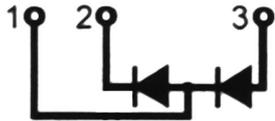# SDD320

## Diode-Diode Modules



| Type | V$_{RSM}$<br>V | V$_{RRM}$<br>V |
|------|------|------|
| **SDD320N08** | 900 | 800 |
| **SDD320N12** | 1300 | 1200 |
| **SDD320N14** | 1500 | 1400 |
| **SDD320N16** | 1700 | 1600 |
| **SDD320N18** | 1900 | 1800 |

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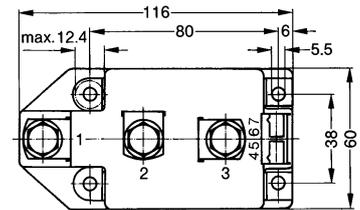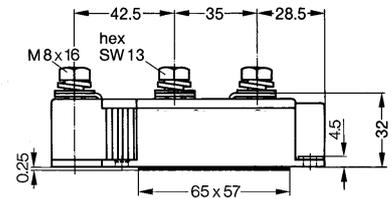


| Symbol | Test Conditions | | Maximum Ratings | Unit |
|--------|----------------|---|-----------------|------|
| I$_{FRMS}$<br>I$_{FAVM}$ | T$_{VJ}$=T$_{VJM}$<br>T$_C$=100$^o$C; 180$^o$ sine | | 480<br>320 | A |
| I$_{FSM}$ | T$_{VJ}$=45$^o$C<br>V$_R$=0 | t=10ms (50Hz), sine<br>t=8.3ms (60Hz), sine | 11500<br>12200 | A |
| | T$_{VJ}$=T$_{VJM}$<br>V$_R$=0 | t=10ms(50Hz), sine<br>t=8.3ms(60Hz), sine | 9600<br>10200 | |
| ∫i²dt | T$_{VJ}$=45$^o$C<br>V$_R$=0 | t=10ms (50Hz), sine<br>t=8.3ms (60Hz), sine | 662000<br>620000 | A$^2$s |
| | T$_{VJ}$=T$_{VJM}$<br>V$_R$=0 | t=10ms(50Hz), sine<br>t=8.3ms(60Hz), sine | 460000<br>430000 | |
| T$_{VJ}$<br>T$_{VJM}$<br>T$_{stg}$ | | | -40...+150<br>150<br>-40...+125 | $^o$C |
| V$_{ISOL}$ | 50/60Hz, RMS<br>I$_{ISOL}$≤1mA | t=1min<br>t=1s | 3000<br>3600 | V~ |
| M$_d$ | Mounting torque (M5)<br>Terminal connection torque (M8) | | 2.5-5/22-24<br>12-15/106-132 | Nm/lb.in. |
| **Weight** | Typical including screws | | 320 | g |

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# SDD320

## Diode-Diode Modules

| Symbol | Test Conditions | Characteristic Values | Unit |
|---|---|---|---|
| $I_{RRM}$ | $T_{VJ}=T_{VJM}$; $V_R=V_{RRM}$ | 40 | mA |
| $V_F$ | $I_F=600A$; $T_{VJ}=25^oC$ | 1.2 | V |
| $V_{TO}$ | For power-loss calculations only | 0.75 | V |
| $r_T$ | $T_{VJ}=T_{VJM}$ | 0.63 | $m\Omega$ |
| $Q_S$ | $T_{VJ}=125^oC$; $I_F=400A$; $-di/dt=50A/us$ | 760 | uC |
| $I_{RM}$ | | 275 | A |
| $R_{thJC}$ | per diode; DC current<br>per module | 0.129<br>0.065 | K/W |
| $R_{thJK}$ | per diode; DC current<br>per module | 0.169<br>0.0845 | K/W |
| $ds$ | 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
* Direct copper bonded $Al_2O_3$-ceramic 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

# SDD320

## Diode-Diode Modules



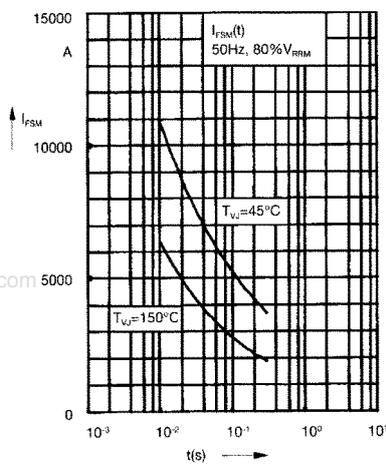Fig. 1  Surge overload current
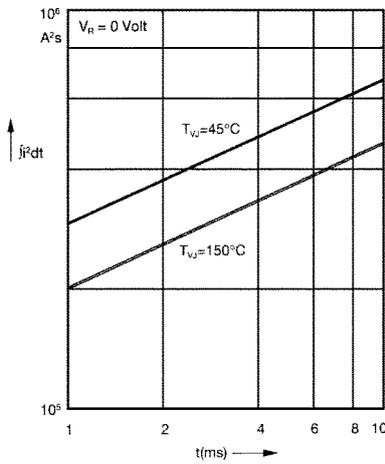$I_{FSM}$: Crest value, t: duration



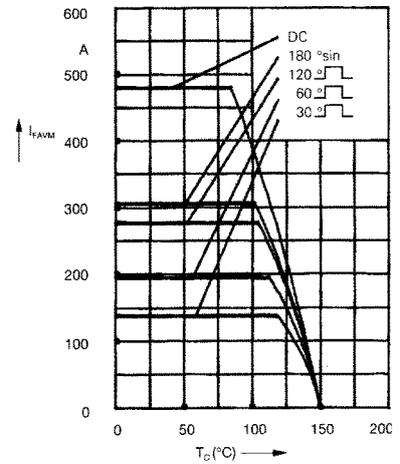Fig. 2  $\int i^2 dt$ versus time (1-10 ms)



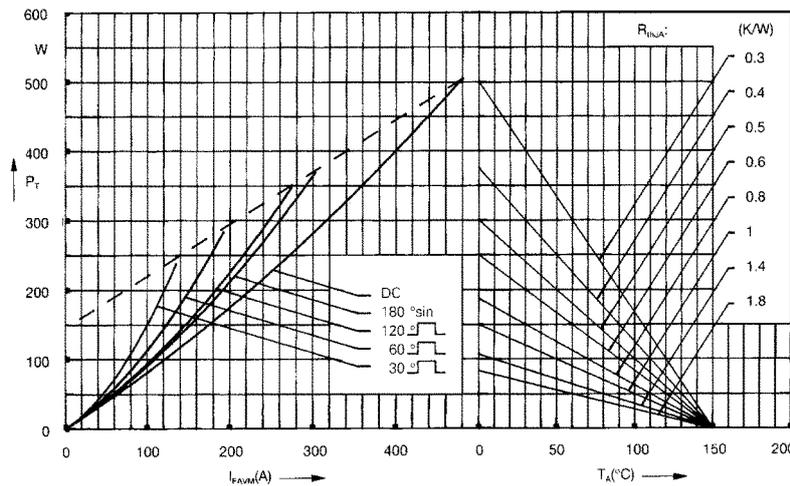Fig. 2a  Maximum forward current at case temperature



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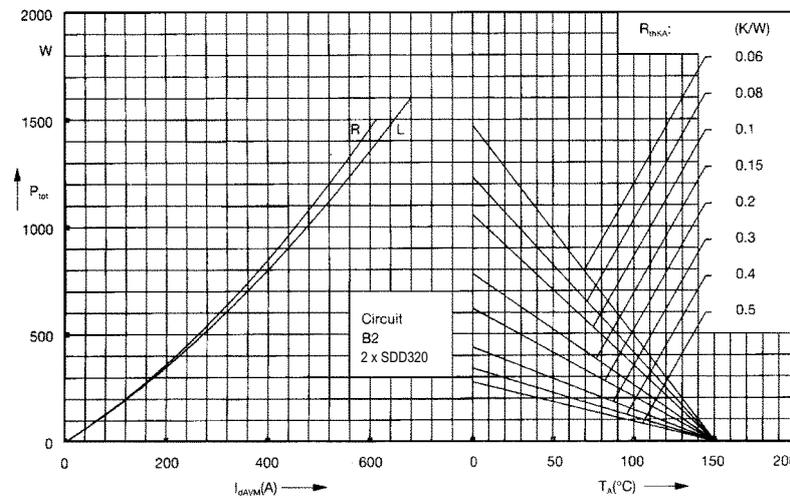


Fig. 4  Single phase rectifier bridge: Power dissipation versus direct output current and ambient temperature
R = resistive load
L = inductive load

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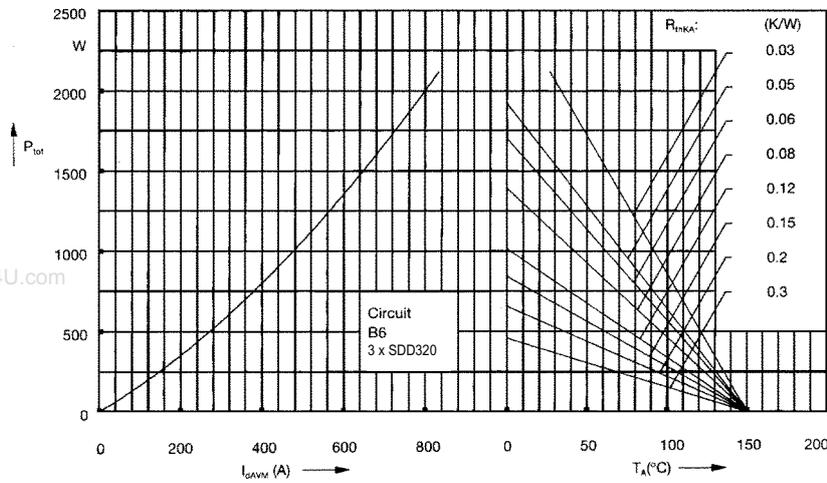
# SDD320

## Diode-Diode Modules

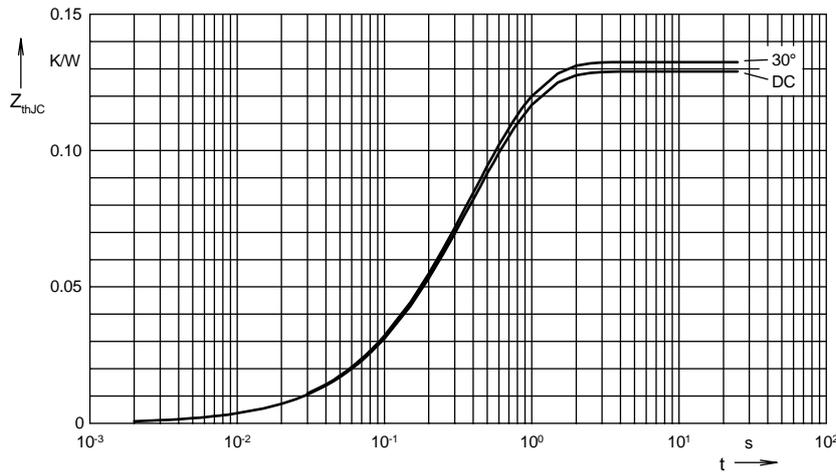Fig. 5 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature



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

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

| d | $R_{thJC}$ (K/W) |
|---|---|
| DC | 0.129 |
| 180$^o$C | 0.131 |
| 120$^o$C | 0.132 |
| 60$^o$C | 0.132 |
| 30$^o$C | 0.133 |

Constants for $Z_{thJC}$ calculation:

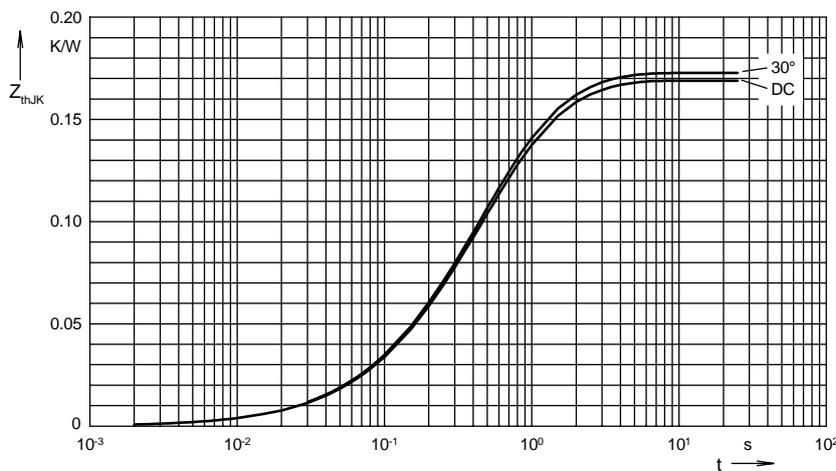| i | $R_{thi}$ (K/W) | $t_i$ (s) |
|---|---|---|
| 1 | 0.0035 | 0.0099 |
| 2 | 0.0165 | 0.168 |
| 3 | 0.1091 | 0.456 |



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

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

| d | $R_{thJK}$ (K/W) |
|---|---|
| DC | 0.169 |
| 180$^o$C | 0.171 |
| 120$^o$C | 0.172 |
| 60$^o$C | 0.172 |
| 30$^o$C | 0.173 |

Constants for $Z_{thJK}$ calculation:

| i | $R_{thi}$ (K/W) | $t_i$ (s) |
|---|---|---|
| 1 | 0.0035 | 0.0099 |
| 2 | 0.0165 | 0.168 |
| 3 | 0.1091 | 0.456 |
| 4 | 0.04 | 1.36 |

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