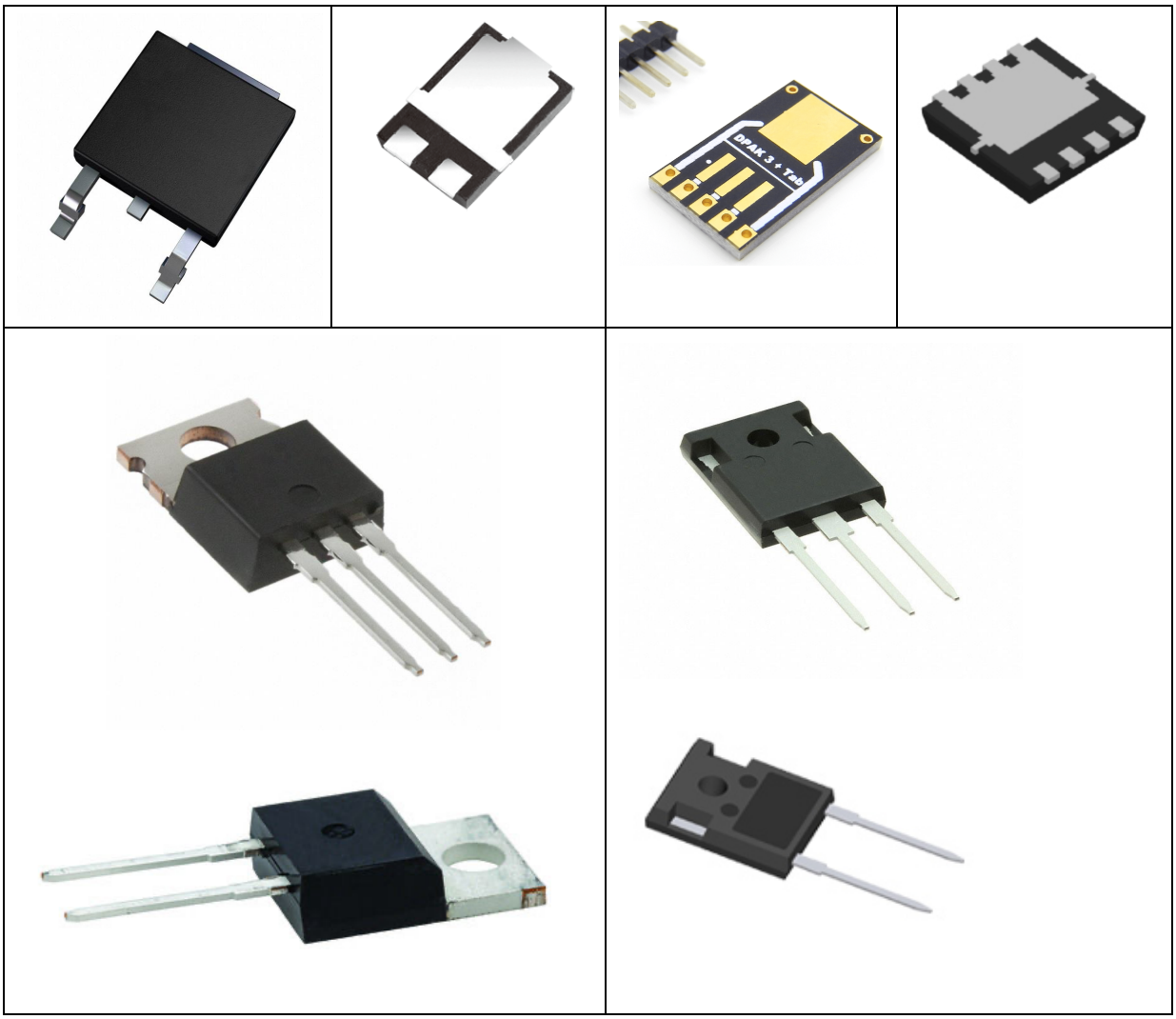
SiC Series Products selection guide

Schottky Diodes and MOSFETs

Novel SiC Products Selection Guide



Specifications are subject to change without notice.
The data indicated herein describe types of components and shall not be considered as assured characteristics.

The products listed in this catalog are not recommended for use in life support systems where a failure or malfunction of the component may directly threaten life or cause injury.

The user of products in such applications shall assume all risks of such use and will agree to hold Bruckewell Technology Co LTD and all the companies whose products are represented in this catalog, harmless against all damages.

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In the recent decades, the Silicon carbide (SiC), turned out to be an excellent semiconductor material. Composed of carbon and silicon, and used in power applications in which it showed excellent performance, far superior to those of silicon.

Significant progress has been made in the field of the semiconductor industry, in which the technologies for the processing of silicon carbide have become increasingly more sophisticated, and have produced semiconductor devices with excellent performance.

In the facts those devices during the applications have shown a remarkable capacity to reduce losses and a high switching speed in comparison to that offered by silicon. The use of silicon carbide (SiC) as a semiconductor begins to expand into multiple applications and always proves to be more and more the candidate to replace silicon in the most important applications such as automotive and E-Bike motor control.

For these reasons, Bruckewell Semi decided to launch the production of the SiC Products, including the SiC Schottky Diode and SiC MOSFET, support the 650V to 1200V, and give the opportunity to its customers to take advantage of the benefits that the products offer in the SiC high-voltage power applications.

Present our SiC products line as below

SMD Package

Amp	DFN3X3	DFN5X6	TO-277	DFN 8X8	TO-252(DPak)	TO-263(D2Pak)
4					CBR04P65D	
6				CBR06P65HL	CBR06P65D	
8				CBR08P65HL	CBR08P65D	
10	CBR10P65HM		CBR10P65S CBR10120S	CBR10P65HL	CBR10P65D CBR10120D	
20			CBR20120S			
30		CBR30120H	CBR30120S			
40						

DFN 3X3 is unique package and CBR10P65HM is first smallest SiC SBD Diode in the industry.

TO-277 has same foot print with TO-252 (DPak), and has better thermal performance.

Through Hole Package

Amp	TO-220AC	TO-220AB	TO-247	TO-247 (Dual Die)
4	CBR04P65			
6	CBR06P65			
8	CBR08P65			
10	CBR10P65 CBR10120	CBR10120P	CBR10120W	
20	CBR20P65 CBR20120	CBR20P65PC CBR20120P	CBR20P65W CBR20120W	CBR20P65WC CBR20120WC
30			CBR30120W	
40				CBR40P65WC CBR40120WC

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Part Nomenclature	
Example: CBR20P65PC	
CBR	SiC Barrier Rectifier
CMS	SiC MOSFET
20	IF, Forward current, as 20A
P65	Breakdown Voltage, as P65=650V, 120=1200V
PC	Package Code Blank: TO-220AC-2L P: TO-220AB PC: TO-220AB, Dual Die D: TO-252-2L, DPAK W: TO-247-2L WC: TO-247-3L, Dual Die WU: TO-247-3L, Single Die S: TO-277 A: SMA, B: SMB, C: SMC B: TO-263, D2PAK H: DFN5x6 HM: DFN3x3 HL: DFN8x8

When the diodes are used simultaneously:

$\Delta Tj(diode1) = P(diode1) \times Rth(j\text{-}c)\ (per\ diode) + P(diode2) \times Rth(c)$

To evaluate the conduction losses use the following equation:

$P = 1.35 \times IF(AV) + 0.144 \times IF2(RMS)$

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Comparison with industry supplier-TO-220AC/AB						
Amp	**Bruckewell**		**ST-Micro**		**Infineon**	
	TO-220AC	TO-220AB	TO-220AC	TO-220AB	TO-220AC	TO-220AB
2					IDH02G65C5 IDH02G120C5	
3					IDH03SG60C IDH03G65C5	
4	CBR04P65				IDH04SG60C IDH04G65C5	
5					IDH05SG60C IDH05G65C5 IDH05G120C5	
6	CBR06P65			STPSC6TH13TI	IDH06SG60C IDH06G65C5	
8	CBR08P65			STPSC8TH13TI STPSC8H065C	IDH08SG60C IDH08G65C5 IDH08G120C5	
9					IDH09SG60C IDH09G65C5	
10	CBR10P65 CBR10120	CBR10120P	STPSC10H065D STPSC10H12D	STPSC10TH13TI	IDH10SG60C IDH10G65C5 IDH10G120C5	
12			STPSC12065 STPSC1206	STPSC12H065C	IDH12SG60C IDH12G65C5	
15			STPSC15H12			
16				STPSC16H065C	IDH16G65C5 IDH16G120C5	
20	CBR20P65 CBR20120	CBR20P65PC CBR20120P	STPSC20065D STPSC20H12D	STPSC20H065C	IDH20G65C5 IDH20G120C5	

Note:

The suffix C5 in the Infineon Parts means the CoolSiC™ 5G, others are CoolSiC™ 3G

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Comparison with Japan suppliers-TO-220AC/AB

Amp	Bruckewell		Rohm		Toshiba	
	TO-220AC	TO-220AB	TO-220AC	ITO-220AC	TO-220AC	ITO-220AC
4	CBR04P65		SCS304AP		TRS4E65F	TRS4A65F
5			SCS205KG			
6	CBR06P65		SCS306AP SCS206AG	SCS206AM	TRS6E65F	TRS6A65F
8	CBR08P65		SCS308AP SCS208AG	SCS208AM	TRS8E65F	TRS8A65F
10	CBR10P65 CBR10120	CBR10120P	SCS310AP SCS210AG SCS210KG	SCS210AM	TRS10E65F	TRS10A65F
12			SCS212AG	SCS212AM		
15			SCS215AG SCS215KG	SCS215AM		
20	CBR20P65 CBR20120	CBR20P65PC CBR20120P	SCS220AG SCS220KG	SCS220AM		

Note:

The suffix of Rohm Parts means the breakdown voltage, A means 650V, K means 1200V

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Comparison with industry supplier-TO-247 Single/ Dual Die

Amp	Bruckewell		ST-Micro		Infineon	
	TO-247	TO-247 Dual	TO-247	TO-247 Dual	TO-247	TO-247 Dual
10	CBR10120W				IDW10G65C5	IDW10G120C5B
20	CBR20P65W CBR20120W	CBR20P65WC CBR20120WC	STPSC20065W	STPSC20H065CW	IDW20G65C5	IDW20G65C5B IDW20G120C5B
12					IDW12G65C5	
15						IDW15G120C5B
16					IDW16G65C5	
24						IDW24G65C5B
30	CBR30120W				IDW30G65C5	IDW30G120C5B
32						IDW32G65C5B
40		CBR40120WC		STPSC40065CW	IDW40G65C5	IDW40G65C5B IDW40G120C5B

Comparison with Japan suppliers-TO-247 Single/ Dual Die

Amp	Bruckewell		Rohm		Fuji electric	
	TO-247	TO-247 Dual	TO-247	TO-247 Dual	TO-247	TO-247 Dual
10	CBR10120W			SCS210KE2	FDCY10S65	
15			SCS215AE			
20	CBR20P65W CBR20120W	CBR20P65WC CBR20120WC	SCS220AE	SCS220AE2 SCS220KE2	FDCY18S120	FDCY20C65
25					FDCY25S65	
30	CBR30120W			SCS230AE2 SCS230KE2		
40		CBR40120WC		SCS240AE2 SCS240KE2		FDCY36C120
50						FDCY50C65

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Product	IO(A)	VB min (V)	VF typ(V)	IR Max (uA)	Package	Number of Diodes
CBR04P65	4	650	1.5	10	TO-220AC	1
CBR04P65D	4	650	1.5	10	DPAK (TO-252)	1
CBR06P65	6	650	1.5	10	TO-220AC	1
CBR06P65D	6	650	1.5	10	DPAK (TO-252)	1
CBR06P65HL	6	650	1.5	10	DFN 8X8	1
CBR08P65	8	650	1.5	10	TO-220AC	1
CBR08P65D	8	650	1.5	10	DPAK (TO-252)	1
CBR08P65HL	8	650	1.5	10	DFN 8X8	1
CBR10P65	10	650	1.5	10	TO-220AC	1
CBR10P65D	10	650	1.5	10	DPAK (TO-252)	1
CBR10P65S	10	650	1.5	10	TO-277	1
CBR10P65HM	10	650	1.5	10	DFN3.3	1
CBR10P65HL	10	650	1.5	10	DFN8X8	1
CBR20P65PC	20	650	1.5	10	TO-220AB	2
CBR20P65	20	650	1.5	10	TO-220AC	1
CBR20P65W	20	650	1.5	10	TO-247	1
CBR20P65WC	20	650	1.5	10	TO-247	2
CBR40P65WC	40	650	1.5	10	TO-247	2
CBR10120	10	1200	1.5	10	TO-220AC	1
CBR10120P	10	1200	1.5	10	TO-220AB	1
CBR10120D	10	1200	1.5	10	DPAK (TO-252)	1
CBR10120S	10	1200	1.5	10	TO-277	1
CBR10120W	10	1200	1.5	10	TO-247	1
CBR20120WC	20	1200	1.5	10	TO-247	2
CBR20120W	20	1200	1.5	10	TO-247	1
CBR20120	20	1200	1.5	10	TO-220AC	1
CBR20120P	20	1200	1.5	10	TO-220AB	1
CBR20120PC	20	1200	1.5	10	TO-220AB	2
CBR20120S	20	1200	1.5	10	TO-277	1
CBR30120W	30	1200	1.5	10	TO-247	1
CBR30120S	30	1200	1.5	10	TO-277	1
CBR30120H	30	1200	1.5	10	DFN 5X6	1
CBR40120WC	40	1200	1.5	10	TO-247	2

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