

OVERVIEW

The LC filter design below is a comparatively simple solution for reducing ripple on the outputs of Vicor's 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, and the system power supply rejection is poor at the ripple frequency.

The RAM/MI-RAM (Ripple Attenuator Module) should be used if greater attenuation of output ripple 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 20 MHz bandwidth limit.

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

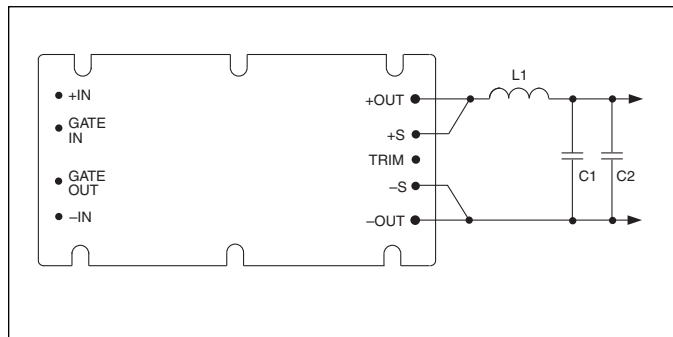


Figure 10-1 — Recommended LC output filter

FILTER COMPONENTS FOR 5 V OUTPUT

- L1 — Vicor P/N 30268 or Micrometals #T38-26/90, 2T #14 (200 nH)
- C1, C2 — Vicor P/N 24252, 270 μF / 10 V, solid tantalum
- Typical data at high line input:
With full load, ripple ~ 11 mV p-p
With 50% load, ripple ~ 8 mV p-p

FILTER COMPONENTS FOR 12 V AND 15 V OUTPUTS

- L1 — Vicor P/N 30268 or Micrometals #T38-26/90, 2T #14 (200 nH)
- C1, C2 — Vicor P/N 24253, 120 μF / 20 V, solid tantalum
- Typical data at high line input:
With full load, ripple ~ 5 mV p-p
With 10% load, ripple ~ 15 mV p-p

FILTER COMPONENTS FOR 24 V AND 28 V OUTPUTS

- L1 — Vicor P/N 30268 or Micrometals #T38-26/90, 2T #14 (200 nH)
- C1, C2 — Vicor P/N 24254, 68 μF / 30 V, solid tantalum
- Typical data at high line input:
With full load, ripple ~ 6 mV p-p
With 10% load, ripple ~ 18 mV p-p