



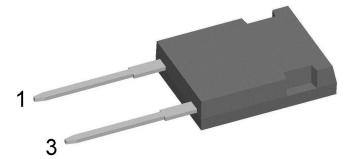
# HiPerDynFRED

$V_{RRM} = 600\text{ V}$   
 $I_{FAV} = 30\text{ A}$   
 $t_{rr} = 35\text{ ns}$

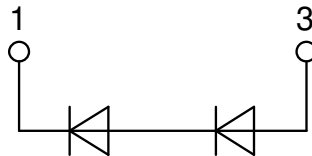
High Performance Dynamic Fast Recovery Diode  
 Extreme Low Loss and Soft Recovery  
 Single Diode

Part number

**DPH30IS600HI**



Backside: isolated



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

**Package: ISOPLUS247**

- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Soldering pins for PCB mounting
- Backside: DCB ceramic
- Reduced weight
- Advanced power cycling

**Disclaimer Notice**

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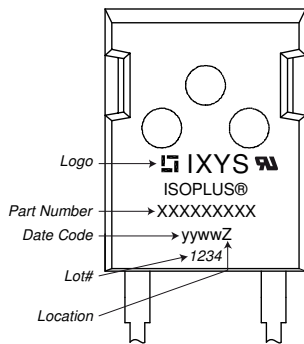


Fast Diode				Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit	
$V_{RSM}$	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			600	V	
$V_{RRM}$	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			600	V	
$I_R$	reverse current, drain current	$V_R = 600 V$	$T_{VJ} = 25^{\circ}C$		1	$\mu A$	
		$V_R = 600 V$	$T_{VJ} = 150^{\circ}C$		0.2	mA	
$V_F$	forward voltage drop	$I_F = 30 A$	$T_{VJ} = 25^{\circ}C$		2.48	V	
		$I_F = 60 A$			3.02	V	
		$I_F = 30 A$	$T_{VJ} = 150^{\circ}C$		1.89	V	
		$I_F = 60 A$			2.45	V	
$I_{FAV}$	average forward current	$T_C = 140^{\circ}C$ rectangular $d = 0.5$	$T_{VJ} = 175^{\circ}C$		30	A	
$V_{FO}$	threshold voltage	} for power loss calculation only	$T_{VJ} = 175^{\circ}C$		1.10	V	
$r_F$	slope resistance				12.6	m $\Omega$	
$R_{thJC}$	thermal resistance junction to case				0.55	K/W	
$R_{thCH}$	thermal resistance case to heatsink			0.3		K/W	
$P_{tot}$	total power dissipation		$T_C = 25^{\circ}C$		285	W	
$I_{FSM}$	max. forward surge current	$t = 10 ms; (50 Hz), sine; V_R = 0 V$	$T_{VJ} = 45^{\circ}C$		450	A	
$C_J$	junction capacitance	$V_R = 400 V$ $f = 1 MHz$	$T_{VJ} = 25^{\circ}C$		30	pF	
$I_{RM}$	max. reverse recovery current	} $I_F = 30 A; V_R = 400 V$ $-di_F / dt = 200 A/\mu s$	$T_{VJ} = 25^{\circ}C$		3	A	
			$T_{VJ} = 125^{\circ}C$		8	A	
$t_{rr}$	reverse recovery time		$T_{VJ} = 25^{\circ}C$		35	ns	
			$T_{VJ} = 125^{\circ}C$		65	ns	



Package ISOPLUS247		Ratings				
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$I_{RMS}$	RMS current	per terminal			70	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>				6		g
$F_C$	mounting force with clip		20		120	N
$d_{Spp/APP}$	creepage distance on surface / striking distance through air	terminal to terminal	5.4			mm
$d_{Spb/APb}$		terminal to backside	4.1			mm
$V_{ISOL}$	isolation voltage	t = 1 second	3600			V
		t = 1 minute	3000			V

**Product Marking**



**Part description**

- D = Diode
- P = HiPerFRED
- H = HiPerDyn
- 30 = Current Rating [A]
- IS = Single Diode
- 600 = Reverse Voltage [V]
- HI = ISOPLUS247 (2)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DPH30IS600HI	DPH30IS600HI	Tube	30	506235

Similar Part	Package	Voltage class
DHG60I600HA	TO-247AD (2)	600
DSEP60-06A	TO-247AD (2)	600
DSEP60-06AT	TO-268AA (D3Pak) (2)	600

**Equivalent Circuits for Simulation**

\* on die level

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

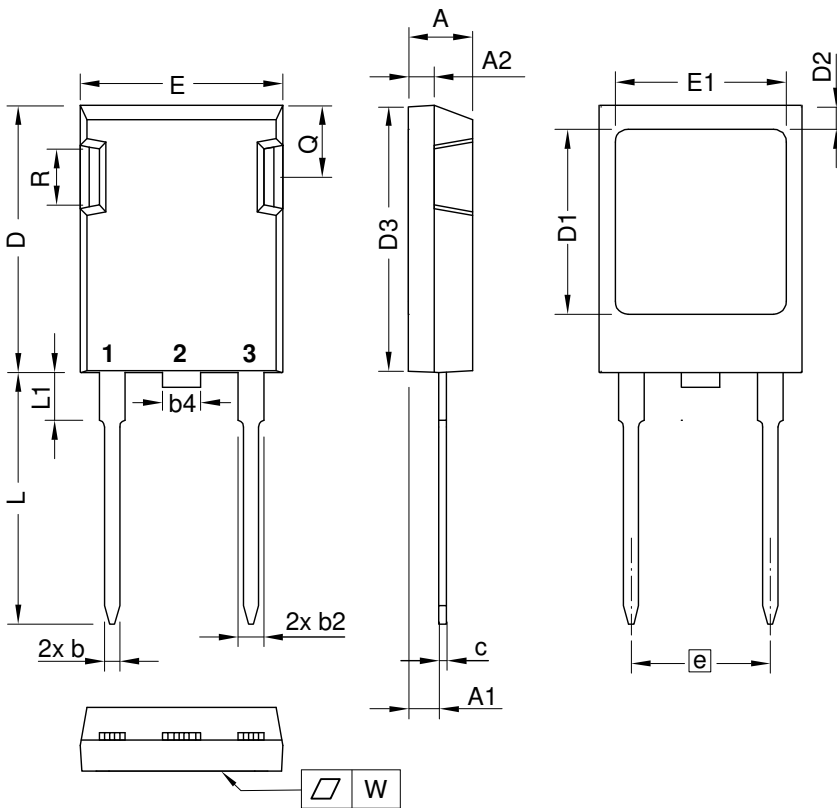


**Fast Diode**

$V_{0\ max}$	threshold voltage	1.1	V
$R_{0\ max}$	slope resistance *	10	mΩ



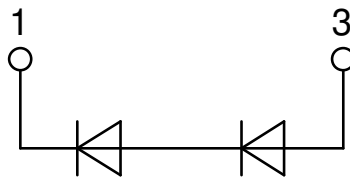
Outlines ISOPLUS247



Dim.	Millimeter		Inches	
	min	max	min	max
A	4.83	5.21	0.190	0.205
A1	2.29	2.54	0.090	0.100
A2	1.91	2.16	0.075	0.085
b	1.14	1.40	0.045	0.055
b2	1.91	2.20	0.075	0.087
b4	2.92	3.24	0.115	0.128
c	0.61	0.83	0.024	0.033
D	20.80	21.34	0.819	0.840
D1	15.75	16.26	0.620	0.640
D2	1.65	2.15	0.065	0.085
D3	20.30	20.70	0.799	0.815
E	15.75	16.13	0.620	0.635
E1	13.21	13.72	0.520	0.540
e	10.90 BSC		0.429 BSC	
L	19.81	20.60	0.780	0.811
L1	3.81	4.38	0.150	0.172
Q	5.59	6.20	0.220	0.244
R	4.25	5.50	0.167	0.217
W	-	0.10	-	0.004

Die konvexe Form des Substrates ist typ. < 0.04 mm über der Kunststoffoberfläche der Bauteilunterseite  
The convex bow of substrate is typ. < 0.04 mm over plastic surface level of device bottom side

Die Gehäuseabmessungen entsprechen dem Typ TO-247 AD gemäß JEDEC außer Schraubloch und  $L_{max}$ .  
This drawing will meet all dimensions requirement of JEDEC outline TO-247 AD except screw hole and except  $L_{max}$ .





**Fast Diode**

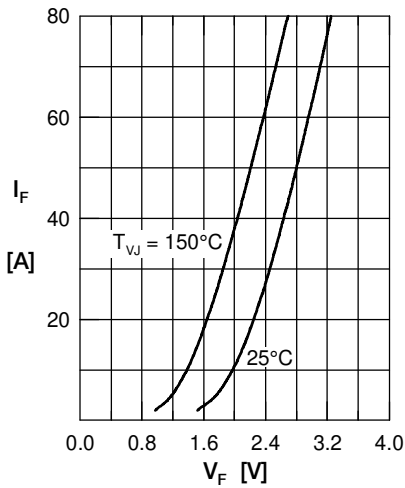


Fig. 1 Forward current  $I_F$  versus  $V_F$

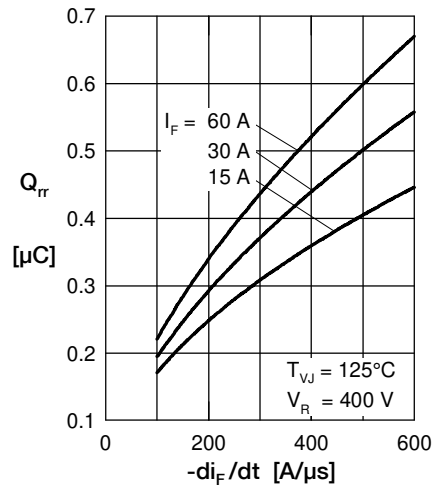


Fig. 2 Typ. reverse recov. charge  $Q_{rr}$  versus  $-di_F/dt$

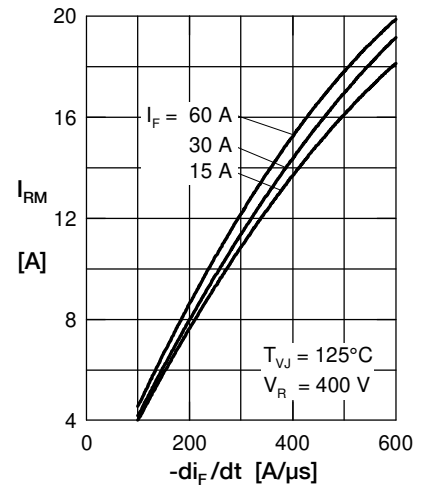


Fig. 3 Typ. reverse recov. current  $I_{RM}$  versus  $-di_F/dt$

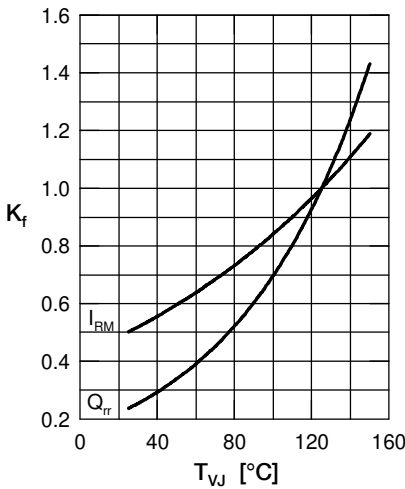


Fig. 4 Typ. dynamic parameters  $Q_{rr}$ ,  $I_{RM}$  versus  $T_{VJ}$

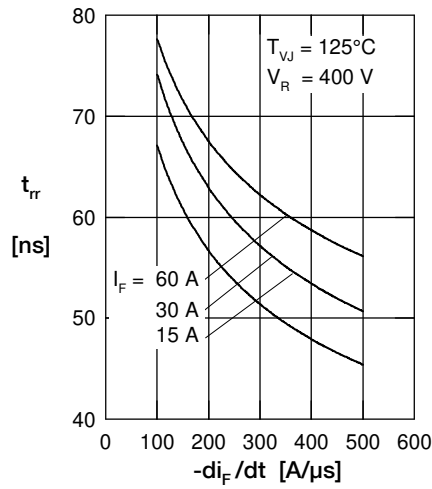


Fig. 5 Typ. reverse recov. time  $t_{rr}$  versus  $-di_F/dt$

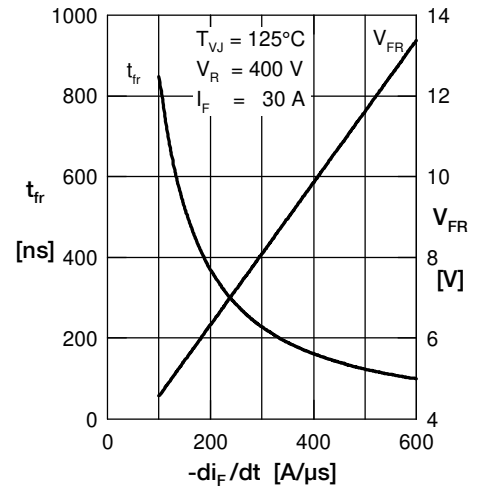


Fig. 6 Typ. forward recov. voltage  $V_{FR}$  & time  $t_{fr}$  versus  $di_F/dt$

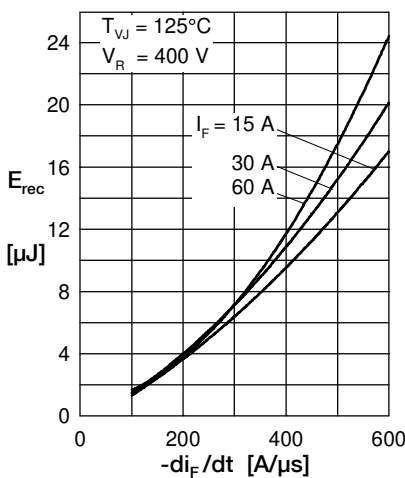


Fig. 7 Typ. recovery energy  $E_{rec}$  versus  $-di_F/dt$

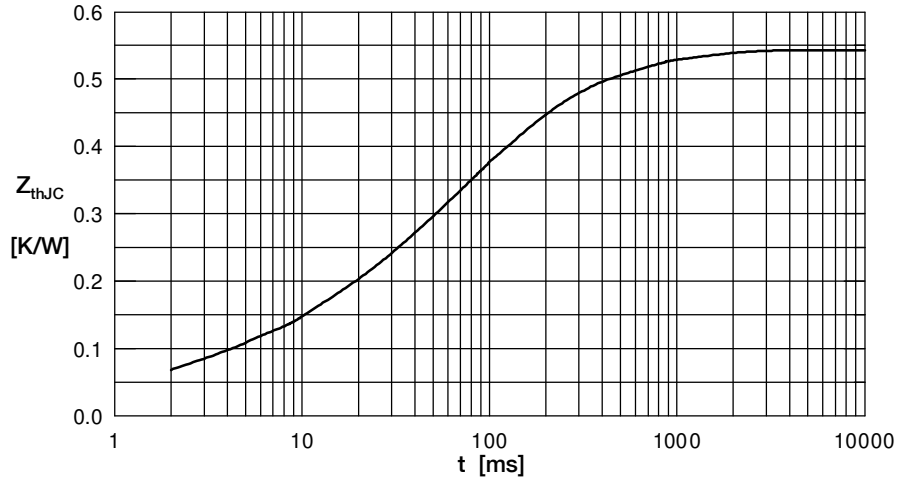


Fig. 8 Transient thermal impedance junction to case