

SiC POWER DEVICES POWER THE FUTURE

6

SiC Wafer SiC Diode(SBD) SiC MOSFET SiC Power Module

SiC Devices Contribute to Greater Energy Savings and Set Miniaturization

High efficiency Energy-saving	High voltage	A wider bandgap gives SiC 10x the dielectric breakdown electric field strength of silicon. This allows SiC MOSFETs to operate at up to 3,000V, compared to just 1,000V with conventional silicon MOSFETs. At the same time, SiC MOSFETs provide reduced ON resistances even at high voltages along with low turn ON/OFF losses, making them truly the best devices for achieving high efficiency and energy savings.		
Stable operation even at high temperatures	Heat resistant	Another advantage of SiC's large bandgap is the ability to operate at high temperatures. As a result, SiC can operate at 200°C or more, unlike silicon with a limit of just 150°C. This is revolutionizing the way we think about system heat dissipation design and thermal safety. For example, it will be possible to incorporate devices in the wheels of EVs while making inverters and their cooling systems smaller.		
Smaller peripheral circuits	High frequency drive	SiC can switch high voltages at high speeds. This allows the impedances of the capacitors and inductors that make up the switching regulator circuits to be reduced. In other words, smaller components can be used, which has the advantage of minimizing system size.		









Combining 20+ years of knowledge and technologies with a reliable production system

ROHM has been conducting pioneering research on SiC devices since 2000, when we first discovered the remarkable benefits of SiC. But although the superior characteristics have been recognized in the industry, the lack of performance and mass production stability have proven to be a bottleneck. Unlike other suppliers, ROHM is able to complete the entire process, from wafer fabrication to device design and packaging, utilizing an in-house production system.





Application-Level Support

ROHM's Support System



We provide global support for the integrated design of high-speed switching SiC devices and gate drivers that combine high accuracy with fast switching control.

ROHM SiC Device Lineup

Device Form	Device Type	Breakdown Voltage	ON Resistance (mΩ)	I _F
	Diode	650V	-	2A to 40A
	(SBD)	1,200V	-	5A to 40A
Wafer Chip	2nd Gen MOSFET	1,200V	80m Ω to 450m Ω	-
Wafers are diced and shipped.		1,700V	1,150mΩ	-
Requires customers to perform die and wire bonding.	3rd 3rd Gen	650V	17mΩ to 120mΩ	-
•	Generation MOSFET	1,200V	22m Ω to 160m Ω	-
	4th Gen	750V	$8m\Omega$ to $45m\Omega$	-
	Generation MOSFET	1,200V	11m Ω to 62m Ω	-
	Diode (SBD)	650V	-	2A to 40A
A		1,200V	-	5A to 40A
Discrete(Molded Package)	2nd Gen MOSFET	1,200V	80m Ω to 450m Ω	-
In addition to the TO-220 and		1,700V	1,150mΩ	-
lineup includes the surface mount	3rd 3rd Gen	650V	17mΩ to 120mΩ	-
TO-263 and TO-268 types.	Generation MOSFET	1,200V	$22m\Omega$ to $160m\Omega$	-
	4th Gen	750V	13m Ω to 45m Ω	-
	Generation MOSFET	1,200V	18m Ω to 62m Ω	-
Full SiC Power Modules Three types of SiC power modules are offered that can drive up to 1,200V/600A.	SiC MOSFET SiC Diode	1,200V / 1,700V	$3m\Omega$ to $34m\Omega$	I _D =80A to 600A

AC/DC Converter IC with Built-in SiC MOSFET

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.



*ROHM February 2022 study

1) The information contained in this document is current as of February 1st , 2022.

2) The information contained herein is subject to change without notice. Before you use our Products, please contact our sales representative (as listed below) and verify the latest specifications.

3) Although ROHM is continuously working to improve product reliability and quality, semiconductors can break down and malfunction due to various factors. Therefore, in order to prevent personal injury or fire arising from failure, please take safety measures such as complying with the derating characteristics, implementing redundant and fire prevention designs, and utilizing backups and fail-safe procedures. ROHM shall have no responsibility for any damages arising out of the use of our Products beyond the rating specified by ROHM.

4) Examples of application circuits, circuit constants and any other information contained herein are provided only to illustrate the standard usage and operations of the Products. The peripheral conditions must be taken into account when designing circuits for mass production.

5) The technical information specified herein is intended only to show the typical functions of and examples of application circuits for the Products. ROHM does not grant you, explicitly or implicitly, any license to use or exercise intellectual property or other rights held by ROHM or any other parties. ROHM shall have no responsibility whatsoever for any dispute arising out of the use of such technical information.

6) The Products are intended for use in general electronic equipment (i.e. AV/OA devices, communication, consumer systems, gaming/entertainment sets) as well as the applications indicated in this document.

7) The Products specified in this document are not designed to be radiation tolerant.

8) For use of our Products in applications requiring a high degree of reliability (as exemplified below), please contact and consult with a ROHM representative: transportation equipment (i.e. cars, ships, trains), primary communication equipment, traffic lights, fire/crime prevention, safety equipment, medical systems, servers, solar cells, and power transmission systems.

9) Do not use our Products in applications requiring extremely high reliability, such as aerospace equipment, nuclear power control systems, and submarine repeaters.

10) ROHM shall have no responsibility for any damages or injury arising from non-compliance with the recommended usage conditions and specifications contained herein.

11) ROHM has used reasonable care to ensure the accuracy of the information contained in this document. However, ROHM does not warrant that such information is error-free and ROHM shall have no responsibility for any damages arising from any inaccuracy or misprint of such information.

12) Please use the Products in accordance with any applicable environmental laws and regulations, such as the ROHS Directive. For more details, including ROHS compatibility, please contact a ROHM sales office as listed below. ROHM shall have no responsibility for any damages or losses resulting non-compliance with any applicable laws or regulations.

13) When providing our Products and technologies contained in this document to other countries, you must abide by the procedures and provisions stipulated in all applicable export laws and regulations, including without limitation the US Export Administration Regulations and the Foreign Exchange and Foreign Trade Act.

14) This document, in part or in whole, may not be reprinted or reproduced without prior consent of ROHM.

ROHM Sales Offices Contact us for further information about the products.								
Santa Clara +1-408-720-1900	United Kingdom	+44-1-908-272400	Hong Kong	+852-2740-6262				
Boston +1-781-565-1138	Finland	+358-400-726 124	Taiwan	+886-2-2500-6956				
Detroit +1-248-348-9920	Spain	+34-9375-24320	Singapore	+65-6436-5100				
San Diego +1-858-625-3600	Hungary	+36-1-950-5859	Philippines	+63-2-8807-6872				
Mexico +52-33-3123-2001	Italy	+39-039-5783432	Thailand	+66-2-254-4890				
Germany +49-2154-921-0	Seoul	+82-2-8182-700	Malaysia	+60-3-7931-8155				
Stuttgart +49-711-7272370	Beijing	+86-10-8525-2483	India	+91-80-4125-0811				
Nuremberg +49-911-810452-26	Shanghai	+86-21-6072-8612	Kyoto	+81-75-365-1077				
France +33 (0) 1 40 60 87 30	Shenzhen	+86-755-8307-3008	Yokohama	+81-45-476-2121				
Catalog No.64X7321E 02.2022 PDF © 2022 ROHM Co., Ltd.								

ROHM Co., Ltd.

21 Saiin Mizosaki-cho, Ukyo-ku, Kyoto 615-8585 Jan TEL : +81-75-311-2121 FAX : +81-75-315-0172



R2051A

www.rohm.com