

preliminary

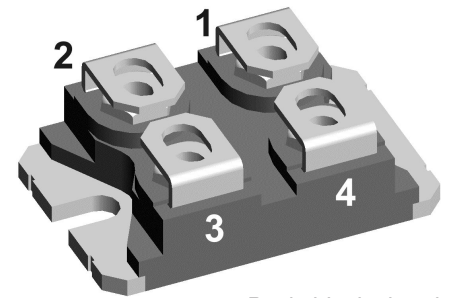
# SiC Schottky Diode

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

$$I_{FAV} = 2 \times 41 \text{ A}$$

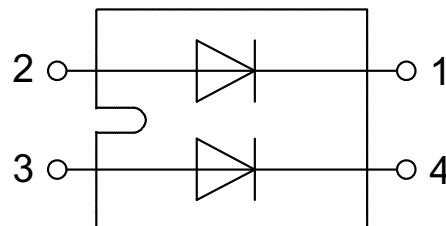
Ultra fast switching  
Zero reverse recovery

Part number  
**DCG85X1200NA**



Backside: isolated

UL pending



## Features / Advantages:

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

## Applications:

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

## Package: SOT-227B (minibloc)

- Isolation Voltage: 3000 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Base plate with Aluminium nitride isolation for low thermal resistance
- Advanced power cycling

## Terms & Conditions of Usage

The data contained in this product data sheet is exclusively intended for technically trained staff. The user will have to evaluate the suitability of the product for the intended application and the completeness of the product data with respect to his application. The specifications of our components may not be considered as an assurance of component characteristics. The information in the valid application- and assembly notes must be considered. Should you require product information in excess of the data given in this product data sheet or which concerns the specific application of your product, please contact the sales office, which is responsible for you. Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact the sales office, which is responsible for you.

Should you intend to use the product in aviation, in health or life endangering or life support applications, please notify. For any such application we urgently recommend

- to perform joint risk and quality assessments;
- the conclusion of quality agreements;

- to establish joint measures of an ongoing product survey, and that we may make delivery dependent on the realization of any such measures.

IXYS reserves the right to change limits, test conditions and dimensions.

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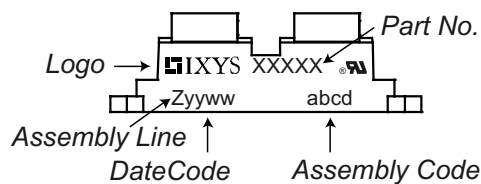
1 - 6

| SiC Diode (per leg)                                       |                                                                                |                                                                          |                                                                          | Ratings                                         |                                                   |            |                |
|-----------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------|------------|----------------|
| Symbol                                                    | Definitions                                                                    | Conditions                                                               |                                                                          | min.                                            | typ.                                              | max.       |                |
| V <sub>RSM</sub>                                          | max. non-repetitive reverse blocking voltage                                   | T <sub>VJ</sub> = 25°C                                                   |                                                                          |                                                 |                                                   | 1200       | V              |
| V <sub>RRM</sub>                                          | max. repetitive reverse blocking voltage                                       | T <sub>VJ</sub> = 25°C                                                   |                                                                          |                                                 |                                                   | 1200       | V              |
| I <sub>R</sub>                                            | reverse current                                                                | V <sub>R</sub> = V <sub>RRM</sub>                                        | T <sub>VJ</sub> = 25°C<br>T <sub>VJ</sub> = 175°C                        |                                                 | 70<br>130                                         | 400<br>800 | μA<br>μA       |
| V <sub>F</sub>                                            | forward voltage                                                                | I <sub>F</sub> = 20 A<br>I <sub>F</sub> = 40 A                           | T <sub>VJ</sub> = 25°C                                                   |                                                 | 1.5                                               | 1.8        | V<br>V         |
|                                                           |                                                                                | I <sub>F</sub> = 20 A<br>I <sub>F</sub> = 40 A                           | T <sub>VJ</sub> = 175°C                                                  |                                                 |                                                   |            | V<br>V         |
|                                                           |                                                                                | I <sub>FAV</sub>                                                         | average forward current                                                  | T <sub>C</sub> = 80°C<br>T <sub>C</sub> = 100°C | } rectangular, d = 0.5<br>T <sub>VJ</sub> = 175°C |            |                |
| I <sub>F25</sub><br>I <sub>F80</sub><br>I <sub>F100</sub> | forward current                                                                | based on typ. V <sub>F0</sub> and r <sub>F</sub>                         | T <sub>C</sub> = 25°C<br>T <sub>C</sub> = 80°C<br>T <sub>C</sub> = 100°C |                                                 |                                                   |            | 73<br>56<br>49 |
| I <sub>FSM</sub>                                          | max forward surge current                                                      | t = 10 ms, half sine (50 Hz)<br>t <sub>p</sub> = 10 μs, pulse            | } T <sub>VJ</sub> = 25°C<br>V <sub>R</sub> = 0V                          |                                                 |                                                   | 1150       | A<br>A         |
| V <sub>F0</sub>                                           | threshold voltage                                                              | } for power loss calculation                                             |                                                                          | T <sub>VJ</sub> = 125°C<br>175°C                |                                                   |            | 0.80<br>0.73   |
| r <sub>F</sub>                                            | slope resistance                                                               |                                                                          | T <sub>VJ</sub> = 125°C<br>175°C                                         |                                                 | 28.4<br>35.2                                      |            | mΩ<br>mΩ       |
| Q <sub>C</sub>                                            | total capacitive charge                                                        |                                                                          | V <sub>R</sub> = 800 V, I <sub>F</sub> = 40A<br>dI/dt = 400 A/μs         | T <sub>VJ</sub> = 25°C                          |                                                   | 200        |                |
| C                                                         | total capacitance                                                              | V <sub>R</sub> = 0 V<br>V <sub>R</sub> = 400 V<br>V <sub>R</sub> = 800 V | } T <sub>VJ</sub> = 25°C, f = 1 MHz                                      |                                                 | 3000<br>185<br>135                                |            | pF<br>pF<br>pF |
| R <sub>thJC</sub><br>R <sub>thJH</sub>                    | thermal resistance junction to case<br>thermal resistance junction to heatsink | with heatsink compound; IXYS test setup                                  |                                                                          |                                                 | 0.72                                              | 0.60       | K/W<br>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             | t = 1 second<br>t = 1 minute                                     | 3000<br>2500 |         |            | V<br>V   |
| $C_P$                                | coupling capacity per switch  | between shorted terminals of diodes and back side metal-lization |              |         |            | pF       |

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

### Product Marking



### Part description

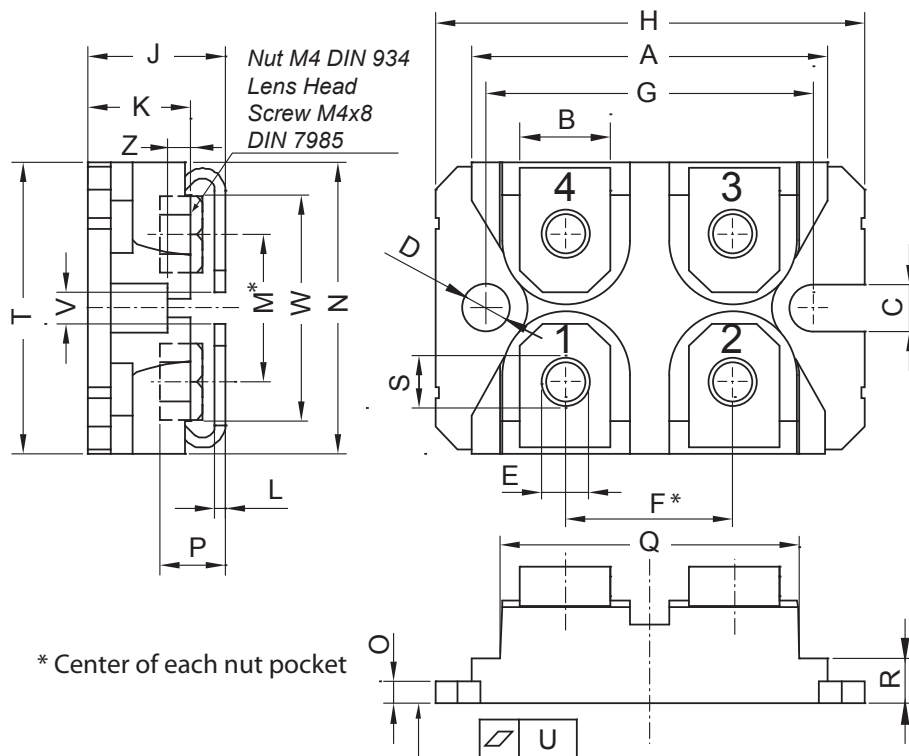
D = Diode  
 C = SiC  
 G = extreme fast  
 85 = Current Rating [A]  
 X = Parallel legs  
 1200 = Reverse Voltage [V]  
 NA = SOT-227 (minibloc)

| Ordering | Part Name    | Marking on Product | Delivering Mode | Base Qty | Ordering Code |
|----------|--------------|--------------------|-----------------|----------|---------------|
| Standard | DCG85X1200NA | DCG85X1200NA       | Tube            | 10       | 520214        |

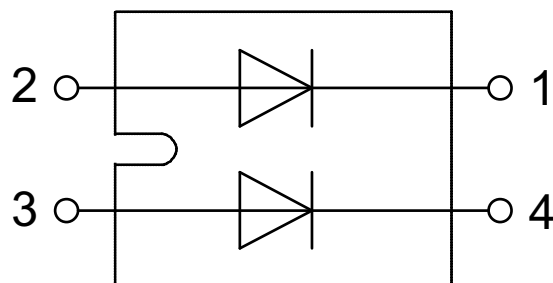
### Equivalent Circuits for Simulation <sup>\* on die level, typical</sup>

|             |                    |                                |                                |    |
|-------------|--------------------|--------------------------------|--------------------------------|----|
|             |                    | $T_{VJ} = 125^{\circ}\text{C}$ | $T_{VJ} = 175^{\circ}\text{C}$ |    |
| $V_{0\max}$ | threshold voltage  | 0.80                           | 0.73                           | V  |
| $R_{0\max}$ | slope resistance * | 28.4                           | 35.2                           | 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)

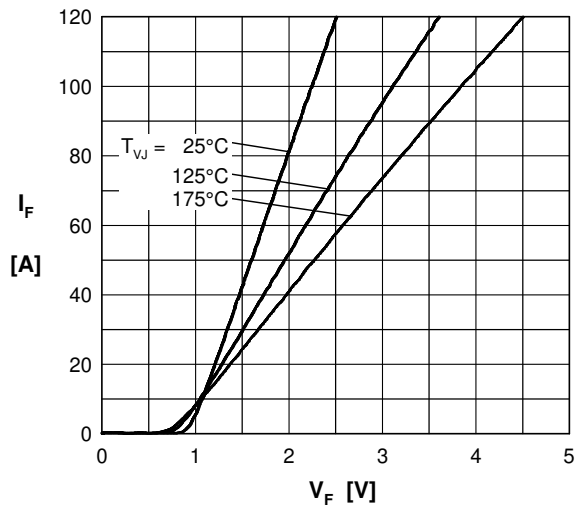


Fig. 1 Typ. forward characteristics

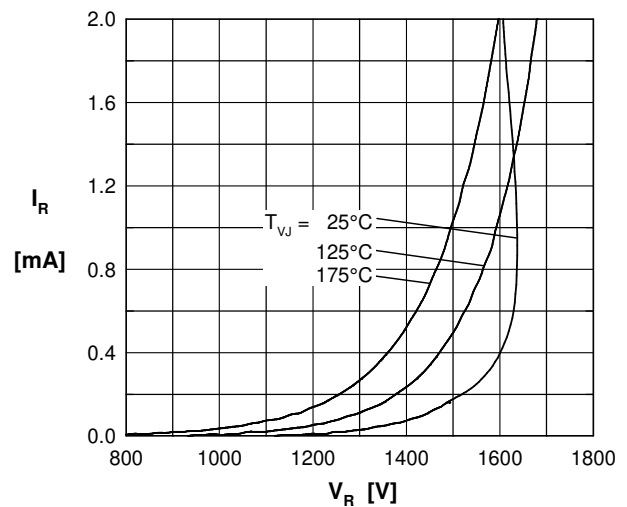


Fig. 2 Typ. reverse characteristics

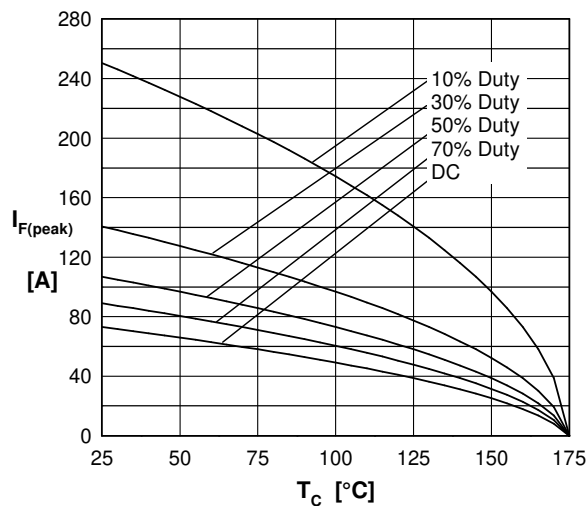


Fig. 3 Typ. current derating

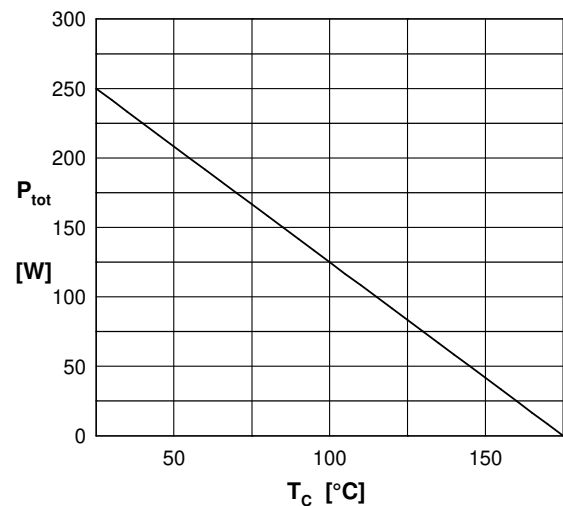


Fig. 4 Power derating

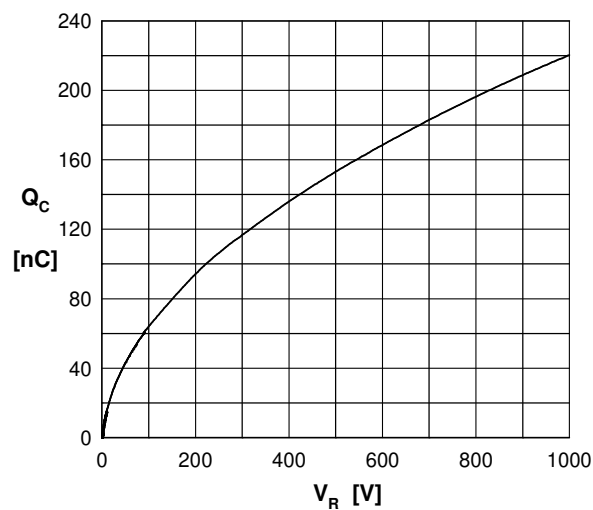


Fig. 5 Typ. recovery charge vs. reverse voltage

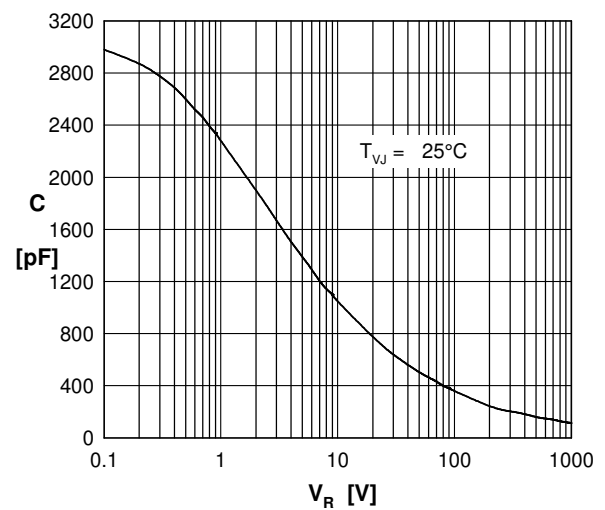


Fig. 6 Typ. junction capacitance vs. reverse Voltage

## SiC Diode (per leg)

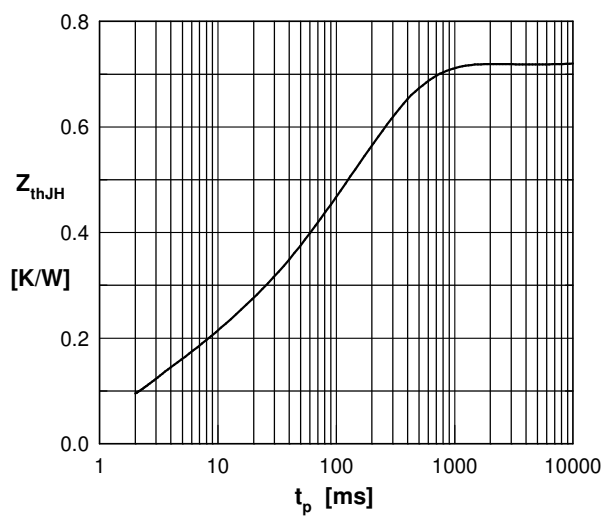


Fig. 7 Typ. transient thermal impedance