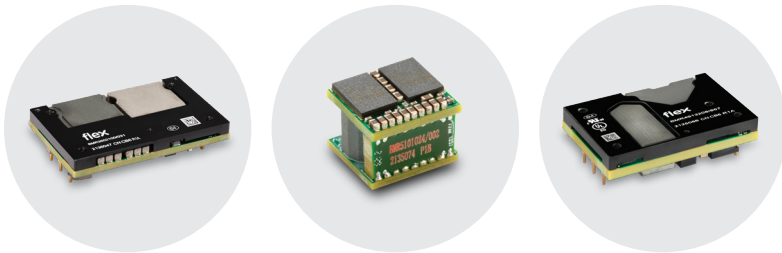




Power Modules

DC/DC Converters for Cloud, Storage and Hyperscale Computing



POWERING CLOUD, STORAGE AND HYPERSCALE COMPUTING

Flex Power Modules' solutions for storage, hyperscale and cloud computing are optimized for high efficiency, power density and quality at a low cost of implementation.


Driven by the ever-increasing demand for power, many cloud-based data centers are transitioning from 12 V to 48 V as the preferred voltage level for rack DC voltage distribution. When large numbers of electronic equipment are tightly packed into a fixed space, power supply efficiency is highly prioritized. However, even the most efficient systems unavoidably produce heat, simultaneously increasing the importance of power density and thermal management.

At Flex Power Modules, our thermal management approach emphasizes the use of top-side heat removal. We redesigned our eighth and quarter brick modules, placing thermal conduction paths from heat dissipating components to the top baseplate for direct heat removal.

The rack-level 48 V architecture supports the potential elimination of input-to-output isolation in the first stage of DC/DC conversion, while some applications support an unregulated intermediate bus voltage:

- Eliminating isolation improves efficiency and reaches higher power densities through the expansion of available power conversion topology options
- Removing the need for voltage regulation brings new opportunities, such as the use of switched-capacitor designs to reduce module height and further increase efficiency and power density

In traditional two-stage power conversions, an emerging trend for the second stage is to use two-phase power modules as building blocks. Multiple two-phase modules are then paralleled to meet total current requirements. These are then combined with an external multi-phase controller that provides final phase-count control and other communication or performance requirements.



Virtualization is the foundation of cloud computing and allows a more efficient use of customer hardware

flex

CLOUD, STORAGE & HYPERSCALE COMPUTING POWER MODULES

BMR510 – 2-phase Voltage Regulator Module - VRM (up to 80 A / 140 A_{peak})



- Wide 4.5 – 16 V input range
- Optimized for top-side cooling
- Over-temperature and current limit protection

Dimensions: 10 x 9 x 7.6 mm / 0.39 x 0.35 x 0.29 in

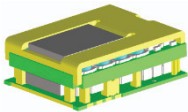
BMR482 – 48 V to load direct conversion (up to 660 A)



- Small ½ in² footprint
- 1 main and up to 5 satellite units can be used in parallel
- High efficiency and excellent thermal performance

**Dimensions: Main – 30 x 12.7 x 16.3 mm / 1.18 x 0.5 x 0.64 in
Satellite – 30 x 12.7 x 14.9 mm / 1.18 x 0.5 x 0.58 in**

BMR313 – Ultra-small Intermediate Bus Converter - IBC (up to 1000 W / 3000 W_{peak})



- Compact non-isolated DC/DC converter
- Peak power capabilities up to 3000 W
- Optimized thermal design for cold wall mounting

Dimensions: 23.4 x 17.8 x 7.6 mm / 0.92 x 0.70 x 0.30 in

BMR350 – Digital quarter brick (up to 860 W / 1200 W_{peak})



- Non-isolated & fully regulated output
- Black box function (event data recorder)
- Parallelable up to 3 units

Dimensions: 58.4 x 36.8 x 12 mm / 2.3 x 1.45 x 0.47 in

BMR310 – Switched capacitor converter (up to 860 W / 1060 W_{peak})



- Non-isolated and unregulated converter
- Parallel design via Droop Load Sharing (DLS)
- Low height profile

Dimensions: 57.9 x 25 x 9.9 mm / 2.28 x 0.98 x 0.38 in

BBMR491 – High power DC/DC IBC in a quarter brick (up to 2450 W_{peak})



- Continuous power up to 1540 W
- Hybrid regulated ratio & fixed regulated versions
- High efficiency of 97.7%

Dimensions: 58.4 x 36.8 x 14 mm / 2.3 x 1.45 x 0.57 in

BMR492 – High power DC/DC IBC in an eighth brick (up to 1100 W_{peak})



- Continuous power up to 800 W
- Excellent thermal behavior
- Digital interface available in 7-pin industrial standard

Dimensions: 58.4 x 22.7 x 14 mm / 2.3 x 0.9 x 0.55 in

Product Variants (more available at flexpowermodules.com)

PRODUCT NUMBER	V _{in}	V _{out}	I _{out}	I _{out_peak}	P _{out}	P _{out_peak}	η
BMR5101024/002	4.5-16 V	0.5-1.3 V	40 A (TDC) per phase 80 A (TDC) total	70 A per phase 140 A total			88% at V _{in} 13.5 V and V _{out} 0.8 V
BMR4820001/004	40-60 V	0.5-1.35 V	110 A				92%
BMR3131011/001C	40-60 V	10-15 V			1000 W	3000 W	>98%
BMR3502100/031	40-60 V	12 V			860 W	1200 W	>98%
BMR3104100/001	40-60 V	10-15 V			650-860 W	1060 W	>98%
BMR4912408/857	48-60 V	12 V			1540 W	2450 W	97.5%
BMR4920300/864	40-60 V	12 V			800 W	1100 W	97.3%

FLEX POWER MODULES

EMEA (Headquarters)

Torshamnsgatan 28 A
16440 Kista, Sweden

APAC

33 Fuhua Road, Jiading District
Shanghai, China 201818

Americas

6201 America Center Drive
San Jose, CA 95002, USA



pm.info@flex.com



flexpowermodules.com



flexpowerdesigner.com



[linkedin.com/showcase/flex-power-modules/](https://www.linkedin.com/showcase/flex-power-modules/)

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