HiPerFRED²
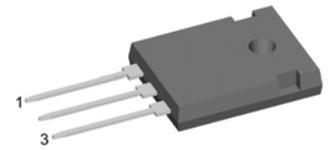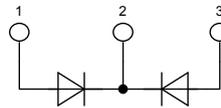
High Performance Fast Recovery Diode
Low Loss and Soft Recovery
Common Cathode

V_{RRM} = 400 V
I_{FAV} = 2x 30 A
t_{rr} = 45 ns

Part number

DPG 60 C 400 HB

Backside: cathode

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:

● 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°C			400	V
I_R	reverse current	V_R = 400 V	T_{VJ} = 25°C			1	μA
		V_R = 400 V	T_{VJ} = 150°C			0.2	mA
V_F	forward voltage	I_F = 30 A	T_{VJ} = 25°C			1.41	V
		I_F = 60 A				1.69	V
		I_F = 30 A	T_{VJ} = 150°C			1.13	V
		I_F = 60 A				1.46	V
I_{FAV}	average forward current	rectangular d = 0.5	T_C = 135°C			30	A
V_{F0}	threshold voltage	} for power loss calculation only	T_{VJ} = 175°C			0.76	V
r_F	slope resistance					10.7	mΩ
R_{thJC}	thermal resistance junction to case					0.95	K/W
T_{VJ}	virtual junction temperature			-55		175	°C
P_{tot}	total power dissipation		T_C = 25°C			160	W
I_{FSM}	max. forward surge current	t = 10 ms (50 Hz), sine	T_{VJ} = 45°C			360	A
I_{RM}	max. reverse recovery current		T_{VJ} = 25°C		4		A
		I_F = 30 A; V_R = 270 V	T_{VJ} = 125°C		8.5		A
t_{rr}	reverse recovery time	-di$_F$/dt = 200 A/μs	T_{VJ} = 25°C		45		ns
			T_{VJ} = 125°C		85		ns
C_J	junction capacitance	V_R = 200 V; f = 1 MHz	T_{VJ} = 25°C		39		pF

Data according to IEC 60747and per diode unless otherwise specified

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Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per pin [1]			50	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.
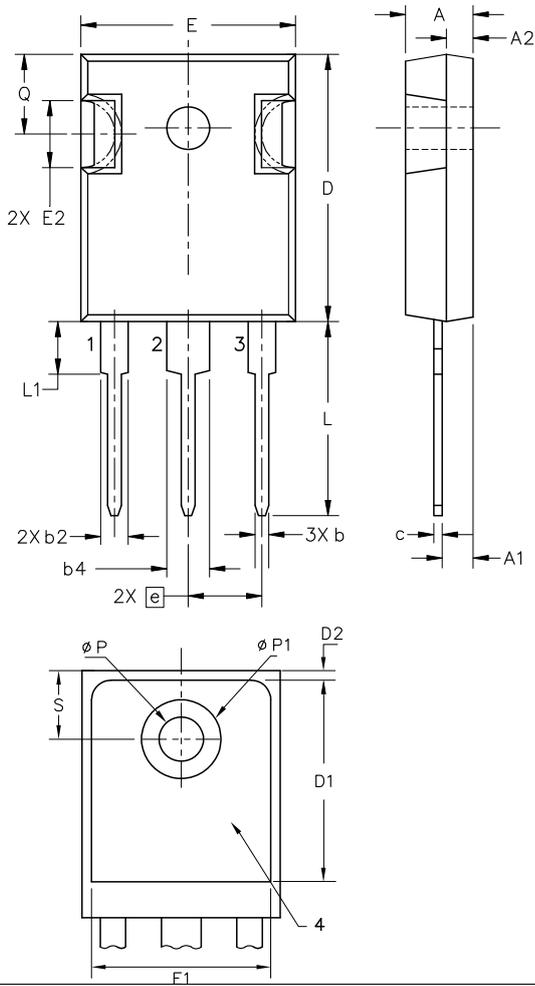
Product Marking

Logo → **IXYS**
Marking on product → abcdef
DateCode → YYWW
Assembly Code → XXXXXX
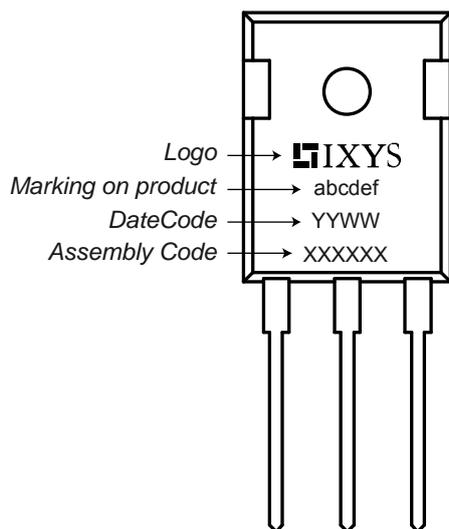
Part number

D = Diode
P = HiPerFRED
G = extreme fast
60 = Current Rating [A]
C = Common Cathode
400 = Reverse Voltage [V]
HB = TO-247AD (3)

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Code Key
Standard	DPG 60 C 400 HB	DPG60C400HB	Tube	30	505825

Similar Part	Package	Voltage Class
DPG60C400QB	TO-3P (3)	400
DPG80C400HB	TO-247AD (3)	400

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Outlines TO-247

Sym.	Inches		Millimeter	
	min.	max.	min.	max.
A	0.185	0.209	4.70	5.30
A1	0.087	0.102	2.21	2.59
A2	0.059	0.098	1.50	2.49
D	0.819	0.845	20.79	21.45
E	0.610	0.640	15.48	16.24
E2	0.170	0.216	4.31	5.48
e	0.215 BSC		5.46 BSC	
L	0.780	0.800	19.80	20.30
L1	-	0.177	-	4.49
Ø P	0.140	0.144	3.55	3.65
Q	0.212	0.244	5.38	6.19
S	0.242 BSC		6.14 BSC	
b	0.039	0.055	0.99	1.40
b2	0.065	0.094	1.65	2.39
b4	0.102	0.135	2.59	3.43
c	0.015	0.035	0.38	0.89
D1	0.515	-	13.07	-
D2	0.020	0.053	0.51	1.35
E1	0.530	-	13.45	-
Ø P1	-	0.29	-	7.39

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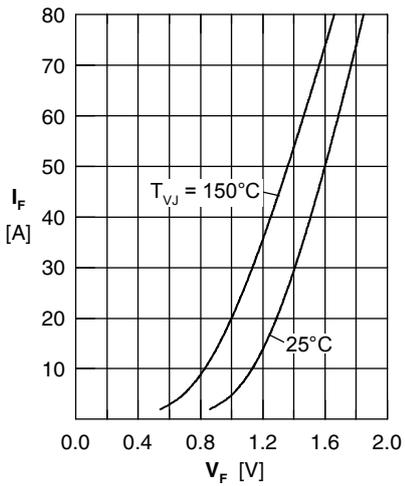
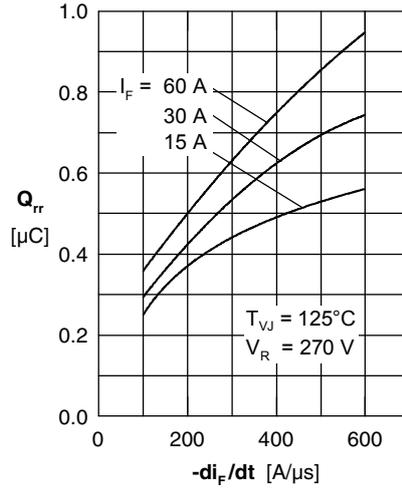Fig. 1 Forward current I_F versus forward voltage V_F

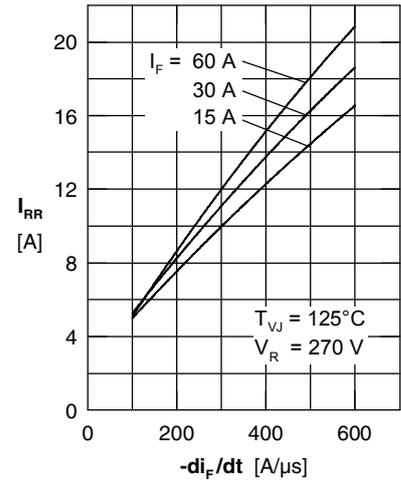Fig. 2 Typ. reverse recovery charge Q_{rr} versus $-di_F/dt$

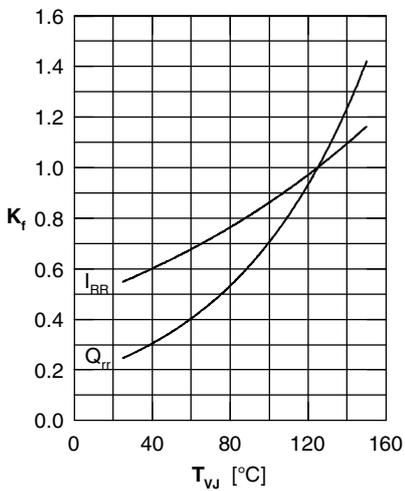Fig. 3 Typ. reverse recovery current I_{RR} versus $-di_F/dt$

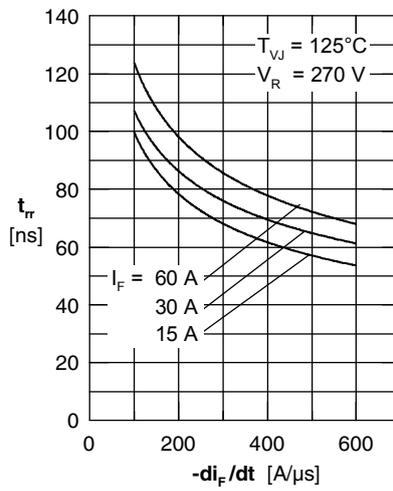Fig. 4 Dynamic parameters Q_{rr}, I_{RR} versus T_{VJ}

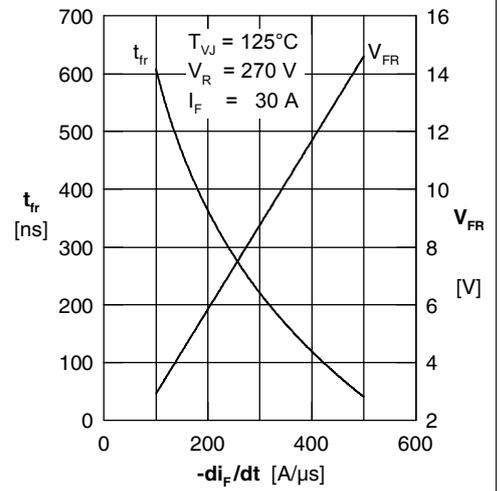Fig. 5 Typ. reverse recovery time t_{rr} versus $-di_F/dt$

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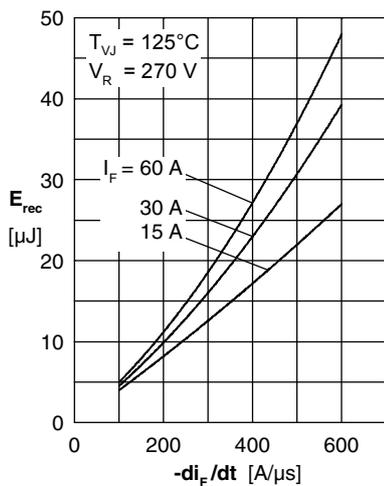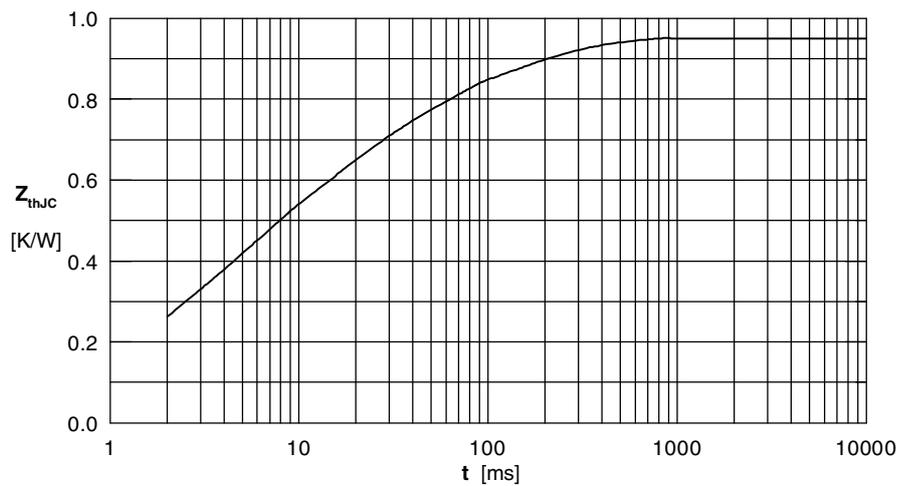

Fig. 7 Typ. recovery energy E_{rec} versus $-di_F/dt$

Fig. 8 Transient thermal impedance junction to case

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

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