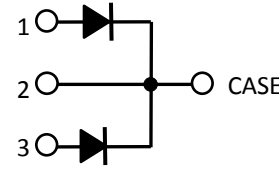


Description

United Silicon Carbide, Inc. offers the xR series of high performance SiC Schottky diodes. With zero reverse recovery charge and 175°C maximum junction temperature, USCi's diodes are ideally suited for high frequency and high efficiency power systems with minimum cooling requirements.



Part Number	Package	Marking
UJ2D1220K	TO-247-3L	UJ2D1220K

Features

- ◆ Positive temperature coefficient for safe operation and ease of paralleling
- ◆ 175°C maximum operating junction temperature
- ◆ Extremely fast switching not dependent on temperature
- ◆ Essentially no reverse or forward recovery
- ◆ RoHS compliant

Typical Applications

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

Maximum Ratings

Parameter	Symbol	Test Conditions	Value (Leg/Device)	Units
DC blocking voltage	V_R		1200	V
Repetitive peak reverse voltage, $T_j=25^\circ\text{C}$	V_{RRM}		1200	V
Surge peak reverse voltage	V_{RSM}		1200	V
Maximum DC forward current	I_F	$T_C = 142^\circ\text{C}$	10/20	A
Non-repetitive forward surge current sine halfwave	I_{FSM}	$T_C = 25^\circ\text{C}, t_p = 10\text{ms}$	75/150	A
		$T_C = 110^\circ\text{C}, t_p = 10\text{ms}$	60/120	
Repetitive forward surge current sine halfwave, $D=0.1$	I_{FRM}	$T_C = 25^\circ\text{C}, t_p = 10\text{ms}$	35/70	A
		$T_C = 110^\circ\text{C}, t_p = 10\text{ms}$	21.8/43.6	
Non-repetitive avalanche energy	E_{AS}	$T_j = 25^\circ\text{C}, L = 10\text{mH},$ $I_{pk}=4.1\text{A/Leg},$ $V_{DD}=100\text{V}$	88/176	mJ
Power dissipation	P_{Tot}	$T_C = 25^\circ\text{C}$	136/272	W
		$T_C = 142^\circ\text{C}$	30/60	
Maximum junction temperature	$T_{J,max}$		175	$^\circ\text{C}$
Operating and storage temperature	T_J, T_{STG}		-55 to 175	$^\circ\text{C}$
Soldering temperatures, wavesoldering only allowed at leads	T_{sold}	1.6mm from case for 10s	260	$^\circ\text{C}$

Electrical Characteristics

$T_J = +25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Test Conditions	Value (Leg/Device)			Units
			Min	Typ	Max	
Forward voltage	V_F	$I_F = 20\text{A}, T_J = 25^\circ\text{C}$	-	1.5	1.7	V
		$I_F = 20\text{A}, T_J = 175^\circ\text{C}$	-	2.5	3	
Reverse current	I_R	$V_R = 1200\text{V}, T_J = 25^\circ\text{C}$	-	30/60	250/500	μA
		$V_R = 1200\text{V}, T_J = 175^\circ\text{C}$	-	60/120	800/1600	
Total capacitive charge ⁽¹⁾	Q_C	$V_R = 800\text{V}$		47/94		nC
Total capacitance	C	$V_R = 1\text{V}, f = 1\text{MHz}$		500/1000		pF
		$V_R = 400\text{V}, f = 1\text{MHz}$		45/90		
		$V_R = 800\text{V}, f = 1\text{MHz}$		35/70		
Capacitance stored energy	E_C	$V_R = 800\text{V}$		12.2/24.4		μJ

(1) See Figure 8, 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 (Leg/Device)			Units
			Min	Typ	Max	
Thermal resistance	$R_{\theta JC}$			0.83/0.415	1.1/0.55	$^\circ\text{C}/\text{W}$

Typical Performance (Per Leg)

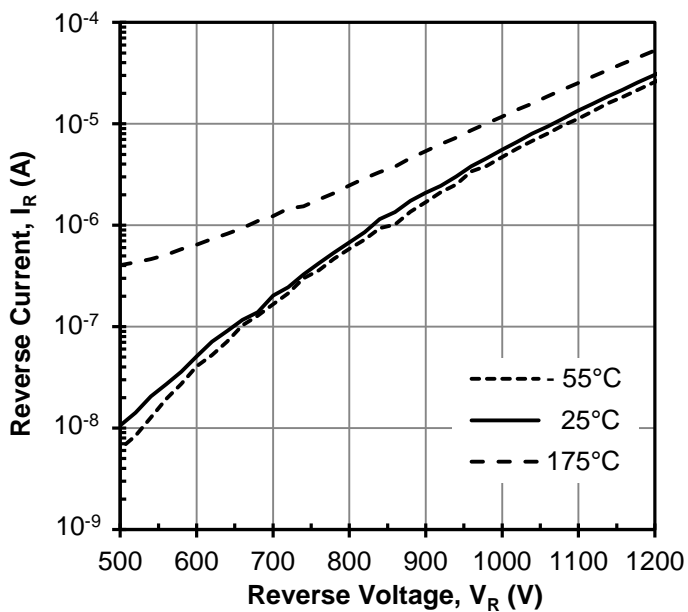


Figure 1 Typical reverse characteristics

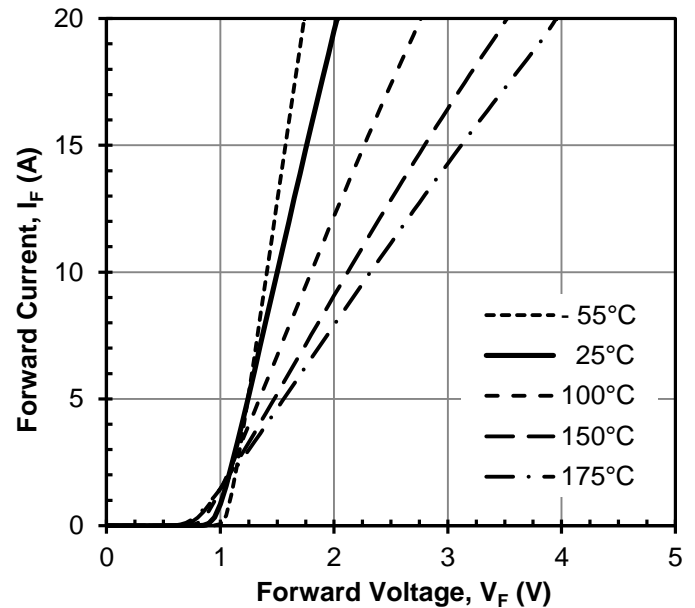


Figure 2 Typical forward characteristics

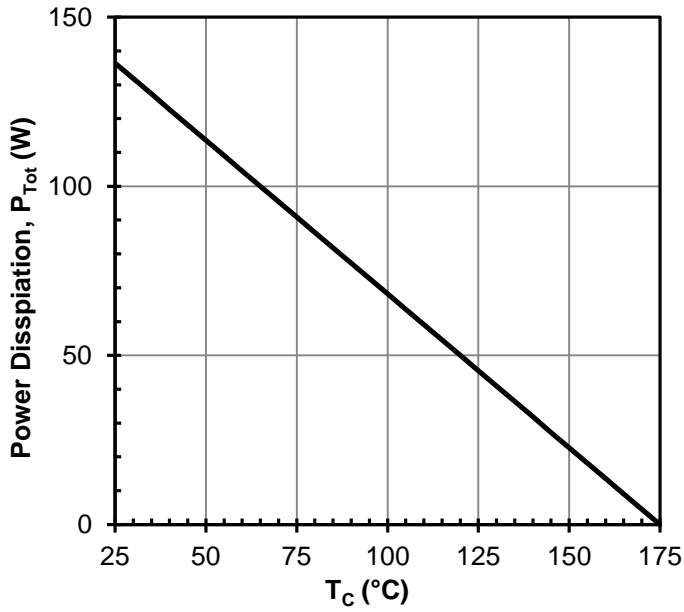


Figure 3 Power dissipation

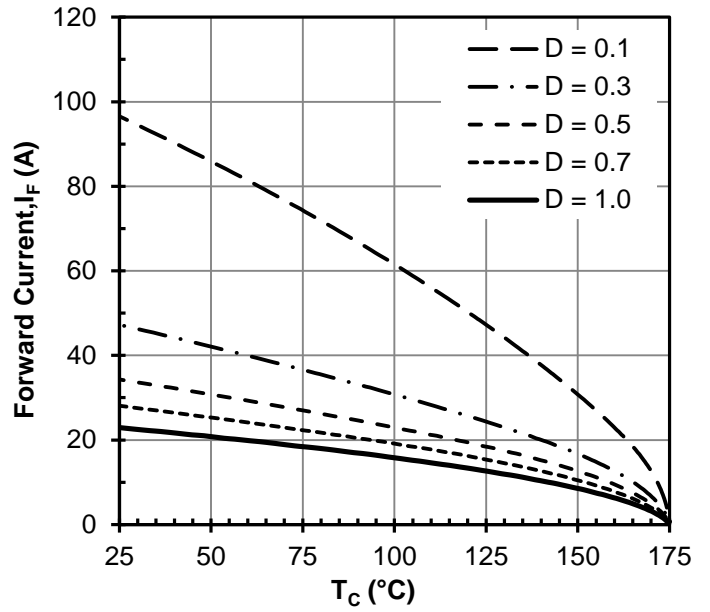


Figure 4 Diode forward current

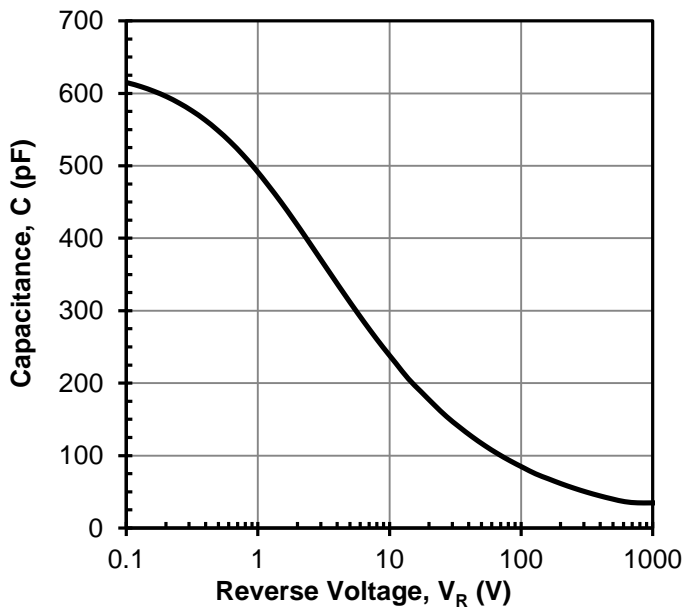


Figure 5 Capacitance vs. reverse voltage

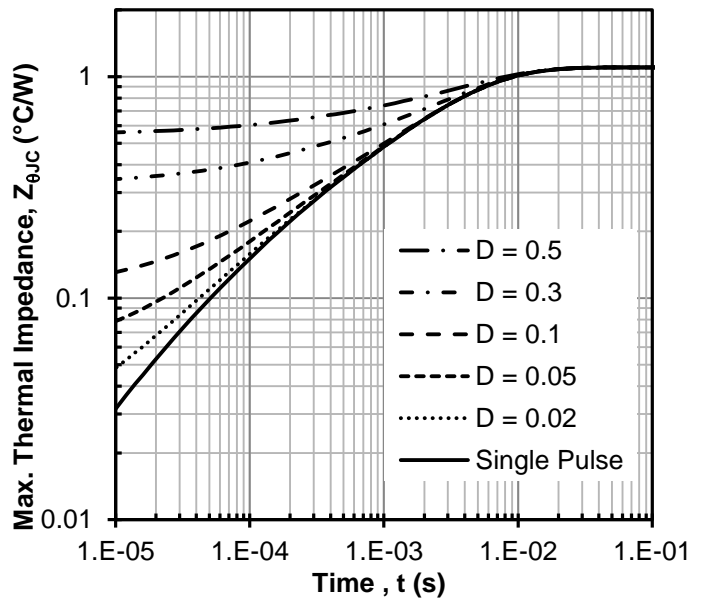


Figure 6 Maximum transient thermal impedance

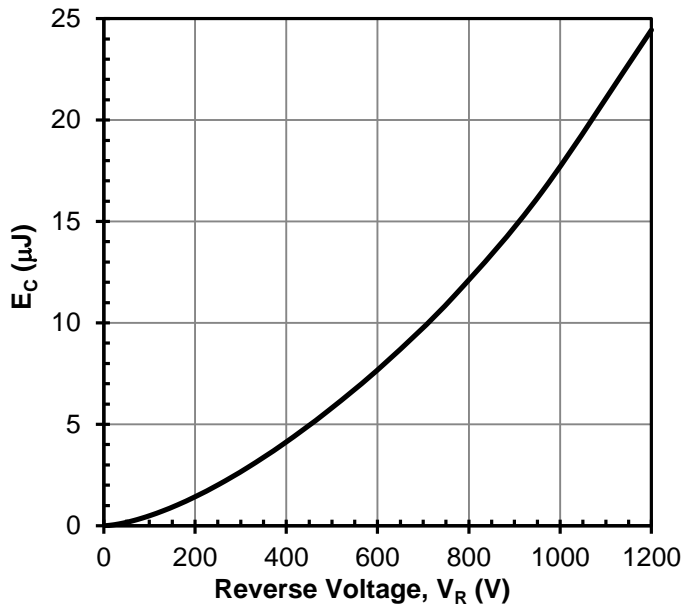


Figure 7 Typical capacitance stored energy vs. reverse voltage

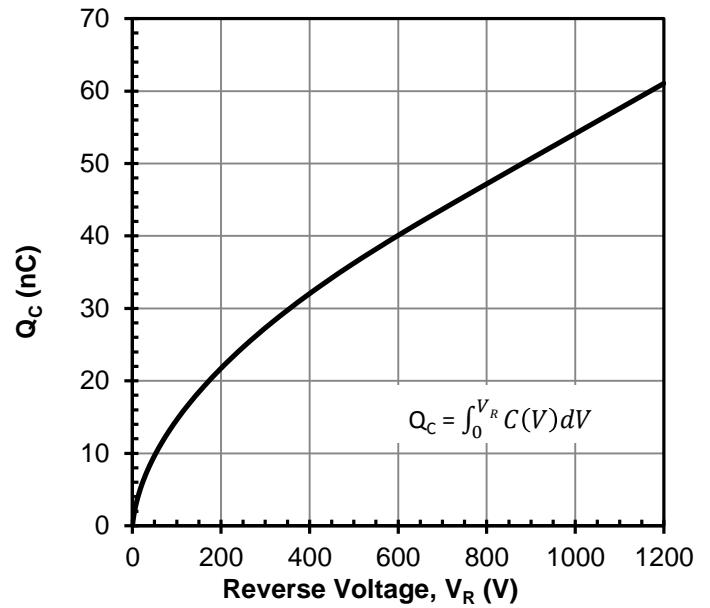


Figure 8 Typical capacitive charge vs. reverse voltage

Disclaimer

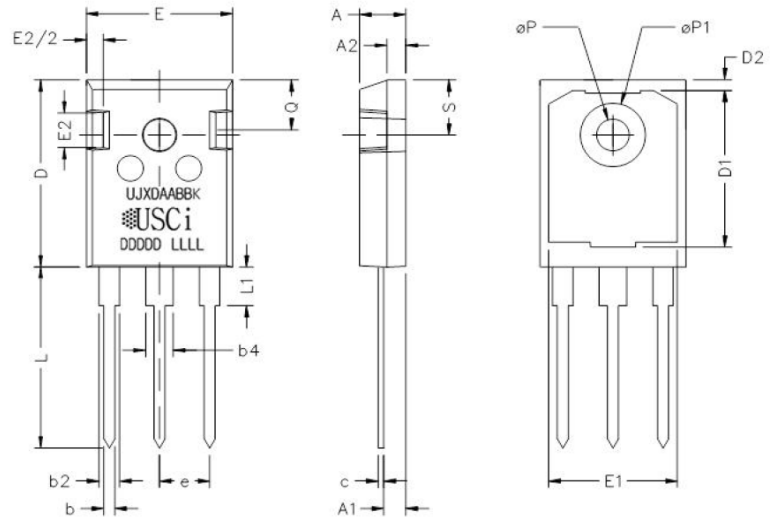
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TO-247-3L OUTLINE

DIM	INCHES		MILLIMETERS	
	min	max	min	max
A	0.193	0.203	4.90	5.16
A1	0.090	0.100	2.29	2.54
A2	0.073	0.083	1.85	2.11
b	0.042	0.052	1.07	1.32
b2	0.075	0.094	1.91	2.39
b4	0.113	0.133	2.87	3.38
c	0.022	0.027	0.56	0.69
D	0.820	0.830	20.83	21.08
D1	0.684	0.696	17.37	17.68
D2	0.042	0.052	1.07	1.32
E	0.621	0.631	15.77	16.03
E1	0.547	0.557	13.89	14.15
E2	0.135	0.157	3.43	3.99
E2/2	0.081	0.095	2.06	2.41
e	0.215		5.46	
L	0.789	0.799	20.04	20.29
L1	0.164	0.176	4.17	4.47
∅P	0.140	0.144	3.56	3.66
∅P1	0.278	0.288	7.06	7.32
Q	0.216	0.226	5.49	5.74
S	0.238	0.248	6.05	6.30



PART MARKING

UJXDAABBK

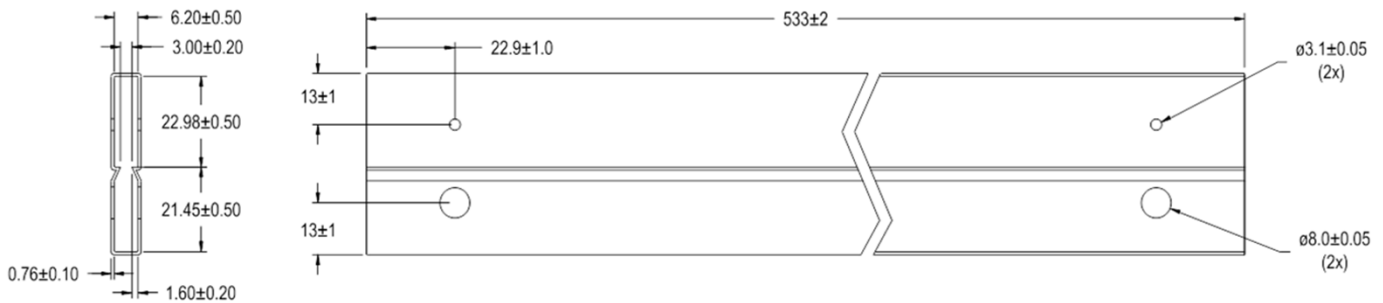
 DDDD LLLL

U =	USCi
JXD =	DIODE
X =	GENERATION
AA =	VOLTAGE RATING
BB =	CURRENT RATING
K =	TO-247-3L

DDDD= DATE CODE

LLLL = LOT CODE

TO-247 TUBE OUTLINE



ALL UNITS IN MILLIMETERS
 TOLERANCES +/-0.25mm UNLESS OTHERWISE SPECIFIED

30 units per tube

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