

HiPerFRED

High Performance Fast Recovery Diode

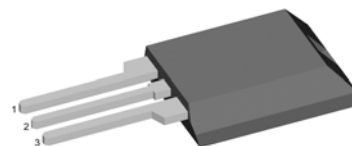
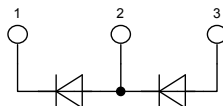
Low Loss and Soft Recovery

Phase leg

Part number

DSEE29-12CC

$$\begin{aligned} V_{RRM} &= 600 \text{ V} \\ I_{FAV} &= 30 \text{ A} \\ t_{rr} &= 35 \text{ ns} \end{aligned}$$



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:

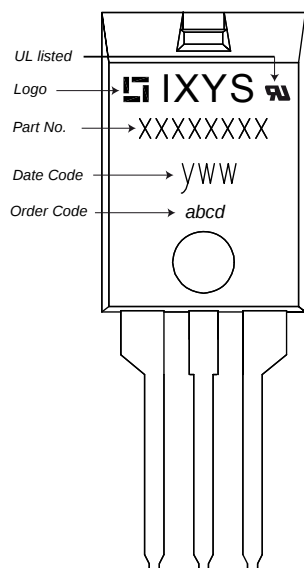
- Housing: ISOPLUS220
- Industry standard outline
- DCB isolated backside
- Isolation Voltage 3000 V
- Epoxy meets UL 94V-0
- RoHS compliant

Ratings

Symbol	Definition	Conditions	min.	typ.	max.	Unit
V_{RRM}	max. repetitive reverse voltage	$T_{VJ} = 25^{\circ}\text{C}$			600	V
I_R	reverse current	$V_R = 600 \text{ V}$ $T_{VJ} = 25^{\circ}\text{C}$			500	μA
		$V_R = 600 \text{ V}$ $T_{VJ} = 150^{\circ}\text{C}$			1	mA
V_F	forward voltage	$I_F = 30 \text{ A}$ $T_{VJ} = 25^{\circ}\text{C}$			1.62	V
		$I_F = 60 \text{ A}$ $T_{VJ} = 25^{\circ}\text{C}$			1.95	V
		$I_F = 30 \text{ A}$ $T_{VJ} = 150^{\circ}\text{C}$			1.27	V
		$I_F = 60 \text{ A}$ $T_{VJ} = 150^{\circ}\text{C}$			1.58	V
I_{FAV}	average forward current	rectangular $d = 0.5$ $T_C = 130^{\circ}\text{C}$			30	A
V_{F0}	threshold voltage	$T_{VJ} = 175^{\circ}\text{C}$ for power loss calculation only			1.00	V
r_F	slope resistance				10	m Ω
R_{thJC}	thermal resistance junction to case				0.90	K/W
T_{VJ}	virtual junction temperature		-55		175	$^{\circ}\text{C}$
P_{tot}	total power dissipation	$T_C = 25^{\circ}\text{C}$			165	W
I_{FSM}	max. forward surge current	$t = 10 \text{ ms}$ (50 Hz), sine $T_{VJ} = 45^{\circ}\text{C}$			200	A
I_{RM}	max. reverse recovery current	$T_{VJ} = 25^{\circ}\text{C}$		17		A
		$I_F = 30 \text{ A}; V_R = 300 \text{ V}$ $T_{VJ} = 100^{\circ}\text{C}$		29		A
t_{rr}	reverse recovery time	$-di_F/dt = 600 \text{ A}/\mu\text{s}$ $T_{VJ} = 25^{\circ}\text{C}$		35		ns
		$T_{VJ} = 100^{\circ}\text{C}$		90		ns
C_J	junction capacitance	$V_R = 400 \text{ V}; f = 1 \text{ MHz}$ $T_{VJ} = 25^{\circ}\text{C}$		26		pF

Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
I_{RMS}	RMS current	per terminal			35	A
R_{thCH}	thermal resistance case to heatsink			0.50		K/W
T_{stg}	storage temperature		-55		150	°C
Weight				2		g
F_c	mounting force with clip		20		60	N
V_{ISOL}	isolation voltage	t = 1 second	3600			V
		t = 1 minute	3000			V
$d_{Spp/App}$	creepage striking distance on surface through air	terminal to terminal	1.0			mm
$d_{Spb/Apb}$	creepage striking distance on surface through air	terminal to backside	3.0			mm

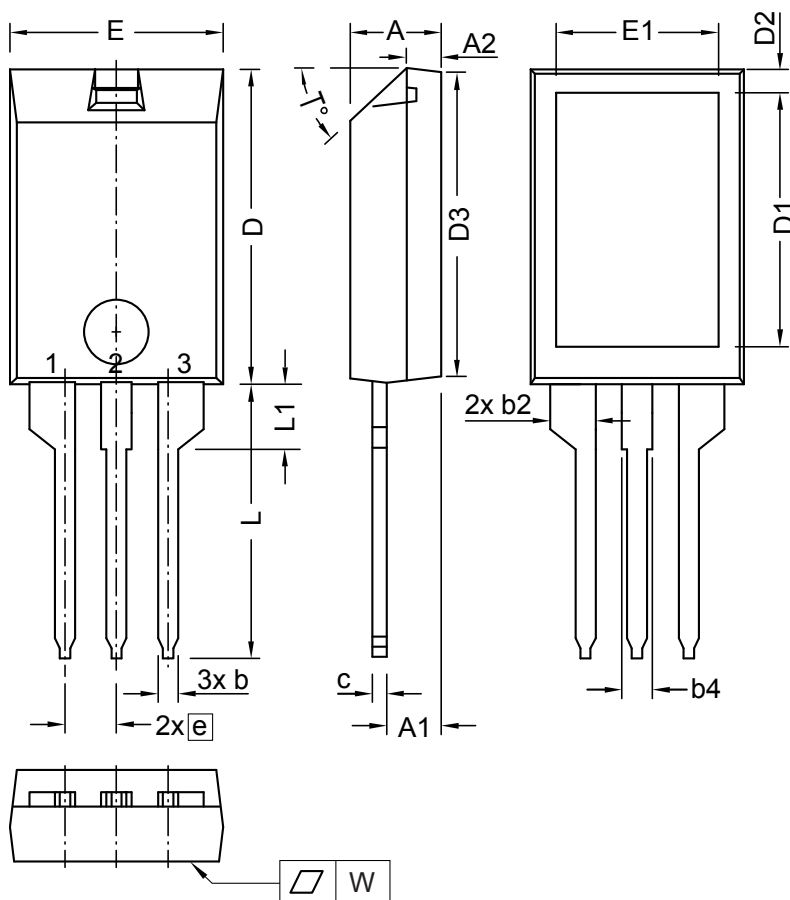
Product Marking



Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Code Key
Standard	DSEE29-12CC	DSEE29-12CC	Tube	50	500694

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

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 requirement of JEDEC outline TO-273 except D and D1.

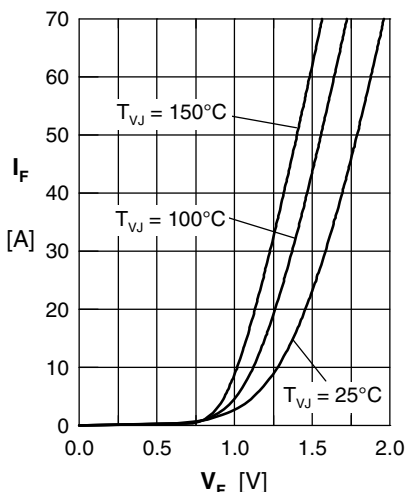


Fig. 1 Forward current I_F vs. V_F

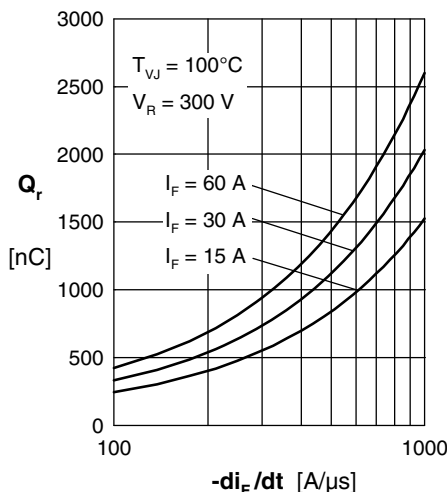


Fig. 2 Typ. reverse recovery charge Q_r versus $-di_F/dt$

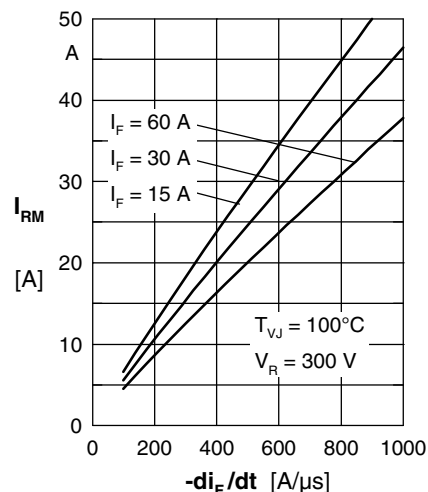


Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$

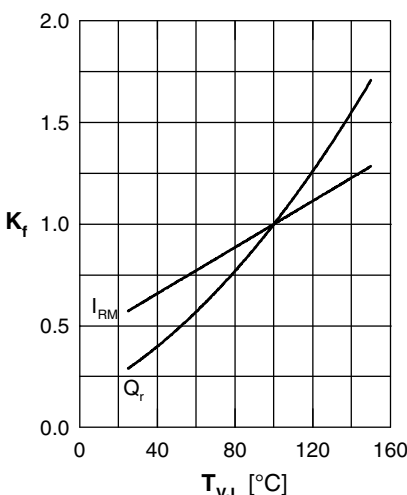


Fig. 4 Dynamic parameters Q_r , I_{RM} versus T_{VJ}

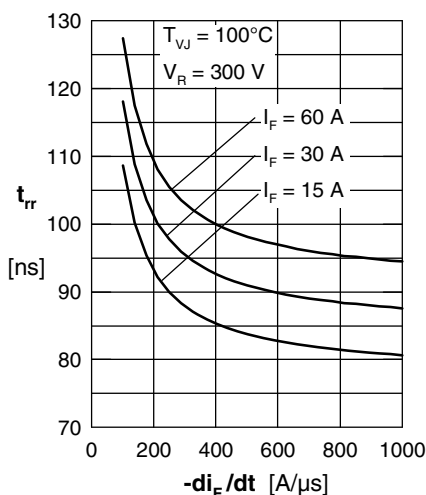


Fig. 5 Typ. recovery time t_{rr} versus $-di_F/dt$

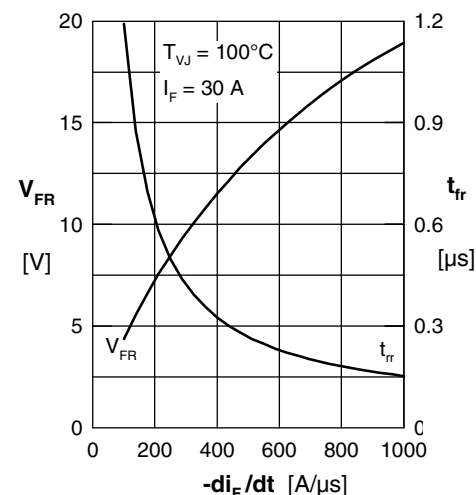


Fig. 6 Typ. peak forward voltage V_{FR} and typ. forward recovery time t_{fr} versus di_F/dt

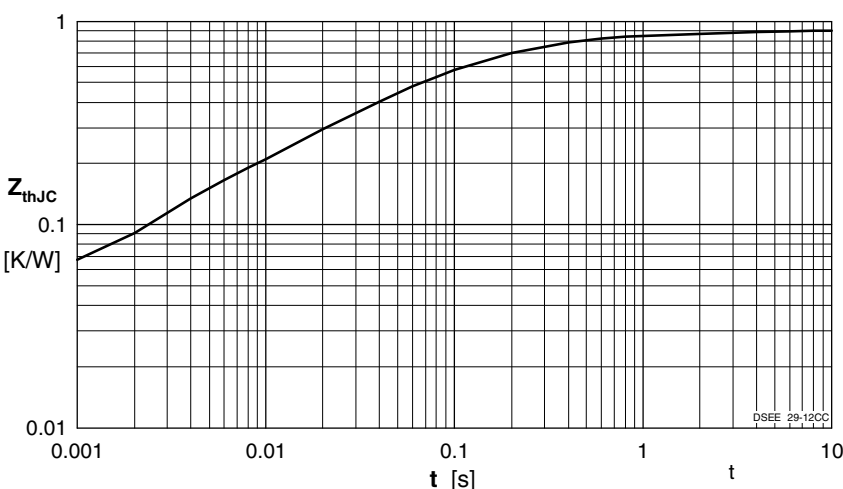


Fig. 7 Transient thermal resistance junction to case

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