



APPLICATION SOLUTION BRIEF

Standard DC-DC Power Conversion Solutions for Server Applications

Typical Power Requirements

- Server applications are broad ranging and can be anywhere from 400 watts to 2.5 kilowatts and higher
- Many low voltage rails can be required in a server, such as:
 - » 1.8 volts between 60 amps and 400 amps
 - » 1.0 volts between 50 amps and 200 amps
- Typical server application PCB ceiling height can be up to 20 mm
- The footprint of the PSA modules has been defined by the processors they are intended to supply
- PSA modules are designed to operate in conjunction with existing DPA structures

With the ever increasing power demands of server processors and associated memory devices, new power conversion design approaches need to be considered both at system and server level.

The solution to achieve the high power required is to move to a 48 volt system with the power conversion design approaches of either distributed power conversion, or direct power conversion employed in the server.

However, the optimum design approach to address the high power levels required is to employ a hybrid architecture where there is direct

conversion product that operates in parallel to the distributed power conversion network.

Though there are many industry standard solutions and products for 48 volt to 12 volt conversion, and 12 volt to low-voltage conversion, now a high density, high current, low voltage industry standard product that is focused on server processors and memory devices is needed.

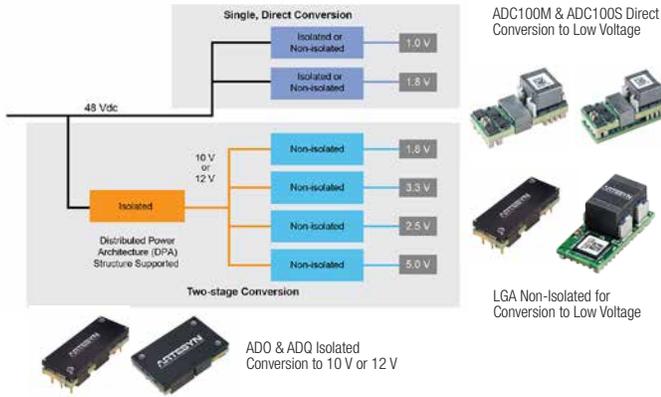
The Power Stamp Alliance (PSA) addresses this need with a multiple sourced standard product that is focused on providing the power rails for server processors at low voltages and high currents.



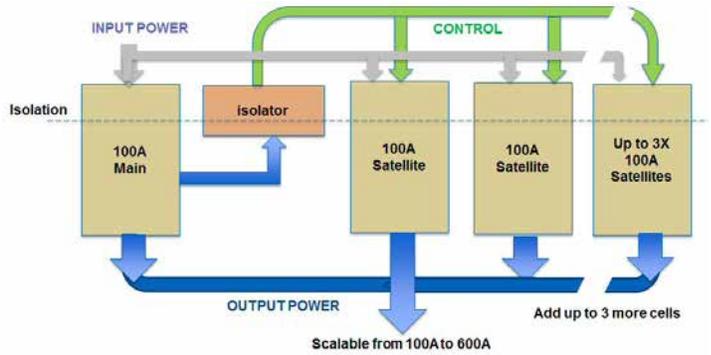
The Power Stamp Alliance will ensure our final customers of multiple sourcing of on-board isolated and non-isolated DC-DC power converters.



Hybrid Architecture of Both Single-stage Conversion and DPA Power Conversion



Power Stage Network of One Main and Satellites to Increase the Current Rating



The Artesyn Solution with Direct Conversion

The hybrid design approach realizes all of the advantages of deploying a 48 volt system distribution voltage that reduces system losses BUT also realizes better thermal management, better power distribution and high efficiency of power conversion in a server application. Examples of Artesyn's products to support the hybrid architecture are show in the diagram above.

By implementing direct conversion products for the low voltage, high current power rails required for processor and memory devices, that power bypasses the 48 volt to 12 volt converter, resulting in a lower power being required on the 12 volt rail. The overall result are power conversion stages that are easy to successfully implement in applications, from the perspective of electrical, thermal performance and now sourcing.

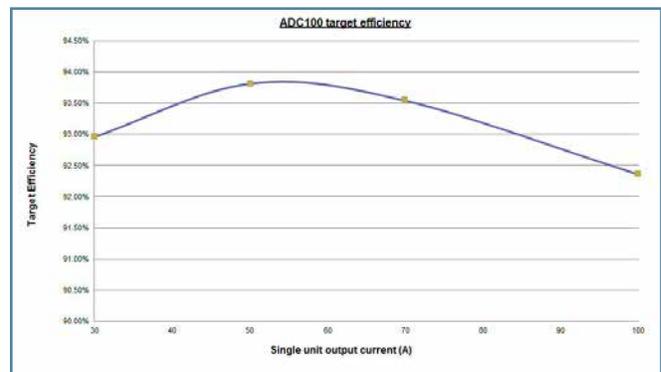
The PSA module specification means that standardized power conversion solutions are now available for the most demanding of server processors that require anywhere between 100 amps and 600 amps from their power supply, in addition to the SVID or AVSBus control functions that they require.

The Artesyn ADC100M and ADC100S products comply to the standard PSA modules specifications. With their Main and Satellite combination, they serve loads between 100 amps and 600 amps. In such a configuration (see top left diagram), the main and satellites operate in a truly multiphase manner. They can be considered a single power converter with inherent current sharing between them and with an almost flat efficiency characteristic. They result in a cost-effective, multiple sourced solution technology solution for the direct-conversion requirements of the optimum design approach for server power conversion architectures.

Artesyn ADC100 Main and Satellite Products



Target Efficiency



Product Ordering Information

Unit Part Number	Function	Vout
ADC100M-04Y	100 A Main 40-60 Vin, 1.8 Vout	1.6 – 2.0 V
ADC100M-04X	100 A Main 40-60 Vin, 0.9 Vout	0.6 – 1.2 V
ADC100S-04Y	100 A Satellite 40-60 Vin, 1.8 Vout	1.6 – 2.0 V
ADC100S-04X	100 A Satellite 40-60 Vin, 0.9 Vout	0.6 – 1.2 V

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