



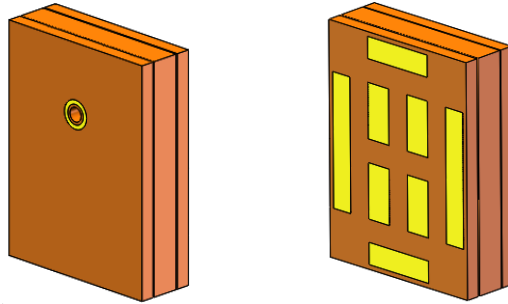
## Specification of Digital MEMS Microphone

RoHS Compliance & Halogen Free

**YG Model:** SD4030T261-YY02-S

**Customer:**

**Customer Model :**



### YINGGE

Designed by:Linda Ding

Checked by: Daniel Peng

Approved by: Janet Wang

### Customer Approval

Approval by:\_\_\_\_\_

## 深圳市莺歌声学技术有限公司

Shenzhen Yingge Acoustics Technology Co., Ltd.



Address: No.3018 Shennan Middle Road, Futian District,  
Shenzhen, Guangdong, P.R.C.

Tel: +86 755-83227251 13509631258 Mr.sun

Fax: +86 755-83012196

E-Mail: [yg@yinglear.com](mailto:yg@yinglear.com) [mic-acts@163.com](mailto:mic-acts@163.com)

QQ:1755836851 P.C.:518000

Website:<https://www.yinglear.com>



## Contents

1. Introduction.....	3
2. Electrical Characteristics .....	3
3. Timing Characteristics .....	5
4. Frequency Response Curve .....	5
5. Test Setup.....	6
6. Measurement Circuit .....	6
7. Mechanical Characteristics .....	7
7.1. Weight.....	7
7.2. Appearance Drawing .....	7
8. Application .....	8
8.1. Pickup Tool Pick Location & PCB Solder Pad Layout .....	8
8.2. Recommended Reflow Process Condition.....	8
8.3. Storage Condition .....	8
9. Packing.....	9
9.1. Tape & Reel Specification.....	9
9.2. Packaging Information .....	10
10. Reliability Test.....	11



## MEMS Microphone

### 1. Introduction

The SD4030T 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.

### 2. Electrical Characteristics

Unless otherwise noted, typical test conditions are  $T_O = 25^\circ\text{C}$ ,  $V_{DD} = 1.8\text{ V}$ . All voltages refer to GND node. The electrical characteristics are measured using a characterization test board .

#### **Electrical Characteristics**

Parameter	Symbol	Note/Test Condition	Vales			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,  $V_{DD} = 1.8\text{ V}$ .

Items	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Directivity		Omni-directional				
Sensitivity	S	94dB SPL @1kHz	-27	-26	-25	dBFS
Current Consumption	$I_{DD}$	Normal mode		650	1000	$\mu\text{A}$
S/N Raito	SNR	94dB SPL @1kHz A-weighted		65		dB
Total Harmonic Distortion	THD	94dB SPL @1kHz,		0.2	0.5	%
Acoustical Overload Point	AOP	10% THD @1kHz		120		dB SPL
Power Supply Rejection	PSR	100mVpp Square wave @217Hz, A-weighted		-80		dBFS



**Low Power Mode**

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

Items	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Directivity		Omni-directional				
Sensitivity	S	94dB SPL @1kHz	-27	-26	-25	dBFS
Current Consumption	I <sub>DD</sub>	Low Power Mode		350	450	μA
	I <sub>slp</sub>	Fclk OFF		< 1	35	μA
S/N Ratio	SNR	94dB SPL @1kHz A-weighted		63		dB
Total Harmonic Distortion	THD	94dB SPL @1kHz		0.2	0.5	%
Acoustical Overload Point	AOP	10% THD @1kHz		120		dB SPL
Power Supply Rejection	PSR	100mVpp Square wave @217Hz, A-weighted		-80		dBFS

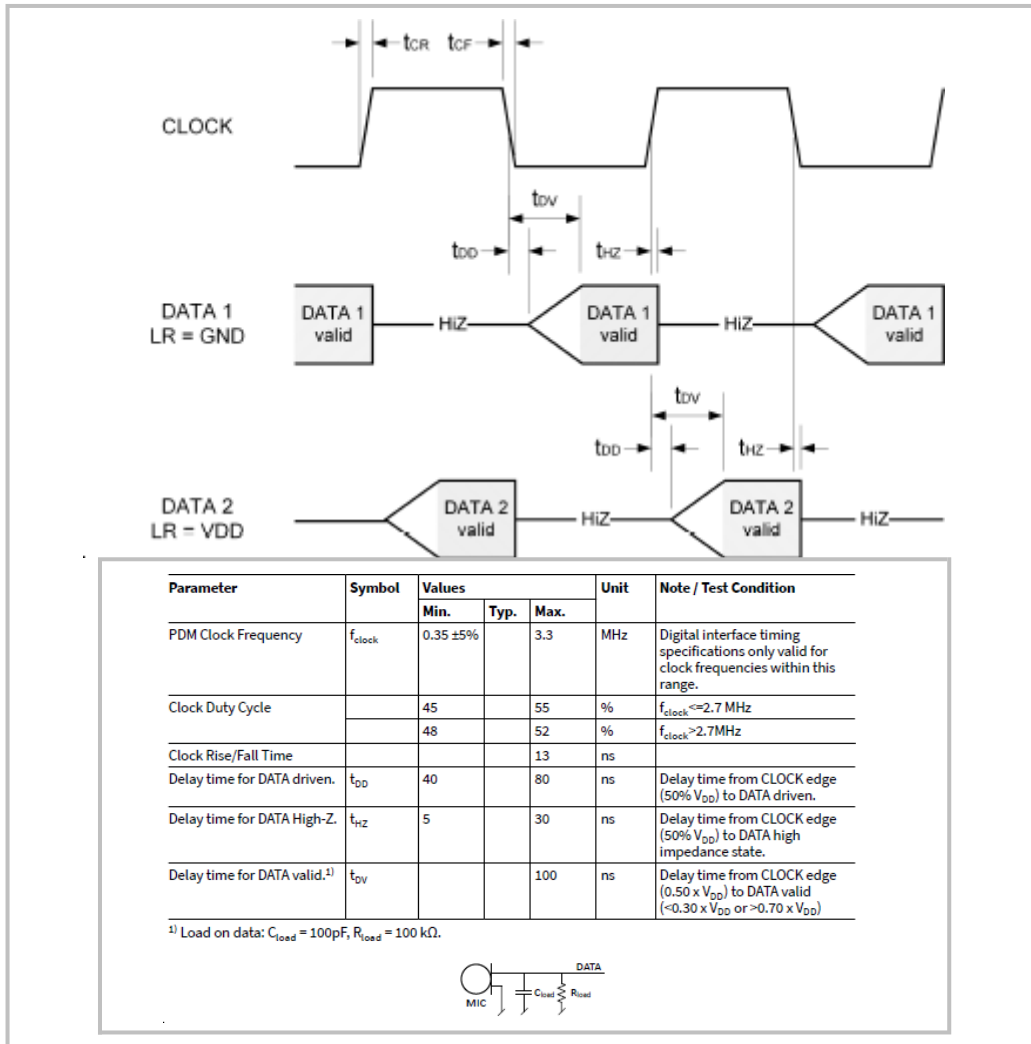
**Operation Ratings**

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		250	kHz
	Low Power Mode		521	768	850	kHz
	Standard Mode		1.38		3.3	MHz
Duty Cycle	DC	Note1)	45		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			0.7*V <sub>DD</sub>			V
Logic Output Low					0.3*V <sub>DD</sub>	V
Load Capacitance					200	pF

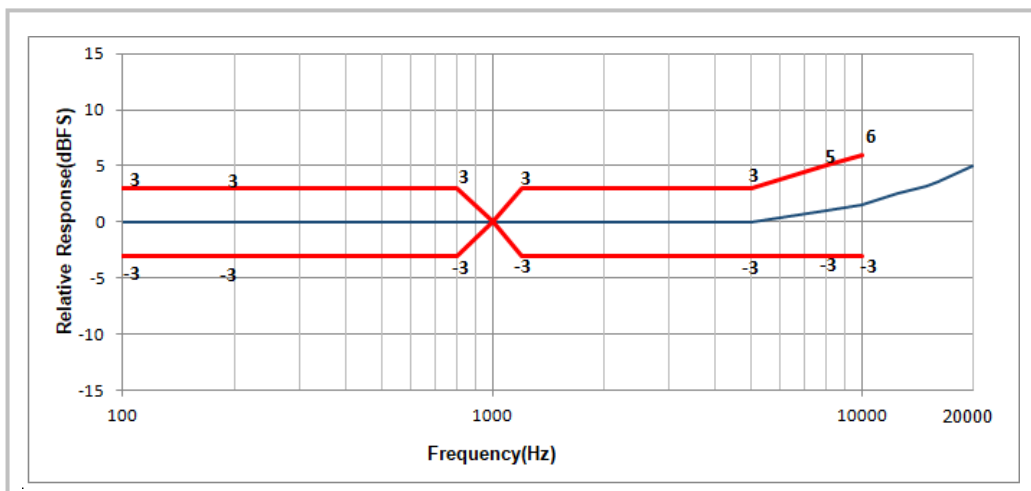
1) For f<sub>CLK</sub> ≤ 2.7 MHz the duty cycle must be in the range of 45~55 % and for f<sub>CLK</sub> > 2.7MHz the duty cycle must be in the range of 48~52 %



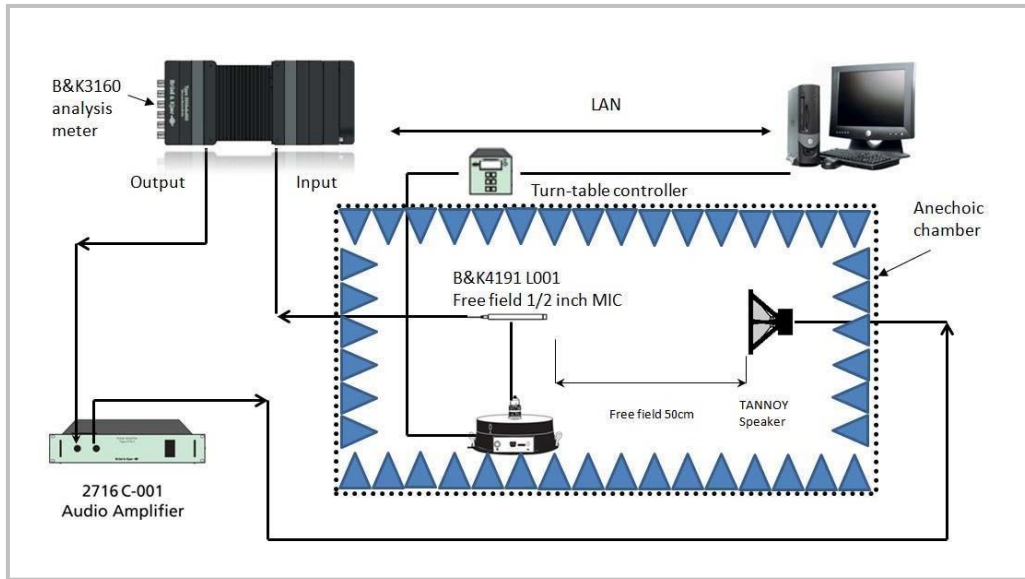
### 3. Timing Characteristics



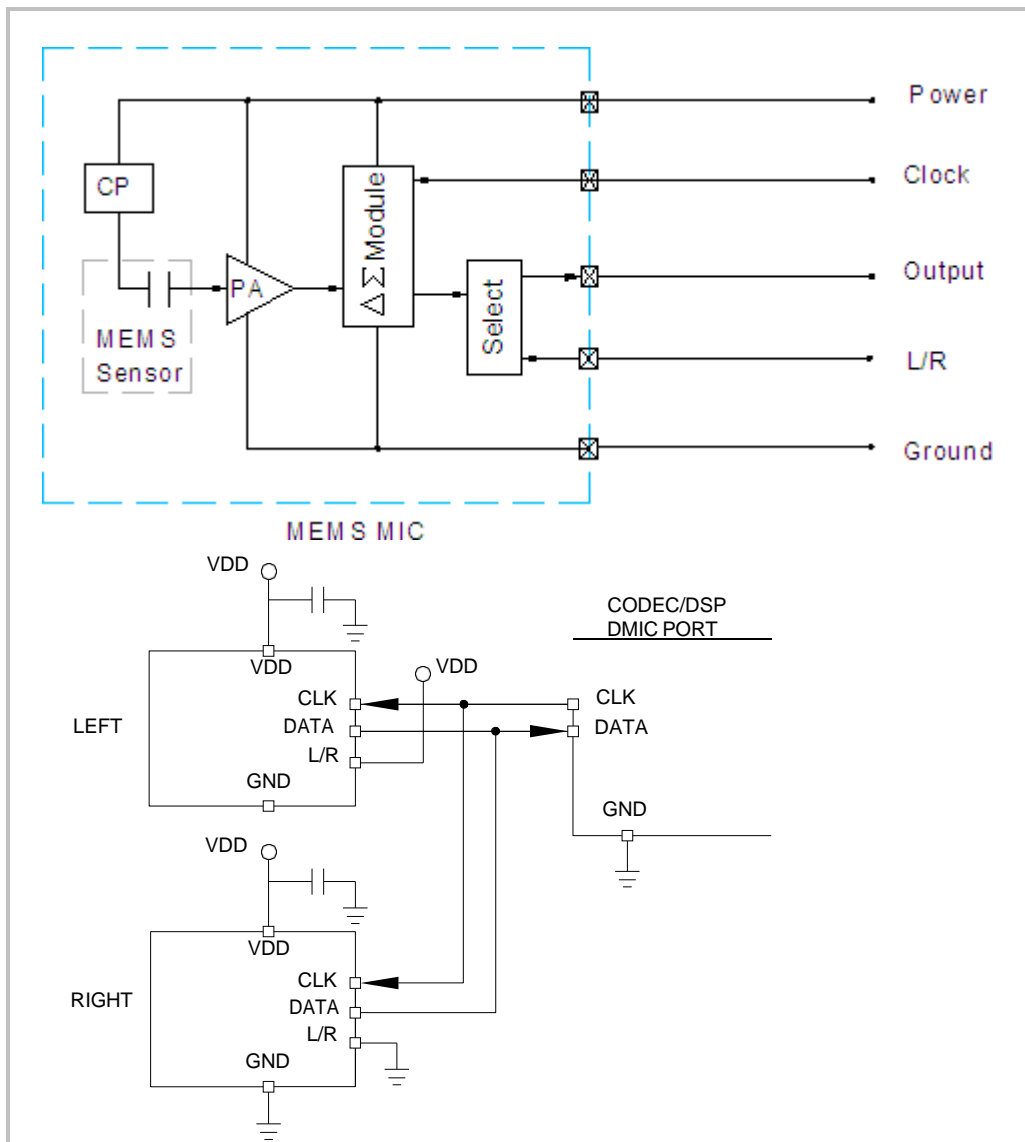
### 4. Frequency Response Curve



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



### 6. Measurement Circuit

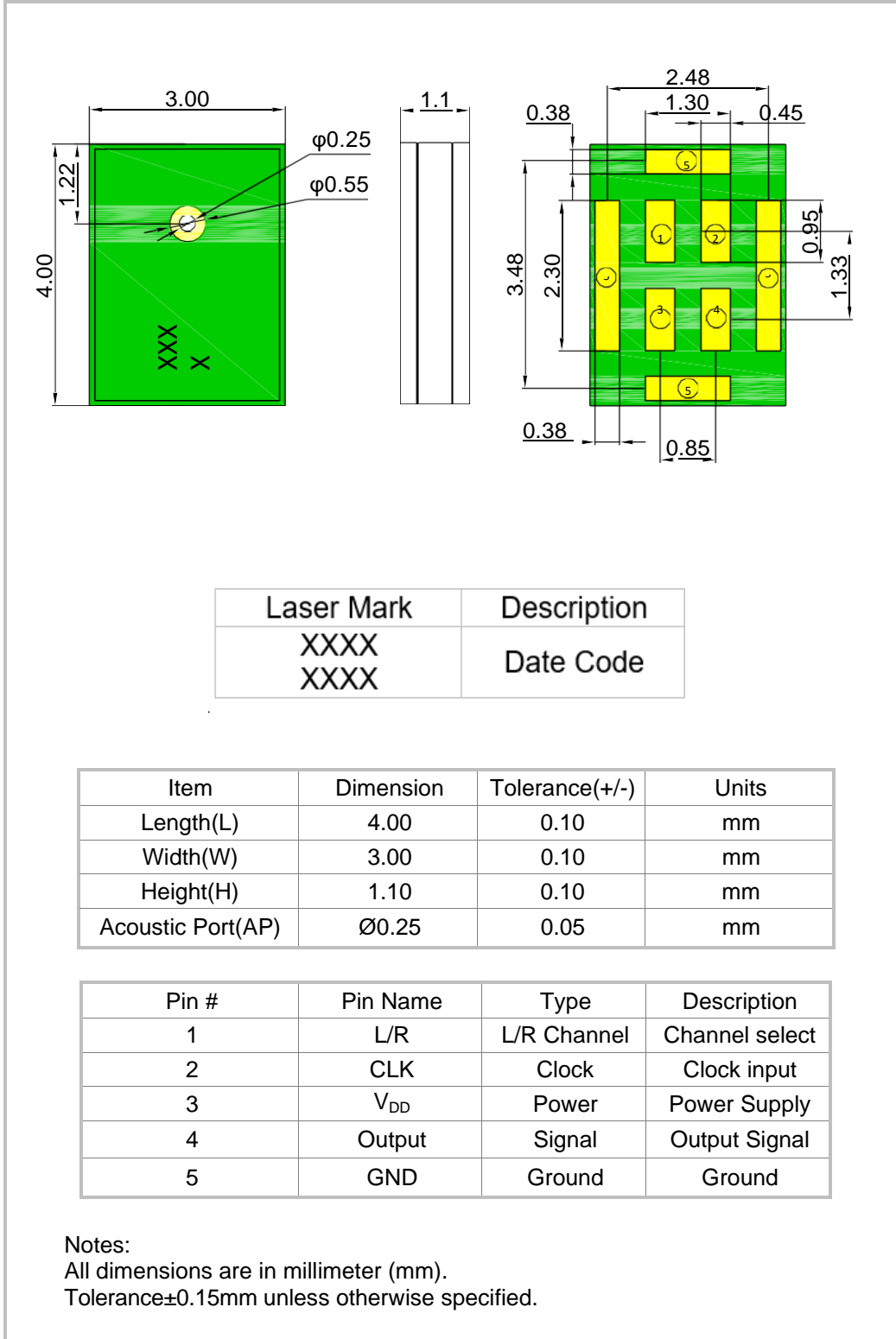




7. Mechanical Characteristics

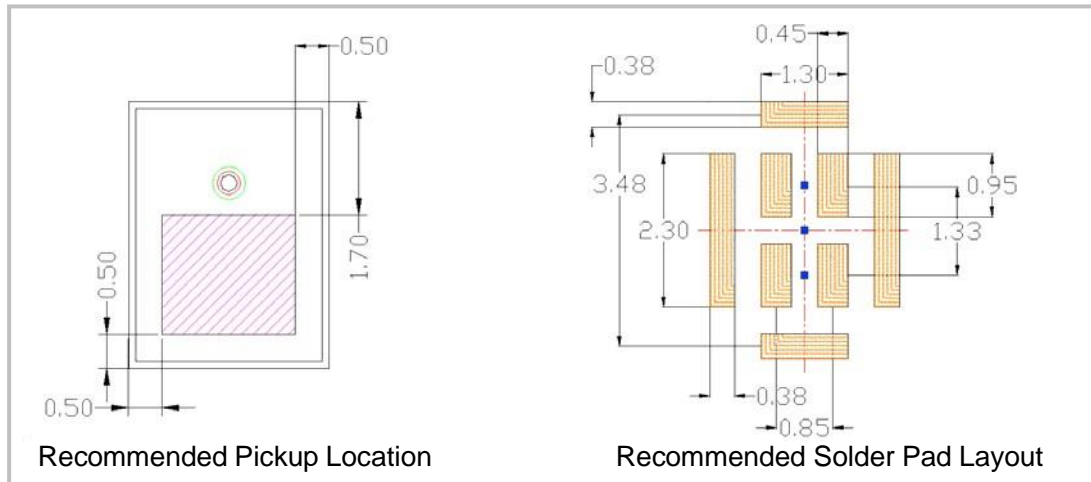
7.1 Weight : Less than 0.03g

7.2 Appearance Drawing(unit: mm)



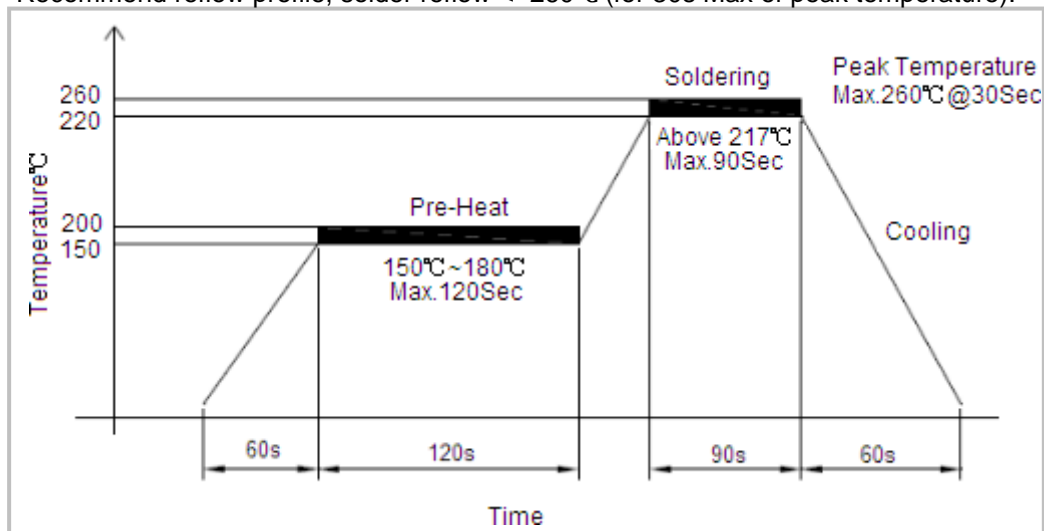
## 8. Application

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

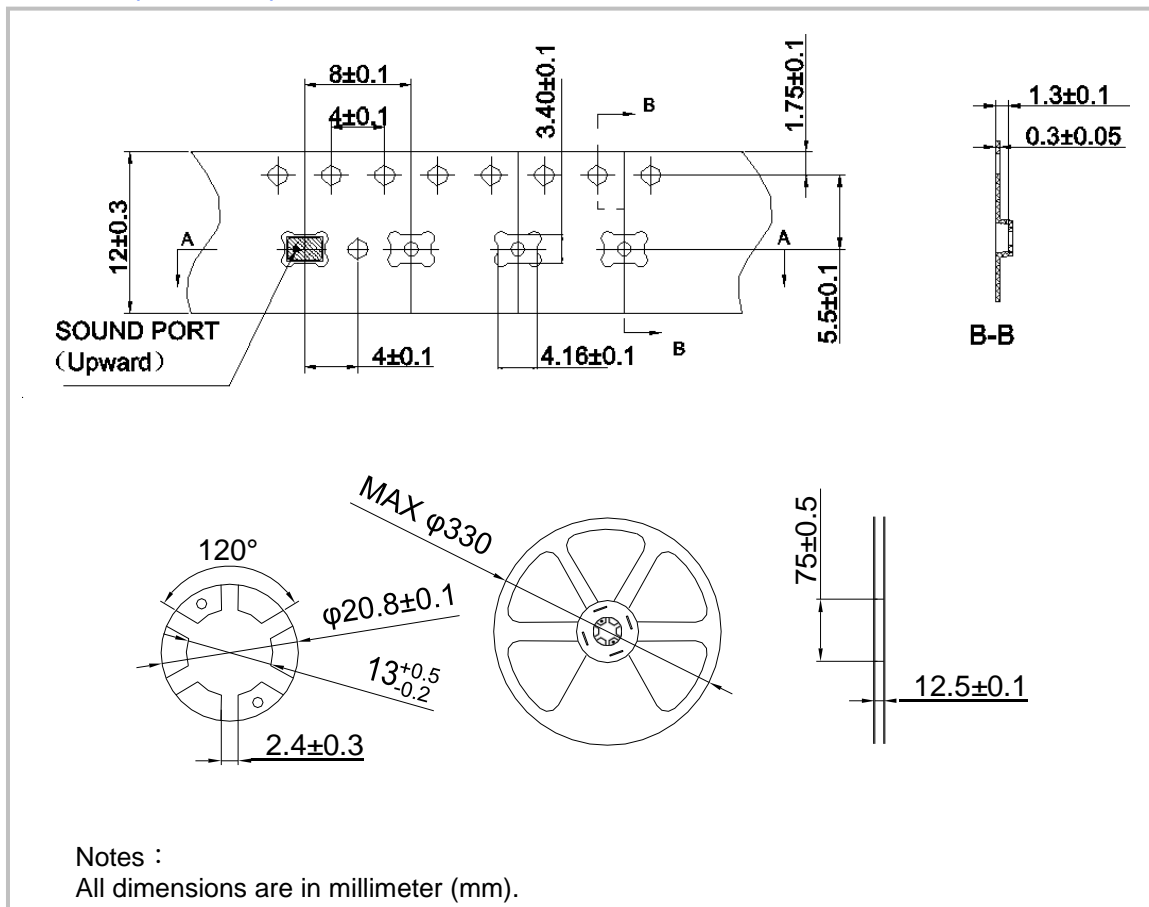
8.3.2 Operating temperature range:  $-40\sim+85^{\circ}\text{C}$ .

8.3.3 MSL (moisture sensitivity Level) is Class 1.



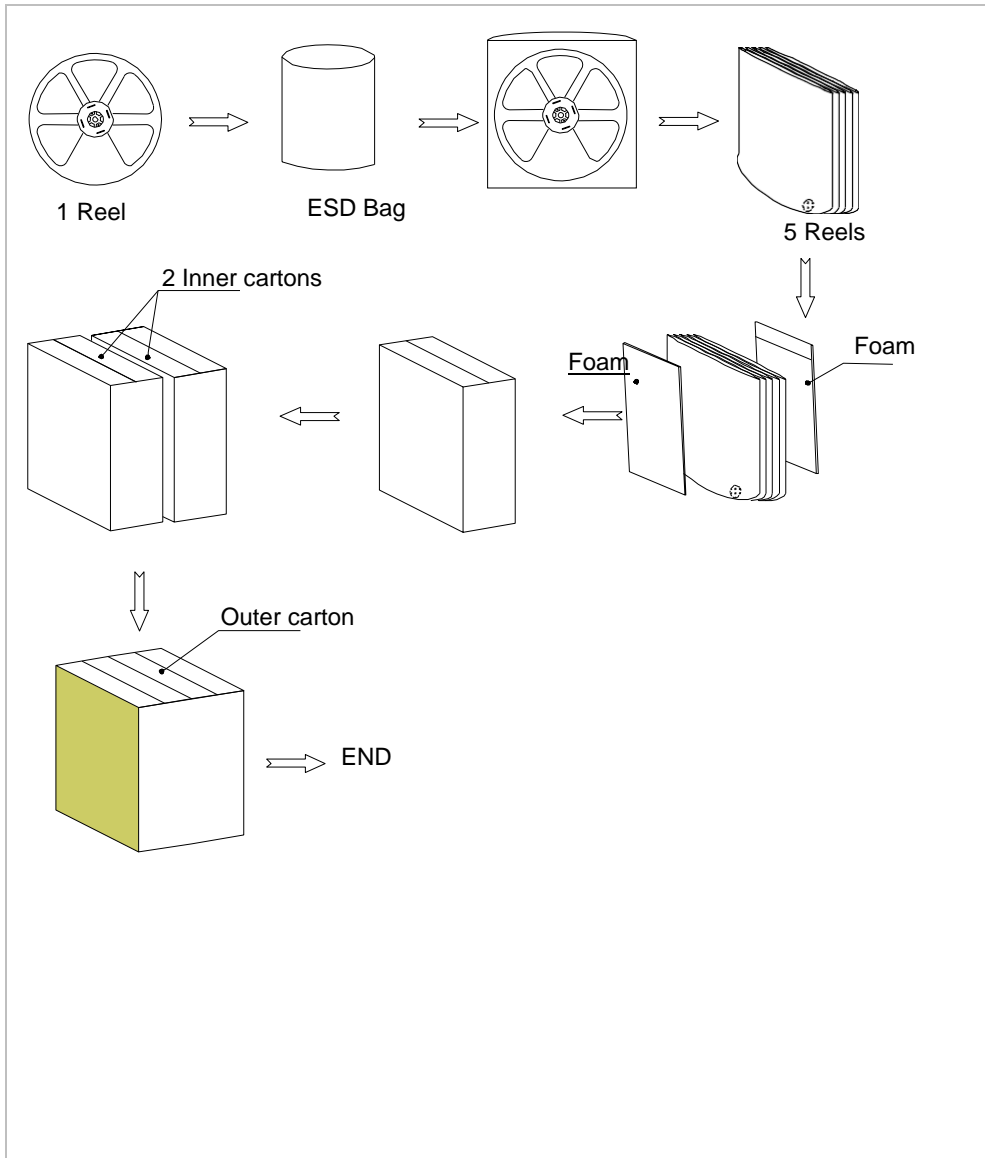
### 9. Packaging

#### 9.1 Tape & Reel Specification





9.2 Packaging Information



Packaging Quantity :
1 Reel=5000pcs
1 Inner Carton =5Reels=25000pcs
1 Outer Carton=2 Inner Cartons=50000pcs



10. Reliability Test

The samples should be placed in the room with 23+/-2°C, 55+/-10%R.H. for 2 hours at least before final measurement, unless otherwise specified. After conducting any of the following tests, the sensitivity change of DUT shall be less than±3dB from its initial value unless otherwise noted, and shall keep its initial operation and appearance.

NO.	Item	Detail
1	Hi-Temperature Storage Test	105±3°C,1000h,recover for two hours
2	Low-Temperature storage Test	-40±3°C,1000h, recover for two hours
3	Hi-Temperature operating Test	105±3°C, under upper limit voltage,1000h,recover for 4 hours
4	Low-Temperature operating Test	-40±3°C, under upper limit voltage,1000h,recover for 4 hours
5	High Humidity &High Heat operating Test	85±3°C, 85%RH, under upper limit voltage, 1000h,recover for 12 hours, there should be no corrosion and deformation inside of microphone after testing
6	High Humidity &High Heat operating Test	65±3°C, 95%RH, under upper limit voltage, 168h,recover for 12 hours ,there should be no corrosion and deformation inside of microphone after testing
7	Thermal Shocking Test	Double-Case Method, -40°C for 15mins→125°C for 15 mins, 100 cycles, recover for two hours
8	Vibration Test	X/Y/Z axes, 12 minutes in each direction. Frequency: 20~2000Hz. Peak Acceleration: 20g.Recover for two hours. The sensitivity change should be less than 1dB after testing
9	Drop Test	Height:1.5m Fixture Weight:150g±10g (Sound Hole Diameter in the fixture is >=0.8mm) Reference Surface: slippery marble floor Duration:4 corners*4 times, 6 faces*4 times The sensitivity change should be less than 1dB after testing
10	Tumbling Test	Height:1.0m Fixture Weight:150g (Sound Hole Diameter in the fixture is >=0.8mm) Duration : 300 times Recommended Time: 10-11times/Min The sensitivity change should be less than 1dB after testing



11	ESD Test	<p>a. HBM Discharge Position: I/O pins Charge Voltage: <math>\pm 3000V</math> Three times Discharge Network: <math>100pF</math> &amp; <math>1500\Omega</math> (IEC61000-4-2)</p> <p>b. MM Discharge Position: I/O pins Charge Voltage: <math>\pm 200V</math> Three times Discharge Network: <math>200pF</math> &amp; <math>0\Omega</math> (IEC STM5.2)</p> <p>c. LID-GND Discharge: contact to lid while unit is grounded Charge Voltage: <math>\pm 8000V</math> Three times Discharge Network: <math>150pF</math> &amp; <math>330\Omega</math> (IEC61000-4-2)</p>
12	Air Pressure Test	<p>The air pressure is <math>0.3MPa</math>, blowing continuously for <math>10s</math>. And the distance from the air gun to the product acoustic port is <math>3\text{ cm}</math>. The caliber of the air gun must be larger than the product acoustic port. The sensitivity change should meet the specification after testing</p>
13	Structure Shock Test	<p><math>10000g</math>, <math>0.1ms</math> pulse width, X/Y/Z axes, 3 times in each direction. The sensitivity change should be less than <math>1dB</math> after testing.</p>

