

国质监认字 002 号



(2002) 量认(国)字 (V2171) 号



No. L0095

Test Report No.:  
**FCC2004-0001**

## TEST REPORT

**EUT** : LCD Panel of Wireless 2-way  
Intelligent Control System

**MODEL/TYPE** : GKB7UIR-3B/50

**CLIENT** : GUANGZHOU GKB ELECTRIC CO., LTD.

**FCC ID** : SDGGKB7UIR-3B

**Classification of Test** : COMMISSION TEST

**Guangzhou Testing & Inspection Institute**  
**for Household Electrical Appliances**  
**广州家用电器检测所 GTIHEA**  
**国家家用电器质量监督检验中心**

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# Guangzhou Testing & Inspection Institute for Household Electrical Appliances

GTIHEA

<b>Test Report No. FCC2004-0001</b>		Page 2 of 24	
<b>Client</b>	<b>Name:</b> GUANGZHOU GKB ELECTRIC CO., LTD. <b>Address:</b> No. 98, Hedong Rd., Fangcun District, Guangzhou, Guangdong Province, P. R. China		
<b>Manufacturer</b>	<b>Name:</b> GUANGZHOU GKB ELECTRIC CO., LTD. <b>Address:</b> No. 98, Hedong Rd., Fangcun District, Guangzhou, Guangdong Province, P. R. China		
<b>Equipment under Test</b>	<b>Name</b> : LCD Panel of Wireless 2-way Intelligent Control System <b>Model/ type</b> : GKB7UIR-3B/50 <b>FCC ID</b> : SDGGKB7UIR-3B <b>Trade mark</b> : GKB <b>Serial no.</b> : — <b>Sampling</b> : —		
Date of Receipt.	2004.02.15	Date of Testing	2004.02.15-2004.03.18
<b>Test Specification</b>		<b>Test Result</b>	
<b>FCC PART 15 Subpart C, 2004</b>		<b>PASS</b>	
<b>Evaluation of Test Result</b>	<p>This device complies with the requirements of Federal Communications Commission (FCC) Rules and Regulations Part 15.</p> <p style="text-align: right;"><b>Issue Date:</b> <u>Nov. 04. 2004</u></p>		
<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>Tested by:</p> <div style="text-align: center;">             _____            Chen Xiuli            Name      Signature         </div> </div> <div style="width: 30%;"> <p>Reviewed by:</p> <div style="text-align: center;">             _____            wang xiaoyan            Name      Signature         </div> </div> <div style="width: 30%;"> <p>Approved by:</p> <div style="text-align: center;">             _____            Name      Signature         </div> </div> </div>			
<b>Other Aspects:</b> <div style="text-align: center; padding-top: 10px;"><b>NONE</b></div>			
Abbreviations: OK,      Pass = passed      Fail = failed      N/A= not applicable      EUT= equipment, sample(s) under tested			
This test report relates only to the EUT, and shall not be reproduced except in full, without written approval of <b>GTIHEA</b> .			

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## 1. General Product Information

### 1.1 Product Function

Refer to the operation instruction.

### 1.2 Ratings and System Details

Power supply	DC 1.5V × 2 (AAA 1.5V alkaline battery)
Max Load	/
Frequency	433.9MHz
Modulation type	Pulse modulation
Power wire	NONE
Interconnecting wires	NONE
Antenna type	Internal permanently attached antenna
Classification	Intentional radiator

### 1.3 Independent Operation Modes

The basic operation modes are:

1. Bi-directional transmission (two-way transmission)

Note: Through the function of bi-directional transmission, the EUT can get the information about the working state of the controlled loads (for example, electrical appliances) and shows the state of all the loads. The EUT transmits the RF signal to change the working state of the controlled electrical appliances. This kind of function is realized by pressing the buttons on the panel.

### 1.4 Submitted Documents

Operating Instructions and Installation Manual  
Rating Label  
Wiring Diagram  
Construction Drawing  
Photographs of EUT  
Material Bill (Parts List)

## **2. Test Sites**

### **2.1 Test Facilities**

The tests and measurements refer to this report were performed by EMC testing Lab. of Guangzhou Testing & Inspection Institute for Household Electric Appliances.

Add. : 204 Xingang West Road Guangzhou 510302 P.R. China  
Telephone : 86-20-84451692  
Fax : 86-20-84183160

The EMC testing laboratory has been recognized by China National Commission for Laboratory Assessment, and authorized by Nemko of Norway since 1997(Aut. No. ELA139), and authorized by TÜV Rheinland of Germany since 1998(Aut. No. 9868976-1216), and registered by FCC since 2001(Registered No. 102430).

### **2.2 Description of Non-standard Method and Deviations**

The testing and measurement method used in this report are all the standard method applied, no any non-standard method and deviations from the used standard were used.

### **2.3 List of Test and Measurement Instruments**

Refer to **Appendix A**.

### 3. Test Set-up and Operation Modes

#### 3.1 Principle of Configuration Selection

**Emission:** The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

#### 3.2 Physical Configuration for Testing

Refer to relative descriptions in this test report.

#### 3.3 Test Operation Mode and Test Software

Refer to **Test Setup**.

#### 3.4 Special Accessories and Auxiliary Equipment

None.

#### 3.5 Countermeasures to Achieve EMC Compliance

None.

## 4. Emission test results (intentional radiator)

Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15 and ANSI C63.4:2003 for FCC Certification.

Test Standards and Results Summary			
Test Condition	Test Requirement	Test Method	Test Result
			Pass Failed N/A
Conducted Emissions on AC, 0.15MHz to 30MHz	FCC 47CFR 15.207	ANSI C63.4:2003	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
Radiated Emissions, 30MHz to 1GHz	FCC 47CFR 15.209	ANSI C63.4:2003	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Field Strength of Fundamental Emissions & Spurious Emissions	FCC 47CFR 15.231(a)	ANSI C63.4:2003	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Note: N/A - Not Applicable

According to FCC 47CFR 15.231(a), the following conditions shall be met to comply with the provisions for this periodic operation:

- (1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.
- (2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.

The EUT is to transmit RF signal while each button is being pressed and ceases transmission almost immediately upon being released. The transmitting time and the receiving time are within not more than 5 seconds.

### 4.1 Conducted emission (0.15MHz~30MHz)

**RESULT** : N/A

**Remarks:**

The EUT is operated by a single source of internal battery power (located in the battery compartment), therefore power line conducted emission was deemed unnecessary.

## 4.2 Radiated emission (Above 30 MHz)

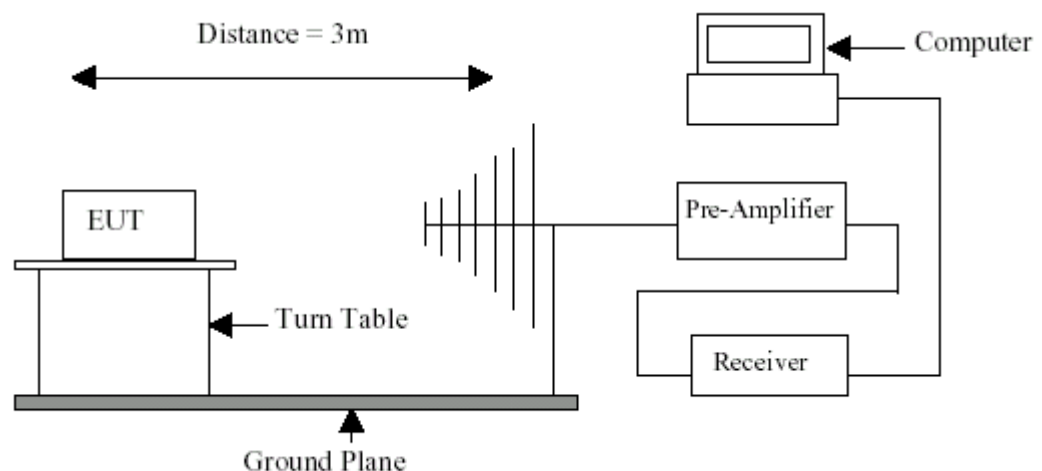
**RESULT** : **Pass**

Test procedure : ANSI C63.4 : 2003  
Frequency range : 30 MHz ~ 5GHz  
Limits : FCC PART 15, Subpart C, Section 15.209  
FCC PART 15, Subpart C, Section 15.231(a)  
Test Site : 3m Anechoic Chamber (Registration Number: 102430)

### Test Method:

The EUT was placed on a wooden turntable, which could rotate from 0° to 360°, 0.8m high above the ground, at a distance of 3m in anechoic chamber, from the receiving broadband antenna, which was mounted on the antenna tower. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results below.

### Test Setup:





Transducer (partial)

3m, 26MHz~2GHz

Freq. (MHz)	3141 (3m) Value (dB)	Cable Value (dB)	Total Value (dB)
26	12.0	0.30	12.30
30	8.7	0.35	9.05
60	6.7	0.70	7.40
100	9.8	1.14	10.94
150	9.4	1.38	10.78
200	10.1	1.62	11.72
250	12.1	1.96	14.06
300	14.5	1.96	16.46
350	15.7	2.36	18.06
400	16.1	2.68	18.78
450	16.9	2.79	19.69
500	17.7	2.87	20.57
550	18.8	3.21	22.01
600	19.9	3.55	23.45
650	20.5	3.58	24.08
700	21.8	3.54	25.34
750	21.5	3.89	25.39
800	22.1	4.11	26.21
850	22.4	4.06	26.46
900	22.9	4.20	27.10
950	23.0	4.50	27.50
1000	24.1	4.56	28.66
1300	26.2	5.00	31.20
1700	27.2	6.00	33.20
2000	30.3	7.00	37.30

3m, 1GHz-18GHz

Freq. (MHz)	3115 (3m) Value (dB)	Cable) Value (dB)	Total Value (dB)
1000	4.36	1.00	5.36
1500	5.71	1.15	6.86
2000	9.33	1.30	10.63
3000	10.62	1.50	12.12
4000	12.32	1.80	14.12
5000	11.86	1.90	13.76
6000	13.06	2.10	15.16
7000	14.58	2.20	16.78
8000	14.23	2.55	18.88
9000	17.98	2.70	20.68
10000	17.58	3.10	21.85
11000	18.75	3.30	22.05
12000	18.71	3.40	22.11
13000	19.81	3.50	23.31
14000	20.91	3.60	24.51
15000	19.71	3.70	23.41
16000	19.51	3.80	23.31
17000	23.81	3.90	27.71
18000	28.21	4.00	32.21

Note: Correction Factor included Antenna Factor and Cable Attenuation.

**(1). Radiated Emissions limits, additional provisions [FCC 47 CFR 15.231(a)]:**

Frequency Range. (MHz)	Field Strength of Fundamental (μV/m)	Field Strength of Spurious Emissions (μV/m)
40.66-40.70	2250	225
70-130	1250	125
130-174	1250 to 3750**	125 to 375**
174-260	3750	375
260-470	3750 to 12500**	375 to 1250**
Above 470	12500	1250

Note: \*\* linear interpolations

Where F is the frequency in MHz, the formula for calculating the maximum permitted fundamental field strengths is as follows: for 433.9MHz,  $\mu\text{V/m}$  at 3 meters =  $41.6667 \times (F) - 7083.3333 = 10995.8$  ( $\mu\text{V/m}$ ). The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.

Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in Section 15.209, whichever limit permits a higher field strength.

The field strength of emissions appearing within restricted bands of operation shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions.

**Results:**

**Test Conditions:**

Ambient Temperature : 25 °C/ 25 °C (Before Test/After Test);  
 Relative Humidity : 60 %/ 60 % (Before Test/After Test);  
 Power Supply : 3V DC ;  
 Operating Mode of the EUT : Bi-directional transmission.

Field Strength of Fundamental Emissions (Peak Value)				
Freq. (MHz)	Antenna Polarity (V/H)	Result dB(μV/m)	Limit dB(μV/m)	Limits (μV/m)
433.9	H	58.8	101	109958
433.9	V	52.8	101	109958

Field Strength of Spurious Emissions (Peak Value)				
Freq. (MHz)	Antenna Polarity (V/H)	Result dB(μV/m)	Limit dB(μV/m)	Limits (μV/m)
867.8	H	39.8	81	10995.8
867.8	V	47.2	81	10995.8
1301.7	H	50.2	74	5000
1735.6	H	39.7	74	5000
2169.5	H	36.8	74	5000
3037.3	H	40.1	81	10995.8
3905.1	H	30.2	74	5000
1301.7	V	50.5	74	5000
1735.6	V	46.0	74	5000
2603.4	V	39.8	81	10995.8
3037.3	V	38.7	81	10995.8
3905.1	V	31.2	74	5000

Field Strength of Fundamental Emissions (Average Value)				
Freq. (MHz)	Antenna Polarity (V/H)	Result dB(μV/m)	Limit dB(μV/m)	Limits (μV/m)
433.9	H	51.2	81	10995.8
433.9	V	45.2	81	10995.8

Field Strength of Spurious Emissions (Average Value)				
Freq. (MHz)	Antenna Polarity (V/H)	Result dB(μV/m)	Limit dB(μV/m)	Limits (μV/m)
867.8	H	32.2	61	1099.6
867.8	V	39.6	61	1099.6
1301.7	H	42.6	54	500
1735.6	H	32.1	54	500
2169.5	H	29.2	54	500
3037.3	H	32.5	61	1099.6
3905.1	H	22.6	54	500
1301.7	V	42.9	54	500
1735.6	V	38.4	54	500
2603.4	V	32.2	61	1099.6
3037.3	V	31.1	61	1099.6
3905.1	V	23.6	54	500

**Remarks:**

- Adjusted by Duty Cycle = -7.6dB
- FCC limit for Average Measurement =  $41.6667 \times (F) - 7083.3333 = 10995.8$  (μV/m)
- Measurements were made using a peak detector.
- Calculated measurement uncertainty: 30MHz to 1GHz    5.9dB

**(2). Radiated Emissions limits, general requirements [FCC 47 CFR 15.209]:**

Frequency range (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meter)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1GHz are based on measurements employing an average detector.

**Results:**

**Test Conditions:**

Ambient Temperature : 25 °C/ 25 °C (Before Test/After Test);  
 Relative Humidity : 60 %/ 60 % (Before Test/After Test);  
 Power Supply : 3V DC ;  
 Operating Mode of the EUT : Bi-directional transmission.

Radiated Emissions Quasi-peak				
Freq. (MHz)	Antenna Polarity (V/H)	Result dB(μV/m)	Limit dB(μV/m)	Limits (μV/m)
148.2	H	21.2	43.5	150
389.1	H	28.4	46	200
830.2	H	39.6	46	200
95.0	V	24.5	43.5	150
440.1	V	23.5	46	200
682.3	V	37.0	46	200
897.8	V	32.9	46	200
951.5	V	34.9	46	200
>960	H/V	<30	54	500

Calculated measurement uncertainty: 30MHz to 1GHz 5.9dB

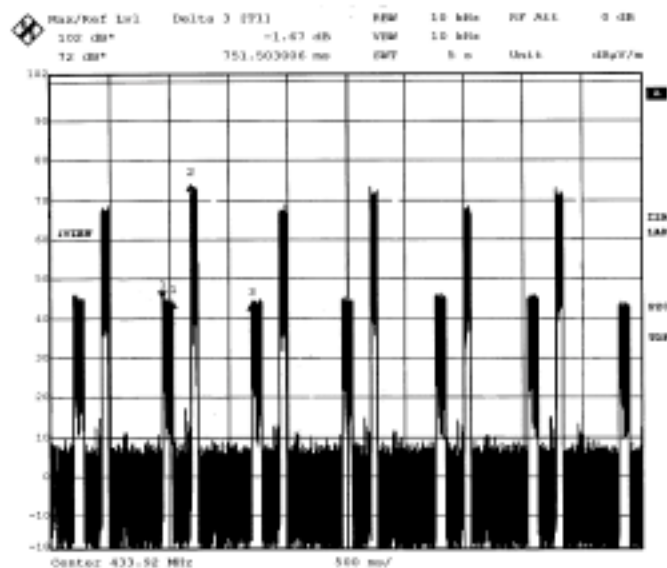
**Attachment:**  
**Duty Cycle Correction**

uty Cycle Correction (Worst case):  $20\log(T_{\text{pulse}} / T_{100\text{ms}})$

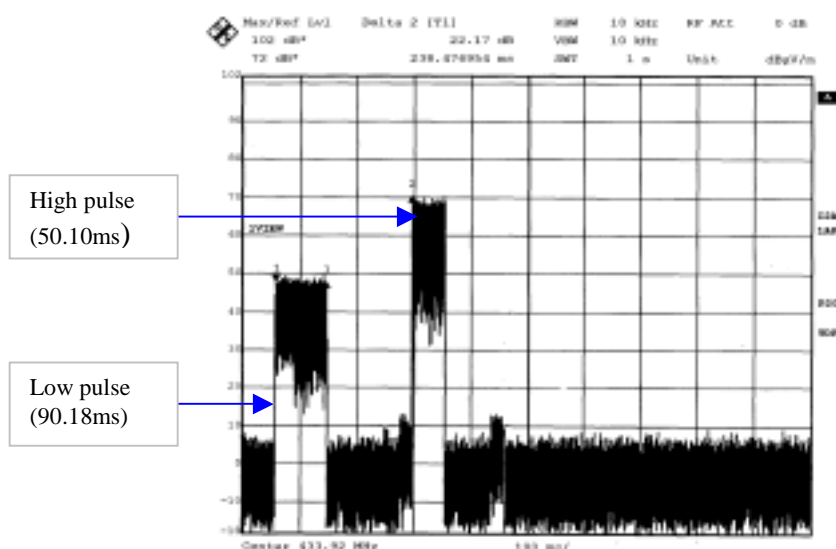
The average duty cycle correction factor =  $((2.36\text{ms} \times 4 + 160\mu\text{s} \times 200) / 100\text{ms}) = -7.6\text{dB}$

Note: According to ANSI C63.4, when the pulse train exceeds 100ms, calculate the duty cycle by averaging the sum of the pulsewidths over the 100ms width with the highest average value.

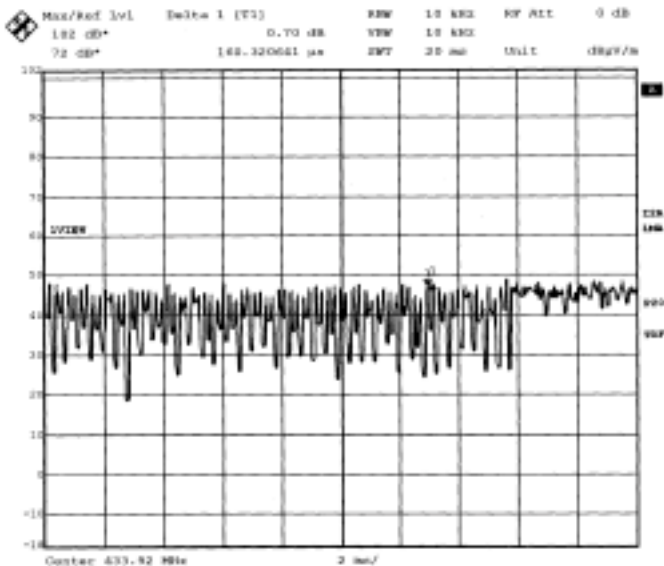
For the EUT, One pulse train (751.50ms, Graph A) includes one high pulse (50.10ms) and one low pulse (90.18ms) (Graph B). This low pulse includes 4 long (2.36ms) pulses and about 200 short (160 $\mu\text{s}$ ) pulses, see graph C and D.



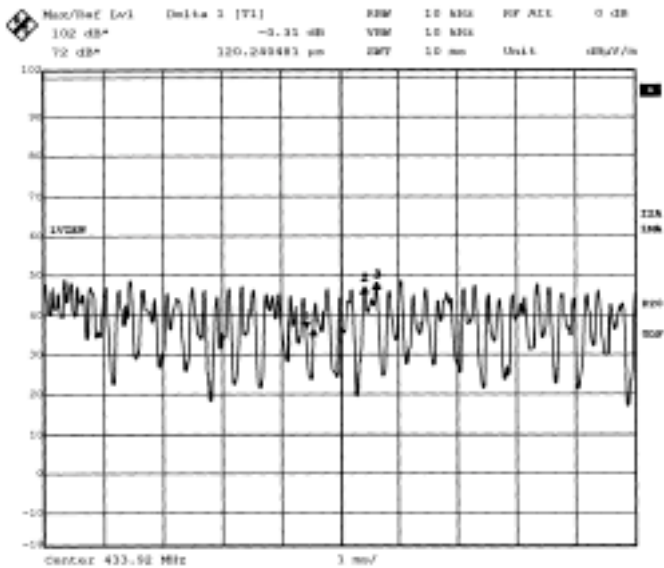
Graph: A,  
Pulse Train



Graph: B,  
One Pulse  
train



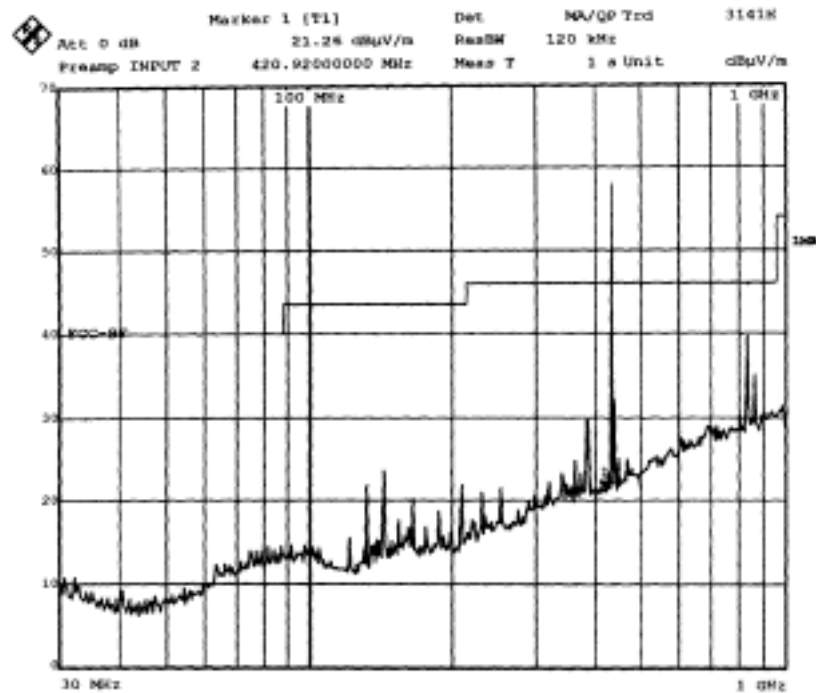
Graph: C,  
Enlarged  
low pulse



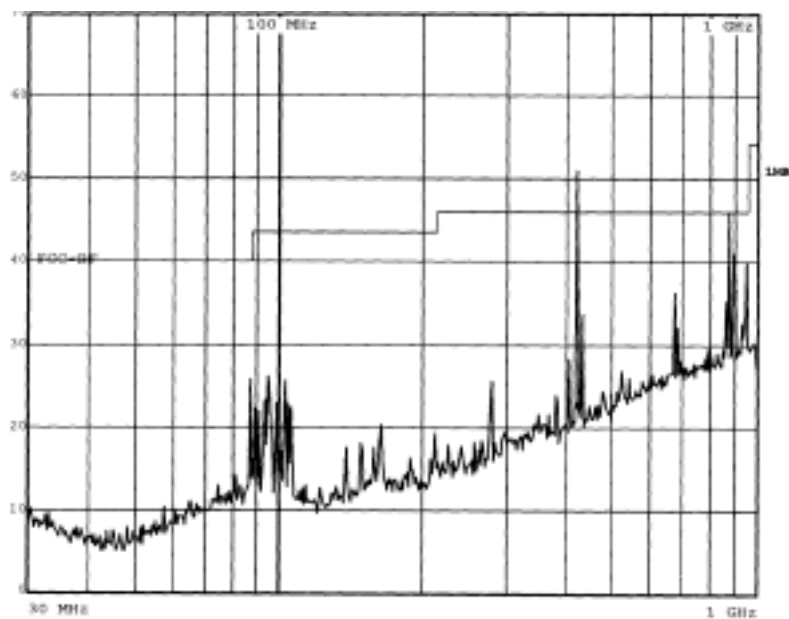
Graph: D,  
Enlarged  
low pulse

### Scan Graph and Scan Settings

Bi-directional transmission (Horizontal)



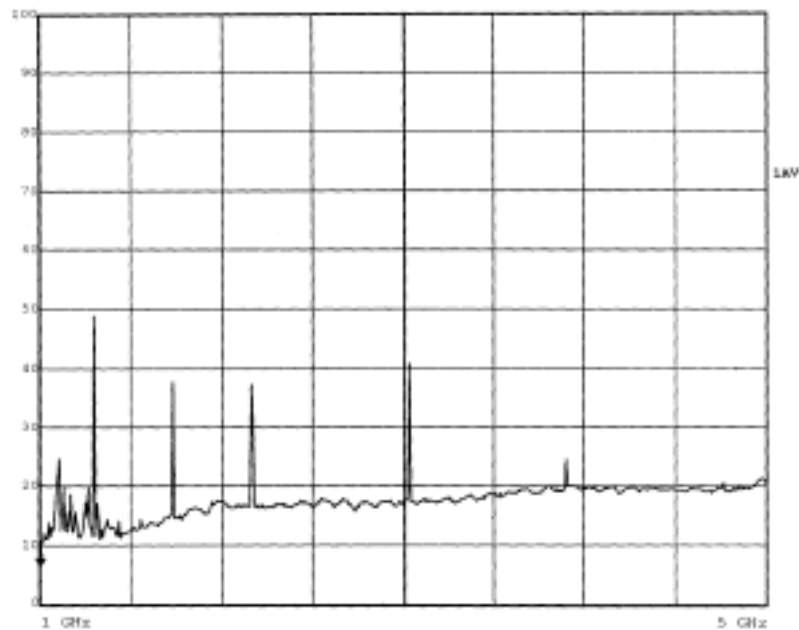
Bi-directional transmission (Vertical)



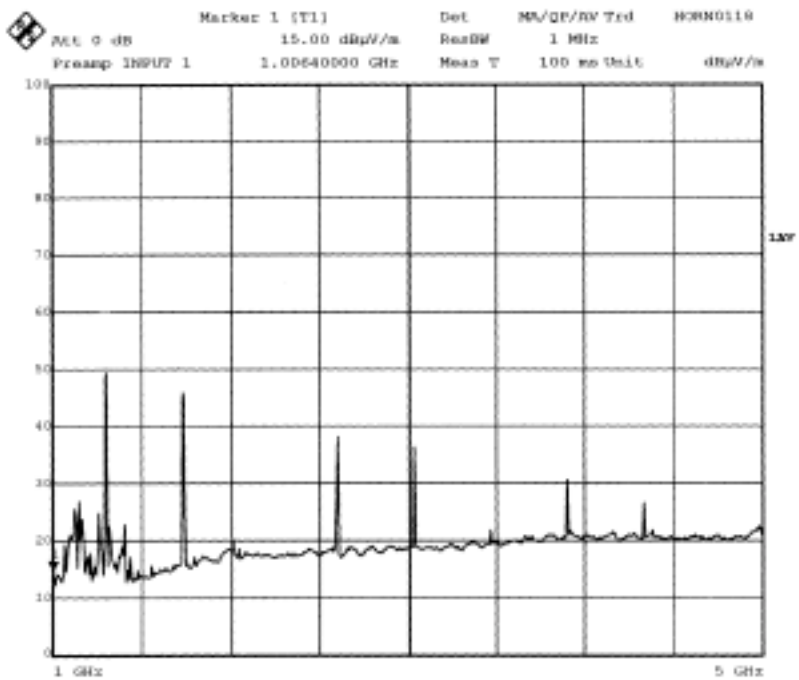


Scan Graph and Scan Settings

Bi-directional transmission (Horizontal /Vertical)



Bi-directional transmission (Horizontal /Vertical)



### 4.3 20dB Bandwidth of Fundamental Emission

**RESULT** : **Pass**

Test procedure : ANSI C63.4 : 2003  
Limits : FCC PART 15, Subpart C, Section 15.231(a)  
Test Site : 3m Anechoic Chamber (Registration Number: 102430)

**Test Method:**

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

**Test Setup:**

As Test Setup of clause 4.2 in this test report.

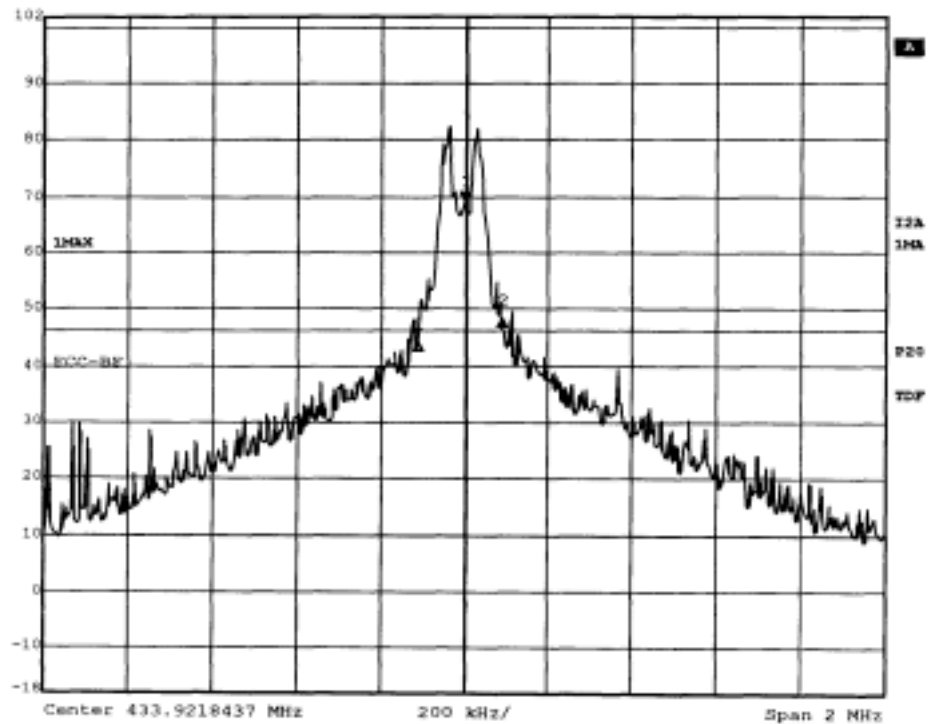
**Results:**

**Test Conditions:**

Ambient Temperature : 25 °C / 25 °C (Before Test/After Test);  
Relative Humidity : 60 % / 60 % (Before Test/After Test);  
Power Supply : 3V DC ;  
Operating Mode of the EUT : Bi-directional transmission.

Frequency Range [MHz]	20dB Bandwidth [KHz]	FCC Limits [MHz]	Conclusion
433.9	172.3	$0.25\% \times 433.9\text{MHz}$ = 1084.75 kHz	No wider than The FCC limits

Scan Graph and Scan Settings



## 5. Photographs & Nameplates of the EUT

### 5.1 Outlook:

Front View of the EUT

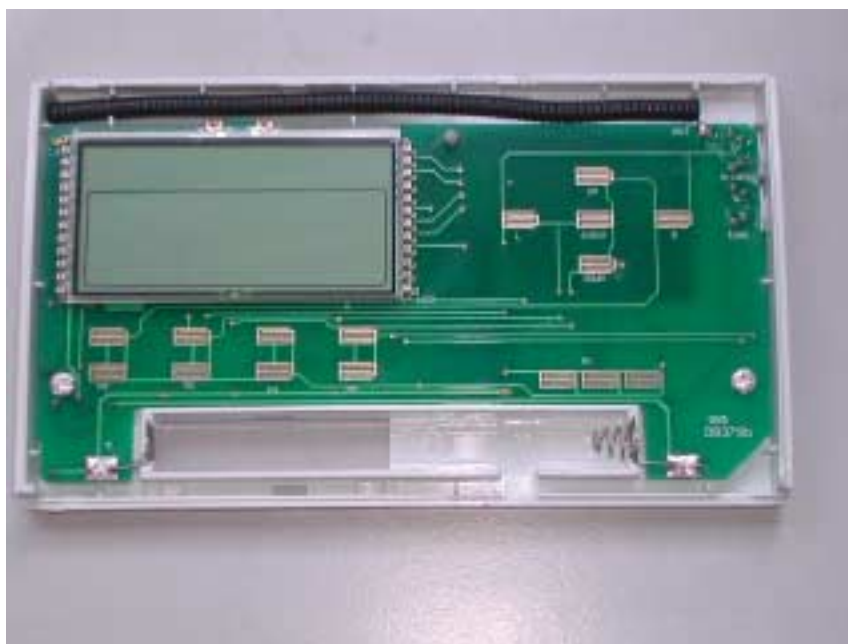


Rear View of the EUT



## 5.2 Structure of internal wires:

Inner Circuit Top View



Inner Circuit Bottom View



### 5.3 Nameplate:

Use direction

1. Model No.: GKB7UIR-3B/50
2. Place two 1.5VDC alkaline batteries and follow sign + - direction.
3. Replace new batteries when the battery icon shows and alarm occurs.
4. Keys on the left and the right corner are shortcut keys. Please set scenes according to the use manual.
5. Two side keys on the right are F key and All Off keys. Press  key do All Off function. Press F key then  key do All On function.
6. Press     keys to select units flash. After selected, press OK key to operate On/Off function.



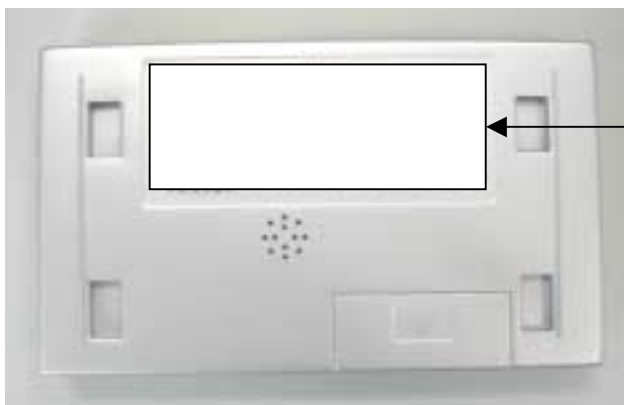
FCC ID: SDGGKB7UIR-3B

GUANGZHOU GKB ELECTRIC CO., LTD.

#### Statement:

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.

Note: The statement is in the Operating Instructions because of the size of nameplate



*Position of the  
nameplate*

## 6. Photograph of the test setup



Measurement of Radiated Emission Test

**Appendix A**

Test Equipment	Mature Date of Calibration	Type/Model	Serial No.	Manufacturer
EMI Test Receiver	2005.10.12	ESI26	834000/009	R & S
EMI Test Receiver	2005.10.12	ESCS30	100158	R & S
LISN	2005.10.12	ESH3-Z5	844982/020	R & S
LISN	2005.10.12	ESH3-Z5	833874/002	R & S
Biconilog Antenna	2005.06.04	3141	1178	EMCO
Waveguide Horn	2005.06.04	3115	0002-6038	EMCO

*End of Document*