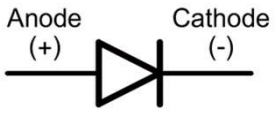
PD013065EP / PD013065EP_G
650V Silicon Carbide Diode

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

Package Outline

Cathode Anode



Applications

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

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˚C T_C = 135˚C	28 13	A
I_{FRM}	Repetitive Peak Forward Current	T_C = 110˚C	67	A
I_{FSM}	Non-Repetitive Forward Surge Current (PW=10ms sinusoidal)	T_C = 25˚C T_C = 110˚C	65 52	A
P_D	Power Dissipation	T_C = 25˚C	115	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 = 13A, T_C = 25°C I_F = 13A, T_C = 175°C	--	1.5 2.0	1.8 2.4	V
I_R	Reverse Current	V_R = 650V T_C = 25°C V_R = 650V T_C = 175°C	--	23 46	59 590	uA
Q_C	Total Capacitive Charge	V_R = 400V	--	24	--	nC
C	Total Capacitance	V_R = 1V, T_J = 25°C, f = 1MHz V_R = 520V, T_J = 25°C, f = 1MHz	--	505 55	--	pF

Thermal Characteristics

T_C = 25°C unless otherwise noted

Symbol	Parameter	Min	Typ	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	--	1.3	1.6	℃/W

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
PD013065EP	PD013065EP	TO-220	-	-	50
PD013065EP_G	PD013065EP_G	TO-220	-	-	50

* PD013065EP_G : RoHS Compliant

Typical Characteristics

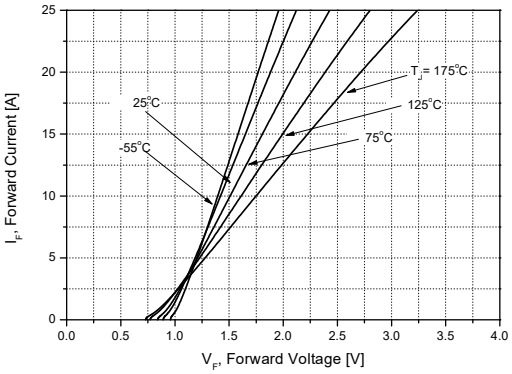


Figure 1. Forward Characteristics

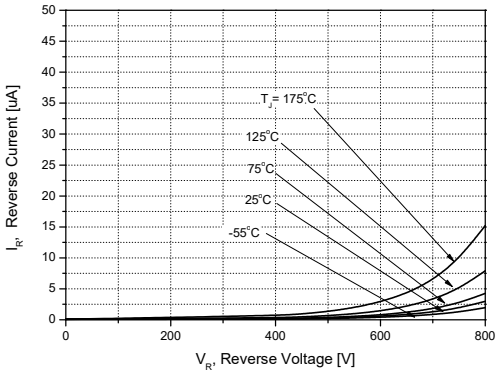


Figure 2. Reverse Characteristics

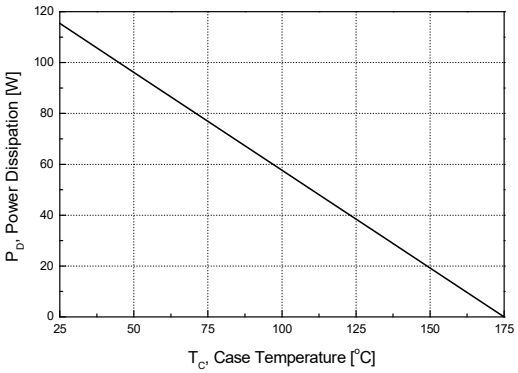


Figure 3. Power Dissipation

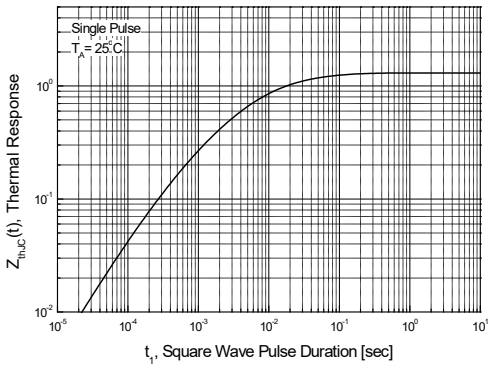


Figure 4. Transient Thermal Resistance

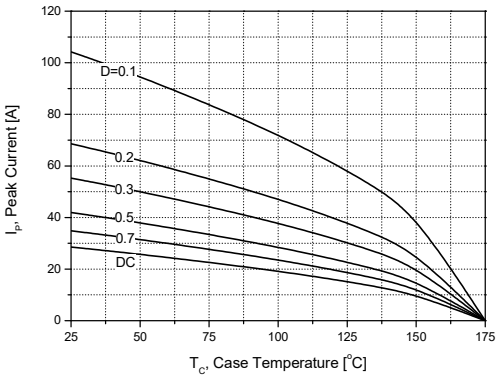


Figure 5. Peak Forward Current Derating

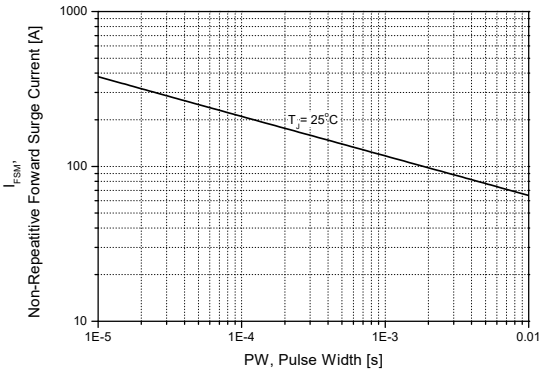


Figure 6. Non-Repetitive Peak Forward Surge Current vs. Pulse Duration

Typical Characteristics

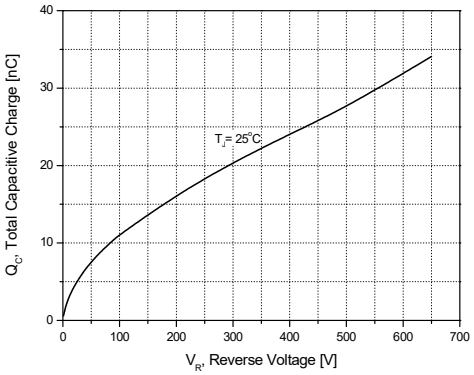


Figure 7. Total Capacitive Charge

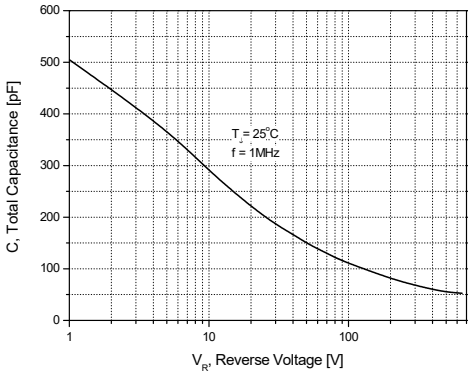


Figure 8. Total Capacitance

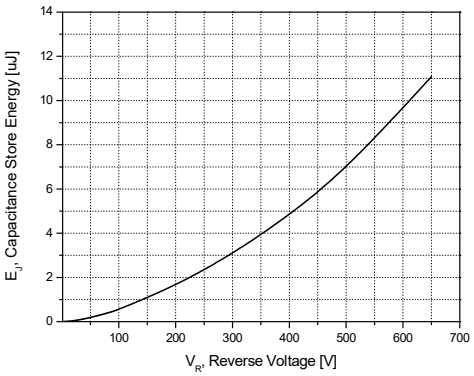


Figure 9. Capacitance Store Energy

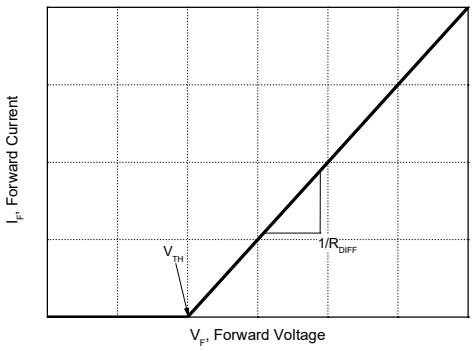


Figure 10. Equivalent Forward Current Curve

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

Threshold Voltage(V_{TH})

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

Differential Resistance (R_{DIFF})

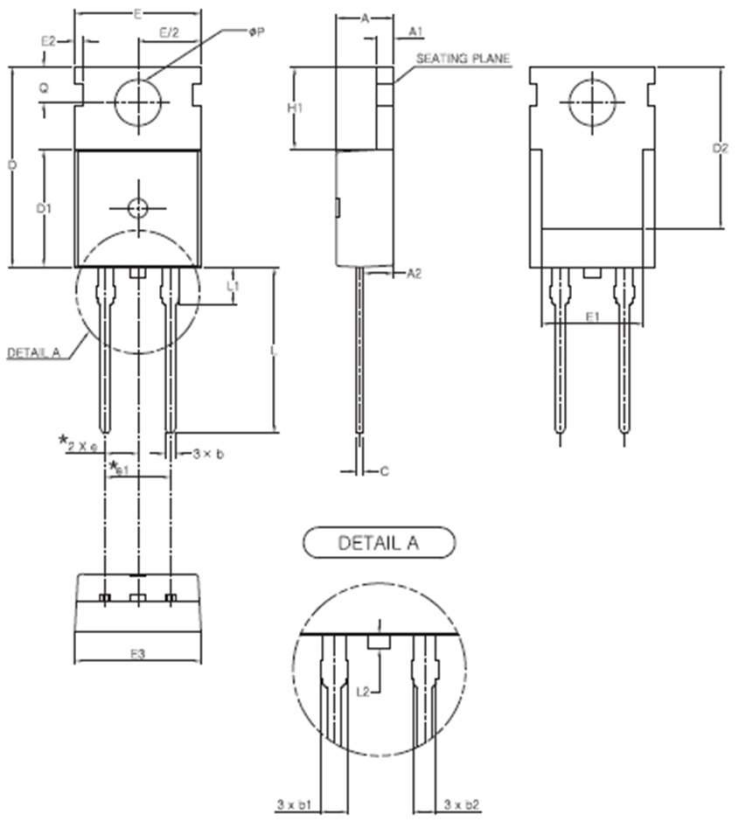
$R_{DIFF}(T_j) = A \times T_j^2 + B \times T_j + C$ [Ω]

$A = 1.28 \times 10^{-6}$
$B = 1.49 \times 10^{-4}$
$C = 4.39 \times 10^{-2}$

[T_j [°C]: -55 °C ≤ T_j ≤ 175 °C; IF ≤ 13 A]

Package Information

TO-220-2L



DETAIL A

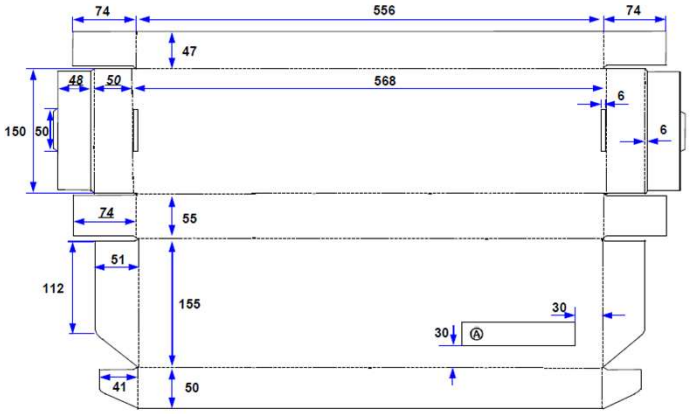
SYMBOL	MIN	NOM	MAX
A	4.30	4.50	4.70
A1	1.25	1.30	1.40
A2	2.20	2.40	2.60
b	0.70	0.80	0.90
b1	1.42	1.52	1.62
b2	1.17	1.27	1.37
c	0.45	0.50	0.60
D	15.50	15.70	15.90
D1	9.00	9.20	9.40
D2		(12.70)	
E	9.70	9.90	10.10
E1		(8.00)	
E2		(0.60)	
E3	9.70	9.90	10.10
e		2.54 BSC	
e1		5.08 BSC	
H1	6.30	6.50	6.70
L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

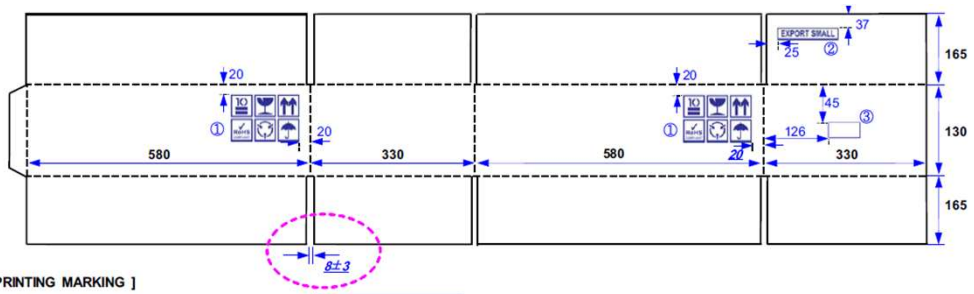
Inner Box



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 

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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