

Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from, Europe, America and south Asia, supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts, Customers Priority, Honest Operation, and Considerate Service", our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip, ALPS, ROHM, Xilinx, Pulse, ON, Everlight and Freescale. Main products comprise IC, Modules, Potentiometer, IC Socket, Relay, Connector. Our parts cover such applications as commercial, industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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## **Sonic Fast Recovery Diode**

=2x1800 V

60 A

230 ns

High Performance Fast Recovery Diode Low Loss and Soft Recovery Phase leg

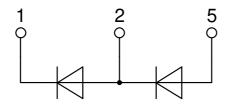
Part number

DHH55-36N1F



Backside: Isolated





#### Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very short recovery time
- Improved thermal behaviour
- Very low Irm-values
- Very soft recovery behaviour
- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low Irm 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: i4-Pac

- 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 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.

IXYS reserves the right to change limits, conditions and dimensions.

Data according to IEC 60747 and per semiconductor unless otherwise specified

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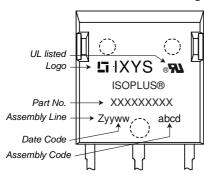


Fast Diode					Ratings		
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V <sub>RSM</sub>	max. non-repetitive reverse blocki	ng voltage	$T_{VJ} = 25^{\circ}C$			1800	V
V <sub>RRM</sub>	max. repetitive reverse blocking ve	oltage	$T_{VJ} = 25^{\circ}C$			1800	V
IR	reverse current, drain current	V <sub>R</sub> = 1800 V	$T_{VJ} = 25^{\circ}C$			200	μΑ
		$V_R = 1800 V$	$T_{VJ} = 125^{\circ}C$			2	mΑ
V <sub>F</sub>	forward voltage drop	I <sub>F</sub> = 60 A	$T_{VJ} = 25^{\circ}C$			2.04	V
		$I_F = 120 A$				2.57	٧
		$I_F = 60 \text{ A}$	T <sub>VJ</sub> = 125°C			2.03	V
		$I_F = 120 A$				2.73	٧
I FAV	average forward current	$T_{c} = 50^{\circ}C$	T <sub>VJ</sub> = 150°C			60	Α
		rectangular $d = 0.5$					
V <sub>F0</sub>	threshold voltage		T <sub>VJ</sub> = 150°C			1.28	٧
r <sub>F</sub>	slope resistance   for power lo	calculation only				12	mΩ
R <sub>thJC</sub>	thermal resistance junction to case	9				0.6	K/W
R <sub>thCH</sub>	thermal resistance case to heatsin	k			0.20		K/W
P <sub>tot</sub>	total power dissipation		$T_C = 25^{\circ}C$			210	W
I <sub>FSM</sub>	max. forward surge current	$t = 10 \text{ ms}$ ; (50 Hz), sine; $V_R = 0 \text{ V}$	$T_{VJ} = 45^{\circ}C$			700	Α
C¹	junction capacitance	$V_{R} = 1200  V$ $f = 1  MHz$	$T_{VJ} = 25^{\circ}C$		28		pF
I <sub>RM</sub>	max. reverse recovery current		$T_{VJ} = 25 ^{\circ}\text{C}$		60		Α
		$I_F = 60 \text{ A}; V_R = 1200 \text{ V}$	$T_{VJ} = 100^{\circ}C$		70		Α
t <sub>rr</sub>	reverse recovery time	$\begin{cases} I_F = 60 \text{ A}; V_R = 1200 \text{ V} \\ -di_F /dt = 800 \text{ A}/\mu\text{s} \end{cases}$	$T_{VJ} = 25 ^{\circ}\text{C}$		230		ns
	,	1	$T_{VJ} = 100^{\circ}C$		350		ns



Package i4-Pac					Ratings		
Symbol	Definition	Conditions		min.	typ.	max.	Unit
I <sub>RMS</sub>	RMS current	per terminal				70	Α
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					9		g
F <sub>c</sub>	mounting force with clip			20		120	N
d <sub>Spp/App</sub>	creepage distance on surface   striking distance through air		terminal to terminal	5.5			mm
d <sub>Spb/Apb</sub>			terminal to backside	5.1			mm
V <sub>ISOL</sub>	isolation voltage	t = 1 second		3000			٧
		t = 1 minute	50/60 Hz, RMS; IISOL ≤ 1 mA	2500			٧

### **Product Marking**

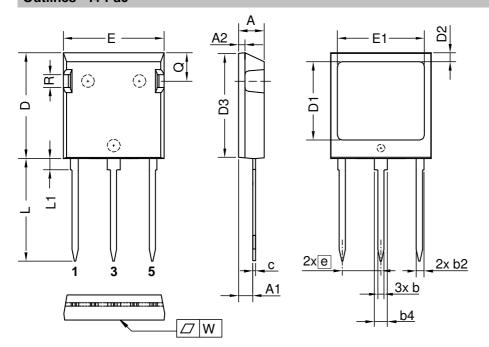


Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DHH55-36N1F	DHH55-36N1F	Tube	25	500173

<b>Equivalent Circuits for Simulation</b>			* on die level	$T_{VJ} = 150 ^{\circ}\text{C}$
$I \rightarrow V_0$	$R_0$	Fast Diode		
V <sub>0 max</sub>	threshold voltage	1.28		V
$R_{0\;\text{max}}$	slope resistance *	9.5		$m\Omega$

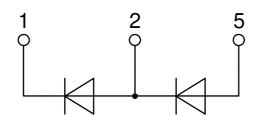


### Outlines i4-Pac



Dim.	Millir	Millimeter		hes
DIIII.	min	max	min	max
Α	4.83	5.21	0.190	0.205
A1	2.59	3.00	0.102	0.118
A2	1.17	2.16	0.046	0.085
b	1.14	1.40	0.045	0.055
b2	1.47	1.73	0.058	0.068
b4	2.54	2.79	0.100	0.110
С	0.51	0.74	0.020	0.029
D	20.80	21.34	0.819	0.840
D1	14.99	15.75	0.590	0.620
D2	1.65	2.03	0.065	0.080
D3	20.30	20.70	0.799	0.815
Е	19.56	20.29	0.770	0.799
E1	16.76	17.53	0.660	0.690
е	7.62 BSC		0.300 BSC	
L	19.81	21.34	0.780	0.840
L1	2.11	2.59	0.083	0.102
Q	5.33	6.20	0.210	0.244
R	2.54	4.57	0.100	0.180
W	-	0.10	-	0.004

Die konvexe Form des Substrates ist typ. < 0.05 mm über der Kunststoffoberfläche der Bauteilunterseite
The convexbow of substrate is typ. < 0.05 mm over plastic surface level ofdevice bottom side





#### **Fast Diode**

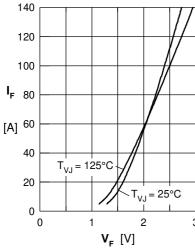


Fig. 1 Typ. rward current I<sub>F</sub> versus V<sub>F</sub>

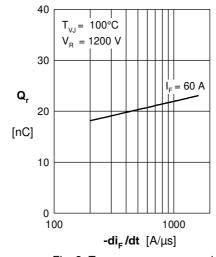


Fig. 2 Typ. reverse recovery charge  $Q_r$  versus  $-di_F/dt$ 

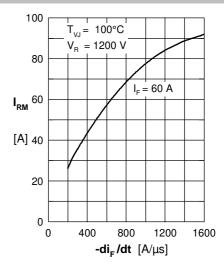


Fig. 3 Typ. peak reverse current  $I_{\rm RM}$  versus  $-{\rm di_F}/{\rm dt}$ 

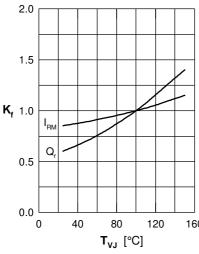


Fig. 4 Dynamic parameters  $Q_r$ ,  $I_{RM}$  versus  $T_{VJ}$ 

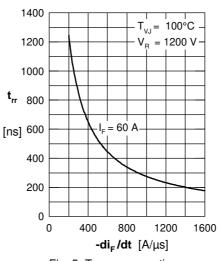


Fig. 5 Typ. recovery time  $t_{rr}$  versus  $-di_{F}/dt$ 

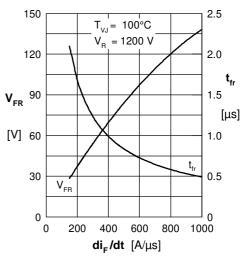


Fig. 6 Typ. peak forward voltage  $V_{FR}$  & typ. forward recovery time  $t_{\rm fr}$  versus  $di_{\rm F}/dt$ 

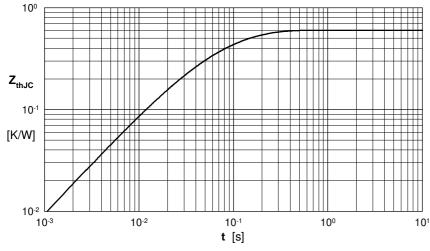


Fig. 7 Transient thermal resistance junction to case

Constants for  $Z_{thJC}$  calculation:

i	$R_{thi}$ (K/W)	t <sub>i</sub> (s)
1	0.212	0.0055
2	0.248	0.0092
3	0.063	0.0007
4	0.077	0.0391