

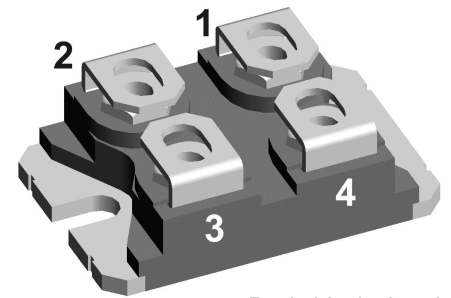
preliminary

# SiC Schottky Diode

 $V_{RRM} = 1200\text{ V}$   
 $I_{FAV} = 2 \times 25\text{ A}$ 

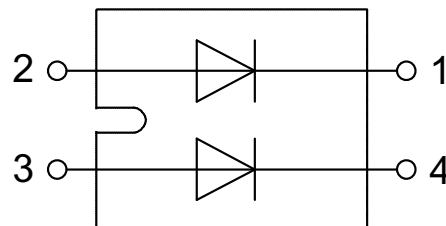
Ultra fast switching  
 Zero reverse recovery

Part number  
**DCG45X1200NA**



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
- $T_{VJM} = 175^{\circ}\text{C}$

### Applications:

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

### Package: SOT-227B (minibloc)

- Isolation Voltage: 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

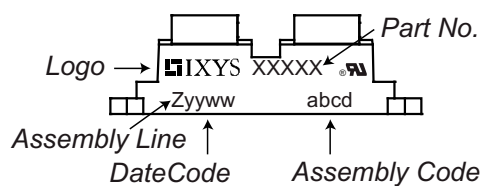
The data contained in this product data sheet is exclusively intended for technically trained staff. The user will have to evaluate the suitability of the product for the intended application and the completeness of the product data with respect to his application. The specifications of our components 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 live 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.

SiC Diode (per leg)				Ratings		
Symbol	Definitions	Conditions	min.	typ.	max.	
$V_{RSM}$	max. non-repetitive reverse blocking voltage				1200	V
$V_{RRM}$	max. repetitive reverse blocking voltage				1200	V
$I_R$	reverse current	$V_R = V_{RRM}$		35 65	200 400	$\mu$ A $\mu$ A
$V_F$	forward voltage	$I_F = 10$ A				V
		$I_F = 20$ A		1.5	1.8	V
		$I_F = 10$ A $I_F = 20$ A		2.2	3.0	V V
$I_{FAV}$	average forward current	$T_C = 80^\circ\text{C}$	} rectangular, d = 0.5 $T_{VJ} = 175^\circ\text{C}$		25	A
		$T_C = 100^\circ\text{C}$			22	A
$I_{F25}$	forward current	based on typ. $V_{F0}$ and $r_F$	$T_C = 25^\circ\text{C}$		44	A
$I_{F80}$			$T_C = 80^\circ\text{C}$		34	A
$I_{F100}$			$T_C = 100^\circ\text{C}$		30	A
$I_{FSM}$	max forward surge current	t = 10 ms, half sine (50 Hz) $t_p = 10 \mu\text{s}$ , pulse	} $T_{VJ} = 25^\circ\text{C}$ $V_R = 0\text{V}$		1150	A A
$V_{F0}$	threshold voltage	} for power loss calculation	$T_{VJ} = 125^\circ\text{C}$	0.80		V
$r_F$	slope resistance		$T_{VJ} = 175^\circ\text{C}$	0.73		V
			$T_{VJ} = 125^\circ\text{C}$	57.0		m $\Omega$
		$T_{VJ} = 175^\circ\text{C}$	70.5		m $\Omega$	
$Q_C$	total capacitive charge	$V_R = 800$ V, $I_F = 20$ A $di/dt = 200$ A/ $\mu\text{s}$	$T_{VJ} = 25^\circ\text{C}$	100		nC
$C$	total capacitance	$V_R = 0$ V	} $T_{VJ} = 25^\circ\text{C}$ , f = 1 MHz	1500		pF
		$V_R = 400$ V		93		pF
		$V_R = 800$ V		67		pF
$R_{thJC}$	thermal resistance junction to case	with heatsink compound; IXYS test setup			0.9	K/W
$R_{thJH}$	thermal resistance junction to heatsink			1.05		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 terminal connection screws			1.5 1.3	Nm 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 t = 1 minute	3000 2500			V V
$C_p$	coupling capacity per switch	between shorted terminals of diodes and back side metalization				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**

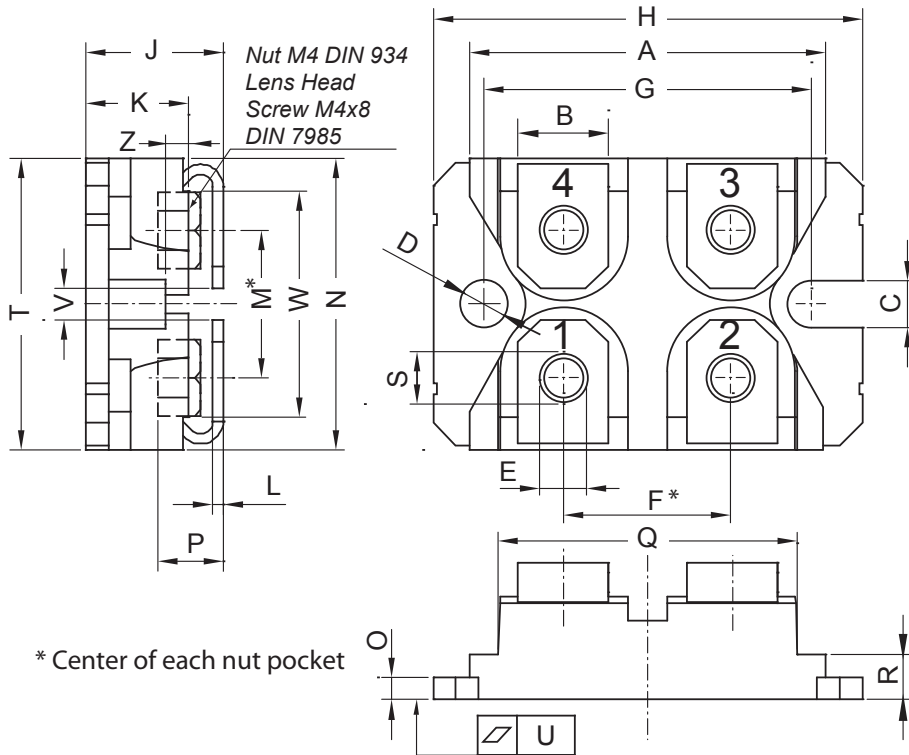
D = Diode  
 C = SiC  
 G = Extreme fast  
 45 = Current Rating [A]  
 X = Parallel legs  
 1200 = Reverse Voltage [V]  
 NA = SOT-227 (minibloc)

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	DCG45X1200NA	DCG45X1200NA	Tube	10	520708

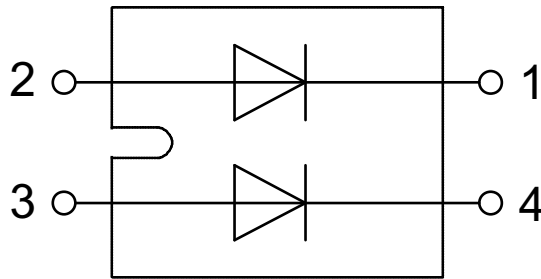
**Equivalent Circuits for Simulation** \*on die level, typical

		$T_{VJ} = 125^{\circ}\text{C}$	$T_{VJ} = 175^{\circ}\text{C}$	
$V_{0\max}$	threshold voltage	0.80	0.73	V
$R_{0\max}$	slope resistance *	57.0	70.5	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)

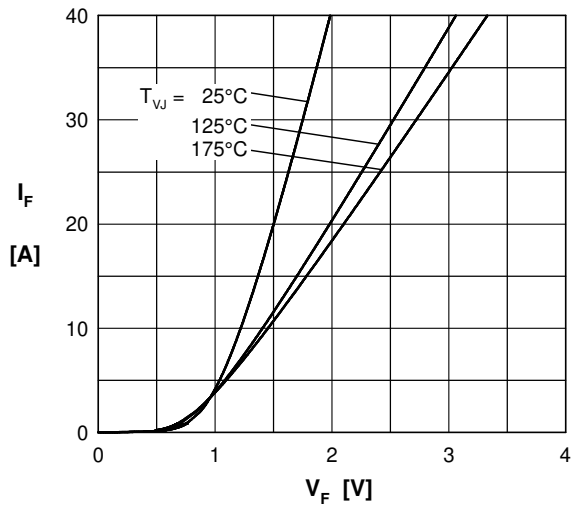


Fig. 1 Typ. forward characteristics.

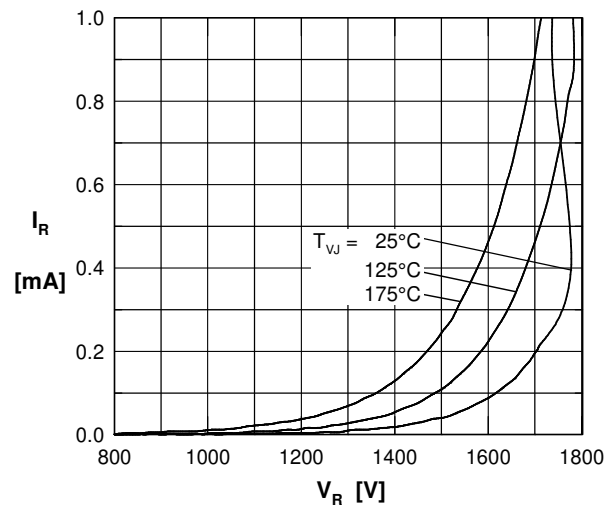


Fig. 2 Typ. reverse characteristics

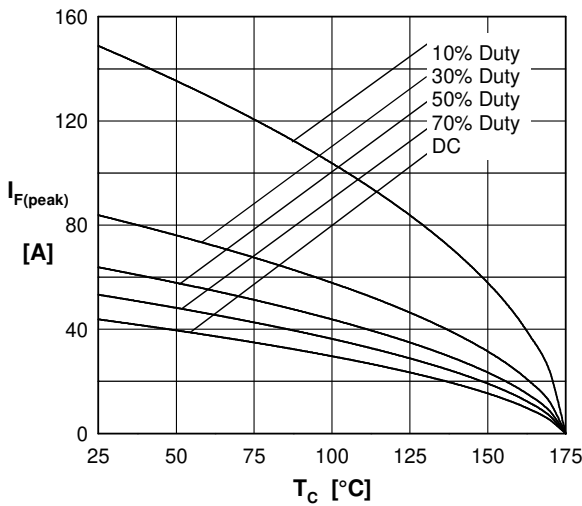


Fig. 3 Typ. current derating

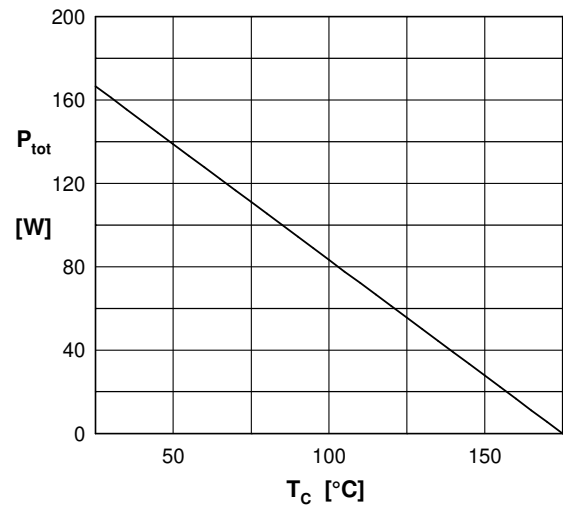


Fig. 4 Power derating

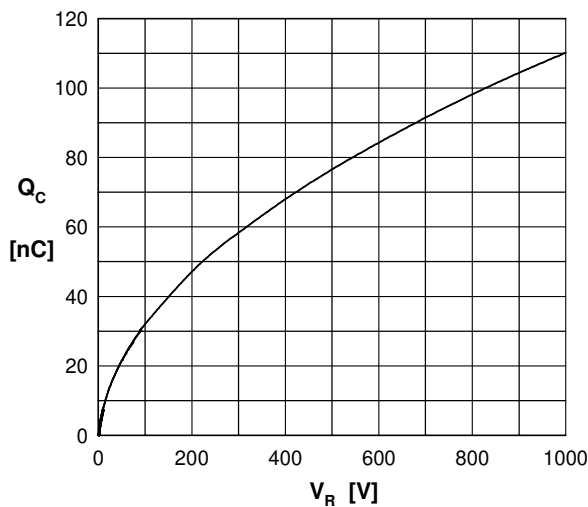


Fig. 5 Typ. recovery charge vs. reverse voltage

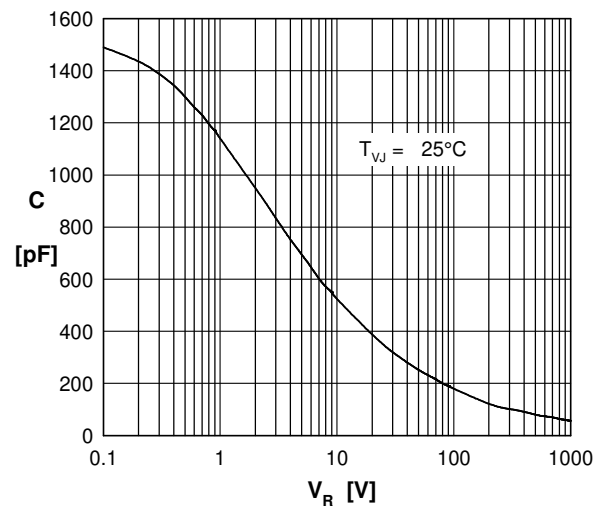


Fig. 6 Typ. junction capacitance vs. reverse Voltage

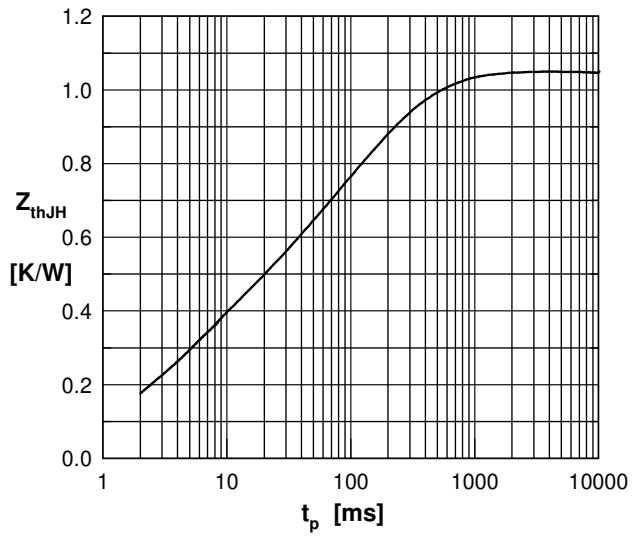
**SiC Diode (per leg)**

Fig. 7 Typ. transient thermal impedance