

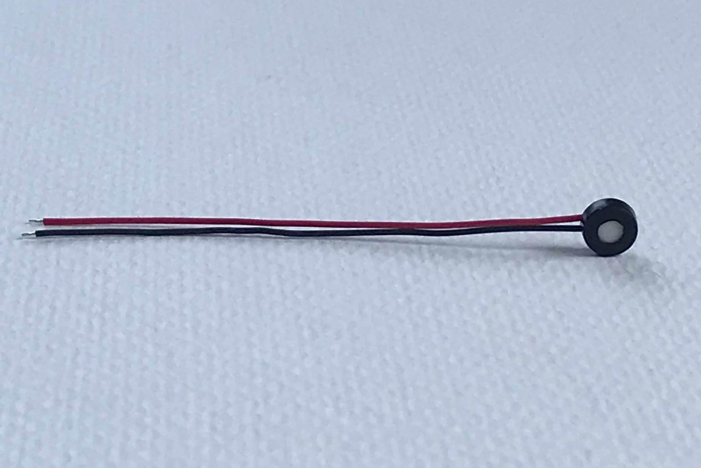


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# EM ELECTRET CONDENSER MICROPHONE

Acoustic Product Specification

Product No: EM-4015LRW-40



Release | Revision: C/2019

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## Electrical Characteristics

Temperature =20±2°C Humidity=65±5% Air pressure=86 to 106 KPa

### Sensitivity

Symbol: S Unit: dB

Condition: 0dB=1V/Pa, at 1KHz

Limits: Min: -43 Center: -40 Max: -37

### Output impedance

Symbol: Z out Unit: KΩ

Condition: f=1kHz

Limits: Max: 2.2

### Current Consumption

Symbol: IDSS Unit: μA

Condition: V<sub>CC</sub>=2.0V, R<sub>L</sub>=2.2KΩ

Limits: Max: 500

### Signal to Noise Ratio

Symbol: S/N Unit: dB

Condition: at 1kHz S.P.L=1Pa (A-Weighted Curve)

Limits: Min: 58

### Decreasing Voltage

Symbol: ΔS-VS Unit: dB

Condition: V<sub>CC</sub> = 3.0V to 2.0V

Limits: Max: -3

### Operating Voltage

Unit: V

Limits: Min: 1.0 Max: 10

### Maximum input S.P.L

Unit: dB

Condition: THD<3% at 1kHz

Limits: Max: 110

### Dimension

Ø 4.0x1.5mm + Rubber Seal : 4.6x2.3mm

### Wire

50mm (UL3302/AWG32#)

### IP Level

IP67

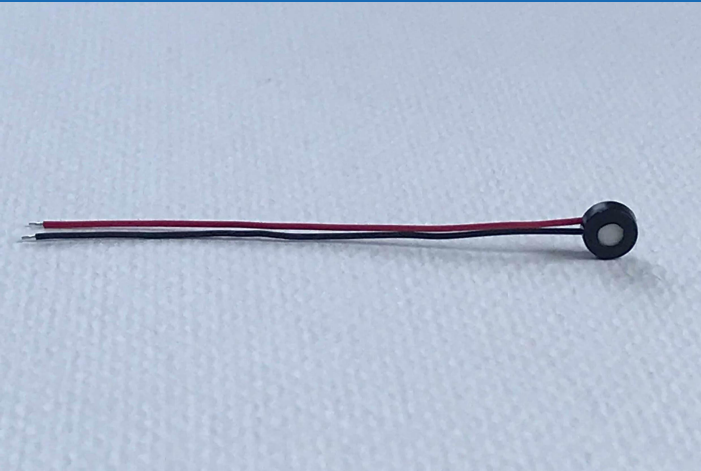


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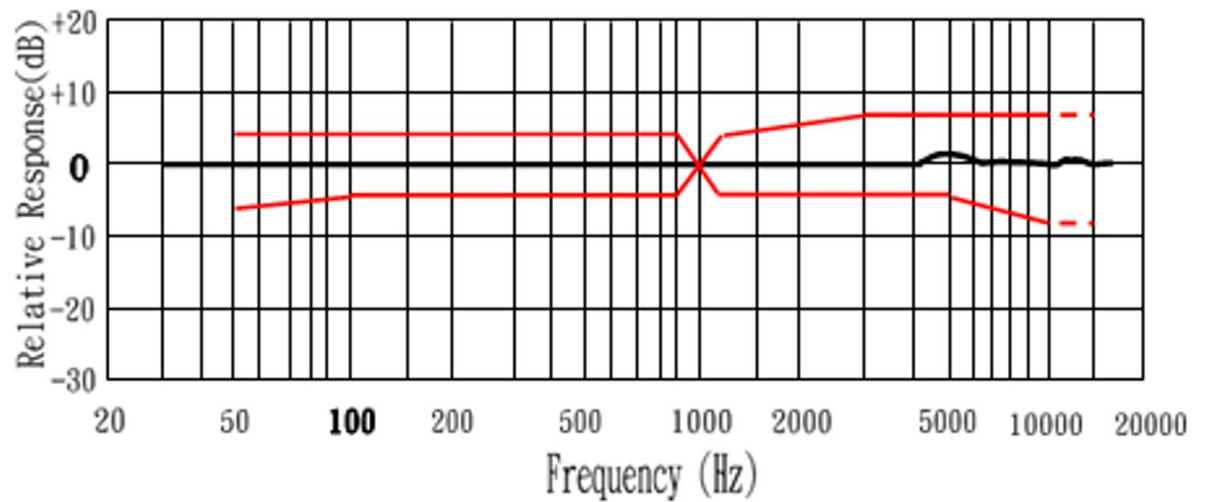
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## Typical Frequency Response Curve

### Frequency Response

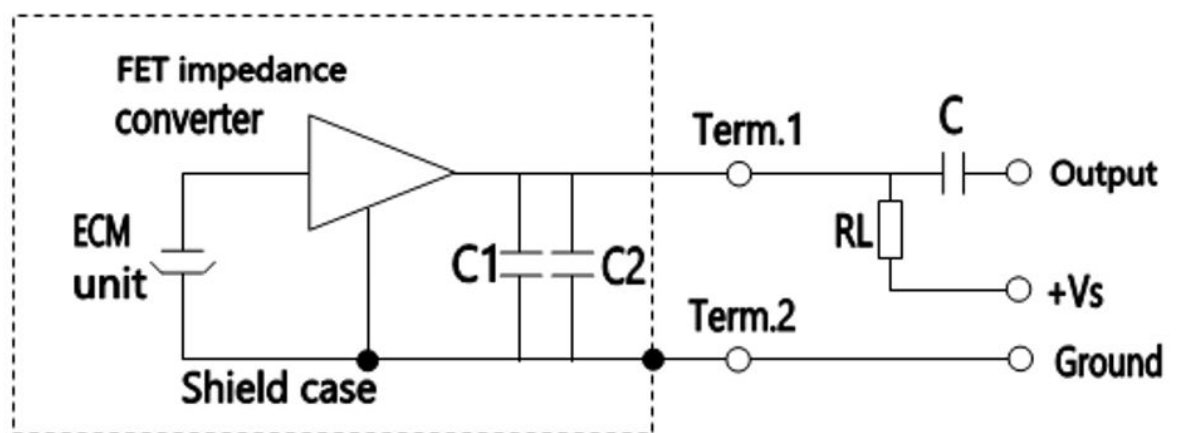


### Microphone Response Tolerance Window

Frequency(Hz)	Lower Limit(dB)	Upper Limit(dB)
50	-6	+3
100	-3	+3
800	-3	+3
1000	0	0
1200	-3	+3
3000	-3	+8
5000	-3	+8
10000	-8	+8

## Measurement Circuit

$RL = 2.2K\Omega$   $V_s = 2.0V$   $C1 = 10pF$   $C2 = 33pF$   $C = 1\mu F$



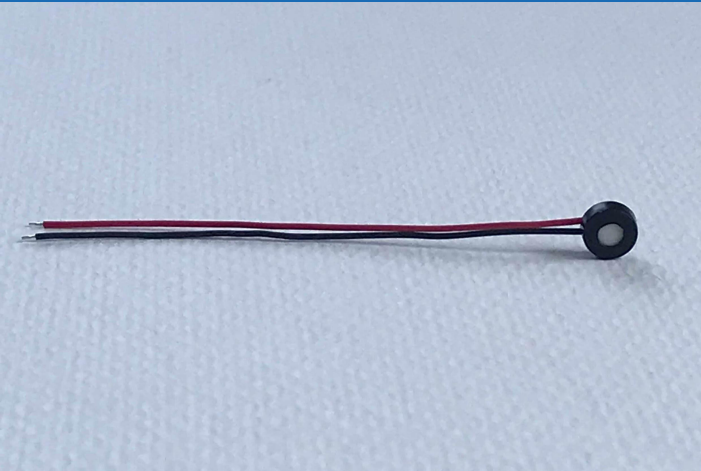


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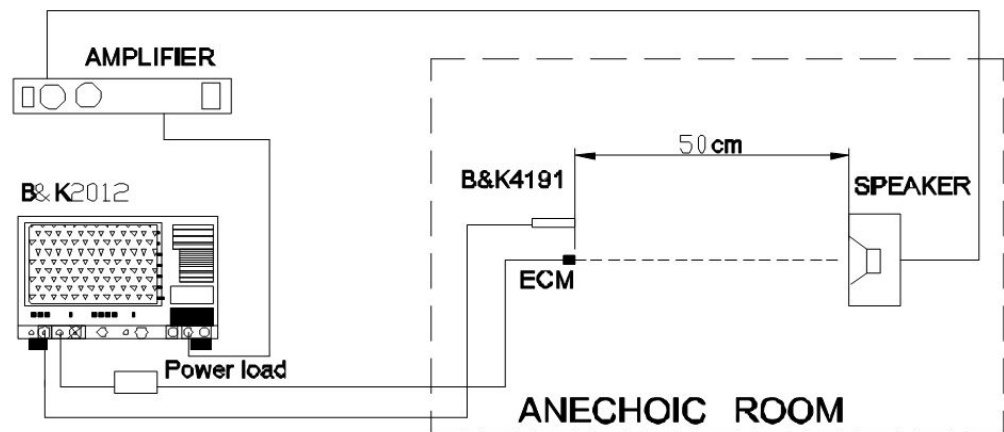
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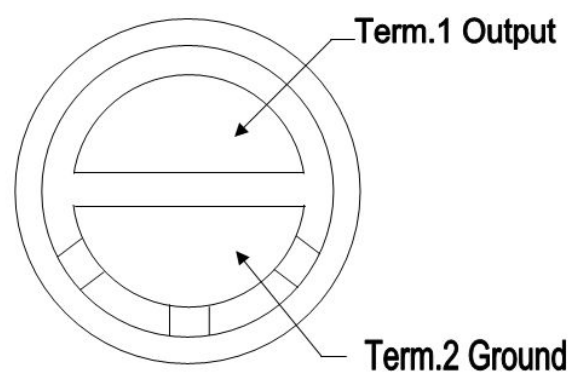
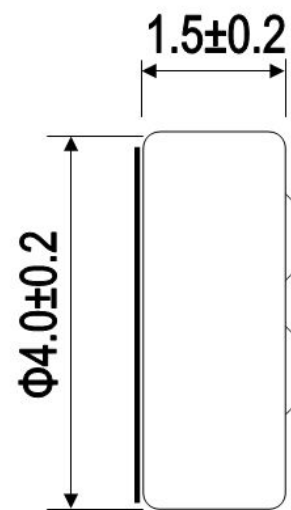
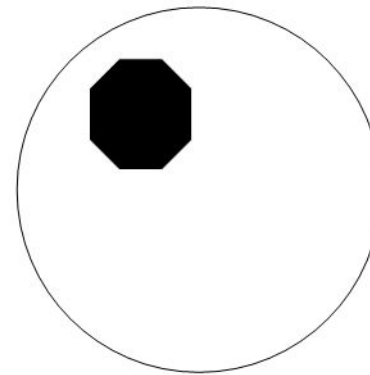
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## Measurement Setup Drawing



## Product External and Dimension

Unit: mm



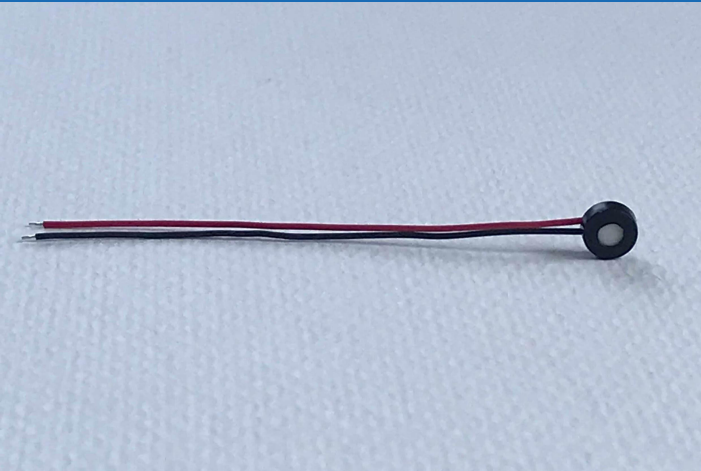


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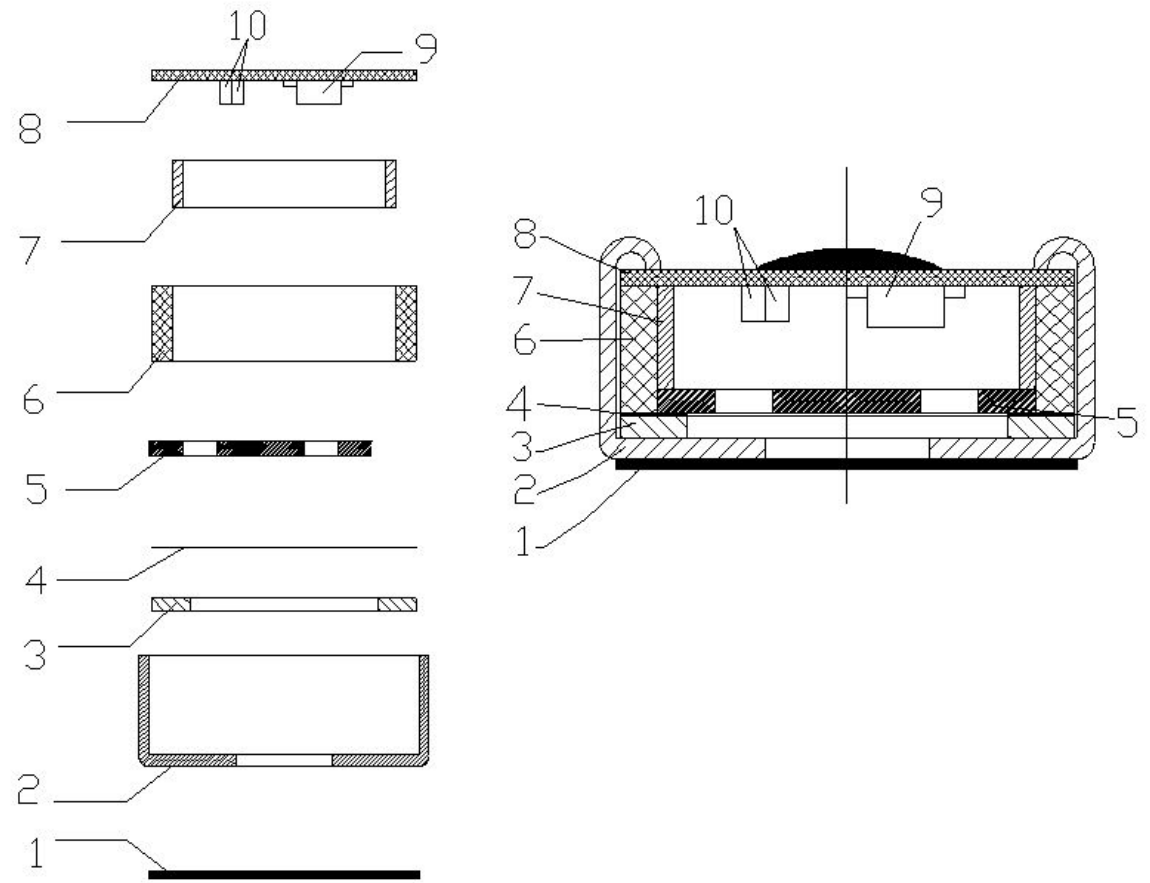
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## Exploded Drawing and Material Table



No.	Part Name	Material	Quantity
1	Waterproof		1
2	Case	Al-Mg alloy	1
3	Diaphragm		1
4	Spacer		1
5	Electret Plate		1
6	Chamber		1
7	Copper Ring		1
8	PCB	FR-4	1
9	FET		1
10	CHIP CAPACITOR	10pF+33pF	2

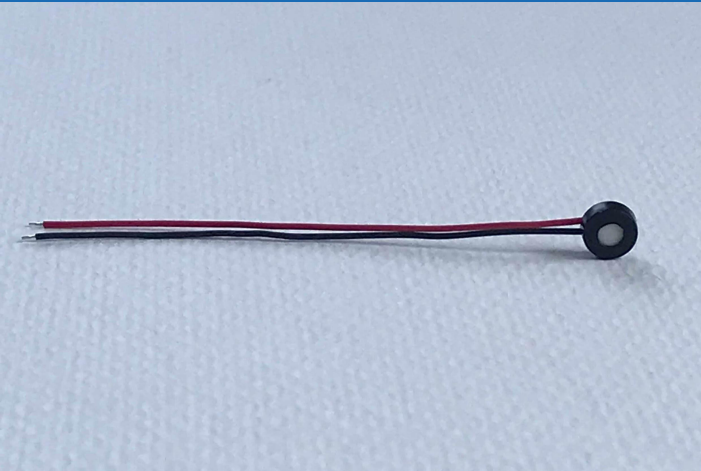


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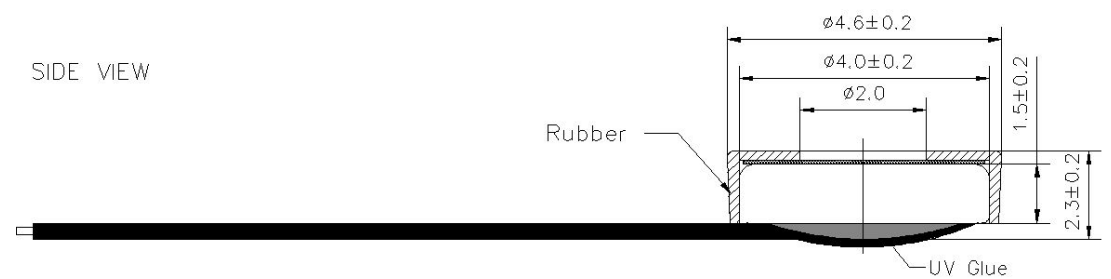
## Accessory Drawing

Unit: mm

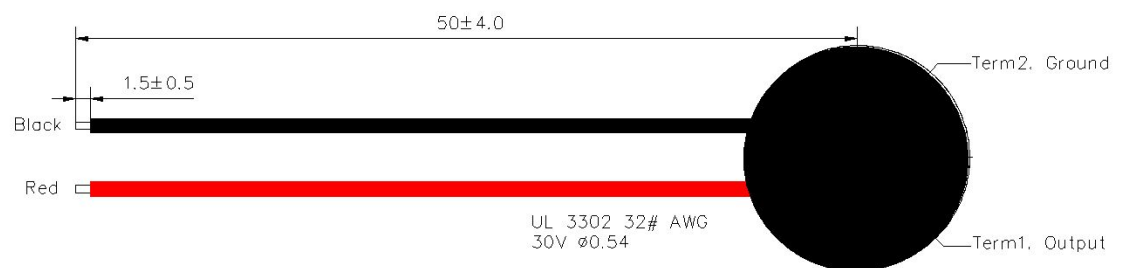
TOP VIEW



SIDE VIEW



BOTTOM VIEW



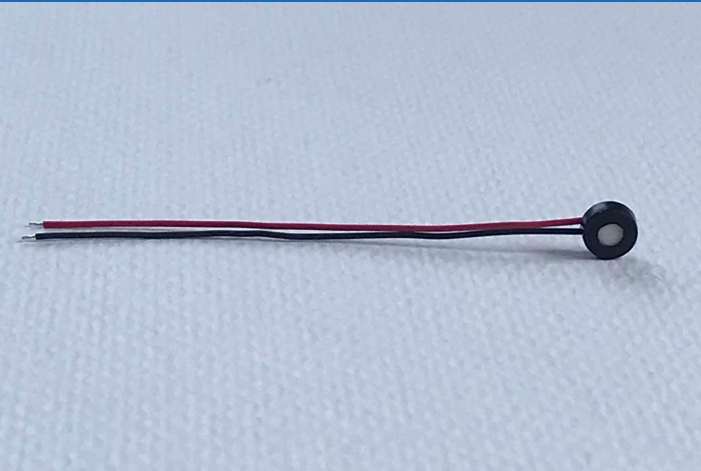


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## Temperature Conditions

### Operating Temperature Range

-40°C~+85°C

### Storage Temperature Range

-40°C~+85°C

## Reliability Test

After each of the following tests, the sensitivity of the microphone should be within  $\pm 3\text{dB}$  of initial sensitivity after 3 hours of conditioning at 20°C.

### Vibration Test

Frequency : 10Hz~55Hz

Amplitude: 1.52mm

Change of Frequency : 1 octave/min

2 hours in each of axis

### High Temperature Test

+85°C for 240 hours.

### Low Temperature Test

-40°C for 240 hours.

### Humidity Test

90%~95%RH,+60°C for 240 hours.

### Thermal Shock Test

-40°C, 30 minutes  $\leftrightarrow$  +80°C, 30 minutes, repeated 32 cycles  $\rightarrow$  room temperature, 3 hours.

### Temperature Cycles

-40°C  $\leftrightarrow$  +20°C  $\leftrightarrow$  +85°C  $\leftrightarrow$  +20°C  $\leftrightarrow$  -40°C  
(2h) (0.5h) (2h) (0.5h) (2h) (0.5h) (2h) (0.5h) (2h) for 10 cycles.

### Packing Drop Test

Height: 1.5m

Procedure: 5 times from each of axis

### Electrostatic Discharge

Tested to IEC61000-4-2 level 3:

a) **Contact Discharge:** The microphone shall operate normally after 10 discharges to is 6KV DC and the discharge network is 150pF and 330Ω.

b) **Air Discharge:** The microphone shall operate normally after 10 discharges to is 8KV DC and the discharge network is 150pF and 330Ω

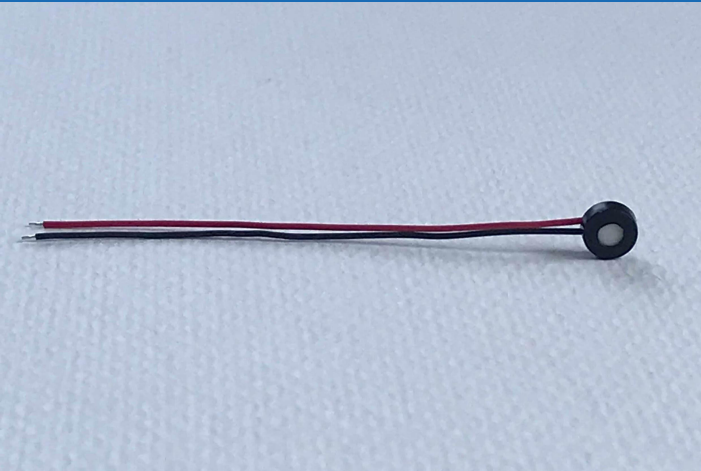


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## Soldering Condition

We suggest using anti-static welding machine which can control soldering temperature automatically.

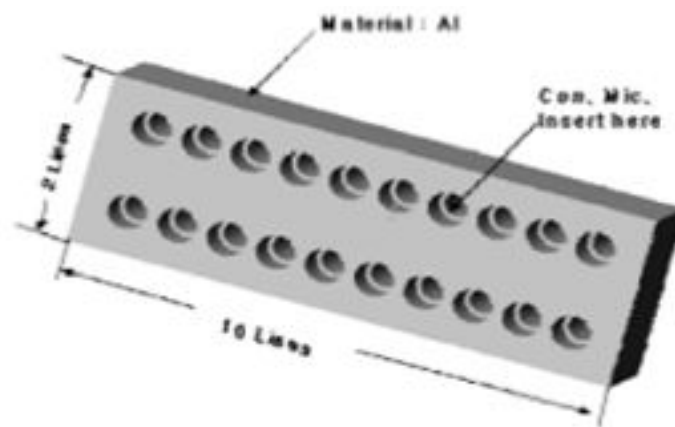
Soldering temperature should be controlled under 320°C and soldering time for each terminal should be 1~2 seconds.

Microphone should be fixed on the metal block (heat sink), which has high radiation effects, and heat sink shall contact with MIC tightly.

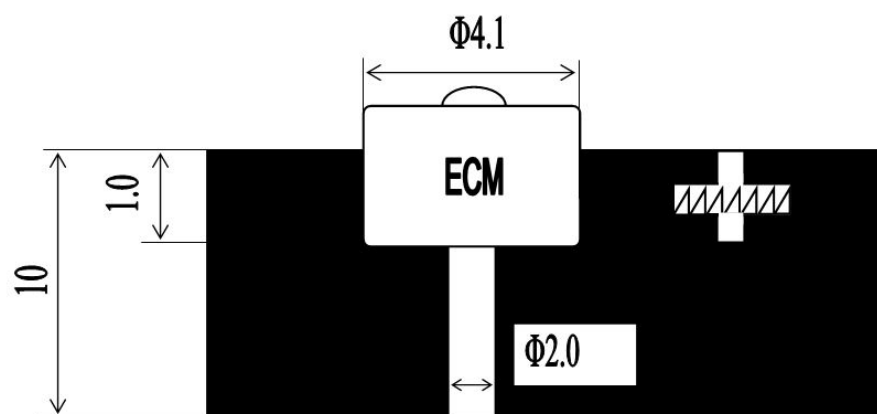
Microphone may easily be destroyed by the static electricity. The countermeasure for eliminating the static electricity shall be by grounding the worktable and operator.

## Heat Sink

Shape of heat sink



Shape of hole at fixed part



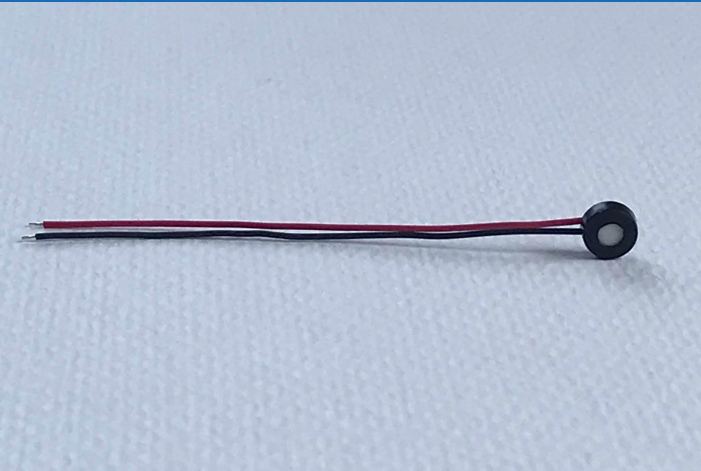


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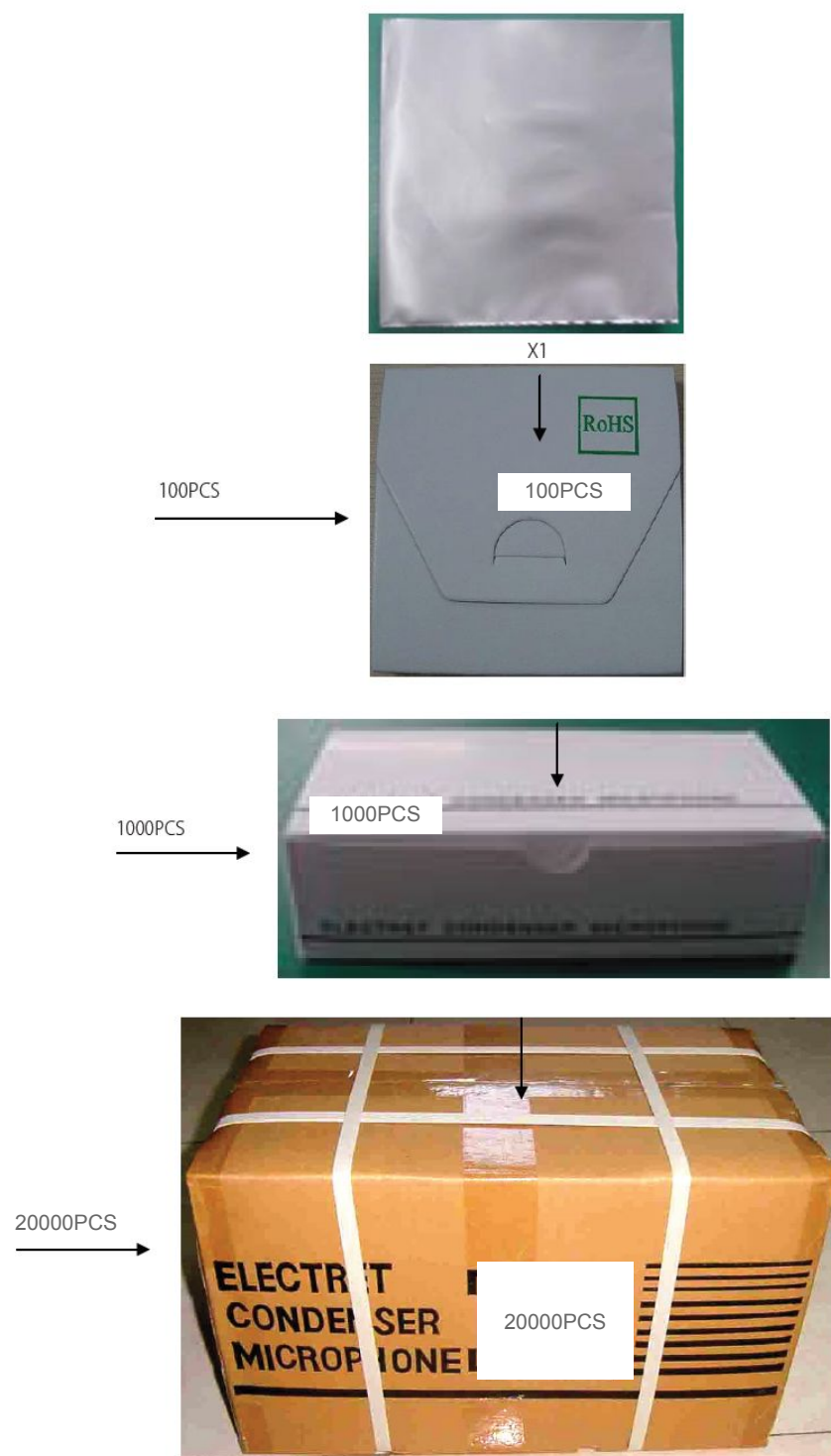
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## Packing



## Details

**Dimension: (length x width x height) unit:mm**

- Anti-Static Bag:**  
100 x 100 x 5mm
- Small Packet:**  
100 x 100 x 10mm
- Middle Box:**  
205 x 105 x 50mm
- Carton Size:**  
550 x 230 x 235mm

### Quantity and Weight

- Small Box:** 100 pcs
- Middle Box:** 1,000 pcs
- Carton:** 20,000 pcs
- 1PC:** 0.1g
- Net Weight:** 2.0kg
- Gross Weight:** 5.0kg