

Overview

The LC filter design below is a comparatively simple solution for reducing ripple on the outputs of the Vicor VI-200 and VI-J00 Family converter modules. These components are small and provide significant peak-to-peak noise attenuation. Since an output filter capacitor is already present in the DC-DC converter, adding an inductor and capacitor to the output creates a pi filter. It is important that the inductor wire be of a size sufficient to carry the load current, including a safety factor and that the core does not saturate. LC filters are generally needed only where very accurate analog signals are involved.

The RAM / MI-RAM (Ripple Attenuator Module) should be used if greater attenuation of output ripple is required or where additional AC power line-ripple frequency rejection is required.

All standard outputs will function with either remote sense or local sense, with the recommended capacitance. Lower ESR is achieved with capacitors in parallel. Ripple data measured at 20MHz bandwidth limit.

Adding excessive amounts of external filtering may compromise the stability of the converter and result in oscillation.

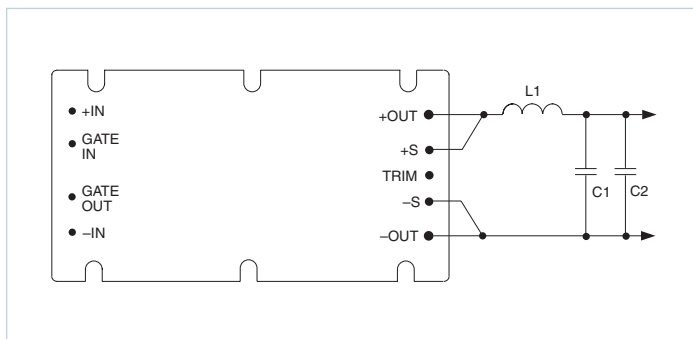


Figure 10.1 — Recommended LC output filter

Filter Components for 5V Output

- L1 — Vicor P/N 30268 or Micrometals #T38-26/90 core with 2T #14 wire (200nH)
- C1, C2 — Vicor P/N 30800, 270 μ F / 10V, solid tantalum, ESR 90m Ω typical
- Typical data at high line input: With full load, ripple ~ 11mV_{p-p}
With 50% load, ripple ~ 8mV_{p-p}

Filter Components for 12V and 15V Outputs

- L1 — Vicor P/N 30268 or Micrometals #T38-26/90 core with 2T #14 wire (200nH)
- C1, C2 — Vicor P/N 30506, 120 μ F / 20V, solid tantalum, ESR 90m Ω typical
- Typical data at high line input: With full load, ripple ~ 5mV_{p-p}
With 10% load, ripple ~ 15mV_{p-p}

Filter Components for 24V and 28V Outputs

- L1 — Vicor P/N 30268 or Micrometals #T38-26/90 core with 2T #14 wire (200nH)
- C1, C2 — 68 μ F / 30V, solid tantalum, ESR 160m Ω typical
- Typical data at high line input: With full load, ripple ~ 6mV_{p-p}
With 10% load, ripple ~ 18mV_{p-p}