



# DID YOU KNOW?

## THE SiC43X FAMILY ENABLES A BUCK CONVERTER DESIGN WITH MINIMAL EXTERNAL COMPONENTS

All too often system designers choose to use a buck regulator based on the simple application schematic shown on the first page of the datasheet, only to find that the implementation of the part in an actual application is considerably more complex. External components used to set the soft-start time, switching frequency, mode of operation, current limit, and error amplifier compensation are conveniently left out of the front page of the datasheet.

Even in more simple buck regulators using a constant on-time topology, where error amplifier compensation doesn't need to be considered, it is quite common that the "ripple injection" components required when low ESR output capacitors are used are not shown in the datasheet.

The SiC43x family of buck regulators was designed from the ground up to eliminate external components. The simple applications diagram (Figure 1) you'll see on the front page of the datasheet is completely representative of the actual circuit implementation. Soft-start time, switching frequency, forced continuous or power save mode, and current limit can all be programmed using just two external resistors connected to the MODE pins.

The products have internal compensation and even the ripple injection components are internal, so even with the use of ceramic output capacitors, no additional components are needed, unlike industry-standard constant on-time controllers. The internal ripple injection and error amplifier compensation components all adjust to the operating conditions chosen, enabling the widest operating range in the industry:  $V_{IN} = 3\text{ V to }24\text{ V}$ ,  $V_{OUT} = 0.6\text{ to }0.95 \cdot V_{IN}$ . Figure 2 illustrates how this is achieved.

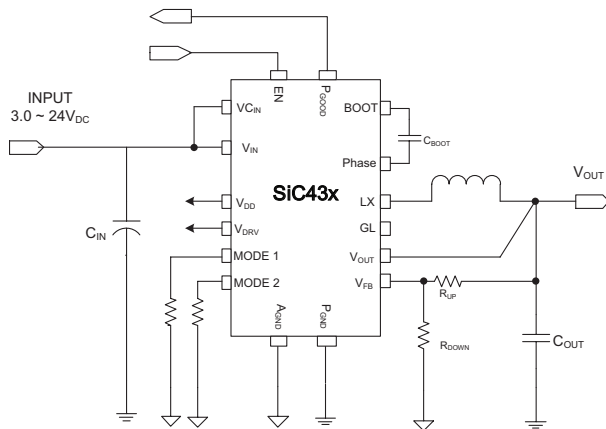


Figure 1. Applications Diagram for SiC43x

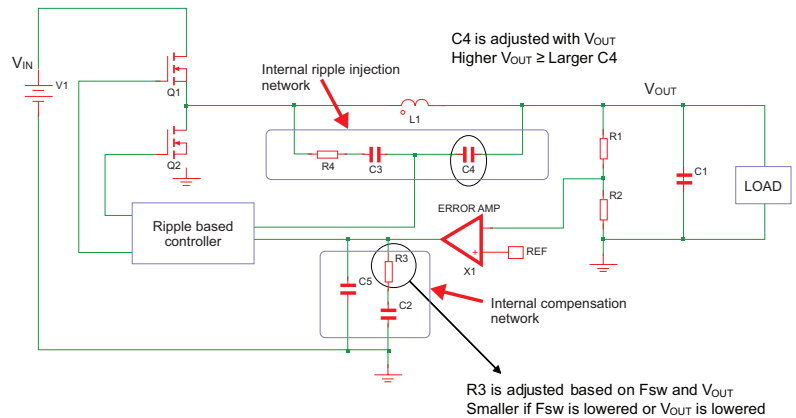


Figure 2. Internal Compensation and Internal Ripple Injection Components

You can experience the simplicity of designing with the SiC43x family by visiting our online design simulation tool at [www.vishay.transim.com](http://www.vishay.transim.com). Evaluation boards for the SiC43x family are available for order to speed up prototyping.