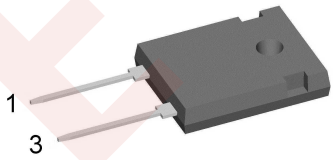
FRED

V_{RRM}	=	1000 V
I_{FAV}	=	60 A
t_{rr}	=	45 ns

Fast Recovery Epitaxial Diode
Single Diode

Part number

DSEI60-10A



Backside: cathode

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

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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.

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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			1000	V
V_{RRM}	*max. repetitive reverse blocking voltage*		T_{VJ} = 25°C			1000	V
I_R	*reverse current, drain current*	V_R = 1000 V	T_{VJ} = 25°C			3	mA
		V_R = 800 V	T_{VJ} = 125°C			14	mA
V_F	*forward voltage drop*	I_F = 60 A	T_{VJ} = 25°C			2.30	V
		I_F = 120 A				2.65	V
		I_F = 60 A	T_{VJ} = 150°C			1.92	V
		I_F = 120 A				2.43	V
I_{FAV}	*average forward current*	T_C = 80°C rectangular d = 0.5	T_{VJ} = 150°C			60	A
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 150°C			1.44	V
r_F	*slope resistance*					8	mΩ
R_{thJC}	*thermal resistance junction to case*					0.5	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.25		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			250	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine; V_R = 0 V	T_{VJ} = 45°C			500	A
C_J	*junction capacitance*	V_R = 600 V f = 1 MHz	T_{VJ} = 25°C		36		pF
I_{RM}	*max. reverse recovery current*	I_F = 60 A; V_R = 540 V $-di_F/dt$ = 300 A/µs	T_{VJ} = 25 °C		15		A
			T_{VJ} = 100 °C		23		A
t_{rr}	*reverse recovery time*		T_{VJ} = 25 °C		100		ns
			T_{VJ} = 100 °C		200		ns

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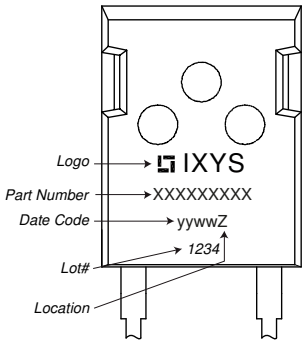
Package TO-247			Ratings			
Symbol	**Definition**	**Conditions**	**min.**	**typ.**	**max.**	**Unit**
I_{RMS}	*RMS current*	per terminal			70	A
T_{VJ}	*virtual junction temperature*		-40		150	°C
T_{op}	*operation temperature*		-40		125	°C
T_{stg}	*storage temperature*		-40		150	°C
Weight				6		g
M_D	*mounting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

Product Marking

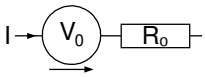


Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSEI60-10A	DSEI60-10A	Tube	30	434515

Similar Part	Package	Voltage class
DSEI60-12A	TO-247AD (2)	1200

Equivalent Circuits for Simulation

** on die level* $T_{VJ} = 150°C$



		Fast Diode	
$V_{0\,max}$	*threshold voltage*	1.44	V
$R_{0\,max}$	*slope resistance **	5.5	mΩ

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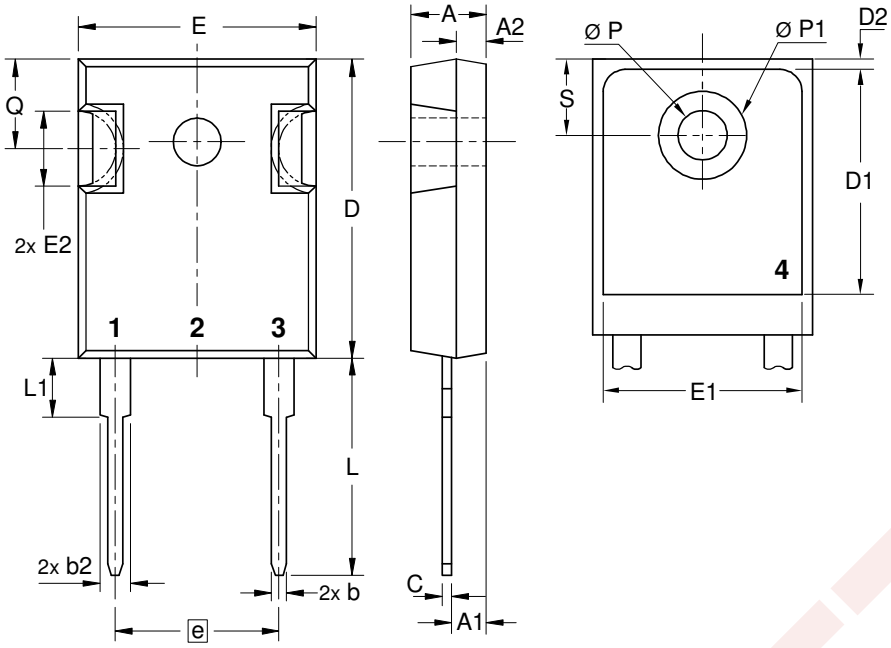
Outlines TO-247



Sym.	Inches min.	Inches max.	Millimeter min.	Millimeter 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	0.430 BSC		10.92 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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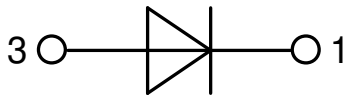

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Fast Diode

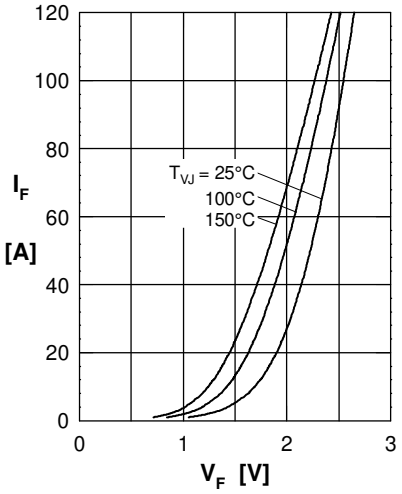

Fig. 1 Forward current I_F versus max. forward voltage drop V_F

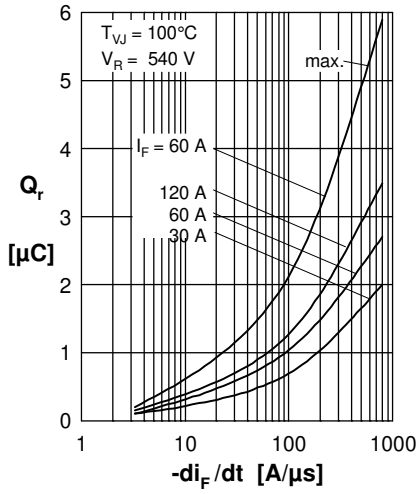

Fig. 2 Typ. reverse recov. charge Q_r versus -di$_F$/dt

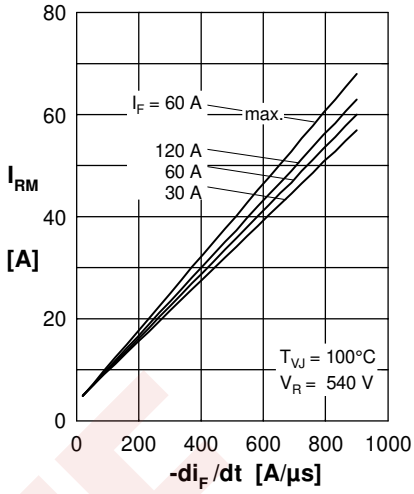

Fig. 3 Typ. peak reverse current I_{RM} versus -di$_F$/dt

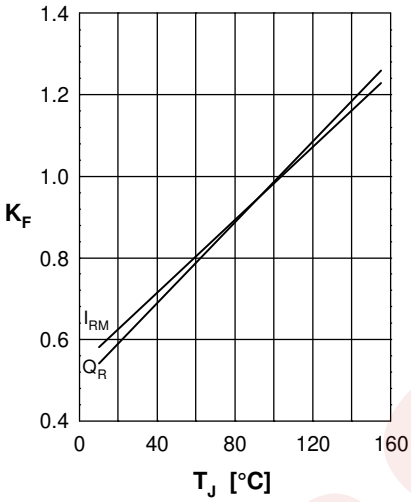

Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

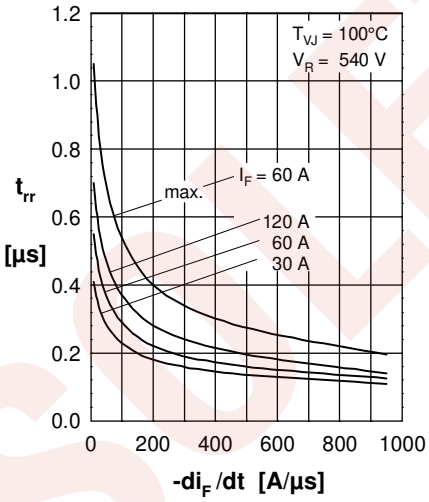

Fig. 5 Typ. recovery time t_{rr} versus -di$_F$/dt

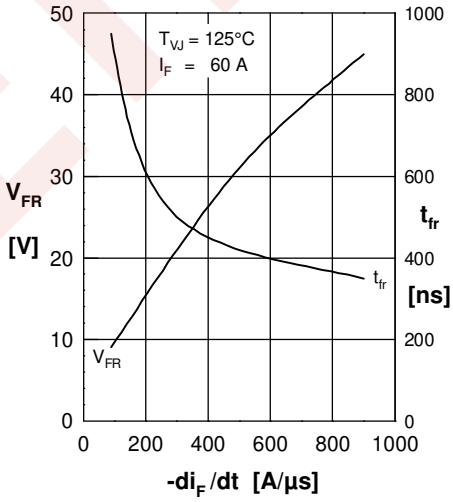

Fig. 6 Typ. peak forward voltage V_{FR} and t_{fr} versus di$_F$/dt

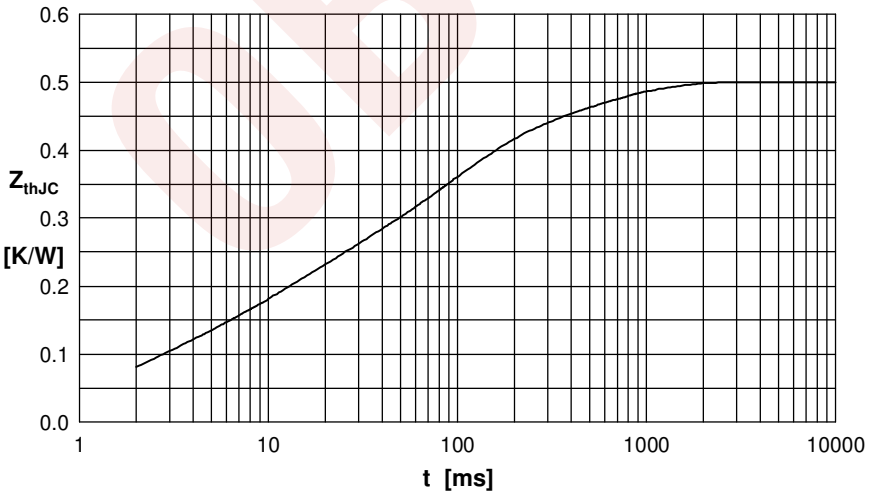

Fig. 7 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.080	0.0018
2	0.120	0.0100
3	0.100	0.5000
4	0.200	0.0800

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