

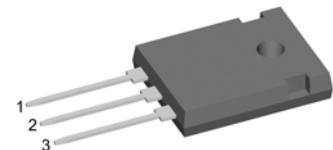
Standard Rectifier

V_{RRM} = 2x 1200V
 I_{FAV} = 25A
 V_F = 1.16V

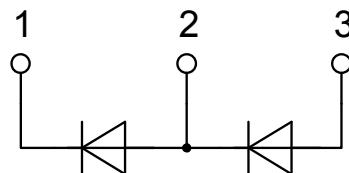
Phase leg

Part number

DSP25-12A



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

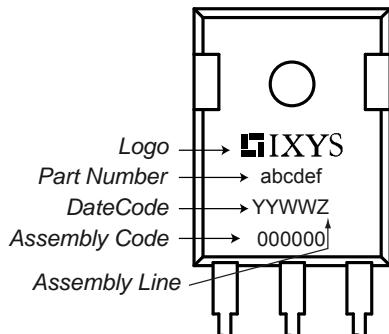
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0

Rectifier

Symbol	Definition	Conditions	Ratings			
			min.	typ.	max.	
V_{RSM}	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^\circ C$			1300	V
V_{RRM}	max. repetitive reverse blocking voltage	$T_{VJ} = 25^\circ C$			1200	V
I_R	reverse current, drain current	$V_R = 1200 V$ $V_R = 1200 V$	$T_{VJ} = 25^\circ C$ $T_{VJ} = 150^\circ C$		40 1.5	μA mA
V_F	forward voltage drop	$I_F = 25 A$ $I_F = 50 A$ $I_F = 25 A$ $I_F = 50 A$	$T_{VJ} = 25^\circ C$ $T_{VJ} = 150^\circ C$		1.23 1.47 1.16 1.50	V V
I_{FAV}	average forward current	$T_C = 135^\circ C$ 180° sine	$T_{VJ} = 175^\circ C$		25	A
V_{F0} r_F	threshold voltage slope resistance } for power loss calculation only		$T_{VJ} = 175^\circ C$		0.81 13.8	V $m\Omega$
R_{thJC}	thermal resistance junction to case				0.9	K/W
R_{thCH}	thermal resistance case to heatsink			0.25		K/W
P_{tot}	total power dissipation		$T_C = 25^\circ C$		160	W
I_{FSM}	max. forward surge current	$t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}$ $t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{sine}$ $t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}$ $t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{sine}$	$T_{VJ} = 45^\circ C$ $V_R = 0 V$ $T_{VJ} = 150^\circ C$ $V_R = 0 V$		300 325 255 275	A
I^2t	value for fusing	$t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}$ $t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{sine}$ $t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}$ $t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{sine}$	$T_{VJ} = 45^\circ C$ $V_R = 0 V$ $T_{VJ} = 150^\circ C$ $V_R = 0 V$		450 440 325 315	A^2s A^2s A^2s A^2s
C_J	junction capacitance	$V_R = 400 V; f = 1 \text{ MHz}$	$T_{VJ} = 25^\circ C$		10	pF

Package TO-247			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal			70	A
T_{stg}	storage temperature		-55		150	°C
T_{VJ}	virtual junction temperature		-40		175	°C
Weight				6		g
M_D	mounting torque		0.8		1.2	Nm
F_c	mounting force with clip		20		120	N

Product Marking

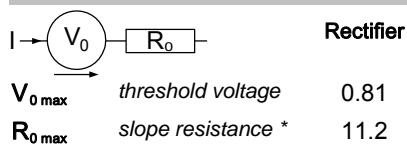


Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSP25-12A	DSP25-12A	Tube	30	463604

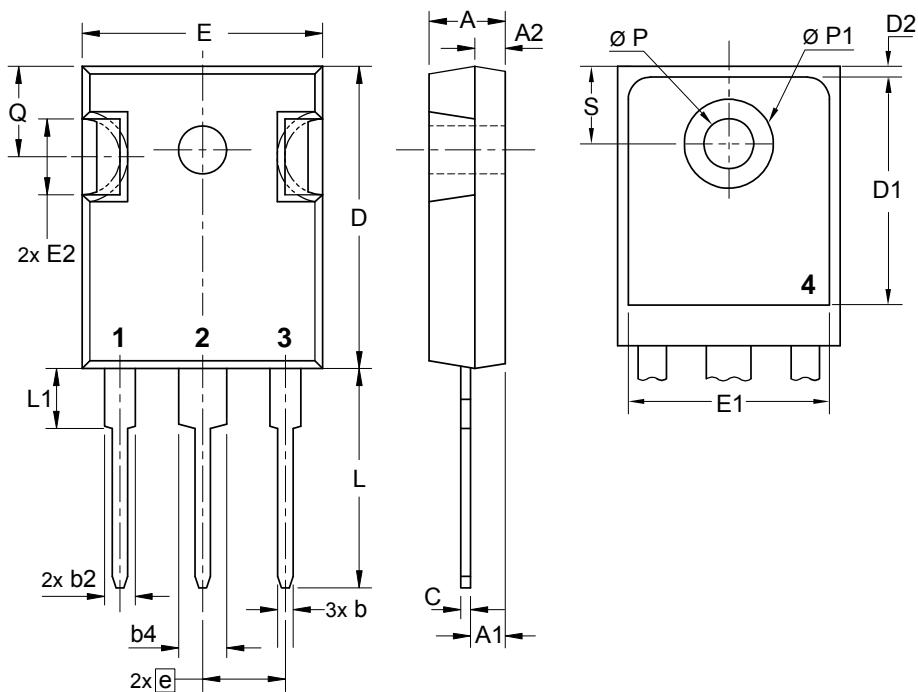
Similar Part	Package	Voltage class
DSP25-12AT	TO-268AA (D3Pak) (2)	1200
DSP25-16A	TO-247AD (3)	1600
DSP25-16AR	ISOPLUS247 (3)	1600
DSP25-16AT	TO-268AA (D3Pak) (2)	1600

Equivalent Circuits for Simulation

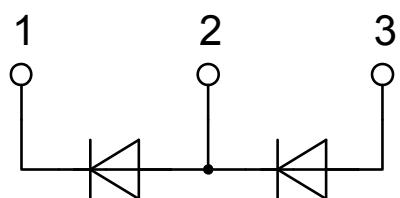
* on die level

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

Outlines TO-247



Sym.	Inches min. max.	Millimeter 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

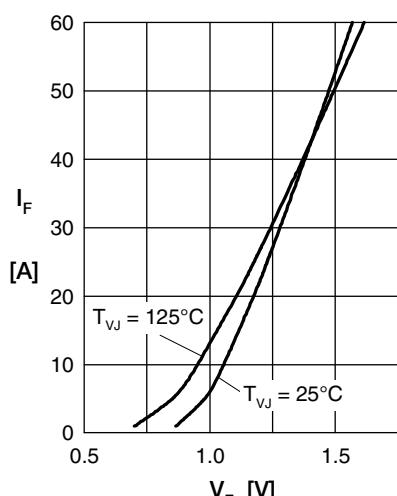


Fig. 1 Forward current versus voltage drop per diode

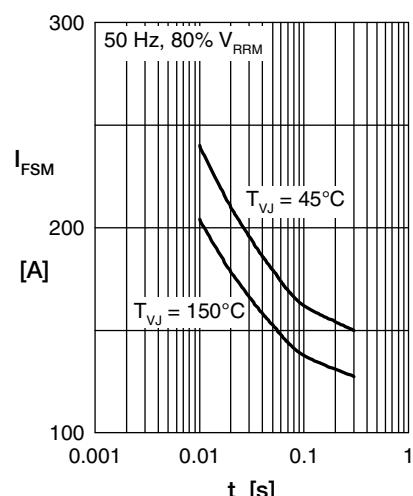


Fig. 2 Surge overload current

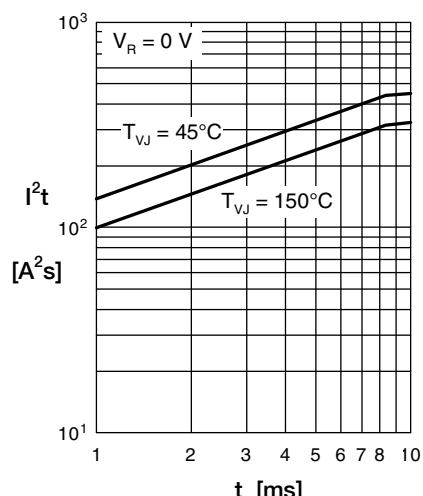
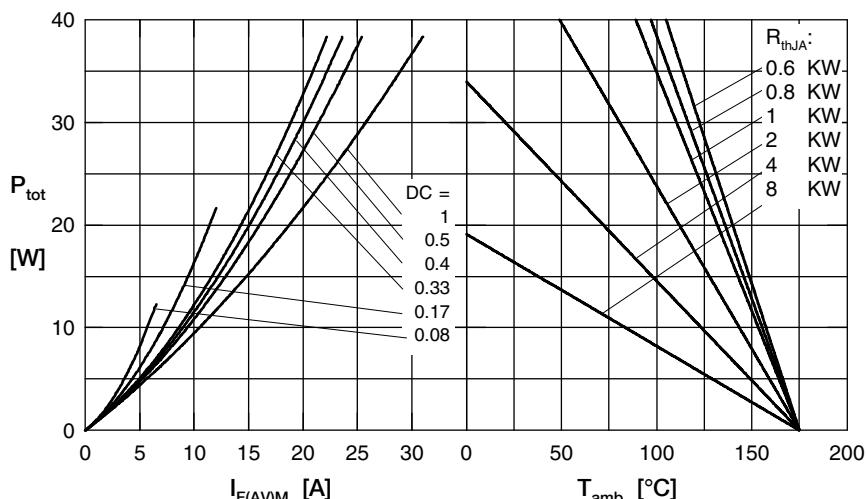
Fig. 3 I^2t versus time per diode

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

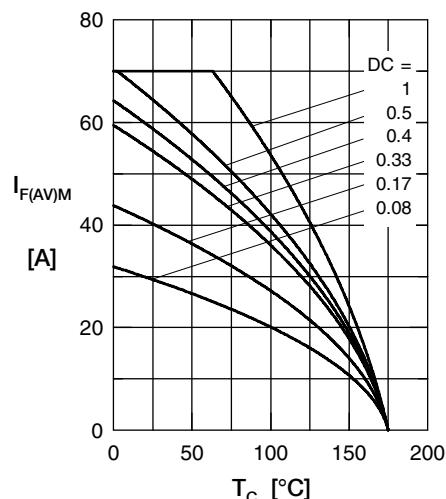


Fig. 5 Max. forward current vs. case temperature

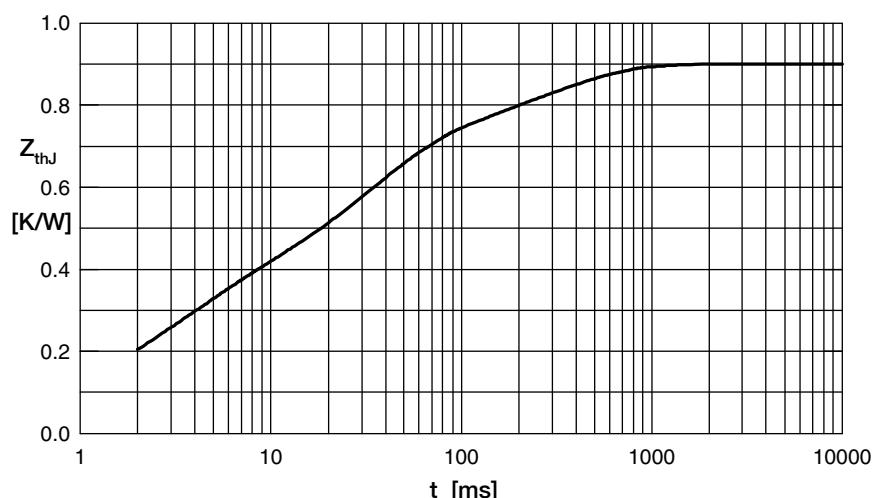


Fig. 6 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.03	0.0004
2	0.08	0.002
3	0.2	0.003
4	0.39	0.03
5	0.2	0.29