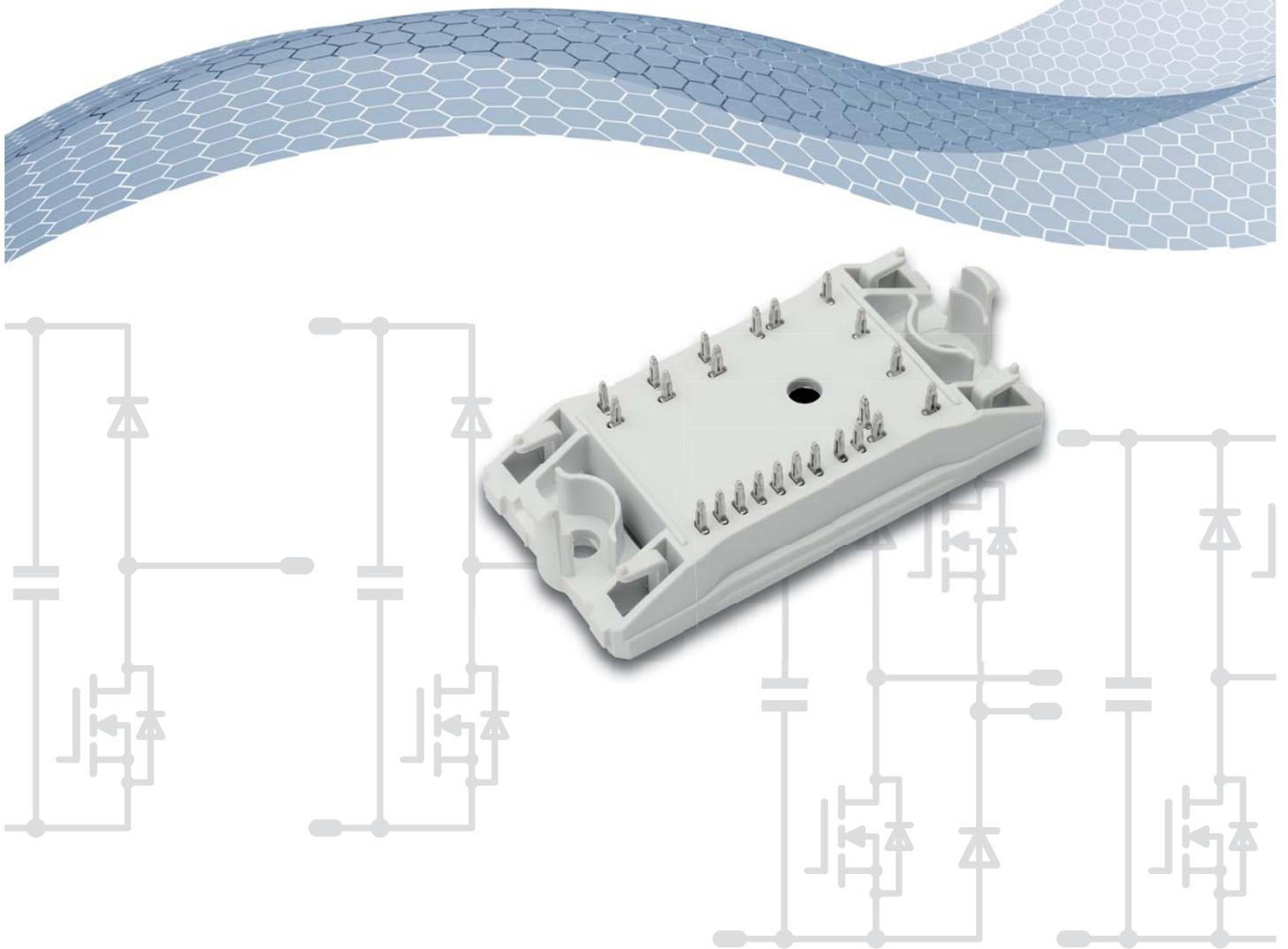


SIC MOSFET-BASED Power Modules for Solar, UPS and Battery Management



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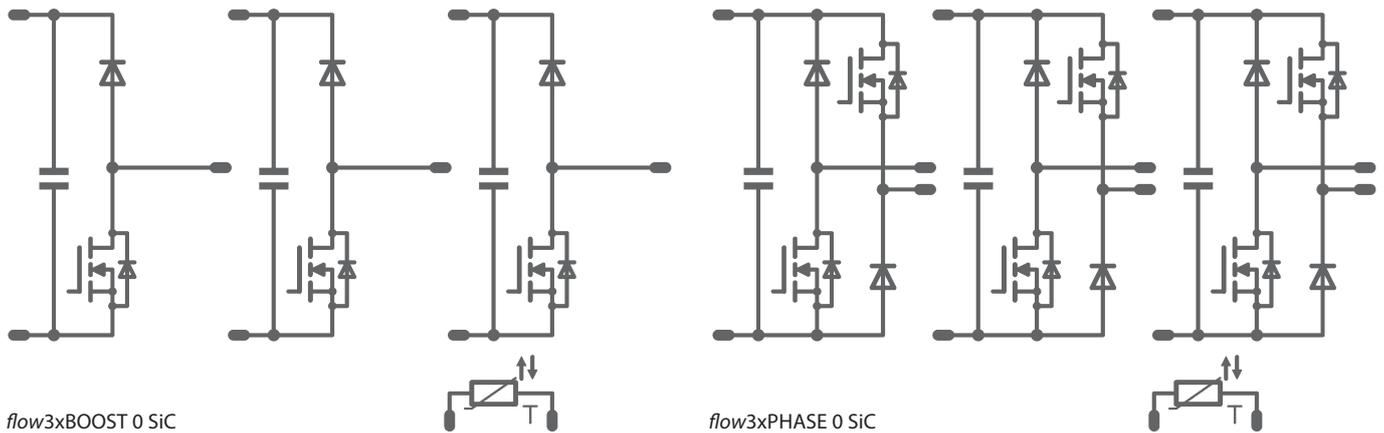
 **RichardsonRFPD**
An Arrow Company

SiC MOSFET-BASED Power Modules for Solar, UPS and Battery Management

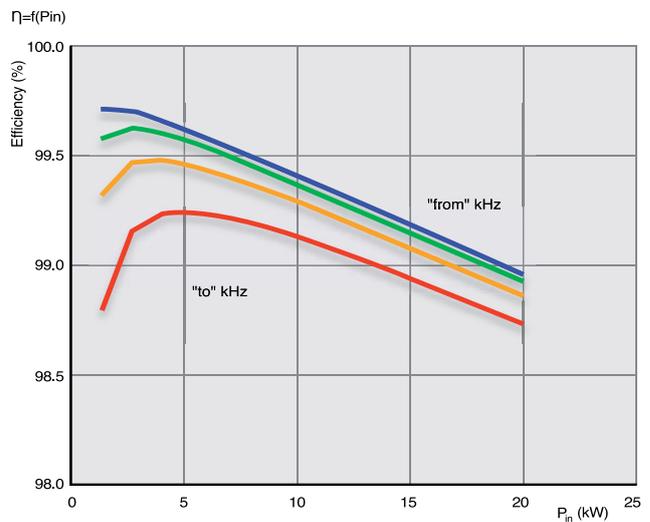
Two factors are shaping the development of advanced power conversion systems - increasingly stringent standards for energy efficiency, especially in solar and UPS applications, and the need to decrease the overall system's costs for the customer.

The solution is the use of wide band power semiconductors as SiC (silicon carbide). Vincotech, a supplier of module-based solutions for power electronics, has rolled out new SiC MOSFET-BASED products for ultra efficient, high-frequency operation in 3-Phase solar inverter, UPS, and battery management applications.

This new generation SiC MOSFET-BASED power modules come in two versions. One is a *flow3xPHASE 0* SiC three-phase inverter module with 3x BUCK/BOOST and split output topology; the other is the *flow3xBOOST 0* SiC with three-channel boost circuits. The three circuits are not connected, which allows them to be used flexibly as individual circuits and to attach shunt resistors for current sensing. The *flow3xPHASE 0* SiC configuration may be used as a bidirectional DC/AC three-phase inverter or a three-channel bidirectional DC-DC.



Both modules feature the latest generation of SiC MOSFET switches designed for ultra fast switching frequencies >100 kHz. They are able to achieve >99 % peak efficiency at $f_{PWM} = 64$ kHz. Equipped with integrated DC capacitors, these new *flow 0* SiC modules provide ultra low inductance.



Conditions: $T_j = T_{jmax} - 25^\circ\text{C}$
 Parameter: $V_{in} = 500$ V DC link = 800 V
 Sw.freq. fsw from 16 kHz to 128 kHz

Typical efficiency as a function of input power for the *flow3xBOOST 0* SiC

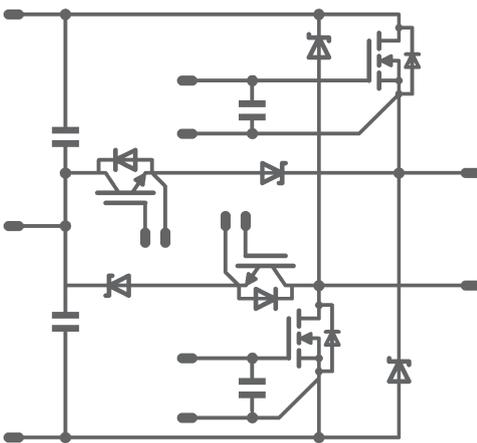
SiC MOSFET-BASED Power Modules for Solar, UPS and Battery Management

Additional to the new generation *flow3xPHASE 0* SiC and *flow3xBOOST 0* SiC power modules in our SiC MOSFET-BASED product portfolio you can find the 2nd generation of the *flowMNPC 0* SiC and *flowBOOST 0* SiC power modules engineered for highly efficient, three-phase solar inverters ranging up to 30 kW with the latest SiC MOSFET generations.

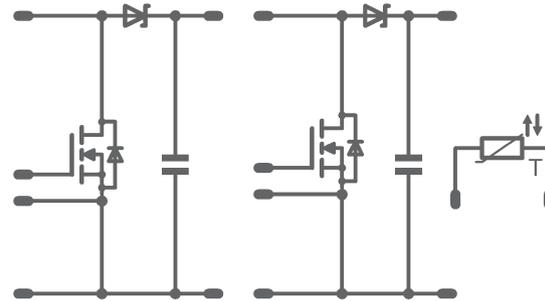
All SiC MOSFET-BASED modules come in low-inductive, 12 mm *flow 0* housings with Press-fit pins. Optional a pre-applied phase-change material for thermal conducting between the module and the heat sink can be used for better R_{th} .



flow 0 housing with 12 mm Press-fit pins and phase-change material



flowMNPC 0 SiC 2nd gen



flowBOOST 0 SiC 2nd gen

FEATURES

- Three-phase inverter with split output for better switching behavior (reduced turn on energy and cross-conduction suppression)
- Three-channel booster
- ROHM™, CREE™ Power SiC MOSFET and Power SiC Schottky diode
- Ultra low inductance with integrated DC-capacitors
- >100 kHz switching frequency
- Temperature sensor

Target Applications:

- Solar e.g. two power module solution *flow3xPHASE 0* SiC + *flow3xBOOST 0* SiC or four module solution *flowBOOST 0* SiC + 3 x *flowMNPC 0* SiC for a three-phase inverter application up to 10 kW, or 30 kW respectively
- UPS
- Battery management

SIC MOSFET-BASED Power Modules for Solar, UPS and Battery Management

Product Portfolio:

Part-No	Rating	Options/comments	Housing
flow3xPHASE 0 SiC			
10-PZ126PA080ME-M909F18Y	1200 V / 80 mOhm	CREE™ SiC MOSFET 2 nd gen + Diodes	
10-PZ126PA080MR-M909F28Y	1200 V / 80 mOhm	ROHM™ SiC MOSFET 2 nd gen + Diodes	
flow3xBOOST 0 SiC			
10-PZ123BA080ME-M909L18Y	1200 V / 80 mOhm	CREE™ SiC MOSFET 2 nd gen + Diodes	
10-PZ123BA080MR-M909L28Y	1200 V / 80 mOhm	ROHM™ SiC MOSFET 2 nd gen + Diodes	
flowMNPC 0 SiC*			
10-PZ12NMA027ME-M340F63Y	1200 V / 27 mOhm	CREE™ SiC MOSFET 2 nd gen + Diodes	
10-PZ12NMA027MR-M340F68Y	1200 V / 27 mOhm	ROHM™ SiC MOSFET 2 nd gen + Diodes	
flowBOOST 0 SiC*			
10-PZ12B2A040ME01-M330L63Y	1200 V / 40 mOhm	CREE™ SiC MOSFET 2 nd gen + Diodes	
10-PZ12B2A040MR01-M330L68Y	1200 V / 40 mOhm	ROHM™ SiC MOSFET 2 nd gen + Diodes	

* under preparation

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