

PD002065EP / PD002065EP_G

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 VF
- RoHS Compliant

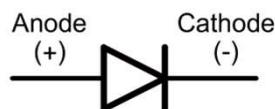
Applications

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

Package Outline



Cathode Anode



Absolute Maximum Ratings

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	$T_C = 25^\circ\text{C}$ $T_C = 150^\circ\text{C}$	7 2 A
I_{FRM}	Repetitive Peak Forward Current	$T_C = 110^\circ\text{C}$	16 A
I_{FSM}	Non-Repetitive Forward Surge Current (PW=10ms sinusoidal)	$T_C = 25^\circ\text{C}$ $T_C = 110^\circ\text{C}$	10 8 A
P_D	Power Dissipation	$T_C = 25^\circ\text{C}$	33 W
T_J, T_{stg}	Operating Junction and Storage Temperature	-55 to +175	$^\circ\text{C}$

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

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
V_F	Forward Voltage	$I_F = 2\text{A}, T_C = 25^{\circ}\text{C}$ $I_F = 2\text{A}, T_C = 175^{\circ}\text{C}$	--	1.5 2.0	1.8 2.4	V
I_R	Reverse Current	$V_R = 650\text{V}, T_C = 25^{\circ}\text{C}$ $V_R = 650\text{V}, T_C = 175^{\circ}\text{C}$	--	12 24	34 340	μA
Q_C	Total Capacitive Charge	$V_R = 400\text{V}$	--	6.5	--	nC
C	Total Capacitance	$V_R = 1\text{V}, T_J = 25^{\circ}\text{C}, f = 1\text{MHz}$ $V_R = 520\text{V}, T_J = 25^{\circ}\text{C}, f = 1\text{MHz}$	--	86 16	--	pF

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

Symbol	Parameter	Min	Typ	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	--	4.5	5.4	$^{\circ}\text{C}/\text{W}$

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
PD002065EP	PD002065EP	TO-220	-	-	50
PD002065EP_G	PD002065EP_G	TO-220	-	-	50

* PD002065EP_G : RoHS Compliant

Typical Characteristics

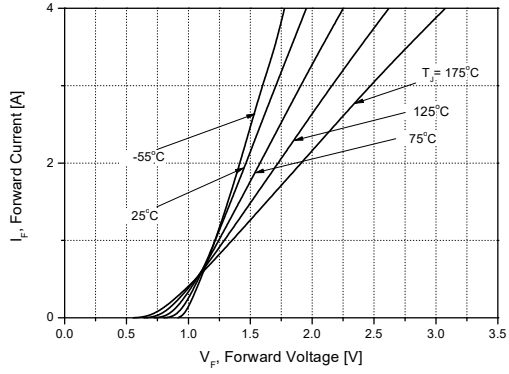


Figure 1. Forward Characteristics

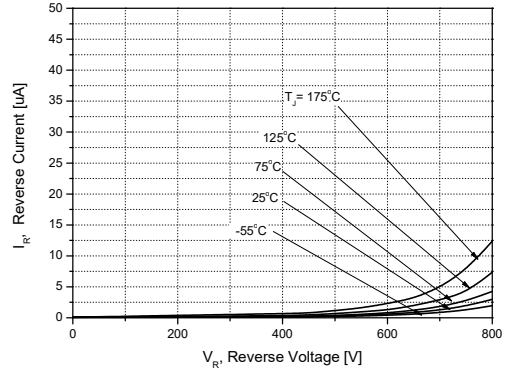


Figure 2. Reverse Characteristics

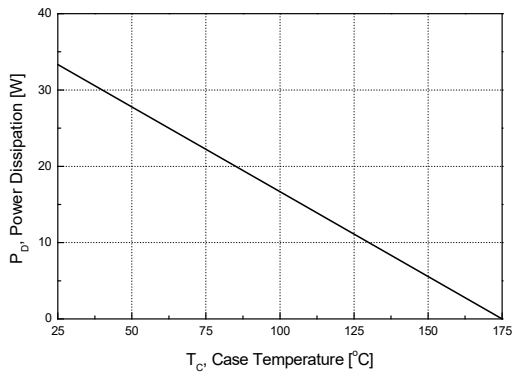


Figure 3. Power Dissipation

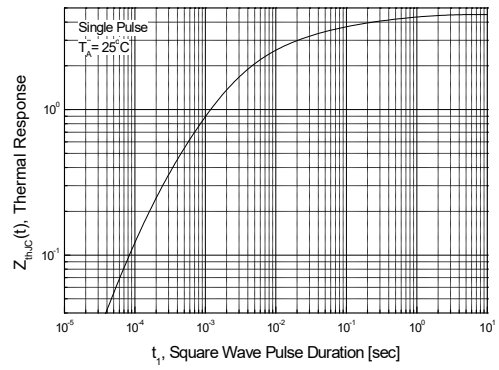


Figure 4. Transient Thermal Resistance

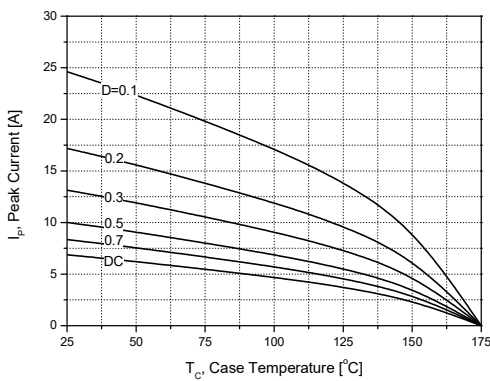


Figure 5. Peak Forward Current Derating

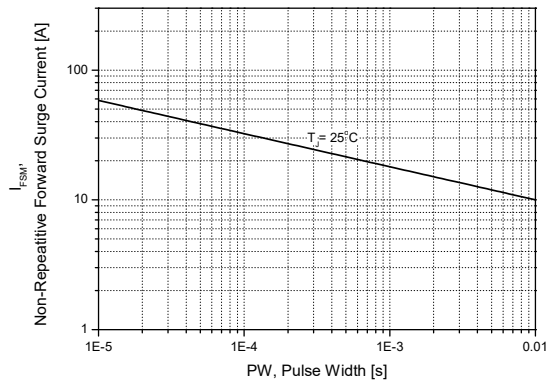


Figure 6. Non-Repetitive Peak Forward Surge Current vs. Pulse Duration

Typical Characteristics

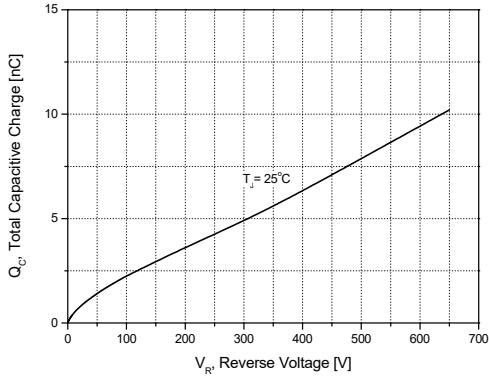


Figure 7. Total Capacitive Charge

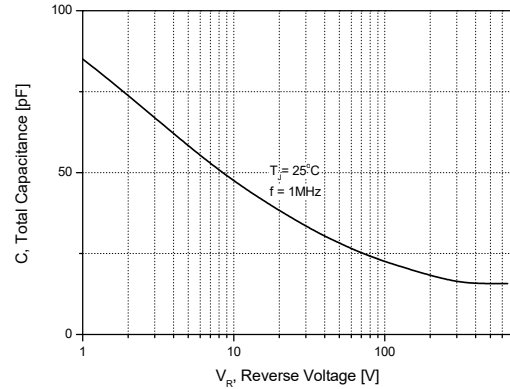


Figure 8. Total Capacitance

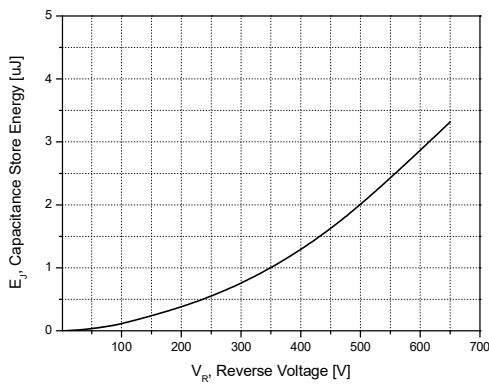


Figure 9. Capacitance Store Energy

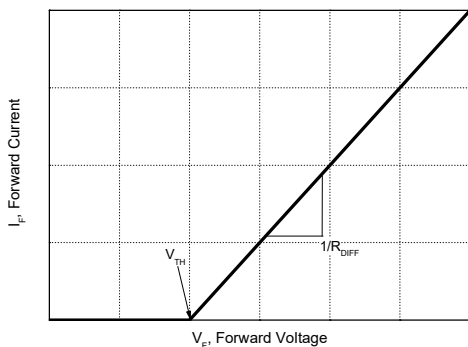


Figure 10. Equivalent Forward Current Curve

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

Threshold Voltage(V_{TH})

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

Differential Resistance (R_{DIFF})

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

$$A = 3.86 \times 10^{-6}$$

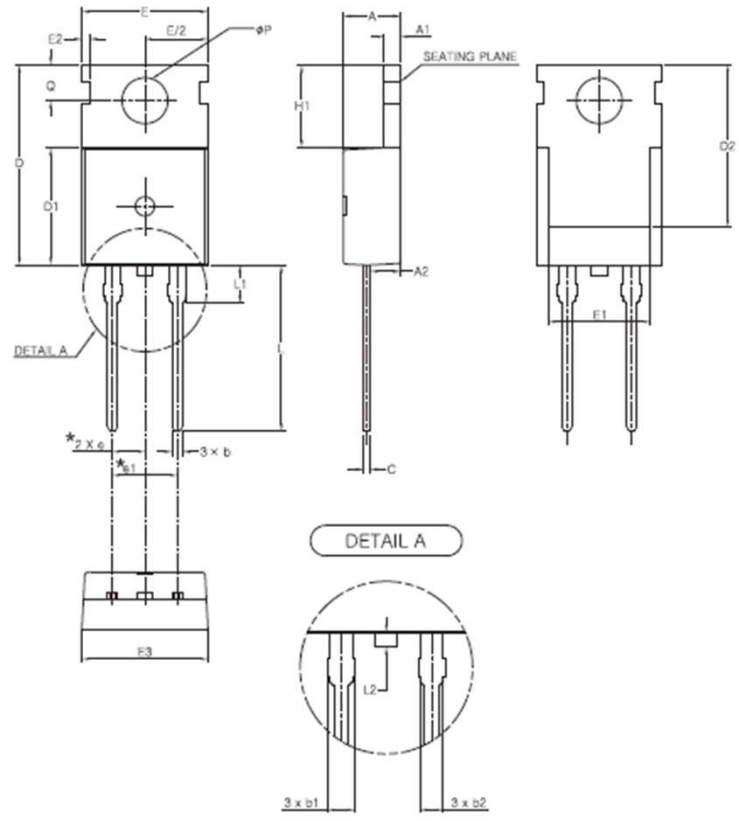
$$B = 1.38 \times 10^{-3}$$

$$C = 21.5 \times 10^{-2}$$

$$[T_j \text{ [}^\circ\text{C]}; -55 \text{ }^\circ\text{C} \leq T_j \leq 175 \text{ }^\circ\text{C}; I_F \leq 2 \text{ A}]$$

Package Information

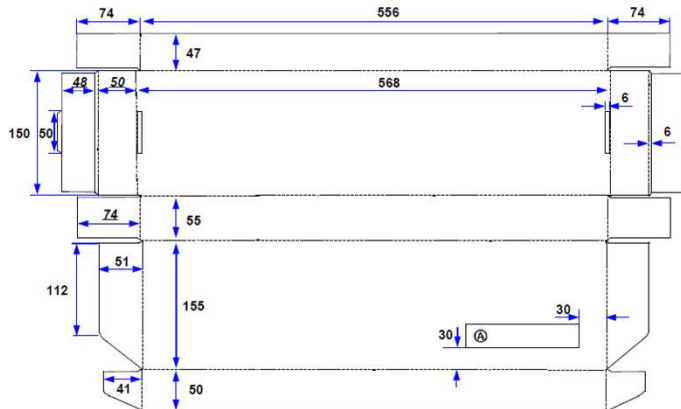
TO-220-2L



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)		
L2	-	-	0.80
phi P	3.50	3.60	3.70
Q	2.70	2.80	2.90

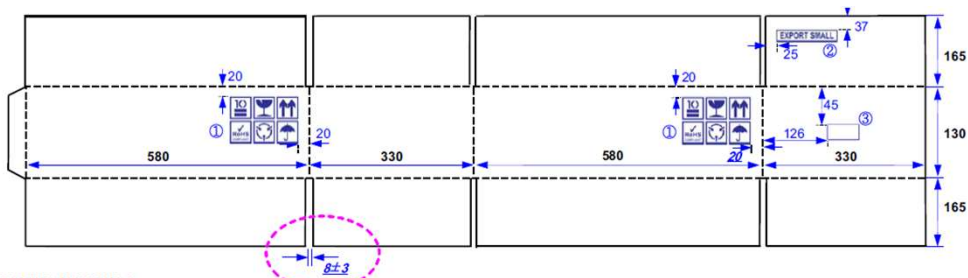
- NOTE
1. THESE DIMENSIONS DO NOT INCLUDE PROTRUSIONS OF THE MOLD
 2. THE '()' MARK IS THE REFERENCE
 3. THE 'L2' SYMBOL IS A PROTRUSION OF THE MOLD
 - * 4. IT HAVE TO APPLY 'TO-220-3L MOLD DIE'

Packing Information Inner Box



PART ID PDXXXXXXEX_G	PKG Type XX-XXXX-XX
LOT No. XXXXXXXXXXXXXX	QTY X,XXX ea
DATE : XXXX.XX.XX	

Outer Box



[BOX PRINTING MARKING]



MARKING SIZE (Each Symbol 30*30)
COLOR (DARK BLUE)

- ② **EXPORT SMALL**
MARKING SIZE (112*20)
COLOR (DARK BLUE)
- ③
LABEL MARKING SIZE (75*35)
COLOR (DARK BLUE)

- [NOTE]
1. MATERIAL : KLB175*K180*KLB175*K180*KLB175
(SUK175*K200*K200*K200*SUK175)
 2. NAIL QTY : 3 PCS
 3. PRINTING TOLERANCE : MARKING SIZE(±3)
MARKING POSITION(±5)

PART ID : PDXXXXXXEX_G	
LOT NO : XXXXXXXXXXXXX	
QTY : XX,XXXX ea	
DATE : XXXX.XX.XX	

Notes

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