THE EQUIPMENT UNDER TEST (EUT)	6
3.3 EUT OPERATION MODE.....	6
3.4 EUT CONFIGURATION	7
4. TEST ENVIRONMENT	8
4.1 ADDRESS OF THE TEST LABORATORY	8
4.2 TEST FACILITY	8
4.3 ENVIRONMENTAL CONDITIONS	8
4.4 DEFINITIONS OF SYMBOLS USED IN THIS TEST REPORT	8
4.5 STATEMENT OF THE MEASUREMENT UNCERTAINTY	8
4.6 MEASUREMENT UNCERTAINTY.....	9
5. Summary of standards and results	9
5.1.DESCRPTION OF STANDARDS AND RESULTS	9
6. Power Line Conducted Emission Test	10
6.1.1 DESCRIPTION OF THE TEST LOCATION.....	10
6.1.2 DESCRIPTION OF THE TEST SET-UP	10
6.1.3 LIMITS OF DISTURBANCE (CLASS B)	10
6.1.4 TEST RESULT.....	11
7. Radiated disturbance (electric field)	12
7.1.TEST EQUIPMENT.....	12
7.2.BLOCK DIAGRAM OF TEST SETUP	12
7.3.RADIATED EMISSION LIMIT STANDARD: FCC 15.231,209.....	13
7.4.TEST PROCEDURE	13
7.5.RADIATED EMISSION TEST RESULTS	14
8. 20 dB Bandwidth test.....	22
8.1. TEST EQUIPMENT.....	22
8.2. TEST INFORMATION.....	22
8.3. TEST RESULTS	23

Copyright of this report is owned by Centre of Testing Service and may not be reproduced other than in full except with the written approval of the issuing Company.

CENTRE OF TESTING SERVICE CO., LTD.

Building F, Dachuang industrial park, No.379, Zhongshan Dadao, Guangzhou, China

Tel: +86-20-85543113 (32 lines)

Fax: +86-20-38780406

Complaint line: +86-20-85533471

E-mail: cts@cts-lab.com.cn

See Reverse For Terms And Conditions of Service



9. Stop Transmitting Time Test	24
9.1. TEST EQUIPMENT.....	24
9.2. TEST INFORMATION.....	24
9.3. TEST RESULTS	24
10. Pulse Desensitization Correction Factor	26
10.1. TEST EQUIPMENT.....	26
TEST INFORMATION.....	26
10.3. TEST RESULTS	26
11. 99% bandwidth.....	29
11.1 TEST PROCEDURE.....	29
11.2. TEST EQUIPMENT.....	29
11.3. TEST INFORMATION.....	29
11.4. TEST RESULTS	29
12. Manufacturer/ Approval holder Declaration	31

Copyright of this report is owned by Centre of Testing Service and may not be reproduced other than in full except with the written approval of the issuing Company.

CENTRE OF TESTING SERVICE CO., LTD.

Building F, Dachuang industrial park, No.379, Zhongshan Dadao, Guangzhou, China

Tel: +86-20-85543113 (32 lines)

Fax: +86-20-38780406

Complaint line: +86-20-85533471

E-mail: cts@cts-lab.com.cn

See Reverse For Terms And Conditions of Service

1. TEST STANDARDS

The tests were performed according to following standards:

- 47 CFR PART 15 OCT, 2011
- ANSI C63.4-2009
- RSS-210 Issue 8
- RSS-Gen Issue 3

2. SUMMARY

2.1 GENERAL REMARKS

Date of receipt of test sample	5 June 2012
Testing commenced on	5 June~08 November 2012
Testing concluded on	08 November 2012

2.2 FINAL ASSESSMENT

The FCC requirements pertaining to the technical standards and tested operation modes are

- - fulfilled.
- ☐ - **not** fulfilled.

The equipment under test

- - fulfils the FCC/IC requirements cited on page 1.
- ☐ - **does not** fulfil the FCC/IC requirements cited on page 1.

3. EQUIPMENT UNDER TEST

3.1 Power supply system utilised

Power supply voltage : ☒ Battery 4.5V(TX)

3.2 Short description of the Equipment under Test (EUT)

Number of tested samples: 1

Serial number: Prototype

3.3 EUT operation mode

The equipment under test was operated during the measurement under the following conditions:

For Radiation emission:

- ☒ -TX +X position
- ☐ -TX +Y position
- ☐ -TX +Z position

Operation mode 1: TX +X position

Note: X position of EUT is the worst case, so only these test results be recorded in the test report.



3.4 EUT configuration

3.4.1. Description of configuration (EUT)

Description	:	RGB Controller
Model Number	:	VO-24-CTL
Operation frequency	:	433.92MHz
Radio Technology	:	FSK
Modulation Technology	:	FSK modulation
Antenna	:	PCB Antenna

3.4.2. Tested Supporting System Details

N/A

Copyright of this report is owned by Centre of Testing Service and may not be reproduced other than in full except with the written approval of the issuing Company.

CENTRE OF TESTING SERVICE CO., LTD.

Building F, Dachuang industrial park, No.379, Zhongshan Dadao, Guangzhou, China

Tel: +86-20-85543113 (32 lines)

Fax: +86-20-38780406

Complaint line: +86-20-85533471

E-mail: cts@cts-lab.com.cn

See Reverse For Terms And Conditions of Service

4. TEST ENVIRONMENT

4.1 Address of the test laboratory

Building F, Dachuang industrial park, No.379, Zhongshan Dadao, Guangzhou, China

Tel: +86-20-85543113 (32 lines)

Fax: +86-20-38780406

4.2 Test facility

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

CNAS-Lab Code: L3394

CENTRE OF TESTING SERVICE CO., LTD has been assessed and proved to be in compliance with CNAS-CL01: 2006 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

IC-Registration No.: 8374A

The 3m Alternate Test Site of CENTRE OF TESTING SERVICE CO., LTD has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 8374A on June 6, 2011 .

FCC-Registration No.: 971995

CENTRE OF TESTING SERVICE 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 No.791995, July 13, 2012.

4.3 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15~35 ° C
Humidity:	25~75 %
Atmospheric pressure:	86~106 kPa

4.4 Definitions of symbols used in this test report

- - The black square indicates that the listed condition, standard or equipment is applicable for this report.
- - The empty square indicates that the listed condition, standard or equipment is **not** applicable for this report.

4.5 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 CTS 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.



4.6 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conduction disturbance	150kHz~30MHz	$\pm 1.22\text{dB}$	(1)
Power disturbance	30MHz~300MHz	$\pm 1.38\text{dB}$	(1)
Radiation emission (3m)	30MHz~300MHz	$\pm 3.14\text{dB}$	(1)
	300MHz~1000MHz	$\pm 3.18\text{dB}$	(1)
	1GHz~18GHz	$\pm 3.54\text{dB}$	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

5. Summary of standards and results

5.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

EMISSION		
Description of Test Item	Standard	Results
Conducted Emission Test	ANSI C63.4-2009 FCC Part 15 C: 15.207 RSS-Gen:7.2.4	N/A
Radiated Emission Test	ANSI C63.4-2009 FCC Part 15 C: 15.231 RSS-Gen:7.2 RSS-210 A5	PASSED
20 dB Bandwidth Test	ANSI C63.4-2009 FCC Part 15 C: 15.231 RSS-Gen:4.6.3	PASSED
Stop Transmitting Time Test	ANSI C63.4-2009 FCC Part 15 C: 15.231	PASSED
99% Bandwidth	RSS-210 Annex 8 RSS-Gen 4.6.1	PASSED
N/A is an abbreviation for Not Applicable.		

Copyright of this report is owned by Centre of Testing Service and may not be reproduced other than in full except with the written approval of the issuing Company.

CENTRE OF TESTING SERVICE CO., LTD.

Building F, Dachuang industrial park, No.379, Zhongshan Dadao, Guangzhou, China

Tel: +86-20-85543113 (32 lines)

Fax: +86-20-38780406

Complaint line: +86-20-85533471

E-mail: cts@cts-lab.com.cn

See Reverse For Terms And Conditions of Service



6.1.4 Test result

The EUT power by battery. Not Applicable.

Copyright of this report is owned by Centre of Testing Service and may not be reproduced other than in full except with the written approval of the issuing Company.

CENTRE OF TESTING SERVICE CO., LTD.

Building F, Dachuang industrial park, No.379, Zhongshan Dadao, Guangzhou, China

Tel: +86-20-85543113 (32 lines)

Fax: +86-20-38780406

Complaint line: +86-20-85533471

E-mail: cts@cts-lab.com.cn

See Reverse For Terms And Conditions of Service

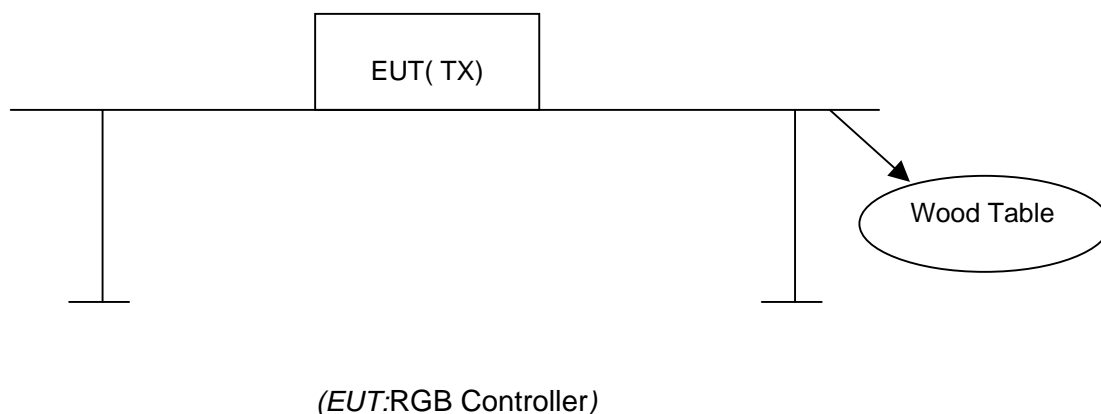
7. Radiated disturbance (electric field)

7.1.Test Equipment

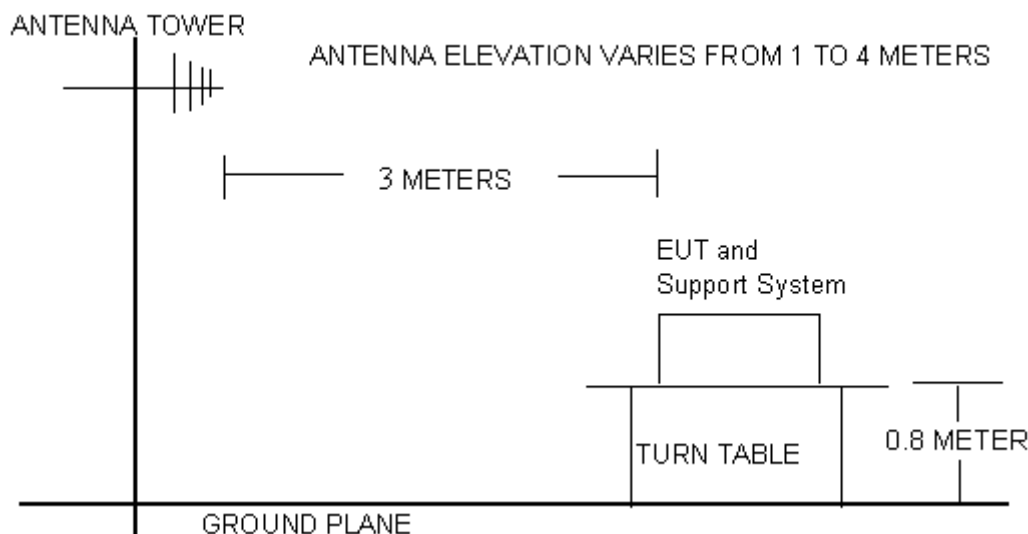
Radiated disturbance (electric field)					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	100868	2011/12
2	Biconical Antenna	ROHDE & SCHWARZ	HK116	100221	2011/12
3	Log per Antenna	ROHDE & SCHWARZ	HL223	100226	2011/12
4	Log per Antenna	ROHDE & SCHWARZ	HL050	100186	2011/12
5	Signal analyzer	ROHDE & SCHWARZ	FSIQ26	100311	2011/12
6	Loop Antenna	A.R.A	PLA-1030/B	1030	2011/12

7.2.Block Diagram of Test Setup

7.2.1 Block Diagram of connection between EUT and simulators



7.2.2 Anechoic Chamber Setup Diagram



7.3. Radiated Emission Limit Standard: FCC 15.231,209

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V}/\text{m}$	$\text{dB}(\mu\text{V})/\text{m}$
0.009 ~ 0.490	300	$2400/\text{F}(\text{KHz})$	----
0.490 ~ 1.705	30	$24000/\text{F}(\text{KHz})$	----
1.705 ~ 30	30	30	----
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	Other: $74.0 \text{ dB}(\mu\text{V})/\text{m}$ (Peak) $54.0 \text{ dB}(\mu\text{V})/\text{m}$ (Average)	

- Remark:
- (1) Emission level $\text{dB}\mu\text{V} = 20 \log$ Emission level $\mu\text{V}/\text{m}$
 - (2) The smaller limit shall apply at the cross point between two frequency bands.
 - (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

7.4. Test Procedure

The EUT and its simulators are placed on a turn table, which is 0.8 meter high above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarization of the antenna is set on Test. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4-2009 on radiated emission Test.

The frequency range from 30MHz to 1000MHz and above 1GHz. is investigated. Please see the following pages.

All measurements for radiated emissions within the restricted bands were performed using a Quasi-Peak detector with 120kHz RBW below 1GHz and a Peak and Average detector with 1MHz RBW above 1GHz,



All measurements for radiated emissions within the restricted bands were performed using a Quasi-Peak detector with 300kHz VBW below 1GHz and a Peak detector with 1MHz VBW above 1GHz, A average detector be caluclated from peak value using duty cycle factor Both 30MHz to 1000MHz and above 1GHz

Pretest x, y, z position of EUT, final, select the worst case x position test and record the test results in the report.

The test modes (TX Mode) is tested in Anechoic Chamber and all the scanning waveforms are reported on section 7.5

7.5.Radiated Emission Test Results

PASSED.

The frequency range from 9KHz to 30MHz,30MHz to 230MHz, 230MHz to 1000MHz and above 1GHz. is investigated. Please see the following pages.

Copyright of this report is owned by Centre of Testing Service and may not be reproduced other than in full except with the written approval of the issuing Company.

CENTRE OF TESTING SERVICE CO., LTD.

Building F, Dachuang industrial park, No.379, Zhongshan Dadao, Guangzhou, China

Tel: +86-20-85543113 (32 lines)

Fax: +86-20-38780406

Complaint line: +86-20-85533471

E-mail: cts@cts-lab.com.cn

See Reverse For Terms And Conditions of Service



Channel:	433.92MHz (TX)	Result:	<input checked="" type="checkbox"/> - passed
Frequency range:	9KHz~30MHz		<input type="checkbox"/> - not passed

EUT	RGB Controller
Operating Condition	BATTERY 4.5V
Test Condition	Ambient Temperature: 25°C Humidity: 56%
Test Date:	5 June~18 June 2012
Operator	Duke
MODEL NO	VO-24-CTL

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBμV/m)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.
Remark: The test result value is too low, Margin >10dB of the limit.							

Copyright of this report is owned by Centre of Testing Service and may not be reproduced other than in full except with the written approval of the issuing Company.

CENTRE OF TESTING SERVICE CO., LTD.

Building F, Dachuang industrial park, No.379, Zhongshan Dadao, Guangzhou, China

Tel: +86-20-85543113 (32 lines)

Fax: +86-20-38780406

Complaint line: +86-20-85533471

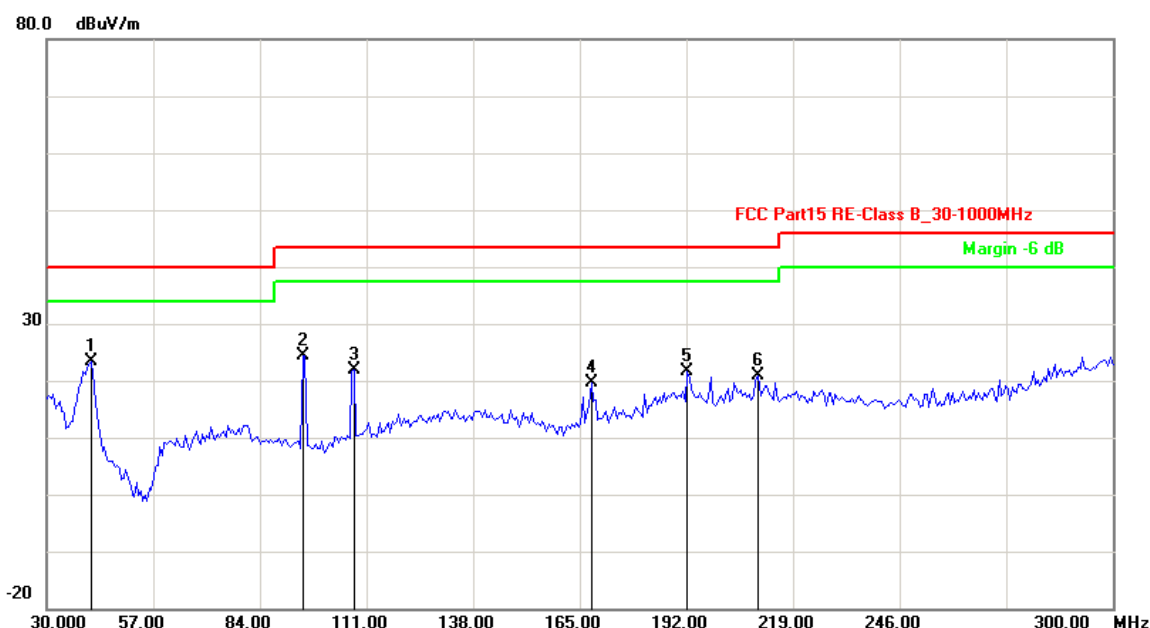
E-mail: cts@cts-lab.com.cn

See Reverse For Terms And Conditions of Service



Channel:	433.92MHz (TX)	Result:	■ - passed
Test point:	Horizontal		□ - not passed
Frequency range:	30-1000MHz		

EUT	RGB Controller
Operating Condition	BATTERY 4.5V
Test Condition	Ambient Temperature: 25°C Humidity: 56%
Test Date:	5 June~18 June 2012
Operator	Duke
MODEL NO	VO-24-CTL



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBμV/m)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.
1	41.3627	-42.34	65.66	23.32	40.00	-16.68	QP
2	94.9299	-40.56	64.99	24.43	43.50	-19.07	QP
3	107.9158	-38.84	60.68	21.84	43.50	-21.66	QP
4	167.9760	-36.03	55.62	19.59	43.50	-23.91	QP
5	192.3246	-31.44	53.03	21.59	43.50	-21.91	QP
6	210.1804	-31.30	52.10	20.80	43.50	-22.70	QP

Note: Level=Reading+Factor. Margin= Level- Limit.

Copyright of this report is owned by Centre of Testing Service and may not be reproduced other than in full except with the written approval of the issuing Company.

CENTRE OF TESTING SERVICE CO., LTD.

Building F, Dachuang industrial park, No.379, Zhongshan Dadao, Guangzhou, China

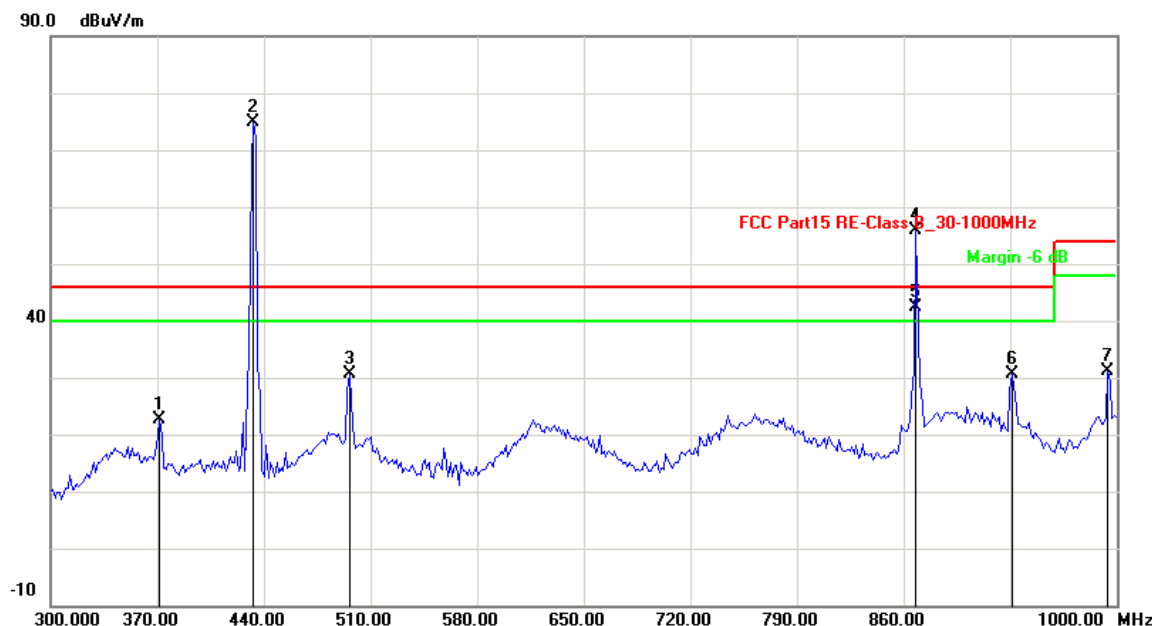
Tel: +86-20-85543113 (32 lines)

Fax: +86-20-38780406

Complaint line: +86-20-85533471

E-mail: cts@cts-lab.com.cn

See Reverse For Terms And Conditions of Service



Fundamental and Harmonics Average Result

Frequency (MHz)	Factor (dB/m)	Reading (dBμV)	Duty Cycle Correction Factor(dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.
433.92	-35.91	74.96	----	74.96	100.82	-25.86	Peak
433.92	-35.91	74.96	-2.25	72.71	80.82	-8.11	AV

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBμV/m)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.
1	371.5430	-34.74	57.45	22.71	46.00	-23.29	QP
3	496.3927	-30.52	61.10	30.58	46.00	-15.42	QP
4	868.1362	-28.61	84.41	55.80	80.82	-25.02	Peak
5	868.1362	-28.61	70.94	42.33	60.82	-18.49	AVG
6	931.2625	-27.25	57.99	30.74	46.00	-15.26	QP
7	994.3887	-29.25	60.49	31.24	54.00	-22.76	QP

Note: Level=Reading+Factor. Margin= Level- Limit.
Average Level=Peak level + Duty Factor



Channel:	433.92 MHz (TX)	Result:	■ - passed
Test point:	Horizontal		□ - not passed
Frequency range:	1GHz-18GHz		

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBμV/m)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.
1	1286.573	-28.93	89.37	60.44	74.00	-13.56	peak
2	1286.573	-28.93	78.32	49.39	54.00	-4.61	AVG
3	1484.970	-27.07	89.59	62.52	74.00	-11.48	peak
4	1484.970	-27.07	78.10	51.03	54.00	-2.97	AVG
5	1727.455	-24.89	85.04	60.15	74.00	-13.85	peak
6	1727.455	-24.89	73.04	48.15	54.00	-5.85	AVG
7	2168.337	-27.21	84.59	57.38	74.00	-16.62	peak
8	2168.337	-27.21	70.49	43.28	54.00	-10.72	AVG
9	4328.657	-5.94	68.05	62.11	74.00	-11.89	peak
10	4328.657	-5.94	56.96	51.02	54.00	-2.98	AVG
11	4769.539	-9.22	67.06	57.84	74.00	-16.16	peak
12	4769.539	-9.22	54.58	45.36	54.00	-8.64	AVG

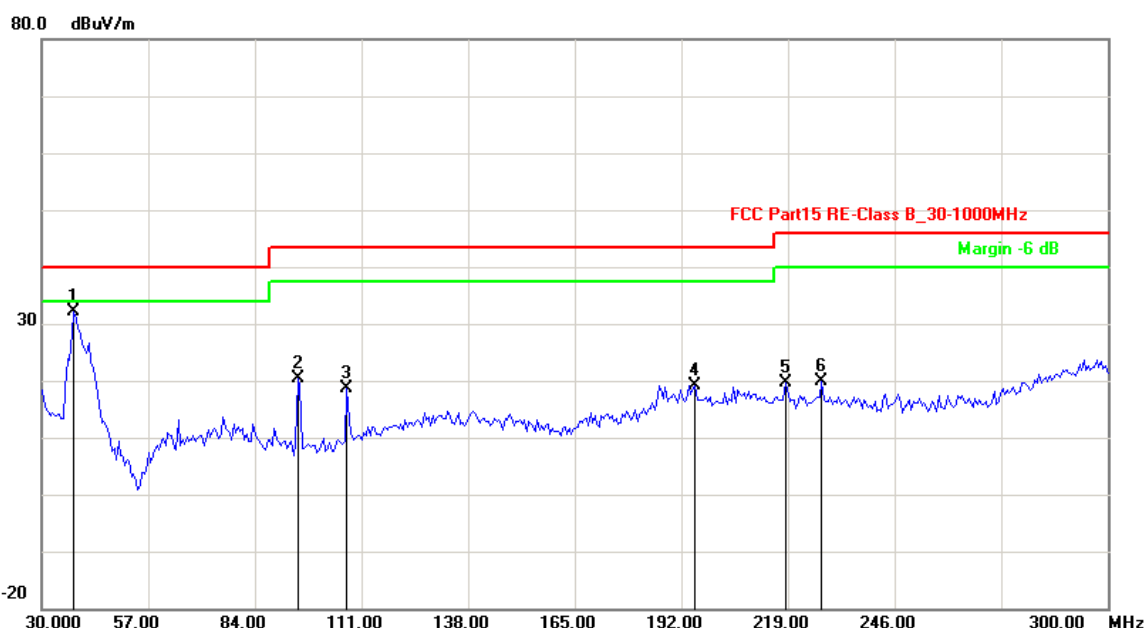
Remark: Other frequency test results margin all >10dB of the limit.

Note: Level=Reading+Factor. Margin= Level- Limit.



Channel:	433.92 MHz (TX)	Result:	■ - passed
Test point:	Vertical		□ - not passed
Frequency range:	30-1000MHz		

EUT	RGB Controller
Operating Condition	BATTERY 4.5V
Test Condition	Ambient Temperature: 25°C Humidity: 56%
Test Date:	5 June~18 June 2012
Operator	Duke
MODEL NO	VO-24-CTL



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBμV/m)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.
1	38.1162	-40.10	72.19	32.09	40.00	-7.91	QP
2	94.9299	-40.56	61.01	20.45	43.50	-23.05	QP
3	107.3747	-38.95	57.52	18.57	43.50	-24.93	QP
4	195.5711	-31.72	50.82	19.10	43.50	-24.40	QP
5	218.2966	-31.67	51.24	19.57	46.00	-26.43	QP
6	227.4950	-31.66	51.44	19.78	46.00	-26.22	QP

Note: Level=Reading+Factor. Margin= Level- Limit.

Copyright of this report is owned by Centre of Testing Service and may not be reproduced other than in full except with the written approval of the issuing Company.

CENTRE OF TESTING SERVICE CO., LTD.

Building F, Dachuang industrial park, No.379, Zhongshan Dadao, Guangzhou, China

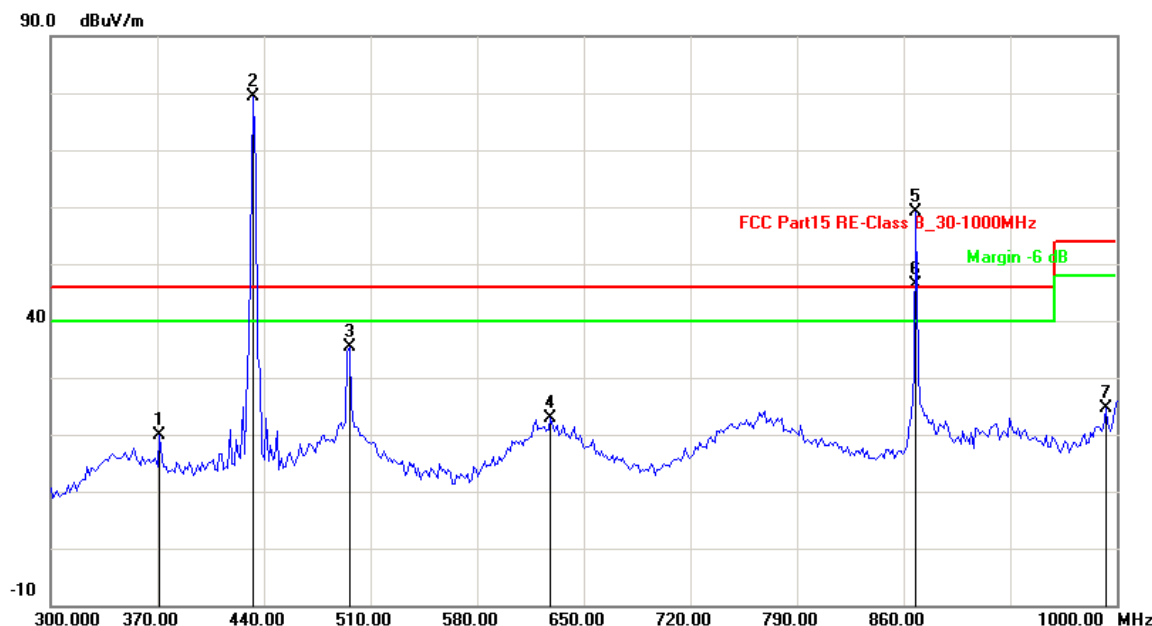
Tel: +86-20-85543113 (32 lines)

Fax: +86-20-38780406

Complaint line: +86-20-85533471

E-mail: cts@cts-lab.com.cn

See Reverse For Terms And Conditions of Service



Fundamental and Harmonics Average Result							
Frequency (MHz)	Factor (dB/m)	Reading (dBμV)	Duty Cycle Correction Factor(dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.
433.92	-35.91	79.44	----	79.44	100.82	-21.38	Peak
433.92	-35.91	79.44	-2.25	77.19	80.82	-3.63	AV

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBμV/m)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.
1	371.5430	-34.74	54.71	19.97	46.00	-26.03	QP
3	496.3927	-30.52	65.80	35.28	46.00	-10.72	QP
4	628.2565	-27.95	50.85	22.90	46.00	-23.10	QP
5	868.1362	-28.61	87.69	59.08	80.82	-21.74	Peak
6	868.1362	-28.61	75.06	46.45	60.82	-14.37	AVG
7	992.9859	-29.34	54.07	24.73	54.00	-29.27	QP

Note:Level=Reading+Factor. Margin= Level- Limit.
Average Level=Peak level + Duty Factor



Channel:	433.92 MHz (TX)	Result:	<input checked="" type="checkbox"/> - passed
Test point:	Vertical		<input type="checkbox"/> - not passed
Frequency range:	1GHz-18GHz		

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBμV/m)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Det.
1	1484.970	-27.22	89.26	62.04	74.00	-11.96	peak
2	1484.970	-27.22	77.38	50.16	54.00	-3.84	AVG
3	1727.455	-25.12	88.55	63.43	74.00	-10.57	peak
4	1727.455	-25.12	75.30	50.18	54.00	-3.82	AVG
5	2168.337	-26.93	88.53	61.60	74.00	-12.40	peak
6	2168.337	-26.93	76.29	49.36	54.00	-4.64	AVG
7	2587.174	-28.65	88.21	59.56	74.00	-14.44	peak
8	2587.174	-28.65	74.52	45.87	54.00	-8.13	AVG
9	3028.056	-30.29	85.76	55.47	74.00	-18.53	peak
10	3028.056	-30.29	74.98	44.69	54.00	-9.31	AVG
11	3909.820	-33.55	77.41	43.86	74.00	-30.14	peak
12	3909.820	-33.55	64.84	31.29	54.00	-22.71	AVG

Remark: Other frequency test results margin all >10dB of the limit.

Note: Level=Reading+Factor. Margin= Level- Limit.

Copyright of this report is owned by Centre of Testing Service and may not be reproduced other than in full except with the written approval of the issuing Company.

8.20 dB Bandwidth test

8.1. Test Equipment

20 dB Bandwidth test					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	10868	2011/12
2	Log per Antenna	ROHDE & SCHWARZ	HL223	100226	2011/12
3	Signal analyzer	ROHDE & SCHWARZ	FSIQ26	100311	2011/12

8.2. Test Information

EUT:	RGB Controller
M/N:	VO-24-CTL
Power supply:	BATTERY 4.5V (TX)
Test Condition:	Ambient Temperature: 25°C Humidity: 56%
Test standard:	FCC PART 15C: 15.231
Test mode:	Transmitting
Test Frequency:	433.92MHz
Test Date:	5 June to 18 June 2012
Test By:	Duke

Copyright of this report is owned by Centre of Testing Service and may not be reproduced other than in full except with the written approval of the issuing Company.

CENTRE OF TESTING SERVICE CO., LTD.

Building F, Dachuang industrial park, No.379, Zhongshan Dadao, Guangzhou, China

Tel: +86-20-85543113 (32 lines)

Fax: +86-20-38780406

Complaint line: +86-20-85533471

E-mail: cts@cts-lab.com.cn

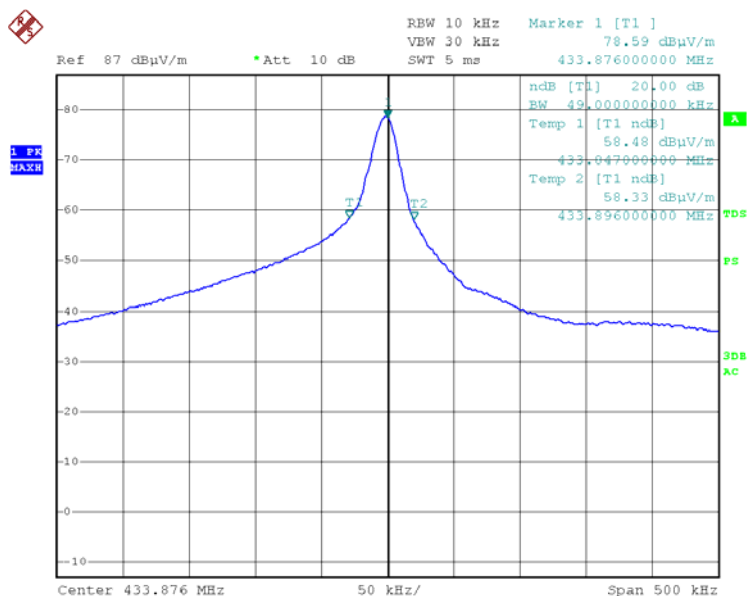
See Reverse For Terms And Conditions of Service

8.3. Test Results

PASSED.

The testing data was attached in the next pages.

Frequency (MHz)	20 dB Bandwidth (kHz)	Limit(kHz): No wider than 0.25% of the center frequency	Conclusion
433.92	49	$433.92 \times 0.25\% = 1.0848 \text{ MHz}$	PASSED



Date: 18.JUN.2012 10:53:07

Copyright of this report is owned by Centre of Testing Service and may not be reproduced other than in full except with the written approval of the issuing Company.

CENTRE OF TESTING SERVICE CO., LTD.

Building F, Dachuang industrial park, No.379, Zhongshan Dadao, Guangzhou, China

Tel: +86-20-85543113 (32 lines)

Fax: +86-20-38780406

Complaint line: +86-20-85533471

E-mail: cts@cts-lab.com.cn

See Reverse For Terms And Conditions of Service

9. Stop Transmitting Time Test

9.1. Test Equipment

Band Edge Compliance test					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	10868	2011/12
2	Log per Antenna	ROHDE & SCHWARZ	HL223	100226	2011/12
3	Signal analyzer	ROHDE & SCHWARZ	FSIQ26	100311	2011/12

9.2. Test Information

EUT:	RGB Controller
M/N:	VO-24-CTL
Power supply:	BATTERY 4.5V (TX)
Test Condition:	Ambient Temperature: 25°C Humidity: 56%
Test standard:	FCC PART 15C: 15.231
Test mode:	Transmitting
Test Frequency:	433.92MHz
Test Date:	5 June to 18 June 2012
Test By:	Duke

9.3. Test Results

PASSED.

The testing data was attached in the next pages.

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 EUT, After 640ms, we could see the EUT stop transmitting.

Frequency (MHz)	Stop Transmitting Time	Limit: not more than 5 seconds of being released	Conclusion
433.92	680ms	5s	PASSED



10. Pulse Desensitization Correction Factor

10.1. Test Equipment

Band Edge Compliance test					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	10868	2011/12
2	Log per Antenna	ROHDE & SCHWARZ	HL223	100226	2011/12
3	Signal analyzer	ROHDE & SCHWARZ	FSIQ26	100311	2011/12
4	Spectrum	Agilent	E4446A	44300459	2011/12

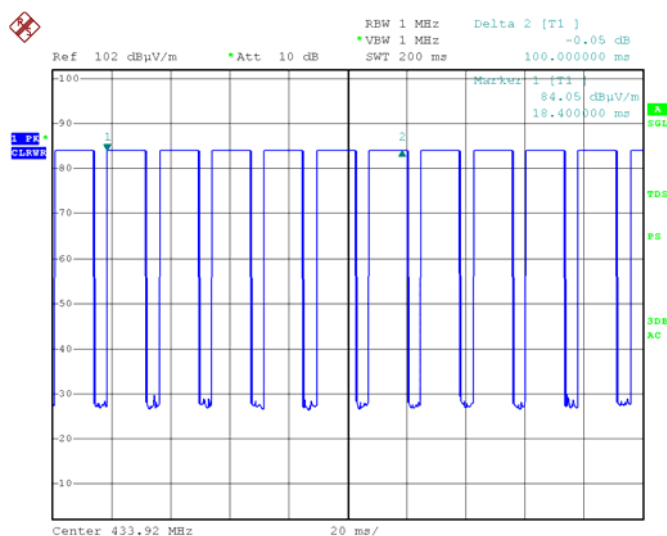
Test Information

EUT:	RGB Controller
M/N:	VO-24-CTL
Power supply:	BATTERY 4.5V (TX)
Test Condition:	Ambient Temperature: 25°C Humidity: 56%
Test standard:	FCC PART 15C: 15.231
Test mode:	Transmitting
Test Frequency:	433.92MHz
Test Date:	5 June to 18 June 2012
Test By:	Duke

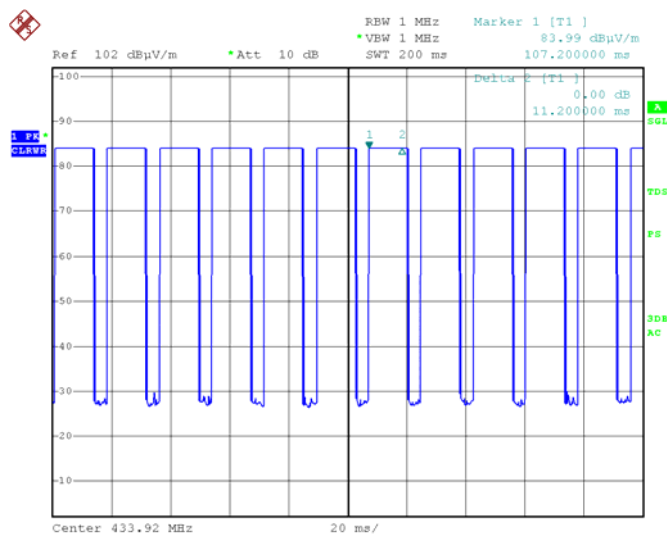
10.3. Test Results

PASSED.

The testing data was attached in the next pages.



Date: 7.DEC.2012 17:45:42



Date: 7.DEC.2012 17:46:17

Copyright of this report is owned by Centre of Testing Service and may not be reproduced other than in full except with the written approval of the issuing Company.

CENTRE OF TESTING SERVICE CO., LTD.

Building F, Dachuang industrial park, No.379, Zhongshan Dadao, Guangzhou, China

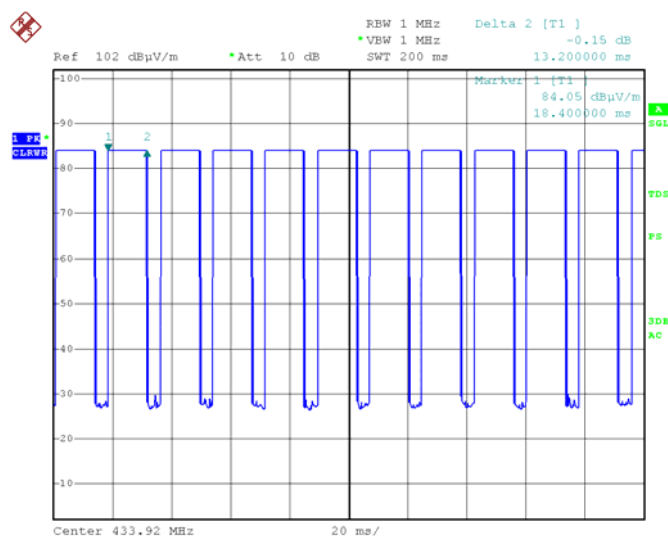
Tel: +86-20-85543113 (32 lines)

Fax: +86-20-38780406

Complaint line: +86-20-85533471

E-mail: cts@cts-lab.com.cn

See Reverse For Terms And Conditions of Service



Date: 7.DEC.2012 17:46:49

Test Data

Ton+off=680ms(which exceeds 0.1 seconds,and use the formula Ton/100ms to calculate the duty-cycle correction factor)

Ton=13.2ms*5+11.2ms*1=77.2ms

Duty cycle Correction Factor=20*log(Ton/Ton+off)= 20*log(77.2ms/100ms)= -2.25dB

Copyright of this report is owned by Centre of Testing Service and may not be reproduced other than in full except with the written approval of the issuing Company.

CENTRE OF TESTING SERVICE CO., LTD.

Building F, Dachuang industrial park, No.379, Zhongshan Dadao, Guangzhou, China

Tel: +86-20-85543113 (32 lines)

Fax: +86-20-38780406

Complaint line: +86-20-85533471

E-mail: cts@cts-lab.com.cn

See Reverse For Terms And Conditions of Service

11. 99% bandwidth

11.1 Test procedure

According to RSS-210 Annex 8 and RSS-Gen 4.6.1 The transmitter output is connected to the spectrum analyzer. The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used given that a peak or peak hold may produce a wider bandwidth than actual. The sweep time is coupled.

11.2. Test Equipment

Band Edge Compliance test					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	10868	2011/12
2	Log per Antenna	ROHDE & SCHWARZ	HL050	100186	2011/12
3	Signal analyzer	ROHDE & SCHWARZ	FSIQ26	100311	2011/12

11.3. Test Information

EUT:	RGB Controller
M/N:	VO-24-CTL
Power supply:	BATTERY 4.5V (TX)
Test Condition:	Ambient Temperature: 25°C Humidity: 56%
Test standard:	FCC PART 15C: 15.231
Test mode:	Transmitting
Test Frequency:	433.92MHz
Test Date:	07 November 2012
Test By:	Duke

11.4. Test Results

PASSED.

Frequency (MHz)	Bandwidth (MHz)
433.92	120KHz

Copyright of this report is owned by Centre of Testing Service and may not be reproduced other than in full except with the written approval of the issuing Company.

CENTRE OF TESTING SERVICE CO., LTD.

Building F, Dachuang industrial park, No.379, Zhongshan Dadao, Guangzhou, China

Tel: +86-20-85543113 (32 lines)

Fax: +86-20-38780406

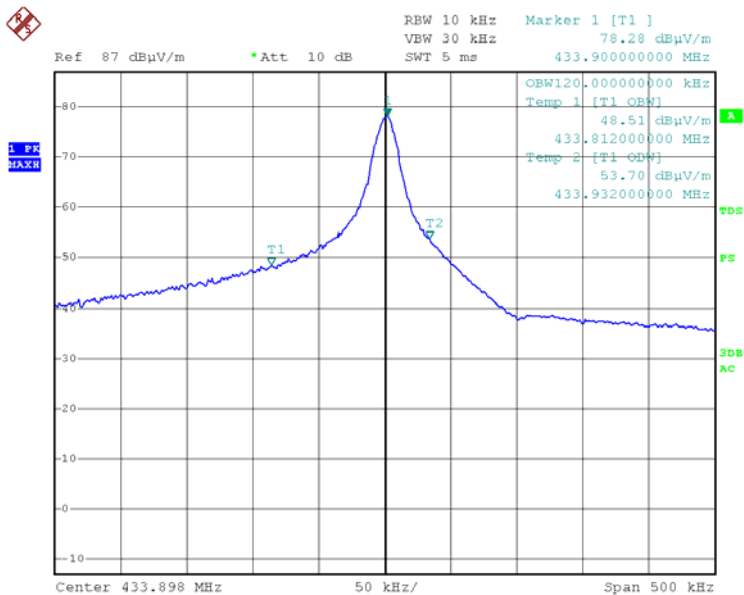
Complaint line: +86-20-85533471

E-mail: cts@cts-lab.com.cn

See Reverse For Terms And Conditions of Service



99% Bandwidth



Date: 7.NOV.2012 11:56:26

Copyright of this report is owned by Centre of Testing Service and may not be reproduced other than in full except with the written approval of the issuing Company.



12. Manufacturer/ Approval holder Declaration

The following identical model(s):

N/A

Belong to the tested device:

Product description: **RGB Controller**
Model name: **VO-24-CTL**

Copyright of this report is owned by Centre of Testing Service and may not be reproduced other than in full except with the written approval of the issuing Company.

CENTRE OF TESTING SERVICE CO., LTD.

Building F, Dachuang industrial park, No.379, Zhongshan Dadao, Guangzhou, China

Tel: +86-20-85543113 (32 lines)

Fax: +86-20-38780406

Complaint line: +86-20-85533471

E-mail: cts@cts-lab.com.cn

See Reverse For Terms And Conditions of Service