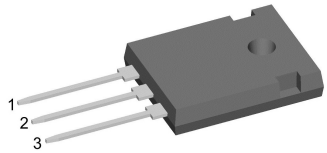
FRED

V_{RRM}	=	1200 V
I_{FAV}	= 2x	30 A
t_{rr}	=	50 ns

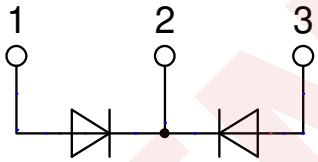
Fast Recovery Epitaxial Diode
Common Cathode

Part number

DSEK60-12A



Backside: cathode



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Features / Advantages:

- Planar passivated chips
- Low leakage current
- Very short recovery time
- Improved thermal behaviour
- Very low Irm-values
- Very soft recovery behaviour
- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low Irm 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

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Fast Diode

Symbol	Definition	Conditions		Ratings min.	typ.	max.	Unit
V_{RSM}	*max. non-repetitive reverse blocking voltage*		T_{VJ} = 25°C			1200	V
V_{RRM}	*max. repetitive reverse blocking voltage*		T_{VJ} = 25°C			1200	V
I_R	*reverse current, drain current*	V_R = 1200 V	T_{VJ} = 25°C			750	µA
		V_R = 960 V	T_{VJ} = 125°C			7	mA
V_F	*forward voltage drop*	I_F = 30 A	T_{VJ} = 25°C			2.55	V
		I_F = 60 A				2.93	V
		I_F = 30 A	T_{VJ} = 150°C			2.20	V
		I_F = 60 A				2.76	V
I_{FAV}	*average forward current*	T_C = 85°C rectangular d = 0.5	T_{VJ} = 150°C			30	A
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 150°C			1.69	V
r_F	*slope resistance*					17.2	mΩ
R_{thJC}	*thermal resistance junction to case*					0.8	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.25		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			155	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine; V_R = 0 V	T_{VJ} = 45°C			200	A
C_J	*junction capacitance*	V_R = 600 V f = 1 MHz	T_{VJ} = 25°C		14		pF
I_{RM}	*max. reverse recovery current*	I_F = 30 A; V_R = 540 V $-di_F/dt$ = 200 A/µs	T_{VJ} = 25 °C		9		A
			T_{VJ} = 100 °C		13		A
t_{rr}	*reverse recovery time*		T_{VJ} = 25 °C		160		ns
			T_{VJ} = 100 °C		320		ns

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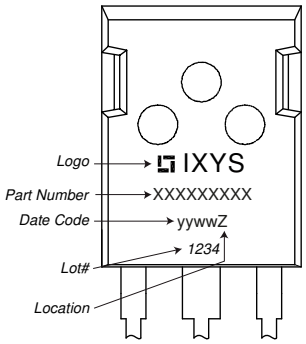
Package TO-247			Ratings			
Symbol	**Definition**	**Conditions**	**min.**	**typ.**	**max.**	**Unit**
I_{RMS}	*RMS current*	per terminal [1]			70	A
T_{VJ}	*virtual junction temperature*		-40		150	°C
T_{op}	*operation temperature*		-40		125	°C
T_{stg}	*storage temperature*		-40		150	°C
Weight				6		g
M_D	*mounting torque*		0.8		1.2	Nm
F_C	*mounting force with clip*		20		120	N

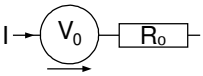
Product Marking



Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSEK60-12A	DSEK60-12A	Tube	30	471542

Equivalent Circuits for Simulation

** on die level* $T_{VJ} = 150°C$



		Fast Diode	
$V_{0\,max}$	*threshold voltage*	1.69	V
$R_{0\,max}$	*slope resistance **	14.7	mΩ

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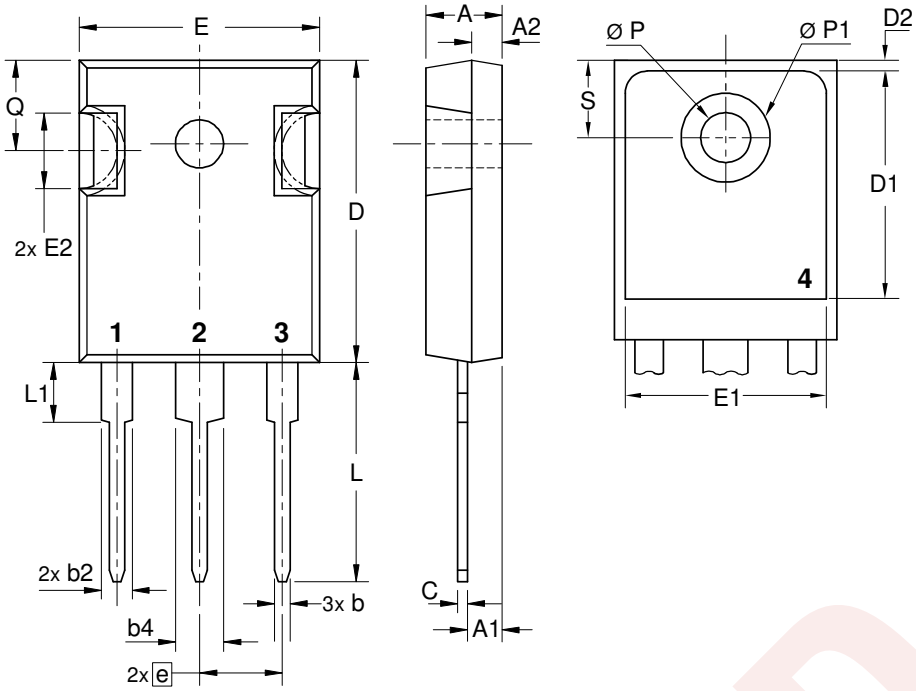
Outlines TO-247



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

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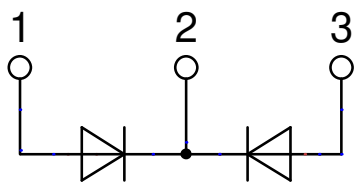

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Fast Diode

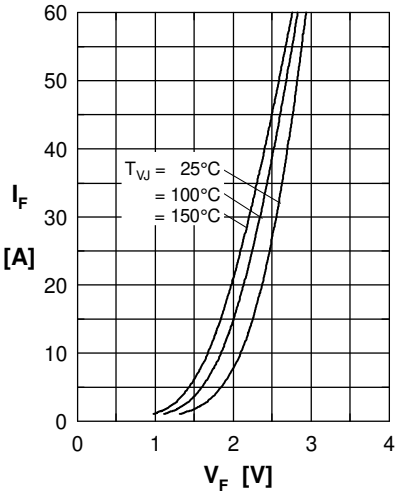

Fig. 1 Forward current I_F versus max. forward voltage drop V_F

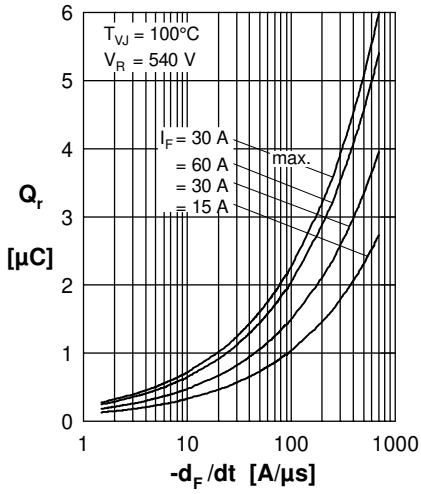

Fig. 2 Typ. reverse recov. charge Q_r versus -di_F/dt

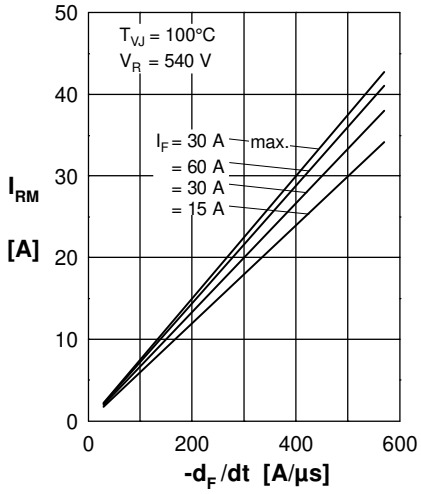

Fig. 3 Typ. peak reverse current I_{RM} versus -di_F/dt

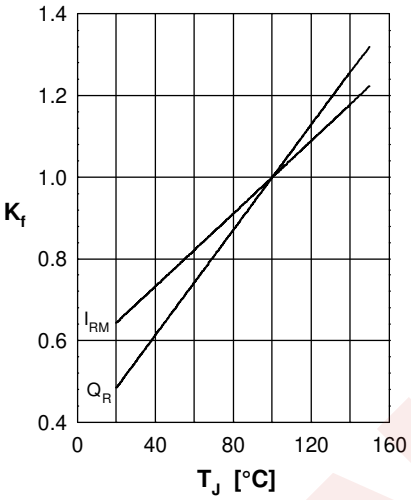

Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

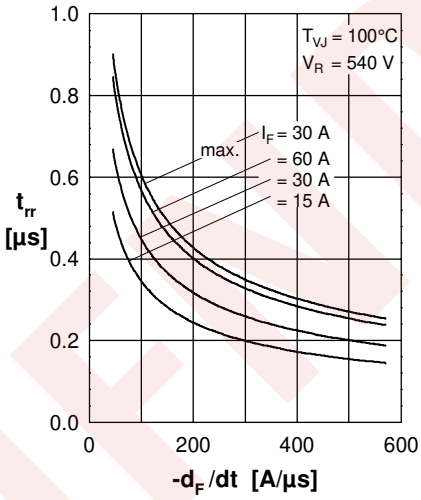

Fig. 5 Typ. recovery time t_{rr} versus -di_F/dt

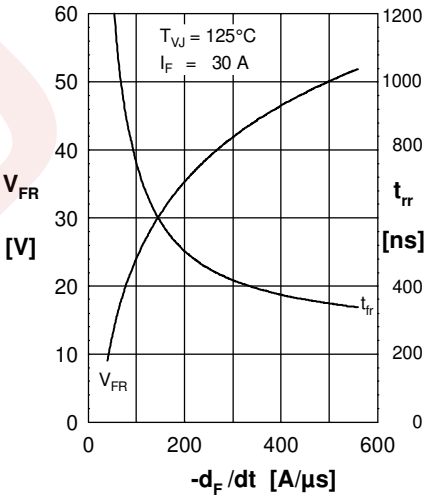

Fig. 6 Typ. peak forward voltage V_{FR} and t_{fr} versus di_F/dt

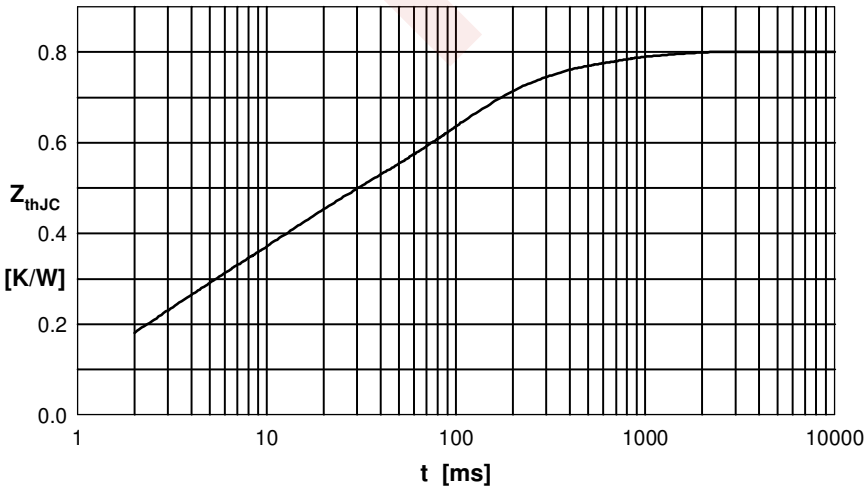

Fig. 7 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.200	0.0018
2	0.220	0.0100
3	0.080	0.5000
4	0.300	0.0900

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