

|             |                   |         |            |
|-------------|-------------------|---------|------------|
| Part name   | Microphones       | Date    | 2025-01-16 |
| Part number | MIC-EMC4015PP-323 | Edition | V1         |
| Department  |                   | Page    | 1 / 8      |

## Contents

|                                                    |    |
|----------------------------------------------------|----|
| <b>1 Scope</b>                                     | 4  |
| <b>2 Microphone model number</b>                   | 4  |
| <b>3 Electrical characteristics</b>                | 4  |
| 3.1 Directivity                                    | 4  |
| 3.2 Sensitivity                                    | 4  |
| 3.3 Output impedance                               | 4  |
| 3.4 Current consumption                            | 4  |
| 3.5 Operating voltage                              | 4  |
| 3.6 Total Harmonic Distortion                      | 4  |
| 3.7 S/N Ratio                                      | 4  |
| 3.8 Acoustical Overload Point                      | 4  |
| <b>4 Measurement circuit</b>                       | 5  |
| <b>5 Typical frequency response curve</b>          | 5  |
| <b>6 Microphone outline dimensions</b>             | 6  |
| <b>7 Measurement system</b>                        | 7  |
| <b>8 Reliability test</b>                          | 7  |
| 8.1 Drop Test                                      | 7  |
| 8.2 Vibration Test                                 | 7  |
| 8.3 High Temperature Test                          | 8  |
| 8.4 Low Temperature Test                           | 8  |
| 8.5 Temperature Cycle Test                         | 8  |
| 8.6 Humidity Test                                  | 8  |
| 8.7 Soldering Heat Shock Test                      | 8  |
| <b>9 Regarding the soldering operation</b>         | 9  |
| 9.1 Soldering Condition                            | 9  |
| 9.2 Soldering fixture                              | 9  |
| <b>10 The graphic of packing method as follows</b> | 10 |

|  |             |                   |         |            |
|--|-------------|-------------------|---------|------------|
|  | Part name   | Microphones       | Date    | 2025-01-16 |
|  | Part number | MIC-EMC4015PP-323 | Edition | V1         |
|  | Department  |                   | Page    | 2 / 8      |

## 1 Scope

This specification shall be applied for back-electrode electret condenser microphone (Back-Electrode ECM).

## 2 Microphone model number

MIC-EMC4015PP-323

## 3 Electrical characteristics

Test Temperature: 15°C ~ 35°C

Test Room Humidity: 40% ~ 85 %R.H.

| NO | Parameter                 | Condition                             | Limits |     |     | Unit   |
|----|---------------------------|---------------------------------------|--------|-----|-----|--------|
|    |                           |                                       | Min    | Nom | Max |        |
| 1  | Directivity               | Omnidirectional                       |        |     |     |        |
| 2  | Sensitivity               | 1kHz(0dB=1V/Pa)                       | -35    | -32 | -29 | 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) |        | 65  |     | dB     |
| 8  | Acoustical Overload Point | <10% THD @1kHz                        |        |     | 115 | dB SPL |

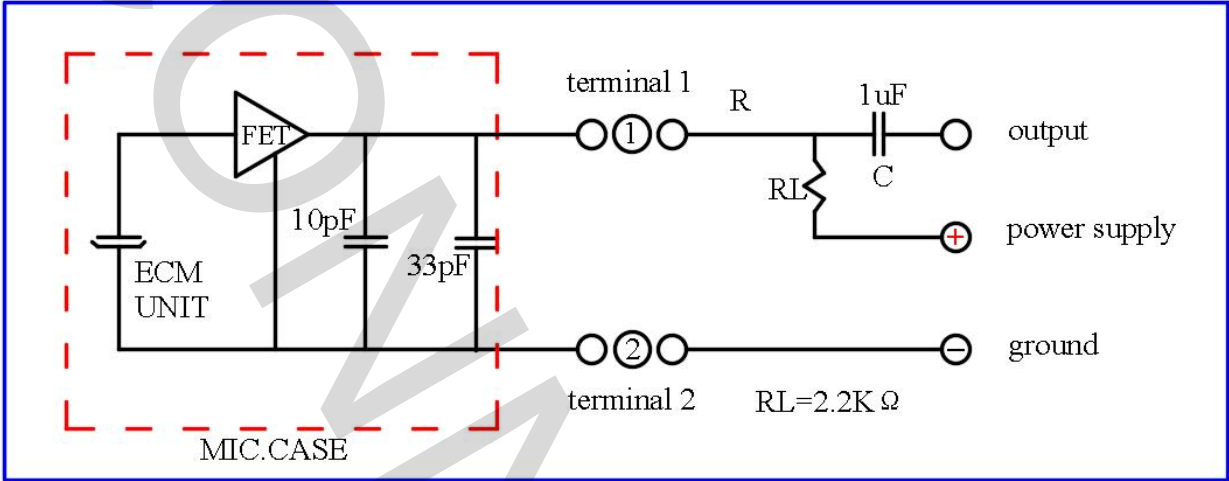
## Temperature conditions

Storage temperature: -10°C ~ 60°C, With 40% ~ 85% R.H. humidity.

Operating temperature: -10°C ~ 60°C, With 40% ~ 85% R.H. humidity.

|             |                   |         |            |
|-------------|-------------------|---------|------------|
| Part name   | Microphones       | Date    | 2025-01-16 |
| Part number | MIC-EMC4015PP-323 | Edition | V1         |
| Department  |                   | Page    | 3 / 8      |

4 Measurement circuit



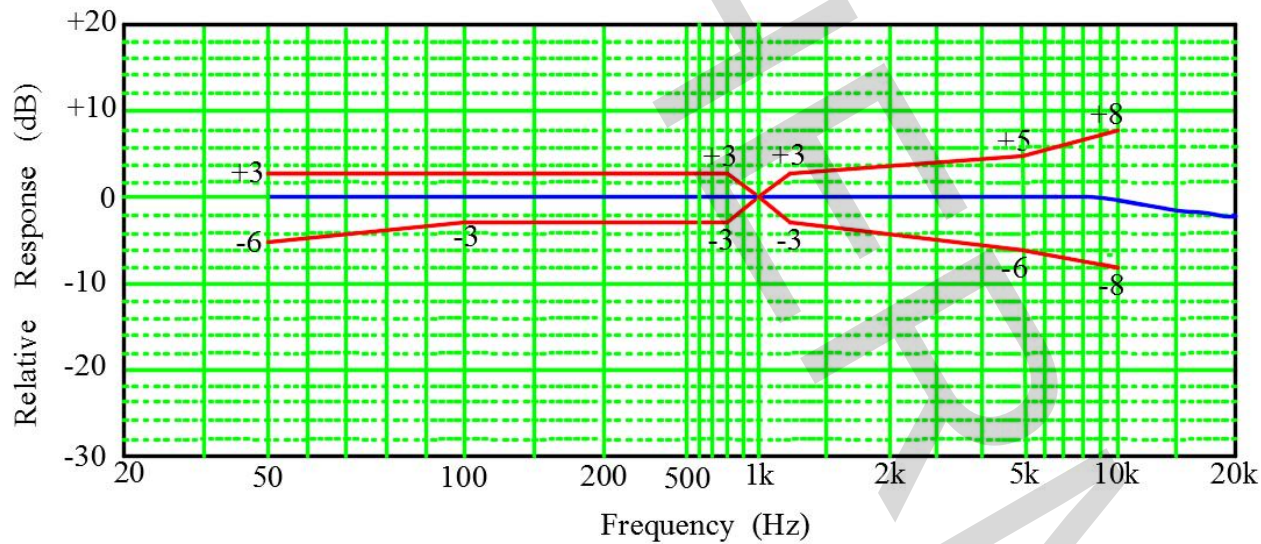
5 Typical frequency response curve

Test temperature: 15°C ~ 35 °C

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

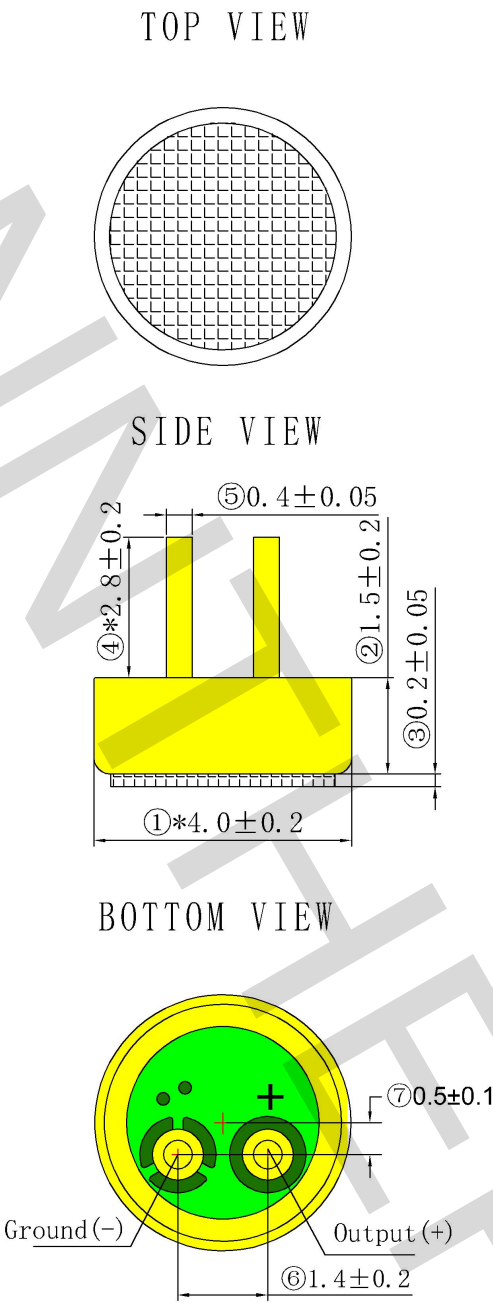
The loud-speaker must be calibrated to make a flat frequency response curve input signal.

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



|             |                   |         |            |
|-------------|-------------------|---------|------------|
| Part name   | Microphones       | Date    | 2025-01-16 |
| Part number | MIC-EMC4015PP-323 | Edition | V1         |
| Department  |                   | Page    | 4 / 8      |

### 6 Microphone outline dimensions



Note:

All dimensions are in millimeter(mm).

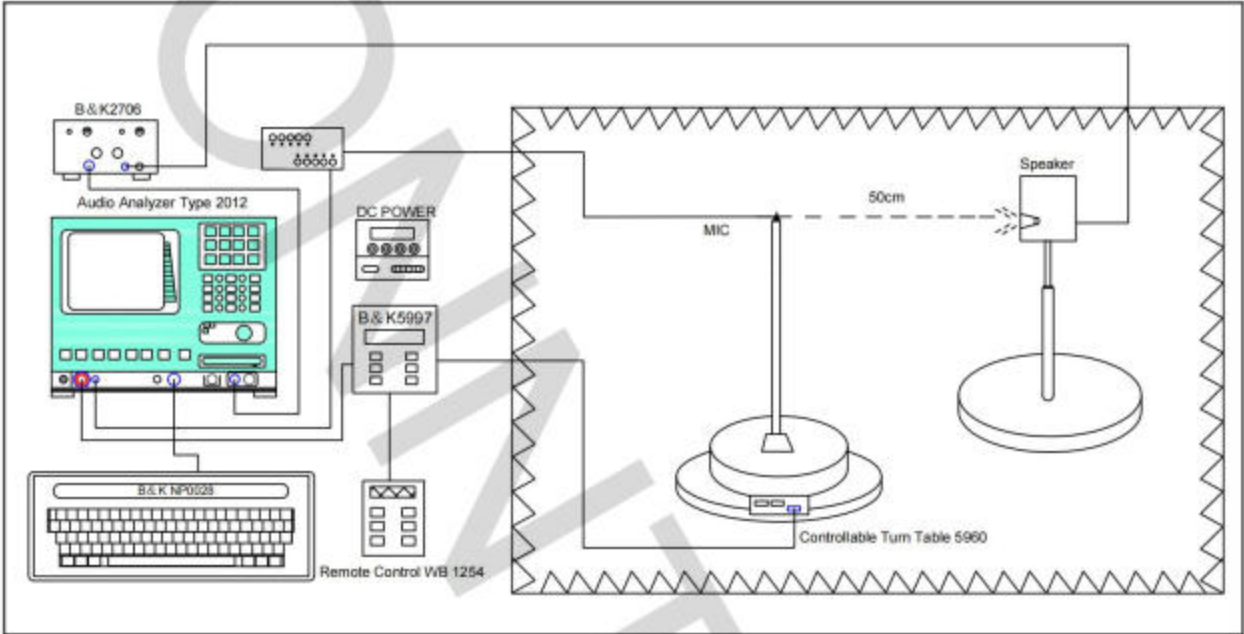
Tolerance:  $\pm 0.1$ mm unless otherwise specified.

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

|             |                   |         |            |
|-------------|-------------------|---------|------------|
| Part name   | Microphones       | Date    | 2025-01-16 |
| Part number | MIC-EMC4015PP-323 | Edition | V1         |
| Department  |                   | Page    | 5 / 8      |

### 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.

|  |             |                   |         |            |
|--|-------------|-------------------|---------|------------|
|  | Part name   | Microphones       | Date    | 2025-01-16 |
|  | Part number | MIC-EMC4015PP-323 | Edition | V1         |
|  | Department  |                   | Page    | 6 / 8      |

### 8.3 High Temperature Test

Temperature: 80°C

Duration: 96 hours

### 8.4 Low Temperature Test

Temperature: -40°C

Duration: 96 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: 96 hours

### 8.7 Soldering Heat Shock Test

350±10°C with in 3 second Max for each terminal

|             |                   |         |            |
|-------------|-------------------|---------|------------|
| Part name   | Microphones       | Date    | 2025-01-16 |
| Part number | MIC-EMC4015PP-323 | Edition | V1         |
| Department  |                   | Page    | 7 / 8      |

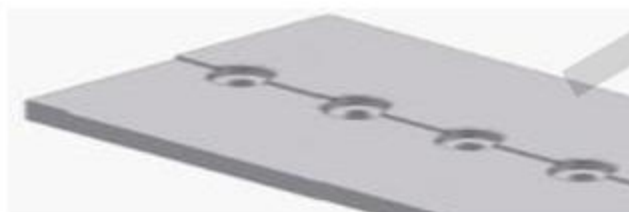
## 9 Regarding the soldering operation

### 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



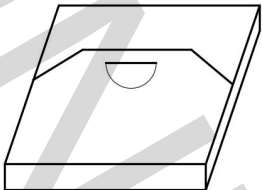
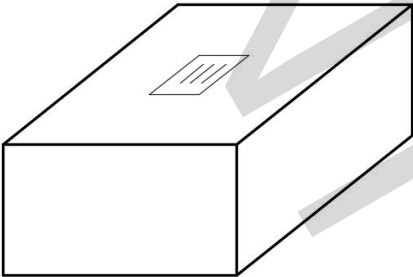
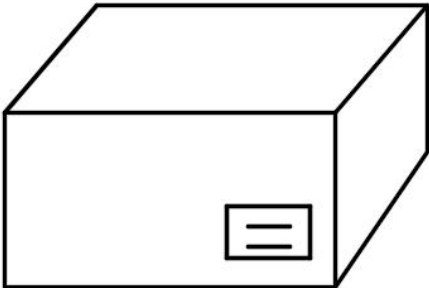
ECM eject hole.

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

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

|  |             |                   |         |            |
|--|-------------|-------------------|---------|------------|
|  | Part name   | Microphones       | Date    | 2025-01-16 |
|  | Part number | MIC-EMC4015PP-323 | Edition | V1         |
|  | Department  |                   | Page    | 8 / 8      |

# 10 The graphic of packing method as follows

|               | Drawing(Unit: mm)                                                                   | Packing<br>(PCS) | Qty<br>(PCS) | Material |
|---------------|-------------------------------------------------------------------------------------|------------------|--------------|----------|
| Packing       |    | 1*100            | 100          | Paper    |
| Middle<br>Box |   | 10*100           | 1000         | Paper    |
| Outer<br>Box  |  | 10*1000          | 10000        | Paper    |

## Special note:

The above packaging method is universal packaging. If the actual shipment order quantity is less than the full box quantity or there is a slight surplus, the carton size and product packaging quantity will be adjusted. we won't notice again, if you have any questions, please contact our marketing department.