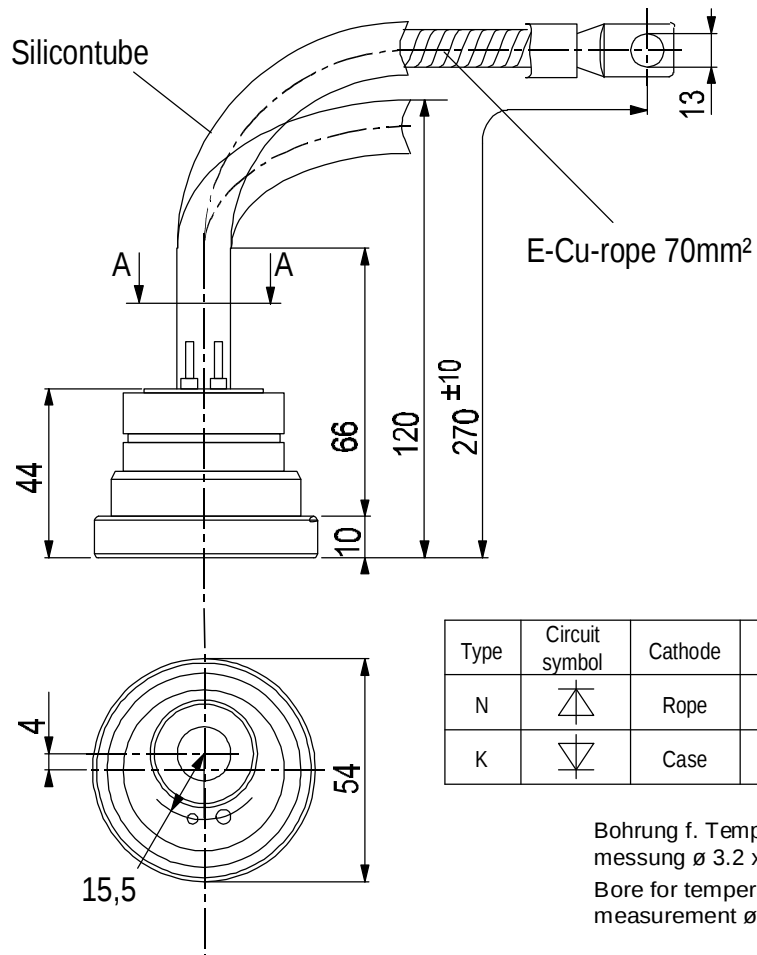


European Power-Semiconductor and Electronics Company GmbH + Co. KG

Leistungsgleichrichterdioden

Power Rectifier Diodes

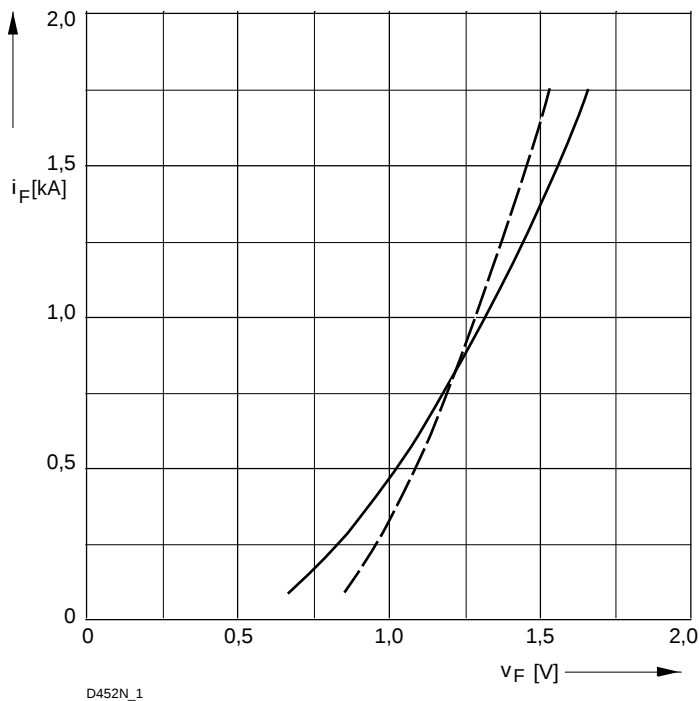
D 452 N



D 452 N

Elektrische Eigenschaften		Electrical properties				
Höchstzulässige Werte		Maximum rated values				
Periodische Spitzensperrspannung	repetitive peak reverse voltage	$t_{vj} = -40^{\circ}\text{C} \dots t_{vj \text{ max}}$	V_{RRM}	800, 1200	V	
				1400, 1800	V	
Stoßspitzensperrspannung	non-repetitive peak reverse voltage	$t_{vj} = +25^{\circ}\text{C} \dots t_{vj \text{ max}}$	$V_{RSM} = V_{RRM}$	+ 100	V	
Durchlaßstrom-Grenzeffektivwert	RMS forward current		I_{FRMSM}	710	A	
Dauergrenzstrom	mean forward current	$t_c = 130^{\circ}\text{C}$	I_{FAVM}	450	A	
Stoßstrom-Grenzwert	surge forward current	$t_{vj} = 25^{\circ}\text{C}, t_p = 10 \text{ ms}$	I_{FSM}	13,5	kA	
		$t_{vj} = t_{vj \text{ max}}, t_p = 10 \text{ ms}$		10,8	kA	
Grenzlastintegral	$I^2 t$ -value	$t_{vj} = 25^{\circ}\text{C}, t_p = 10 \text{ ms}$	$I^2 t$	911,25	kA^2s	
		$t_{vj} = t_{vj \text{ max}}, t_p = 10 \text{ ms}$		583,2	kA^2s	
Charakteristische Werte		Characteristic values				
Durchlaßspannung	on-state voltage	$t_{vj} = t_{vj \text{ max}}, i_F = 1,35 \text{ kA}$	V_T	max.	1,48	V
Schleusenspannung	threshold voltage	$t_{vj} = t_{vj \text{ max}}$	$V_{T(TO)}$		0,77	V
Ersatzwiderstand	slope resistance	$t_{vj} = t_{vj \text{ max}}$	r_T		0,48	mΩ
Sperrstrom	reverse current	$t_{vj} = t_{vj \text{ max}}, V_R = V_{RRM}$	i_R	max.	50	mA
Thermische Eigenschaften		Thermal properties				
Innerer Widerstand	thermal resistance, junction	$\Theta = 180^{\circ} \sin$	R_{thJC}	max.	0,0855	$^{\circ}\text{C/W}$
	to case	DC		max.	0,0810	$^{\circ}\text{C/W}$
Übergangs-Wärmewiderstand	thermal resistance, case to heatsink	ohne Anschlußlasche/without contact lug	R_{thCK}	max.	0,016	$^{\circ}\text{C/W}$
		mit Anschlußlasche/with contact lug		max.	0,026	$^{\circ}\text{C/W}$
Höchstzul.Sperrschichttemperatur	max. junction temperature		$t_{vj \text{ max}}$		180	$^{\circ}\text{C}$
Betriebstemperatur	operating temperature		$t_{c \text{ op}}$		-40...+180	$^{\circ}\text{C}$
Lagertemperatur	storage temperature		t_{stg}		-40...+180	$^{\circ}\text{C}$
Mechanische Eigenschaften		Mechanical properties				
Si-Element mit Druckkontakt	Si-pellet with pressure contact					
Anzugsdrehmoment	tightening torque	Gehäuseform/case design E	F		5,5	kN
Gewicht	weight		G	typ.	560	g
Kriechstrecke	creepage distance				14	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	

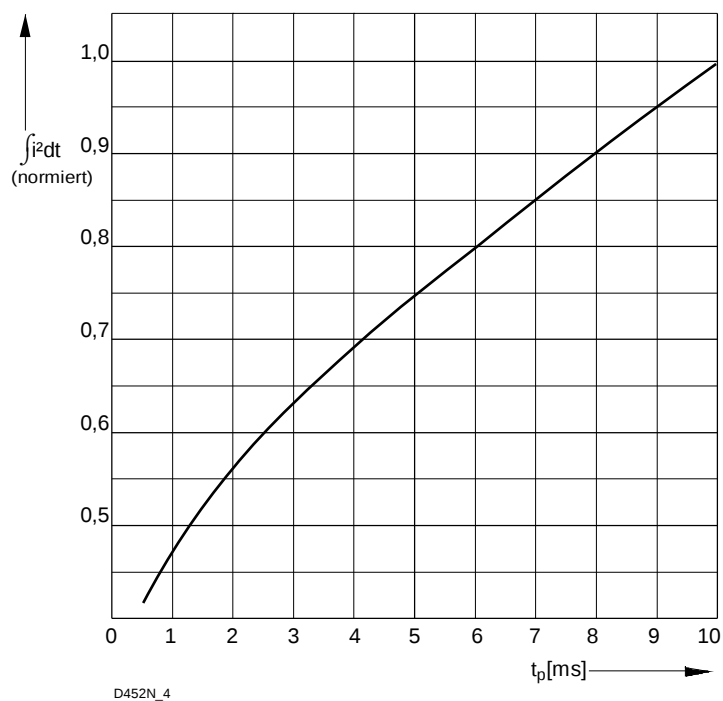
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D452N_1

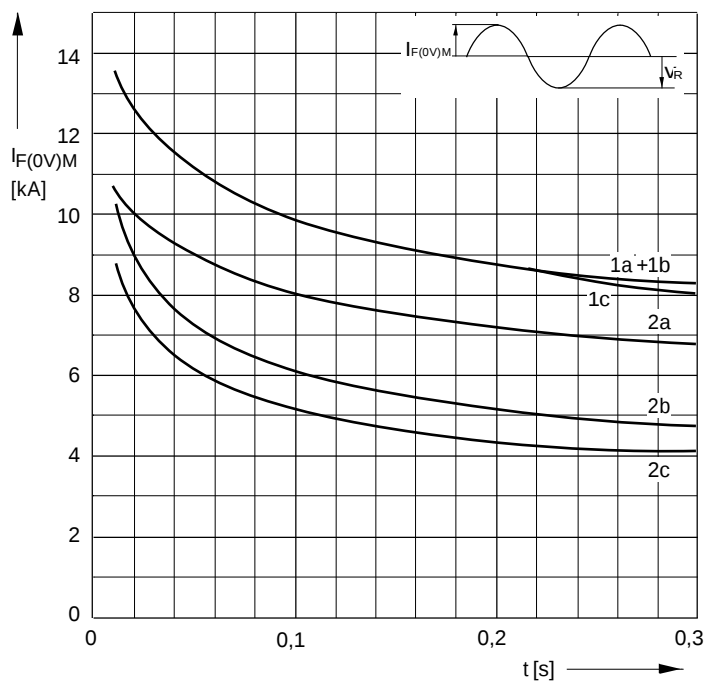
Bild/Fig. 1
Grenzdurchlaßkennlinie
Limiting forward characteristic $i_F = f(v_F)$

— $t_j = 180\text{ °C}$
- - - $t_j = 25\text{ °C}$



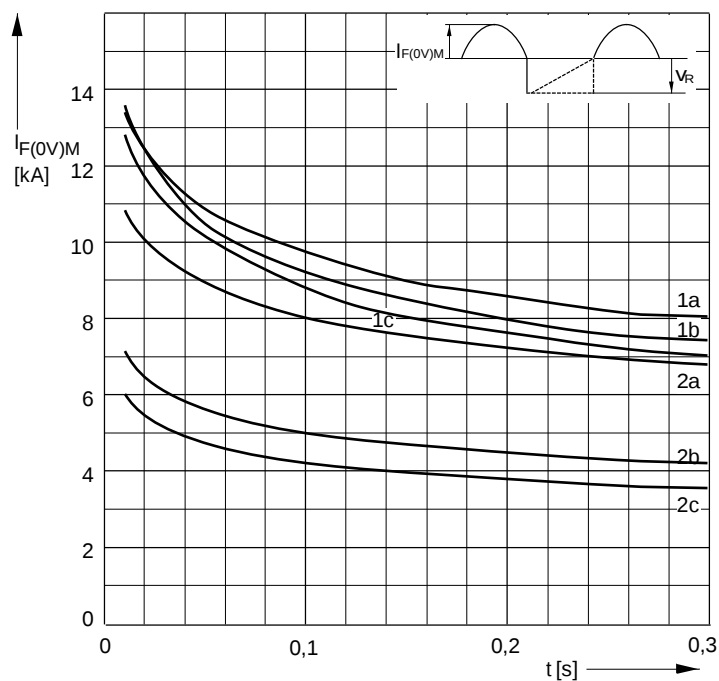
D452N_4

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



D452N_5

Bild / Fig. 3
Grenzstrom / Maximum overload forward current $I_{F(0V)M} = f(t)$
1 - $I_{FAV(vor)} = 0\text{ A}$; $t_j = t_c = 25\text{ °C}$
2 - $I_{FAV(vor)} = 450\text{ A}$; $t_c = 130\text{ °C}$; $t_j = 180\text{ °C}$
a - $V_R \leq 50\text{ V}$
b - $V_R = 0,5\text{ V}_{RRM}$
c - $V_R = 0,8\text{ V}_{RRM}$



D452N_6

Bild / Fig. 4
Grenzstrom / Maximum overload forward current $I_{F(0V)M} = f(t)$
1 - $I_{FAV(vor)} = 0\text{ A}$; $t_j = t_c = 25\text{ °C}$
2 - $I_{FAV(vor)} = 450\text{ A}$; $t_c = 130\text{ °C}$; $t_j = 180\text{ °C}$
a - $V_R \leq 50\text{ V}$
b - $V_R = 0,5\text{ V}_{RRM}$
c - $V_R = 0,8\text{ V}_{RRM}$

D 452 N

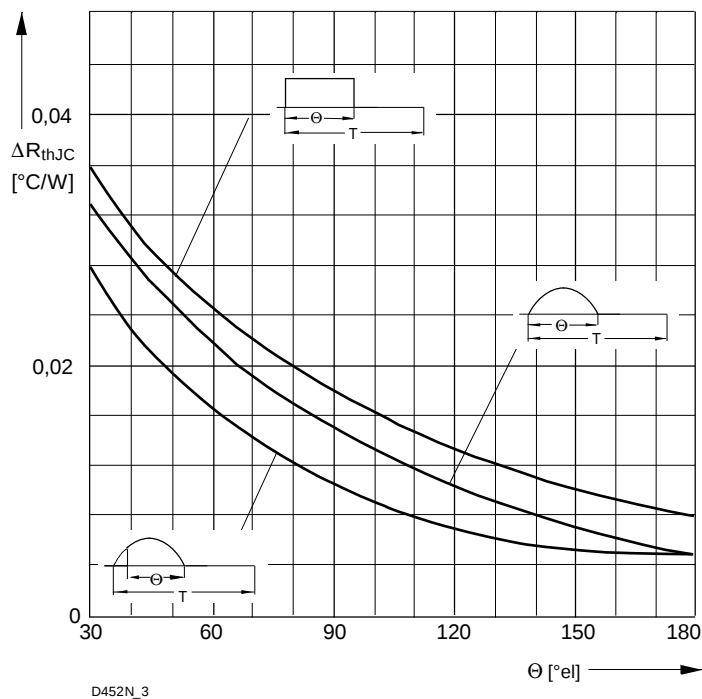


Bild / Fig. 5
Differenz zwischen den Wärmewiderständen
für Pulsstrom und DC
Difference between the values of thermal resistance for
pulse current and DC
Parameter: Stromkurvenform / Current waveform

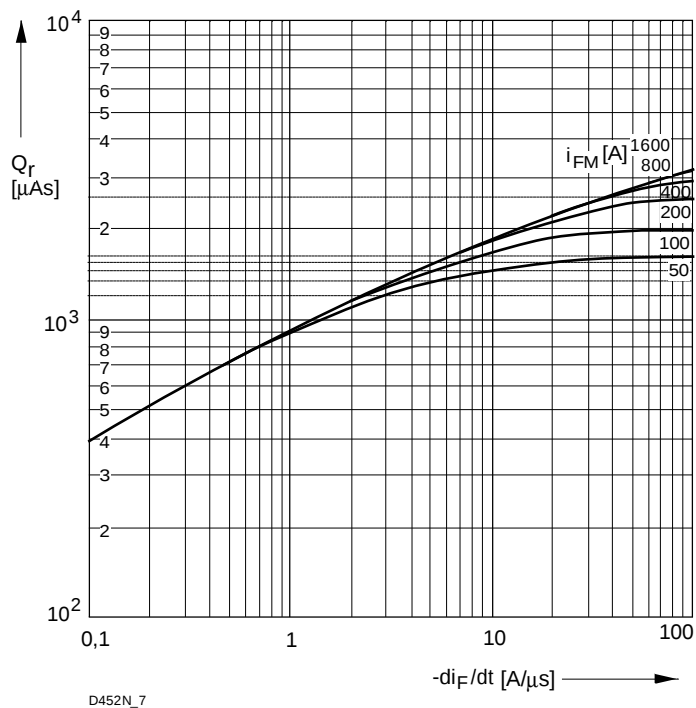


Bild / Fig. 6
Sperrverzögerungsladung / Recovered charge $Q_r = f(-di_F/dt)$
 $t_{vj} = t_{vjmax}$; $VR \leq 0,5 V_{RRM}$; $VRM = 0,8 V_{RRM}$
Beschaltung / Snubber: $C = 0,68 \mu F$; $R = 5,6 \Omega$
Parameter: Durchlaßstrom / Forward current i_{FM}

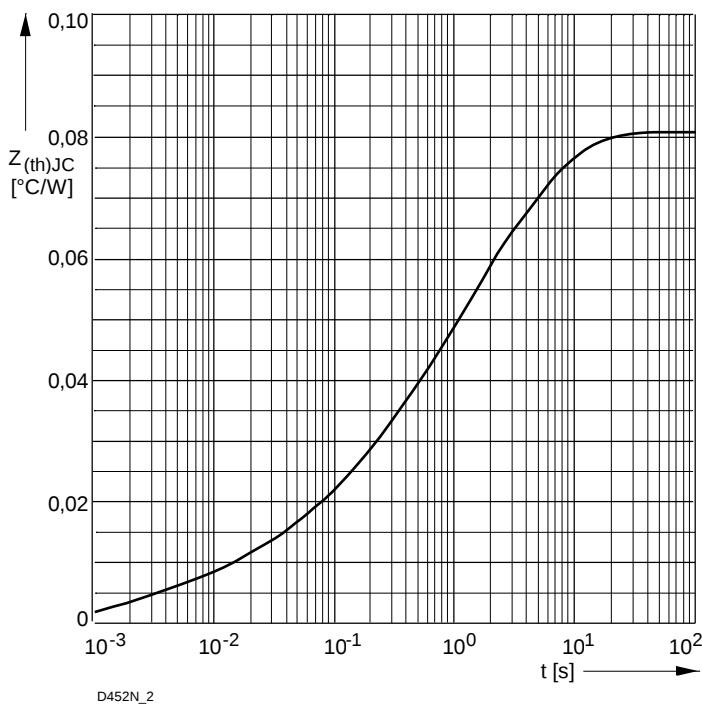


Bild / Fig. 7
Transienter innerer Wärmewiderstand
Transient thermal impedance $Z_{thJC} = f(t)$, DC
1 - Beidseitige Kühlung / Two-sided cooling
2 - Anodenseitige Kühlung / Anode-sided cooling
3 - Kathodenseitige Kühlung / Cathode-sided cooling

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	0,00059	0,00531	0,0056	0,021	0,0248	0,0237	
τ_n [s]	0,000231	0,00252	0,0251	0,175	1,269	6,262	

Analytische Funktion / Analytical function:

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

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