PowerCubeSemi, Inc.
Potential · Convergence · Smart

PCD06065C
650V Silicon Carbide Diode

Features

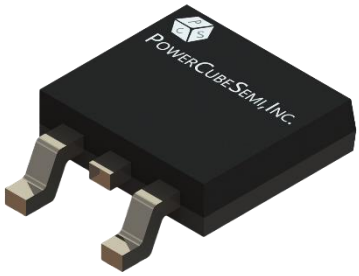
- 650-Volt Schottky Rectifier
- Shorter recovery time
- High-speed switching possible
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Switching
- Positive Temperature Coefficient on V_F
- RoHS Compliant
- AEC-Q101 Qualified

Applications

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

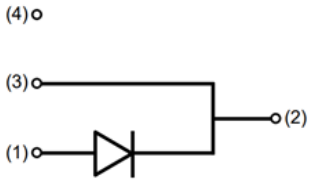
Package Outline

PKG : TO-252



RoHS

Halogen-Free



1. Anode
2. Case
3. Cathode
4. No Connection

Absolute Maximum Ratings

T_C = 25°C unless otherwise noted

Symbol	Parameter		Value	Units
V_{RRM}	Repetitive Peak Reverse Voltage		650	V
V_{RSM}	Surge Peak Reverse Voltage		650	V
V_{DC}	DC Blocking Voltage		650	V
I_F	Continuous Forward Current	T_C = 25˚C T_C = 150˚C	18 6	A
I_{FRM}	Repetitive Peak Forward Current	T_C = 110˚C	15	A
I_{FSM}	Non-Repetitive Forward Surge Current (PW=10ms sinusoidal)	T_C = 25˚C T_C = 110˚C	43 35	A
P_D	Power Dissipation	T_C = 25˚C	79	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 = 6A, T_C = 25°C I_F = 6A, T_C = 175°C	- -	1.45 1.95	1.75 2.35	V
I_R	Reverse Current	V_R = 650V T_C = 25°C V_R = 650V T_C = 175°C	- -	5 25	100 -	uA
Q_C	Total Capacitive Charge	V_R = 400V	-	23	-	nC
C	Total Capacitance	V_R = 1V, f = 1MHz V_R = 520V, f = 1MHz	- -	269 41	- -	pF

Thermal Characteristics

T_C = 25°C unless otherwise noted

Symbol	Parameter	Min	Typ	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	-	1.9	2.3	℃/W

Typical Characteristics

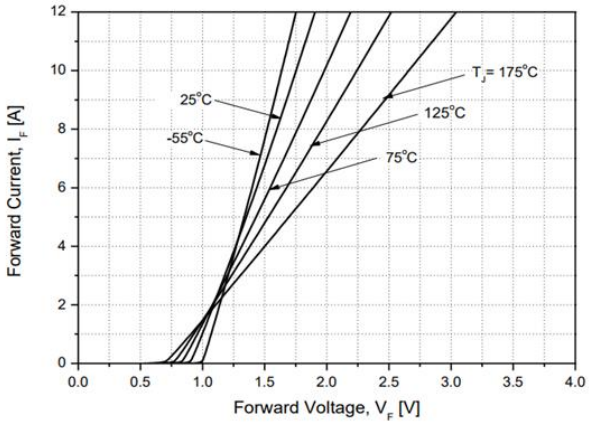


Figure 1. Forward Characteristics

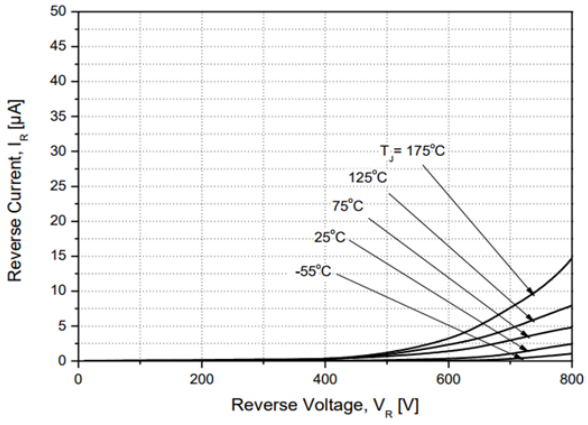


Figure 2. Reverse Characteristics

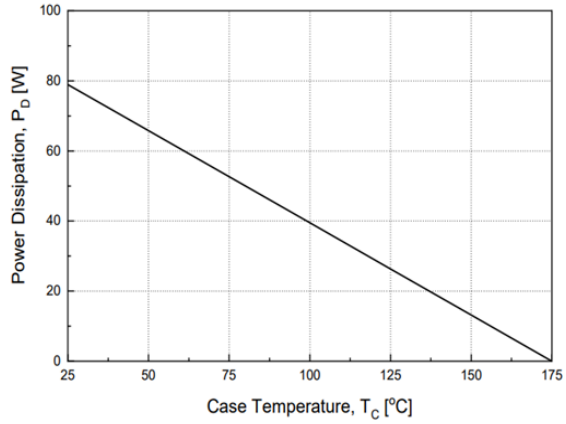


Figure 3. Power Dissipation

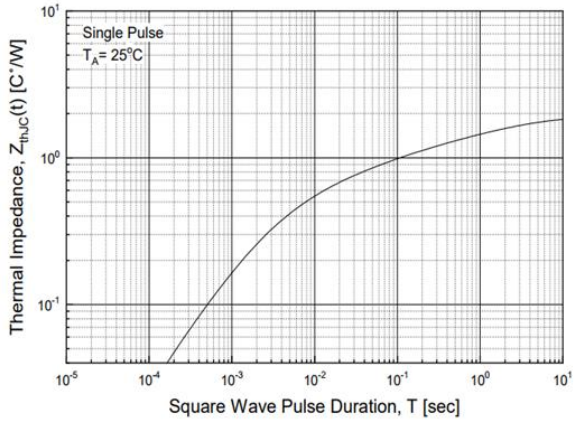


Figure 4. Transient Thermal Resistance

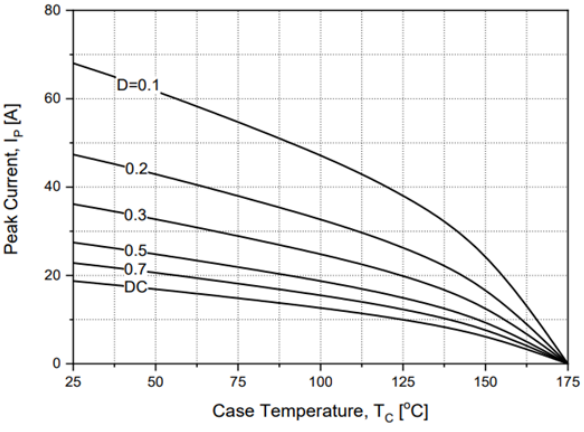


Figure 5. Peak Forward Current Derating

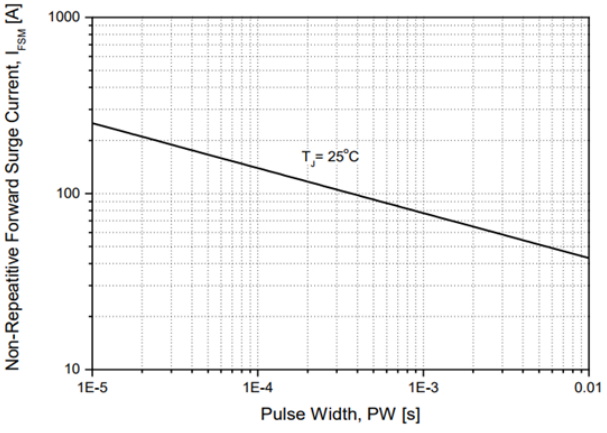


Figure 6. Non-Repetitive Peak Forward Surge Current vs. Pulse Duration

Typical Characteristics

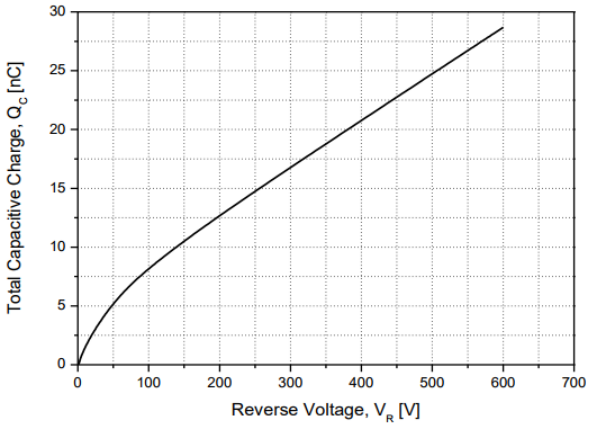


Figure 7. Total Capacitive Charge

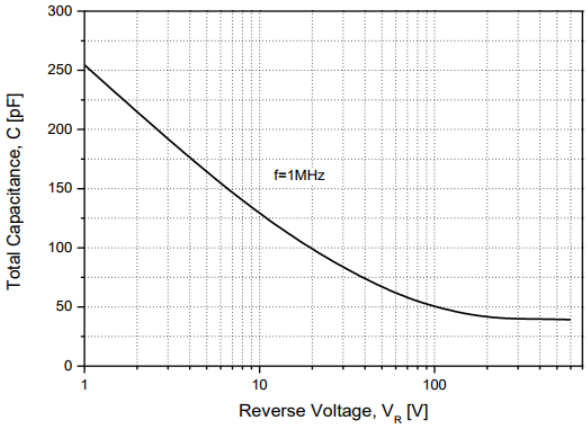


Figure 8. Total Capacitance

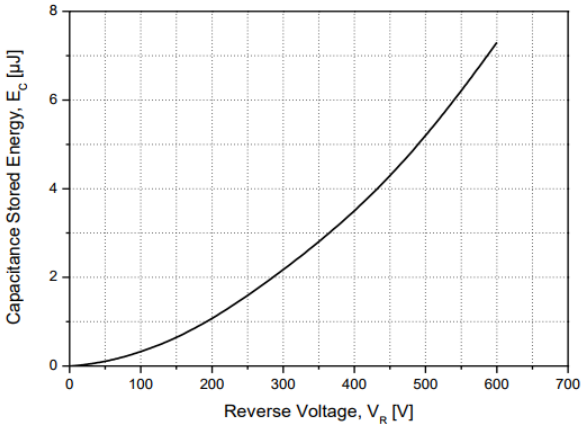


Figure 9. Capacitance Stored Energy

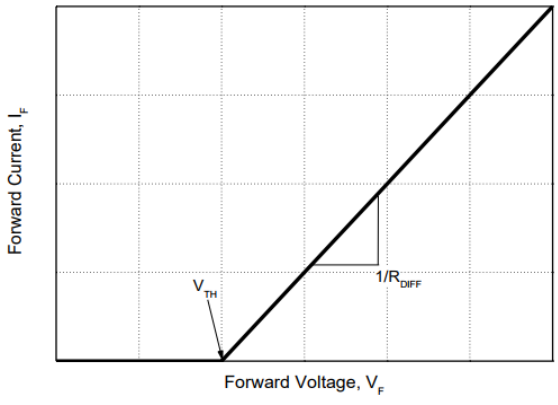


Figure 10. Equivalent Forward Current Curve

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

Threshold Voltage(V_{TH})

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

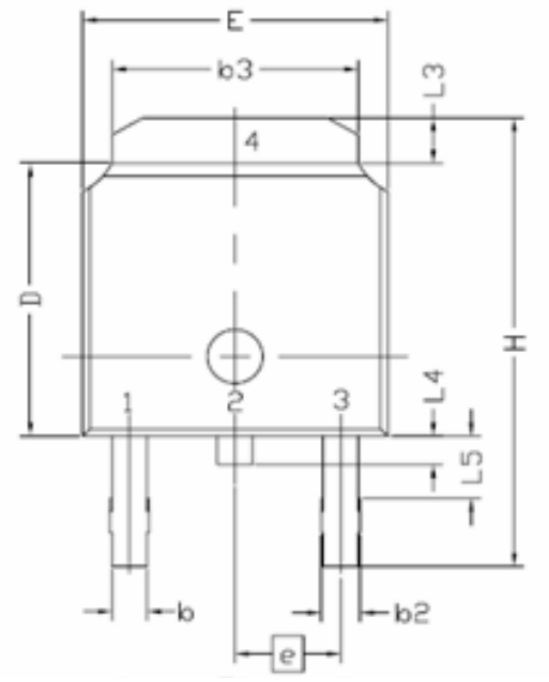
Differential Resistance (R_{DIFF})

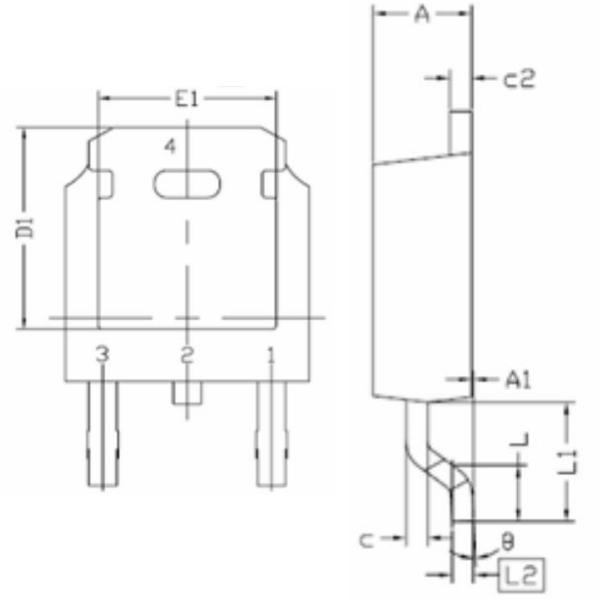
$R_{DIFF}(T_j) = A \times T_j^2 + B \times T_j + C$ [Ω]

$A = 1.56 \times 10^{-6}$
$B = 3.18 \times 10^{-4}$
$C = 7.26 \times 10^{-2}$

[T_j [°C]; -55 °C ≤ T_j ≤ 175 °C; IF ≤ 6 A]

Package Information





Unit : mm

SYMBOL	DIMENSIONS			NOTES
	MIN	NOM	MAX	
E	6.34	6.54	6.74	
L	1.30	1.60	1.90	
L1	2.60	2.90	3.20	
L2		0.5 BSC		
L3	0.82	1.02	1.22	
L4	0.80	1.00	1.20	
L5	2.60	2.90	3.20	
D	5.80	6.10	6.40	
H	8.40	9.00	9.60	
b	1.42	1.52	1.62	
b2	2.35	2.55	2.75	
b3	5.20	5.30	5.40	
e		4.58 BSC		
A	2.08	2.28	2.48	
A1	0.00	0.15	-	
c	0.40	0.50	0.60	
c2	0.40	0.50	0.60	
D1	-	5.25	-	
E1	-	4.8	-	
θ	0.00°	10.00°		