CH100 & CH101 OPTOCOUPLER SERIES

Hermetic Ceramic, Radiation-Hard Transistor Optocouplers For High-Reliability Applications

FEATURES

- Operational at Temperatures Below -150°C
- Total Ionizing Dose Tested to 150 Krad(Si)
- Displacement Damage Tested to 1 MeV x 10^{12}
- Surface Mount 4-Pin Package
- Flexibility in Design for Mounting Styles
- High Current Transfer Ratio
- High Isolation Voltage up to 1,000V_{DC}

2 Fern Court • Peterlee • County Durham • SR8 2RR • United Kingdom
W: www.isocom.uk.com
E: sales@isocom.uk.com
T: +44 (0)191 416 6546

Radiation-Hard CH100 & CH101 Optocouplers Tested for -150°C Low Temperature Atmospheres in Space Applications

Forward Voltage (V^F)

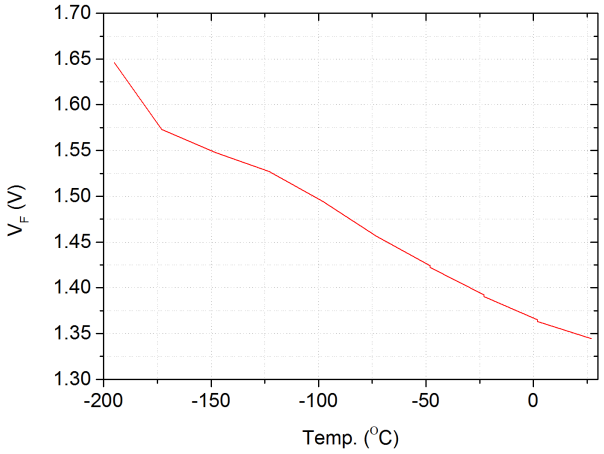

Figure 1 – *Forward voltage at various temperatures for the diode.*

Current Transfer Ration (CTR)

Where I_{CE} is the collector-emitter current, and IF is the forward current of the diode -

$$CTR = \left(\frac{I_{CE}}{I_F}\right) * 100$$

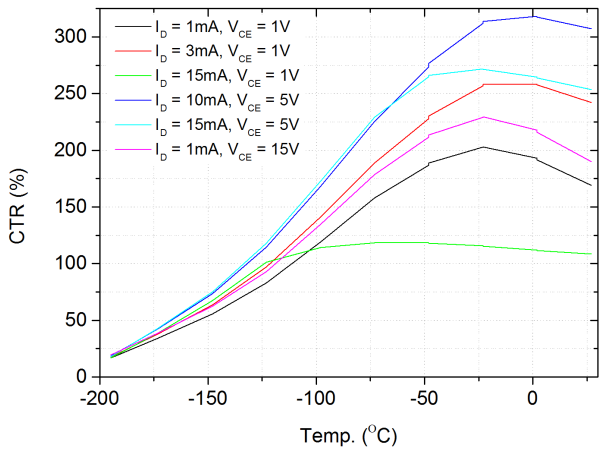

Figure 2 - *Current transfer ratio plotted against temperature for various different values of ID and VCE.*

ISOCOM's ultra-low profile optocoupler series is capable of operating under the extreme temperatures, from -150°C to +125°C, encountered in low temperature, high-reliability applications. The CH100 and CH101 series combines miniaturisation with reliable performance to be suitable for low temperatures in space and aerospace.

Now, the CH100 optocoupler series is a popular hermetic ceramic package in their wide range of products. The CH100 is a radiation-hard, single channel optically coupled isolator, composed of an infrared emitting diode and silicon phototransistor.

This particular part can be mounted directly onto a printed circuit board (PCB), offering flexibility for the customer's desired design. The optoisolators have an low profile of 2.1mm x 2.54mm x 3.0mm. The PCB mounting space saves up to 23% compared to other products currently on the market.

The series has undergone experimentation for low temperature tolerance by Durham University to investigate the performance of the CH100 at temperatures ranging between 300K and 78K.

The devices were mounted into a cryostat for measurements to be made. The sample chamber was evacuated to 10^{-1} mbar and then filled with helium to act as a heat exchange gas. A liquid nitrogen reservoir feeds a heat exchanger within the cryostat, controlled by a temperature controller.

For each reading, the required temperature was set and then the system was left for 10 minutes to steady. After this waiting period, the device was tested, returning the results relating to optocoupler performance. The following temperatures were tested in this experiment – 300K, 275K, 250K, 225K, 200K, 175K, 150K, 125K, 78K.

The CH100 and CH101 series operated successfully under these conditions and did not experience any critical failure, ensuring excellent performance under the extreme temperatures in space and aerospace applications.

Thomas Bayat, CEO and Managing Director of ISOCOM Limited, said "We have expanded our ultra-low profile optocoupler range to allow space electronic OEMs to develop smaller and smaller end-devices."

Leading UK manufacturer, ISOCOM Limited, are well-known for their optoelectronic and microelectronic components, as well as their technological advancements into the development of optocouplers such as creating Europe's very first 4-pin hermetic ceramic optically-coupled isolator.

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