Standard Rectifier

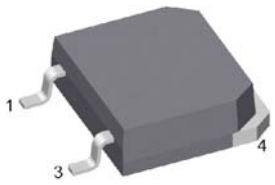
V_{RRM} = 2x 1600 V
I_{FAV} = 45 A
V_F = 1,23 V

Phase leg

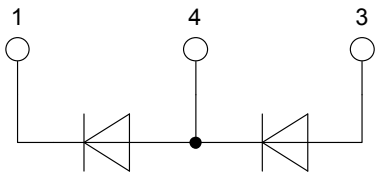
Part number

DSP45-16AZ

Marking on Product: DSP45-16AZ



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-268AA (D3Pak-HV)

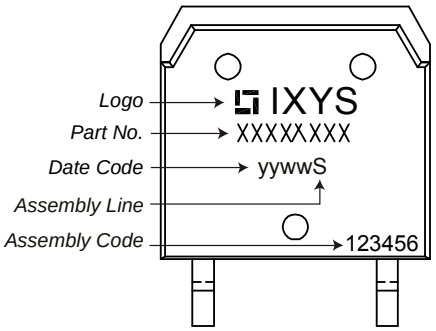
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0

Rectifier

Symbol	Definition	Conditions		Ratings min.	typ.	max.	Unit
V_{RSM}	*max. non-repetitive reverse blocking voltage*		T_{VJ} = 25°C			1700	V
V_{RRM}	*max. repetitive reverse blocking voltage*		T_{VJ} = 25°C			1600	V
I_R	*reverse current*	V_R = 1600 V	T_{VJ} = 25°C			40	µA
		V_R = 1600 V	T_{VJ} = 150°C			1,5	mA
V_F	*forward voltage drop*	I_F = 45 A	T_{VJ} = 25°C			1,26	V
		I_F = 90 A				1,52	V
		I_F = 45 A	T_{VJ} = 150°C			1,23	V
		I_F = 90 A				1,57	V
I_{FAV}	*average forward current*	T_C = 130°C 180° sine	T_{VJ} = 175°C			45	A
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 175°C			0,86	V
r_F	*slope resistance* }					7,8	mΩ
R_{thJC}	*thermal resistance junction to case*					0,55	K/W
R_{thCH}	*thermal resistance case to heatsink*				0,15		K/W
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			520	A
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			410	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			440	A
I^2t	*value for fusing*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			1,15	kA²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			1,13	kA²s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			840	A²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			805	A²s
C_J	*junction capacitance*	V_R = 400 V; f = 1 MHz	T_{VJ} = 25°C		19		pF

Package TO-268AA (D3Pak-HV)			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				4		g
F_C	*mounting force with clip*		20		120	N
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*	*terminal to terminal*	9,4			mm
$d_{Spb/Apb}$		*terminal to backside*	5,6			mm

Product Marking



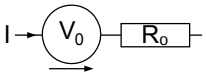
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSP45-16AZ-TUB	DSP45-16AZ	Tube	30	514141

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

DSP45-18A	TO-247AD (3)	1800

Equivalent Circuits for Simulation

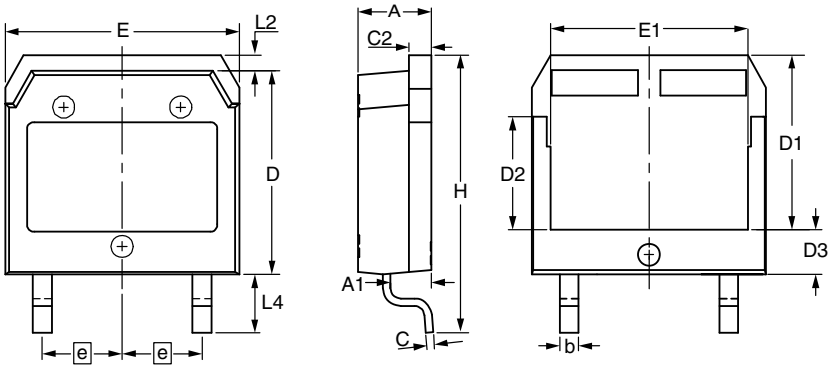
** on die level* T_{VJ} = 175°C

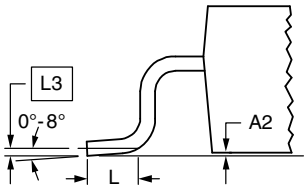


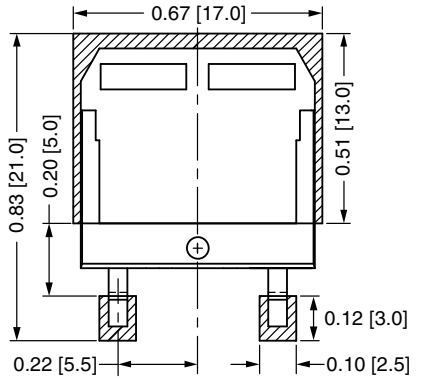
Rectifier

$V_{0\,max}$	*threshold voltage*	0,86	V
$R_{0\,max}$	*slope resistance **	6,5	mΩ

Outlines TO-268AA (D3Pak-HV)

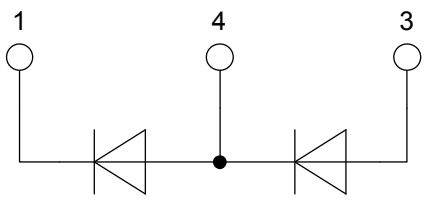






RECOMMENDED MINIMUM FOOT PRINT

Dim.	Millimeter		Inches	
	min	max	min	max
A	4.90	5.10	0.193	0.201
A1	2.70	2.90	0.106	0.114
A2	0.02	0.25	0.001	0.010
b	1.15	1.45	0.045	0.057
C	0.40	0.65	0.016	0.026
C2	1.45	1.60	0.057	0.063
D	13.80	14.00	0.543	0.551
D1	11.80	12.10	0.465	0.476
D2	7.50	7.80	0.295	0.307
D3	2.90	3.20	0.114	0.126
E	15.85	16.05	0.624	0.632
E1	13.30	13.60	0.524	0.535
e	5.450 BSC		0.215 BSC	
H	18.70	19.10	0.736	0.752
L	1.70	2.00	0.067	0.079
L2	1.00	1.15	0.039	0.045
L3	0.250 BSC		0.010 BSC	
L4	3.80	4.10	0.150	0.161



Rectifier

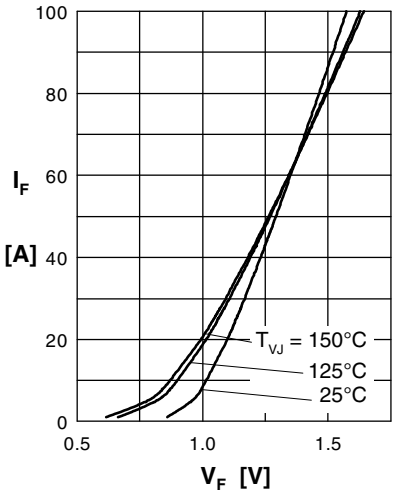


Fig. 1 Forward current versus voltage drop per diode

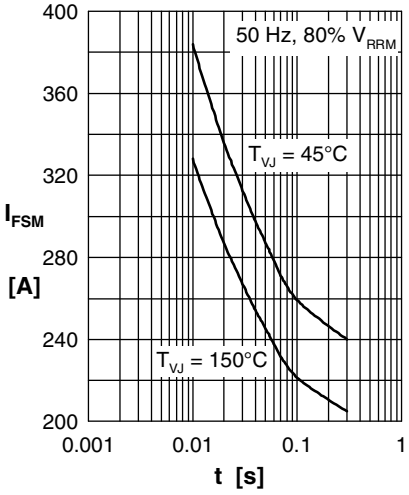


Fig. 2 Surge overload current

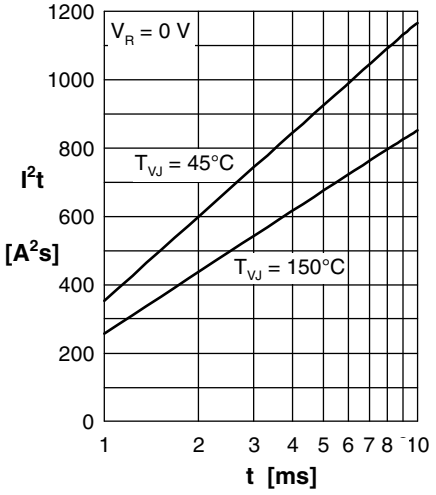


Fig. 3 I^2t versus time per diode

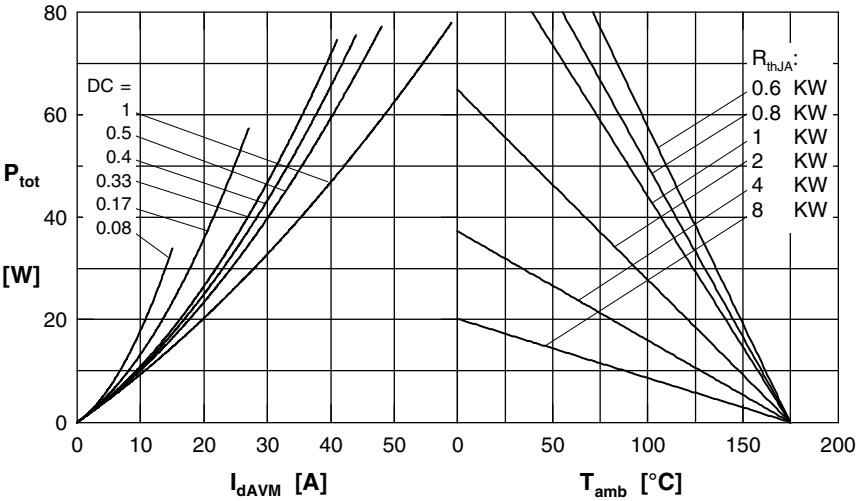


Fig. 4 Power dissipation vs. direct output current & ambient temperature

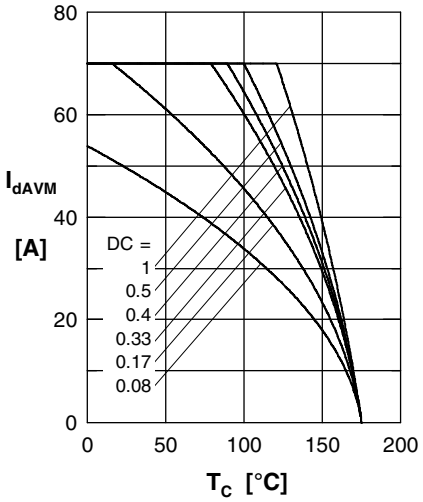


Fig. 5 Max. forward current vs. case temperature

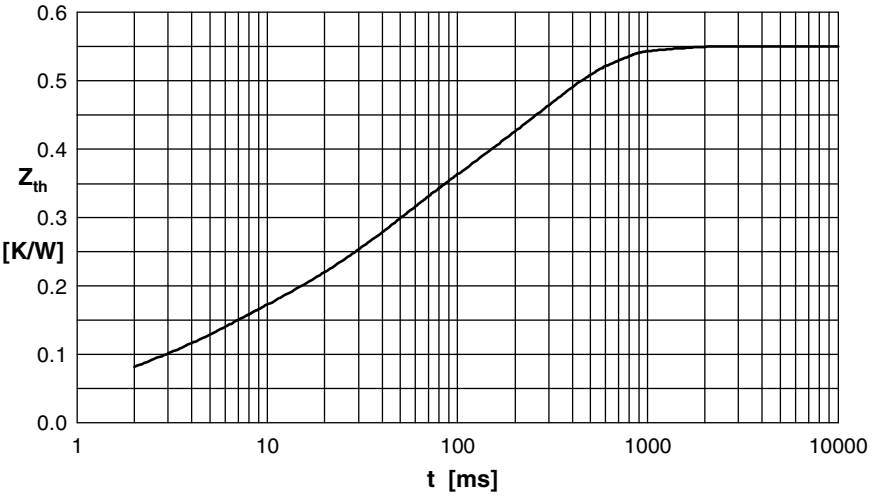


Fig. 6 Transient thermal impedance junction to case

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