

**HiPerFRED**

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

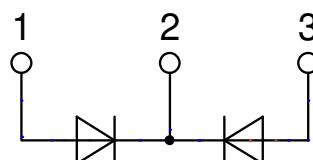
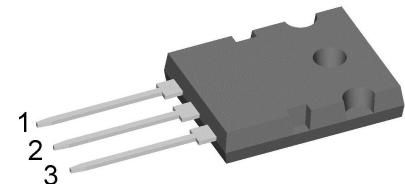
High Performance Fast Recovery Diode

Low Loss and Soft Recovery

Common Cathode

**Part number**

**DSEC120-12AK**



**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-264

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

**Terms and Conditions of Usage**

The data contained in this product data sheet is exclusively intended for technically trained staff. The user will have to evaluate the suitability of the product for the intended application and the completeness of the product data with respect to his application. The specifications of our components may not be considered as an assurance of component characteristics. The information in the valid application- and assembly notes must be considered. Should you require product information in excess of the data given in this product data sheet or which concerns the specific application of your product, please contact your local sales office.

Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact your local sales office. Should you intend to use the product in aviation, in health or life endangering or life support applications, please notify. For any such application we urgently recommend

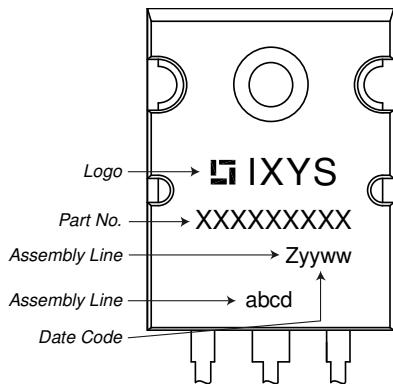
- to perform joint risk and quality assessments;
- the conclusion of quality agreements;
- to establish joint measures of an ongoing product survey, and that we may make delivery dependent on the realization of any such measures.

## Fast Diode

Symbol	Definition	Conditions	Ratings			
			min.	typ.	max.	Unit
$V_{RSM}$	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^\circ\text{C}$			1200	V
$V_{RRM}$	max. repetitive reverse blocking voltage	$T_{VJ} = 25^\circ\text{C}$			1200	V
$I_R$	reverse current, drain current	$V_R = 1200 \text{ V}$ $V_R = 1200 \text{ V}$	$T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 150^\circ\text{C}$		650 2.5	$\mu\text{A}$ mA
$V_F$	forward voltage drop	$I_F = 60 \text{ A}$ $I_F = 120 \text{ A}$ $I_F = 60 \text{ A}$ $I_F = 120 \text{ A}$	$T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 150^\circ\text{C}$		2.66 3.18 1.81 2.40	V V V V
$I_{FAV}$	average forward current	$T_C = 115^\circ\text{C}$ rectangular $d = 0.5$	$T_{VJ} = 175^\circ\text{C}$		60	A
$V_{F0}$ $r_F$	threshold voltage slope resistance } for power loss calculation only		$T_{VJ} = 175^\circ\text{C}$		1.08 9.4	V $\text{m}\Omega$
$R_{thJC}$	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		$T_C = 25^\circ\text{C}$		330	W
$I_{FSM}$	max. forward surge current	$t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}; V_R = 0 \text{ V}$	$T_{VJ} = 45^\circ\text{C}$		500	A
$C_J$	junction capacitance	$V_R = 600 \text{ V}$ $f = 1 \text{ MHz}$	$T_{VJ} = 25^\circ\text{C}$		30	pF
$I_{RM}$	max. reverse recovery current		$T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 100^\circ\text{C}$		13 20	A A
$t_{rr}$	reverse recovery time	$I_F = 60 \text{ A}; V_R = 600 \text{ V}$ $-di_F/dt = 200 \text{ A}/\mu\text{s}$	$T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 100^\circ\text{C}$		80 220	ns ns

## Package TO-264

Symbol	Definition	Conditions	min.	typ.	max.	Unit
$I_{RMS}$	RMS current	per terminal <sup>1)</sup>			70	A
$T_{VJ}$	virtual junction temperature		-55		175	°C
$T_{op}$	operation temperature		-55		150	°C
$T_{stg}$	storage temperature		-55		150	°C
<b>Weight</b>				10		g
$M_d$	mounting torque		0.8		1.2	Nm
$F_c$	mounting force with clip		20		120	N



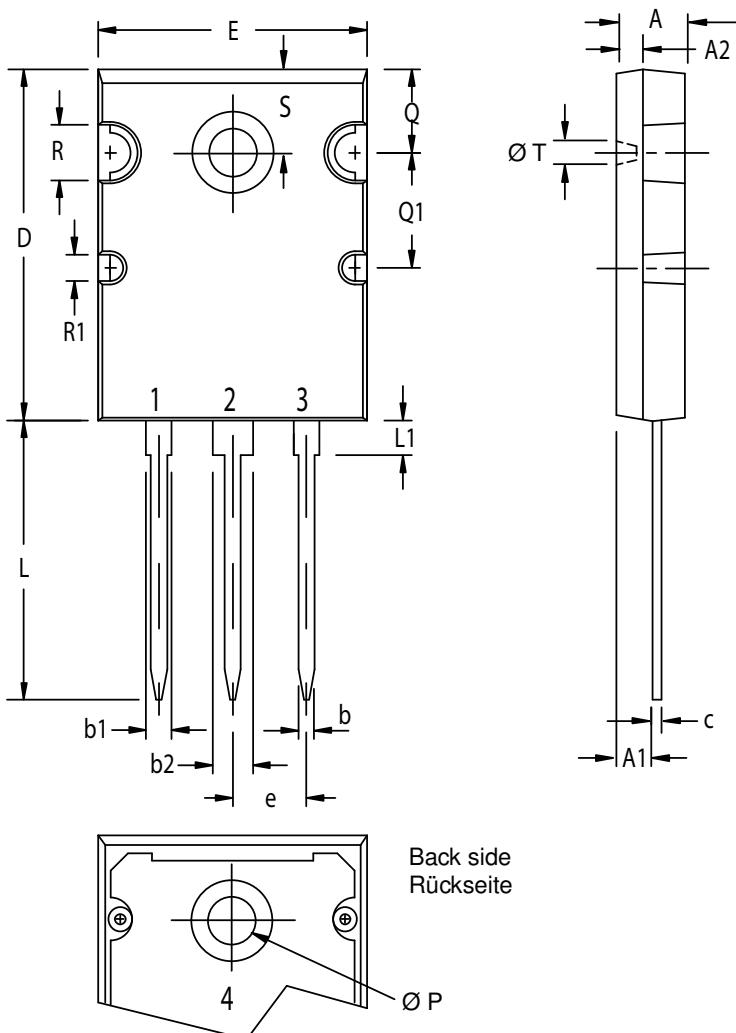
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSEC120-12AK	DSEC120-12AK	Tube	25	498653

## Equivalent Circuits for Simulation

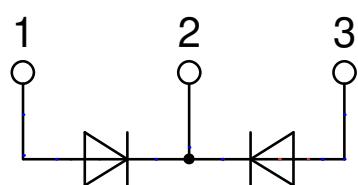
<sup>\*</sup>on die level $T_{VJ} = 175 \text{ }^{\circ}\text{C}$ 

	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



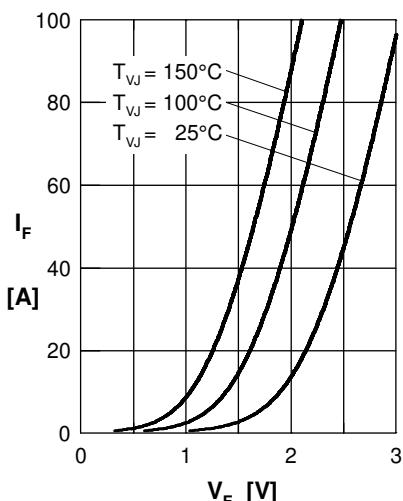
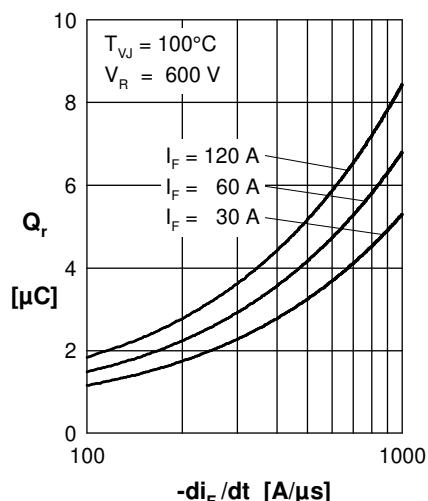
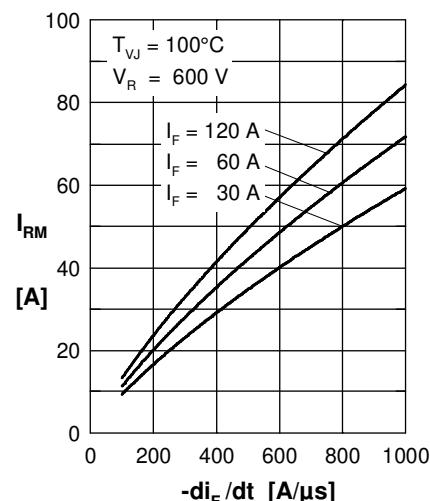
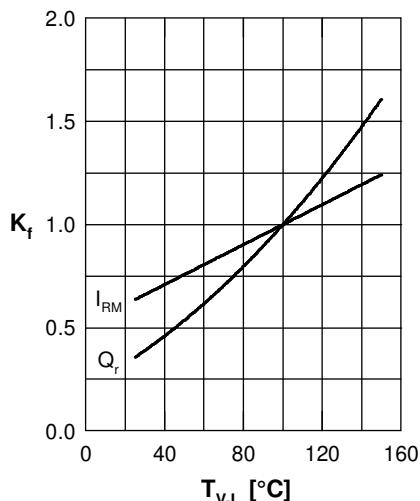
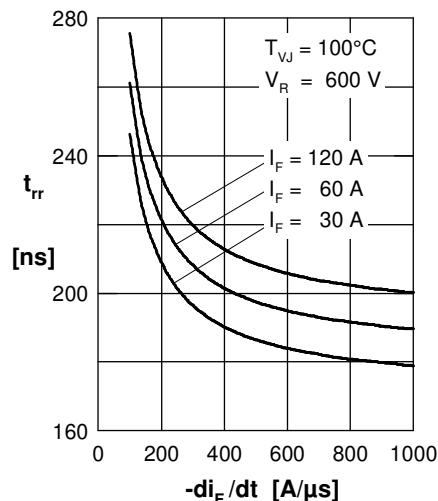
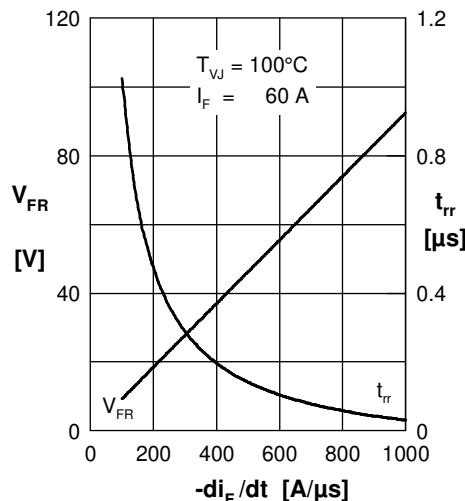
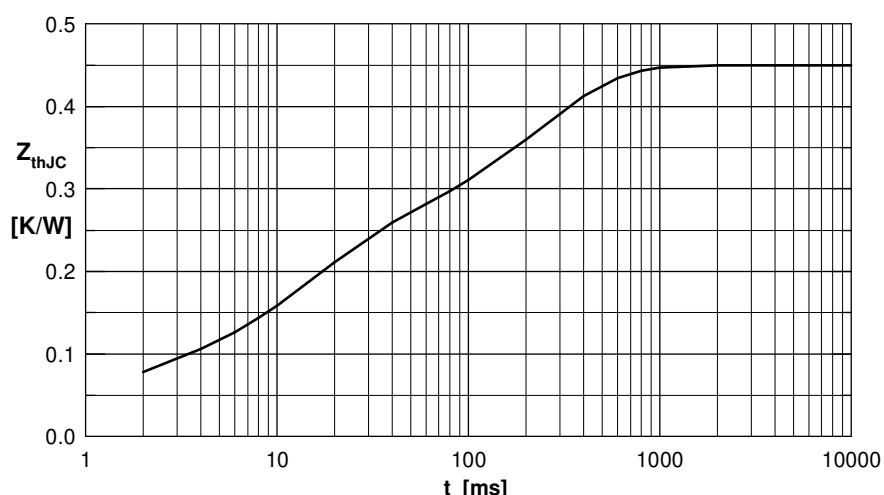
**Fast Diode**Fig. 1 Forward current  $I_F$  versus  $V_F$ Fig. 2 Typ. reverse recov. charge  $Q_r$  versus  $-di_F/dt$ Fig. 3 Typ. peak reverse current  $I_{RM}$  versus  $-di_F/dt$ Fig. 4 Typ. dynamic parameters  $Q_r$ ,  $I_{RM}$  versus  $T_{VJ}$ Fig. 5 Typ. recovery time  $t_{rr}$  versus  $-di_F/dt$ Fig. 6 Typ. peak forward voltage  $V_{FR}$  and  $t_{rr}$  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



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

#### Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помошь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помошь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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