

## 650V Silicon Carbide Schottky Diode

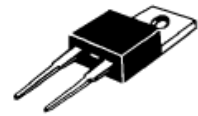
### DESCRIPTION :

- 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
$I_F$	15A ( $T_c=160^\circ\text{C}$ )
$Q_C$	59nC

### TYPICAL APPLICATIONS :

- Switch Mode Power Supplies, Power Factor Correction
- Uninterruptible Power Supplies
- Motor drives



TO-220AC

### 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	$T_c=25^\circ\text{C}$ $T_c=160^\circ\text{C}$	$I_F$	86 15	A
Non-Repetitive Forward Surge Current	$T_c=25^\circ\text{C}$ , $t_p=10\text{ms}$ , Half sine pulse	$I_{FSM}$	120	A
$i^2t$ value	$T_c=25^\circ\text{C}$ , $t_p=10\text{ms}$	$\int i^2 dt$	72	$\text{A}^2\text{S}$
Power dissipation	$T_c=25^\circ\text{C}$ $T_c=110^\circ\text{C}$	$P_{tot}$	294 127	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		$R_{th(j-c)}$	0.51	$^\circ\text{C}/\text{W}$

**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 = 15A, $T_J = 25^\circ\text{C}$ IF = 15A, $T_J = 175^\circ\text{C}$	$V_F$		1.26 1.38		V
Reverse Current VR = 650V, $T_J = 25^\circ\text{C}$ VR = 650V, $T_J = 175^\circ\text{C}$	$I_R$		0.5 3.0		$\mu\text{A}$
Total Capacitive Charge VR = 400V	$Q_C$		59		nC
Total capacitance VR = 1V, f = 1MHz VR = 300V, f = 1MHz VR = 600V, f = 1MHz	C		945 94 85		pF
Capacitance Stored Energy VR = 400 V	$E_C$		15		$\mu\text{J}$

Typical Performance

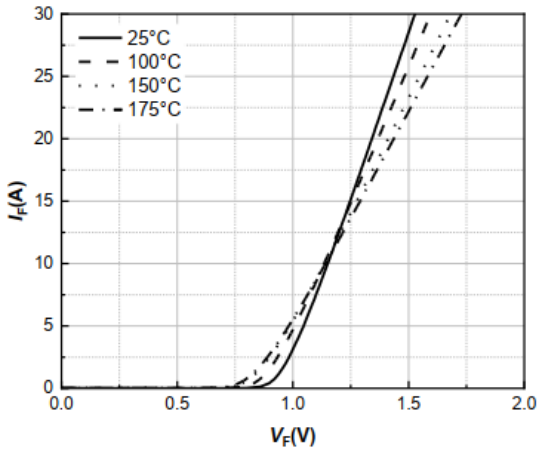


Figure 1. Forward characteristics

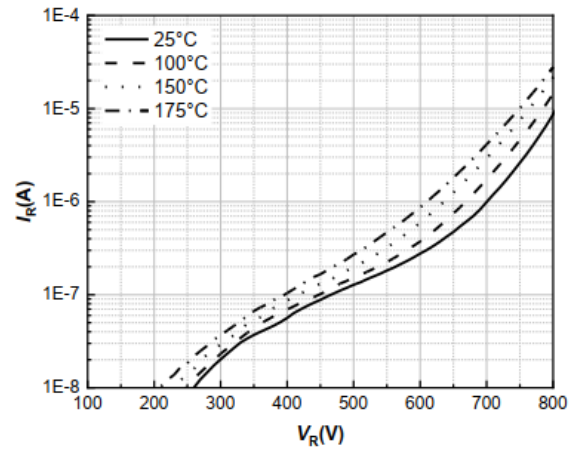


Figure 2. Reverse characteristics

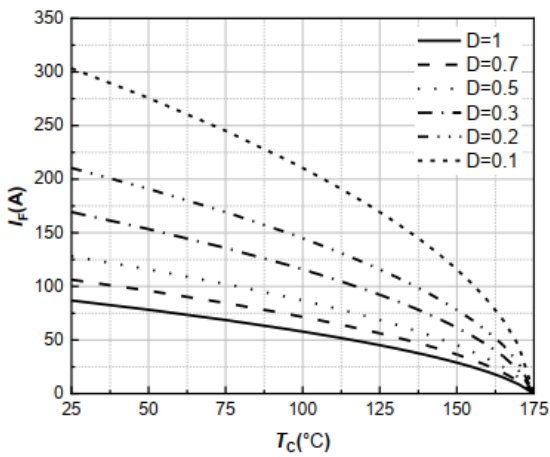


Figure 3. Diode forward current as function of temperature, D=duty cycle

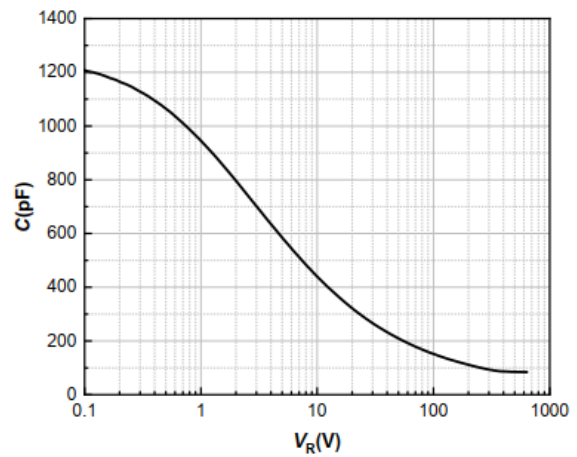


Figure 4. Typical capacitance as function of reverse voltage,  $C=f(V_R)$ ;  $T_j=25^\circ\text{C}$ ;  $f=1\text{ MHz}$

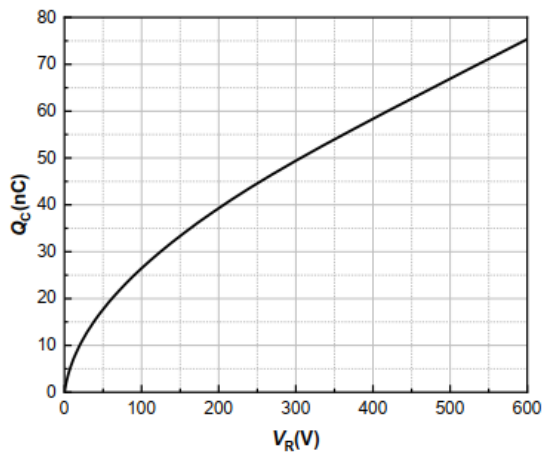


Figure 5. Typical reverse charge as function of reverse voltage

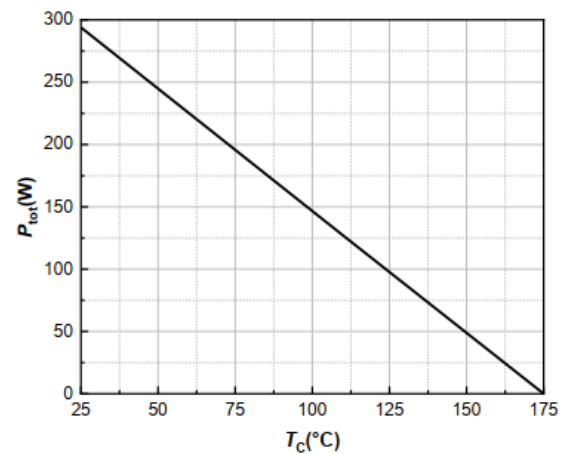


Figure 6. Power dissipation as function of case temperature

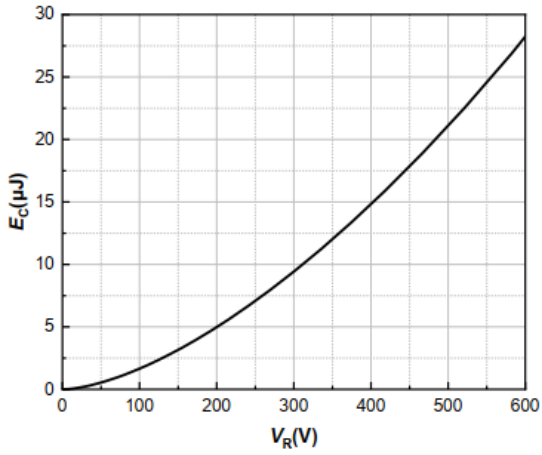
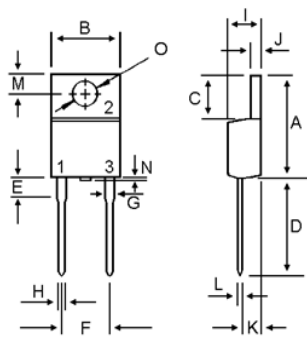


Figure 7. Capacitance Stored Energy

• Circuit diagram



• Package outlines : Dimensions in (mm)



DIM	MILLIMETERS	
	MIN	MAX
A	14.68	16.00
B	9.78	10.42
C	5.02	6.60
D	13.00	14.62
E	3.10	4.19
F	4.82	5.34
G	1.10	1.67
H	0.69	1.01
I	4.22	4.98
J	1.14	1.40
K	2.20	3.30
L	0.28	0.61
M	2.48	3.00
N	---	2.00
O	3.50	4.00

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