



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!



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Standard Rectifier

$$V_{RRM} = 2 \times 1200 \text{ V}$$

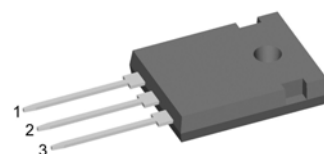
$$I_{FAV} = 45 \text{ A}$$

$$V_F = 1.23 \text{ V}$$

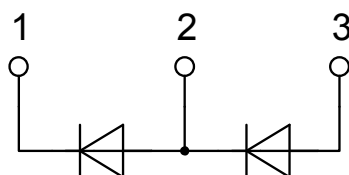
Phase leg

Part number

DSP45-12A



Backside: anode/cathode



Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very low forward voltage drop
- Improved thermal behaviour

Applications:

- Diode for main rectification
- For single and three phase bridge configurations

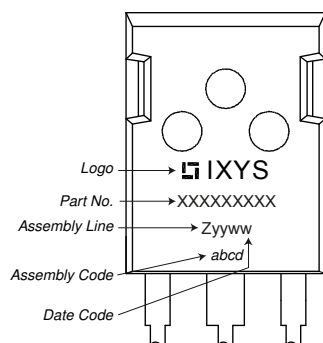
Package: TO-247

- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0

Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				1300	V
V_{RRM}	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				1200	V
I_R	reverse current	$V_R = 1200\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$			40	μA
		$V_R = 1200\text{ V}$	$T_{VJ} = 150^{\circ}\text{C}$			1.5	mA
V_F	forward voltage drop	$I_F = 45\text{ A}$	$T_{VJ} = 25^{\circ}\text{C}$			1.26	V
		$I_F = 90\text{ A}$				1.57	V
		$I_F = 45\text{ A}$	$T_{VJ} = 150^{\circ}\text{C}$			1.23	V
		$I_F = 90\text{ A}$				1.66	V
I_{FAV}	average forward current	$T_C = 130^{\circ}\text{C}$ 180° sine	$T_{VJ} = 175^{\circ}\text{C}$			45	A
V_{FO}	threshold voltage	} for power loss calculation only	$T_{VJ} = 175^{\circ}\text{C}$			0.81	V
r_F	slope resistance					9.1	m Ω
R_{thJC}	thermal resistance junction to case					0.55	K/W
R_{thCH}	thermal resistance case to heatsink				0.25		K/W
P_{tot}	total power dissipation		$T_C = 25^{\circ}\text{C}$			270	W
I_{FSM}	max. forward surge current	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45^{\circ}\text{C}$			480	A
		t = 8,3 ms; (60 Hz), sine	$V_R = 0\text{ V}$			520	A
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 150^{\circ}\text{C}$			410	A
		t = 8,3 ms; (60 Hz), sine	$V_R = 0\text{ V}$			440	A
I^2t	value for fusing	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45^{\circ}\text{C}$			1.15	kA ² s
		t = 8,3 ms; (60 Hz), sine	$V_R = 0\text{ V}$			1.13	kA ² s
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 150^{\circ}\text{C}$			840	A ² s
		t = 8,3 ms; (60 Hz), sine	$V_R = 0\text{ V}$			805	A ² s
C_J	junction capacitance	$V_R = 400\text{ V}; f = 1\text{ MHz}$	$T_{VJ} = 25^{\circ}\text{C}$		18		pF

Package TO-247			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal			70	A
T_{VJ}	virtual junction temperature		-40		175	°C
T_{op}	operation temperature		-40		150	°C
T_{stg}	storage temperature		-40		150	°C
Weight				6		g
M_D	mounting torque		0.8		1.2	Nm
F_C	mounting force with clip		20		120	N

Product Marking



Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSP45-12A	DSP45-12A	Tube	30	480673

Similar Part	Package	Voltage class
DSP45-12AZ	TO-268AA (D3Pak) (2HV)	1200
DSP45-16A	TO-247AD (3)	1600
DSP45-16AZ	TO-268AA (D3Pak) (2HV)	1600
DSP45-16AR	ISOPLUS247 (3)	1600
DSP45-18A	TO-247AD (3)	1800

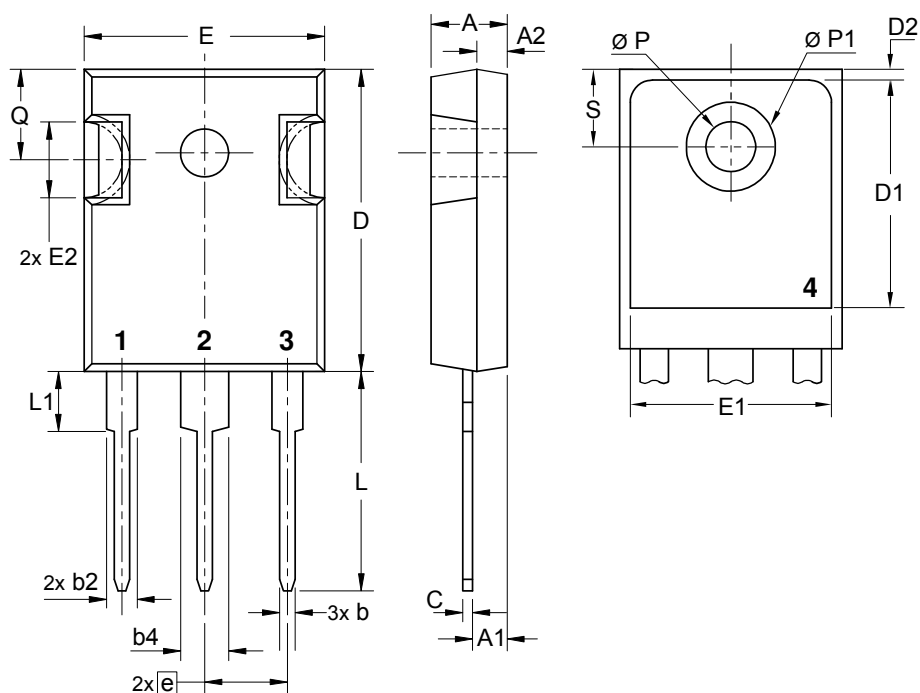
Equivalent Circuits for Simulation

* on die level

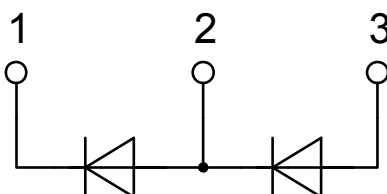
$T_{VJ} = 175^{\circ}\text{C}$

$I \rightarrow$	V_0	R_0	Rectifier
$V_{0\max}$	threshold voltage	0.81	V
$R_{0\max}$	slope resistance *	6.5	mΩ

Outlines TO-247



Sym.	Inches		Millimeter	
	min.	max.	min.	max.
A	0.185	0.209	4.70	5.30
A1	0.087	0.102	2.21	2.59
A2	0.059	0.098	1.50	2.49
D	0.819	0.845	20.79	21.45
E	0.610	0.640	15.48	16.24
E2	0.170	0.216	4.31	5.48
e	0.215	BSC	5.46	BSC
L	0.780	0.800	19.80	20.30
L1	-	0.177	-	4.49
Ø P	0.140	0.144	3.55	3.65
Q	0.212	0.244	5.38	6.19
S	0.242	BSC	6.14	BSC
b	0.039	0.055	0.99	1.40
b2	0.065	0.094	1.65	2.39
b4	0.102	0.135	2.59	3.43
c	0.015	0.035	0.38	0.89
D1	0.515	-	13.07	-
D2	0.020	0.053	0.51	1.35
E1	0.530	-	13.45	-
Ø P1	-	0.29	-	7.39



Rectifier

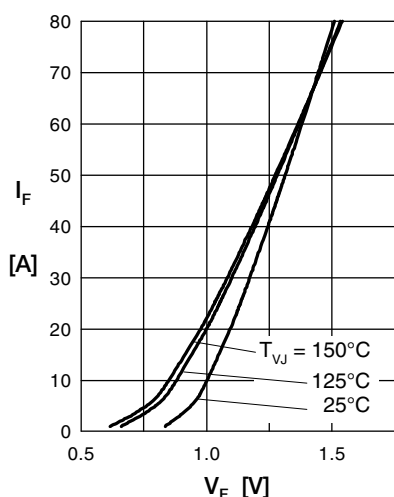


Fig. 1 Forward current versus voltage drop per diode

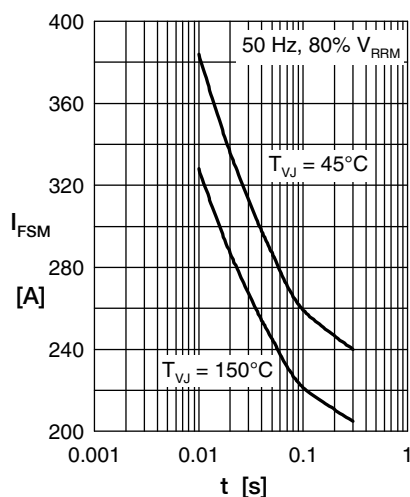


Fig. 2 Surge overload current

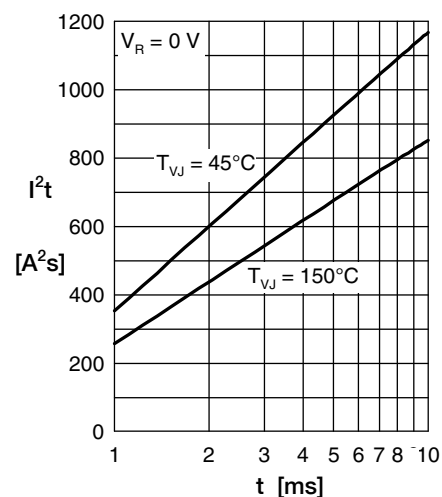


Fig. 3 I^2t versus time per diode

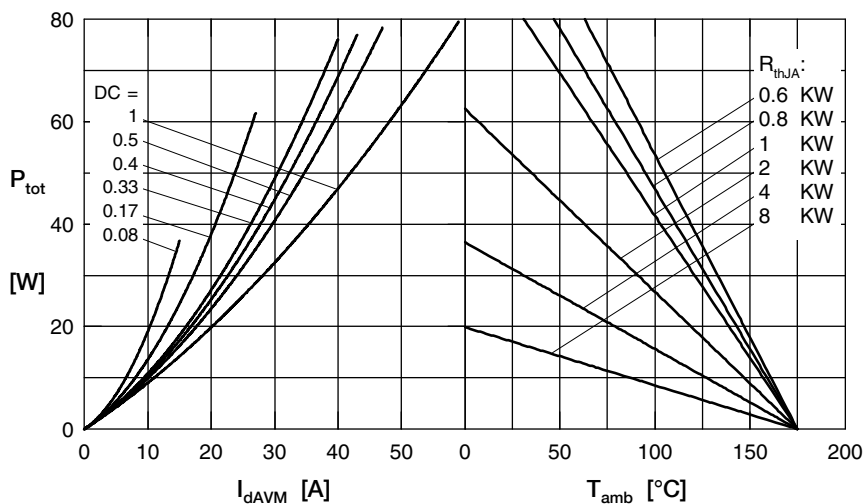


Fig. 4 Power dissipation vs. direct output current & ambient temperature

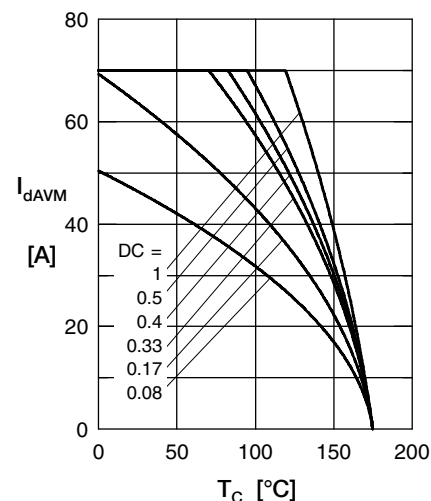


Fig. 5 Max. forward current vs. case temperature

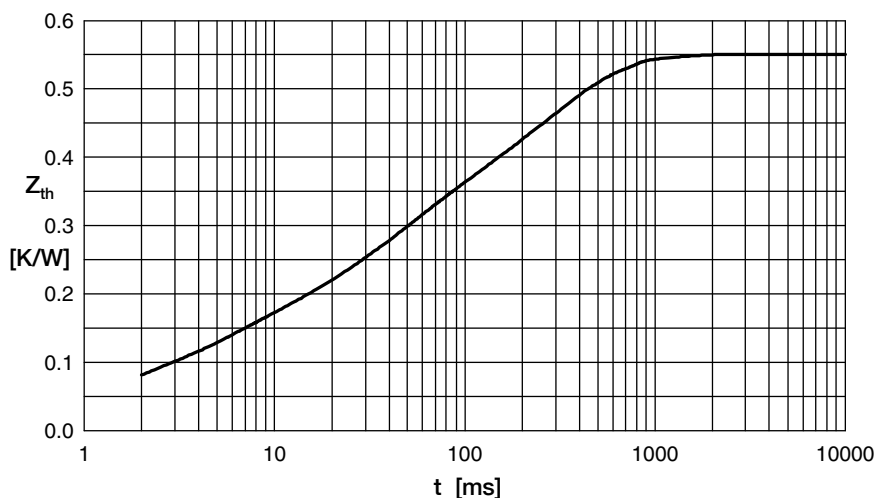


Fig. 6 Transient thermal impedance junction to case

i	R_i	t_i
1	0.033	0.0006
2	0.095	0.0039
3	0.164	0.033
4	0.258	0.272