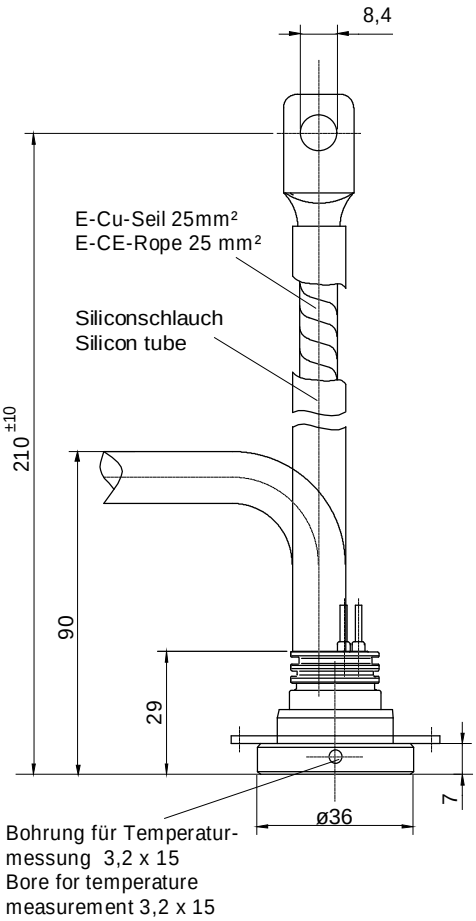
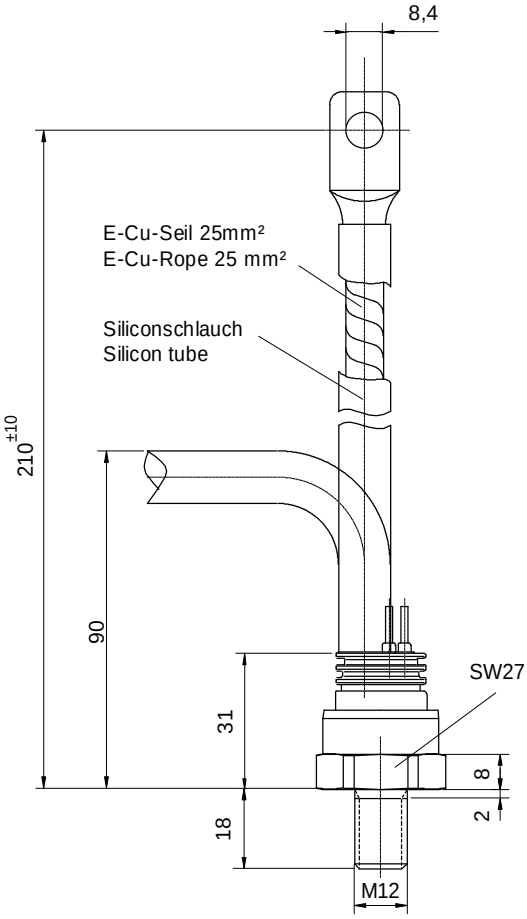
European Power-
Semiconductor and
Electronics Company
GmbH + Co. KG

# Leistungsgleichrichterdioden
# Power Rectifier Diodes
# D 255 N




| Typ<br>Type | Schaltsymbol<br>Circuit symbol | Kathode<br>Cathode | Anode<br>Anode | Schutzschlauch<br>Prot. flex. tubing |
|---|---|---|---|---|
| N | | Seil<br>Rope | Gehäuse<br>Case | rot<br>red |
| K | | Gehäuse<br>Case | Seil<br>Rope | blau<br>blue |

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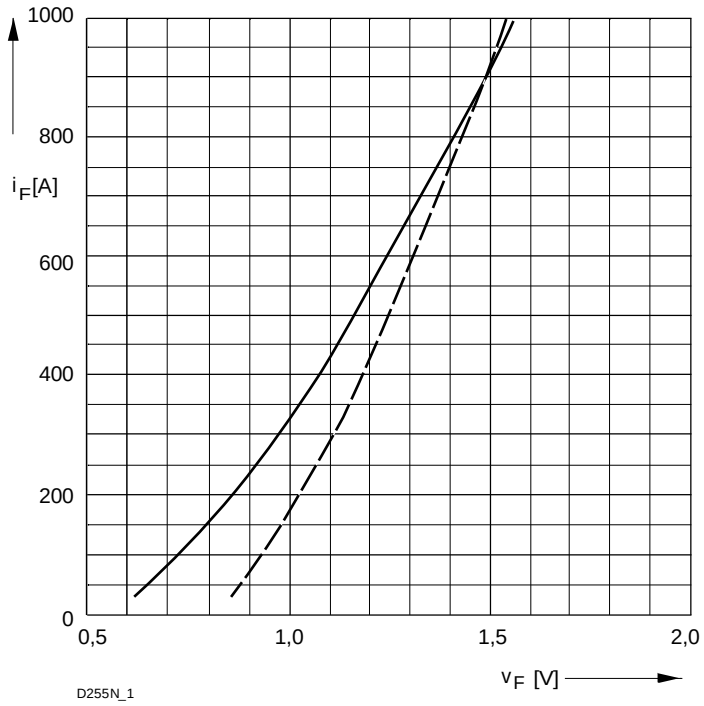
VWK July 1996

## D 255 N

| **Elektrische Eigenschaften** | **Electrical properties** | | | | | |
|---|---|---|---|---|---|---|
| **Höchstzulässige Werte** | **Maximum rated values** | | | | | |
| Periodische Spitzensperrspannung | repetitive peak reverse voltage | $t_{vj}$ = -40°C... $t_{vj\ max}$ | $V_{RRM}$ | | 200, 400 | V |
| | | | | | 600, 800 * | V |
| Stoßspitzensperrspannung | non-repetitive peak reverse voltage | $t_{vj}$ = +25°C... $t_{vj\ max}$ | $V_{RSM} = V_{RRM}$ | | + 50 | V |
| Durchlaßstrom-Grenzeffektivwert | RMS forward current | | $I_{FRMSM}$ | | 400 | A |
| Dauergrenzstrom | mean forward current | $t_c$ = 110 °C | $I_{FAVM}$ | | 255 | A |
| | | $t_c$ = 130 °C | | | 202 | A |
| Stoßstrom-Grenzwert | surge forward current | $t_{vj}$ = 25°C, $t_p$ = 10 ms | $I_{FSM}$ | | 5,8 | kA |
| | | $t_{vj} = t_{vj\ max}$, $t_p$ = 10 ms | | | 4,6 | kA |
| Grenzlastintegral | $I^2t$-value | $t_{vj}$ = 25°C, $t_p$ = 10 ms | $I^2t$ | | 168,2 | $kA^2s$ |
| | | $t_{vj} = t_{vj\ max}$, $t_p$ = 10 ms | | | 105,8 | $kA^2s$ |
| **Charakteristische Werte** | **Characteristic values** | | | | | |
| Durchlaßspannung | on-state voltage | $t_{vj} = t_{vj\ max}$, $i_F$ = 800 A | $V_T$ | max. | 1,4 | V |
| Schleusenspannung | threshold voltage | $t_{vj} = t_{vj\ max}$ | $V_{T(TO)}$ | | 0,65 | V |
| Ersatzwiderstand | slope resistance | $t_{vj} = t_{vj\ max}$ | $r_T$ | | 0,85 | mΩ |
| Sperrstrom | reverse current | $t_{vj} = t_{vj\ max}$, $V_R = V_{RRM}$ | $i_R$ | max. | 20 | mA |
| **Thermische Eigenschaften** | **Thermal properties** | | | | | |
| Innerer Widerstand | thermal resistance, junction | Θ = 180° sin | $R_{thJC}$ | max. | 0,230 | °C/W |
| | to case | DC | | max. | 0,225 | °C/W |
| Übergangs-Wärmewiderstand | thermal resistance,case to heatsink | | $R_{thCK}$ | max. | 0,04 | °C/W |
| Höchstzul.Sperrschichttemperatur | max. junction temperature | | $t_{vj\ max}$ | | 180 | °C |
| Betriebstemperatur | operating temperature | | $t_{c\ op}$ | | -40...+180 | °C |
| Lagertemperatur | storage temperature | | $t_{stg}$ | | -40...+180 | °C |
| **Mechanische Eigenschaften** | **Mechanical properties** | | | | | |
| Si-Element mit Druckkontakt | Si-pellet with pressure contact | ∅ = 17 mm | | | | |
| Anzugsdrehmoment | tightening torque | Gehäuseform/case design B | M1 | | 20 | Nm |
| Gewicht | weight | | G | typ. | 175 | g |
| Kriechstrecke | creepage distance | | | | 12 | mm |
| Feuchteklasse | humidity classification | DIN 40040 | | | | C |
| Schwingfestigkeit | vibration resistance | f = 50 Hz | | | 50 | $m/s^2$ |
| Maßbild | outline | | | | Seite/page | |
| Polarität | polarity | | | | Anode=Gehäuse/case | |

* Bitte Liefertermin erfragen / Delivery on request




Bild/Fig. 1
Grenzdurchlaßkennlinie
Limiting forward characteristic $i_F = f(v_F)$
———— $t_{vj}$ = 180 °C
— — — $t_{vj}$ = 25 °C

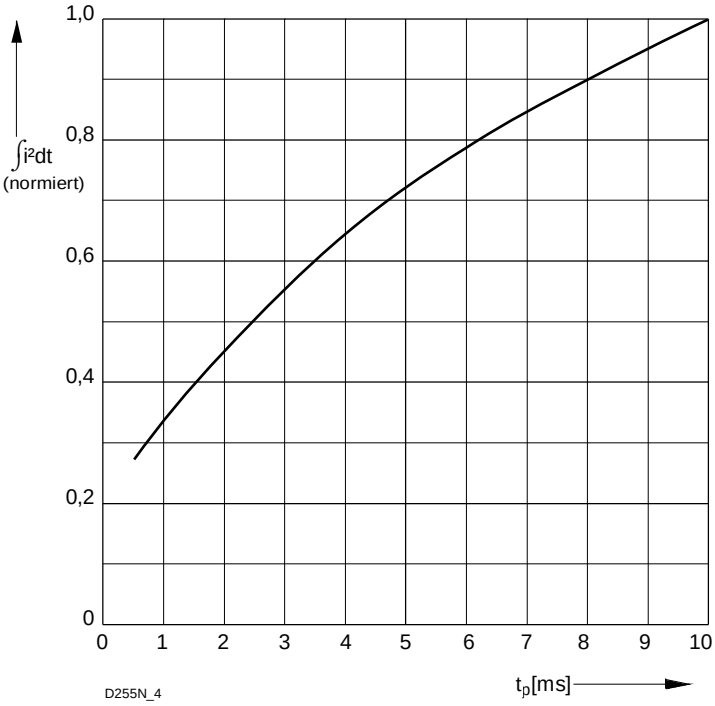



Bild / Fig. 2
Normiertes Grenzlastintegral / Normalized i²t
$\int i^2dt = f(t_p)$

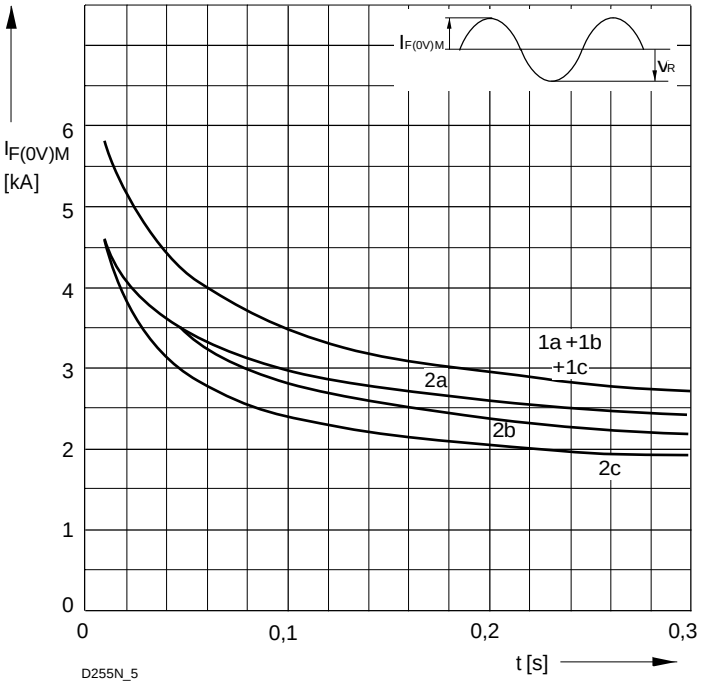



Bild / Fig. 3
Grenzstrom / Maximum overload forward current $I_{F(0V)M} = f(t)$
1 - $I_{FAV(vor)}$ = 0 A; $t_{vj} = t_C$ = 25 °C
2 - $I_{FAV(vor)}$ = 255 A; $t_C$ = 110 °C; $t_{vj}$ = 180 °C
a - $v_R \leq$ 50 V
b - $v_R$ = 0,5 $V_{RRM}$
c - $v_R$ = 0,8 $V_{RRM}$

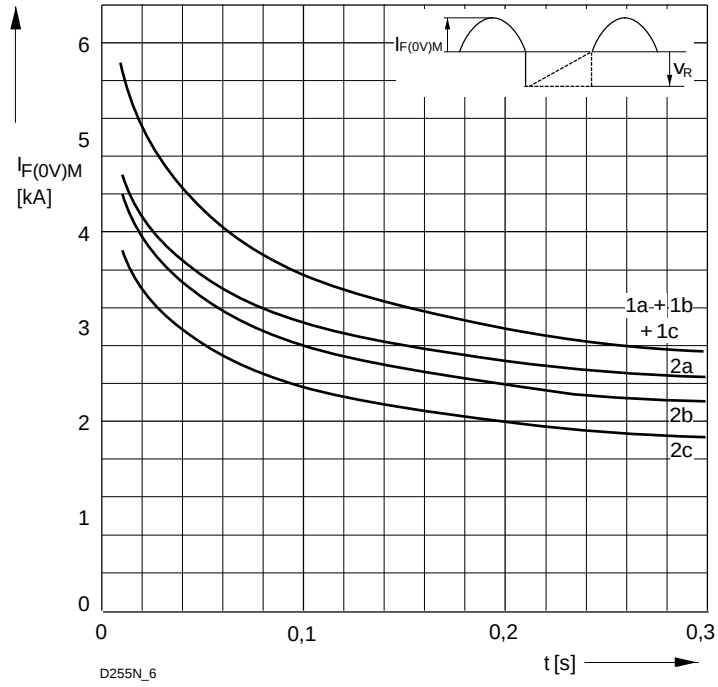



Bild / Fig. 4
Grenzstrom / Maximum overload forward current $I_{F(0V)M} = f(t)$
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2 - $I_{FAV(vor)}$ = 255 A; $t_C$ = 110 °C; $t_{vj}$ = 180 °C
a - $v_R \leq$ 50 V
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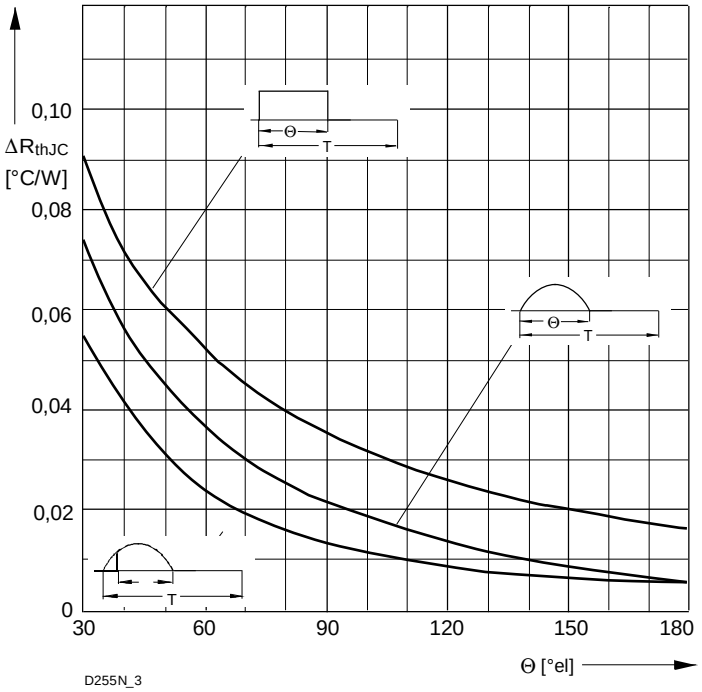


Bild / Fig. 5
Differenz zwischen den Wärmewiderständen
für Pulsstrom und DC
Difference between the values of thermal resistance for
pulse current and DC
Parameter: Stromkurvenform / Current waveform

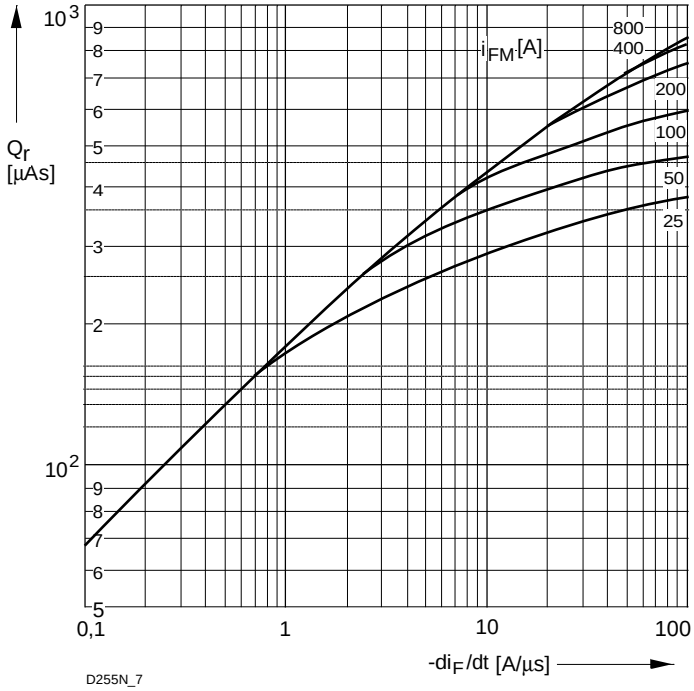


Bild / Fig. 6
Sperrverzögerungsladung / Recovered charge $Q_r = f(-di_F/dt)$
$t_{vj} = t_{vjmax}$; $v_R \leq 0{,}5\ V_{RRM}$; $V_{RM} = 0{,}8\ V_{RRM}$
Beschaltung / Snubber: C = 0,68 µF; R = 5,6 Ω
Parameter: Durchlaßstrom / Forward current $i_{FM}$

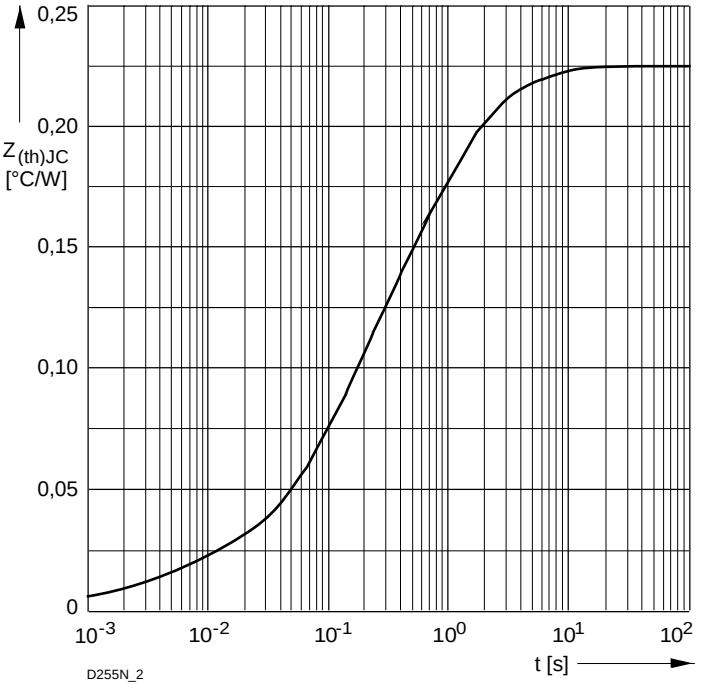


Bild / Fig. 7
Transienter innerer Wärmewiderstand
Transient thermal impedance $Z_{thJC} = f(t)$, DC
1 - Beidseitige Kühlung / Two-sided cooling
2 - Anodenseitige Kühlung / Anode-sided cooling
3 - Kathodenseitige Kühlung / Cathode-sided cooling

Analytische Elemente des transienten Wärmewiderstandes $Z_{thJC}$ für DC
Analytical elements of transient thermal impedance $Z_{thJC}$ for DC

| Pos. n | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| $R_{thn}$ °C/W | 0,00102 | 0,00502 | 0,00771 | 0,06455 | 0,113 | 0,0337 | |
| $\tau_n$ [s] | 0,000054 | 0,000569 | 0,00559 | 0,0944 | 0,596 | 5,23 | |

Analytische Funktion / Analytical function:

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