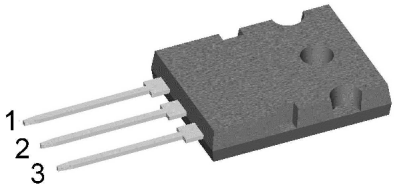
HiPerFRED

V_{RRM}	=	1200 V
I_{FAV}	= 2x	60 A
t_{rr}	=	40 ns

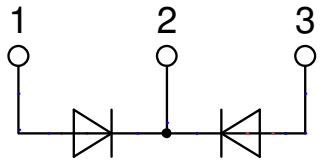
High Performance Fast Recovery Diode
Low Loss and Soft Recovery
Common Cathode

Part number

DSEC120-12AK



Backside: cathode



Features / Advantages:

- Planar passivated chips
- Very 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)

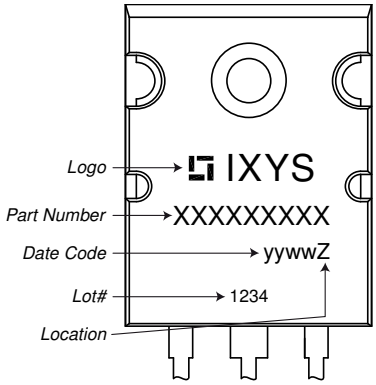
Package: TO-264

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

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			650	µA
		V_R = 1200 V	T_{VJ} = 150°C			2,5	mA
V_F	*forward voltage drop*	I_F = 60 A	T_{VJ} = 25°C			2,66	V
		I_F = 120 A				3,18	V
		I_F = 60 A	T_{VJ} = 150°C			1,81	V
		I_F = 120 A				2,40	V
I_{FAV}	*average forward current*	T_C = 115°C	T_{VJ} = 175°C			60	A
		rectangular d = 0.5					
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 175°C			1,08	V
r_F	*slope resistance* }					9,4	mΩ
R_{thJC}	*thermal resistance junction to case*					0,45	K/W
R_{thCH}	*thermal resistance case to heatsink*				0,15		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			330	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		30		pF
I_{RM}	*max. reverse recovery current*		T_{VJ} = 25°C		13		A
		I_F = 60 A; V_R = 600 V	T_{VJ} = 100°C		20		A
t_{rr}	*reverse recovery time*	$-di_F/dt$ = 200 A/µs	T_{VJ} = 25°C		80		ns
			T_{VJ} = 100°C		220		ns

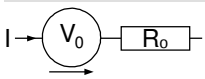
Package TO-264			Ratings			
Symbol	**Definition**	**Conditions**	**min.**	**typ.**	**max.**	**Unit**
I_{RMS}	*RMS current*	per terminal 1)			70	A
T_{VJ}	*virtual junction temperature*		-55		175	°C
T_{op}	*operation temperature*		-55		150	°C
T_{stg}	*storage temperature*		-55		150	°C
Weight				10		g
M_D	*mounting torque*		0,8		1,2	Nm
F_C	*mounting force with clip*		20		120	N



Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSEC120-12AK	DSEC120-12AK	Tube	25	498653

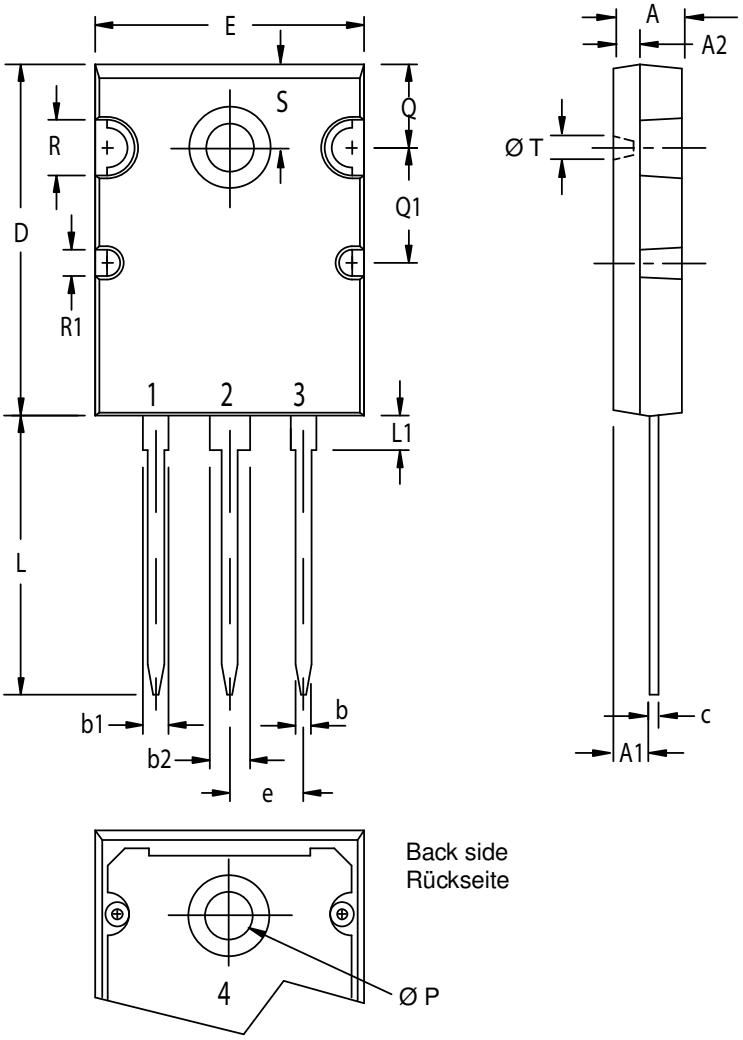
Equivalent Circuits for Simulation

** on die level* $T_{VJ} = 175°C$

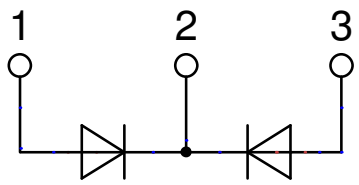


		Fast Diode	
$V_{0\,max}$	*threshold voltage*	1,08	V
$R_{0\,max}$	*slope resistance **	6,8	mΩ

Outlines TO-264



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.190	0.202	4.82	5.13
A1	0.100	0.114	2.54	2.89
A2	0.079	0.083	2.00	2.10
b	0.044	0.056	1.12	1.42
b1	0.094	0.106	2.39	2.69
b2	0.114	0.122	2.90	3.09
c	0.021	0.033	0.53	0.83
D	1.020	1.030	25.91	26.16
E	0.780	0.786	19.81	19.96
e	5.46 BSC		.215 BSC	
J	0.000	0.010	0.00	0.25
K	0.000	0.010	0.00	0.25
L	0.800	0.820	20.32	20.83
L1	0.090	0.102	2.29	2.59
P	0.125	0.144	3.17	3.66
Q	0.239	0.247	6.07	6.27
Q1	0.330	0.342	8.38	8.69
R	0.150	0.170	3.81	4.32
R1	0.070	0.090	1.78	2.29
S	0.238	0.248	6.04	6.30
T	0.062	0.072	1.57	1.83



Fast Diode

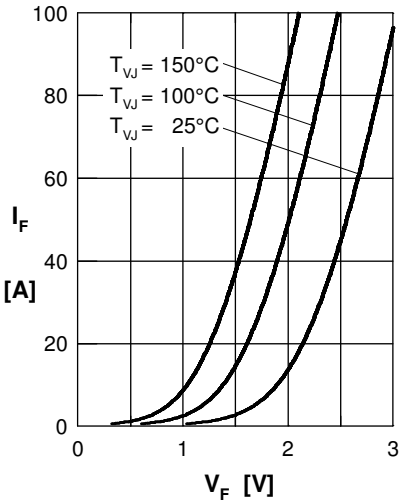


Fig. 1 Forward current I_F versus V_F

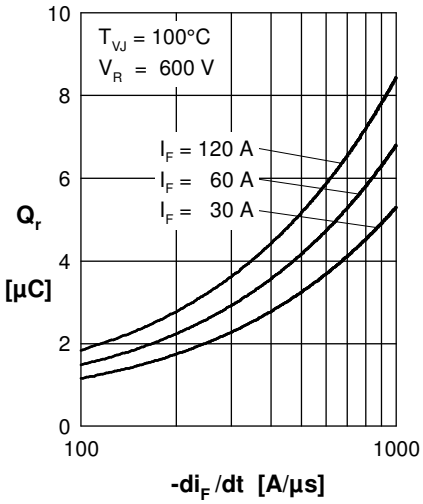


Fig. 2 Typ. reverse recov. charge Q_r versus -di$_F$/dt

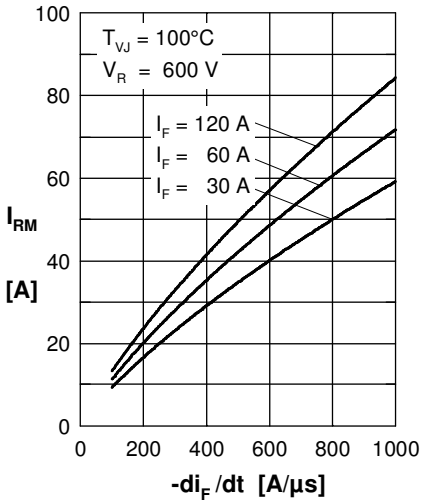


Fig. 3 Typ. peak reverse current I_{RM} versus -di$_F$/dt

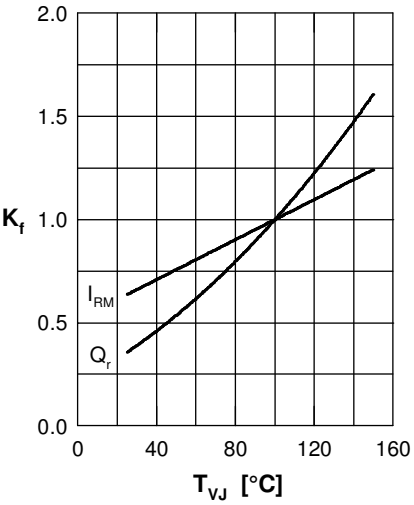


Fig. 4 Typ. dynamic parameters Q_r, I_{RM} versus T_{VJ}

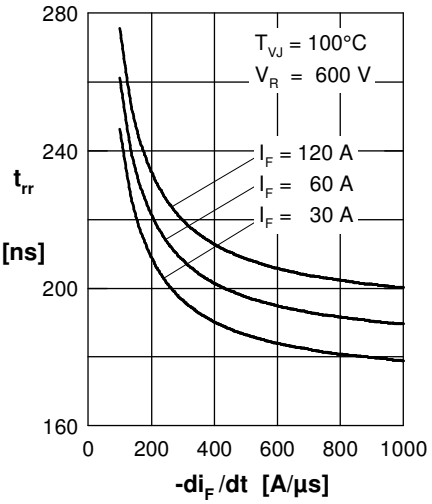


Fig. 5 Typ. recovery time t_{rr} versus -di$_F$/dt

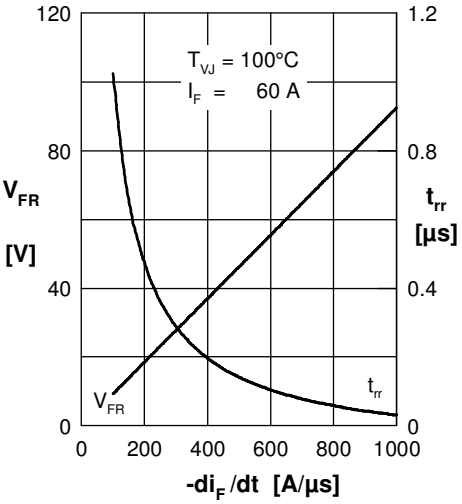


Fig. 6 Typ. peak forward voltage V_{FR} and t_{fr} versus di$_F$/dt

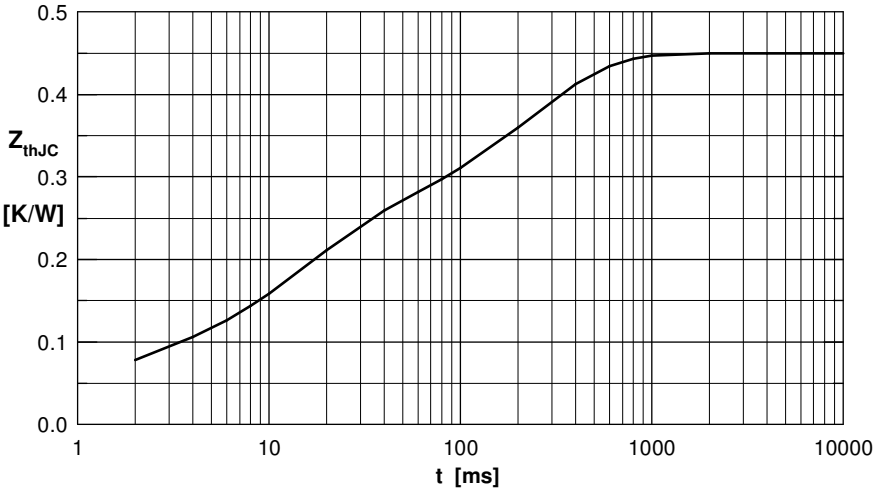


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.0050	0.0001
2	0.0550	0.0010
3	0.1750	0.0140
4	0.2150	0.2300