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USING SWITCHING POWER SUPPLIES WITH DIODE ISOLATED CAPACITOR BANKS

Andrew H. Bushnell

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GENERAL ATOMICS
Energy Products
SORRENTO ELECTRONICS
4949 GREENCRAIG LN, SAN DIEGO, CA 92123-1506
858.522.8400
www.ga-esi.com

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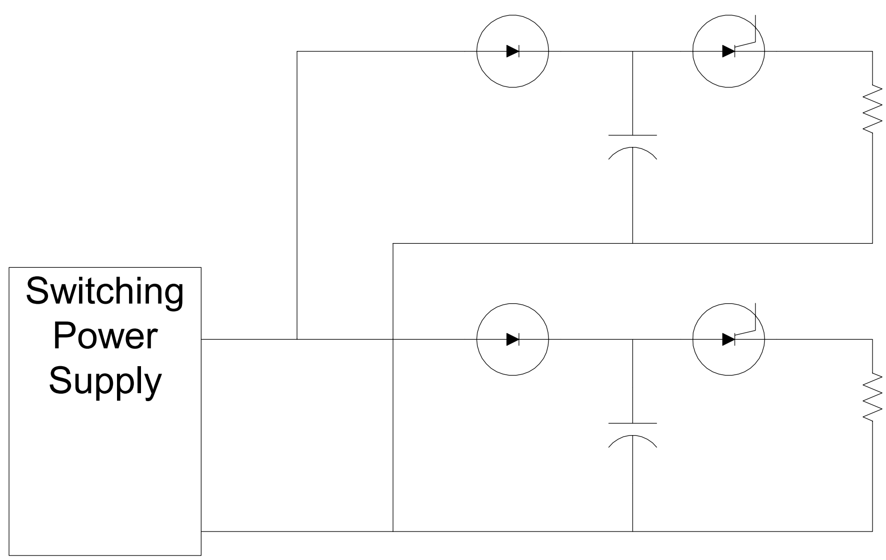
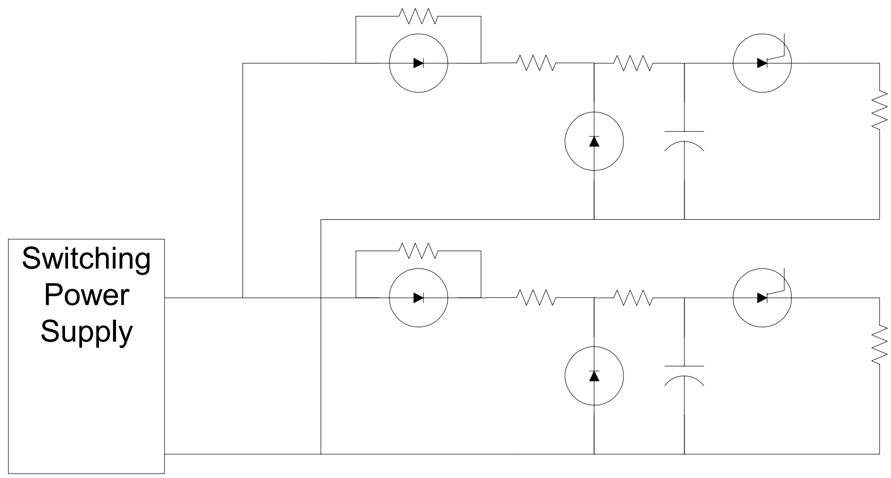
Sorrento Electronics
General Atomics Energy Products
4949 Greencraig Lane
San Diego, CA 92123
858-522-8405
andy.bushnell@ga.com

In many applications it is desirable to charge multiple capacitor banks with one or more power supplies ganged together. In some cases the banks must be isolated with diodes to allow the banks to fire at different times. The figure below shows a basic circuit.



Several items should be added to this circuit for proper operation. Resistors should be added in parallel with the diodes so that the power supply can sense the capacitor charge voltage. Also protection networks need to be added between the diode and the capacitor if there is any possibility of voltage reversal on the capacitor including faults. See Engineering Technical Bulletin Interfacing Pulsed Power Systems to Switching Power Supplies.



The size on the resistor in parallel depends on the amount of current that must be provided for the metering string and the required accuracy.   For instance assume that there are four power supplies each with 200 MΩ. The total metering resistance looking back into all four power supplies would be 50 MΩ. If we wish to keep the error caused by the resistance to less then 0.1 % then the resistor should be less then or equal to 0.1% X 50 MΩ or 50 kΩ. If this resistance is unacceptable in the design of the system for other reasons then special metering circuits must be built directly on the capacitors for power supply control.