VISHAY

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DID YOU KNOW?

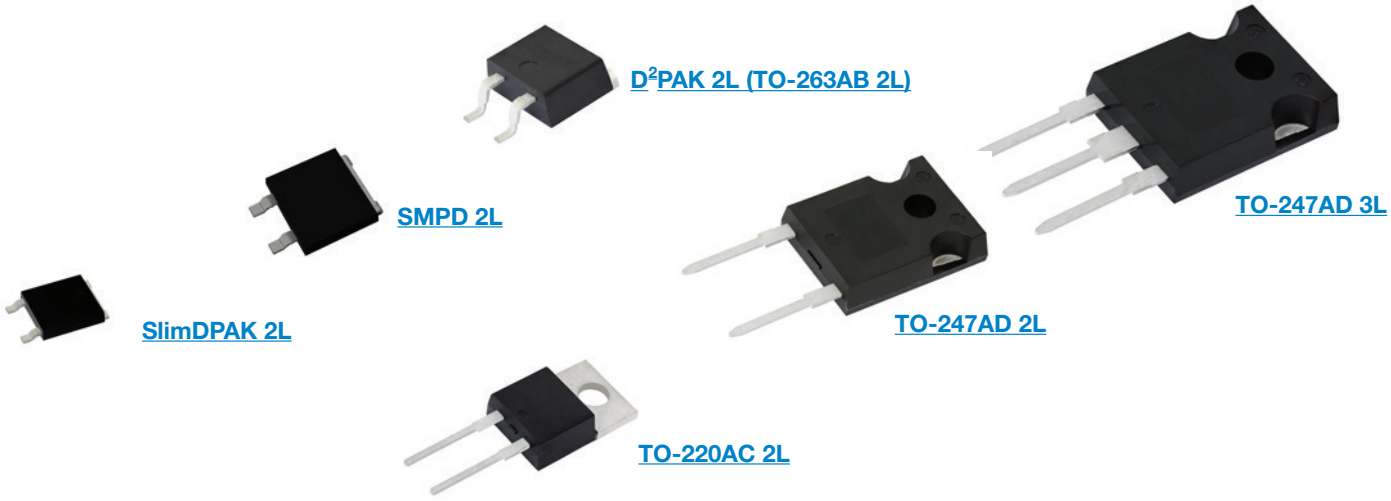
SiC DIODES FOR HIGH END PFC

Vishay now offers a complete family of surface-mount (SMD) and through-hole (THD) SiC Schottky diodes with breakdown voltages of 650 V and 1200 V.

This family includes not only 650 V from 4 A to 20 A and 1200 V from 5 A to 30 A for single-chip devices, but 650 V from 16 A to 40 A and 1200 V from 10 A to 40 A for dual-chip devices in the common cathode configuration.

SiC Technology

SiC-based Schottky diodes are designed for use in high performance AC/DC and DC/DC converters circuits like PFC, and output rectification in ultra high frequency DC/DC converters. The devices are key to achieving high efficiency in converters that helps improve power density and reliability. SiC diodes feature excellent reverse recovery behavior and V_{RRM} capability compared to Si-based PN diodes. Vishay's SiC diodes are well-designed with low Q_C x V_F, which helps reduce turn-on stress and hence switching losses in the active switch. This characteristic is essential to increase the switching frequency, and thus the power density, of the converter. Moreover, the Vishay MPS structure guarantees the high surge capability that further improves reliability and simplifies circuit design. This structure also aids in the implementation of SiC diodes in bridgeless PFC and other circuits directly connected to the grid.



Benefits of Vishay SiC Technology

The SiC diode offers:

- Virtually zero reverse recovery losses, invariant with temperature and working condition
- Purely capacitive switching, no losses inside the diode
- Good current surge
- High ratio between forward current and diode capacitance
- Low leakage at high temperature
- Low induced losses in the active switch
- Improved EMI

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Vishay SiC Diode Family

The Vishay SiC portfolio covers a wide range of current ratings. All devices have maximum T_J of 175 °C and breakdown voltages of either 650 V or 1200 V. The packages available are the SlimDPAK 2L, SMPD 2L, and D²PAK 2L (TO-263AB 2L) for single-chip SMDs and the TO-220AC 2L and TO-247AD 2L for THDs. For dual chips in the common cathode configuration, the TO-247AD 3L package is available.

V_{RRM} = 650 V Part Number	I_F (A)	V_F at I_F, T_J = 175 °C (V)	10 ms I_{FSM} at T_J = 25 °C (A)	Total Q_C, ∫0 V to 400 V (nC)	Leakage at V_{RRM}, T_J = 175 °C (µA)	Package
VS-3C04EV07T-M3	4	1.58	29	12	12	SlimDPAK 2L
VS-3C06EV07T-M3	6	1.58	42	17	16	
VS-3C08EV07T-M3	8	1.58	52	22	25	
VS-3C10EV07T-M3	10	1.52	60	29	19	
VS-3C04ED07T-M3	4	1.58	29	12	12	SMPD 2L
VS-3C06ED07T-M3	6	1.58	42	17	16	
VS-3C08ED07T-M3	8	1.58	52	22	25	
VS-3C10ED07T-M3	10	1.52	60	29	19	
VS-3C12ED07T-M3	12	1.58	83	34	20	
VS-3C16ED07T-M3	16	1.58	104	44	25	
VS-3C20ED07T-M3	20	1.6	110	53	32	
VS-3C04ET07S2L-M3	4	1.58	29	12	1.3	D²PAK 2L
VS-3C06ET07S2L-M3	6	1.58	42	17	1.3	
VS-3C08ET07S2L-M3	8	1.58	54	22	1.9	
VS-3C10ET07S2L-M3	10	1.52	60	29	4.5	
VS-3C12ET07S2L-M3	12	1.58	83	34	5	
VS-3C16ET07S2L-M3	16	1.58	104	44	6.5	
VS-3C20ET07S2L-M3	20	1.6	110	53	9	
VS-3C04ET07T-M3	4	1.58	29	12	1.3	TO-220AC 2L
VS-3C06ET07T-M3	6	1.58	42	17	1.3	
VS-3C08ET07T-M3	8	1.58	54	22	1.9	
VS-3C10ET07T-M3	10	1.52	60	29	4.5	
VS-3C12ET07T-M3	12	1.58	83	34	5	
VS-3C16ET07T-M3	16	1.58	104	44	6.5	
VS-3C20ET07T-M3	20	1.6	110	53	9	
VS-3C16CP07L-M3	2 x 8	1.58	54	22	1.9	TO-247AD 3L
VS-3C20CP07L-M3	2 x 10	1.52	60	29	4.5	
VS-3C40CP07L-M3	2 x 20	1.6	110	53	9	

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SiC DIODES FOR HIGH END PFC

V_{RRM} = 1200 V Part Number	I_F (A)	V_F at I_F, T_J = 175 °C (V)	10 ms I_{FSM} at T_J = 25 °C (A)	Total Q_C, ∫0 V to 800 V (nC)	Leakage at V_{RRM}, T_J = 175 °C (µA)	Package
VS-3C05ET12S2L-M3	5	1.85	42	28	3	D²PAK 2L
VS-3C10ET12S2L-M3	10	1.85	84	55	4.5	
VS-3C15ET12S2L-M3	15	1.85	110	81	6.5	
VS-3C20ET12S2L-M3	20	1.85	180	107	12	
VS-3C05ET12T-M3	5	1.85	42	28	3	TO-220AC 2L
VS-3C10ET12T-M3	10	1.85	84	55	4.5	
VS-3C15ET12T-M3	15	1.85	110	81	6.5	
VS-3C20ET12T-M3	20	1.85	180	107	12	
VS-3C10EP12L-M3	10	1.85	84	55	4.5	TO-247AD 2L
VS-3C15EP12L-M3	15	1.85	110	81	6.5	
VS-3C20EP12L-M3	20	1.85	180	107	12	
VS-3C30EP12L-M3	30	1.85	260	182	15	
VS-3C10CP12L-M3	2 x 5	1.85	42	28	3	TO-247AD 3L
VS-3C20CP12L-M3	2 x 10	1.85	84	55	4.5	
VS-3C30CP12L-M3	2 x 15	1.85	110	81	6.5	

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