



Pulsed Load



Adjustable Output



Reduced Time to Market



# Pulsed Engraving Laser Fast and Dynamic Power for Speed and Precision

## The Customer's Challenge

Pulsed fiber lasers, a relatively new technology, were developed to improve engraving precision, processing speed and consistency. They achieve this, even for complex patterns and images, thanks to the short pulse duration minimizing thermal effects and faster processing with high peak power pulses.

One manufacturer was looking to take advantage of the opportunities that existed for these new systems. The design team was exploring ways of developing a new system, further improving resolution and contrast, with the ability to fine tune the system to get the best result. In addition, by increasing processing speed they could offer lower production costs to their customers. They needed to get their new system to market quickly to ensure they could maximize the opportunity that existed.



## The Solution

Two 24V input ZVS Buck Regulators were used in parallel to provide the necessary current, and included adjustability to provide the regulated 12 – 15V output for the optimization of the laser load.

[Link to Whiteboard »](#)



## The Results

Vicor's ZVS Regulators are part of a unique product range that delivers more power at higher temperatures, in smaller package sizes. The zero-voltage switching topology of the regulators reduces losses from higher input voltages, creating higher conversion efficiency than available anywhere else.

The ZVS Buck's switching frequency of 1.5MHz provides the very fast transient response to the high energy load steps necessary to support the high pulsed load output current. This enabled the system designers to develop a laser engraving system with both enhanced resolution and increased speed, even for complex patterns and images.

The high level of integration of the SiP package reduced the number of additional external components required, significantly reducing development time.

### Product Family Key Specifications

#### Cool-Power ZVS Buck Switching Regulators

<b>Input Voltages</b>	12V <sub>IN</sub> nominal (8 to 18V <sub>IN</sub> ) 24V <sub>IN</sub> nominal (8 to 36V <sub>IN</sub> ) 48V <sub>IN</sub> nominal (36 to 60V <sub>IN</sub> )
<b>Output Voltage</b>	Wide output range (1 – 16V)
<b>Output Power</b>	8 , 9, 10, and 15A versions
<b>Efficiency</b>	Up to 96.5%; Light load and full load high efficiency performance
<b>Dimensions</b>	10 x 14 x 2.56mm