



**THE DATASHEET OF
DSEC30-06A**



HiPerFRED

$$V_{RRM} = 600V$$

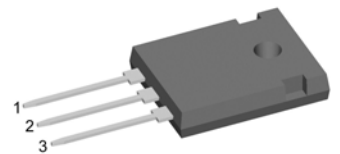
$$I_{FAV} = 2 \times 15A$$

$$t_{rr} = 35ns$$

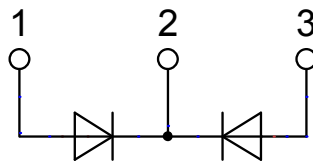
High Performance Fast Recovery Diode
 Low Loss and Soft Recovery
 Common Cathode

Part number

DSEC30-06A



Backside: cathode

**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:

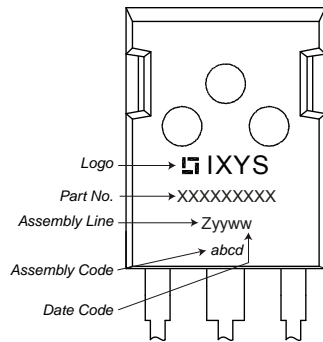
- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode
- Rectifiers in switch mode power supplies (SMPS)
- Uninterruptible power supplies (UPS)

Package: TO-247

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

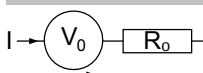
Fast Diode				Ratings		
Symbol	Definition	Conditions	min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			600	V
V_{RRM}	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			600	V
I_R	reverse current, drain current	$V_R = 600 V$	$T_{VJ} = 25^{\circ}C$		100	μA
		$V_R = 600 V$	$T_{VJ} = 150^{\circ}C$		0.5	mA
V_F	forward voltage drop	$I_F = 15 A$	$T_{VJ} = 25^{\circ}C$		2.03	V
		$I_F = 30 A$			2.24	V
		$I_F = 15 A$	$T_{VJ} = 150^{\circ}C$		1.34	V
		$I_F = 30 A$			1.57	V
I_{FAV}	average forward current	$T_C = 140^{\circ}C$ rectangular $d = 0.5$	$T_{VJ} = 175^{\circ}C$		15	A
V_{FO}	threshold voltage	} for power loss calculation only	$T_{VJ} = 175^{\circ}C$		0.99	V
r_F	slope resistance				14.3	m Ω
R_{thJC}	thermal resistance junction to case				1.6	K/W
R_{thCH}	thermal resistance case to heatsink			0.25		K/W
P_{tot}	total power dissipation		$T_C = 25^{\circ}C$		95	W
I_{FSM}	max. forward surge current	$t = 10 \text{ ms}; (50 \text{ Hz}), \text{ sine}; V_R = 0 V$	$T_{VJ} = 45^{\circ}C$		110	A
C_J	junction capacitance	$V_R = 400 V \quad f = 1 \text{ MHz}$	$T_{VJ} = 25^{\circ}C$		12	pF
I_{RM}	max. reverse recovery current	} $I_F = 15 A; V_R = 300 V$ $-di_F/dt = 200 A/\mu s$	$T_{VJ} = 25^{\circ}C$		5	A
t_{rr}	reverse recovery time		$T_{VJ} = 100^{\circ}C$		7	A
			$T_{VJ} = 25^{\circ}C$		35	ns
			$T_{VJ} = 100^{\circ}C$		95	ns
E_{AS}	non-repetitive avalanche energy	$I_{AS} = 1 A \quad L = 180 \mu H$	$T_{VJ} = 25^{\circ}C$		0.1	mJ
I_{AR}	repetitive avalanche current	$V_A = 1.5 \cdot V_R \text{ typ.}; f = 10 \text{ kHz}$			0.1	A

Package TO-247			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal ¹⁾			50	A
T_{VJ}	virtual junction temperature		-55		175	°C
T_{op}	operation temperature		-55		150	°C
T_{stg}	storage temperature		-55		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


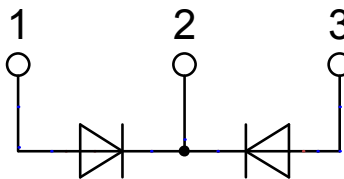
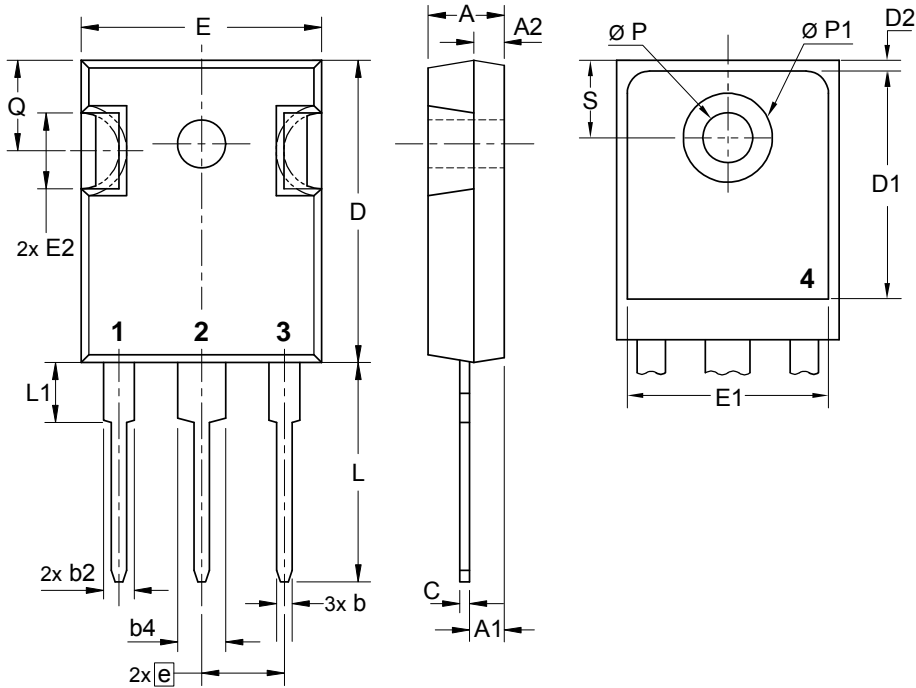
Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSEC30-06A	DSEC30-06A	Tube	30	473502

Similar Part	Package	Voltage class
DSEC30-06B	TO-247AD (3)	600
DSEC29-06AC	ISOPLUS220AB (3)	600

Equivalent Circuits for Simulation
** on die level*
 $T_{VJ} = 175\text{ °C}$

Fast Diode

$V_{0\ max}$	threshold voltage	0.99	V
$R_{0\ max}$	slope resistance *	11.7	mΩ

Outlines TO-247



Fast Diode

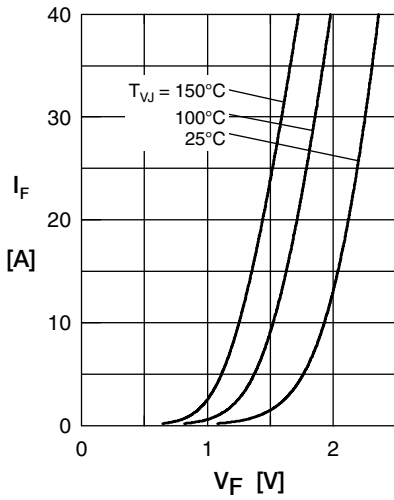


Fig. 1 Forward current I_F versus V_F

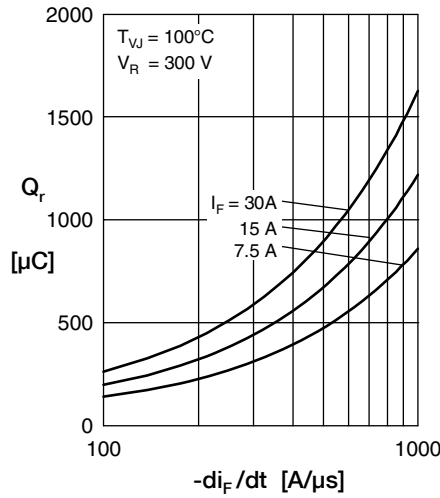


Fig. 2 Typ. reverse recov. charge Q_r versus $-di_F/dt$

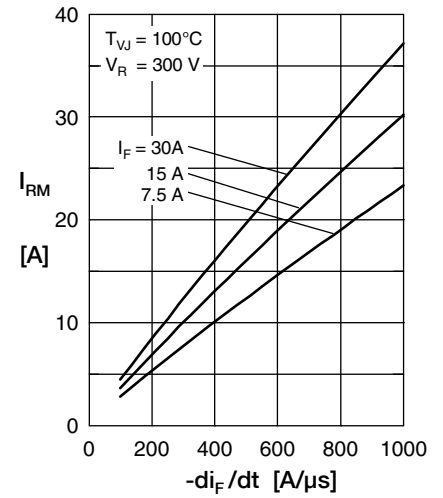


Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$

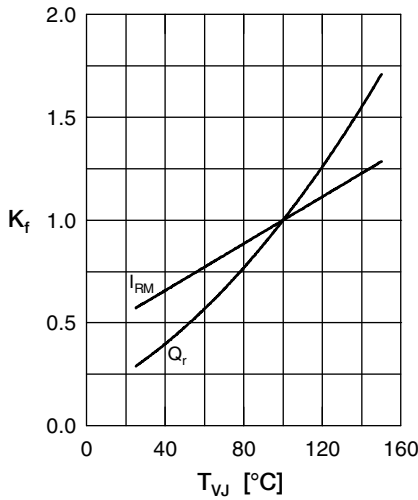


Fig. 4 Dynamic parameters Q_r , I_{RM} versus T_{VJ}

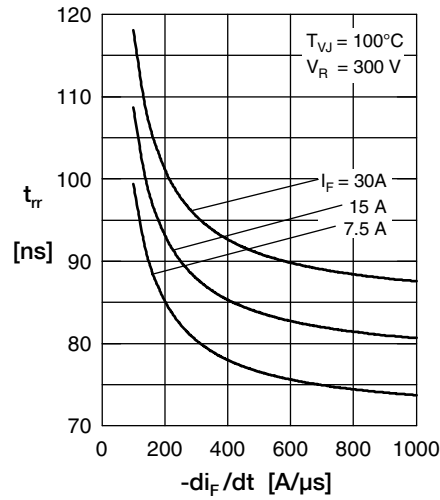


Fig. 5 Typ. recovery time t_{rr} versus $-di_F/dt$

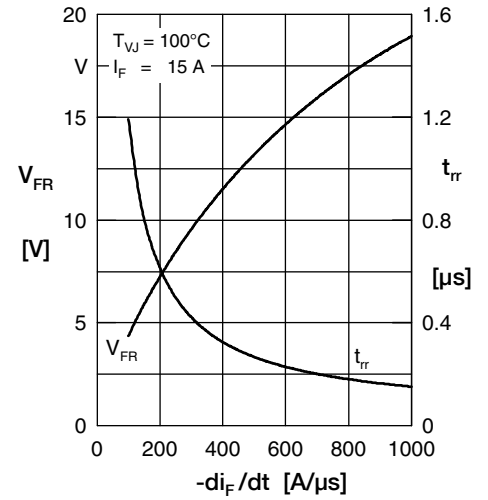


Fig. 6 Typ. peak forward voltage V_{FR} and t_{rr} versus di_F/dt

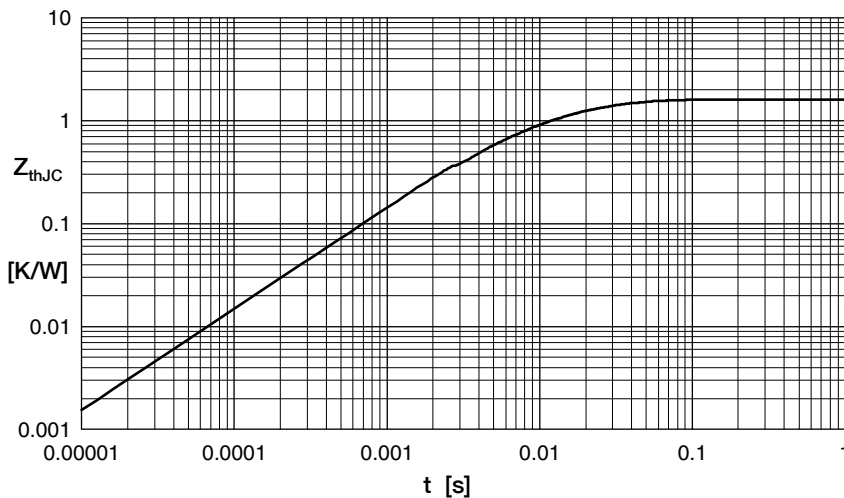


Fig. 7 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.908	0.0052
2	0.350	0.0003
3	0.342	0.017

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- ⊖ [IXYS Information](#)

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- ✓ Shortage Management
- ✓ Alternative Solution
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