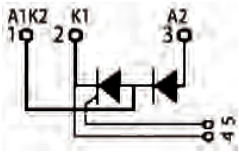


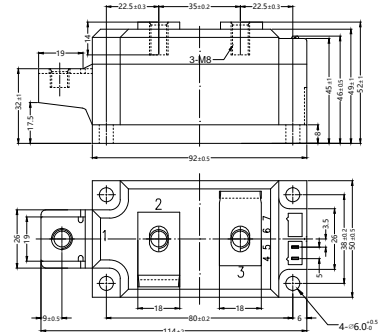
# STD253GK18BT

## Thyristor-Diode Modules



Type	V <sub>RSM</sub>	V <sub>RRM</sub>
	V <sub>DSM</sub>	V <sub>DRM</sub>
	V	V
STD253GK08BT	900	800
STD253GK12BT	1300	1200
STD253GK14BT	1500	1400
STD253GK16BT	1700	1600
STD253GK18BT	1900	1800
STD253GK20BT	2100	2000
STD253GK22BT	2300	2200
STD253GK24BT	2500	2400
STD253GK26BT	2700	2600

Dimensions in mm (1mm=0.0394")



Symbol	Test Conditions	Maximum Ratings	Unit	
I <sub>TRMS</sub> , I <sub>FRMS</sub> I <sub>TAVM</sub> , I <sub>FAVM</sub>	T <sub>VJ</sub> =T <sub>VJM</sub> ; 50Hz/60Hz T <sub>C</sub> =85°C; 180° sine	410/490 250	A	
I <sub>TSM</sub> , I <sub>FSM</sub>	T <sub>VJ</sub> =45°C V <sub>R</sub> =0 t=10ms (50Hz), sine t=8.3ms (60Hz), sine	9100 10900	A	
	T <sub>VJ</sub> =T <sub>VJM</sub> V <sub>R</sub> =0 t=10ms(50Hz), sine t=8.3ms(60Hz), sine	8000 9600		
∫i <sup>2</sup> dt	T <sub>VJ</sub> =45°C V <sub>R</sub> =0 t=10ms (50Hz), sine t=8.3ms (60Hz), sine	470000 565000	A <sup>2</sup> s	
	T <sub>VJ</sub> =T <sub>VJM</sub> V <sub>R</sub> =0 t=10ms(50Hz), sine t=8.3ms(60Hz), sine	414000 496000		
(di/dt) <sub>cr</sub>	T <sub>VJ</sub> =T <sub>VJM</sub> f=50Hz, t <sub>p</sub> =200us V <sub>D</sub> =2/3V <sub>DRM</sub> I <sub>G</sub> =0.5A dig/dt=0.5A/us	repetitive non repetitive	150 500	A/us
	(dv/dt) <sub>cr</sub>	T <sub>VJ</sub> =T <sub>VJM</sub> ; R <sub>GK</sub> =∞; method 1 (linear voltage rise)	V <sub>DR</sub> =2/3V <sub>DRM</sub>	1000
P <sub>GM</sub>	T <sub>VJ</sub> =T <sub>VJM</sub> I <sub>T</sub> =I <sub>TAVM</sub>	t <sub>p</sub> =30us t <sub>p</sub> =500us	120 60	W
P <sub>GAV</sub>			8	W
V <sub>RGM</sub>			10	V
T <sub>VJ</sub> T <sub>VJM</sub> T <sub>stg</sub>			-40...+125 125 -40...+125	°C
V <sub>ISOL</sub>	50/60Hz, RMS I <sub>ISOL</sub> ≤1mA	t=1min t=1s	2000 2500	V~
M <sub>d</sub>	Mounting torque (M6)		5	Nm
	Terminal connection torque (M6)		5	
Weight	Typical		173	g

**Sirectifier®**

# STD253GK18BT

## Thyristor-Diode Modules

Symbol	Test Conditions	Characteristic Values		Unit
$I_{RRM}, I_{DRM}$	$T_{VJ}=T_{VJM}; V_R=V_{RRM}; V_D=V_{DRM}$	50		mA
$V_{TM}$	$I_{TM}=750A; T_{VJ}=25^{\circ}C$	$\leq 1800V$	2000-2200V	V
		1.75	2.10	
$V_{TO}$	For power-loss calculations only ( $T_{VJ}=T_{VJM}$ )	1.2		V
$r_T$		2.3		m $\Omega$
$V_{GT}$	$V_D=6V;$ $T_{VJ}=25^{\circ}C$ $T_{VJ}=-40^{\circ}C$	2		V
		2.6		
$I_{GT}$	$V_D=6V;$ $T_{VJ}=25^{\circ}C$ $T_{VJ}=-40^{\circ}C$	150		mA
		200		
$V_{GD}$	$T_{VJ}=T_{VJM}; V_D=2/3V_{DRM}$	0.25		V
$I_{GD}$	$T_{VJ}=T_{VJM}; V_D=2/3V_{DRM}$	10		mA
$I_L$	$T_{VJ}=25^{\circ}C; t_p=30\mu s; V_D=6V$ $I_G=0.45A; di_G/dt=0.45A/\mu s$	800		mA
$I_H$	$T_{VJ}=25^{\circ}C; V_D=6V; R_{GK}=\infty$	250		mA
$t_{gd}$	$T_{VJ}=25^{\circ}C; V_D=1/2V_{DRM}$ $I_G=0.5A; di_G/dt=0.5A/\mu s$	2		us
$t_q$	$T_{VJ}=T_{VJM}; I_T=250A; t_p=200\mu s; -di/dt=10A/\mu s$ $V_R=100V; dv/dt=20V/\mu s; V_D=2/3V_{DRM}$ typ.	300		us
$Q_s$	$T_{VJ}=T_{VJM}; I_T, I_F=250A; -di/dt=50A/\mu s$	650		uC
$I_{RM}$		235		A
$R_{thJC}$	per thyristor/diode; DC current per module	0.130		K/W
		0.065		
$R_{thCH}$	per thyristor/diode; DC current per module	0.124		K/W
		0.062		
$d_s$	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 3600 V~
- \* Pressure Contacts Technology
- \* UL File NO.E310749
- \* RoHS Compliant

### APPLICATIONS

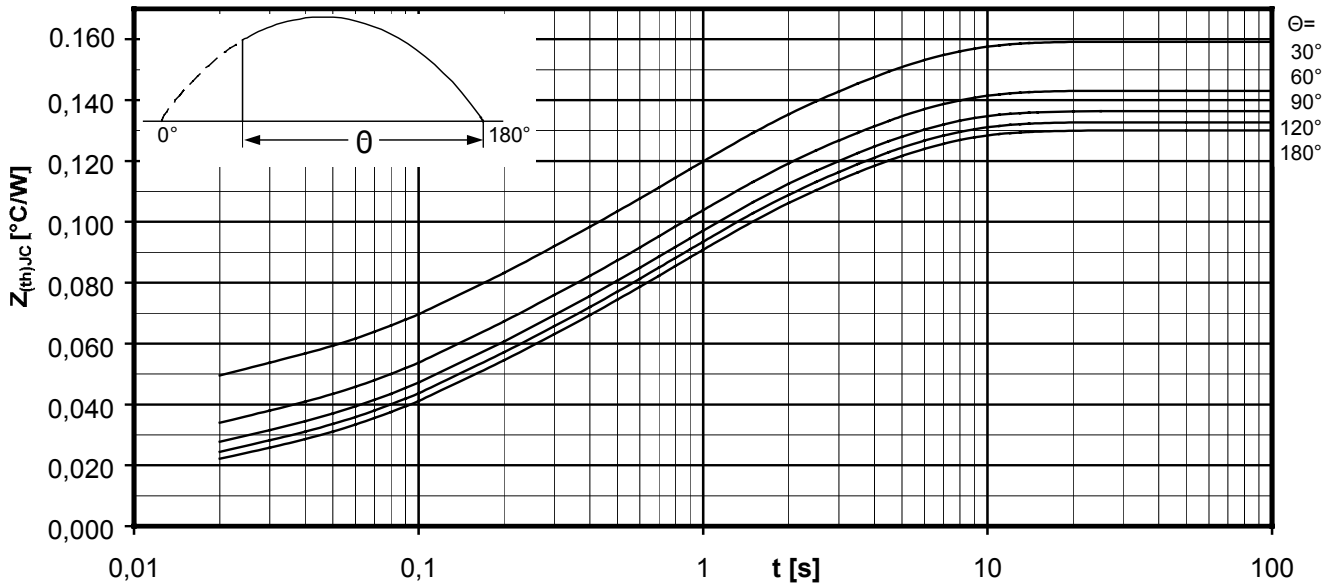
- \* Motor control
- \* Power converter
- \* Heat and temperature control for industrial furnaces and chemical processes
- \* Lighting control
- \* Contactless switches

### ADVANTAGES

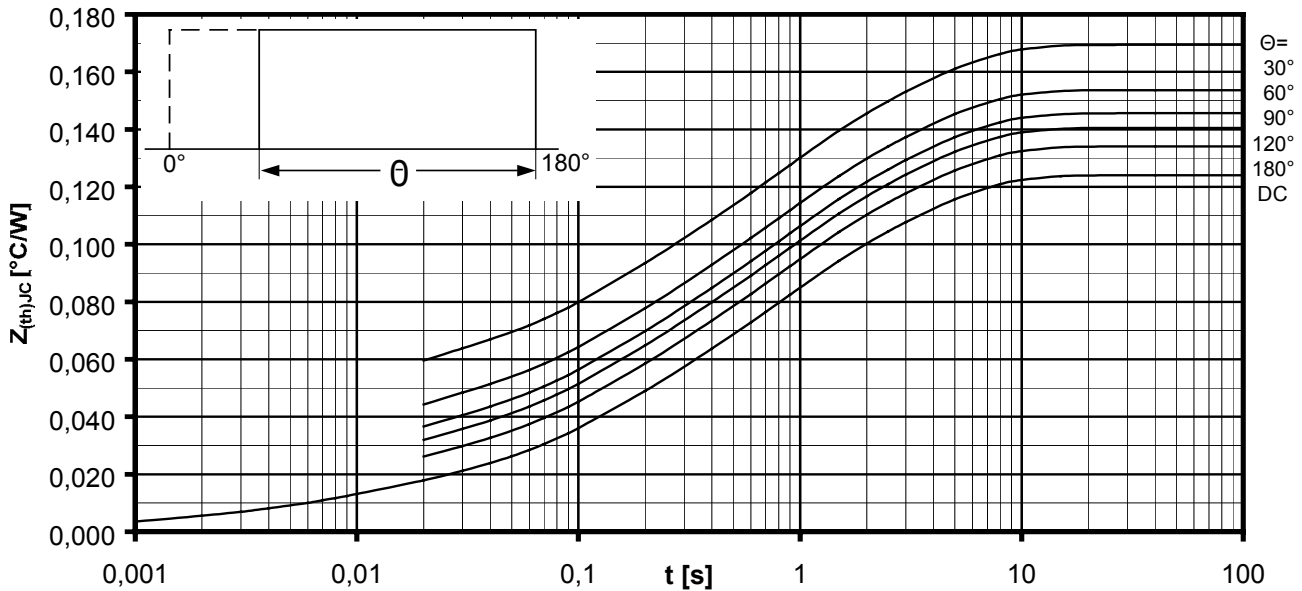
- \* Space and weight savings
- \* Simple mounting
- \* Improved temperature and power cycling
- \* Reduced protection circuits

# STD253GK18BT

## Thyristor-Diode Modules



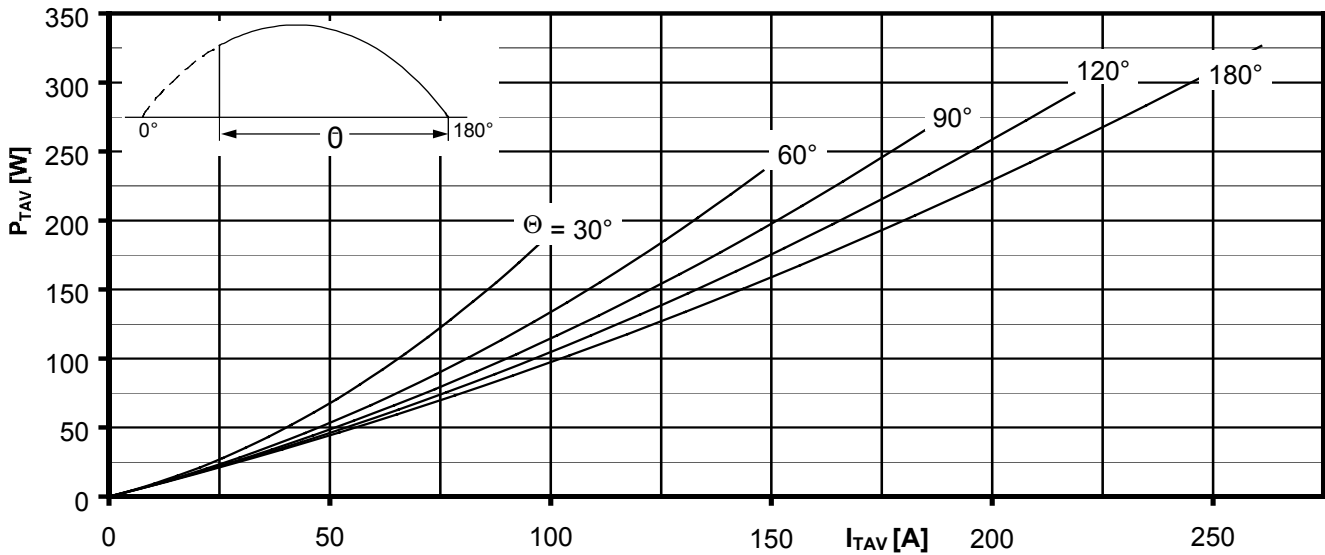
Transient thermal impedance per arm  $Z_{thJC} = f(t)$   
Sinusoidal current  
Parameter: Current conduction angle  $\Theta$



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

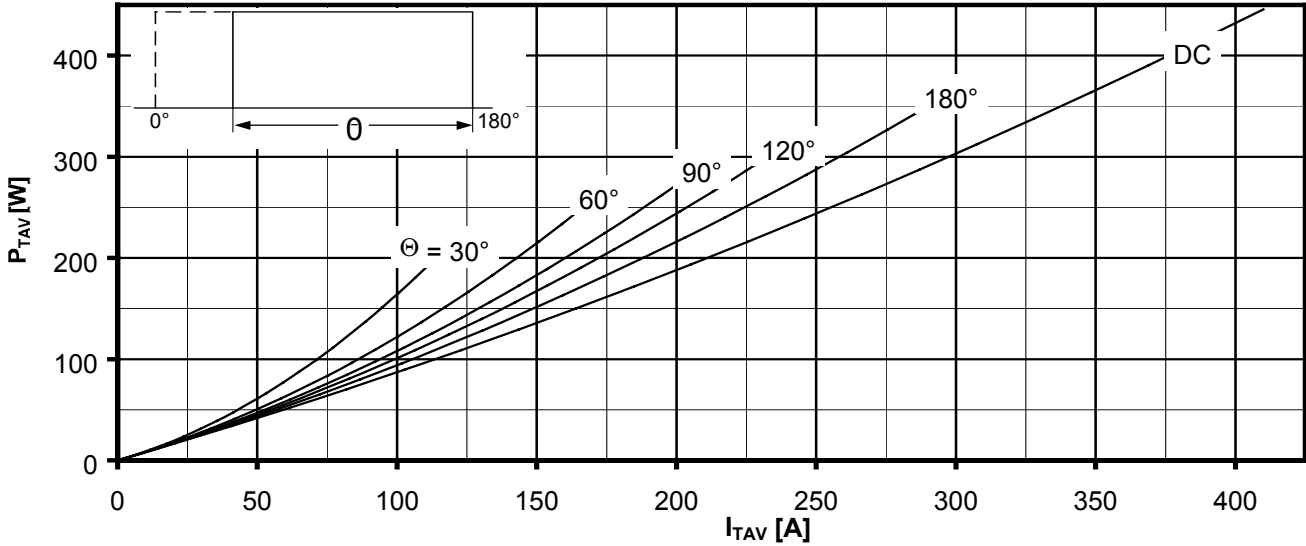
# STD253GK18BT

## Thyristor-Diode Modules



On-state power loss per arm  $P_{TAV} = f(I_{TAV})$   
 Sinusoidal current  
 Current load per arm

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

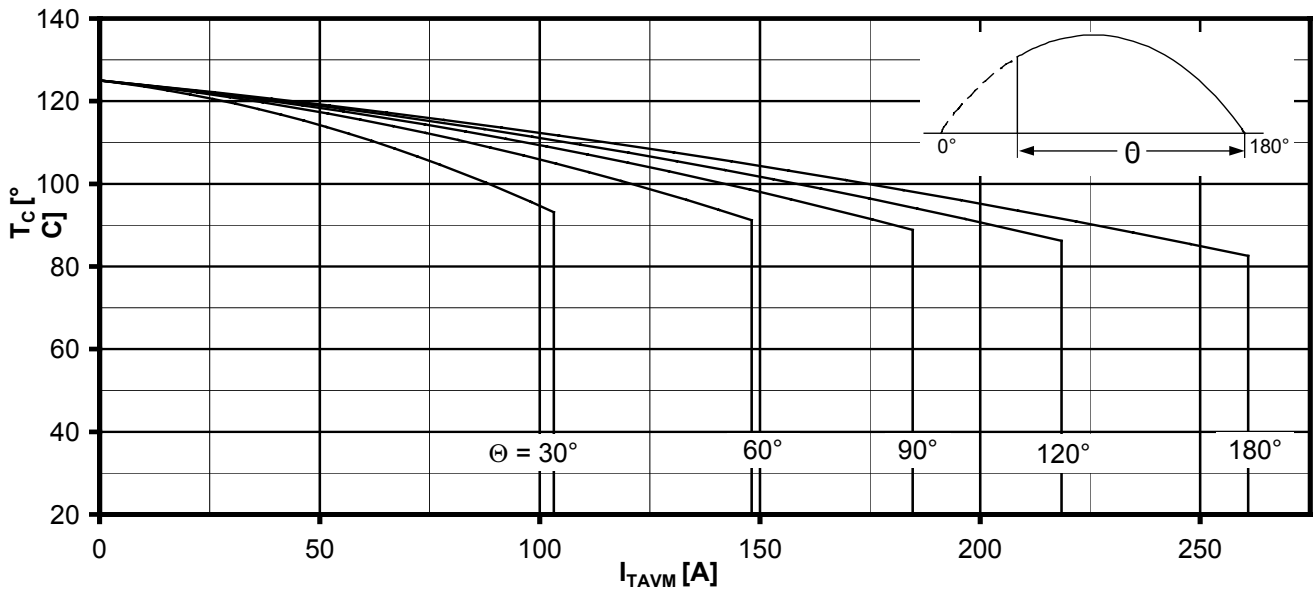


On-state power loss per arm  $P_{TAV} = f(I_{TAV})$   
 Rectangular current Current load per arm

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

# STD253GK18BT

## Thyristor-Diode Modules

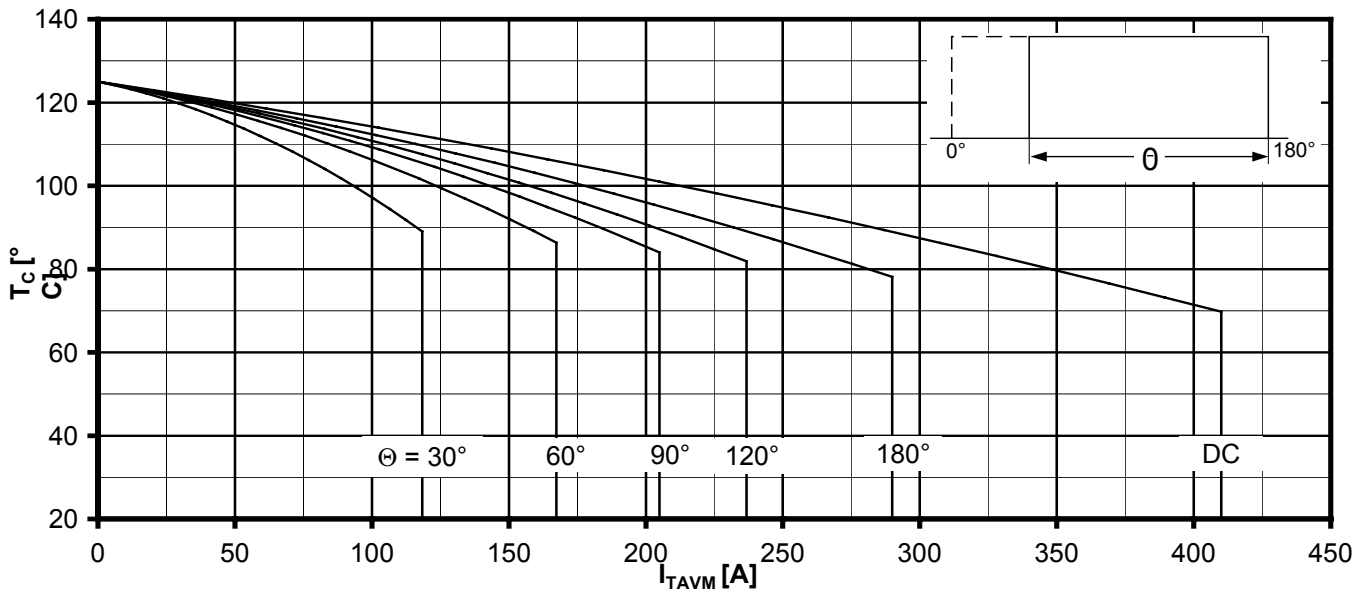


Maximum allowable case temperature  $T_C = f(I_{TAVM})$

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  $T_C = f(I_{TAVM})$

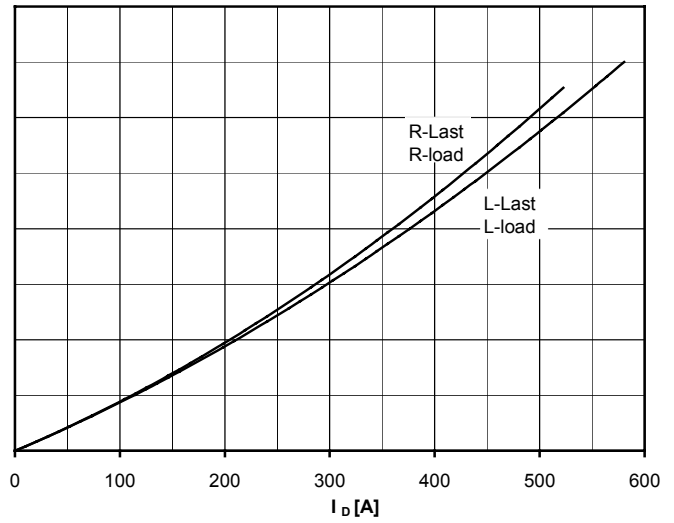
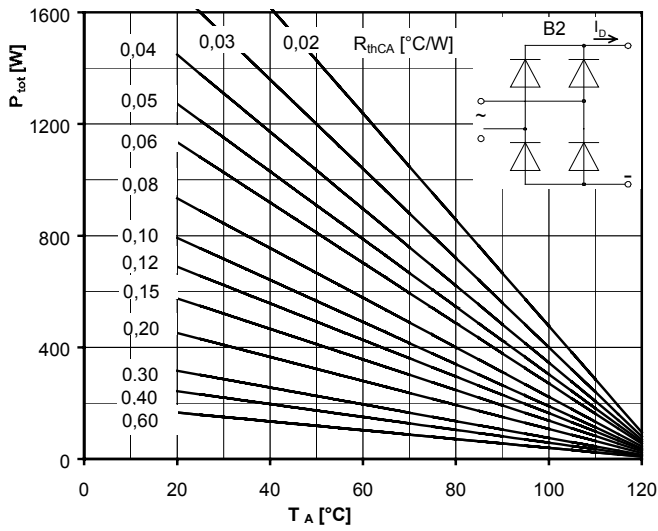
Rectangular current Current load per arm

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

Parameter: Current conduction angle  $\Theta$

# STD253GK18BT

## Thyristor-Diode Modules



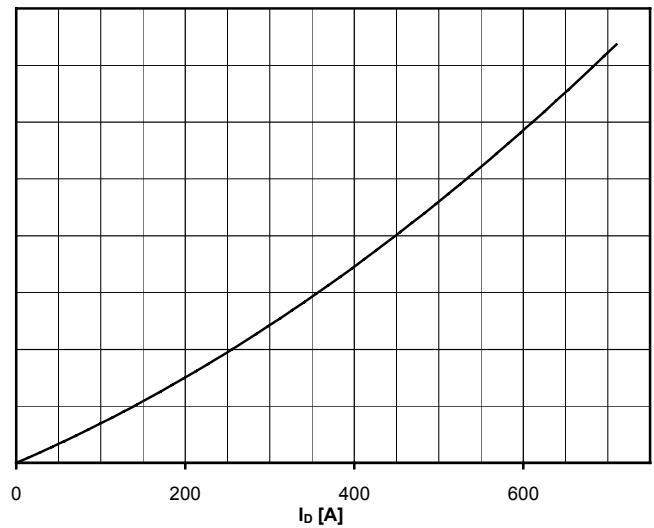
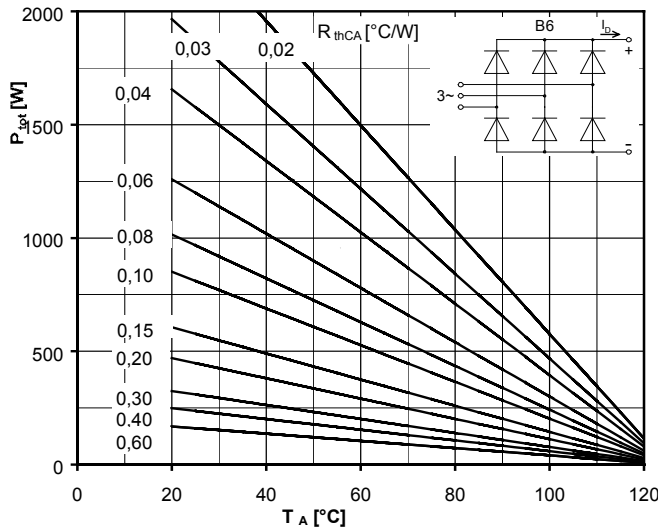
### Maximum rated output current $I_D$

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

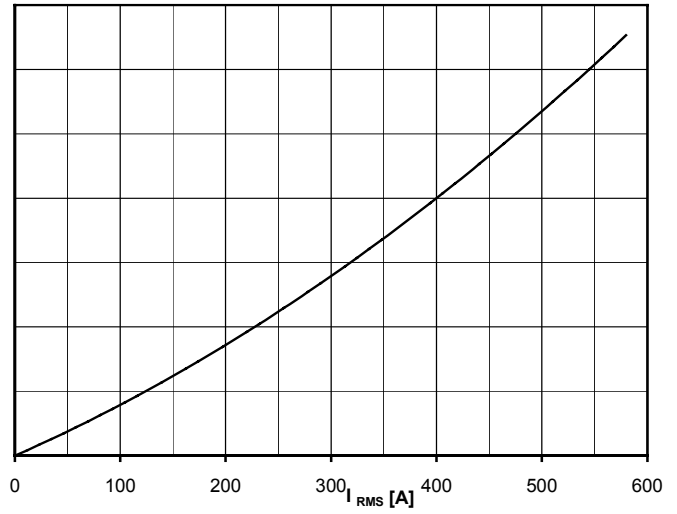
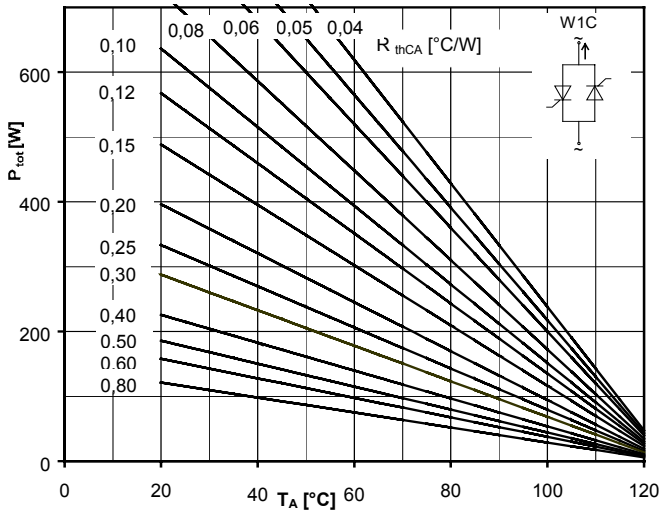
Total power dissipation at circuit  $P_{tot}$

Parameter:

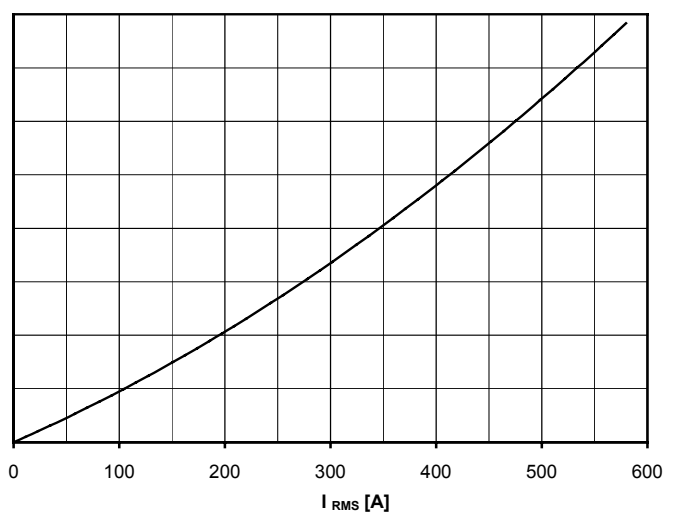
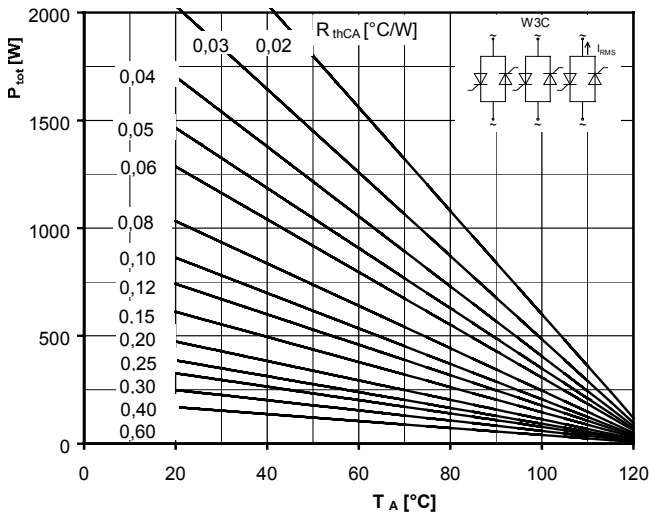
Thermal resistance cases to ambient  $R_{thCA}$

# STD253GK18BT

## Thyristor-Diode Modules



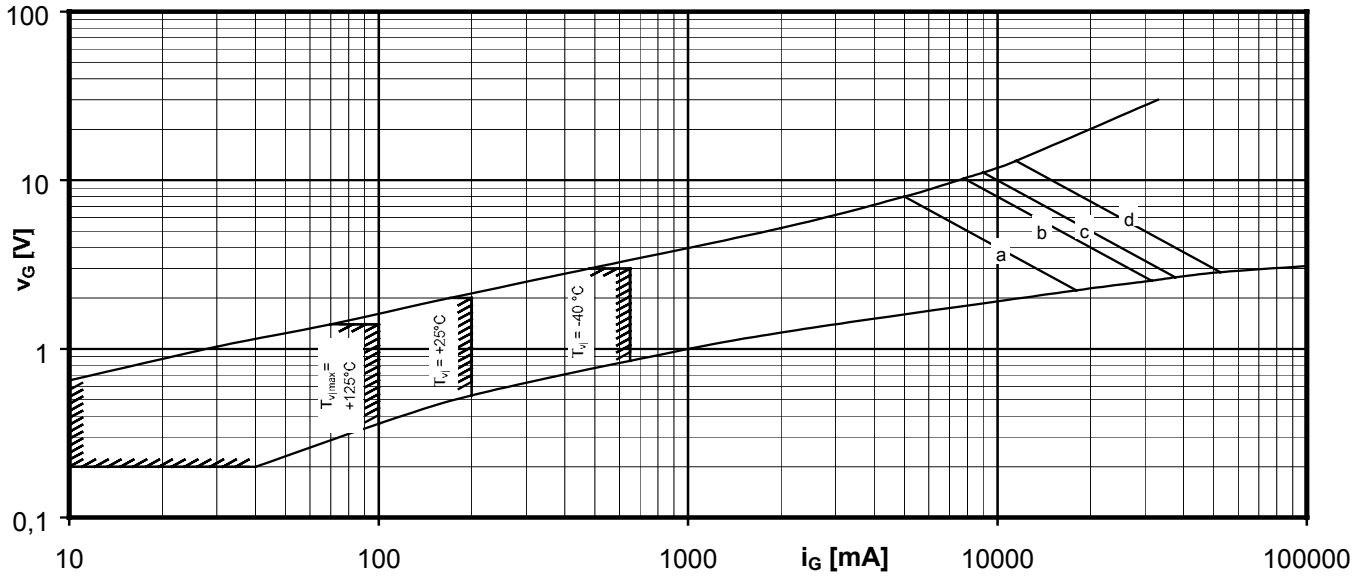
**Maximum rated RMS current  $I_{RMS}$**   
 Single-phase inverse parallel circuit  
 Total power dissipation at circuit  $P_{tot}$   
 Parameter:  
 Thermal resistance case to ambient  $R_{thCA}$



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

# STD253GK18BT

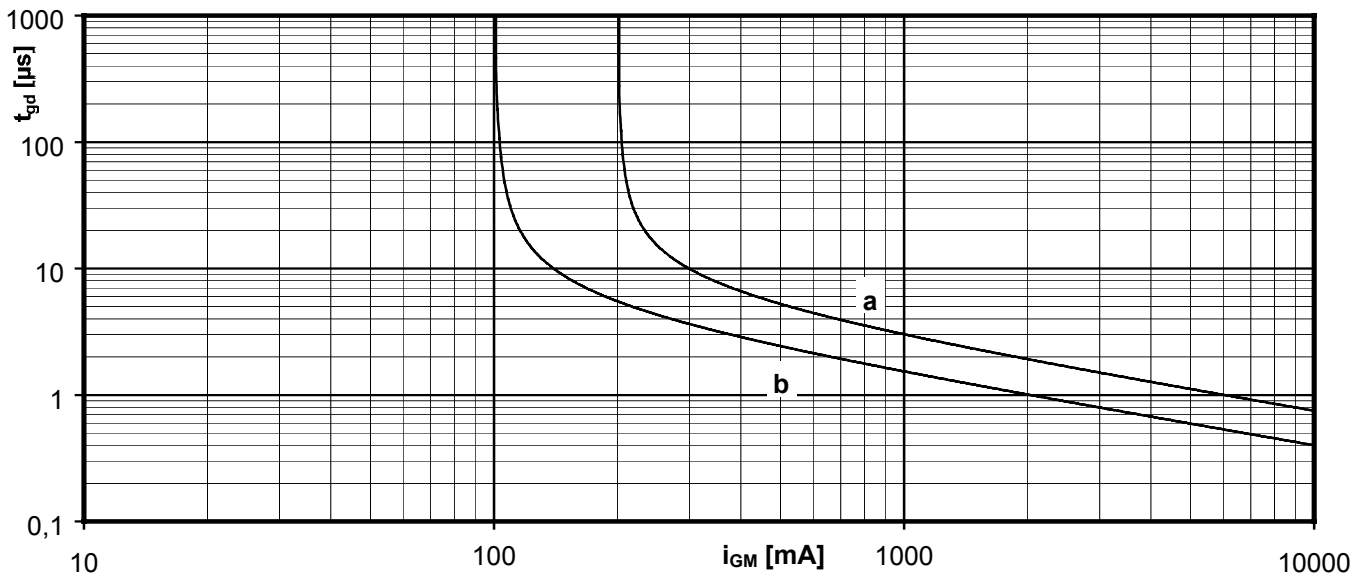
## Thyristor-Diode Modules



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 - 40 W/10ms   b - 80 W/1ms   c - 100 W/0,5ms   d - 150W/0,1ms



Gate controlled delay time  $t_{gd} = f(i_G)$   $T_{vj} = 25^\circ\text{C}$ ,

$$di_G/dt = i_{GM}/1\mu\text{s}$$

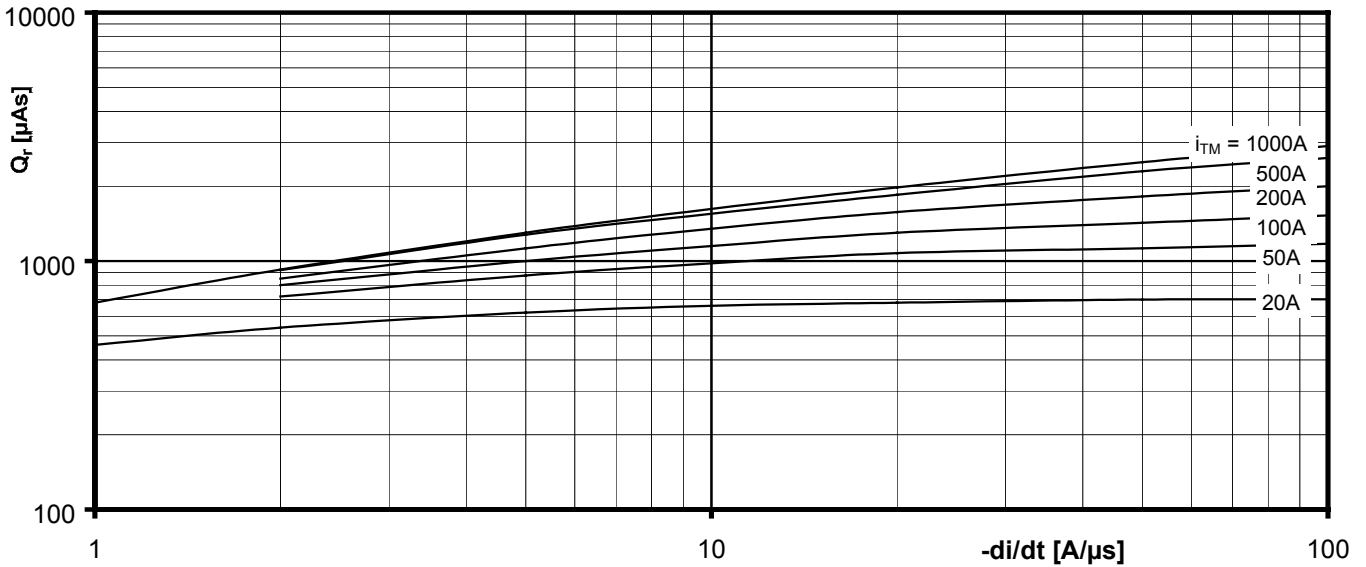
a - Limiting characteristic

b - Typical characteristic

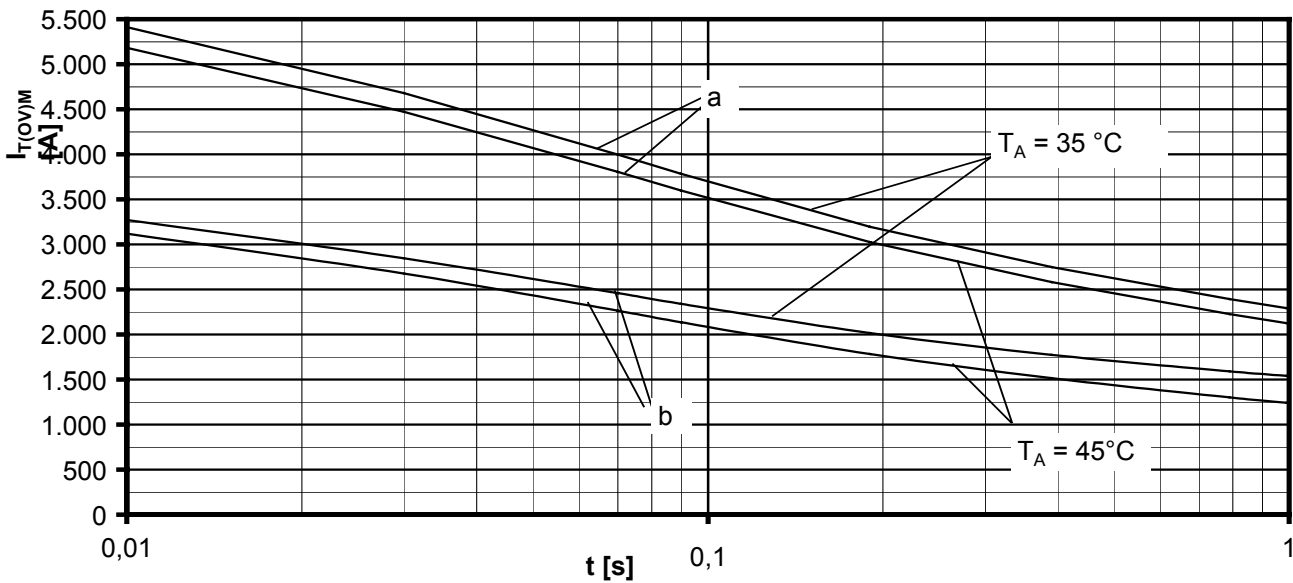


# STD253GK18BT

## Thyristor-Diode 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  $i_{TM}$



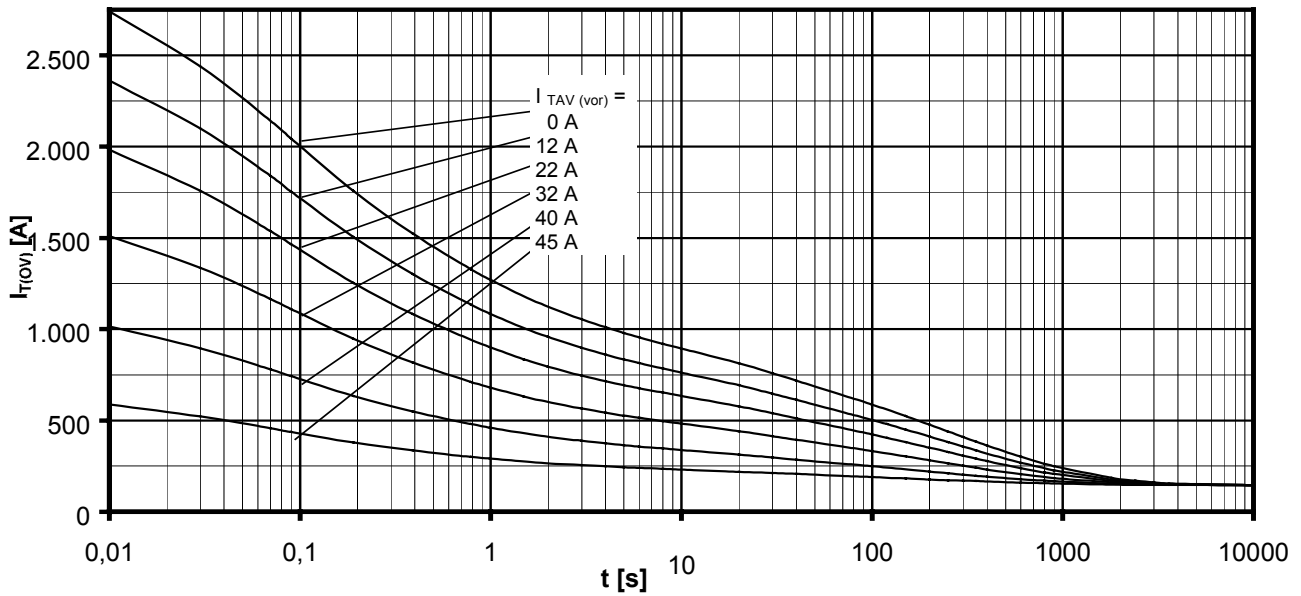
Maximum overload on-state current  $I_{T(OV)M} = f(t)$ ,  $v_{RM} = 0,8 V_{RRM}$

- 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

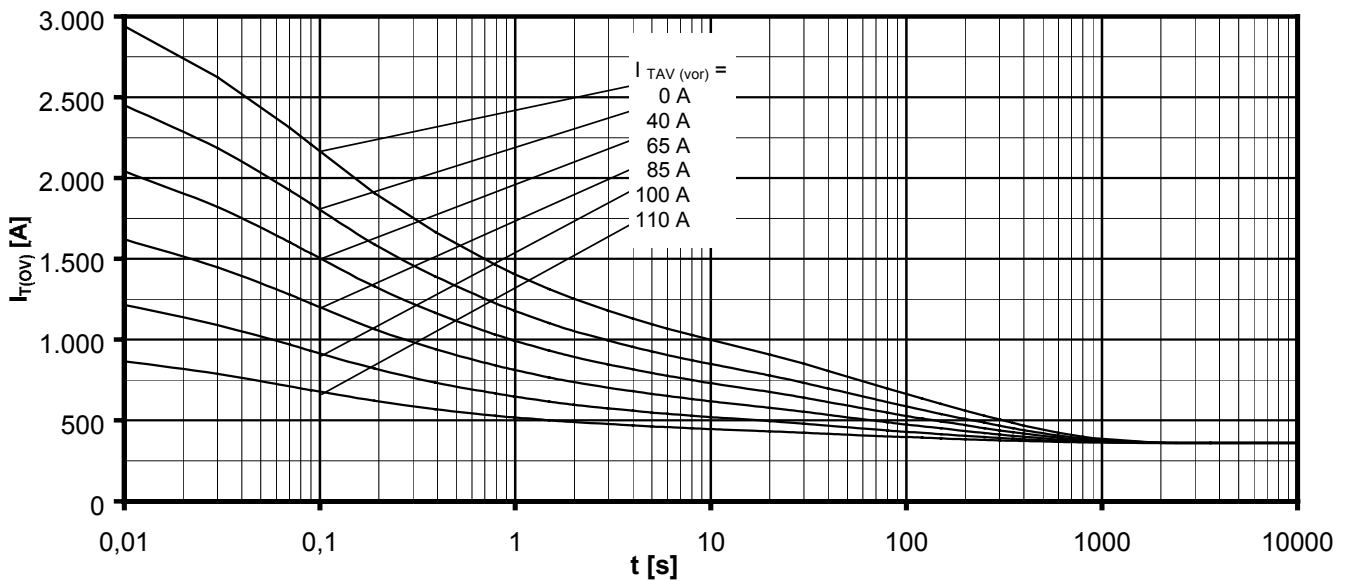


# STD253GK18BT

## Thyristor-Diode 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  $T_A = 35^\circ\text{C}$   
Parameter: Pre-load current per arm  $I_{TAV(vor)}$