HORN 豪恩
Electret Condenser Microphone Units

深圳市豪恩电声科技有限公司

SHENZHEN HORN ELECTROACOUSTIC TECHNOLOGY CO., LTD
TEL: 86-755-28121370/28121371/28109416/28109419
FAX: 86-755-28109417
Website:www. horn. com. cn
E-mail: rd@horn. com. cn

Certificate of Confirmed Products

Date: Feb. 04. 2004 NO: W04011403

SUPPLIER	HORN	BUYER	Digi-Key Corporation
TITLE	ECM	MODEL	EM4011-52FC10&33
SIZE	φ4.0 × 1.1mm	TEST CONDITION	2.2KΩ 2V
QUANTITY		SAMPLE: 15PCS	

SPECIFICATIONS

Sensitivity	-52 ± 4dB (0dB=1V/Pa. 1KHz)
Directivity	Omnidirectional
Impedance	Low impedance
Standard operation voltage	2V
Operation voltage	1.0-10V
Current consumption	Max500uA
Maximum input S.P.L	100dB
S/N ratio	More than 58dB
Sensitive reduction	within-3dB at 1.5V

The test result from customers	Signature: ____ . ____ . 2004		
Final confirmed	Pass	Refuse	Accepted basis on
Remarks			

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

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SPEC.SHEET NO: W04011403

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CUSTOMER: Digi-Key Corporation

APPROVAL SHEET

PRODUCT NAME	PART NUMBR	DIMENSION	REMARK
Electret Condenser Microphone	**EM4011-52FC10&33**	Ø4.0×1.1(mm)	(SMT)

APPROVED BY	CHECKED BY	ISSUED BY
04.2.4	2/4	04.2/4

APPROVED BY:

DATE:

PART NUMBER :EM4011-52FC10&33

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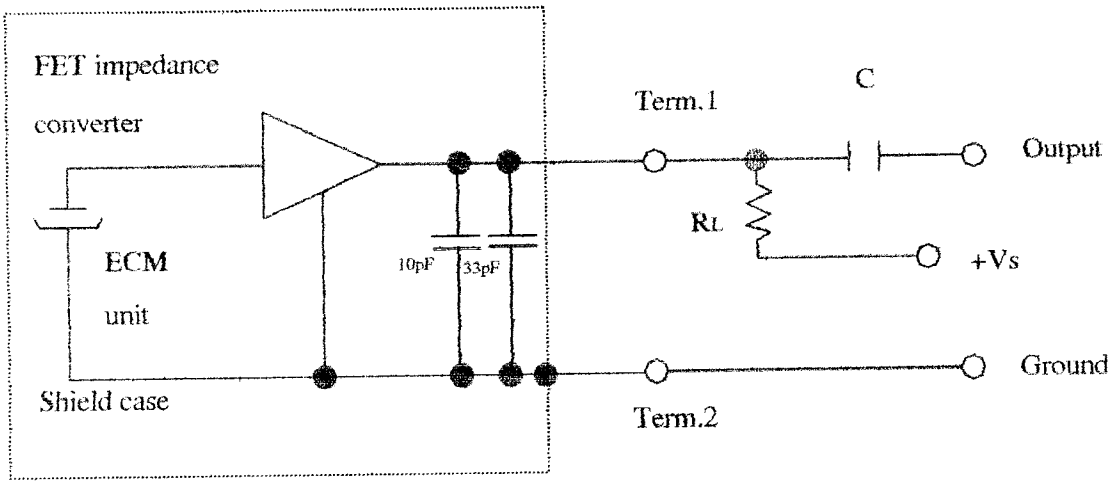
SPECIFICATION

Item	Symbol	Test conditions	Min	Standard	Max	Unit
Sensitivity	S	f=1KHz. P_{in}=1Pa	-56	-52	-48	dB (0dB=1V/Pa)
Directivity	Omnidirectional					
Impedance	Zout				2.2	KΩ
Input sound pressure level	S.P.L				100	dB
Operation voltage	Vs	-	1.0	2	10	V
Current consumption	I	f=1KHz. P_{in}=1Pa			500	uA
Sensitivity reduction	ΔS	f=1KHz. P_{in}=1Pa Vs=2→1.5V			-3	dB
S/N ratio	S/N(A)	f=1KHz. P_{in}=1Pa A=curve	58			dB

Measurement Circuit (Test Condition Vs=2V R_L=2.2KΩ

Ta=20℃ R.H=65%)



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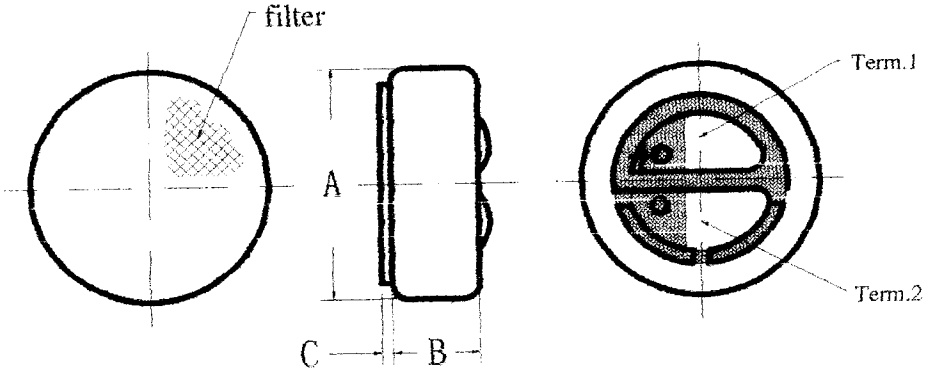
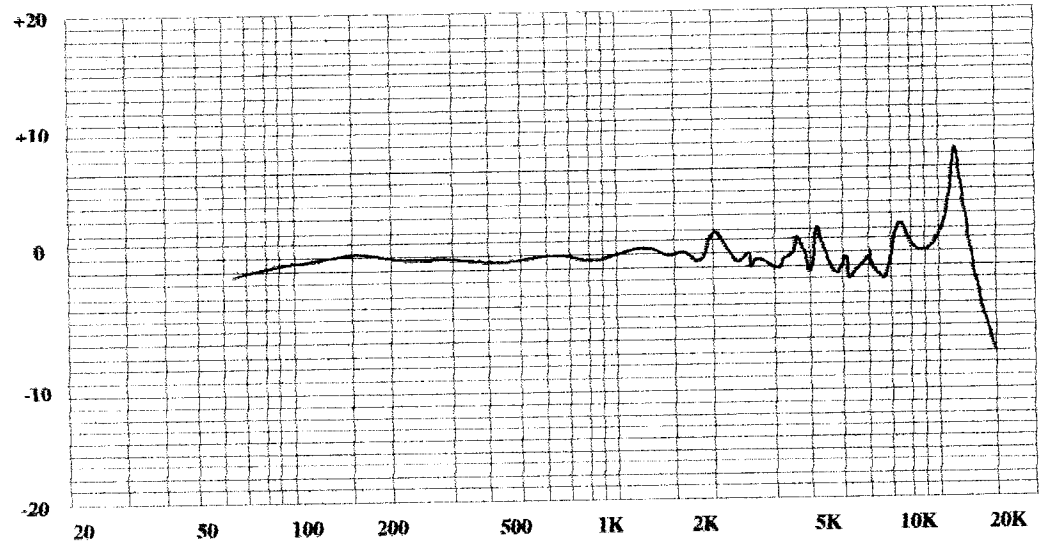
Dimensional Drawing

unit: mm



PART	MIN	STANDARD	MAX	REMARK
A	Ø3.8	Ø4.0	Ø4.2	
B	1.0	1.1	1.2	
C	-	-	0.2	

Typical Frequency Response Curve



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Ambient condition

(1) Operating condition
Ambient temperature: -10℃～+45℃
Relative humidity: ≤ 85%

(2) Storage condition
Ambient temperature: -20℃ ～+60℃
Relative humidity: 45%～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 +/-3dB 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 +/-3 dB from initial sensitivity.

3) High Temperature Storage:

To be no interference in operation after high temperature test 70℃+/-3℃ for 48 hours. The sensitivity to be within+/-3dB from initial sensitivity.

4) Isotherm & Iso-humidity Storage

To be no interference in operation after storage test at temperature 60℃+/-2℃ and relative humidity(93+/-3%) for 48 hours, the sensitivity to be within +/-3dB from initial sensitivity, the test is performed at temperature 20℃after operation for 6 hours.

5) Low Temperature Storage

To be no interference in operation after test at temperature -20℃+/-3℃ for 48 hours, the sensitivity to be within +/-3dB from initial sensitivity

6) Temperature Cycle Test

After exposure at 55+/-2℃for 1 hour, at 20+/-2℃ for 1 hour. at -10+/-2℃ for 1 hour, at 20+/-2℃for 1 hour, with 5 cycles. Change of sensitivity within +/-3dB from initial measuring should be done after 2 hours exposed to 20℃±2℃).

7) Collision Test

After collided with the acceleration 100+/-10m/s, at the vertical & horizontal directions for 1000+/-10 times. at the state of packing. Change of sensitivity within +/-3dB from initial.

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TEST RESULT OF SAMPLES

NO.	1KHz (dB)	CURRENT (mA)	NOTES
1	-51	0.19	
2	-52.5	0.23	
3	-53.2	0.18	
4	-51.3	0.18	
5	-53.8	0.22	
6	-51	0.19	
7	-53	0.2	
8	-52.5	0.17	
9	-51.5	0.17	
10	-52.5	0.18	
11	-50.8	0.24	
12	-52.4	0.17	
13	-51.5	0.22	
14	-52.5	0.23	
15	-51.8	0.17	

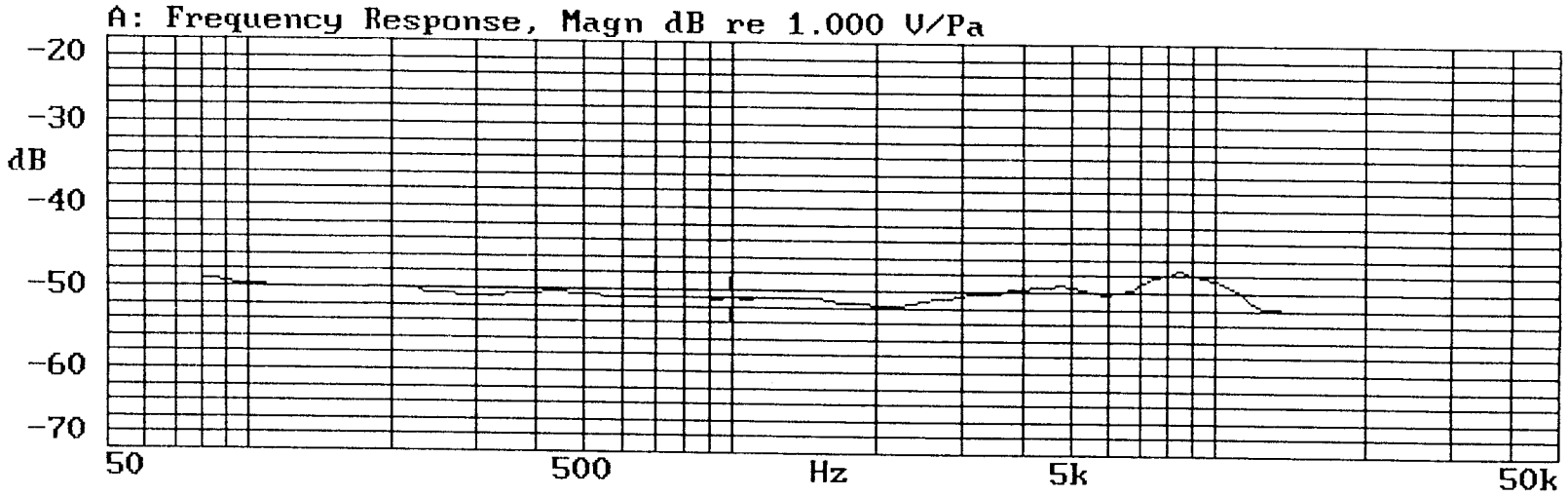
Customer: Digi-Key Corporation Date: 2004.02.04

Part number: EM4011-52FC10&33 Sensitivity: -52±4dB

Test condition: 2.2KΩ 2V Tester: G1

SHENZHEN HORN ELECTROACOUSTIC TECHNOLOGY CO.,LTD.

X:1.0000kHz *Y:-50.96dB* ZA:Live Curve SSR Fund.



MODEL:	EM4011-52FC10&33
CODE:	6#
SENSITIVITY:	-50.96dB (1KHz)
TEST CONDITION:	2.2KΩ 2V

03-FEB-2004 08:51:22

Mode: SSR