Specification of MEMS Microphone

(RoHS Compliance & Halogen Free)

Customer Name :

Customer Model :

Goermicro Model : S15OB381-124

10644
ISO/TS16949:2009
2551
ISO14001:2004
2728
ISO9001:2008

Tel : + 86 536 3051234
E- Mail : Goermicro@Goermicro.com
Website: http://www.Goermicro.com
Address: No.268 Dongfang Road, High-Tech Industry Development District, Weifang, Shandong, P.R.C.

Restricted

1 Security Warning

2 Publication History

Version	Description	Date	Author	Approved
1.0	New Design	2020.12.08	Aaron	Roy
2.0	Update THD performance in Section 3 Update Document Template	2021.09.16	Zamp	Roy

Contents

1 Introduction:

MEMS MIC which is able to endure reflow temperature up to 260℃ for 50 seconds can be used in SMT process. It is widely used in telecommunication and electronics device such as mobile phone, laptop computers, and other portable electronic devices etc.

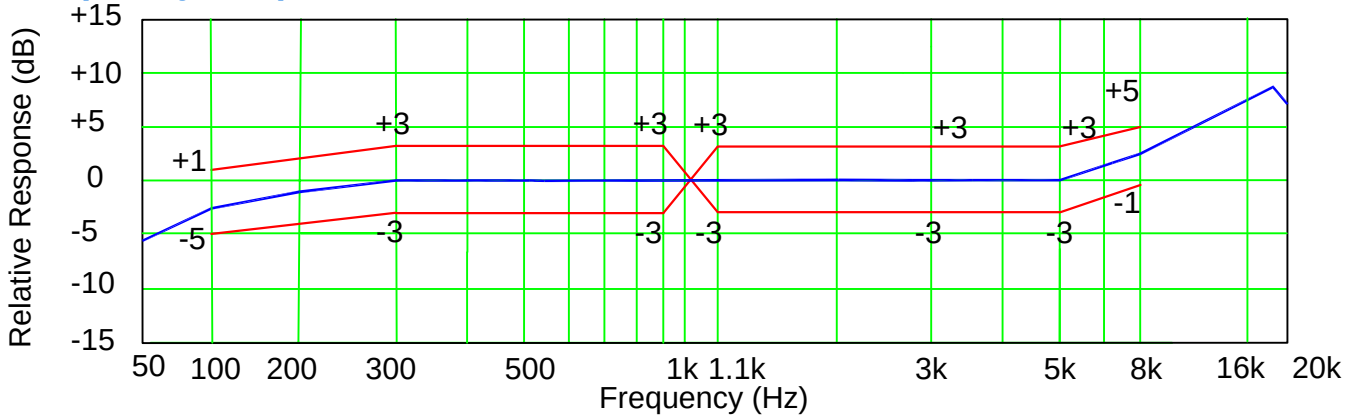
2 Test Condition (Vs=2.0V, L=50cm)

StandardConditions (As IEC 60268-4)	Temperature	Humidity	Air pressure
Environment Conditions	+15℃～+35℃	25％R.H.～75%R.H.	86kPa～106kPa
Basic Test Conditions	+20℃ ± 2℃	60％R.H.～70%R.H.	86kPa～106kPa

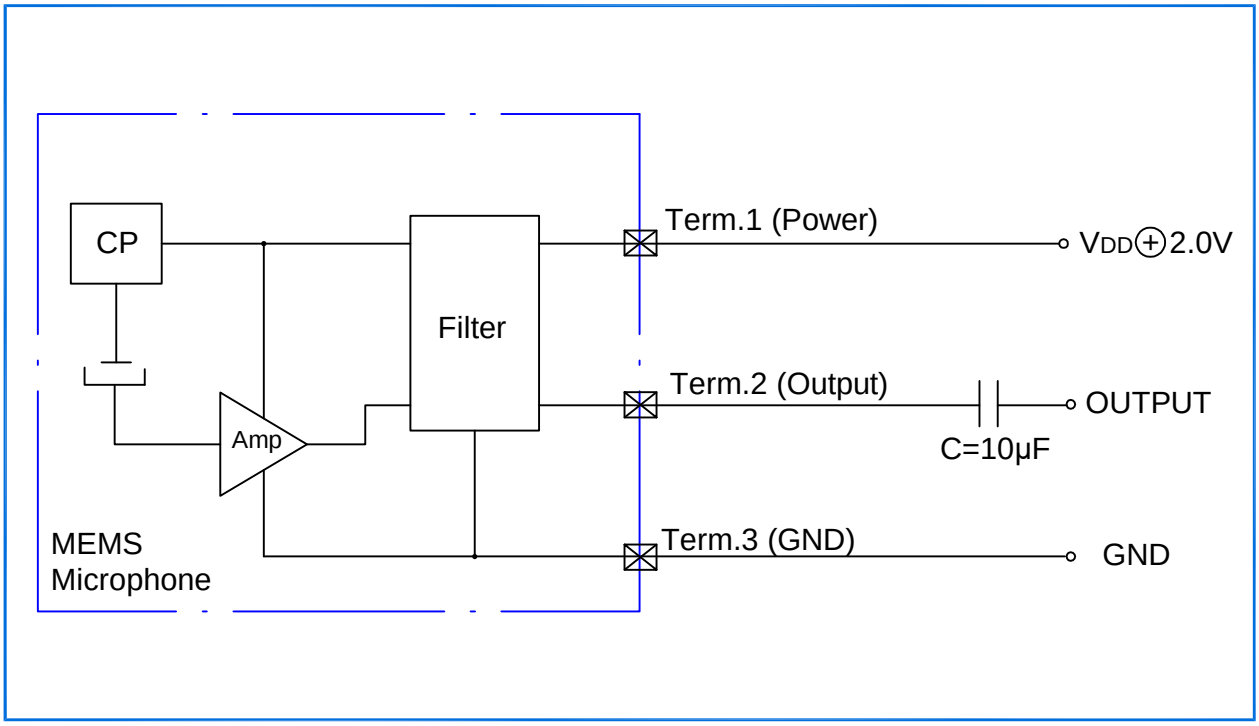
3 Acoustic and Electrical Characteristics

Item	Symbol	Test Conditions	Min	Typ	Max	Unit
Operating Voltage Range	V_S		1.5		3.6	V
Current Consumption	I	Vs=2.0V			150	μA
Sensitivity	S	f=1kHz, Pin=1Pa	-39	-38	-37	dBV
S/N Ratio	SNR	f=1kHz, Pin=1Pa A-Weighted Curve		62.5		dB
Total Harmonic Distortion	THD	***1% THD@1kHz***		***113***		***dB SPL***
Acoustic Overload Point	AOP	10%THD@1kHz		128		dB SPL
Power Supply Rejection	PSR	100mVpp square wave@217Hz, Vs=2.0V, A-Weighted		-96		dBV
Power Supply Rejection Ration	PSRR	200mVpp sinewave@1k Hz, Vs=2.0V		68		dB
Output Impedance	Zout	f=1kHz, Pin=1Pa			400	Ω
Decreasing Voltage Characteristic	ΔS	f=1kHz, Pin=1Pa Vs=3.6 --1.5V	No Change			
Directivity	D(θ)		Omnidirectional			

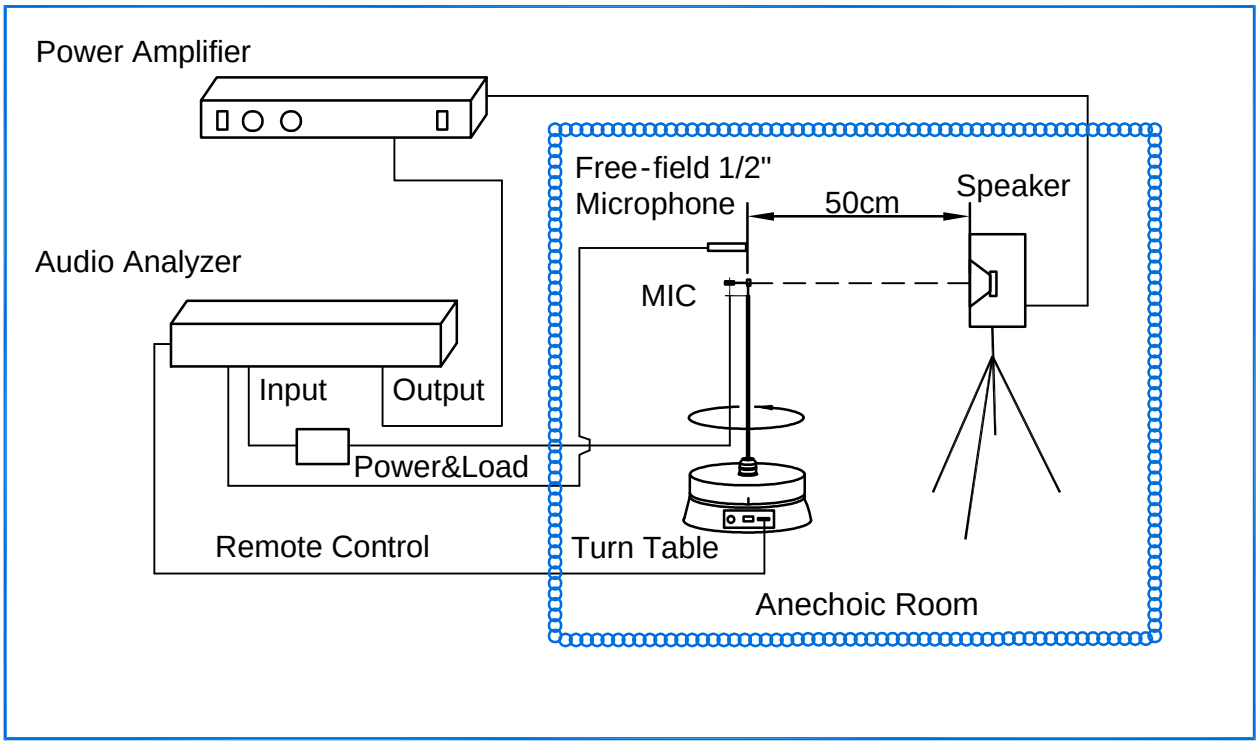
4 Frequency Response Curve and Limits



5 Measurement Circuit

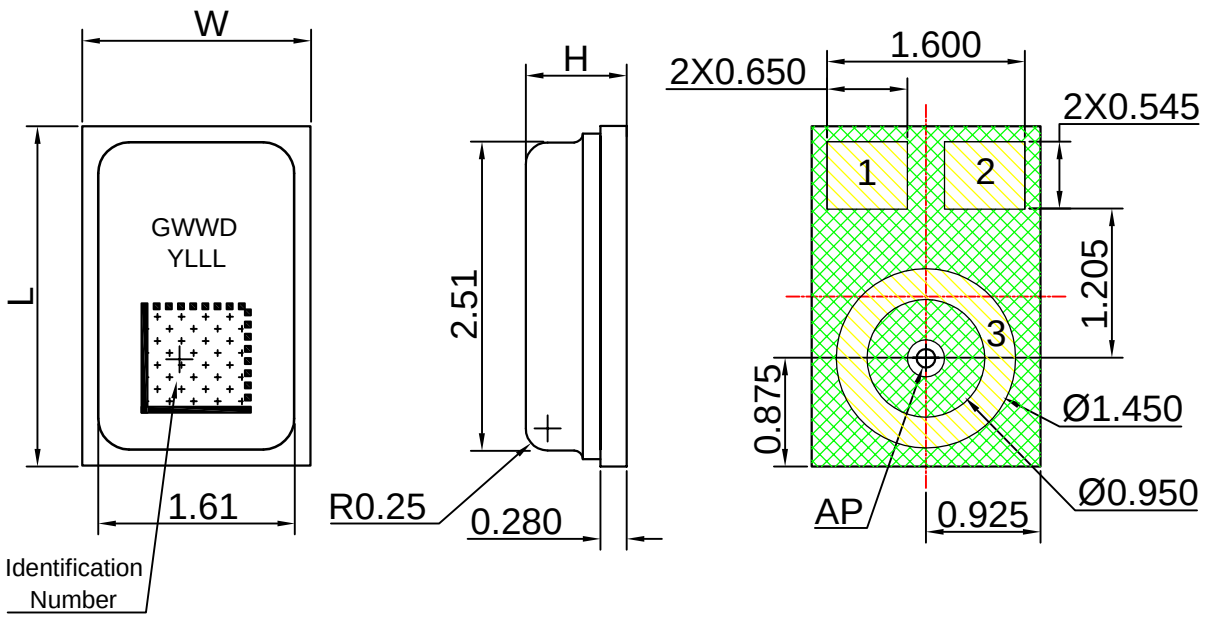


6 Test Setup Drawing



7 Mechanical Characteristics

7.1 Appearance Drawing (Unit: mm)



Top View

Bottom View

Pin#	Function
1	Power
2	Output
3	GND

Item	Dimension	Tolerance	Units
Length(L)	2.75	±0.10	mm
Width(W)	1.85	±0.10	mm
Height(H)	0.90	±0.10	mm
Acoustic Port(AP)	Ø0.25	±0.05	mm

Note: 1. Tolerance ±0.1 mm unless otherwise specified.

2. Identification Number Convention: Job Identification Number.

Identification Number

G	W	W	D
Y	L	L	L

G: Goermicro WW:Week D:Day

Y:Year LLL: Serial Number

2D Code

7.2 Weight

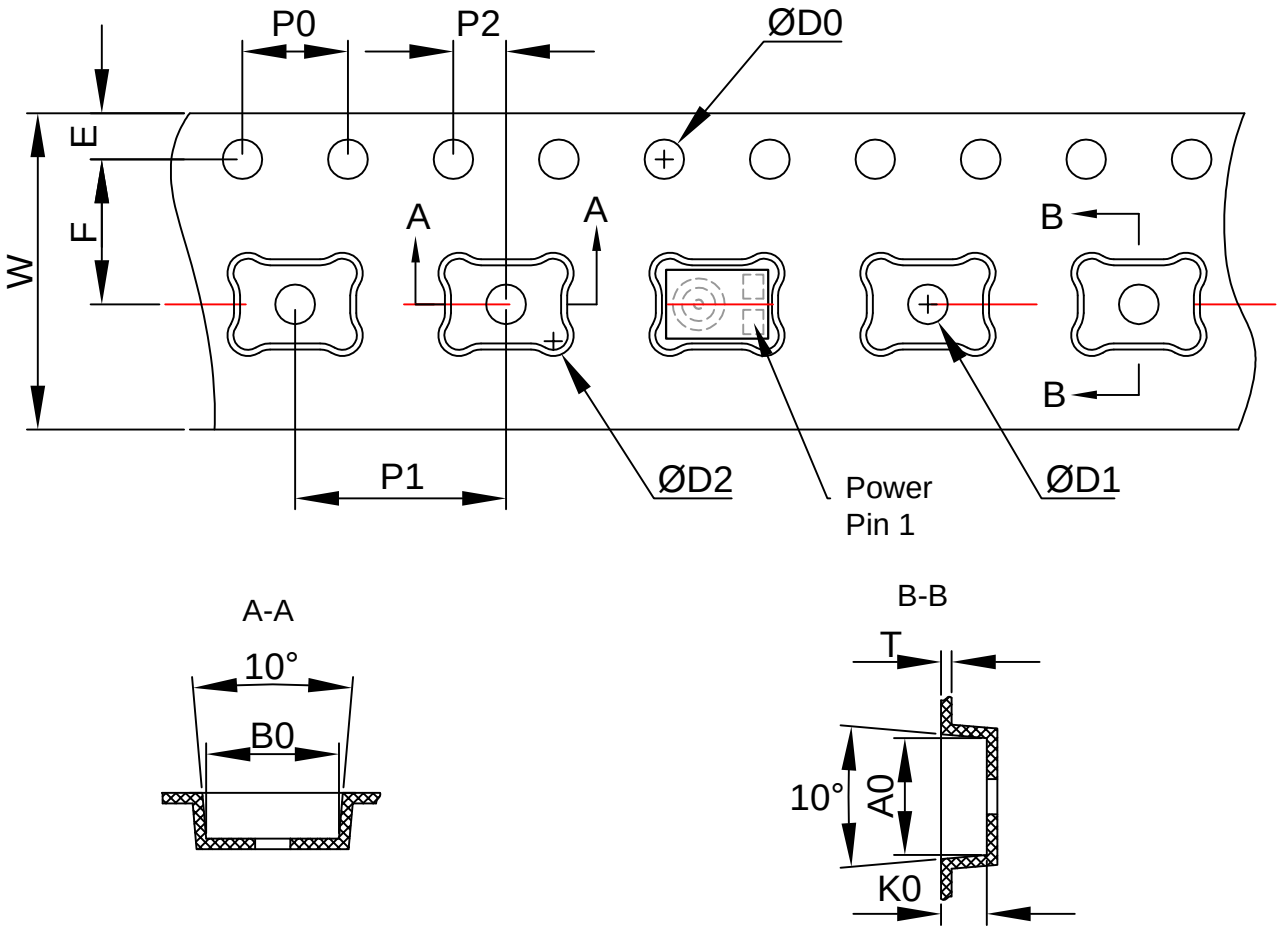
The weight of the MIC is Less than 0.02g.

8 Reliability Test

8.1 Vibration Test	To be no interference in operation after vibrations, 4 cycles, from 20 to 2,000Hz in each direction(X,Y,Z), 48 minutes, using peak acceleration of 20g, sensitivity should vary within ±3dB from initial sensitivity. (The measurement to be done after 2 hours of conditioning at +15℃～+35℃, R.H.25％～75%)
8.2 Drop Test	To be no interference in operation after dropped to 1.0cm steel plate 12 times from 1.5 meter height in state of JIG,JIG weight of 100g, sensitivity should vary within ±3dB from initial sensitivity. (The measurement to be done after 2 hours of conditioning at +15℃～+35℃, R.H.25％～75%)
8.3 Temperature Test	a) After exposure at +125℃ for 200 hours, sensitivity should vary within ±3dB from initial sensitivity. (The measurement to be done after 2 hours of conditioning at +15℃～+35℃, R.H.25％～75%) b) After exposure at -40℃ for 200 hours, sensitivity should vary within ±3dB from initial sensitivity. (The measurement to be done after 2 hours of conditioning at +15℃～+35℃, R.H.25％～75%)
8.4 Humidity Test	After exposure at +85℃ and 85% relative humidity for 200 hours, sensitivity should vary within ±3dB from initial sensitivity. (The measurement to be done after 2 hours of conditioning at +15℃～+35℃, R.H.25％～75%)
8.5 Mechanical Shock Test	Then subject samples to three one-half sine shock pulses (3000 g for 0.3 milliseconds) in each direction (for six axes in total) along each of the three mutually perpendicular axes for a total of 18 shocks, sensitivity should vary within ±3dB from initial sensitivity. (The measurement to be done after 2 hours of conditioning at +15℃～+35℃, R.H.25％～75%)
8.6 Thermal Shock Test	After exposure at -40℃ for 30 minutes, at +125℃ for 30 minutes (change time 20 seconds) 32 cycles, sensitivity should vary within ±3dB from initial sensitivity. (The measurement to be done after 2 hours of conditioning at +15℃～+35℃, R.H.25％～75%)
8.7 Reflow Test	Adopt the reflow curve of item 12.3, after three reflows, sensitivity should vary within ±2dB from initial sensitivity. (The measurement to be done after 2 hours of conditioning at +15℃～+35℃, R.H.25％～75%)
8.8 Electrostatic Discharge Test	Under C=150pF, R=330ohm. Tested to ±8KV contact to the case and tested to ±2kV contact to I/O terminals.10 times. Grounding. Sensitivity should vary within ±3dB from initial sensitivity. (The measurement to be done after 2 hours of conditioning at +15℃～+35℃, R.H.25％～75%)

9 Package

9.1 Tape Specification



The Dimensions as Follows:

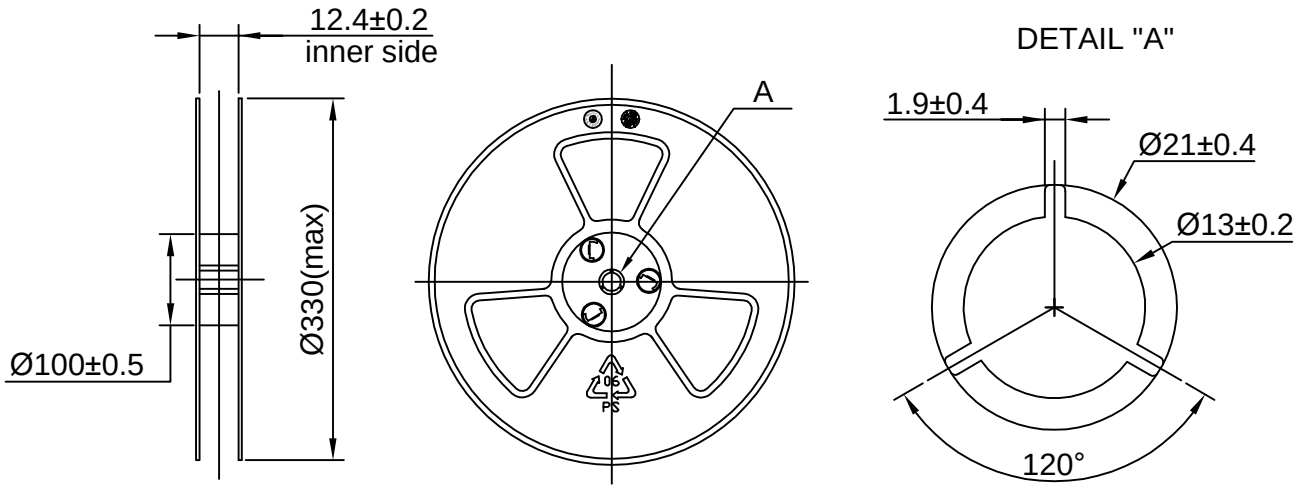
ITEM	W	E	F	ØD0	ØD1
DIM(mm)	12.0±0.30	1.75±0.10	5.5±0.05	$1.50^{+0.10}_{0}$	$1.00^{+0.10}_{0}$
ITEM	P0	10P0	P1	A0	B0
DIM(mm)	4.00±0.10	40.00±0.20	8.00±0.10	3.00±0.05	2.05±0.05
ITEM	K0	P2	T	ØD2	
DIM(mm)	1.10±0.10	2.00±0.05	0.30±0.05	0.50±0.10	

9.2 Reel Dimension

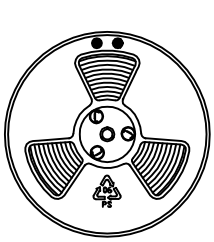
7" reel for sample stage

13" reel will be provided for the mass production stage

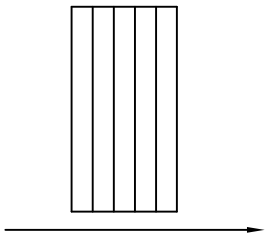
The following is 13" reel dimensions (unit:mm)

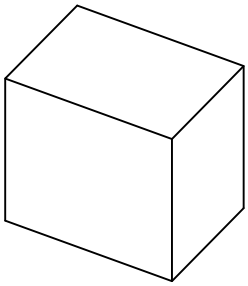


9.3 The Content of Box(13" reel)

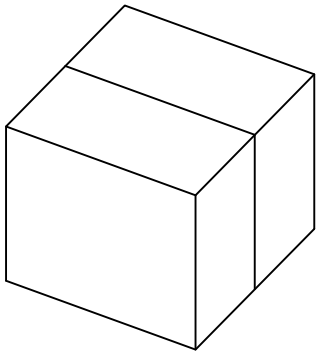


Packing (5,500PCS)

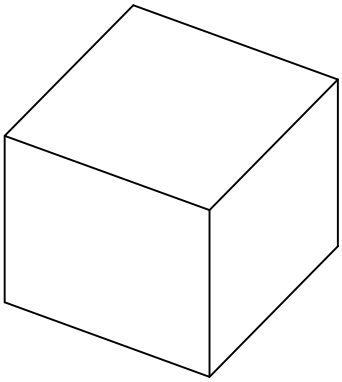




Inner Box(27,500PCS)
(340mm×135mm×355mm)



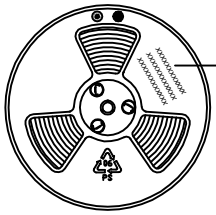
Two Inner Box(55,000PCS)



Outer Box(55,000PCS)
(370mm×300mm×390mm)

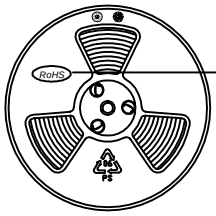
9.4 Packing Explain

9.4.1 The Label Content of the Reel



The Content Includes:
Product type, Lot, Customer P/N;
and other essential information such as
Quantity, Date etc.

9.4.2 The RoHS Label



RoHS Compliance&
Halogen Free Mark

10 Storage and Transportation

10.1 Keep MEMS MIC in warehouse with less than 75% humidity and without sudden temperature change, acid air, any other harmful air or strong magnetic field. Recommend storage period no more than 1 year and floor life(out of bag) at factory no more than 4 weeks.

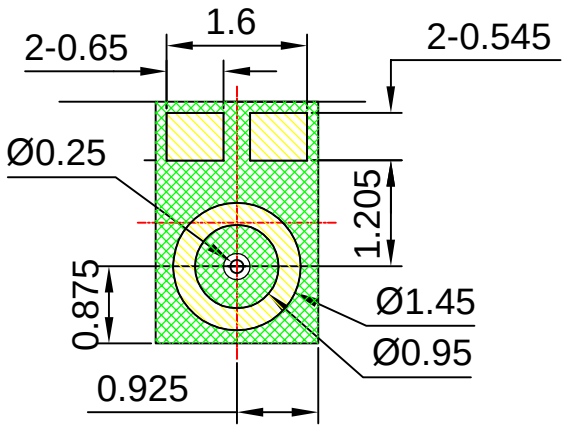
10.2 The MEMS MIC with normal pack can be transported by ordinary conveyances. Please protect products against moist, shock, sunburn and pressure during transportation.

10.3 Storage Temperature Range：-40℃～+70℃（Microphone units with package）

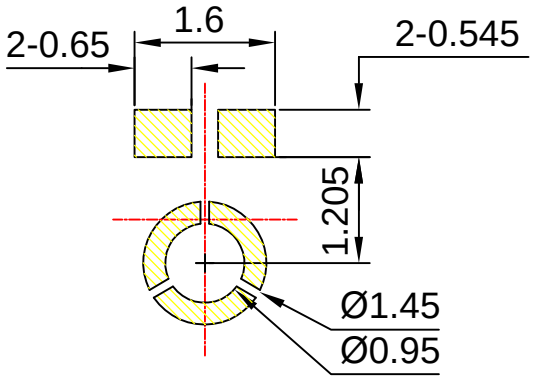
10.4 Operating Temperature Range：-40℃～+100℃

11 Land Pattern Recommendation

11.1 The Pattern of MIC Pad(Unit:mm)



11.2 Recommended Soldering Surface Land Pattern(Unit:mm)

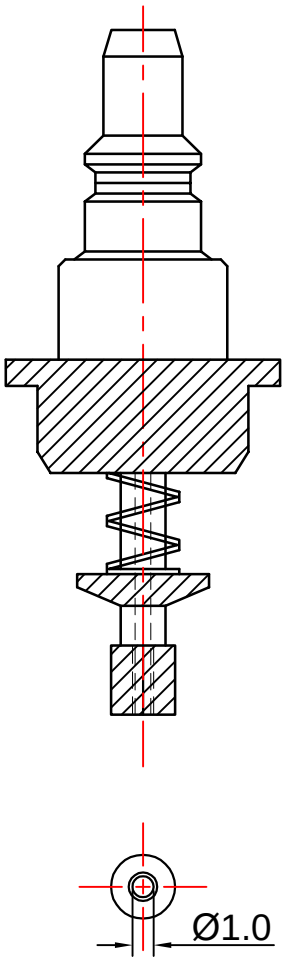


12 Soldering Recommendation

12.1 Soldering Machine Condition

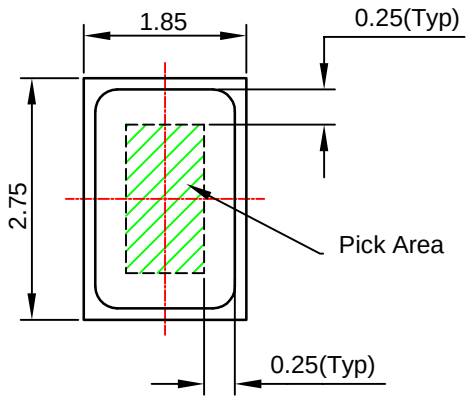
Temperature Control	8 zones
Heater Type	Hot Air
Solder Type	Lead-free

12.2 The Drawing and Dimension of Nozzle

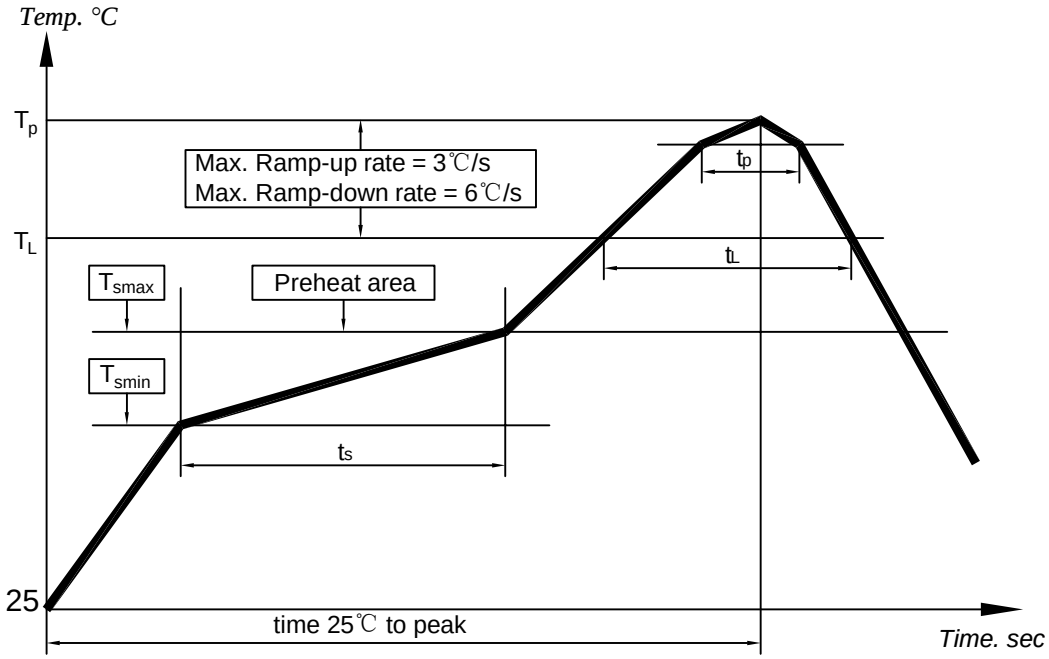


Inside Diameter: Ø1.0mm;

Please don't vacuum over the acoustic port directly.
Please don't blow the acoustic port directly.



12.3 Reflow Profile



Key Features of The Profile:

Average Ramp-up rate(T_{smax} to T_p)	3℃/s max.
Preheat : Temperature Min(T_{smin}) Temperature Max(T_{smax}) Time(T_{smin} to T_{smax})(t_s)	 150℃ 200℃ 60~180s
Time maintained above : Tempreature(T_L) Time(t_L)	 217℃ 60~150s
Peak Temperature(T_p)	260℃
Time within 5℃ of actual Peak Temperature(t_p) :	30~40s
Ramp-down rate(T_p to T_{smax})	6℃/s max
Time 25℃ to Peak Temperature	8min max

When MEMS MIC is soldered on PCB, the reflow profile is set according to solder paste and the thickness of PCB etc.

13 Cautions

13.1 Board Wash Restrictions

It is very important not to board wash the PCBA after reflow process, otherwise this could damage the microphone.

13.2 Vacuum Restrictions

It is very important not to put a vacuum over the acoustic port of the microphone. otherwise this could damage the microphone.

13.3 Ultrasonic Restrictions

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

13.4 Air Blow Restrictions

It is very important not tnot o use air gun near the port hloe of the microphone, otherwise this could damage the microphone.

14 Output Inspection Standard

Output inspection standard is executed according to <<ISO2859-1:1999>>.