

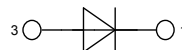
Standard Rectifier

Single Diode

$$\begin{aligned} V_{RRM} &= 1200 \text{ V} \\ I_{FAV} &= 45 \text{ A} \\ V_F &= 1.23 \text{ V} \end{aligned}$$

Part number

DSI45-12A



Backside: 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:

- Housing: TO-247
- Industry standard outline
- Epoxy meets UL 94V-0
- RoHS compliant

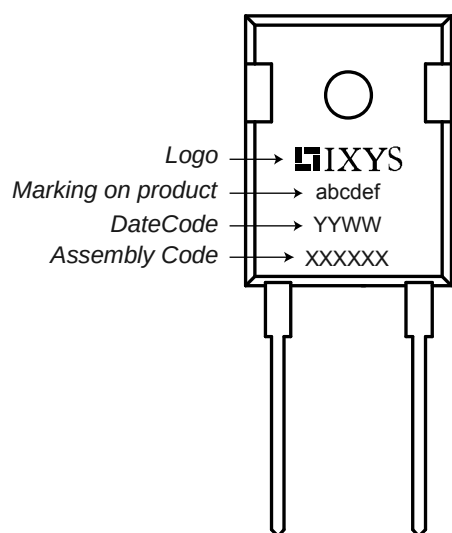
Symbol	Definition	Conditions		Ratings			Unit
				min.	typ.	max.	
V_{RRM}	max. repetitive reverse voltage		$T_{VJ} = 25^{\circ}\text{C}$			1200	V
I_R	reverse current	$V_R = 1200 \text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$			20	μA
		$V_R = 1200 \text{ V}$	$T_{VJ} = 150^{\circ}\text{C}$			3	mA
V_F	forward voltage	$I_F = 45 \text{ A}$	$T_{VJ} = 25^{\circ}\text{C}$			1.28	V
		$I_F = 90 \text{ A}$				1.37	V
		$I_F = 45 \text{ A}$	$T_{VJ} = 150^{\circ}\text{C}$			1.23	V
		$I_F = 90 \text{ A}$				1.35	V
I_{FAV}	average forward current	rectangular d = 0.5	$T_C = 130^{\circ}\text{C}$			45	A
V_{F0}	threshold voltage	for power loss calculation only				0.81	V
r_F	slope resistance					9.1	m Ω
R_{thJC}	thermal resistance junction to case					0.55	K/W
T_{VJ}	virtual junction temperature			-40		175	$^{\circ}\text{C}$
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	$V_R = 0 \text{ V}$			518	A
		t = 10 ms (50 Hz), sine	$T_{VJ} = 150^{\circ}\text{C}$			408	A
		t = 8,3 ms (60 Hz), sine	$V_R = 0 \text{ V}$			441	A
I^2t	value for fusing	t = 10 ms (50 Hz), sine	$T_{VJ} = 45^{\circ}\text{C}$			1152	A ² s
		t = 8,3 ms (60 Hz), sine	$V_R = 0 \text{ V}$			1120	A ² s
		t = 10 ms (50 Hz), sine	$T_{VJ} = 150^{\circ}\text{C}$			832	A ² s
		t = 8,3 ms (60 Hz), sine	$V_R = 0 \text{ V}$			808	A ² s
C_J	junction capacitance	$V_R = 400 \text{ V}; f = 1 \text{ MHz}$	$T_{VJ} = 25^{\circ}\text{C}$		18		pF

Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
I_{RMS}	RMS current	per pin ¹⁾			70	A
R_{thCH}	thermal resistance case to heatsink			0.25		K/W
T_{stg}	storage temperature		-55		150	°C
Weight				6		g
M_D	mounting torque		0.8		1.2	Nm
F_c	mounting force with clip		20		120	N

¹⁾ I_{RMS} is typically limited by: 1. pin-to-chip resistance; or by 2. current capability of the chip.

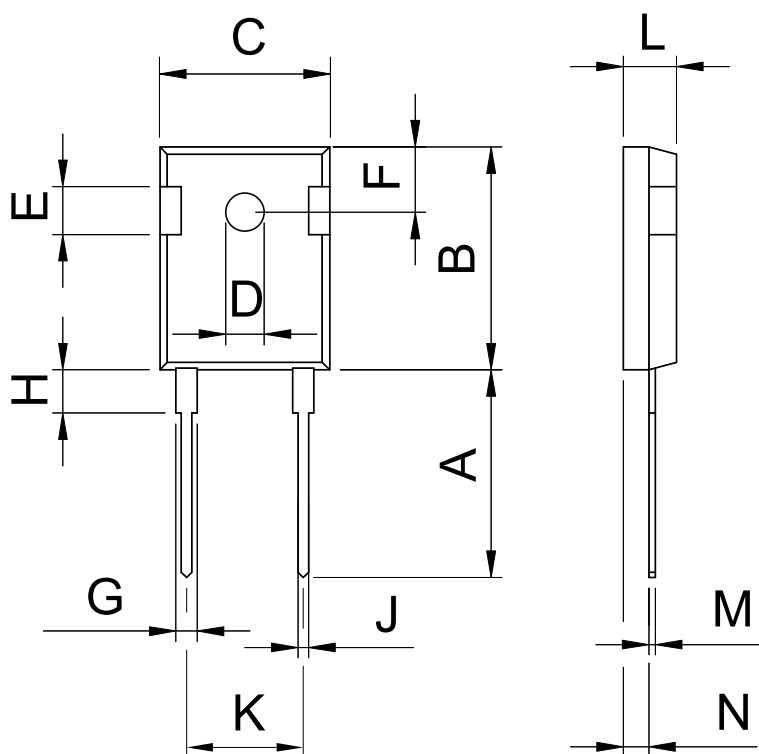
In case of 1, a common cathode/anode configuration and a non-isolated backside, the whole current capability can be used by connecting the backside.

Product Marking



Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Code Key
Standard	DSI45-12A	DSI45-12A	Tube	30	471895

Similar Part	Package	Voltage class
DSI45-16A	TO-247AD (2)	1600
DSI45-16AR	ISOPLUS247 (2)	1600
DSI45-08A	TO-247AD (2)	800

Outlines TO-247


Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	19.81	20.32	0.780	0.800
B	20.80	21.46	0.819	0.845
C	15.75	16.26	0.610	0.640
D	3.55	3.65	0.140	0.144
E	4.32	5.49	0.170	0.216
F	5.4	6.2	0.212	0.244
G	1.65	2.13	0.065	0.084
H	-	4.5	-	0.177
J	1.0	1.4	0.040	0.055
K	10.8	11.0	0.426	0.433
L	4.7	5.3	0.185	0.209
M	0.4	0.8	0.016	0.031
N	1.5	2.49	0.087	0.102

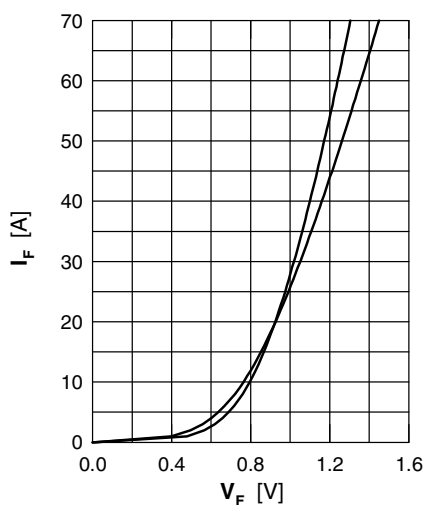


Fig. 1 Forward current versus voltage drop per diode

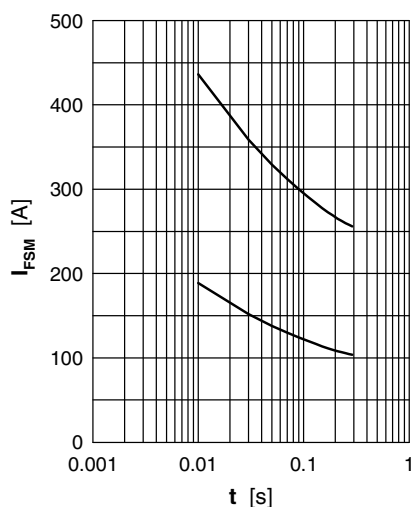


Fig. 2 Surge overload current

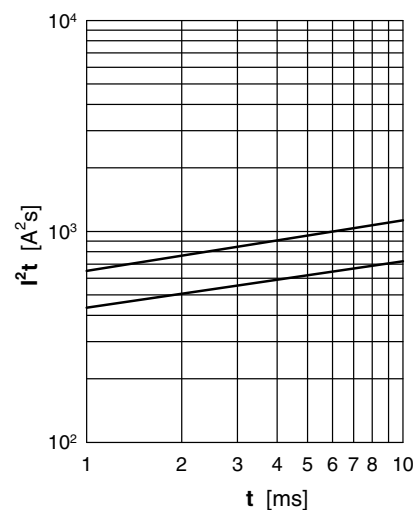


Fig. 3 I^2t versus time per diode

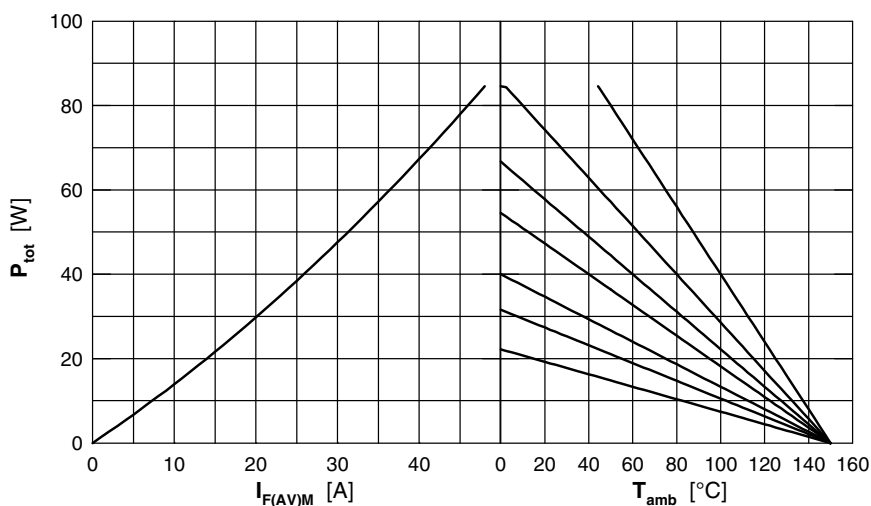


Fig. 4 Power dissipation vs. direct output current & ambient temperature, sine 180°

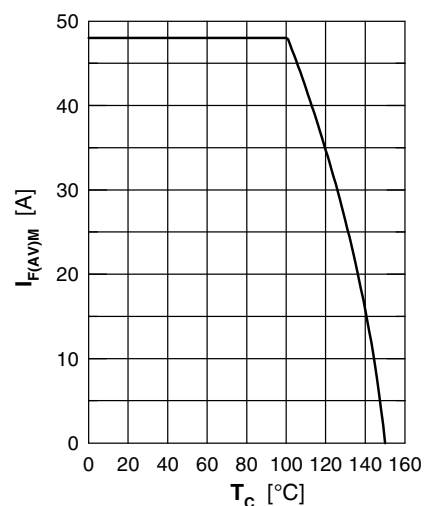


Fig. 5 Max. forward current versus case temperature, sine180°

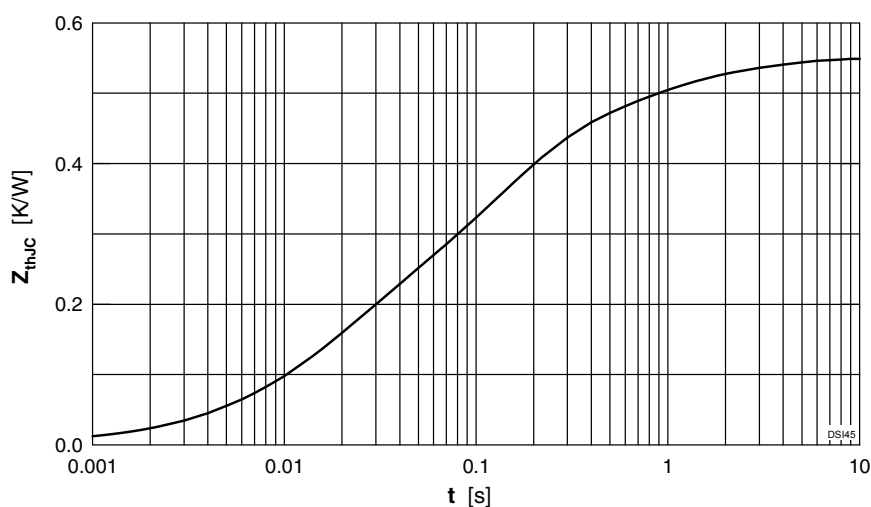


Fig. 6 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.1633	0.016
2	0.2517	0.118
3	0.0933	0.588
4	0.04167	2.6