NBM™

Non-Isolated Fixed-Ratio Bus Converter

An ideal solution for customers bridging new 48V technologies with existing 12V solutions

Description

NBM non-isolated bus converters deliver high-efficiency voltage transformation and current multiplication for space-constrained, high-performance power architectures. Featuring inherent bidirectional capability, NBMs can step down or step up input voltages using a fixed internal auto-transformer turns-ratio. Downstream buck or buck-boost regulators can then be connected to the NBM output to supply tightly regulated voltages for specific system loads.

Core Technology

Built on the Vicor resonant Sine Amplitude Converter (SAC™) topology, NBMs utilize high-frequency zero-voltage switching (ZVS) and zero-current switching (ZCS). This advanced design yields exceptional efficiency, high power density, low electrical noise and fast transient response.

Key System Values

Reduced Board Space and Cost: The NBM's low AC impedance, extending beyond the bandwidth of typical downstream regulators, allows bulk capacitance to be relocated from the regulator input to the NBM's high-voltage input. This significantly reduces total capacitance requirements, saving valuable board area and system cost.

Flexible Packaging: Offered in compact ChiP and SM-ChiP packaging options to meet the demanding thermal and spatial constraints of modern power designs.

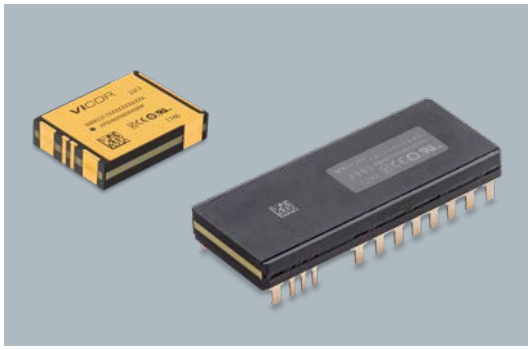
Features & Benefits

- High peak efficiency: Up to 98.2%
- High power density: Up to 8100W/in^3
- Bidirectional start up and steady-state operation
- Parallel inputs and outputs for high-powered arrays
- Through-hole (ChiP™) and surface mount (SM-ChiP™) packaging

Applications

NBMs are commonly deployed to bridge 48V and 12V power rails. Because of their true bidirectional design, they seamlessly support both 48V-to-12V step-down and 12V-to-48V step-up conversions.

NBM2317 SM-ChiP™
0.90 x 0.68 x 0.20in
[22.8 x 17.3 x 5.2mm]



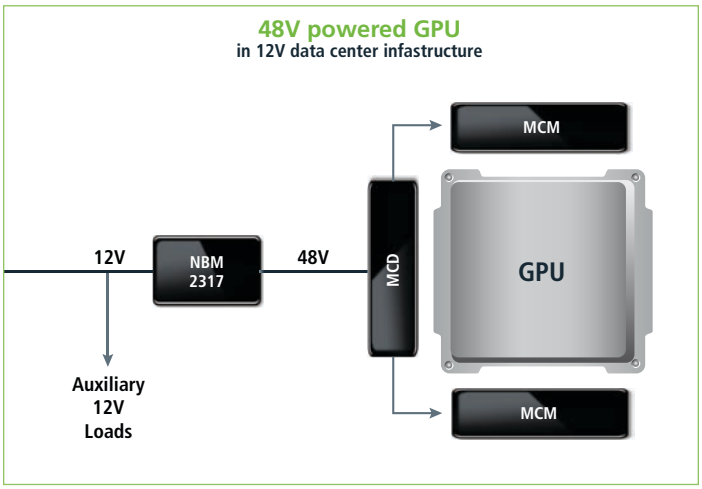
NBM6123 ChiP™
2.402 x 0.990 x 0.284in
[61.00 x 25.14 x 7.21mm]

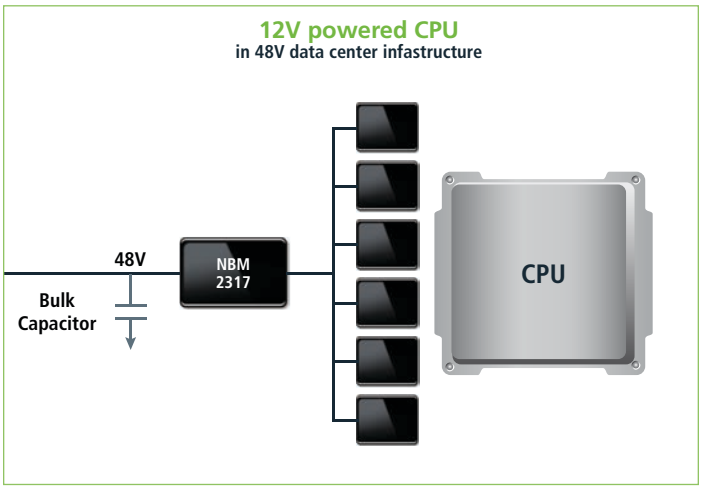
Family of NBM Products

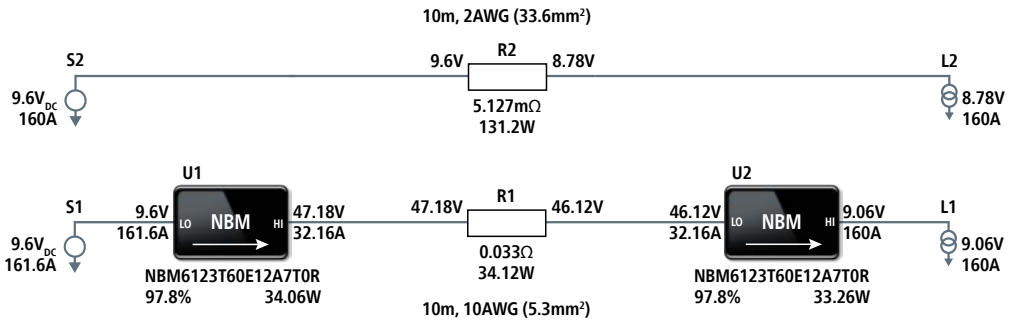
Model Number	Input Voltage (V)	Output Voltage (V)	Output Power* (W)	Output Current* (A)	Package
NBM2317S60D1565T0R	40.0 – 60.0	10.0 – 15.0		65	2317 SM-ChiP™
NBM2317S60D1580T0R	40.0 – 60.0	10.0 – 15.0		80	2317 SM-ChiP
NBM2317S60D1580TMR	40.0 – 60.0	10.0 – 15.0		80	2317 SM-ChiP
NBM6123T46C15A6M0R	42 (36 – 60)	13.8 (12 – 15.3)	2400	160	6123 ChiP™
NBM6123T46C15A6T0R	42 (36 – 60)	13.8 (12 – 15.3)	2400	160	6123 ChiP
NBM6123T60E12A7T0R	48 (36 – 60)	9.6 (7.2 – 12)	2000	170	6123 ChiP

* Consult product data sheets for full product ratings and specifications.

Block Diagrams







Showing the benefits of bidirectional capability:
Two NBM6123 modules are used (one forward, one in reverse), to reduce power loss in high-power DC transmission.

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