

## Standard Rectifier

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

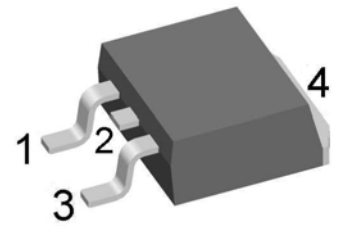
$$I_{FAV} = 8A$$

$$V_F = 1.08V$$

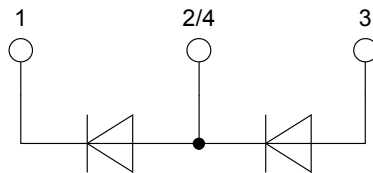
Phase leg

Part number

DSP8-12S



Backside: anode/cathode



### Features / Advantages:

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

### Applications:

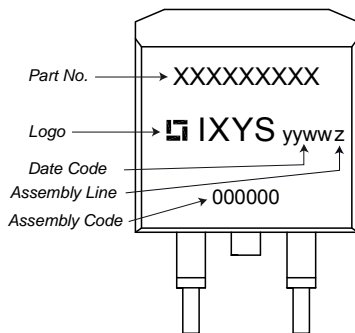
- Diode for main rectification
- For single and three phase bridge configurations

### Package: TO-263 (D2Pak)

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

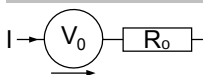
Rectifier				Ratings		
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$V_{RSM}$	max. non-repetitive reverse blocking voltage				1300	V
$V_{RRM}$	max. repetitive reverse blocking voltage				1200	V
$I_R$	reverse current, drain current	$V_R = 1200$ V			10	$\mu$ A
		$V_R = 1200$ V			0.2	mA
$V_F$	forward voltage drop	$I_F = 8$ A			1.16	V
		$I_F = 16$ A			1.35	V
		$I_F = 8$ A			1.08	V
		$I_F = 16$ A			1.34	V
$I_{FAV}$	average forward current	$T_C = 160^\circ$ C			8	A
		rectangular $d = 0.5$				
$V_{FO}$	threshold voltage				0.79	V
$r_F$	slope resistance					
$R_{thJC}$	thermal resistance junction to case				1.5	K/W
$R_{thCH}$	thermal resistance case to heatsink		0.25			K/W
$P_{tot}$	total power dissipation				100	W
$I_{FSM}$	max. forward surge current	$t = 10$ ms; (50 Hz), sine			120	A
		$t = 8,3$ ms; (60 Hz), sine			130	A
		$t = 10$ ms; (50 Hz), sine			100	A
		$t = 8,3$ ms; (60 Hz), sine			110	A
$I^2t$	value for fusing	$t = 10$ ms; (50 Hz), sine			72	A <sup>2</sup> s
		$t = 8,3$ ms; (60 Hz), sine			70	A <sup>2</sup> s
		$t = 10$ ms; (50 Hz), sine			50	A <sup>2</sup> s
		$t = 8,3$ ms; (60 Hz), sine			50	A <sup>2</sup> s
$C_J$	junction capacitance	$V_R = 400$ V $f = 1$ MHz			4	pF

Package TO-263 (D2Pak)			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
$F_C$	mounting force with clip		20		60	N

**Product Marking**


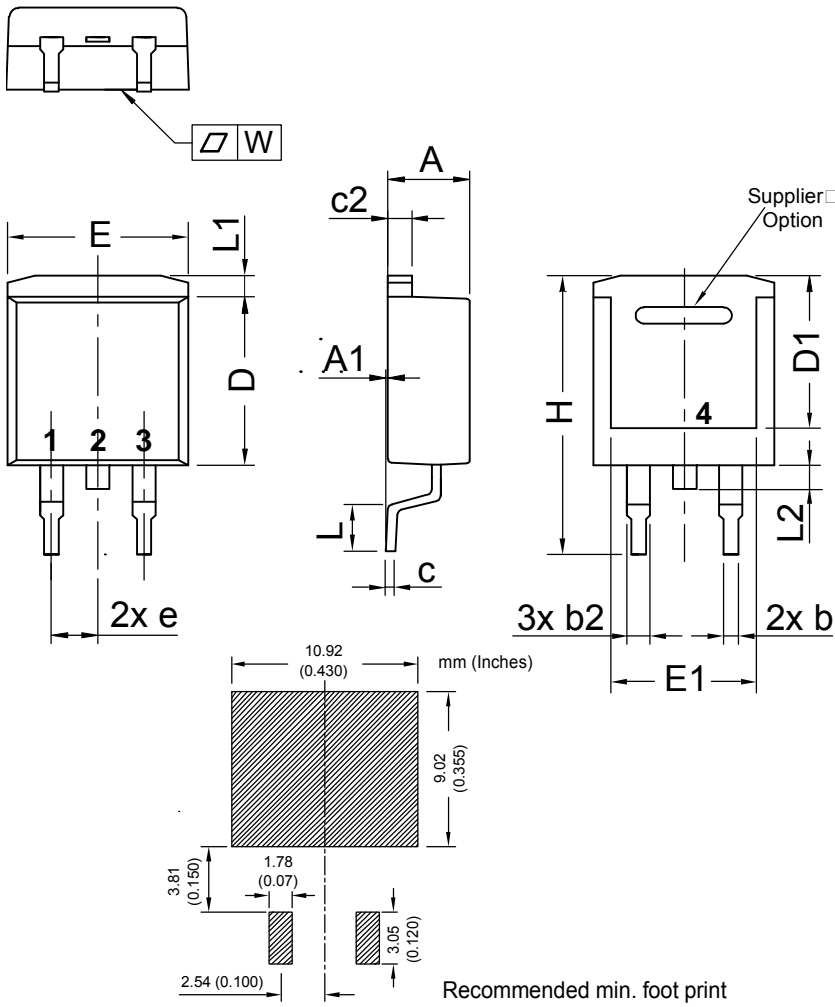
Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSP8-12S	DSP8-12S	Tape & Reel	800	499390

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

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

**Rectifier**

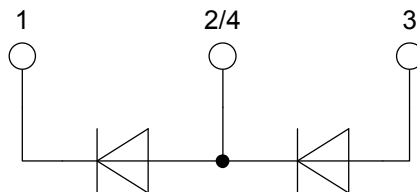
$V_{0\ max}$	threshold voltage	0.79	V
$R_{0\ max}$	slope resistance *	30	mΩ

## Outlines TO-263 (D2Pak)



Dim.	Millimeter		Inches	
	min	max	min	max
A	4.06	4.83	0.160	0.190
A1	typ. 0.10		typ. 0.004	
A2	2.41		0.095	
b	0.51	0.99	0.020	0.039
b2	1.14	1.40	0.045	0.055
c	0.40	0.74	0.016	0.029
c2	1.14	1.40	0.045	0.055
D	8.38	9.40	0.330	0.370
D1	8.00	8.89	0.315	0.350
D2	2.5		0.098	
E	9.65	10.41	0.380	0.410
E1	6.22	8.50	0.245	0.335
e	2,54 BSC		0,100 BSC	
e1	4.28		0.169	
H	14.61	15.88	0.575	0.625
L	1.78	2.79	0.070	0.110
L1	1.02	1.68	0.040	0.066
W	typ. 0.02	0.040	typ. 0.0008	0.002

All dimensions conform with and/or within JEDEC standard.



## Rectifier

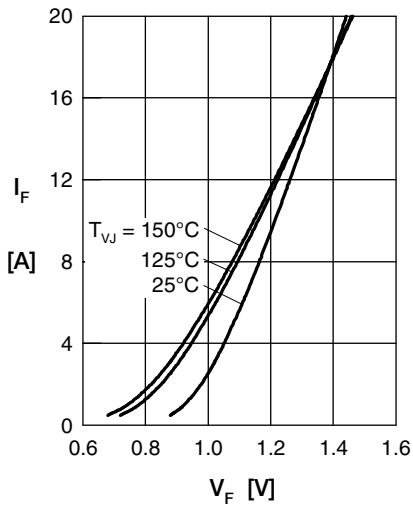


Fig. 1 Forward current versus voltage drop per diode

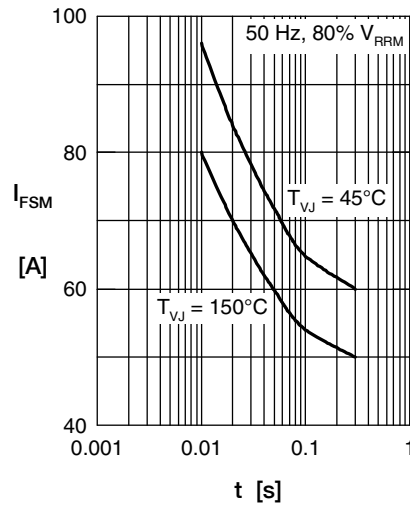


Fig. 2 Surge overload current

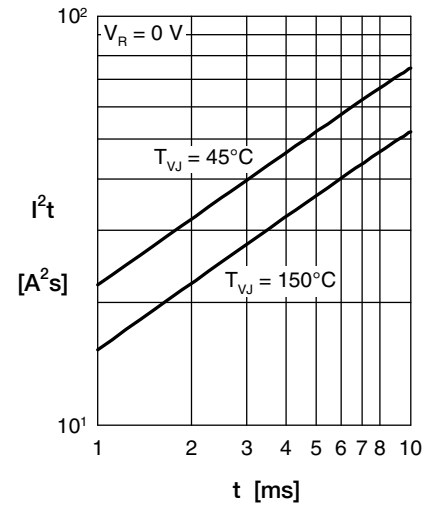


Fig. 3  $I^2t$  versus time per diode

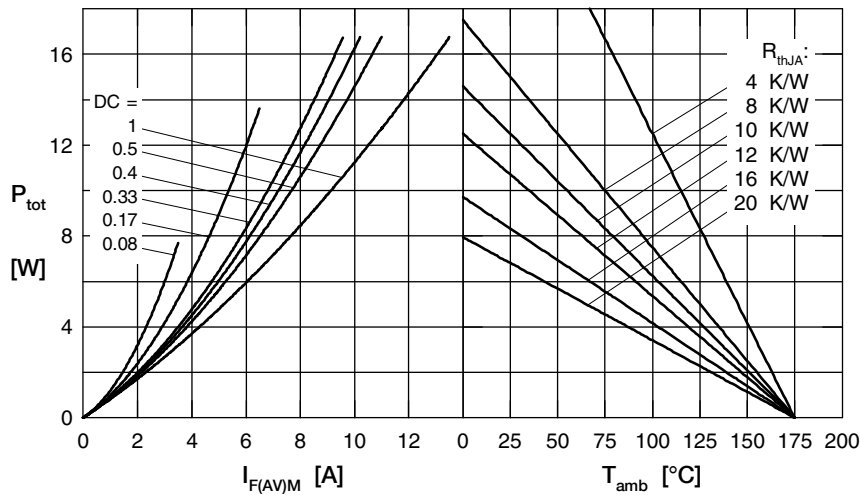


Fig. 4 Power dissipation vs. direct output current and ambient temperature

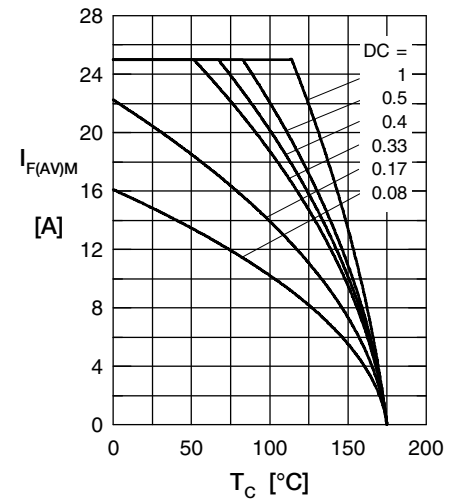


Fig. 5 Max. forward current vs. case temperature

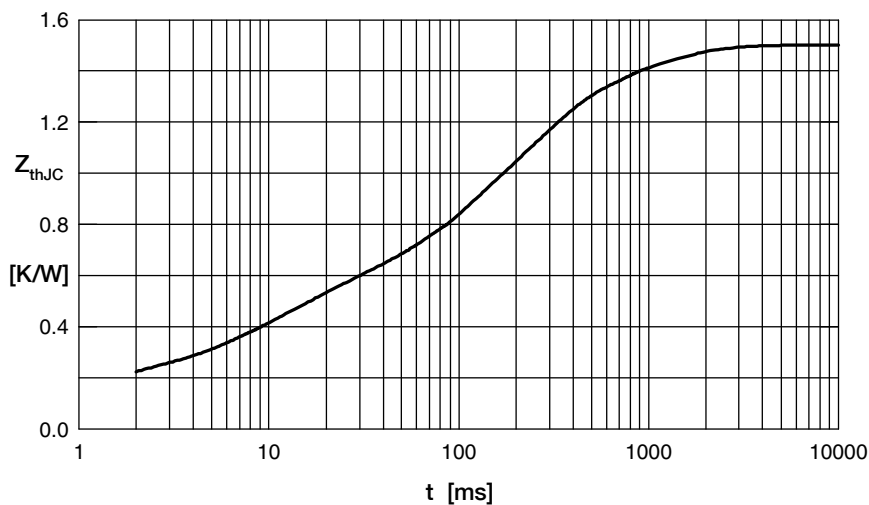


Fig. 6 Transient thermal impedance junction to case

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