Rad-hard RHRPMICL1
Integrated current limiter for space applications

First integrated programmable current limiter provides a flexible solution for power distribution load protection

This ICL is a versatile device designed for load protection in satellites in case of over-current events. It integrates all the functions of a solid-state power switch (SSP) and is compatible with different bus voltages. Designed to drive an external P-Channel MOSFET, it allows more flexibility of use and load adaptation. The RHRPMICL1 is a perfect solution for power distribution load protection, allowing fast design and PCB optimization.

KEY BENEFITS & FEATURES
- Wide Supply Voltage Range
- 8.5 to 52 V DC
- Floating ground thanks to embedded 14.8V Zener diode
- Large Configurability for Design Time Reduction and Optimization
- 3 operating modes: Latched, Re-triggerable, and Foldback
- Programmable Trip-Off (tON) and Recovery (tOFF) times
- Analog and digital telemetry
- Maximum Protection
- Smart Protection for repetitive overloads
- Configurable under-voltage lockout
- Hermetic 20-pin Flat package
- Radiation hardened
- TID: 100 kRad
- SEL- and SEU-free up 87 mEV.cm²/mg
- QML-V qualified

KEY APPLICATIONS
- Load protection
- Redundant loads
- Power conditioning and distribution units
A TURN-ON SOLUTION FOR FAST DESIGN

The RHRPMICL1 is designed to detect current increases above a programmable threshold, and put the system in limited-current mode for a configurable time interval. The subsequent behaviour will depend on the configuration mode set for RHRPMICL1.

This device can operate in three modes: Latched, Re-triggerable and Foldback. When in Latched mode, after an over-current event is detected, the device supplies the load with a limited current for a configurable time interval (tON). After that, the RHRPMICL1 switches off the device and an external reset (through tele-command signal or cycling OFF/ON the UVLO thresholds) is needed to restore normal operation.

When in Re-triggerable mode, after an over-current event is detected, the device supplies the load with a limited current for a configurable time interval (tON). After that, the RHRPMICL1 switches off the device for a configurable time interval (tOFF). When this time is elapsed, the RHRPMICL1 enables the device to re-start (automatic self-recovery).

Foldback mode limits the current as soon as an over-current event is detected. If the output voltage decreases during the event, the current limit value is decreased accordingly to ensure the current remains at a safe value, even in short-circuit conditions.

All key parameters are easily configurable via external components, including current limit values, under-voltage lockout thresholds and timing parameters.

Analog and digital telemetry outputs are available to monitor current levels.

The RHRPMICL1 also features a wide supply-voltage range and the possibility to use the floating ground configuration to prevent the collapse of the bus supply to ground in the event of a VCC to GND short failure inside the device, keeping the application alive.

The floating ground feature, together with an internal Zener diode, also allows extending the operating voltage range.

RHRPMICL1 BLOCK DIAGRAM

DEVICE SUMMARY

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<th>Order code</th>
<th>Quality Level</th>
<th>SMD Agency Number</th>
<th>Package/ Finishing</th>
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<th>Resolution</th>
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<td>Flat-20</td>
<td>Gold</td>
<td>Strip Pack</td>
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