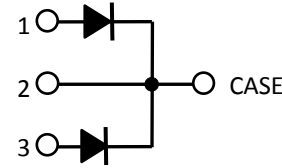


## Description

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
UJ2D1230K	TO-247-3L	UJ2D1230K

## 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	$I_F$	$T_C = 138^\circ\text{C}$	15/30	A
Non-repetitive forward surge current sine halfwave	$I_{FSM}$	$T_C = 25^\circ\text{C}, t_p = 10\text{ms}$	112.5/225	A
		$T_C = 110^\circ\text{C}, t_p = 10\text{ms}$	90/180	
Repetitive forward surge current sine halfwave, $D=0.1$	$I_{FRM}$	$T_C = 25^\circ\text{C}, t_p = 10\text{ms}$	51.2/102.4	A
		$T_C = 110^\circ\text{C}, t_p = 10\text{ms}$	31.3/62.6	
Non-repetitive avalanche energy	$E_{AS}$	$T_j = 25^\circ\text{C}, L = 10\text{mH},$ $I_{pk}=5\text{A}/\text{Leg},$ $V_{DD}=100\text{V}$	132/264	mJ
Power dissipation	$P_{Tot}$	$T_C = 25^\circ\text{C}$	187/374	W
		$T_C = 138^\circ\text{C}$	46/92	
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	$V_F$	$I_F = 30\text{A}, T_J = 25^\circ\text{C}$	-	1.5	1.7	V
		$I_F = 30\text{A}, T_J = 175^\circ\text{C}$	-	2.5	3	
Reverse current	$I_R$	$V_R = 1200\text{V}, T_J = 25^\circ\text{C}$	-	45/90	375/750	$\mu\text{A}$
		$V_R = 1200\text{V}, T_J = 175^\circ\text{C}$	-	90/180	1000/2000	
Total capacitive charge <sup>(1)</sup>	$Q_C$	$V_R = 800\text{V}$		69/138		nC
Total capacitance	C	$V_R = 1\text{V}, f = 1\text{MHz}$		730/1460		pF
		$V_R = 400\text{V}, f = 1\text{MHz}$		64/128		
		$V_R = 800\text{V}, f = 1\text{MHz}$		51/102		
Capacitance stored energy	$E_C$	$V_R = 800\text{V}$		17.5/35		$\mu\text{J}$

(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	$R_{\theta JC}$			0.6/0.3	0.8/0.4	$^\circ\text{C}/\text{W}$

## Typical Performance (Per Leg)

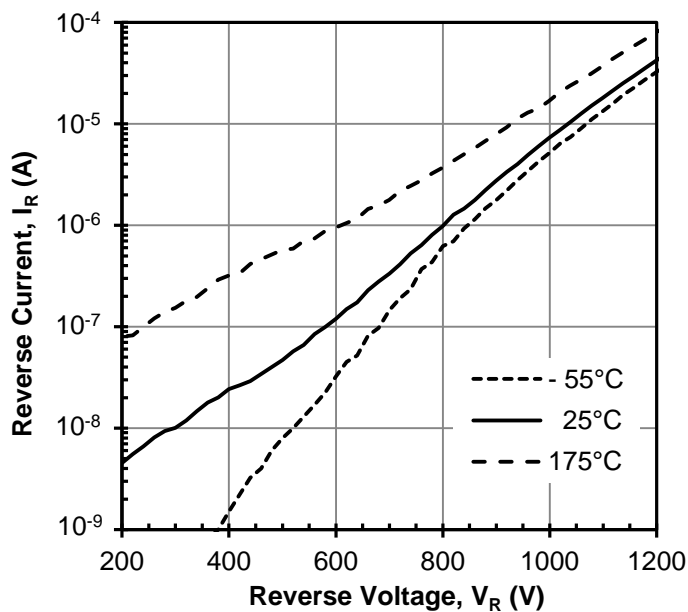


Figure 1 Typical reverse characteristics

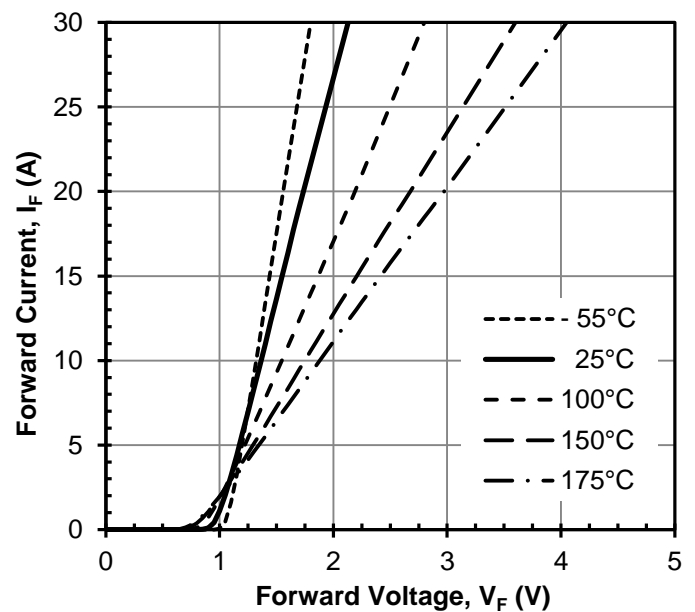


Figure 2 Typical forward characteristics

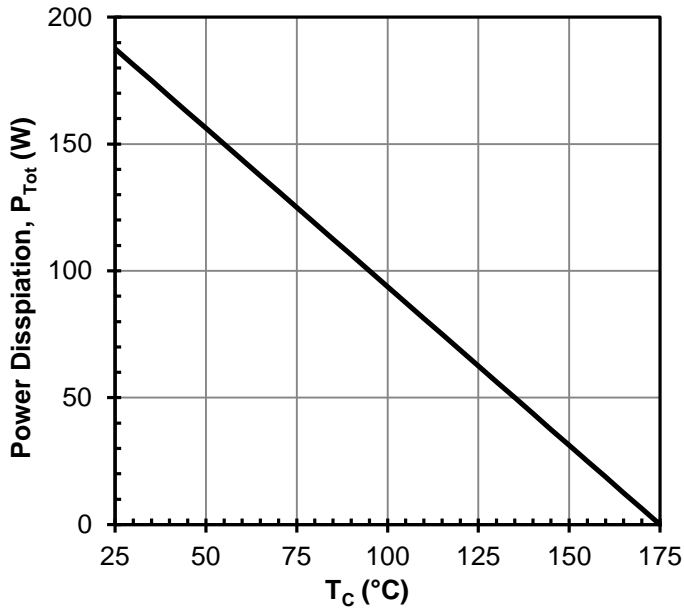


Figure 3 Power dissipation

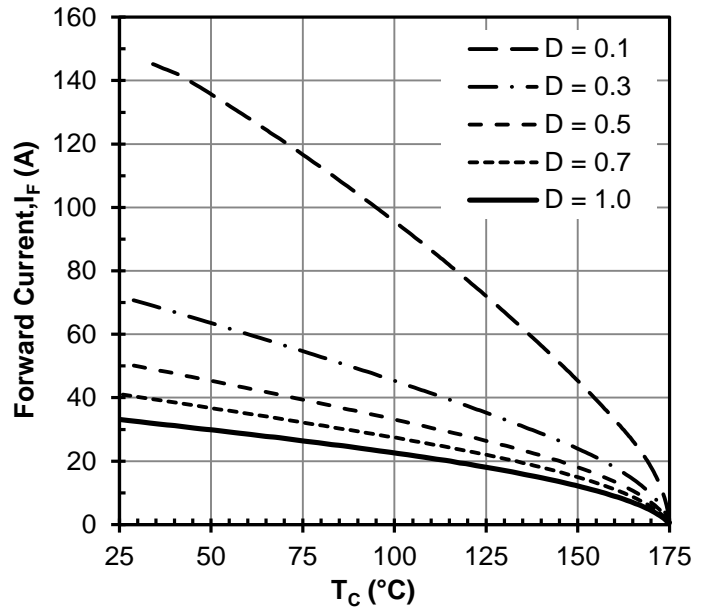


Figure 4 Diode forward current

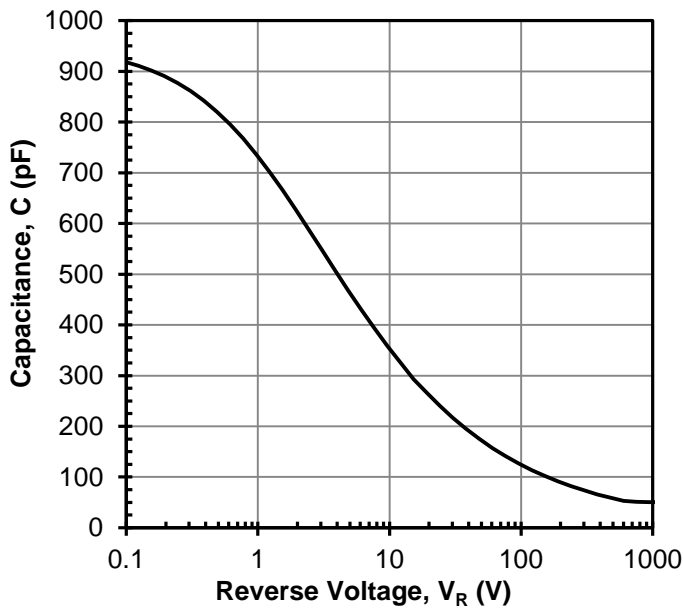


Figure 5 Capacitance vs. reverse voltage

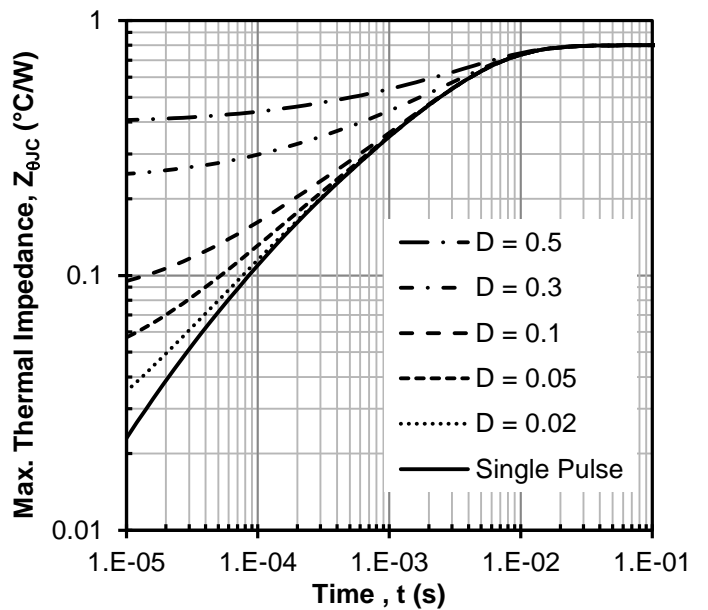
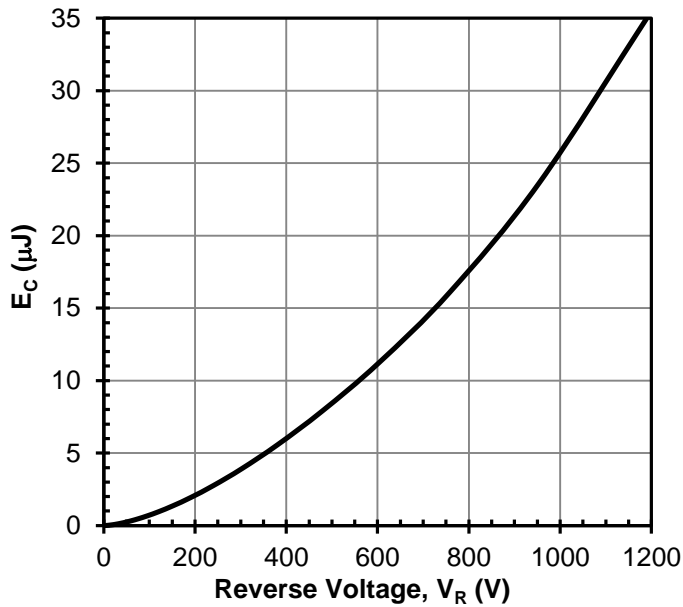
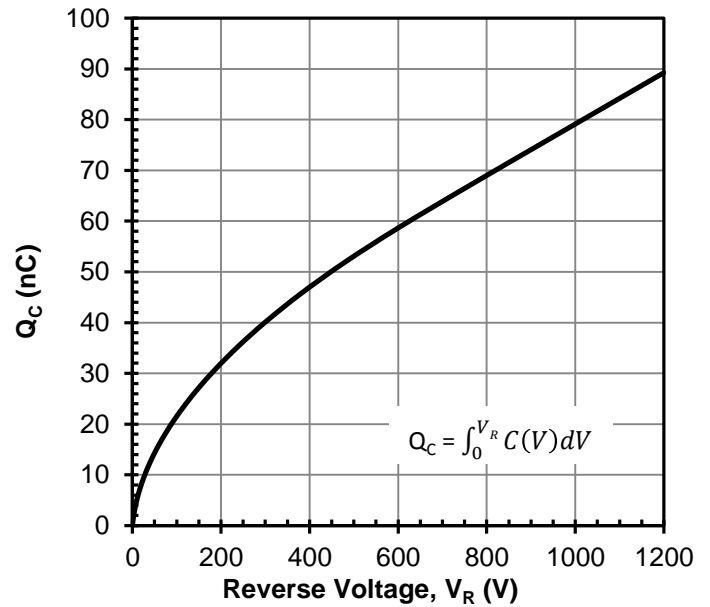


Figure 6 Maximum transient thermal impedance



**Figure 7** Typical capacitance stored energy vs. reverse voltage



**Figure 8** Typical capacitive charge vs. reverse voltage

**Disclaimer**

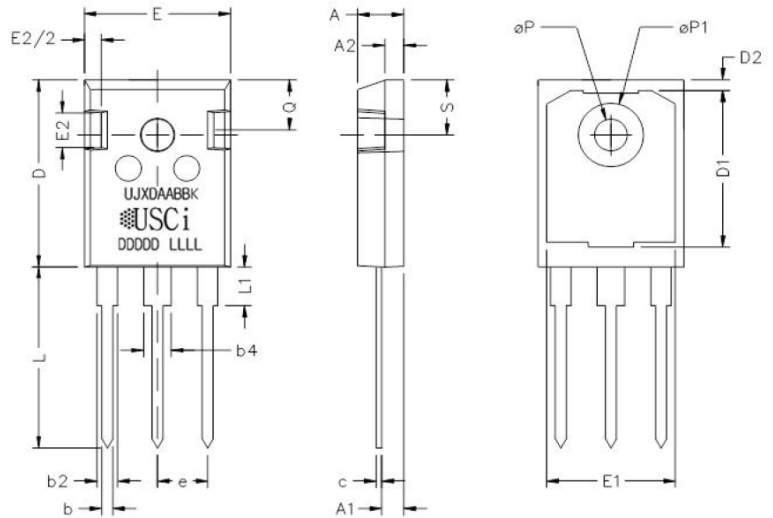
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**TO-247-3L OUTLINE**

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**

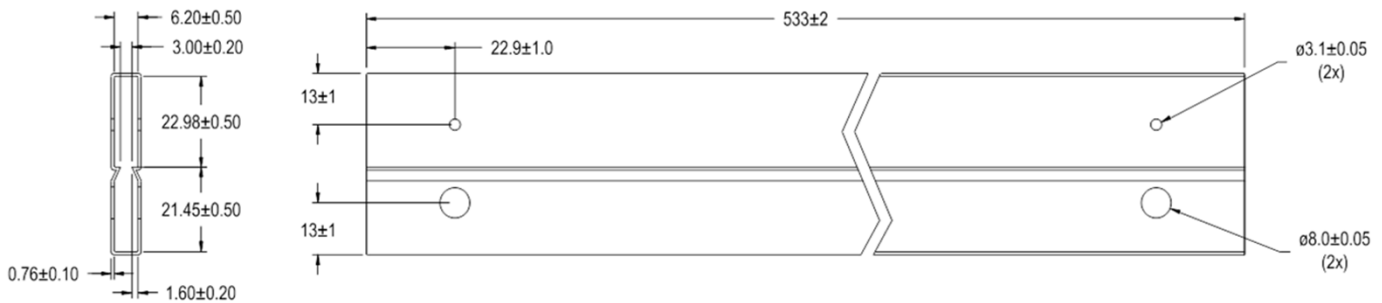
UJXDAABBK  
  
 DDDD LLLL

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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