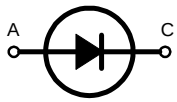
HiPerFRED™ Epitaxial Diode with soft recovery

I_{FAV} = 30 A
V_{RRM} = 400 V
t_{rr} = 30 ns

Preliminary Data

V_{RSM} V	V_{RRM} V	Type
400	400	DSEP 30-04A



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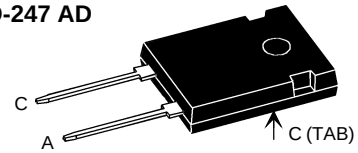

A = Anode, C = Cathode, TAB = Cathode

Symbol	Conditions	Maximum Ratings	
I_{FRMS}		70	A
I_{FAVM}	T_C = 140°C; rectangular, d = 0.5	30	A
I_{FSM}	T_{VJ} = 45°C; t_p = 10 ms (50 Hz), sine	tbd	A
E_{AS}	T_{VJ} = 25°C; non-repetitive I_{AS} = tbd A; L = tbd µH	tbd	mJ
I_{AR}	$V_A = 1.5 \cdot V_R$ typ.; f = 10 kHz; repetitive	tbd	A
T_{VJ}		-55...+175	°C
T_{VJM}		175	°C
T_{stg}		-55...+150	°C
P_{tot}	T_C = 25°C	165	W
M_d	mounting torque	0.8...1.2	Nm
Weight	typical	6	g

Symbol	Conditions	Characteristic Values typ.	max.	
I_R ①	T_{VJ} = 25°C $V_R = V_{RRM}$		250	µA
	T_{VJ} = 150°C $V_R = V_{RRM}$		1	mA
V_F ②	I_F = 30 A; T_{VJ} = 150°C		1.11	V
	T_{VJ} = 25°C		1.46	V
R_{thJC}			0.9	K/W
R_{thCH}		0.25		K/W
t_{rr}	I_F = 1 A; -di/dt = 300 A/µs; V_R = 30 V; T_{VJ} = 25°C	30		ns
I_{RM}	V_R = 100 V; I_F = 50 A; $-di_F/dt$ = 100 A/µs T_{VJ} = 100°C	5.5	6.8	A

Pulse test: ① Pulse Width = 5 ms, Duty Cycle < 2.0 %
② Pulse Width = 300 µs, 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.

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

800

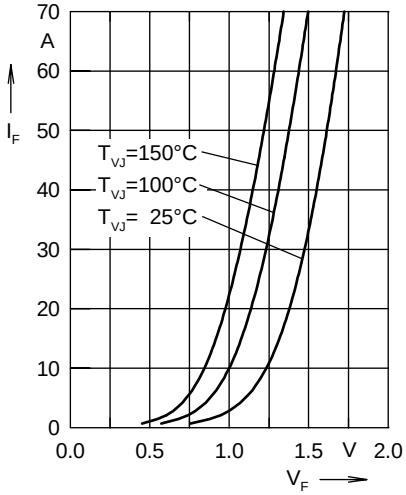

Fig. 1 Forward current I_F versus V_F

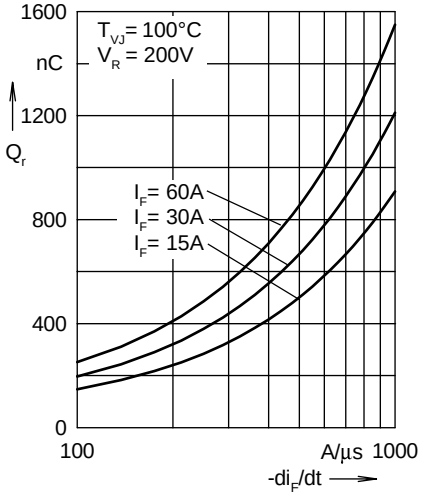

Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

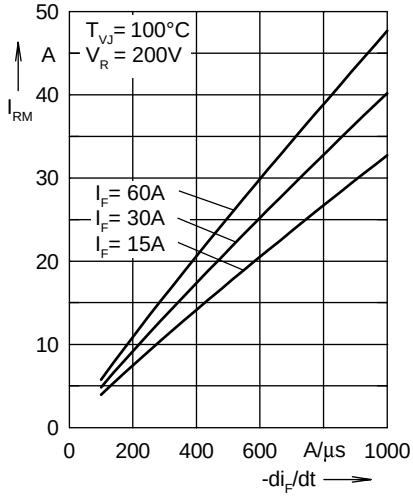

Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

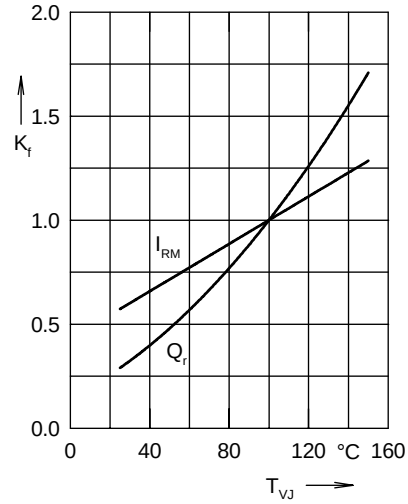

Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

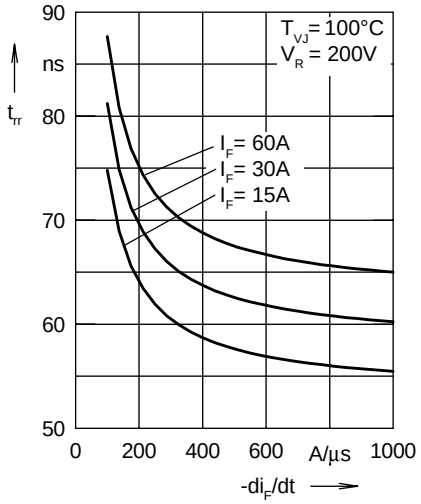

Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

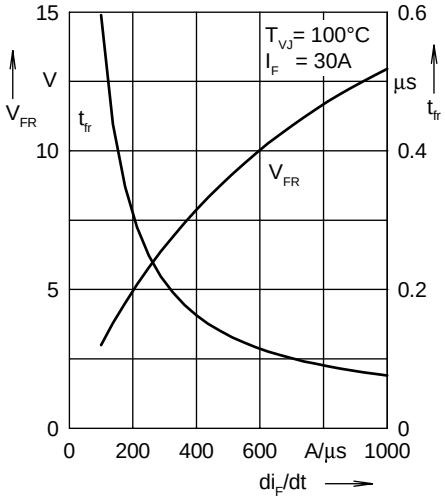

Fig. 6 Peak forward voltage V_{FR} and t_{fr} versus di_F/dt

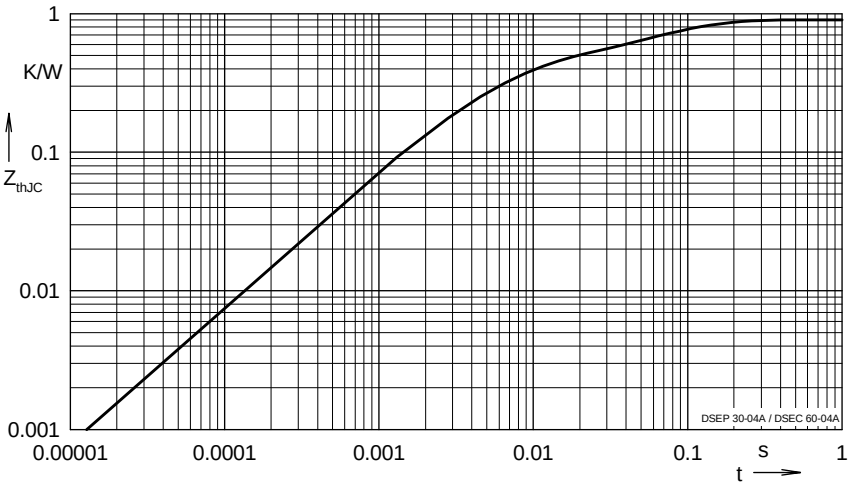

Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.465	0.0052
2	0.179	0.0003
3	0.256	0.0396

NOTE: Fig. 2 to Fig. 6 shows typical values

800