

# Sonic Fast Recovery Diode

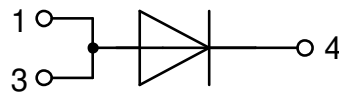
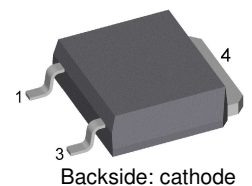
$V_{RRM} = 1800\text{ V}$   
 $I_{FAV} = 10\text{ A}$   
 $t_{rr} = 260\text{ ns}$

High Performance Fast Recovery Diode  
 Low Loss and Soft Recovery  
 Single Diode

**Part number**

**DHG10IM1800UZ**

Marking on Product: HAVGZI



## 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-252 (DPak)

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

## Disclaimer Notice

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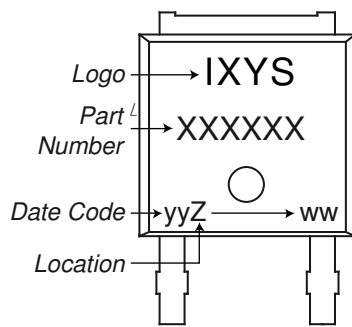


Fast Diode				Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit	
$V_{RSM}$	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			1800	V	
$V_{RRM}$	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			1800	V	
$I_R$	reverse current, drain current	$V_R = 1800 V$	$T_{VJ} = 25^{\circ}C$		50	$\mu A$	
		$V_R = 1800 V$	$T_{VJ} = 150^{\circ}C$		0.4	mA	
$V_F$	forward voltage drop	$I_F = 10 A$	$T_{VJ} = 25^{\circ}C$		2.27	V	
		$I_F = 20 A$			2.94	V	
		$I_F = 10 A$	$T_{VJ} = 150^{\circ}C$		2.43	V	
		$I_F = 20 A$			3.42	V	
$I_{FAV}$	average forward current	$T_C = 110^{\circ}C$ rectangular $d = 0.5$	$T_{VJ} = 175^{\circ}C$		10	A	
$V_{FO}$	threshold voltage	} for power loss calculation only	$T_{VJ} = 175^{\circ}C$		1.40	V	
$r_F$	slope resistance				101	m $\Omega$	
$R_{thJC}$	thermal resistance junction to case				1.5	K/W	
$R_{thCH}$	thermal resistance case to heatsink			0.5		K/W	
$P_{tot}$	total power dissipation		$T_C = 25^{\circ}C$		85	W	
$I_{FSM}$	max. forward surge current	$t = 10 ms; (50 Hz), sine; V_R = 0 V$	$T_{VJ} = 45^{\circ}C$		60	A	
$C_J$	junction capacitance	$V_R = 200 V \quad f = 1 MHz$	$T_{VJ} = 25^{\circ}C$		3	pF	
$I_{RM}$	max. reverse recovery current	} $I_F = 10 A; V_R = 900 V$ $-di_F / dt = 350 A/\mu s$	$T_{VJ} = 25^{\circ}C$		15	A	
			$T_{VJ} = 150^{\circ}C$		17.5	A	
$t_{rr}$	reverse recovery time		$T_{VJ} = 25^{\circ}C$		260	ns	
			$T_{VJ} = 150^{\circ}C$		350	ns	



Package TO-252 (DPak)		Ratings				
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$I_{RMS}$	RMS current	per terminal			20	A
$T_{VJ}$	virtual junction temperature		-55		175	°C
$T_{op}$	operation temperature		-55		150	°C
$T_{stg}$	storage temperature		-55		150	°C
<b>Weight</b>				0.3		g
$F_C$	mounting force with clip		20		60	N
$d_{Spp/App}$	creepage distance on surface / striking distance through air	terminal to terminal	3.6			mm
$d_{Spb/Apb}$		terminal to backside	3.0			mm

**Product Marking**



**Part description**

- D = Diode
- H = Sonic Fast Recovery Diode
- G = extreme fast
- 10 = Current Rating [A]
- IM = Single Diode
- 1800 = Reverse Voltage [V]
- UZ = TO-252AA (DPak) (2HV)

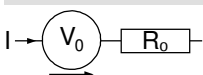
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DHG10IM1800UZ-TRL	HAVGZI	Tape & Reel	2500	526360
Alternative	DHG10IM1800UZ-TUB	HAVGZI	Tube	70	526353

Similar Part	Package	Voltage class
DHG10I1800PA	TO-220AC (2)	1800

**Equivalent Circuits for Simulation**

\* on die level

$T_{VJ} = 175^{\circ}C$

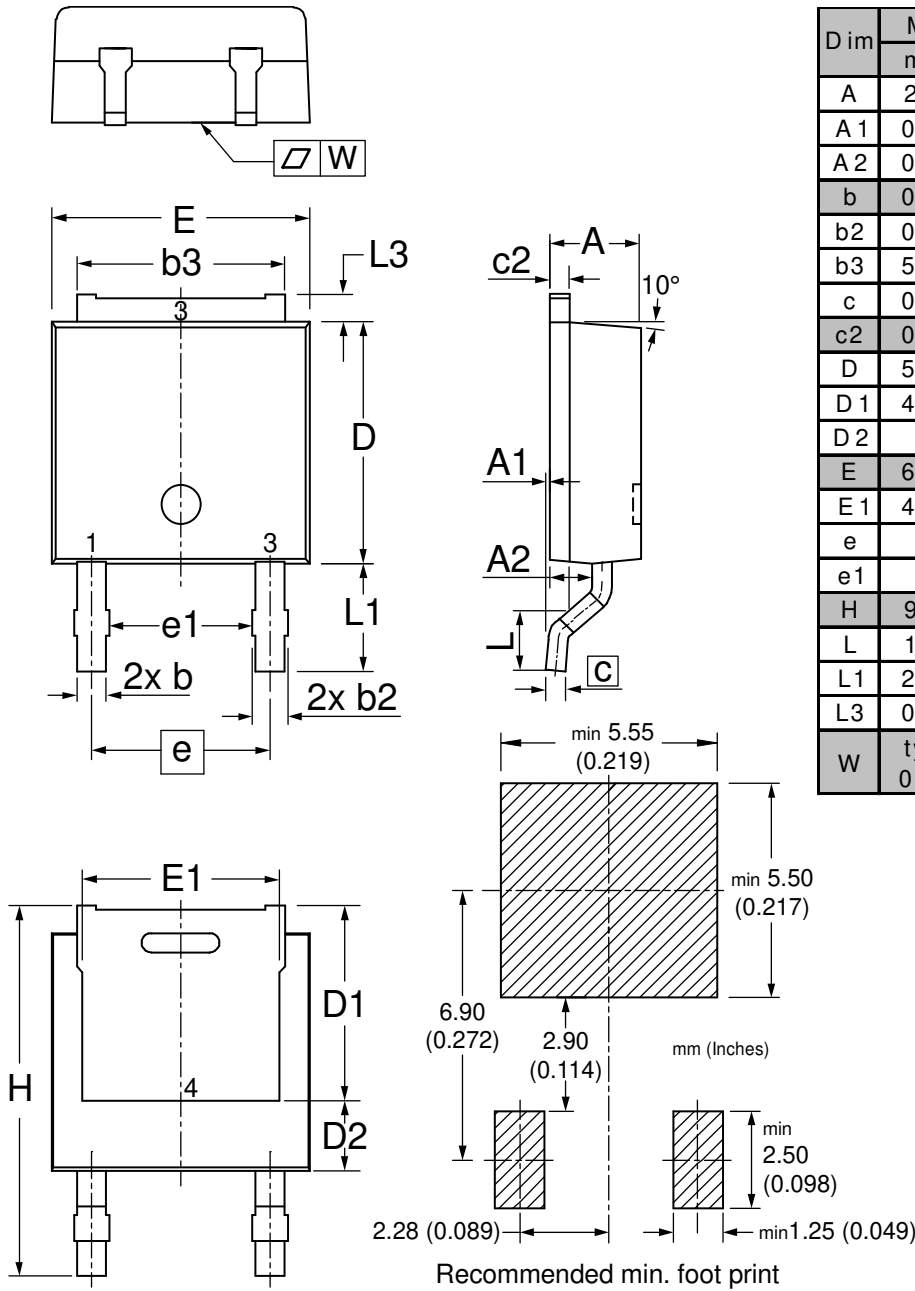


**Fast Diode**

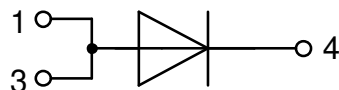
$V_{0\ max}$	threshold voltage	1.4	V
$R_{0\ max}$	slope resistance *	98	mΩ



**Outlines TO-252 (DPak)**



Dim	Millimeters		Inches	
	min	max	min	max
A	2.18	2.39	0.086	0.094
A1	0.00	0.13	0.000	0.005
A2	0.97	1.17	0.038	0.046
b	0.64	0.89	0.025	0.035
b2	0.76	1.14	0.030	0.045
b3	5.08	5.59	0.200	0.220
c	0.46	0.61	0.018	0.024
c2	0.46	0.58	0.018	0.023
D	5.97	6.22	0.235	0.245
D1	4.57	5.21	0.180	0.205
D2	2.03		0.080	
E	6.35	6.73	0.250	0.265
E1	4.32	5.21	0.170	0.205
e	4.57		0.180	
e1	3.62		0.143	
H	9.15	10.34	0.360	0.407
L	1.40	1.78	0.055	0.070
L1	2.54	2.92	0.100	0.115
L3	0.64	1.02	0.025	0.040
W	typ. 0.02	0.040	typ. 0.0008	0.000





**Fast Diode**

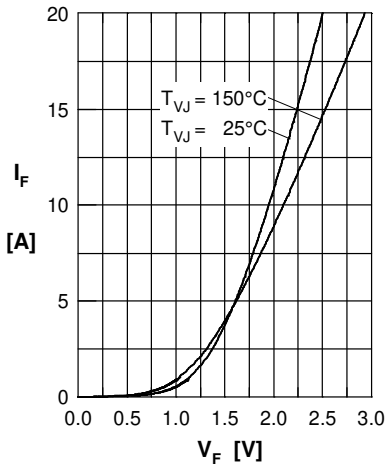


Fig. 1 Typ. Forward current versus  $V_F$

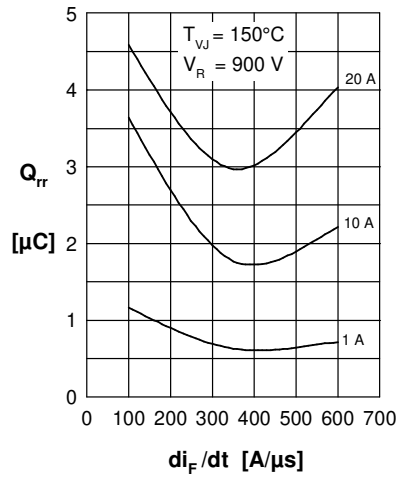


Fig. 2 Typ. reverse recov. charge  $Q_{rr}$  versus  $di/dt$

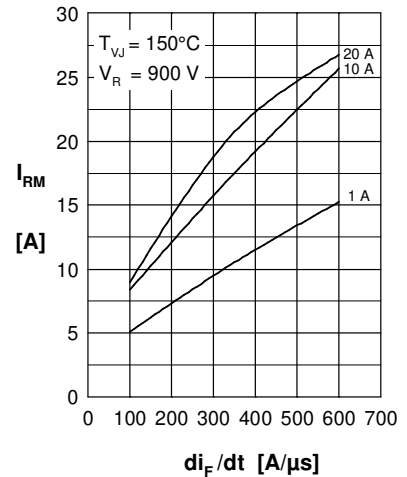


Fig. 3 Typ. peak reverse current  $I_{RM}$  versus  $di/dt$

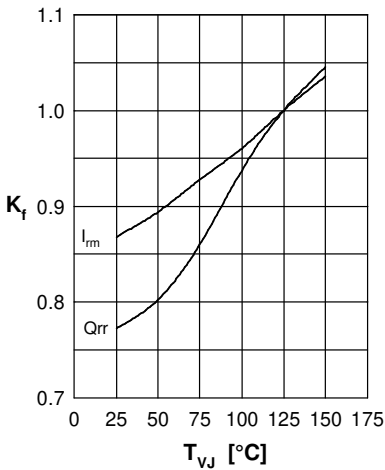


Fig. 4 Dynamic parameters  $Q_{rr}$ ,  $I_{RM}$  versus  $T_{VJ}$

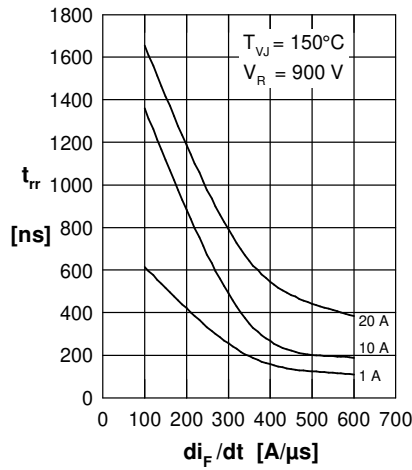


Fig. 5 Typ. recovery time  $t_{rr}$  versus  $di_F/dt$

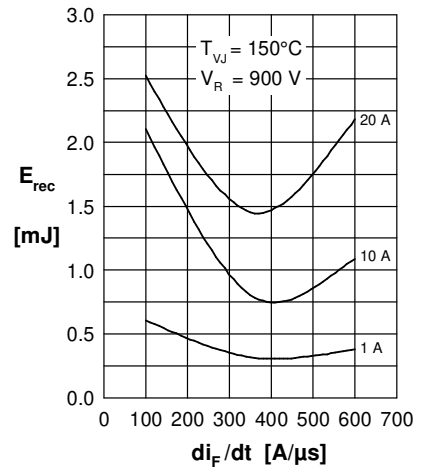


Fig. 6 Typ. recovery energy  $E_{rec}$  versus  $di/dt$

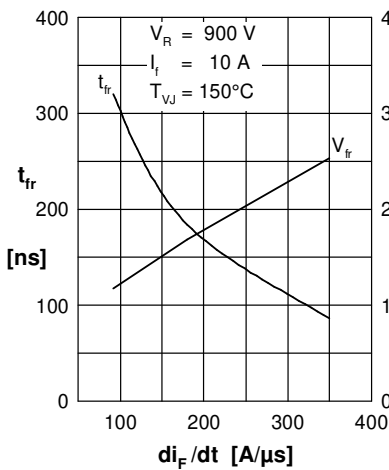


Fig. 7 Typ. peak forward voltage  $V_{fr}$  and  $t_{rr}$  versus  $di_F/dt$

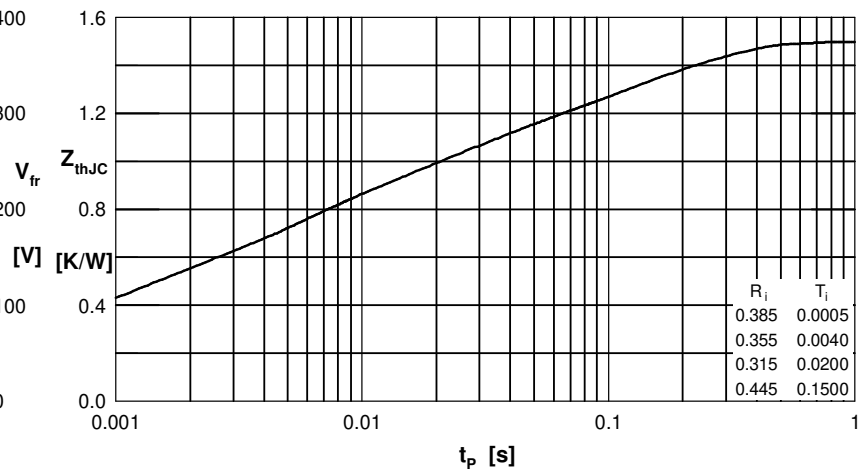


Fig. 8 Typ. transient thermal impedance junction to case