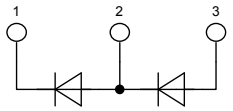
HiPerFRED

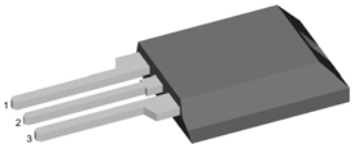
High Performance Fast Recovery Diode
Low Loss and Soft Recovery
Phase leg

V_{RRM} = 600 V
I_{FAV} = 15 A
t_{rr} = 25 ns

Part number

DSEE15-12CC





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
- 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:

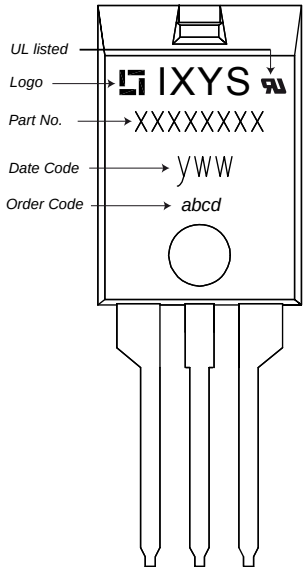
- Housing: ISOPLUS220
- Industry standard outline
- DCB isolated backside
- Isolation Voltage 3000 V
- Epoxy meets UL 94V-0
- RoHS compliant

Ratings

Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RRM}	*max. repetitive reverse voltage*		T_{VJ} = 25°C			600	V
I_R	*reverse current*	V_R = 600 V	T_{VJ} = 25°C			100	µA
		V_R = 600 V	T_{VJ} = 150°C			0.5	mA
V_F	*forward voltage*	I_F = 15 A	T_{VJ} = 25°C			2.04	V
		I_F = 30 A				2.25	V
		I_F = 15 A	T_{VJ} = 150°C			1.35	V
		I_F = 30 A				1.59	V
I_{FAV}	*average forward current*	rectangular d = 0.5	T_C = 140°C			15	A
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 175°C			0.99	V
r_F	*slope resistance* }					15	mΩ
R_{thJC}	*thermal resistance junction to case*					1.60	K/W
T_{VJ}	*virtual junction temperature*			-55		175	°C
P_{tot}	*total power dissipation*		T_C = 25°C			95	W
I_{FSM}	*max. forward surge current*	t = 10 ms (50 Hz), sine	T_{VJ} = 45°C			110	A
I_{RM}	*max. reverse recovery current*		T_{VJ} = 25°C		11		A
		I_F = 15 A; V_R = 300 V	T_{VJ} = 100°C		19		A
t_{rr}	*reverse recovery time*	$-di_F/dt$ = 600 A/µs	T_{VJ} = 25°C		25		ns
			T_{VJ} = 100°C		83		ns
C_J	*junction capacitance*	V_R = 400 V; f = 1 MHz	T_{VJ} = 25°C		12		pF

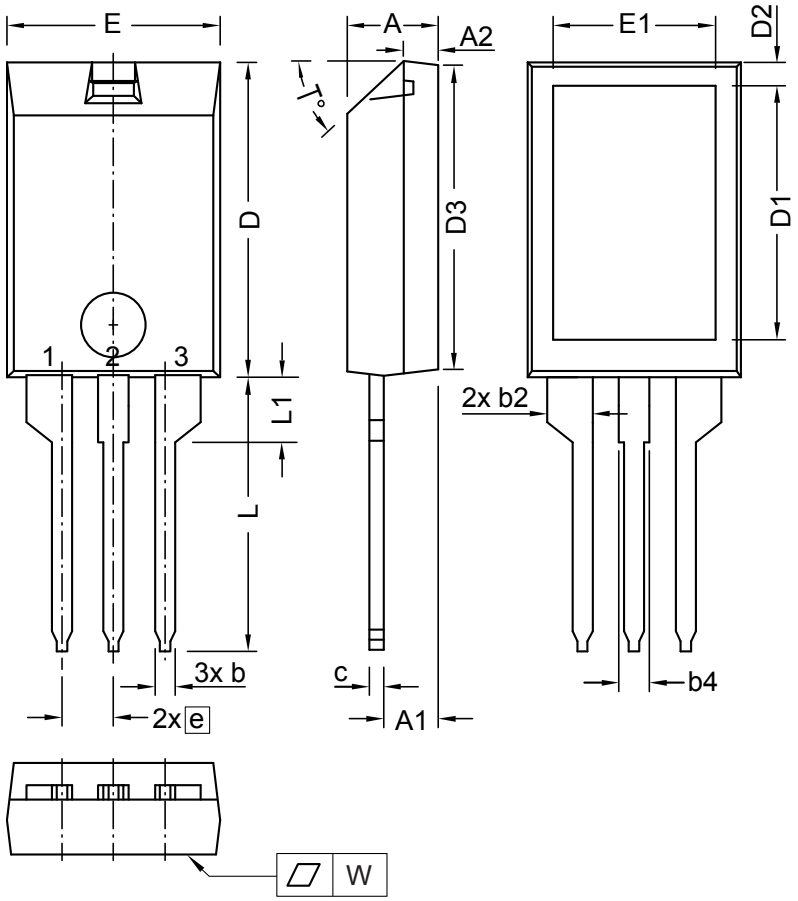
Symbol	Definition	Conditions	Ratings min.	typ.	max.	Unit
I_{RMS}	*RMS current*	per terminal			35	A
R_{thCH}	*thermal resistance case to heatsink*			0.50		K/W
T_{stg}	*storage temperature*		-55		150	°C
Weight				2		g
F_C	*mounting force with clip*		20		60	N
V_{ISOL}	*isolation voltage*	t = 1 second	3600			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	DSEE15-12CC	DSEE15-12CC	Tube	50	500725

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.

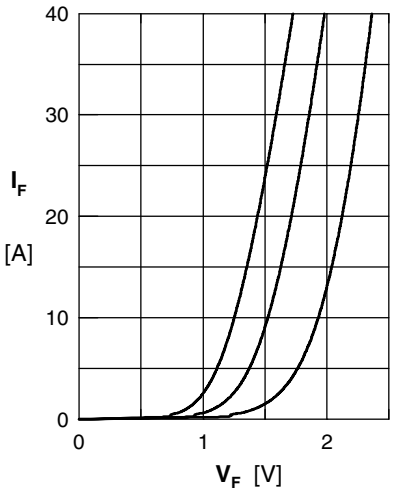


Fig. 1 Forward current I_F vs. V_F

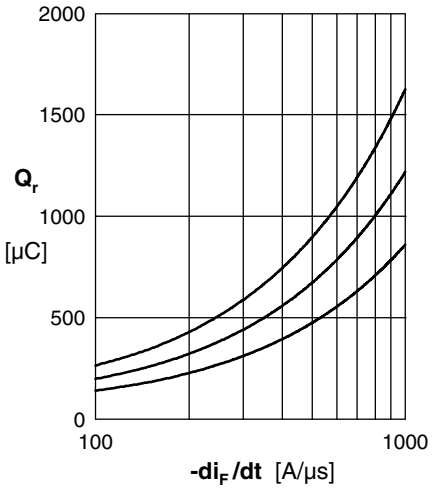


Fig. 2 Typ. reverse recovery charge Q_{rr} versus $-di_F/dt$

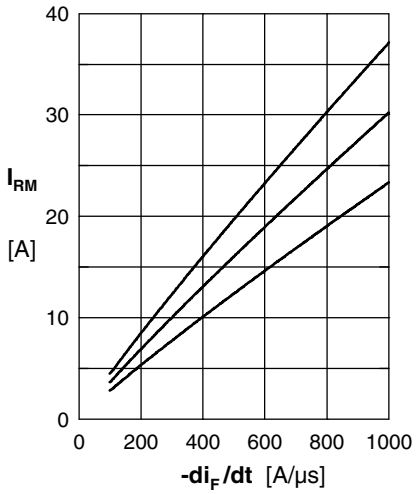


Fig. 3 Typ. peak reverse current I_{RM} versus $-di_F/dt$

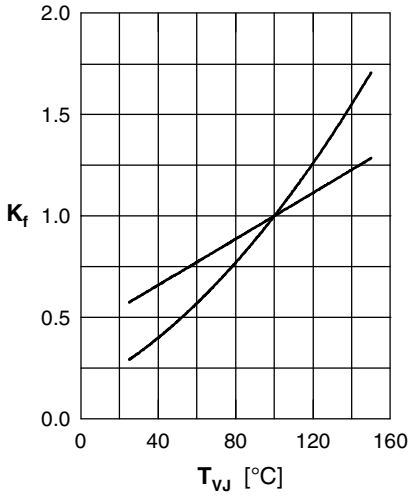


Fig. 4 Dynamic parameters Q_r, I_{RM} versus T_{VJ}

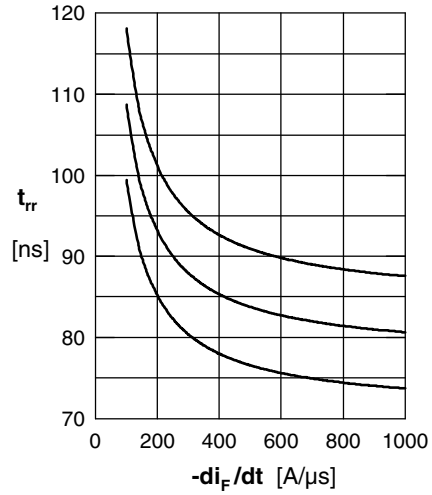


Fig. 5 Typ. recovery time t_{rr} versus $-di_F/dt$

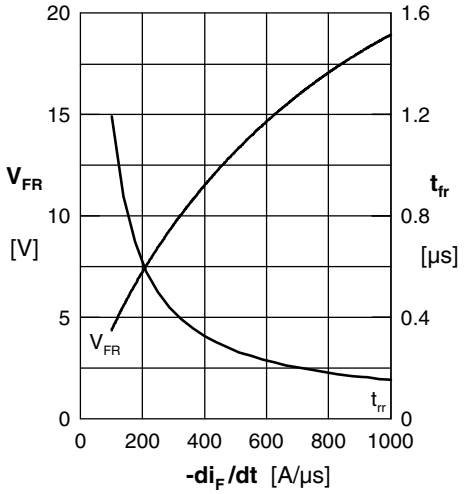


Fig. 6 Typ. peak forward voltage V_{FR} and typ. forward recovery time t_{fr} versus di_F/dt

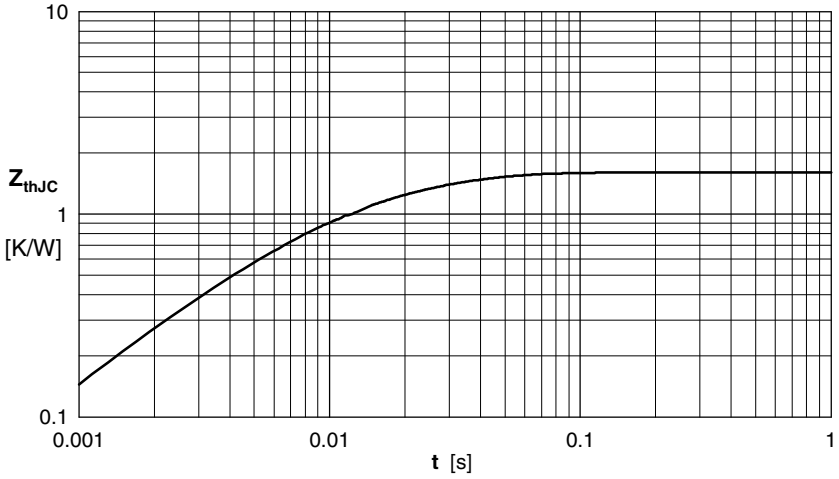


Fig. 7 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.908	0.0052
2	0.350	0.0003
3	0.342	0.017