

SCHOTT: The International Expert in Glass- and Ceramics-to-metal Sealing Technologies

SCHOTT Electronic Packaging is the only global supplier who offers **all** types of hermetic housing technologies. Well-known for its expertise in glass-to-metal seals (GTMS), SCHOTT has been offering high temperature co-fired ceramics (HTCC) for the last 10 years. Now, it also supplies low-temperature co-fired ceramics (LTCC) with its partner, VIA electronic.

Glass-to-metal Sealing Technology

For more than 70 years, SCHOTT has been developing and manufacturing hermetic packaging components in which wiring is guided through metal and then insulated using melted glass. Extensive stress tests show that this bond remains completely sealed, even in harsh conditions.

Hence, SCHOTT's GTMS packages protect sensitive electronic components from aggressive chemicals and extreme pressures and temperatures in a wide variety of applications, including:

- Automotive
- Communications
- Nuclear power plants and submarines

In addition to standard products, the design (e.g. pin count, layout, materials) of the feedthroughs can be customized. Similarly, the manufacturing process can also be adjusted to meet individual customer requirements.

Ceramic-to-metal Sealing (SCHOTT CerTMS®) Technology

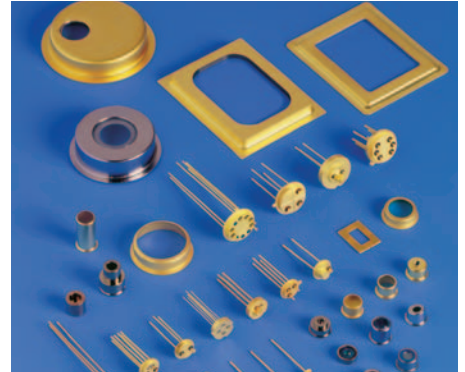
Hermetic packages with ceramic-to-metal seals offer a large number of inputs/outputs. Hence, this technology is suitable for complex rerouting and cross wiring package designs. GTMS and CerTMS® can also be combined in one hybrid package for complicated configurations. Additional optical and thermal interfaces – especially for fiber optic applications – can be integrated using conventional soldering processes with glass or metal solder.

Full Ceramic Packages

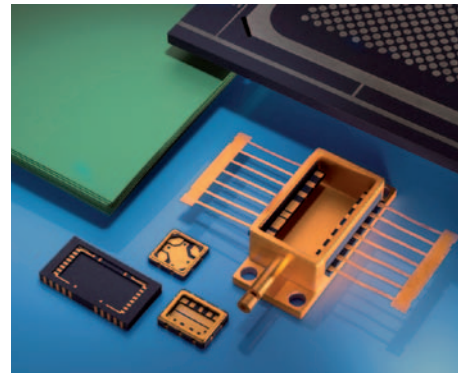
Multilayer ceramics (HTCC and LTCC) form part of the printed circuit board (PCB) layout inside the package. Hence, they are ideal for complex designs and makes it easier to miniaturize packages. Standard IC interconnection processes can be used and impedance matched high frequency feedthroughs for fast data transmission can also be integrated into the system.

Ceramic packages are found in applications such as:

- Opto-electronics
- High frequency communications
- Micro-electronic-mechanical systems (MEMS)



Variety of GTMS TO headers, windows and caps



SCHOTT CerTMS® hybrid package and HTCC packages



Variety of high and low temperature co-fired ceramics

The One-stop Source for All Hermetic Packages

Optical Glass Expertise

A hermetic package is composed of two parts, the housing with sealed-in feedthroughs and a matching lid. In opto-electronics, the lid or cap fulfills two primary functions. First, it protects the optical components of transmission and reception applications. Second, it acts as an optical interface. Hence, the optical properties of the window or lens installed in the cap must fulfill extremely high requirements.

SCHOTT has been the first to systematically develop optical glasses over the last 125 years. In-house experts have accumulated a strong foundation and experience in providing specialty glasses and materials for a variety of applications. SCHOTT is, thereby, well-equipped to offer design capabilities to help customers modify and optimize their optical designs to achieve higher efficiencies.

Aspherical Lens and Ball Caps

A low T_g glass molded asphere or a ball lens is hermetically sealed into a machined metal frame with the use of specialized solder glass. This sealing technique has been used in numerous applications, and the seal between the glass body and the metal cap has shown to be very stable.

In addition, SCHOTT can leverage upon its expertise in glass technology to develop and mold aspheres of extremely small diameters or provide customized glass types to suit different specification requests such as refractive indices and ball lens diameters.

SCHOTT's soldered aspherical and ball lens caps are used in:

- TOSA and ROSA designs
- FTTx applications
- Specialty imaging

Molded Lens Caps

Molded caps are sealed hermetically by fusing the glass directly to the metal frame without the use of any other interface materials. The fusion process must be designed in such a way that the glass can cool down without the formation of bubbles and inclusions, while at the same time achieve the desired optical properties, which is often subject to very low tolerance limits.

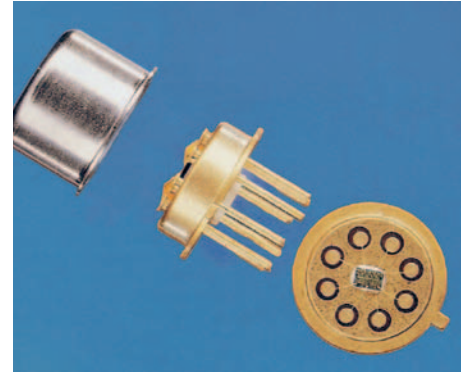
Molded lens caps from SCHOTT are ideal for:

- Integrated sensors
- Photodiode receivers

For more information:

SCHOTT Electronic Packaging GmbH
Christoph-Dorner-Strasse 29
84028 Landshut
Germany

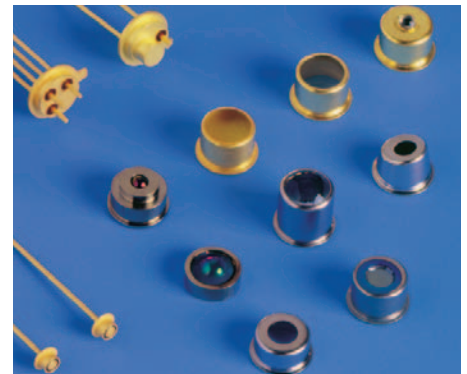
Phone: +49 (0)871/826-329
Fax: +49 (0)3641/288-89090
Tanja.Wituschek@schott.com
www.schott.com/epackaging



Hermetic sealing of TO package



Aspherical lens caps with molded glass aspheres and solder rings



Variety of TO caps, including ball lens caps, molded lens caps and window caps.