

HiPerFRED

$$V_{RRM} = 2 \times 600 \text{ V}$$

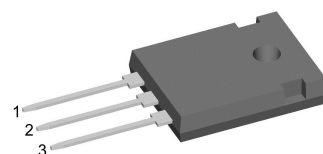
$$I_{FAV} = 30 \text{ A}$$

$$t_{rr} = 35 \text{ ns}$$

High Performance Fast Recovery Diode
 Low Loss and Soft Recovery
 Phase leg

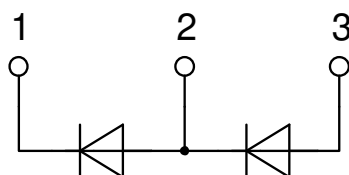
Part number

DPF30P600HR



Backside: isolated

 E72873



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: ISO247

- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Soldering pins for PCB mounting
- Backside: DCB ceramic
- Reduced weight
- Advanced power cycling

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				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			500	μA	
		V _R = 600 V	T _{VJ} = 150°C			1	mA	
V _F	forward voltage drop	I _F = 30 A	T _{VJ} = 25°C			1.62	V	
		I _F = 60 A				1.95	V	
		I _F = 30 A	T _{VJ} = 150°C			1.27	V	
		I _F = 60 A				1.58	V	
I _{FAV}	average forward current	T _C = 130°C rectangular d = 0.5	T _{VJ} = 175°C			30	A	
V _{F0}	threshold voltage	} for power loss calculation only		T _{VJ} = 175°C		1.00	V	
r _F	slope resistance					10	mΩ	
R _{thJC}	thermal resistance junction to case					0.9	K/W	
R _{thCH}	thermal resistance case to heatsink				0.3		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		200	A	
C _J	junction capacitance	V _R = 400 V f = 1 MHz		T _{VJ} = 25°C	26		pF	
I _{RM}	max. reverse recovery current	} I _F = 30 A; V _R = 300 V -di _F /dt = 600 A/μs		T _{VJ} = 25 °C	17		A	
				T _{VJ} = 100 °C	29		A	
t _{rr}	reverse recovery time			T _{VJ} = 25 °C	35		ns	
				T _{VJ} = 100 °C	90		ns	

Package ISO247				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal				70	A
T_{VJ}	virtual junction temperature			-55		175	°C
T_{op}	operation temperature			-55		150	°C
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
$d_{Spp/Apb}$	creepage distance on surface striking distance through air	terminal to terminal		2.7			mm
$d_{Spb/Apb}$		terminal to backside		4.1			mm
V_{ISOL}	isolation voltage	t = 1 second	50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA	3600			V
		t = 1 minute		3000			V

Product Marking



Part description

D = Diode
 P = HiPerFRED
 F = ultra fast
 30 = Current Rating [A]
 P = Phase leg
 600 = Reverse Voltage [V]
 HR = ISO247 (3)

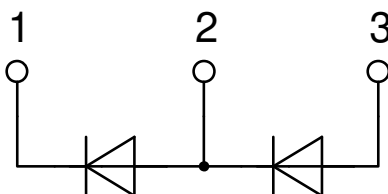
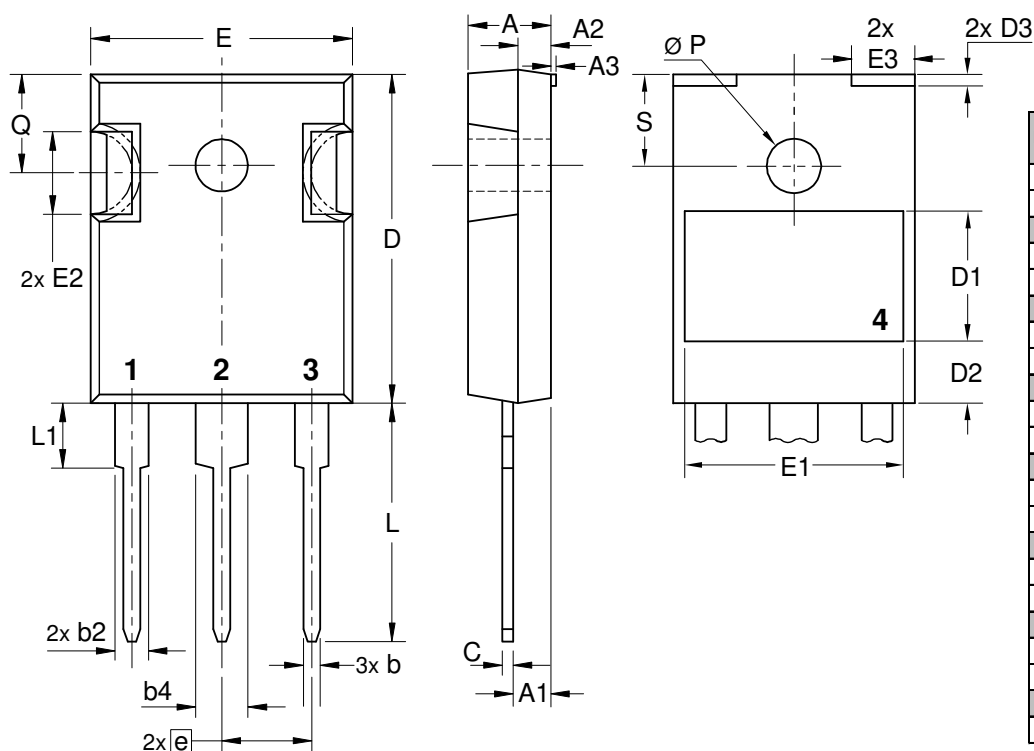
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DPF30P600HR	DPF30P600HR	Tube	30	517860

Equivalent Circuits for Simulation

* on die level

$T_{VJ} = 175^{\circ}\text{C}$

		Fast Diode	
$V_{0\max}$	threshold voltage	1	V
$R_{0\max}$	slope resistance *	6.2	mΩ

Outlines ISO247


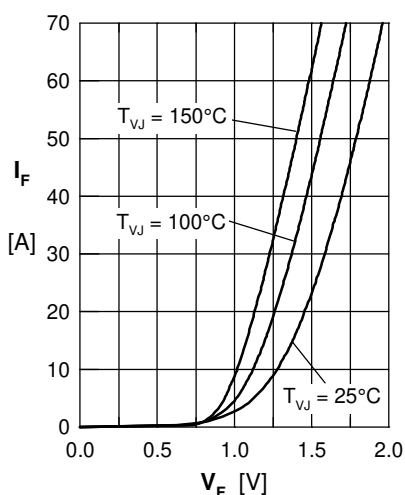
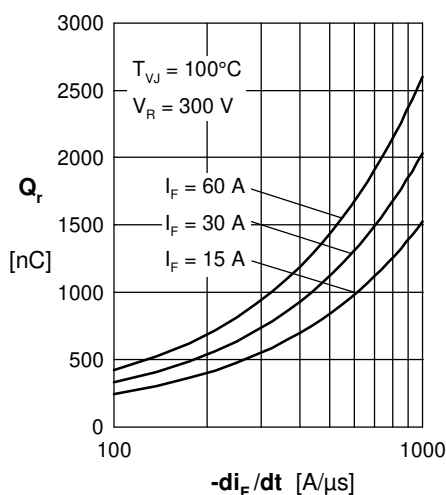
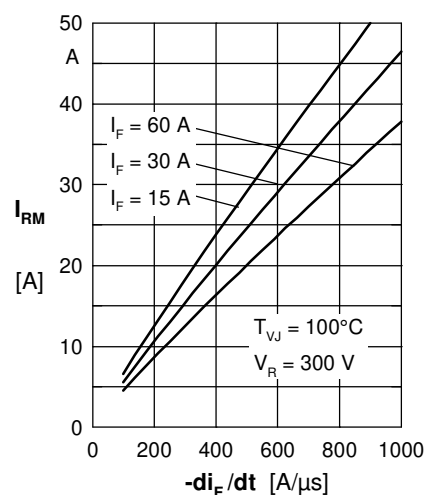
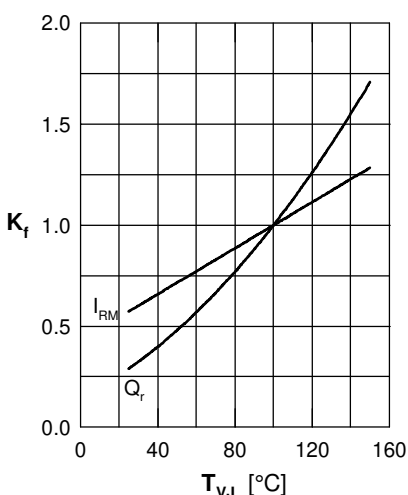
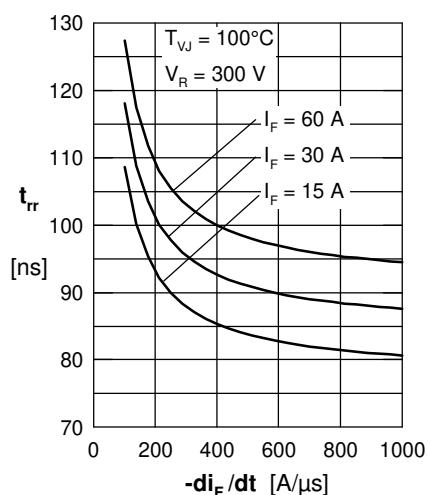
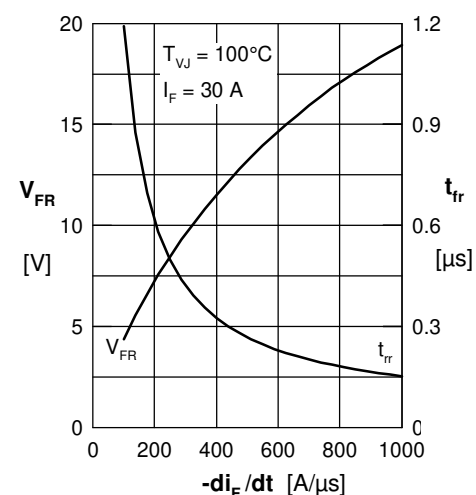
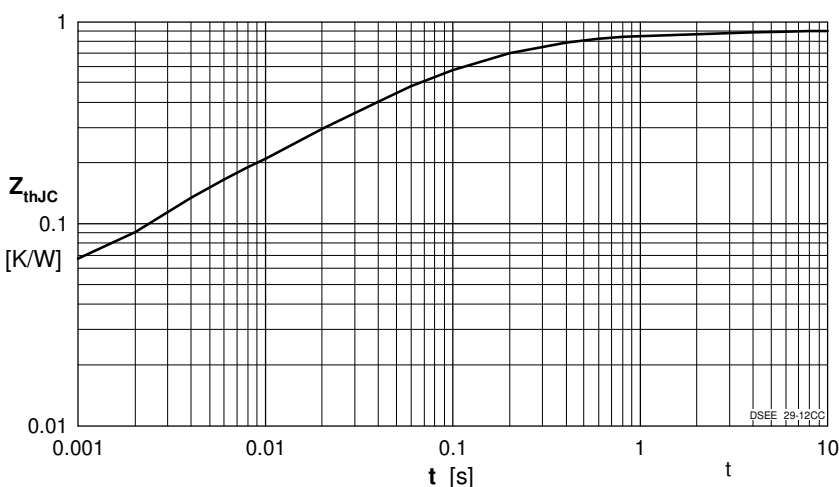
Fast Diode

 Fig. 1 Forward current I_F vs. 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 typ. forward recovery time t_{fr} versus di_F/dt


Fig. 7 Transient thermal resistance junction to case

 Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.038	0.00024
2	0.07	0.0036
3	0.245	0.0235
4	0.198	0.1421
5	0.35	0.25