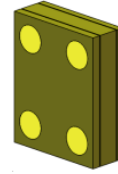




# PUIaudio



Data Sheet

AMM-3742-2-T

## Features:

The AMM-3742-2-T analog MEMS microphone features a specialized pre-amplification ASIC that provides high sensitivity and high SNR output from a capacitive audio sensor. It's packaged for surface mounting and high temperature reflow assembly.

- -42dB sensitivity
- 65dB Signal-to-Noise
- Analog output
- Small 3.76mm x 2.95mm surface-mount package

## Specifications (V<sub>DD</sub> = 2.7V, T<sub>A</sub> = 23±2°C, RH = 55±10%, unless otherwise specified.)

Parameter	Test Condition	Value	Unit
Sensitivity	94dB SPL f <sub>IN</sub> = 1 kHz	-43 (min) -42 (typ) -41 (max)	dB
Supply Voltage		2.0 (typ)	V <sub>DD</sub>
Supply Voltage Range		1.6 (min) 2.0 (typ) 3.6 (max)	V <sub>DD</sub>
Output Impedance (@ 1 kHz)		300 (typ)	Ω
Supply Current	1.6V ≤ V <sub>DD</sub> ≤ 3.6V	200 (max)	μA
Signal-to-Noise Ratio	f <sub>IN</sub> = 1 kHz 94dB SPL A-weighted	59 (typ)	dB
Frequency Range	See Frequency Response Curve for response limits	100 – 20k	Hz
Total Harmonic Distortion	f <sub>IN</sub> = 1 kHz 94dB SPL	0.5 (max)	%
Acoustic Overload Point (AOP)	(f <sub>TEST</sub> = 1 kHz, 10% THD)	132 (typ)	dB
Power Supply Rejection	100mV <sub>PP</sub> 217 Hz square wave on V <sub>DD</sub> , A-weighted	-100 (typ)	dB

## Physical Properties

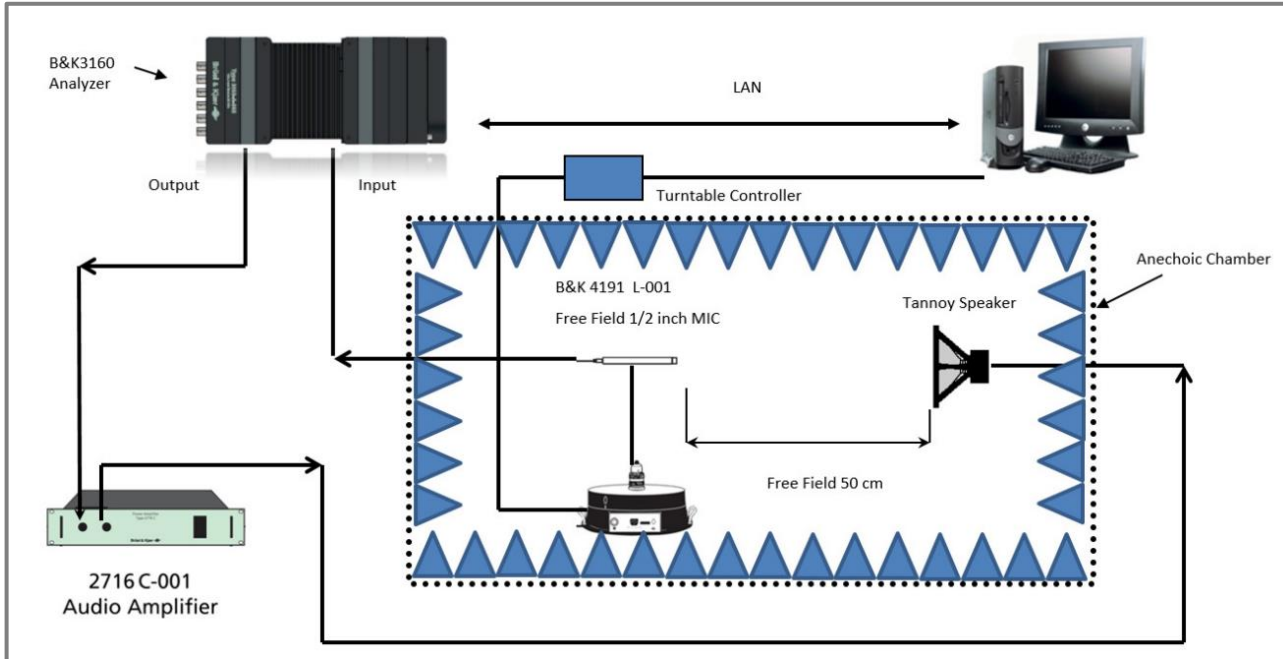
Parameter	Condition	Value	Unit
Directivity		Omnidirectional	
Weight		0.1 (max)	Grams
Operating Temperature		-40 (min) 85 (max)	°C
Storage Temperature		-40 (min) 100 (max)	°C
MSL (Moisture Sensitivity Level)*		Class 1	
Acceptable Soldering Methods		See below for reflow soldering information	
Environmental Compliances		RoHS/Halogen Free	

\*MSL level dependent on product remaining in sealed packaging until use

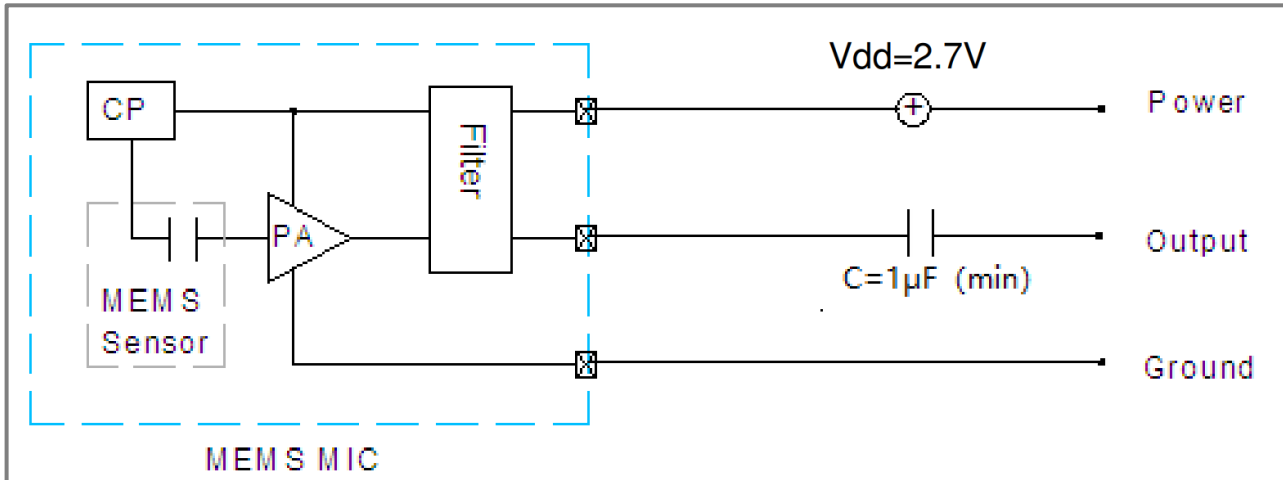
## Absolute Maximum Ratings

Parameter	Condition	Value	Unit
Supply Voltage		4.2	V <sub>DC</sub>
Voltage on any Pin		-0.3 (min) V <sub>DD</sub> + 0.3 (max)	V <sub>DC</sub>
Max Sound Pressure Level		160	dB
Max Mechanical Shock		10000	G
Max Vibration		Pre-MIL-STD-883 Method 2007, Test Condition B	

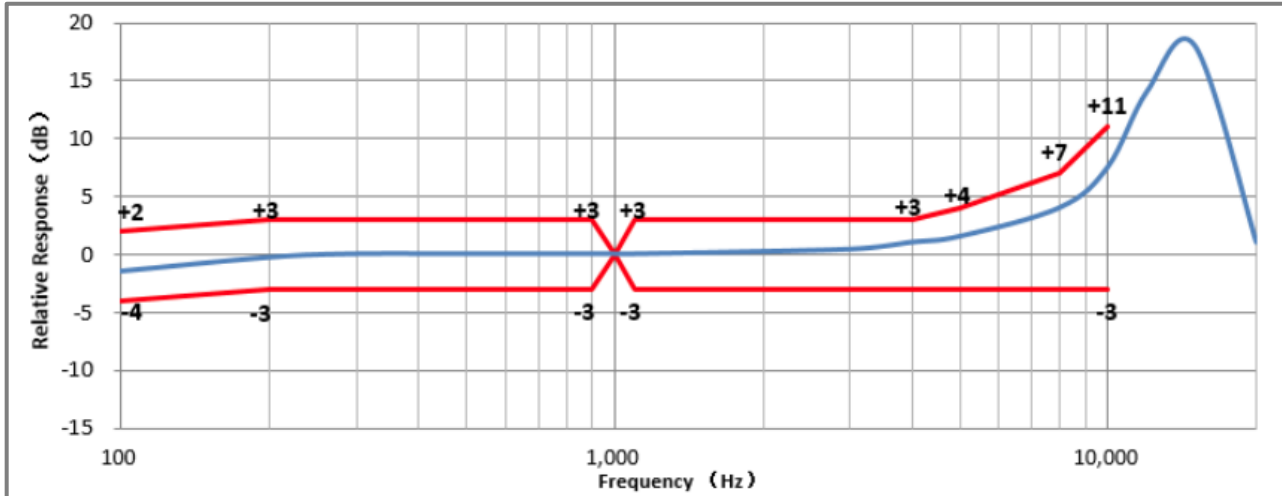
## Measurement Method



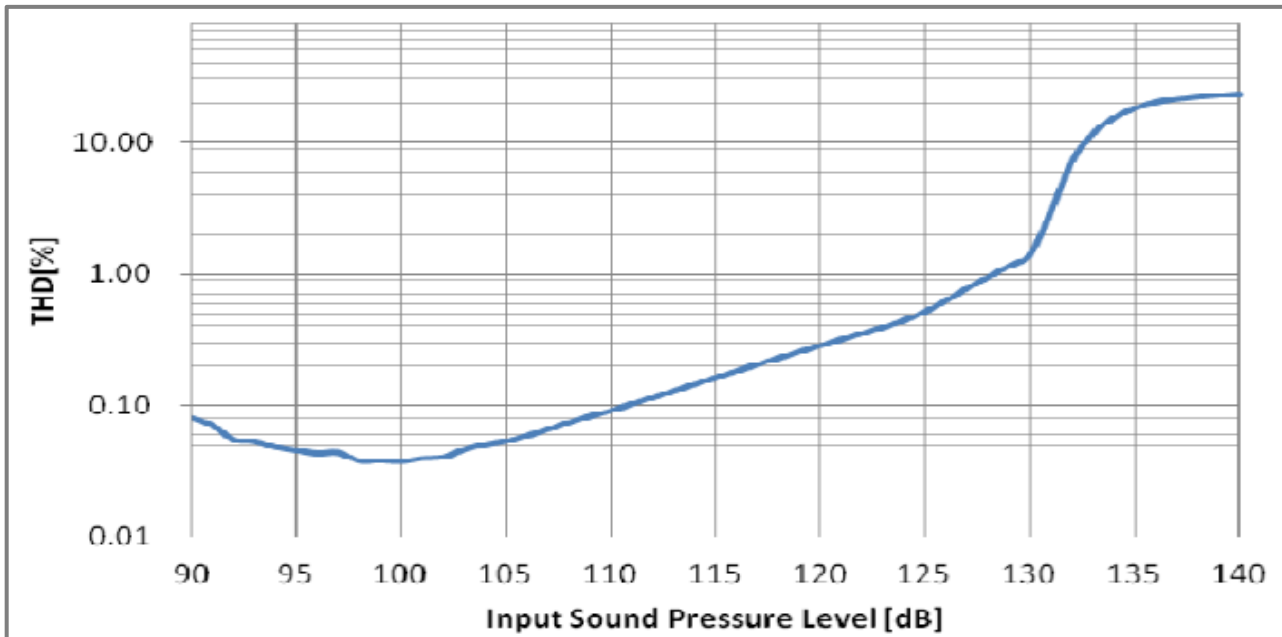
## Measurement Circuit



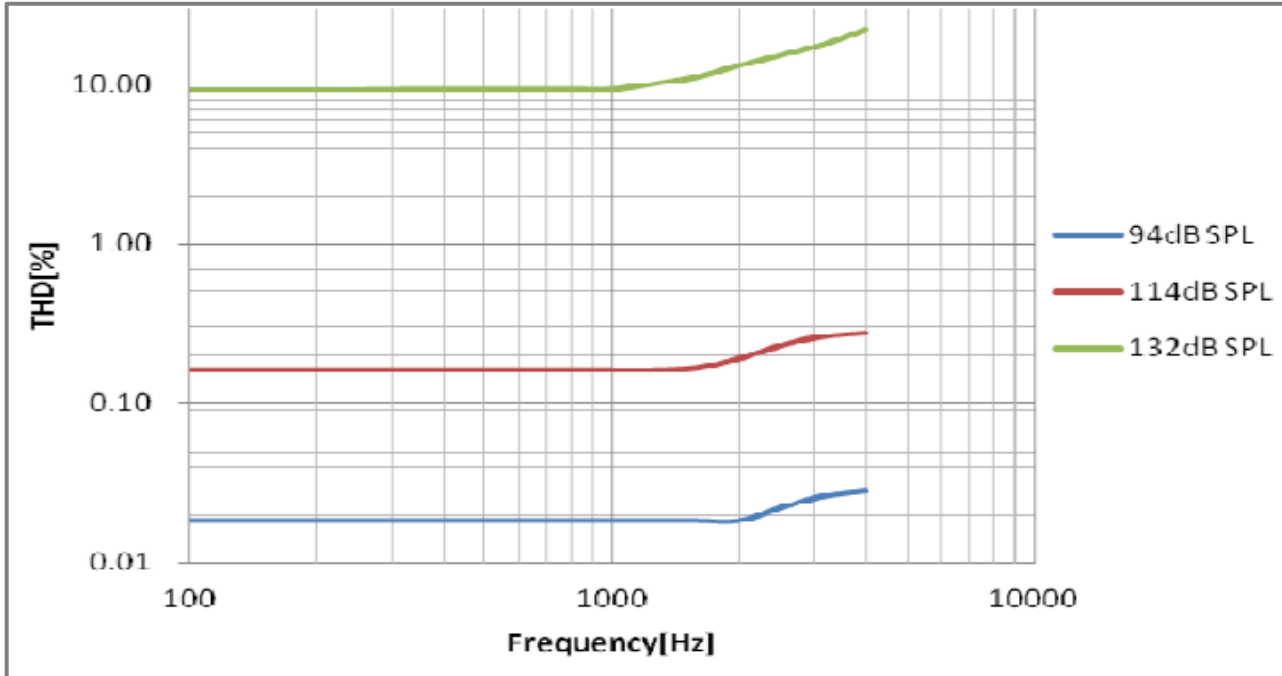
### Typical Frequency Response (Normalized to 0dB at 1kHz)



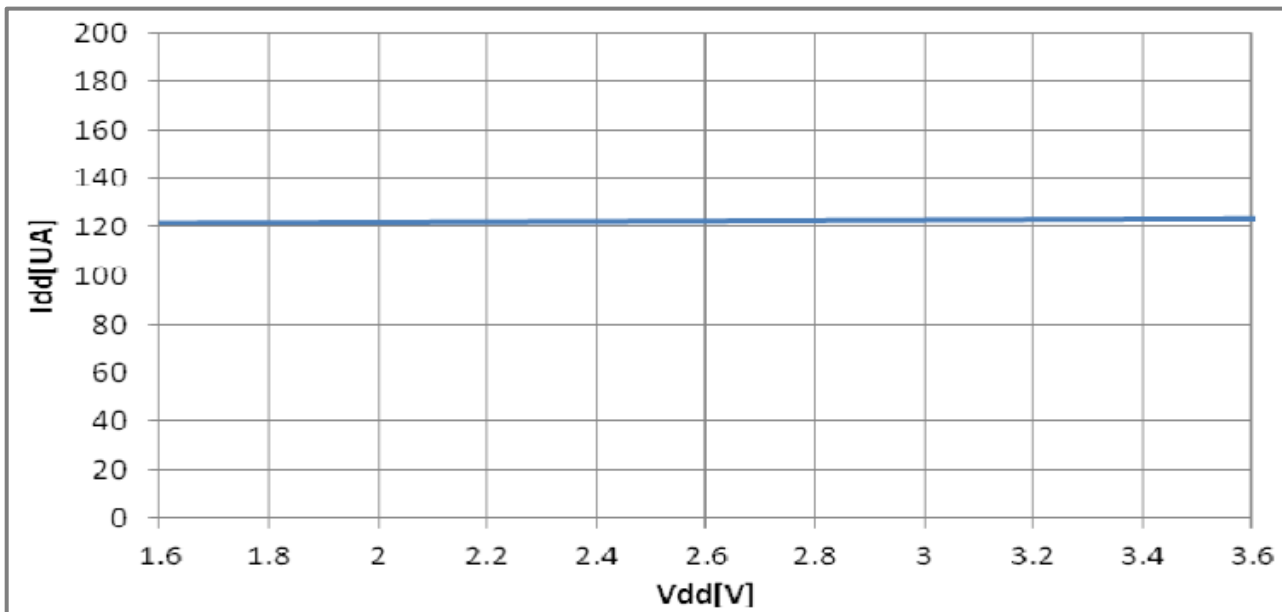
### Typical THD Vs SPL



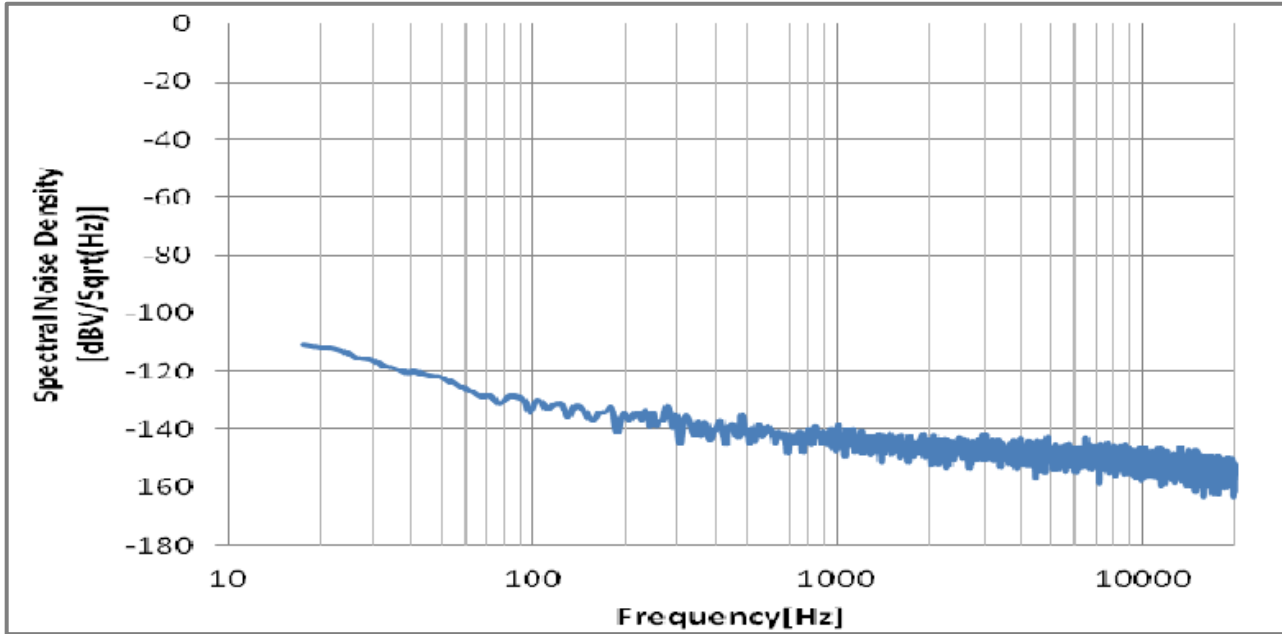
## Typical THD Vs Frequency



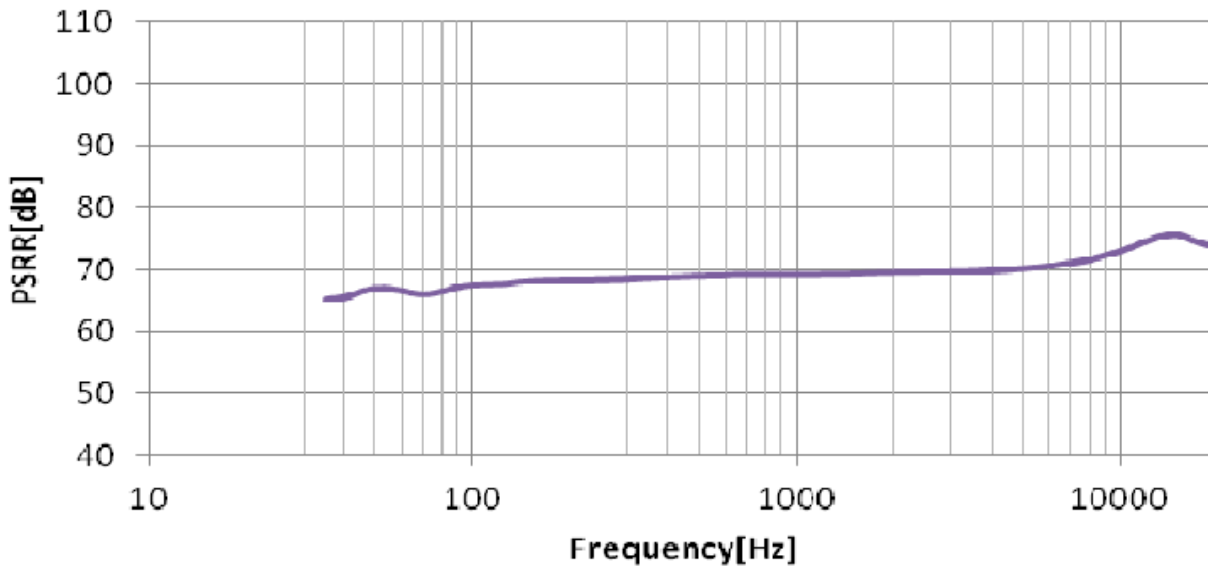
## Current Consumption Vs Voltage



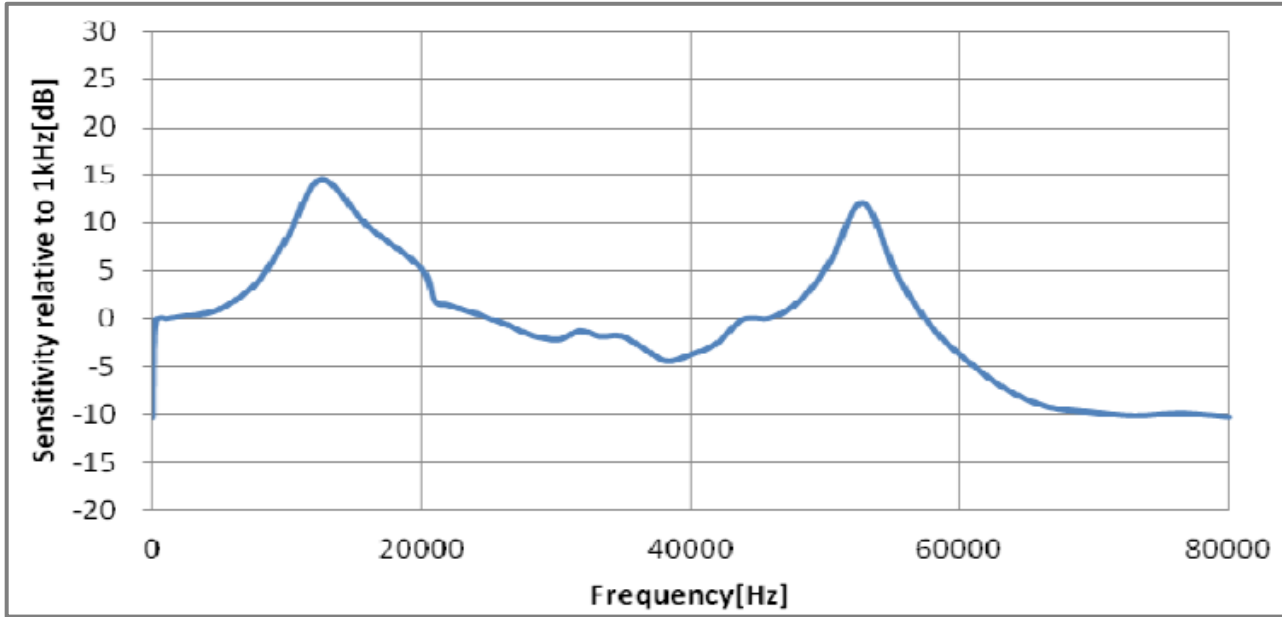
## Typical Noise Floor



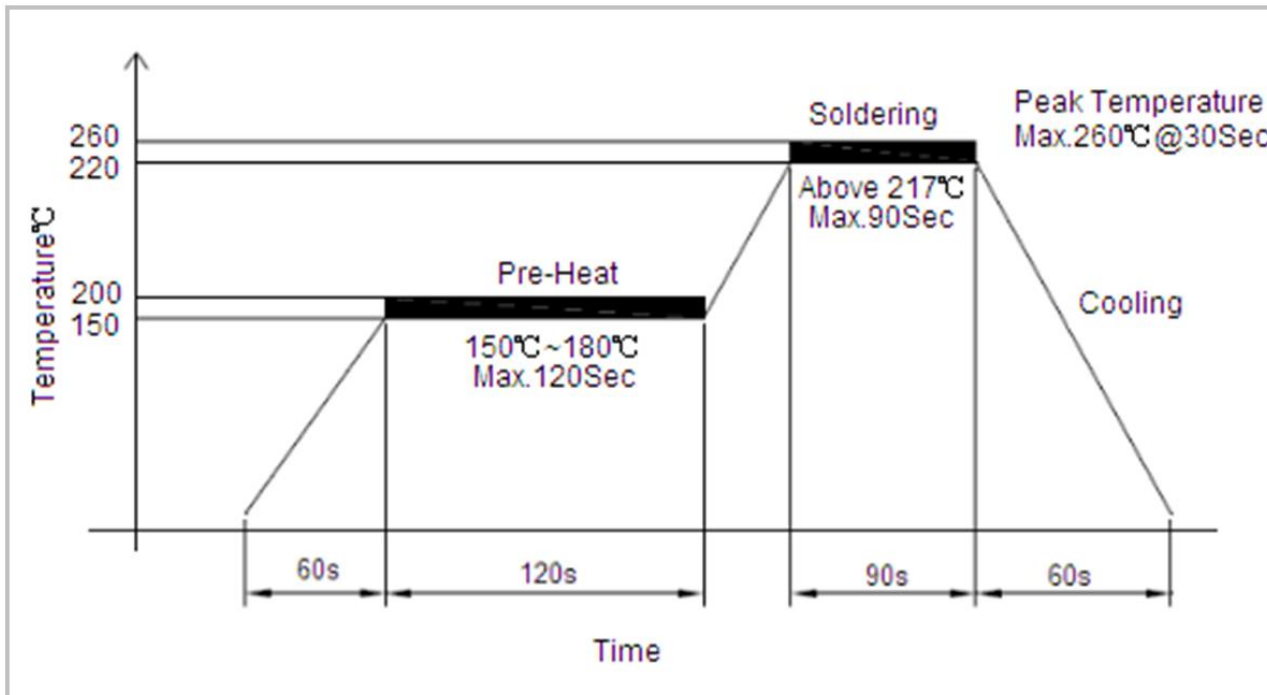
## Typical PSRR Vs Frequency



## Typical Free Field Ultrasonic Response



## Recommended Reflow Soldering Procedure (Recommended profile, temperature $\leq 260^{\circ}\text{C}$ , 30s maximum at peak temperature)



### Important notes to minimize device damage

1. Do not handle the microphone with pick-and-place vacuum tools that could contact the microphone acoustic port hole.
2. Never expose the microphone's acoustic port hole to vacuum. Such exposure can damage or destroy the MEMS element.
3. Never allow air to blow air into the microphone acoustic port hole. The port hole must be sealed to prevent particle contamination if a blown air-cleaning process is used.
4. A clean room environment is recommended for PCB assembly to avoid microphone contamination.
5. Do not use blown air or ultrasonic cleaning procedures on MEMS Microphones. A no-clean paste is recommended for the assembly, avoiding subsequent cleaning steps. cleaning substances can severely damage the microphone MEMS element.
6. it is recommended to cover the sound port with protective tape during PCB sawing or system assembly. This prevents blocking or partially blocking the acoustic port hole during PCB assembly.
7. Do not use excessive force to place the microphone on the PCB. Use industry standard pick and place tools to limit the mechanical force exerted on the package.

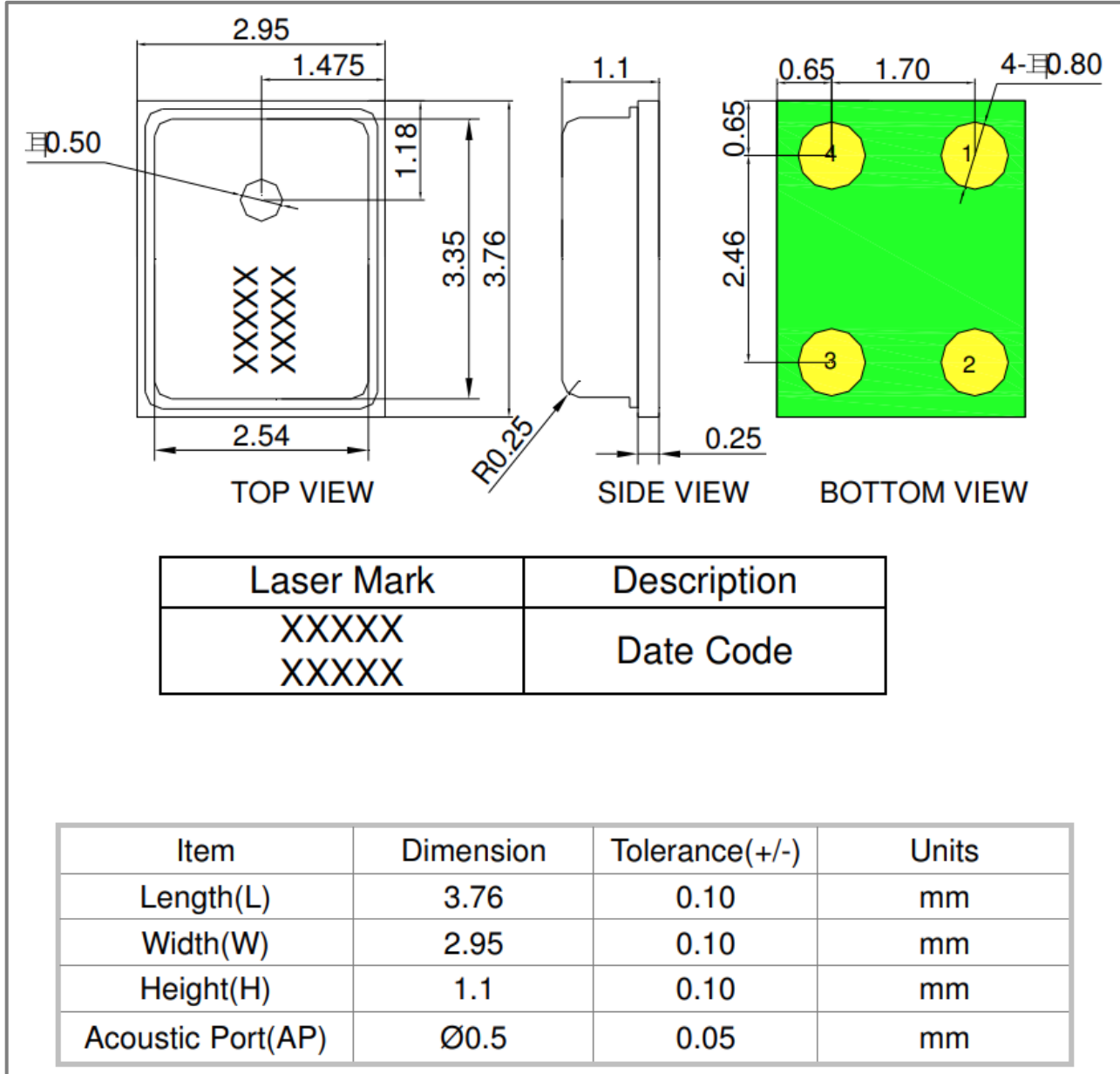


**Reliability Testing** (Samples under test are acclimated at  $T_A = 23 \pm 2^\circ\text{C}$ , R.H. =  $55 \pm 10\%$  for two hours. After each test completes and corresponding recovery time (if applicable) elapses, any measured sensitivity change is  $\leq \pm 3\text{dB}$ , unless otherwise specified)

Type of Test	Test Specifications
High Temperature Storage Test	1000hrs at $105 \pm 3^\circ\text{C}$ Two-hour recovery
High Temperature Operational Test	1000hrs at $105 \pm 3^\circ\text{C}$ $V_{DD} = V_{DD} (\text{max})$ Four-hour recovery
Low Temperature Storage Test	1000hrs at $-40 \pm 3^\circ\text{C}$ Two-hour recovery
Low Temperature Operational Test	1000hrs at $-40 \pm 3^\circ\text{C}$ $V_{DD} = V_{DD} (\text{max})$ Four-hour recovery
Temperature Shock	Thirty cycles, each from cold to hot Each cycle is thirty minutes at $-40^\circ\text{C}$ , thirty minutes at $125^\circ\text{C}$ Five-minute transition
High Humidity, High Temperature Operating Test	1000hrs at $85 \pm 3^\circ\text{C}$ and 85%RH $V_{DD} = V_{DD} (\text{max})$ Twelve-hour recovery No corrosion or defamation inside the microphone
High Humidity, High Temperature Operating Test	168hrs at $65 \pm 3^\circ\text{C}$ and 95%RH $V_{DD} = V_{DD} (\text{max})$ Twelve-hour recovery No corrosion or defamation inside the microphone
Static Humidity	One hour at $25^\circ\text{C}$ precondition 1000hrs at $85 \pm 3^\circ\text{C}$ and 85%RH Dry at room ambient temperature
Temperature-Cycle Testing	Double-case method: 30min at $-40 \pm 3^\circ\text{C}$ Followed by 30min at $125 \pm 3^\circ\text{C}$ 30 cycles, two-hour recovery
Vibration Test	Twelve minutes along the x, y, and z axis $f_{IN} = 20\text{Hz}$ to 2kHz 20G peak acceleration Two-hour recovery Less than 1dB sensitivity change
Shock Test	Height: 1.5m Fixture weight: $150 \pm 10\text{g}$ Fixture's sound hole diameter is $\geq 0.8\text{mm}$ Reference surface is marble floor Duration: four corners x four times; six faces x four times Less than 1dB sensitivity change
Simulated Reflow (without solder)	Samples are qualified with three $260 \pm 5^\circ\text{C}$ reflow profile passes Two hours of settling is required between each reflow profile test

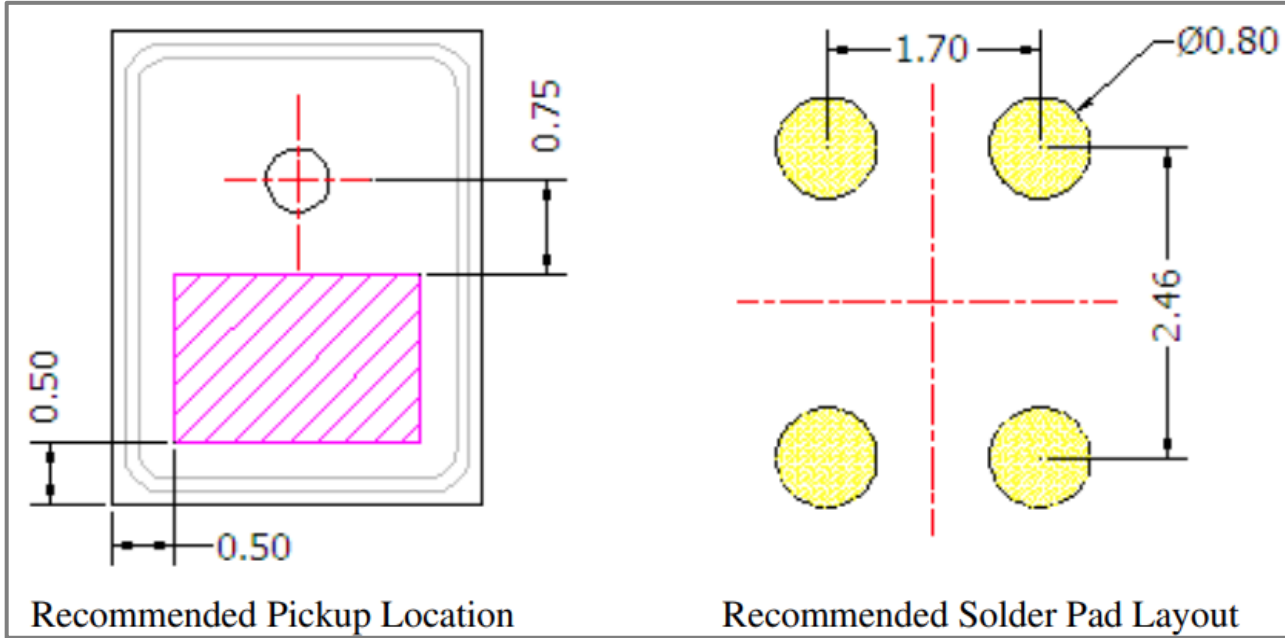
ESD Sensitivity	Measured according to MIL-STD-883G, Method 3015.7, Human Body Model (HBM) Identify ESD threshold levels indicating 3000V HBM passage.
Random Vibrations	Random vibrations on three perpendicular axis Four cycles, 20Hz to 2kHz 20G peak acceleration Thirty minutes per axis
Mechanical Shock	Half-sine shock pulses 3000G±15%, 300µs Eighteen total shocks
Operational Life	Samples tested at 125°C for 168hrs at V <sub>DD(MAX)</sub>
Drop Test	Repeated three times in six directions (total drops is eighteen). Dropped onto a steel surface from 1.5m height Inspect for mechanical damage Less than ±3dB sensitivity variation after each drop

**Dimensions** (Dimension are in mm.)



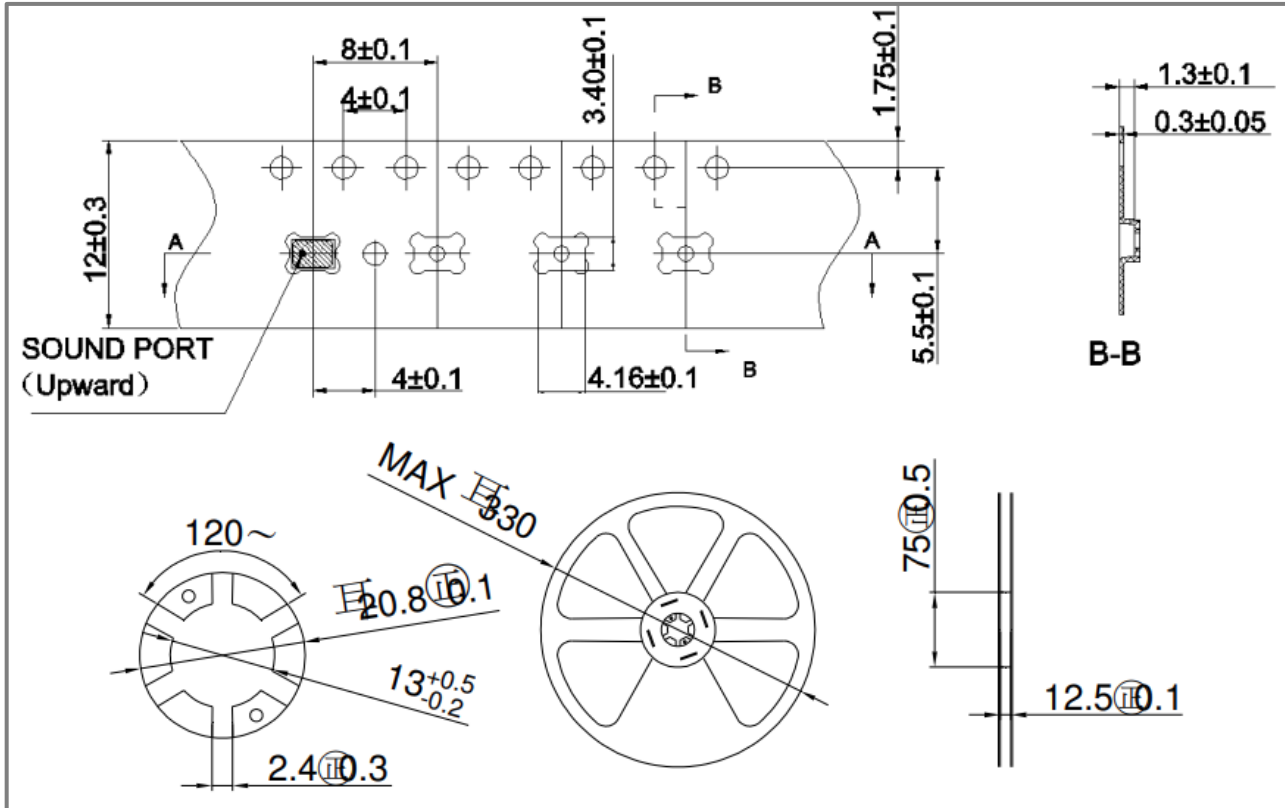
Notes:  
 All dimensions are in millimeter (mm).  
 Tolerance±0.15mm unless otherwise specified.

### Suggested Land Pattern\*

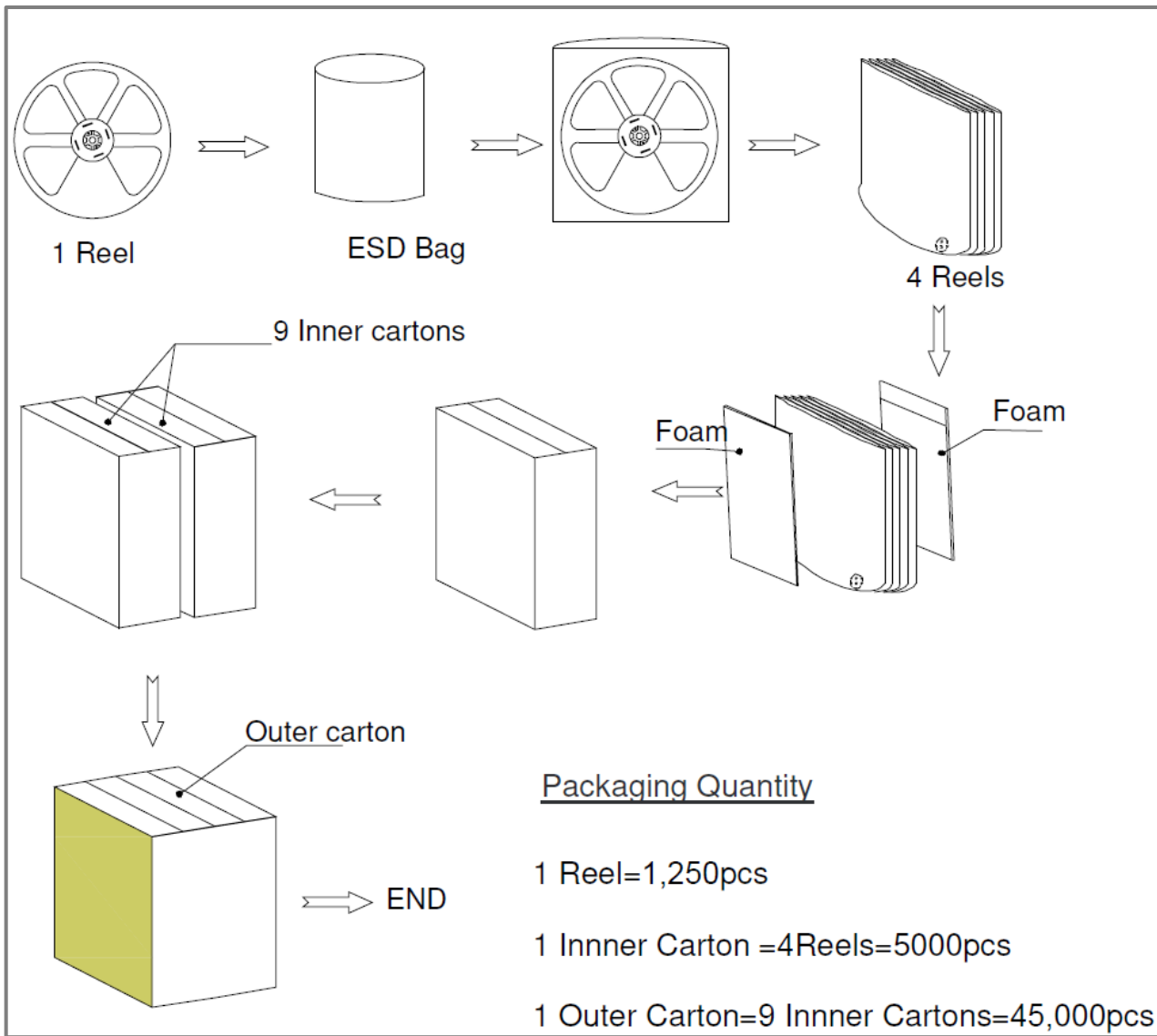


\*This land pattern is advisory only and its use or adaptation is entirely voluntary. PUI Audio disclaims all liability of any kind associated with the use, application, or adaptation of this land pattern.

### Packaging



All Dimensions are in millimeter (mm).



**Specifications Revisions**

Revision	Description	Date
A	Released from Engineering	05-05-2023

Note:

1. Unless otherwise specified:
  - A. All dimensions are in millimeters.
  - B. Default tolerances are  $\pm 0.5\text{mm}$  and angles are  $\pm 3^\circ$ .
2. Specifications subject to change or withdrawal without notice.
3. This part is ROHS 2015/863/EU compliant.