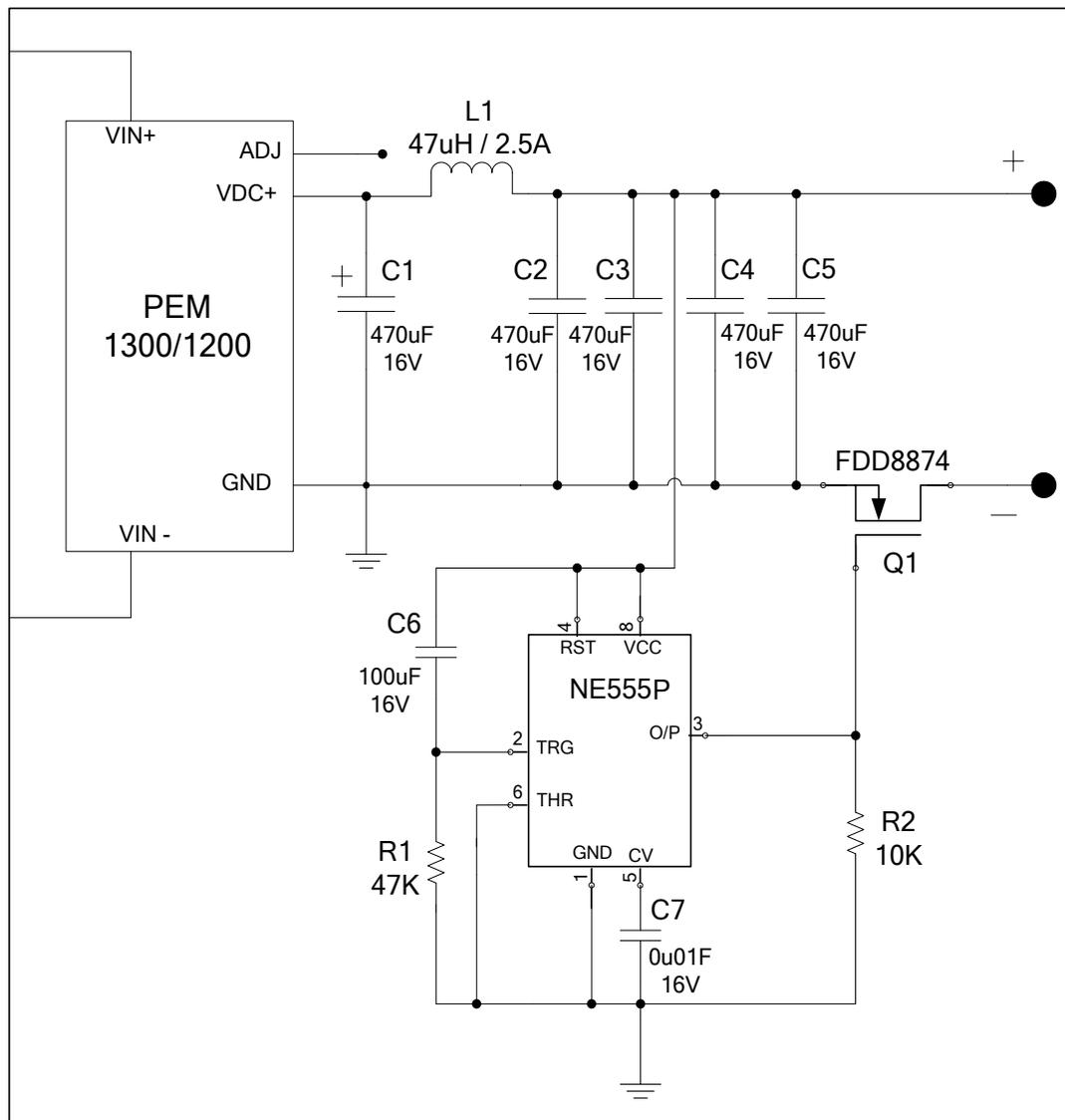


PEM1200 and PEM1300 – Capacitor bank and delay circuit for high start-up surge currents

As per IEEE802.3af standards for POE, the maximum RMS current limit from the PSE is 350mA, and maximum surge current limit is 400mA. To conform to this limitation, POE modules like the PEM1200 and PEM1300 featured a 'current limit mode'.

Certain host devices can have a very high start-up current surge which may result in the module going in to the current limit mode which in turn causes a severe drop in the module's output voltage, resulting in resets or other problems during start-up of the host devices.

This application note explains how to provide a capacitor bank with a delay circuit between the output of the PEM module and the input of the host device, which can help eliminate the start-up surge from the host device being passed back to the module.



Delay Circuit (only for PEM1205, PEM1305, PEM1212 and PEM1312)

PEM1200 and PEM1300 – Capacitor bank and delay circuit for high start-up surge currents



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This circuit cannot be used for 3.3V version.

When the PEM module switches on, it charges the capacitor bank (C1~C5) at the output. The Q1 mosfet stays switched off, disconnecting the power input to the host device. The Q1 mosfet switches on after a delay. The surge demand of the host board is catered from the capacitor bank.

To provide for a larger capacitor bank, the delay duration can be adjusted, if required, by changing the value of C6 capacitor. The delay time is directly proportional to capacitance (C6) value.

Equation to calculate the delay: Delay (sec) = $1.1 * R1 * C6$, (*R1 value Ohms, C6 value in Farads*)

The capacitors C1~C5 values should be tuned so as to provide an adequate energy reserve for the surge requirement of the host device. However, care must be taken to ensure that the capacity of the capacitor bank and the delay time is within the power supply limits of the module.