高端电力电子器件和装置制造商

CSG40L4500

门极可关断晶闸管

特 性

- 双面散热
- 可靠性高
- 高压性能
- 无快熔故障保护
- 大浪涌电流性能
- 关断性能可减少设备尺寸和重量
- 环保低噪音

关键参数

I_{TCM}	4000A
V_{DRM}	4500V
$I_{T(AV)}$	1180A
dV_D/dt	1000V/μs
di_T/dt	300A/μs

应 用

- 变速交流电机驱动逆变器(VSD-AC)
- 高电压转换器
- 斩波器
- DC / DC 转换器

电压等级

型号	断态重复峰值电压	反向重复峰值电压	测试条件
CSG40L4500	4500	16	T_{vj} = 125°C, I_{DM} = 100mA, I_{RRM} = 50mA

电流等级

符号	参数	测试条件	Max.	单位
I_{TGQM}	Peak controllable off-state current	V = 66% V_{DRM} , T_j = 125°C, dI_{GQ}/dt = 40A/μs ,Cs = 3μF	4000	A
$I_{T(AV)}$	Mean on-state current	T_{HS} = 80°C. Double side cooled, half sine 50Hz	1180	A
$I_{T(RMS)}$	RMS on-state current		1850	A

浪涌等级

符号	参数	测试条件	Max.	单位
I_{TSM}	Surge (non-repetitive) on-state current	10ms half sine. T_j = 125°C	20.0	kA
I^2t	I^2t for fusing	10ms half sine. T_j =125°C	2.0×10^6	A^2s
di_T/dt	Critical rate of rise of on-state current	V_D = 3000V, I_T = 3000A, T_j = 125°C, I_{FG} > 40A, Rise time > 1.0μs	300	A/μs
dV_D/dt	Rate of rise of off-state voltage	To 66% V_{DRM}; $R_{GK} \leq 1.5\Omega$, T_j = 125°C	130	V/μs
		To 66% V_{DRM}; V_{RG} = -2V, T_j = 125°C	1000	V/μs
L_S	Peak stray inductance in snubber circuit	I_T = 3000A, V_D = V_{DRM}, T_j = 125°C, $dI/_{GQ}$ = 40A/μs, Cs = 3.0μF	200	nH

门极等级

符号	参数	测试条件	Min.	Max.	单位
V_{RGM}	Peak reverse gate voltage	This value maybe exceeded during turn-off	-	16	V
I_{FGM}	Peak forward gate current		20	100	A
$P_{FG(AV)}$	Average forward gate power		-	20	W
P_{RGM}	Peak reverse gate power		-	24	kW
di_{GQ}/dt	Rate of rise of reverse gate current		20	60	A/μs
$t_{ON(min)}$	Minimum permissable on time		50	-	μs
$t_{OFF(min)}$	Minimum permissable off time		100	-	μs

热力和力学参数

符号	参数	测试条件		Min.	Max.	单位
R_{thJC}	DC thermal resistance - junction to heatsink surface	Double side cooled		-	0.011	°C/W
		Anode side cooled		-	0.017	°C/W
		Cathode side cooled		-	0.03	°C/W
R_{thCH}	Contact thermal resistance	Clamping force 40.0kN With mounting compound	per contact	-	0.0021	°C/W
T_{VJM}	Virtual junction temperature			-40	125	°C
T_{OP}/T_{stg}	Operating junction/storage temperature range			-40	125	°C
F	Clamping force			36.0	44.0	kN

特 性

符号	参数	测试条件	Max.	单位
V_{TM}	On-state voltage	At 4000A peak, $I_{G(ON)}$ = 10A d.c.	4.0	V
I_{DM}	Peak off-state current	V_{DRM} = 4500V, V_{RG} = 0V	100	mA
I_{RRM}	Peak reverse current	At V_{RRM}	50	mA
V_{GT}	Gate trigger voltage	V_D = 24V, I_T = 110A, T_j = 25°C	1.2	V
I_{GT}	Gate trigger current	V_D = 24V, I_T = 110A, T_j = 25°C	4.0	A
I_{RGM}	Reverse gate cathode current	V_{RGM} = 16V, No gate/cathode resistor	50	mA
E_{ON}	Turn-on energy	V_D = 2000V	2700	mJ
t_d	Delay time	I_T = 3000A, dI_T/dt = 300A/μs	2.0	μs
t_r	Rise time	I_{FG} = 40A, rise time < 1.0μs	6.0	μs
E_{OFF}	Turn-off energy		13500	mJ
t_{gs}	Storage time		25.0	μs
t_{gf}	Fall time	I_T = 3000A, V_{DM} = V_{DRM}	2.5	μs
t_{gq}	Gate controlled turn-off time	Snubber Cap Cs = 3.0μF,	27.5	μs
Q_{GQ}	Turn-off gate charge	di_{GQ}/dt = 40A/μs	12000	μC
Q_{GQT}	Total turn-off gate charge		24000	μC
I_{GQM}	Peak reverse gate current		950	A

曲 线

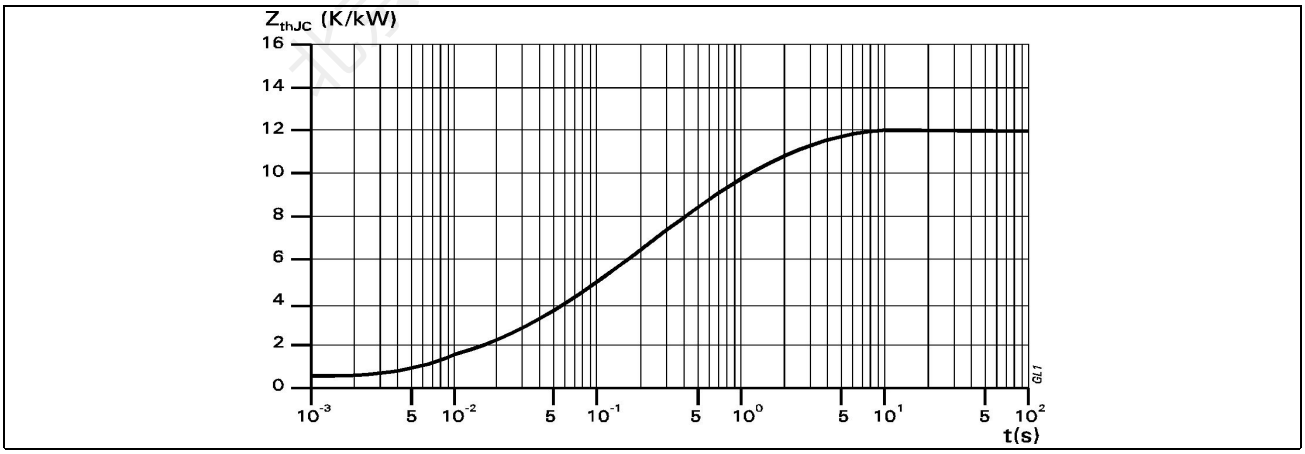


Fig. 1 Transient thermal impedance, junction to case.

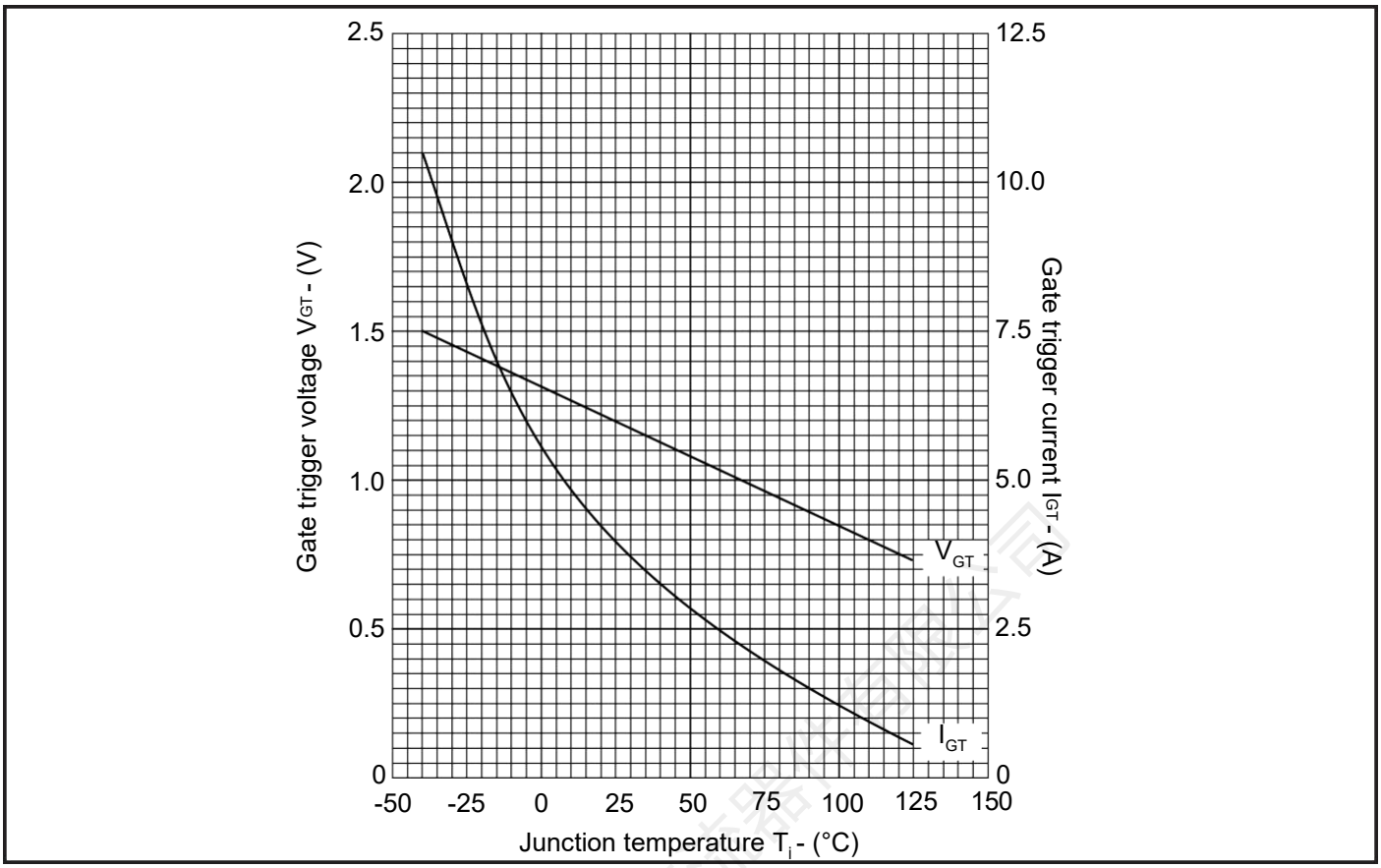


Figure 2. Maximum gate trigger voltage/current vs junction temperature

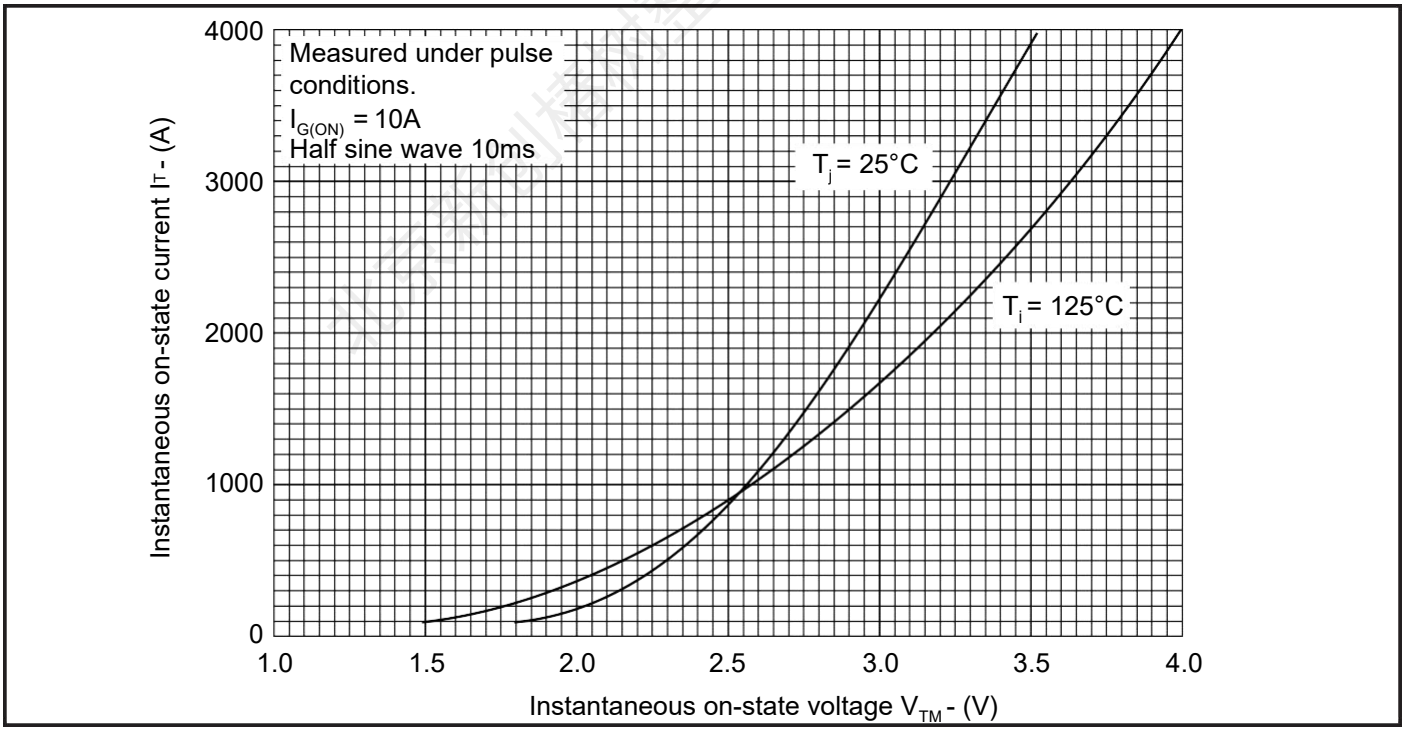


Figure 3. On-state characteristics

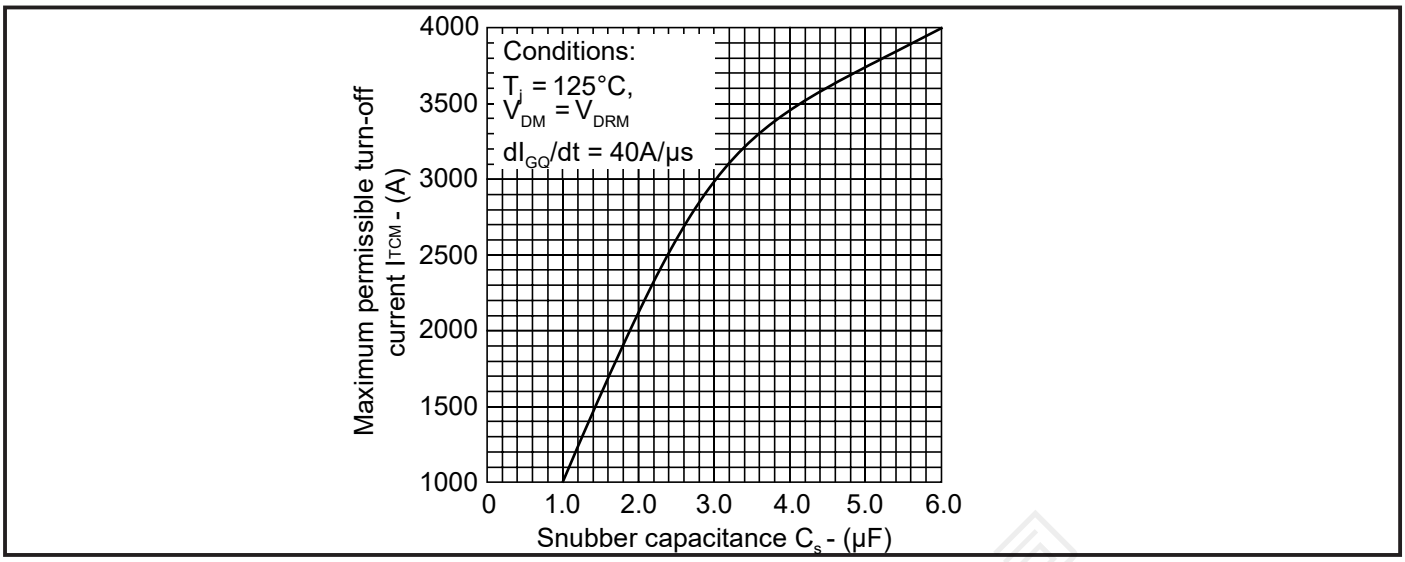


Figure 4. Maximum dependence of I_{TCM} on Cs

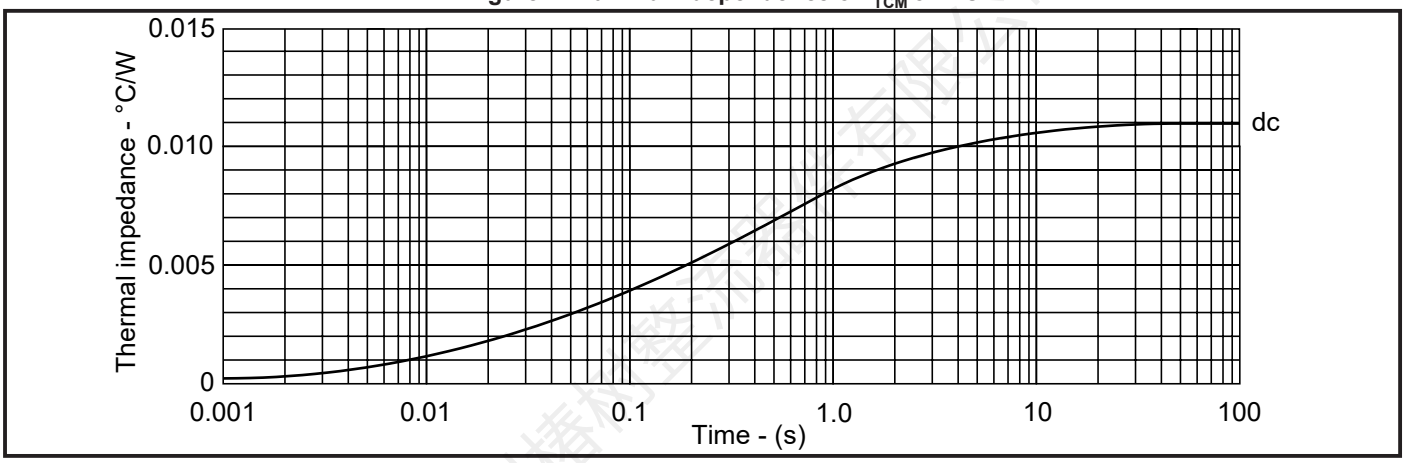


Figure 5. Maximum (limit) transient thermal impedance - double side cooled

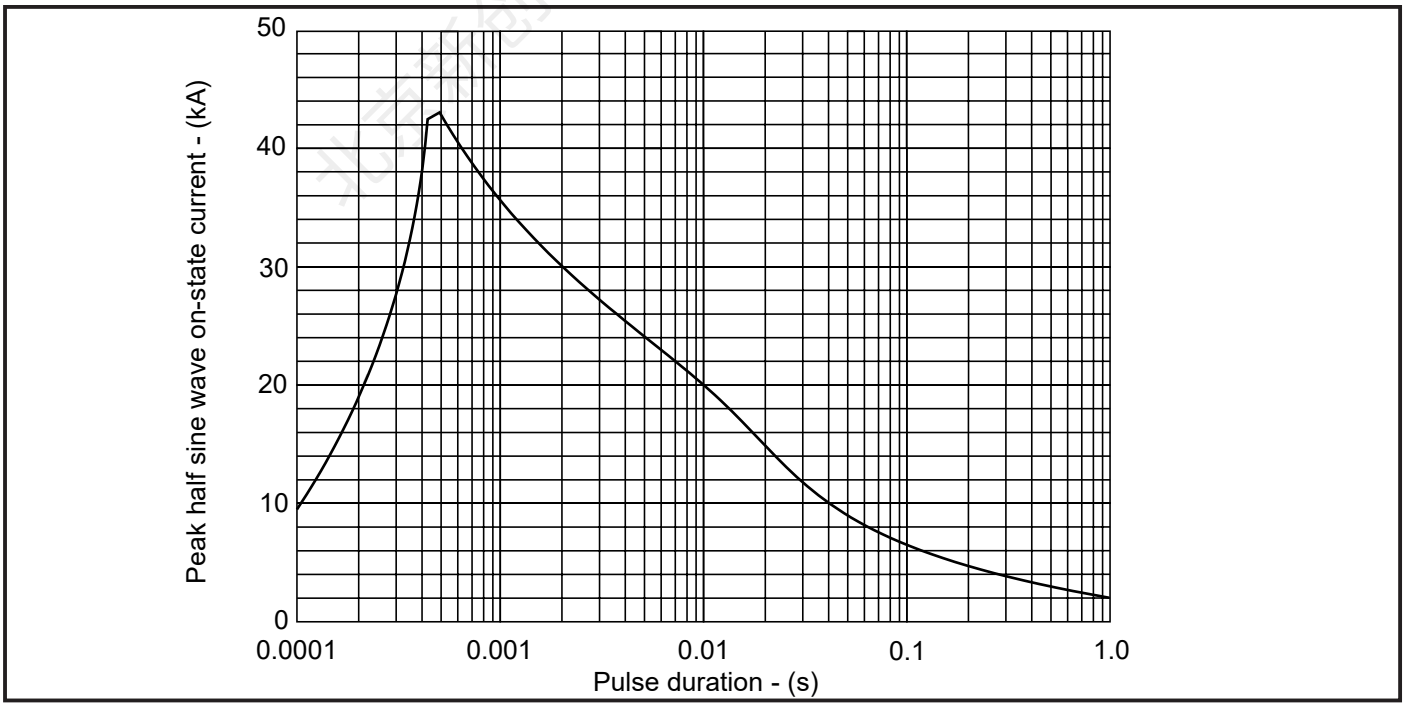


Figure 6. Surge (non-repetitive) on-state current vs time

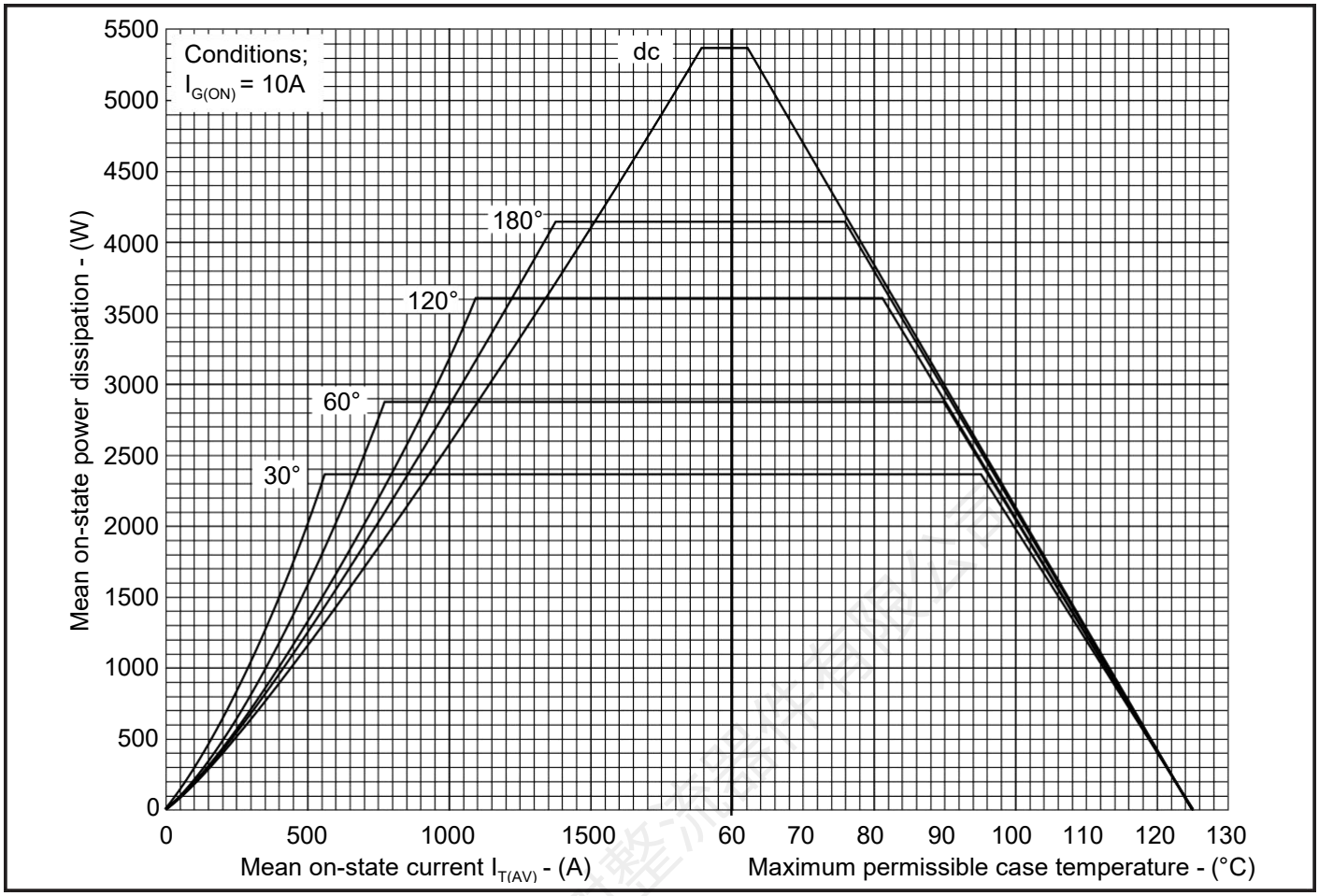


Figure 7. Steady state rectangular wave conduction loss - double side cooled

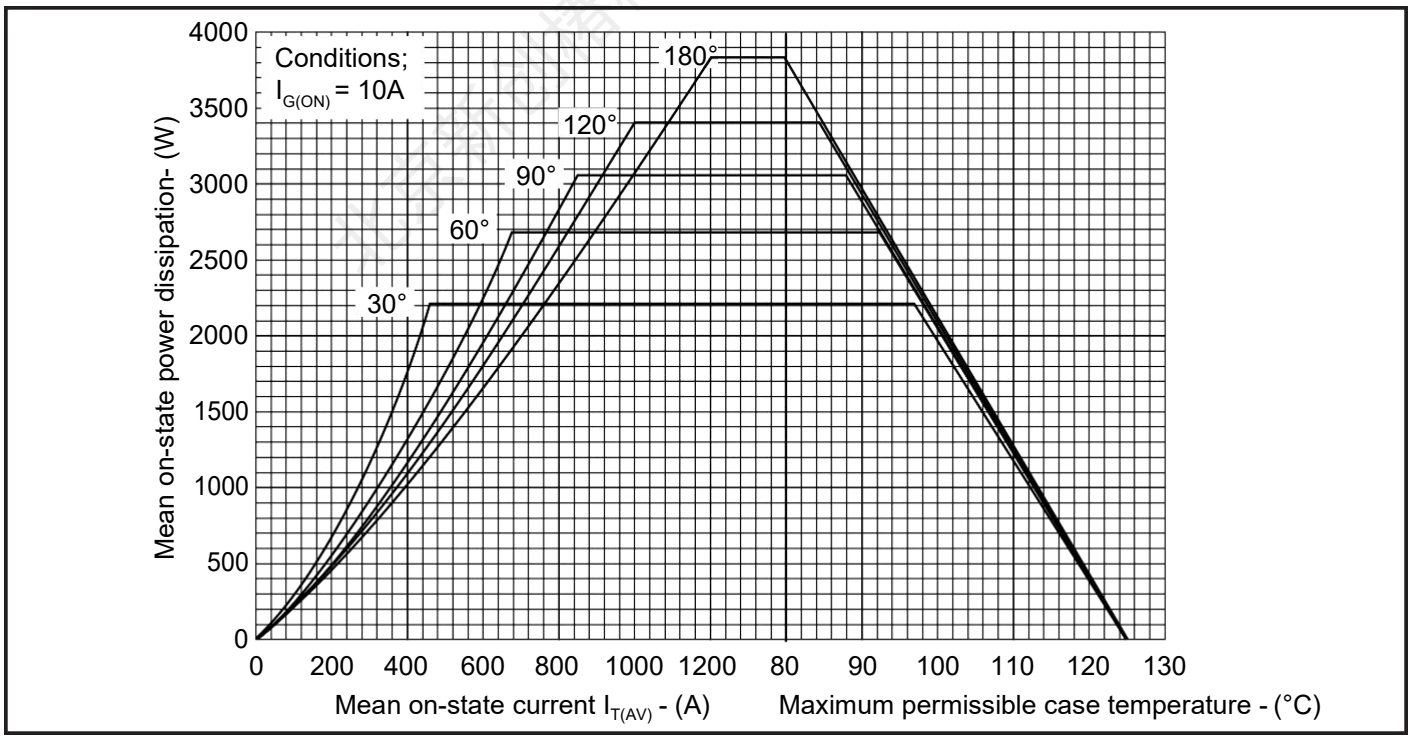


Figure 8. Steady state sinusoidal wave conduction loss - double side cooled

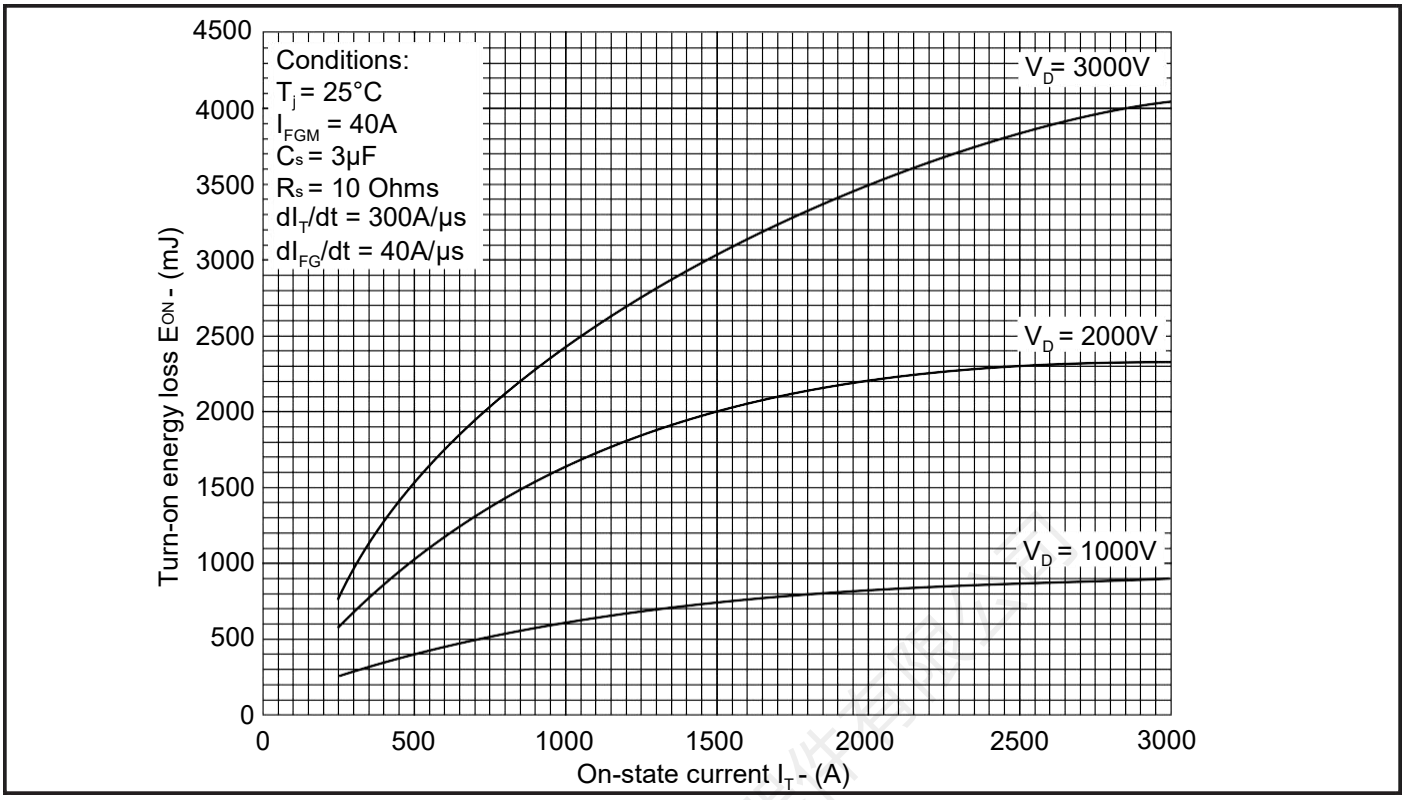


Figure 9. Turn-on energy vs on-state current

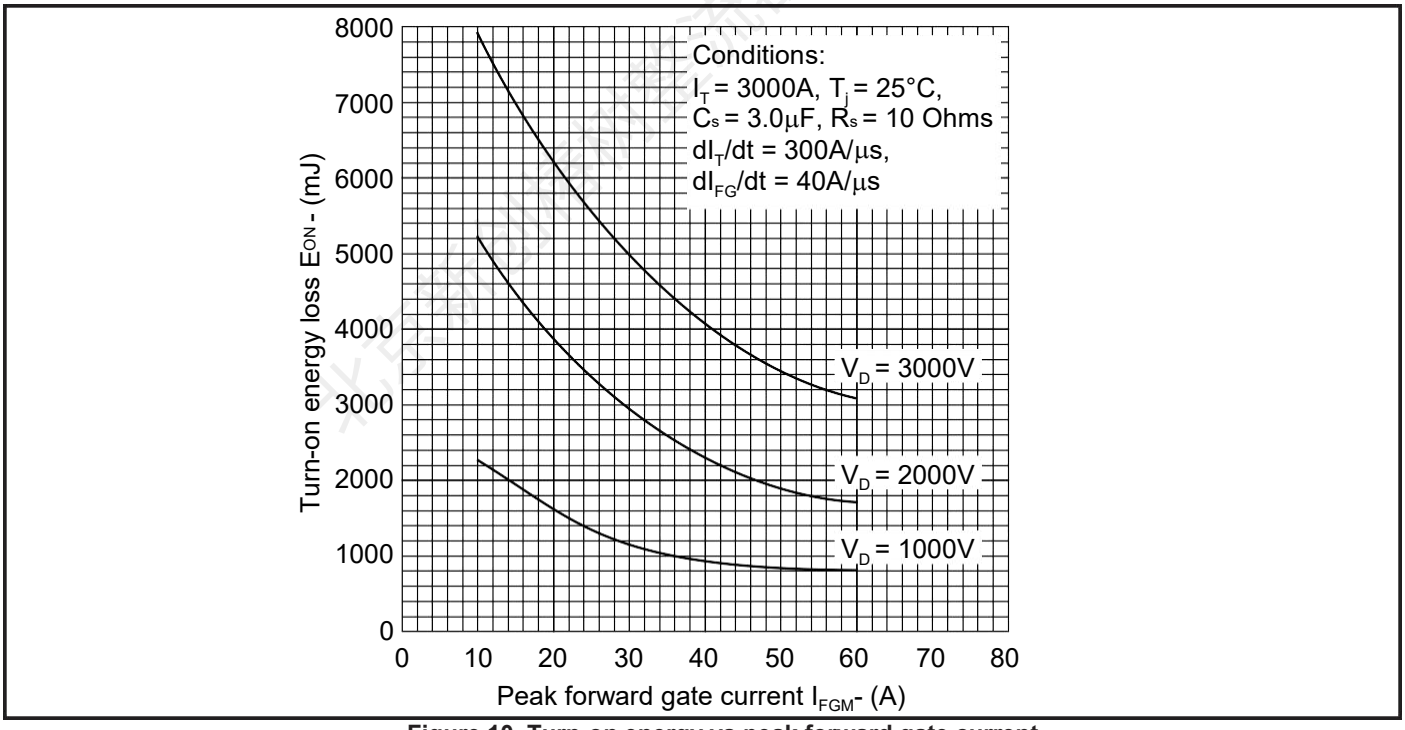


Figure 10. Turn-on energy vs peak forward gate current

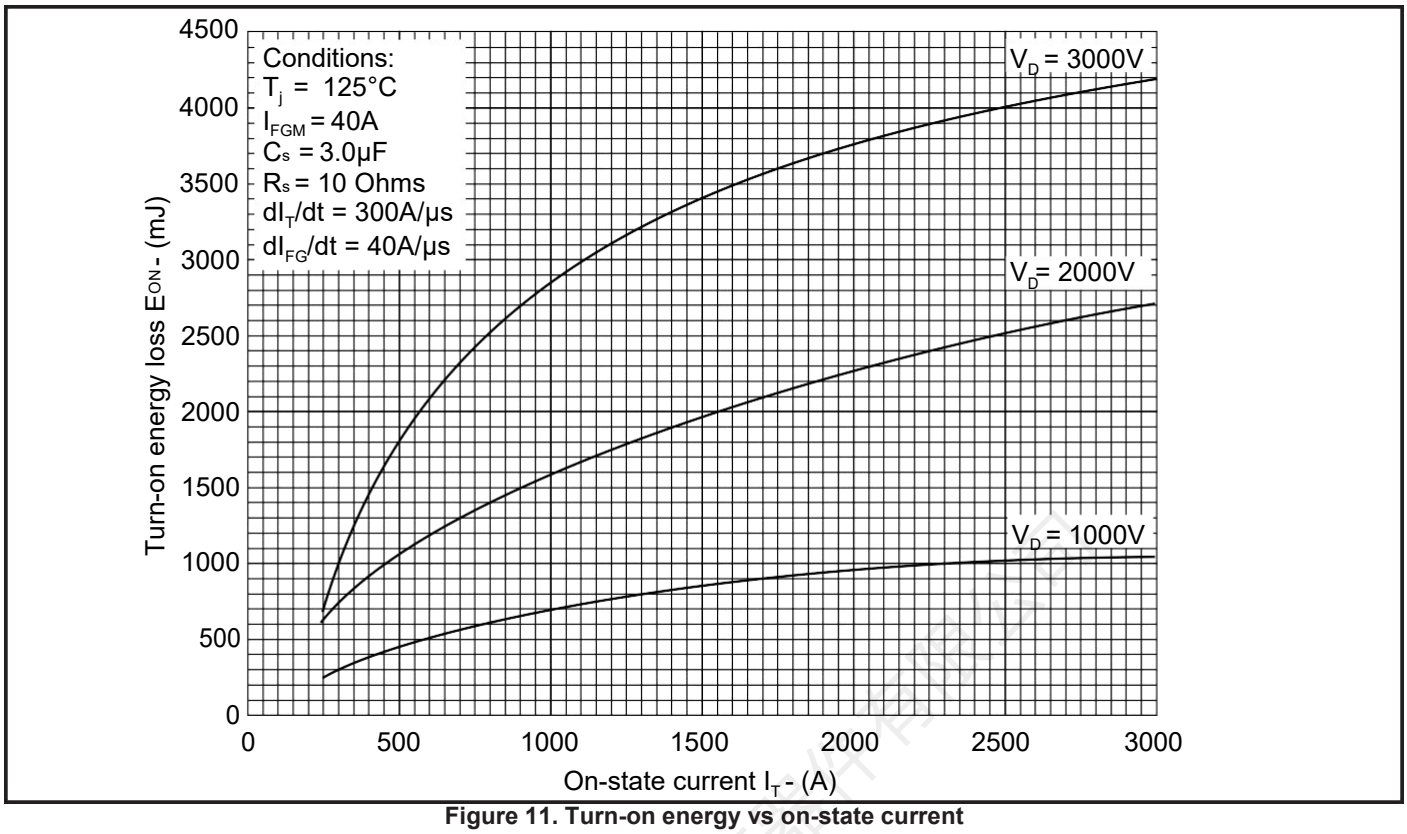


Figure 11. Turn-on energy vs on-state current

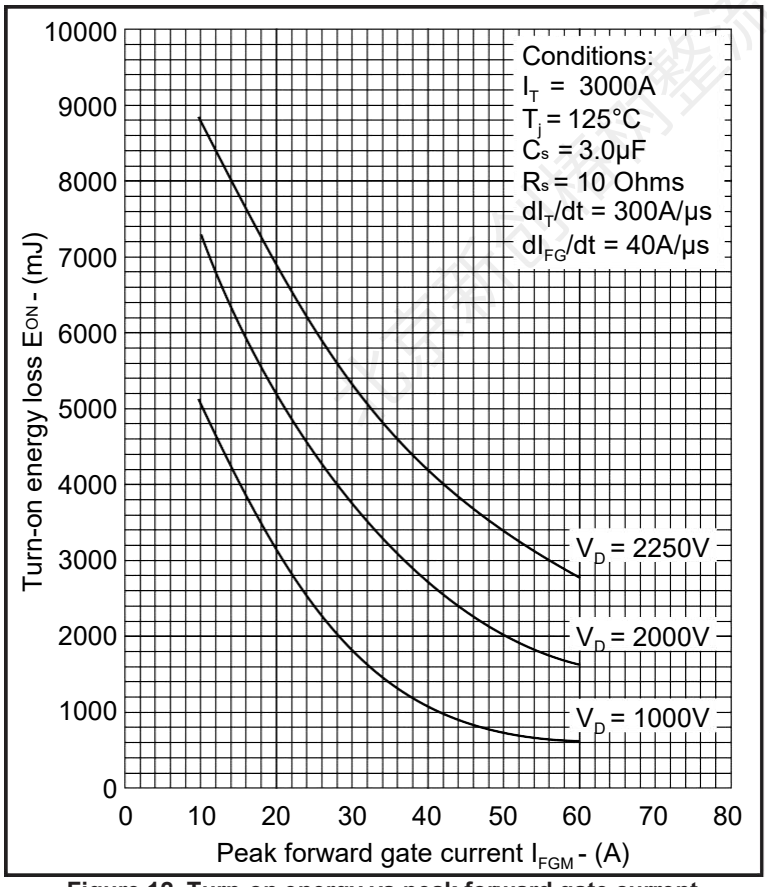


Figure 12. Turn-on energy vs peak forward gate current

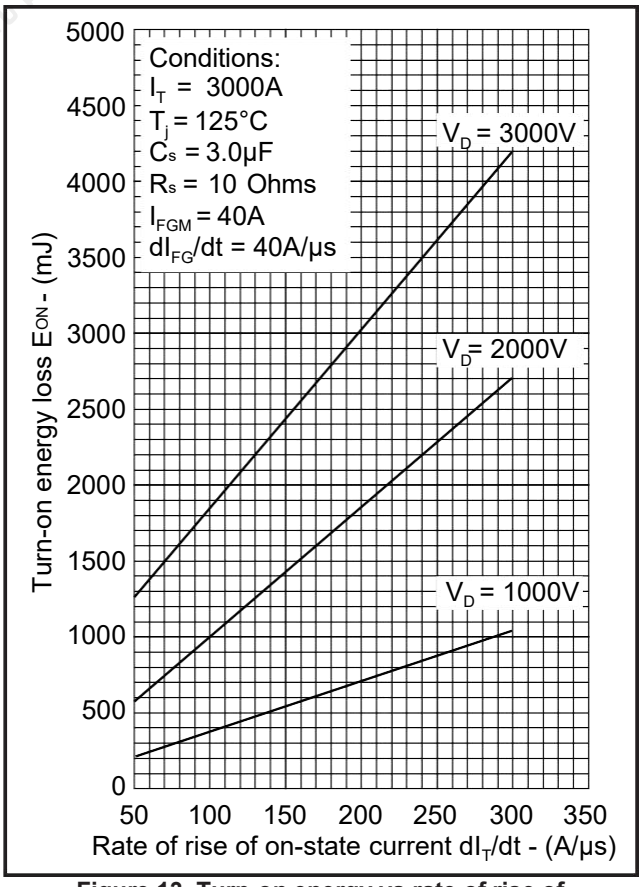


Figure 13. Turn-on energy vs rate of rise of on-state current

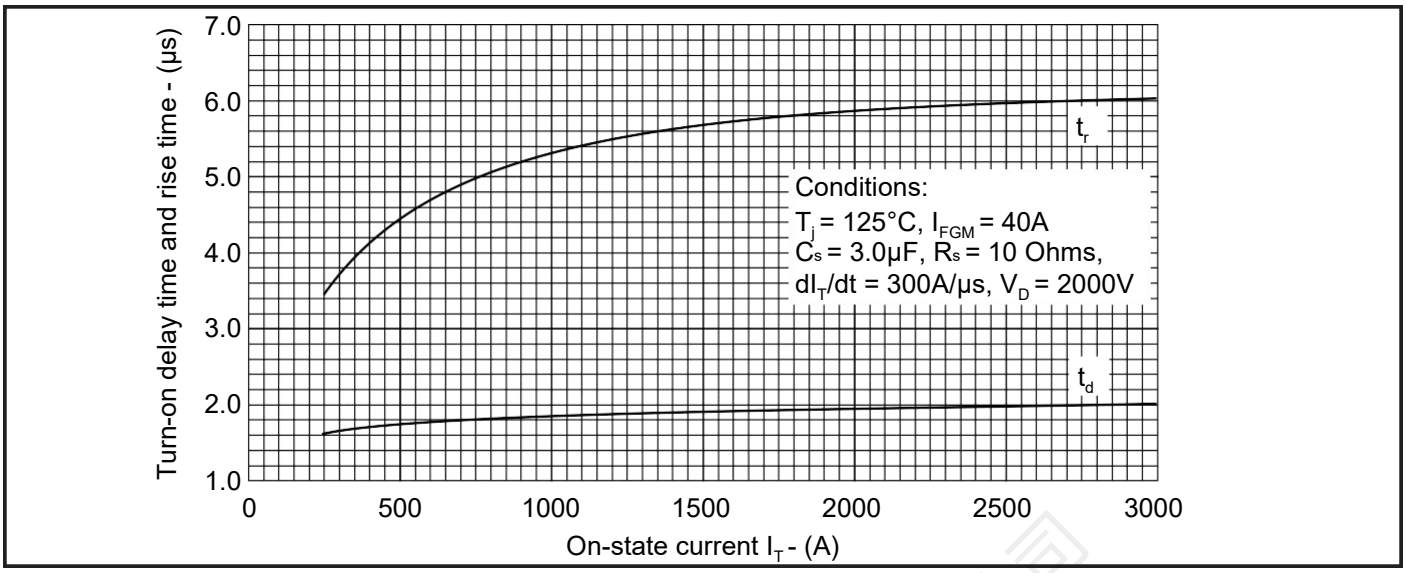


Fig.ure 14. Delay and rise time vs on-state current

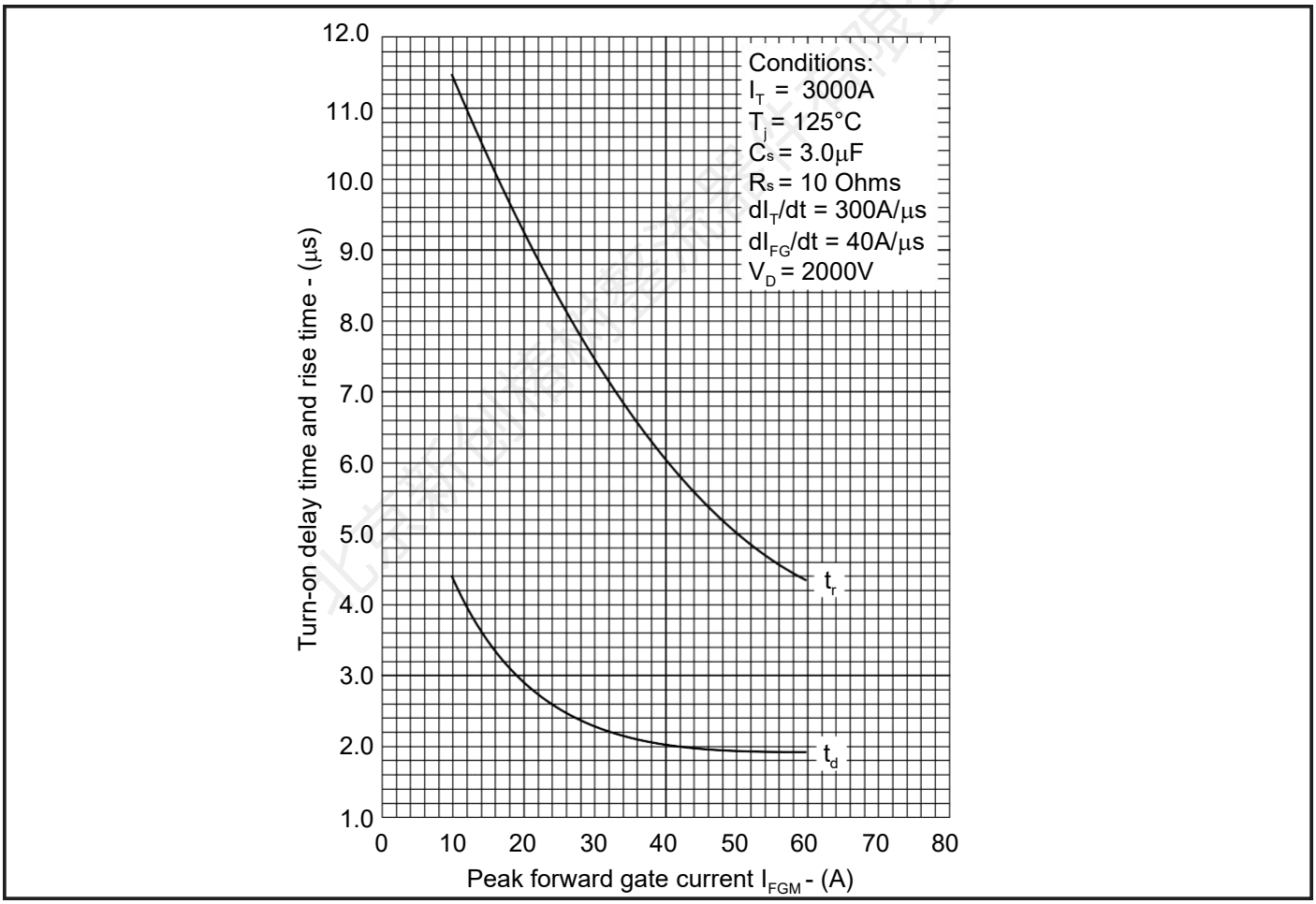


Figure 15. Delay and rise time vs peak forward gate current

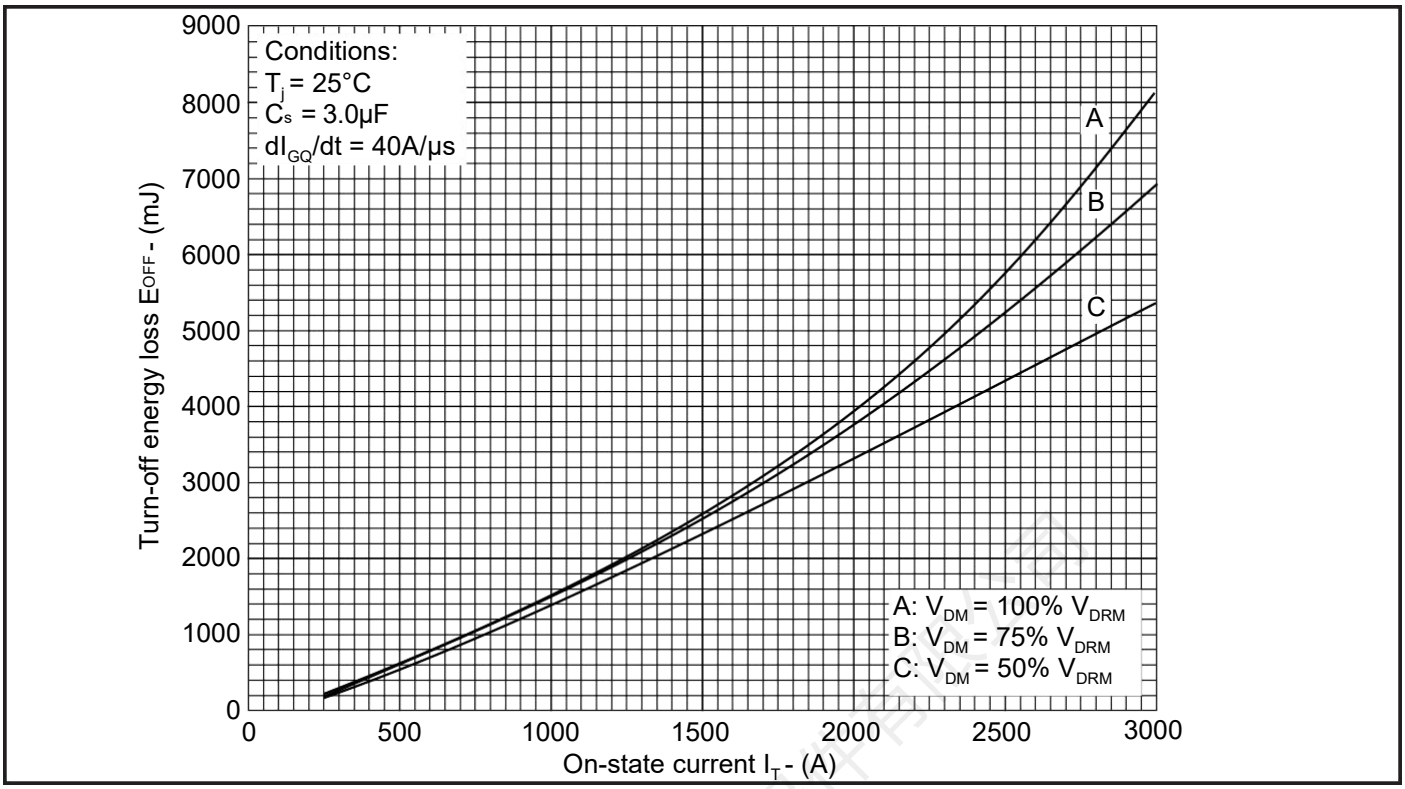


Figure 16. Turn-off energy loss vs on-state current

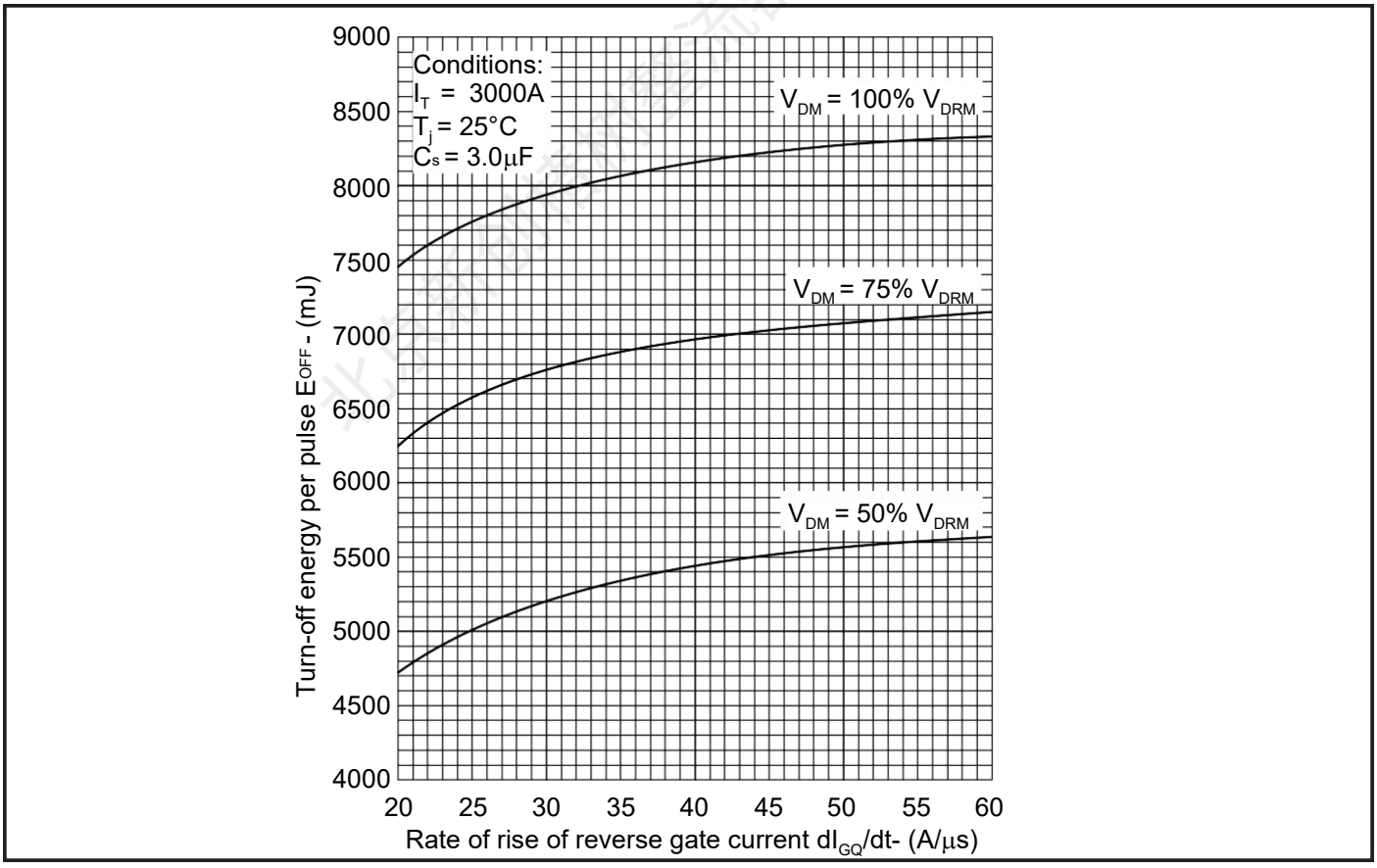


Figure 17. Turn-off energy vs rate of rise of reverse gate current

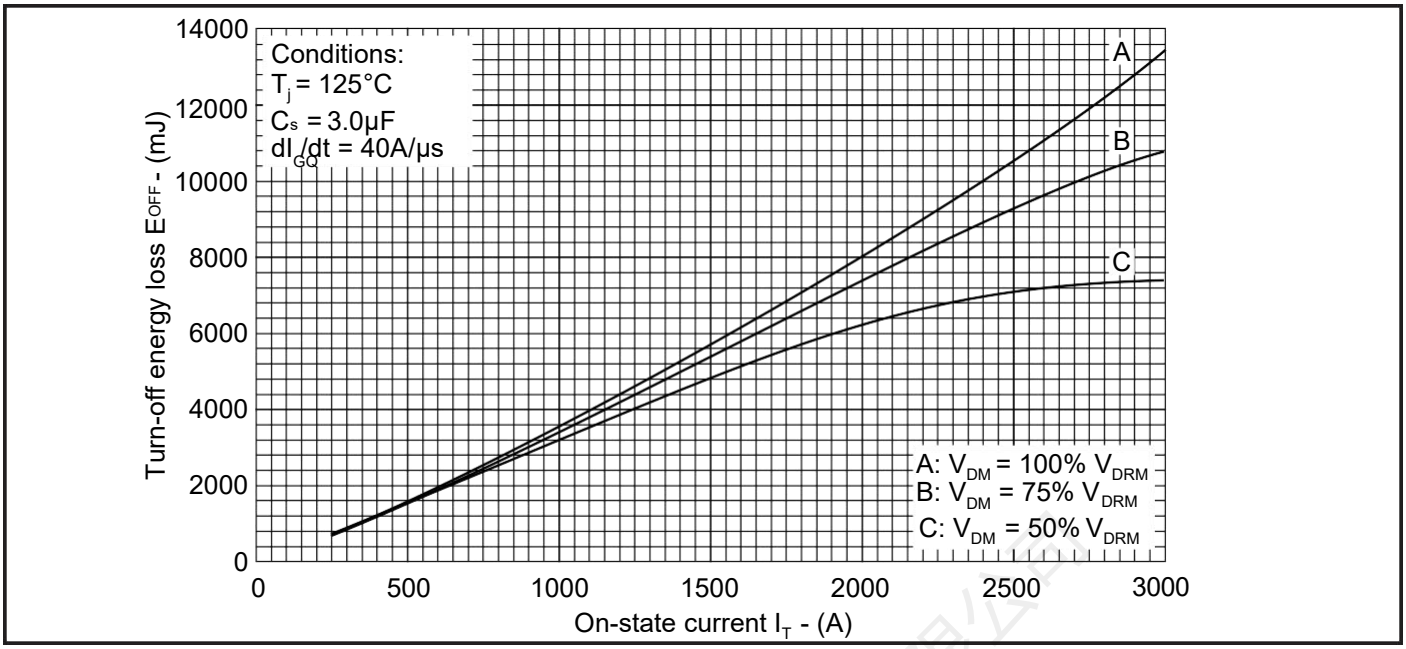


Figure 18. Turn-off energy vs on-state current

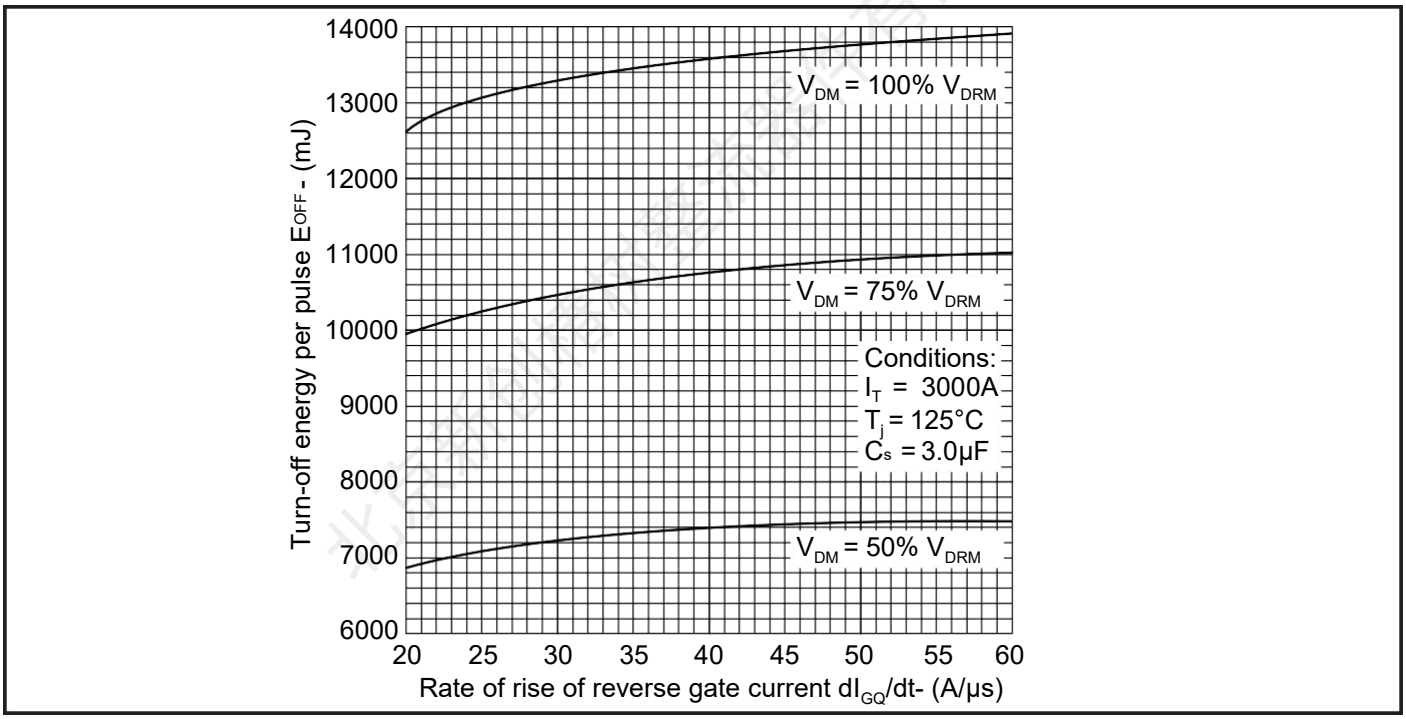


Figure 19. Turn-off energy loss vs rate of rise of reverse gate current

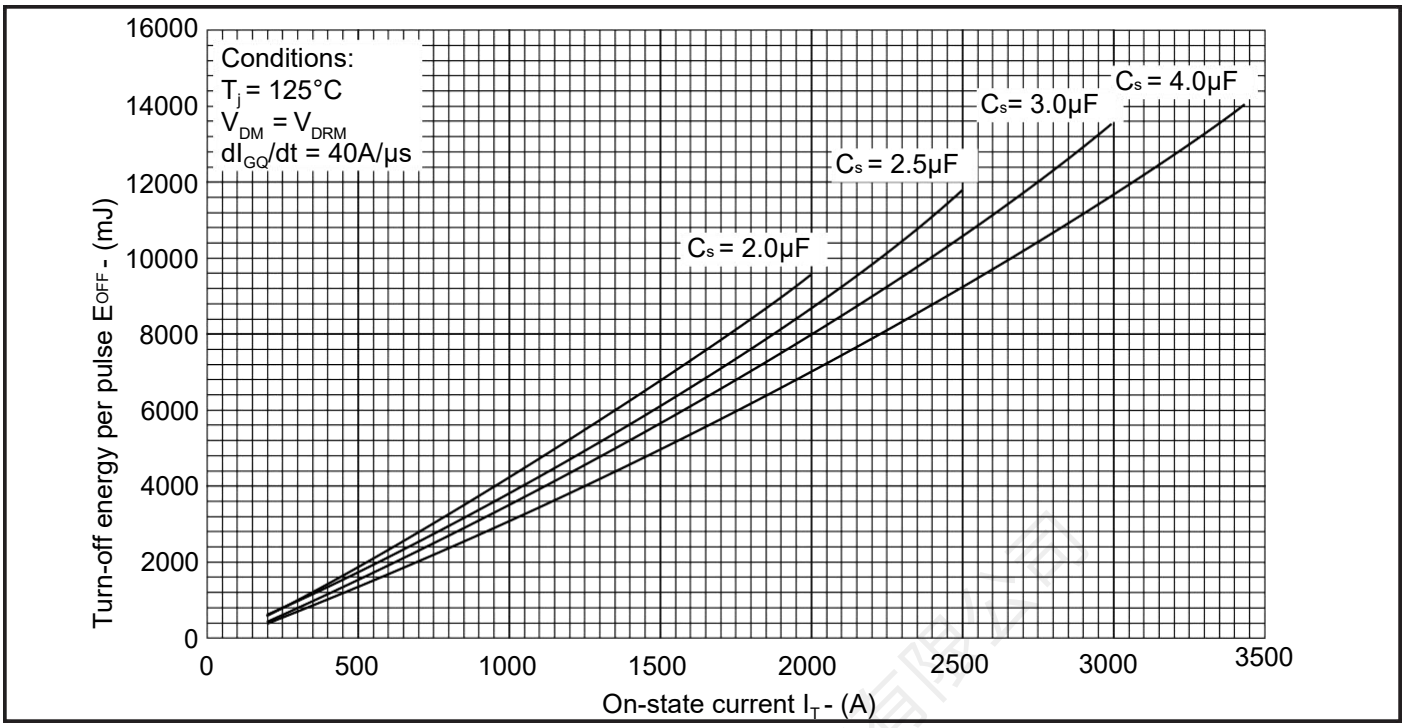


Figure 20. Turn-off energy vs on-state current

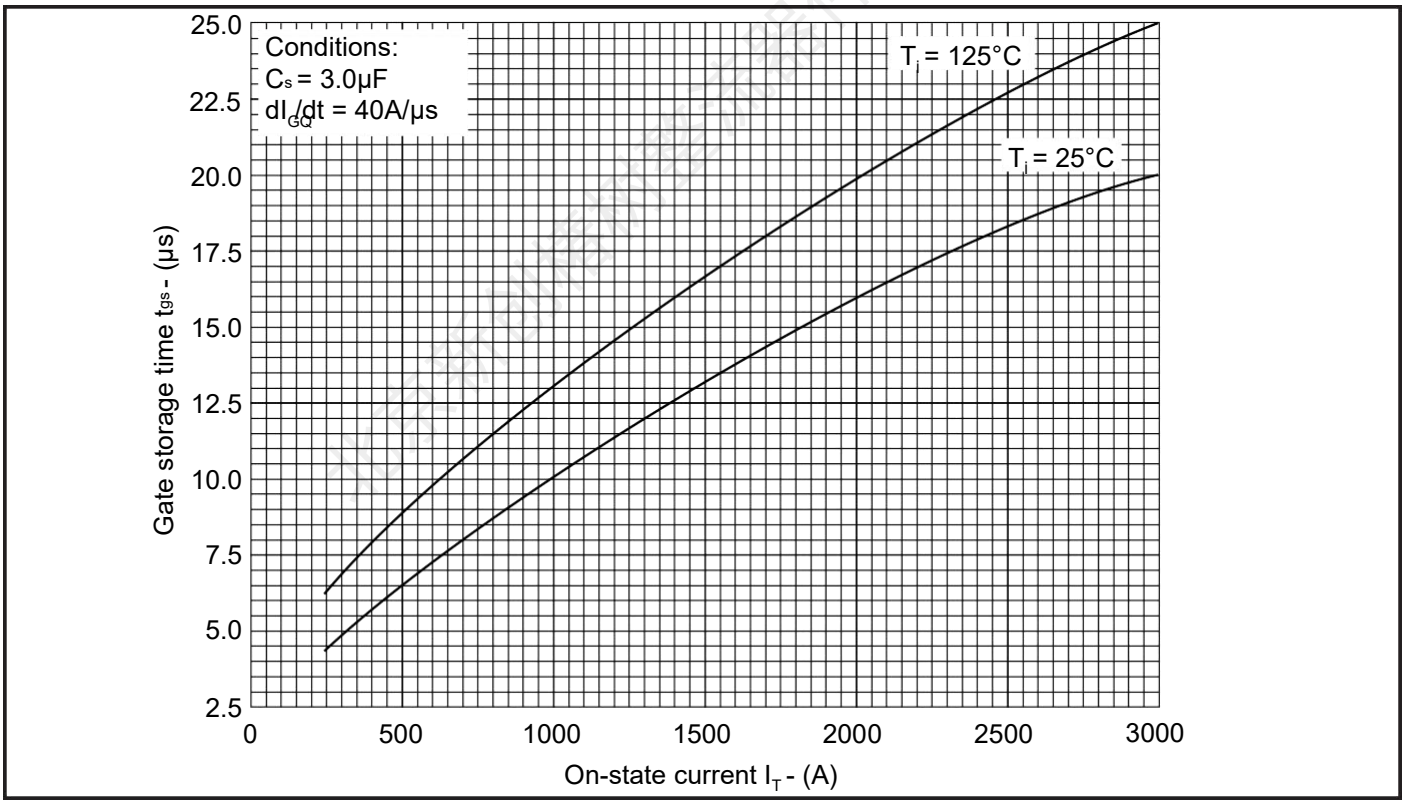


Figure 21. Gate storage time vs on-state current

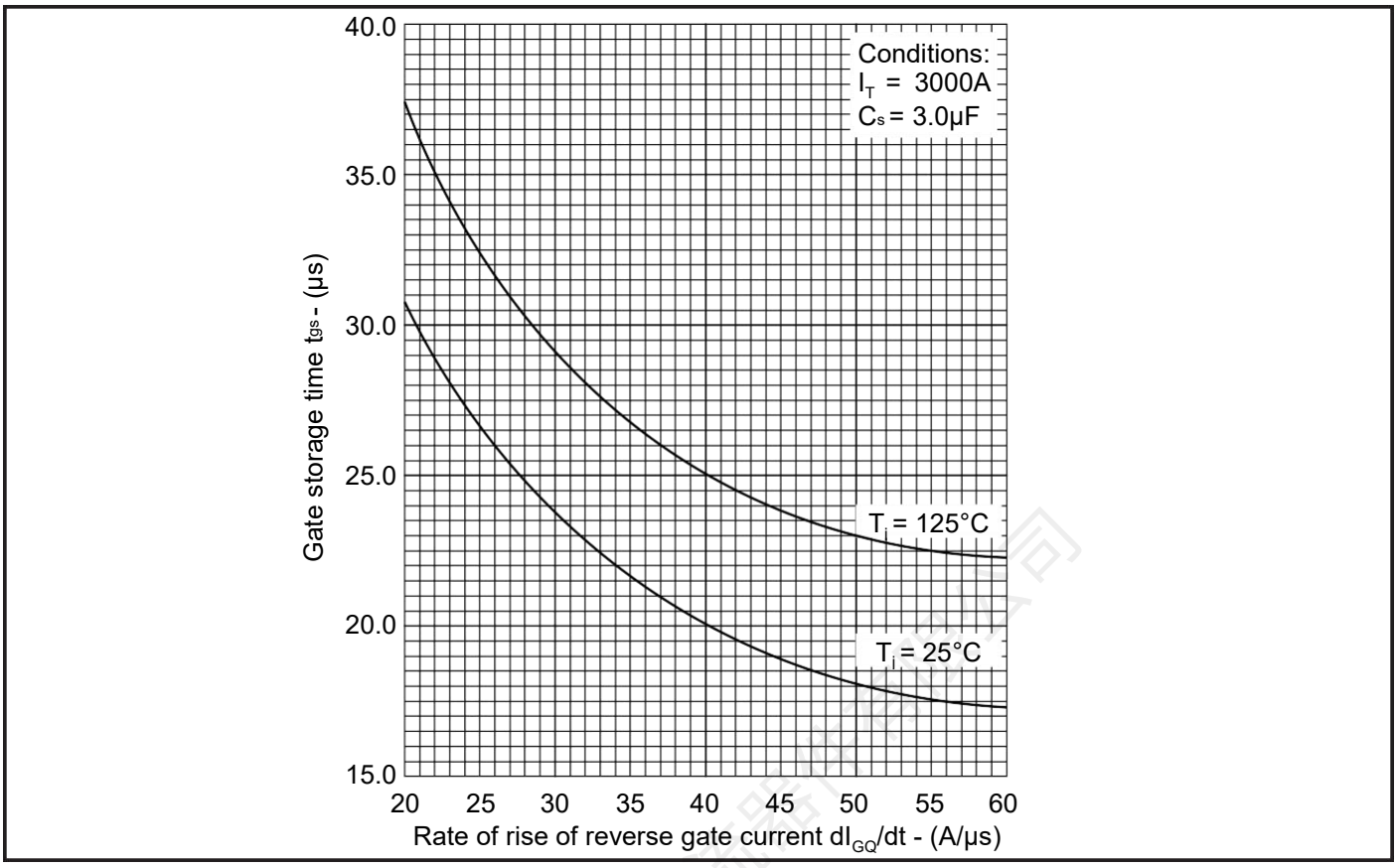


Figure 22. Gate storage time vs rate of rise of reverse gate current

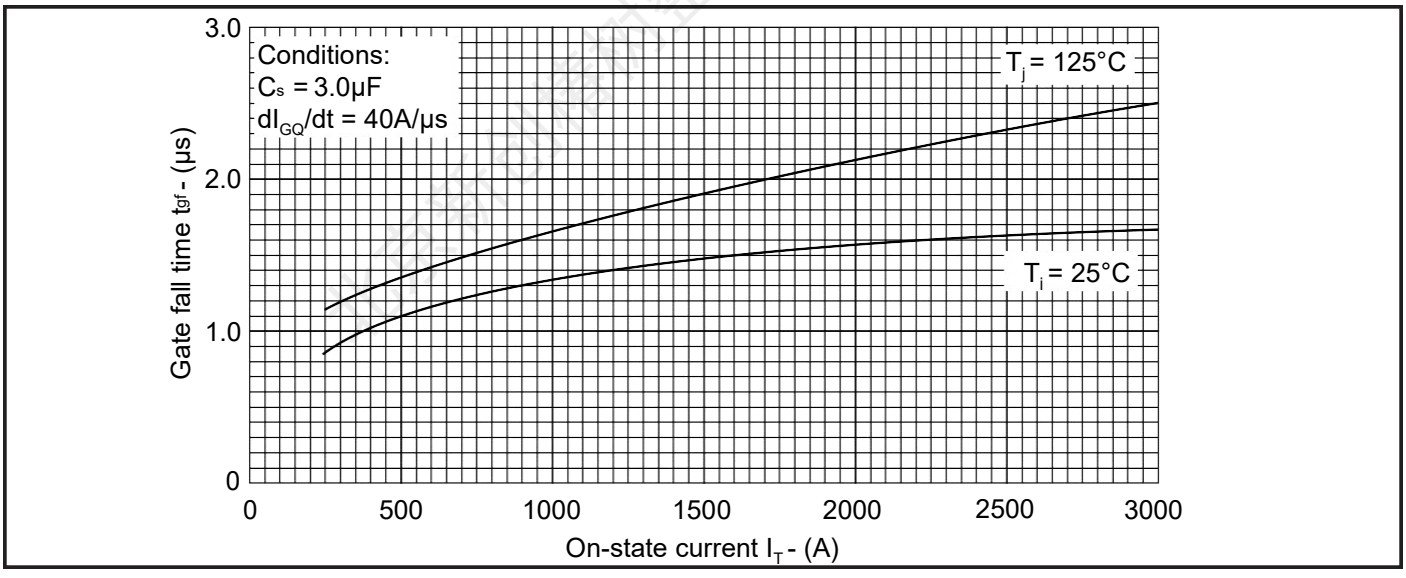


Figure 23. Gate fall time vs on-state current

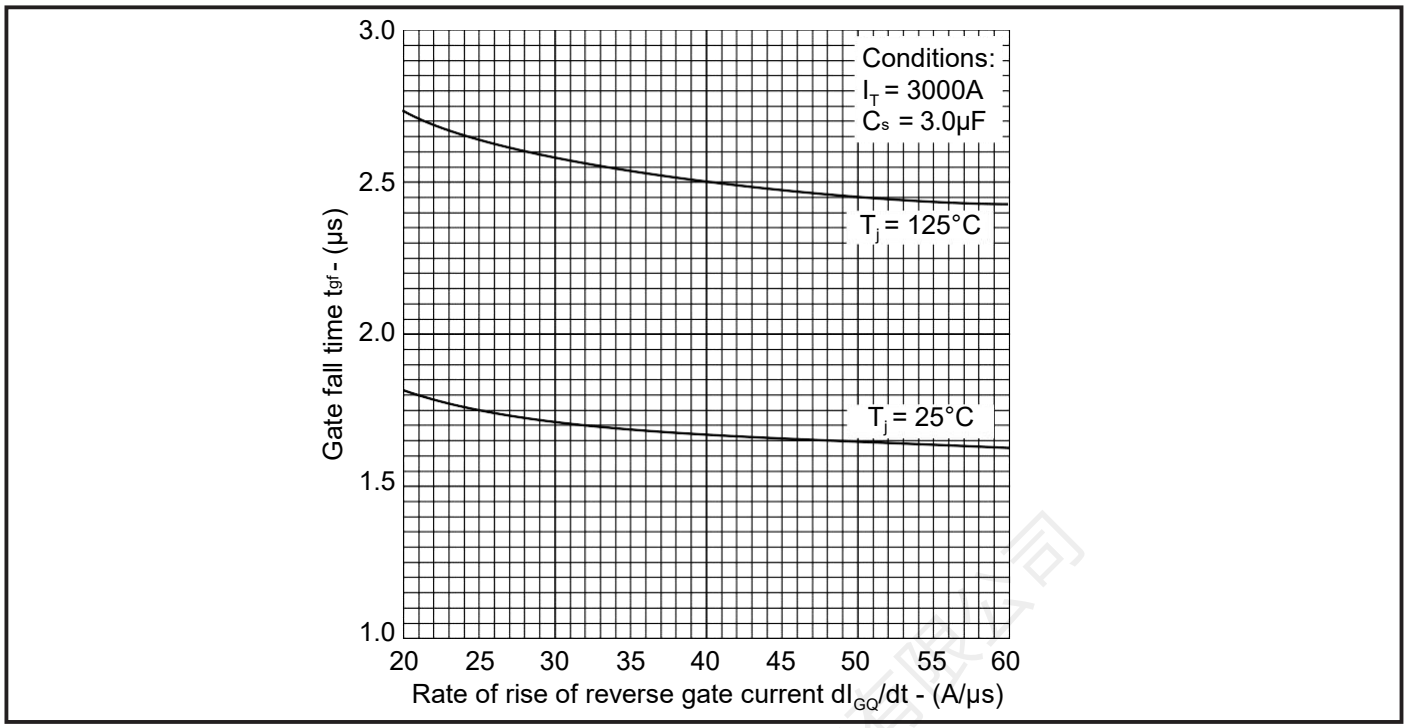


Figure 24. Gate fall time vs rate of rise of reverse gate current

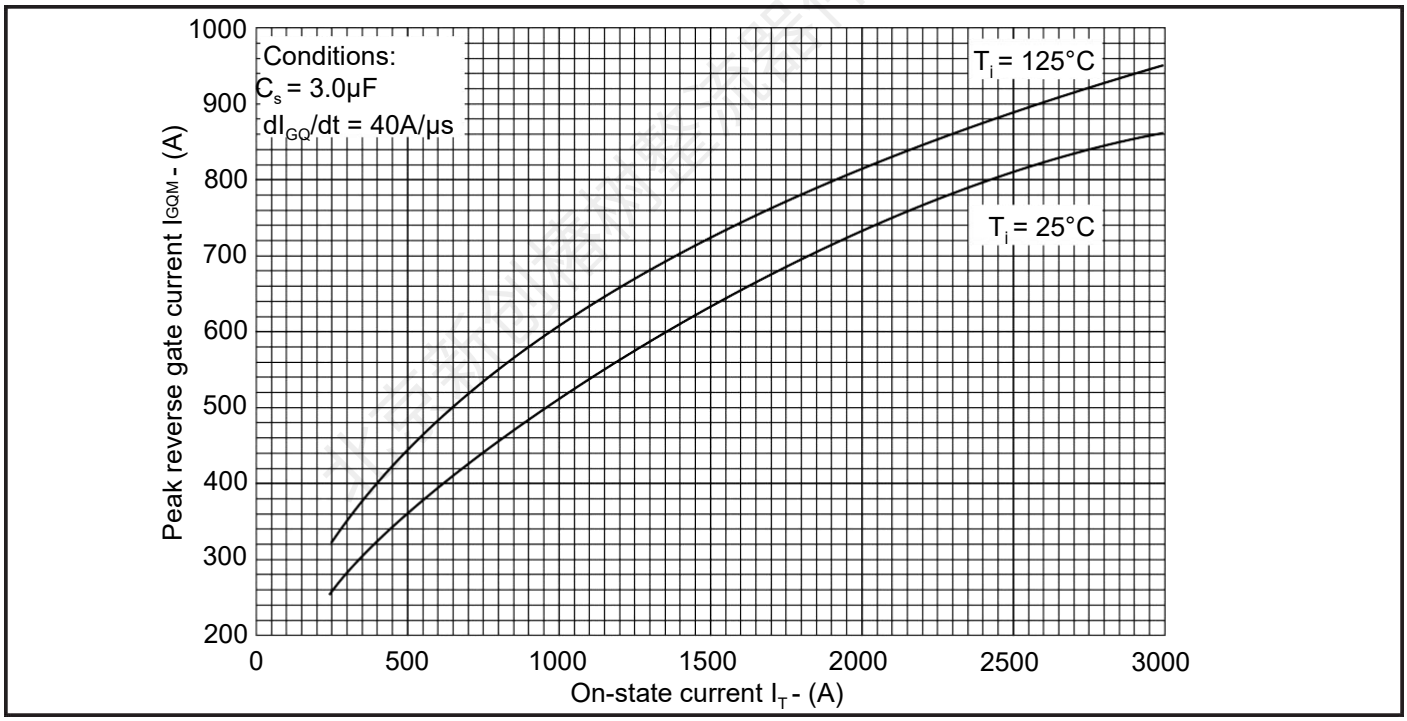


Figure 25. Peak reverse gate current vs on-state current

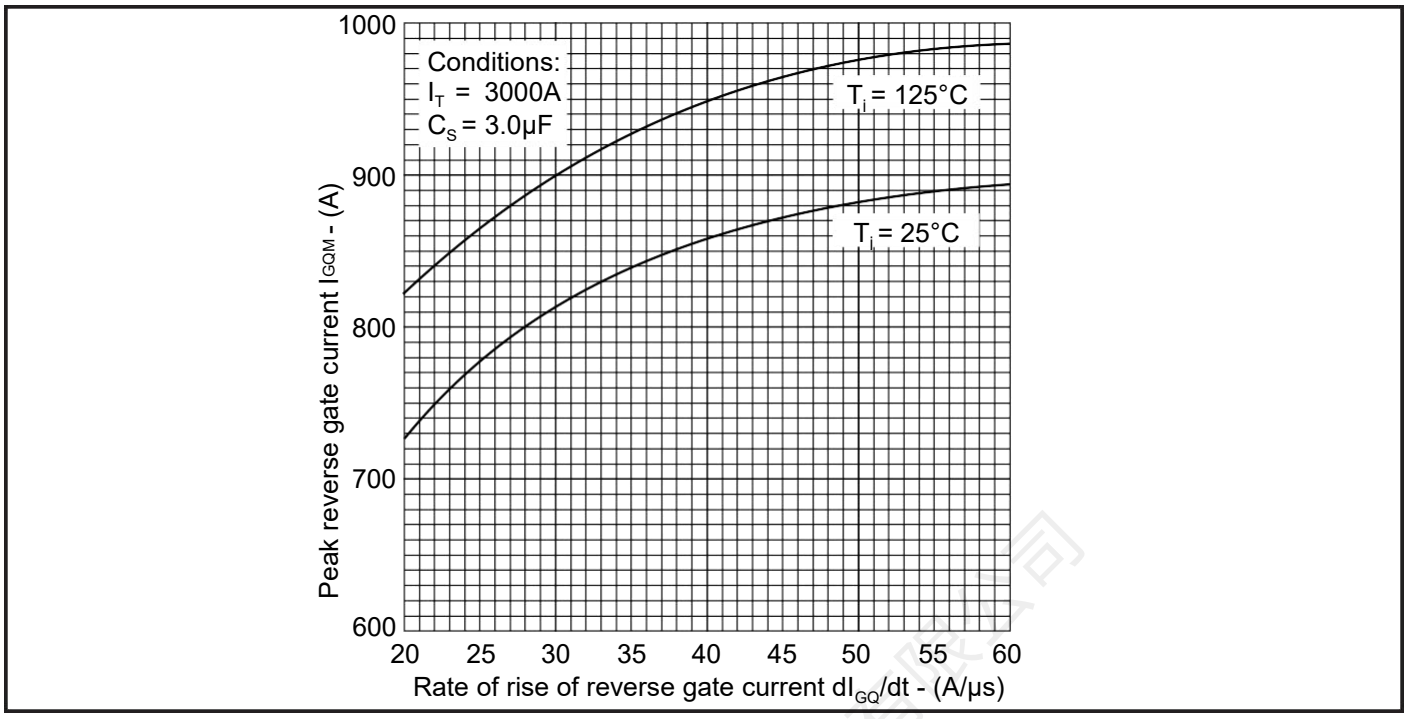


Figure 26. Reverse gate current vs rate of rise of reverse gate current

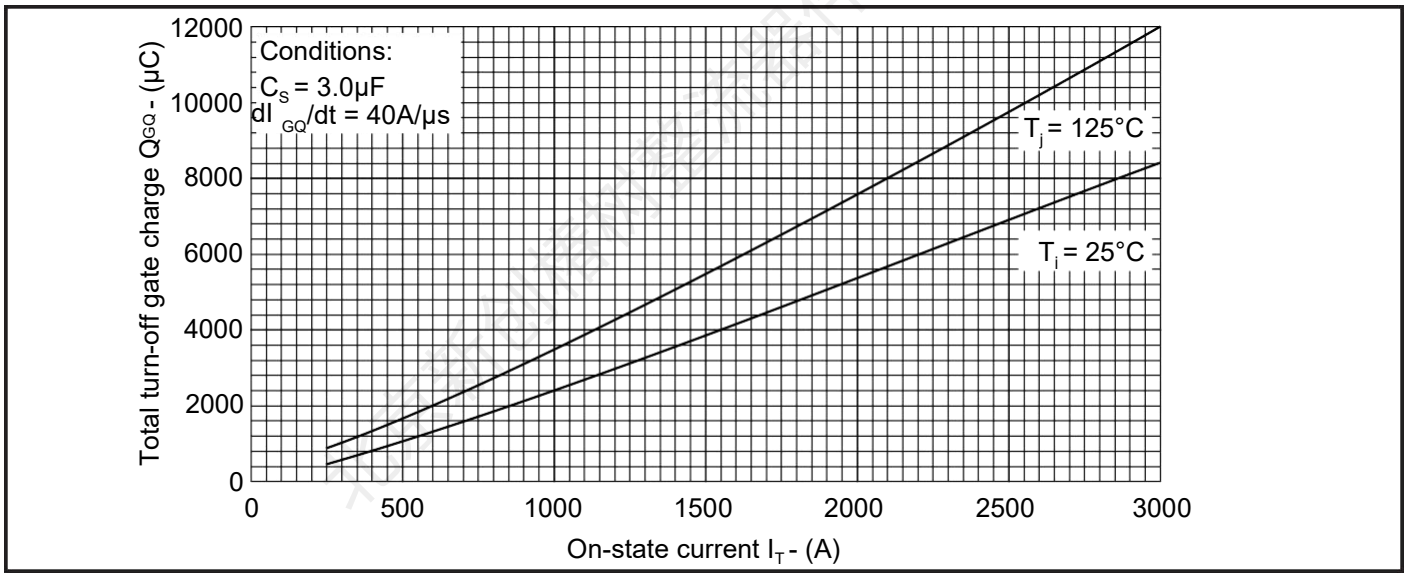


Figure 27. Turn-off gate charge vs on-state current

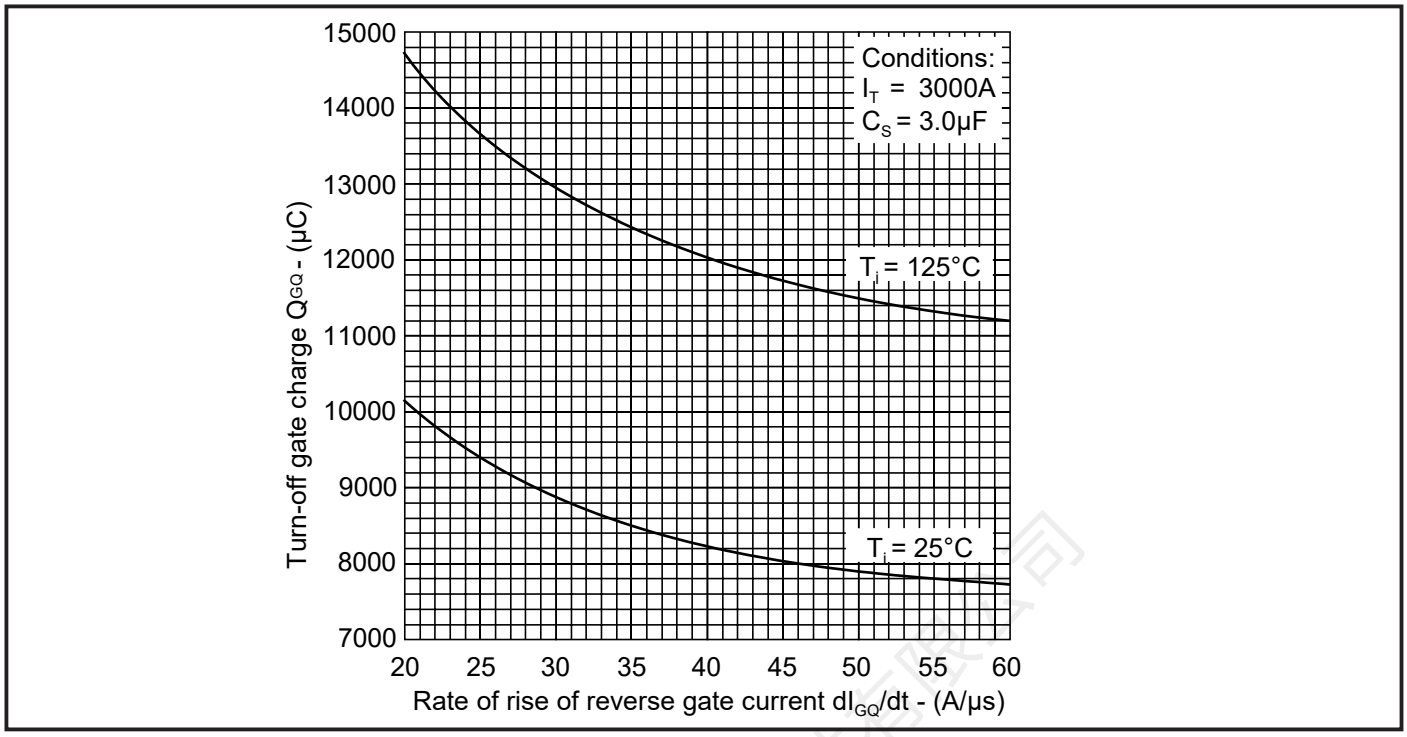


Figure 28. Turn-off gate charge vs rate of rise of reverse gatecurrent

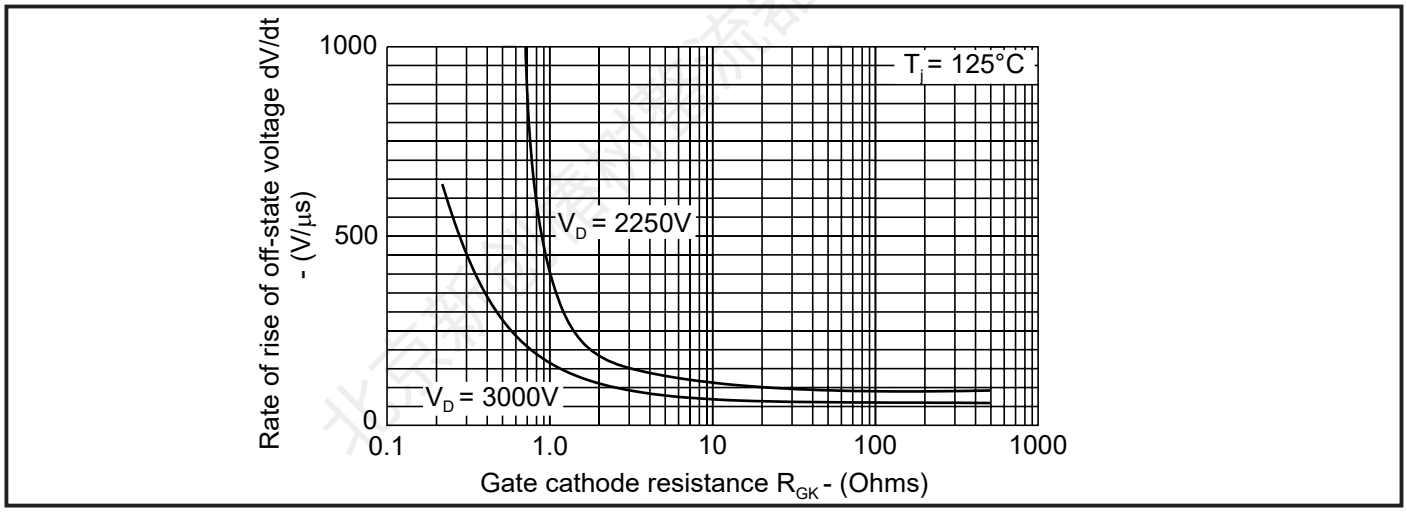
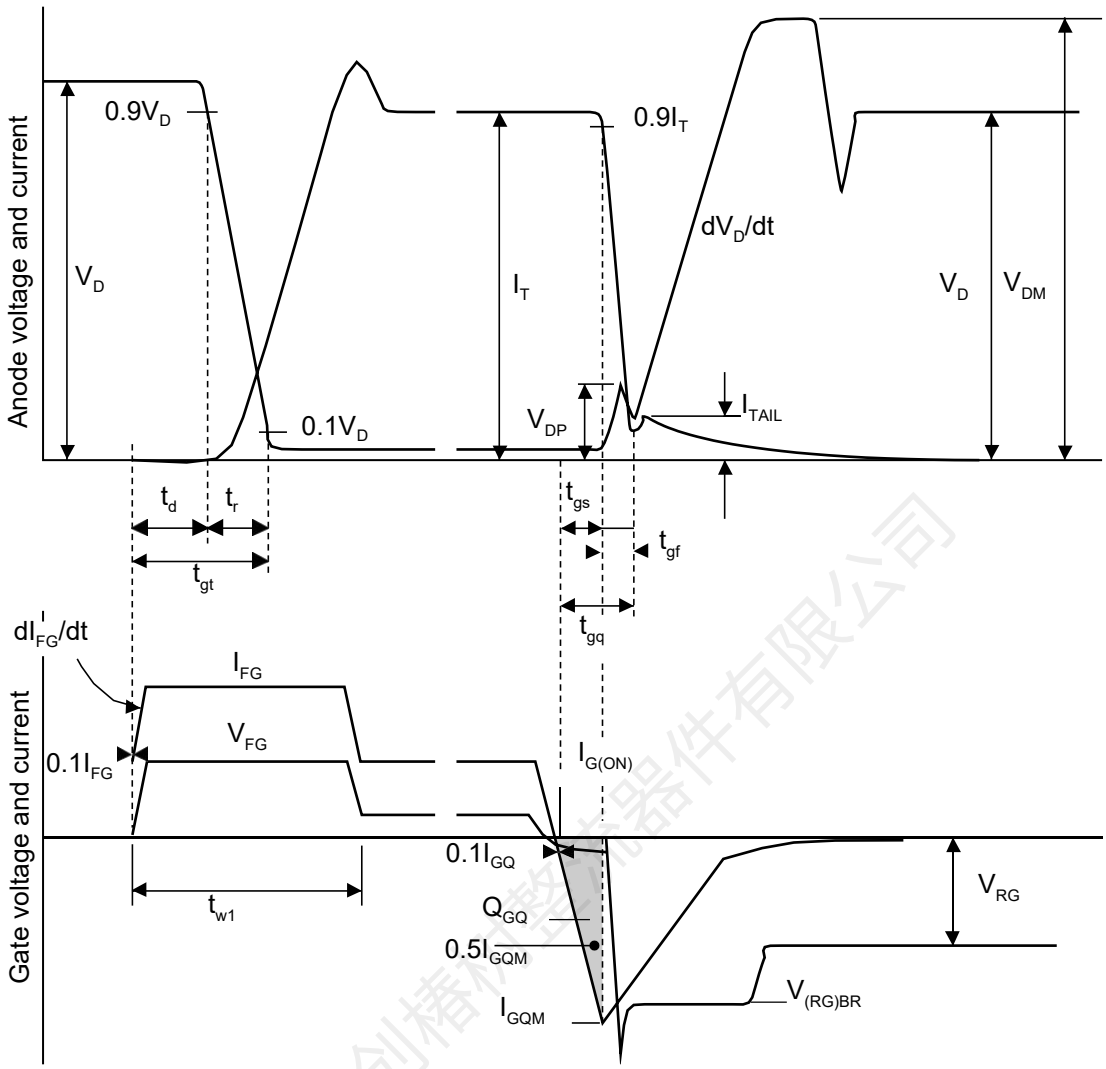


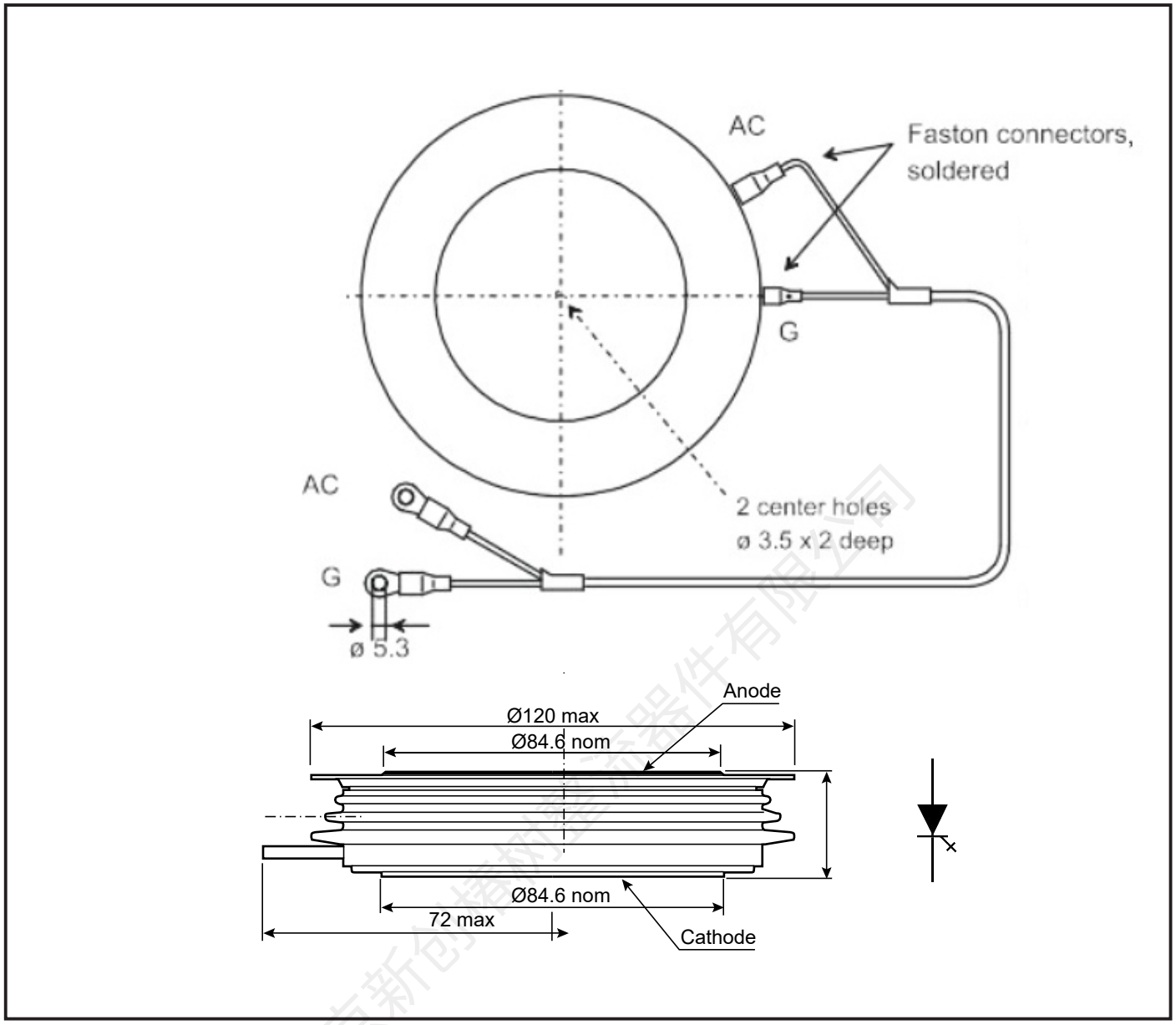
Figure 29. Rate of rise of off-state voltage vs gate cathode resistance



Recommended gate conditions:
I_{TCM} = 3000A
I_{FG} = 40A
$I_{G(ON)}$ = 10A d.c.
$t_{w1(min)}$ = 20μs
I_{GQM} = 950A
di_{GQ}/dt = 40A/μs
Q_{GQ} = 12000μC
$V_{RG(min)}$ = 2V
$V_{RG(max)}$ = 16V

Figure 30. General switching waveforms

产品外形尺寸



Note：all dimensions are in millimeters and represent nominal values unless stated otherwise.

Nominal weight: 1700g

Clamping force: 40±4kN

Lead double coax, length: 630mm.

Any kind of leads and connectors can be customized by sample from user.

Package outine type code: L

