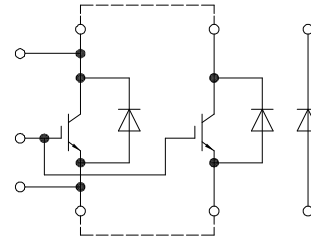


Vorläufige Daten / preliminary data



V_{CEs} = 1700V
I_{C nom} = 1600A / I_{CRM} = 3200A

Typische Anwendungen

- Chopper-Anwendungen
- Hochleistungsumrichter
- Traktionsumrichter
- Windgeneratoren

Typical Applications

- Chopper Applications
- High Power Converters
- Traction Drives
- Wind Turbines

Elektrische Eigenschaften

- Erweiterte Sperrschichttemperatur T_{vj op}
- Niedriges V_{CEsat}

Electrical Features

- Extended Operation Temperature T_{vj op}
- Low V_{CEsat}

Mechanische Eigenschaften

- 4 kV AC 1min Isolationsfestigkeit
- AISiC Bodenplatte für erhöhte thermische Lastwechselfestigkeit
- Gehäuse mit CTI > 400
- Große Luft- und Kriechstrecken
- Hohe Last- und thermische Wechselfestigkeit
- Hohe Leistungsdichte
- IHM B Gehäuse

Mechanical Features

- 4 kV AC 1min Insulation
- AISiC Base Plate for increased Thermal Cycling Capability
- Package with CTI > 400
- High Creepage and Clearance Distances
- High Power and Thermal Cycling Capability
- High Power Density
- IHM B Housing

Module Label Code

Barcode Code 128



DMX - Code



Content of the Code

| Content of the Code | Digit |
|----------------------------|---------|
| Module Serial Number | 1 - 5 |
| Module Material Number | 6 - 11 |
| Production Order Number | 12 - 19 |
| Datecode (Production Year) | 20 - 21 |
| Datecode (Production Week) | 22 - 23 |

| | | |
|-----------------|---------------------------------|----------------------|
| prepared by: WB | date of publication: 2011-08-02 | material no: 34564 |
| approved by: PL | revision: 2.1 | UL approved (E83335) |

Technische Information / technical information

IGBT-Module
IGBT-modules

FD1600/1200R17HP4_B2



Vorläufige Daten preliminary data

IGBT-Wechselrichter / IGBT-inverter

Höchstzulässige Werte / Maximum Rated Values

| | | | | |
|--|---|--------------------|----------------------|----|
| Kollektor-Emitter-Sperrspannung Collector-emitter voltage | $T_{vj} = -40^{\circ}\text{C}$ $T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$ | V_{CES} | 1570 1700 1700 | V |
| Kollektor-Dauergleichstrom Continuous DC collector current | $T_C = 100^{\circ}\text{C}, T_{vj} = 175^{\circ}\text{C}$ | $I_{C\text{ nom}}$ | 1600 | A |
| Periodischer Kollektor-Spitzenstrom Repetitive peak collector current | $t_p = 1\text{ ms}$ | I_{CRM} | 3200 | A |
| Gesamt-Verlustleistung Total power dissipation | $T_C = 25^{\circ}\text{C}, T_{vj} = 175^{\circ}\text{C}$ | P_{tot} | 10,5 | kW |
| Gate-Emitter-Spitzenspannung Gate-emitter peak voltage | | V_{GES} | +/-20 | V |

Charakteristische Werte / Characteristic Values

| | | | min. | typ. | max. | | |
|---|---|---|---------------------|----------------------|------|-------------|---|
| Kollektor-Emitter-Sättigungsspannung Collector-emitter saturation voltage | $I_C = 1600\text{ A}, V_{GE} = 15\text{ V}$ $I_C = 1600\text{ A}, V_{GE} = 15\text{ V}$ $I_C = 1600\text{ A}, V_{GE} = 15\text{ V}$ | $T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$ | $V_{CE\text{ sat}}$ | 1,90 2,30 2,40 | 2,25 | V V V | |
| Gate-Schwellenspannung Gate threshold voltage | $I_C = 64,0\text{ mA}, V_{CE} = V_{GE}, T_{vj} = 25^{\circ}\text{C}$ | | V_{GEth} | 5,2 | 5,8 | 6,4 | V |
| Gateladung Gate charge | $V_{GE} = -15\text{ V} \dots +15\text{ V}$ | | Q_G | 17,0 | | | μC |
| Interner Gatewiderstand Internal gate resistor | $T_{vj} = 25^{\circ}\text{C}$ | | R_{Gint} | 0,97 | | | Ω |
| 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} | 130 | | | nF |
| Rückwirkungskapazität 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} | 4,20 | | | nF |
| Kollektor-Emitter-Reststrom Collector-emitter cut-off current | $V_{CE} = 1570\text{ V}, V_{GE} = 0\text{ V}, T_{vj} = 25^{\circ}\text{C}$ | | 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 |
| Einschaltverzögerungszeit, induktive Last Turn-on delay time, inductive load | $I_C = 1600\text{ A}, V_{CE} = 900\text{ V}$ $V_{GE} = \pm 15\text{ V}$ $R_{Gon} = 1,1\ \Omega$ | $T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$ | $t_{d\text{ on}}$ | 0,40 0,43 0,45 | | | μs μs μs |
| Anstiegszeit, induktive Last Rise time, inductive load | $I_C = 1600\text{ A}, V_{CE} = 900\text{ V}$ $V_{GE} = \pm 15\text{ V}$ $R_{Gon} = 1,1\ \Omega$ | $T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$ | t_r | 0,18 0,20 0,20 | | | μs μs μs |
| Abschaltverzögerungszeit, induktive Last Turn-off delay time, inductive load | $I_C = 1600\text{ A}, V_{CE} = 900\text{ V}$ $V_{GE} = \pm 15\text{ V}$ $R_{Goff} = 0,6\ \Omega$ | $T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$ | $t_{d\text{ off}}$ | 1,05 1,20 1,20 | | | μs μs μs |
| Fallzeit, induktive Last Fall time, inductive load | $I_C = 1600\text{ A}, V_{CE} = 900\text{ V}$ $V_{GE} = \pm 15\text{ V}$ $R_{Goff} = 0,6\ \Omega$ | $T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$ | t_f | 0,30 0,46 0,51 | | | μs μs μs |
| Einschaltverlustenergie pro Puls Turn-on energy loss per pulse | $I_C = 1600\text{ A}, V_{CE} = 900\text{ V}, L_s = 50\text{ nH}$ $V_{GE} = \pm 15\text{ V}$ $R_{Gon} = 1,1\ \Omega$ | $T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$ | E_{on} | 380 500 535 | | | mJ mJ mJ |
| Abschaltverlustenergie pro Puls Turn-off energy loss per pulse | $I_C = 1600\text{ A}, V_{CE} = 900\text{ V}, L_s = 50\text{ nH}$ $V_{GE} = \pm 15\text{ V}$ $R_{Goff} = 0,6\ \Omega$ | $T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$ | E_{off} | 420 570 600 | | | mJ mJ mJ |
| Kurzschlußverhalten SC data | $V_{GE} \leq 15\text{ V}, V_{CC} = 1000\text{ V}$ $V_{CEmax} = V_{CES} - L_{sCE} \cdot di/dt$ | $t_p \leq 10\ \mu\text{s}, T_{vj} = 150^{\circ}\text{C}$ | I_{SC} | 7500 | | | A |
| Wärmewiderstand, Chip bis Gehäuse Thermal resistance, junction to case | pro IGBT / per IGBT | | R_{thJC} | | | 14,0 | K/kW |
| Wärmewiderstand, Gehäuse bis Kühlkörper Thermal resistance, case to heatsink | pro IGBT / per IGBT $\lambda_{Paste} = 1\text{ W/(m}\cdot\text{K)} / \lambda_{grease} = 1\text{ W/(m}\cdot\text{K)}$ | | R_{thCH} | | | 15,0 | K/kW |

prepared by: WB

date of publication: 2011-08-02

approved by: PL

revision: 2.1



Vorläufige Daten
preliminary data

Diode-Wechselrichter / Diode-inverter

Höchstzulässige Werte / Maximum Rated Values

| | | | | |
|--|--|----------------------|----------------------|--|
| Periodische Spitzensperrensorgung Repetitive peak reverse voltage | $T_{vj} = -40^{\circ}\text{C}$ $T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$ | V_{RRM} | 1570 1700 1700 | V |
| Dauergleichstrom Continuous DC forward current | | I_F | 1600 | A |
| Periodischer Spitzenstrom Repetitive peak forward current | $t_p = 1 \text{ ms}$ | I_{FRM} | 2400 | A |
| Grenzlastintegral I^2t - value | $V_R = 0 \text{ V}, t_p = 10 \text{ ms}, T_{vj} = 125^{\circ}\text{C}$ $V_R = 0 \text{ V}, t_p = 10 \text{ ms}, T_{vj} = 150^{\circ}\text{C}$ | I^2t | 630 595 | kA^2s kA^2s |
| Spitzenverlustleistung Maximum power dissipation | $T_{vj} = 125^{\circ}\text{C}$ | P_{ROM} | 2400 | kW |
| Mindesteinschaltdauer Minimum turn-on time | | $t_{on \text{ min}}$ | 10,0 | μs |

Charakteristische Werte / Characteristic Values

| | | | min. | typ. | max. | |
|---|---|---|------------|----------------------|------|---|
| Durchlassspannung Forward voltage | $I_F = 1600 \text{ A}, V_{GE} = 0 \text{ V}$ $I_F = 1600 \text{ A}, V_{GE} = 0 \text{ V}$ $I_F = 1600 \text{ A}, V_{GE} = 0 \text{ V}$ | $T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$ | V_F | 1,65 1,65 1,65 | 2,10 | V V V |
| Rückstromspitze Peak reverse recovery current | $I_F = 1600 \text{ A}, -di_F/dt = 9000 \text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 900 \text{ V}$ $V_{GE} = -15 \text{ V}$ | $T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$ | I_{RM} | 1700 1950 2000 | | A A A |
| Sperrverzögerungsladung Recovered charge | $I_F = 1600 \text{ A}, -di_F/dt = 9000 \text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 900 \text{ V}$ $V_{GE} = -15 \text{ V}$ | $T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$ | Q_r | 450 740 840 | | μC μC μC |
| Abschaltenergie pro Puls Reverse recovery energy | $I_F = 1600 \text{ A}, -di_F/dt = 9000 \text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 900 \text{ V}$ $V_{GE} = -15 \text{ V}$ | $T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$ | E_{rec} | 250 460 525 | | mJ mJ mJ |
| Wärmewiderstand, Chip bis Gehäuse Thermal resistance, junction to case | pro Diode / per diode | | R_{thJC} | | 19,0 | K/kW |
| Wärmewiderstand, Gehäuse bis Kühlkörper Thermal resistance, case to heatsink | pro Diode / per diode $\lambda_{Paste} = 1 \text{ W}/(\text{m}\cdot\text{K}) / \lambda_{grease} = 1 \text{ W}/(\text{m}\cdot\text{K})$ | | R_{thCH} | 16,0 | | K/kW |

| | |
|-----------------|---------------------------------|
| prepared by: WB | date of publication: 2011-08-02 |
| approved by: PL | revision: 2.1 |

Vorläufige Daten
preliminary data

Diode-Brems-Chopper / Diode-brake-chopper

Höchstzulässige Werte / Maximum Rated Values

| | | | | |
|--|--|----------------------|----------------------|--|
| Periodische Spitzensperrensorgung Repetitive peak reverse voltage | $T_{vj} = -40^{\circ}\text{C}$ $T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$ | V_{RRM} | 1570 1700 1700 | V |
| Dauergleichstrom Continuous DC forward current | | I_F | 1200 | A |
| Periodischer Spitzenstrom Repetitive peak forward current | $t_p = 1 \text{ ms}$ | I_{FRM} | 2400 | A |
| Grenzlastintegral I^2t - value | $V_R = 0 \text{ V}, t_p = 10 \text{ ms}, T_{vj} = 125^{\circ}\text{C}$ $V_R = 0 \text{ V}, t_p = 10 \text{ ms}, T_{vj} = 150^{\circ}\text{C}$ | I^2t | 140 130 | kA^2s kA^2s |
| Spitzenverlustleistung Maximum power dissipation | $T_{vj} = 125^{\circ}\text{C}$ | P_{ROM} | 1200 | kW |
| Mindesteinschaltdauer Minimum turn-on time | | $t_{on \text{ min}}$ | 10,0 | μs |

Charakteristische Werte / Characteristic Values

| | | | min. | typ. | max. | |
|---|---|---|------------|----------------------|------|---|
| Durchlassspannung Forward voltage | $I_F = 1200 \text{ A}, V_{GE} = 0 \text{ V}$ $I_F = 1200 \text{ A}, V_{GE} = 0 \text{ V}$ $I_F = 1200 \text{ A}, V_{GE} = 0 \text{ V}$ | $T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$ | V_F | 1,80 1,90 1,95 | 2,20 | V V V |
| Rückstromspitze Peak reverse recovery current | $I_F = 1200 \text{ A}, -di_F/dt = 7700 \text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 900 \text{ V}$ $V_{GE} = -15 \text{ V}$ | $T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$ | I_{RM} | 1250 1350 1400 | | A A A |
| Sperrverzögerungsladung Recovered charge | $I_F = 1200 \text{ A}, -di_F/dt = 7700 \text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 900 \text{ V}$ $V_{GE} = -15 \text{ V}$ | $T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$ | Q_r | 280 460 510 | | μC μC μC |
| Abschaltenergie pro Puls Reverse recovery energy | $I_F = 1200 \text{ A}, -di_F/dt = 7700 \text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 900 \text{ V}$ $V_{GE} = -15 \text{ V}$ | $T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$ | E_{rec} | 180 300 345 | | mJ mJ mJ |
| Wärmewiderstand, Chip bis Gehäuse Thermal resistance, junction to case | pro Diode / per diode | | R_{thJC} | | 37,5 | K/kW |
| Wärmewiderstand, Gehäuse bis Kühlkörper Thermal resistance, case to heatsink | pro Diode / per diode $\lambda_{\text{Paste}} = 1 \text{ W}/(\text{m}\cdot\text{K}) / \lambda_{\text{grease}} = 1 \text{ W}/(\text{m}\cdot\text{K})$ | | R_{thCH} | 32,5 | | K/kW |

prepared by: WB

date of publication: 2011-08-02

approved by: PL

revision: 2.1

Technische Information / technical information

IGBT-Module
IGBT-modules

FD1600/1200R17HP4_B2



Vorläufige Daten preliminary data

Modul / Module

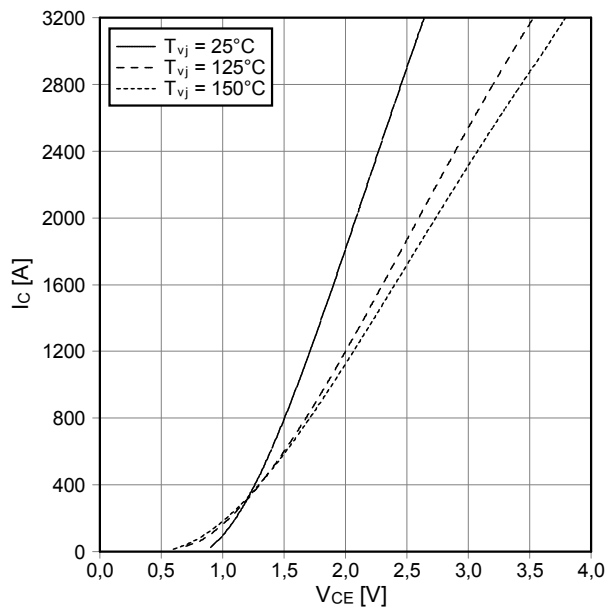
| | | | | | |
|--|--|--|--------------|--------------|--------------|
| Isolations-Prüfspannung Isolation test voltage | RMS, f = 50 Hz, t = 1 min. | V _{ISOL} | 4,0 | | kV |
| Material Modulgrundplatte Material of module baseplate | | | AISiC | | |
| Kriechstrecke Creepage distance | Kontakt - Kühlkörper / terminal to heatsink Kontakt - Kontakt / terminal to terminal | | 32,2 32,2 | | mm |
| Luftstrecke Clearance | Kontakt - Kühlkörper / terminal to heatsink Kontakt - Kontakt / terminal to terminal | | 19,1 19,1 | | mm |
| Vergleichszahl der Kriechwegbildung Comperative tracking index | | CTI | > 400 | | |
| | | | min. | typ. | max. |
| Modulstreuintuktivität Stray inductance module | | L _{sCE} | | 6,0 | nH |
| Modulleitungswiderstand, Anschlüsse - Chip Module lead resistance, terminals - chip | T _C = 25°C, pro Schalter / per switch | R _{CC'-EE'} R _{AA'+CC'} | | 0,15 0,24 | mΩ |
| Höchstzulässige Sperrschichttemperatur Maximum junction temperature | Wechselrichter, Brems-Chopper / Inverter, Brake-Chopper | T _{vj max} | | | 175 °C |
| Temperatur im Schaltbetrieb Temperature under switching conditions | Wechselrichter, Brems-Chopper / Inverter, Brake-Chopper | T _{vj op} | -40 | | 150 °C |
| Lagertemperatur Storage temperature | | T _{stg} | -40 | | 150 °C |
| Anzugsdrehmoment f. Modulmontage Mounting torque for modul mounting | Schraube M6 - Montage gem. gültiger Applikation Note screw M6 - mounting according to valid application note | M | 4,25 | - | 5,75 Nm |
| Anzugsdrehmoment f. elektr. Anschlüsse Terminal connection torque | Schraube M4 - Montage gem. gültiger Applikation Note screw M4 - mounting according to valid application note Schraube M8 - Montage gem. gültiger Applikation Note screw M8 - mounting according to valid application note | M | 1,8 8,0 | - | 2,1 10 Nm |
| Gewicht Weight | | G | | 1200 | g |

| | |
|-----------------|---------------------------------|
| prepared by: WB | date of publication: 2011-08-02 |
| approved by: PL | revision: 2.1 |

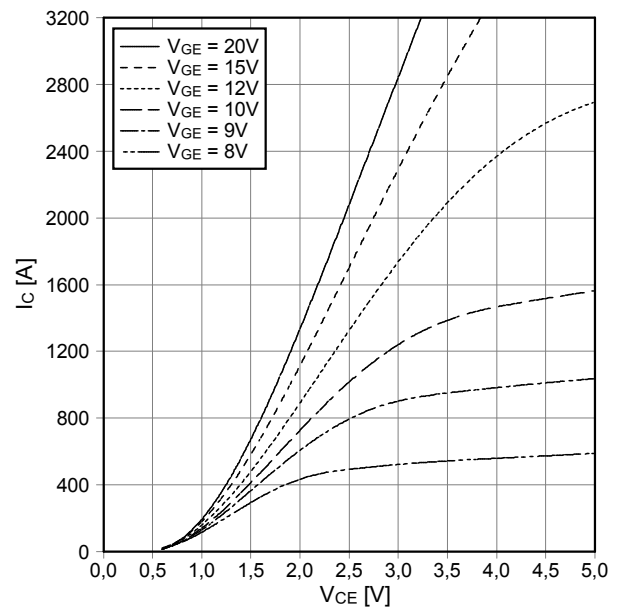


Vorläufige Daten
preliminary data

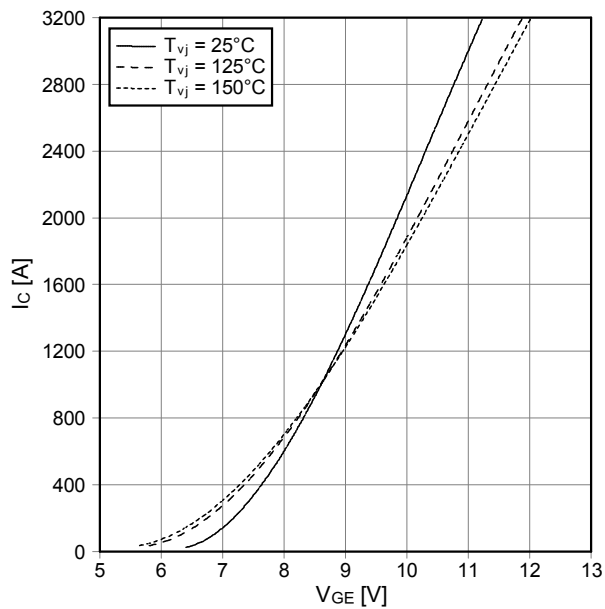
Ausgangskennlinie IGBT-Wechselr. (typisch)
output characteristic IGBT-inverter (typical)
 $I_c = f(V_{CE})$
 $V_{GE} = 15\text{ V}$



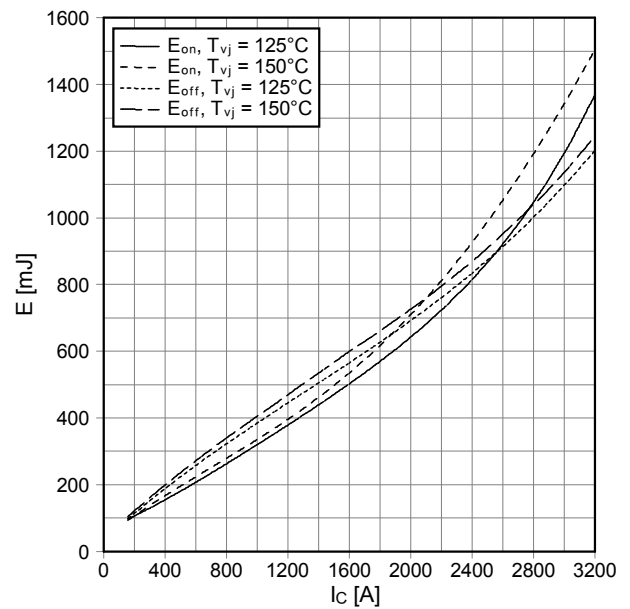
Ausgangskennlinienfeld IGBT-Wechselr. (typisch)
output characteristic IGBT-inverter (typical)
 $I_c = f(V_{CE})$
 $T_{vj} = 150^\circ\text{C}$



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



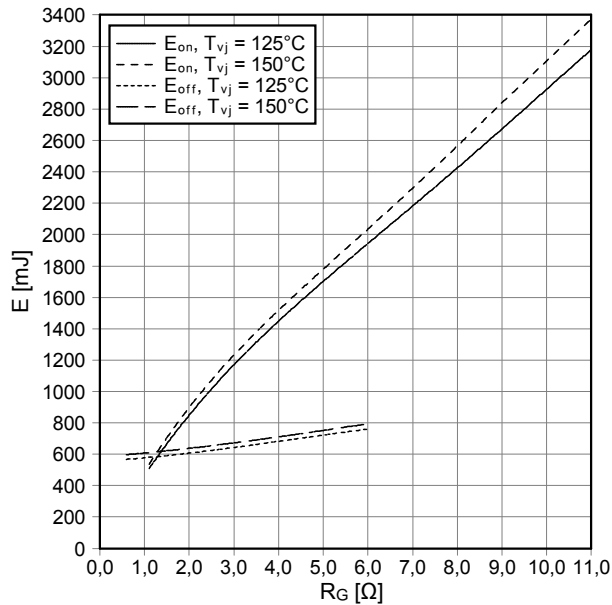
Schaltverluste IGBT-Wechselr. (typisch)
switching losses IGBT-inverter (typical)
 $E_{on} = f(I_c)$, $E_{off} = f(I_c)$
 $V_{GE} = \pm 15\text{ V}$, $R_{Gon} = 1.1\ \Omega$, $R_{Goff} = 0.6\ \Omega$, $V_{CE} = 900\text{ V}$



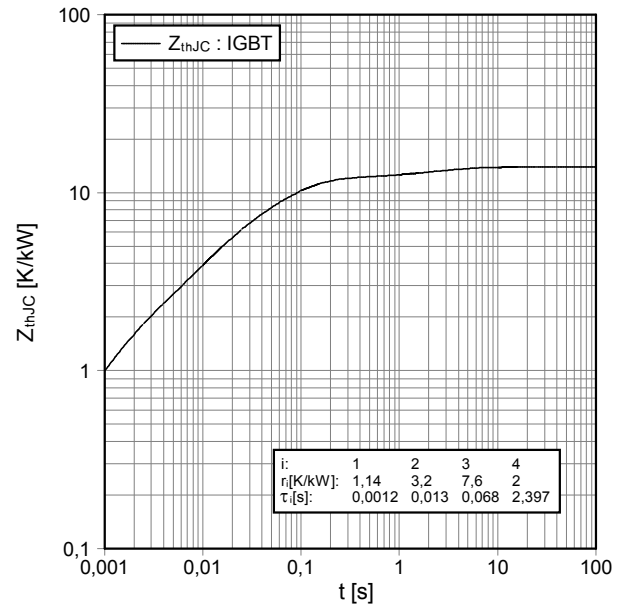
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|-----------------|---------------------------------|
| prepared by: WB | date of publication: 2011-08-02 |
| approved by: PL | revision: 2.1 |

Vorläufige Daten
preliminary data

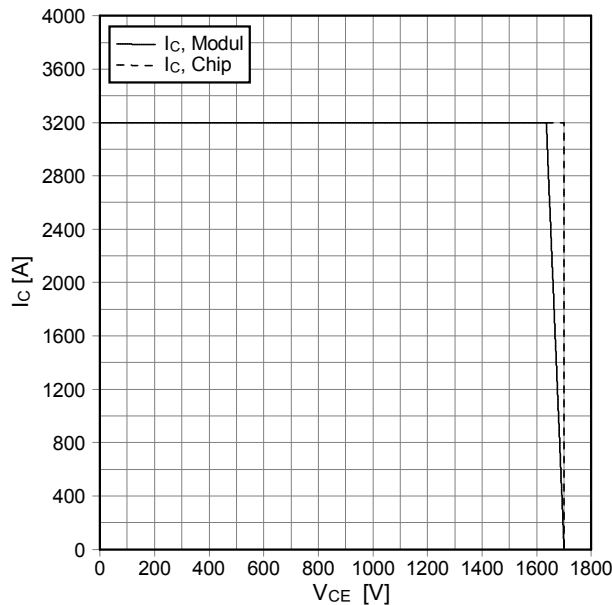
Schaltverluste IGBT-Wechselr. (typisch)
switching losses IGBT-Inverter (typical)
 $E_{on} = f(R_G)$, $E_{off} = f(R_G)$
 $V_{GE} = \pm 15 \text{ V}$, $I_C = 1600 \text{ A}$, $V_{CE} = 900 \text{ V}$



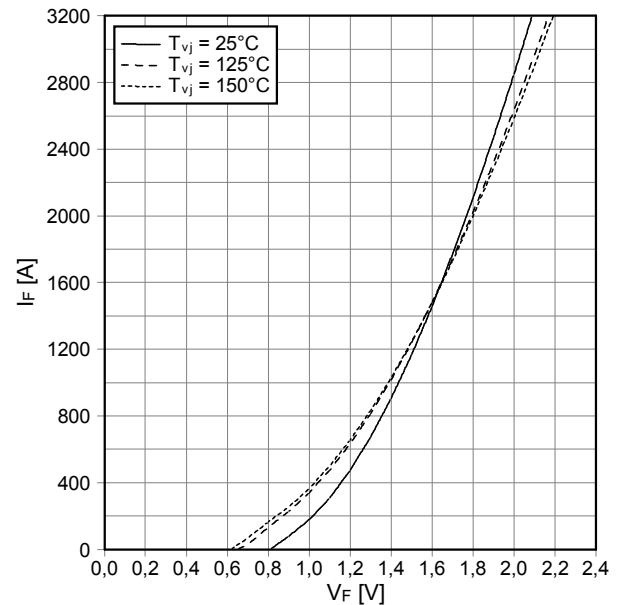
Transienter Wärmewiderstand IGBT-Wechselr.
transient thermal impedance IGBT-inverter
 $Z_{thJC} = f(t)$



Sicherer Rückwärts-Arbeitsbereich IGBT-Wr. (RBSOA)
reverse bias safe operating area IGBT-inv. (RBSOA)
 $I_C = f(V_{CE})$
 $V_{GE} = \pm 15 \text{ V}$, $R_{Goff} = 0.6 \Omega$, $T_{vj} = 150^\circ\text{C}$



Durchlasskennlinie der Diode-Wechselr. (typisch)
forward characteristic of diode-inverter (typical)
 $I_F = f(V_F)$



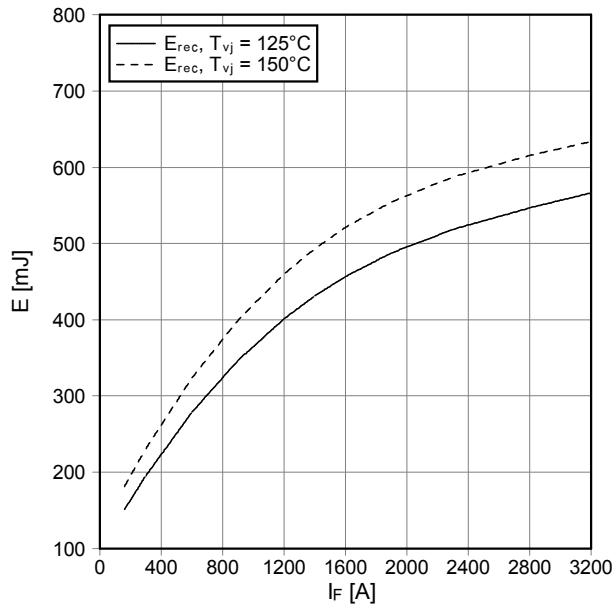
| | |
|-----------------|---------------------------------|
| prepared by: WB | date of publication: 2011-08-02 |
| approved by: PL | revision: 2.1 |

Vorläufige Daten
preliminary data

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

$E_{rec} = f(I_F)$

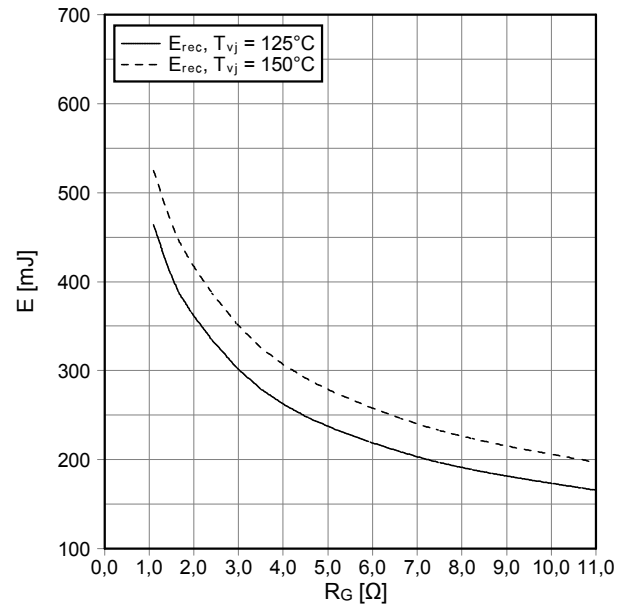
$R_{Gon} = 1.1 \Omega$, $V_{CE} = 900 V$



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

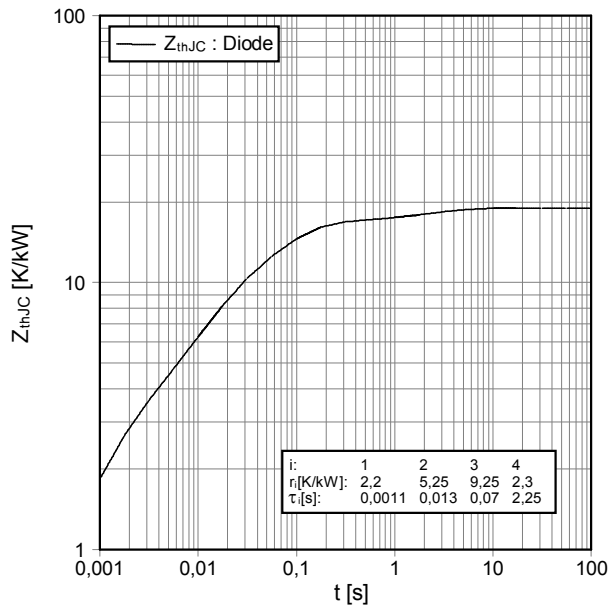
$E_{rec} = f(R_G)$

$I_F = 1600 A$, $V_{CE} = 900 V$



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

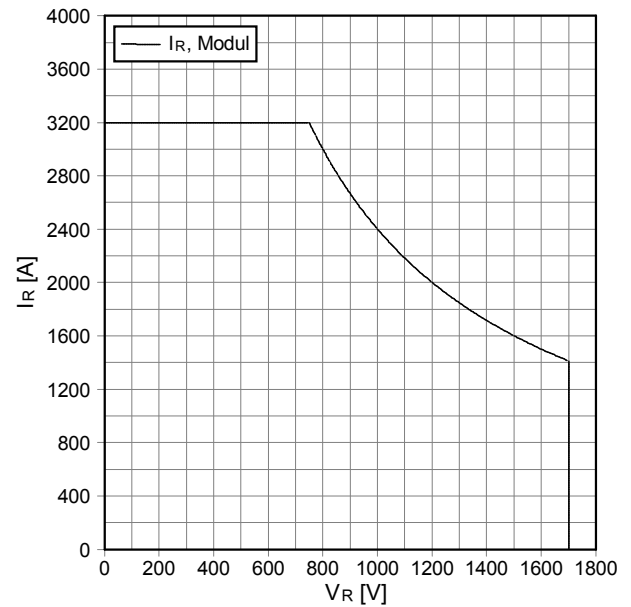
$Z_{thJC} = f(t)$



Sicherer Arbeitsbereich Diode-Wechselr. (SOA)
safe operation area diode-inverter (SOA)

$I_R = f(V_R)$

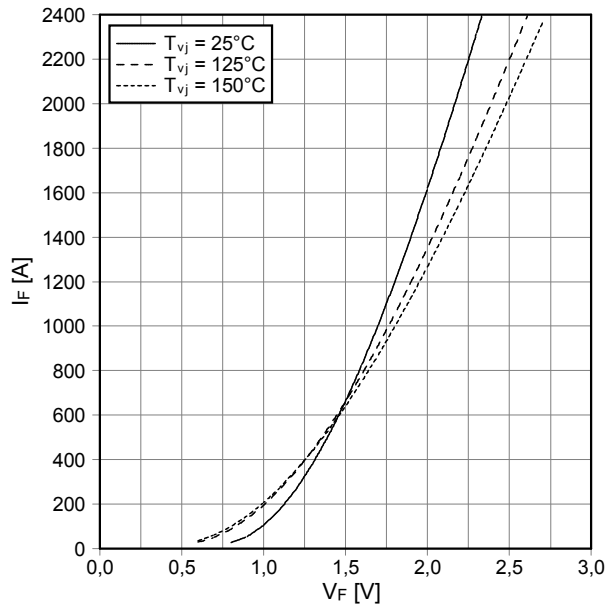
$T_{vj} = 150^\circ C$



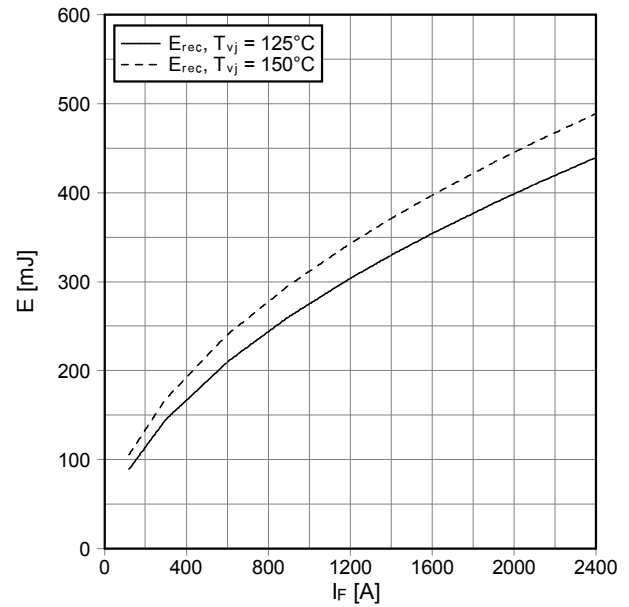
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| prepared by: WB | date of publication: 2011-08-02 |
| approved by: PL | revision: 2.1 |

Vorläufige Daten
preliminary data

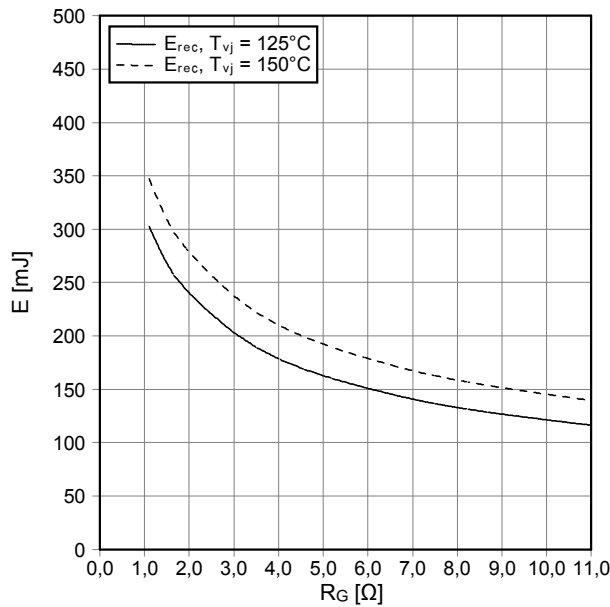
Durchlasskennlinie der Diode-Brems-Chopper
forward characteristic of Diode-brake-chopper
 $I_F = f(V_F)$



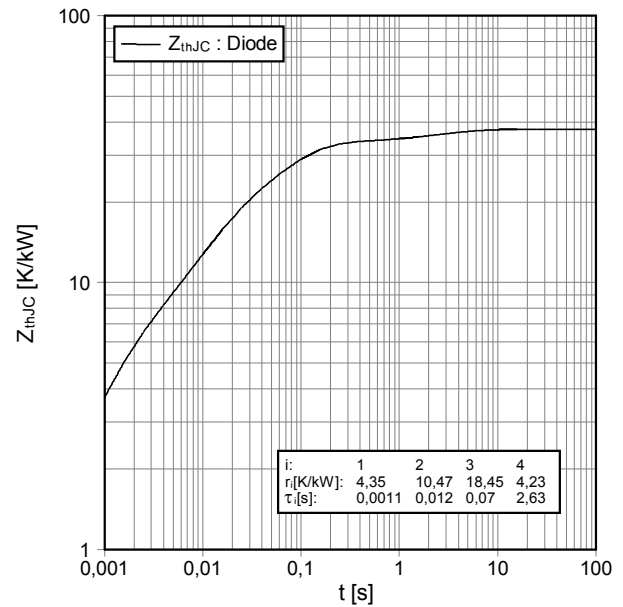
Schaltverluste Diode-Brems-Chopper
switching losses Diode-brake-chopper
 $E_{rec} = f(I_F)$
 $R_{Gon} = \Omega, V_{CE} = 900\text{ V}$



Schaltverluste Diode-Brems-Chopper
switching losses Diode-brake-chopper
 $E_{rec} = f(R_G)$
 $I_F = 1200\text{ A}, V_{CE} = 900\text{ V}$



Transienter Wärmewiderstand Diode-Brems-Chopper
transient thermal impedance Diode-brake-chopper
 $Z_{thJC} = f(t)$



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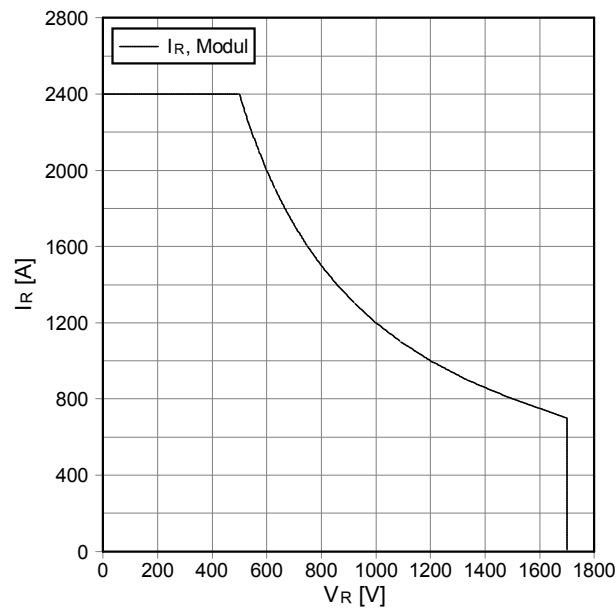
Vorläufige Daten
preliminary data

Sicherer Arbeitsbereich Diode-Brems-Chopper (SOA)

safe operation area diode-brake-chopper (SOA)

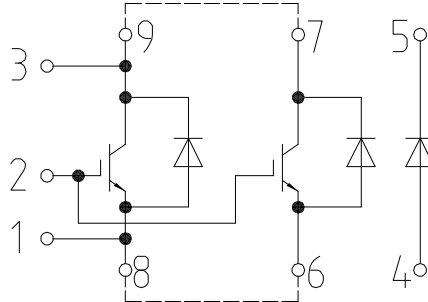
$I_R = f(V_R)$

$T_{vj} = 150^\circ\text{C}$

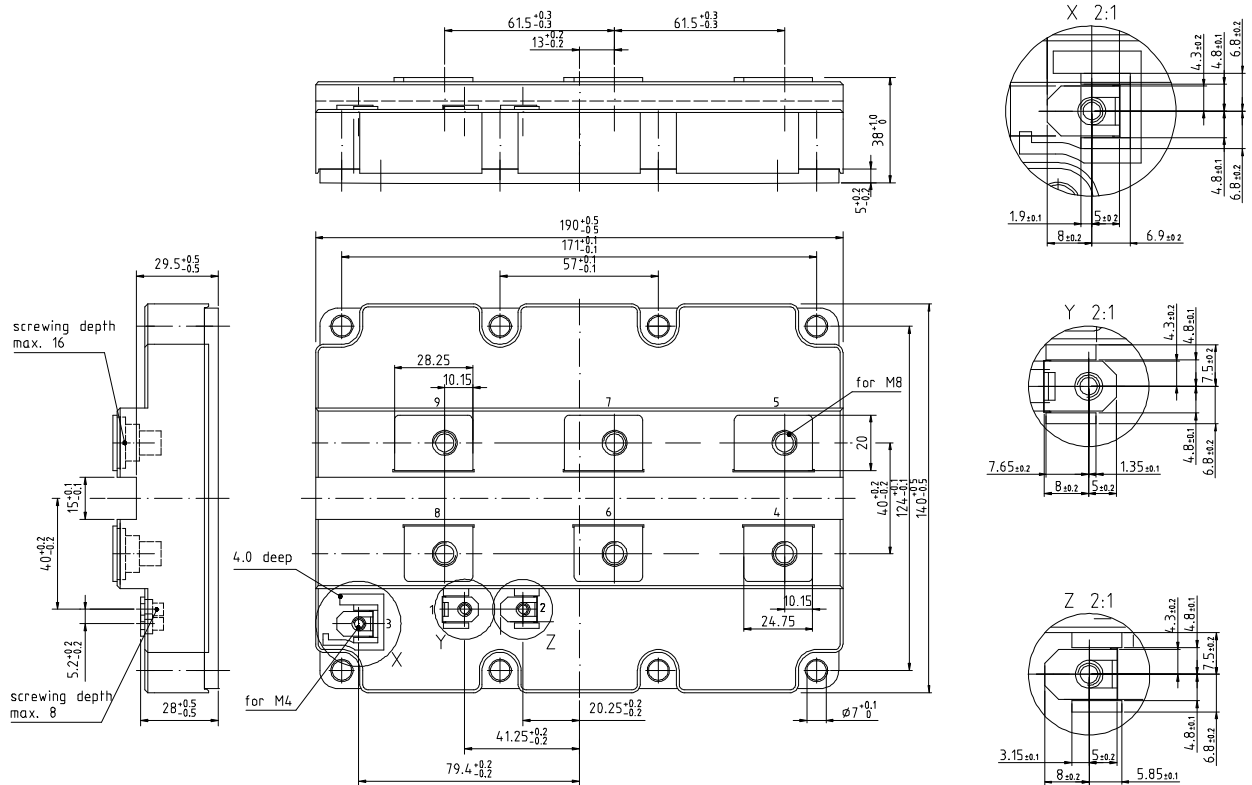


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Schaltplan / circuit diagram



Gehäuseabmessungen / package outlines



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**Vorläufige Daten
preliminary data**

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