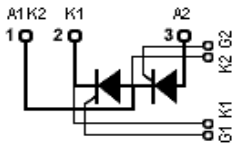
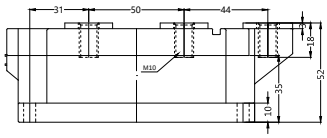
STT500GK40BT

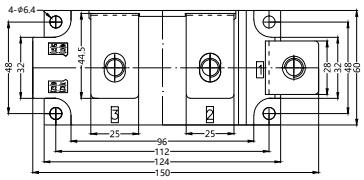
Thyristor-Thyristor Modules



Type	V_{RSM} V_{DSM} V	V_{RRM} V_{DRM} V
STT500GK22BT	2300	2200
STT500GK24BT	2500	2400
STT500GK28BT	2900	2800
STT500GK30BT	3100	3000
STT500GK32BT	3300	3200
STT500GK36BT	3700	3600
STT500GK40BT	4100	4000

Dimensions in mm (1mm=0.0394")





Symbol	Test Conditions		Maximum Ratings	Unit
I_{TRMS}, I_{FRMS} I_{TAVM}, I_{FAVM}	$T_{VJ}=T_{VJM}$ $T_C=85^oC$; 180° sine		900 500	A
I_{TSM}, I_{FSM}	$T_{VJ}=45^oC$ $V_R=0$	t=10ms (50Hz), sine t=8.3ms (60Hz), sine	17000 20000	A
	$T_{VJ}=T_{VJM}$ $V_R=0$	t=10ms(50Hz), sine t=8.3ms(60Hz), sine	14500 17400	
$\int i^2dt$	$T_{VJ}=45^oC$ $V_R=0$	t=10ms (50Hz), sine t=8.3ms (60Hz), sine	1445000 1734000	A^2s
	$T_{VJ}=T_{VJM}$ $V_R=0$	t=10ms(50Hz), sine t=8.3ms(60Hz), sine	1050000 1260000	
$(di/dt)_{cr}$	$T_{VJ}=T_{VJM}$ f=50Hz, t_P=200us $V_D=2/3V_{DRM}$ I_G=1A di_G/dt=1A/us	repetitive, $I_T=960A$ non repetitive, $I_T=I_{TAVM}$	100 500	A/us
$(dv/dt)_{cr}$	$T_{VJ}=T_{VJM}$; $V_{DR}=2/3V_{DRM}$ $R_{GK}=\infty$; method 1 (linear voltage rise)		1000	V/us
P_{GM}	$T_{VJ}=T_{VJM}$ $I_T=I_{TAVM}$	t_P=30us t_P=500us	120 60	W
P_{GAV}			20	W
V_{RGM}			10	V
T_{VJ} T_{VJM} T_{stg}			-40...+140 140 -40...+125	°C
V_{ISOL}	50/60Hz, RMS $I_{ISOL}\leq$1mA	t=1min t=1s	4000 4500	V~
M_d	Mounting torque (M6) Terminal connection torque (M10)		4.5-7/40-60 11-13/97-115	Nm/lb.in.
Weight	Typical		1430	g

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Symbol	Test Conditions	Characteristic Values	Unit
I_{RRM}	$T_{VJ}=T_{VJM}$; $V_R=V_{RRM}$	≤ 100	mA
V_{TM}	I_{TM}=1500A; T_{VJ}=25°C	≤2.65	V
V_{TO}	For power-loss calculations only ($T_{VJ}=T_{VJM}$)	0.90	V
r_T		0.27	mΩ
V_{GT}	V_D=6V; T_{VJ}=25°C T_{VJ}=-40°C	≤ 2.2 ≤ 3.0	V
I_{GT}	V_D=6V; T_{VJ}=25°C T_{VJ}=-40°C	≤300 ≤400	mA
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°C; t_p=30us; V_D=6V I_G=1A; di_G/dt=1A/us	≤ 1500	mA
I_H	T_{VJ}=25°C; V_D=6V; R_{GK}=∞	≤300	mA
t_{gd}	T_{VJ}=25°C; V_D=1/2V_{DRM} I_G=1A; di_G/dt=1A/us	≤ 4	us
t_q	$T_{VJ}=T_{VJM}$; I_T=500A; t_p=200us; -di/dt=10A/us V_R=100V; dv/dt=50V/us; V_D=2/3V_{DRM}	typ. 350	us
R_{thJC}	DC current	≤ 0.062	K/W
R_{thJK}	DC current	≤ 0.065	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^2

FEATURES

* International standard package
* Copper base plate
* Pressure Contact Technology
* BusBar Terminal
* Isolation voltage 3600 V~
* UL file NO.310749
* RoHS compliant

APPLICATIONS

* Motor control, softstarter
* Power converter
* Heat and temperature control for industrial furnaces and chemical processes
* Lighting control
* Solid state switches

ADVANTAGES

* Simple mounting
* Improved temperature and power cycling
* Reduced protection circuits

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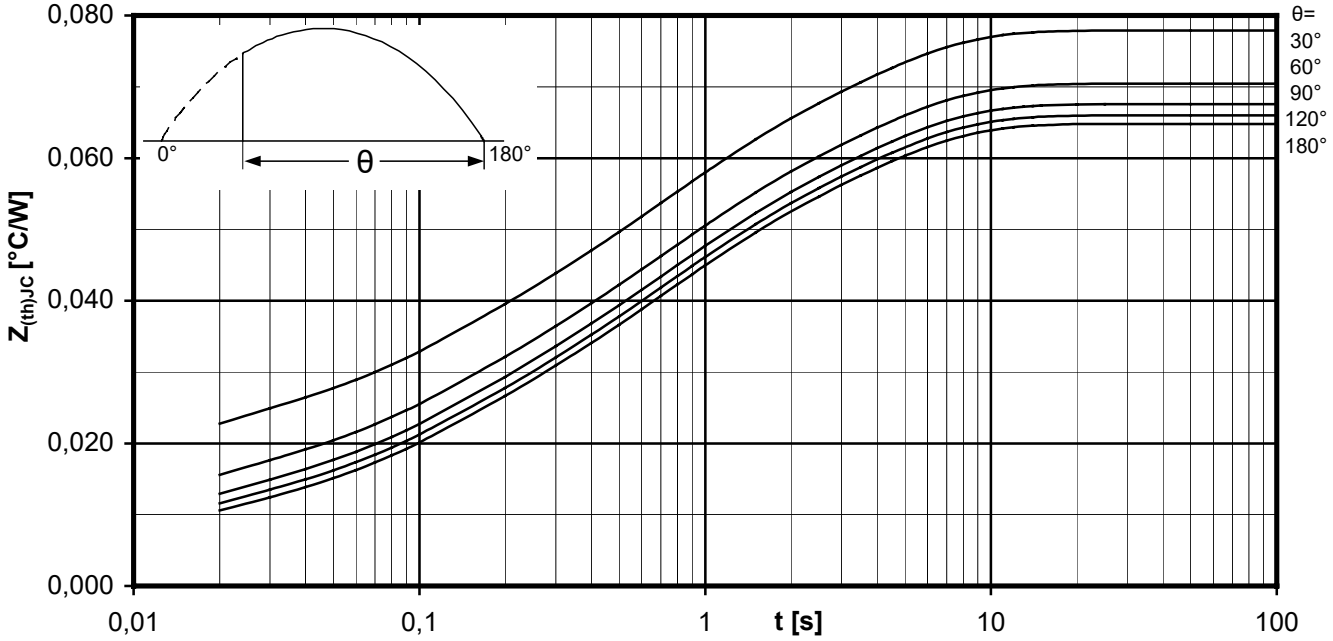
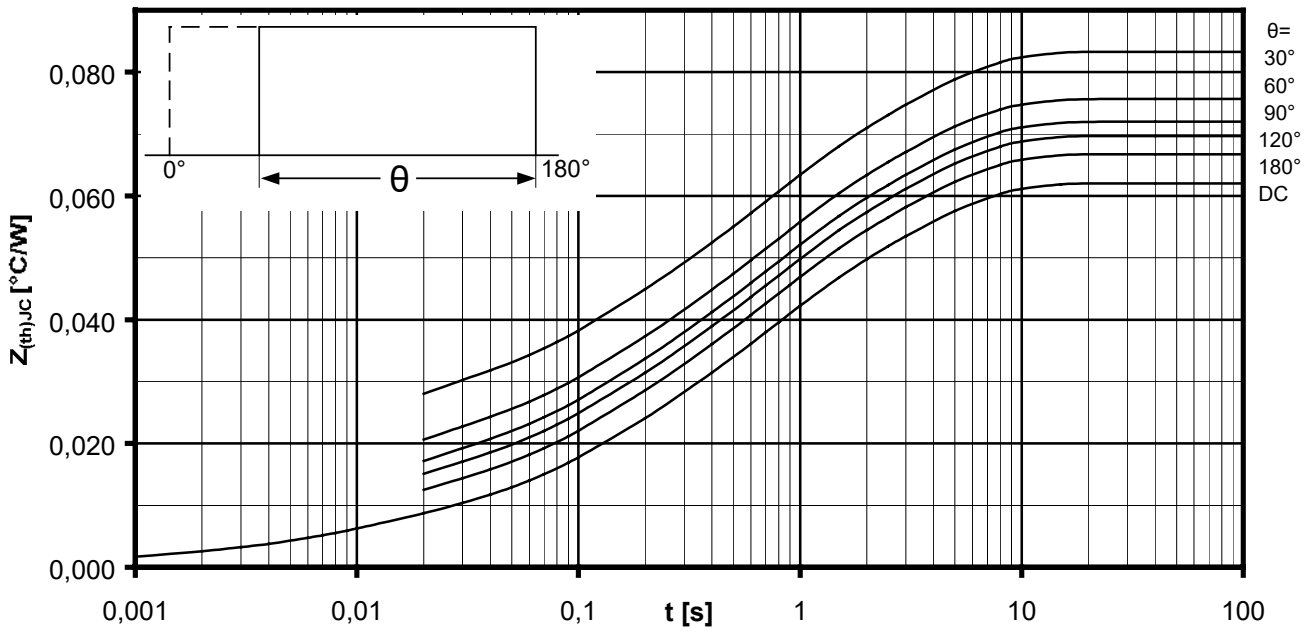


Transient thermal impedance per arm Z_{thJC}=f(t)
Sinusoidal current
Parameter: Current conduction angle θ



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

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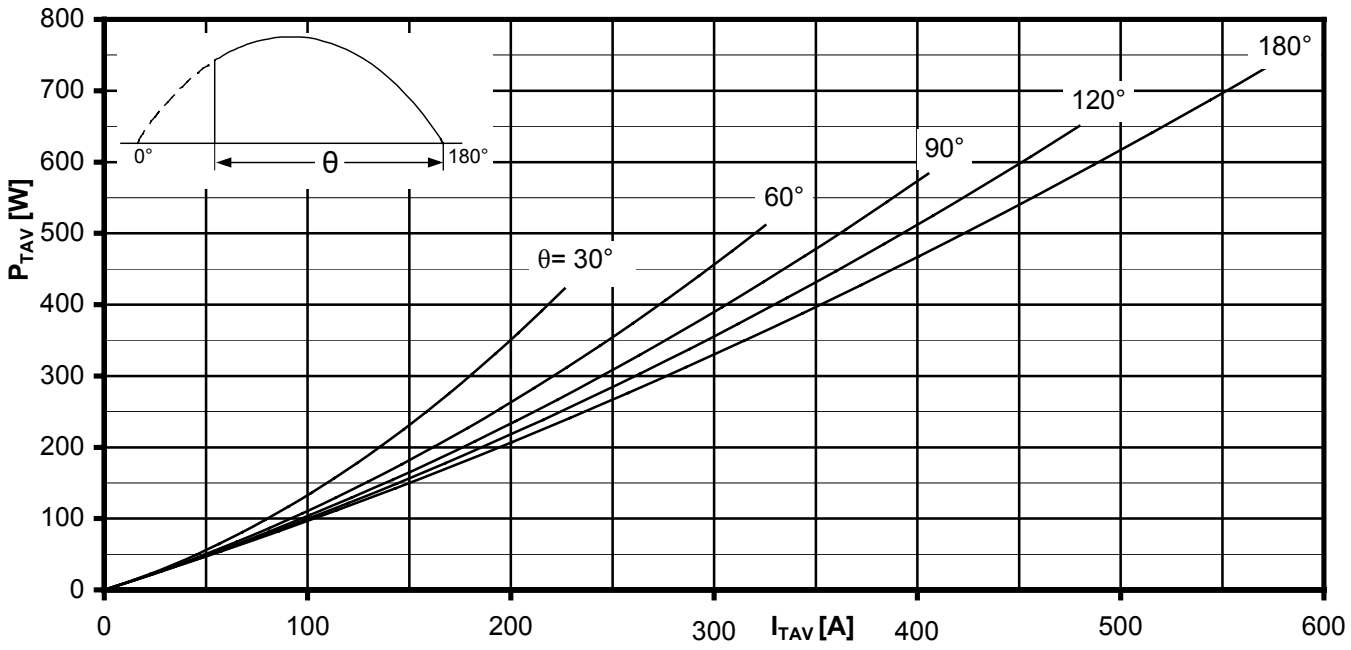
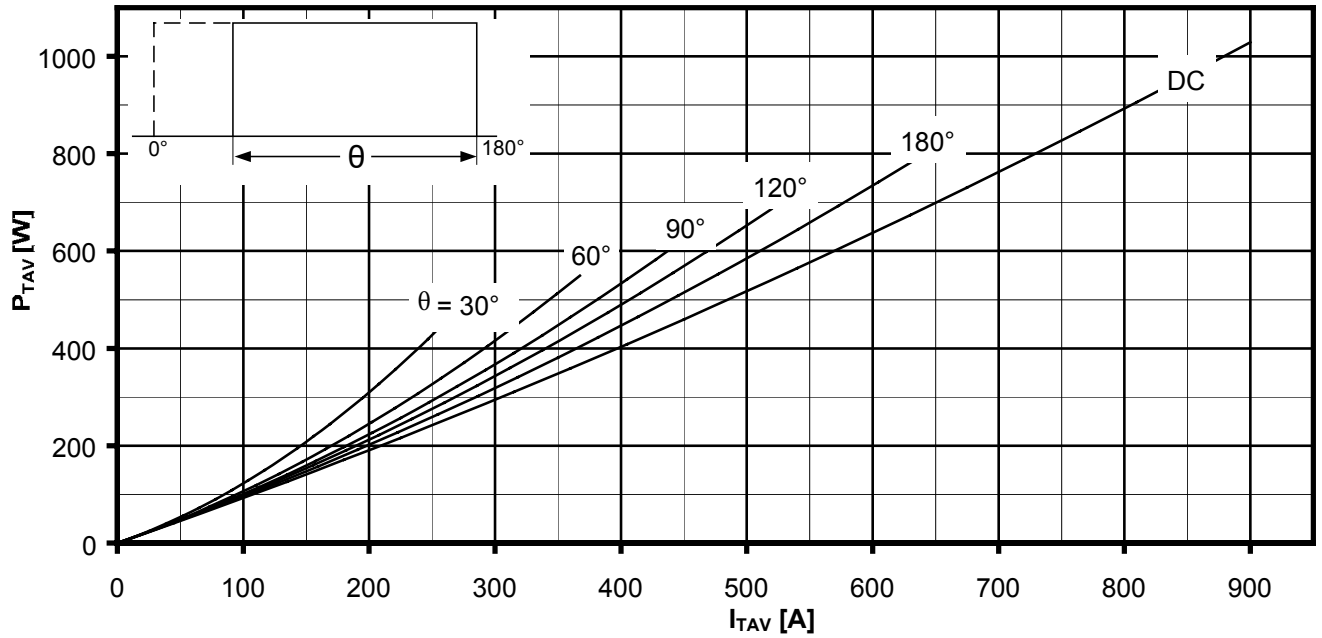


On-state power loss per arm $P_{TAV}=f(I_{TAV})$
Sinusoidal current Current load per arm
Calculation base P_{TAV} (switching losses should be considered separately)
Parameter: Current conduction angle θ



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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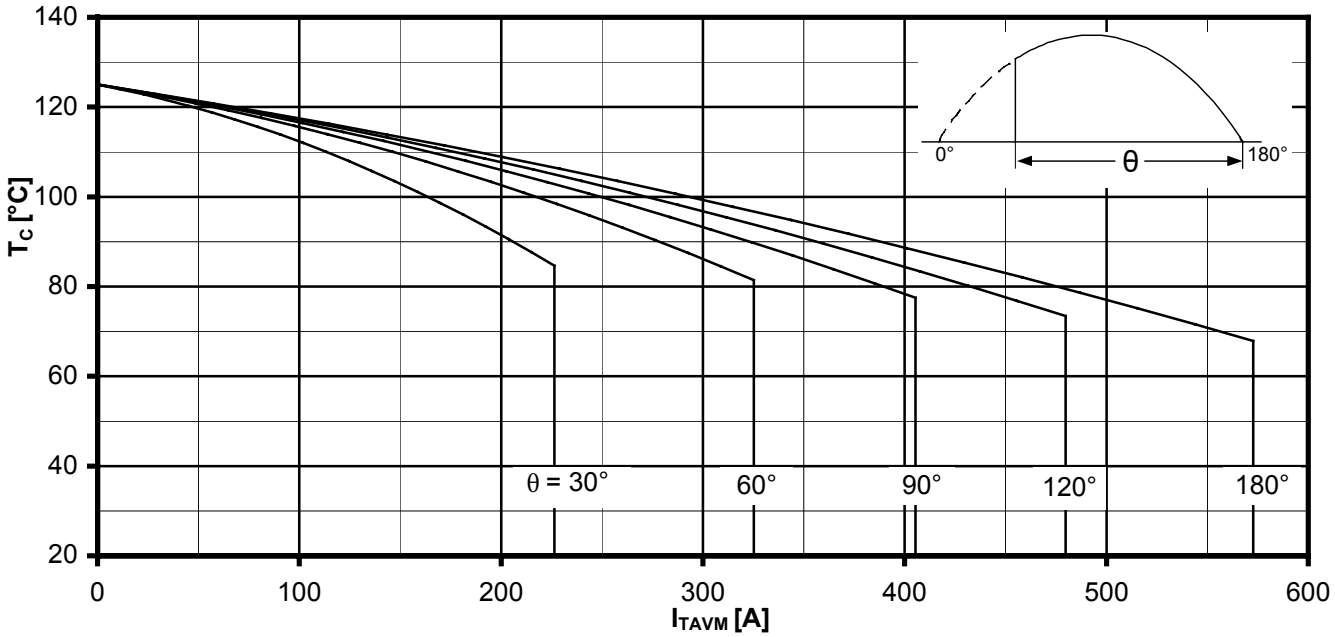
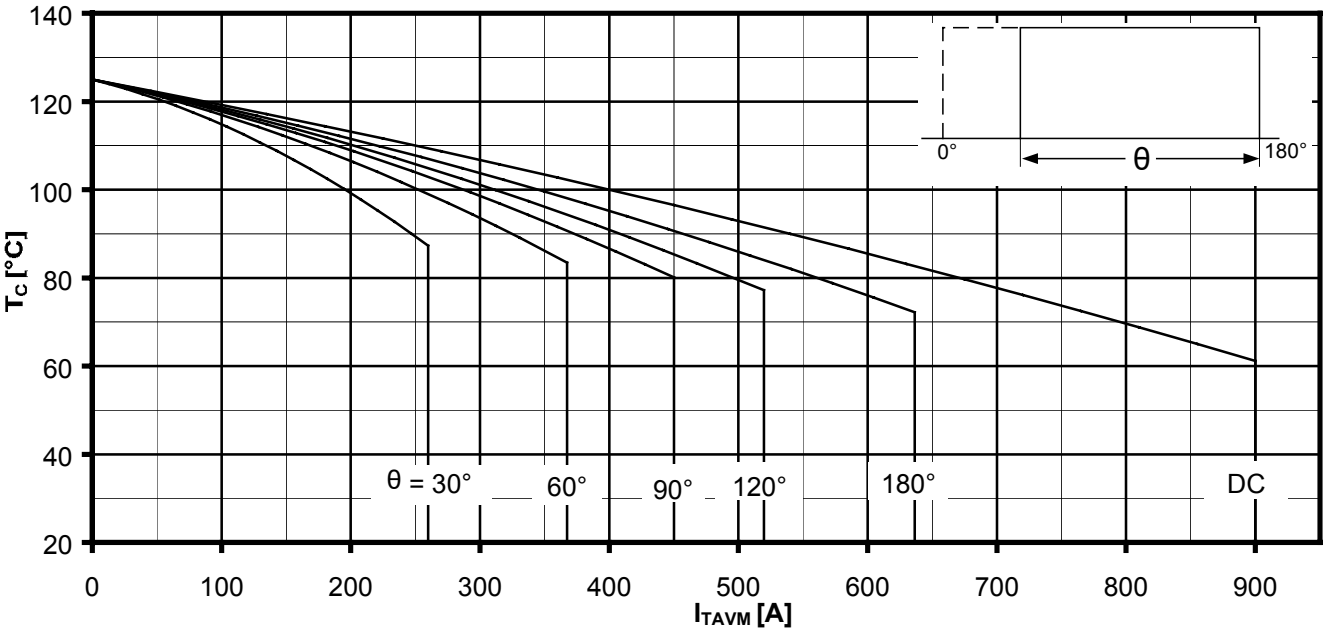


Maximum allowable case temperature $T_C=f(I_{TAVM})$

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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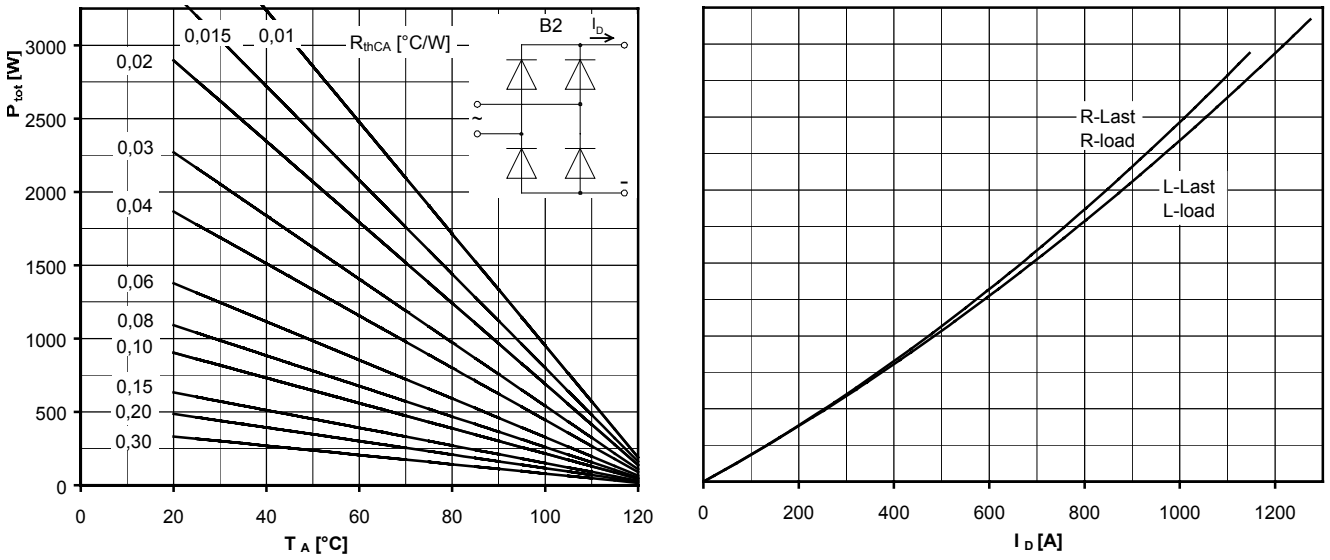
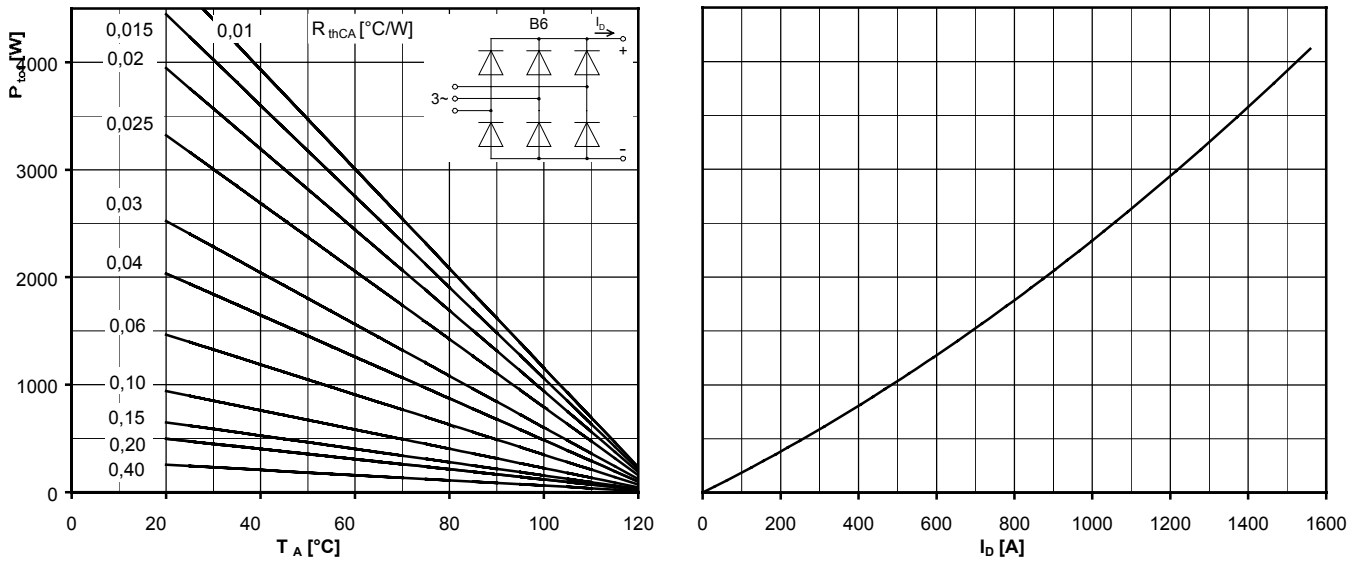


Maximum rated output current I_D
Two-pulse bridge circuit
Total power dissipation at circuit P_{tot} Parameter:
Thermal resistance cases to ambient R_{thCA}



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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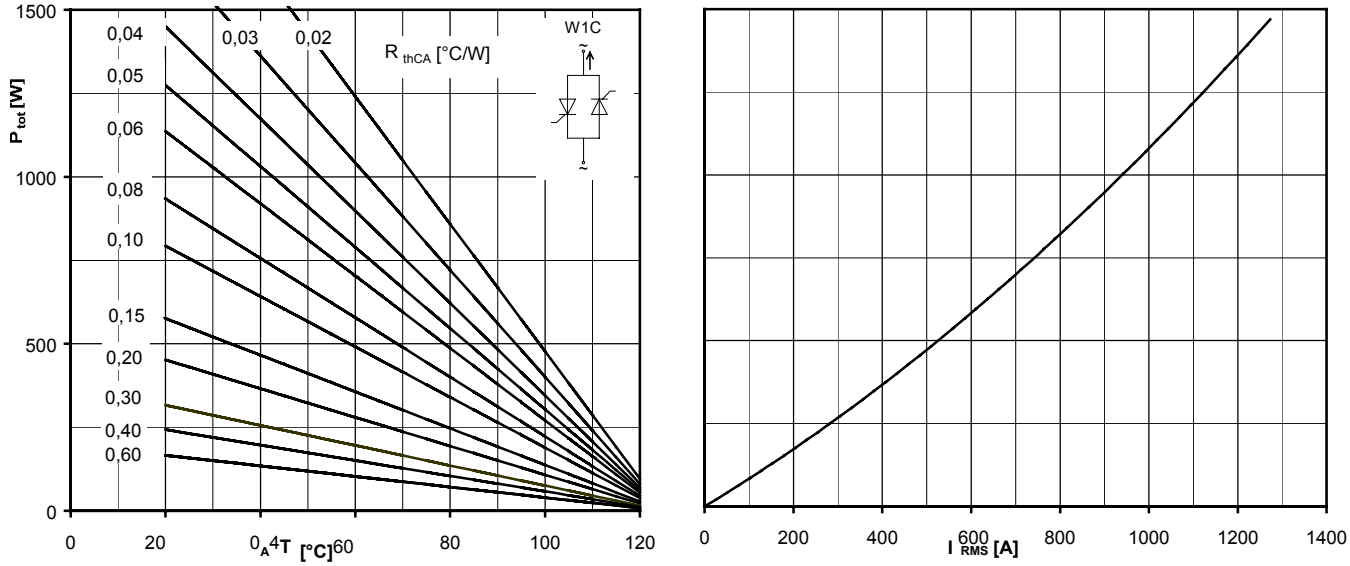


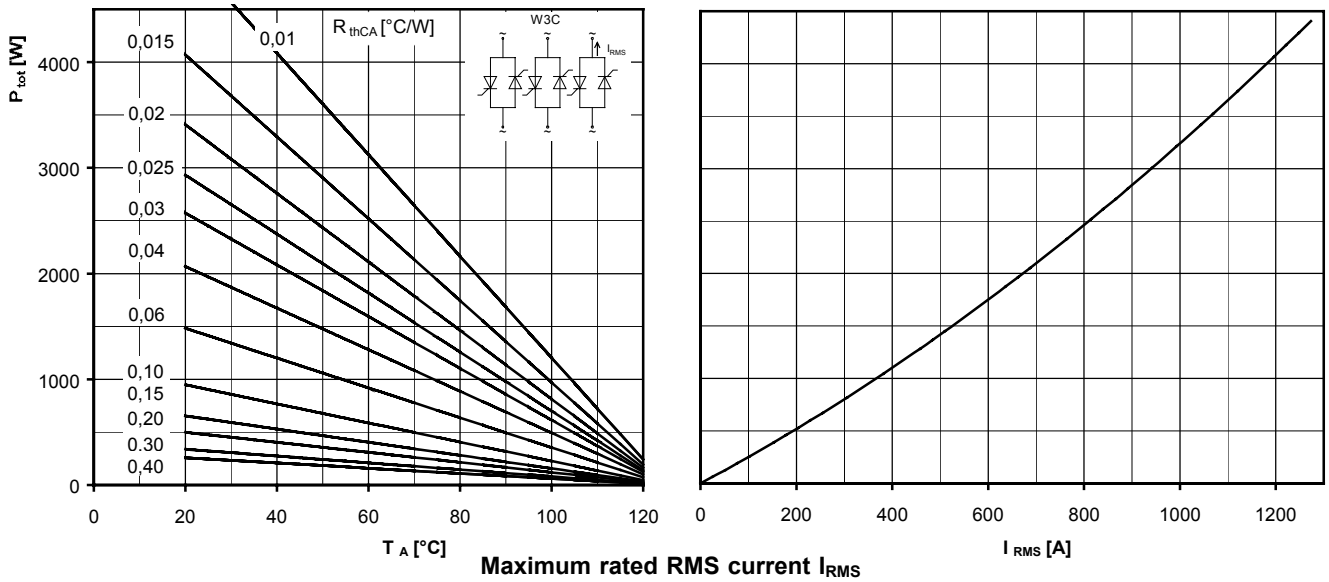
Maximum rated RMS current I_{RMS}

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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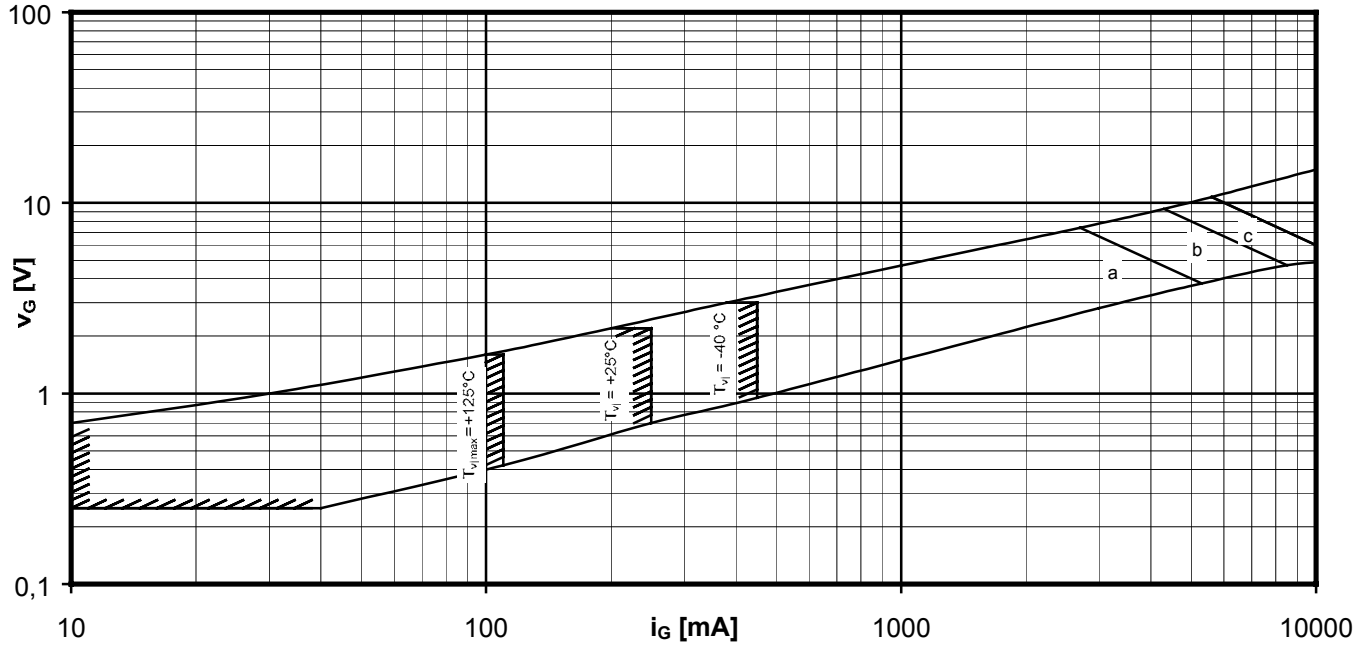
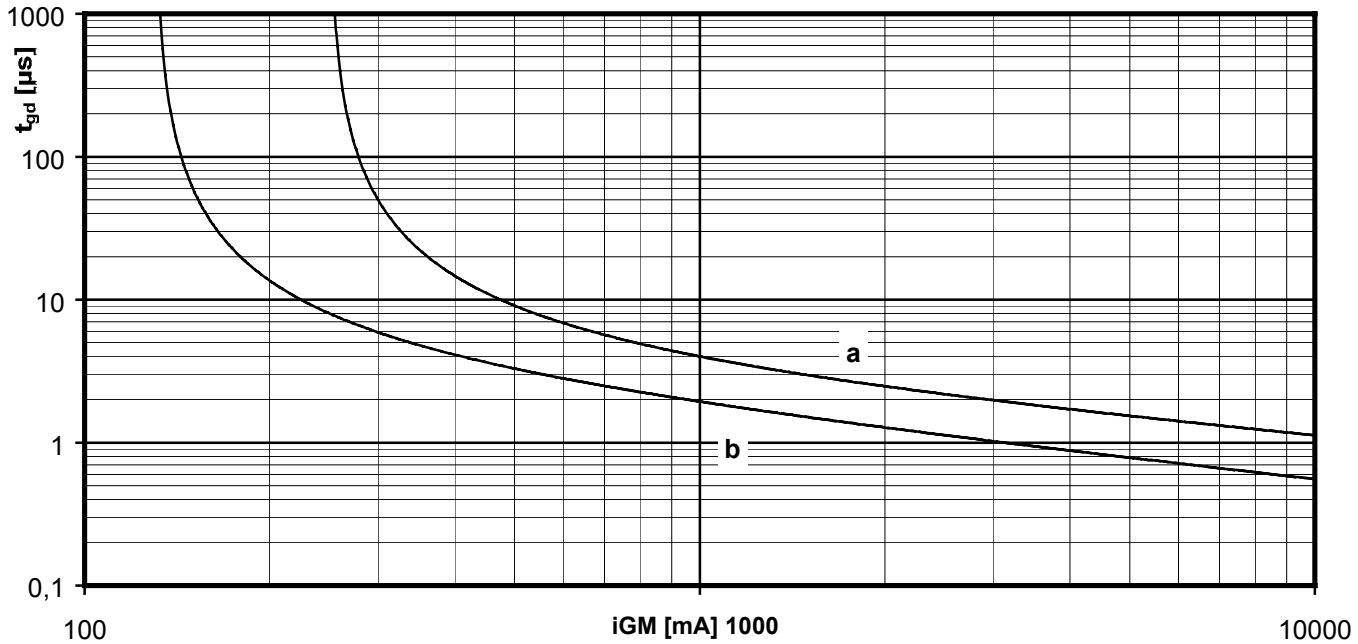


Gate characteristic $v_G = f(i_G)$ with triggering area for V_D=6 V

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

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



iGM [mA] 1000

Gate controlled delay time $t_{gd}=f(i_G)$

T_{vj}=25°C,$di_G/dt=i_{GM}$/1µs

a-Limiting characteristic

b-Typical characteristic

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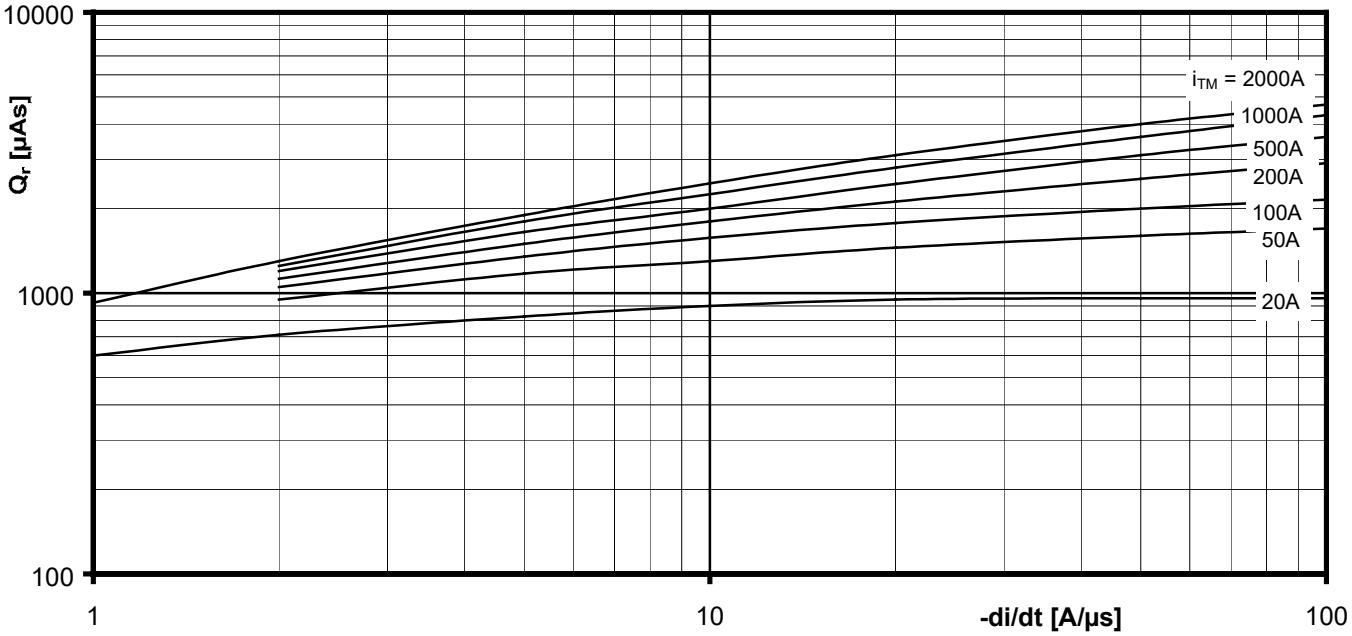
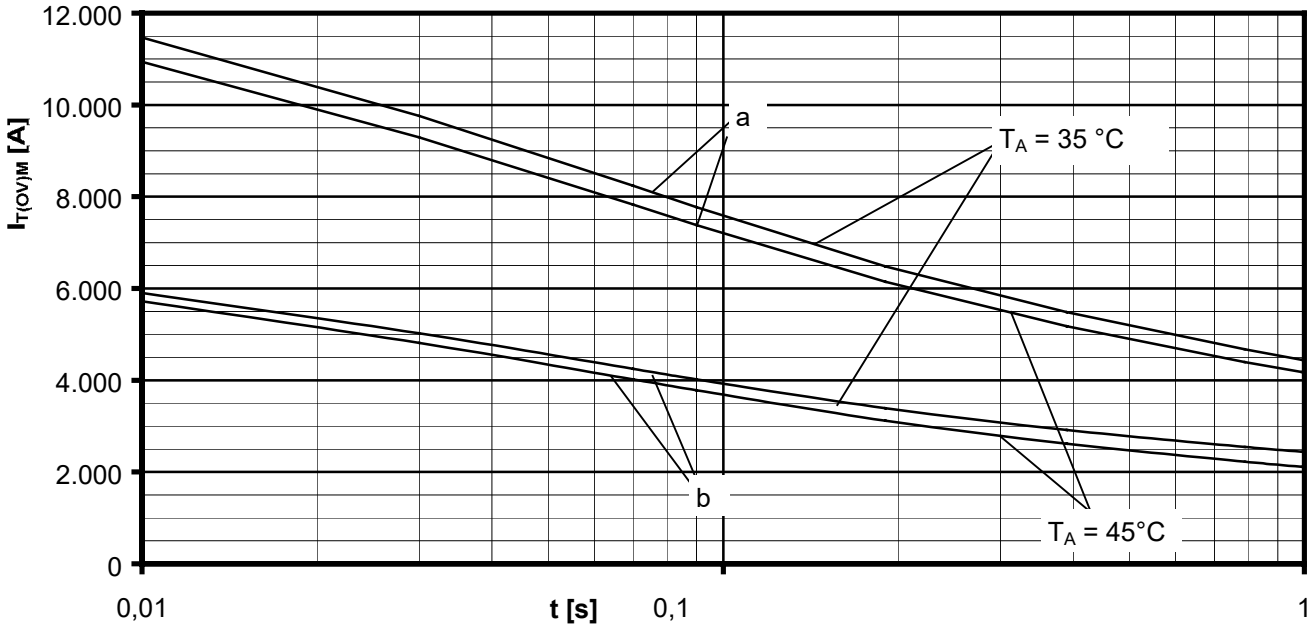


Recovered charge Q_r=f(-di/dt)
T_{vj}=T_{vjmax},v_R≤0,5V_{RRM}, v_{RM}=0,8 V_{RRM}
Parameter:On-state current i_{TM}



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

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

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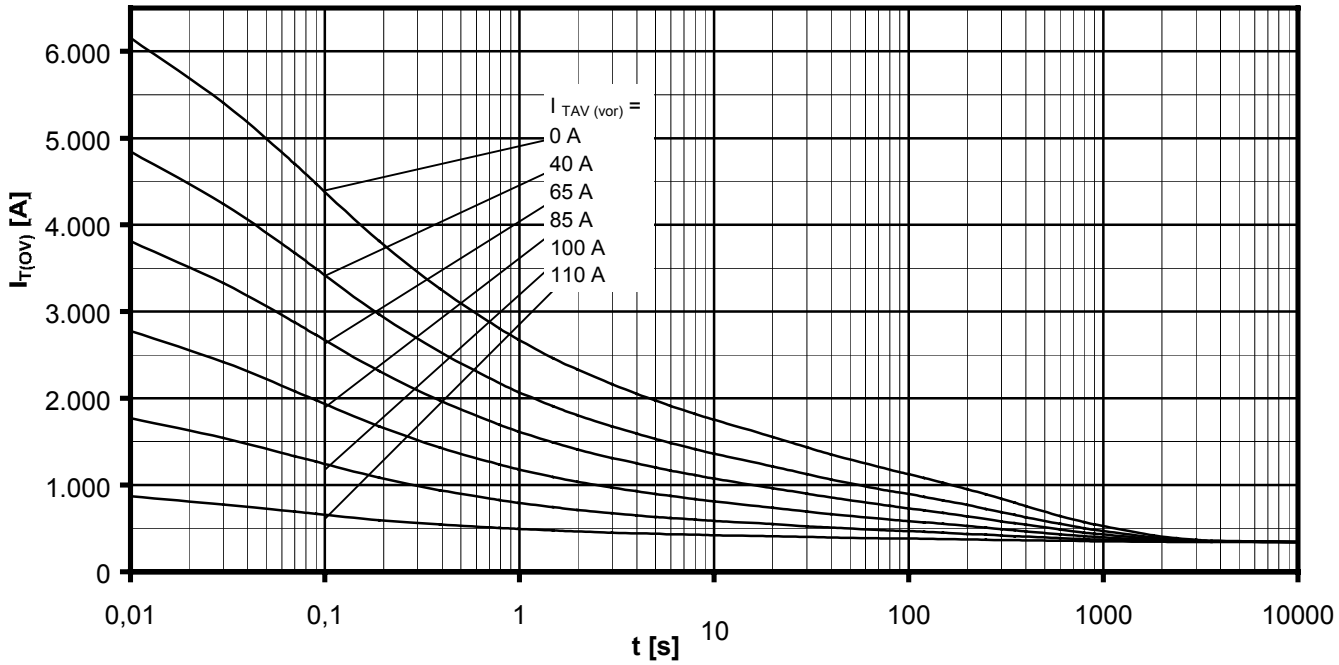
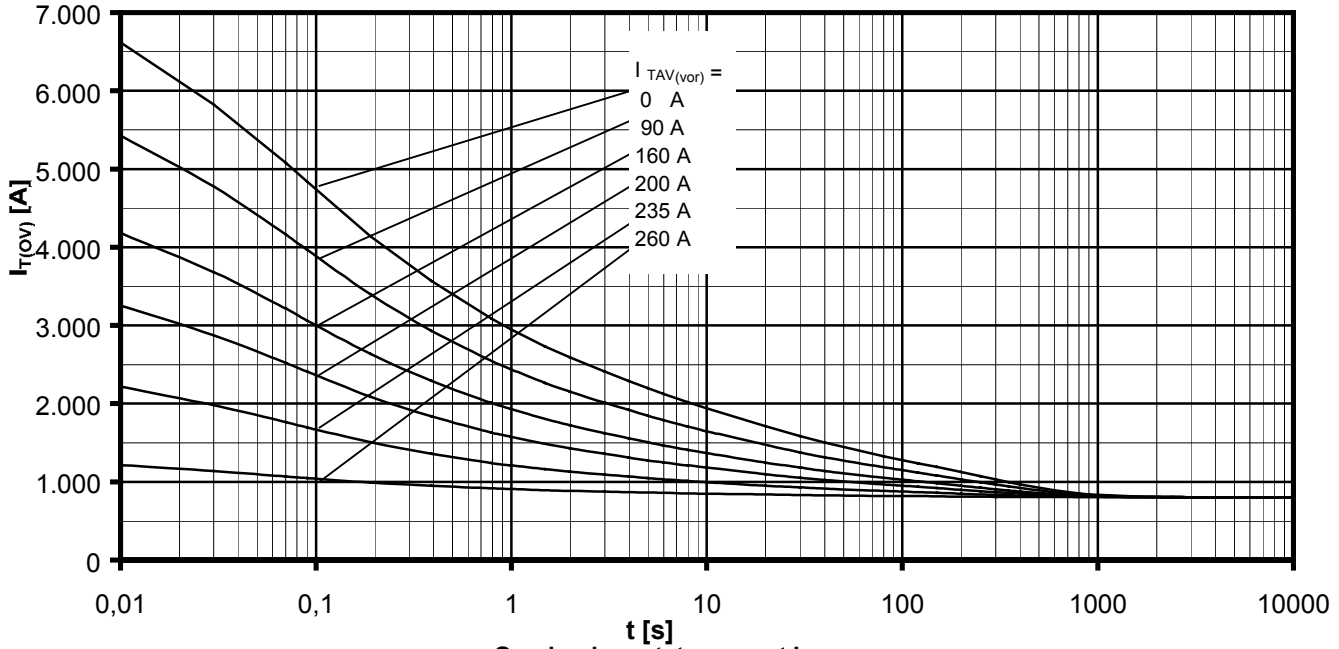


Overload on-state current $I_{T(OV)}$
Six-pulse bridge circuit, 120° rectangular
Heatsink type KM17 (45W) Natural cooling at T_A=45°C
Parameter: Pre-load current per arm $I_{TAV(vor)}$



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

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