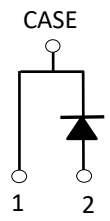
Description

United Silicon Carbide, Inc. 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.



Part Number	Package	Marking
UJ3D06506TS	TO-220-2L	UJ3D06506TS

Features

- 175°C maximum operating junction temperature
- Easy paralleling
- Extremely fast switching not dependent on temperature
- No reverse or forward recovery
- Enhanced surge current capability, MPS structure
- Excellent thermal performance, Ag sintered
- 100% UIS tested
- AEC-Q101 qualified

Typical Applications

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

Maximum Ratings

Parameter	Symbol	Test Conditions	Value	Units
DC blocking voltage	V_R		650	V
Repetitive peak reverse voltage, T_j=25°C	V_{RRM}		650	V
Surge peak reverse voltage	V_{RSM}		650	V
Maximum DC forward current	I_F	T_C = 153°C	6	A
Non-repetitive forward surge current sine halfwave	I_{FSM}	T_C = 25°C, t_p = 10ms	45	A
		T_C = 110°C, t_p =10ms	39	
Repetitive forward surge current sine halfwave, D=0.1	I_{FRM}	T_C = 25°C, t_p = 10ms	29.5	A
		T_C = 110°C, t_p =10ms	17.9	
Non-repetitive peak forward current	$I_{F,max}$	T_C = 25°C, t_p =10µs	320	A
		T_C = 110°C, t_p =10µs	320	
i^2t value	$\int i^2dt$	T_C = 25°C, t_p =10ms	10.1	A^2s
		T_C = 110°C, t_p =10ms	7.6	
Power dissipation	P_{Tot}	T_C = 25°C	93.4	W
		T_C = 153°C	13.4	
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

Electrical Characteristics

T_J = +25°C unless otherwise specified

Parameter	Symbol	Test Conditions	Value			Units
			Min	Typ	Max	
Forward voltage	V_F	I_F=6A, T_J=25°C	-	1.5	1.7	V
		I_F=6A, T_J=150°C	-	1.8	2.1	
		I_F=6A, T_J=175°C	-	1.9	2.25	
Reverse current	I_R	V_R=650V, T_J=25°C	-	0.7	40	µA
		V_R=650V, T_J=175°C	-	6		
Total capacitive charge (1)	Q_C	V_R=400V		14.5		nC
Total capacitance	C	V_R=1V, f=1MHz		196		pF
		V_R=300V, f=1MHz		24		
		V_R=600V, f=1MHz		21		
Capacitance stored energy	E_C	V_R=400V		2.2		µJ

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

Thermal characteristics

Parameter	symbol	Test Conditions	Value			Units
			Min	Typ	Max	
Thermal resistance, junction - case	$R_{\theta JC}$			1.2	1.6	°C/W

Typical Performance

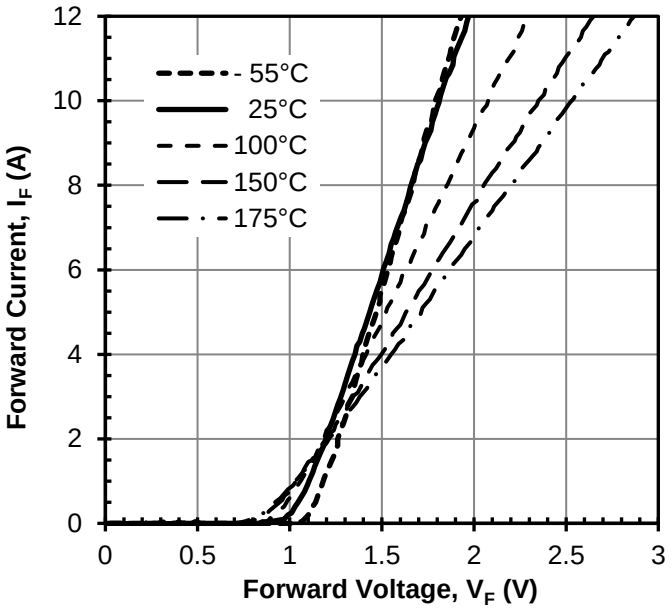


Figure 1 Typical forward characteristics

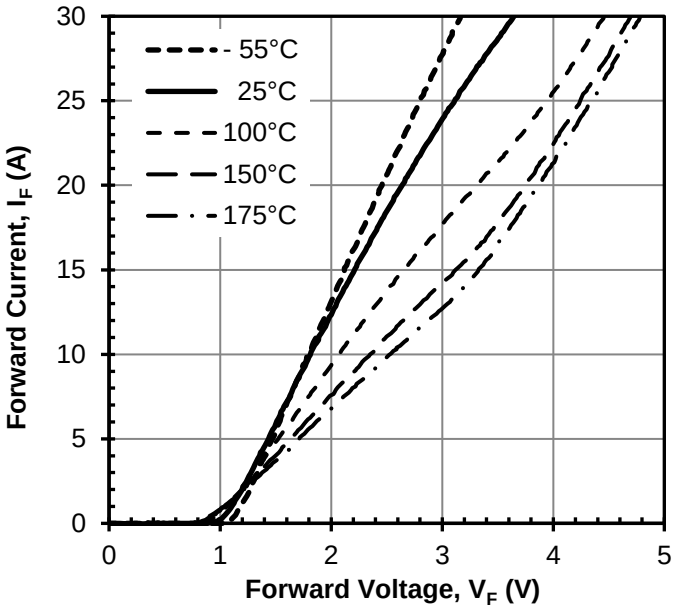


Figure 2 Typical forward characteristics in surge current

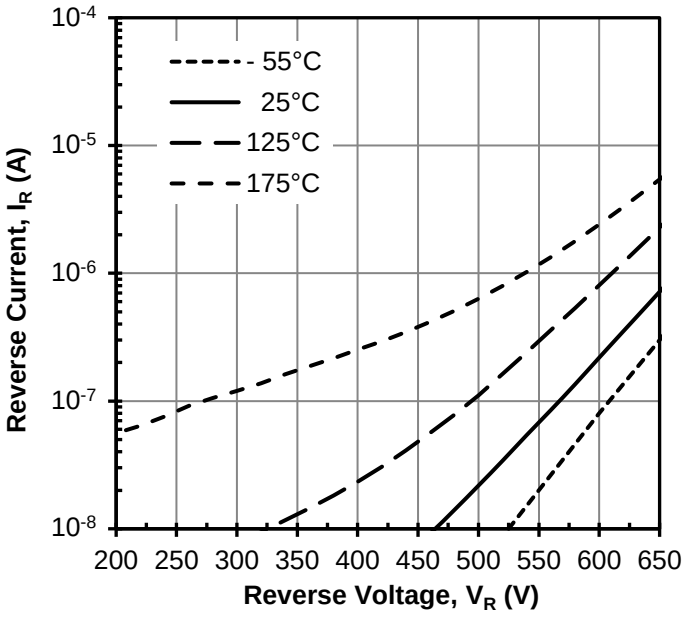


Figure 3 Typical reverse characteristics

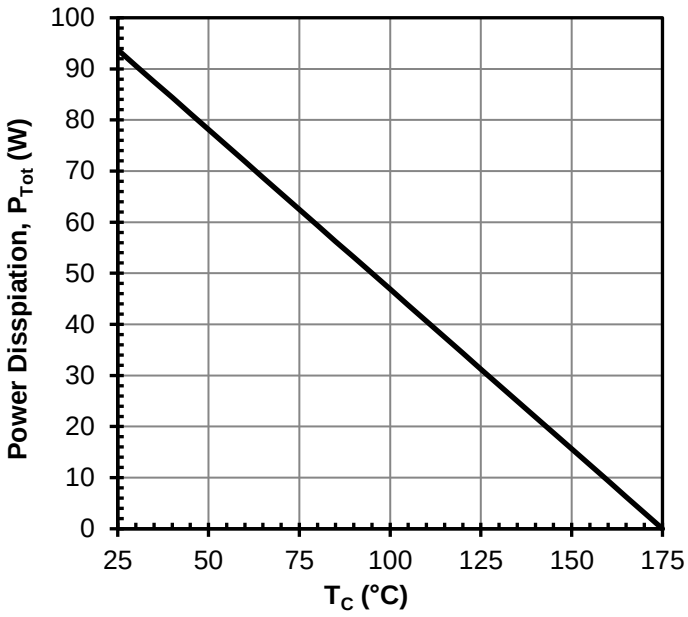


Figure 4 Power dissipation

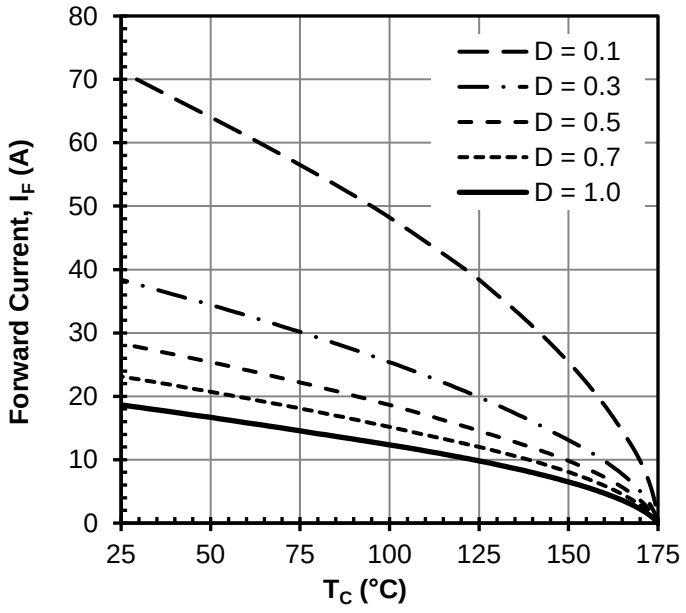


Figure 5 Diode forward current

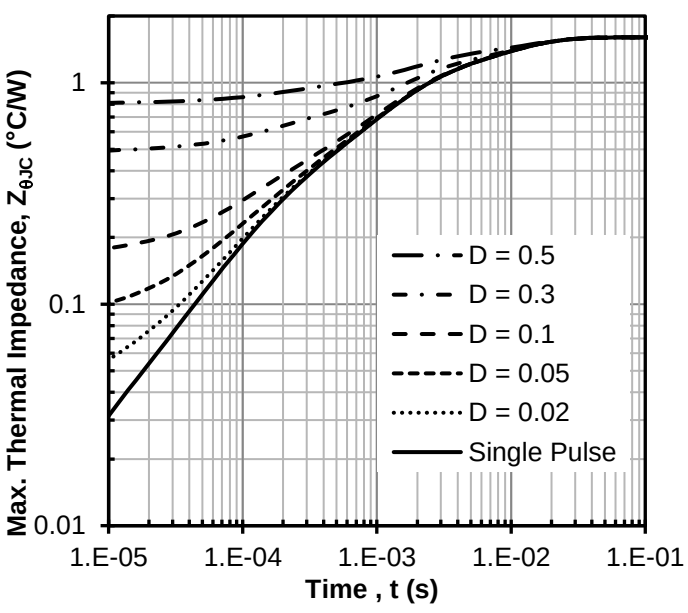


Figure 6 Maximum transient thermal impedance

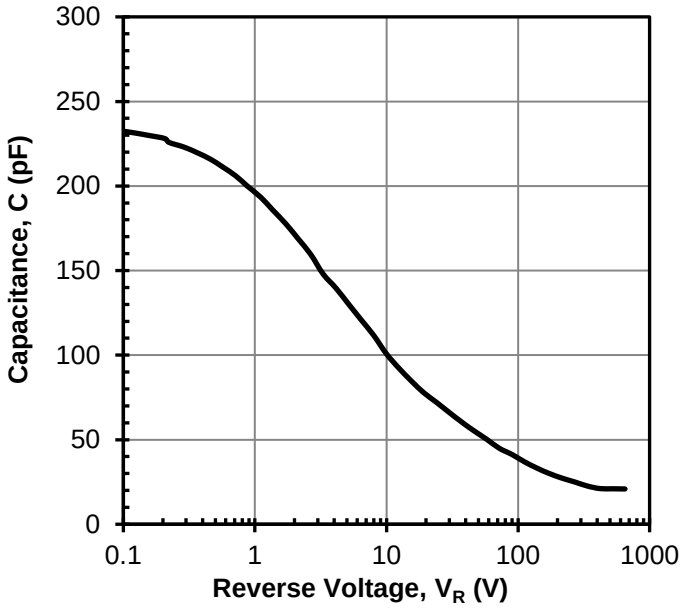


Figure 7 Capacitance vs. reverse voltage at 1MHz

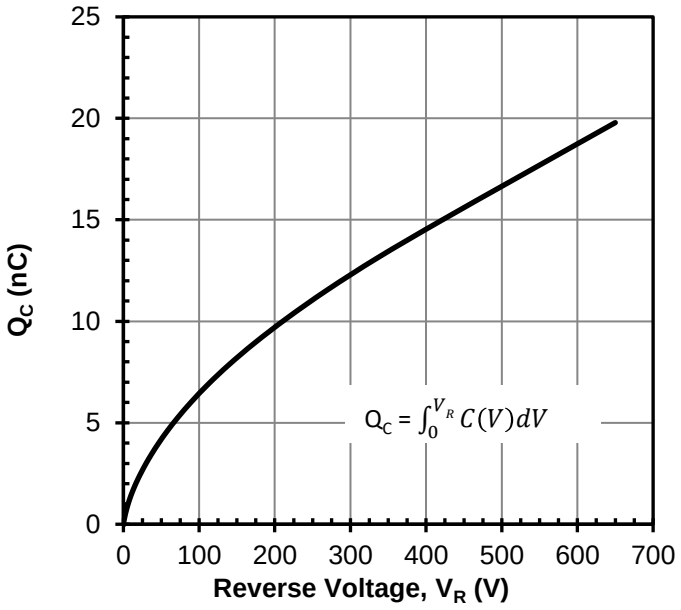


Figure 8 Typical capacitive charge vs. reverse voltage

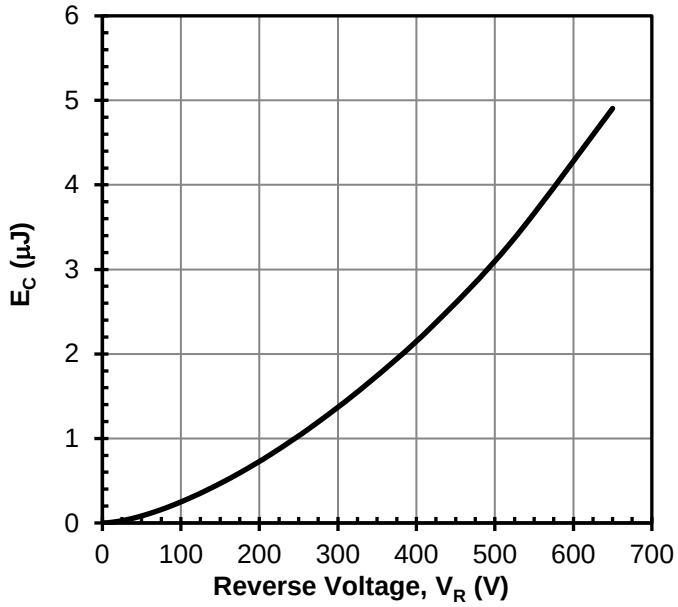


Figure 9 Typical capacitance stored energy vs. reverse voltage

Disclaimer

United Silicon Carbide, Inc. reserves the right to change or modify any of the products and their inherent physical and technical specifications without prior notice. United Silicon Carbide, Inc. assumes no responsibility or liability for any errors or inaccuracies within.

Information on all products and contained herein is intended for description only. No license, express or implied, to any intellectual property rights is granted within this document.

United Silicon Carbide, Inc. assumes no liability whatsoever relating to the choice, selection or use of the United Silicon Carbide, Inc. products and services described herein.