

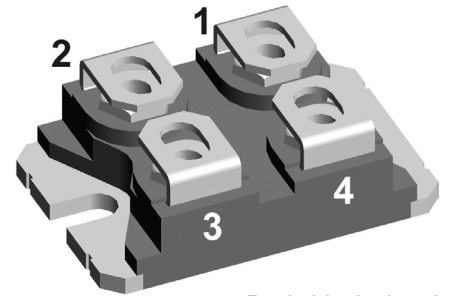
# SiC Schottky Diode

$$V_{RRM} = 1200 \text{ V}$$

$$I_{FAV} = 2 \times 47 \text{ A}$$

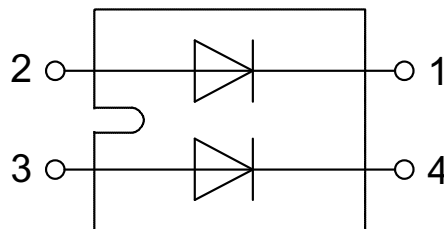
Ultra fast switching  
Zero reverse recovery

Part number  
**DCG100X1200NA**



Backside: isolated

 E72873



## Features / Advantages:

- Ultra fast switching
- Zero reverse recovery
- Zero forward recovery
- Temperature independent switching behavior
- Positive temperature coefficient of forward voltage
- $T_{VJM} = 175^{\circ}\text{C}$

## Applications:

- Solar inverter
- Uninterruptible power supply (UPS)
- Welding equipment
- Switched-mode power supplies
- Medical equipment
- High speed rectifier

## Package: SOT-227B (minibloc)

- Isolation Voltage: 2500 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Base plate with Aluminium nitride isolation for low thermal resistance
- Advanced power cycling

## Disclaimer Notice

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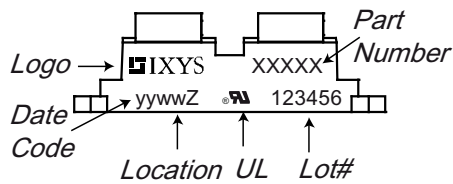
| SiC Diode (per leg) |                                              |                                                                                                                                  |                                                                 | Ratings                        |              |             |                                      |
|---------------------|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|--------------------------------|--------------|-------------|--------------------------------------|
| Symbol              | Definitions                                  | Conditions                                                                                                                       |                                                                 | min.                           | typ.         | max.        |                                      |
| $V_{RSM}$           | max. non-repetitive reverse blocking voltage | $T_{VJ} = 25^{\circ}\text{C}$                                                                                                    |                                                                 |                                |              | 1200        | V                                    |
| $V_{RRM}$           | max. repetitive reverse blocking voltage     | $T_{VJ} = 25^{\circ}\text{C}$                                                                                                    |                                                                 |                                |              | 1200        | V                                    |
| $I_R$               | reverse current                              | $V_R = V_{RRM}$                                                                                                                  | $T_{VJ} = 25^{\circ}\text{C}$<br>$T_{VJ} = 175^{\circ}\text{C}$ |                                | 100<br>300   | 500<br>1000 | $\mu\text{A}$<br>$\mu\text{A}$       |
| $V_F$               | forward voltage                              | $I_F = 25\text{ A}$<br>$I_F = 50\text{ A}$                                                                                       | $T_{VJ} = 25^{\circ}\text{C}$                                   |                                | 1.25<br>1.60 |             | V<br>V                               |
|                     |                                              |                                                                                                                                  | $T_{VJ} = 175^{\circ}\text{C}$                                  |                                | 1.55<br>2.25 |             | V<br>V                               |
|                     |                                              | $T_C = 80^{\circ}\text{C}$<br>$T_C = 100^{\circ}\text{C}$                                                                        | $T_{VJ} = 175^{\circ}\text{C}$                                  |                                |              | 47<br>41    | A<br>A                               |
|                     |                                              |                                                                                                                                  |                                                                 |                                |              |             |                                      |
| $I_{FAV}$           | average forward current                      | $T_C = 80^{\circ}\text{C}$<br>$T_C = 100^{\circ}\text{C}$                                                                        | rectangular<br>$d = 0.5$                                        | $T_{VJ} = 175^{\circ}\text{C}$ |              |             |                                      |
| $I_{F25}$           | forward current                              | based on typ. $V_{F0}$ and $r_F$                                                                                                 | $T_C = 25^{\circ}\text{C}$                                      |                                |              | 82          | A                                    |
| $I_{F80}$           |                                              |                                                                                                                                  | $T_C = 80^{\circ}\text{C}$                                      |                                |              | 63          | A                                    |
| $I_{F100}$          |                                              |                                                                                                                                  | $T_C = 100^{\circ}\text{C}$                                     |                                |              | 55          | A                                    |
| $I_{FSM}$           | max forward surge current                    | $t = 10\text{ ms}$ , $\frac{1}{2}$ sine (50 Hz), $V_R = 0\text{ V}$<br>$t_p = 10\text{ }\mu\text{s}$ , pulse, $V_R = 0\text{ V}$ | $T_{VJ} = 25^{\circ}\text{C}$                                   |                                |              |             | A<br>A                               |
| $V_{F0}$            | threshold voltage                            | for power loss calculation                                                                                                       | $T_{VJ} = 125^{\circ}\text{C}$<br>$175^{\circ}\text{C}$         |                                | 0.75         |             | V<br>V                               |
| $r_F$               | slope resistance                             |                                                                                                                                  | $T_{VJ} = 125^{\circ}\text{C}$<br>$175^{\circ}\text{C}$         |                                | 34.0         |             | $\text{m}\Omega$<br>$\text{m}\Omega$ |
| $Q_C$               | total capacitive charge                      | $V_R = 800\text{ V}$ , $I_F = 50\text{ A}$<br>$di/dt = 200\text{ A}/\mu\text{s}$                                                 | $T_{VJ} = 25^{\circ}\text{C}$                                   |                                | 250          |             | nC                                   |
| $C$                 | total capacitance                            | $V_R = 0\text{ V}$<br>$V_R = 400\text{ V}$<br>$V_R = 800\text{ V}$                                                               | $f = 1\text{ MHz}$                                              | $T_{VJ} = 25^{\circ}\text{C}$  | 3380         |             | pF                                   |
|                     |                                              |                                                                                                                                  |                                                                 |                                | 230          |             | pF                                   |
|                     |                                              |                                                                                                                                  |                                                                 |                                | 173          |             | pF                                   |
| $R_{thJC}$          | thermal resistance junction to case          | with heatsink compound; IXYS test setup                                                                                          |                                                                 |                                |              | 0.52        | K/W                                  |
| $R_{thJH}$          | thermal resistance junction to heatsink      |                                                                                                                                  |                                                                 |                                |              | 0.65        | K/W                                  |



| Package Outlines SOT-227B (minibloc) |                               |                                                                                                  | Ratings      |      |            |          |
|--------------------------------------|-------------------------------|--------------------------------------------------------------------------------------------------|--------------|------|------------|----------|
| Symbol                               | Definitions                   | Conditions                                                                                       | min.         | typ. | max.       | Unit     |
| $I_{RMS}$                            | RMS current                   | per terminal                                                                                     |              |      | 100        | A        |
| $T_{stg}$                            | storage temperature           |                                                                                                  | -40          |      | 150        | °C       |
| $T_{op}$                             | operation temperature         |                                                                                                  | -40          |      | 150        | °C       |
| $T_{VJ}$                             | virtual junction temperature  |                                                                                                  | -40          |      | 175        | °C       |
| <b>Weight</b>                        |                               |                                                                                                  |              | 30   |            | g        |
| $M_D$                                | mounting torque <sup>1)</sup> | screws to heatsink<br>terminal connection screws                                                 |              |      | 1.5<br>1.3 | Nm<br>Nm |
| $d_{Spp}$                            | creepage distance on surface  | terminal to terminal                                                                             | 10.5         |      |            | mm       |
| $d_{Spb}$                            |                               | terminal to backside                                                                             | 8.5          |      |            | mm       |
| $d_{App}$                            | striking distance through air | terminal to terminal                                                                             | 3.2          |      |            | mm       |
| $d_{Apb}$                            |                               | terminal to backside                                                                             | 6.8          |      |            | mm       |
| $V_{ISOL}$                           | isolation voltage             | $I_{ISOL} \leq 1 \text{ mA}; 50/60 \text{ Hz}$<br>$t = 1 \text{ sec.}$<br>$t = 1 \text{ minute}$ | 3000<br>2500 |      |            | V<br>V   |
| $C_p$                                | coupling capacity per switch  | between shorted terminals of one diode<br>and back side metallization                            |              | 20   |            | pF       |

<sup>1)</sup> further information see application note IXAN0073 on  
www.ixys.com/TechnicalSupport/appnotes.aspx (General / Isolation, Mounting, Soldering, Cooling)

### Product Marking



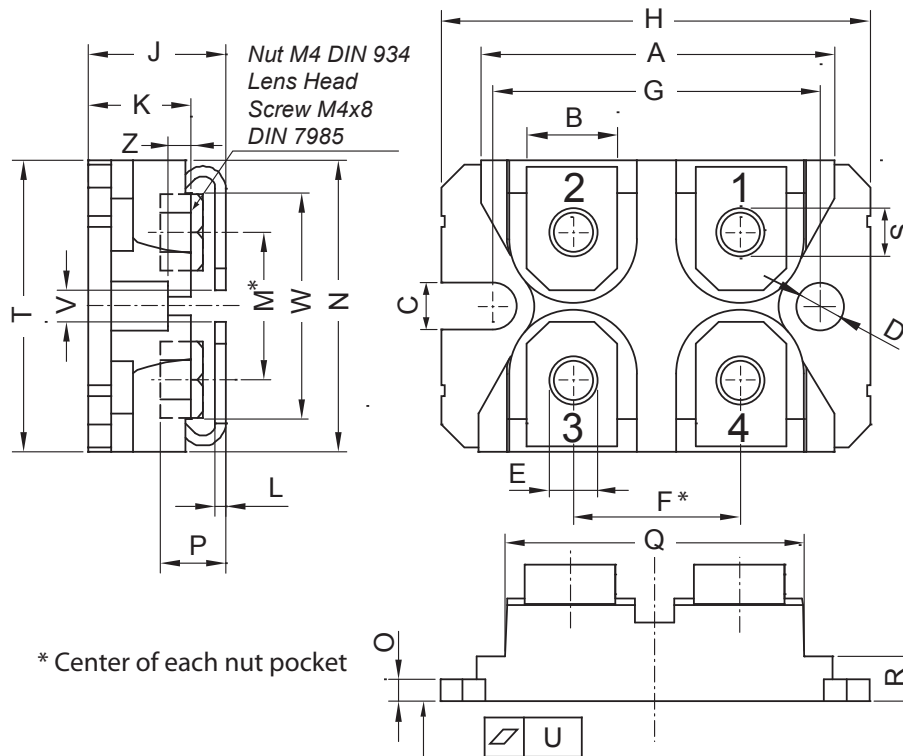
### Part description

D = Diode  
C = SiC  
G = extreme fast  
100 = Current Rating [A]  
X = Parallel legs  
1200 = Reverse Voltage [V]  
NA = SOT-227 (minibloc)

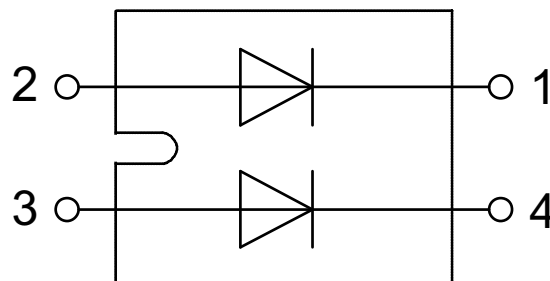
| Ordering | Part Name     | Marking on Product | Delivering Mode | Base Qty | Ordering Code |
|----------|---------------|--------------------|-----------------|----------|---------------|
| Standard | DCG100X1200NA | DCG100X1200NA      | Tube            | 10       | DCG100X1200NA |

### Equivalent Circuits for Simulation <sup>\*on die level, typical</sup>

|              |                    |                                |                                |    |
|--------------|--------------------|--------------------------------|--------------------------------|----|
|              |                    | $T_{VJ} = 125^{\circ}\text{C}$ | $T_{VJ} = 175^{\circ}\text{C}$ |    |
| $V_{0 \max}$ | threshold voltage  |                                | 0.75                           | V  |
| $R_{0 \max}$ | slope resistance * |                                | 34.0                           | mΩ |

**Outlines SOT-227B (minibloc)**


| Dim. | Millimeter |       | Inches |       |
|------|------------|-------|--------|-------|
|      | min        | max   | min    | max   |
| A    | 31.50      | 31.88 | 1.240  | 1.255 |
| B    | 7.80       | 8.20  | 0.307  | 0.323 |
| C    | 4.09       | 4.29  | 0.161  | 0.169 |
| D    | 4.09       | 4.29  | 0.161  | 0.169 |
| E    | 4.09       | 4.29  | 0.161  | 0.169 |
| F    | 14.91      | 15.11 | 0.587  | 0.595 |
| G    | 30.12      | 30.30 | 1.186  | 1.193 |
| H    | 37.80      | 38.23 | 1.488  | 1.505 |
| J    | 11.68      | 12.22 | 0.460  | 0.481 |
| K    | 8.92       | 9.60  | 0.351  | 0.378 |
| L    | 0.74       | 0.84  | 0.029  | 0.033 |
| M    | 12.50      | 13.10 | 0.492  | 0.516 |
| N    | 25.15      | 25.42 | 0.990  | 1.001 |
| O    | 1.95       | 2.13  | 0.077  | 0.084 |
| P    | 4.95       | 6.20  | 0.195  | 0.244 |
| Q    | 26.54      | 26.90 | 1.045  | 1.059 |
| R    | 3.94       | 4.42  | 0.155  | 0.167 |
| S    | 4.55       | 4.85  | 0.179  | 0.191 |
| T    | 24.59      | 25.25 | 0.968  | 0.994 |
| U    | -0.05      | 0.10  | -0.002 | 0.004 |
| V    | 3.20       | 5.50  | 0.126  | 0.217 |
| W    | 19.81      | 21.08 | 0.780  | 0.830 |
| Z    | 2.50       | 2.70  | 0.098  | 0.106 |



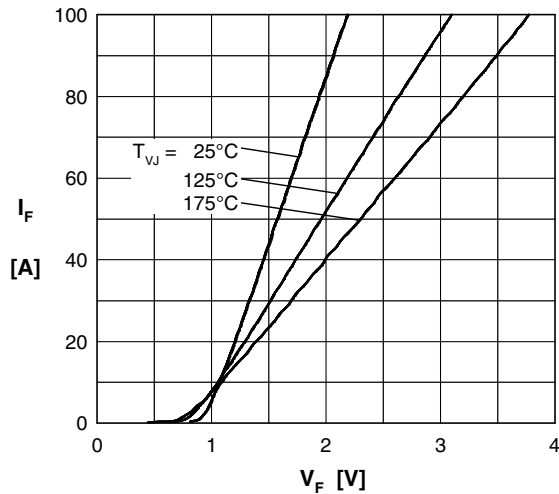
**SiC Diode (per leg)**


Fig. 1 Typ. forward characteristics

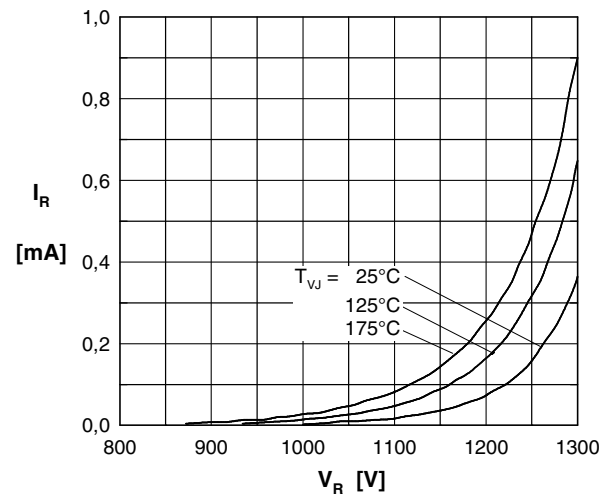


Fig. 2 Typ. reverse characteristics

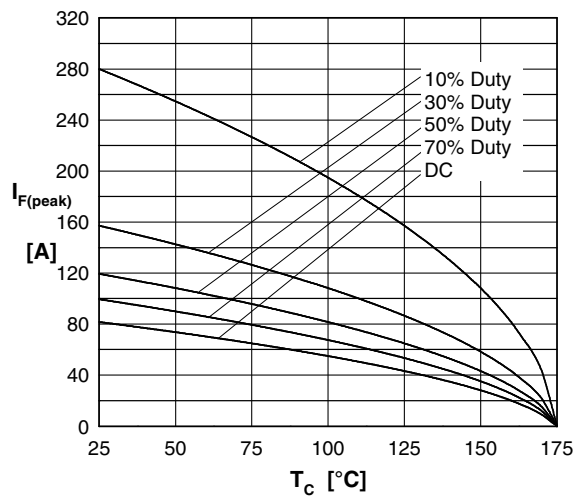


Fig. 3 Typ. current derating

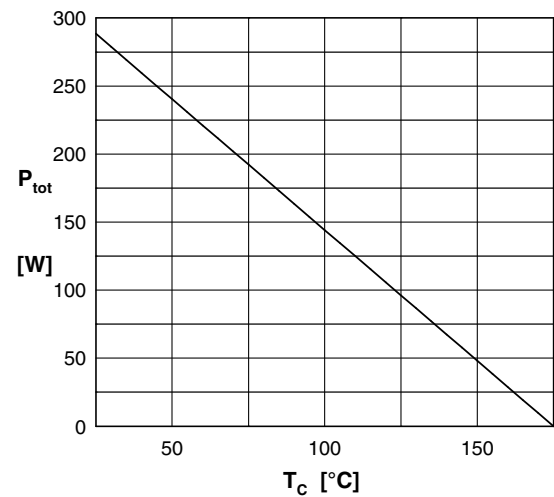


Fig. 4 Power derating

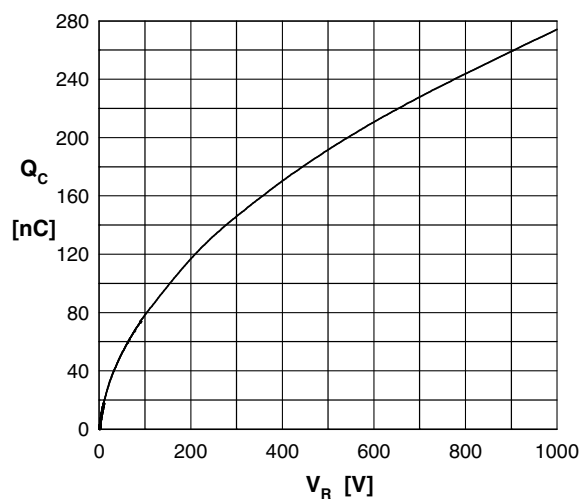


Fig. 5 Typ. recovery charge vs. reverse voltage

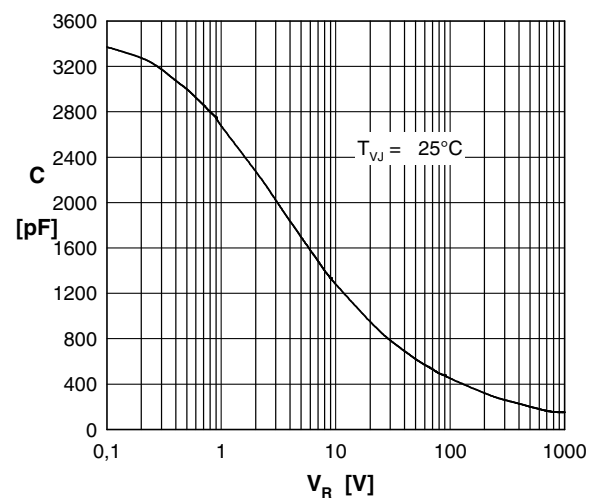


Fig. 6 Typ. junction capacitance vs. reverse Voltage



**SiC Diode (per leg)**

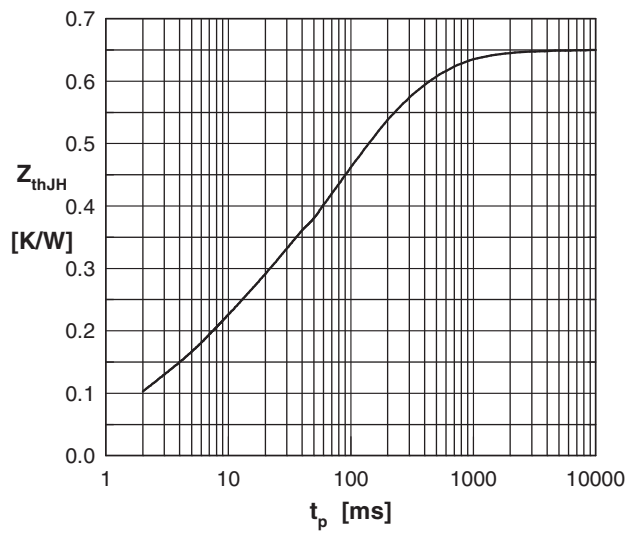


Fig. 7 Typ. transient thermal impedance