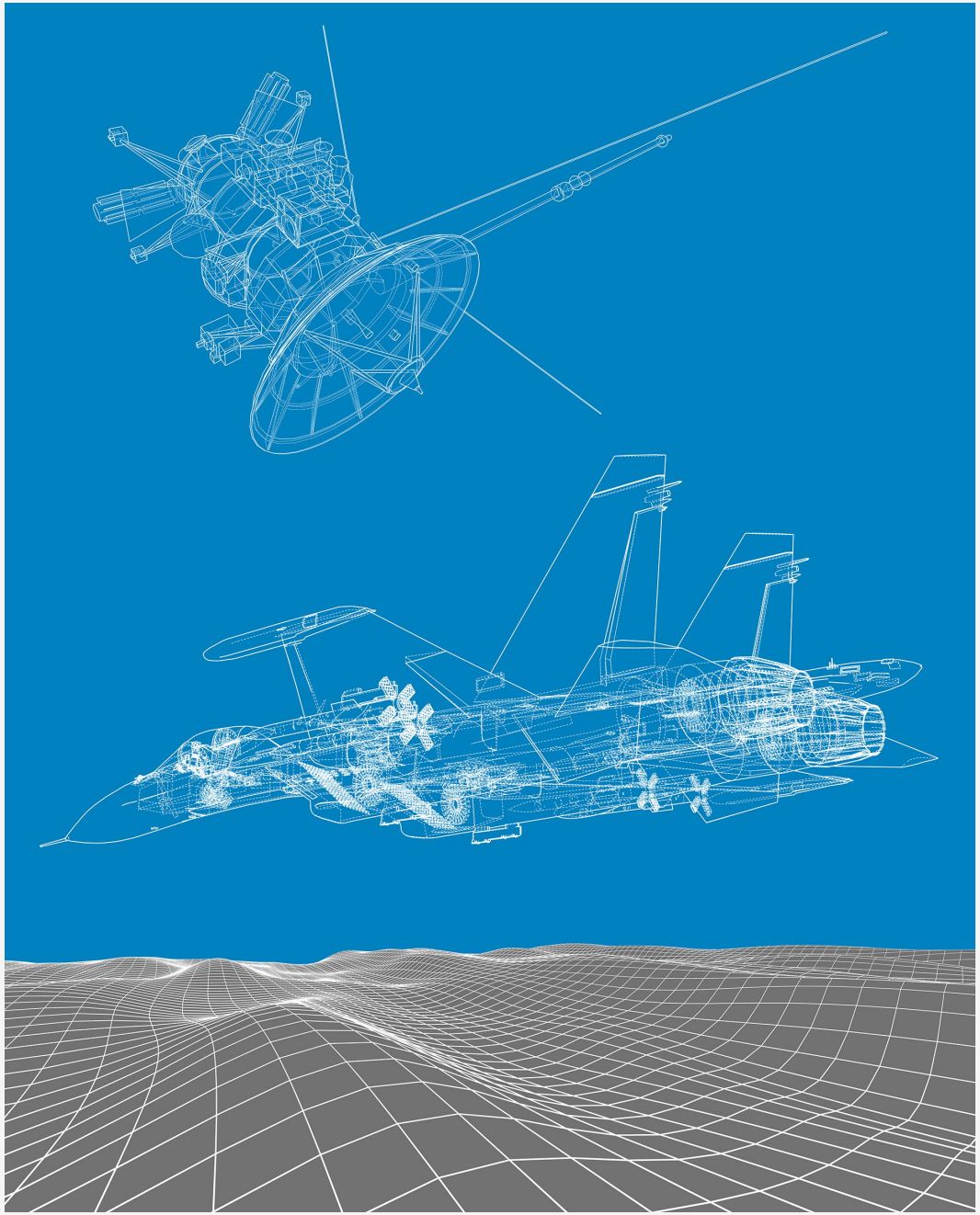
AirBorn
a molex company

VPX Power Regeneration Applications

Jerry Hovdestad – Principal Business Development Analyst

January 14, 2025



About AirBorn

Our Power Pedigree

Designing & manufacturing interconnects put us on the map 6 decades ago, but we offer so much more. Our power system expertise is becoming widely used by OEMs in many DOD and industrial applications.

- 30+ Years of Power Design and Manufacturing
- Designs in Ground Vehicles and Aircraft (MIL & Commercial)
- Designs from 50W-300kW
- Vertically-integrated processes

AirBorn
a molex company

AirBorn Power Systems

Plugfest 2024/2025

USAF Event to demonstrate MOSA principals
New DOD Secretaries of Defense Reaffirm MOSA

- At the Plugfest event, there will be seven groups:
  - SBC & Switch Group
  - RF (SDR, Tuner) & PNT Group
  - GPU Group
  - Power Supply Group **AirBorn**
  - Chassis Management Group
  - Communications & Security Group
  - Small Form Factor Group

AirBorn
a molex company

AirBorn Power Systems

Problem: How to show high-power capability (2000W and more) with standard lab wall power

TYPICAL 3U CHASSIS

- Power:
  300W-800W

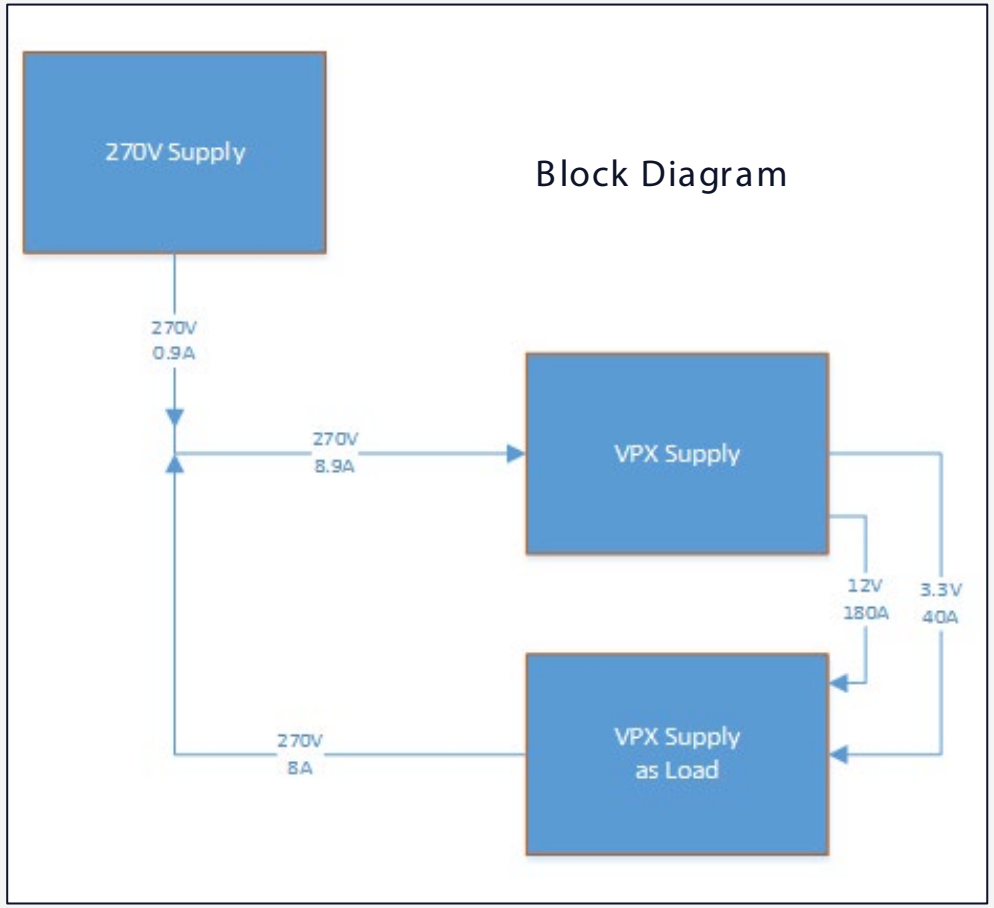
TYPICAL 6U CHASSIS

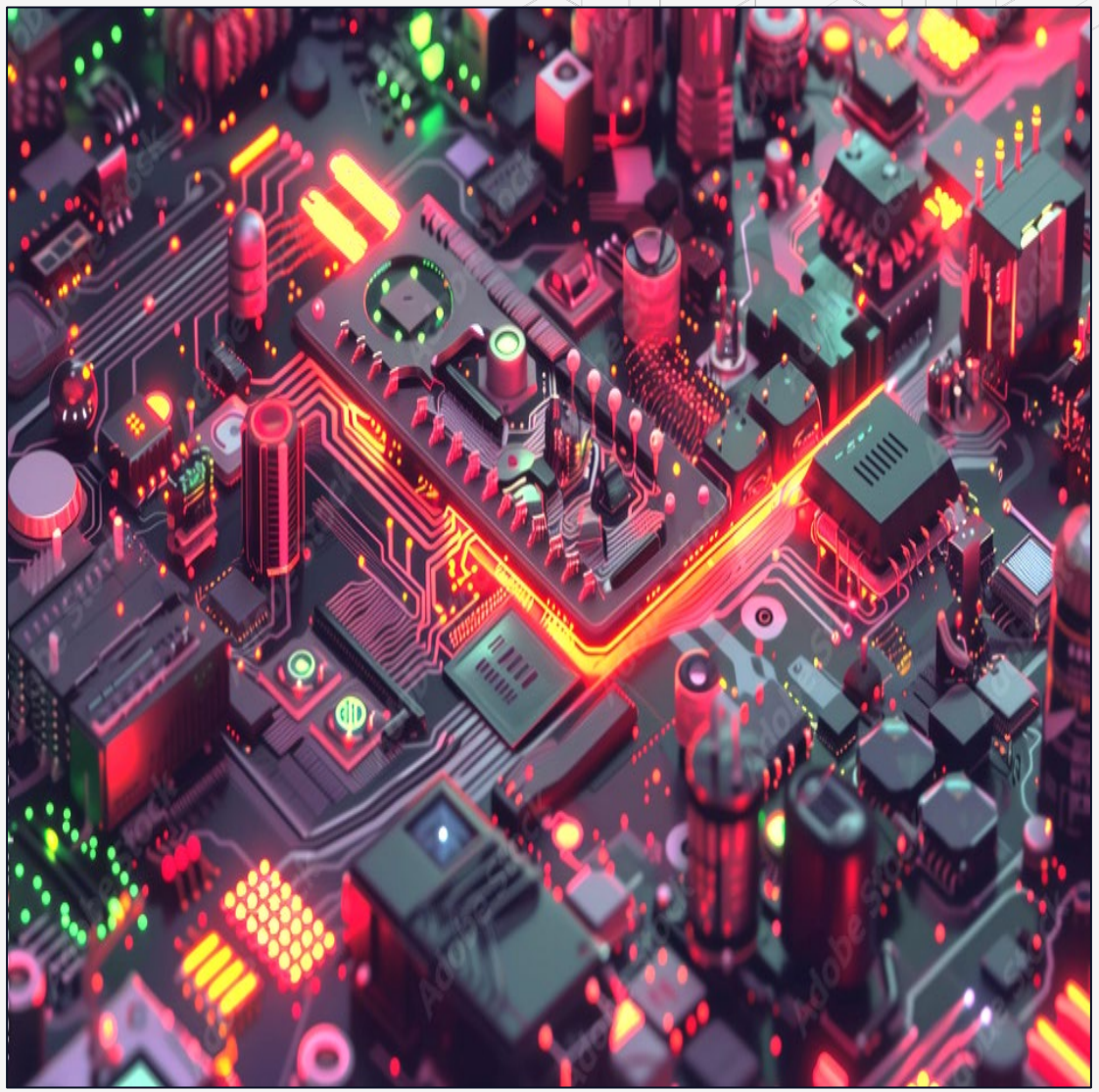
- Power:
  2000W-6000W

AirBorn
a molex company

AirBorn Power Systems

Solution: Regenerative Power

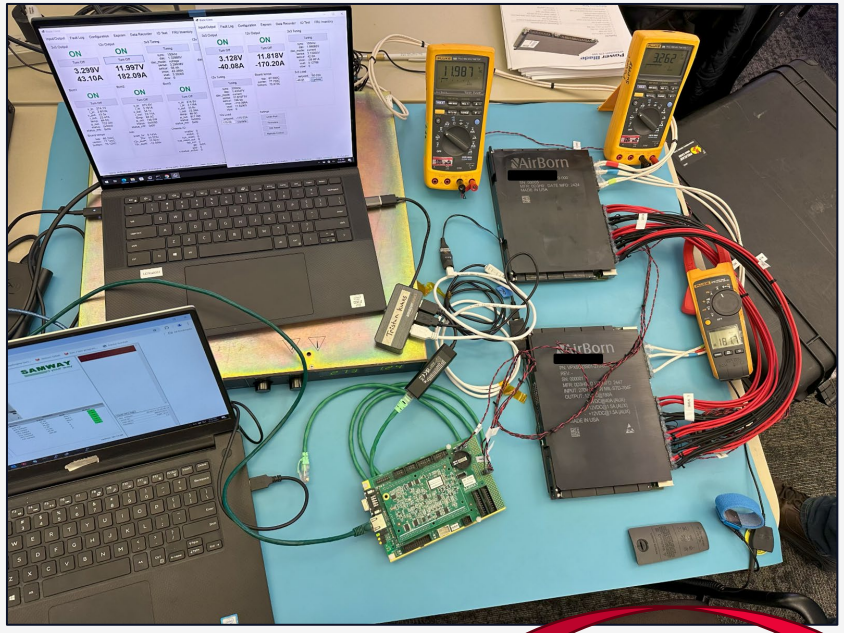


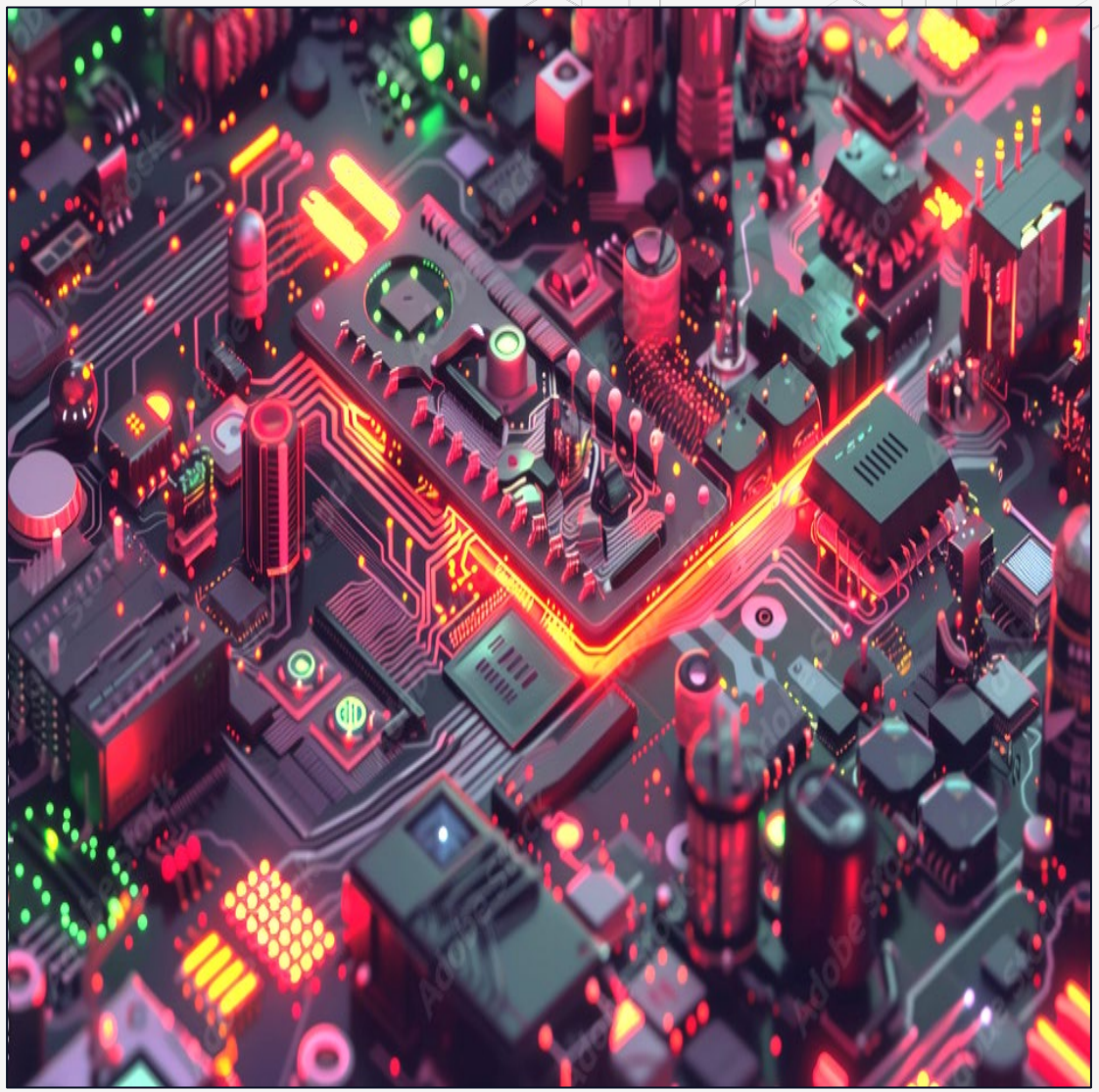


AirBorn
a molex company

AirBorn Power Systems

Theory: Full-Load Bench Demo

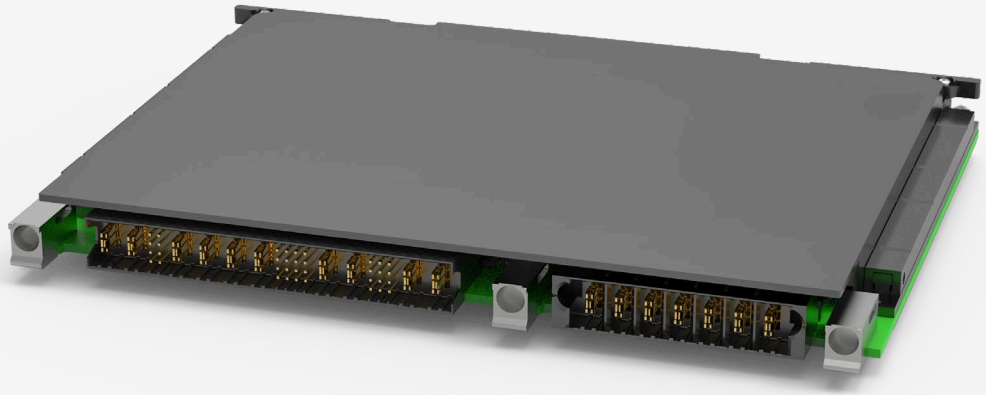


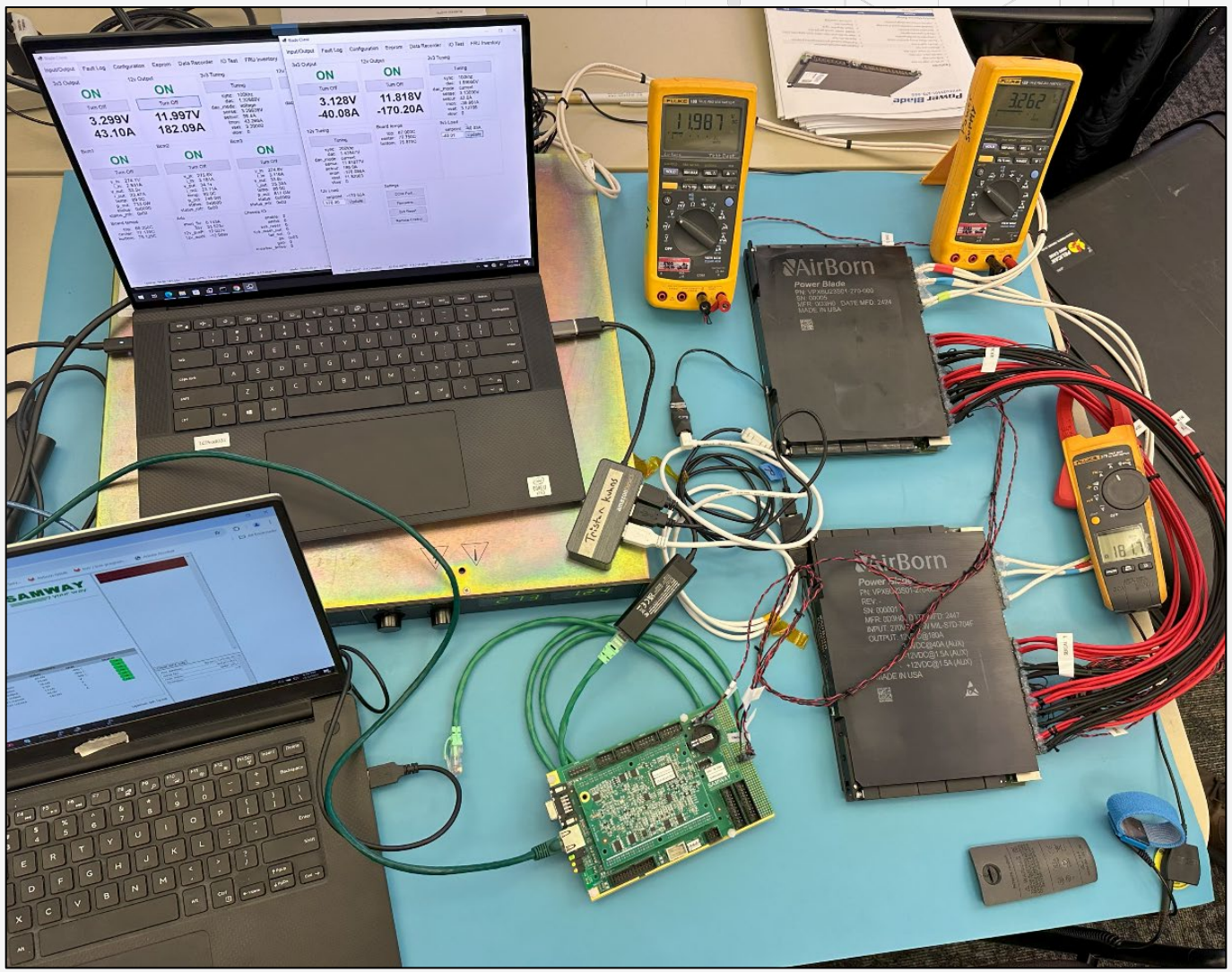


AirBorn
a molex company

AirBorn Power Systems

Theory: Full-Load Bench Demo



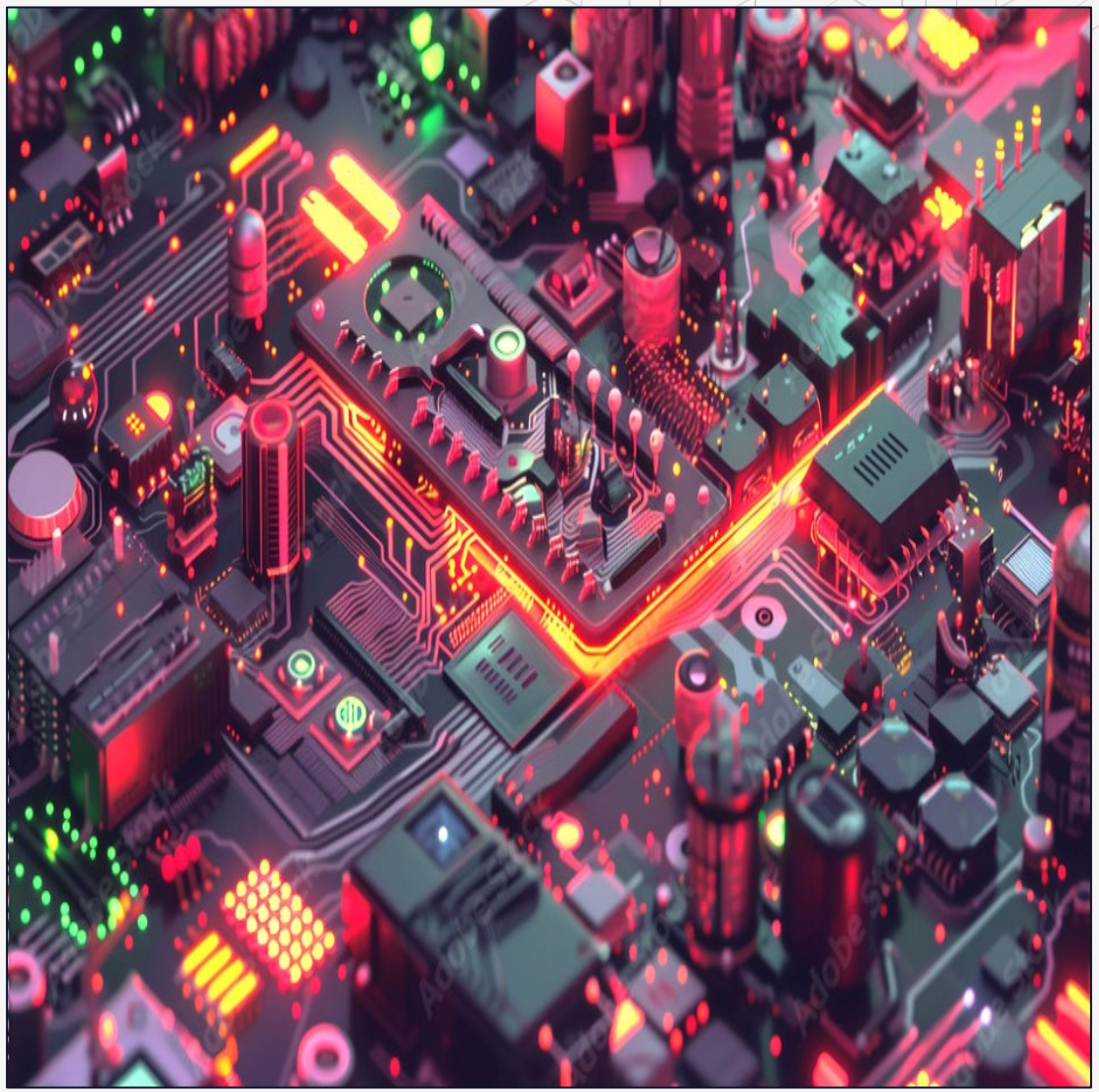


AirBorn
a molex company

AirBorn Power Systems

Regenerative Power

- Background
- Theory
- Application
- Results

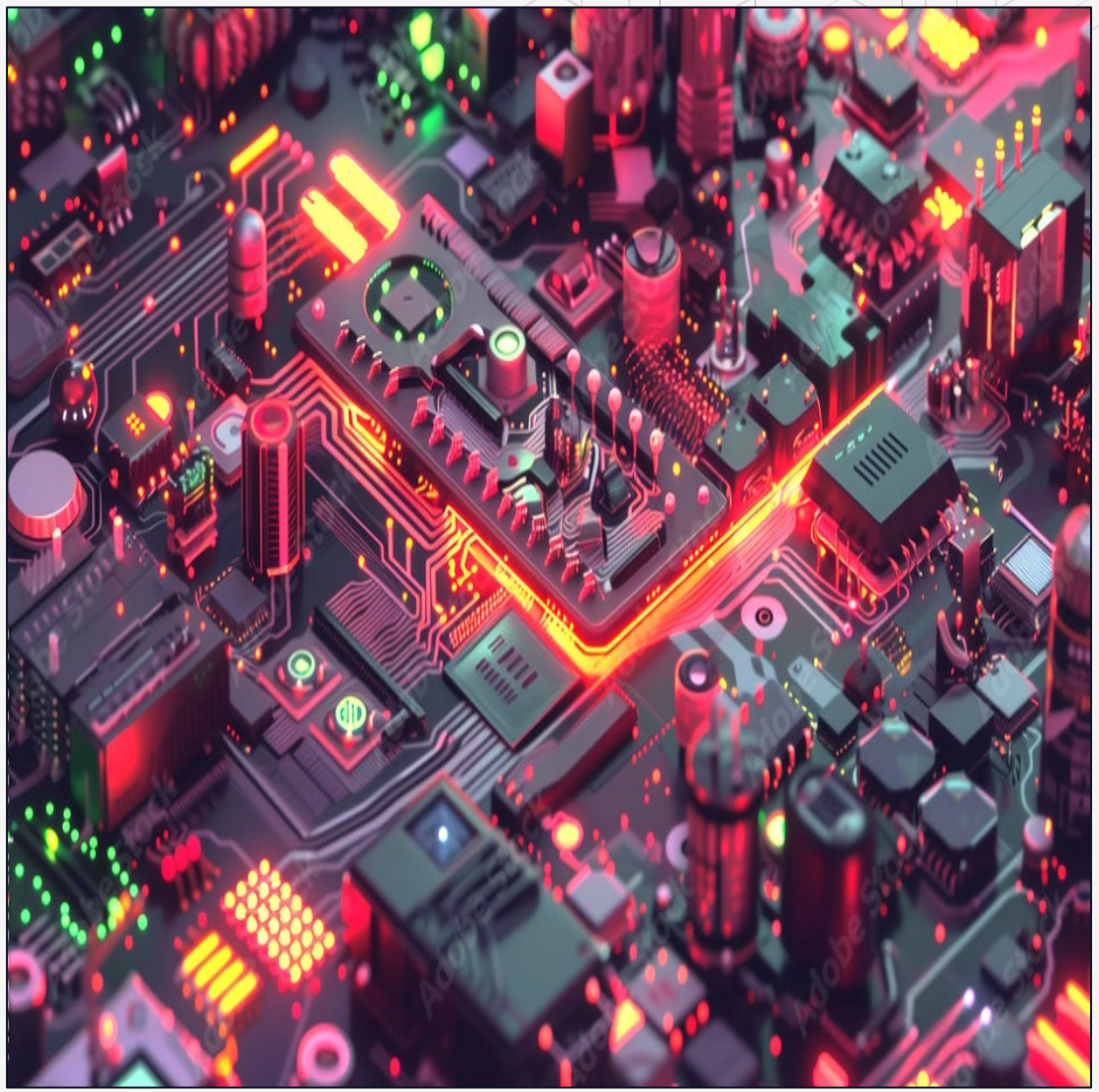


AirBorn
a molex company

AirBorn Power Systems

Background

- Load testing of power supplies is used for performance measurement and verification
- Typically, an external load is used, or load cards in chassis with resistive loads
- Certain power supply designs may be able to be configured for reverse power flow to be used in place of a load

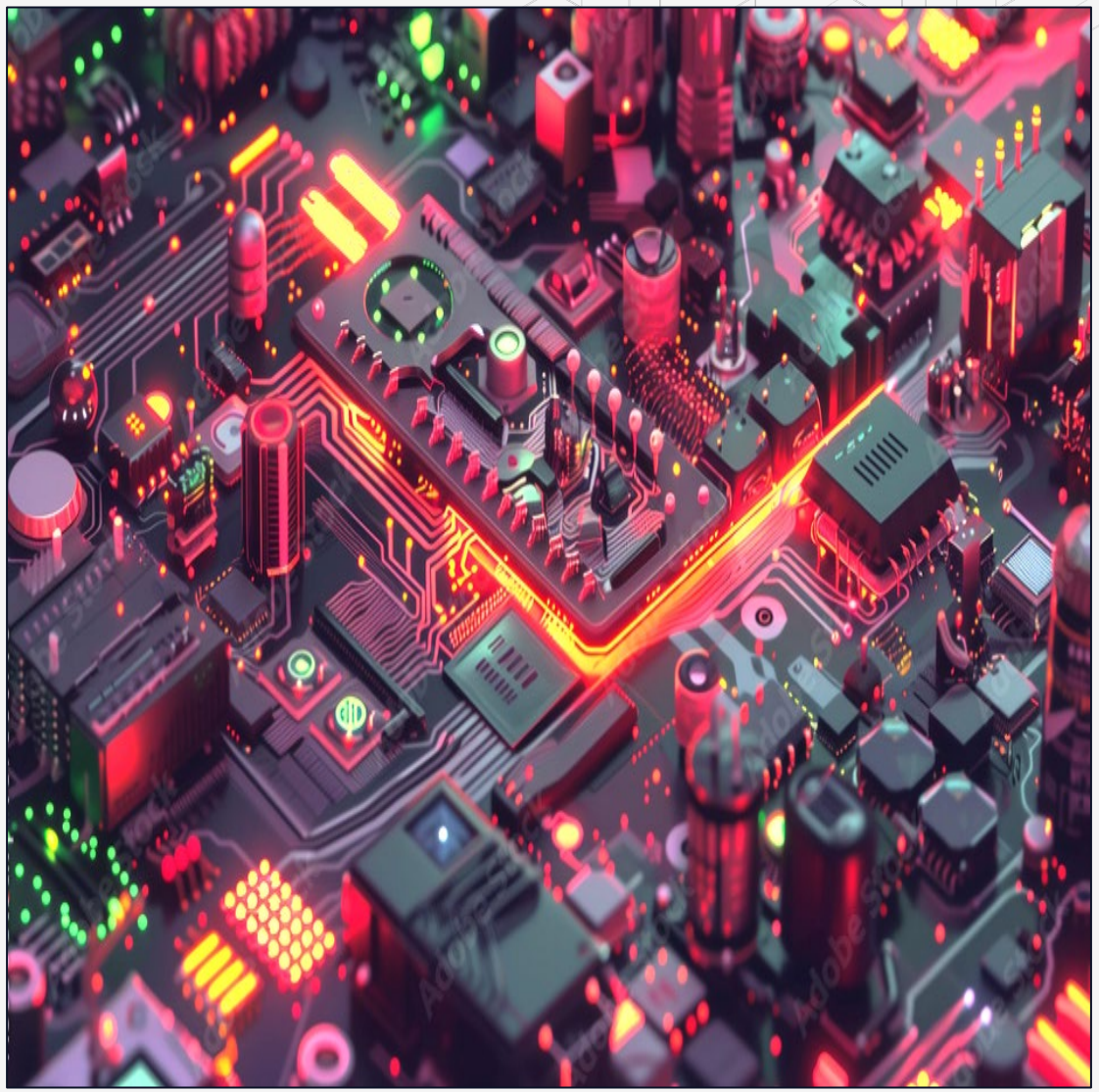


AirBorn
a molex company

AirBorn Power Systems

Theory

- Allows for an input power supply to be significantly smaller than the supply that would be required for supporting the actual load power
- Similar to load share mode, the 12V and 3.3V connections are voltage based with gradual adjustments on the voltage targets to achieve desired currents
- The same regulation software is used for current balancing in parallel operation as is used for achieving a desired load current. The difference in software is a negative current setpoint instead of a positive setpoint

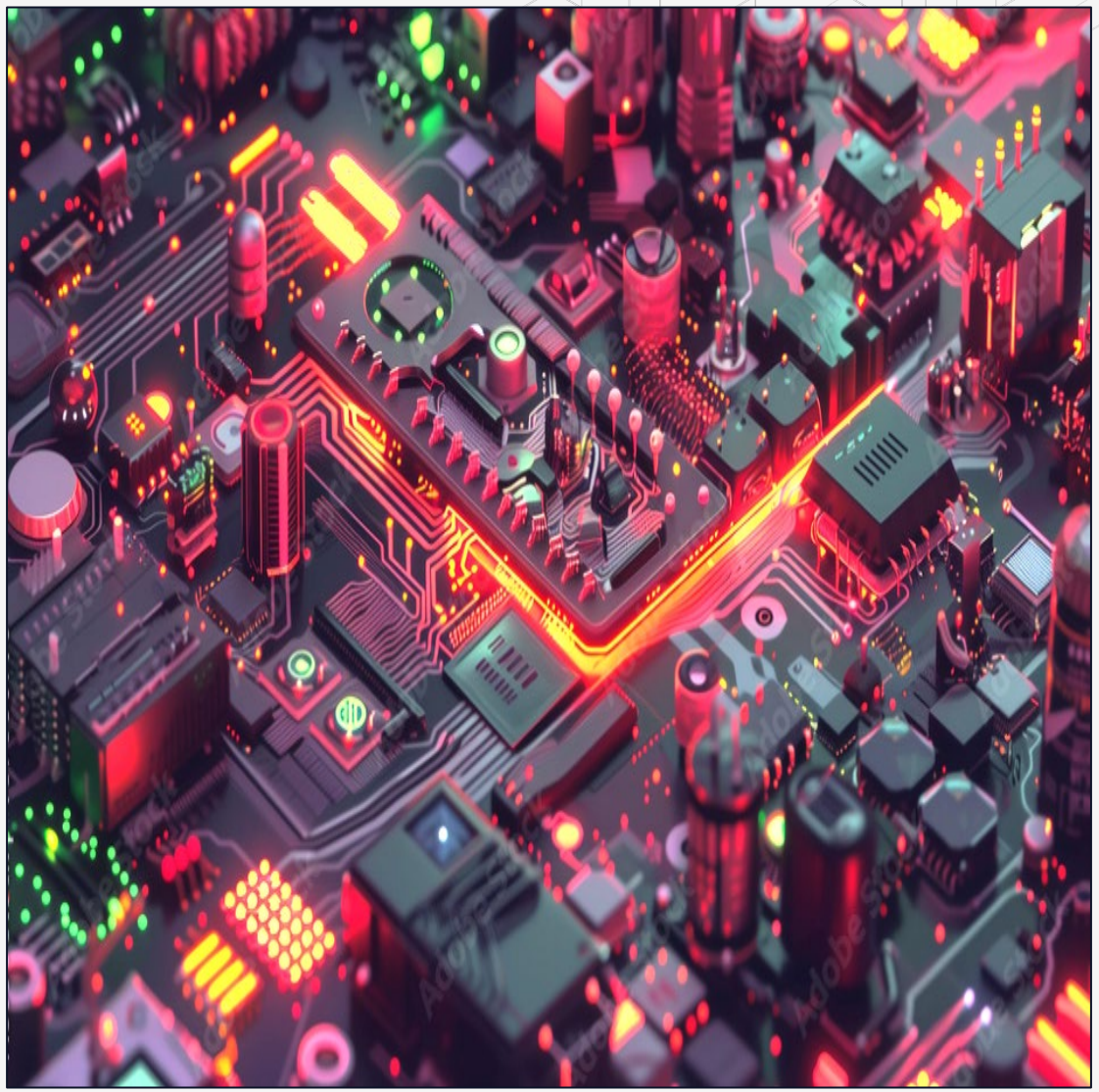


AirBorn
a molex company

AirBorn Power Systems

Theory Continued

- Algorithm to dispatch power when in parallel operation may be used to regulate load power
- Power supplies may be configured for supply operation only, or as regenerative capable as part number options
- Supplies configured for supply operation only block reverse power flow independent of software operation



AirBorn
a molex company

Summary

Feature	Benefit
• Full power can be developed with only input power making up the system losses	• Can fully test multiple power supplies with limited input current
• Very low heat generated vs resistive load	• In a 2,300-Watt system, only ~240Watts are dissipated as heat
• Lower cost than bulky external generative loads	• Smaller manufacturing footprint and lower cost
• Does not require external power like a generative load	• Does not require special facility power and cabling
• 7 of the 2,300-Watt AirBorn VPX power supplies can be fully loaded from a 120V, 15A* wall outlet	• Multiple units can be run without any special infrastructure additions

*Derated to 12A for 80% continuous

AirBorn
a molex company

VPX Power Supply

Key Features

Power

- 2000+ Watts output power
- (180 amps @ 12VDC)
- Most competing products are rated from 800-1400 Watts

Efficiency

- 95% with flat efficiency curve (produces less heat!)
- > 90% efficiency maintained from 20A to 180A loads
- Systems run cooler and last longer
- Most competing products are just 85-89% efficient
- In a class well above the rest!

AirBorn
a molex company

One Product, Many Applications

Function

- DC in VPX out
- AC in VPX out
- DC in AC out
- VPX in DC out
- VPX in AC out

AC - single or 3 phase
VPX - +12VDC & 3.3VDC

Environment

- Conduction cooled
- Liquid cooled
- Air cooled

VITA Specification

- ANSI/VITA 48.2
- ANSI/VITA 48.4
- ANSI/VITA 48.5; 48.7; 48.8; 48.9

AirBorn
a molex company

AirBorn
a molex company

Thank You