

High Voltage Standard Rectifier

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

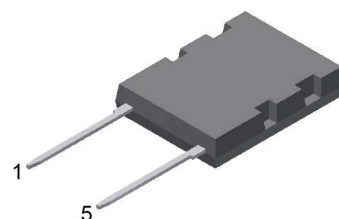
$$I_{FAV} = 120 \text{ A}$$

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

Single Diode

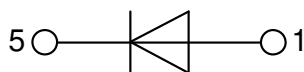
Part number

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

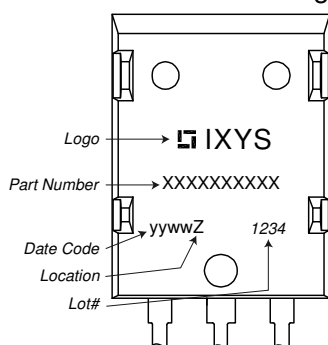
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Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				2300	V
V_{RRM}	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				2200	V
I_R	reverse current	$V_R = 2200\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$			100	μA
		$V_R = 2200\text{ V}$	$T_{VJ} = 150^{\circ}\text{C}$			3.5	mA
V_F	forward voltage drop	$I_F = 120\text{ A}$	$T_{VJ} = 25^{\circ}\text{C}$			1.31	V
		$I_F = 240\text{ A}$				1.64	V
		$I_F = 120\text{ A}$	$T_{VJ} = 150^{\circ}\text{C}$			1.23	V
		$I_F = 240\text{ A}$				1.68	V
I_{FAV}	average forward current	$T_C = 125^{\circ}\text{C}$ rectangular $d = 0.5$	$T_{VJ} = 175^{\circ}\text{C}$			120	A
V_{F0}	threshold voltage	} for power loss calculation only		$T_{VJ} = 175^{\circ}\text{C}$		0.75	V
r_F	slope resistance					3.8	m Ω
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	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 45^{\circ}\text{C}$			2.00	kA
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			2.16	kA
		$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 150^{\circ}\text{C}$			1.70	kA
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			1.84	kA
I^2t	value for fusing	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 45^{\circ}\text{C}$			20.0	kA ² s
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			19.4	kA ² s
		$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 150^{\circ}\text{C}$			14.5	kA ² s
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			14.0	kA ² s
C_J	junction capacitance	$V_R = 700\text{ V}; f = 1\text{ MHz}$		$T_{VJ} = 25^{\circ}\text{C}$	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
Weight					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		3600			V
		t = 1 minute		3000			V
50/60 Hz, RMS; I _{ISOL} ≤ 1 mA							

Product Marking



Part description

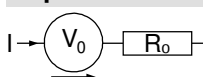
D = Diode
 N = High Voltage Standard Rectifier
 A = (≥ 2000 V)
 120 = Current Rating [A]
 E = Single Diode
 2200 = Reverse Voltage [V]
 KO = ISOPLUS264 (2HV)

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

Equivalent Circuits for Simulation

* on die level

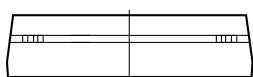
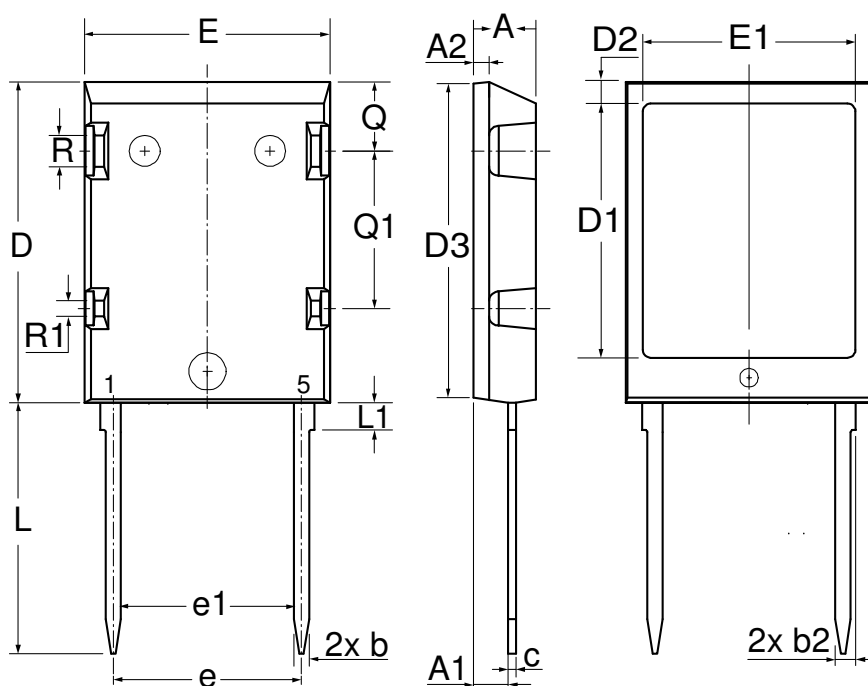
$T_{VJ} = 175^\circ\text{C}$



Rectifier

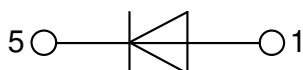
$V_{0\max}$ threshold voltage 0.75 V

$R_{0\max}$ slope resistance * 1.2 mΩ

Outlines ISOPLUS264


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

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



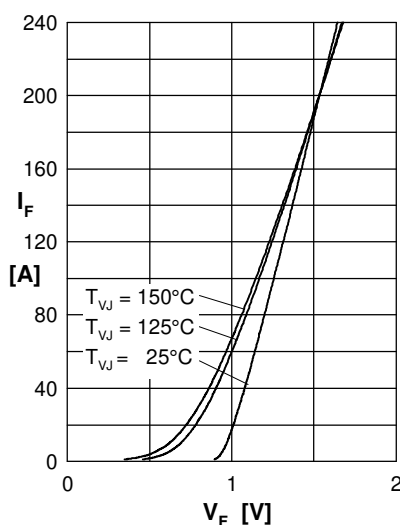
Rectifier


Fig. 1 Forward current versus voltage drop per diode

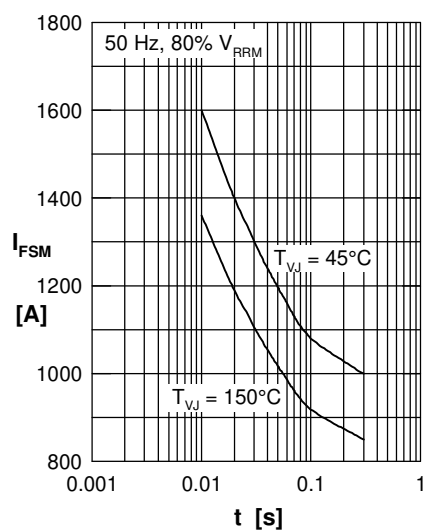


Fig. 2 Surge overload current

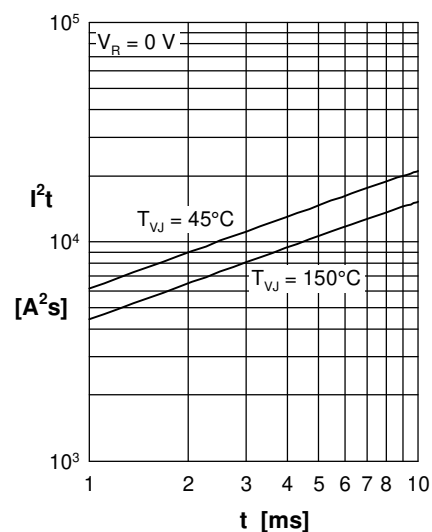
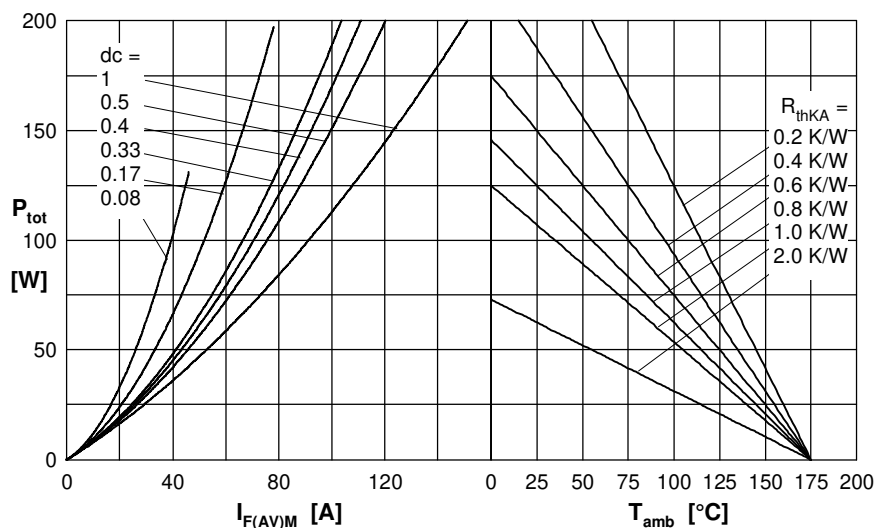

 Fig. 3 I^2t versus time per diode


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

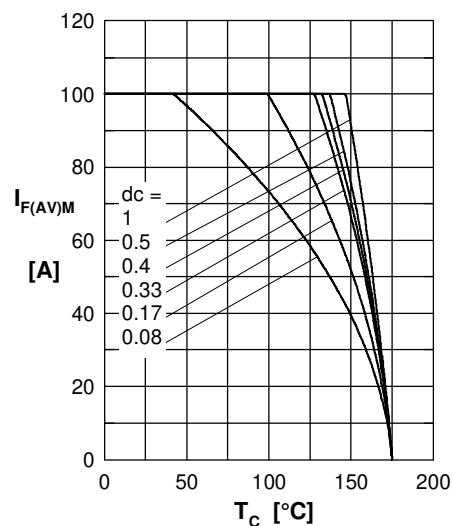


Fig. 5 Max. forward current versus case temperature

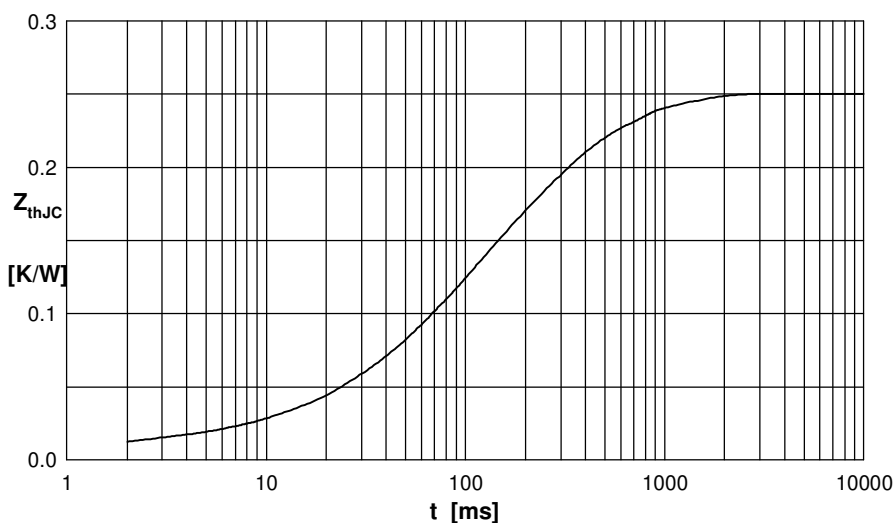


Fig. 6 Transient thermal impedance junction to case

 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