



DONGGUAN NANJING ELECTRONICS LTD.,

TO-247-2 Silicon Carbide Schottky Diode

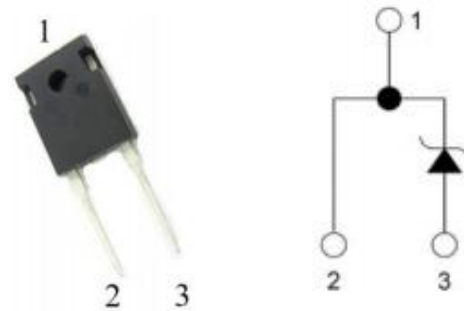
NJ20PS120A SiC Diode 1200V, 20A, 93nC

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
NJ20PS120A	1200V	20A	93nC

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	58 26 20	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}	140 130	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}	110 100	A
Total power dissipation : $T_C = 25^{\circ}\text{C}$ $T_C=110^{\circ}\text{C}$	P_D	250 108	W
Single Pulse Avalanche Energy: $L = 2\text{mH}$, $I_{AS} = 10\text{A}$	E_{AS}	100	mJ
Diode dv/dt ruggedness: $V_R = 0\text{-}1200\text{V}$	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	Typ.	Max	Unit
Thermal resistance, junction-case	R_{thJC}	0.6	0.75	$^{\circ}C/W$

Electrical Characteristic

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

Parameter	Symbol	Value			Unit	Test Condition
		Min.	Typ.	Max.		
DC Blocking Voltage	V_{DC}	1200			V	$T_j = 25^{\circ}C$
Forward Voltage	V_F		1.45 1.8 2.0	1.8	V	$I_F = 20A$ $T_j = 25^{\circ}C$ $T_j = 125^{\circ}C$ $T_j = 175^{\circ}C$
Reverse Current	I_R		10 20 50	200 250 300	μA	$V_R = 1200V$ $T_j = 25^{\circ}C$ $T_j = 125^{\circ}C$ $T_j = 175^{\circ}C$
Total Capacitance Charge	Q_C		93		nC	$V_R = 800V$ $T_j = 25^{\circ}C$
Total Capacitance	C		1120 92 62		pF	$V_R = 1V$ $V_R = 400V$ $V_R = 800V$ $T_j = 25^{\circ}C$ Freq = 1MHz

Characteristics Curves

Figure 1. Forward Characteristics

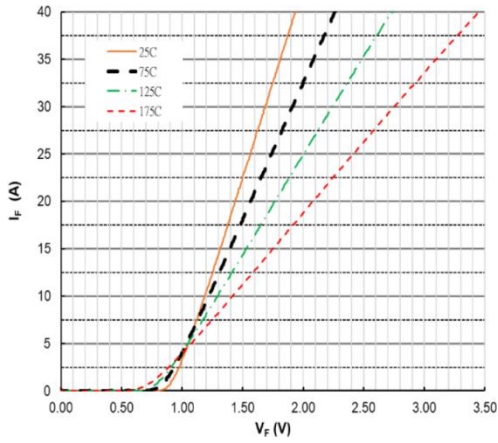


Figure 2. Forward Characteristics

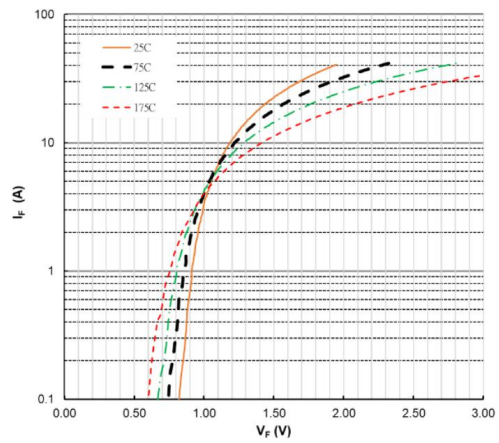


Figure 3. Reverse Characteristics

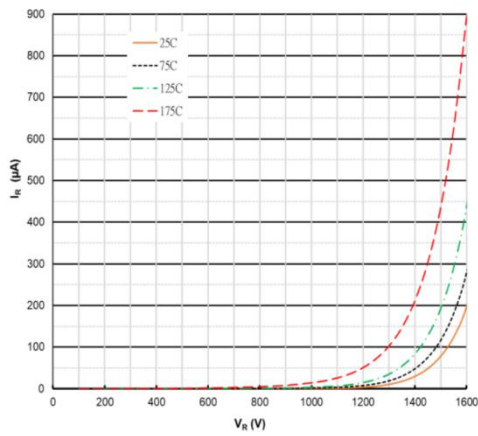


Figure 4. Power Derating

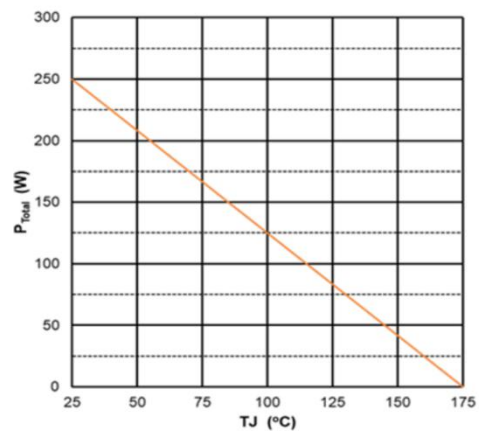


Figure 5. Reverse charge vs. Reverse Voltage

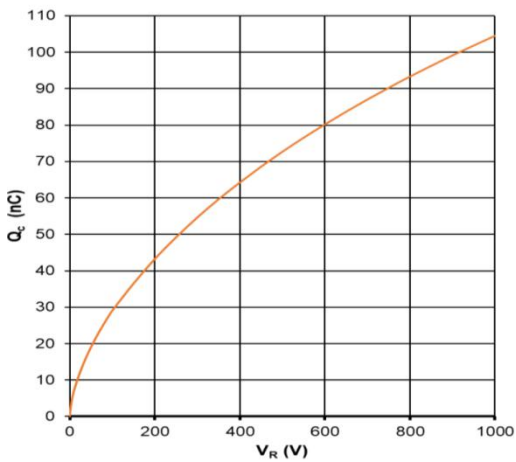
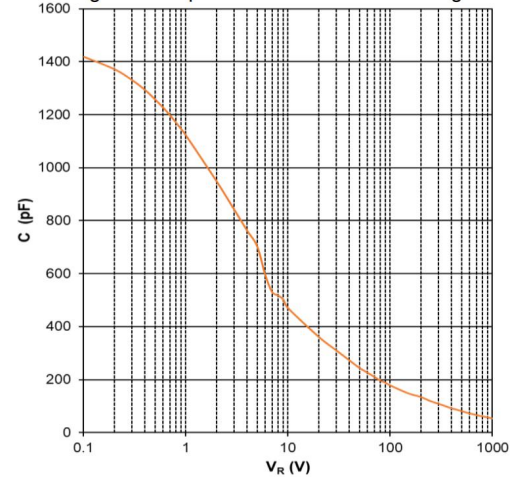
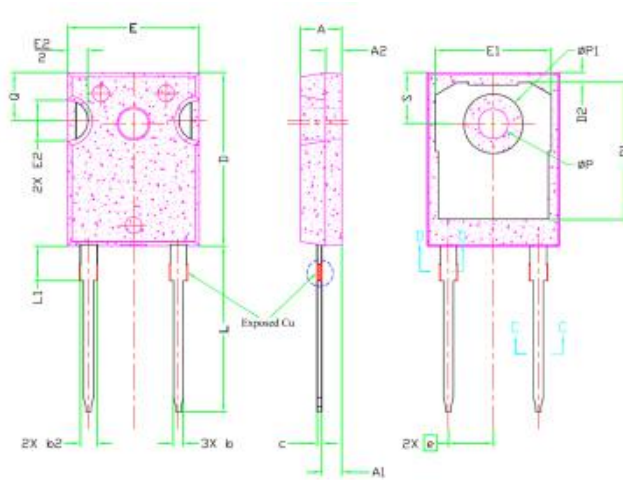


Figure 6. Capacitance vs. Reverse Voltage



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 Per 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.

