

Microelectronics: Integrated Circuit Packaging, Screening and Test

Possibilities of Packaging. *Made Easy.*

Honeywell's Integrated Circuit Packaging

Honeywell has a long history of delivering radiation hardened ICs in single chip packages and multi-chip modules (MCMs) for space and military applications. The packaging is a key factor in the long term reliability of the products.

Systems requirements vary widely and the package must meet both mechanical and electrical requirements while doing so in a small form factor. Honeywell offers a wide variety of ceramic packaging options supporting a range of pin counts up to 1200 or more and can support the high speed data requirements of today's communication links. Both hermetic and non-hermetic packaging technologies are available.

Hermetic Wirebond	Non-Hermetic Flip Chip	Multi-Chip Modules (MCMs)
Flat Pack (FP)	Land Grid Array (LGA)	Stacked Die
Quad Flat Pack (QFP)	Column Grid Array (CGA)	Double Sided
Land Grid Array (LGA)		Planar/non-stacked
Column Grid Array (CGA)		Memory and ASIC
Ball Grid Array (BGA)		Multi-Function
Dual In-line Package (DIP)		
Leadless Chip Carrier (LCC)		

Honeywell has a long history of package design and analysis services for QML-V / Space applications. Honeywell products have the ruggedness and reliability to survive long space missions.

- Developing high reliability ASICs, Memories and Mixed Signal microelectronics for military and space since early 1990's.
- Over 700 different ASIC designs have been manufactured by Honeywell

- Silicon On Insulator (SOI) CMOS is delivers radiation hardness by process
- Security of a Trusted facility and Foundry
- Honeywell has design, wafer fabrication, assembly, test and screening within a single facility.

Packaging Qualifications

Honeywell has developed packages for space ASICS and standard products since the early 1990's- designing over 500 different designs. Our customers have the security of partnering with a trusted facility and foundry. The packages are manufactured and screened to meet the demanding mechanical, electrical, and thermal requirements of space and military applications.

- Design, Assembly, Screening processes certified to MIL-PRF-38535.
- MIL-PRF-38535 Qualified Manufacturer for both "Q" Level tactical devices and "V" Level Space applications.
- QML Class Y Flip Chip in development, contact Honeywell for details.

New Package Development

Packaging continues to evolve with new technology and improvements to existing packages. This includes advances in package design and modeling to support requirements for:

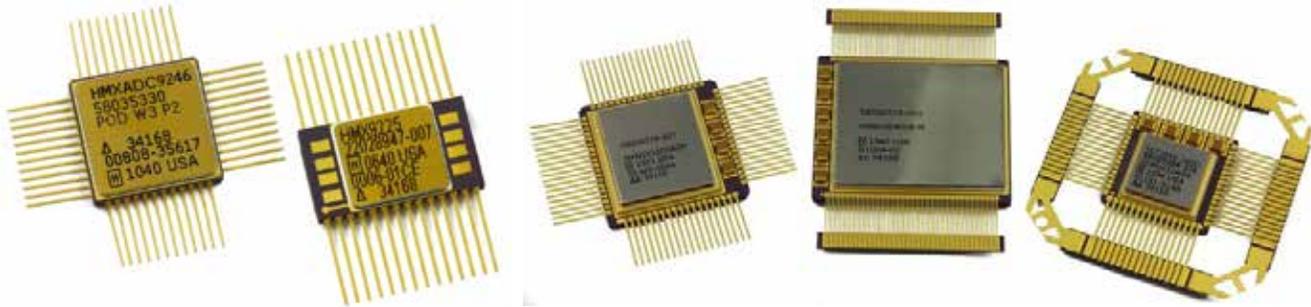
- Higher I/O Counts
- Reduction in package size
- Reducing mechanical stress
- Improved heat removal and increased power handling capability
- Increasing clock, data and single frequencies requiring low parasitic loading

Electrical Test / Burn-In / Screening

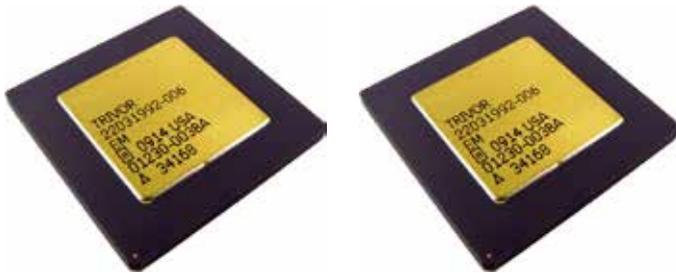
As part of the qualification process, our products are screened to MIL-PRF-38535 per MIL-STD-883 methods to meet QML V and Q requirements. Honeywell uses fully qualified test, burn-in, and screening processes and facilities. Burn-in encompasses static, dynamic, and accelerated test capabilities.

Testing, Burn-in, and Total Ionizing Dose (TID) radiation testing are conducted at Honeywell using advanced test hardware and software tools. The test data management system includes data storage, mapping, analysis and customized reporting. In addition to digital and analog testing, we also perform laser trimming for circuits requiring the highest precision.

Examples of Available Range Packages



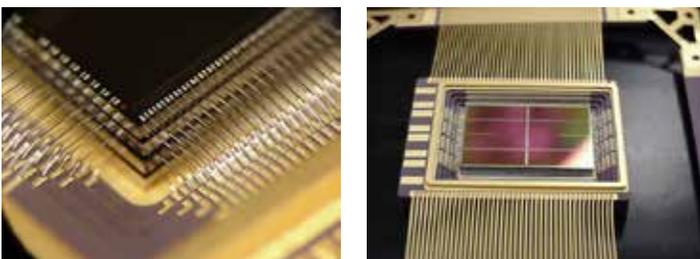
Flat Packs and Quad Flat Packs



Land Grid Arrays



Flip Chip



Die Stacking and Multi-Chip Modules

For More Information

For additional information about Honeywell's Microelectronics Integrated Circuit Packaging, Screening and Test, please visit: <https://aerospace.honeywell.com/microelectronics> or contact us at: microelectronics@honeywell.com

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