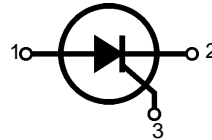


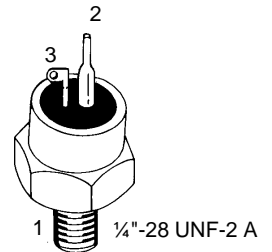
# Phase Control Thyristors

$V_{RRM} = 800-1400 \text{ V}$   
 $I_{T(RMS)} = 120 \text{ A}$   
 $I_{T(AV)M} = 69 \text{ A}$

$V_{RSM}$	$V_{RRM}$	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
	$T_{case} = 85^{\circ}\text{C}; 180^{\circ}$ sine	63	A
$I_{T(AV)M}$	$T_{case} = 80^{\circ}\text{C}; 180^{\circ}$ sine	69	A
$I_{TSM}$	$T_{VJ} = 45^{\circ}\text{C}; V_R = 0$	t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine	1200 A 1340 A
	$T_{VJ} = T_{VJM}; V_R = 0$	t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine	1100 A 1250 A
$I^2t$	$T_{VJ} = 45^{\circ}\text{C}; V_R = 0$	t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine	7200 A <sup>2</sup> s 7550 A <sup>2</sup> s
	$T_{VJ} = T_{VJM}; V_R = 0$	t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine	6050 A <sup>2</sup> s 6500 A <sup>2</sup> s
$(di/dt)_{cr}$	$T_{VJ} = T_{VJM}; f = 50\text{Hz}; t_p = 200\mu\text{s}; V_D = 2/3 V_{DRM}; I_G = 0.5 \text{ A}$	repetitive, $I_T = 150 \text{ A}$	150 A/ $\mu\text{s}$
	$di_G/dt = 0.5 \text{ A}/\mu\text{s}$	non repetitive, $I_T = I_{T(AV)M}$	400 A/ $\mu\text{s}$
$(dv/dt)_{cr}$	$T_{VJ} = T_{VJM}; R_{GK} = \infty; \text{method 1 (linear voltage rise)}$	$V_{DR} = 2/3 V_{DRM}$	1000 V/ $\mu\text{s}$
$P_{GM}$	$T_{VJ} = T_{VJM}; t_p = 30 \mu\text{s}$	10	W
$P_{G(AV)}$	$I_T = I_{T(AV)M}; t_p = 500 \mu\text{s}$	5	W
		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

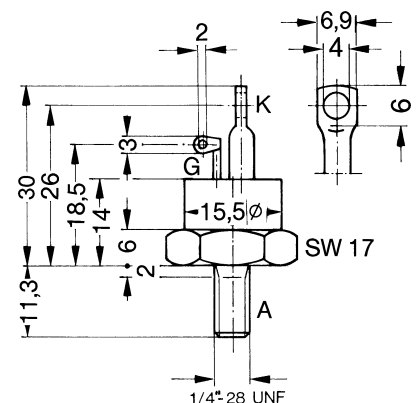
### Applications

- 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

Symbol	Test Conditions	Characteristic Values
$I_R, I_D$	$T_{VJ} = T_{VJM}; V_R = V_{RRM}; V_D = V_{DRM}$	$\leq 10$ mA
$V_T$	$I_T = 150$ A; $T_{VJ} = 25^\circ\text{C}$	$\leq 1.5$ V
$V_{T0}$	For power-loss calculations only ( $T_{VJ} = 125^\circ\text{C}$ )	0.85 V
$r_T$		3.5 m $\Omega$
$V_{GT}$	$V_D = 6$ V; $T_{VJ} = 25^\circ\text{C}$	$\leq 1.5$ V
	$T_{VJ} = -40^\circ\text{C}$	$\leq 1.9$ V
$I_{GT}$	$V_D = 6$ V; $T_{VJ} = 25^\circ\text{C}$	$\leq 100$ mA
	$T_{VJ} = -40^\circ\text{C}$	$\leq 200$ mA
$V_{GD}$	$T_{VJ} = T_{VJM}; V_D = 2/3 V_{DRM}$	$\leq 0.2$ V
$I_{GD}$		$\leq 1$ mA
$I_L$	$T_{VJ} = 25^\circ\text{C}; t_p = 30$ $\mu\text{s}$ $I_G = 0.1$ A; $di_G/dt = 0.1$ A/ $\mu\text{s}$	$\leq 100$ mA
$I_H$	$T_{VJ} = 25^\circ\text{C}; V_D = 6$ V; $R_{GK} = \infty$	$\leq 80$ 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/ $\mu\text{s}$	$\leq 2$ $\mu\text{s}$
$t_q$	$T_{VJ} = T_{VJM}; I_T = 50$ A, $t_p = 200$ $\mu\text{s}$ ; $di/dt = -10$ A/ $\mu\text{s}$ $V_R = 100$ V; $dv/dt = 10$ V/ $\mu\text{s}$ ; $V_D = 2/3 V_{DRM}$	typ. 100 $\mu\text{s}$
$R_{thJC}$	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 <sup>2</sup>

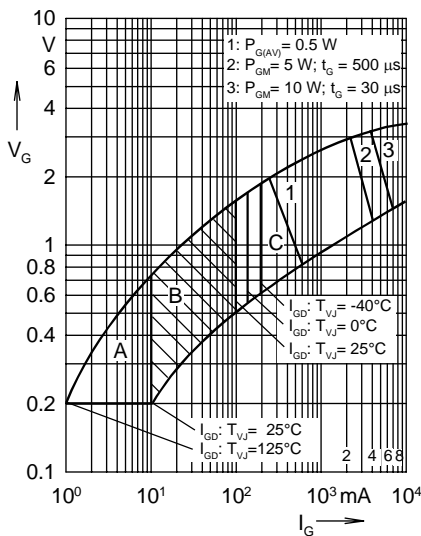


Fig. 1 Gate trigger range  
Triggering:  
A = no; B = possible, C = safe

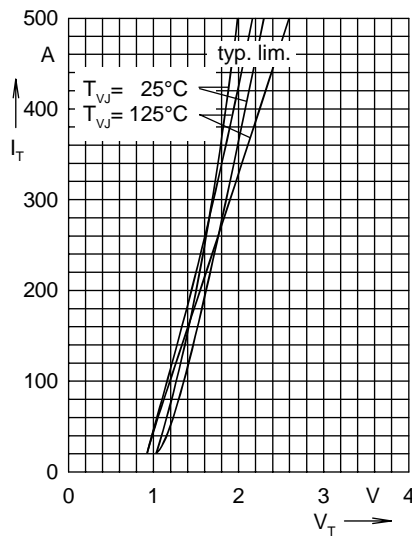


Fig. 2 On-state characteristics

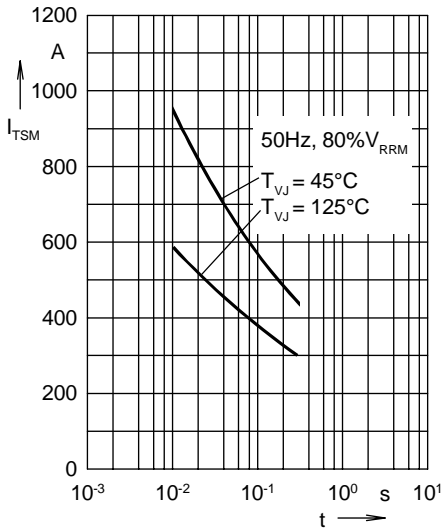


Fig. 3 Surge overload current  
 $I_{TSM}$ : crest value,  $t$ : duration

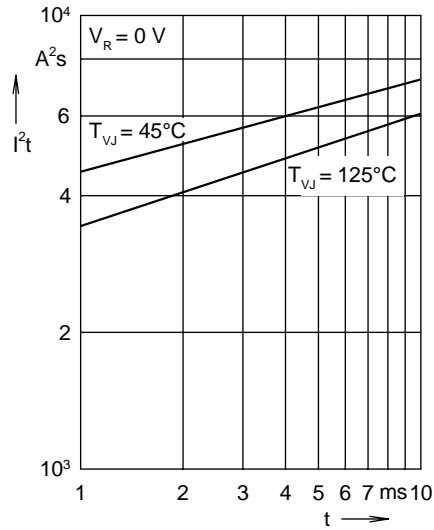


Fig. 4  $I^2t$  versus time (1-10 ms)

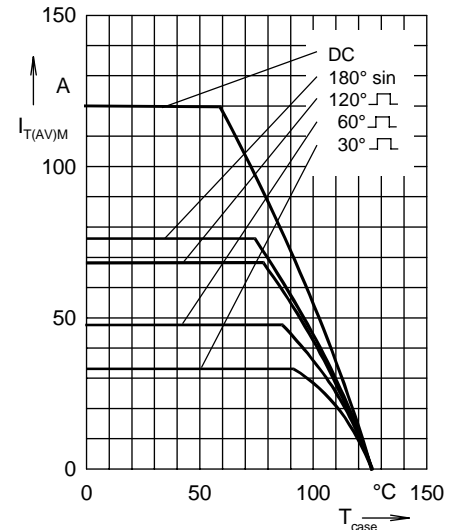


Fig. 5 Maximum forward current at case temperature

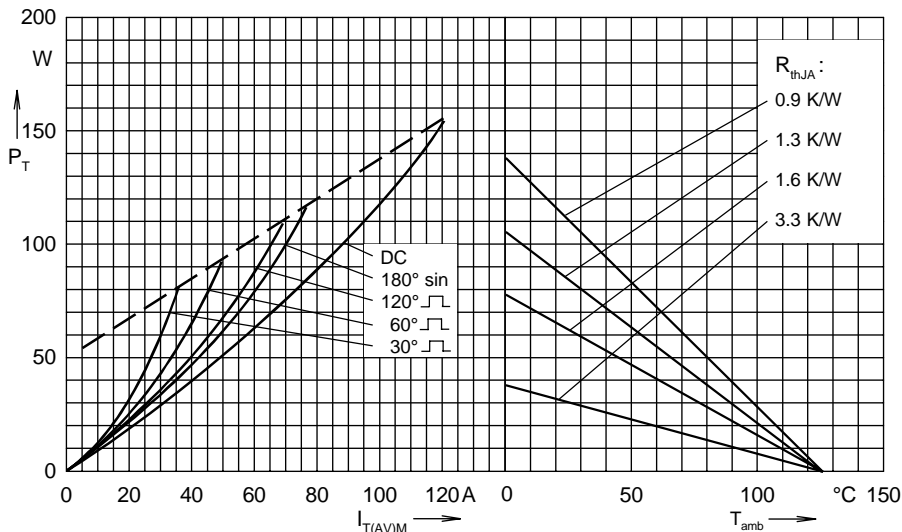


Fig. 6 Power dissipation versus on-state current and ambient temperature

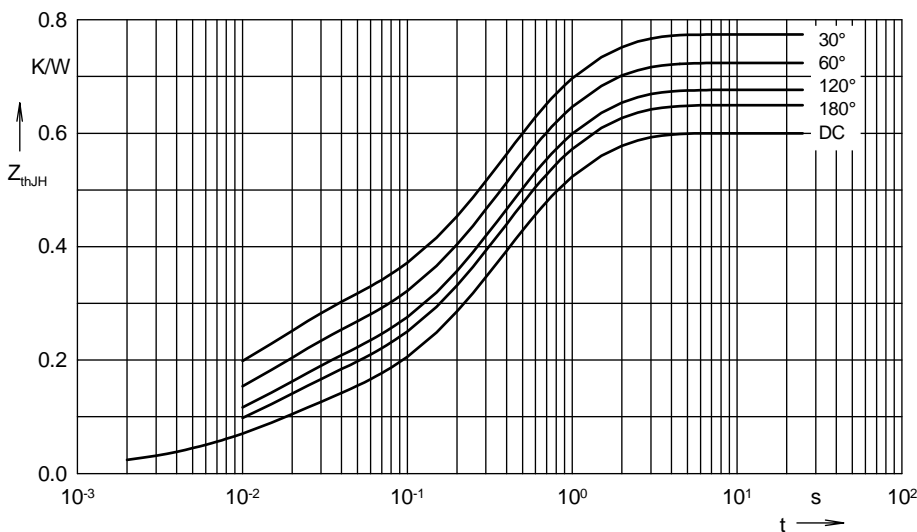


Fig. 7 Transient thermal impedance junction to heatsink

$R_{thJH}$  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