

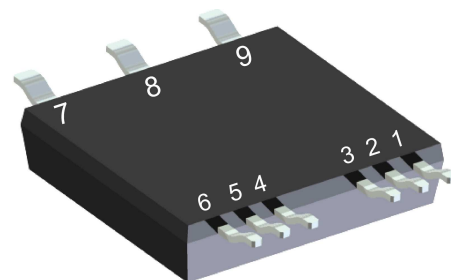
# Sonic Fast Recovery Diode

$$\begin{aligned} V_{RRM} &= 1200 \text{ V} \\ I_{DAV} &= 60 \text{ A} \\ t_{rr} &= 160 \text{ ns} \end{aligned}$$

High Performance Fast Recovery Diode  
 Low Loss and Soft Recovery  
 3~ Rectifier Bridge

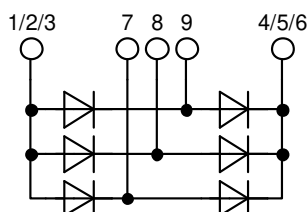
Part number

**DHG60U1200LB**



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: SMPD

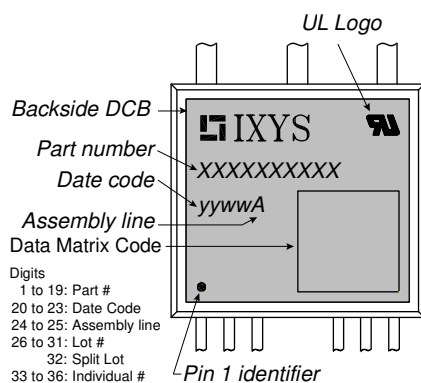
- Isolation Voltage: 3000 V~
- Industry convenient outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Soldering pins for PCB mounting
- Backside: DCB ceramic
- Reduced weight
- Advanced power cycling

## 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			50	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> = 20 A	T <sub>VJ</sub> = 25°C			2.00	V	
		I <sub>F</sub> = 60 A				2.92	V	
		I <sub>F</sub> = 20 A	T <sub>VJ</sub> = 125°C			1.94	V	
		I <sub>F</sub> = 60 A				3.15	V	
I <sub>DAV</sub>	bridge output current	T <sub>C</sub> = 80°C rectangular      d = ⅓	T <sub>VJ</sub> = 150°C			60	A	
V <sub>F0</sub>	threshold voltage	} for power loss calculation only		T <sub>VJ</sub> = 150°C		1.35	V	
r <sub>F</sub>	slope resistance					29	mΩ	
R <sub>thJC</sub>	thermal resistance junction to case					1.2	K/W	
R <sub>thCH</sub>	thermal resistance case to heatsink				0.40		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> = 20 A; V <sub>R</sub> = 600 V -di <sub>F</sub> /dt = 600 A/μs		T <sub>VJ</sub> = 25 °C	19		A	
				T <sub>VJ</sub> = 125 °C	25		A	
t <sub>rr</sub>	reverse recovery time			T <sub>VJ</sub> = 25 °C	160		ns	
				T <sub>VJ</sub> = 125 °C	280		ns	

Package    SMPD				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
I <sub>RMS</sub>	RMS current	per terminal				100	A
T <sub>VJ</sub>	virtual junction temperature			-55		150	°C
T <sub>op</sub>	operation temperature			-55		125	°C
T <sub>stg</sub>	storage temperature			-55		150	°C
Weight					8.5		g
F <sub>C</sub>	mounting force with clip			40		130	N
d <sub>Spp/App</sub>	creepage distance on surface   striking distance through air	terminal to terminal		1.6			mm
d <sub>Spb/Apb</sub>		terminal to backside		4.0			mm
V <sub>ISOL</sub>	isolation voltage	t = 1 second	50/60 Hz, RMS; I <sub>ISOL</sub> ≤ 1 mA	3000			V
		t = 1 minute		2500			V



### Part description

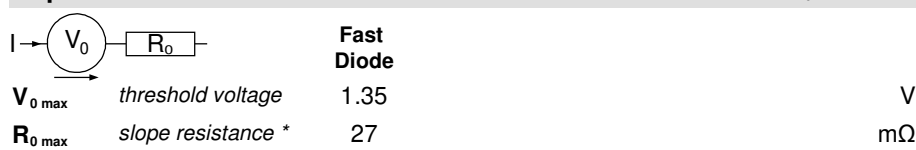
D = Diode  
 H = Sonic Fast Recovery Diode  
 G = extreme fast  
 60 = Current Rating [A]  
 U = 3- Rectifier Bridge  
 1200 = Reverse Voltage [V]  
 LB = SMPD-B

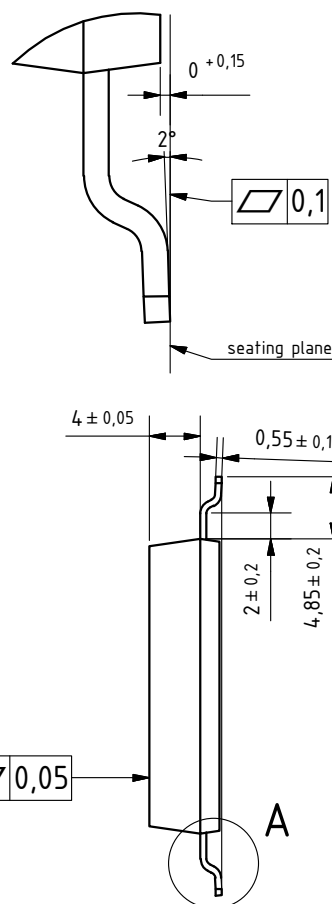
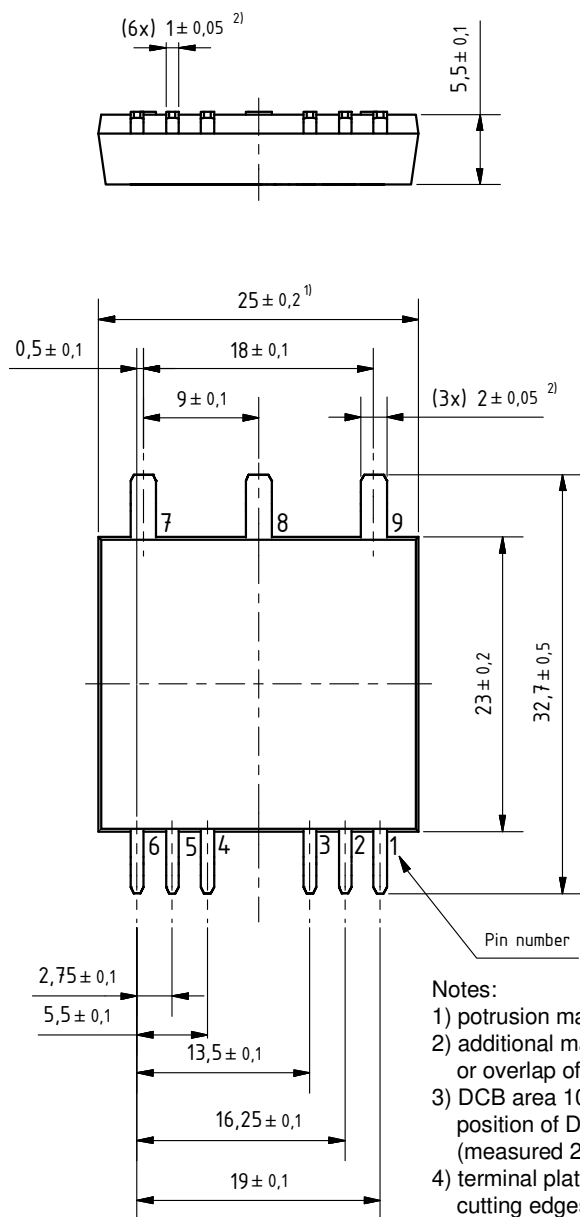
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DHG60U1200LB-TUB	DHG60U1200LB-TUB	Tube	20	524936
Alternative	DHG60U1200LB-TRR	DHG60U1200LB	Tape & Reel	200	524950

### Equivalent Circuits for Simulation

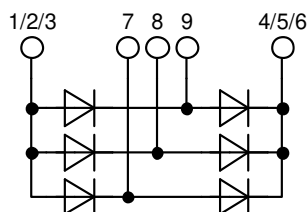
\* on die level

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



**Outlines SMPD**
**A ( 8 : 1 )**

**Notes:**

- 1) potrusion may add 0.2 mm max. on each side
- 2) additional max. 0.05 mm per side by punching misalignement or overlap of dam bar or bending compression
- 3) DCB area 10 to 50  $\mu\text{m}$  convex;  
position of DCB area in relation to plastic rim:  $\pm 25 \mu\text{m}$  (measured 2 mm from Cu rim)
- 4) terminal plating: 0.2 - 1  $\mu\text{m}$  Ni + 10 - 25  $\mu\text{m}$  Sn (gal v.)  
cutting edges may be partially free of plating



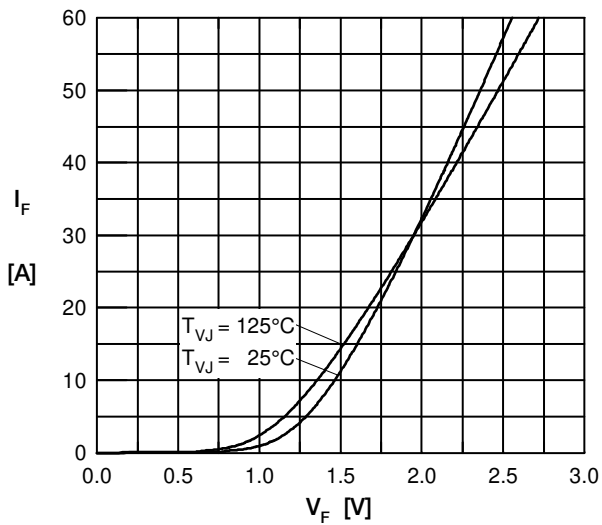
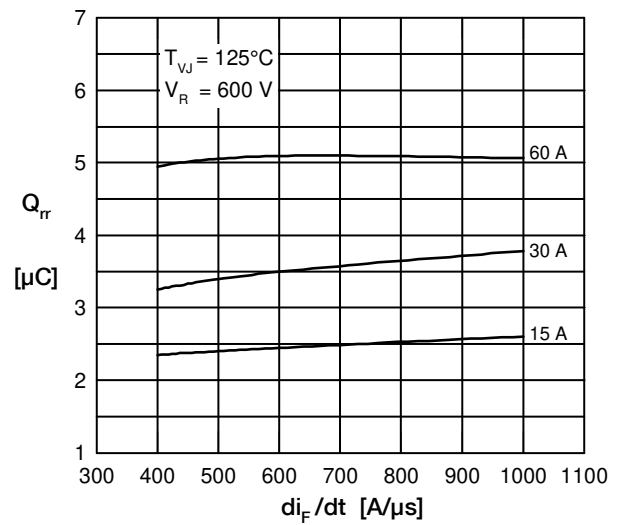
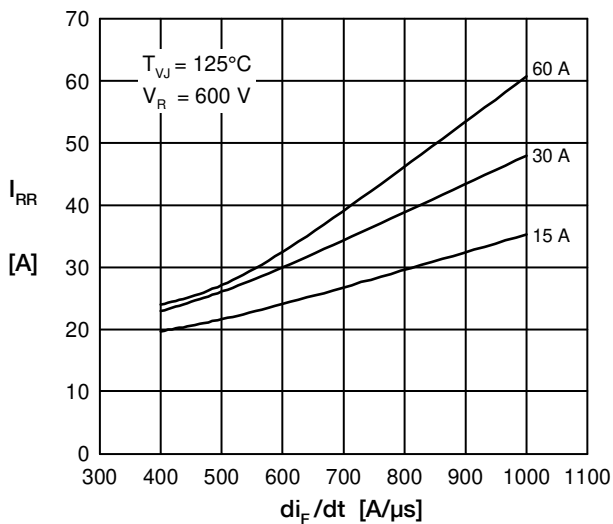
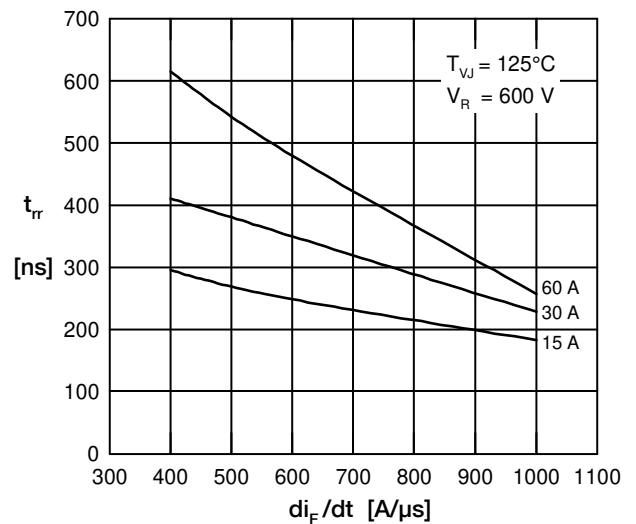
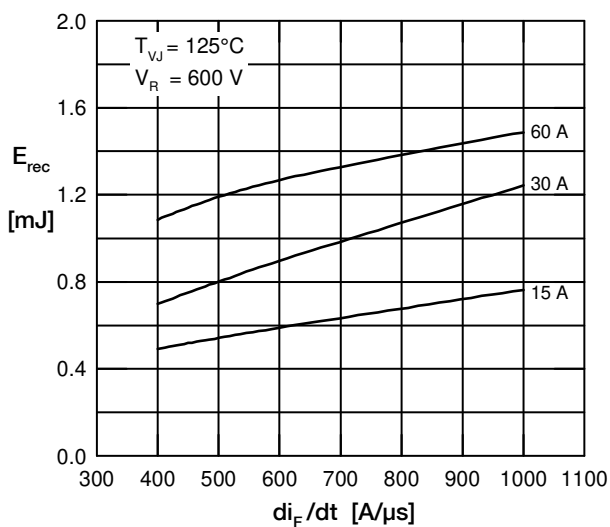
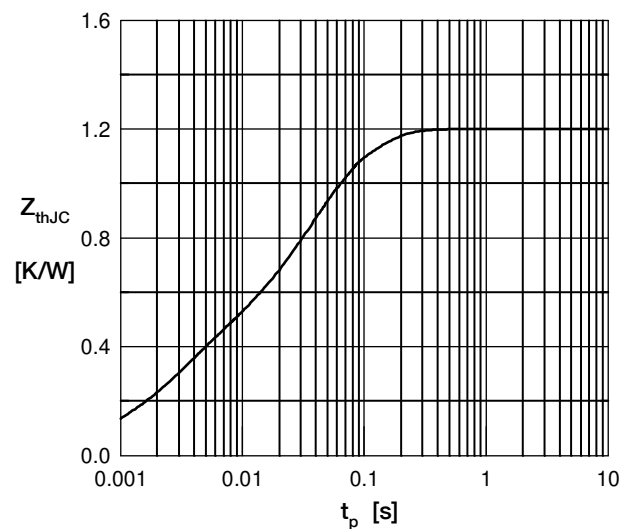
**Fast Diode**

 Fig. 7 Typ. Forward current versus  $V_F$ 

 Fig. 8 Typ. reverse recov.charge  $Q_{rr}$  vs.  $di/dt$ 

 Fig. 9 Typ. peak reverse current  $I_{RM}$  vs.  $di/dt$ 

 Fig. 10 Typ. recovery time  $t_{rr}$  versus  $di/dt$ 

 Fig. 11 Typ. recovery energy  $E_{rec}$  versus  $di/dt$ 


Fig. 12 Typ. transient thermal impedance

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