



DONGGUAN NANJING ELECTRONICS LTD.,

TO-220-2 Silicon Carbide Schottky Diode

NJ65C15T2 SiC Diode 650 V, 15A, 56nC

Features

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

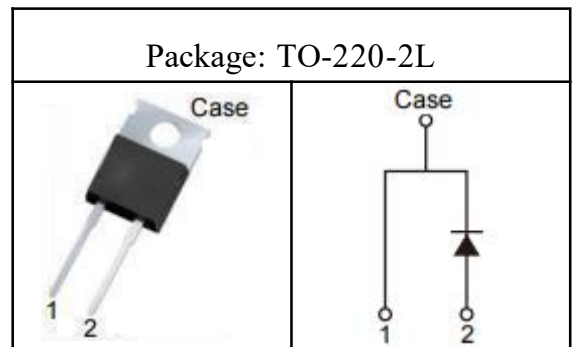
Benefits

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

Applications

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

Part NO.	NJ65C15T2
V_{RRM}	= 650 V
$I_F(T_C=155^\circ\text{C})$	= 15A
Q_C	= 56nC



Typical Characteristics

Maximum ratings ($T_j=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test conditions	Value	Unit
V_{RRM}	Repetitive peak reverse voltage		650	V
I_F	Continuous forward current	$T_c=25^{\circ}\text{C}$ $T_c=135^{\circ}\text{C}$ $T_c=155^{\circ}\text{C}$	60 27 15	A
I_{FRM}	Repetitive forward surge current	$T_c=25^{\circ}\text{C}$, $t_p=10\text{ms}$, Half Sine Wave	90	A
I_{FSM}	Non-Repetitive forward surge current	$T_c=25^{\circ}\text{C}$, $t_p=10\text{ms}$, Half Sine Wave $T_c=150^{\circ}\text{C}$, $t_p=10\text{ms}$, Half Sine Wave	130 110	A
$I_{F, \max}$	Non-Repetitive forward surge current	$T_c=25^{\circ}\text{C}$, $t_p=10\mu\text{s}$, Pulse	960	A
$\int i^2 dt$	i^2t value	$T_c=25^{\circ}\text{C}$, $t_p=10\text{ms}$ $T_c=150^{\circ}\text{C}$, $t_p=10\text{ms}$	84 60	A^2S
P_{tot}	Power dissipation	$T_c=25^{\circ}\text{C}$ $T_c=110^{\circ}\text{C}$	217 94	W
E_{AS}	Non-Repetitive Avalanche Switching Energy	$V_{DD}=50\text{V}$, $L=1\text{mH}$, $I_D=11\text{A}$	60	mJ
E_{AR}	Repetitive Avalanche Energy	$V_{DD}=50\text{V}$, $L=680\mu\text{H}$, $I_D=11\text{A}$	41	mJ
T_j	Operating junction temperature		-40~175	$^{\circ}\text{C}$
T_{stg}	Storage temperature		-40~150	$^{\circ}\text{C}$
T_{sold}	Soldering temperature	1.6mm (0.063") from Case for 10s	260	$^{\circ}\text{C}$
M	Mounting Torque	M3 Screw	0.7	Nm

Typical Characteristics

Static Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
V_{DC}	DC blocking voltage	$T_j=25^{\circ}C$	650			V
V_F	Diode forward voltage	$I_F=15A, T_j=25^{\circ}C$ $I_F=15A, T_j=135^{\circ}C$ $I_F=15A, T_j=175^{\circ}C$		1.28 1.31 1.39	1.45 1.54 1.70	V
I_R	Reverse current	$V_R=650V, T_j=25^{\circ}C$ $V_R=650V, T_j=175^{\circ}C$		1 18	50 200	μA

AC Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
Q_C	Total capacitive charge	$V_R=400V, T_j=25^{\circ}C$ $Q_C = \int_0^V R C(V)dV$		56		nC
C	Total capacitance	$V_R=1V, f=1MHz$ $V_R=300V, f=1MHz$ $V_R=600V, f=1MHz$		826 91 79		pF
E_C	Capacitance stored energy	$V_R=400V$		8.5		μJ

Thermal Characteristics

Symbol	Parameter	Value			Unit
		Min.	Typ.	Max.	
$R_{th(jc)}$	Thermal Resistance from Junction to Case		0.69		$^{\circ} C/W$

Typical Characteristics

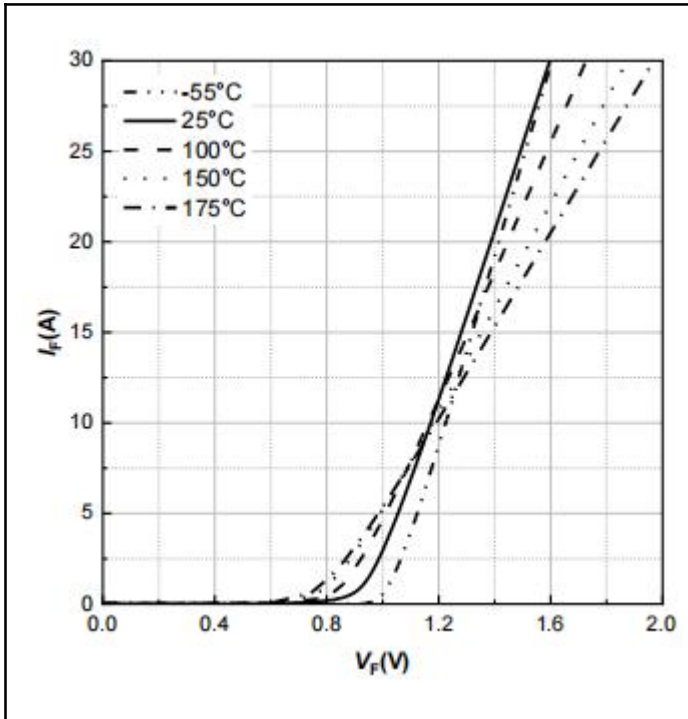


Figure 1. Typical forward characteristics

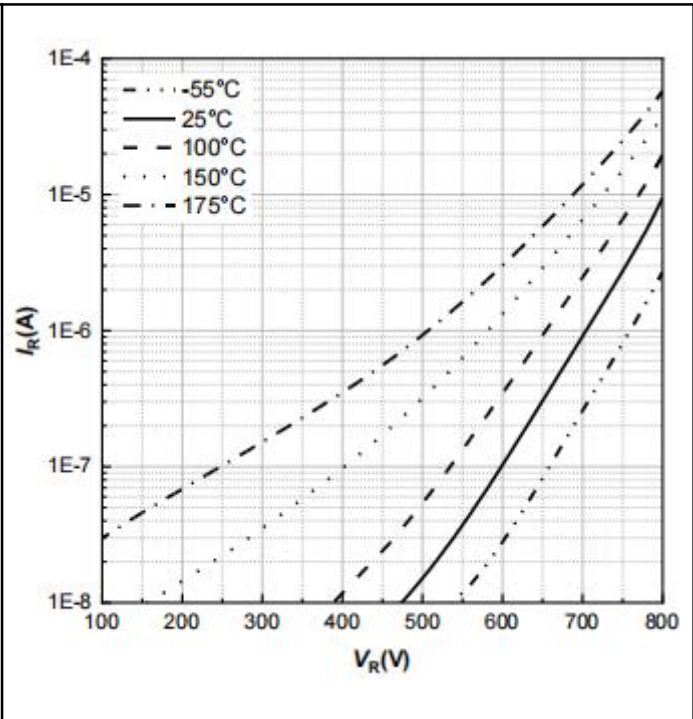


Figure 2. Typical reverse current as function of reverse voltage

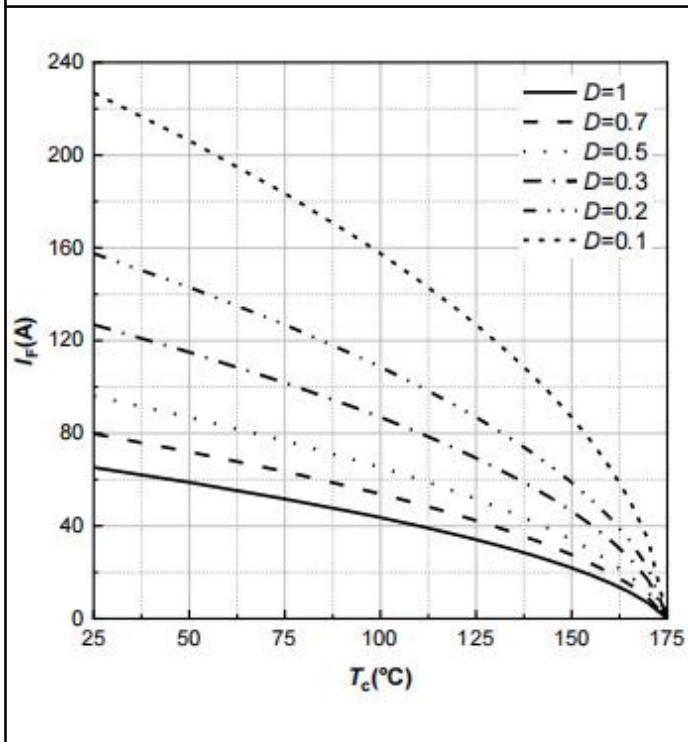


Figure 3. Diode forward current as function of temperature, D=duty cycle

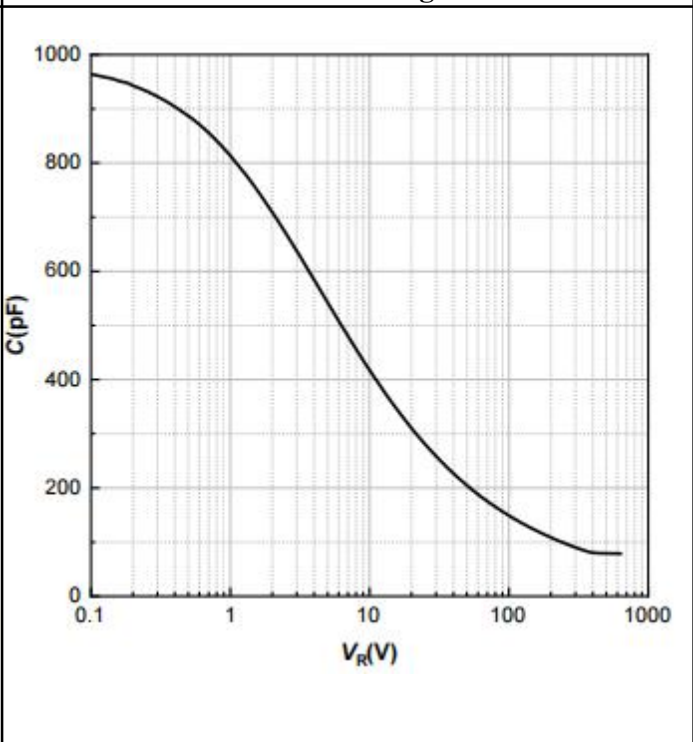


Figure 4. Typical capacitance as function of reverse voltage, $C=f(V_R)$; $T_j=25^\circ\text{C}$; $f=1\text{ MHz}$

Typical Characteristics

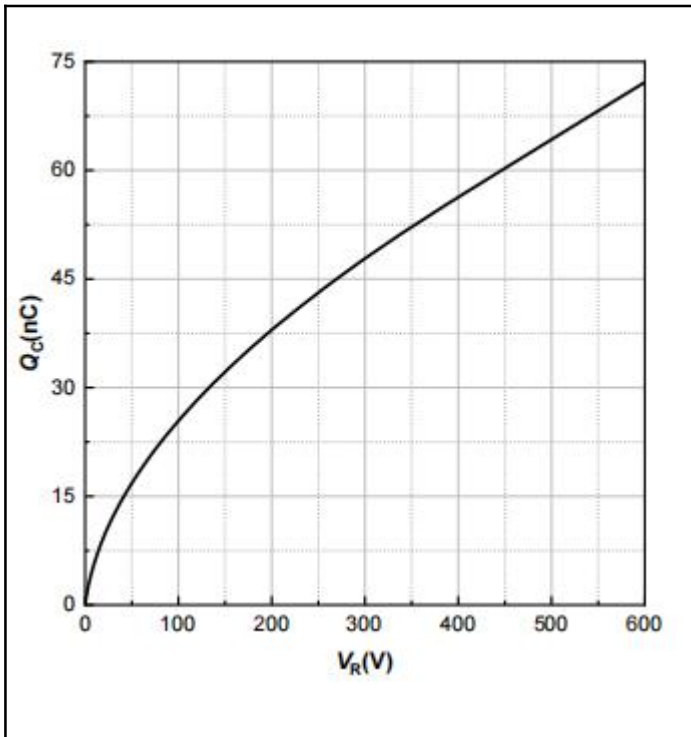


Figure 5. Typical reverse charge as function of reverse voltage

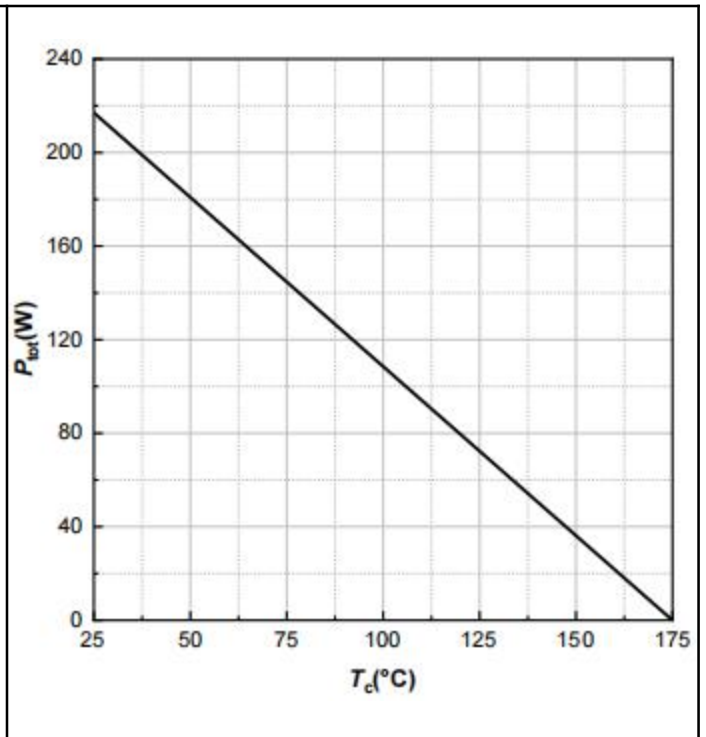


Figure 6. Power dissipation as function of case temperature

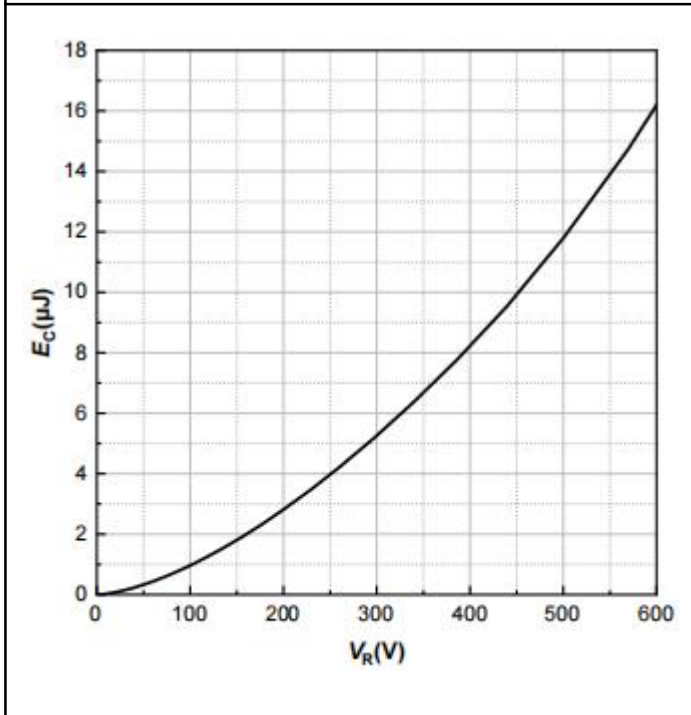


Figure 7. Capacitance stored energy

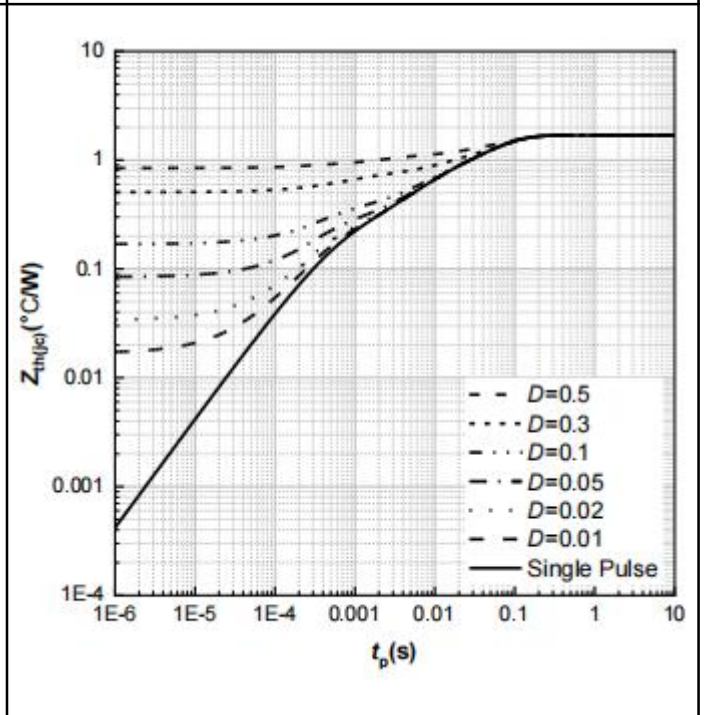
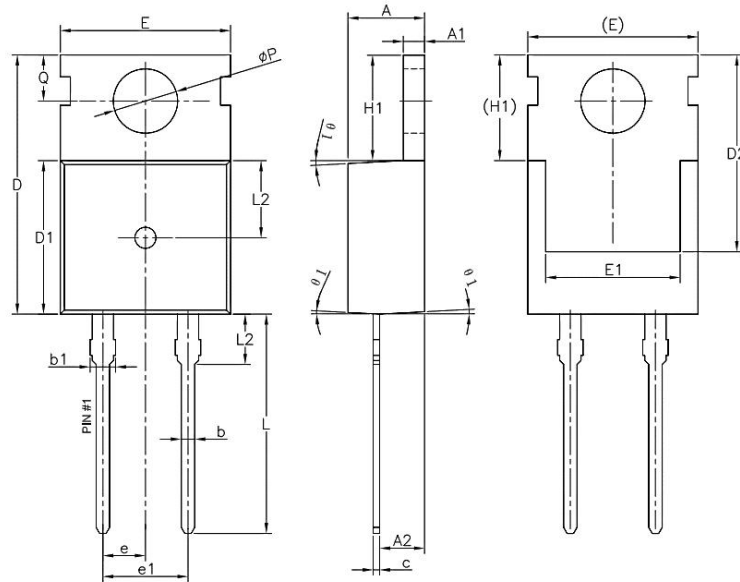


Figure 8. Max. transient thermal impedance, $Z_{th(jc)}=f(t_p)$, parameter: $D=t_p/T$

Package Outline Dimensions

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°