

## Standard Rectifier

$$V_{RRM} = 2 \times 1200V$$

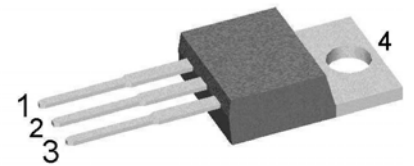
$$I_{FAV} = 8A$$

$$V_F = 1.08V$$

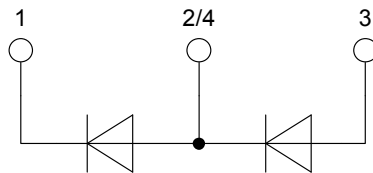
Phase leg

Part number

DSP8-12A



Backside: anode/cathode



### Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very low forward voltage drop
- Improved thermal behaviour

### Applications:

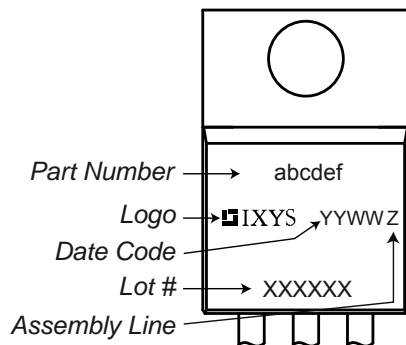
- Diode for main rectification
- For single and three phase bridge configurations

### Package: TO-220

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

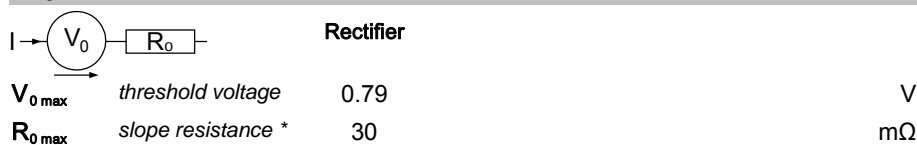
Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
$V_{RSM}$	max. non-repetitive reverse blocking voltage					1300	V
$V_{RRM}$	max. repetitive reverse blocking voltage					1200	V
$I_R$	reverse current, drain current	$V_R = 1200$ V	$T_{VJ} = 25^\circ\text{C}$			10	$\mu\text{A}$
		$V_R = 1200$ V	$T_{VJ} = 150^\circ\text{C}$			0.2	mA
$V_F$	forward voltage drop	$I_F = 8$ A	$T_{VJ} = 25^\circ\text{C}$			1.16	V
		$I_F = 16$ A				1.35	V
		$I_F = 8$ A	$T_{VJ} = 150^\circ\text{C}$			1.08	V
		$I_F = 16$ A				1.34	V
$I_{FAV}$	average forward current	$T_C = 160^\circ\text{C}$ rectangular	$T_{VJ} = 175^\circ\text{C}$ d = 0.5			8	A
$V_{FO}$	threshold voltage	} for power loss calculation only				0.79	V
$r_F$	slope resistance					33	m $\Omega$
$R_{thJC}$	thermal resistance junction to case					1.5	K/W
$R_{thCH}$	thermal resistance case to heatsink				0.50		K/W
$P_{tot}$	total power dissipation			$T_C = 25^\circ\text{C}$		100	W
$I_{FSM}$	max. forward surge current	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45^\circ\text{C}$			120	A
		t = 8,3 ms; (60 Hz), sine	$V_R = 0$ V			130	A
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 150^\circ\text{C}$			100	A
		t = 8,3 ms; (60 Hz), sine	$V_R = 0$ V			110	A
$I^2t$	value for fusing	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45^\circ\text{C}$			72	A <sup>2</sup> s
		t = 8,3 ms; (60 Hz), sine	$V_R = 0$ V			70	A <sup>2</sup> s
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 150^\circ\text{C}$			50	A <sup>2</sup> s
		t = 8,3 ms; (60 Hz), sine	$V_R = 0$ V			50	A <sup>2</sup> s
$C_J$	junction capacitance	$V_R = 400$ V	f = 1 MHz	$T_{VJ} = 25^\circ\text{C}$		4	pF

Package TO-220			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$I_{RMS}$	RMS current	per terminal			25	A
$T_{stg}$	storage temperature		-55		150	°C
$T_{vj}$	virtual junction temperature		-55		175	°C
<b>Weight</b>				2		g
$M_D$	mounting torque		0.4		0.6	Nm
$F_C$	mounting force with clip		20		60	N

**Product Marking**


Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSP8-12A	DSP8-12A	Tube	50	465062

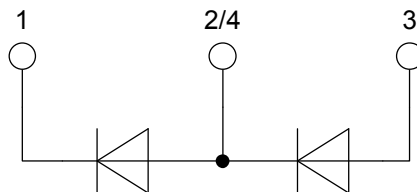
Similar Part	Package	Voltage class
DSP8-12AC	ISOPLUS220AB (3)	1200
DSP8-12S	TO-263AB (D2Pak) (2)	1200
DSP8-12AS	TO-263AA (D2Pak) (3)	1200
DSP8-08A	TO-220AB (3)	800
DSP8-08S	TO-263AB (D2Pak) (2)	800
DSP8-08AS	TO-263AA (D2Pak) (3)	800

**Equivalent Circuits for Simulation**
*\* on die level*
 $T_{vj} = 175^{\circ}C$ 


## Outlines TO-220



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.32	4.82	0.170	0.190
A1	1.14	1.39	0.045	0.055
A2	2.29	2.79	0.090	0.110
b	0.64	1.01	0.025	0.040
b2	1.15	1.65	0.045	0.065
C	0.35	0.56	0.014	0.022
D	14.73	16.00	0.580	0.630
E	9.91	10.66	0.390	0.420
e	2.54	BSC	0.100	BSC
H1	5.85	6.85	0.230	0.270
L	12.70	13.97	0.500	0.550
L1	2.79	5.84	0.110	0.230
$\varnothing P$	3.54	4.08	0.139	0.161
Q	2.54	3.18	0.100	0.125



## Rectifier

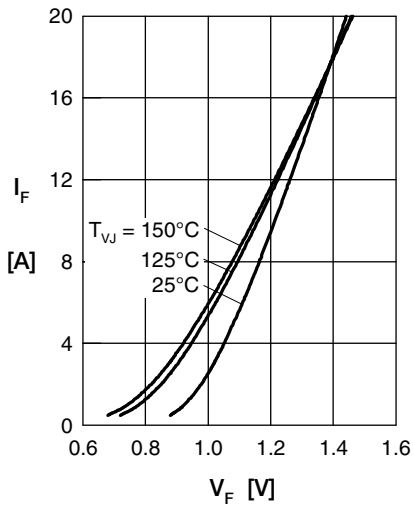


Fig. 1 Forward current versus voltage drop per diode

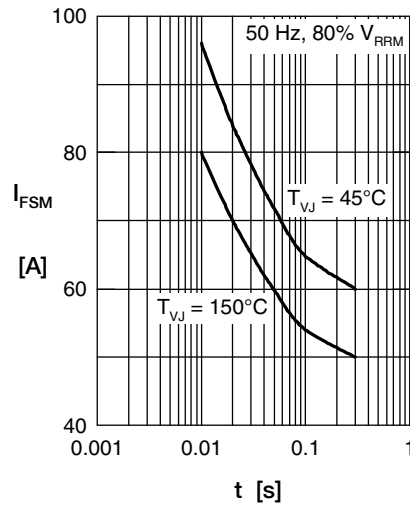


Fig. 2 Surge overload current

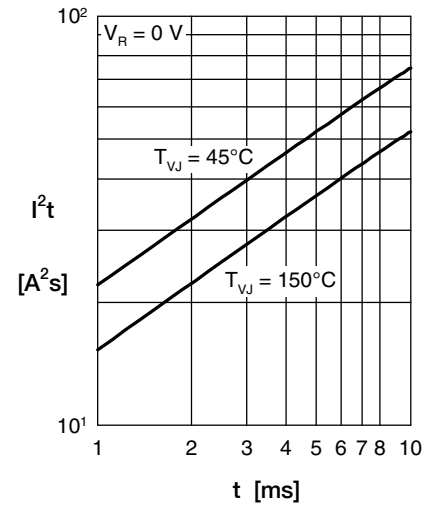


Fig. 3  $I^2t$  versus time per diode

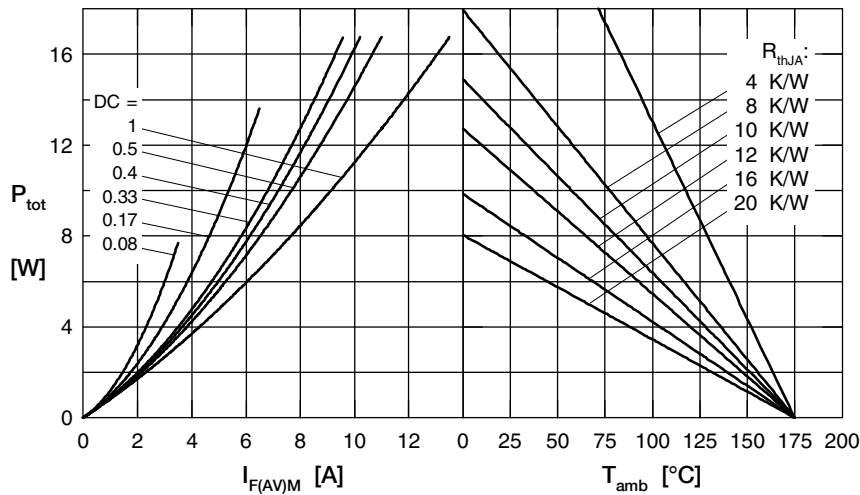


Fig. 4 Power dissipation vs. direct output current and ambient temperature

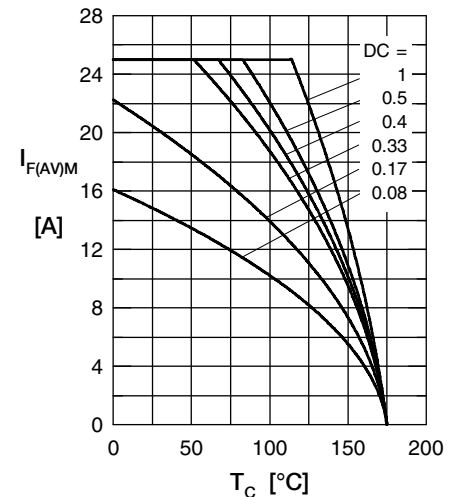


Fig. 5 Max. forward current vs. case temperature

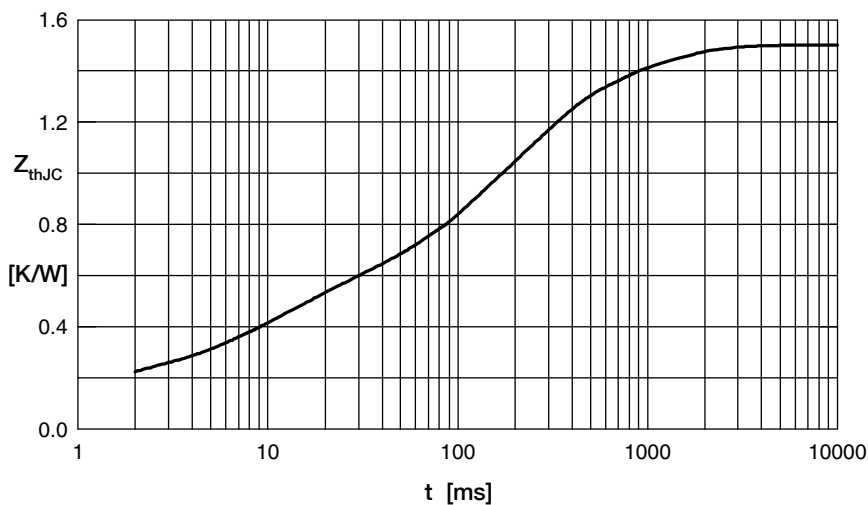


Fig. 6 Transient thermal impedance junction to case

Constants for  $Z_{thJC}$  calculation:

i	$R_{thi}$ (K/W)	$t_i$ (s)
1	0.155	0.0005
2	0.332	0.0095
3	0.713	0.17
4	0.3	0.8
5	0.00001	0.00001