

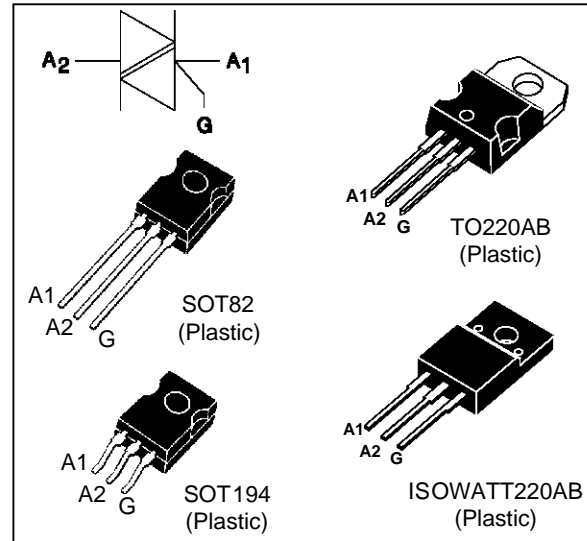
## HIGH PERFORMANCE TRIACS

### FEATURES

- $I_{TRMS} = 4\text{ A}$
- $V_{DRM} = 400\text{ V to }600\text{ V}$
- SENSITIVE GATE :  $I_{GT} \leq 5\text{ mA}$
- LOW  $I_H \leq 10\text{ mA}$

### DESCRIPTION

The T405 high voltage TRIAC Families are high performance planar diffused PNP devices glass passivated technology. Packaged either in TO220AB, SOT82, SOT194 and ISOWATT220AB these products are intended for all bidirectional switch applications.



### ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit	
$I_T(\text{RMS})$	RMS on-state current (360° conduction angle)	TO220AB SOT194/SOT82	$T_c = 95\text{ °C}$	4	A
		ISOWATT220AB	$T_c = 85\text{ °C}$		
$I_{TSM}$	Non repetitive surge peak on-state current ( $T_j$ initial = 25°C )		$t_p = 8.3\text{ ms}$	35	A
			$t_p = 10\text{ ms}$		
$i^2t$	$i^2t$ value		$t_p = 10\text{ ms}$	4.5	A <sup>2</sup> s
$di/dt$	Critical rate of rise of on-state current Gate supply : $I_G = 50\text{ mA}$ $di_G/dt = 1\text{ A}/\mu\text{s}$		Repetitive $F = 50\text{ Hz}$	10	A/ $\mu\text{s}$
			Non Repetitive	50	
$T_{stg}$ $T_j$	Storage and operating junction temperature range		- 40 to + 150 - 40 to + 110		°C °C
$T_l$	Maximum lead temperature for soldering during 10 s at 4.5 mm from case		260		°C

Symbol	Parameter	T405		Unit
		-400	-600	
$V_{DRM}$ $V_{RRM}$	Repetitive peak off-state voltage $T_j = 110\text{ °C}$	400	600	V

## THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
Rth (j-a)	Junction to ambient	SOT82 / SOT194	100	°C/W
		TO220AB	60	
		ISOWATT220AB	50	
Rth (j-c) DC	Junction to case for DC	SOT82 / SOT194 TO220AB	3.5	°C/W
		ISOWATT220AB	5.3	
Rth (j-c) AC	Junction to case for 360° conduction angle ( F= 50 Hz)	SOT82 / SOT194 TO220AB	2.6	°C/W
		ISOWATT220AB	4	

## GATE CHARACTERISTICS (maximum values)

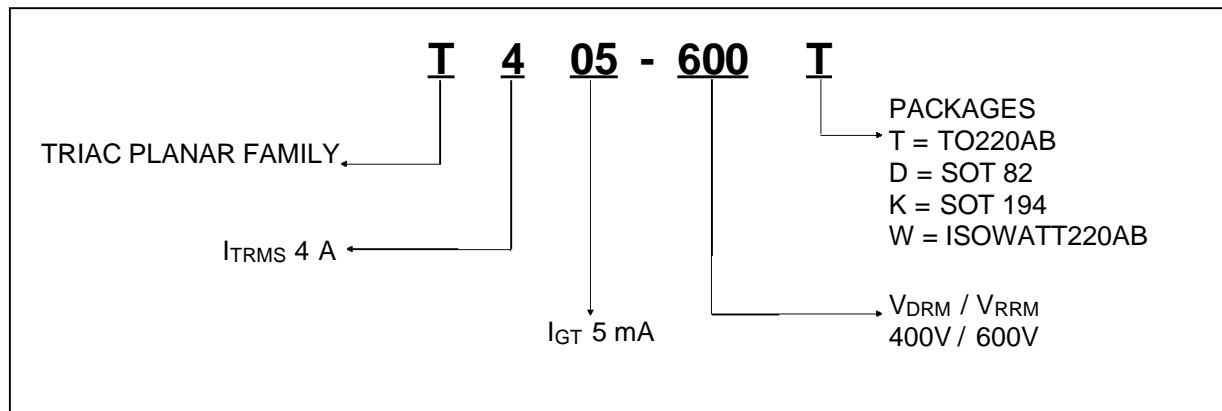
$P_{G(AV)} = 1 \text{ W}$      $P_{GM} = 40 \text{ W}$  (tp = 20  $\mu\text{s}$ )     $I_{GM} = 4 \text{ A}$  (tp = 20  $\mu\text{s}$ )     $V_{GM} = 16 \text{ V}$  (tp = 20  $\mu\text{s}$ ).

## ELECTRICAL CHARACTERISTICS

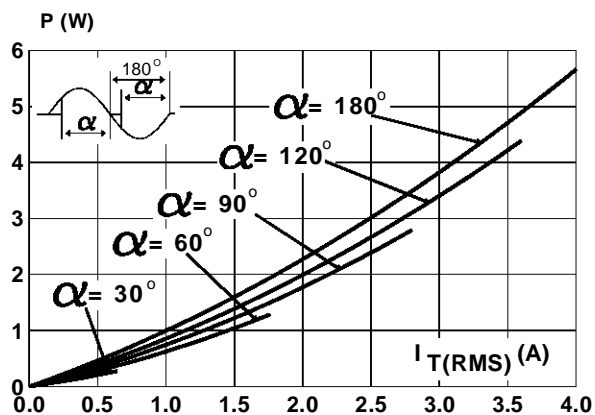
Symbol	Test Conditions		Quadrant		Value	Unit
$I_{GT}$	$V_D=12\text{V}$ (DC) $R_L=33\Omega$	$T_j=25^\circ\text{C}$	I-II-III	MAX	5	mA
$V_{GT}$	$V_D=12\text{V}$ (DC) $R_L=33\Omega$	$T_j=25^\circ\text{C}$	I-II-III	MAX	1.5	V
$V_{GD}$	$V_D=V_{DRM}$ $R_L=3.3\text{k}\Omega$	$T_j=110^\circ\text{C}$	I-II-III	MIN	0.2	V
tgt	$V_D=V_{DRM}$ $I_G = 40\text{mA}$ $di_G/dt = 0.5\text{A}/\mu\text{s}$ $I_{TM} = 5.5\text{A}$	$T_j=25^\circ\text{C}$	I-II-III	TYP	2	$\mu\text{s}$
$I_L$	$I_G=1.2 I_{GT}$	$T_j=25^\circ\text{C}$	I-III	MAX	10	mA
			II	max	15	
$I_H$ *	$I_T= 100\text{mA}$ gate open	$T_j=25^\circ\text{C}$		MAX	10	mA
$V_{TM}$ *	$I_{TM}= 5.5\text{A}$ tp= 380 $\mu\text{s}$	$T_j=25^\circ\text{C}$		MAX	1.75	V
$I_{DRM}$ $I_{RRM}$	V <sub>DRM</sub> Rated V <sub>RRM</sub> Rated	$T_j=25^\circ\text{C}$		MAX	0.01	mA
		$T_j=110^\circ\text{C}$		MAX	2	
dV/dt *	Linear slope up to $V_D=67\%V_{DRM}$ gate open	$T_j=110^\circ\text{C}$		MIN	5	V/ $\mu\text{s}$
				TYP	20	
(di/dt) <sub>c</sub> *	(dV/dt) <sub>c</sub> = 0.1V/ $\mu\text{s}$	$T_j=110^\circ\text{C}$		MIN	1.8	A/ms

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

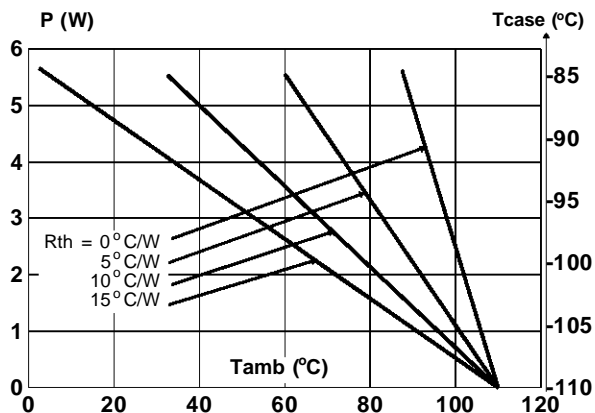
ORDERING INFORMATION



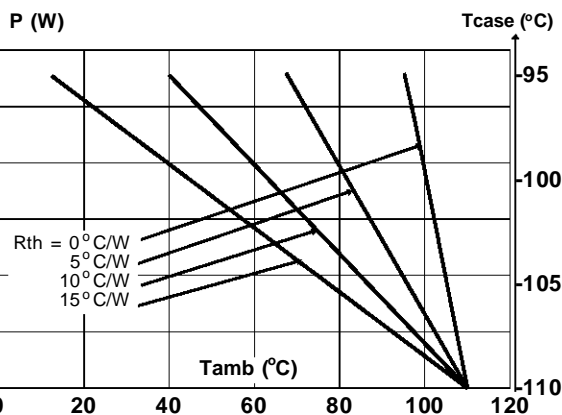
**Fig.1** : Maximum power dissipation versus RMS on-state current (F=50Hz).  
(Curves are cut off by (di/dt)c limitation)



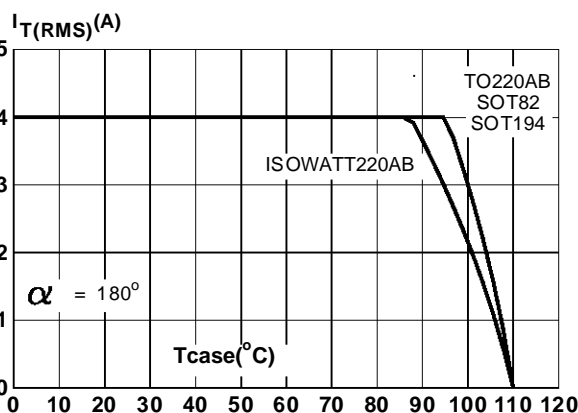
**Fig.3** : Correlation between maximum RMS power dissipation and maximum allowable temperatures (Tamb and Tcase) for different thermal resistances heatsink + contact (ISOWATT220AB).



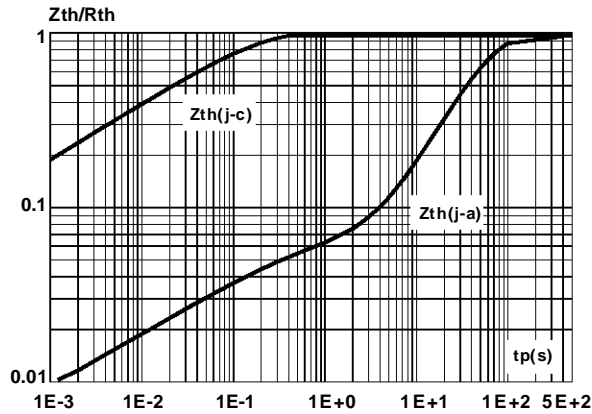
**Fig.2** : Correlation between maximum power dissipation and maximum allowable temperatures (Tamb and Tcase) for different thermal resistances heatsink + contact (TO220AB / SOT82 / SOT194).



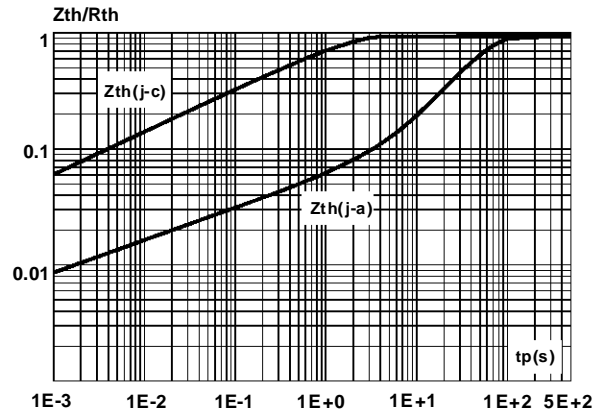
**Fig.4** : RMS on-state current versus case temperature.



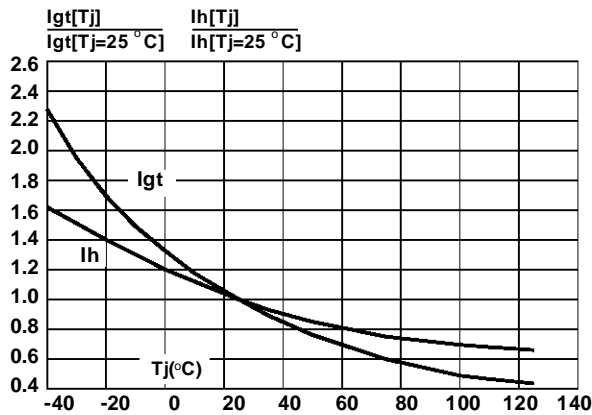
**Fig.5 :** Relative variation of thermal impedance versus pulse duration (SOT82 / SOT194 / TO220AB only).



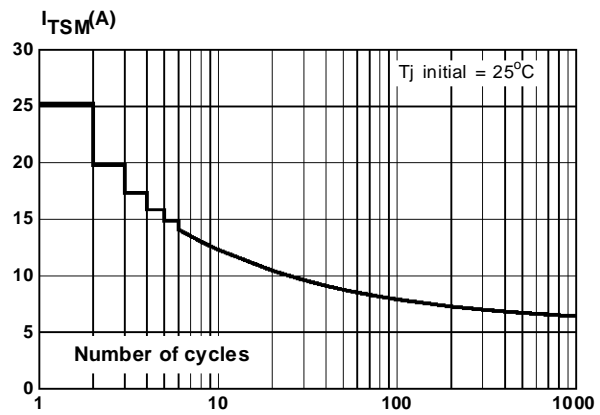
**Fig.6 :** Relative variation of thermal impedance versus pulse duration (ISOWATT220AB only).



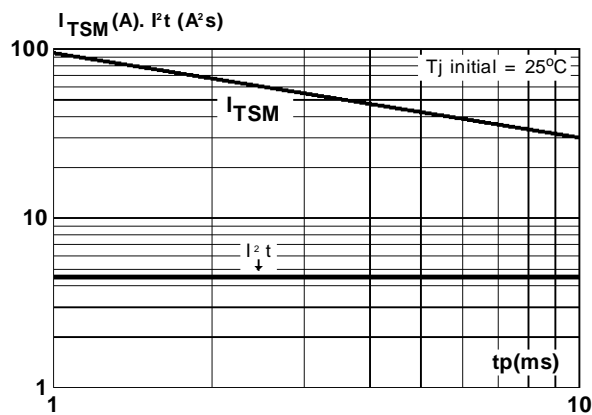
**Fig.7 :** Relative variation of gate trigger current and holding current versus junction temperature.



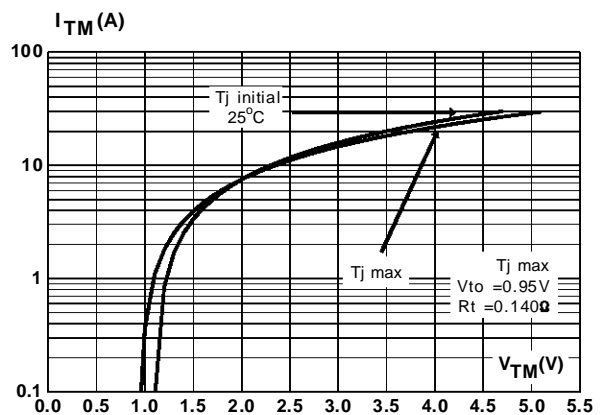
**Fig.8 :** Non Repetitive surge peak on-state current versus number of cycles.



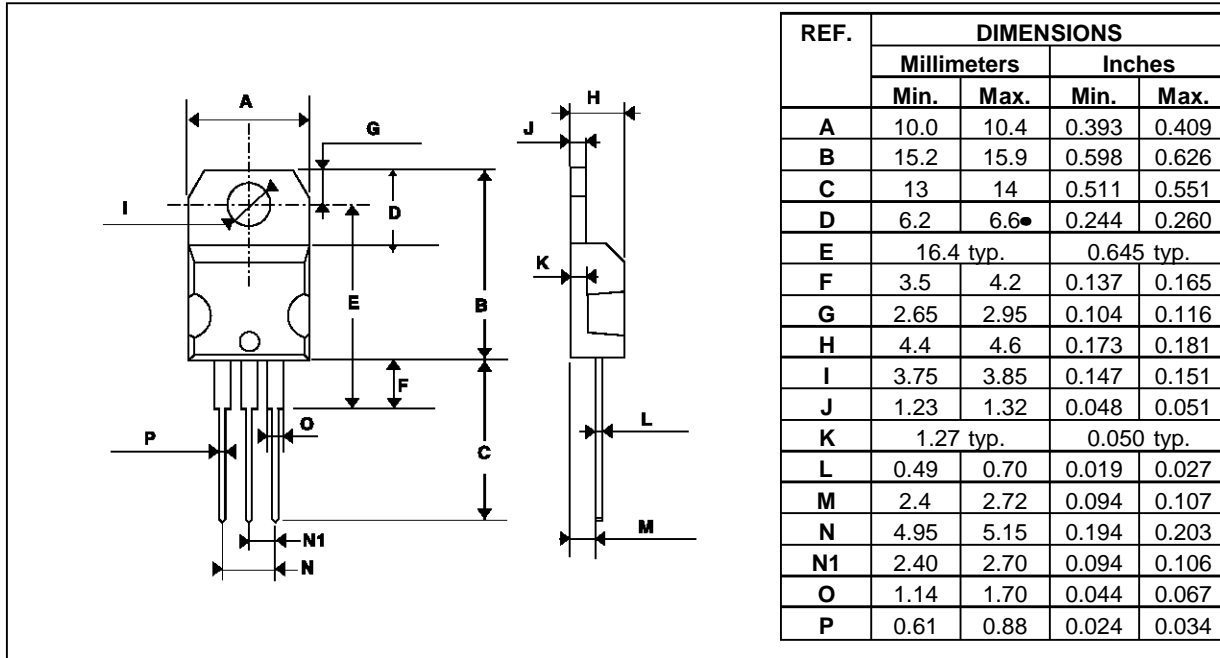
**Fig.9 :** Non repetitive surge peak on-state current for a sinusoidal pulse with width :  $t_p \leq 10\text{ms}$ , and corresponding value of  $I^2t$ .



**Fig.10 :** On-state characteristics (maximum values).

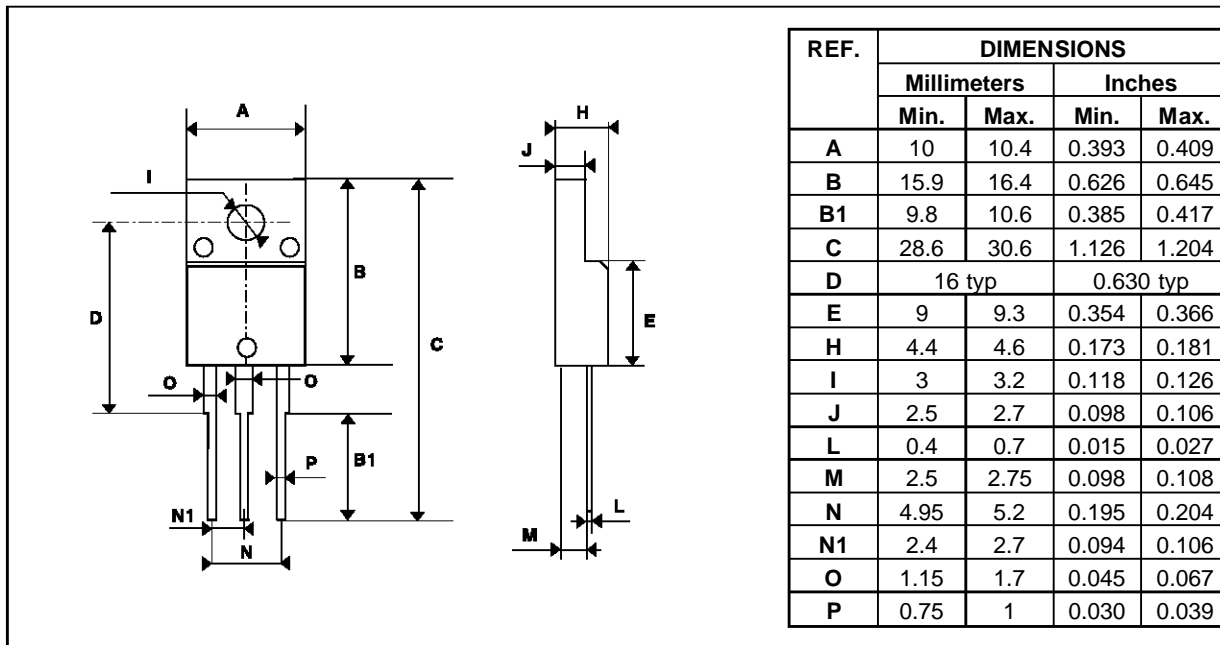


**PACKAGE MECHANICAL DATA**  
TO220AB Plastic



Cooling Method : C  
 Marking : Type number  
 Weight : 2 g  
 Recommended torque value : 0.55 m.N.  
 Maximum torque value : 0.70 m.N.

**PACKAGE MECHANICAL DATA**  
ISOWATT220AB Plastic

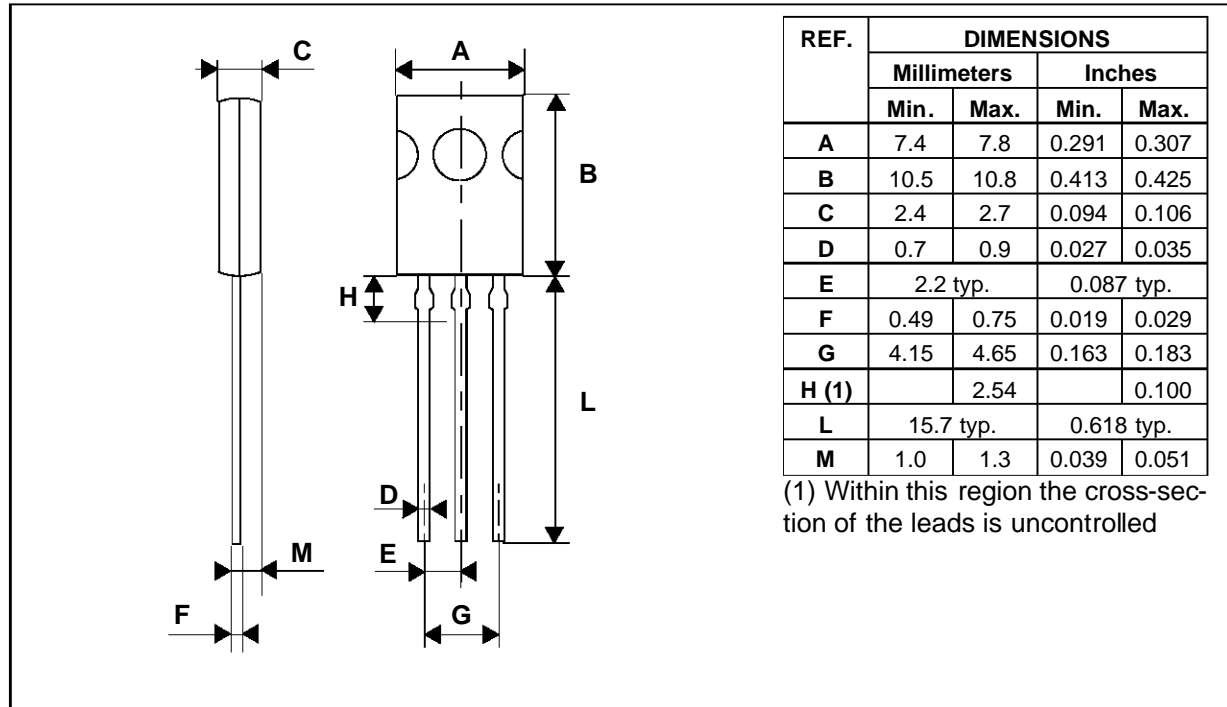


Cooling Method : C  
 Marking : Type number  
 Weight : 2.1g  
 Recommended torque value : 0.55 m.N.  
 Maximum torque value : 0.70 m.N.

# T405

## PACKAGE MECHANICAL DATA

SOT 82 Plastic

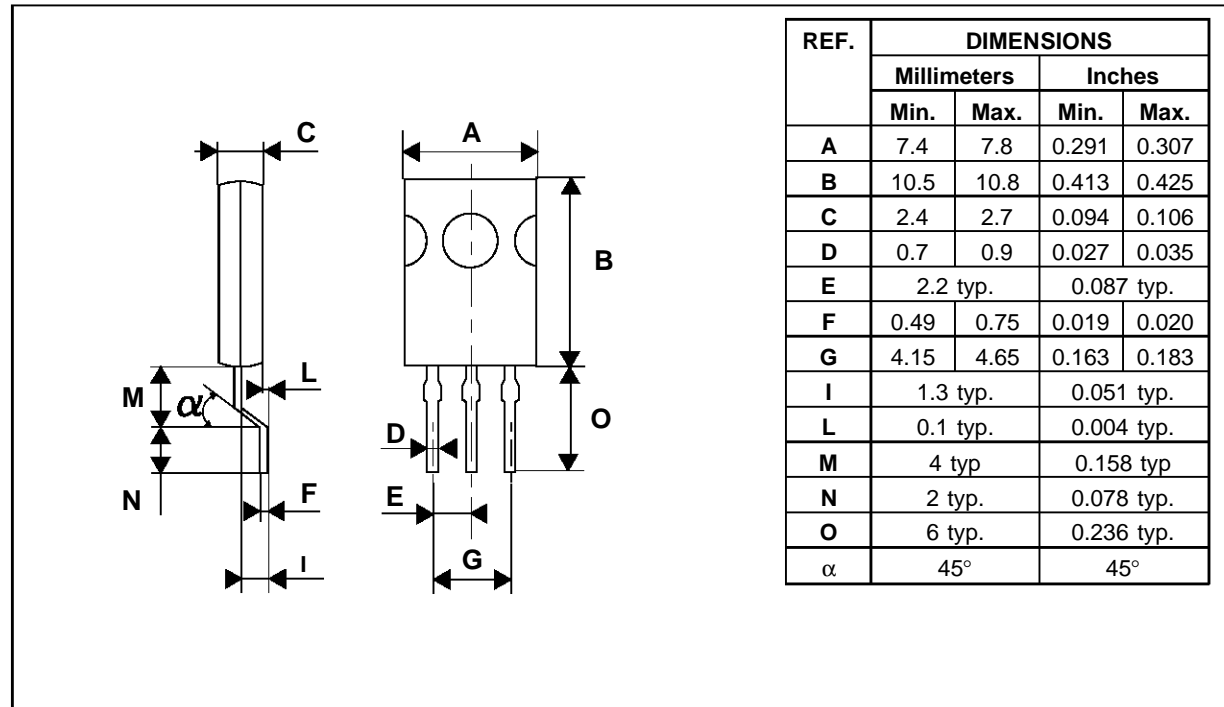


Marking : Type number

Weight : 0.72g

## PACKAGE MECHANICAL DATA

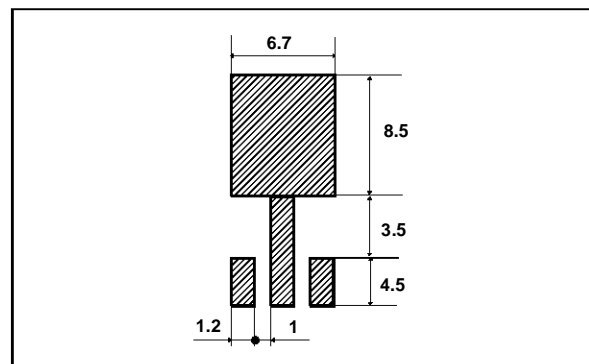
SOT 194 Plastic



Marking : Type number

Weight : 0.68g

## FOOT PRINT



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