

## SENSITIVE GATE TRIACS

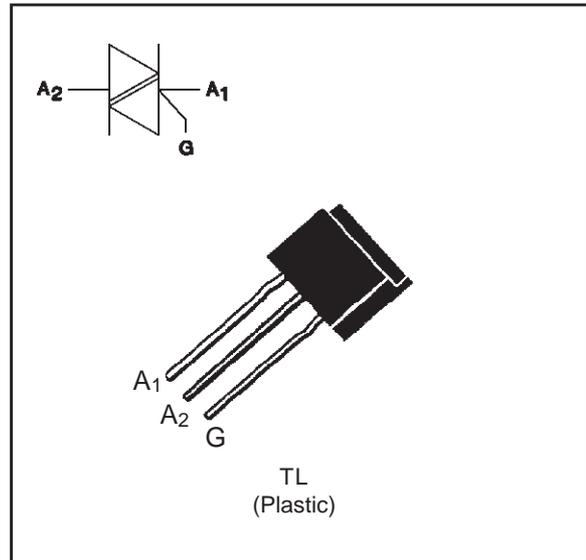
### FEATURES

- VERY LOW  $I_{GT} = 5\text{mA max}$
- LOW  $I_H = 15\text{mA max}$

### DESCRIPTION

The TLC116 ---> TLC386 T/D/S/A triac family uses a high performance glass passivated PNPN technology.

These parts are suitable for general purpose applications where gate high sensitivity is required. Application on 4Q such as phase control and static



### ABSOLUTE RATINGS (limiting values)

Symbol	Parameter	Value	Unit	
$I_T(\text{RMS})$	RMS on-state current (360° conduction angle)	$T_I = 40^\circ\text{C}$	3	A
		$T_a = 25^\circ\text{C}$	1.3 (1)	
$I_{TSM}$	Non repetitive surge peak on-state current ( $T_j$ initial = $25^\circ\text{C}$ )	$t_p = 8.3\text{ ms}$	31.5	A
		$t_p = 10\text{ ms}$	30	
$I^2t$	$I^2t$ value	$t_p = 10\text{ ms}$	4.5	$\text{A}^2\text{s}$
$di/dt$	Critical rate of rise of on-state current Gate supply : $I_G = 50\text{mA}$ $di_G/dt = 0.1\text{A}/\mu\text{s}$	Repetitive $F = 50\text{ Hz}$	10	$\text{A}/\mu\text{s}$
		Non Repetitive	50	
$T_{stg}$ $T_j$	Storage and operating junction temperature range	- 40 to + 150 - 40 to + 110	$^\circ\text{C}$ $^\circ\text{C}$	
$T_I$	Maximum lead temperature for soldering during 4 s at 4.5 mm from case	230	$^\circ\text{C}$	

Symbol	Parameter	TLC				Unit
		116 T/D/S/A	226 T/D/S/A	336 T/D/S/A	386 T/D/S/A	
$V_{DRM}$ $V_{RRM}$	Repetitive peak off-state voltage $T_j = 110^\circ\text{C}$	200	400	600	700	V

(1) With Cu surface  $1\text{cm}^2$ .

**THERMAL RESISTANCES**

Symbol	Parameter	Value	Unit
Rth (j-a)	Junction to ambient on printed circuit with Cu surface 1cm <sup>2</sup>	50	°C/W
Rth (j-l) DC	Junction leads for DC	20	°C/W
Rth (j-l) AC	Junction leads for 360° conduction angle ( F= 50 Hz)	15	°C/W

**GATE CHARACTERISTICS** (maximum values)

P<sub>G</sub> (AV) = 0.1W    P<sub>GM</sub> = 2W (tp = 20 μs)    I<sub>GM</sub> = 1A (tp = 20 μs)    V<sub>GM</sub> = 16V (tp = 20 μs).

**ELECTRICAL CHARACTERISTICS**

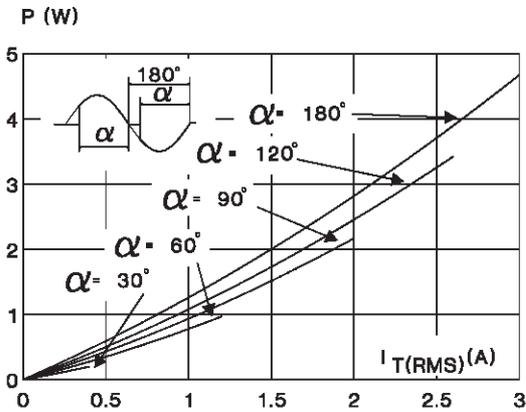
Symbol	Test Conditions		Quadrant		Suffix				Unit
					T	D	S	A	
I <sub>GT</sub>	V <sub>D</sub> =12V (DC) R <sub>L</sub> =33Ω	T <sub>j</sub> =25°C	I-II-III	MAX	5	5	10	10	mA
			IV	MAX	5	10	10	25	
V <sub>GT</sub>	V <sub>D</sub> =12V (DC) R <sub>L</sub> =33Ω	T <sub>j</sub> =25°C	I-II-III-IV	MAX	1.5				V
V <sub>GD</sub>	V <sub>D</sub> =V <sub>DRM</sub> R <sub>L</sub> =3.3kΩ	T <sub>j</sub> =110°C	I-II-III-IV	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	I-II-III-IV	TYP	2				μs
I <sub>L</sub>	I <sub>G</sub> = 1.2 I <sub>GT</sub>	T <sub>j</sub> =25°C	I-III-IV	MAX	15	15	25	25	mA
			II		15	15	25	25	
I <sub>H</sub> *	I <sub>T</sub> = 100mA gate open	T <sub>j</sub> =25°C		MAX	15	15	25	25	mA
V <sub>TM</sub> *	I <sub>TM</sub> = 4A tp= 380μs	T <sub>j</sub> =25°C		MAX	1.85				V
I <sub>DRM</sub> I <sub>RRM</sub>	V <sub>DRM</sub> Rated V <sub>R</sub> RRM Rated	T <sub>j</sub> =25°C		MAX	0.01				mA
		T <sub>j</sub> =110°C		MAX	0.75				
dV/dt *	Linear slope up to V <sub>D</sub> =67%V <sub>DRM</sub> gate open	T <sub>j</sub> =110°C		TYP	10	10	20	20	V/μs
(dV/dt) <sub>c</sub> *	(dI/dt) <sub>c</sub> = 1.3A/ms	T <sub>j</sub> =110°C		TYP	1	1	5	5	V/μs

\* For either polarity of electrode A<sub>2</sub> voltage with reference to electrode A<sub>1</sub>.

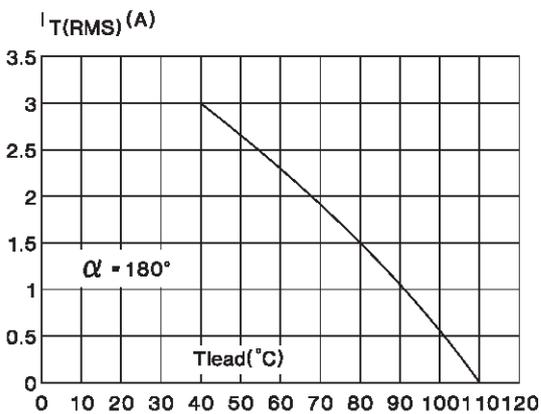
ORDERING INFORMATION

Package	$I_T(\text{RMS})$	$V_{\text{DRM}} / V_{\text{RRM}}$	Sensitivity Specification			
	A	V	T	D	S	A
TLC ..6	3	200	X	X	X	X
		400	X	X	X	X
		600	X	X	X	X
		700	X	X	X	X

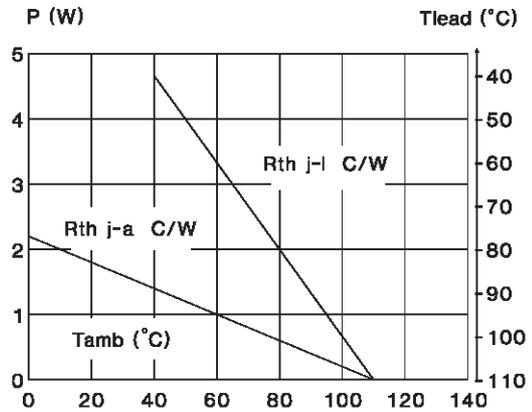
**Fig.1** : Maximum RMS power dissipation versus RMS on-state current ( $F=50\text{Hz}$ ).  
(Curves are cut off by  $(di/dt)_c$  limitation)



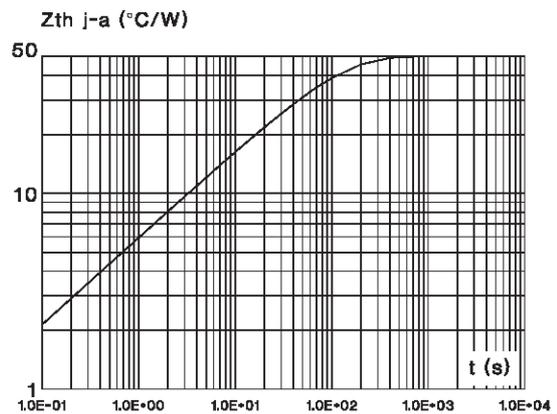
**Fig.3** : RMS on-state current versus case temperature.



**Fig.2** : Correlation between maximum RMS power dissipation and maximum allowable temperatures ( $T_{\text{amb}}$  and  $T_{\text{lead}}$ ).

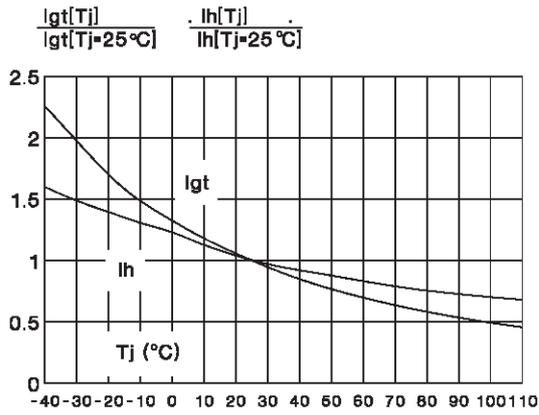


**Fig.4** : Thermal transient impedance junction to case and junction to ambient versus pulse duration.

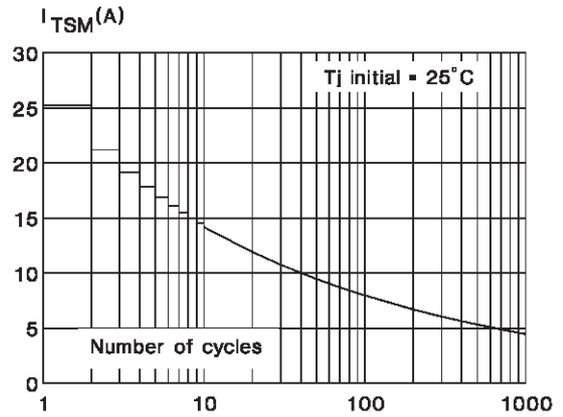


# TLC116 T/D/S/A ---> TLC386 T/D/S/A

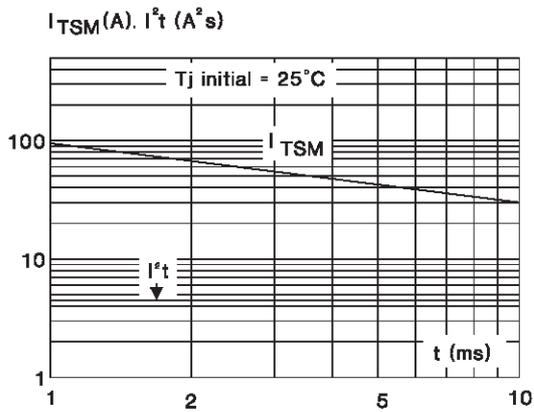
**Fig.5** : Relative variation of gate trigger current and holding current versus junction temperature.



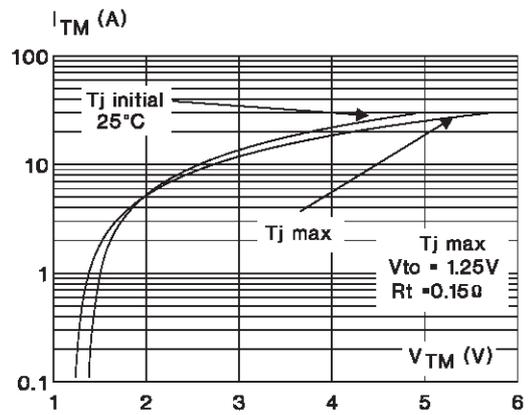
**Fig.6** : Non Repetitive surge peak on-state current versus number of cycles.



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

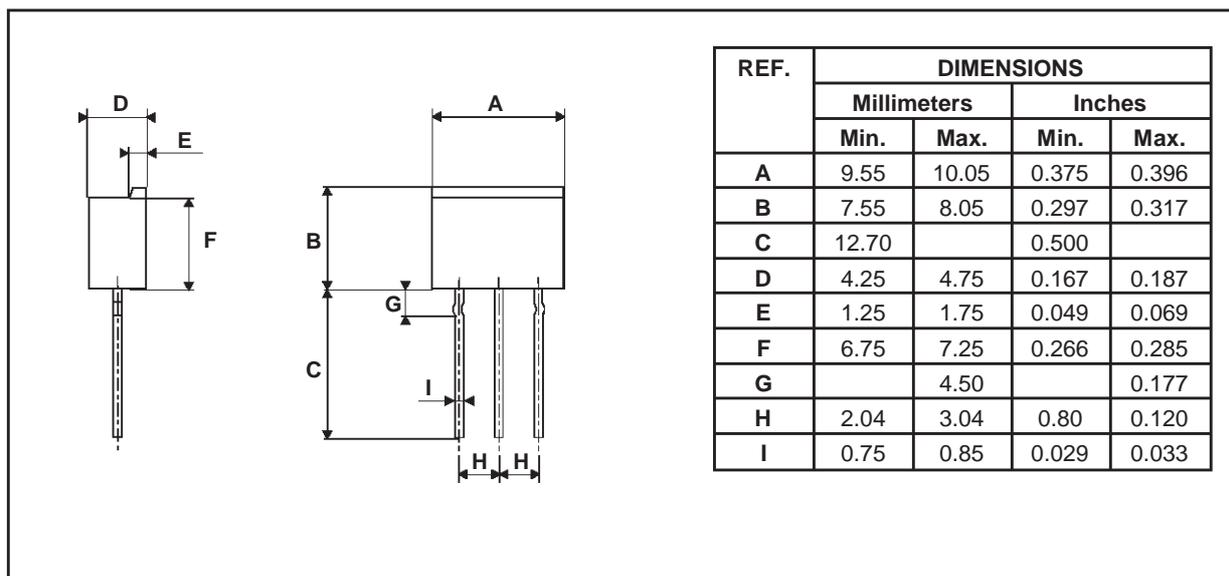


**Fig.8** : On-state characteristics (maximum values).



**PACKAGE MECHANICAL DATA**

TL Plastic



Marking : type number  
Weight : 0.75 g

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