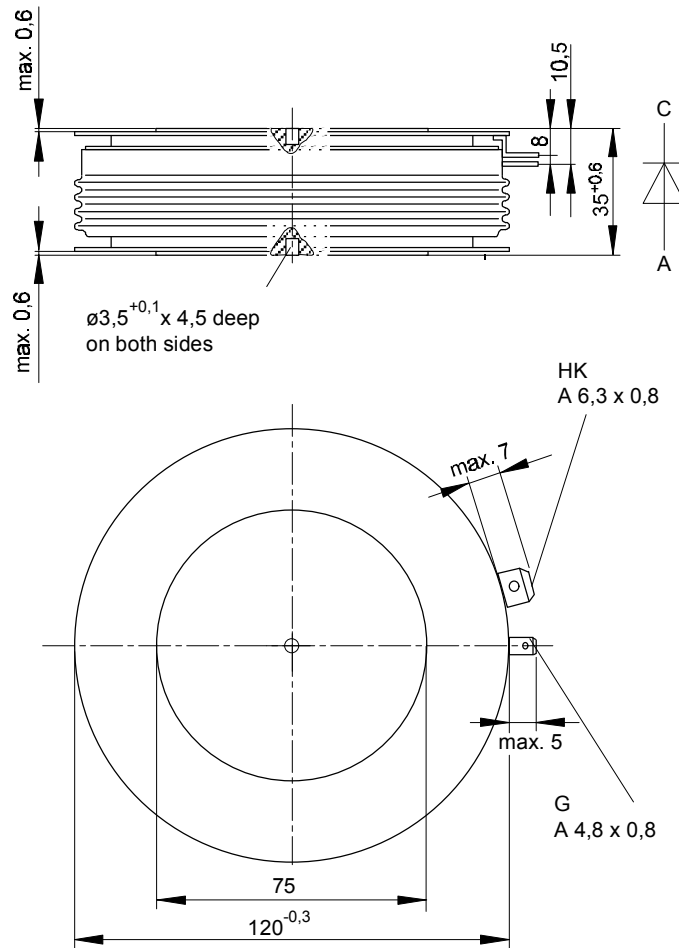




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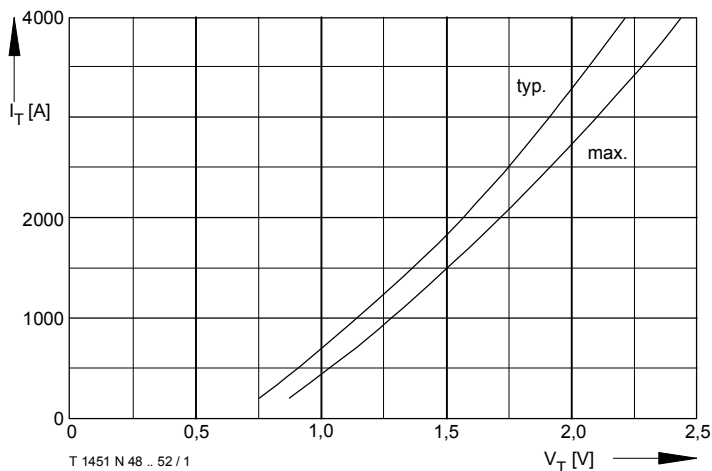
Marketing Information

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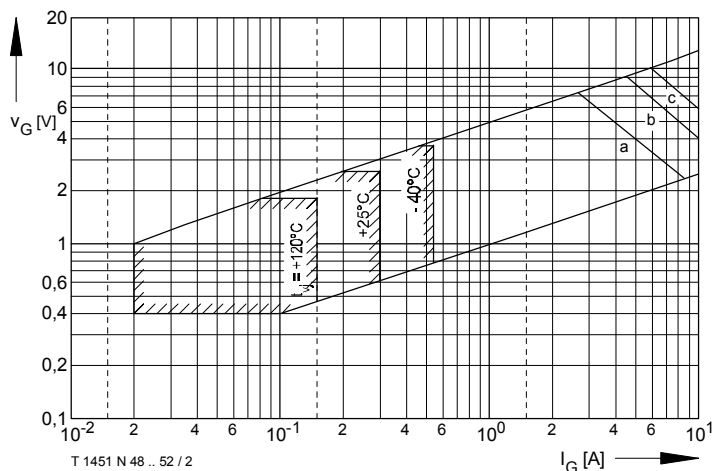
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Elektrische Eigenschaften		Electrical properties	
<i>Höchstzulässige Werte</i>		<i>Maximum rated values</i>	
Periodische Vorwärts- und Rückwärts-Spitzensperrspannung	repetitive peak forward off-state and reverse voltages	$t_{vj} = -40^{\circ}\text{C} \dots t_{vj \text{ max, } f = 50 \text{ Hz}}$	$V_{\text{DRM}}, V_{\text{RRM}}$ 4800 5000 5200 V
Durchlaßstrom-Grenzeffektivwert	RMS forward current		I_{TRMSM} 3200 A
Dauergrenzstrom	mean forward current	$t_c = 85^{\circ}\text{C}, f = 50 \text{ Hz}$	I_{TAVM} 1450 A
		$t_c = 60^{\circ}\text{C}, f = 50 \text{ Hz}$	2030 A
Stoßstrom-Grenzwert	surge forward current	$t_{vj} = 25^{\circ}\text{C}, t_p = 10 \text{ ms}, V_R = 0$	I_{FSM} 31,0 kA
		$t_{vj} = t_{vj \text{ max}}, t_p = 10 \text{ ms}, V_R = 0$	28,5 kA
Grenzlastintegral	I^2t -value	$t_{vj} = 25^{\circ}\text{C}, t_p = 10 \text{ ms}$	$I^2 t$ $4,8 \cdot 10^6 \text{ A}^2\text{s}$
		$t_{vj} = t_{vj \text{ max}}, t_p = 10 \text{ ms}$	$4,0 \cdot 10^6 \text{ A}^2\text{s}$
Kritische Stromsteilheit	critical rate of rise of on-state current	$v_D = 0,67 V_{\text{DRM}}, f = 50 \text{ Hz}$	$(di_T/dt)_{\text{cr}}$ 150 A/ μs
		$i_{\text{GM}} = 3 \text{ A}, di_G/dt = 6 \text{ A}/\mu\text{s}$	
Kritische Spannungssteilheit	critical rate of rise of off-state voltage	$t_{vj} = t_{vj \text{ max}}, v_D = 0,67 V_{\text{DRM}}$	$(dv/dt)_{\text{cr}}$ 2000 V/ μs
	5. Kennbuchstabe / 5 th letter H		
<i>Charakteristische Werte</i>		<i>Characteristic values</i>	
	on-state voltage	$t_{vj} = t_{vj \text{ max}}, i_T = 2000 \text{ A}$	v_T typ. 1,57 max. 1,70 V
Schleusenspannung	threshold voltage	$t_{vj} = t_{vj \text{ max}}$	$V_{\text{T(TO)}}$ 0,88 0,92 V
Ersatzwiderstand	slope resistance	$t_{vj} = t_{vj \text{ max}}$	r_T 0,34 0,37 m Ω
Durchlaßrechenkennlinien	on-state characteristics for calculation	$t_{vj} = t_{vj \text{ max}}$	A 0,497 0,539
$V_T = a + B \cdot i_T + C \cdot \ln(i_T + 1) + D \cdot \sqrt{i_T}$		$t_{vj} = t_{vj \text{ max}}$	B 0,00137 0,000139
		$t_{vj} = t_{vj \text{ max}}$	C -0,0127 0,00534
		$t_{vj} = t_{vj \text{ max}}$	D 0,02 0,00164
Zündstrom	gate trigger current	$t_{vj} = 25^{\circ}\text{C}, v_D = 6 \text{ V}$	I_{GT} max. 300 mA
Zündspannung	gate trigger voltage	$t_{vj} = 25^{\circ}\text{C}, v_D = 6 \text{ V}$	V_{GT} max. 2,5 V
Nicht zündender Steuerstrom	gate non-trigger current	$t_{vj} = t_{vj \text{ max}}, v_D = 6 \text{ V}$	I_{GD} 20 mA
		$t_{vj} = t_{vj \text{ max}}, v_D = 0,5 V_{\text{DRM}}$	10 mA
Nicht zündende Steuerspannung	gate non-trigger voltage	$t_{vj} = t_{vj \text{ max}}, v_D = 0,5 V_{\text{DRM}}$	V_{GD} 0,4 V
Haltestrom	holding current	$t_{vj} = 25^{\circ}\text{C}, v_D = 12 \text{ V}, R_A = 4,7 \Omega$	I_H 350 mA
Einraststrom	latching current	$t_{vj} = 25^{\circ}\text{C}, v_D = 12 \text{ V}, R_{\text{GK}} \geq 10 \Omega$	I_L max. 3000 mA
		$i_{\text{GM}} = 3 \text{ A}, di_G/dt = 5 \text{ A}/\mu\text{s}, t_g = 20 \mu\text{s}$	
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 100 mA
Zündverzögerung	gate controlled delay time	$t_{vj} = 25^{\circ}\text{C}, i_{\text{GM}} = 3 \text{ A}, di_G/dt = 5 \text{ A}/\mu\text{s}$	t_{gd} 2 μs
Freiwerdezeit	circuit commutated turn-off time	$t_{vj} = t_{vj \text{ max}}, i_{\text{TM}} = i_{\text{TAVM}}, v_{\text{RM}} = 100 \text{ V}$	t_q typ. 400 μs
		$v_{\text{DM}} = 0,67 V_{\text{RRM}}, dv_D/dt = 20 \text{ V}/\mu\text{s}$	
		$-di/dt = 10 \text{ A}/\mu\text{s}$	
		4. Kennbuchstabe / 4 th letter O	
Sperrverzögerungsladung	recovered charge	$t_{vj} = t_{vj \text{ max}}, i_{\text{TM}} = 2 \text{ kA}, di/dt = 10 \text{ A}/\mu\text{s}$	Q_r 18 mAs
		$v_R = 0,5 V_{\text{RRM}}, v_{\text{RM}} = 0,8 V_{\text{RRM}}$	
Rückstromspitze	peak reverse recovery current	$t_{vj} = t_{vj \text{ max}}, i_{\text{TM}} = 2 \text{ kA}, di/dt = 10 \text{ A}/\mu\text{s}$	I_{RM} A
		$v_R = 0,5 V_{\text{RRM}}, v_{\text{RM}} = 0,8 V_{\text{RRM}}$	
<i>Thermische Eigenschaften</i>		<i>Thermal properties</i>	
Innerer Wärmewiderstand für	thermal resistance, junction to case	$\Theta = 180^{\circ} \sin$	R_{thJC} max. 0,0107 $^{\circ}\text{C}/\text{W}$
beidseitige Kühlung	for two-sided cooling	DC	max. 0,0100 $^{\circ}\text{C}/\text{W}$
Übergangs-Wärmewiderstand	thermal resistance, case to heatsink	beidseitig / two-sided	R_{thCK} max. 0,0025 $^{\circ}\text{C}/\text{W}$
Höchstzul.Sperrschichttemperatur	max. junction temperature		$t_{vj \text{ max}}$ 120 $^{\circ}\text{C}$
Betriebstemperatur	operating temperature		$t_{c \text{ op}}$ -40...+120 $^{\circ}\text{C}$
Lagertemperatur	storage temperature		t_{stg} -40...+150 $^{\circ}\text{C}$
<i>Mechanische Eigenschaften</i>		<i>Mechanical properties</i>	
Si-Elemente mit Druckkontakt	Si-pellet with pressure contact		75TN52
Anpreßkraft	clamping force	F	36...52 kN
Gewicht	weight	G	typ. 1700 g
Kriechstrecke	creepage distance		33 mm
Feuchtklasse	humidity classification	DIN 40040	C
Schwingfestigkeit	vibration resistance	f = 50 Hz	50 m/s ²



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Bild / Fig. 1
Grenzdurchlaßkennlinie / Limiting on-state characteristic
 $i_T = f(v_T)$, $t_{vj} = t_{vj\ max}$



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Bild / Fig. 2
Steuercharakteristik mit Zündbereichen / Gate characteristic with triggering areas $v_G = f(I_G)$, $V_D = 6V$
Parameter:

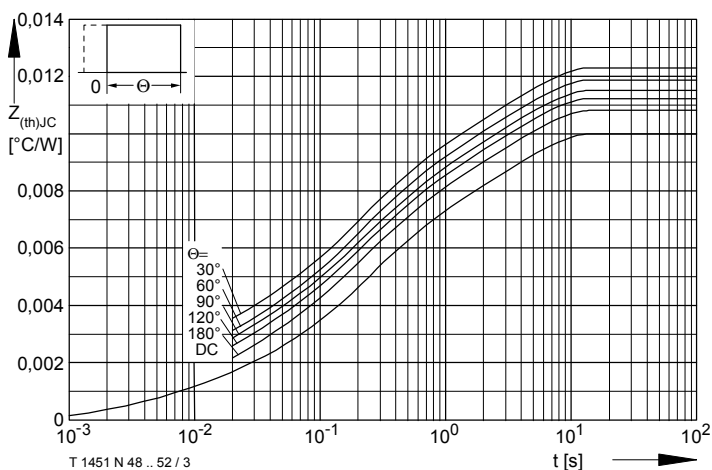
	a	b	c
Steuerimpulsdauer / trigger puls duration t_g [ms]	10	1	0,5
Höchstzulässige Spitzensteuerverlustleistung / Max. rated peak gate power dissipation [W]	20	40	60

Analytische Elemente des transienten Wärmewiderstandes Z_{thJC} pro Zweig für DC
Analytical elements of transient thermal impedance Z_{thJC} per arm for DC

Pos. n	1	2	3	4	5
R_{thn} [°C/W]	0,00047	0,0008	0,0028	0,0027	0,00323
τ_n [s]	0,0041	0,015	0,11	0,44	3,16

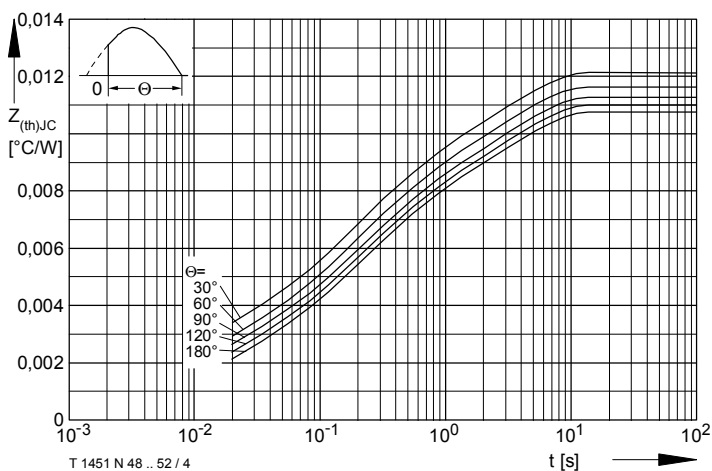
Analytische Funktion / Analytical function:

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



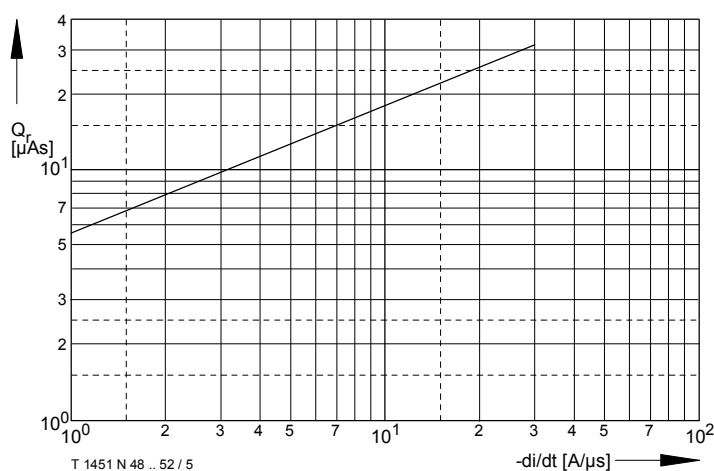
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Bild / Fig. 3
Transienter innerer Wärmewiderstand / Transient thermal impedance
 $Z_{(th)JC} = f(t)$
Doppelseitige Kühlung / Two-sided cooling
Parameter: Stromflußwinkel / current conduction angle θ



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Bild / Fig. 4
Transienter innerer Wärmewiderstand / Transient thermal impedance
 $Z_{thJC} = f(t)$
Doppelseitige Kühlung / Two-sided cooling
Parameter: Stromflußwinkel / current conduction angle θ



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Bild / Fig. 5
Sperrverzögerungsladung / Recovered charge $Q_r = f(-di/dt)$
 $t_{vj} = 120^\circ C$, $i_{TM} = 2000 A$, $v_R = 0.5 V_{RRM}$, $v_{RM} = 0.8 V_{RRM}$
Parameter: Durchlaßstrom / On-state current i_{TM}