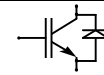


Technische Information / Technical Information

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Vorläufige Daten
Preliminary data

Elektrische Eigenschaften / Electrical properties

Höchstzulässige Werte / Maximum rated values

Diode Gleichrichter/ Diode Rectifier

| | | | | |
|---|--|--------------|------|----------------------|
| Periodische Rückw. Spitzensperrspannung repetitive peak reverse voltage | | V_{RRM} | 1600 | V |
| Gleichrichter Ausgang Grenzeffektivstrom maximum RMS current at Rectifier output | | I_{RMSmax} | 60 | A |
| Dauergleichstrom DC forward current | $T_C = 80^\circ\text{C}$ | I_d | 25 | A |
| Stoßstrom Grenzwert surge forward current | $t_p = 10\text{ ms}, T_{vj} = 25^\circ\text{C}$ | I_{FSM} | 315 | A |
| | $t_p = 10\text{ ms}, T_{vj} = 150^\circ\text{C}$ | | 260 | A |
| Grenzlastintegral I^2t - value | $t_p = 10\text{ ms}, T_{vj} = 25^\circ\text{C}$ | I^2t | 500 | A^2s |
| | $t_p = 10\text{ ms}, T_{vj} = 150^\circ\text{C}$ | | 340 | A^2s |

Transistor Wechselrichter/ Transistor Inverter

| | | | | |
|--|---|-----------------------|---------|---|
| Kollektor-Emitter-Sperrspannung collector-emitter voltage | | V_{CES} | 1200 | V |
| Kollektor-Dauergleichstrom DC-collector current | $T_C = 80^\circ\text{C}$ | $I_{C,nom.}$ I_C | 25 | A |
| | $T_C = 25^\circ\text{C}$ | | 40 | A |
| Periodischer Kollektor Spitzenstrom repetitive peak collector current | $t_p = 1\text{ ms}, T_C = 80^\circ\text{C}$ | I_{CRM} | 50 | A |
| Gesamt-Verlustleistung total power dissipation | $T_C = 25^\circ\text{C}$ | P_{tot} | 150 | W |
| Gate-Emitter-Spitzenspannung gate-emitter peak voltage | | V_{GES} | +/- 20V | V |

Diode Wechselrichter/ Diode Inverter

| | | | | |
|--|--|-----------|-----|----------------------|
| Dauergleichstrom DC forward current | $T_C = 80^\circ\text{C}$ | I_F | 25 | A |
| Periodischer Spitzenstrom repetitive peak forw. current | $t_p = 1\text{ ms}$ | I_{FRM} | 50 | A |
| Grenzlastintegral I^2t - value | $V_R = 0\text{V}, t_p = 10\text{ms}, T_{vj} = 125^\circ\text{C}$ | I^2t | 170 | A^2s |

Transistor Brems-Chopper/ Transistor Brake-Chopper

| | | | | |
|--|---|-----------------------|---------|---|
| Kollektor-Emitter-Sperrspannung collector-emitter voltage | | V_{CES} | 1200 | V |
| Kollektor-Dauergleichstrom DC-collector current | $T_C = 80^\circ\text{C}$ | $I_{C,nom.}$ I_C | 15 | A |
| | $T_C = 25^\circ\text{C}$ | | 25 | A |
| Periodischer Kollektor Spitzenstrom repetitive peak collector current | $t_p = 1\text{ ms}, T_C = 80^\circ\text{C}$ | I_{CRM} | 30 | A |
| Gesamt-Verlustleistung total power dissipation | $T_C = 25^\circ\text{C}$ | P_{tot} | 100 | W |
| Gate-Emitter-Spitzenspannung gate-emitter peak voltage | | V_{GES} | +/- 20V | V |

Diode Brems-Chopper/ Diode Brake-Chopper

| | | | | |
|--|--------------------------|-----------|----|---|
| Dauergleichstrom DC forward current | $T_C = 80^\circ\text{C}$ | I_F | 10 | A |
| Periodischer Spitzenstrom repetitive peak forw. current | $t_p = 1\text{ ms}$ | I_{FRM} | 20 | A |

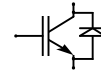
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|-----------------------------|--------------------------------|
| prepared by: Andreas Schulz | date of publication:06.03.2001 |
| approved by: Hornkamp | revision: 1 |

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Modul Isolation/ Module Isolation

| | | | | |
|--|--|------------|-----|----|
| Isolations-Prüfspannung insulation test voltage | RMS, f = 50 Hz, t = 1 min. NTC connected to Baseplate | V_{ISOL} | 2,5 | kV |
|--|--|------------|-----|----|

Elektrische Eigenschaften / Electrical properties

Charakteristische Werte / Characteristic values

Diode Gleichrichter/ Diode Rectifier

| | | | min. | typ. | max. | |
|--|---|-------------|------|------|------|------------|
| Durchlaßspannung forward voltage | $T_{vj} = 150^{\circ}\text{C}$, $I_F = 25\text{ A}$ | V_F | - | 1,05 | - | V |
| Schleusenspannung threshold voltage | $T_{vj} = 150^{\circ}\text{C}$ | $V_{(TO)}$ | - | - | 0,8 | V |
| Ersatzwiderstand slope resistance | $T_{vj} = 150^{\circ}\text{C}$ | r_T | - | - | 10,5 | m Ω |
| Sperrstrom reverse current | $T_{vj} = 150^{\circ}\text{C}$, $V_R = 1600\text{ V}$ | I_R | - | 2 | - | mA |
| Modul Leitungswiderstand, Anschlüsse-Chip lead resistance, terminals-chip | $T_C = 25^{\circ}\text{C}$ | R_{AA+CC} | - | 5 | - | m Ω |

Transistor Wechselrichter/ Transistor Inverter

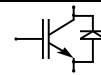
| | | | min. | typ. | max. | |
|--|---|---------------------|------|------------|----------|----------|
| Kollektor-Emitter Sättigungsspannung collector-emitter saturation voltage | $V_{GE} = 15\text{V}$, $T_{vj} = 25^{\circ}\text{C}$, $I_C = 25\text{ A}$ $V_{GE} = 15\text{V}$, $T_{vj} = 125^{\circ}\text{C}$, $I_C = 25\text{ A}$ | $V_{CE\text{ sat}}$ | - | 1,7 2 | 2,2 - | V V |
| Gate-Schwellenspannung gate threshold voltage | $V_{CE} = V_{GE}$, $T_{vj} = 25^{\circ}\text{C}$, $I_C = 1,0\text{ mA}$ | $V_{GE(TO)}$ | 5,0 | 5,8 | 6,5 | V |
| Eingangskapazität input capacitance | f = 1MHz, $T_{vj} = 25^{\circ}\text{C}$ $V_{CE} = 25\text{ V}$, $V_{GE} = 0\text{ V}$ | C_{ies} | - | 1,8 | - | nF |
| Kollektor-Emitter Reststrom collector-emitter cut off current | $V_{GE} = 0\text{V}$, $T_{vj} = 25^{\circ}\text{C}$, $V_{CE} = 1200\text{ V}$ | I_{CES} | - | - | 5 | mA |
| Gate-Emitter Reststrom 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) turn on delay time (inductive load) | $I_C = I_{Nenn}$, $V_{CC} = 600\text{ V}$ $V_{GE} = \pm 15\text{V}$, $T_{vj} = 25^{\circ}\text{C}$, $R_G = 36\text{ Ohm}$ $V_{GE} = \pm 15\text{V}$, $T_{vj} = 125^{\circ}\text{C}$, $R_G = 36\text{ Ohm}$ | $t_{d,on}$ | - | 85 90 | - - | ns ns |
| Anstiegszeit (induktive Last) rise time (inductive load) | $I_C = I_{Nenn}$, $V_{CC} = 600\text{ V}$ $V_{GE} = \pm 15\text{V}$, $T_{vj} = 25^{\circ}\text{C}$, $R_G = 36\text{ Ohm}$ $V_{GE} = \pm 15\text{V}$, $T_{vj} = 125^{\circ}\text{C}$, $R_G = 36\text{ Ohm}$ | t_r | - | 30 45 | - - | ns ns |
| Abschaltverzögerungszeit (ind. Last) turn off delay time (inductive load) | $I_C = I_{Nenn}$, $V_{CC} = 600\text{ V}$ $V_{GE} = \pm 15\text{V}$, $T_{vj} = 25^{\circ}\text{C}$, $R_G = 36\text{ Ohm}$ $V_{GE} = \pm 15\text{V}$, $T_{vj} = 125^{\circ}\text{C}$, $R_G = 36\text{ Ohm}$ | $t_{d,off}$ | - | 420 520 | - - | ns ns |
| Fallzeit (induktive Last) fall time (inductive load) | $I_C = I_{Nenn}$, $V_{CC} = 600\text{ V}$ $V_{GE} = \pm 15\text{V}$, $T_{vj} = 25^{\circ}\text{C}$, $R_G = 36\text{ Ohm}$ $V_{GE} = \pm 15\text{V}$, $T_{vj} = 125^{\circ}\text{C}$, $R_G = 36\text{ Ohm}$ | t_f | - | 65 90 | - - | ns ns |
| Einschaltverlustenergie pro Puls turn-on energy loss per pulse | $I_C = I_{Nenn}$, $V_{CC} = 600\text{ V}$ $V_{GE} = \pm 15\text{V}$, $T_{vj} = 125^{\circ}\text{C}$, $R_G = 36\text{ Ohm}$ $L_S = 45\text{ nH}$ | E_{on} | - | 3,5 | - | mWs |
| Abschaltverlustenergie pro Puls turn-off energy loss per pulse | $I_C = I_{Nenn}$, $V_{CC} = 600\text{ V}$ $V_{GE} = \pm 15\text{V}$, $T_{vj} = 125^{\circ}\text{C}$, $R_G = 36\text{ Ohm}$ $L_S = 45\text{ nH}$ | E_{off} | - | 2,5 | - | mWs |
| Kurzschlußverhalten SC Data | $t_P \leq 10\mu\text{s}$, $V_{GE} \leq 15\text{V}$, $R_G = 36\text{ Ohm}$ $T_{vj} \leq 125^{\circ}\text{C}$, $V_{CC} = 720\text{ V}$ | I_{SC} | - | 100 | - | A |

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Elektrische Eigenschaften / Electrical properties

Charakteristische Werte / Characteristic values

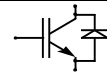
| | | min. | typ. | max. | | |
|--|---|---------------------|-------------|-------------|-----|----------------|
| Modulinduktivität stray inductance module | | L_{GCE} | - | - | 100 | nH |
| Modul Leitungswiderstand, Anschlüsse-Chip lead resistance, terminals-chip | $T_C = 25^\circ\text{C}$ | R_{CC+EE} | - | 7 | - | m Ω |
| Diode Wechselrichter/ Diode Inverter | | min. | typ. | max. | | |
| Durchlaßspannung forward voltage | $V_{GE} = 0\text{V}, T_{vj} = 25^\circ\text{C}, I_F = 25\text{A}$ $V_{GE} = 0\text{V}, T_{vj} = 125^\circ\text{C}, I_F = 25\text{A}$ | V_F | - | 1,65 | 2,2 | V |
| Rückstromspitze peak reverse recovery current | $I_F = I_{Nenn}, -di_F/dt = 700\text{A}/\mu\text{s}$ $V_{GE} = -10\text{V}, T_{vj} = 25^\circ\text{C}, V_R = 600\text{V}$ $V_{GE} = -10\text{V}, T_{vj} = 125^\circ\text{C}, V_R = 600\text{V}$ | I_{RM} | - | 26 | - | A |
| Sperrverzögerungsladung recovered charge | $I_F = I_{Nenn}, -di_F/dt = 700\text{A}/\mu\text{s}$ $V_{GE} = -10\text{V}, T_{vj} = 25^\circ\text{C}, V_R = 600\text{V}$ $V_{GE} = -10\text{V}, T_{vj} = 125^\circ\text{C}, V_R = 600\text{V}$ | Q_r | - | 2,8 | - | μAs |
| Abschaltenergie pro Puls reverse recovery energy | $I_F = I_{Nenn}, -di_F/dt = 700\text{A}/\mu\text{s}$ $V_{GE} = -10\text{V}, T_{vj} = 25^\circ\text{C}, V_R = 600\text{V}$ $V_{GE} = -10\text{V}, T_{vj} = 125^\circ\text{C}, V_R = 600\text{V}$ | E_{RQ} | - | 0,9 | - | mWs |
| Transistor Brems-Chopper/ Transistor Brake-Chopper | | min. | typ. | max. | | |
| Kollektor-Emitter Sättigungsspannung collector-emitter saturation voltage | $V_{GE} = 15\text{V}, T_{vj} = 25^\circ\text{C}, I_C = 15\text{A}$ $V_{GE} = 15\text{V}, T_{vj} = 125^\circ\text{C}, I_C = 15\text{A}$ | $V_{CE\text{ sat}}$ | - | 1,7 | 2,2 | V |
| Gate-Schwellenspannung gate threshold voltage | $V_{CE} = V_{GE}, T_{vj} = 25^\circ\text{C}, I_C = 0,5\text{mA}$ | $V_{GE(TO)}$ | 5,0 | 5,8 | 6,5 | V |
| Eingangskapazität input capacitance | $f = 1\text{MHz}, T_{vj} = 25^\circ\text{C}$ $V_{CE} = 25\text{V}, V_{GE} = 0\text{V}$ | C_{ies} | - | 1,1 | - | nF |
| Kollektor-Emitter Reststrom collector-emitter cut off current | $V_{GE} = 0\text{V}, T_{vj} = 25^\circ\text{C}, V_{CE} = 1200\text{V}$ | I_{CES} | - | 5,0 | - | mA |
| Gate-Emitter Reststrom gate-emitter leakage current | $V_{CE} = 0\text{V}, V_{GE} = 20\text{V}, T_{vj} = 25^\circ\text{C}$ | I_{GES} | - | - | 400 | nA |
| Schaltverluste und -bedingungen Switching losses and conditions | siehe Wechselrichter in Dbl FP15R12KE3 see inverter in datasheet FP15R12KE3 | | | | | |
| Diode Brems-Chopper/ Diode Brake-Chopper | | min. | typ. | max. | | |
| Durchlaßspannung forward voltage | $T_{vj} = 25^\circ\text{C}, I_F = 15\text{A}$ $T_{vj} = 125^\circ\text{C}, I_F = 15\text{A}$ | V_F | - | 2,05 | 2,5 | V |
| Schaltverluste und -bedingungen Switching losses and conditions | siehe Wechselrichter in Dbl FB10R12KE3 see inverter in datasheet FB10R12KE3 | | | | | |
| NTC-Widerstand/ NTC-Thermistor | | min. | typ. | max. | | |
| Nennwiderstand rated resistance | $T_C = 25^\circ\text{C}$ | R_{25} | - | 5 | - | k Ω |
| Abweichung von R_{100} deviation of R_{100} | $T_C = 100^\circ\text{C}, R_{100} = 493\ \Omega$ | $\Delta R/R$ | -5 | | 5 | % |
| Verlustleistung power dissipation | $T_C = 25^\circ\text{C}$ | P_{25} | | | 20 | mW |
| B-Wert B-value | $R_2 = R_1 \exp [B(1/T_2 - 1/T_1)]$ | $B_{25/50}$ | | 3375 | | K |

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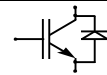
Vorläufige Daten Preliminary data

Thermische Eigenschaften / Thermal properties

| | | | | min. | typ. | max. | |
|--|---|------------|-----|------|------|------|--|
| Innerer Wärmewiderstand thermal resistance, junction to case | Gleichr. Diode/ Rectif. Diode | R_{thJC} | - | - | 1 | K/W | |
| | Trans. Wechr./ Trans. Inverter | | - | - | 0,8 | K/W | |
| | Diode Wechr./ Diode Inverter | | - | - | 1,35 | K/W | |
| | Trans. Bremse/ Trans. Brake | | - | - | 1,2 | K/W | |
| | Diode Bremse/ Diode Brake | | - | - | 2,3 | K/W | |
| Übergangs-Wärmewiderstand thermal resistance, case to heatsink | Gleichr. Diode/ Rectif. Diode $\lambda_{paste}=1W/m^2K$ | R_{thCK} | - | 0,08 | - | K/W | |
| | Trans. Wechr./ Trans. Inverter $\lambda_{grease}=1W/m^2K$ | | - | 0,04 | - | K/W | |
| | Diode Wechr./ Diode Inverter | | - | 0,08 | - | K/W | |
| Höchstzulässige Sperrschichttemperatur maximum junction temperature | | T_{vj} | - | - | 150 | °C | |
| Betriebstemperatur operation temperature | | T_{op} | -40 | - | 125 | °C | |
| Lagertemperatur storage temperature | | T_{stg} | -40 | - | 125 | °C | |

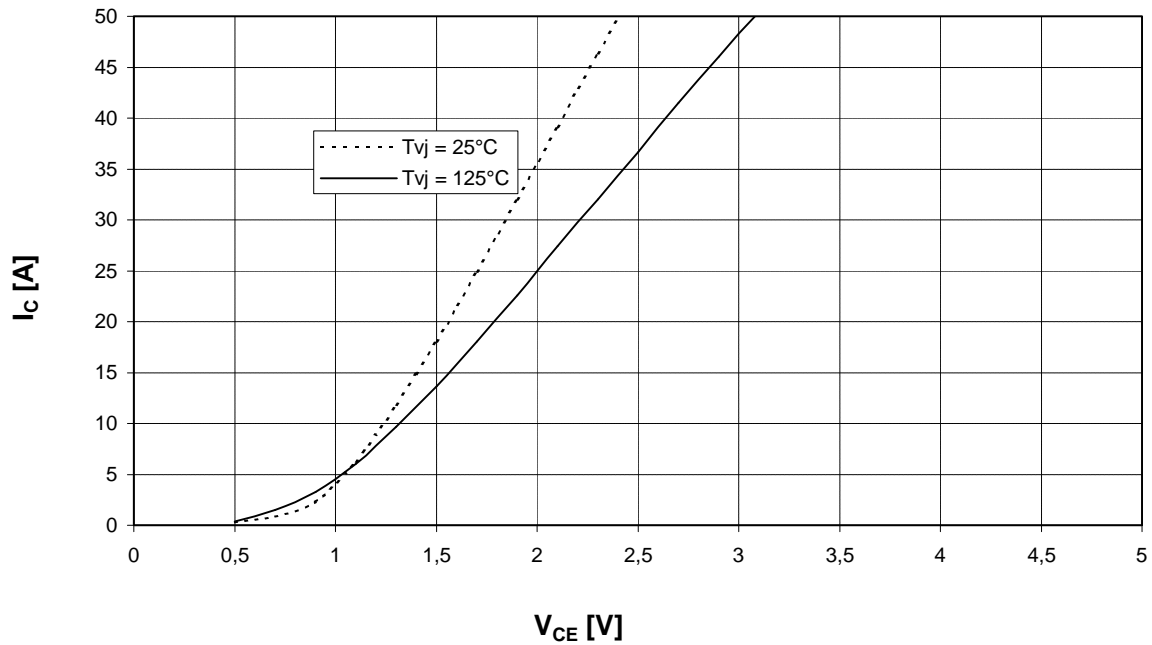
Mechanische Eigenschaften / Mechanical properties

| | | | | | |
|--|--|---|--|-----------------|----|
| Innere Isolation internal insulation | | | | Al_2O_3 | |
| CTI comperative tracking index | | | | 225 | |
| Anzugsdrehmoment f. mech. Befestigung mounting torque | | M | | 3 $\pm 10\%$ | Nm |
| Gewicht weight | | G | | 180 | g |

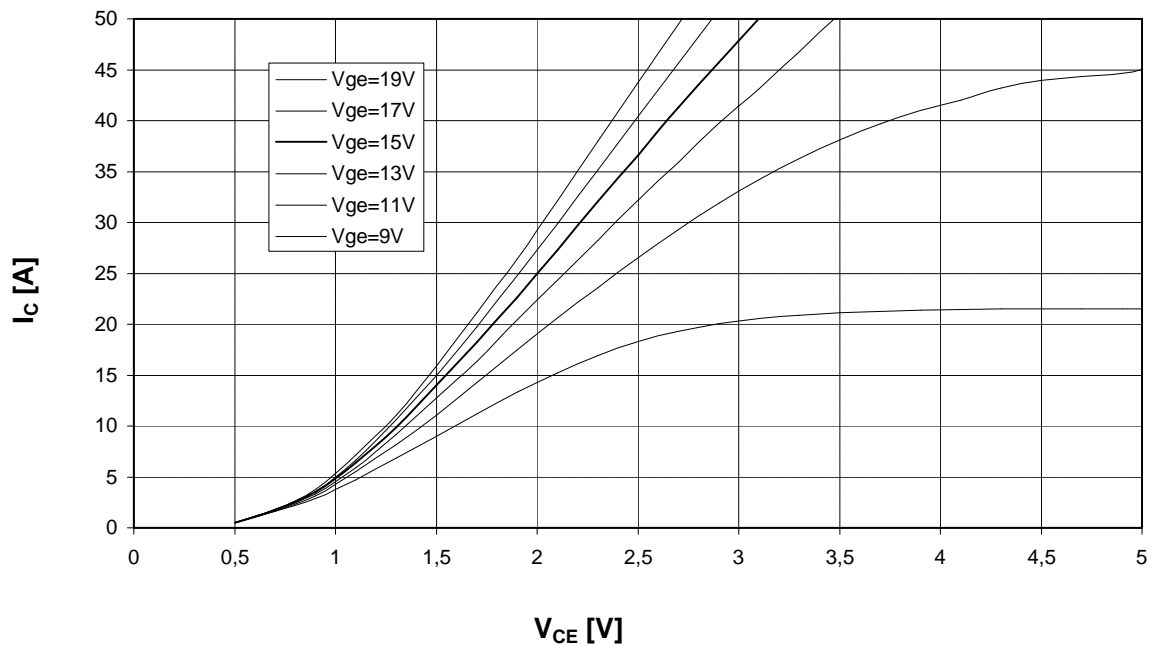


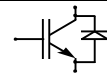
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Ausgangskennlinienfeld Wechselr. (typisch) $I_C = f(V_{CE})$
Output characteristic Inverter (typical) $V_{GE} = 15\text{ V}$



Ausgangskennlinienfeld Wechselr. (typisch) $I_C = f(V_{CE})$
Output characteristic Inverter (typical) $T_{vj} = 125^\circ\text{C}$

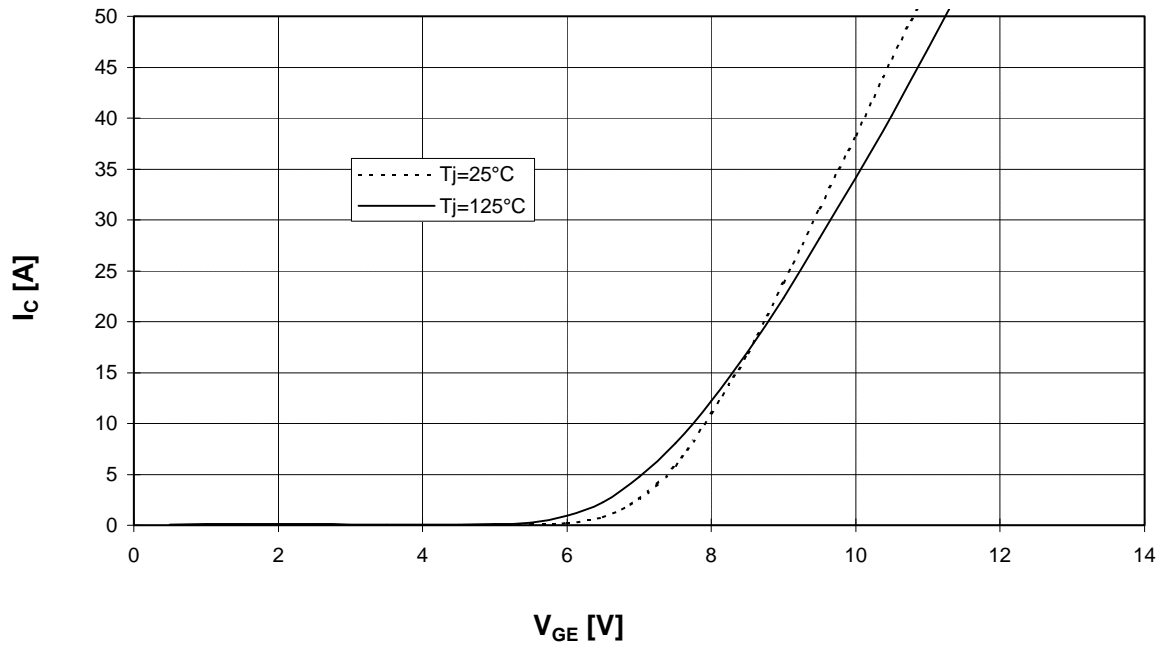




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Preliminary data

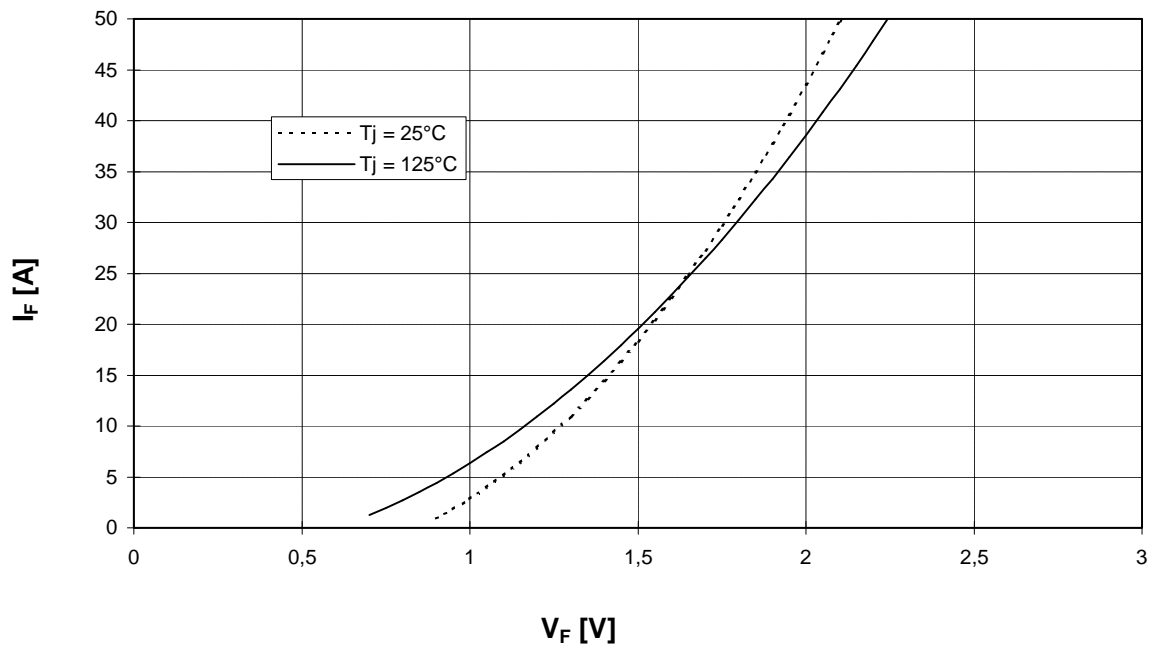
Übertragungscharakteristik Wechselr. (typisch)
Transfer characteristic Inverter (typical)

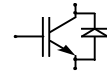
$I_C = f(V_{GE})$
 $V_{CE} = 20\text{ V}$



Durchlaßkennlinie der Freilaufdiode Wechselr. (typisch)
Forward characteristic of FWD Inverter (typical)

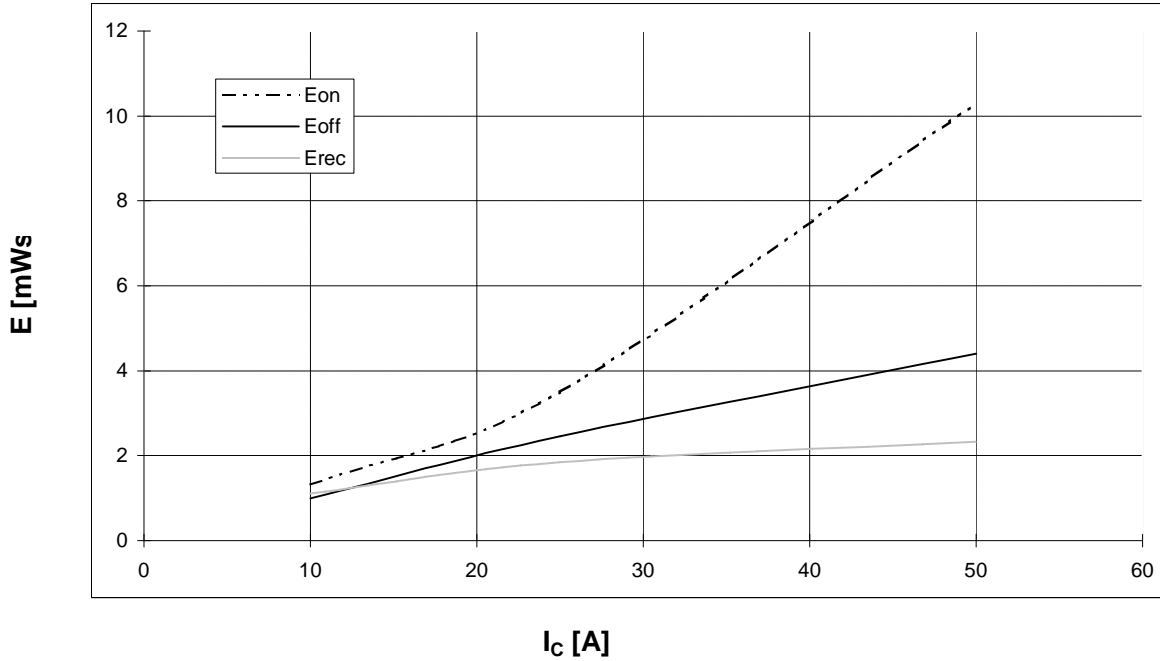
$I_F = f(V_F)$



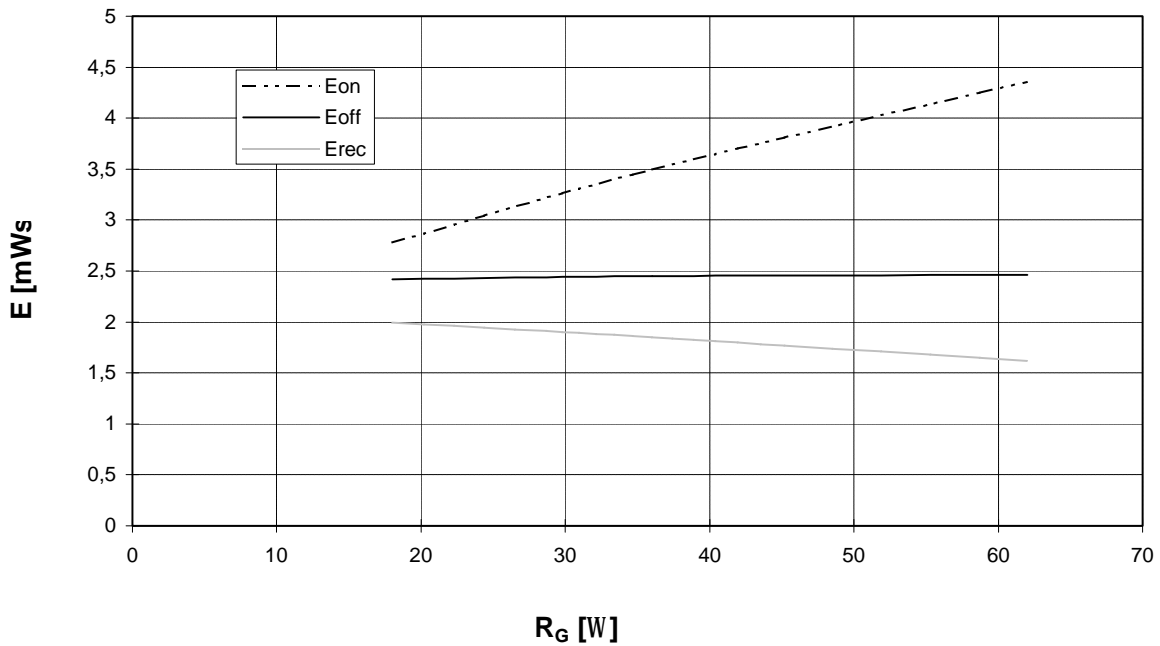


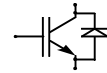
Vorläufige Daten
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Schaltverluste Wechselr. (typisch) $E_{on} = f(I_C)$, $E_{off} = f(I_C)$, $E_{rec} = f(I_C)$ $V_{CC} = 600\text{ V}$
 Switching losses Inverter (typical) $T_j = 125^\circ\text{C}$, $V_{GE} = \pm 15\text{ V}$, $R_{Gon} = R_{Goff} = 36\text{ Ohm}$



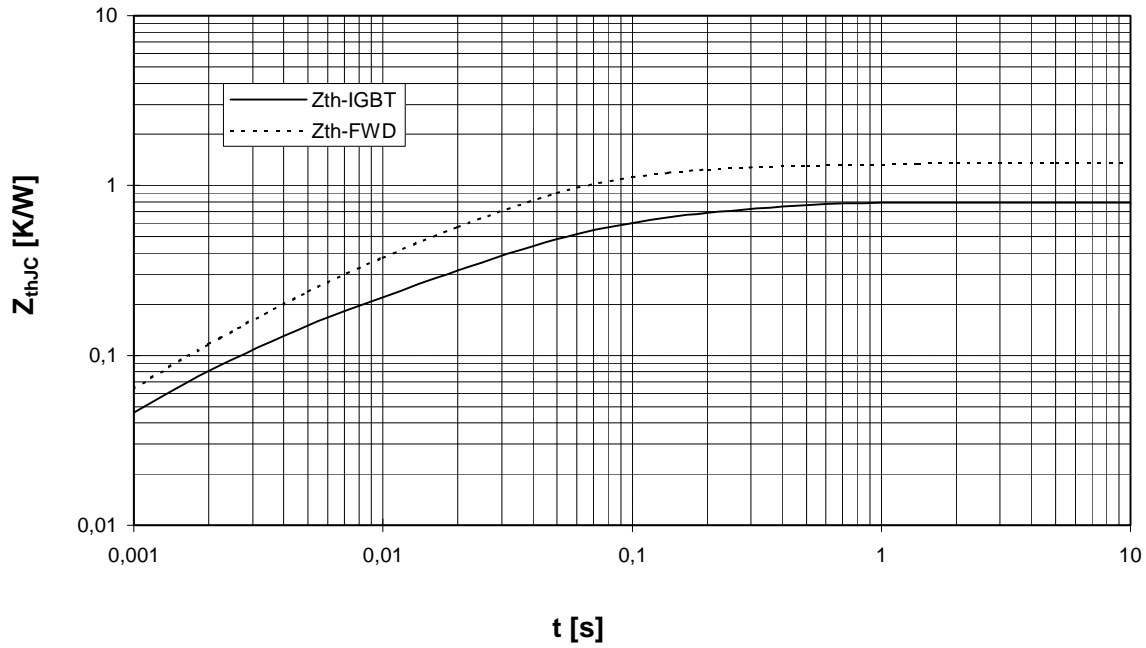
Schaltverluste Wechselr. (typisch) $E_{on} = f(R_G)$, $E_{off} = f(R_G)$, $E_{rec} = f(R_G)$
 Switching losses Inverter (typical) $T_j = 125^\circ\text{C}$, $V_{GE} = \pm 15\text{ V}$, $I_C = I_{nenn}$, $V_{CC} = 600\text{ V}$



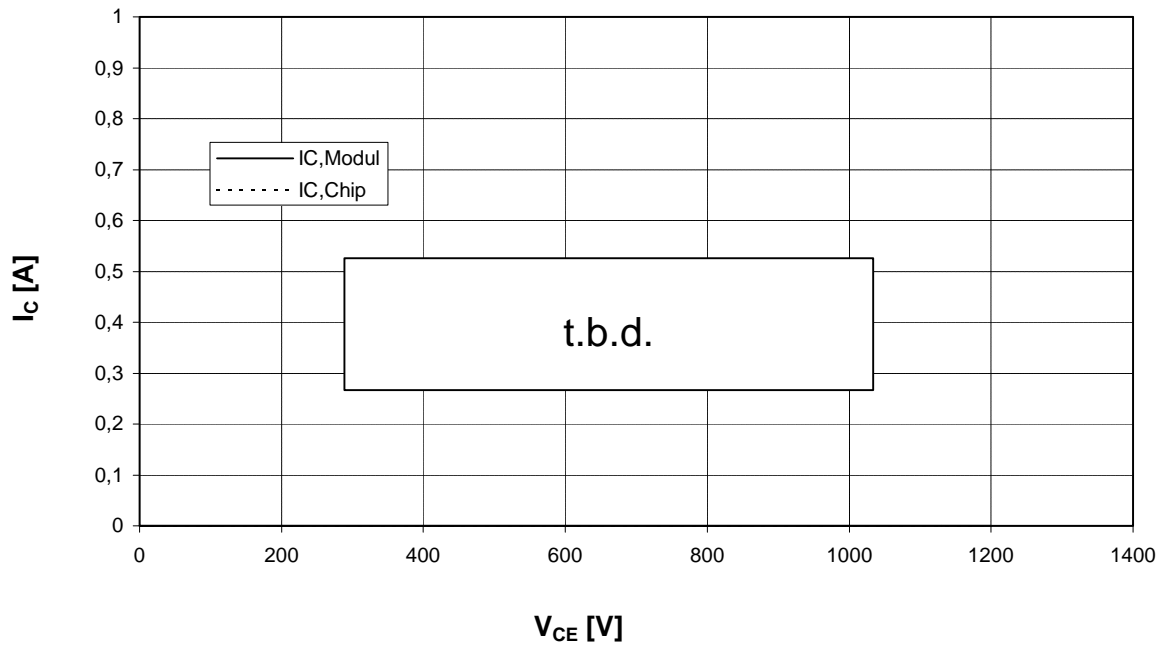


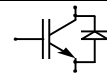
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Transienter Wärmewiderstand Wechslr. $Z_{thJC} = f(t)$
Transient thermal impedance Inverter



Sicherer Arbeitsbereich Wechslr. (RBSOA) $I_C = f(V_{CE})$
Reverse bias safe operating area Inverter (RBSOA) $T_{vi} = 125^\circ\text{C}, V_{GE} = \pm 15\text{V}, R_G = 36 \text{ Ohm}$

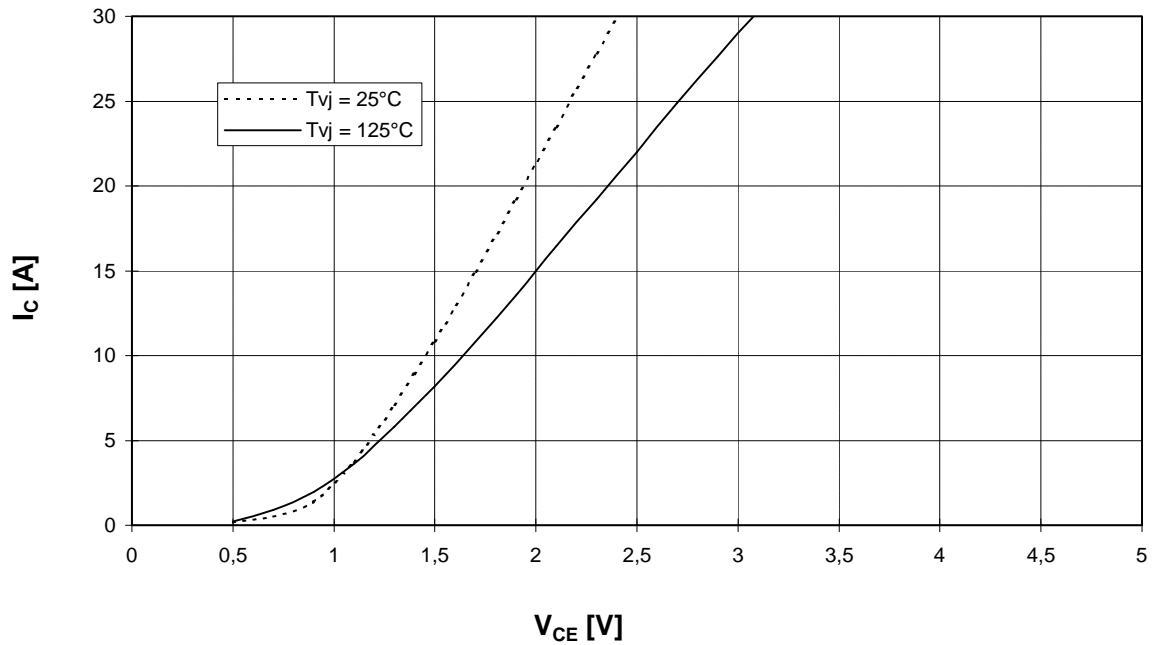




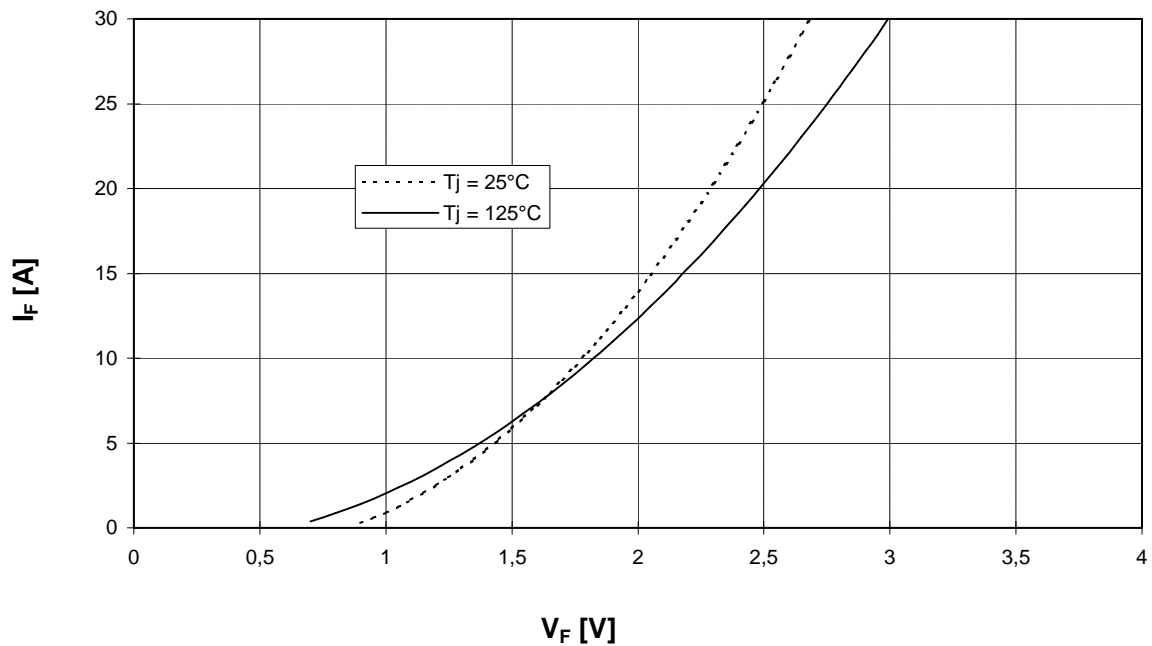
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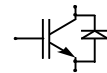
Ausgangskennlinienfeld Brems-Chopper-IGBT (typisch)
Output characteristic brake-chopper-IGBT (typical)

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



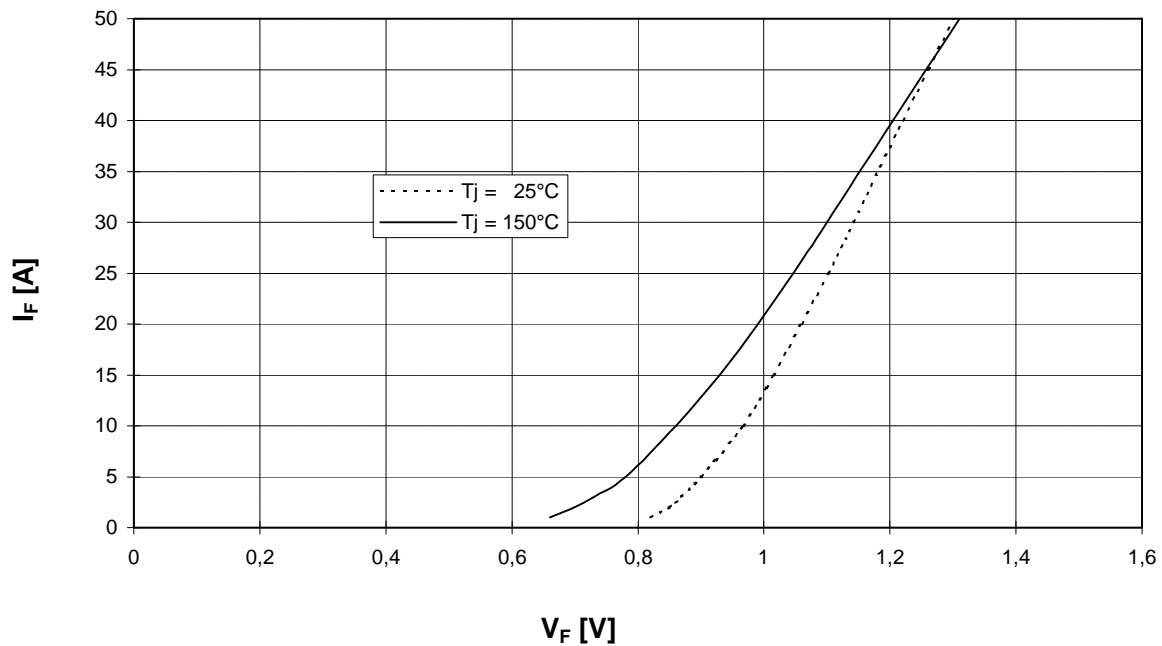
Durchlaßkennlinie der Brems-Chopper-Diode (typisch) $I_F = f(V_F)$
Forward characteristic of brake-chopper-FWD (typical)



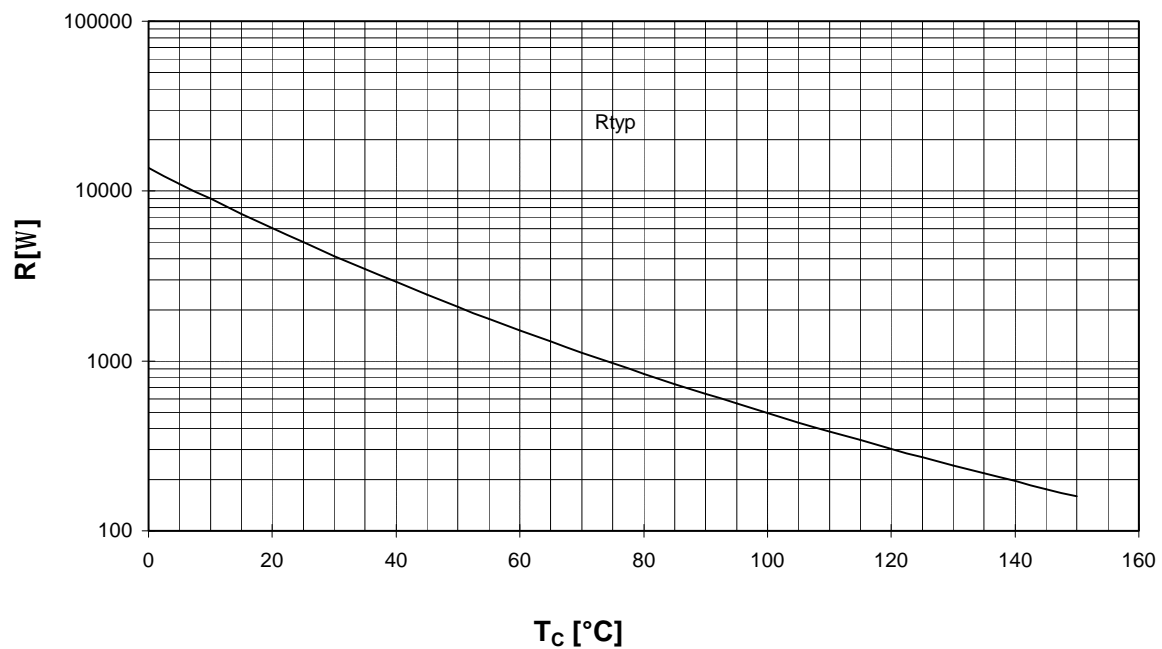


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Durchlaßkennlinie der Gleichrichterdiode (typisch) $I_F = f(V_F)$
Forward characteristic of Rectifier Diode (typical)



NTC- Temperaturkennlinie (typisch) $R = f(T)$
NTC- temperature characteristic (typical)

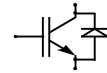


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IGBT-Module
IGBT-Modules

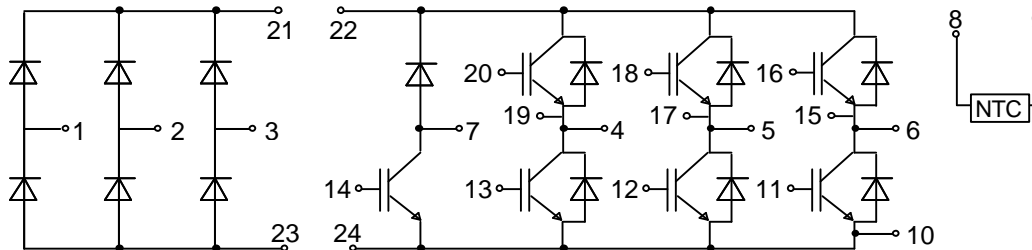
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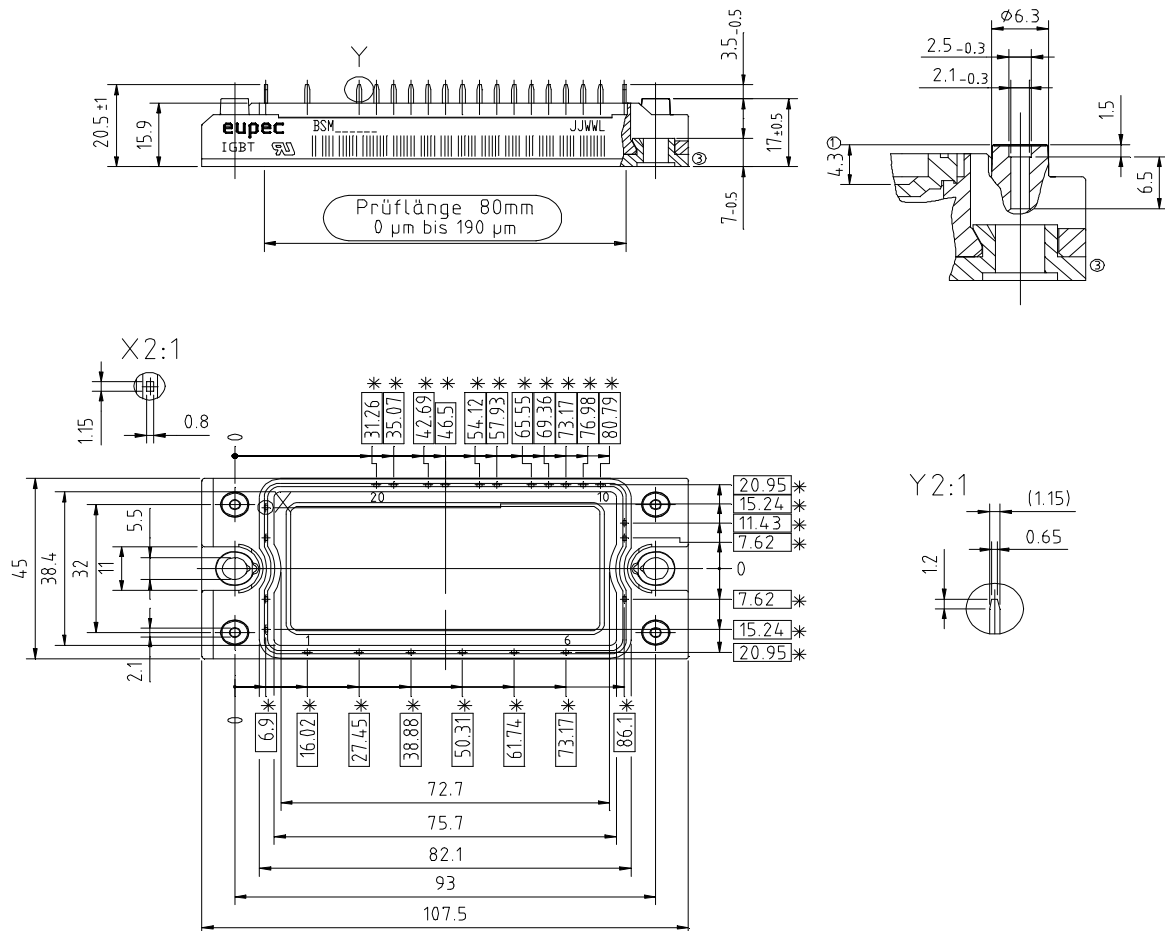


Vorläufige Daten
Preliminary data

Schaltplan/ Circuit diagram



Gehäuseabmessungen/ Package outlines



* = alle Maße mit einer Toleranz von $\pm \varnothing 0.4$

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 promises no characteristics. It is valid in combination with the belonging technical notes.

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

- Конкурентоспособные цены и скидки постоянным клиентам.
- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
- Тестирование поставляемой продукции.
- Поставку компонентов, требующих военную и космическую приемку.
- Входной контроль качества.
- Наличие сертификата ISO.

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- Регистрацию проекта у производителя компонентов.
- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



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