

## TT 250 N, TD 250 N, DT 250 N

## Elektrische Eigenschaften

## Electrical properties

## Höchstzulässige Werte

## Maximum rated values

|                                                          |                                                        |                                                                                                                                         |                                   |                                                      |
|----------------------------------------------------------|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|------------------------------------------------------|
| Periodische Vorwärts- und Rückwärts-Spitzensperrspannung | repetitive peak forward off-state and reverse voltages | $t_{vj} = -40^{\circ}\text{C} \dots t_{vj\text{ max}}$                                                                                  | $V_{\text{DRM}}, V_{\text{RRM}}$  | 600, 800 V<br>1000, 1200 V<br>1400, 1600 V<br>1800 V |
| Vorwärts-Stoßspitzenspannung                             | non repetitive peak forward off-state voltage          | $t_{vj} = -40^{\circ}\text{C} \dots t_{vj\text{ max}}$                                                                                  | $V_{\text{DSM}} = V_{\text{DRM}}$ |                                                      |
| Rückwärts-Stoßspitzenspannung                            | non repetitive peak reverse voltage                    | $t_{vj} = +25^{\circ}\text{C} \dots t_{vj\text{ max}}$                                                                                  | $V_{\text{RSM}} = V_{\text{RRM}}$ | + 100 V                                              |
| Durchlaßstrom-Grenzeffektivwert                          | RMS on-state current                                   | $t_C = 85^{\circ}\text{C}$                                                                                                              | $I_{\text{TRMSM}}$                | 410 A                                                |
| Dauergrenzstrom                                          | average on-state current                               | $t_C = 82^{\circ}\text{C}$                                                                                                              | $I_{\text{TAVM}}$                 | 250 A<br>261 A                                       |
| Stoßstrom-Grenzwert                                      | surge current                                          | $t_{vj} = 25^{\circ}\text{C}, t_p = 10\text{ ms}$<br>$t_{vj} = t_{vj\text{ max}}, t_p = 10\text{ ms}$                                   | $I_{\text{TSM}}$                  | 8000 A<br>7000 A                                     |
| Grenzlastintegral                                        | $\int i^2 dt$ -value                                   | $t_{vj} = 25^{\circ}\text{C}, t_p = 10\text{ ms}$<br>$t_{vj} = t_{vj\text{ max}}, t_p = 10\text{ ms}$                                   | $\int i^2 dt$                     | 320000 A <sup>2</sup> s<br>245000 A <sup>2</sup> s   |
| Kritische Stromsteilheit                                 | critical rate of rise of on-state current              | $V_D \leq 67\% V_{\text{DRM}}, f_o = 50\text{ Hz}$<br>$V_L = 10\text{ V}, I_{\text{GM}} = 1\text{ A}, di_G/dt = 1\text{ A}/\mu\text{s}$ | $(di/dt)_{\text{cr}}$             | 150 A/ $\mu\text{s}$                                 |
| Kritische Spannungssteilheit                             | critical rate of rise of off-state voltage             | $t_{vj} = t_{vj\text{ max}}, V_D = 67\% V_{\text{DRM}}$                                                                                 | $(dv/dt)_{\text{cr}}$             | 1000 V/ $\mu\text{s}$                                |

## Charakteristische Werte

## Characteristic values

|                                    |                                        |                                                                                                                                                                                                                                                                 |                   |                        |
|------------------------------------|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------------------|
| Durchlaßspannung                   | on-state voltage                       | $t_{vj} = t_{vj\text{ max}}, I_T = 800\text{ A}$                                                                                                                                                                                                                | $V_T$             | max. 1,5 V             |
| Schleusenspannung                  | threshold voltage                      | $t_{vj} = t_{vj\text{ max}}$                                                                                                                                                                                                                                    | $V_{T(TO)}$       | 0,8 V                  |
| Ersatzwiderstand                   | slope resistance                       | $t_{vj} = t_{vj\text{ max}}$                                                                                                                                                                                                                                    | $r_T$             | 0,7 m $\Omega$         |
| Zündstrom                          | gate trigger current                   | $t_{vj} = 25^{\circ}\text{C}, V_D = 6\text{ V}$                                                                                                                                                                                                                 | $I_{\text{GT}}$   | max. 200 mA            |
| Zündspannung                       | gate trigger voltage                   | $t_{vj} = 25^{\circ}\text{C}, V_D = 6\text{ V}$                                                                                                                                                                                                                 | $V_{\text{GT}}$   | max. 2 V               |
| Nicht zündender Steuerstrom        | gate non trigger current               | $t_{vj} = t_{vj\text{ max}}, V_D = 6\text{ V}$                                                                                                                                                                                                                  | $I_{\text{GD}}$   | max. 10 mA             |
| Nicht zündende Steuerspannung      | gate non trigger voltage               | $t_{vj} = t_{vj\text{ max}}, V_D = 0,5 V_{\text{DRM}}$                                                                                                                                                                                                          | $V_{\text{GD}}$   | max. 0,2 V             |
| Haltestrom                         | holding current                        | $t_{vj} = 25^{\circ}\text{C}, V_D = 6\text{ V}, R_A = 5\text{ }\Omega$                                                                                                                                                                                          | $I_H$             | max. 300 mA            |
| Einraststrom                       | latching current                       | $t_{vj} = 25^{\circ}\text{C}, V_D = 6\text{ V}, R_{\text{GK}} \geq 10\text{ }\Omega$<br>$I_{\text{GM}} = 1\text{ A}, di_G/dt = 1\text{ A}/\mu\text{s}, t_g = 20\text{ }\mu\text{s}$<br>$t_{vj} = t_{vj\text{ max}}, V_D = V_{\text{DRM}}, V_R = V_{\text{RRM}}$ | $I_L$             | max. 1,2 A             |
| Vorwärts- und Rückwärts-Sperrstrom | forward off-state and reverse currents |                                                                                                                                                                                                                                                                 | $i_D, i_R$        | max. 50 mA             |
| Zündverzögerung                    | gate controlled delay time             | $t_{vj} = 25^{\circ}\text{C}, I_{\text{GM}} = 1\text{ A}, di_G/dt = 1\text{ A}/\mu\text{s}$                                                                                                                                                                     | $t_{\text{gd}}$   | max. 3 $\mu\text{s}$   |
| Freiwerdezeit                      | circuit commutated turn-off time       | siehe Techn. Erl./see Techn. Inf.                                                                                                                                                                                                                               | $t_q$             | typ. 250 $\mu\text{s}$ |
| Isolations-Prüfspannung            | insulation test voltage                | RMS, $f = 50\text{ Hz}, t = 1\text{ min}$                                                                                                                                                                                                                       | $V_{\text{ISOL}}$ | 3 kV                   |

## Thermische Eigenschaften

## Thermal properties

|                                   |                                      |                                                                                                                                    |                     |                                                                      |
|-----------------------------------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------------------------------------------------------------------|
| Innerer Wärmewiderstand           | thermal resistance, junction to case | $\Theta = 180^{\circ}\text{el, sinus: pro Modul/per module}$<br>pro Zweig/per arm<br>DC: pro Modul/per module<br>pro Zweig/per arm | $R_{\text{thJC}}$   | max. 0,065°C/W<br>max. 0,13 °C/W<br>max. 0,062°C/W<br>max. 0,124°C/W |
| Übergangs-Wärmewiderstand         | thermal resistance, case to heatsink | pro Modul/per module<br>pro Zweig/per arm                                                                                          | $R_{\text{thCK}}$   | max. 0,02 °C/W<br>max. 0,04 °C/W                                     |
| Höchstzul. Sperrschichttemperatur | max. junction temperature            |                                                                                                                                    | $t_{vj\text{ max}}$ | 125°C                                                                |
| Betriebstemperatur                | operating temperature                |                                                                                                                                    | $t_{\text{c op}}$   | - 40°C ... +125°C                                                    |
| Lagertemperatur                   | storage temperature                  |                                                                                                                                    | $t_{\text{stg}}$    | - 40°C ... +130°C                                                    |

## Mechanische Eigenschaften

## Mechanical properties

|                              |                                  |                               |    |                           |
|------------------------------|----------------------------------|-------------------------------|----|---------------------------|
| Si-Elemente mit Druckkontakt | Si-pellets with pressure contact |                               |    | AlN                       |
| Innere Isolation             | internal insulation              |                               |    |                           |
| Anzugsdrehmomente            | tightening torques               |                               |    |                           |
| mechanische Befestigung      | mounting torque                  | Toleranz/tolerance $\pm 15\%$ | M1 | 6 Nm                      |
| elektrische Anschlüsse       | terminal connection torque       | Toleranz/tolerance + 5%/- 10% | M2 | 12 Nm                     |
| Gewicht                      | weight                           |                               | G  | typ. 800 g                |
| Kriechstrecke                | creepage distance                |                               |    | 17 mm                     |
| Schwingfestigkeit            | vibration resistance             | $f = 50\text{ Hz}$            |    | 5 · 9,81 m/s <sup>2</sup> |
| Maßbild                      | outline                          |                               |    | 8                         |

Diese Module können auch mit gemeinsamer Anode oder gemeinsamer Kathode geliefert werden.

These modules can also be supplied with common anode or common cathode.

Recognized by UNDERWRITERS LABORATORIES INC.

TT 251 N, TD 251 N, DT 251 N

**Elektrische Eigenschaften****Electrical properties****Höchstzulässige Werte****Maximum rated values**

|                                                          |                                                        |                                                                                                                                         |                                   |                                                      |
|----------------------------------------------------------|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|------------------------------------------------------|
| Periodische Vorwärts- und Rückwärts-Spitzensperrspannung | repetitive peak forward off-state and reverse voltages | $t_{vj} = -40^{\circ}\text{C} \dots t_{vj\text{ max}}$                                                                                  | $V_{\text{DRM}}, V_{\text{RRM}}$  | 600, 800 V<br>1000, 1200 V<br>1400, 1600 V<br>1800 V |
| Vorwärts-Stoßspitzenspannung                             | non repetitive peak forward off-state voltage          | $t_{vj} = -40^{\circ}\text{C} \dots t_{vj\text{ max}}$                                                                                  | $V_{\text{DSM}} = V_{\text{DRM}}$ |                                                      |
| Rückwärts-Stoßspitzenspannung                            | non repetitive peak reverse voltage                    | $t_{vj} = +25^{\circ}\text{C} \dots t_{vj\text{ max}}$                                                                                  | $V_{\text{RSM}} = V_{\text{RRM}}$ | + 100 V                                              |
| Durchlaßstrom-Grenzeffektivwert                          | RMS on-state current                                   | $t_c = 85^{\circ}\text{C}$                                                                                                              | $I_{\text{TRMSM}}$                | 410 A                                                |
| Dauergrenzstrom                                          | average on-state current                               | $t_c = 82^{\circ}\text{C}$                                                                                                              | $I_{\text{TAVM}}$                 | 250 A<br>261 A                                       |
| Stoßstrom-Grenzwert                                      | surge current                                          | $t_{vj} = 25^{\circ}\text{C}, t_p = 10\text{ ms}$<br>$t_{vj} = t_{vj\text{ max}}, t_p = 10\text{ ms}$                                   | $I_{\text{TSM}}$                  | 9100 A<br>8000 A                                     |
| Grenzlastintegral                                        | $\int i^2 dt$ -value                                   | $t_{vj} = 25^{\circ}\text{C}, t_p = 10\text{ ms}$<br>$t_{vj} = t_{vj\text{ max}}, t_p = 10\text{ ms}$                                   | $\int i^2 dt$                     | 414000 A <sup>2</sup> s<br>320000 A <sup>2</sup> s   |
| Kritische Stromsteilheit                                 | critical rate of rise of on-state current              | $v_D \leq 67\% V_{\text{DRM}}, f_o = 50\text{ Hz}$<br>$v_L = 10\text{ V}, i_{\text{GM}} = 1\text{ A}, di_G/dt = 1\text{ A}/\mu\text{s}$ | $(di/dt)_{\text{cr}}$             | 250 A/ $\mu\text{s}$                                 |
| Kritische Spannungssteilheit                             | critical rate of rise of off-state voltage             | $t_{vj} = t_{vj\text{ max}}, v_D = 67\% V_{\text{DRM}}$                                                                                 | $(dv/dt)_{\text{cr}}$             | 1000 V/ $\mu\text{s}$                                |

**Charakteristische Werte****Characteristic values**

|                                    |                                        |                                                                                                                                                                                     |                    |                        |
|------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------------|
| Durchlaßspannung                   | on-state voltage                       | $t_{vj} = t_{vj\text{ max}}, i_T = 800\text{ A}$                                                                                                                                    | $v_T$              | max. 1,4 V             |
| Schleusenspannung                  | threshold voltage                      | $t_{vj} = t_{vj\text{ max}}$                                                                                                                                                        | $V_{\text{T(TO)}}$ | 0,8 V                  |
| Ersatzwiderstand                   | slope resistance                       | $t_{vj} = t_{vj\text{ max}}$                                                                                                                                                        | $r_T$              | 0,7 m $\Omega$         |
| Zündstrom                          | gate trigger current                   | $t_{vj} = 25^{\circ}\text{C}, v_D = 6\text{ V}$                                                                                                                                     | $i_{\text{GT}}$    | max. 200 mA            |
| Zündspannung                       | gate trigger voltage                   | $t_{vj} = 25^{\circ}\text{C}, v_D = 6\text{ V}$                                                                                                                                     | $V_{\text{GT}}$    | max. 2 V               |
| Nicht zündender Steuerstrom        | gate non trigger current               | $t_{vj} = t_{vj\text{ max}}, v_D = 6\text{ V}$                                                                                                                                      | $i_{\text{GD}}$    | max. 10 mA             |
| Nicht zündende Steuerspannung      | gate non trigger voltage               | $t_{vj} = t_{vj\text{ max}}, v_D = 0,5 V_{\text{DRM}}$                                                                                                                              | $V_{\text{GD}}$    | max. 0,2 V             |
| Haltestrom                         | holding current                        | $t_{vj} = 25^{\circ}\text{C}, v_D = 6\text{ V}, R_{\text{AK}} = 5\text{ }\Omega$                                                                                                    | $I_{\text{H}}$     | max. 300 mA            |
| Einraststrom                       | latching current                       | $t_{vj} = 25^{\circ}\text{C}, v_D = 6\text{ V}, R_{\text{GK}} \geq 10\text{ }\Omega$<br>$i_{\text{GM}} = 1\text{ A}, di_G/dt = 1\text{ A}/\mu\text{s}, t_g = 20\text{ }\mu\text{s}$ | $I_{\text{L}}$     | max. 1,2 A             |
| Vorwärts- und Rückwärts-Sperrstrom | forward off-state and reverse currents | $t_{vj} = t_{vj\text{ max}}, v_D = V_{\text{DRM}}, v_R = V_{\text{RRM}}$                                                                                                            | $i_D, i_R$         | max. 50 mA             |
| Zündverzögerung                    | gate controlled delay time             | $t_{vj} = 25^{\circ}\text{C}, i_{\text{GM}} = 1\text{ A}, di_G/dt = 1\text{ A}/\mu\text{s}$                                                                                         | $t_{\text{gd}}$    | max. 3 $\mu\text{s}$   |
| Freiwerdezeit                      | circuit commutated turn-off time       | siehe Techn. Erl./see Techn. Inf.                                                                                                                                                   | $t_q$              | typ. 250 $\mu\text{s}$ |
| Isolations-Prüfspannung            | insulation test voltage                | RMS, $f = 50\text{ Hz}, t = 1\text{ min}$                                                                                                                                           | $V_{\text{ISOL}}$  | 3 kV                   |

**Thermische Eigenschaften****Thermal properties**

|                                   |                                      |                                                                                                                                    |                     |                                                                                                                                                                     |
|-----------------------------------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Innerer Wärmewiderstand           | thermal resistance, junction to case | $\Theta = 180^{\circ}\text{el, sinus: pro Modul/per module}$<br>pro Zweig/per arm<br>DC: pro Modul/per module<br>pro Zweig/per arm | $R_{\text{thJC}}$   | max. 0,065 $^{\circ}\text{C}/\text{W}$<br>max. 0,13 $^{\circ}\text{C}/\text{W}$<br>max. 0,062 $^{\circ}\text{C}/\text{W}$<br>max. 0,124 $^{\circ}\text{C}/\text{W}$ |
| Übergangs-Wärmewiderstand         | thermal resistance, case to heatsink | pro Modul/per module<br>pro Zweig/per arm                                                                                          | $R_{\text{thCK}}$   | max. 0,02 $^{\circ}\text{C}/\text{W}$<br>max. 0,04 $^{\circ}\text{C}/\text{W}$                                                                                      |
| Höchstzul. Sperrschichttemperatur | max. junction temperature            |                                                                                                                                    | $t_{vj\text{ max}}$ | 125 $^{\circ}\text{C}$                                                                                                                                              |
| Betriebstemperatur                | operating temperature                |                                                                                                                                    | $t_{\text{c op}}$   | -40 $^{\circ}\text{C} \dots +125^{\circ}\text{C}$                                                                                                                   |
| Lagertemperatur                   | storage temperature                  |                                                                                                                                    | $t_{\text{stg}}$    | -40 $^{\circ}\text{C} \dots +130^{\circ}\text{C}$                                                                                                                   |

**Mechanische Eigenschaften****Mechanical properties**

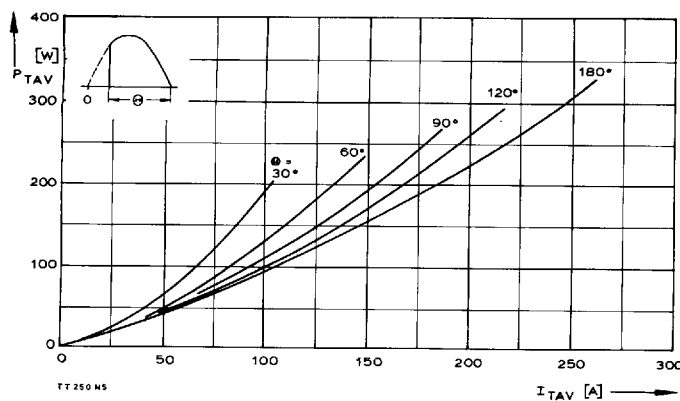
|                              |                                  |                               |    |                           |
|------------------------------|----------------------------------|-------------------------------|----|---------------------------|
| Si-Elemente mit Druckkontakt | Si-pellets with pressure contact |                               |    | AlN                       |
| Innere Isolation             | internal insulation              |                               |    |                           |
| Anzugsdrehmomente            | tightening torques               |                               |    |                           |
| mechanische Befestigung      | mounting torque                  |                               |    |                           |
| elektrische Anschlüsse       | terminal connection torque       | Toleranz/tolerance $\pm 15\%$ | M1 | 6 Nm                      |
| Gewicht                      | weight                           | Toleranz/tolerance + 5%/- 10% | M2 | 12 Nm                     |
| Kriechstrecke                | creepage distance                |                               | G  | typ. 800 g                |
| Schwingfestigkeit            | vibration resistance             |                               |    | 17 mm                     |
| Maßbild                      | outline                          | $f = 50\text{ Hz}$            |    | 5 · 9,81 m/s <sup>2</sup> |
|                              |                                  |                               |    | 8                         |

Diese Module können auch mit gemeinsamer Anode oder gemeinsamer Kathode geliefert werden.

These modules can also be supplied with common anode or common cathode.

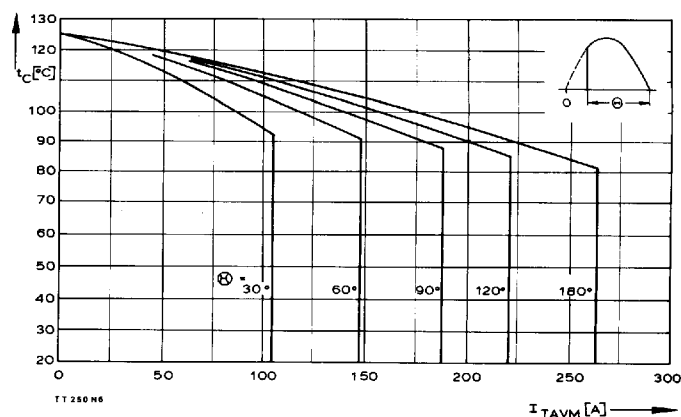
Recognized by UNDERWRITERS LABORATORIES INC.

TT 250 N, TD 250 N, DT 250 N  
TT 251 N, TD 251 N, DT 251 N



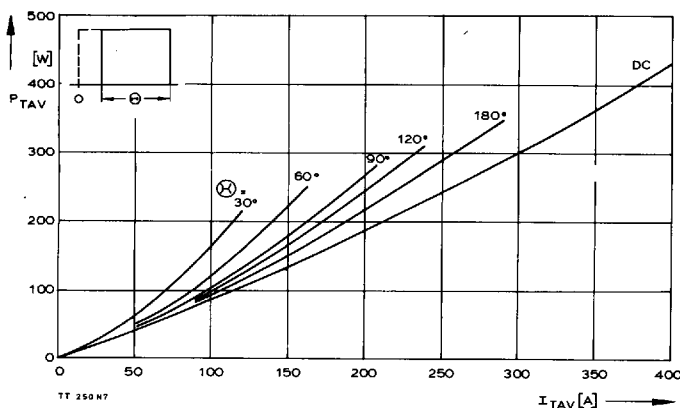
Bild/Fig. 1

Durchlaßverlustleistung eines Zweiges/On-state power loss per arm  $P_{TAV}$   
Parameter: Stromflußwinkel/current conduction angle  $\theta$



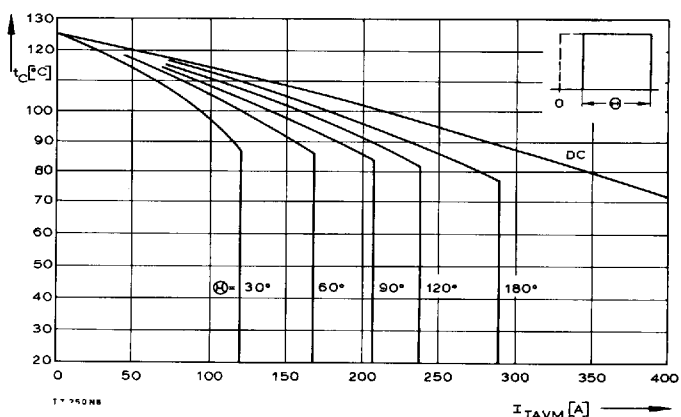
Bild/Fig. 2

Höchstzulässige Gehäusetemperatur  $t_c$  in Abhängigkeit vom Zweigstrom  
Maximum allowable case temperature  $t_c$  versus current per arm



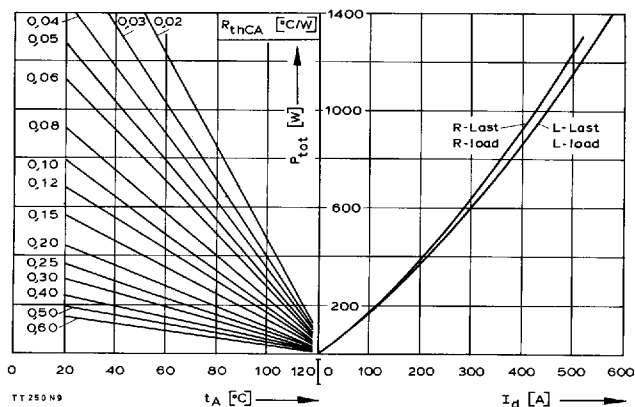
Bild/Fig. 3

Durchlaßverlustleistung eines Zweiges/On-state power loss per arm  $P_{TAV}$   
Parameter: Stromflußwinkel/current conduction angle  $\theta$



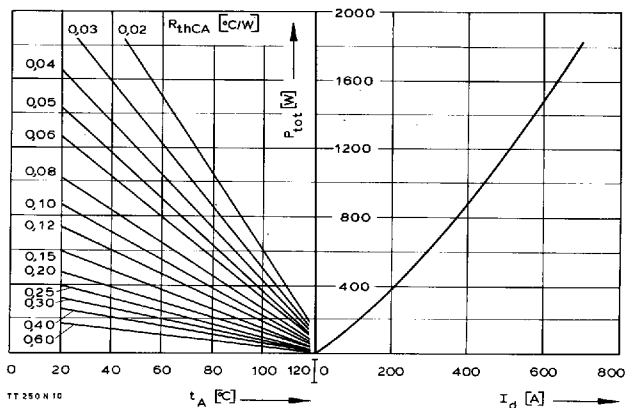
Bild/Fig. 4

Höchstzulässige Gehäusetemperatur  $t_c$  in Abhängigkeit vom Zweigstrom  
Maximum allowable case temperature  $t_c$  versus current per arm



Bild/Fig. 5

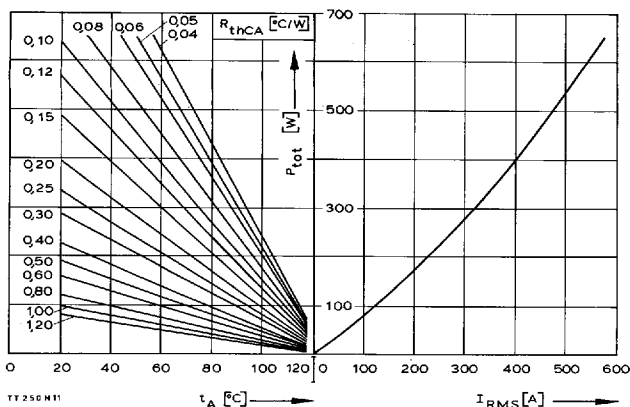
B2 - Zweipuls-Brückenschaltung/Two-pulse bridge circuit  
Höchstzulässiger Ausgangsstrom  $I_d$  in Abhängigkeit von der Umgebungstemperatur  $t_A$ .  
Maximum allowable output current  $I_d$  versus ambient temperature  $t_A$ .  
Parameter: Wärmewiderstand zwischen Powerblock und Umgebung/  
thermal resistance case to ambient  $R_{thCA}$



Bild/Fig. 6

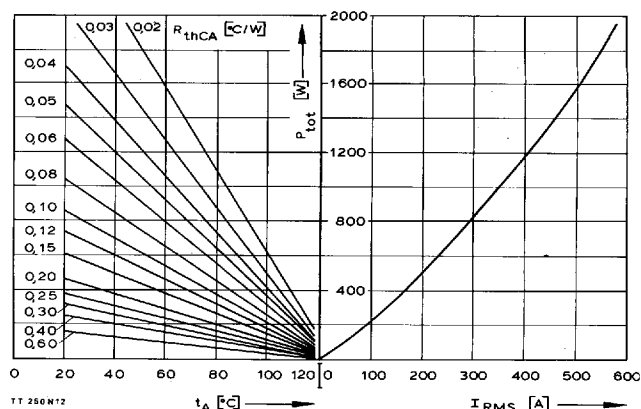
B6 - Sechspuls-Brückenschaltung/Six-pulse bridge circuit  
Höchstzulässiger Ausgangsstrom  $I_d$  in Abhängigkeit von der Umgebungstemperatur  $t_A$ .  
Maximum allowable output current  $I_d$  versus ambient temperature  $t_A$ .  
Parameter: Wärmewiderstand zwischen Powerblock und Umgebung/  
thermal resistance case to ambient  $R_{thCA}$

TT 250 N, TD 250 N, DT 250 N  
TT 251 N, TD 251 N, DT 251 N



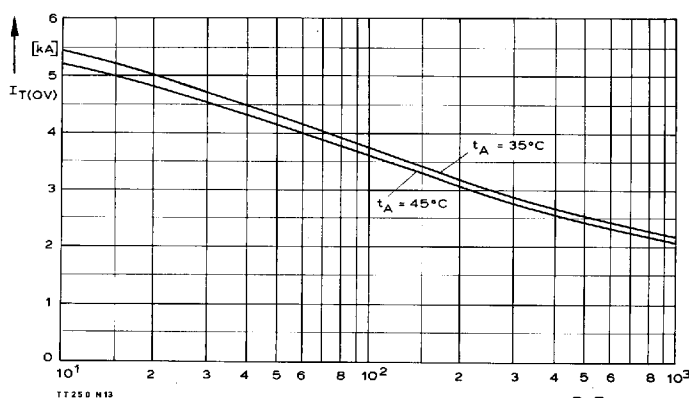
Bild/Fig. 7

W1C – Einphasen-Wechselwegschaltung/Single-phase inverse parallel circuit  
Höchstzulässiger Strom  $I_{RMS}$  in Abhängigkeit von der Umgebungstemperatur  $t_A$ .  
Maximum allowable current  $I_{RMS}$  versus ambient temperature  $t_A$ .  
Parameter: Wärmewiderstand zwischen Powerblock und Umgebung/  
thermal resistance case to ambient  $R_{thCA}$



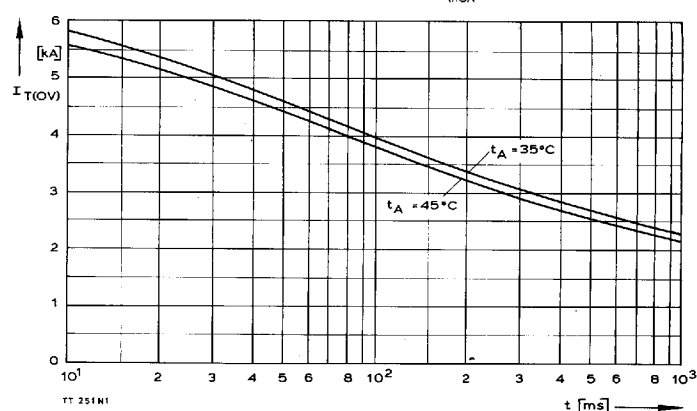
Bild/Fig. 8

W3C – Dreiphasen-Wechselwegschaltung/Three-phase inverse parallel circuit  
Höchstzulässiger Strom je Phase  $I_{RMS}$  in Abhängigkeit von der Umgebungstemperatur  $t_A$ .  
Maximum allowable current per phase  $I_{RMS}$  versus ambient temperature  $t_A$ .  
Parameter: Wärmewiderstand zwischen Powerblock und Umgebung/  
thermal resistance case to ambient  $R_{thCA}$



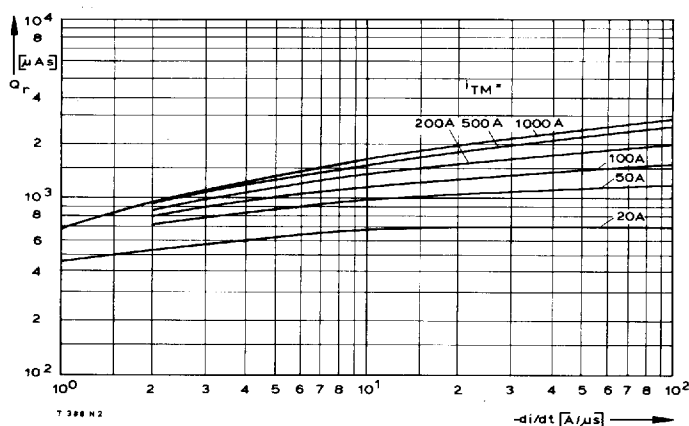
Bild/Fig. 9 TT 250 N

Grenzstrom je Zweig  $I_{T(OV)M}$  bei Luftselbstkühlung,  $t_A = 45^\circ\text{C}$  und verstärkter Luftkühlung,  $t_A = 35^\circ\text{C}$ , Kühlkörper KP0.33S,  $V_{RM} = 0.8 V_{RRM}$ .  
Limiting overload on-state current per arm  $I_{T(OV)M}$  at natural ( $t_A = 45^\circ\text{C}$ ) and forced ( $t_A = 35^\circ\text{C}$ ) cooling, heatsink type KP0.33S,  $V_{RM} = 0.8 V_{RRM}$ .  
a – Belastung nach Leerlauf/current surge under no-load conditions  
b – Belastung nach Betrieb mit Dauergrenzstrom  $I_{TAVM}$   
Current surge occurs during operation at limiting mean on-state current rating  $I_{TAVM}$



Bild/Fig. 10 TT 251 N

Grenzstrom je Zweig  $I_{T(OV)M}$  bei Luftselbstkühlung,  $t_A = 45^\circ\text{C}$  und verstärkter Luftkühlung,  $t_A = 35^\circ\text{C}$ , Kühlkörper KP0.33S,  $V_{RM} = 0.8 V_{RRM}$ .  
Limiting overload on-state current per arm  $I_{T(OV)M}$  at natural ( $t_A = 45^\circ\text{C}$ ) and forced ( $t_A = 35^\circ\text{C}$ ) cooling, heatsink type KP0.33S,  $V_{RM} = 0.8 V_{RRM}$ .  
a – Belastung nach Leerlauf/current surge under no-load conditions  
b – Belastung nach Betrieb mit Dauergrenzstrom  $I_{TAVM}$   
Current surge occurs during operation at limiting mean on-state current rating  $I_{TAVM}$

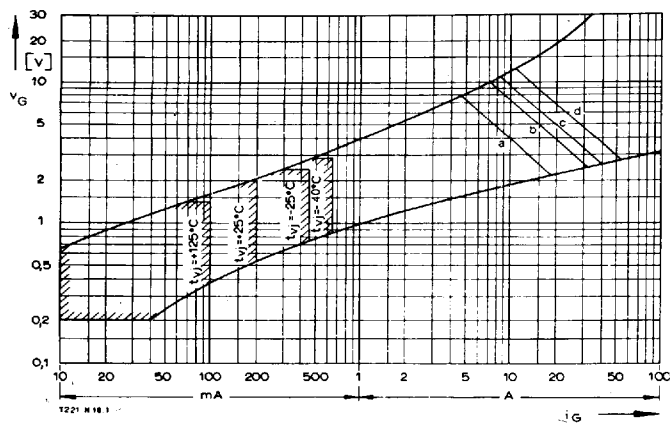


Bild/Fig. 11

Sperrverzögerungsladung  $Q_r$  in Abhängigkeit von der abkommütierenden Stromsteilheit  $-di/dt$  bei  $t_{vj} = t_{vj \max}$ ,  $V_R = 0.5 V_{RRM}$ ,  $V_{RM} = 0.8 V_{RRM}$ .  
Der angegebene Verlauf ist gültig für 90% aller Elemente.  
Recovered charge versus the rate of decay of the forward on-state current  $-di/dt$  at  $t_{vj} = t_{vj \max}$ ,  $V_R = 0.5 V_{RRM}$ ,  $V_{RM} = 0.8 V_{RRM}$ .  
These curves are valid for 90% of all devices.  
Parameter: Durchlaßstrom  $i_{TM}$ /On-state current  $I_{TM}$

TT 250 N, TD 250 N, DT 250 N

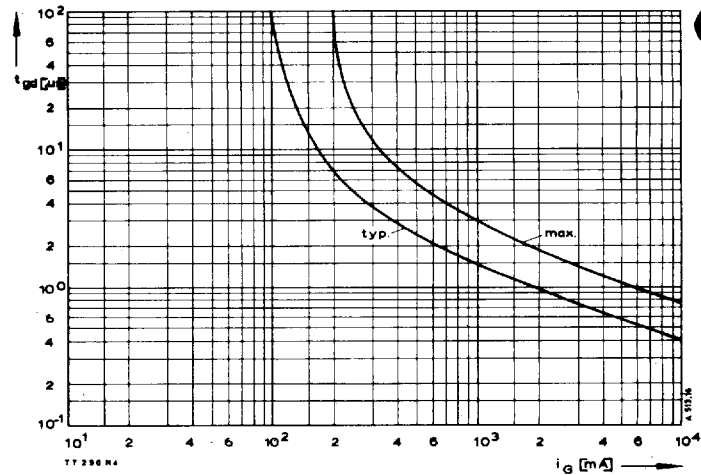
TT 251 N, TD 251 N, DT 251 N



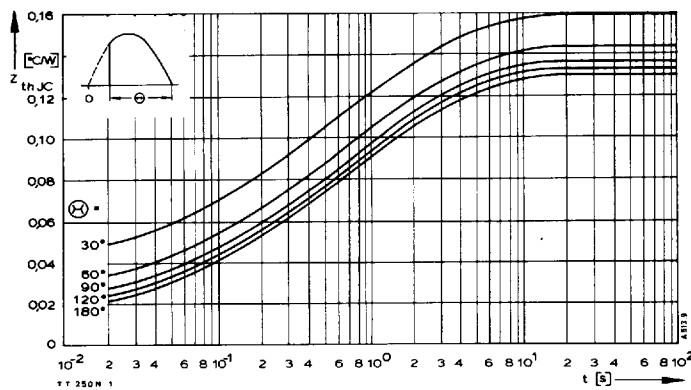
Bild/Fig. 12

Zündbereich und Spitzensteuerleistung bei  $v_D = 6$  V.Gate characteristic and peak gate power dissipation at  $v_D = 6$  V.

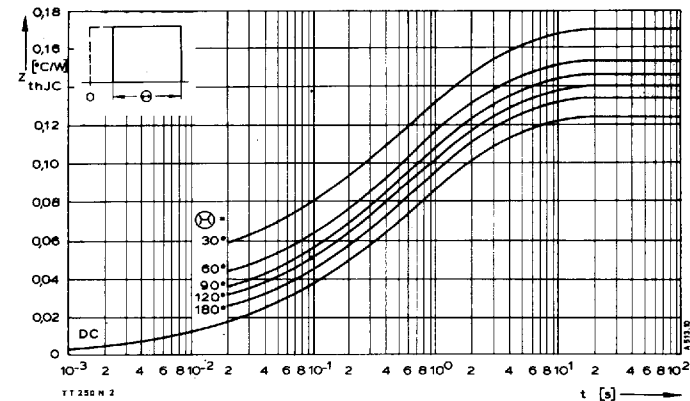
| Parameter:                                                                      | a  | b  | c   | d   |
|---------------------------------------------------------------------------------|----|----|-----|-----|
| Steuerimpulsdauer/Pulse duration $t_g$ [ms]                                     | 10 | 1  | 0,5 | 0,1 |
| Höchstzulässige Spitzensteuerleistung/<br>Maximum allowable peak gate power [W] | 40 | 80 | 100 | 150 |



Bild/Fig. 13

Zündverzugs/Gate controlled delay time  $t_{gd}$ .DIN 41787,  $t_a = 1$  μs,  $T_J = 25$ °C.

Bild/Fig. 14

Transienter innerer Wärmewiderstand je Zweig  $Z_{thJC}$ .Transient thermal impedance per arm  $Z_{thJC}$ , junction to case.

Bild/Fig. 15

Transienter innerer Wärmewiderstand je Zweig  $Z_{thJC}$ .Transient thermal impedance, junction to case, per arm  $Z_{thJC}$ .

| Pos. n           | 1      | 2      | 3      | 4      | 5      |
|------------------|--------|--------|--------|--------|--------|
| $R_{thn}$ [°C/W] | 0,0031 | 0,0097 | 0,0257 | 0,0429 | 0,0426 |
| $\tau_n$ [s]     | 0,0009 | 0,008  | 0,11   | 0,61   | 3,06   |

$$Z_{thJC} = \sum_{n=1}^{n_{max}} R_{thn} (1 - e^{-t/\tau_n})$$

Transienter Wärmewiderstand  $Z_{thJC}$  pro Zweig für DC.Transient thermal impedance  $Z_{thJC}$  per arm for DC.