INO has developed a number of hermetic vacuum packaging technologies for MEMS devices based on metallic and ceramic headers. Processes are performed in state-of-the-art semi-automated vacuum furnaces and systems that allow for activation of thin film getters. The ceramic LCC vacuum packaging technology can accommodate uncooled bolometric detectors and other MEMS devices that require a vacuum environment below 10 mTorr. For temperature-sensitive devices, a low temperature process can be used (<175°C). INO’s solid expertise in vacuum technology allows to adapt the vacuum sealing technology to specific device requirements. INO also offers short-series production and technology transfers.

APLICATIONS
• LWIR imagers and sensors
• Various MEMS devices such as:
  • Accelerometers
  • Resonators
  • Micromirrors

BENEFITS
• High productivity due to batch processing
• Low-cost
• Compact size
• Fluxless technology
• Compatible with temperature sensitive devices
• Flexibility in package geometry, window materials and solder alloys
• Integrated pressure sensors for cavity pressure monitoring

CERAMIC LCC PACKAGES

Ceramic LCC Package
68 pins

Ceramic LCC Package
116 pins
# HERMETIC VACUUM PACKAGING

Ceramic LCC Packages

## TYPICAL SPECIFICATIONS

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<td>Package</td>
<td>Leadless Chip Carrier (LCC)</td>
<td>Leadless Chip Carrier (LCC)</td>
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</table>
| Footprint                | - External size: 24 x 24 mm  
                         |  - Cavity size: 15.8 x 15.8 mm  
                         |  - Cavity depth: 1.3 mm                                                   | - External size: 32.3 x 32.3 mm  
                         |  - Cavity size: 23.2 x23.2 mm  
                         |  - Cavity depth: 1.52 mm                                                  |
| Number of pins           | 68                                                                             | 116                                                                            |
| Window                   | Germanium, Silicon and N-BK7 (Antireflection Coating on request)              | (Antireflection coating on request)                                          |
| Getter                   | SAES PaGeLid                                                                  |                                                                                |
| Pressure                 | <10 mTorr                                                                     |                                                                                |
| Max. process temperature |                                                                                | 175°C or 285°C                                                                |
| Throughput               | 12 packages/run                                                               | 9 packages/run                                                                |
| Hermeticity yield        | > 90%                                                                          |                                                                                |
| Package reliability*     | Shock: MIL-STD-810 method 516  
                         |  Vibration: MIL-STD-810 method 516  
                         |  Thermal cycling: MIL-STD-810 method 501  
                         |  Temperature/humidity: GR-1209-CORE                                        | In progress:  
                         |  Shock: MIL-STD-810 method 516  
                         |  Vibration: MIL-STD-810 method 516  
                         |  Thermal cycling: MIL-STD-810 method 501  
                         |  Temperature/humidity: GR-1209-CORE                                        |

*175 °C bonding process reliability under progress