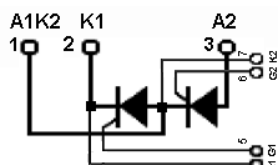
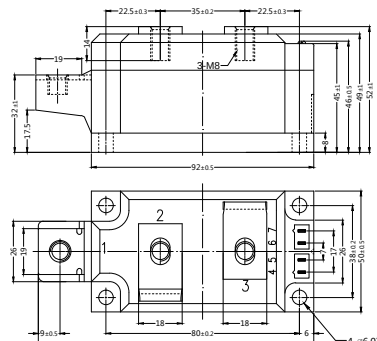


Thyristor-Thyristor Modules



Dimensions in mm (1mm=0.0394")



P1

STT320GK26BT

Thyristor-Thyristor Modules

Symbol	Test Conditions	Characteristic Values		Unit
I_{RRM}, I_{DRM}	$T_{VJ}=T_{VJM}; V_R=V_{RRM}; V_D=V_{DRM}$	60		mA
V_{TM}	$I_{TM}=960A; T_{VJ}=25^{\circ}C$	$\leq 1800V$	2000-2600V	V
		1.85	2.20	
V_{TO}	For power-loss calculations only ($T_{VJ}=T_{VJM}$)	0.8		V
r_T		0.6		mΩ
V_{GT}	$V_D=6V;$ $T_{VJ}=25^{\circ}C$ $T_{VJ}=-40^{\circ}C$	2 2.6		V
I_{GT}	$V_D=6V;$ $T_{VJ}=25^{\circ}C$ $T_{VJ}=-40^{\circ}C$	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	$T_{VJ}=25^{\circ}C; t_p=30\mu s; V_D=6V$ $I_G=0.45A; di_G/dt=0.45A/\mu s$	1200		mA
I_H	$T_{VJ}=25^{\circ}C; V_D=6V; R_{GK}=\infty$	300		mA
t_{gd}	$T_{VJ}=25^{\circ}C; V_D=1/2V_{DRM}$ $I_G=0.5A; di_G/dt=0.5A/\mu s$	3		μs
t_q	$T_{VJ}=T_{VJM}; I_T=320A; t_p=200\mu s; -di/dt=10A/\mu s$ $V_R=100V; dv/dt=20V/\mu s; V_D=2/3V_{DRM}$ typ.	250		μs
Q_S	$T_{VJ}=T_{VJM}; I_T, I_F=320A; -di/dt=50A/\mu s$	650		μC
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

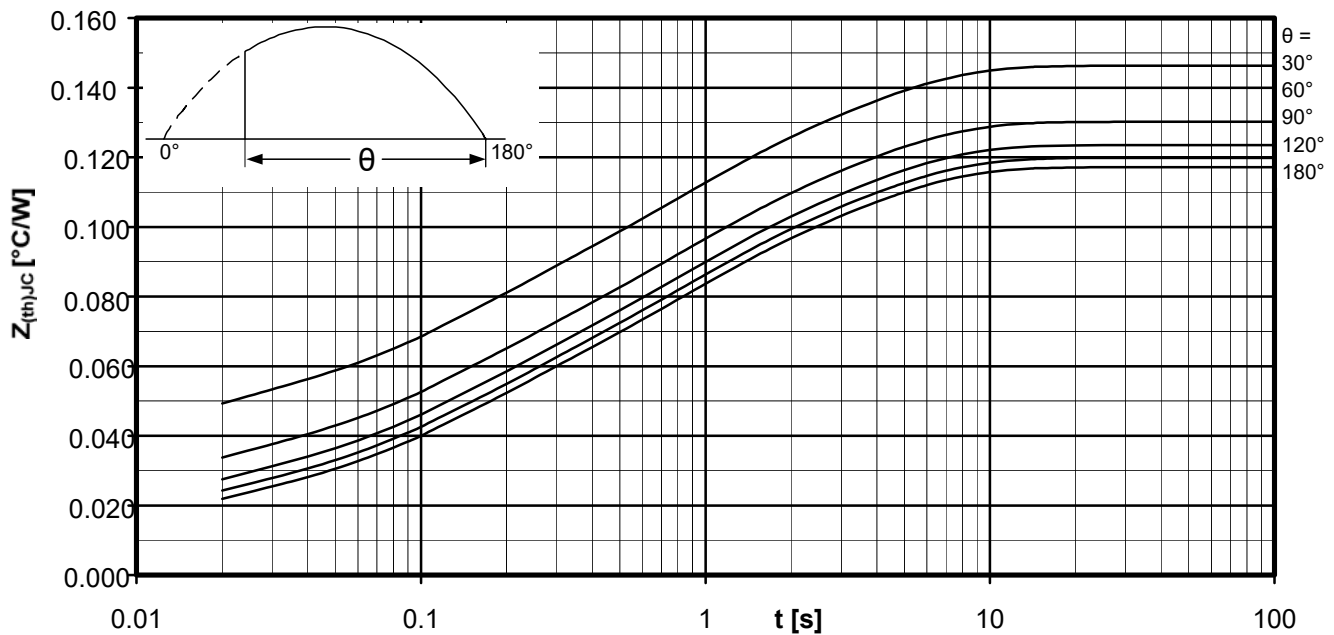
- * Space and weight savings
- * Simple mounting
- * Improved temperature and power cycling
- * Reduced protection circuits



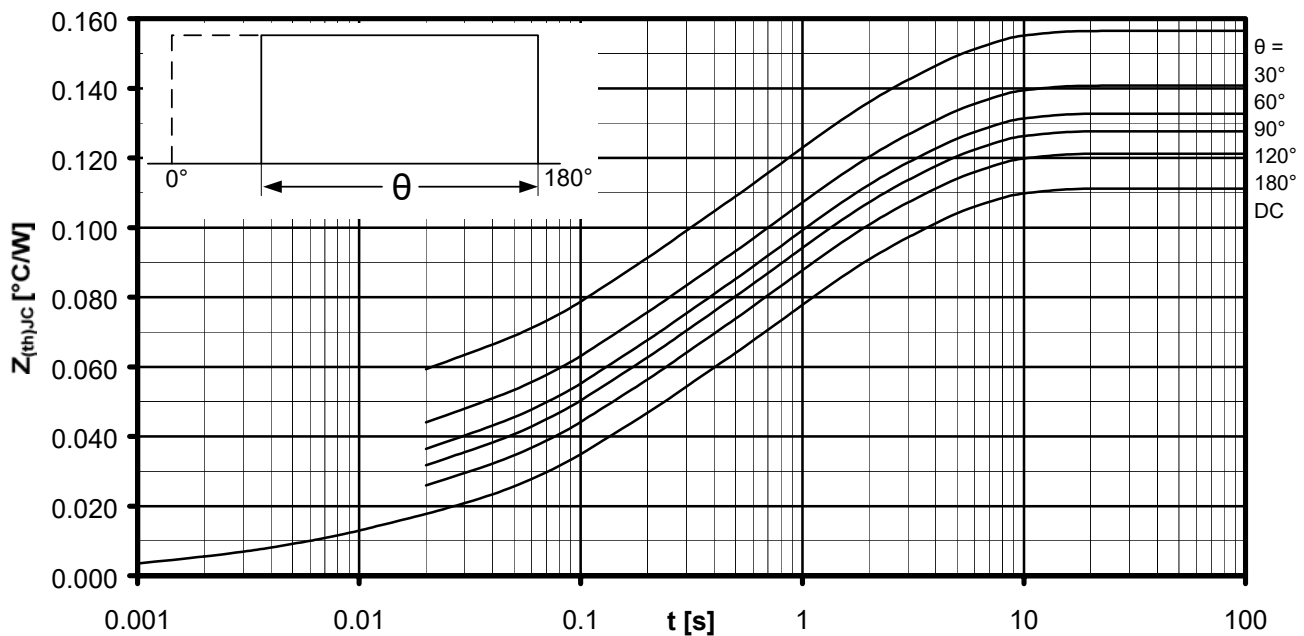
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Thyristor-Thyristor Modules



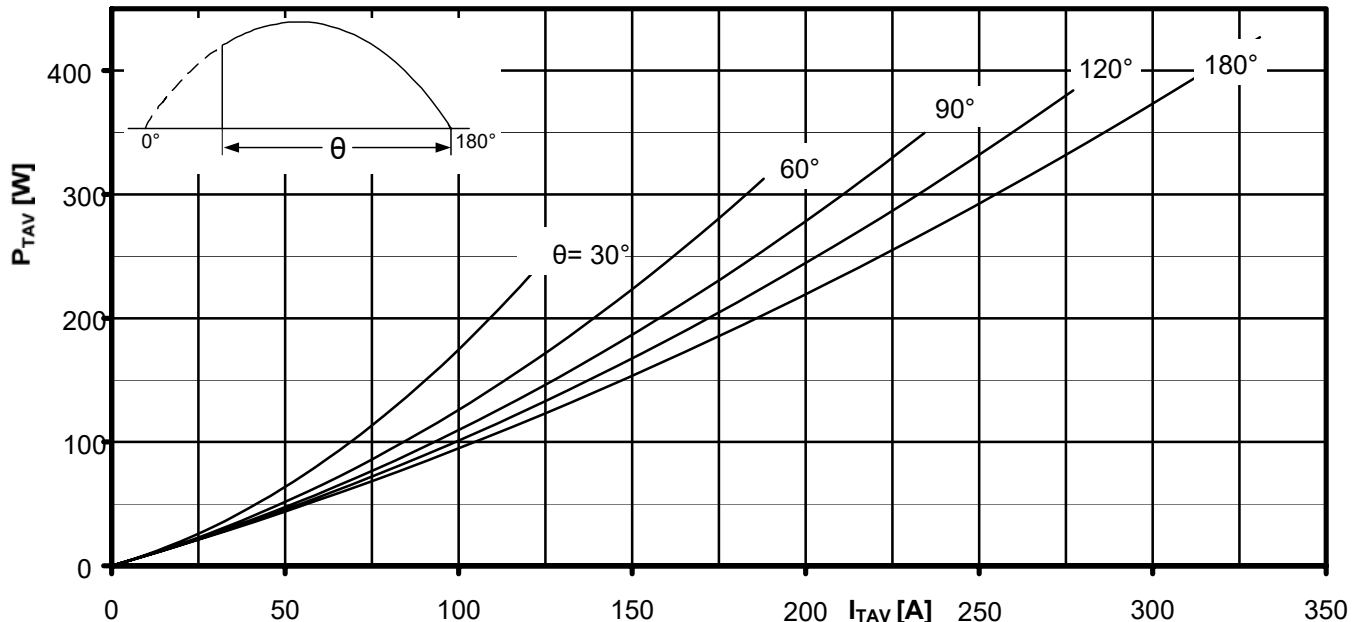
Transient thermal impedance per arm $Z_{thJC} = f(t)$
Sinusoidal current
Parameter: Current conduction angle θ



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

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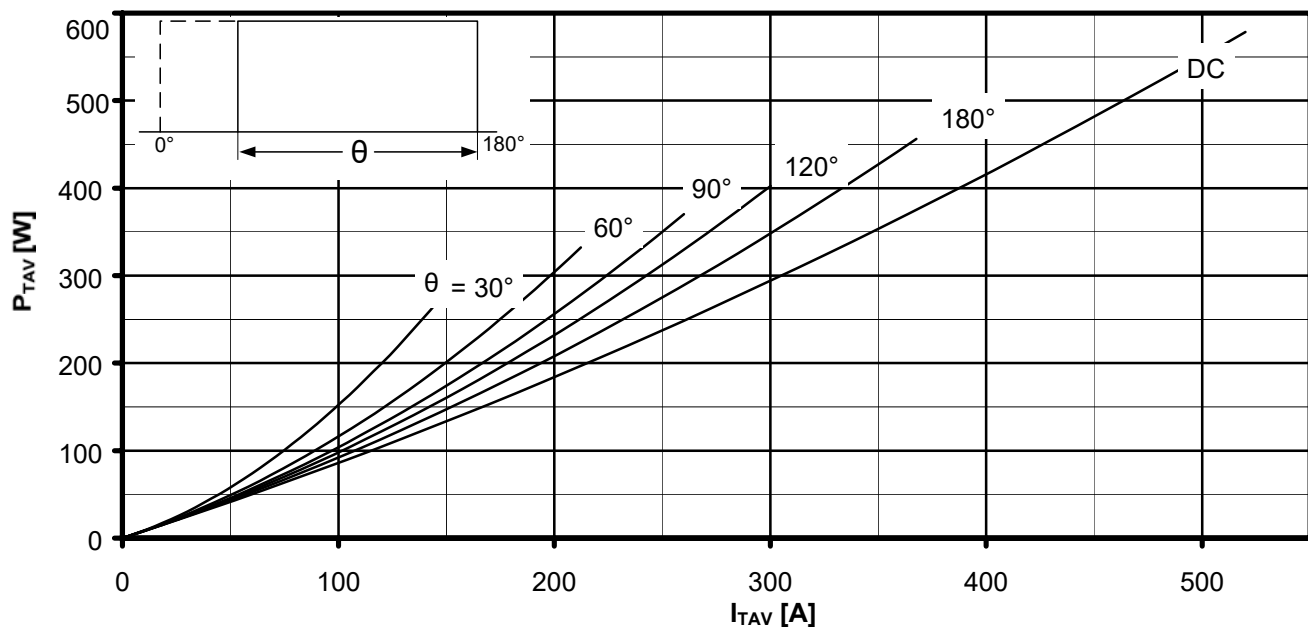
Thyristor-Thyristor Modules



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



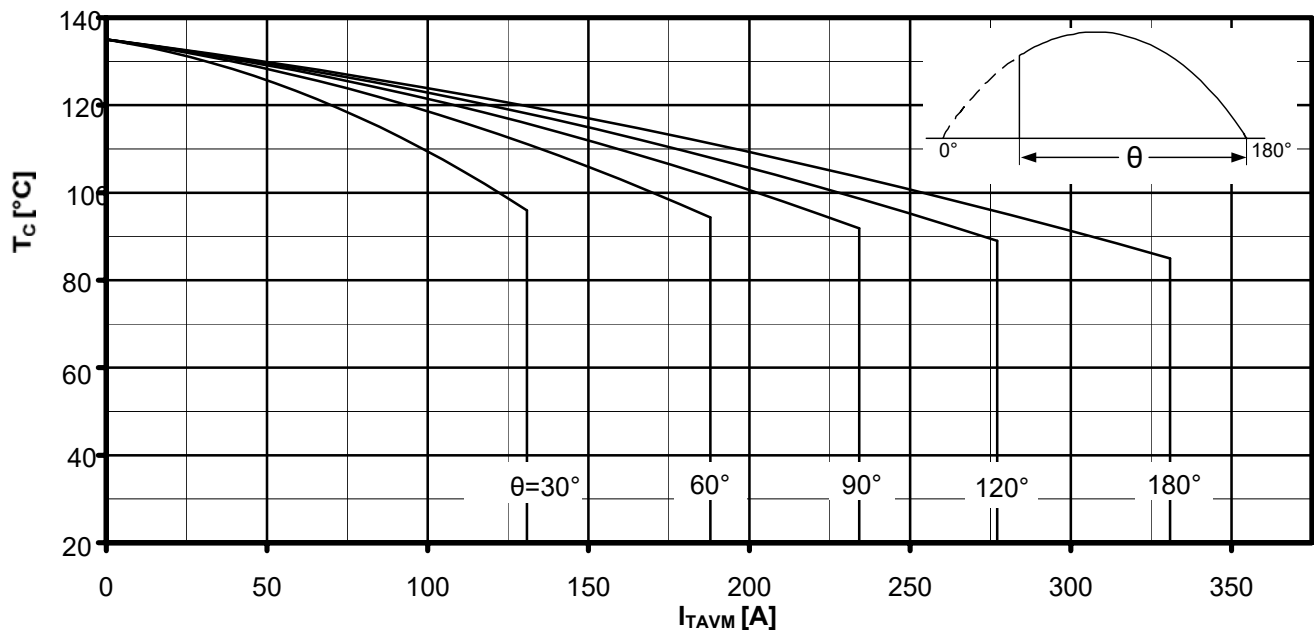
On-state power loss per arm $P_{TAV} = f(I_{TAV})$
Rectangular current Current load per arm

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

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Thyristor-Thyristor Modules

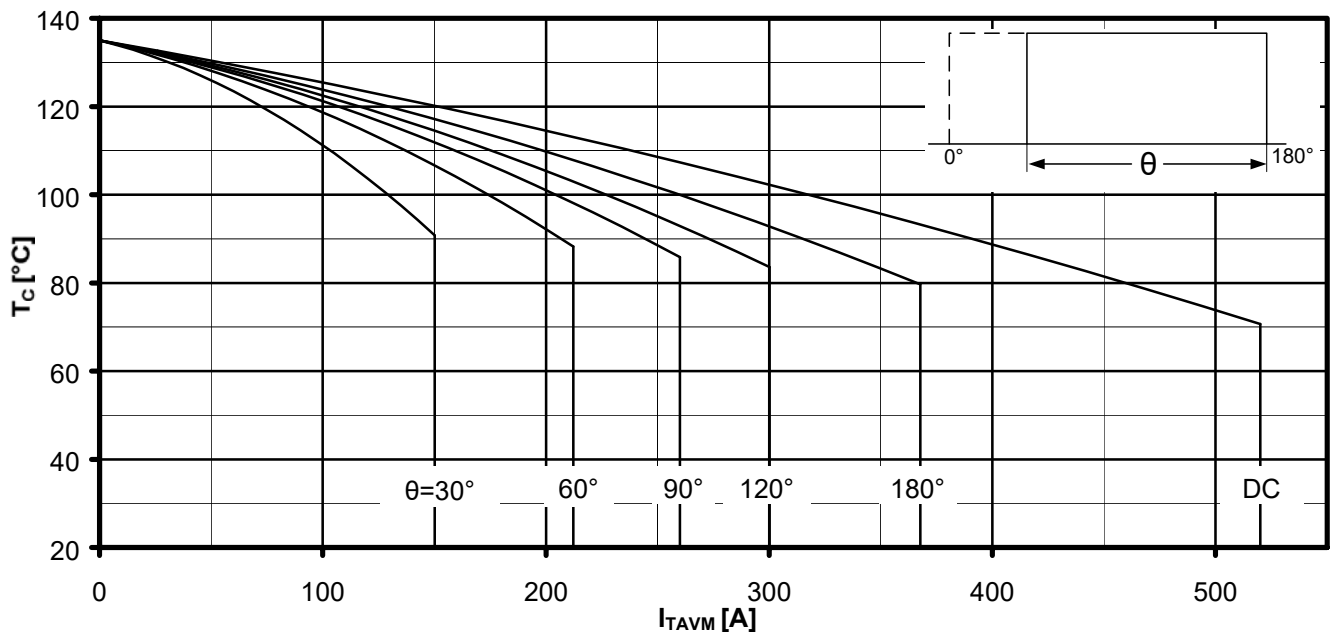


Maximum allowable case temperature $T_c = f(I_{TAVM})$

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

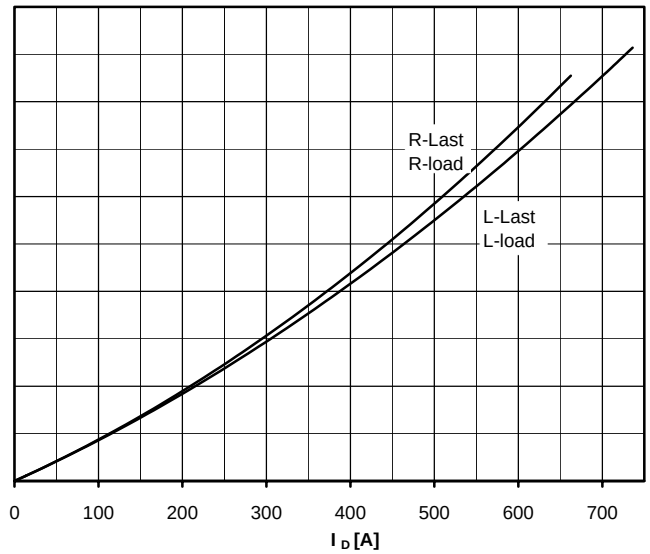
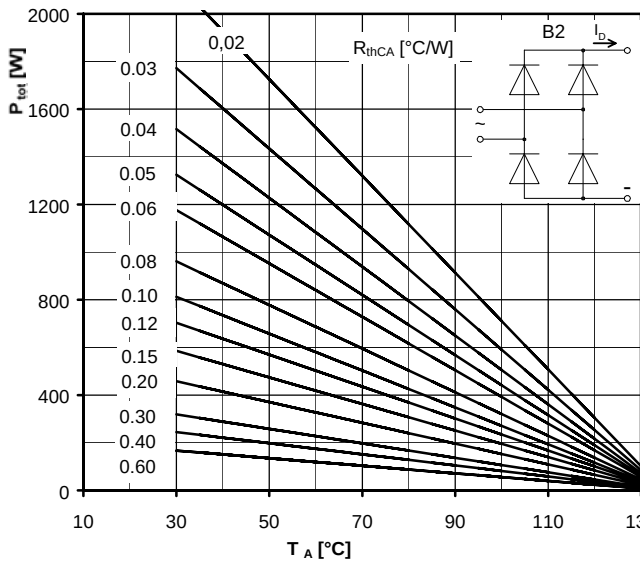
Calculation base P_{TAV} (switching losses should be considered separately)

Parameter: Current conduction angle θ

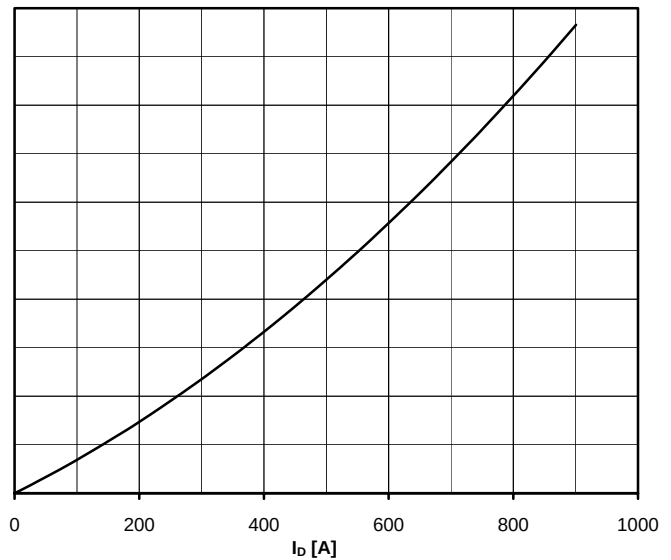
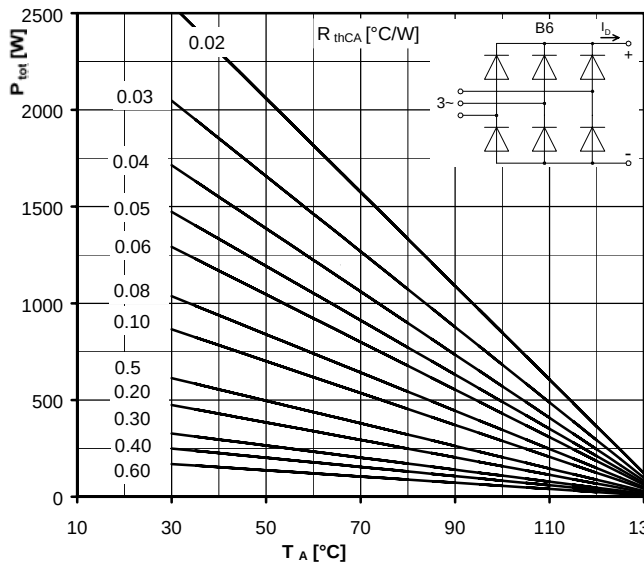
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Thyristor-Thyristor Modules



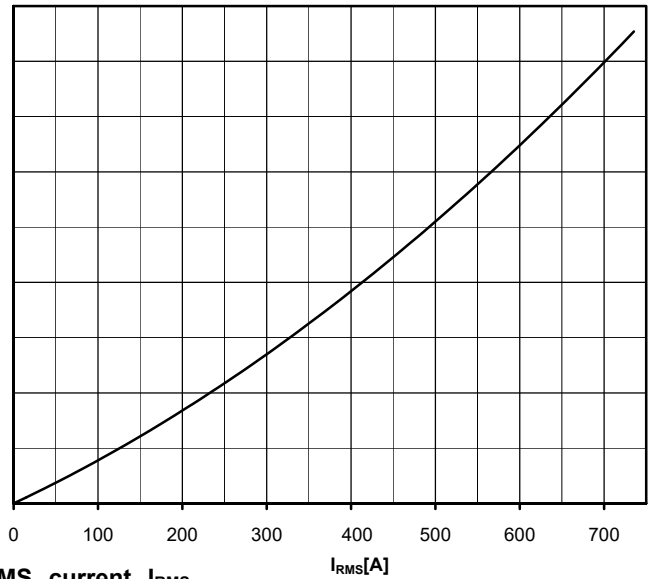
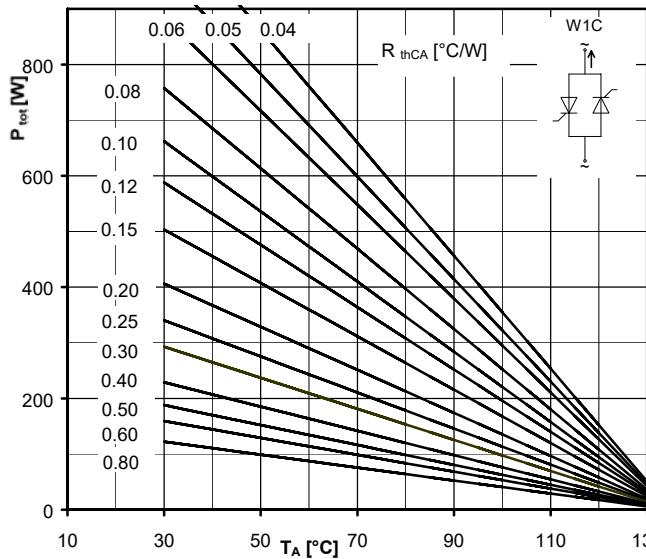
Maximum rated output current I_D
Two-pulse bridge circuit
Total power dissipation at circuit P_{tot}
Parameter:
Thermal resistance cases to ambient R_{thCA}



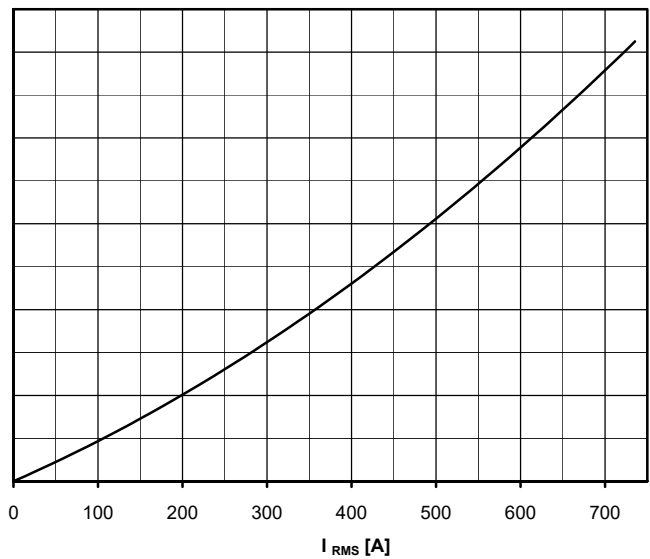
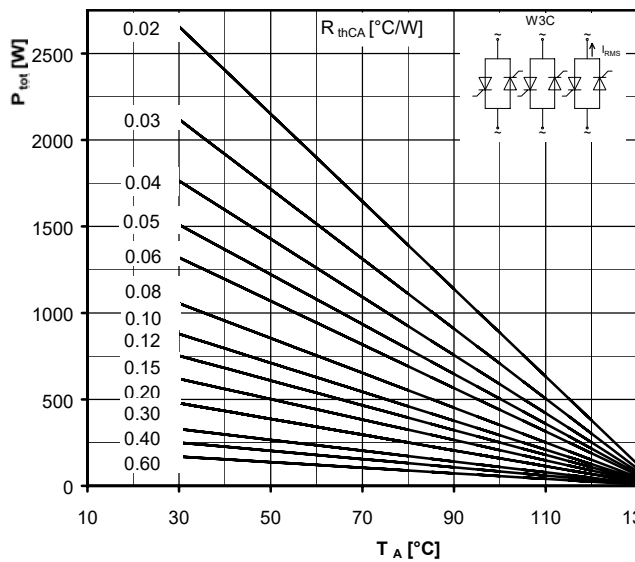
Maximum rated output current I_D
Six-pulse bridge circuit
Total power dissipation at circuit P_{tot}
Parameter:
Thermal resistance cases to ambient R_{thCA}

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Thyristor-Thyristor Modules



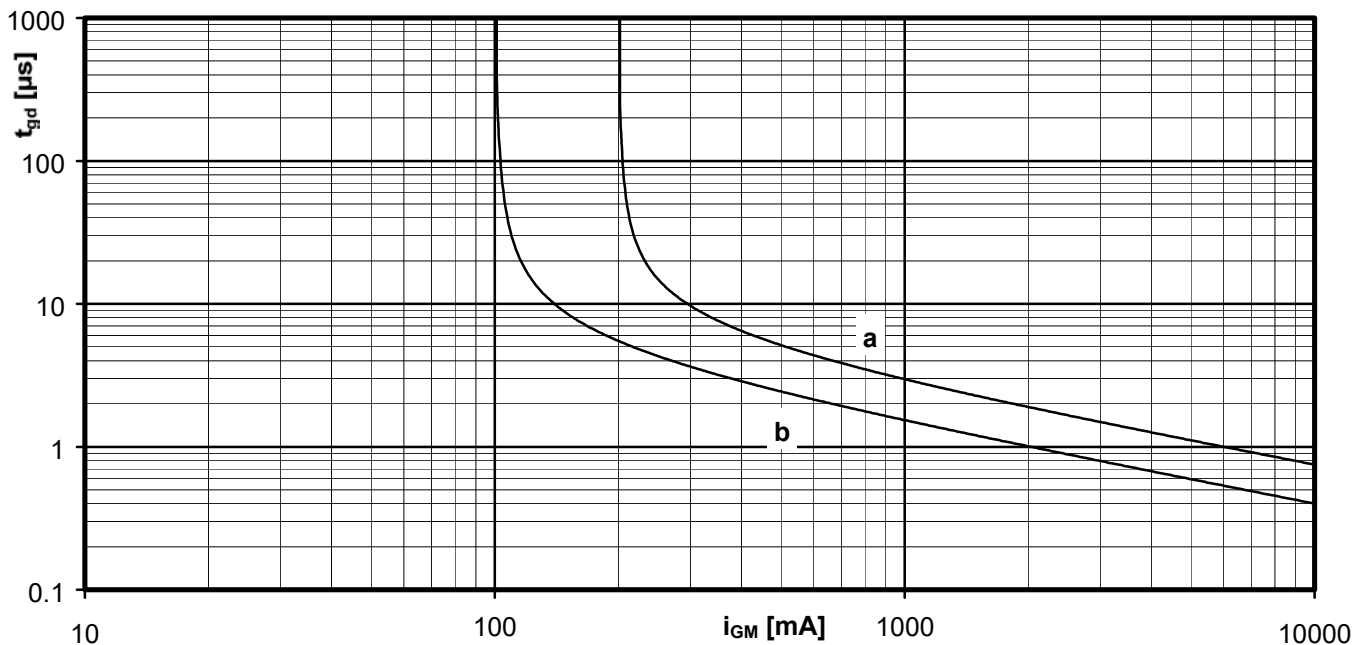
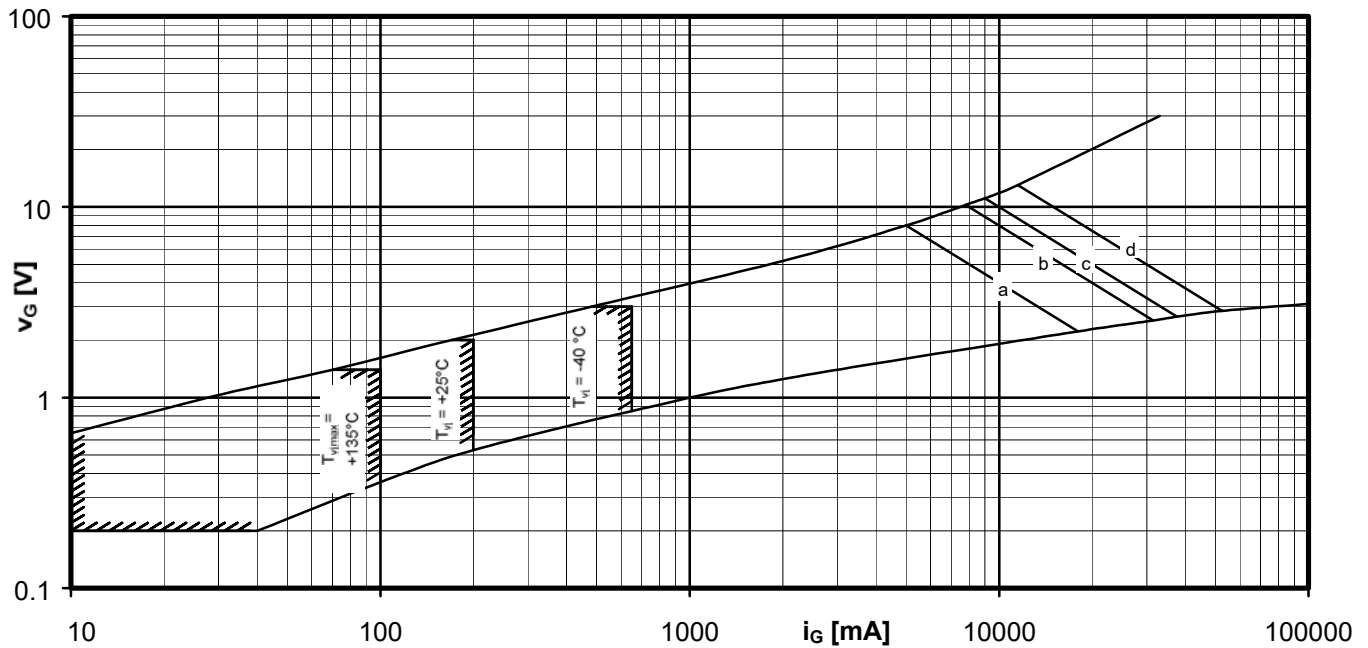
Maximum rated RMS current I_{RMS}
 Single-phase inverse parallel circuit
 Total power dissipation at circuit P_{tot}
 Parameter:
 Thermal resistance case to ambient R_{thCA}



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}

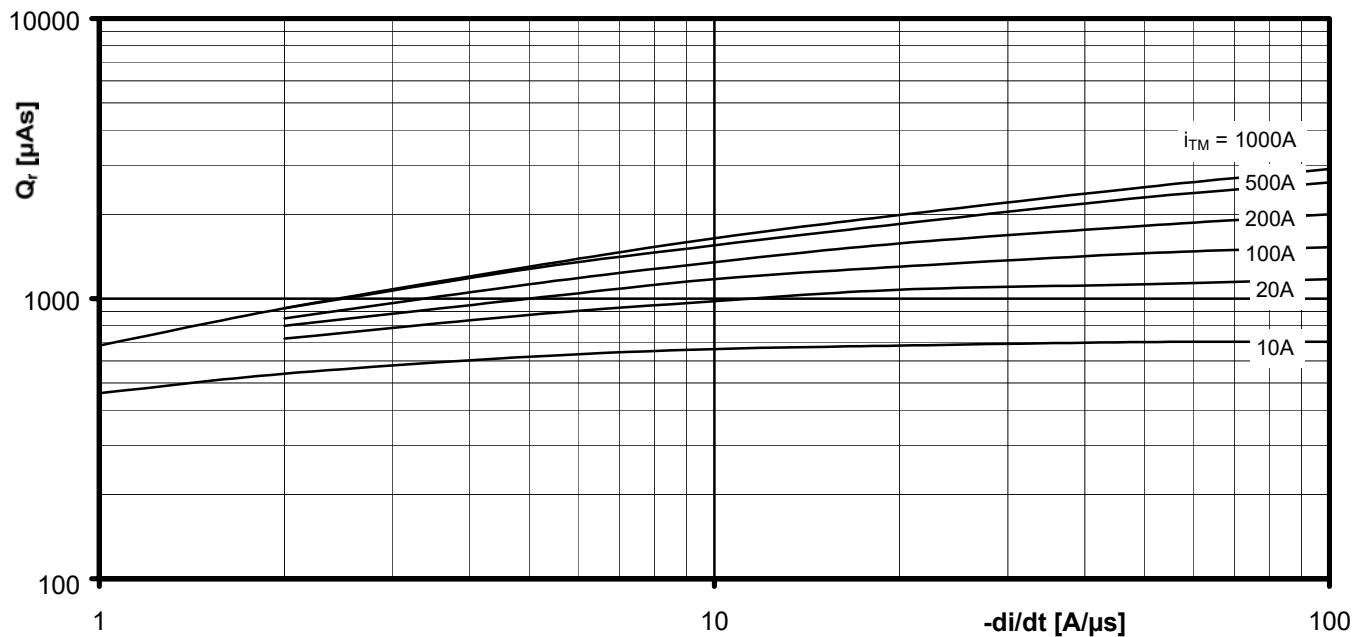
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Thyristor-Thyristor Modules

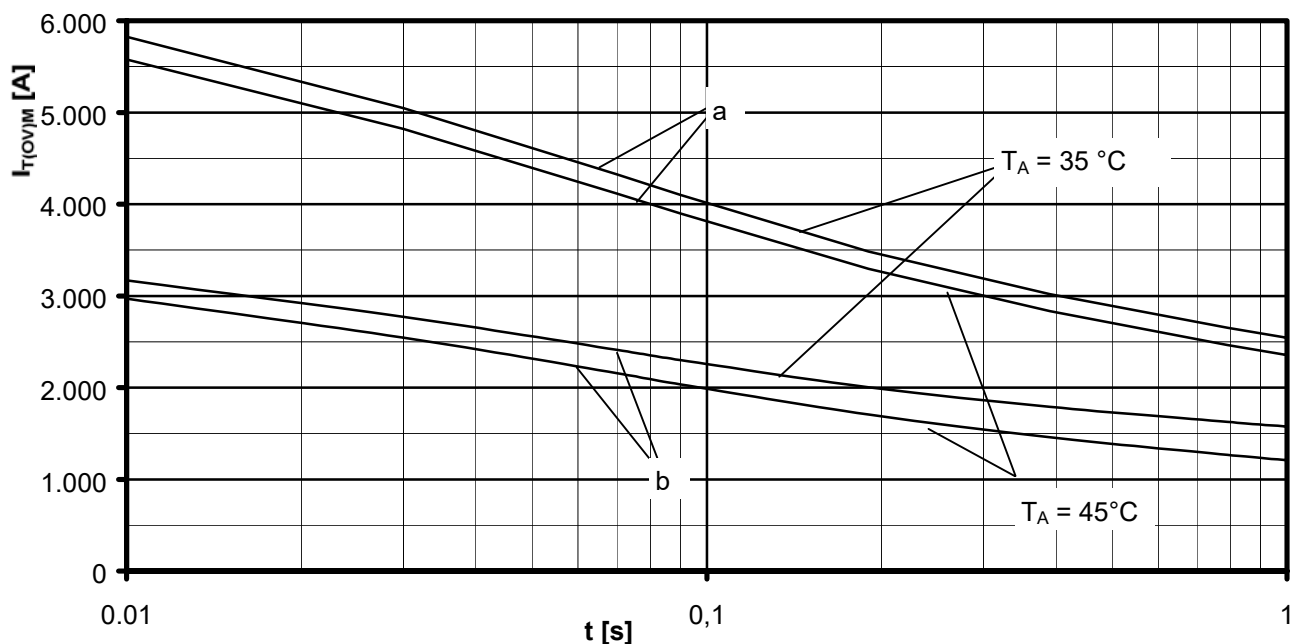


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Thyristor-Thyristor Modules



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}

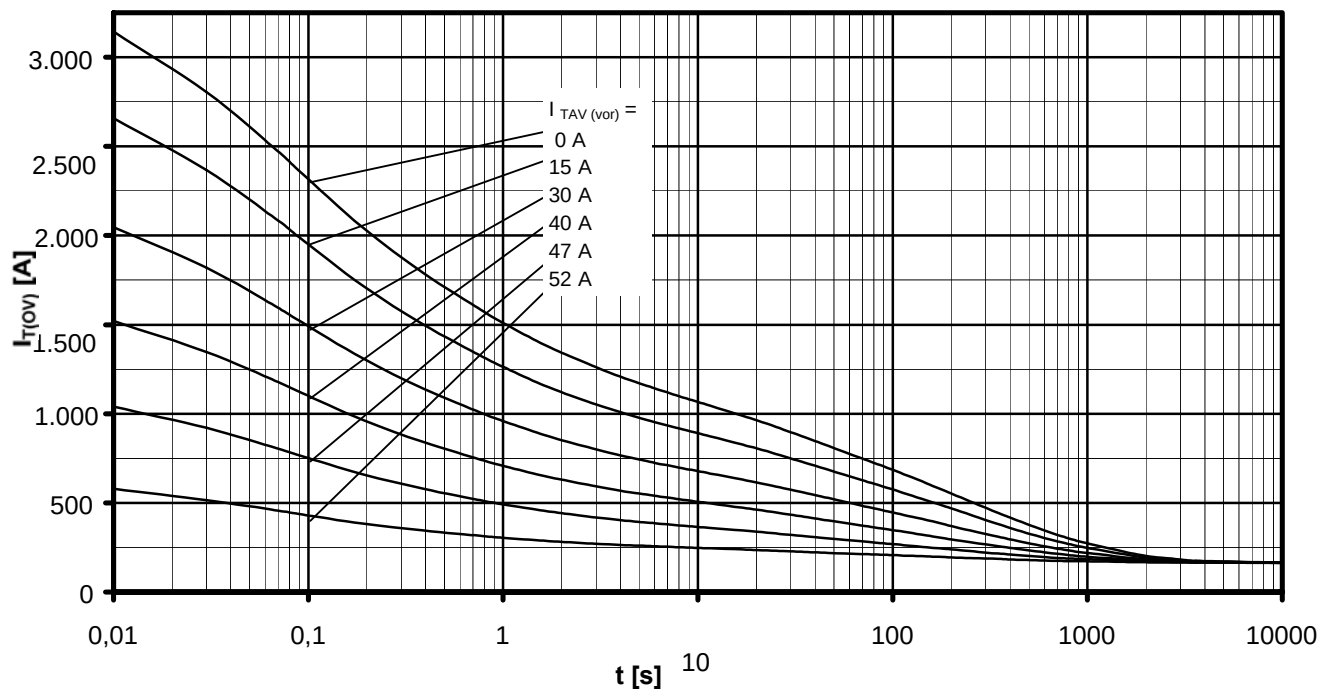


Maximum overload on-state current $I_{T(OV)M} = f(t), v_{RM} = 0,8 V_{RRM}$

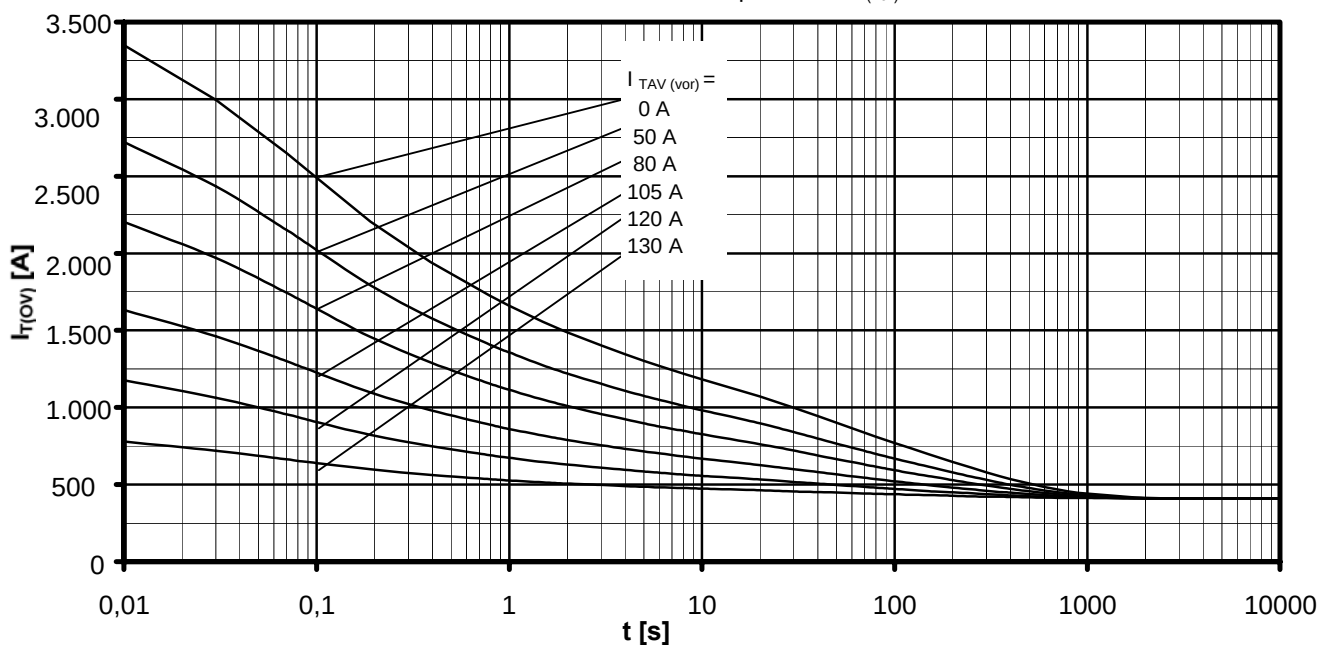
a: No-load conditions
 b: after load with I_{TAVM}
 $T_A = 35^\circ C$, Forced air cooling
 $T_A = 45^\circ C$, Natural air cooling

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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 $I_{TAV(vor)}$