RAD-HARD RHRPMICL1A

Integrated current limiter for space applications

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

A versatile device designed for load protection in satellites in case of over-current events, the RHRPMICL1A integrates all the functions of a solid-state protection (SSP) system 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 RHRPMICL1A is a perfect solution for power distribution load protection, allowing fast design and PCB optimization.

KEY FEATURES & BENEFITS

- 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 FLAT-20 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 RHRPMICL1A 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 RHRPMICL1A's configuration.

This device can operate in three modes: Re-triggerable – In Re-triggerable mode, when an over-current event is detected, the device supplies the load with a limited current for a configurable time interval (tON). Afterwards, the RHRPMICL1A switches OFF the P-channel Power MOSFET for a configurable time interval (tOFF). When this time is elapsed, the RHRPMICL1A device is able to re-start autonomously (automatic self-recovery).

Latched - In Latched mode, when an over-current event is detected, the device supplies the load with a limited current for a configurable time interval (tON). Afterwards, the RHRPMICL1A device switches off the P-channel MOSFET and an external reset (through tele-command signal or cycling OFF/ON the Undervoltage-Lockout thresholds) is needed to restore normal operation.

Foldback - 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 RHRPMICL1A 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 Main Supply Bus alive.
The floating ground feature, together with an internal Zener diode, also allows extending the operating voltage range.

RHRPMICL1A block diagram
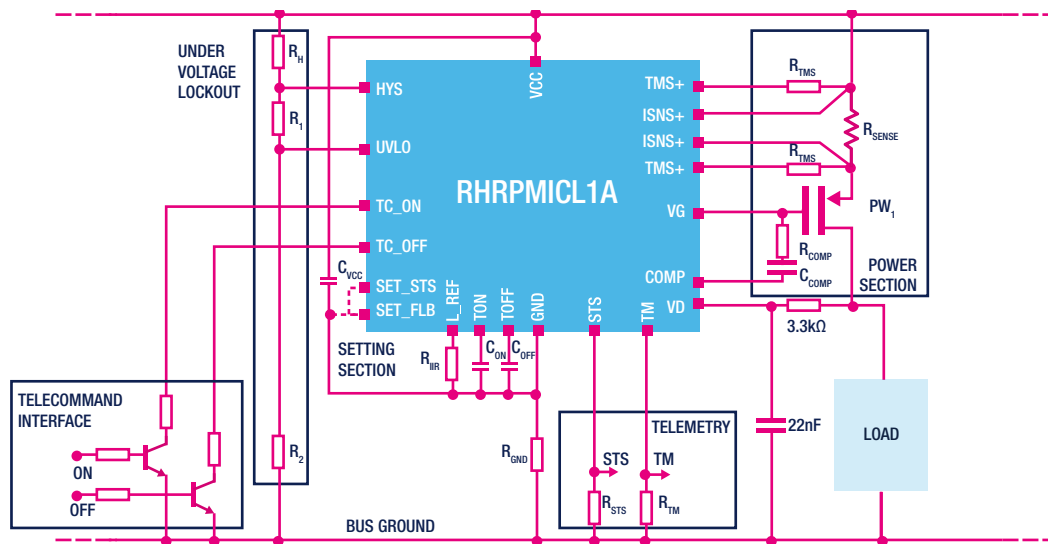
Device summary

Order code	Quality Level	SMD	Package	Terminal Finish	Marking
RH-PMICL1AK1	Engineering Model	-		Gold	RH-PMICL1AK1
RHRPMICL1AK01V	QML-V	5962-17211	Flat-20	Gold	5962R1721101VXC
RHRPMICL1AK02V	QML-V	5962-17211		Solder Dip	5962R1721101VXA
RHRPMICL1AD2V	QML-V	5962-17211	Die Version	-	-