







## ISO/IEC17025 Accredited Lab.

Report No: FCC 0808144
File reference No: 2008-09-03

Applicant: Suzhou Cleva Electrical Appliance Co., Ltd.

Product: Remote Controller

Model No: KL-RC01A

Trademark: DBY

Test Standards: FCC Part 15 Subpart C, Paragraph 15.231

Test result:

It is herewith confirmed and found to comply with the

requirements set up by ANSI C63.4&FCC Part 15 Subpart C, Paragraph 15.231 regulations for the evaluation of

Taragraph 13.231 regulations for the evaluation of

electromagnetic compatibility

Approved By

Jack Chung

Jack Chung Manager

Dated: September 3,2008

Results appearing herein relate only to the sample tested

The technical reports is issued errors and omissions exempt and is subject to withdrawal at

# SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO LTD

5/F,Block 4, Anhua Industrial Zone.,No.8 TaiRan Rd.CheGongMiao,FuTian District, Shenzhen,CHINA.

Tel (755) 83448688 Fax (755) 83442996

Report No: 0808144 Page 2 of 30

Date: 2008-09-03



# **Special Statement:**

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meets with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

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

## **CNAS-LAB Code: L2292**

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of testing Laboratories.

# FCC-Registration No.: 899988

The 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.:899988.

# IC- Registration No.: IC5205A-01

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration No.: IC 5205A-01.

Page 3 of 30

Report No: 0808144 Date: 2008-09-03



# **Test Report Conclusion** Content

1.0	General Details	4
1.1	Test Lab Details.	4
1.2	Applicant Details	4
1.3	Description of EUT	4
1.4	Submitted Sample	4
1.5	Test Duration	5
1.6	Test Uncertainty	5
1.7	Test By	5
2.0	List of Measurement Equipment	5
3.0	Technical Details	7
3.1	Summary of Test Results	7
3.2	Test Standards	7
4.0	EUT Modification	7
5.0	Power Line Conducted Emission Test.	8
5.1	Schematics of the Test.	8
5.2	Test Method and Test Procedure	8
5.3	Configuration of the EUT	8
5.4	EUT Operating Condition.	9
5.5	Conducted Emission Limit.	9
5.6	Test Result	9
6.0	Radiated Emission test	10
5.1	Test Method and Test Procedure	10
5.2	Configuration of the EUT	10
5.3	EUT Operation Condition.	10
5.4	Radiated Emission Limit	11
5.5	Test Result	11
7.0	20dB Bandwidth Test	17
8.0	Deactivate Test	19
9.0	Duty Cycle	21
9.0	FCC ID Label	25
10.0	Photo of Testing.	26

Report No: 0808144 Page 4 of 30

Date: 2008-09-03



## 1.0 General Details

### 1.1 Test Lab Details

Name: SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO LTD

Address: 5/F,Block 4, Anhua Industrial Zone.,No.8 TaiRan Rd.CheGongMiao,FuTian District,

Shenzhen, CHINA.

Telephone: (755) 83448688 Fax: (755) 83442996

Site on File with the Federal Communications Commission – United Sates

Registration Number: 899988

For 3m & 10 m OATS

Site Listed with Industry Canada of Ottawa, Canada

Registration Number: IC: 5205A-01

For 3m & 10 m OATS

## 1.2 Applicant Details

Applicant: Suzhou Cleva Electrical Appliance Co., Ltd Address: 813 BinHe Road,215011,Suzhou,P.R. China

Telephone: 0512-66161832 Fax: 0512-66161839

# 1.3 Description of EUT

Product: Remote Controller

Brand Name: N/A

Model Number: KL-RC01A

Additional Model Name N/A
Additional Trade Name N/A

Rating: 12V DC input Operation Frequency 433.92MHz

Antenna Designation A permanent fixed antenna, designed as an indispensable part of the EUT.

## 1.4 Submitted Sample

1 Sample

Page 5 of 30

Report No: 0808144 Date: 2008-09-03



1.5 Test Duration 2008-08-27 to 2008-09-02

1.6 Test Uncertainty

Conducted Emissions Uncertainty = 3.6dB Radiated Emissions Uncertainty = 4.7dB

1.7 Test Engineer

Terry Tang

The sample tested by

Print Name: Terry Tang

2.0		Test Equi	pments		
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	ROHDE&SCHWARZ	ESPI 3	100379	2007-12-05	2008-12-04
Absorbing Clamp	ROHDE&SCHWARZ	MDS-21	100126	2007-12-05	2008-12-04
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100294	2007-12-05	2008-12-04
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100253	2007-12-05	2008-12-04
Ultra Broadband ANT	ROHDE&SCHWARZ	HL562	100157	2007-12-05	2008-12-04
ESDV Test Receiver	ROHDE&SCHWARZ	ESDV	100008	2008-04-26	2009-04-25
4-WIRE ISN	ROHDE&SCHWARZ	ENY 41	830663/044	2008-02-18	2009-02-17
GG ENY22 Double 2-Wire ISN	ROHDE&SCHWARZ	ENY22	83066/016	2008-02-18	2009-02-17
Impuls-Begrenzer	ROHDE&SCHWARZ	ESH3-Z2	100281	2008-02-18	2009-02-17
System Controller	CT	SC100	-	2008-02-18	2009-02-17
Printer	EPSON	РНОТО ЕХЗ	CFNH234850	2008-02-18	2009-02-17
FM-AM Signal Generator	JUNGJIN	SG-150M	389911177	2008-02-18	2009-02-17
Color TV Pattern Generator	PHILIPS	PM5418	LO621747	2008-02-18	2009-02-17

The report refers only to the sample tested and does not apply to the bulk.

This report is issued in confidence to the client and it will be strictly treated as such by the Shenzhen Timeway Technology Consulting Co.,Ltd. It may not be reproduced rather in its entirety or in part and it may not be used for adverting. The client to whom the report is issued may, however, show or send it . or a certified copy there of prepared by the Shenzhen Timeway Technology Consulting co.,Ltd to his customer. Supplier or others persons directly concerned. Shenzhen Timeway Technology Consulting co.,Ltd will not, without the consent of the client enter into any discussion of correspondence with any third party concerning the contents of the report.

Page 6 of 30

Report No: 0808144 Date: 2008-09-03

Computer	IBM	8434	1S8434KCE99BLX LO*	-	-
Oscillator	KENWOOD	AG-203D	3070002	2008-02-18	2009-02-17
Spectrum Analyzer	HAMEG	HM5012	-	-	-
Power Supply	LW	APS1502	-	-	-
5K VA AC Power Source	California Instruments	5001iX	56060	2008-02-18	2009-02-17
CDN	EM TEST	CDN M2/M3	-	2008-02-18	2009-02-17
Attenuation	EM TEST	ATT6/75	-	2008-02-18	2009-02-17
Resistance	EM TEST	R100	-	2008-02-18	2009-02-17
Electromagnetic Injection Clamp	LITTHI	EM101	35708	2008-02-18	2009-02-17
Signal Generator	ROHDE&SCHWARZ	SMT03	100029	2008-02-18	2009-02-17
Power Amplifier	AR	150W1000	300999	2008-02-18	2009-02-17
Field probe	Holaday	HI-6005	105152	2008-02-18	2009-02-17
Bilog Antenna	Chase	CBL6111C	2576	2008-02-18	2009-02-17
ESPI Test Receiver	ROHDE&SCHWARZ	ESI26	838786/013	2008-02-18	2009-02-17
3m OATS			N/A	2008-02-18	2009-02-17
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170265	2008-08-18	2009-08-17
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-631	2008-04-26	2009-04-25

Page 7 of 30

Report No: 0808144 Date: 2008-09-03



## 3.0 Technical Details

## 3.1 Summary of test results

# The EUT has been tested according to the following specifications:

Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.207	aph 15.207 Conducted		N/A
	Emission Test		
FCC Part 15, Paragraph 15.209	General Requirement	PASS	Meets Class B Limit
FCC Part 15, Paragraph 15.231 (b)	Radiated Emission Test	PASS	Compliant
FCC Part 15, Paragraph 15.231 (c)	20dB	PASS	Compliant
	Bandwidth		
	Testing		
FCC Part 15, Paragraph 15.231 (a) (1)	Deactivate	PASS	Compliant
	Testing		

## 3.2 Test Standards

FCC Part 15 Subpart C, Paragraph 15.231

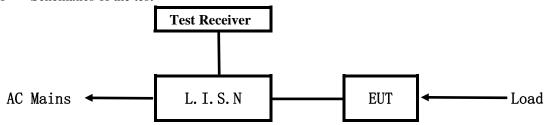
# 4.0 EUT Modification

No modification by Shenzhen Timeway Technology Consulting Co.,Ltd



## 5. Power Line Conducted Emission Test

## 5.1 Schematics of the test

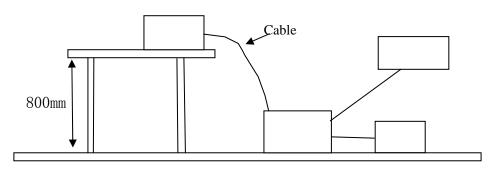


**EUT: Equipment Under Test** 

## 5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.4-2003. The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 500hm/50uH as specified by section 5.1 of ANSI C63.4 –2003.

## Block diagram of Test setup



# 5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.4-2003. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

## A. EUT

	Device	Manufacturer	Model	FCC ID
F	Remote	Shenzhen DBY Technology Co., Ltd	KL-RC01A	WN2KL-RC01A
	Controller			

## B. Internal Device

Device	Manufacturer	Model	FCC ID/DOC
N/A			

## C. Peripherals

Device	Manufacturer	Model	FCC ID/DOC	Cable
N/A				

The report refers only to the sample tested and does not apply to the bulk.

This report is issued in confidence to the client and it will be strictly treated as such by the Shenzhen Timeway Technology Consulting Co.,Ltd. It may not be reproduced rather in its entirety or in part and it may not be used for adverting. The client to whom the report is issued may, however, show or send it . or a certified copy there of prepared by the Shenzhen Timeway Technology Consulting co.,Ltd to his customer. Supplier or others persons directly concerned. Shenzhen Timeway Technology Consulting co.,Ltd will not, without the consent of the client enter into any discussion of correspondence with any third party concerning the contents of the report.

Report No: 0808144 Page 9 of 30

Date: 2008-09-03



# 5.4 EUT Operating Condition

Operating condition is according to ANSI C63.4 -2003.

- A Setup the EUT and simulators as shown on follow
- B Enable AF signal and confirm EUT active to normal condition

## 5.5 Power line conducted Emission Limit according to Paragraph 15.207

Frequency	Class A Lim	its (dB µ V)	Class B Lim	nits (dB µ V)	
(MHz)	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level	
$0.15 \sim 0.50$	79.0	66.0	66.0~56.0*	56.0~46.0*	
$0.50 \sim 5.00$	73.0	60.0	56.0	46.0	
5.00 ~ 30.00	73.0	60.0	60.0	50.0	

Notes:

- 1. \*Decreasing linearly with logarithm of frequency.
- 2. The tighter limit shall apply at the transition frequencies

## 5.6 Test Results

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.

Note: Owing to DC operation of EUT, this test item is not performed

Page 10 of 30

Report No: 0808144 Date: 2008-09-03



## 6 Radiated Emission Test

- 6.1 Test Method and test Procedure:
- (1) The EUT was tested according to ANSI C63.4 –2003. The radiated test was performed at Timeway Laboratory. This site is on file with the FCC laboratory division, Registration No.899988
- (2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.4-2003.
- (3) The frequency spectrum from 30 MHz to 1 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 kHz. All readings are above 1 GHz, peak values with a resolution bandwidth of 1 MHz. Measurements were made at 3 meters.
- (4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (5) Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is 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 of specification limit), and are distinguished with a "QP" in the data table.
- (6) The antenna polarization : Vertical polarization and Horizontal polarization.

# Block diagram of Test setup Distance = 3m Computer Pre -Amplifier EUT Turn-table Receiver

- 6.2 Configuration of The EUT
  Same as section 5.3 of this report
- 6.3 EUT Operating Condition
  Same as section 5.4 of this report.

Page 11 of 30

Report No: 0808144 Date: 2008-09-03



## 6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

# A FCC Part 15 Subpart C Paragraph 15.231 Limit

Fundamental Frequency (MHz)	Field Strength of		Field Strength of Spurious	
	Fundamental		Emission	
	uV/m dBuV/m u		uV/m	dBuV/m
40.66-40.70	2250	67.04	225	47.04
70-130	1250	61.94	125	41.94
130-174	1250-3370	61.94-70.55	125-375	41.94-51.48
174-260	3750	71.48	375	51.48
260-470	3750-12500	71.48-81.94	375-1250	51.48-61.94
Above 470	12500	81.94	1250	61.94

Note:

- 1. RF Field Strength (dBuV) = 20 log RF Voltage (uV)
- 2.Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
- 3. The emission limit in this paragraph is based on measurement instrumentation employing an average detector.
- 4.Linear interpolations for frequency ranges 130-174MHz and 260-470MHz
- 5.the above field strength limits are specified at a distance of 3-meters and the tighter limits apply at the band edges

## B. Frequencies in restricted band are complied to limit on Paragraph 15.209.

Frequency Range (MHz)	Distance (m)	Field strength (dB $\mu$ V/m)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note:

- 1. RF Voltage  $(dBuV) = 20 \log RF \text{ Voltage } (uV)$
- 2. In the Above Table, the tighter limit applies at the band edges.
- 3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT
- 4. All scanning using PK detector. And the final emission level was get using QP detector for frequency range from 30-1000MHz. As to 1G-4G, the final emission level got using PK detector. And Average =  $peak(dBuV/m) duty\ cycle(dB)$
- 5. New batteries were installed in the equipment under test for radiated emission testing.

Page 12 of 30

Report No: 0808144 Date: 2008-09-03



#### 6.5 Test result

#### **Fundamental Radiated Emission Data** $\mathbf{A}$

Product:	Remote Controller	Test Mode:	Keeping Tx transmitting
Test Item:	Fundamental Radiated Emission and Spurious Emission Data	Temperature:	25℃
Test Voltage:	12V	Humidity:	56%
Test Result:	Pass		

Frequency	Emission PK/AV	Horiz /	Limits PK/AV	Margin
(MHz)	(dBuV/m)	Vert	(dBuV/m)	(dB)
433.92	88.31/77.09	Horizontal	100.82/80.82	-12.51/-3.73
433.92	80.72/69.50	Vertical	100.82/80.82	-20.1/-11.32
867.84	64.82/53.60	Horizontal	80.82/60.82	-16.00/-7.22
867.84	57.71/46.49	Vertical	80.82/60.82	-23.11/-14.33
1301.76	39.85/20.46	Horizontal	80.82/60.82	-40.97/-40.36
1301.76	36.42/25.20	Vertical	80.82/60.82	-44.4/-35.62
1735.68	37.51/26.29	Horizontal	80.82/60.82	-43.31/-34.53
1735.68		Vertical	80.82/60.82	
2169.60	38.73/27.51	Horizontal	80.82/60.82	-41.89/-33.31
2169.60		Vertical	80.82/60.82	
2603.52		Horizontal	80.82/60.82	
2603.52		Vertical	80.82/60.82	
3037.44		Horizontal	80.82/60.82	
3037.44		Vertical	80.82/60.82	
3471.36		Horizontal	80.82/60.82	
3471.36		Vertical	80.82/60.82	
3905.28		Horizontal	80.82/60.82	
3905.28		Vertical	80.82/60.82	
4339.2		Horizontal	80.82/60.82	
4339.2		Vertical	80.82/60.82	

Note: Average =  $peak(dBuV/m) - duty \ cycle(dB)$ 



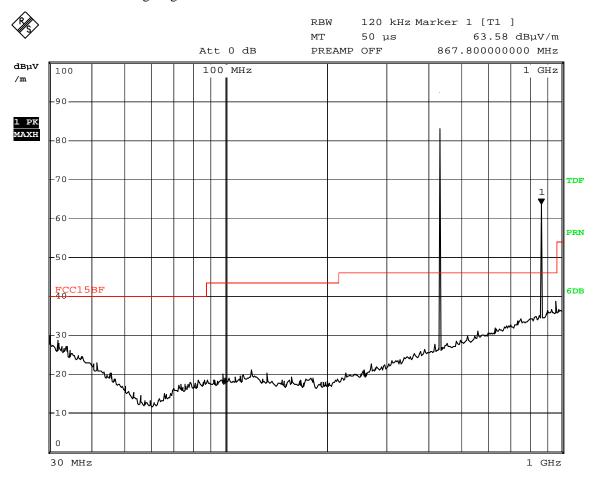
# B. General Radiated Emission Data and Harmonics Radiated Emission Data

## Radiated Emission In Horizontal (30MHz----1000MHz)

EUT set Condition: Keep Tx Transmitting

**Results:** Pass

Please refer to following diagram for individual



Date: 2.SEP.2008 16:37:57

Frequency (MHz)	Level@3m (dB $\mu$ V/m)	Antenna Polarity	Limit@3m (dB \mu V/m)
	-	Н	1
		Н	

The report refers only to the sample tested and does not apply to the bulk.



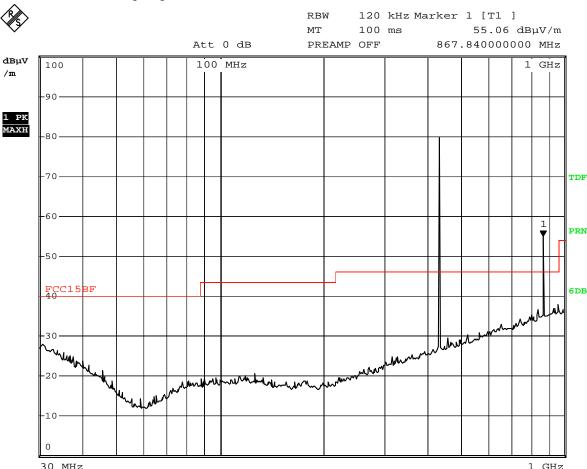
# B. General Radiated Emission Data and Harmonics Radiated Emission Data

## Radiated Emission In Horizontal (30MHz----1000MHz)

EUT set Condition: Keep Tx Transmitting

**Results:** Pass

Please refer to following diagram for individual

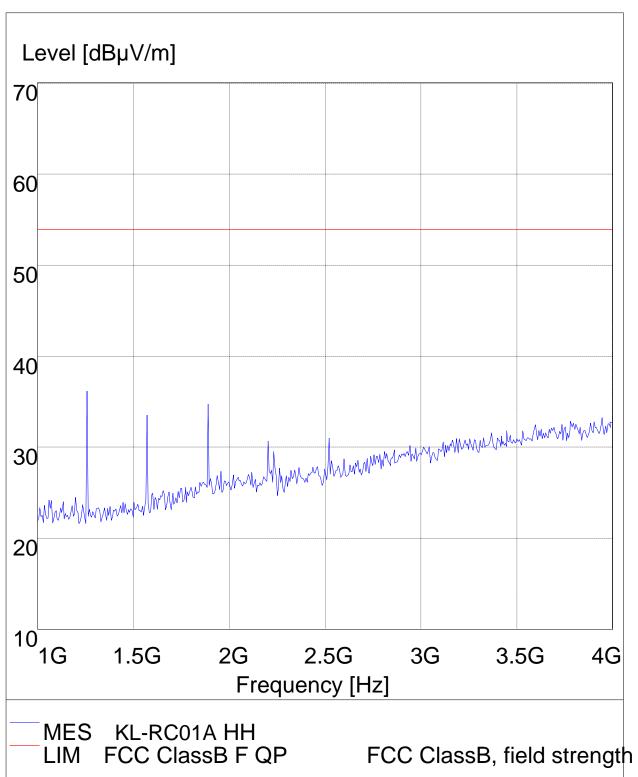


Date: 2.SEP.2008 16:35:47

Frequency (MHz)	Level@3m (dB $\mu$ V/m)	Antenna Polarity	Limit@3m (dB $\mu$ V/m)
		V	



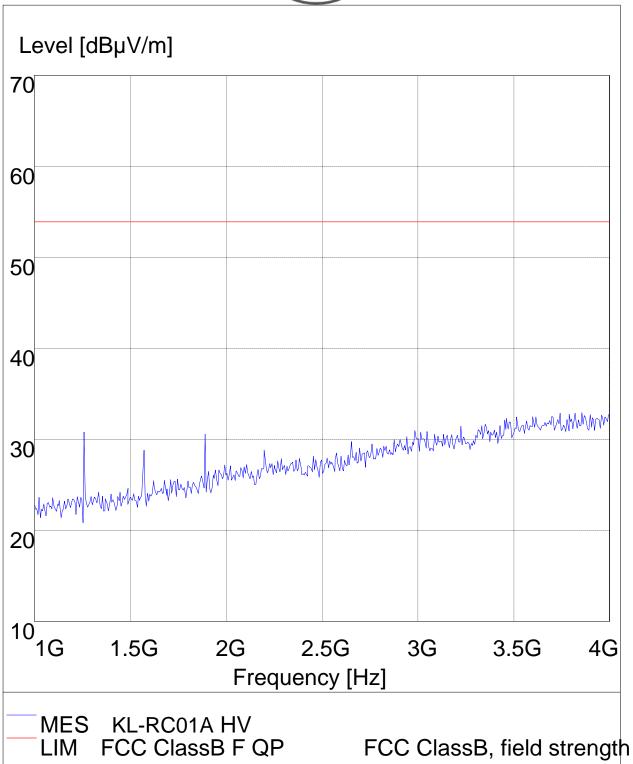
Test Plot above 1G



The report refers only to the sample tested and does not apply to the bulk.

This report is issued in confidence to the client and it will be strictly treated as such by the Shenzhen Timeway Technology Consulting Co.,Ltd. It may not be reproduced rather in its entirety or in part and it may not be used for adverting. The client to whom the report is issued may, however, show or send it. or a certified copy there of prepared by the Shenzhen Timeway Technology Consulting co.,Ltd to his customer. Supplier or others persons directly concerned. Shenzhen Timeway Technology Consulting co.,Ltd will not, without the consent of the client enter into any discussion of correspondence with any third party concerning the contents of the report.





Report No: 0808144 Page 17 of 30

Date: 2008-09-03



# 7.0 20dB Bandwidth Testing

# 7.1 Requirement

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.

## 7.2 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.

## 7.3 Test Data

Frequency (MHz)	20dB Bandwidth Emission (kHz)	Limit (MHz)	Result
433.92	370.74	1.08	Pass

Limit=Frequency x 0.25%=433.92 x 0.25%=1.08MHz

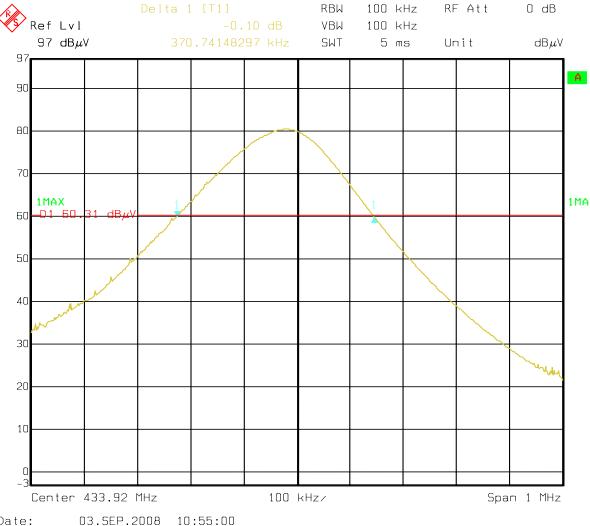
Refer to attached plots:

Page 18 of 30

Report No: 0808144 Date: 2008-09-03

Date:





10:55:00

Page 19 of 30

Report No: 0808144 Date: 2008-09-03

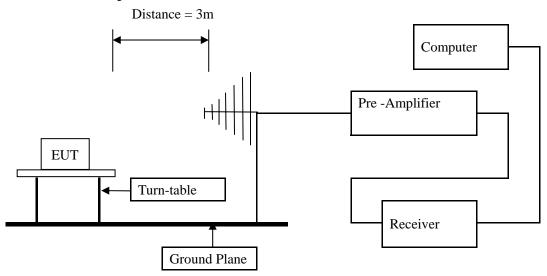


## 8.0 Deactivate Test

## 8.1 Requirement

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.

## 8. 2 Radiated Test Setup



For the actual test configuration , please refer to the related items – Photos of Testing The deactivation test was performed in the 3 meters chamber B test site, using the setup accordance with the ANSI C63.4 - 2003. The specification used was the FCC 15.231(a) limits.

## 8.3 Test Procedure

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

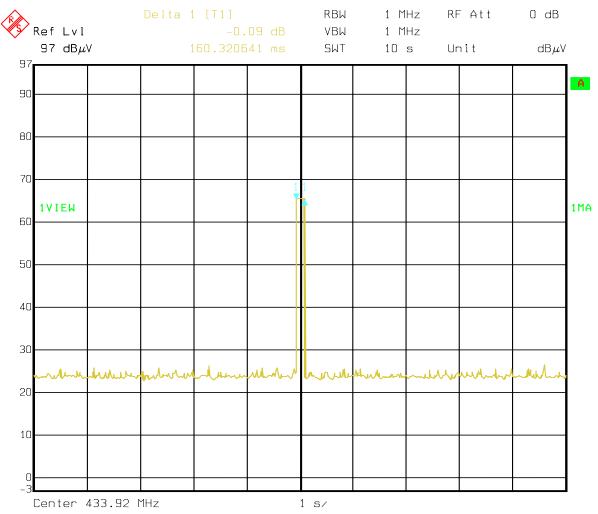
## 8.4 Test Data

## Refer to attached plots:

Page 20 of 30

Report No: 0808144 Date: 2008-09-03





Date: 03.SEP.2008 12:44:26

Report No: 0808144 Page 21 of 30

Date: 2008-09-03



# 9.0 Duty Cycle

## **9.1** Limit

Nil (No dedicated limit specified in the Rules).

## 9.2 Test Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. Set center frequency of spectrum analyzer=operating frequency.
- 4. Set the spectrum analyzer as RBW, VBW=1MHz, Span=0Hz, Adjust Sweep=200ms.
- 5. Repeat above procedures until all frequency measured were complete.

## 9.3 Test Data

```
Tp = 41.383 ms

Ton_1 = 0.942*6 = 5.652 (ms)

Ton_2 = 0.301*19 = 5.719 (ms)

Ton = Ton_1 + Ton_2 = 11.371

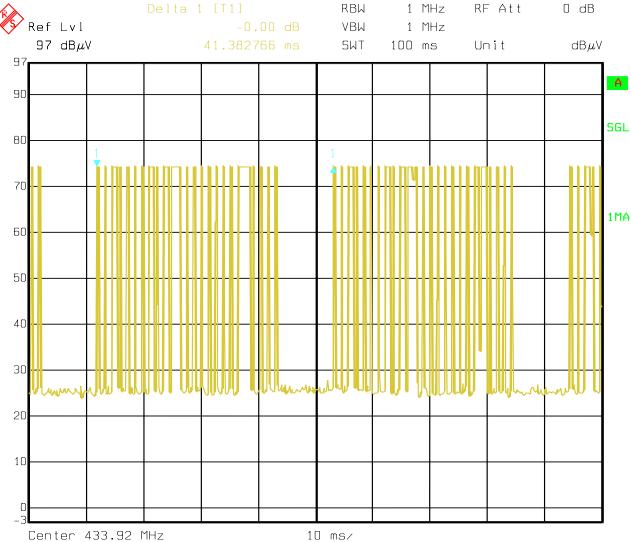
Factor = 20 * log (Ton / Tp) = 20 * log (11.371/41.383) = - 11.22dB
```

## Refer to attached plots for details:

Page 22 of 30

Report No: 0808144 Date: 2008-09-03



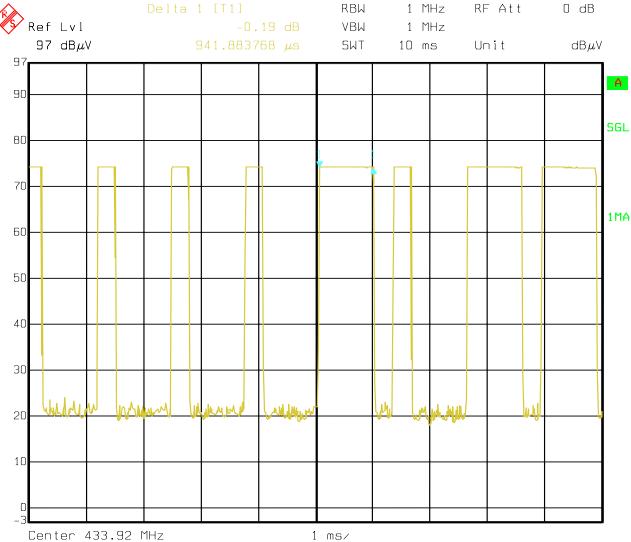


Date: 03.SEP.2008 11:12:05

Page 23 of 30

Report No: 0808144 Date: 2008-09-03



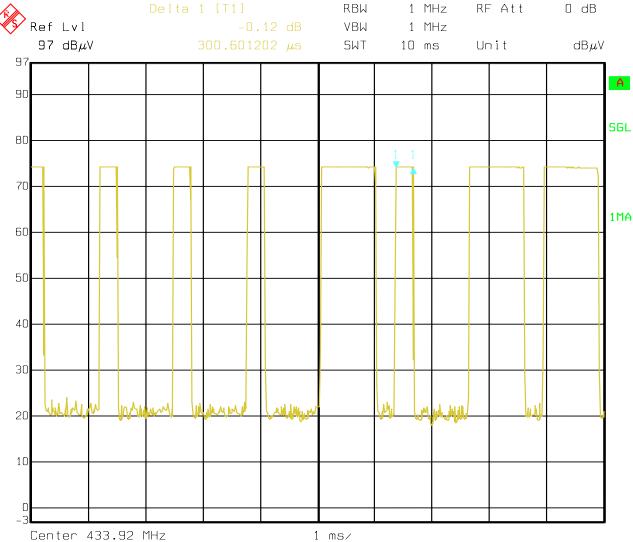


Date: 03.SEP.2008 11:08:49

Page 24 of 30

Report No: 0808144 Date: 2008-09-03





Date: 03.SEP.2008 11:10:00

Page 25 of 30

Report No: 0808144 Date: 2008-09-03



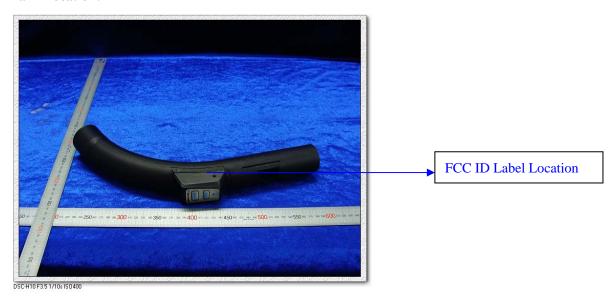
## 10.0 FCC ID Label

FCC ID: WN2KL-RC01A

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The label must not be a stick-on paper label. 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.

## Mark Location:



Page 26 of 30

Report No: 0808144 Date: 2008-09-03



#### 11.0. Photo of testing

#### 11.1 Conducted test View-N/A

#### 11.2 Radiated emission test view



Page 27 of 30

Report No: 0808144 Date: 2008-09-03



## 11.3 Radiated emission test view



DSC-H10 F4.0 1/8s ISO800

Page 28 of 30

Report No: 0808144 Date: 2008-09-03



## 11.3 Photo for the EUT

## Outside View For KL-RC01A

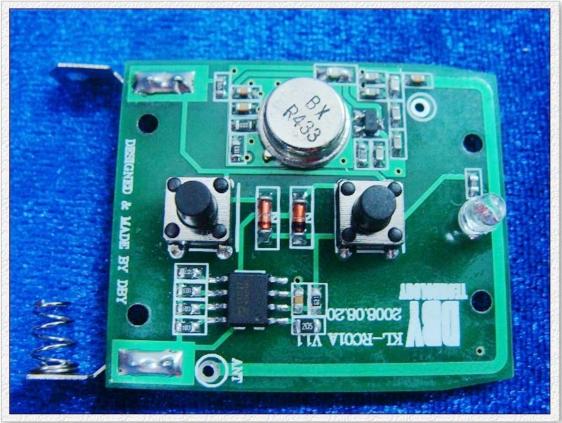


DSC-H10 F3.5 1/10s ISO 400

Page 29 of 30

Report No: 0808144 Date: 2008-09-03



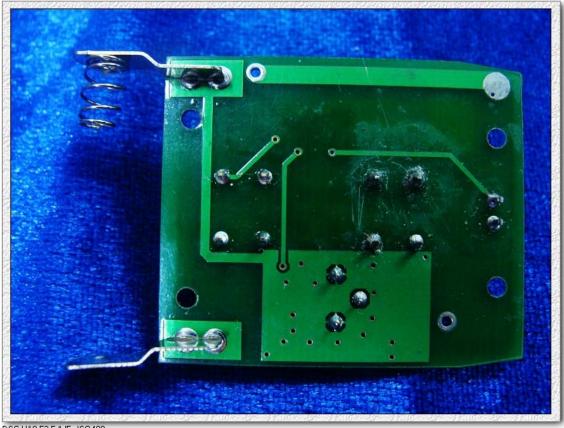


DSC-H10 F3.5 1/8s ISO 400

Page 30 of 30

Report No: 0808144 Date: 2008-09-03





DSC-H10 F3.5 1/5s ISO 400

# End of the report