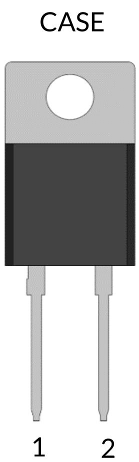
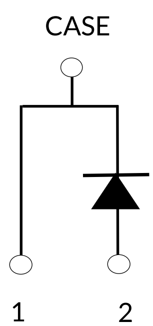
DATASHEET

UJ3D1210TS





Part Number	Package	Marking
UJ3D1210TS	TO-220-2L	UJ3D1210TS

10A -1200V SiC Schottky Diode

Rev. C, February 2020

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
- Excellent thermal performance, Ag sintered
- 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		1200	V
Repetitive peak reverse voltage, T_J=25°C	V_{RRM}		1200	V
Surge peak reverse voltage	V_{RSM}		1200	V
Maximum DC forward current	I_F	T_C = 157°C	10	A
Non-repetitive forward surge current sine halfwave	I_{FSM}	T_C = 25°C, t_p = 10ms	120	A
		T_C = 110°C, t_p = 10ms	110	
Repetitive forward surge current sine halfwave, D=0.1	I_{FRM}	T_C = 25°C, t_p = 10ms	54.2	A
		T_C = 110°C, t_p = 10ms	32.3	
Non-repetitive peak forward current	$I_{F,max}$	T_C = 25°C, t_p = 10µs	720	A
		T_C = 110°C, t_p = 10µs	720	
i^2t value	$\int i^2dt$	T_C = 25°C, t_p = 10ms	72	A^2s
		T_C = 110°C, t_p = 10ms	60	
Power dissipation	P_{tot}	T_C = 25°C	220.6	W
		T_C = 157°C	26.5	
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	$R_{\theta JC}$			0.52	0.68	°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 = 10A, T_J=25°C	-	1.4	1.6	V
		I_F = 10A, T_J=150°C	-	1.85	2.3	
		I_F = 10A, T_J=175°C	-	2	2.6	
Reverse current	I_R	V_R=1200V, T_J=25°C	-	10	110	μA
		V_R=1200V, T_J=175°C	-	450		
Total capacitive charge (1)	Q_C	V_R=800V		51		nC
Total capacitance	C	V_R=1V, f = 1MHz		510		pF
		V_R=400V, f = 1MHz		48		
		V_R=800V, f = 1MHz		41		
Capacitance stored energy	E_C	V_R=800V		15		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

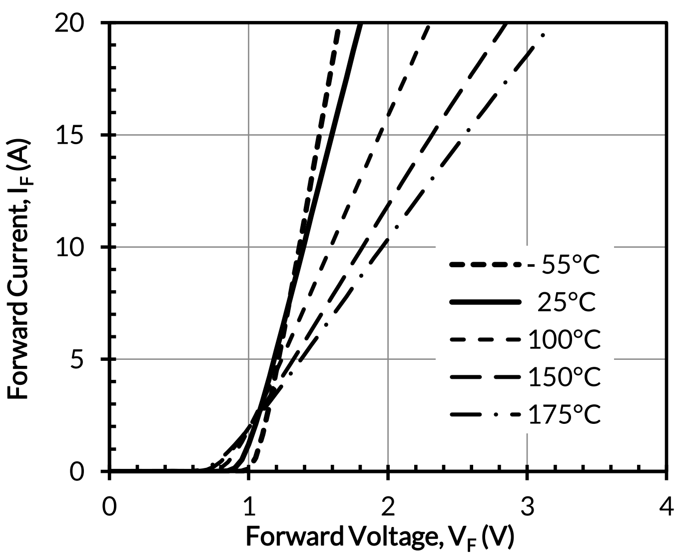


Figure 1. Typical forward characteristics

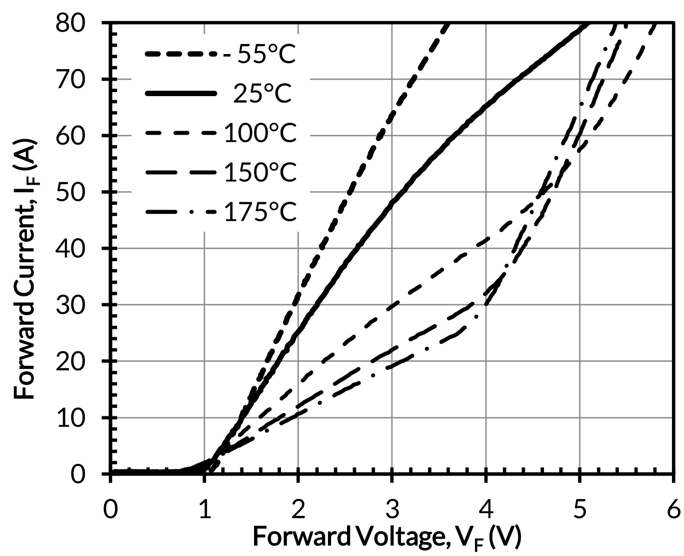


Figure 2. Typical forward characteristics in surge current

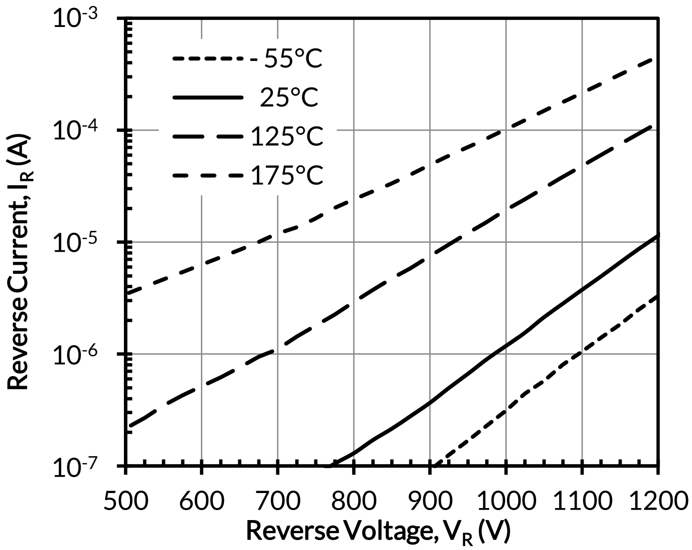


Figure 3. Typical reverse characteristics

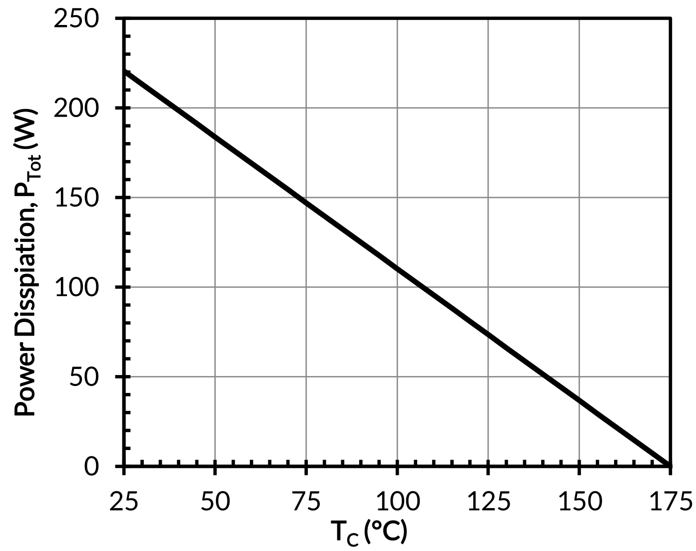


Figure 4. Power dissipation

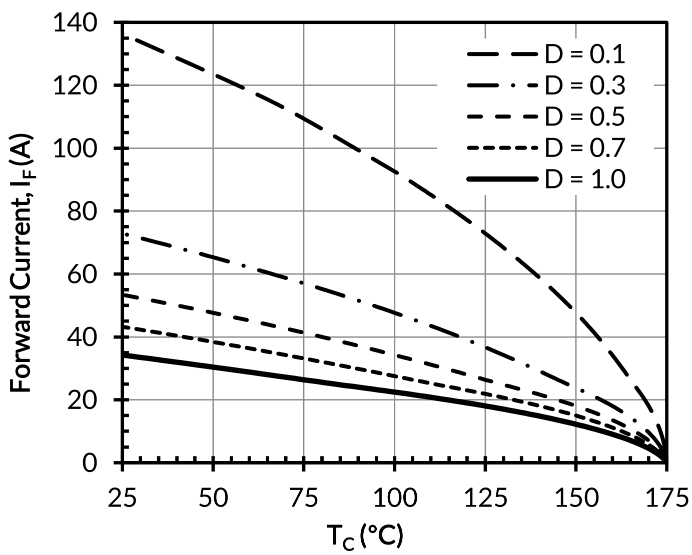


Figure 5. Diode forward current

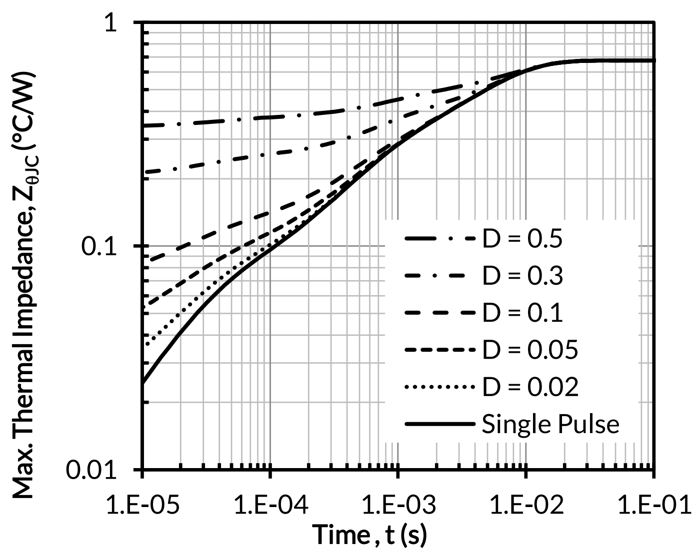


Figure 6. Maximum transient thermal impedance

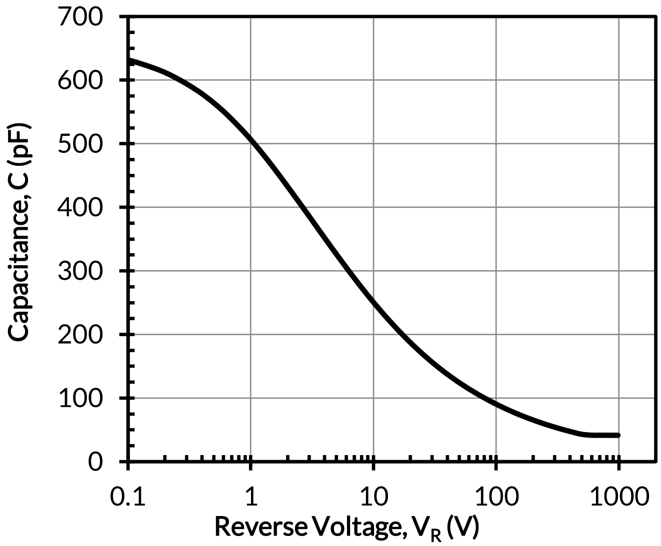


Figure 7. Capacitance vs. reverse voltage at 1MHz

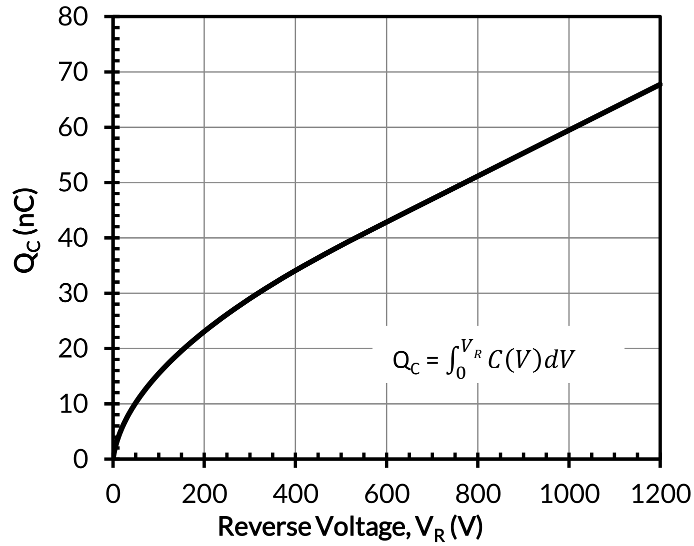


Figure 8. Typical capacitive charge vs. reverse voltage

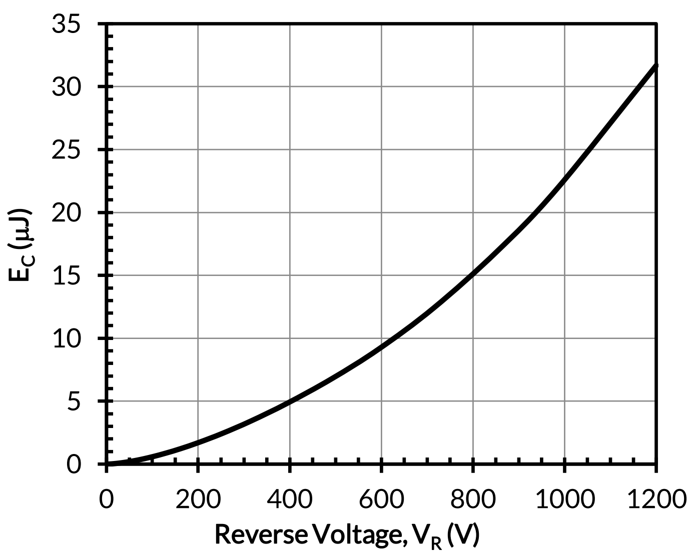


Figure 9. Typical capacitance stored energy vs. reverse voltage

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