

SiC Diode

V_R	650V
I_F	40 A
Q_C	101 nC

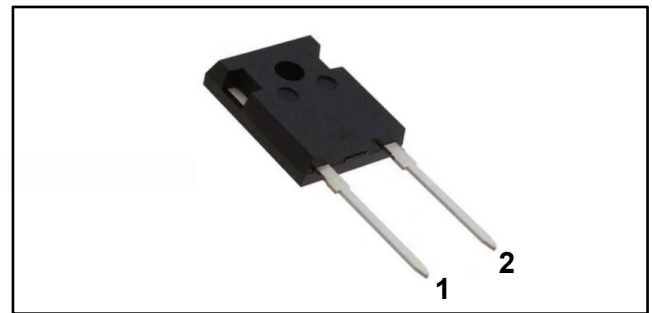
Features

- Low Forward Voltage Drop
- High-Speed Switching
- Positive Temperature Coefficient
- Temperature-Independent Switching Behavior

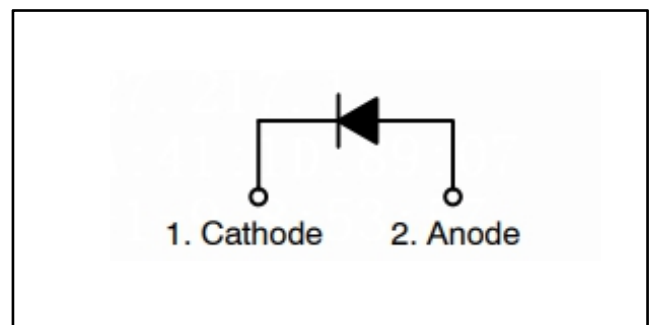
Applications

- Power Factor Correction
- Sever Mode Power Supplies
- Uninterruptible Power Supply

● **Outline**



● **Inner Circuit**



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

Symbol	Parameter	Conditions	Value		Unit	Note
			Min	Typ		
V_{RRM}	Repetitive Peak Reverse Voltage		-	650	V	
V_{DC}	DC Blocking Voltage	$I_R=1\text{mA}$, $T_C=25^\circ\text{C}$	650	935	V	Fig.3
I_F	Continuous Forward Current	$T_C=25^\circ\text{C}$	-	86	A	Fig.4
		$T_C=125^\circ\text{C}$	-	50	A	
		$T_C=143^\circ\text{C}$	-	40	A	
I_{FRM}	Repetitive Peak Forward Surge Current	$T_C=25^\circ\text{C}$, $t_p=10\text{ms}$, Half Sine Wave (After test: $V_F \geq 0.5\text{V}@I_F=1\text{mA}$; $V_R \geq 500\text{V}@I_R=1\text{mA}$; $I_R \leq 5\text{mA}@V_R=650\text{V}$)	200	250	A	
		$T_C=125^\circ\text{C}$, $t_p=10\text{ms}$, Half Sine Wave (After test: $V_F \geq 0.5\text{V}@I_F=1\text{mA}$; $V_R \geq 500\text{V}@I_R=1\text{mA}$; $I_R \leq 5\text{mA}@V_R=650\text{V}$)	180	225	A	
I_{FSM}	Non-repetitive Peak Forward Surge Current	$T_C=25^\circ\text{C}$, $t_p=10\text{ms}$, Half Sine Wave (After test: $V_F \geq 0.5\text{V}@I_F=1\text{mA}$; $V_R \geq 500\text{V}@I_R=1\text{mA}$; $I_R \leq 5\text{mA}@V_R=650\text{V}$)	218	272	A	Fig.10
		$T_C=125^\circ\text{C}$, $t_p=10\text{ms}$, Half Sine Wave (After test: $V_F \geq 0.5\text{V}@I_F=1\text{mA}$; $V_R \geq 500\text{V}@I_R=1\text{mA}$; $I_R \leq 5\text{mA}@V_R=650\text{V}$)	196	245	A	
P_{tot}	Power Dissipation	$T_C=25^\circ\text{C}$	-	357	W	Fig.5
		$T_C=125^\circ\text{C}$	-	119	W	
T_{stg}	Storage Temperature		-	-55 to 175	$^\circ\text{C}$	

SiC Diode
Electrical Characteristics

Symbol	Parameter	Conditions	Value			Unit	Note
			Min	Typ	Max		
V _F	Forward Voltage	I _F =40A, T _j =25°C	-	1.42	1.6	V	Fig.1
		I _F =40A, T _j =125°C	-	1.71	-	V	
		I _F =40A, T _j =175°C	-	1.93	-	V	
I _R	Reverse Current	V _R =650V, T _j =25°C	-	0.02	5	μA	Fig.2
		V _R =650V, T _j =125°C	-	0.11	-	μA	
		V _R =650V, T _j =175°C	-	0.63	-	μA	
Q _c	Total Capacitive Charge	V _R =400V, T _j =25°C	-	101	-	nC	Fig.7
C	Total Capacitance	f=1 MHz, V _R =0V, T _j =25°C	-	1890	-	pF	Fig.6
		f=1 MHz, V _R =200V, T _j =25°C	-	193	-	pF	
		f=1 MHz, V _R =400V, T _j =25°C	-	188	-	pF	
E _c	Capacitance Stored Energy	V _R =400V	-	16	-	μJ	Fig.8

Thermal Characteristics

Symbol	Parameter	Min	Typ	Max	Unit	Note
R _{th(j-c)}	Thermal Resistance , Junction to Case	-	0.42	-	°C/W	Fig.9

Electrical Characteristic Curves

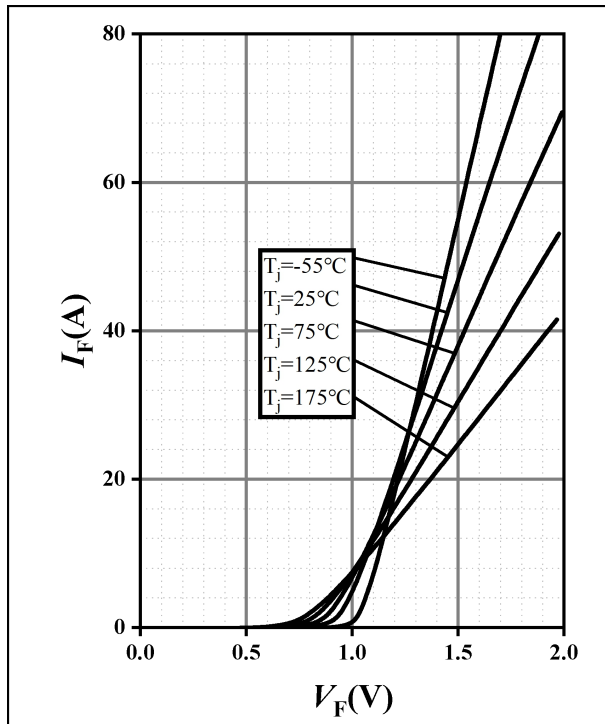


Fig.1 Forward Characteristics

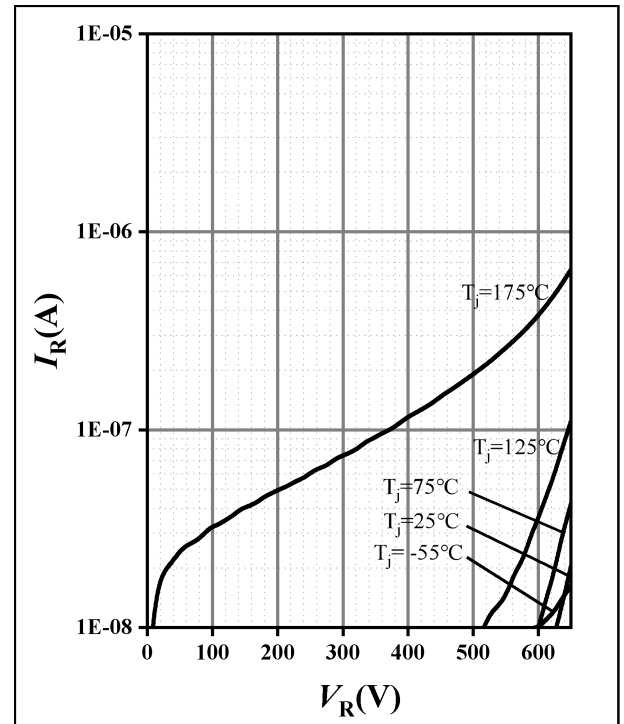


Fig.2 Reverse Characteristics

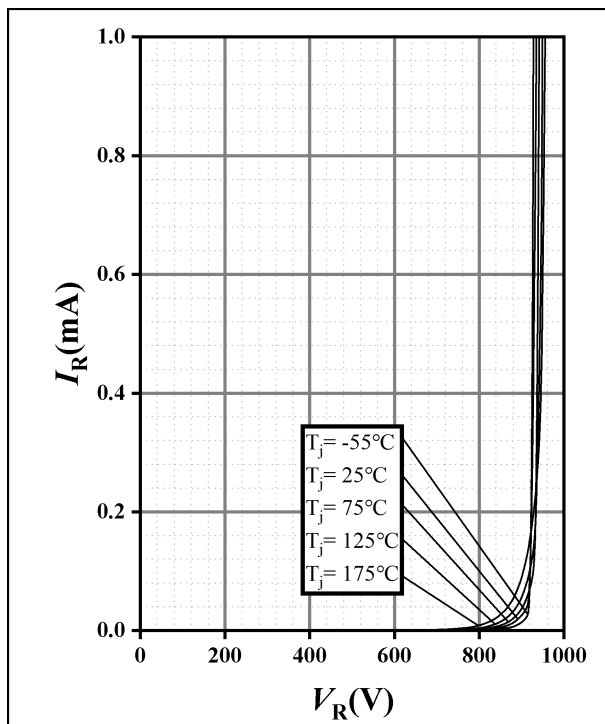


Fig.3 Reverse Characteristics

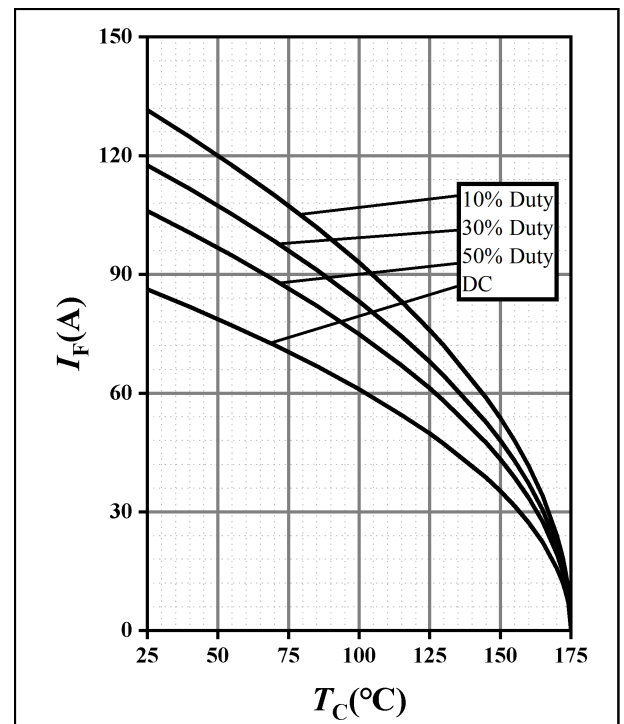


Fig.4 Peak Forward Current Derating

Electrical Characteristic Curves

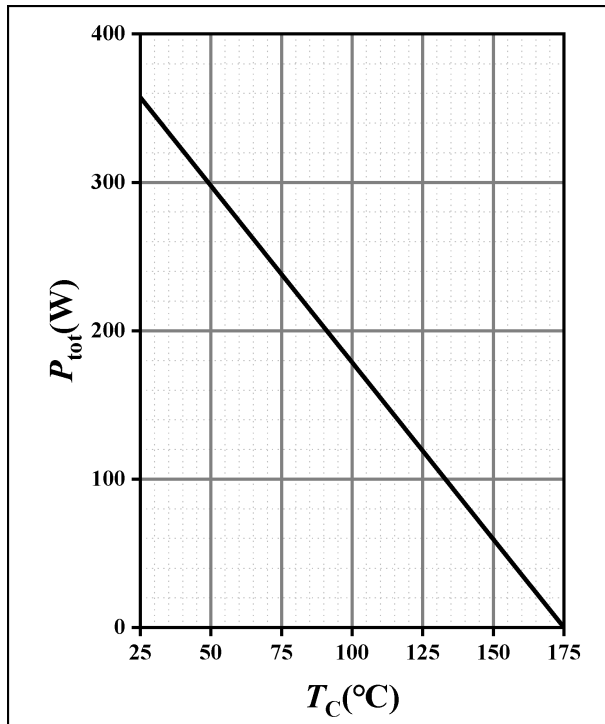


Fig.5 Power Dissipation

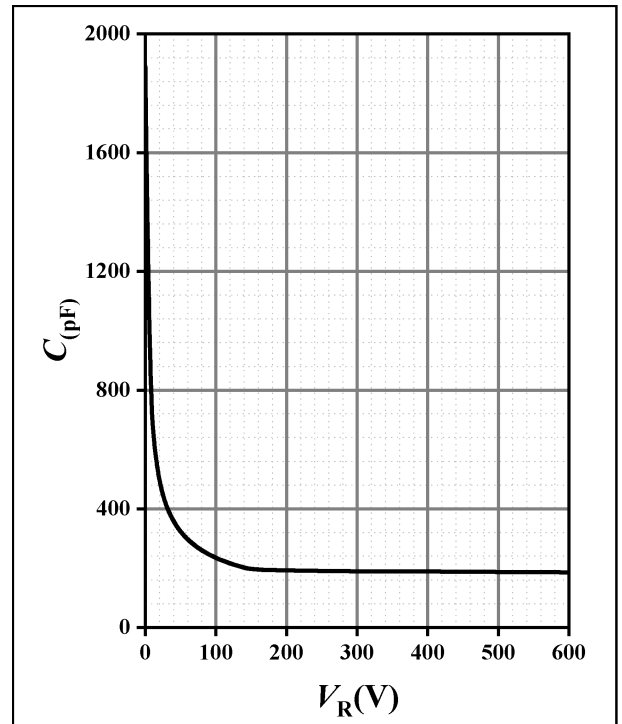


Fig.6 Capacitance vs. Reverse Voltage

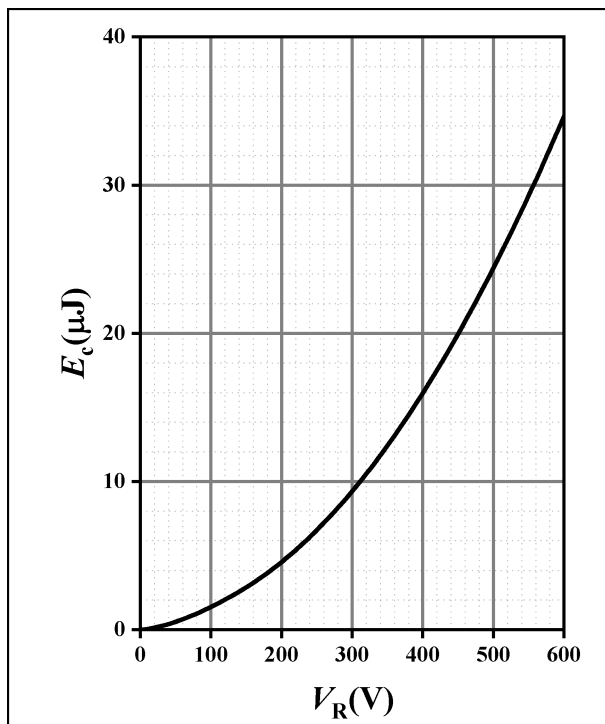


Fig.7 Capacitance Charge vs. Reverse Voltage

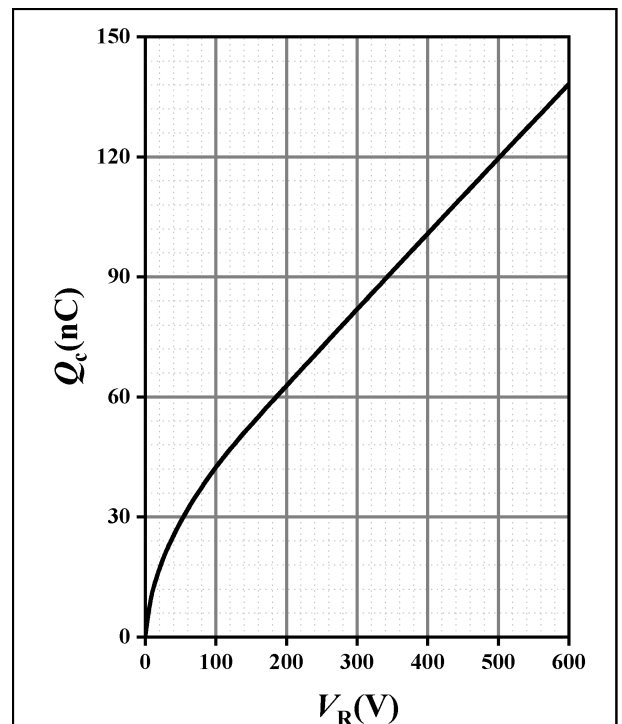


Fig.8 Capacitance Stored Energy vs. Reverse Voltage

SiC Diode

Electrical Characteristic Curves

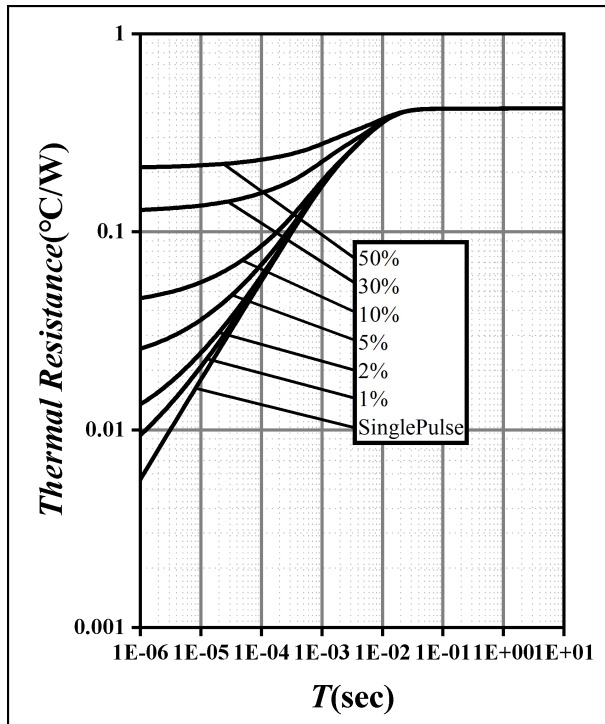


Fig.9 Transient Thermal Impedance

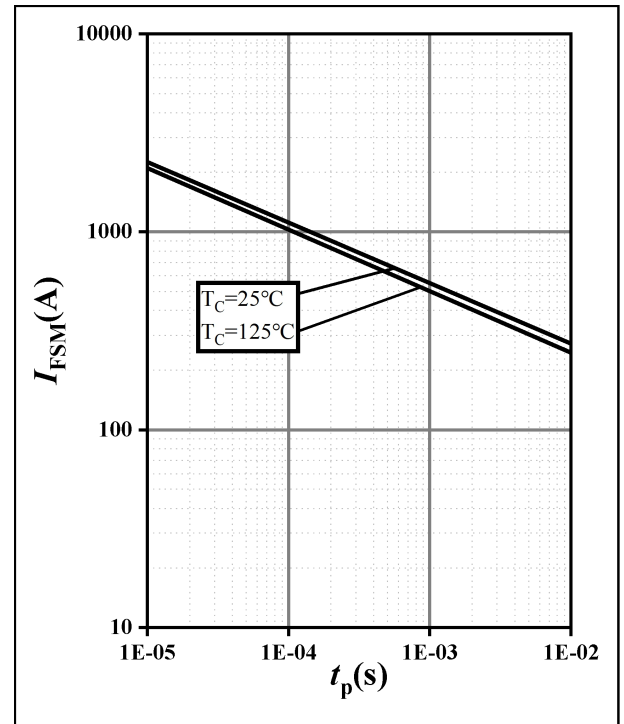
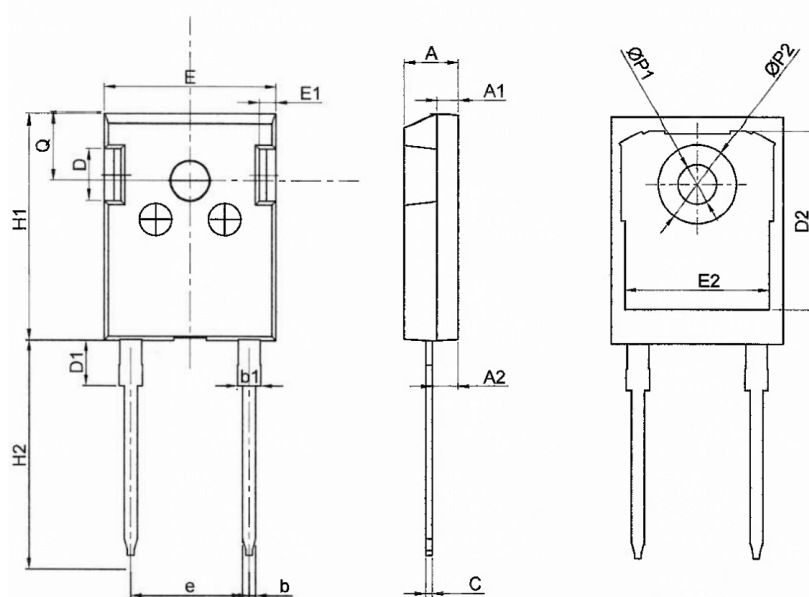


Fig.10 Non-Repetitive Peak Forward Surge Current vs. Pulse Duration

SiC Diode

Package Outline



SYMBOL	mm		
	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	1.85	2.00	2.15
A2	2.20	2.40	2.60
b	1.10	1.20	1.30
b1	2.04	2.14	2.24
C	0.50	0.60	0.70
D	4.51	4.71	4.91
D1	-	-	4.35
D2	16.25	16.55	16.85
E	15.50	15.80	16.10
E1	1.33	1.53	1.73
E2	13.00	13.30	13.60
e	10.87 BSC		
H1	20.70	20.90	21.10
H2	19.62	19.92	20.22
ØP1	-	-	3.80
ØP2	-	-	7.30
Q	6.15 BSC		