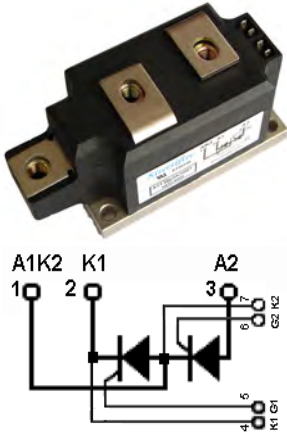


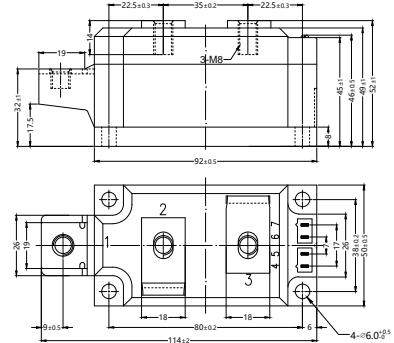
STT253GK22BT

Thyristor-Thyristor Modules



Type	V_{RSM}	V_{RRM}
	V_{DSM}	V_{DRM}
	V	V
STT253GK08BT	900	800
STT253GK12BT	1300	1200
STT253GK14BT	1500	1400
STT253GK16BT	1700	1600
STT253GK18BT	1900	1800
STT253GK20BT	2100	2000
STT253GK22BT	2300	2200

Dimensions in mm (1mm=0.0394")



Symbol	Test Conditions	Maximum Ratings	Unit
I_{TRMS}, I_{FRMS} I_{TAVM}, I_{FAVM}	$T_{VJ}=T_{VJM}; 50\text{Hz}/60\text{Hz}$ $T_C=85^\circ\text{C}; 180^\circ \text{ sine}$	410/490 250	A
I_{TSM}, I_{FSM}	$T_{VJ}=45^\circ\text{C}$ $V_R=0$ $t=10\text{ms (50Hz), sine}$ $t=8.3\text{ms (60Hz), sine}$	9100 10900	A
	$T_{VJ}=T_{VJM}$ $V_R=0$ $t=10\text{ms(50Hz), sine}$ $t=8.3\text{ms(60Hz), sine}$	8000 9600	
$\int i^2 dt$	$T_{VJ}=45^\circ\text{C}$ $V_R=0$ $t=10\text{ms (50Hz), sine}$ $t=8.3\text{ms (60Hz), sine}$	470000 565000	A^2s
	$T_{VJ}=T_{VJM}$ $V_R=0$ $t=10\text{ms(50Hz), sine}$ $t=8.3\text{ms(60Hz), sine}$	414000 496000	
$(di/dt)_{cr}$	$T_{VJ}=T_{VJM}$ $f=50\text{Hz}, t_p=200\mu\text{s}$ $V_D=2/3V_{DRM}$ $I_G=0.5\text{A}$ $di_G/dt=0.5\text{A}/\mu\text{s}$	repetitive 150	A/ μs
		non repetitive 500	
$(dv/dt)_{cr}$	$T_{VJ}=T_{VJM};$ $R_{GK}=\infty; \text{method 1 (linear voltage rise)}$	$V_{DR}=2/3V_{DRM}$ 1000	V/ μs
P_{GM}	$T_{VJ}=T_{VJM}$ $I_T=I_{TAVM}$	$t_p=30\mu\text{s}$ $t_p=500\mu\text{s}$	120 60 W
P_{GAV}			8 W
V_{RGM}			10 V
T_{VJ} T_{VJM} T_{stg}			-40...+125 125 -40...+125 $^\circ\text{C}$
V_{ISOL}	50/60Hz, RMS $I_{ISOL} \leq 1\text{mA}$	$t=1\text{min}$ $t=1\text{s}$	3000 3600 V~
M_d	Mounting torque (M6) Terminal connection torque (M8)		5 12 Nm
Weight	Typical		650 g

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Thyristor-Thyristor Modules

Symbol	Test Conditions	Characteristic Values		Unit
I_{RRM}, I_{DRM}	$T_{VJ}=T_{VJM}; V_R=V_{RRM}; V_D=V_{DRM}$	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 Ω
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 ²

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

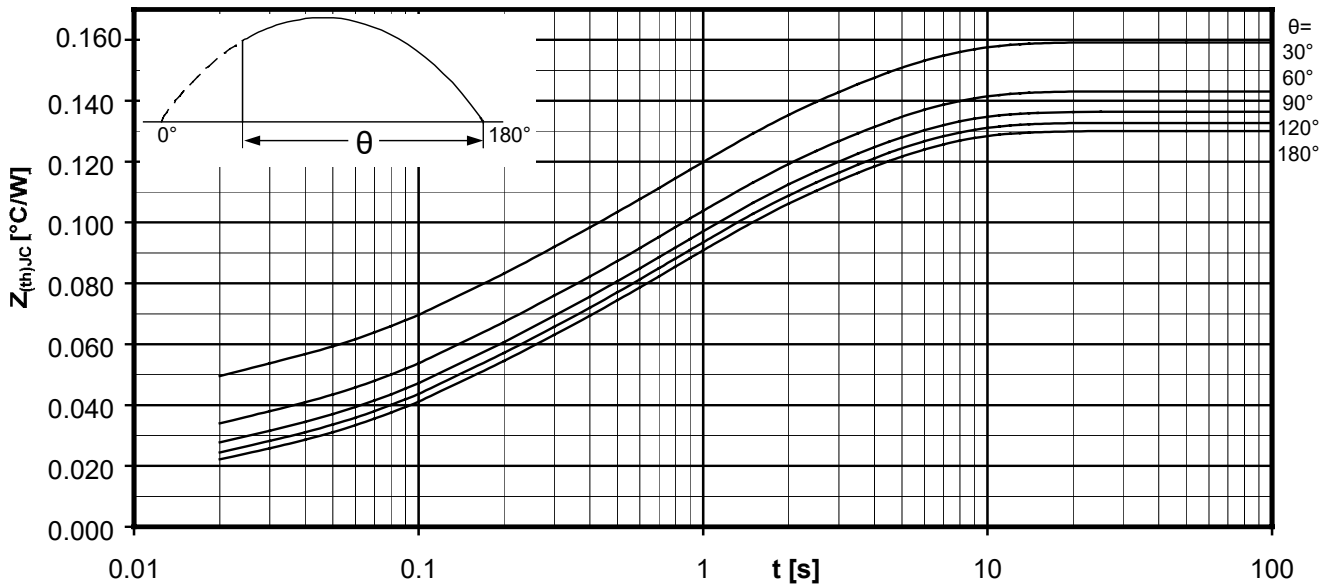
- * Space and weight savings
- * Simple mounting
- * Improved temperature and power cycling
- * Reduced protection circuits



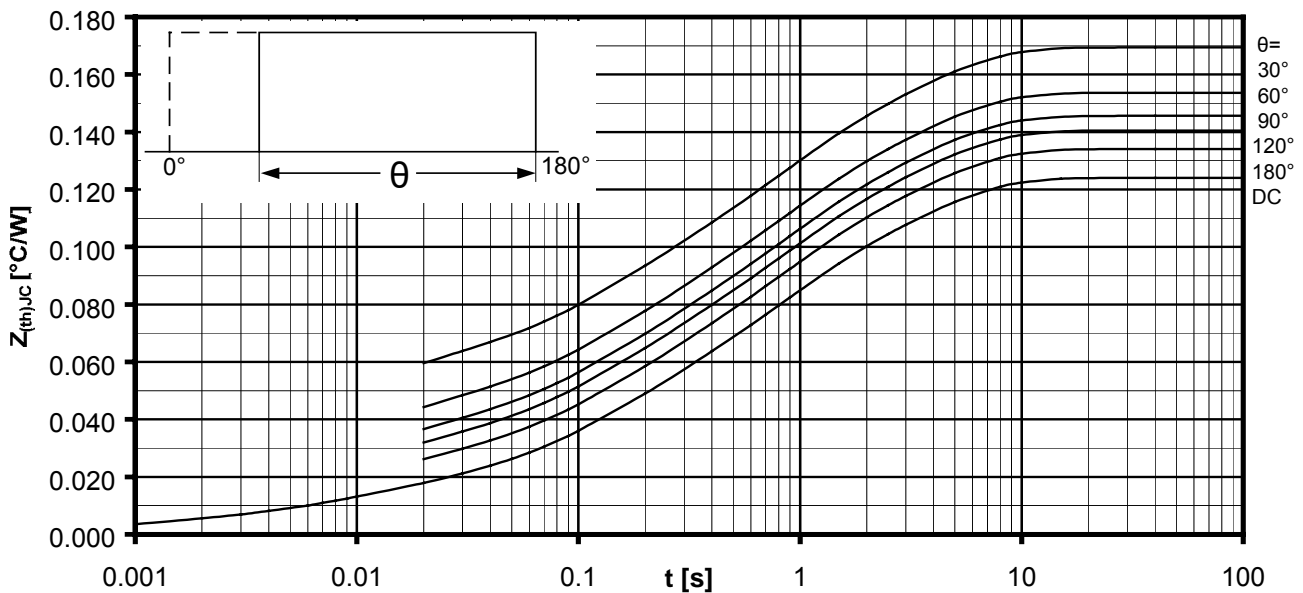
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Thyristor-Thyristor Modules



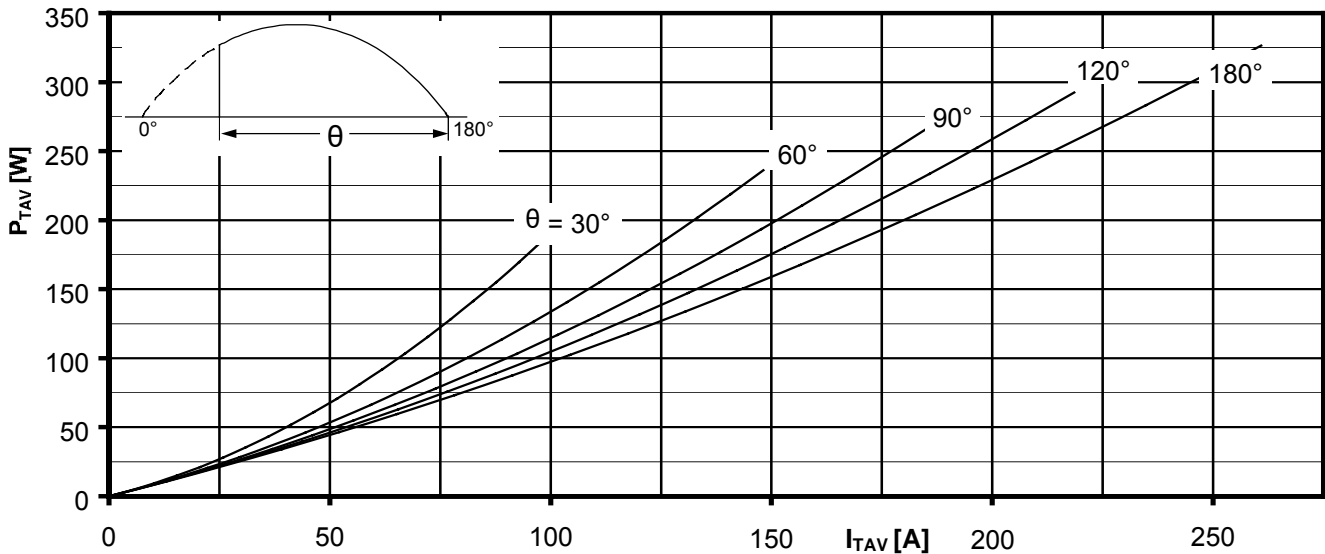
Transient thermal impedance per arm $Z_{thJC} = f(t)$
Sinusoidal current
Parameter: Current conduction angle θ



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

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Thyristor-Thyristor Modules

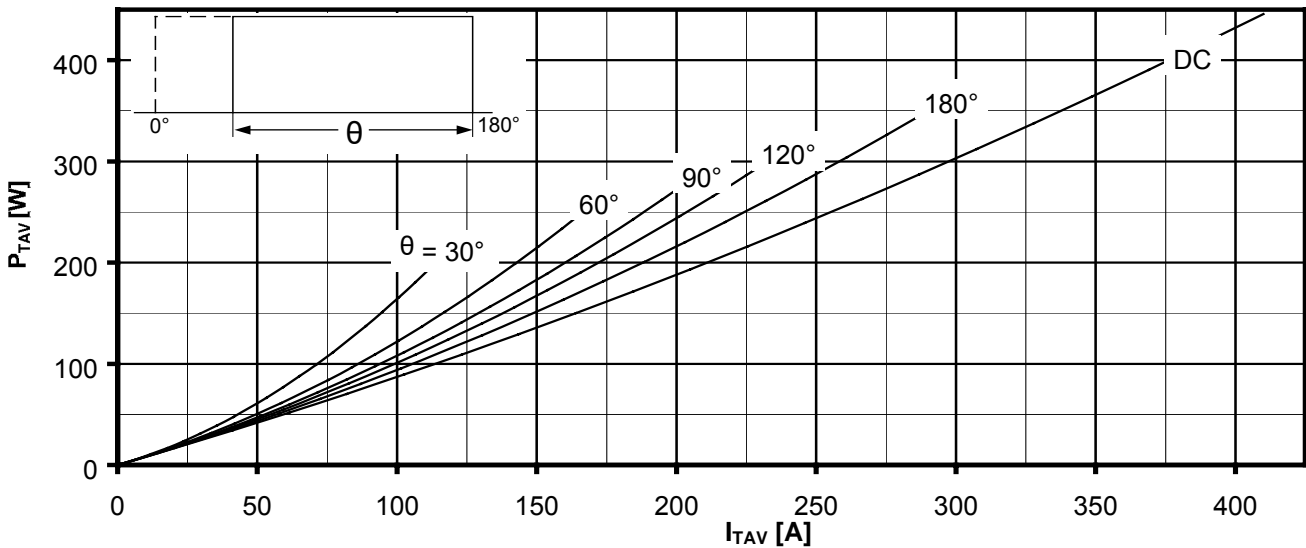


On-state power loss per arm $P_{TAV} = f(I_{TAV})$

Sinusoidal current
Current load per arm

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

Parameter: Current conduction angle θ



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

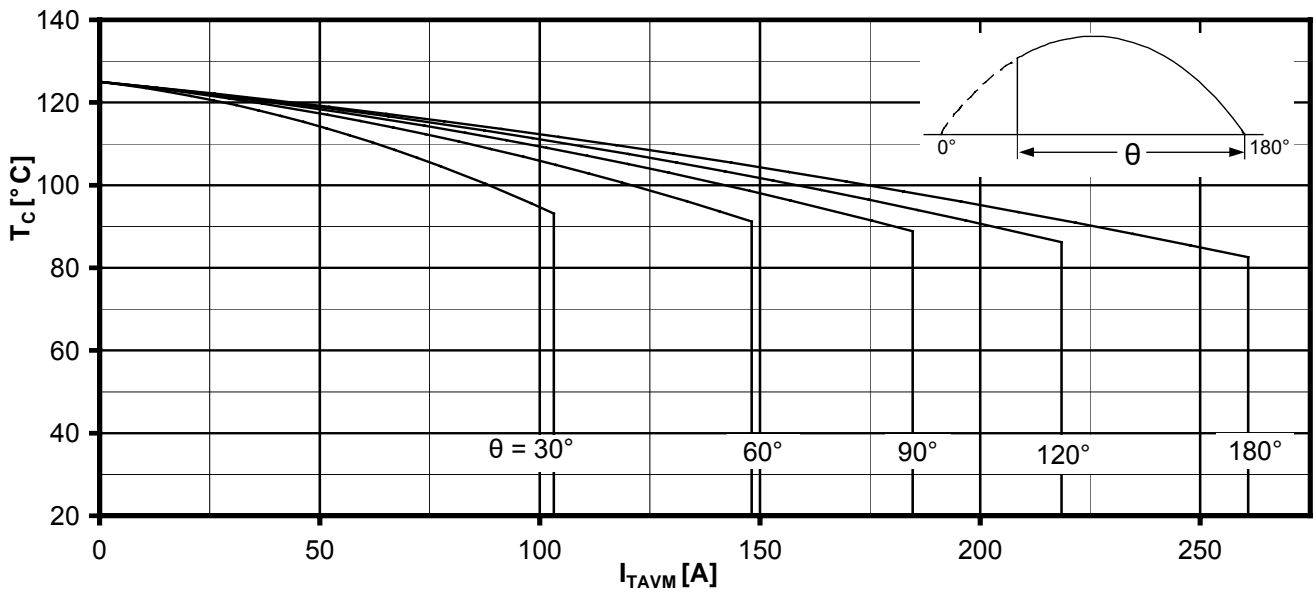
Rectangular current Current load per arm

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

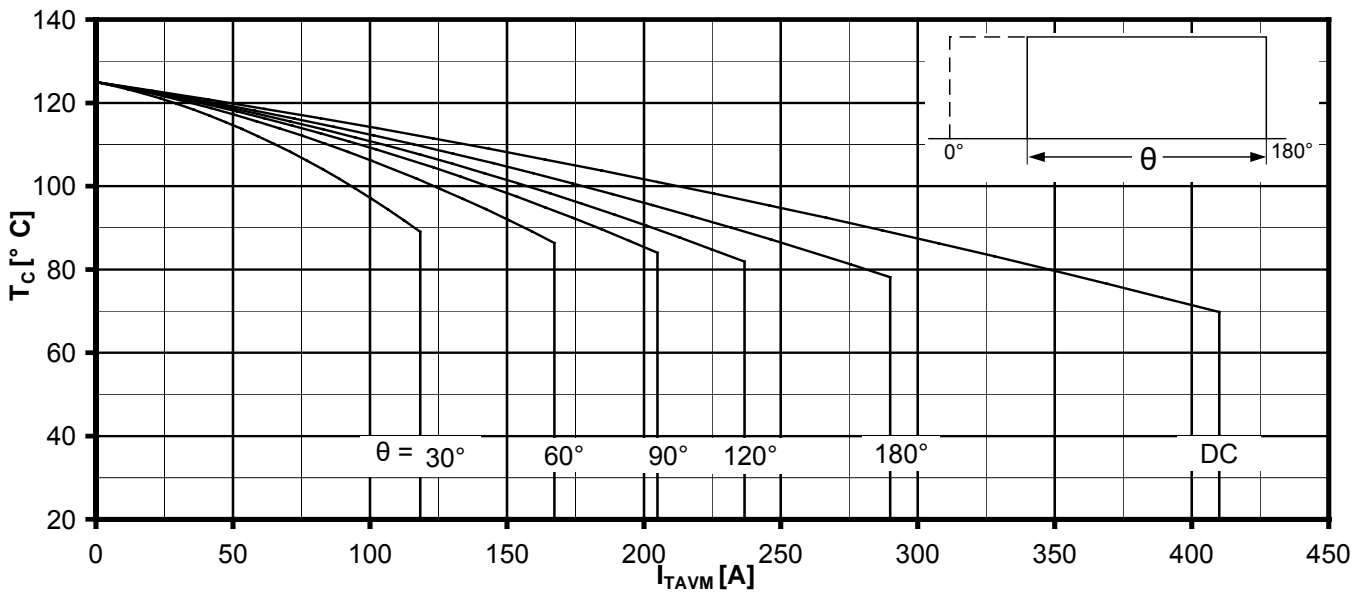
Parameter: Current conduction angle θ

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Thyristor-Thyristor Modules



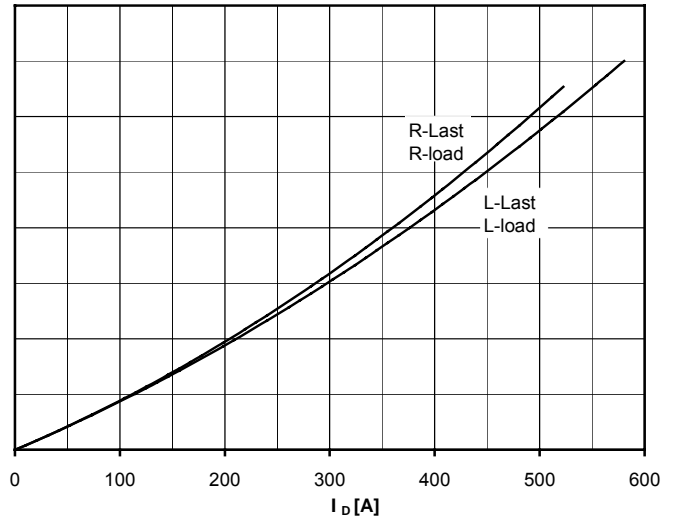
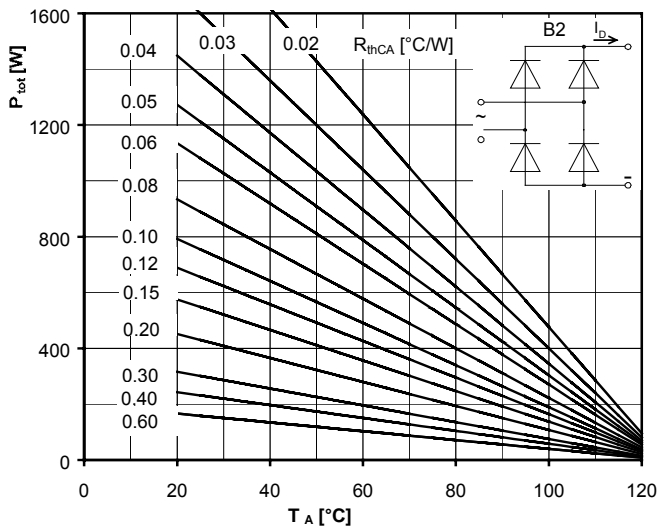
Maximum allowable case temperature $T_C = f(I_{TAVM})$
 Sinusoidal current Current load per arm
Calculation base P_{TAV} (switching losses should be considered separately)
 Parameter: Current conduction angle θ



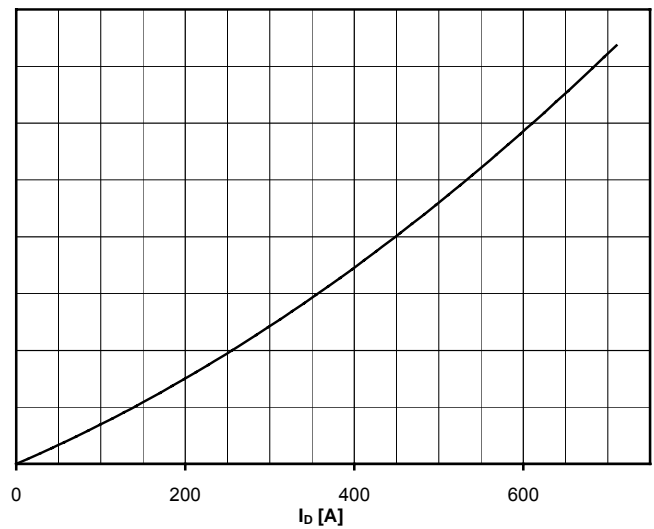
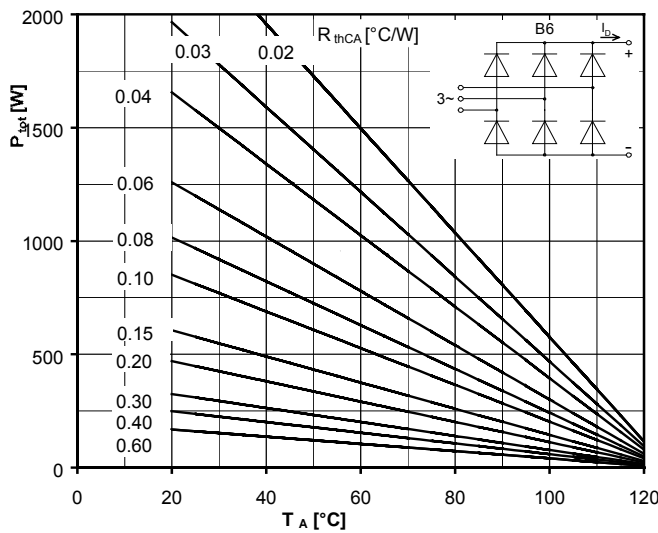
Maximum allowable case temperature $T_C = f(I_{TAVM})$
 Rectangular current Current load per arm
Calculation base P_{TAV} (switching losses should be considered separately)
 Parameter: Current conduction angle θ

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Thyristor-Thyristor Modules



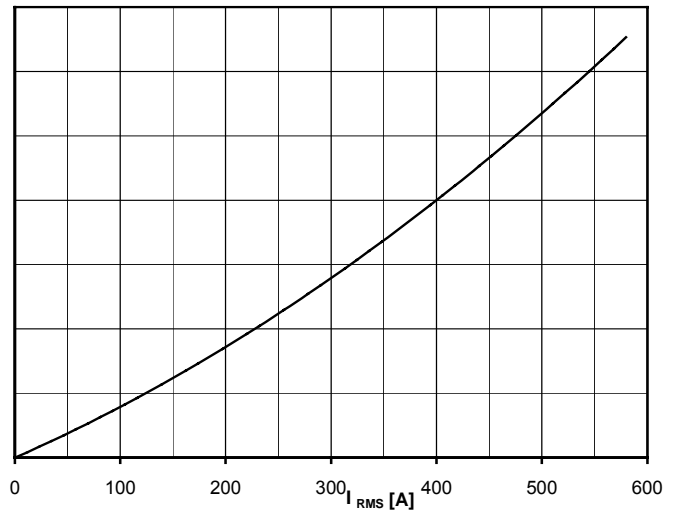
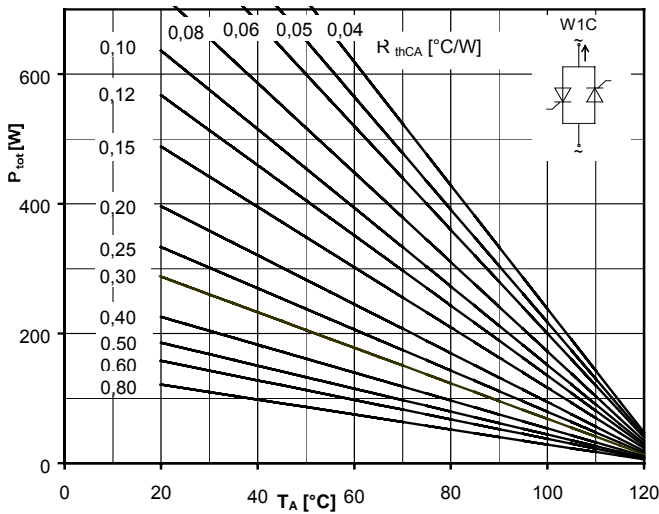
Maximum rated output current I_D Two-pulse bridge circuit
 Total power dissipation at circuit P_{tot}
 Parameter:
 Thermal resistance cases to ambient R_{thCA}



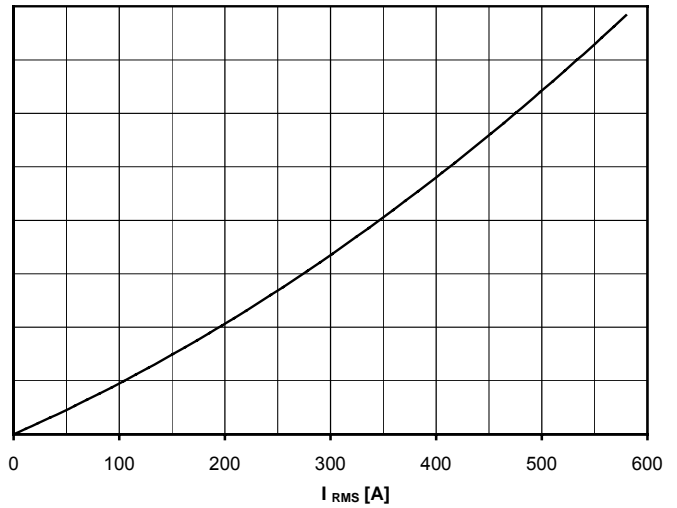
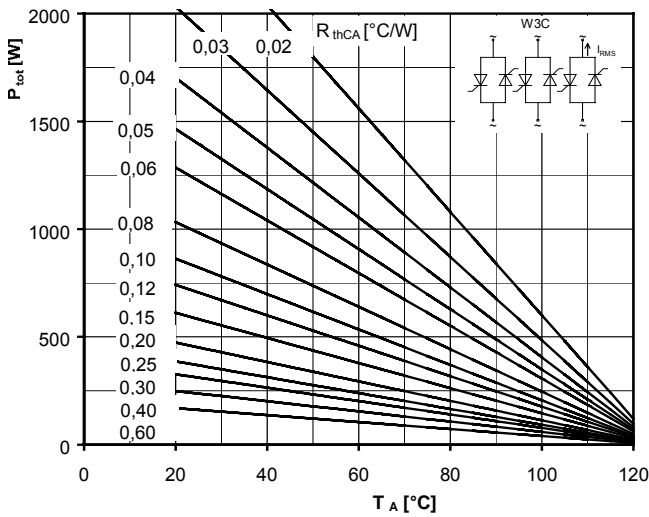
Maximum rated output current I_D Six-pulse bridge circuit
 Total power dissipation at circuit P_{tot}
 Parameter:
 Thermal resistance cases to ambient R_{thCA}

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Thyristor-Thyristor Modules



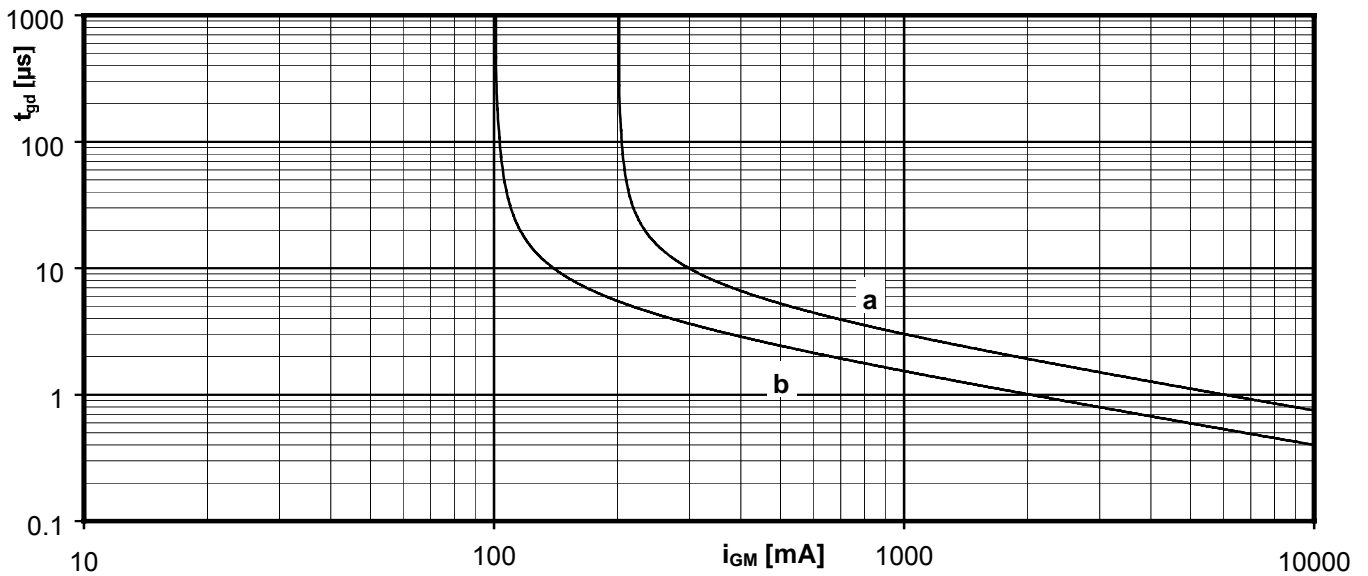
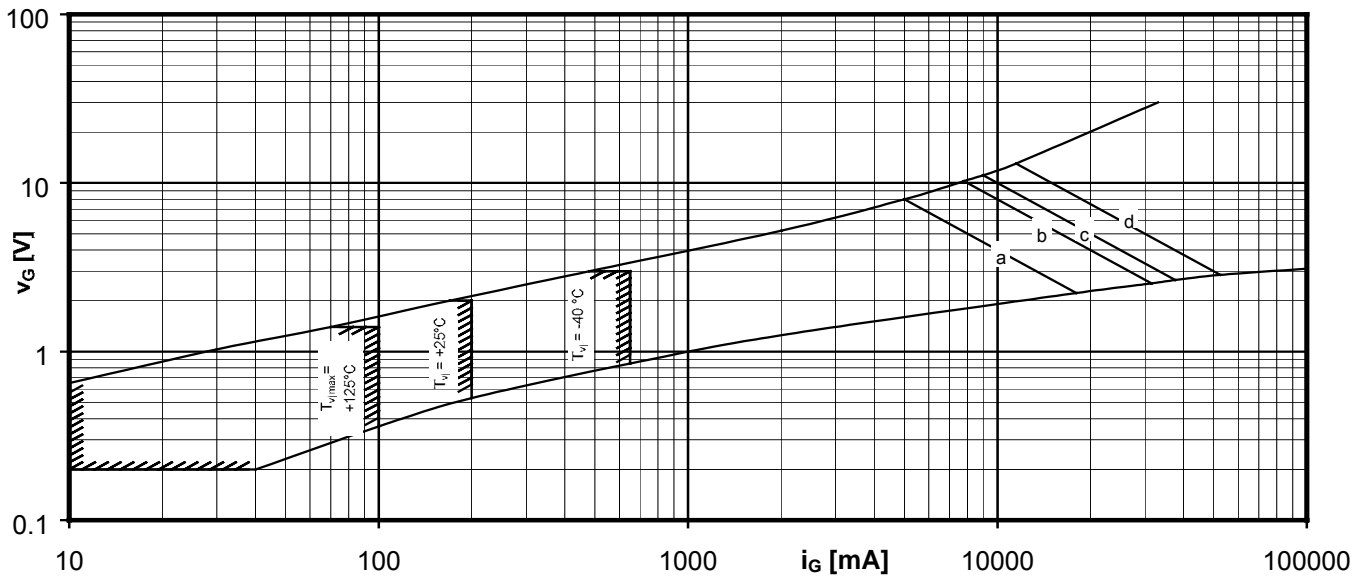
Maximum rated RMS current I_{RMS}
 Single-phase inverse parallel circuit
 Total power dissipation at circuit P_{tot}
 Parameter:
 Thermal resistance case to ambient R_{thCA}



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}

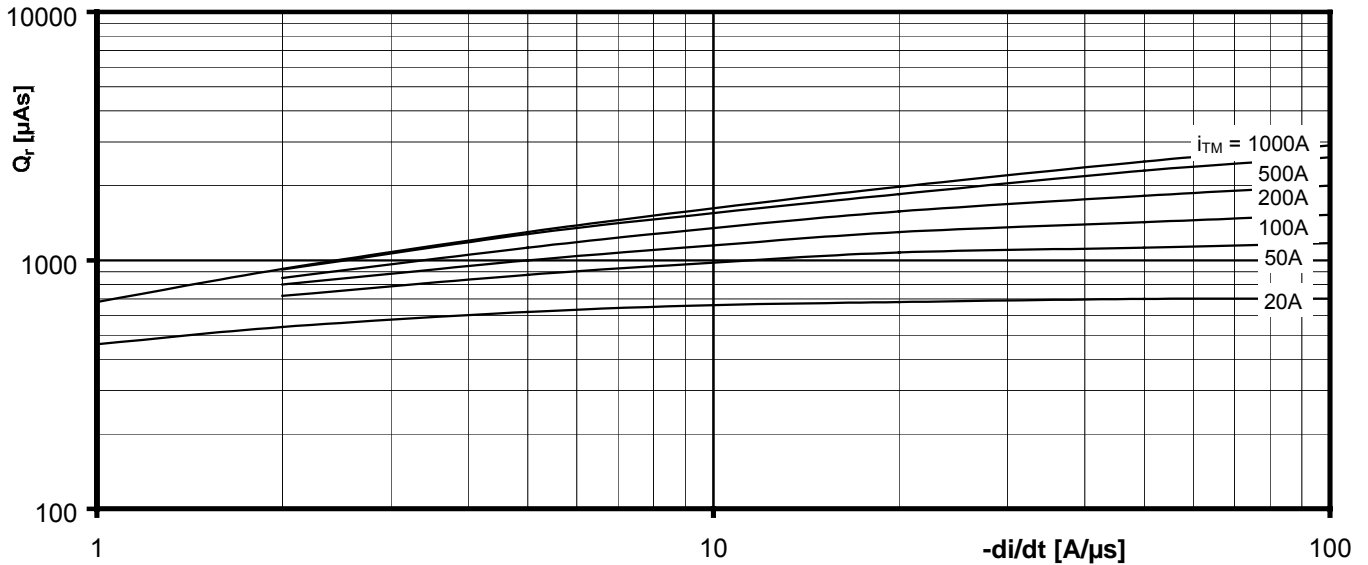
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Thyristor-Thyristor Modules

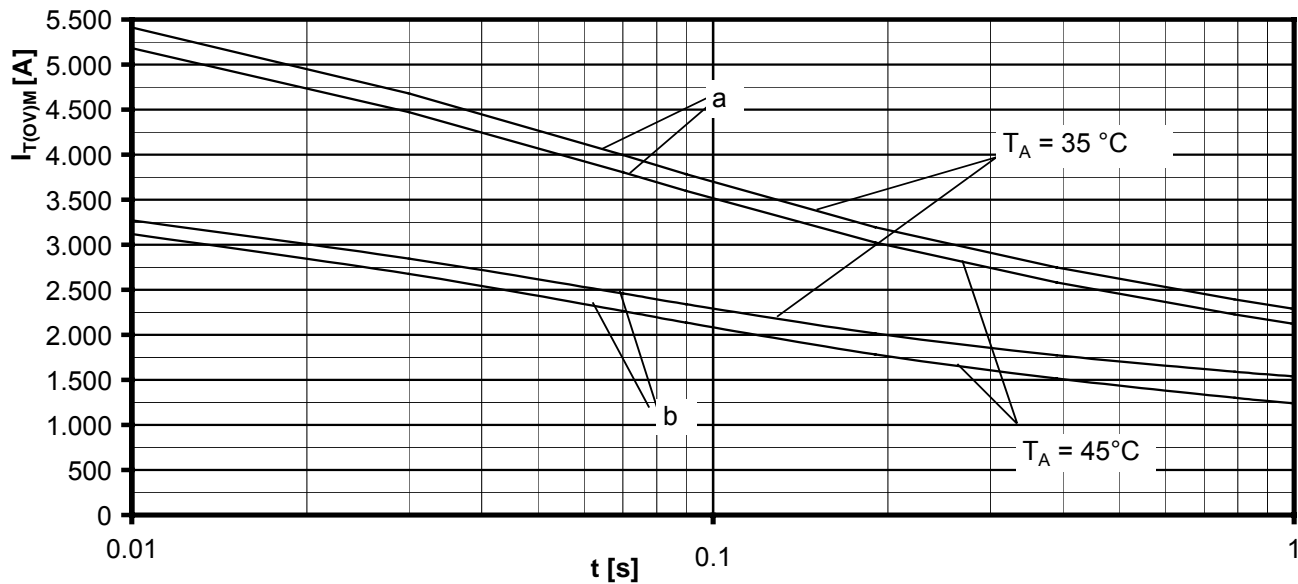


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Thyristor-Thyristor Modules



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}



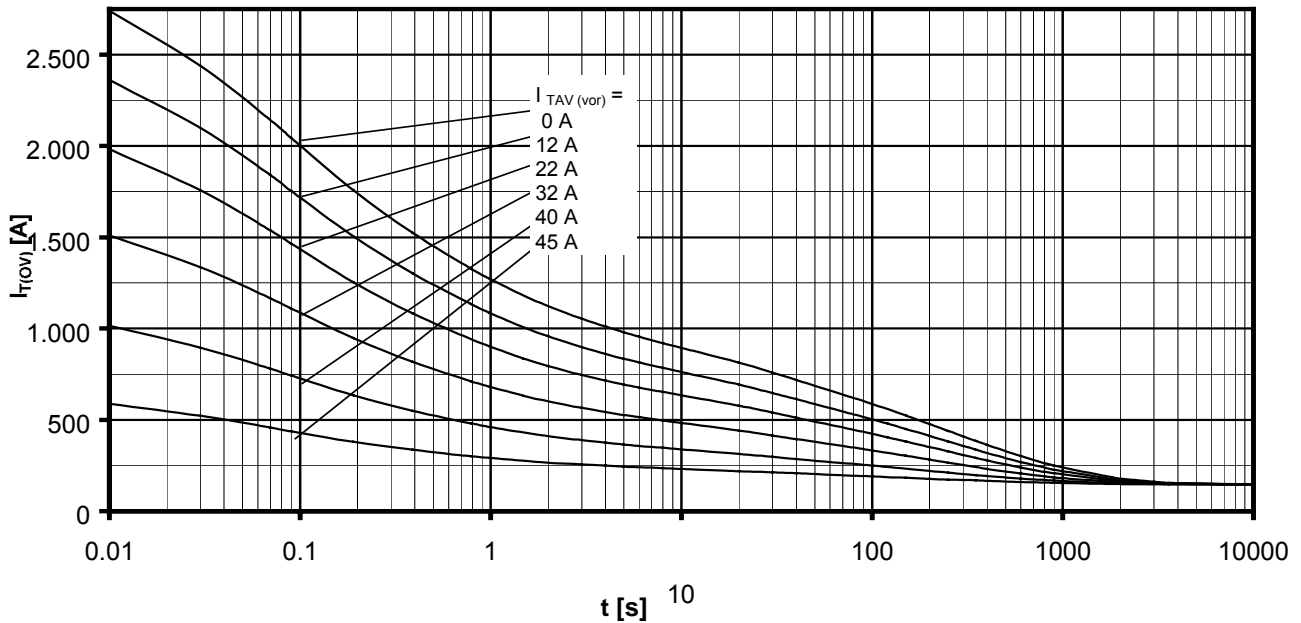
Maximum overload on-state current $I_{T(OV)M} = f(t)$, $v_{RM} = 0,8 V_{RRM}$

- 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

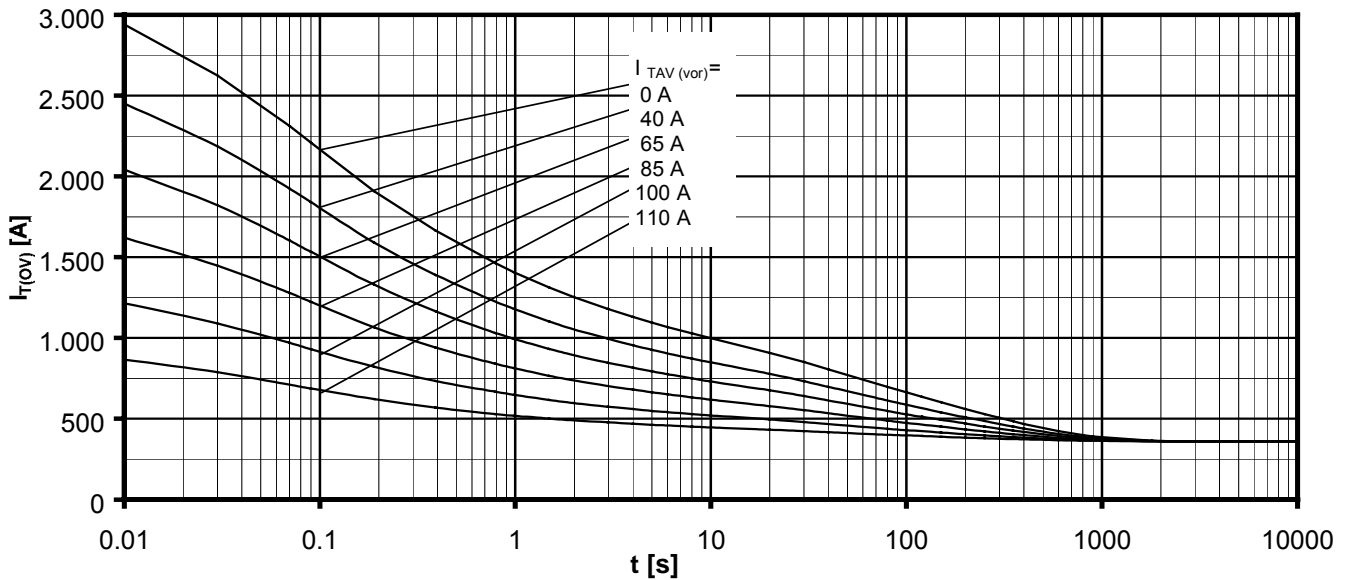


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Thyristor-Thyristor Modules



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