650V Silicon Carbide Diode

DESCRIPTION：

·Zero reverse recovery current

·Zero forward recovery voltage

·Temperature independent switching behavior

·Excellent Surge Current Capability

·Positive Temperature Coefficient on VF

·High Frequency Operation

V_{RRM}	650V
I_F	8A (Tc=150℃)
Q_C	25nC

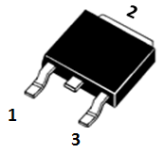
TYPICAL APPLICATIONS：

·Switch Mode Power Supplies

·Power Factor Correction

·Uninterruptible Power Supplies

·Motor drives



TO-252

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

Characteristic	Condition	Symbol	Value	Unit
Repetitive Peak Reverse Voltage		V_{RRM}	650	V
Average Forward Current	Tc=25℃ Tc=135℃ Tc=150℃	I_F	28 12 8	A
Non-Repetitive Forward Surge Current	Tc=25℃; tp = 10ms; Half sine pulse Tc=150℃; tp = 10ms; Half sine pulse	I_{FSM}	80 54	A
i^2t value	Tc=25℃; tp = 10ms; Tc=25℃; tp = 10ms	$\int i^2dt$	32 14	A^2S
Power dissipation	Tc=25℃ Tc=110℃	Ptot	93 40	W
Non-Repetitive Avalanche Switching Energy	V_{DD}=50V, L=1mH, I_D=6.8A	EAS	23	mJ
Storage temperature Range		T_{STG}	-40~+150	℃
Operation Junction Range		Tj	-40~+175	℃
Soldering Temperature	1.6mm (0.063”) from Case for 10s	T_{SOLD}	260	℃

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

Characteristic	Symbol	Min.	Typ.	Max.	Unit
DC Blocking Voltage	V_{DC}	650			
Forward Voltage IF = 8A, T_J =25℃ IF = 8A, T_J =135℃ IF = 8A, T_J =175℃	V_F		1.28 1.40 1.44	1.41 1.65 1.79	V
Reverse Current VR = 650V, T_J =25℃ VR = 650V, T_J =175℃	I_R		1 10	20 200	uA
Total Capacitive Charge VR = 400V	Q_C		25		nC
Diode Capacitance VR = 1V, f =1MHz VR = 400V, f =1MHz VR = 600V, f =1MHz	C_d		342 37 36		pF
Capacitance Stored Energy VR = 400V	E_C		3.2		uJ

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Typical	Unit
Thermal resistance, junction to case	with heatsink compound	$R_{th(j-C)}$	1.6	℃/W

Typical Performance

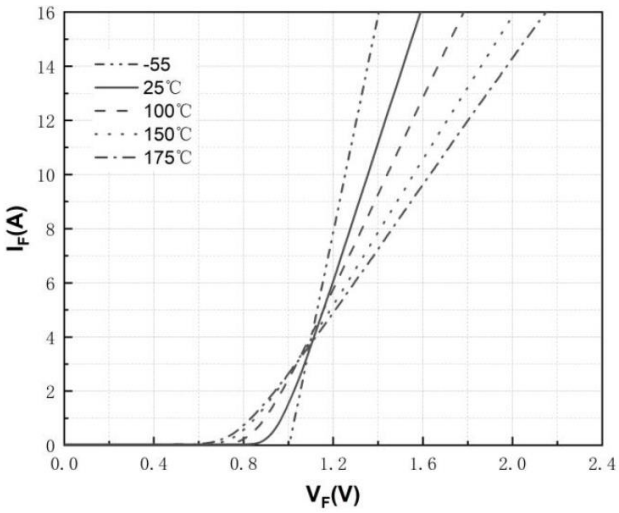


Figure 1. Forward characteristics

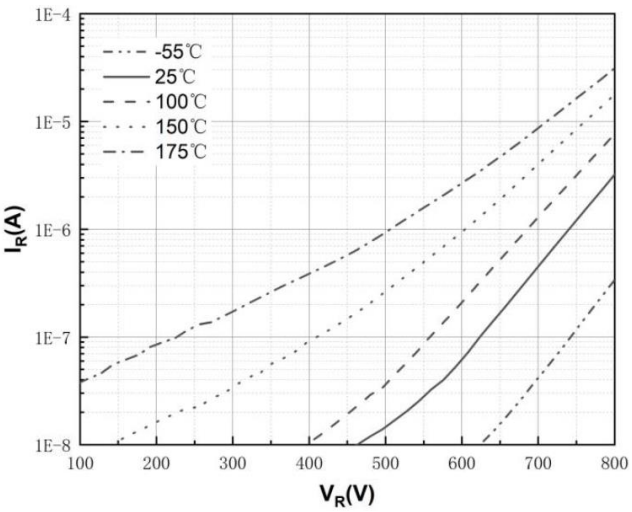


Figure 2. Typical reverse current as function of reverse voltage

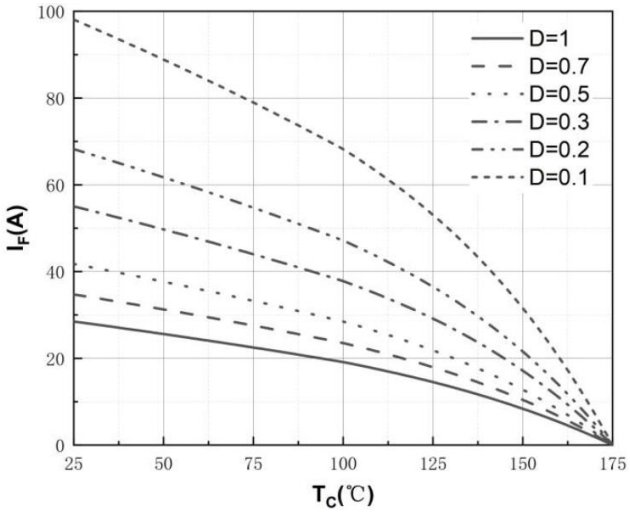


Figure 3. Diode forward current as function of temperature, D=duty cycle

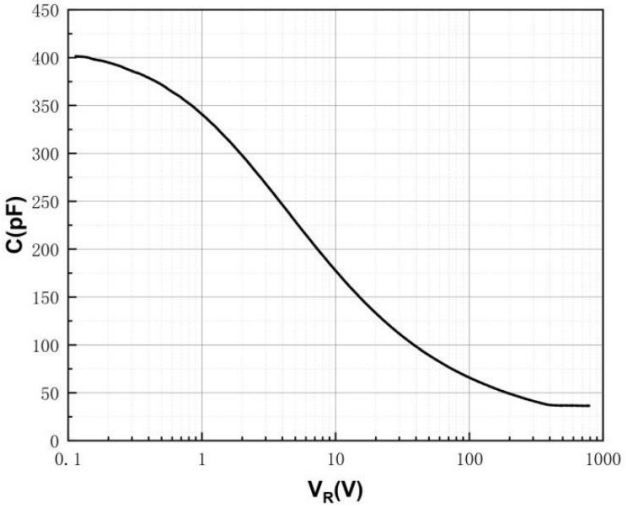


Figure 4. Typical capacitance as function of reverse voltage, C=f(VR); Tj=25°C; f=1 MHz

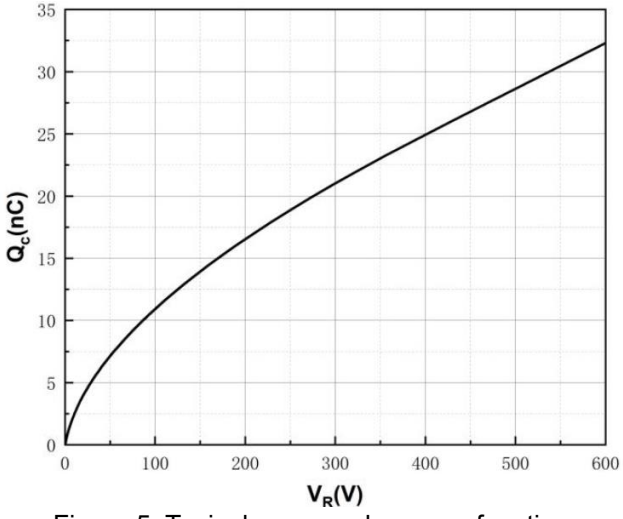


Figure 5. Typical reverse charge as function of reverse voltage

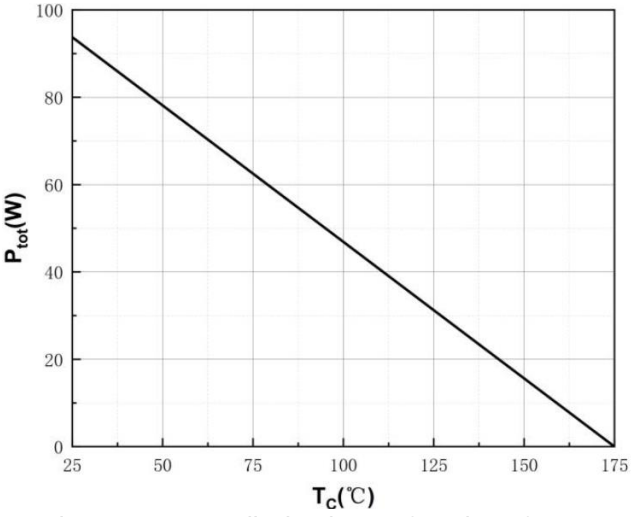


Figure 6. Power dissipation as function of case temperature

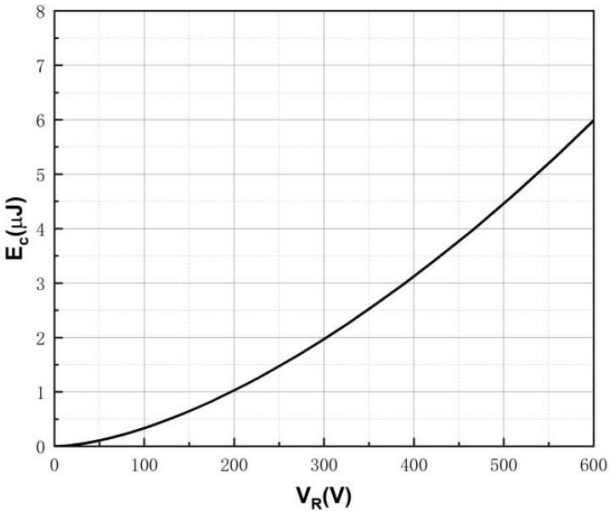


Figure 7. Capacitance Stored Energy

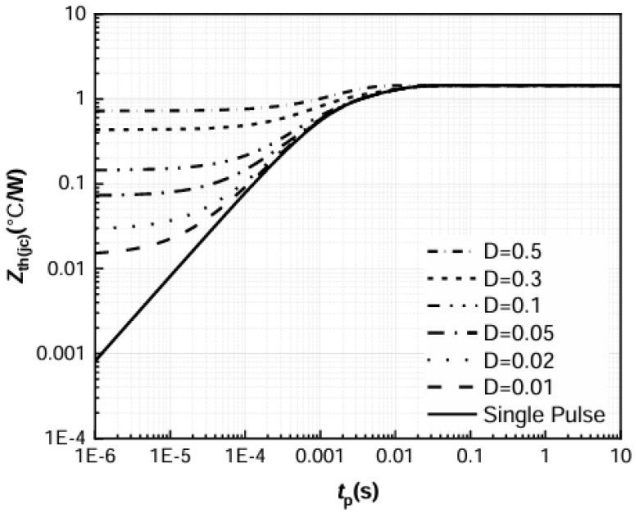
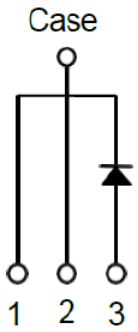
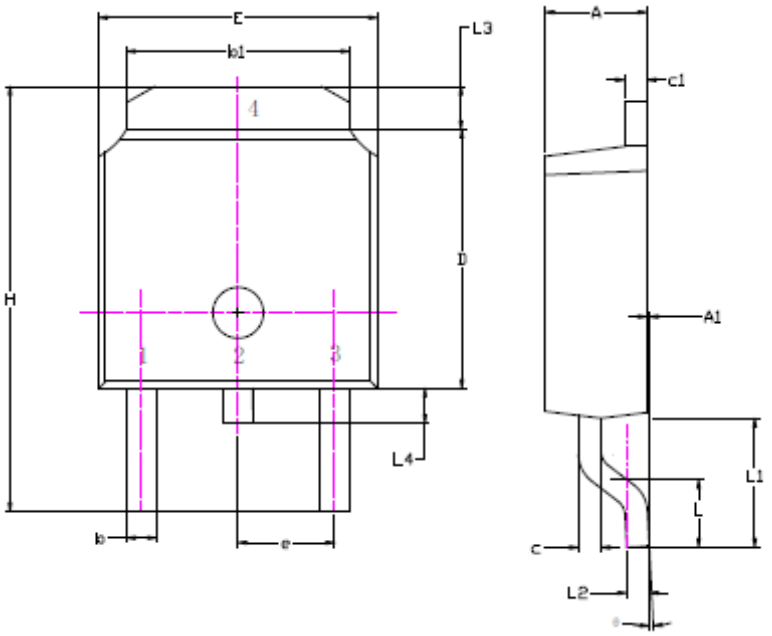


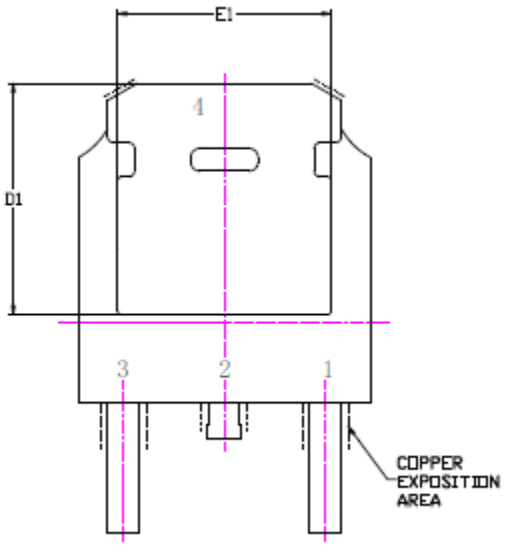
Figure 8. Max. transient thermal impedance, Zth(jc)= f(tp), parameter: D =tp/T

·Circuit diagram



· Package outlines : Dimensions in (mm)





SYMBOL	DIMENSIONAL REQMTS	
	MIN	MAX
A	2.20	2.40
A1	0.00	0.127
b	0.635	0.889
b1	5.17	5.42
c	0.46	0.60
c1	0.46	0.58
D	6.00	6.20
D1	5.15 REF	
E	6.50	6.70
E1	4.83 REF	
e	2.286 BSC	
H	9.40	10.40
L	1.40	1.70
L1	2.90 REF	
L2	0.508 BSC	
L3	0.89	1.27
L4	0.64	1.01
θ	0°	10°

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