

Benefits

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

General Features

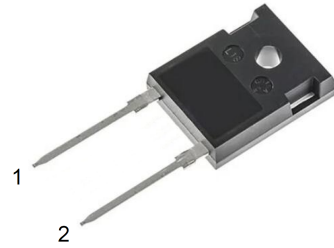
- 1.2kV Schottky Rectifier
- Zero Reverse Recovery Current
- High-Frequency Operation
- Temperature-Independent Switching
- Extremely Fast Switching
- Positive Temperature Coefficient on VF
- Increased Creepage/Clearance Distance

Application

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

$V_{RRM} = 1200\text{ V}$
$I_F, T_C < 135^\circ\text{C} = 15\text{ A}$
$Q_c = 52\text{ nC}$

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	$T_C \leq 25^\circ\text{C}$	31.5
		$T_C \leq 135^\circ\text{C}$	15
		$T_C \leq 155^\circ\text{C}$	10
Non-Repetitive Forward Surge Current(Fig.8)	I_{FSM}	$T_C=25^\circ\text{C}, t_p=10\text{ ms, Half Sine Pulse}$	67
		$T_C=110^\circ\text{C}, t_p=10\text{ ms, Half Sine Pulse}$	59
Repetitive Peak Forward Surge Current	I_{FRM}	$T_C=25^\circ\text{C}, t_p=10\text{ ms, Half Sine Pulse}$	46
		$T_C=110^\circ\text{C}, t_p=10\text{ ms, Half Sine Pulse}$	30
Non-Repetitive Peak Forward Current(Fig.8)	$I_{F,max}$	$T_C=25^\circ\text{C}, t_p=10\text{ us, Pulse}$	750
		$T_C=110^\circ\text{C}, t_p=10\text{us, Pulse}$	620
Power Dissipation(Fig.4)	P_{tot}	$T_C=25^\circ\text{C}$	153
		$T_C=110^\circ\text{C}$	66
Diode dV/dt ruggedness	dV/dt	200	V/ns
i_2t value	$\int i^2 dt$	$T_C=25^\circ\text{C}, t_p=10\text{ ms}$	22.5
		$T_C=110^\circ\text{C}, t_p=10\text{ ms}$	17.5
Operating Junction and Storage Temperature	T_J, T_{stg}	-55 ~ +175	$^\circ\text{C}$
TO-247 Mounting Torque	M3 Screw	1	Nm
	6-32 Screw	8.8	lbf-in



Electrical Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
V_F	Forward Voltage(Fig.1)	$I_F = 10A, T_J = 25^\circ C$	--	1.5	1.8	V
		$I_F = 10A, T_J = 175^\circ C$	--	2.2	3.0	V
I_R	Reverse Current(Fig.2)	$V_R = 1200V, T_J = 25^\circ C$	--	30	250	μA
		$V_R = 1200V, T_J = 175^\circ C$	--	55	350	μA
Q_C	Total Capacitive Charge(Fig.5)	$V_R = 800V, I_F = 10A$ $di/dt = 200A/\mu s, T_J = 25^\circ C$	--	52	--	nC
C	Total Capacitance(Fig.6)	$V_R = 0V, T_J = 25^\circ C, f = 1MHz$	--	754	--	pF
		$V_R = 400V, T_J = 25^\circ C, f = 1MHz$	--	45	--	pF
		$V_R = 800V, T_J = 25^\circ C, f = 1MHz$	--	38	--	pF
$R_{\theta JC}$	Thermal Resistance from Junction to Case (Fig.9)		--	0.98	--	$^\circ C/W$
E_C	Capacitance Stored Energy(Fig.7)	$V_R = 800V$	--	14.5	--	μJ

Typical Performance

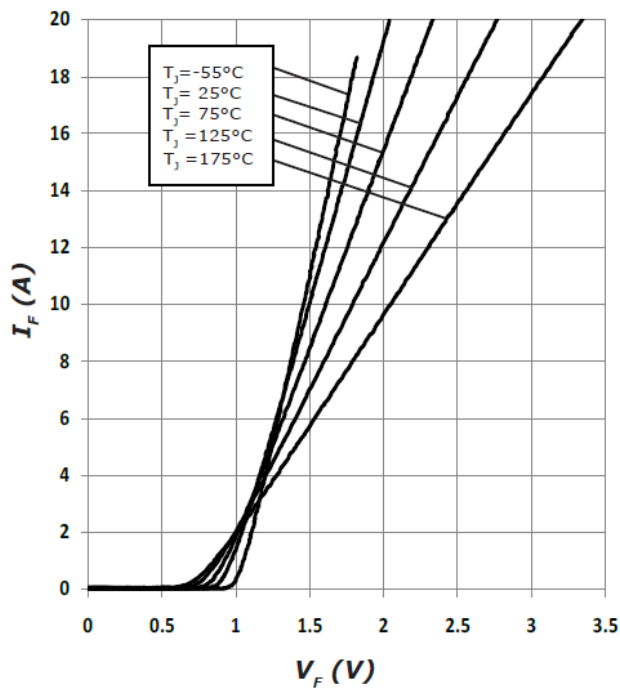


Figure 1. Forward Characteristics

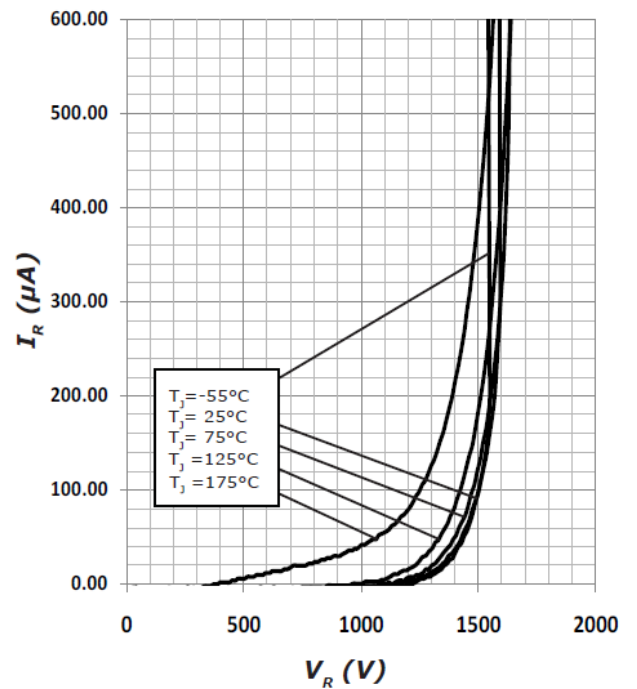


Figure 2. Reverse Characteristics

■ Typical Performance

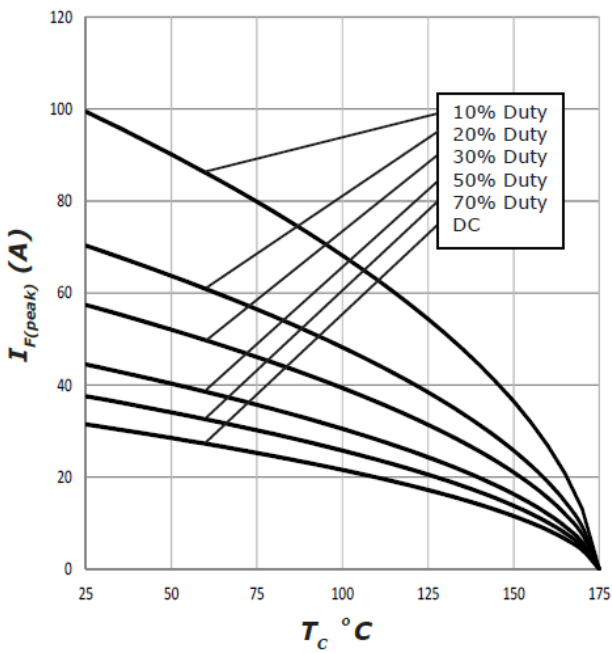


Figure 3. Current Derating

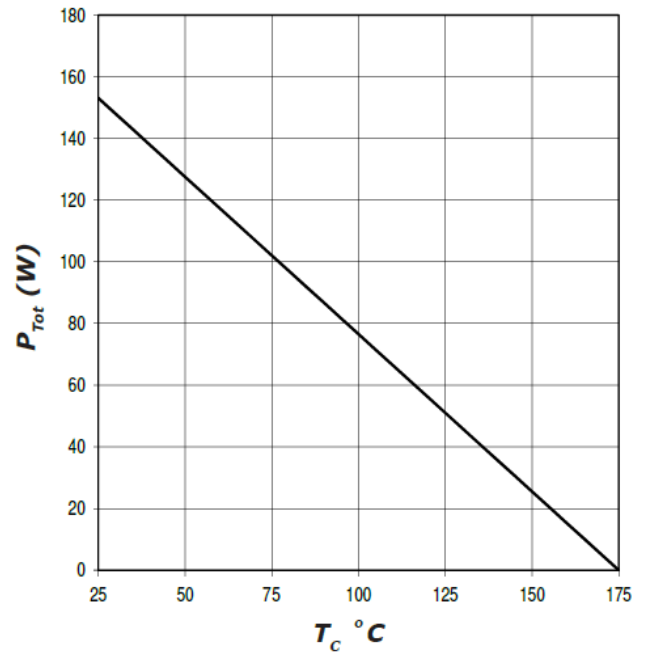


Figure 4. Power Derating

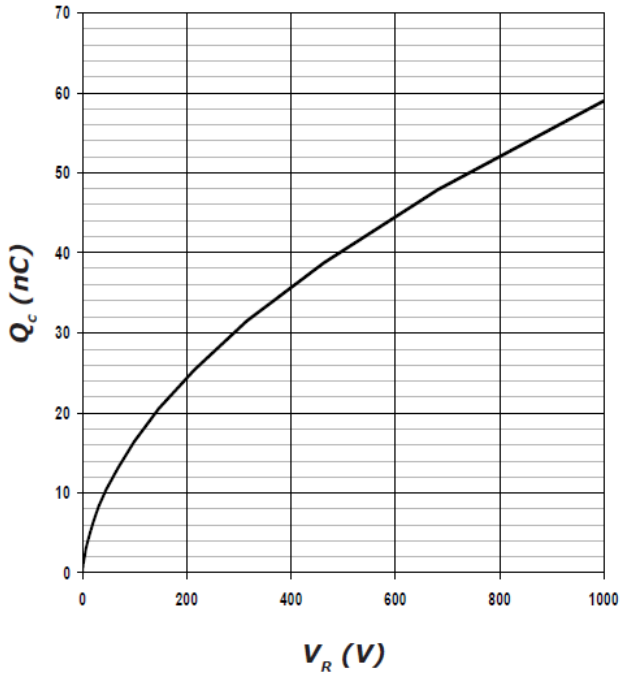


Figure 5. Recovery Charge vs. Reverse Voltage

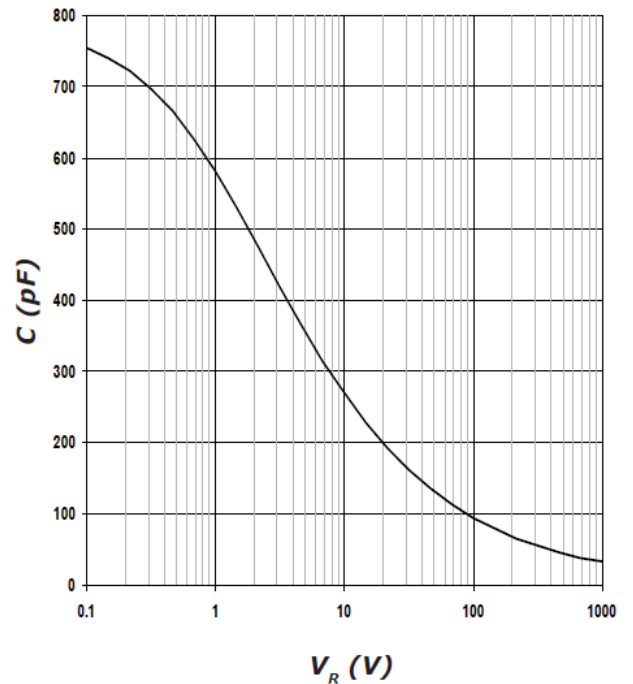


Figure 6. Capacitance vs. Reverse Voltage

■ Typical Performance

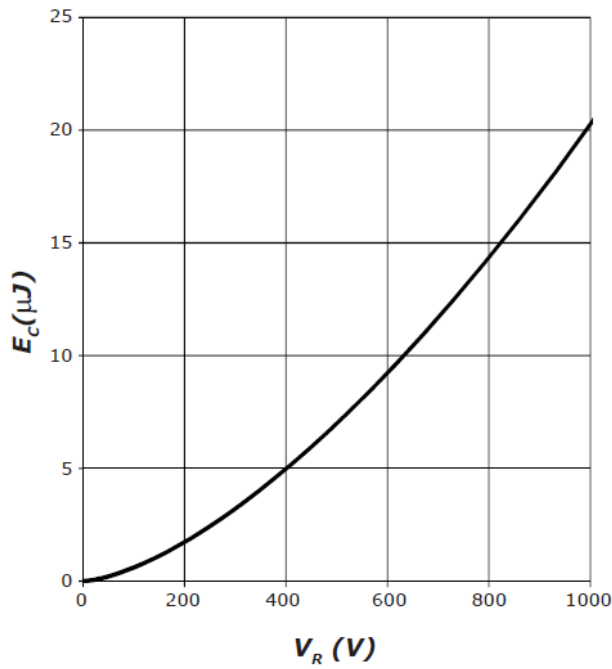


Figure 7. Typical Capacitance Stored Energy

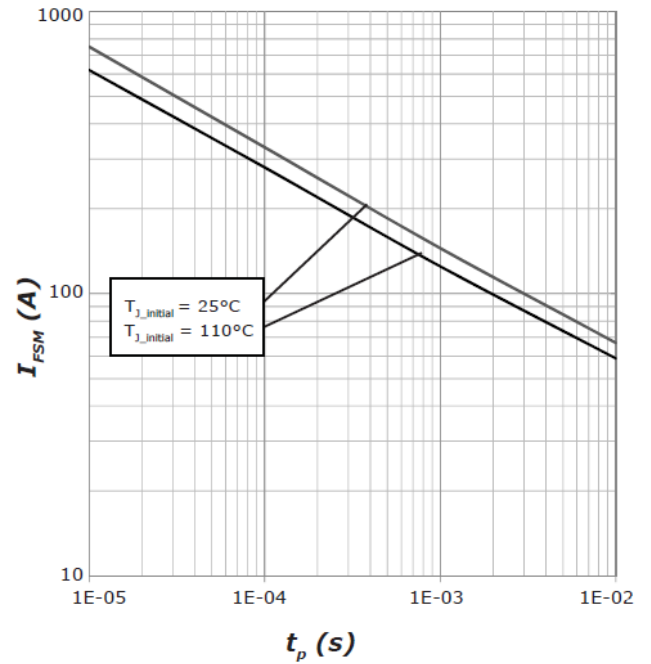


Figure 8. Non-repetitive peak forward surge current versus pulse duration (sinusoidal waveform)

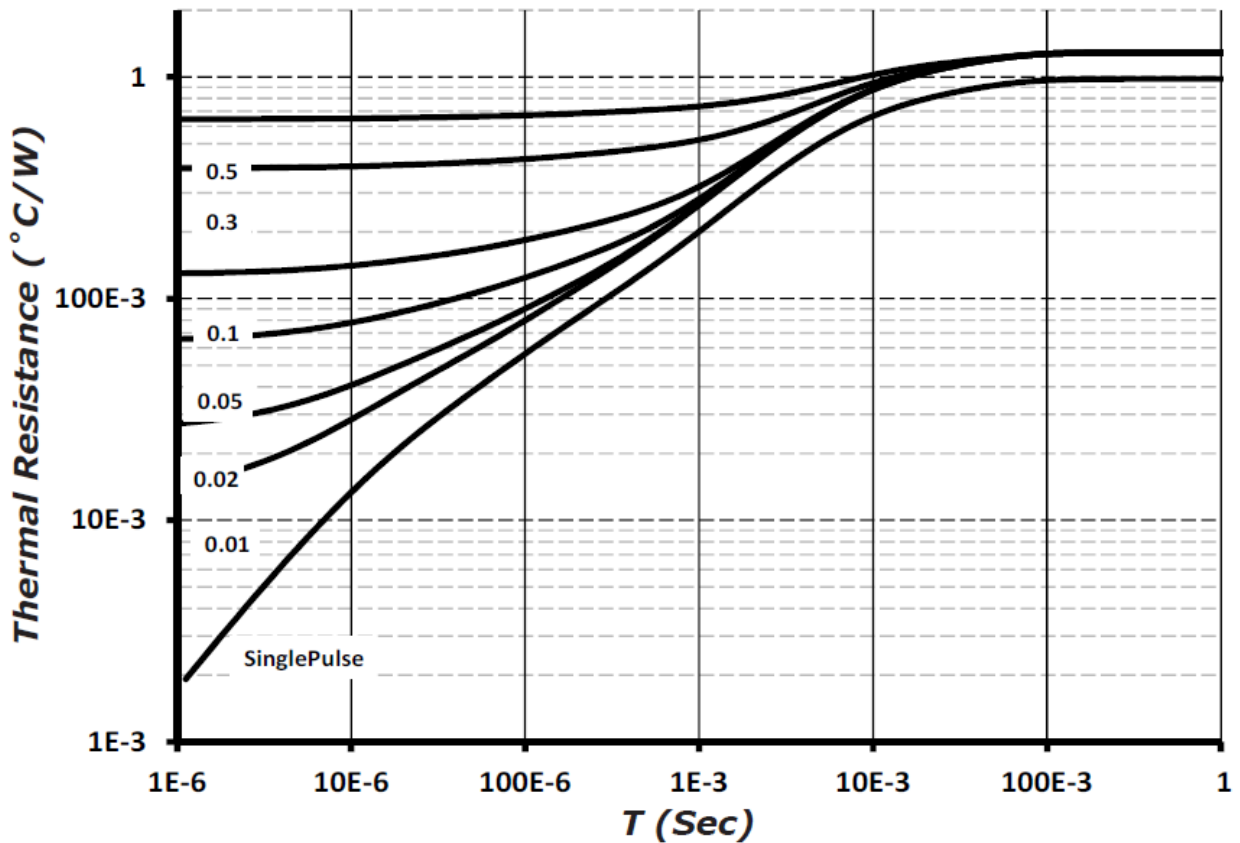
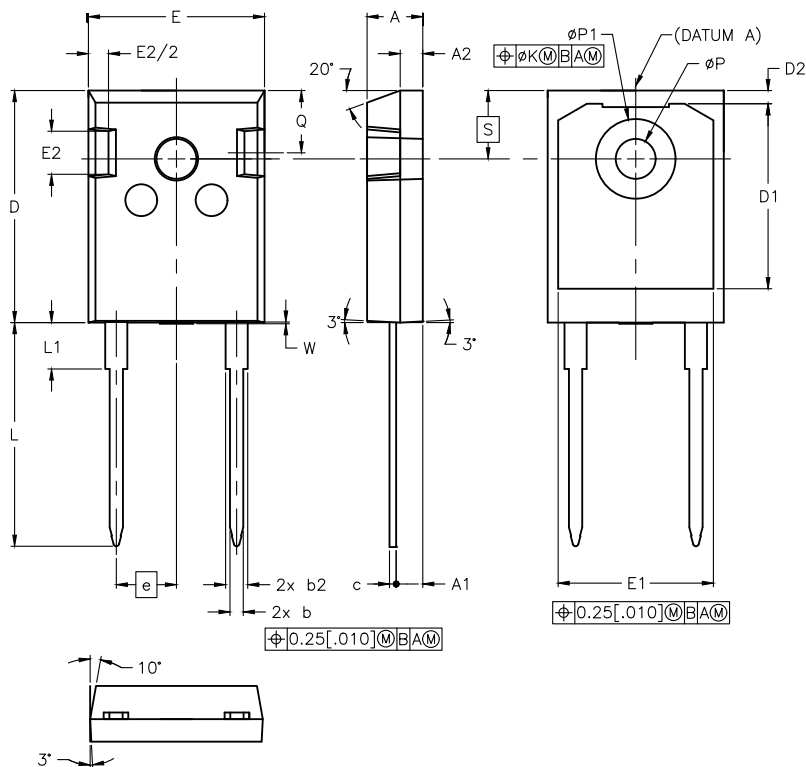


Figure 9. Transient Thermal Impedance

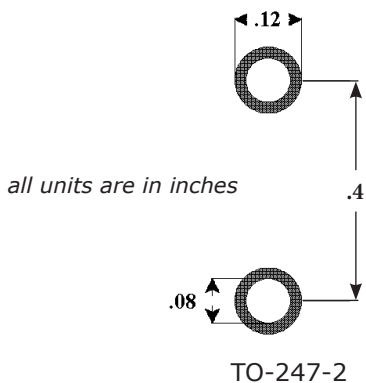
Outline Drawing

TO-247-2 Package Outline Dimensions

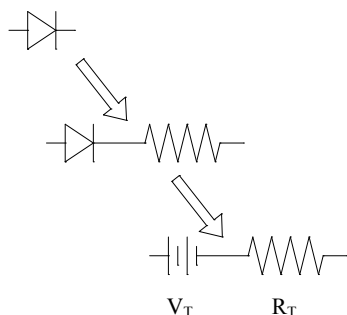


POS	Inches		Millimeters	
	Min	Max	Min	Max
A	.190	.205	4.70	5.31
A1	.087	.102	2.21	2.59
A2	.059	.098	1.50	2.49
b	.039	.055	0.99	1.40
b2	.065	.094	1.65	2.39
c	.015	.035	0.38	0.89
D	.819	.845	20.80	21.46
D1	.515	-	13.08	-
D2	.020	.053	0.51	1.35
E	.620	.640	15.49	16.26
E1	.530	-	13.46	-
E2	.135	.157	3.43	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



$$V_f = V_T + I_f \cdot R_T$$

$$V_T = 0.98 + (T_j \cdot -1.71 \cdot 10^{-3})$$

$$R_T = 0.040 + (T_j \cdot 5.32 \cdot 10^{-4})$$

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