



DONGGUAN NANJING ELECTRONICS LTD.,
TO-247-2 Silicon Carbide Schottky Diode

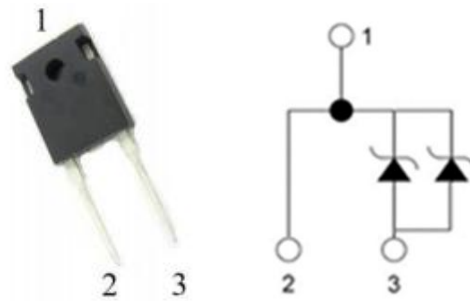
NJ50PD120A SiC Diode 1200V, 50A, 310nC

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
- High surge current capability



**TO-247-2
Pin definition**

Applications

- Motor Drives
- Solar / Wind Inverters
- 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 $T_C=150^\circ\text{C}$	Q_C
NJ50PS120A	1200V	50A	310nC

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

Typical Characteristics

Maximum Ratings

$T_C=25^{\circ}\text{C}$, unless otherwise specified

Parameter	Symbol	Value	Unit
Peak Repetitive Reverse Voltage	V_{RRM}	1200	V

Maximum Ratings

$T_C=25^{\circ}\text{C}$, unless otherwise specified

Parameter	Symbol	Value	Unit
Continuous Forward Current: $T_C = 25^{\circ}\text{C}$ $T_C = 135^{\circ}\text{C}$ $T_C = 150^{\circ}\text{C}$	I_F	155 75 50	A
Non Repetitive Forward Surge Current: $T_C = 25^{\circ}\text{C}$, $t_p = 10\text{ms}$, Half Sine Pulse $T_C = 110^{\circ}\text{C}$, $t_p = 10\text{ms}$, Half Sine Pulse	I_{FSM}	350 330	A
Repetitive peak Forward Surge Current: Freq = 0.1Hz, 100 cycles $T_C = 25^{\circ}\text{C}$, $t_p = 10\text{ms}$, Half Sine Pulse $T_C = 110^{\circ}\text{C}$, $t_p = 10\text{ms}$, Half Sine Pulse	I_{FRM}	320 300	A
Total power dissipation : $T_C = 25^{\circ}\text{C}$ $T_C = 110^{\circ}\text{C}$	P_D	625 271	W
Single Pulse Avalanche Energy: $L = 2\text{mH}$, $I_{AS} = 10\text{A}$	E_{AS}	100	mJ
Diode dv/dt ruggedness: $V_R = 0-1200\text{V}$	dv/dt	80	V/ns
Operating Junction Temperature	T_j	-55 to 175	$^{\circ}\text{C}$
Storage Temperature	T_{stg}	-55 to 175	$^{\circ}\text{C}$

Typical Characteristics

Thermal Resistance

Parameter	Symbol	Condition	Typ.	Max	Unit
Thermal resistance	$R_{th(j-c)}$	junction-case	0.24		$^{\circ}\text{C}/\text{W}$

Electrical Characteristic

$T_C = 25^{\circ}\text{C}$, unless otherwise specified

Parameter	Symbol	Value			Unit	Test Condition
		Min.	Typ.	Max.		
DC Blocking Voltage	V_{DC}	1200			V	$T_j = 25^{\circ}\text{C}$
Forward Voltage	V_F		1.40 1.65 1.85	1.7	V	$I_F = 50\text{A}$ $T_j = 25^{\circ}\text{C}$ $T_J = 125^{\circ}\text{C}$ $T_j = 175^{\circ}\text{C}$
Reverse Current	I_R		30 180 540	200 400 700	μA	$V_R = 1200\text{V}$ $T_j = 25^{\circ}\text{C}$ $T_J = 125^{\circ}\text{C}$ $T_j = 175^{\circ}\text{C}$
Total Capacitance Charge	Q_C		310		nC	$V_R = 800\text{V}$ $T_J = 25^{\circ}\text{C}$
Total Capacitance	C		3620 293 207		pF	$V_R = 1\text{V}$ $V_R = 400\text{V}$ $V_R = 800\text{V}$ $T_J = 25^{\circ}\text{C}$ Freq = 1MHz

Characteristics Curves

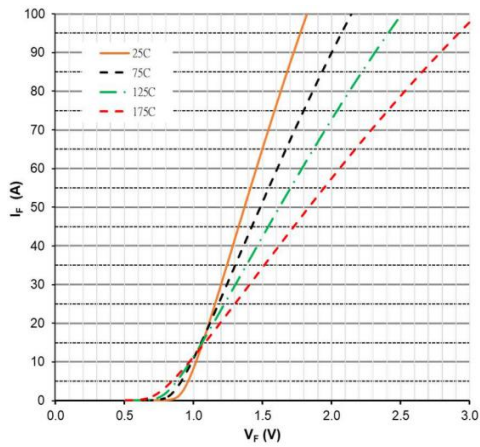


Figure 1. Forward Characteristics

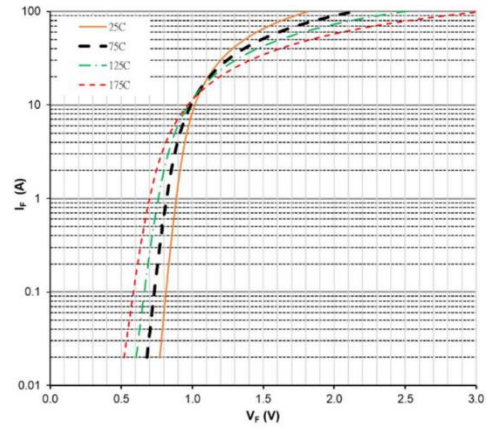


Figure 2. Forward Characteristics

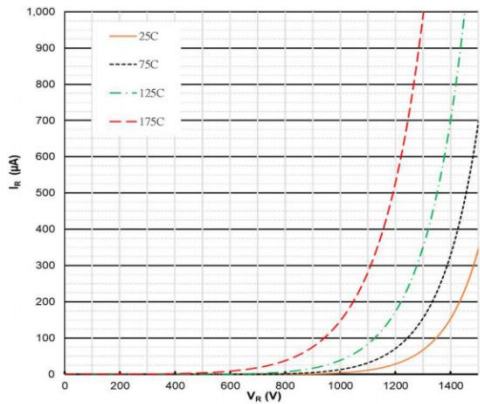


Figure 3. Reverse Characteristics

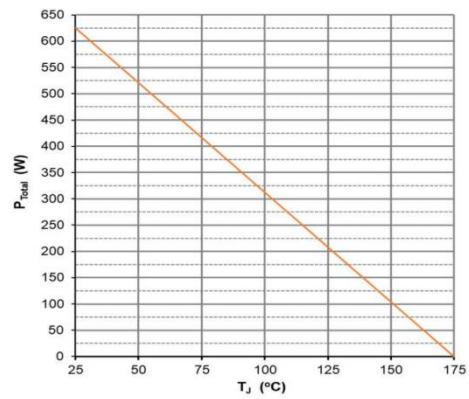


Figure 4. Power Derating

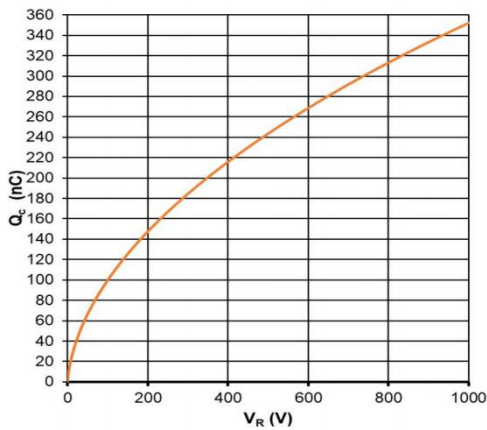


Figure 5. Reverse charge vs. Reverse Voltage

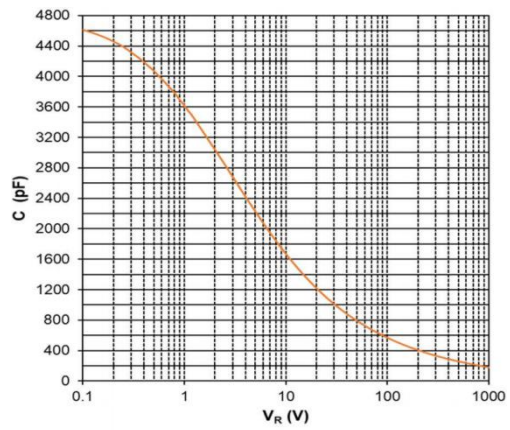
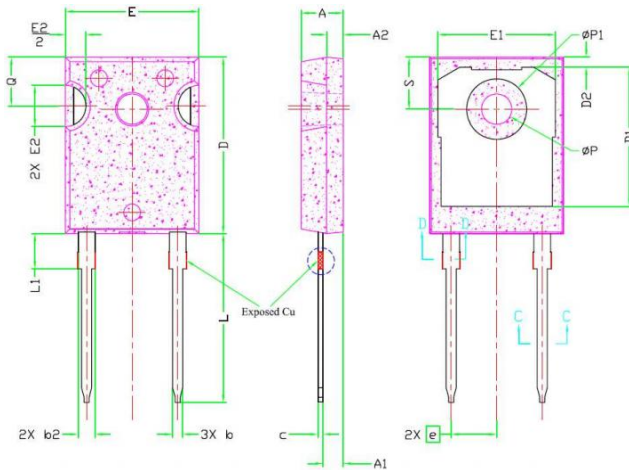


Figure 6. Capacitance vs. Reverse Voltage

Package Outline:TO-247-2

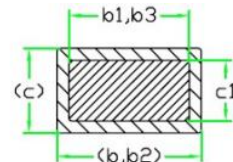


SYMBOL	DIMENSIONS			NOTES
	MIN.	NOM.	MAX.	
A	4.83	5.02	5.21	
A1	2.29	2.41	2.55	
A2	1.50	2.00	2.49	
b	1.12	1.20	1.33	
b1	1.12	1.20	1.28	
b2	1.91	2.00	2.39	6
b3	1.91	2.00	2.34	
c	0.55	0.60	0.69	6
c1	0.55	0.60	0.65	
D	20.80	20.95	21.10	4
D1	16.25	16.55	17.65	5
D2	0.51	1.19	1.35	
E	15.75	15.94	16.13	4
E1	13.46	14.02	14.16	5
E2	4.32	4.91	5.49	3
e	5.44BSC			
L	19.81	20.07	20.32	
L1	4.10	4.19	4.40	6
ØP	3.56	3.61	3.65	7
ØP1	7.19REF.			
Q	5.39	5.79	6.20	
S	6.04	6.17	6.30	



Note:

1. Package Reference: JEDEC TO247, Variation AD.
2. All Dimensions Are In mm.
3. Slot Required, Notch May Be Rounded
4. Dimension D & E Do Not Include Mold Flash. Mold Flash Shall Not Exceed 0.127mm Pre Side. These Dimensions Are Measured At The Outermost Extreme Of The Plastic Body.
5. Thermal Pad Contour Optional Within Dimension D1 & E1.
6. Lead Finish Uncontrolled In L1.
7. ØP To Have A Maximum Draft Angle Of 1.5° To The Top Of The Part With A Maximum Hole Diameter Of 3.91mm.
8. Dimension "b2" And "b4" Does Not Include Dambar Protrusion. Allowable Dambar Protrusion Shall Be 0.10mm Total In Excess Of "b2" And "b4" Dimension At Maximum Material Condition.



Section C-C, D-D