

# MODEL 165

## Custom Hybrid Military Grade Microcircuit

### DESCRIPTION

Hybrid microcircuits offer a reliable, cost effective alternative to larger and heavier circuit boards and to the costly design effort and implementation of a custom IC. Hybrids also offer the advantage of a much broader combination of components and resistor technologies. Generally, a circuit board schematic can be directly converted to hybrid technology with little or no change in component selection.

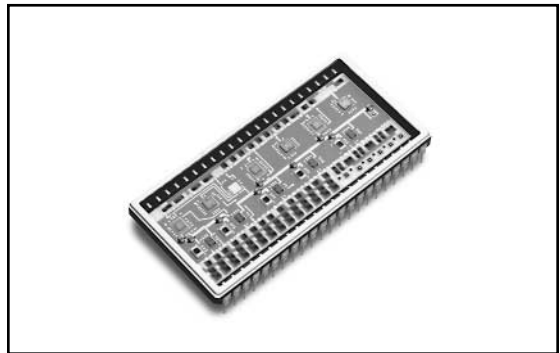
The implementation of a custom hybrid requires a partnership between the customer and BI. A project engineer and a program manager work with you throughout the design and manufacturing cycle.

BI specialist will assist in proper package and process selection to meet your environmental requirements. Our design engineers will develop a CAD layout design and the documents required for proper manufacturability.

### FEATURES

- Fully customized circuit and package
- Wide package variety
- Thick film and thin film technology
- QML-38534 listed
- Reduced package size
- Improved circuit performance
- Improved reliability

Specifications subject to change without notice.



Our quality assurance personnel will develop appropriate inspection and qualification plans.

Our hybrids consist of a ceramic substrate on which multiple layers of gold conductors, resistive inks and insulative materials are screened. Components are then epoxy mounted to the substrate. Semiconductors are wire bonded with gold and aluminum bonds. The substrate is then placed into a package and affixed with an epoxy preform. The package is sealed, marked and subjected to various environmental screens as required to meet customer specifications. All parts are 100% electrically tested over the operating temperature range using our custom automated test system.

The microcircuit quality, engineering and manufacturing systems are certified to QS 9000 and have been listed on the QML-38534 since 1989 for custom circuits.

### TYPICAL APPLICATIONS

- Analog signal conditioning
- Instrumentation amplifiers
- Power amplifiers
- Data acquisition
- Data converters
- Line driver/receiver
- Analog switching
- DC/DC converters

## ELECTRICAL

### Thick Film Resistors

Absolute Accuracy	to 0.5%
Temperature Coefficient of Resistance	$\pm 50\text{ppm}/^\circ\text{C}$ to $\pm 200\text{ppm}/^\circ\text{C}$
Temperature Coefficient of Resistance Tracking	$\pm 10\text{ppm}/^\circ\text{C}$

### Thin Film Resistors

Absolute Accuracy	to 0.1%
Temperature Coefficient of Resistance	$\pm 5\text{ppm}/^\circ\text{C}$ to $\pm 50\text{ppm}/^\circ\text{C}$
Temperature Coefficient of Resistance Tracking	$\pm 2\text{ppm}/^\circ\text{C}$
Operating Temperature Range	$-55^\circ\text{C}$ to $+125^\circ\text{C}$
Functional Trimming	Circuit accuracies can be tightened on certain parameters by performing active functional trimming on resistor elements

## COMPONENT TECHNOLOGIES

Semiconductor Components	All transistors & diodes in die form
Integrated Circuits	IC or ASIC in die form
Capacitors	Ceramic chip, tantalum chip and bondable MOS capacitors
Other Components	Wide range of components including inductors, transformers, crystals, etc

## MECHANICAL

Substrate	Alumina (beryllia also available)
Interconnect Layers	1 to 6
Interconnect Material	Gold or palladium silver
Die Attach	Epoxy (solder, eutectic also available)
Package Construction	Metal with glass insulated feedthroughs and cofired ceramic

## PACKAGING

Package Size	A wide variety of custom packaging from 0.25" to 3.0" on a side
Package types	Metal (seam weld), metal (solder seal), ceramic (seam weld), ceramic (solder seal), ceramic (epoxy seal) and polymer encapsulated (PEP)
Package configurations	SIP, DIP, Plug-in (platform or sidewall), Planar (flatpack) and LCC

## QUALITY

ISO 9001, QS 9000, QML-38534

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## ORDERING INFORMATION

During the proposal phase, a customer interface will be set up to develop and price alternate design approaches. A schematic with basic dimensional and environmental requirements are sufficient at this stage.

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## ENVIRONMENTAL

Environmental screens include, but are not limited to MIL-STD-883 such as: leak test, centrifuge, temperature cycling, burn-in and stabilization bake.

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