



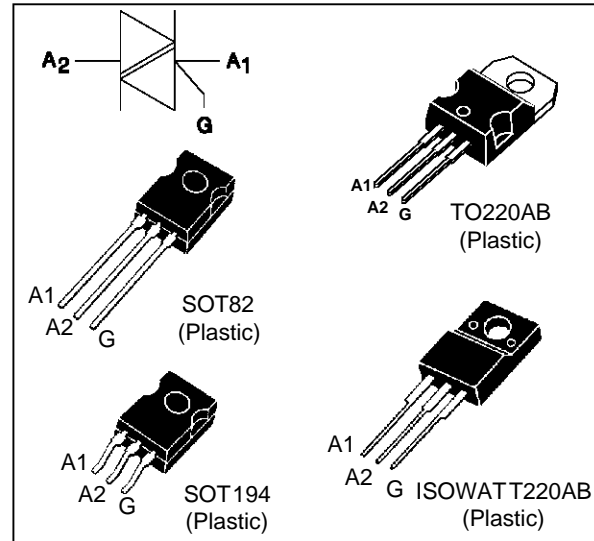
## HIGH PERFORMANCE TRIACS

### FEATURES

- $I_{TRMS} = 4\text{ A}$
- $V_{DRM} = 400\text{ V to }800\text{ V}$
- SENSITIVE GATE :  $I_{GT} \leq 10\text{ mA}$
- HIGH COMMUTATION :  $(di/dt)_c > 3.5\text{ A/ms}$

### DESCRIPTION

The T410 / T435 high voltage TRIAC Families are high performance planar diffused PNPN devices glass passivated technology. Packaged either in TO220AB, SOT82, SOT194 and ISOWATT220AB these products are intended for all bi-directional switch applications.



### ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit	
$I_{T(RMS)}$	RMS on-state current (360° conduction angle)	TO220AB SOT194/SOT82	$T_c = 110\text{ °C}$	4	A
		ISOWATT220AB	$T_c = 100\text{ °C}$		
$I_{TSM}$	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 : $I_G = 500\text{ mA}$ $di_G/dt = 1\text{ A}/\mu\text{s}$		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 + 125	°C °C
TI	Maximum lead temperature for soldering during 10 s at 4.5 mm from case			260	°C

Symbol	Parameter	T410 or T435				Unit
		-400	-600	-700	-800	
$V_{DRM}$ $V_{RRM}$	Repetitive peak off-state voltage $T_j = 125\text{ °C}$	400	600	700	800	V

**THERMAL RESISTANCES**

Symbol	Parameter		Value	Unit
Rth (j-a)	Junction to ambient	SOT82 / SOT194	100	°C/W
		TO220AB	60	
		ISOWATT 220AB	50	
Rth (j-c) DC	Junction to case for DC	SOT82 / SOT194 TO220AB	3.5	°C/W
		ISOWATT 220AB	5.3	
Rth (j-c) AC	Junction to case for 360° conduction angle ( F= 50 Hz)	SOT82 / SOT194 TO220AB	2.6	°C/W
		ISOWATT 220AB	4	

**GATE CHARACTERISTICS** (maximum values)

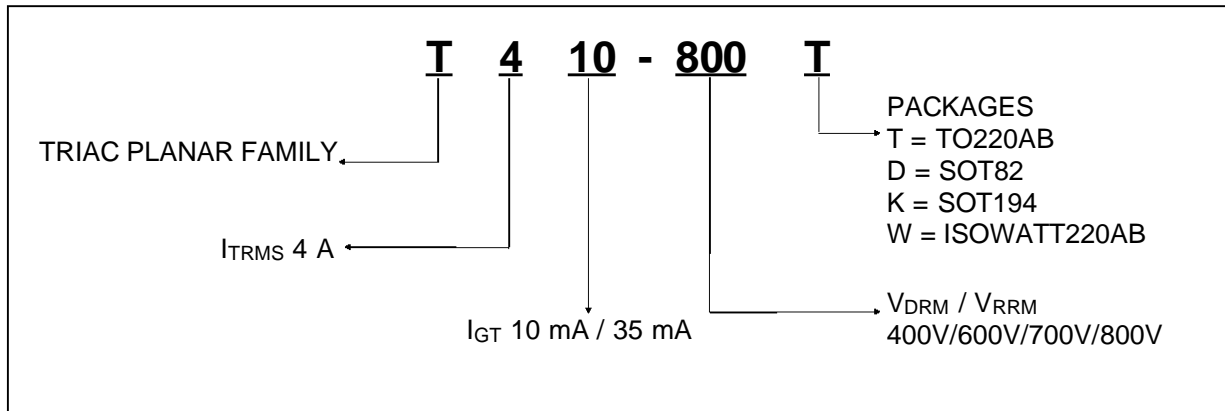
$P_{G(AV)} = 1 \text{ W}$      $P_{GM} = 10 \text{ W}$  (tp = 20 μs)     $I_{GM} = 4 \text{ A}$  (tp = 20 μs)     $V_{GM} = 16 \text{ V}$  (tp = 20 μs).

**ELECTRICAL CHARACTERISTICS**

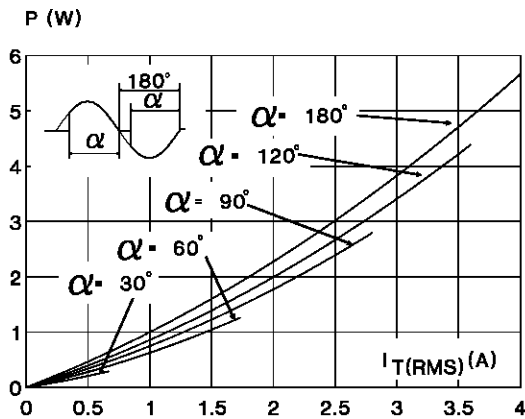
Symbol	Test Conditions		Quadrant		Suffix		Unit
					T410	T435	
$I_{GT}$	$V_D=12\text{V}$ (DC) $R_L=33\Omega$	$T_j=25^\circ\text{C}$	I-II-III	MAX	10	35	mA
$V_{GT}$	$V_D=12\text{V}$ (DC) $R_L=33\Omega$	$T_j=25^\circ\text{C}$	I-II-III	MAX	1.5		V
$V_{GD}$	$V_D=V_{DRM}$ $R_L=3.3\text{k}\Omega$	$T_j=125^\circ\text{C}$	I-II-III	MIN	0.2		V
tgt	$V_D=V_{DRM}$ $I_G = 500\text{mA}$ $di_G/dt = 3\text{A}/\mu\text{s}$ $I_{TM} = 5.5\text{A}$	$T_j=25^\circ\text{C}$	I-II-III	TYP	2		μs
$I_L$	$I_G=1.2 I_{GT}$	$T_j=25^\circ\text{C}$	I-II-III	MAX	30	60	mA
$I_H$ *	$I_T= 100\text{mA}$ gate open	$T_j=25^\circ\text{C}$		MAX	15	35	mA
$V_{TM}$ *	$I_{TM}= 5.5\text{A}$ tp= 380μs	$T_j=25^\circ\text{C}$		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
		$T_j=125^\circ\text{C}$		MAX	2		
dV/dt *	Linear slope up to $V_D=67\%V_{DRM}$ gate open	$T_j=125^\circ\text{C}$		MIN	50	250	V/μs
					30	250	
(di/dt) <sub>c</sub> *	dV/dt = 0.1V/μs	$T_j=125^\circ\text{C}$		MIN	2.7	4.4	A/ms
	dV/dt = 20V/μs			MIN	1.8	2.7	

\* For either polarity of electrode A2 voltage with reference to electrode A1.

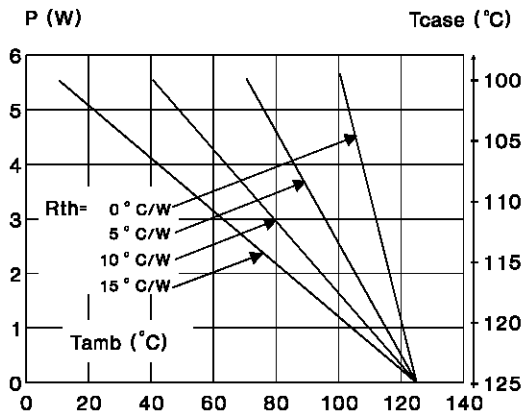
ORDERING INFORMATION



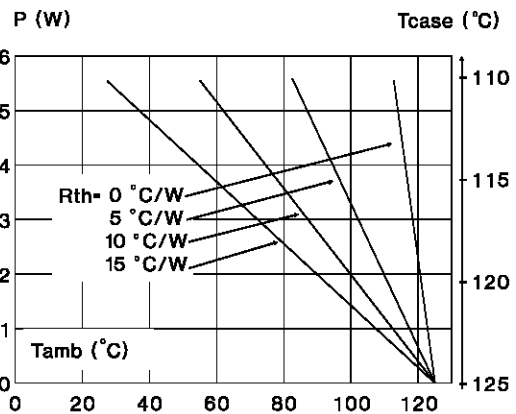
**Fig.1** : Maximum RMS power dissipation versus RMS on-state current (F=50Hz).  
(Curves are cut off by (di/dt)c limitation)



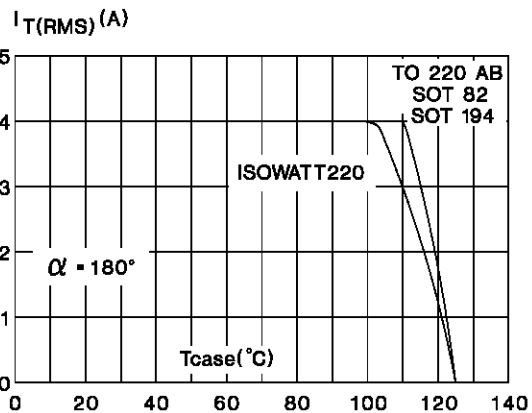
**Fig.3** : Correlation between maximum RMS power dissipation and maximum allowable temperatures (Tamb and Tcase) for different thermal resistances heatsink + contact (ISOWATT220AB).



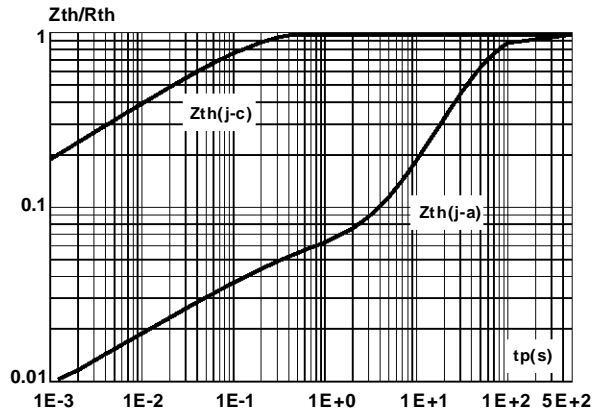
**Fig.2** : Correlation between maximum RMS power dissipation and maximum allowable temperatures (Tamb and Tcase) for different thermal resistances heatsink + contact (TO220AB / SOT82 / SOT 94).



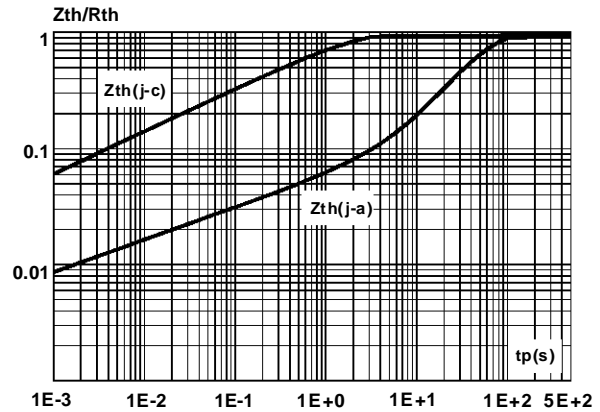
**Fig.4** : RMS on-state current versus case temperature.



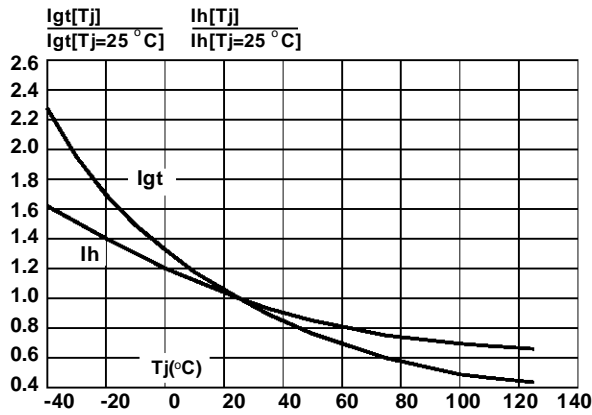
**Fig.5 :** Relative variation of thermal impedance versus pulse duration (SOT82 / SOT194 / TO220AB only).



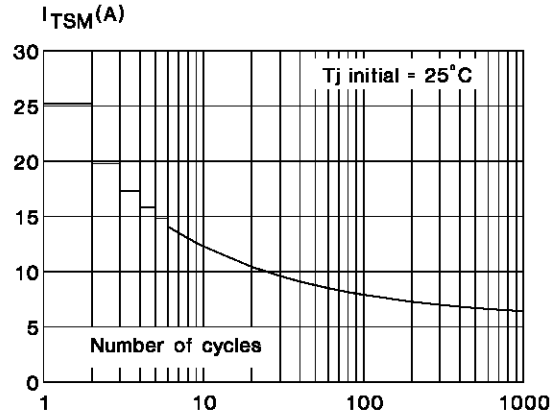
**Fig.6 :** Relative variation of thermal impedance versus pulse duration ( ISOWATT220AB only).



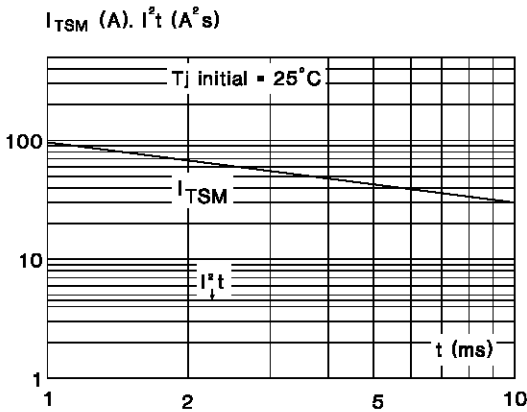
**Fig.7 :** Relative variation of gate trigger current and holding current versus junction temperature.



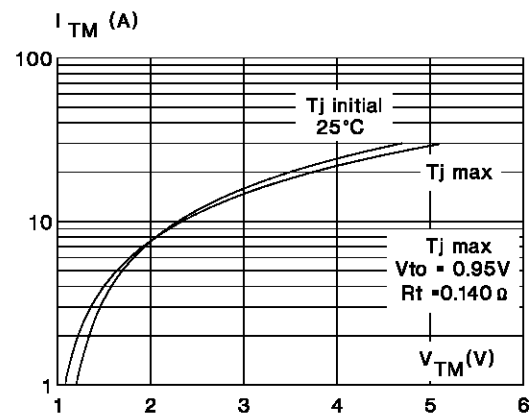
**Fig.8 :** Non Repetitive surge peak on-state current versus number of cycles.



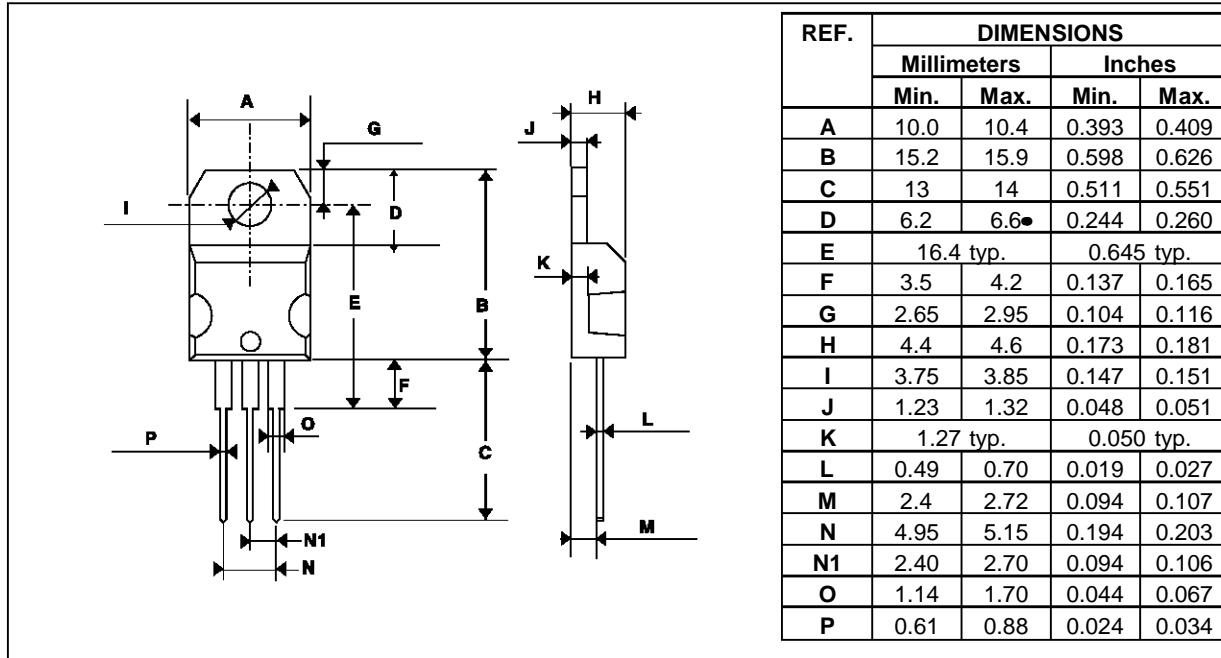
**Fig.9 :** Non repetitive surge peak on-state current for a sinusoidal pulse with width :  $t \leq 10\text{ms}$ , and corresponding value of  $I^2t$ .



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

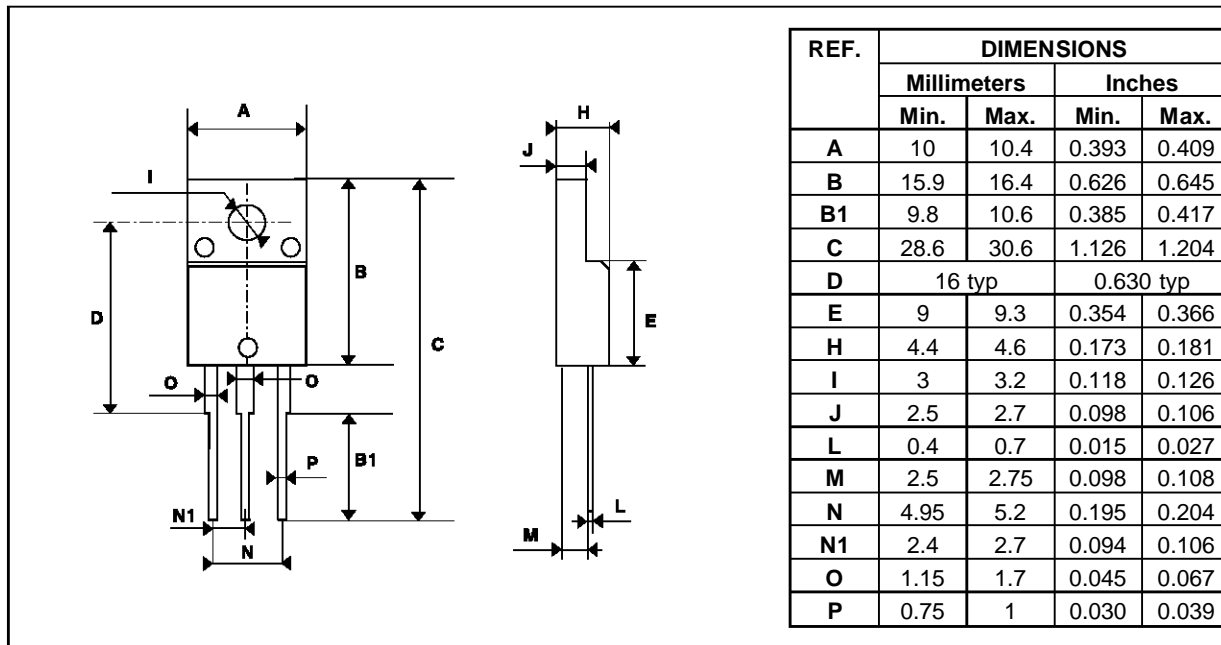


**PACKAGE MECHANICAL DATA**  
TO220AB Plastic



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

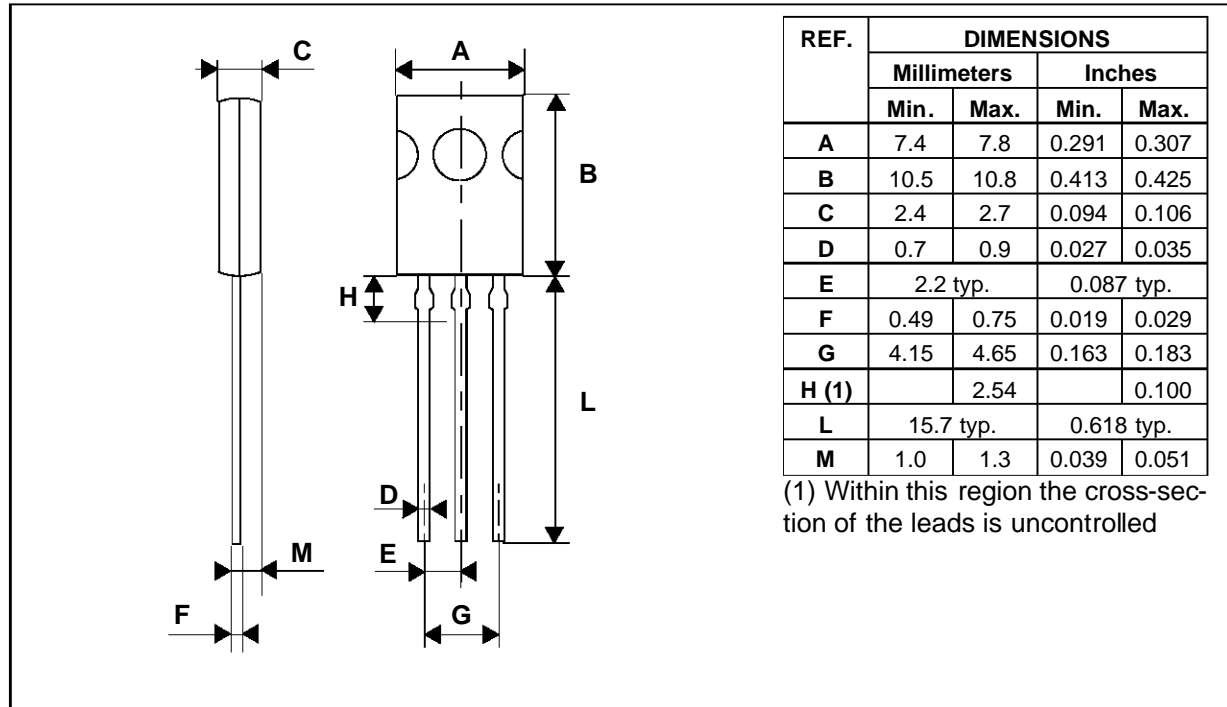


Cooling Method : C  
 Marking : Type number  
 Weight : 2.1g  
 Recommended torque value : 0.55 m.N.  
 Maximum torque value : 0.70 m.N.

**T410 / T435**

**PACKAGE MECHANICAL DATA**

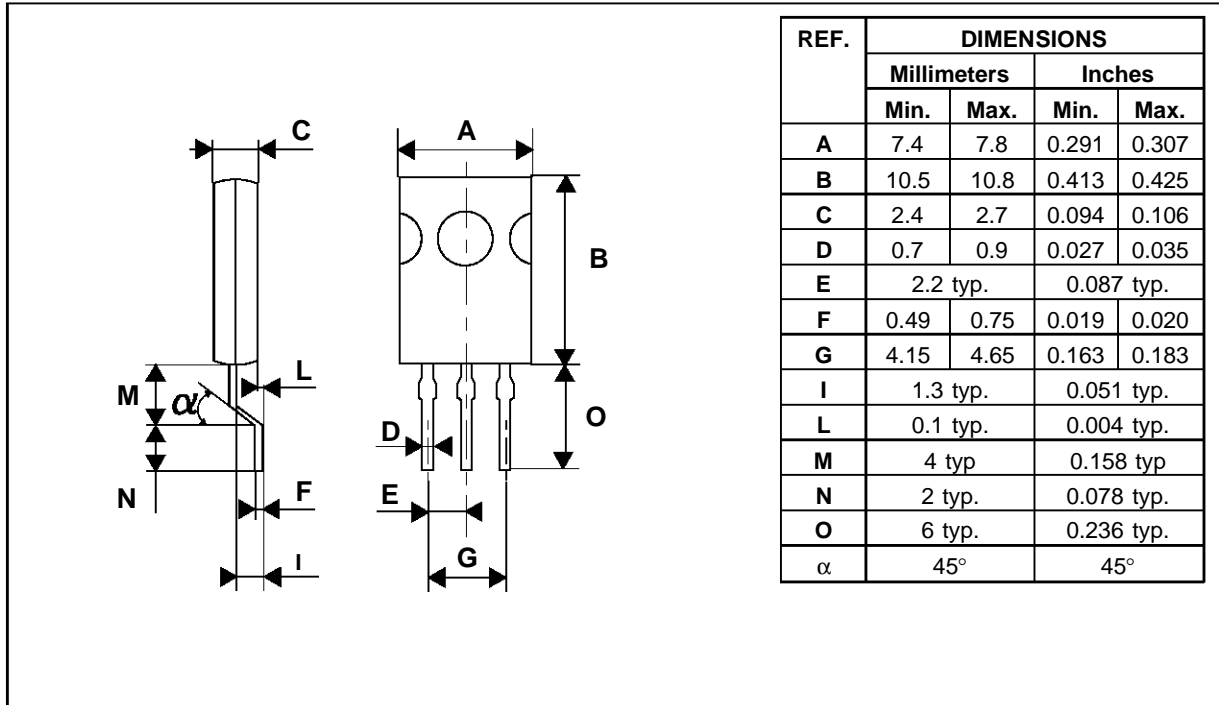
SOT82 Plastic



Marking : Type number  
 Weight : 0.72g

## PACKAGE MECHANICAL DATA

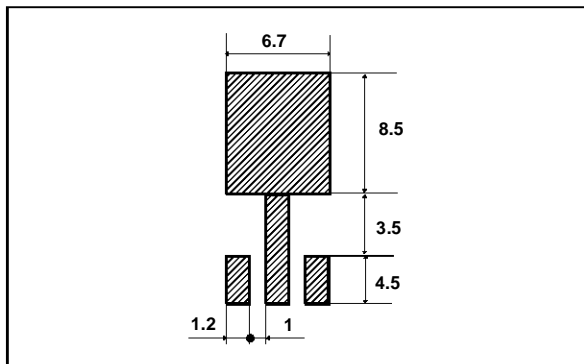
SOT194 Plastic



Marking : Type number

Weight : 0.68g

## FOOT PRINT



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