

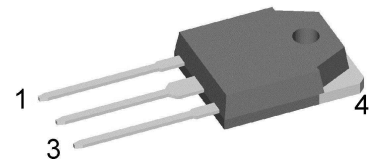
HiPerFRED²

$V_{RRM} = 400\text{ V}$
 $I_{FAV} = 2 \times 30\text{ A}$
 $t_{rr} = 45\text{ ns}$

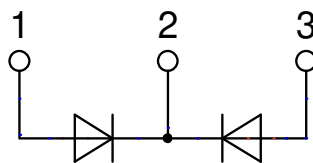
High Performance Fast Recovery Diode
 Low Loss and Soft Recovery
 Common Cathode

Part number

DPG60C400QB



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: TO-3P

- Industry standard outline compatible with TO-247
- RoHS compliant
- Epoxy meets UL 94V-0

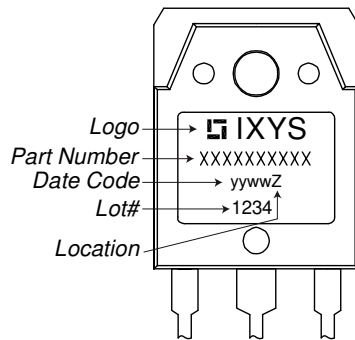
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Fast Diode				Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit	
V_{RSM}	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			400	V	
V_{RRM}	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			400	V	
I_R	reverse current, drain current	$V_R = 400 V$	$T_{VJ} = 25^{\circ}C$		1	μA	
		$V_R = 400 V$	$T_{VJ} = 150^{\circ}C$		0.2	mA	
V_F	forward voltage drop	$I_F = 30 A$	$T_{VJ} = 25^{\circ}C$		1.41	V	
		$I_F = 60 A$			1.69	V	
		$I_F = 30 A$	$T_{VJ} = 150^{\circ}C$		1.13	V	
		$I_F = 60 A$			1.46	V	
I_{FAV}	average forward current	$T_C = 135^{\circ}C$ rectangular $d = 0.5$	$T_{VJ} = 175^{\circ}C$		30	A	
V_{FO}	threshold voltage	} for power loss calculation only	$T_{VJ} = 175^{\circ}C$		0.76	V	
r_F	slope resistance				10.7	m Ω	
R_{thJC}	thermal resistance junction to case				0.95	K/W	
R_{thCH}	thermal resistance case to heatsink			0.3		K/W	
P_{tot}	total power dissipation		$T_C = 25^{\circ}C$		160	W	
I_{FSM}	max. forward surge current	$t = 10 ms; (50 Hz), sine; V_R = 0 V$	$T_{VJ} = 45^{\circ}C$		360	A	
C_J	junction capacitance	$V_R = 200 V$ $f = 1 MHz$	$T_{VJ} = 25^{\circ}C$		39	pF	
I_{RM}	max. reverse recovery current	} $I_F = 30 A; V_R = 270 V$ $-di_F / dt = 200 A/\mu s$	$T_{VJ} = 25^{\circ}C$		4	A	
			$T_{VJ} = 125^{\circ}C$		8.5	A	
t_{rr}	reverse recovery time		$T_{VJ} = 25^{\circ}C$		45	ns	
			$T_{VJ} = 125^{\circ}C$		85	ns	

Package TO-3P			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal ¹⁾			50	A
T_{VJ}	virtual junction temperature		-55		175	°C
T_{op}	operation temperature		-55		150	°C
T_{stg}	storage temperature		-55		150	°C
Weight				5		g
M_D	mounting torque		0.8		1.2	Nm
F_C	mounting force with clip		20		120	N

Product Marking

Part description

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

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DPG60C400QB	DPG60C400QB	Tube	30	501908

Similar Part	Package	Voltage class
DPG60C400HB	TO-247AD (3)	400
DPG80C400HB	TO-247AD (3)	400

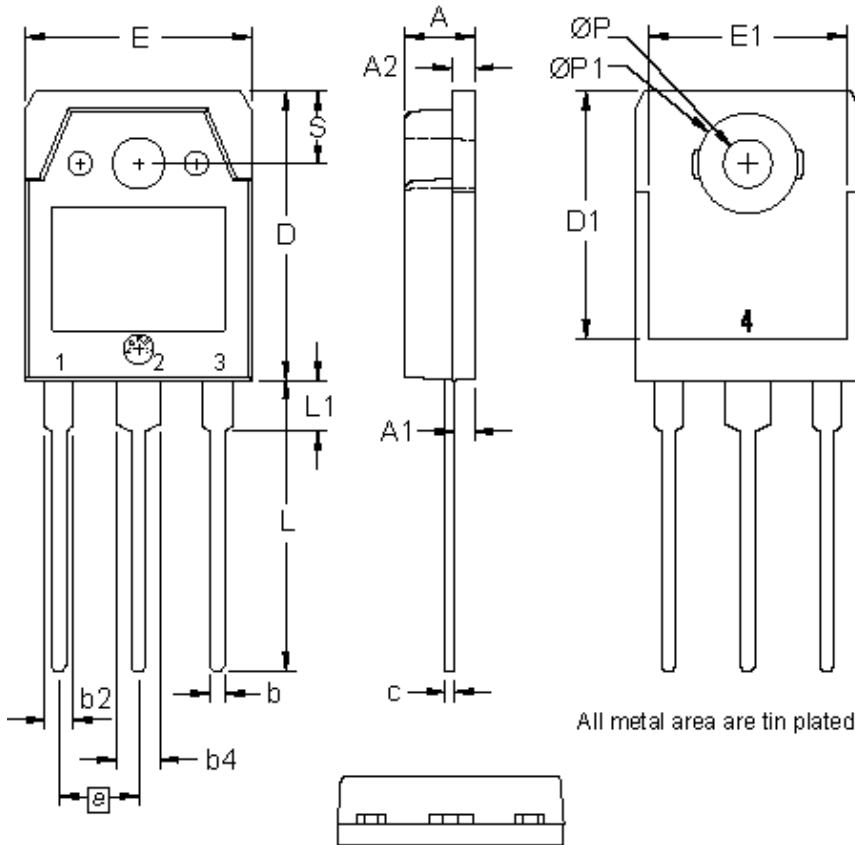
Equivalent Circuits for Simulation
** on die level*
 $T_{VJ} = 175^{\circ}\text{C}$

Fast Diode

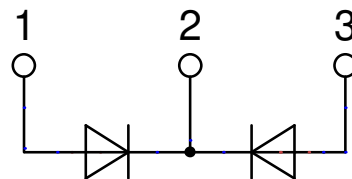
$V_{0\ max}$	threshold voltage	0.76	V
$R_{0\ max}$	slope resistance *	8.1	mΩ



Outlines TO-3P



Dim.	Millimeter		Inches	
	min	max	min	max
A	4.70	4.90	0.185	0.193
A1	1.30	1.50	0.051	0.059
A2	1.45	1.65	0.057	0.065
b	0.90	1.15	0.035	0.045
b2	1.90	2.20	0.075	0.087
b4	2.90	3.20	0.114	0.126
c	0.55	0.80	0.022	0.031
D	19.80	20.10	0.780	0.791
D1	16.90	17.20	0.665	0.677
E	15.50	15.80	0.610	0.622
E1	13.50	13.70	0.531	0.539
e	5.45 BSC		0.215 BSC	
L	19.80	20.20	0.780	0.795
L1	3.40	3.60	0.134	0.142
Ø P	3.20	3.40	0.126	0.134
ØP1	6.90	7.10	0.272	0.280
S	4.90	5.10	0.193	0.201



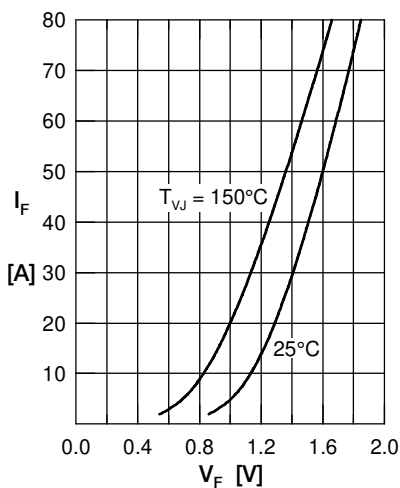
Fast Diode


Fig. 1 Forward current I_F versus V_F

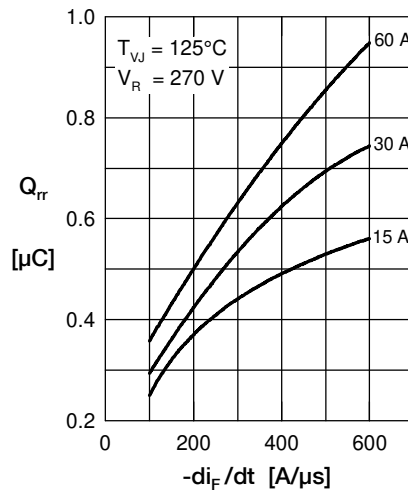


Fig. 2 Typ. reverse recov. charge Q_{rr} versus $-di_F/dt$

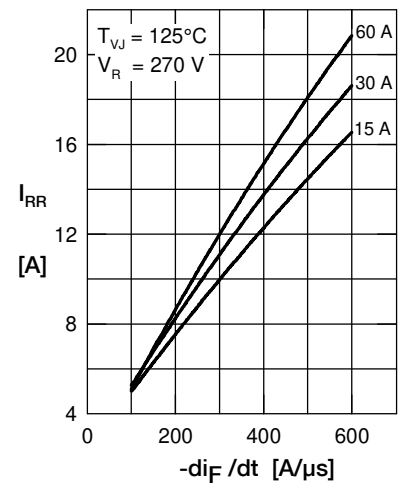


Fig. 3 Typ. reverse recovery current I_{RR} versus $-di_F/dt$

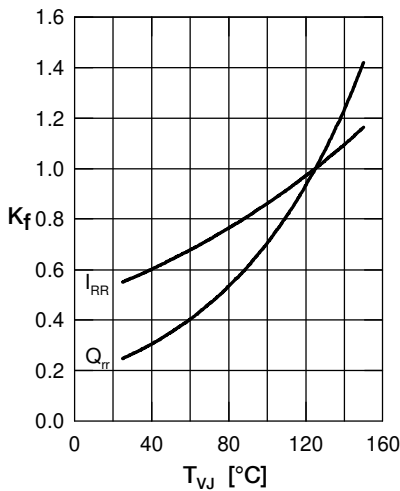


Fig. 4 Typ. dynamic parameters Q_{rr} , I_{RR} versus T_{VJ}

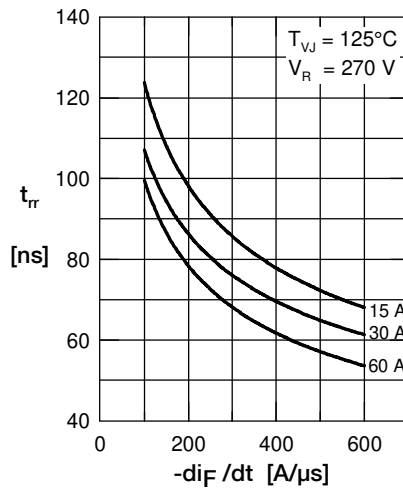


Fig. 5 Typ. reverse recov. time t_{rr} versus $-di_F/dt$

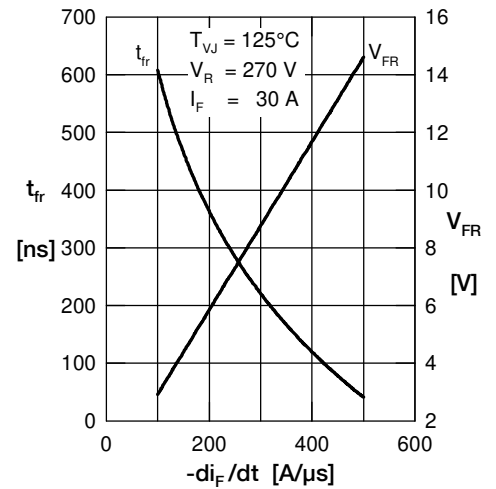


Fig. 6 Typ. forward recov. voltage V_{FR} & time t_{fr} versus di_F/dt

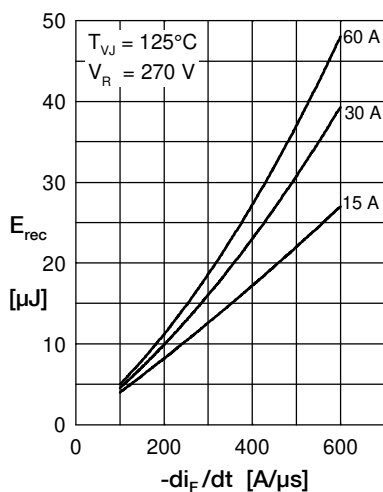


Fig. 7 Typ. recovery energy E_{rec} versus $-di_F/dt$

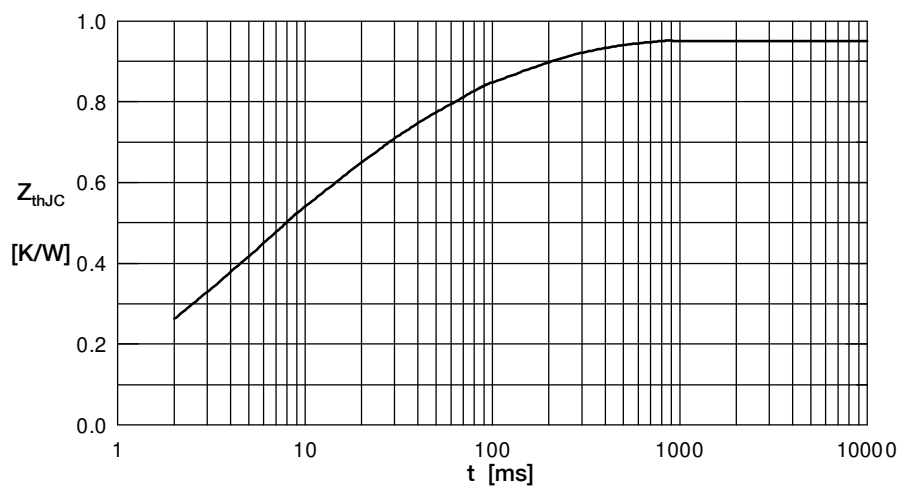


Fig. 8 Transient thermal impedance junction to case

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