

## Excellent Integrated System Limited

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**DSEE29-12CC**

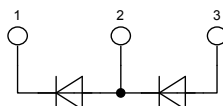
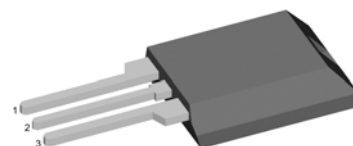
# HiPerFRED

High Performance Fast Recovery Diode

Low Loss and Soft Recovery

Phase leg

Part number

**DSEE29-12CC**

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


Backside: isolated


**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:**

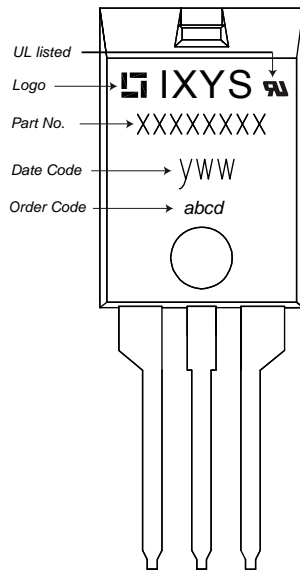
- Housing: ISOPLUS220
- Industry standard outline
- DCB isolated backside
- Isolation Voltage 3000 V
- Epoxy meets UL 94V-0
- RoHS compliant

 **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	$\mu\text{A}$
		$V_R = 600\text{ V}$ $T_{VJ} = 150^\circ\text{C}$			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	} for power loss calculation only $T_{VJ} = 175^\circ\text{C}$			1.00	V
$r_F$	slope resistance				10	m $\Omega$
$R_{thJC}$	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
		$T_{VJ} = 100^\circ\text{C}$		29		A
$t_{rr}$	reverse recovery time	$I_F = 30\text{ A}; V_R = 300\text{ V}$ $-di_F/dt = 600\text{ A}/\mu\text{s}$ $T_{VJ} = 25^\circ\text{C}$		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
<b>Weight</b>				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

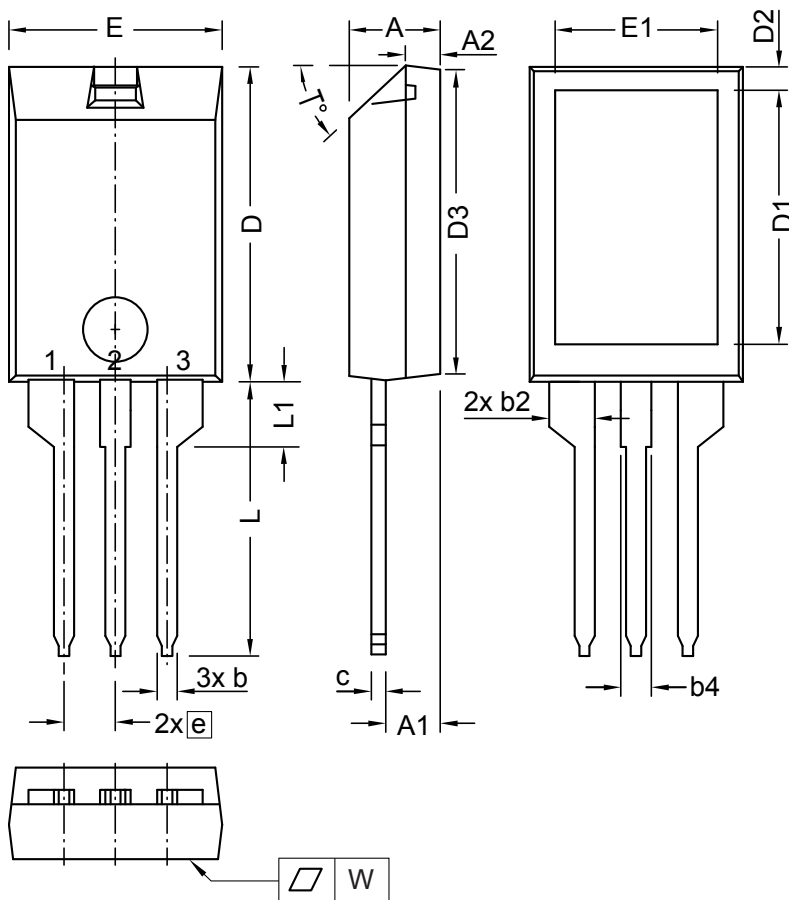
### Product Marking



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.

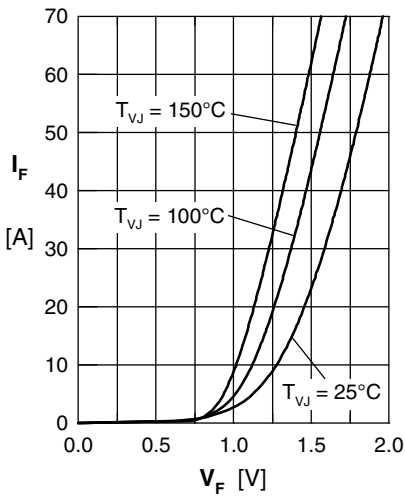


Fig. 1 Forward current  $I_F$  vs.  $V_F$

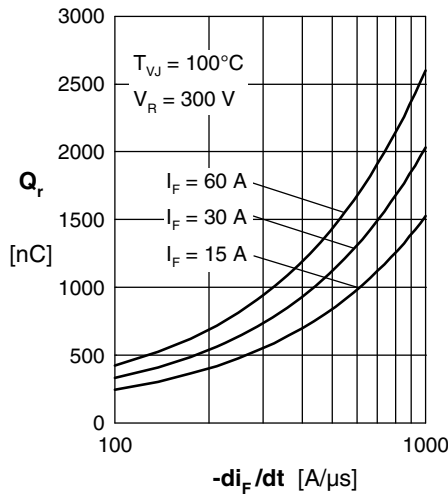


Fig. 2 Typ. reverse recovery charge  $Q_r$  versus  $-di_F/dt$

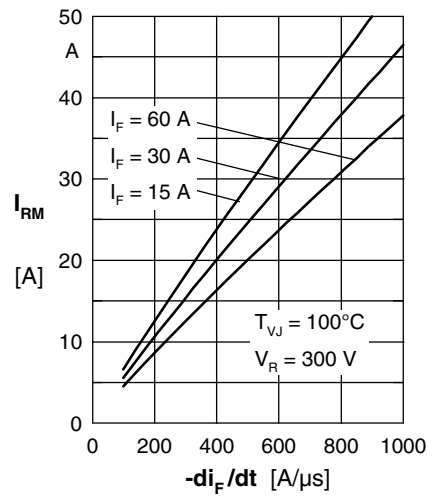


Fig. 3 Typ. peak reverse current  $I_{RM}$  versus  $-di_F/dt$

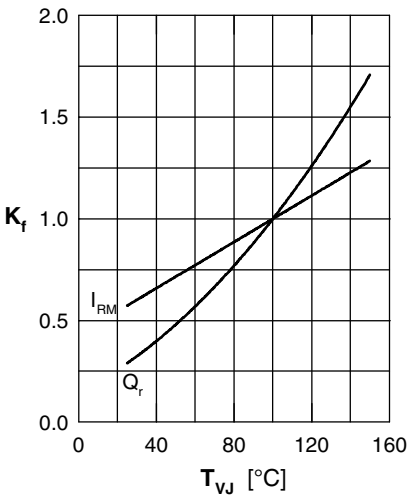


Fig. 4 Dynamic parameters  $Q_r$ ,  $I_{RM}$  versus  $T_{VJ}$

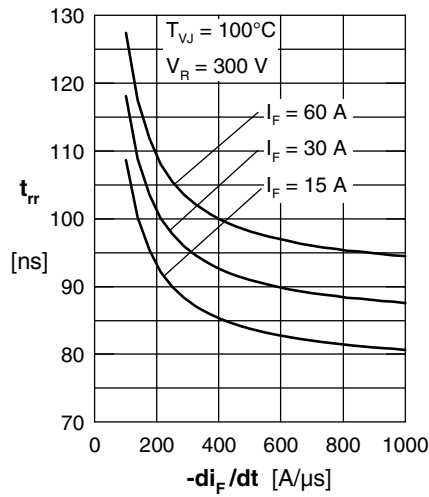


Fig. 5 Typ. recovery time  $t_{tr}$  versus  $-di_F/dt$

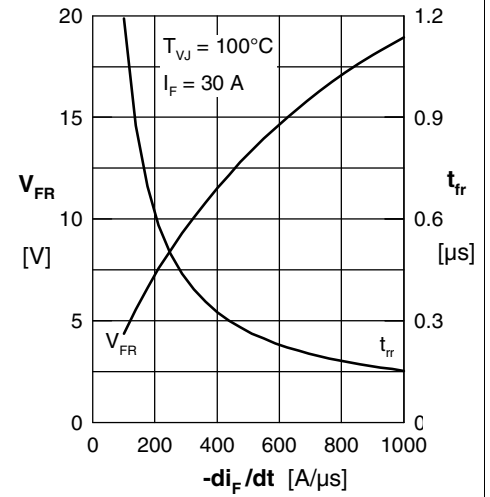


Fig. 6 Typ. peak forward voltage  $V_{FR}$  and typ. forward recovery time  $t_{tr}$  versus  $di_F/dt$

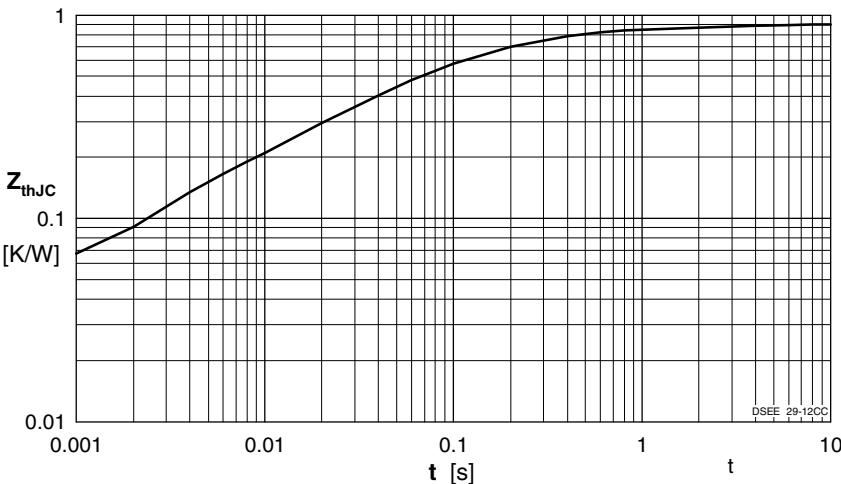


Fig. 7 Transient thermal resistance junction to case

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