

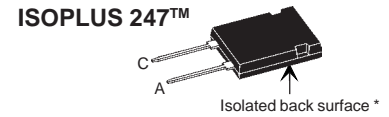
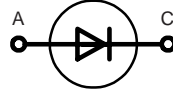
# HiPerDynFRED™ Epitaxial Diode

## with soft recovery

### (Electrically Isolated Back Surface)

$I_{FAV} = 30 \text{ A}$   
 $V_{RRM} = 600 \text{ V}$   
 $t_{rr} = 20 \text{ ns}$

$V_{RSM}$ V	$V_{RRM}$ V	Type
600	600	DSEP 30-06CR



A = Anode, C = Cathode

\* Patent pending

Symbol	Conditions	Maximum Ratings	
$I_{FRMS}$		70	A
$I_{FAVM}$	$T_C = 135^\circ\text{C}$ ; rectangular, $d = 0.5$	30	A
$I_{FRM}$	$t_p < 10 \mu\text{s}$ ; rep. rating, pulse width limited by $T_{VJM}$	tbd	A
$I_{FSM}$	$T_{VJ} = 45^\circ\text{C}$ ; $t_p = 10 \text{ ms}$ (50 Hz), sine	300	A
$E_{AS}$	$T_{VJ} = 25^\circ\text{C}$ ; non-repetitive $I_{AS} = 3 \text{ A}$ ; $L = 180 \mu\text{H}$	1.2	mJ
$I_{AR}$	$V_A = 1.5 \cdot V_R$ typ.; $f = 10 \text{ kHz}$ ; repetitive	0.3	A
$T_{VJ}$		-55...+175	$^\circ\text{C}$
$T_{VJM}$		175	$^\circ\text{C}$
$T_{stg}$		-55...+150	$^\circ\text{C}$
$P_{tot}$	$T_C = 25^\circ\text{C}$	250	W
$V_{ISOL}$	50/60 Hz RMS; $I_{ISOL} \leq 1 \text{ mA}$	2500	V~
$F_C$	mounting force with clip	20...120	N
Weight	typical	6	g

### Features

- Silicon chip on Direct-Copper-Bond substrates
- High power dissipation
- Isolated mounting surface
- 2500 V electrical isolation
- Low cathode to tab capacitance (< 25 pF)
- International standard package
- Planar passivated chips
- Very short recovery time
- Extremely low switching losses
- Low  $I_{RM}$ -values
- Soft recovery behaviour
- Epoxy meets UL 94V-0
- Isolated and UL registered E153432

### Applications

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode in converters and motor control circuits and PFC circuits
- Rectifiers in switch mode power supplies (SMPS)
- Inductive heating
- Uninterruptible power supplies (UPS)
- Ultrasonic cleaners and welders

### Advantages

- 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

Symbol	Conditions	Characteristic Values	
		typ.	max.
$I_R$ ①	$T_{VJ} = 25^\circ\text{C}$ $V_R = V_{RRM}$		250 $\mu\text{A}$
	$T_{VJ} = 150^\circ\text{C}$ $V_R = V_{RRM}$		1 mA
$V_F$ ②	$I_F = 30 \text{ A}$ ; $T_{VJ} = 150^\circ\text{C}$ $T_{VJ} = 25^\circ\text{C}$		1.79 V
			2.46 V
$R_{thJC}$			0.6 K/W
$R_{thCH}$	with heatsink compound	0.25	K/W
$t_{rr}$	$I_F = 1 \text{ A}$ ; $-di/dt = 200 \text{ A}/\mu\text{s}$ ; $V_R = 30 \text{ V}$ ; $T_{VJ} = 25^\circ\text{C}$	20	ns
$I_{RM}$	$V_R = 100 \text{ V}$ ; $I_F = 50 \text{ A}$ ; $-di_F/dt = 100 \text{ A}/\mu\text{s}$ $T_{VJ} = 100^\circ\text{C}$	4.5	7.0 A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %  
 ② Pulse Width = 300  $\mu\text{s}$ , Duty Cycle < 2.0 %

Data according to IEC 60747 and per diode unless otherwise specified

Dimensions see Outlines.pdf

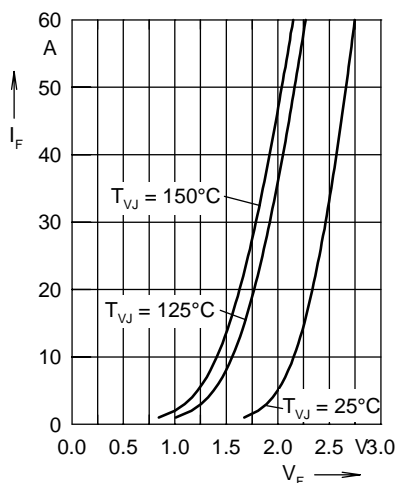


Fig. 1 Forward current  $I_F$  versus  $V_F$

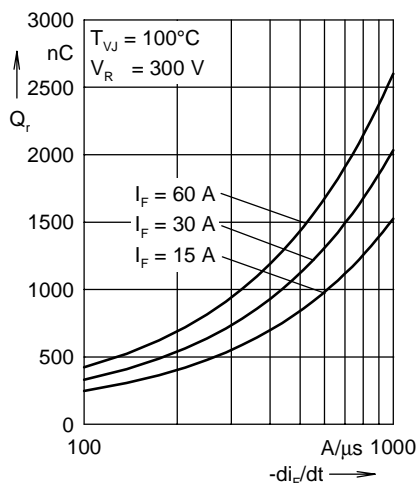


Fig. 2 Reverse recovery charge  $Q_r$  versus  $-di_F/dt$

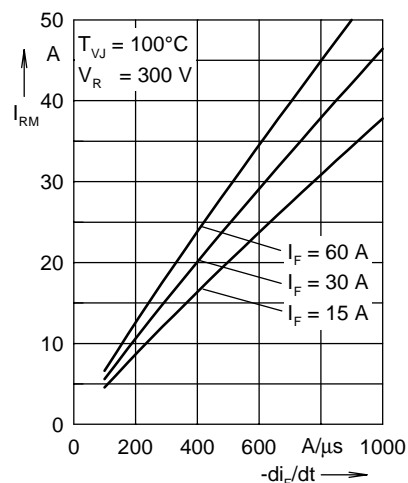


Fig. 3 Peak reverse current  $I_{RM}$  versus  $-di_F/dt$

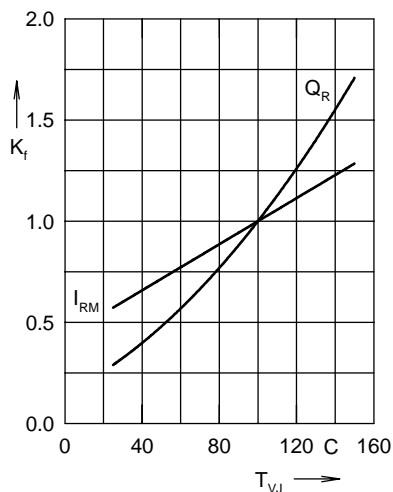


Fig. 4 Dynamic parameters  $Q_r$ ,  $I_{RM}$  versus  $T_{VJ}$

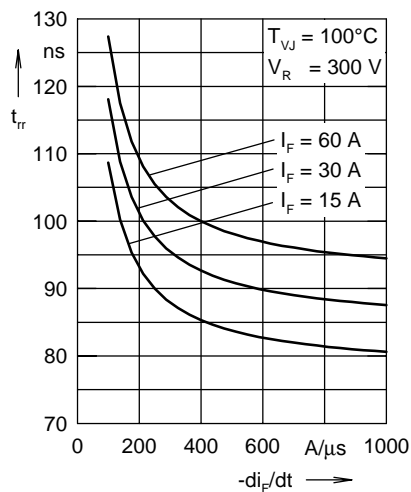


Fig. 5 Recovery time  $t_{rr}$  versus  $-di_F/dt$

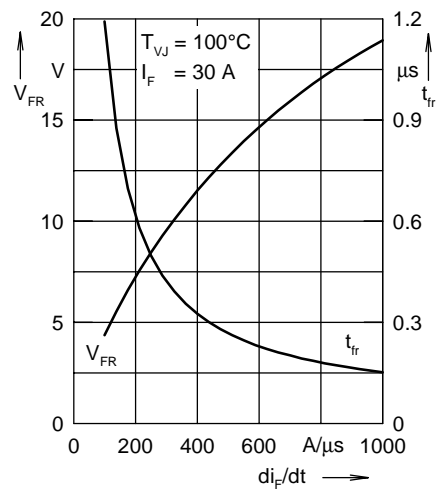


Fig. 6 Peak forward voltage  $V_{FR}$  and  $t_{fr}$  versus  $di_F/dt$

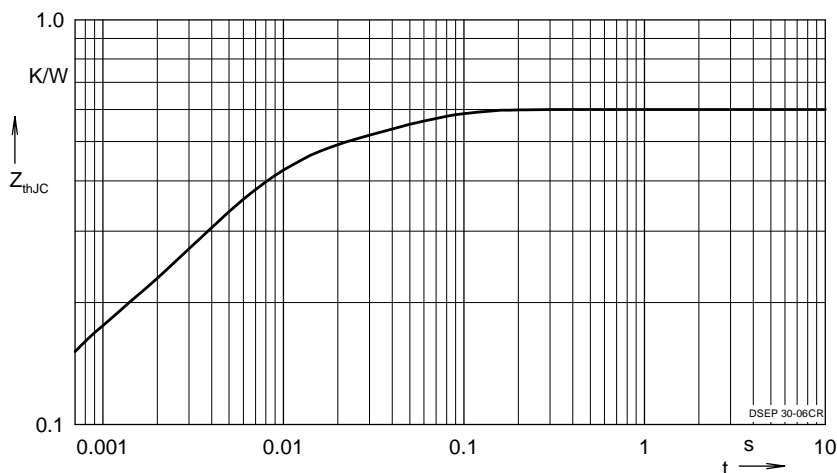


Fig. 7 Transient thermal resistance junction to case

Constants for  $Z_{thJC}$  calculation:

i	$R_{thi}$ (K/W)	$t_i$ (s)
1	0.31	0.005
2	0.1193	0.0003
3	0.1707	0.04



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