

Latchup Detection and Protection (LDAP)

Enabling Advanced Commercial-Off-The-Shelf (COTS) to 'Space-Grade'

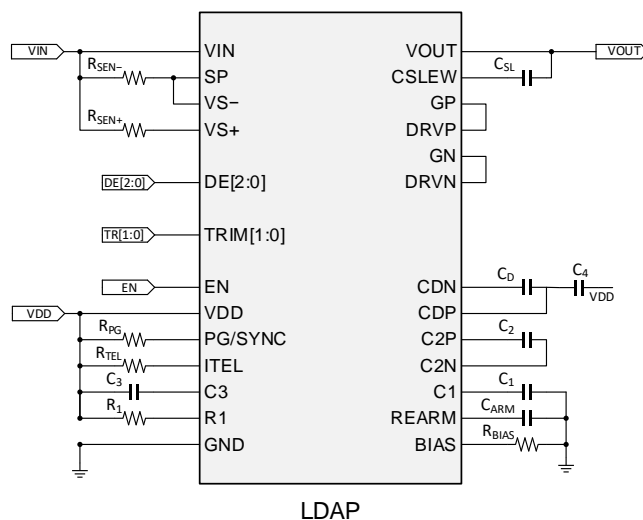
Description

LDAP is an integrated solution designed to detect Single-Event Latchup (SEL) in a target device and subsequently provide a recovery. It can be used to protect power supply and Commercial-Off-The-Shelf (COTS) devices from anomalous current due to SEL.

LDAP is based on ZES' proprietary technology, offering an unprecedented means to protect COTS from SEL – enabling advanced COTS devices to space. Specifically, LDAP incorporates two levels of protections. First, LDAP can detect the early onset of SEL occurrence, including micro-SEL, a localized SEL whose current is often relatively low. Second, LDAP can also provide an overall current limit. Collectively, two levels of protection efficiently remove SEL by an appropriate power cycling.

LDAP is immune to Single-Event Transient (SET) and Single-Event Upset (SEU), and is unaffected by long-term drift current due to Total Ionized Dose (TID).

High integration makes LDAP an ideal candidate to protect advanced COTS devices in space.



Typical Application Circuit Implementation

Features

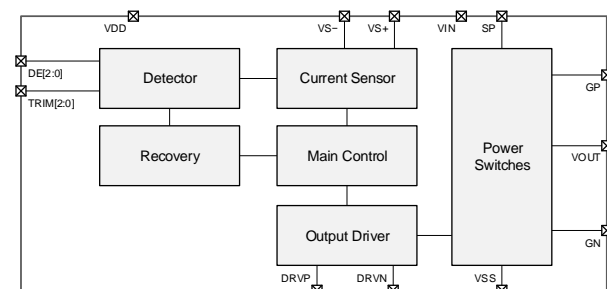
- Fast response to SEL
- Detection of the SEL occurrence at on-set
- Detection of micro-SEL
- Automatic and adjustable power cycling
- Immune from current drift due to aging and TID
- Wide-range supply voltage and loading current
- Space qualified technology
- Radiation Hardened by Design (RHBD)
- Qualified for space enhanced plastic (SEP)
- ITAR free
- QFN32: 5mm X 5mm
- Module: 12mm X 12mm

Electrical Performance

Input Voltage	1.2V-5V
Nominal Loading Current	1mA-500mA*
Power Cycling Time	<10ms (Adjustable)
Operating Temperature	-55°C to 125°C
Voltage Drop	0.1V @ 500mA, 5V

Radiation Performance (Cyclotron Verified)

TID	200 Krad (Si)
SEL	110 MeV-cm ² /mg
SEFI	110 MeV-cm ² /mg
SEU	110 MeV-cm ² /mg
Ion Fluence	Up to 10 ⁷ /cm ²

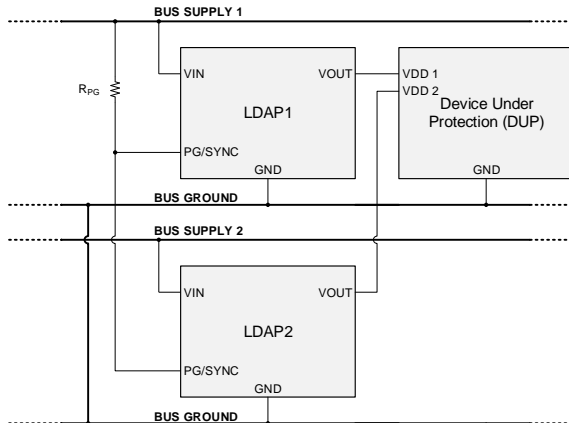


Simplified Block Diagram

* Higher current can be achieved if an external switch is employed.

Applications

#1: Synchronized LDAPs Protecting a DUP



#2: LDAP with an External Power Switch for High Current

