

## Sonic Fast Recovery Diode

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

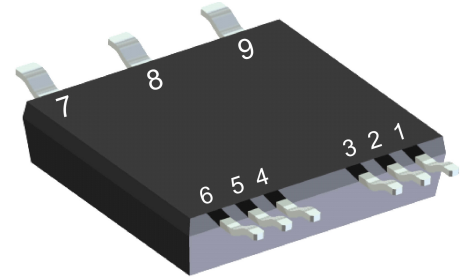
$$I_{DAV} = 60 \text{ A}$$

$$t_{rr} = 160 \text{ ns}$$


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

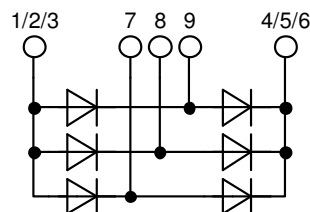
Part number

**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

### 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

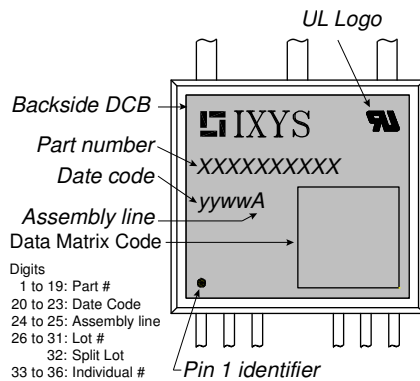
- to perform joint risk and quality assessments;

- 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.

Fast Diode				Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit	
$V_{RSM}$	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			1200	V	
$V_{RRM}$	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			1200	V	
$I_R$	reverse current, drain current	$V_R = 1200\text{ V}$	$T_{VJ} = 25^{\circ}C$		50	$\mu A$	
		$V_R = 1200\text{ V}$	$T_{VJ} = 125^{\circ}C$		0.5	mA	
$V_F$	forward voltage drop	$I_F = 20\text{ A}$	$T_{VJ} = 25^{\circ}C$		1.99	V	
		$I_F = 60\text{ A}$			1.93	V	
		$I_F = 20\text{ A}$	$T_{VJ} = 125^{\circ}C$		2.30	V	
		$I_F = 60\text{ A}$			3.21	V	
$I_{DAV}$	bridge output current	$T_C = 80^{\circ}C$ rectangular $d = \frac{1}{3}$	$T_{VJ} = 150^{\circ}C$		60	A	
$V_{FO}$	threshold voltage	} for power loss calculation only	$T_{VJ} = 150^{\circ}C$		1.35	V	
$r_F$	slope resistance				29	m $\Omega$	
$R_{thJC}$	thermal resistance junction to case				1.2	K/W	
$R_{thCH}$	thermal resistance case to heatsink			0.40		K/W	
$P_{tot}$	total power dissipation		$T_C = 25^{\circ}C$		100	W	
$I_{FSM}$	max. forward surge current	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}; V_R = 0\text{ V}$	$T_{VJ} = 45^{\circ}C$		200	A	
$C_J$	junction capacitance	$V_R = 600\text{ V}$ $f = 1\text{ MHz}$	$T_{VJ} = 25^{\circ}C$		11	pF	
$I_{RM}$	max. reverse recovery current	} $I_F = 20\text{ A}; V = 600\text{ V}$ $-d_F/dt = 600\text{ A}/\mu\text{s}$	$T_{VJ} = 25^{\circ}C$		19	A	
			$T_{VJ} = 125^{\circ}C$		25	A	
$t_{rr}$	reverse recovery time		$T_{VJ} = 25^{\circ}C$		160	ns	
			$T_{VJ} = 125^{\circ}C$		280	ns	

Package SMPD		Ratings				
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$I_{RMS}$	RMS current	per terminal			100	A
$T_{VJ}$	virtual junction temperature		-55		150	°C
$T_{op}$	operation temperature		-55		125	°C
$T_{stg}$	storage temperature		-55		150	°C
<b>Weight</b>				8.5		g
$F_C$	mounting force with clip		40		130	N
$d_{Spp/APP}$	creepage distance on surface / striking distance through air	terminal to terminal	1.6			mm
$d_{Spb/APb}$		terminal to backside	4.0			mm
$V_{ISOL}$	isolation voltage	t = 1 second	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	DHG60U1200LB	Blister	45	513421
Alternative	DHG60U1200LB-TRR	DHG60U1200LB	Tape & Reel	200	513414

### Equivalent Circuits for Simulation

\* on die level

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

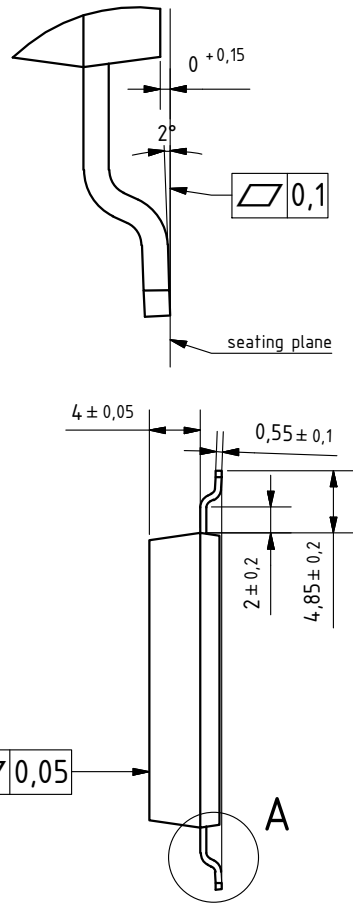
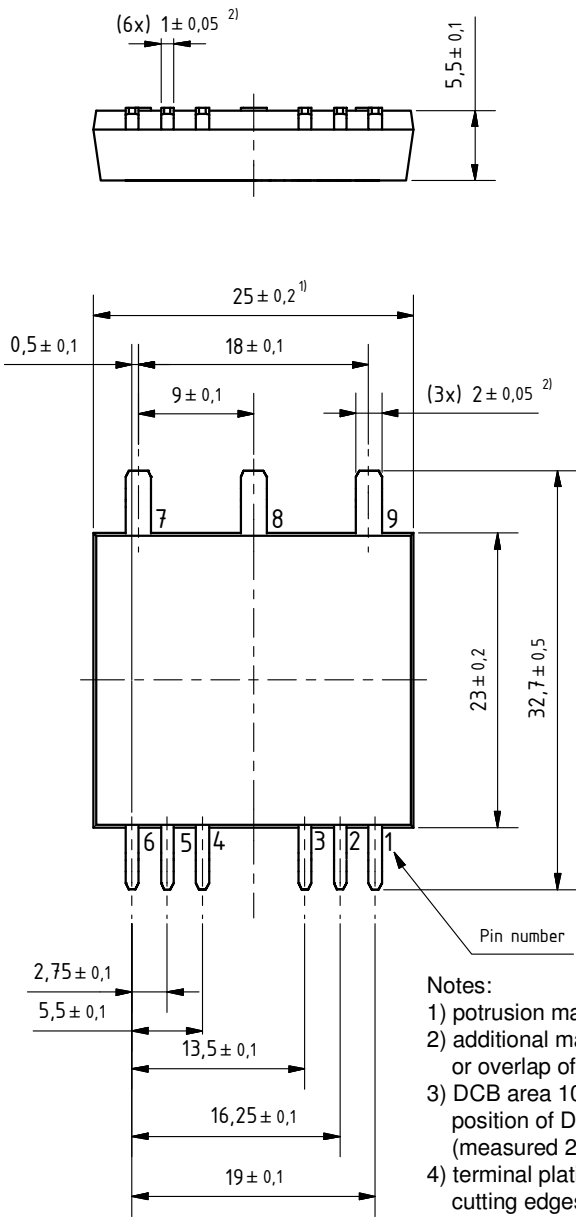


**Fast Diode**

$V_{0\text{ max}}$	threshold voltage	1.35	V
$R_{0\text{ max}}$	slope resistance *	27	mΩ

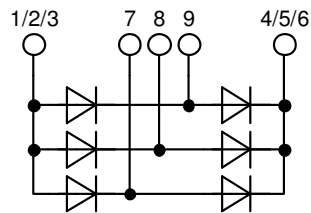
## Outlines SMPD

A ( 8 : 1 )



**Notes:**

- 1) protrusion may add 0.2 mm max. on each side
- 2) additional max. 0.05 mm per side by punching misalignment 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**

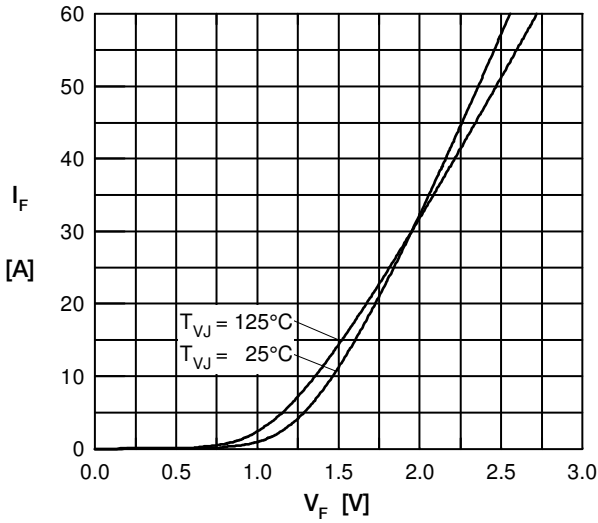


Fig. 7 Typ. Forward current versus  $V_F$

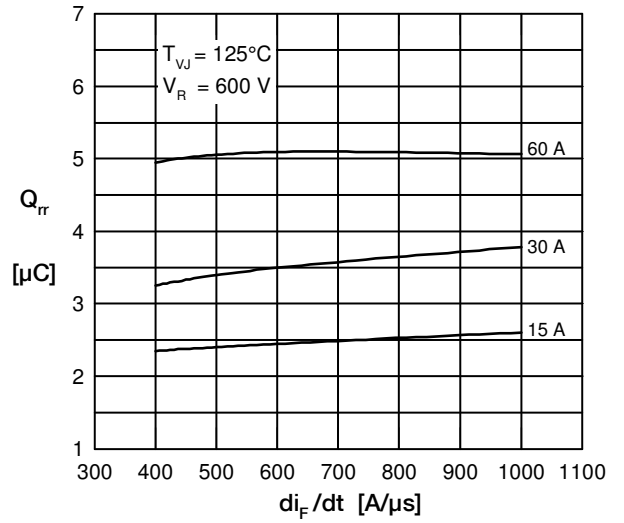


Fig. 8 Typ. reverse recov.charge  $Q_{rr}$  vs.  $di/dt$

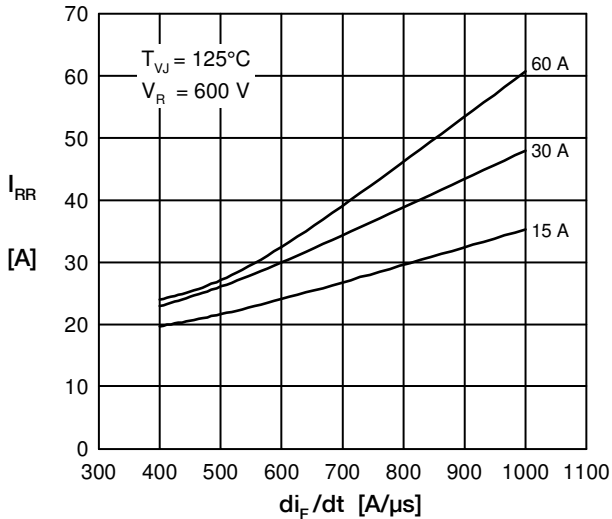


Fig. 9 Typ. peak reverse current  $I_{RM}$  vs.  $di/dt$

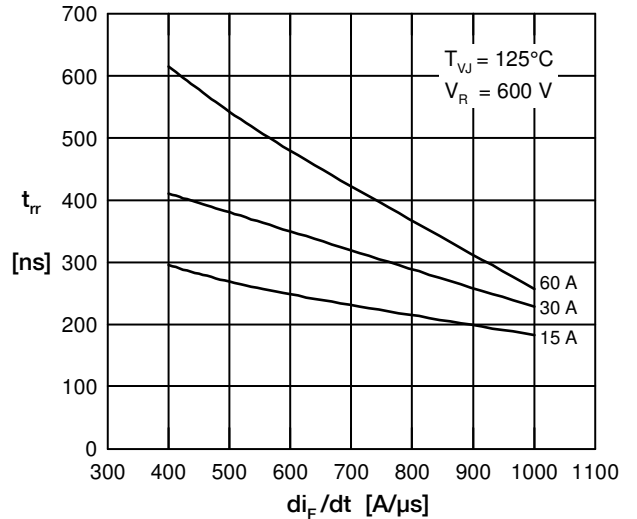


Fig. 10 Typ. recovery time  $t_{rr}$  versus  $di/dt$

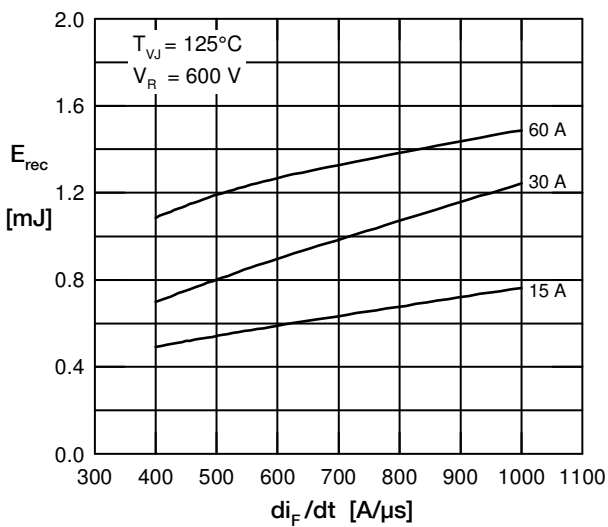


Fig.11 Typ. recovery energy  $E_{rec}$  versus  $di/dt$

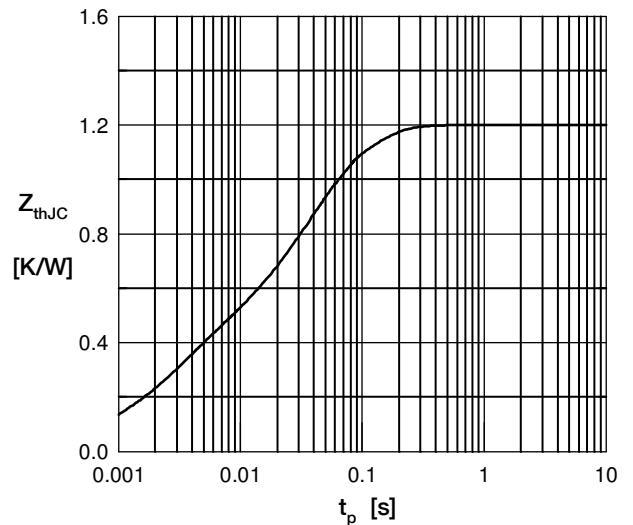


Fig. 12 Typ. transient thermal impedance