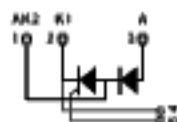


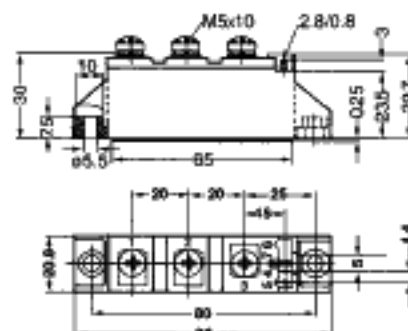
CTD100, CDT100

Thyristor-Diode Modules, Diode-Thyristor Modules



Type	V_{RSM} V_{DSM} V	V_{RRM} V_{DRM} V
CTD/CDT100GK08	900	800
CTD/CDT100GK12	1300	1200
CTD/CDT100GK14	1500	1400
CTD/CDT100GK16	1700	1600
CTD/CDT100GK18	1900	1800
CTD/CDT100GK20	2100	2000
CTD/CDT100GK22	2300	2200

Dimensions in mm (1mm=0.0394")



Symbol	Test Conditions		Maximum Ratings	Unit		
$I_{T_{RMS}}, I_{F_{RMS}}$ $I_{T_{AVM}}, I_{F_{AVM}}$	$T_{VJ}=T_{VJM}$ $T_c=85^{\circ}\text{C}; 180^{\circ}$ sine		180 100	A		
I_{TSM}, I_{FSM}	$T_{VJ}=45^{\circ}\text{C}$ $V_R=0$	$t=10\text{ms}$ (50Hz), sine $t=8.3\text{ms}$ (60Hz), sine	1700 1800	A		
	$T_{VJ}=T_{VJM}$ $V_R=0$	$t=10\text{ms}$ (50Hz), sine $t=8.3\text{ms}$ (60Hz), sine	1540 1640			
	$\int i^2 dt$	$T_{VJ}=45^{\circ}\text{C}$ $V_R=0$	$t=10\text{ms}$ (50Hz), sine $t=8.3\text{ms}$ (60Hz), sine		14450 13500	A^2s
		$T_{VJ}=T_{VJM}$ $V_R=0$	$t=10\text{ms}$ (50Hz), sine $t=8.3\text{ms}$ (60Hz), sine		11850 11300	
$(di/dt)_{or}$		$T_{VJ}=T_{VJM}$ $f=50\text{Hz}, t_p=200\mu\text{s}$ $V_D=2/3V_{DRM}$ $I_G=0.45\text{A}$ $di/dt=0.45\text{A}/\mu\text{s}$	repetitive, $I_T=250\text{A}$ non repetitive, $I_T=I_{TAVM}$	150 500	A/ μs	
$(dv/dt)_{or}$	$T_{VJ}=T_{VJM}; V_{DR}=2/3V_{DRM}$ $R_{GK}=\infty$; method 1 (linear voltage rise)		1000	V/ μs		
P_{GM}	$T_{VJ}=T_{VJM}$ $I_T=I_{TAVM}$	$t_p=30\mu\text{s}$ $t_p=300\mu\text{s}$	10 5	W		
P_{GAV}			0.5	W		
V_{RGM}			10	V		
T_{VJ} T_{VJM} T_{stg}			-40...+125 125 -40...+125	$^{\circ}\text{C}$		
V_{ISOL}	50/60Hz, RMS $I_{ISOL}\leq 1\text{mA}$	$t=1\text{min}$ $t=1\text{s}$	3000 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		

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CTD100, CDT100

Thyristor-Diode Modules, Diode-Thyristor Modules

Symbol	Test Conditions	Characteristic Values	Unit
I_{RRM}, I_{DRM}	$T_{VJ}=T_{VJM}; V_R=V_{RRM}; V_D=V_{DRM}$	15	mA
V_T, V_F	$I_T, I_F=300A; T_{VJ}=25^{\circ}C$	1.74	V
V_{TO}	For power-loss calculations only ($T_{VJ}=T_{VJM}$)	0.85	V
r_T		3.2	m Ω
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}	$T_{VJ}=T_{VJM}; V_D=2/3V_{DRM}$	0.25	V
I_{GD}	$T_{VJ}=T_{VJM}; V_D=2/3V_{DRM}$	10	mA
I_L	$T_{VJ}=25^{\circ}C; t_p=30\mu s; V_D=6V$ $I_G=0.45A; di_G/dt=0.45A/\mu s$	200	mA
I_H	$T_{VJ}=25^{\circ}C; V_D=6V; R_{GK}=\infty$	150	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. 185	μs
Q_S	$T_{VJ}=T_{VJM}; I_T, I_F=50A; -di/dt=6A/\mu s$	170	μC
I_{RM}		45	A
R_{thJC}	per thyristor/diode; DC current per module	0.22 0.11	K/W
R_{thJK}	per thyristor/diode; DC current per module	0.42 0.21	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
- * Direct copper bonded Al₂O₃-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

D E E C o r p .

CTD100, CDT100

Thyristor-Diode Modules, Diode-Thyristor Modules

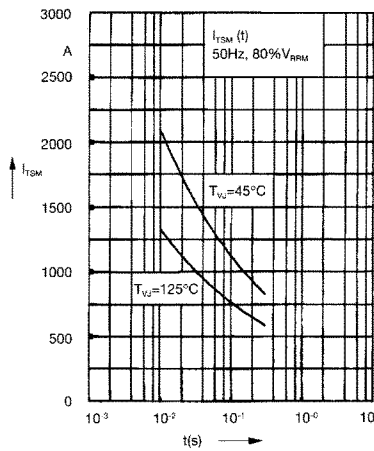


Fig. 1 Surge overload current
 I_{TSM} , I_{FSM} : Crest value, t : duration

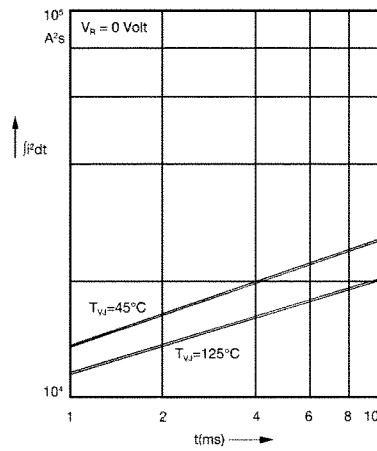


Fig. 2 $\int I^2 dt$ versus time (1-10 ms)

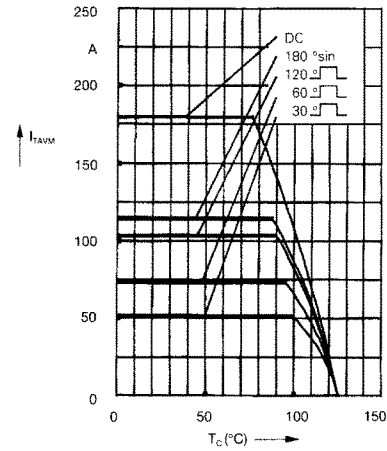


Fig. 2a Maximum forward current
at case temperature

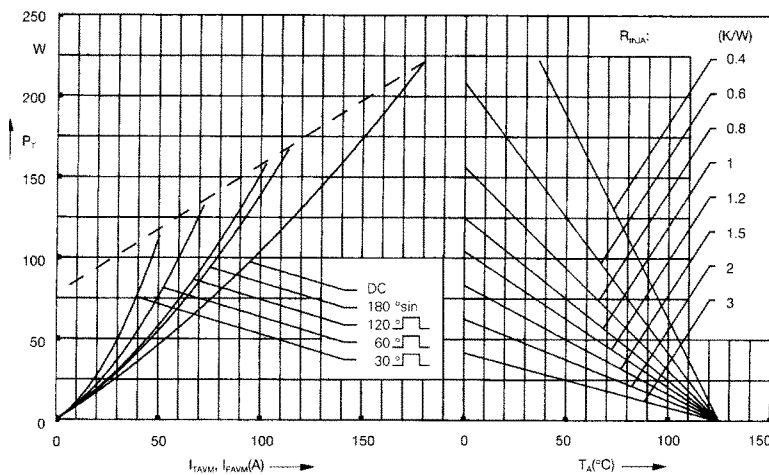


Fig. 3 Power dissipation versus on-state current and ambient temperature
(per thyristor or diode)

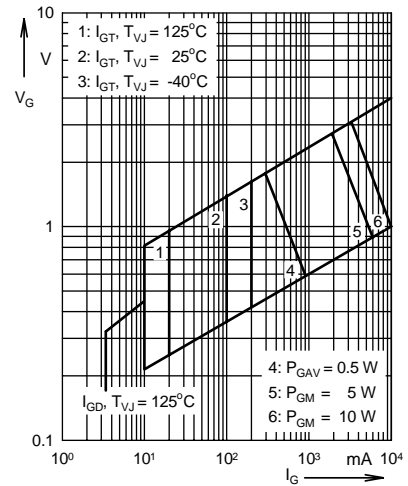


Fig. 4 Gate trigger characteristics

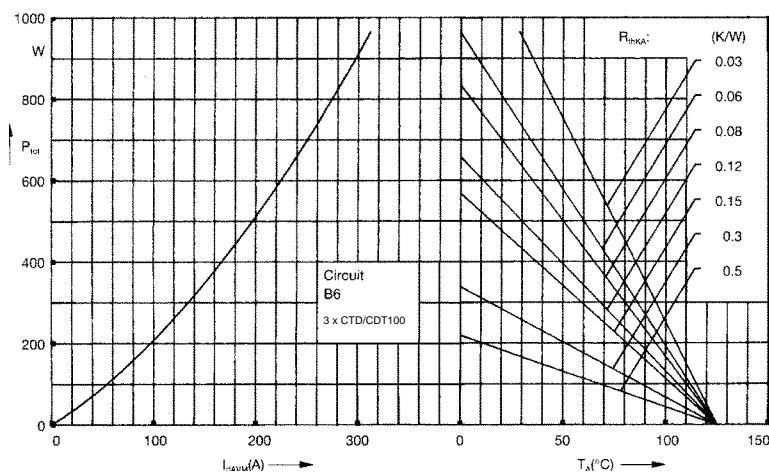


Fig. 5 Three phase rectifier bridge: Power dissipation versus direct output current
and ambient temperature

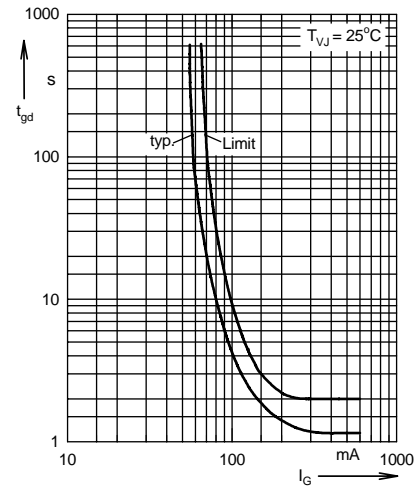


Fig. 6 Gate trigger delay time

CTD100, CDT100

Thyristor-Diode Modules, Diode-Thyristor Modules

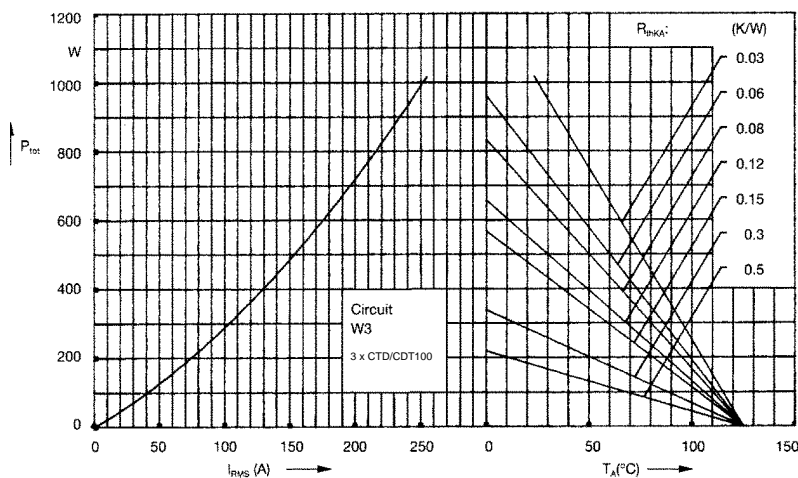


Fig. 7 Three phase AC-controller:
Power dissipation versus RMS
output current and ambient
temperature

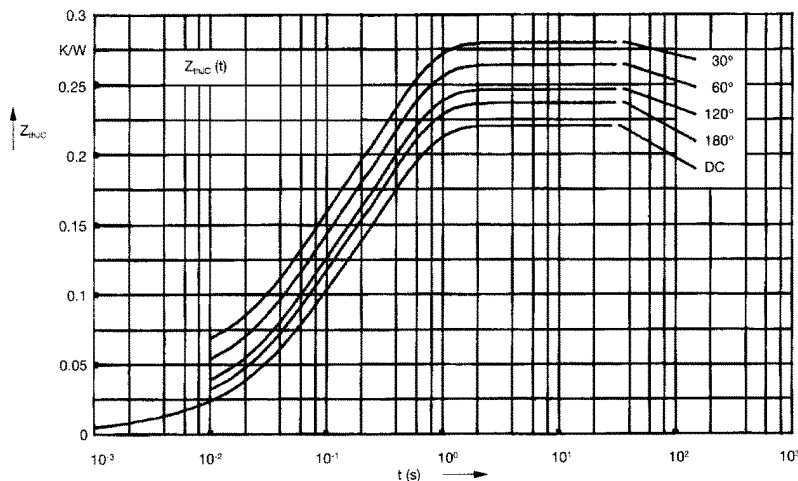


Fig. 8 Transient thermal impedance
junction to case (per thyristor or
diode)

R_{thJC} for various conduction angles d :

d	R_{thJC} (K/W)
DC	0.22
180°C	0.23
120°C	0.25
60°C	0.27
30°C	0.28

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.0066	0.0019
2	0.0678	0.0477
3	0.1456	0.344

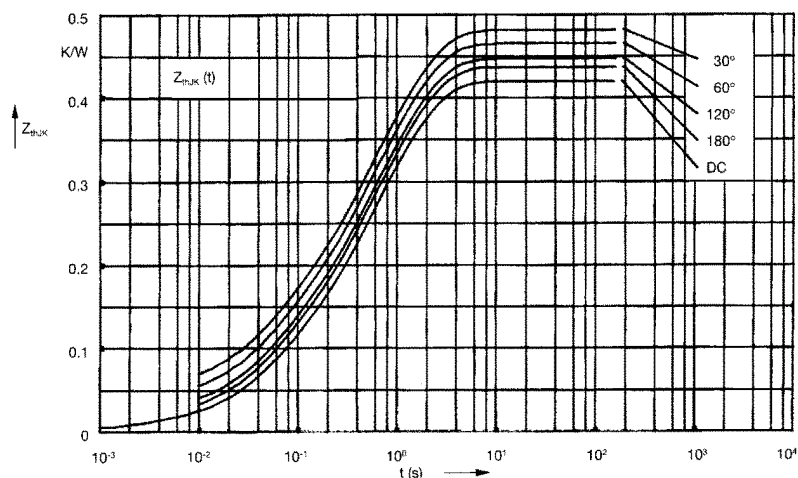


Fig. 9 Transient thermal impedance
junction to heatsink (per thyristor
or diode)

R_{thJK} for various conduction angles d :

d	R_{thJK} (K/W)
DC	0.42
180°C	0.43
120°C	0.45
60°C	0.47
30°C	0.48

Constants for Z_{thJK} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.0066	0.0019
2	0.0678	0.0477
3	0.1456	0.344
4	0.2	1.32