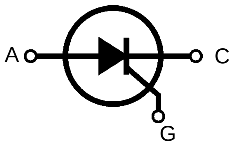
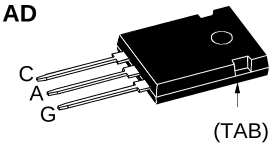
Phase Control Thyristor

V_{RRM} = 1200-1600 V
$I_{T(RMS)}$ = 49 A
$I_{T(AV)M}$ = 31 A

V_{RSM} V_{DSM} V	V_{RRM} V_{DRM} V	Type
1200	1200	CS 30-12io1
1400	1400	CS 30-14io1
1600	1600	CS 30-16io1



TO-247 AD



C = Cathode, A = Anode, G = Gate
TAB = Anode

Symbol	Test Conditions		Maximum Ratings	
$I_{T(RMS)}$	$T_{VJ} = T_{VJM}$		49	A
$I_{T(AV)M}$	T_{case} = 85°C; 180° sine		31	A
I_{TSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	300	A
	V_R = 0 V	t = 8.3 ms (60 Hz), sine	320	A
	$T_{VJ} = T_{VJM}$	t = 10 ms (50 Hz), sine	270	A
	V_R = 0 V	t = 8.3 ms (60 Hz), sine	290	A
I²t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	450	A²s
	V_R = 0 V	t = 8.3 ms (60 Hz), sine	440	A²s
	$T_{VJ} = T_{VJM}$	t = 10 ms (50 Hz), sine	365	A²s
	V_R = 0 V	t = 8.3 ms (60 Hz), sine	355	A²s
$(di/dt)_{cr}$	$T_{VJ} = T_{VJM}$ f = 50 Hz, t_P =200 µs V_D = 2/3 V_{DRM}	repetitive, I_T = 40 A	150	A/µs
	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_{GAV}			0.5	W
V_{RGM}			10	V
T_{VJ}			-40...+125	°C
T_{VJM}			125	°C
T_{stg}			-40...+125	°C
M_d	Mounting torque M3		1.13	Nm
			10	lb.in.
Weight			6	g

Features

- Thyristor for line frequency
- International standard package JEDEC TO-247
- Planar passivated chip
- Long-term stability of blocking currents and voltages

Applications

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

Advantages

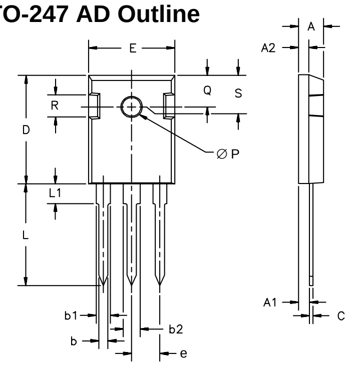
- Easy to mount with 1 screw (isolated mounting screw hole)
- Space and weight savings
- Simple mounting
- Improved temperature and power cycling

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

723

Symbol	Test 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 = 45 A; T_{VJ} = 25°C		≤	1.6	V
V_{T0}	For power-loss calculations only (T_{VJ} = 125°C)			0.9	V
r_T				15	mΩ
V_{GT}	V_D = 6 V;	T_{VJ} = 25°C	≤	1.0	V
		T_{VJ} = -40°C	≤	1.2	V
I_{GT}	V_D = 6 V;	T_{VJ} = 25°C	≤	65	mA
		T_{VJ} = -40°C	≤	80	mA
		T_{VJ} = 125°C	≤	50	mA
V_{GD}	$T_{VJ} = T_{VJM}$;	V_D = 2/3 V_{DRM}	≤	0.2	V
I_{GD}			≤	5	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 = 1/2 V_{DRM} I_G = 0.3 A; di_G/dt = 0.3 A/µs		≤	2	µs
R_{thJC}	DC current			0.62	K/W
R_{thJH}	DC current			0.82	K/W
a	Max. acceleration, 50 Hz			50	m/s^2

TO-247 AD Outline



Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches Max.
A	4.7	5.3	.185	.209
A_1	2.2	2.54	.087	.102
A_2	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b_1	1.65	2.13	.065	.084
b_2	2.87	3.12	.113	.123
C	.4	.8	.016	.031
D	20.80	21.46	.819	.845
E	15.75	16.26	.610	.640
e	5.20	5.72	0.205	0.225
L	19.81	20.32	.780	.800
L1		4.50		.177
∅P	3.55	3.65	.140	.144
Q	5.89	6.40	0.232	0.252
R	4.32	5.49	.170	.216
S	6.15 BSC		242 BSC	

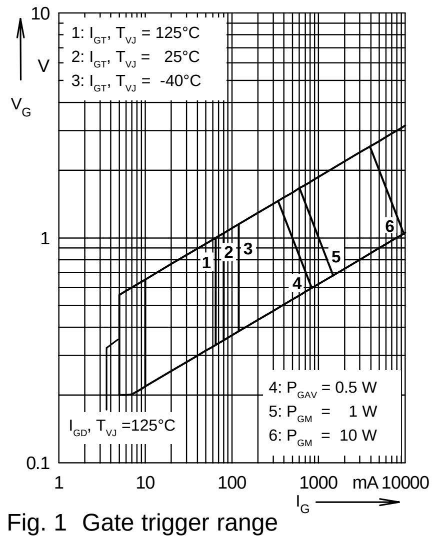


Fig. 1 Gate trigger range

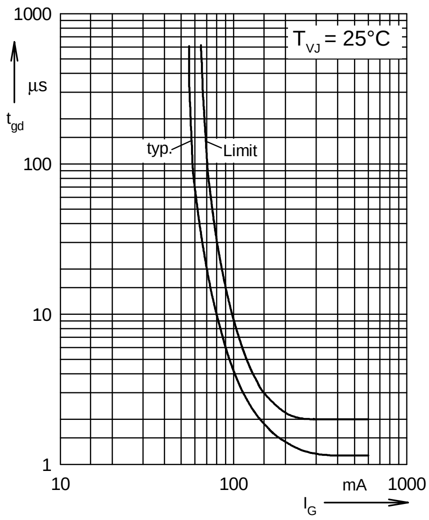


Fig. 2 Gate controlled delay time t_{gd}

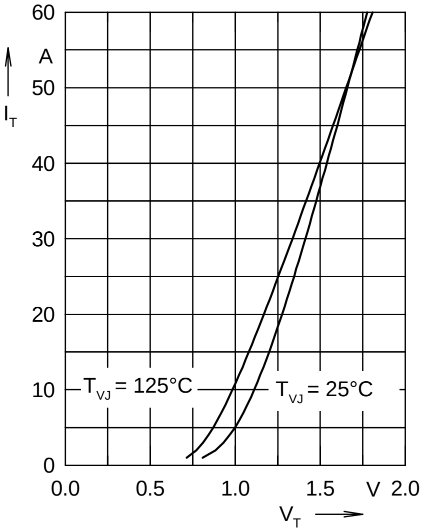


Fig. 3 Forward characteristics

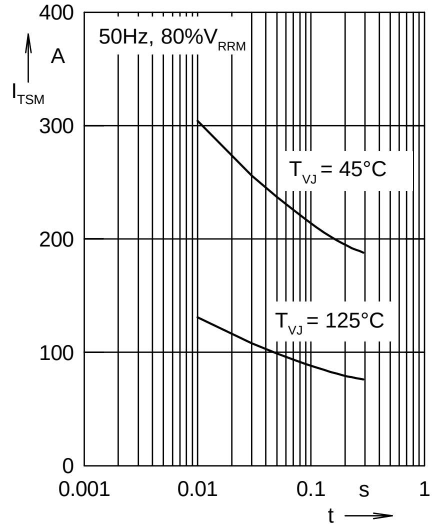


Fig. 4 Surge overload current I_{TSM}: crest value, t: duration

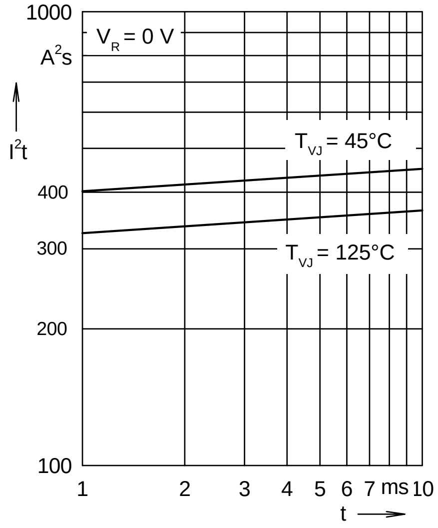


Fig. 5 I^2t versus time (1-10 ms)

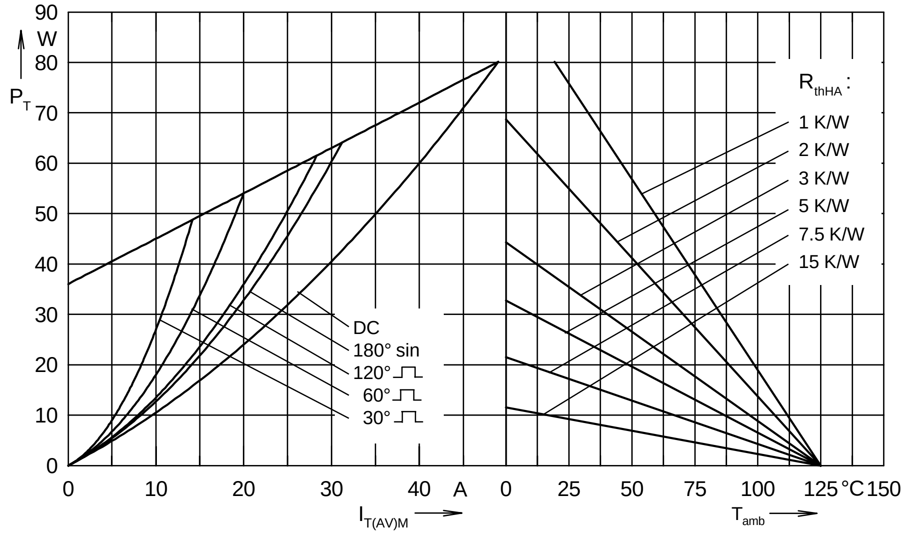


Fig. 6 Power dissipation versus forward current and ambient temperature

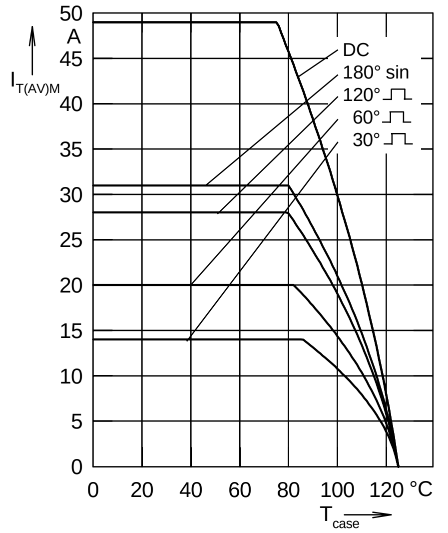


Fig. 7 Max. forward current at case temperature

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

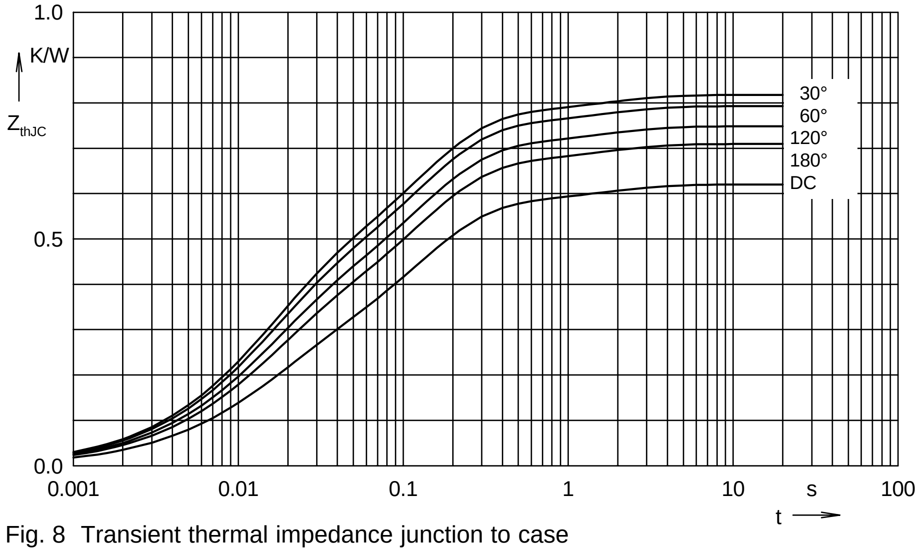


Fig. 8 Transient thermal impedance junction to case

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