# Standard Rectifier

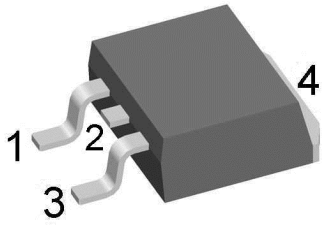
| | | |
|---|---|---|
| $V_{RRM}$ | = | 800 V |
| $I_{FAV}$ | = | 30 A |
| $V_F$ | = | 1.25 V |

Single Diode

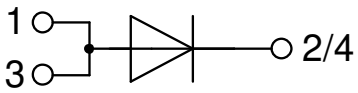
**Part number**

**DSI30-08AS**

*Marking on Product: DSI30-08AS*




Backside: 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)

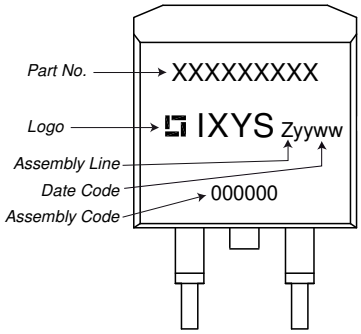
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0

| Rectifier | | | | Ratings | | | |
|---|---|---|---|---|---|---|---|
| **Symbol** | **Definition** | **Conditions** | | **min.** | **typ.** | **max.** | **Unit** |
| $V_{RSM}$ | *max. non-repetitive reverse blocking voltage* | | $T_{VJ}$ = 25°C | | | 900 | V |
| $V_{RRM}$ | *max. repetitive reverse blocking voltage* | | $T_{VJ}$ = 25°C | | | 800 | V |
| $I_R$ | *reverse current* | $V_R$ = 800 V | $T_{VJ}$ = 25°C | | | 40 | µA |
| | | $V_R$ = 800 V | $T_{VJ}$ = 150°C | | | 1.5 | mA |
| $V_F$ | *forward voltage drop* | $I_F$ = 30 A | $T_{VJ}$ = 25°C | | | 1.29 | V |
| | | $I_F$ = 60 A | | | | 1.60 | V |
| | | $I_F$ = 30 A | $T_{VJ}$ = 150°C | | | 1.25 | V |
| | | $I_F$ = 60 A | | | | 1.66 | V |
| $I_{FAV}$ | *average forward current* | $T_C$ = 130°C | $T_{VJ}$ = 175°C | | | 30 | A |
| | | rectangular d = 0.5 | | | | | |
| $V_{F0}$ | *threshold voltage* } *for power loss calculation only* | | $T_{VJ}$ = 175°C | | | 0.82 | V |
| $r_F$ | *slope resistance* | | | | | 14.1 | mΩ |
| $R_{thJC}$ | *thermal resistance junction to case* | | | | | 0.9 | K/W |
| $R_{thCH}$ | *thermal resistance case to heatsink* | | | | 0.25 | | K/W |
| $P_{tot}$ | *total power dissipation* | | $T_C$ = 25°C | | | 160 | W |
| $I_{FSM}$ | *max. forward surge current* | t = 10 ms; (50 Hz), sine | $T_{VJ}$ = 45°C | | | 300 | A |
| | | t = 8,3 ms; (60 Hz), sine | $V_R$ = 0 V | | | 325 | A |
| | | t = 10 ms; (50 Hz), sine | $T_{VJ}$ = 150°C | | | 255 | A |
| | | t = 8,3 ms; (60 Hz), sine | $V_R$ = 0 V | | | 275 | A |
| $I^2t$ | *value for fusing* | t = 10 ms; (50 Hz), sine | $T_{VJ}$ = 45°C | | | 450 | $A^2s$ |
| | | t = 8,3 ms; (60 Hz), sine | $V_R$ = 0 V | | | 440 | $A^2s$ |
| | | t = 10 ms; (50 Hz), sine | $T_{VJ}$ = 150°C | | | 325 | $A^2s$ |
| | | t = 8,3 ms; (60 Hz), sine | $V_R$ = 0 V | | | 315 | $A^2s$ |
| $C_J$ | *junction capacitance* | $V_R$ = 400 V; f = 1 MHz | $T_{VJ}$ = 25°C | | 10 | | pF |

| Package | TO-263 (D2Pak) | | Ratings | | | |
|---|---|---|---|---|---|---|
| **Symbol** | **Definition** | **Conditions** | **min.** | **typ.** | **max.** | **Unit** |
| $I_{RMS}$ | *RMS current* | per terminal [1] | | | 35 | A |
| $T_{VJ}$ | *virtual junction temperature* | | -40 | | 175 | °C |
| $T_{op}$ | *operation temperature* | | -40 | | 150 | °C |
| $T_{stg}$ | *storage temperature* | | -40 | | 150 | °C |
| **Weight** | | | | 2 | | g |
| $F_C$ | *mounting force with clip* | | 20 | | 60 | N |

[1] $I_{RMS}$ is typically limited by the pin-to-chip resistance (1); or by the current capability of the chip (2). In case of (1) and a product with multiple pins for one chip-potential, the current capability can be increased by connecting the pins as one contact.

## Product Marking

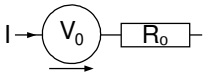



| Ordering | Ordering Number | Marking on Product | Delivery Mode | Quantity | Code No. |
|---|---|---|---|---|---|
| Standard | DSI30-08AS-TRL | DSI30-08AS | Tape & Reel | 800 | 489212 |
| Alternative | DSI30-08AS-TUB | DSI30-08AS | Tube | 50 | 470996 |

| Similar Part | Package | Voltage class |
|---|---|---|
| DSI30-08A | TO-220AC (2) | 800 |
| DSI30-08AC | ISOPLUS220AC (2) | 800 |
| DSI30-12AS | TO-263AB (D2Pak) (2) | 1200 |
| DSI30-12A | TO-220AC (2) | 1200 |
| DSI30-12AC | ISOPLUS220AC (2) | 1200 |
| DSI30-16AS | TO-263AB (D2Pak) (2) | 1600 |
| DSI30-16A | TO-220AC (2) | 1600 |

## Equivalent Circuits for Simulation

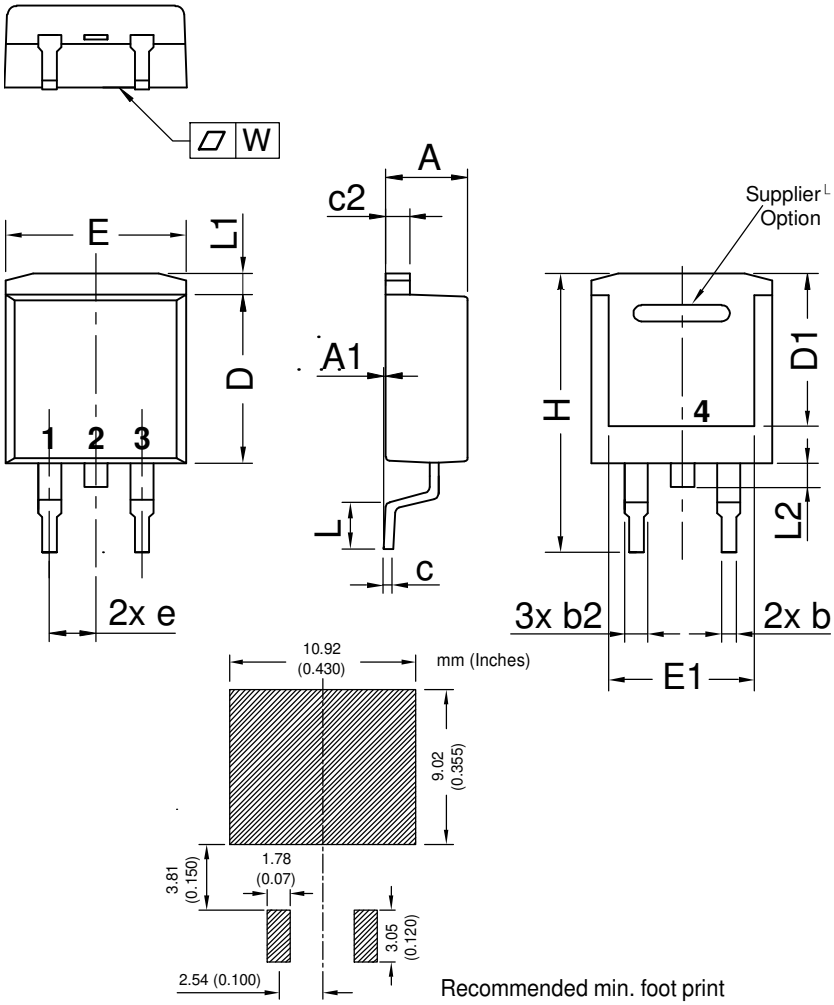
** on die level* $T_{VJ}$ = 175 °C




**Rectifier**

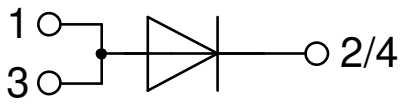
| | | | |
|---|---|---|---|
| $V_{0\,max}$ | *threshold voltage* | 0.82 | V |
| $R_{0\,max}$ | *slope resistance ** | 11 | mΩ |

## 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

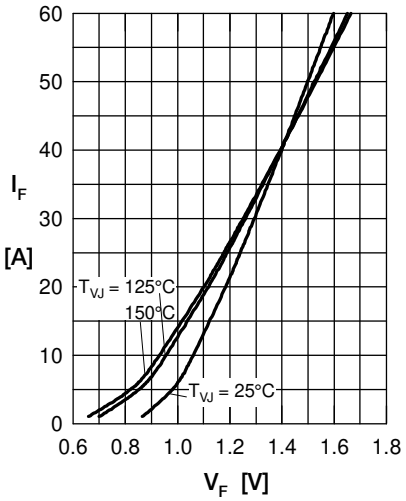



Fig. 1 Forward current versus voltage drop per diode

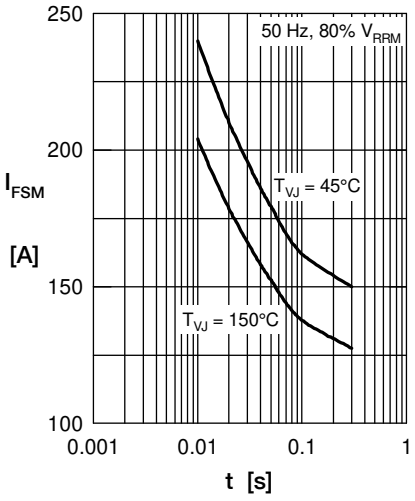



Fig. 2 Surge overload current

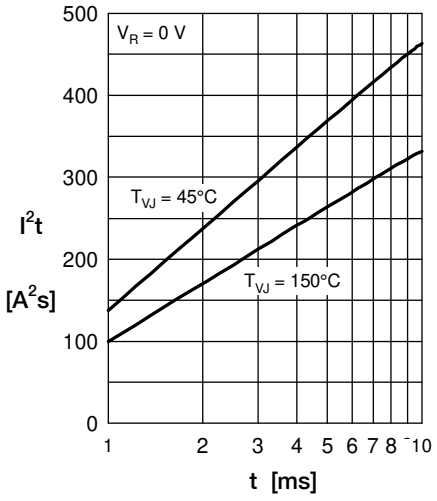



Fig. 3 $I^2t$ versus time per diode

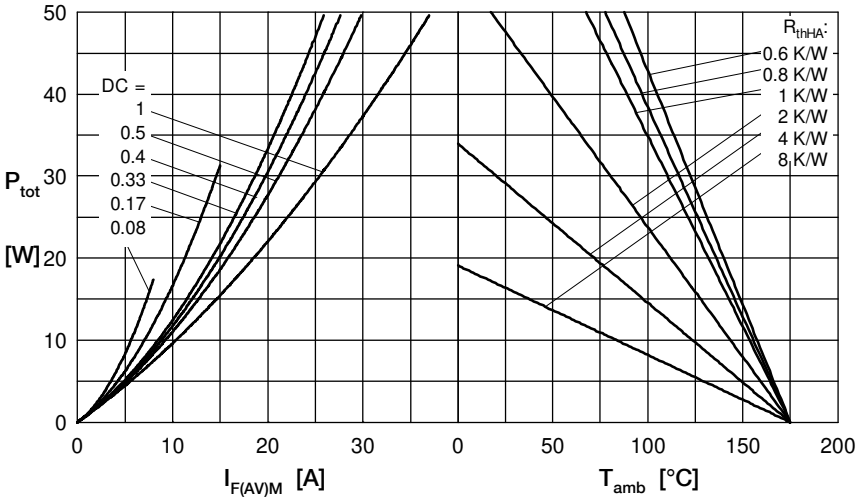



Fig. 4 Power dissipation vs. direct output current and ambient temperature

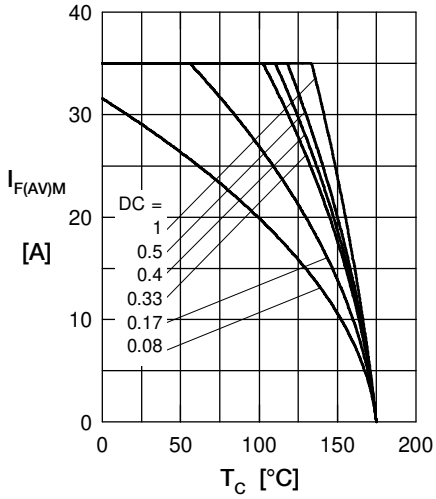



Fig. 5 Max. forward current vs. case temperature

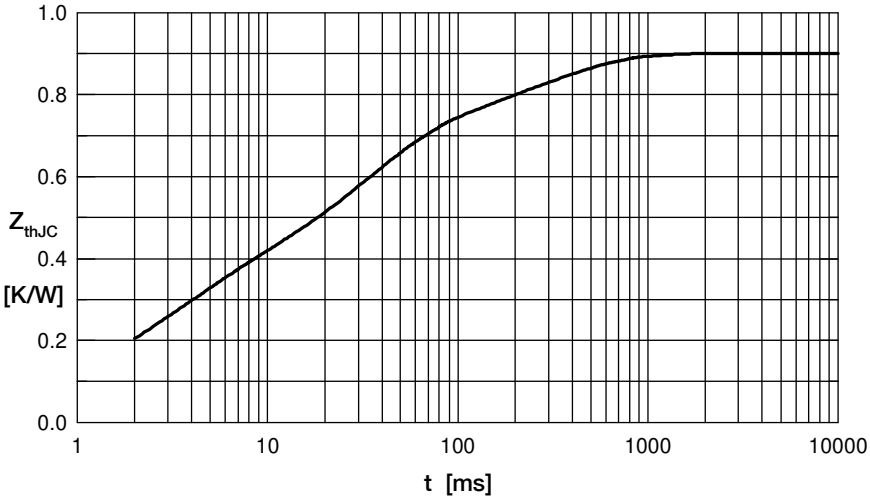



Fig. 6 Transient thermal impedance junction to case

Constants for $Z_{thJC}$ calculation:

| i | $R_{thi}$ (K/W) | $t_i$ (s) |
|---|---|---|
| 1 | 0.03 | 0.0004 |
| 2 | 0.08 | 0.002 |
| 3 | 0.2 | 0.003 |
| 4 | 0.39 | 0.03 |
| 5 | 0.2 | 0.29 |