

### Benefits

- Replace Bipolar with Unipolar Rectifiers
- Essentially No Switching Losses
- Higher Efficiency
- Reduction of Heat Sink Requirements
- Parallel Devices Without Thermal Runaway

### General Features

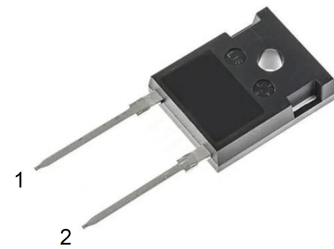
- 1.2kV Schottky Rectifier
- Zero Reverse Recovery Current
- High-Frequency Operation
- Temperature-Independent Switching
- Extremely Fast Switching
- Positive Temperature Coefficient on VF
- Increased Creepage/Clearance Distance

### Application

- Switch Mode Power Supplies (SMPS)
- Boost diodes in PFC or DC/DC stages
- Free Wheeling Diodes in Inverter stages
- AC/DC converters

$V_{RRM} = 1200\text{ V}$   
 $I_F, T_C < 135^\circ\text{C} = 26\text{ A}$   
 $Q_c = 99\text{ nC}$

### Package TO-247-2



### Equivalent Circuit



### Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Repetitive Peak Reverse Voltage	$V_{RRM}$	1200	V
Surge Peak Reverse Voltage	$V_{RSM}$	1300	V
DC Blocking Voltage	$V_{DC}$	1200	V
Forward Current(Fig.3)	$I_F$	$T_C \leq 25^\circ\text{C}$	54
		$T_C \leq 135^\circ\text{C}$	26
		$T_C \leq 156^\circ\text{C}$	20
Non-Repetitive Forward Surge Current(Fig.8)	$I_{FSM}$	$T_C=25^\circ\text{C}, t_p=10\text{ ms, Half Sine Pulse}$	130
		$T_C=110^\circ\text{C}, t_p=10\text{ ms, Half Sine Pulse}$	104
Repetitive Peak Forward Surge Current	$I_{FRM}$	$T_C=25^\circ\text{C}, t_p=10\text{ ms, Half Sine Pulse}$	86
		$T_C=110^\circ\text{C}, t_p=10\text{ ms, Half Sine Pulse}$	56
Non-Repetitive Peak Forward Current(Fig.8)	$I_{F,max}$	$T_C=25^\circ\text{C}, t_p=10\text{ us, Pulse}$	1150
		$T_C=110^\circ\text{C}, t_p=10\text{ us, Pulse}$	650
Power Dissipation(Fig.4)	$P_{tot}$	$T_C=25^\circ\text{C}$	246
		$T_C=110^\circ\text{C}$	106.5
Diode dV/dt ruggedness	$dV/dt$	200	V/ns
$I_2t$ value	$\int i^2 dt$	$T_C=25^\circ\text{C}, t_p=10\text{ ms}$	84.5
		$T_C=110^\circ\text{C}, t_p=10\text{ ms}$	54
Operating Junction and Storage Temperature	$T_J, T_{stg}$	-55 ~ +175	$^\circ\text{C}$
TO-247 Mounting Torque		M3 Screw	1
		6-32 Screw	8.8
			Nm lbf-in

### Electrical Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
$V_F$	Forward Voltage(Fig.1 )	$I_F = 20A, T_J = 25^\circ C$	--	1.5	1.8	V
		$I_F = 20A, T_J = 175^\circ C$	--	2.2	3.0	V
$I_R$	Reverse Current(Fig.2 )	$V_R = 1200V, T_J = 25^\circ C$	--	35	200	$\mu A$
		$V_R = 1200V, T_J = 175^\circ C$	--	65	400	$\mu A$
$Q_C$	Total Capacitive Charge(Fig.5)	$V_R = 800V, I_F = 20A$ $di/dt = 200A/\mu s, T_J = 25^\circ C$	--	99	--	nC
$C$	Total Capacitance(Fig.6)	$V_R = 0V, T_J = 25^\circ C, f = 1MHz$	--	1500	--	pF
		$V_R = 400V, T_J = 25^\circ C, f = 1MHz$	--	93	--	pF
		$V_R = 800V, T_J = 25^\circ C, f = 1MHz$	--	67	--	pF
$R_{\theta JC}$	Thermal Resistance from Junction to Case (Fig.9)		--	0.61	--	$^\circ C/W$
$E_C$	Capacitance Stored Energy(Fig.7)	$V_R = 800V$	--	28	--	$\mu J$

### Typical Performance

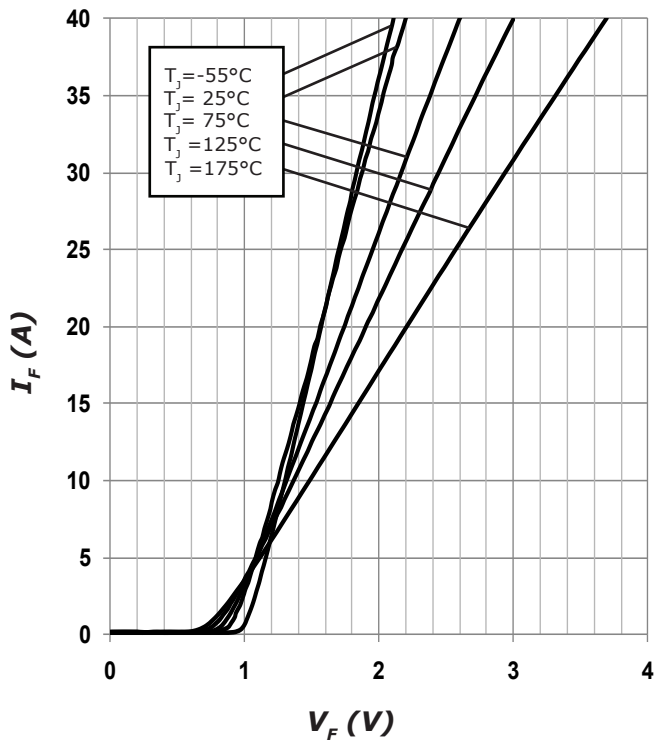


Figure 1. Forward Characteristics

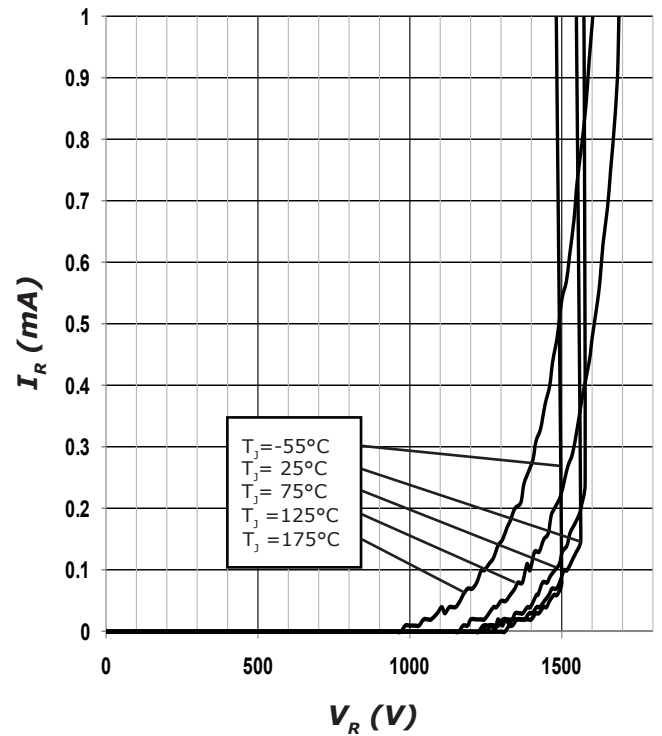


Figure 2. Reverse Characteristics

## ■ Typical Performance

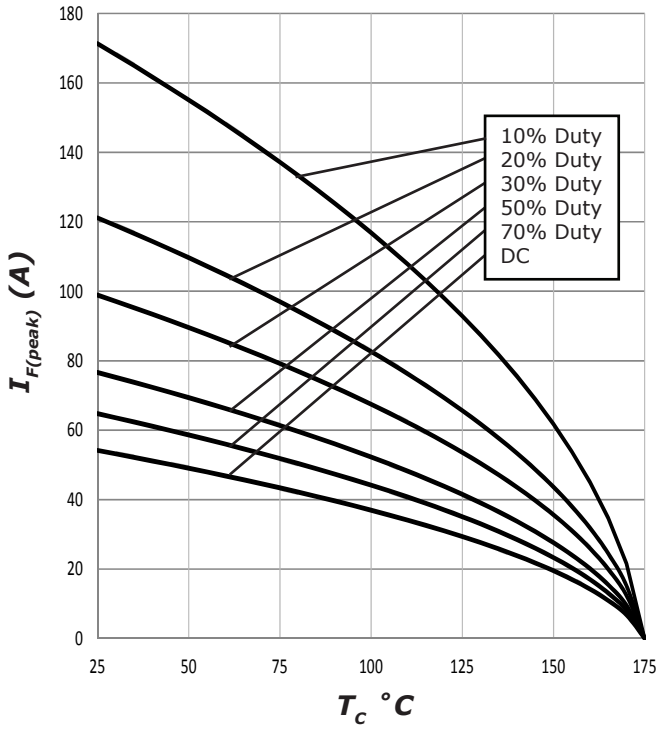


Figure 3. Current Derating

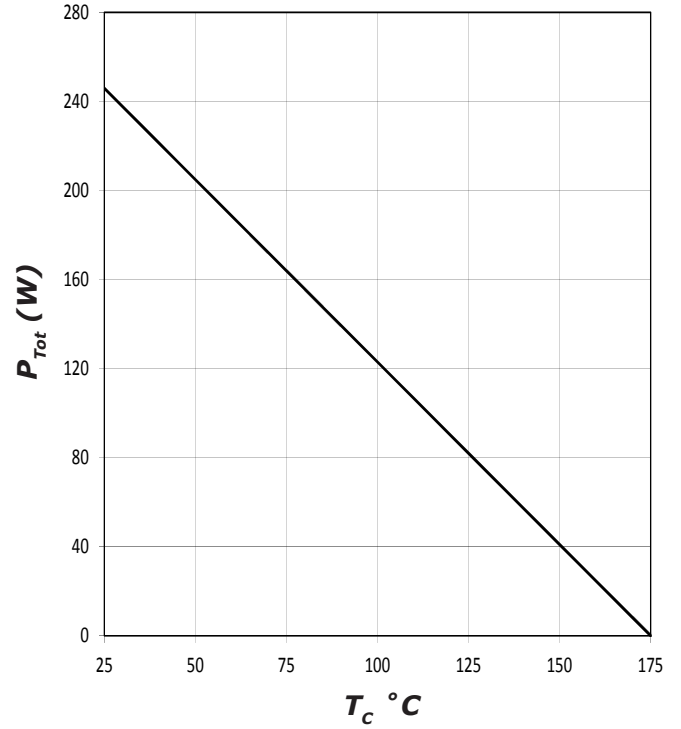


Figure 4. Power Derating

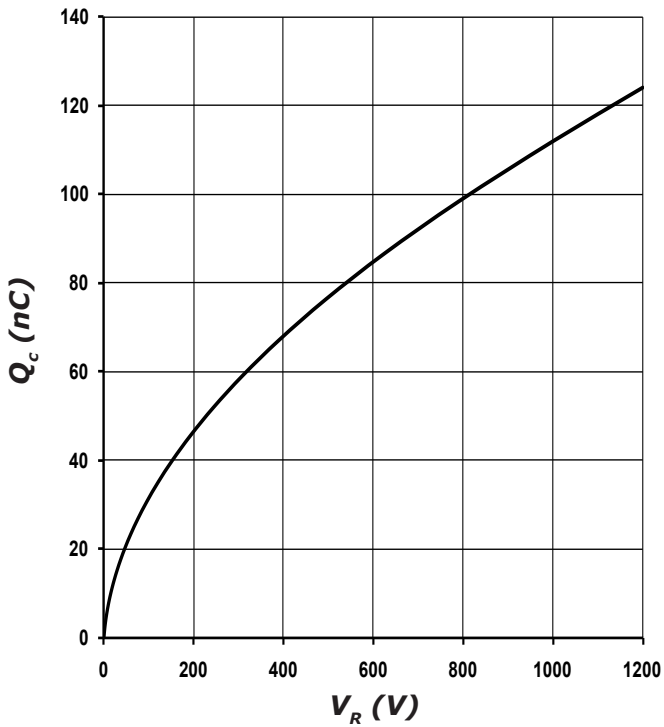


Figure 5. Recovery Charge vs. Reverse Voltage

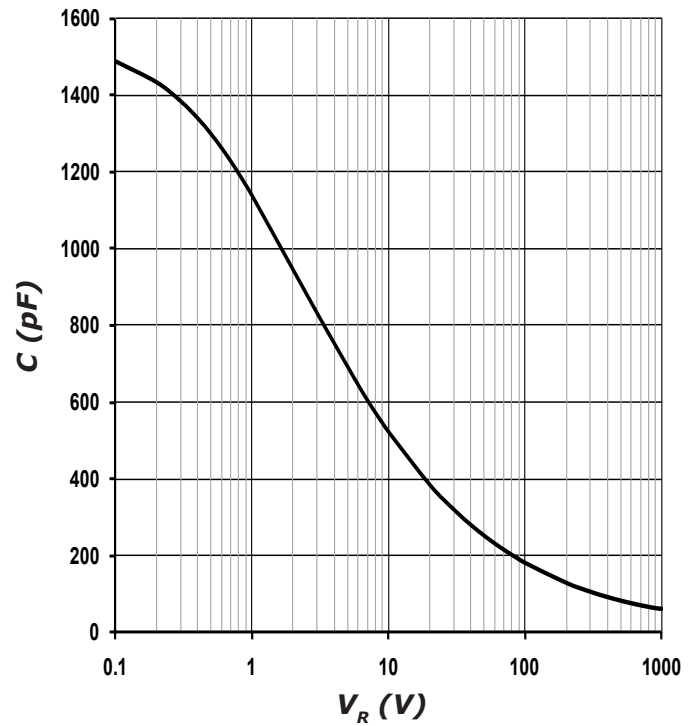


Figure 6. Capacitance vs. Reverse Voltage

## ■ Typical Performance

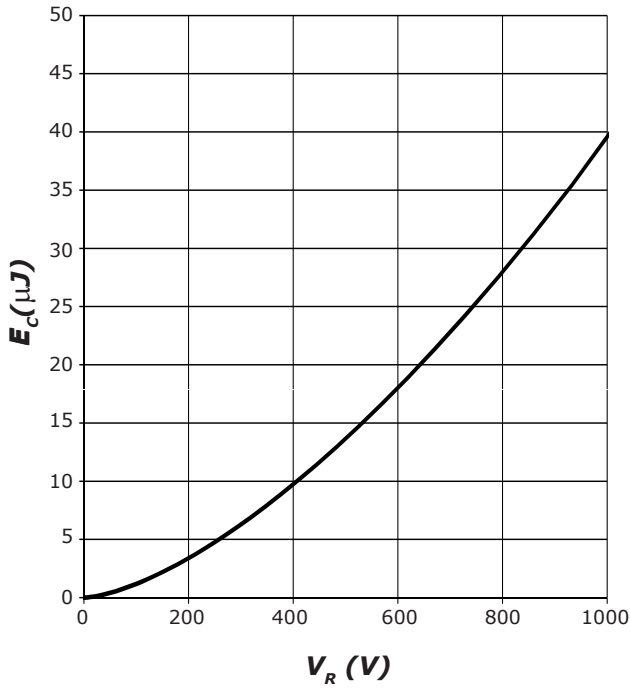


Figure 7. Typical Capacitance Stored Energy

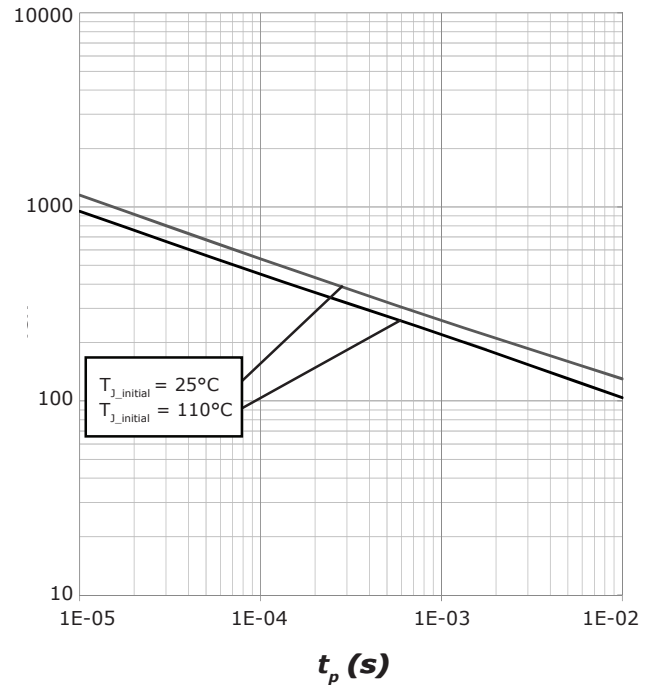


Figure 8. Non-Repetitive Peak Forward Surge Current versus Pulse Duration (sinusoidal waveform)

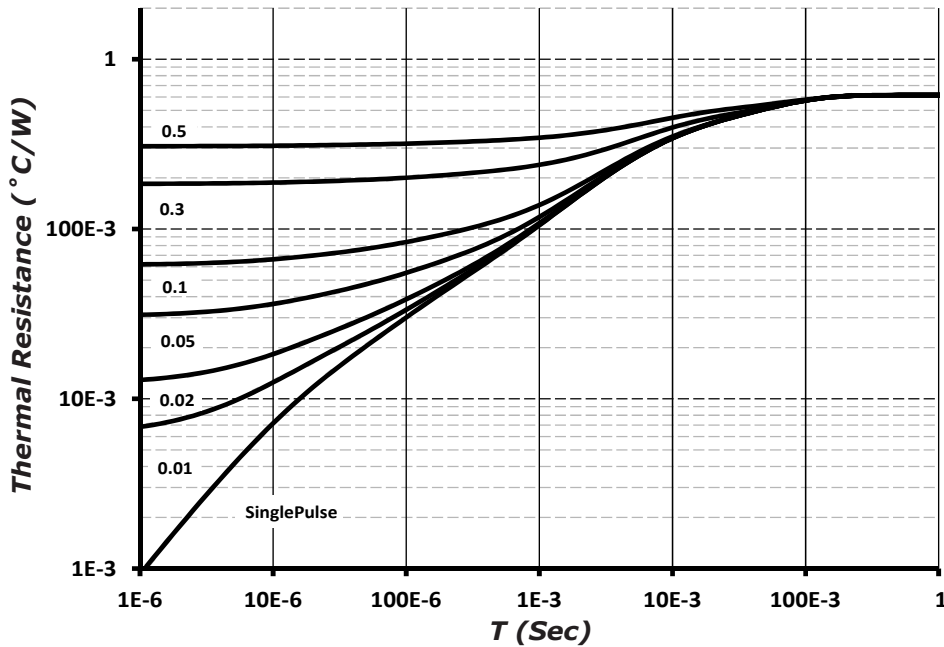
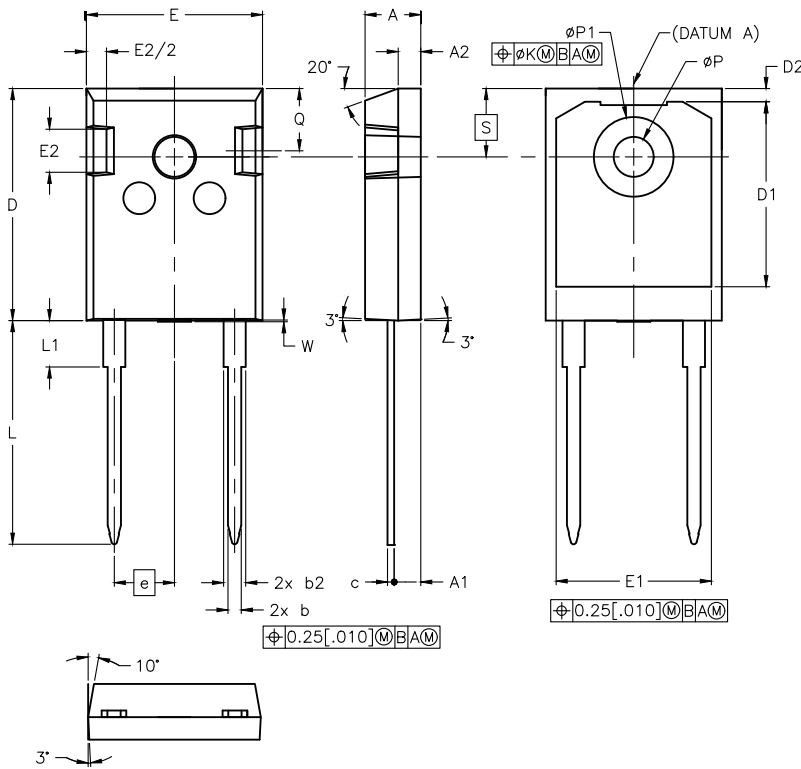


Figure 9. Transient Thermal Impedance

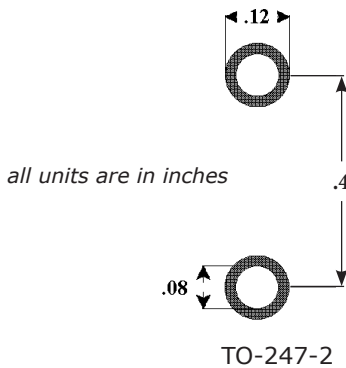
## Outline Drawing

### TO-247-2 Package Outline Dimensions

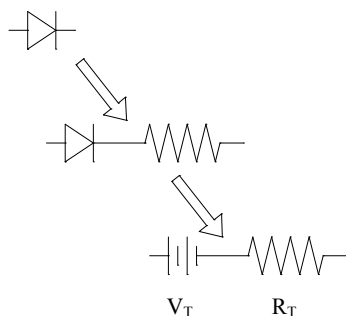


POS	Inches		Millimeters	
	Min	Max	Min	Max
A	.190	.205	4.70	5.31
A1	.087	.102	2.21	2.59
A2	.059	.098	1.50	2.49
b	.039	.055	0.99	1.40
b2	.065	.094	1.65	2.39
c	.015	.035	0.38	0.89
D	.819	.845	20.80	21.46
D1	.515	-	13.08	-
D2	.020	.053	0.51	1.35
E	.620	.640	15.49	16.26
E1	.530	-	13.46	-
E2	.135	.157	3.43	3.99
e	.214		5.44	
ØK	.010		0.25	
L	.780	.800	19.81	20.32
L1	-	.177	-	4.50
ØP	.140	.144	3.56	3.66
ØP1	.278	.291	7.06	7.39
Q	.212	.244	5.38	6.20
S	.243		6.17	
W	-	.006	-	0.15

## Recommended Solder Pad Layout



## Diode Model



$$V_f = V_T + I_f * R_T$$

$$V_T = 0.97 + (T_J * -1.40 * 10^{-3})$$

$$R_T = 0.023 + (T_J * 2.71 * 10^{-4})$$

Note:  $T_J$  = Diode Junction Temperature In Degrees Celsius, valid from 25°C to 175°C