

# Standard Rectifier

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

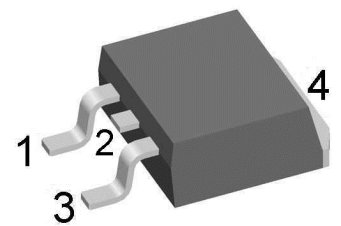
$$I_{FAV} = 8 \text{ A}$$

$$V_F = 1.08 \text{ V}$$

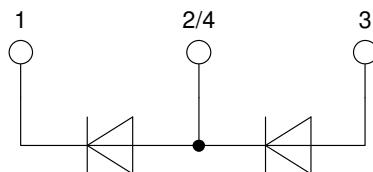
Phase leg

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

### Disclaimer Notice

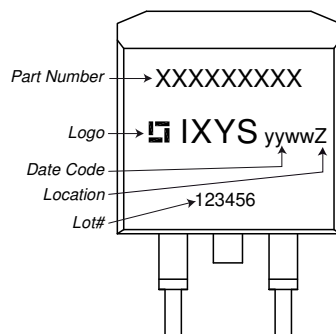
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Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
$V_{RSM}$	max. non-repetitive reverse blocking voltage					1300	V
$V_{RRM}$	max. repetitive reverse blocking voltage					1200	V
$I_R$	reverse current	$V_R = 1200$ V	$T_{VJ} = 25^\circ\text{C}$			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
$V_{F0}$	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				0.25		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-263 (D2Pak)			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$I_{RMS}$	RMS current	per terminal			25	A
$T_{VJ}$	virtual junction temperature		-55		175	°C
$T_{op}$	operation temperature		-55		150	°C
$T_{stg}$	storage temperature		-55		150	°C
<b>Weight</b>				1.5		g
$F_c$	mounting force with clip		20		60	N

### Product Marking



Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSP8-12S-TRL	DSP8-12S-TRL	Tape & Reel	800	499390
Alternative	DSP8-12S-TUB	DSP8-12S	Tube	50	499382

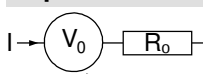
Similar Part	Package	Voltage class
DSP8-12AS	TO-263AA (D2Pak) (3)	1200
DSP8-12A	TO-220AB (3)	1200
DSP8-12AC	ISOPLUS220AB (3)	1200
DSP8-08S	TO-263AB (D2Pak) (2)	800

DSP8-08AS	TO-263AA (D2Pak) (3)	800
DSP8-08A	TO-220AB (3)	800

### Equivalent Circuits for Simulation

\* on die level

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

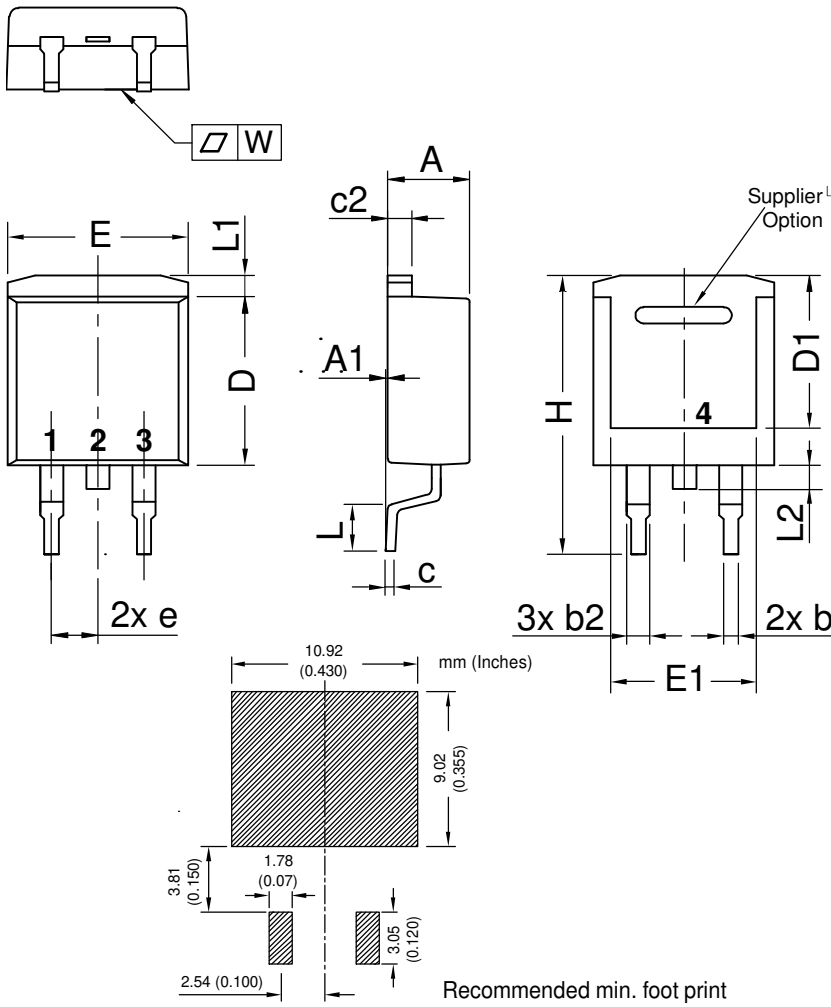


Rectifier

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

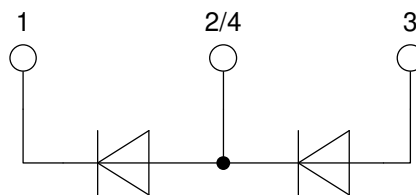


**Outlines TO-263 (D2Pak)**



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.*



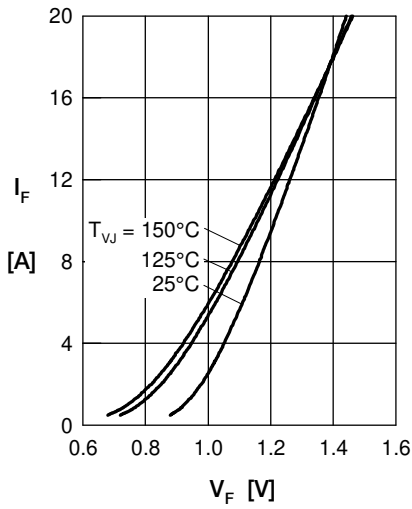
**Rectifier**


Fig. 1 Forward current versus voltage drop per diode

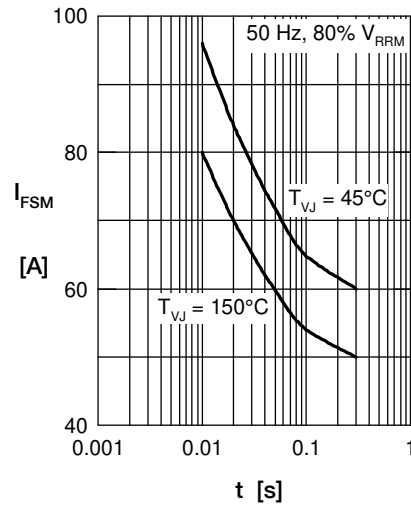


Fig. 2 Surge overload current

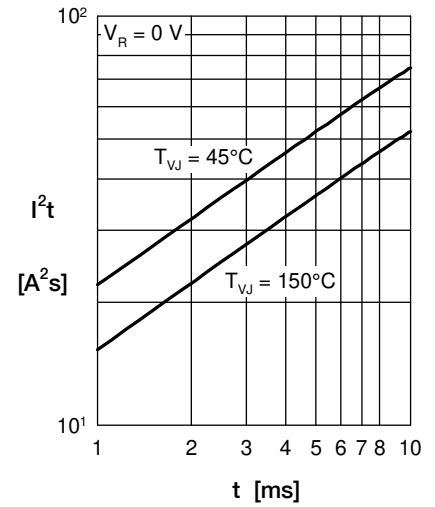
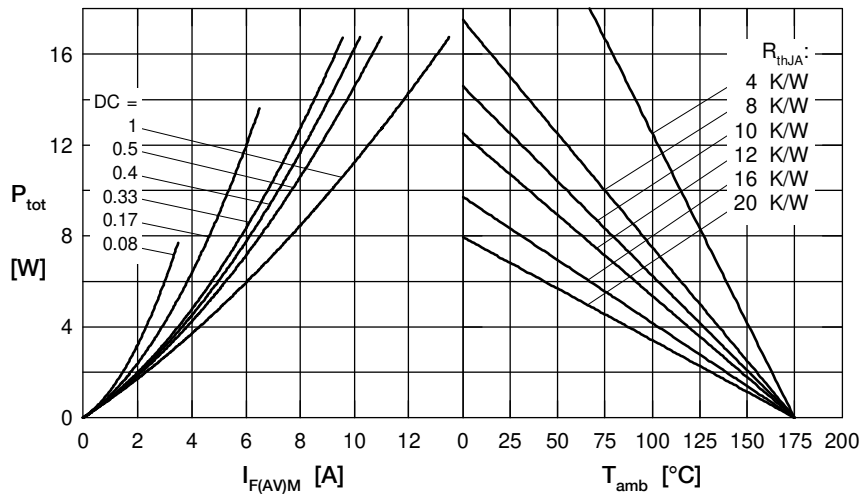

 Fig. 3  $I^2t$  versus time per diode


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

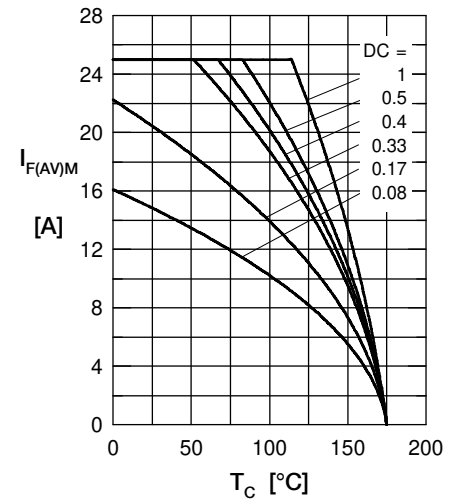


Fig. 5 Max. forward current vs. case temperature

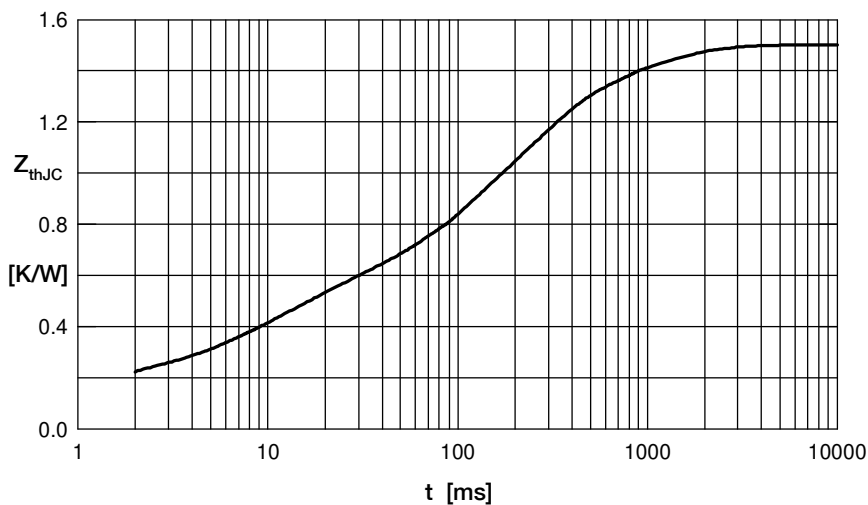


Fig. 6 Transient thermal impedance junction to case

 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