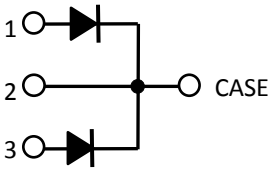
Description

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.



RoHS

Halogen Free

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°C	V_{RRM}		1200	V
Surge peak reverse voltage	V_{RSM}		1200	V
Maximum DC forward current	I_F	T_C = 142°C	10/20	A
Non-repetitive forward surge current sine halfwave	I_{FSM}	T_C = 25°C, t_p = 10ms	75/150	A
		T_C = 110°C, t_p =10ms	60/120	
Repetitive forward surge current sine halfwave, D=0.1	I_{FRM}	T_C = 25°C, t_p = 10ms	35/70	A
		T_C = 110°C, t_p =10ms	21.8/43.6	
Non-repetitive avalanche energy	E_{AS}	T_j = 25°C, L = 10mH, Ipk=4.1A/Leg, V_{DD}=100V	88/176	mJ
Power dissipation	P_{Tot}	T_C = 25°C	136/272	W
		T_C = 142°C	30/60	
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 (Leg/Device)			Units
			Min	Typ	Max	
Forward voltage	V_F	I_F = 20A, T_J = 25°C	-	1.5	1.7	V
		I_F = 20A, T_J =175°C	-	2.5	3	
Reverse current	I_R	V_R=1200V, T_j=25°C	-	30/60	250/500	µA
		V_R=1200V, T_J=175°C	-	60/120	800/1600	
Total capacitive charge (1)	Q_C	V_R=800V		47/94		nC
Total capacitance	C	V_R=1V, f=1MHz		500/1000		pF
		V_R=400V, f=1MHz		45/90		
		V_R=800V, f=1MHz		35/70		
Capacitance stored energy	E_C	V_R=800V		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	°C/W

Typical Performance (Per Leg)

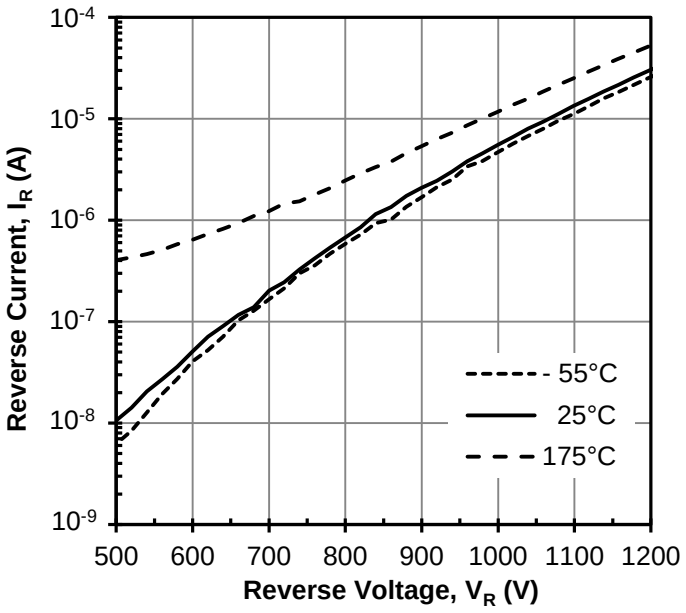


Figure 1 Typical reverse characteristics

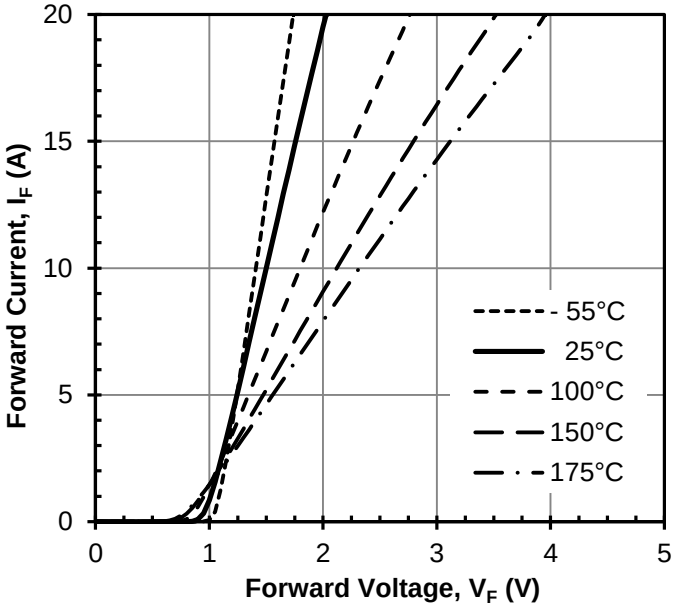


Figure 2 Typical forward characteristics

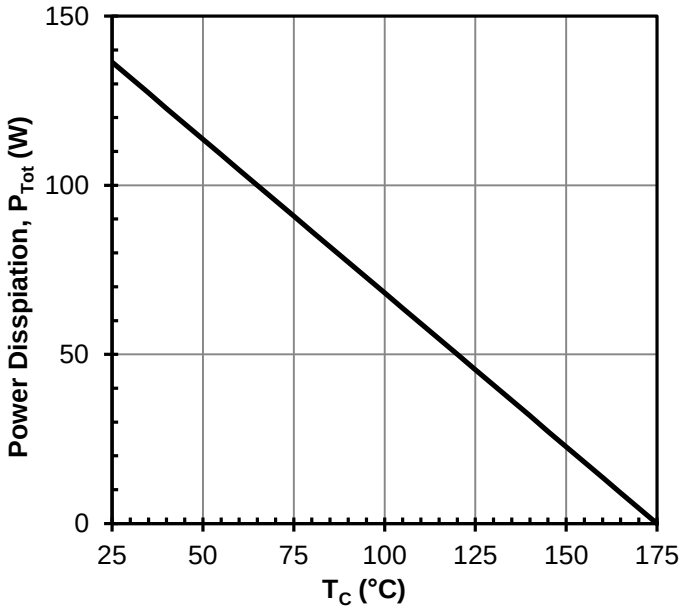


Figure 3 Power dissipation

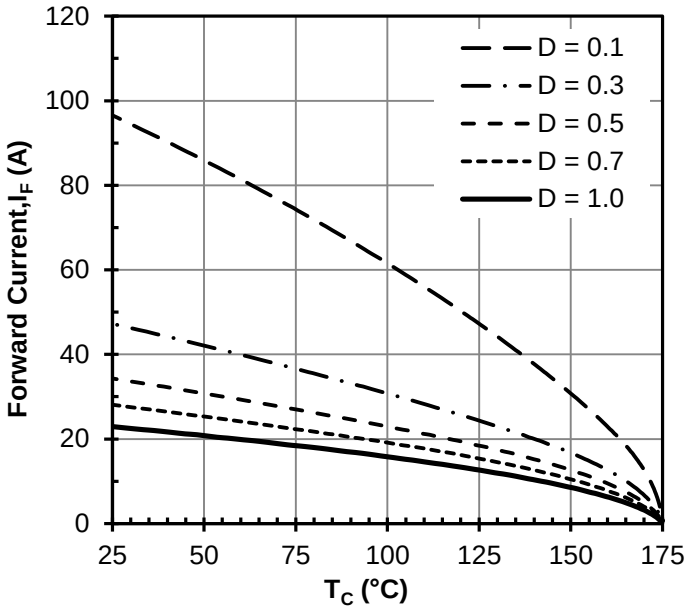


Figure 4 Diode forward current

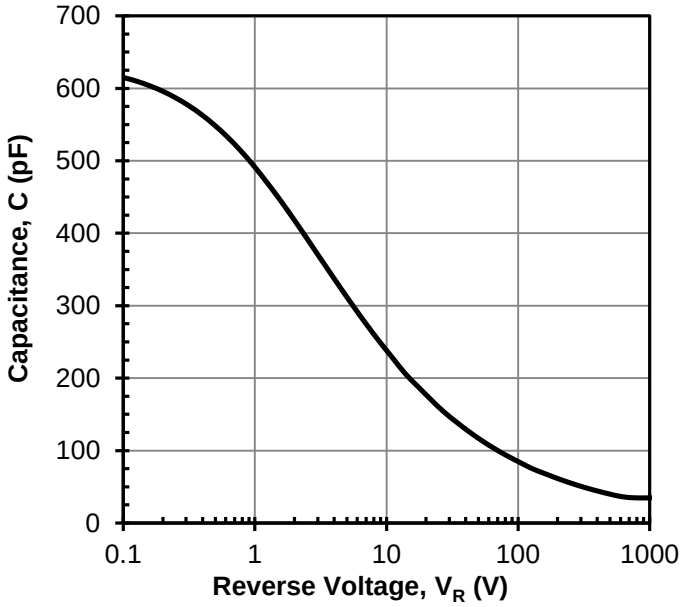


Figure 5 Capacitance vs. reverse voltage

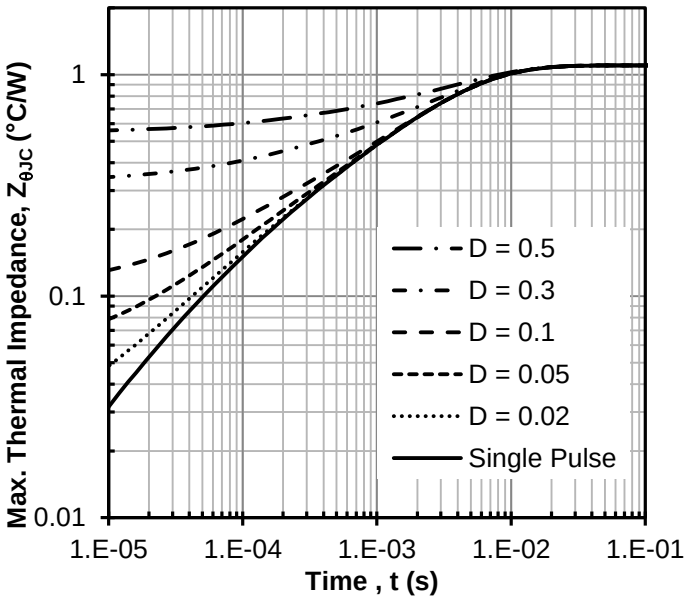


Figure 6 Maximum transient thermal impedance

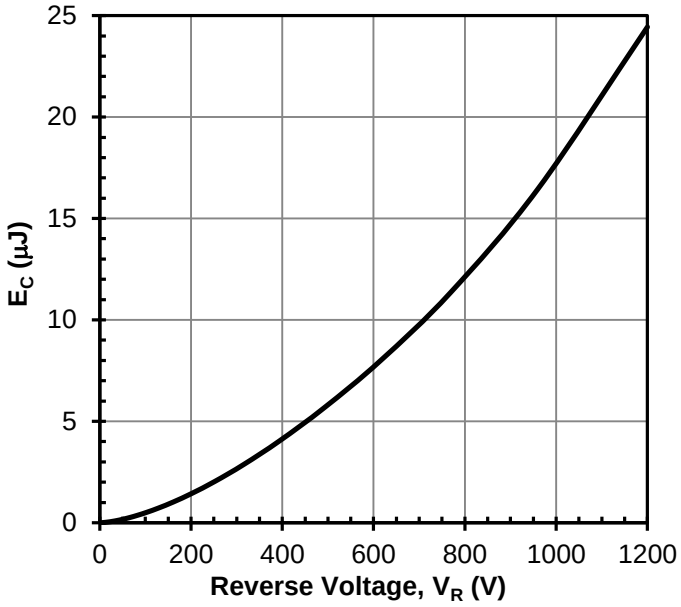


Figure 7 Typical capacitance stored energy vs. reverse voltage

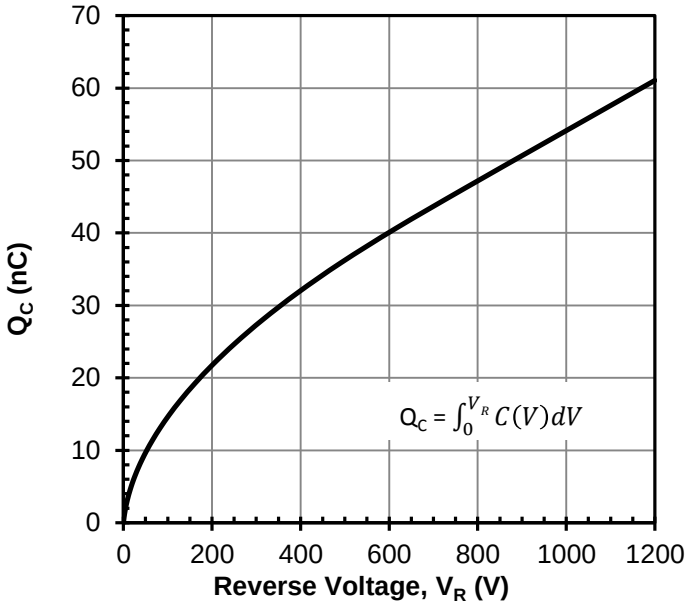


Figure 8 Typical capacitive charge vs. reverse voltage

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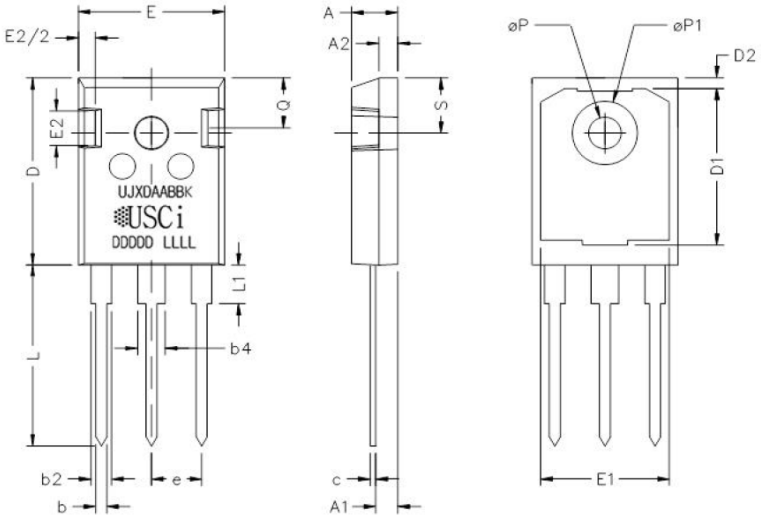
TO-247-3L OUTLINE

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
ØP	0.140	0.144	3.56	3.66
ØP1	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



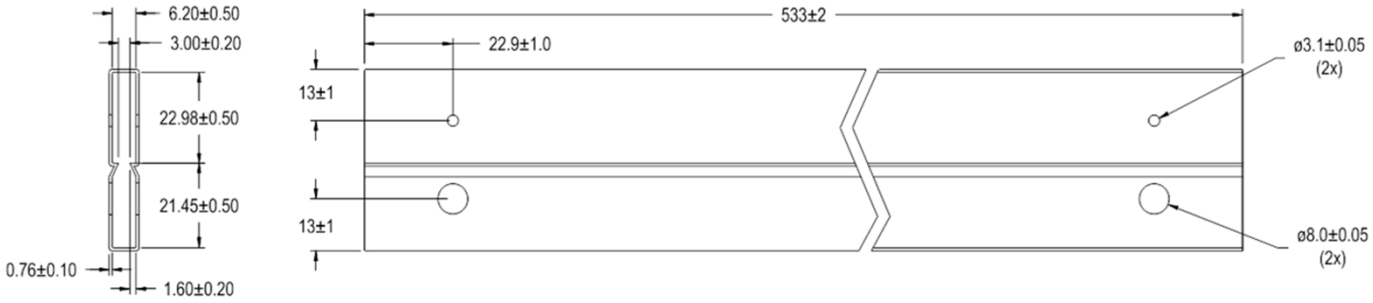
PART MARKING

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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