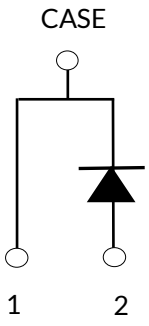
DATASHEET

UJ3D1725K2

25A - 1700V SiC Schottky Diode

Rev. A, September 2020





Part Number	Package	Marking
UJ3D1725K2	TO-247-2L	UJ3D1725K2

Description

UnitedSiC offers the 3rd generation of high performance SiC Merged-PiN-Schottky (MPS) diodes. With zero reverse recovery charge and 175°C maximum junction temperature, these diodes are ideally suited for high frequency and high efficiency power systems with minimum cooling requirements.

Features

- Maximum operating temperature of 175°C
- Easy paralleling
- Extremely fast switching not dependent on temperature
- No reverse or forward recovery
- Enhanced surge current capability, MPS structure
- 100% UIS tested
- AEC-Q101 qualified

Typical applications

- Power converters
- Industrial motor drives
- Switch mode power supplies
- Power factor correction modules

Maximum Ratings

Parameter	Symbol	Test Conditions	Value	Units
DC blocking voltage	V_R		1700	V
Repetitive peak reverse voltage, T_J=25°C	V_{RRM}		1700	V
Surge peak reverse voltage	V_{RSM}		1700	V
Maximum DC forward current	I_F	T_C = 138°C	25	A
Non-repetitive forward surge current sine halfwave	I_{FSM}	T_C = 25°C, t_p = 10ms	180	A
		T_C = 110°C, t_p = 10ms	163	
Repetitive forward surge current sine halfwave, D=0.1	I_{FRM}	T_C = 25°C, t_p = 10ms	117	A
		T_C = 110°C, t_p = 10ms	68.7	
Non-repetitive peak forward current	$I_{F,max}$	T_C = 25°C, t_p = 10µs	1100	A
		T_C = 110°C, t_p = 10µs	1100	
i^2t value	$\int i^2dt$	T_C = 25°C, t_p = 10ms	162	A^2s
		T_C = 110°C, t_p = 10ms	133	
Power dissipation	P_{tot}	T_C = 25°C	283	W
		T_C = 138°C	69.8	
Maximum junction temperature	$T_{J,max}$		175	°C
Operating and storage temperature	T_J, T_{STG}		-55 to 175	°C
Soldering temperatures, wavesoldering only allowed at leads	T_{sold}	1.6mm from case for 10s	260	°C

Thermal Characteristics

Parameter	Symbol	Test Conditions	Value			Units
			Min	Typ	Max	
Thermal resistance, junction-to-case	$R_{\theta JC}$			0.41	0.53	°C/W

Electrical Characteristics (T_J = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Value			Units
			Min	Typ	Max	
Forward voltage	V_F	I_F = 25A, T_J=25°C	-	1.54	1.7	V
		I_F = 25A, T_J=150°C	-	2.1		
		I_F = 25A, T_J=175°C	-	2.3	2.75	
Reverse current	I_R	V_R=1700V, T_J=25°C	-	24	360	µA
		V_R=1700V, T_J=175°C	-	950		
Total capacitive charge (1)	Q_C	V_R=1200V		184		nC
Total capacitance	C	V_R=1V, f = 1MHz		1500		pF
		V_R=800V, f = 1MHz		100		
		V_R=1700V, f = 1MHz		80		
Capacitance stored energy	E_C	V_R=1200V		78		µJ

(1) Q_c is independent on T_J, di_F/dt, and I_F as shown in the application note USCi_AN0011.

Typical Performance Diagrams

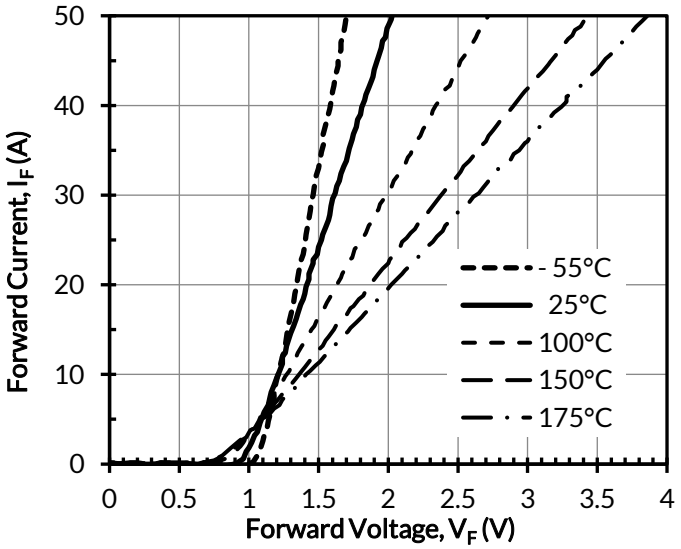


Figure 1. Typical forward characteristics

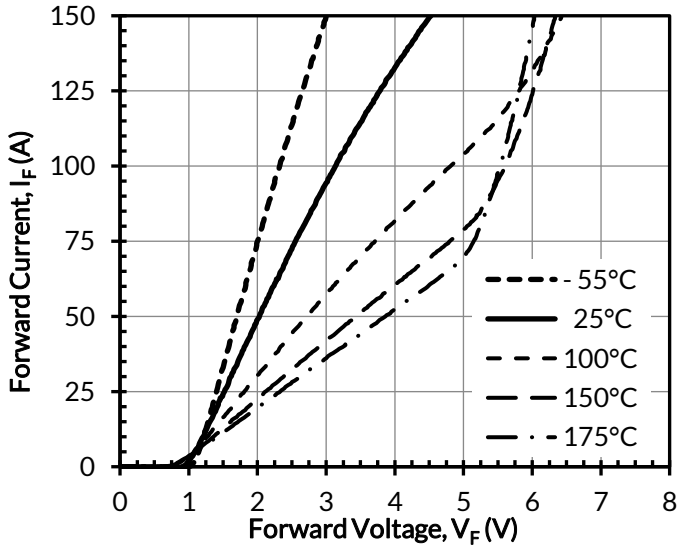


Figure 2. Typical forward characteristics in surge current

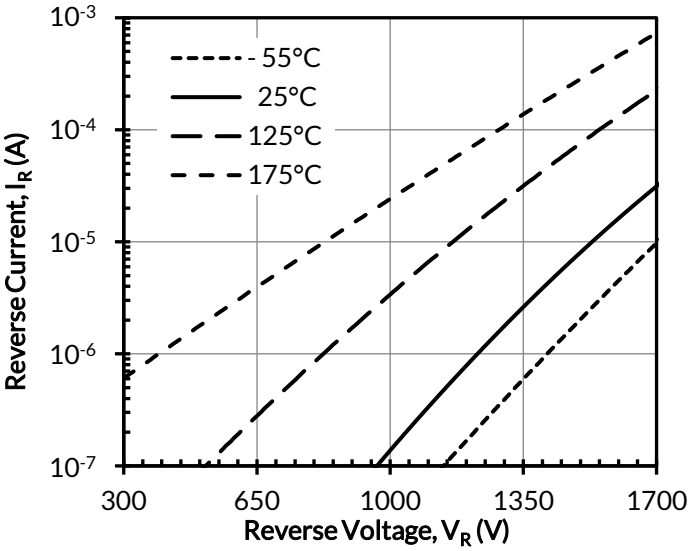


Figure 3. Typical reverse characteristics

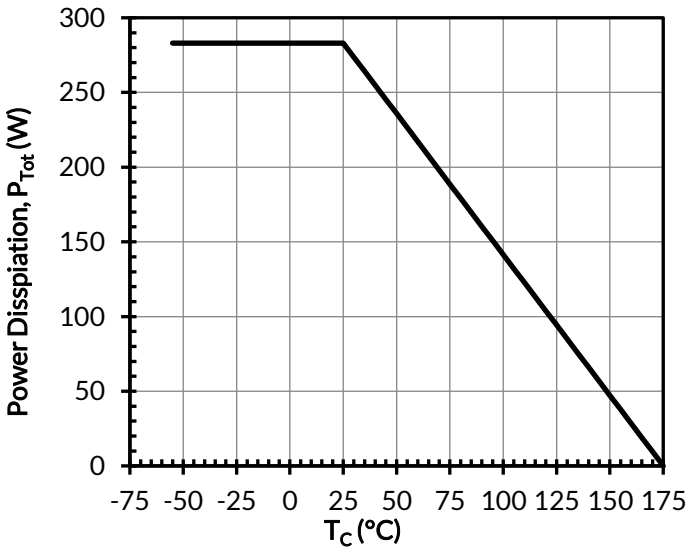


Figure 4. Power dissipation

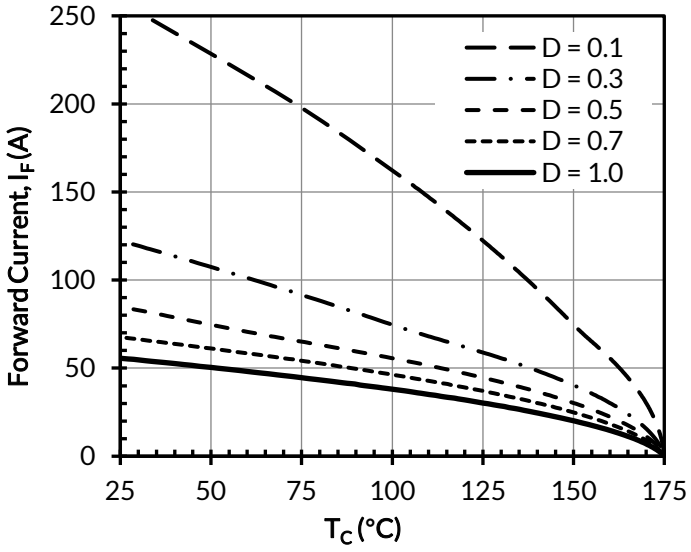


Figure 5. Diode forward current

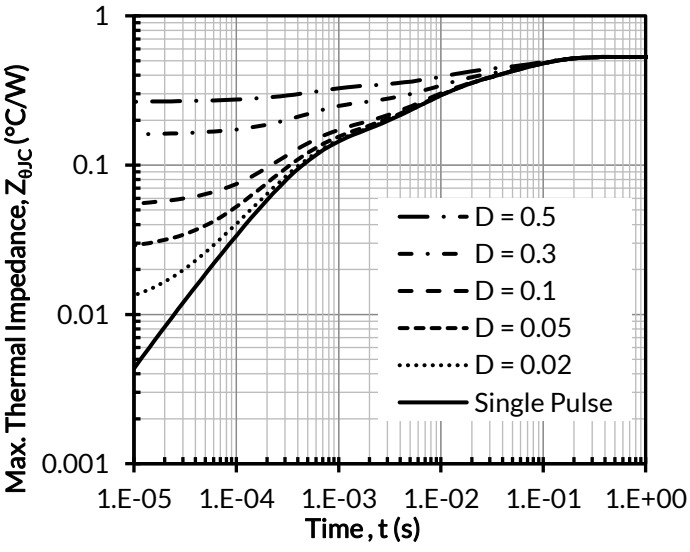


Figure 6. Maximum transient thermal impedance

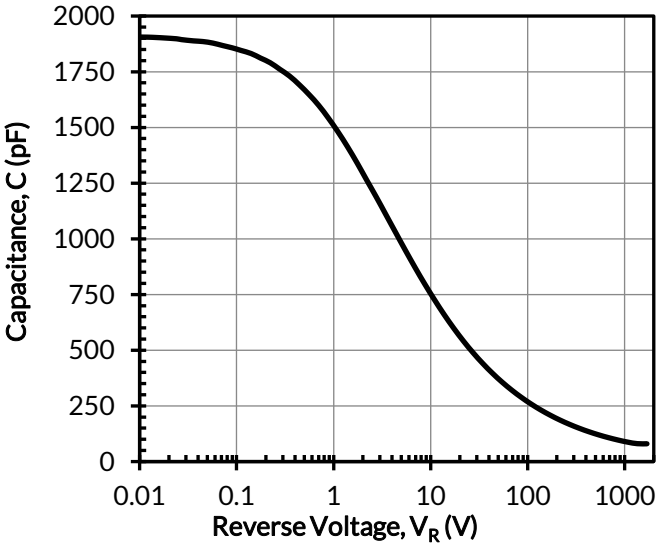


Figure 7. Capacitance vs. reverse voltage at 1MHz

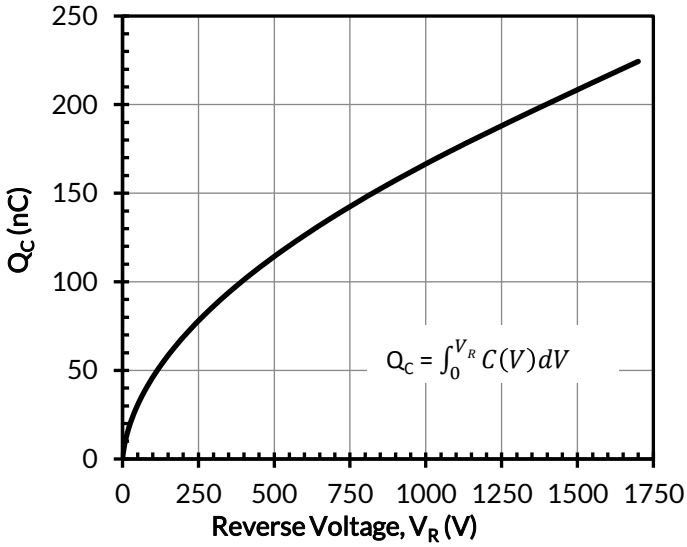


Figure 8. Typical capacitive charge vs. reverse voltage

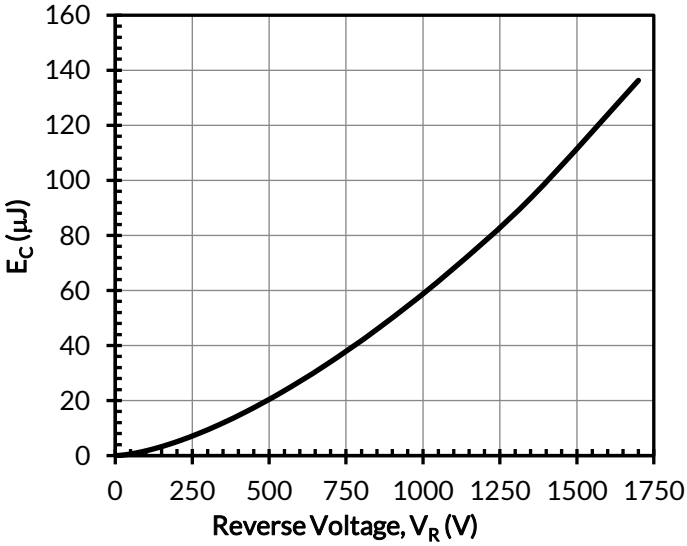


Figure 9. Typical capacitance stored energy vs. reverse voltage

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