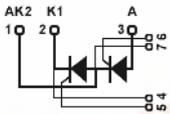


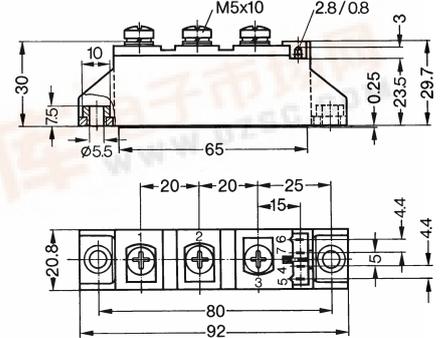
CTT60

Thyristor-Thyristor Modules



Type	V _{RSM} V _{DSM} V	V _{RRM} V _{DRM} V
CTT60GK08	900	800
CTT60GK12	1300	1200
CTT60GK14	1500	1400
CTT60GK16	1700	1600
CTT60GK18	1900	1800

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°C; 180° sine	100 60	A
I _{TSM} , I _{FSM}	T _{VJ} =45°C V _R =0 t=10ms (50Hz), sine t=8.3ms (60Hz), sine	1500 1600	A
	T _{VJ} =T _{VJM} V _R =0 t=10ms(50Hz), sine t=8.3ms(60Hz), sine	1350 1450	
∫i ² dt	T _{VJ} =45°C V _R =0 t=10ms (50Hz), sine t=8.3ms (60Hz), sine	11200 10750	A ² s
	T _{VJ} =T _{VJM} V _R =0 t=10ms(50Hz), sine t=8.3ms(60Hz), sine	9100 8830	
(di/dt) _{cr}	T _{VJ} =T _{VJM} f=50Hz, t _p =200us V _D =2/3V _{DRM} I _G =0.45A dig/dt=0.45A/us	repetitive, I _T =150A 150	A/us
		non repetitive, I _T =I _{TAVM} 500	
(dv/dt) _{cr}	T _{VJ} =T _{VJM} ; R _{GK} =∞; 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 5 t _p =300us	W
P _{GAV}		0.5	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 3000 t=1s 3600	V~
M _d	Mounting torque (M5) Terminal connection torque (M5)	2.5-4.0/22-35 2.5-4.0/22-35	Nm/lb.in.
Weight	Typical including screws	90	g

CTT60

Thyristor-Thyristor Modules

Symbol	Test Conditions	Characteristic Values	Unit
I_{RRM}, I_{DRM}	$T_{VJ}=T_{VJM}; V_R=V_{RRM}; V_D=V_{DRM}$	5	mA
V_T, V_F	$I_T, I_F=200A; T_{VJ}=25^\circ C$	1.57	V
V_{TO}	For power-loss calculations only ($T_{VJ}=125^\circ C$)	0.85	V
r_T		3.7	$m\Omega$
V_{GT}	$V_D=6V;$ $T_{VJ}=25^\circ C$ $T_{VJ}=-40^\circ C$	1.5 1.6	V
I_{GT}	$V_D=6V;$ $T_{VJ}=25^\circ C$ $T_{VJ}=-40^\circ C$	100 200	mA
V_{GD}	$T_{VJ}=T_{VJM};$ $V_D=2/3V_{DRM}$	0.2	V
I_{GD}		10	mA
I_L	$T_{VJ}=25^\circ C; t_p=10\mu s; V_D=6V$ $I_G=0.45A; di_G/dt=0.45A/\mu s$	450	mA
I_H	$T_{VJ}=25^\circ C; V_D=6V; R_{GK}=\infty$	200	mA
t_{gd}	$T_{VJ}=25^\circ C; V_D=1/2V_{DRM}$ $I_G=0.45A; di_G/dt=0.45A/\mu s$	2	μs
t_q	$T_{VJ}=T_{VJM}; I_T=150A; t_p=200\mu s; -di/dt=10A/\mu s$ $V_R=100V; dv/dt=20V/\mu s; V_D=2/3V_{DRM}$	typ. 150	μs
Q_s	$T_{VJ}=T_{VJM}; I_T, I_F=50A; -di/dt=3A/\mu s$	100	μC
I_{RM}		24	A
R_{thJC}	per thyristor/diode; DC current per module	0.45 0.225	K/W
R_{thJK}	per thyristor/diode; DC current per module	0.65 0.325	K/W
d_s	Creeping distance on surface	12.7	mm
d_A	Strike distance through air	9.6	mm
a	Maximum allowable acceleration	50	m/s^2

FEATURES

- * International standard package
- * Direct copper bonded Al_2O_3 -ceramic base plate
- * Planar passivated chips
- * Isolation voltage 3600 V~
- * UL registered, E 72873
- * Gate-cathode twin pins for version 1

APPLICATIONS

- * DC motor control
- * Softstart AC motor controller
- * Light, heat and temperature control

ADVANTAGES

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

CTT60

Thyristor-Thyristor Modules

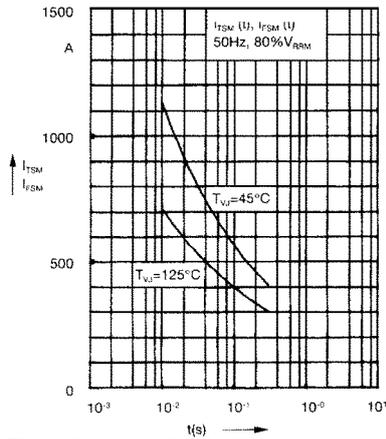


Fig. 1 Surge overload current
 I_{TSM} , I_{FSM} : Crest value, t : duration

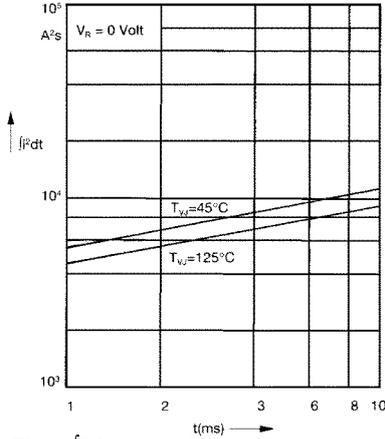


Fig. 2 $\int i^2 dt$ versus time (1-10 ms)

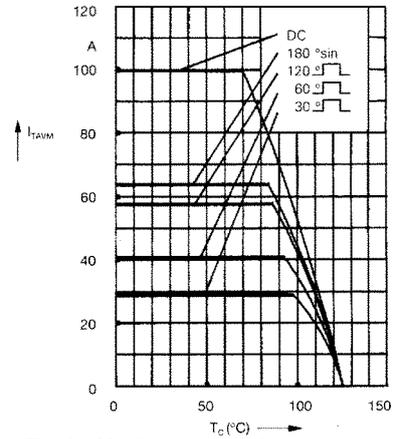


Fig. 2a Maximum forward current
at case temperature

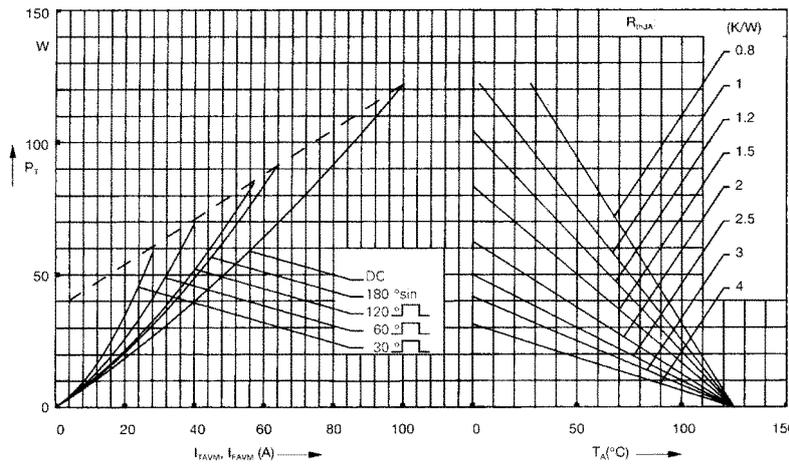


Fig. 3 Power dissipation versus on-state current and ambient temperature
(per thyristor or diode)

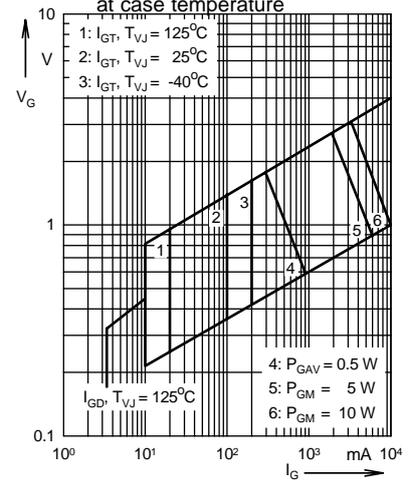


Fig. 4 Gate trigger characteristics

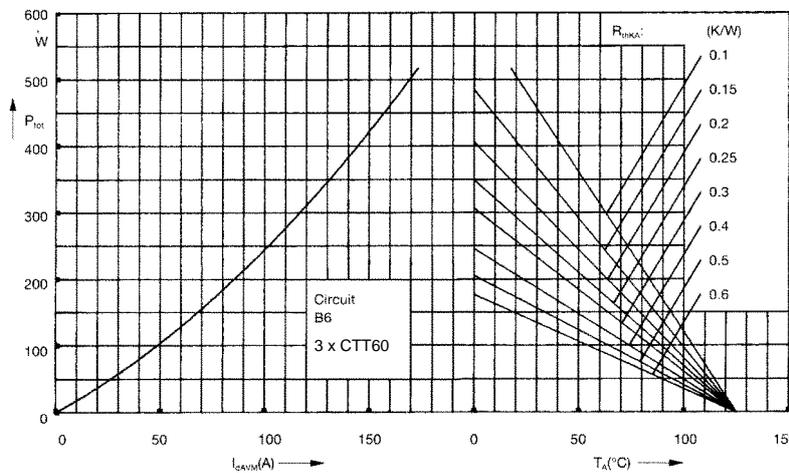


Fig. 5 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature

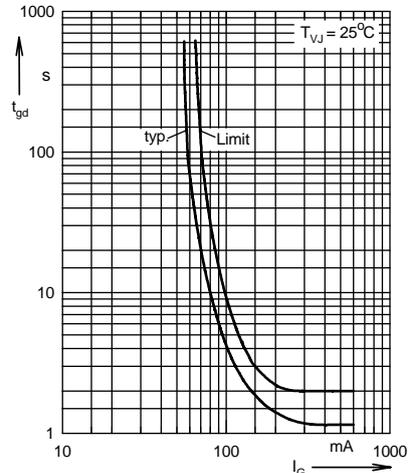


Fig. 6 Gate trigger delay time

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Thyristor-Thyristor Modules

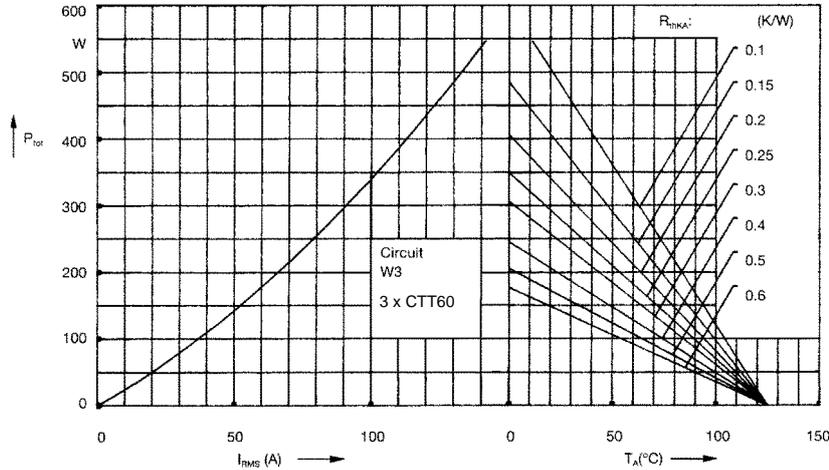


Fig. 7 Three phase AC-controller: Power dissipation versus RMS output current and ambient temperature

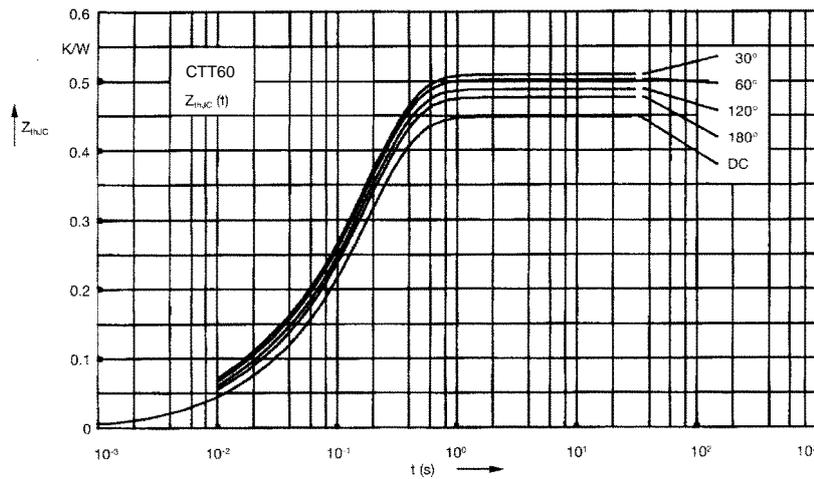


Fig. 8 Transient thermal impedance junction to case (per thyristor or diode)

R_{thJC} for various conduction angles d:

d	R_{thJC} (K/W)
DC	0.45
180°C	0.47
120°C	0.49
60°C	0.505
30°C	0.52

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.014	0.015
2	0.026	0.0095
3	0.41	0.175

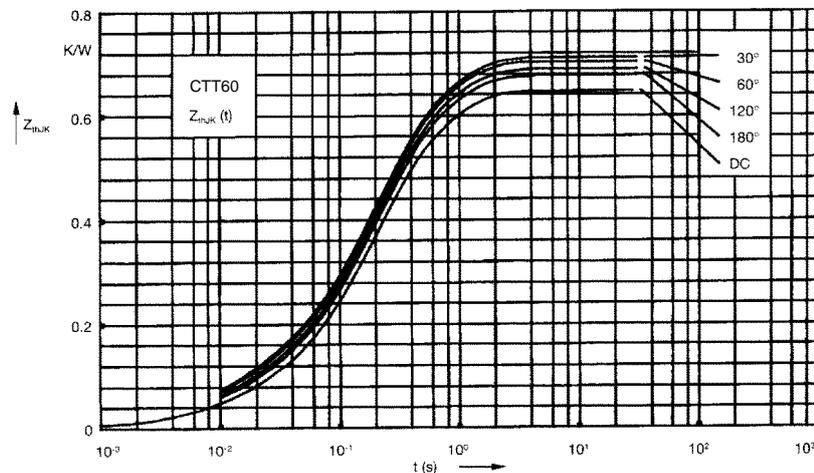


Fig. 9 Transient thermal impedance junction to heatsink (per thyristor or diode)

R_{thJK} for various conduction angles d:

d	R_{thJK} (K/W)
DC	0.65
180°C	0.67
120°C	0.69
60°C	0.705
30°C	0.72

Constants for Z_{thJK} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.014	0.015
2	0.026	0.0095
3	0.41	0.175
4	0.2	0.67