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SPECIFICATION FOR APPROVAL

Digital MEMS Microphone

Part Number	OWMMOD-403010A-S261F
Note	This item is in compliance with the following requirements: 1. RoHS directive 2. REACH
Customer P/N	

		Prepared	Checked	Approved
Ole Wolff	Signature / Date	Song Wang 2020.06.08		

		Confirmation		
Customer	Signature / Date			

REVISION NOTES:

Date	Rev.	Description of Revision
2020.6.8	00	Initial Release
2021.8.31	01	Update 2D Pin definition

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1. SCOPE

THIS SPECIFICATION IS APPLIED TO OLE WOLFF MINI SILICON MICROPHONE UNIT, MODEL NO.: OWMMOD-403010A-S261F

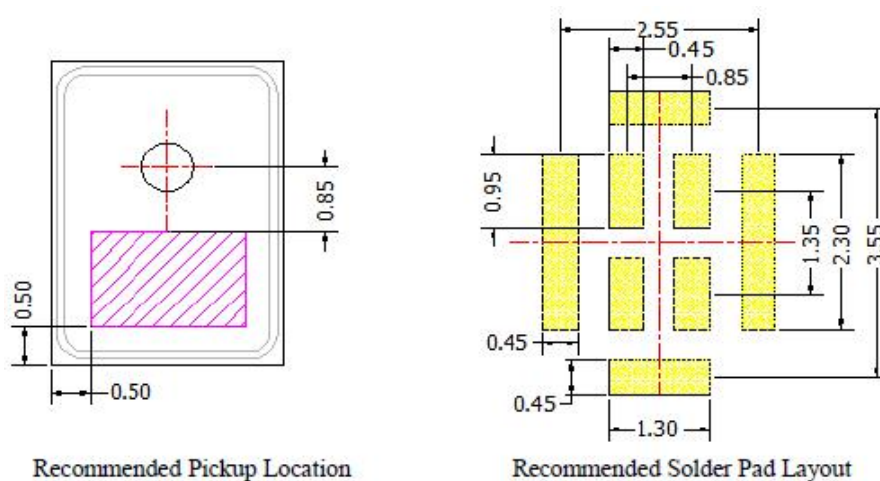
THE MEMS MICROPHONES ARE INTEGRATED WITH SPECIALIZED PRE-AMPLIFICATION ASIC TO PROVIDE HIGH SENSITIVITY, HIGH SNR OUTPUT FROM A CAPACITIVE AUDIO SENSOR. IT'S PACKAGED FOR SURFACE MOUNTING AND HIGH TEMPERATURE RE-FLOW ASSEMBLY.

2. DIMENSIONS AND MECHANICAL LAYOUT

DIMENSIONS: AS SHOWN IN FIGURE 6

WEIGHT: 0.025g

3. PICKUP TOOL PICK LOCATION & PCB SOLDER PAD LAYOUT (FIGURE 1)



Recommended Pickup Location

Recommended Solder Pad Layout

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4. ELECTRICAL SPECIFICATIONS

Specification	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Directivity		Omni-directional				
Sensitivity Range	S	94dB SPL @1kHz,	-27	-26	-25	dBFS
Current Consumption	IDD	Fclk=3.072M Hz		1100	1400	uA
		Fclk=2.4M Hz		800	950	uA
		Fclk=768kHz		300	350	uA
		Fclk<250kHz			50	uA
S/N Ratio	SNR	94dB SPL @1kHz, A-Weighted	60	62		dB(A)
Operating Voltage	V _{DD}		1.64		3.6	V
Total Harmonic distortion	THD	94dB SPL @1kHz, S=Typ			0.5	%
Total Harmonic distortion	THD	100dB SPL @1kHz, S=Typ			1	%
Maximum input S.P.L	AOP	10% THD @1kHz S=Typ, V _{dd} =2V, R _{load} >2Kohm		120		dB
Power Supply Rejection	PSR	100mVpp Square wave @217Hz, A-weighted		-80		dB
Data Format			½cycle PDM			
Clock Frequency	Fclk		1.0	2.4	3.25	MHz
Clock Duty Cycle			40		60	%
Logic Low Input/Output Voltage			-0.35		0.35* V _{dd}	V
Logic High Input/Output Voltage			0.65* V _{dd}		V _{dd} + 0.3	V
Short Circuit Current	I _{sc}	Grounded puput pin	1		10	mA
Load Capacitance	C _{load}				100	pF

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Low Power Mode Specifications(25°C VDD = 1.8~3.6 V, SEL = GND, Fclk=768kHz, no load, unless otherwise indicated						
Clock Frequency	Fclk		350		800	kHz
Supply Current	Idd			300	350	uA
Sensitivity Range	S		-27	-26	-25	dBFS
Operating Voltage	V _{DD}		1.8		3.6	V
S/N Ratio	SNR		59	61		dB(A)
Total Harmonic distortion	THD	94dB SPL @1kHz, S=Typ			0.5	%
Total Harmonic distortion	THD	100dB SPL @1kHz, S=Typ			1	%
Maximum input S.P.L	AOP	10% THD @1kHz S=Typ, Vdd =2V, Rload>2Kohm		120		dB
Power Supply Rejection	PSR	100mVpp Square wave @217Hz, A-weighted		-80		dB
Sleep Mode Specifications(25°C VDD = 1.8 V, SEL = GND, Fclk< 250kHz, no load, unless otherwise indicated						
Clock Frequency	Fclk		0		250	kHz
Supply Current	Idd				50	uA


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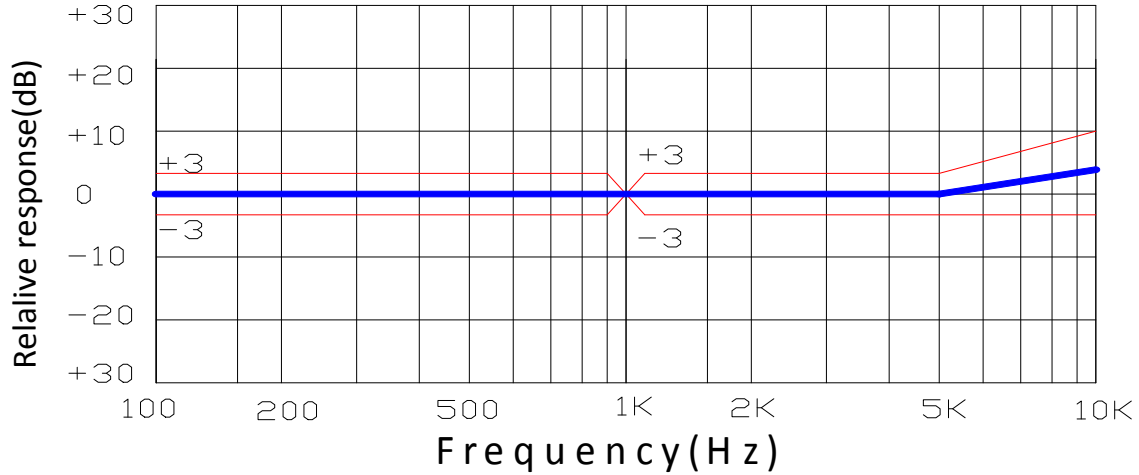
5. RELIABILITY TEST

Test Item	Description	Standard
Reflow	3 reflow cycles with peak temperature of +260°C	IPC-JEDEC J-STD-020D-01
High Temperature Storage	+105°C environment for 1,000 hours	IEC 68-2-2 Test Ba
Low Temperature Storage	-40°C environment for 1,000 hours	IEC 68-2-1 Test Aa
High Temperature Bias	+105°C environment while under bias for 1,000 hours	IEC 68-2-2 Test Ba
Low Temperature Bias	-40°C environment while under bias for 1,000 hours	IEC 68-2-1 Test Aa
High Temperature/Humidity Bias	+85±3°C/85±3% R.H. environment while under bias for 1,000 hours	JESD22-A101A-B
Thermal Shock	100 cycles of air-air thermal shock from -40°C to +125°C with 30 minute soaks	IEC 68-2-4
Tumble test	300 Random Drops of Test Box on to Steel Base from 1.0m, 10 Tumbles/Minute	IEC60068-2-32 Test Ed
Vibration	16 minutes in each X, Y, Z axis from 20 to 2,000 Hz with peak acceleration of 20 G	MIL 883E, Method 2007.2,A
Mechanical Shock	3 pulses of 10,000 G in each of the X, Y, and Z directions	IEC 68-2-27 Test Ea
Drop test	1.5meter height onto a concrete surface each time at three direction	IEC60068-2-32
ESD-HBM	3 discharges of ±2kV direct contact to I/O pins	MIL 883E, Method 3015.7
ESD-LID/GND	3 discharges of ±8kV direct contact to lid while unit is grounded	IEC 61000-4-2
ESD-MM	3 discharges of ±200V direct contact to IO pins	ESD STM5.2

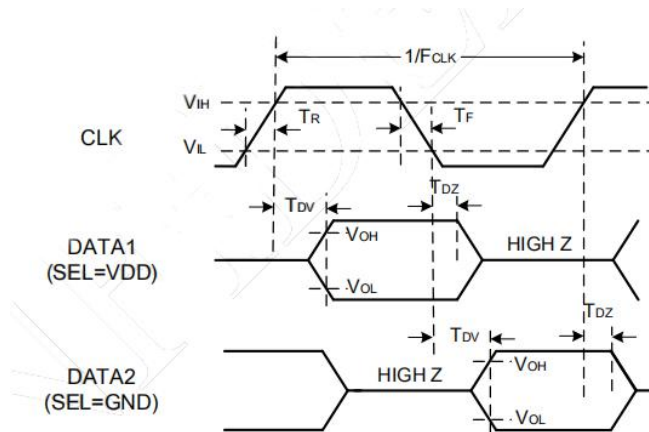
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6. TYPICAL FREQUENCY RESPONSE (FIGURE 2)




7. I/O TIMING DIAGRAM

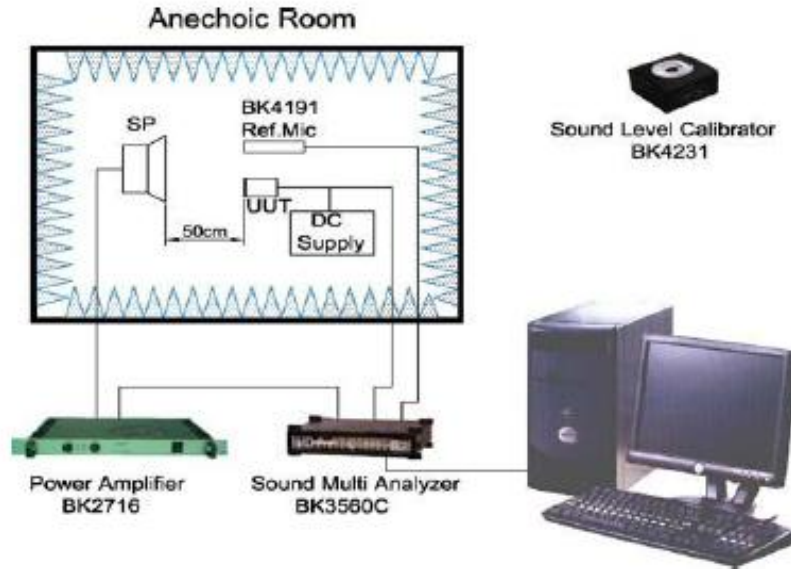


Parameter	Symbol	Min	Typ	Max	Unit	Comments
Clock Rising Time	T_R			15	ns	RL=1M Ω , CL=12pF
Clock Falling Time	T_F			15	ns	RL=1M Ω , CL=12pF
DATA into Hi Z time	T_{DZ}	0		20	ns	RL=1M Ω , CL=12pF
DATA Valid time	T_{DV}	24	36	80	ns	RL=1M Ω , CL=12pF
				110	ns	Max Cloud
Clock Jitter				0.5	ns	Period jitter in RMS
Clock Duty Cycle		40	50	60	%	
Clock Frequency		350	2400	4800	KHz	

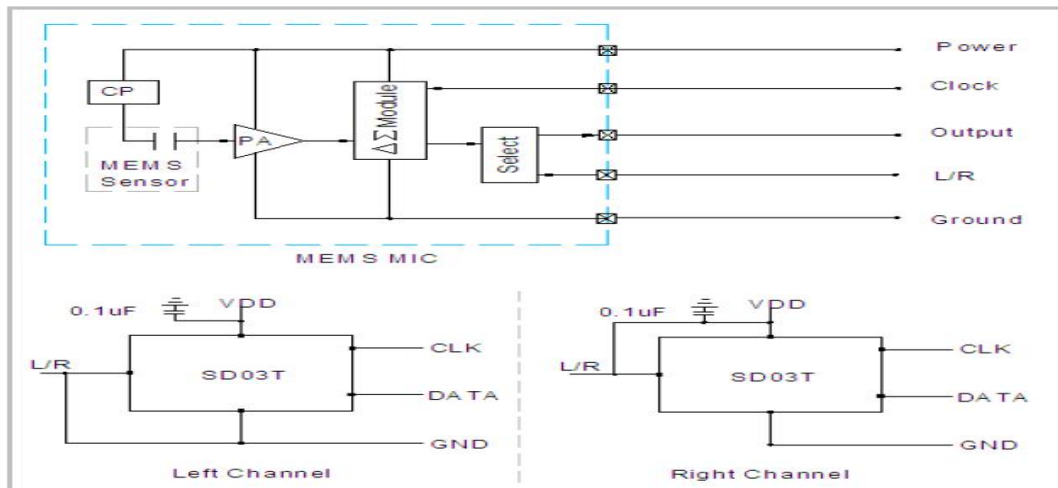
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8. MEASUREMENT CIRCUIT (FIGURE 3)



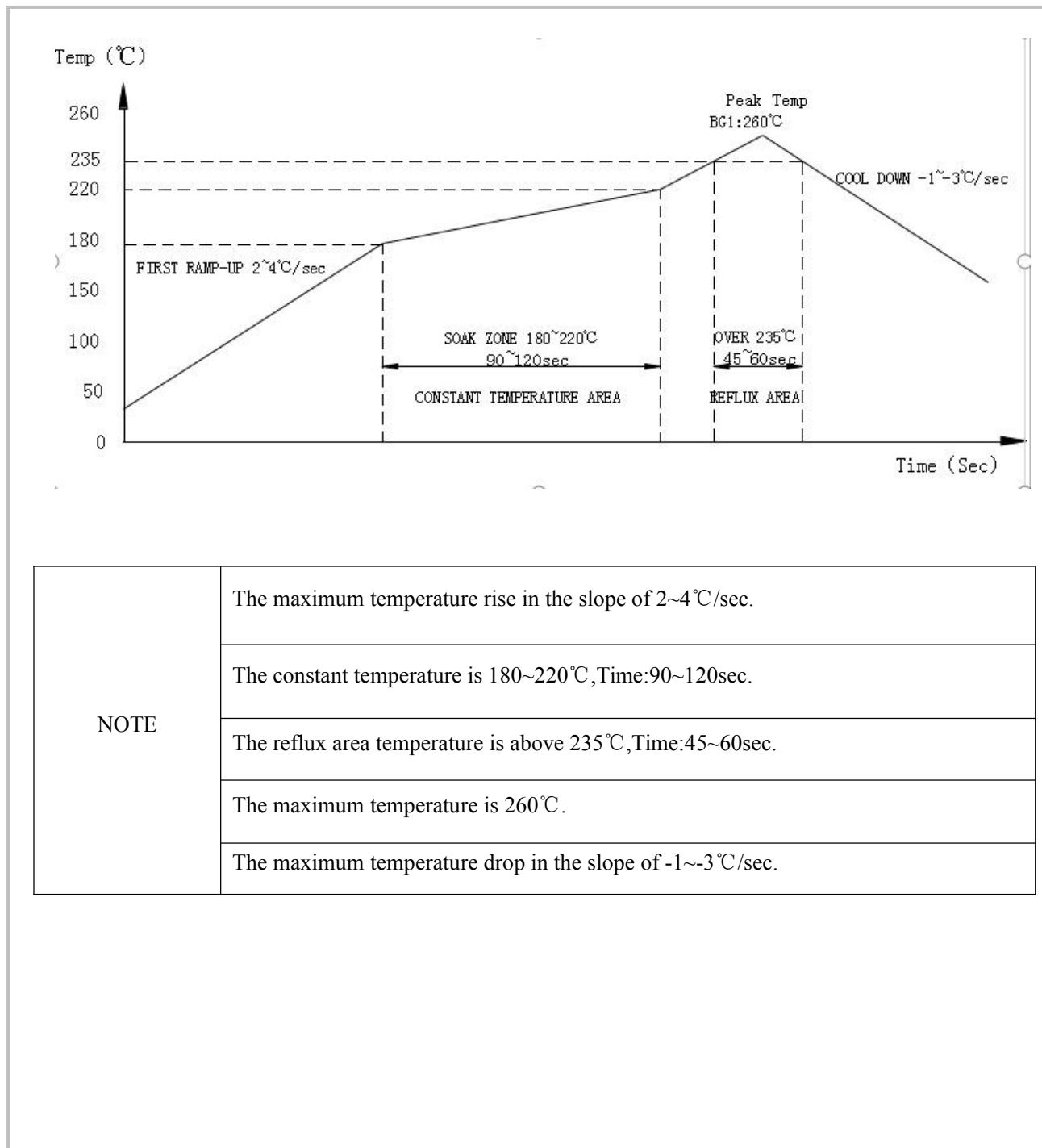
9. APPLICATION CIRCUIT (FIGURE 4)



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10. REFLOW PROFILE (FIGURE 5)

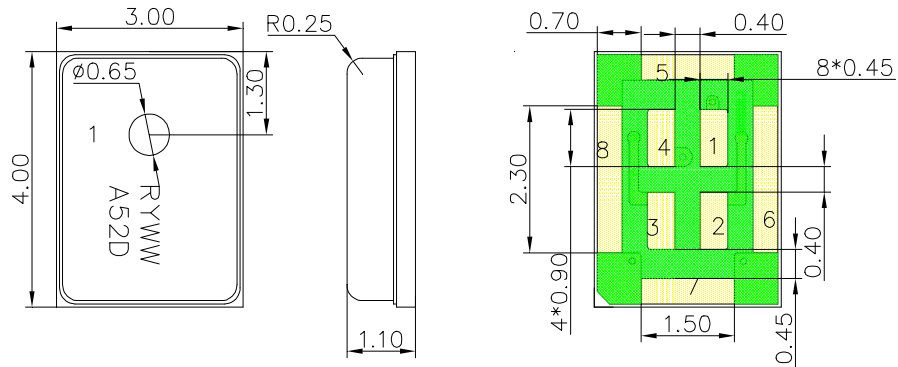


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11. APPEARANCE & DIMENSIONS (FIGURE 6)

The board surface cleaning pressure is 0.3Mpa limited



Top View

Side View

Bottom View

Item	Dimension	Tolerance(+/-)	Units
Length(L)	4.0	0.10	mm
Width(W)	3.0	0.10	mm
Height(H)	1.0	0.10	mm
Acoustic Port(AP)	Ø0.65	0.05	mm

Pin #	Pin Name	Type	Description
1	CLK	Clock	Clock input
2	Data	PDM	Output signal
3	V _{DD}	Power	Power Supply
4	L/R	L/R Channel	Channel select
5,6,7,8	GND	Ground	Ground

Notes:

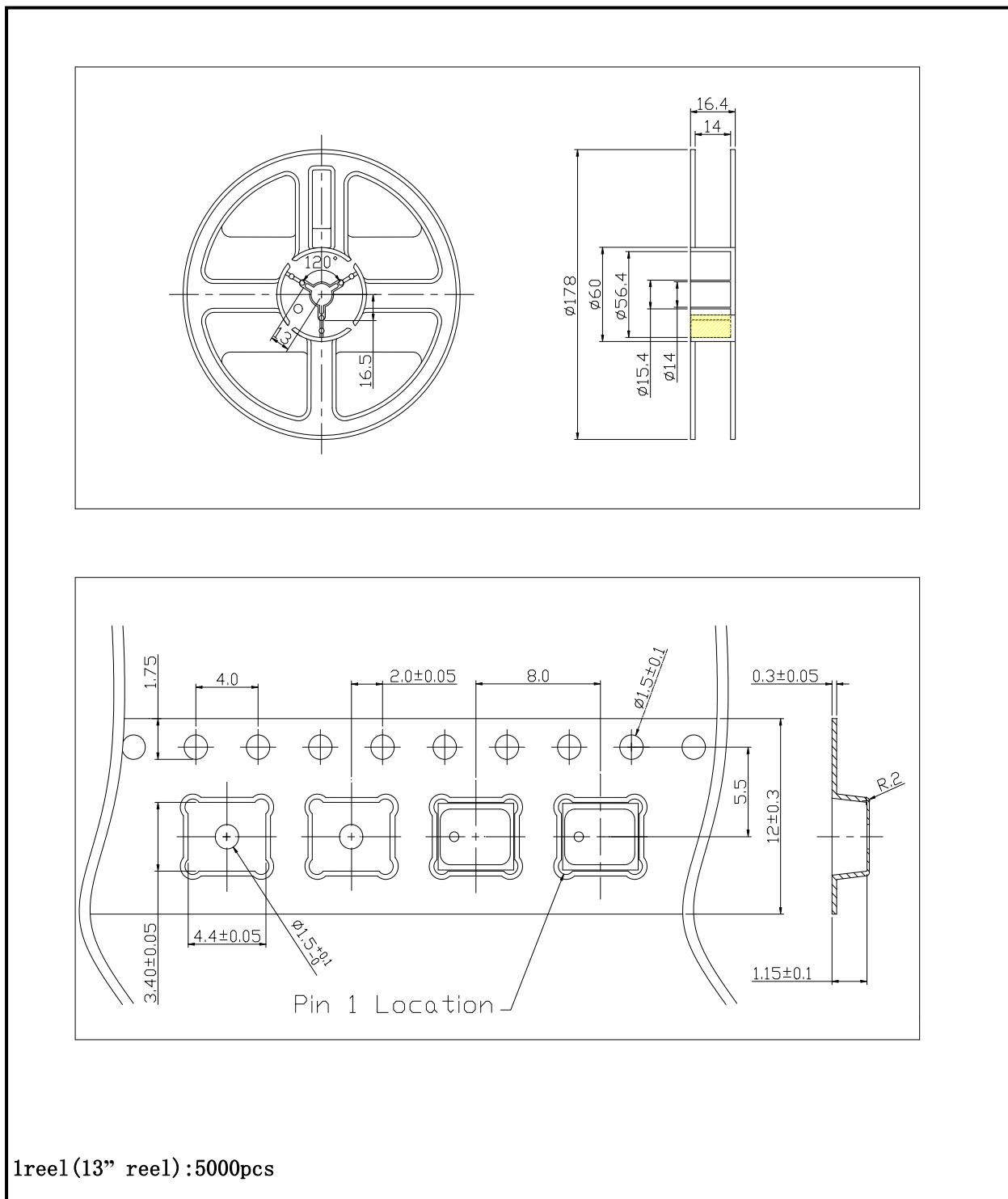
All dimensions are in millimeter (mm).

Tolerance±0.15mm unless otherwise specified.

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12. PACKING (UNIT: MM) (FIGURE 7)



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13. CAUTIONS WHEN USING MEMS MIC

a. Board Wash Restrictions

It is very important not to wash this silicon microphone; otherwise this could damage the microphone.

b. Sound Hole Protection

It is very important not to operate vacuum and air blow into sound hole (without any covering over sound holes), otherwise this could damage the microphone. And it is necessary to be careful about substances into sound hole inside silicon microphone.

c. ESD Protection

The microphone is sensitive element, it is necessary to be careful when using it. Otherwise this may damage the microphone.

d. Ultrasonic Restrictions

It is very important not to use ultrasonic process. Otherwise this could damage the microphone.

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