



**SGS-THOMSON**  
MICROELECTRONICS

**TYN 204 ---> TYN 1004**

SCR

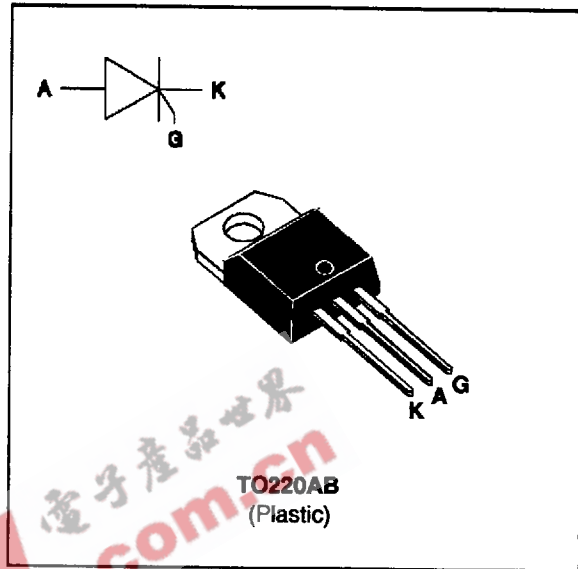
**FEATURES**

- HIGH SURGE CAPABILITY
- HIGH ON-STATE CURRENT
- HIGH STABILITY AND RELIABILITY

**DESCRIPTION**

The TYN 204 ---> TYN 1004 Family of Silicon Controlled Rectifiers uses a high performance glass passivated technology.

This general purpose Family of Silicon Controlled Rectifiers is designed for power supplies up to 400Hz on resistive or inductive load.



**ABSOLUTE RATINGS (limiting values)**

Symbol	Parameter	Value	Unit
$I_T(RMS)$	RMS on-state current (180° conduction angle)	$T_c = 115\text{ °C}$ 4	A
$I_T(AV)$	Average on-state current (180° conduction angle, single phase circuit)	$T_c = 115\text{ °C}$ 2.5	A
$I_{TSM}$	Non repetitive surge peak on-state current ( $T_j$ initial = 25°C)	$t_p = 8.3\text{ ms}$ 63	A
		$t_p = 10\text{ ms}$ 60	
$i^2t$	$i^2t$ value	$t_p = 10\text{ ms}$ 18	A <sup>2</sup> s
$di/dt$	Critical rate of rise of on-state current Gate supply : $I_G = 100\text{ mA}$ $di_G/dt = 1\text{ A}/\mu\text{s}$	100	A/ $\mu\text{s}$
$T_{stg}$ $T_j$	Storage and operating junction temperature range	- 40 to + 150 - 40 to + 125	°C °C
$T_l$	Maximum lead temperature for soldering during 10 s at 4.5 mm from case	260	°C

Symbol	Parameter	TYN					Unit
		204	404	604	804	1004	
$V_{DRM}$ $V_{RRM}$	Repetitive peak off-state voltage $T_j = 125\text{ °C}$	200	400	600	800	1000	V

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**THERMAL RESISTANCES**

Symbol	Parameter	Value	Unit
Rth (j-a)	Junction to ambient	60	°C/W
Rth (j-c) DC	Junction to case for DC	2.5	°C/W

**GATE CHARACTERISTICS (maximum values)**

$P_G (AV) = 1W$   $P_{GM} = 10W$  ( $t_p = 20 \mu s$ )  $I_{FGM} = 4A$  ( $t_p = 20 \mu s$ )  $V_{RGM} = 5V$ .

**ELECTRICAL CHARACTERISTICS**

Symbol	Test Conditions	Value	Unit
I <sub>GT</sub>	V <sub>D</sub> =12V (DC) R <sub>L</sub> =33Ω	T <sub>J</sub> =25°C MAX	15 mA
V <sub>GT</sub>	V <sub>D</sub> =12V (DC) R <sub>L</sub> =33Ω	T <sub>J</sub> =25°C MAX	1.5 V
V <sub>GD</sub>	V <sub>D</sub> =V <sub>DRM</sub> R <sub>L</sub> =3.3kΩ	T <sub>J</sub> = 110°C MIN	0.2 V
t <sub>gt</sub>	V <sub>D</sub> =V <sub>DRM</sub> I <sub>G</sub> = 40mA dI <sub>G</sub> /dt = 0.5A/μs	T <sub>J</sub> =25°C TYP	2 μs
I <sub>L</sub>	I <sub>G</sub> = 1.2 I <sub>GT</sub>	T <sub>J</sub> =25°C TYP	50 mA
I <sub>H</sub>	I <sub>T</sub> = 100mA gate open	T <sub>J</sub> =25°C MAX	30 mA
V <sub>TM</sub>	I <sub>TM</sub> = 8A t <sub>p</sub> = 380μs	T <sub>J</sub> =25°C MAX	1.8 V
I <sub>DRM</sub> I <sub>RRM</sub>	V <sub>DRM</sub> Rated V <sub>RRM</sub> Rated	T <sub>J</sub> =25°C MAX	0.01 mA
		T <sub>J</sub> = 110°C	2
dV/dt	Linear slope up to V <sub>D</sub> =67%V <sub>DRM</sub> gate open	T <sub>J</sub> = 110°C MIN	200 V/μs
t <sub>q</sub>	V <sub>D</sub> =67%V <sub>DRM</sub> I <sub>TM</sub> = 8A V <sub>R</sub> = 25V dI <sub>TM</sub> /dt=30 A/μs dV <sub>D</sub> /dt= 50V/μs	T <sub>J</sub> = 110°C TYP	70 μs

Fig.1 : Maximum average power dissipation versus average on-state current.

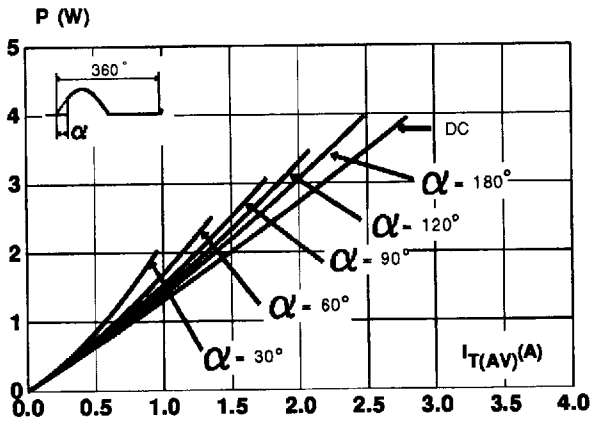


Fig.2 : Correlation between maximum average power dissipation and maximum allowable temperatures (Tamb and Tcase) for different thermal resistances heatsink + contact.

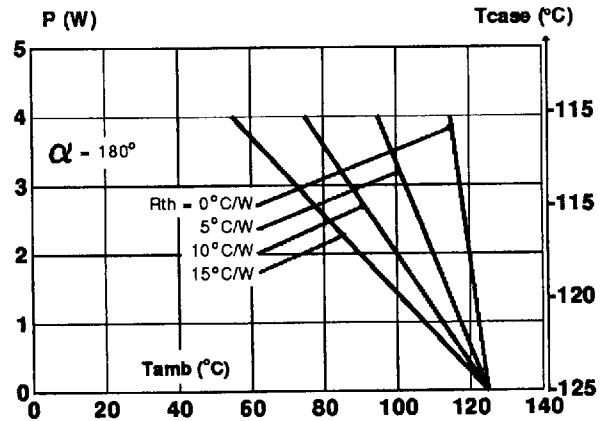


Fig.3 : Average on-state current versus case temperature.

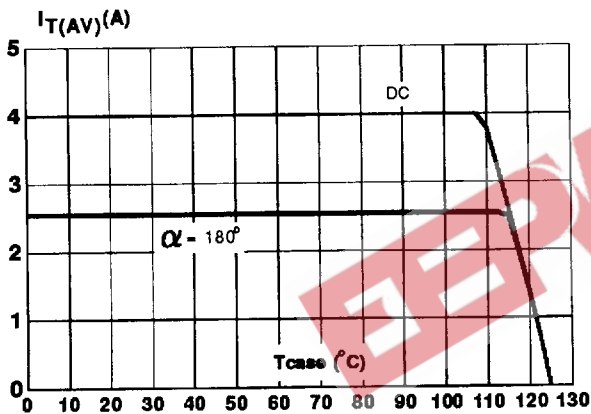


Fig.4 : Relative variation of thermal impedance versus pulse duration.

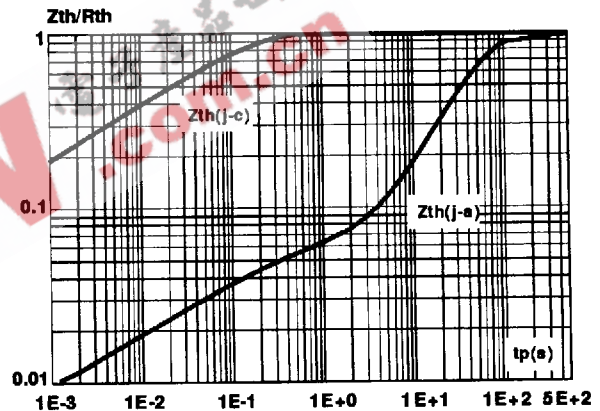


Fig.5 : Relative variation of gate trigger current versus junction temperature.

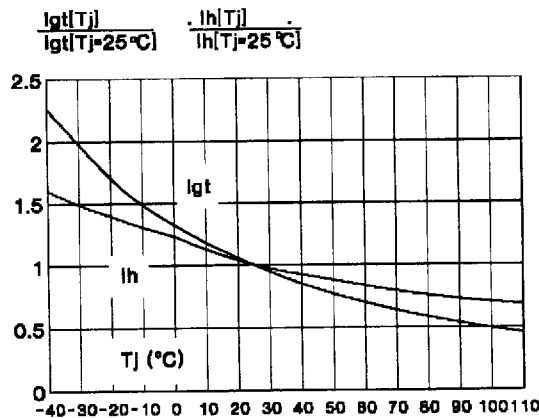
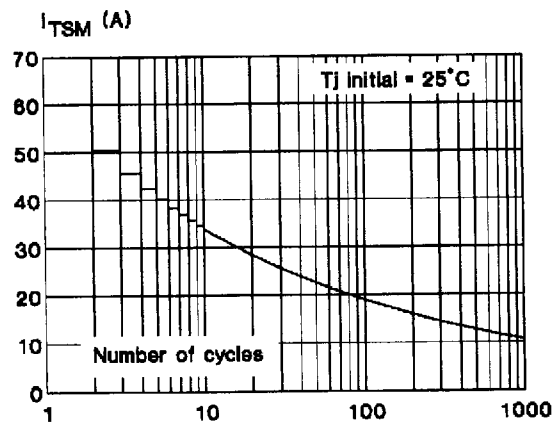
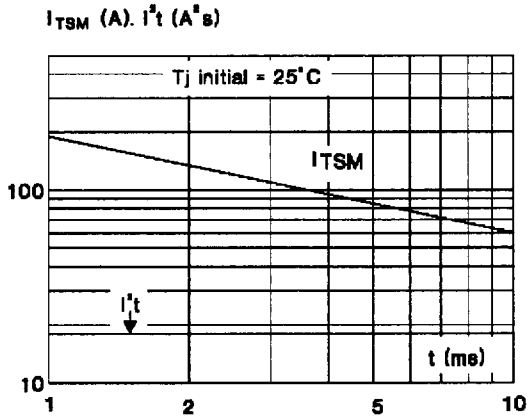


Fig.6 : Non repetitive surge peak on-state current versus number of cycles.

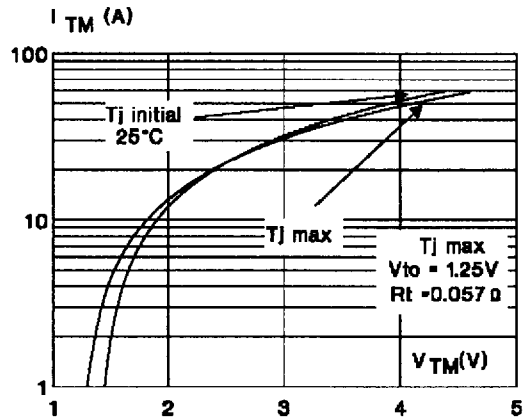


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**Fig.7 :** Non repetitive surge peak on-state current for a sinusoidal pulse with width :  $t \leq 10$  ms, and corresponding value of  $I^2t$ .

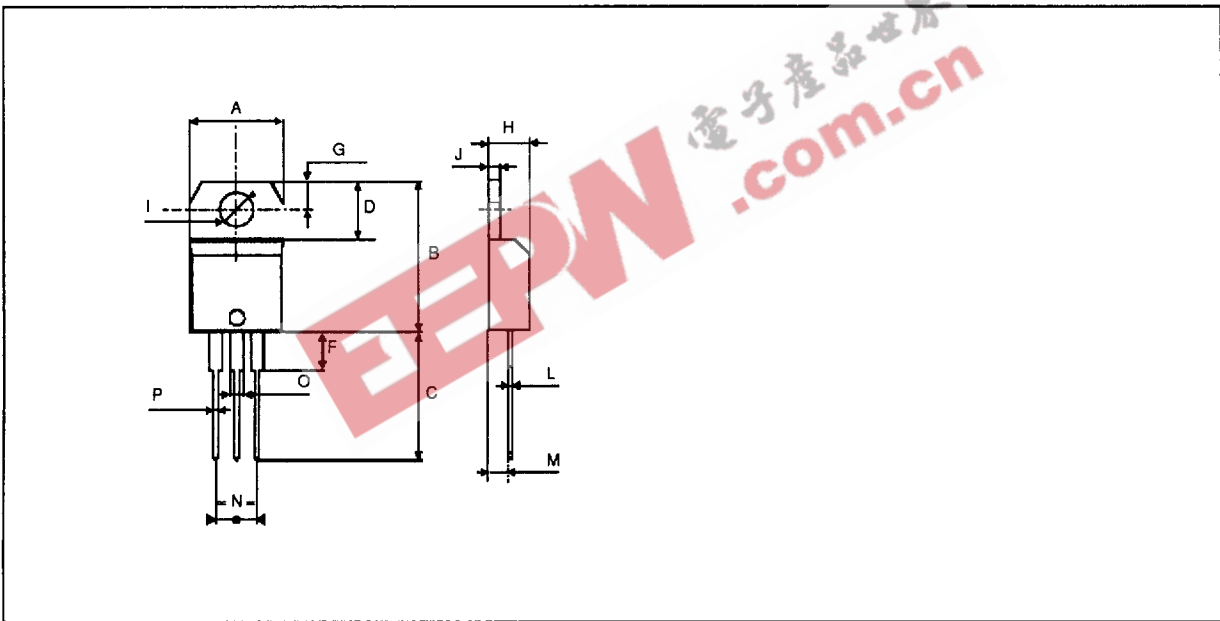


**Fig.8 :** On-state characteristics (maximum values).



**PACKAGE MECHANICAL DATA**

TO220AB Plastic



Cooling method : C  
 Marking : type number  
 Weight : 2.3 g

Recommended torque value : 0.8 m.N.  
 Maximum torque value : 1 m.N.

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