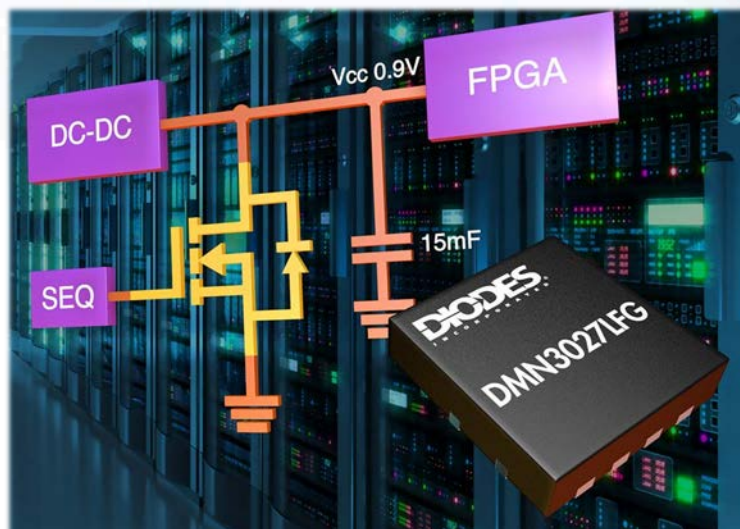




MOSFET Enables Safe Capacitor Discharge

The DMN3027LFG 30V N-channel MOSFET is designed as a switch to rapidly and safely discharge large bulk capacitors used on FPGA power rails. The latest FPGAs found in telecoms equipment, servers and data centers have multiple power rails that need to be correctly sequenced to safely power these systems up and down. Designers of high-reliability DC-DC power supplies can achieve this quickly and easily with this new MOSFET from Diodes.

To avoid damaging the FPGA system, each power rail needs to discharge before the next rail in the sequence is disabled. This is achieved by actively discharging the capacitors through the DMN3027LFG switch.



The Diodes' Advantage

The DMN3027LFG is a 30V N-channel MOSFET, in the thermally efficient PowerDI3333, designed to safely discharge capacitors.

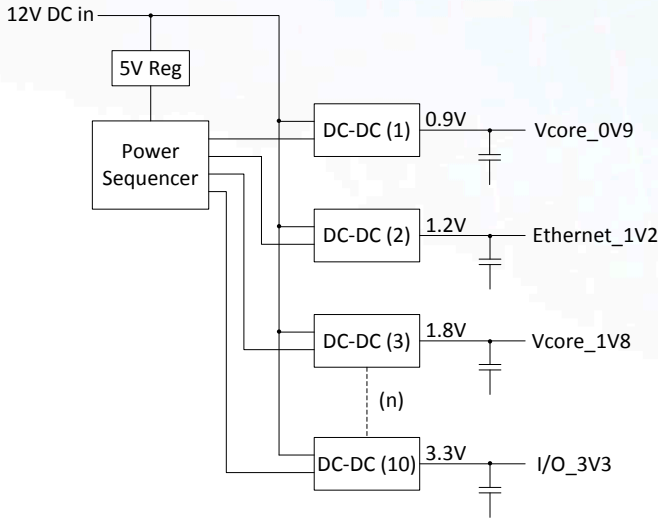
- **$R_{DS(on)} < 26 \text{ m}\Omega$**
Optimized to discharge a 15mF capacitor in <10ms, whilst avoiding high-peak currents that could cause EMI or thermal stress the devices.
- **Safe Operating Area (SOA)**
Measured under typical application conditions with 1V V_{cc} operation and <10ms, the channel resistance self-limits the current.
- **PowerDI3333 – 3.3mm x 3.3mm Footprint**
Low thermal resistance from junction to exposed pad of <10degC/W enabling the dissipation of up to 3W for greater power density.

Circuit Function

During power -down sequence, the large bulk capacitances are discharged by turning on the DMN3027LFG from the enable signal of the Power Sequencer.

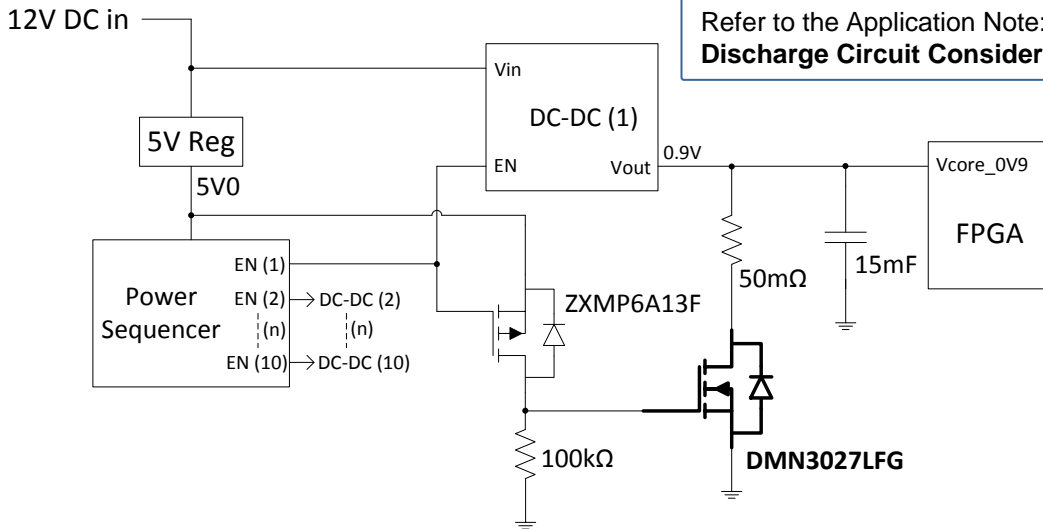


FPGA Power Sequencing Circuit



FPGAs need the different power rails to be powered up and down in a defined sequence. For power down, each sequenced rail needs to be fully off before the next rail is turned off. With large high-speed and high-functionality FPGA's, the power rails may have large bulk capacitances to be discharged quickly and safely within a total time of 100ms and up to 10 rails each to be discharged within 10ms each.

Active Capacitor Discharge Circuit



Refer to the Application Note: **Active Capacitor Discharge Circuit Considerations for FPGAs**

N-channel MOSFET for Capacitor Discharge

Part Number	Polarity	BV_{DSS} (V)	I_D (A)	I_{DM} (A)	$R_{DS(on)}$ max @ $V_{GS} = 4.5V$ (mΩ)	Package
DMN3027LFG	N	30	8	70	26.5	POWERDI3333-8