PowerCubeSemi, Inc.
Potential · Convergence · Smart

PCD50065P
650V Silicon Carbide Schottky Diode

Features

- Positive temperature coefficient
- Temperature-independent switching
- Maximum working temperature at 175℃
- Unipolar devices and zero reverse recovery current
- Zero forward recovery voltage
- Essentially no switching losses
- Reduction of heat sink requirements
- High-frequency operation
- Reduction of EMI

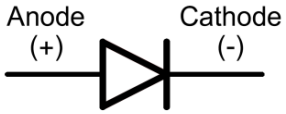
Applications

- Power Factor Correction (PFC)
- Solar/Photovoltaic inverter
- Uninterruptible power supply
- Motor drives
- Electric car and charger

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		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 = 135˚C T_C = 143˚C	119 56 50	A
I_{FSM}	Non-Repetitive Forward Surge Current @ T_C=25℃, tp=10ms, Half Sine Wave		380	A
P_D	Power Dissipation	T_C = 25˚C T_C = 110˚C	454 196	W
$\int i^2dt$	i^2t Value @ T_C=25℃, tp=10ms		722	A^2S
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 = 50A, T_C = 25°C I_F = 50A, T_C = 175°C	- -	1.45 1.9	1.6 -	V
I_R	Reverse Current	V_R = 650V T_C = 25°C V_R = 650V T_C = 175°C	- -	3 20	25 -	μA
Q_C	Total Capacitive Charge	V_R = 400V	-	135.3	-	nC
C	Total Capacitance	V_R = 0V, f = 1MHz V_R = 200V, f = 1MHz V_R = 400V, f = 1MHz	- - -	2453 247 243	- - -	pF
E_C	Capacitance Stored Energy	V_R=400V	-	16.5	-	μJ

Thermal Characteristics

T_C = 25°C unless otherwise noted

Symbol	Parameter	Min	Typ	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	-	0.33	-	℃/W

Typical Characteristics

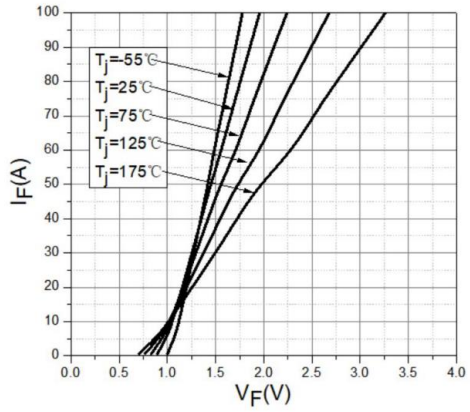


Figure 1. Forward Characteristics

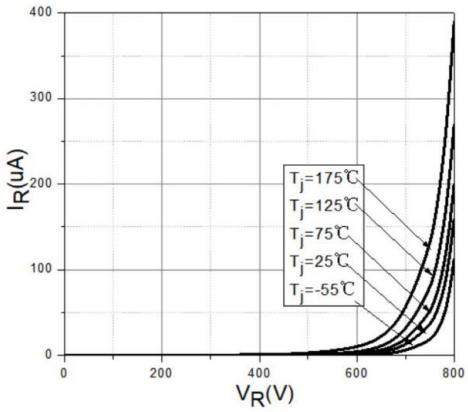


Figure 2. Reverse Characteristics

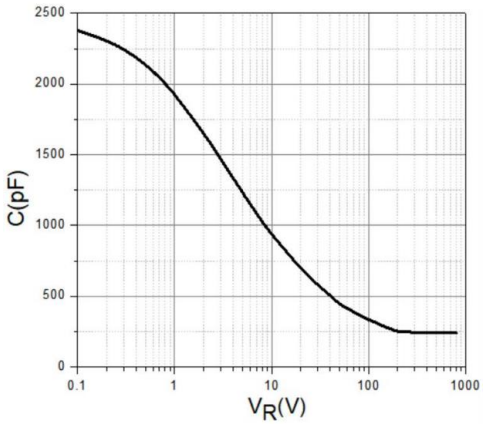


Figure 3. Capacitance vs. Reverse Voltage

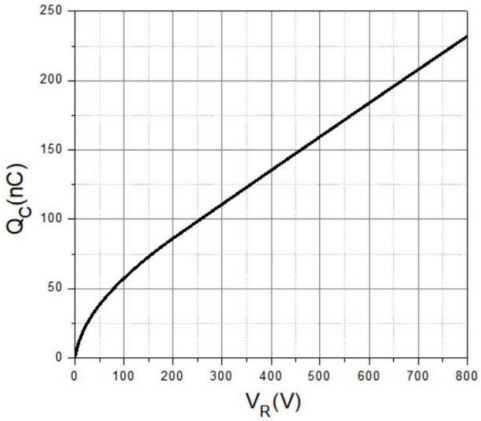


Figure 4. Total Capacitance Charge vs. Reverse Voltage

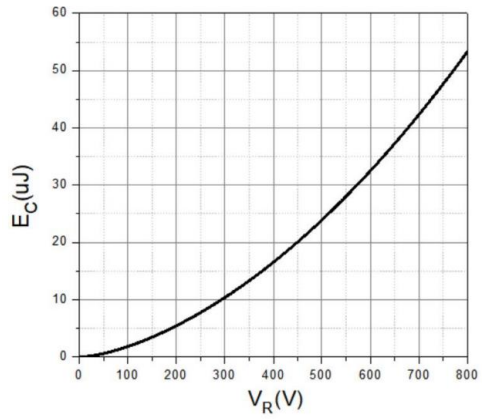


Figure 5. Capacitance Stored Energy

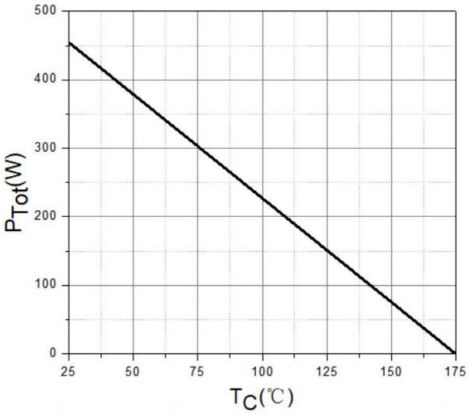


Figure 6. Power Derating

Typical Characteristics

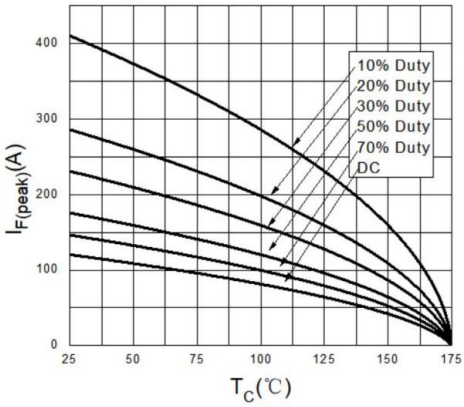


Figure 7. Current Derating

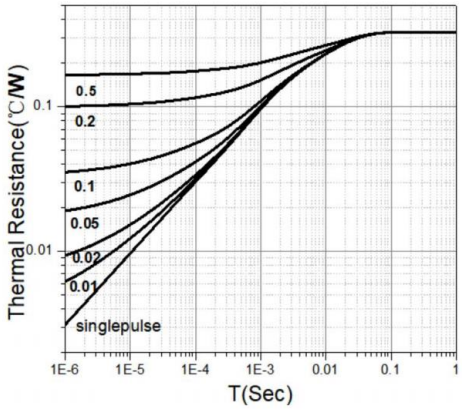
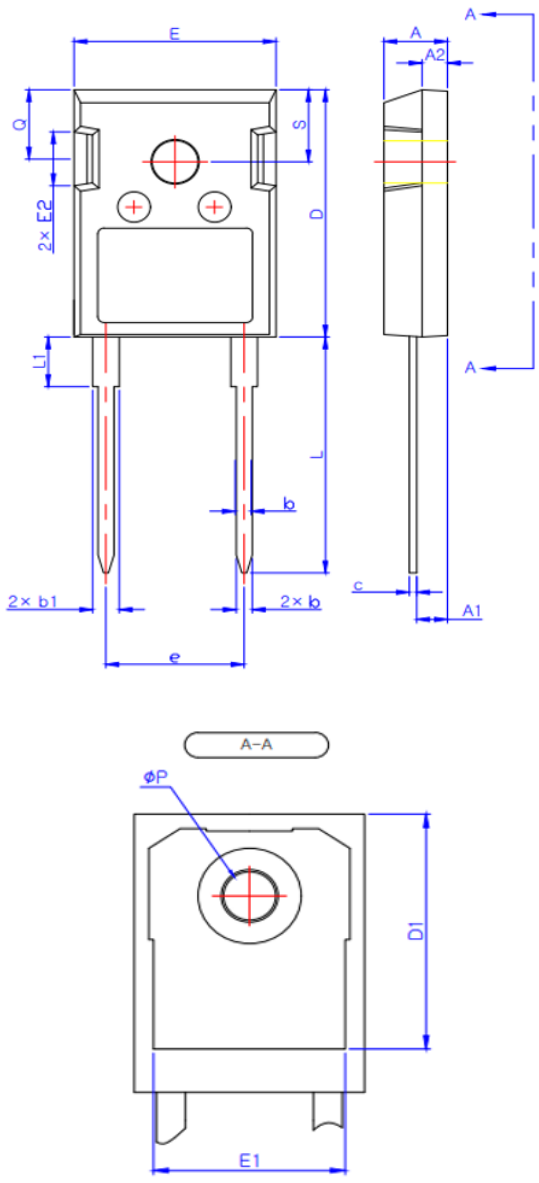


Figure 8. Transient Thermal Impedance

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	