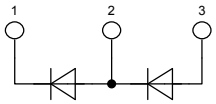
Standard Rectifier

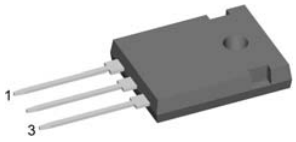
Phase leg

V_{RRM} = 1600 V
I_{FAV} = 2x 45 A
V_F = 1.23 V

Part number

DSP45-16A





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:

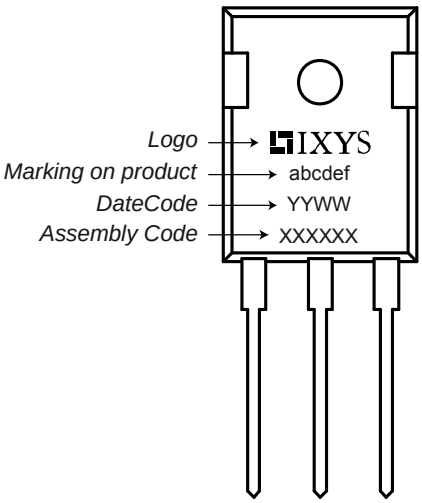
- Housing: TO-247
- Industry standard outline
- Epoxy meets UL 94V-0
- RoHS compliant

				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RRM}	*max. repetitive reverse voltage*		T_{VJ} = 25°C			1600	V
I_R	*reverse current*	V_R = 1600 V	T_{VJ} = 25°C			20	µA
		V_R = 1600 V	T_{VJ} = 150°C			3	mA
V_F	*forward voltage*	I_F = 45 A	T_{VJ} = 25°C			1.28	V
		I_F = 90 A				1.37	V
		I_F = 45 A	T_{VJ} = 150°C			1.23	V
		I_F = 90 A				1.35	V
I_{FAV}	*average forward current*	rectangular d = 0.5	T_C = 130°C			45	A
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 175°C			0.81	V
r_F	*slope resistance* }					9.1	mΩ
R_{thJC}	*thermal resistance junction to case*					0.55	K/W
T_{VJ}	*virtual junction temperature*			-40		175	°C
P_{tot}	*total power dissipation*		T_C = 25°C			270	W
I_{FSM}	*max. forward surge current*	t = 10 ms (50 Hz), sine	T_{VJ} = 45°C			480	A
		t = 8,3 ms (60 Hz), sine	V_R = 0 V			518	A
		t = 10 ms (50 Hz), sine	T_{VJ} = 150°C			408	A
		t = 8,3 ms (60 Hz), sine	V_R = 0 V			441	A
I^2t	*value for fusing*	t = 10 ms (50 Hz), sine	T_{VJ} = 45°C			1152	A^2s
		t = 8,3 ms (60 Hz), sine	V_R = 0 V			1120	A^2s
		t = 10 ms (50 Hz), sine	T_{VJ} = 150°C			832	A^2s
		t = 8,3 ms (60 Hz), sine	V_R = 0 V			808	A^2s
C_J	*junction capacitance*	V_R = 400 V; f = 1 MHz	T_{VJ} = 25°C		18		pF

Symbol	Definition	Conditions	Ratings min.	typ.	max.	Unit
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.

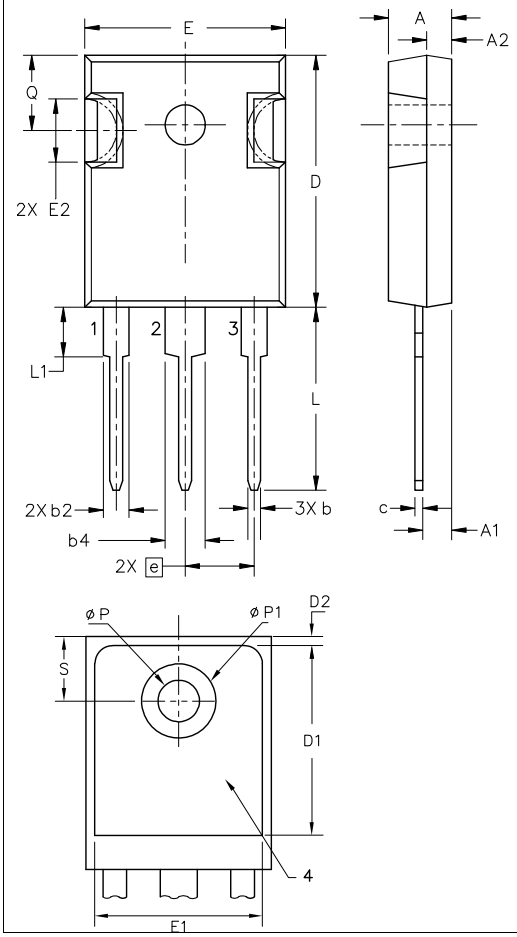
Product Marking



Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Code Key
Standard	DSP45-16A	DSP45-16A	Tube	30	480665

Similar Part	Package	Voltage class
DSP45-16AR	ISOPLUS247 (3)	1600
DSP45-12A	TO-247AD (3)	1200

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

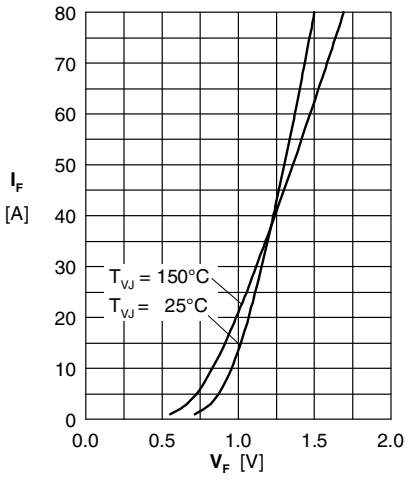


Fig. 1 Forward current versus voltage drop per diode

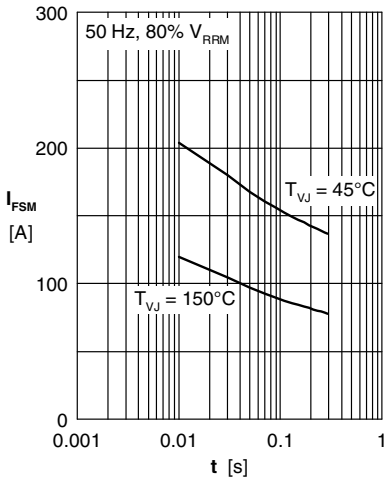


Fig. 2 Surge overload current

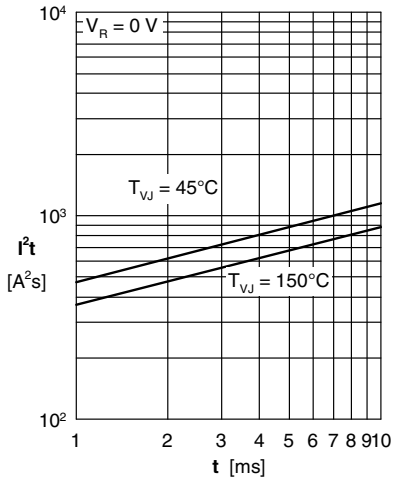


Fig. 3 I^2t versus time per diode

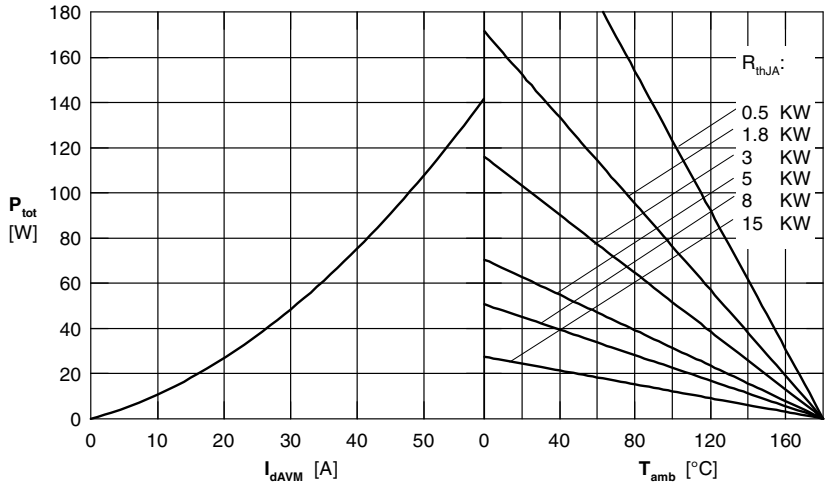


Fig. 4 Power dissipation vs. direct output current & ambient temperature, sine 180°

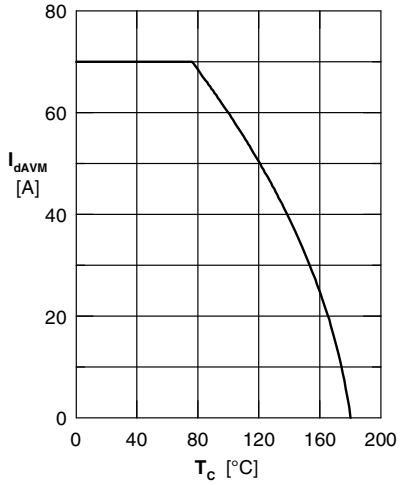


Fig. 5 Max. forward current versus case temperature, sine180°

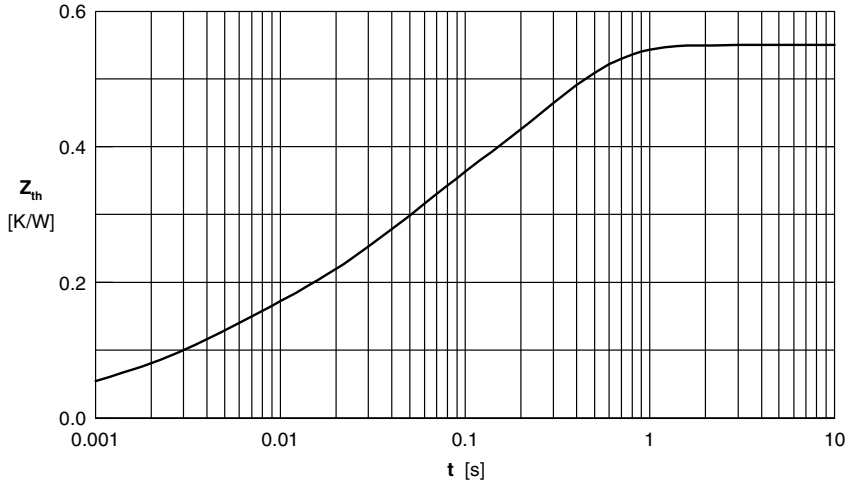


Fig. 6 Transient thermal impedance junction to case

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