SCDP7100N04

Power welding diode

FEATURES

-High current
-Very low on-state voltage
-Very low thermal resistance

APPLICATION

-High current rectifiers
-Welding.
-Pulse power

Photo non-contractual

TECHNICAL SPECIFICATION

Electrical properties

Parameter		Value & test conditions
Repetitive reverse voltage	V_{RRM}	700 V
Average forward current	I_{AV}	7100 A @ Tc=85ºC
R.M.S. Forward current	I_{RMS}	11147 A @ Tc=85ºC
Surge forward current	I_{FSM}	55 kA at 10ms, Tj_{max}
I^2t value	I^2t	15100 kA^2s
Reverse current	I_R	50 mA @ Tj_{max}
Treshold voltage	Vo	0,70 V.
Slope resistance	ro	0,029 mOhm
On-state voltage max.	V_{FM}	0,85 V at I_{FM}=5000 A @ Tj_{max}

Thermal properties

Parameter		Value & test conditions
Max. operating junction temperature	Tj_{max}	170 ºC
Thermal resistance junction-capsule	RTH_{j-c}	DC 0,010ºC/W.
		180º sin 0,0121ºC/W.
		120º sin 0,0134ºC/W.
		60º sin 0,0163ºC/W.
Thermal resistance capsule-heatsink	RTH_{c-hs}	0,010ºC/W.
Storage temperature	T_{stg}	-60...+170ºC

Mechanical properties

Parameter		Value & test conditions
Weight	M	26 g.
Clamping force	m	20...24 kN

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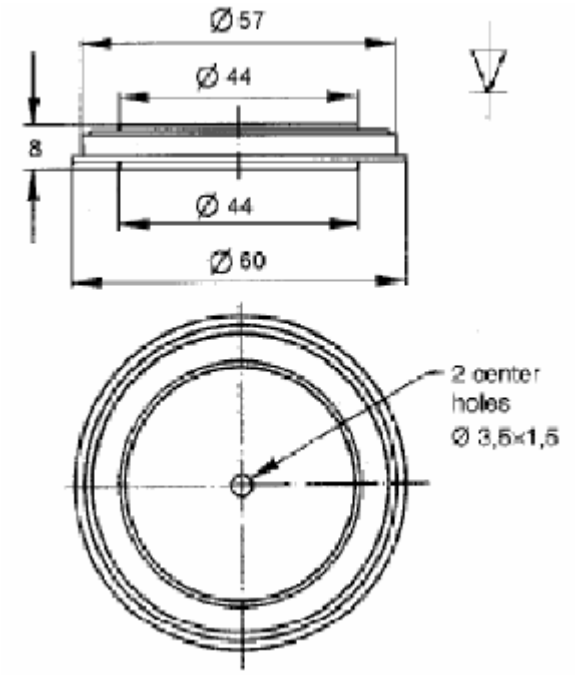
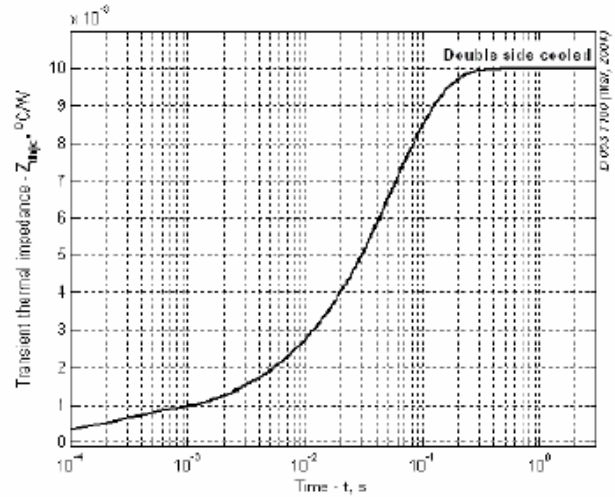
DIMENSIONS



GRAPH. & TABLES



Analytical function for transient thermal impedance junction to case Z_{thjc} for DC:

$$Z_{thjc} = \sum_{i=1}^{n} R_i \left(1 - e^{-\frac{t}{\tau_i}} \right)$$

DC Double side cooled

i	1	2	3	4
R_i, °C/W	0.000683	0.004738	0.003829	0.000749
τ_i, s	0.000170	0.067768	0.045073	0.004826

Thermal resistance junction to case
for sinusoidal and rectangular current waveforms
at different conduction angles (θ).
Double side cooled

θ = 180° rec.	θ = 120° rec.	θ = 90° rec.	θ = 60° rec.	θ = 30° rec.	θ = 180° sin.
°C/W	°C/W	°C/W	°C/W	°C/W	°C/W
0.012035	0.013377	0.014458	0.016285	0.020922	0.011645

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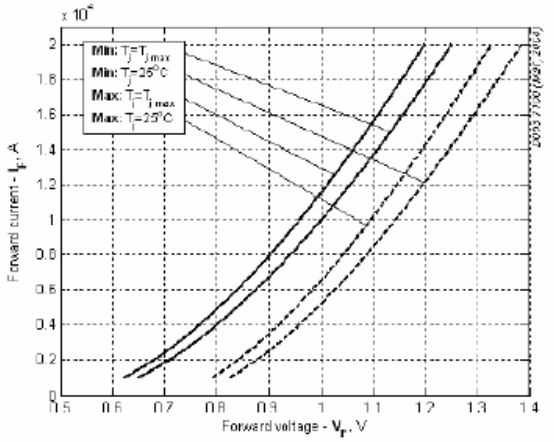
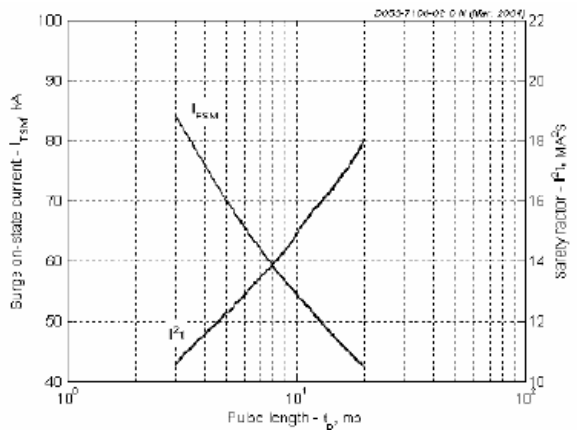


Forward current vs. forward voltage (min. and max. values)



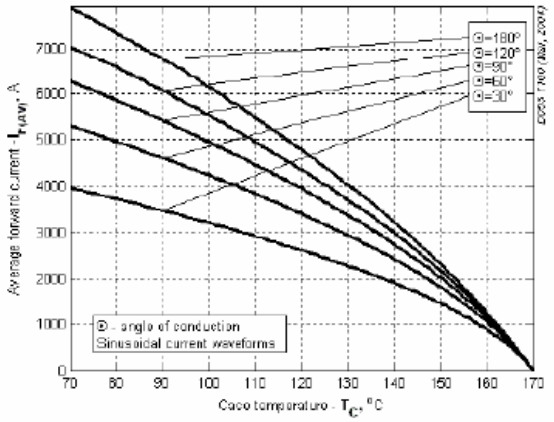
Surge current Safety factor vs. Pulse width for non-repetitive, half-sinusoidal surge current pulses

On-state characteristic model:

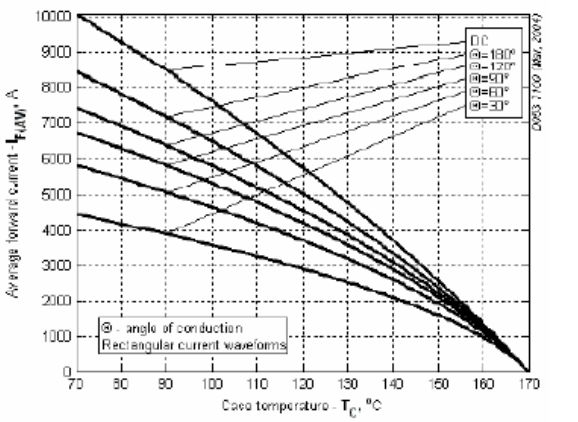
$$V_T = A + B \cdot i_F + C \cdot \ln(i_F + 1) + D \cdot \sqrt{i_F}$$

Valid for i_F = 1000 A ÷ 20000 A

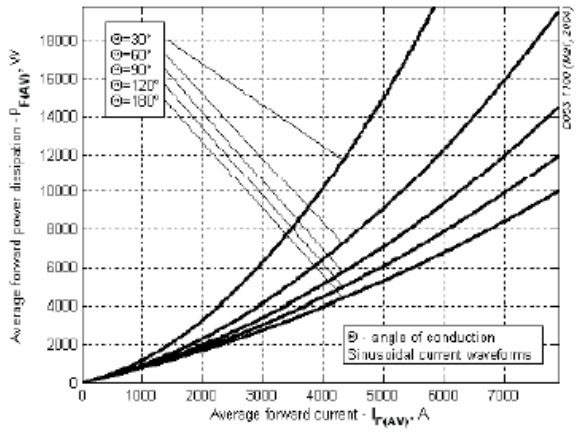
	Maximum characteristics		Minimum characteristics	
	$T_j = T_{j\,max}$	$T_j = 25°C$	$T_j = T_{j\,max}$	$T_j = 25°C$
A	0.505651	0.689728	0.527635	0.719716
B	0.000007	0.000010	0.000008	0.000011
C	-0.002781	-0.001393	-0.002902	-0.001453
D	0.004050	0.003179	0.004226	0.003317



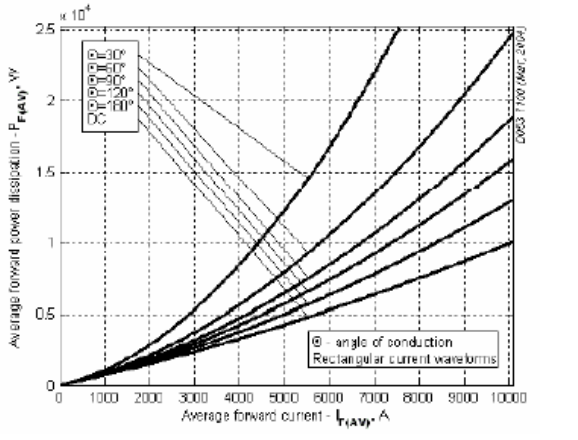
Average forward current I_{FAV} vs. Case temperature T^C for sinusoidal current waveforms at different conduction angles, f=50Hz



Average forward current I_{FAV} vs. Case temperature T^C for rectangular current waveforms at different conduction angles and for DC, f=50Hz



Average forward power dissipation P_{FAV} vs. Case temperature T^C for sinusoidal current waveforms at different conduction angles, f=50Hz



Average forward power dissipation P_{FAV} vs. Case temperature T^C for rectangular current waveforms at different conduction angles and for DC, f=50Hz

Cost Effective Products

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