

astron(elec-tron-ics)

verb: I. representation defined

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Radiation Tolerant Optocouplers and Hall Effect Sensors for CubeSat Technologies



CubeSats, also referred to as microsats or nanosatellites, are miniaturized satellites. They offer universities, researchers and private sector companies unprecedented access to low-earth orbit space exploration capabilities, once only reserved for government space agencies. Despite their smaller size, the surveillance and diagnostic capabilities of CubeSats have been found to effectively support many traditional space exploration R&D requirements, at a fraction of the cost. A typical CubeSat design may be found here.



The overall design of most CubeSats is simplified enough to allow for a lower price point, yet robust enough to ensure a workable and reliable satellite. The compact and lightweight designs of today's CubeSats can occupy an overall footprint as small as the palm of a human hand. Supporting components within these systems emphasize lower cost COTS components, both electronic and electromechanical. They must be sufficiently small and lightweight to avoid mass loading. They must also be able to withstand the harsh environmental conditions of space, offer the necessary reliability and favorable price-to-performance ratio, and yet still be capable of continuous independent space flight.

- As with any satellite installation, environmental considerations include:
- Need for minimum mass loading effects (low weight, miniature designs)
 - Capability to withstand wide operating temperature ranges
 - Capability to withstand continual and intermittent radiation exposures
 - Low power consumption
 - Low outgassing designs
 - Low cost (COTS technologies preferred)

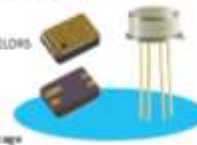
Through its OPTEK Technology brand, TT Electronics offers decades of experience in the design, development and manufacture of COTS components, including radiation tolerant optocouplers and high-reliability Hall Effect sensors for spacecraft and satellite.

COTS Radiation Tolerant Optocouplers and Hi-Rel Hall Effect Sensors for CubeSat Applications

TT Electronics is one of the industry's largest manufacturers and suppliers of optocouplers and Hall Effect sensors for CubeSat and other satellite and spacecraft requirements. We offer COTS and custom designs, all backed by an experienced applications engineering team and an extensive global technical sales network. Just a few of our many offerings include:

Radiation Tolerant Optocouplers

- HCC1000, HCC1001, HCC1002
- Total Ionizing Dose (TID) Radiation Tolerant to 100krad (50j/cm² ELDRS @ 1 rad/s), extended to 3000krad
- Neutron capable to 1E12 neutrons (14MeV)
- 3000 V electrical isolation (optocoupler assembly to 50,000 V)
- TX and TXV for MIL-PRF-19500 conformance requirements
- Base contact provided for conventional transistor biasing
- Options: high-voltage isolator assembly or custom designed package



High-Reliability HallLogic® Hall Effect Sensors

- OMH0010, OMH0015, OMH1020, OMH0040, OMH0075, OMH1030 (R, S versions)
- Designed for non-contact switching operations
- Operates over a broad range of supply voltages
- Excellent temperature stability in harsh environments
- Suitable for military and space applications
- Processing patterned after class B or S of MIL-STD-883
- Through Hole 0.40" (10.16 mm) lead length minimum
- ESD Rating of Class 1B per MIL-STD-883G, M3818.7, HB model
- Tested to 350 krad (x1) per MIL-STD-883 method 1019.8 and up to 130 krad (x1) for ELDRS



Automotive Linear Hall Effect Sensors

- OMH0150, OMH0150B, OMH0150S
- Automatic linear output capable of sinking and sourcing current
- Designed for non-contact switching operations
- Operates over a broad range of supply voltages
- Excellent temperature stability in harsh environments
- Suitable for military and space applications
- Processing patterned after class B or S of MIL-STD-883

