

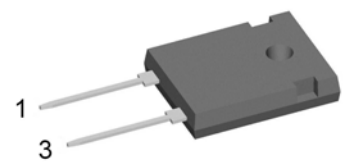
HiPerFRED

$$\begin{aligned} V_{RRM} &= 1200V \\ I_{FAV} &= 30A \\ t_{rr} &= 35ns \end{aligned}$$

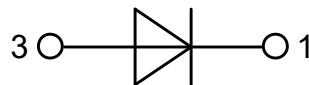
High Performance Fast Recovery Diode
 Low Loss and Soft Recovery
 Single Diode

Part number

DSEP30-12B



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

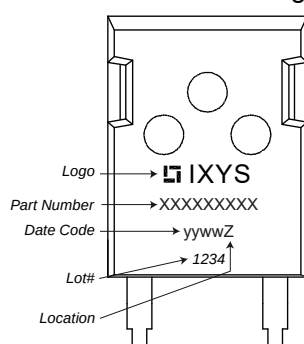
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Fast Diode				Ratings				
Symbol	Definition	Conditions		min.	typ.	max.	Unit	
V_{RSM}	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				1200	V	
V_{RRM}	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				1200	V	
I_R	reverse current, drain current	$V_R = 1200\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$			100	μA	
		$V_R = 1200\text{ V}$	$T_{VJ} = 150^{\circ}\text{C}$			0,5	mA	
V_F	forward voltage drop	$I_F = 30\text{ A}$	$T_{VJ} = 25^{\circ}\text{C}$			3,75	V	
		$I_F = 60\text{ A}$				4,63	V	
		$I_F = 30\text{ A}$	$T_{VJ} = 150^{\circ}\text{C}$			2,30	V	
		$I_F = 60\text{ A}$				3,10	V	
I_{FAV}	average forward current	$T_C = 100^{\circ}\text{C}$ rectangular d = 0.5	$T_{VJ} = 175^{\circ}\text{C}$			30	A	
V_{F0}	threshold voltage	} for power loss calculation only		$T_{VJ} = 175^{\circ}\text{C}$		1,26	V	
r_F	slope resistance					25,2	m Ω	
R_{thJC}	thermal resistance junction to case					0,9	K/W	
R_{thCH}	thermal resistance case to heatsink				0,25		K/W	
P_{tot}	total power dissipation	$T_C = 25^{\circ}\text{C}$				165	W	
I_{FSM}	max. forward surge current	t = 10 ms; (50 Hz), sine; $V_R = 0\text{ V}$		$T_{VJ} = 45^{\circ}\text{C}$		200	A	
C_J	junction capacitance	$V_R = 600\text{ V}$ f = 1 MHz		$T_{VJ} = 25^{\circ}\text{C}$	12		pF	
I_{RM}	max. reverse recovery current	} $I_F = 30\text{ A}; V_R = 600\text{ V}$ -di _F /dt = 400 A/μs		$T_{VJ} = 25^{\circ}\text{C}$	12,5		A	
	$T_{VJ} = 125^{\circ}\text{C}$			18		A		
t_{rr}	reverse recovery time			$T_{VJ} = 25^{\circ}\text{C}$		140		ns
				$T_{VJ} = 125^{\circ}\text{C}$		480		ns

Package TO-247			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal			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				6		g
M_D	mounting torque		0,8		1,2	Nm
F_C	mounting force with clip		20		120	N

Product Marking



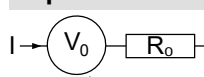
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSEP30-12B	DSEP30-12B	Tube	30	521203

Similar Part	Package	Voltage class
DSEP30-12A	TO-247AD (2)	1200

Equivalent Circuits for Simulation

* on die level

$T_{VJ} = 175^{\circ}\text{C}$



Fast Diode

$V_{0 \max}$ threshold voltage

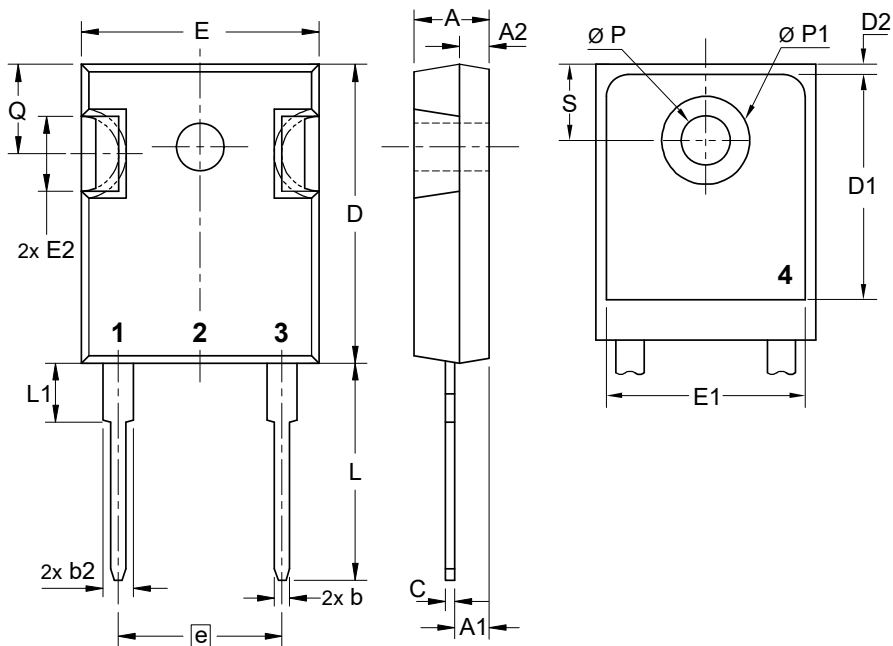
1,26

V

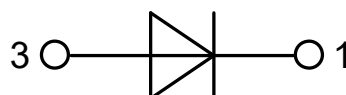
$R_{0 \max}$ slope resistance *

22,6

mΩ

Outlines TO-247


Sym.	Inches		Millimeter	
	min.	max.	min.	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



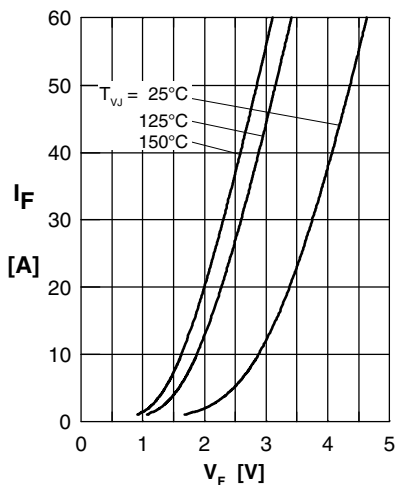
Fast Diode


Fig. 1 Forward current I_F versus V_F

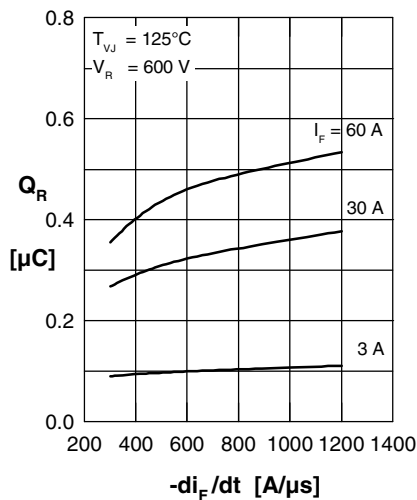


Fig. 2 Typ. reverse recov. charge Q_R versus $-di_F/dt$

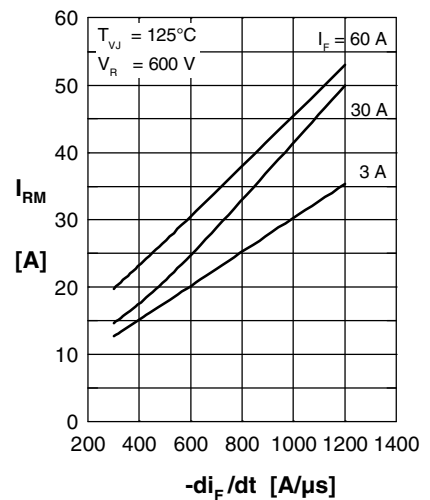


Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$

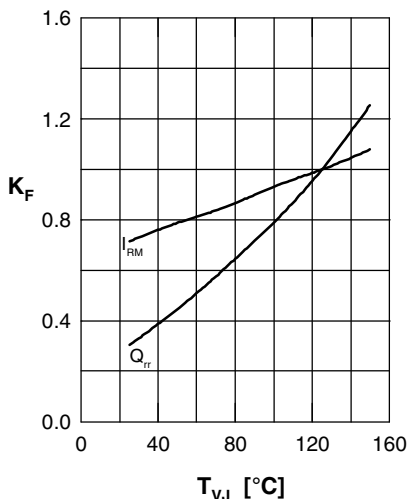


Fig. 4 Typ. dynamic parameters Q_r , I_{RM} versus T_{VJ}

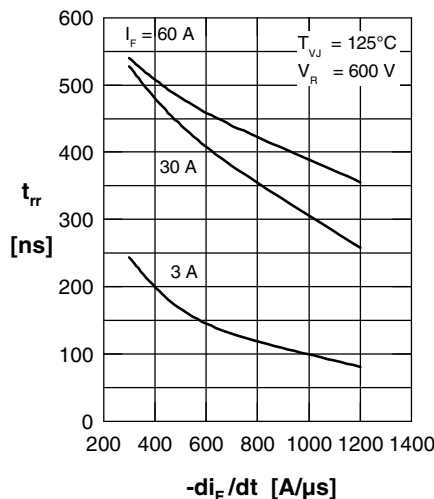


Fig. 5 Typ. recovery time t_{rr} versus $-di_F/dt$

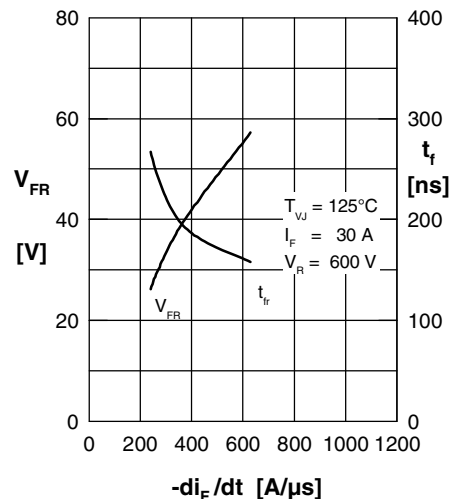


Fig. 6 Typ. peak forward voltage V_{FR} and t_{fr} versus di_F/dt

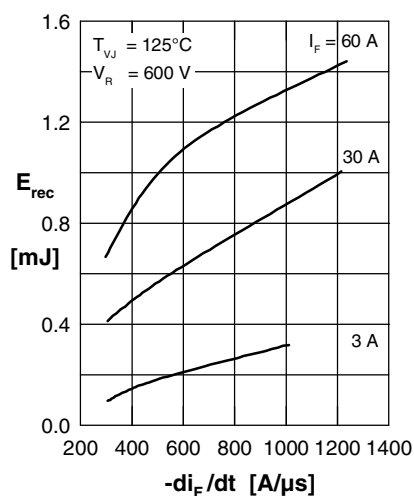


Fig. 7 Typ. recovery energy E_{rec} versus $-di_F/dt$

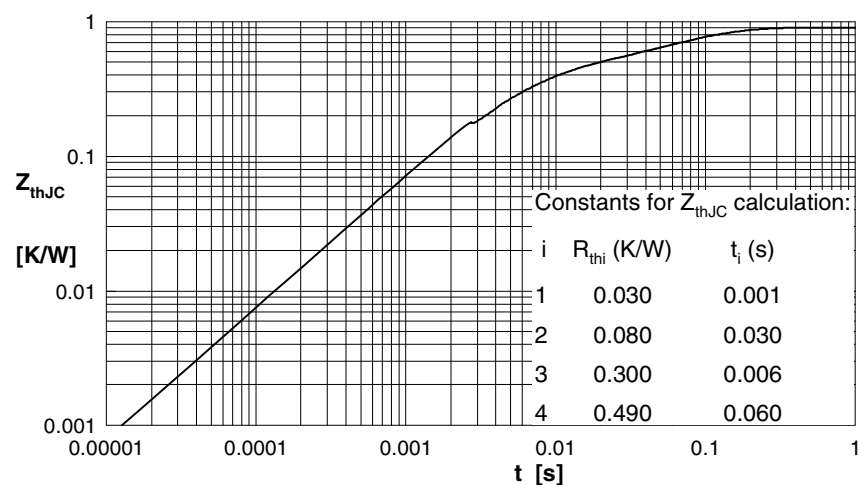


Fig. 8 Transient thermal resistance junction to case