advanced

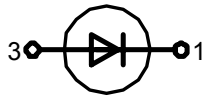
FRED

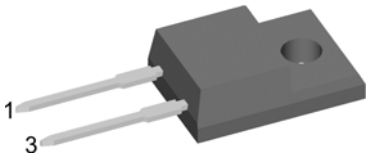
Fast Recovery Diode
Low Loss and Soft Recovery
Single Diode

V_{RRM} = 600 V
I_{FAV} = 10 A
t_{rr} = 35 ns

Part number *(Marking on product)*

DFE 10 I 600PM





Backside: isolated

Features / Advantages:

- Planar passivated chips
- Llow leakage current
- Very short recovery time
- Improved thermal behaviour
- 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-220ACFP
- Industry standard outline
- Plastic overmolded tab for electrical isolation
- Epoxy meets UL 94V-0
- RoHS compliant

Symbol	Definition	Conditions		Ratings min.	typ.	max.	Unit
V_{RRM}	*max. repetitive reverse voltage*		T_{VJ} = 25 °C			600	V
I_R	*reverse current*	V_R = 600 V	T_{VJ} = 25 °C			20	µA
		V_R = 600 V	T_{VJ} = 125 °C			1.5	mA
V_F	*forward voltage*	I_F = 10 A	T_{VJ} = 25 °C			1.50	V
		I_F = 20 A				1.80	V
		I_F = 10 A	T_{VJ} = 150 °C			1.30	V
		I_F = 20 A				1.70	V
I_{FAV}	*average forward current*	rectangular, d = 0.5	T_C = 100 °C			10	A
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 150 °C			0.98	V
r_F	*slope resistance* }					28.7	mΩ
R_{thJC}	*thermal resistance junction to case*					4.20	K/W
T_{VJ}	*virtual junction temperature*			-55		150	°C
P_{tot}	*total power dissipation*		T_C = 25 °C			30	W
I_{FSM}	*max. forward surge current*	t_p = 10 ms (50 Hz), sine	T_{VJ} = 45 °C			100	A
I_{RM}	*max. reverse recovery current*	I_F = 10 A;	T_{VJ} = 25 °C				A
			T_{VJ} = 125 °C		4		A
t_{rr}	*reverse recovery time*	$-di_F/dt$ = 100 A/µs	T_{VJ} = 25 °C		35		ns
		V_R = 300 V	T_{VJ} = 125 °C		120		ns
C_J	*junction capacitance*	V_R = 300 V; f = 1 MHz	T_{VJ} = 25 °C		tbd		pF
E_{AS}	*non-repetitive avalanche energy*	I_{AS} = tbd A; L = 100 µH	T_{VJ} = 25 °C			tbd	mJ
I_{AR}	*repetitive avalanche current*	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz				tbd	A

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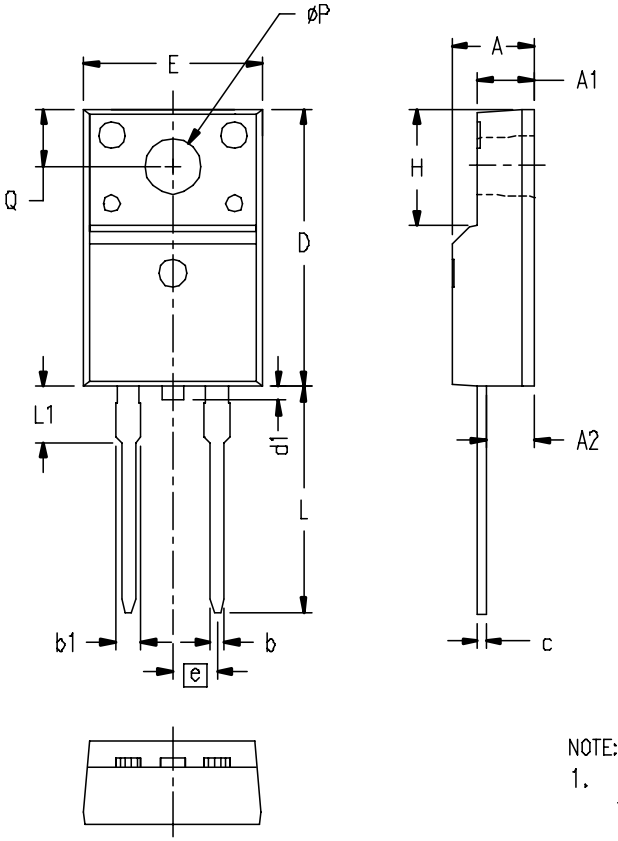
Symbol	Definition	Conditions	Ratings min.	typ.	max.	Unit
I_{RMS}	*RMS current*	per pin*			35	A
R_{thCH}	*thermal resistance case to heatsink*			0.50		K/W
M_D	*mounting torque*		0.4		0.6	Nm
F_C	*mounting force with clip*		20		60	N
T_{stg}	*storage temperature*		-55		150	°C
Weight				2		g

* Irms 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.

Outlines TO-220ACFP



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.177	.193	4.50	4.90
A1	.092	.108	2.34	2.74
A2	.101	.117	2.56	2.96
b	.028	.035	0.70	0.90
b1	.050	.058	1.27	1.47
c	.018	.024	0.45	0.60
D	.617	.633	15.67	16.07
d1	0	.043	0	1.10
E	.392	.408	9.96	10.36
e	.100 BSC		2.54 BSC	
H	.255	.271	6.48	6.88
L	.499	.523	12.68	13.28
L1	.119	.135	3.03	3.43
øP	.121	.129	3.08	3.28
Q	.126	.134	3.20	3.40

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