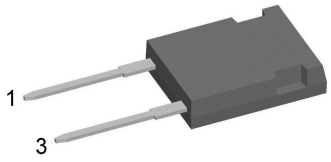
HiPerDynFRED

V_{RRM}	=	1200 V
I_{FAV}	=	30 A
t_{rr}	=	15 ns

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

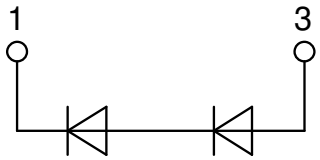
Part number

DSEP30-12CR



Backside: isolated

E72873



Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very short recovery time
- Improved thermal behaviour
- Very low Irm-values
- Very soft recovery behaviour
- Soft reverse recovery for low EMI/RFI
- Low Irm 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

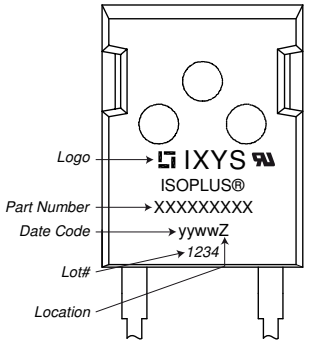
- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Soldering pins for PCB mounting
- Backside: DCB ceramic
- Reduced weight
- Advanced power cycling

Fast Diode

Symbol	Definition	Conditions		Ratings min.	typ.	max.	Unit
V_{RSM}	*max. non-repetitive reverse blocking voltage*		T_{VJ} = 25°C			1200	V
V_{RRM}	*max. repetitive reverse blocking voltage*		T_{VJ} = 25°C			1200	V
I_R	*reverse current, drain current*	V_R = 1200 V	T_{VJ} = 25°C			250	µA
		V_R = 1200 V	T_{VJ} = 150°C			2	mA
V_F	*forward voltage drop*	I_F = 30 A	T_{VJ} = 25°C			4.98	V
		I_F = 60 A				6.33	V
		I_F = 30 A	T_{VJ} = 150°C			3.18	V
		I_F = 60 A				4.40	V
I_{FAV}	*average forward current*	T_C = 105°C	T_{VJ} = 175°C			30	A
		rectangular d = 0.5					
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 175°C			1.69	V
r_F	*slope resistance* }					36.6	mΩ
R_{thJC}	*thermal resistance junction to case*					0.6	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.3		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			250	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine; V_R = 0 V	T_{VJ} = 45°C			250	A
C_J	*junction capacitance*	V_R = 800 V f = 1 MHz	T_{VJ} = 25°C		13		pF
I_{RM}	*max. reverse recovery current*		T_{VJ} = 25°C		5.5		A
		I_F = 30 A; V_R = 600 V	T_{VJ} = 100°C		12.5		A
t_{rr}	*reverse recovery time*	$-di_F/dt$ = 600 A/µs	T_{VJ} = 25°C		15		ns
			T_{VJ} = 100°C		70		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	50/60 Hz, RMS; I_{ISOL} ≤ 1 mA	3600			V
		t = 1 minute		3000			V

Product Marking

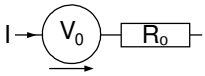


Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSEP30-12CR	DSEP30-12CR	Tube	30	481955

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

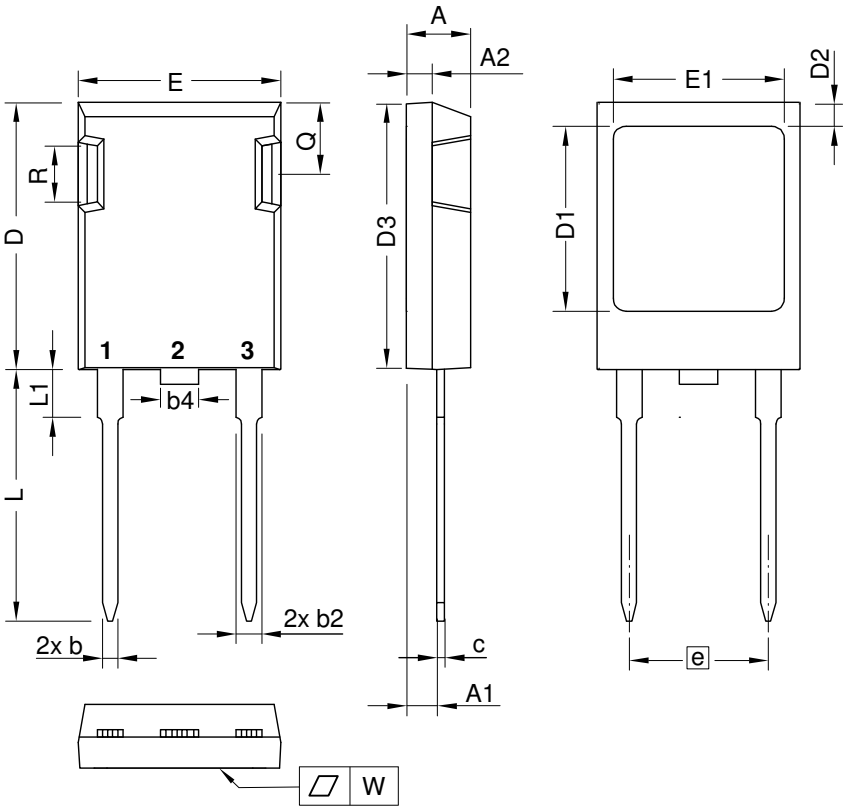
Equivalent Circuits for Simulation

** on die level* T_{VJ} = 175°C



		Fast Diode	
$V_{0\ max}$	*threshold voltage*	1.69	V
$R_{0\ max}$	*slope resistance **	34	mΩ

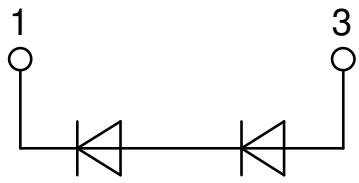
Outlines ISOPLUS247



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
b2	1.91	2.20	0.075	0.087
b4	2.92	3.24	0.115	0.128
c	0.61	0.83	0.024	0.033
D	20.80	21.34	0.819	0.840
D1	15.75	16.26	0.620	0.640
D2	1.65	2.15	0.065	0.085
D3	20.30	20.70	0.799	0.815
E	15.75	16.13	0.620	0.635
E1	13.21	13.72	0.520	0.540
e	10.90 BSC		0.429 BSC	
L	19.81	20.60	0.780	0.811
L1	3.81	4.38	0.150	0.172
Q	5.59	6.20	0.220	0.244
R	4.25	5.50	0.167	0.217
W	-	0.10	-	0.004

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 requiarement of JEDEC outline TO-247 AD except screw hole and except $L_{max.}$



Fast Diode

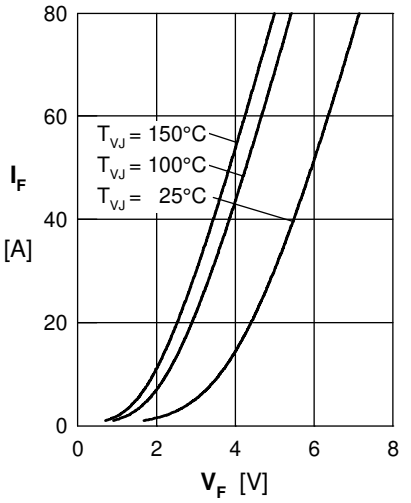


Fig. 1 Forward current I_F vs. V_F

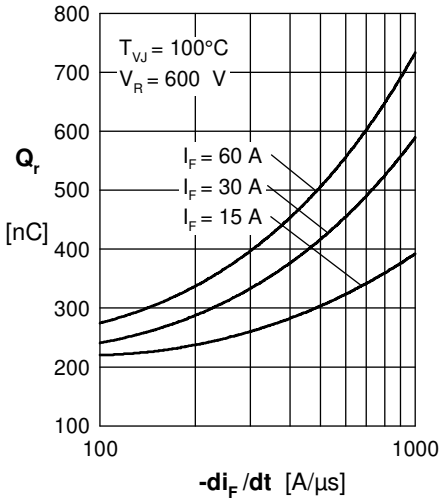


Fig. 2 Reverse recovery charge Q_r versus $-di_F/dt$

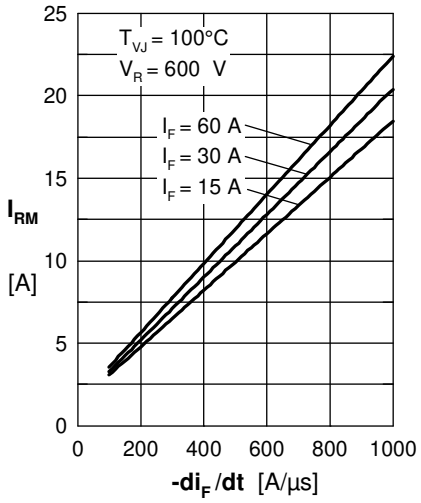


Fig. 3 Peak reverse current I_{RM} versus $-di_F/dt$

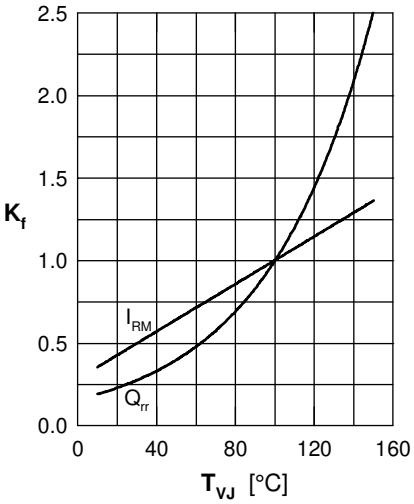


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

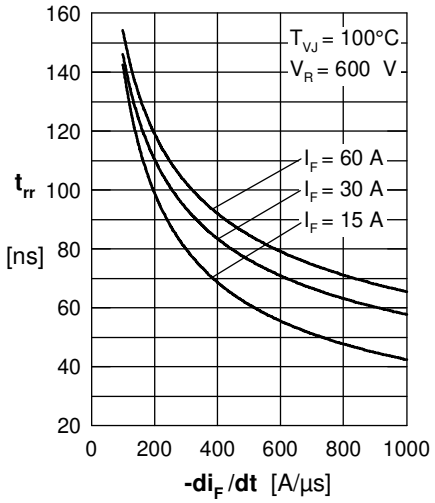


Fig. 5 Recovery time t_{rr} versus $-di_F/dt$

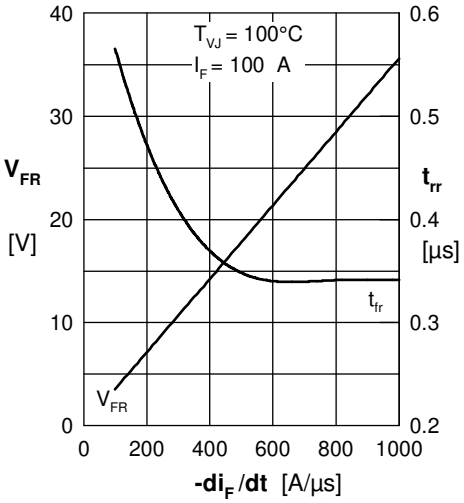


Fig. 6 Peak forward voltage V_{FR} and tfr versus di_F/dt

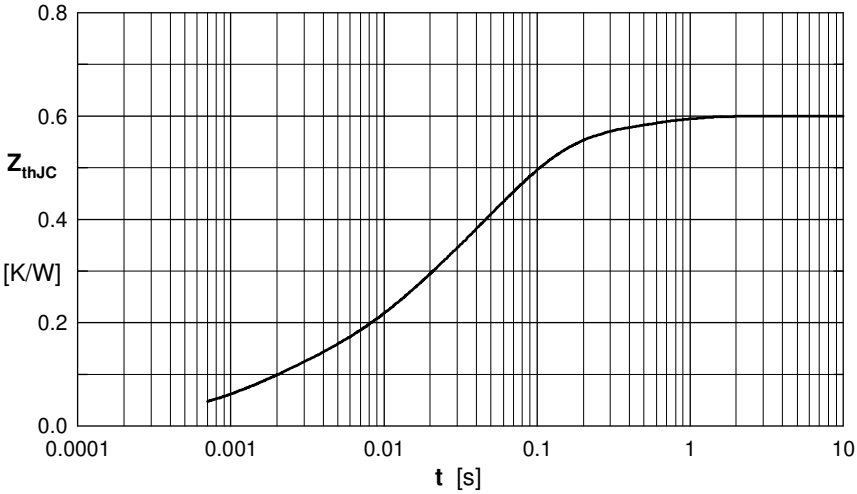


Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.08	0.0013
2	0.122	0.0097
3	0.116	0.037
4	0.23	0.07
5	0.052	0.45