PowerCubeSemi, Inc.
Potential · Convergence · Smart

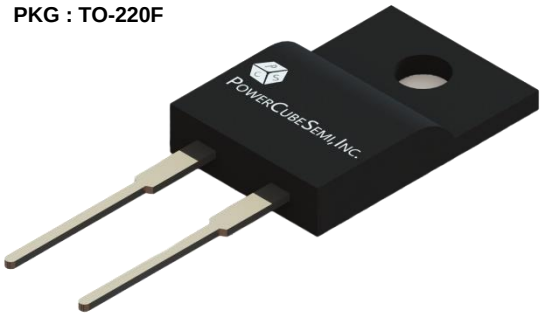
PCD15120H
1200V Silicon Carbide Diode

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 V_F
- RoHS Compliant
- AEC-Q101 Ready

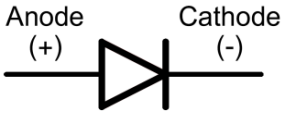
Package Outline

PKG : TO-220F



Applications

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



RoHS

Halogen-Free

Absolute Maximum Ratings

T_C = 25°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˚C T_C = 70˚C	18 15	A
I_{FRM}	Repetitive Peak Forward Current	T_C = 110˚C	38	A
I_{FSM}	Non-Repetitive Forward Surge Current (PW=10ms sinusoidal)	T_C = 25˚C T_C = 110˚C	108 86	A
P_D	Power Dissipation	T_C = 25˚C	150	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 = 15A, T_C = 25°C I_F = 15A, T_C = 175°C	-	1.4 1.9	1.7 2.3	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	-	88	-	nC
C	Total Capacitance	V_R = 1V, f = 1MHz V_R = 800V, f = 1MHz	-	844 70	-	pF

Thermal Characteristics

T_C = 25°C unless otherwise noted

Symbol	Parameter	Min	Typ	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	-	3.0	3.6	℃/W

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
PCD15120H	PCD15120	TO-220F_2L	-	-	50

* PCD15120H : RoHS Compliant

Typical Characteristics

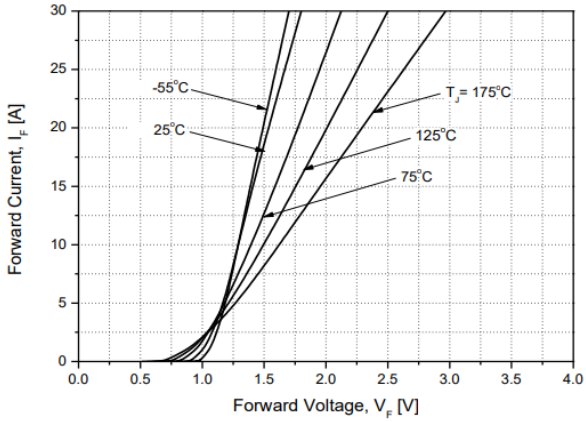


Figure 1. Forward Characteristics

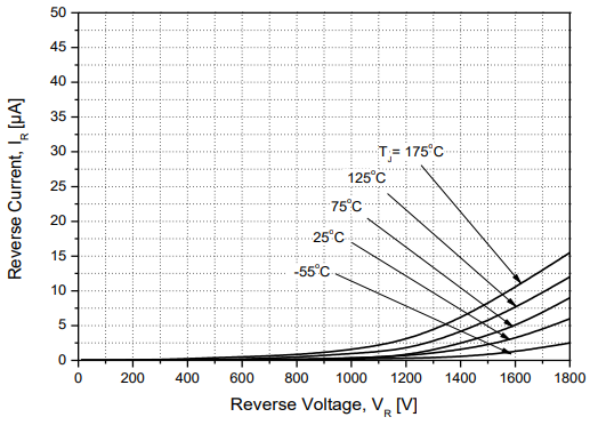


Figure 2. Reverse Characteristics

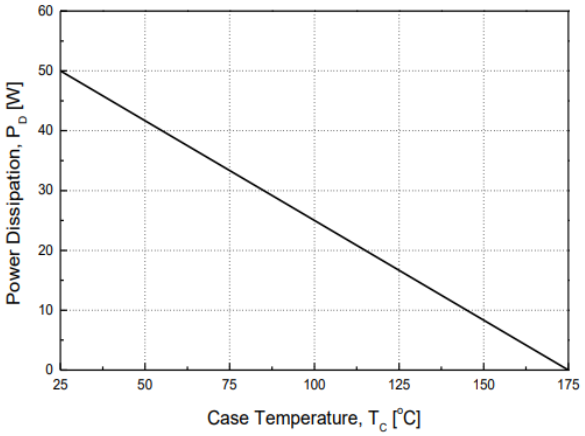


Figure 3. Power Dissipation

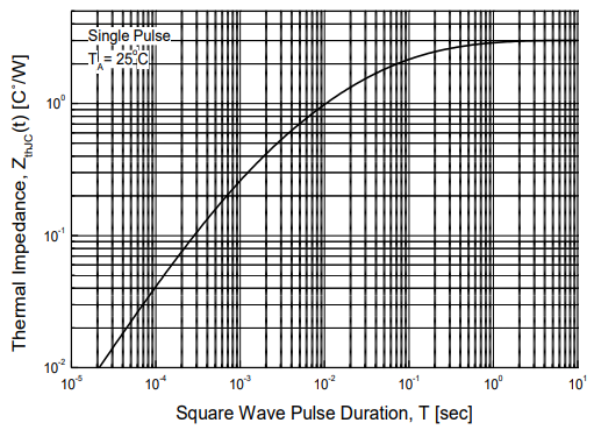


Figure 4. Transient Thermal Resistance

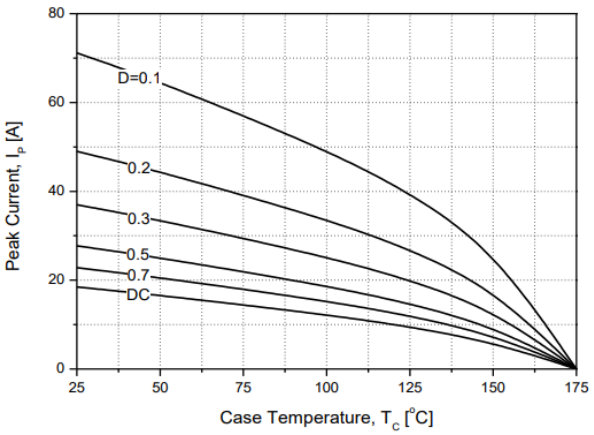


Figure 5. Peak Forward Current Derating

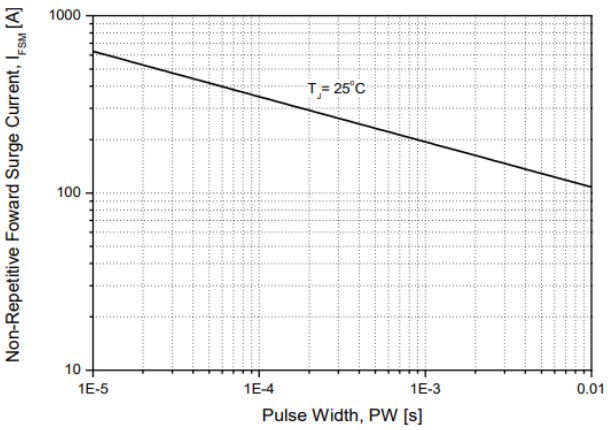


Figure 6. Non-Repetitive Peak Forward Surge Current vs. Pulse Duration

Typical Characteristics

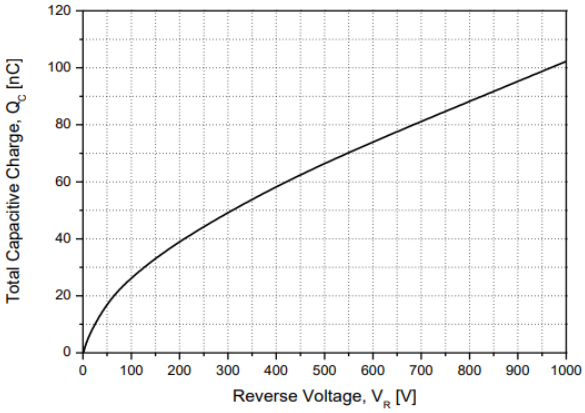


Figure 7. Total Capacitive Charge

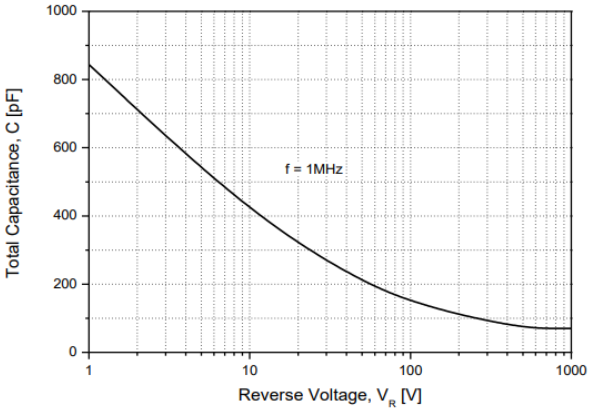


Figure 8. Total Capacitance

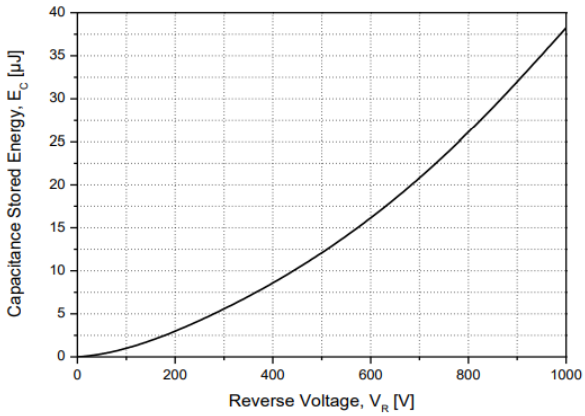


Figure 9. Capacitance Store Energy

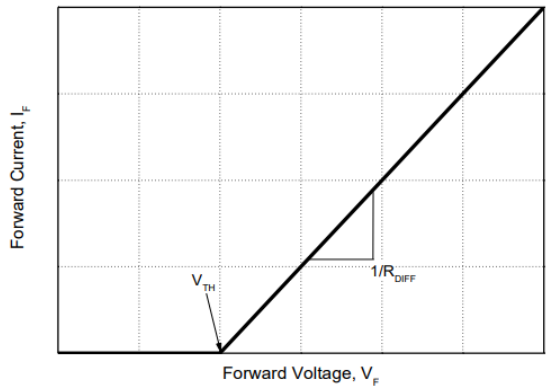


Figure 10. Equivalent Forward Current Curve

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

Threshold Voltage(V_{TH})

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

Differential Resistance (R_{DIFF})

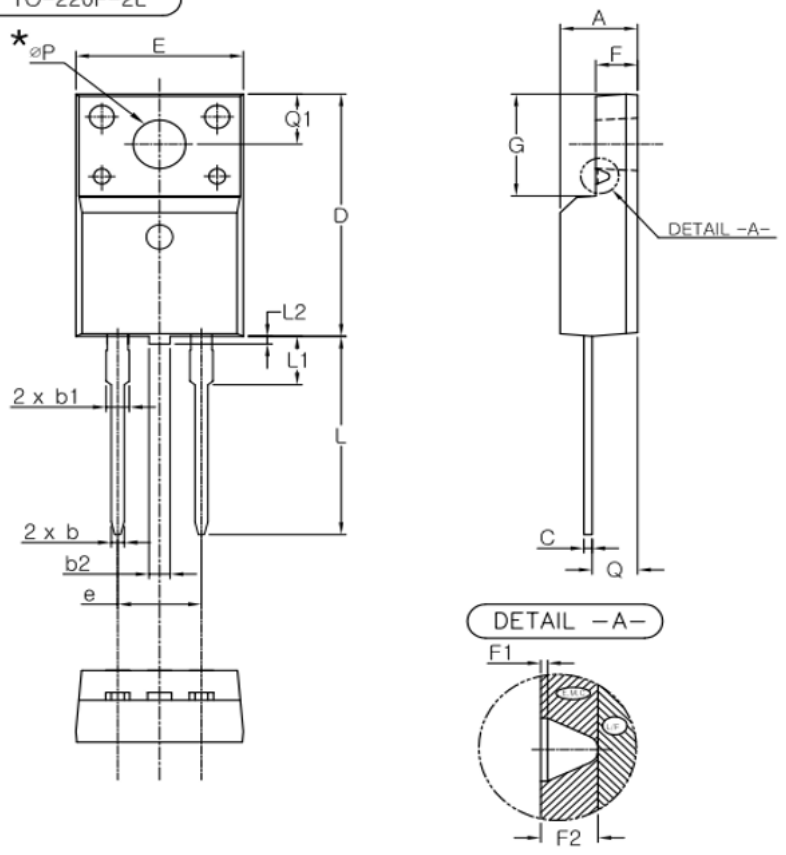
$R_{DIFF}(T_j) = A \times T_j^2 + B \times T_j + C$ [Ω]

$A = 9.54 \times 10^{-7}$
$B = 2.12 \times 10^{-4}$
$C = 3.04 \times 10^{-2}$

[T_j [°C]; -55 °C ≤ T_j ≤ 175 °C; IF ≤ 15 A]

Package Information

TO-220F-2L



SYMBOL	MIN	NOM	MAX
A	4.50	4.70	4.90
b	0.70	0.80	0.90
b1	1.33	1.40	1.47
b2	0.98	1.28	1.58
C	0.45	0.50	0.60
D	15.67	15.87	16.07
E	9.96	10.16	10.36
e		5.08 BSC	
F	2.34	2.54	2.74
F1		(0.10)	
F2		(0.84)	
G	6.48	6.68	6.88
L	12.78	12.98	13.18
L1	2.98	3.18	3.38
L2	–	–	0.80
Q	2.56	2.76	2.96
Q1	3.10	3.30	3.50
* øP	3.08	3.18	3.28

NOTE

1. THESE DIMENSIONS DO NOT INCLUDE PROTRUSIONS OF THE MOLD.
2. THE "( )" MARK IS THE REFERENCE
3. THE "L2" SYMBOL IS A PROTRUSION OF THE MOLD.