

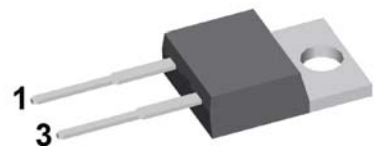
HiPerFRED

$$\begin{aligned} V_{RRM} &= 1200\text{V} \\ I_{FAV} &= 12\text{A} \\ t_{rr} &= 35\text{ns} \end{aligned}$$

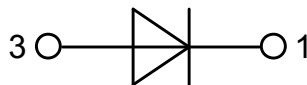
High Performance Fast Recovery Diode
Low Loss and Soft Recovery
Single Diode

Part number

DSEP12-12B



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)

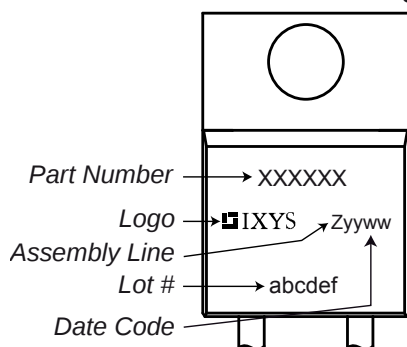
Package: TO-220

- 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	$T_{VJ} = 25^{\circ}\text{C}$				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	$I_F = 15\text{ A}$	$T_{VJ} = 25^{\circ}\text{C}$			3.25	V
		$I_F = 30\text{ A}$				3.96	V
		$I_F = 15\text{ A}$	$T_{VJ} = 150^{\circ}\text{C}$			2.06	V
		$I_F = 30\text{ A}$				2.89	V
I_{FAV}	average forward current	$T_C = 130^{\circ}\text{C}$ rectangular d = 0.5	$T_{VJ} = 175^{\circ}\text{C}$			12	A
V_{F0}	threshold voltage	} for power loss calculation only				1.00	V
r_F	slope resistance					55	m Ω
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	$T_C = 25^{\circ}\text{C}$				95	W
I_{FSM}	max. forward surge current	t = 10 ms; (50 Hz), sine; $V_R = 0\text{ V}$	$T_{VJ} = 45^{\circ}\text{C}$			90	A
C_J	junction capacitance	$V_R = 600\text{ V}$ f = 1 MHz	$T_{VJ} = 25^{\circ}\text{C}$		5		pF
I_{RM}	max. reverse recovery current	} $I_F = 15\text{ A}; V_R = 800\text{ V}$ -di _F /dt = 500 A/ μs	$T_{VJ} = 25^{\circ}\text{C}$		14		A
			$T_{VJ} = 125^{\circ}\text{C}$		23		A
t_{rr}	reverse recovery time		$T_{VJ} = 25^{\circ}\text{C}$		70		ns
			$T_{VJ} = 125^{\circ}\text{C}$		300		ns

Package TO-220			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal			35	A
T_{VJ}	virtual junction temperature		-55		175	°C
T_{op}	operation temperature		-55		150	°C
T_{stg}	storage temperature		-55		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



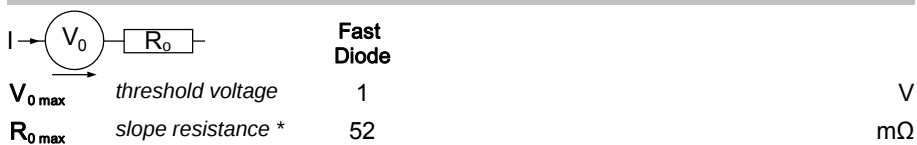
Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSEP12-12B	DSEP12-12B	Tube	50	501129

Similar Part	Package	Voltage class
DSEP12-12A	TO-220AC (2)	1200
DSEP15-12CR	ISOPLUS247 (2)	1200

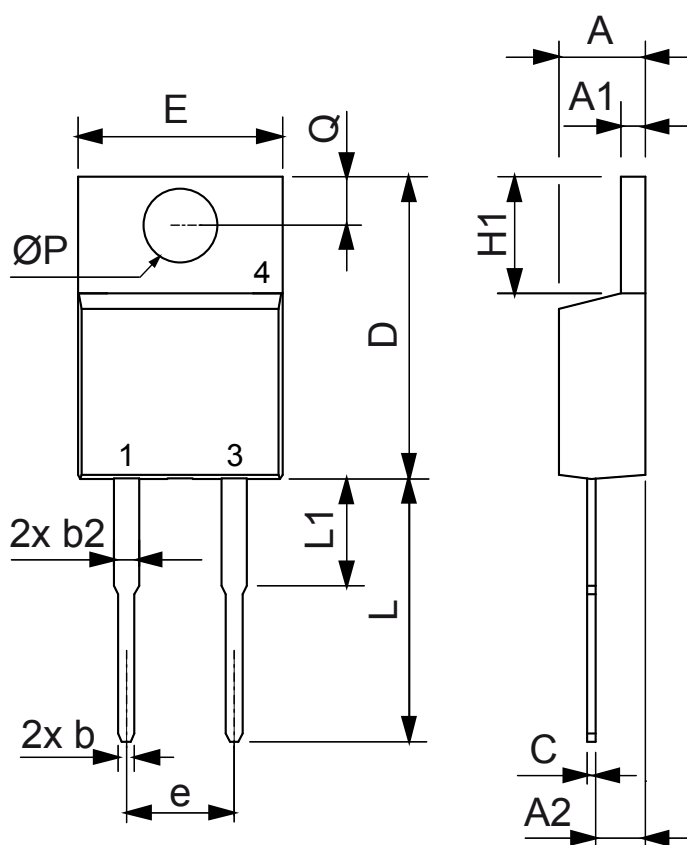
Equivalent Circuits for Simulation

* on die level

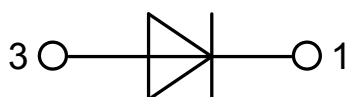
$T_{VJ} = 175^{\circ}\text{C}$



Outlines TO-220



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
$\varnothing P$	3.54	4.08	0.139	0.161
Q	2.54	3.18	0.100	0.125



Fast Diode

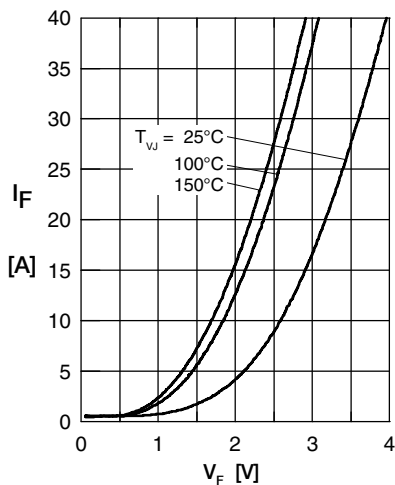


Fig. 1 Forward current I_F versus V_F

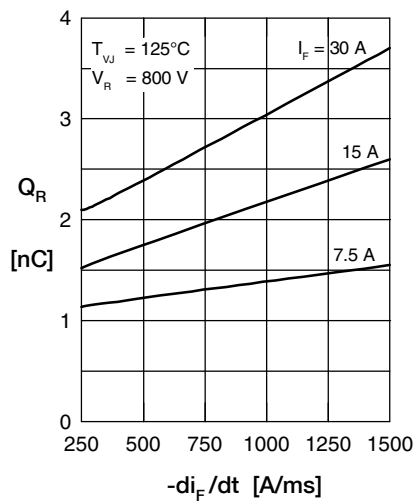


Fig. 2 Typ. reverse recov. charge Q_R versus $-di_F/dt$

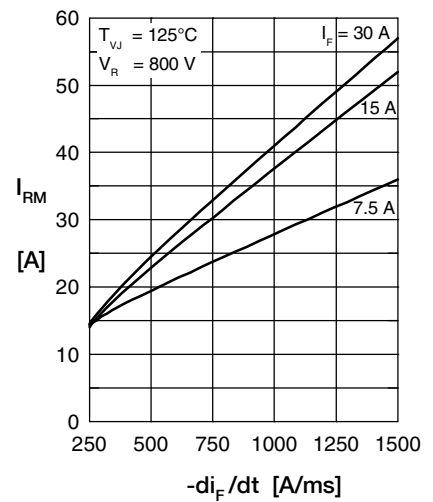


Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$

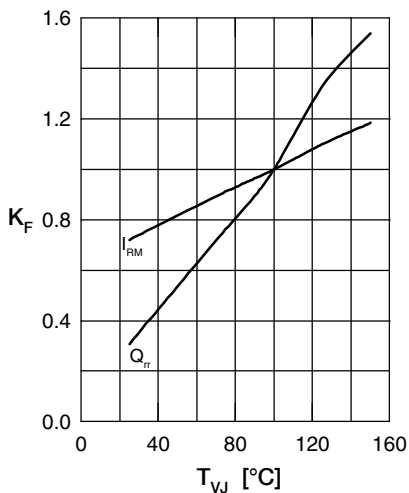


Fig. 4 Typ. dynamic parameters Q_R , I_{RM} versus T_{VJ}

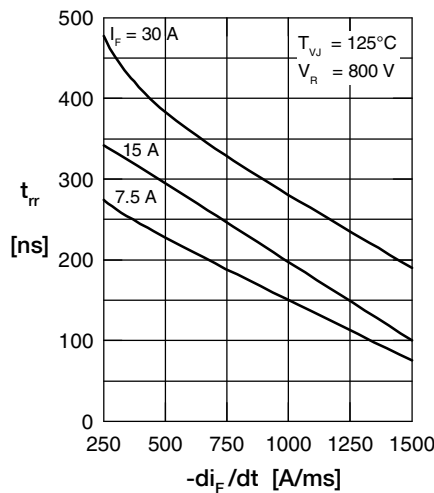


Fig. 5 Typ. recovery time t_{rr} versus $-di_F/dt$

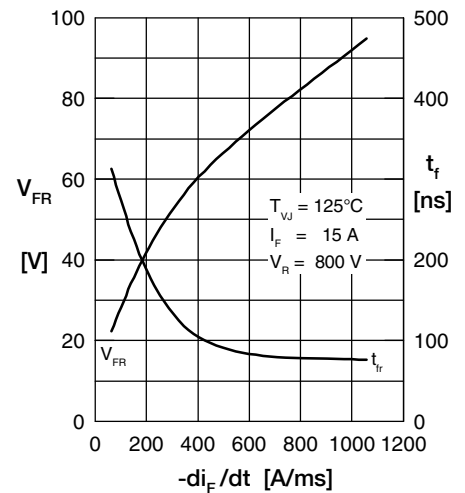


Fig. 6 Typ. peak forward voltage V_{FR} and t_{fr} versus di_F/dt

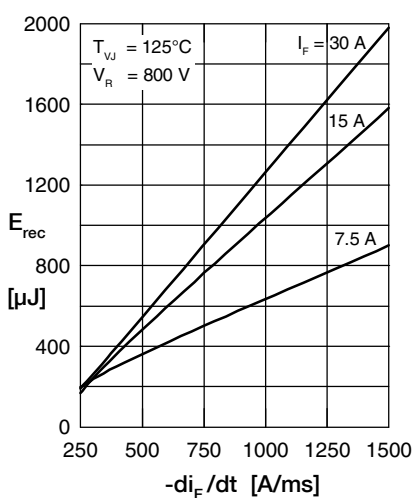


Fig. 7 Typ. recovery energy E_{rec} versus $-di_F/dt$

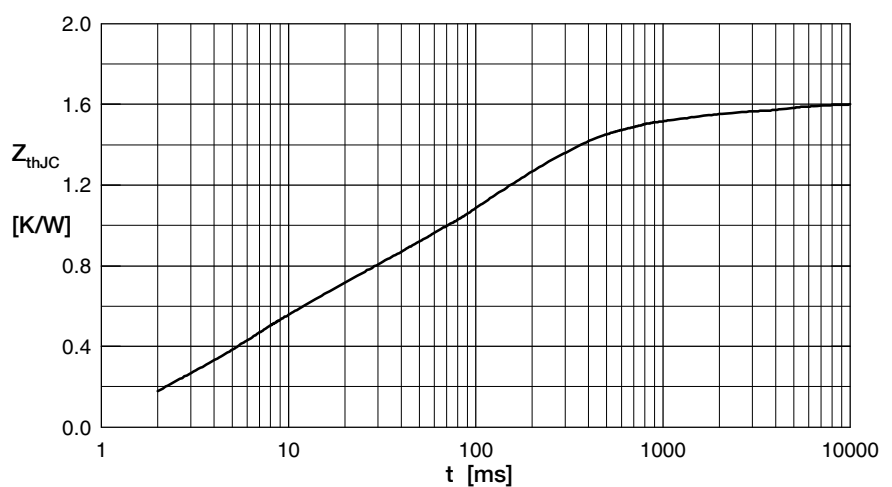


Fig. 8 Transient thermal resistance junction to case