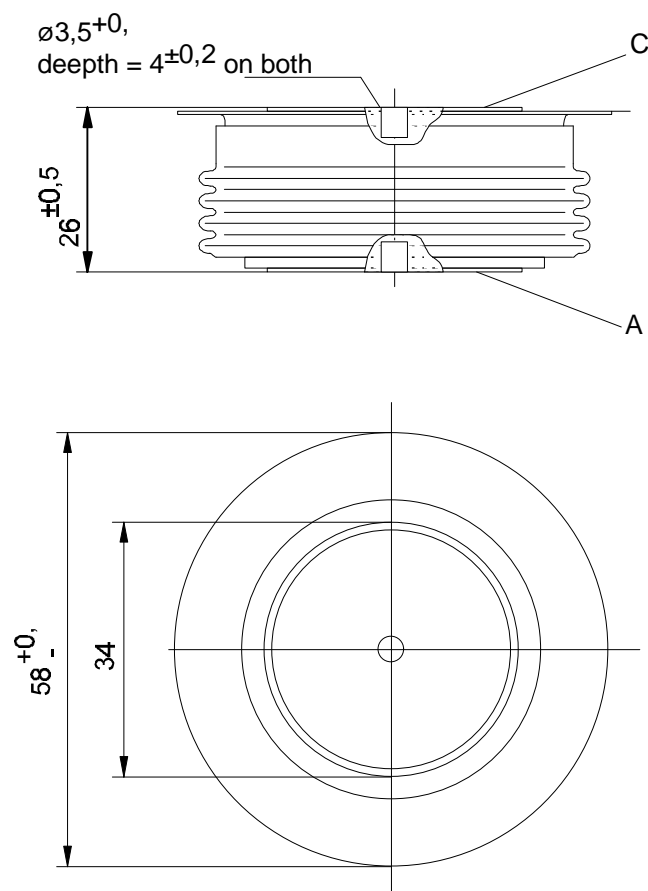


European Power-Semiconductor and Electronics Company

## Marketing Information D 291 S



Applikation: Beschaltungsdiode zu GTO - Vorrichtungen  
Application: Snubberdiode at GTO - Inverter

**Elektrische Eigenschaften / Electrical properties**

*Höchstzulässige Werte / Maximum rated values*

Periodische Spitzensperrspannung repetitive peak reverse voltage	$t_{vj} = -40^{\circ}\text{C} \dots 140^{\circ}\text{C}$	$V_{RRM}$	3500V, 4000 V 4500 V
Stoßspitzensperrspannung non-repetitive peak reverse voltage	$t_{vj} = +25^{\circ}\text{C} \dots 140^{\circ}\text{C}$	$V_{RSM}$	3600V, 4100 4600 V
Durchlaßstrom-Grenzeffektivwert / RMS forward current		$I_{FRMSM}$	700 A
Dauergrenzstrom / mean forward current	$t_C = 85^{\circ}\text{C}$ $t_C = 51^{\circ}\text{C}$	$I_{FAVM}$	290 A 445 A
Stoßstrom-Grenzwert <sup>1)</sup> surge forward current <sup>1)</sup>	$t_{vj} = 25^{\circ}\text{C}$ $t_{vj} = 125^{\circ}\text{C}$	$I_{FSM}$	5200 A 4500 A
Grenzlastintegral $I^2t$ -value	$t_{vj} = 25^{\circ}\text{C}$ $t_{vj} = 125^{\circ}\text{C}$	$I^2t$	135000 100000 A <sup>2</sup> s
Kritische periodische Ausschaltstromsteilheit critical repetitive rate of fall of on - state	$t_{vj} = 125^{\circ}\text{C}$ , $I_M = 3000 \text{ A}$ , $V_{RM} = 1600 \text{ V}$ $C = 0,125 \mu\text{F}$ , $R = 6\Omega$	$(-di/dt)_{com}$	700 A/ $\mu\text{s}$

*Charakteristische Werte / Characteristic values*

Durchlaßspannung / forward voltage	$t_{vj} = 125^{\circ}\text{C}$ , $I_M = 1200 \text{ A}$	$V_F$	4,15 V
Schleusenspannung / threshold voltage	$t_{vj} = 125^{\circ}\text{C}$	$V_{(TO)}$	1,9 V
Ersatzwiderstand / forward slope resistance	$t_{vj} = 125^{\circ}\text{C}$	$r_T$	1,76 m $\Omega$
Sperrstrom / reverse current	$t_{vj} = 125^{\circ}\text{C}$ , $V_R = 0,67 V_{RRM}$ $t_{vj} = 125^{\circ}\text{C}$ , $V_R = V_{RRM}$	$i_R$	ca. 30 mA 50 mA
Rückstromspitze / peak reverse recovery current	$i_{FM} = 1000 \text{ A}$ , $-di/dt = 250 \text{ A}/\mu\text{s}$ $t_{vj} = 125^{\circ}\text{C}$ ; $V_{R(Spr)} = 1000 \text{ V}$ ; $C = 0,125 \mu\text{F}$ ; $R = 6\Omega$	$I_{RM}$	500 A
Sperrverzögerungsladung recovered charge	$i_{FM} = 1000 \text{ A}$ , $-di/dt = 250 \text{ A}/\mu\text{s}$ $t_{vj} = 125^{\circ}\text{C}$ ; $V_{R(Spr)} = 1000 \text{ V}$ ; $C = 0,125 \mu\text{F}$ ; $R = 6\Omega$	$Q_{rr}$	950 $\mu\text{As}$

**Thermische Eigenschaften / Thermal properties**

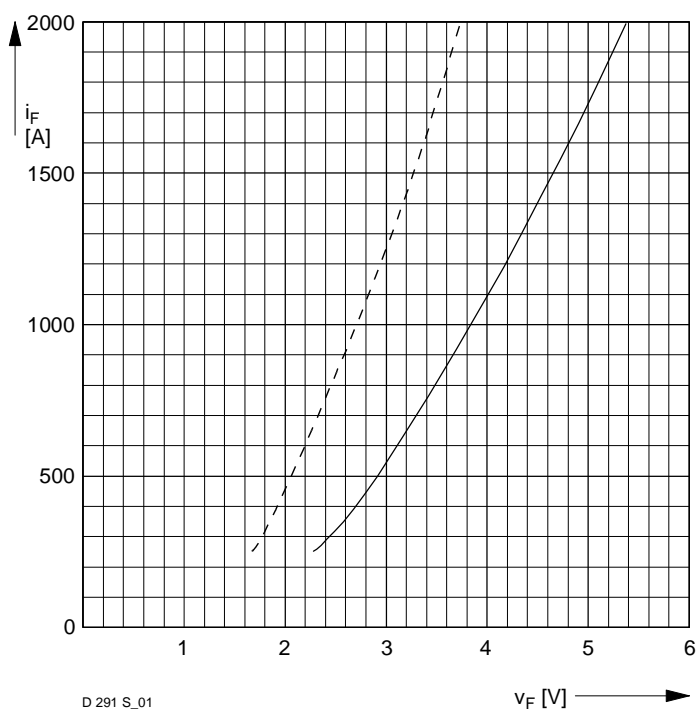
Innerer Wärmewiderstand thermal resistance, junction to case	Kühlfläche / cooling surface beidseitig / two-sided einseitig / single-sided	$R_{thJC}$	0,04 K/W 0,08 K/W
Übergangs-Wärmewiderstand thermal resistance, case to heatsink	Kühlfläche / cooling surface beidseitig / two-sided einseitig / single-sided	$R_{thCK}$	0,006 K/W 0,012 K/W
Höchstzulässige Sperrschichttemp. / max. junction temperat.		$t_{vjmax}$	125 $^{\circ}\text{C}$
Betriebstemperatur / operating temperature		$t_C op$	-40...+125 $^{\circ}\text{C}$
Lagertemperatur / storage temperature		$t_{stg}$	-40...+150 $^{\circ}\text{C}$

**Mechanische Eigenschaften / Mechanical properties**

Gehäuse, siehe Anlage / case, see appendix			Seite / page 1
Anpreßkraft / clamping force		F	9...13 kN
Gewicht / weight		G	ca. 250 g
Luftstrecke / air distance			20 mm
Kriechstrecke / creepage distance			30 mm
Feuchteklasse / humidity classification	DIN 40040		C
Schwingfestigkeit / vibration resistance	$f = 50 \text{ Hz}$		50 m/s <sup>2</sup>

Mit dieser technischen Information werden Halbleiterbauelemente spezifiziert, jedoch keine Eigenschaften zugesichert. Sie gilt in Verbindung mit den zugehörigen Technischen Erläuterungen.

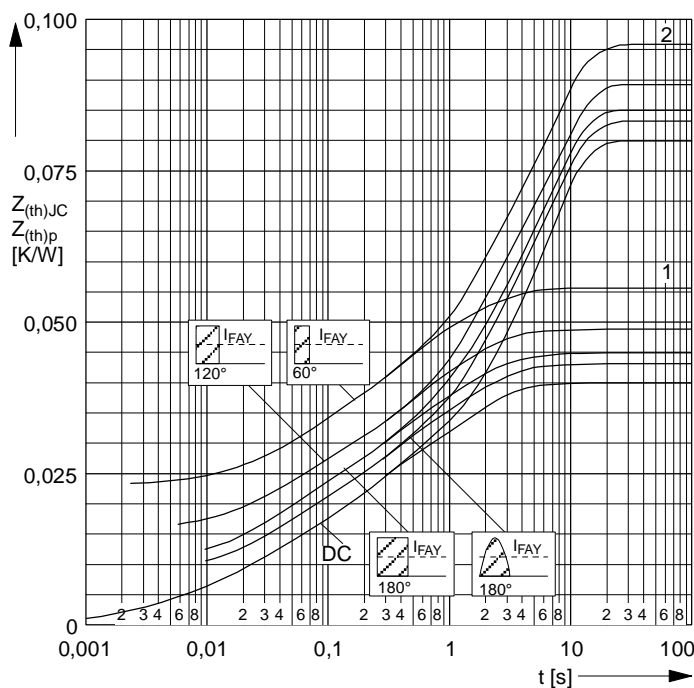
This technical information specifies semiconductor devices but promises no characteristics. It is valid in combination with the belonging technical notes.



D 291 S\_01

Fig. 1  
On-state characteristics  $i_F = f(v_F)$   
 $t_{vj} = 125^\circ\text{C}$

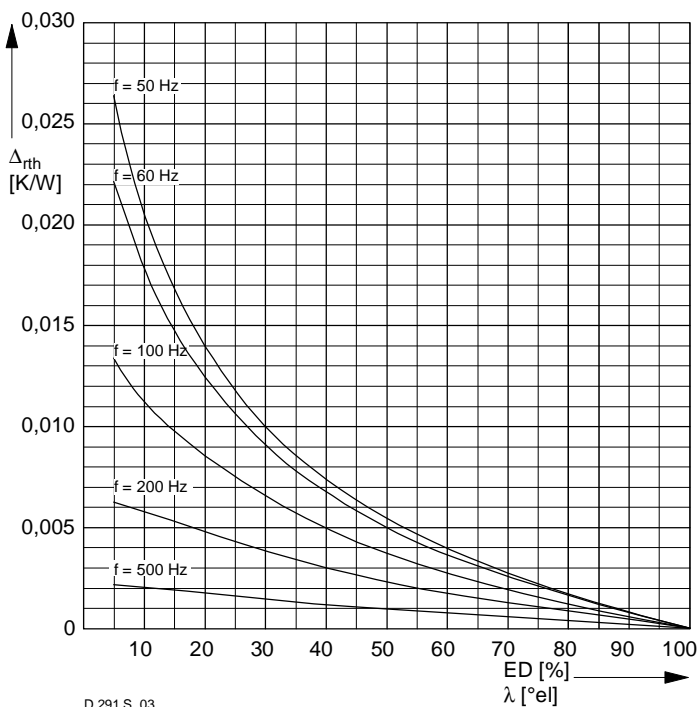
— Upper limit of scatter range  
- - - Lower limit of scatter range



D 291 S\_02

Fig. 2  
Transient thermal impedance DC and impuls current  
( $f = 50\text{ Hz}$ )  
Parameter: Current wave form

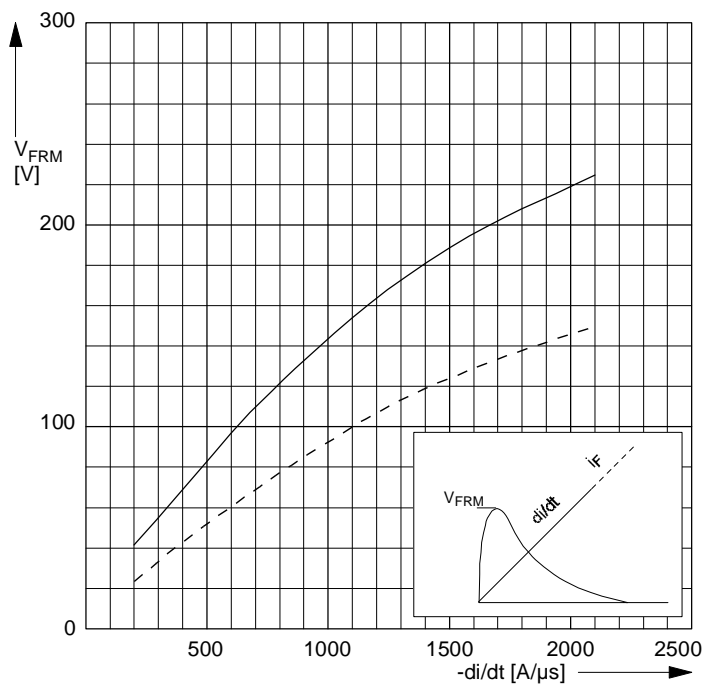
1. single-sided cooling  
2. both-sided cooling



D 291 S\_03

Fig. 3  
 $\Delta_{rth} = f(ED, \text{frequency})$

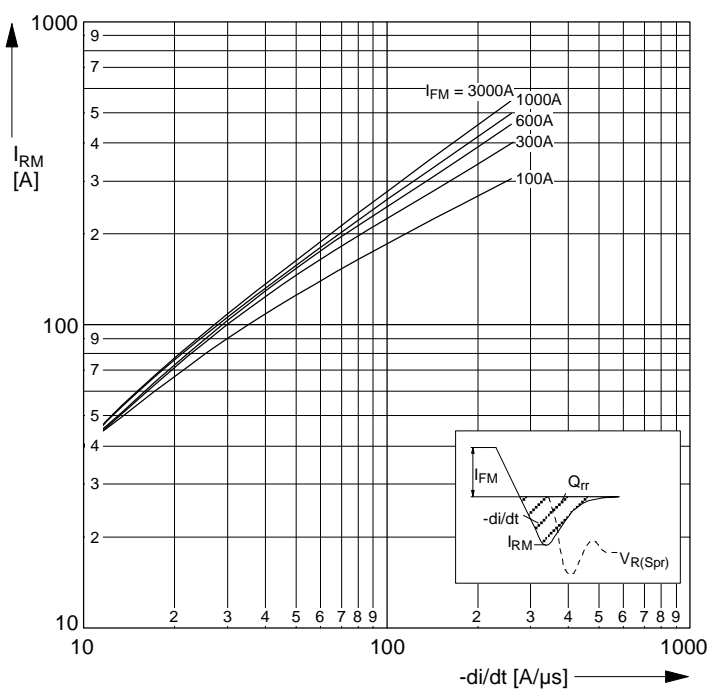
Both-sided and one-sided cooling  
Current wave form: squarewave  
Parameter: frequency



D 291 S\_08

Fig. 4  
Peak forward recovery voltage (typical values)

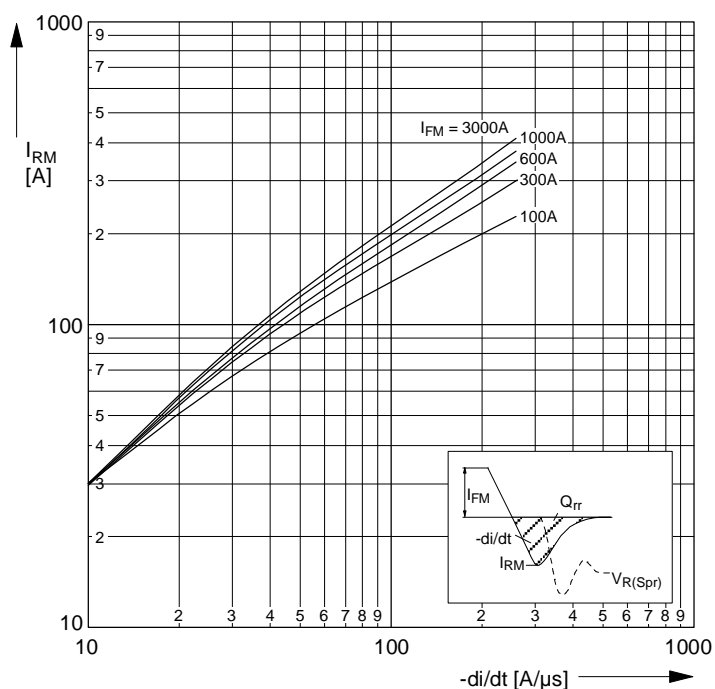
—  $t_{vj} = 125^\circ\text{C}$   
- - -  $t_{vj} = 25^\circ\text{C}$



D 291 S\_04

Fig. 5  
Reverse recovery current (upper limit ca. 98% value)  
 $I_{RM} = f(di/dt)$

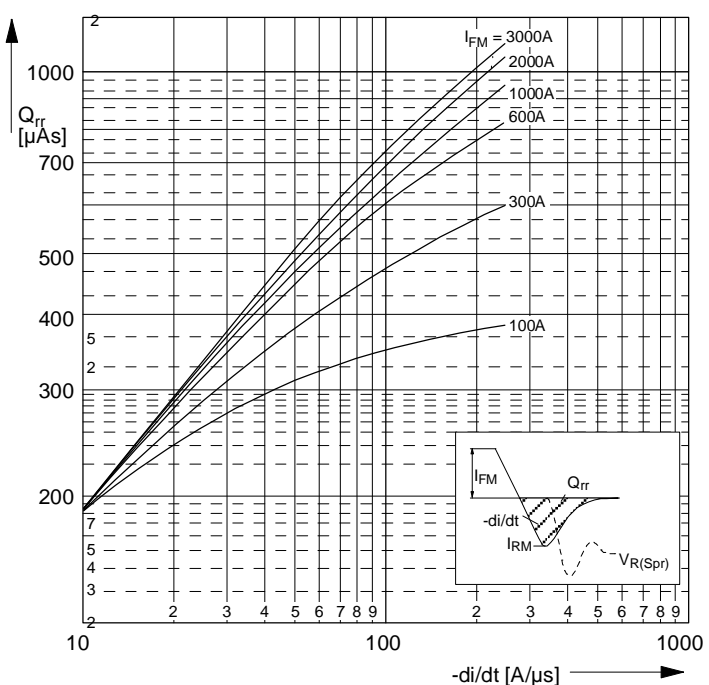
Parameter:  $I_{FM}$   
 $t_{vj} \leq 125^\circ\text{C}$ ;  $C_S = 0,125 \mu\text{F}$   
 $R_S = 6 \Omega$ ;  $V_{R(Spr)} = 1000 \text{ V}$



D 291 S\_05

Fig. 6  
Reverse recovery current (lower limit ca. 2% value)  
 $I_{RM} = f(di/dt)$

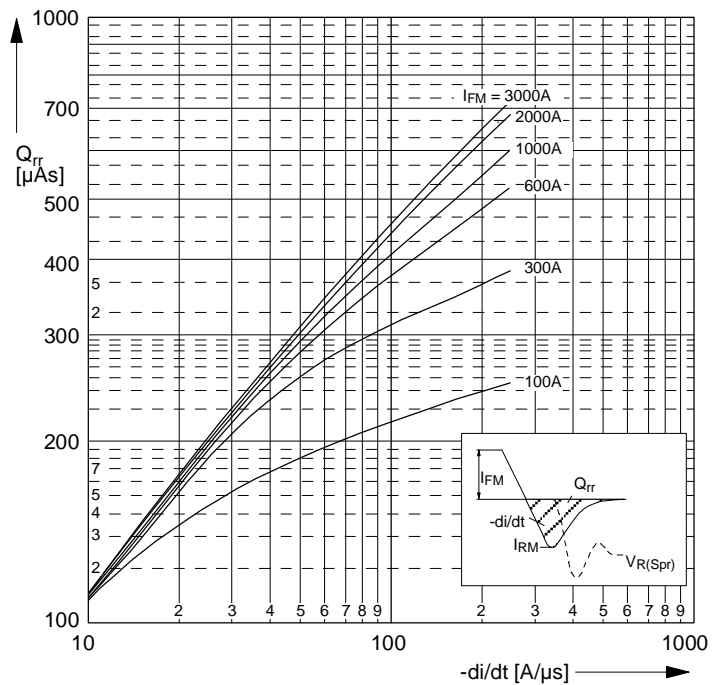
Parameter:  $I_{FM}$   
 $t_{vj} \leq 125^\circ\text{C}$ ;  $C_S = 0,125 \mu\text{F}$   
 $R_S = 6 \Omega$ ;  $V_{R(Spr)} = 1000 \text{ V}$



D 291 S\_07

Fig. 7  
Reverse recovery charge (upper limit ca. 98% value)  
 $Q_{rr} = f(di/dt)$

Parameter:  $I_{FM}$   
 $t_{vj} \leq 125^\circ\text{C}$ ;  $C_S = 0,1 \mu\text{F}$   
 $R_S = 6 \Omega$ ;  $V_{R(Spr)} = 1000 \text{ V}$



D 291 S\_06

Fig. 8  
Reverse recovery charge (lower limit ca. 2% value)  
 $Q_{rr} = f(di/dt)$

Parameter:  $I_{FM}$   
 $t_{vj} \leq 125^\circ\text{C}$ ;  $C_S = 0,1 \mu\text{F}$   
 $R_S = 6 \Omega$ ;  $V_{R(Spr)} = 1000 \text{ V}$