

SMTA5-300



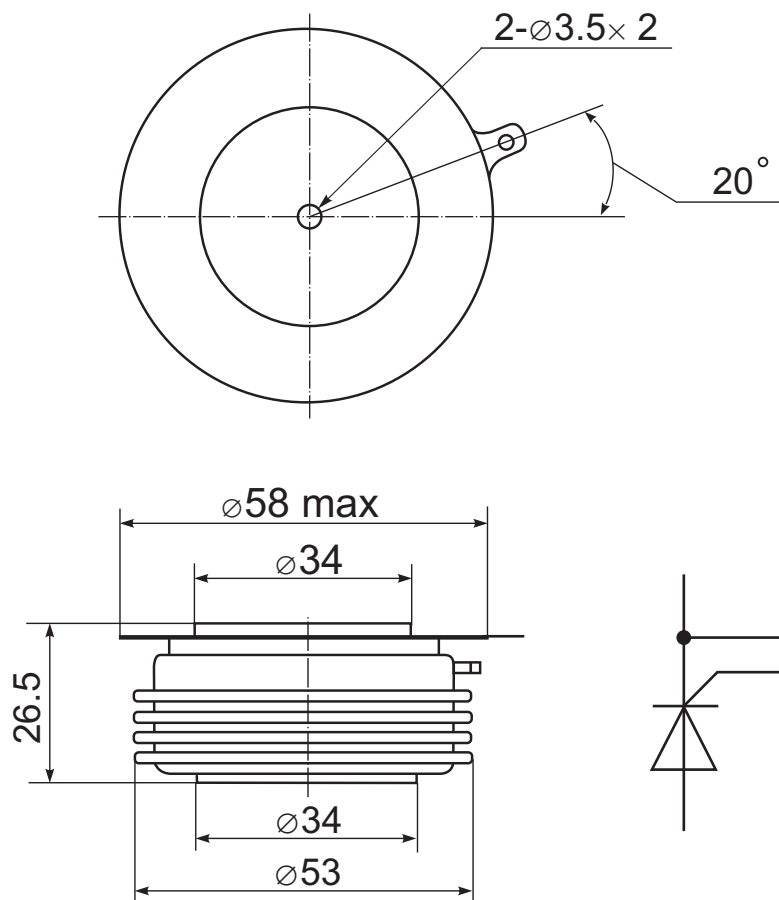
Phase Control Thyristor

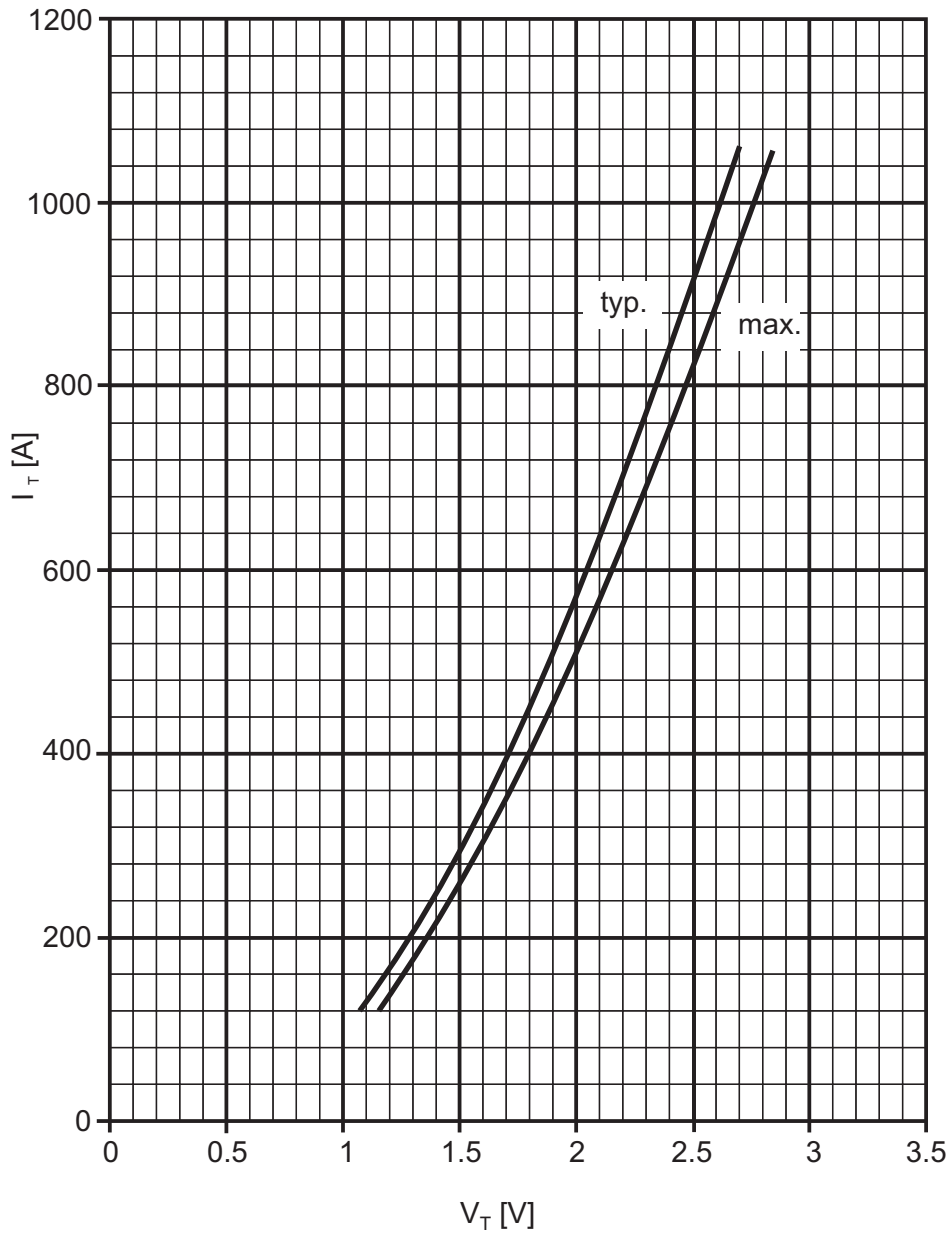


Type	V_{RSM}	V_{RRM} , V_{DRM}
SMTA5-300-50	5100	5000
SMTA5-300-52	5300	5200
SMTA5-300-55	5600	5500
SMTA5-300-60	6100	6000
SMTA5-300-65	6600	6500

Symbol	Parameter	Test Conditions	Value	Unit
I_{TAVM}	average on-state current	$T_c=100^\circ\text{C}$	300	A
I_{TRMS}	maximum RMS on-state current	$T_{VJ}=T_{VJM}$	520	A
I_{TSM}	surge-current	$T_c=25^\circ\text{C}; t_p=10\text{ms}$	4.8	kA
		$T_{VJ}=T_{VJM}; t_p=10\text{ms}$	4.3	
i^2t	i^2t -value	$T_c=25^\circ\text{C}; t_p=10\text{ms}$	115	$\text{kA}^2\cdot\text{s}$
		$T_{VJ}=T_{VJM}; t_p=10\text{ms}$	92.5	
$(di/dt)_{cr}$	critical rate of rise of on-state current	$T_{VJ}=T_{VJM}; V_D=0.67\cdot V_{DRM};$ $f=50\text{ Hz}; i_{GM}=3\text{A};$ $di_G/dt=6\text{A}/\mu\text{s}$	250	$\text{A}/\mu\text{s}$
$(dv/dt)_{cr}$	critical rate of rise of off-state voltage	$T_{VJ}=T_{VJM}; V_D=0.67\cdot V_{DRM};$ gate open	1000	$\text{V}/\mu\text{s}$
I_{RRM}/I_{DRM}	off-state Leakage current	$T_{VJ}=T_{VJM}; V_R=V_{RRM}; V_D=V_{DRM}$	100	mA
V_{RRM}	reverse repeat Peak value voltage	$T_{VJ}=T_{VJM}; 180^\circ\text{C sine wave},$ 50 Hz; gate open	5000-6500	V
V_{DRM}	off state repeat Peak value voltage		5000-6500	V
V_{RSM}	non-repetitive peak reverse voltage	$T_{VJ}=T_{VJM}$	5100-6600	V
V_{TM}	on-state voltage	$T_{VJ}=T_{VJM}; I_{TM}=800\text{A}$	2.35	V
r_T	slope resistance	$T_{VJ}=T_{VJM}$	2.3	m
V_{GT}	gate trigger voltage	$T_{VJ}=25^\circ\text{C}; V_D=12\text{V}$	2.5	V
I_{GT}	gate trigger current	$T_{VJ}=25^\circ\text{C}; V_D=12\text{V}$	350	mA
V_{GD}	gate non-trigger voltage	$T_{VJ}=T_{VJM}; V_D=0.67\cdot V_{DRM}$	0.4	V
I_{GD}	gate non-trigger current	$T_{VJ}=T_{VJM}; V_D=0.67\cdot V_{DRM}$	10	mA
I_H	holding current	$T_{VJ}=25^\circ\text{C}; V_D=12\text{V};$ gate open	350	mA
I_L	latching current	$T_{VJ}=25^\circ\text{C}; V_D=12\text{V};$ $t_G=20\mu\text{s}; i_{GM}=3\text{A};$ $di_G/dt=6\text{A}/\mu\text{s}$	450	mA

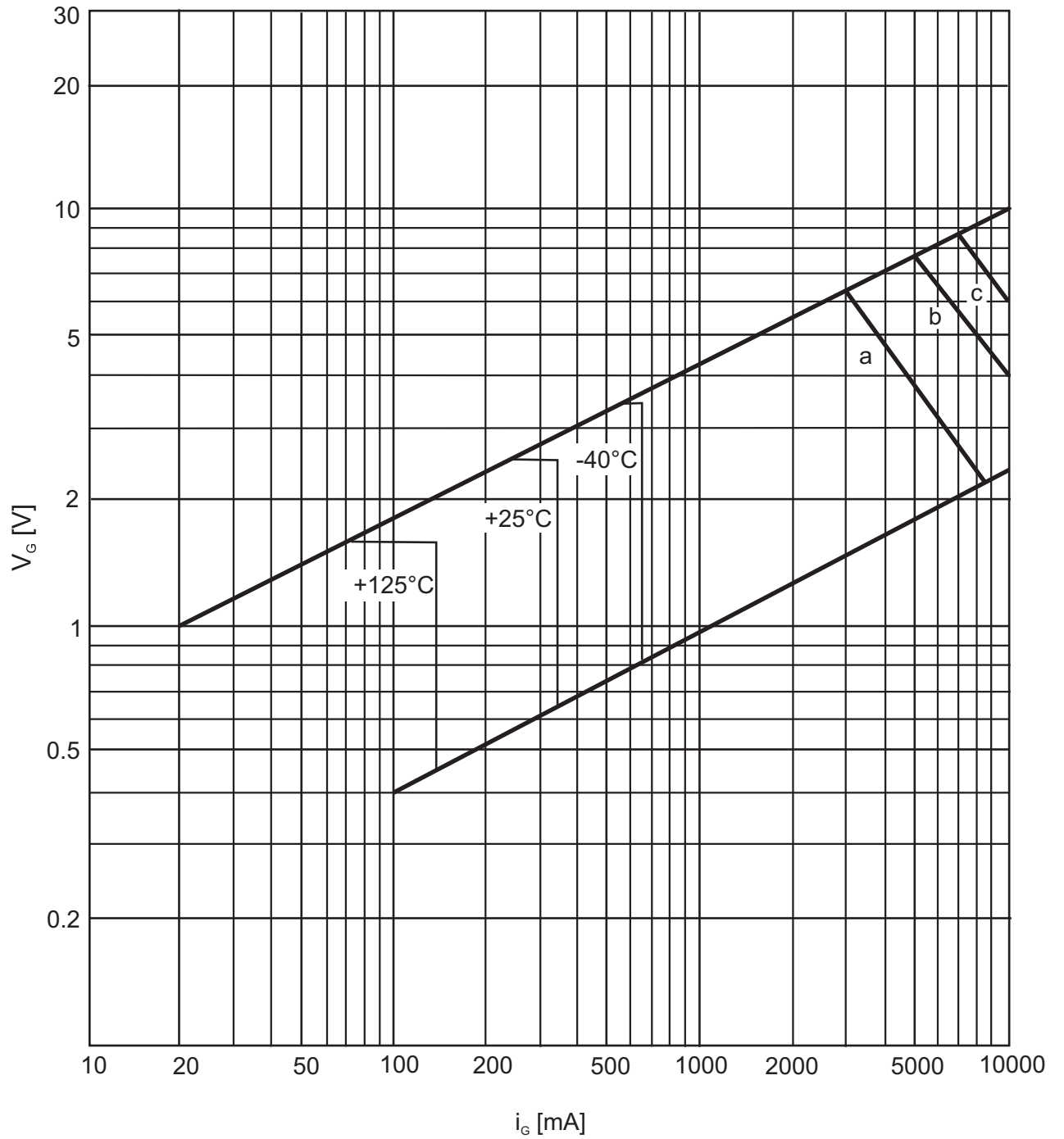
t_{gd}	delay time	$T_{VJ}=25^{\circ}\text{C}; V_D=0.5 \cdot V_{DRM};$ $i_{GM}=3\text{A}; di_G/dt=6\text{A}/\mu\text{s}$	2	μs
t_q	turn-off time	$T_{VJ}=T_{VJM}; I_T=I_{TAVM};$ $t_p=200\mu\text{s}; di_R/dt=10\text{A}/\mu\text{s};$ $V_D=0.67 \cdot V_{DRM}; V_R=100\text{V};$ $dV_D/dt=20\text{V}/\mu\text{s}$	500	μs
Q_r	recovered charge	$T_{VJ}=T_{VJM}; I_T=I_{TAVM}; di_R/dt=10\text{A}/\mu\text{s};$ $V_R=0.5 \cdot V_{RRM}; V_{RM}=0.8 \cdot V_{RRM}$	3.5	mAs
V_{TO}	threshold voltage	$T_{VJ}=T_{VJM}$	1.20	V
T_{VJ}	working junction temperature		-40...+125	$^{\circ}\text{C}$
T_{VJM}	maximum working junction temperature		125	$^{\circ}\text{C}$
T_{stg}	storage temperature		-40...+125	$^{\circ}\text{C}$
R_{thJC}	thermal resistance; junction to case	DC, two-sided cooling	0.045	K/W
R_{thCH}	thermal resistance; case to heatsink	two-sided cooling	0.008	K/W
F	clamping force		12	kN
W	weight		280	g
a	maximum allowable acceleration		50	m/s^2





Limiting on-state characteristic $i_T = f(V_T)$

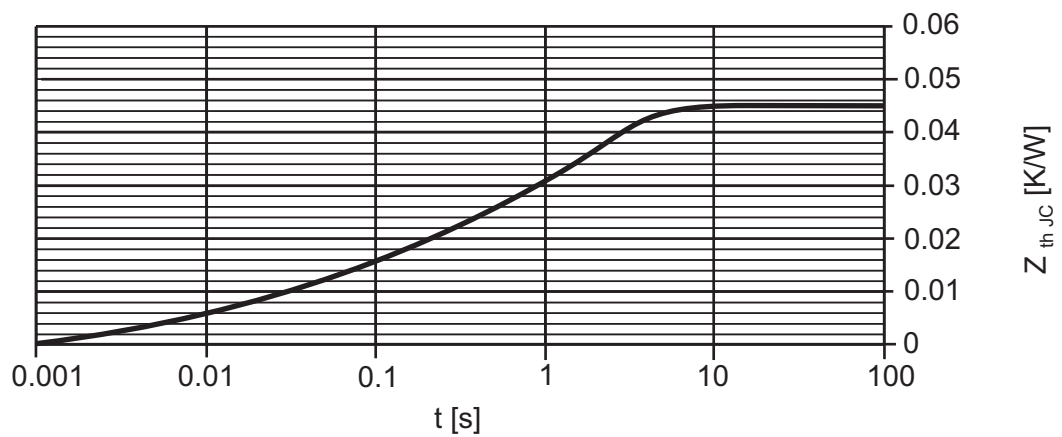
$$T_{Vj} = T_{Vj \max}$$



Gate characteristic $V_G=f(i_G)$ with triggering area for $V_D = 6\text{V}$

Maximum rated peak gate power dissipation $P_{GM} = f(t_g)$:

- a - 20 W (10ms)
- b - 40 W (1ms)
- c - 60 W (0.5ms)



Transient thermal impedance $Z_{th_{JC}} = f(t)$
DC, two-sided cooling

Features:

- Hermetic metal case with ceramic insulator
- Capsule packages for double sided cooling
- International standard case
- Amplifying gates

Typical Applications:

- DC motor control
- AC motor soft starter
- Controlled rectifiers
- AC controllers