

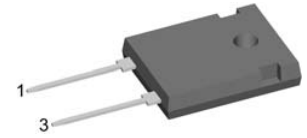
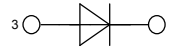
# Standard Rectifier

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

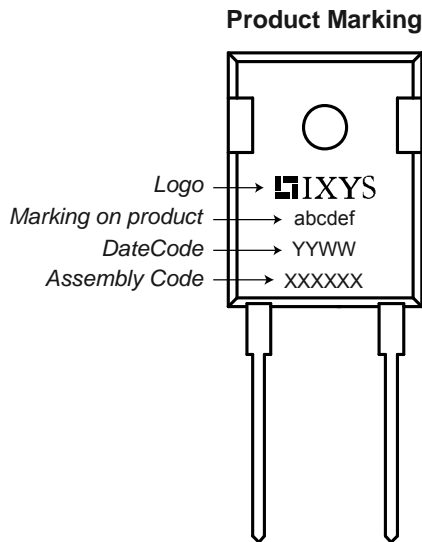
### Package:

- 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				1200	V
$I_R$	reverse current	$V_R = 1200 \text{ V}$			20	$\mu\text{A}$
		$V_R = 1200 \text{ V}$			3	mA
$V_F$	forward voltage	$I_F = 45 \text{ A}$			1.28	V
		$I_F = 90 \text{ A}$			1.37	V
		$I_F = 45 \text{ A}$			1.23	V
		$I_F = 90 \text{ A}$			1.35	V
$I_{FAV}$	average forward current	rectangular d = 0.5			45	A
$V_{FO}$	threshold voltage	} for power loss calculation only			0.81	V
$r_F$	slope resistance				9.1	m $\Omega$
$R_{thJC}$	thermal resistance junction to case				0.55	K/W
$T_{VJ}$	virtual junction temperature		-40		175	$^{\circ}\text{C}$
$P_{tot}$	total power dissipation				270	W
$I_{FSM}$	max. forward surge current	t = 10 ms (50 Hz), sine			480	A
		t = 8,3 ms (60 Hz), sine			518	A
		t = 10 ms (50 Hz), sine			408	A
		t = 8,3 ms (60 Hz), sine			441	A
$I^2t$	value for fusing	t = 10 ms (50 Hz), sine			1152	A <sup>2</sup> s
		t = 8,3 ms (60 Hz), sine			1120	A <sup>2</sup> s
		t = 10 ms (50 Hz), sine			832	A <sup>2</sup> s
		t = 8,3 ms (60 Hz), sine			808	A <sup>2</sup> s
$C_J$	junction capacitance	$V_R = 400 \text{ V}; f = 1 \text{ MHz}$		18		pF

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

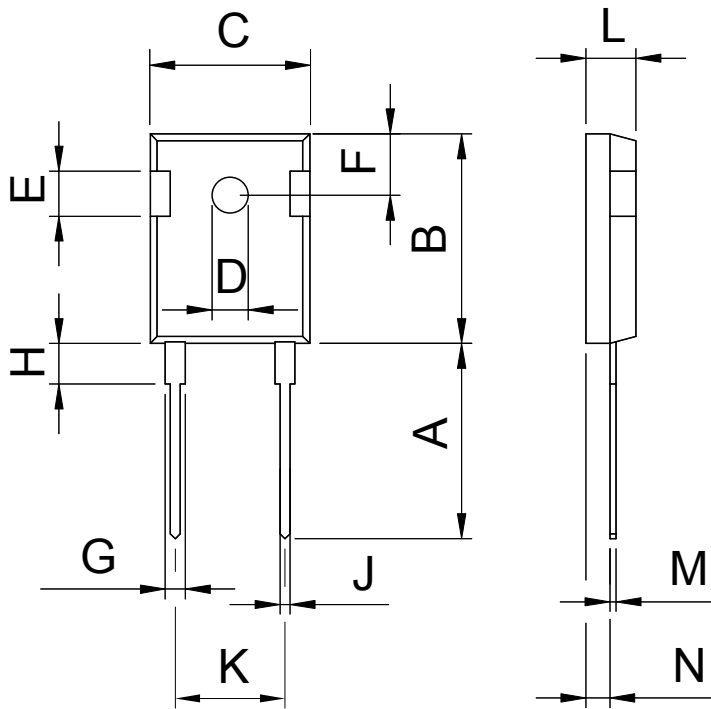
<sup>1)</sup>  $I_{RMS}$  is typically limited by: 1. pin-to-chip resistance; or by 2. current capability of the chip.  
 In case of 1, a common cathode/anode configuration and a non-isolated backside, the whole current capability can be used by connecting the backside.



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

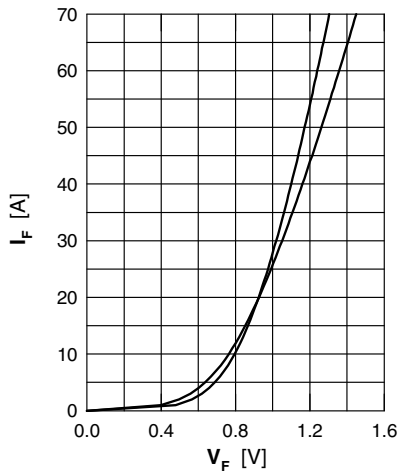


Fig. 1 Forward current versus voltage drop per diode

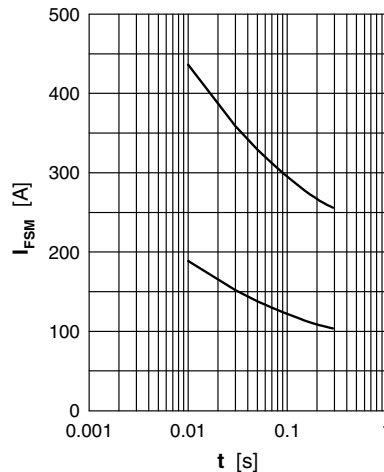


Fig. 2 Surge overload current

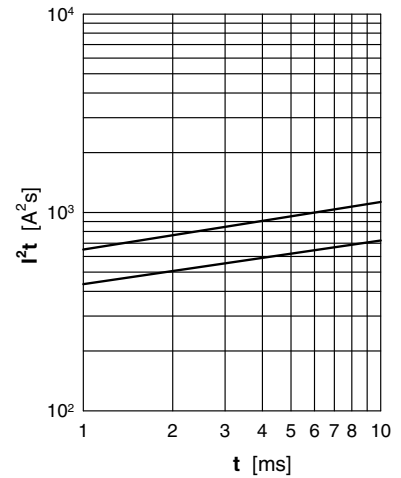


Fig. 3  $I^2t$  versus time per diode

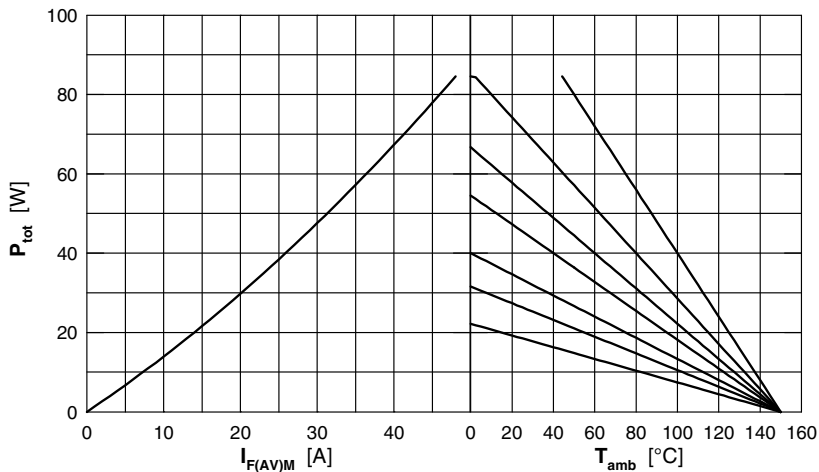


Fig. 4 Power dissipation vs. direct output current & ambient temperature, sine 180°

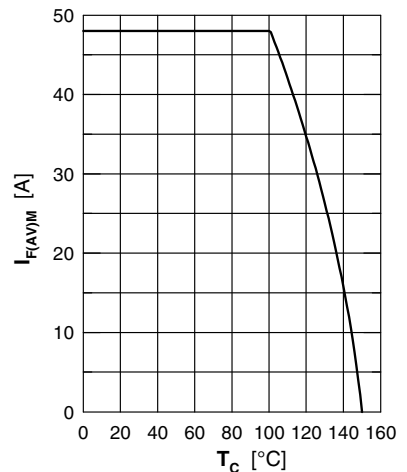


Fig. 5 Max. forward current versus case temperature, sine 180°

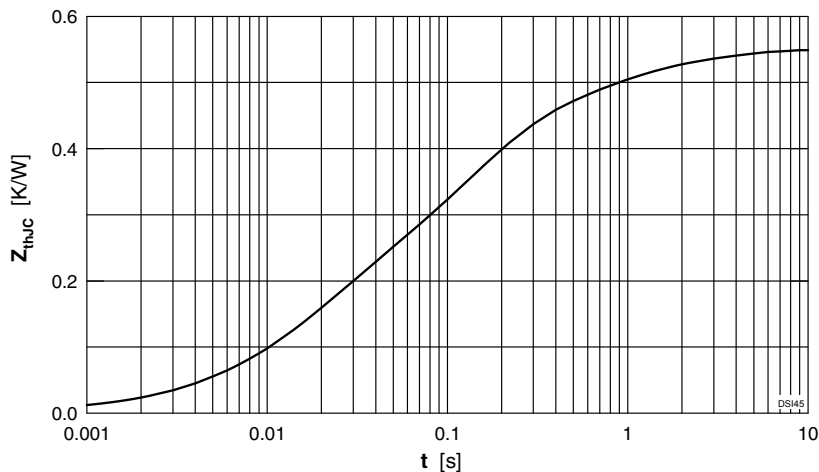


Fig. 6 Transient thermal impedance junction to case

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