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POWER • TEAMWORK • CUSTOM • SUPPORT •
TIME • FLEXIBILITY • VISION • PERFORMANCE
VATION • EXPERTISE • EFFICIENCY • CONFIGU
MPONENTS • RELIABILITY • LONGEVITY • VOLU
ROVEN • DENSITY • QUALIFIED • COMPETITIVE
SOLUTIONS • INTEGRATION • OPPORTUNITY

Intermediate Bus Architecture (IBA)

Definition of Intermediate Bus Architecture

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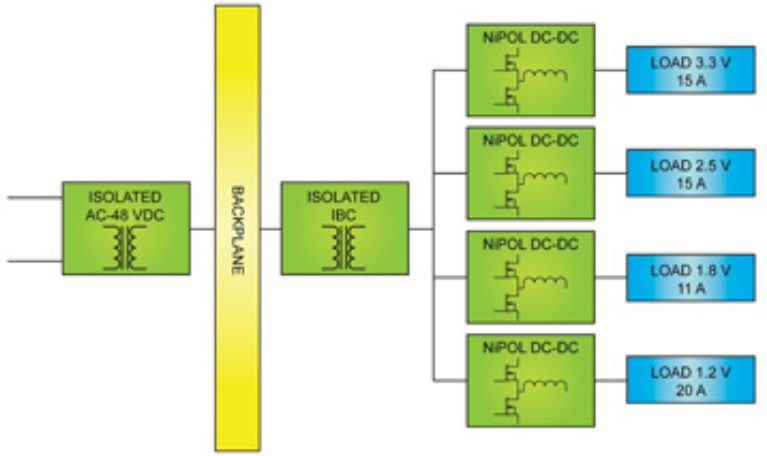
- A power distribution technique that has gained popularity by providing lower cost, improved power quality, smaller size and higher efficiency while taking advantage of the newest advances in power components

- Configured with an AC front end power supply delivering an output of typically -48 V. In some equipment, the DC output of the front end can be 380 V from a power-factor-correction (PFC) front end or 350 V from a 3-phase front end

- This DC output voltage from the AC front-end is supplied to an Intermediate Bus Converter that provides isolation and conversion to a lower-level intermediate bus voltage, typically 9.6 or 12 V

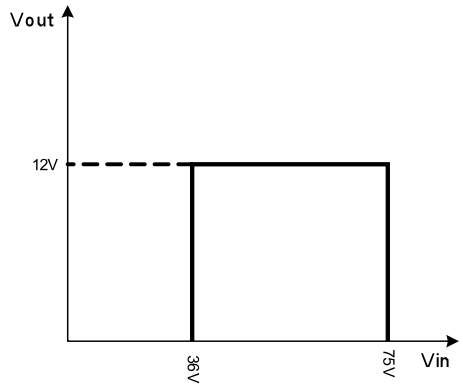
- The intermediate bus voltage is then supplied to downstream non-isolated, Point Of Load regulators that provide regulated voltages for a variety of electronic loads

Benefits of Intermediate Bus Architecture

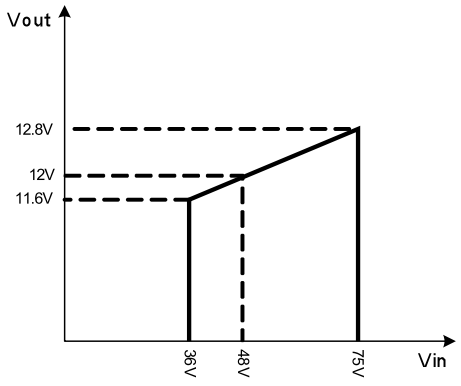


- The proliferation in the number of lower voltage output requirements led to the development of a more cost effective power solution
- IBA replaced the more traditional single output "brick" DC-DC module approach in favor of using one or more bricks to create a single "intermediate" output (typically 9.6 V to 12 V)
- Lower cost, high efficient non-isolated buck regulators are then used to provide the individual point of load regulation.

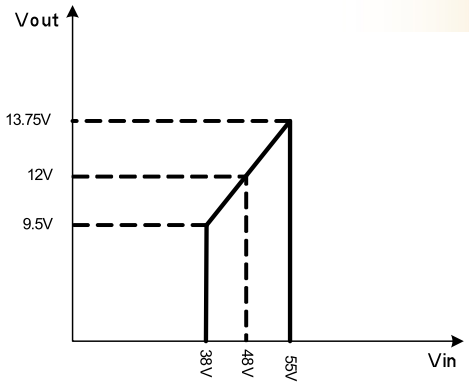
IBC – Regulated, Semi-regulated, Fixed Ratio



Regulated DC/DC Converter
(±0.2% Regulation)



Semi-Regulated DC/DC Converter
(±7% Regulation)



Fixed Ratio DC/DC Converter
(4:1 ratio)

- **Regulated**
  - Output voltage is constant over input voltage and output load conditions
  - Operates over a wide input voltage range (36 – 75 V)
  - Typical efficiency ~93%

- **Semi-Regulated**
  - Output voltage is loosely regulated and changes typically ±7-10% over input voltage and output load conditions
  - Operates over a wide input voltage range (36 – 75 V)
  - Typical efficiency ~95%

- **Fixed Ratio**
  - Output voltage changes as a fixed ratio of the input voltage (4:1 or 5:1)
  - Operates over a narrow input voltage range (38 – 55 or 36 – 60 V)
  - Typical efficiency >97%

Typical Backplane / Distribution Voltages

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Below are some typical backplane / distribution voltages and where they are most commonly used:

- Non isolated -36 V to -75 Vdc
  - Central Office (CO) locations
  - ✗ Cannot use the fixed ratio IBC
- Regulated, isolated 42 V to 50 V
  - Provided by a regulated AC-DC or DC-DC front end supply
  - Data center and or CO locations
  - ✓ Can use the fixed ratio IBC
- Regulated, isolated 54 V
  - Provided by a regulated AC-DC or DC-DC front end supply
  - Data center and or CO locations
  - Systems that include Power over Ethernet (PoE)
  - ✓ Can use the fixed ratio IBC
- Regulated, Isolated 12 V
  - Provided by a regulated AC-DC or DC-DC front end supply
  - Low to mid end systems
  - 1U “pizza box” systems
  - ✗ Cannot use the fixed ratio IBC

Applications

- Intermediate Bus Architecture Applications
  - High power density
  - High efficiency
  - Simplified thermal management

- Enterprise networks
- Optical access networks
- Computing
- Data storage
- Networking

- Power-over-Ethernet
- Telecom
- Wireless networks
- Industrial
- Test equipment