Goertek

Specification of MEMS

Microphone

(RoHS Compliance & Halogen Free)

Customer Name：

Customer Model：

GoerTek Model： SD07OT261-039

GoerTek		CUSTOMER APPROVAL
DESIGN	Jasen 2018.12.17	
CHKD	Samual 2018.12.17	
STANDARD	Sweety 2018.12.17	
APVD	Daniel 2018.12.17	

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Restricted

1 Security warning

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2 Publication history

Version	Date	Description	Author	Approved
1.0	2018.12.17	New Design	Jasen	Daniel

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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, MP3, PDAs etc.

2 Test Condition (V_{DD}=1.8V f_{CLK}=2.4MHz, L=50 cm)

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

3 Electrical and Acoustical Characteristics

| Item	Symbol	Test Conditions	Min	Stan.	Max	Unit
Sensitivity	S	f=1kHz,Pin=1Pa	-27	-26	-25	dBFS (Note 1)
Directivity	D(θ)		Omnidirectional			
Current Consumption (Note 2)	I	f_{clk}=2.4MHz		500	600	uA
S/N Ratio	S/N	f=1kHz, Pin=1Pa A-Weighted Curve		65		dB
Operating Voltage Range	V_{DD}		1.6	1.8	3.6	V
Clock Frequency Range	f_{CLK}		1.2	2.4	3.5	MHz
Distortion	THD	94dB SPL@ 1kHz			1	%
Acoustic Overload Point	AOP	10% THD @1 kHz	-	120	-	dB SPL
Power Supply Rejection	PSR	Measured with 217Hz, 100mVpp square wave			-88	dBFS
Phase	Ph		Unity			
Short Circuit Current	Isc		1		10	mA
Clock Duty Cycle	f_{DC}		40		60	%
Output Logic Low Level	V_{OL}		-0.30		0.35×VDD	V
Output Logic High Level	V_{OH}		0.65×V_{DD}		VDD+0.3	V
Clock rise time	t_{CR}				10	ns
Clock fall time	t_{CF}				10	ns
Time from Clock Transition to DATA Becoming High Impedance(Note 3)	t_{DH}	CL=13pF,RL=1MΩ	0		15	ns
Time from Clock Transition to DATA Becoming Valid (Note 3)	t_{DV}	CL=13pF,RL=1MΩ	20		40	ns
Startup time	t_{SU}				50	ms

Note 1. dBFS = 20xlog (A/B)   where A is the level of the signal, B is the level that corrsponds to Full-scale level.
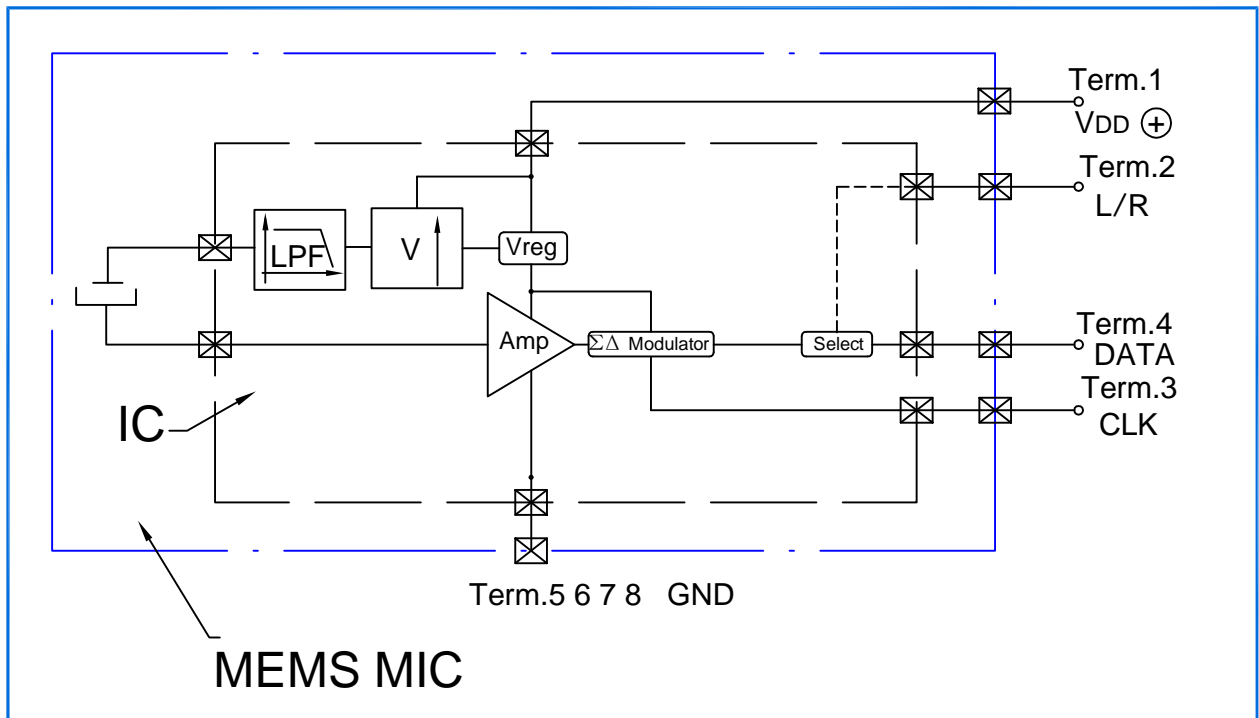Note 2. The current consumption depends on the applied Clock Frequency and the load on the DATA output.
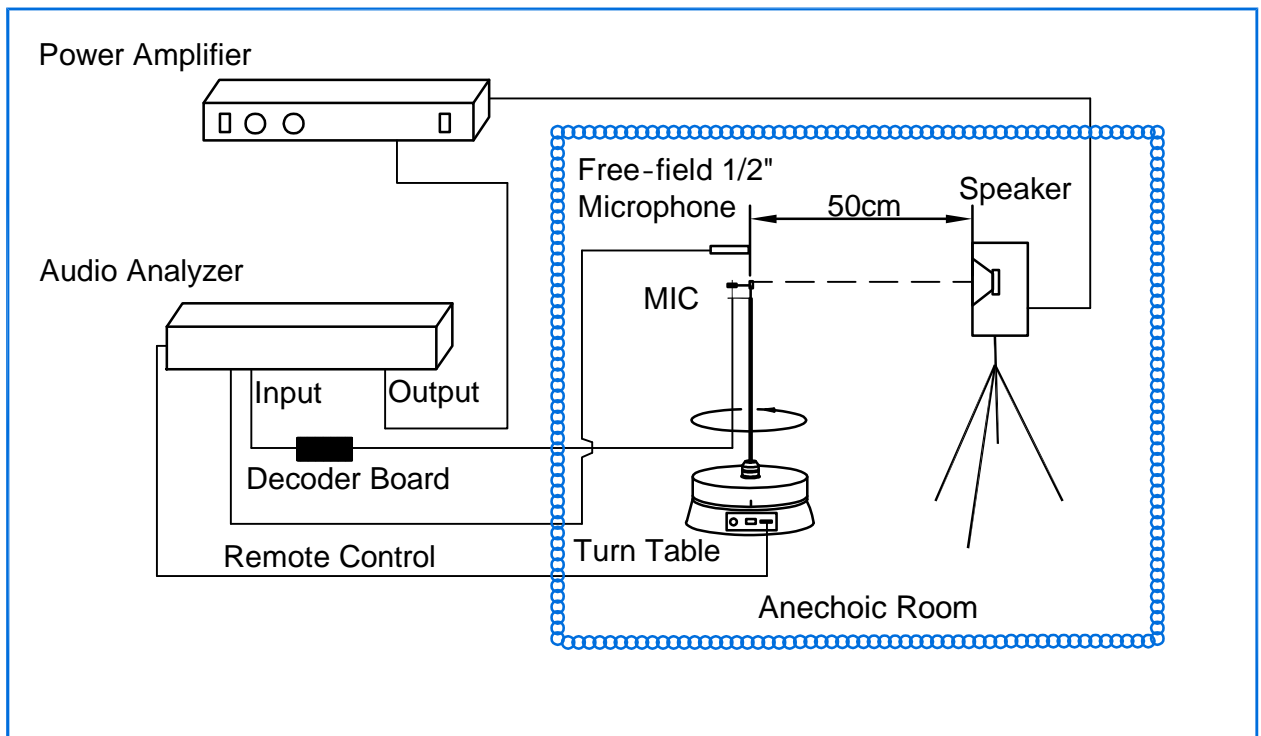
Note 3. Timing
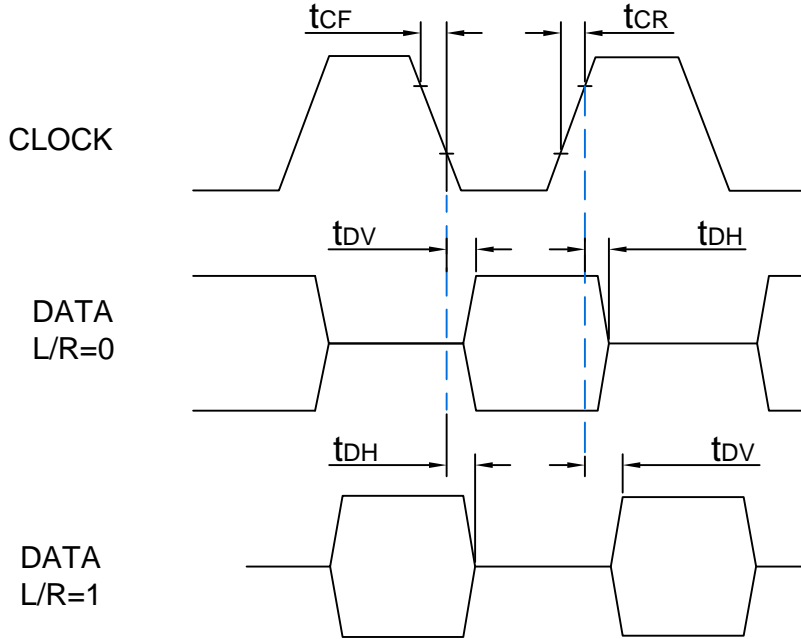
4 Frequency Response Curve and Limits
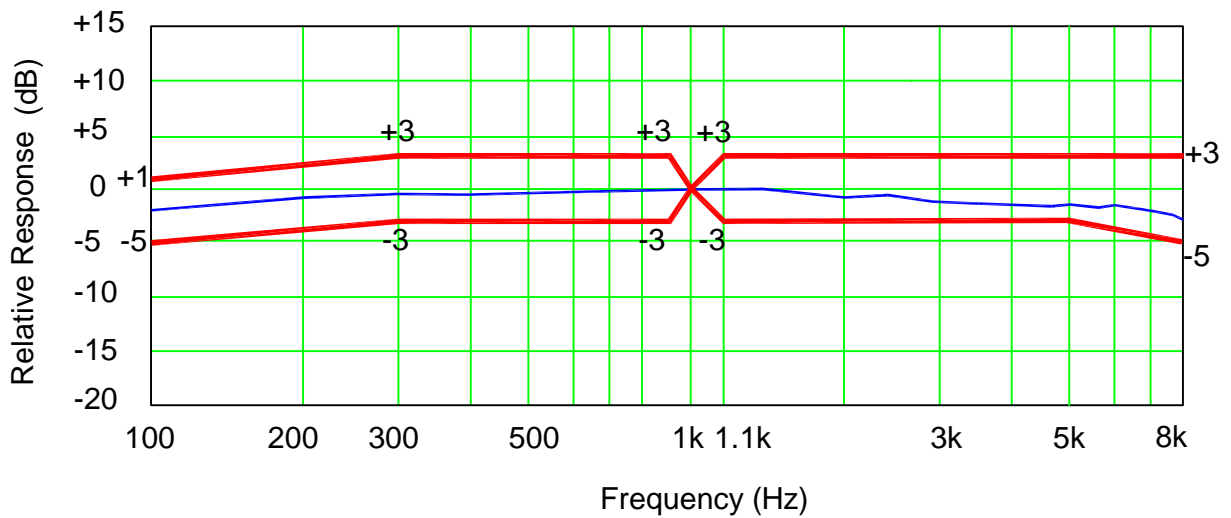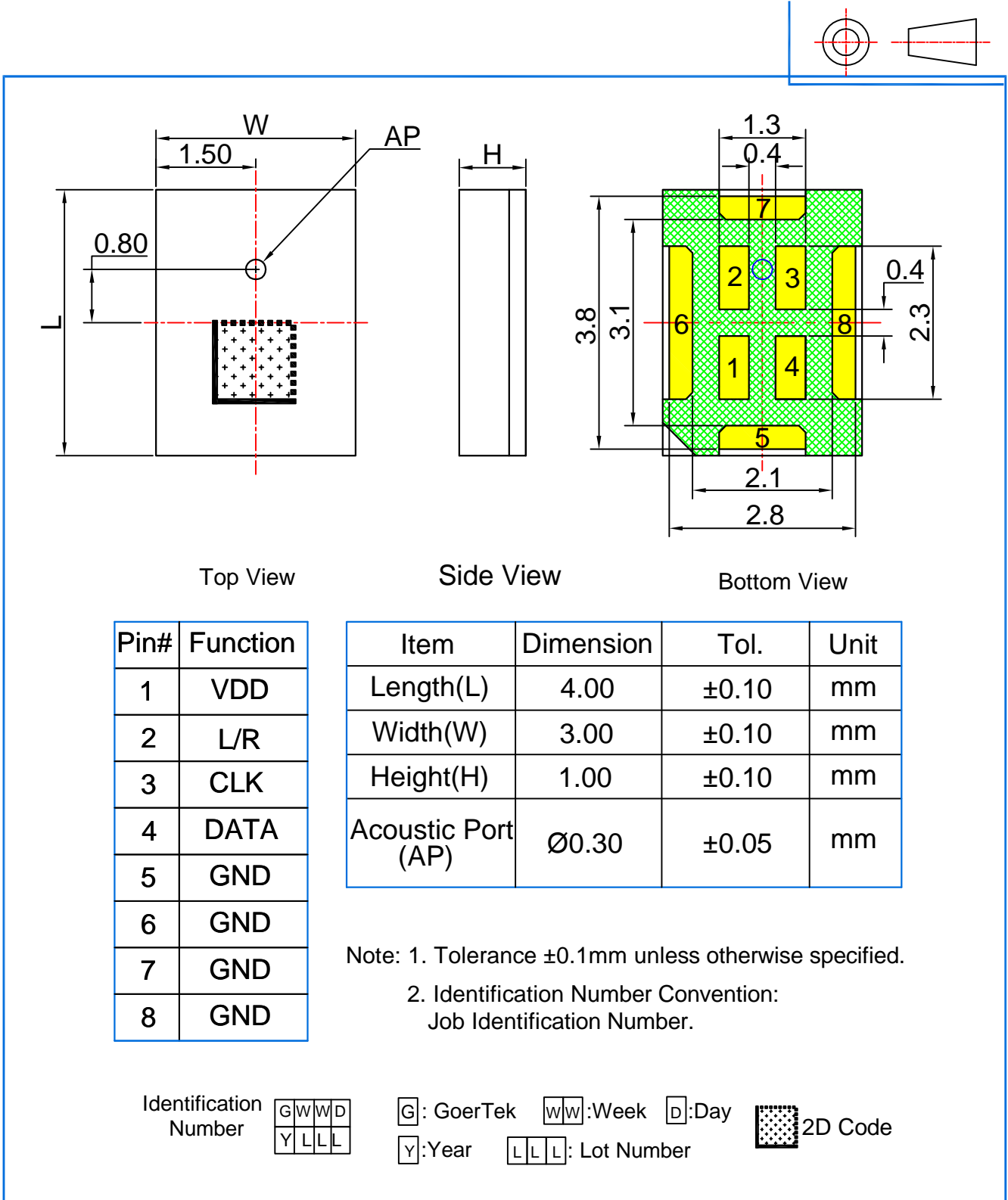
5 Measurement Circuit

6 Test Setup Drawing

7 Mechanical Characteristics

7.1 Appearance Drawing (Unit: mm)

Top View

Side View

Bottom View

Pin#	Function
1	VDD
2	L/R
3	CLK
4	DATA
5	GND
6	GND
7	GND
8	GND

Item	Dimension	Tol.	Unit
Length(L)	4.00	±0.10	mm
Width(W)	3.00	±0.10	mm
Height(H)	1.00	±0.10	mm
Acoustic Port (AP)	Ø0.30	±0.05	mm

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

2. Identification Number Convention:
   Job Identification Number.

Identification Number | G | W | W | D |
                       | Y | L | L | L |

G : GoerTek   WW :Week   D :Day

Y :Year   L L L : Lot Number

2D Code

## 7.2 Weight

The weight of the MIC is less than 0.05g.

8 Reliability

Items 8.1---8.7: Qty 32 units, the other tests Qty 10 units.

8.1 Vibration Test	To be no interference in operation after vibrations, 4 cycles, from 20 to 2000HZ in each direction(X,Y,Z), 48min, user acceleration of 20g, sensitivity should vary within ±3dB from initial sensitivity. The measurement to be done after 2h of conditioning at +15℃～+35℃, R.H 25%～75% (Refer to JESD22-B103B)
8.2 Drop Test	To be no interference in operation after dropped to 1.0cm steel plate 12 times from 1.0 meter height in state of Outer packing, sensitivity should vary within ±3dB from initial sensitivity. The measurement to be done after 2h of conditioning at +15℃～+35℃, R.H 25%～75% (Refer to IEC 60068-2-32)
8.3 Temperature Test	a) After exposure at +125℃ for 200h, sensitivity should vary within ±3dB from initial sensitivity. The measurement to be done after 2h of conditioning at +15℃～+35℃, R.H 25%～75% (Refer to IEC 60068-2-2) b) After exposure at -40℃ for 200h, sensitivity should vary within ±3dB from initial sensitivity. The measurement to be done after 2h of conditioning at +15℃～+35℃, R.H 25%～75% (Refer to IEC 60068-2-1)
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 2h of conditioning at +15℃～+35℃, R.H 25%～75% (Refer to IEC 60068-2-67)
8.5 Mechanical Shock Test	Then subject samples to three one-half sine shock pulses (1500 g for 0.5 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 2h of conditioning at +15℃～+35℃, R.H 25%～75% (Refer to IEC 60068-2-27)
8.6 Thermal Shock Test	After exposure at -40℃ for 30min, at +125℃ for 30min (change time 20 seconds) 32 cycles, sensitivity should vary within ±3dB from initial sensitivity. The measurement to be done after 2h of conditioning at +15℃～+35℃, R.H 25%～75% (Refer to IEC 60068-2-14)
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 2h of conditioning at +15℃～+35℃, R.H 25%～75%
8.8 ESD Shock Test	Under C=150pF, R=330ohm, air discharge voltage ± 8KV to the case,10 times(time interval 1.2s), sensitivity should vary within ±3dB from initial sensitivity. Under C=150pF, R=330ohm, contact discharge ± 2KV to I/O terminals,10 times(time interval 1.2s), case grounded, sensitivity should vary within ±3dB from initial sensitivity. （Refer to IEC 61000-4-2）

9 Package

## 9.1 Tape Specification
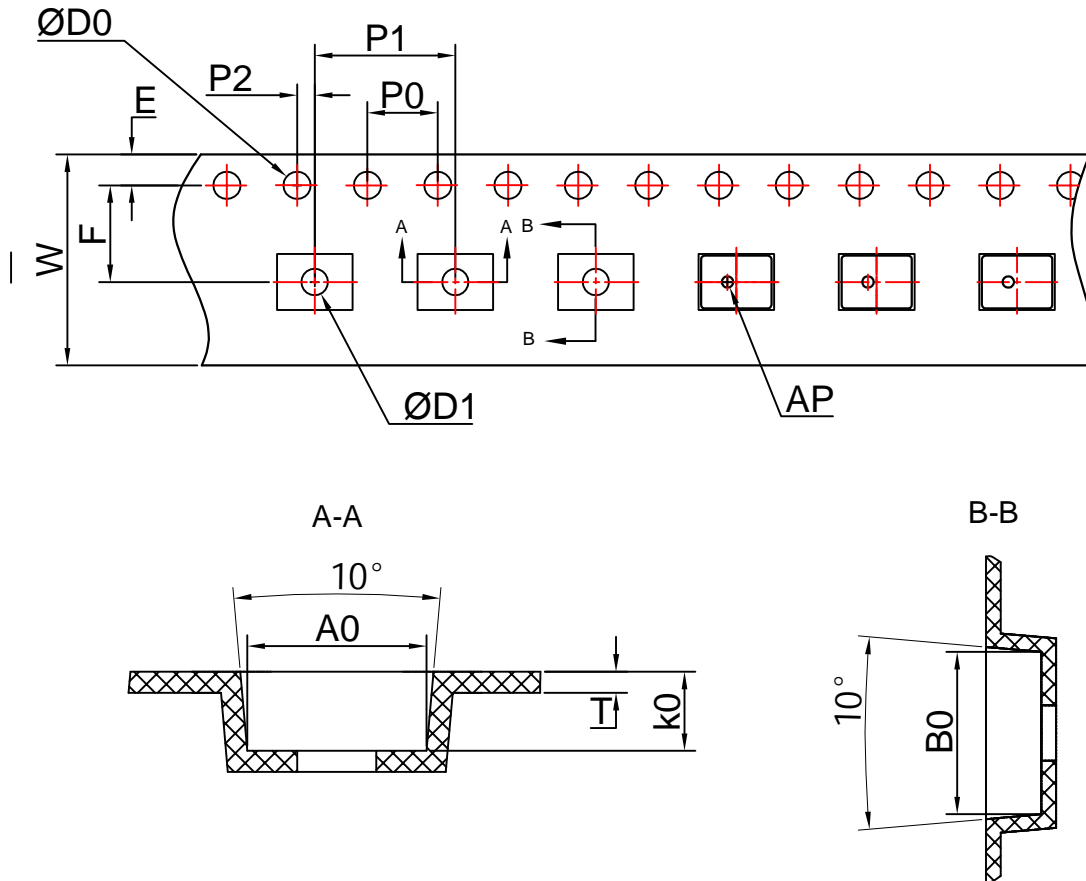
The Dimensions as Follows:

ITEM	W	E	F	ØD0	ØD1
DIM(mm)	12.0±0.10	1.75±0.10	5.50±0.05	1.55±0.05	1.50±0.1
ITEM	P0	10P0	P1	A0	B0
DIM(mm)	4.00±0.10	40.00±0.20	8.00±0.10	4.30±0.10	3.20±0.10
ITEM	K0	P2	T		
DIM(mm)	1.30±0.10	1.00±0.05	0.30±0.05		

9.2 Reel Dimension

7" reel for sample stage
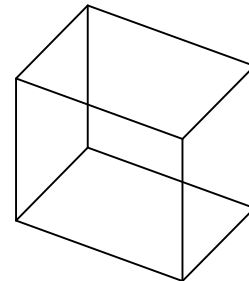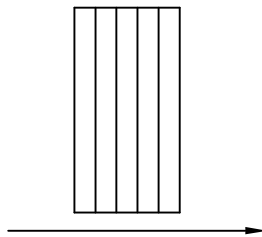
13" reel will be provided for the mass production stage

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

DETAIL A

12.4±0.2
inner side

Ø330(max)

Ø100±0.5
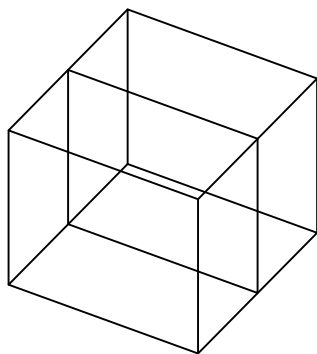
A

1.9±0.4

Ø21±0.4

Ø13±0.2
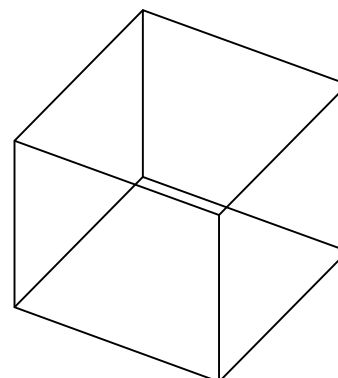
120°
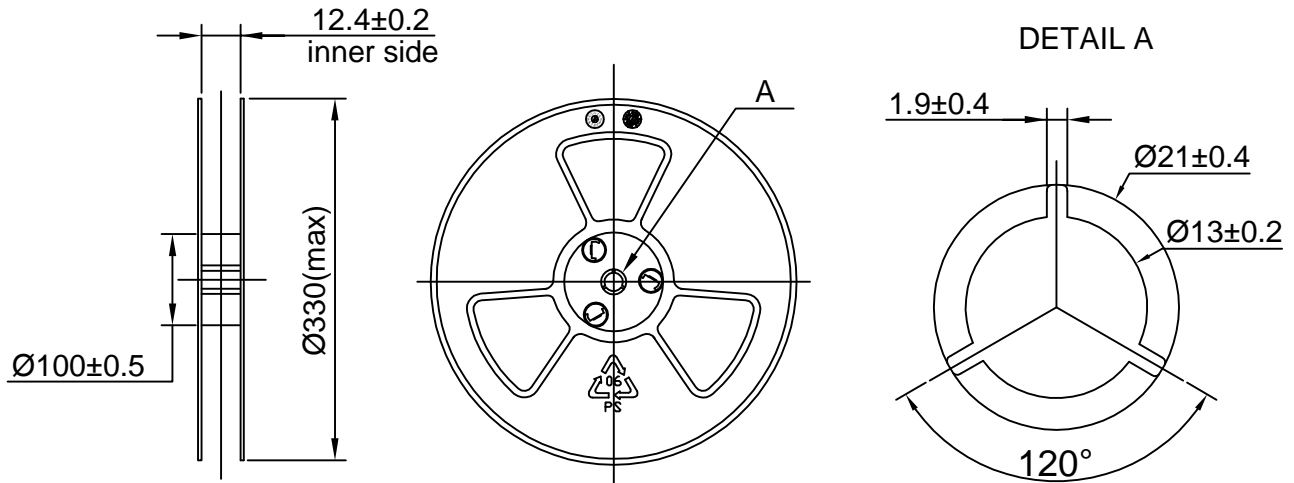
9.3 The Content of Box(13" reel)
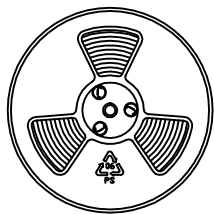
Packing (4,000PCS)

Inner Box(20,000PCS)
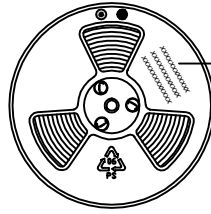(340mm×135mm×355mm)

Two Inner Box(40,000PCS)

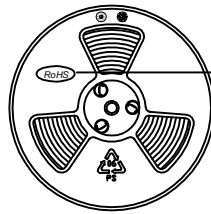Outer Box(40,000PCS)
(370mm×300mm×390mm)

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 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.

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(MIC only)：-40℃～+100℃

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

11 Land Pattern Recommendation

11.1 The Pattern of MIC Pad (unit:mm)
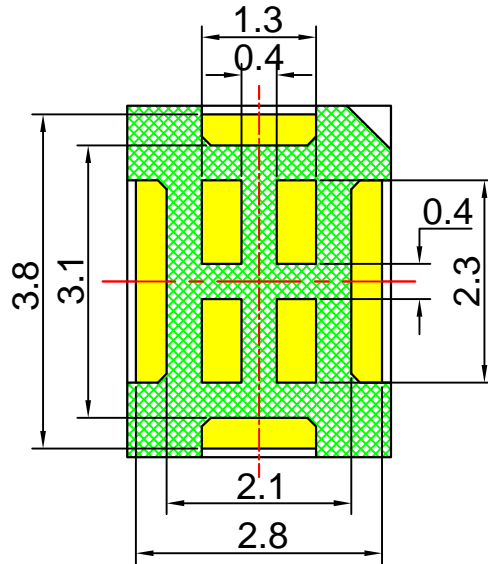
11.2 Recommended Solder Stencil Pattern (unit:mm)
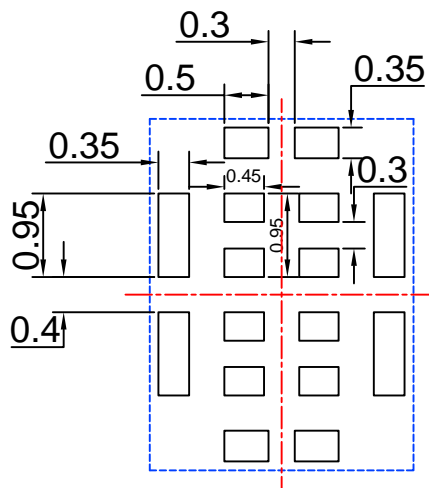
12 Soldering Recommendation

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

Nozzle Diameter: 1.0mm

AP
Ø1.25
Forbidden area for
vacuum application

1.58

2.45

Recommendation
area for pick up

1.0

No large than 48kPa vacuum force is available.
No large than 0.2MPa air pressure is available.
The recommendation is for reference.
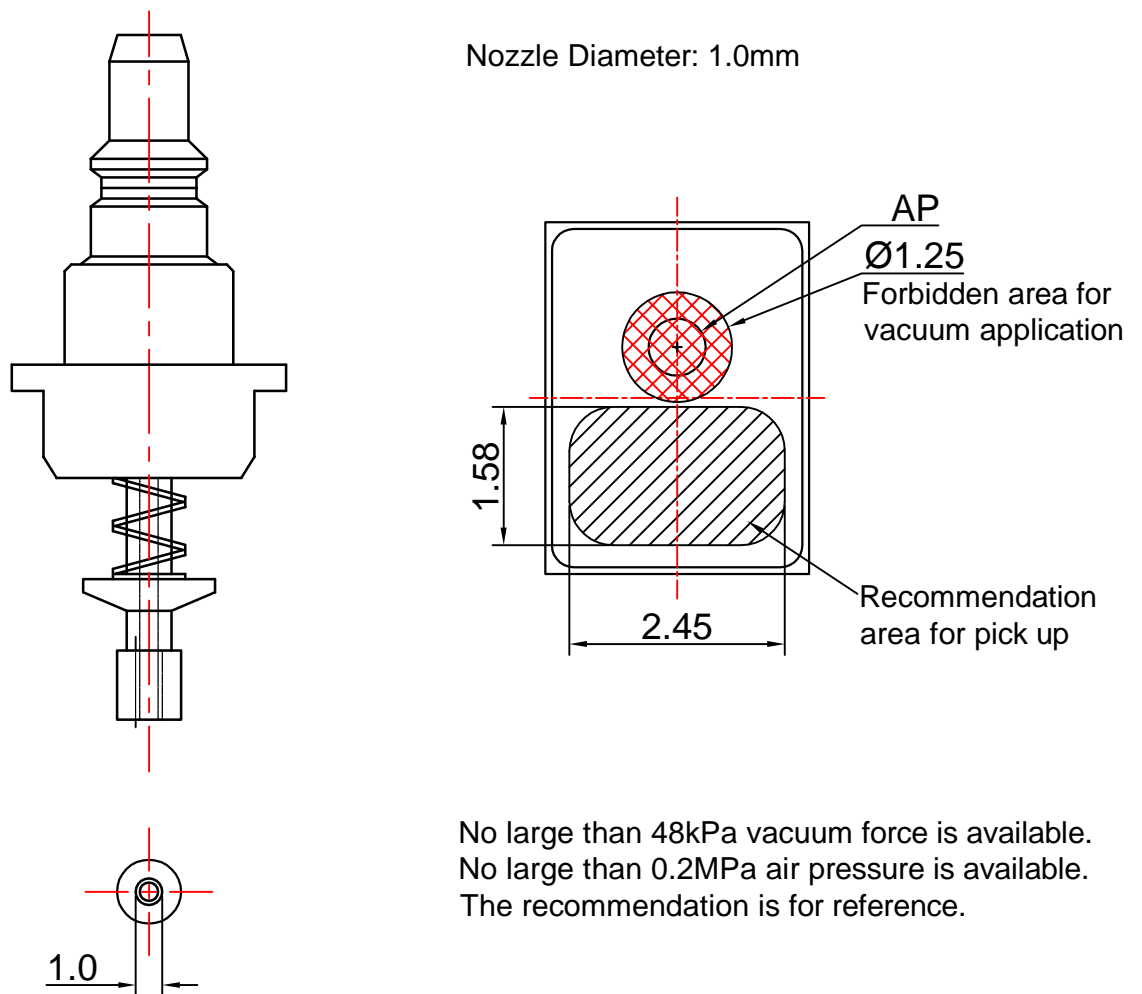
12.3 Reflow Profile
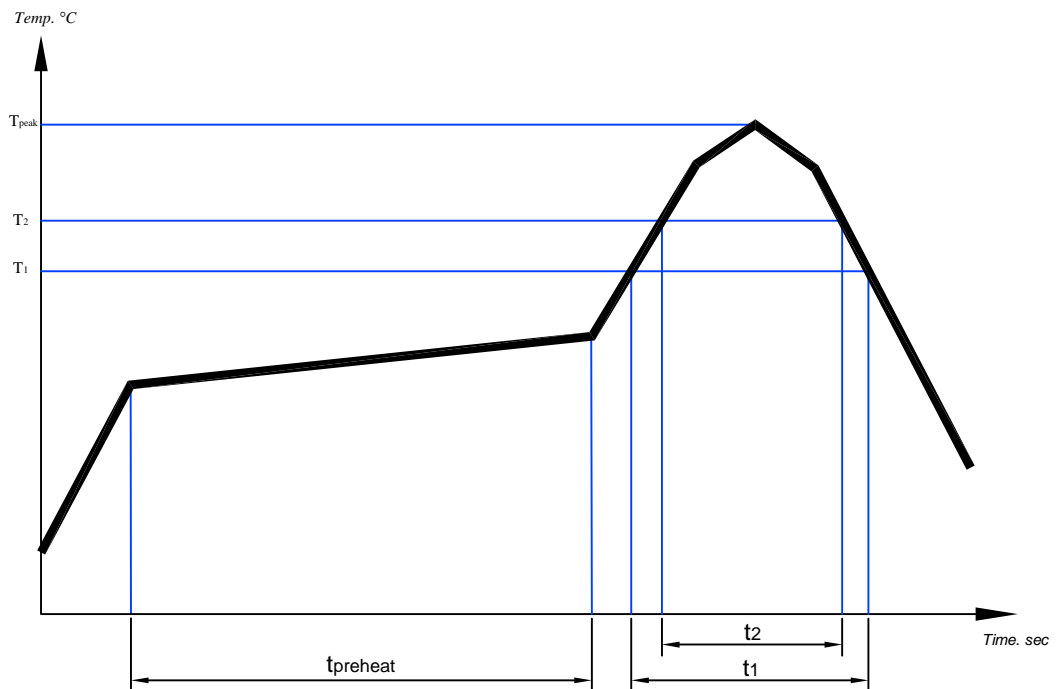
Key Features of The Profile:

Average Temperature Gradient in Preheating	---	2.5℃/s
Preheat Time (170℃~180℃)	$t_{preheat}$	120-180s
Time Above 217℃	t_1	Max 80s
Time Above 230℃	t_2	Max 60s
Peak Temperature In Reflow	T_{peak}	260℃
Temperature Gradient In Cooling	---	Max -5℃/s

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

13 Cautions When Using MEMS MIC

13.1 Board Wash Restrictions

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

13.2 Nozzle Restrictions

It is very important not to be pull a nozzle over the acoustic port of the microphone or blow the acoustic port,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 Wire width Restrictions

It is needed to adjust the dumping resistance according to the wire length and wire tod,etc. when using.
It is also necessary to insert dumping resistance in the Data line located adjacent to the microphone according to circumstances.

13.5 Dust Restrictions

It is very important to prevent the dust into the acoustic port,otherwise this could damage the microphone.

14 Output Inspection Standard

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