PowerCubeSemi, Inc.
Potential · Convergence · Smart

PCD10170P
1700V Silicon Carbide Diode

Features

- 1700-Volt Schottky Rectifier
- Shorter recovery time
- High-speed switching possible
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Switching
- Positive Temperature Coefficient on VF
- RoHS Compliant

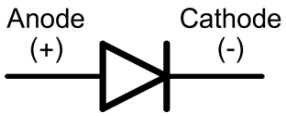
Applications

- Switch Mode Power Supplies
- Power Factor Correction
- Motor Drives
- HID Lighting

Package Outline

PKG : TO-247 2L

RoHS



Halogen-Free

Absolute Maximum Ratings

T_C = 25°C unless otherwise noted

Symbol	Parameter		Value	Units
V_{RRM}	Repetitive Peak Reverse Voltage		1700	V
V_{RSM}	Surge Peak Reverse Voltage		1700	V
V_{DC}	DC Blocking Voltage		1700	V
I_F	Continuous Forward Current	T_C = 25˚C T_C = 160˚C	36 10	A
I_{FRM}	Repetitive Peak Forward Current	T_C = 110˚C	83	A
I_{FSM}	Non-Repetitive Forward Surge Current (PW=10ms sinusoidal)	T_C = 25˚C T_C = 110˚C	60 50	A
P_D	Power Dissipation	T_C = 25˚C	214	W
T_J, Tstg	Operating Junction and Storage Temperature		-55 to +175	℃

Electrical Characteristics

T_C = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
V_F	Forward Voltage	I_F = 10A, T_C = 25°C I_F = 10A, T_C = 175°C	- -	1.5 2.0	1.8 2.4	V
I_R	Reverse Current	V_R = 1700V T_C = 25°C V_R = 1700V T_C = 175°C	- -	5 20	100 -	uA
Q_C	Total Capacitive Charge	V_R = 1200V	-	101	-	nC
C	Total Capacitance	V_R = 1V, T_J = 25°C, f = 1MHz V_R = 1200V, T_J = 25°C, f = 1MHz	- -	682 53	- -	pF

Thermal Characteristics

T_C = 25°C unless otherwise noted

Symbol	Parameter	Min	Typ	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	-	0.70	0.84	℃/W

Typical Characteristics

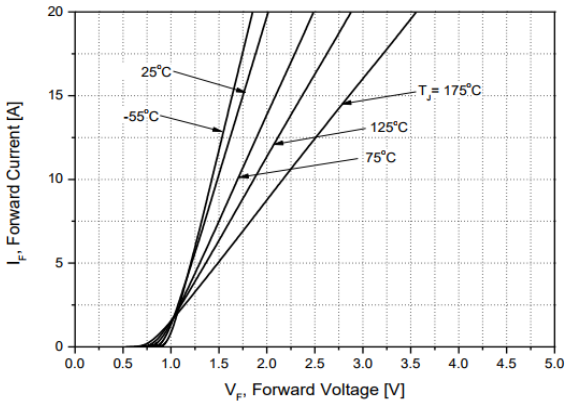


Figure 1. Forward Characteristics

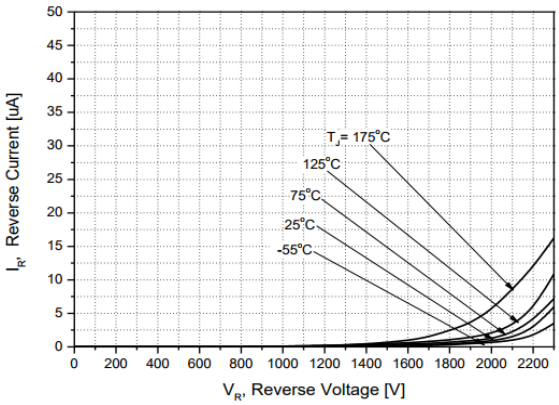


Figure 2. Reverse Characteristics

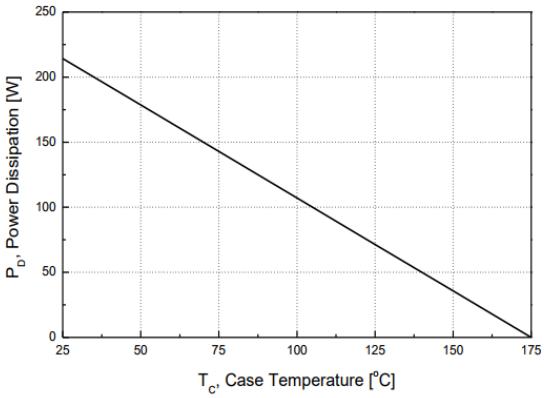


Figure 3. Power Dissipation

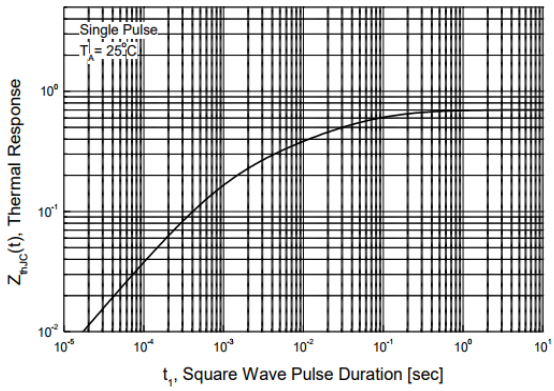


Figure 4. Transient Thermal Resistance

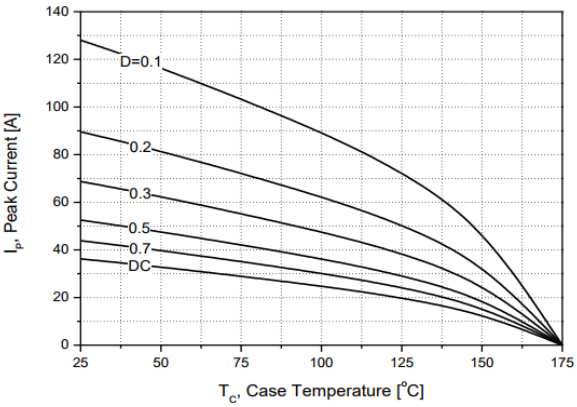


Figure 5. Peak Forward Current Derating

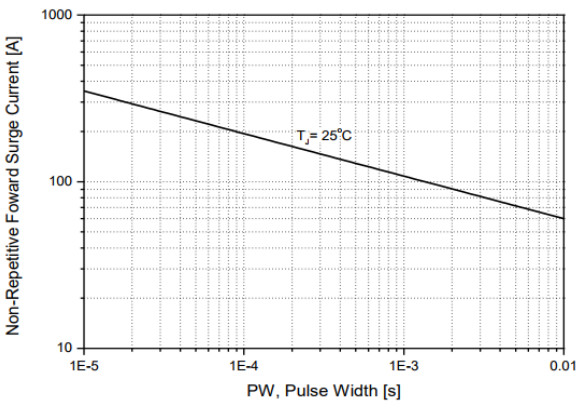


Figure 6. Non-Repetitive Peak Forward Surge Current vs. Pulse Duration

Typical Characteristics

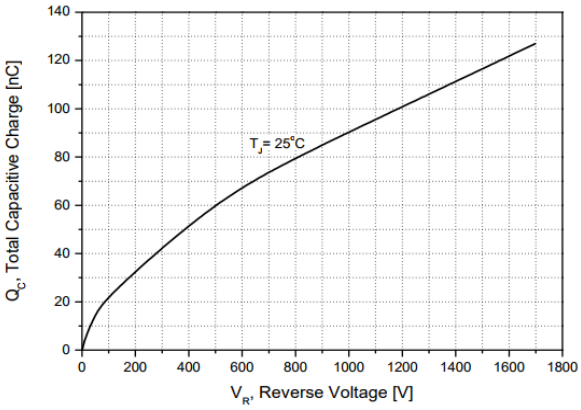


Figure 7. Total Capacitive Charge

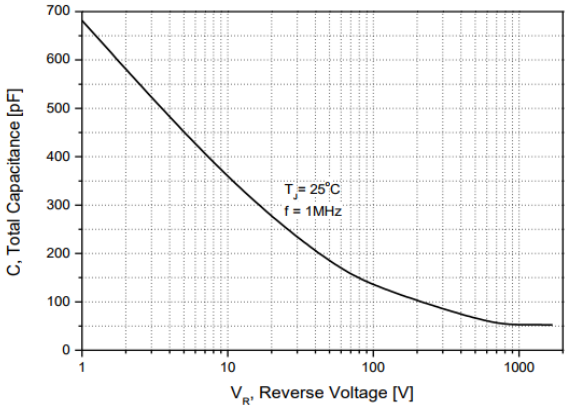


Figure 8. Total Capacitance

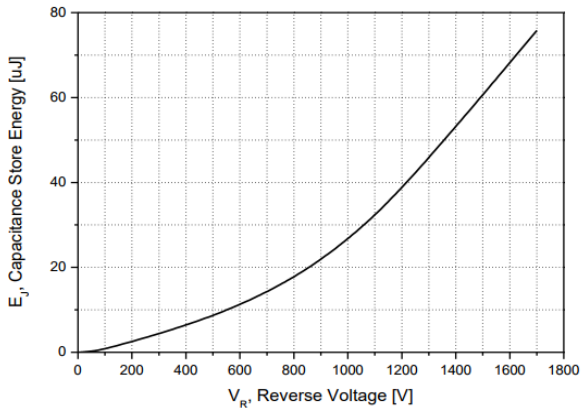


Figure 9. Capacitance Store Energy

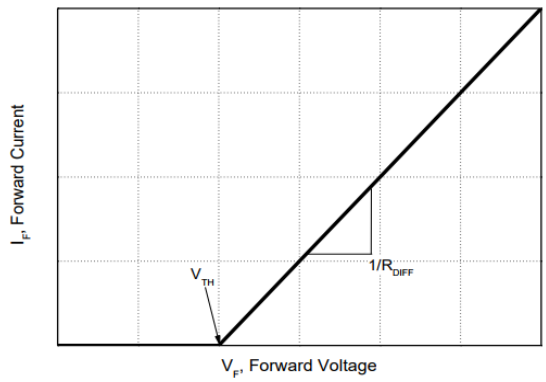


Figure 10. Equivalent Forward Current Curve

$$V_F = V_{TH} + R_{DIFF} \times I_F$$

Threshold Voltage(V_{TH})

$V_{TH}(T_j) = -0.001 \times (T_j) + 0.950$ [V]

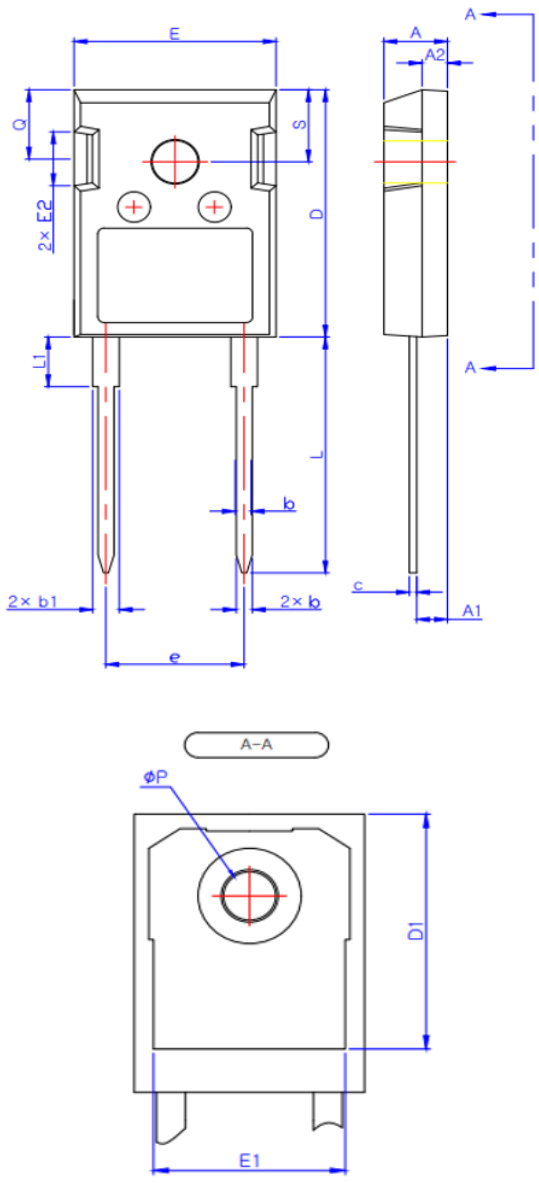
Differential Resistance (R_{DIFF})

$R_{DIFF}(T_j) = A \times T_j^2 + B \times T_j + C$ [Ω]

$A = 1.70 \times 10^{-6}$
$B = 2.19 \times 10^{-4}$
$C = 4.75 \times 10^{-2}$

[T_j [°C]; -55 °C ≤ T_j ≤ 175 °C; IF ≤ 10 A]

Package Information



SYMBOL	DIMENSIONS			NOTES
	MIN	NOM	MAX	
A	4.70	5.00	5.20	
A1	2.30	-	2.50	
A2	1.90	2.00	2.10	
b	1.10	1.20	1.30	
b2	-	2.00	-	
C	0.5	0.6	0.7	
D	20.8	20.95	21.1	
D1	-	16.55	-	
D2	0.95	1.17	1.35	
E	15.48	15.88	16.28	
E1	13.06	13.26	13.56	
E2	4.90	5.00	5.10	
E3	1.50	1.60	1.70	
e	5.34	5.44	5.54	
L	19.80	20.00	20.32	
L1	-	4.17	4.50	
ØP	3.50	3.60	3.70	
ØP1	7.00	7.19	7.40	
S	6.04	6.15	6.3	