

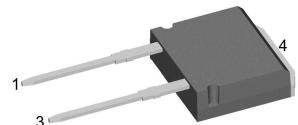
High Voltage Standard Rectifier

V_{RRM} = 2200 V
 I_{FAV} = 30 A
 V_F = 1.24 V

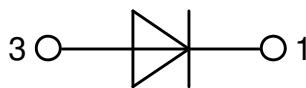
Single Diode

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

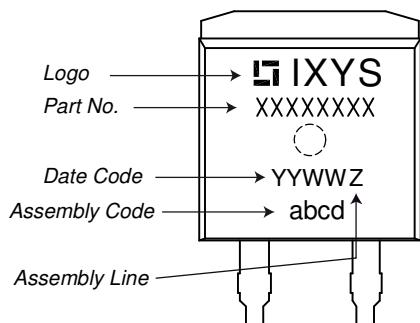
- to perform joint risk and quality assessments;
- the conclusion of quality agreements;
- to establish joint measures of an ongoing product survey, and that we may make delivery dependent on the realization of any such measures.

Rectifier

| Symbol | Definition | Conditions | Ratings | | | |
|-------------------|----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|------|------------------------------|----------------------------------------------------------------------------------------------|
| | | | min. | typ. | max. | |
| 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 | $V_R = 2200 \text{ V}$ $V_R = 2200 \text{ V}$ | $T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 150^\circ\text{C}$ | | 40 1.5 | μA mA |
| V_F | forward voltage drop | $I_F = 30 \text{ A}$ $I_F = 60 \text{ A}$ $I_F = 30 \text{ A}$ $I_F = 60 \text{ A}$ | $T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 150^\circ\text{C}$ | | 1.26 1.53 1.24 1.63 | V V |
| I_{FAV} | average forward current | $T_C = 140^\circ\text{C}$ rectangular | $T_{VJ} = 175^\circ\text{C}$ | | 30 | A |
| V_{F0} r_F | threshold voltage slope resistance } for power loss calculation only | | $T_{VJ} = 175^\circ\text{C}$ | | 0.83 13.4 | V $\text{m}\Omega$ |
| 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 | | $T_C = 25^\circ\text{C}$ | | 210 | W |
| I_{FSM} | max. forward surge current | $t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}$ $t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{sine}$ $t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}$ $t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{sine}$ | $T_{VJ} = 45^\circ\text{C}$ $V_R = 0 \text{ V}$ $T_{VJ} = 150^\circ\text{C}$ $V_R = 0 \text{ V}$ | | 370 400 315 340 | A |
| I^2t | value for fusing | $t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}$ $t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{sine}$ $t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}$ $t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{sine}$ | $T_{VJ} = 45^\circ\text{C}$ $V_R = 0 \text{ V}$ $T_{VJ} = 150^\circ\text{C}$ $V_R = 0 \text{ V}$ | | 685 665 495 480 | A^2s A^2s A^2s A^2s |
| C_J | junction capacitance | $V_R = 700 \text{ V}; f = 1 \text{ MHz}$ | $T_{VJ} = 25^\circ\text{C}$ | 7 | | pF |

Package TO-262 (I2Pak)

| 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 |
| Weight | | | | 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 = (\geq 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 |

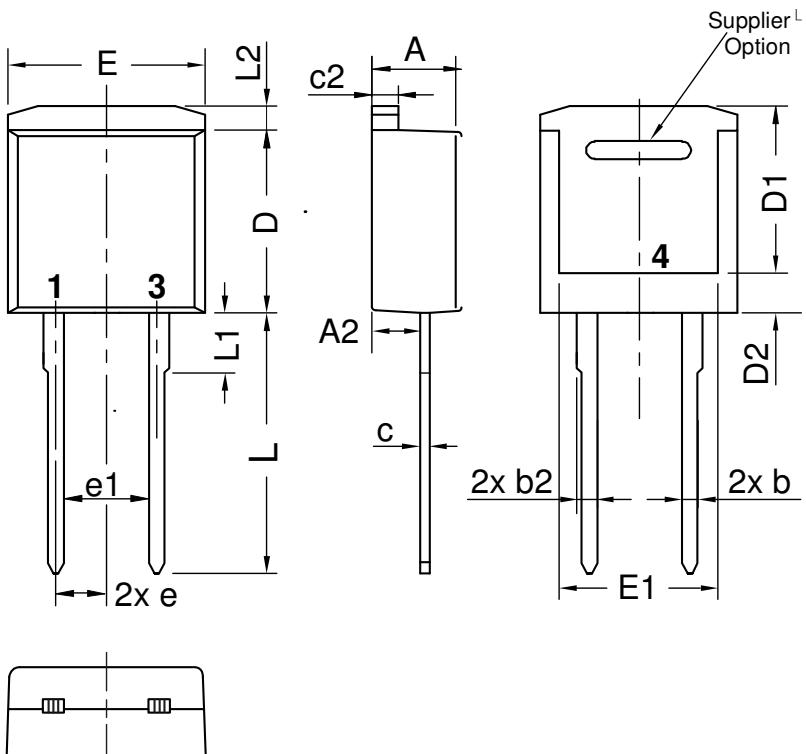
Equivalent Circuits for Simulation

* on die level

 $T_{VJ} = 175$ °C

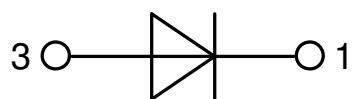
| | | | |
|--------------|--------------------|------|----|
| | Rectifier | | |
| $V_{0\ max}$ | threshold voltage | 0.83 | V |
| $R_{0\ max}$ | slope resistance * | 10.2 | mΩ |

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

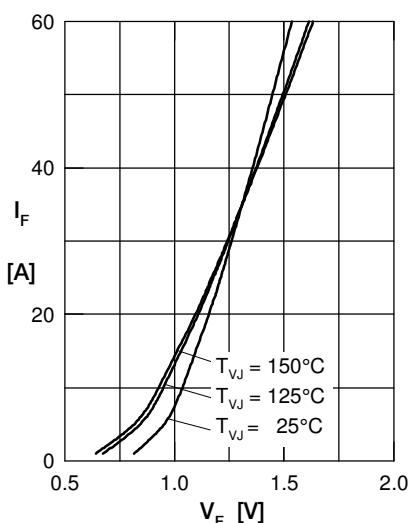


Fig. 1 Forward current versus voltage drop per diode

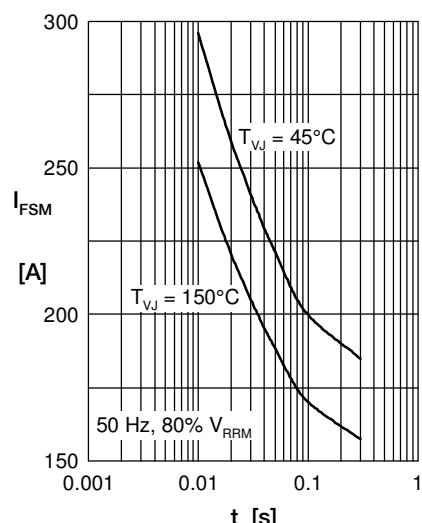


Fig. 2 Surge overload current

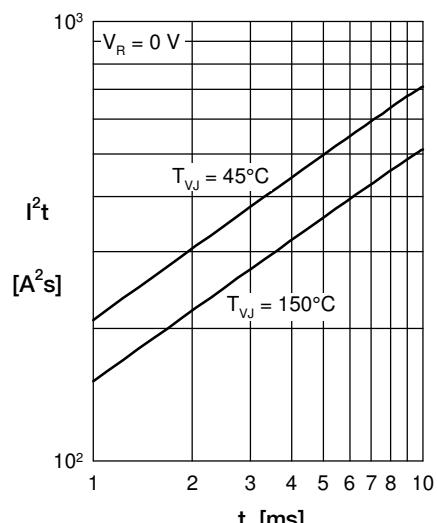
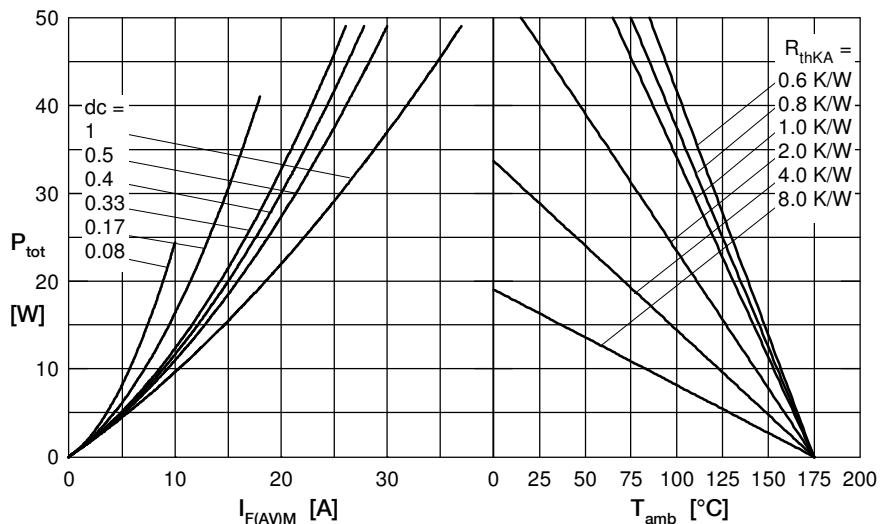
Fig. 3 I^2t versus time per diode

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

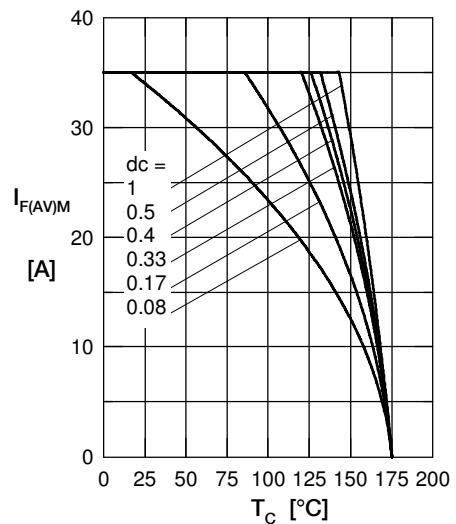


Fig. 5 Max. forward current versus case temperature

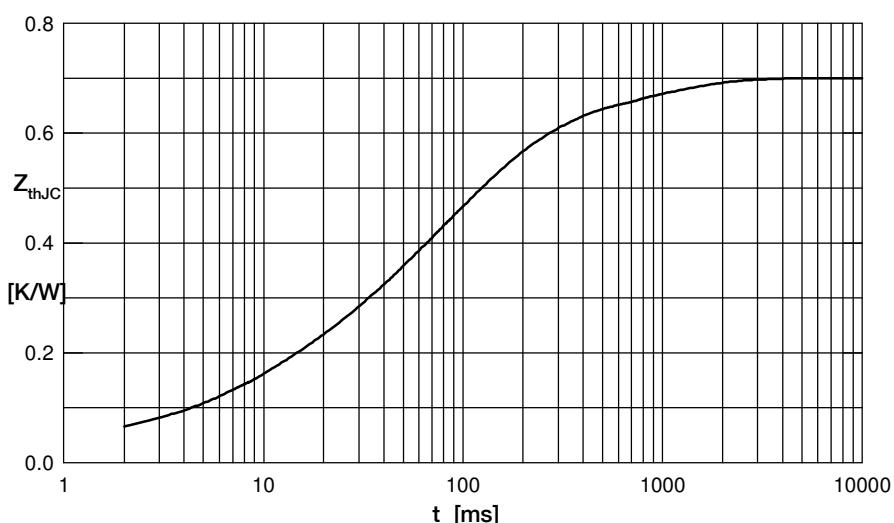


Fig. 6 Transient thermal impedance junction to case

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 |