1

T809 700-54-65

Key Parameters

V_{DSM}	5400~6500	V
$I_{T(AV)}$	730	A
I_{TSM}	11.8	kA
V_{TO}	1.2	V
r_T	1.05	mΩ

Voltage Ratings

Device Type	V_{DSM}/V_{RSM}(V)	Test Conditions
T809 700-54	5400	T_{vj} = 125 °C
T809 700-58	5800	I_{DRM} = 200 mA
T809 700-62	6200	I_{RRM} = 200 mA
T809 700-65	6500	$V_{DM}=V_{DRM}$, $V_{RM}=V_{RRM}$
		t_p = 10 ms
		$V_{DRM}=V_{DSM}-900$
		$V_{RRM}=V_{RSM}-900$

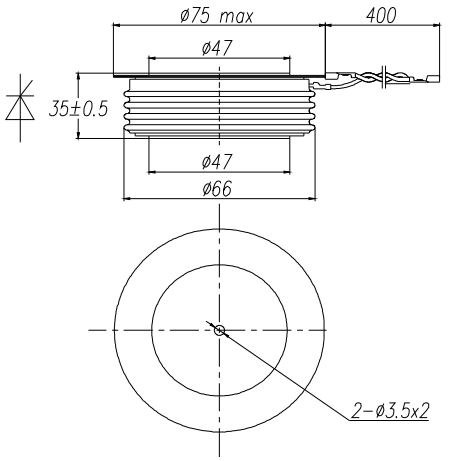
Applications

- SVC
- Motor drive
- Industry converter

Features

- Double-side cooling
- High power capability
- Low loss

Outline



Thermal & Mechanical Data

Symb.	Parameter	Min	Type	Max	Unit
R_{thjc}	Thermal Resistance Junction to Case	-	-	0.022	K / W
R_{thcs}	Thermal Resistance Case ro Heatsink	-	-	0.005	K / W
T_{vj}	Junction Temperature	-40	-	125	°C
T_{stg}	Storage Temperature	-40	-	140	°C
F	Mounting Force	-	22	-	kN
m	Weight	-	0.6	-	kg

Current Ratings

Symb.	Parameter	Test	Conditions	Min	Type	Max	Unit
$I_{T(AV)}$	Mean On-State Current	Half Sine Wave	T_C=70 °C	-	-	730	A
			T_C=85 °C	-	-	600	A
$I_{T(RMS)}$	RMS On-State Current	T_C =70 °C		-	-	1146	A
I_{TSM}	Surge (non-repetitive) On-State Current	10ms, T_{vj} =125 °C	V_R = 0	-	-	11.8	kA
I^2t	Limiting load integral	Sine Wave, 10ms		-	-	69.6	10^4A^2s

T809 700-54-65

Characteristics

Symb.	Parameter	Test Conditions	Min	Type	Max	Unit
V_{TM}	Peak on-state voltage	T_{vj} = 125 °C, I_{TM} = 1000 A	-	-	2.25	V
I_{DRM}	Forward leakage current	T_{vj} = 125 °C, V_{DRM}	-	-	200	mA
I_{RRM}	Reverse leakage current	T_{vj} = 125 °C, V_{RRM}	-	-	200	mA
V_{TO}	Threshold voltage	T_{vj} = 125 °C	-	-	1.20	V
r_T	Slope resistance	T_{vj} = 125 °C	-	-	1.05	mΩ
I_H	Holding current	T_{vj} = 25 °C	-	-	200	mA
I_L	Latching current	T_{vj} = 25 °C	-	-	1000	mA

Dynamic Parameters

Symb.	Parameter	Test Conditions		Min	Type	Max	Unit
dv/dt	Critical rate of rise of off-state voltage	T_{vj} = 125 °C, 0.67V_{DRM}		2000	-	-	V/μs
di/dt	Critical rate of rise of on-state current	T_{vj} =125°C, V_{DM} =0.5V_{DRM}, I_{TM} =1000A I_{FG} = 2 A, tr = 0.5 μs	f = 1 Hz	-	-	1000	A/μs
			f = 50 Hz	-	-	100	
t_d	Delay time	T_{vj} = 25 °C, V_{DM} = 0.67V_{DRM}, I_{TM} = 2000 A		-	-	5.0	μs
t_q	Turn-off time	T_{vj}=125°C, V_{DM}=0.67V_{DRM}, dv_D/dt=20V/μs, V_R=200V di_T/dt = -1.5 A/μs, I_T = 2000 A		-	800	-	μs
Q_{rr}	Recovery Charge	T_{vj} = 125°C, di_T/dt = -1.5A/μs, V_R = 200V, I_T = 2000A		-	2500	-	μC
Q_{ra}	Recovery Charge, 50% chord			-	1900	-	μC
I_{rr}	Reverse recovery current			-	60	-	A
t_{rr}	Reverse recovery time			-	60	-	μs

Gate Parameters

Symb.	Parameter	Test Conditions	Min	Type	Max	Unit
I_{GT}	Gate trigger current	T_{vj} = 25 °C	-	-	300	mA
V_{GT}	Gate trigger voltage	T_{vj} = 25 °C	-	-	3	V
V_{GD}	Gate non-trigger voltage	T_{vj} = 125 °C, V_D = 0.4V_{DRM}	0.3	-	-	V
V_{FGM}	Peak forward gate voltage		-	-	12	V
V_{RGM}	Peak reverse gate voltage		-	-	5	V
I_{FGM}	Peak forward gate current		-	-	4	A
P_{GM}	Gate power losses		-	-	20	W
$P_{G(AV)}$	Gate power losses (mean)		-	-	4	W

T809 700-54-65

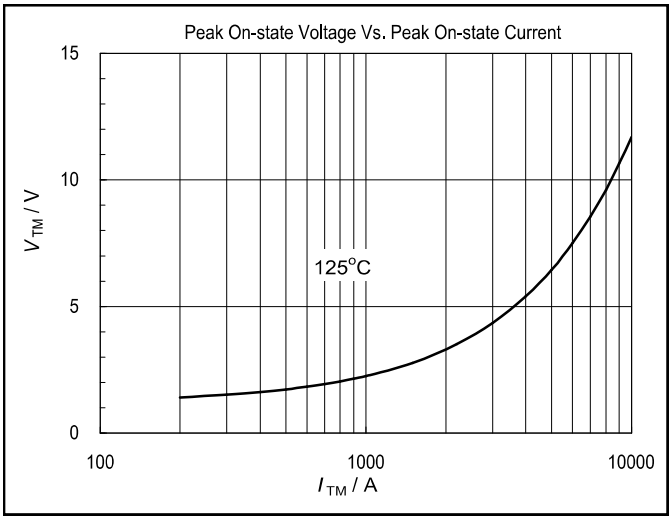


Fig1. Peak On-state Voltage Vs. Peak On-state Current

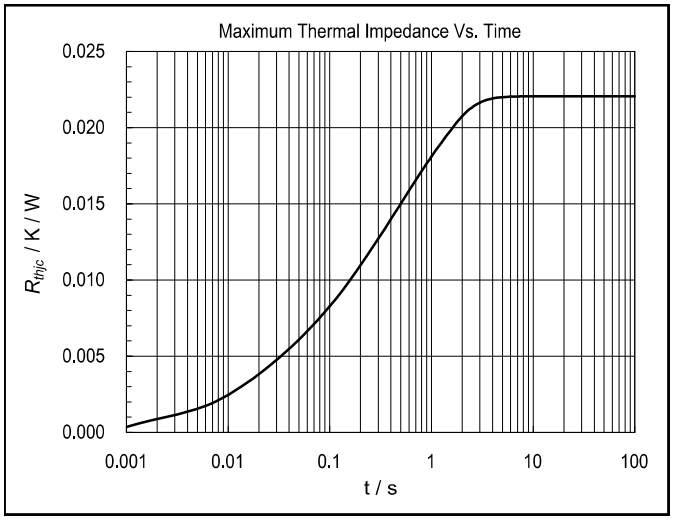


Fig2. Maximum Thermal Impedance Vs. Time

Transient thermal impedance function (double side cooled)

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

i	1	2	3	4
R_{thi} (K/kW)	12.09	6.216	1.831	1.912
τ_i (s)	0.892	0.126	0.041	0.007

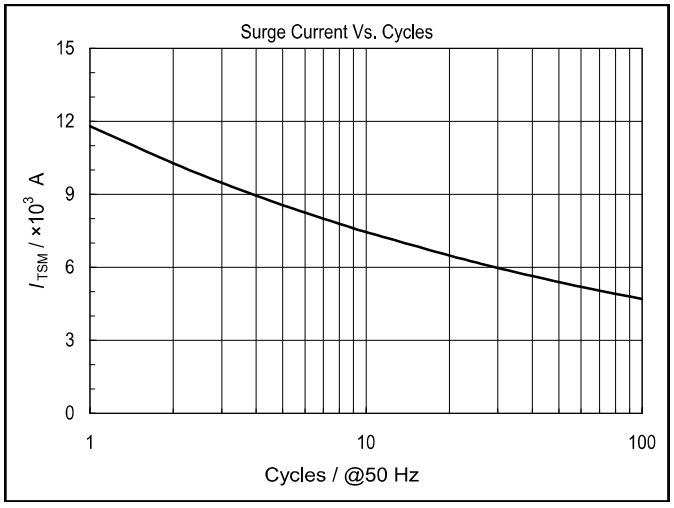


Fig3. Surge Current Vs. Cycles

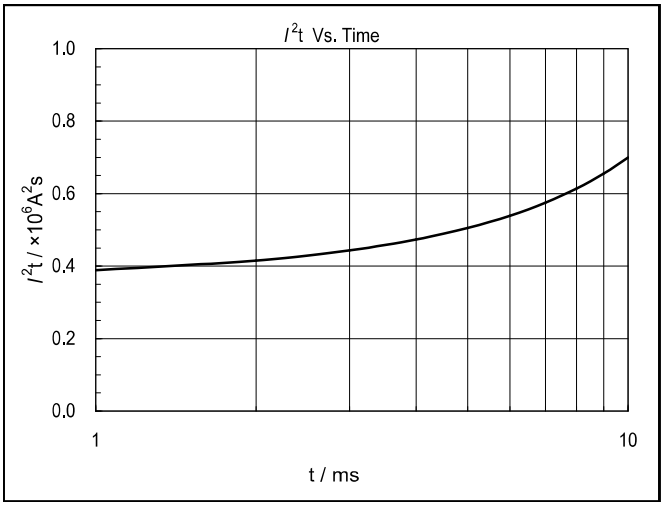


Fig4. I^2t Vs. Time

T809 700-54-65

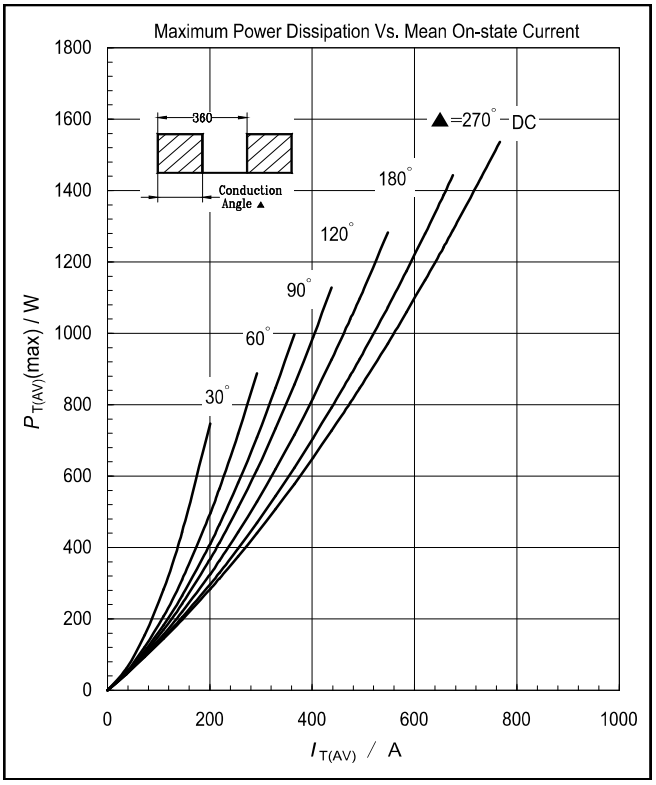


Fig5. Maximum Power Dissipation Vs. Mean On-state Current

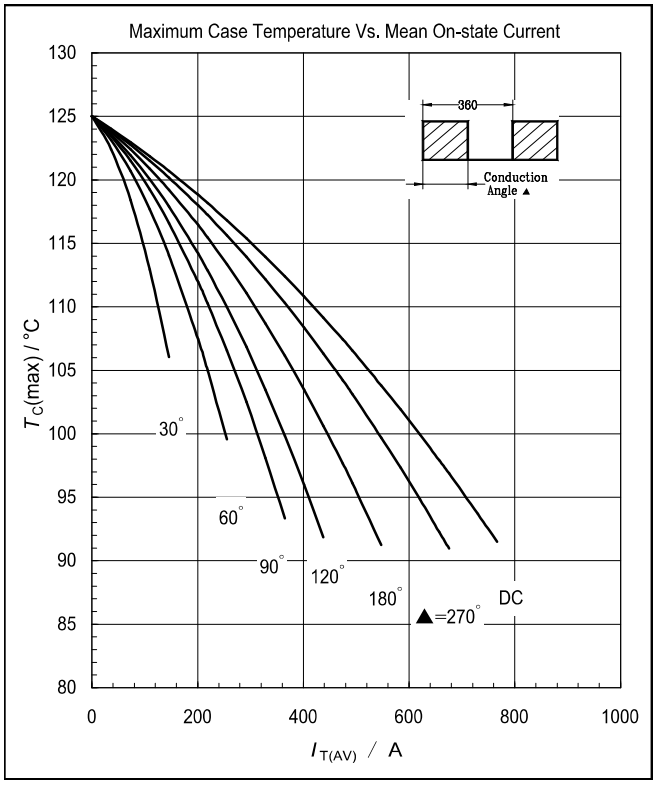


Fig6. Maximum Case Temperature Vs. Mean On-state Current

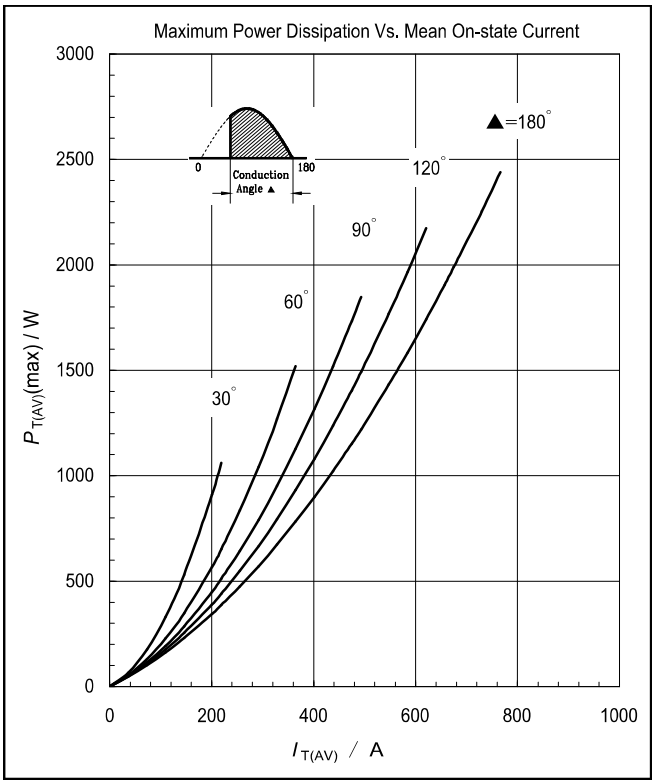


Fig7. Maximum Power Dissipation Vs. Mean On-state Current

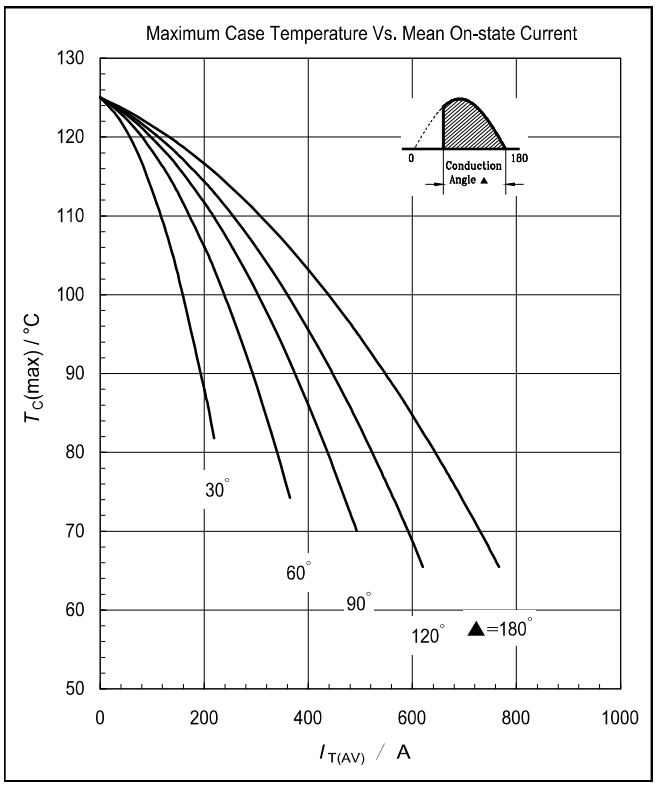


Fig8. Maximum Case Temperature Vs. Mean On-state Current

T809 700-54-65

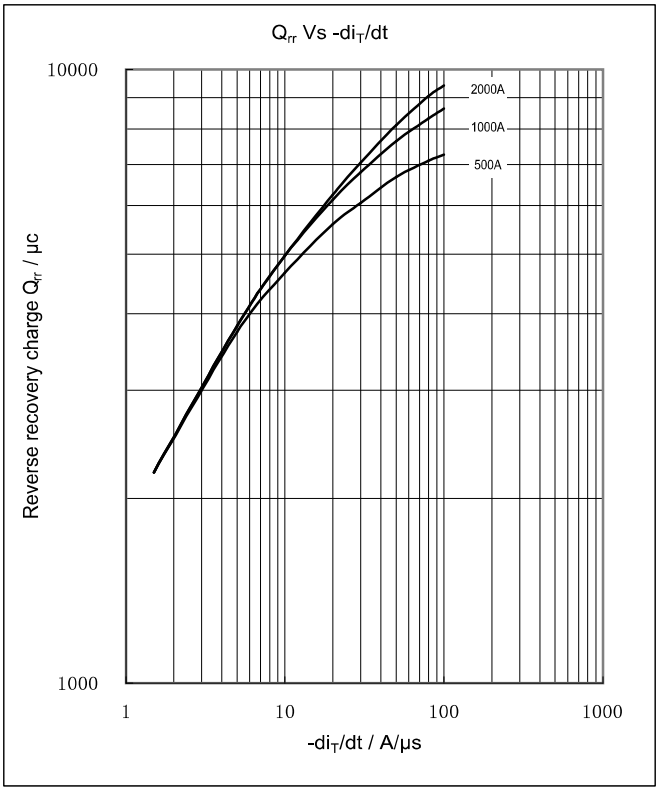


Fig9. Reverse recovery charge Vs. $-di_T/dt$

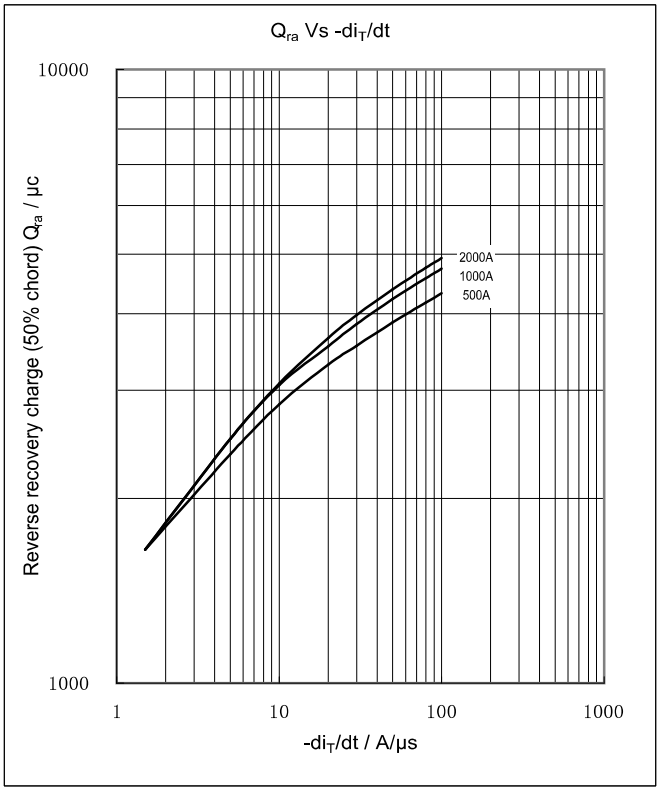


Fig10. Reverse recovery charge (50% chord) Vs. $-di_T/dt$

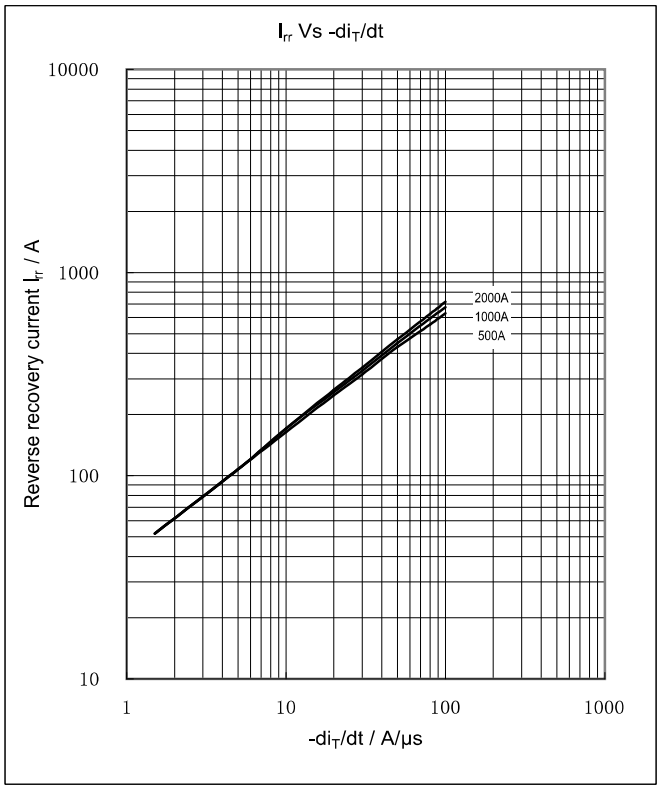


Fig11. Reverse recovery current Vs. $-di_T/dt$

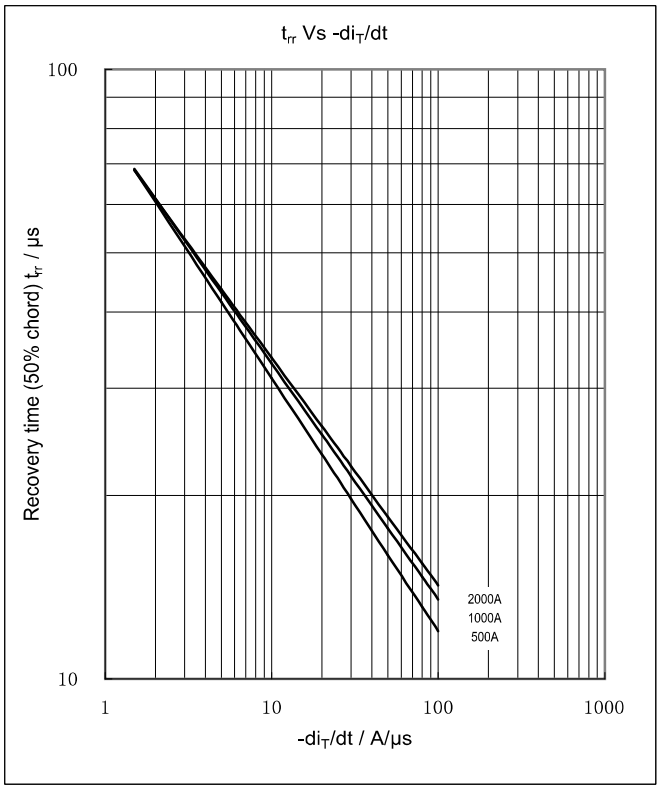


Fig12. Reverse recovery time Vs. $-di_T/dt$

T809 700-54-65

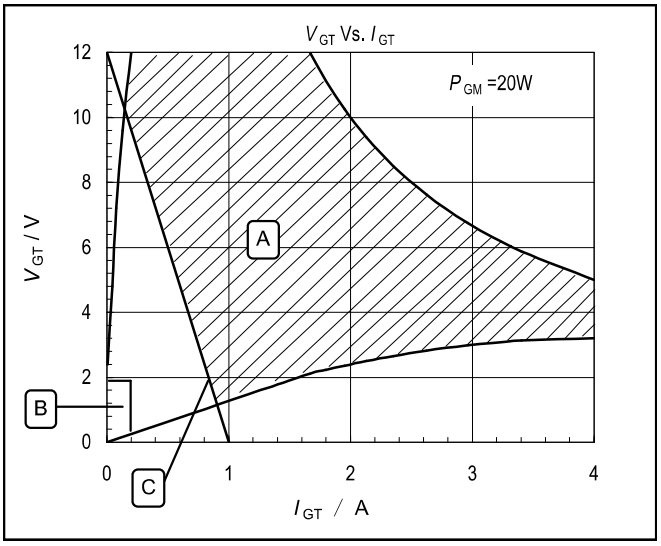


Fig13. V_{GT} Vs. I_{GT}

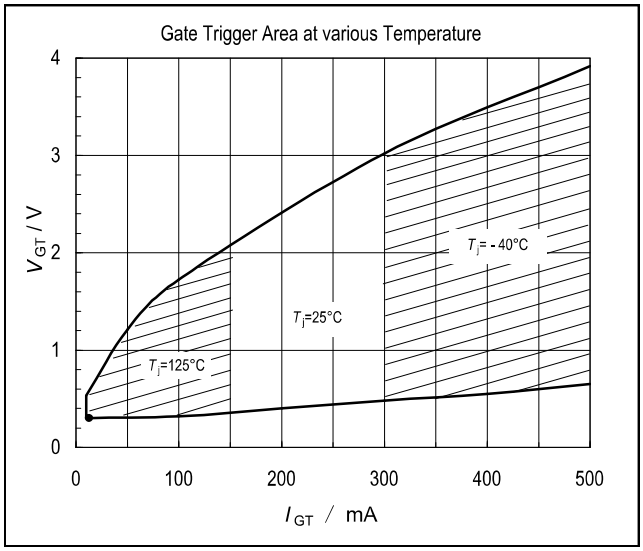


Fig14. Gate Trigger Area at various Temperature

A is Recommended Triggering Area.

B is Unreliable Triggering Area.

C is Recommended Gate Load Line.