HiPerFRED

V_{RRM}	= 2x	600 V
I_{FAV}	=	30 A
t_{rr}	=	35 ns

High Performance Fast Recovery Diode
Low Loss and Soft Recovery
Phase leg

Part number

DSEE29-12CC
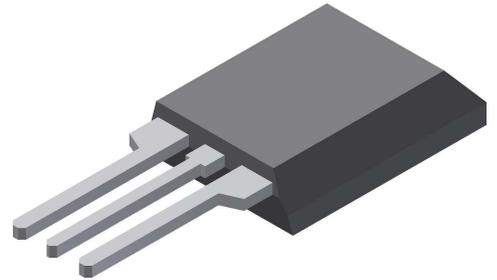
Backside: isolated

UL E72873
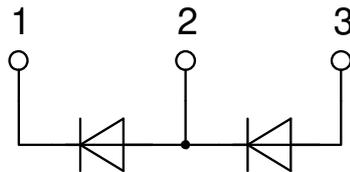
Features / Advantages:

● Planar passivated chips
● Very low leakage current
● Very short recovery time
● Improved thermal behaviour
● Very low Irm-values
● Very soft recovery behaviour
● Avalanche voltage rated for reliable operation
● 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: ISOPLUS220

● 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

<div style="text-align: right">Ratings</div>

Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	*max. non-repetitive reverse blocking voltage*		$T_{VJ} = 25°C$			600	V
V_{RRM}	*max. repetitive reverse blocking voltage*		$T_{VJ} = 25°C$			600	V
I_R	*reverse current, drain current*	$V_R = 600$ V	$T_{VJ} = 25°C$			500	µA
		$V_R = 600$ V	$T_{VJ} = 150°C$			1	mA
V_F	*forward voltage drop*	$I_F = 30$ A	$T_{VJ} = 25°C$			1.62	V
		$I_F = 60$ A				1.95	V
		$I_F = 30$ A	$T_{VJ} = 150°C$			1.27	V
		$I_F = 60$ A				1.58	V
I_{FAV}	*average forward current*	$T_C = 130°C$	$T_{VJ} = 175°C$			30	A
		rectangular d = 0.5					
V_{F0}	*threshold voltage* } *for power loss calculation only*		$T_{VJ} = 175°C$			1.00	V
r_F	*slope resistance*					10	mΩ
R_{thJC}	*thermal resistance junction to case*					0.9	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.5		K/W
P_{tot}	*total power dissipation*		$T_C = 25°C$			165	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine; $V_R = 0$ V	$T_{VJ} = 45°C$			200	A
C_J	*junction capacitance*	$V_R = 400$ V f = 1 MHz	$T_{VJ} = 25°C$		26		pF
I_{RM}	*max. reverse recovery current*		$T_{VJ} = 25°C$		17		A
		$I_F = 30$ A; $V_R = 300$ V	$T_{VJ} = 100°C$		29		A
t_{rr}	*reverse recovery time*	$-di_F/dt = 600$ A/µs	$T_{VJ} = 25°C$		35		ns
			$T_{VJ} = 100°C$		90		ns

Data according to IEC 60747and per semiconductor unless otherwise specified   20200211c

Package	ISOPLUS220			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
F_C	mounting force with clip		20		60	N
$d_{Spp/App}$	creepage distance on surface / striking distance through air	terminal to terminal	1.0			mm
$d_{Spb/Apb}$		terminal to backside	3.0			mm
V_{ISOL}	isolation voltage	t = 1 second	3600			V
		t = 1 minute, 50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA	3000			V

Product Marking
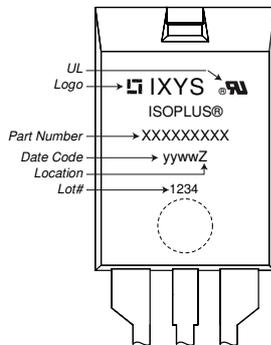
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSEE29-12CC	DSEE29-12CC	Tube	50	500694

Similar Part	Package	Voltage class
DSEE30-12A	TO-247AD (3)	600

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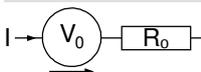
Fast Diode

$V_{0\ max}$	threshold voltage	1	V
$R_{0\ max}$	slope resistance *	6.2	mΩ

IXYS reserves the right to change limits, conditions and dimensions.   Data according to IEC 60747 and per semiconductor unless otherwise specified   20200211c

Outlines   ISOPLUS220
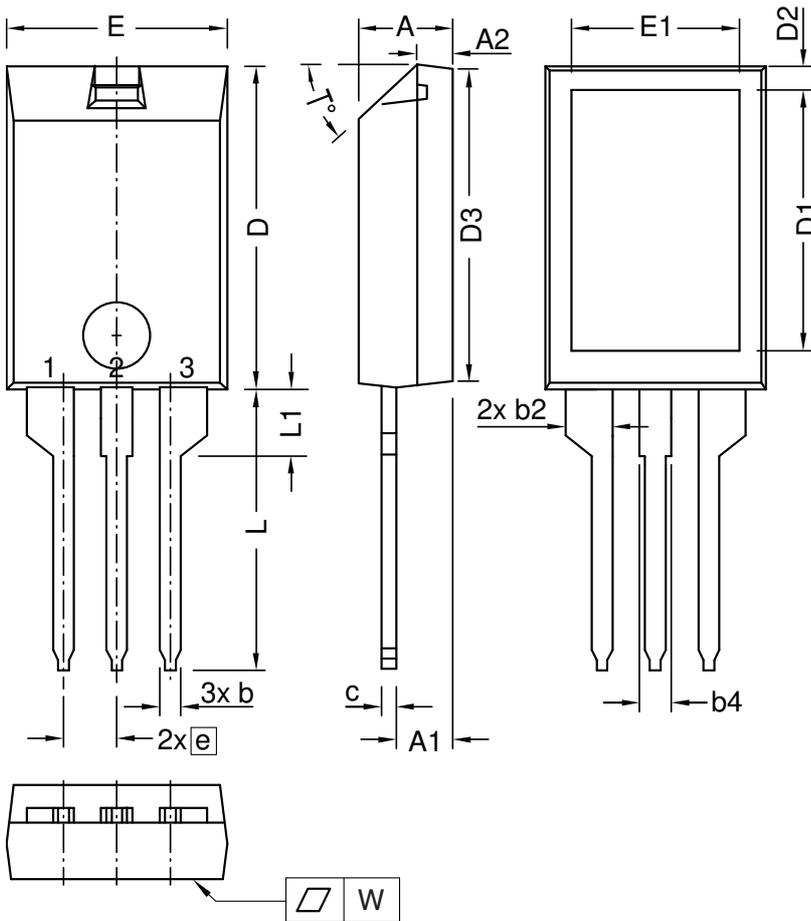
Dim.	Millimeters		Inches	
	min	max	min	max
A	4.00	5.00	0.157	0.197
A1	2.50	3.00	0.098	0.118
A2	1.60	1.80	0.063	0.071
b	0.90	1.30	0.035	0.051
b2	2.35	2.55	0.093	0.100
b4	1.25	1.65	0.049	0.065
c	0.70	1.00	0.028	0.039
D	15.00	16.00	0.591	0.630
D1	12.00	13.00	0.472	0.512
D2	1.10	1.50	0.043	0.059
D3	14.90	15.50	0.587	0.610
E	10.00	11.00	0.394	0.433
E1	7.50	8.50	0.295	0.335
e	2.54 BSC		0.100 BSC	
L	13.00	14.50	0.512	0.571
L1	3.00	3.50	0.118	0.138
T°	42.5	47.5		
W	-	0.1	-	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-273 gemäß JEDEC außer D und D1.
This drawing will meet all dimensions requiarement of JEDEC outline TO-273 except D and D1.
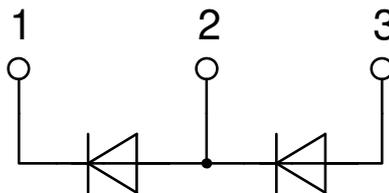
Fast Diode
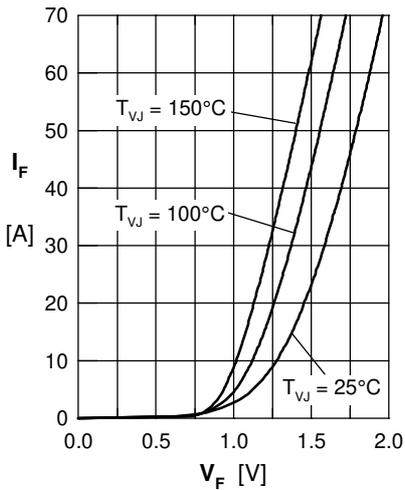
Fig. 1 Forward current I_F vs. V_F
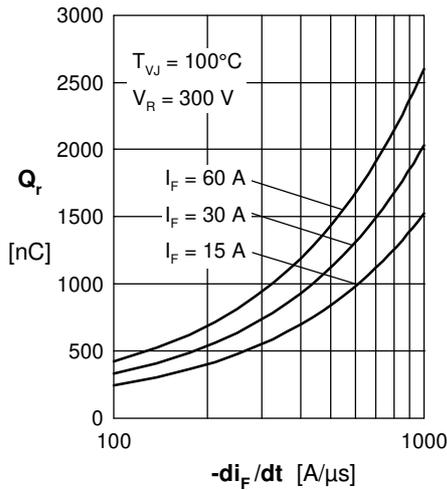
Fig. 2 Typ. reverse recovery charge Q_r versus $-di_F/dt$
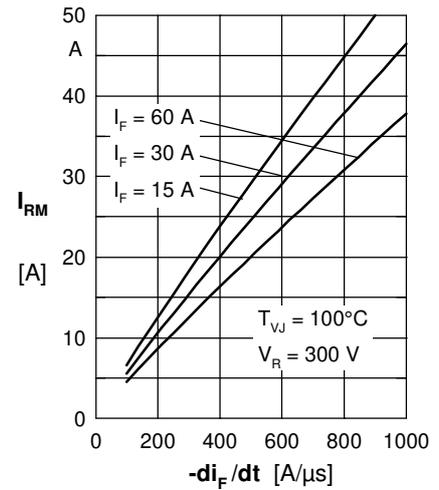

Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$
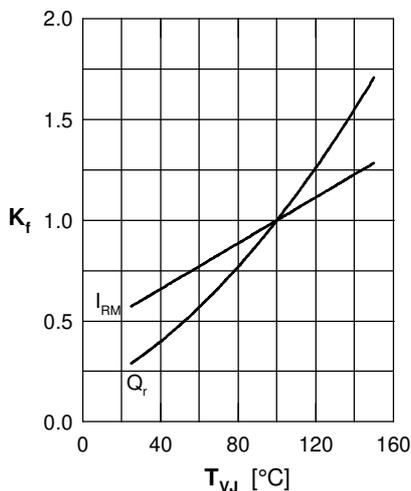

Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}
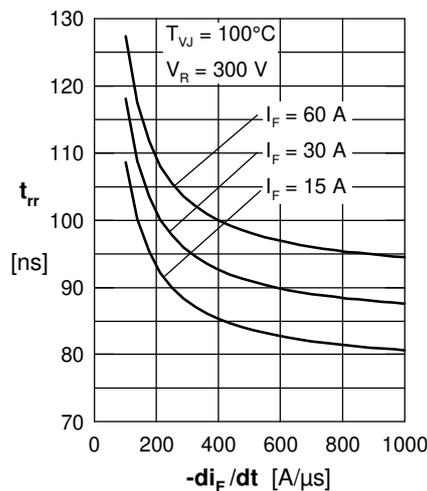
Fig. 5 Typ. recovery time t_{rr} versus $-di_F/dt$
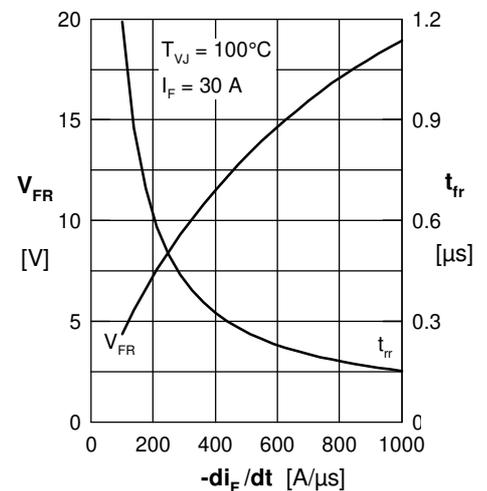
Fig. 6 Typ. peak forward voltage V_{FR} and typ. forward recovery time t_{fr} versus di_F/dt
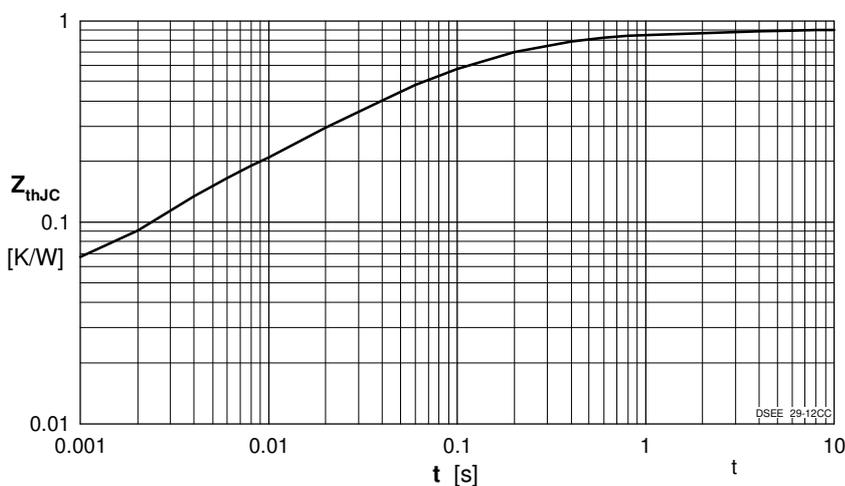
Fig. 7 Transient thermal resistance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.038	0.00024
2	0.07	0.0036
3	0.245	0.0235
4	0.198	0.1421
5	0.35	0.25

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