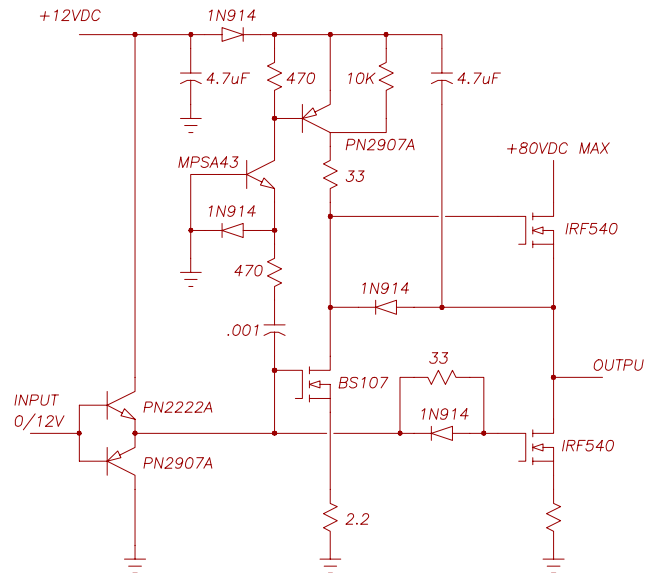


MOSFET BRIDGE DRIVER



CIRCUIT DESCRIPTION:

This driver requires 12V CMOS logic levels. The PN2222/PN2907 combo forms an emitter-follower that boosts the CMOS current to levels sufficient to drive the bottom IRF540. The 1N914/33 ohm combo insures slower turn-on than turn-off for the bottom IRF540.

The MPSA43 acts as a common base level shifter for the top MOSFET driver. The 1N914 across its base to emitter prevents reverse base to emitter breakdown. The series 470 ohm, .001uF capacitor forms a 500nS, 20mA current pulse on every falling edge of the input. The MPSA43 couples this current into the base of the top PN2907. The 33 ohm collector resistor ensures the PN2907 saturates. At the end of the 500nS time constant, the top IRF540 gate has fully turned on and the 10K resistor acts as a sustaining source for gate drive voltage.

On the rising edge of the input, the BS107 turns on, dumping the top IRF540's gate charge. The 1N914 clamps the gate voltage to 1 diode drop below the top IRF540's source voltage, turning it fully off before the bottom IRF540 turns on.

The top 1N914 and right-hand 4.7uF capacitor forms the boot-strap top IRF540 gate drive power supply. The diode charges the cap to 12V while the bottom IRF540 is on. The charged cap "rides up" with the output voltage when the top IRF540 turns on, providing a gate drive voltage 12V higher than the bridge power supply.

This circuit draws no significant quiescent current. What current is drawn is primarily capacitor leakage current. If tantalum or ceramic capacitors are used, the top IRF540 can stay "on" for several minutes before it needs to be refreshed.

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