

TPS7H2201-SP

1.5-7 VIN, 6 A, Load Switch with Reverse Current Protection and Current Limiting

Features

- VIN = 1.5 to 7 V, 6 A maximum current
- On-state resistance of 34 mΩ at VIN=5 V and 25 °C (46 mΩ across temperature)
- Reverse current protection
- Configurable rise time
- Programmable current limiting
- Programmable fault timers (current limit and retry)
- OVP and UVLO
- Current sensing output
- Thermally enhanced 16 pins CDFP ($\Theta_{JC}=0.6\text{ }^{\circ}\text{C/W}$)

Applications

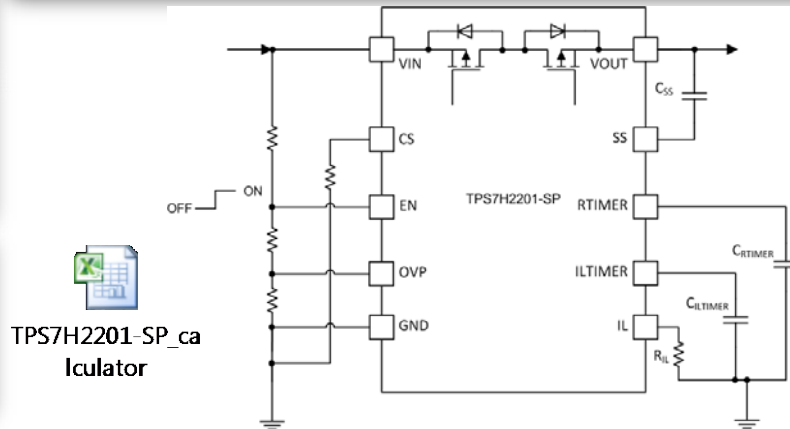
- Space Satellite Power Management and Distribution
- Power Redundancy and SEL Protection

Radiation Performance

- TID = 100kRad(Si), RHA
- SEL/SEB/SEGR Immune to LET > 75MeV @ 125C
- SEFI/SET onset @ LET = 65MeV

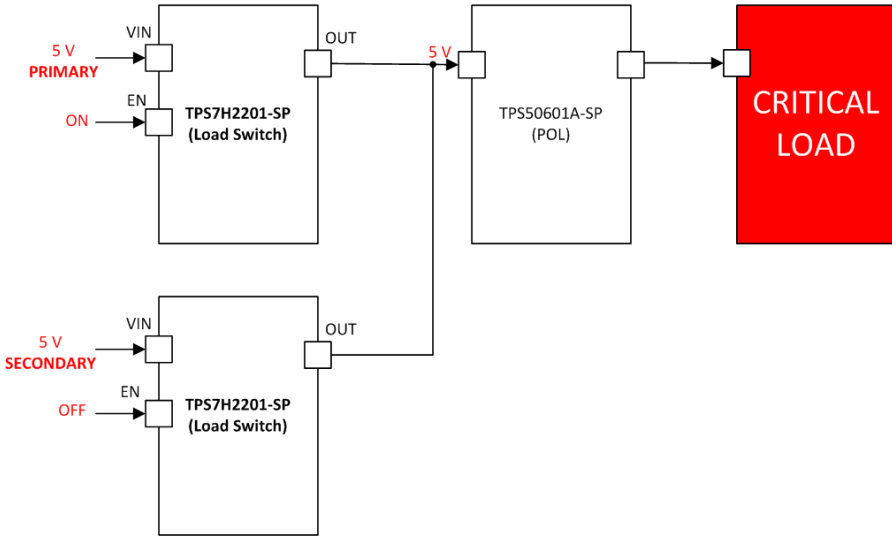
Benefits

- Highly integrated solution eliminating the need for discrete FETs for power management
- Controlled inrush current during system power-up
- Reverse current protection for redundancy applications
- Able to parallel for current sharing and reduced RON
- Low threshold enable compatible with multiple IO standards
- Over current system protection with programmable fault timer

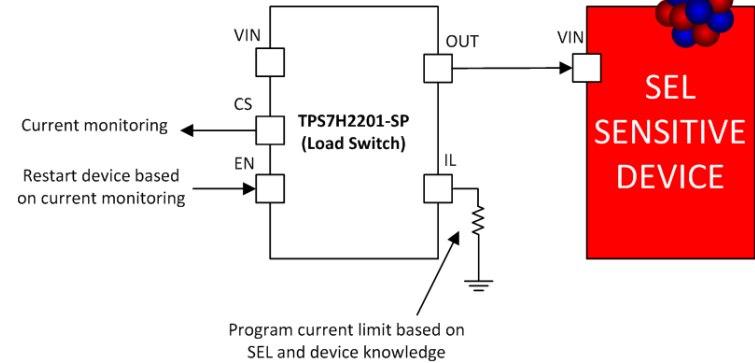


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Redundancy



Latchup Protection

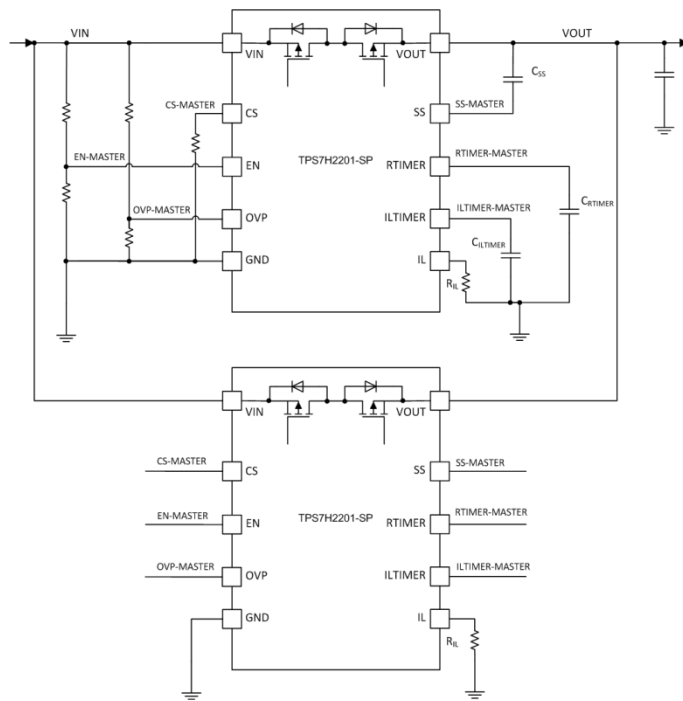


Power management and distribution

(i.e. disconnect selective loads during certain orbit periods)

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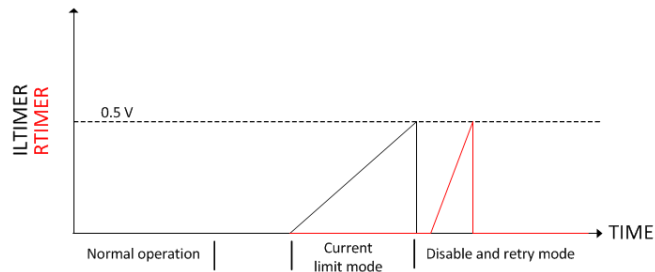
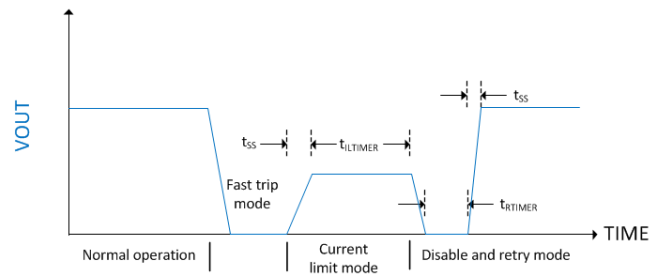
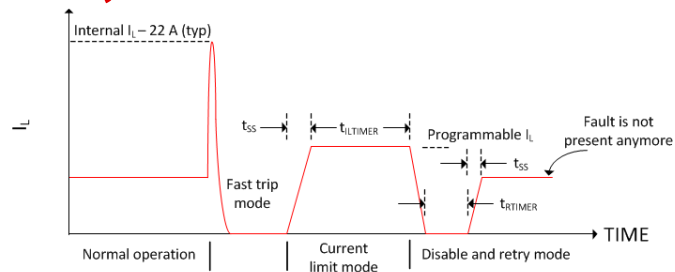
Parallel Operation (12 A)



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Programmable Fault Timers:

- Current Limit
- Retry



TPS7H2201-SP | SEE Testing

- Date: June 18th, 2018
- Location: Texas A&M University
- Ions used: Pr at 0° (65 MeV) and 28° (75 MeV)
- Hardware: TPS7H2201EVM-CVAL, 4 different units
- Summary of results:
 - No SEL, SEB and SEGR behavior observed. SEL testing performed at 125 °C and LET=75 MeV
 - No undesired change in the FET (opening or closing due to heavy ions) tested at corner input voltages (1.5 and 7 V) and 65 MeV during:
 - Current limit, Reverse current protection (redundancy) and OVP
 - **VOUT SETs at 65 MeV observed during normal operation** (mostly VIN=5 V, load= 6 A)
 - Preliminary sensitive area was located during testing
 - Will perform test run with temporarily modified silicon (FIB) (initial plan was July)
 - Will implement metal change in silicon after validation
 - No change in schedule, release to market for QMLV version is still 1Q2019.

TPS7H2201-SP | SEE Testing

- Date: August 9-10th @ Vanderbilt
 - More narrowed sensitive area identified
- Date: August 15th, 2018 @ Berkeley
 - Testing 4 different FIBs
- Date: August 22nd @ Vanderbilt
 - Laser validation of SET behavior improvement in “golden” FIB
- Date: September 11th, 2018 @ TAMU
 - Heavy ions validation of SET behavior improvement in “golden” FIB
- Date: October 5th, 2018 @ TAMU
 - Final silicon heavy ions testing