650V Silicon Carbide Schottky Diode

DESCRIPTION：

·Zero Forward Recovery Voltage

·Zero Reverse Recovery Current

·Excellent Surge Current Capability

·Temperature Independent Switching

·Positive Temperature Coefficient on V_F

·High Frequency Operation

·Increased Power Density

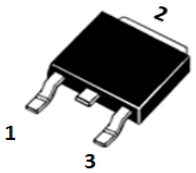
·Essentially no Switching Losses

·Reduction of Heat Sink Requirements

·Higher Efficiency

·Reduced EMI

V_{RRM}	650V
I_F	4A (Tc=150℃)
Q_C	12nC



TO-252

TYPICAL APPLICATIONS：

·Uninterruptible Power Supplies

·Switch Mode Power Supplies

·Power Factor Correction

·Motor Drivers

MAXIMUM RATINGS (at T_J = 25 °C, unless otherwise specified)

Characteristic	Condition	Symbol	Value	Unit
Repetitive Peak Reverse Voltage		V_{RRM}	650	V
Continuous Forward Current	Tc=25℃ Tc=150℃	I_F	13 4	A
Non-Repetitive Forward Surge Current	Tc=25℃, t_P=10ms, Half sine pulse	I_{FSM}	32	A
i^2t value	Tc=25℃, t_P=10ms	$\int i^2dt$	5	A^2S
Power dissipation	Tc=25℃ Tc=110℃	P_{tot}	55 24	W
Operation Junction Range		Tj	-55~+175	℃
Storage temperature Range		T_{STG}	-55~+175	℃

ELECTRICAL CHARATERISTICS (at T_J = 25 °C, unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
DC Blocking Voltage	V_{DC}	650			V
Forward Voltage IF = 4A, T_J =25℃ IF = 4A, T_J =175℃	V_F		1.35 1.63		V
Reverse Current VR = 650V, T_J =25℃ VR = 650V, T_J =175℃	I_R		1 6		uA
Total Capacitive Charge VR = 400V, $QC = \int_0^{VR} C(V)dV$	Q_C		12		nC
Total capacitance VR = 1V, f =1MHz VR = 300V, f =1MHz VR = 600V, f =1MHz	C		163 21 19		pF
Capacitance Stored Energy VR = 400 V	Ec		2		uJ

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Typical	Unit
Thermal resistance, junction to case		$R_{th(j-C)}$	2.69	℃/W

Typical Performance

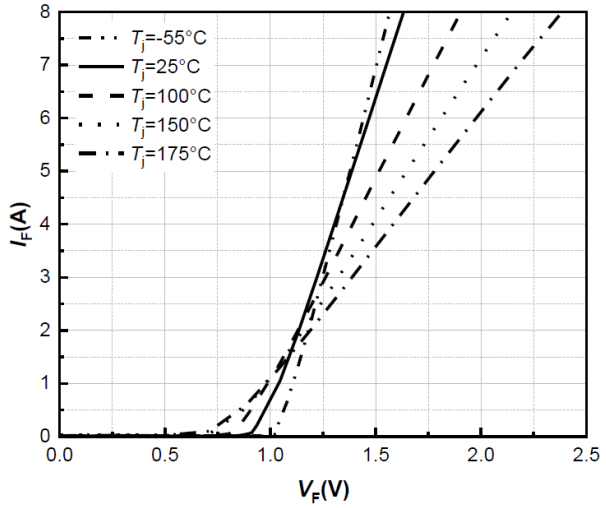


Figure 1. Typical Forward characteristics

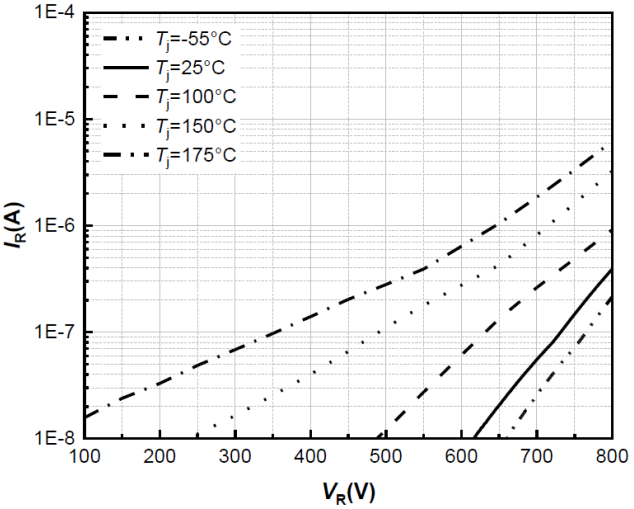


Figure 2. Typical reverse current as function of reverse voltage

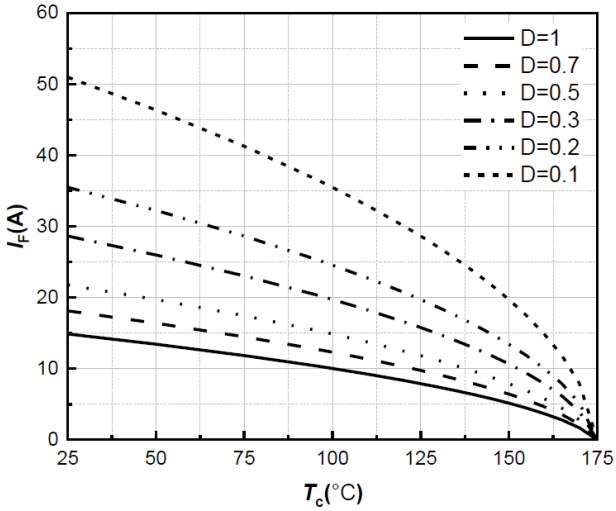


Figure 3. Diode forward current as function of temperature, D=duty cycle

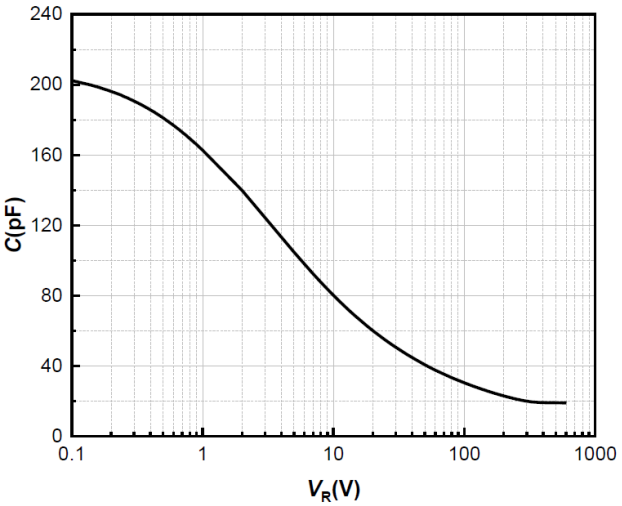


Figure 4. Typical capacitance as function of reverse voltage, C=f(V_R); Tj=25°C; f=1 MHz

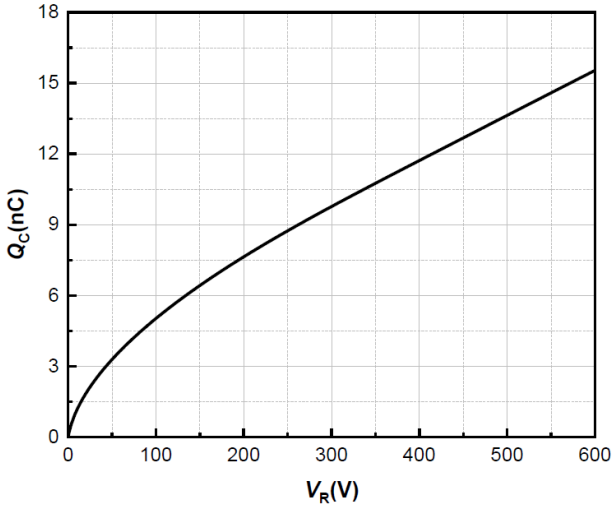


Figure 5. Typical reverse charge as function of reverse voltage

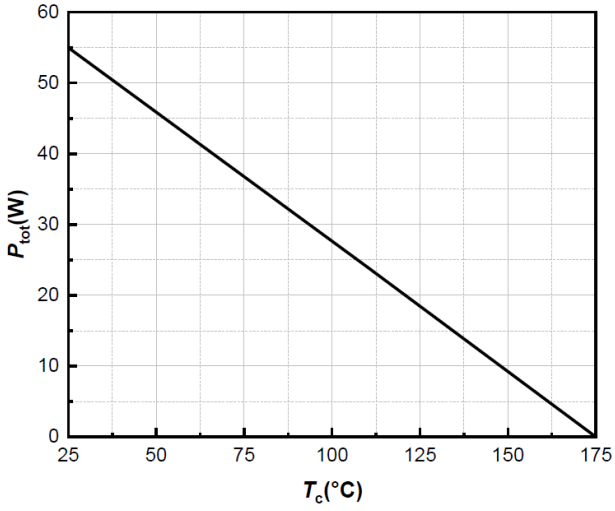


Figure 6. Power dissipation as function of case temperature

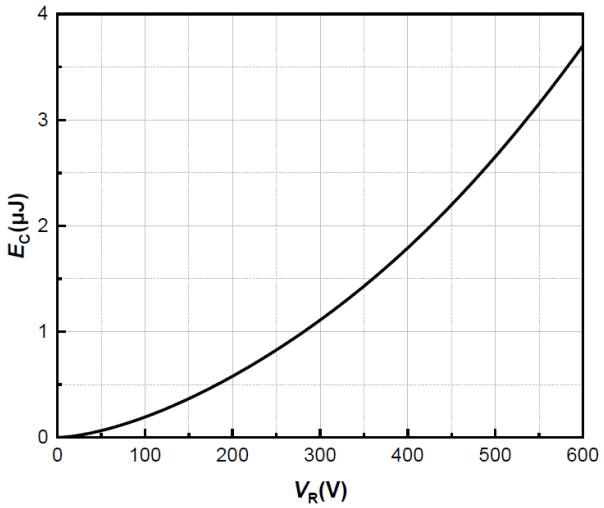


Figure 7. Capacitance Stored Energy

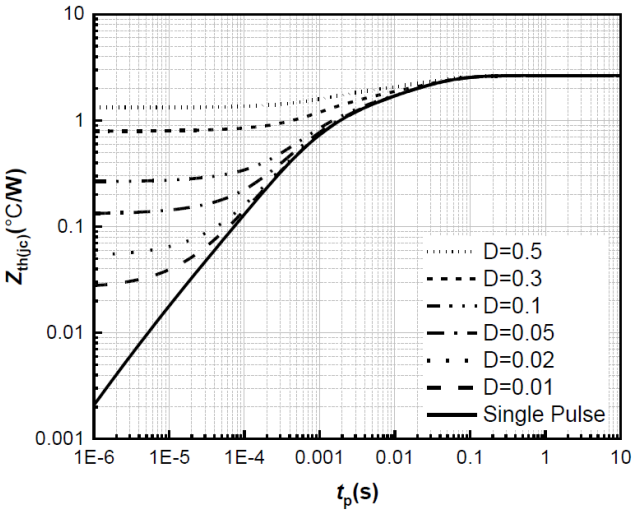
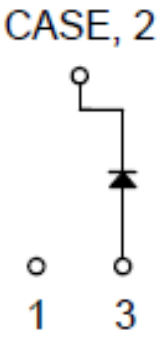
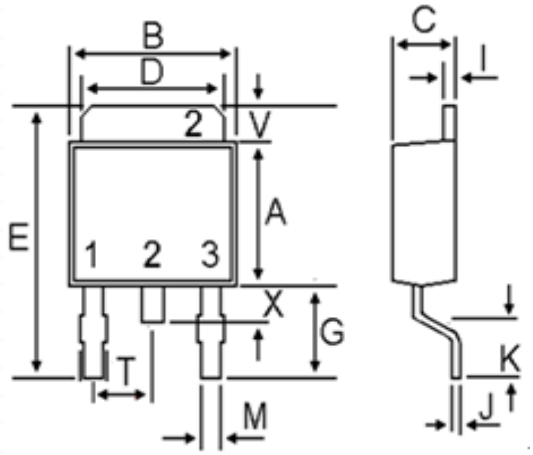


Figure 8. Max. transient thermal impedance, $Z_{th(jc)}$= f(tp), parameter: D =tp/T

·Circuit diagram



·TO-252 Package outlines : Dimensions in (mm)



DIM	MILLIMETERS	
	MIN	MAX
A	5.97	6.22
B	6.30	6.75
C	2.18	2.40
D	4.95	5.50
E	9.40	10.41
G	2.75	3.20
I	0.46	0.89
J	0.46	0.61
K	1.40	1.78
M	0.64	0.89
T	2.18	2.38
V	0.89	1.27
X	---	1.05

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