DONGGUAN NANJING ELECTRONICS LTD.,

TO-220-2 Silicon Carbide Schottky Diode

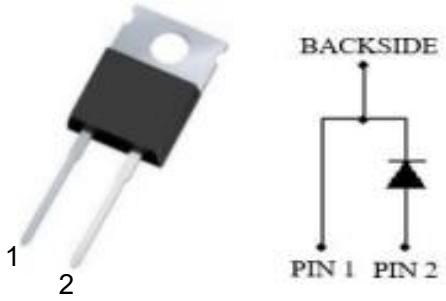
NJ65C6T2 SiC Diode 650 V, 6 A, 25 nC

General Description

This product family offers state of the art performance. It is designed for high frequency applications here high efficiency and high reliability are required.

Features

- Zero Forward/Reverse Recovery Current
- High Blocking Voltage
- High Frequency Operation
- Positive Temperature Coefficient on VF
- Temperature Independent Switching Behavior



TO-220-2
Pin definition

Applications

- Motor Drives
- Solar
- AC/DC converters
- DC/DC converters
- Uninterruptable power supplies

Benefits

- Higher System Efficiency
- Parallel Device Convenience without thermal runaway
- Higher Temperature Application
- No Switching loss
- Hard Switching & Higher Reliability
- Environmental Protection

Key performance parameters

Type	V_R	I_F T_C=150°C	Q_C
NJ65C6T2	650 V	6A	25 nC

Caution: This device is sensitive to electrostatic discharge .Users should follow ESD handing procedures.

Maximum Ratings

T_C=25℃, unless otherwise specified

Parameter	Symbol	Value	Unit
Peak Repetitive Reverse Voltage	V_{RRM}	650	V
Peak Reverse Surge Voltage	V_{RSM}	650	V
DC Blocking Voltage	V_R	650	V

Maximum Ratings

T_C=25℃, unless otherwise specified

Symbol	Parameter	Test conditions	Value	Unit
V_{RRM}	Repetitive peak reverse voltage		650	V
I_F	Continuous forward current	T_C=25°C T_C=160°C	26 6	A
I_{FSM}	Non-Repetitive forward surge current	T_C=25°C , t_p=10ms, Half Sine Wave	60	A
$\int i^2dt$	i²t value	T_c=25°C, t_p=10ms	18	A^2S
P_{tot}	Power dissipation	Tc=25℃ Tc=110℃	103 44	W
T_j	Operating junction temperature		-55~175	℃
T_{stg}	Storage temperature		-55~175	℃

Thermal Resistance

Symbol	Parameter	Value			Unit
		Min.	Typ.	Max.	
$R_{th(jc)}$	Thermal Resistance from Junction to Cas		1.45		° C/W

Electrica Characteristic

T_C =25℃, unless otherwise specified

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
V_{DC}	DC blocking voltage	T_j=25°C	650			V
V_F	Diode forward voltage	I_F=6A,T_j=25°C I_F=6A,T_j=135°C I_F=6A,T_j=175°C		1.25 1.32 1.38	1.48 1.74 1.90	V
I_R	Reverse current	V_R=650V ,T_j=25°C V_R=650V ,T_j=175°C		0.5 15	50 200	μA

AC Characteristic

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
Q_C	Total capactive charge	V_R=400V ,T_j=25°C $Q_C = \int_0^V R\ C(V)dV$		25		nC
C	Total capacitance	V_R=1V f=1MHz V_R=300V f=1MHz V_R=600V f=1MHz		350 42 36		pF
E_C	Capacitance stored energy	V_R=400V		3.8		μJ

Typical Characteristics

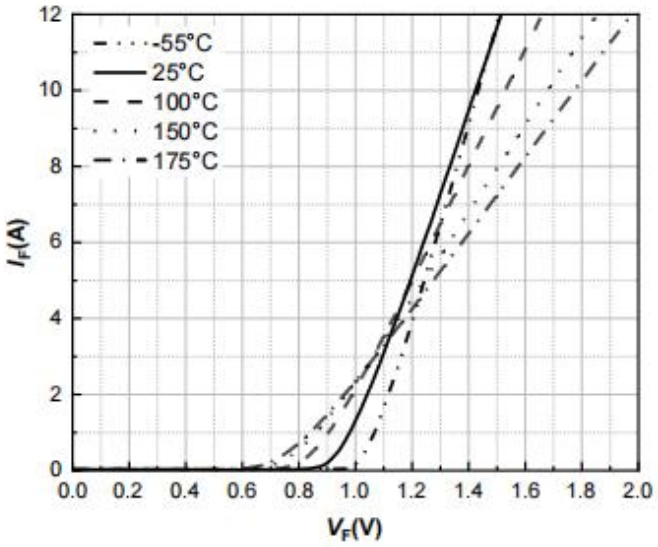


Figure 1. Typical forward characteristics

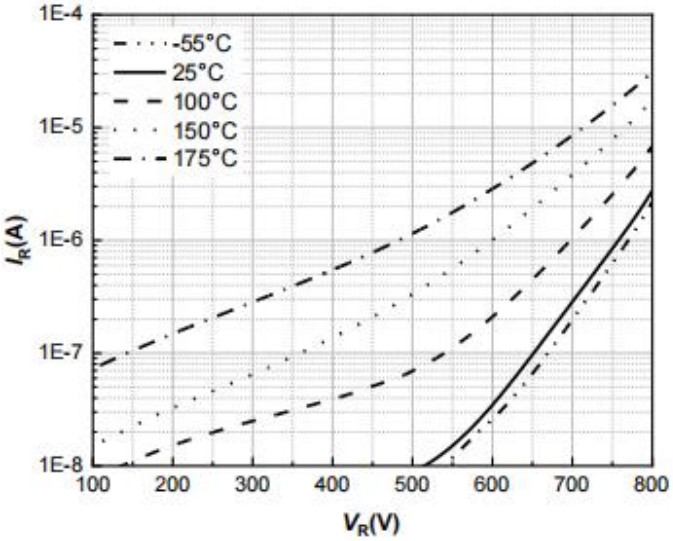


Figure 2. Typical reverse current as function of reverse voltage

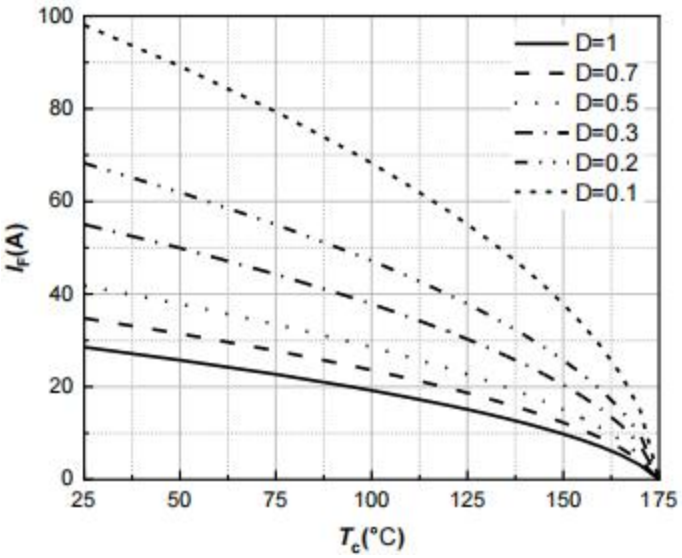


Figure 3. Diode forward current as function of temperature, D=duty cycle

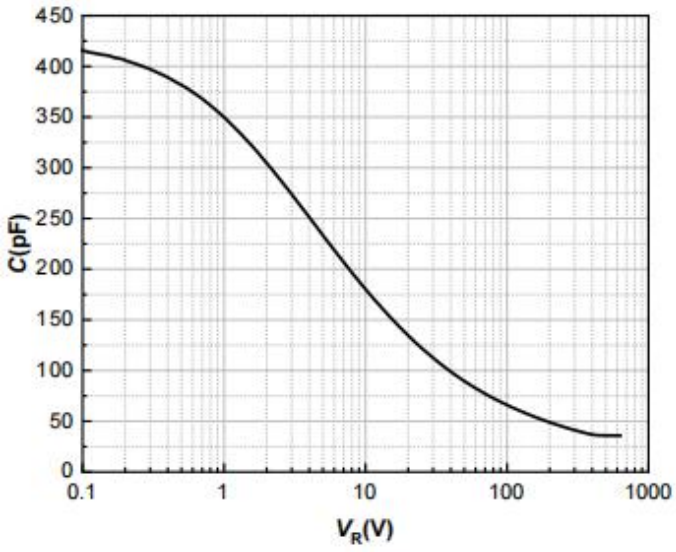


Figure 4.Typical capacitance as function of reverse voltage, C=f(V_R); T_j=25℃; f=1 MHz

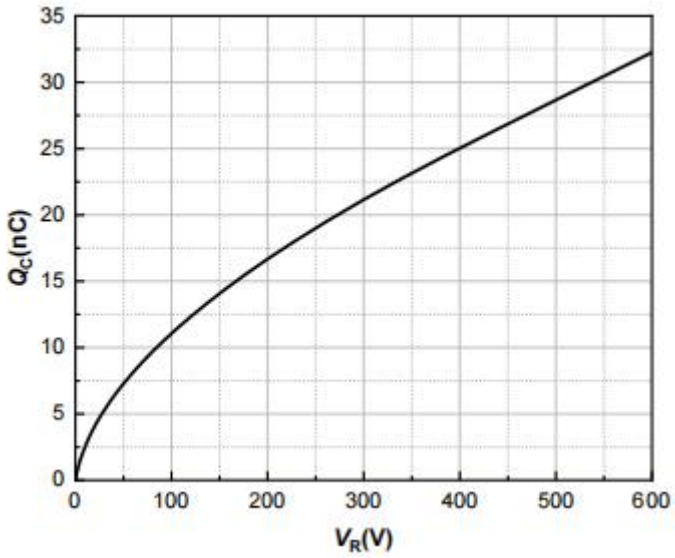


Figure 5. Typical reverse charge as function of reverse voltage

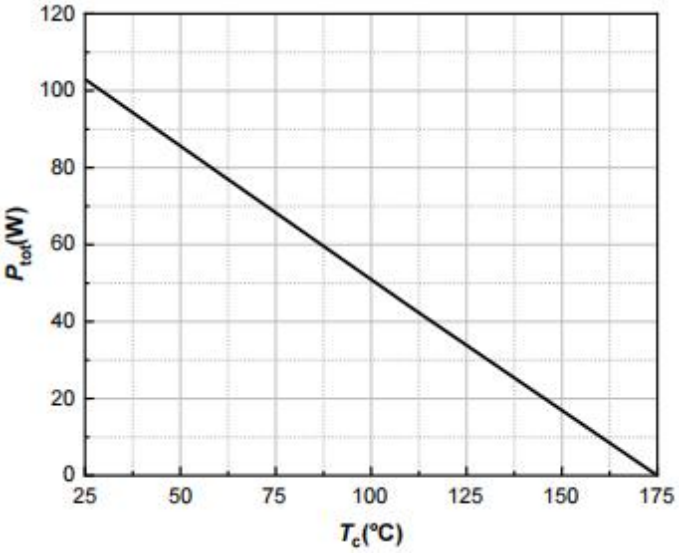


Figure 6. Power dissipation as function of case temperature

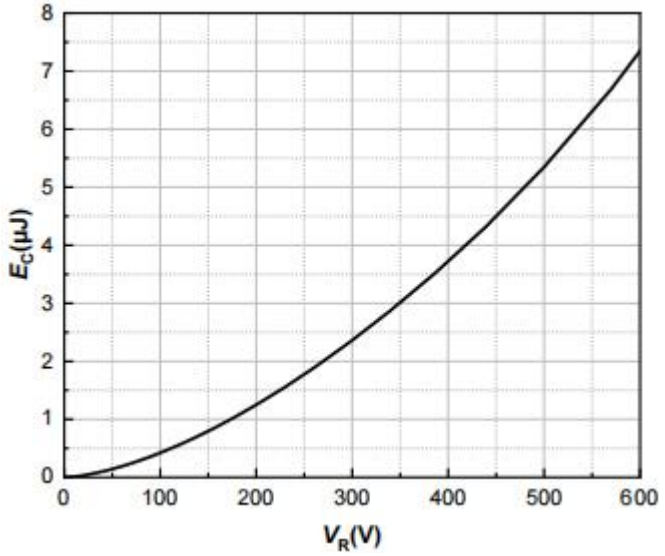


Figure7. Capacitance stored energy

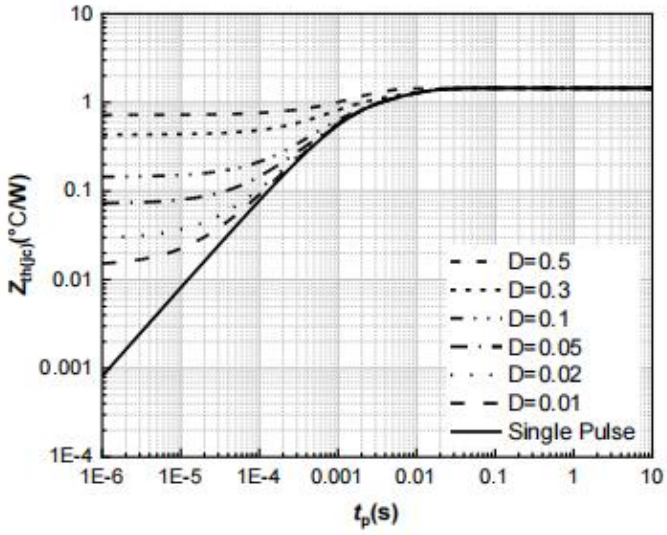
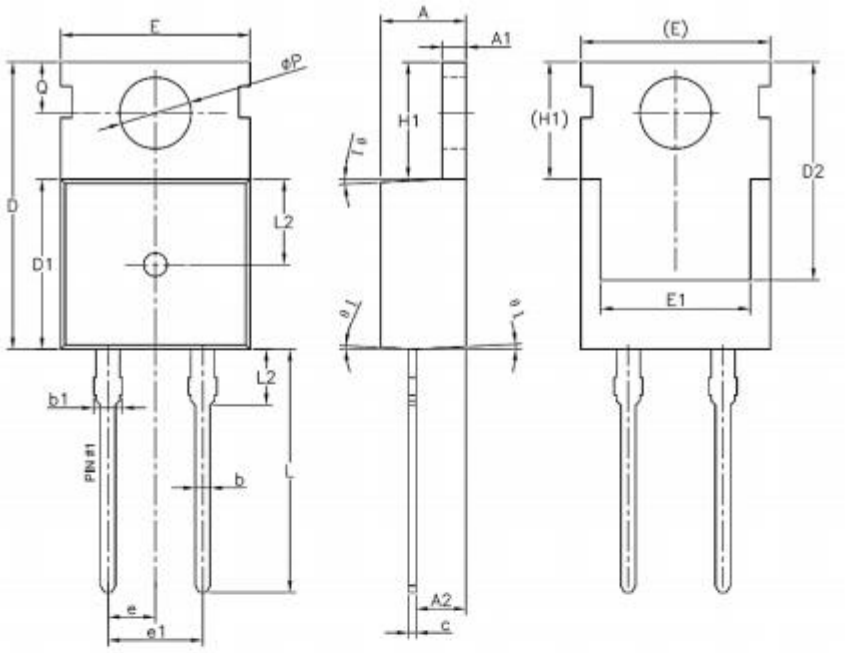


Figure 8. Max.transient thermal impedance,$Z_{th(jc)}=f_{(tp)}$,parameter:$D=t_p/T$

Package Outline: TO-220-2



SYMBOL	Unit: mm		
	MIN	NOM	MAX
A	4.40	4.50	4.60
A1	1.27	1.30	1.33
A2	2.30	2.40	2.50
b	0.70	-	0.90
b1	1.42	-	1.57
c	0.45	0.50	0.60
D	15.30	15.70	16.10
D1	9.10	9.20	9.30
D2	13.10	-	13.70
E	9.70	9.90	10.20
E1	7.80	8.00	8.20
e	2.54 BSC		
e1	5.08 BSC		
H1	6.30	6.50	6.70
L	12.78	13.08	13.38
L1	-	-	3.50
L2	4.60 REF		
ΦP	3.55	3.60	3.65
Q	2.73	-	2.87
θ1	1°	3°	5°