

## 650V Silicon Carbide Schottky Diode

### DESCRIPTION :

- Negligible reverse recovery
- High Speed Switching
- Positive temperature Coefficient
- Temperature Independent Switching
- RoHS Compliant

$V_{RRM}$	650V
$I_F$	10A (TC=154°C)
$Q_C$	30nC

### TYPICAL APPLICATIONS :

- Switch mode power supplies
- Solar inverters
- Data Center
- Uninterruptible power supplies (UPS)



TO-247AB

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

Characteristic	Condition	Symbol	Value	Unit
Repetitive Peak Reverse Voltage		$V_{RRM}$	650	V
Continuous Forward Current	$T_C=25^\circ\text{C}$ $T_C=135^\circ\text{C}$ $T_C=154^\circ\text{C}$	$I_F$	32 15 10	A
Non-Repetitive Forward Surge Current	$T_C=25^\circ\text{C}$ , $t_P=10\text{ms}$ , Half sine pulse $T_C=110^\circ\text{C}$ , $t_P=10\text{ms}$ , Half sine pulse	$I_{FSM}$	92 88	A
Repetitive Peak Forward Surge Current	$T_C=25^\circ\text{C}$ , $t_P=10\text{ms}$ , Half sine pulse	$I_{FRM}$	85	A
$i^2t$ value	$T_C=25^\circ\text{C}$ , $t_P=10\text{ms}$ $T_C=110^\circ\text{C}$ , $t_P=10\text{ms}$	$\int i^2 dt$	40 38	$\text{A}^2\text{S}$
Power dissipation	$T_C=25^\circ\text{C}$ $T_C=110^\circ\text{C}$ $T_C=150^\circ\text{C}$	$P_{tot}$	130 56 21	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 - case		$R_{th(j-c)}$	1.15	$^{\circ}\text{C}/\text{W}$

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

Characteristic	Symbol	Min.	Typ.	Max.	Unit
DC Blocking Voltage	$V_{DC}$	650			V
Forward Voltage IF = 5A IF = 10A, $T_c = 25^{\circ}\text{C}$ IF = 10A, $T_c = 175^{\circ}\text{C}$	$V_F$		1.17 1.37 1.66	1.6	V
Reverse Current VR = 650V, $T_c = 25^{\circ}\text{C}$ VR = 650V, $T_c = 175^{\circ}\text{C}$	$I_R$		5 12	60	$\mu\text{A}$
Total Capacitive Charge VR = 400V	$Q_C$		30		nC
Total capacitance VR = 1V, f = 1MHz VR = 200V, f = 1MHz VR = 400V, f = 1MHz	C		455 57 56		pF
Capacitance Stored Energy VR = 400 V	$E_C$		4.9		$\mu\text{J}$

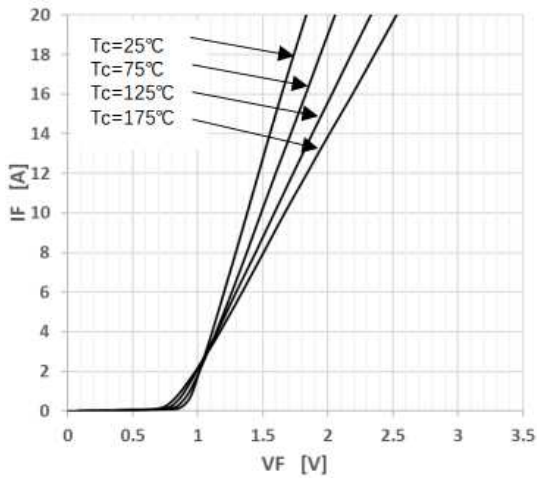


Figure 1. Forward characteristics

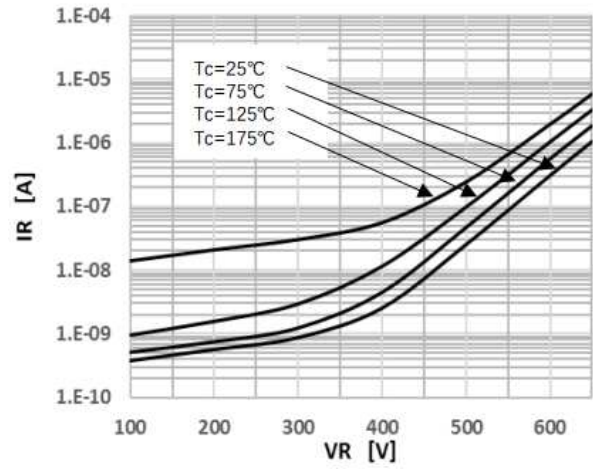


Figure 2. Reverse characteristics

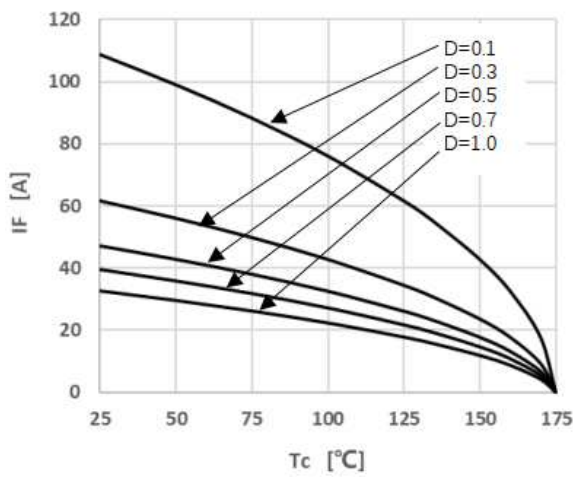


Figure 3. Peak Forward Current Derating

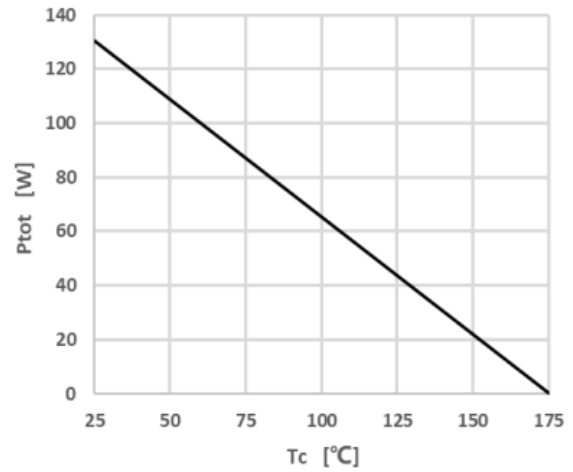


Figure 4. Power Dissipation

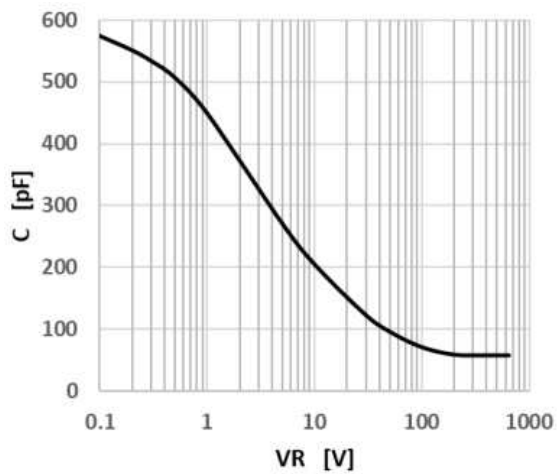


Figure 5. Capacitance vs. Reverse Voltage

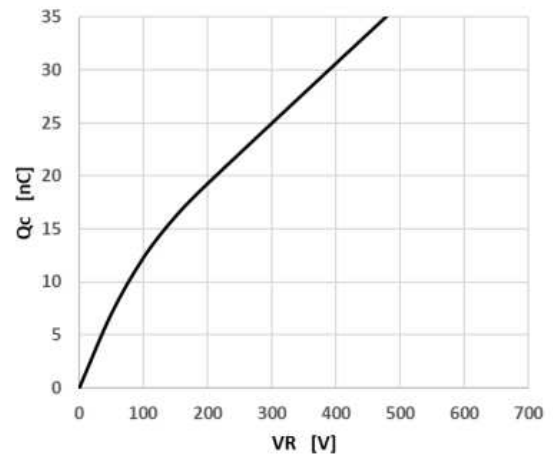


Figure 6. Capacitance Charge vs. Reverse Voltage

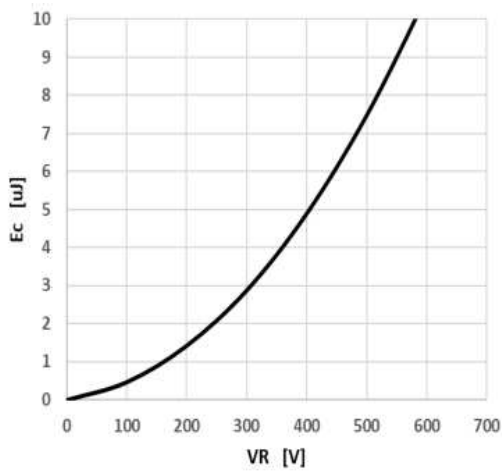


Figure 7. Capacitance Stored Energy

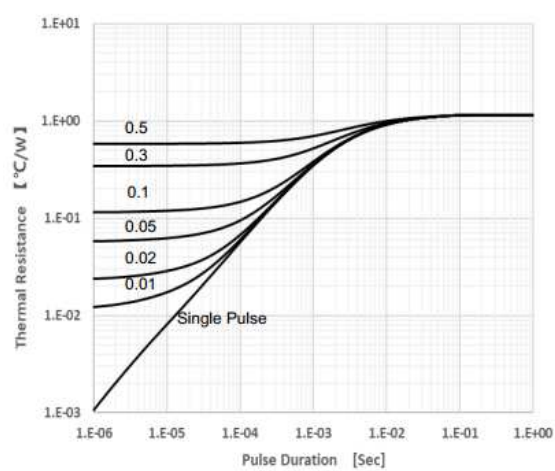
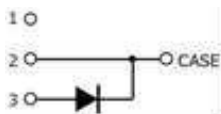
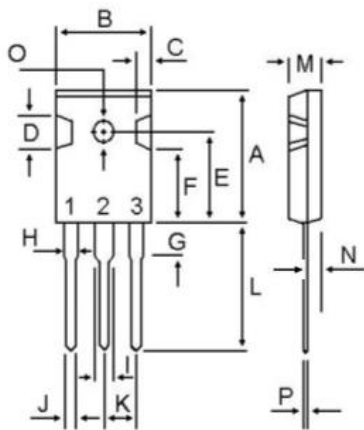


Figure 8. Transient Thermal Impedance

- Circuit diagram



- TO-247AB Package outlines : Dimensions in (mm)



DIM	MILLIMETERS	
	MIN	MAX
A	20.63	22.38
B	15.38	16.20
C	1.90	2.70
D	5.10	6.10
E	14.81	15.22
F	11.72	12.84
G	3.75	4.35
H	1.82	2.46
I	---	1.25
J	0.89	1.53
K	10.52	11.32
L	18.50	21.50
M	4.68	5.36
N	2.40	2.80
O	3.25	3.65
P	0.55	0.70

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