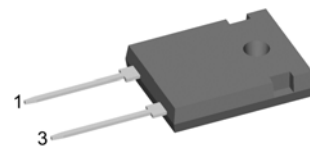


HiPerFRED²

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

Part number

DPG 60 I 400 HA



Backside: cathode

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:

- Housing: TO-247
- Industry standard outline
- Epoxy meets UL 94V-0
- RoHS compliant

Ratings

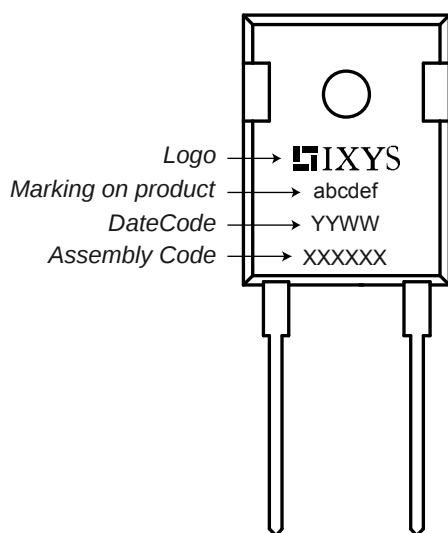
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RRM}	max. repetitive reverse voltage	$T_{VJ} = 25^{\circ}\text{C}$				400	V
I_R	reverse current	$V_R = 400\text{V}$ $T_{VJ} = 25^{\circ}\text{C}$				1	μA
		$V_R = 400\text{V}$ $T_{VJ} = 150^{\circ}\text{C}$				0.3	mA
V_F	forward voltage	$I_F = 60\text{A}$ $T_{VJ} = 25^{\circ}\text{C}$				1.47	V
		$I_F = 120\text{A}$ $T_{VJ} = 25^{\circ}\text{C}$				1.80	V
		$I_F = 60\text{A}$ $T_{VJ} = 150^{\circ}\text{C}$				1.22	V
		$I_F = 120\text{A}$ $T_{VJ} = 150^{\circ}\text{C}$				1.59	V
I_{FAV}	average forward current	rectangular $d = 0.5$ $T_C = 120^{\circ}\text{C}$				60	A
V_{FO}	threshold voltage	$T_{VJ} = 175^{\circ}\text{C}$	} for power loss calculation only			0.81	V
r_F	slope resistance					6.1	m Ω
R_{thJC}	thermal resistance junction to case					0.55	K/W
T_{VJ}	virtual junction temperature			-55		175	$^{\circ}\text{C}$
P_{tot}	total power dissipation	$T_C = 25^{\circ}\text{C}$				275	W
I_{FSM}	max. forward surge current	$t = 10\text{ ms}$ (50 Hz), sine $T_{VJ} = 45^{\circ}\text{C}$				450	A
I_{RM}	max. reverse recovery current	$T_{VJ} = 25^{\circ}\text{C}$			4		A
		$I_F = 60\text{A}; V_R = 270\text{V}$ $T_{VJ} = 125^{\circ}\text{C}$			9.5		A
t_{rr}	reverse recovery time	$-di_F/dt = 200\text{ A}/\mu\text{s}$ $T_{VJ} = 25^{\circ}\text{C}$			45		ns
		$T_{VJ} = 125^{\circ}\text{C}$			85		ns
C_J	junction capacitance	$V_R = 200\text{V}; f = 1\text{ MHz}$ $T_{VJ} = 25^{\circ}\text{C}$			61		pF

Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
I_{RMS}	RMS current	per pin ¹⁾			70	A
R_{thCH}	thermal resistance case to heatsink			0.25		K/W
T_{stg}	storage temperature		-55		150	°C
Weight				6		g
M_D	mounting torque		0.8		1.2	Nm
F_C	mounting force with clip		20		120	N

¹⁾ I_{RMS} is typically limited by: 1. pin-to-chip resistance; or by 2. current capability of the chip.

In case of 1, a common cathode/anode configuration and a non-isolated backside, the whole current capability can be used by connecting the backside.

Product Marking

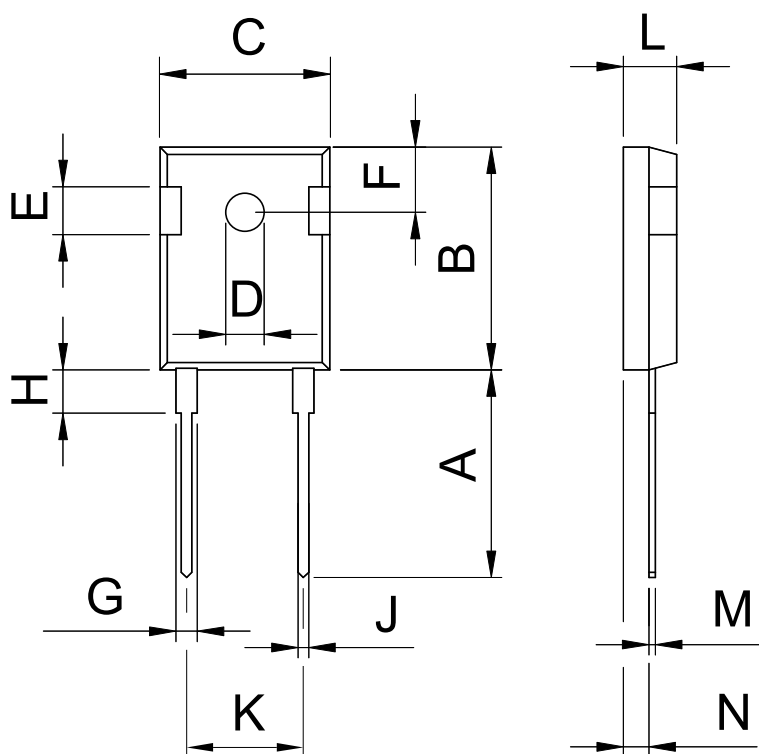


Part number

D = Diode
 P = HiPerFRED
 G = extreme fast
 60 = Current Rating [A]
 I = Single Diode
 400 = Reverse Voltage [V]
 HA = TO-247AD (2)

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Code Key
Standard	DPG 60 I 400 HA	DPG60I400HA	Tube	30	506242

Similar Part	Package	Voltage Class
DPG60IM400QB	TO-3P (3)	400

Outlines TO-247


Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	19.81	20.32	0.780	0.800
B	20.80	21.46	0.819	0.845
C	15.75	16.26	0.610	0.640
D	3.55	3.65	0.140	0.144
E	4.32	5.49	0.170	0.216
F	5.4	6.2	0.212	0.244
G	1.65	2.13	0.065	0.084
H	-	4.5	-	0.177
J	1.0	1.4	0.040	0.055
K	10.8	11.0	0.426	0.433
L	4.7	5.3	0.185	0.209
M	0.4	0.8	0.016	0.031
N	1.5	2.49	0.087	0.102

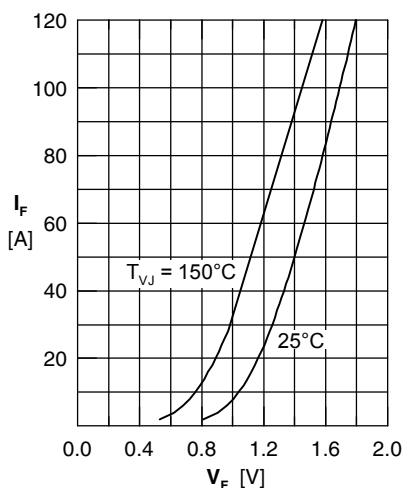


Fig. 1 Forward current I_F versus forward voltage V_F

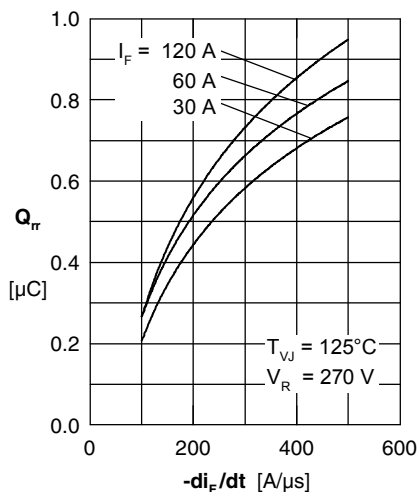


Fig. 2 Typ. reverse recovery charge Q_{rr} versus $-di_F/dt$

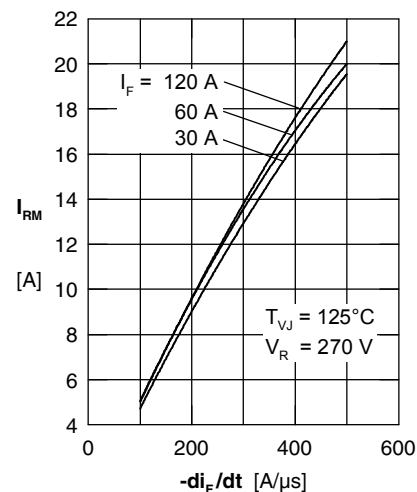


Fig. 3 Typ. reverse recovery current I_{RM} versus $-di_F/dt$

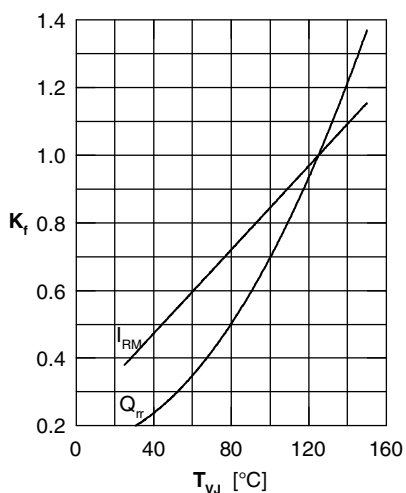


Fig. 4 Dynamic parameters Q_{rr} , I_{RM} versus T_{VJ}

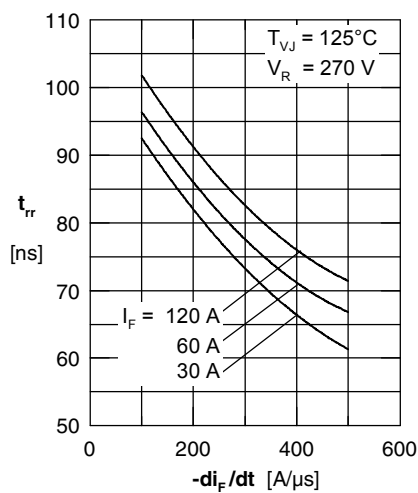


Fig. 5 Typ. reverse recovery time t_{rr} versus $-di_F/dt$

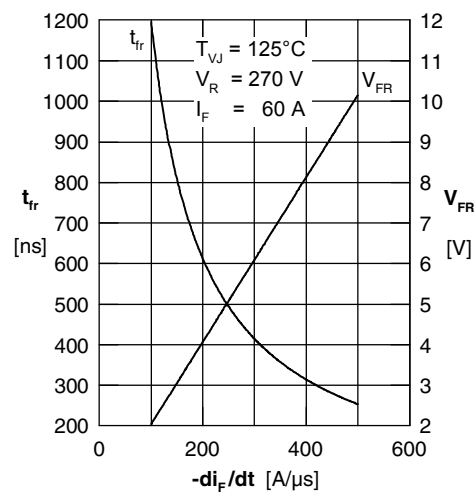


Fig. 6 Typ. forward recovery voltage V_{FR} & forward recovery time t_{fr} vs. di_F/dt

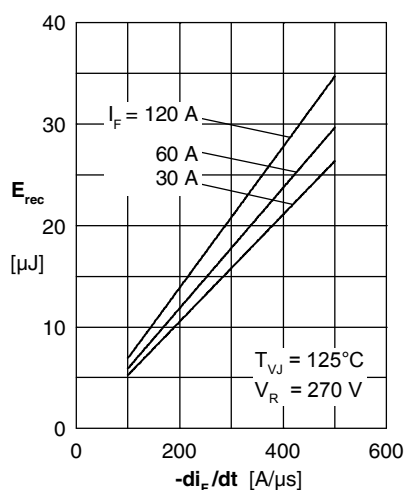


Fig. 7 Typ. recovery energy E_{rec} versus $-di_F/dt$

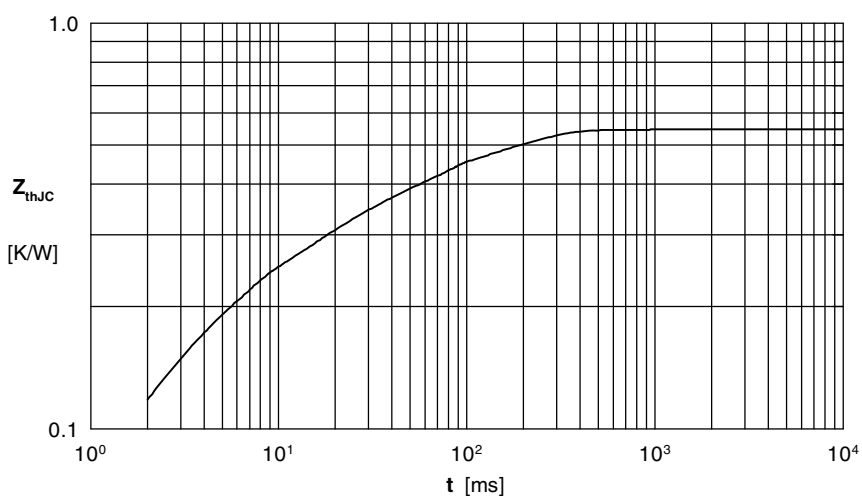


Fig. 8 Transient thermal impedance junction to case