

PD013065ED / PD013065ED_G

650V Silicon Carbide Diode

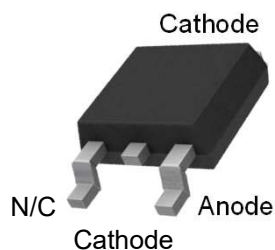
Features

- 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



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 $T_C = 25^\circ\text{C}$ $T_C = 140^\circ\text{C}$	30 13	A
I_{FRM}	Repetitive Peak Forward Current $T_C = 110^\circ\text{C}$	72	A
I_{FSM}	Non-Repetitive Forward Surge Current (PW=10ms sinusoidal) $T_C = 25^\circ\text{C}$ $T_C = 110^\circ\text{C}$	65 52	A
P_D	Power Dissipation $T_C = 25^\circ\text{C}$	130	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	$I_F = 13\text{A}, T_C = 25^\circ\text{C}$ $I_F = 13\text{A}, T_C = 175^\circ\text{C}$	--	1.5 2.0	1.8 2.4	V
I_R	Reverse Current	$V_R = 650\text{V}, T_C = 25^\circ\text{C}$ $V_R = 650\text{V}, T_C = 175^\circ\text{C}$	--	23 46	59 590	μA
Q_C	Total Capacitive Charge	$V_R = 400\text{V}$	--	24	--	nC
C	Total Capacitance	$V_R = 1\text{V}, T_J = 25^\circ\text{C}, f = 1\text{MHz}$ $V_R = 520\text{V}, T_J = 25^\circ\text{C}, f = 1\text{MHz}$	--	505 55	--	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	--	1.15	1.4	$^\circ\text{C}/\text{W}$

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
PD013065ED	PD013065ED	D-PAK	380mm	16mm	2500
PD013065ED_G	PD013065ED_G	D-PAK	380mm	16mm	2500

* PD013065ED_G : RoHS Compliant

* Quantity of Tube type : 70ea

Typical Characteristics

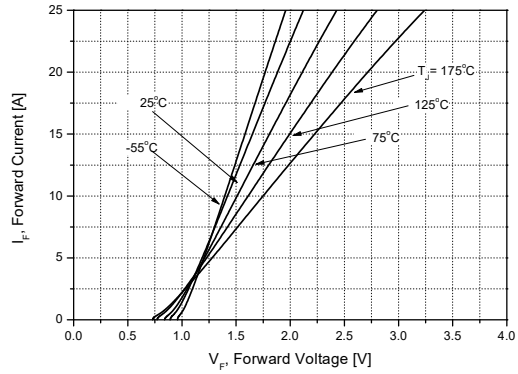


Figure 1. Forward Characteristics

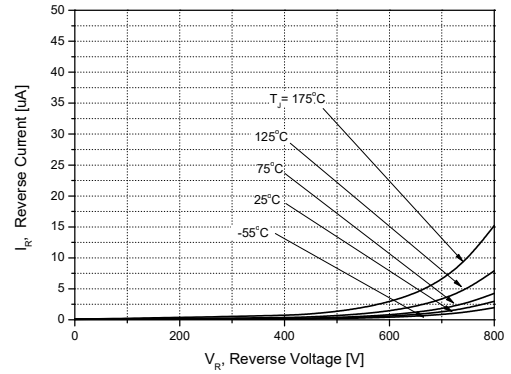


Figure 2. Reverse Characteristics

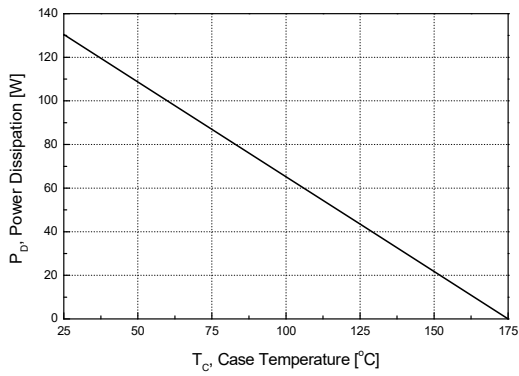


Figure 3. Power Dissipation

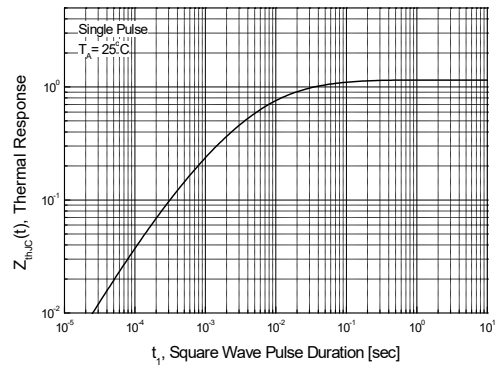


Figure 4. Transient Thermal Resistance

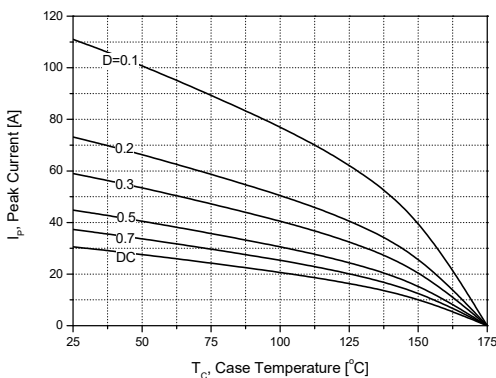


Figure 5. Peak Forward Current Derating

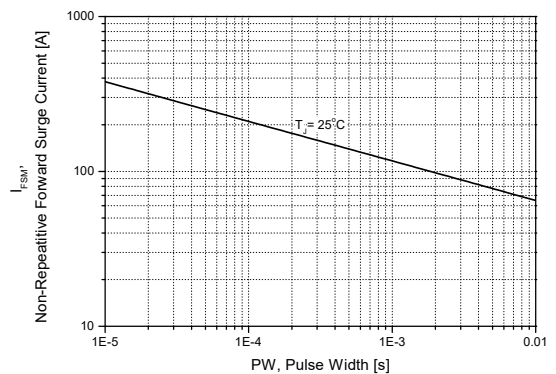


Figure 6. Non-Repetitive Peak Forward Surge Current vs. Pulse Duration

Typical Characteristics

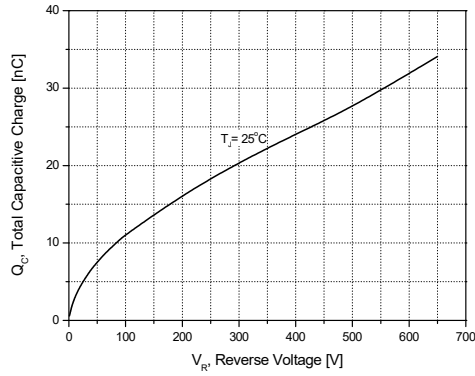


Figure 7. Total Capacitive Charge

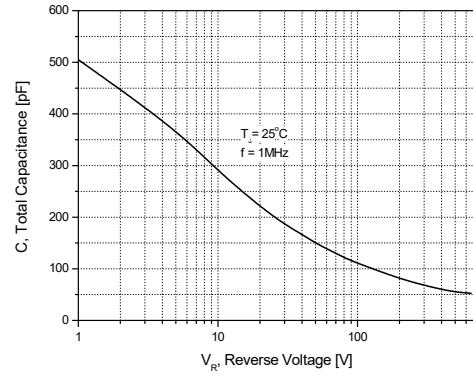


Figure 8. Total Capacitance

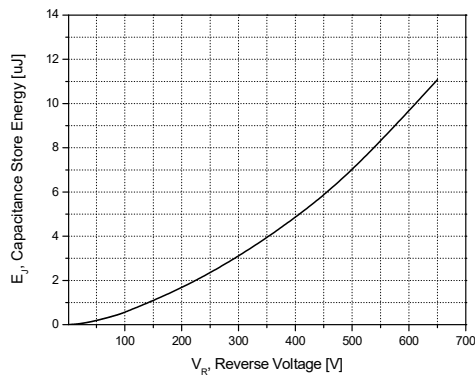


Figure 9. Capacitance Store Energy

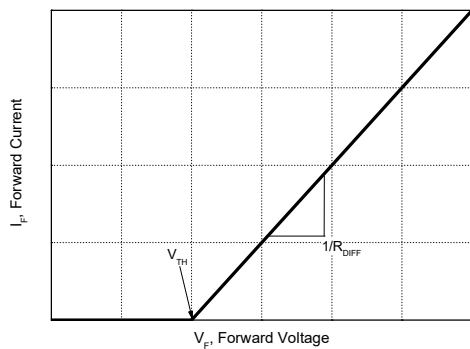


Figure 10. Equivalent Forward Current Curve

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

Threshold Voltage(V_{TH})

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

Differential Resistance (R_{DIFF})

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

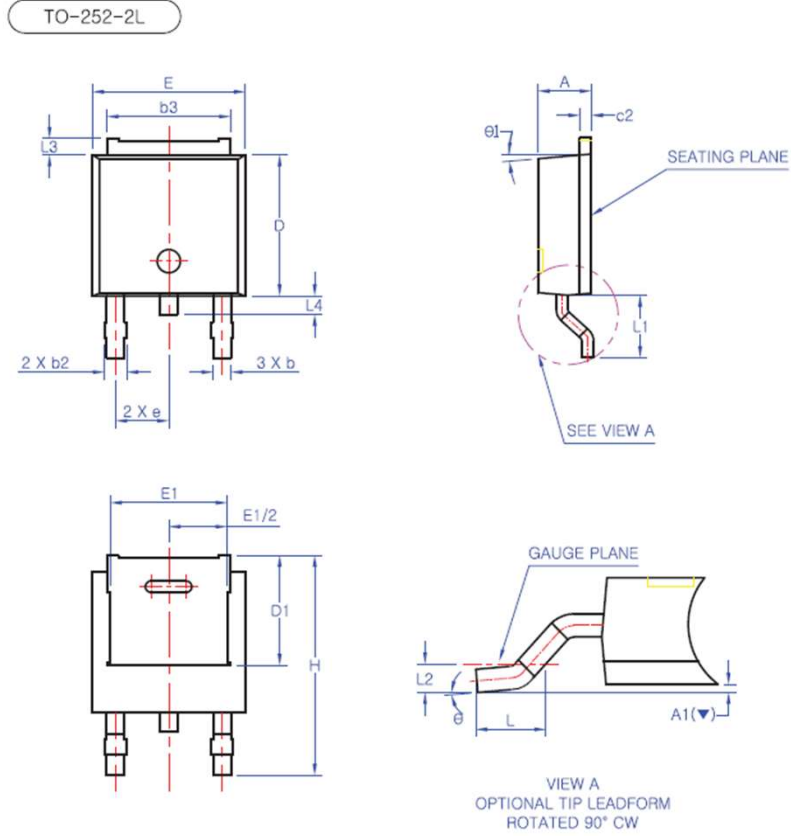
$$A = 1.28 \times 10^{-6}$$

$$B = 1.49 \times 10^{-4}$$

$$C = 4.39 \times 10^{-2}$$

$$[T_j \text{ [}^\circ\text{C]}; -55 \text{ }^\circ\text{C} \leq T_j \leq 175 \text{ }^\circ\text{C}; I_F \leq 13 \text{ A}]$$

Package Information



SYMBOL	MIN	NOM	MAX
A	2.20	2.30	2.40
A1 (▼)	0.00	-	0.127
b	0.66	0.76	0.86
b2	-	-	0.96
b3	5.04	5.34	5.64
c2	0.40	0.50	0.60
D	5.90	6.10	6.30
D1		(4.75)	
E	6.40	6.60	6.80
E1		(5.04)	
e		2.30 BSC	
H	9.20	9.50	9.80
L	1.27	1.47	1.67
L1	2.50	2.70	2.90
L2		0.508 BSC	
L3	0.50	0.70	0.90
L4	0.60	0.80	1.00
θ	0°	-	10°
θ1		(5°)	

*** NOTE**

1. THESE DIMENSIONS DO NOT INCLUDE PROTRUSIONS OF THE MOLD.
2. THE "()" MARK IS THE REFERENCE
3. COPLANARITY : MAX 0.10mm
4. THE "L4" SYMBOL IS A PROTRUSION OF THE LEAD FRAME.

Notes

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