



深圳市兴华鑫电子科技有限公司
Shenzhen xinghuaxin Electronic Technology Co., Ltd

承認書

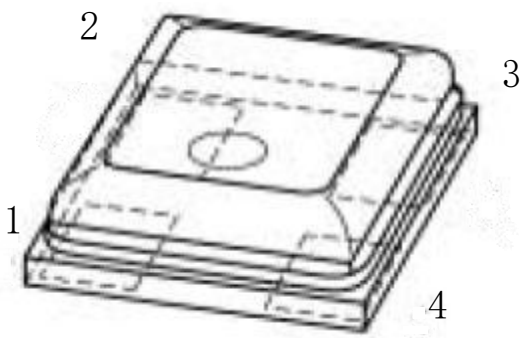
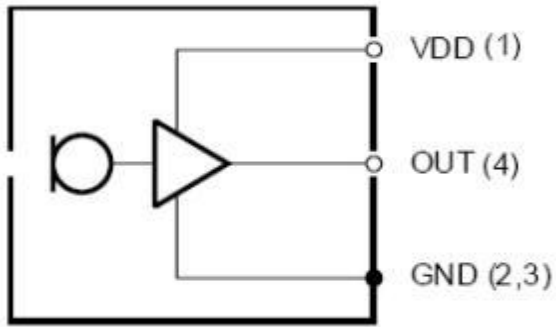
SPECIFICATION FOR APPROVAL

客戶 (Customer): _____
客戶料號 (Customer P/N): _____
興華鑫型號 (Supplier P/N): XHxDZ-3722
產品名稱 (Description): 咪头 (Microphone)
產品規格 (Specification): 3.7 x 2.2 x 1.10mm

客戶承認欄 (Customer Authorization Signature)	深圳市興華鑫電子科技有限公司 承認欄 (Supplier Audit)		
	審核	檢查	制作
	唐国兴	唐玉来	吴银娟
	日期: 2022 年 04 月 19 日 版次: A		

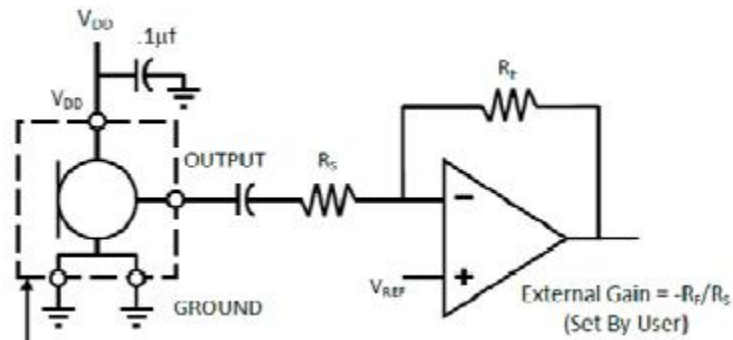
声音让生活更精彩!

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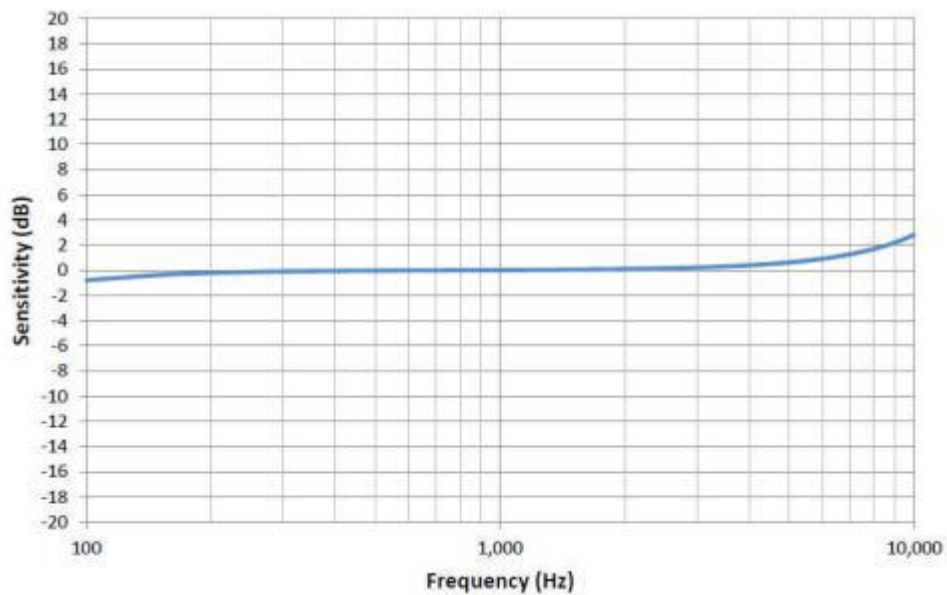
1	Name: Silicon MEMS Omni-directional Microphone	
2	Features:	
	3.1	SMD MEMS microphone for automated surface mount assembly
	3.2	Reflow soldering up to 260°C (Lead free)
	3.3	High long-term temperature stability
	3.4	Stable sensitivity over power supply range of 1.6~3.6V
	3.5	Low current consumption of 95uA
	3.6	Excellent power supply rejection of -66dB
	3.7	High integrated immunity to EMI
	3.8	RoHS-compliant, halogen-free package with small footprint and low height of 1.25mm
3	Applications. The FSM42A3722H11-001 is designed for:	
	4.1	Mobile Phones (Handsets, Headsets)
	4.2	Consumer (Game Consoles, PDA's)
	4.3	Computer (Personal Computers, Notebooks)
	4.4	Cameras (Digital Still Cameras, Video Cameras)
	4.5	Navigation Device (Portable GPS)
	4.6	Blue-tooth (Headsets)
4	Product Description	
	Miniature Silicon MEMS (Micro Electro Mechanical System) Omni-directional Microphone with single-ended analog interface designed for automated reflow soldering assembly as SMD (Surface Mounted Device) component. It is an alternative to conventional ECMs (Electret Condenser Microphones). Due to its robust design with a metallic lid and monolithic integrated EMI-blocking capacitors and utilization of Silicon MEMS technology, the FSM42A3722H11-001 shows high immunity to EMI (Electromagnetic Interference) and heat. The capped Chip-On-Board package solution contains the micromechanical sensor chip and an amplifier chip. The RoHS-compliant halogen-free device has a size of 3.76 x 2.24 x 1.10 mm³.	
5	Circuit Diagram:	
	 	

Pin Definition and Function							
Pin No.		Symbol			Function		
1		V _{DD}			Power		
2		GND			Ground		
3		GND			Ground		
4		OUT			Output		
Maximum Ratings							
Storage Temperature		T _{STG}			-40°C ~ 140 °C		
Operating Temperature Range		T _A			-40°C ~ 125°C		
Operating Voltage Range		V _{DD}			1.6 V~ 3.6 V		
Typical robustness to electrostatic discharge							
ESD capability all pins (HBM, JESD22-A114)				V _{ESD_HBM}	± 2.5 kV		
ESD capability all pins (MM, JESD22-A115)				V _{ESD_MM}	± 500 V		
6	Acoustical and Electrical Characteristics						
Unless otherwise noted, typical test conditions are T _A = 23 °C, V _{DD} = 2.0 V and R.H. = 50 % measured in a pressure chamber test setup. All voltages refer to GND node							
Parameter		Symbol	Values			Unit	Note / Test Condition
			Min.	Typ.	Max.		
Sensitivity 1 kHz		S _{1kHz}	-43	-42	-41	dB(V/Pa)	1 kHz, 94 dB SPL
Relative Sensitivity 4 kHz		⊗S _{4kHz}	-1		+4	dB	Relative to sensitivity 1 kHz
Relative Sensitivity 240 Hz		⊗S _{240Hz}	-1		+1	dB	Relative to sensitivity 1 kHz
Acoustic Overload Point		AOP		10		%	130 dB SPL @ 1 kHz
Signal-to-Noise Ratio				59		dB(A)	94dB SPL @ 1kHz A-weighted
Total Harmonic Distortion		THD		1		%	94 dB SPL, 1 kHz
Current Consumption		I _{dd}		95	120	u A	V _{DD} = 2.0 V
Power Supply Rejection Ratio		PSRR		-66		dBr	F=217Hz 0.1Vpp Square
DC Output Voltage		V _{OUT}		0.9		V	DC Voltage at Pin 4
Output Impedance		Z _{OUT}		150	300	Ω	1 kHz
1) Psophometrically weighted noise measurement with CCITT-filter (ITU-T Rec. P.53)							
2) Noise measurement with A-weighting filter (IEC 651)							

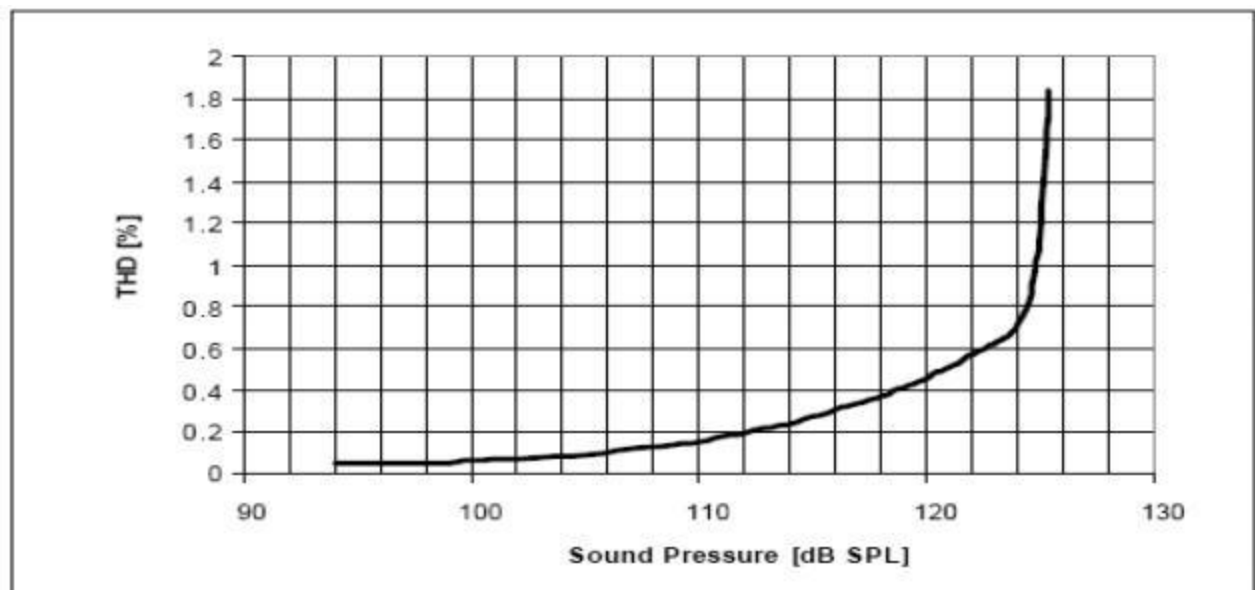
7 Schematic Measuring Diagram:



8 Typical Measurements Results:

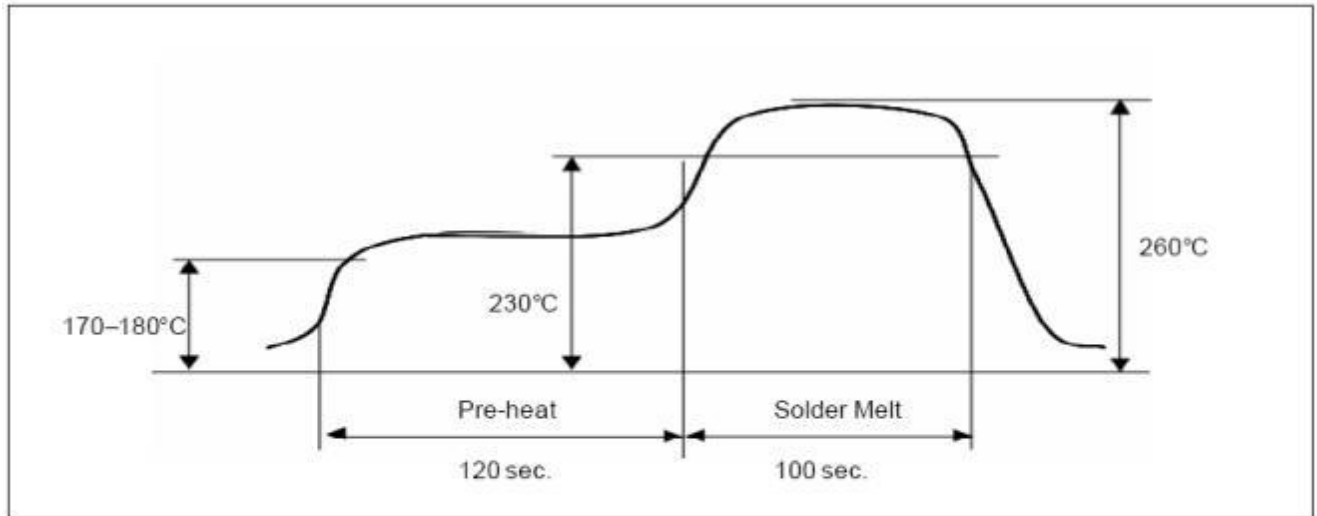


Typical frequency response curve relative to the sensitivity at a frequency of 1 kHz



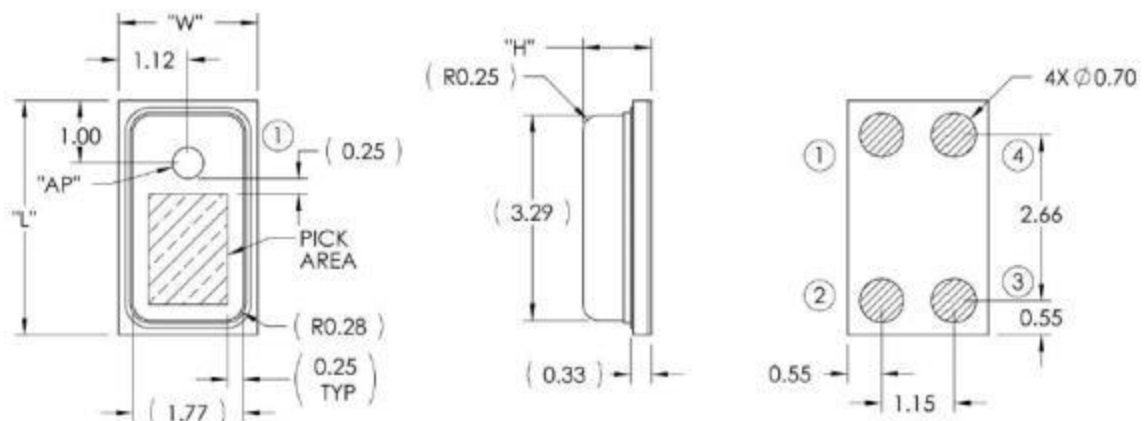
9	RELIABILITY SPECIFICATIONS																						
	Note: After test conditions are performed, the sensitivity of the microphone shall not deviate more than 3dB from its initial value																						
	<table border="1"> <thead> <tr> <th data-bbox="150 362 464 427">Test</th><th data-bbox="464 362 1492 427">Description</th></tr> </thead> <tbody> <tr> <td data-bbox="150 427 464 510">Thermal Shock</td><td data-bbox="464 427 1492 510">Microphone unit must operate when exposed to air-to-air thermal shock 100 cycles, from –40°C to +125°C. (IEC 68-2-4),</td></tr> <tr> <td data-bbox="150 510 464 593">High Temperature Storage Test</td><td data-bbox="464 510 1492 593">Microphone unit must maintain sensitivity after storage at +105°C for 1,000 hours. (IEC 68-2-2 Test Ba)</td></tr> <tr> <td data-bbox="150 593 464 676">Low Temperature Storage Test</td><td data-bbox="464 593 1492 676">Microphone unit must maintain sensitivity after storage at –40°C for 1,000 hours. (IEC 68-2-1 Test Aa)</td></tr> <tr> <td data-bbox="150 676 464 759">High Temperature Operating Test</td><td data-bbox="464 676 1492 759">Microphone unit must operate within sensitivity specifications for 1,000 hours at 105°C. (IEC 68-2-2 Test Ba)</td></tr> <tr> <td data-bbox="150 759 464 842">Low Temperature Operating Test</td><td data-bbox="464 759 1492 842">Microphone unit must operate within sensitivity specifications for 1,000 hours at –40°C. (IEC 68-2-1 Test Aa)</td></tr> <tr> <td data-bbox="150 842 464 916">Humidity Test</td><td data-bbox="464 842 1492 916">Tested under Bias at 85°C/85% R.H. for 1,000 hours. (JESD22-A101A-B)</td></tr> <tr> <td data-bbox="150 916 464 1039">Vibration Test</td><td data-bbox="464 916 1492 1039">Microphone unit must operate under test condition: 4 cycles, from 20 to 2,000 Hz in each direction (x,y,z), 48 minutes, using peak acceleration of 20 G (+20%, -0%). (MIL 883E, method 2007.2, A)</td></tr> <tr> <td data-bbox="150 1039 464 1122">Electrostatic Discharge</td><td data-bbox="464 1039 1492 1122">Tested to 2kV direct contact discharge or 8kV air discharge as specified by IEC 1000-4-2, level 3 and level 4.</td></tr> <tr> <td data-bbox="150 1122 464 1205">Reflow</td><td data-bbox="464 1122 1492 1205">Microphone is tested to 5 passes through reflow oven, with microphone mounted upside-down under conditions of 260°C for 30 seconds maximum.</td></tr> <tr> <td data-bbox="150 1205 464 1272">Mechanical Shock</td><td data-bbox="464 1205 1492 1272">Microphone must operate after exposure to shock test of 10,000 G per IEC 68-2-27, Ea.</td></tr> </tbody> </table>	Test	Description	Thermal Shock	Microphone unit must operate when exposed to air-to-air thermal shock 100 cycles, from –40°C to +125°C. (IEC 68-2-4),	High Temperature Storage Test	Microphone unit must maintain sensitivity after storage at +105°C for 1,000 hours. (IEC 68-2-2 Test Ba)	Low Temperature Storage Test	Microphone unit must maintain sensitivity after storage at –40°C for 1,000 hours. (IEC 68-2-1 Test Aa)	High Temperature Operating Test	Microphone unit must operate within sensitivity specifications for 1,000 hours at 105°C. (IEC 68-2-2 Test Ba)	Low Temperature Operating Test	Microphone unit must operate within sensitivity specifications for 1,000 hours at –40°C. (IEC 68-2-1 Test Aa)	Humidity Test	Tested under Bias at 85°C/85% R.H. for 1,000 hours. (JESD22-A101A-B)	Vibration Test	Microphone unit must operate under test condition: 4 cycles, from 20 to 2,000 Hz in each direction (x,y,z), 48 minutes, using peak acceleration of 20 G (+20%, -0%). (MIL 883E, method 2007.2, A)	Electrostatic Discharge	Tested to 2kV direct contact discharge or 8kV air discharge as specified by IEC 1000-4-2, level 3 and level 4.	Reflow	Microphone is tested to 5 passes through reflow oven, with microphone mounted upside-down under conditions of 260°C for 30 seconds maximum.	Mechanical Shock	Microphone must operate after exposure to shock test of 10,000 G per IEC 68-2-27, Ea.
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10	Notes:																						
	1. Do not pull a vacuum over the porthole of the microphone. Pulling a vacuum over the porthole can damage the device. 2. Do not board wash after the reflow process. Board washing and cleaning agents can damage the device. Do not expose to ultrasonic processing or cleaning. 3. Number of Reflow = recommend no more than 3 cycles. 4. elf life: Twelve (12) months when devices are to be stored in factory supplied, unopened ESD moisture sensitive bag under maximum environmental conditions of 30°C, 70% R.H. 5. exposure: Devices should not be exposed to high humidity, high temperature environment. MSL (moisture sensitivity level) Class 2A. 6. out of bag: Maximum of 90 days out of ESD moisture sensitive bag, assuming maximum conditions of 30°C/70% R.H.																						

11 Solder Reflow Profile



<i>Stage</i>	<i>Temperature Profile</i>	<i>Time (maximum)</i>
Pre-heat	170 ~ 180 C	120 sec.
Solder Melt	Above 230 C	100 sec.
Peak	260 C maximum	30 sec.

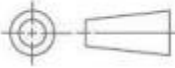
12 Package Outline



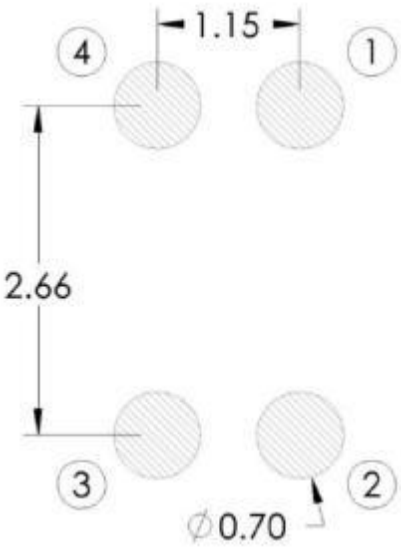
Please don't vacuum over the acoustic port directly. The recommendation is for reference.

Item	Dimension	Tolerance
Length (L)	3.76	±0.10
Width (W)	2.24	±0.10
Height (H)	1.10	±0.10
Acoustic Port (AP)	Ø0.50	±0.05

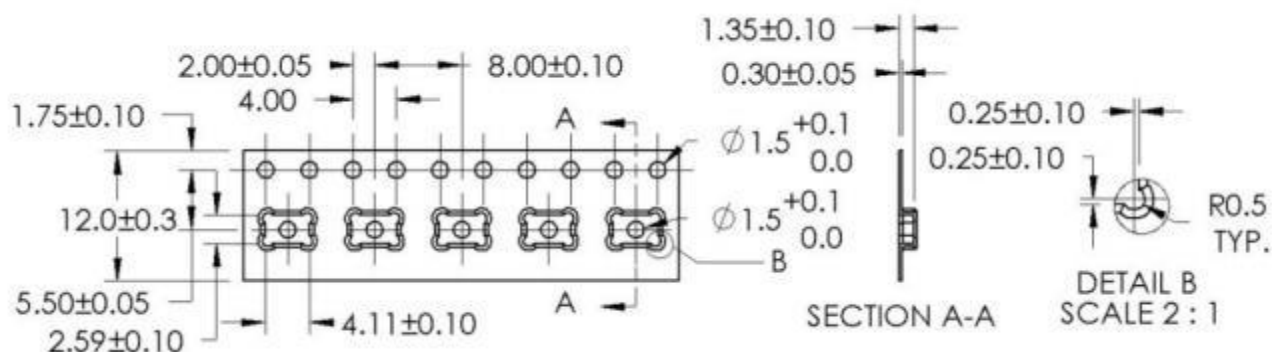
Pin #	Pin Name	Type	Description
1	V _{DD}	Power	Power Supply
2	GROUND	Power	Ground
3	GROUND	Power	Ground
4	OUTPUT	Signal	Output Signal

Notes: Pick Area only extends to 0.25 mm of any edge or hole unless otherwise specified.
 Dimensions are in millimeters unless otherwise specified.
Tolerance is ±0.15mm unless otherwise specified

13 Recommended Customer Land Pattern



14 Tape Outline



Notes: Dimensions are in millimeters unless otherwise specified.

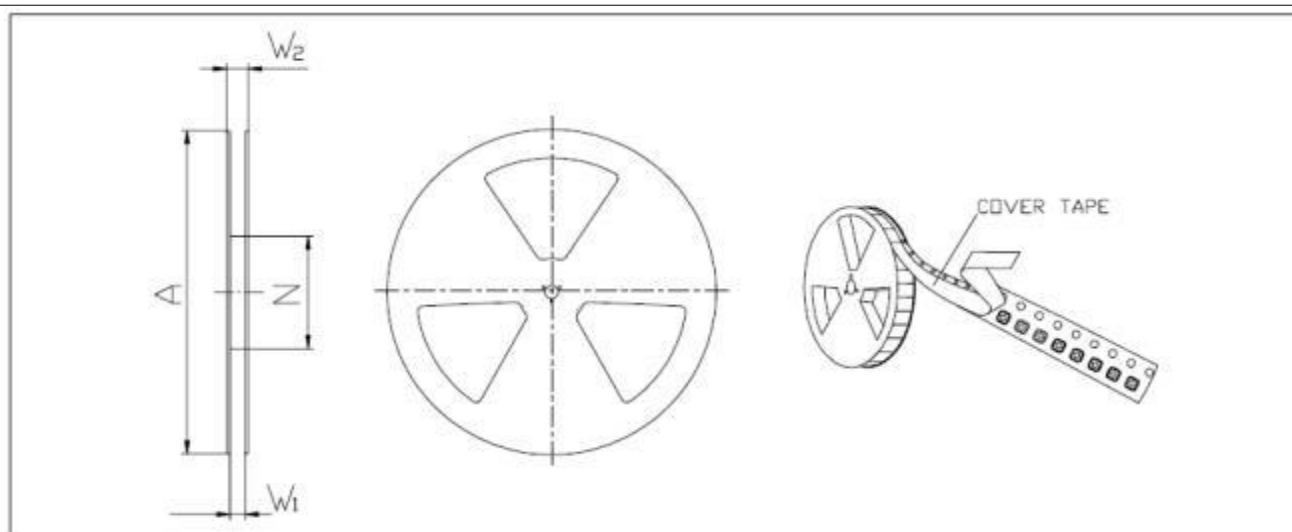
Vacuum pickup only in the pick area indicated in Mechanical Specifications.

Tape & reel per EIA-481.

Labels applied directly to reel and external package.

Shelf life: Twelve (12) months when devices are to be stored in factory supplied, unopened ESD moisture sensitive bag under maximum environmental conditions of 30°C, 70% R.H.

15 Reel Outline



Reel Dimension (mm) and Quantity per Reel

A	W ₁	W ₂	N	Quantity per Reel
Ø 330	12.4±1.5	18.4 MAX	Ø 100	5000