



# GMA2718H09-F42-4P

## **GMA2718H09-F42-4P Top-Inlet Analog Silicon**

### **MEMS Microphone Specification**

(RoHS Compliance&Halogen Free)

**REV 1.0**



# GMA2718H09-F42-4P

## 1. Introduction

### 1.1 General Description

GMA2718H09-F42-4P is an analog top port MEMS microphone with high performance and low-power consumption. It integrates a MEMS microphone element, an impedance converter, and an output amplifier.

Other high-performance specifications include 130 dB SPL acoustic overload point in high performance mode,  $\pm 1$ dB sensitivity tolerance and enhanced immunity to both radiated and conducted RF interface.

Excellent acoustic performance, along with the compact size is best-suited for a wide range of consumer electronic products, offering a product with high-quality to meet the application requirement.

### 1.2 Product Features

- Low Current Consumption
- RF Protection
- HD Voice MEMS Microphone
- Omnidirectional
- Pb-free and RoHS Compliant
- Standard SMD Reflow
- Small Package
- Flat Frequency Response
- Sensitivity Matching
- Low Noise

### 1.3 Application

- Cellphones
- Smartphones
- Tablets
- TWS
- Headsets
- Smart home devices, Internet of Things



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## 2. Absolute Maximum Ratings

Supply voltage:VDD to GND.....-0.5V~5.0V  
 Supply voltage:Output to GND.....-0.3V~5.0V  
 Input Current to Any Pin..... $\pm 5\text{mA}$

ESD Tolerance

The Lid Mode.....8KV

The I/O Pin Mode.....8KV

## 3. Acoustic & Electrical Characteristics

Test conditions:

$T_a=23\pm 2^\circ\text{C}$ ,  $\text{RH}=55\pm 20\%$ ,  $\text{VDD} = 1.8\text{V}$ ,  $\text{VDD}(\text{min}) < \text{VDD} < \text{VDD}(\text{max})$ , no load, unless otherwise indicated

**Table 1. General Microphone Specifications**

Item	Test Conditions	Min	Typ	Max	Unit
Sensitivity	94dB SPL @ 1kHz	-45	-42	-39	dBv/Pa
Output Impedance	1kHz	—	—	300	$\Omega$
Directivity		Omnidirectional			
Power Supply Rejection	100 mVpp square wave @ 217 Hz, VDD= 2.0V, A-weighted	—	-101	—	dBv
Power Supply Rejection Ratio	200mVpp sinewave @ 1kHz, VDD = 2.0V	—	65	—	dB
S/N Ratio	94dB SPL @ 1kHz, A-weighted	—	58	—	dB (A)
Operating Voltage Range		1.5	—	3.6	V
Total Harmonic Distortion	94dB SPL@ 1kHz, S=Typ, VDD=2.2V	—	0.15	—	%
Current Consumption		—	92	100	$\mu\text{A}$
Acoustic Overload Point	10% THD @ 1kHz	124	126	—	dB SPL



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## 4. Frequency Response Curve

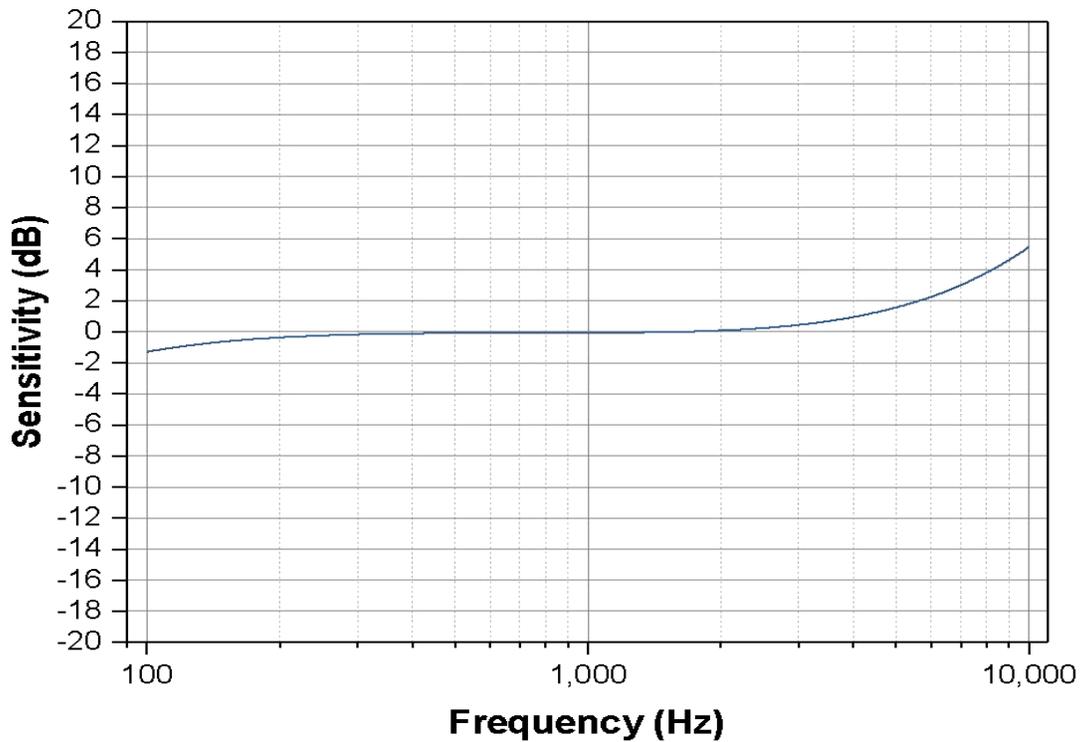


Figure 1. Typical Free Field Response Normalized to 1 kHz

## 5. Application Circuit

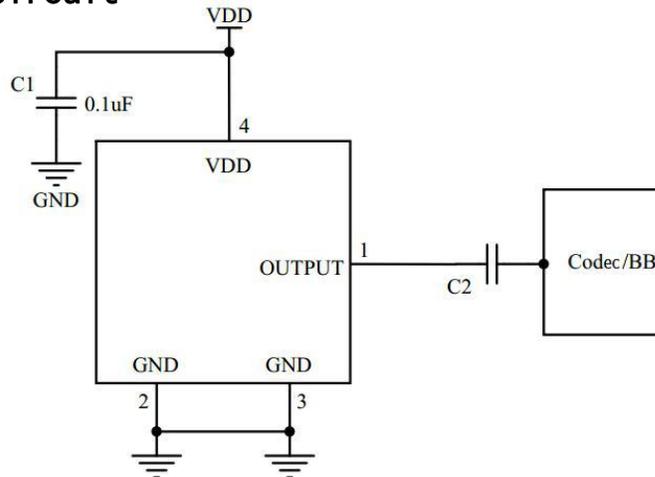


Figure 2. Typical Application Circuit

Notes:

1. All Ground pins must be connected to ground
2. Capacitors near the microphone should not contain Class 2 dielectrics due to their piezoelectric effects.



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## 6. Mechanical Specifications

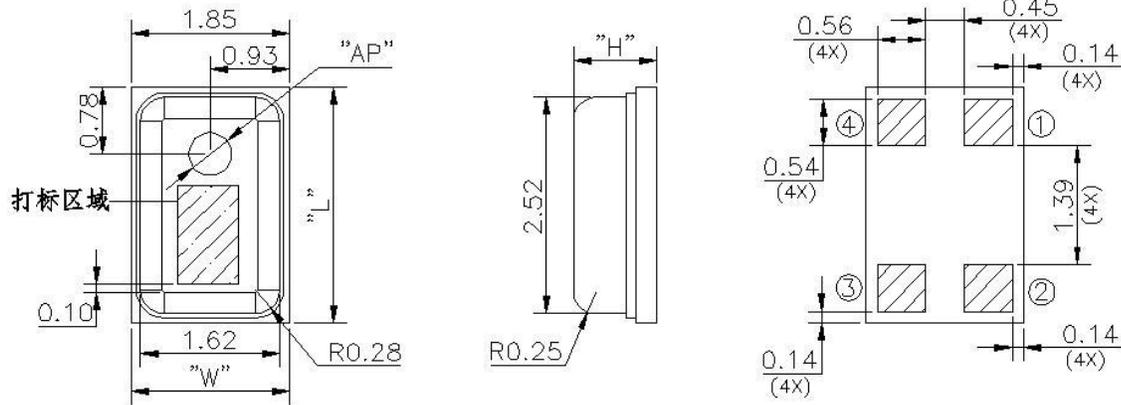


Figure 3. Mechanical

### Drawing

ITEM	DIMENSION	TOLERANCE	UNITS
LENGTH (L)	2.75	±0.10	mm
WIDTH (W)	1.85	±0.10	mm
HEIGHT (H)	0.95	±0.10	mm
ACOUSTIC PORT (AP)	0.5	±0.05	mm

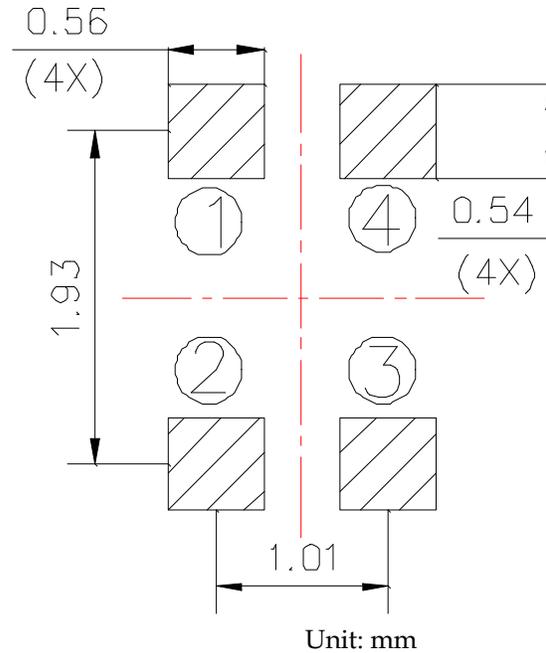
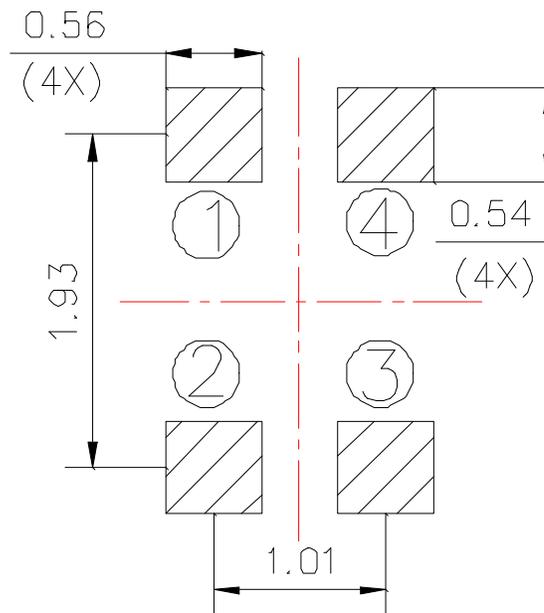
Table 3. Pin Definition

Pin #	Pin Name	Type	Description
1	OUTPUT	Signal	Output Signal
2	GND	Power	Ground
3	GND	Power	Ground
4	V <sub>DD</sub>	Power	Power Supply

Table 2. Mechanical Dimension

### Notes:

1. All dimensions are in millimeters (mm).
2. Tolerance is ±0.15mm unless otherwise specified.
3. Weight is 0.022±10%g.

**7. Recommended Soldering Surface Land Pattern and Stencil Pattern****7.1 Example of Land Pattern****Figure 4. Example of Land Pattern Drawing****7.2 Example of Solder Stencil Pattern****Figure 5. Example of Solder Stencil Pattern**



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## 8. Recommended Reflow Profile

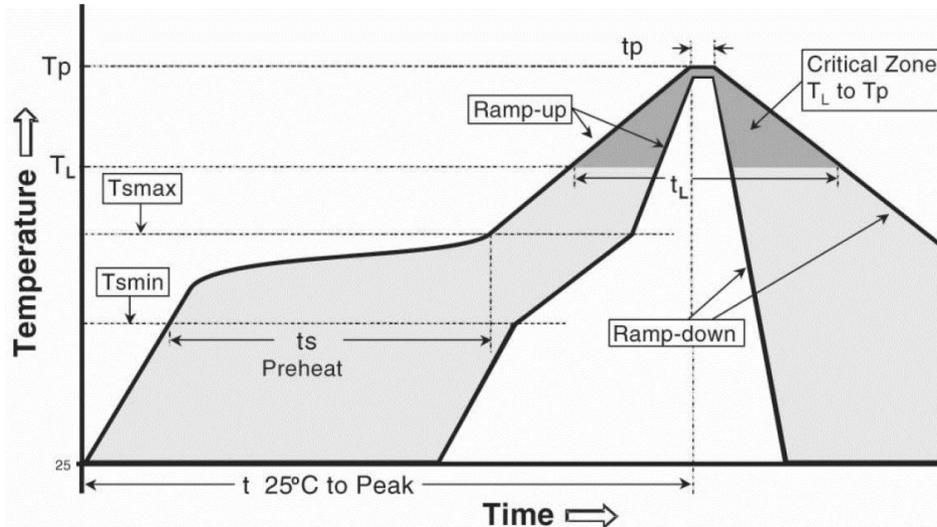


Figure 6. Reflow Profile

Profile Feature	Pb-Free
Average ramp-up rate (T <sub>smax</sub> to T <sub>p</sub> )	3°C/second max.
Preheat	
- Temperature Min (T <sub>smin</sub> )	150°C
- Temperature Max (T <sub>smax</sub> )	200°C
- Time (T <sub>smax</sub> to T <sub>smax</sub> ) (t <sub>s</sub> )	60-180 seconds
Time maintained above	
- Temperature (T <sub>L</sub> )	217°C
- Time (T <sub>L</sub> )	60-150 seconds
Peak Temperature (T <sub>p</sub> )	260°C
Time within 5°C of actual Peak Temperature (t <sub>p</sub> )	20-40 seconds
Ramp-down Rate	6°C/second max.
Temperature 25°C to Peak Temperature	8 minutes max.

Table 4. Reflow Profile

Notes:

1. Do not board wash or clean after the reflow process.
2. Do not brush board with or without solvents after the reflow process.
3. Do not directly expose to ultrasonic processing, welding, or cleaning.
4. Do not insert any object in acoustic port hole of device at any time.
5. Do not apply air pressure into the acoustic port hole.
6. Do not pull a vacuum over acoustic port hole of the microphone.
7. Do not apply a vacuum when repacking into sealed bags at a rate faster than 0.5 atm/sec.
8. Recommended number of reflow is not more than 5 times.



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## 9. Packing Information

### 9.1 Tape Specification

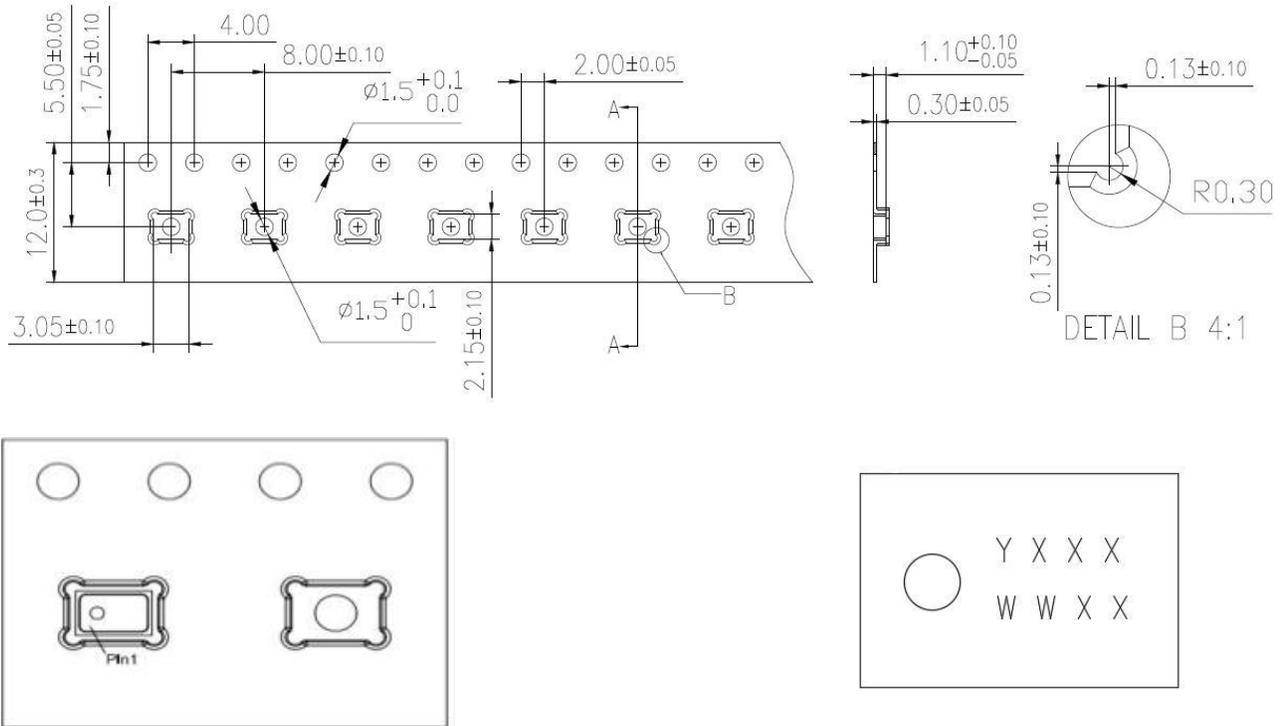


Figure 7. Tape Drawing

Line	Character	Description
1	YXXX	Y=Year code, WW=Week code, XX=Date code
2	WWXX	

Table 5. Character Definition

Notes:

1. Dimensions are in millimeters unless otherwise specified.
2. Tape and Reel Per EIA-481 standard.
3. Label applied to external package and direct to reel.
4. Shelf life: Twelve (12) months when devices are to be stored in factory supplied, unopened ESD moisture sensitive under maximum environmental conditions of 30°C, 70%RH.



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## 9.2 Reel Specification

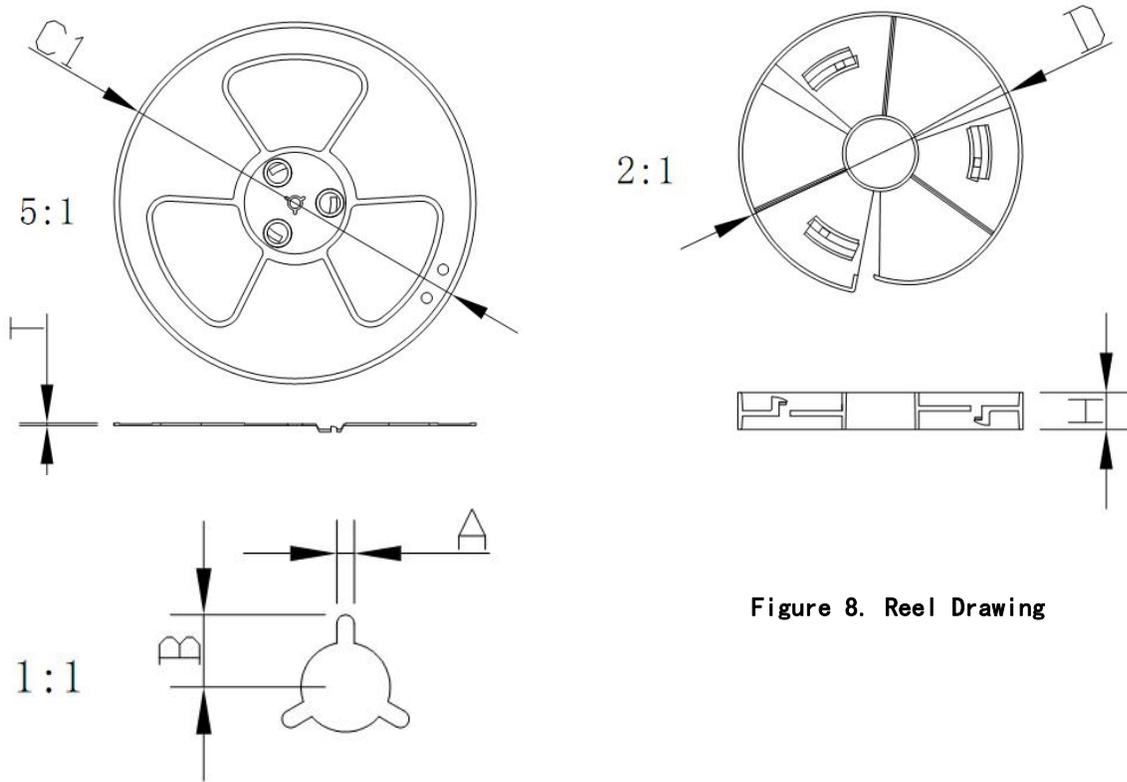


Figure 8. Reel Drawing

Reel Dimension	
Specification	13"
C1±1.0	330
A±0.2	2.6
B±0.2	10.8
T±0.2	2.0

Reel Dimension		
Tape Width	D±0.5	H+1
12	100	12.5



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## 9.3 Carton Specification

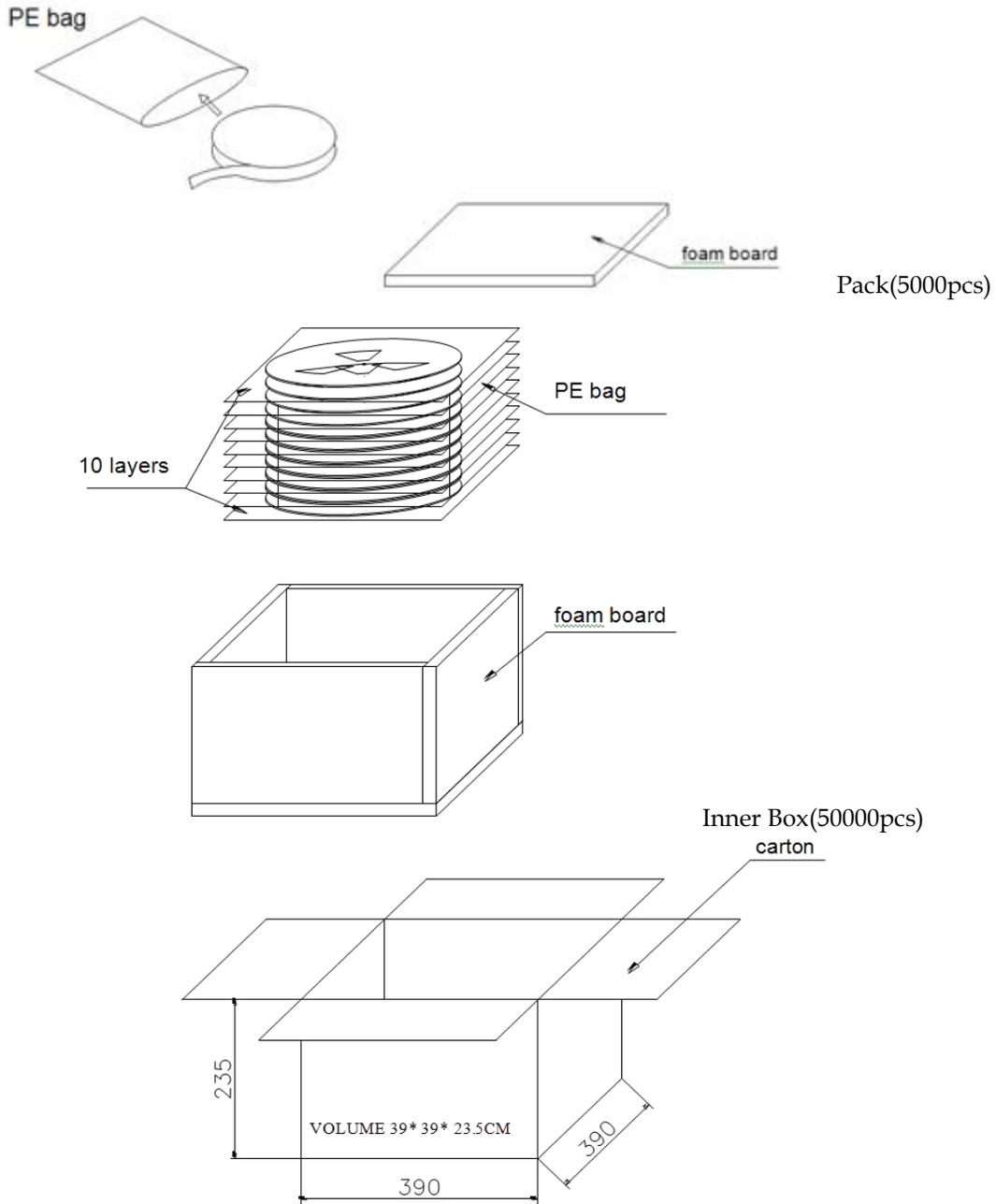


Figure 9. Carton Drawing

## 9.4 Order Information

Qty / Reel	Qty / Outer Box
5,000	50000



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## 10. Reliability Specifications

Test item	Detail	Standard
Reflow Simulation	Refer to Sec.9 for solder reflow Profile, total 5times	/
Low Temperature Bias	Conditions:-40°C Duration:168 hours while under bias	IEC 60068-2-2 Test Aa
High Temperature Bias	Conditions:105°C Duration:168 hours while under bias	IEC 60068-2-2 Test Ba
Thermal Shock	Conditions: 100cycles of air-air thermal shock from -40 °C to 125 °C with 15-minute soaks	IEC 60068-2-4
Temperature/Humidity Bias	Conditions: 85°C/85%RH environment while Under bias for 168 hours	JESD 22-A101A-B
Mechanical Shock	Conditions:3 pulses of 10,000g in The X,Y and Z direction	IEC 60068-2-27 Test Ea
Vibration Test	Test axis:X,Y,Z Conditions:2-400Hz 1 oct/min Test time:15 mins per axis Use fixture during the testing	IEC 60068-2-6
Drop Test	Conditions: For each sample, Drop by all comers ,edges, Surfaces respectively. Steel floor. Drop height:1800mm	IEC 60068-2-32
ESD	Conditions: ±8KV direct contact to the lid When unit is grounded, ±4KV Direct contact to the I/O Pins. 10 times	IEC 61000-4-2

## Revision History

Revision	Description	Date
1.0	Initial Release	9/7/2020



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