

### Features

- 1700-Volt Schottky Rectifier
- Zero Reverse Recovery
- Zero Forward Recovery Voltage
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Switching
- Halogen-Free; RoHS Complaint



$V_{RRM}$	=	1700 V
$I_F; T_c < 150^\circ C$	=	20A
$Q_c$	=	205 nC

### Benefits

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



TO-247-2

Part Number	Package	Marking
C5D20170H	TO-247-2	C5D20170H

### Package



### Maximum Ratings

Symbol	Parameter	Value	Unit	Test Conditions	Note
$V_{RRM}$	Repetitive Peak Reverse Voltage	1700	V		
$V_{RSM}$	Surge Peak Reverse Voltage	1700	V		
$V_{DC}$	DC Blocking Voltage	1700	V		
$I_F$	Continuous Forward Current	20	A	$T_c < 150^\circ C$	
$I_{FRM}$	Repetitive Peak Forward Surge Current	99 57	A	$T_c = 25^\circ C, t_p = 10 \text{ ms}, \text{Half Sine Wave}, D = 1$ $T_c = 110^\circ C, t_p = 10 \text{ ms}, \text{Half Sine Wave}, D = 1$	
$I_{FSM}$	Non-Repetitive Peak Forward Surge Current	117 88	A	$T_c = 25^\circ C, t_p = 10 \text{ ms}, \text{Half Sine Wave}, D = 1$ $T_c = 110^\circ C, t_p = 10 \text{ ms}, \text{Half Sine Wave}, D = 1$	
$P_{tot}$	Power Dissipation	377 163	W	$T_c = 25^\circ C$ $T_c = 110^\circ C$	
$T_c$	Maximum Case Temperature	150	$^\circ C$		
$T_j$	Operating Junction Range	-55 to +175	$^\circ C$		
$T_{stg}$	Storage Temperature Range	-55 to +150	$^\circ C$		
	TO-247 Mounting Torque	1 8.8	Nm lbf-in	M3 Screw 6-32 Screw	

### Electrical Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
$V_F$	Forward Voltage	1.5 3.0	2.2 3.5	V	$I_F = 20\text{ A } T_J = 25^\circ\text{C}$ $I_F = 20\text{ A } T_J = 175^\circ\text{C}$	
$I_R$	Reverse Current	20 100	100 400	$\mu\text{A}$	$V_R = 1700\text{ V } T_J = 25^\circ\text{C}$ $V_R = 1700\text{ V } T_J = 175^\circ\text{C}$	
$Q_C$	Total Capacitive Charge	205		nC	$V_R = 1700\text{ V}, I_F = 20\text{ A}$ $di/dt = 200\text{ A}/\mu\text{s}$ $T_J = 25^\circ\text{C}$	
C	Total Capacitance	2079 187.5 97		pF	$V_R = 0\text{ V}, T_J = 25^\circ\text{C}, f = 1\text{ MHz}$ $V_R = 200\text{ V}, T_J = 25^\circ\text{C}, f = 1\text{ MHz}$ $V_R = 800\text{ V}, T_J = 25^\circ\text{C}, f = 1\text{ MHz}$	

Note:

1. This is a majority carrier diode, so there is no reverse recovery charge.

### Thermal Characteristics

Symbol	Parameter	Typ.	Unit
$R_{\theta JC}$	Thermal Resistance from Junction to Case	0.4	$^\circ\text{C}/\text{W}$

### Typical Performance

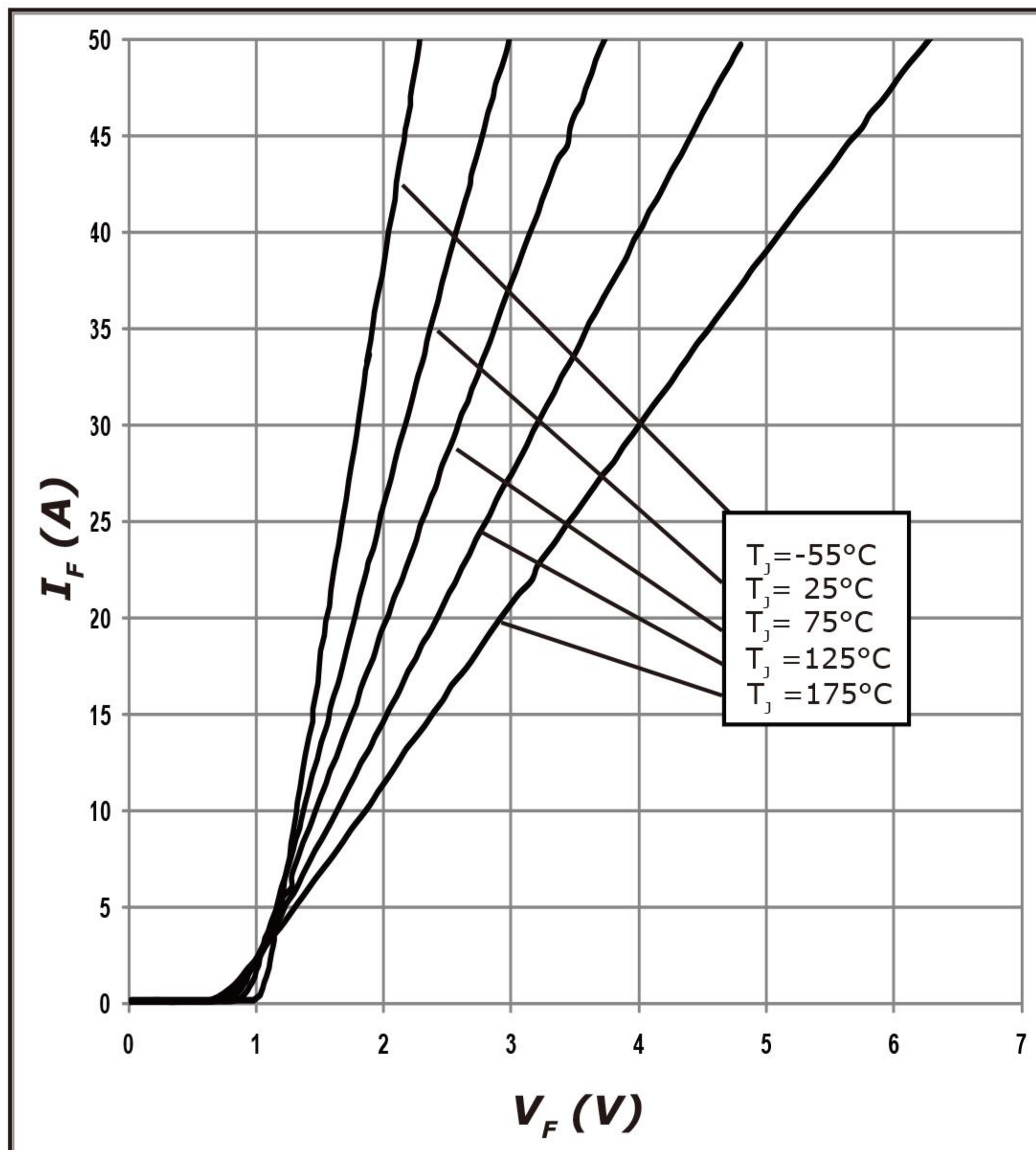


Figure 1. Forward Characteristics

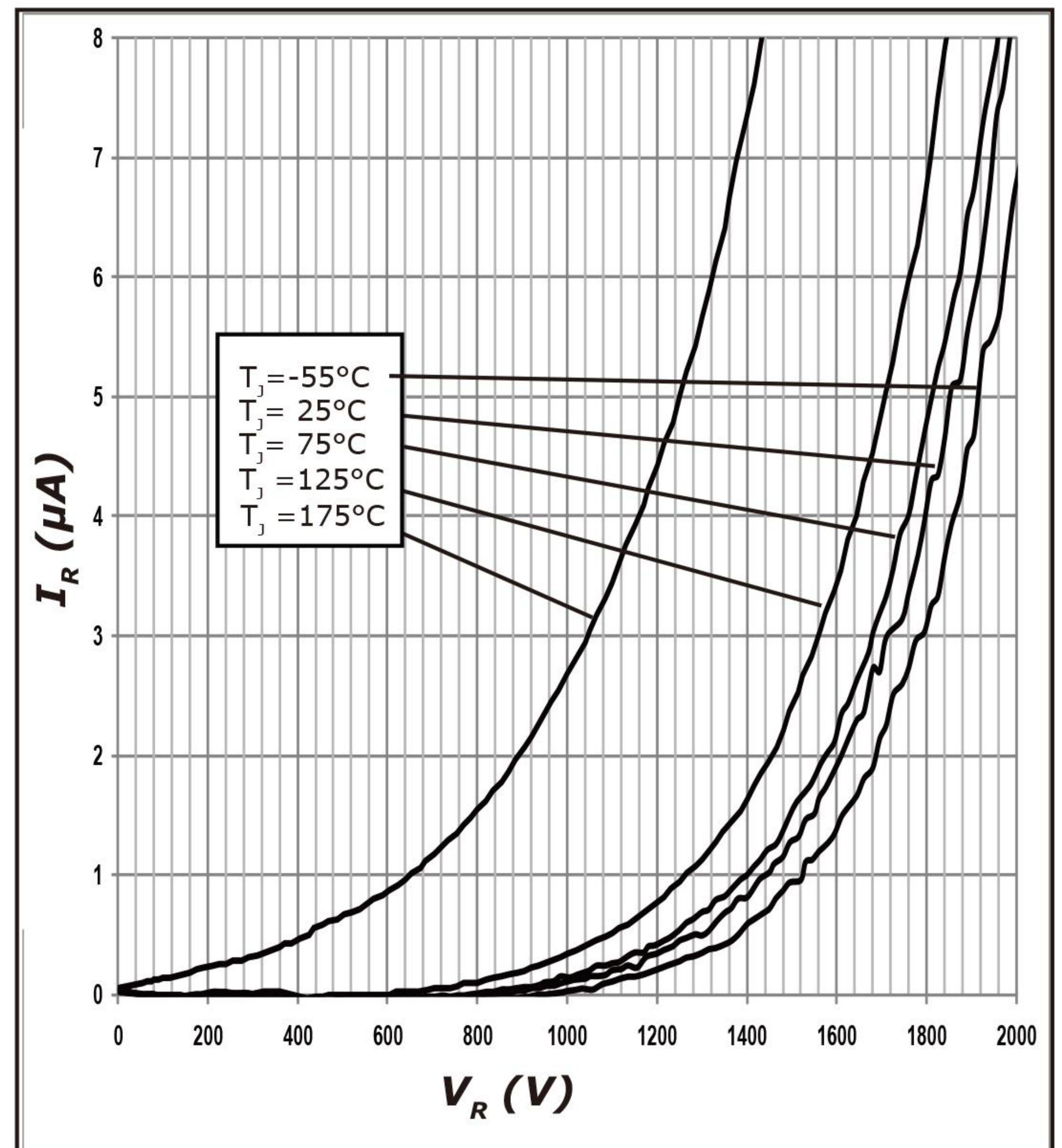


Figure 2. Reverse Characteristics

### Typical Performance

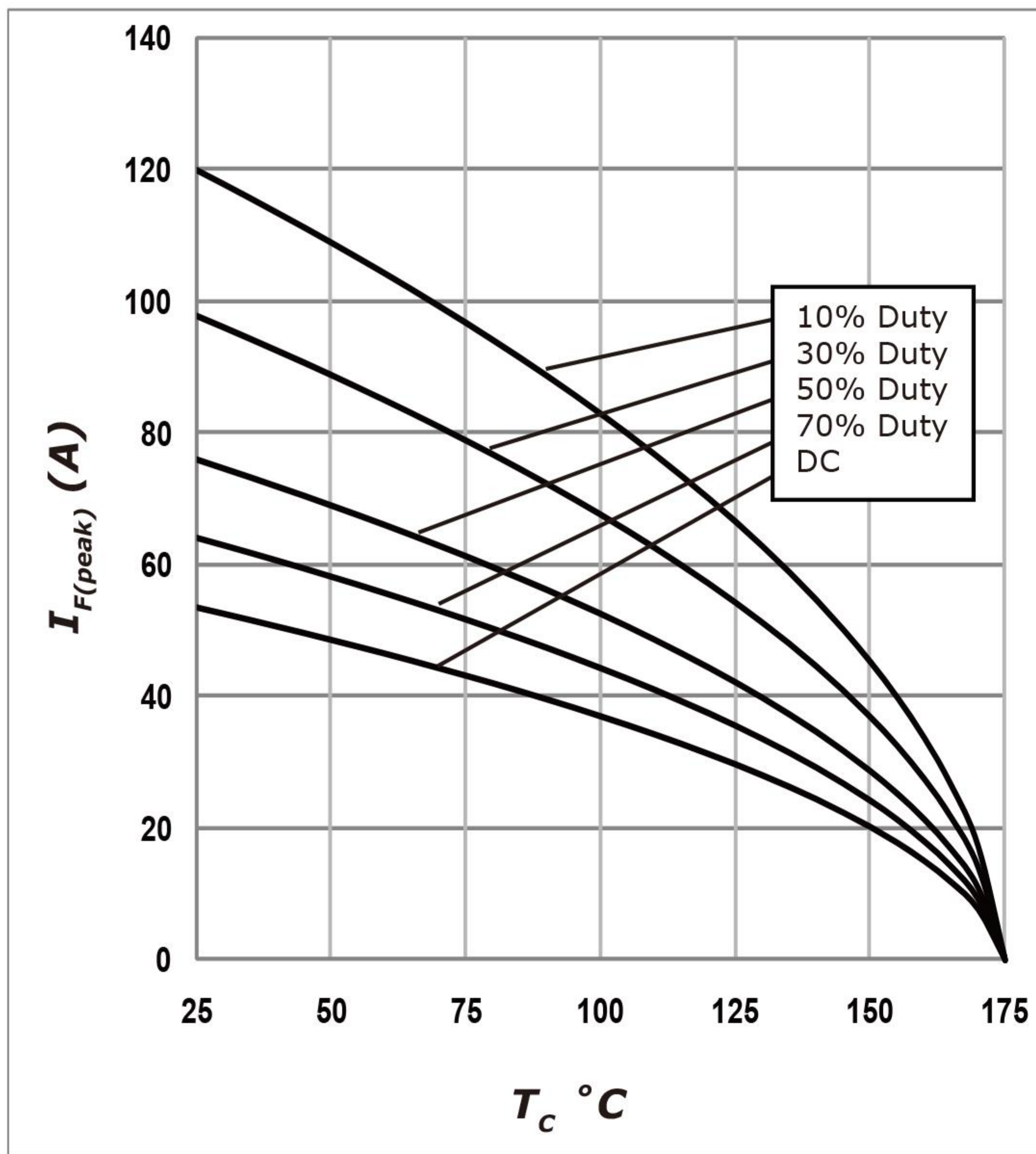


Figure 3. Current Derating

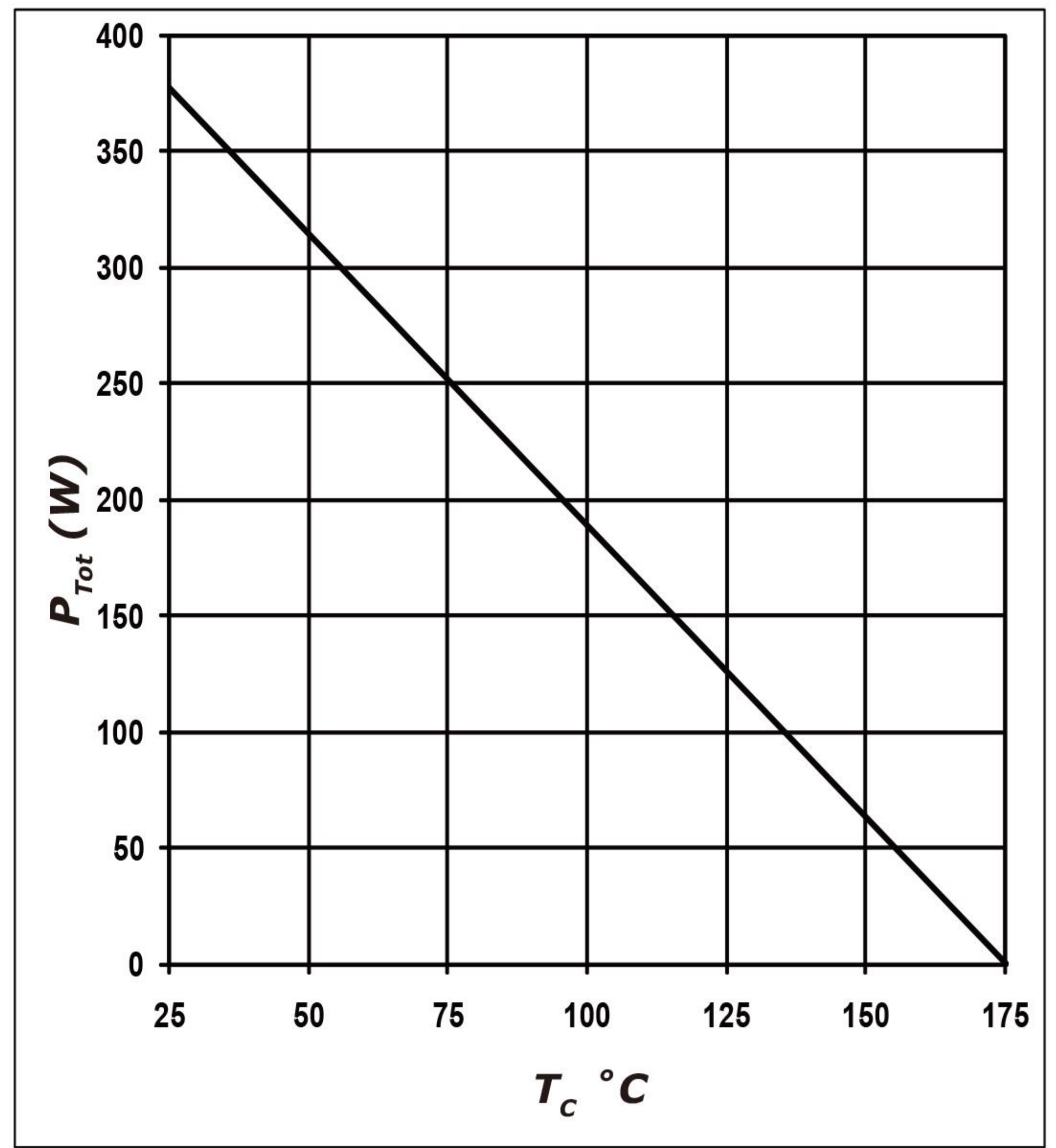


Figure 4. Power Derating

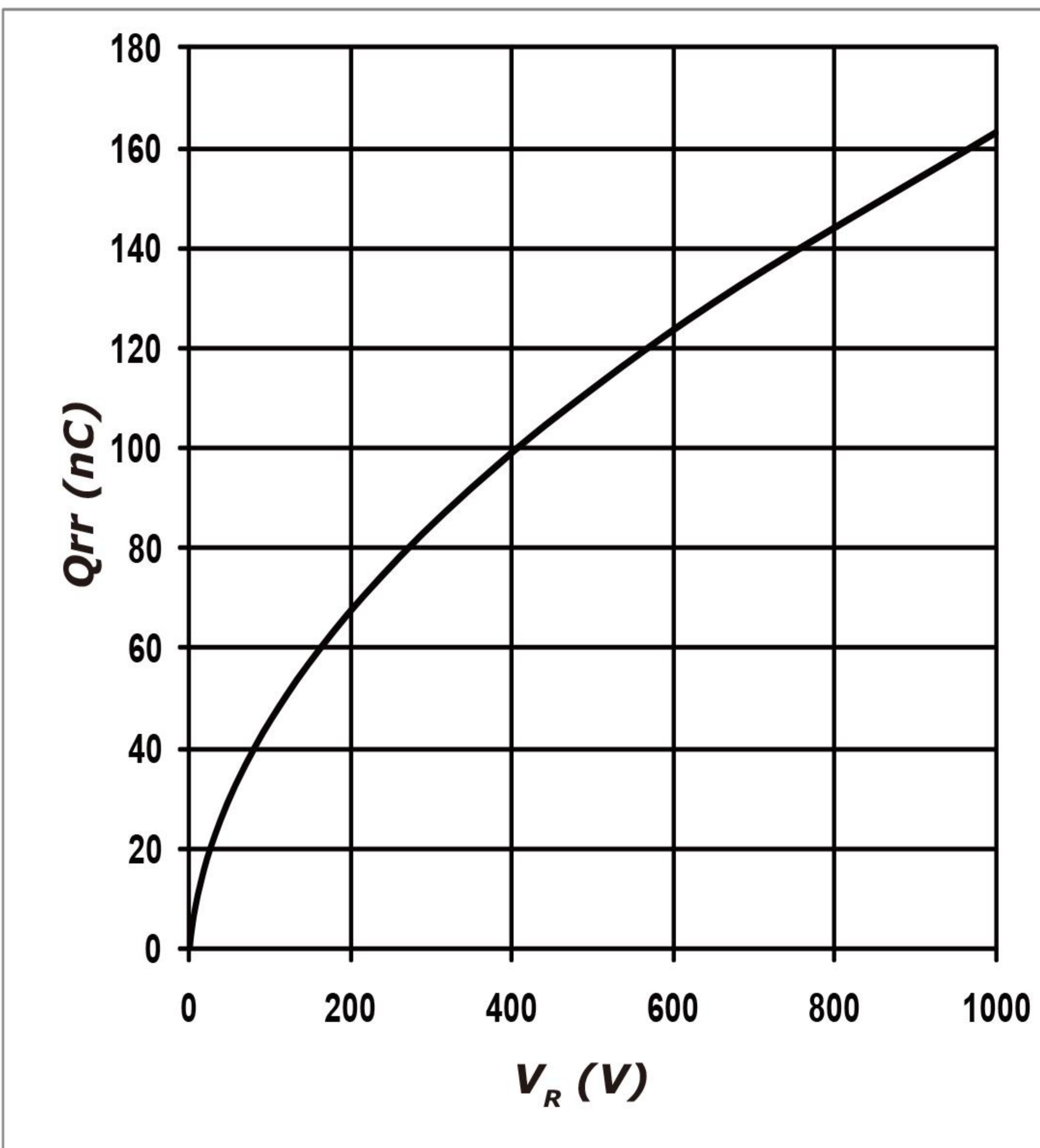


Figure 5. Recovery Charge vs. Reverse Voltage

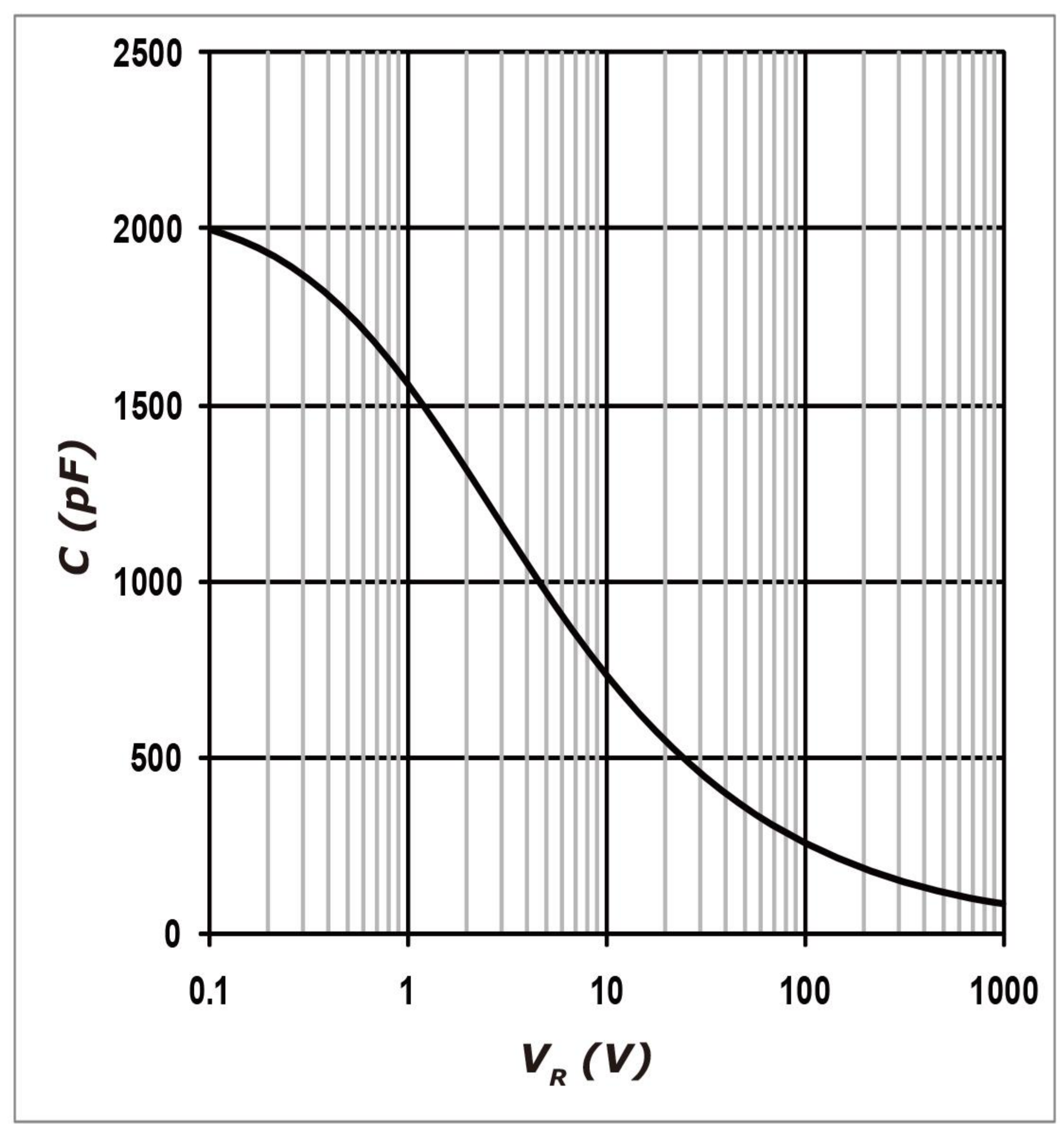


Figure 6. Capacitance vs. Reverse Voltage

### Typical Performance

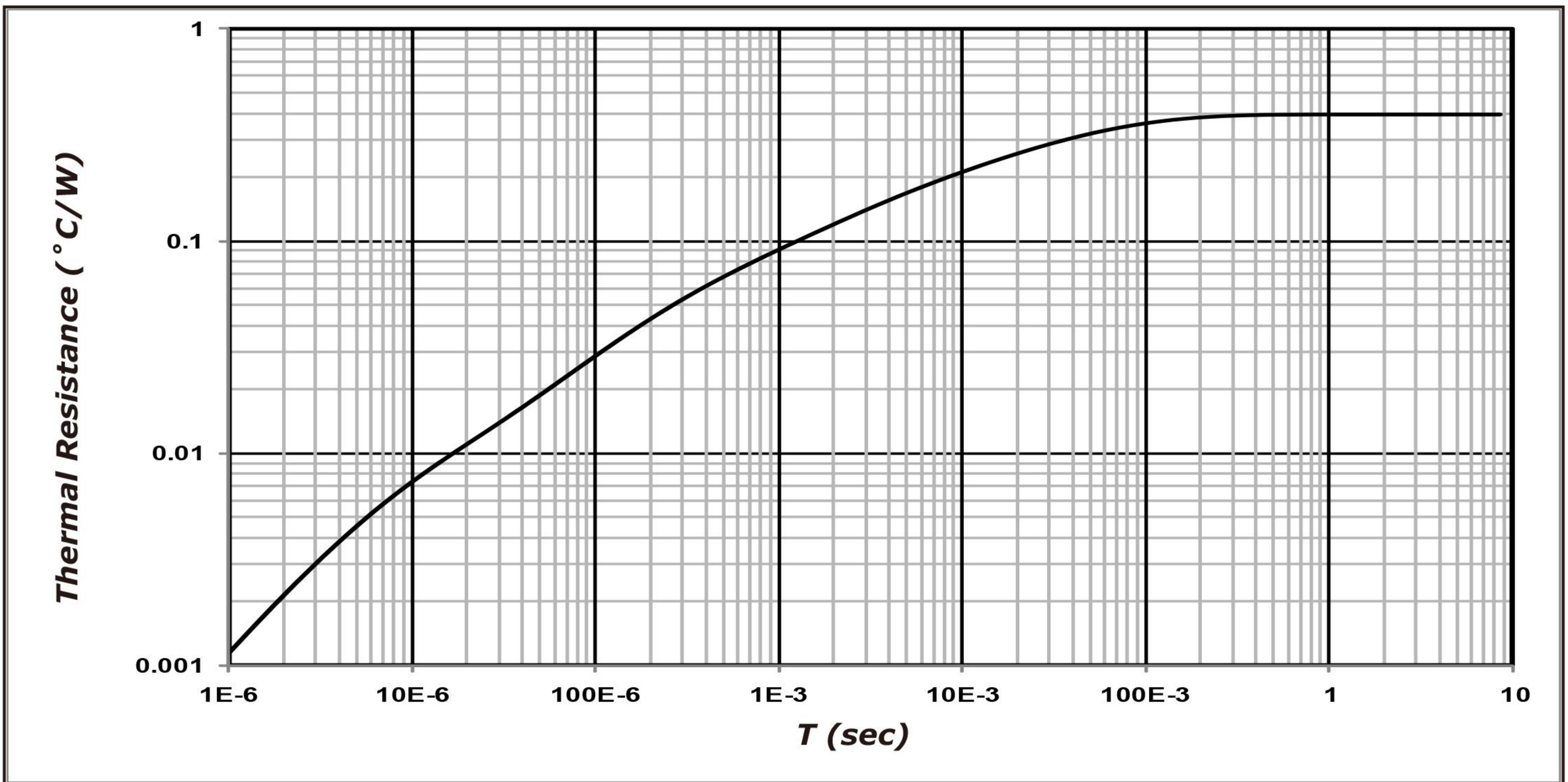
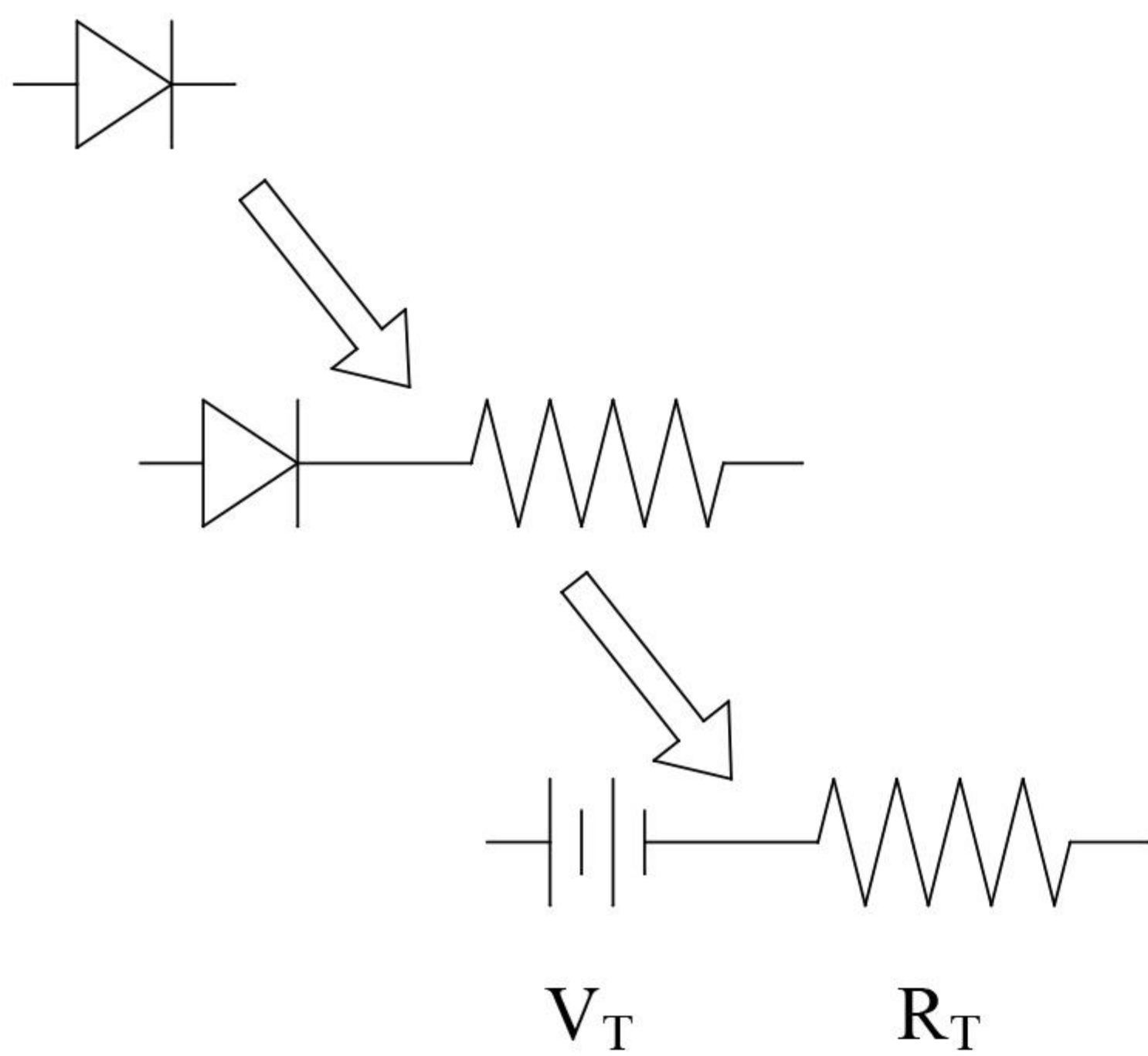


Figure 7. Transient Thermal Impedance

### Diode Model



$$V_{f_T} = V_T + I_f * R_T$$

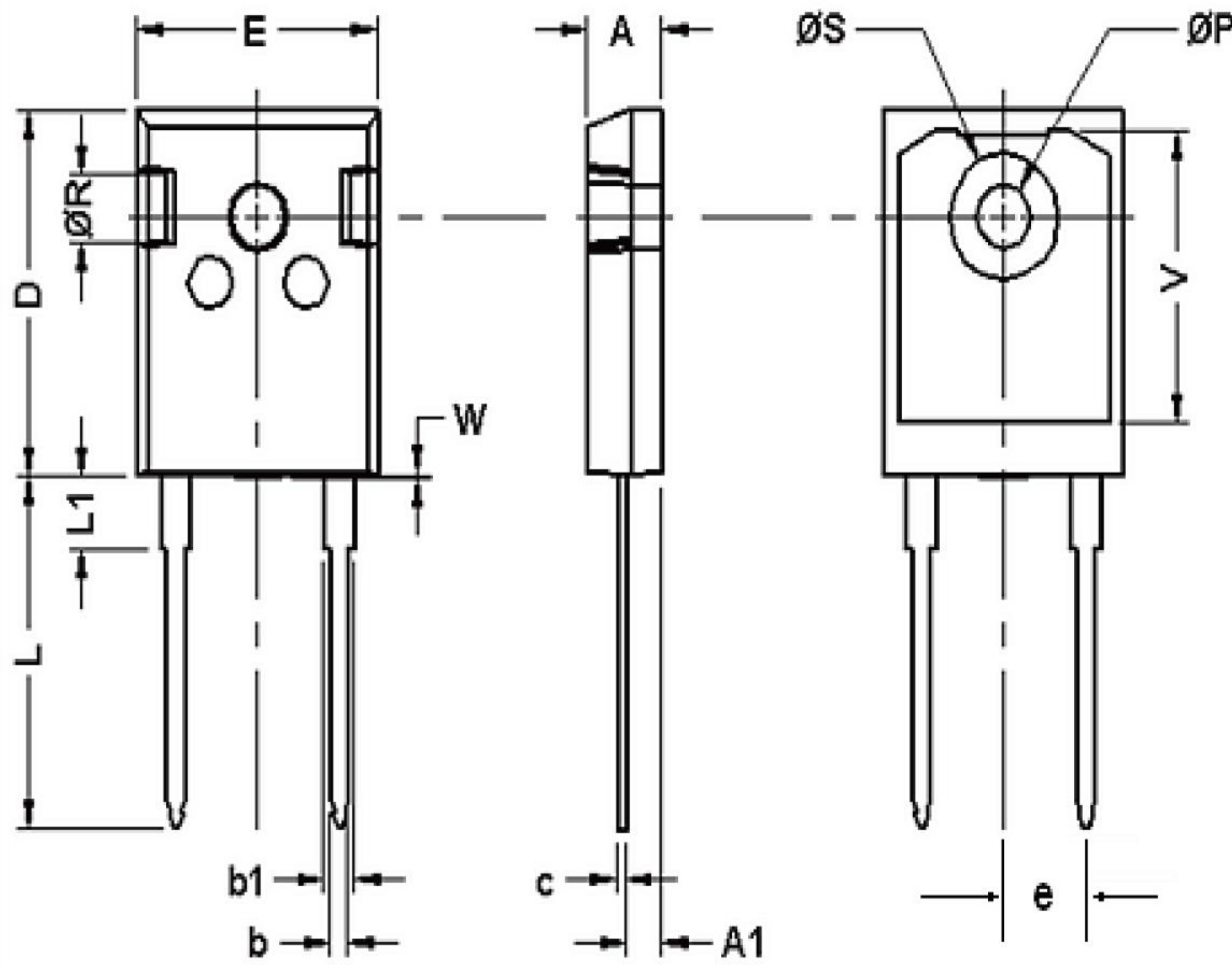
$$V_T = 0.99 + (T_j * -1.50 * 10^{-3})$$

$$R_T = 0.03 + (T_j * 0.5 * 10^{-3})$$

**Note:** T<sub>j</sub> = Diode Junction Temperature in Degrees Celsius

## Package Dimensions

Package TO-247-2



POS	Inches		Millimeters	
	Min	Max	Min	Max
A	0.185	0.209	4.70	5.31
A1	0.087	0.102	2.21	2.59
b	0.040	0.055	1.02	1.40
b1	0.065	0.088	1.65	2.23
C	0.016	0.031	0.41	0.79
D	0.819	0.845	20.80	21.46
E	0.61	0.640	15.49	16.26
e	0.215	0.215	5.46	5.46
L	0.78	0.80	19.81	20.32
L1	0.164	0.176	4.17	4.47
øP	0.140	0.144	3.56	3.66
Q	0.212	0.244	5.38	6.20
øR	0.135	0.157	3.43	3.99
øS	0.278	0.288	7.06	7.32
V	0.652	0.662	16.56	16.81
W	0.000	0.006	0.00	0.15



Part Number	Package	Marking
C5D20170H	TO-247-2	C5D20170H