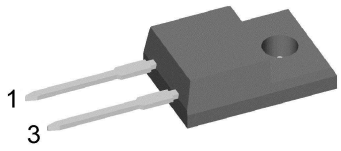
HiPerFRED

V_{RRM}	=	600 V
I_{FAV}	=	15 A
t_{rr}	=	25 ns

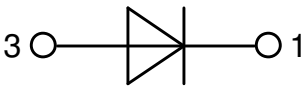
High Performance Fast Recovery Diode
Low Loss and Soft Recovery
Single Diode

Part number

DPG30I600PM



Backside: isolated



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)

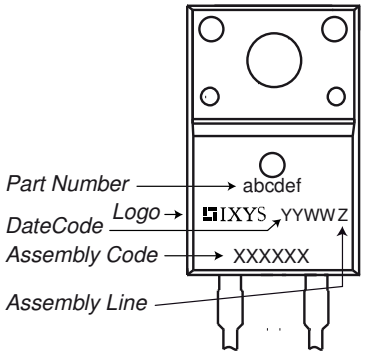
Package: TO-220FP

- Isolation Voltage: 2500 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0

Fast Diode				Ratings			
Symbol	**Definition**	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
V_{RSM}	*max. non-repetitive reverse blocking voltage*		T_{VJ} = 25°C			600	V
V_{RRM}	*max. repetitive reverse blocking voltage*		T_{VJ} = 25°C			600	V
I_R	*reverse current, drain current*	V_R = 600 V	T_{VJ} = 25°C			250	µA
		V_R = 600 V	T_{VJ} = 150°C			2	mA
V_F	*forward voltage drop*	I_F = 30 A	T_{VJ} = 25°C			2.52	V
		I_F = 60 A				3.22	V
		I_F = 30 A	T_{VJ} = 150°C			1.63	V
		I_F = 60 A				2.27	V
I_{FAV}	*average forward current*	T_C = 95°C	T_{VJ} = 175°C			15	A
		rectangular d = 0.5					
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 175°C			0.84	V
r_F	*slope resistance* }					20	mΩ
R_{thJC}	*thermal resistance junction to case*					3.5	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.50		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			165	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine; V_R = 0 V	T_{VJ} = 45°C			250	A
C_J	*junction capacitance*	V_R = 400 V f = 1 MHz	T_{VJ} = 25°C		26		pF
I_{RM}	*max. reverse recovery current*		T_{VJ} = 25°C		2.5		A
		I_F = 30 A; V_R = 300 V	T_{VJ} = 100°C		4.5		A
t_{rr}	*reverse recovery time*	$-di_F/dt$ = 200 A/µs	T_{VJ} = 25°C		25		ns
			T_{VJ} = 100°C		70		ns

Package TO-220FP					Ratings			
Symbol	Definition	Conditions			min.	typ.	max.	Unit
I_{RMS}	*RMS current*	per terminal					35	A
T_{VJ}	*virtual junction temperature*				-55		175	°C
T_{op}	*operation temperature*				-55		150	°C
T_{stg}	*storage temperature*				-55		150	°C
Weight						2		g
M_D	*mounting torque*				0.4		0.6	Nm
F_C	*mounting force with clip*				20		60	N
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*		*terminal to terminal*	3.2	2.7			mm
$d_{Spb/Apb}$			*terminal to backside*	2.5	2.5			mm
V_{ISOL}	*isolation voltage*	t = 1 second	50/60 Hz, RMS; I_{ISOL} ≤ 1 mA		2500			V
		t = 1 minute			2100			V

Product Marking

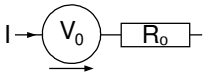


Part description

D = Diode
P = HiPerFRED
G = extreme fast
30 = Current Rating [A]
I = Single Diode
600 = Reverse Voltage [V]
PM = TO-220ACFP (2)

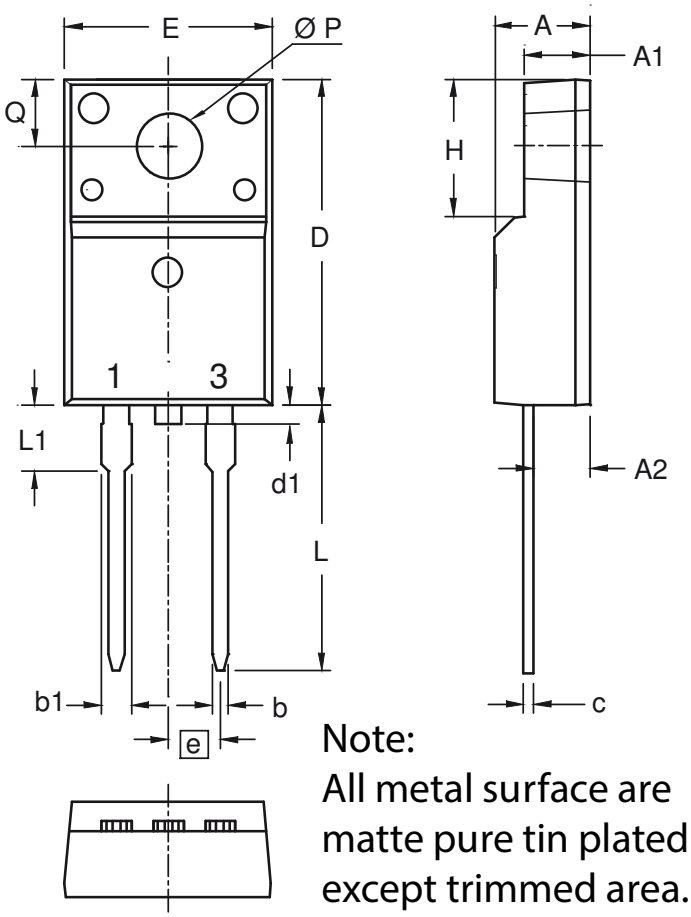
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DPG30I600PM	DPG30I600PM	Tube	50	521763

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



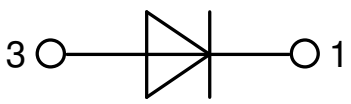
		Fast Diode	
$V_{0\,max}$	*threshold voltage*	0.84	V
$R_{0\,max}$	*slope resistance **	17	mΩ

Outlines TO-220FP



Note:
All metal surface are matte pure tin plated except trimmed area.

Dim.	Millimeters		Inches	
	min	max	min	max
A	4.50	4.90	0.177	0.193
A1	2.34	2.74	0.092	0.108
A2	2.56	2.96	0.101	0.117
b	0.70	0.90	0.028	0.035
b1	1.27	1.47	0.050	0.058
c	0.45	0.60	0.018	0.024
D	15.67	16.07	0.617	0.633
d1	0	1.10	0	0.043
E	9.96	10.36	0.392	0.408
e	2.54 BSC		0.100 BSC	
H	6.48	6.88	0.255	0.271
L	12.68	13.28	0.499	0.523
L1	3.03	3.43	0.119	0.135
Ø P	3.08	3.28	0.121	0.129
Q	3.20	3.40	0.126	0.134



Fast Diode

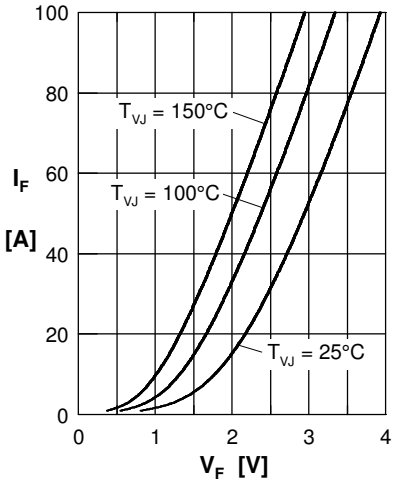


Fig. 1 Forward current I_F versus V_F

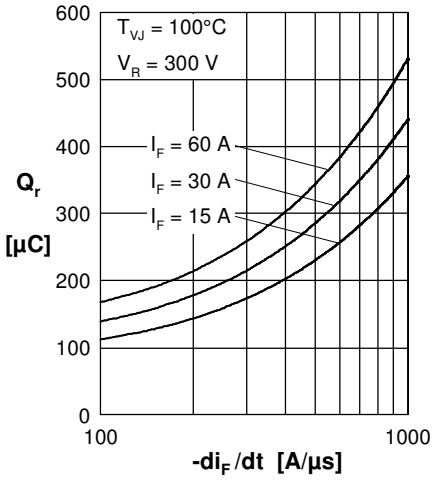


Fig. 2 Typ. reverse recovery charge Q_r versus $-di_F/dt$

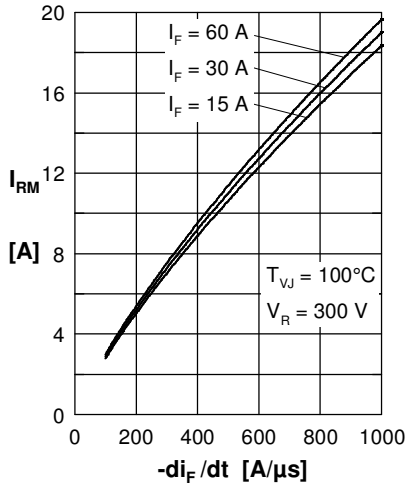


Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$

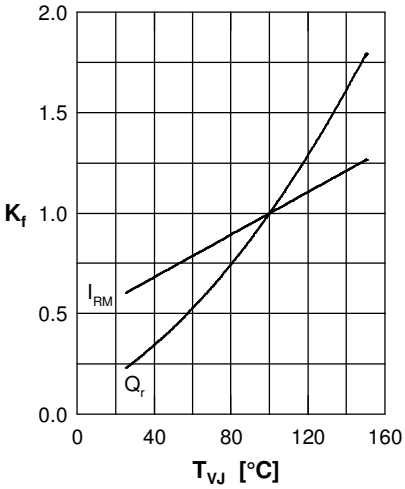


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

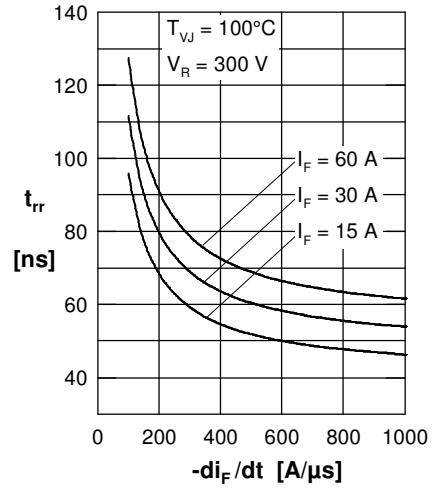


Fig. 5 Typ. recovery time t_{rr} versus $-di_F/dt$

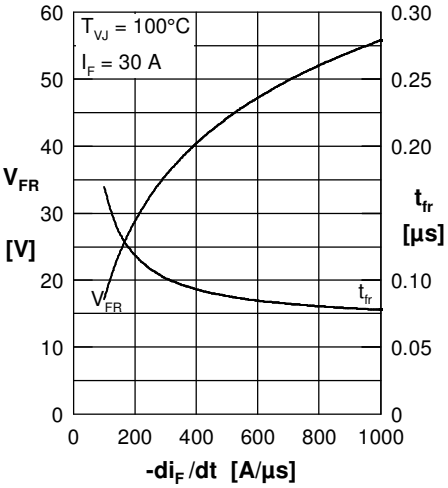


Fig. 6 Typ. peak forward voltage V_{FR} and t_{fr} versus di_F/dt

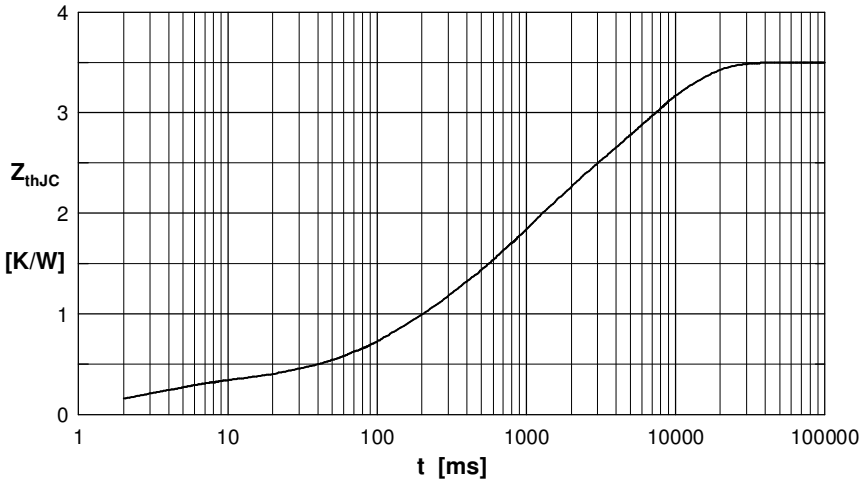


Fig. 7 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.30	0.003
2	0.50	0.130
3	1.15	0.800
4	1.55	6.500