

# Sonic Fast Recovery Diode

$V_{RRM}$  = 1800 V  
 $I_{FAV}$  = 20 A  
 $t_{rr}$  = 300 ns

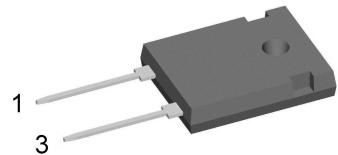
High Performance Fast Recovery Diode

Low Loss and Soft Recovery

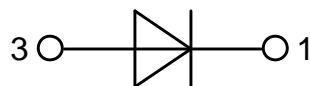
Single Diode

Part number

DH20-18A



Backside: cathode



## 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: TO-247

- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0

## 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 your local sales office.

Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact your local sales office.

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.

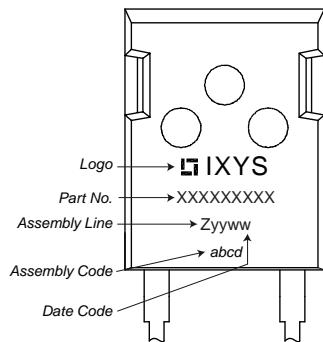
## Fast Diode

Symbol	Definition	Conditions	Ratings			
			min.	typ.	max.	
$V_{RSM}$	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^\circ\text{C}$			1800	V
$V_{RRM}$	max. repetitive reverse blocking voltage	$T_{VJ} = 25^\circ\text{C}$			1800	V
$I_R$	reverse current, drain current	$V_R = 1800 \text{ V}$ $V_R = 1800 \text{ V}$	$T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$		50 0.2	$\mu\text{A}$ mA
$V_F$	forward voltage drop	$I_F = 20 \text{ A}$ $I_F = 40 \text{ A}$ $I_F = 20 \text{ A}$ $I_F = 40 \text{ A}$	$T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$		2.24 2.83 2.35 3.25	V V V V
$I_{FAV}$	average forward current	$T_C = 95^\circ\text{C}$ rectangular $d = 0.5$	$T_{VJ} = 150^\circ\text{C}$		20	A
$V_{F0}$ $r_F$	threshold voltage slope resistance } for power loss calculation only		$T_{VJ} = 150^\circ\text{C}$		1.44 43	V $\text{m}\Omega$
$R_{thJC}$	thermal resistance junction to case				0.9	K/W
$R_{thCH}$	thermal resistance case to heatsink			0.25		K/W
$P_{tot}$	total power dissipation		$T_C = 25^\circ\text{C}$		140	W
$I_{FSM}$	max. forward surge current	$t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}; V_R = 0 \text{ V}$	$T_{VJ} = 45^\circ\text{C}$		150	A
$C_J$	junction capacitance	$V_R = 900 \text{ V}$ $f = 1 \text{ MHz}$	$T_{VJ} = 25^\circ\text{C}$		7	pF
$I_{RM}$	max. reverse recovery current		$T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$		22 25	A A
$t_{rr}$	reverse recovery time	$I_F = 20 \text{ A}; V_R = 900 \text{ V}$ $-di_F/dt = 400 \text{ A}/\mu\text{s}$	$T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$		300 550	ns ns

## Package TO-247

Symbol	Definition	Conditions	min.	typ.	max.	Unit
$I_{RMS}$	$RMS$ current	per terminal			70	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>				6		g
$M_d$	mounting torque		0.8		1.2	Nm
$F_c$	mounting force with clip		20		120	N

## Product Marking

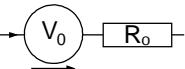


Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DH20-18A	DH20-18A	Tube	30	499730

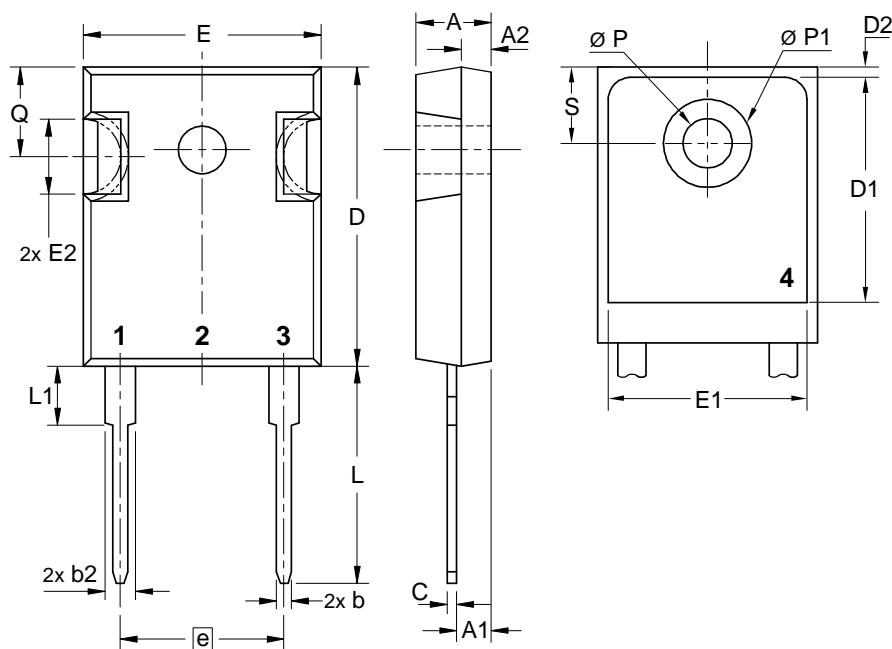
## Equivalent Circuits for Simulation

\* on die level

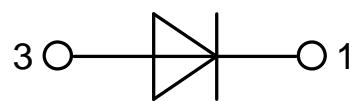
 $T_{VJ} = 150$  °C

	Fast Diode
$V_{0\ max}$	threshold voltage
$R_{0\ max}$	slope resistance *

## Outlines TO-247



Sym.	Inches min. max.	Millimeter min. max.
A	0.185 0.209	4.70 5.30
A1	0.087 0.102	2.21 2.59
A2	0.059 0.098	1.50 2.49
D	0.819 0.845	20.79 21.45
E	0.610 0.640	15.48 16.24
E2	0.170 0.216	4.31 5.48
e	0.430 BSC	10.92 BSC
L	0.780 0.800	19.80 20.30
L1	- 0.177	- 4.49
ø P	0.140 0.144	3.55 3.65
Q	0.212 0.244	5.38 6.19
S	0.242 BSC	6.14 BSC
b	0.039 0.055	0.99 1.40
b2	0.065 0.094	1.65 2.39
b4	0.102 0.135	2.59 3.43
c	0.015 0.035	0.38 0.89
D1	0.515 -	13.07 -
D2	0.020 0.053	0.51 1.35
E1	0.530 -	13.45 -
ø P1	- 0.29	- 7.39



## Fast Diode

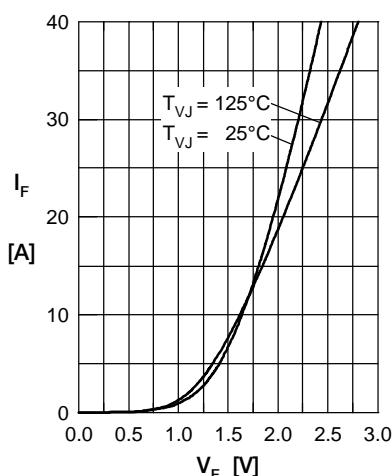
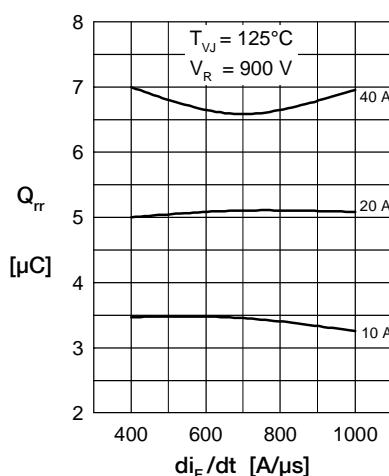
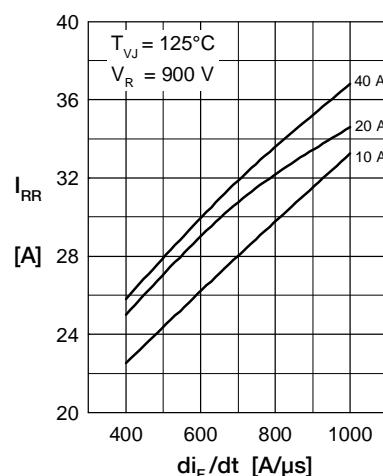
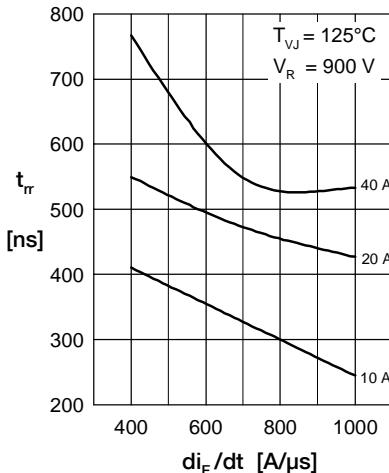
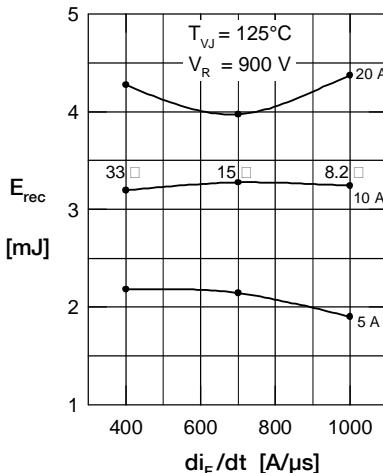
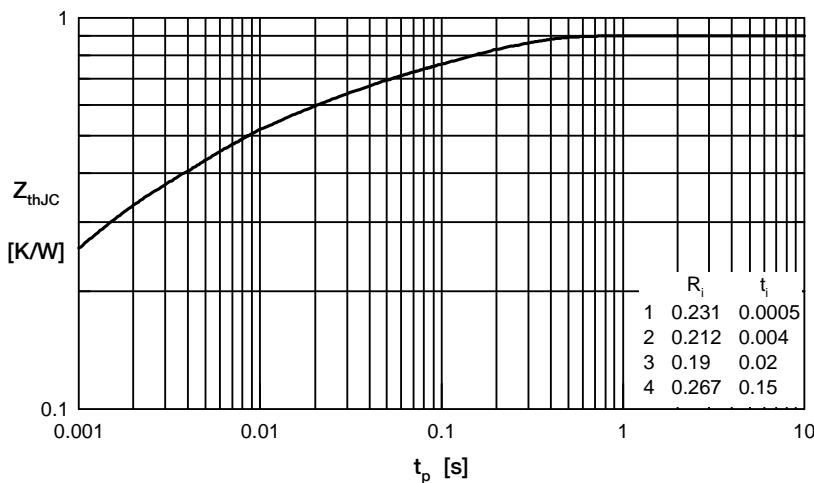
Fig. 1 Typ. Forward current versus V<sub>F</sub>Fig. 2 Typ. reverse recov. charge Q<sub>rr</sub> versus di/dtFig. 3 Typ. peak reverse current I<sub>rr</sub> versus di/dtFig. 4 Dynamic parameters Q<sub>rr</sub>, I<sub>rm</sub> versus T<sub>VJ</sub>Fig. 5 Typ. recovery time t<sub>rr</sub> versus di/dtFig. 6 Typ. recovery energy E<sub>rec</sub> versus di/dt

Fig. 7 Typ. transient thermal impedance junction to case