

***3SM121E4T1UB* MEMS Microphone IC**

Product Description

The *3SM121E4T1UB* 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 re-flow assembly. *3SM121E4T1UB* 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 mobile phone, headset.

Features

- High stability - no risk of membrane aging
- Suitable for automatic pick-and-place handler and SMT process
- Miniature dimension 3.76mm x 2.95mm x 1.10mm
- Low current consumption 80uA
- RoHS/Green Compliant
- Sensitivity deviation within ± 1 dB
- Package type : LGA 4-pin

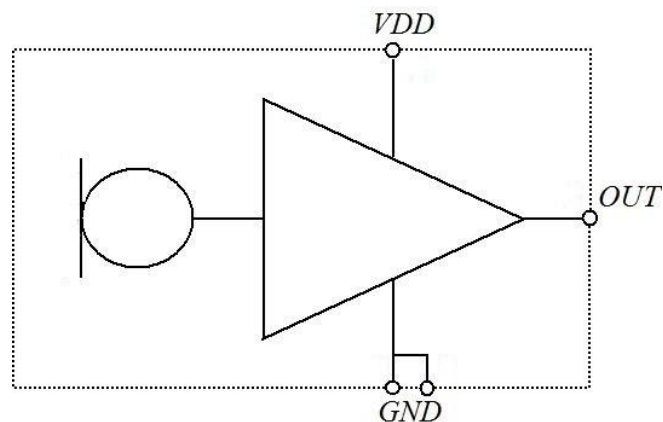
Applications

- Mobile Phones
- ANC Headsets
- TWS Headsets
- IoT Devices

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Functional Block Diagram



Acoustical and Electrical Characteristics

Table 1 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 | -43 | -42 | -41 | dBV/Pa | 1kHz, 94dB SPL |
| Signal to Noise Ratio | S/N | | 59 | | dBA | A-weighted |
| Equivalent Noise Level | ENL | | 35 | | dBA | A-weighted |
| Total Harmonic Distortion | THD | | 0.1 | | % | 94dB SPL |
| Acoustic Overload Point | AOP | | 130 | | dBSPL | 10% THD @1kHz, S = Typ. |
| Electrical | | | | | | |
| Supply Voltage | Vdd | 1.6 | | 3.6 | V | |
| Current Consumption | I _{sb} | | 80 | | μA | |
| Power Supply Rejection | PSR+N | | -93 | | dBA | 217Hz, 100 mV peak to peak square wave superimposed on Vcc 2.1V |
| Power Supply Rejection Ratio | PSRR | | 63 | | dB | 217Hz, 200 mV peak to peak sine wave superimposed on Vcc 2.1V |
| Output Impedance | Z _{out} | | | 200 | Ω | |
| Output DC Offset | | | 1.3 | | V | |

Temperature Range

Table 2

| | | |
|-----------------------------|------------------|---------------|
| Storage Temperature | T _{STG} | -40°C ~ 100°C |
| Operating Temperature Range | T _A | -40°C ~ 85°C |

Reliability Qualifications

Table 3

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

Reflow Profile

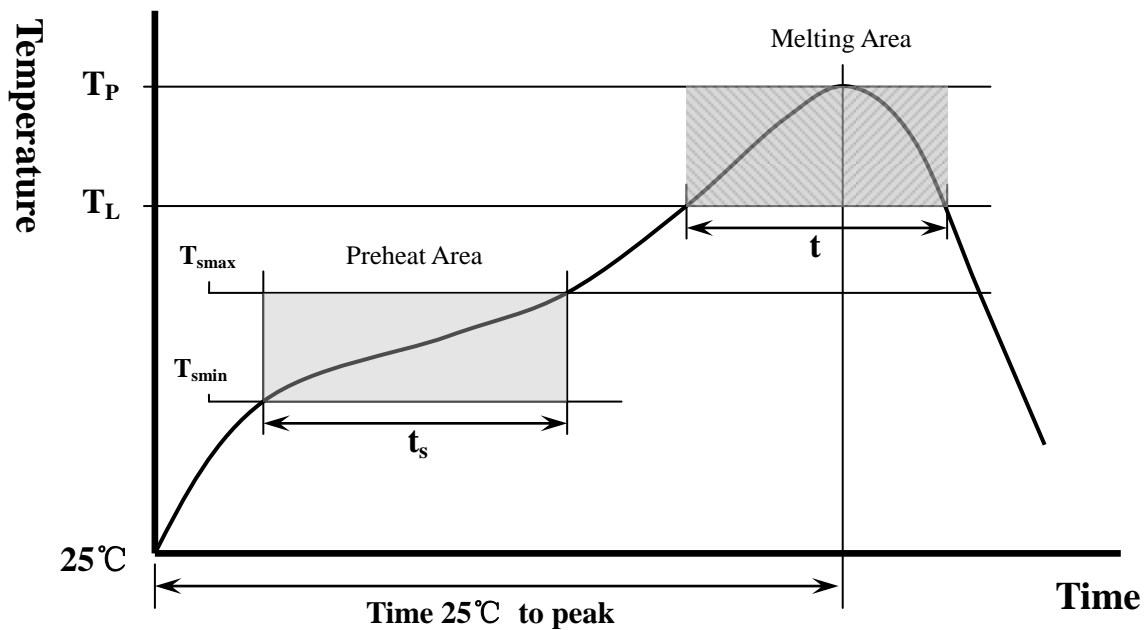
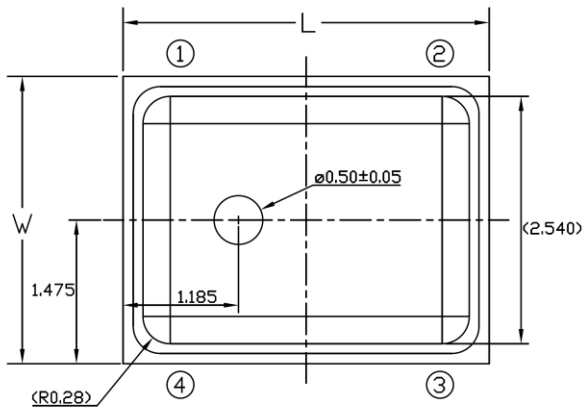


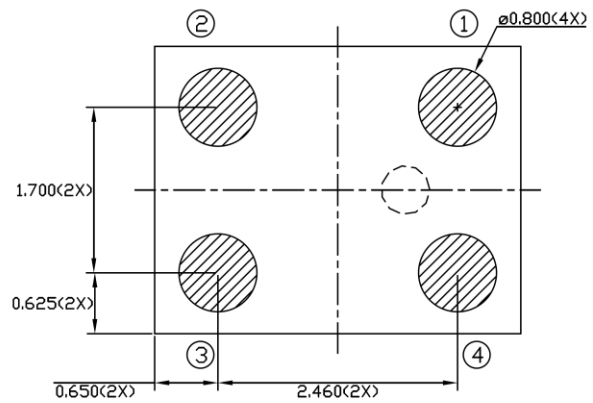
Table 4. Recommended Reflow Profile Limits

| Profile Feature | Pb-free |
|--|------------------|
| Preheat | |
| Minimum temperature (T_{smin}) | 150 °C |
| Maximum temperature (T_{smax}) | 200 °C |
| Time (t_s) | 60~180 sec |
| Average Ramp up rate (T_{smax} to T_P) | 3 °C/sec |
| Melting area | |
| Melting temperature (T_L) | 217 °C |
| Time maintained above melting (t) | 60~150 sec |
| Peak Temperature (T_P) | 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 |

Pin Definition and Function

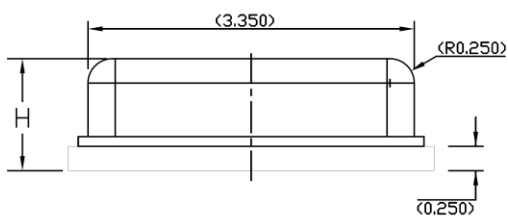


Top View



Bottom View

Unit: mm

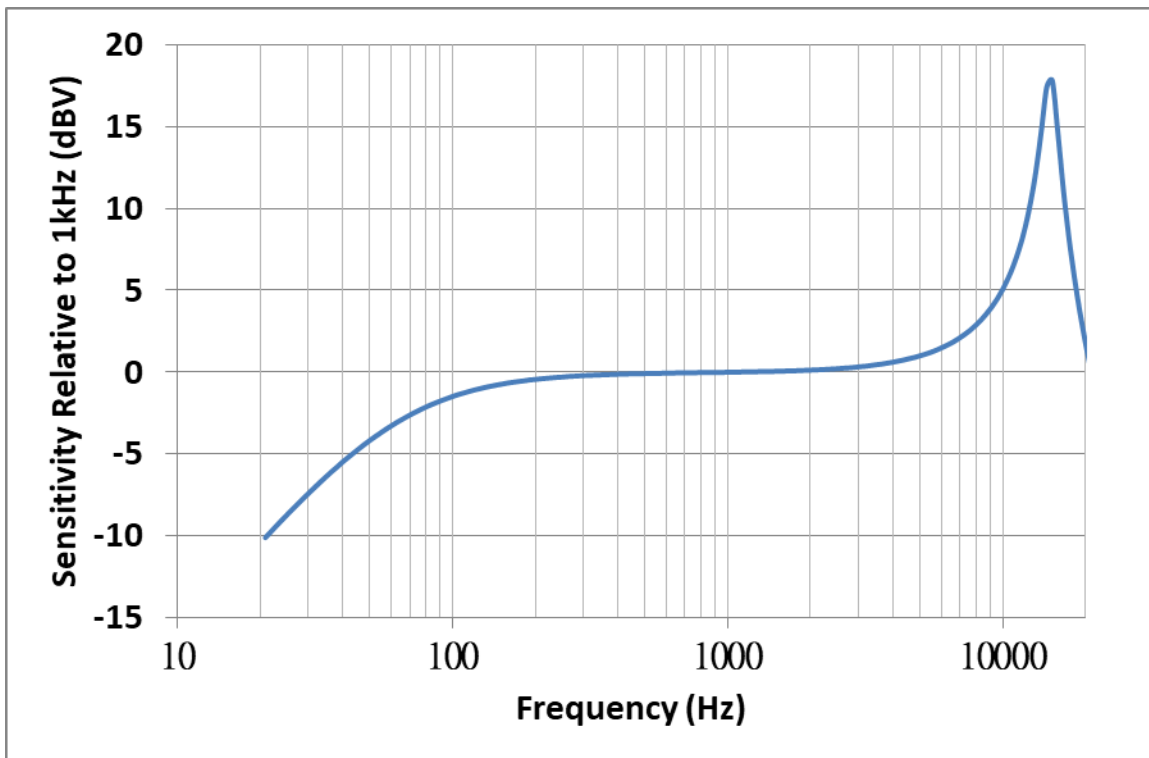


Side View

Table 5

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

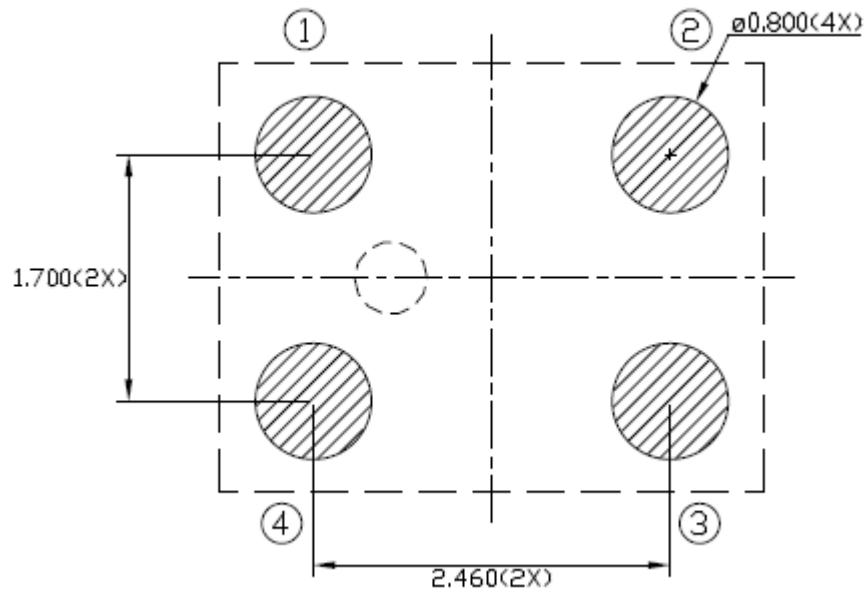
Frequency Response



Typical frequency response normalized to 1KHz (Measured)

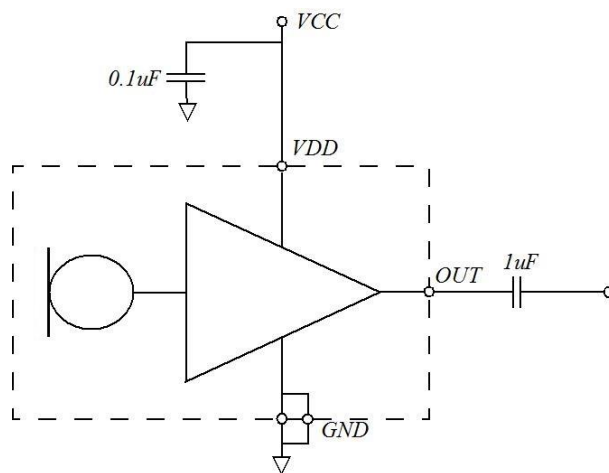
PCB Land Pattern Layout

Recommended Land Pattern



Application Circuit

Typical Application:

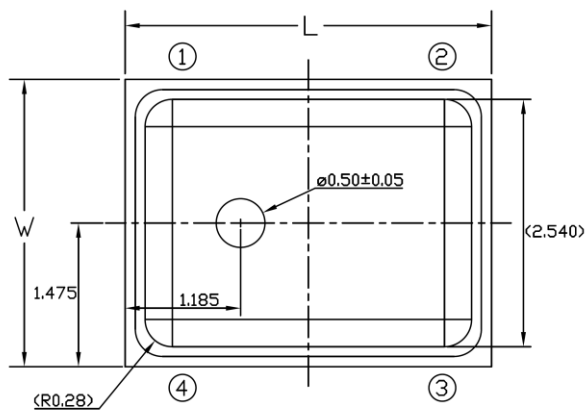


Handling Instructions

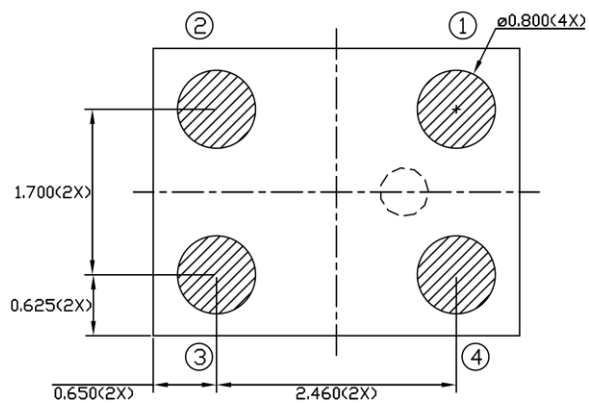
The MEMS microphone IC can be handled using standard pick-and-place and chip-shooting equipment. Care should be taken to avoid damage to the MEMS microphone IC structure as follows:

- 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

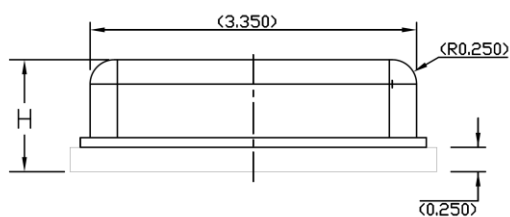


Top View



Bottom View

Unit: mm



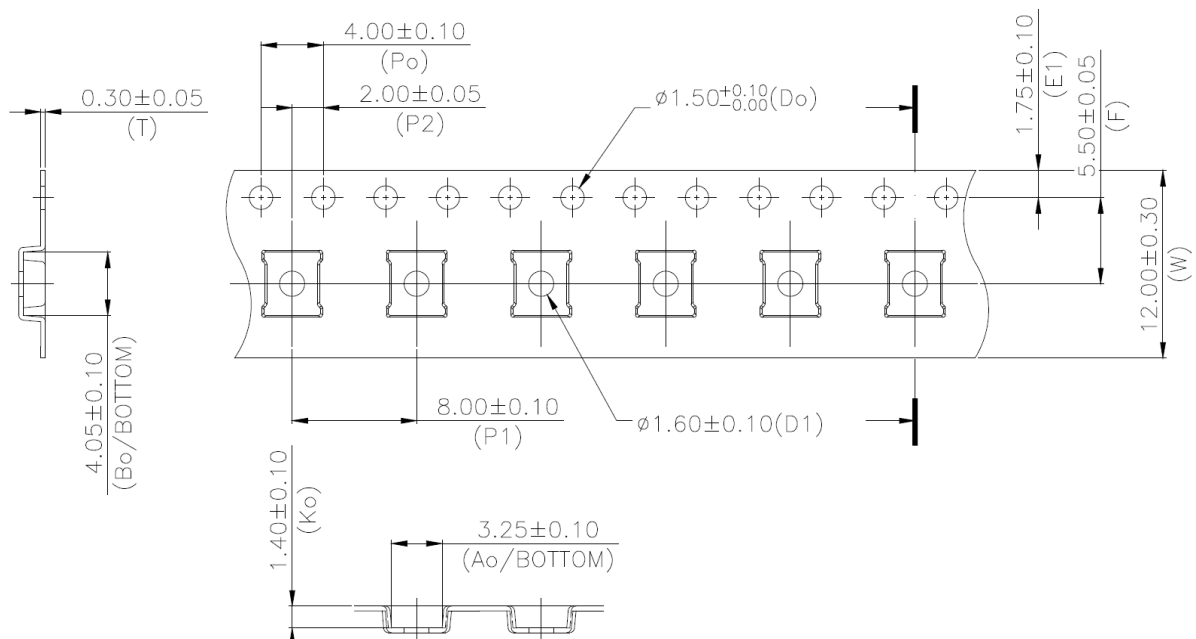
Side View

Table 6(Top View)

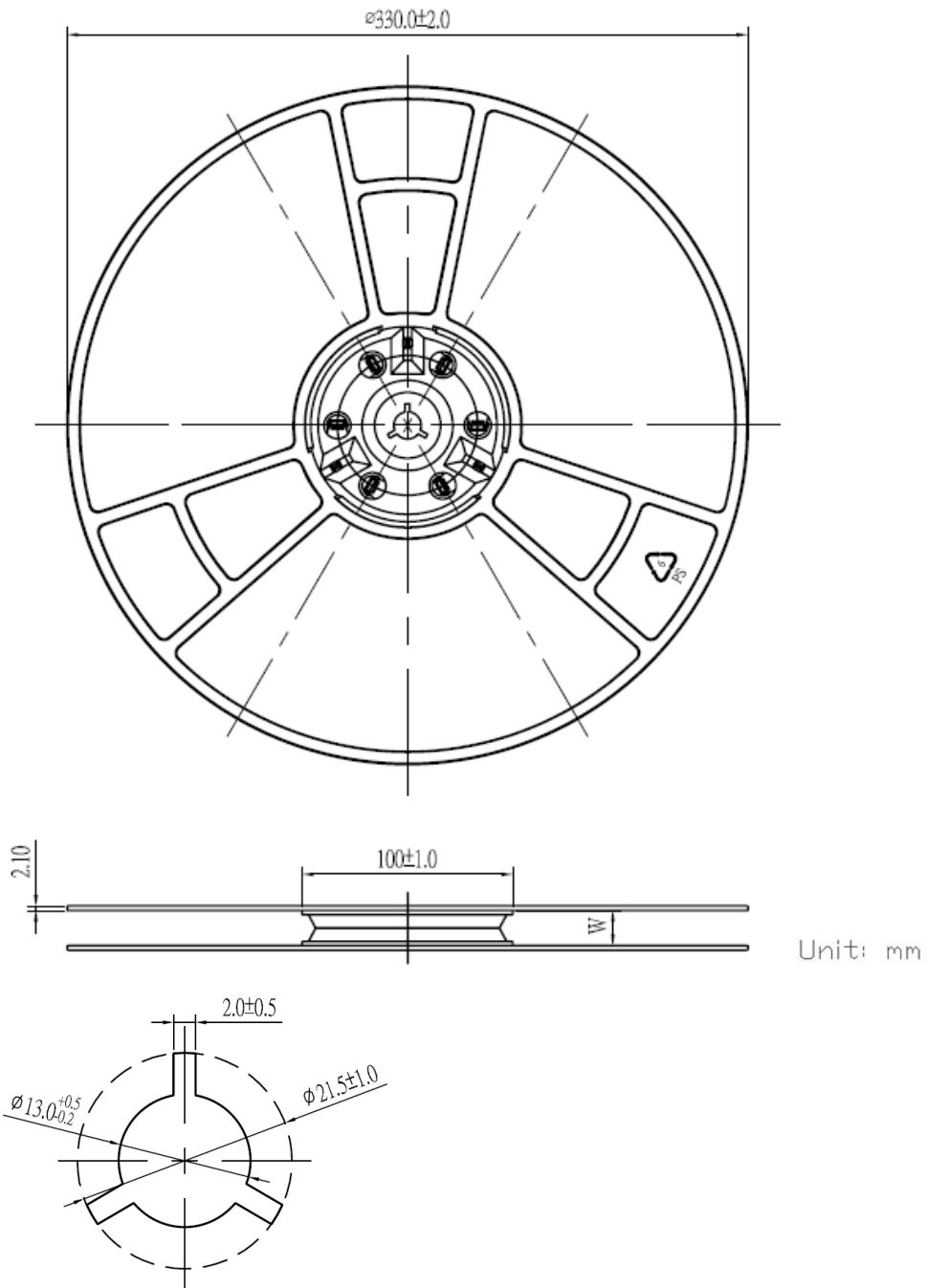
| Item | Dimension | Tolerance |
|---------------|-----------|-----------|
| Length (L) | 3.76 mm | ±0.10 mm |
| Width (W) | 2.95 mm | ±0.10 mm |
| Height (H) | 1.10 mm | ±0.15 mm |
| Acoustic Port | Φ 0.50 mm | ±0.05 mm |

Package Information

Carrier Tape:



1. 10 sprocket hole pitch cumulative tolerance ± 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 ± 0.05 mm.
6. MSL(Moisture sensitivity level) Class1.

13" Tape Reel :


| Model Number | Reel Diameter | Quantity Per Reel |
|--------------|---------------|-------------------|
| 3SM121E4T1UB | 13" | 5,000 |

Revision History

| Revision | Date | Description |
|----------|------------|-----------------------------|
| 1.0 | 2019/09/27 | Formal release |
| 1.1 | 2019/10/04 | Modify "Frequency Response" |

单击下面可查看定价，库存，交付和生命周期等信息

[>>3S\(Solid state system\)\(鑫创科技\)](#)