



PCD30120A

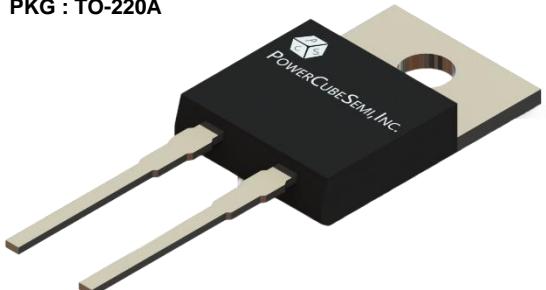
1200V Silicon Carbide Diode

Features

- 1200-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

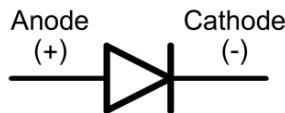
Package Outline

PKG : TO-220A



Applications

- Switch Mode Power Supplies
- Power Factor Correction
- Motor Drives
- Uninterruptible Power Supply
- Solar Inverter
- EV Charger



Absolute Maximum Ratings

$T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Value	Units
V_{RRM}	Repetitive Peak Reverse Voltage	1200	V
V_{RSM}	Surge Peak Reverse Voltage	1200	V
V_{DC}	DC Blocking Voltage	1200	V
I_F	Continuous Forward Current $T_C = 25^\circ\text{C}$ $T_C = 150^\circ\text{C}$	91 30	A
I_{FRM}	Repetitive Peak Forward Current $T_C = 110^\circ\text{C}$	213	A
I_{FSM}	Non-Repetitive Forward Surge Current (PW=10ms sinusoidal) $T_C = 25^\circ\text{C}$ $T_C = 110^\circ\text{C}$	240 192	A
P_D	Power Dissipation $T_C = 25^\circ\text{C}$	428	W
T_J, T_{stg}	Operating Junction and Storage Temperature	-55 to +175	°C

Electrical Characteristics

T_C = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
V _F	Forward Voltage	I _F = 30A, T _C = 25°C I _F = 30A, T _C = 175°C	--	1.45 2.0	1.75 2.4	V
I _R	Reverse Current	V _R = 1200V T _C = 25°C V _R = 1200V T _C = 175°C	--	10 50	200 -	uA
Q _C	Total Capacitive Charge	V _R = 800V	--	178	--	nC
C	Total Capacitance	V _R = 1V, T _J = 25°C, f = 1MHz V _R = 800V, T _J = 25°C, f = 1MHz	--	1757 122	--	pF

Thermal Characteristics

T_C = 25°C unless otherwise noted

Symbol	Parameter	Min	Typ	Max	Units
R _{θJC}	Thermal Resistance, Junction-to-Case	--	0.35	0.42	°C/W

Typical Characteristics

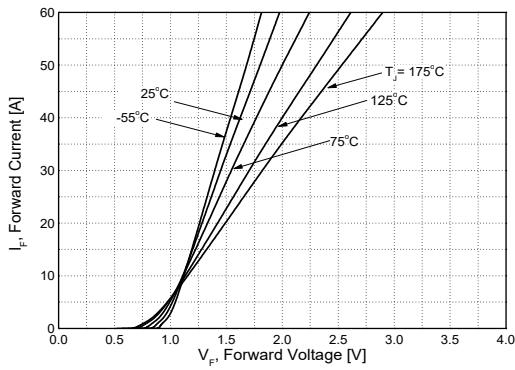


Figure 1. Forward Characteristics

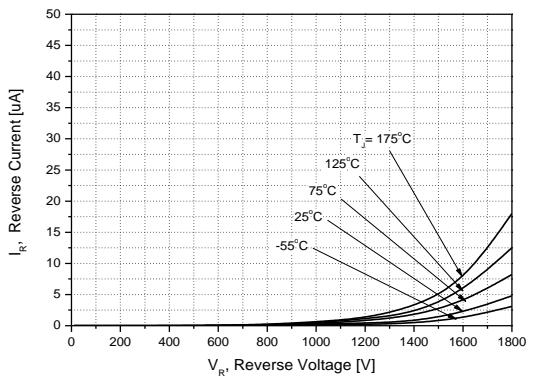


Figure 2. Reverse Characteristics

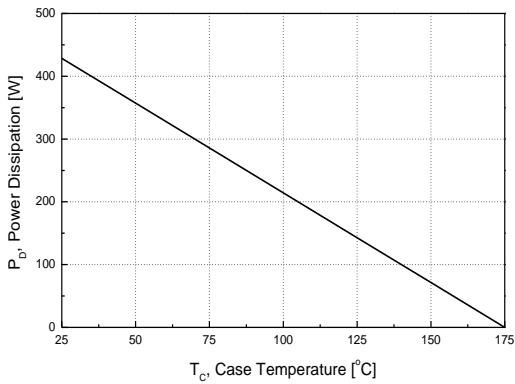


Figure 3. Power Dissipation

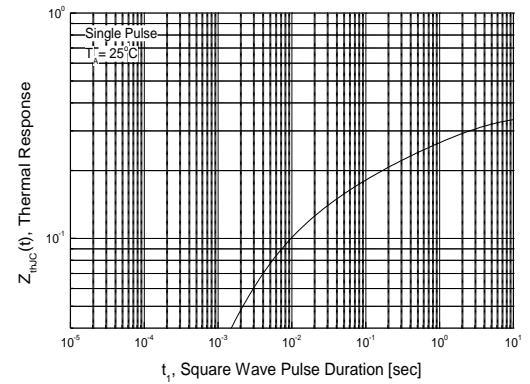


Figure 4. Transient Thermal Resistance

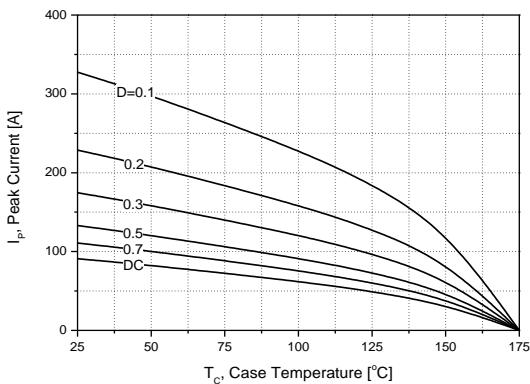


Figure 5. Peak Forward Current Derating

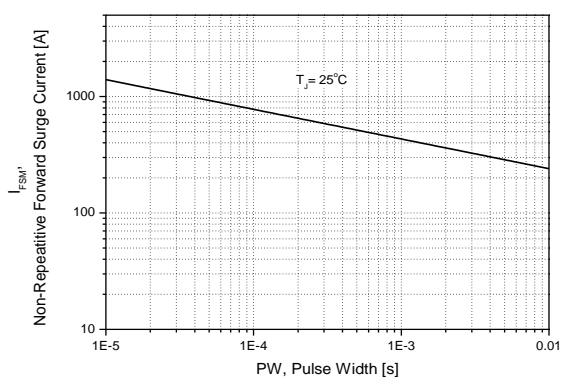


Figure 6. Non-Repetitive Peak Forward Surge Current vs. Pulse Duration

Typical Characteristics

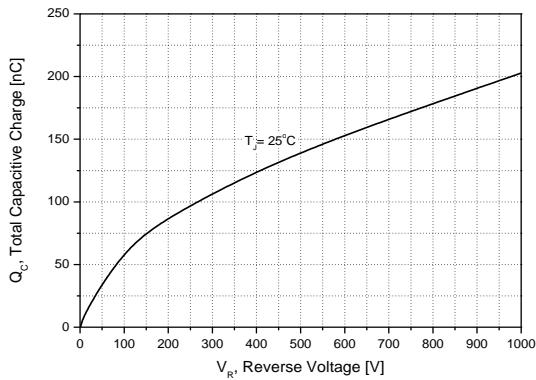


Figure 7. Total Capacitive Charge

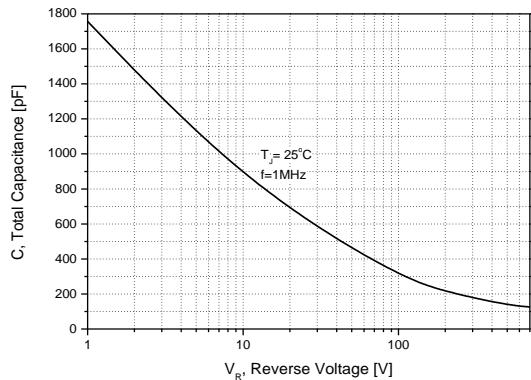


Figure 8. Total Capacitance

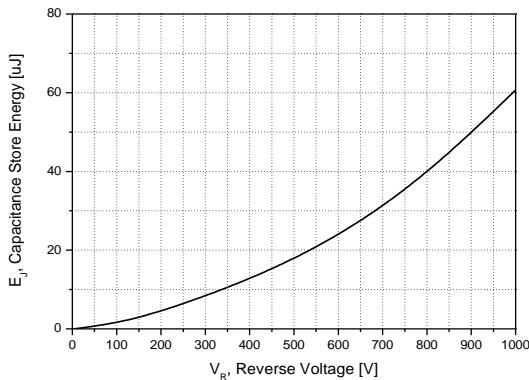


Figure 9. Capacitance Store Energy

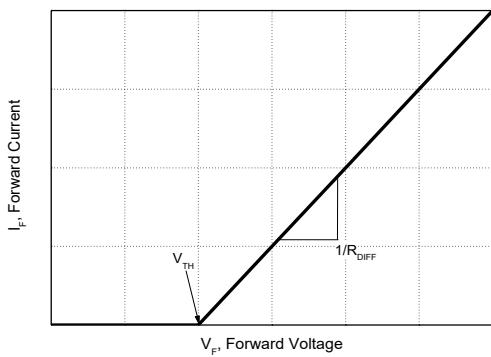


Figure 10. Equivalent Forward Current Curve

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

Threshold Voltage(V_{TH})

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

Differential Resistance (R_{DIFF})

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

$$A = 4.43 \times 10^{-7}$$

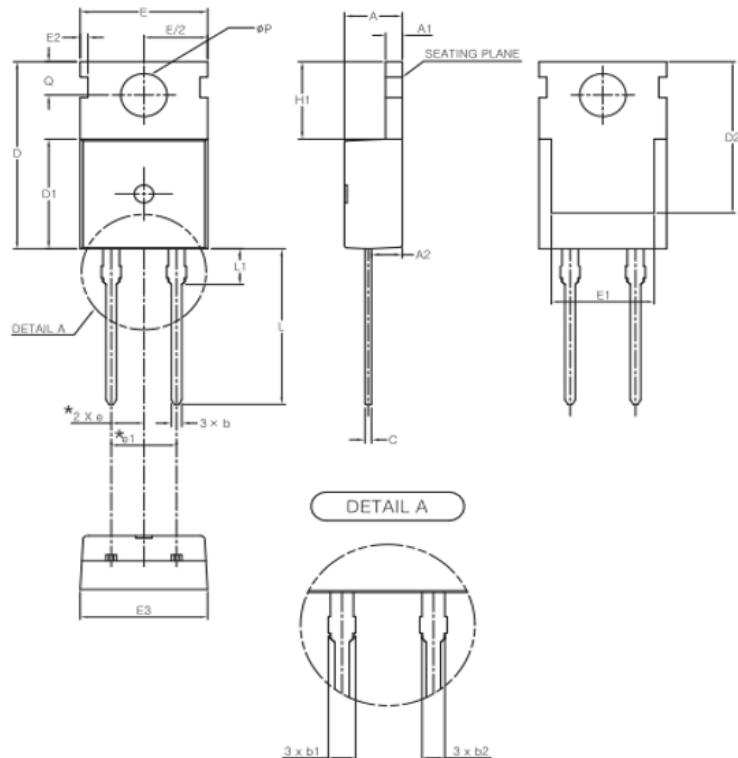
$$B = 6.14 \times 10^{-5}$$

$$C = 1.72 \times 10^{-2}$$

$[T_j \text{ [} ^\circ \text{C}]$; $-55 \text{ } ^\circ \text{C} \leq T_j \leq 175 \text{ } ^\circ \text{C}; I_F \leq 30 \text{ A}]$

Package Information

TO-220-2L



SYMBOL	MIN	NOM	MAX
A	4.30	4.50	4.70
A1	1.25	1.30	1.40
A2	2.20	2.40	2.60
b	0.70	0.80	0.90
b1	1.42	1.52	1.62
b2	1.17	1.27	1.37
c	0.45	0.50	0.60
D	15.50	15.70	15.90
D1	9.00	9.20	9.40
D2	(12.70)		
E	9.70	9.90	10.10
E1	(8.00)		
E2	(0.60)		
E3	9.70	9.90	10.10
e	2.54 BSC		
e1	5.08 BSC		
H1	6.30	6.50	6.70
L	12.88	13.08	13.28
L1	(3.00)		
ϕP	3.50	3.60	3.70
Q	2.70	2.80	2.90

NOTE

1. THESE DIMENSIONS DO NOT INCLUDE PROTRUSIONS OF THE MOLD.
2. THE "L" MARK IS THE REFERENCE
3. IT HAVE TO APPLY THE "TO-220-2L MOLD DIE"