



**Vesper Piezoelectric MEMS Voice Accelerometers**  
**ASSEMBLY AND HANDLING GUIDLINES**

**Application Note 10**  
**Rev 0.0.1**

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## 1. INTRODUCTION

This Application Note is intended to be used as a reference for the best practices in the manufacturing process using Vesper’s piezoelectric MEMS voice accelerometers. Vesper piezoelectric MEMS devices are inherently robust by design.

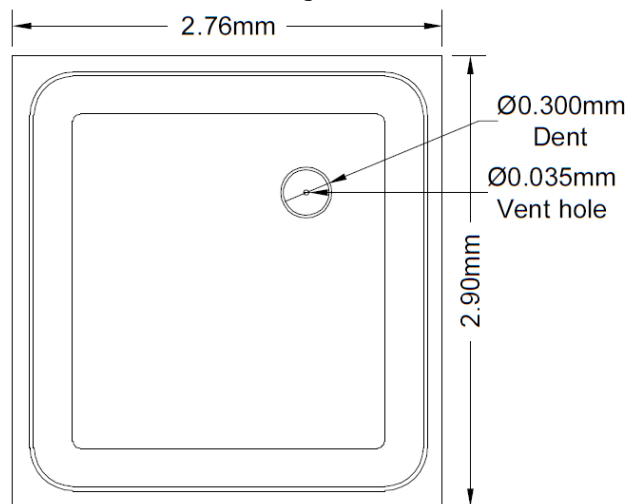
### 1.1 MOISTURE SENSITIVITY (MSL) RATING

Vesper voice accelerometers have a Moisture Sensitivity Level (MSL) of 1, which means they have an unlimited floor life and do not need to be kept in a dry pack or stored in a dry-box after the package has been opened.

### 1.2 GENERAL HANDLING

Vesper’s piezoelectric MEMS voice accelerometers are resistant to harsh environments such as dust and moisture. However, to avoid mechanical damage to the accelerometer, we recommend using appropriate handling procedures when manually handling the parts or when using pick and place equipment. The following guidelines will avoid damage:

- Tape and Reel handling
  - Store Tape and Reel box in a vertical position
  - Carefully follow the Tape and Reel specifications in the product datasheet before feeding into the pick and place machine
  - Discard devices that are mishandled
- Mechanical handling
  - Do not apply high air pressure over the vent hole. For example, air gun should not be applied directly on to the vent hole.
  - Do not introduce water or spray through the vent hole of the device.
  - Do not expose the vent hole to harsh chemicals.
  - Epoxy/glue is not required for the vent hole as Vesper’s voice accelerometers are immune to air conducted sound. Vent hole location for one of Vesper’s voice accelerometers is as shown below.
  - Use a placement force of <1,000g when using a pick and place machine.
  - Vesper MEMS accelerometers are tolerant up to a 10,000 g shock.
  - Do use the recommended device pick location as noted in the product datasheet.
- Other handling recommendations
  - Vesper MEMS accelerometers are not sensitive to light.



*Vent hole location for VA1200, one of Vesper’s voice accelerometers*

### 1.3 ELECTROSTATIC DISCHARGE (ESD)

Vesper MEMS voice accelerometers are Level 2 (passes 2kV) compliant for ESD-HBM and Level C2b (passes 750V) for ESD-CDM. Please refer to JEDEC specs JS-001/JS-002 for details.

## 2. PCB MOUNT SETUP

Vesper piezoelectric MEMS voice accelerometers are fully solder reflow compatible. They can be placed on the PCB using a pick and place machine with the recommended device pick location as noted in the product datasheet or by hand. The following guidelines will ensure successful PCB mount every time.

### 2.1 SOLDER TYPE

Solder: SAC305 alloy (Sn 96.5%, Ag %3.0, Cu %0.5) or equivalent  
Flux: No clean flux

### 2.2 SOLDER STENCIL TYPE

Stencil Type: Laser cut  
Stencil Thickness: 100um approx.

### 2.3 SOLDER STENCIL AND PCB LAND PATTERN DESIGN

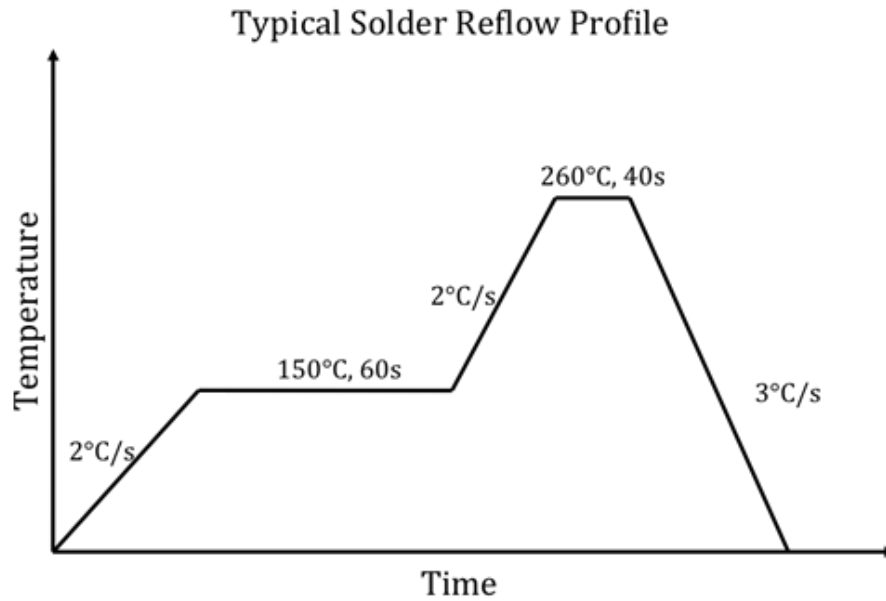
The PCB land pattern should be a 1:1 match of the voice accelerometer pins when viewing the accelerometer from the topside (lid side). Please follow the PCB and solder stencil pattern in the product datasheet.

## 3. SOLDER REFLOW PROFILE

Vesper piezoelectric MEMS voice accelerometer can be soldered with the industry standard reflow profile described in JEDEC standard J-STD-020.

### 3.1 REFLOW PROFILE

For Pb-free solder the mic should reach a peak temperature of 260°C:



*Recommended Solder Reflow Profile*

#### 4. REVISION HISTORY

Revision	Date	Description
0.0.1	01/22/2021	Initial Revision