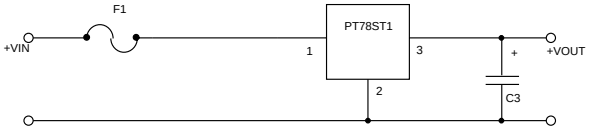
Vehicular Power Adapter Using ISRs

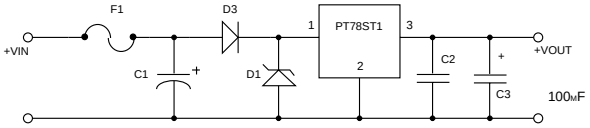
The Power Trends' Integrated Switching Regulators (ISRs) can be used in vehicular power adapter applications with the addition of one external component (excluding the fuse and casework). The basic circuit diagram is shown below.

Figure 12



Since vehicular electrical power is somewhat hostile toward electronic circuitry, you might want to consider using a more conservative approach by including a few additional components. These optional components are shown in the schematic diagram below. The decision to add these components should be based on the projected use assumptions of the consumer versus the incremental costs.

Figure 13



Optional Component Notes:

C1 - The ISR draws its current in 650 kHz pulses and too much series inductance from the vehicular wiring may cause it to "ring". We suggest you use a 100µF/35V electrolytic capacitor on the input. This capacitor will also reduce the "upstream" conducted noise into the vehicle's electrical system.

D1 - This component will prevent damage from vehicular "load dumps" and spikes above 38 volts. We suggest you use a 1N5365B (36 volt) zener diode or an equivalent over-voltage protection device. This component may be eliminated if the maximum input voltage to the unit will not exceed 38 volts.

C2 - The ISR has about 75mVpp of ripple @ 650 kHz on the output. If it is necessary to reduce this output ripple, use a couple of 1µF ceramic capacitors. Adding 2µF to the output will attenuate the ripple down to about 35mVpp. If the end equipment has a battery installed and it is on-line, the battery makes an excellent filter.

D3 - This diode will prevent damage to the unit in case the input polarity is reversed. Any general purpose 1 Amp diode will do, such as a 1N4001. If polarity reversal is not a cause of concern, or you don't mind the fuse being blown under this condition, then it does not need to be included.

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