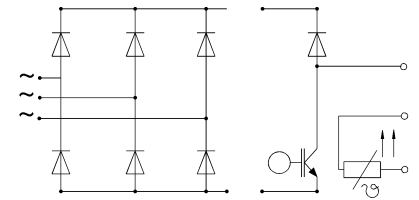


## SKiiP 83 ANB 15 T1

## MiniSKiiP 8 SEMIKRON integrated intelligent Power SKiiP 83 ANB 15 T1 3-phase bridge rectifier + IGBT braking chopper

Case M8a



UL recognized file no. E63532

- specification of temperature sensor see part A of data book '99
- common characteristics see page B 16 – 4 of data book '99

- <sup>1)</sup>  $T_{\text{heatsink}} = 25\text{ °C}$ , unless otherwise specified
- <sup>2)</sup> CAL = Controlled Axial Lifetime Technology (soft and fast recovery)
- <sup>3)</sup> limited by spring contact

| Absolute Maximum Ratings         |   | Values            | Units            |
|----------------------------------|---|-------------------|------------------|
| Symbol                           | Conditions <sup>1)</sup>  |                   |                  |
| Bridge Rectifier                 |   |                   |                  |
| $V_{RRM}$                        |   | 1500              | V                |
| $I_D$                            | $T_{\text{heatsink}} = 80\text{ °C}$                            | 100 <sup>3)</sup> | A                |
| $I_{FSM}$                        | $t_p = 10\text{ ms}$ ; sin. $180^\circ$ , $T_j = 25\text{ °C}$  | 1600              | A                |
| $I_{2t}$                         | $t_p = 10\text{ ms}$ ; sin. $180^\circ$ , $T_j = 25\text{ °C}$  | 12000             | A <sup>2</sup> s |
| IGBT Chopper                     |   |                   |                  |
| $V_{CES}$                        |   | 1200              | V                |
| $V_{GES}$                        |   | $\pm 20$          | V                |
| $I_C$                            | $T_{\text{heatsink}} = 25 / 80\text{ °C}$                       | 95 / 65           | A                |
| $I_{CM}$                         | $t_p < 1\text{ ms}$ ; $T_{\text{heatsink}} = 25 / 80\text{ °C}$ | 190 / 130         | A                |
| Freewheeling Diode <sup>2)</sup> |   |                   |                  |
| $V_{RRM}$                        |   | 1200              | V                |
| $I_F$                            | $T_{\text{heatsink}} = 25 / 80\text{ °C}$                       | 38 / 26           | A                |
| $I_{FM}$                         | $t_p < 1\text{ ms}$ ; $T_{\text{heatsink}} = 25 / 80\text{ °C}$ | 76 / 52           | A                |
| $T_j$                            | Diode & IGBT  | - 40 ... + 150    | °C               |
| $T_{stg}$                        |   | - 40 ... + 125    | °C               |
| $V_{isol}$                       | AC, 1 min.  | 2500              | V                |

| Characteristics               |  | min. | typ.        | max.     | Units         |
|-------------------------------|--|------|-------------|----------|---------------|
| Symbol                        | Conditions <sup>1)</sup>                               |      |             |          |               |
| Diode - Rectifier             |  |      |             |          |               |
| $V_F$                         | $I_F = 100\text{ A}$ $T_j = 125\text{ °C}$             | -    | 1,15        | -        | V             |
| $V_{TO}$                      | $T_j = 125\text{ °C}$                                  | -    | 0,8         | -        | V             |
| $r_T$                         | $T_j = 125\text{ °C}$                                  | -    | 3,5         | -        | m $\Omega$    |
| $R_{thjh}$                    | per diode  | -    | -           | 0,7      | K/W           |
| IGBT - Chopper                |  |      |             |          |               |
| $V_{CESat}$                   | $I_C = 75\text{ A}$ $T_j = 25\text{ (125) °C}$         | -    | 2,5(3,1)    | 3,0(3,7) | V             |
| $t_{d(on)}$                   | $V_{CC} = 600\text{ V}$ ; $V_{GE} = \pm 15\text{ V}$   | -    | 35          | -        | ns            |
| $t_r$                         | $I_C = 75\text{ A}$ ; $T_j = 125\text{ °C}$            | -    | 70          | -        | ns            |
| $t_{d(off)}$                  | $R_{gon} = R_{goff} = 15\text{ }\Omega$                | -    | 450         | -        | ns            |
| $t_f$                         | inductive load   | -    | 70          | -        | ns            |
| $E_{on} + E_{off}$            |  | -    | 18          | -        | mJ            |
| $C_{ies}$                     | $V_{CE} = 25\text{ V}$ ; $V_{GE} = 0\text{ V}$ , 1 MHz | -    | 5,0         | -        | nF            |
| $R_{thjh}$                    | per IGBT   | -    | -           | 0,35     | K/W           |
| Diode <sup>2)</sup> - Chopper |  |      |             |          |               |
| $V_F = V_{EC}$                | $I_F = 25\text{ A}$ $T_j = 25\text{ (125) °C}$         | -    | 2,0(1,8)    | 2,5(2,3) | V             |
| $V_{TO}$                      | $T_j = 125\text{ °C}$                                  | -    | 1,0         | 1,2      | V             |
| $r_T$                         | $T_j = 125\text{ °C}$                                  | -    | 32          | 44       | m $\Omega$    |
| $I_{RRM}$                     | $I_F = 25\text{ A}$ ; $V_R = -600\text{ V}$            | -    | 25          | -        | A             |
| $Q_{rr}$                      | $di_F/dt = -500\text{ A}/\mu\text{s}$                  | -    | 4,5         | -        | $\mu\text{C}$ |
| $E_{off}$                     | $V_{GE} = 0\text{ V}$ , $T_j = 125\text{ °C}$          | -    | 1,0         | -        | mJ            |
| $R_{thjh}$                    | per diode  | -    | -           | 1,2      | K/W           |
| Temperature Sensor            |  |      |             |          |               |
| $R_{TS}$                      | $T = 25 / 100\text{ °C}$                               |      | 1000 / 1670 |          | $\Omega$      |
| Mechanical Data               |  |      |             |          |               |
| $M_1$                         | mounting torque  | 2,5  | -           | 3,5      | Nm            |
| Case                          | mechanical outline see pages B 16 – 13 and B 16 – 14   |      | M8a         |          |               |

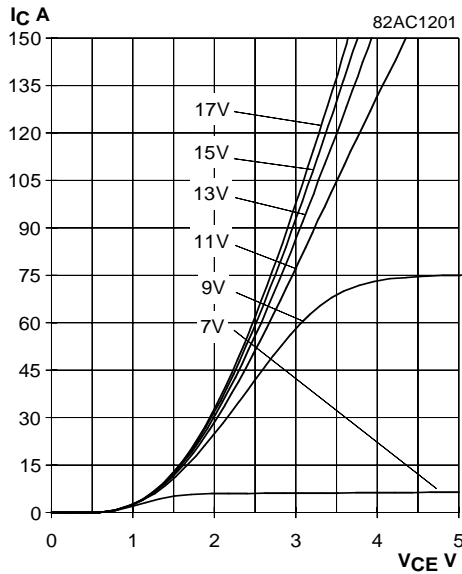


Fig. 1 Typ. output characteristic,  $t_p = 80 \mu s$ ;  $25 \text{ }^\circ\text{C}$

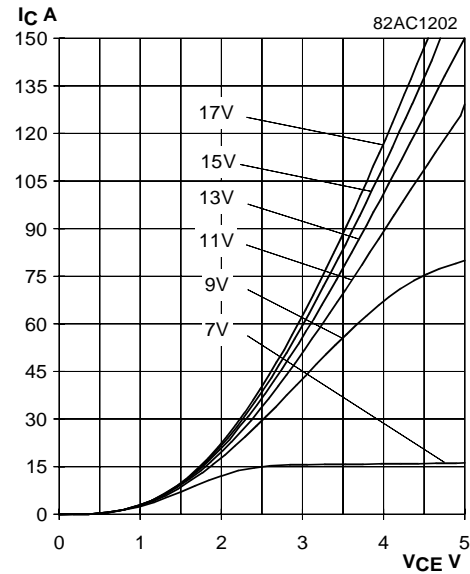


Fig. 2 Typ. output characteristic,  $t_p = 80 \mu s$ ;  $125 \text{ }^\circ\text{C}$

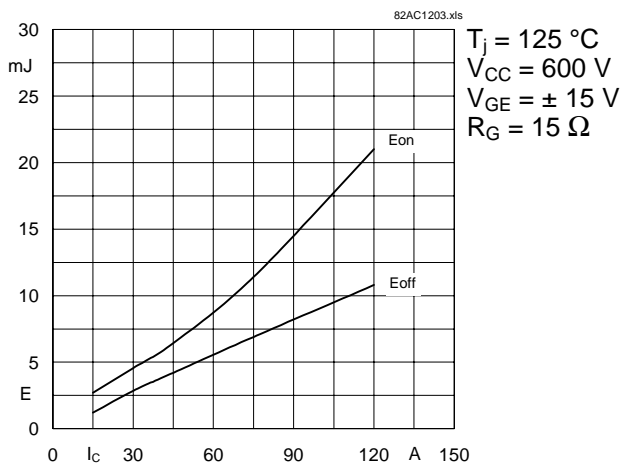


Fig. 3 Turn-on /-off energy =  $f(I_c)$

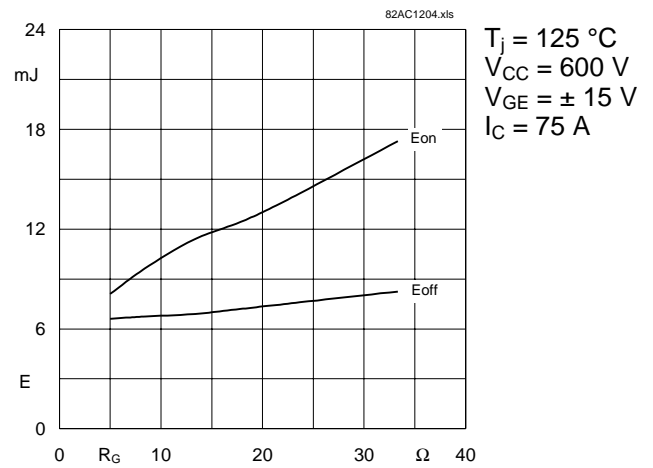


Fig. 4 Turn-on /-off energy =  $f(R_G)$

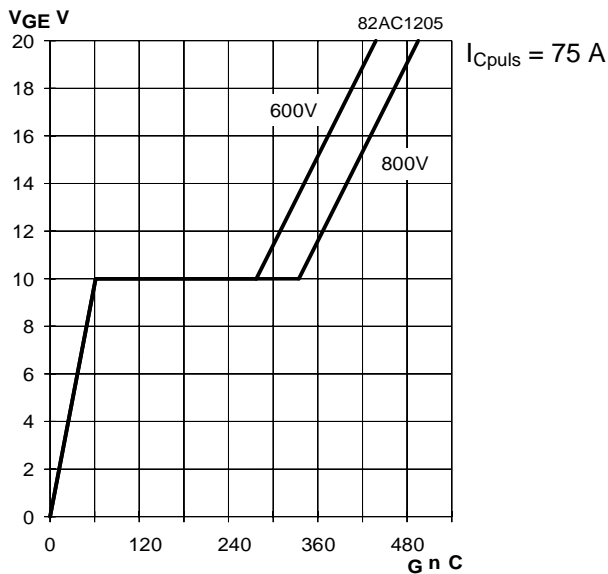


Fig. 5 Typ. gate charge characteristic

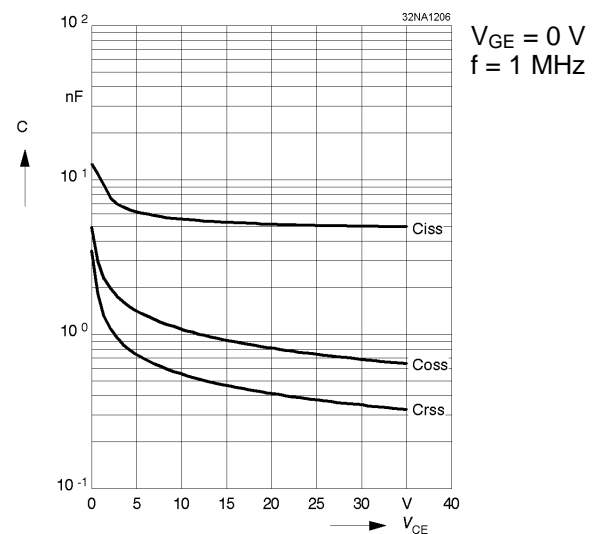


Fig. 6 Typ. capacitances vs.  $V_{CE}$