



Standard Rectifier

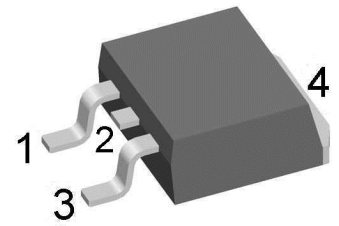
$V_{RRM} = 2 \times 800 \text{ V}$
 $I_{FAV} = 8 \text{ A}$
 $V_F = 1.08 \text{ V}$

Phase leg

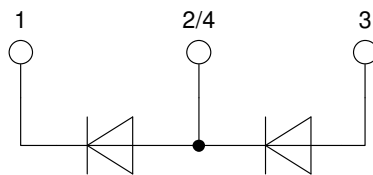
Part number

DSP8-08S

Marking on Product: DSP8-08S



Backside: anode/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

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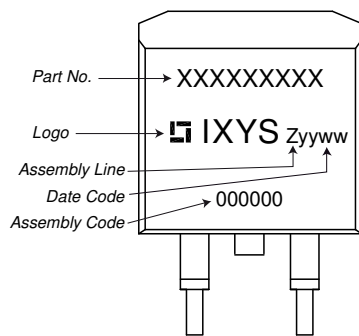


| Rectifier | | | | Ratings | | | |
|------------|--|---|-------------|------------------------------|------|------|------------------|
| Symbol | Definition | Conditions | | min. | typ. | max. | Unit |
| V_{RSM} | max. non-repetitive reverse blocking voltage | | | | | 900 | V |
| V_{RRM} | max. repetitive reverse blocking voltage | | | | | 800 | V |
| I_R | reverse current | $V_R = 800\text{ V}$ | | $T_{VJ} = 25^\circ\text{C}$ | | 10 | μA |
| | | $V_R = 800\text{ V}$ | | $T_{VJ} = 150^\circ\text{C}$ | | 0.2 | mA |
| V_F | forward voltage drop | $I_F = 8\text{ A}$ | | $T_{VJ} = 25^\circ\text{C}$ | | 1.16 | V |
| | | $I_F = 16\text{ A}$ | | | | 1.35 | V |
| | | $I_F = 8\text{ A}$ | | $T_{VJ} = 150^\circ\text{C}$ | | 1.08 | V |
| | | $I_F = 16\text{ A}$ | | | | 1.34 | V |
| I_{FAV} | average forward current | $T_C = 160^\circ\text{C}$ | rectangular | $T_{VJ} = 175^\circ\text{C}$ | | 8 | A |
| V_{FO} | threshold voltage | } for power loss calculation only | | $T_{VJ} = 175^\circ\text{C}$ | | 0.79 | V |
| r_F | slope resistance | | | | | 33 | m Ω |
| R_{thJC} | thermal resistance junction to case | | | | | 1.5 | K/W |
| R_{thCH} | thermal resistance case to heatsink | | | | 0.25 | | K/W |
| P_{tot} | total power dissipation | | | $T_C = 25^\circ\text{C}$ | | 100 | W |
| I_{FSM} | max. forward surge current | $t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$ | | $T_{VJ} = 45^\circ\text{C}$ | | 120 | A |
| | | $t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$ | | $V_R = 0\text{ V}$ | | 130 | A |
| | | $t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$ | | $T_{VJ} = 150^\circ\text{C}$ | | 100 | A |
| | | $t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$ | | $V_R = 0\text{ V}$ | | 110 | A |
| I^2t | value for fusing | $t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$ | | $T_{VJ} = 45^\circ\text{C}$ | | 72 | A ² s |
| | | $t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$ | | $V_R = 0\text{ V}$ | | 70 | A ² s |
| | | $t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$ | | $T_{VJ} = 150^\circ\text{C}$ | | 50 | A ² s |
| | | $t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$ | | $V_R = 0\text{ V}$ | | 50 | A ² s |
| C_J | junction capacitance | $V_R = 400\text{ V}; f = 1\text{ MHz}$ | | $T_{VJ} = 25^\circ\text{C}$ | | 4 | pF |



| Package TO-263 (D2Pak) | | | Ratings | | | |
|------------------------|------------------------------|--------------|---------|------|------|------|
| Symbol | Definition | Conditions | min. | typ. | max. | Unit |
| I_{RMS} | RMS current | per terminal | | | 25 | A |
| T_{VJ} | virtual junction temperature | | -55 | | 175 | °C |
| T_{op} | operation temperature | | -55 | | 150 | °C |
| T_{stg} | storage temperature | | -55 | | 150 | °C |
| Weight | | | | 2 | | g |
| F_C | mounting force with clip | | 20 | | 60 | N |

Product Marking



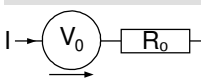
| Ordering | Ordering Number | Marking on Product | Delivery Mode | Quantity | Code No. |
|-------------|-----------------|--------------------|---------------|----------|----------|
| Standard | DSP8-08S-TRL | DSP8-08S | Tape & Reel | 800 | 495670 |
| Alternative | DSP8-08S-TUB | DSP8-08S | Tube | 50 | 498793 |

| Similar Part | Package | Voltage class |
|--------------|----------------------|---------------|
| DSP8-08AS | TO-263AA (D2Pak) (3) | 800 |
| DSP8-08A | TO-220AB (3) | 800 |
| DSP8-12S | TO-263AB (D2Pak) (2) | 1200 |
| DSP8-12AS | TO-263AA (D2Pak) (3) | 1200 |
| DSP8-12A | TO-220AB (3) | 1200 |
| DSP8-12AC | ISOPLUS220AB (3) | 1200 |

Equivalent Circuits for Simulation

* on die level

$T_{VJ} = 175\text{ °C}$



Rectifier

| | | | |
|--------------|--------------------|------|----|
| $V_{0\ max}$ | threshold voltage | 0.79 | V |
| $R_{0\ max}$ | slope resistance * | 30 | mΩ |

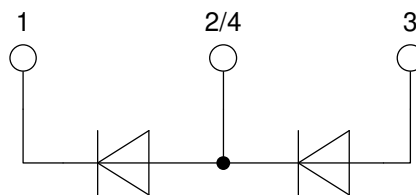


Outlines TO-263 (D2Pak)



| 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.



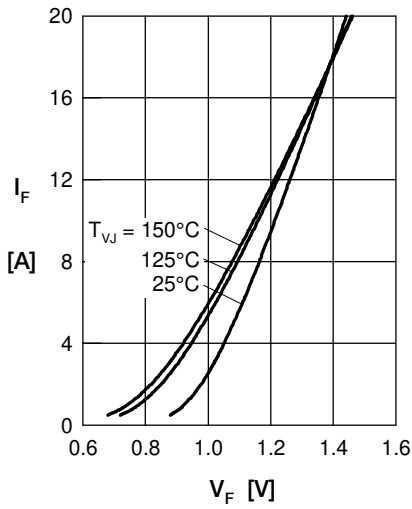
Rectifier


Fig. 1 Forward current versus voltage drop per diode

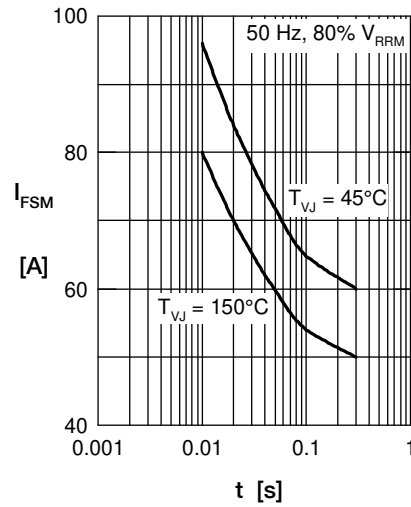


Fig. 2 Surge overload current

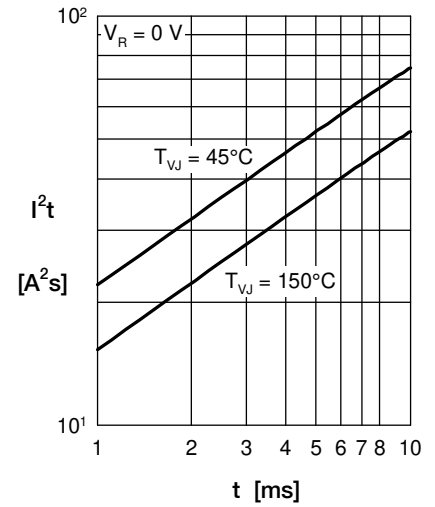
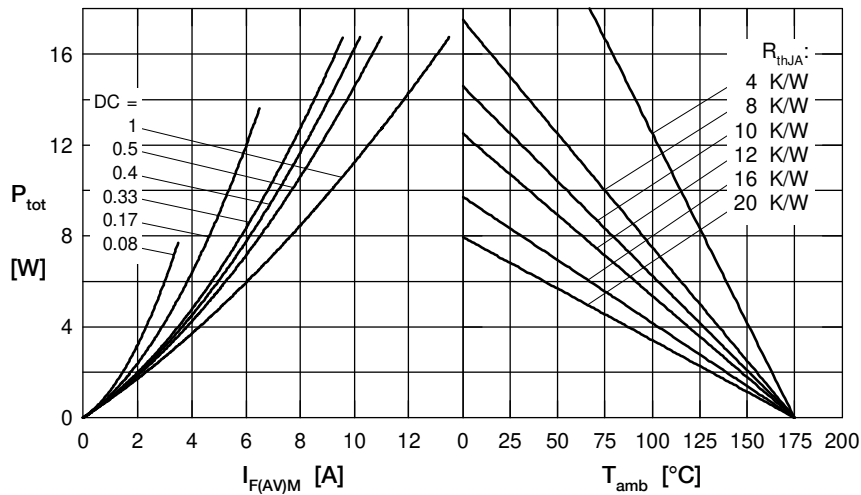

 Fig. 3 I^2t versus time per diode


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

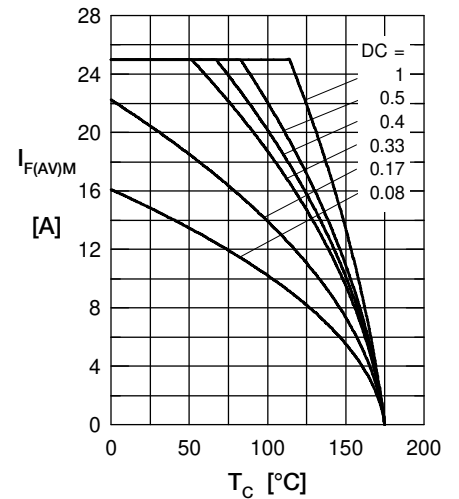


Fig. 5 Max. forward current vs. case temperature

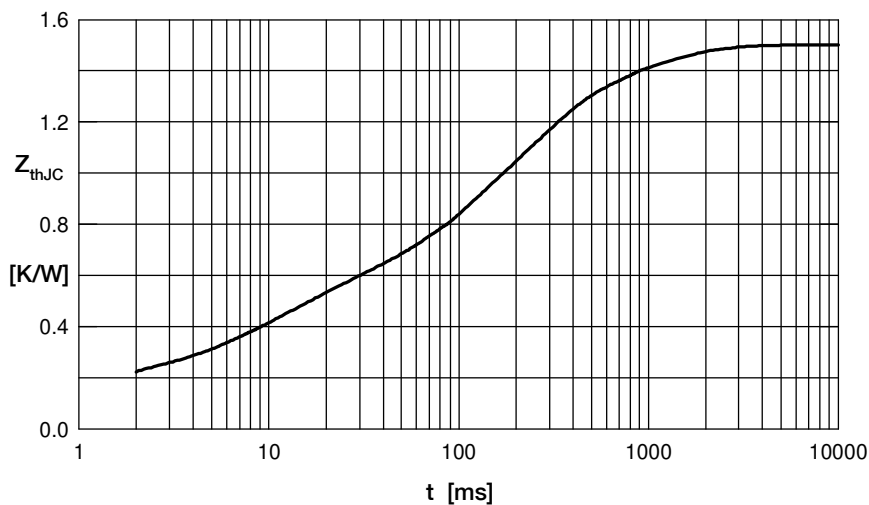


Fig. 6 Transient thermal impedance junction to case

 Constants for Z_{thJC} calculation:

| i | R_{thi} (K/W) | t_i (s) |
|---|-----------------|-----------|
| 1 | 0.155 | 0.0005 |
| 2 | 0.332 | 0.0095 |
| 3 | 0.713 | 0.17 |
| 4 | 0.3 | 0.8 |
| 5 | 0.00001 | 0.00001 |

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