

# EB2718ATSSA MEMS Microphone IC

## Product Description

The **EB2718ATSSA** microphone IC are integrated with specialized pre-amplification ASIC to provide high sensitivity, high SNR output from a capacitive audio sensor. It's packaged for surface mounting and high temperature reflow assembly. **EB2718ATSSA** which is able to endure reflow temperature up to 260 °C for 30 seconds can be used in SMT process. It is widely used in telecommunication and electronics device such as headset, wearable device.

## Features

- Top port
- High stability - no risk of membrane aging
- Suitable for automatic pick-and-place handler and SMT process
- Miniature dimension 2.75mm x 1.85mm x1.05mm
- Low current consumption 80uA
- RoHS/Green compliant
- Sensitivity deviation within  $\pm 1$ dB
- Package type : LGA 4-pin
- Omnidirectional

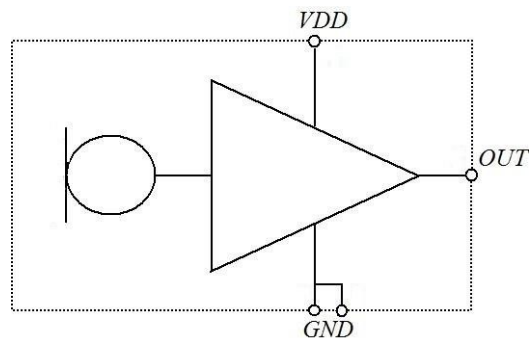
## Applications

- ANC Headsets
- TWS Headsets
- Wearable Devices
- IoT Devices

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## Functional Block Diagram



## Pin Definition and Function

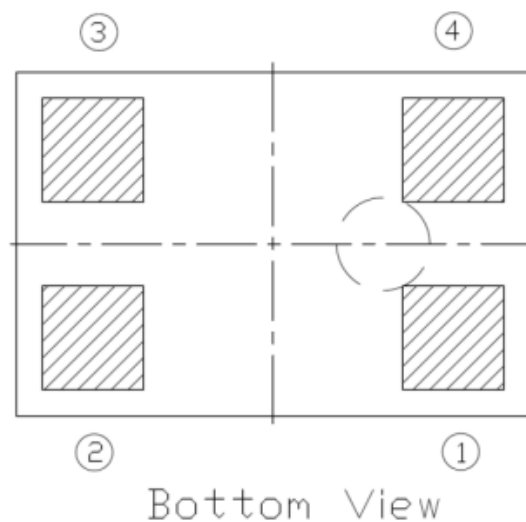


Table 1

| Pin # | Symbol | Function             |
|-------|--------|----------------------|
| 1     | OUTPUT | Analog signal output |
| 2     | GND    | Ground               |
| 3     | GND    | Ground               |
| 4     | VDD    | Power supply         |

## Temperature Range

Table 2

|                             |                  |               |
|-----------------------------|------------------|---------------|
| Storage Temperature         | T <sub>STG</sub> | -40°C ~ 125°C |
| Operating Temperature Range | T <sub>A</sub>   | -40°C ~ 105°C |

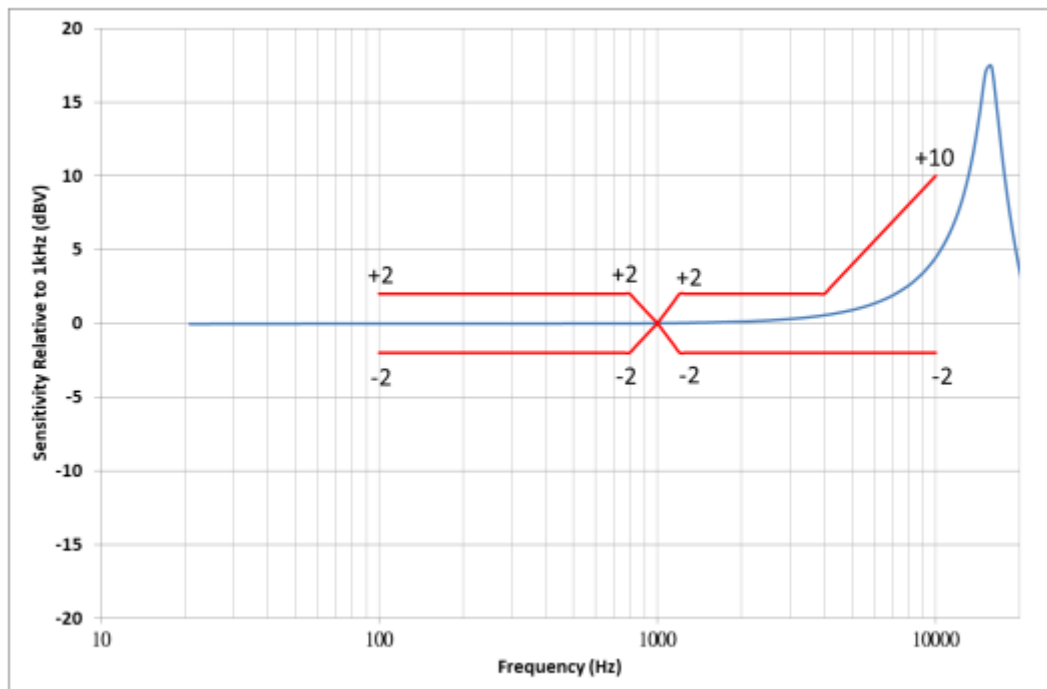
## Acoustical and Electrical Characteristics

Table 3 Typical test conditions are  $T_A = 23\text{ }^{\circ}\text{C}$ ,  $V_{DD} = 2.1\text{ V}$  and  $R.H. = 50\%$  measured in a pressure chamber test setup. All voltages refer to GND node

| Parameters                   | Symbol                    | Min. | Typ. | Max. | Unit          | Test Conditions                                    |
|------------------------------|---------------------------|------|------|------|---------------|----------------------------------------------------|
| Acoustic                     |                           |      |      |      |               |                                                    |
| Sensitivity                  | S                         | -39  | -38  | -37  | dBV/Pa        | 1KHz, 94dBSPL                                      |
| Signal to Noise Ratio        | S/N                       |      | 64   |      | dBA           | A-weighted                                         |
| Equivalent Noise Level       | ENL                       |      | 30   |      | dBA           | A-weighted                                         |
| Total Harmonic Distortion    | THD                       |      | 0.1  |      | %             | 94dBSPL                                            |
|                              |                           |      | 120  |      | dBSPL         | 1% THD @1KHz,<br>S = Typ.                          |
| Acoustic Overload Point      | AOP                       |      | 128  |      | dBSPL         | 10% THD @1KHz,<br>S = Typ.                         |
| Low Frequency Roll-off       | LFRO                      |      | <20  |      | Hz            | -3dB relative to 1KHz                              |
| Electrical                   |                           |      |      |      |               |                                                    |
| Supply Voltage               | Vdd                       | 1.6  |      | 3.6  | V             |                                                    |
| Current Consumption          | Isb                       |      | 80   |      | $\mu\text{A}$ | Vdd=2.1V                                           |
|                              |                           |      | 80   |      | $\mu\text{A}$ | Vdd=3.6V                                           |
| Power Supply Rejection       | PSR+N                     |      | -93  |      | dBA           | 217Hz, 100 mV peak to peak square wave on Vcc 2.1V |
| Power Supply Rejection Ratio | PSRR                      |      | 63   |      | dB            | 1KHz, 200 mV peak to peak sine wave on Vcc 2.1V    |
| Output Impedance             | Zout                      |      |      | 200  | $\Omega$      | @1KHz                                              |
| Output DC Offset             |                           |      | 1.3  |      | V             |                                                    |
| Directivity                  | Omnidirectional           |      |      |      |               |                                                    |
| Polarity                     | Decreasing output voltage |      |      |      |               | Increasing sound pressure                          |

## Frequency Response

### Frequency Response



*Typical frequency response normalized to 1KHz (Measured)*

*Typical frequency response normalized to 1KHz (Measured)*

## Reliability Qualifications

Table 4

| Test Item                       | Description                                                                                                                                                                                               |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High Temperature Storage        | Storage at 125°C for 1,000 hours<br>IEC 60068-2-2 Test Ba                                                                                                                                                 |
| Low Temperature Storage         | Storage at -40°C for 1,000 hours<br>IEC 60068-2-1 Test Aa                                                                                                                                                 |
| High Temperature Operation Bias | Under Bias at 105°C for , 1,000 hours<br>IEC 60068-2-2 Test Ba                                                                                                                                            |
| Low Temperature Operation Bias  | Under Bias at -40°C for , 1,000 hours<br>IEC 60068-2-1 Test Aa                                                                                                                                            |
| Temperature Humidity Bias       | Under Bias at 85°C/85%RH for 1,000 hours<br>JESD22-A101-B                                                                                                                                                 |
| Thermal Shock                   | Thermal Shock 100 cycles from -40°C~125°C, 100 cycles<br>IEC 60068-2-14                                                                                                                                   |
| Reflow                          | 3 reflow cycles with peak 260°C<br>J-STD-020D                                                                                                                                                             |
| Vibration                       | 4 cycles lasting 12 minutes from 20 to 2KHz in X, Y and Z with peak acceleration of 20G<br>MIL 883E, Method 2007.2, A                                                                                     |
| Shock                           | 3 pulses 10,000G in X,Y and Z<br>IEC 60068-2-27, Test Ea                                                                                                                                                  |
| ESD                             | HBM:3KV, MM:300V, CDM:500V<br>Air Discharge:15KV,<br>Contact Discharg:8KV<br>JESD22-A114(HBM);<br>JESD22-A115(MM)<br>JESD22-C101(CDM)<br>IEC 61000-4-2(Air Discharge)<br>IEC 61000-4-2(Contact Discharge) |
| Tumble test                     | 300 tumbles from a height of 1m onto a steel base.                                                                                                                                                        |

Notes: Microphones meet all acoustic and electrical specifications before and after reliability testing, except sensitivity which can deviate up to 3dB.

After 3 reflow cycles, the sensitivity of the microphone shall not deviate more than 1 dB from its initial value

## Reflow Profile

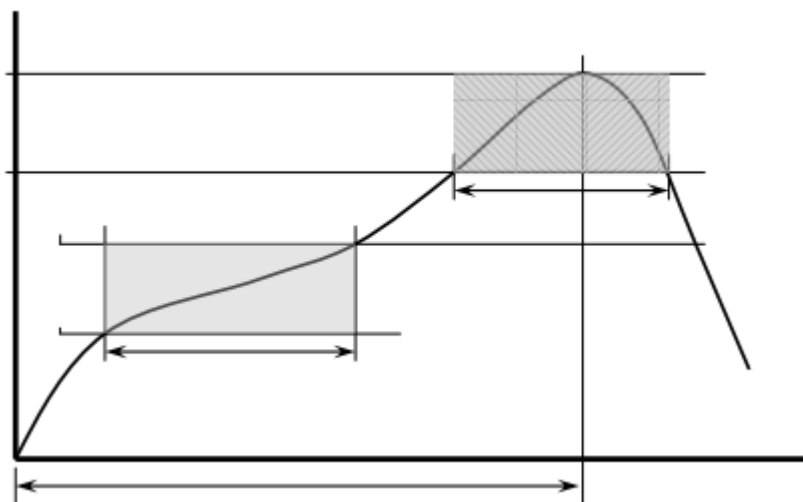


Table 5. Recommended Reflow Profile Limits

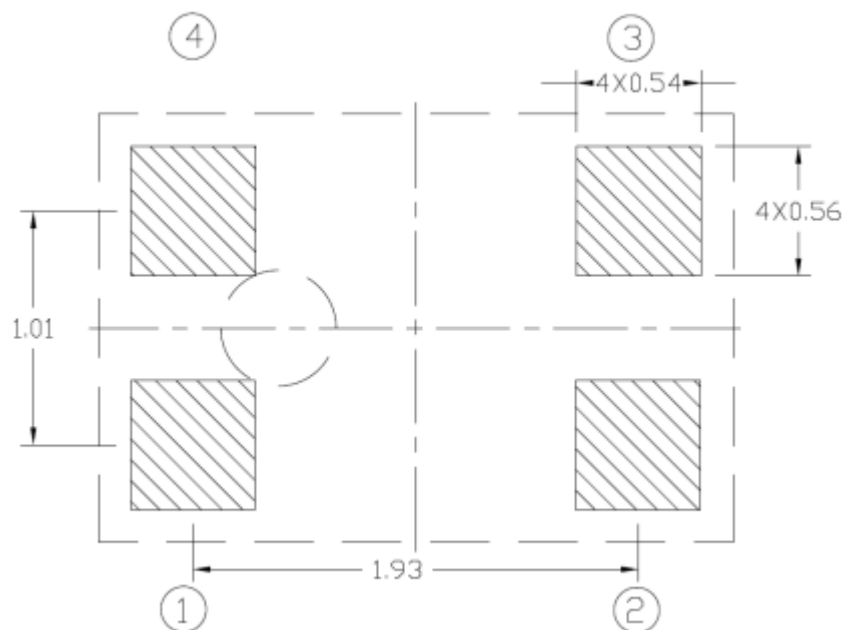
| Profile Feature                            | Pb-free          |
|--------------------------------------------|------------------|
| Preheat                                    |                  |
| Minimum temperature (Tsmin)                | 150 °C           |
| Maximum temperature (Tmax)                 | 200 °C           |
| Time (ts)                                  | 60~180 sec       |
| Average Ramp up rate (Tmax to Tp)          | 3 °C/sec         |
| Melting area                               |                  |
| Melting temperature (TL)                   | 217 °C           |
| Time maintained above melting (tl)         | 60~150 sec       |
| Peak Temperature (TP)                      | 260 °C           |
| Time within 5°C of actual peak temperature | 20~40 sec        |
| Ramp down rate                             | 6 °C/sec maximum |
| Time 25°C to peak temperature              | 8 minute maximum |

Notes: Based on IPC/JDEC J-STD-020 Revision C.

All temperatures refer to topside of the package, measured on the package body surface.

## PCB Land Pattern Layout

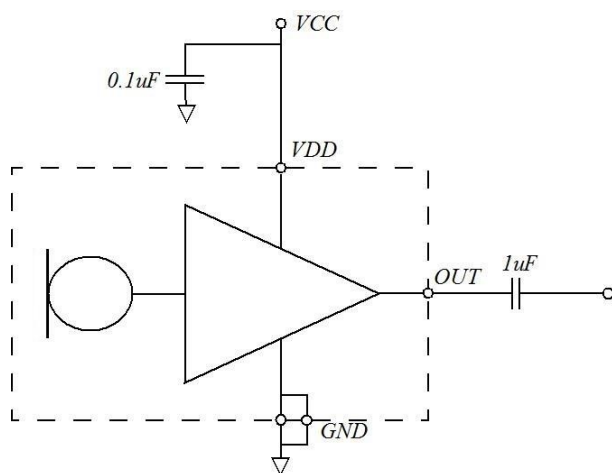
### Recommended Land Pattern





## Application Circuit

Typical Application:



## **Handling Instructions**

The MEMS microphone IC can be handled using standard pick-and-place and chip-shooting equipment. Care should be taken to avoid damage to the MEMS microphone IC structure as follows:

- . Do not apply vacuum nozzle over the acoustic port (AP) of the microphone to avoid damage to the device.
- . Do not blow air directly into acoustic port. If air gun cleaning is required, the minimum distance is 10cm and the maximum air blow pressure is 30psi.
- . Brushing the board with/without solvents may damage the device.
- . Do not use excessive force to place the microphone on the PCB.
- . In case of manual handling, it should be handled with plastic tweezers to avoid damage to the device.
- . Do not open and remove IC from packaging until devices are ready to be mounted.
- . Suggest PCB depaneling be done with depaneling cutter/router, or manually de-panel PCB with care and without any contact of MEMS Microphone IC.

## Dimensions

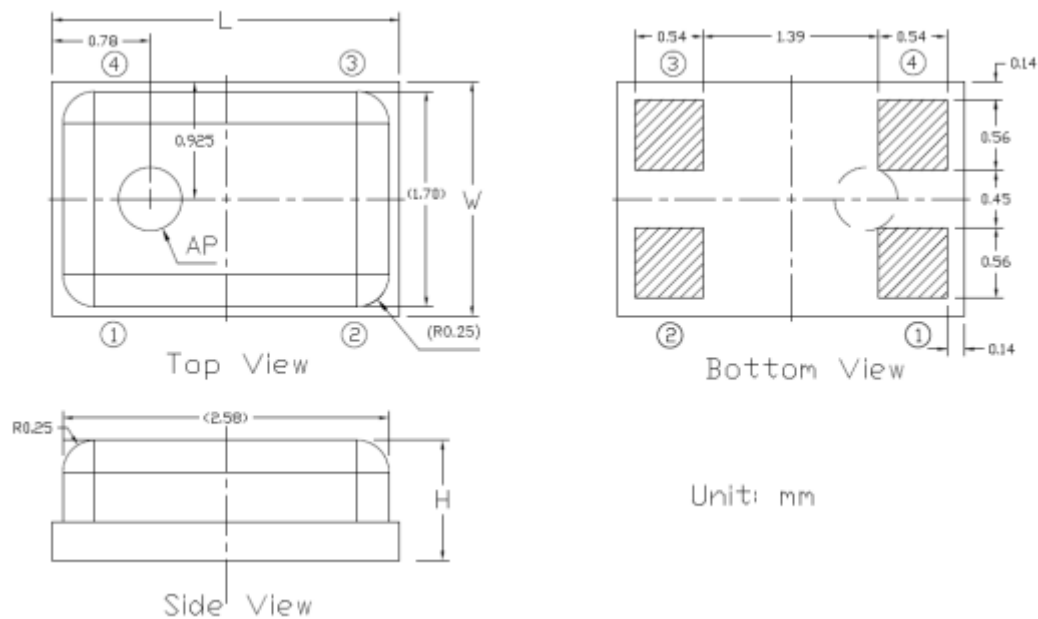
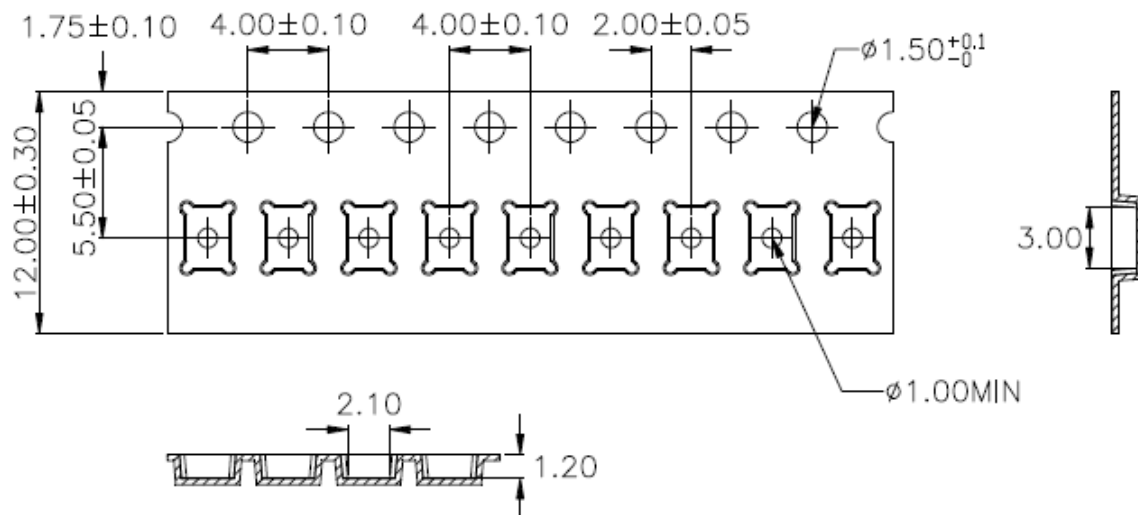


Table 6(Top View)

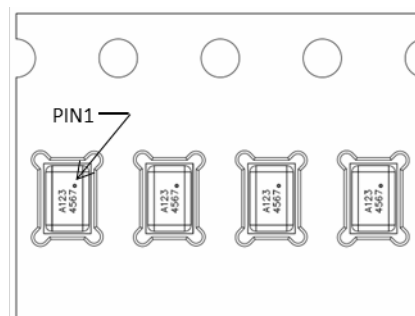
| Item          | Dimension      | Tolerance     |
|---------------|----------------|---------------|
| Length (L)    | 2.75 mm        | $\pm 0.10$ mm |
| Width (W)     | 1.85 mm        | $\pm 0.10$ mm |
| Height (H)    | 1.05 mm        | $\pm 0.10$ mm |
| Acoustic Port | $\Phi 0.50$ mm | $\pm 0.05$ mm |

## Package Information

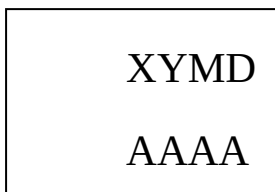
### Carrier Tape:



1. 10 sprocket hole pitch cumulative tolerance  $\pm 0.20$ .
2. Carrier camber is within 1 mm in 250 mm.
3. Material : Black Conductive Polystyrene Alloy.
4. All dimensions meet EIA-481 requirements.
5. Thickness :  $0.30 \pm 0.05$  mm.
6. MSL(Moisture sensitivity level) Class1.



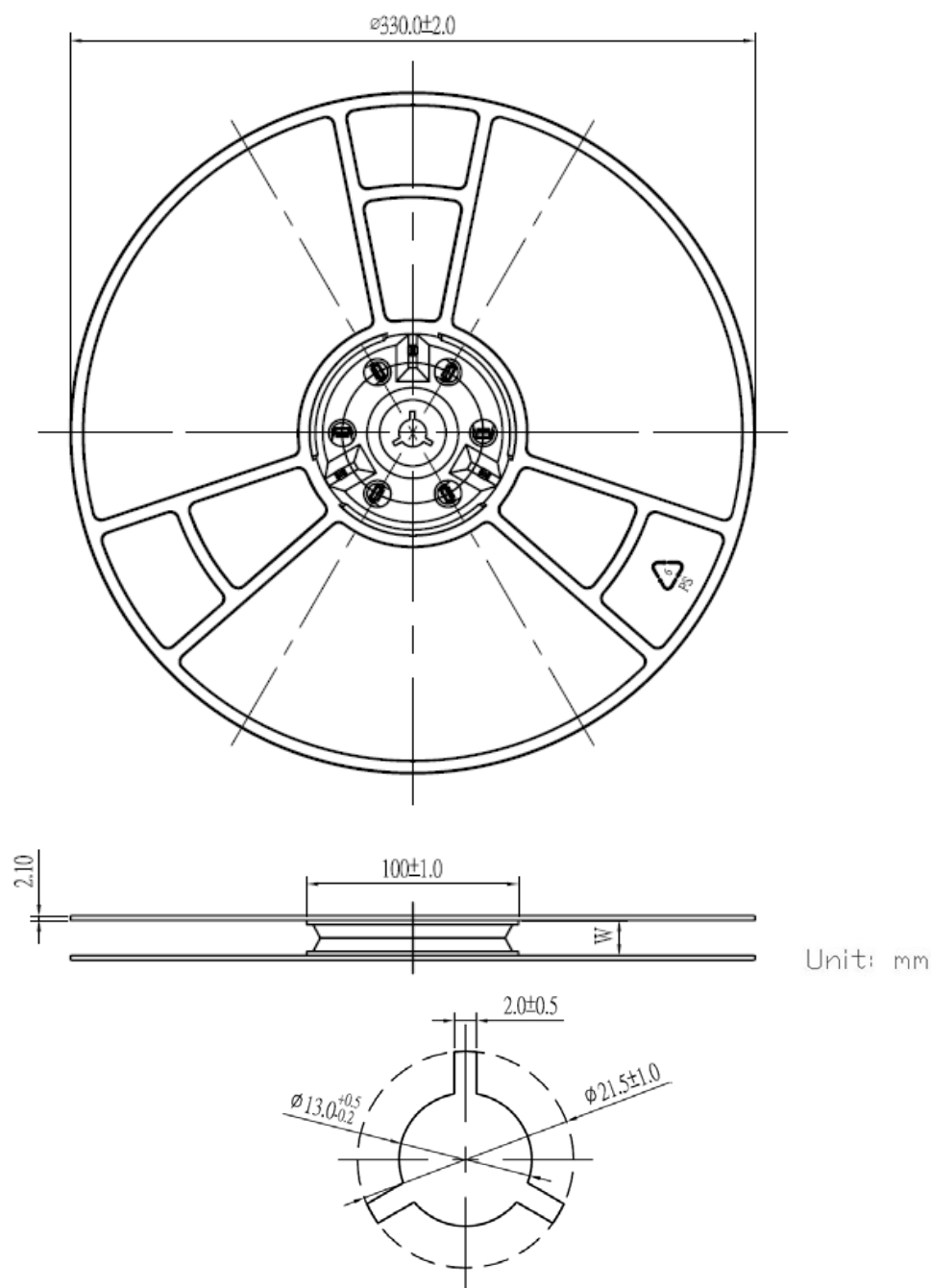
### Laser Marking:



### Laser marking on the top side

|      |                                                                                                 |
|------|-------------------------------------------------------------------------------------------------|
| XYMD | Internal Tracking Code(X:Subject to change without notice)<br>Date Code(Y:Year; M:Month; D:Day) |
| AAAA | Lot Tracking Code                                                                               |

13" Tape Reel :



| Model Number | Reel Diameter | Quantity Per Reel |
|--------------|---------------|-------------------|
| EB2718ATSSA  | 13"           | 5,000             |

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## Revision History

| Revision | Date       | Description    |
|----------|------------|----------------|
| 1.0      | 2021/03/29 | Formal release |