

HiPerFRED

$$V_{RRM} = 600\text{ V}$$

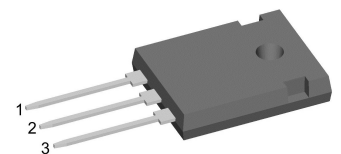
$$I_{FAV} = 2 \times 15\text{ A}$$

$$t_{rr} = 25\text{ ns}$$

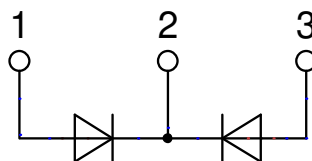
High Performance Fast Recovery Diode
 Low Loss and Soft Recovery
 Common Cathode

Part number

DSEC30-06B



Backside: cathode



Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very short recovery time
- Improved thermal behaviour
- Very low I_{rm} -values
- Very soft recovery behaviour
- 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

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-247

- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0

Disclaimer Notice

Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at www.littelfuse.com/disclaimer-electronics.

Fast Diode				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V _{RSM}	max. non-repetitive reverse blocking voltage	T _{VJ} = 25°C				600	V
V _{RRM}	max. repetitive reverse blocking voltage	T _{VJ} = 25°C				600	V
I _R	reverse current, drain current	V _R = 600 V	T _{VJ} = 25°C			100	μA
		V _R = 600 V	T _{VJ} = 150°C			0,5	mA
V _F	forward voltage drop	I _F = 15 A	T _{VJ} = 25°C			2,53	V
		I _F = 30 A				2,97	V
		I _F = 15 A	T _{VJ} = 150°C			1,58	V
		I _F = 30 A				2,02	V
I _{FAV}	average forward current	T _C = 130°C rectangular d = 0.5	T _{VJ} = 175°C			15	A
V _{F0}	threshold voltage	} for power loss calculation only		T _{VJ} = 175°C		0,98	V
r _F	slope resistance					27	mΩ
R _{thJC}	thermal resistance junction to case					1,6	K/W
R _{thCH}	thermal resistance case to heatsink				0,25		K/W
P _{tot}	total power dissipation	T _C = 25°C				95	W
I _{FSM}	max. forward surge current	t = 10 ms; (50 Hz), sine; V _R = 0 V		T _{VJ} = 45°C		110	A
C _J	junction capacitance	V _R = 400V f = 1 MHz		T _{VJ} = 25°C	12		pF
I _{RM}	max. reverse recovery current	} I _F = 15 A; V _R = 300 V -di _F /dt = 200 A/μs	T _{VJ} = 25°C		2		A
			T _{VJ} = 100°C		3		A
t _{rr}	reverse recovery time		T _{VJ} = 25°C		25		ns
			T _{VJ} = 100°C		80		ns
E _{AS}	non-repetitive avalanche energy	I _{AS} = 1 A L = 180 μH	T _{VJ} = 25°C			0,1	mJ
I _{AR}	repetitive avalanche current	V _A = 1.5·V _R typ.: f = 10 kHz				0,1	A

Package TO-247			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal ⁿ			50	A
T_{VJ}	virtual junction temperature		-55		175	°C
T_{op}	operation temperature		-55		150	°C
T_{stg}	storage temperature		-55		150	°C
Weight				6		g
M_D	mounting torque		0,8		1,2	Nm
F_C	mounting force with clip		20		120	N

Product Marking



Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSEC30-06B	DSEC30-06B	Tube	30	492647

Similar Part	Package	Voltage class
DSEC30-06A	TO-247AD (3)	600
DSEC29-06AC	ISOPLUS220AB (3)	600

Equivalent Circuits for Simulation

* on die level

$T_{VJ} = 175^{\circ}\text{C}$

$I \rightarrow$	V_0	R_0	Fast Diode	
$V_{0 \max}$	threshold voltage	0,98		V
$R_{0 \max}$	slope resistance *	24,5		mΩ

Outlines TO-247


Sym.	Inches		Millimeter	
	min.	max.	min.	max.
A	0.185	0.209	4.70	5.30
A1	0.087	0.102	2.21	2.59
A2	0.059	0.098	1.50	2.49
D	0.819	0.845	20.79	21.45
E	0.610	0.640	15.48	16.24
E2	0.170	0.216	4.31	5.48
e	0.215	BSC	5.46	BSC
L	0.780	0.800	19.80	20.30
L1	-	0.177	-	4.49
Ø P	0.140	0.144	3.55	3.65
Q	0.212	0.244	5.38	6.19
S	0.242	BSC	6.14	BSC
b	0.039	0.055	0.99	1.40
b2	0.065	0.094	1.65	2.39
b4	0.102	0.135	2.59	3.43
c	0.015	0.035	0.38	0.89
D1	0.515	-	13.07	-
D2	0.020	0.053	0.51	1.35
E1	0.530	-	13.45	-
Ø P1	-	0.29	-	7.39



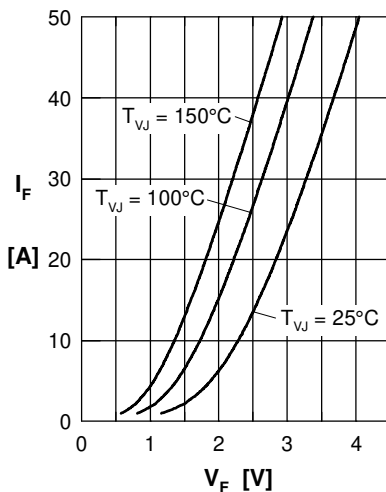
Fast Diode


Fig. 1 Forward current
 I_F versus V_F

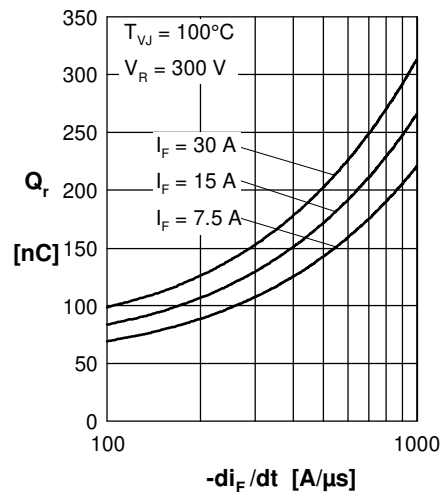


Fig. 2 Reverse recovery charge
 Q_r versus $-di_F/dt$

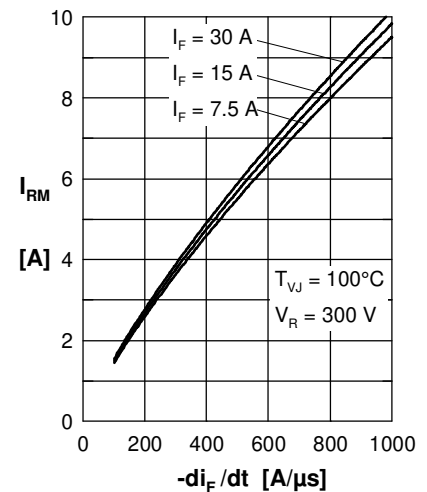


Fig. 3 Peak reverse current
 I_{RM} versus $-di_F/dt$

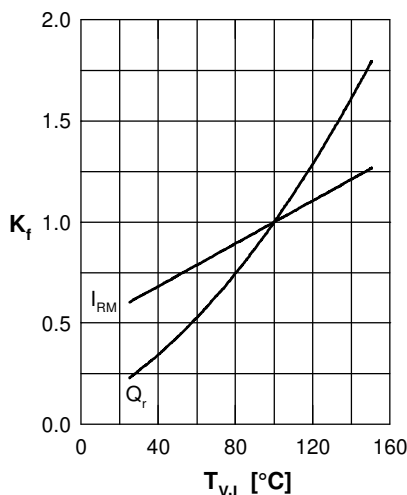


Fig. 4 Dynamic parameters
 Q_r , I_{RM} versus T_{VJ}

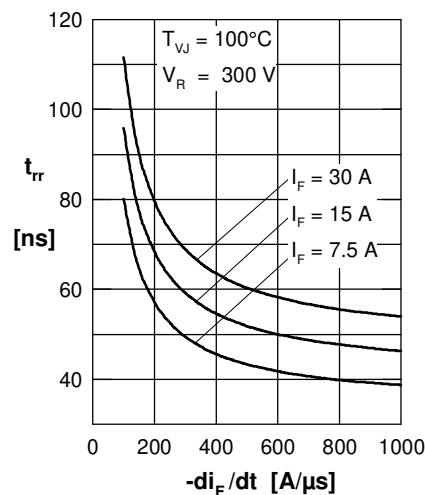


Fig. 5 Recovery time
 t_{rr} versus $-di_F/dt$

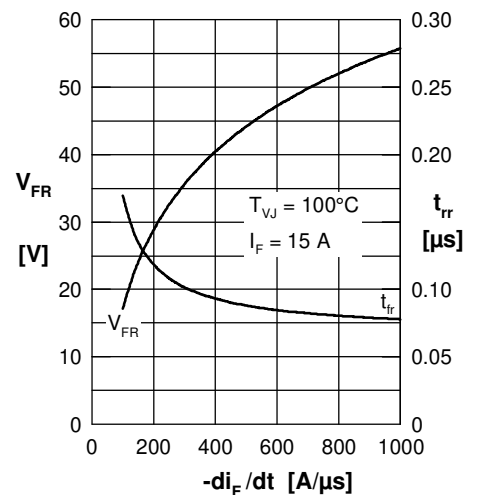


Fig. 6 Peak forward voltage
 V_{FR} and t_{fr} versus di_F/dt

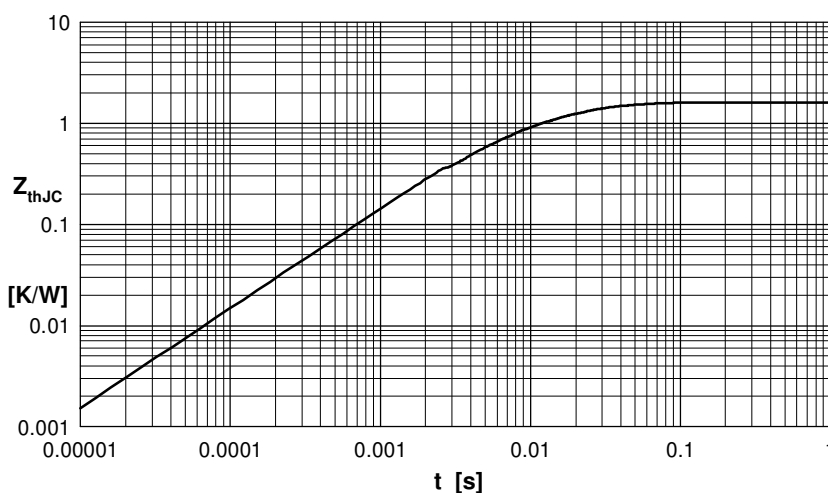


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.908	0.005
2	0.350	0.0003
3	0.342	0.017