

APEC 2019 reveals a gentle hint of AI in power management

Steve Taranovich -March 27, 2019

Vicor

I met with Robert Gendron, Corporate VP of Vicor. He showed me the AI vehicle power strip concept. This is a 3.6kW output with 200V to 400V input and 10 regulated outputs (each output is programmable from 10V to 52V out). This has a PMBus and is in a sealed enclosure.

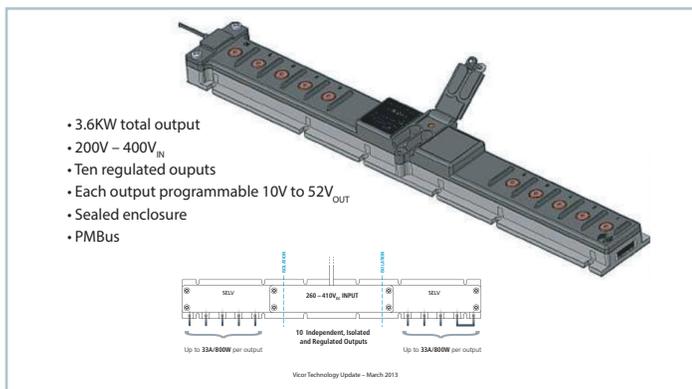


Figure 1 – The AI vehicle power strip powers intelligence in the car, bridging 48V and 12V systems with Vicor power converters 70W

Vicor also has innovative package designs that can power AI with their vertical power delivery concept. AI accelerators are quickly growing for learning/inferencing applications and power management needs to keep up with that. Vicor is doing its part with its vertical power delivery architecture.

Lateral power delivery (LPD)

Vicor presently has lateral power delivery with multichip modules on the sides of the XPU and that does reduce PDN losses and server board layer count. It also improves the transient response while extending peak current capability to greater than 1,000A.

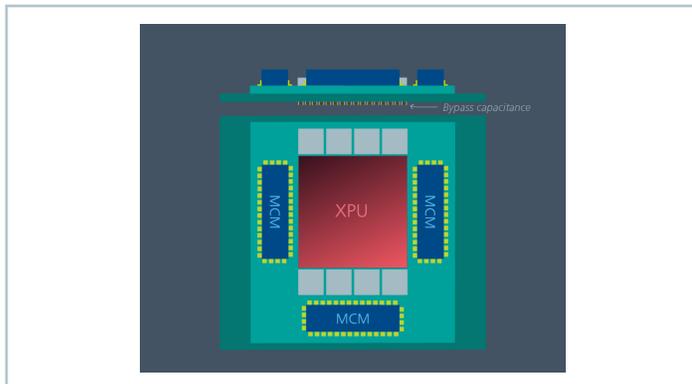


Figure 2 – Lateral power delivery has typical resistance of 70 $\mu\Omega$ and a PDN loss at 1,000A of 70W

Vertical power delivery (VPD)

Vicor is now pursuing the VPD with the MCM mounted on the bottom of the MCU. This minimizes PDN loss and frees up valuable real estate around the XPU. This architecture also integrates the PoL capacitance and maximizes system efficiency and XPU performance.

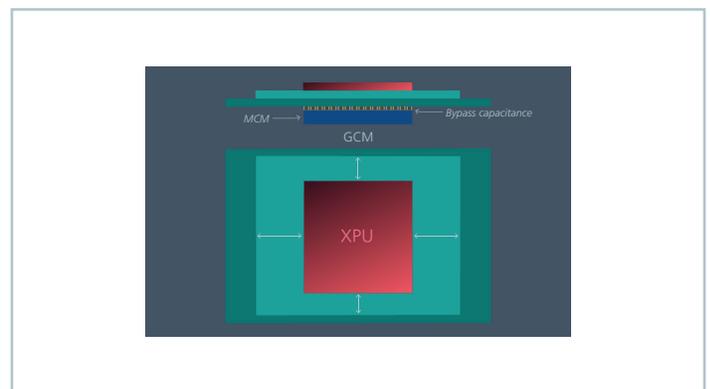


Figure 3 – Vertical power delivery has typical resistance of 10 $\mu\Omega$ and a PDN loss at 1,000A of 10W 70W

Vicor ecosystem for AI

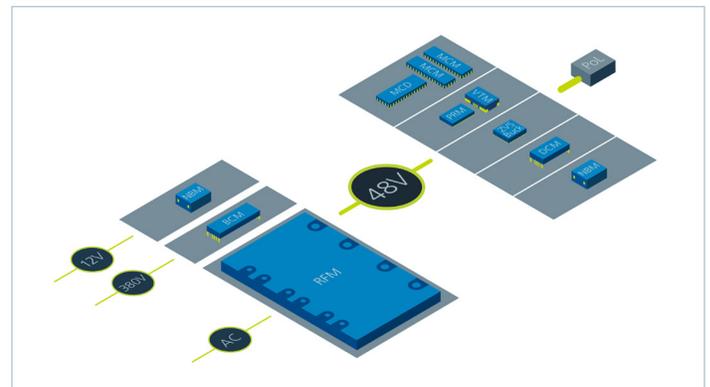


Figure 4 – Vicor solutions for AI and datacenter deployment

I can't wait to see what new power architectures will use AI by the next APEC conference in 2020. I am sure the solutions and architectures will have grown significantly by then.

"Alexa, take me to New Orleans!"

References

IoT-Based Degradation Management for Self-Healing Power Converters, A V Rocha, DF Melo, TAC Maia, VN Ferreira, BJC Filho, IEEE 2019

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