

|  |             |                              |         |            |
|--|-------------|------------------------------|---------|------------|
|  | Part name   | Electret Microphones 4.0*1.5 | Date    | 2026-04-08 |
|  | Part number | MIC-EMC4015PP-423            | Edition | V1         |
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## 1 Scope

This specification is applicable to AI voice-controlled microphones.

## 2 AI voice-controlled microphone models

MIC-EMC4015PP-423

## 3 Electrical characteristics

Test Temperature: 15°C ~ 35°C

Test Room Humidity: 45% ~ 85 %R.H.

| NO | Parameter                 | Condition                             | Limits |     |     | Unit   |
|----|---------------------------|---------------------------------------|--------|-----|-----|--------|
|    |                           |                                       | Min    | Nom | Max |        |
| 1  | Directivity               | Omnidirectional                       |        |     |     |        |
| 2  | Sensitivity               | 1kHz(0dB=1V/Pa)                       | -45    | -42 | -39 | dB     |
| 3  | Output impedance          | f=1kHz                                |        |     | 2.2 | kΩ     |
| 4  | Current Consumption       | VCC=2.0V, RL =2.2kΩ                   |        |     | 0.5 | mA     |
| 5  | Operating Voltage         |                                       | 2.0    |     | 5.0 | V      |
| 6  | Total Harmonic Distortion | f=1kHz, Pin=94dB                      |        |     | 1   | %      |
| 7  | S/N Ratio                 | f=1kHz, Pin=1Pa<br>(A-Weighted curve) |        | 60  |     | dB     |
| 8  | Acoustical Overload Point | <10% THD @1kHz                        |        |     | 115 | dB SPL |

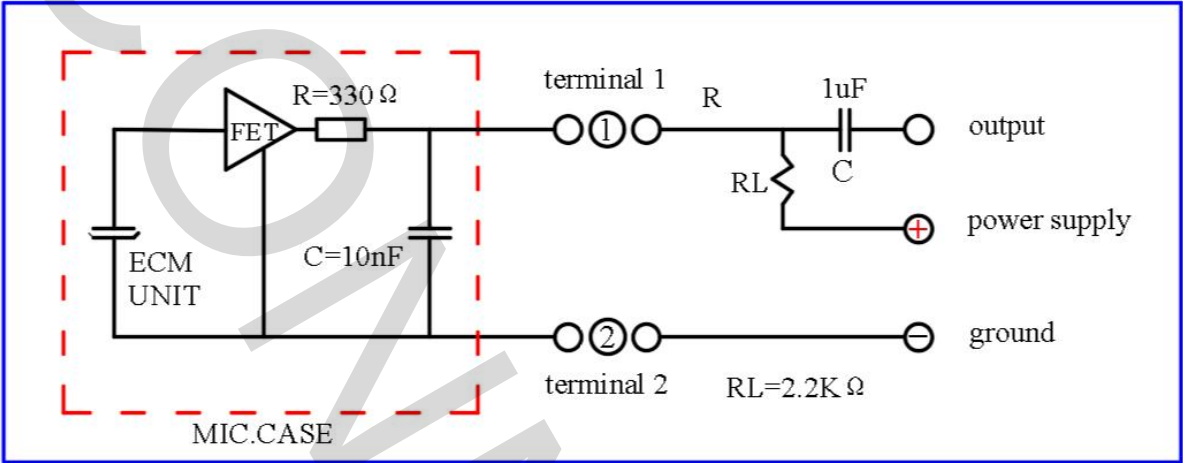
## Temperature conditions

Storage temperature: -40°C ~ 85°C, With 30% ~ 85% R.H. humidity

Operating temperature: -40°C ~ 70°C, With 30% ~ 75% R.H. humidity

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#### 4 Measurement circuit



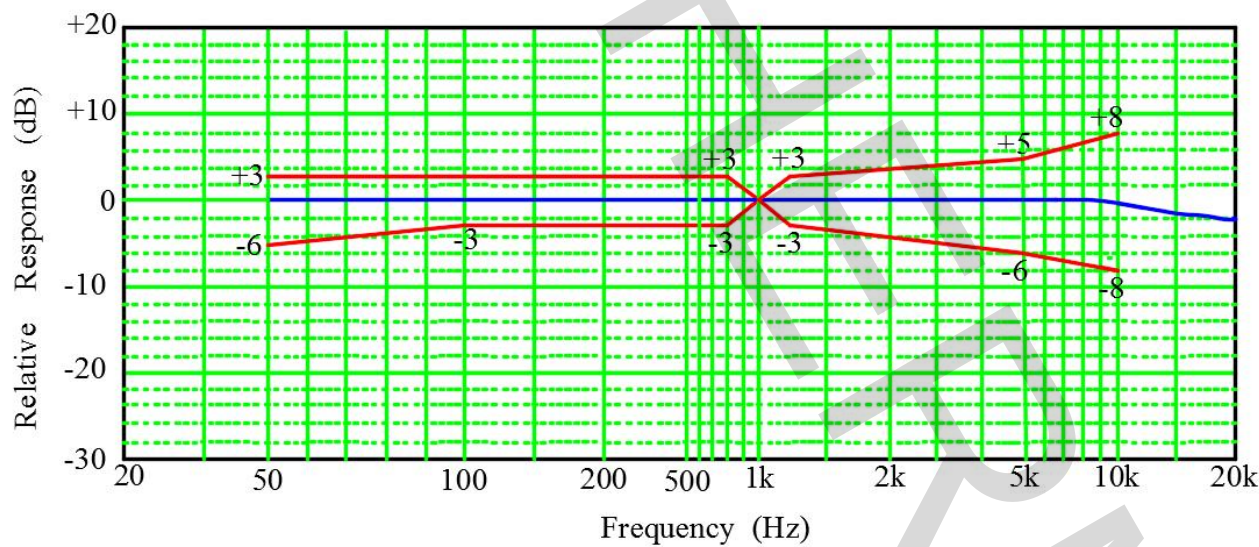
#### 5 Typical frequency response curve

Test temperature: 15°C ~ 35 °C

Acoustic stimulus: 1Pa (94dB SPL at 1kHz) at 50cm from the loud-speaker.

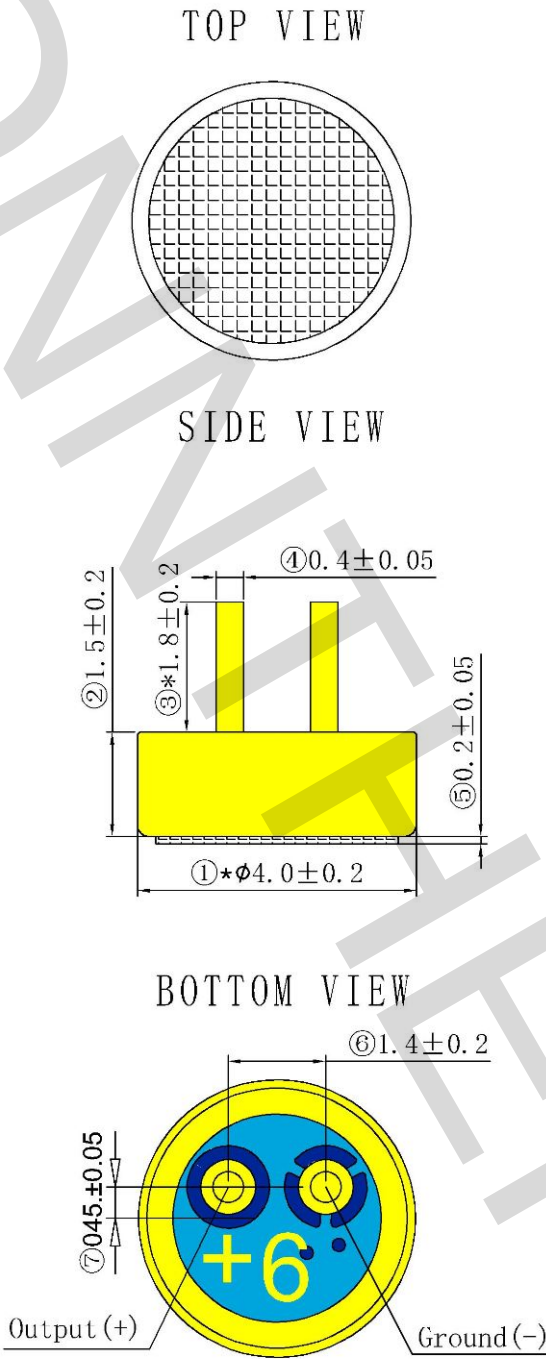
The loud-speaker must be calibrated to make a flat frequency response curve input signal.

Placement Location: The frequency response of microphone unit measured at 50cm from the loud-speaker.



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### 6 Microphone outline dimensions



Note:

All dimensions are in millimeter(mm).

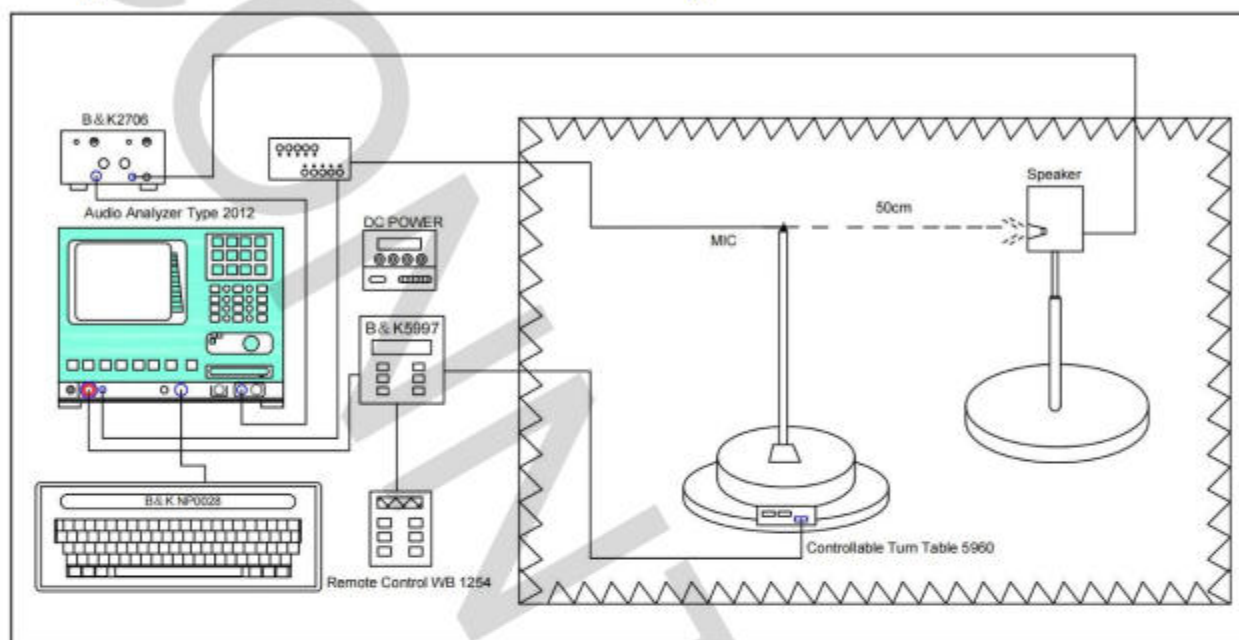
Tolerance: +/-0.1mm unless otherwise specified.

The dimensions marked with \* are the key controlled dimensions.

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## 7 Measurement system

The specification for the far-field measurement system conforms to IEC60268-4.



## 8 Reliability test

Sensitivity difference shall be within  $\pm 3\text{dB}$  (at 1kHz) between before and after the experiment, Wait for 2 hours to test after completing experiment.

Ambient temperature:  $15^{\circ}\text{C} \sim 35^{\circ}\text{C}$ .

### 8.1 Drop Test

Height: 1m

Drop Face: 2cm hardwood board

Duration: 3 times in each of three directions in state of packing

### 8.2 Vibration Test

Frequency range: 10~55Hz

Accelerate: 3mm amplitude

Duration per axis: 30minutes vibration at three axes

### 8.3 High Temperature Test

Temperature:  $80^{\circ}\text{C}$

Duration: 200 hours

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#### **8.4 Low Temperature Test**

Temperature: -40°C

Duration: 200 hours

#### **8.5 Temperature Cycle Test**

Low temperature: -25±2°C X 30min ->

Normal temperature: 20°C±2°C X 10min ->

High temperature: 70°C±2°C X 30min ->

Normal temperature: 20°C±2°C X 10min)

No. of repetitions: 5

#### **8.6 Humidity Test**

Temperature: 70°C

Humidity: 90~95% R.H.

Duration: 200 hours

#### **8.7 Soldering Heat Shock Test**

350±10°C within 3 second Max for each terminal

#### **8.8 Electrostatic discharge**

Tested to IEC61000-4-2 level 3:

##### **a) Contact discharge**

The microphone shall operate normally after 10 discharges to the output. The charge voltage is ±6000VDC and the discharge network is 150pF and 330Ω.

##### **b) Air discharge**

The microphone shall operate normally after 10 discharges to the sound hole. The charge voltage is ±8000VDC and the discharge network is 150pF and 330Ω.

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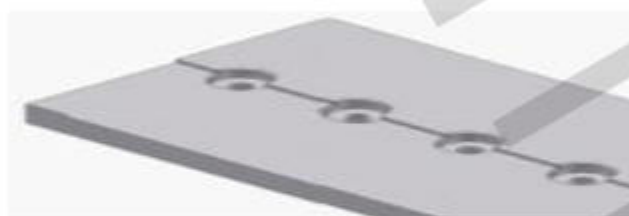
## 9.Regarding the soldering operation

### 9.1 Soldering Condition

Every ECM contains a FET with microphone body. This FET is easy to damageable from excessive heat and electrical shock. Proper attention for the soldering work is required same as followings.

Recommend to use high temperature soldering iron and apply  $350\pm 10^{\circ}\text{C}$  temperature range, Soldering should be accomplished within 1-3 seconds at each terminal so as not to be overheated. Do not make a cavity at the surface on the PCB and wiring board (Opened cavity will influence to the sensitivity of ECM MIC). Optimal design for heat sink pad is same as below.

### 9.2 Soldering fixture



ECM eject hole.

Solder pad jig hole size: microphone diameter + 0.05mm.

Solder pad jig hole height: microphone height -0.2mm.

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**10 The graphic of packing method as follows**

