

# Sonic Fast Recovery Diode

$$V_{RRM} = 3300 \text{ V}$$

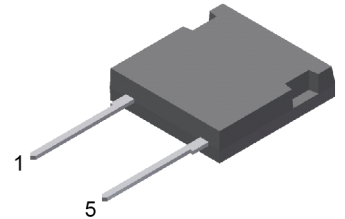
$$I_{F80} = 50 \text{ A}$$

$$t_{rr} = 1650 \text{ ns}$$

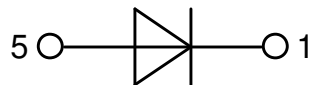
High Performance Fast Recovery Diode  
 Low Loss and Soft Recovery  
 Single Diode

Part number

**DHG55I3300FE**



Backside: isolated  
 see important note page 3



## 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
- Snubber diode
- Free wheeling diode
- Rectifiers in switch mode power supplies (SMPS)
- Uninterruptible power supplies (UPS)

## Package: i4-Pac

- Isolation Voltage: 4200 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](http://www.littelfuse.com/disclaimer-electronics).



**Features / Advantages:**

- Planar passivated chips
- Very low leakage current
- Very short recovery time
- Improved thermal behaviour
- Very low I<sub>rm</sub>-values
- Very soft recovery behaviour
- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low I<sub>rm</sub> reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

**Applications:**

- Antiparallel diode for high frequency switching devices
- Snubber diode
- Free wheeling diode
- Rectifiers in switch mode power supplies (SMPS)
- Uninterruptible power supplies (UPS)

**Package: i4-Pac**

- Isolation Voltage: 4200 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](http://www.littelfuse.com/disclaimer-electronics).

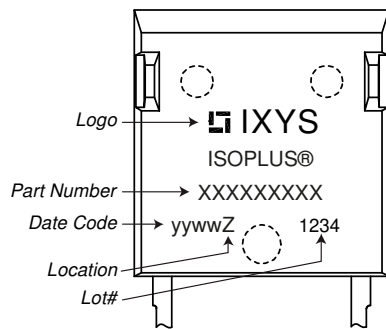


Fast Diode				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
$V_{RSM}$	max. non-repetitive reverse blocking voltage					3300	V
$V_{RRM}$	max. repetitive reverse blocking voltage					3300	V
$I_R$	reverse current, drain current	$V_R = 3300\text{ V}$		$T_{VJ} = 25^\circ\text{C}$		100	$\mu\text{A}$
		$V_R = 3300\text{ V}$		$T_{VJ} = 125^\circ\text{C}$		2	mA
$V_F$	forward voltage drop	$I_F = 60\text{ A}$		$T_{VJ} = 25^\circ\text{C}$		3.38	V
		$I_F = 120\text{ A}$				4.35	V
		$I_F = 60\text{ A}$		$T_{VJ} = 125^\circ\text{C}$		3.39	V
		$I_F = 120\text{ A}$				4.70	V
$I_{FAV}$	average forward current	$T_C = 80^\circ\text{C}$		$T_{VJ} = 150^\circ\text{C}$		50	A
		DC	$d = 1$				
$V_{FO}$	threshold voltage	} for power loss calculation only				2.50	V
$r_F$	slope resistance					14.5	m $\Omega$
$R_{thJC}$	thermal resistance junction to case					0.45	K/W
$R_{thCH}$	thermal resistance case to heatsink					0.15	K/W
$P_{tot}$	total power dissipation			$T_C = 25^\circ\text{C}$		280	W
$I_{FSM}$	max. forward surge current	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}; V_R = 0\text{ V}$		$T_{VJ} = 45^\circ\text{C}$		600	A
$C_J$	junction capacitance	$V_R = 1800\text{ V}$ $f = 1\text{ MHz}$		$T_{VJ} = 25^\circ\text{C}$		16	pF
$I_{RM}$	max. reverse recovery current	} $I_F = 60\text{ A}; V_R = 1800\text{ V}$		$T_{VJ} = 25^\circ\text{C}$		55	A
				$T_{VJ} = 125^\circ\text{C}$		65	A
$t_{rr}$	reverse recovery time	} $-di_F/dt = 500\text{ A}/\mu\text{s}$		$T_{VJ} = 25^\circ\text{C}$		1650	ns
				$T_{VJ} = 125^\circ\text{C}$		2400	ns



Package i4-Pac		Ratings				
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$I_{RMS}$	RMS current	per terminal			70	A
$T_{VJ}$	virtual junction temperature		-40		150	°C
$T_{op}$	operation temperature		-40		125	°C
$T_{stg}$	storage temperature		-40		150	°C
<b>Weight</b>				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	13.8			mm
$d_{Spb/ Apb}$		terminal to backside	5.1			mm
$V_{ISOL}$	isolation voltage	t = 1 second	4200			V
		t = 1 minute	2500			V

**Product Marking**



**Part description**

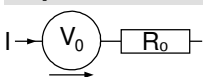
- D = Diode
- H = Sonic Fast Recovery Diode
- G = extreme fast
- 55 = Current Rating [A]
- I = Single Diode
- 3300 = Reverse Voltage [V]
- FE = i4-Pac (2HV)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DHG55I3300FE	DHG55I3300FE	Tube	25	516110

**Equivalent Circuits for Simulation**

\* on die level

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



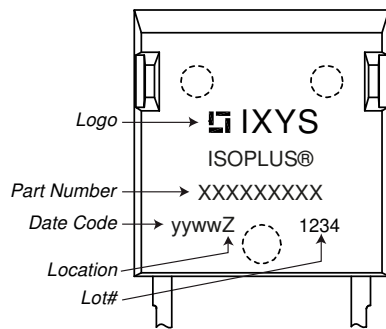
**Fast Diode**

$V_{0\ max}$	threshold voltage	2.5	V
$R_{0\ max}$	slope resistance *	14.5	mΩ



Package i4-Pac		Ratings				
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$I_{RMS}$	RMS current	per terminal			70	A
$T_{VJ}$	virtual junction temperature		-40		150	°C
$T_{op}$	operation temperature		-40		125	°C
$T_{stg}$	storage temperature		-40		150	°C
<b>Weight</b>				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	13.8			mm
$d_{Spb/ Apb}$		terminal to backside	5.1			mm
$V_{ISOL}$	isolation voltage	t = 1 second	4200			V
		t = 1 minute	2500			V

**Product Marking**



**Part description**

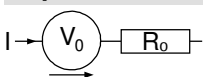
- D = Diode
- H = Sonic Fast Recovery Diode
- G = extreme fast
- 55 = Current Rating [A]
- I = Single Diode
- 3300 = Reverse Voltage [V]
- FE = i4-Pac (2HV)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DHG55I3300FE	DHG55I3300FE	Tube	25	516110

**Equivalent Circuits for Simulation**

\* on die level

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

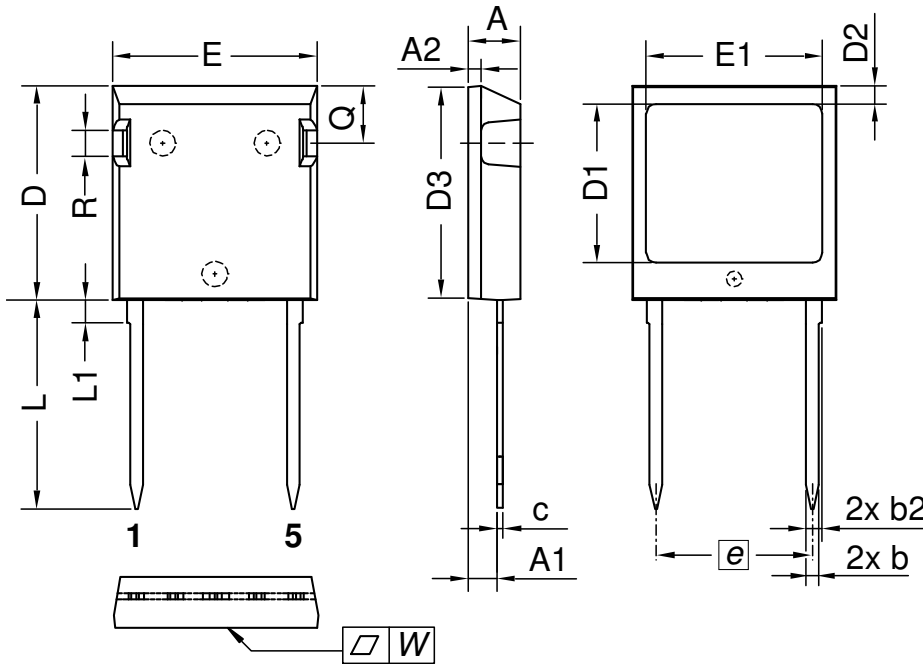


**Fast Diode**

$V_{0\ max}$	threshold voltage	2.5	V
$R_{0\ max}$	slope resistance *	14.5	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
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	15.24	BSC	0.600	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 of device bottom side

**Important note:**

External clearances between pins and between pins and tab may be insufficient to prevent flash over under all conditions. It is the customer's responsibility to apply additional insulation appropriate to the application.

ISOPLUS264 is designed to isolate a max continuous operation voltage (DC) of 1700 V. The peak test voltage of 4200 V assures safety for transient voltages only. The package is not tested for partial discharge.

If the product is used outside the package design voltage range the customer must use additional electrical insulation. Extra insulation layers should be used both between the tab and any heatsink and between any conducting clip and the top surface of the package particularly when metal parts (such as a heatsink or a clip) are in contact. Please note that the intention of this package is to provide customers with an encapsulated die for high voltage application but the responsibility rests entirely with the customer to ensure for safe operation. Bodily injury cannot be excluded if this warning is disregarded. Device implementation is the end user's responsibility.

For a low FIT rate over lifetime failures due to SEB (Single Event Burnout) and an adequate voltage derating should be considered.

