





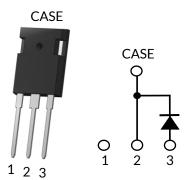








UJ3D1210KS



Part Number	Package	Marking
UJ3D1210KS	TO-247-3L	UJ3D1210KS











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 = 158°C	10	Α	
Non-repetitive forward surge current		$T_C = 25$ °C, $t_p = 10$ ms	120	A	
sine halfwave	I _{FSM}	$T_C = 110^{\circ}C, t_p = 10 ms$	110		
Repetitive forward surge current	1	$T_C = 25$ °C, $t_p = 10$ ms	56.7	Α	
sine halfwave, D=0.1	I _{FRM}	$T_C = 110^{\circ}C, t_p = 10 ms$	33.6		
Non-repetitive peak forward current	I _{F,max}	$T_C = 25^{\circ}C, t_p = 10 \mu s$	720	А	
		$T_C = 110^{\circ}C, t_p = 10\mu s$	720		
i ² t value	∫i²dt -	$T_C = 25$ °C, $t_p = 10$ ms	72		
		$T_C = 110^{\circ}C, t_p = 10 \text{ms}$	60	A^2s	
Power dissipation	P _{tot} –	T _C = 25°C	234.4	14/	
		T _C = 158°C	26.6	W	
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	Тур	Max	Offits
Thermal resistance, junction-to-case	$R_{\theta JC}$			0.49	0.64	°C/W











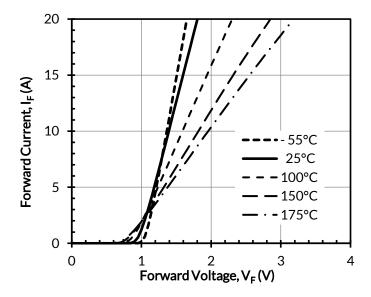


Electrical Characteristics (T_J = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Value			Units	
			Min	Тур	Max	Units	
Forward voltage	V _F	I _F = 10A, T _J =25°C	-	1.4	1.6		
		I _F = 10A, T _J = 150°C	-	1.85	2.3	V	
		I _F = 10A, T _J = 175°C	-	2	2.6		
Reverse current	I _R	V _R =1200V, T _J =25°C	-	10	110	μΑ	
		V _R =1200V, T _J =175°C	-	450			
Total capacitive charge ⁽¹⁾	Q _C	V _R =800V		51		nC	
Total capacitance	С	$V_R=1V, f=1MHz$		510			
		V _R =400V, f = 1MHz		48		pF	
		V _R =800V, f = 1MHz		41			
Capacitance stored energy	E _C	V _R =800V		15		μЈ	

(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





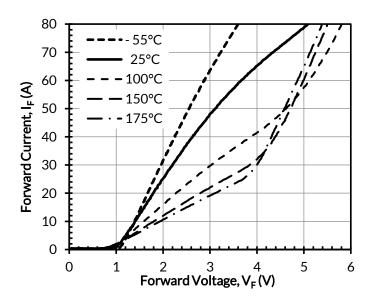


Figure 2. Typical forward characteristics in surge current



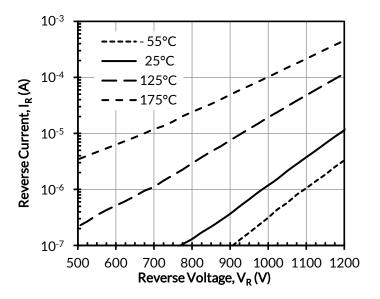








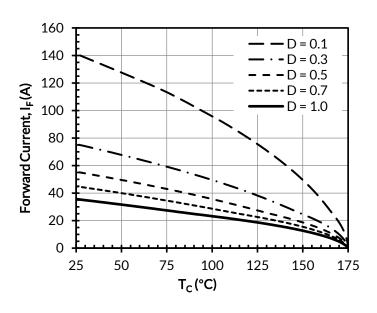




250 200 200 150 100 25 50 75 100 125 150 175 T_C(°C)

Figure 3. Typical reverse characteristics

Figure 4. Power dissipation



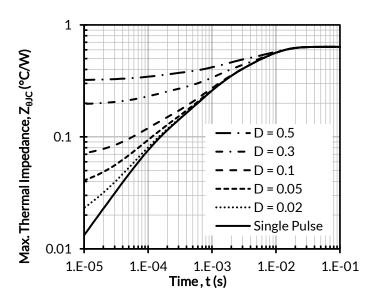


Figure 5. Diode forward current

Figure 6. Maximum transient thermal impedance



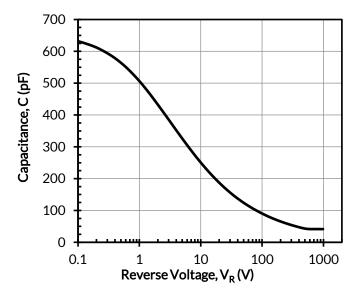












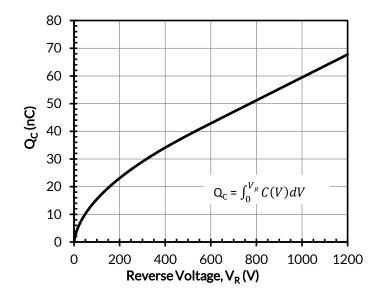


Figure 7. Capacitance vs. reverse voltage at 1MHz

Figure 8. Typical capacitive charge vs. reverse voltage

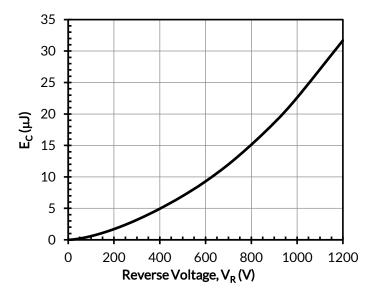


Figure 9. Typical capacitance stored energy vs. reverse voltage













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