PD020120EP / PD020120EP_G
1200V Silicon Carbide Diode

Features

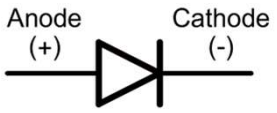
- 1200-Volt Schottky Rectifier
- Shorter recovery time
- High-speed switching possible
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Switching
- Positive Temperature Coefficient on VF
- RoHS Compliant

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˚C T_C = 145˚C	49 20	A
I_{FRM}	Repetitive Peak Forward Current	T_C = 110˚C	115	A
I_{FSM}	Non-Repetitive Forward Surge Current	T_C = 25˚C T_C = 110˚C	100 80	A
P_D	Power Dissipation	T_C = 25˚C	220	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 = 20A, T_C = 25°C I_F = 20A, T_C = 175°C	--	1.5 2.0	1.8 2.4	V
I_R	Reverse Current	V_R = 1200V T_C = 25°C V_R = 1200V T_C = 175°C	--	30 60	70 700	uA
Q_C	Total Capacitive Charge	V_R = 800V	--	66	--	nC
C	Total Capacitance	V_R = 1V, T_J = 25°C, f = 1MHz V_R = 800V, T_J = 25°C, f = 1MHz	--	1275 83	--	pF

Thermal Characteristics

T_C = 25°C unless otherwise noted

Symbol	Parameter	Min	Typ	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	--	0.68	0.8	℃/W

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
PD020120EP	PD020120EP	TO-220	-	-	50
PD020120EP_G	PD020120EP_G	TO-220	-	-	50

* PD020120EP_G : RoHS Compliant

Typical Characteristics

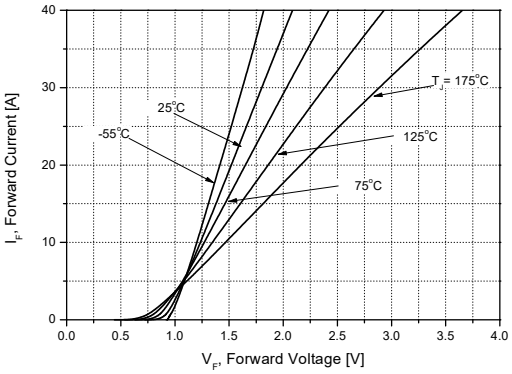


Figure 1. Forward Characteristics

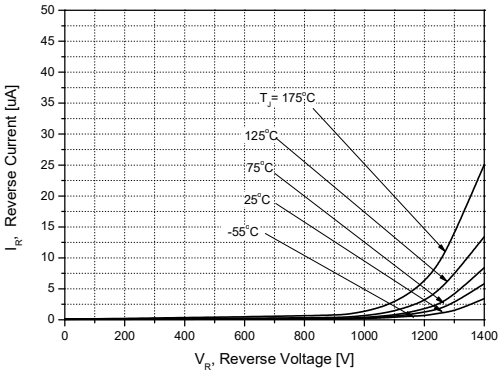


Figure 2. Reverse Characteristics

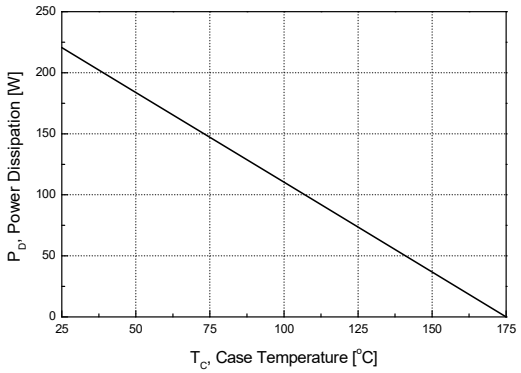


Figure 3. Power Dissipation

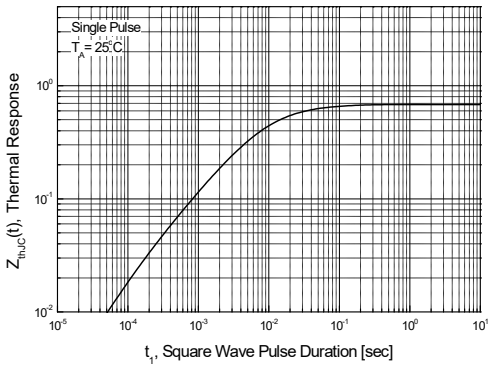


Figure 4. Transient Thermal Resistance

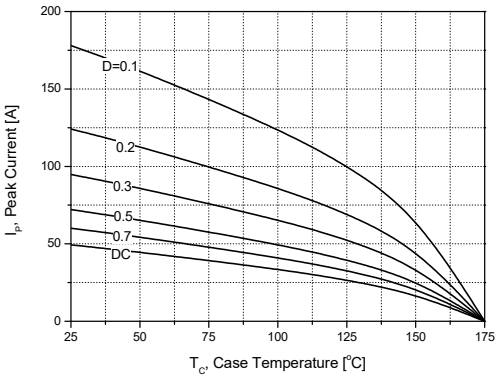


Figure 5. Peak Forward Current Derating

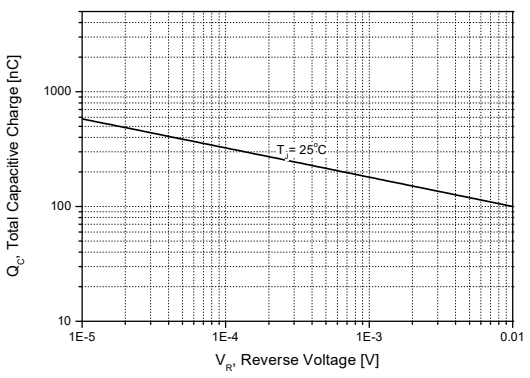


Figure 6. Non-Repetitive Peak Forward Surge Current vs. Pulse Duration

Typical Characteristics

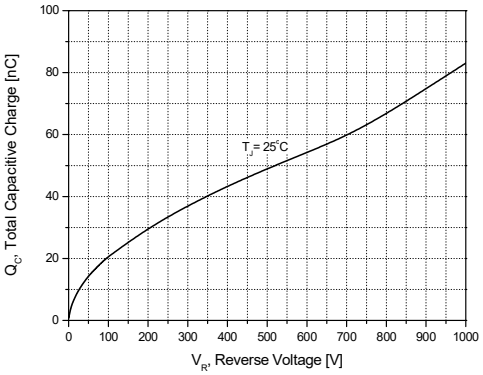


Figure 7. Total Capacitive Charge

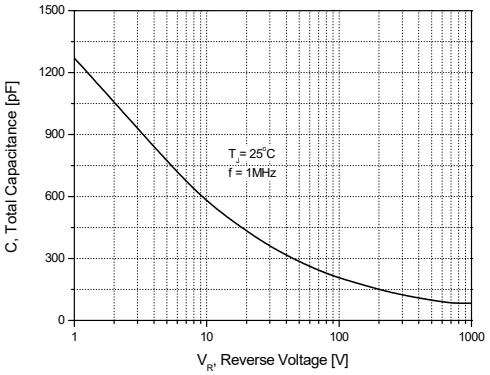


Figure 8. Total Capacitance

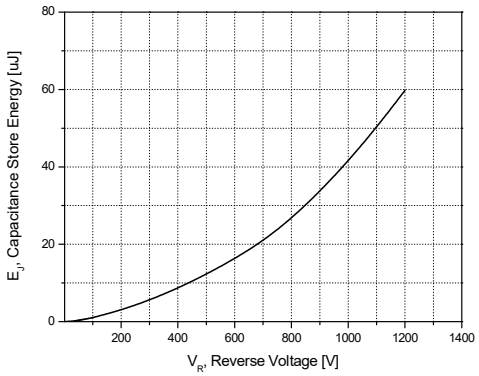


Figure 9. Capacitance Store Energy

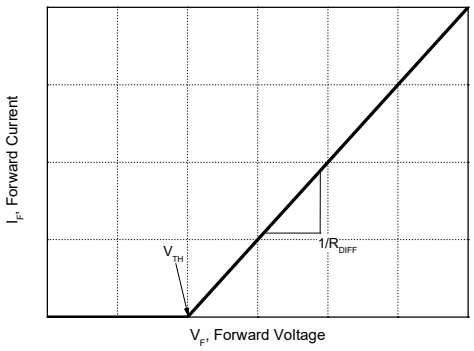


Figure 10. Equivalent Forward Current Curve

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

Threshold Voltage(V_{TH})

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

Differential Resistance (R_{DIFF})

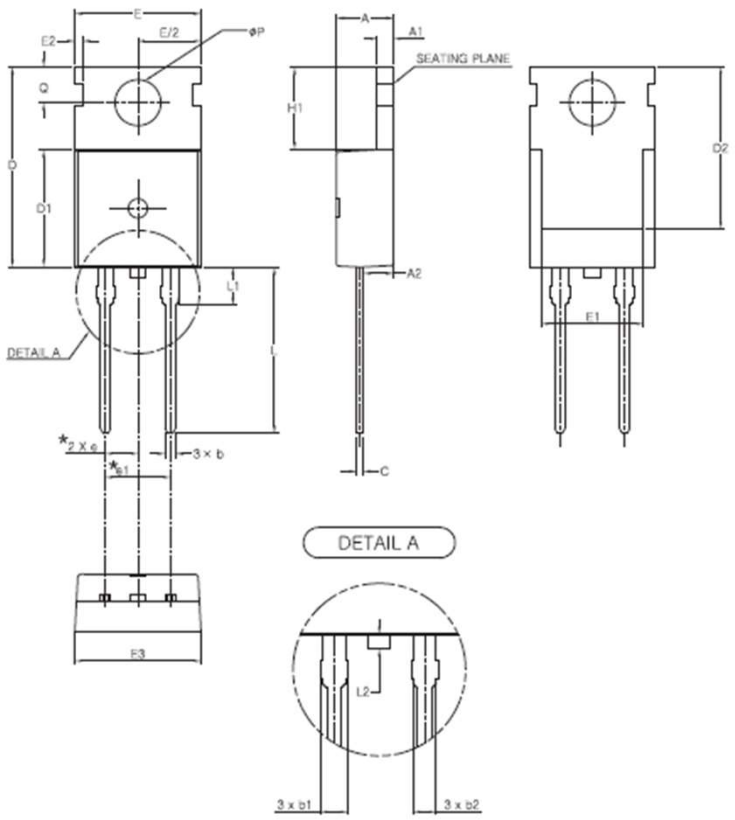
$R_{DIFF}(T_j) = A \times T_j^2 + B \times T_j + C$ [Ω]

$A = 9.99 \times 10^{-7}$
$B = 9.02 \times 10^{-5}$
$C = 2.59 \times 10^{-2}$

[T_j [°C]: -55 °C ≤ T_j ≤ 175 °C; IF ≤ 20 A]

Package Information

TO-220-2L



DETAIL A

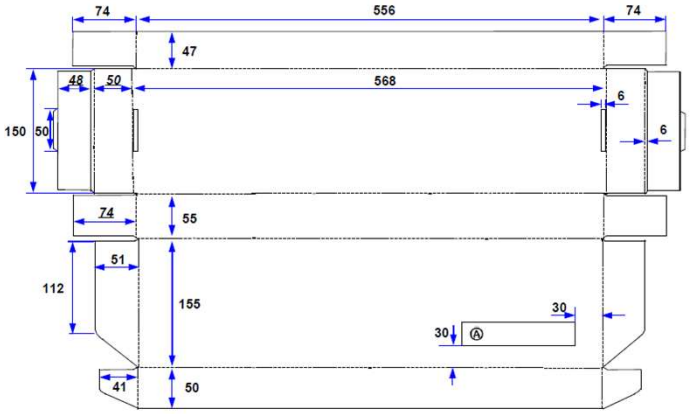
SYMBOL	MIN	NOM	MAX
A	4.30	4.50	4.70
A1	1.25	1.30	1.40
A2	2.20	2.40	2.60
b	0.70	0.80	0.90
b1	1.42	1.52	1.62
b2	1.17	1.27	1.37
c	0.45	0.50	0.60
D	15.50	15.70	15.90
D1	9.00	9.20	9.40
D2		(12.70)	
E	9.70	9.90	10.10
E1		(8.00)	
E2		(0.60)	
E3	9.70	9.90	10.10
e		2.54 BSC	
e1		5.08 BSC	
H1	6.30	6.50	6.70
L	12.88	13.08	13.28
L1		(3.00)	
L2	-	-	0.80
øP	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

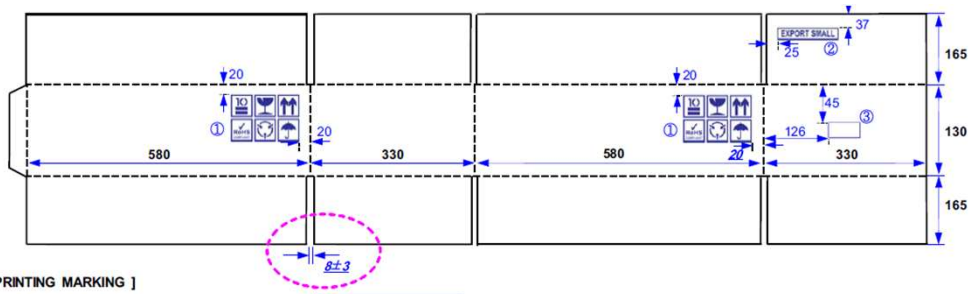


PART ID	PKG Type
PDXXXXXXEX_G	XX-XXXX-XX
LOT No.	QTY
XXXXXXXXXXXXX	X,XXX ea

YES POWER TECHNIX

DATE : XXXX.XX.XX

Outer Box



[BOX PRINTING MARKING]

① RoHS COMPLIANT

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 : XXXXXXXXXXXX

QTY : XX,XXXX ea

YES POWER TECHNIX

DATE : XXXX.XX.XX

Notes

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C. In order to prevent personal injury or fire arising from failure, please take safety measures such as complying with the derating characteristics, implementing redundant and fire prevention designs, and utilizing backups and fail-safe procedures.

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