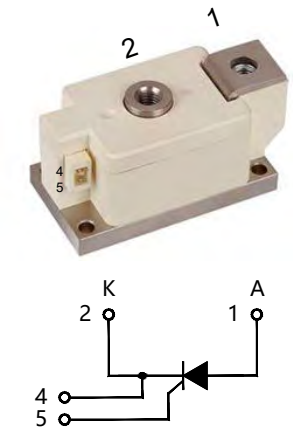
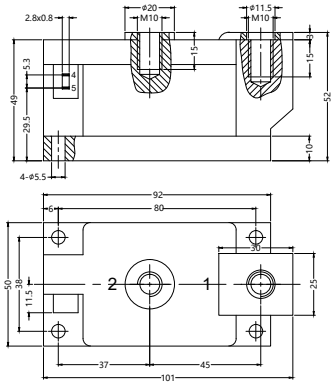
STO320GK22BT

Single Thyristor Module



Type	V_{RSM} V_{DSM} V	V_{RRM} V_{DRM} V
STO320GK08BT	900	800
STO320GK12BT	1300	1200
STO320GK14BT	1500	1400
STO320GK16BT	1700	1600
STO320GK18BT	1900	1800
STO320GK20BT	2100	2000
STO320GK22BT	2300	2200
STO320GK24BT	2500	2400
STO320GK26BT	2700	2600

Dimensions in mm



Symbol	Test Conditions		Maximum Ratings	Unit
I_{TRMS}, I_{FRMS} I_{TAVM}, I_{FAVM}	$T_{VJ}=T_{VJM}$; 50Hz $T_C=85^oC$; 180° sine		502 320	A
I_{TSM}, I_{FSM}	$T_{VJ}=45^oC$ $V_R=0$	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	
∫i2dt	$T_{VJ}=45^oC$ $V_R=0$	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	320000 384000	
$(di/dt)_{cr}$	$T_{VJ}=T_{VJM}$ f=50Hz, t_p=200us $V_D=2/3V_{DRM}$ I_G=0.5A di_G/dt=0.5A/us	repetitive non repetitive	150 500	A/us
$(dv/dt)_{cr}$	$T_{VJ}=T_{VJM}$; $R_{GK}=\infty$; method 1 (linear voltage rise)	$V_{DR}=2/3V_{DRM}$	1000	V/us
P_{GM}	$T_{VJ}=T_{VJM}$ $I_T=I_{TAVM}$	t_p=30us t_p=500us	120 60	W
P_{GAV}			8	W
V_{RGM}			10	V
T_{VJ} T_{VJM} T_{stg}			-40...+130 130 -40...+130	°C
V_{ISOL}	50/60Hz, RMS $I_{ISOL}\leq$1mA	t=1min t=1s	3000 3600	V~
M_d	Mounting torque (M5) Terminal connection torque (M10)		5 17	Nm
Weight	Typical		940	g

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Symbol	Test Conditions	Characteristic Values	Unit
I_{RRM}, I_{DRM}	$T_{VJ}=T_{VJM}$; $V_R=V_{RRM}$; $V_D=V_{DRM}$	60	mA
V_{TM}	I_{TM}=960A; T_{VJ}=25°C	≤1800V | 2000-2600V 1.85 | 2.20	V
V_{TO}	For power-loss calculations only ($T_{VJ}=T_{VJM}$)	0.8	V
r_T		0.6	mΩ
V_{GT}	V_D=6V; T_{VJ}=25°C T_{VJ}=-40°C	2 2.6	V
I_{GT}	V_D=6V; T_{VJ}=25°C T_{VJ}=-40°C	200 250	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=0.45A; di_G/dt=0.45A/us	1200	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=0.5A; di_G/dt=0.5A/us	3	us
t_q	$T_{VJ}=T_{VJM}$; I_T=320A; t_p=200us; -di/dt=10A/us V_R=100V; dv/dt=20V/us; V_D=2/3V_{DRM} typ.	250	us
Q_S	$T_{VJ}=T_{VJM}$; I_T, I_F=320A; -di/dt=50A/us	650	uC
I_{RM}		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	0.04 0.02	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
* 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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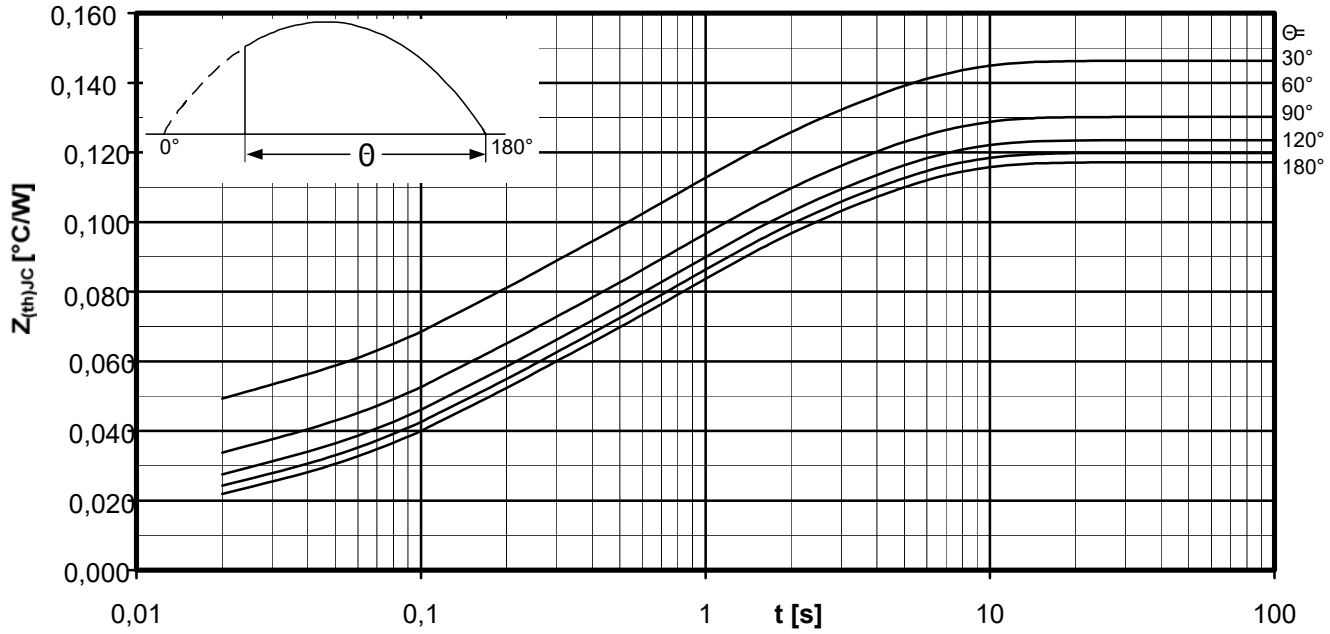
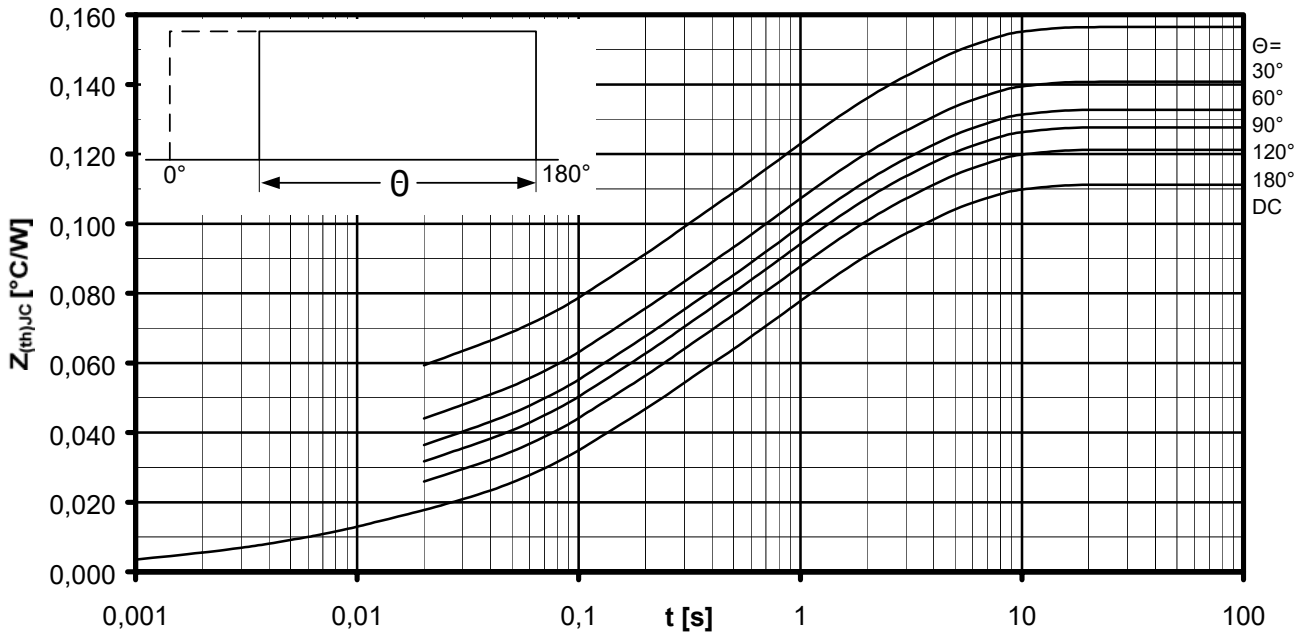
Single Thyristor Module



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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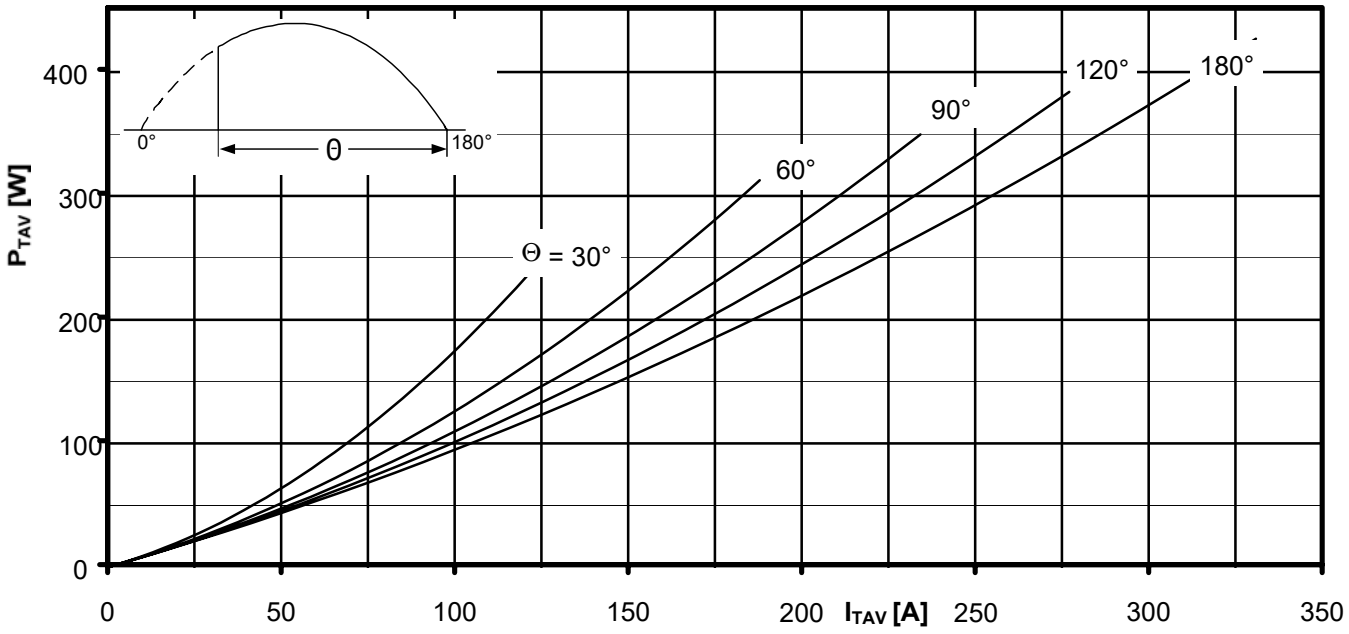
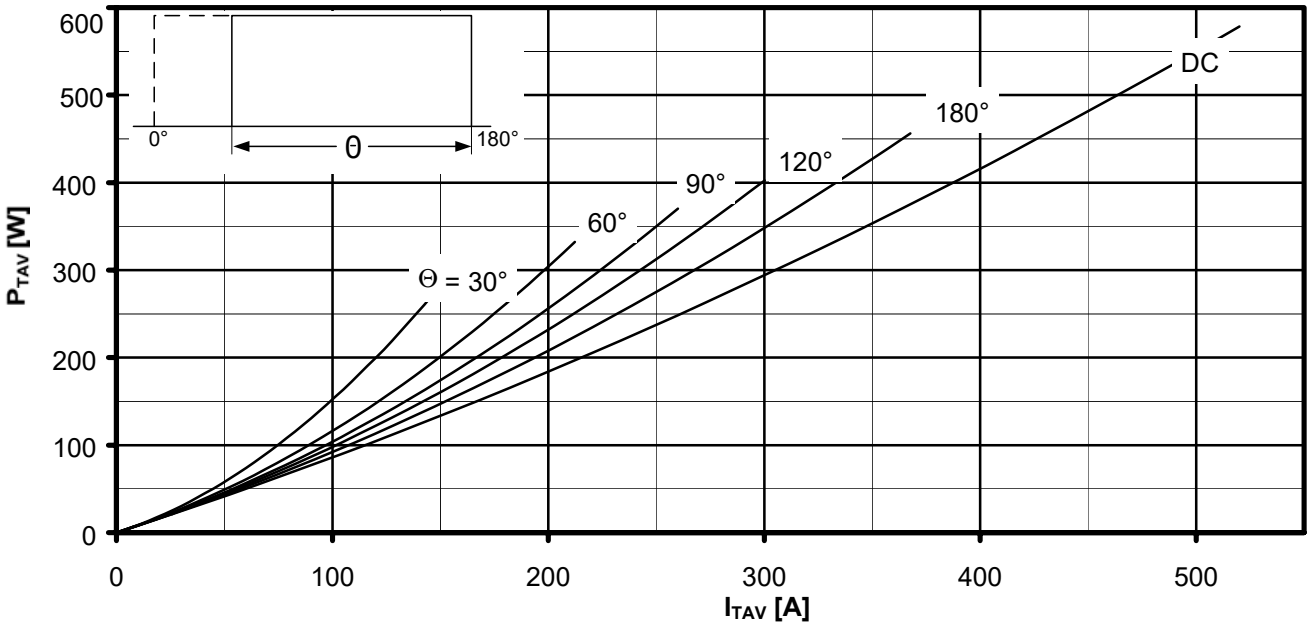
Single Thyristor Module



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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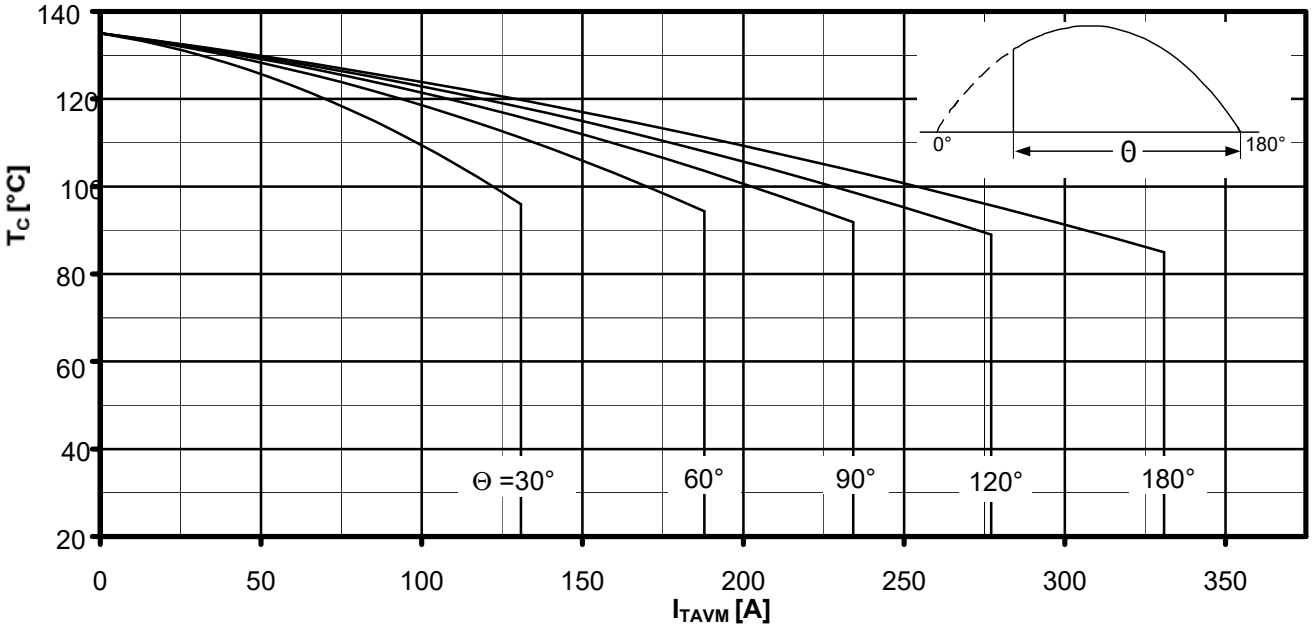
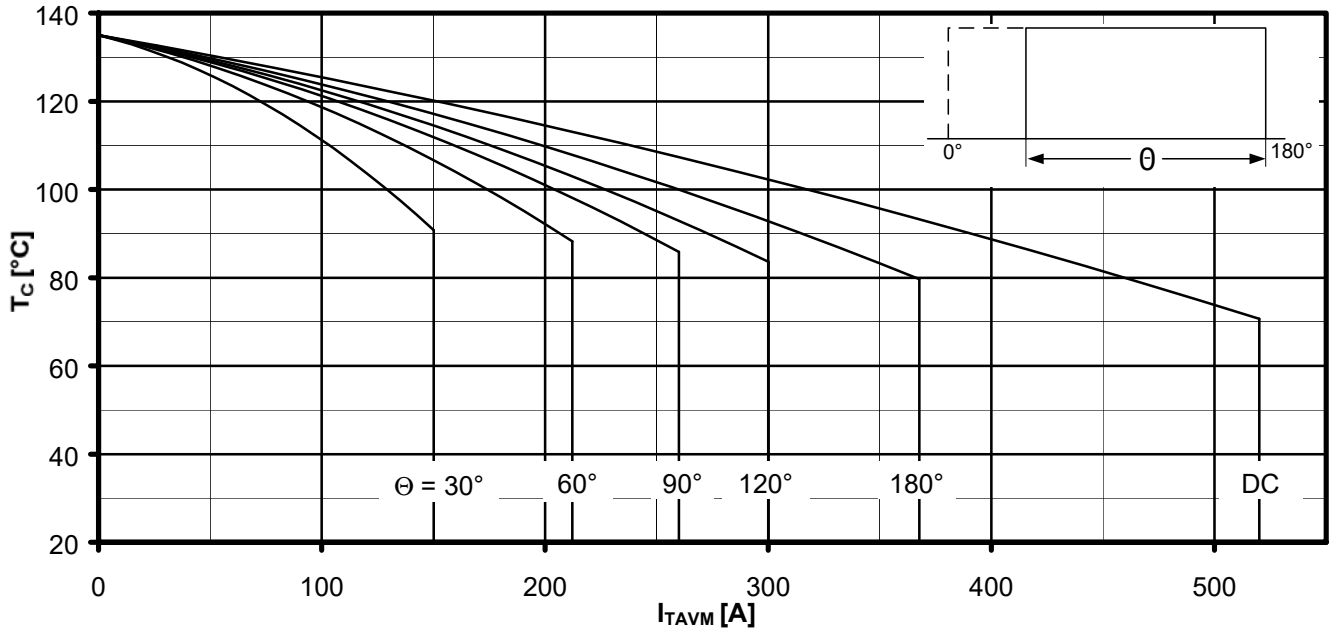


Maximum allowable case temperature $T_C = f(I_{TAVM})$

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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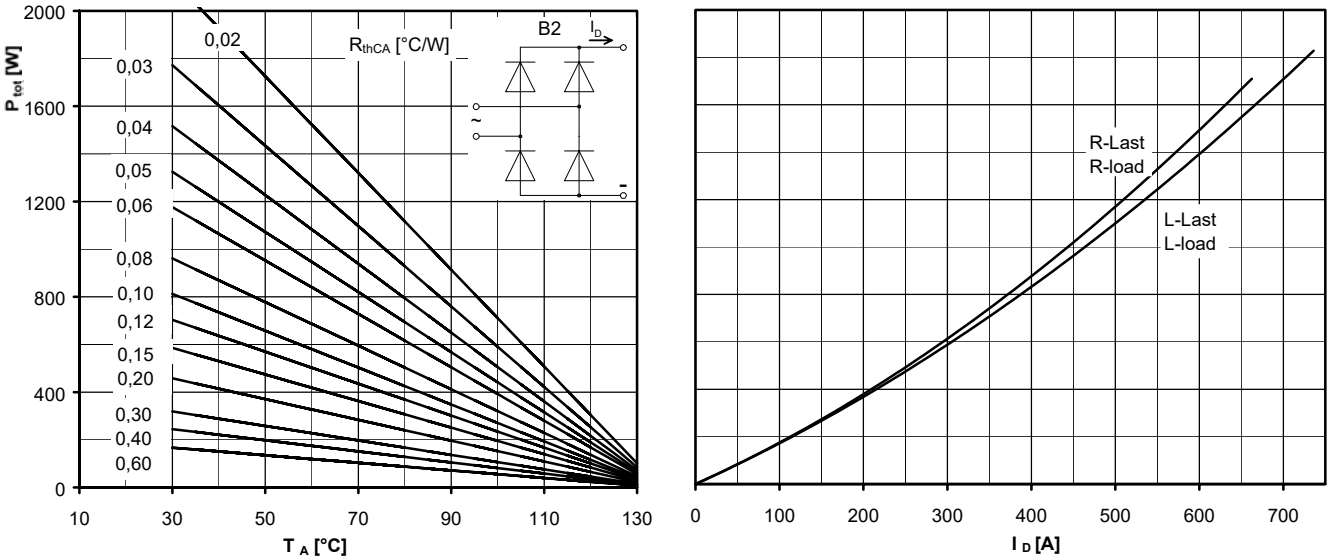
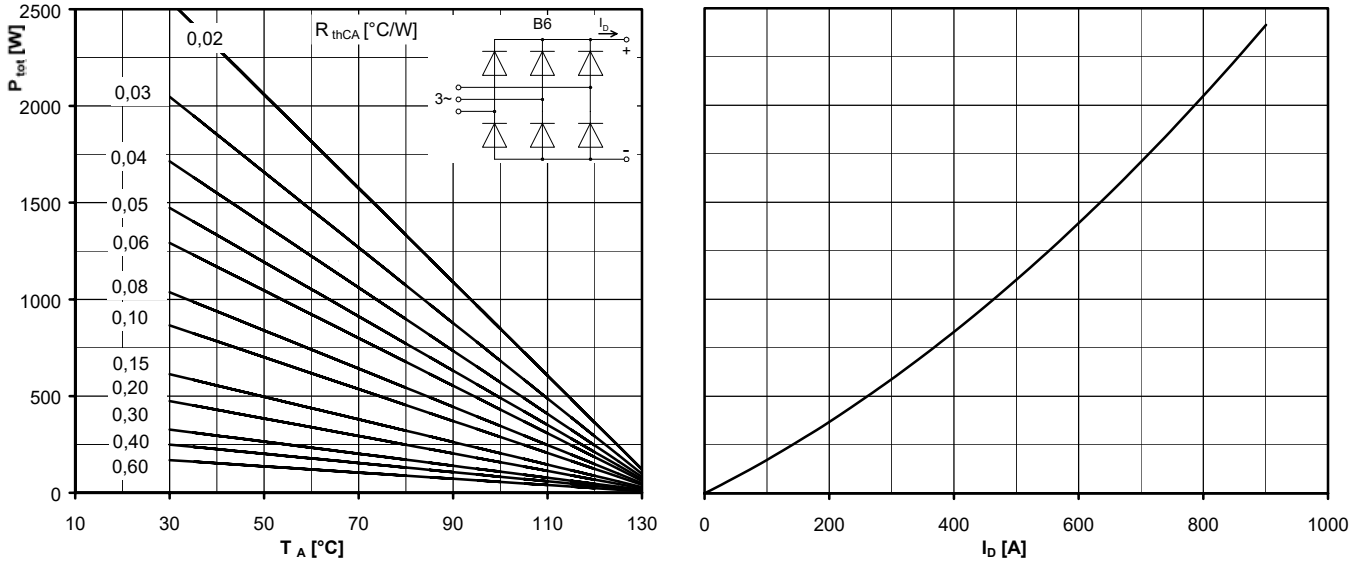
Single Thyristor Module



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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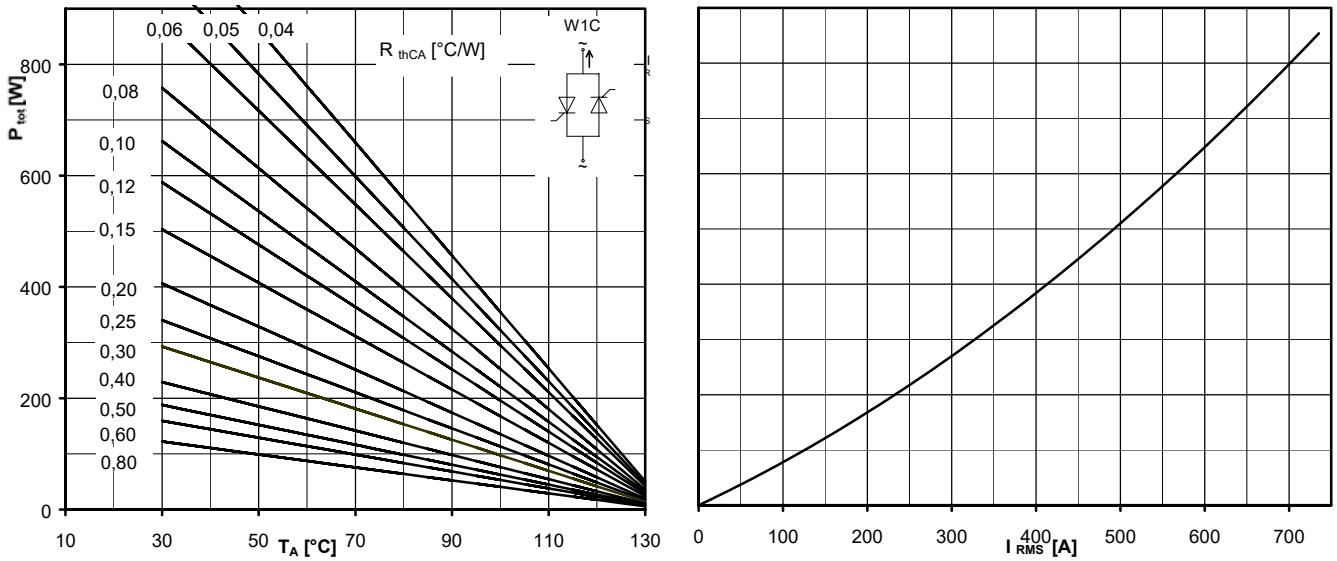
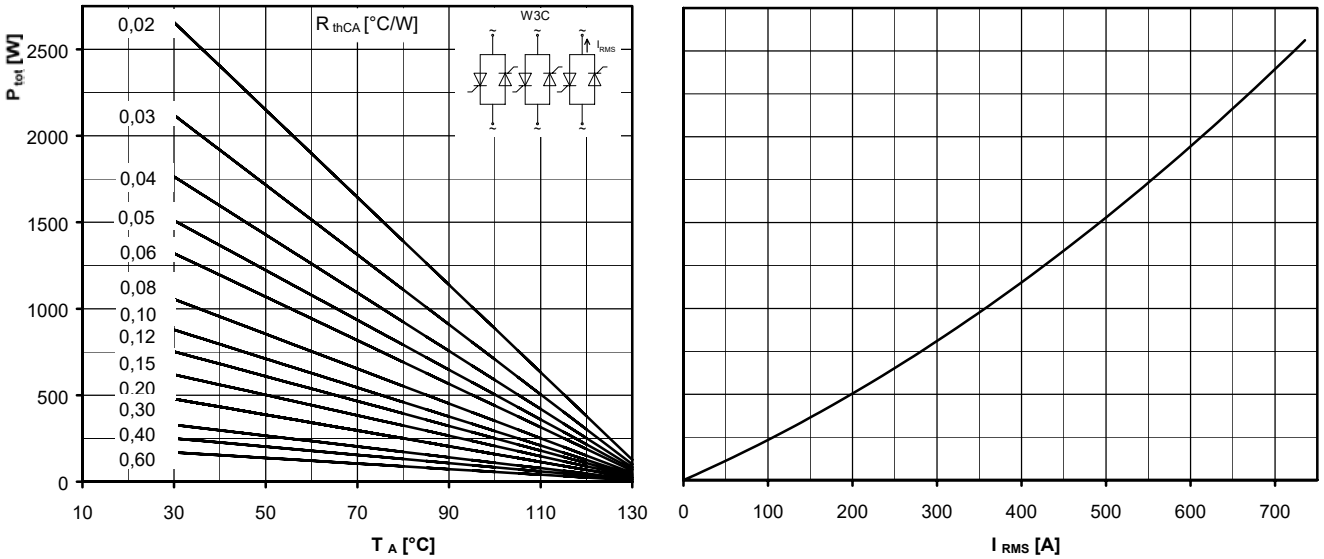
Single Thyristor Module



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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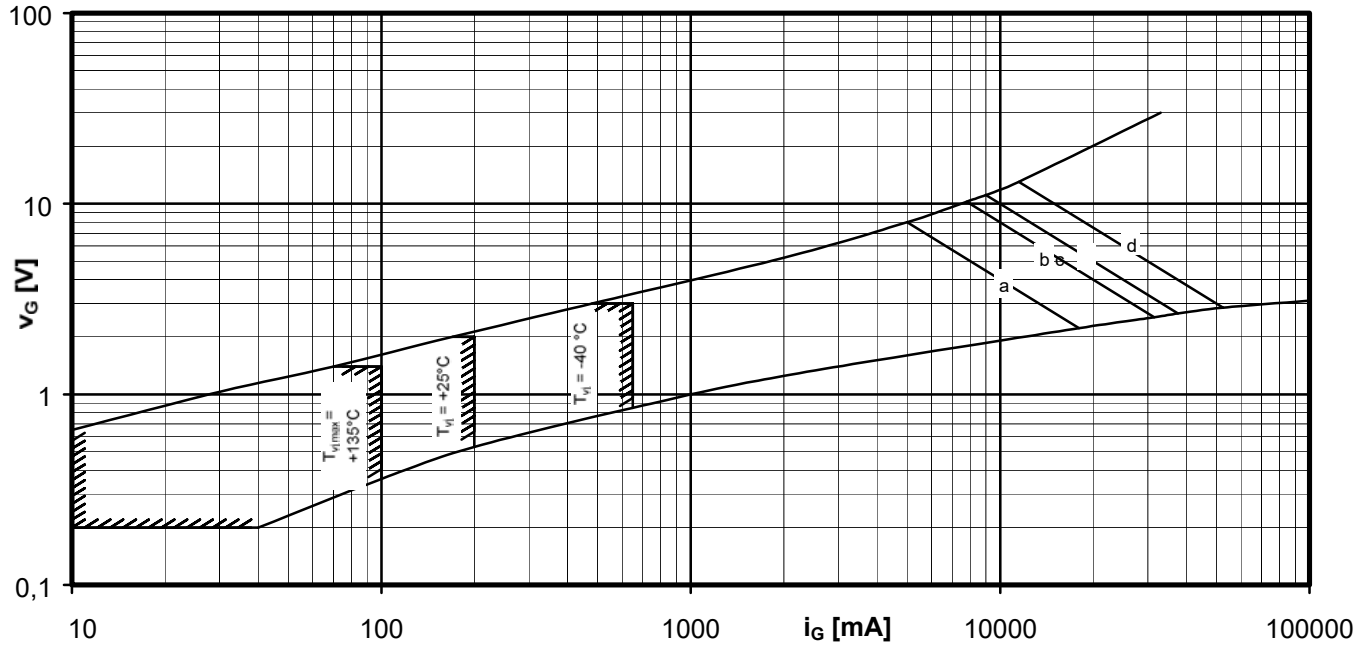
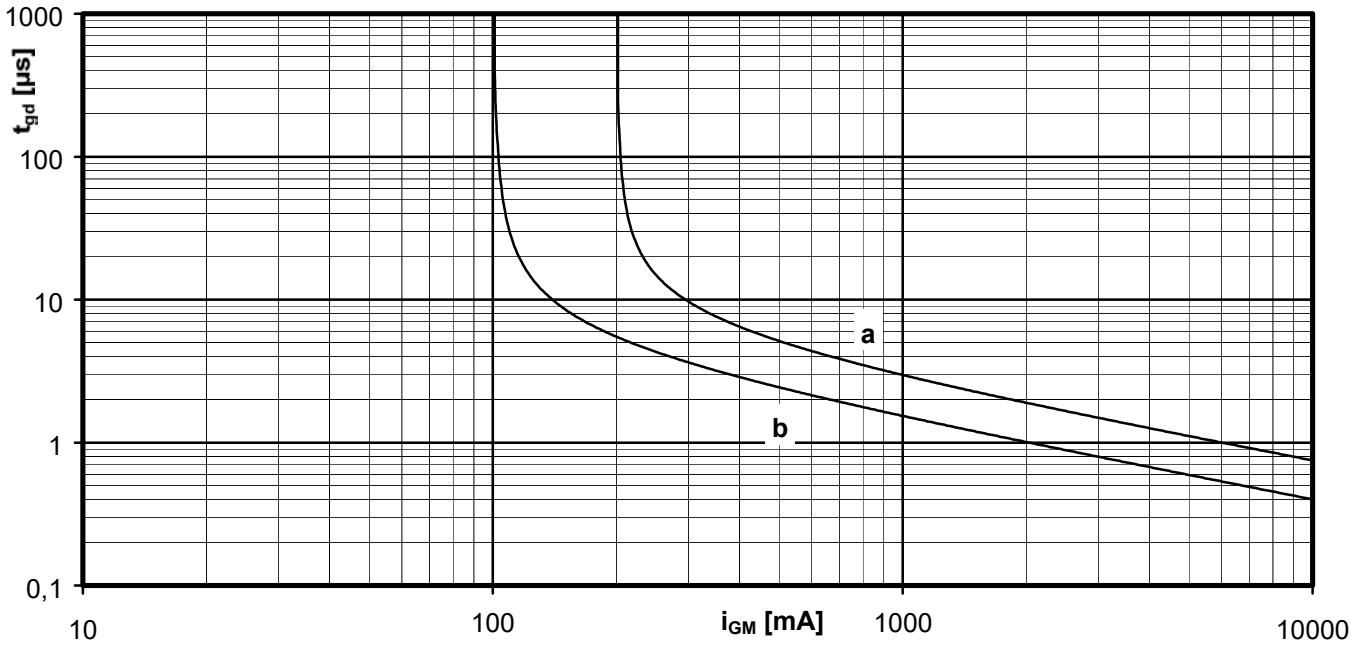
Single Thyristor Module



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 - 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°C,
$di_G/dt=i_{GM}/1\mu s$
a-Limiting characteristic
b-Typical characteristic

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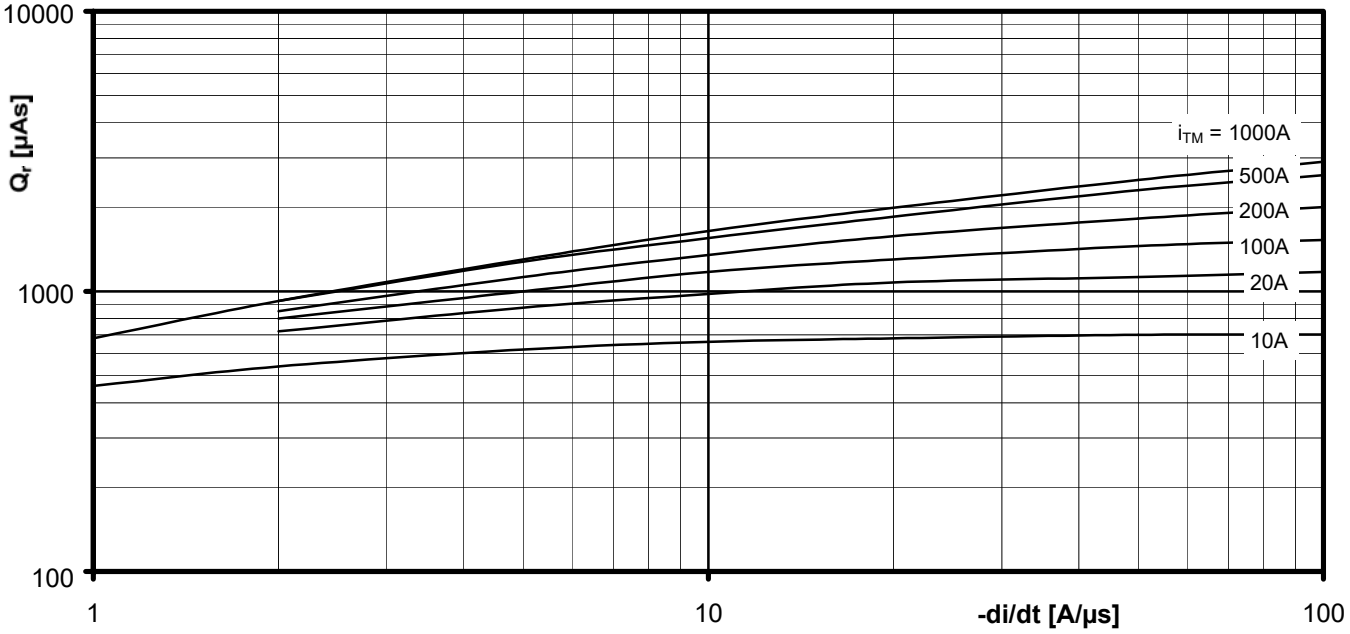
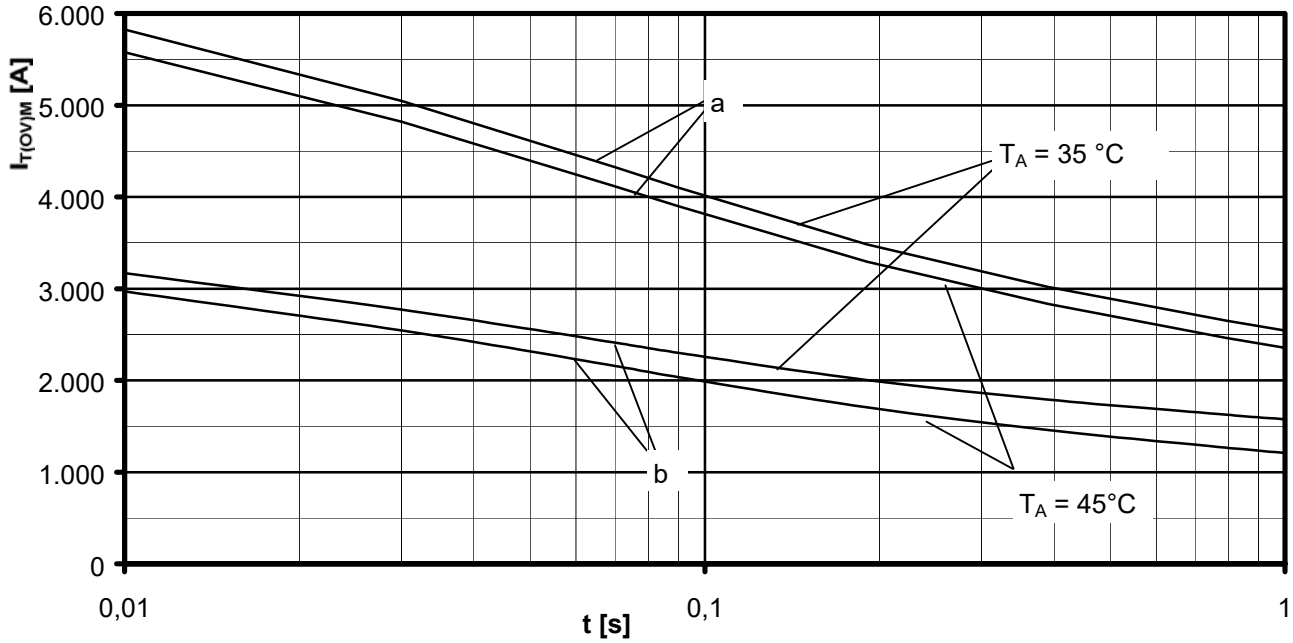


Recovered charge Q_r=f(-di/dt)
$T_{vj}=T_{vjmax}$,v_R≤0,5 V_{RRM}, v_{RM}=0,8 V_{RRM}
Parameter: On-state current i_{TM}



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°C, Forced air cooling
T_A=45°C, Natural air cooling

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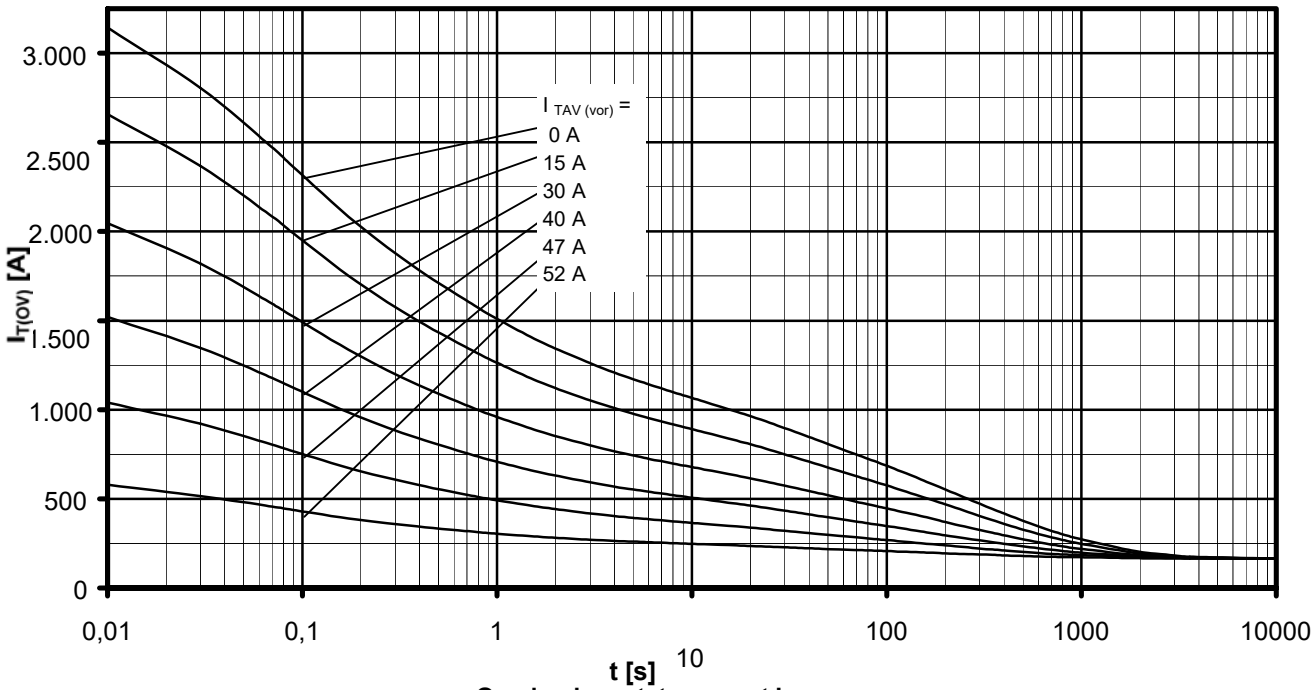
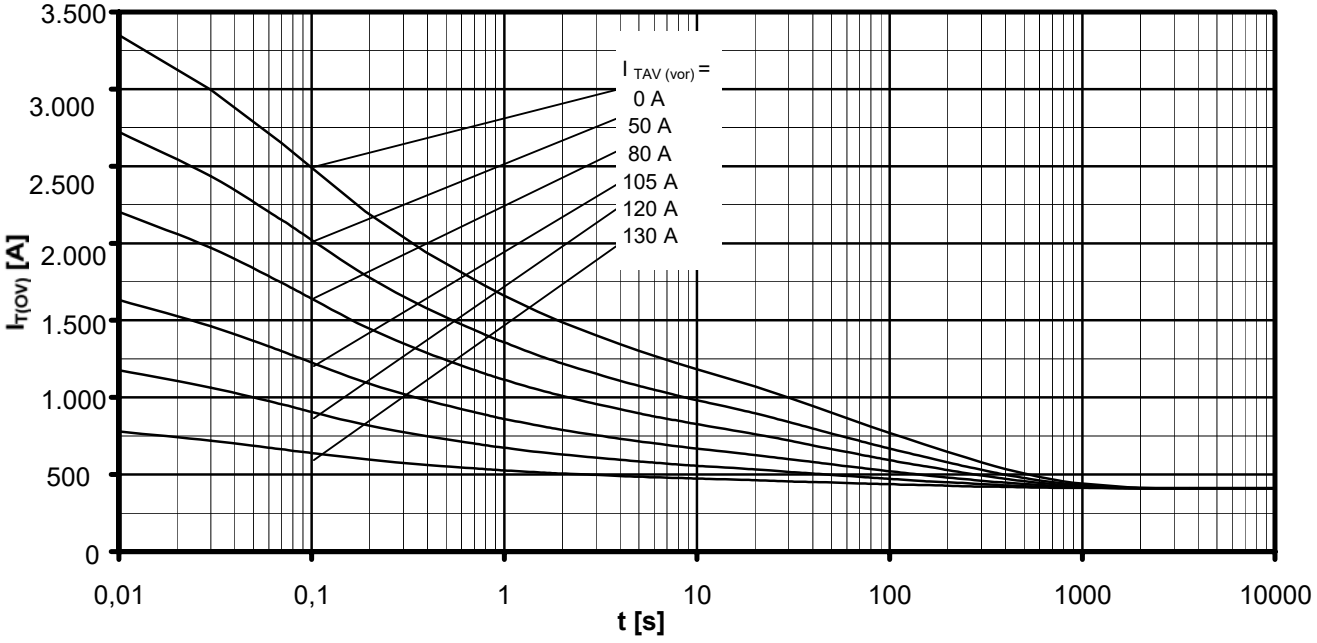


Overload on-state current $I_{T(OV)}$
Six-pulse bridge circuit, 120° rectangular
Heatsink type KM17 (45W) Natural cooling at T_A = 45°C
Parameter: Pre-load current per arm $I_{TAV(vor)}$



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 $I_{TAV(vor)}$