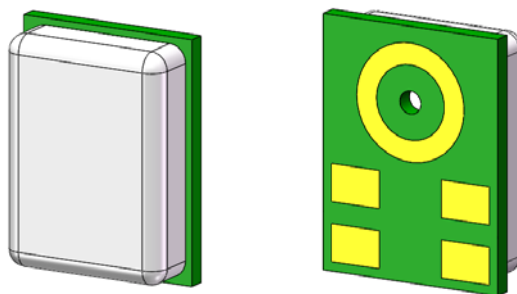


## Specification of MEMS Microphone

**RoHS Compliance & Halogen Free**

**LinkMems P/N: LMD3526B261-OFA03**



| Designed by | Checked by | Approved by |
|-------------|------------|-------------|
| Kevin       | Thomas     | Hary        |

**Customer Approval**

**Approved by:\_\_\_\_\_**



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## MEMS Microphone

### 1. Introduction

The LMD3526B MEMS Microphones are integrated with specialized Pre-amplification ASIC to provide high sensitivity, high SNR output from a capacitive audio sensor. It's packaged for surface mounting and high temperature reflow assembly. Data format is a single bit PDM.

### 2. Electrical Characteristics

Test Condition:  $V_{DD}=1.8V$ ,  $23\pm 2^{\circ}C$ ,  $55\pm 10\%R.H.$ , unless otherwise specified.

#### Electrical Characteristics

| Parameter            | Symbol   | Note/Test Condition | Values |      |      | Unit |
|----------------------|----------|---------------------|--------|------|------|------|
|                      |          |                     | Min.   | Typ. | Max. |      |
| Power supply voltage | $V_{DD}$ |                     | 1.62   | 1.8  | 3.6  | V    |

#### Standard Mode

Test Condition: Measurement Clock Frequency 2.4 MHz,  $V_{DD} = 1.8 V$

| Specification             | Symbol | Test Conditions                          | Min.             | Typ. | Max. | Unit    |
|---------------------------|--------|------------------------------------------|------------------|------|------|---------|
| Directivity               |        |                                          | Omni-directional |      |      |         |
| Sensitivity Range         | S      | 94dB SPL @1kHz                           | -27              | -26  | -25  | dB      |
| Current Consumption       | I      |                                          |                  | 750  |      | $\mu A$ |
| S/N Ratio                 | SNR    | 94dB SPL @1kHz<br>A-Weighted             |                  | 65   |      | dB(A)   |
| Total Harmonic Distortion | THD    | 94dB SPL @1kHz                           |                  |      | 0.5  | %       |
| Acoustic Overload Point   | AOP    | 10% THD @1kHz                            |                  | 120  |      | dB SPL  |
| Power Supply Rejection    | PSR    | 100mVpp Square wave@217Hz,<br>A-weighted |                  | -90  |      | dB      |

### **Low Power Mode**

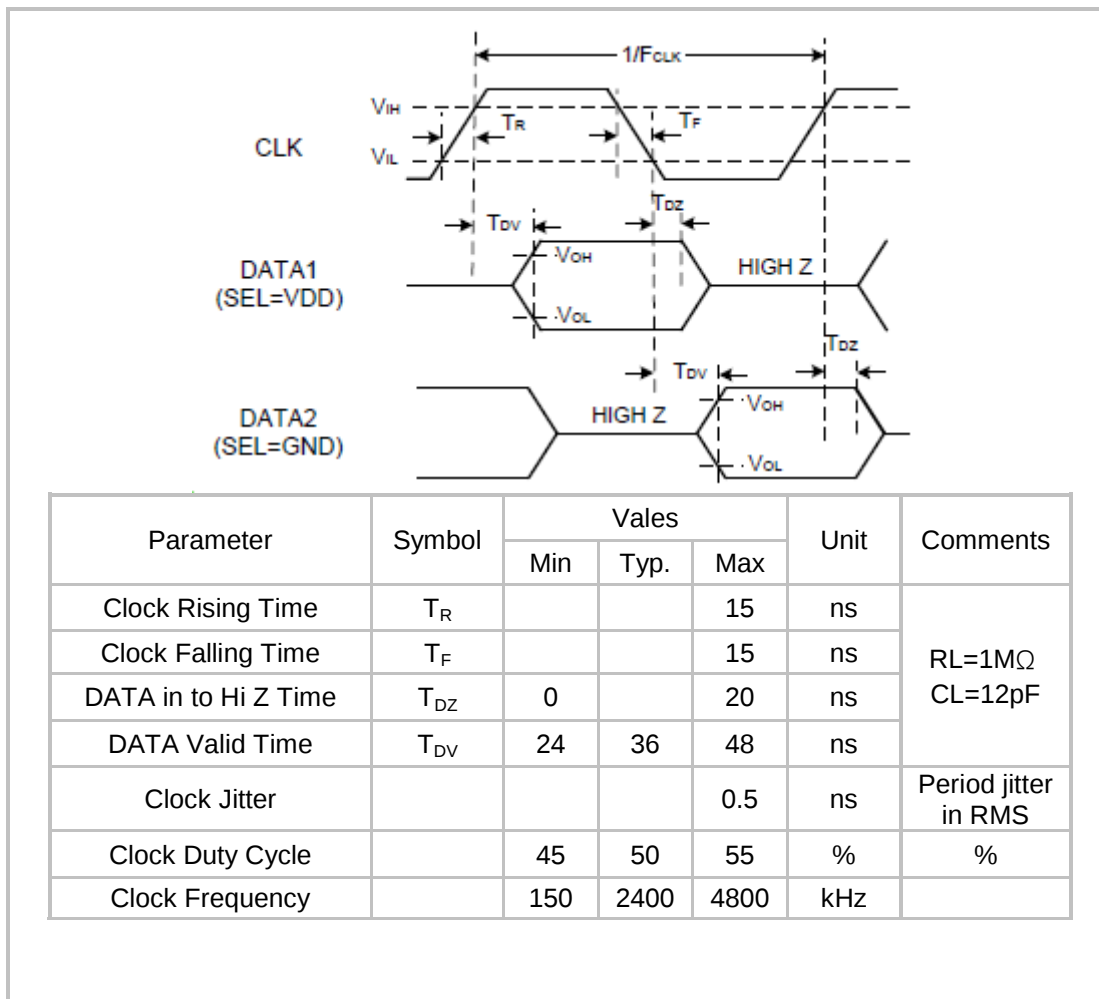
Test Condition: Measurement Clock Frequency 768 kHz, VDD = 1.8 V

| Specification             | Symbol | Test Conditions                          | Min.             | Typ. | Max. | Unit   |
|---------------------------|--------|------------------------------------------|------------------|------|------|--------|
| Directivity               |        |                                          | Omni-directional |      |      |        |
| Sensitivity Range         | S      | 94dB SPL @1kHz                           | -27              | -26  | -25  | dB     |
| Current Consumption       | I      |                                          |                  | 320  |      | μA     |
| S/N Ratio                 | SNR    | 94dB SPL @1kHz<br>A-Weighted             |                  | 64   |      | dB(A)  |
| Total Harmonic Distortion | THD    | 94dB SPL @1kHz                           |                  |      | 0.5  | %      |
| Acoustic Overload Point   | AOP    | 10% THD @1kHz                            |                  | 120  |      | dB SPL |
| Power Supply Rejection    | PSR    | 100mVpp Square wave@217Hz,<br>A-weighted |                  | -90  |      | dB     |

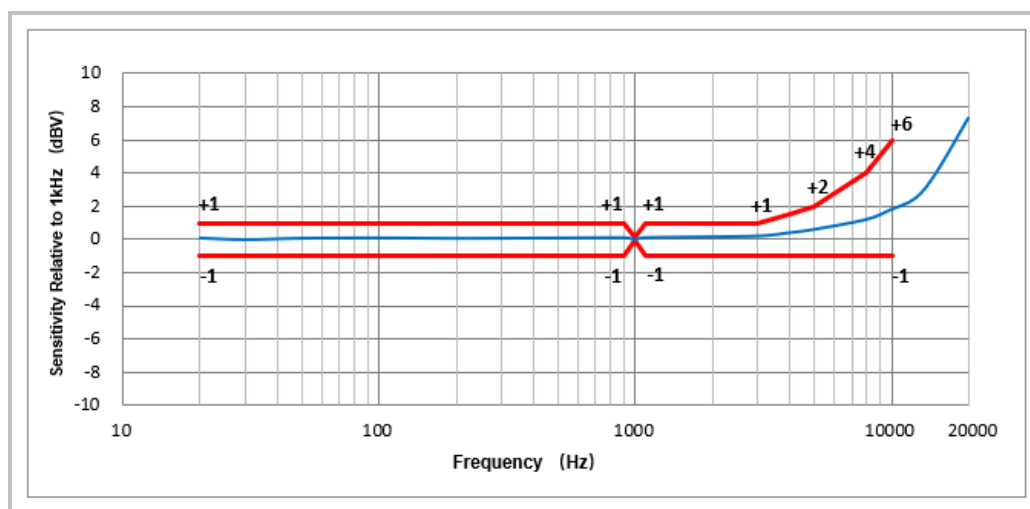
### **Operation Ratings**

| Parameter            |                | Symbol          | Note/Test Condition | Vales                 |      |                      | Unit |
|----------------------|----------------|-----------------|---------------------|-----------------------|------|----------------------|------|
|                      |                |                 |                     | Min                   | Typ. | Max                  |      |
| Power supply voltage |                | V <sub>DD</sub> |                     | 1.62                  |      | 3.6                  | V    |
| Frequency Range      | Sleep Mode     |                 |                     | 0                     |      | 50                   | kHz  |
|                      | Low Power Mode |                 |                     | 150                   | 768  | 900                  | kHz  |
|                      | Standard Mode  |                 |                     | 1000                  |      | 4800                 | kHz  |
| Duty Cycle           |                | DC              |                     | 45                    | 50   | 55                   | %    |
| Logic Input High     |                |                 |                     | 0.65*V <sub>DD</sub>  |      | V <sub>DD</sub> +0.3 | V    |
| Logic Input Low      |                |                 |                     | -0.3                  |      | 0.35*V <sub>DD</sub> | V    |
| Logic Output High    |                |                 |                     | V <sub>DD</sub> -0.45 |      |                      | V    |
| Logic Output Low     |                |                 |                     |                       |      | 0.45                 | V    |
| Load Capacitance     |                |                 |                     |                       |      | 140                  | pF   |

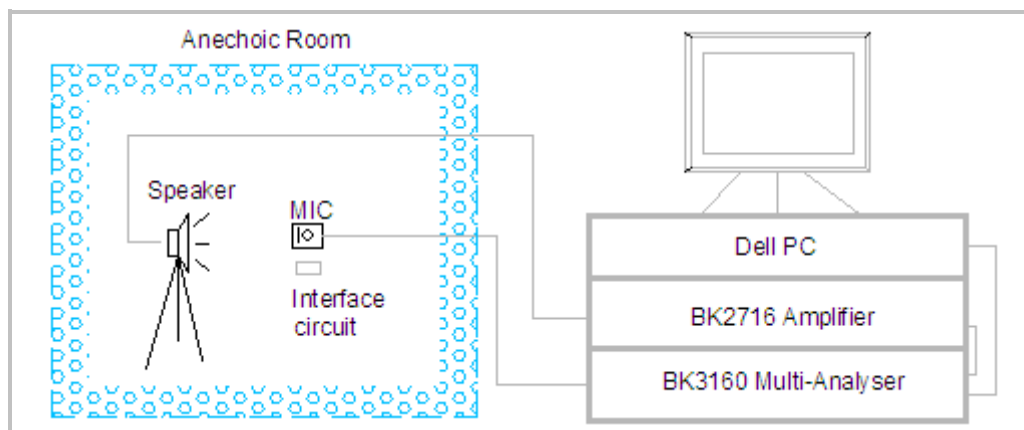
### 3. Timing Characteristics



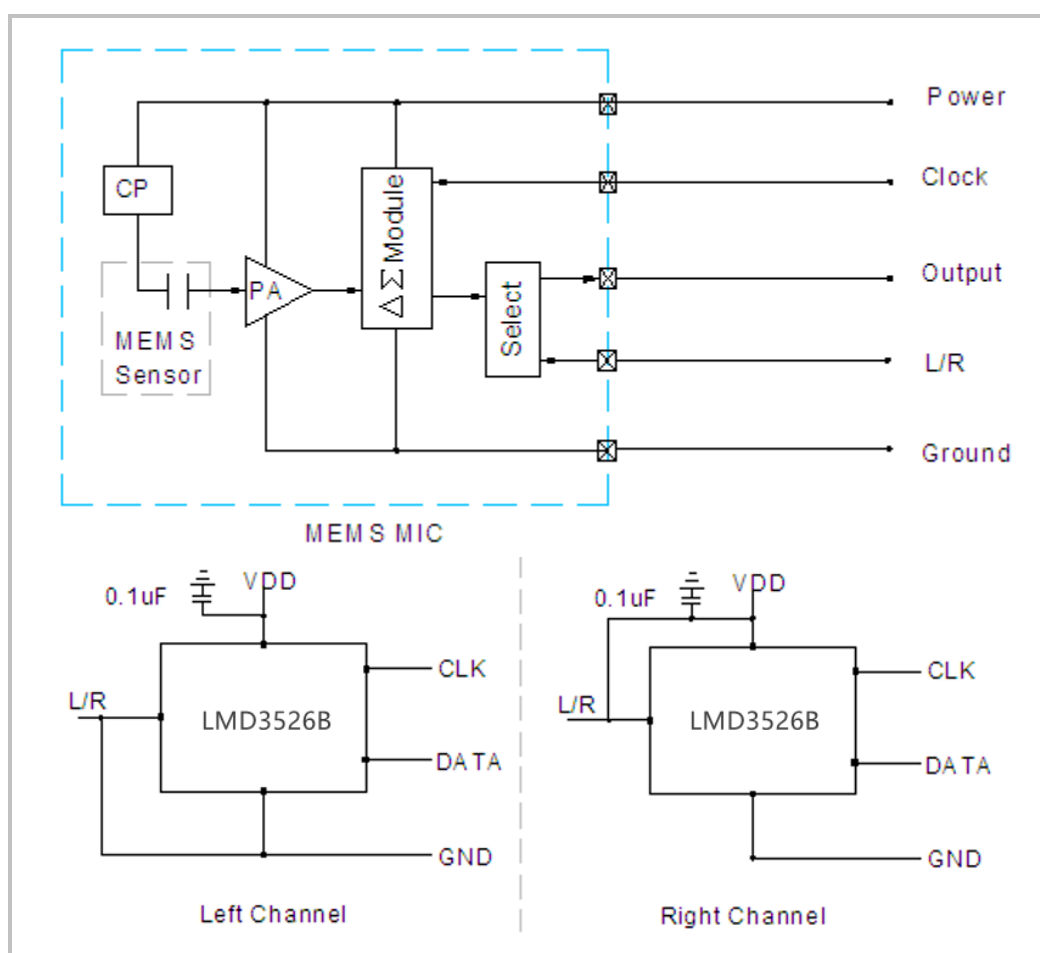
### 4. Frequency Response Curve



## 5. Test Setup (Sensitivity Test in Anechoic Room)



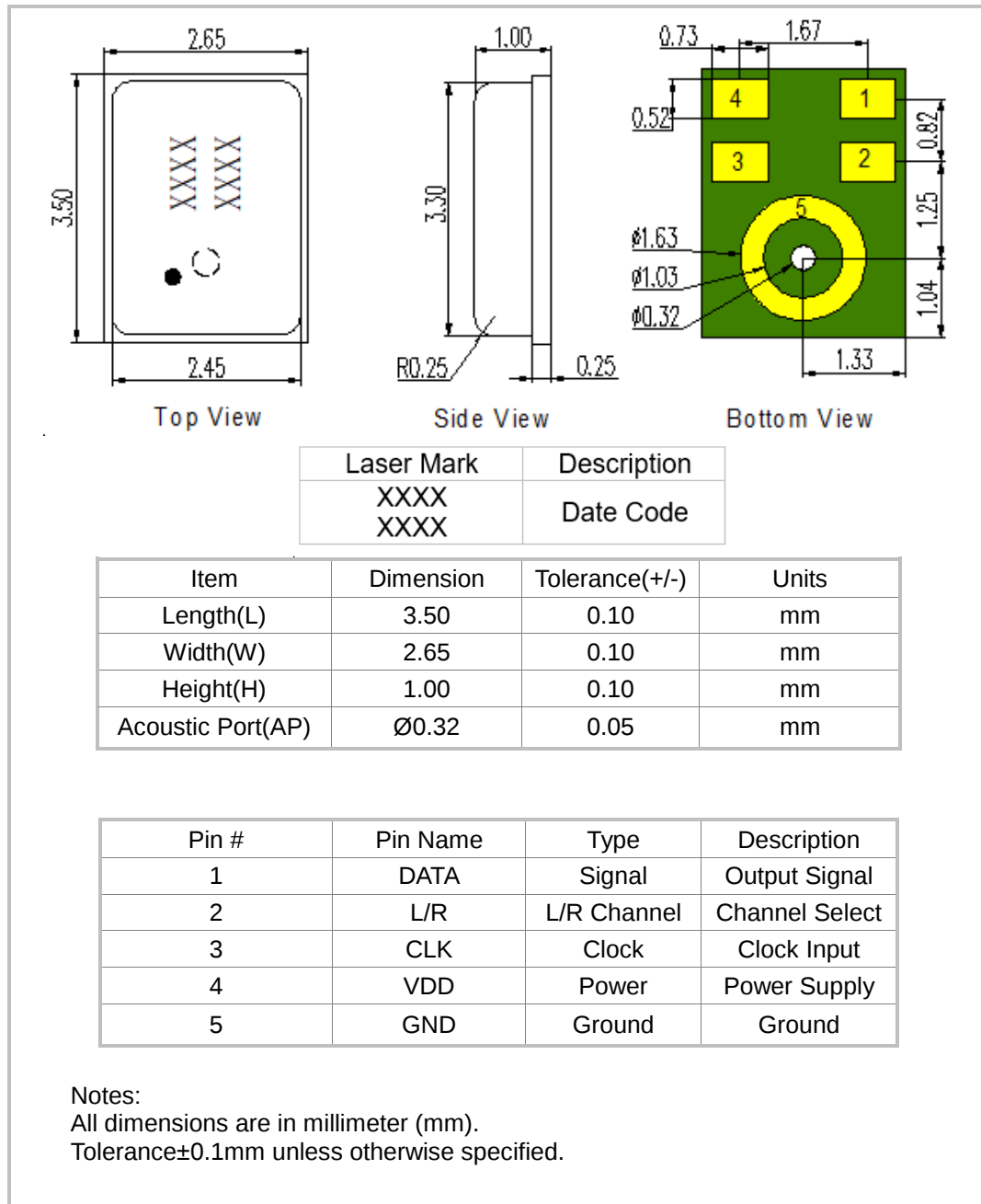
## 6. Measurement Circuit



## 7. Mechanical Characteristics

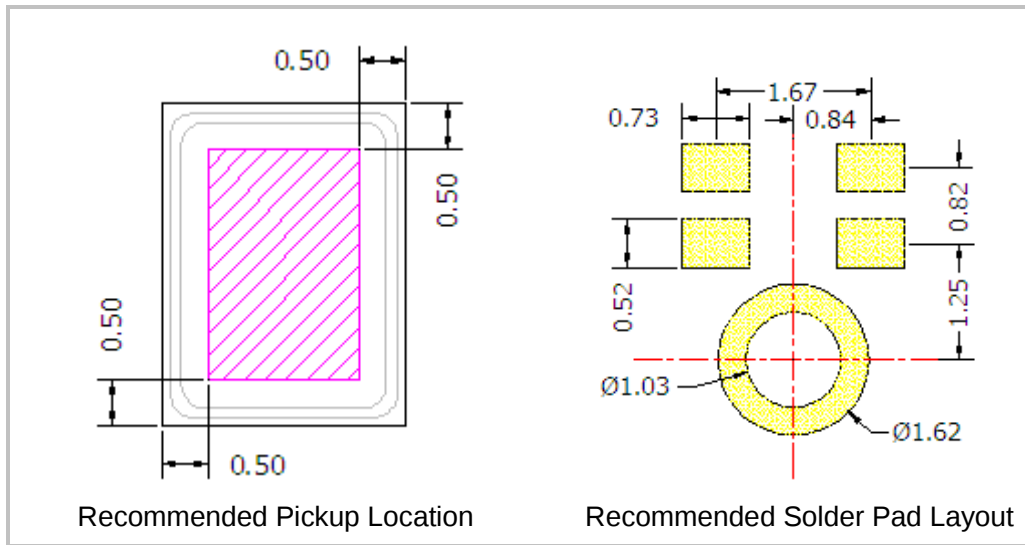
7.1 Weight: Less than 0.03g

7.2 Appearance Drawing(unit: mm)



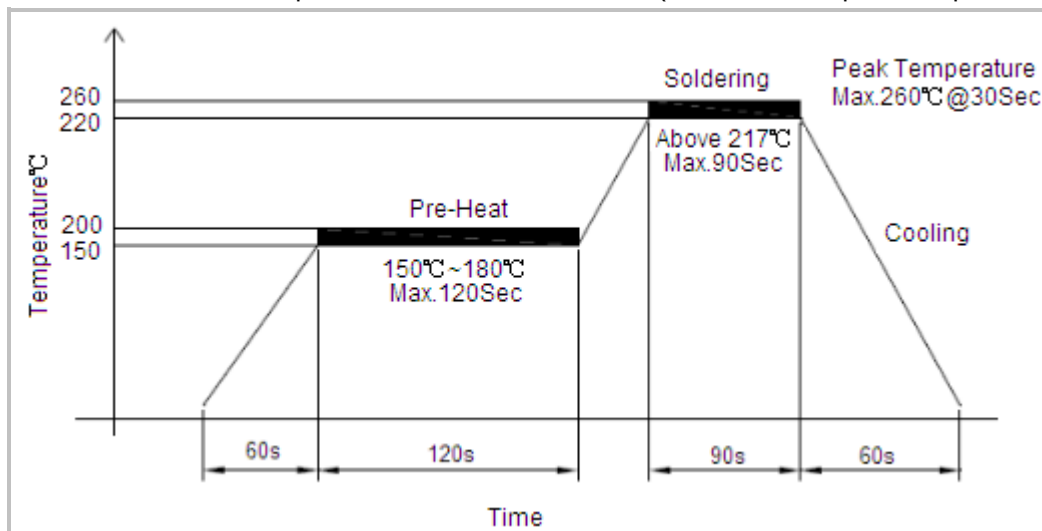
## 8. Application

### 8.1 Pickup Tool Pick Location & PCB Solder Pad Layout



### 8.2 Recommended Reflow Process Condition

Recommend reflow profile, solder reflow  $\leq 260^{\circ}\text{C}$  (for 30s Max of peak temperature).



#### Important Notes

In order to minimize device damage:

1. Do not wash or clean the boards after the reflow process.
2. Do not apply the airflow which pressure over 0.3MPa blow into the port hole within a distance of less than 5 cm.
3. Do not exposed to ultrasonic processing or cleaning.
4. Do not pull a vacuum over port hole of the microphone.

### 8.3 Storage Condition

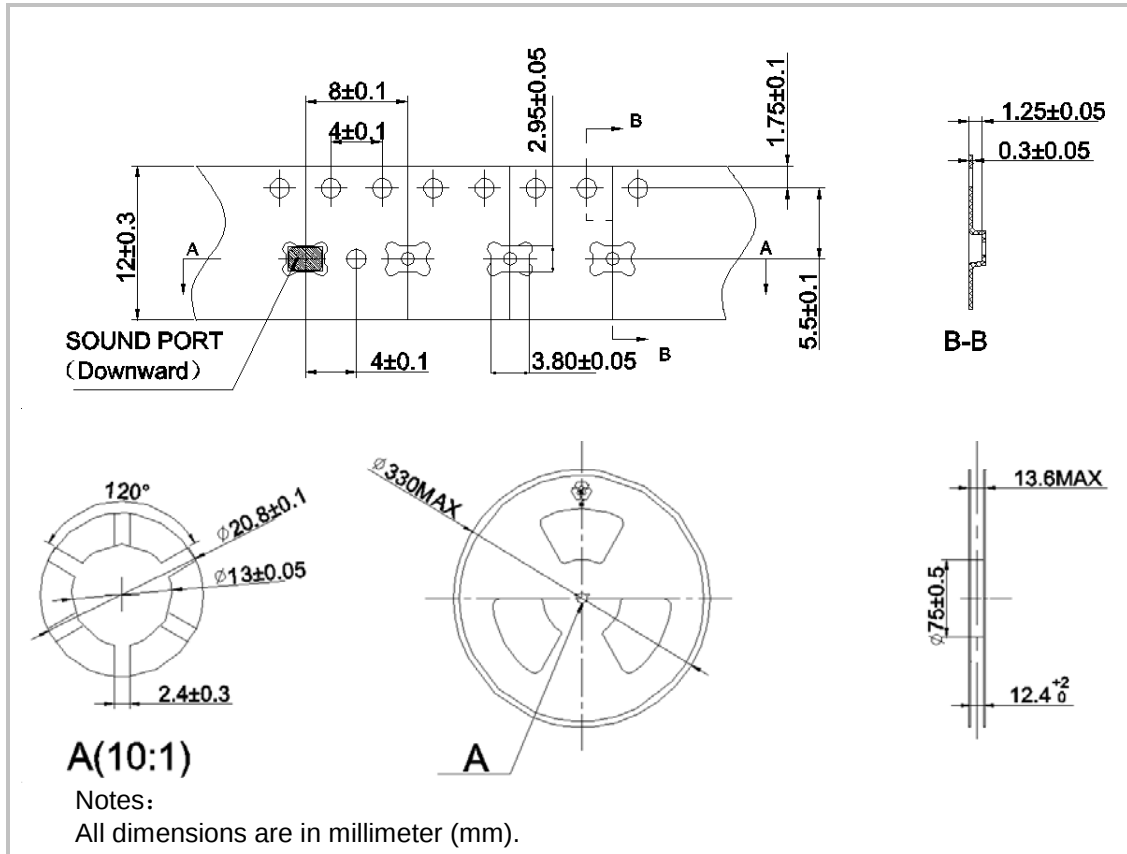
8.3.1 Storage temperature range:  $-40^{\circ}\text{C}$  ~  $+100^{\circ}\text{C}$ , and humidity is less than 75%.

8.3.2 Operating temperature range:  $-40^{\circ}\text{C}$  ~  $+85^{\circ}\text{C}$ .

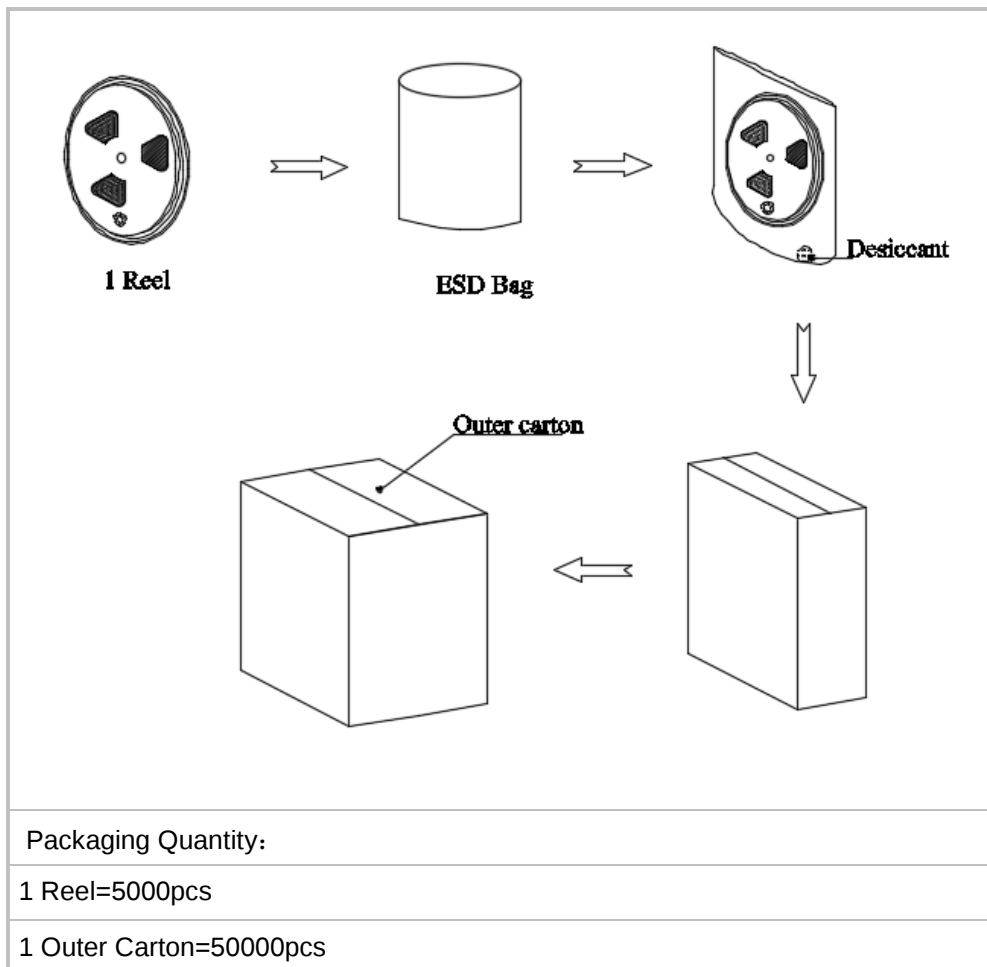
8.3.3 MSL (moisture sensitivity Level) is Class 1.

## 9. Packaging

### 9.1 Tape & Reel Specification



## 9.2 Packaging Information



## 10. Reliability Test

The samples should be placed in the room with  $23\pm 2^{\circ}\text{C}$ ,  $55\pm 10\%\text{R.H.}$  for 2 hours at least before final measurement, unless otherwise specified.

| Item                              | Detail                                                                                                                                                                                                        | Standard          |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| Simulated Reflow (Without Solder) | Samples for qualification testing require 3 times $260\pm 5^{\circ}\text{C}$ reflow solder profiles. 2 hours of setting time is required between each reflow profile test.                                    | $\pm 3\text{ dB}$ |
| Static Humidity                   | Precondition at $+25^{\circ}\text{C}$ for 1 hour. Then expose to $+85^{\circ}\text{C}$ with 85% relative humidity for 240 hours.                                                                              | $\pm 3\text{ dB}$ |
| Temperature Shock                 | Each cycle shall consist of 30 minutes at $-40^{\circ}\text{C}$ , 30 minutes at $+125^{\circ}\text{C}$ with 5 minutes transition time. Test duration is for 30 cycles, starting from cold to hot temperature. | $\pm 3\text{ dB}$ |
| ESD Sensitivity                   | According to MIL-STD-883G, Method 3015.7 for Human Body Model.<br>Discharge Position: I/O pins<br>Charge Voltage: $\pm 3000\text{V}$<br>Discharge Network: $100\text{pF}$ & $1500\Omega$                      | $\pm 3\text{ dB}$ |
| Random Vibrations                 | Vibrate randomly along three perpendicular directions for 30 minutes in each direction, 4 cycles from $20\text{Hz}$ ~ $2000\text{Hz}$ with a peak acceleration $20\text{g}$ .                                 | $\pm 3\text{ dB}$ |
| Mechanical Shock                  | Subject samples to half sine shock pulses ( $3000\text{g}\pm 15\%$ for $0.3\text{ms}$ ) in each direction, totally 18 shocks.                                                                                 | $\pm 3\text{ dB}$ |
| High temperature Storage          | Microphone unit must maintain sensitivity after storage at $+105^{\circ}\text{C}$ for 240 hours.                                                                                                              | $\pm 3\text{ dB}$ |
| Low temperature Storage           | Microphone unit must maintain sensitivity after storage at $-40^{\circ}\text{C}$ for 240 hours.                                                                                                               | $\pm 3\text{ dB}$ |
| Drop Test                         | The test was repeated in six directions for 3 times, Dropped from $1.5\text{m}$ height on to a steel surface, total 18 times and inspected for mechanical damage.                                             | $\pm 3\text{ dB}$ |

## Specification Revisions

| Revision | Description          | Approved | Date       |
|----------|----------------------|----------|------------|
| 1.0      | New Version Released | Hary     | 17/11/2023 |
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