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# PRODUCT INFORMATION

Part Numbers

**CEM- OB60348-354G-PAK**

Revision

**0-2012**

Type

**Omni-Directional Back Electret Condenser Microphone**

Compliance

- **RoHS, Lead Free**
- **ISO 9001:2000**



Date	ECN #	Rev #	Description	Page	Prepared By	Approved By

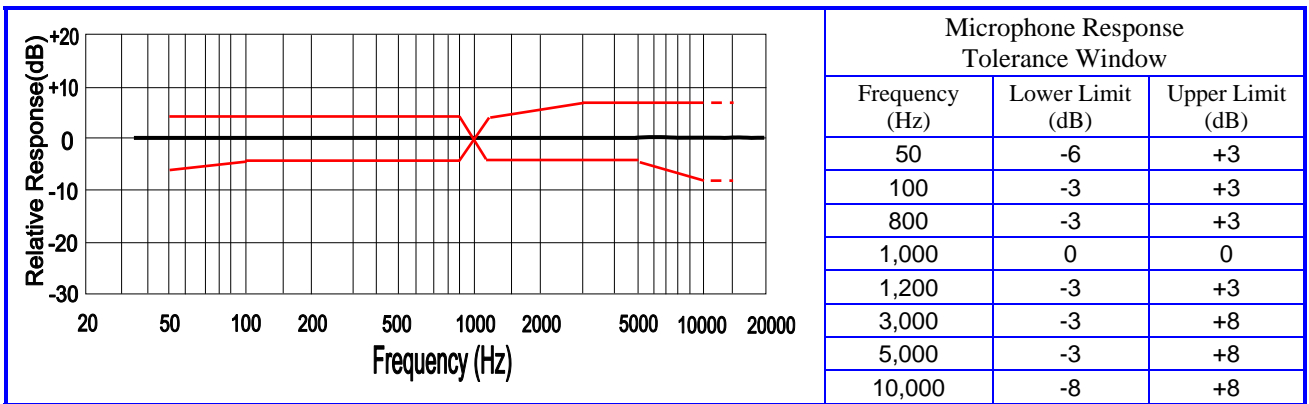


### 1. Electrical Characteristics

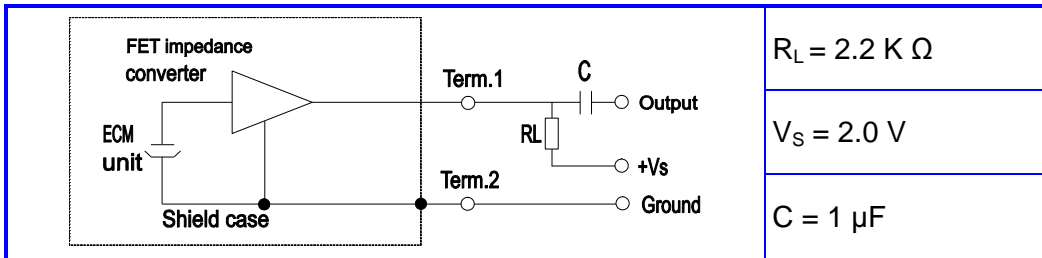
Test condition:  $V_s = 2.0\text{ V}$ ,  $R_L = 2.2\text{ K}\Omega$  at  $20\pm 2^\circ\text{C}$ , Relative Humidity  $50\pm 5\%$  unless otherwise specified

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Directivity			Omni-Directional			
Operating Voltage	$V_{CC}$		1.0		10	Vdc
Current Consumption	$I_{DSS}$	$V_s = 2.0\text{ V}$ ; $R_L = 2.2\text{ K}\Omega$			500	$\mu\text{A}$
Frequency Range	F		50		10,000	Hz.
Sensitivity Range	S	0 dB = 1V/Pa, at 1k Hz.	-39	-35	-31	dB(A)
Output Impedance	Z out	@ 1,000 Hz.			2,200	Ohms
Signal to Noise Ratio	S/N	0 dB = 1V/Pa, at 1k Hz.	58			dB(A)
Decreasing Voltage	$\Delta S - V_s$	$V_s = 3.0\text{ V}$ to $2.0\text{ V}$			-3	dB(A)
Maximum Input S.P.L.					110	dB(A)

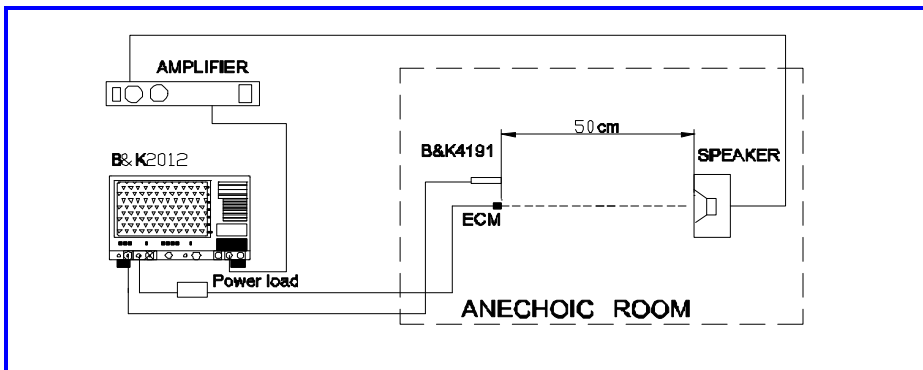
### 2. Frequency Response Curve



### 3. Measurement Circuit



### 4. Measurement Setup Drawing

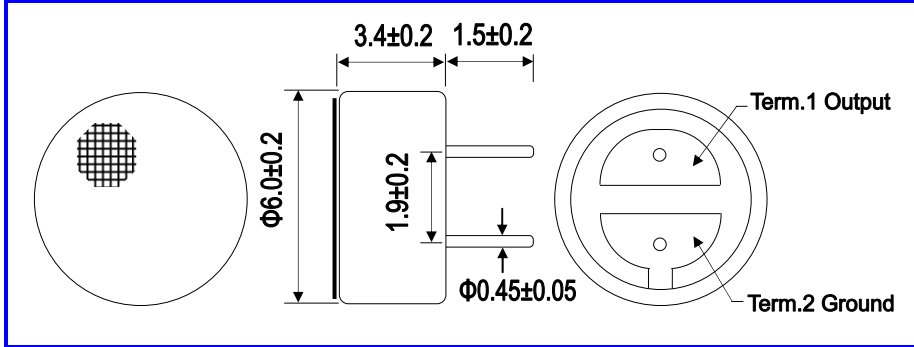


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### 5. Mechanical Characteristics

- 5.1. **Weight:** Less than 0.2 grams
- 5.2. **All dimensions are:** in millimeter (mm).
- 5.3. **Tolerance:** ±0.2 mm unless otherwise specified.
- 5.4. **Microphone Dimensions**

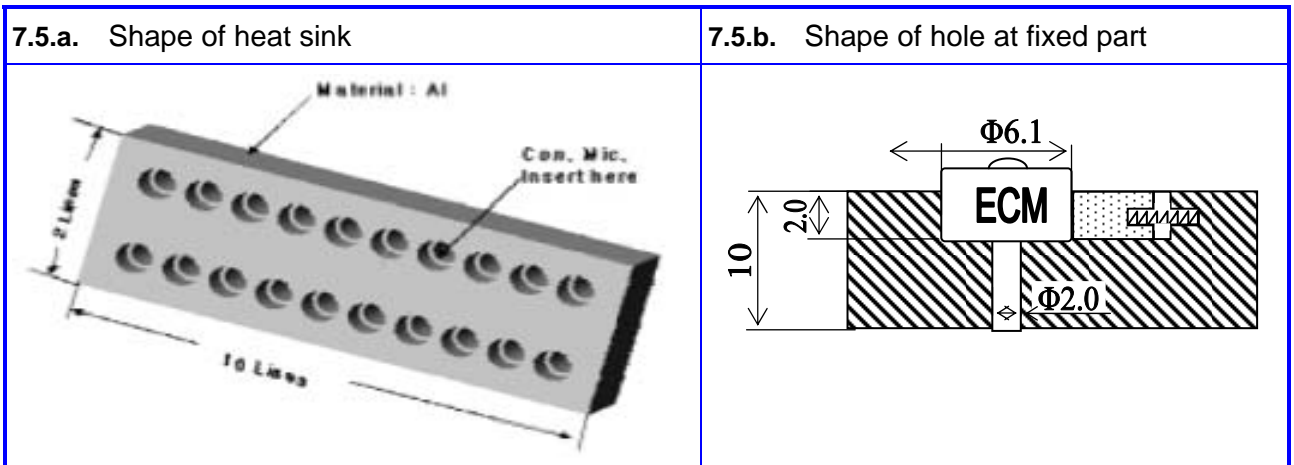


### 6. Application

- 6.1. Temperature Condition
  - 6.1.a. Storage temperature range: -40°C ~+85°C.
  - 6.1.b. Operating temperature range: -40°C ~+85°C.
- 6.2. Storage
  - 6.2.a. Devices are to be stored in factory supplied unopened ESD moisture sensitive bag under maximum environmental conditions of 30°C, 70% R.H.
  - 6.2.b. Exposure: Devices should not be exposed to high humidity high temperature environment. MSL (moisture sensitivity level) Class 2

### 7. Soldering Condition

- 7.1. We suggest using anti-static welding machine which can control soldering temperature automatically.
- 7.2. Soldering temperature should be controlled under 320°C and soldering time for each terminal should be 1~2 sec.
- 7.3. Microphone should be fixed on the metal block (heat sink), which has high radiation effects, and heat sink shall contact with MIC tightly.
- 7.4. Microphone may easily be destroyed by the static electricity and the countermeasure for eliminating the static electricity shall be executed (worktable and human body shall be ground connection)
- 7.5. Heat Sink





## 8. Reliability

<b>Thermal Operating Temperature Test</b>	<b>240 hours</b> continuous operation at <b>Rated Voltage</b> , at <b>Maximum Rated Operating Temperature</b> *
	<b>240 hours</b> continuous operation at <b>Rated Voltage</b> , at <b>Minimum Rated Operating Temperature</b> *
<b>Thermal Storage Temperature Test</b>	<b>96 hours</b> storage at <b>Maximum Rated Storage Temperatures</b> *
	<b>96 hours</b> storage at <b>Minimum Rated Storage Temperatures</b> *
<b>Temperature Shock</b>	<p><b>30 cycles</b> of <b>Minimum</b> and <b>Maximum Operating Temperature</b> Each cycle shall be set per diagram and is 3 hours long *</p>
<b>Highly Accelerated Temperature and Humidity Stress Test (HAST)</b>	The DUTs are soldered onto a test PCB. The PCB is placed in the oven and the input terminal leads are brought out and connected to the electrical power supply. The test PCB is powered up using the electrical power supply that is designed to maintain a constant voltage of the <b>maximum rated voltage</b> for the duration of the test. The oven is programmed to maintain a temperature of 110°C, 85% RH for <b>264 hours</b> with a pressure of 122 KPa introduced *
<b>Humidity Test</b>	Precondition at +25°C for <b>1 hour</b> . Then expose to +70°C with 90 to 95% relative humidity for <b>120 hours</b> *
<b>ESD Sensitivity</b>	Perform ESD sensitivity threshold measurements for each contact according to MIL-STD-883G, Method 3,015.7 for Human Body Model. Identify the ESD threshold levels indicating passage of 8,000V Human Body Model. *
<b>Termination Strength</b>	Maximum of 9.8 N (1.0 Kg) load pull test, applied to each terminal in axial direction for <b>1 minute</b>
<b>Drop Test</b>	Samples are mounted on a test PCB. The PCB itself was then glued onto a metal fixture slightly bigger than the PCB. The fixture was dropped naturally from the 1.5 m height onto a steel surface. The test was repeated in <b>six directions for three times, total 18 times</b> and inspected for mechanical damage *
<b>Random Vibrations</b>	Vibrate randomly along three perpendicular directions for <b>30 minutes in each direction</b> . The Power Spectral Density of the vibration had a + 3 dB/octave rise from 20 Hz to 80 Hz, a constant value of 0.053 g <sup>2</sup> /Hz from 80 Hz. to 350 Hz and finally a -3 dB/octave drop from 350 Hz to 2,000 Hz. Having subjected the units to vibration, they were tested for all electrical and acoustic parameters
<b>Mechanical Shock</b>	Subject samples to half sine shock pulses (3,000 g's ±15% for 0.3 ms) in each direction, totally <b>6 shocks</b>
<b>Sinusoidal Vibration</b>	Vibrate randomly from 10 Hz to 55 Hz, 1 octave/minute with 2 mm amplitude (peak to peak) for <b>2 hours in each direction</b> For this test are that the PCB must deflect at least 1mm before mechanical failure of the unit occurs
<b>Life Test</b>	ples to +125°C for <b>168 hours</b> under full <b>maximum rated voltage</b>
<b>* Reliability Test Performance</b>	<b>Parts should conform to original performance within ±3dB, after 3 hours of recovery period</b>

## 9. Concept of Unit

The difference between concept of “PASCAL” unit and the one unit “ $\mu\text{bar}$ ” can be explained as follows:

In calibrating the sensitivity of ECMs, the sensitivity is manifested differently according as the units “PASCAL” or “ $\mu\text{bar}$ ”. For example:

$$-60 \text{ dB (0 dB = 1 V / } \mu\text{bar)} - -42 \text{ dB (0 dB = 1 V / Pa)}$$

## 10. Warranty

For a period of one (1) year from date of shipping under normal handling and operations conditions

This warranty does not apply to products damaged through misuse, abuse, improper installation, alteration, rework, or attempt to repair



## 11. General Information

CONSTRUCTION MATERIAL				TESTING PROCEDURES													
<b>ITEM</b>	<b>PART NAME</b>	<b>MATERIAL</b>	<b>QTY</b>	<ol style="list-style-type: none"> <li>1. Measure the microphones under standard operating condition.</li> <li>2. Put the microphone and standard microphone face to the sound source (speaker), the distance between sound source and microphone &amp; standard microphone is 50cm. And keep the center distance 5cm between them to ensure that the change of sound pressure should be kept within <math>\pm 1</math>dB.</li> <li>3. Keep the sound source pressure within <math>\pm 1</math>dB from speaker Measured by standard microphone.</li> <li>4. The sensitivity of microphone can obtain its output voltage when sound source kept within 1,000Hz &amp; 0.1Pa.</li> <li>5. Testing Condition               <ul style="list-style-type: none"> <li>• <b>In Normal Weather</b> <table border="1"> <tr> <td>Environment Temperature:</td> <td>5~+35°C</td> </tr> <tr> <td>Relative Humidity:</td> <td>45 ~ 85%</td> </tr> <tr> <td>Air Pressure:</td> <td>86 ~ 106Kpa</td> </tr> </table> </li> <li>• <b>In Arbitrate Weather</b> <table border="1"> <tr> <td>Environment Temperature:</td> <td>20<math>\pm</math>2°C</td> </tr> <tr> <td>Relative Humidity:</td> <td>~ 70%</td> </tr> <tr> <td>Air Pressure:</td> <td>86 ~ 106Kpa</td> </tr> </table> </li> </ul> </li> </ol>		Environment Temperature:	5~+35°C	Relative Humidity:	45 ~ 85%	Air Pressure:	86 ~ 106Kpa	Environment Temperature:	20 $\pm$ 2°C	Relative Humidity:	~ 70%	Air Pressure:	86 ~ 106Kpa
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1	Felt	Fabric Cloth	1														
2	Case	Al-Mg Alloy	1														
3	Diaphragm	Polarized	1														
4	Spacer		1														
5	Electret Back		1														
6	Housing Chamber		1														
7	Ring	Copper	1														
8	P.C.B	FR-4	1														
9	FET		1														
10	PC Pins		2														

## 12. Packaging

		MARKING	Anti-Static Foam		
		<b>Bundle</b>	Dimensions	<b>X1</b>	<b>10 cm</b>
		Customer PN		<b>Y1</b>	<b>10 cm</b>
		Other PN if required		<b>Z1</b>	<b>1 cm</b>
		Quantity	Quantity	<b>100</b>	
		Lot and/or Date Code	<b>Small Box</b>		
		Bundle Number	Dimensions	<b>X2</b>	<b>10 cm</b>
<b>Shipping Box</b>	<b>Y2</b>	<b>10 cm</b>			
Customer Part Number	<b>Z2</b>	<b>1 cm</b>			
		Other PN (if required)	Quantity	<b>100</b>	
		Quantity	<b>BUNDLE</b>		
		Lot and/or Date Code	Dimensions	<b>X3</b>	<b>20.5 cm</b>
		PO Number		<b>Y3</b>	<b>10.5 cm</b>
		Net Weight		<b>Z3</b>	<b>5 cm</b>
		Gross Weight	Quantity	<b>1,400</b>	
		Box Number	<b>SHIPPING BOX</b>		
		of Number of Boxes	Dimensions	<b>X3</b>	<b>55 cm</b>
<b>Made in China</b>	<b>Y3</b>	<b>23 cm</b>			
	<b>Z3</b>	<b>23.5 cm</b>			
			Number of Bundles	<b>20</b>	
			Quantity	<b>28,000</b>	
			Approximate Gross Weight	<b>8.6 Kg.</b>	