

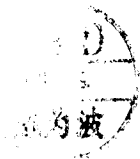

Address:  
Block 9, Shuiwei Ind Zone, Shuiwei New  
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Tel: (86)755-28121370/ 28121371/28109416/28109419  
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E-mail: rd@horn.com.cn  
Website: www.horn.com.cn

**CUSTOMER : Digi-Key Corporation**

## APPROVAL SHEET

PRODUCT NAME	PART NUMBER	DIMENSION	REMARK
Electret Condenser Microphone	<b>EM6013-48BC10&amp;33</b>	$\phi 6.0 \times 1.3(\text{mm})$	D.S.PCB

APPROVED BY	CHECKED BY	ISSUED BY
		

**APPROVED BY**

**DATE:**

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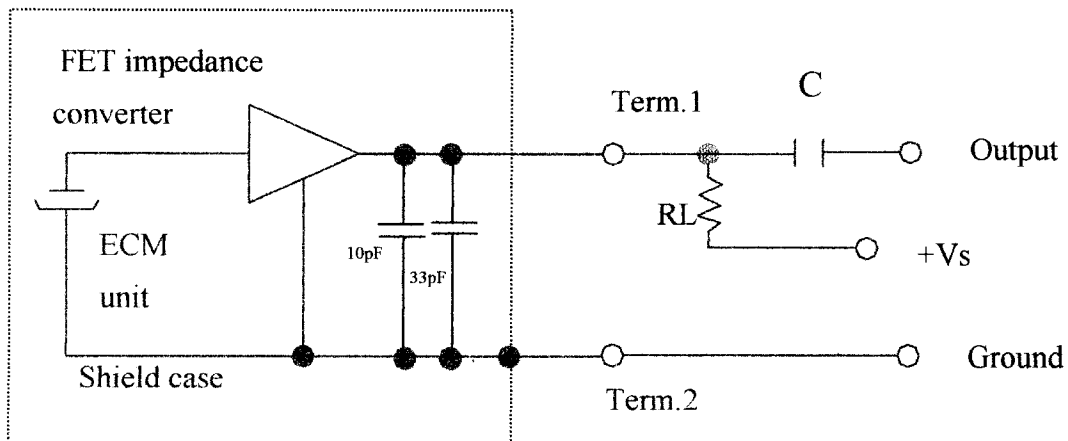
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## SPECIFICATION

Item	Symbol	Test conditions	Min	Standard	Max	Unit
Sensitivity	S	$f=1\text{KHz}, P_{in}=1\text{Pa}$	-50	-48	-46	dB <small><math>0\text{dB}=1\text{V/Pa}</math></small>
Directivity	Omnidirectional					
Impedance	$Z_{out}$				2.2	K $\Omega$
Input sound Pressure level	S.P.L				100	dB
Operation voltage	$V_s$	-	1.0	2	10	V
Current consumption	I	$f=1\text{KHz}, P_{in}=1\text{Pa}$			500	$\mu\text{A}$
Sensitivity reduction	$\Delta S$	$f=1\text{KHz}, P_{in}=1\text{Pa}$ $V_s=2 \rightarrow 1.5\text{V}$			-3	dB
S/N ratio	S/N(A)	$f=1\text{KHz}, P_{in}=1\text{Pa}$ A=curve	60			dB

**Measurement Circuit** ( Test Condition  $V_s=2\text{V}$   $R_L=2.2\text{K}\Omega$

$T_a=20^\circ\text{C}$   $R.H=65\%$  )

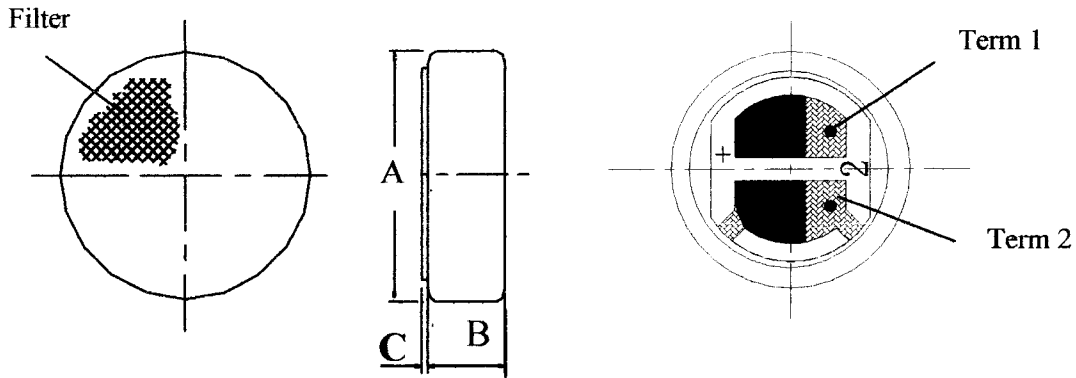


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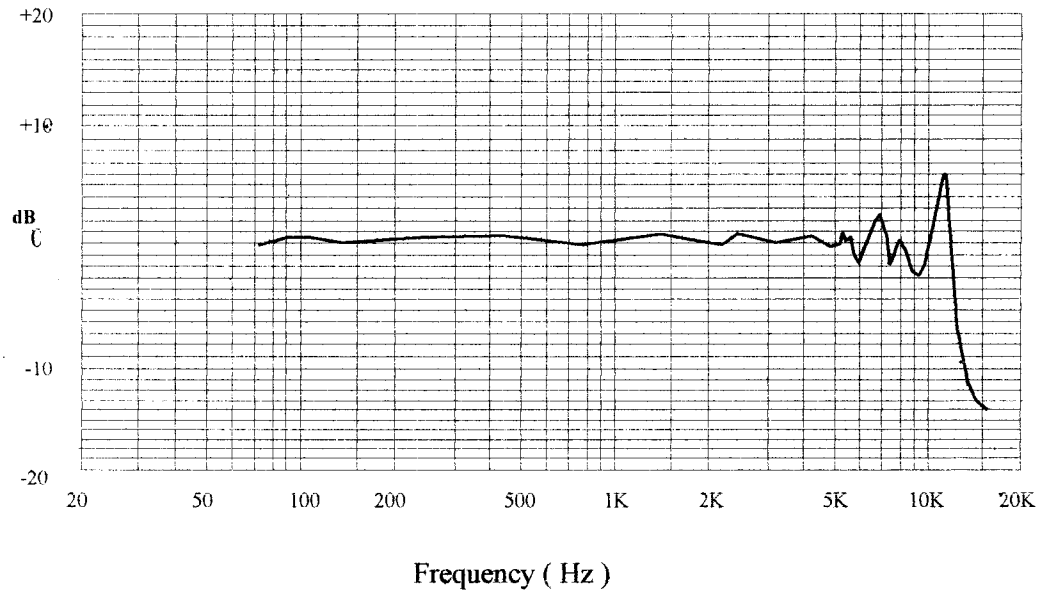
## Dimensional Drawing

unit: mm



PART	MIN	STANDARD	MAX	REMARK
A	φ 5.9	φ 6.0	φ 6.1	
B	1.2	1.3	1.4	
C	0.1	0.2	0.3	

## Typical Frequency Response Curve



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## Ambient condition

### (1) Operating condition

Ambient temperature:  $-10^{\circ}\text{C} \sim +45^{\circ}\text{C}$   
Relative humidity:  $\leq 85\%$

### (2) Storage condition

Ambient temperature:  $-20^{\circ}\text{C} \sim +60^{\circ}\text{C}$   
Relative humidity:  $45\% \sim 75\%$

## Reliability Test

### 1) Vibration Test

To be no interference in operation after vibration of full amplitude 2mm for 30 minutes at three axis, the sensitivity to be within  $\pm 3\text{dB}$  from initial sensitivity.

### 2) Drop Test

To be no interference in operation after dropped to concrete floor each time from 1 meter height of three directions in state of packing, the sensitivity to be within  $\pm 3\text{dB}$  from initial sensitivity.

### 3) High Temperature Test

To be no interference in operation after high temperature test  $70 \pm 3^{\circ}\text{C}$  for 48 hours, the sensitivity to be within  $\pm 3\text{dB}$  from initial sensitivity.

### 4) Isotherm & Iso-humidity Test

To be no interference in operation after storage test at temperature  $60 \pm 2^{\circ}\text{C}$  and relative humidity ( $93 \pm 3\%$ ) for 48 hours, the sensitivity to be within  $\pm 3\text{dB}$  from initial sensitivity. the test is performed at temperature  $20^{\circ}\text{C}$  after operation for 6 hours.

### 5) Low Temperature Test

To be no interference in operation after high temperature test  $-20 \pm 3^{\circ}\text{C}$  for 48 hours, the sensitivity to be within  $\pm 3\text{dB}$  from initial sensitivity.

### 6) Temperature Cycle Test

After exposure at  $+55 \pm 2^{\circ}\text{C}$  for 1 hour, at  $20 \pm 2^{\circ}\text{C}$  for 1 hour, at  $-10 \pm 2^{\circ}\text{C}$  for 1 hour, at  $20 \pm 2^{\circ}\text{C}$  for 1 hour, with 5 cycles. Change of sensitivity within  $\pm 3\text{dB}$  from initial measuring should be done after 2 hours exposed to  $20 \pm 2^{\circ}\text{C}$ .

### 7) Collision Test

After collided with the acceleration  $100 \pm 10\text{m/s}$ , at the vertical & horizontal directions for  $1000 \pm 10$  times, at the state of packing. Change of sensitivity within  $\pm 3\text{dB}$  from initial.



Electret Condenser Microphone Units

深圳市豪恩电声科技有限公司  
SHENZHEN HORN ELECTROACOUSTIC TECHNOLOGY CO.,LTD

### TEST RESULT OF SAMPLES

NO.	1KHz (dB)	CURRENT (mA)	NOTES
1	-48.2	0.13	(1KHz、0dB=1V/Pa)
2	-47.9	0.12	
3	-48	0.13	
4	-48.1	0.12	
5	-48.2	0.12	
6	-48.1	0.15	
7	-47.8	0.14	
8	-48.5	0.13	
9	-48.5	0.12	
10	-48.1	0.1	
11	-48.2	0.13	
12	-48	0.12	
13	-48.1	0.13	
14	-48	0.14	
15	-47.9	0.11	



Customer: Digi-Key Corporation

Date: 2003.12.09

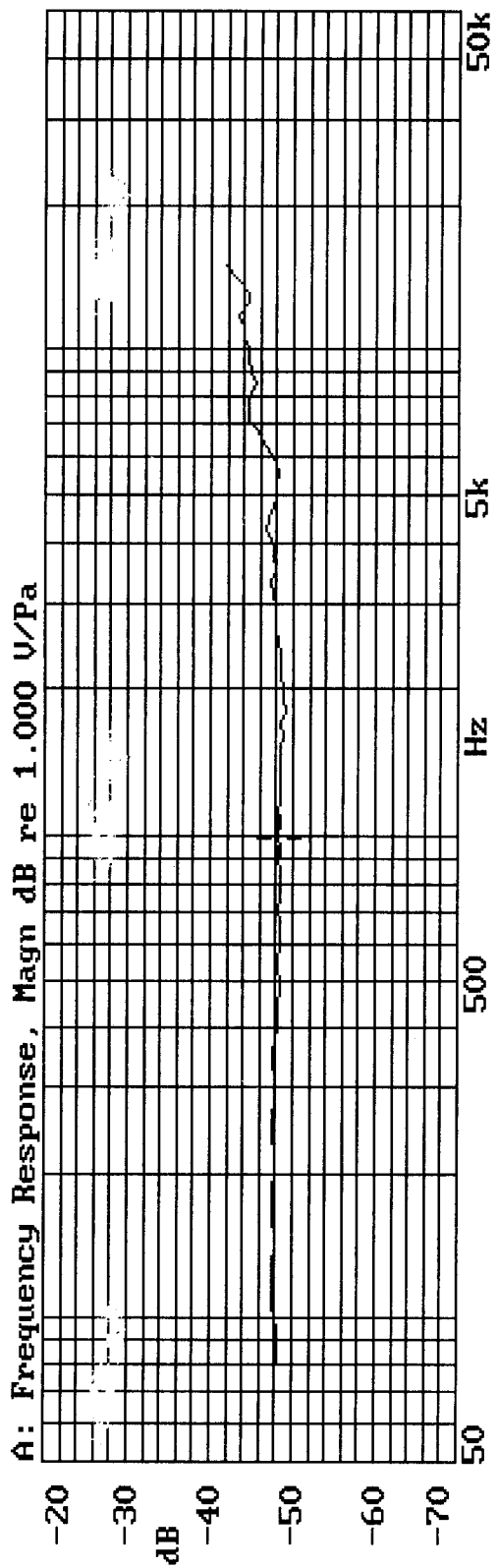
Part number: EM6013-48BC10&33

Sensitivity: -48±2dB

Test condition: 2.2K Ω 2V

Tester: G1

SHENZHEN HORN ELECTROACOUSTIC TECHNOLOGY CO., LTD.  
X:1.000kHz \*Y:-48.18dB\* ZA:Live Curve SSR Fund.



MODEL : EM6013-48BC10&33  
CODE : 5#  
SENSITIVITY : -48.18dB (1KHz)  
TEST CONDITION : 2.2KΩ 2V

08-DEC-2003 16:19:28

Mode: SSR





Electret Condenser Microphone Units

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## Certificate of Confirmed Products

Date: Dec. 07. 2003

NO: W031206006

SUPPLIER	HORN	BUYER	<b>Digi-Key Corporation</b>	
TITLE	ECM	MODEL	<b>EM6013-48BC10&amp;33</b>	
SIZE	$\phi 6.0 \times 1.3\text{mm}$	TEST CONDITION	2.2K $\Omega$ 2V	
QUANTITY		SAMPLE: 15PCS		
<b>SPECIFICATIONS</b>				
Sensitivity		-48 $\pm$ 2dB (0dB=1V/Pa. 1KHz )		
Directivity		Omnidirectional		
Impedance		Low impedance		
Standard operation voltage		2V		
Operation voltage		1.0-10V		
Current consumption		Max 500uA		
Maximum input S.P.L		100dB		
S/N ratio		More than 60 dB		
Sensitive reduction		within-3dB at 1.5V		
The test result from customers		Signature: _____ . _____ . 2003		
Final confirmed	Pass	Refuse	Accepted basis on	
Remarks				

\*\*\*\*\* The form must be confirmed by return fax after your test as your best regards! \*\*\*\*\*