高端电力电子器件和装置制造商

CSG30J4500

门极可关断晶闸管

应 用

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

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

电压等级

型号	断态重复峰值电压 V_{DRM} V	反向重复峰值电压 V_{RRM} V	测试条件
CSG30J4500	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_{TCM}	Repetitive peak controllable on-state current	V_D = 66% V_{DRM}, Tj = 125°C, di_{GQ}/dt = 40A/μs, Cs = 6μF.	3000	A
$I_{T(AV)}$	Mean on-state current	T_{HS} = 80°C. Double side cooled. Half sine 50Hz.	870	A
$I_{T(RMS)}$	RMS on-state current	T_{HS} = 80°C. Double side cooled. Half sine 50Hz.	1365	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℃	16.0	kA
I^2t	I^2t for fusing	10ms half sine. T_j =125℃	1.28×10^6	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} ≤ 1.5Ω, T_j = 125°C	100	V/μs
		To 66% V_{DRM}; V_{RG} = -2V, T_j = 125°C	1000	V/μs
L_S	Peak stray inductance in snubber circuit	-	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		-	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		30	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
$R_{th(j-hs)}$	DC thermal resistance - junction to heatsink surface	Double side cooled		-	0.0146	°C/W
		Anode side cooled		-	0.0233	°C/W
		Cathode side cooled		-	0.0392	°C/W
$R_{th(c-hs)}$	Contact thermal resistance	Clamping force 35.0kN With mounting compound	per contact	-	0.0036	°C/W
T_{vj}	Virtual junction temperature			-40	125	°C
T_{OP}/T_{stg}	Operating junction/storage temperature range			-40	125	°C
-	Clamping force			33.0	37.0	kN

特 性

T_j = 125℃ unless stated otherwise					
符号	参数	测试条件	Min.	Max.	单位
V_{TM}	On-state voltage	At 3000A peak, $I_{G(ON)}$ = 8A 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 = 100A, T_j = 25°C	-	1.2	V
I_{GT}	Gate trigger current	V_D = 24V, I_T = 100A, T_j = 25°C	-	3.5	A
I_{RGM}	Reverse gate cathode current	V_{RGM} = 16V, No gate/cathode resistor	-	50	mA
E_{ON}	Turn-on energy	V_D = 2250V I_T = 3000A, dI_T/dt = 300A/μs I_{FG} = 40A, rise time < 1.0μs	-	3000	mJ
t_d	Delay time		-	1.5	μs
t_r	Rise time		-	3.0	μs
E_{OFF}	Turn-off energy	I_T = 3000A, V_{DM} = 3000V Snubber Cap Cs = 6.0μF, di_{GQ}/dt = 40A/μs	-	6300	mJ
t_{gs}	Storage time		-	20.6	μs
t_{gf}	Fall time		-	2.2	μs
t_{gq}	Gate controlled turn-off time		-	22.8	μs
Q_{GQ}	Turn-off gate charge		-	10000	μC
Q_{GQT}	Total turn-off gate charge		-	20000	μC
I_{GQM}	Peak reverse gate current		-	830	A

曲 线

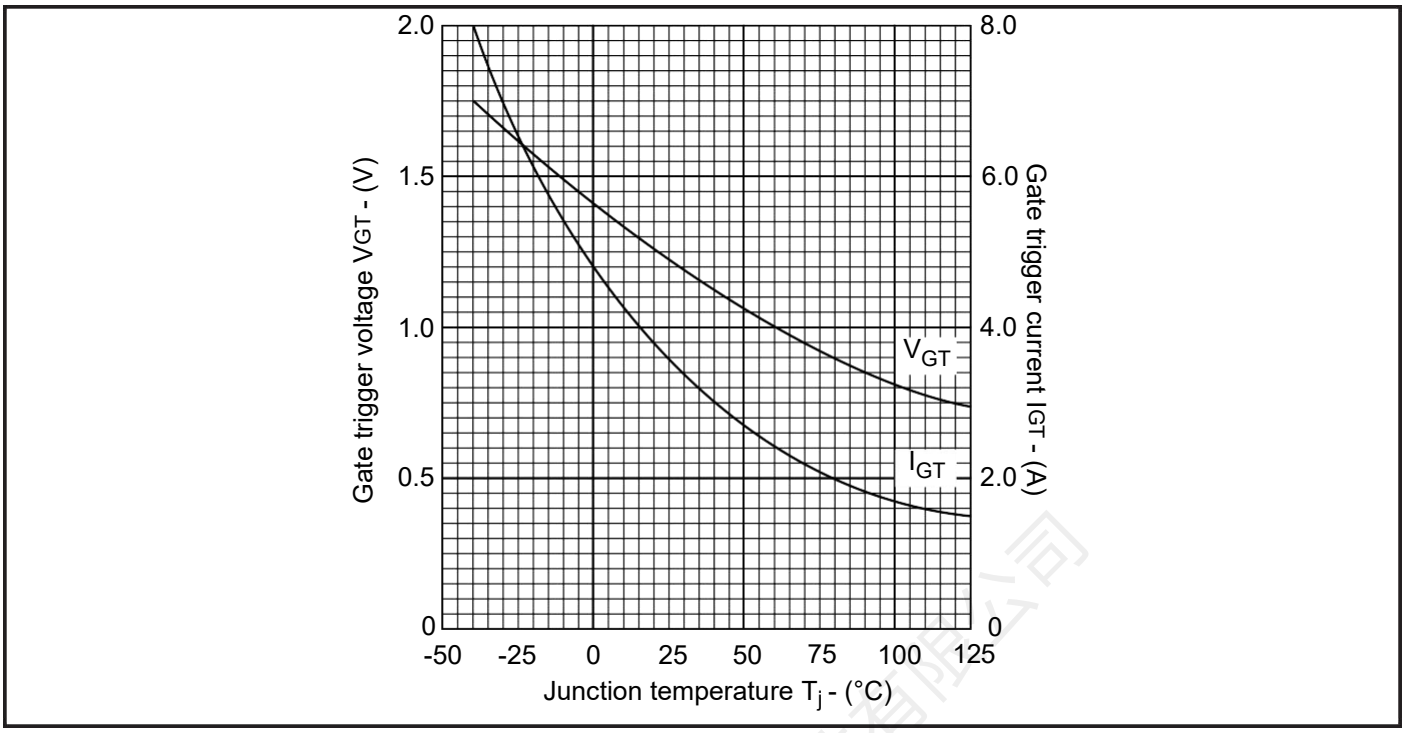

Fig.1 Maximum gate trigger voltage/current vs junction temperature

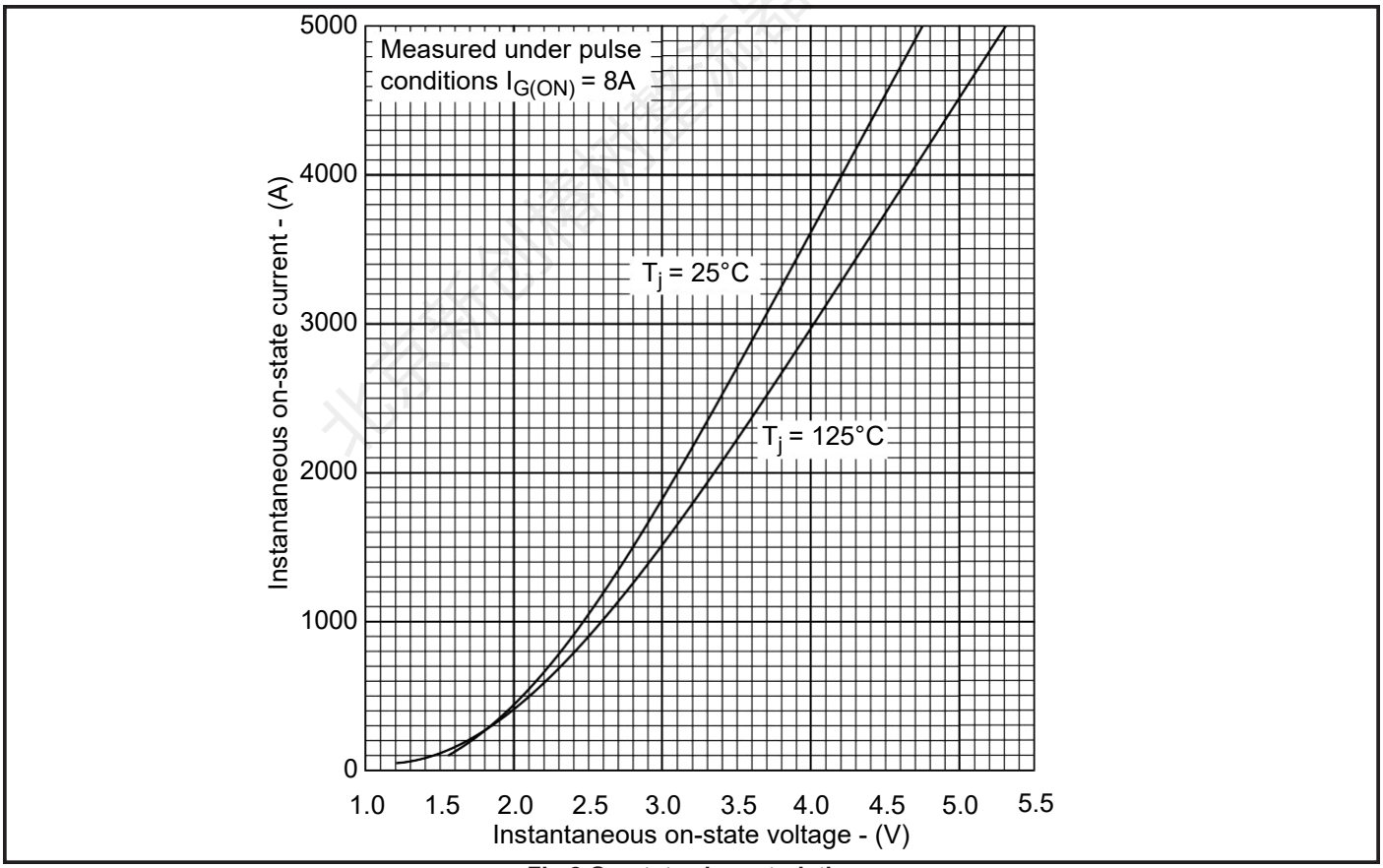

Fig.2 On-state characteristics

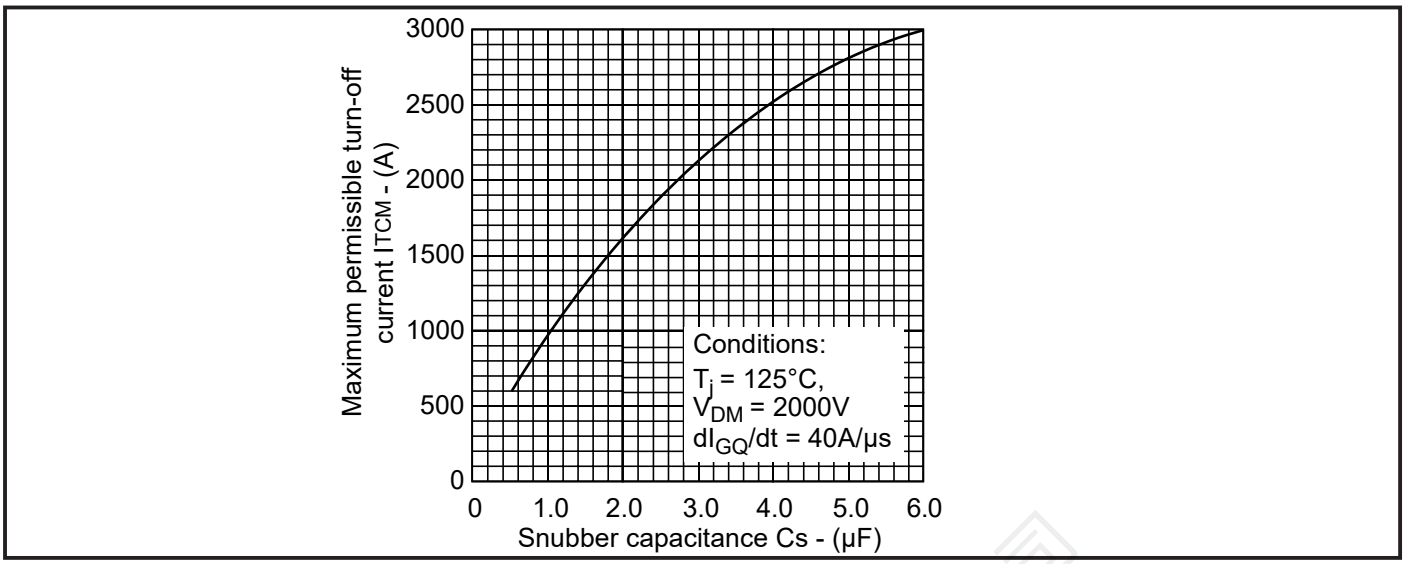

Fig.3 Maximum dependence of I_{TCM} on C_S

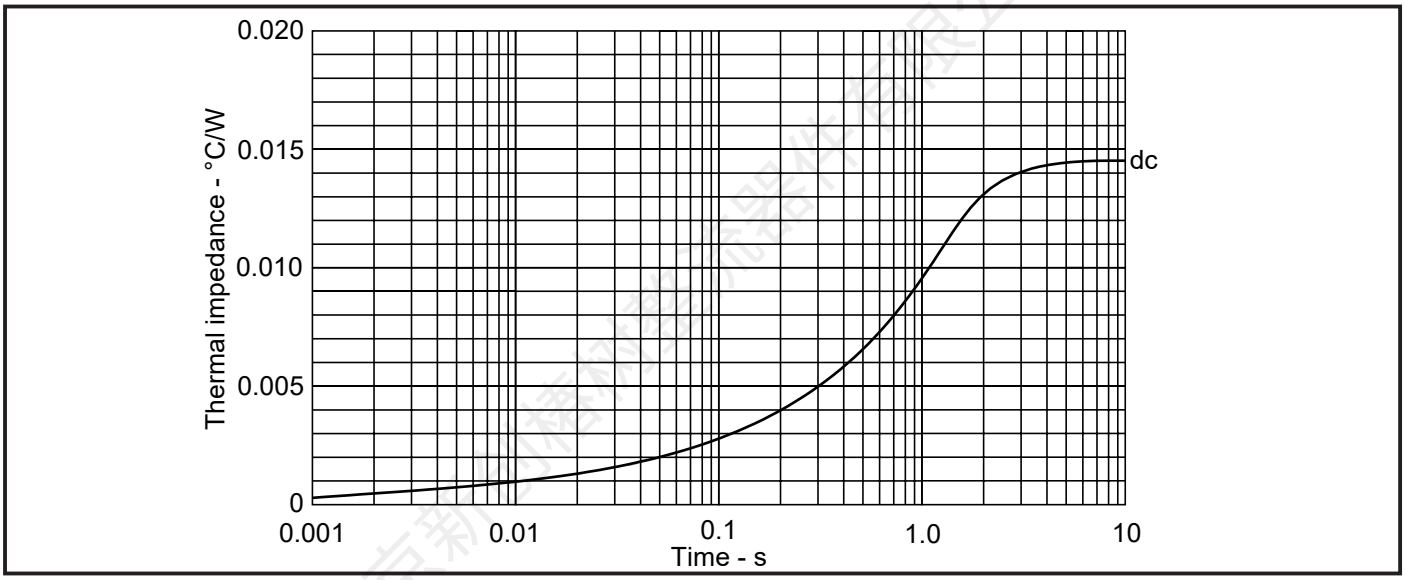

Fig.4 Maximum (limit) transient thermal impedance - double side cooled

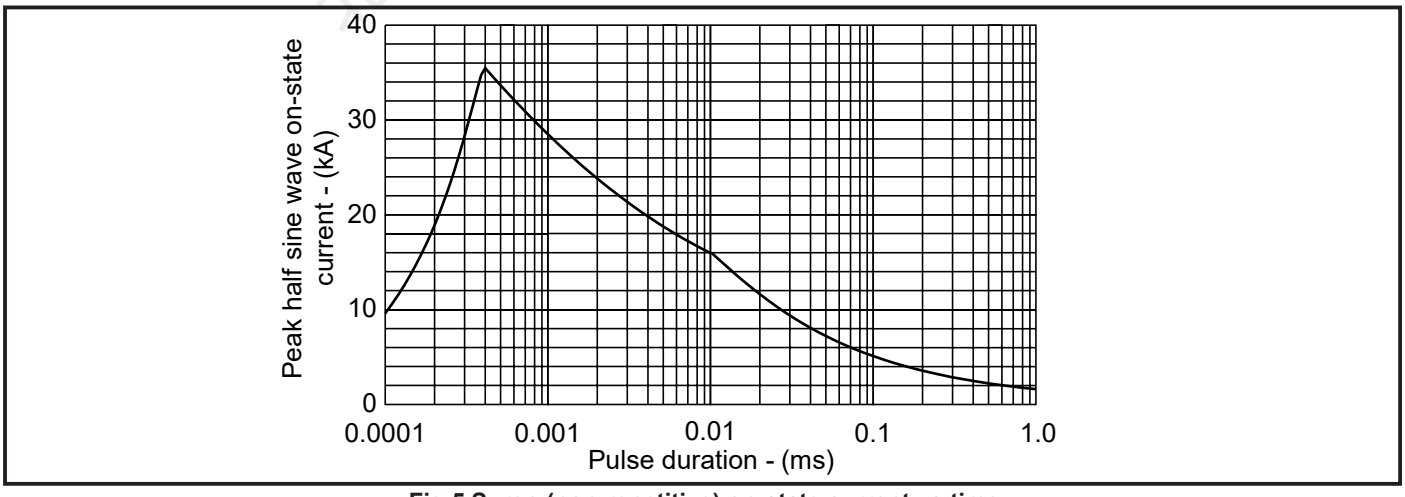

Fig.5 Surge (non-repetitive) on-state current vs time

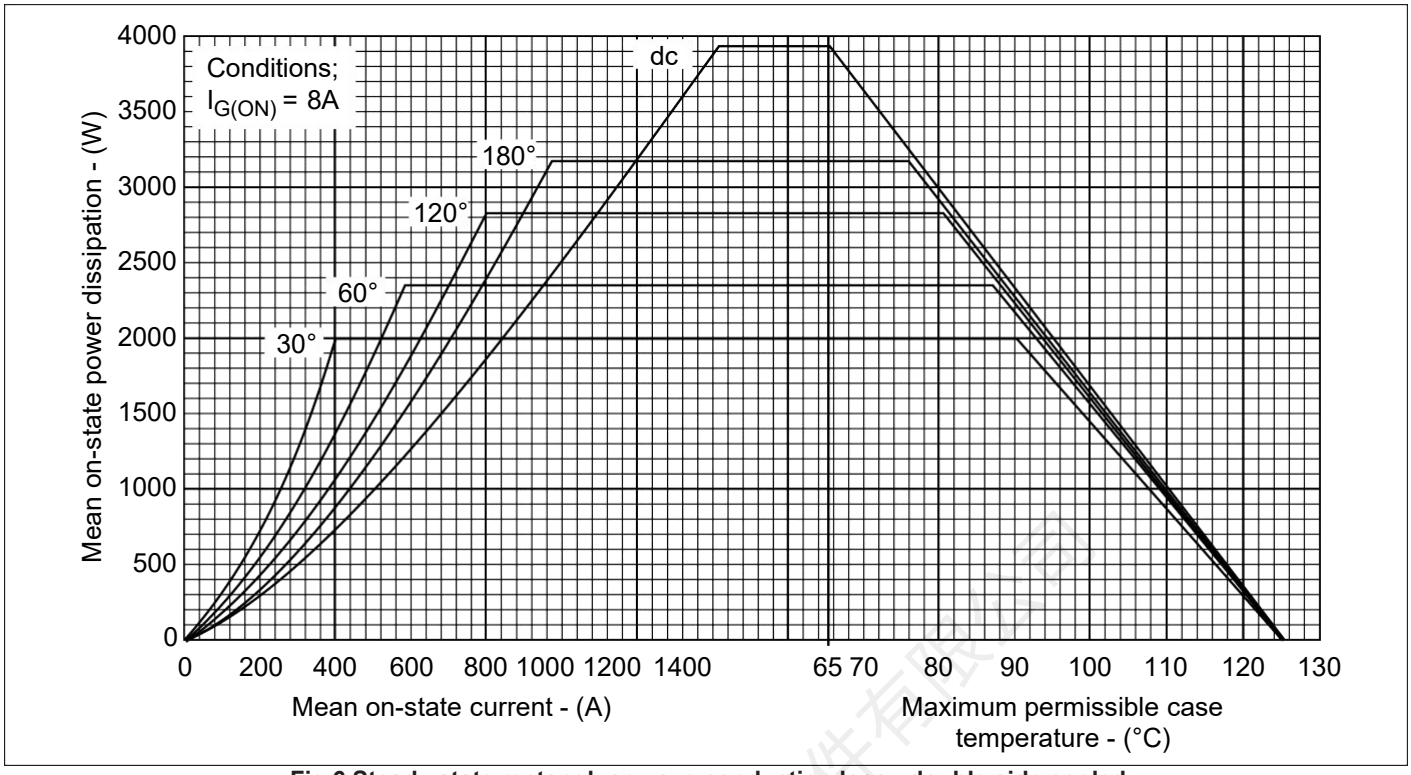

Fig.6 Steady state rectangluar wave conduction loss - double side cooled

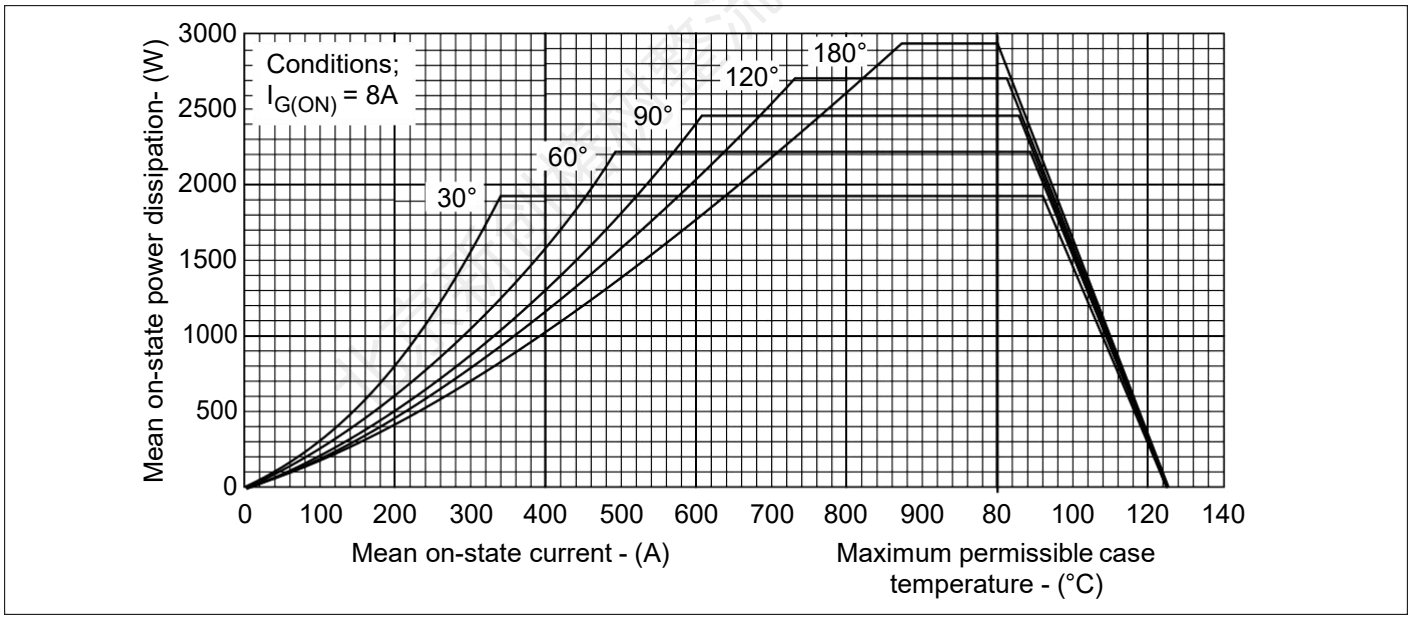

Fig.7 Steady state sinusoidal wave conduction loss - double side cooled

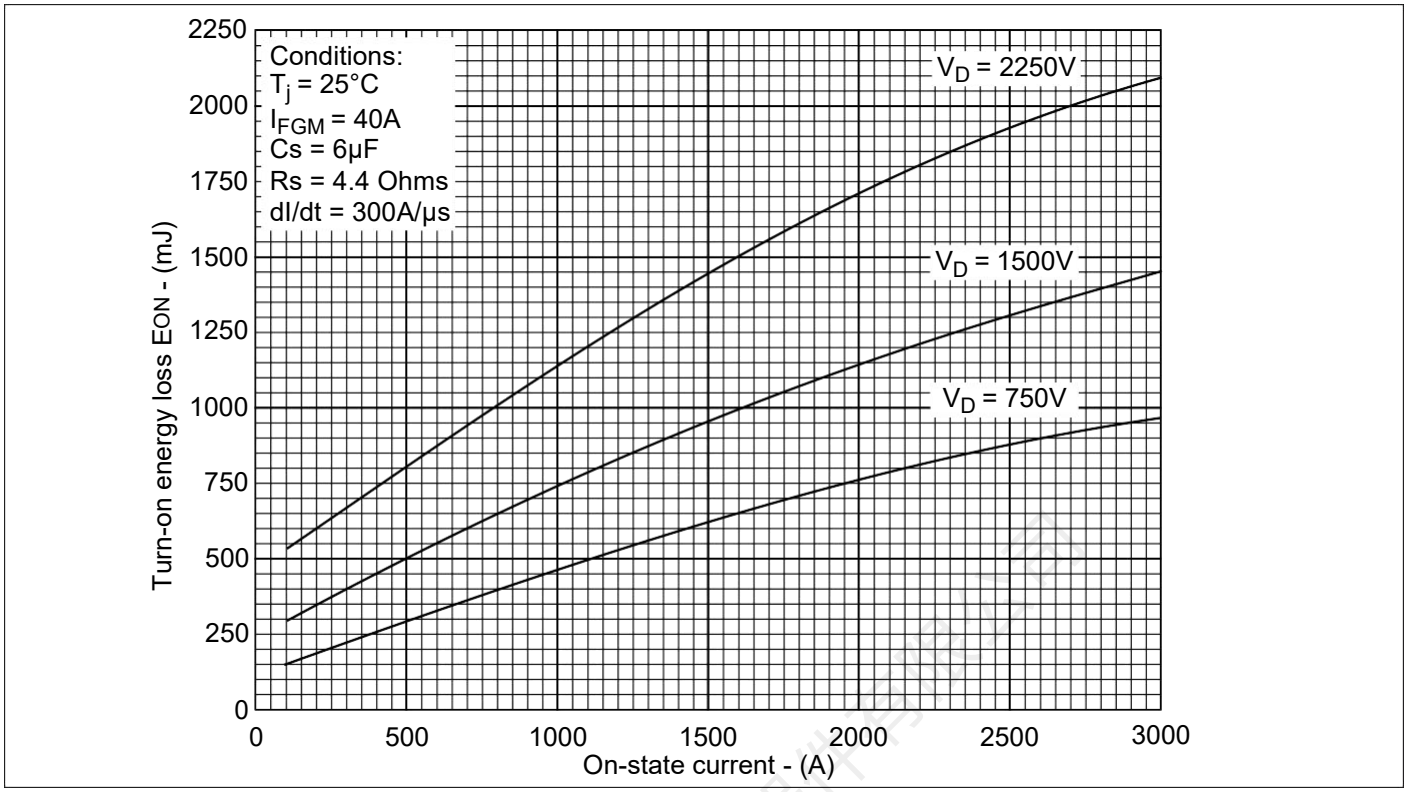

Fig.8 Turn-on energy vs on-state current

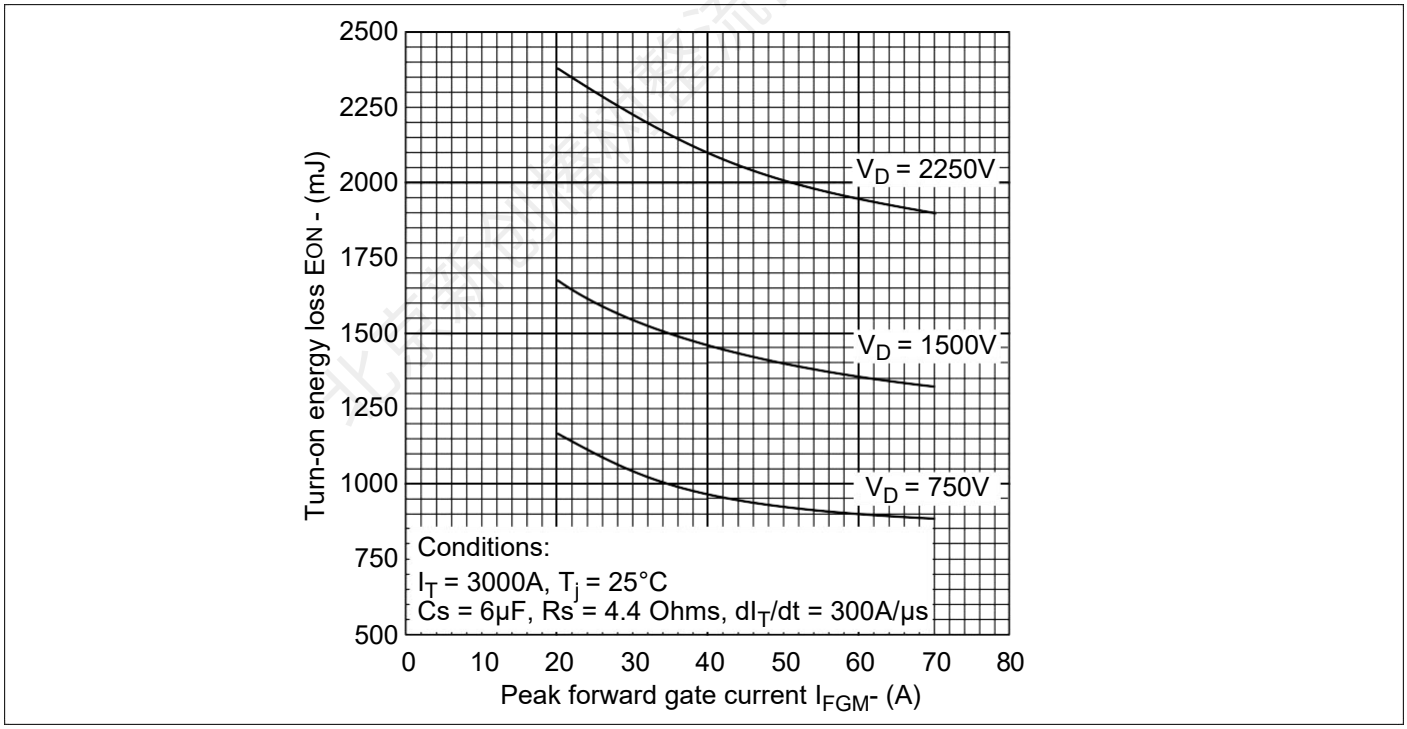

Fig.9 Turn-on energy vs peak forward gate current

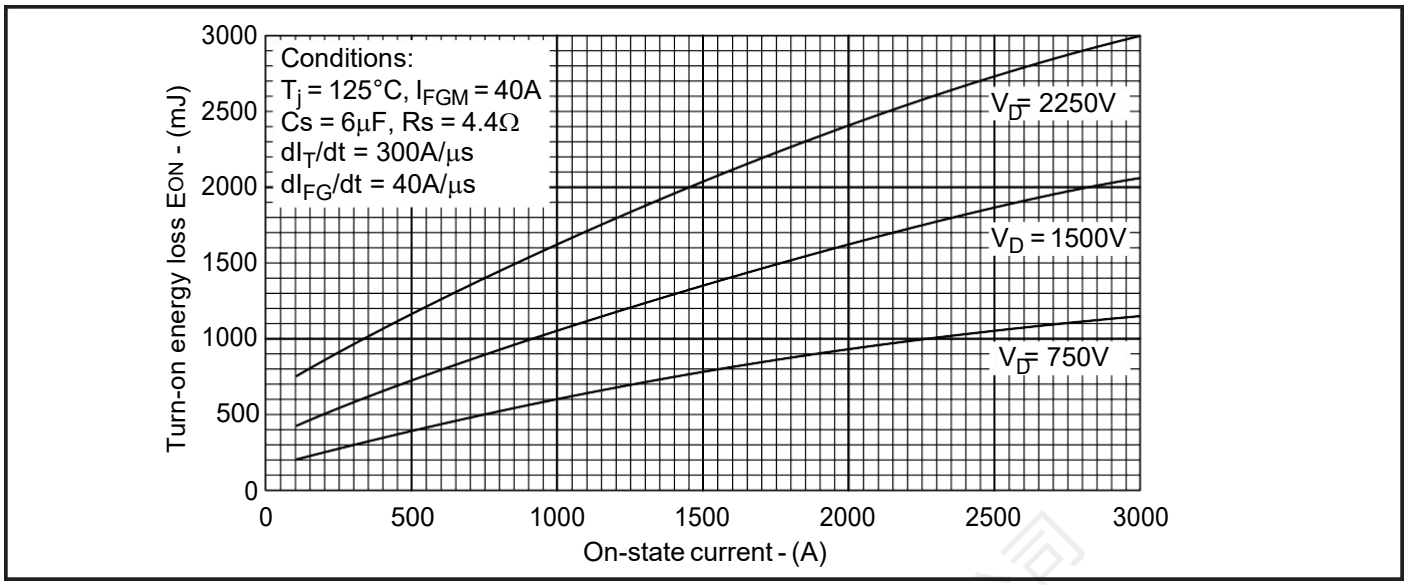

Fig.10 Turn-on energy vs on-state current

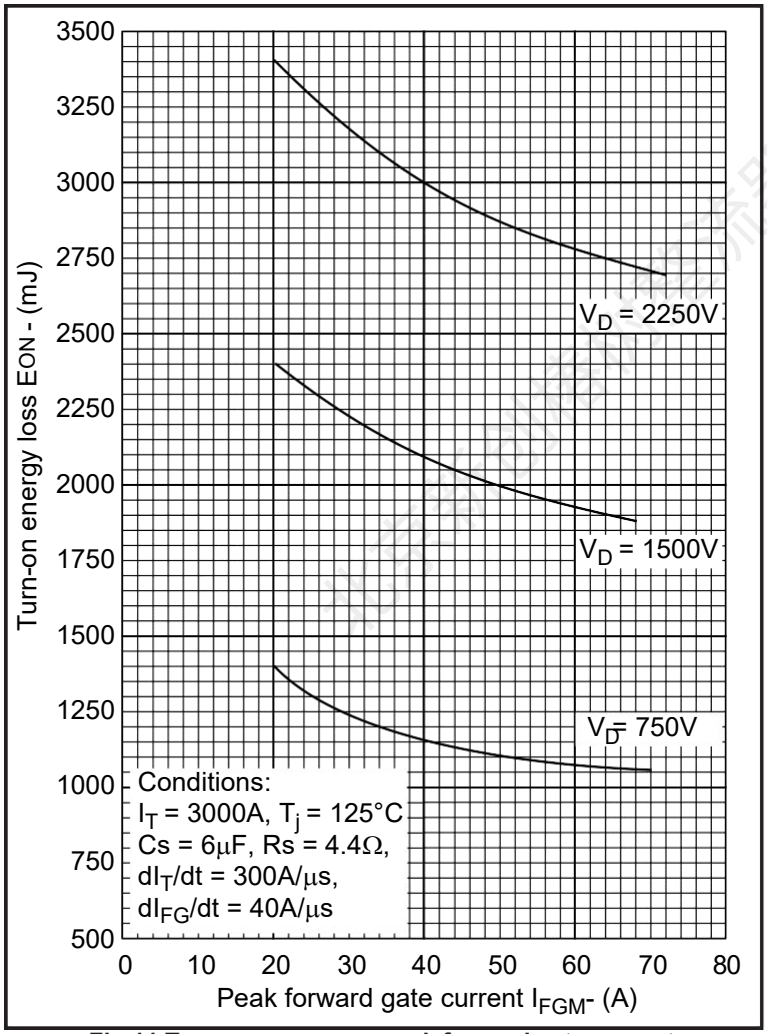

Fig.11 Turn-on energy vs peak forward gate current

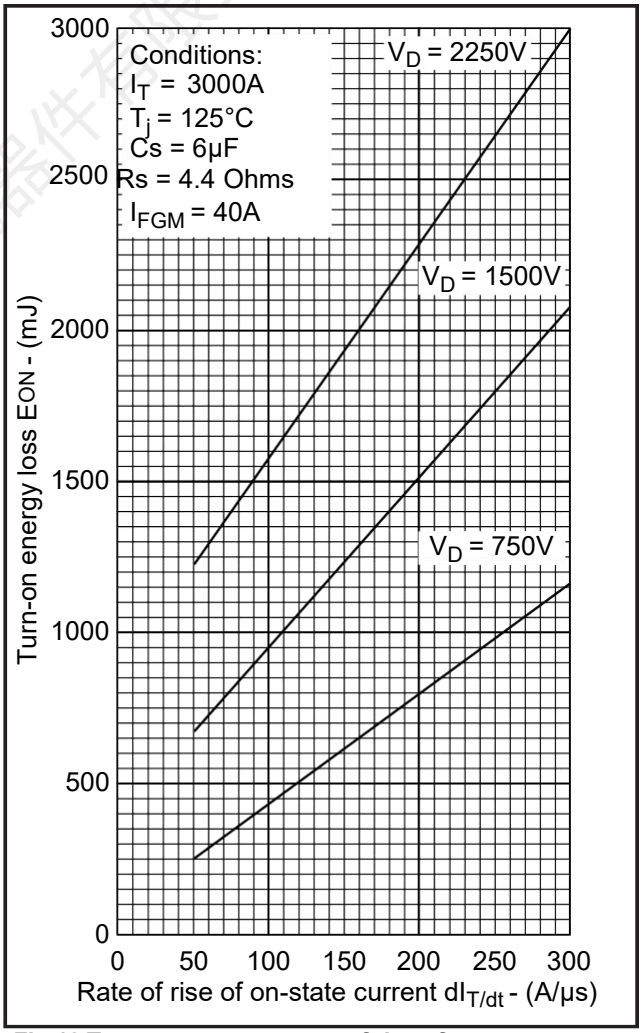

Fig.12 Turn-on energy vs rate of rise of on-state current

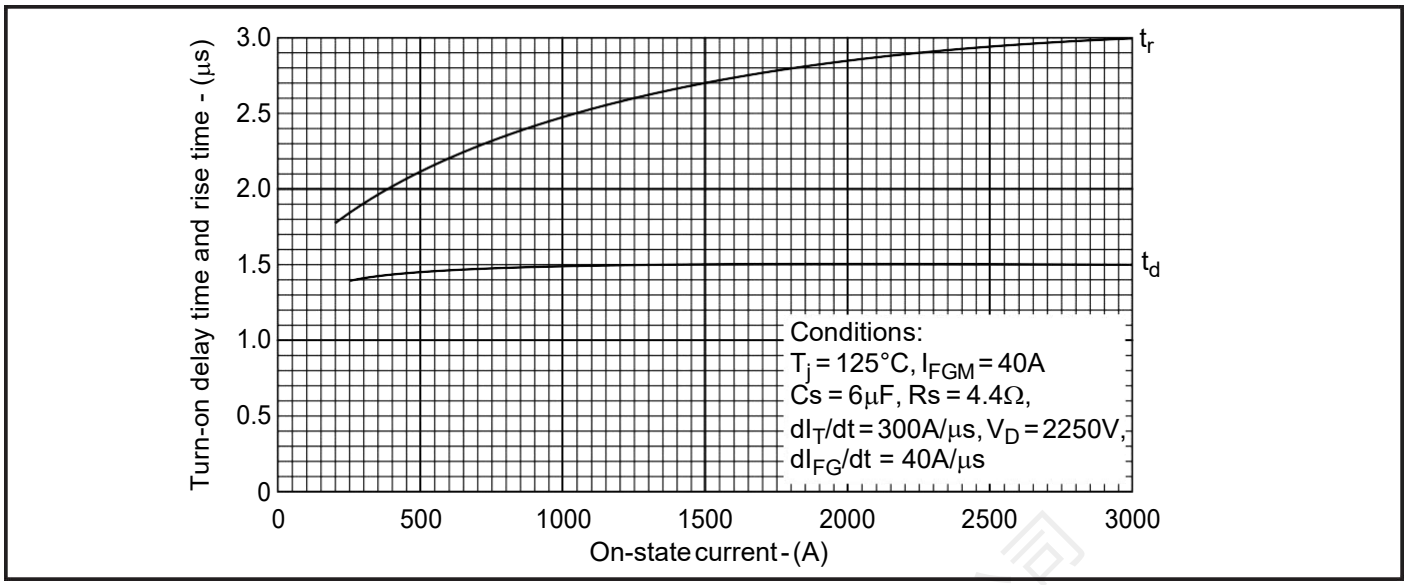

Fig.13 Delay time & rise time vs turn-on current

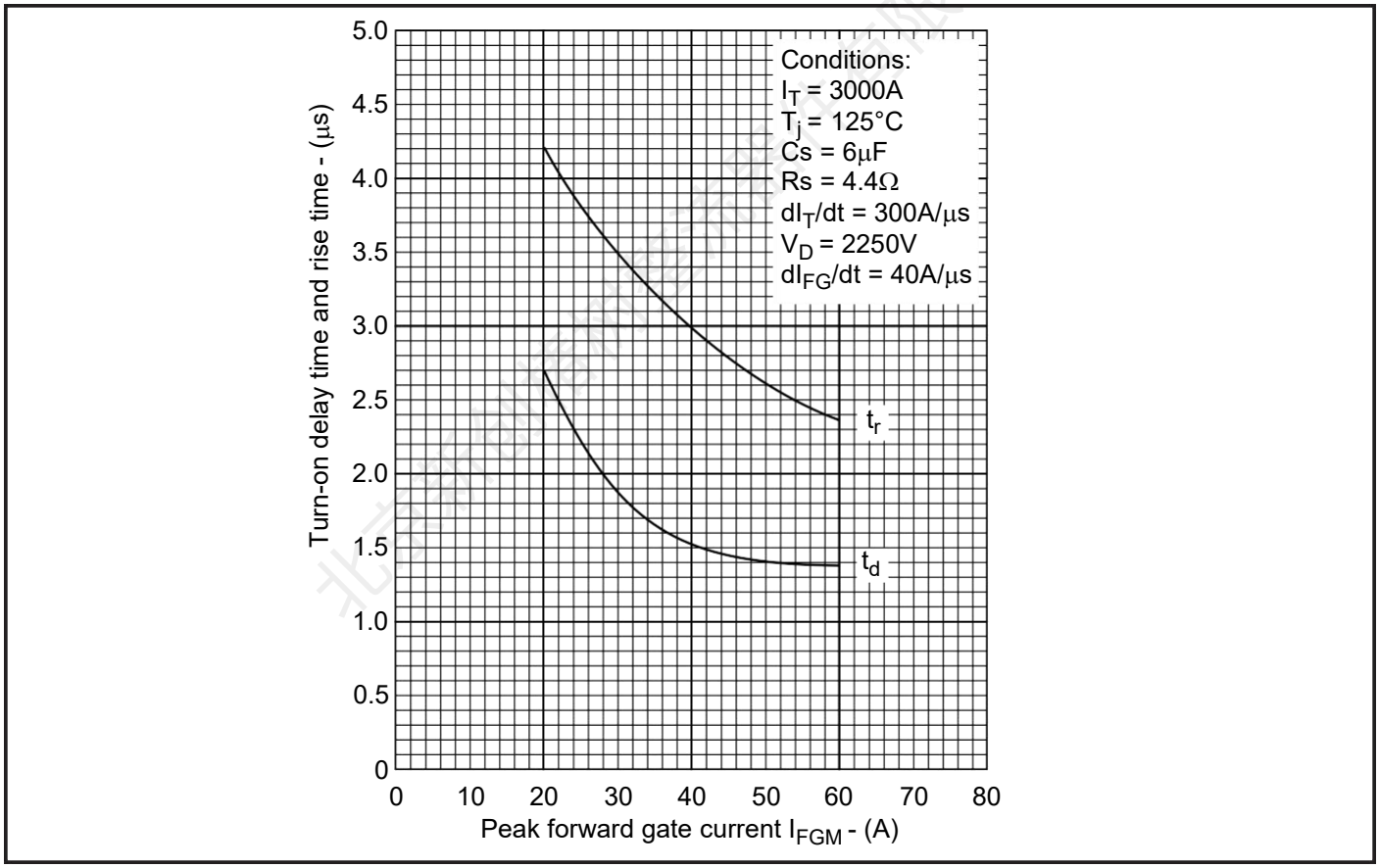

Fig.14 Delay time & rise time vs peak forward gate current

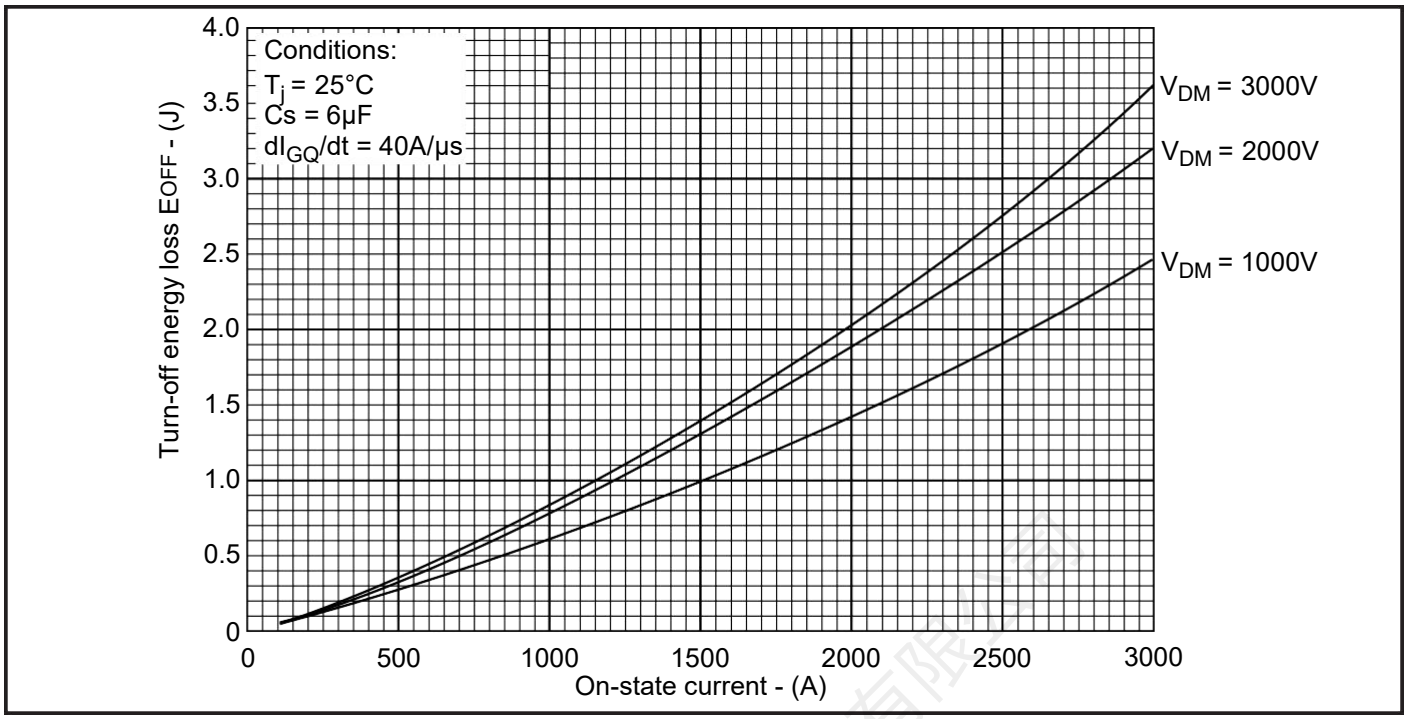

Fig.15 Turn-off energy vs on-state current

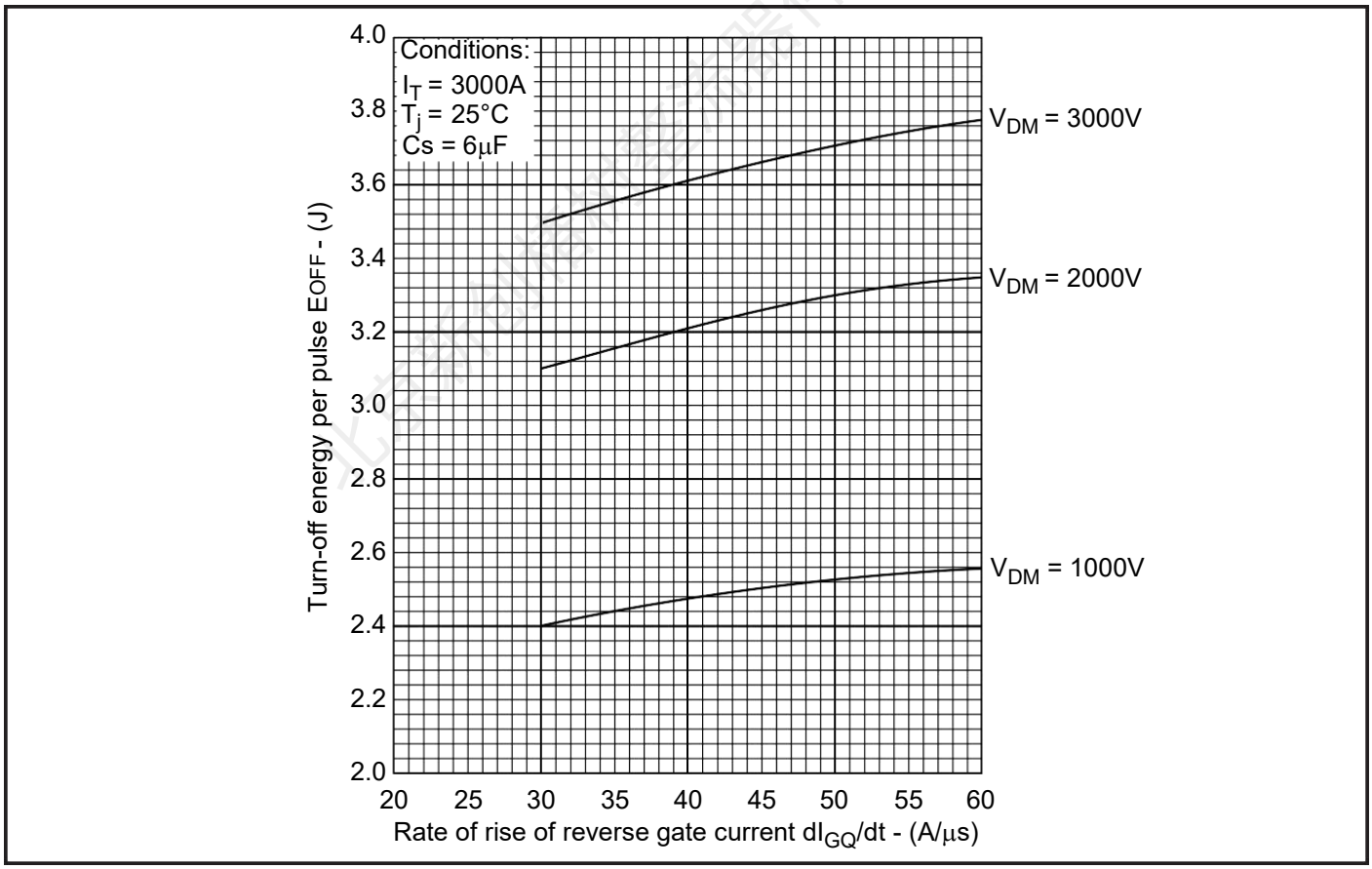

Fig.16 Turn-off energy vs rate of rise of reverse gate current

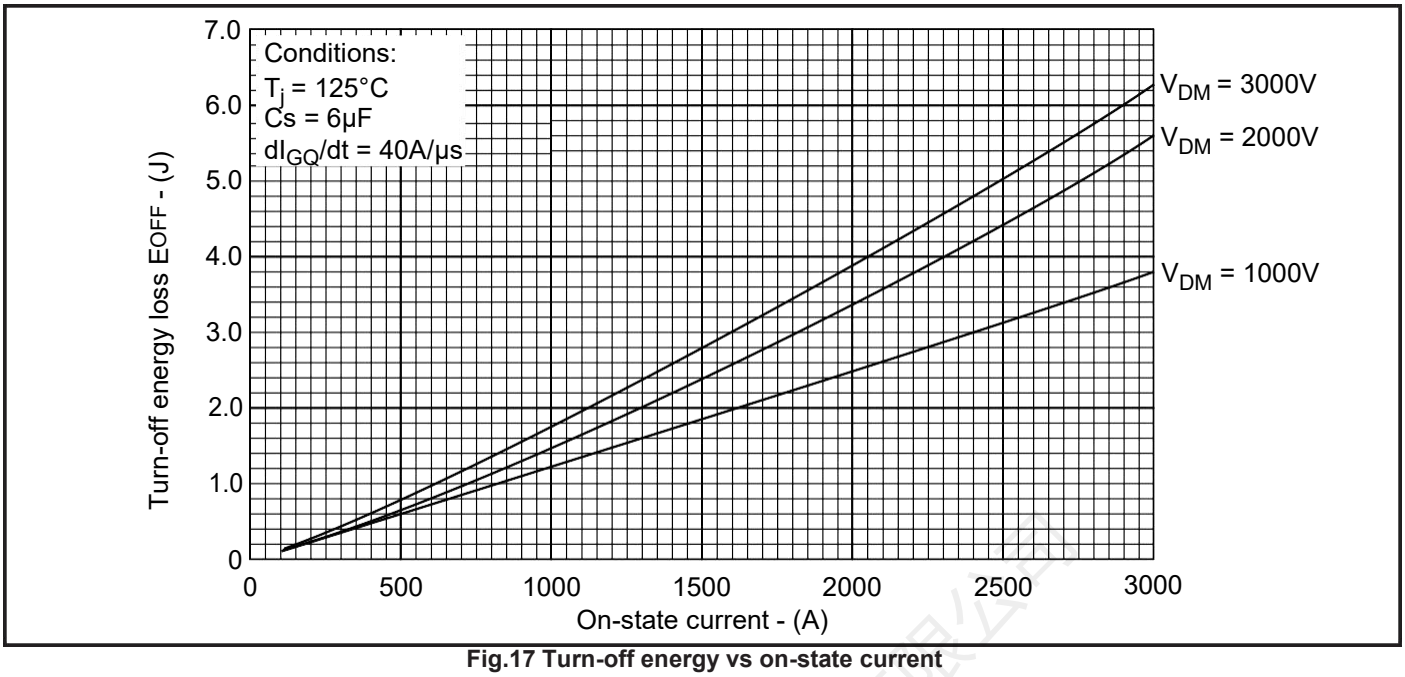

Fig.17 Turn-off energy vs on-state current

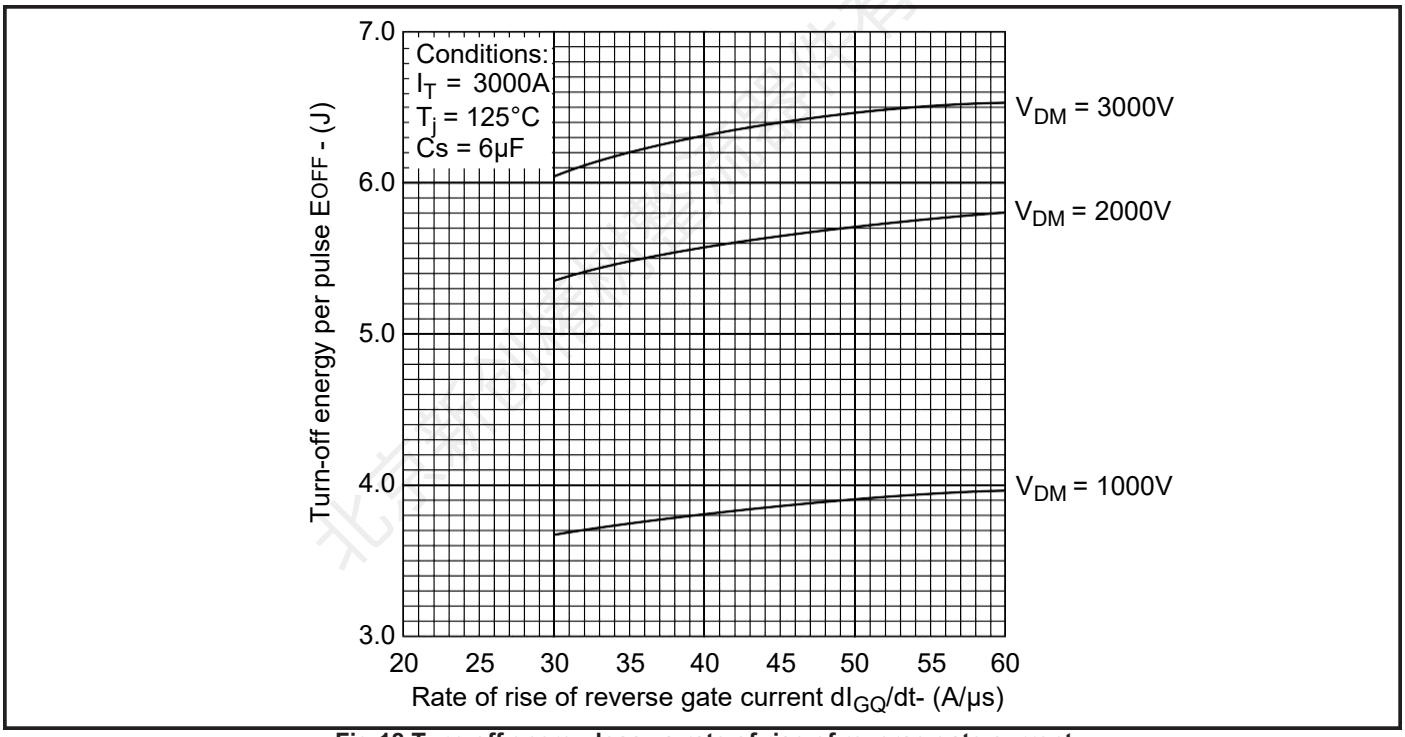

Fig.18 Turn-off energy loss vs rate of rise of reverse gate current

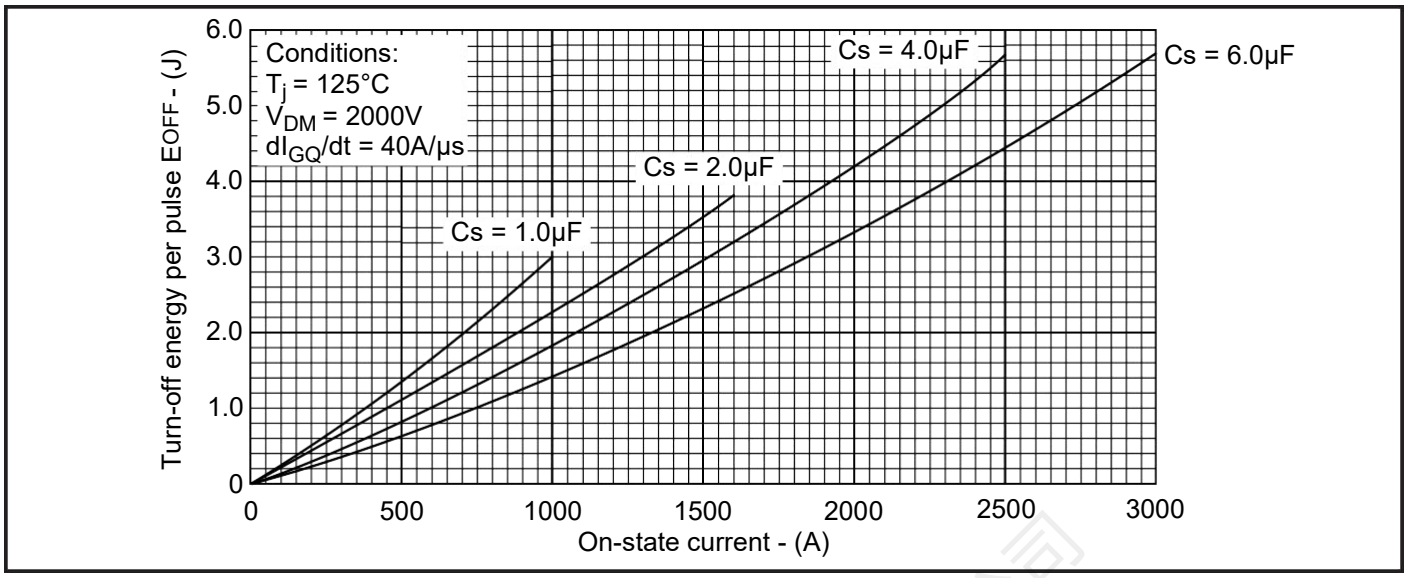

Fig.19 Turn-off energy vs on-state current

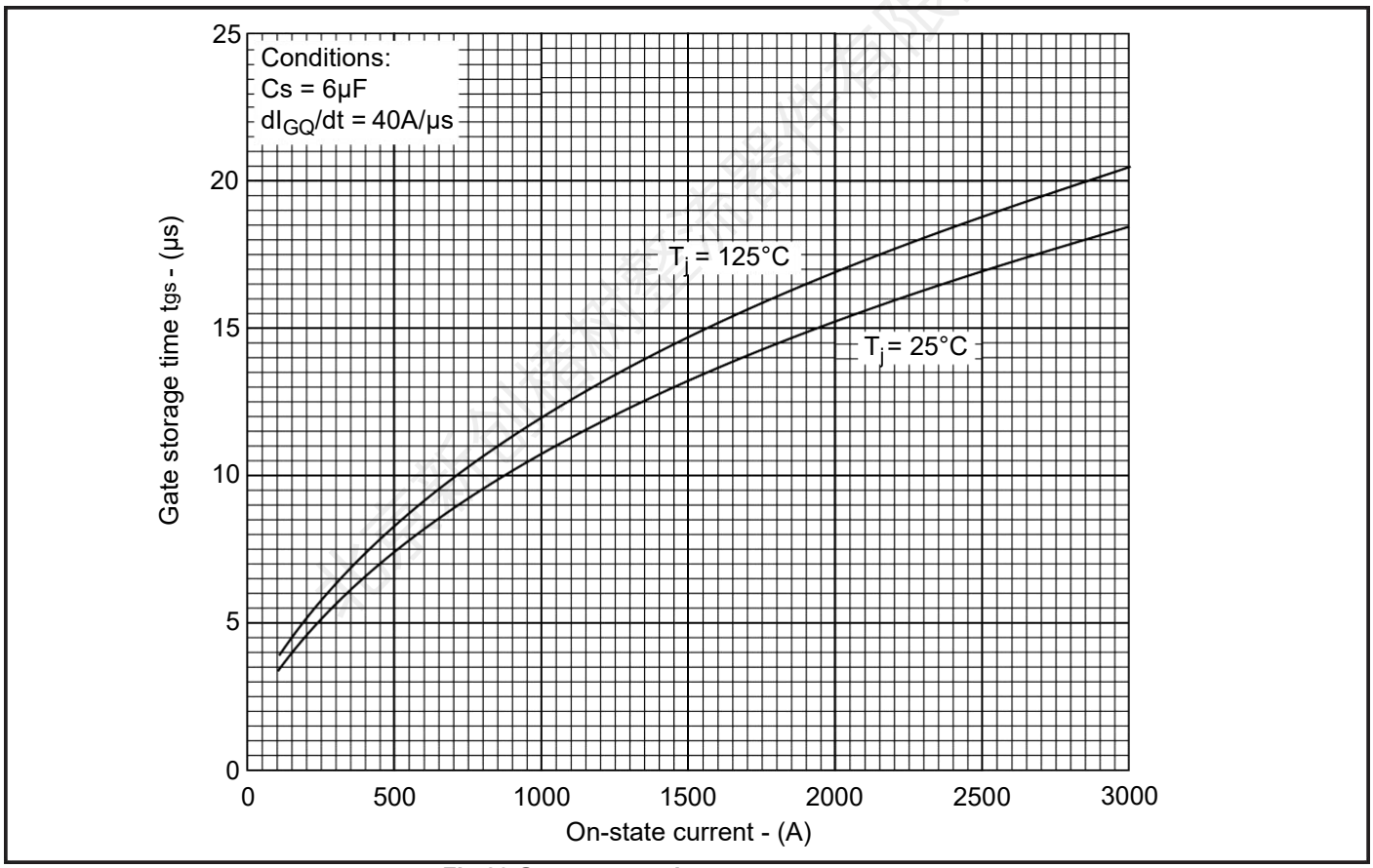

Fig.20 Gate storage time vs on-state current

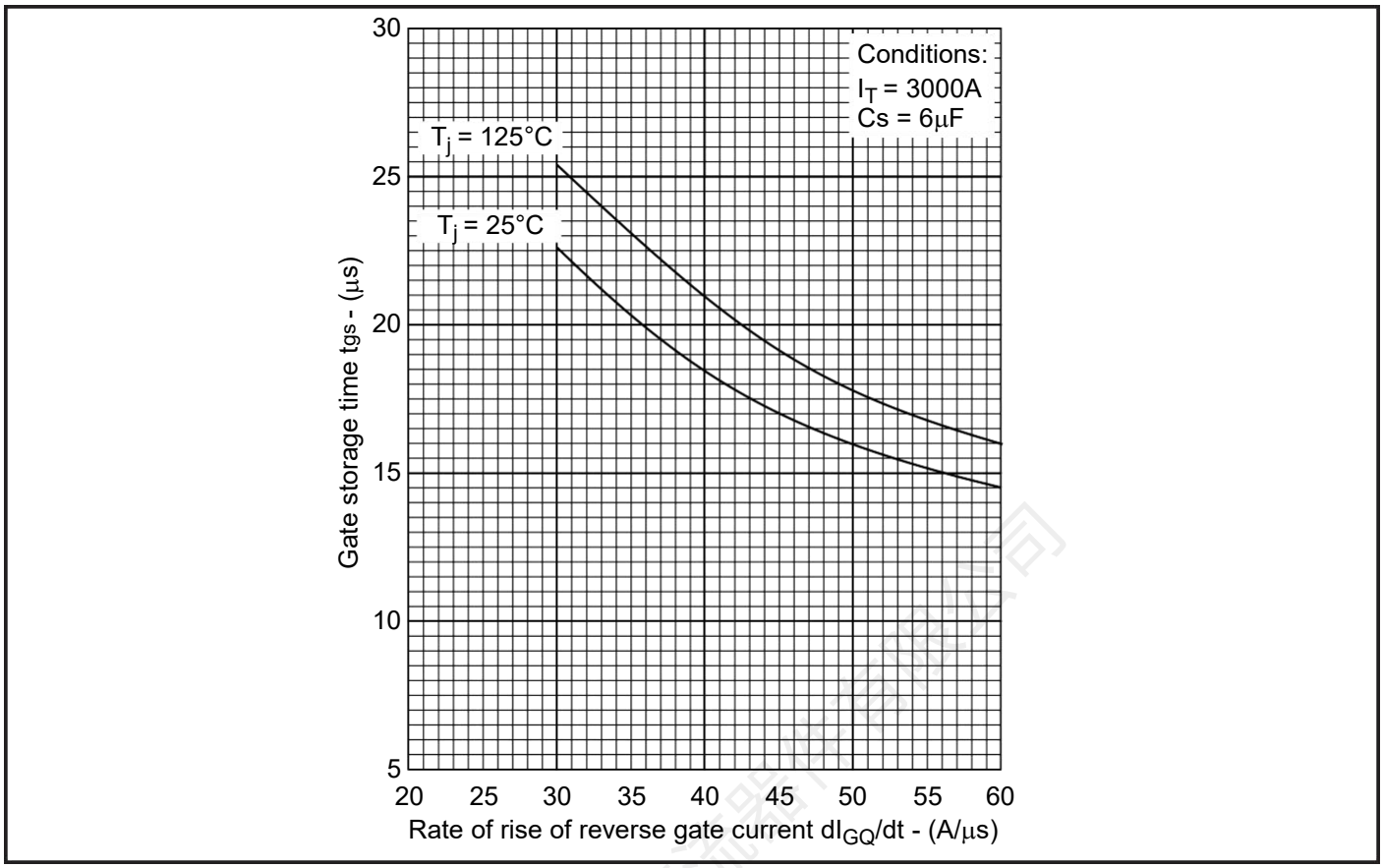

Fig.21 Gate storage time vs rate of rise of reverse gate current

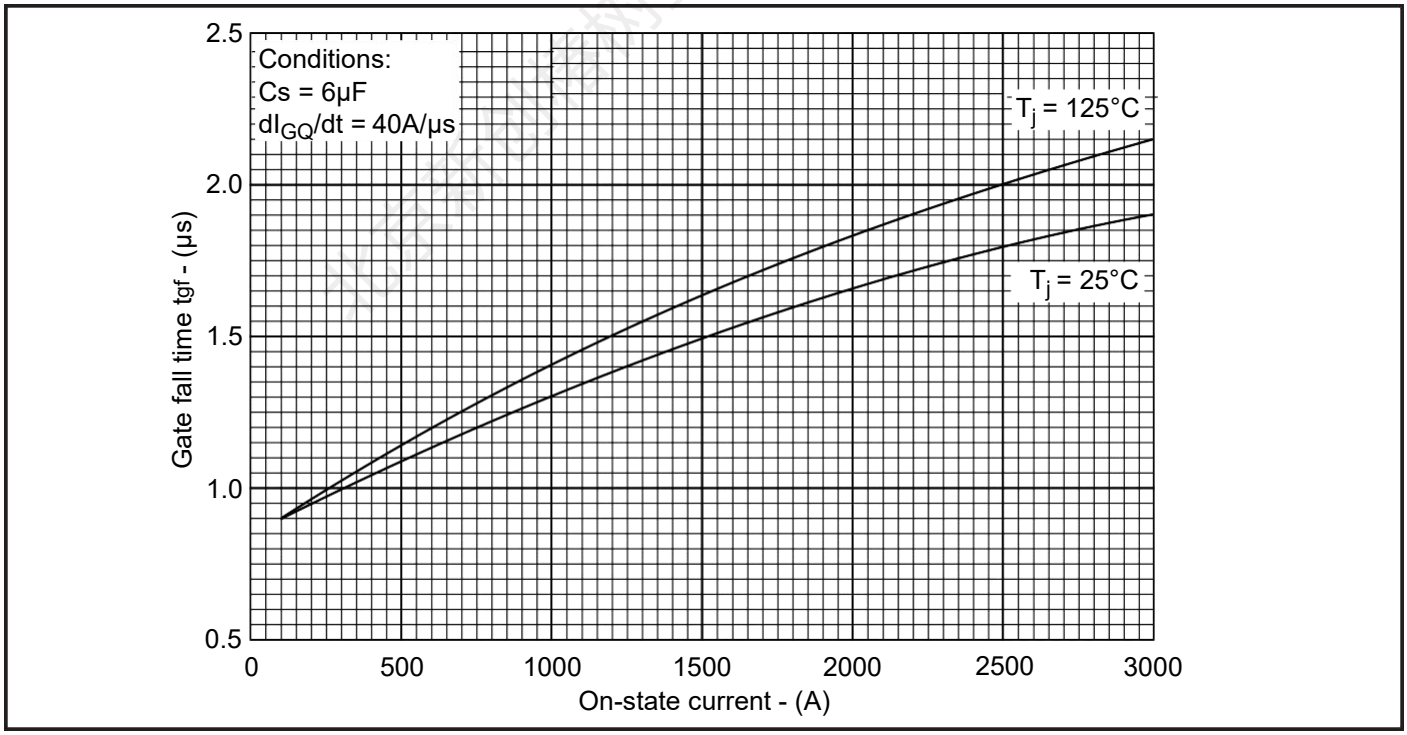

Fig.22 Gate fall time vs on-state current

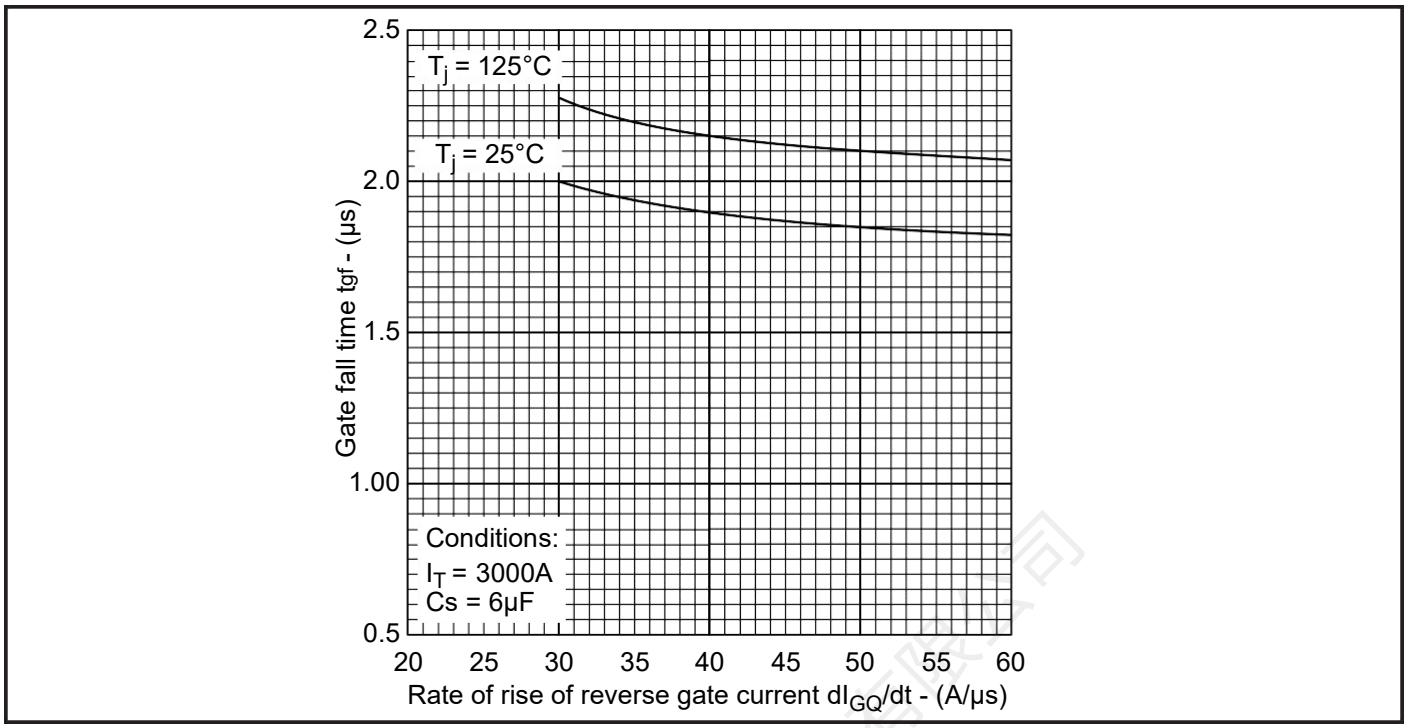

Fig.23 Gate fall time vs rate of rise of reverse gate current

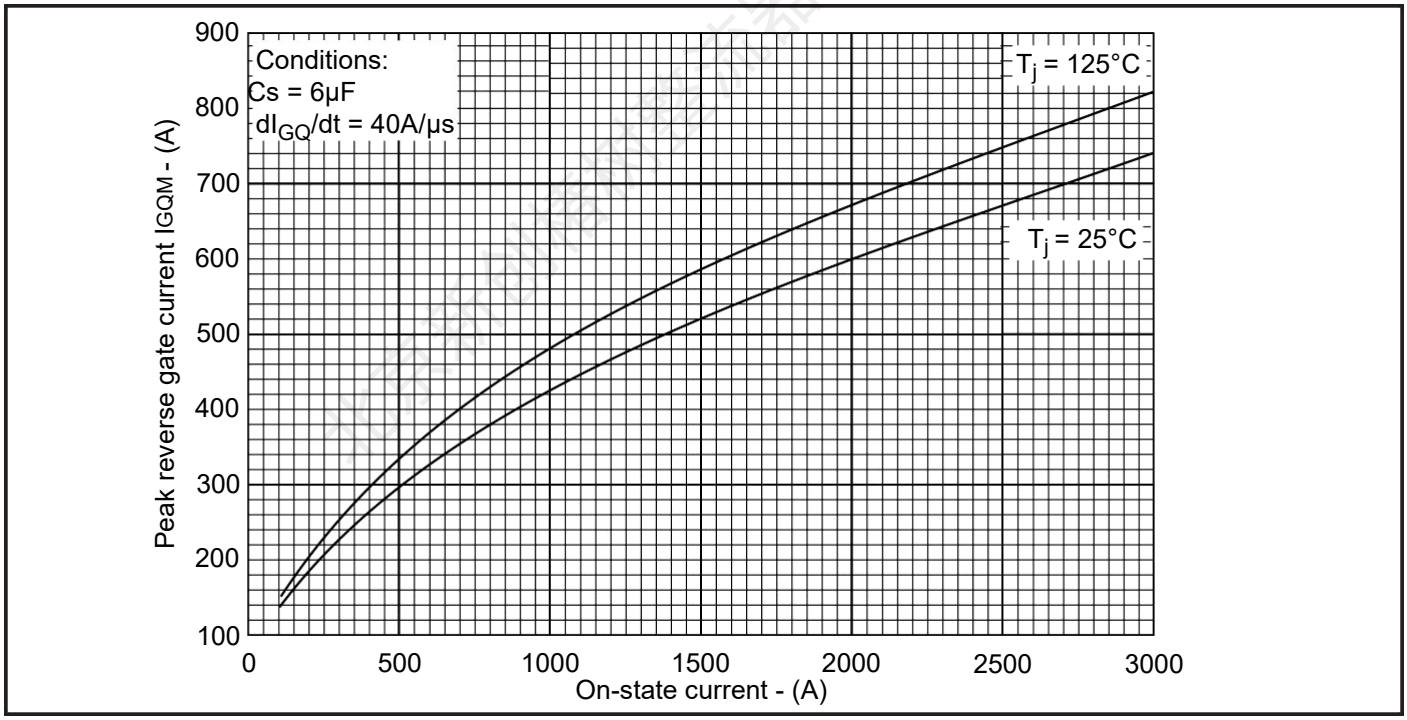

Fig.24 Peak reverse gate current vs turn-off current

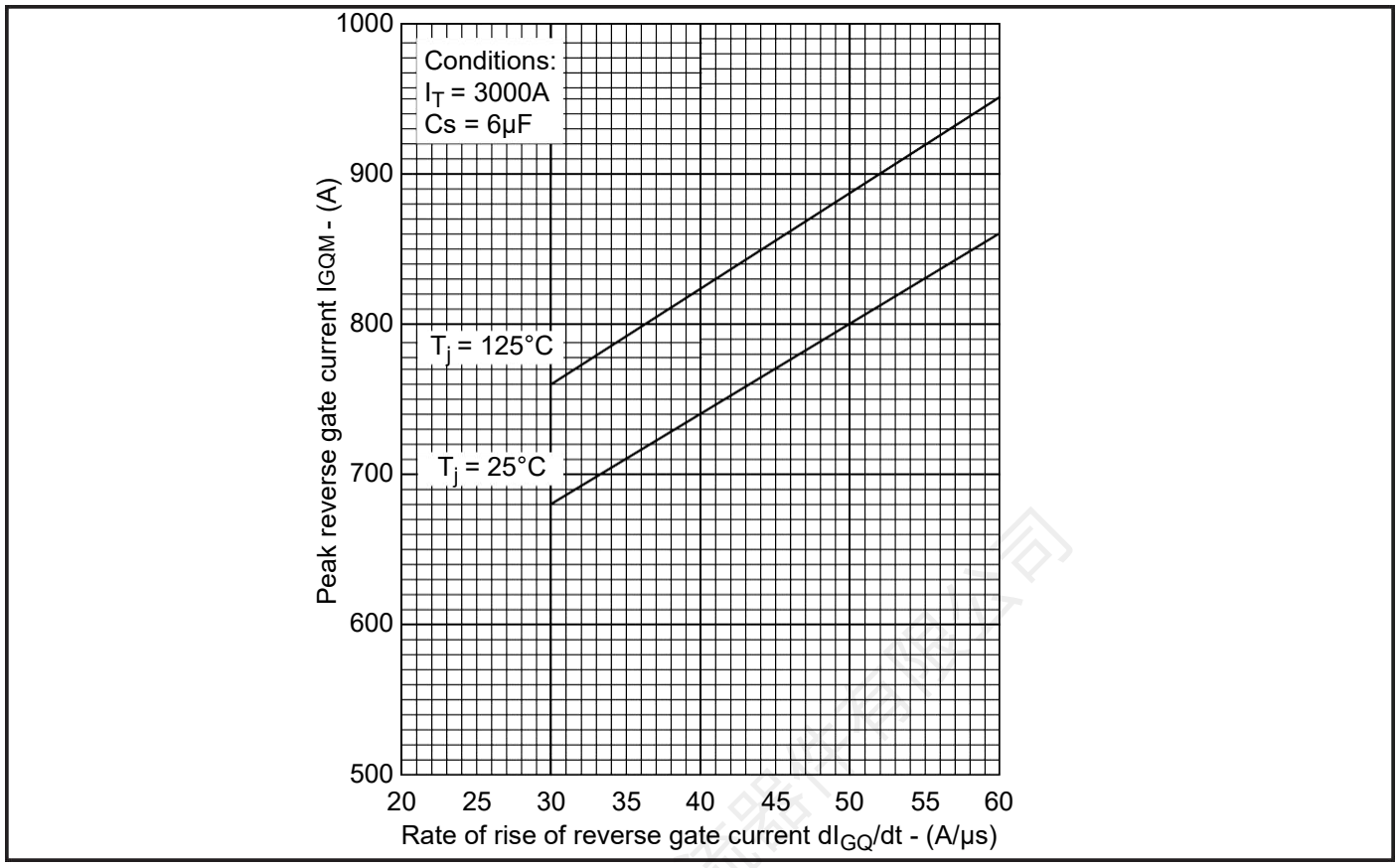

Fig.25 Peak reverse gate current vs rate of rise of reversegate current

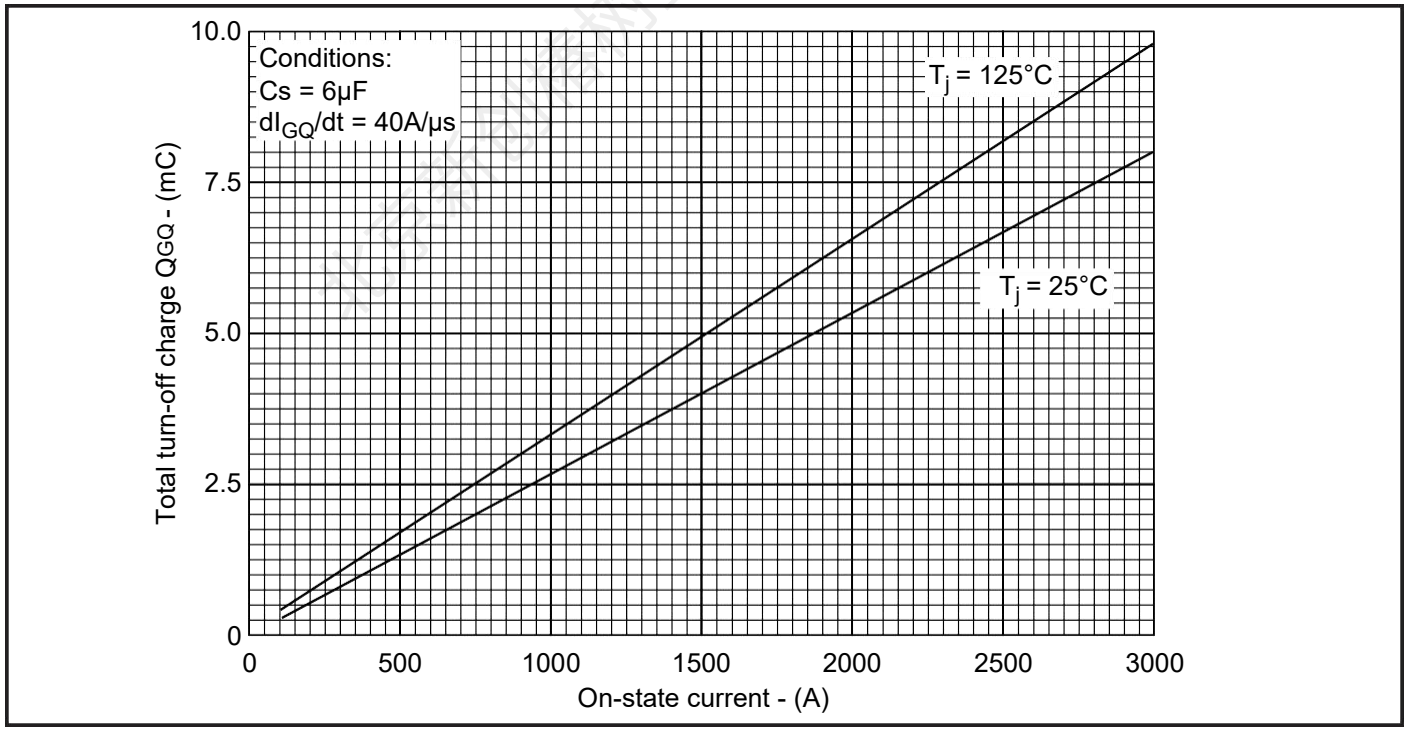

Fig.26 Turn-off gate charge vs on-state current

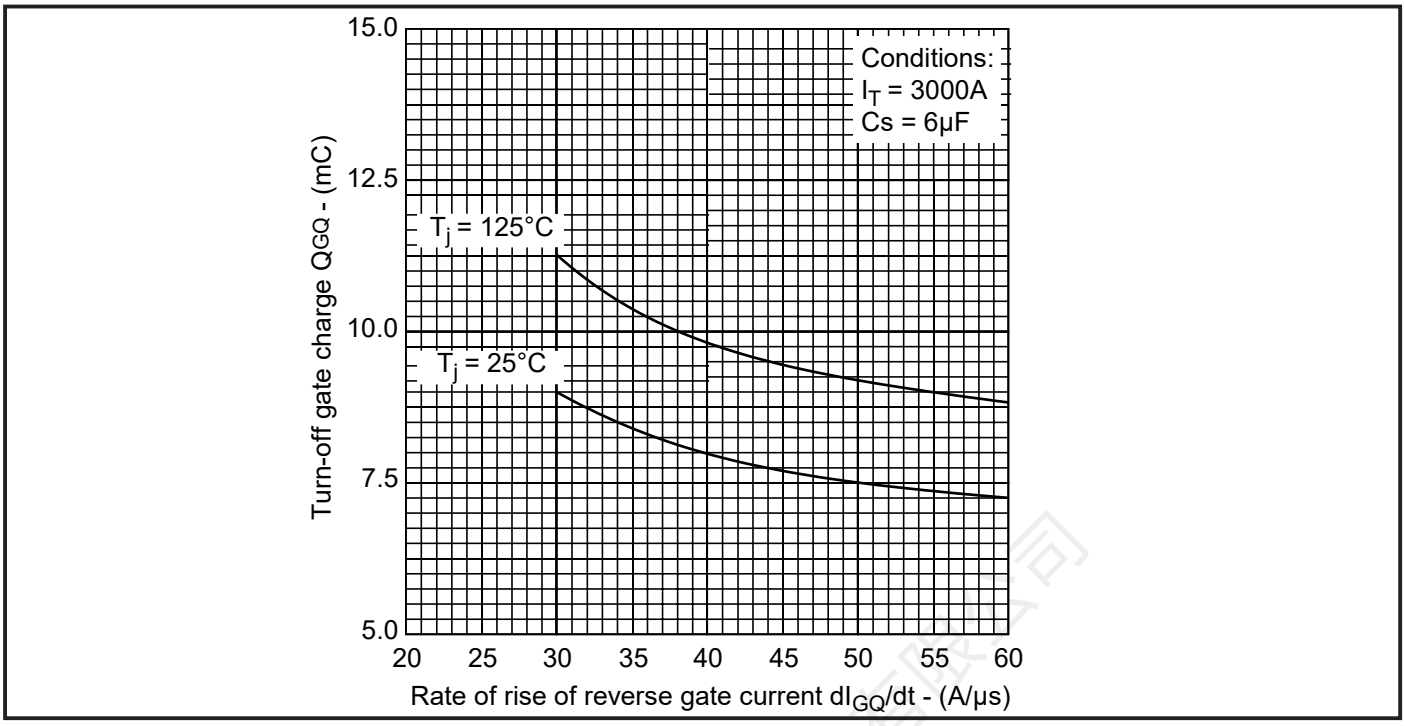

Fig.27 Turn-off gate charge vs rate of rise of reverse gate current

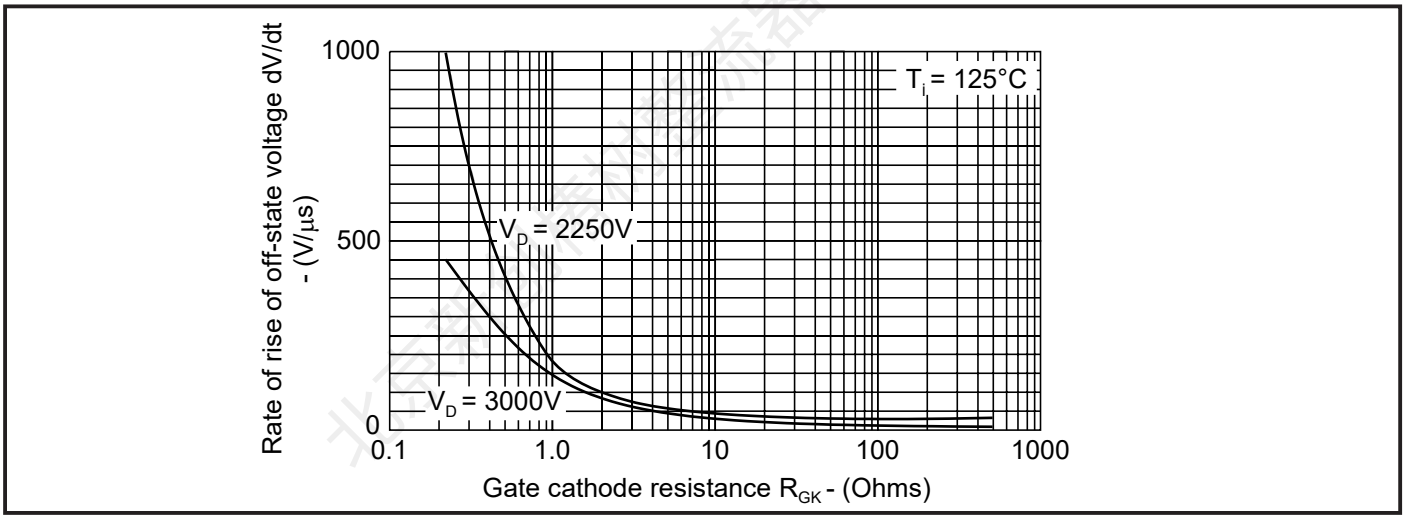

Fig.28 Rate of rise of off-state voltage vs gate cathode resistance

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