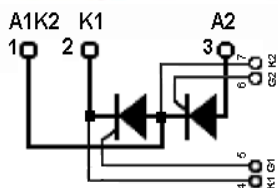


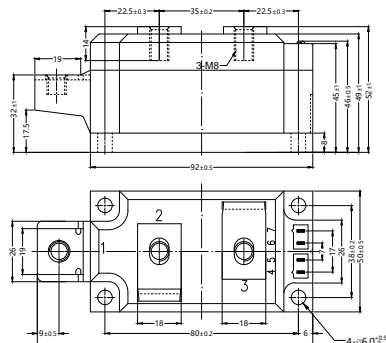
# STT320GK40BT

## Thyristor-Thyristor Modules



Type	$V_{RSM}$ $V_{DSM}$ V	$V_{RRM}$ $V_{DRM}$ V
STT320GK22BT	2300	2200
STT320GK24BT	2500	2400
STT320GK28BT	2900	2800
STT320GK30BT	3100	3000
STT320GK32BT	3300	3200
STT320GK36BT	3700	3600
STT320GK40BT	4100	4000

### Dimensions in mm (1mm=0.0394")



Symbol	Test Conditions	Maximum Ratings	Unit	
$I_{TRMS}$ , $I_{FRMS}$ $I_{TAVM}$ , $I_{FAVM}$	$T_{VJ}=T_{VJM}$ ; 50Hz $T_C=85^{\circ}C$ ; 180° sine	502 320	A	
$I_{TSM}$ , $I_{FSM}$	$T_{VJ}=45^{\circ}C$ $V_R=0$ $t=10ms$ (50Hz), sine $t=8.3ms$ (60Hz), sine	9100 10900	A	
	$T_{VJ}=T_{VJM}$ $V_R=0$ $t=10ms$ (50Hz), sine $t=8.3ms$ (60Hz), sine	8000 9600		
$\int i^2 dt$	$T_{VJ}=45^{\circ}C$ $V_R=0$ $t=10ms$ (50Hz), sine $t=8.3ms$ (60Hz), sine	414000 496000	$A^2s$	
	$T_{VJ}=T_{VJM}$ $V_R=0$ $t=10ms$ (50Hz), sine $t=8.3ms$ (60Hz), sine	347000 427000		
$(di/dt)_{cr}$	$T_{VJ}=T_{VJM}$ $f=50Hz$ , $t_p=200\mu s$ $V_D=2/3V_{DRM}$ $I_G=0.5A$ $di/dt=0.5A/\mu s$ repetitive	150	A/ $\mu s$	
	non repetitive	500		
$(dv/dt)_{cr}$	$T_{VJ}=T_{VJM}$ ; $R_{GK}=\infty$ ; method 1 (linear voltage rise) $V_{DR}=2/3V_{DRM}$	1000	V/ $\mu s$	
$P_{GM}$	$T_{VJ}=T_{VJM}$ $I_T=I_{TAVM}$ $t_p=30\mu s$ $t_p=500\mu s$	120 60	W	
		8		
$P_{GAV}$		10	W	
$V_{RGM}$		10	V	
$T_{VJ}$ $T_{VJM}$ $T_{stg}$		-40...+125 125 -40...+125	$^{\circ}C$	
	$V_{ISOL}$	50/60Hz, RMS $I_{ISOL}\leq 1mA$ $t=1min$ $t=1s$		4000 4500
	$V_{\sim}$			
$M_d$	Mounting torque (M6)	5	Nm	
	Terminal connection torque (M8)	9		
Weight	Typical	650	g	

**Sirectifier®**

# STT320GK40BT

## Thyristor-Thyristor Modules

Symbol	Test Conditions	Characteristic Values	Unit
$I_{RRM}, I_{DRM}$	$T_{VJ}=T_{VJM}; V_R=V_{RRM}; V_D=V_{DRM}$	$\leq 60$	mA
$V_{TM}$	$I_{TM}=960A; T_{VJ}=25^{\circ}C$	$\leq 2.60$	V
$V_{TO}$	For power-loss calculations only ( $T_{VJ}=T_{VJM}$ )	0.8	V
$r_T$		0.6	m $\Omega$
$V_{GT}$	$V_D=6V;$ $T_{VJ}=25^{\circ}C$ $T_{VJ}=-40^{\circ}C$	$\leq 2$ $\leq 2.6$	V
$I_{GT}$	$V_D=6V;$ $T_{VJ}=25^{\circ}C$ $T_{VJ}=-40^{\circ}C$	$\leq 200$ $\leq 250$	mA
$V_{GD}$	$T_{VJ}=T_{VJM};$ $V_D=2/3V_{DRM}$	$\leq 0.25$	V
$I_{GD}$	$T_{VJ}=T_{VJM};$ $V_D=2/3V_{DRM}$	$\leq 10$	mA
$I_L$	$T_{VJ}=25^{\circ}C; t_p=30\mu s; V_D=6V$ $I_G=0.45A; di_G/dt=0.45A/\mu s$	$\leq 1200$	mA
$I_H$	$T_{VJ}=25^{\circ}C; V_D=6V; R_{GK}=\infty$	$\leq 300$	mA
$t_{gd}$	$T_{VJ}=25^{\circ}C; V_D=1/2V_{DRM}$ $I_G=0.5A; di_G/dt=0.5A/\mu s$	$\leq 3$	us
$t_q$	$T_{VJ}=T_{VJM}; I_T=320A; t_p=200\mu s; -di/dt=10A/\mu s$ $V_R=100V; dv/dt=20V/\mu s; V_D=2/3V_{DRM}$	typ. 250	us
$Q_s$	$T_{VJ}=T_{VJM}; I_T, I_F=320A; -di/dt=50A/\mu s$	$\leq 650$	uC
$I_{RM}$		$\leq 235$	A
$R_{thJC}$	per thyristor/diode; DC current per module	0.111 0.056	K/W
$R_{thCH}$	per thyristor/diode; DC current per module	0.040 0.020	K/W
$d_s$	Creeping distance on surface	12.7	mm
$d_A$	Creepage distance in air	9.6	mm
$a$	Maximum allowable acceleration	50	m/s <sup>2</sup>

### FEATURES

- \* International standard package
- \* Isolation voltage 4500 V~
- \* Pressure Contacts Technology
- \* UL File NO.E310749
- \* RoHS Compliant

### APPLICATIONS

- \* Motor control
- \* Power converter
- \* Heat and temperature control for industrial furnaces and chemical processes
- \* Lighting control
- \* Contactless switches

### ADVANTAGES

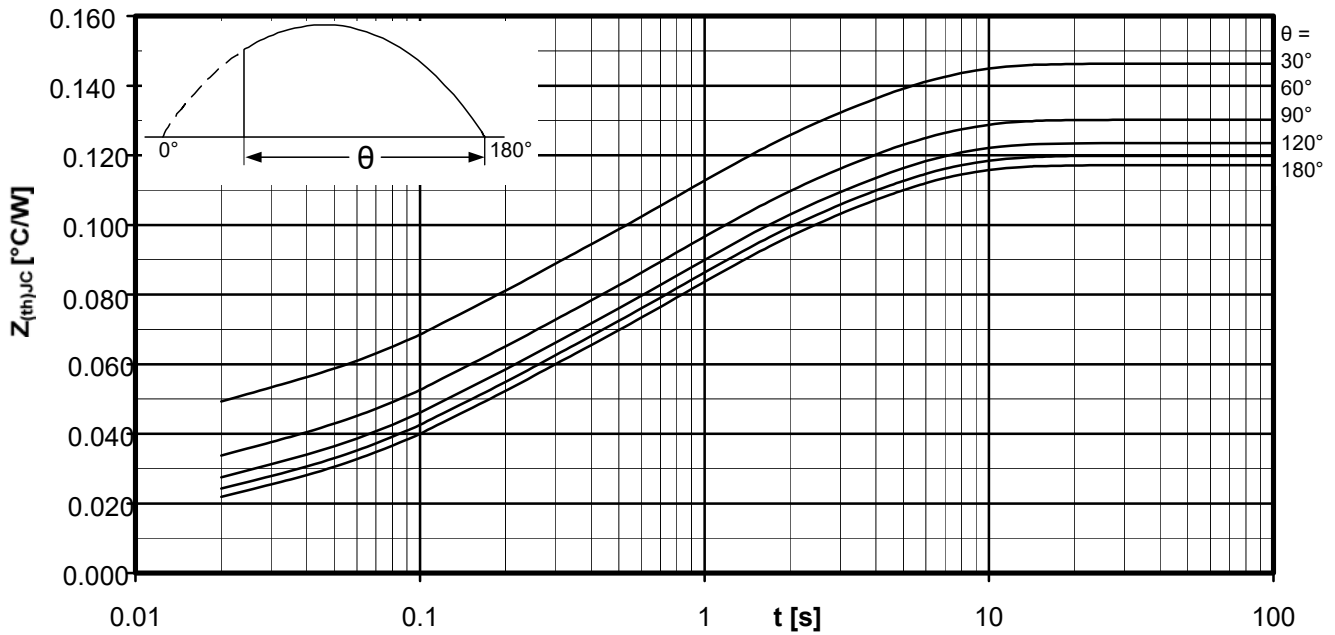
- \* Space and weight savings
- \* Simple mounting
- \* Improved temperature and power cycling
- \* Reduced protection circuits



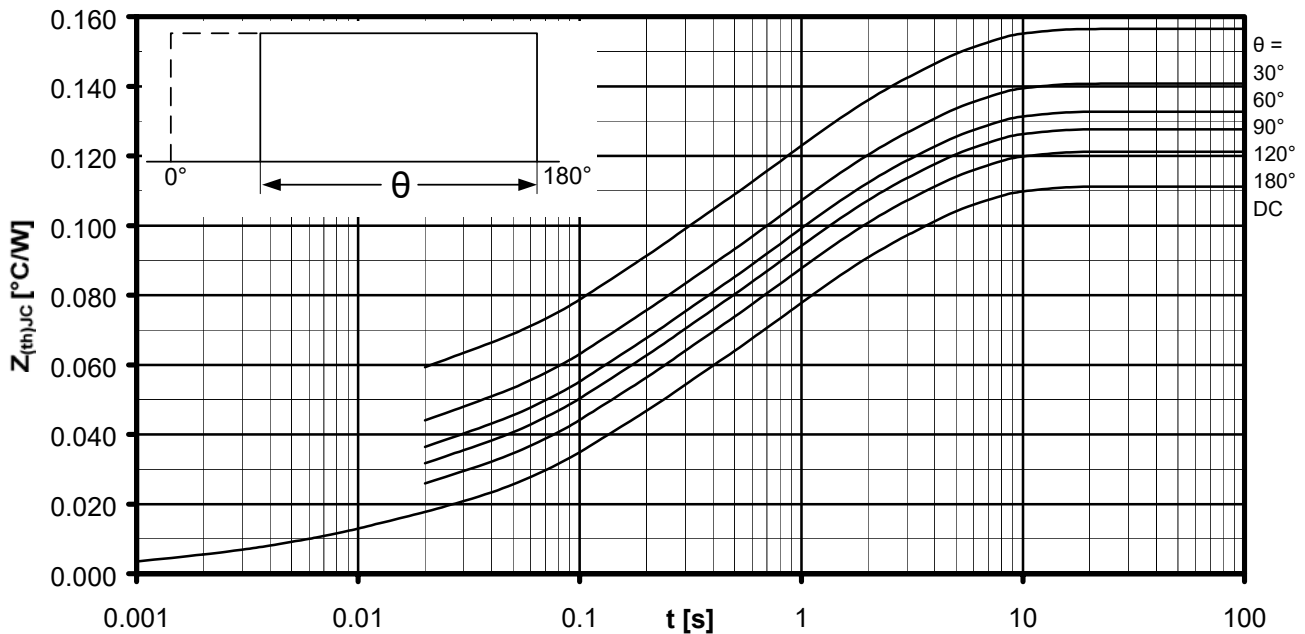
**Sirectifier®**

# STT320GK40BT

## Thyristor-Thyristor Modules



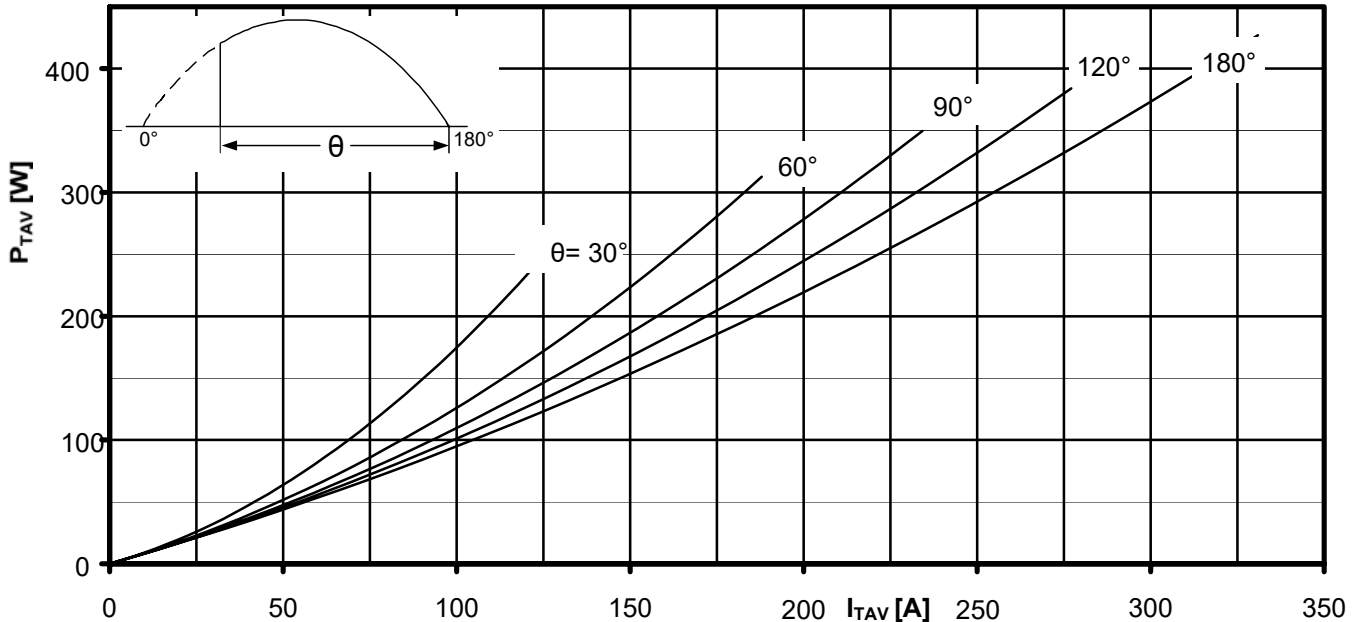
Transient thermal impedance per arm  $Z_{thJC} = f(t)$   
Sinusoidal current  
Parameter: Current conduction angle  $\theta$



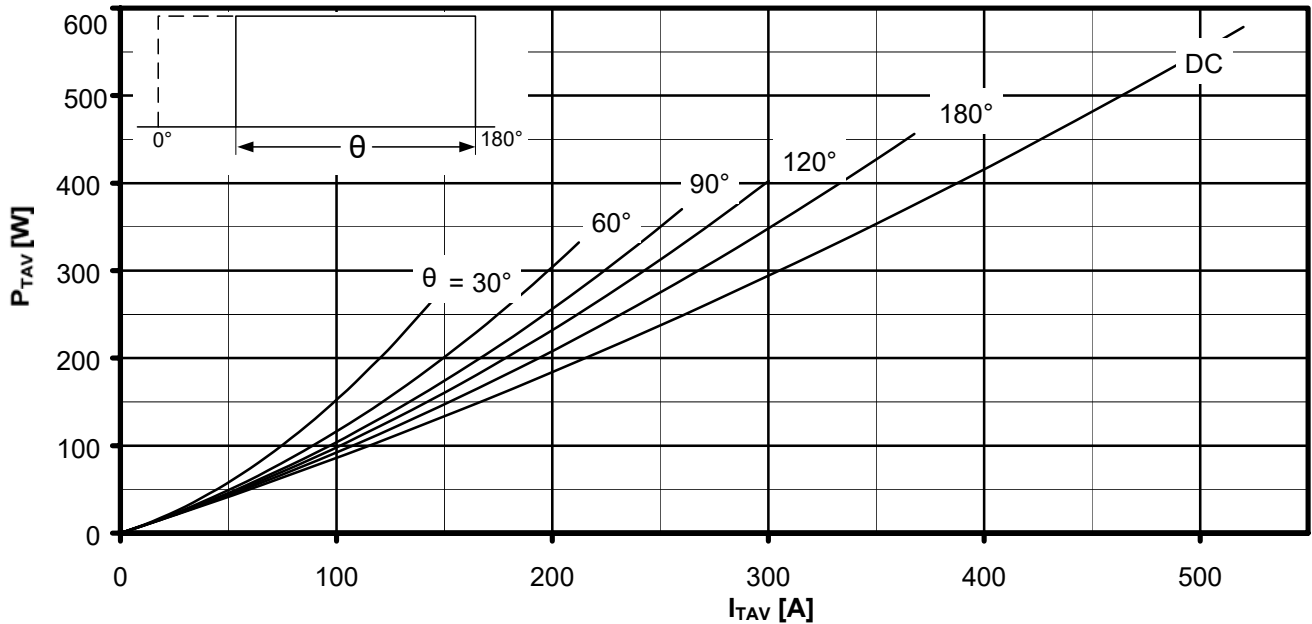
Transient thermal impedance per arm  $Z_{thJC} = f(t)$   
Rectangular current  
Parameter: Current conduction angle  $\theta$

# STT320GK40BT

## Thyristor-Thyristor Modules



Calculation base  $P_{TAV}$  (switching losses should be considered separately)  
Parameter: Current conduction angle  $\theta$

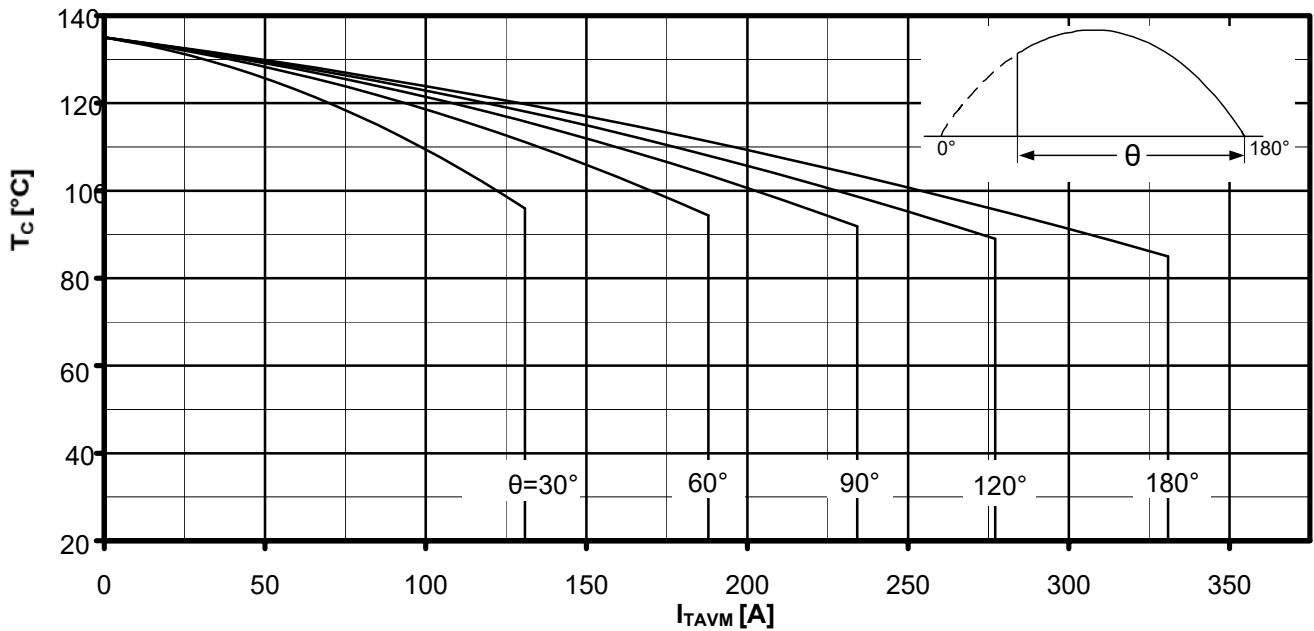


Calculation base  $P_{TAV}$  (switching losses should be considered separately)  
Parameter: Current conduction angle  $\theta$



# STT320GK40BT

## Thyristor-Thyristor Modules

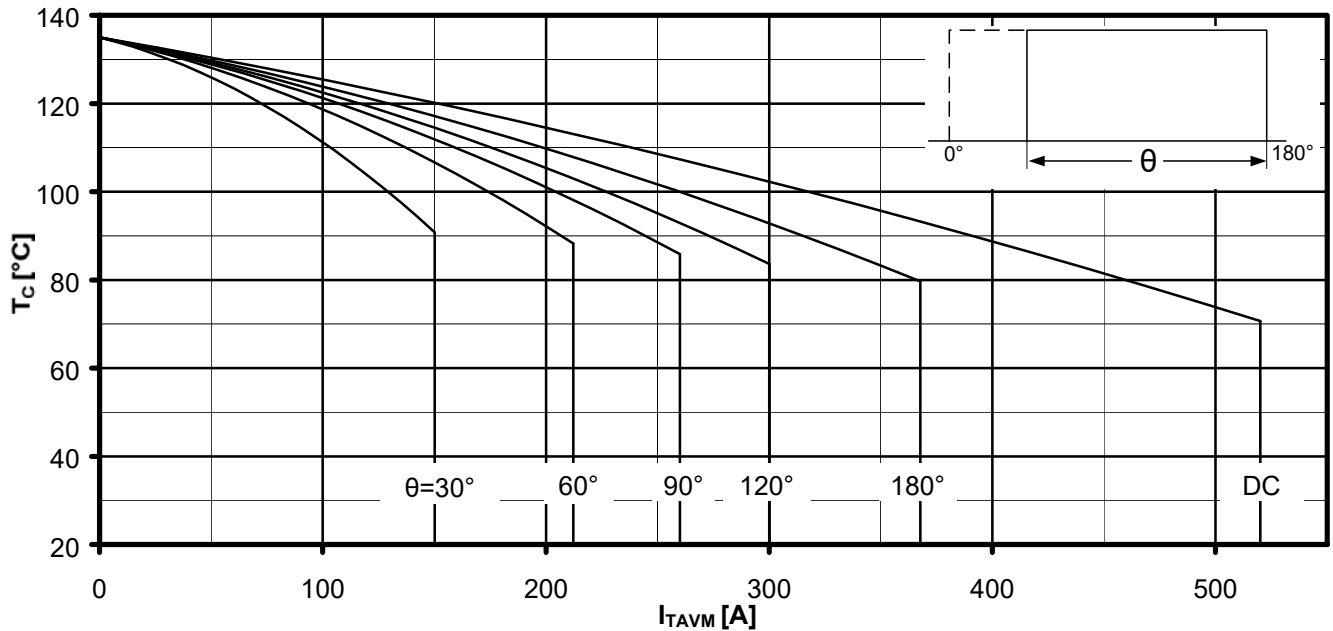


Maximum allowable case temperature  $T_c = f(I_{TAVM})$

Sinusoidal current Current load per arm

Calculation base  $P_{TAV}$  (switching losses should be considered separately)

Parameter: Current conduction angle  $\theta$



Maximum allowable case temperature  $T_c = f(I_{TAVM})$

Rectangular current Current load per arm

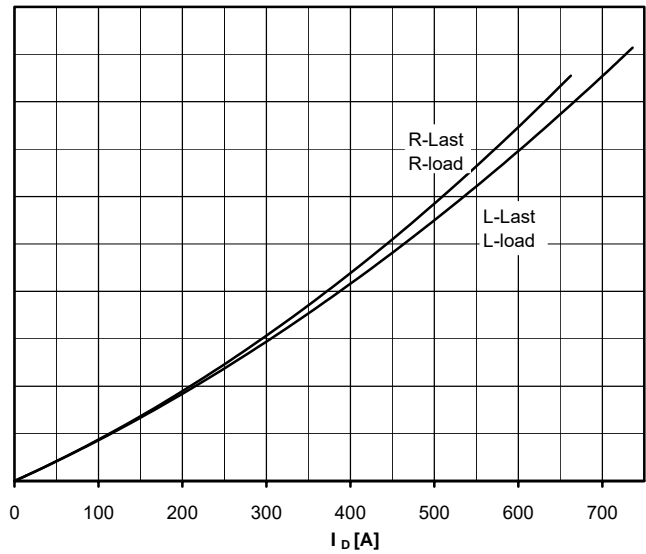
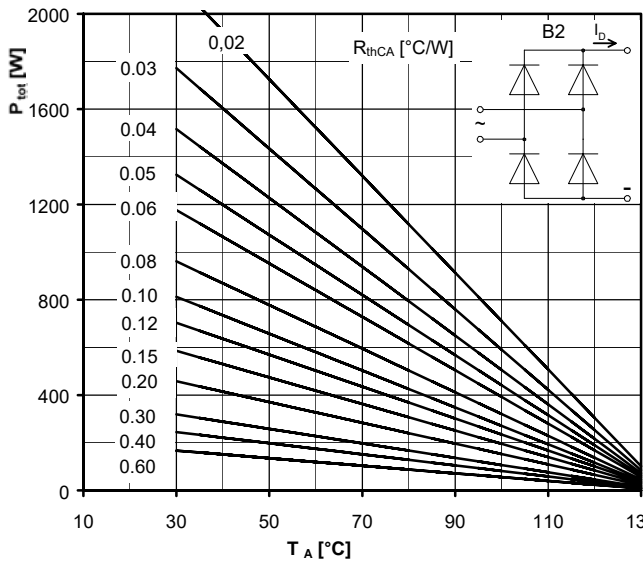
Calculation base  $P_{TAV}$  (switching losses should be considered separately)

Parameter: Current conduction angle  $\theta$

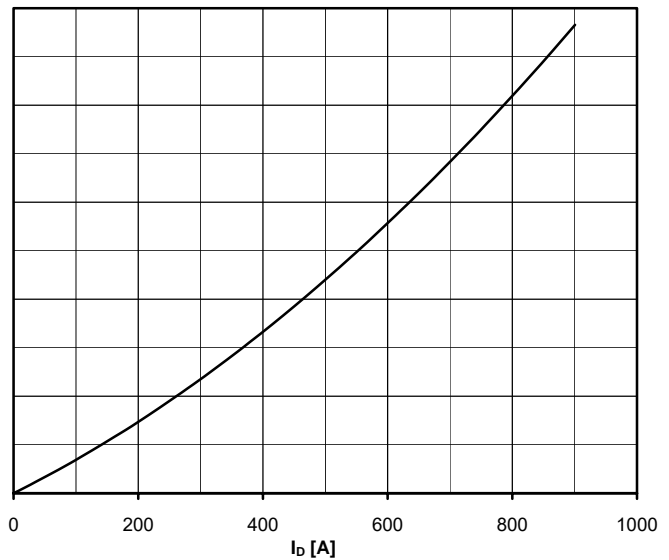
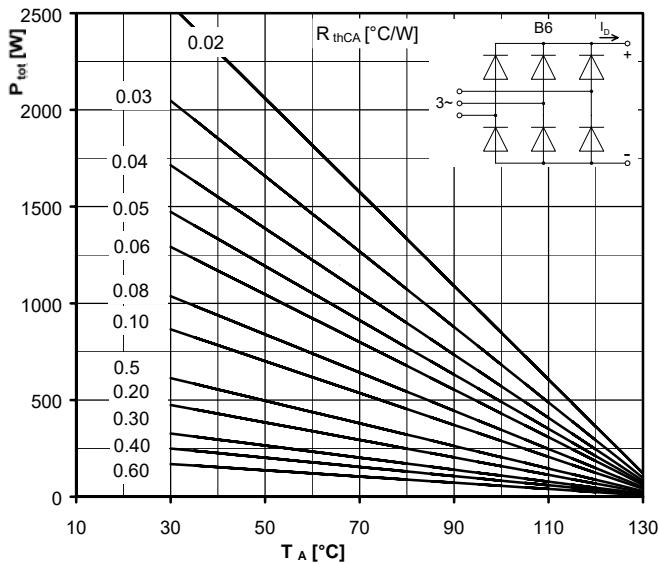


# STT320GK40BT

## Thyristor-Thyristor Modules



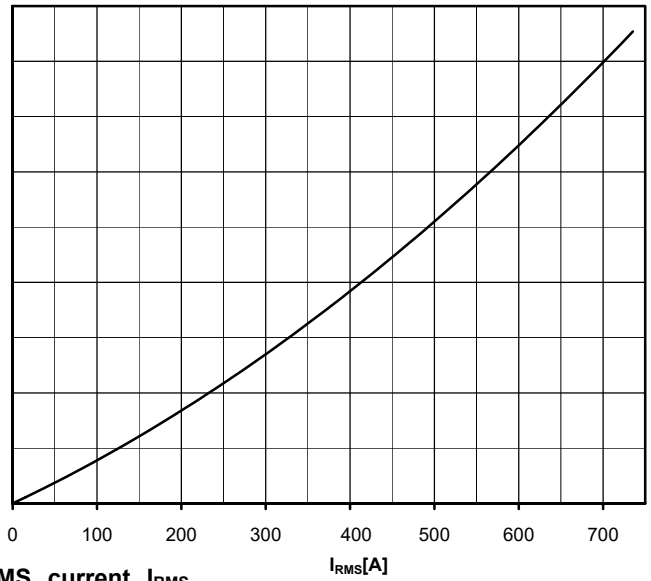
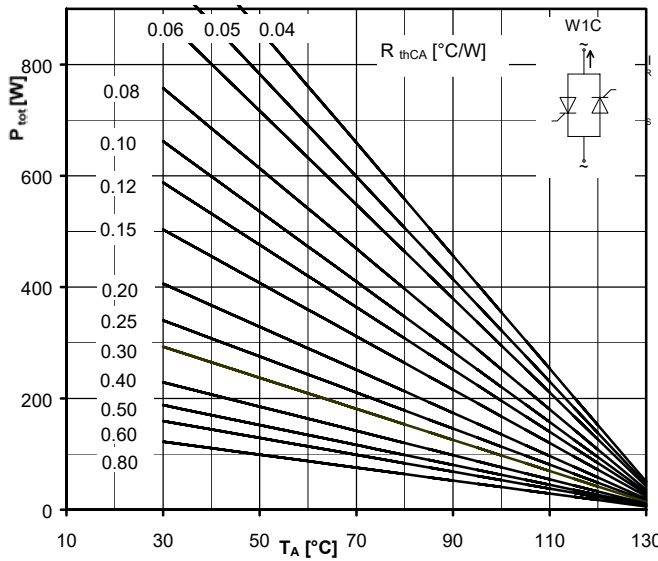
**Maximum rated output current  $I_D$**   
 Two-pulse bridge circuit  
 Total power dissipation at circuit  $P_{tot}$   
 Parameter:  
 Thermal resistance cases to ambient  $R_{thCA}$



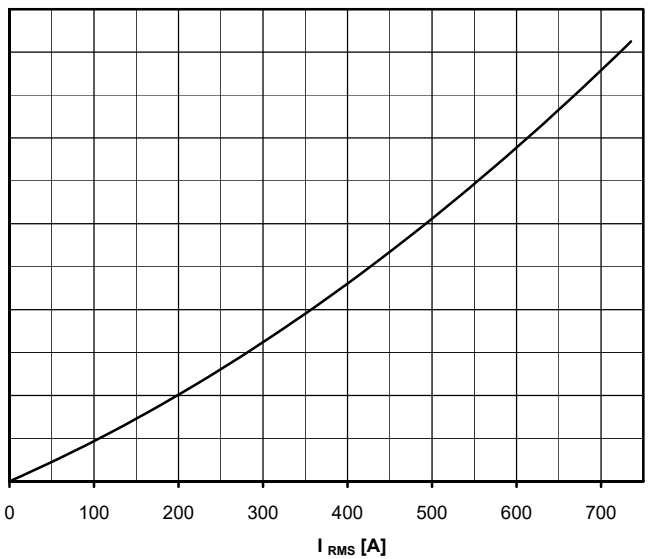
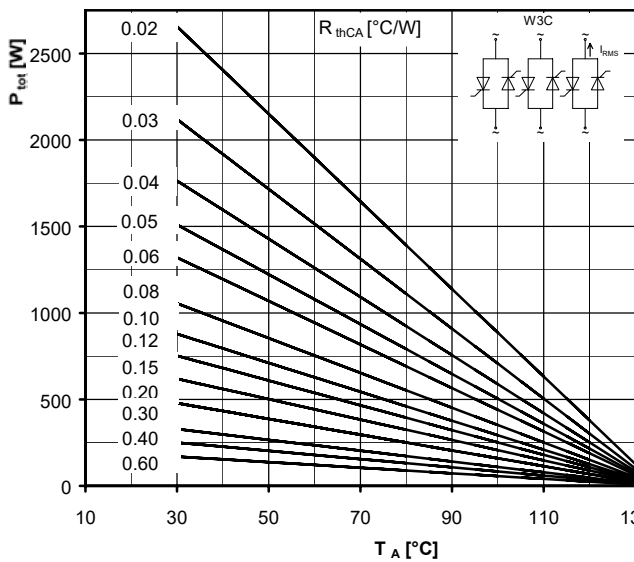
**Maximum rated output current  $I_D$**   
 Six-pulse bridge circuit  
 Total power dissipation at circuit  $P_{tot}$   
 Parameter:  
 Thermal resistance cases to ambient  $R_{thCA}$

# STT320GK40BT

## Thyristor-Thyristor Modules



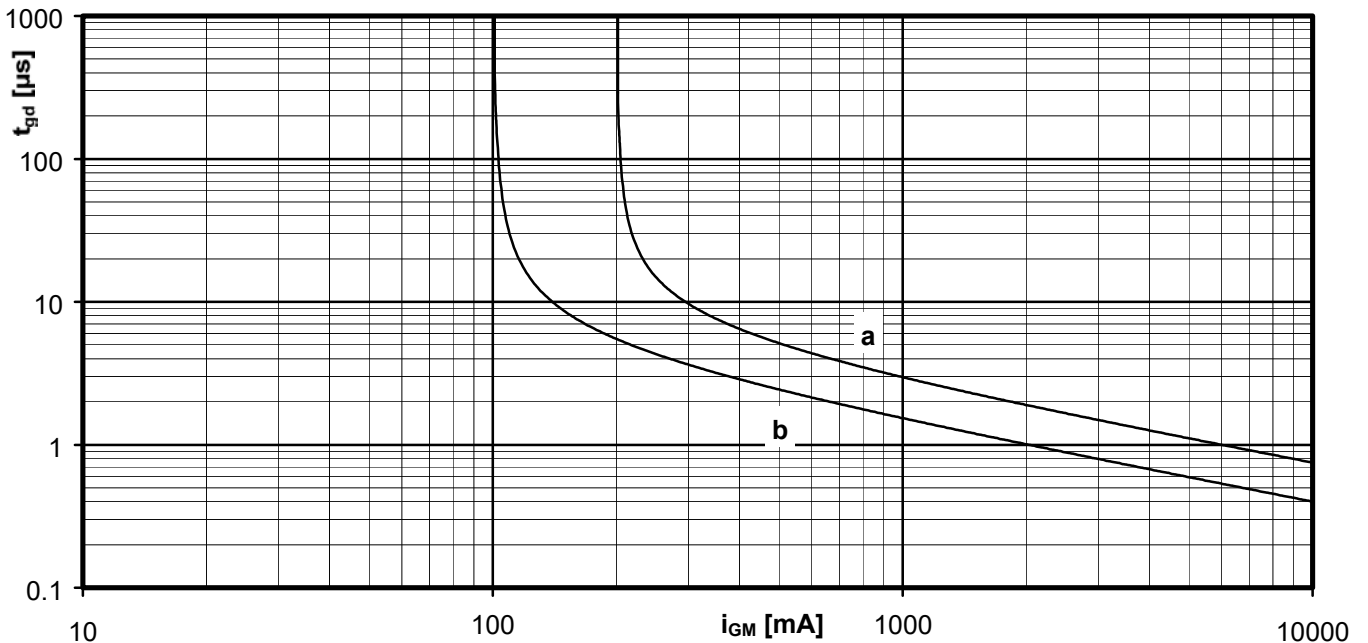
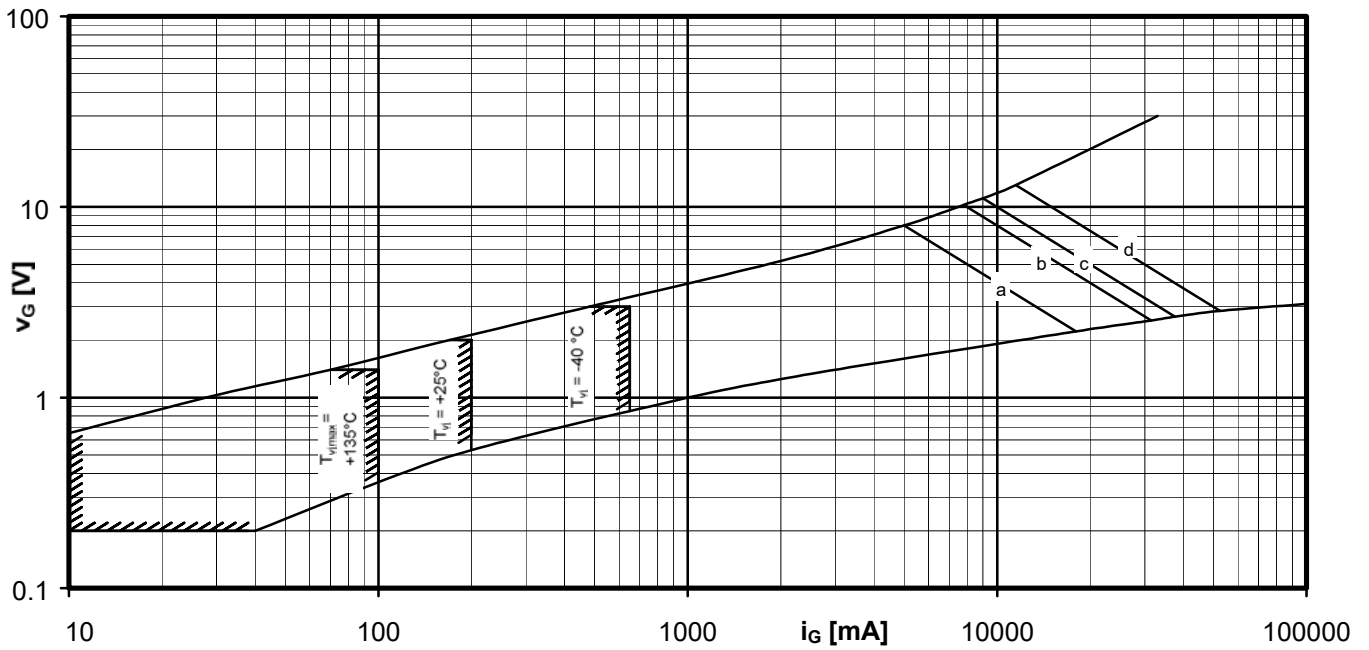
**Maximum rated RMS current  $I_{RMS}$**   
 Single-phase inverse parallel circuit  
 Total power dissipation at circuit  $P_{tot}$   
 Parameter:  
 Thermal resistance case to ambient  $R_{thCA}$



**Maximum rated RMS current  $I_{RMS}$**   
 Three-phase inverse parallel circuit  
 Total power dissipation at circuit  $P_{tot}$   
 Parameter:  
 Thermal resistance cases to ambient  $R_{thCA}$

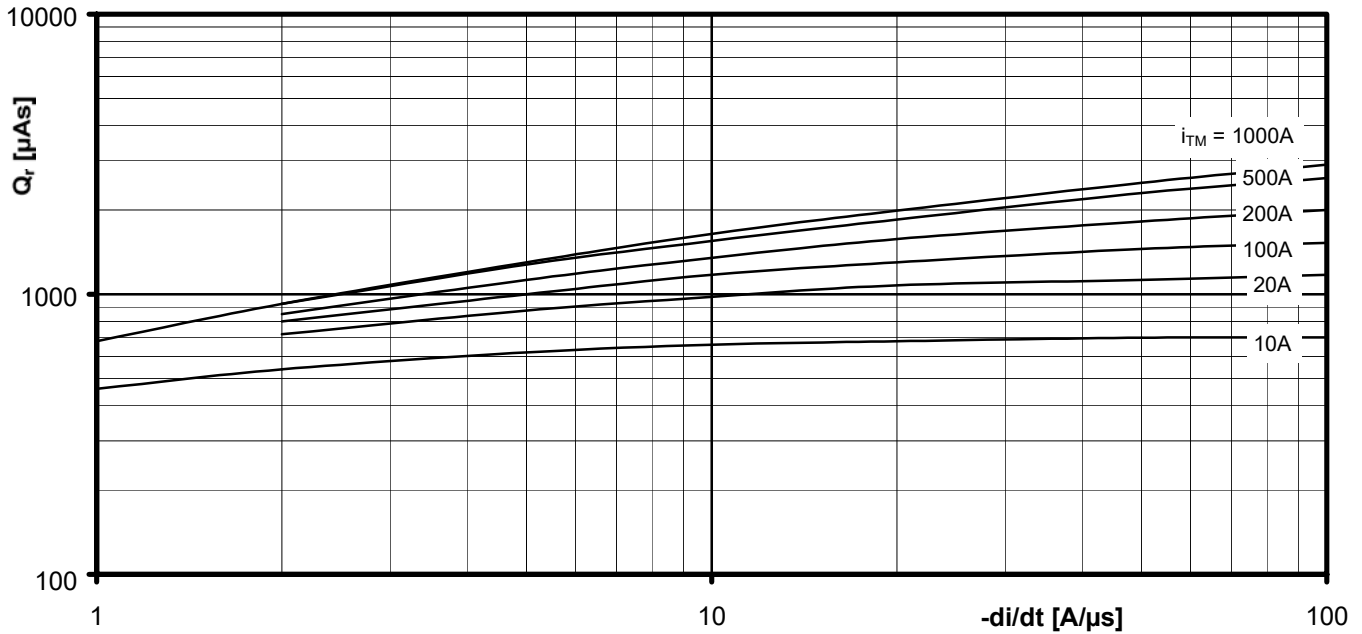
# STT320GK40BT

## Thyristor-Thyristor Modules

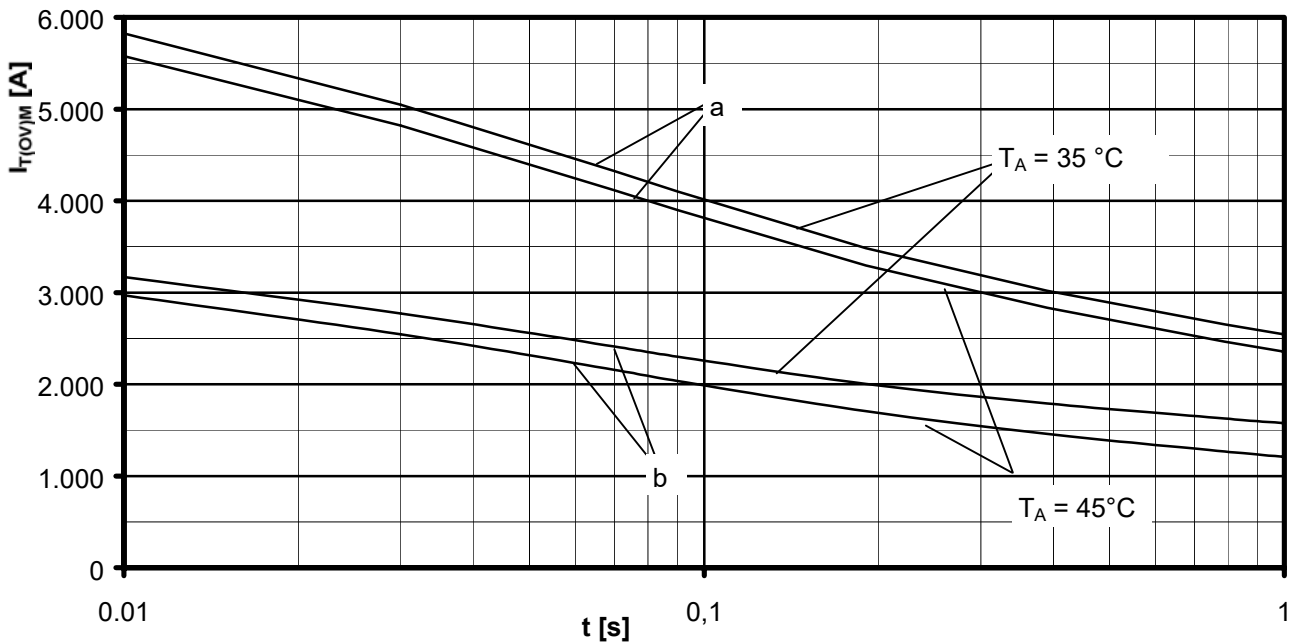


# STT320GK40BT

## Thyristor-Thyristor Modules



Recovered charge  $Q_r = f(-di/dt)$   
 $T_{vj} = T_{vjmax}$ ,  $V_R \leq 0,5 V_{RRM}$ ,  $V_{RM} = 0,8 V_{RRM}$   
 Parameter: On-state current  $i_{TM}$



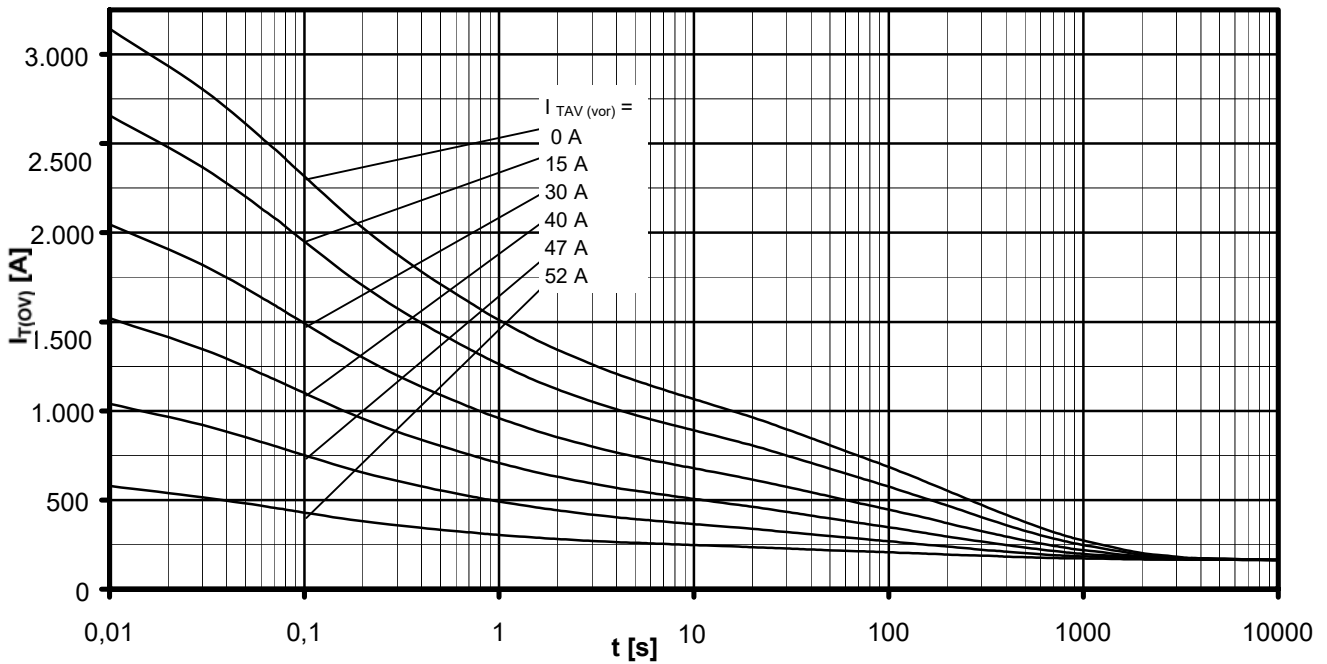
Maximum overload on-state current  $I_{T(OV)M} = f(t)$ ,  $v_{RM} = 0,8 V_{RRM}$

- a: No-load conditions
- b: after load with  $I_{TAVM}$
- $T_A = 35^\circ C$ , Forced air cooling
- $T_A = 45^\circ C$ , Natural air cooling

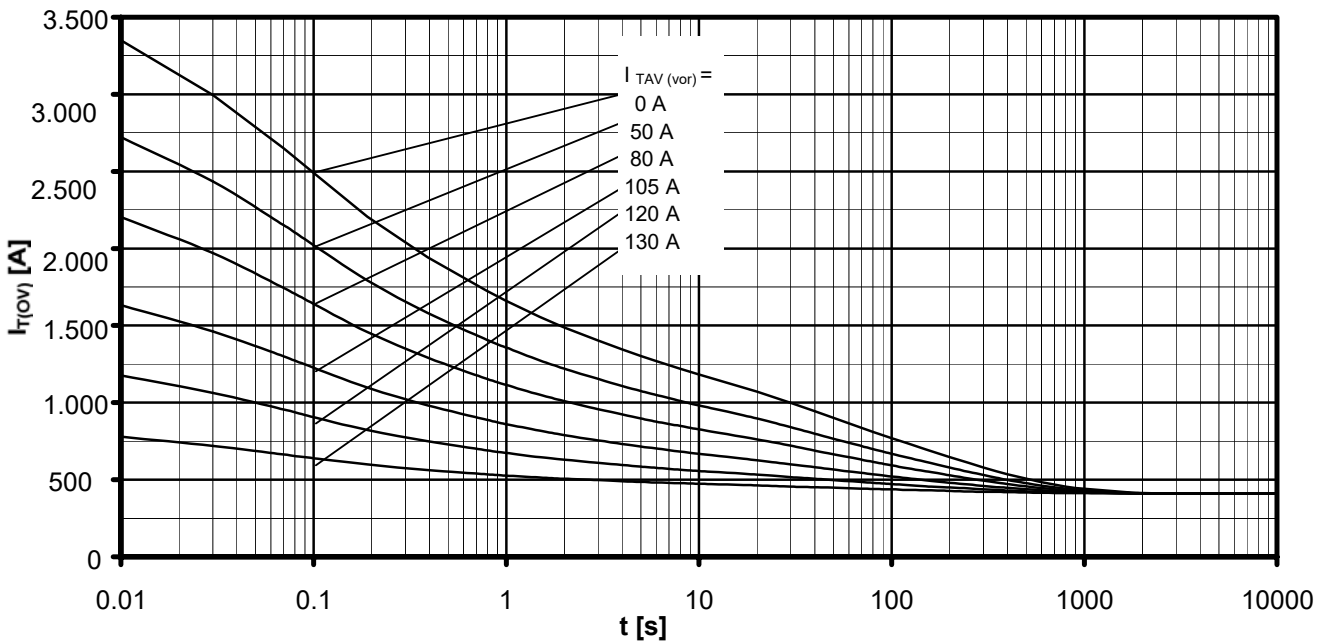


# STT320GK40BT

## Thyristor-Thyristor Modules



**Overload on-state current  $I_{T(ov)}$**   
 Six-pulse bridge circuit, 120° rectangular  
 Heatsink type KM17 (45W) Natural cooling at  $T_A = 45^\circ\text{C}$   
 Parameter: Pre-load current per arm  $I_{TAV(vor)}$



**Overload on-state current  $I_{T(ov)}$**   
 Six-pulse bridge circuit, 120° rectangular  
 Heatsink type KM17(45W) Forced cooling at  $T_A = 35^\circ\text{C}$   
 C Parameter: Pre-load current per arm  $I_{TAV(vor)}$

