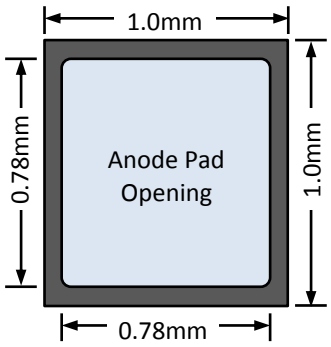
Description

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	Anode Metal	Cathode Metal	Packaging
UJD06504Z	Al 5µm	Ti/Ni/Au 0.07/0.1/0.1µm	Die on Tape

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	Units
DC blocking voltage	V_R		650	V
Repetitive peak reverse voltage, T_j=25°C	V_{RRM}		650	V
Surge peak reverse voltage	V_{RSM}		650	V
Maximum DC forward current (1)	I_F	T_C = 156°C	4	A
Non-repetitive forward surge current (1) sine halfwave	I_{FSM}	T_C = 25°C, t_p = 10ms	30	A
		T_C = 110°C, t_p =10ms	24	
Repetitive forward surge current (1) sine halfwave, D=0.1	I_{FRM}	T_C = 25°C, t_p = 10ms	21.5	A
		T_C = 110°C, t_p =10ms	12.4	
Non-repetitive peak forward current (1)	$I_{F,max}$	T_C = 25°C, t_p =10µs	235	A
		T_C = 110°C, t_p =10µs	212	
Non-repetitive avalanche energy (1)	E_{AS}	T_j = 25°C, L = 5mH, Ipk=3.55A, V_{DD}=100V	33	mJ
Maximum junction temperature	$T_{J,max}$		175	°C
Operating and storage temperature	T_J, T_{STG}		-55 to 175	°C

(1) Assumes a maximum junction-to-case thermal resistance of 2.1°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 = 4A, T_J = 25°C	-	1.5	1.7	V
		I_F = 4A, T_J =150°C	-	1.8	2.1	
		I_F = 4A, T_J =175°C	-	2	2.25	
Reverse current	I_R	V_R=650V, T_j=25°C	-	10	170	µA
		V_R=650V, T_J=175°C	-	20	550	
Total capacitive charge (2)	Q_C	V_R=400V		9.3		nC
Total capacitance	C	V_R=1V, f=1MHz		125		pF
		V_R=300V, f=1MHz		16		
		V_R=600V, f=1MHz		13		
Capacitance stored energy	E_C	V_R=400V		1.3		µJ

(2) See Figure 4, Q_c is independent on T_j, di_F/dt, and I_F as shown in the application note USCi_AN0011.

Typical Performance

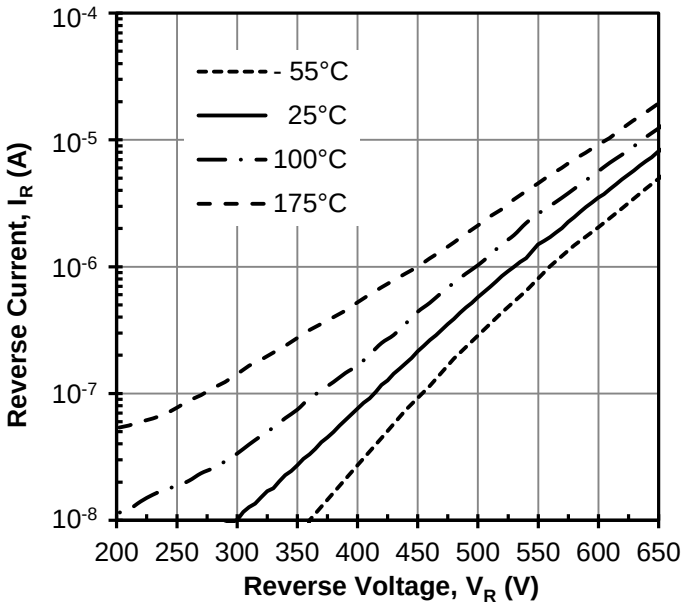


Figure 1 Typical reverse characteristics

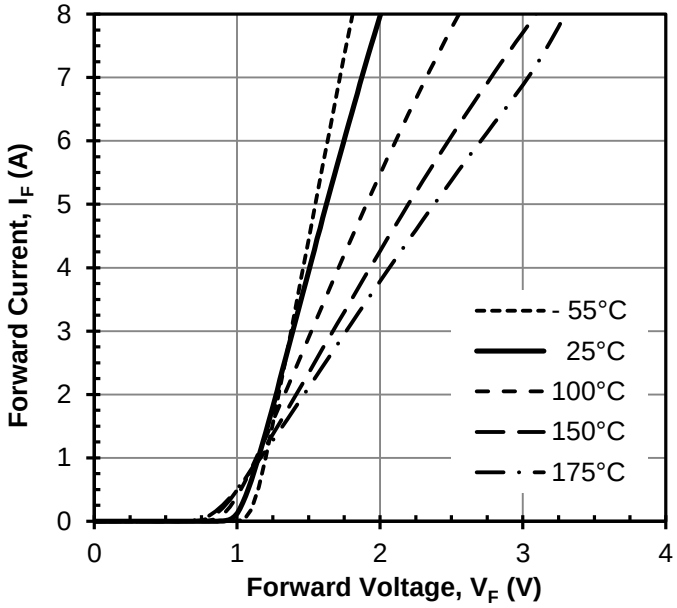


Figure 2 Typical forward characteristics

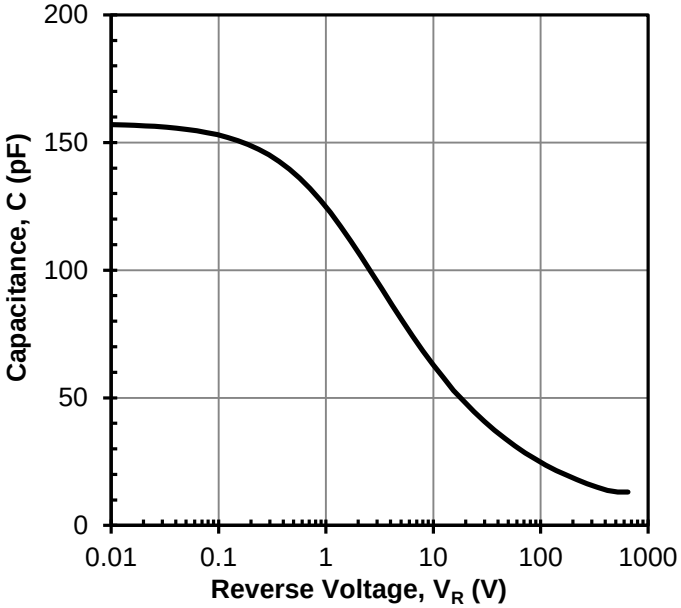


Figure 3 Capacitance vs. reverse voltage

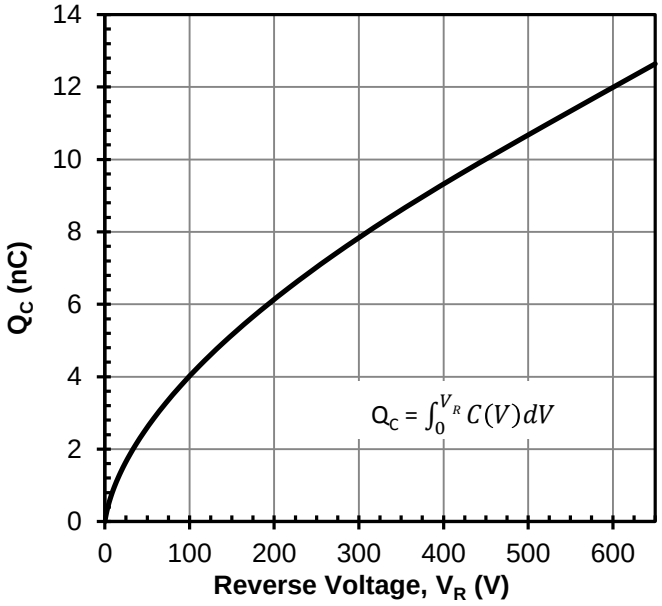


Figure 4 Typical capacitive charge vs. reverse voltage

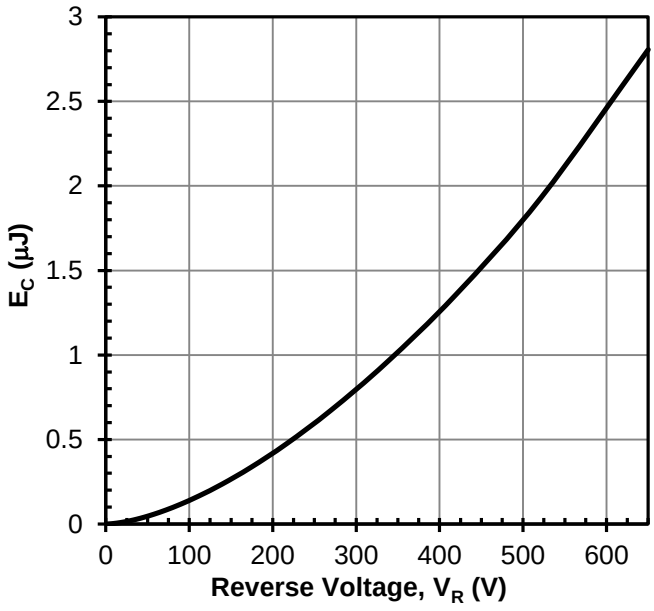


Figure 5 Typical capacitance stored energy vs. reverse voltage

Mechanical Characteristics

Parameter	Typical Value	Units
Die Dimensions (L x W)	1.0 x 1.0	mm
Top Anode Pad Opening (L x W)	0.78 x 0.78	mm
Wafer Size	100	mm
Anode Metallization (Al)	5	µm
Cathode Metallization (Ti/Ni/Au)	0.07/0.1/0.1	µm
Frontside Passivation BCB	5.5	µm
Die Thickness	100	µm

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