

# High Voltage Standard Rectifier

$$V_{RRM} = 2200 \text{ V}$$

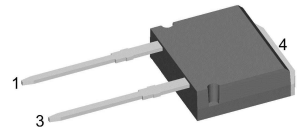
$$I_{FAV} = 30 \text{ A}$$

$$V_F = 1.24 \text{ V}$$

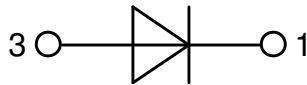
## Single Diode

### Part number

**DNA30ER2200IY**



Backside: anode



### 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-262 (I2Pak)

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

### Terms Conditions of usage:

The data contained in this product data sheet is exclusively intended for technically trained staff. The user will have to evaluate the suitability of the product for the intended application and the completeness of the product data with respect to his application. The specifications of our components may not be considered as an assurance of component characteristics. The information in the valid application- and assembly notes must be considered. Should you require product information in excess of the data given in this product data sheet or which concerns the specific application of your product, please contact the sales office, which is responsible for you.

Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact the sales office, which is responsible for you.

Should you intend to use the product in aviation, in health or live endangering or life support applications, please notify. For any such application we urgently recommend

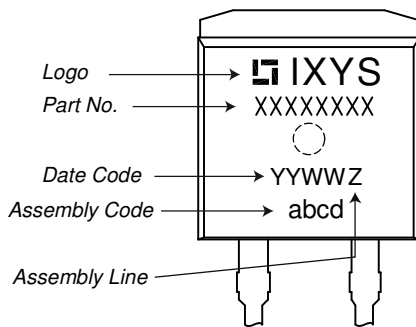
- to perform joint risk and quality assessments;

- the conclusion of quality agreements;

- to establish joint measures of an ongoing product survey, and that we may make delivery dependent on the realization of any such measures.

Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
$V_{RSM}$	max. non-repetitive reverse blocking voltage			$T_{VJ} = 25^{\circ}C$		2300	V
$V_{RRM}$	max. repetitive reverse blocking voltage			$T_{VJ} = 25^{\circ}C$		2200	V
$I_R$	reverse current	$V_R = 2200$ V		$T_{VJ} = 25^{\circ}C$		40	$\mu A$
		$V_R = 2200$ V		$T_{VJ} = 150^{\circ}C$		1.5	mA
$V_F$	forward voltage drop	$I_F = 30$ A		$T_{VJ} = 25^{\circ}C$		1.26	V
		$I_F = 60$ A				1.53	V
		$I_F = 30$ A		$T_{VJ} = 150^{\circ}C$		1.24	V
		$I_F = 60$ A				1.63	V
$I_{FAV}$	average forward current	$T_C = 140^{\circ}C$		$T_{VJ} = 175^{\circ}C$		30	A
		rectangular	d = 0.5				
$V_{FO}$	threshold voltage			$T_{VJ} = 175^{\circ}C$		0.83	V
$r_F$	slope resistance	} for power loss calculation only				13.4	m $\Omega$
$R_{thJC}$	thermal resistance junction to case					0.7	K/W
$R_{thCH}$	thermal resistance case to heatsink				0.50		K/W
$P_{tot}$	total power dissipation			$T_C = 25^{\circ}C$		210	W
$I_{FSM}$	max. forward surge current	t = 10 ms; (50 Hz), sine		$T_{VJ} = 45^{\circ}C$		370	A
		t = 8,3 ms; (60 Hz), sine		$V_R = 0$ V		400	A
		t = 10 ms; (50 Hz), sine		$T_{VJ} = 150^{\circ}C$		315	A
		t = 8,3 ms; (60 Hz), sine		$V_R = 0$ V		340	A
$I^2t$	value for fusing	t = 10 ms; (50 Hz), sine		$T_{VJ} = 45^{\circ}C$		685	A <sup>2</sup> s
		t = 8,3 ms; (60 Hz), sine		$V_R = 0$ V		665	A <sup>2</sup> s
		t = 10 ms; (50 Hz), sine		$T_{VJ} = 150^{\circ}C$		495	A <sup>2</sup> s
		t = 8,3 ms; (60 Hz), sine		$V_R = 0$ V		480	A <sup>2</sup> s
$C_J$	junction capacitance	$V_R = 700$ V; f = 1 MHz		$T_{VJ} = 25^{\circ}C$		7	pF

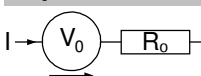
Package TO-262 (I2Pak)			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$I_{RMS}$	RMS current	per terminal			35	A
$T_{VJ}$	virtual junction temperature		-55		175	°C
$T_{op}$	operation temperature		-55		150	°C
$T_{stg}$	storage temperature		-55		150	°C
<b>Weight</b>				1.5		g
$F_C$	mounting force with clip		20		60	N
$d_{Spp/App}$	creepage distance on surface / striking distance through air	terminal to terminal	4.2			mm
$d_{Spb/Apb}$		terminal to backside	4.9			mm

**Product Marking**

**Part description**

D = Diode  
 N = High Voltage Standard Rectifier  
 A = (>= 2000V)  
 30 = Current Rating [A]  
 ER = Single Diode  
 2200 = Reverse Voltage [V]  
 IY = TO-262 (I2Pak) (2HV)

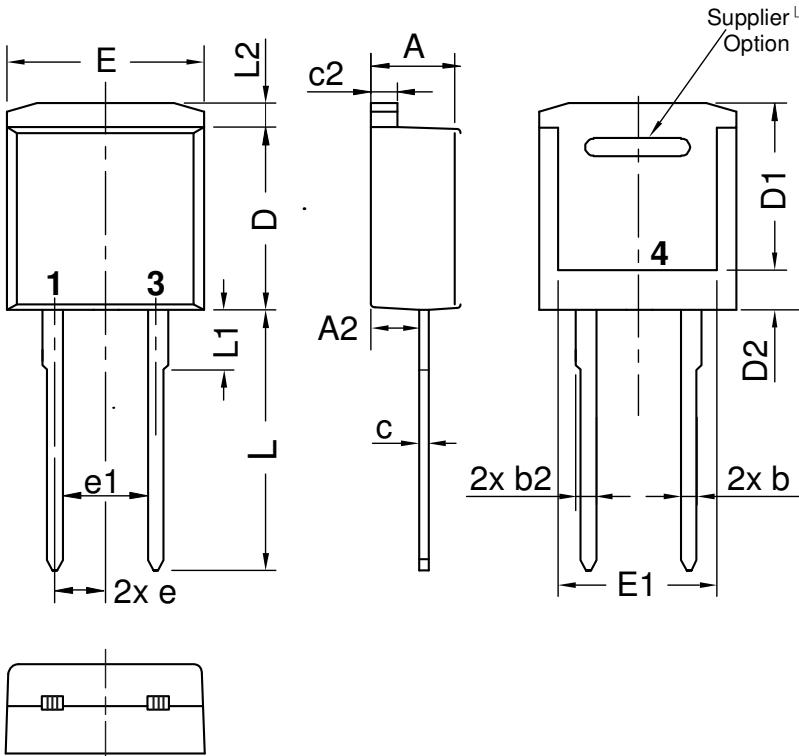
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DNA30ER2200IY	DNA30ER2200IY	Tube	50	513702

Similar Part	Package	Voltage class
DNA30E2200PA	TO-220AC (2)	2200
DNA30E2200PZ	TO-263AB (D2Pak) (2HV)	2200
DNA30EM2200PZ	TO-263AB (D2Pak) (2HV)	2200
DNA30E2200FE	i4-Pac (2HV)	2200

**Equivalent Circuits for Simulation**
*\* on die level*
 $T_{VJ} = 175\text{°C}$ 

**Rectifier**

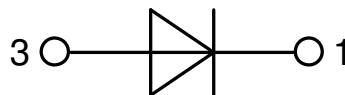
$V_{0\ max}$	threshold voltage	0.83	V
$R_{0\ max}$	slope resistance *	10.2	mΩ

## Outlines TO-262 (I2Pak)



Dim.	Millimeter		Inches	
	min	max	min	max
A	4.06	4.83	0.160	0.190
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	
L	13.00	13.60	0.512	0.535
L1	2.90	3.10	0.114	0.122
L2	1.02	1.68	0.040	0.066

*All dimensions conform with and/or within JEDEC standard.*



## Rectifier

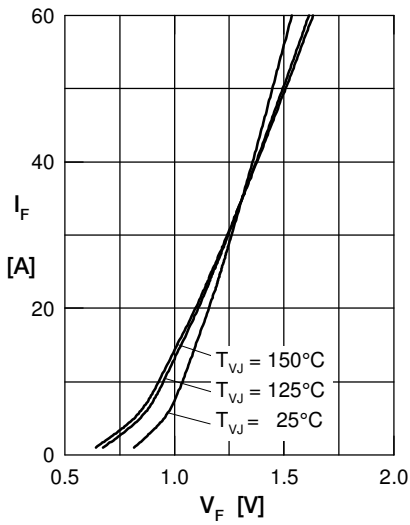


Fig. 1 Forward current versus voltage drop per diode

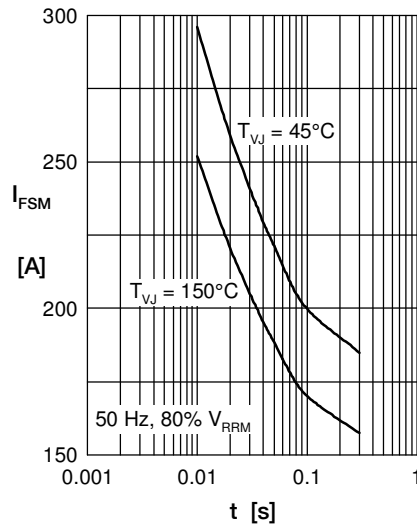


Fig. 2 Surge overload current

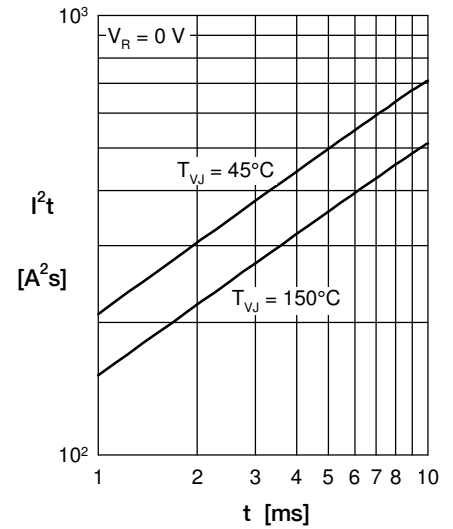


Fig. 3  $I^2t$  versus time per diode

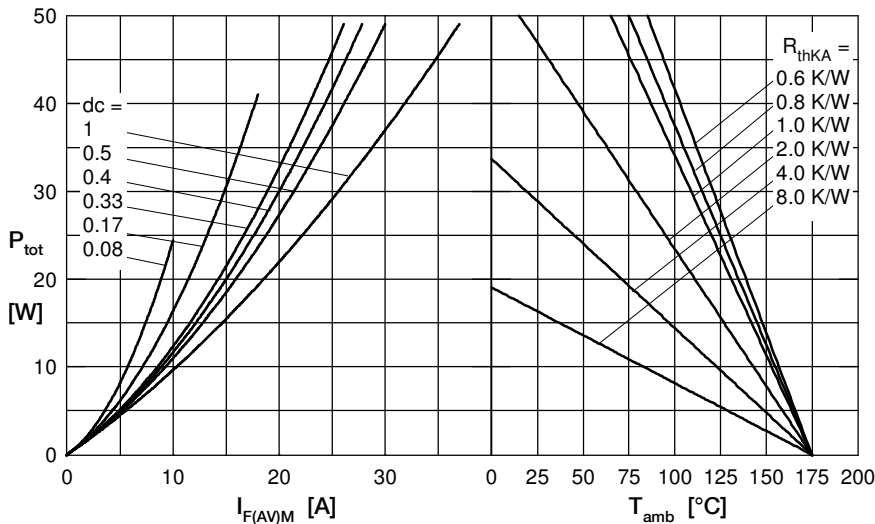


Fig. 4 Power dissipation versus direct output current and ambient temperature

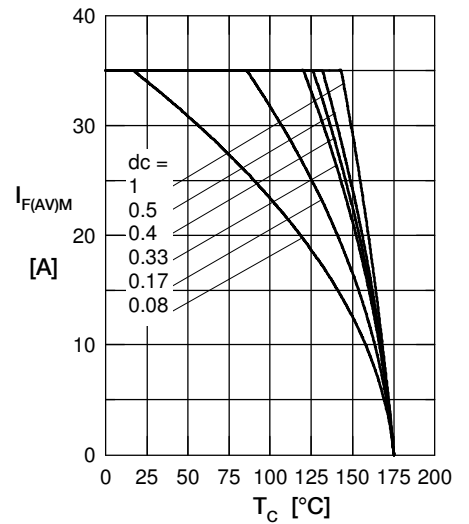


Fig. 5 Max. forward current versus case temperature

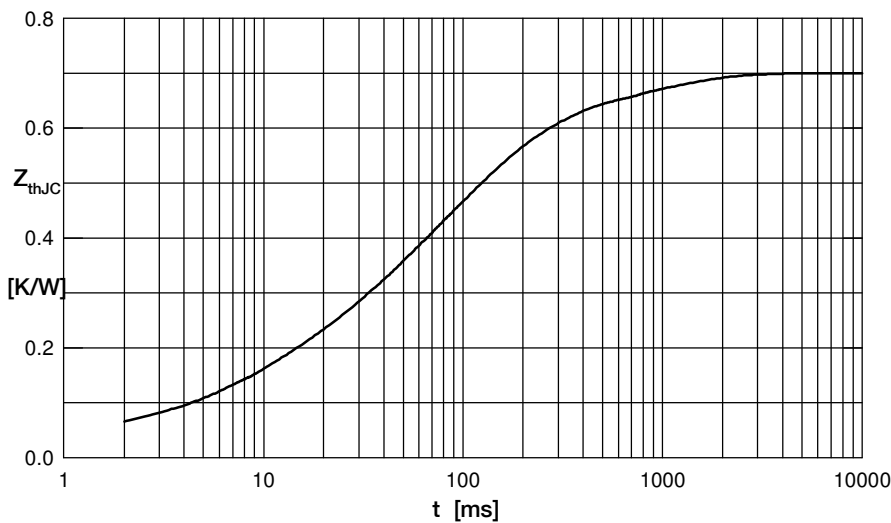


Fig. 6 Transient thermal impedance junction to case

Constants for  $Z_{thJC}$  calculation:

i	$R_{thi}$ (K/W)	$t_i$ (s)
1	0.03	0.0003
2	0.072	0.0065
3	0.131	0.027
4	0.367	0.105
5	0.1	0.8