

SiC Schottky Diodes Boast Surge Current Robustness

[UnitedSiC](#) has announced four new junction barrier Schottky (JBS) diodes to complement its FET and JFET transistor products. The UJ3D 1200-V and 1700-V devices, which are part of the company's third generation of SiC merged-PiN-Schottky (MPS) diodes, are said to offer the industry's best surge current performance (see figure and the table).

According to the company, these SiC SB diodes also possess a $V_F \times Q_C$ figure of merit (FoM) that is at least 12% to 15% better than what diodes from other manufacturers can achieve, and are highly optimized for power system designs requiring elevated efficiency levels and ultra-fast switching speeds. These new offerings include a 1700-V 25-A rated model (the UJ3D1725K2), plus three 1200-V devices with ratings of 10 A (the UJ3D1210K2), 20 A (the UJ3D1220K2) and 50 A (the UJ3D1250K2).

Having a >8.8-mm clearance between the anode and the cathode, these devices are better at coping with high pollution environments where voltage transients are likely to be present. Meanwhile, in high-current situations, the novel PN junction arrangement featured enables the injection of additional charge carriers. Thanks to this, the diodes can withstand much higher surge currents than competing devices (up to 12x the rated current).

Fully compliant with the AEC-Q101 automotive standard, all SiC diodes come in a compact TO247-2L package format and in die form. Applications that will benefit most from these new SiC diodes include fast-charge electric vehicle (EV) charging access points, industrial motor drives and solar energy inverters.

As Anup Bhalla, VP engineering at UnitedSiC, explains, "Through the unique characteristics of the UJ3D1725K2, we can provide our customers with reliable, space-saving, cost-effective SiC diodes that have substantially better performance levels and assured quality, supported by high volume manufacturing."

The UJ3D1725K2 1000-up resale price is \$6.47. The UJ3D1210K2, UJ3D1220K2 and UJ3D1250K2 1000-up resale prices are \$2.24, \$3.39, and \$9.55 respectively. All devices are available from authorized distributors. For more information, see the [SiC Schottky Diodes Selector Guide](#).



Figure. The third-generation SiC merged-PiN-Schottky (MPS) diodes, which offer current ratings of 25 A at a 1700-V blocking voltage, and 10 A, 20 A or 50 A at a 1200-V blocking voltage, are said to offer the industry's best surge current performance. For example, the 10-A 1200-V SiC Schottky specifies a non-repetitive forward surge current sine half wave rating of 120 A at 25°C.

Table. Surge current specifications for the UJ3D SiC Schottky diodes.

Model	Blocking voltage	I _F , typical	Non-repetitive forward surge current sine half wave, I _{FSM} , t _p = 10 ms		Repetitive forward surge current sine half wave, D=0.1, I _{FRM}	
			25°C	110°C	25°C	110°C
UJ3D1725K2	1700 V	25 A	180 A	163 A	117 A	68.7 A
UJ3D1210K2	1200 V	10 A	120 A	110 A	39.4	24
UJ3D1220K2	1200 V	20 A	190 A	180 A	71.9 A	40.9 A
UJ3D1250K2	1200 V	50 A	275 A	--	163.5 A	99.6 A