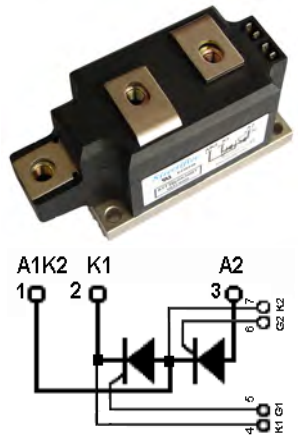
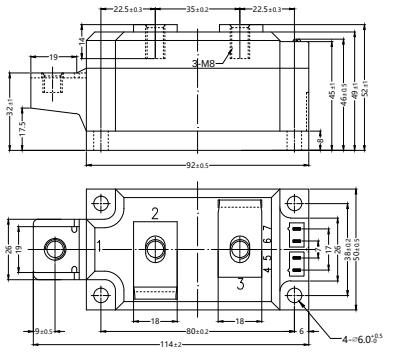
STT320GK40BT

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 $T_C=85^oC$; 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	
$\int i^2dt$	$T_{VJ}=45^oC$ $V_R=0$	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	347000 427000	
$(di/dt)_{cr}$	$T_{VJ}=T_{VJM}$ 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...+125 125 -40...+125	°C
V_{ISOL}	50/60Hz, RMS I_{ISOL}≤1mA	t=1min t=1s	4000 4500	V~
M_d	Mounting torque (M6) Terminal connection torque (M8)		5 9	Nm
Weight	Typical		650	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	≤ 2.60	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	0.040 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^2

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

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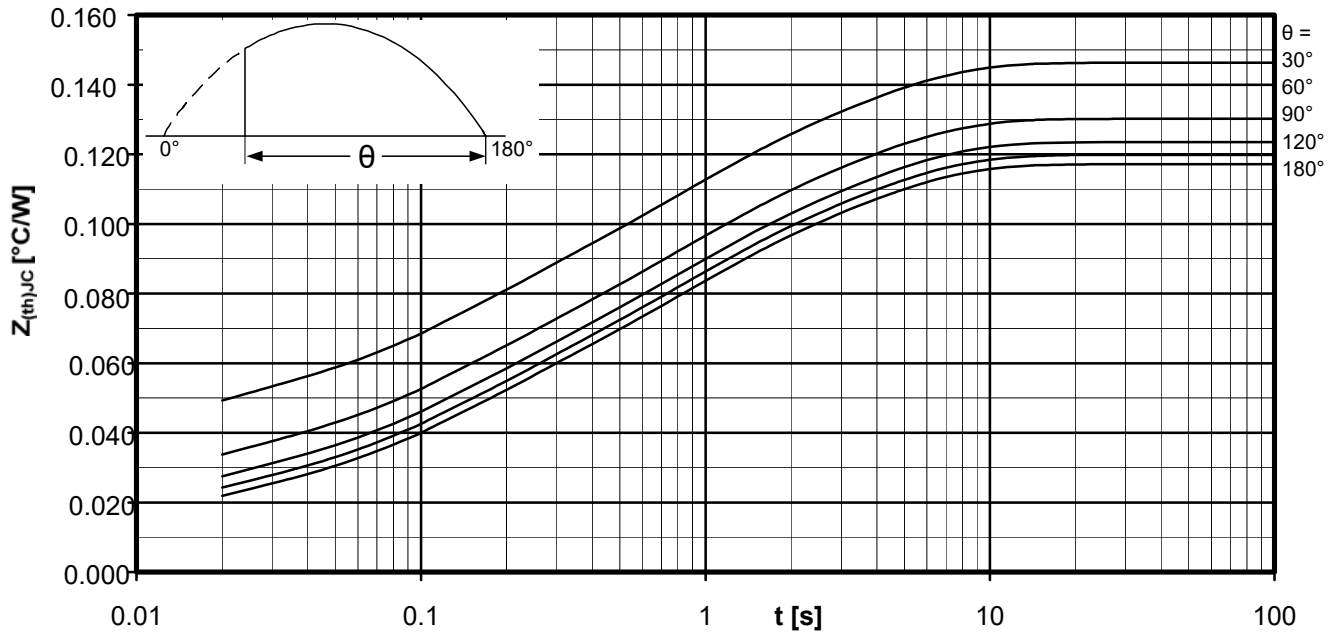
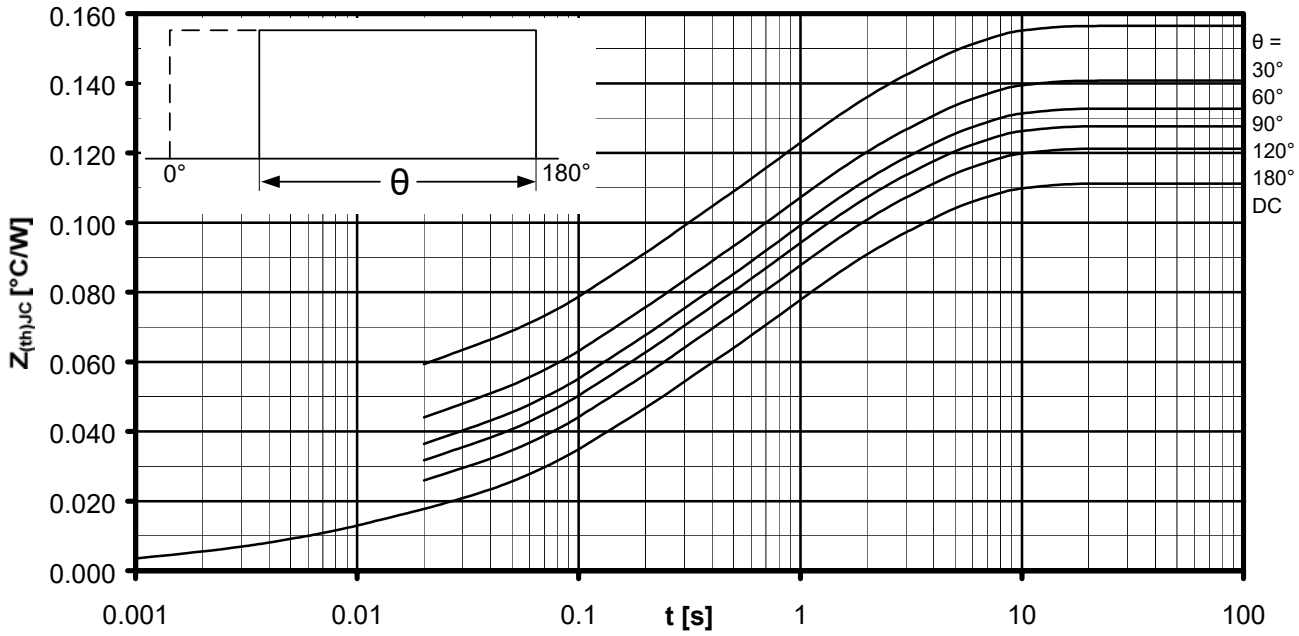


Transient thermal impedance per arm Z_{thJC} = f(t)
Sinusoidal current
Parameter: Current conduction angle θ



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

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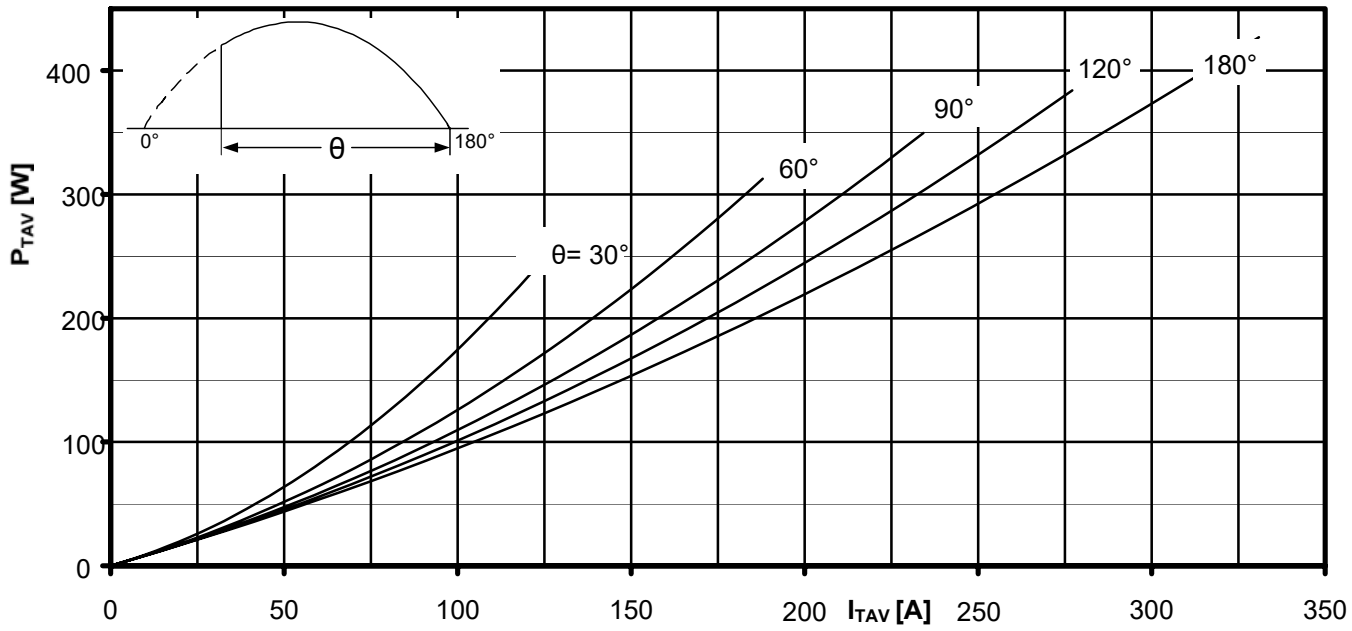
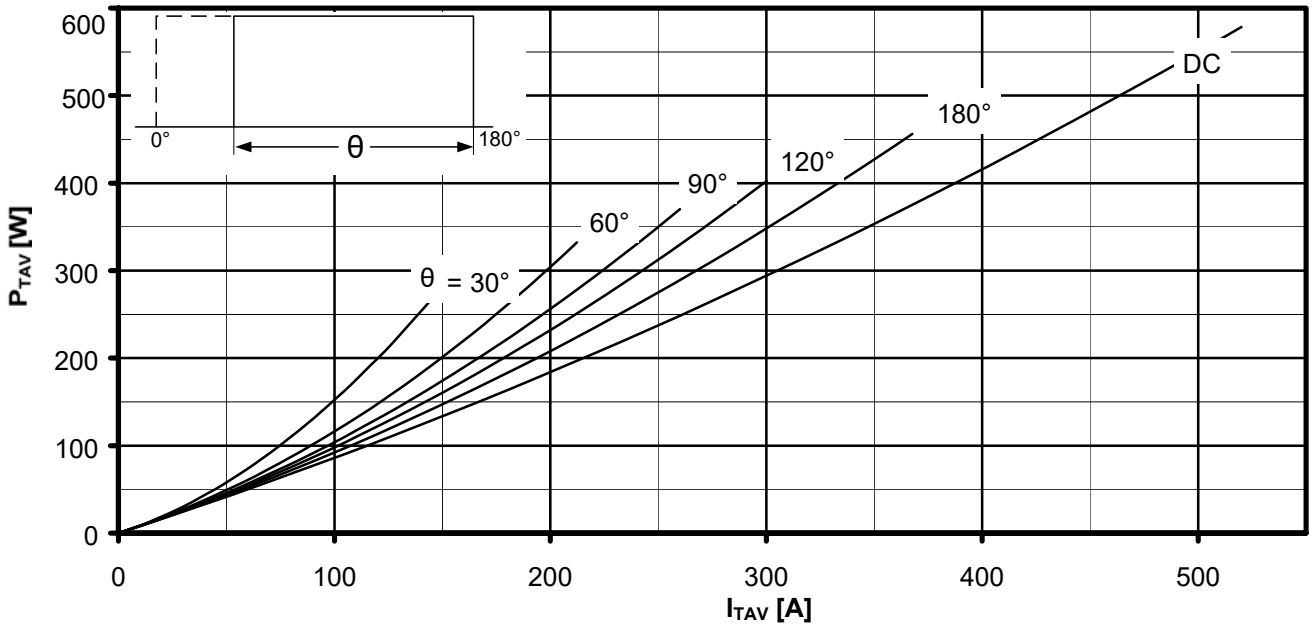


On-state power loss per arm $P_{TAV} = f(I_{TAV})$
Sinusoidal current
Current load per arm

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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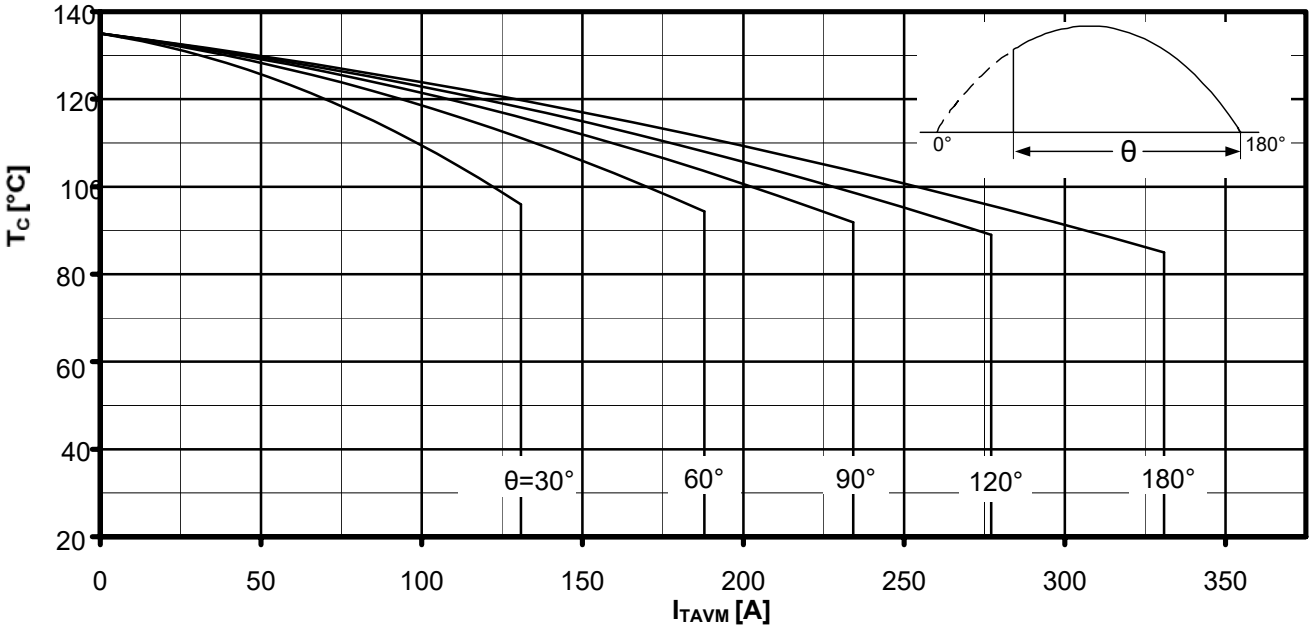
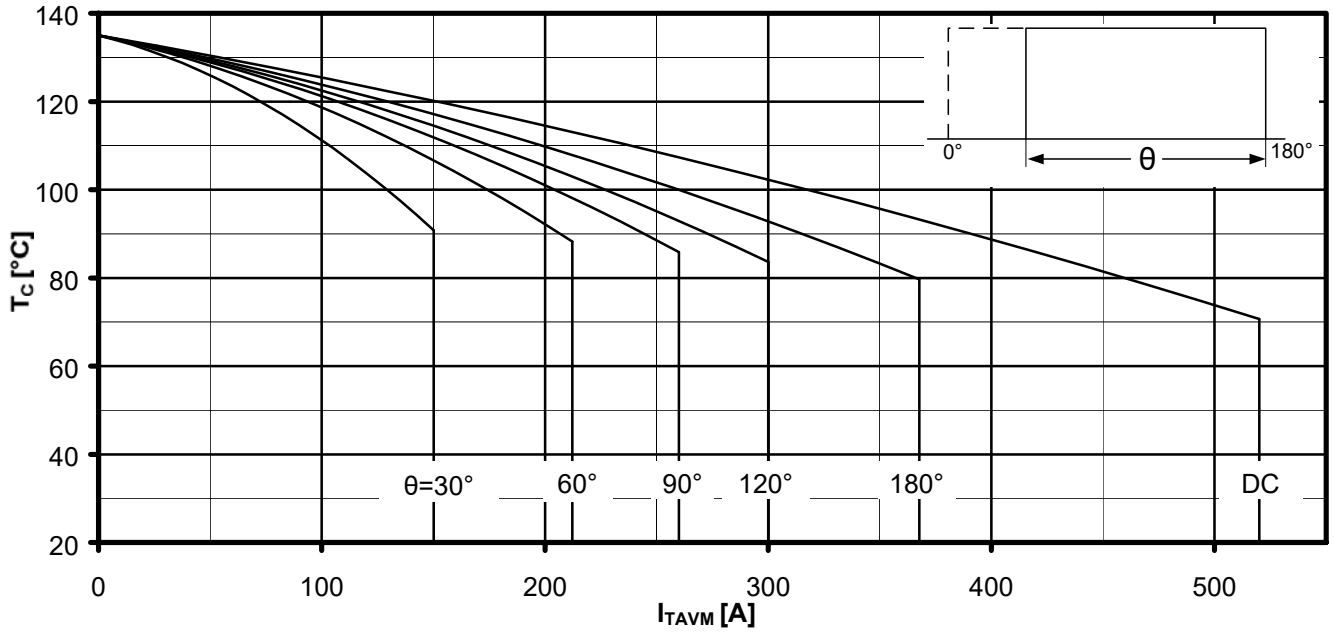


Maximum allowable case temperature $T_C = f(I_{TAVM})$

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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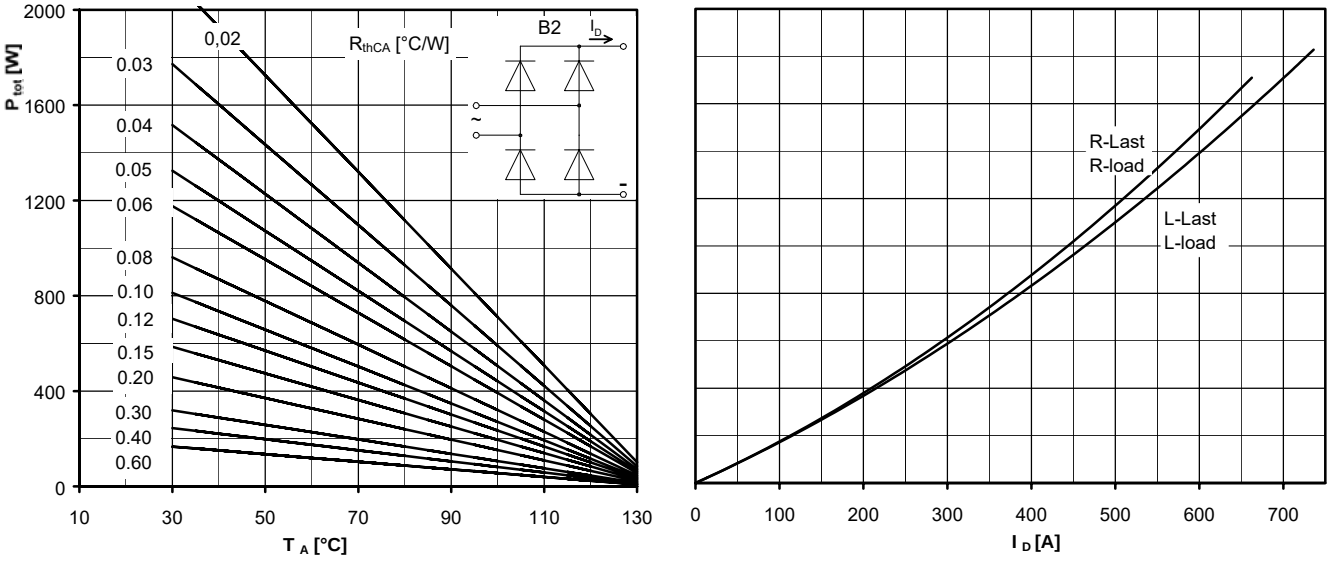
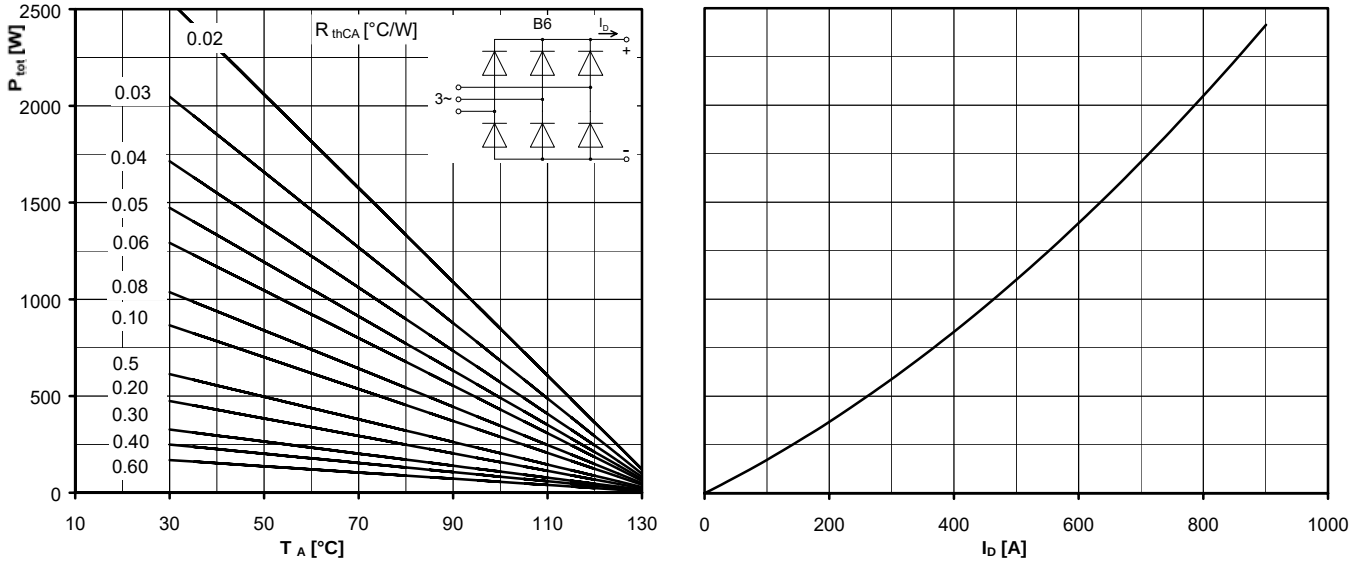


Maximum rated output current ID
Two-pulse bridge circuit
Total power dissipation at circuit P_{tot}
Parameter:
Thermal resistance cases to ambient R_{thCA}



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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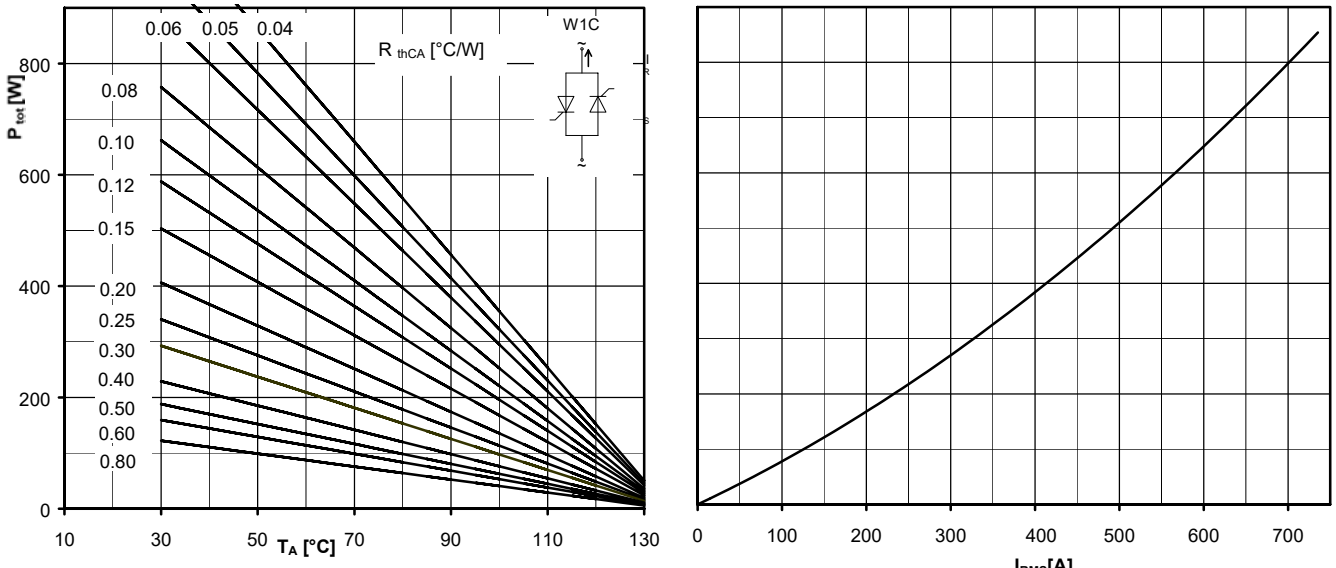
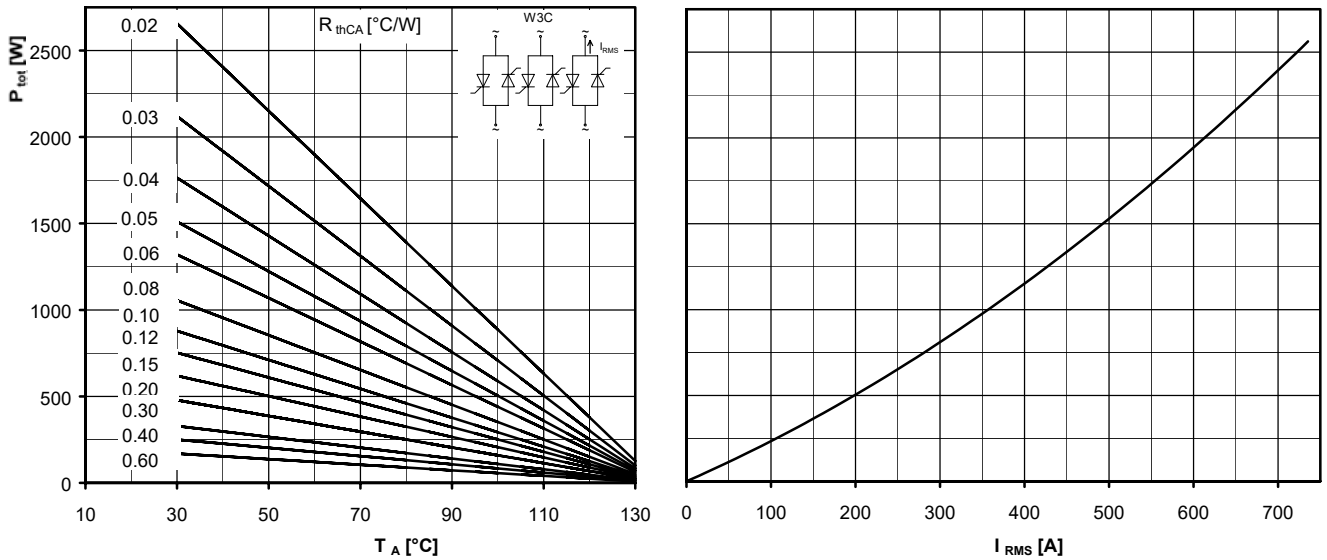


Maximum rated RMS current I_{RMS}
Single-phase inverse parallel circuit
Total power dissipation at circuit P_{tot}
Parameter:
Thermal resistance case to ambient R_{thCA}



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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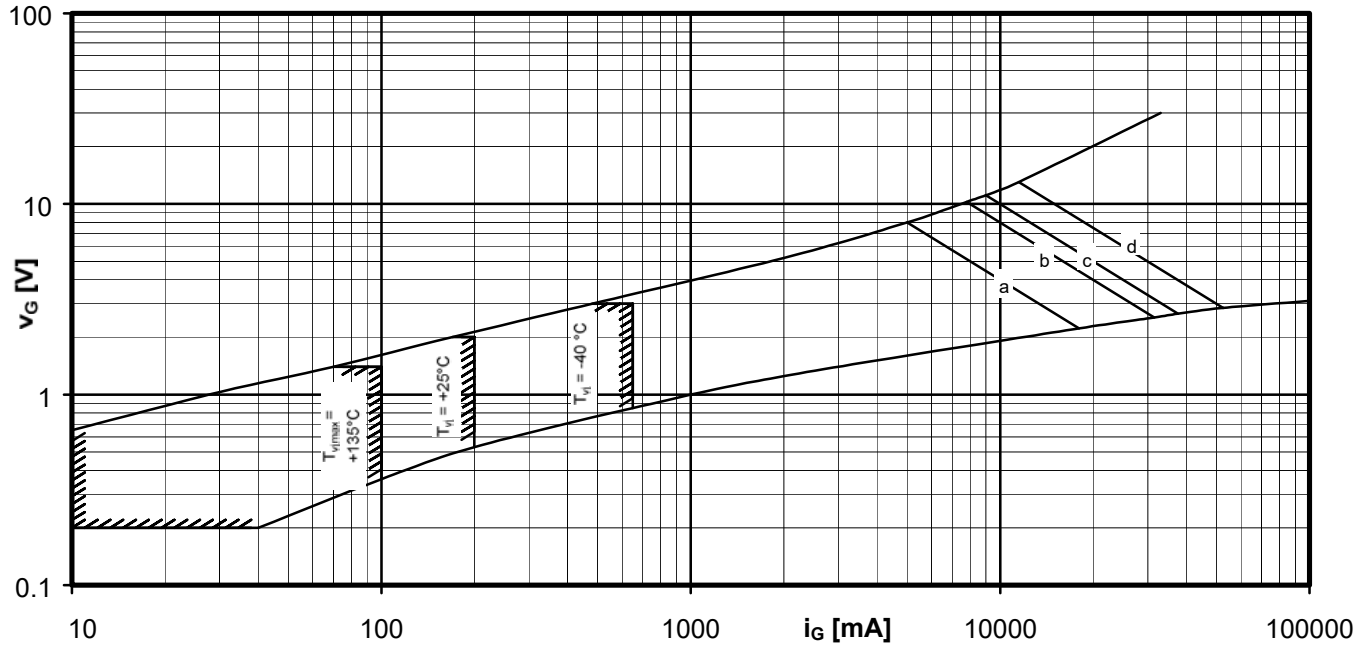
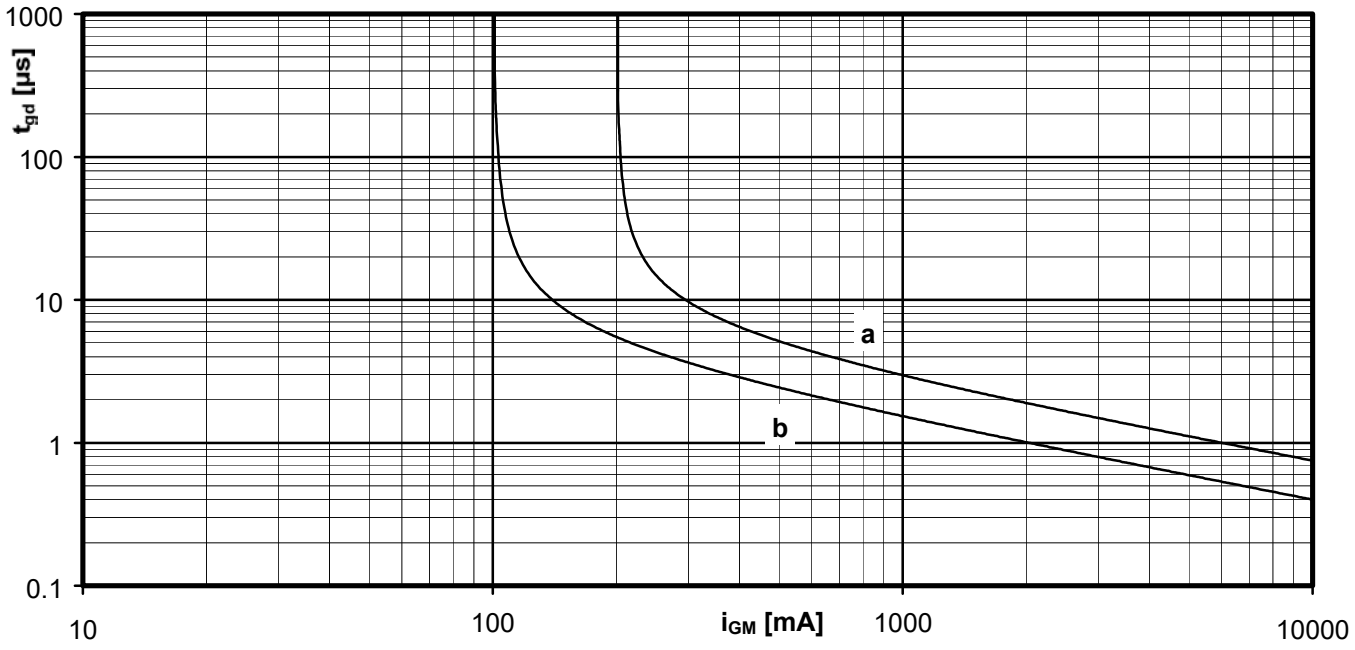


Gate characteristic $v_G = f(i_G)$ with triggering area for V_D = 6 V
Maximum rated peak gate power dissipation $P_{GM} = f(t_g)$:
a - 40 W/10ms b - 80 W/1ms c - 100 W/0,5ms d – 150W/0,1ms



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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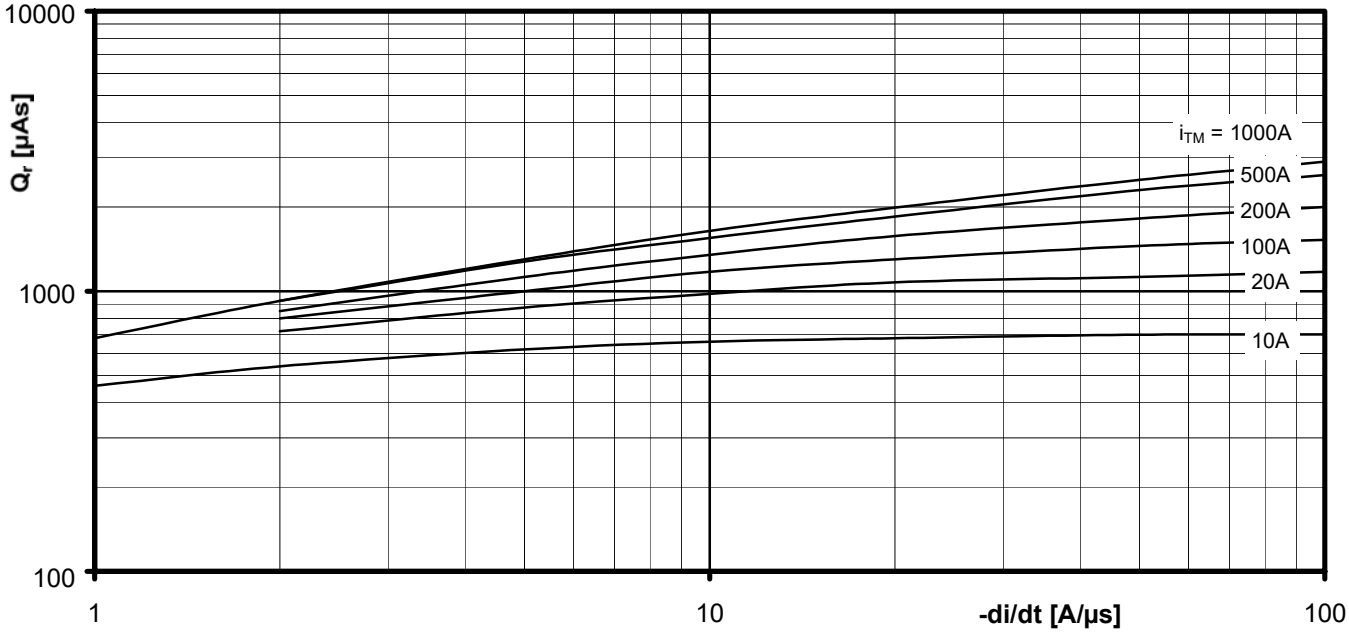
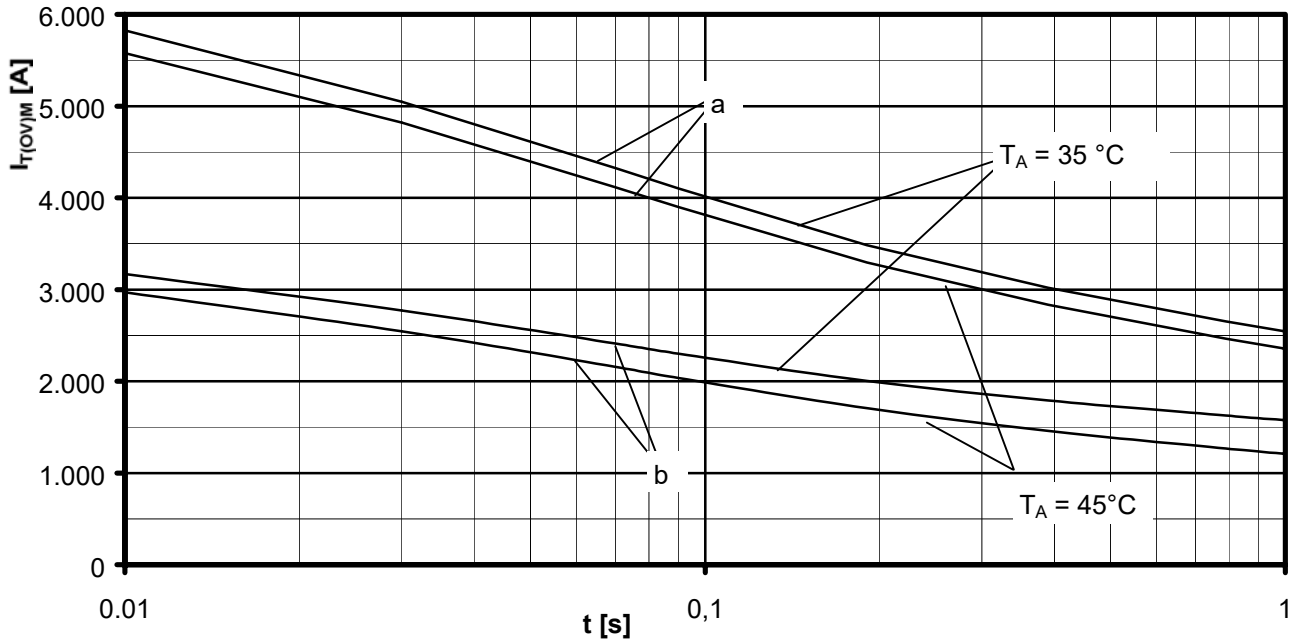


Recovered charge Q_r = f(-di/dt)
$T_{vj} = T_{vjmax}$, $v_R \leq 0,5\ V_{RRM}$, $v_{RM} = 0,8\ V_{RRM}$
Parameter: On-state current i_{TM}



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

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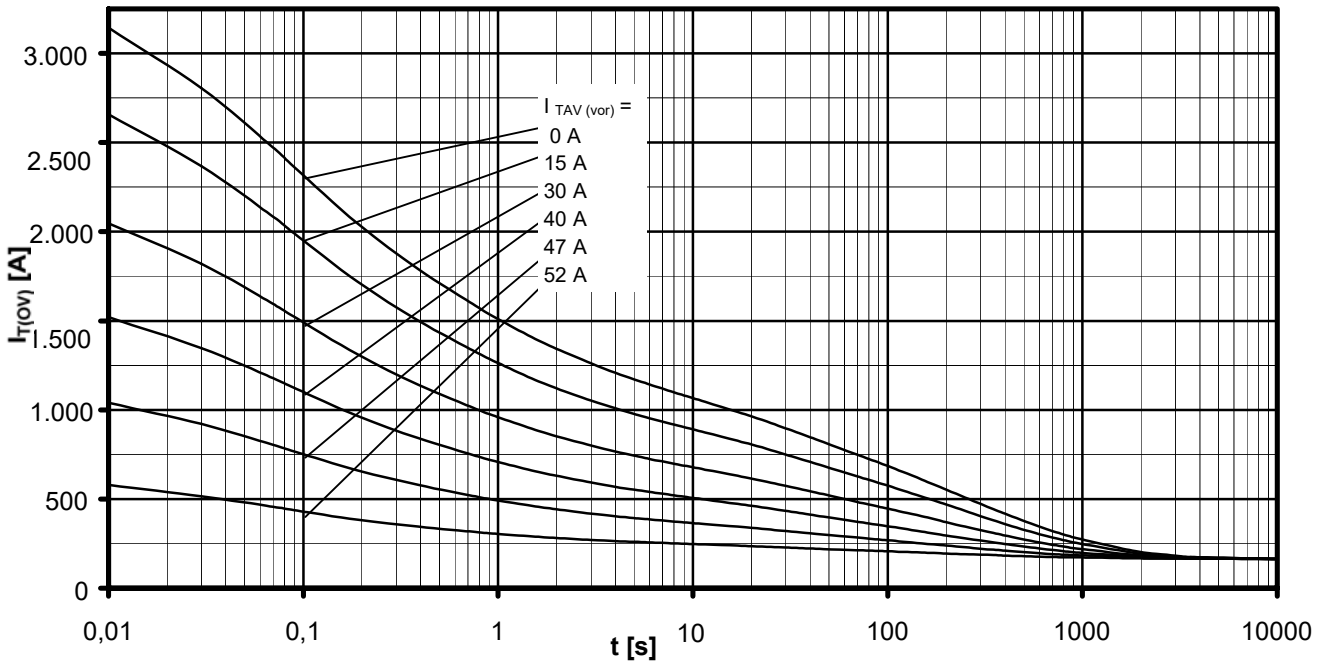
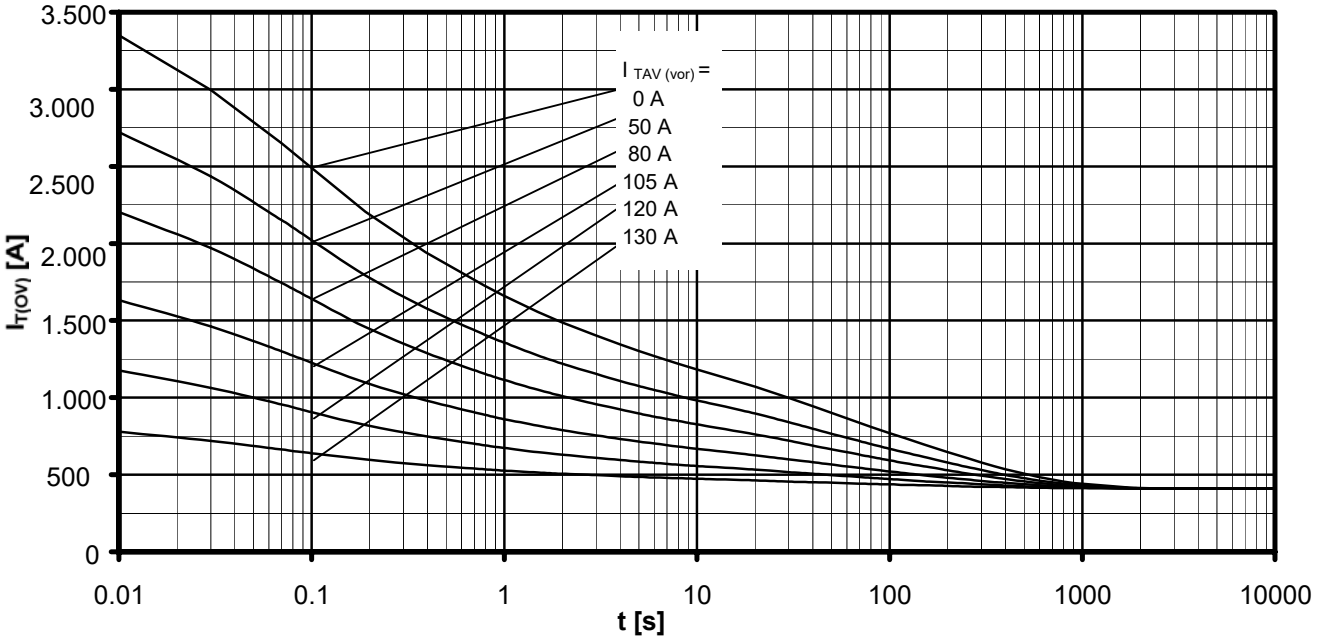


Overload on-state current $I_{T(OV)}$
Six-pulse bridge circuit, 120° rectangular
Heatsink type KM17 (45W) Natural cooling at T_A = 45°C
Parameter: Pre-load current per arm $I_{TAV(vor)}$



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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