

Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from, Europe, America and south Asia, supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts, Customers Priority, Honest Operation, and Considerate Service", our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip, ALPS, ROHM, Xilinx, Pulse, ON, Everlight and Freescale. Main products comprise IC, Modules, Potentiometer, IC Socket, Relay, Connector. Our parts cover such applications as commercial, industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



# Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China









## HiPerFRED

=2x 600 V

15 A

25 ns

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

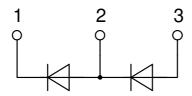
Part number

**DSEE15-12CC** 



Backside: isolated

**F1** 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

#### Terms Conditions of usage:

The data contained in this product data sheet is exclusively intended for technically trained staff. The user will have to evaluate the suitability of the product for the intended application and the completeness of the product data with respect to his application. The specifications of our components may not be considered as an assurance of component characteristics. The information in the valid application- and assembly notes must be considered. Should you require product information in excess of the data given in this product data sheet or which concerns the specific application of your product, please contact your local sales office.

Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact your local sales office.

Should you intend to use the product in aviation, in health or life endangering or life support applications, please notify. For any such application we urgently recommend

to perform joint risk and quality assessments;
the conclusion of quality agreements;

- to establish joint measures of an ongoing product survey, and that we may make delivery dependent on the realization of any such measures.

IXYS reserves the right to change limits, conditions and dimensions.

Data according to IEC 60747 and per semiconductor unless otherwise specified

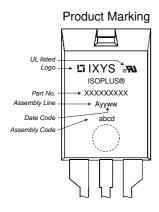
20160916b



Fast Diode					Ratings		
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V <sub>RSM</sub>	max. non-repetitive reverse blocki	ng voltage	$T_{VJ} = 25^{\circ}C$			600	V
V <sub>RRM</sub>	max. repetitive reverse blocking ve	oltage	$T_{VJ} = 25^{\circ}C$			600	V
IR	reverse current, drain current	$V_R = 600 \text{ V}$	$T_{VJ} = 25^{\circ}C$			100	μΑ
		$V_R = 600 V$	$T_{VJ} = 150$ °C			0.5	mΑ
V <sub>F</sub>	forward voltage drop	I <sub>F</sub> = 15 A	$T_{VJ} = 25^{\circ}C$			2.04	V
		$I_F = 30 \text{ A}$				2.25	٧
		I <sub>F</sub> = 15 A	T <sub>VJ</sub> = 150°C			1.35	V
		$I_F = 30 A$				1.59	٧
I FAV	average forward current	T <sub>C</sub> = 140°C	T <sub>vJ</sub> = 175°C			15	Α
		rectangular d = 0.5					
V <sub>F0</sub>	threshold voltage		T <sub>vJ</sub> = 175°C			0.99	٧
$\mathbf{r}_{F}$	slope resistance } for power lo	ss calculation only				15	mΩ
R <sub>thJC</sub>	thermal resistance junction to case	9				1.6	K/W
R <sub>thCH</sub>	thermal resistance case to heatsin	k			0.50		K/W
P <sub>tot</sub>	total power dissipation		$T_C = 25^{\circ}C$			95	W
I <sub>FSM</sub>	max. forward surge current	$t = 10 \text{ ms}$ ; (50 Hz), sine; $V_R = 0 \text{ V}$	$T_{VJ} = 45^{\circ}C$			110	Α
C¹	junction capacitance	$V_R = 400  \text{V}$ f = 1 MHz	$T_{VJ} = 25^{\circ}C$		12		pF
I <sub>RM</sub>	max. reverse recovery current		$T_{VJ} = 25 ^{\circ}\text{C}$		11		Α
		$I_F = 15 \text{ A}; V_R = 300 \text{ V}$	$T_{VJ} = 100^{\circ}C$		19		Α
t <sub>rr</sub>	reverse recovery time	$I_F = 15 \text{ A}; V_R = 300 \text{ V}$ $-\text{di}_F / \text{dt} = 600 \text{ A}/\mu\text{s}$	$T_{VJ} = 25 ^{\circ}\text{C}$		25		ns
	,	1	$T_{VJ} = 100^{\circ}C$		83		ns



Package ISOPLUS220					Ratings		
Symbol	Definition	Conditions		min.	typ.	max.	Unit
I <sub>RMS</sub>	RMS current	per terminal				35	Α
T <sub>VJ</sub>	virtual junction temperature			-55		175	°C
T <sub>op</sub>	operation temperature			-55		150	°C
T <sub>stg</sub>	storage temperature			-55		150	°C
Weight					2		g
F <sub>c</sub>	mounting force with clip			20		60	N
d <sub>Spp/App</sub>	creepage distance on surface   striking distance through air		terminal to terminal	1.0			mm
d <sub>Spb/Apb</sub>			terminal to backside	3.0			mm
V <sub>ISOL</sub>	isolation voltage	t = 1 second	50/60 Hz. BMS: IIsor ≤ 1 mA	3600			V
.002		t = 1 minute		3000			٧

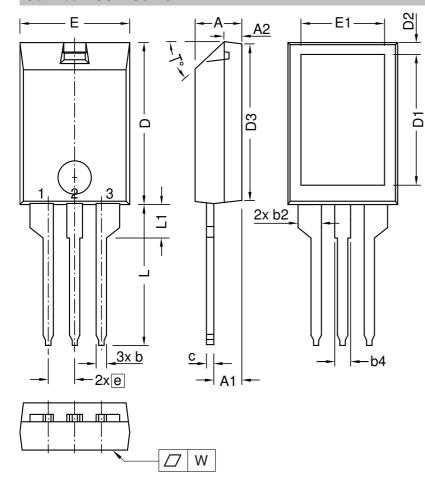


Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSEE15-12CC	DSEE15-12CC	Tube	50	500725

<b>Equivalent Circuits for Simulation</b>			* on die level	T <sub>vJ</sub> = 175 °C
$I \rightarrow V_0$	$R_0$	Fast Diode		
V <sub>0 max</sub>	threshold voltage	0.99		V
$R_{0  \text{max}}$	slope resistance *	11.3		mΩ



### **Outlines ISOPLUS220**



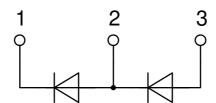
Dim.	Millim	neters	Inches	
Diiii.	min	max	min	max
Α	4.00	5.00	0.157	0.197
A1	2.50	3.00	0.098	0.118
A2	1.60	1.80	0.063	0.071
b	0.90	1.30	0.035	0.051
b2	2.35	2.55	0.093	0.100
b4	1.25	1.65	0.049	0.065
С	0.70	1.00	0.028	0.039
D	15.00	16.00	0.591	0.630
D1	12.00	13.00	0.472	0.512
D2	1.10	1.50	0.043	0.059
D3	14.90	15.50	0.587	0.610
Е	10.00	11.00	0.394	0.433
E1	7.50	8.50	0.295	0.335
е	2.54	BSC	0.100	BSC
L	13.00	14.50	0.512	0.571
L1	3.00	3.50	0.118	0.138
Τ°	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**

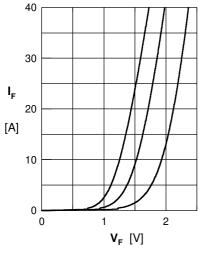


Fig. 1 Forward current I<sub>F</sub> vs. V<sub>F</sub>

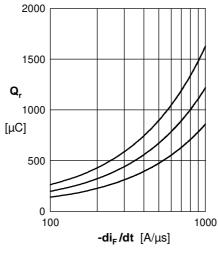


Fig. 2 Typ. reverse recovery charge  $Q_{rr}$  versus  $-di_F/dt$ 

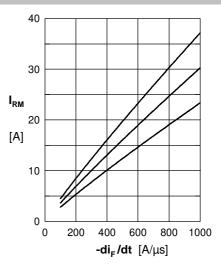


Fig. 3 Typ. peak reverse current  $I_{RM}$  versus  $-di_F/dt$ 

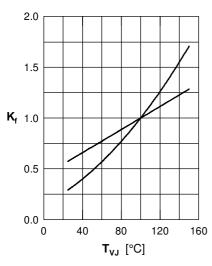


Fig. 4 Dynamic parameters  $Q_r$ ,  $I_{RM}$  versus  $T_{VJ}$ 

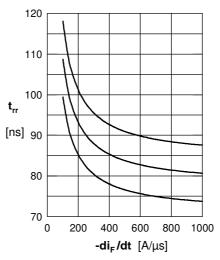


Fig. 5 Typ. recovery time  $t_{rr}$  versus  $-di_{F}/dt$ 

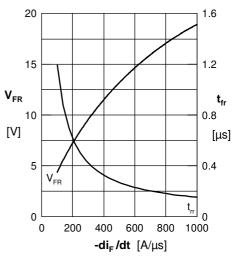


Fig. 6 Typ. peak forward voltage  $V_{FR}$  and typ. forward recovery time  $t_{\rm fr}$  versus  $di_{\rm F}/dt$ 

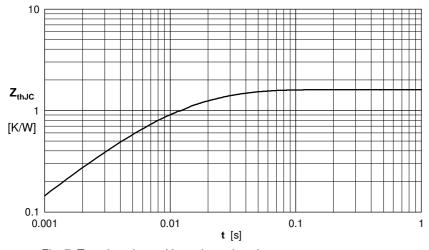


Fig. 7 Transient thermal impedance junction to case

Constants for  $\mathbf{Z}_{\text{thJC}}$  calculation:

i	$R_{thi}$ (K/W)	t <sub>i</sub> (s)
1	0.908	0.0052
2	0.350	0.0003
3	0.342	0.017