

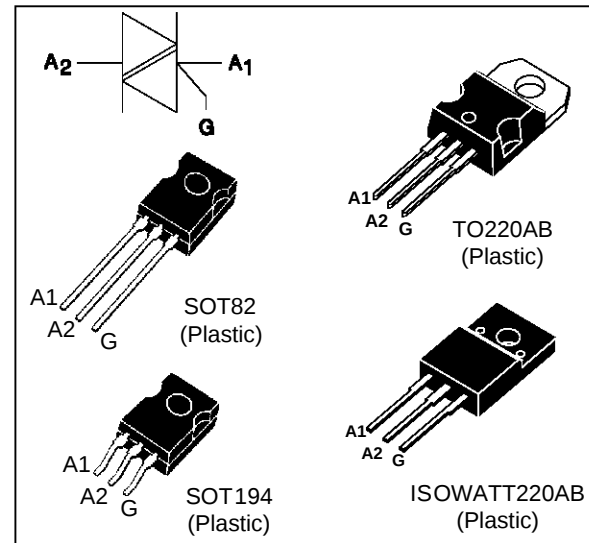
HIGH PERFORMANCE TRIACS

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(RMS)}	RMS on-state current (360° conduction angle)	TO220AB SOT194/SOT82	T _c = 95 °C	4	A
		ISOWATT220AB	T _c = 85 °C		
I _{TSM}	Non repetitive surge peak on-state current (T _j initial = 25°C)		tp = 8.3 ms	35	A
			tp = 10 ms	30	
I ² _t	I ² _t value		tp = 10 ms	4.5	A ² s
di/dt	Critical rate of rise of on-state current Gate supply : I _G = 50mA di _G /dt = 1A/μs		Repetitive F = 50 Hz	10	A/μs
			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 $T_j = 110\text{ }^\circ\text{C}$	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 μs) $I_{GM} = 4 \text{ A}$ (tp = 20 μs) $V_{GM} = 16 \text{ V}$ (tp = 20 μs).

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}	$V_D=V_{DRM}$ $R_L=3.3k\Omega$	$T_j=110^\circ\text{C}$	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	μs
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 μs	$T_j=25^\circ\text{C}$		MAX	1.75	V
I_{DRM} I_{RRM}	V_{DRM} Rated V_{RRM} 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/ μs
				TYP	20	
(di/dt)c *	(dV/dt)c = 0.1V/ μs	$T_j=110^\circ\text{C}$		MIN	1.8	A/ms

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

ORDERING INFORMATION

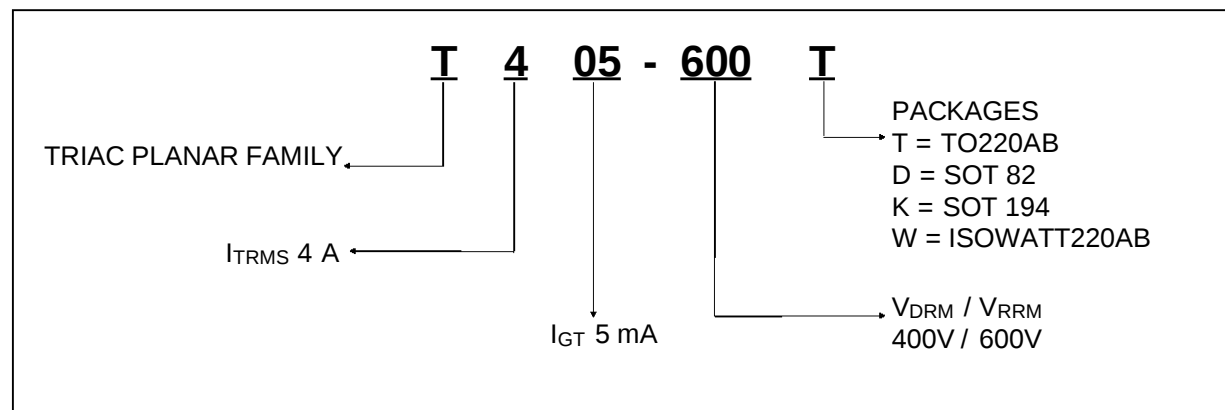


Fig.1 : Maximum power dissipation versus RMS on-state current ($F=50Hz$).
 (Curves are cut off by $(di/dt)_c$ limitation)

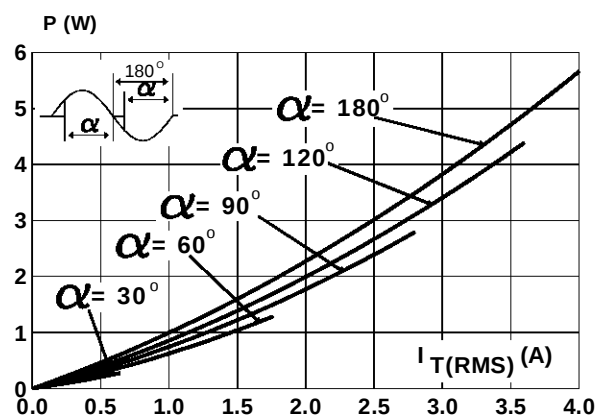


Fig.3 : Correlation between maximum RMS power dissipation and maximum allowable temperatures (T_{amb} and T_{case}) for different thermal resistances heatsink + contact (ISOWATT220AB).

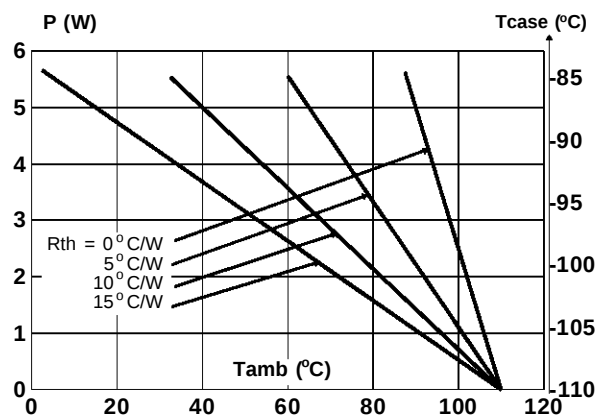


Fig.2 : Correlation between maximum power dissipation and maximum allowable temperatures (T_{amb} and T_{case}) for different thermal resistances heatsink + contact (TO220AB / SOT82 / SOT194).

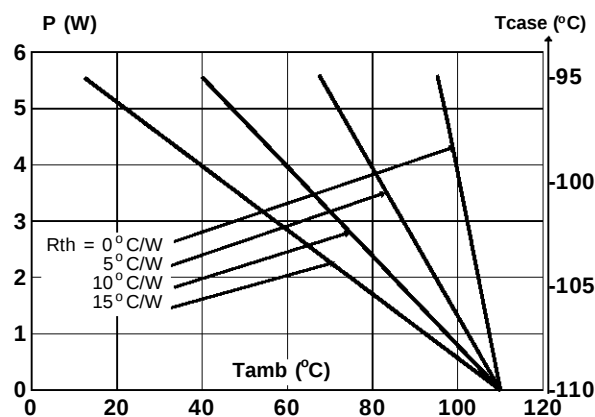


Fig.4 : RMS on-state current versus case temperature.

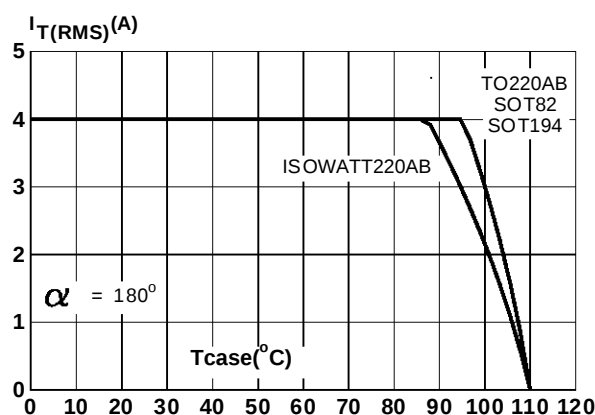


Fig.5 : Relative variation of thermal impedance versus pulse duration (SOT82 / SOT194 / TO220AB only).

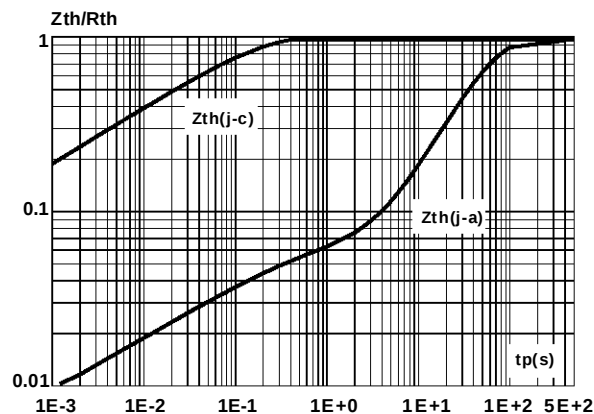


Fig.6 : Relative variation of thermal impedance versus pulse duration (ISOWATT220AB only).

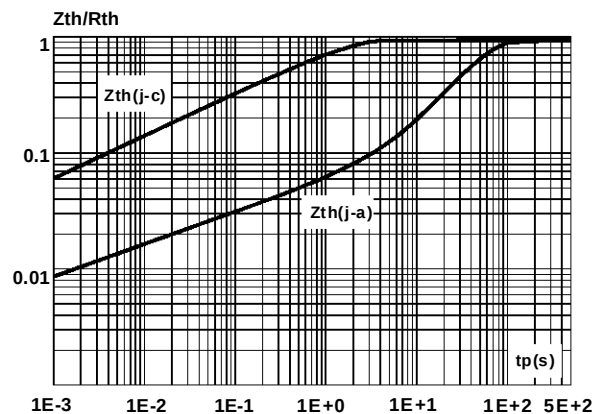


Fig.7 : Relative variation of gate trigger current and holding current versus junction temperature.

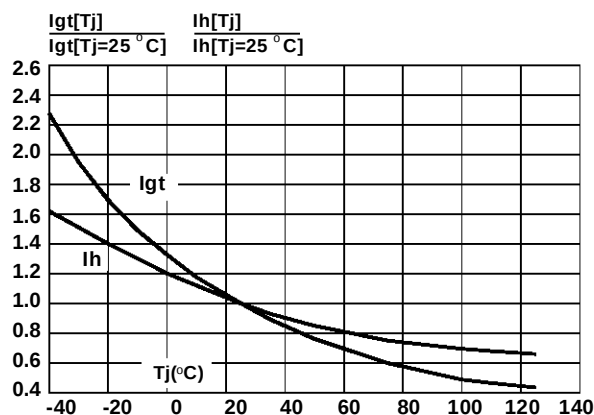


Fig.8 : Non Repetitive surge peak on-state current versus number of cycles.

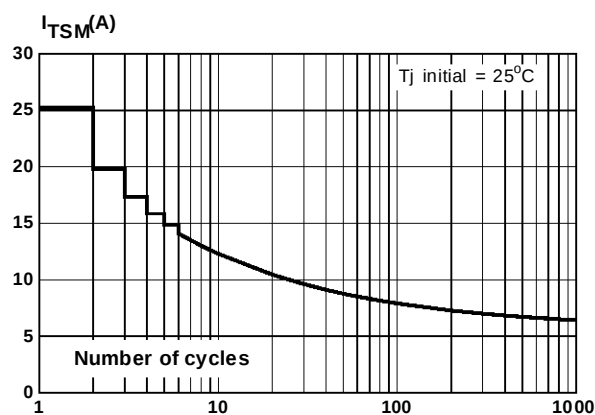


Fig.9 : Non repetitive surge peak on-state current for a sinusoidal pulse with width : $t_p \leq 10\text{ms}$, and corresponding value of I^2t .

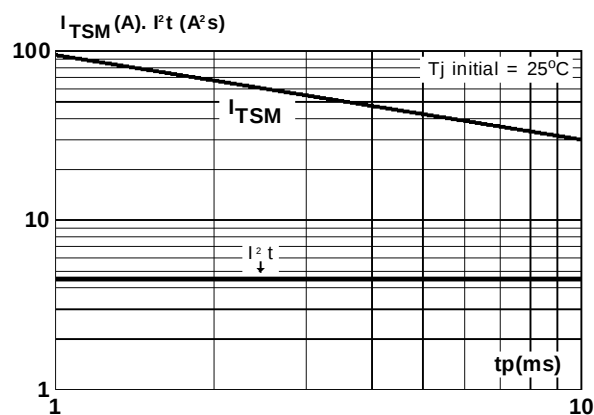
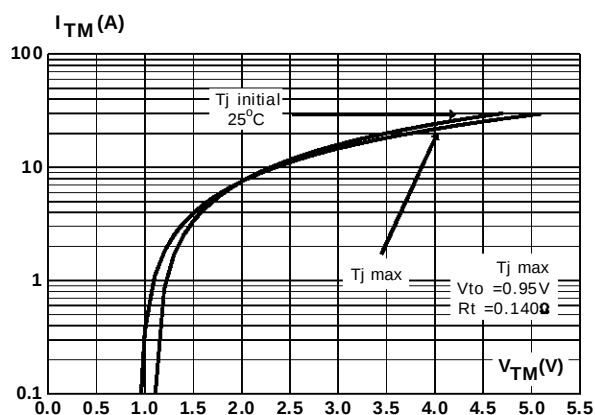
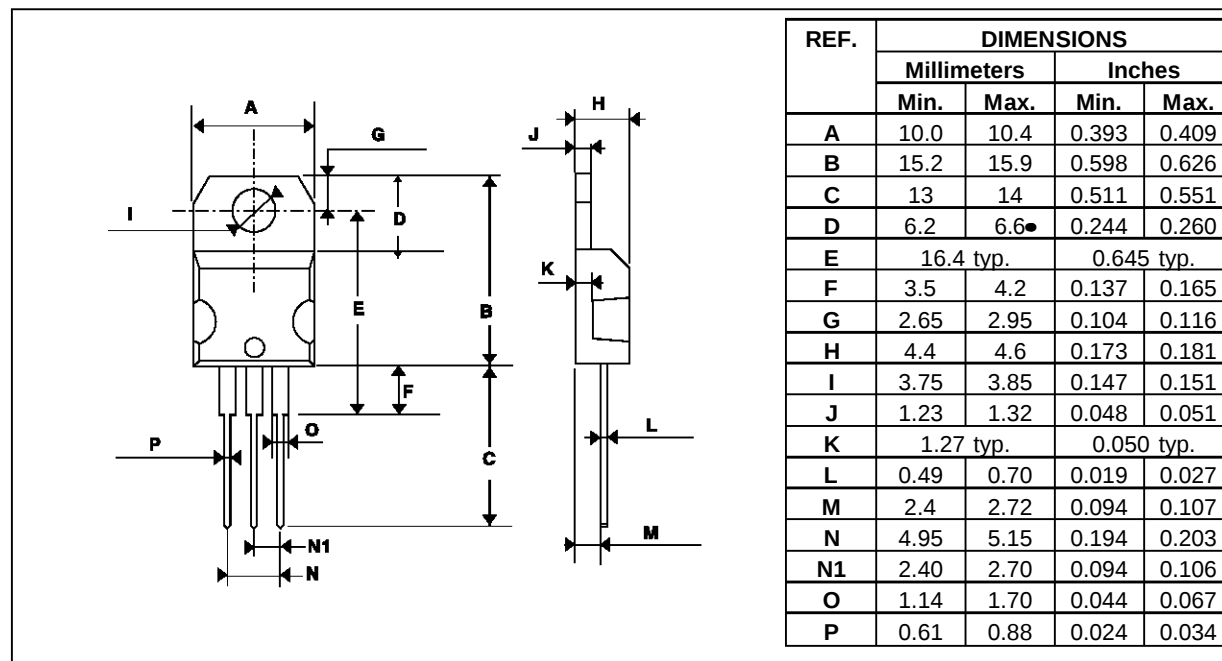


Fig.10 : On-state characteristics (maximum values).



PACKAGE MECHANICAL DATA

TO220AB Plastic



Cooling Method : C

Marking : Type number

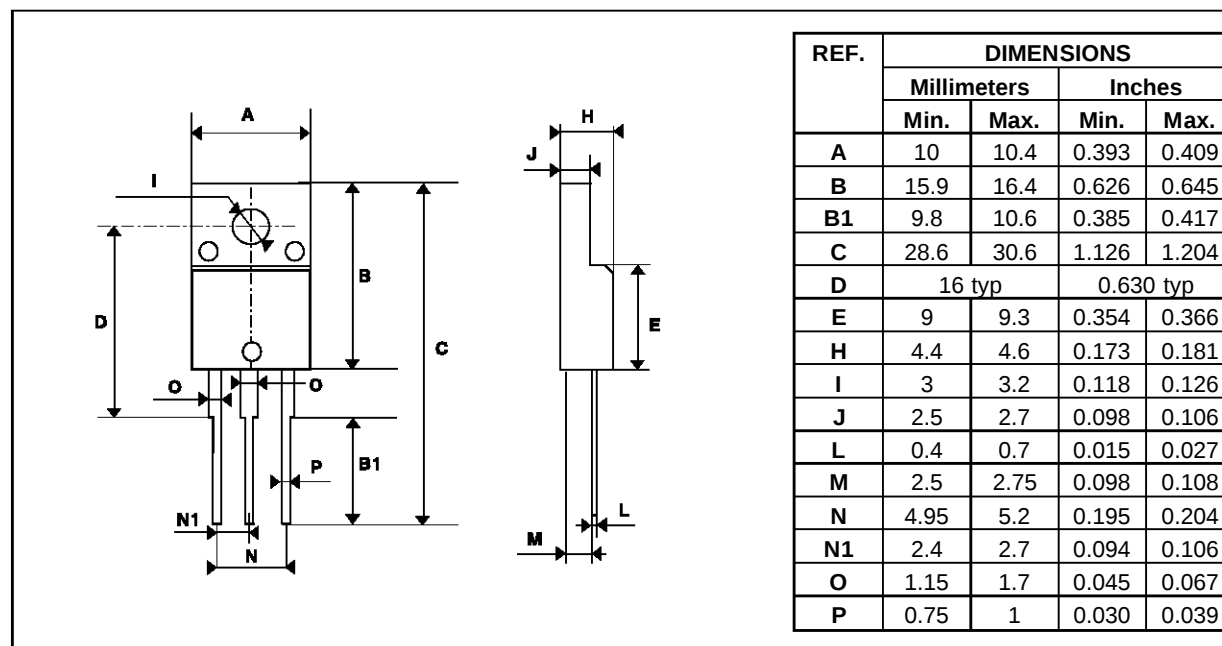
Weight : 2 g

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

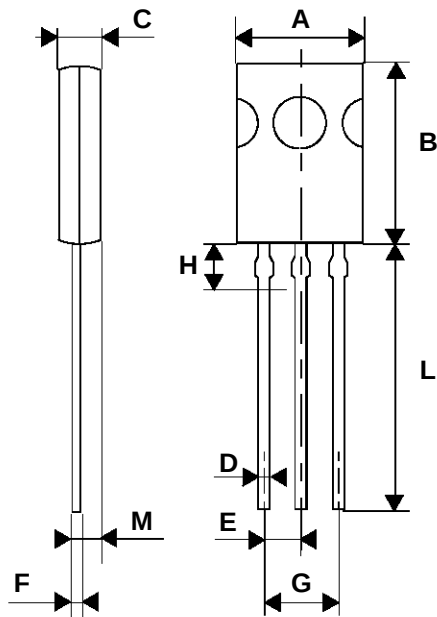
Recommended torque value : 0.55 m.N.

Maximum torque value : 0.70 m.N.

T405

PACKAGE MECHANICAL DATA

SOT 82 Plastic



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	7.4	7.8	0.291	0.307
B	10.5	10.8	0.413	0.425
C	2.4	2.7	0.094	0.106
D	0.7	0.9	0.027	0.035
E	2.2 typ.		0.087 typ.	
F	0.49	0.75	0.019	0.029
G	4.15	4.65	0.163	0.183
H (1)		2.54		0.100
L	15.7 typ.		0.618 typ.	
M	1.0	1.3	0.039	0.051

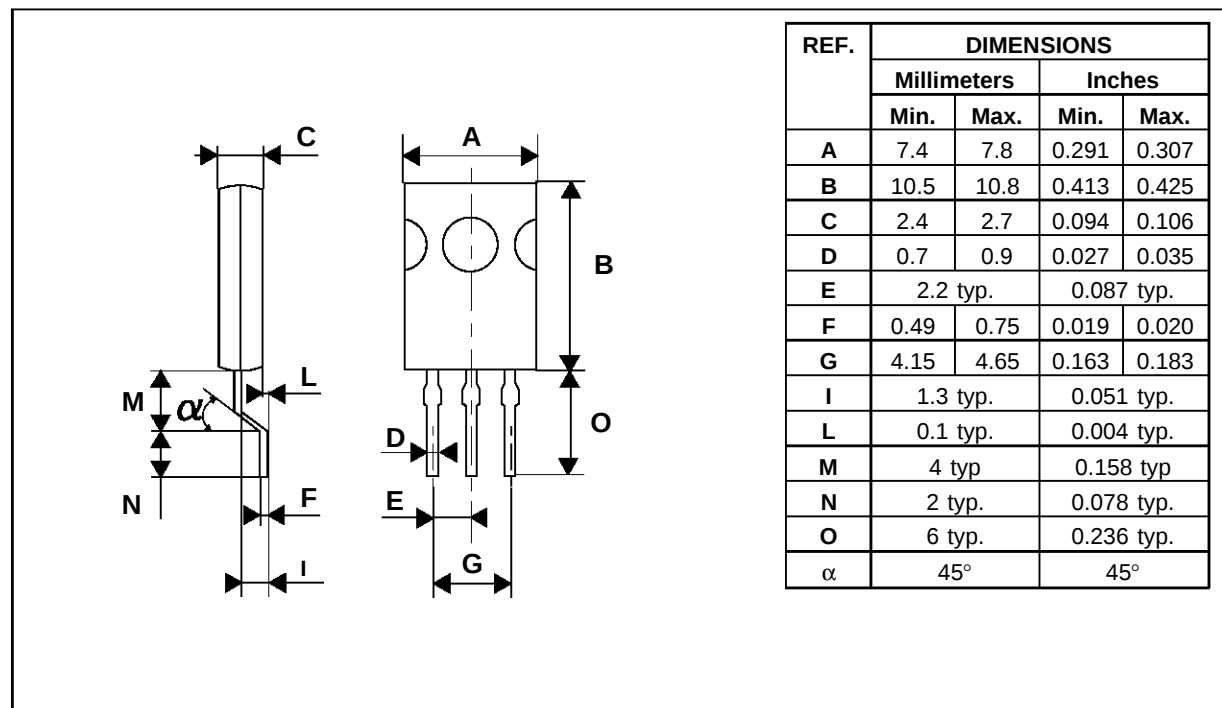
(1) Within this region the cross-section of the leads is uncontrolled

Marking : Type number

Weight : 0.72g

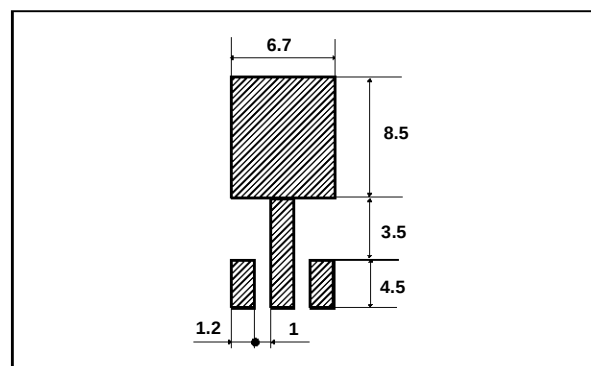
PACKAGE MECHANICAL DATA

SOT 194 Plastic



Marking : Type number

Weight : 0.68g

FOOT PRINT

Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of SGS-THOMSON Microelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied.

SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

© 1995 SGS-THOMSON Microelectronics - Printed in Italy - All rights reserved.

SGS-THOMSON Microelectronics GROUP OF COMPANIES

Australia - Brazil - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco -
The Netherlands - Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.