AN1302

Motorola Pressure Sensors — Recommended Housing For Very Low Absolute Pressure Measurements

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INTRODUCTION

This application note describes the problems of measuring absolute pressure under 30 kPa and a description of a housing to solve these problems.

PROBLEM

When measuring absolute pressure under 30 kPa, very small leaks may introduce small offset and/or linearity errors.

CAUSE

Micro leaks are due to a very small gap between the metal leadframe and the plastic molded housing which surrounds the pressure sensor die.

When the sensor is measuring a very low pressure, the ambient pressure may be large enough to force some bubbles into the protective gel which may introduce stress on the sensor die.

SOLUTION

One way to avoid the problem is to place the sensor element in an external encapsulation. This can easily be achieved as shown in Figures 1, 2 and 3. These figures show the use of epoxy molding or equivalent compound in the solution of the problem.

The hermeticity must be very well done at the interface with the electrical connection to prevent any error; nevertheless if the leak is small enough the error may be negligible. The pressure around the sensor in this case is the same inside and outside of its housing.

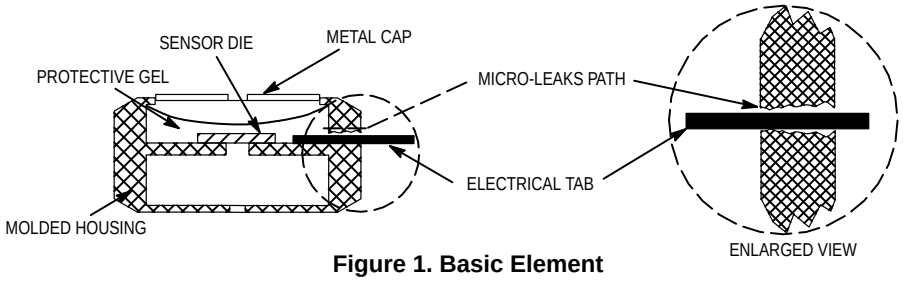

Figure 1. Basic Element

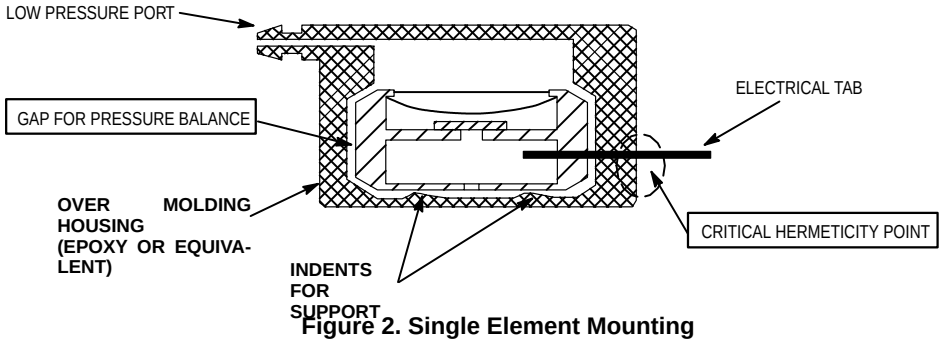

Figure 2. Single Element Mounting

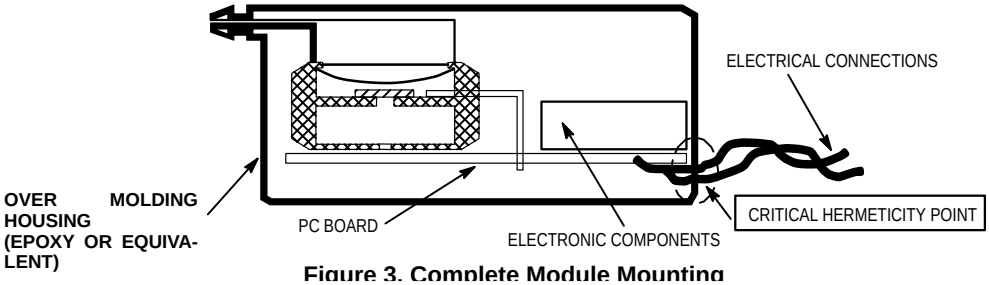

Figure 3. Complete Module Mounting

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