



Standard Rectifier

$V_{RRM} = 1200\text{ V}$

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

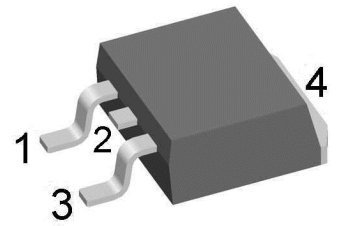
$V_F = 1.25\text{ V}$

Single Diode

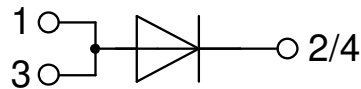
Part number

DSI30-12AS

Marking on Product: *DSI30-12AS*



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

Disclaimer Notice

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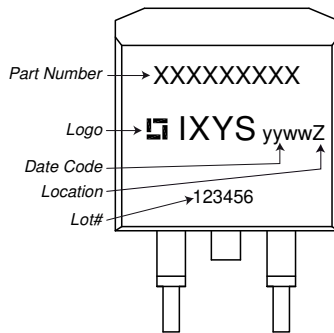


| Rectifier | | | | Ratings | | | |
|------------|--|-----------------------------------|-------------|------------------------------|------|------|------------------|
| Symbol | Definition | Conditions | | min. | typ. | max. | Unit |
| V_{RSM} | max. non-repetitive reverse blocking voltage | | | | | 1300 | V |
| V_{RRM} | max. repetitive reverse blocking voltage | | | | | 1200 | V |
| I_R | reverse current | $V_R = 1200$ V | | $T_{VJ} = 25^\circ\text{C}$ | | 40 | μA |
| | | $V_R = 1200$ V | | $T_{VJ} = 150^\circ\text{C}$ | | 1.5 | mA |
| V_F | forward voltage drop | $I_F = 30$ A | | $T_{VJ} = 25^\circ\text{C}$ | | 1.29 | V |
| | | $I_F = 60$ A | | | | 1.60 | V |
| | | $I_F = 30$ A | | $T_{VJ} = 150^\circ\text{C}$ | | 1.25 | V |
| | | $I_F = 60$ A | | | | 1.66 | V |
| I_{FAV} | average forward current | $T_C = 130^\circ\text{C}$ | rectangular | $T_{VJ} = 175^\circ\text{C}$ | | 30 | A |
| V_{F0} | threshold voltage | } for power loss calculation only | | $T_{VJ} = 175^\circ\text{C}$ | | 0.82 | V |
| r_F | slope resistance | | | | | 14.1 | m Ω |
| 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 | | | $T_C = 25^\circ\text{C}$ | | 160 | W |
| I_{FSM} | max. forward surge current | $t = 10$ ms; (50 Hz), sine | | $T_{VJ} = 45^\circ\text{C}$ | | 300 | A |
| | | $t = 8,3$ ms; (60 Hz), sine | | $V_R = 0$ V | | 325 | A |
| | | $t = 10$ ms; (50 Hz), sine | | $T_{VJ} = 150^\circ\text{C}$ | | 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 | | $T_{VJ} = 45^\circ\text{C}$ | | 450 | A ² s |
| | | $t = 8,3$ ms; (60 Hz), sine | | $V_R = 0$ V | | 440 | A ² s |
| | | $t = 10$ ms; (50 Hz), sine | | $T_{VJ} = 150^\circ\text{C}$ | | 325 | A ² s |
| | | $t = 8,3$ ms; (60 Hz), sine | | $V_R = 0$ V | | 315 | A ² s |
| C_J | junction capacitance | $V_R = 400$ V; $f = 1$ MHz | | $T_{VJ} = 25^\circ\text{C}$ | | 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 | | | | 1.5 | | 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 | DSI30-12AS-TRL | DSI30-12AS | Tape & Reel | 800 | 507511 |
| Alternative | DSI30-12AS-TUB | DSI30-12AS | Tube | 50 | 470988 |

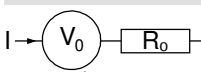
| Similar Part | Package | Voltage class |
|--------------|----------------------|---------------|
| DSI30-12A | TO-220AC (2) | 1200 |
| DSI30-12AC | ISOPLUS220AC (2) | 1200 |
| DSI30-16AS | TO-263AB (D2Pak) (2) | 1600 |
| DSI30-16A | TO-220AC (2) | 1600 |

| | | |
|------------|----------------------|-----|
| DSI30-08AS | TO-263AB (D2Pak) (2) | 800 |
| DSI30-08A | TO-220AC (2) | 800 |
| DSI30-08AC | ISOPLUS220AC (2) | 800 |

Equivalent Circuits for Simulation

* on die level

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

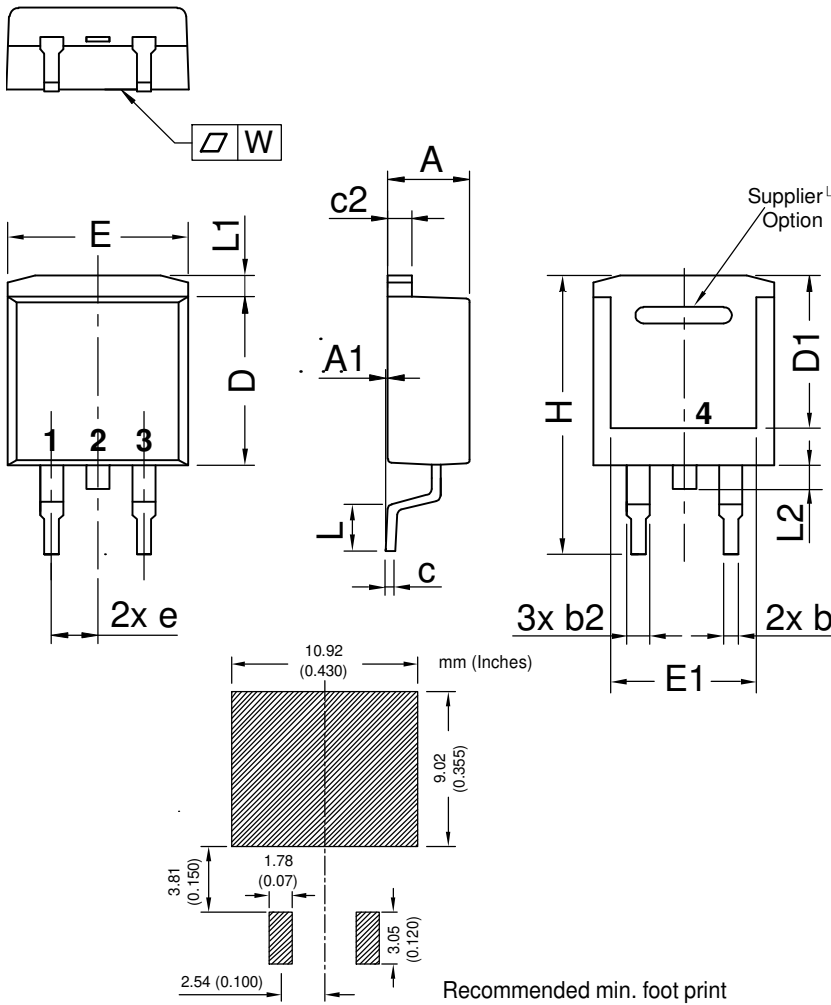


Rectifier

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

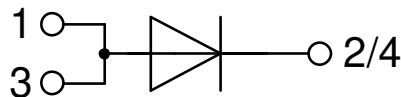


Outlines TO-263 (D2Pak)



| 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.



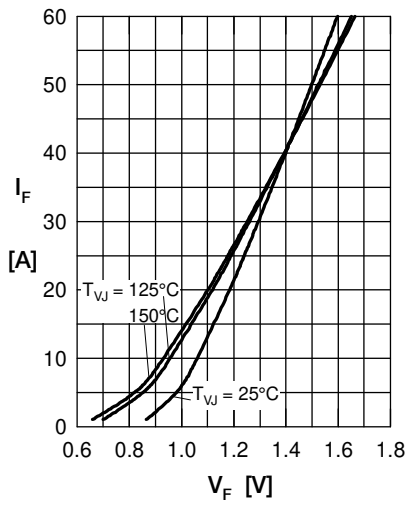
Rectifier


Fig. 1 Forward current versus voltage drop per diode

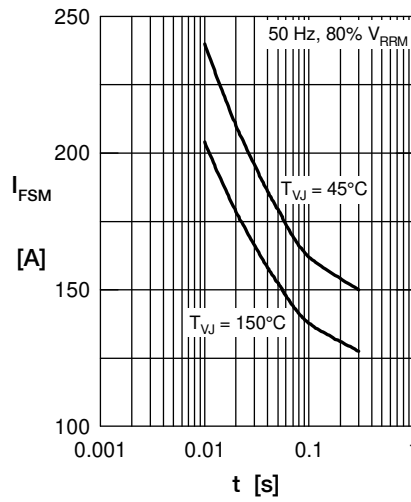


Fig. 2 Surge overload current

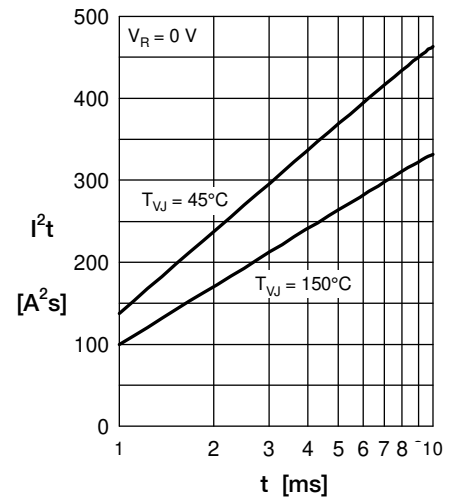
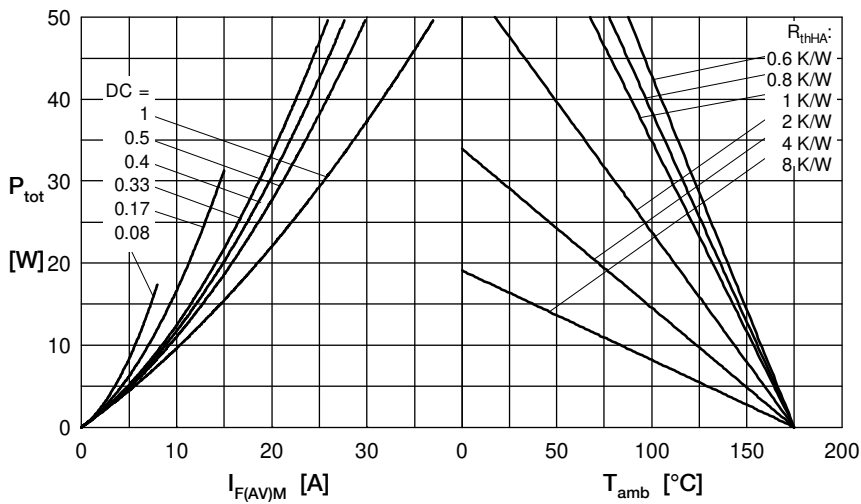

 Fig. 3 I^2t versus time per diode


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

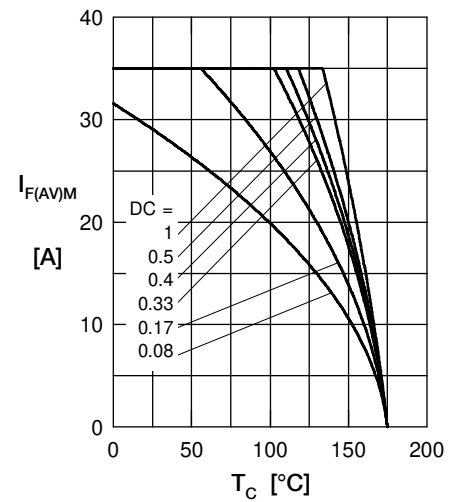


Fig. 5 Max. forward current vs. case temperature

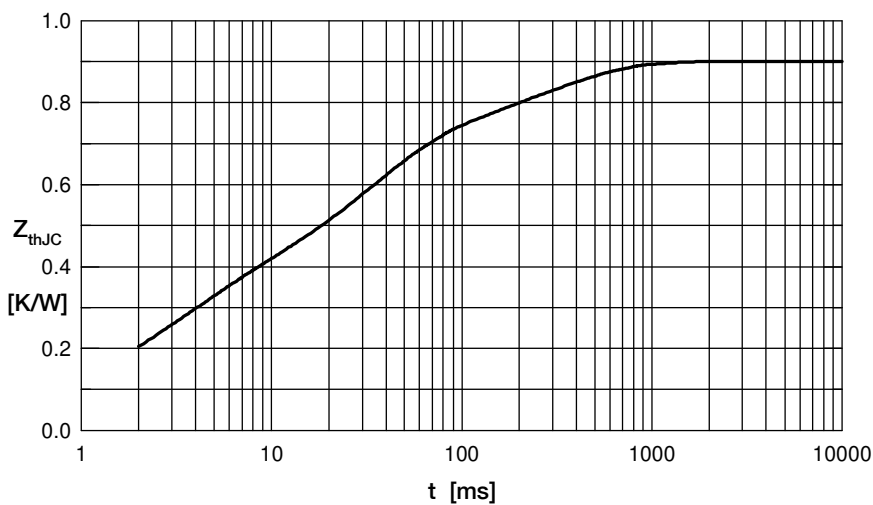


Fig. 6 Transient thermal impedance junction to case

 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 |