

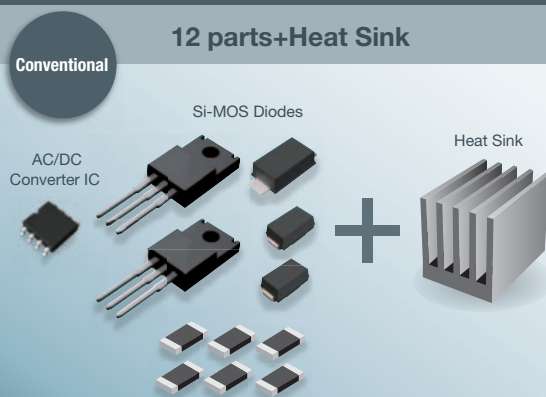


World's First^{*} Achieves greater miniaturization Built-in SiC MOSFET AC/DC Converters

Pioneering and industry-leading SiC technology allowed ROHM to develop new breakthrough products. This includes the world's first^{*} AC/DC converters that leverage the advantages of SiC, such as higher efficiency and heat resistance, to achieve superior performance in a smaller form factor. This time, in response to numerous customer requests, we developed a compact surface mount package that supports automatic mounting.

AC/DC Converter Configuration Comparison (Excluding Transformer)

AC/DC Converter IC + Silicon MOS



AC/DC Converter IC with Built-in SiC MOSFET

Novel Solution

Monolithic design

AC/DC Converter IC with Built-in SiC MOSFET



BM2SCQ12xT-LBZ
TO220-6M Package
(10.0mm × 4.5mm × 25.6mm)

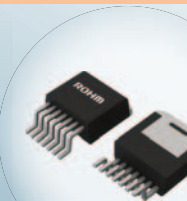
In addition,
this time

Significantly reduces the number of external parts

Reduces the risk of failure while multiple built-in protection functions ensure superior reliability

AC/DC Converter IC with Built-in SiC MOSFET

48W Single Surface Mount



BM2SC12xFP2-LBZ
TO263-7L Package
(10.18mm × 4.43mm × 15.5mm)

Surface mounting achieves further miniaturization

Supports 48W by incorporating a heat dissipation pattern

Greater miniaturization

1 Fewer external parts required

In addition to a built-in driver protection circuit, SiC enables configuration of a 2-stage silicon MOS in just a single stage.

Improved efficiency

2 Contributes to greater energy savings

High efficiency SiC minimizes system power consumption

Higher reliability

3 Improves set reliability

Reducing the number of parts contributes to improved system reliability

Application Examples

Optimized for auxiliary power supply circuits in 400VAC industrial equipment:

- General-purpose inverters
- AC servos
- PLCs (Programmable Logic Controllers)
- Manufacturing equipment
- Robots
- Industrial AC
- Industrial lighting (i.e. street lamps)

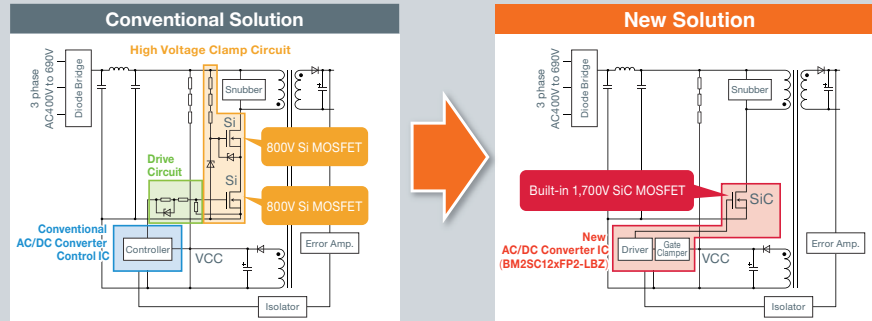


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Achieves breakthrough miniaturization by replacing 12 components and heat sink with a single package

The monolithic design replaces up to 12 components (AC/DC converter IC, 800V SiC MOSFET x 2, Zener diode x 3, resistor x 6) and heat sink utilized for conventional discrete Si MOSFET configurations, dramatically reducing the number of external parts required. In addition, the high withstand voltage and voltage surge resistance of the internal SiC MOSFET allow users to decrease the size of components used for surge suppression.

Adoption Results



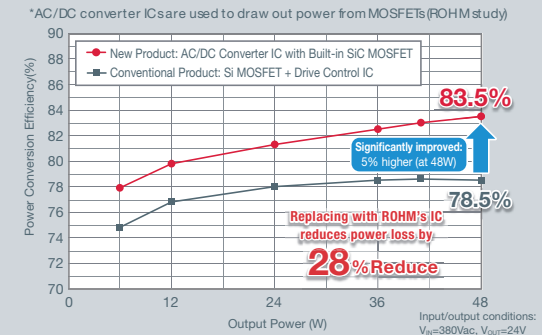
Reduces man-hours and risk while multiple built-in protection functions provide superior reliability

The monolithic design reduces the man-hours required for component selection and reliability evaluation for the clamp and drive circuits while also minimizing component failure risk and simplifying the development load for SiC MOSFET adoption. In addition, overload protection (FB OLP), overvoltage protection (OVP) of the supply voltage pin, and a high accuracy thermal shutdown function (TSD) are built in, along with over current protection and secondary overvoltage protection functions. Incorporating multiple protection circuits for industrial power supplies that require continuous operation significantly improves system reliability.

Maximizes SiC MOSFET performance to achieve dramatically improved power savings

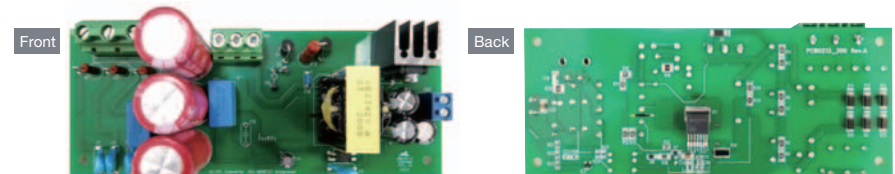
A gate driver circuit optimized for SiC MOSFET drive is also built in that maximizes performance, increasing efficiency by as much as 5% over conventional Si MOSFETs (ROHM April 2021 study).

AC Converter Efficiency Comparison: Si vs SiC



48W evaluation board enables immediate verification

This board allows users to confirm the compact, high efficiency design that reduces power at light loads through burst, pseudo-resonant, soft switching and other operations.



BM2SC123FP2 Evaluation Board: BM2SC123FP2-EVK-001

Heat Sink Pattern Area: 300mm²

Product Lineup

Surface Mount Type

Part No.	Package	MOSFET	Method	V _{cc} OVP	FB OLP
New BM2SC121FP2-LBZ		SiC MOSFET 1,700V(Max) 1.12Ω(Typ)	Quasi-Resonant 120kHz(Max)	Latch	Auto Restart
New BM2SC122FP2-LBZ					Latch
New BM2SC123FP2-LBZ				Auto Restart	Auto Restart
New BM2SC124FP2-LBZ					Latch

Insertion Type

Part No.	Package	MOSFET	Method	V _{cc} OVP	FB OLP
BM2SCQ121T-LBZ		SiC MOSFET 1,700V(Max) 1.12Ω(Typ)	Quasi-Resonant 120kHz(Max)	Latch	Auto Restart
BM2SCQ122T-LBZ					Latch
BM2SCQ123T-LBZ				Auto Restart	Auto Restart
BM2SCQ124T-LBZ					Latch



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The content specified in this document is correct as of 1st March, 2022.