DONGGUAN NANJING ELECTRONICS LTD.,

TO-220-2 Silicon Carbide Schottky Diode

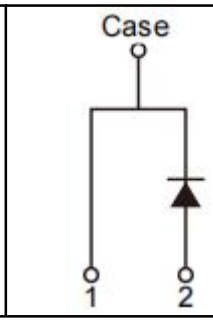
NJ120C10T2 SiC Diode 1200V, 10A, 55nC

Features

- ✓ Zero forward recovery voltage
- ✓ Zero reverse recovery current
- ✓ Excellent surge current capability
- ✓ Temperature independent switching
- ✓ Positive temmperature coefficient on V_F
- ✓ High frequency operation

Part NO.	NJ120C10T2
V_{RRM}	= 1200 V
$I_F(T_C=160°C)$	= 10A
Q_C	= 55nC

Package: TO-220



Benefits

- ✓ Increased Power Density
- ✓ Essentially no Switching Losses
- ✓ Reduction of Heat Sink Requirements
- ✓ Higher Efficiency
- ✓ Reduced EMI

Halogen

RoHS

Applications

- ✓ Uninterruptible power supplies
- ✓ Switch mode power supplies (SMPS)
- ✓ Power Factor Correction
- ✓ Motor Drivers

Maximum ratings (T_j=25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Value	Unit
V_{RRM}	Repetitive peak reverse voltage		1200	V
I_F	Continuous forward current	T_C=25°C T_C=135°C T_C=160°C	38 15 10	A
I_{FRM}	Repetitive forward surge current	T_C=25°C , t_p=10ms, Half Sine Wave	90	A
I_{FSM}	Non-Repetitive forward surge current	T_C=25°C , t_p=10ms, Half Sine Wave T_C=150°C , t_p=10ms, Half Sine Wave	105 94	A
$I_{F,\ max}$	Non-Repetitive forward surge current	T_C=25°C , t_p=10μs， Pulse	875	A
$\int i^2dt$	i^2t value	T_c=25°C, t_p=10ms T_c=150°C, t_p=10ms	55 44	A^2S
P_{tot}	Power dissipation	Tc=25°C Tc=110°C	192 83	W
E_{AS}	Non-Repetitive Avalanche Switching Energy	V_{DD}=50V, L=1mH, I_D=12.5A	325	mJ
E_{AR}	Repetitive Avalanche Energy	V_{DD}=50V, L=590μH, I_D=25.5A	191	mJ
T_j	Operating junction temperature		-40~175	°C
T_{stg}	Storage temperature		-40~150	°C
T_{sold}	Soldering temperature		260	°C

Static Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
V_{DC}	DC blocking voltage	T_j=25°C	1200			V
V_F	Diode forward voltage	I_F=10A,T_j=25°C I_F=10A,T_j=135°C I_F=10A,T_j=175°C		1.41 1.81 2.10	1.57 2.21 2.59	V
I_R	Reverse current	V_R=1200V ,T_j=25°C V_R=1200V ,T_j=175°C		0.2 14	200 400	μA

AC Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
Q_C	Total capactive charge	V_R=800V ,T_j=25°C $Q_C = \int_0^{V_R} C(V)dV$		55		nC
C	Total capacitance	V_R=1V f=1MHz V_R=400V f=1MHz V_R=800V f=1MHz		571 52 39		pF
E_C	Capacitance stored energy	V_R=800V		16		μJ

Thermal Characteristics

Symbol	Parameter	Value			Unit
		Min.	Typ.	Max.	
$R_{th(jc)}$	Thermal Resistance from Junction to Case		0.78		° C/W

Typical Characteristics

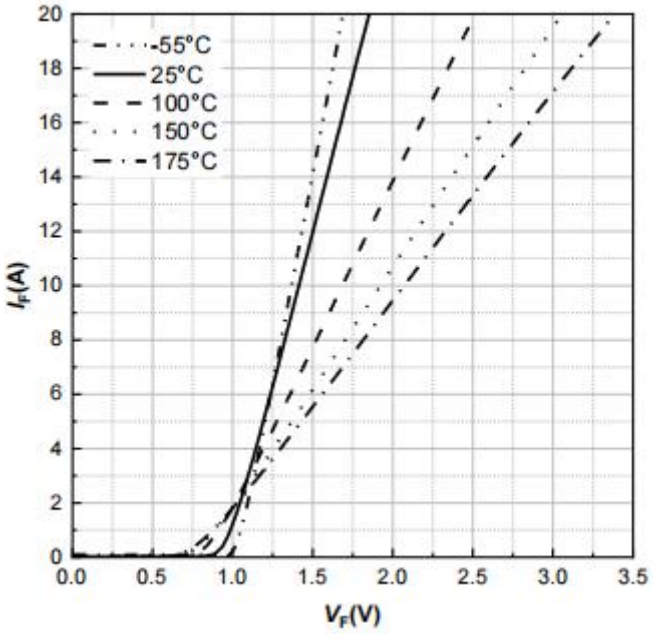


Figure 1. Typical forward characteristics

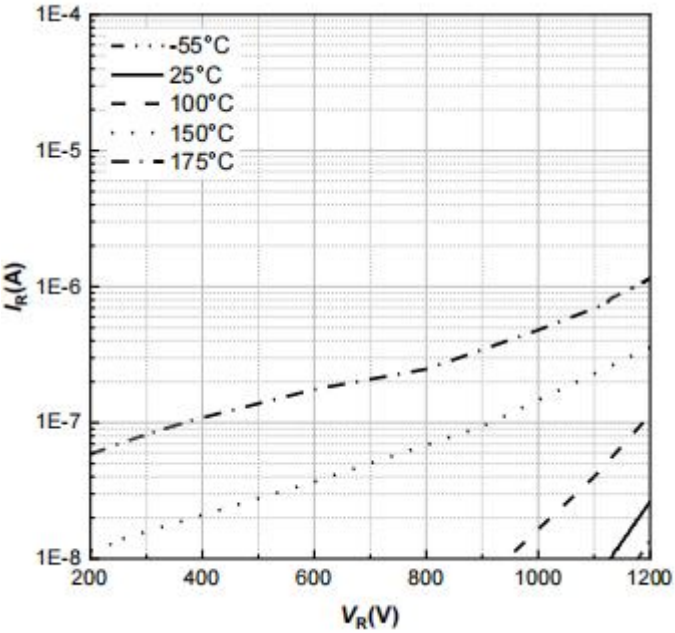


Figure 2. Typical reverse current as function of reverse voltage

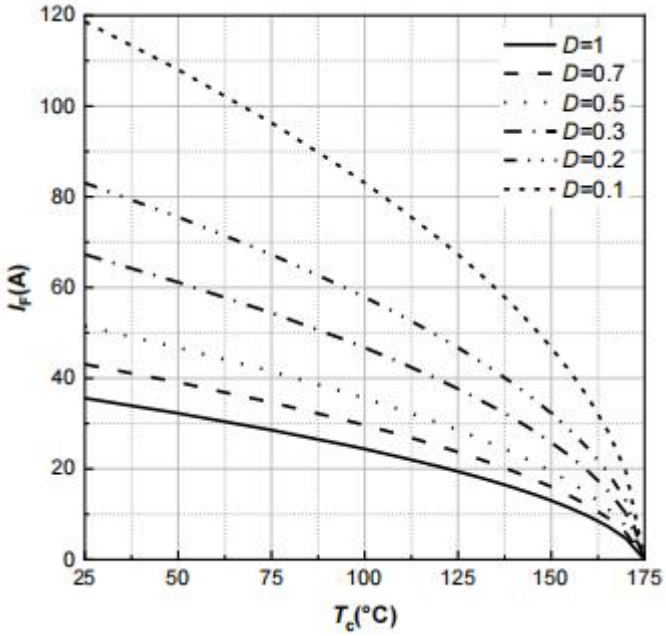


Figure 3. Diode forward current as function of temperature, D=duty cycle

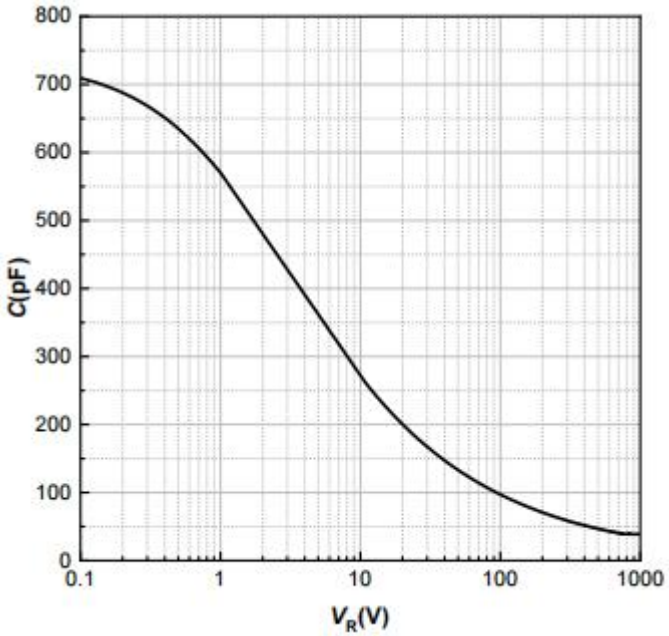


Figure 4.Typical capacitance as function of reverse voltage, C=f(V_R); T_j=25℃; f=1 MHz

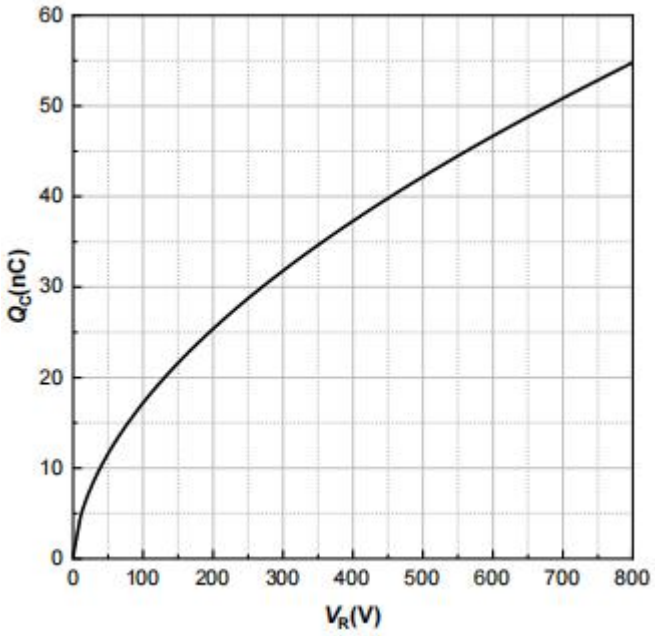


Figure 5. Typical reverse charge as function of reverse voltage

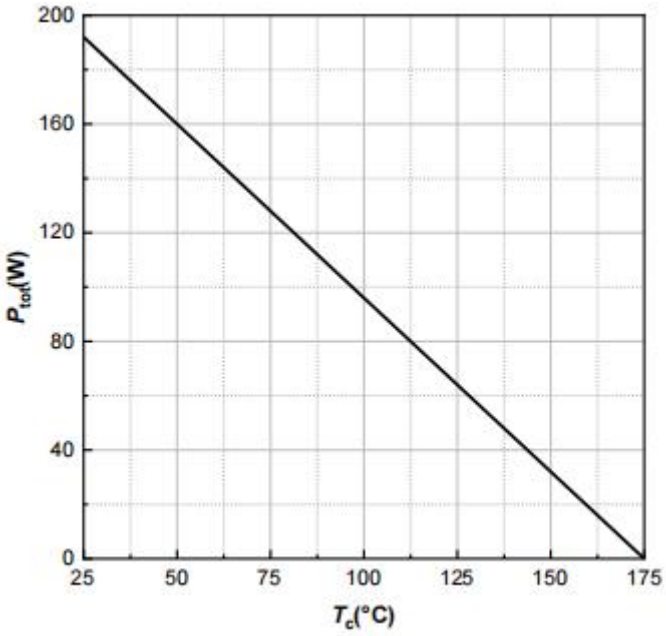


Figure 6. Power dissipation as function of case temperature

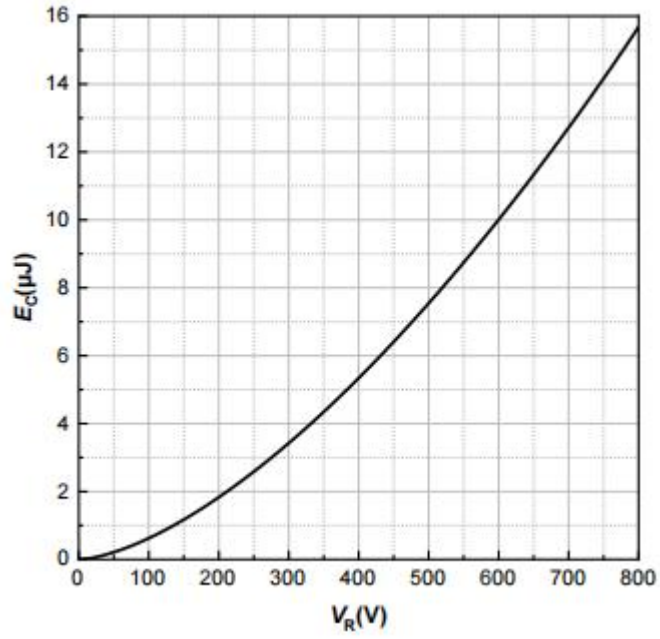


Figure7. Capacitance stored energy

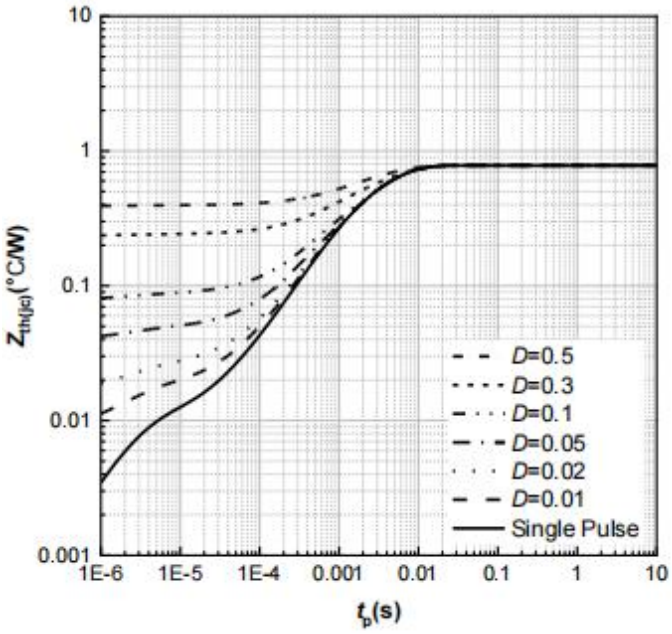
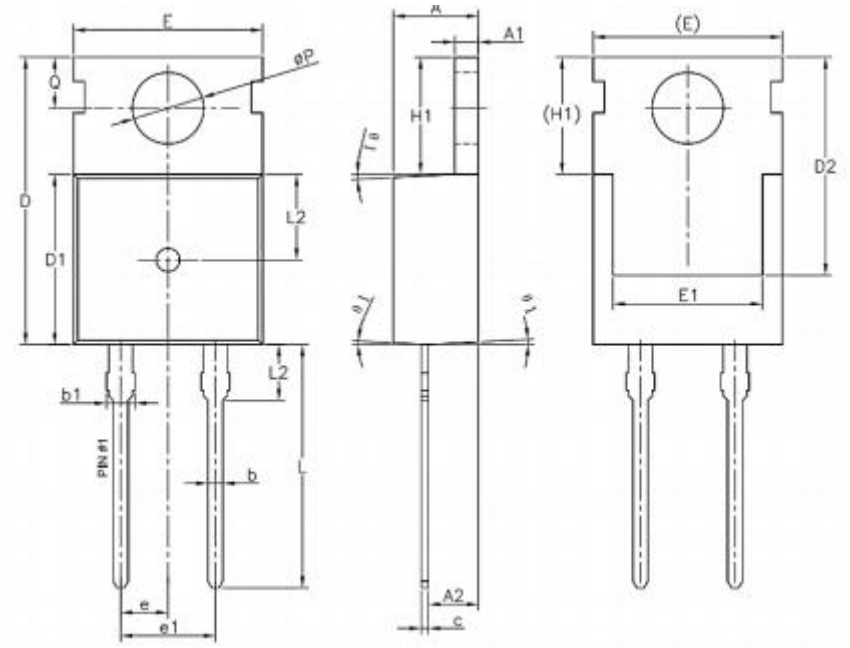


Figure 8. Max.transient thermal impedance,$Z_{th(jc)}=f_{(tp)}$,parameter:$D=t_p/T$

Package outlines



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		
ØP	3.55	3.60	3.65
Q	2.73	-	2.87
θ1	1°	3°	5°