

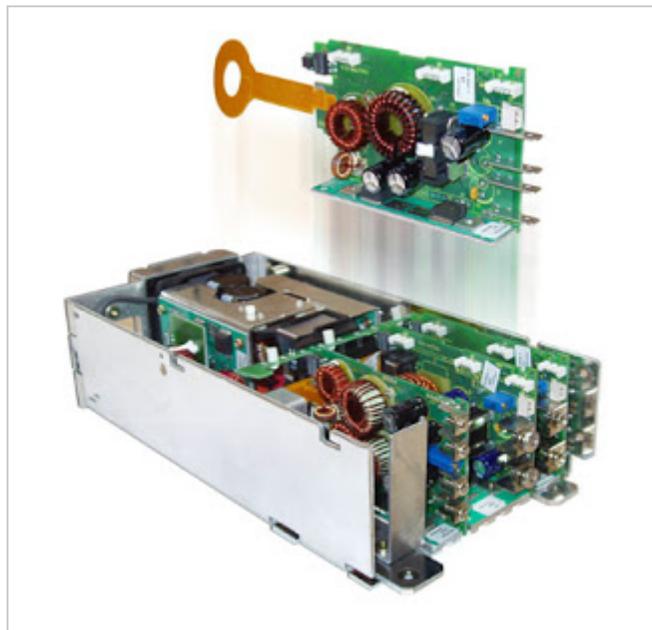
Monday, February 29, 2016

## An alternative to isolated DC-DC converters

Traditionally when several voltages (5V to 24V) are required in a system, either a multiple output power supply is used or a single output "bulk" supply with isolated DC-DC converters. For voltages lower than 5V (0.6 to 3.3V) the electronics industry has migrated to using multiple non-isolated DC-DC converters, often referred to Point of Load or POLs to drive FPGAs powered from a bus voltage between 5V to 12V.

With low power (typically less than 300W) dual, triple or quad requirements in the standard voltages of 5V, 12V, 15V and 24V, a single AC-DC power supply is used. These are cost effective and readily available.

For medium power requirements (350W to 1500W), often the choice is to use a modular power supply like TDK-Lambda's NV, Vega or Alpha series. As the term "modular" implies, they are put together using pre-assembled modules and are available with short lead-times. All the outputs are conveniently put into one package.



TDK-Lambda's Vega series

Another choice is to use a single output AC-DC power supply with board mount isolated DC-DC converters to produce additional outputs. These readily available converters range from around 10W to 60W, can accept input voltages of 12V, 24V or 48V and supply single, dual or triple outputs, with output voltages of 3.3V, 5V, 12V and 15V.



## TDK-Lambda's CCG series of 25mm x 25mm 30W isolated DC-DC converters

When the requirement is for a higher power (100W or greater) second, third or fourth output, the DC-DC converter choice becomes more limited and because of the power involved, heat dissipation is harder to manage. Cost can also become an issue. Utilizing technology developed from the low voltage output Point of Load non-isolated converters, higher output voltage non-isolated converters are now being considered.

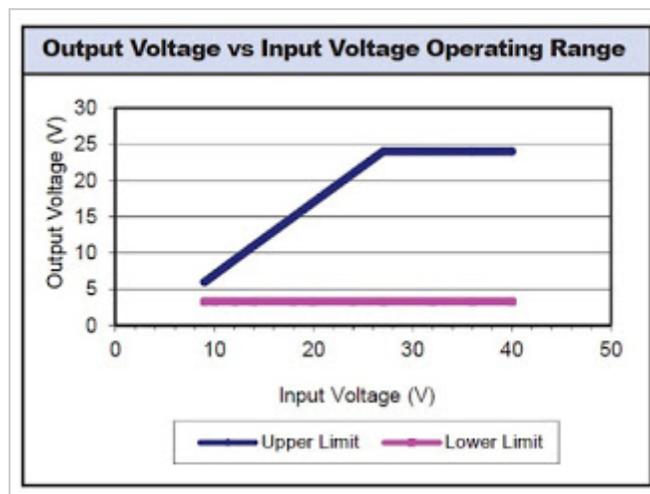
Without the constraints of input to output isolation, high performance "buck" (step-down) converters with very high efficiencies can be achieved. With less waste heat, package sizes can be minimized and costs reduced.

TDK-Lambda's i6A24014A033V, for example has the following specifications:

Input voltage: +9 to 40Vdc  
Output range: +3.3 to 24Vdc  
Output power: Up to 250W  
Output current: Up to 14A  
Efficiency: Up to 98%  
Package size: 33mm x 23mm

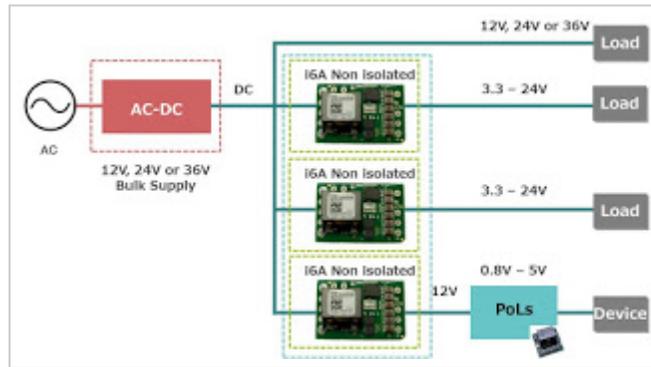


As a note, these types of (step-down) buck converters cannot supply a voltage higher than the input.



Although these types of converters have no input to output isolation, the AC-DC power supply will have, in accordance with the safety standards IEC 60950 / 60601.

Below is a typical application using the i6A:



Power Guy

Posted by [Power Guy](#)