

preliminary

# Sonic Fast Recovery Diode

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

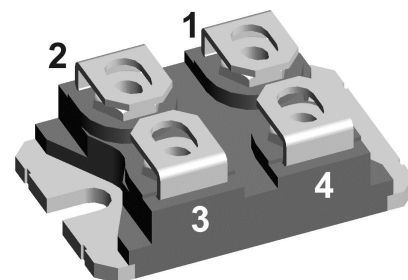
$$I_{FAV} = 2 \times 25 \text{ A}$$

$$t_{rr} = 200 \text{ ns}$$

High Performance Fast Recovery Diode  
 Low Loss and Soft Recovery  
 Parallel legs

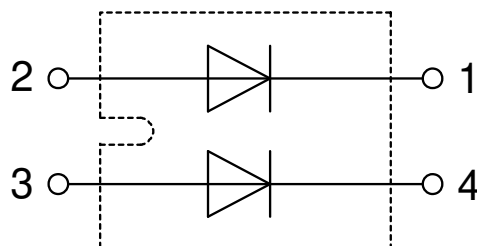
Part number

**DHG50X1200NA**



Backside: Isolated

 E72873



## Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very short recovery time
- Improved thermal behaviour
- Very low  $I_{rm}$ -values
- Very soft recovery behaviour
- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low  $I_{rm}$  reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

## Applications:

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode
- Rectifiers in switch mode power supplies (SMPS)
- Uninterruptible power supplies (UPS)

## Package: SOT-227B (minibloc)

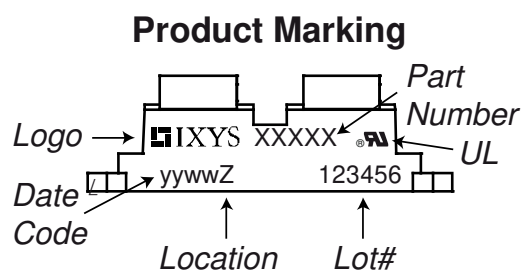
- Isolation Voltage: 3000 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Base plate: Copper internally DCB isolated
- Advanced power cycling

## Disclaimer Notice

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Fast Diode				Ratings				
Symbol	Definition	Conditions		min.	typ.	max.	Unit	
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, drain current	V <sub>R</sub> = 1200 V	T <sub>VJ</sub> = 25°C			30	μA	
		V <sub>R</sub> = 1200 V	T <sub>VJ</sub> = 125°C			0.5	mA	
V <sub>F</sub>	forward voltage drop	I <sub>F</sub> = 25 A	T <sub>VJ</sub> = 25°C			2.11	V	
		I <sub>F</sub> = 50 A				2.74	V	
		I <sub>F</sub> = 25 A	T <sub>VJ</sub> = 125°C			2.09	V	
		I <sub>F</sub> = 50 A				2.88	V	
I <sub>FAV</sub>	average forward current	T <sub>C</sub> = 65°C rectangular      d = 0.5	T <sub>VJ</sub> = 150°C			25	A	
V <sub>F0</sub>	threshold voltage	} for power loss calculation only		T <sub>VJ</sub> = 150°C		1.23	V	
r <sub>F</sub>	slope resistance					30	mΩ	
R <sub>thJC</sub>	thermal resistance junction to case					1.2	K/W	
R <sub>thCH</sub>	thermal resistance case to heatsink				0.1		K/W	
P <sub>tot</sub>	total power dissipation	T <sub>C</sub> = 25°C				100	W	
I <sub>FSM</sub>	max. forward surge current	t = 10 ms; (50 Hz), sine; V <sub>R</sub> = 0 V		T <sub>VJ</sub> = 45°C		200	A	
C <sub>J</sub>	junction capacitance	V <sub>R</sub> = 600 V   f = 1 MHz		T <sub>VJ</sub> = 25°C	11		pF	
I <sub>RM</sub>	max. reverse recovery current	} I <sub>F</sub> = 30 A; V <sub>R</sub> = 600 V -di <sub>F</sub> /dt = 600 A/μs		T <sub>VJ</sub> = 25 °C	23		A	
				T <sub>VJ</sub> = 125 °C	30		A	
t <sub>rr</sub>	reverse recovery time			T <sub>VJ</sub> = 25 °C	200		ns	
				T <sub>VJ</sub> = 125 °C	350		ns	

Package SOT-227B (minibloc)				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
$I_{RMS}$	RMS current	per terminal				100	A
$T_{VJ}$	virtual junction temperature			-40		150	°C
$T_{op}$	operation temperature			-40		125	°C
$T_{stg}$	storage temperature			-40		150	°C
<b>Weight</b>					30		g
$M_D$	mounting torque			1.1		1.5	Nm
$M_T$	terminal torque			1.1		1.5	Nm
$d_{Spp/App}$	creepage distance on surface   striking distance through air	terminal to terminal	10.5	3.2			mm
$d_{Spb/Apb}$		terminal to backside	8.6	6.8			mm
$V_{ISOL}$	isolation voltage	t = 1 second	50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA	3000			V
		t = 1 minute		2500			V



### Part description

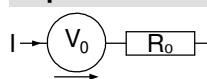
D = Diode  
 H = Sonic Fast Recovery Diode  
 G = extreme fast  
 50 = Current Rating [A]  
 X = Parallel legs  
 1200 = Reverse Voltage [V]  
 NA = SOT-227B (minibloc)

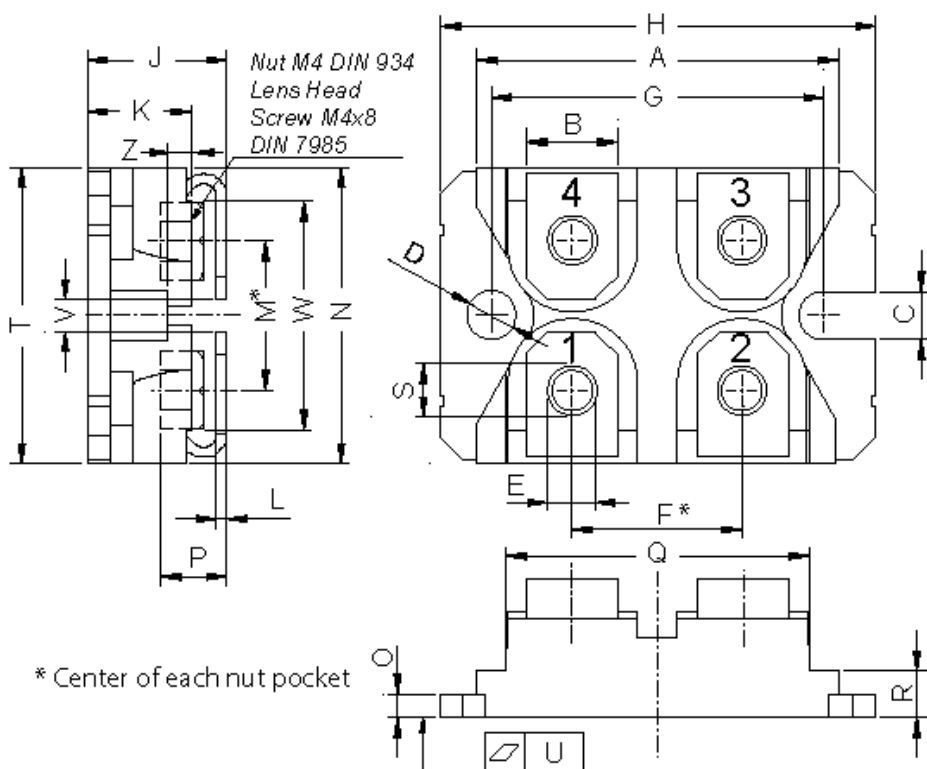
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DHG50X1200NA	DHG50X1200NA	Tube	10	507766

### Equivalent Circuits for Simulation

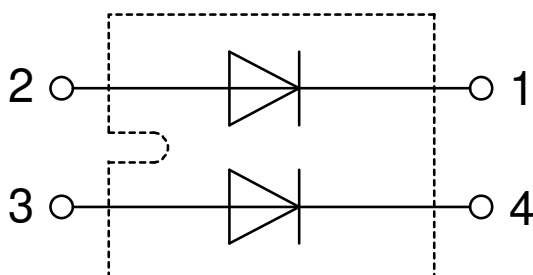
\* on die level

 $T_{VJ} = 150^{\circ}\text{C}$ 

		<b>Fast Diode</b>	
$V_{0\max}$	threshold voltage	1.23	V
$R_{0\max}$	slope resistance *	28	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



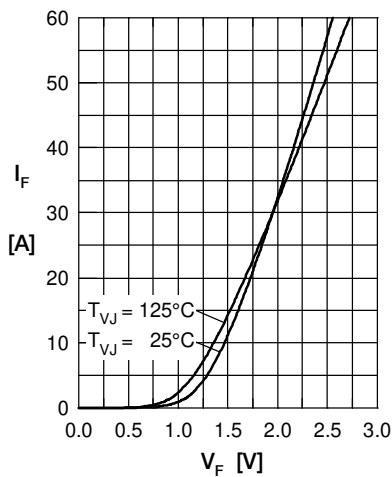
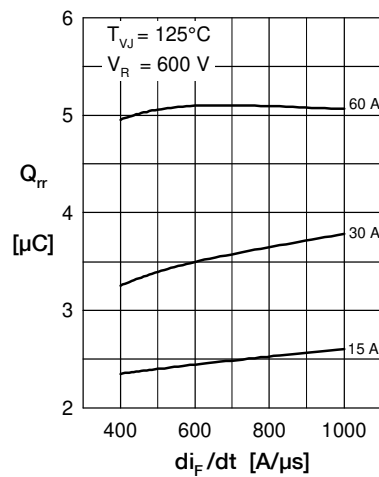
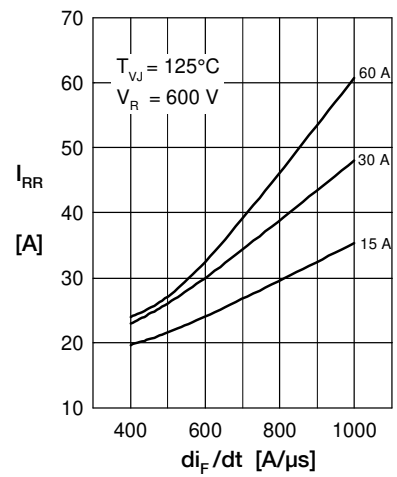
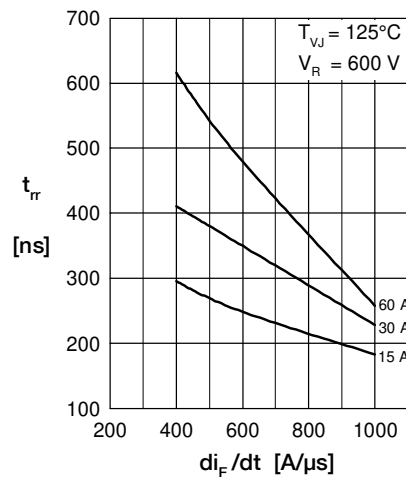
**Fast Diode**

 Fig. 1 Typ. Forward current versus  $V_F$ 

 Fig. 2 Typ. reverse recov. charge  $Q_{rr}$  versus  $di_F/dt$ 

 Fig. 3 Typ. peak reverse current  $I_{RM}$  versus  $di_F/dt$ 

 Fig. 4 Dynamic parameters  $Q_{rr}$ ,  $I_{RM}$  versus  $T_{VJ}$ 

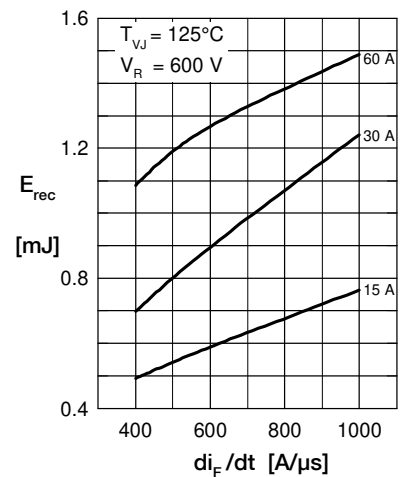
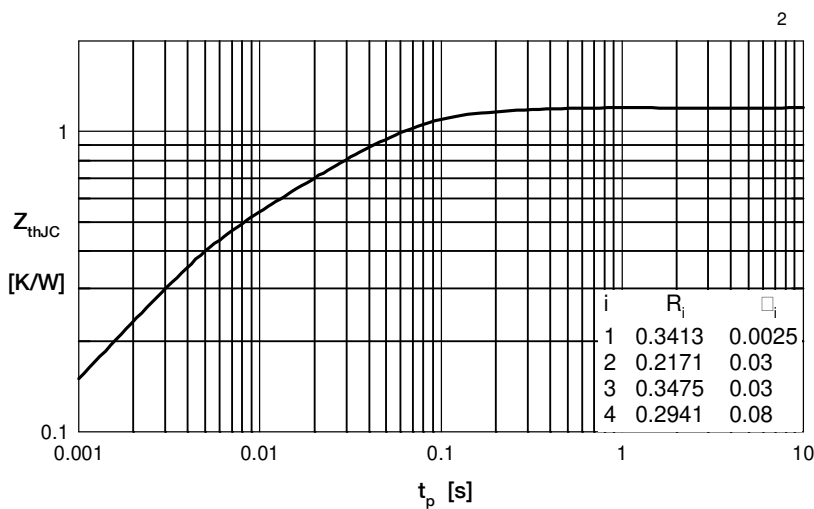
 Fig. 5 Typ. recovery time  $t_{rr}$  versus  $di_F/dt$ 

 Fig. 6 Typ. recovery energy  $E_{rec}$  versus  $di_F/dt$ 


Fig. 7 Typ. transient thermal impedance junction to case