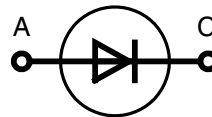


# HiPerFRED™ Epitaxial Diode

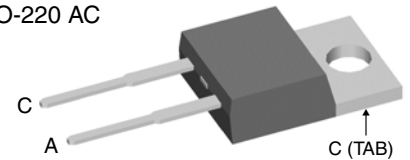
## with soft recovery

$I_{FAV} = 15\text{ A}$   
 $V_{RRM} = 1200\text{ V}$   
 $t_{rr} = 35\text{ ns}$

$V_{RSM}$	$V_{RRM}$	Type
V	V	
1200	1200	DSEP 12-12B



TO-220 AC



A = Anode, C = Cathode, TAB = Cathode

Symbol	Conditions	Maximum Ratings	
$I_{FRMS}$		35	A
$I_{FAVM}$	$T_C = 120^\circ\text{C}$ ; rectangular, $d = 0.5$	15	A
$I_{FSM}$	$T_{VJ} = 45^\circ\text{C}$ ; $t_p = 10\text{ ms}$ (50 Hz), sine	90	A
$E_{AS}$	$T_{VJ} = 25^\circ\text{C}$ ; non-repetitive $I_{AS} = 9\text{ A}$ ; $L = 180\text{ }\mu\text{H}$	8.7	mJ
$I_{AR}$	$V_A = 1.25 \cdot V_R$ typ.; $f = 10\text{ kHz}$ ; repetitive	0.9	A
$T_{VJ}$		-55...+175	$^\circ\text{C}$
$T_{VJM}$		175	$^\circ\text{C}$
$T_{stg}$		-55...+150	$^\circ\text{C}$
$P_{tot}$	$T_C = 25^\circ\text{C}$	95	W
$M_d$	mounting torque	0.4...0.6	Nm
Weight	typical	2	g

### Features

- 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

### Applications

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

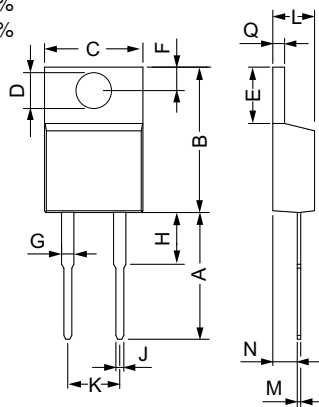
### Advantages

- 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	$V_R = V_{RRM}$ $V_R = V_{RRM}$	$T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 150^\circ\text{C}$		100 $\mu\text{A}$ 0.5 mA
$V_F$ ②	$I_F = 15\text{ A}$	$T_{VJ} = 150^\circ\text{C}$ $T_{VJ} = 25^\circ\text{C}$		2.20 V 3.25 V
$R_{thJC}$ $R_{thCH}$			0.5	1.6 K/W K/W
$t_{rr}$	$I_F = 1\text{ A}$ ; $V_R = 30\text{ V}$ ; $-di_F/dt = 100\text{ A}/\mu\text{s}$	$T_{VJ} = 25^\circ\text{C}$	35	ns
$I_{RM}$	$I_F = 25\text{ A}$ ; $V_R = 100\text{ V}$ ; $-di_F/dt = 100\text{ A}/\mu\text{s}$	$T_{VJ} = 25^\circ\text{C}$	3.7	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.



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	12.7	14.73	0.5	0.58
B	14.23	16.51	0.56	0.65
C	9.66	10.66	0.38	0.42
D	3.54	4.08	0.139	0.161
E	5.85	6.85	2.3	0.42
F	2.54	3.42	0.1	0.135
G	1.15	1.77	0.045	0.07
H	-	6.35	-	0.25
J	0.64	0.89	0.025	0.035
K	4.83	5.33	0.19	0.21
L	3.56	4.82	0.14	0.19
M	0.51	0.76	0.02	0.03
N	2.04	2.49	0.08	0.115
Q	0.64	1.39	0.025	0.055

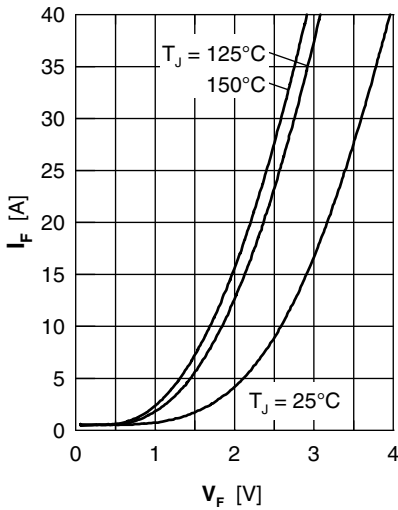


Fig.1 Forward current  $I_F$  versus  $V_F$

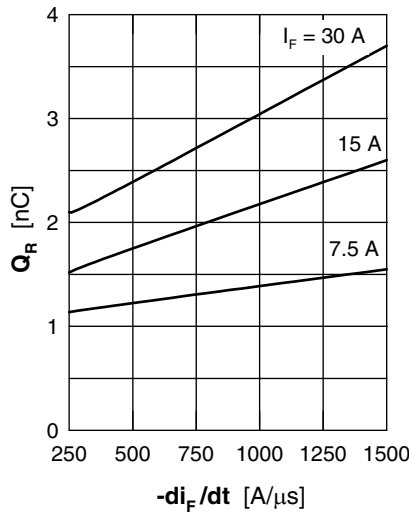


Fig.2 Typ. reverse recovery charge  $Q_{rr}$  versus  $-di_F/dt$

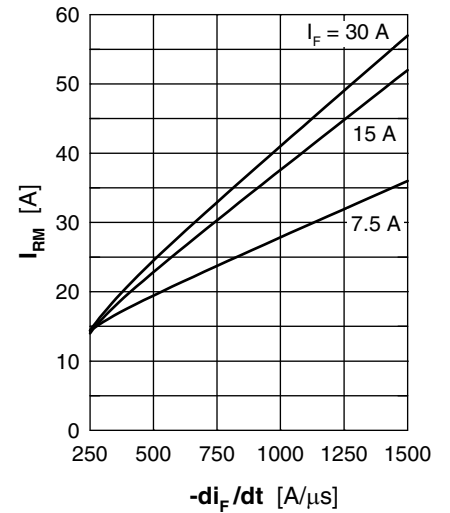


Fig.3 Typ. peak reverse current  $I_{RM}$  versus  $-di_F/dt$

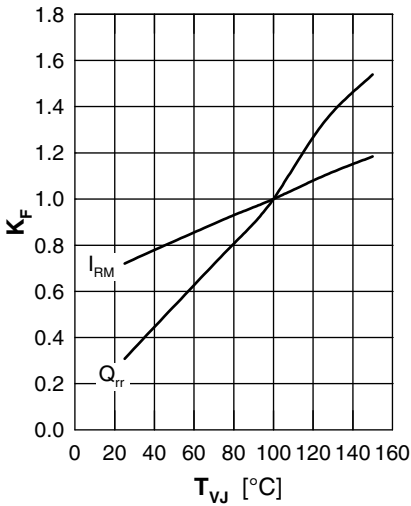


Fig.4 Dynamic parameters  $Q_{RR}$ ,  $I_{RM}$  versus  $T_{VJ}$

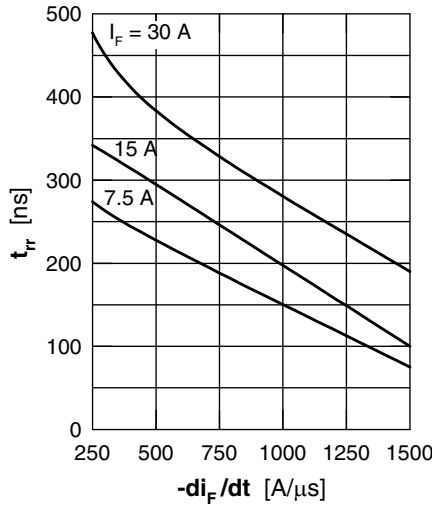


Fig.5 Typ. recovery time  $t_{rr}$  versus  $-di_F/dt$

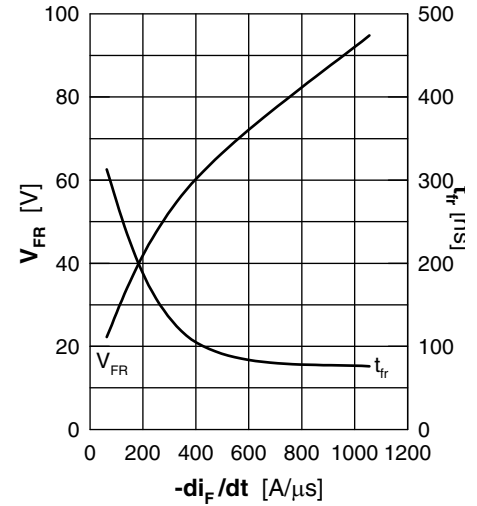


Fig.6 Typ. peak forward voltage  $V_{FR}$  and  $t_{rr}$  versus  $-di_F/dt$

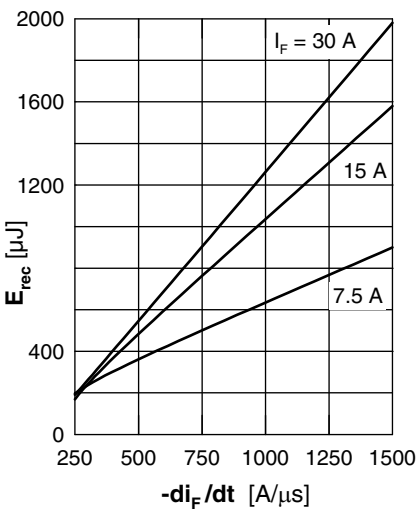


Fig.7 Typ. recovery energy  $E_{rec}$  versus  $-di_F/dt$

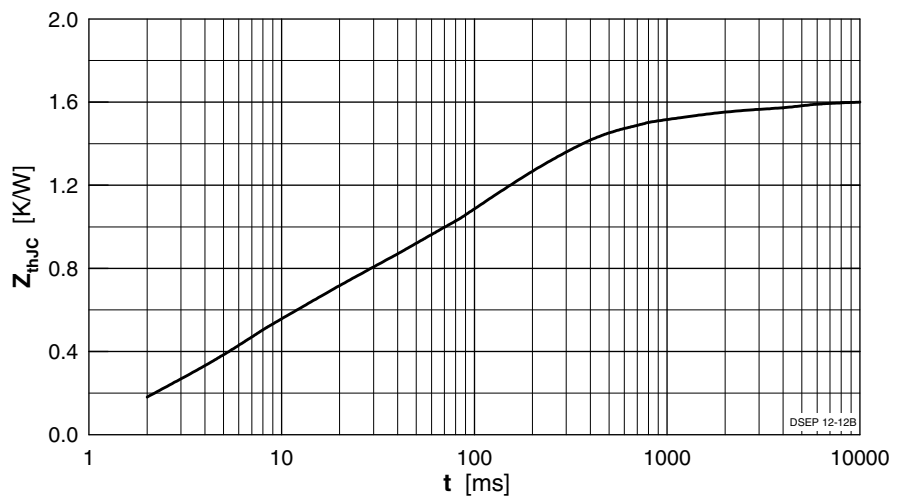


Fig.8 Transient thermal resistance junction to case