

DC/DC Converters for Artificial Intelligence & Machine Learning applications

Artificial Intelligence is evolving rapidly and has surpassed human decision making capabilities in several instances. It is already producing some of the most effective and impactful results seen in today's businesses.

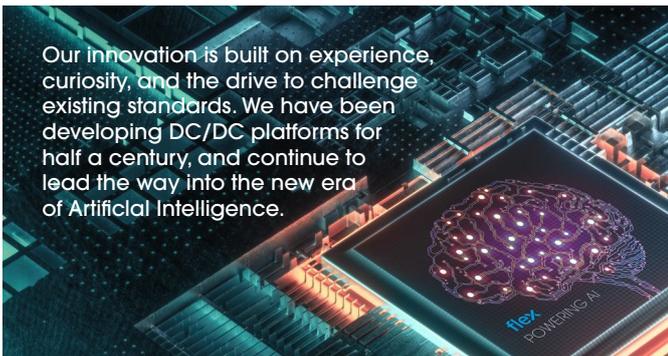
Many new AI-based products and services rely heavily on the cloud. AI can be extremely compute-intensive where local or edge devices struggle to manage everything independently. As such, power delivery and power efficiency have become key concerns in large scale computing systems. The industry is experiencing a dramatic increase in power consumption through processors with ASICs and GPUs that process complex AI functions.

Rack power is also increasing with the deployment of Machine Learning and AI applications. In most cases, power delivery is now a limiting factor in computing performance with new CPUs consuming ever increasing currents. Power delivery impacts not only the distribution of power but also the efficiency, size, cost and thermal performance.

There is an increasing demand for power density – rack power levels previously needing less than 10kW now require more than 30kW to power intensive AI applications. There is also an increase in preferred rack voltage from 12V to 48V for improved DC distribution.

Additionally, an emerging trend is to reduce power system loss through eliminating isolation at the board level, which opens the market for non-isolated topologies.

Our innovative products are designed to match all these criteria.



Our innovation is built on experience, curiosity, and the drive to challenge existing standards. We have been developing DC/DC platforms for half a century, and continue to lead the way into the new era of Artificial Intelligence.



Latest power modules for AI/ML



BMR510 – 2-phase Integrated Power Stage (80A_{TDC}/160A_{peak})

- Optimized for top-side cooling
- Current and temperature sense
- Accepts tri-state PWM signals
- LGA or solder bump mount version
- Halogen-free

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



BMR321 – 8:1 fixed ratio digital IBC (750W_{TDP}/1500W_{peak})

- Unregulated 8:1 fixed ratio converter
- Non-isolated
- Digital interface compatible with PMBus
- Parallelable
- Following Open Compute Project standard OAM v2.0

Dimensions:
41.47 x 17.67 x 6.9mm / 1.63 x 0.69 x 0.27 in



BMR351 – Digital quarter brick IBC (1600W_{TDP}/2320W_{peak})

- Fully regulated output
- Excellent thermal performance
- Non-isolated
- Parallelable
- Event data recorder

Dimensions:
58.4 x 36.8 x 14.7 mm / 2.3 x 1.45 x 0.58 in



BMR316 – 4:1 fixed ratio IBC (1000W_{TDP} /3000W_{peak})

- Compact non-isolated DC/DC converter
- High density IBC up to 14,875W/in³ (908W/cm³)
- Digital PMBus interface
- LGA industry standard footprint and pinout
- Halogen-free
- High efficiency with 97.7% peak

Dimensions:
23.4 x 17.8 x 7.6 mm / 0.92 x 0.7 x 0.29 in



BMR352 – Digital quarter brick (2000W_{TDP}/3000W_{peak})

- Fully regulated output
- Peak power capabilities up to 3kW < 0.5 sec
- Non-isolated
- Active current share

Dimensions:
58.4 x 36.8 x 14.7 mm / 2.3 x 1.45 x 0.58 in



BMR314 – Ultra-small 4:1 fixed ratio IBC (800W_{TDP}/1500W_{peak})

- Compact non-isolated DC/DC converter
- Input output ratio 4:1
- Digital PMBus interface
- LGA industry standard footprint and pinout
- Halogen-free
- Optimized thermal design for cold wall

Dimensions:
28 x 17.8 x 9.65 mm / 1.1 x 0.7 x 0.38 in

Focus products

PRODUCT NUMBER	V _{in}	V _{out}	I _{out}	I _{out,peak}	P _{out}	P _{out,peak}	EFFICIENCY
BMR5101034/002	4.5-15V	0.5-1.3V	40A (TDC)* per phase 80A (TDC)* total	80A per phase 160A total	—	—	92%
BMR511x044/002	5-15V	0.5-1.8V	40A (TDC)* per phase 80A (TDC)* total	70A per phase 140A total	—	—	94.5%
BMR350x250/531	40-60V	12V	—	—	1300W	1700W	97.7%
BMR3512202/002	40-60V	12.2V	—	—	1600W	2320W	97.7%
BMR3520200/001	40-60V	12.2V	—	—	2000W	3000W	97.7%
BMR3201000/001	40-60V	5-7.5V	—	—	400W	—	97.6%
BMR3211000/001	40-60V	5-7.5V	—	—	750W	1500W	98.05%
BMR3161011/021	38-60V	9.5-15V	—	—	1000W	3000W	97.7%
BMR3141011/001	38-60V	9.5-15V	—	—	800W	1500W	97.4%

* Thermal Design Current