

Gate turn off Thyristor Type WG20045SN

Absolute maximum ratings

	VOLTAGE RATINGS	MAXIMUM LIMITS	UNITS
V _{DRM}	Repetitive peak off-state voltage, (note 1).	4500	V
V _{DSM}	Non-repetitive peak off-state voltage, (note 1).	4500	
V _{RRM}	Repetitive peak reverse voltage	18	
V _{DC-link}	Maximum continuous DC-link voltage.	2200	

	RATINGS	MAXIMUM LIMITS	UNITS
I _{TGQ}	Maximum controllable current, (note 2).	2000	A
I _{T(AV)}	Mean on-state current, T _{sink} =55°C, (note 3).	870	
I _{T(RMS)}	Nominal RMS current, T _{sink} =25°C, (note 3).	1730	
I _{TSM}	Peak non-repetitive surge current, t _p =10ms, (note 4).	13	kA
	Peak non-repetitive surge current, t _p =2ms, (note 4).	22	
I ² t	Surge current load limiting integral, t _p =10ms, (note 4).	0.85×10 ⁶	A ² s
L _s	Snubber circuit loop inductance, (note 2).	300	nH
di/dt _(crit)	Critical rate of rise of on state current, (note 5).	400	A/μs
V _{RGM}	Peak reverse gate voltage, (note 6).	18	V
T _j	Operating junction temperature range.	-40 to +125	°C
T _{stg}	Storage temperature range.	-40 to +125	°C

Notes:-

- 1) V_{GK} ≤ -2V.
- 2) T_j=125°C, V_D=67%V_{DRM}, V_{DM}≤V_{DRM}, di_{GQ}/dt=30A/μs, C_s=4μF.
- 3) Doubleside cooled, single phase; 50Hz, 180° sinewave.
- 4) T_{j (initial)}=125°C, single phase, 180° sinewave, re-applied voltage V_D=V_R≤10V.
- 5) I_T=2000A repetitive, I_{GM}=30A, di_{GM}/dt=20A/μs, for higher di/dt please consult the factory.
- 6) May exceed this value during turn off avalanche period.

Characteristics

	PARAMETER	MIN	TYP	MAX	TEST CONDITIONS	UNITS
V_{TM}	Maximum peak on-state voltage.	-	-	3.50	$I_T=2000A$.	V
dv/dt	Critical rate of rise of off-state voltage (linear).	1000	-	-	$V_D=3000V, V_G=0V / R_G=0\Omega$.	V/ μs
I_{DRM}	Repetitive peak off-state current.	-	-	100	Rated $V_{DRM}, V_{GK} \leq -2V$.	mA
I_{RRM}	Repetitive peak reverse current.	-	-	50	Rated $V_{RRM}, R_{GK}=\infty$.	mA
I_{GKM}	Peak reverse gate leakage current	-	-	50	$V_{GK}=-16V$	mA
V_{GT}	Gate trigger voltage	-	-	1.0	$V_D=24V, T_j=25^\circ C, R_A=0.1\Omega$.	V
I_{GT}	Gate trigger current	-	-	2.5		A
I_L	Latching current	-	-	50	$T_j=25^\circ C$.	A
t_d	Delay time	-	2.0	-	$V_D=50\%V_{DRM}, I_T=2000A,$ $di_T/dt=200A/\mu s, I_{GM}=30A,$ $di_G/dt=20A\mu s, C_s=4\mu F$.	μs
t_r	Rise time	-	6.0	-		μs
t_{gt}	Turn on time	-	8.0	-		μs
E_{on}	Turn on energy per pulse	-	2.5	-		J
t_s	Storage time	-	22	-	$V_D=50\%V_{DRM}, V_{DM}=V_{DRM},$ $I_{TGQ}=I_{TGQM}, di_{GQ}/dt=30A\mu s,$ $C_s=4\mu F, L_s=300nH$	μs
t_f	Fall time	-	3.0	-		μs
t_{gq}	Turn off time	-	25	-		μs
E_{off}	Turn off energy per pulse	-	7.5	-		J
I_{GQM}	Peak turn off gate current	-	-	725		A
Q_{GQ}	Turn off gate charge	-	10	-		μC
R_θ	Thermal resistance junction to sink.	-	-	40 49 27		Anode side cooled. Cathode side cooled. Double side cooled.
F	Mounting force.	17	-	24		kN
W_t	Weight.	-	0.8	-		kg

Notes:-

- 1) Unless otherwise indicated $T_j=125^\circ C$.

Figure 1, Instantaneous forward gate characteristics

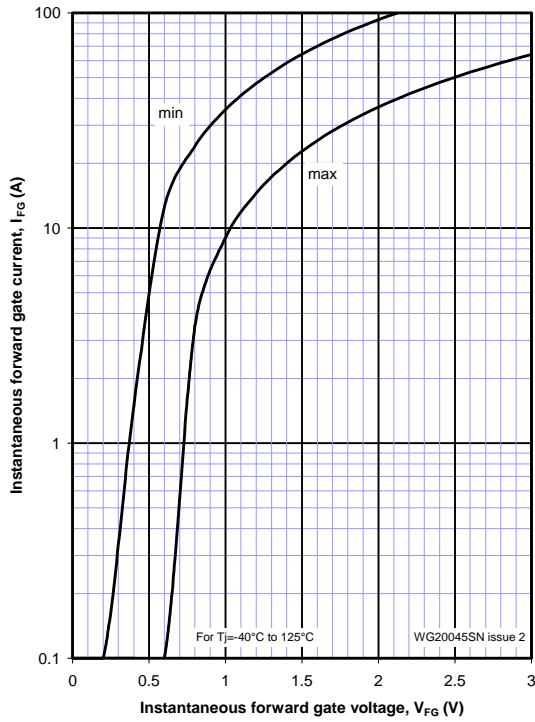


Figure 2, Maximum instantaneous on state characteristics

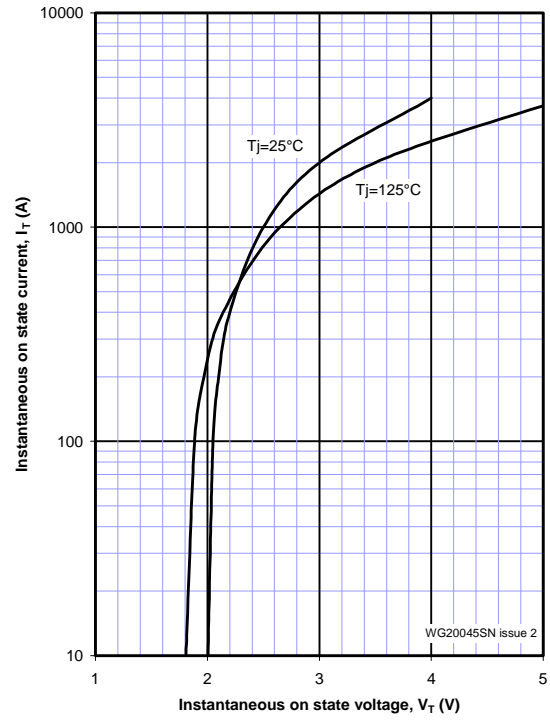


Figure 3, Maximum, non repetitive, overload ratings

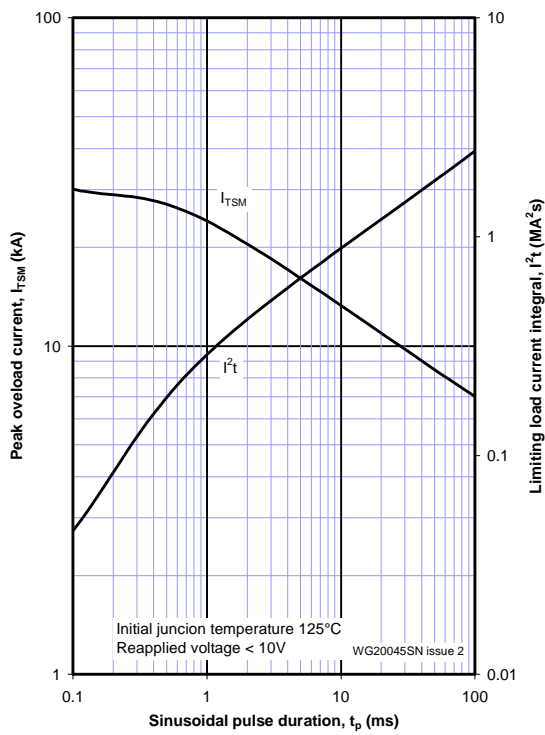


Figure 4, Transient thermal impedance

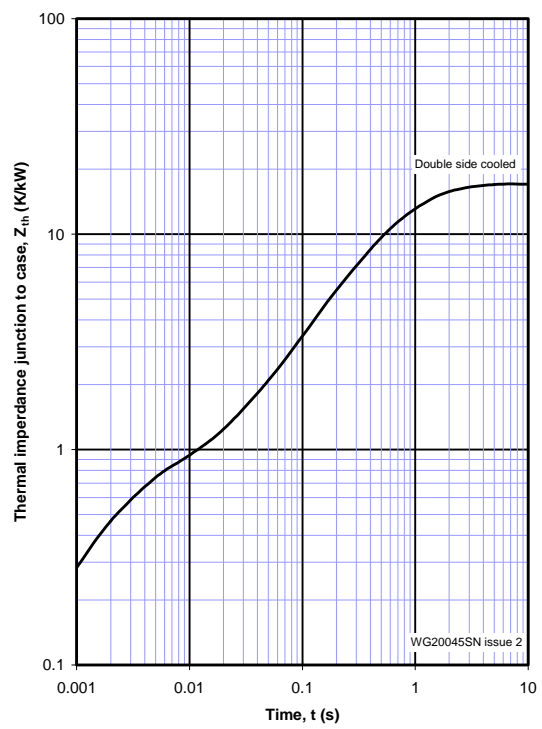


Figure 5, Forward blocking vs external gate-cathode resistance

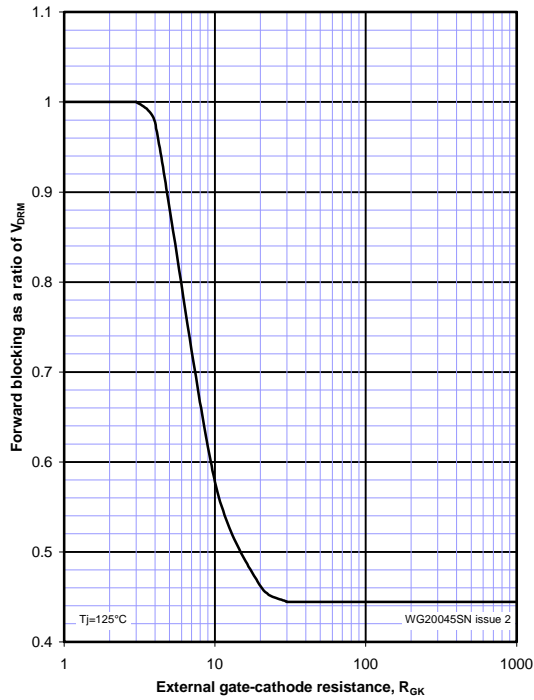


Figure 6, D.C. gate trigger current vs junction temperature

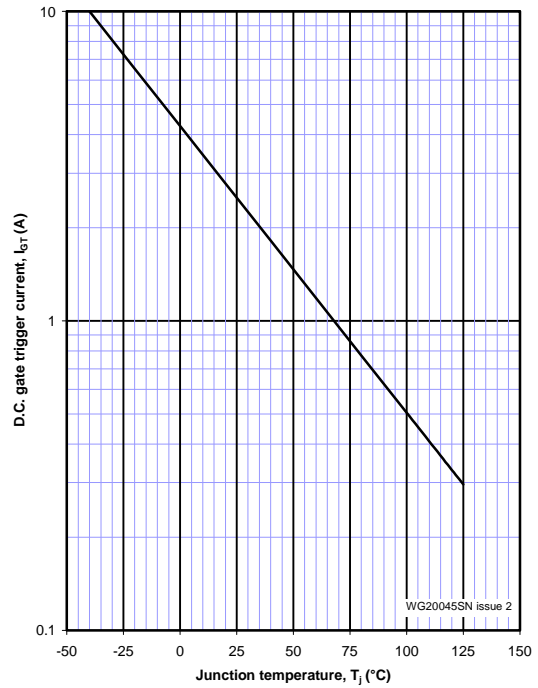


Figure 7, Typical turn on energy per pulse vs turn on current

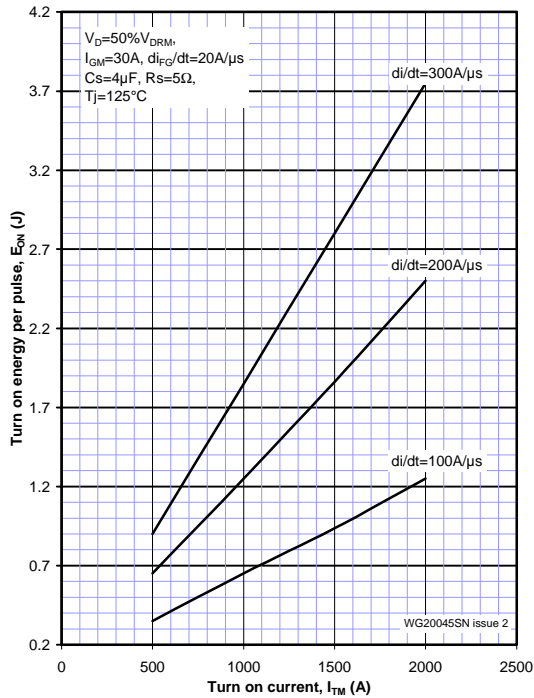


Figure 8, Typical turn off energy per pulse vs turn off current

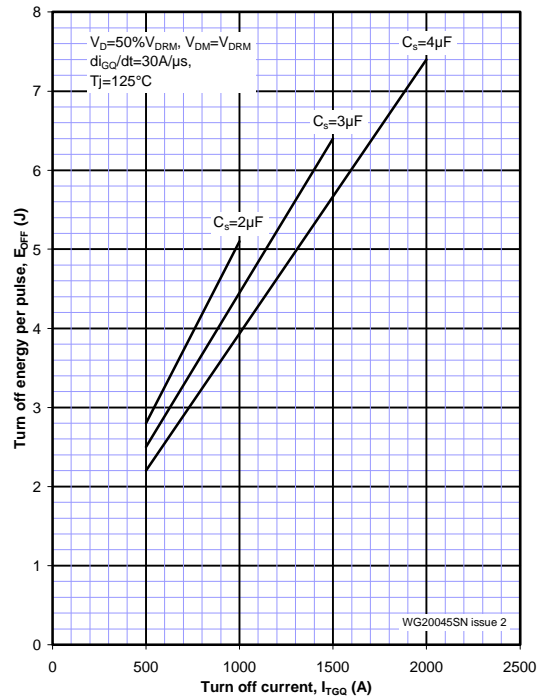


Figure 9, Maximum gate turn off charge vs turn off current

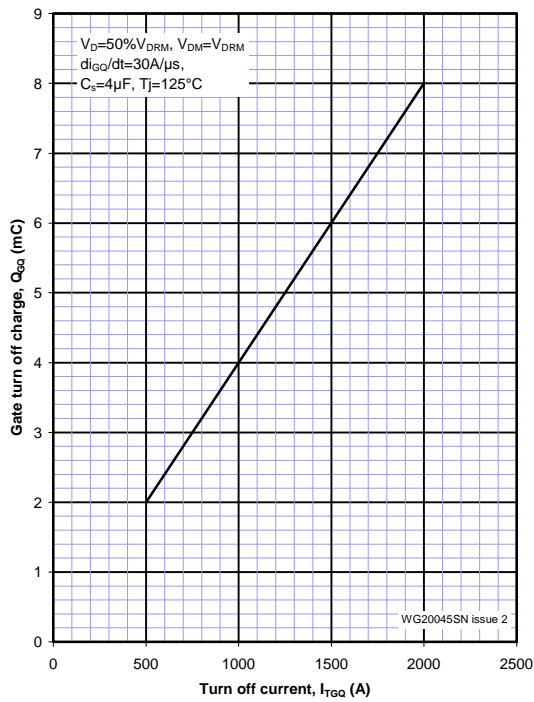


Figure 10, Maximum permissible turn off current vs snubber capacitance

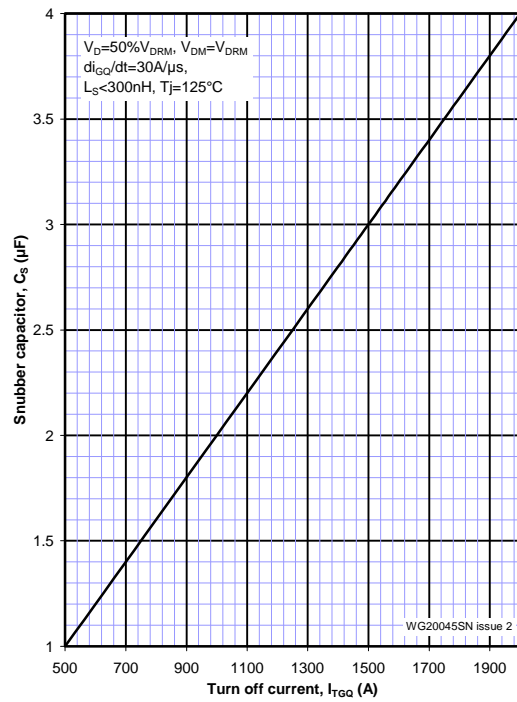
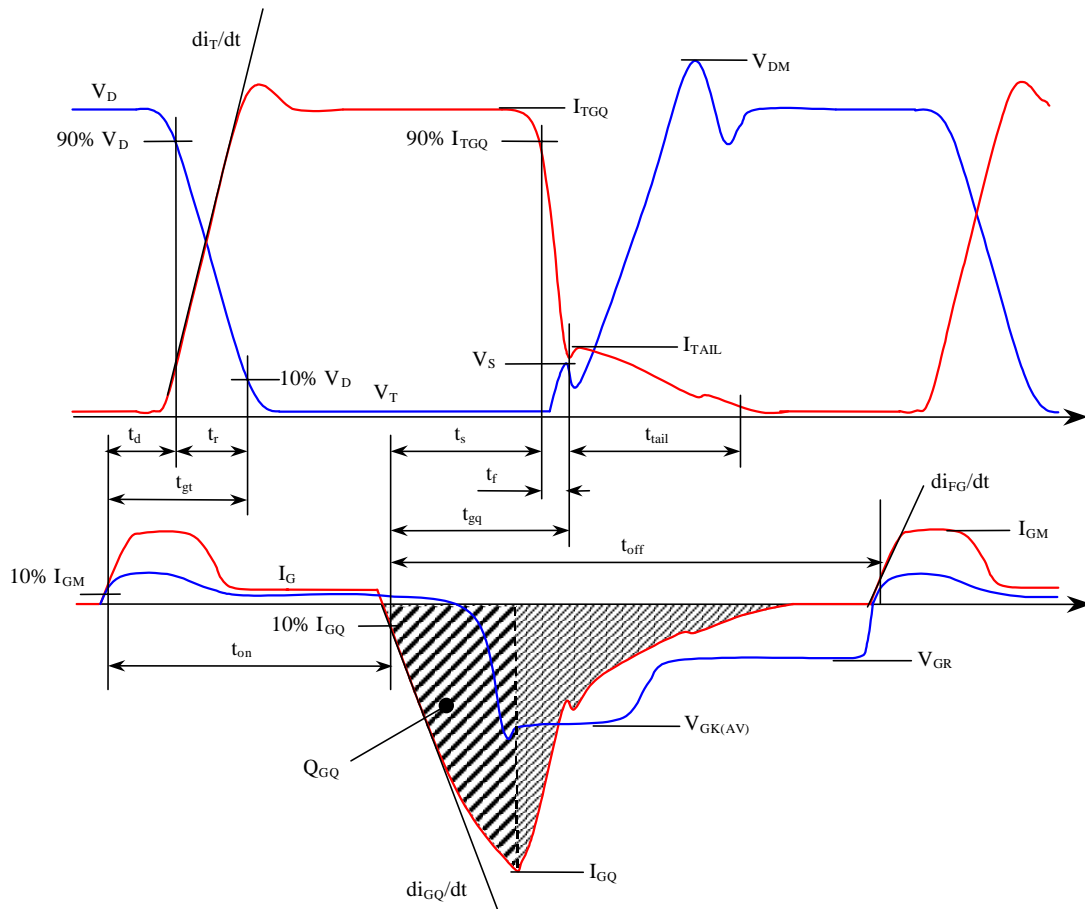
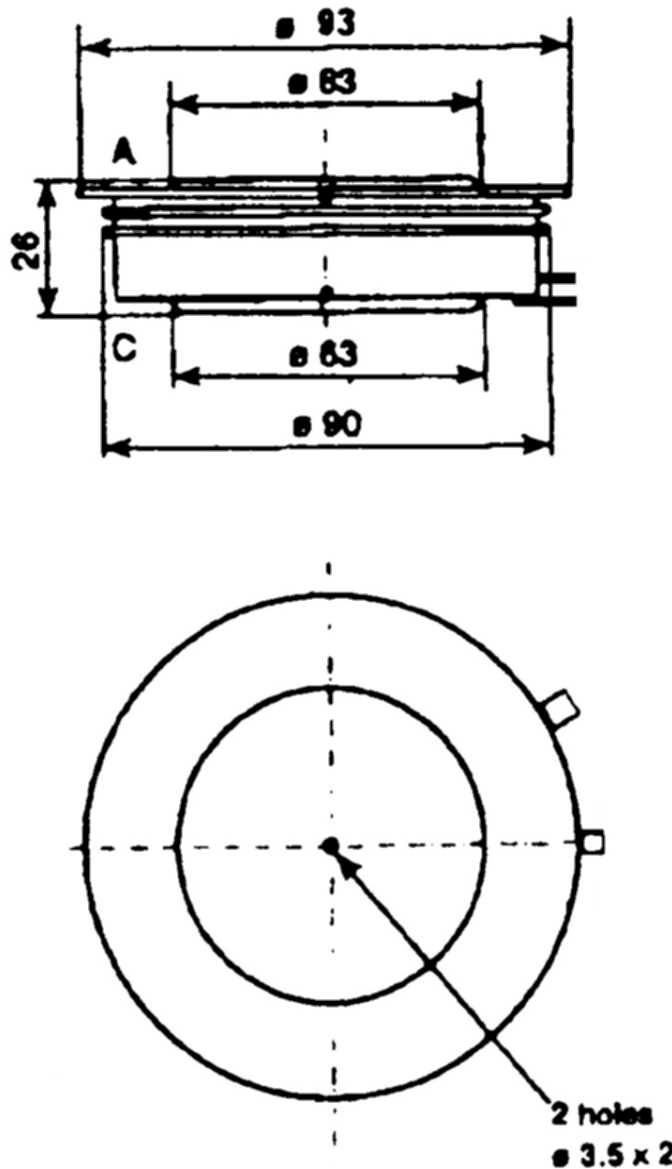


Fig 11, GTO thyristor typical switching waveforms



Outline drawing & ordering information



ORDERING INFORMATION		(Please quote 9 digit code as below)	
WG200	◆ ◆	SN	◆ ◆ ◆
Fixed Type Code	Voltage Code (Required $V_{DRM} / 100$)	Fixed Outline Code	Suffix code (if any) Reserved for special selections

Typical order code : WG20045SN – 4.5kV V_{DRM} , 26mm high capsule GTO thyristor

<h1 style="color: red;">WESTCODE</h1> <p>http://www.westcode.com</p>	<p>UK: Westcode Semiconductors Ltd PO Box 57, Chippenham, England SN15 1JL Tel: +44 (0)1249 444524 Fax: +44 (0)1249 659448 E-mail: WSL.sales@westcode.com</p> <p>USA: Westcode Semiconductors Inc 3270 Cherry Avenue, Long Beach, California 90807 Tel: 562 595 6971 Fax: 562 595 8182 E-mail: WSI.sales@westcode.com</p>
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