

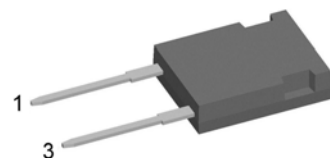
HiPerFRED

$$\begin{aligned} V_{RRM} &= 1200\text{ V} \\ I_{FAV} &= 30\text{ A} \\ t_{rr} &= 40\text{ ns} \end{aligned}$$

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

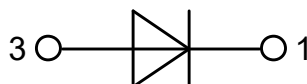
Part number

DSEP30-12AR



Backside: isolated

 E72873



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: ISOPLUS247

- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Soldering pins for PCB mounting
- Backside: DCB ceramic
- Reduced weight
- Advanced power cycling

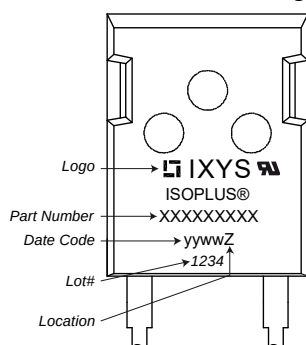
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Fast Diode				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				1200	V
V_{RRM}	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				1200	V
I_R	reverse current, drain current	$V_R = 1200\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$			250	μA
		$V_R = 1200\text{ V}$	$T_{VJ} = 150^{\circ}\text{C}$			1	mA
V_F	forward voltage drop	$I_F = 30\text{ A}$	$T_{VJ} = 25^{\circ}\text{C}$			2,74	V
		$I_F = 60\text{ A}$				3,27	V
		$I_F = 30\text{ A}$	$T_{VJ} = 150^{\circ}\text{C}$			1,79	V
		$I_F = 60\text{ A}$				2,30	V
I_{FAV}	average forward current	$T_C = 105^{\circ}\text{C}$ rectangular	$T_{VJ} = 175^{\circ}\text{C}$ d = 0.5			30	A
V_{F0}	threshold voltage	} for power loss calculation only		$T_{VJ} = 175^{\circ}\text{C}$		1,12	V
r_F	slope resistance					16	m Ω
R_{thJC}	thermal resistance junction to case					1,1	K/W
R_{thCH}	thermal resistance case to heatsink				0,25		K/W
P_{tot}	total power dissipation	$T_C = 25^{\circ}\text{C}$				135	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 = 200 A/ μs		$T_{VJ} = 25^{\circ}\text{C}$	8,5		A
				$T_{VJ} = 100^{\circ}\text{C}$	13		A
t_{rr}	reverse recovery time			$T_{VJ} = 25^{\circ}\text{C}$	60		ns
				$T_{VJ} = 100^{\circ}\text{C}$	170		ns

Package ISOPLUS247			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
F_c	mounting force with clip		20		120	N
$d_{Spp/App}$	creepage distance on surface striking distance through air	terminal to terminal	5,4			mm
$d_{Spb/Apb}$		terminal to backside	4,1			mm
V_{ISOL}	isolation voltage	t = 1 second	3600			V
		t = 1 minute	3000			V

Product Marking



Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSEP30-12AR	DSEP30-12AR	Tube	30	481920

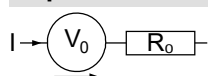
Similar Part	Package	Voltage class
DSEP30-12A	TO-247AD (2)	1200
DSEP29-12A	TO-220AC (2)	1200
DHG30I1200HA	TO-247AD (2)	1200
DSEP30-12CR	ISOPLUS247 (2)	1200

DSEP30-12B	TO-247AD (2)	1200
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Equivalent Circuits for Simulation

* on die level

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



Fast Diode

$V_{0 \max}$ threshold voltage

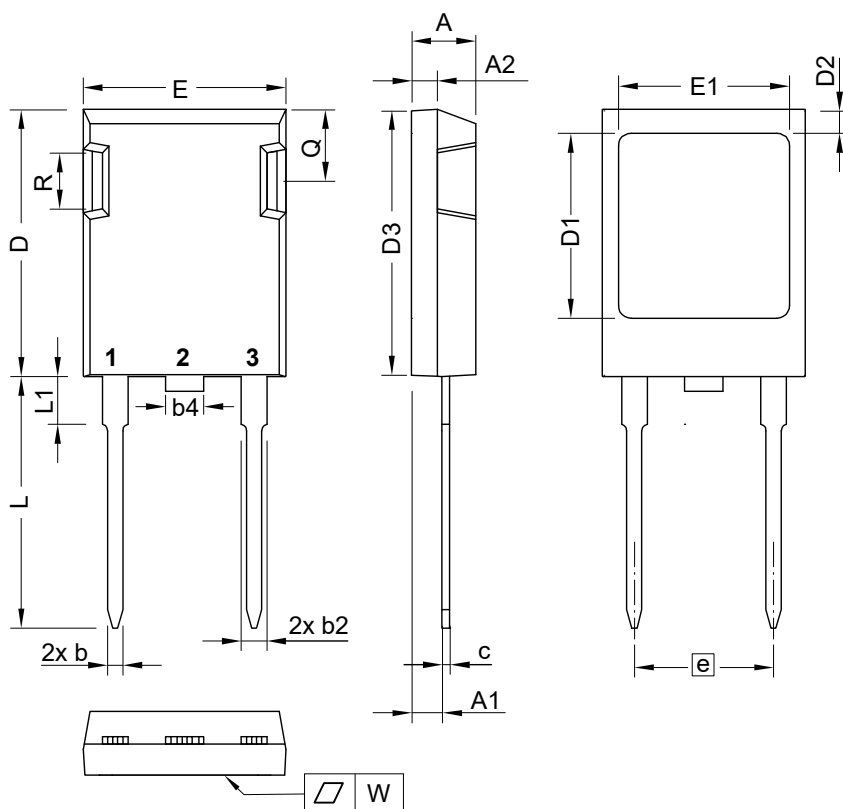
1,12

V

$R_{0 \max}$ slope resistance *

13,4

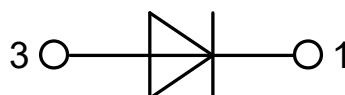
mΩ

Outlines ISOPLUS247


Dim.	Millimeter		Inches	
	min	max	min	max
A	4.83	5.21	0.190	0.205
A1	2.29	2.54	0.090	0.100
A2	1.91	2.16	0.075	0.085
b	1.14	1.40	0.045	0.055
b1	1.91	2.20	0.075	0.087
b2	2.92	3.24	0.115	0.128
b3	0.61	0.83	0.024	0.033
b4	20.80	21.34	0.819	0.840
c	15.75	16.26	0.620	0.640
D	1.65	2.15	0.065	0.085
D1	20.30	20.70	0.799	0.815
D2	15.75	16.13	0.620	0.635
D3	13.21	13.72	0.520	0.540
E	10.90	BSC	0.429	BSC
E1	19.81	20.60	0.780	0.811
L	3.81	4.38	0.150	0.172
L1	5.59	6.20	0.220	0.244
Q	4.25	5.50	0.167	0.217
R	-	0.10	-	0.004
W	-	-	-	-

Die konvexe Form des Substrates ist typ. < 0.04 mm über der Kunststoffoberfläche der Bauteilunterseite
 The convex bow of substrate is typ. < 0.04 mm over plastic surface level of device bottom side

Die Gehäuseabmessungen entsprechen dem Typ TO-247 AD gemäß JEDEC außer Schraubloch und L_{max} .
 This drawing will meet all dimensions requirement of JEDEC outline TO-247 AD except screw hole and except L_{max} .



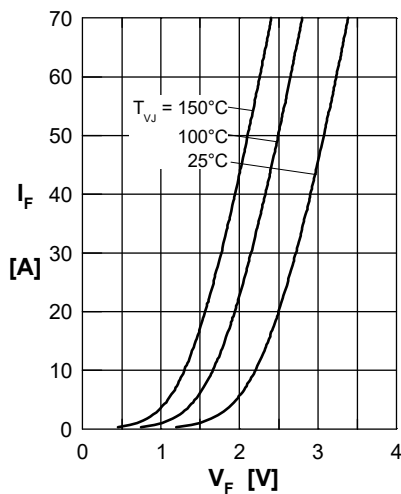
Fast Diode


Fig. 1 Forward current
 I_F versus V_F

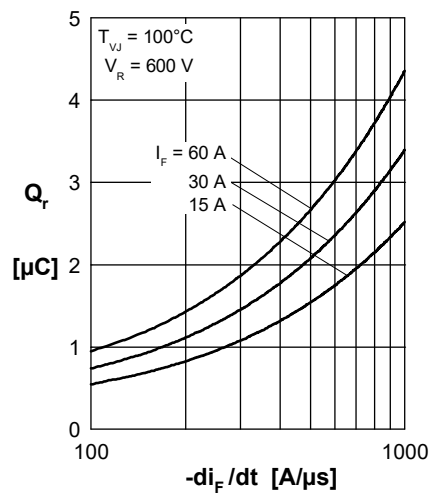


Fig. 2 Typ. reverse recov. charge
 Q_r versus $-di_F/dt$

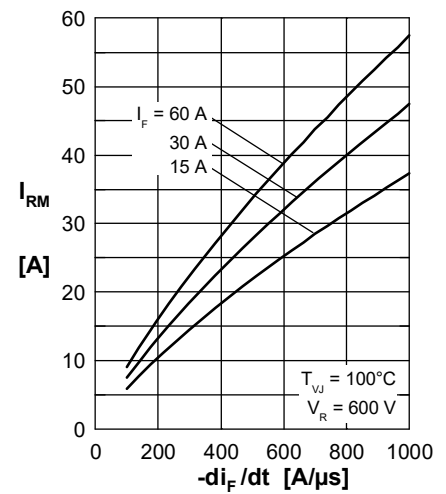


Fig. 3 Typ. peak reverse current
 I_{RM} versus $-di_F/dt$

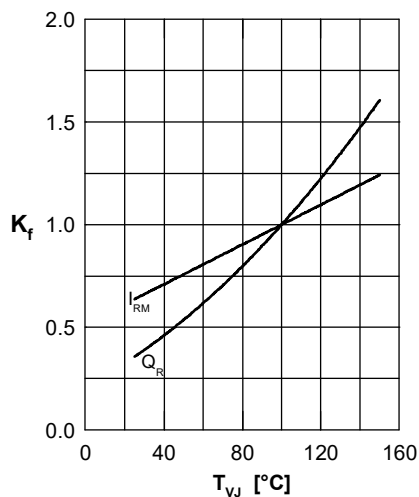


Fig. 4 Typ. dynamic parameters
 Q_r , I_{RM} versus T_{VJ}

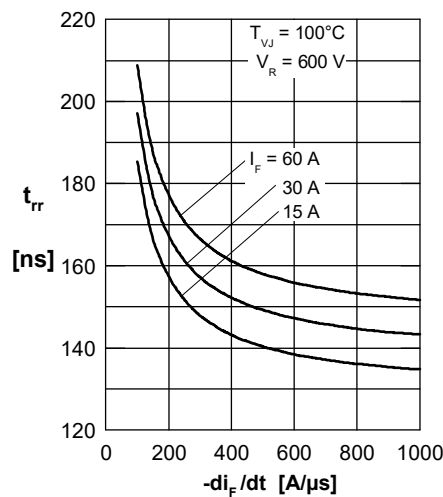


Fig. 5 Typ. recovery time
 t_{rr} versus $-di_F/dt$

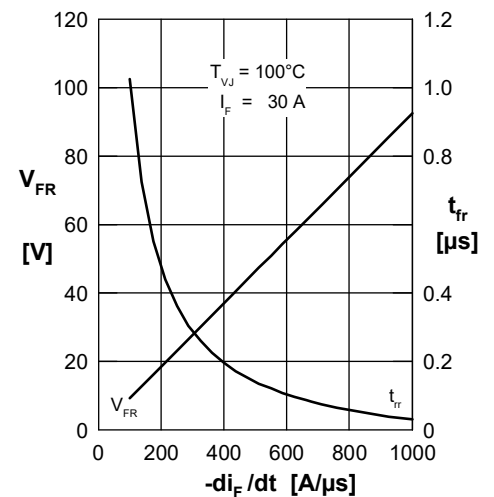


Fig. 6 Typ. peak forward voltage
 V_{FR} and t_{rr} versus di_F/dt

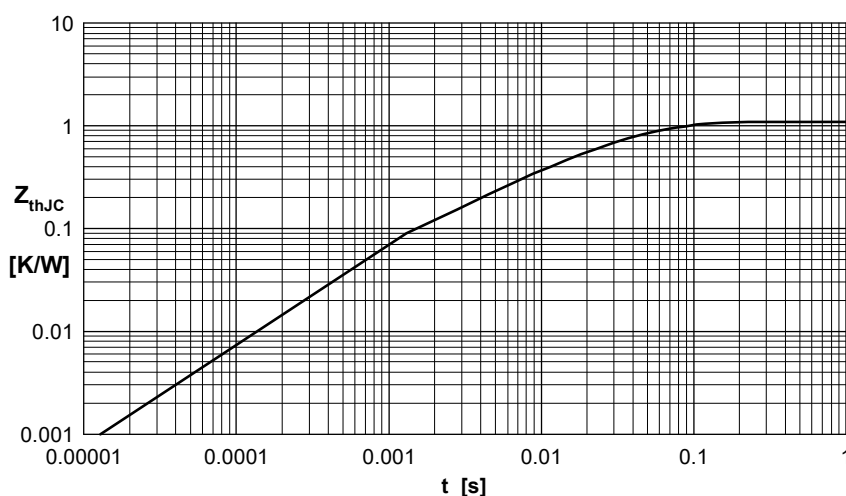


Fig. 7 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.030	0.0005
2	0.100	0.0050
3	0.360	0.0200
4	0.610	0.0500