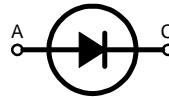
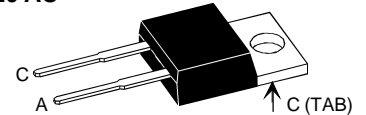


# HiPerFRED™ Epitaxial Diode

## with soft recovery

$I_{FAV} = 2x 10 A$   
 $V_{RRM} = 1200 V$   
 $t_{rr} = 40 ns$

$V_{RSM}$ V	$V_{RRM}$ V	Type
1200	1200	DSEC 16-12A


**TO-220 AC**


A = Anode, C = Cathode, TAB = Cathode

Symbol	Test Conditions	Maximum Ratings	
$I_{FRMS}$		14	A
$I_{FAVM}$	$T_C = 115^\circ C$ ; rectangular, $d = 0.5$	10	A
$I_{FSM}$	$T_{VJ} = 45^\circ C$ ; $t_p = 10 ms$ (50 Hz), sine	40	A
$E_{AS}$	$T_{VJ} = 25^\circ C$ ; non-repetitive $I_{AS} = 8 A$ ; $L = 180 \mu H$	6.9	mJ
$I_{AR}$	$V_A = 1.25 \cdot V_R$ typ.; $f = 10 kHz$ ; repetitive	0.8	A
$T_{VJ}$		-55...+175	°C
$T_{VJM}$		175	°C
$T_{stg}$		-55...+150	°C
$P_{tot}$	$T_C = 25^\circ C$	60	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

**Dimensions see outlines.pdf**

Symbol	Test Conditions	Characteristic Values	
		typ.	max.
$I_R$ ①	$T_{VJ} = 25^\circ C$ $V_R = V_{RRM}$ $T_{VJ} = 150^\circ C$ $V_R = V_{RRM}$		60 $\mu A$ 0.25 mA
$V_F$ ②	$I_F = 10 A$ ; $T_{VJ} = 150^\circ C$ $T_{VJ} = 25^\circ C$		1.96 V 2.94 V
$R_{thJC}$			2.5 K/W
$R_{thCH}$		0.5	K/W
$t_{rr}$	$I_F = 1 A$ ; $-di/dt = 50 A/\mu s$ ; $V_R = 30 V$ ; $T_{VJ} = 25^\circ C$	40	ns
$I_{RM}$	$V_R = 100 V$ ; $I_F = 12 A$ ; $-di_F/dt = 100 A/\mu s$ $T_{VJ} = 100^\circ C$		8.5 A

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

Data according to IEC 60747 and per diode unless otherwise specified

IXYS reserves the right to change limits, test conditions and dimensions.

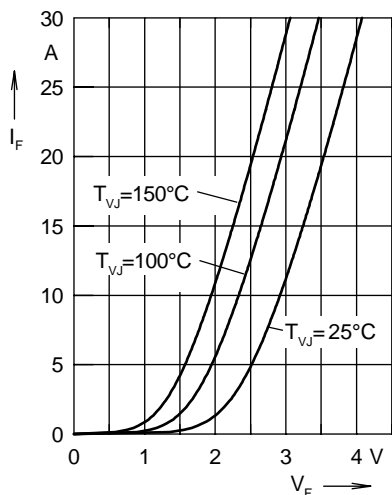


Fig. 1 Forward current  $I_F$  versus  $V_F$

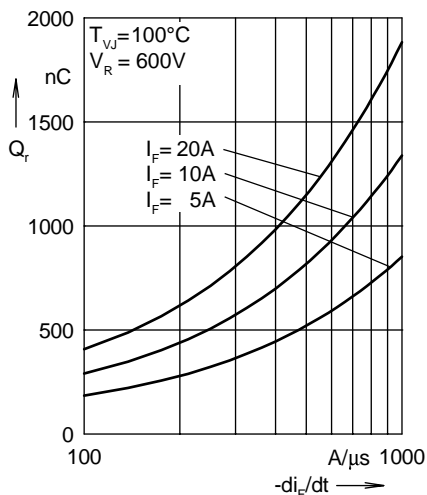


Fig. 2 Reverse recovery charge  $Q_r$  versus  $-di_F/dt$

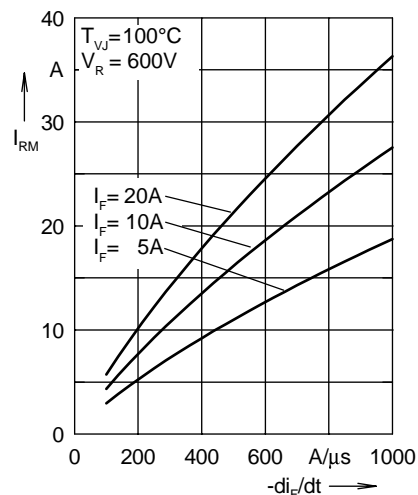


Fig. 3 Peak reverse current  $I_{RM}$  versus  $-di_F/dt$

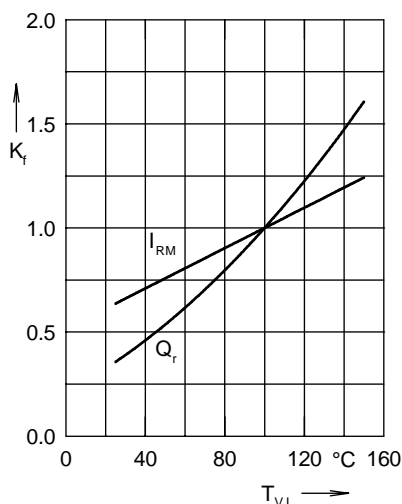


Fig. 4 Dynamic parameters  $Q_r$ ,  $I_{RM}$  versus  $T_{VJ}$

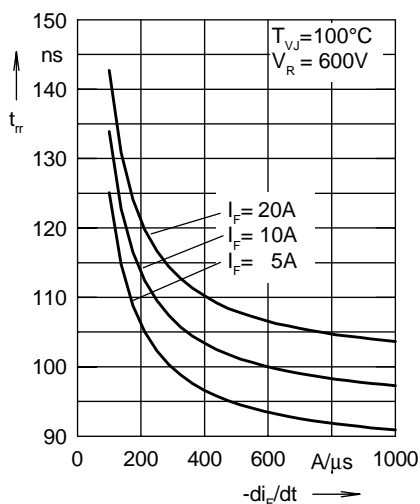


Fig. 5 Recovery time  $t_{rr}$  versus  $-di_F/dt$

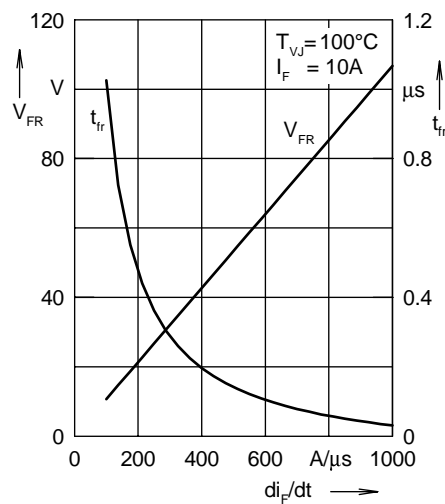


Fig. 6 Peak forward voltage  $V_{FR}$  and  $t_{rr}$  versus  $di_F/dt$

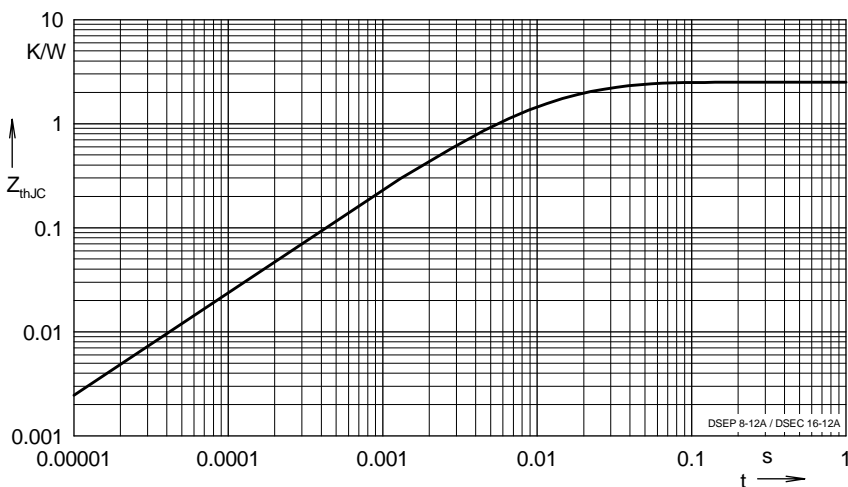


Fig. 7 Transient thermal resistance junction to case

Constants for  $Z_{thJC}$  calculation:

i	$R_{thi}$ (K/W)	$t_i$ (s)
1	1.449	0.0052
2	0.558	0.0003
3	0.493	0.017