FRED

V_{RRM}	=	1200 V
I_{FAV}	=	12 A
t_{rr}	=	50 ns
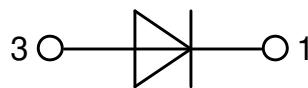
Fast Recovery Epitaxial Diode
Single Diode

Part number

DSEI12-12A

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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-220

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

Disclaimer Notice
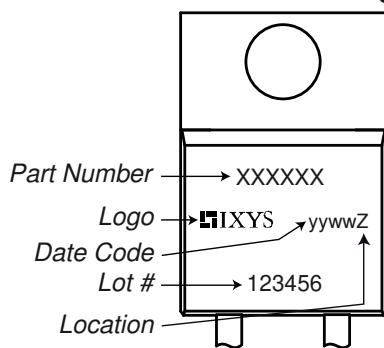
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Fast Diode

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			250	µA
		V_R = 960 V	T_{VJ} = 125°C			4	mA
V_F	*forward voltage drop*	I_F = 12 A	T_{VJ} = 25°C			2,58	V
		I_F = 24 A				2,94	V
		I_F = 12 A	T_{VJ} = 150°C			2,23	V
		I_F = 24 A				2,72	V
I_{FAV}	*average forward current*	T_C = 100°C rectangular d = 0.5	T_{VJ} = 150°C			12	A
V_{F0}	*threshold voltage*	*for power loss calculation only*	T_{VJ} = 150°C			1,77	V
r_F	*slope resistance*					38	mΩ
R_{thJC}	*thermal resistance junction to case*					1,6	K/W
R_{thCH}	*thermal resistance case to heatsink*				0,50		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			78	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine; V_R = 0 V	T_{VJ} = 45°C			75	A
C_J	*junction capacitance*	V_R = 600 V f = 1 MHz	T_{VJ} = 25°C		6		pF
I_{RM}	*max. reverse recovery current*	I_F = 11 A; V_R = 540 V $-di_F/dt$ = 100 A/µs	T_{VJ} = 25°C		4		A
			T_{VJ} = 100°C		6		A
t_{rr}	*reverse recovery time*		T_{VJ} = 25°C		150		ns
			T_{VJ} = 100°C		300		ns

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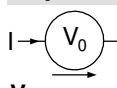
Package   TO-220
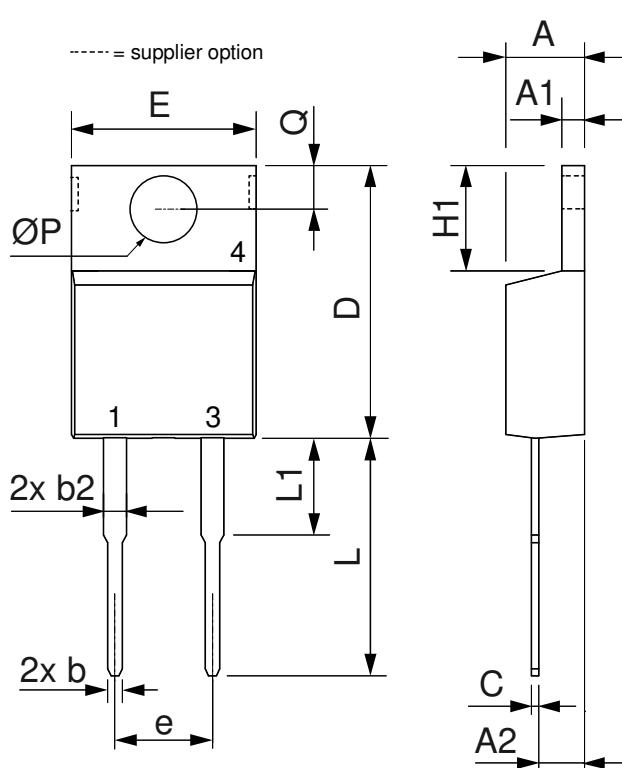
Symbol	Definition	Conditions	min.	typ.	max.	Unit
Ratings						
I_{RMS}	RMS current	per terminal			25	A
T_{VJ}	virtual junction temperature		-40		150	°C
T_{op}	operation temperature		-40		125	°C
T_{stg}	storage temperature		-40		150	°C
Weight				2		g
M_D	mounting torque		0,4		0,6	Nm
F_c	mounting force with clip		20		60	N

Product Marking

Part Number → XXXXXX

Logo → ⊞IXYS   yywwZ

Date Code →

Lot # → 123456

Location →
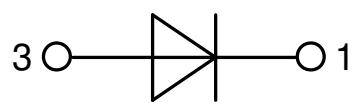
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSEI12-12A	DSEI12-12A	Tube	50	459801

Equivalent Circuits for Simulation   *on die level* $T_{VJ} = 150°C$

I → V_0 → R_0

Fast Diode

$V_{0\ max}$	threshold voltage	1,77		V
$R_{0\ max}$	slope resistance *	35		mΩ

IXYS reserves the right to change limits, conditions and dimensions.   Data according to IEC 60747and per semiconductor unless otherwise specified   20210721e

Outlines   TO-220

----- = supplier option

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.32	4.82	0.170	0.190
A1	1.14	1.39	0.045	0.055
A2	2.29	2.79	0.090	0.110
b	0.64	1.01	0.025	0.040
b2	1.15	1.65	0.045	0.065
C	0.35	0.56	0.014	0.022
D	14.73	16.00	0.580	0.630
E	9.91	10.66	0.390	0.420
e	5.08	BSC	0.200	BSC
H1	5.85	6.85	0.230	0.270
L	12.70	13.97	0.500	0.550
L1	2.79	5.84	0.110	0.230
ØP	3.54	4.08	0.139	0.161
Q	2.54	3.18	0.100	0.125

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Fast Diode
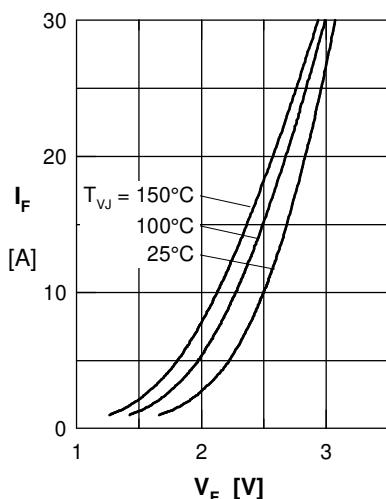
Fig. 1 Forward current I_F versus max. forward voltage drop V_F
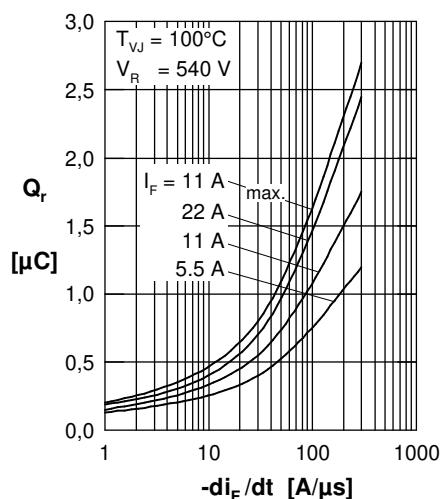
Fig. 2 Typ. reverse recov. charge Q_r versus $-di_F/dt$
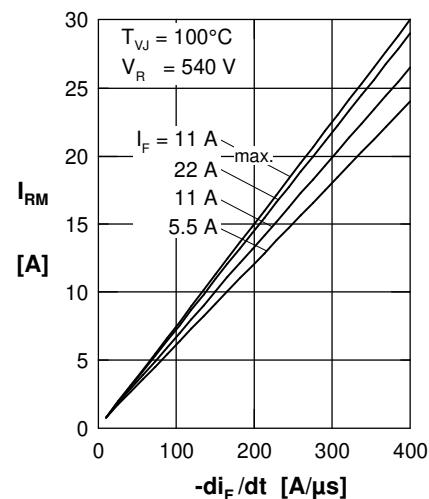

Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$
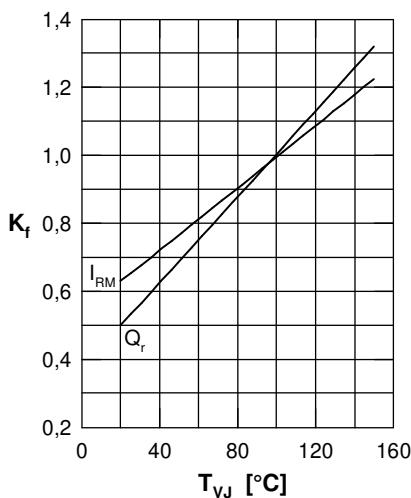

Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}
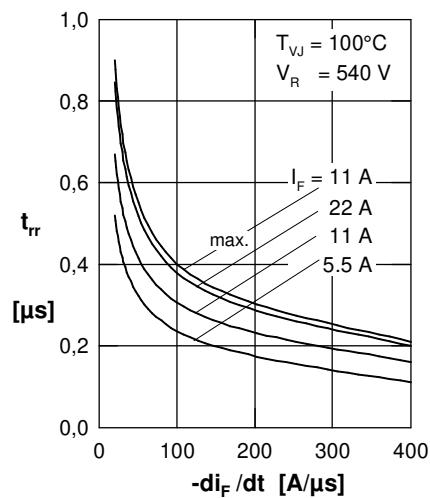
Fig. 5 Typ. recovery time t_{rr} versus $-di_F/dt$
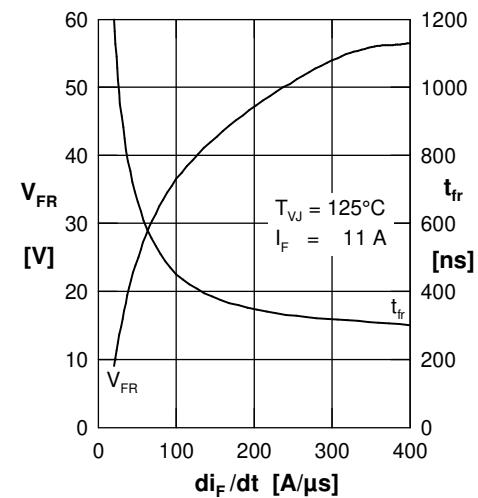
Fig. 6 Typ. peak forward voltage V_{FR} and t_{fr} versus di_F/dt
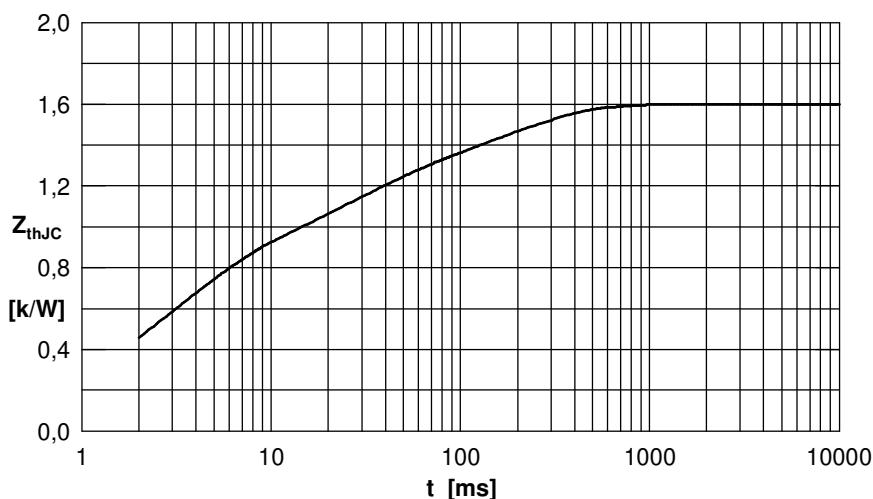
Fig. 7 Transient thermal impedance junction to case

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
5	0.680	0.0300