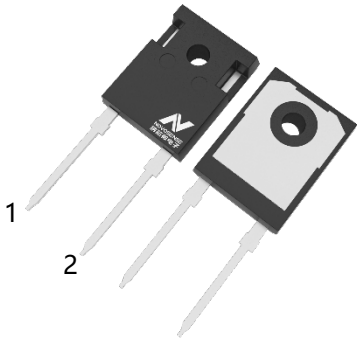
NPD020N120A-DTOGT

SiC Schottky Diode

Datasheet (EN) 1.1

Key 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
- Power Factor Correction
- Motor Drivers

Device information

Part Number	V_{RRM}	$I_F(T_C=150°C)$	Q_C	$T_{j\,max}$	Package
NPD020N120A-DTOGT	1200V	20A	106nC	175°C	TO-247-2

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1. Maximum Ratings

at T_j =25°C unless otherwise specified

Symbol	Parameter	Test conditions	Value	Unit
V_{RRM}	Repetitive peak reverse voltage		1200	V
V_{RSM}	Surge peak reverse voltage		1200	V
I_F	Continuous forward current	T_C =25°C T_C =135°C T_C =150°C	61 28 20	A
I_{FSM}	Non-Repetitive forward surge current	T_C=25°C, t_p=10ms, Half Sine Wave	200	A
P_{tot}	Power dissipation	T_C=25°C T_C=150°C	267 44	W
$\int i^2dt$	i^2t value	T_C=25°C, t_p=10ms	200	A^2S
T_j	Operating junction temperature		-55~175	°C
T_{stg}	Storage temperature		-55~175	°C
M	Mounting torque, M3 screw		0.6	Nm

2. Electrical Characteristics

Static Characteristics, at T_j =25°C unless otherwise specified

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=20A, T_j=25°C I_F=20A, T_j=175°C		1.41 1.90	1.60 2.80	V
I_R	Reverse current	V_R=1200V, T_j=25°C V_R=1200V, T_j=175°C		0.5 5	200 400	μA

AC Characteristics, at T_j =25°C unless otherwise specified

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
Q_C	Total capacitive charge	V_R=800V, T_j=25°C		106		nC
C	Total capacitance	V_R=1V, f=1MHz V_R=400V, f=1MHz V_R=800V, f=1MHz		1144 99 74		pF

3. Thermal Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
$R_{th(jc)}$	Thermal resistance from junction to case			0.56		°C/W

4. Electrical Characteristics Diagrams

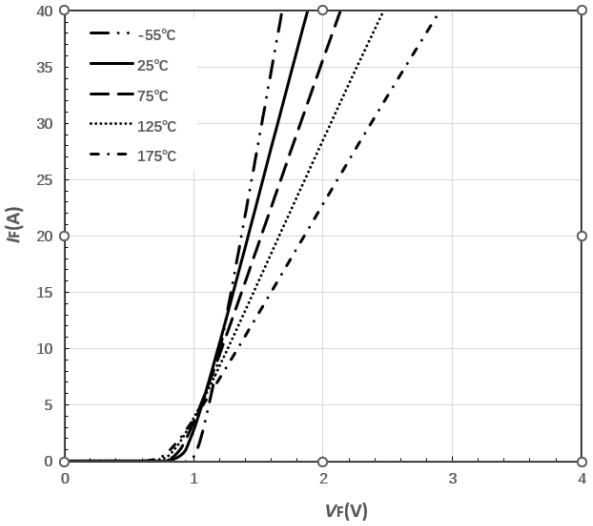


Figure 1. Typical forward characteristics

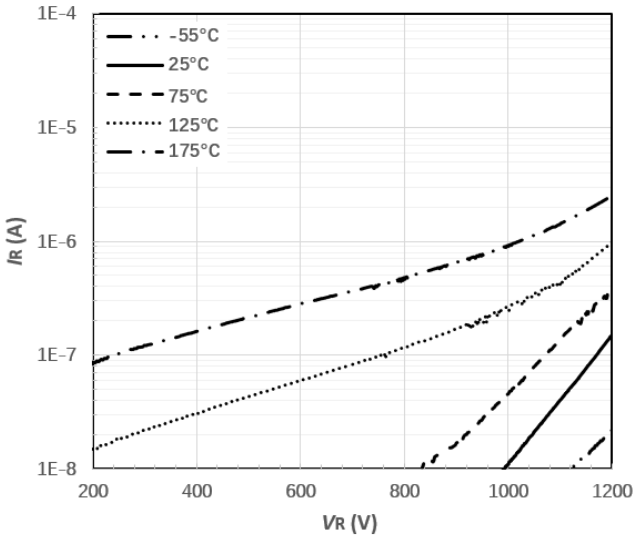


Figure 2. Typical reverse characteristics

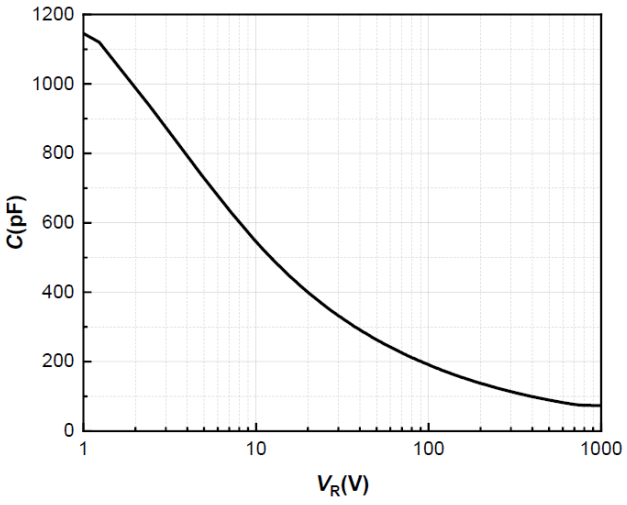


Figure 3. Typical capacitance as function of reverse voltage, C=f(VR); T_j=25°C; f=1 MHz

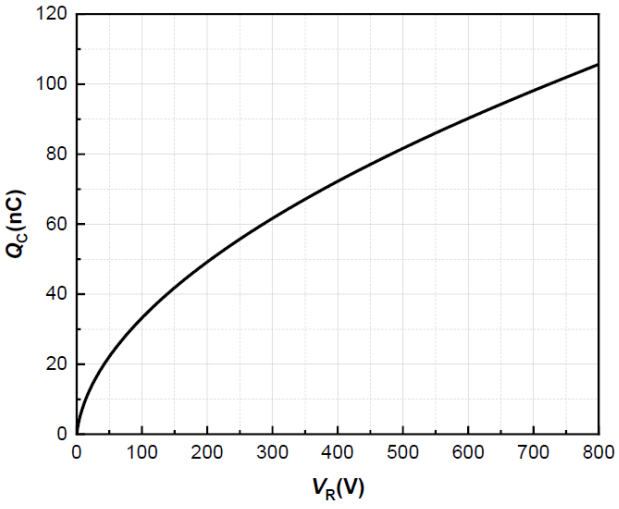


Figure 4. Typical reverse charge as function of reverse voltage

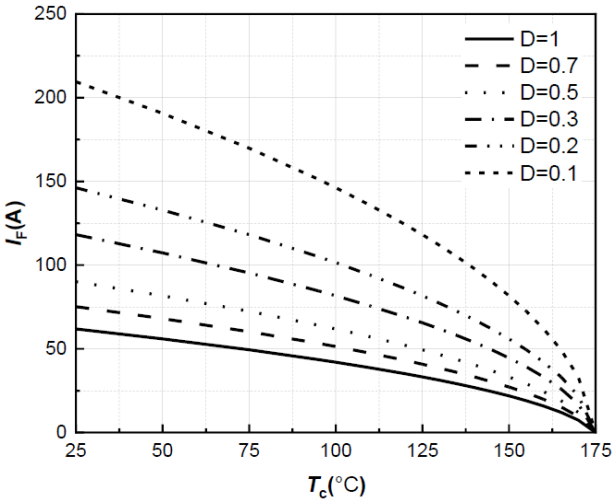


Figure 5. Forward current as function of case temperature

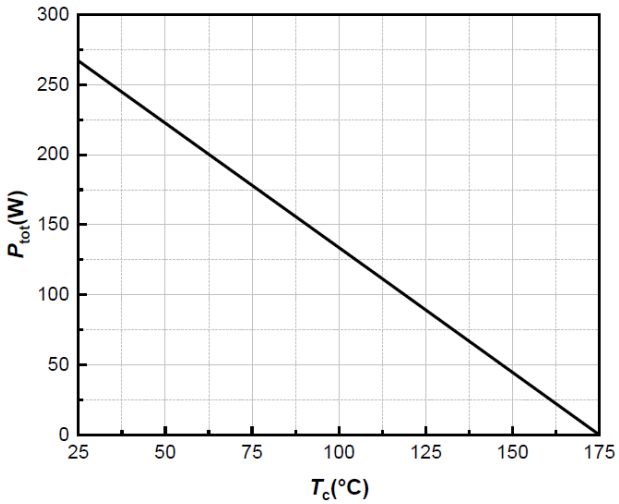


Figure 6. Power dissipation as function of case temperature

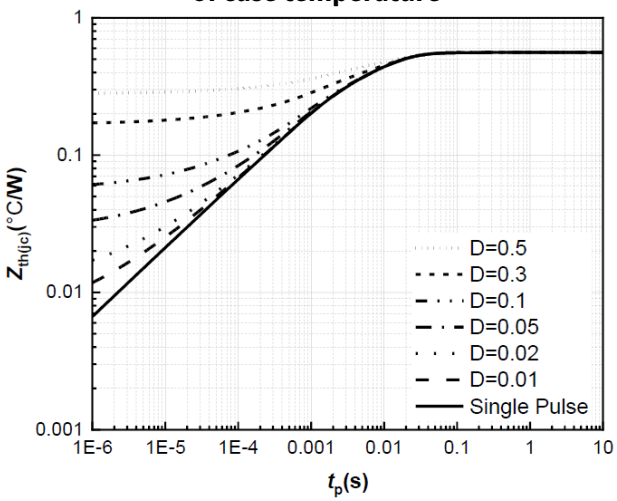
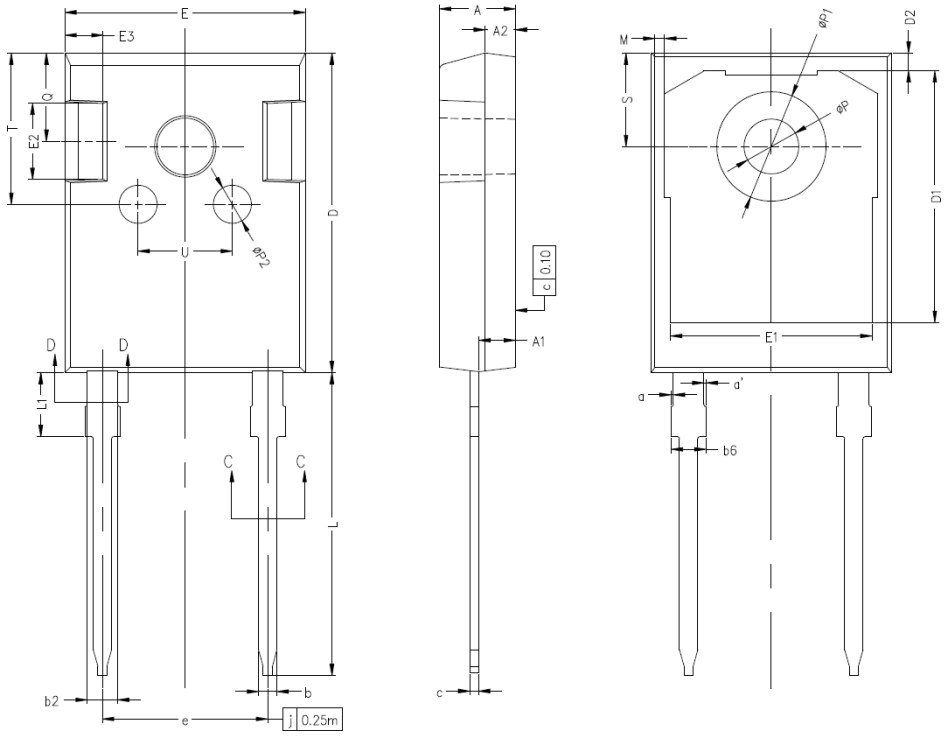


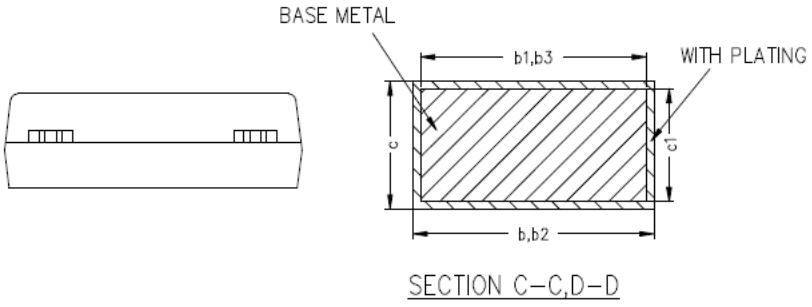
Figure 7. Max transient thermal impedance

5. Package Information



(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	4.90	5.00	5.10
A1	2.31	2.41	2.51
A2	1.90	2.00	2.10
a	0	–	0.15
a'	0	–	0.15
b	1.16	–	1.29
b1	1.15	1.20	1.25
b2	1.96	–	2.06
b3	1.95	2.00	2.02
b6	–	–	2.25
c	0.59	–	0.66
c1	0.58	0.60	0.62
D	20.90	21.00	21.10
D1	16.25	16.55	16.85
D2	1.05	1.20	1.35
E	15.70	15.80	15.90
E1	13.06	13.26	13.46
E2	4.90	5.00	5.10
E3	2.40	2.50	2.60
e	10.78	10.88	10.98
L	19.80	19.92	20.10
L1	3.93	–	4.46
M	0.35	–	0.95
P	3.50	3.60	3.70
P1	7.00	–	7.40
P2	2.40	2.50	2.60
Q	5.60	–	6.00
S	6.05	6.15	6.25
T	9.80	–	10.20
U	6.00	–	6.40



SECTION C–C,D–D

NOTES:
1. ALL DIMENSIONS REFER TO JEDEC STANDARD TO–247 AD DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS.
2. EJECTION MARK DEPTH $0.10^{+0.15}_{-0.05}$.

6. Ordering Information

Part Number	Package Type	Packing Type	SPQ
NPD020N120A-DTOGT	TO247-2	Tube	30

7. Revision History

Revision	Description	Date
1.0	Released version	2023/1/10
1.1	Update I_{FSM}	2024/6/13

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