

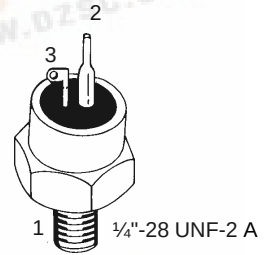
Phase Control Thyristors

$$V_{RRM} = 800-1400 \text{ V}$$

$$I_{T(RMS)} = 120 \text{ A}$$

$$I_{T(AV)M} = 69 \text{ A}$$

V_{RSM}	V_{RRM}	Type
V_{DSM}	V_{DRM}	
V	V	
900	800	CS 35-08io4
1300	1200	CS 35-12io4
1500	1400	CS 35-14io4

TO-208AC
(TO-65)

1 = Anode, 2 = Cathode, 3 = Gate

Symbol	Test Conditions	Maximum Ratings
$I_{T(RMS)}$	$T_{VJ} = T_{VJM}$	120 A
$I_{T(AV)M}$	$T_{case} = 85^{\circ}\text{C}; 180^{\circ} \text{ sine}$	63 A
	$T_{case} = 80^{\circ}\text{C}; 180^{\circ} \text{ sine}$	69 A
I_{TSM}	$T_{VJ} = 45^{\circ}\text{C};$ $V_R = 0$	$t = 10 \text{ ms (50 Hz), sine}$ 1200 A $t = 8.3 \text{ ms (60 Hz), sine}$ 1340 A
	$T_{VJ} = T_{VJM}$ $V_R = 0$	$t = 10 \text{ ms (50 Hz), sine}$ 1100 A $t = 8.3 \text{ ms (60 Hz), sine}$ 1250 A
I^2t	$T_{VJ} = 45^{\circ}\text{C}$ $V_R = 0$	$t = 10 \text{ ms (50 Hz), sine}$ 7200 A ² s $t = 8.3 \text{ ms (60 Hz), sine}$ 7550 A ² s
	$T_{VJ} = T_{VJM}$ $V_R = 0$	$t = 10 \text{ ms (50 Hz), sine}$ 6050 A ² s $t = 8.3 \text{ ms (60 Hz), sine}$ 6500 A ² s
$(di/dt)_{cr}$	$T_{VJ} = T_{VJM}$ $f = 50 \text{ Hz}, t_p = 200 \mu\text{s}$ $V_D = 2/3 V_{DRM}$ $I_G = 0.5 \text{ A}$ $di_G/dt = 0.5 \text{ A}/\mu\text{s}$	repetitive, $I_T = 150 \text{ A}$ 150 A/ μs non repetitive, $I_T = I_{T(AV)M}$ 400 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}	$T_{VJ} = T_{VJM}$ $I_T = I_{T(AV)M}$	$t_p = 30 \mu\text{s}$ 10 W $t_p = 500 \mu\text{s}$ 5 W
$P_{G(AV)}$		0.5 W
V_{RGM}		10 V
T_{VJ}		-40...+125 $^{\circ}\text{C}$
T_{VJM}		125 $^{\circ}\text{C}$
T_{stg}		-40...+125 $^{\circ}\text{C}$
M_d	Mounting torque	2.5 Nm 22 lb.in.
Weight		20 g

Features

- Thyristor for line frequencies
- International standard package JEDEC TO-208AC
- Planar glassivated chip
- Long-term stability of blocking currents and voltages

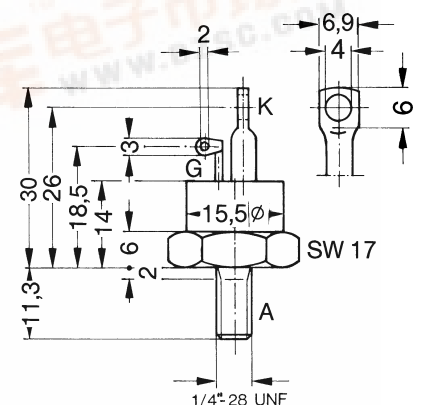
Applications

- Motor control
- Power converter
- AC power controller

Advantages

- Space and weight savings
- Simple mounting
- Improved temperature and power cycling

Dimensions in mm (1 mm = 0.0394")



Data according to IEC 60747

IXYS reserves the right to change limits, test conditions and dimensions

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Symbol	Test Conditions	Characteristic Values
I_R, I_D	$T_{VJ} = T_{VJM}; V_R = V_{RRM}; V_D = V_{DRM}$	≤ 10 mA
V_T	$I_T = 150$ A; $T_{VJ} = 25^\circ\text{C}$	≤ 1.5 V
V_{T0}	For power-loss calculations only ($T_{VJ} = 125^\circ\text{C}$)	0.85 V
r_T		3.5 mΩ
V_{GT}	$V_D = 6$ V; $T_{VJ} = 25^\circ\text{C}$	≤ 1.5 V
	$T_{VJ} = -40^\circ\text{C}$	≤ 1.9 V
I_{GT}	$V_D = 6$ V; $T_{VJ} = 25^\circ\text{C}$	≤ 100 mA
	$T_{VJ} = -40^\circ\text{C}$	≤ 200 mA
V_{GD}	$T_{VJ} = T_{VJM}; V_D = 2/3 V_{DRM}$	≤ 0.2 V
I_{GD}		≤ 1 mA
I_L	$T_{VJ} = 25^\circ\text{C}; t_p = 30$ μs $I_G = 0.1$ A; $di_G/dt = 0.1$ A/μs	≤ 100 mA
I_H	$T_{VJ} = 25^\circ\text{C}; V_D = 6$ V; $R_{GK} = \infty$	≤ 80 mA
t_{gd}	$T_{VJ} = 25^\circ\text{C}; V_D = 1/2 V_{DRM}$ $I_G = 0.1$ A; $di_G/dt = 0.1$ A/μs	≤ 2 μs
t_q	$T_{VJ} = T_{VJM}; I_T = 50$ A, $t_p = 200$ μs; $di/dt = -10$ A/μs $V_R = 100$ V; $dv/dt = 10$ V/μs; $V_D = 2/3 V_{DRM}$	typ. 100 μs
R_{thJC}	DC current	0.4 K/W
R_{thJH}	DC current	0.6 K/W
d_s	Creepage distance on surface	1.7 mm
d_A	Strike distance through air	1.7 mm
a	Max. acceleration, 50 Hz	50 m/s ²

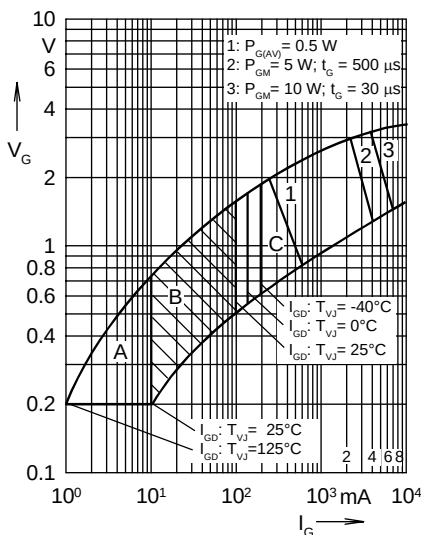


Fig. 1 Gate trigger range
Triggering:
A = no; B = possible, C = safe

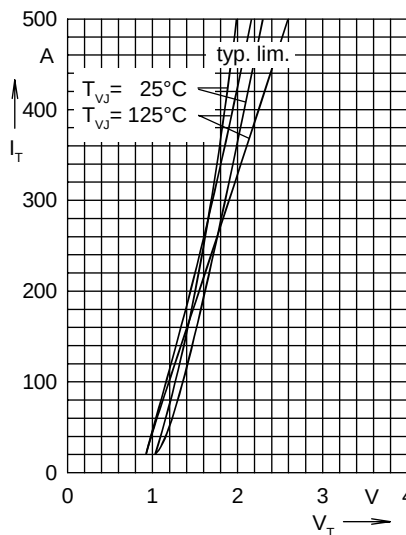


Fig. 2 On-state characteristics

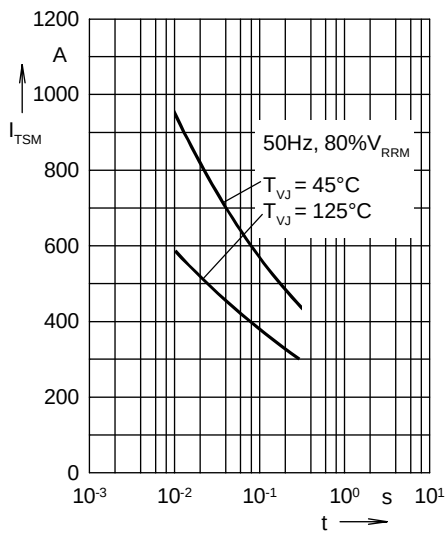


Fig. 3 Surge overload current
 I_{TSM} : crest value, t : duration

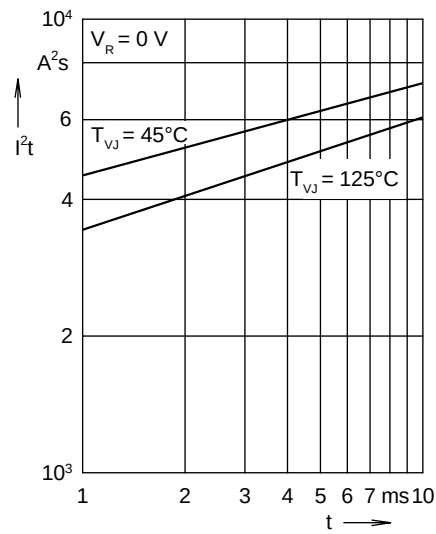


Fig. 4 I^2t versus time (1-10 ms)

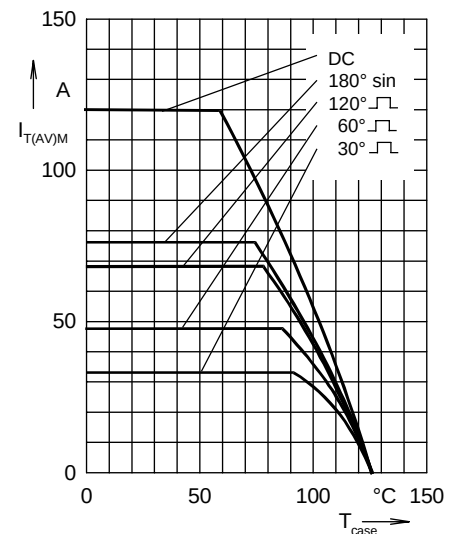


Fig. 5 Maximum forward current at case temperature

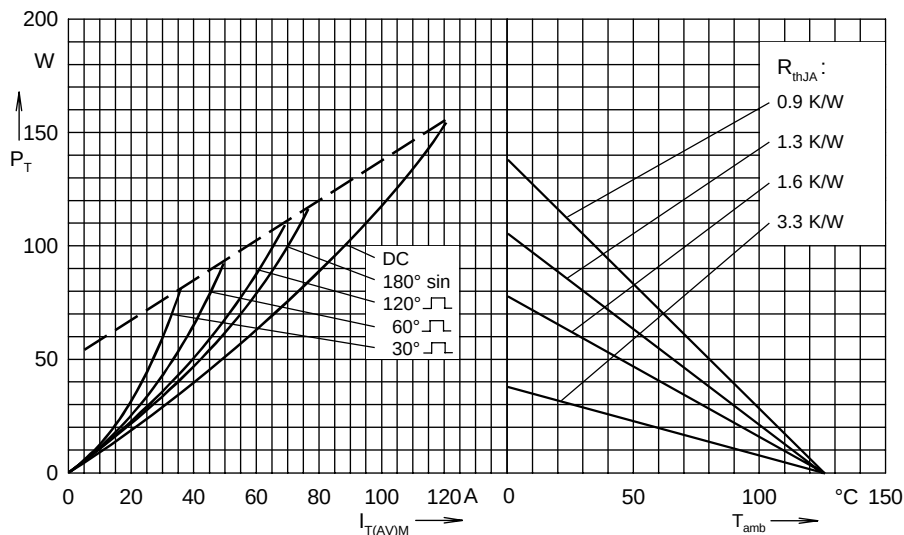


Fig. 6 Power dissipation versus on-state current and ambient temperature

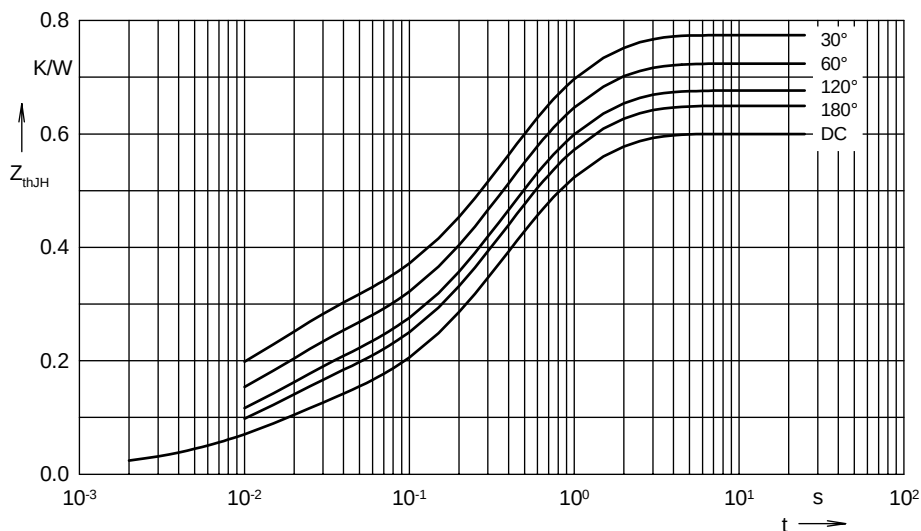


Fig. 7 Transient thermal impedance junction to heatsink

R_{thJH} for various conduction angles d :

d	R_{thJH} (K/W)
DC	0.6
180°	0.65
120°	0.677
60°	0.725
30°	0.775

Constants for Z_{thJH} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.01	0.001
2	0.09	0.013
3	0.30	0.3
4	0.20	0.9