Sonic Fast Recovery Diode

V_{RRM}	=	2 x 1800 V
I_{FAV}	=	60 A
t_{rr}	=	230 ns

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

Part number

DHH55-36N1F

1
3
5
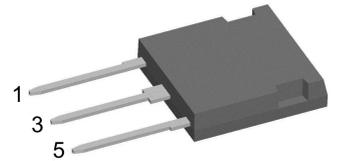
Backside: Isolated

E72873

1   3   5
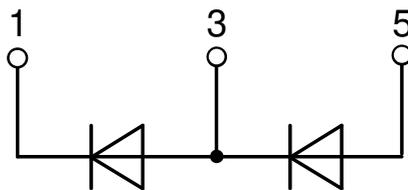
Features / Advantages:

● 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

Disclaimer Notice

Information furnished is believed to be accurate and reliable. However, users should independently
evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for,
and may not be used in, all applications. Read complete Disclaimer Notice at www.littelfuse.com/disclaimer-electronics.

Fast Diode

Ratings

Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage		$T_{VJ} = 25°C$			1800	V
V_{RRM}	max. repetitive reverse blocking voltage		$T_{VJ} = 25°C$			1800	V
I_R	reverse current, drain current	$V_R = 1800$ V	$T_{VJ} = 25°C$			200	μA
		$V_R = 1800$ V	$T_{VJ} = 125°C$			2	mA
V_F	forward voltage drop	$I_F = 60$ A	$T_{VJ} = 25°C$			2.04	V
		$I_F = 120$ A				2.57	V
		$I_F = 60$ A	$T_{VJ} = 125°C$			2.03	V
		$I_F = 120$ A				2.73	V
I_{FAV}	average forward current	$T_C = 50°C$ rectangular d = 0.5	$T_{VJ} = 150°C$			60	A
V_{F0}	threshold voltage	for power loss calculation only	$T_{VJ} = 150°C$			1.28	V
r_F	slope resistance					12	mΩ
R_{thJC}	thermal resistance junction to case					0.6	K/W
R_{thCH}	thermal resistance case to heatsink				0.2		K/W
P_{tot}	total power dissipation		$T_C = 25°C$			210	W
I_{FSM}	max. forward surge current	t = 10 ms; (50 Hz), sine; $V_R = 0$ V	$T_{VJ} = 45°C$			700	A
C_J	junction capacitance	$V_R = 1200$ V f = 1 MHz	$T_{VJ} = 25°C$		28		pF
I_{RM}	max. reverse recovery current	$I_F = 60$ A; $V_R = 1200$ V -di_F/dt = 800 A/μs	$T_{VJ} = 25°C$		60		A
			$T_{VJ} = 100°C$		70		A
t_{rr}	reverse recovery time		$T_{VJ} = 25°C$		230		ns
			$T_{VJ} = 100°C$		350		ns

Package   i4-Pac

Symbol	Definition	Conditions		min.	typ.	max.	Unit
Ratings							
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
Weight					5.5		g
F_C	mounting force with clip			20		120	N
$d_{Spp/App}$	creepage distance on surface | striking distance through air	terminal to terminal		5.5			mm
$d_{Spb/Apb}$		terminal to backside		5.1			mm
V_{ISOL}	isolation voltage	t = 1 second	50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA	3000			V
		t = 1 minute		2500			V

Product Marking

UL Logo
Part Number → XXXXXXXXX
Date Code → yywwZ   1234
Location
Lot#

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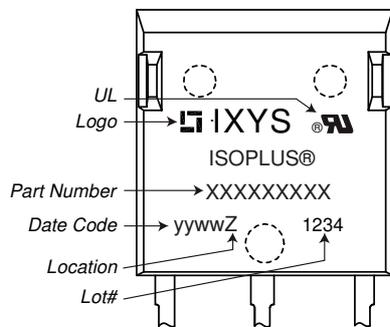
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DHH55-36N1F	DHH55-36N1F	Tube	25	500173

Equivalent Circuits for Simulation   *on die level* $T_{VJ} = 150°C$
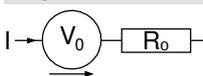
		Fast Diode	
$V_{0\,max}$	threshold voltage	1.28	V
$R_{0\,max}$	slope resistance *	9.5	mΩ

Outlines   i4-Pac
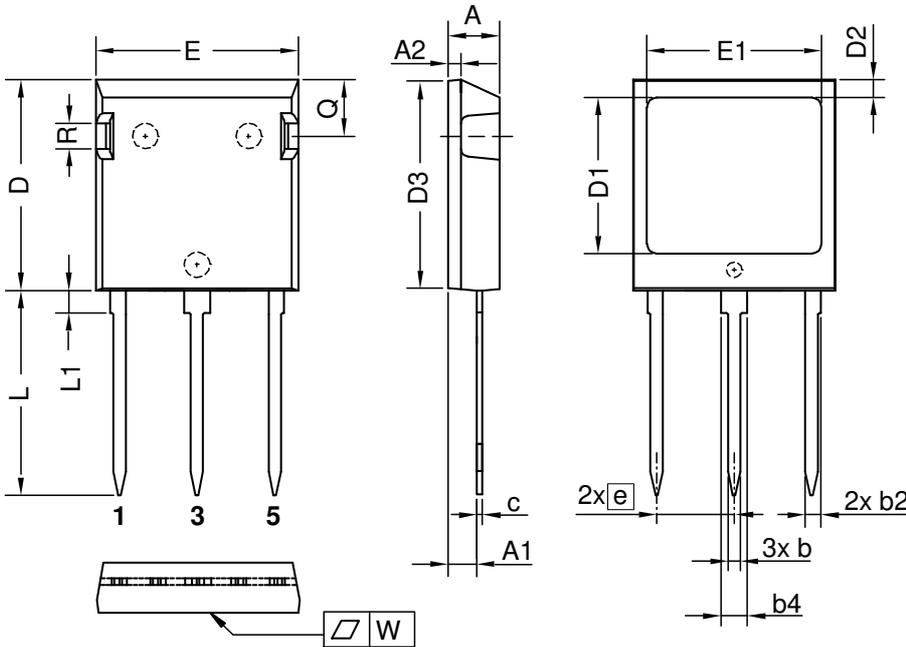
Dim.	Millimeter		Inches	
	min	max	min	max
A	4.83	5.21	0.190	0.205
A1	2.59	3.00	0.102	0.118
A2	1.17	2.16	0.046	0.085
b	1.14	1.40	0.045	0.055
b2	1.47	1.73	0.058	0.068
b4	2.54	2.79	0.100	0.110
c	0.51	0.74	0.020	0.029
D	20.80	21.34	0.819	0.840
D1	14.99	15.75	0.590	0.620
D2	1.65	2.03	0.065	0.080
D3	20.30	20.70	0.799	0.815
E	19.56	20.29	0.770	0.799
E1	16.76	17.53	0.660	0.690
e	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 convex bow of substrate is typ. < 0.05 mm over plastic surface level of device bottom side
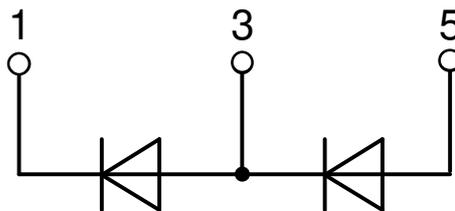
Fast Diode
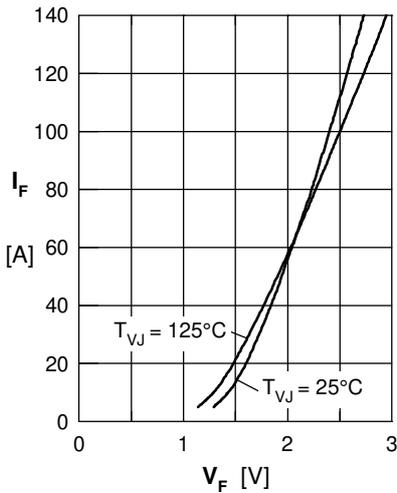
Fig. 1 Typ. rward current
I_F versus V_F
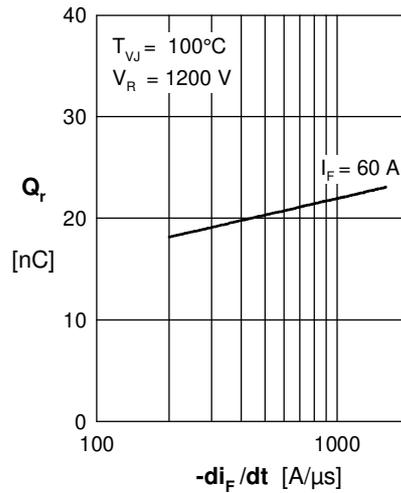
Fig. 2 Typ. reverse recovery charge
Q_r versus $-di_F/dt$
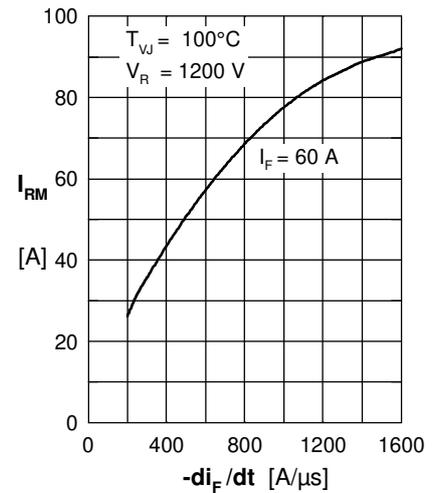
Fig. 3 Typ. peak reverse current
I_{RM} versus $-di_F/dt$
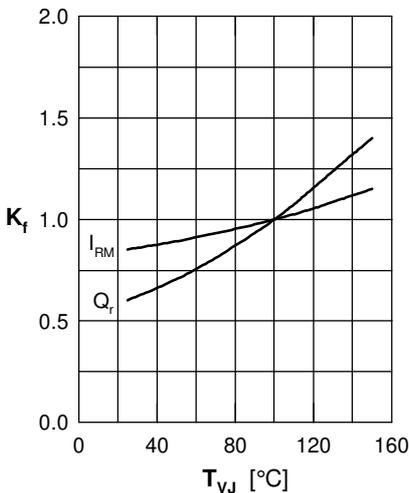
Fig. 4 Dynamic parameters
Q_r, I_{RM} versus T_{VJ}
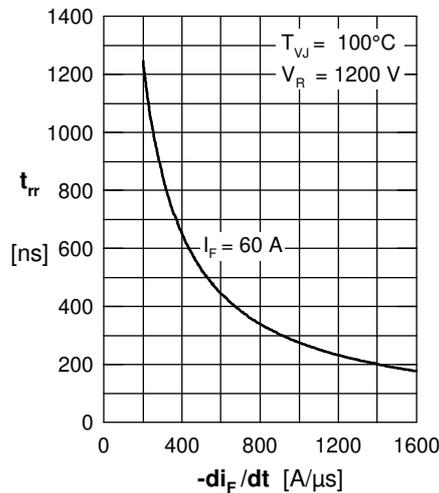
Fig. 5 Typ. recovery time
t_{rr} versus $-di_F/dt$
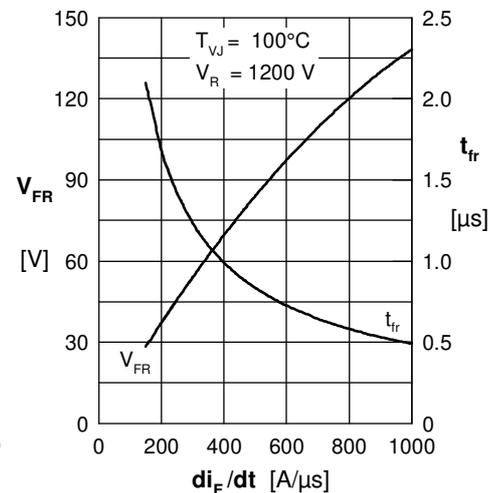
Fig. 6 Typ. peak forward voltage
V_{FR} & typ. forward recovery
time t_{fr} versus di_F/dt
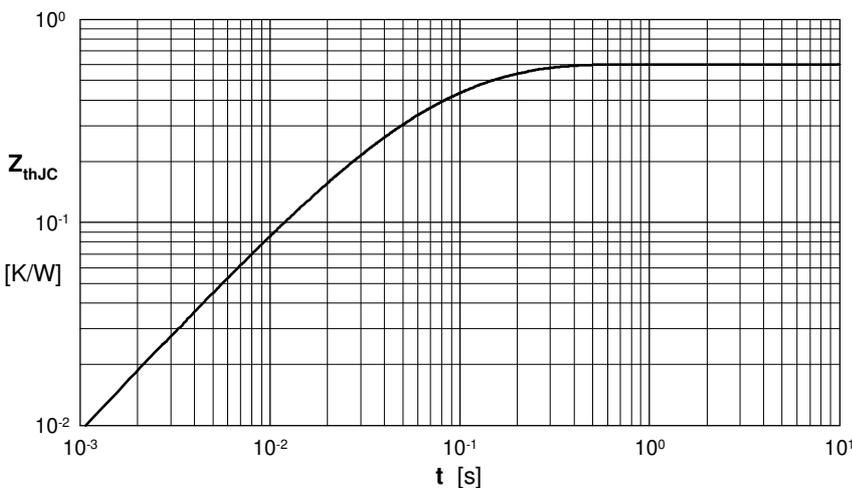
Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.212	0.0055
2	0.248	0.0092
3	0.063	0.0007
4	0.077	0.0391