

**Vorläufige Daten**  
**preliminary data****IGBT-Wechselrichter / IGBT-inverter****Höchstzulässige Werte / maximum rated values**

|                                                                          |                                                          |                             |          |        |
|--------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------|----------|--------|
| Kollektor-Emitter-Sperrspannung<br>collector-emitter voltage             | $T_{vj} = 25^{\circ}\text{C}$                            | $V_{CES}$                   | 1200     | V      |
| Kollektor-Dauergleichstrom<br>DC-collector current                       | $T_C = 80^{\circ}\text{C}$<br>$T_C = 25^{\circ}\text{C}$ | $I_{C\text{ nom}}$<br>$I_C$ | 25<br>40 | A<br>A |
| Periodischer Kollektor Spitzenstrom<br>repetitive peak collector current | $t_P = 1\text{ ms}$ , $T_C = 80^{\circ}\text{C}$         | $I_{CRM}$                   | 50       | A      |
| Gesamt-Verlustleistung<br>total power dissipation                        | $T_C = 25^{\circ}\text{C}$                               | $P_{tot}$                   | 155      | W      |
| Gate-Emitter-Spitzenspannung<br>gate-emitter peak voltage                |                                                          | $V_{GES}$                   | +/-20    | V      |

**Charakteristische Werte / characteristic values**

|                                                                              |                                                                                                                                                                                                                                                       |                     | min. | typ.         | max. |                                |
|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------|--------------|------|--------------------------------|
| Kollektor-Emitter Sättigungsspannung<br>collector-emitter saturation voltage | $I_C = 25\text{ A}$ , $V_{GE} = 15\text{ V}$ , $T_{vj} = 25^{\circ}\text{C}$<br>$I_C = 25\text{ A}$ , $V_{GE} = 15\text{ V}$ , $T_{vj} = 125^{\circ}\text{C}$                                                                                         | $V_{CE\text{ sat}}$ |      | 1,70<br>1,90 | 2,15 | V<br>V                         |
| Gate-Schwellenspannung<br>gate threshold voltage                             | $I_C = 1,00\text{ mA}$ , $V_{CE} = V_{GE}$ , $T_{vj} = 25^{\circ}\text{C}$                                                                                                                                                                            | $V_{GEth}$          | 5,0  | 5,8          | 6,5  | V                              |
| Gateladung<br>gate charge                                                    | $V_{GE} = -15\text{ V} \dots +15\text{ V}$                                                                                                                                                                                                            | $Q_G$               |      | 0,24         |      | $\mu\text{C}$                  |
| Interner Gatewiderstand<br>internal gate resistor                            | $T_{vj} = 25^{\circ}\text{C}$                                                                                                                                                                                                                         | $R_{Gint}$          |      | 8,0          |      | $\Omega$                       |
| Eingangskapazität<br>input capacitance                                       | $f = 1\text{ MHz}$ , $T_{vj} = 25^{\circ}\text{C}$ , $V_{CE} = 25\text{ V}$ , $V_{GE} = 0\text{ V}$                                                                                                                                                   | $C_{ies}$           |      | 1,80         |      | nF                             |
| Rückwirkungskapazität<br>reverse transfer capacitance                        | $f = 1\text{ MHz}$ , $T_{vj} = 25^{\circ}\text{C}$ , $V_{CE} = 25\text{ V}$ , $V_{GE} = 0\text{ V}$                                                                                                                                                   | $C_{res}$           |      | 0,064        |      | nF                             |
| Kollektor-Emitter Reststrom<br>collector-emitter cut-off current             | $V_{CE} = 1200\text{ V}$ , $V_{GE} = 0\text{ V}$ , $T_{vj} = 25^{\circ}\text{C}$                                                                                                                                                                      | $I_{CES}$           |      |              | 5,0  | mA                             |
| Gate-Emitter Reststrom<br>gate-emitter leakage current                       | $V_{CE} = 0\text{ V}$ , $V_{GE} = 20\text{ V}$ , $T_{vj} = 25^{\circ}\text{C}$                                                                                                                                                                        | $I_{GES}$           |      |              | 400  | nA                             |
| Einschaltverzögerungszeit (ind. Last)<br>turn-on delay time (inductive load) | $I_C = 25\text{ A}$ , $V_{CE} = 600\text{ V}$<br>$V_{GE} = \pm 15\text{ V}$ , $R_{Gon} = 36\ \Omega$ , $T_{vj} = 25^{\circ}\text{C}$<br>$V_{GE} = \pm 15\text{ V}$ , $R_{Gon} = 36\ \Omega$ , $T_{vj} = 125^{\circ}\text{C}$                          | $t_{d\text{ on}}$   |      | 0,09<br>0,09 |      | $\mu\text{s}$<br>$\mu\text{s}$ |
| Anstiegszeit (induktive Last)<br>rise time (inductive load)                  | $I_C = 25\text{ A}$ , $V_{CE} = 600\text{ V}$<br>$V_{GE} = \pm 15\text{ V}$ , $R_{Gon} = 36\ \Omega$ , $T_{vj} = 25^{\circ}\text{C}$<br>$V_{GE} = \pm 15\text{ V}$ , $R_{Gon} = 36\ \Omega$ , $T_{vj} = 125^{\circ}\text{C}$                          | $t_r$               |      | 0,03<br>0,05 |      | $\mu\text{s}$<br>$\mu\text{s}$ |
| Abschaltverzögerungszeit (ind. Last)<br>turn-off delay time (inductive load) | $I_C = 25\text{ A}$ , $V_{CE} = 600\text{ V}$<br>$V_{GE} = \pm 15\text{ V}$ , $R_{Goff} = 36\ \Omega$ , $T_{vj} = 25^{\circ}\text{C}$<br>$V_{GE} = \pm 15\text{ V}$ , $R_{Goff} = 36\ \Omega$ , $T_{vj} = 125^{\circ}\text{C}$                        | $t_{d\text{ off}}$  |      | 0,42<br>0,52 |      | $\mu\text{s}$<br>$\mu\text{s}$ |
| Fallzeit (induktive Last)<br>fall time (inductive load)                      | $I_C = 25\text{ A}$ , $V_{CE} = 600\text{ V}$<br>$V_{GE} = \pm 15\text{ V}$ , $R_{Goff} = 36\ \Omega$ , $T_{vj} = 25^{\circ}\text{C}$<br>$V_{GE} = \pm 15\text{ V}$ , $R_{Goff} = 36\ \Omega$ , $T_{vj} = 125^{\circ}\text{C}$                        | $t_f$               |      | 0,07<br>0,09 |      | $\mu\text{s}$<br>$\mu\text{s}$ |
| Einschaltverlustenergie pro Puls<br>turn-on energy loss per pulse            | $I_C = 25\text{ A}$ , $V_{CE} = 600\text{ V}$ , $L_S = 45\text{ nH}$<br>$V_{GE} = \pm 15\text{ V}$ , $R_{Gon} = 36\ \Omega$ , $T_{vj} = 25^{\circ}\text{C}$<br>$V_{GE} = \pm 15\text{ V}$ , $R_{Gon} = 36\ \Omega$ , $T_{vj} = 125^{\circ}\text{C}$   | $E_{on}$            |      | 2,40<br>3,50 |      | mJ<br>mJ                       |
| Abschaltverlustenergie pro Puls<br>turn-off energy loss per pulse            | $I_C = 25\text{ A}$ , $V_{CE} = 600\text{ V}$ , $L_S = 45\text{ nH}$<br>$V_{GE} = \pm 15\text{ V}$ , $R_{Goff} = 36\ \Omega$ , $T_{vj} = 25^{\circ}\text{C}$<br>$V_{GE} = \pm 15\text{ V}$ , $R_{Goff} = 36\ \Omega$ , $T_{vj} = 125^{\circ}\text{C}$ | $E_{off}$           |      | 1,80<br>2,10 |      | mJ<br>mJ                       |
| Kurzschlußverhalten<br>SC data                                               | $t_P \leq 10\ \mu\text{s}$ , $V_{GE} \leq 15\text{ V}$<br>$T_{vj} \leq 125^{\circ}\text{C}$ , $V_{CC} = 900\text{ V}$ , $V_{CEmax} = V_{CES} - L_{sCE} \cdot di/dt$                                                                                   | $I_{SC}$            |      | 100          |      | A                              |
| Innerer Wärmewiderstand<br>thermal resistance, junction to case              | pro IGBT<br>per IGBT                                                                                                                                                                                                                                  | $R_{thJC}$          |      |              | 0,80 | K/W                            |

prepared by: Andreas Schulz

date of publication: 2003-7-8

approved by: Robert Severin

revision: 2.0

**Vorläufige Daten**  
**preliminary data****Diode-Wechselrichter / diode-inverter****Höchstzulässige Werte / maximum rated values**

|                                                                     |                                                                            |           |      |                      |
|---------------------------------------------------------------------|----------------------------------------------------------------------------|-----------|------|----------------------|
| Periodische Spitzensperrspannung<br>repetitive peak reverse voltage | $T_{vj} = 25^{\circ}\text{C}$                                              | $V_{RRM}$ | 1200 | V                    |
| Dauergleichstrom<br>DC forward current                              |                                                                            | $I_F$     | 25   | A                    |
| Periodischer Spitzenstrom<br>repetitive peak forward current        | $t_P = 1\text{ ms}$                                                        | $I_{FRM}$ | 50   | A                    |
| Grenzlastintegral<br>$I^2t$ - value                                 | $V_R = 0\text{ V}$ , $t_P = 10\text{ ms}$ , $T_{vj} = 125^{\circ}\text{C}$ | $I^2t$    | 170  | $\text{A}^2\text{s}$ |

**Charakteristische Werte / characteristic values**

|                                                                 |                                                                                                                                                                                                                                  |            | min. | typ.         | max. |                                |
|-----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------|--------------|------|--------------------------------|
| Durchlassspannung<br>forward voltage                            | $I_F = 25\text{ A}$ , $V_{GE} = 0\text{ V}$ , $T_{vj} = 25^{\circ}\text{C}$<br>$I_F = 25\text{ A}$ , $V_{GE} = 0\text{ V}$ , $T_{vj} = 125^{\circ}\text{C}$                                                                      | $V_F$      |      | 1,65<br>1,65 | 2,15 | V<br>V                         |
| Rückstromspitze<br>peak reverse recovery current                | $I_F = 25\text{ A}$ , $-di_F/dt = 700\text{ A}/\mu\text{s}$<br>$V_R = 600\text{ V}$ , $V_{GE} = -15\text{ V}$ , $T_{vj} = 25^{\circ}\text{C}$<br>$V_R = 600\text{ V}$ , $V_{GE} = -15\text{ V}$ , $T_{vj} = 125^{\circ}\text{C}$ | $I_{RM}$   |      | 26,0<br>24,0 |      | A<br>A                         |
| Sperrverzögerungsladung<br>recovered charge                     | $I_F = 25\text{ A}$ , $-di_F/dt = 700\text{ A}/\mu\text{s}$<br>$V_R = 600\text{ V}$ , $V_{GE} = -15\text{ V}$ , $T_{vj} = 25^{\circ}\text{C}$<br>$V_R = 600\text{ V}$ , $V_{GE} = -15\text{ V}$ , $T_{vj} = 125^{\circ}\text{C}$ | $Q_r$      |      | 2,80<br>5,00 |      | $\mu\text{C}$<br>$\mu\text{C}$ |
| Abschaltenergie pro Puls<br>reverse recovery energy             | $I_F = 25\text{ A}$ , $-di_F/dt = 700\text{ A}/\mu\text{s}$<br>$V_R = 600\text{ V}$ , $V_{GE} = -15\text{ V}$ , $T_{vj} = 25^{\circ}\text{C}$<br>$V_R = 600\text{ V}$ , $V_{GE} = -15\text{ V}$ , $T_{vj} = 125^{\circ}\text{C}$ | $E_{rec}$  |      | 0,90<br>1,80 |      | mJ<br>mJ                       |
| Innerer Wärmewiderstand<br>thermal resistance, junction to case | pro Diode<br>per diode                                                                                                                                                                                                           | $R_{thJC}$ |      |              | 1,35 | K/W                            |

**Diode-Gleichrichter / diode-rectifier****Höchstzulässige Werte / maximum rated values**

|                                                                                     |                                                                                                               |             |            |                                              |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-------------|------------|----------------------------------------------|
| Periodische Rückw. Spitzensperrspannung<br>repetitive peak reverse voltage          | $T_{vj} = 25^{\circ}\text{C}$                                                                                 | $V_{RRM}$   | 1600       | V                                            |
| Durchlassstrom Grenzeffektivwert pro Dio.<br>forward current RMS maximum per diode  | $T_C = 80^{\circ}\text{C}$                                                                                    | $I_{FRMSM}$ | 50         | A                                            |
| Gleichrichter Ausgang Grenzeffektivstrom<br>maximum RMS current at Rectifier output | $T_C = 80^{\circ}\text{C}$                                                                                    | $I_{RMSM}$  | 60         | A                                            |
| Stoßstrom Grenzwert<br>surge forward current                                        | $t_p = 10\text{ ms}$ , $T_{vj} = 25^{\circ}\text{C}$<br>$t_p = 10\text{ ms}$ , $T_{vj} = 150^{\circ}\text{C}$ | $I_{FSM}$   | 315<br>260 | A<br>A                                       |
| Grenzlastintegral<br>$I^2t$ - value                                                 | $t_p = 10\text{ ms}$ , $T_{vj} = 25^{\circ}\text{C}$<br>$t_p = 10\text{ ms}$ , $T_{vj} = 150^{\circ}\text{C}$ | $I^2t$      | 495<br>340 | $\text{A}^2\text{s}$<br>$\text{A}^2\text{s}$ |

**Charakteristische Werte / characteristic values**

|                                                                 |                                                        |            | min. | typ. | max. |     |
|-----------------------------------------------------------------|--------------------------------------------------------|------------|------|------|------|-----|
| Durchlassspannung<br>forward voltage                            | $T_{vj} = 150^{\circ}\text{C}$ , $I_F = 25\text{ A}$   | $V_F$      |      | 1,05 |      | V   |
| Sperrstrom<br>reverse current                                   | $T_{vj} = 150^{\circ}\text{C}$ , $V_R = 1600\text{ V}$ | $I_R$      |      | 2,00 |      | mA  |
| Innerer Wärmewiderstand<br>thermal resistance, junction to case | pro Diode<br>per diode                                 | $R_{thJC}$ |      |      | 1,00 | K/W |

**Vorläufige Daten**  
**preliminary data****IGBT-Brems-Chopper / IGBT-brake-chopper****Höchstzulässige Werte / maximum rated values**

|                                                                          |                                                          |                     |          |        |
|--------------------------------------------------------------------------|----------------------------------------------------------|---------------------|----------|--------|
| Kollektor-Emitter-Sperrspannung<br>collector-emitter voltage             | $T_{vj} = 25^{\circ}\text{C}$                            | $V_{CES}$           | 1200     | V      |
| Kollektor-Dauergleichstrom<br>DC-collector current                       | $T_c = 80^{\circ}\text{C}$<br>$T_c = 25^{\circ}\text{C}$ | $I_{Cnom}$<br>$I_C$ | 15<br>25 | A<br>A |
| Periodischer Kollektor Spitzenstrom<br>repetitive peak collector current | $t_P = 1 \text{ ms}$ , $T_c = 80^{\circ}\text{C}$        | $I_{CRM}$           | 30       | A      |
| Gesamt-Verlustleistung<br>total power dissipation                        | $T_c = 25^{\circ}\text{C}$                               | $P_{tot}$           | 105      | W      |
| Gate-Emitter-Spitzenspannung<br>gate-emitter peak voltage                |                                                          | $V_{GES}$           | +/-20    | V      |

**Charakteristische Werte / characteristic values**

|                                                                              |                                                                                                                                                                                                                                  |              | min. | typ.         | max. |                                |
|------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------|--------------|------|--------------------------------|
| Kollektor-Emitter Sättigungsspannung<br>collector-emitter saturation voltage | $I_C = 15 \text{ A}$ , $V_{GE} = 15 \text{ V}$ , $T_{vj} = 25^{\circ}\text{C}$<br>$I_C = 15 \text{ A}$ , $V_{GE} = 15 \text{ V}$ , $T_{vj} = 125^{\circ}\text{C}$                                                                | $V_{CE sat}$ |      | 1,70<br>1,90 | 2,15 | V<br>V                         |
| Gate-Schwellenspannung<br>gate threshold voltage                             | $I_C = 0,50 \text{ mA}$ , $V_{CE} = V_{GE}$ , $T_{vj} = 25^{\circ}\text{C}$                                                                                                                                                      | $V_{GEth}$   | 5,0  | 5,8          | 6,5  | V                              |
| Gateladung<br>gate charge                                                    | $V_{GE} = -15 \text{ V} \dots +15 \text{ V}$                                                                                                                                                                                     | $Q_G$        |      | 0,15         |      | $\mu\text{C}$                  |
| Interner Gatewiderstand<br>internal gate resistor                            |                                                                                                                                                                                                                                  | $R_{Gint}$   |      | 0,00         |      | $\Omega$                       |
| Eingangskapazität<br>input capacitance                                       | $f = 1 \text{ MHz}$ , $T_{vj} = 25^{\circ}\text{C}$<br>$V_{CE} = 25 \text{ V}$ , $V_{GE} = 0 \text{ V}$                                                                                                                          | $C_{ies}$    |      | 1,10         |      | nF                             |
| Rückwirkungskapazität<br>reverse transfer capacitance                        | $f = 1 \text{ MHz}$ , $T_{vj} = 25^{\circ}\text{C}$<br>$V_{CE} = 25 \text{ V}$ , $V_{GE} = 0 \text{ V}$                                                                                                                          | $C_{res}$    |      | 0,04         |      | nF                             |
| Kollektor-Emitter Reststrom<br>collector-emitter cut-off current             | $V_{CE} = 1200 \text{ V}$ , $V_{GE} = 0 \text{ V}$ , $T_{vj} = 25^{\circ}\text{C}$                                                                                                                                               | $I_{CES}$    |      |              | 5,0  | mA                             |
| Gate-Emitter Reststrom<br>gate-emitter leakage current                       | $V_{CE} = 0 \text{ V}$ , $V_{GE} = 20 \text{ V}$ , $T_{vj} = 25^{\circ}\text{C}$                                                                                                                                                 | $I_{GES}$    |      |              | 400  | nA                             |
| Einschaltverzögerungszeit (ind. Last)<br>turn-on delay time (inductive load) | $I_C = 15 \text{ A}$ , $V_{CE} = 600 \text{ V}$<br>$V_{GE} = \pm 15 \text{ V}$ , $R_{Gon} = 75 \Omega$ , $T_{vj} = 25^{\circ}\text{C}$<br>$V_{GE} = \pm 15 \text{ V}$ , $R_{Gon} = 75 \Omega$ , $T_{vj} = 125^{\circ}\text{C}$   | $t_{d on}$   |      | 0,09<br>0,09 |      | $\mu\text{s}$<br>$\mu\text{s}$ |
| Anstiegszeit (induktive Last)<br>rise time (inductive load)                  | $I_C = 15 \text{ A}$ , $V_{CE} = 600 \text{ V}$<br>$V_{GE} = \pm 15 \text{ V}$ , $R_{Gon} = 75 \Omega$ , $T_{vj} = 25^{\circ}\text{C}$<br>$V_{GE} = \pm 15 \text{ V}$ , $R_{Gon} = 75 \Omega$ , $T_{vj} = 125^{\circ}\text{C}$   | $t_r$        |      | 0,03<br>0,05 |      | $\mu\text{s}$<br>$\mu\text{s}$ |
| Abschaltverzögerungszeit (ind. Last)<br>turn-off delay time (inductive load) | $I_C = 15 \text{ A}$ , $V_{CE} = 600 \text{ V}$<br>$V_{GE} = \pm 15 \text{ V}$ , $R_{Goff} = 75 \Omega$ , $T_{vj} = 25^{\circ}\text{C}$<br>$V_{GE} = \pm 15 \text{ V}$ , $R_{Goff} = 75 \Omega$ , $T_{vj} = 125^{\circ}\text{C}$ | $t_{d off}$  |      | 0,42<br>0,52 |      | $\mu\text{s}$<br>$\mu\text{s}$ |
| Fallzeit (induktive Last)<br>fall time (inductive load)                      | $I_C = 15 \text{ A}$ , $V_{CE} = 600 \text{ V}$<br>$V_{GE} = \pm 15 \text{ V}$ , $R_{Goff} = 75 \Omega$ , $T_{vj} = 25^{\circ}\text{C}$<br>$V_{GE} = \pm 15 \text{ V}$ , $R_{Goff} = 75 \Omega$ , $T_{vj} = 125^{\circ}\text{C}$ | $t_f$        |      | 0,07<br>0,09 |      | $\mu\text{s}$<br>$\mu\text{s}$ |
| Einschaltverlustenergie pro Puls<br>turn-on energy loss per pulse            | $I_C = 15 \text{ A}$ , $V_{CE} = 600 \text{ V}$<br>$V_{GE} = \pm 15 \text{ V}$ , $R_{Gon} = 75 \Omega$ , $T_{vj} = 25^{\circ}\text{C}$<br>$V_{GE} = \pm 15 \text{ V}$ , $R_{Gon} = 75 \Omega$ , $T_{vj} = 125^{\circ}\text{C}$   | $E_{on}$     |      | 1,50<br>2,10 |      | mJ<br>mJ                       |
| Abschaltverlustenergie pro Puls<br>turn-off energy loss per pulse            | $I_C = 15 \text{ A}$ , $V_{CE} = 600 \text{ V}$<br>$V_{GE} = \pm 15 \text{ V}$ , $R_{Goff} = 75 \Omega$ , $T_{vj} = 25^{\circ}\text{C}$<br>$V_{GE} = \pm 15 \text{ V}$ , $R_{Goff} = 75 \Omega$ , $T_{vj} = 125^{\circ}\text{C}$ | $E_{off}$    |      | 1,10<br>1,30 |      | mJ<br>mJ                       |
| Kurzschlußverhalten<br>SC data                                               | $t_P \leq 10 \mu\text{sec}$ , $V_{GE} \leq 15 \text{ V}$<br>$T_{vj} \leq 125^{\circ}\text{C}$ , $V_{CC} = 900 \text{ V}$ , $V_{CEmax} = V_{CES} - L_{sCE} \cdot di/dt$                                                           | $I_{SC}$     |      | 60           |      | A                              |
| Innerer Wärmewiderstand<br>thermal resistance, junction to case              | pro IGBT<br>per IGBT                                                                                                                                                                                                             | $R_{thJC}$   |      |              | 1,20 | K/W                            |

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date of publication: 2003-7-8

approved by: Robert Severin

revision: 2.0

**Vorläufige Daten**  
**preliminary data****Diode-Brems-Chopper / Diode-brake-chopper****Höchstzulässige Werte / maximum rated values**

|                                                                     |                                                                              |           |      |                      |
|---------------------------------------------------------------------|------------------------------------------------------------------------------|-----------|------|----------------------|
| Periodische Spitzensperrspannung<br>repetitive peak reverse voltage | $T_{vj} = 25^{\circ}\text{C}$                                                | $V_{RRM}$ | 1200 | V                    |
| Dauergleichstrom<br>DC forward current                              |                                                                              | $I_F$     | 10   | A                    |
| Periodischer Spitzenstrom<br>repetitive peak forw. current          | $t_p = 1 \text{ ms}$                                                         | $I_{FRM}$ | 20   | A                    |
| Grenzlastintegral<br>$I^2t$ - value                                 | $V_R = 0 \text{ V}$ , $t_p = 10 \text{ ms}$ , $T_{vj} = 125^{\circ}\text{C}$ | $I^2t$    | 20,0 | $\text{A}^2\text{s}$ |

**Charakteristische Werte / characteristic values**

|                                                                 |                                                                                                                                                                                                                                        |            | min. | typ.         | max. |                                |
|-----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------|--------------|------|--------------------------------|
| Durchlaßspannung<br>forward voltage                             | $I_F = 10 \text{ A}$ , $V_{GE} = 0 \text{ V}$ , $T_{vj} = 25^{\circ}\text{C}$<br>$I_F = 10 \text{ A}$ , $V_{GE} = 0 \text{ V}$ , $T_{vj} = 125^{\circ}\text{C}$                                                                        | $V_F$      |      | 1,80<br>1,85 | 2,25 | V<br>V                         |
| Rückstromspitze<br>peak reverse recovery current                | $I_F = 10 \text{ A}$ , $-di_F/dt = 400 \text{ A}/\mu\text{s}$<br>$V_R = 600 \text{ V}$ , $V_{GE} = -15 \text{ V}$ , $T_{vj} = 25^{\circ}\text{C}$<br>$V_R = 600 \text{ V}$ , $V_{GE} = -15 \text{ V}$ , $T_{vj} = 125^{\circ}\text{C}$ | $I_{RM}$   |      | 14,0<br>15,0 |      | A<br>A                         |
| Sperrverzögerungsladung<br>recovered charge                     | $I_F = 10 \text{ A}$ , $-di_F/dt = 400 \text{ A}/\mu\text{s}$<br>$V_R = 600 \text{ V}$ , $V_{GE} = -15 \text{ V}$ , $T_{vj} = 25^{\circ}\text{C}$<br>$V_R = 600 \text{ V}$ , $V_{GE} = -15 \text{ V}$ , $T_{vj} = 125^{\circ}\text{C}$ | $Q_r$      |      | 1,00<br>1,80 |      | $\mu\text{C}$<br>$\mu\text{C}$ |
| Abschaltenergie pro Puls<br>reverse recovery energy             | $I_F = 10 \text{ A}$ , $-di_F/dt = 400 \text{ A}/\mu\text{s}$<br>$V_R = 600 \text{ V}$ , $V_{GE} = -15 \text{ V}$ , $T_{vj} = 25^{\circ}\text{C}$<br>$V_R = 600 \text{ V}$ , $V_{GE} = -15 \text{ V}$ , $T_{vj} = 125^{\circ}\text{C}$ | $E_{rec}$  |      | 0,26<br>0,56 |      | mJ<br>mJ                       |
| Innerer Wärmewiderstand<br>thermal resistance, junction to case | pro Diode<br>per diode                                                                                                                                                                                                                 | $R_{thJC}$ |      |              | 2,30 | K/W                            |

**NTC-Widerstand / NTC-thermistor****Charakteristische Werte / characteristic values**

|                                                    |                                                             |              | min. | typ. | max. |            |
|----------------------------------------------------|-------------------------------------------------------------|--------------|------|------|------|------------|
| Nennwiderstand<br>rated resistance                 | $T_C = 25^{\circ}\text{C}$                                  | $R_{25}$     |      | 5,00 |      | k $\Omega$ |
| Abweichung von $R_{100}$<br>deviation of $R_{100}$ | $T_C = 100^{\circ}\text{C}$ , $R_{100} = 493 \Omega$        | $\Delta R/R$ | -5   |      | 5    | %          |
| Verlustleistung<br>power dissipation               | $T_C = 25^{\circ}\text{C}$                                  | $P_{25}$     |      |      | 20,0 | mW         |
| B-Wert<br>B-value                                  | $R_2 = R_{25} \exp [B_{25/50}(1/T_2 - 1/(298,15\text{K}))]$ | $B_{25/50}$  |      | 3375 |      | K          |

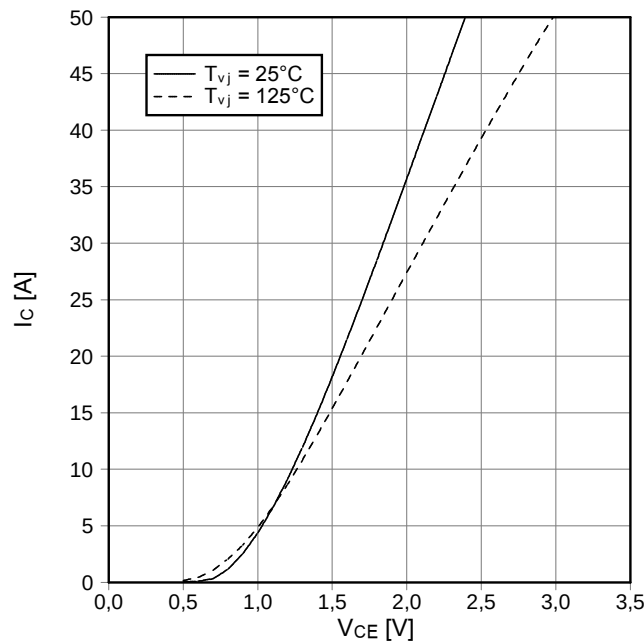
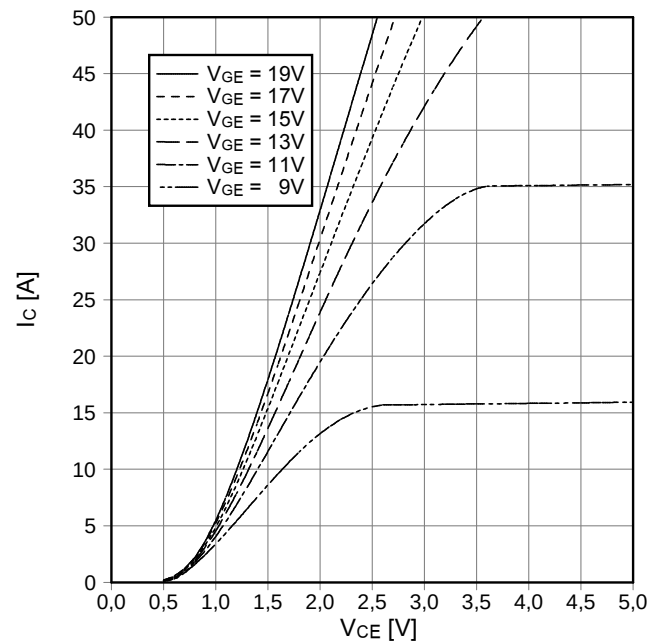
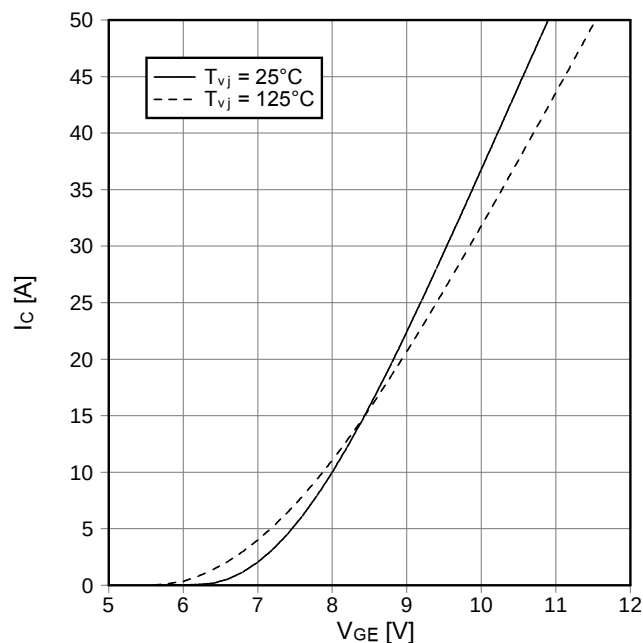
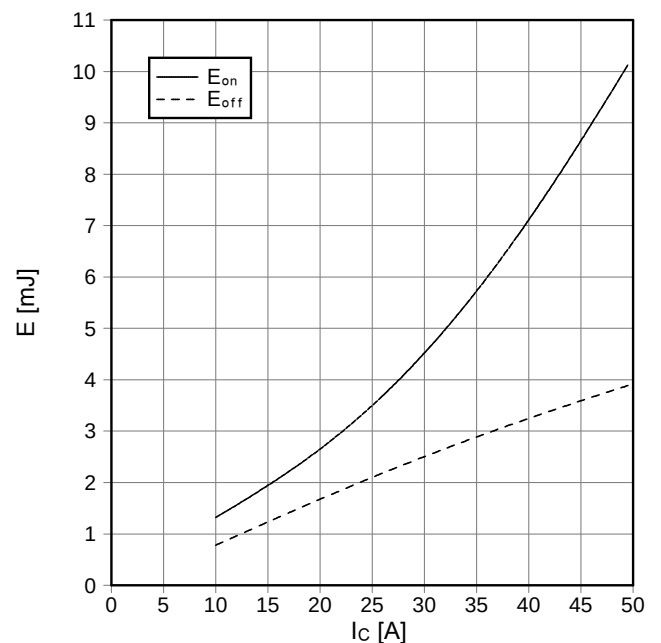
**Vorläufige Daten**  
**preliminary data****Modul / module**

|                                                                                              |                                                                                                                                            |                                              |                                |               |
|----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------------------|---------------|
| Isolations-Prüfspannung<br>insulation test voltage                                           | RMS, f = 50 Hz, t = 1 min.                                                                                                                 | V <sub>ISOL</sub>                            | 2,5                            | kV            |
| Material Modulgrundplatte<br>material of module baseplate                                    |                                                                                                                                            |                                              | Cu                             |               |
| Material für innere Isolation<br>material for internal insulation                            |                                                                                                                                            |                                              | Al <sub>2</sub> O <sub>3</sub> |               |
| Kriechstrecke<br>creepage distance                                                           | Kontakt - Kühlkörper / terminal to heatsink<br>Kontakt - Kontakt / terminal to terminal                                                    |                                              | 10,0                           | mm            |
| Luftstrecke<br>clearance distance                                                            | Kontakt - Kühlkörper / terminal to heatsink<br>Kontakt - Kontakt / terminal to terminal                                                    |                                              | 7,50                           | mm            |
| Vergleichszahl der Kriechwegbildung<br>comparative tracking index                            |                                                                                                                                            | CTI                                          | > 225                          |               |
|                                                                                              |                                                                                                                                            |                                              |                                |               |
| Übergangs-Wärmewiderstand<br>thermal resistance, case to heatsink                            | pro Modul / per module<br>$\lambda_{\text{Paste}} = 1 \text{ W/(m}\cdot\text{K)} / \lambda_{\text{grease}} = 1 \text{ W/(m}\cdot\text{K)}$ | R <sub>thCH</sub>                            | min. 0,02                      | typ. max. K/W |
| Modulinduktivität<br>stray inductance module                                                 |                                                                                                                                            | L <sub>sCE</sub>                             | 60                             | nH            |
| Modulleitungswiderstand,<br>Anschlüsse - Chip<br>module lead resistance,<br>terminals - chip | T <sub>C</sub> = 25°C, pro Schalter / per switch                                                                                           | R <sub>CC'+EE'</sub><br>R <sub>AA'+CC'</sub> | 4,00<br>3,00                   | mΩ            |
| Höchstzulässige Sperrschichttemperatur<br>maximum junction temperature                       |                                                                                                                                            | T <sub>vj max</sub>                          |                                | 150 °C        |
| Temperatur im Schaltbetrieb<br>temperature under switching conditions                        |                                                                                                                                            | T <sub>vj op</sub>                           | -40                            | 125 °C        |
| Lagertemperatur<br>storage temperature                                                       |                                                                                                                                            | T <sub>stg</sub>                             | -40                            | 125 °C        |
| Anzugsdrehmoment f. mech. Befestigung<br>mounting torque                                     | Schraube / screw M5                                                                                                                        | M                                            | 3,00                           | - 6,00 Nm     |
| Gewicht<br>weight                                                                            |                                                                                                                                            | G                                            | 180                            | g             |

**Mit dieser technischen Information werden Halbleiterbauelemente spezifiziert, jedoch keine Eigenschaften zugesichert. Sie gilt in Verbindung mit den zugehörigen technischen Erläuterungen.**

**This technical information specifies semiconductor devices but guarantees no characteristics. It is valid with the appropriate technical explanations.**

|                             |                               |
|-----------------------------|-------------------------------|
| prepared by: Andreas Schulz | date of publication: 2003-7-8 |
| approved by: Robert Severin | revision: 2.0                 |

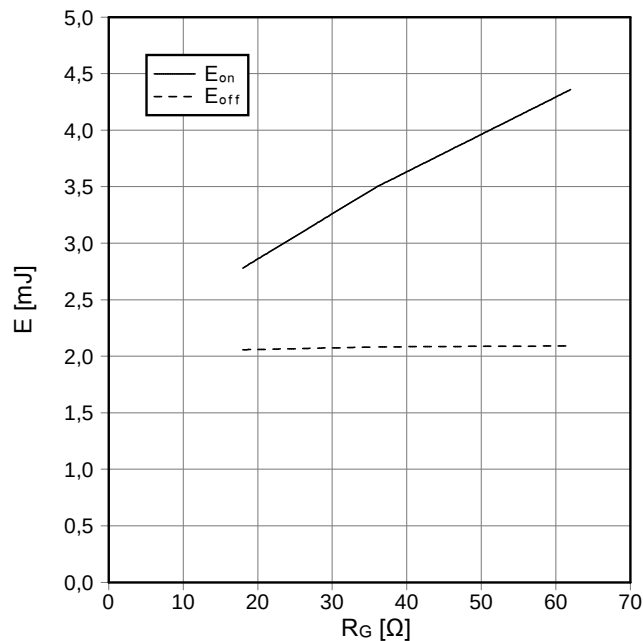
**Vorläufige Daten**  
**preliminary data**
**Ausgangskennlinie IGBT-Wechselr. (typisch)**  
**output characteristic IGBT-inverter (typical)**
 $I_C = f(V_{CE})$   
 $V_{GE} = 15 \text{ V}$ 

**Ausgangskennlinienfeld IGBT-Wechselr. (typisch)**  
**output characteristic IGBT-inverter (typical)**
 $I_C = f(V_{CE})$   
 $T_{vj} = 125^\circ\text{C}$ 

**Übertragungscharakteristik IGBT-Wechselr. (typisch)**  
**transfer characteristic IGBT-inverter (typical)**
 $I_C = f(V_{GE})$   
 $V_{CE} = 20 \text{ V}$ 

**Schaltverluste IGBT-Wechselr. (typisch)**  
**switching losses IGBT-inverter (typical)**
 $E_{on} = f(I_C)$ ,  $E_{off} = f(I_C)$   
 $V_{GE} = \pm 15 \text{ V}$ ,  $R_{Gon} = 36 \Omega$ ,  $R_{Goff} = 36 \Omega$ ,  $V_{CE} = 600 \text{ V}$ ,  
 $T_{vj} = 125^\circ\text{C}$ 


# Vorläufige Daten preliminary data

Schaltverluste IGBT-Wechselr. (typisch)  
switching losses IGBT-Inverter (typical)

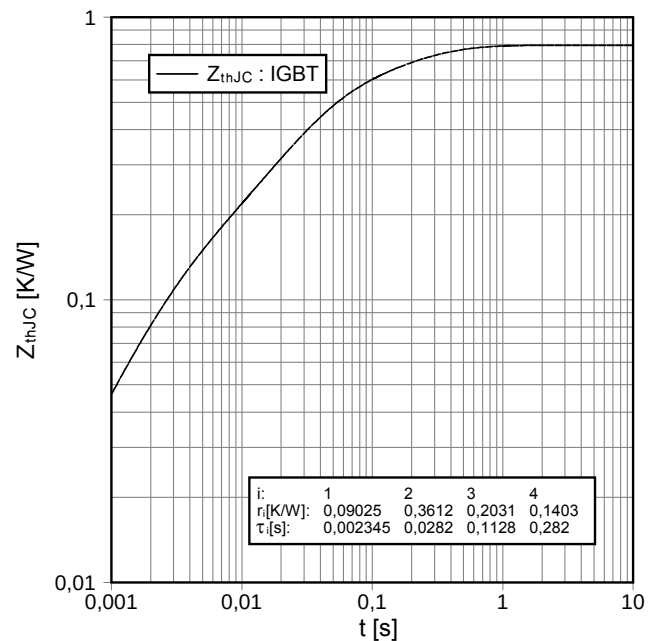
$E_{on} = f(R_G)$ ,  $E_{off} = f(R_G)$

$V_{GE} = \pm 15 \text{ V}$ ,  $I_C = 25 \text{ A}$ ,  $V_{CE} = 600 \text{ V}$ ,  $T_{vj} = 125^\circ\text{C}$



Transienter Wärmewiderstand IGBT-Wechselr.  
transient thermal impedance IGBT-inverter

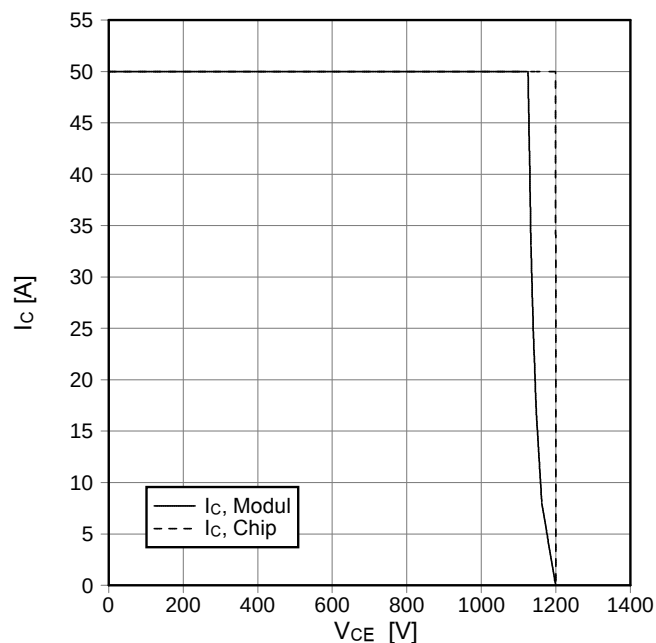
$Z_{thJC} = f(t)$



Sicherer Rückwärts-Arbeitsbereich IGBT-Wr. (RBSOA)  
reverse bias safe operating area IGBT-inv. (RBSOA)

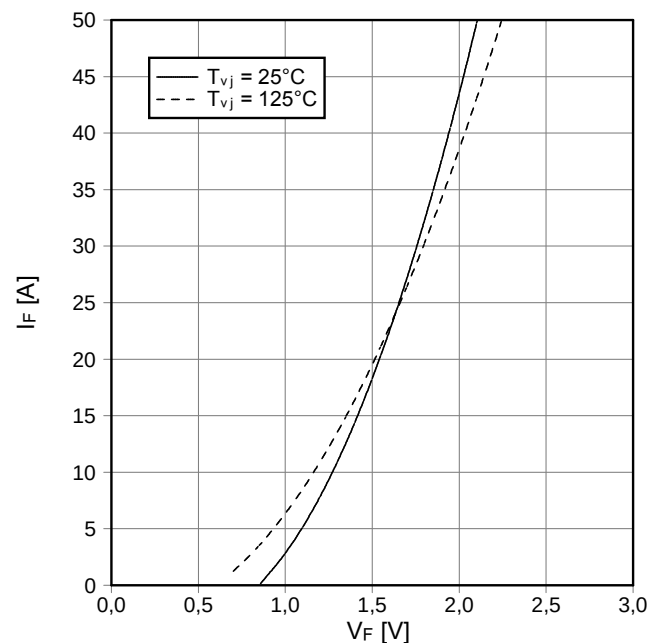
$I_C = f(V_{CE})$

$V_{GE} = \pm 15 \text{ V}$ ,  $R_{Goff} = 36 \Omega$ ,  $T_{vj} = 125^\circ\text{C}$



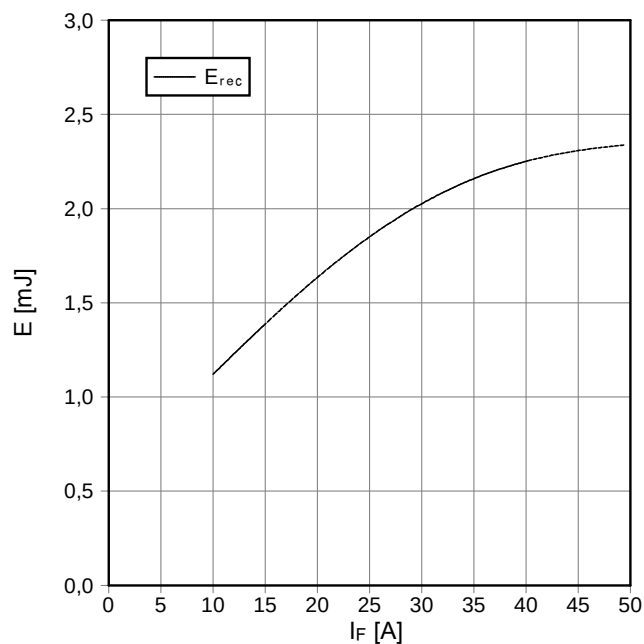
Durchlaßkennlinie der Diode-Wechselr. (typisch)  
forward characteristic of diode-inverter (typical)

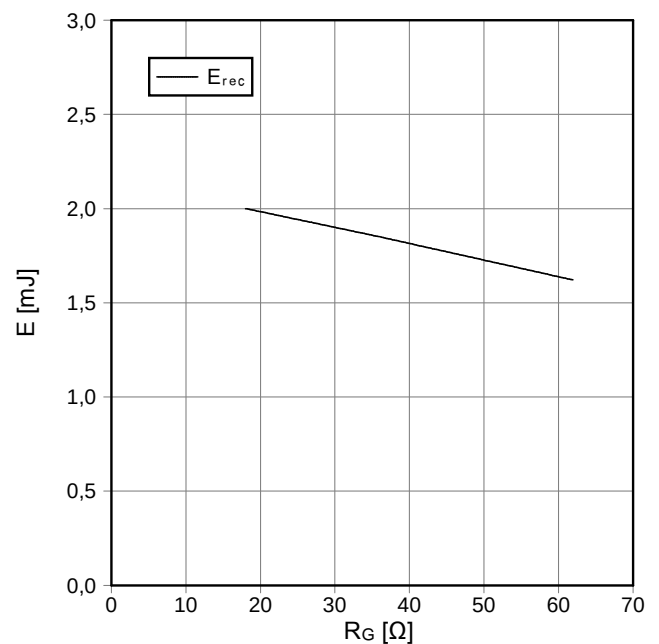
$I_F = f(V_F)$

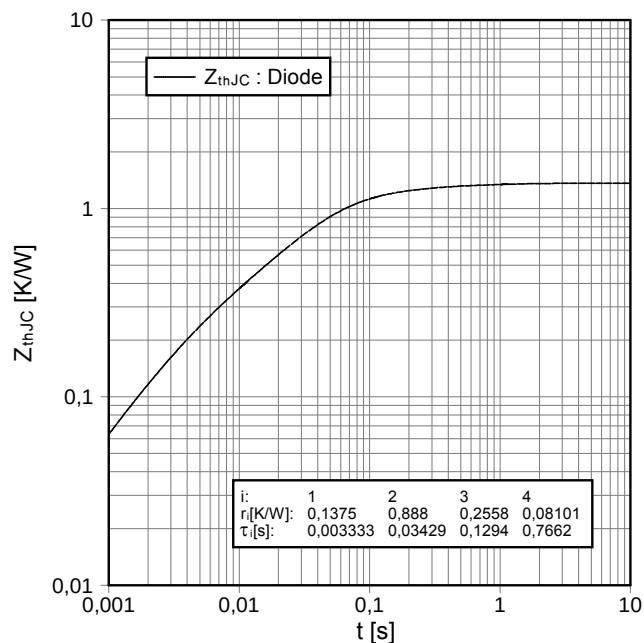


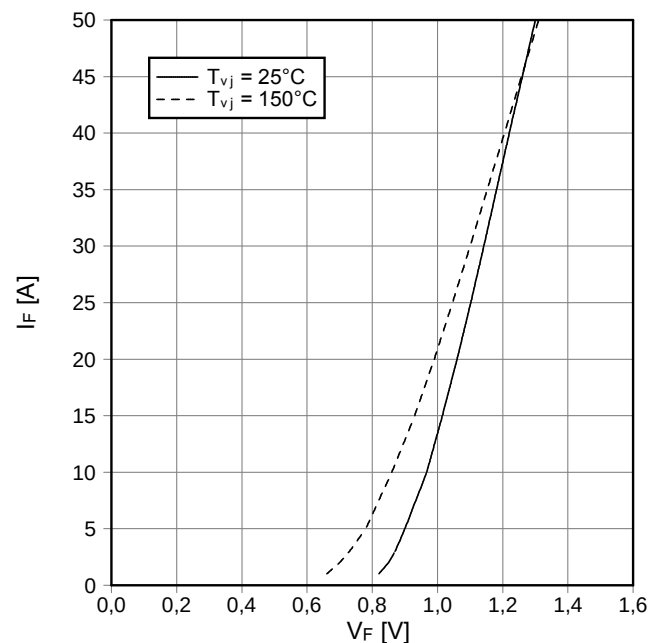
Vorläufige Daten  
preliminary data

Schaltverluste Diode-Wechselr. (typisch)  
switching losses diode-inverter (typical)

 $E_{rec} = f(I_F)$   
 $R_{Gon} = 36 \Omega$ ,  $V_{CE} = 600 \text{ V}$ ,  $T_{vj} = 125^\circ\text{C}$ 

Schaltverluste Diode-Wechselr. (typisch)  
switching losses diode-inverter (typical)

 $E_{rec} = f(R_G)$   
 $I_F = 25 \text{ A}$ ,  $V_{CE} = 600 \text{ V}$ ,  $T_{vj} = 125^\circ\text{C}$ 

Transienter Wärmewiderstand Diode-Wechselr.  
transient thermal impedance diode-inverter

 $Z_{thJC} = f(t)$ 

Durchlaßkennlinie der Diode-Gleichrichter (typisch)  
forward characteristic of diode-rectifier (typical)

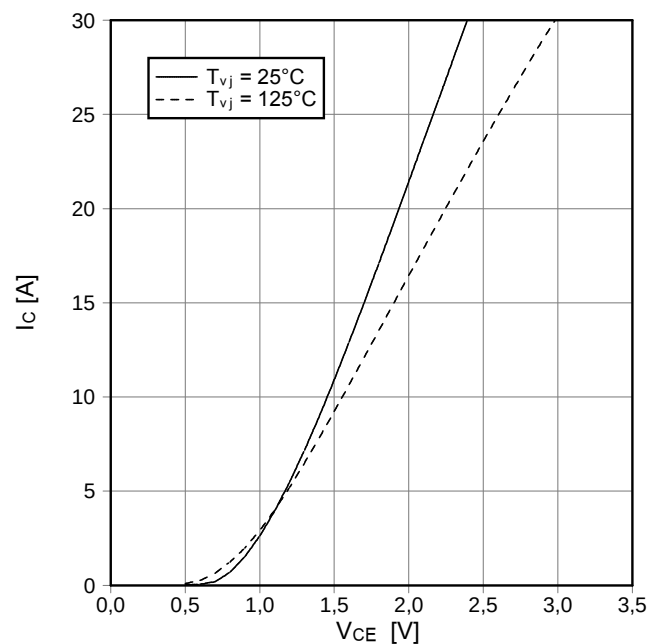
 $I_F = f(V_F)$ 




**Vorläufige Daten  
preliminary data**

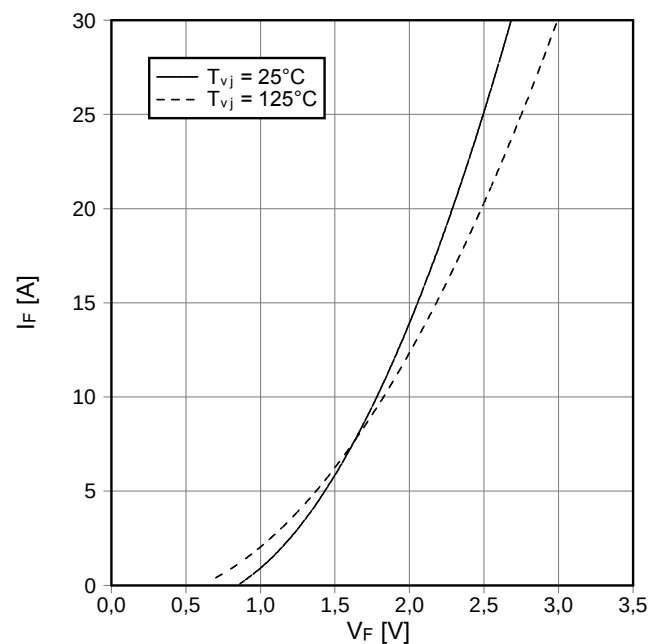
**Ausgangskennlinie IGBT-Brems-Chopper (typisch)**  
**output characteristic IGBT-brake-chopper (typical)**

$I_C = f(V_{CE})$   
 $V_{GE} = 15\text{ V}$



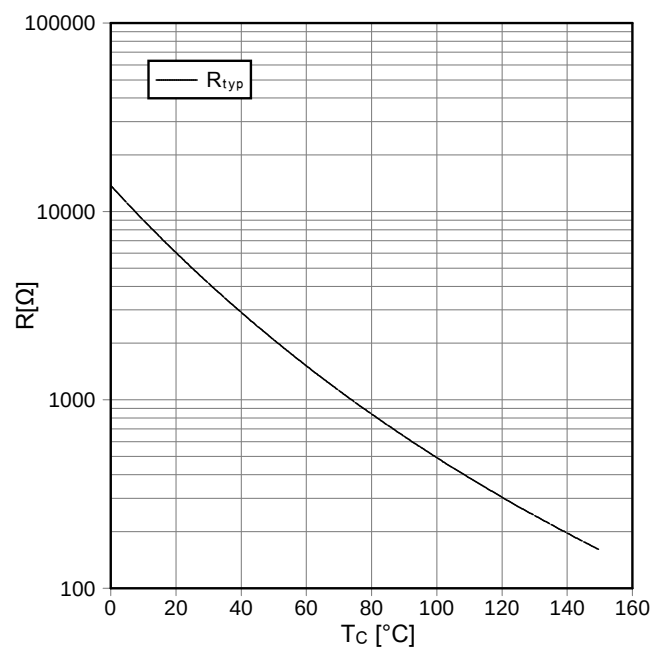
**Durchlaßkennlinie der Diode-Brems-Chopper (typisch)**  
**forward characteristic of diode-brake-chopper (typical)**

$I_F = f(V_F)$



**NTC-Temperaturkennlinie (typisch)**  
**NTC-temperature characteristic (typical)**

$R = f(T)$



prepared by: Andreas Schulz

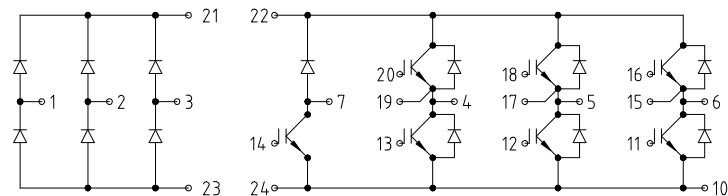
date of publication: 2003-7-8

approved by: Robert Severin

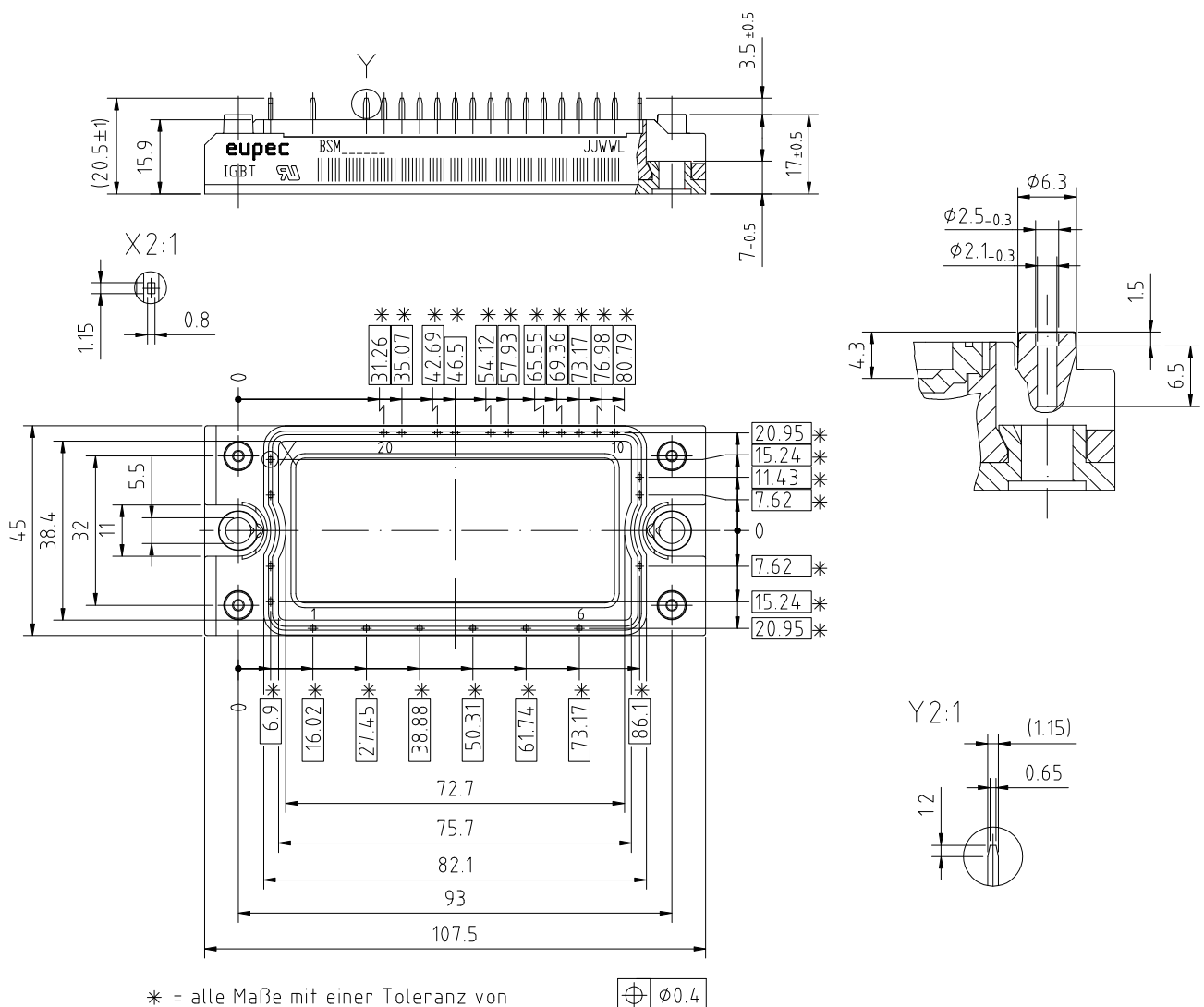
revision: 2.0

**Vorläufige Daten**  
**preliminary data**

## Schaltplan / circuit diagram



## Gehäuseabmessungen / package outlines



|                             |                               |
|-----------------------------|-------------------------------|
| prepared by: Andreas Schulz | date of publication: 2003-7-8 |
| approved by: Robert Severin | revision: 2.0                 |

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