**Mission "Fire Fly" - A Nano-Satellite**



NASA GSFC
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photo: NASA/GSFC/Firefly/
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**HVM's Mini-Cube on a "Fire Fly" PCB**

**A Nano Satellite mission called "Fire Fly" Sponsored by the NSF and led by NASA's Goddard Space Flight Center uses HVM Technology's new Mini-Cube, a low-power, high voltage power supply.  Here's an e-mail that explains why:**

"Rob,

Got your email requesting info about our application that uses your UMHV-0530?

We are using it to provide high voltage bias for a microchannel plate.  This microchannel plate reads out the light pulses from an inorganic scintillator.

The scintillator produces light pulses in response to gamma rays or energetic electrons that enter the scintillator crystal.

These gamma rays or electrons are produced by certain types of lightning discharges, and they propagate up into space where they can only be detected by Earth-orbiting satellites - they were only first discovered in 1994, and are still very mysterious, since it takes very energetic phenomena to generate gamma rays, and the Earth had not previously been considered a source for such energetic radiations.

We are flying a small "CubeSat" called Firefly (http://firefly.gsfc.nasa.gov) to study these gamma rays associated with lightning, launch in late 2010 / early 2011.  The satellite is only 4 kg, and 10 cm x 10 cm x 34 cm.  Total power budget about 3W.  Given the small spatial volume and mass, and the low power, we need high voltage supplies which are tiny, efficient, and which can be used in a somewhat fluctuating thermal environment.  Also, minimizing extra circuitry is important to us.

HVM's UMHV-0530 had the following advantages:
a) Very small size and mass
b) High-impedance "programming pin" simplified the interface and resulting circuitry required
c) Efficient (~55-60% at the voltages and loads we are using)
d) Very stable with temperature (over a wide range from -20 C to +50C) - this is important because we   have only very limited thermal control on the spacecraft and if the HV output changed with temperature, our electronics gain would also change, making accurate measurements more difficult (we don't even have enough mass, power, budget, or schedule to add a closed-loop temperature controller)
e) HVM's willingness to work with us in modifying processes for improved vacuum compatibility.

Cheers,
Doug"