

## High temp multi-chip modules for down hole drills

*For continuous operation at ultra high temperatures*

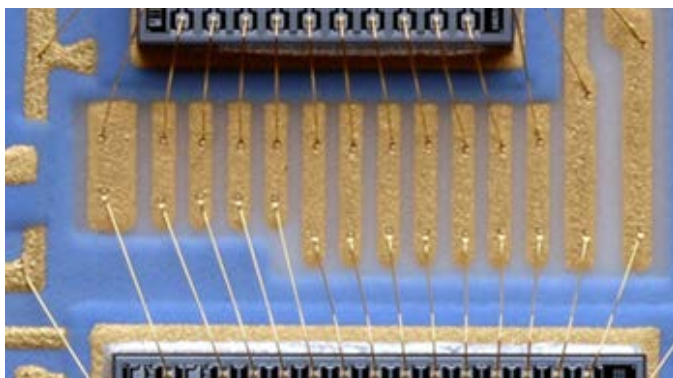
The oil and gas industry's need for electronics that can perform reliably for longer periods of time in ever-harsher environments and higher temperatures is growing steadily as the sector evolves. Plus, the volume and quality of oil and gas in new and difficult locations is much harder to evaluate, and the drive to improve the reserve-recovery rate, is increasing the importance of electronic down well measurement and control tools. The industry is now turning to Spectrum Control's custom MCMs (multi-chip modules) for help.

### Select For High-Rel and Features

Our specialist techniques of bare semiconductor die on thick film ceramic interconnect overcomes the high temperature performance and reliability limitations of traditional glass fibre laminate printed circuit boards. And our product solutions are specifically designed to fit down to 1" tubes to provide an ideal solution for small diameter tools operating at depth.

***Spectrum Control has over 70 years experience in the custom design, in-house manufacturing and testing of high reliability microelectronics.***

Spectrum Control's high temperature technology can reduce costs and downtime by prolonging the life of expensive drilling and monitoring equipment, with features including extended lifetime at 225°C, on-going development in ultra-high temperature ranges and the ability to reliably withstand extreme shock and vibration.



Spectrum Control has the ability to design and package electronics that can be placed deep inside the well shaft to constantly monitor and measure conditions, which are relayed back to the control room. This allows for intelligence-led decisions that can improve the efficiency of the well and decrease the likelihood of downtime.

### Custom Solutions for the Industry

We provide custom microelectronic solutions to reduce unnecessary and costly downtime due to the failure of short lifetime electronics within equipment encountering extremes. This includes:

- Measurement While Drilling (MWD)
- Logging While Drilling (LWD)
- Intelligent completions
- Extended life-time at 225°C continuous (Ultra High Temperature)