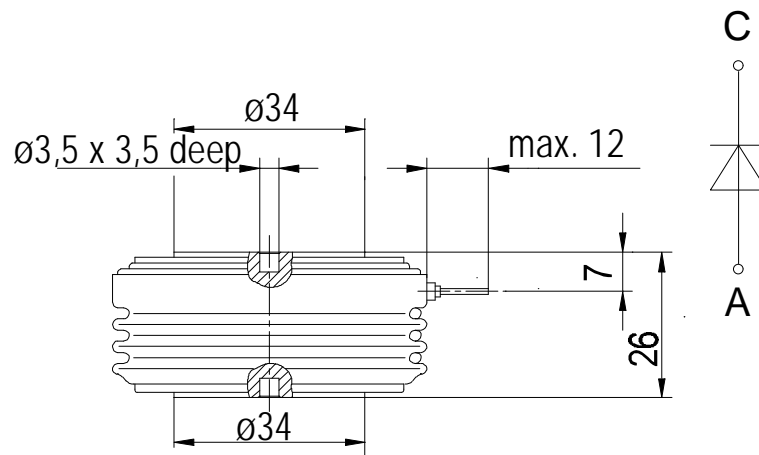
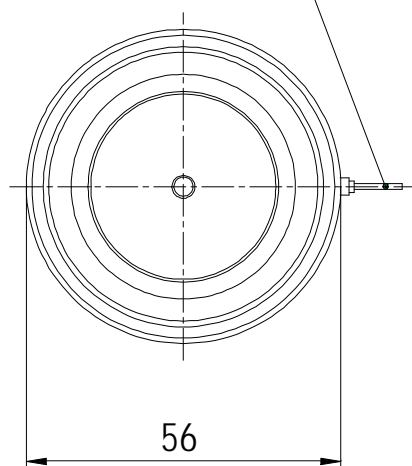


European Power-Semiconductor and Electronics Company GmbH + Co. KG

Leistungsgleichrichterdioden Power Rectifier Diodes D 1030 N



Pump out pipe metallic connected to the cathode



D 1030 N

Elektrische Eigenschaften

Electrical properties

Höchstzulässige Werte

Maximum rated values

Periodische Spitzensperrspannung	repetitive peak reverse voltage	$t_{vj} = -40^{\circ}\text{C} \dots t_{vj \max}$	V_{RRM}	1800, 2000, 2200 2400, 2600	V V
Stoßspitzensperrspannung	non-repetitive peak reverse voltage	$t_{vj} = +25^{\circ}\text{C} \dots t_{vj \max}$	$V_{RSM} = V_{RRM}$	+ 100	V
Durchlaßstrom-Grenzeffektivwert	RMS forward current		I_{FRMSM}	2,04	kA
Dauergrenzstrom	mean forward current	$t_c = 100^{\circ}\text{C}$ $t_c = 75^{\circ}\text{C}$	I_{FAVM}	1,03 1,3	kA kA
Stoßstrom-Grenzwert	surge forward current	$t_{vj} = 25^{\circ}\text{C}, t_p = 10 \text{ ms}$ $t_{vj} = t_{vj \max}, t_p = 10 \text{ ms}$	I_{FSM}	17 145	kA kA
Grenzlastintegral	$I^2 t$ -value	$t_{vj} = 25^{\circ}\text{C}, t_p = 10 \text{ ms}$ $t_{vj} = t_{vj \max}, t_p = 10 \text{ ms}$	$I^2 t$	1445 1051	kA^2s kA^2s

Charakteristische Werte

Characteristic values

Durchlaßspannung	on-state voltage	$t_{vj} = t_{vj \max}, i_F = 4 \text{ kA}$	V_T	max.	2,05	V
Schleusenspannung	threshold voltage	$t_{vj} = t_{vj \max}$	$V_{T(TO)}$		0,82	V
Ersatzwiderstand	slope resistance	$t_{vj} = t_{vj \max}$	r_T		0,28	mΩ
Sperrstrom	reverse current	$t_{vj} = t_{vj \max}, V_R = V_{RRM}$	i_R	max.	40	mA

Thermische Eigenschaften

Thermal properties

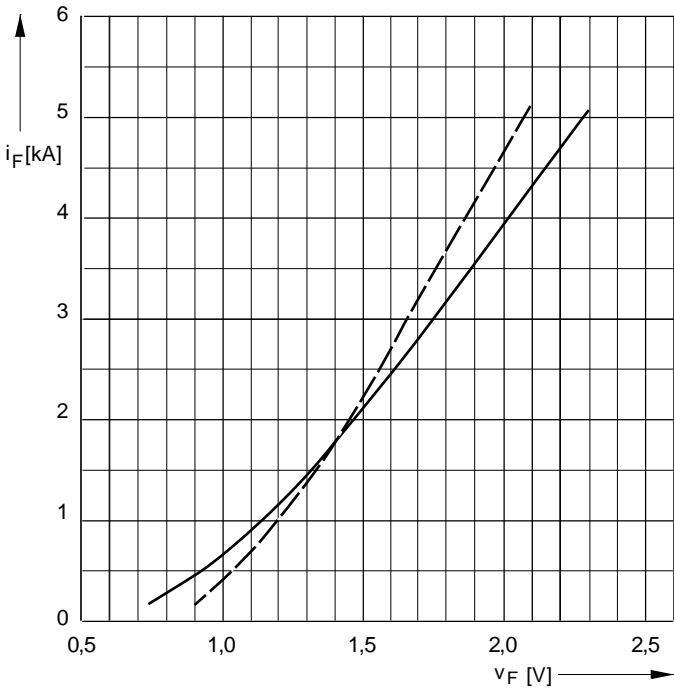
Innerer Widerstand	thermal resistance, junction to case	beidseitig/two-sided, $\Theta = 180^{\circ} \sin$	R_{thJC}	max.	0,038	$^{\circ}\text{C/W}$
		beidseitig/two sided, DC		max.	0,035	$^{\circ}\text{C/W}$
		Anode/anode, $\Theta = 180^{\circ} \sin$		max.	0,064	$^{\circ}\text{C/W}$
		Anode/anode, DC		max.	0,061	$^{\circ}\text{C/W}$
		Kathode/cathode, $\Theta = 180^{\circ} \sin$		max.	0,085	$^{\circ}\text{C/W}$
		Kathode/cathode, DC		max.	0,082	$^{\circ}\text{C/W}$
Übergangs-Wärmewiderstand	thermal resistance, case to heatsink	beidseitig /two-sided	R_{thCK}	max.	0,005	$^{\circ}\text{C/W}$
		einseitig /single-sided		max.	0,010	$^{\circ}\text{C/W}$
Höchstzul. Sperrschichttemperatur	max. junction temperature		$t_{vj \max}$		160	$^{\circ}\text{C}$
Betriebstemperatur	operating temperature		$t_{c \text{ op}}$		-40...+150	$^{\circ}\text{C}$
Lagertemperatur	storage temperature		t_{stg}		-40...+150	$^{\circ}\text{C}$

Mechanische Eigenschaften

Mechanical properties

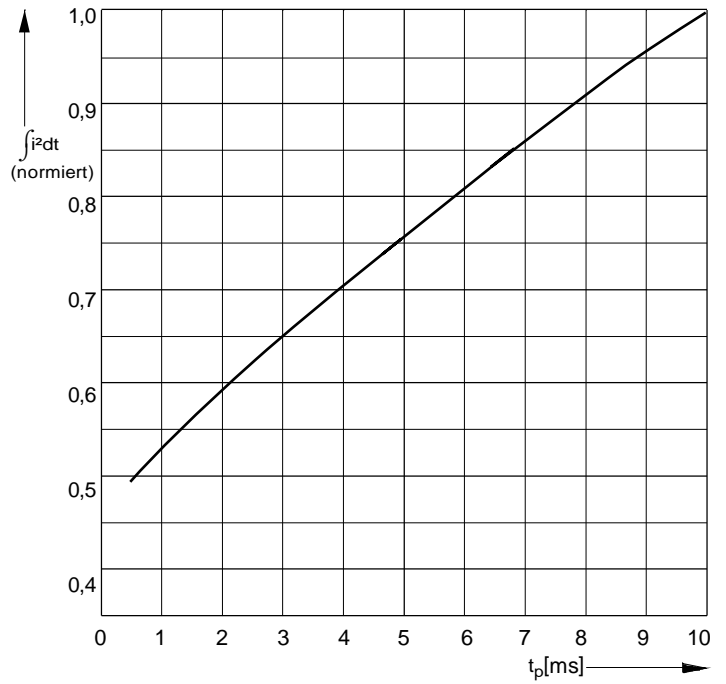
Si-Element mit Druckkontakt	Si-pellet with pressure contact	$\varnothing = 36 \text{ mm}$				
Anpreßkraft	clamping force	Gehäuseform/case design T	F		10...24	kN
Gewicht	weight		G	typ.	285	g
Kriechstrecke	creepage distance				30	mm
Feuchteklasse	humidity classification	DIN 40040				C
Schwingfestigkeit	vibration resistance	$f = 50 \text{ Hz}$			50	m/s^2
Maßbild	outline					

D 1030 N



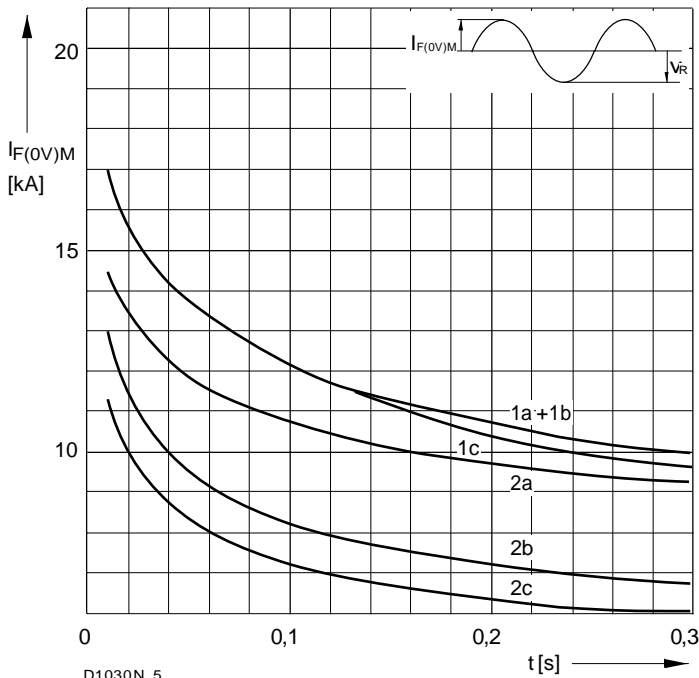
D1030N_1

Bild/Fig. 1
Grenzdurchlaßkennlinie
Limiting forward characteristic $i_F = f(v_F)$
— $t_{vj} = 160\text{ °C}$
- - - $t_{vj} = 25\text{ °C}$



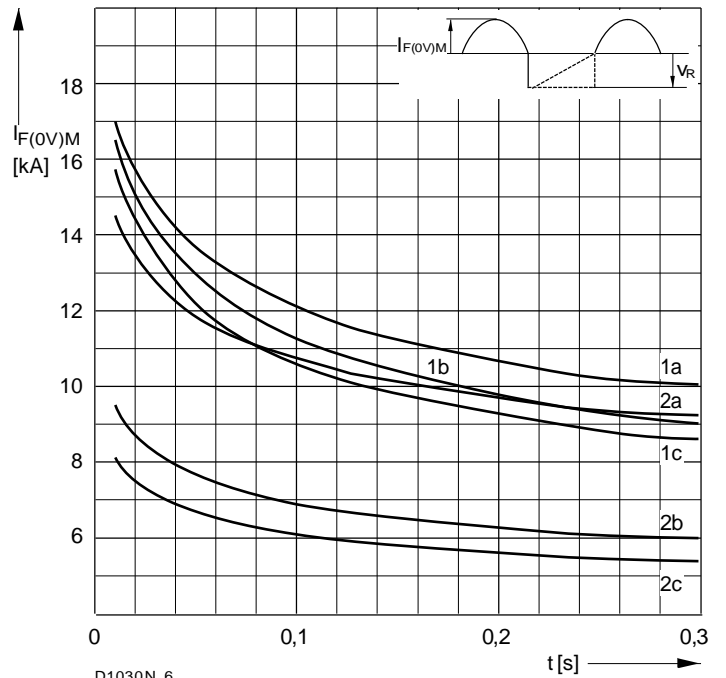
D1030N_4

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



D1030N_5

Bild / Fig. 3
Grenzstrom / Maximum overload forward current $I_{F(0V)M} = f(t)$
1 - $I_{FAV(vor)} = 0\text{ A}$; $t_{vj} = t_c = 25\text{ °C}$
2 - $I_{FAV(vor)} = 1030\text{ A}$; $t_c = 100\text{ °C}$; $t_{vj} = 160\text{ °C}$
a - $v_R \leq 50\text{ V}$
b - $v_R = 0,5\text{ V}_{RRM}$
c - $v_R = 0,8\text{ V}_{RRM}$



D1030N_6

Bild / Fig. 4
Grenzstrom / Maximum overload forward current $I_{F(0V)M} = f(t)$
1 - $I_{FAV(vor)} = 0\text{ A}$; $t_{vj} = t_c = 25\text{ °C}$
2 - $I_{FAV(vor)} = 1030\text{ A}$; $t_c = 100\text{ °C}$; $t_{vj} = 160\text{ °C}$
a - $v_R \leq 50\text{ V}$
b - $v_R = 0,5\text{ V}_{RRM}$
c - $v_R = 0,8\text{ V}_{RRM}$

D 1030 N

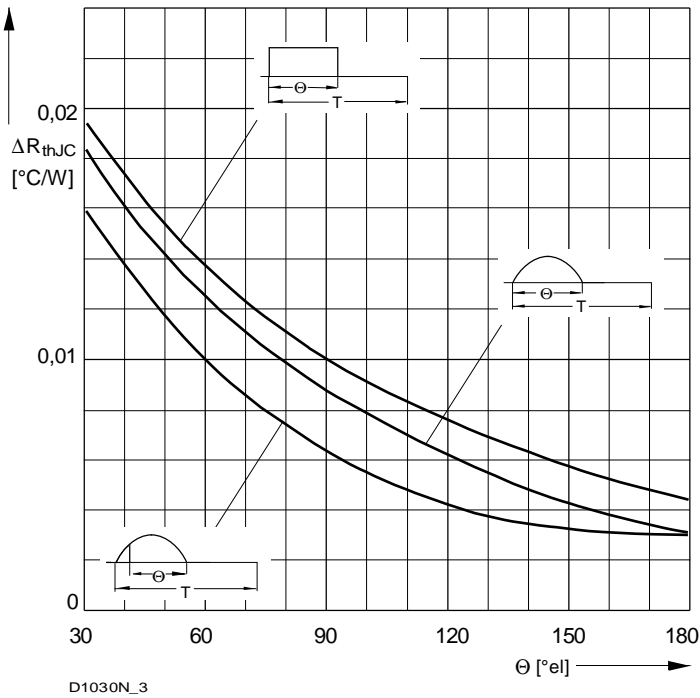


Bild / Fig. 5
 Differenz zwischen den Wärmewiderständen für Pulsstrom und DC
 Difference between the values of thermal resistance for pulse current and DC
 Parameter: Stromkurvenform / Current waveform

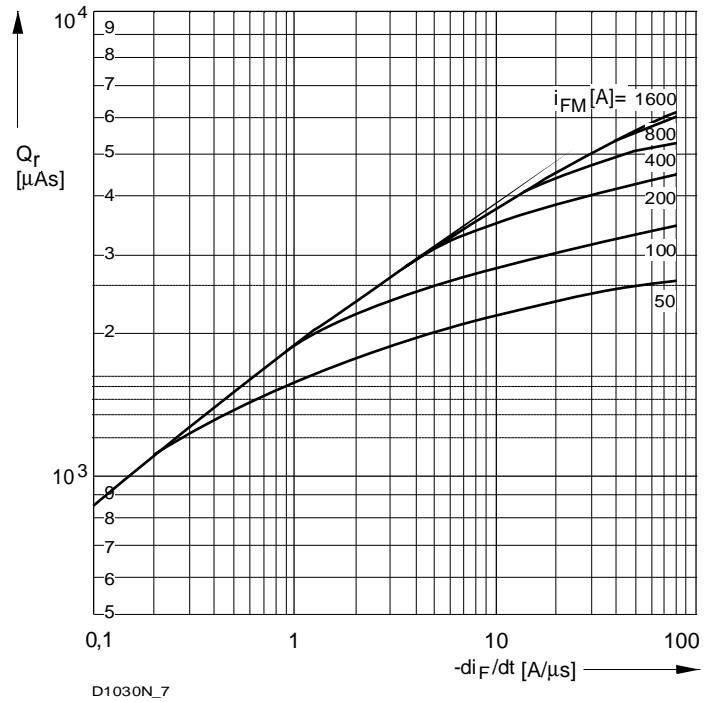


Bild / Fig. 6
 Sperrverzögerungsladung / Recovered charge $Q_r = f(-di_F/dt)$
 $t_{vj} = t_{vjmax}$; $V_R \leq 0,5 V_{RRM}$; $V_{RM} = 0,8 V_{RRM}$
 Beschaltung / Snubber: $C = 1 \mu F$; $R = 3,9 \Omega$
 Parameter: Durchlaßstrom / Forward current i_{FM}

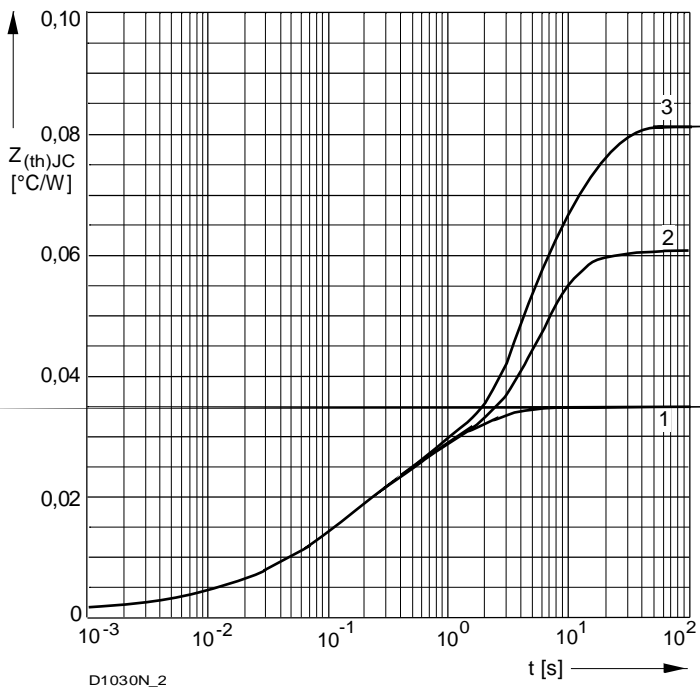


Bild / Fig. 7
 Transienter innerer Wärmewiderstand
 Transient thermal impedance $Z_{thJC} = f(t)$, DC
 1 - Beidseitige Kühlung / Two-sided cooling
 2 - Anodenseitige Kühlung / Anode-sided cooling
 3 - Kathodenseitige Kühlung / Cathode-sided cooling

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

Kühlg. Cooling	Pos. n	1	2	3	4	5	6	7
1	$R_{thn} \text{ } ^\circ\text{C/W}$	0,00017	0,00338	0,00429	0,0131	0,01406		
	τ_n [s]	0,000272	0,00261	0,0417	0,173	0,999		
2	$R_{thn} \text{ } ^\circ\text{C/W}$	0,000221	0,003179	0,00357	0,01713	0,0369		
	τ_n [s]	0,00033	0,0026	0,0297	0,182	5,83		
3	$R_{thn} \text{ } ^\circ\text{C/W}$	0,000218	0,003052	0,00216	0,0169	0,00537	0,0543	
	τ_n [s]	0,000328	0,00254	0,0179	0,46	6,65	6,82	

- 1 - Beidseitige Kühlung / Two-sided cooling
- 2 - Anodenseitige Kühlung / Anode-sided cooling
- 3 - Kathodenseitige Kühlung / Cathode-sided cooling

Analytische Funktion / Analytical function

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