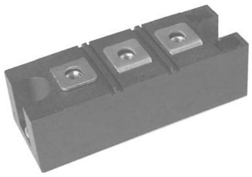
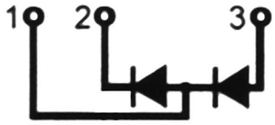
# SDD165

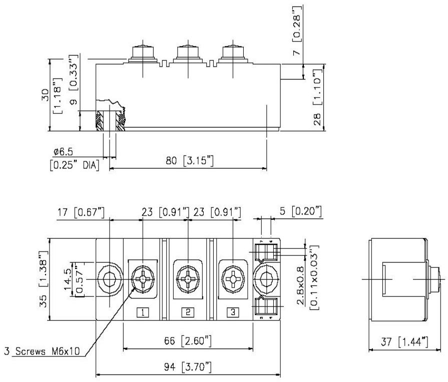
## Diode-Diode Modules





| Type | $V_{RSM}$<br>V | $V_{RRM}$<br>V |
|---|---|---|
| **SDD165N08** | 900 | 800 |
| **SDD165N12** | 1300 | 1200 |
| **SDD165N14** | 1500 | 1400 |
| **SDD165N16** | 1700 | 1600 |
| **SDD165N18** | 1900 | 1800 |

**Dimensions in mm (1mm=0.0394")**



| Symbol | Test Conditions | | Maximum Ratings | Unit |
|---|---|---|---|---|
| $I_{FRMS}$<br>$I_{FAVM}$ | $T_{VJ}=T_{VJM}$<br>$T_C=100^oC$; $180^o$ sine | | 300<br>165 | A |
| $I_{FSM}$ | $T_{VJ}=45^oC$ | t=10ms (50Hz), sine | 4700 | A |
| | $V_R=0$ | t=8.3ms (60Hz), sine | 5000 | |
| | $T_{VJ}=T_{VJM}$ | t=10ms(50Hz), sine | 4100 | |
| | $V_R=0$ | t=8.3ms(60Hz), sine | 4300 | |
| $\int i^2dt$ | $T_{VJ}=45^oC$ | t=10ms (50Hz), sine | 110000 | $A^2s$ |
| | $V_R=0$ | t=8.3ms (60Hz), sine | 104000 | |
| | $T_{VJ}=T_{VJM}$ | t=10ms(50Hz), sine | 84000 | |
| | $V_R=0$ | t=8.3ms(60Hz), sine | 77000 | |
| $T_{VJ}$<br>$T_{VJM}$<br>$T_{stg}$ | | | -40...+150<br>150<br>-40...+125 | $^oC$ |
| $V_{ISOL}$ | 50/60Hz, RMS | t=1min | 3000 | V~ |
| | $I_{ISOL}\leq 1mA$ | t=1s | 3600 | |
| $M_d$ | Mounting torque (M6)<br>Terminal connection torque (M6) | | 2.25-2.75/20-25<br>4.5-5.5/40-48 | Nm/lb.in. |
| **Weight** | Typical including screws | | 120 | g |

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| Symbol | Test Conditions | Characteristic Values | Unit |
|---|---|---|---|
| $I_R$ | $T_{VJ}=T_{VJM}$; $V_R=V_{RRM}$ | 20 | mA |
| $V_F$ | $I_F=300A$; $T_{VJ}=25^oC$ | 1.3 | V |
| $V_{TO}$ | For power-loss calculations only | 0.8 | V |
| $r_T$ | $T_{VJ}=T_{VJM}$ | 1.3 | mΩ |
| $Q_S$ | $T_{VJ}=125^oC$; $I_F=300A$; -di/dt=50A/us | 550 | uC |
| $I_{RM}$ |  | 235 | A |
| $R_{thJC}$ | per diode; DC current<br>per module | 0.21<br>0.105 | K/W |
| $R_{thJK}$ | per diode; DC current<br>per module | 0.31<br>0.155 | K/W |
| $d_S$ | Creepage distance on surface | 12.7 | mm |
| $d_A$ | Strike distance through air | 9.6 | mm |
| a | Maximum allowable acceleration | 50 | $m/s^2$ |

### *FEATURES*

- International standard package
- Copper base plate
- Planar passivated chips
- Isolation voltage 3600 V~

### *APPLICATIONS*

- Supplies for DC power equipment
- DC supply for PWM inverter
- Field supply for DC motors
- Battery DC power supplies

### *ADVANTAGES*

- Space and weight savings
- Simple mounting
- Improved temperature and power cycling
- Reduced protection circuits

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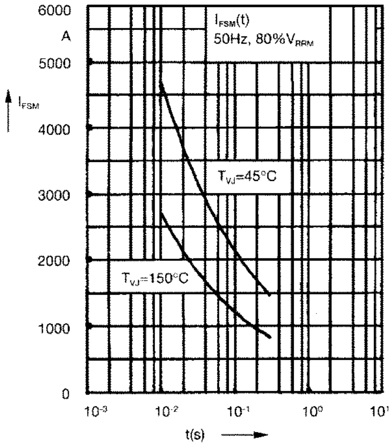

Fig. 1 Surge overload current
$I_{FSM}$: Crest value, t: duration

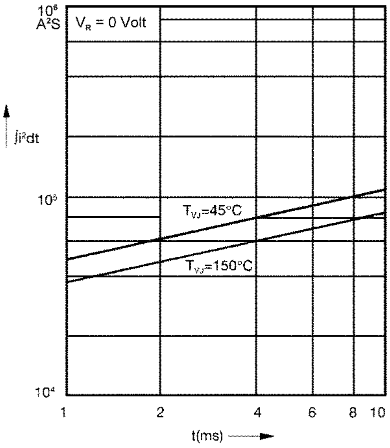

Fig. 2 $\int i^2dt$ versus time (1-10 ms)

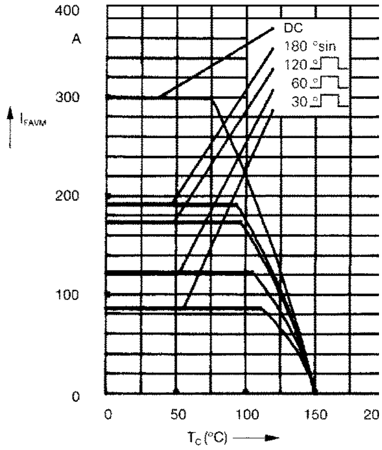

Fig. 2a Maximum forward current
at case temperature

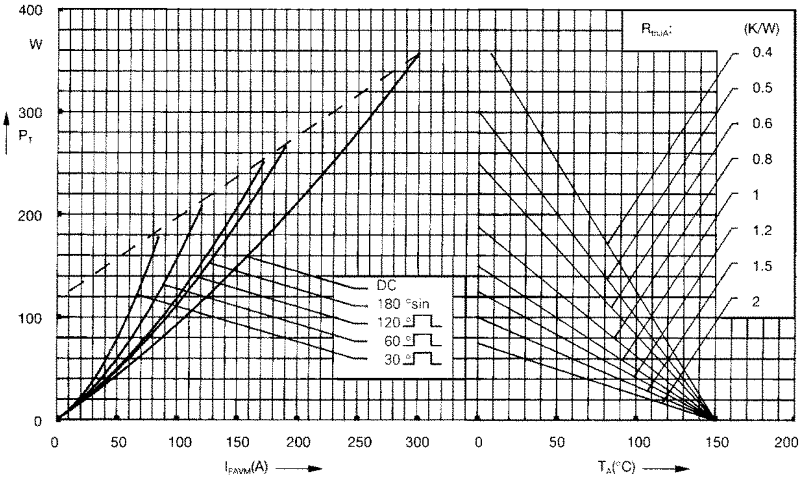

Fig. 3 Power dissipation versus
forward current and ambient
temperature (per diode)

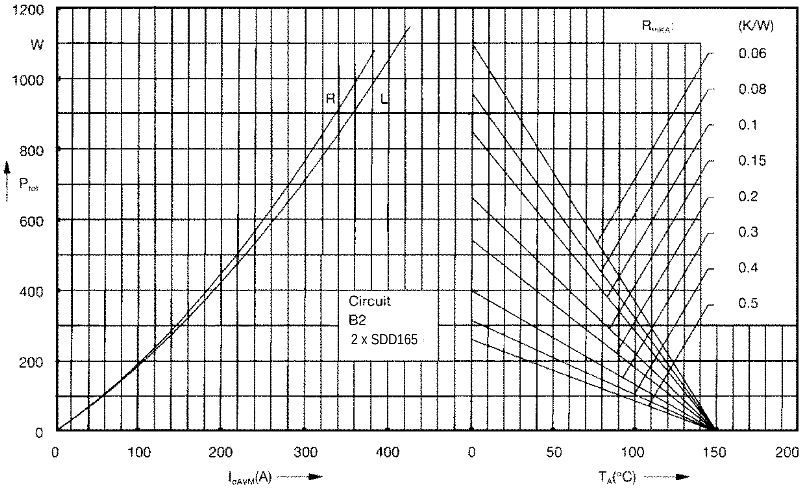

Fig. 4 Single phase rectifier bridge:
Power dissipation versus direct
output current and ambient
temperature
R = resistive load
L = inductive load

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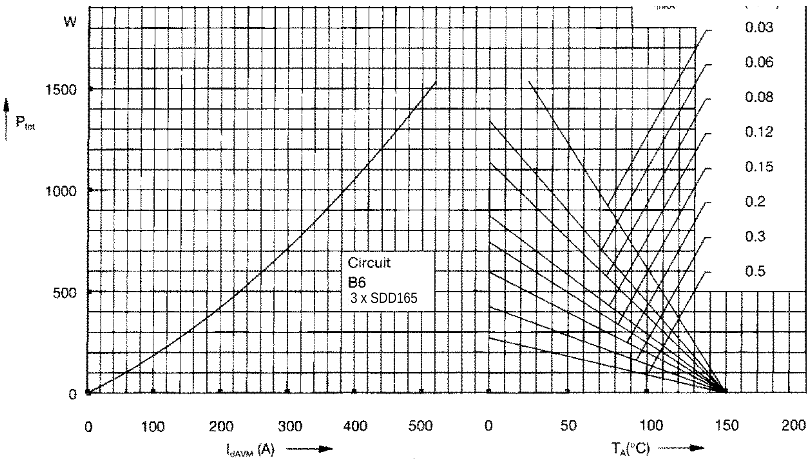

Fig. 5 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature

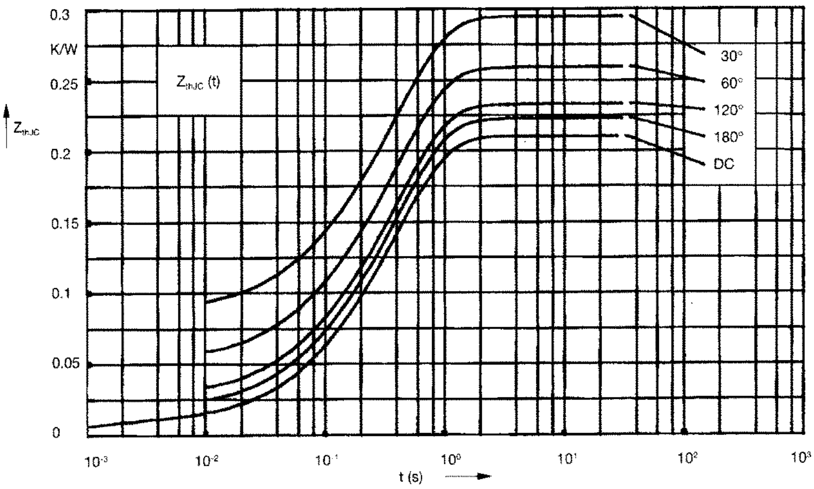

Fig. 6 Transient thermal impedance junction to case (per diode)

$R_{thJC}$ for various conduction angles d:

| d | $R_{thJC}$ (K/W) |
|---|---|
| DC | 0.210 |
| 180°C | 0.223 |
| 120°C | 0.233 |
| 60°C | 0.260 |
| 30°C | 0.295 |

Constants for $Z_{thJC}$ calculation:

| i | $R_{thi}$ (K/W) | $t_i$ (s) |
|---|---|---|
| 1 | 0.0087 | 0.001 |
| 2 | 0.0163 | 0.065 |
| 3 | 0.185 | 0.4 |

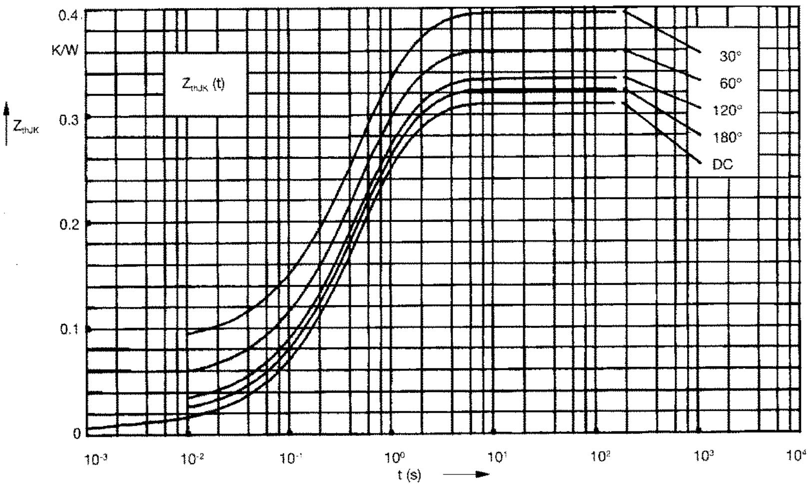

Fig. 7 Transient thermal impedance junction to heatsink (per diode)

$R_{thJK}$ for various conduction angles d:

| d | $R_{thJK}$ (K/W) |
|---|---|
| DC | 0.31 |
| 180°C | 0.323 |
| 120°C | 0.333 |
| 60°C | 0.360 |
| 30°C | 0.395 |

Constants for $Z_{thJK}$ calculation:

| i | $R_{thi}$ (K/W) | $t_i$ (s) |
|---|---|---|
| 1 | 0.0087 | 0.001 |
| 2 | 0.0163 | 0.065 |
| 3 | 0.185 | 0.4 |
| 4 | 0.1 | 1.29 |