HiPerFRED

V_{RRM}	=	**300** V
I_{FAV}	=	**10** A
t_{rr}	=	**35** ns

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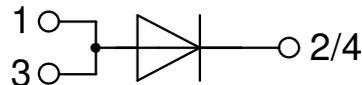Single Diode

Part number

DPG10IM300UC

Marking on Product: PAOGUI
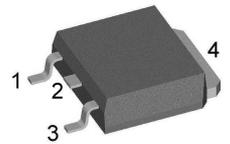
Backside: cathode

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: TO-252 (DPak)

● Industry standard outline
● RoHS compliant
● Epoxy meets UL 94V-0

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°C			300	V
V_{RRM}	max. repetitive reverse blocking voltage		T_{VJ} = 25°C			300	V
I_R	reverse current, drain current	V_R = 300 V	T_{VJ} = 25°C			1	µA
		V_R = 300 V	T_{VJ} = 150°C			0.06	mA
V_F	forward voltage drop	I_F = 10 A	T_{VJ} = 25°C			1.27	V
		I_F = 20 A				1.45	V
		I_F = 10 A	T_{VJ} = 150°C			0.98	V
		I_F = 20 A				1.17	V
I_{FAV}	average forward current	T_C = 150°C	T_{VJ} = 175°C			10	A
		rectangular d = 0.5					
V_{F0}	threshold voltage	} for power loss calculation only	T_{VJ} = 175°C			0.74	V
r_F	slope resistance					17.7	mΩ
R_{thJC}	thermal resistance junction to case					2.3	K/W
R_{thCH}	thermal resistance case to heatsink				0.5		K/W
P_{tot}	total power dissipation		T_C = 25°C			65	W
I_{FSM}	max. forward surge current	t = 10 ms; (50 Hz), sine; V_R = 0 V	T_{VJ} = 45°C			140	A
C_J	junction capacitance	V_R = 150 V f = 1 MHz	T_{VJ} = 25°C		15		pF
I_{RM}	max. reverse recovery current		T_{VJ} = 25°C		3		A
		I_F = 10 A; V_R = 200 V	T_{VJ} = 125°C		5.5		A
t_{rr}	reverse recovery time	$-di_F/dt$ = 200 A/µs	T_{VJ} = 25°C		35		ns
			T_{VJ} = 125°C		45		ns

Package	TO-252 (DPak)		Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal [1]			20	A
T_{VJ}	virtual junction temperature		-55		175	°C
T_{op}	operation temperature		-55		150	°C
T_{stg}	storage temperature		-55		150	°C
Weight				0.3		g
F_C	mounting force with clip		20		60	N

[1] I_{RMS} is typically limited by the pin-to-chip resistance (1); or by the current capability of the chip (2). In case of (1) and a product with multiple pins for one chip-potential, the current capability can be increased by connecting the pins as one contact.

Product Marking

Logo → IXYS
Part Number → XXXXXX
Date Code → yyZ → ww
Location
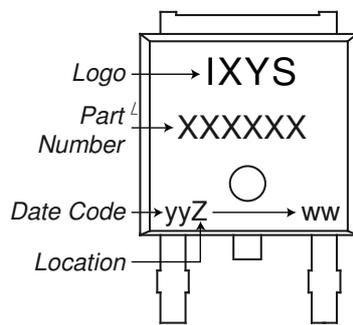
Part description

D = Diode
P = HiPerFRED
G = extreme fast
10 = Current Rating [A]
IM = Single Diode
300 = Reverse Voltage [V]
UC = TO-252AA (DPak)

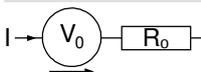| Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DPG10IM300UC-TRL	PAOGUI	Tape & Reel	2500	505682
Alternative	DPG10IM300UC-TUB	PAOGUI	Tube	70	524908

Similar Part	Package	Voltage class
DPG10I300PA	TO-220AC (2)	300

Equivalent Circuits for Simulation   *on die level $T_{VJ} = 175°C$

I → V_0 → R_0

		Fast Diode	
$V_{0\ max}$	threshold voltage	0.74	V
$R_{0\ max}$	slope resistance *	14.5	mΩ

Outlines   TO-252 (DPak)
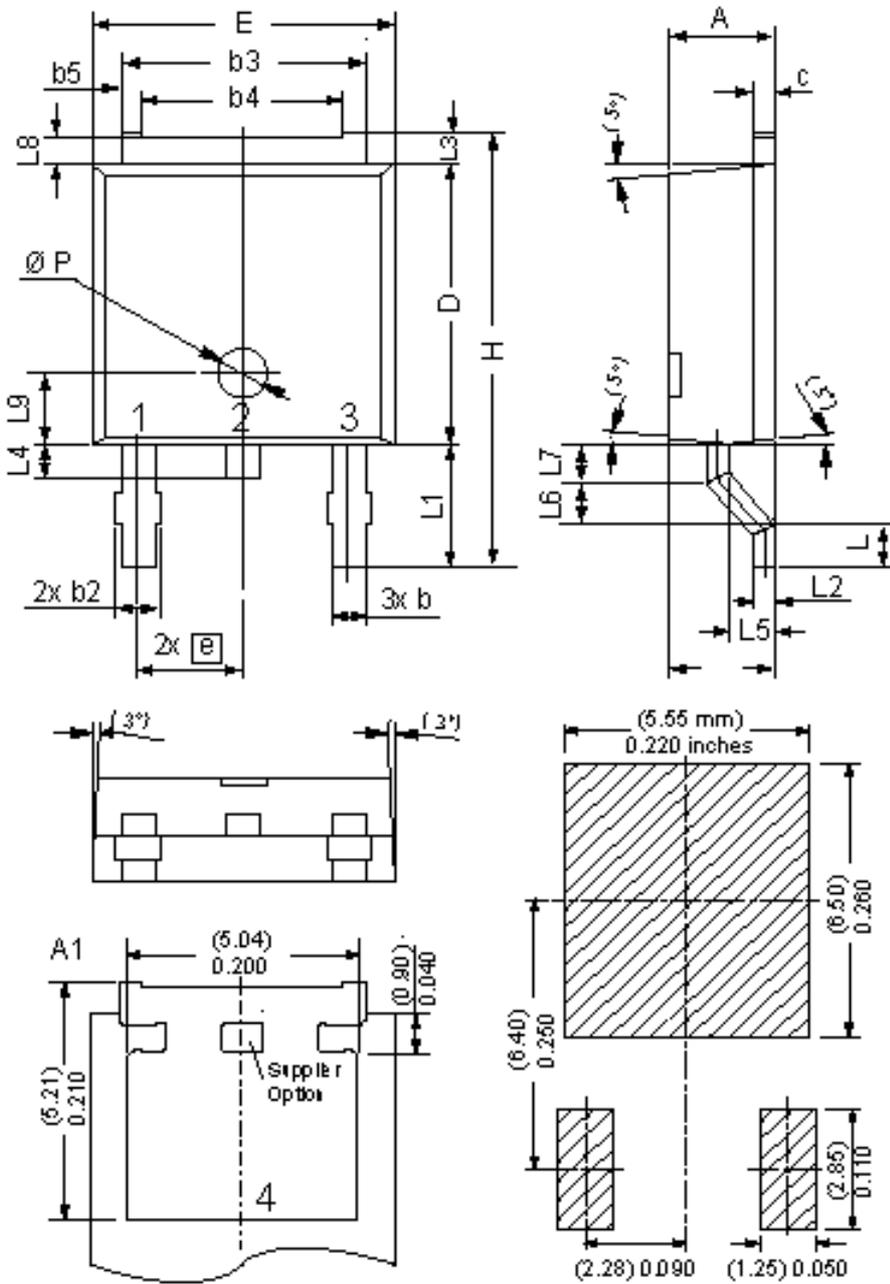
Dim.	Millimeters		Inches	
	min	max	min	max
A	2.20	2.40	0.087	0.094
A1	2.10	2.50	0.083	0.098
b	0.66	0.86	0.026	0.034
b2	-	0.96	-	0.038
b3	5.04	5.64	0.198	0.222
b4	4.34 BSC		0.171 BSC	
b5	0.50 BSC		0.020 BSC	
c	0.40	0.86	0.016	0.034
D	5.90	6.30	0.232	0.248
E	6.40	6.80	0.252	0.268
e	2.10	2.50	0.083	0.098
H	9.20	10.10	0.362	0.398
L	0.55	1.28	0.022	0.050
L1	2.50	2.90	0.098	0.114
L2	0.40	0.60	0.016	0.024
L3	0.50	0.90	0.020	0.035
L4	0.60	1.00	0.024	0.039
L5	0.82	1.22	0.032	0.048
L6	0.79	0.99	0.031	0.039
L7	0.81	1.01	0.032	0.040
L8	0.40	0.80	0.016	0.031
L9	1.50 BSC		0.059 BSC	
Ø P	1.00 BSC		0.039 BSC	

Recommended min. foot print

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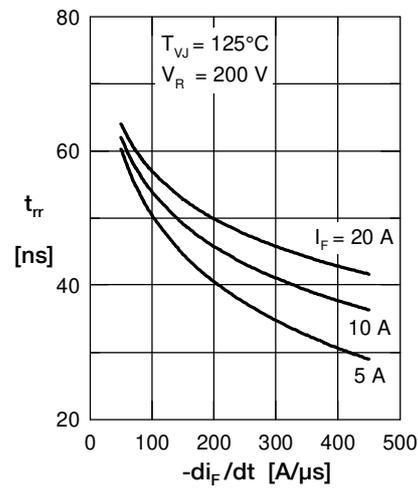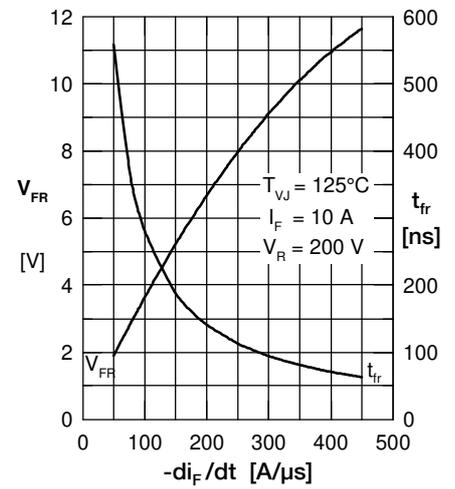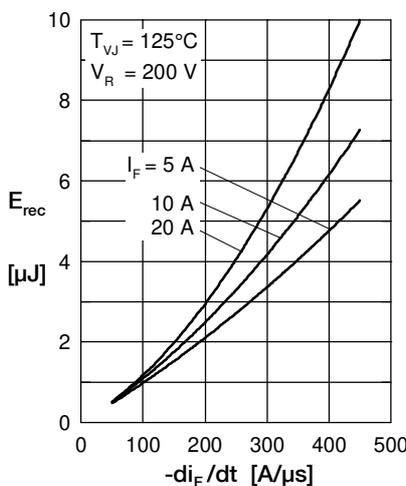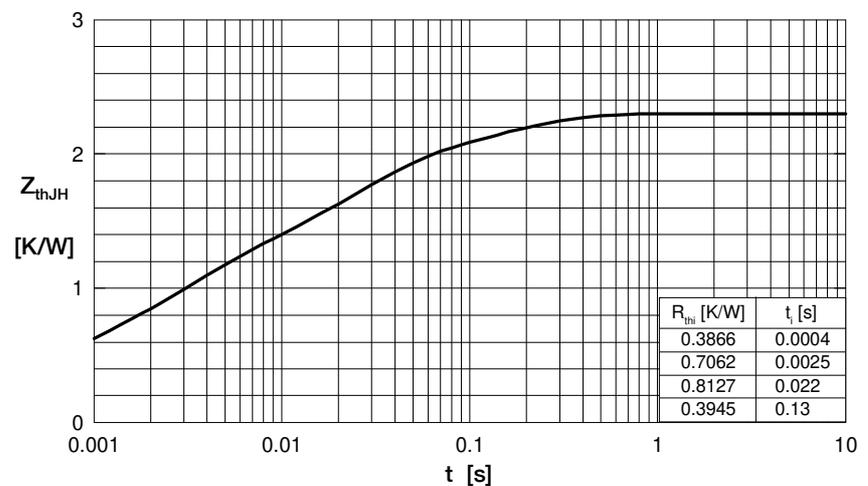© 2020 IXYS all rights reserved
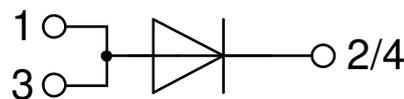
Fast Diode
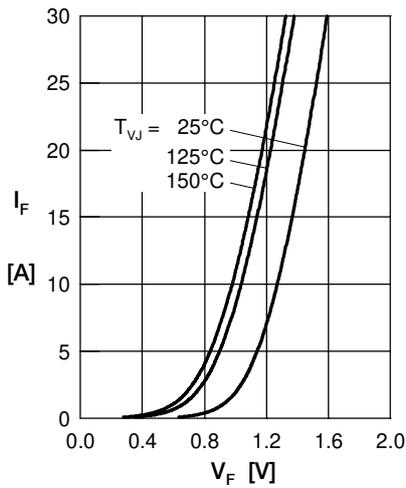
Fig. 1 Forward current
I_F versus V_F
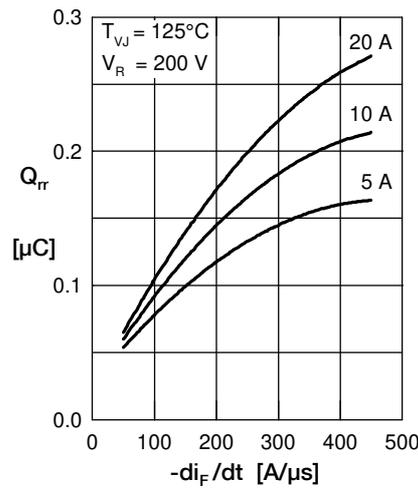
Fig. 2 Typ. reverse recov. charge
Q_{rr} versus -di_F/dt
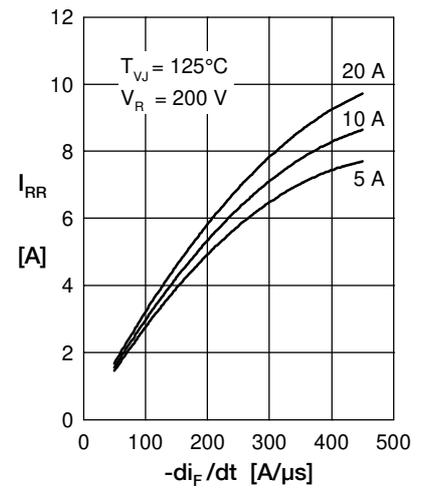
Fig. 3 Typ. reverse recov. current
I_{RR} versus -di_F/dt
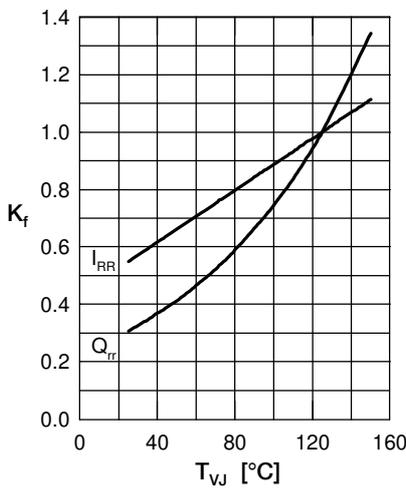
Fig. 4 Typ. dynamic parameters
Q_{rr}, I_{RR} versus T_{VJ}

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

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

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

R_{thi} [K/W]	t_i [s]
0.3866	0.0004
0.7062	0.0025
0.8127	0.022
0.3945	0.13

Fig. 8 Transient thermal resistance junction to case

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