

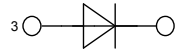
Standard Rectifier

Single Diode

$V_{RRM} = 800 \text{ V}$
 $I_{FAV} = 45 \text{ A}$
 $V_F = 1.23 \text{ V}$

Part number

DSI45-08A



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

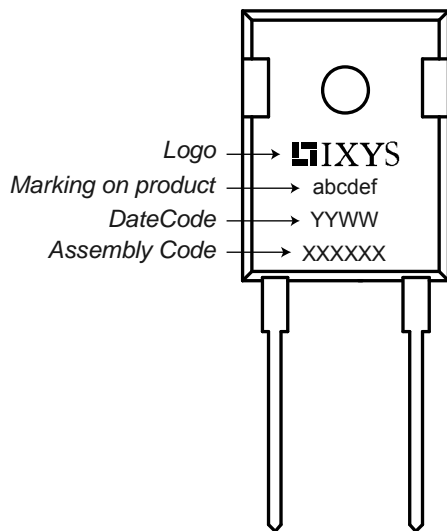
Package:

- Housing: TO-247
- Industry standard outline
- Epoxy meets UL 94V-0
- RoHS compliant

| Symbol | Definition | Conditions | Ratings | | | Unit |
|------------|--|--|---------|------|------|--------------------|
| | | | min. | typ. | max. | |
| V_{RRM} | <i>max. repetitive reverse voltage</i> | | | | 800 | V |
| I_R | <i>reverse current</i> | $V_R = 800 \text{ V}$ | | | 20 | μA |
| | | $V_R = 800 \text{ V}$ | | | 3 | mA |
| V_F | <i>forward voltage</i> | $I_F = 45 \text{ A}$ | | | 1.28 | V |
| | | $I_F = 90 \text{ A}$ | | | 1.37 | V |
| | | $I_F = 45 \text{ A}$ | | | 1.23 | V |
| | | $I_F = 90 \text{ A}$ | | | 1.35 | V |
| I_{FAV} | <i>average forward current</i> | rectangular d = 0.5 | | | 45 | A |
| V_{F0} | <i>threshold voltage</i> | } <i>for power loss calculation only</i> | | | 0.81 | V |
| r_F | <i>slope resistance</i> | | | | 9.1 | m Ω |
| R_{thJC} | <i>thermal resistance junction to case</i> | | | | 0.55 | K/W |
| T_{VJ} | <i>virtual junction temperature</i> | | -40 | | 175 | $^{\circ}\text{C}$ |
| P_{tot} | <i>total power dissipation</i> | | | | 270 | W |
| I_{FSM} | <i>max. forward surge current</i> | t = 10 ms (50 Hz), sine | | | 480 | A |
| | | t = 8,3 ms (60 Hz), sine | | | 518 | A |
| | | t = 10 ms (50 Hz), sine | | | 408 | A |
| | | t = 8,3 ms (60 Hz), sine | | | 441 | A |
| I^2t | <i>value for fusing</i> | t = 10 ms (50 Hz), sine | | | 1152 | A ² s |
| | | t = 8,3 ms (60 Hz), sine | | | 1120 | A ² s |
| | | t = 10 ms (50 Hz), sine | | | 832 | A ² s |
| | | t = 8,3 ms (60 Hz), sine | | | 808 | A ² s |
| C_J | <i>junction capacitance</i> | $V_R = 400 \text{ V}; f = 1 \text{ MHz}$ | | | 18 | pF |

| Symbol | Definition | Conditions | Ratings | | | Unit |
|---------------|-------------------------------------|-----------------------|---------|------|------|------|
| | | | min. | typ. | max. | |
| I_{RMS} | RMS current | per pin ¹⁾ | | | 70 | A |
| R_{thCH} | thermal resistance case to heatsink | | | 0.25 | | K/W |
| T_{stg} | storage temperature | | -55 | | 150 | °C |
| Weight | | | | 6 | | g |
| M_D | mounting torque | | 0.8 | | 1.2 | Nm |
| F_C | mounting force with clip | | 20 | | 120 | N |

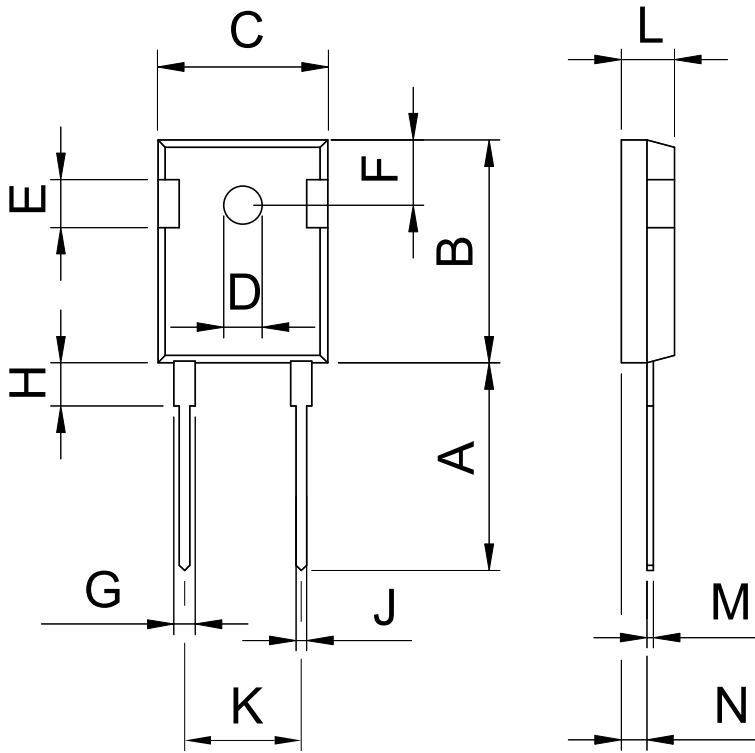
¹⁾ I_{RMS} is typically limited by: 1. pin-to-chip resistance; or by 2. current capability of the chip.
 In case of 1, a common cathode/anode configuration and a non-isolated backside, the whole current capability can be used by connecting the backside.

Product Marking


| Ordering | Part Name | Marking on Product | Delivering Mode | Base Qty | Code Key |
|----------|-----------|--------------------|-----------------|----------|----------|
| Standard | DSI45-08A | DSI45-08A | Tube | 30 | 471887 |

| Similar Part | Package | Voltage class |
|--------------|----------------|---------------|
| DSI45-12A | TO-247AD (2) | 1200 |
| DSI45-16A | TO-247AD (2) | 1600 |
| DSI45-16AR | ISOPLUS247 (2) | 1600 |

Outlines TO-247



| Dim. | Millimeter | | Inches | |
|------|------------|-------|--------|-------|
| | Min. | Max. | Min. | Max. |
| A | 19.81 | 20.32 | 0.780 | 0.800 |
| B | 20.80 | 21.46 | 0.819 | 0.845 |
| C | 15.75 | 16.26 | 0.610 | 0.640 |
| D | 3.55 | 3.65 | 0.140 | 0.144 |
| E | 4.32 | 5.49 | 0.170 | 0.216 |
| F | 5.4 | 6.2 | 0.212 | 0.244 |
| G | 1.65 | 2.13 | 0.065 | 0.084 |
| H | - | 4.5 | - | 0.177 |
| J | 1.0 | 1.4 | 0.040 | 0.055 |
| K | 10.8 | 11.0 | 0.426 | 0.433 |
| L | 4.7 | 5.3 | 0.185 | 0.209 |
| M | 0.4 | 0.8 | 0.016 | 0.031 |
| N | 1.5 | 2.49 | 0.087 | 0.102 |

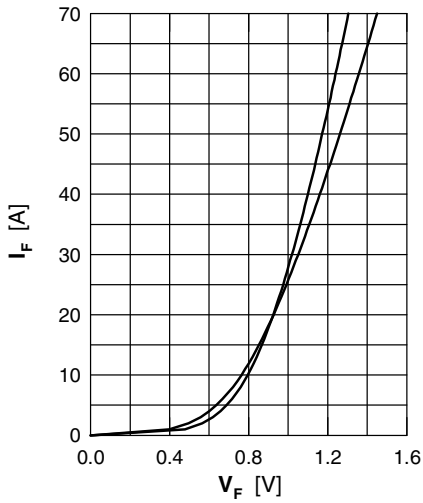


Fig. 1 Forward current versus voltage drop per diode

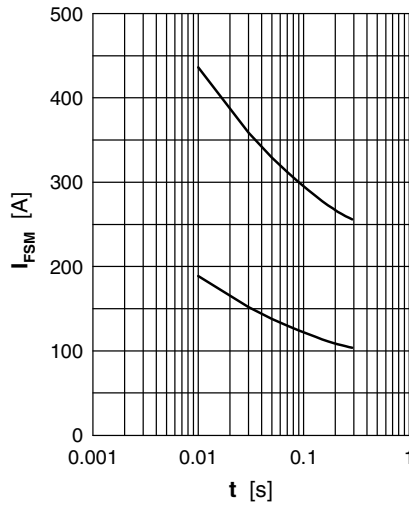


Fig. 2 Surge overload current

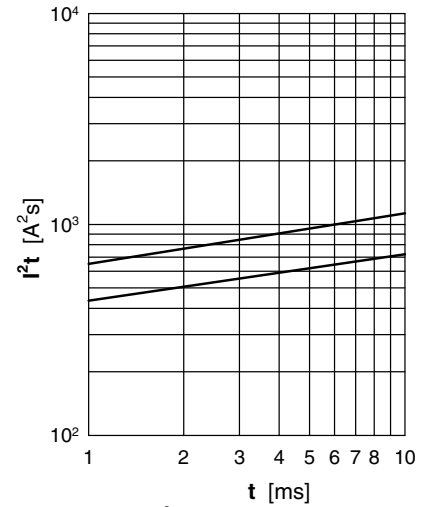


Fig. 3 I^2t versus time per diode

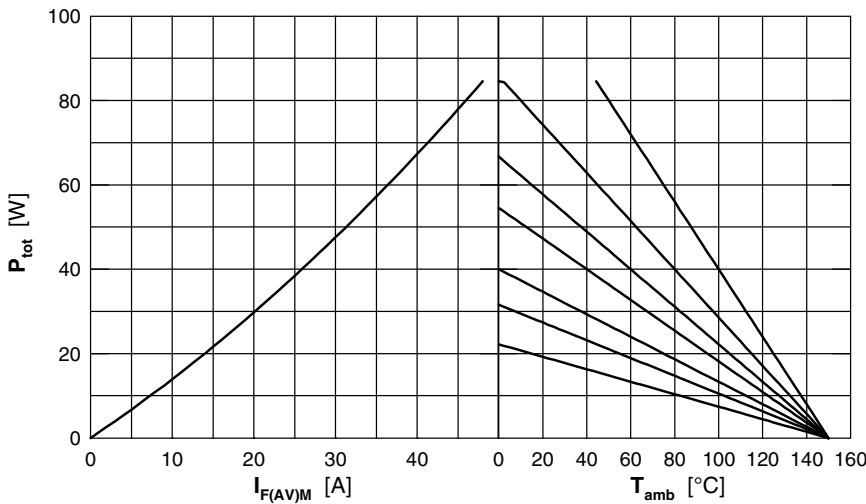


Fig. 4 Power dissipation vs. direct output current & ambient temperature, sine 180°

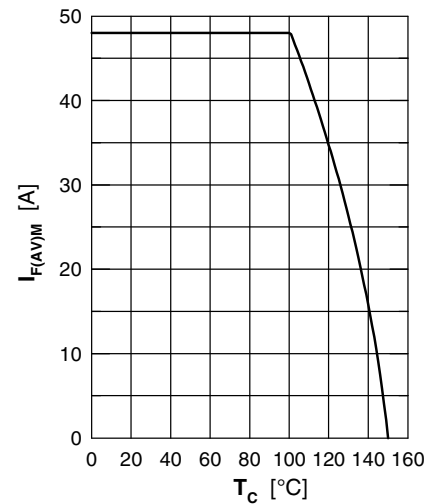


Fig. 5 Max. forward current versus case temperature, sine 180°

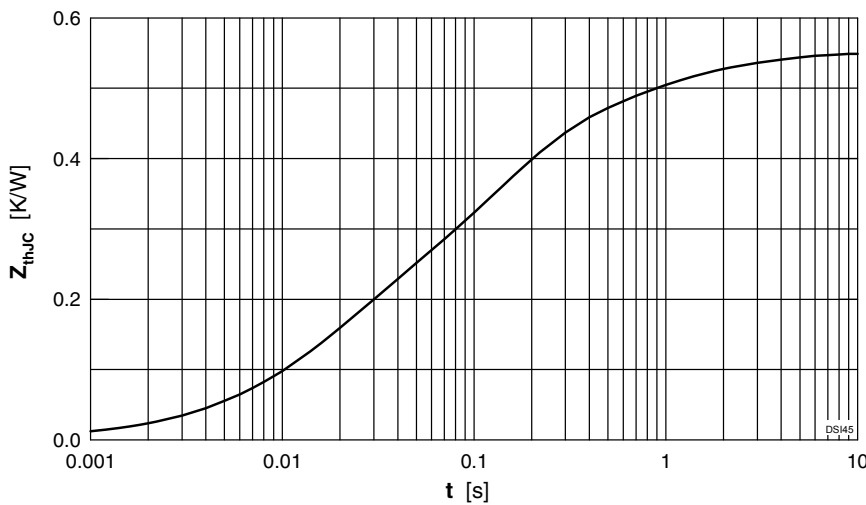


Fig. 6 Transient thermal impedance junction to case

Constants for Z_{thjC} calculation:

| i | R_{thi} (K/W) | t_i (s) |
|---|-----------------|-----------|
| 1 | 0.1633 | 0.016 |
| 2 | 0.2517 | 0.118 |
| 3 | 0.0933 | 0.588 |
| 4 | 0.04167 | 2.6 |