System Level Protection for High-Voltage Multiplexers in Multi-Channel Data Acquisition Systems

Multiplexers with integrated fault protection
# TMUX1072

## 2-Channel 2:1 Analog Switch with Overvoltage Detection and Protection

### Features
- **Wide Supply Range** $V_{CC}$: 2.3V – 5.5V
- Supports IO signals beyond $V_{CC}$ up to 5.5V
- Input tolerance up to 18V
- Overvoltage triggering threshold: 6V
- Powered-off protection (I/O pins Hi-Z, when $V_{CC}=0V$)
- 1.8-V Compatible Control Inputs
- **Wide bandwidth** for differential high-speed data
  - Bandwidth: 1.2 GHz
  - Low $C_{ON}$: 4.5 pF (typ.)
  - Low $R_{ON}$: 6 $\Omega$ (typ.)
- Standby power down mode current consumption: 10μA (max)
- Operating Temperature Range: -40 to 125°C
- Package options:
  - QFN-12 Package (2mm x 1.7mm)
  - SOP-10 Package (3mm x 3mm)

### Benefits
- Ideal for 2.5V, 3.3V and 5V supply rails
- Pass IO signals greater than Vcc (for eg. Vcc = 3.3V, and I/O signal = 5V)
- Protects systems up to 18V OVP short conditions
- Powered-off protection eliminates the need for power supply sequencing requirements
- 1.8-V logic support eliminates the need of a level translator between MCU and EN pin.
- Wide BW and low $R_{ON}$ for minimal signal degradation

### Applications
- Data acquisition (DAQ), Field Instrumentation
- Video Surveillance, Automotive Rear Camera
- Portable Data Terminal

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### Application Use Case – Beyond $V_{CC}$

**12-QFN (2mmx1.7mm)**

**10-SOP (3mmx3mm)**

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1. **Data acquisition (DAQ)**, Field Instrumentation
2. **Video Surveillance**, Automotive Rear Camera
3. **Portable Data Terminal**
TMUX1072

Internal block diagram and fault protection behavior

Product Folder [here](#)
MPC50x
+36V VDD | ± 15V input signal | Overvoltage tolerance up to 70VPP

Features
- Analog overvoltage protection: 70vpp (-36V to +36V)
- 1.3kΩ Ron (inc. 1kΩ series current limiting resistor)
- None-fault channel continues to operate normally
- Digital input tolerates up to 4V above supply
- 2nA (typ) ON leakage current
- 2uA OFF leakage current under fault condition
- Break-before-make switching

Applications
- Factory Automation, Programmable Logic Controllers (PLC), Analog Input Modules, ATE Test Equipment, Battery Monitoring

Benefits
- Integrated OVP prevents fault to impact downstream devices.
- Reduced BOM and board area
- Wide supply operation to provide native protection for over-voltage

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<th>Device</th>
<th>Configuration</th>
<th>#Ch.</th>
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