



5SDD 48H3200

Old part no. DV 889-4650-32

Rectifier Diode

Properties

- Industry standard housing
- Suitable for parallel operation
- High operating temperature
- Low forward voltage drop

Key Parameters

| | | | |
|------------|---|--------|----|
| V_{RRM} | = | 3 200 | V |
| I_{FAVm} | = | 4 708 | A |
| I_{FSM} | = | 61 000 | A |
| V_{TO} | = | 0.992 | V |
| r_T | = | 0.067 | mΩ |

Types

| | |
|---------------------|---|
| | V_{RRM} |
| 5SDD 48H3200 | 3 200 V |
| Conditions: | $T_j = -40 \div 160 \text{ }^\circ\text{C}$, half sine waveform, $f = 50 \text{ Hz}$ |

Mechanical Data

| | | |
|-------|---------------------------|-----------------------|
| F_m | Mounting force | $50 \pm 5 \text{ kN}$ |
| m | Weight | 0.9 kg |
| D_s | Surface creepage distance | 40 mm |
| D_a | Air str ke distance | 20 mm |

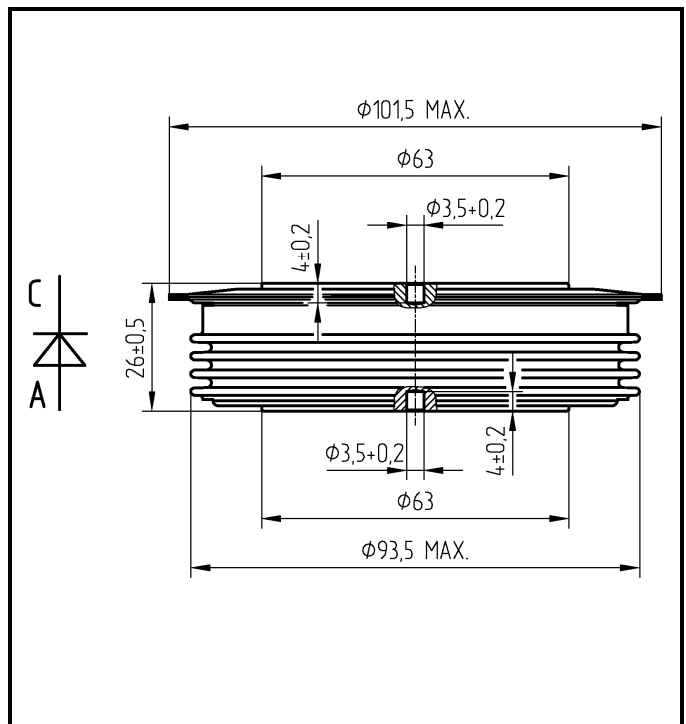


Fig. 1 Case



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| Maximum Ratings | | Maximum Limits | Unit | |
|------------------------|---|----------------------------------|------------------------------------|-----------------------|
| V_{RRM} | Repetitive peak reverse voltage $T_j = -40 \div 160 \text{ }^\circ\text{C}$ | 3 200 | V | |
| I_{FAVm} | Average forward current $T_c = 85 \text{ }^\circ\text{C}$ | 4 708 | A | |
| I_{FRMS} | RMS forward current $T_c = 85 \text{ }^\circ\text{C}$ | 7 395 | A | |
| I_{RRM} | Repetitive reverse current $V_R = V_{RRM}$ | 100 | mA | |
| I_{FSM} | Non repetitive peak surge current $V_R = 0 \text{ V, half sine pulse}$ | $t_p = 8.3 \text{ ms}$ | 65 160 | A |
| | | $t_p = 10 \text{ ms}$ | 61 000 | A |
| I^2t | Limiting load integral $V_R = 0 \text{ V, half sine pulse}$ | $t_p = 8.3 \text{ ms}$ | 17 622 000 | A²s |
| | | $t_p = 10 \text{ ms}$ | 18 605 000 | A²s |
| $T_{jmin} - T_{jmax}$ | Operating temperature range | -40 \div 160 | $^\circ\text{C}$ | |
| T_{STG} | Storage temperature range | -40 \div 160 | $^\circ\text{C}$ | |

Unless otherwise specified $T_j = 160 \text{ }^\circ\text{C}$

| Characteristics | | Value | | | Unit |
|------------------------|--|--------------|--------------|--------------|---------------------------------|
| | | <i>min</i> | <i>typ</i> | <i>max</i> | |
| V_{T0} | Threshold voltage | | | 0.992 | V |
| r_T | Forward slope resistance $I_{F1} = 7\,304 \text{ A, } I_{F2} = 21\,913 \text{ A}$ | | | 0.067 | mΩ |
| V_{FM} | Maximum forward voltage $I_{FM} = 4\,000 \text{ A}$ | | | 1.200 | V |
| Q_{rr} | Recovered charge $V_R = 100 \text{ V, } I_{FM} = 2000 \text{ A, } di_F/dt = -30 \text{ A}/\mu\text{s}$ | | 4 000 | | μC |

Unless otherwise specified $T_j = 160 \text{ }^\circ\text{C}$

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| Thermal Parameters | | | Value | Unit |
|---------------------------|--|----------------------|--------------|-------------|
| R_{thjc} | Thermal resistance junction to case | double side cooling | 8.0 | K/kW |
| | | anode side cooling | 14.5 | |
| | | cathode side cooling | 18.0 | |
| R_{thch} | Thermal resistance case to heatsink | double side cooling | 2.5 | K/kW |
| | | single side cooling | 5.0 | |

Transient Thermal Impedance

Analytical function for transient thermal impedance

$$Z_{thjc} = \sum_{i=1}^4 R_i (1 - \exp(-t / \tau_i))$$

Conditions:

$F_m = 50 \pm 5$ kN, Double side cooled

Correction for periodic waveforms

| | |
|-------------------|----------|
| 180° sine: | 1.0 K/kW |
| 120° sine: | 1.5 K/kW |
| 60° sine: | 2.5 K/kW |
| 180° rectangular: | 0.9 K/kW |
| 120° rectangular: | 1.5 K/kW |
| 60° rectangular: | 2.5 K/kW |

| i | 1 | 2 | 3 | 4 |
|--------------|--------|--------|--------|--------|
| τ_i (s) | 0.4406 | 0.1045 | 0.0092 | 0.0022 |
| R_i (K/kW) | 4.533 | 2.255 | 0.868 | 0.345 |

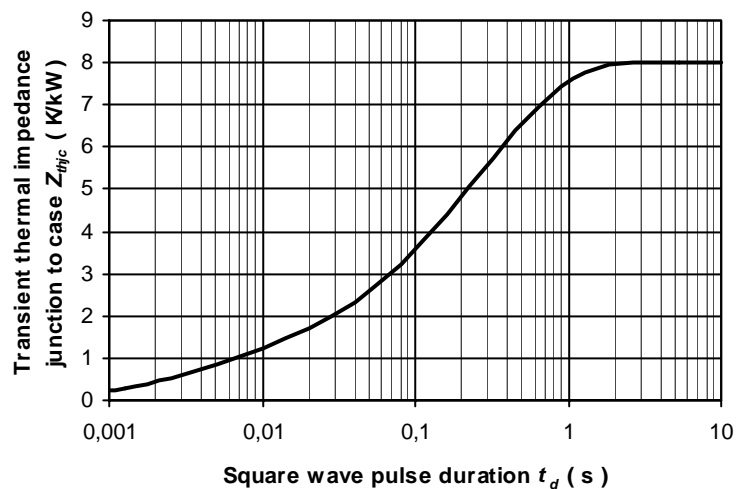


Fig. 2 Dependence transient thermal impedance junction to case on square pulse

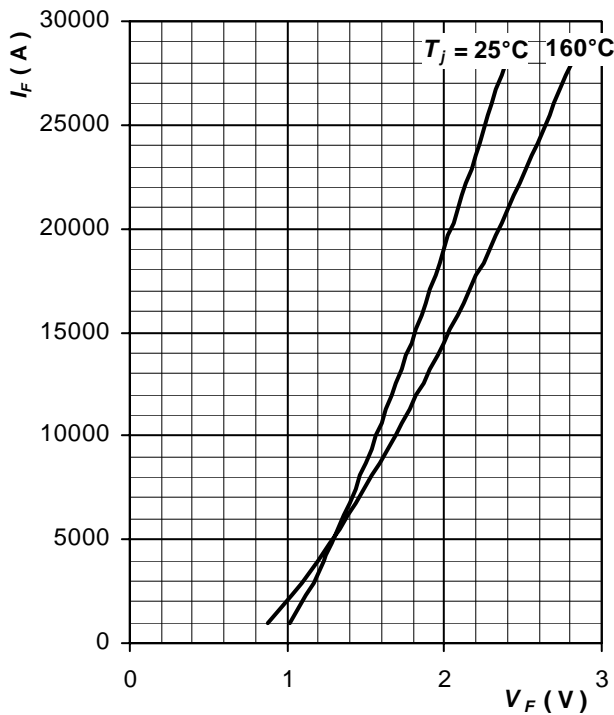


Fig. 3 Maximum forward voltage drop characteristics

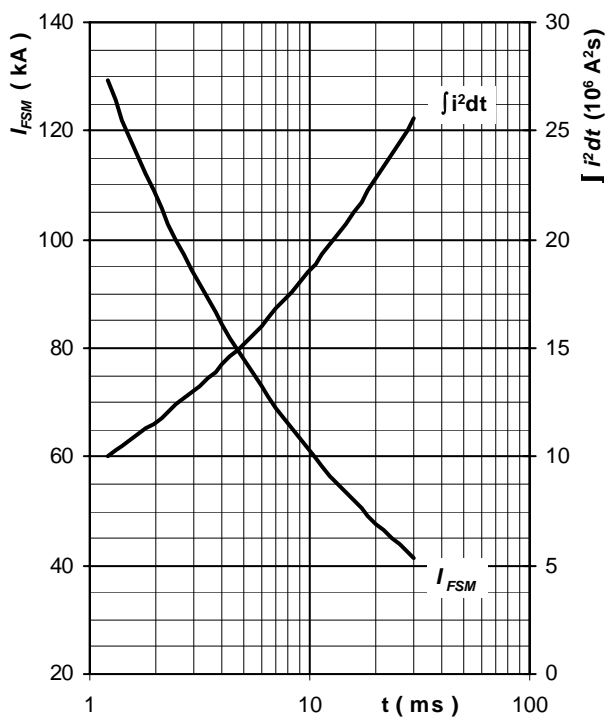


Fig. 4 Surge forward current vs. pulse length, half sine wave, single pulse, $V_R = 0 \text{ V}$, $T_j = T_{jmax}$

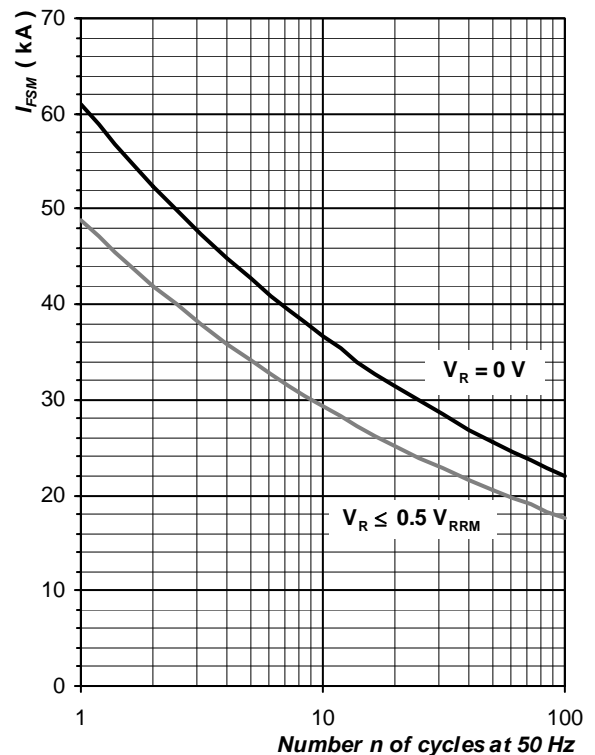


Fig. 5 Surge forward current vs. number of pulses, half sine wave, $T_j = T_{jmax}$

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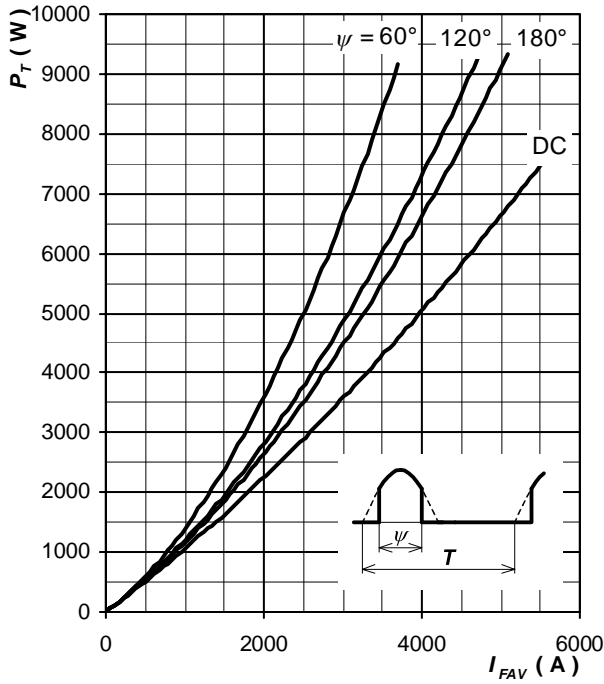


Fig. 6 Forward power loss vs. average forward current, sine waveform, $f = 50 \text{ Hz}$, $T = 1/f$

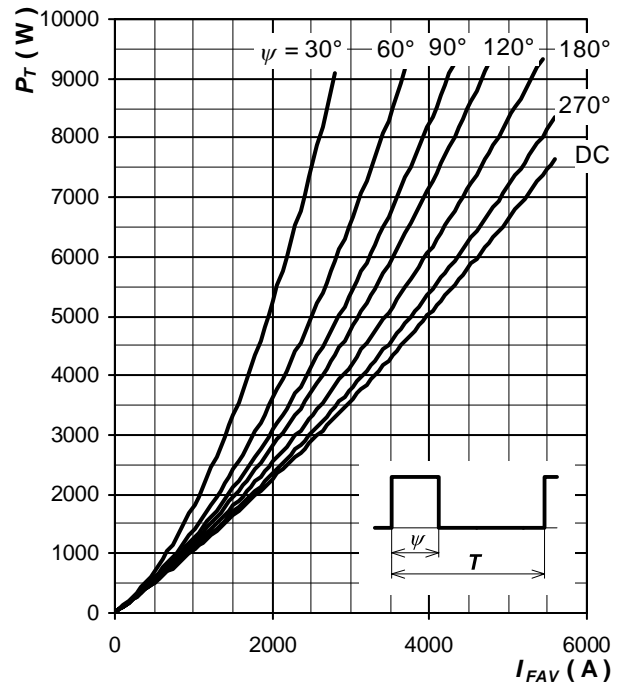


Fig. 7 Forward power loss vs. average forward current, square waveform, $f = 50 \text{ Hz}$, $T = 1/f$

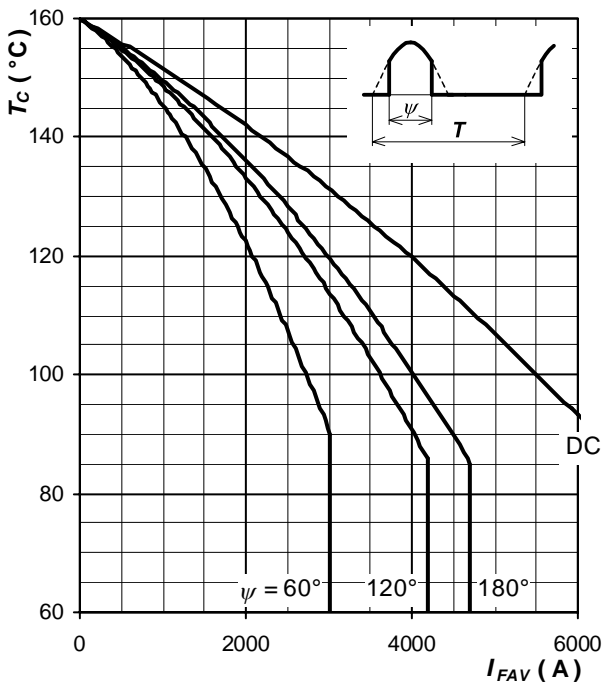


Fig. 8 Max. case temperature vs. aver. forward current, sine waveform, $f = 50 \text{ Hz}$, $T = 1/f$

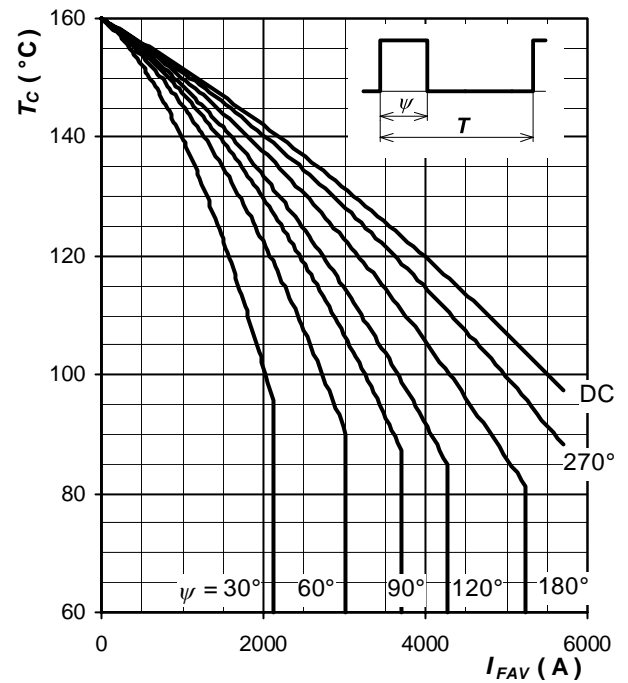


Fig. 9 Max. case temperature vs. aver. forward current, square waveform, $f = 50 \text{ Hz}$, $T = 1/f$

Notes:

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