

PD010120EP / PD010120EP_G

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

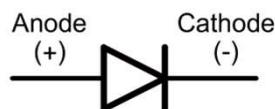
Applications

- 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	1200	V
V_{RSM}	Surge Peak Reverse Voltage	1200	V
V_{DC}	DC Blocking Voltage	1200	V
I_F	Continuous Forward Current $T_C = 25^\circ\text{C}$ $T_C = 140^\circ\text{C}$	23 10	A
I_{FRM}	Repetitive Peak Forward Current $T_C = 110^\circ\text{C}$	54	A
I_{FSM}	Non-Repetitive Forward Surge Current $T_C = 25^\circ\text{C}$ $T_C = 110^\circ\text{C}$	50 40	A
P_D	Power Dissipation $T_C = 25^\circ\text{C}$	94	W
T_J, T_{stg}	Operating Junction and Storage Temperature	-55 to +175	$^\circ\text{C}$

* Per Leg / Per Device

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

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
V_F	Forward Voltage	$I_F = 10\text{A}, T_C = 25^{\circ}\text{C}$ $I_F = 10\text{A}, T_C = 175^{\circ}\text{C}$	--	1.5 2.0	1.8 2.4	V
I_R	Reverse Current	$V_R = 1200\text{V}, T_C = 25^{\circ}\text{C}$ $V_R = 1200\text{V}, T_C = 175^{\circ}\text{C}$	--	20 40	50 500	μA
Q_C	Total Capacitive Charge	$V_R = 800\text{V}$	--	36	--	nC
C	Total Capacitance	$V_R = 1\text{V}, T_J = 25^{\circ}\text{C}, f = 1\text{MHz}$ $V_R = 800\text{V}, T_J = 25^{\circ}\text{C}, f = 1\text{MHz}$	--	650 45	--	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	--	1.6	1.9	$^{\circ}\text{C}/\text{W}$

* Per Leg / Per Device

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
PD010120EP	PD010120EP	TO-220	-	-	50
PD010120EP_G	PD010120EP_G	TO-220	-	-	50

* PD010120EP_G : RoHS Compliant

Typical Characteristics

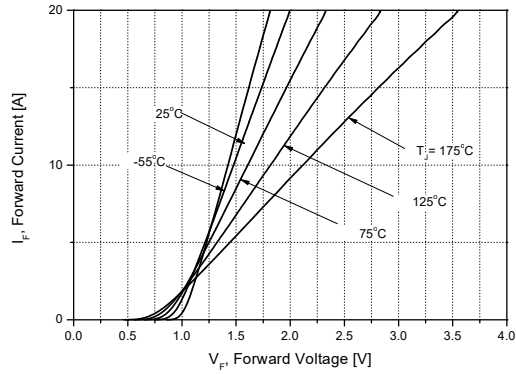


Figure 1. Forward Characteristics

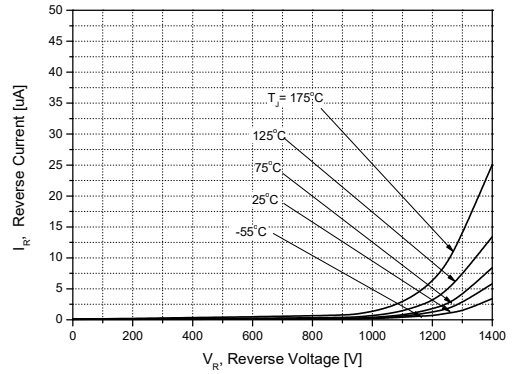


Figure 2. Reverse Characteristics

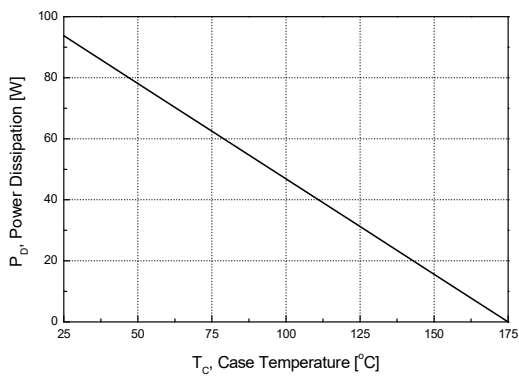


Figure 3. Power Dissipation

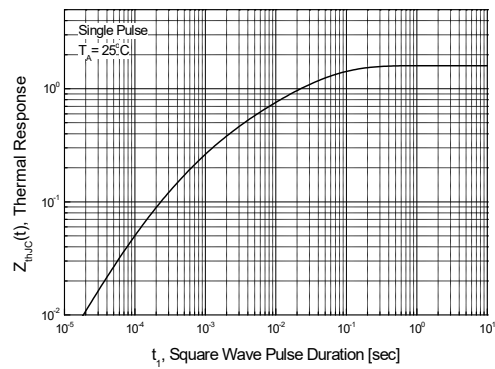


Figure 4. Transient Thermal Resistance

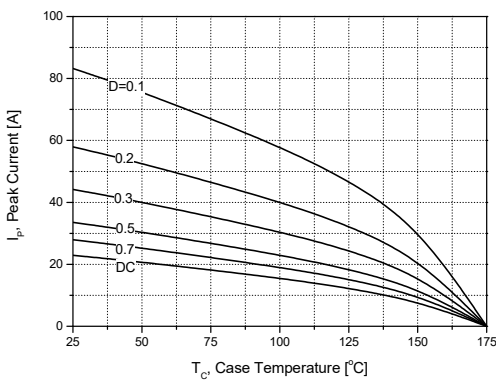


Figure 5. Peak Forward Current Derating

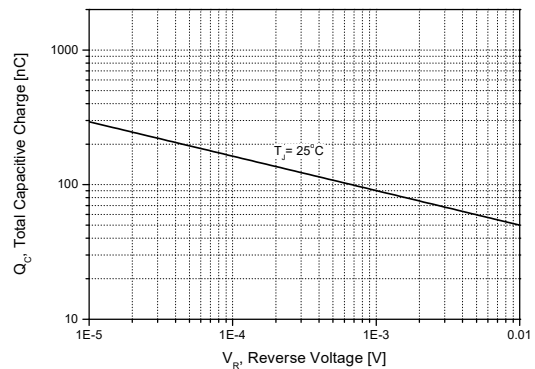


Figure 6. Non-Repetitive Peak Forward Surge Current vs. Pulse Duration

Typical Characteristics (Per Leg)

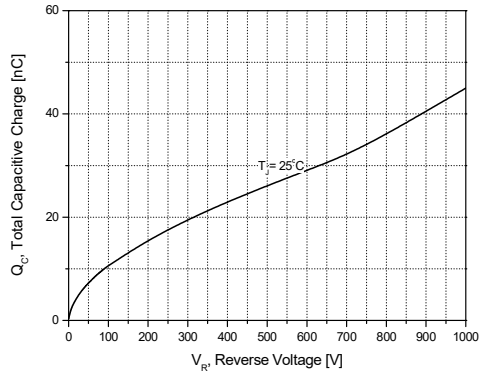


Figure 7. Total Capacitive Charge

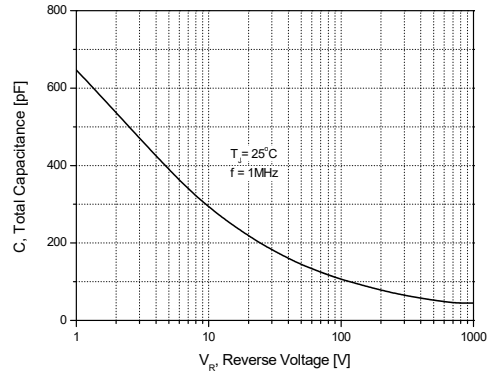


Figure 8. Total Capacitance

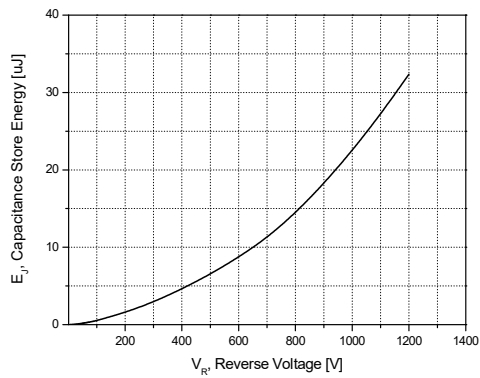


Figure 9. Capacitance Store Energy

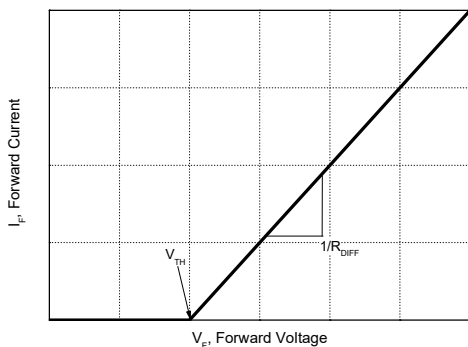


Figure 10. Equivalent Forward Current Curve

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

Threshold Voltage(V_{TH})

$$V_{TH}(T_j) = -0.001 \times (T_j) + 0.930 \text{ [V]}$$

Differential Resistance (R_{DIFF})

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

$$A = 1.85 \times 10^{-6}$$

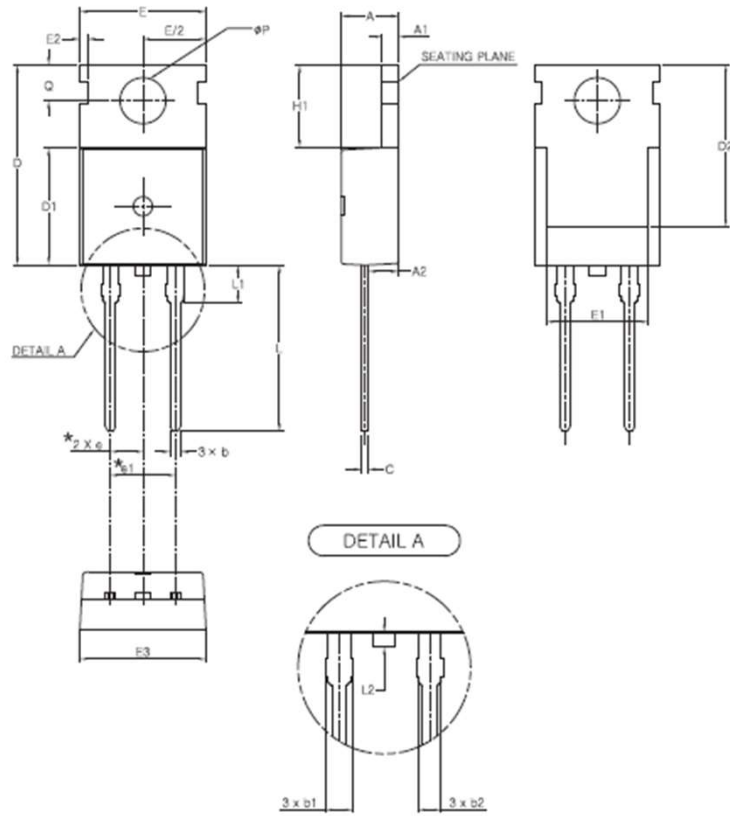
$$B = 2.10 \times 10^{-4}$$

$$C = 4.61 \times 10^{-2}$$

$[T_j \text{ [}^\circ\text{C]}; -55 \text{ }^\circ\text{C} \leq T_j \leq 175 \text{ }^\circ\text{C}; I_F \leq 10 \text{ A}]$

Package Information

TO-220-2L

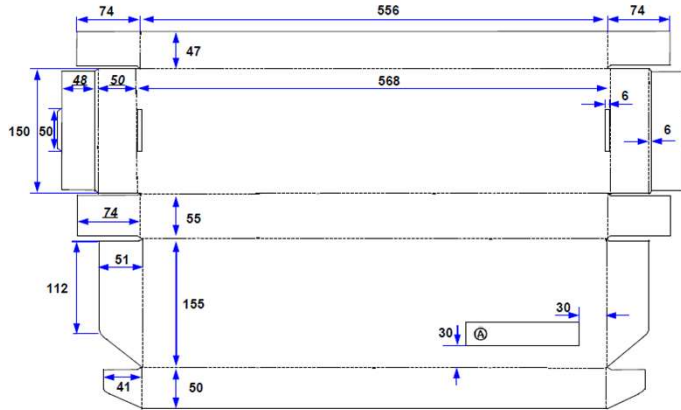


SYMBOL	MIN	NOM	MAX
A	4.30	4.50	4.70
A1	1.25	1.30	1.40
A2	2.20	2.40	2.60
b	0.70	0.80	0.90
b1	1.42	1.52	1.62
b2	1.17	1.27	1.37
c	0.45	0.50	0.60
D1	15.50	15.70	15.90
D2	9.00	9.20	9.40
E	(12.70)		
E1	9.70	9.90	10.10
E2	(0.60)		
E3	9.70	9.90	10.10
e	2.54 BSC		
e1	5.08 BSC		
H1	6.30	6.50	6.70
L	12.88	13.08	13.28
L1	(3.00)		
L2	-	-	0.80
φP	3.50	3.60	3.70
Q	2.70	2.80	2.90

NOTE

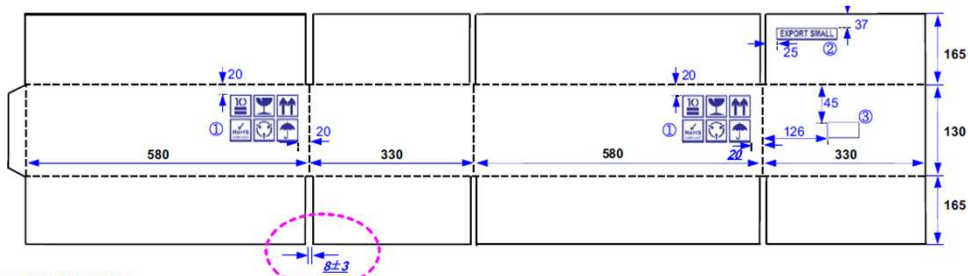
1. THESE DIMENSIONS DO NOT INCLUDE PROTRUSIONS OF THE MOLD
2. THE '(J)' MARK IS THE REFERENCE
3. THE 'L2' SYMBOL IS A PROTRUSION OF THE MOLD
- * 4. IT HAVE TO APPLY 'TO-220-3L MOLD DIE'

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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