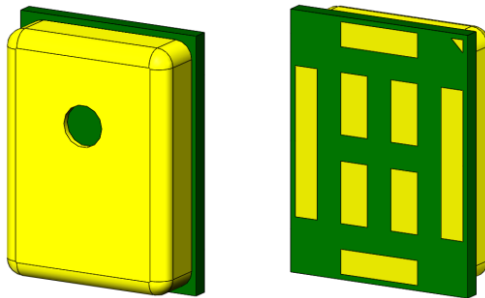


# Specification of MEMS Microphone

RoHS Compliance & Halogen Free

LinkMems P/N: LMD4030T261-OA1



Designed by	Checked by	Approved by
Kevin	Thomas	Hary

**Customer Approval**

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



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## MEMS Microphone

### 1. Introduction

The LMD4030T 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 A-Weighted		58		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, A-weighted		-90		dB

**Low Power Mode**

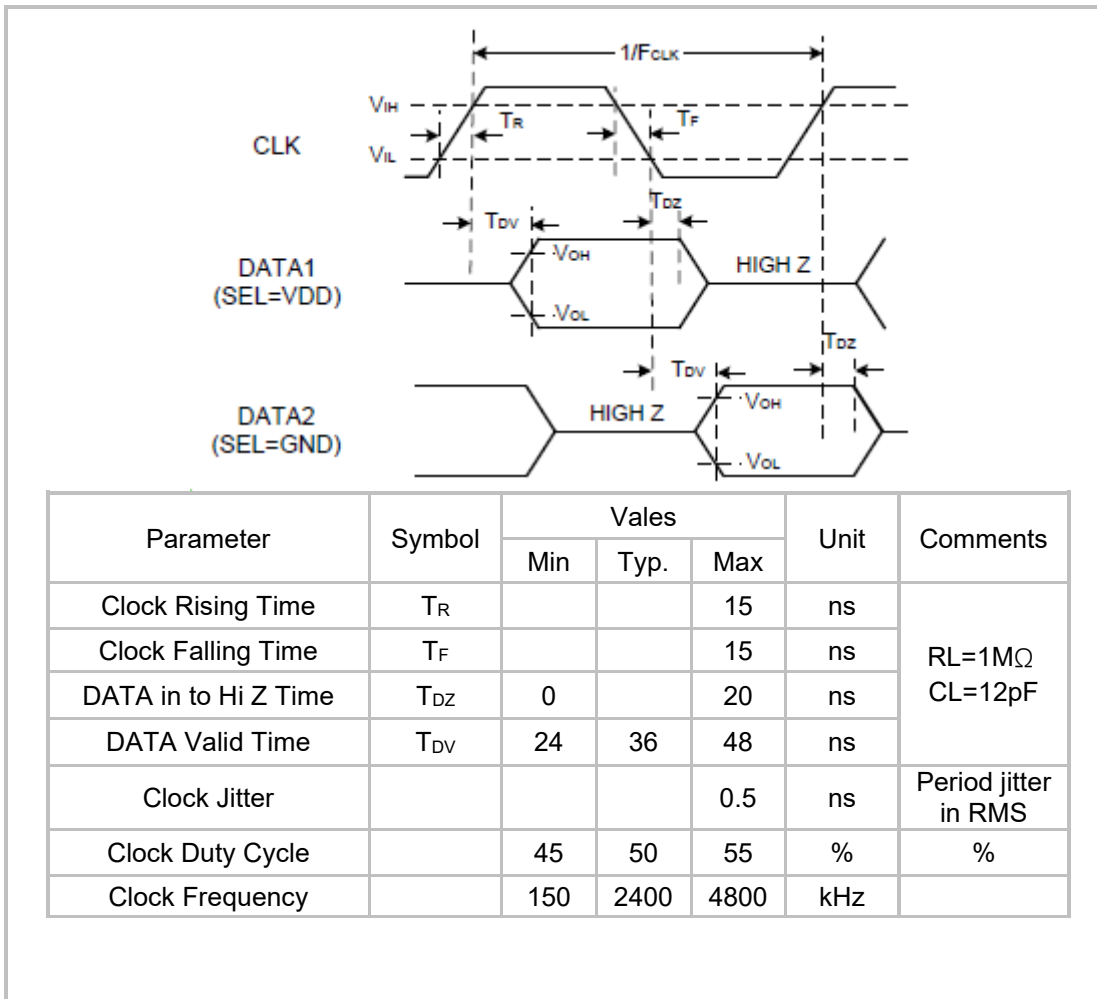
Test Condition: Measurement Clock Frequency 768 kHz, VDD = 1.8 V

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 A-Weighted		57		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, A-weighted		-90		dB

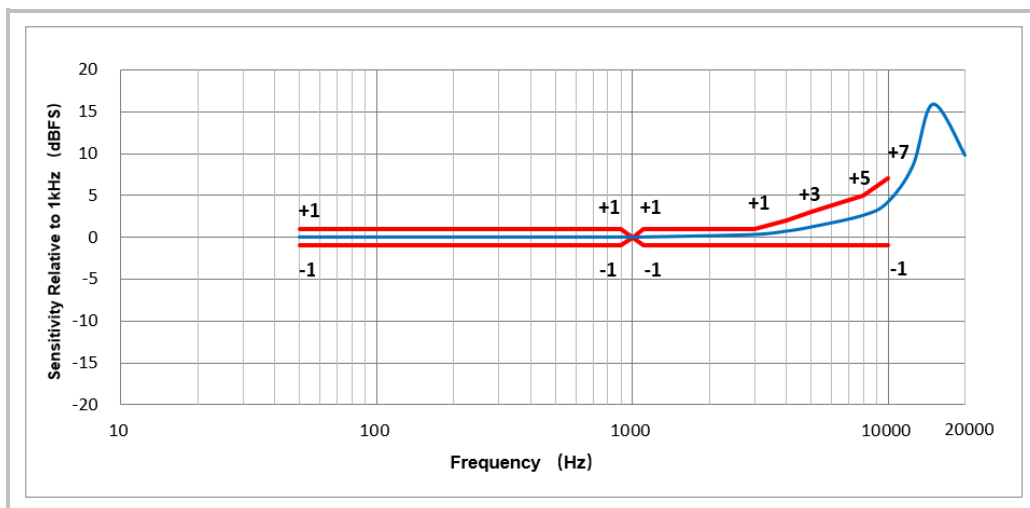
**Operation Ratings**

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

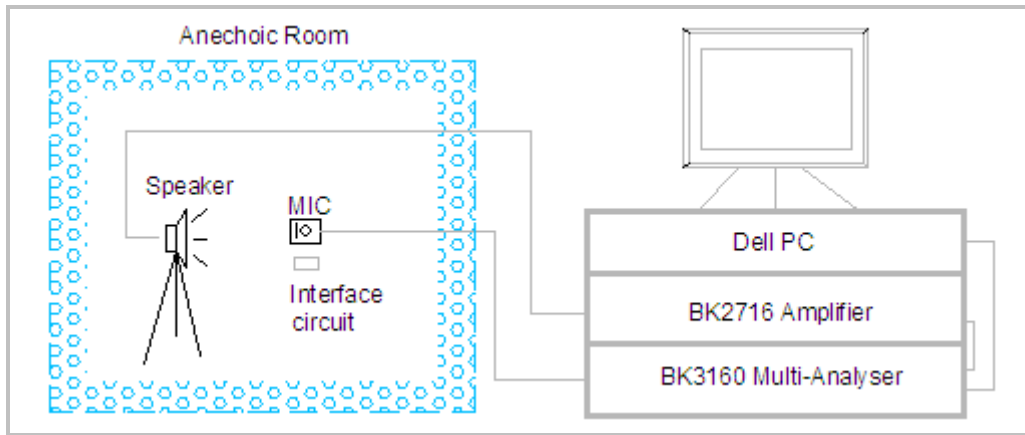
### 3. Timing Characteristics



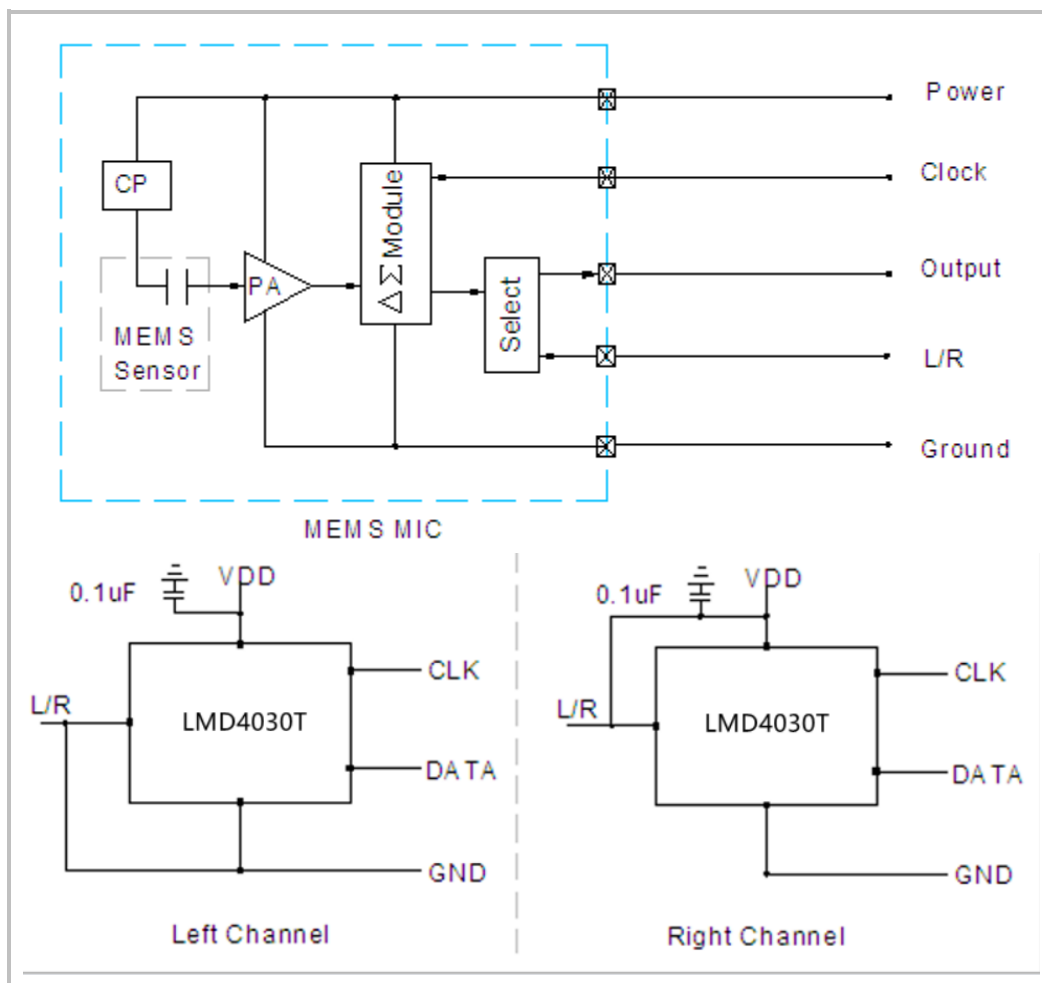
### 4. Frequency Response Curve



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



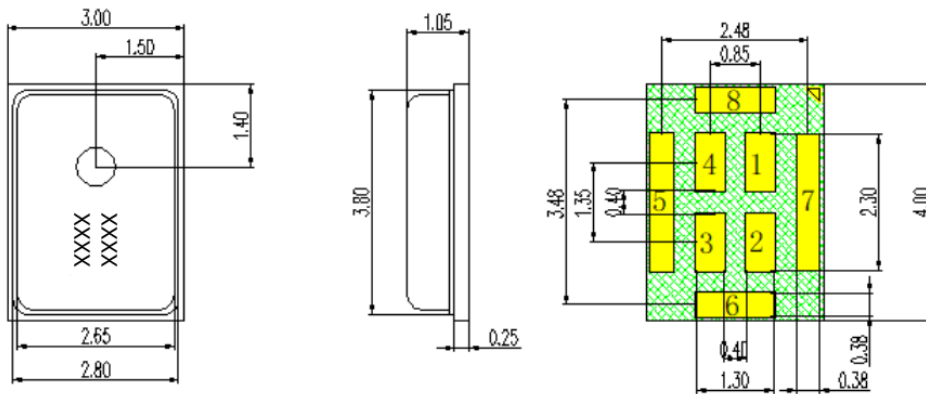
### 6. Measurement Circuit



## 7. Mechanical Characteristics

7.1 Weight: Less than 0.03g

7.2 Appearance Drawing (unit: mm)



Laser Mark	Description
XXXX XXXX	Date Code

Item	Dimension	Tolerance(+/-)	Units
Length(L)	4.00	0.10	mm
Width(W)	3.00	0.10	mm
Height(H)	1.05	0.10	mm
Acoustic Port(AP)	Ø0.65	0.05	mm

Pin #	Pin Name	Type	Description
1	CLK	Clock	Clock Input
2	DATA	Signal	Output Signal
3	VDD	Power	Power Supply
4	L/R	L/R Channel	Channel Select
5	GND	Ground	Ground
6	GND	Ground	Ground
7	GND	Ground	Ground
8	GND	Ground	Ground

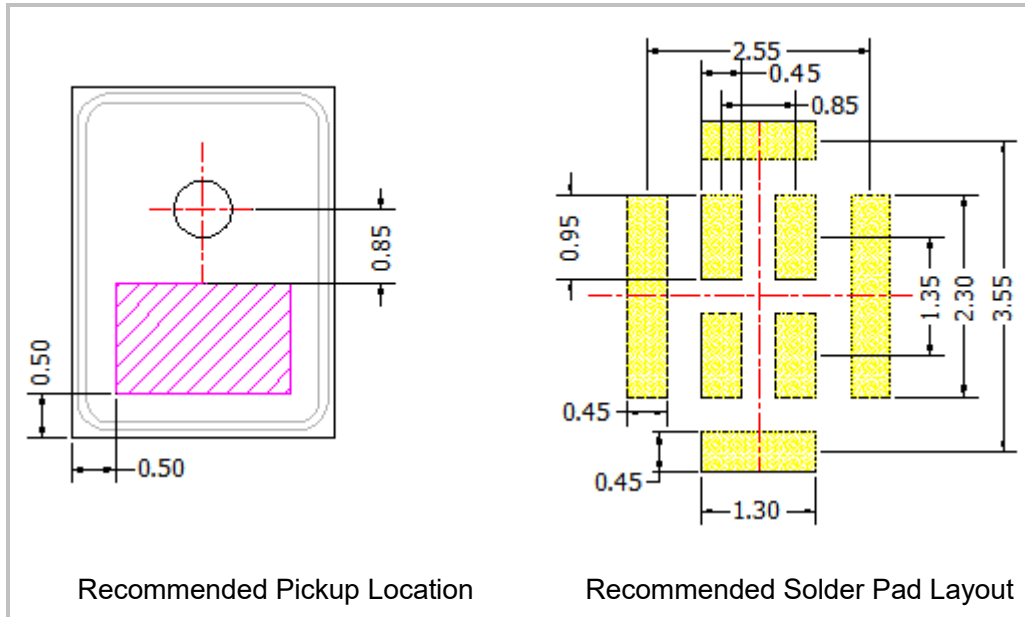
**Notes:**

All dimensions are in millimeter (mm).

Tolerance±0.1mm unless otherwise specified.

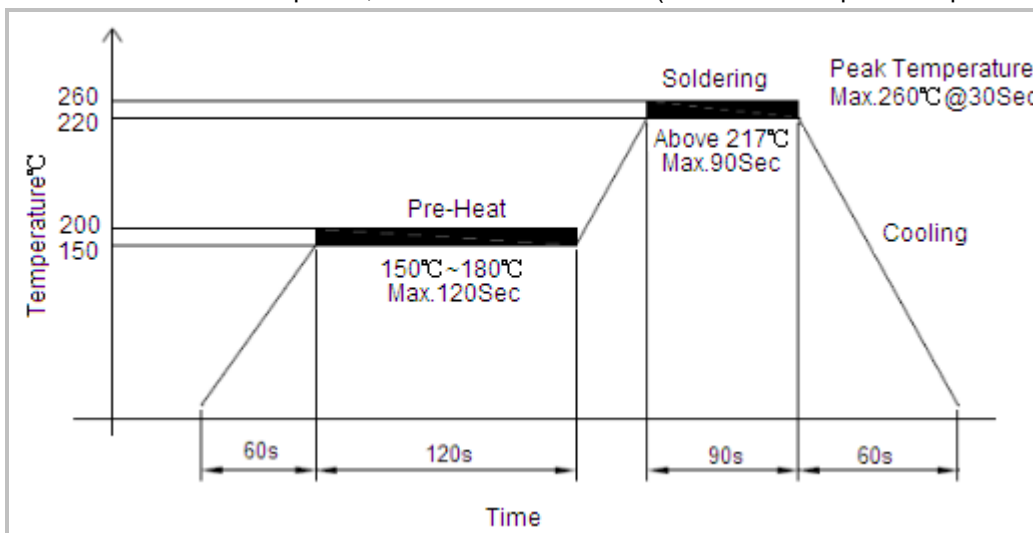
## 8. Application

### 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:  $-40^{\circ}\text{C} \sim +100^{\circ}\text{C}$ , and humidity is less than 75%.

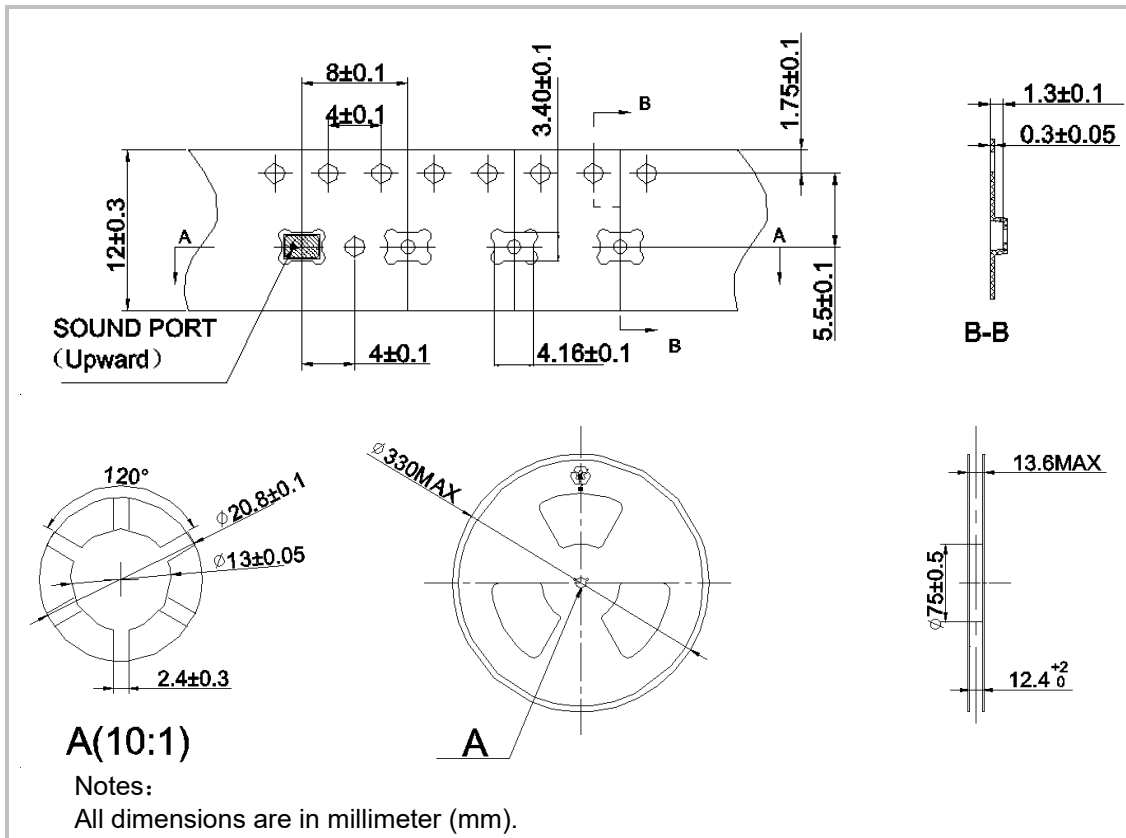
8.3.2 Operating temperature range:  $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$ .

8.3.3 MSL (moisture sensitivity Level) is Class 1.

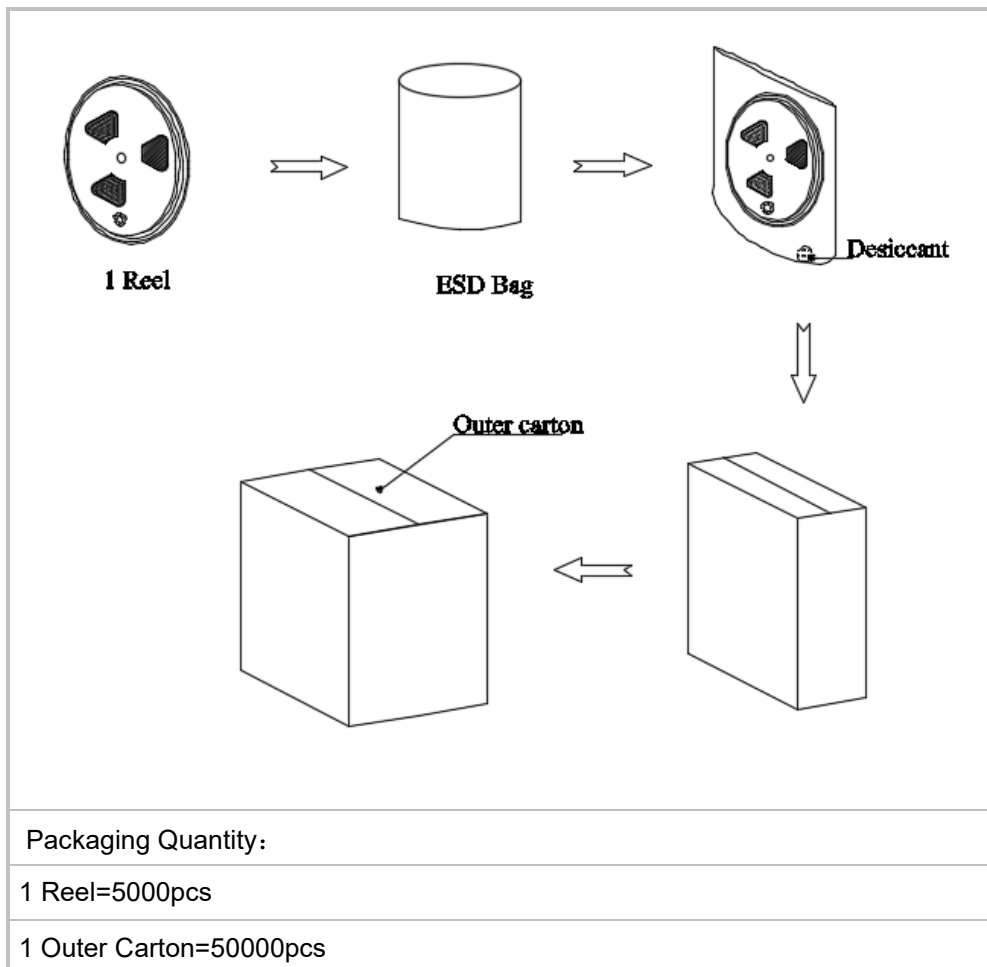


## 9. Packaging

### 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.	$\pm 3$ 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.	$\pm 3$ 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.	$\pm 3$ dB
ESD Sensitivity	According to MIL-STD-883G, Method 3015.7 for Human Body Model. Discharge Position: I/O pins Charge Voltage: $\pm 3000\text{V}$ Discharge Network: $100\text{pF}$ & $1500\Omega$	$\pm 3$ 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 $20\text{g}$ .	$\pm 3$ 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.	$\pm 3$ dB
High temperature Storage	Microphone unit must maintain sensitivity after storage at $+105^{\circ}\text{C}$ for 240 hours.	$\pm 3$ dB
Low temperature Storage	Microphone unit must maintain sensitivity after storage at $-40^{\circ}\text{C}$ for 240 hours.	$\pm 3$ dB
Drop Test	The test was repeated in six directions for 3 times, Dropped from 1.5m height on to a steel surface, total 18 times and inspected for mechanical damage.	$\pm 3$ dB

## Specification Revisions

Revision	Description	Approved	Date
1.2	New Version Released	Hary	17/05/2024