

# High Voltage Standard Rectifier

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

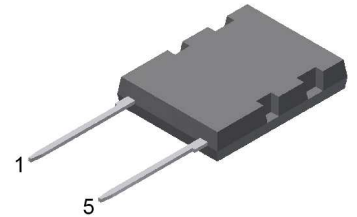
$$I_{FAV} = 120 \text{ A}$$

$$V_F = 1.23 \text{ V}$$

## Single Diode

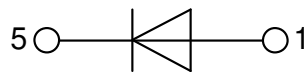
Part number

**DNA120E2200KO**



Backside: isolated

 E72873



### 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: ISOPLUS264

- Isolation Voltage: 3600 V~
- Industry convenient outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Soldering pins for PCB mounting
- Backside: DCB ceramic
- Reduced weight
- Advanced power cycling

### Disclaimer Notice

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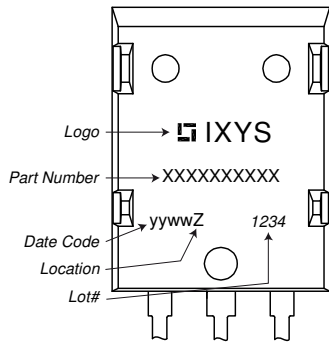


Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
$V_{RSM}$	max. non-repetitive reverse blocking voltage					2300	V
$V_{RRM}$	max. repetitive reverse blocking voltage					2200	V
$I_R$	reverse current	$V_R = 2200$ V		$T_{VJ} = 25^\circ\text{C}$		100	$\mu\text{A}$
		$V_R = 2200$ V		$T_{VJ} = 150^\circ\text{C}$		3.5	mA
$V_F$	forward voltage drop	$I_F = 120$ A		$T_{VJ} = 25^\circ\text{C}$		1.31	V
		$I_F = 240$ A				1.64	V
		$I_F = 120$ A		$T_{VJ} = 150^\circ\text{C}$		1.23	V
		$I_F = 240$ A				1.68	V
$I_{FAV}$	average forward current	$T_C = 125^\circ\text{C}$	rectangular	$T_{VJ} = 175^\circ\text{C}$		120	A
$V_{FO}$	threshold voltage	} for power loss calculation only				0.75	V
$r_F$	slope resistance					3.8	m $\Omega$
$R_{thJC}$	thermal resistance junction to case					0.25	K/W
$R_{thCH}$	thermal resistance case to heatsink				0.2		K/W
$P_{tot}$	total power dissipation			$T_C = 25^\circ\text{C}$		600	W
$I_{FSM}$	max. forward surge current	$t = 10$ ms; (50 Hz), sine		$T_{VJ} = 45^\circ\text{C}$		2.00	kA
		$t = 8,3$ ms; (60 Hz), sine		$V_R = 0$ V		2.16	kA
		$t = 10$ ms; (50 Hz), sine		$T_{VJ} = 150^\circ\text{C}$		1.70	kA
		$t = 8,3$ ms; (60 Hz), sine		$V_R = 0$ V		1.84	kA
$I^2t$	value for fusing	$t = 10$ ms; (50 Hz), sine		$T_{VJ} = 45^\circ\text{C}$		20.0	kA <sup>2</sup> s
		$t = 8,3$ ms; (60 Hz), sine		$V_R = 0$ V		19.4	kA <sup>2</sup> s
		$t = 10$ ms; (50 Hz), sine		$T_{VJ} = 150^\circ\text{C}$		14.5	kA <sup>2</sup> s
		$t = 8,3$ ms; (60 Hz), sine		$V_R = 0$ V		14.0	kA <sup>2</sup> s
$C_J$	junction capacitance	$V_R = 700$ V; $f = 1$ MHz		$T_{VJ} = 25^\circ\text{C}$		88	pF



Package ISOPLUS264		Ratings				
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$I_{RMS}$	RMS current	per terminal			70	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>				10		g
$F_C$	mounting force with clip		20		120	N
$d_{Spp/App}$	creepage distance on surface / striking distance through air	terminal to terminal	13.8			mm
$d_{Spb/Apb}$		terminal to backside	5.0			mm
$V_{ISOL}$	isolation voltage	t = 1 second t = 1 minute	3600 3000			V V
		50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA				

**Product Marking**



**Part description**

- D = Diode
- N = High Voltage Standard Rectifier
- A = (>= 2000V)
- 120 = Current Rating [A]
- E = Single Diode
- 2200 = Reverse Voltage [V]
- KO = ISOPLUS264 (2HV)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DNA120E2200KO	DNA120E2200KO	Tube	25	523314

**Equivalent Circuits for Simulation**

*\* on die level*

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

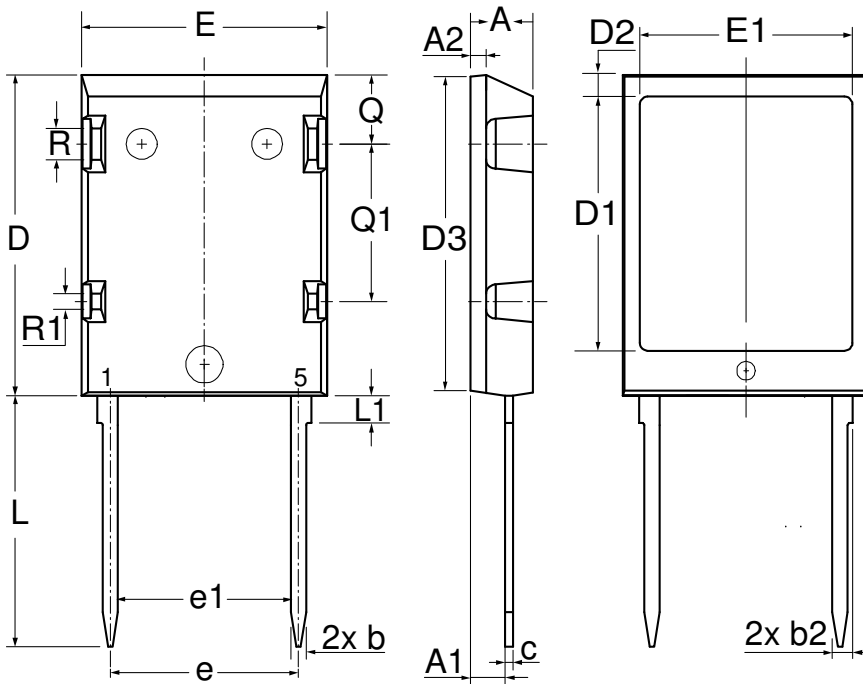


**Rectifier**

$V_{0\ max}$	threshold voltage	0.75	V
$R_{0\ max}$	slope resistance *	1.2	mΩ

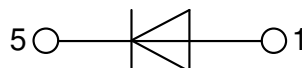
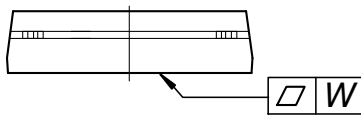


Outlines ISOPLUS264



Dim.	Millimeter		Inches	
	min	max	min	max
A	4.83	5.21	0.190	0.205
A1	2.59	3.00	0.102	0.118
A2	1.17	1.40	0.046	0.055
b	1.14	1.40	0.045	0.055
b2	1.60	1.83	0.063	0.072
c	0.51	0.74	0.020	0.029
D	25.91	26.42	1.020	1.040
D1	20.34	20.85	0.801	0.821
D2	1.65	2.03	0.065	0.080
D3	25.29	25.78	1.000	1.020
E	19.56	20.29	0.770	0.799
E1	16.97	17.53	0.668	0.690
e	15.24	BSC	0.600	BSC
e1	14.10	BSC	0.555	BSC
L	19.81	20.83	0.780	0.820
L1	2.03	2.59	0.080	0.102
Q	5.33	5.97	0.210	0.235
Q1	12.45	13.03	0.490	0.513
R	3.81	4.57	0.150	0.180
R1	2.54	3.30	0.100	0.130
W	-	0.10	-	0.004

Die konvexe Form des Substrates ist typ. < 0.05 mm über der Kunststoffoberfläche der Bauteilunterseite  
The convex bow of substrate is typ. < 0.05 mm over plastic surface level of device bottom side





**Rectifier**

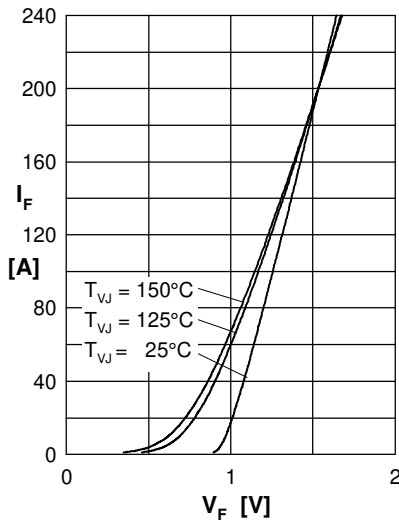


Fig. 1 Forward current versus voltage drop per diode

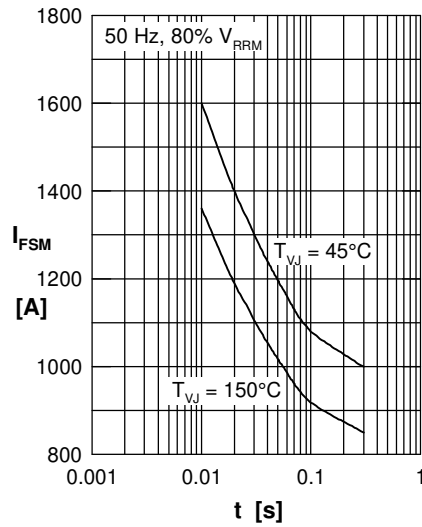


Fig. 2 Surge overload current

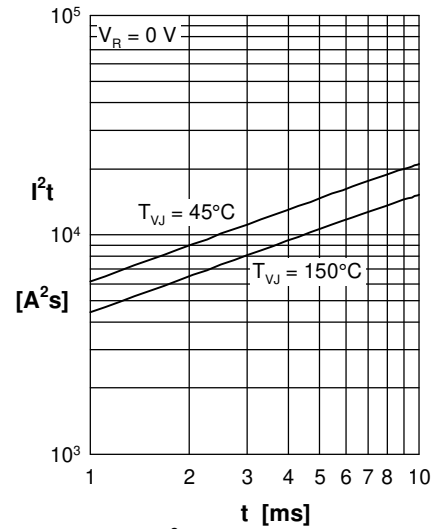


Fig. 3  $I^2t$  versus time per diode

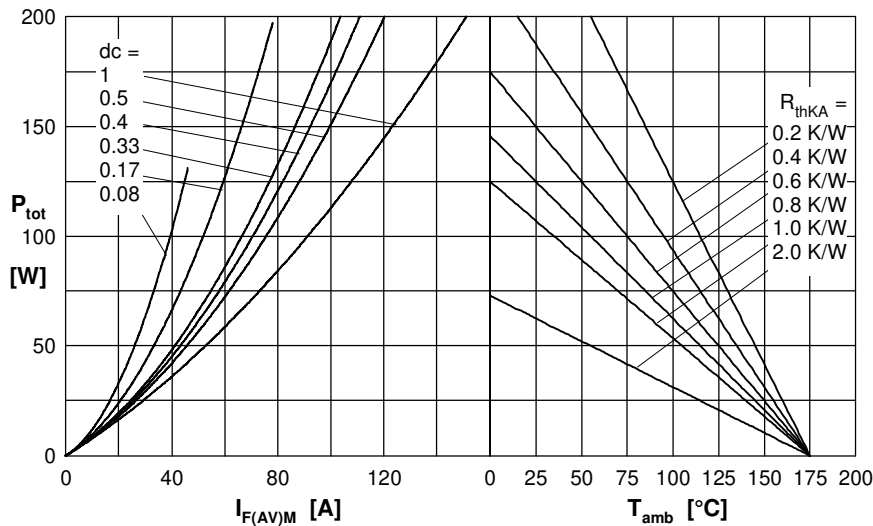


Fig. 4 Power dissipation versus direct output current & ambient temperature

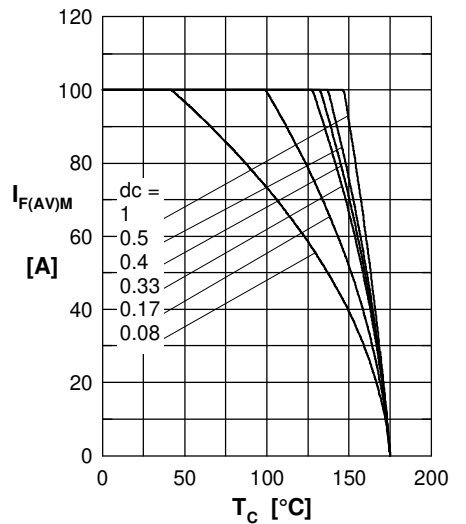


Fig. 5 Max. forward current versus case temperature

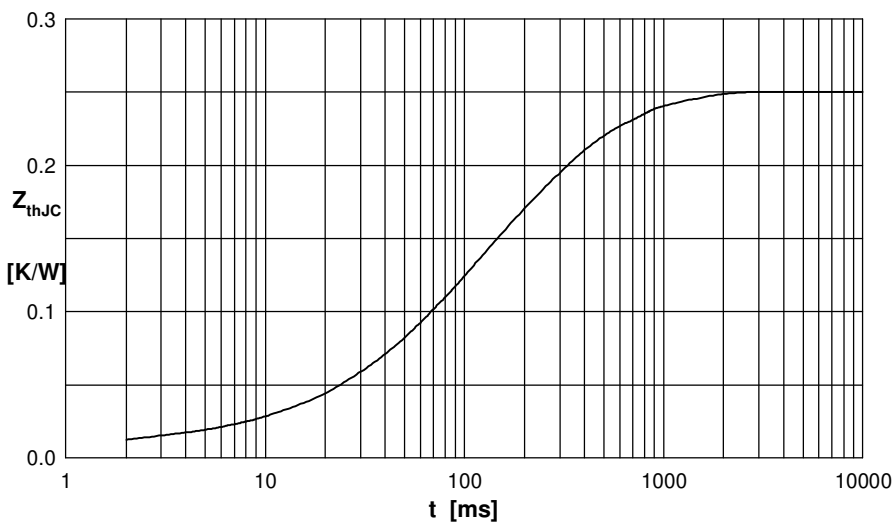


Fig. 6 Transient thermal impedance junction to case

Constants for  $Z_{thJC}$  calculation:

i	$R_{thi}$ (K/W)	$t_i$ (s)
1	0.01	0.001
2	0.05	0.050
3	0.12	0.150
4	0.07	0.500