

# ANTREX Electronics

## Electronic Components Sourcing Information

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### Product Reference Information

**Part Number:** FP30R06KE3BOSA1  
**Manufacturer:** Infineon Technologies  
**Package:** Module  
**Availability:** Please confirm with sales

**Product Page:**

<https://antrexco.com/product/details/infineon-technologies/fp30r06ke3bosa1.html>

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### Quality & Trust

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**Note:**

This PDF includes an ANTREX product reference cover page.

The original manufacturer datasheet follows from the next page.

EconoPIM™2 Modul mit Trench/Feldstop IGBT<sup>3</sup> und Emitter Controlled<sup>3</sup> Diode  
EconoPIM™2 module with trench/fieldstop IGBT<sup>3</sup> and Emitter Controlled<sup>3</sup> diode

## Vorläufige Daten Preliminary Data

### IGBT, Wechselrichter / IGBT, Inverter

#### Höchstzulässige Werte / Maximum Rated Values

|                                                                          |                                                                                                                              |                             |          |        |
|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|-----------------------------|----------|--------|
| Kollektor-Emitter-Sperrspannung<br>Collector-emitter voltage             | $T_{vj} = 25^{\circ}\text{C}$                                                                                                | $V_{CES}$                   | 600      | V      |
| Kollektor-Dauergleichstrom<br>Continuous DC collector current            | $T_C = 65^{\circ}\text{C}, T_{vj\max} = 175^{\circ}\text{C}$<br>$T_C = 25^{\circ}\text{C}, T_{vj\max} = 175^{\circ}\text{C}$ | $I_{C\text{ nom}}$<br>$I_C$ | 30<br>37 | A<br>A |
| Periodischer Kollektor-Spitzenstrom<br>Repetitive peak collector current | $t_P = 1\text{ ms}$                                                                                                          | $I_{CRM}$                   | 60       | A      |
| Gesamt-Verlustleistung<br>Total power dissipation                        | $T_C = 25^{\circ}\text{C}, T_{vj\max} = 175$                                                                                 | $P_{\text{tot}}$            | 125      | 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    | $I_C = 30\text{ A}, V_{GE} = 15\text{ V}$<br>$I_C = 30\text{ A}, V_{GE} = 15\text{ V}$<br>$I_C = 30\text{ A}, V_{GE} = 15\text{ V}$                                                       | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$                 | $V_{CE\text{ sat}}$ | 1,55<br>1,70<br>1,80  | 2,00 | V<br>V<br>V                                     |
| Gate-Schwellenspannung<br>Gate threshold voltage                                | $I_C = 0,43\text{ mA}, V_{CE} = V_{GE}, T_{vj} = 25^{\circ}\text{C}$                                                                                                                      |                                                                                                                   | $V_{GEth}$          | 4,9                   | 5,8  | 6,5 V                                           |
| Gateladung<br>Gate charge                                                       | $V_{GE} = -15\text{ V} \dots +15\text{ V}$                                                                                                                                                |                                                                                                                   | $Q_G$               | 0,30                  |      | $\mu\text{C}$                                   |
| Interner Gatewiderstand<br>Internal gate resistor                               | $T_{vj} = 25^{\circ}\text{C}$                                                                                                                                                             |                                                                                                                   | $R_{Gint}$          | 0,0                   |      | $\Omega$                                        |
| Eingangskapazität<br>Input capacitance                                          | $f = 1\text{ MHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}$                                                                                                |                                                                                                                   | $C_{ies}$           | 1,65                  |      | nF                                              |
| Rückwirkungskapazität<br>Reverse transfer capacitance                           | $f = 1\text{ MHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}$                                                                                                |                                                                                                                   | $C_{res}$           | 0,051                 |      | nF                                              |
| Kollektor-Emitter-Reststrom<br>Collector-emitter cut-off current                | $V_{CE} = 600\text{ V}, V_{GE} = 0\text{ V}, T_{vj} = 25^{\circ}\text{C}$                                                                                                                 |                                                                                                                   | $I_{CES}$           |                       | 1,0  | 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, induktive Last<br>Turn-on delay time, inductive load | $I_C = 30\text{ A}, V_{CE} = 300\text{ V}$<br>$V_{GE} = \pm 15\text{ V}$<br>$R_{Gon} = 56\ \Omega$                                                                                        | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$                 | $t_{don}$           | 0,10<br>0,10<br>0,10  |      | $\mu\text{s}$<br>$\mu\text{s}$<br>$\mu\text{s}$ |
| Anstiegszeit, induktive Last<br>Rise time, inductive load                       | $I_C = 30\text{ A}, V_{CE} = 300\text{ V}$<br>$V_{GE} = \pm 15\text{ V}$<br>$R_{Gon} = 56\ \Omega$                                                                                        | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$                 | $t_r$               | 0,06<br>0,065<br>0,07 |      | $\mu\text{s}$<br>$\mu\text{s}$<br>$\mu\text{s}$ |
| Abschaltverzögerungszeit, induktive Last<br>Turn-off delay time, inductive load | $I_C = 30\text{ A}, V_{CE} = 300\text{ V}$<br>$V_{GE} = \pm 15\text{ V}$<br>$R_{Goff} = 56\ \Omega$                                                                                       | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$                 | $t_{doff}$          | 0,60<br>0,65<br>0,70  |      | $\mu\text{s}$<br>$\mu\text{s}$<br>$\mu\text{s}$ |
| Fallzeit, induktive Last<br>Fall time, inductive load                           | $I_C = 30\text{ A}, V_{CE} = 300\text{ V}$<br>$V_{GE} = \pm 15\text{ V}$<br>$R_{Goff} = 56\ \Omega$                                                                                       | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$                 | $t_f$               | 0,04<br>0,045<br>0,05 |      | $\mu\text{s}$<br>$\mu\text{s}$<br>$\mu\text{s}$ |
| Einschaltverlustenergie pro Puls<br>Turn-on energy loss per pulse               | $I_C = 30\text{ A}, V_{CE} = 300\text{ V}, L_S = 45\text{ nH}$<br>$V_{GE} = \pm 15\text{ V}, di/dt = 600\text{ A}/\mu\text{s} (T_{vj} = 150^{\circ}\text{C})$<br>$R_{Gon} = 56\ \Omega$   | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$                 | $E_{on}$            | 1,40<br>1,70<br>1,80  |      | mJ<br>mJ<br>mJ                                  |
| Abschaltverlustenergie pro Puls<br>Turn-off energy loss per pulse               | $I_C = 30\text{ A}, V_{CE} = 300\text{ V}, L_S = 45\text{ nH}$<br>$V_{GE} = \pm 15\text{ V}, du/dt = 2000\text{ V}/\mu\text{s} (T_{vj} = 150^{\circ}\text{C})$<br>$R_{Goff} = 56\ \Omega$ | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$                 | $E_{off}$           | 1,00<br>1,15<br>1,20  |      | mJ<br>mJ<br>mJ                                  |
| Kurzschlußverhalten<br>SC data                                                  | $V_{GE} \leq 15\text{ V}, V_{CC} = 360\text{ V}$<br>$V_{CEmax} = V_{CES} - L_{SCE} \cdot di/dt$                                                                                           | $t_P \leq 8\ \mu\text{s}, T_{vj} = 25^{\circ}\text{C}$<br>$t_P \leq 6\ \mu\text{s}, T_{vj} = 150^{\circ}\text{C}$ | $I_{SC}$            | 210<br>150            |      | A<br>A                                          |
| Wärmewiderstand, Chip bis Gehäuse<br>Thermal resistance, junction to case       | pro IGBT / per IGBT                                                                                                                                                                       |                                                                                                                   | $R_{thJC}$          |                       | 1,20 | K/W                                             |
| Wärmewiderstand, Gehäuse bis Kühlkörper<br>Thermal resistance, case to heatsink | pro IGBT / per IGBT<br>$\lambda_{Paste} = 1\text{ W}/(\text{m} \cdot \text{K}) / \lambda_{grease} = 1\text{ W}/(\text{m} \cdot \text{K})$                                                 |                                                                                                                   | $R_{thCH}$          | 0,40                  |      | K/W                                             |
| Temperatur im Schaltbetrieb<br>Temperature under switching conditions           |                                                                                                                                                                                           |                                                                                                                   | $T_{vj\text{ op}}$  | -40                   | 150  | $^{\circ}\text{C}$                              |

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Vorläufige Daten  
Preliminary Data

## Diode, Wechselrichter / Diode, Inverter

## Höchstzulässige Werte / Maximum Rated Values

|                                                                     |                                                                                                                                              |           |              |                                              |
|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------------|----------------------------------------------|
| Periodische Spitzensperrspannung<br>Repetitive peak reverse voltage | $T_{vj} = 25^{\circ}\text{C}$                                                                                                                | $V_{RRM}$ | 600          | V                                            |
| Dauergleichstrom<br>Continuous DC forward current                   |                                                                                                                                              | $I_F$     | 30           | A                                            |
| Periodischer Spitzenstrom<br>Repetitive peak forward current        | $t_P = 1\text{ ms}$                                                                                                                          | $I_{FRM}$ | 60           | A                                            |
| Grenzlastintegral<br>$I^2t$ - value                                 | $V_R = 0\text{ V}, t_P = 10\text{ ms}, T_{vj} = 125^{\circ}\text{C}$<br>$V_R = 0\text{ V}, t_P = 10\text{ ms}, T_{vj} = 150^{\circ}\text{C}$ | $I^2t$    | 90,0<br>82,0 | $\text{A}^2\text{s}$<br>$\text{A}^2\text{s}$ |

## Charakteristische Werte / Characteristic Values

|                                                                                 |                                                                                                                                           |                                                                                                   | min.       | typ.                 | max. |                                                 |
|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|------------|----------------------|------|-------------------------------------------------|
| Durchlassspannung<br>Forward voltage                                            | $I_F = 30\text{ A}, V_{GE} = 0\text{ V}$<br>$I_F = 30\text{ A}, V_{GE} = 0\text{ V}$<br>$I_F = 30\text{ A}, V_{GE} = 0\text{ V}$          | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $V_F$      | 1,60<br>1,55<br>1,50 | 2,05 | V<br>V<br>V                                     |
| Rückstromspitze<br>Peak reverse recovery current                                | $I_F = 30\text{ A}, -di_F/dt = 600\text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$<br>$V_R = 300\text{ V}$<br>$V_{GE} = -15\text{ V}$  | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $I_{RM}$   | 22,0<br>24,0<br>27,0 |      | A<br>A<br>A                                     |
| Sperrverzögerungsladung<br>Recovered charge                                     | $I_F = 30\text{ A}, -di_F/dt = 600\text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$<br>$V_R = 300\text{ V}$<br>$V_{GE} = -15\text{ V}$  | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $Q_r$      | 1,15<br>2,30<br>2,70 |      | $\mu\text{C}$<br>$\mu\text{C}$<br>$\mu\text{C}$ |
| Abschaltenergie pro Puls<br>Reverse recovery energy                             | $I_F = 30\text{ A}, -di_F/dt = 600\text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$<br>$V_R = 300\text{ V}$<br>$V_{GE} = -15\text{ V}$  | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $E_{rec}$  | 0,12<br>0,30<br>0,36 |      | mJ<br>mJ<br>mJ                                  |
| Wärmewiderstand, Chip bis Gehäuse<br>Thermal resistance, junction to case       | pro Diode / per diode                                                                                                                     |                                                                                                   | $R_{thJC}$ |                      | 1,80 | K/W                                             |
| Wärmewiderstand, Gehäuse bis Kühlkörper<br>Thermal resistance, case to heatsink | pro Diode / per diode<br>$\lambda_{Paste} = 1\text{ W}/(\text{m}\cdot\text{K})$ / $\lambda_{grease} = 1\text{ W}/(\text{m}\cdot\text{K})$ |                                                                                                   | $R_{thCH}$ | 0,60                 |      | K/W                                             |
| Temperatur im Schaltbetrieb<br>Temperature under switching conditions           |                                                                                                                                           | $T_{vj\text{ op}}$                                                                                | -40        |                      | 150  | $^{\circ}\text{C}$                              |

## Diode, Gleichrichter / Diode, Rectifier

## Höchstzulässige Werte / Maximum Rated Values

|                                                                                     |                                                                                                         |             |             |                                              |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-------------|-------------|----------------------------------------------|
| Periodische Spitzensperrspannung<br>Repetitive peak reverse voltage                 | $T_{vj} = 25^{\circ}\text{C}$                                                                           | $V_{RRM}$   | 1600        | V                                            |
| Durchlassstrom Grenzeffektivwert pro Chip<br>Maximum RMS forward current per chip   | $T_C = 80^{\circ}\text{C}$                                                                              | $I_{FRMSM}$ | 60          | A                                            |
| Gleichrichter Ausgang Grenzeffektivstrom<br>Maximum RMS current at rectifier output | $T_C = 80^{\circ}\text{C}$                                                                              | $I_{RMSM}$  | 50          | A                                            |
| Stoßstrom Grenzwert<br>Surge forward current                                        | $t_p = 10\text{ ms}, T_{vj} = 25^{\circ}\text{C}$<br>$t_p = 10\text{ ms}, T_{vj} = 150^{\circ}\text{C}$ | $I_{FSM}$   | 450<br>370  | A<br>A                                       |
| Grenzlastintegral<br>$I^2t$ - value                                                 | $t_p = 10\text{ ms}, T_{vj} = 25^{\circ}\text{C}$<br>$t_p = 10\text{ ms}, T_{vj} = 150^{\circ}\text{C}$ | $I^2t$      | 1000<br>685 | $\text{A}^2\text{s}$<br>$\text{A}^2\text{s}$ |

## Charakteristische Werte / Characteristic Values

|                                                                                 |                                                                                                                                           |                    | min. | typ. | max. |                    |
|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------|------|------|--------------------|
| Durchlassspannung<br>Forward voltage                                            | $T_{vj} = 150^{\circ}\text{C}, I_F = 30\text{ A}$                                                                                         | $V_F$              |      | 0,90 |      | V                  |
| Sperrstrom<br>Reverse current                                                   | $T_{vj} = 150^{\circ}\text{C}, V_R = 1600\text{ V}$                                                                                       | $I_R$              |      | 1,00 |      | mA                 |
| Wärmewiderstand, Chip bis Gehäuse<br>Thermal resistance, junction to case       | pro Diode / per diode                                                                                                                     | $R_{thJC}$         |      |      | 0,85 | K/W                |
| Wärmewiderstand, Gehäuse bis Kühlkörper<br>Thermal resistance, case to heatsink | pro Diode / per diode<br>$\lambda_{Paste} = 1\text{ W}/(\text{m}\cdot\text{K})$ / $\lambda_{grease} = 1\text{ W}/(\text{m}\cdot\text{K})$ | $R_{thCH}$         |      | 0,28 |      | K/W                |
| Temperatur im Schaltbetrieb<br>Temperature under switching conditions           |                                                                                                                                           | $T_{vj\text{ op}}$ | -40  |      | 150  | $^{\circ}\text{C}$ |

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Vorläufige Daten  
Preliminary DataIGBT, Brems-Chopper / IGBT, Brake-Chopper  
Höchstzulässige Werte / Maximum Rated Values

|                                                                          |                                                                                                                              |                             |          |        |
|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|-----------------------------|----------|--------|
| Kollektor-Emitter-Sperrspannung<br>Collector-emitter voltage             | $T_{vj} = 25^{\circ}\text{C}$                                                                                                | $V_{CES}$                   | 600      | V      |
| Kollektor-Dauergleichstrom<br>Continuous DC collector current            | $T_C = 65^{\circ}\text{C}, T_{vj\max} = 175^{\circ}\text{C}$<br>$T_C = 25^{\circ}\text{C}, T_{vj\max} = 175^{\circ}\text{C}$ | $I_{C\text{ nom}}$<br>$I_C$ | 30<br>37 | A<br>A |
| Periodischer Kollektor-Spitzenstrom<br>Repetitive peak collector current | $t_P = 1\text{ ms}$                                                                                                          | $I_{CRM}$                   | 60       | A      |
| Gesamt-Verlustleistung<br>Total power dissipation                        | $T_C = 25^{\circ}\text{C}, T_{vj\max} = 175$                                                                                 | $P_{\text{tot}}$            | 125      | 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    | $I_C = 30\text{ A}, V_{GE} = 15\text{ V}$<br>$I_C = 30\text{ A}, V_{GE} = 15\text{ V}$<br>$I_C = 30\text{ A}, V_{GE} = 15\text{ V}$ | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$                             | $V_{CE\text{ sat}}$ | 1,55<br>1,70<br>1,80  | 2,00       | V<br>V<br>V                                     |
| Gate-Schwellenspannung<br>Gate threshold voltage                                | $I_C = 0,43\text{ mA}, V_{CE} = V_{GE}, T_{vj} = 25^{\circ}\text{C}$                                                                |                                                                                                                               | $V_{GEth}$          | 4,9                   | 5,8<br>6,5 | V                                               |
| Gateladung<br>Gate charge                                                       | $V_{GE} = -15\text{ V} \dots +15\text{ V}$                                                                                          |                                                                                                                               | $Q_G$               | 0,30                  |            | $\mu\text{C}$                                   |
| Interner Gatewiderstand<br>Internal gate resistor                               | $T_{vj} = 25^{\circ}\text{C}$                                                                                                       |                                                                                                                               | $R_{Gint}$          | 0,0                   |            | $\Omega$                                        |
| Eingangskapazität<br>Input capacitance                                          | $f = 1\text{ MHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}$                                          |                                                                                                                               | $C_{ies}$           | 1,65                  |            | nF                                              |
| Rückwirkungskapazität<br>Reverse transfer capacitance                           | $f = 1\text{ MHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}$                                          |                                                                                                                               | $C_{res}$           | 0,051                 |            | nF                                              |
| Kollektor-Emitter-Reststrom<br>Collector-emitter cut-off current                | $V_{CE} = 600\text{ V}, V_{GE} = 0\text{ V}, T_{vj} = 25^{\circ}\text{C}$                                                           |                                                                                                                               | $I_{CES}$           |                       | 1,0        | 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, induktive Last<br>Turn-on delay time, inductive load | $I_C = 30\text{ A}, V_{CE} = 300\text{ V}$<br>$V_{GE} = \pm 15\text{ V}$<br>$R_{Gon} = 56\text{ }\Omega$                            | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$                             | $t_{don}$           | 0,10<br>0,10<br>0,10  |            | $\mu\text{s}$<br>$\mu\text{s}$<br>$\mu\text{s}$ |
| Anstiegszeit, induktive Last<br>Rise time, inductive load                       | $I_C = 30\text{ A}, V_{CE} = 300\text{ V}$<br>$V_{GE} = \pm 15\text{ V}$<br>$R_{Gon} = 56\text{ }\Omega$                            | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$                             | $t_r$               | 0,06<br>0,065<br>0,07 |            | $\mu\text{s}$<br>$\mu\text{s}$<br>$\mu\text{s}$ |
| Abschaltverzögerungszeit, induktive Last<br>Turn-off delay time, inductive load | $I_C = 30\text{ A}, V_{CE} = 300\text{ V}$<br>$V_{GE} = \pm 15\text{ V}$<br>$R_{Goff} = 56\text{ }\Omega$                           | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$                             | $t_{doff}$          | 0,60<br>0,65<br>0,70  |            | $\mu\text{s}$<br>$\mu\text{s}$<br>$\mu\text{s}$ |
| Fallzeit, induktive Last<br>Fall time, inductive load                           | $I_C = 30\text{ A}, V_{CE} = 300\text{ V}$<br>$V_{GE} = \pm 15\text{ V}$<br>$R_{Goff} = 56\text{ }\Omega$                           | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$                             | $t_f$               | 0,04<br>0,045<br>0,05 |            | $\mu\text{s}$<br>$\mu\text{s}$<br>$\mu\text{s}$ |
| Einschaltverlustenergie pro Puls<br>Turn-on energy loss per pulse               | $I_C = 30\text{ A}, V_{CE} = 300\text{ V}, L_S = \text{t.b.d. nH}$<br>$V_{GE} = \pm 15\text{ V}$<br>$R_{Gon} = 56\text{ }\Omega$    | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$                             | $E_{on}$            | 1,40<br>1,70<br>1,80  |            | mJ<br>mJ<br>mJ                                  |
| Abschaltverlustenergie pro Puls<br>Turn-off energy loss per pulse               | $I_C = 30\text{ A}, V_{CE} = 300\text{ V}, L_S = \text{t.b.d. nH}$<br>$V_{GE} = \pm 15\text{ V}$<br>$R_{Goff} = 56\text{ }\Omega$   | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$                             | $E_{off}$           | 1,00<br>1,15<br>1,20  |            | mJ<br>mJ<br>mJ                                  |
| Kurzschlußverhalten<br>SC data                                                  | $V_{GE} \leq 15\text{ V}, V_{CC} = 360\text{ V}$<br>$V_{CEmax} = V_{CES} - L_{SCE} \cdot di/dt$                                     | $t_P \leq 8\text{ }\mu\text{s}, T_{vj} = 25^{\circ}\text{C}$<br>$t_P \leq 6\text{ }\mu\text{s}, T_{vj} = 150^{\circ}\text{C}$ | $I_{SC}$            | 210<br>150            |            | A<br>A                                          |
| Wärmewiderstand, Chip bis Gehäuse<br>Thermal resistance, junction to case       | pro IGBT / per IGBT                                                                                                                 |                                                                                                                               | $R_{thJC}$          |                       | 1,20       | K/W                                             |
| Wärmewiderstand, Gehäuse bis Kühlkörper<br>Thermal resistance, case to heatsink | pro IGBT / per IGBT<br>$\lambda_{Paste} = 1\text{ W/(m}\cdot\text{K)} / \lambda_{grease} = 1\text{ W/(m}\cdot\text{K)}$             |                                                                                                                               | $R_{thCH}$          | 0,40                  |            | K/W                                             |
| Temperatur im Schaltbetrieb<br>Temperature under switching conditions           |                                                                                                                                     |                                                                                                                               | $T_{vj\text{ op}}$  | -40                   | 150        | $^{\circ}\text{C}$                              |

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Vorläufige Daten  
Preliminary DataDiode, Brems-Chopper / Diode, Brake-Chopper  
Höchstzulässige Werte / Maximum Rated Values

|                                                                     |                                                                                                                                              |           |              |                                              |
|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------------|----------------------------------------------|
| Periodische Spitzensperrspannung<br>Repetitive peak reverse voltage | $T_{vj} = 25^{\circ}\text{C}$                                                                                                                | $V_{RRM}$ | 600          | V                                            |
| Dauergleichstrom<br>Continuous DC forward current                   |                                                                                                                                              | $I_F$     | 15           | A                                            |
| Periodischer Spitzenstrom<br>Repetitive peak forward current        | $t_P = 1\text{ ms}$                                                                                                                          | $I_{FRM}$ | 30           | A                                            |
| Grenzlastintegral<br>$I^2t$ - value                                 | $V_R = 0\text{ V}, t_P = 10\text{ ms}, T_{vj} = 125^{\circ}\text{C}$<br>$V_R = 0\text{ V}, t_P = 10\text{ ms}, T_{vj} = 150^{\circ}\text{C}$ | $I^2t$    | 28,0<br>21,0 | $\text{A}^2\text{s}$<br>$\text{A}^2\text{s}$ |

## Charakteristische Werte / Characteristic Values

|                                                                                 |                                                                                                                                           |                                                                                                   |                    | min. | typ.                 | max. |                                                 |
|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|--------------------|------|----------------------|------|-------------------------------------------------|
| Durchlassspannung<br>Forward voltage                                            | $I_F = 15\text{ A}, V_{GE} = 0\text{ V}$<br>$I_F = 15\text{ A}, V_{GE} = 0\text{ V}$<br>$I_F = 15\text{ A}, V_{GE} = 0\text{ V}$          | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $V_F$              |      | 1,60<br>1,55<br>1,50 | 2,05 | V<br>V<br>V                                     |
| Rückstromspitze<br>Peak reverse recovery current                                | $I_F = 15\text{ A}, -di_F/dt = 1500\text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$<br>$V_R = 300\text{ V}$                            | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $I_{RM}$           |      | 20,0<br>24,0<br>25,0 |      | A<br>A<br>A                                     |
| Sperrverzögerungsladung<br>Recovered charge                                     | $I_F = 15\text{ A}, -di_F/dt = 1500\text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$<br>$V_R = 300\text{ V}$                            | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $Q_r$              |      | 0,75<br>1,30<br>1,60 |      | $\mu\text{C}$<br>$\mu\text{C}$<br>$\mu\text{C}$ |
| Abschaltenergie pro Puls<br>Reverse recovery energy                             | $I_F = 15\text{ A}, -di_F/dt = 1500\text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$<br>$V_R = 300\text{ V}$                            | $T_{vj} = 25^{\circ}\text{C}$<br>$T_{vj} = 125^{\circ}\text{C}$<br>$T_{vj} = 150^{\circ}\text{C}$ | $E_{rec}$          |      | 0,17<br>0,30<br>0,40 |      | mJ<br>mJ<br>mJ                                  |
| Wärmewiderstand, Chip bis Gehäuse<br>Thermal resistance, junction to case       | pro Diode / per diode                                                                                                                     |                                                                                                   | $R_{thJC}$         |      |                      | 3,00 | K/W                                             |
| Wärmewiderstand, Gehäuse bis Kühlkörper<br>Thermal resistance, case to heatsink | pro Diode / per diode<br>$\lambda_{Paste} = 1\text{ W}/(\text{m}\cdot\text{K})$ / $\lambda_{grease} = 1\text{ W}/(\text{m}\cdot\text{K})$ |                                                                                                   | $R_{thCH}$         |      | 1,00                 |      | K/W                                             |
| Temperatur im Schaltbetrieb<br>Temperature under switching conditions           |                                                                                                                                           |                                                                                                   | $T_{vj\text{ op}}$ | -40  |                      | 150  | $^{\circ}\text{C}$                              |

## 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   |      | $\text{k}\Omega$ |
| Abweichung von R100<br>Deviation of R100 | $T_C = 100^{\circ}\text{C}, R_{100} = 493\text{ }\Omega$      | $\Delta R/R$ | -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                |
| B-Wert<br>B-value                        | $R_2 = R_{25} \exp [B_{25/80}(1/T_2 - 1/(298,15\text{ K}))]$  | $B_{25/80}$  |    |      | t.b.d. |      | K                |
| B-Wert<br>B-value                        | $R_2 = R_{25} \exp [B_{25/100}(1/T_2 - 1/(298,15\text{ K}))]$ | $B_{25/100}$ |    |      | t.b.d. |      | K                |

Angaben gemäß gültiger Application Note.  
Specification according to the valid application note.

|                 |                                 |
|-----------------|---------------------------------|
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| approved by: WR | revision: 2.0                   |

Vorläufige Daten  
Preliminary Data

## Modul / Module

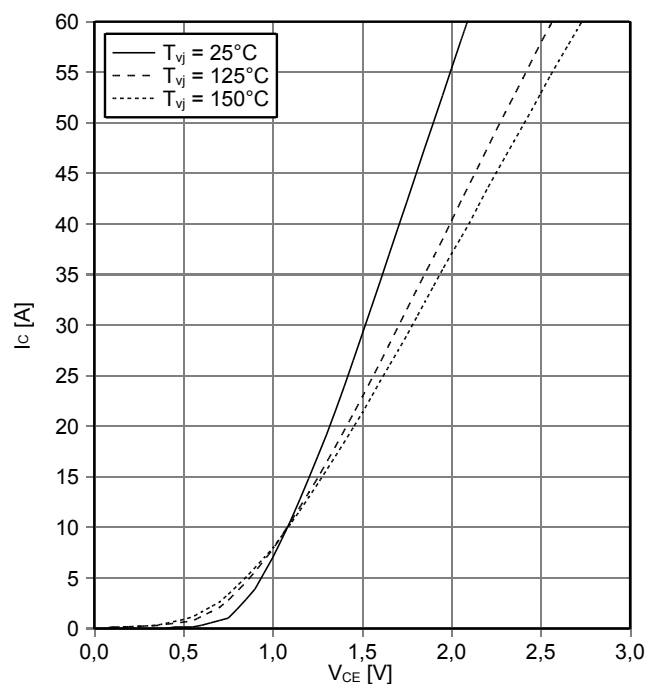
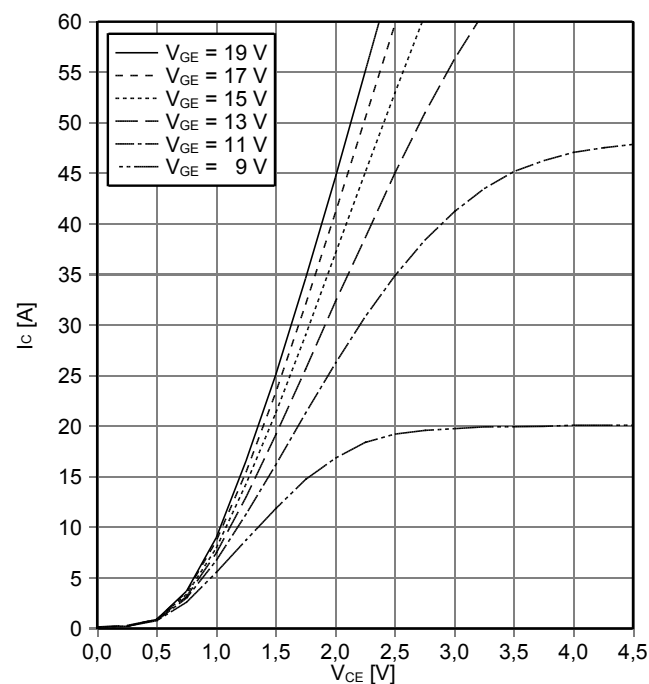
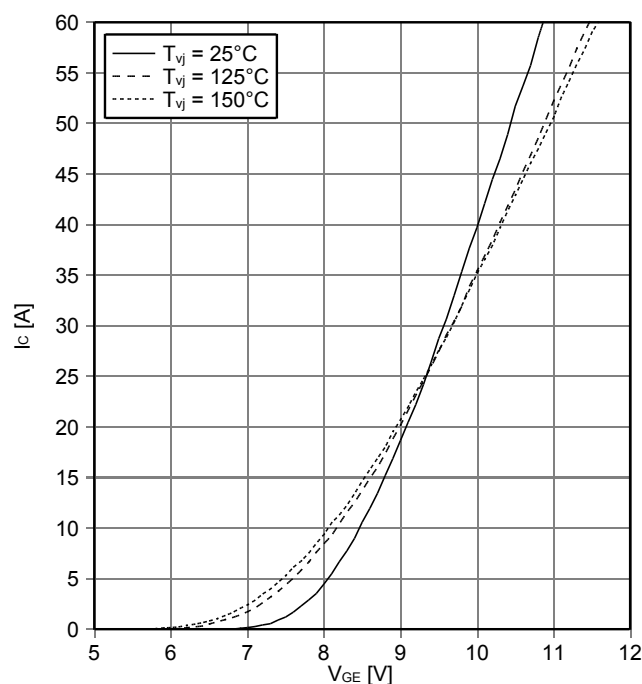
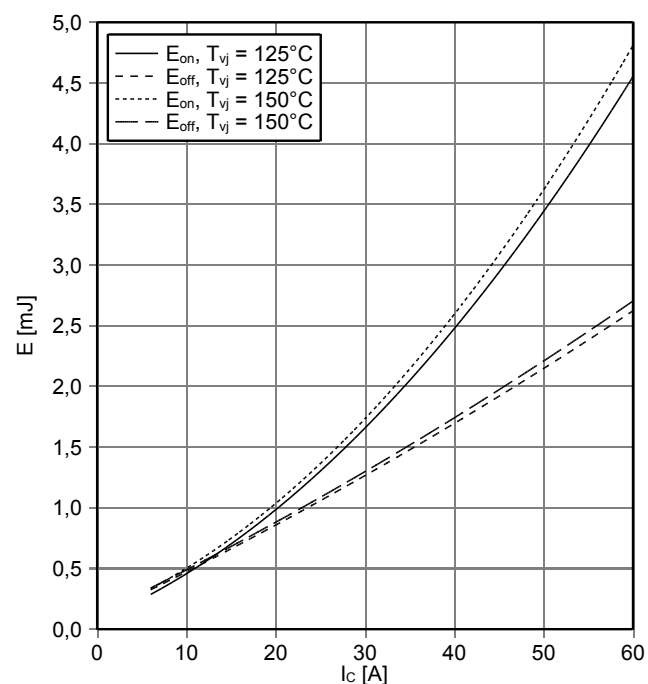
|                                                                                        |                                                                                                                                            |                                              |                                |              |                  |
|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------------------|--------------|------------------|
| Isolations-Prüfspannung<br>Isolation test voltage                                      | RMS, f = 50 Hz, t = 1 min.                                                                                                                 | V <sub>ISOL</sub>                            | 2,5                            | kV           |                  |
| Material Modulgrundplatte<br>Material of module baseplate                              |                                                                                                                                            |                                              | Cu                             |              |                  |
| Innere Isolation<br>Internal isolation                                                 | Basisisolation (Schutzklasse 1, EN61140)<br>basic insulation (class 1, IEC 61140)                                                          |                                              | 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                                                               | Kontakt - Kühlkörper / terminal to heatsink<br>Kontakt - Kontakt / terminal to terminal                                                    |                                              | 7,5                            | mm           |                  |
| Vergleichszahl der Kriechwegbildung<br>Comperative tracking index                      |                                                                                                                                            | CTI                                          | > 225                          |              |                  |
|                                                                                        |                                                                                                                                            |                                              |                                |              |                  |
|                                                                                        |                                                                                                                                            |                                              | min.                           | typ.         | max.             |
| Wärmewiderstand, Gehäuse bis Kühlkörper<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>                            |                                | 0,02         | K/W              |
| Modulstreuinduktivität<br>Stray inductance module                                      |                                                                                                                                            | L <sub>sCE</sub>                             |                                | 60           | nH               |
| Modulleitungswiderstand, Anschlüsse - Chip<br>Module lead resistance, 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                 | Wechselrichter, Brems-Chopper / inverter, brake-chopper<br>Gleichrichter / rectifier                                                       | T <sub>vj max</sub>                          |                                |              | 175 °C<br>150 °C |
| Temperatur im Schaltbetrieb<br>Temperature under switching conditions                  | Wechselrichter, Brems-Chopper / inverter, brake-chopper<br>Gleichrichter / rectifier                                                       | T <sub>vj op</sub>                           | -40<br>-40                     |              | 150 °C<br>150 °C |
| Lagertemperatur<br>Storage temperature                                                 |                                                                                                                                            | T <sub>stg</sub>                             | -40                            |              | 125 °C           |
| Anzugsdrehmoment f. Modulmontage<br>Mounting torque for modul mounting                 | Schraube M5 - Montage gem. gültiger Applikationsschrift<br>Screw M5 - Mounting according to valid application note                         | M                                            | 3,00                           | -            | 6,00 Nm          |
| Gewicht<br>Weight                                                                      |                                                                                                                                            | G                                            |                                | 180          | g                |

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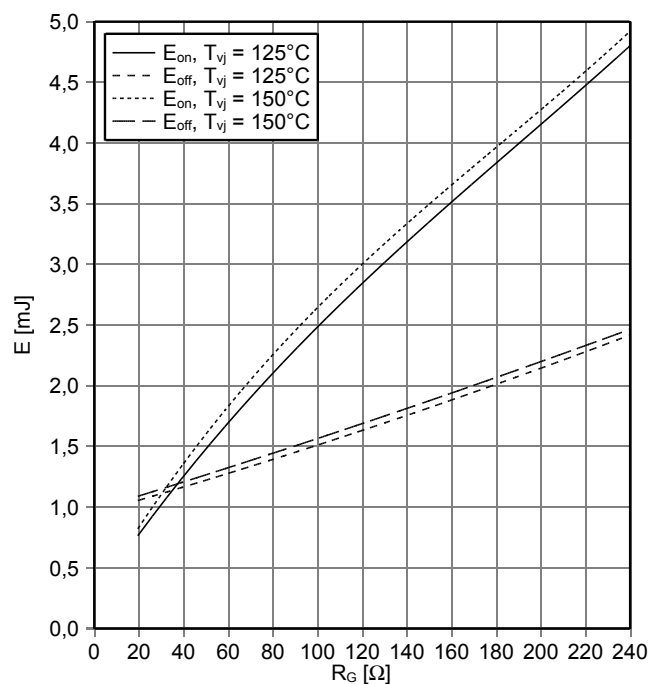
approved by: WR

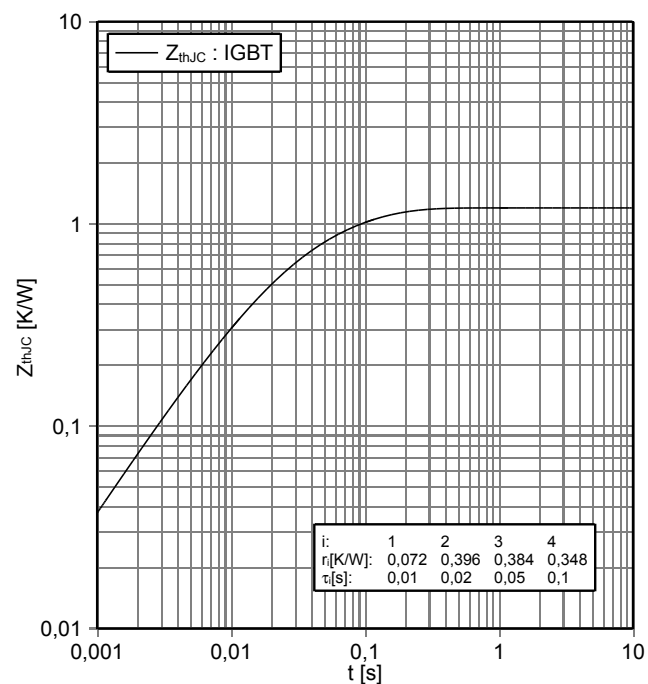
revision: 2.0

Vorläufige Daten  
Preliminary DataAusgangskennlinie IGBT, Wechselrichter (typisch)  
output characteristic IGBT, Inverter (typical) $I_C = f(V_{CE})$   
 $V_{GE} = 15\text{ V}$ Ausgangskennlinienfeld IGBT, Wechselrichter (typisch)  
output characteristic IGBT, Inverter (typical) $I_C = f(V_{CE})$   
 $T_{vj} = 150^\circ\text{C}$ Übertragungscharakteristik IGBT, Wechselrichter (typisch)  
transfer characteristic IGBT, Inverter (typical) $I_C = f(V_{GE})$   
 $V_{CE} = 20\text{ V}$ Schaltverluste IGBT, Wechselrichter (typisch)  
switching losses IGBT, Inverter (typical) $E_{on} = f(I_C)$ ,  $E_{off} = f(I_C)$   
 $V_{GE} = \pm 15\text{ V}$ ,  $R_{Gon} = 56\text{ }\Omega$ ,  $R_{Goff} = 56\text{ }\Omega$ ,  $V_{CE} = 300\text{ V}$ 

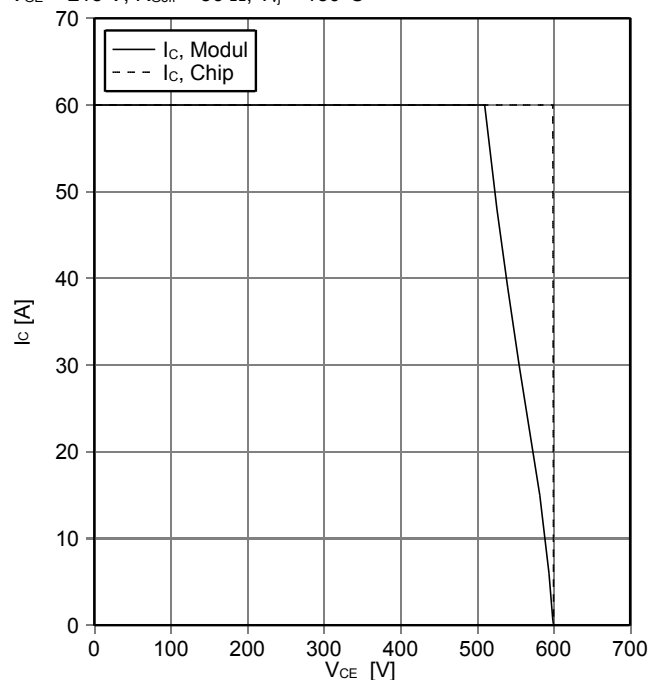
Vorläufige Daten  
Preliminary Data

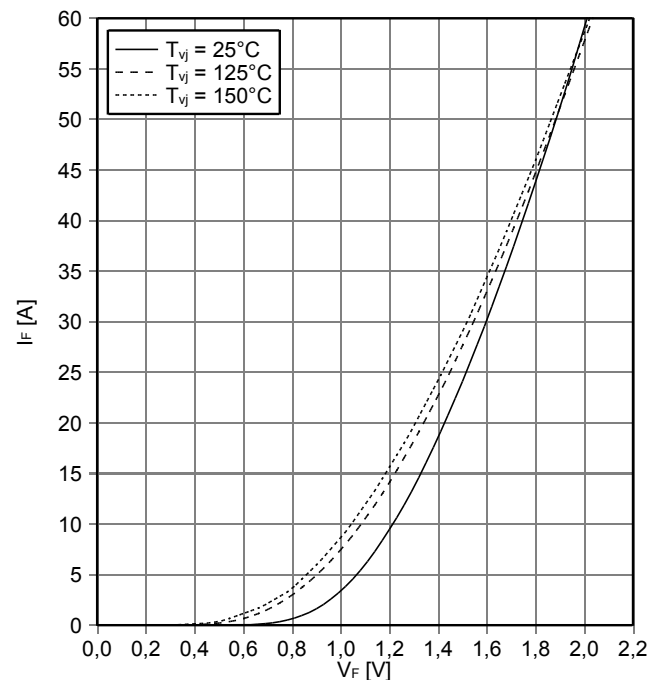
Schaltverluste IGBT, Wechselrichter (typisch)  
switching losses IGBT, Inverter (typical)

 $E_{on} = f(R_G)$ ,  $E_{off} = f(R_G)$   
 $V_{GE} = \pm 15 \text{ V}$ ,  $I_C = 30 \text{ A}$ ,  $V_{CE} = 300 \text{ V}$ 

Transienter Wärmewiderstand IGBT, Wechselrichter  
transient thermal impedance IGBT, Inverter

 $Z_{thJC} = f(t)$ 

Sicherer Rückwärts-Arbeitsbereich IGBT, Wechselrichter  
(RBSOA)

reverse bias safe operating area IGBT, Inverter (RBSOA)

 $I_C = f(V_{CE})$   
 $V_{GE} = \pm 15 \text{ V}$ ,  $R_{Goff} = 56 \Omega$ ,  $T_{vj} = 150^\circ\text{C}$ 

Durchlasskennlinie der Diode, Wechselrichter (typisch)  
forward characteristic of Diode, Inverter (typical)

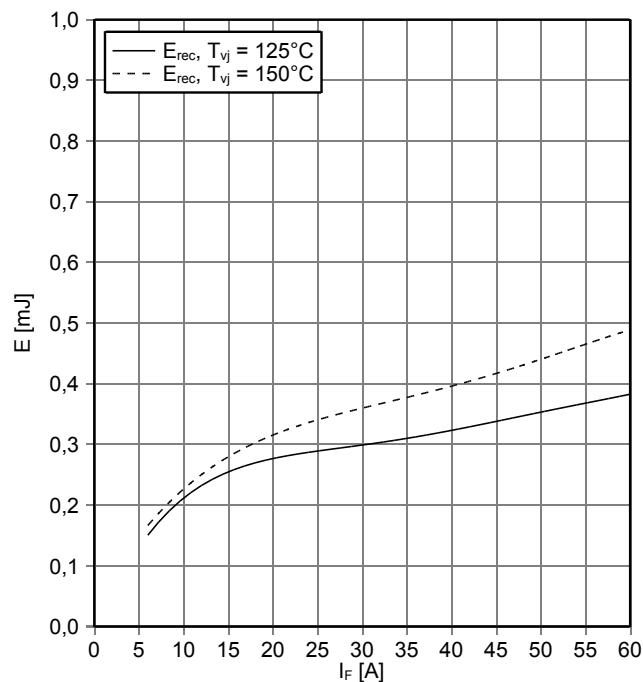
 $I_F = f(V_F)$ 


Vorläufige Daten  
Preliminary Data

Schaltverluste Diode, Wechselrichter (typisch)  
switching losses Diode, Inverter (typical)

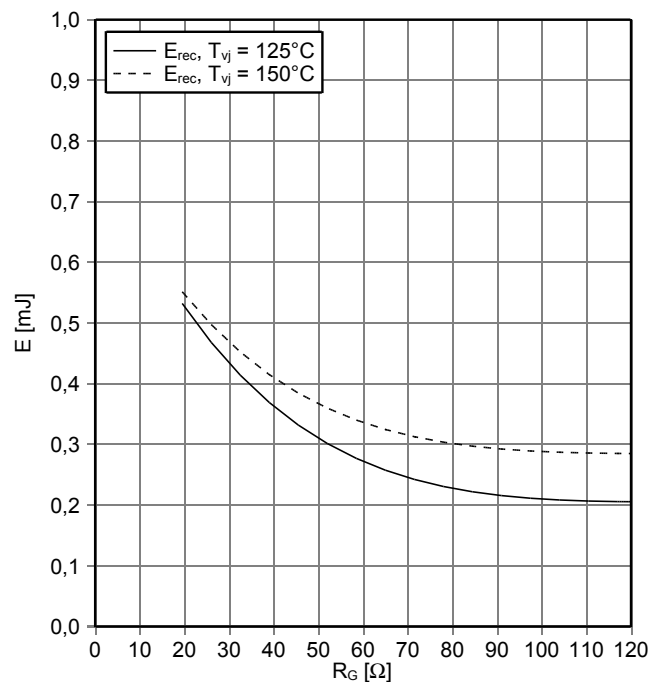
$$E_{rec} = f(I_F)$$

$$R_{Gon} = 56 \Omega, V_{CE} = 300 V$$

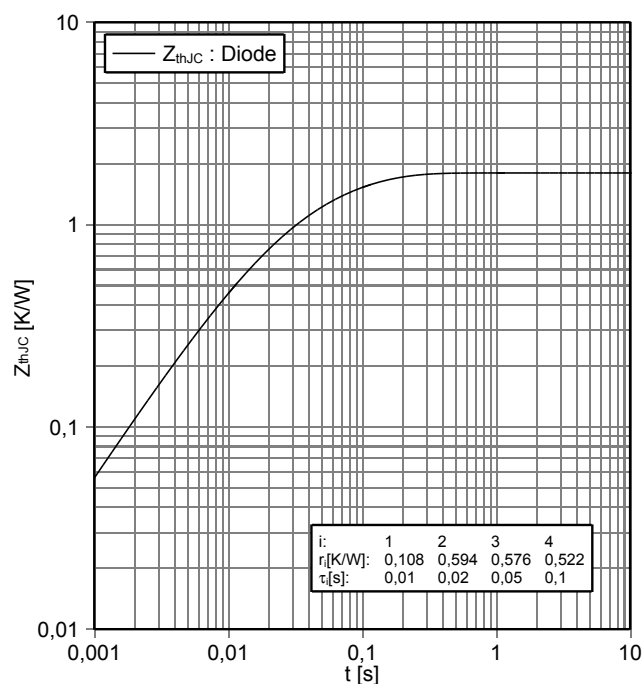

Schaltverluste Diode, Wechselrichter (typisch)  
switching losses Diode, Inverter (typical)

$$E_{rec} = f(R_G)$$

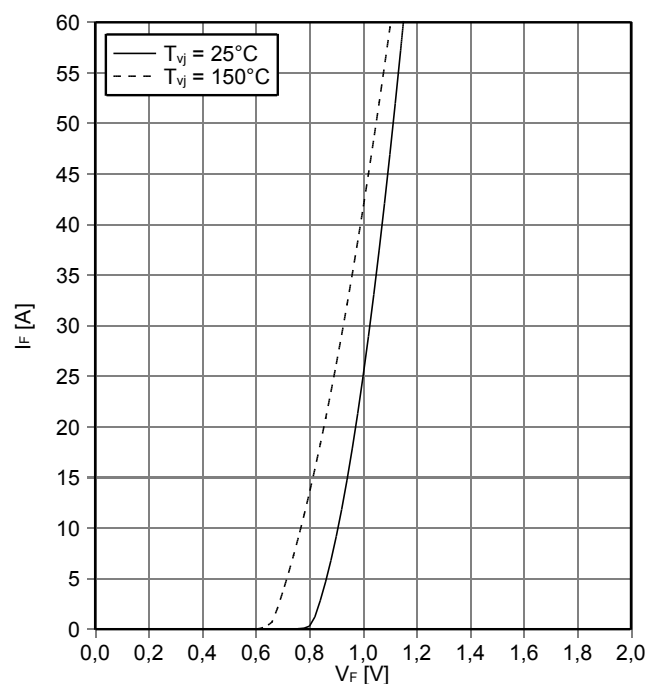
$$I_F = 30 A, V_{CE} = 300 V$$


Transienter Wärmewiderstand Diode, Wechselrichter  
transient thermal impedance Diode, Inverter

$$Z_{thJC} = f(t)$$


Durchlasskennlinie der Diode, Gleichrichter (typisch)  
forward characteristic of Diode, Rectifier (typical)

$$I_F = f(V_F)$$



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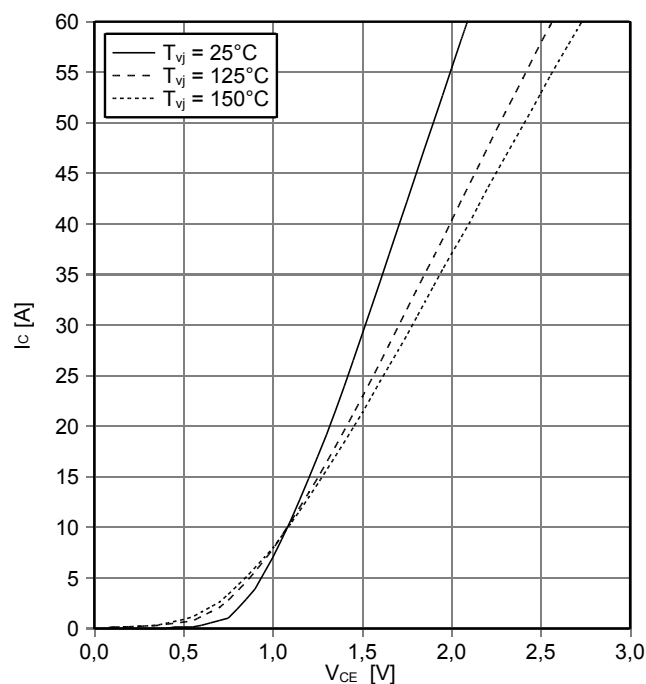
approved by: WR

date of publication: 2013-10-03

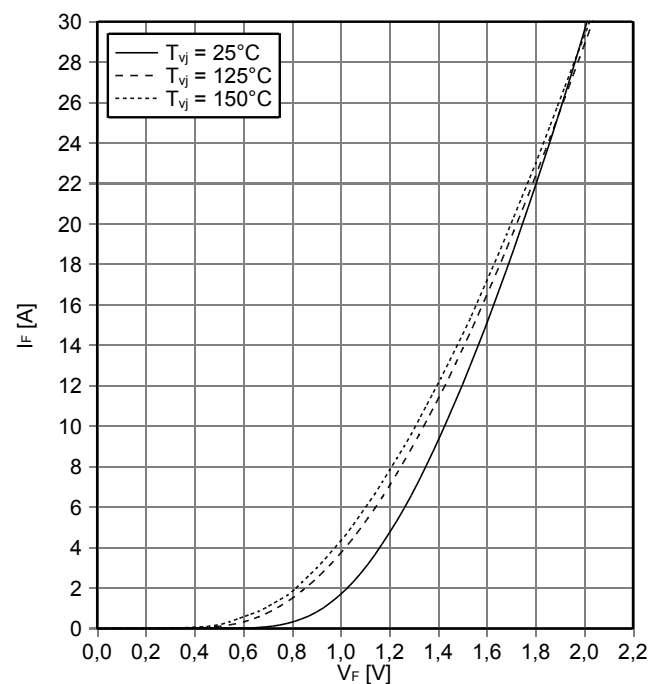
revision: 2.0

# Vorläufige Daten Preliminary Data

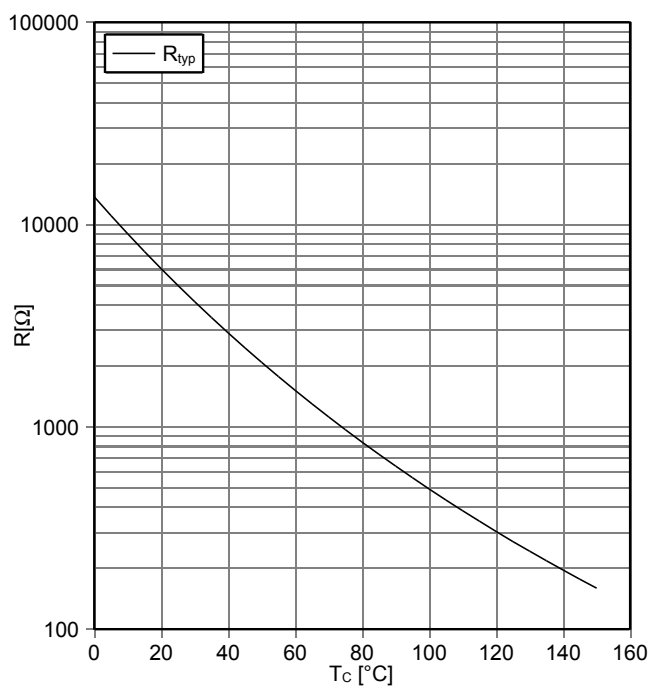
## Ausgangskennlinie IGBT, Brems-Chopper (typisch) output characteristic IGBT, Brake-Chopper (typical)

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


## Durchlasskennlinie der Diode, Brems-Chopper (typisch) forward characteristic of Diode, Brake-Chopper (typical)

 $I_F = f(V_F)$ 


## NTC-Widerstand-Temperaturkennlinie (typisch) NTC-Thermistor-temperature characteristic (typical)

 $R = f(T)$ 


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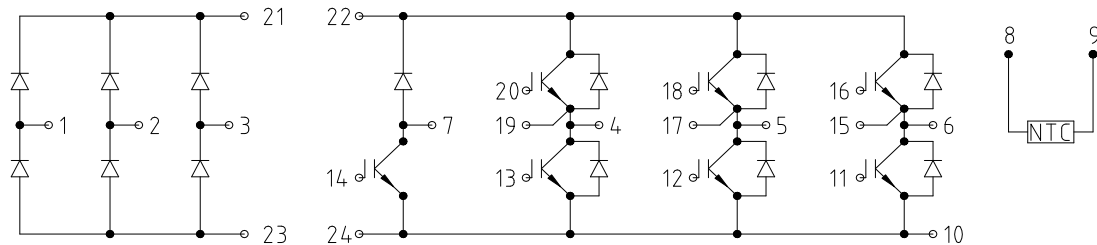
date of publication: 2013-10-03

approved by: WR

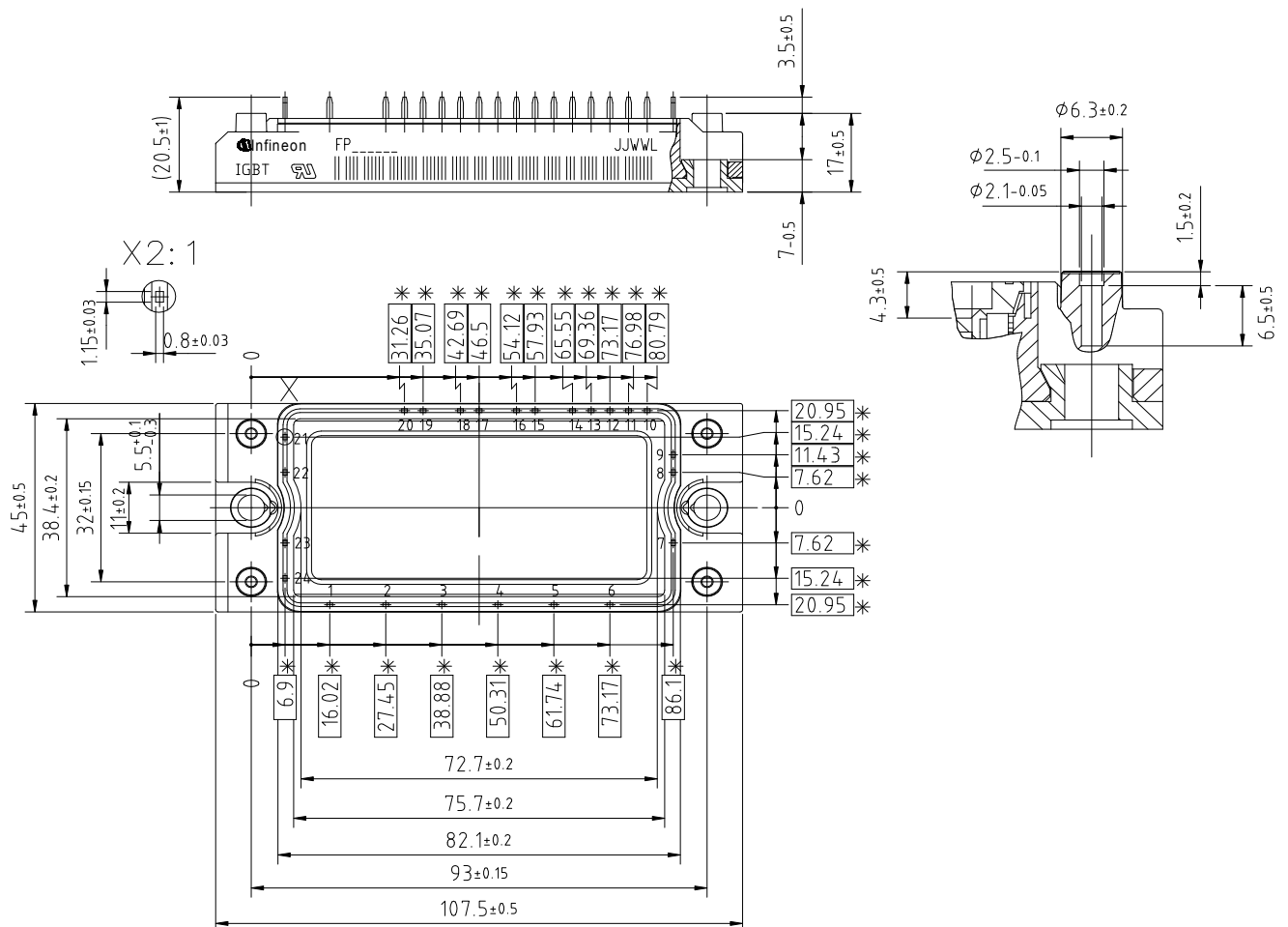
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**Vorläufige Daten**  
**Preliminary Data**

## Schaltplan / circuit\_diagram\_headline



## Gehäuseabmessungen / package outlines



|                 |                                 |
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**Preliminary Data****Nutzungsbedingungen**

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- the conclusion of Quality Agreements;
- to establish joint measures of an ongoing product survey, and that we may make delivery depended on the realization of any such measures.

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