

650V Silicon Carbide Schottky Diode

DESCRIPTION :

- Zero reverse recovery current
- Zero forward recovery voltage
- Temperature independent switching behavior
- Excellent Surge Current Capability
- Positive Temperature Coefficient on V_F
- High Frequency Operation
- RoHS Compliant

V_{RRM}	650V
I_F	1A ($T_c=90^\circ\text{C}$)
Q_C	7.5 nC



SMAF

TYPICAL APPLICATIONS :

- SMPS, PFC
- UPS
- Motor drives

MAXIMUM RATINGS (at $T_J = 25^\circ\text{C}$, unless otherwise specified)

Characteristic	Condition	Symbol	Value	Unit
Repetitive Peak Reverse Voltage		V_{RRM}	650	V
Continuous Forward Current	$T_c=25^\circ\text{C}$ $T_c=90^\circ\text{C}$	I_F	1.5 1	A
Non-Repetitive Forward Surge Current	$T_c=25^\circ\text{C}$, $t_p=10\text{ms}$, Half sine pulse	I_{FSM}	12	A
i^2t value	$T_c=25^\circ\text{C}$, $t_p=10\text{ms}$	$\int i^2 dt$	0.72	A^2S
Power dissipation	$T_c=25^\circ\text{C}$ $T_c=110^\circ\text{C}$	P_{tot}	2.1 0.9	W
Operation Junction temperature		T_J	-55~+175	$^\circ\text{C}$
Storage temperature		T_{STG}	-55~+175	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Typical	Unit
Thermal resistance	Junction to case	$R_{th(j-c)}$	69.3	$^\circ\text{C}/\text{W}$

ELECTRICAL CHARACTERISTICS (at $T_J = 25\text{ }^\circ\text{C}$, unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
DC Blocking Voltage	V_{DC}	650			V
Forward Voltage IF = 1A, $T_J = 25^\circ\text{C}$ IF = 1A, $T_J = 175^\circ\text{C}$	V_F		1.2 1.3		V
Reverse Current VR = 650V, $T_J = 25^\circ\text{C}$ VR = 650V, $T_J = 175^\circ\text{C}$	I_R		0.5 8		μA
Total Capacitive Charge VR = 400V	Q_C		7.5		nC
Total capacitance VR = 1V, f = 1MHz VR = 300V, f = 1MHz VR = 600V, f = 1MHz	C		81 14.7 13.6		pF
Capacitance Stored Energy VR = 400 V	E_C		1.8		μJ

Typical Performance

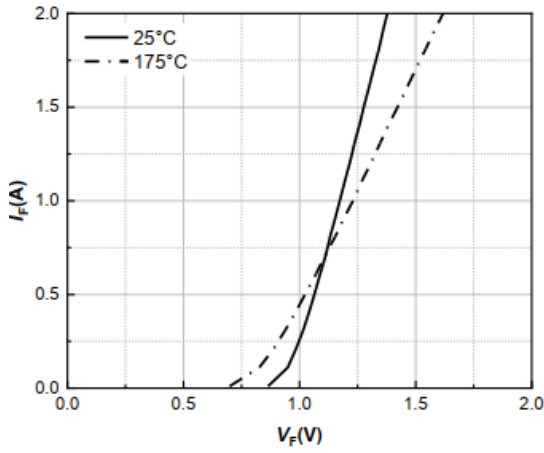


Figure 1. Forward characteristics

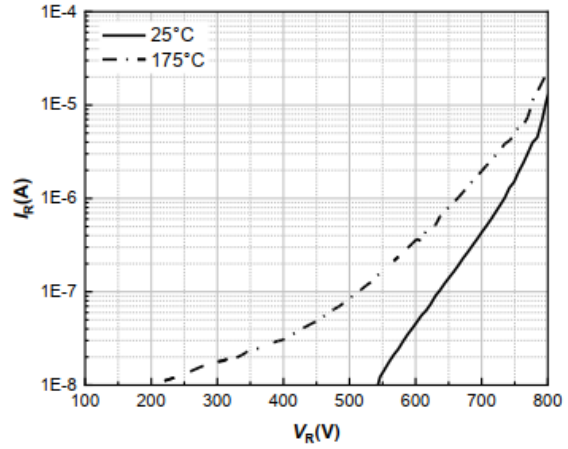


Figure 2. Reverse characteristics

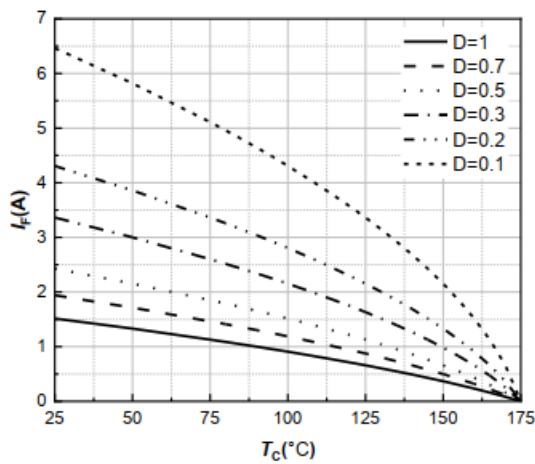


Figure 3. Diode forward current as function of temperature, D=duty cycle

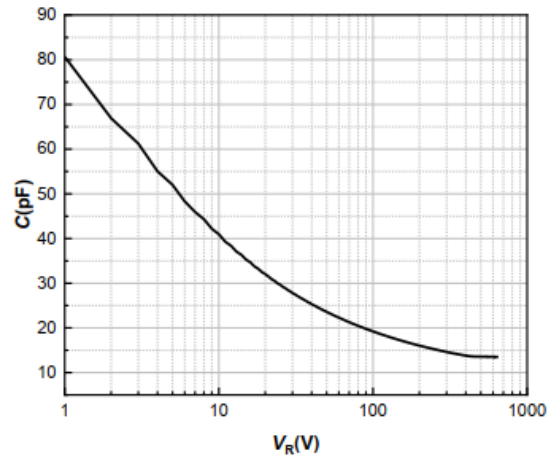


Figure 4. Typical capacitance as function of reverse voltage, $C=f(V_R)$; $T_j=25^\circ\text{C}$; $f=1\text{ MHz}$

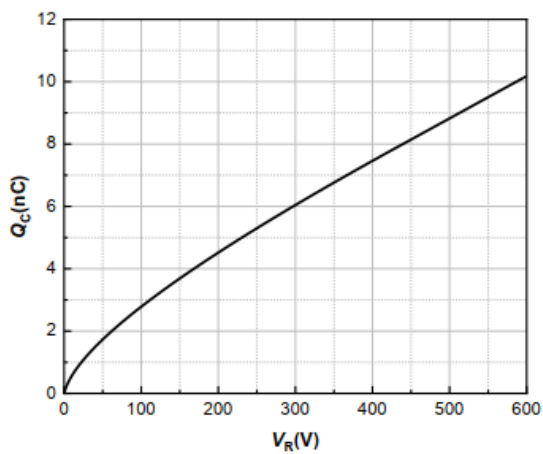


Figure 5. Typical reverse charge as function of reverse voltage

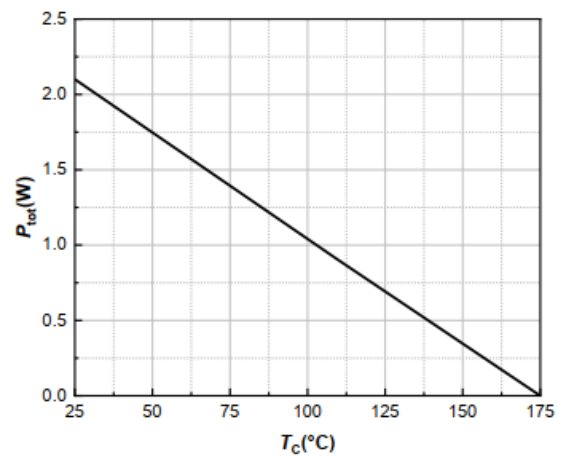


Figure 6. Power dissipation as function of case temperature

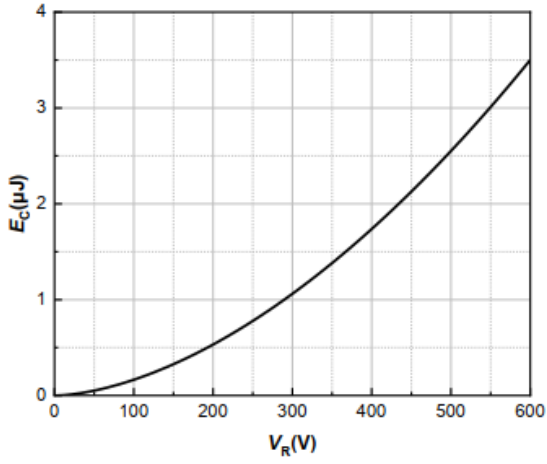
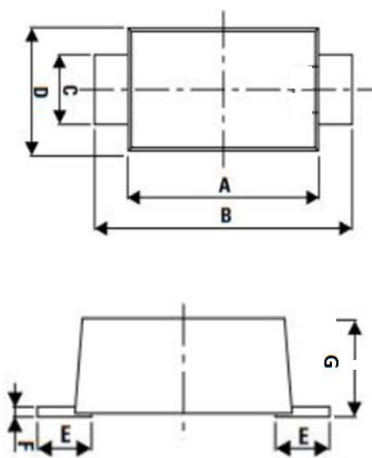


Figure 7. Capacitance Stored Energy

• Circuit diagram



• Package outlines : Dimensions in (mm)



DIM	MILLIMETERS	
	MIN	MAX
A	4.20	4.40
B	5.20	5.40
C	1.30	1.50
D	2.55	2.75
E	1.00	1.10
F	0.12	0.18
G	1.00	1.10

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