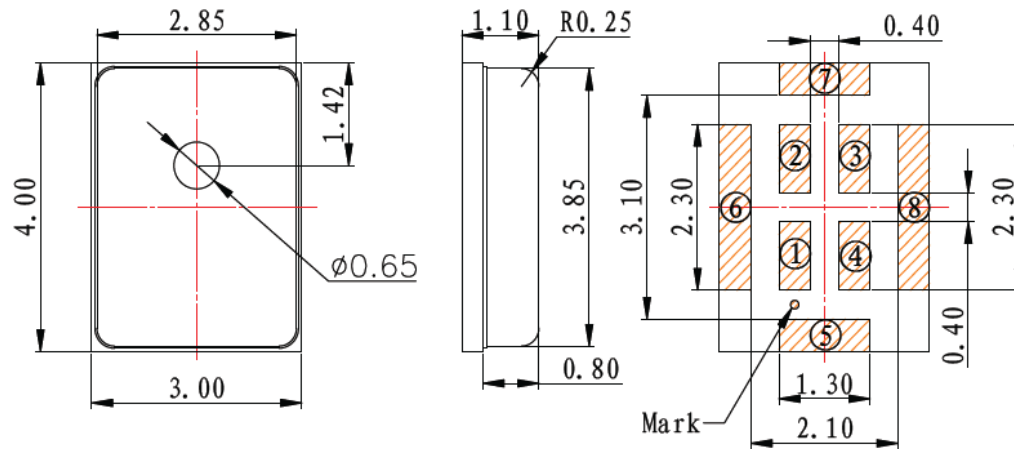


Specification of Digital MEMS Microphone

1. Mechanical Specifications

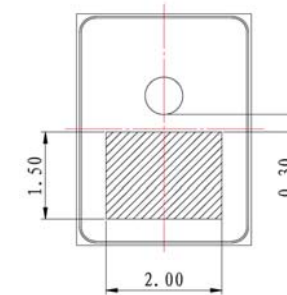


Item	Dimension	Tolerance	Units
Length(L)	4.00	±0.10	mm
Width(W)	3.00	±0.10	mm
Height(H)	1.10	±0.10	mm
Acoustic port(AP)	Φ0.65	±0.10	mm

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

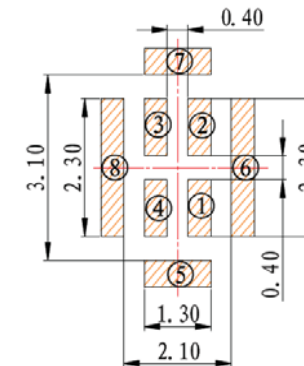
Note:
 All dimensions are in millimeter(mm).
 Tolerance: +/-0.1mm unless otherwise specified.
 Weight: 0.024±10%

2. Vacuum nozzle pickup location



Recommended area for vacuum nozzle pickup location

3. Example solder stencil pattern



PROJECTION		Research Develop Innovate RDI, Inc. 333 North Bedford Road, Suite 135, Mount Kisco, NY 10549		
	SCALE	TITLE		
N/A	N/A	Digital MEMS microphone cartridge, top port, SMT mount, RoHS Compliant		
TOLERANCE EXCEPT AS NOTED	DR. Tina	DATE 11/13/20	REF. P/N: RMM-3526DB-26NL	SHEET 1 OF 5
DEC. INCHES N/A	CK. BM	PRE-MI	DRAWING NO. 5156	SIZE F
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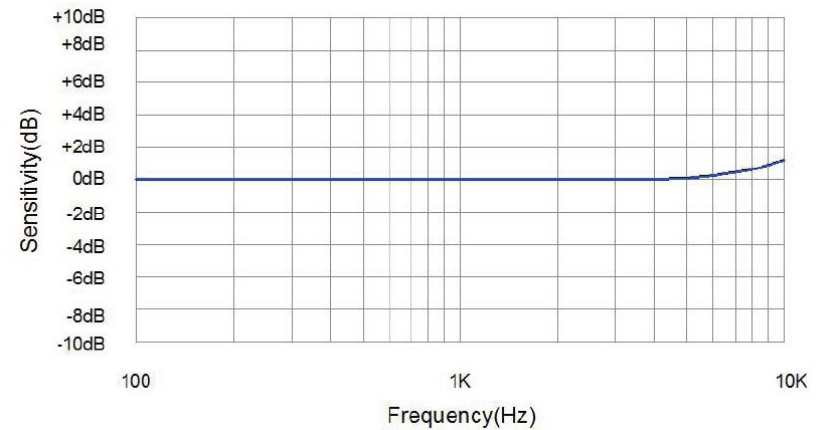
Specification of Digital MEMS Microphone

4. Acoustic and Electrical Characteristics

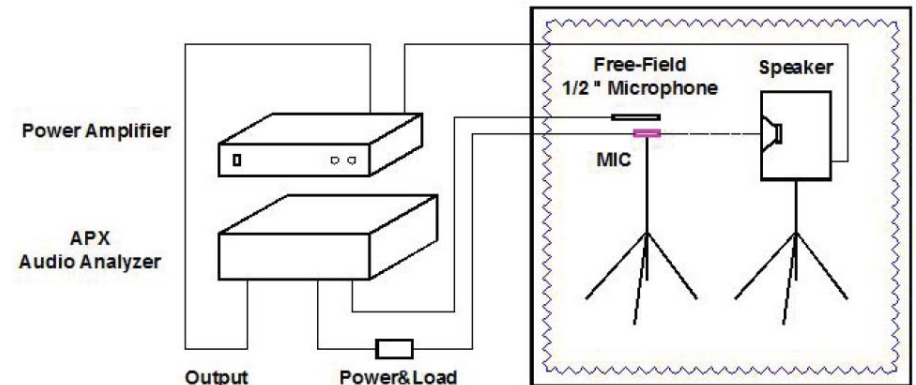
(Test Conditions: 23±2°C, 55±20% R.H. V_{DD}=2.0V. f_{clock}=2.4MHz)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Directivity	D(θ)	Omni-Directional				
Sensitivity	S	94dB SPL @1KHz	-32	-29	-26	dBFS
Supply Voltage	V _{DD}	-	1.6	-	3.6	V
Current Consumption	I _{DD}	-	-	0.54	-	mA
S/N Ratio	S/N	94dB SPL @1KHz (A-weighted)	-	61	-	dB
Sleep Current	I _{SLEEP}	F _{CLOCK} < 1 kHz	-	3	4	uA
Total Harmonic Distortion	THD	94dB SPL @1KHz	-	0.2	-	%
Acoustic Overload Point	AOP	10% THD @ 1 kHz	-	120	-	dB SPL
Power Supply Rejection	PSR	100 mVpp square wave @ 217 Hz, A-weighted	-	-90	-	dBFS
Fall-asleep Time	-	(F _{CLOCK} < 1KHz)	-	-	50	usec
Wake-up Time	-	(F _{CLOCK} ≥ 1MHz)	-	-	52	msec
Short Circuit Current	I _{SC}	Grounded Data Pin	-	1	10	mA
Output Load	C _{LOAD}	-	-	-	100	pF
Data Format	-	-	1-Bit PDM			
Clock Frequency	F _{CLOCK}	-	1.0	2.4	3.2	MHz
Clock Duty Cycle	F _{DC}	-	40	-	60	%
Clock Rise Time	t _{CR}	-	-	-	10	nsec
Clock Fall Time	t _{CF}	-	-	-	10	nsec
Logic Input / Output Low	V _{IOL}	I _{OUT} =1mA	-0.30	-	0.35xV _{DD}	V
Logic Input / Output Hight	V _{IOH}	I _{OUT} =1mA	0.65xV _{DD}	-	V _{DD} +0.3	V
Delay Time for Valid Data	t _{DV}	-	18	-	60	nsec
Delay Time for Hight z	t _{DH}	-	0	-	16	nsec

5. Frequency Response Curve



6. Test Setup Drawing

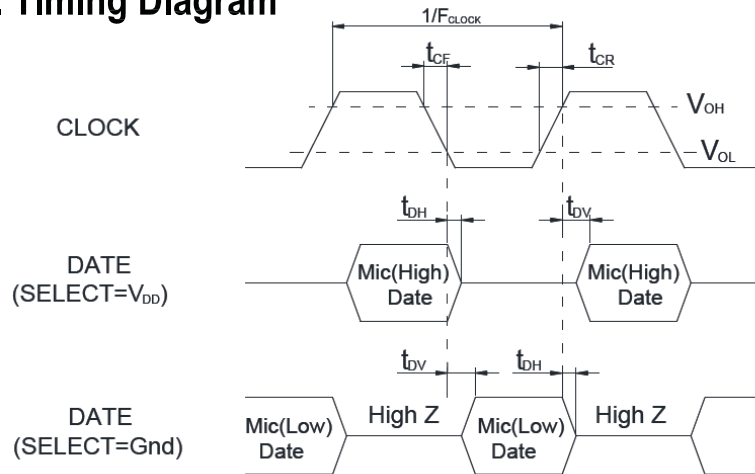


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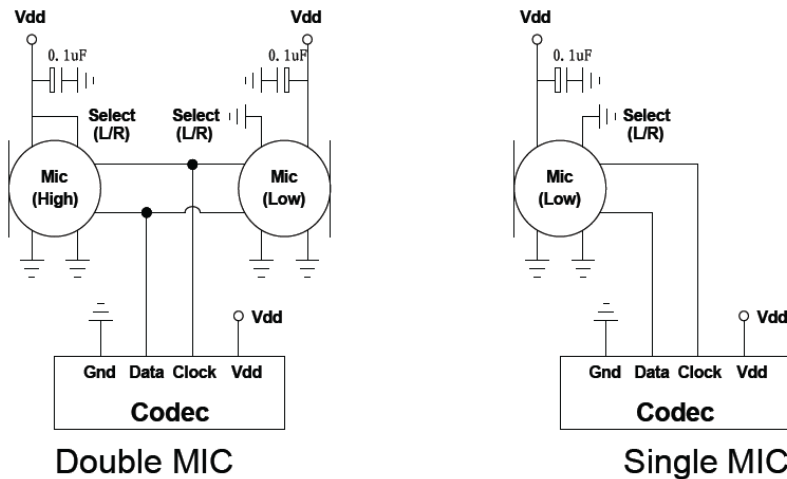
Specification of Digital MEMS Microphone

7. Timing Diagram

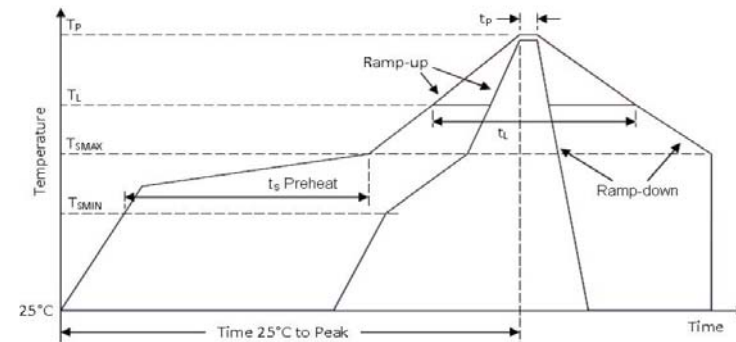


Microphone	Select (L/R)	Asserts DATA On	Latch DATA On
Mic(High)	V _{DD}	Rising clock edge	Falling clock edge
Mic(Low)	GND	Falling clock edge	Rising clock edge

8. Recommended interface circuit




9. Reflow Guarantee



Profile Feature	Pb-Free
Average Ramp-up rate (T_{SMAX} to T_P)	3°C/second max.
Preheat	
Temperature Min (T_{SMIN})	150°C
Temperature Max (T_{SMAX})	200°C
Time (T_{SMIN} to T_{SMAX}) (t_s)	60-180 seconds
Time maintained above:	
Temperature (T_L)	217°C
Time (t_l)	60-150 seconds
Peak Temperature (T_P)	260°C
Time within 5°C of actual Peak Temperature (t_r)	20-40 seconds
Ramp-down rate (T_P to T_{SMAX})	6°C/second max
Time 25°C to Peak Temperature	8 minutes max

Notes:

- Vacuuming over acoustical hole of the microphone is not allowed, because the Devices can be damaged by vacuum.
- Washing the board after reflow process is not allowed, because board washing and Cleaning agents can damage the device. A device should not be exposed to ultrasonic processing or cleaning.
- Recommended number of reflow is no more than 5 times.

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Specification of Digital MEMS Microphone

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. Recommend storage period no more than 1 year and floor life(out of bag) at factory no more than 4 weeks.
- 10.3. The MEMS MIC with normal pack can be transported by ordinary conveyances. Please protect products against moist, shock, sunburn and pressure during transportation.
- 10.4. Storage Temperature Range: -40°C ~ +85°C
(Microphone units with package)
- 10.5. Operating Temperature Range: -40°C ~ +105°C

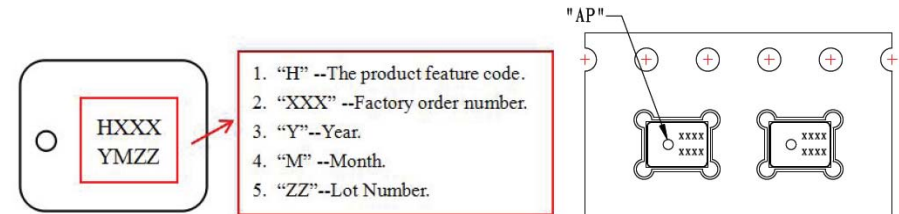
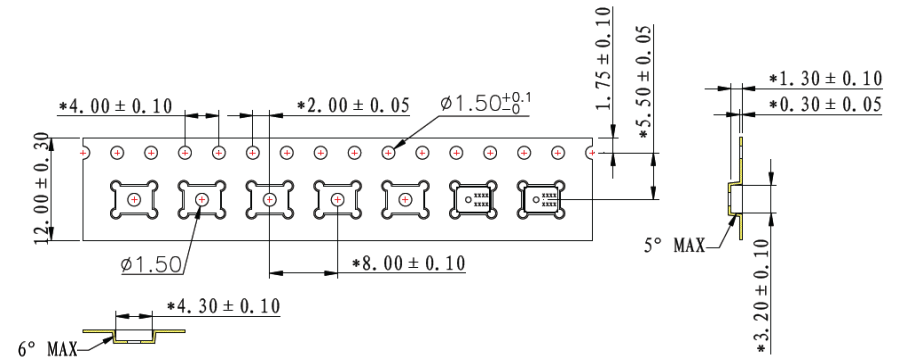
11. Reliability Specifications

Note: The microphone sensitivity after stress must deviate by no more than ±3dBFs from the initial value.

Test Item	Detail
Thermal Shock Test	100 cycles of air-air thermal shock from -40°C to +105°C with 15 minute soaks.
High Temperature Test	+105°C environment while under bias for 240 hours.
Low Temperature Test	-40°C environment while under bias for 240 hours.
Humidity Test	+85°C/85% R.H. environment while under bias for 240 hours.
Vibration Test	16 minutes in each X, Y, Z axis from 20 to 2,000 Hz with peak acceleration of 20G
Drop Test	1.5-meter height onto a concrete surface each time at three directions in state of packaging.
Reflow Test	5 reflow cycles with peak temperature of +260°C.
ESD 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.

12. Packaging Specifications

12.1. Tape Specification



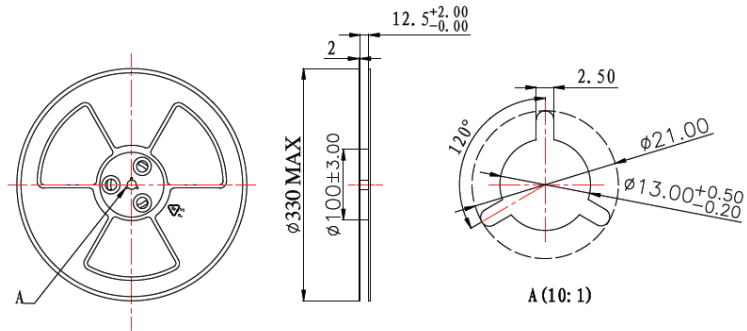
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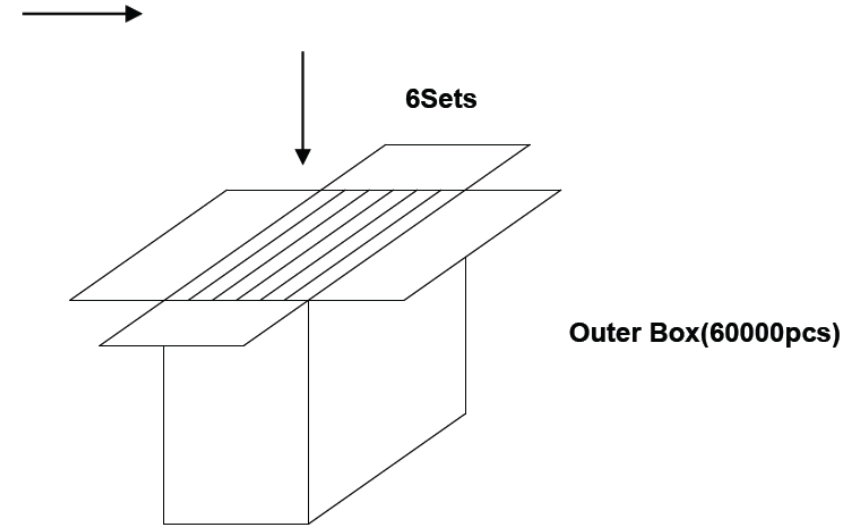
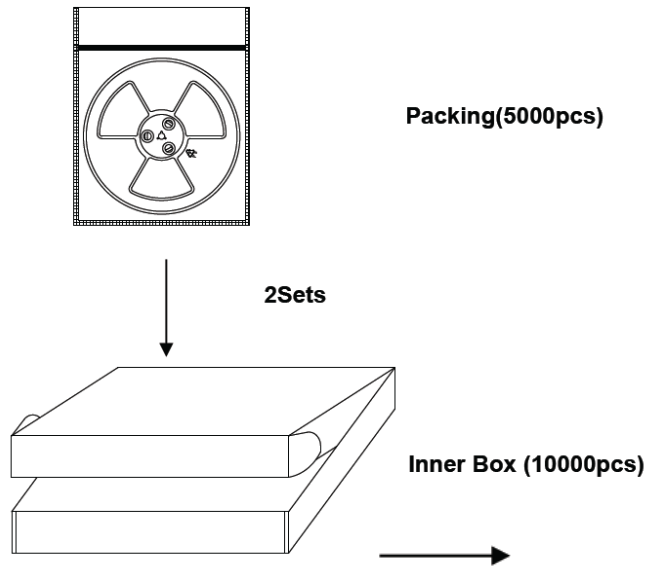
Specification of Digital MEMS Microphone

12.2. Reel Dimension

13" reel dimensions (unit:mm)



12.3. The Content of Box(13" reel)



Qty/ Reel	Qty/ One Inner Box	Qty/ Outer Box (Six Inner Box)
5000 pcs	10,000 pcs	60,000 pcs
Φ 330mm	355×340×45mm	365×290×370mm

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