

4855452 INTERNATIONAL RECTIFIER

55C 04934 D

Data Sheet No. PD-2.086

T-01-19 T-01-21

INTERNATIONAL RECTIFIER **IR**

4AF, 8AF SERIES

25 and 50 Amp Pressfit Rectifier Diodes

Major Ratings and Characteristics

| | 4AF... | 8AF... | Units | |
|-----------------|------------|------------|-------------------|------------------|
| $I_F(AV)$ | 25 | 50 | A | |
| @ Max T_C | 150 | 150 | °C | |
| $I_F(RMS)$ | 39 | 79 | A | |
| I_{FSM} | 50Hz | 300 | 600 | A |
| | 60Hz | 314 | 628 | A |
| I^2_t | 50Hz | 450 | 1800 | A ² s |
| | 60Hz | 411 | 1643 | A ² s |
| $I^2\sqrt{t}$ | 6 365 | 25 455 | A ² √s | |
| V_{RRM} range | 50 to 600 | 50 to 400 | V | |
| T_J range | -65 to 175 | -65 to 195 | °C | |

Features and Descriptions

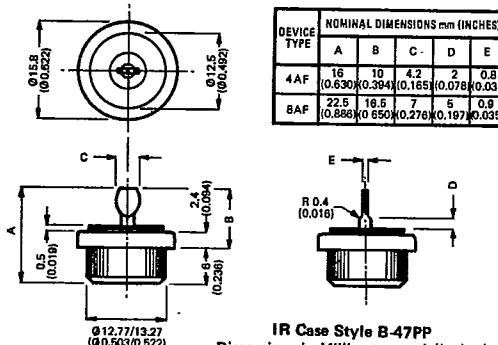
- Convenient pressfit package.
- Available with or without leads.
- High surge capabilities.
- Fully characterised bulletin.

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CASE STYLE AND DIMENSIONS



"PP" outline code



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4AF, 8AF Series

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ELECTRICAL SPECIFICATIONS

Reverse voltage ratings

| Part number* | | V_{RRM} , Maximum peak repetitive reverse voltage, $T_J = T_J \text{ max}$ | V_{RSM} , Maximum peak non-repetitive reverse voltage, $T_J = T_J \text{ max}$ | I_{FM} Maximum peak reverse leakage current at rated V_{RRM} , $T_J = T_J \text{ max}$ | |
|--------------|----------|--|--|--|----------|
| | | V | V | mA (4AF) | mA (8AF) |
| 4AF05... | 8AF05... | 50 | 75 | 6 | 7 |
| 4AF1... | 8AF1... | 100 | 150 | 6 | 7 |
| 4AF2... | 8AF2... | 200 | 300 | 6 | 5 |
| 4AF4... | 8AF4... | 400 | 500 | 4 | 5 |
| 4AF6... | | 600 | 700 | 4 | |

* To complete part number add polarity coding and outline code. For polarity add "N" for case cathode or "R" for case anode. For outline coding refer to outline drawings. i.e. 4AF4... with case cathode and flat lug complete code is 4AF4NPP.

Forward conduction

| | | 4AF.... | 8AF.... | Units | Conditions |
|------------|--|---------|---------|-----------------------|--|
| I_{FRM} | Maximum peak repetitive forward current | 137 | 277 | A | 180° conduction, half sine wave max. $T_C = 150^\circ\text{C}$ |
| I_{FSM} | Maximum peak, one cycle non-repetitive forward current | 357 | 714 | A | $t = 10\text{ms}$ Sinusoidal half-wave 100% rated V_{RRM} reapplied, initial $T_J = T_J \text{ max}$. |
| | | 373 | 747 | A | $t = 8.3\text{ms}$ |
| | | 300 | 600 | A | $t = 10\text{ms}$ Sinusoidal half-wave no voltage reapplied, initial $T_J = T_J \text{ max}$ |
| | | 314 | 628 | A | $t = 8.3\text{ms}$ |
| I^2t | Maximum I^2t for fusing | 636 | 2546 | A^2s | $t = 10\text{ms}$ 100% rated V_{RRM} reapplied initial $T_J = T_J \text{ max}$ |
| | | 581 | 2324 | A^2s | $t = 8.3\text{ms}$ |
| | Maximum I^2t , for individual device fusing. | 450 | 1800 | A^2s | $t = 10\text{ms}$ No voltage reapplied initial $T_J = T_J \text{ max}$ |
| | | 411 | 1643 | A^2s | $t = 8.3\text{ms}$ |
| I^2/t | Maximum I^2/t for, individual device fusing ① | 6365 | 25455 | A^2/s | $t = 0.1$ to 10ms , no voltage reapplied |
| $V_F(T_O)$ | Maximum value of threshold voltage | 0.84 | 0.75 | V | $T_J = 175^\circ\text{C}$ (4AF) |
| r_F | Maximum value of forward slope resistance | 4.333 | 5.148 | $\text{m}\Omega$ | $T_J = 195^\circ\text{C}$ (8AF) |
| V_{FM} | Maximum peak forward voltage | 1.25 | 1.45 | V | $T_J = 25^\circ\text{C}$, $I_{FM} = \pi \times \text{rated } I_F(AV)$ |

① I^2t for time $t_x = I^2 \sqrt{t} \cdot \sqrt{t_x}$.

THERMAL AND MECHANICAL SPECIFICATIONS

| | | 4AF.... | 8AF.... | Units | Conditions |
|------------|---|------------|------------|------------------|-------------------------|
| T_J | Junction operating temperature range | -65 to 175 | -65 to 195 | $^\circ\text{C}$ | |
| T_{stg} | Storage temperature range | -65 to 190 | -65 to 195 | $^\circ\text{C}$ | |
| R_{thJC} | Maximum internal thermal resistance, junction to case | 0.80 | 0.60 | K/W | DC operation |
| R_{thCS} | Maximum thermal resistance, case to heatsink | 0.50 | 0.50 | K/W | As per mounting details |
| $wt.$ | Approximate weight | 10 (0.36) | 10 (0.36) | g (oz) | |
| | Outline (... PP types only) | B-47 | B-47 | | |

MOUNTING

A $12.6 \pm 0.02\text{mm}$ (0.496 to 0.497 inch) diameter hole should be drilled in heatsink, the leading edge chamfered to 0.038mm (0.015 inch) $\times 45^\circ$. The autodiode should then be press fitted, ensuring that the sides of the autodiode are kept parallel to the sides of the hole.

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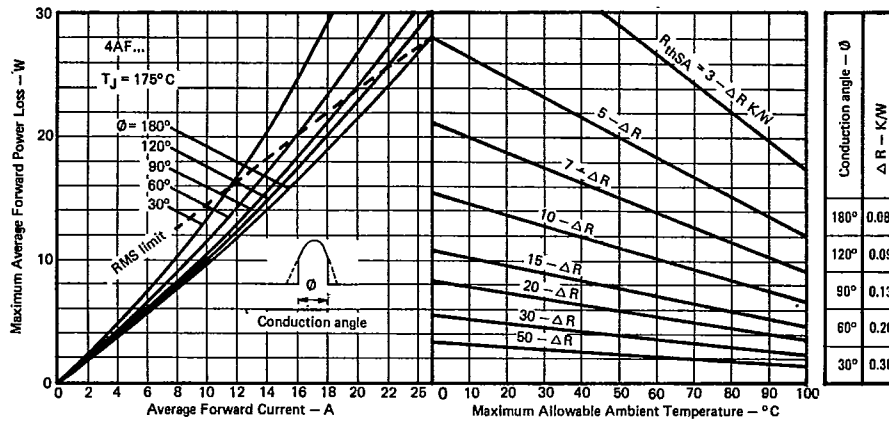
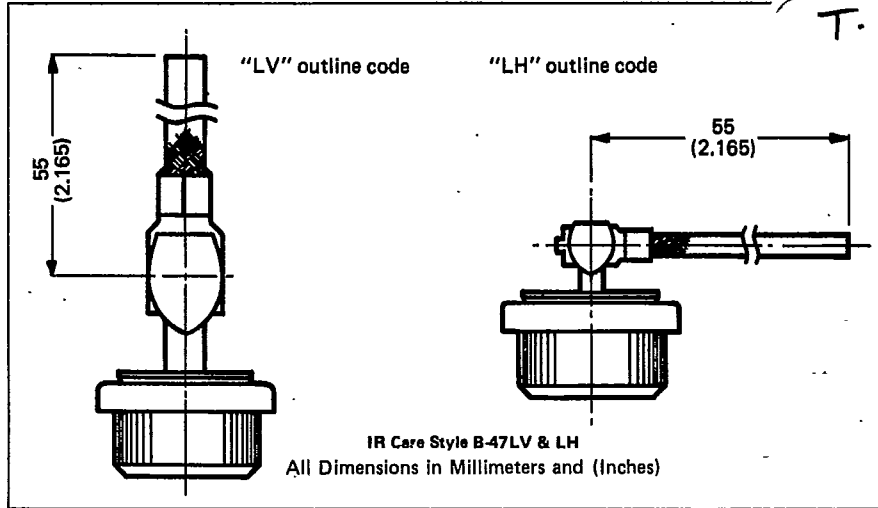


Fig. 1 - Current Rating Nomogram (Sinusoidal Waveforms 50-400 Hz), 4AF Series.

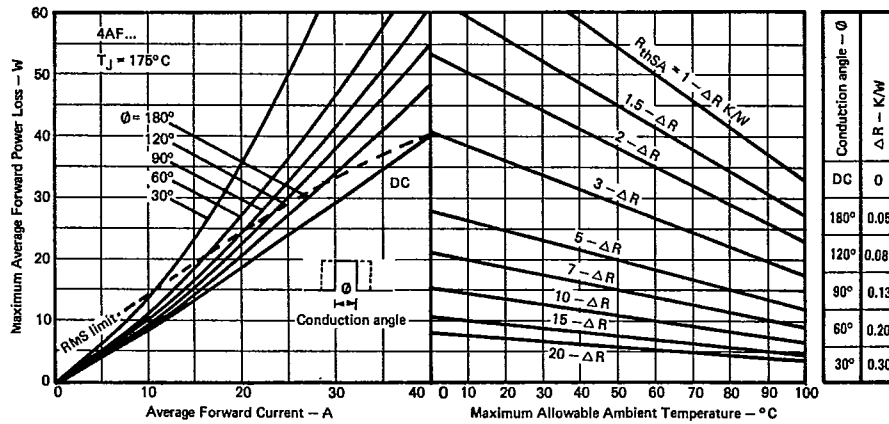


Fig. 2 - Current Rating Nomogram (Rectangular Waveforms 50-400 Hz), 4AF Series.

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4AF Series

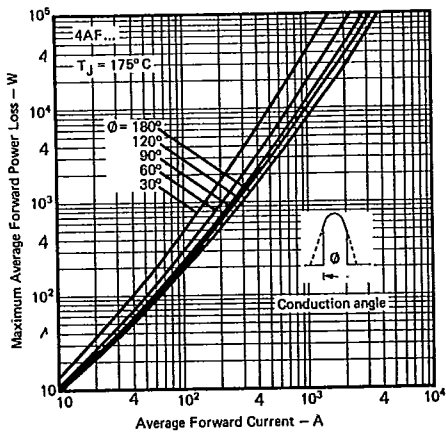


Fig. 3 - Maximum Forward Power Loss Vs. Forward Current (Sinusoidal Current Waveform), 4AF Series

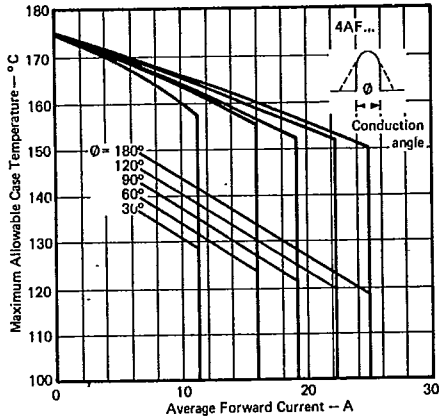


Fig. 5 - Average Forward Current Vs. Maximum Allowable Case Temperature (Sinusoidal Current Waveform), 4AF Series



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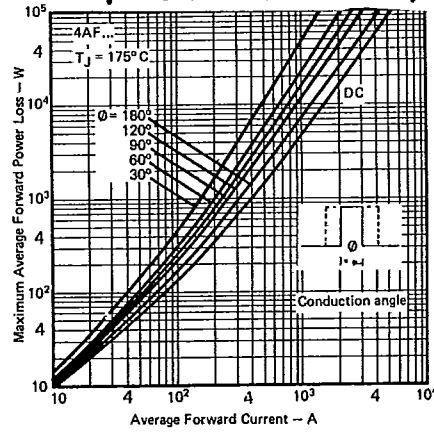


Fig. 4 - Maximum Forward Power Loss Vs. Forward Current (Rectangular Current Waveform), 4AF Series

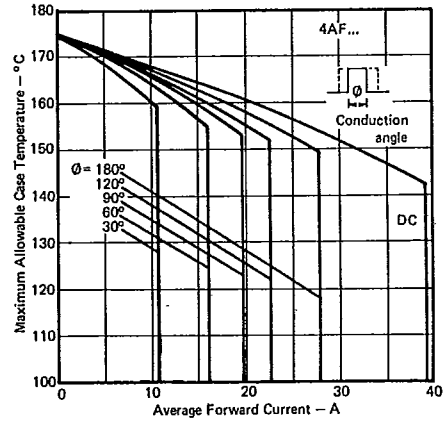


Fig. 6 - Average Forward Current Vs. Maximum Allowable Case Temperature (Rectangular Current Waveform), 4AF Series



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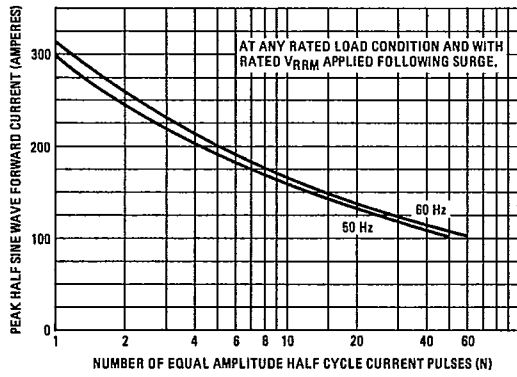


Fig. 9 - Maximum Non-Repetitive Surge Current Vs. Number of Current Pulses, 4AF Series

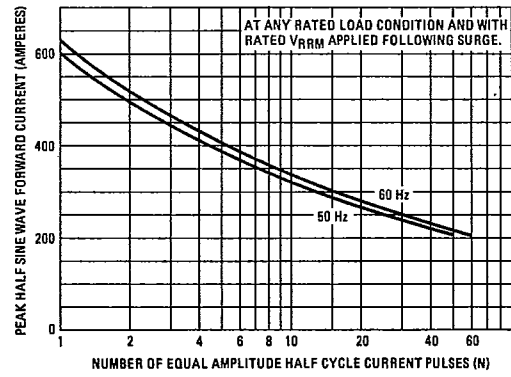


Fig. 10 - Maximum Non-Repetitive Surge Current Vs. Number of Current Pulses, 8AF Series

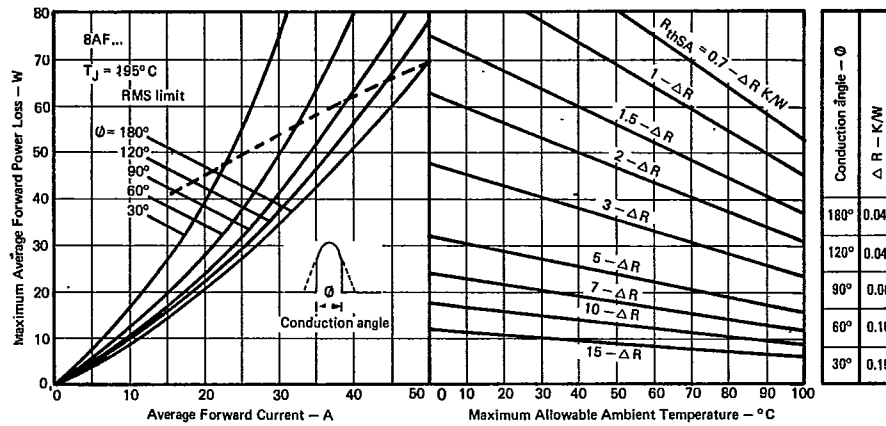


Fig. 11 - Current Rating Nomogram (Sinusoidal Waveforms 50-400 Hz), 8AF Series.

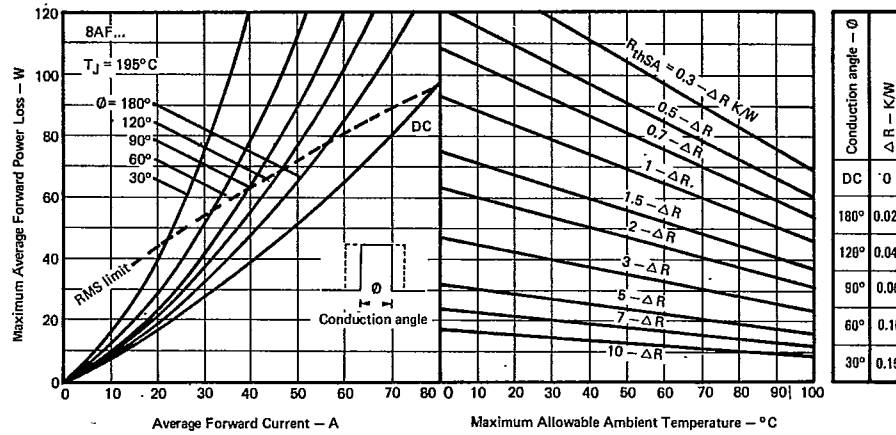


Fig. 12 - Current Rating Nomogram (Rectangular Waveforms 50-400 Hz), 8AF Series.

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8AF Series

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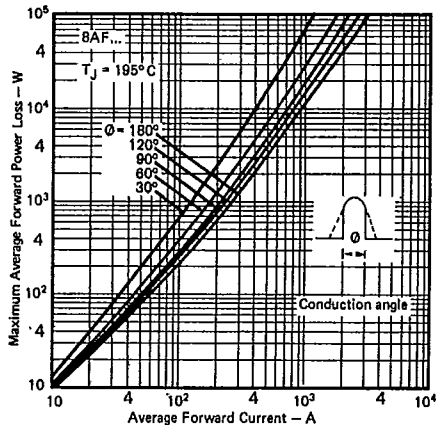


Fig. 13 — Maximum Power Loss Vs. Forward Current (Sinusoidal Current Waveform), 8AF Series

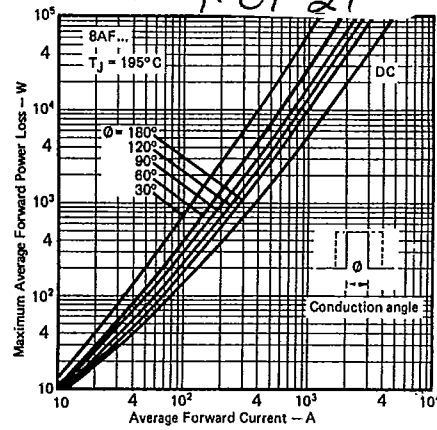


Fig. 14 — Maximum Power Loss Vs. Forward Current (Rectangular Current Waveform), 8AF Series

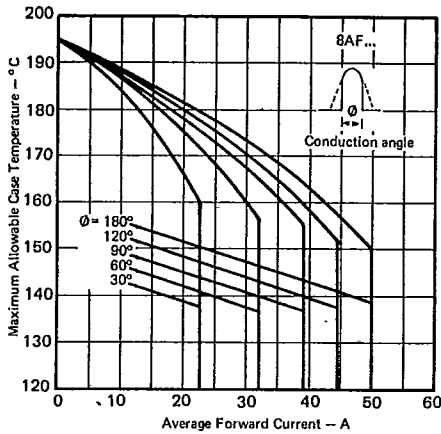


Fig. 15 — Average Forward Current Vs. Maximum Allowable Case Temperature (Sinusoidal Current Waveform), 8AF Series

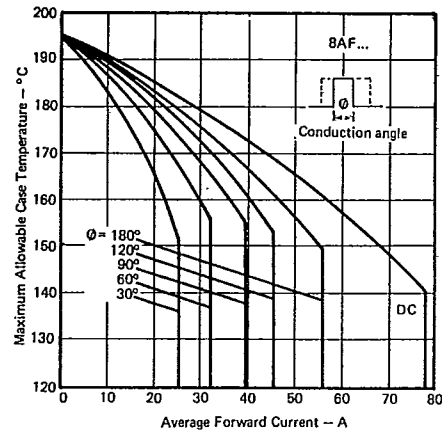


Fig. 16 — Average Forward Current Vs. Maximum Allowable Case Temperature (Rectangular Current Waveform), 8AF Series

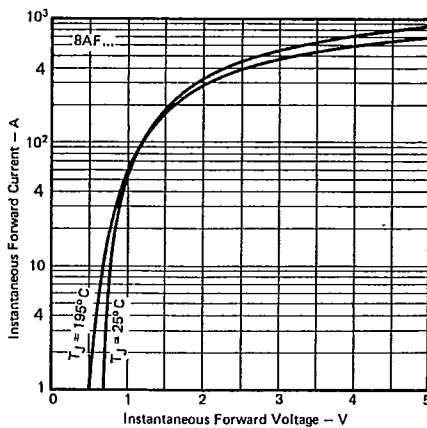


Fig. 17 — Maximum Forward Voltage Vs. Forward Current, 8AF Series

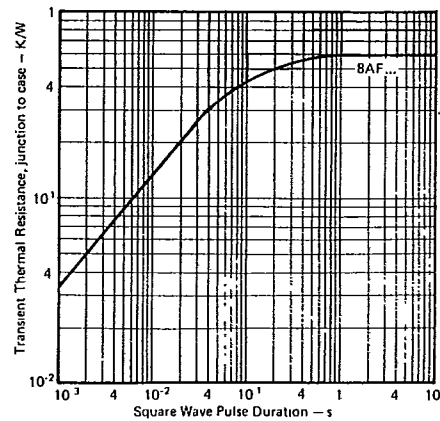


Fig. 18 — Maximum Transient Thermal Impedance, Junction-to-Case Vs. Pulse Duration, 8AF Series