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THE RESEARCH OF POWER FAILURE PROTECTION CIRCUIT FOR SATELLITE HIGH-POWER
SUPPLY EQUIPMENT

Abstract

When satellite power bus breaks down instantaneously or drops sharply, the gate-source capacitance voltage of the MOSFET still maintains a certain value resulting in high on-resistance and thermal breakdown of the MOSFET. In this paper the high-power failure protection circuit is presented. When power failure happens, the sampling circuit will send out shutdown command according to the difference of the voltage detection signal and reference signal by the comparator, so as to drive the triode on to close the relay which is connected in the grid and source of the MOSFET in order to turn off the MOSFET and realize the power failure protection of high power DCDC converter. The high-power failure circuit contains filter circuit to enhance the anti-jamming, aiming at the vibration when satellite launches and power bus transient drop when satellite is in orbit, the power failure circuit is mainly applied for high power supply equipment of the satellite, which is applicable for different power bus voltage such as 42V, 100V and so on. The simulating and experiment results show that the power failure protection circuit runs simply and effectively which has been applied in the satellite power supply equipment. In order to ensure satellite power supply system reliability and safety, this power failure protection circuit plays an important role, which has broad prospects in the application to the fields of deep space exploration and moon exploration project.

Keywords: high-power; power failure protection; DCDC convert