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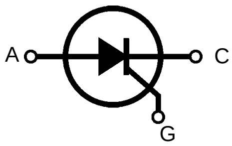
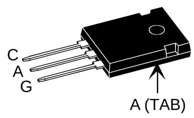
Phase Control Thyristor

V_{RRM} = 800-1600 V
$I_{T(RMS)}$ = 75 A
$I_{T(AV)M}$ = 48 A

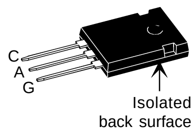
V_{RSM} V_{DSM} V	V_{RRM} V_{DRM} V	Type	
900	800	CS 45-08io1	
1300	1200	CS 45-12io1	
1700	1600	CS 45-16io1	CS 45-16io1R



TO-247 AD
Version io1



ISOPLUS 247™
Version io1R



* Patent pending

C = Cathode, A = Anode, G = Gate

Symbol	Conditions		Maximum Ratings	
$I_{T(RMS)}$	$T_{VJ} = T_{VJM}$		75	A
$I_{T(AV)M}$	T_C = 75°C; 180° sine		48	A
I_{TSM}	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	520	A
	V_R = 0 V	t = 8.3 ms (60 Hz), sine	560	A
	$T_{VJ} = T_{VJM}$	t = 10 ms (50 Hz), sine	460	A
	V_R = 0 V	t = 8.3 ms (60 Hz), sine	500	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	1350	A^2s
	V_R = 0 V	t = 8.3 ms (60 Hz), sine	1300	A^2s
	$T_{VJ} = T_{VJM}$	t = 10 ms (50 Hz), sine	1050	A^2s
	V_R = 0 V	t = 8.3 ms (60 Hz), sine	1030	A^2s
$(di/dt)_{cr}$	$T_{VJ} = T_{VJM}$ f = 50 Hz, t_P = 200 µs	repetitive, I_T = 40 A	150	A/µs
	$V_D = {}^2/_3\ V_{DRM}$ I_G = 0.3 A di_G/dt = 0.3 A/µs	non repetitive, $I_T = I_{T(AV)M}$	500	A/µs
$(dv/dt)_{cr}$	$T_{VJ} = T_{VJM}$; $R_{GK} = \infty$; method 1 (linear voltage rise)	$V_{DR} = {}^2/_3\ V_{DRM}$	1000	V/µs
P_{GM}	$T_{VJ} = T_{VJM}$	t_P = 30 µs	10	W
	$I_T = I_{T(AV)M}$	t_P = 300 µs	5	W
$P_{G(AV)}$			0.5	W
V_{RGM}			10	V
T_{VJ}			-40...+140	°C
T_{VJM}			140	°C
T_{stg}			-40...+125	°C
M_d	Version io1:	mounting torque M3	0.8...1.2	Nm
F_C	Version io1R:	mounting force with clip	20...120	N
V_{ISOL} *	50/60 Hz, RMS, t = 1 minute, leads-to-tab		2500	V~
Weight			6	g

* Verson io1R only

Features

- Thyristor for line frequency
- International standard package JEDEC TO-247
- Planar passivated chip
- Long-term stability of blocking currents and voltages
- Version AR isolated and UL registered E153432
- Epoxy meets UL 94V-0

Applications

- Motor control
- Power converter
- AC power controller
- Switch-mode and resonant mode power supplies
- Light and temperature control

Advantages

- Easy to mount with 1 screw (isolated mounting screw hole)
- Space and weight savings
- Simple mounting
- Improved temperature and power cycling

Data according to IEC 60747
IXYS reserves the right to change limits, test conditions and dimensions

030

Symbol	Conditions			Characteristic Values	
I_R, I_D	$T_{VJ} = T_{VJM}$; $V_R = V_{RRM}$; $V_D = V_{DRM}$		≤	5	mA
V_T	I_T = 80 A; T_{VJ} = 25°C		≤	1.64	V
V_{T0} r_T	For power-loss calculations only (T_{VJ} = 125°C)			0.85 11	V mΩ
V_{GT}	V_D = 6 V;	T_{VJ} = 25°C T_{VJ} = -40°C	≤ ≤	1.5 1.6	V V
I_{GT}	V_D = 6 V;	T_{VJ} = 25°C T_{VJ} = -40°C	≤ ≤	100 200	mA mA
V_{GD} I_{GD}	$T_{VJ} = T_{VJM}$;	$V_D = ^2/_3\, V_{DRM}$	≤ ≤	0.2 10	V mA
I_L	T_{VJ} = 25°C; t_P = 10 µs I_G = 0.3 A; di_G/dt = 0.3 A/µs		≤	150	mA
I_H	T_{VJ} = 25°C; V_D = 6 V; R_{GK} = ∞		≤	100	mA
t_{gd}	T_{VJ} = 25°C; V_D = ½ V_{DRM} I_G = 0.3 A; di_G/dt = 0.3 A/µs		≤	2	µs
R_{thJC} R_{thJH}	DC current DC current			0.62 0.82	K/W K/W
a	Max. acceleration, 50 Hz			50	m/s^2

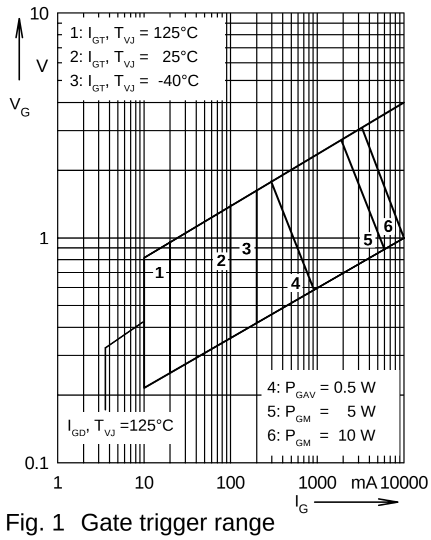


Fig. 1 Gate trigger range

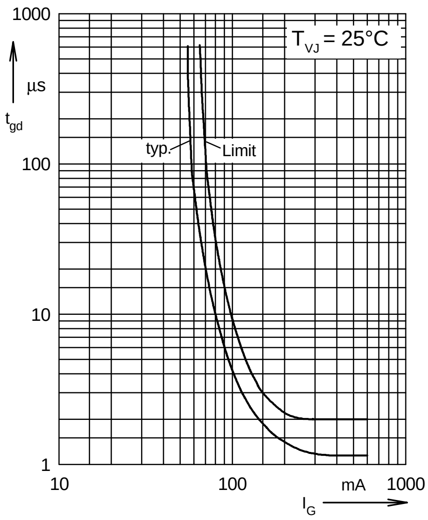
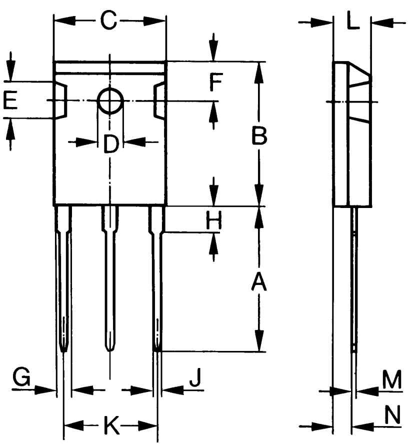


Fig. 2 Gate controlled delay time t_{gd}

TO-247 AD and ISOPLUS 247™



Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches Max.
A	19.81	20.32	0.780	0.800
B	20.80	21.46	0.819	0.845
C	15.75	16.26	0.610	0.640
D*	3.55	3.65	0.140	0.144
E	4.32	5.49	0.170	0.216
F	5.4	6.2	0.212	0.244
G	1.65	2.13	0.065	0.084
H	-	4.5	-	0.177
J	1.0	1.4	0.040	0.055
K	10.8	11.0	0.426	0.433
L	4.7	5.3	0.185	0.209
M	0.4	0.8	0.016	0.031
N	1.5	2.49	0.087	0.102

* ISOPLUS 247™ without hole

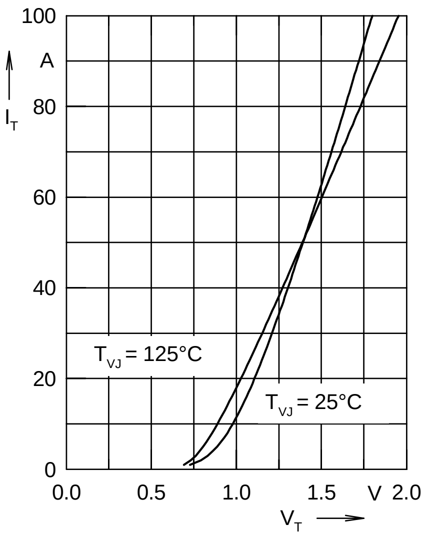


Fig. 3 Forward characteristics

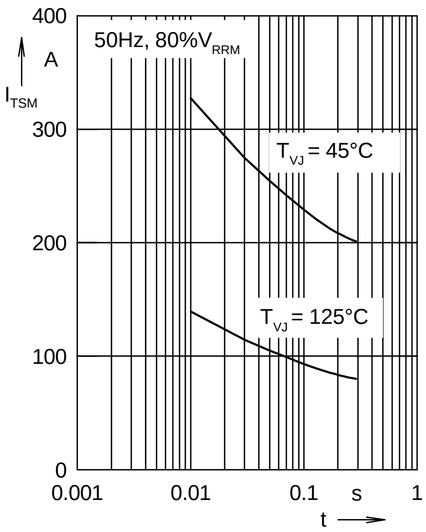


Fig. 4 Surge overload current
I_{TSM}: crest value, t: duration

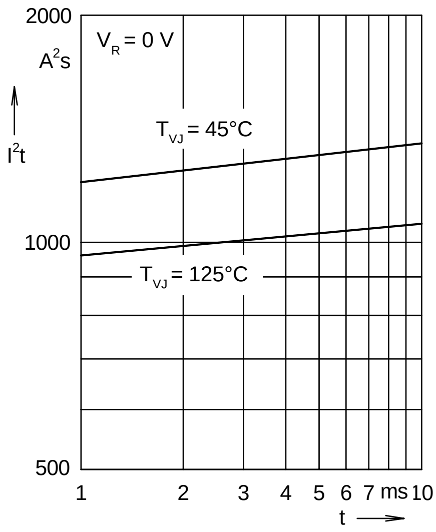


Fig. 5 I^2t versus time (1-10 ms)

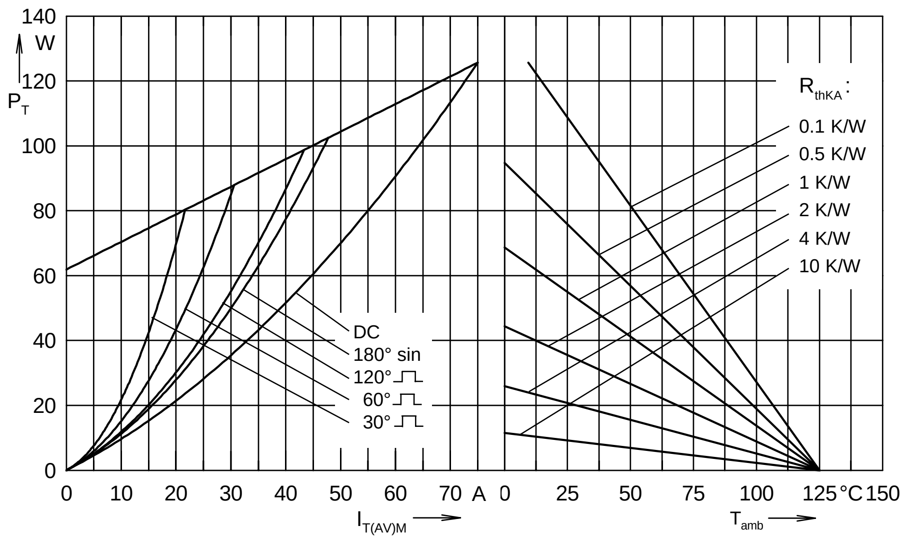


Fig. 6 Power dissipation versus forward current and ambient temperature

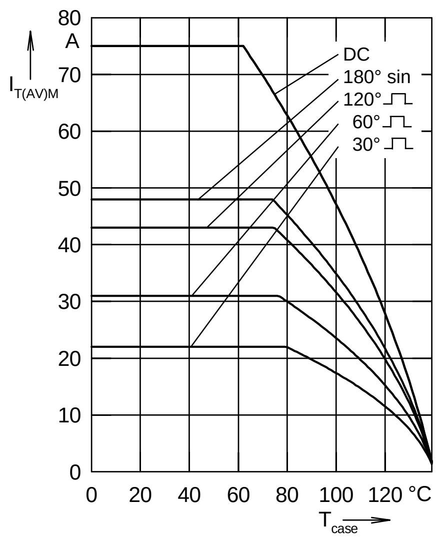


Fig. 7 Max. forward current at case temperature

R_{thJC} for various conduction angles d:

d	R_{thJC} (K/W)
DC	0.62
180°	0.71
120°	0.748
60°	0.793
30°	0.817

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.206	0.013
2	0.362	0.118
3	0.052	1.488

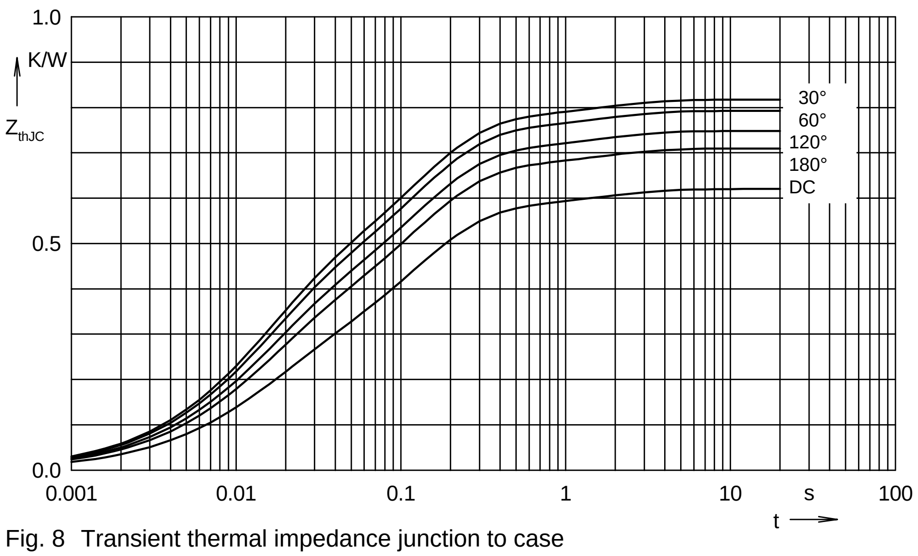


Fig. 8 Transient thermal impedance junction to case