AMD2012-CE2/3

MFC Power Supply

(Specification October 2011)

The ***AMD2012-CE2/3*** is a dual output power supply with one fixed 500 volt bias supply, and one variable output from 0 volts to 2KV. This power supply is specifically designed for the macro fiber composites (MFC) applications. Use of the bias supply allows a range of -500 volts to +1500 volts to be applied to the MFC.

SPECIFICATIONS:

- Two power supplies are included - a variable supply from 0 volts to 2000 volts, and a fixed 500 volt supply, for bias of the MFC.

- Input voltage: 8 to 15 volts. Reverse polarity protected. Includes a self-resetting (thermal) fuse and output short circuit protection (between the bias supply and the HV output).

- Input current (Nominal 12 volt input voltage.): 60 mA typ. (0.72W) with 500 volts on all outputs. 114 mA typ. (1.4W) with maximum output voltage on all outputs.

- Charge time with 5 nf capacitance load is less than 10 mS from 0V to 2000V (-500 to +1500V on the MFC). (This requires about 4 watts of peak input power during charging.)

- An active discharge circuit is employed for removal of the charge on the MFC when the control voltage is altered. The charge removal time is matched to the charging time.

- Mechanical dimensions are 1.25" x 2.2". Height will not exceed 0.75 inch for the tallest components. Components are mounted on both sides of the PCB. CAUTION - High voltages are present on both sides of the PCB. Four corner mounting holes are provided for #4 screws.

- Input/output connections are solder posts.

- Operating Temperature is -40 to 75C.

- Two modes of operation are available:

    - With the jumper J1 in the pin 1-2 position: The control pin provides a linear function of input voltage to output voltage for the 2 kV power supply. The control pin operates over a 0 to 5 volt range for a 0 to 2000 volt output. A dual slope function has been implemented to match the characteristics of the MFC. This means, that at 0 volts on the control pin, there would be -500 volts across the MFC. At 2.5 volts, 0 volts will be across the MFC, and at +5 volts, 1500 volts will be placed across the MFC. The slope is a straight line between 0 and 2.5 volts and a different straight line slope from 2.5 to 5 volts.

    - With the jumper J1 in the pin 2-3 position: The control pin accepts pulse width modulation (PWM) from 1 mS to 2 mS for a 0 to 3 volt(min) pulse. The repetition rate is nominally 50 Hz, but may be between 5 Hz and 300 Hz. Pulses less than 0.1 mS, or greater than 5 mS are ignored. Pulses between 0.1 mS and 1 mS are treated as 1 mS for minimum output voltage (-500 volts). Pulses between 2 mS and 5 mS are treated as 2 mS pulses for maximum output voltage (+1500 volts). 1 mS pulses will produce -500 volts

across the MFC. 1.5 mS pulses will produce around 0 volts across the MFC. And 2 mS pulses will produce 1500 volts across the MFC. Slope control is the same as in the analog mode, mentioned above.

- An enable line is provided to shut down all power supplies to save power consumption, and for safety. The +500 volt bias supply is always on, except when the enable line is at a logic high (>3 volts), or not connected. Less than 1 volt, or grounding the enable line, will produce normal output voltages.

- Input impedance for Control and Enable inputs: > 10Megohm. Both inputs are protected with a 10 kohm series resistor followed by a small capacitance to ground. Clamp diodes are connected to ground and +5 volts after the 10 kohm resistor. Absolute maximum input voltage is -5volts to +7volts.

- Output voltages are referenced to the common ground at the input.

- Tolerances for output voltages relative to common ground:

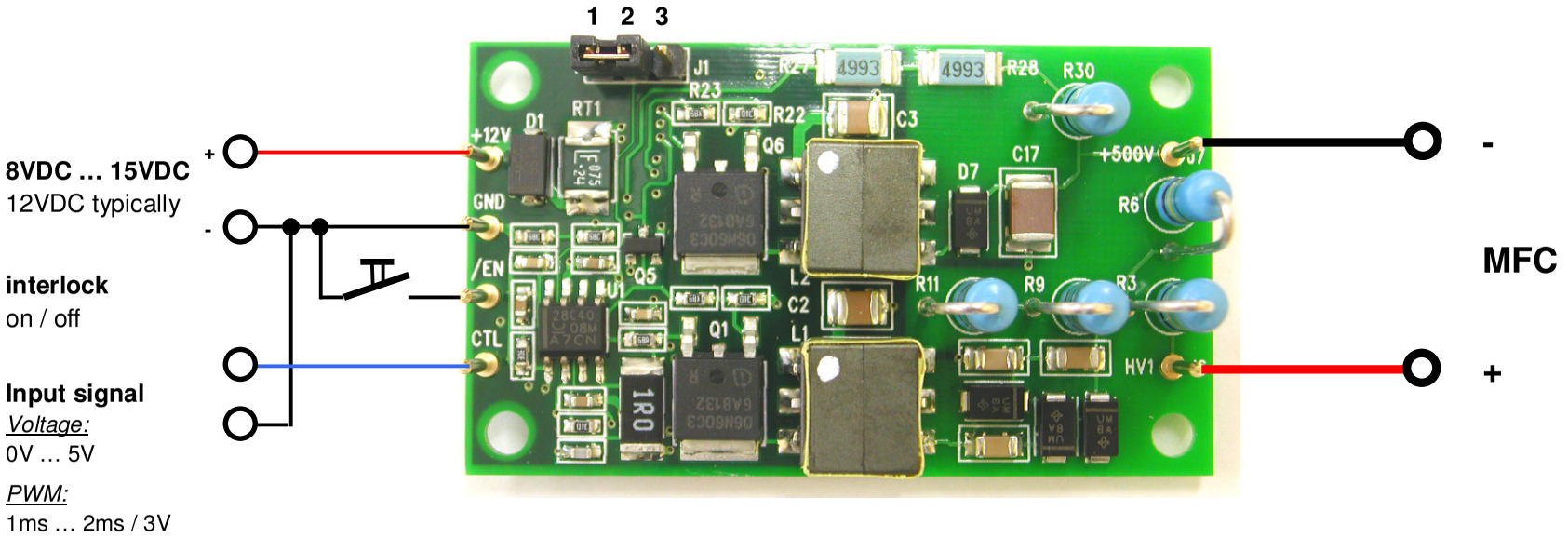
  - 500 volt fixed output: +/- 4% max., or +/- 20 volts. (Typ. +/- 10 volts)

  - High voltage output: +/- 4% max of full scale, or +/- 80 volts. (Typ. +/- 40 volts)

*****CAUTION: BEWARE OF HIGH VOLTAGES ON BOTH SIDES OF THE PC BOARD WHEN POWER IS APPLIED!*****

Wiring Diagram AMD2012-CE3

mode selection jumper
1-2: voltage input / 2-3 PWM input



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