

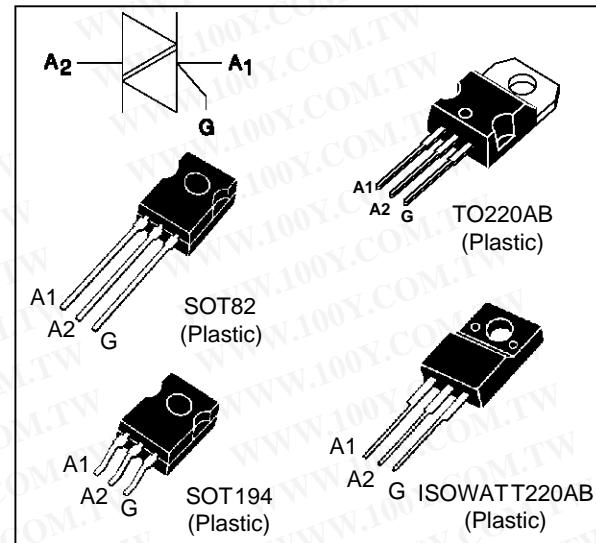
## HIGH PERFORMANCE TRIACS

### 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	4	A
		SOT194/SOT82		
		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
		$t_p = 10\text{ ms}$	30	
$i^2t$	$i^2t$ 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 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)

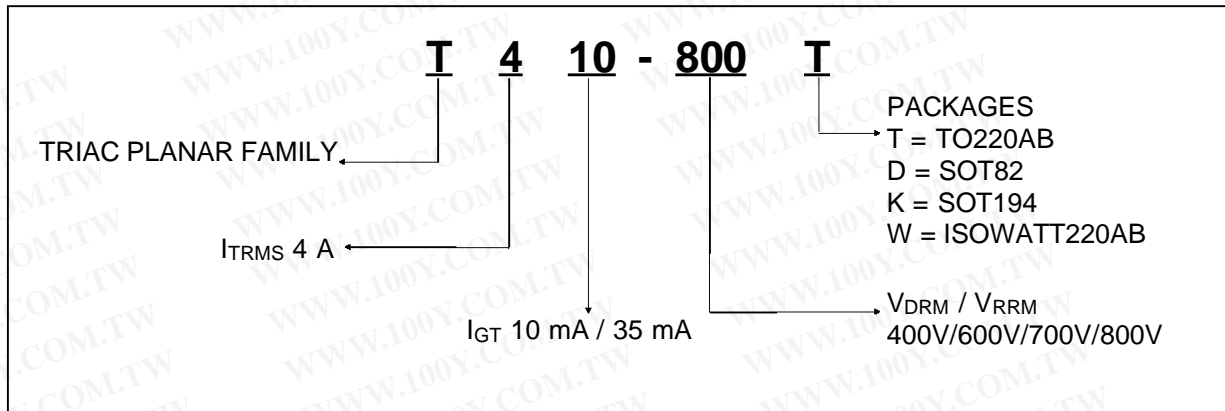
$P_{G(AV)} = 1\text{ W}$     $P_{GM} = 10\text{ W}$  (tp = 20 μs)    $I_{GM} = 4\text{ A}$  (tp = 20 μs)    $V_{GM} = 16\text{ V}$  (tp = 20 μs).

**ELECTRICAL CHARACTERISTICS**

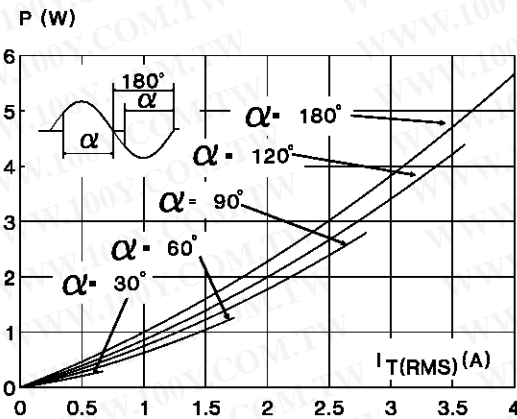
Symbol	Test Conditions		Quadrant		Suffix		Unit
					T410	T435	
$I_{GT}$	$V_D=12\text{ V}$ (DC) $R_L=33\Omega$	$T_j=25^\circ\text{C}$	I-II-III	MAX	10	35	mA
$V_{GT}$	$V_D=12\text{ V}$ (DC) $R_L=33\Omega$	$T_j=25^\circ\text{C}$	I-II-III	MAX	1.5		V
$V_{GD}$	$V_D=V_{DRM}$ $R_L=3.3k\Omega$	$T_j=125^\circ\text{C}$	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	$V_{DRM} = 400\text{V} / 600\text{V}$	$T_j=125^\circ\text{C}$	MIN	50	250	V/μs
		$V_{DRM} = 700\text{V} / 800\text{V}$			30	250	
(dl/dt)c *	$dV/dt = 0.1\text{V}/\mu\text{s}$	$T_j=125^\circ\text{C}$		MIN	2.7	4.4	A/ms
	$dV/dt = 20\text{V}/\mu\text{s}$			MIN	1.8	2.7	

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

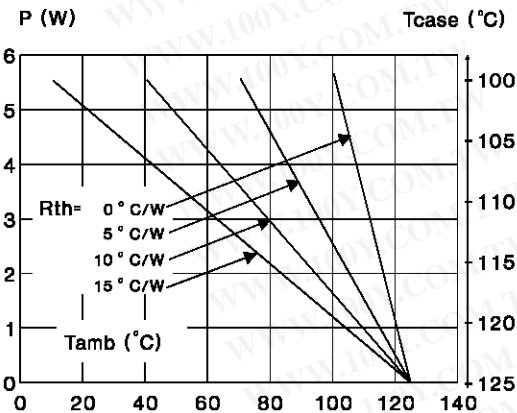
ORDERING INFORMATION



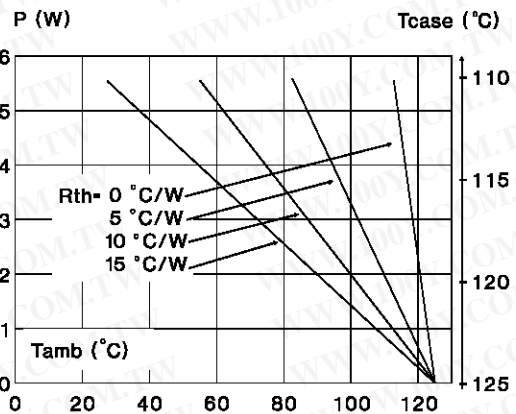
**Fig.1** : Maximum RMS power dissipation versus RMS on-state current (F=50Hz).  
(Curves are cut off by (di/dt)c limitation)



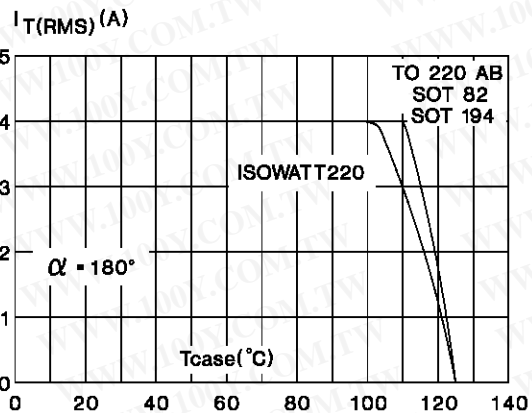
**Fig.3** : Correlation between maximum RMS power dissipation and maximum allowable temperatures (Tamb and Tcase) for different thermal resistances heatsink + contact (ISOWATT220AB).



**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).

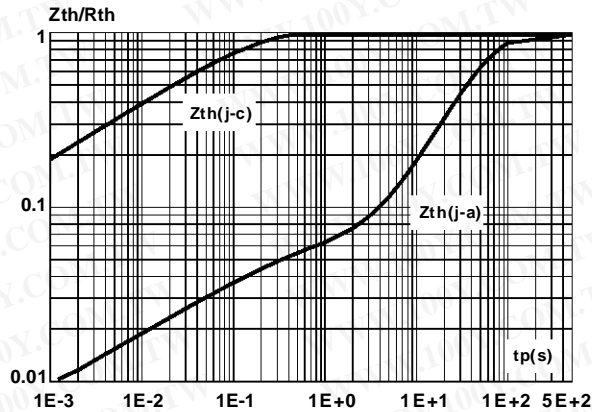


**Fig.4** : RMS on-state current versus case temperature.

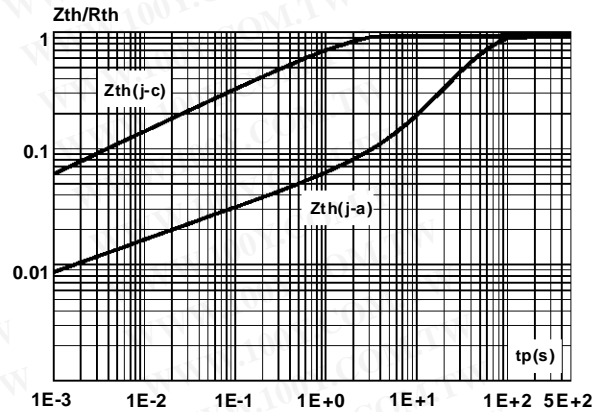


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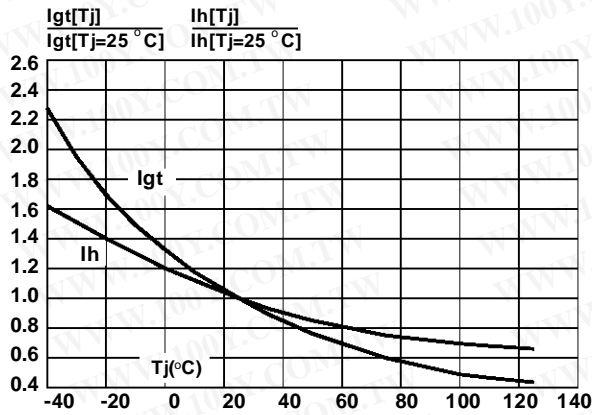
**Fig.5** : Relative variation of thermal impedance versus pulse duration (SOT82 / SOT194 / TO220AB only).



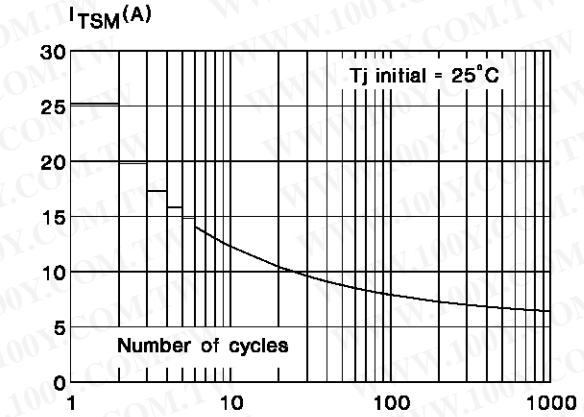
**Fig.6** : Relative variation of thermal impedance versus pulse duration ( ISOWATT220AB only).



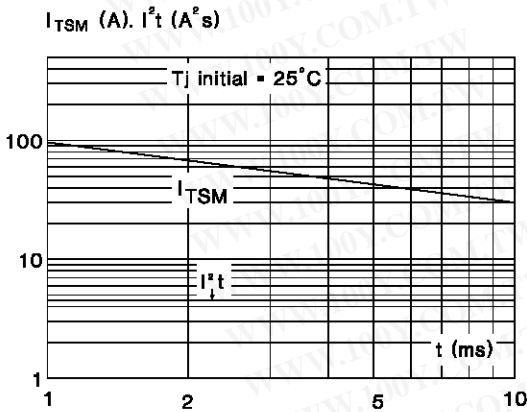
**Fig.7** : Relative variation of gate trigger current and holding current versus junction temperature.



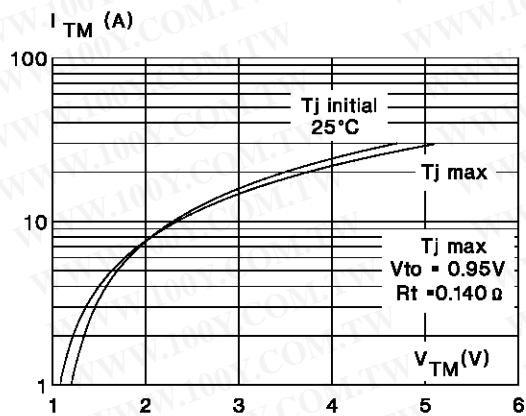
**Fig.8** : Non Repetitive surge peak on-state current versus number of cycles.



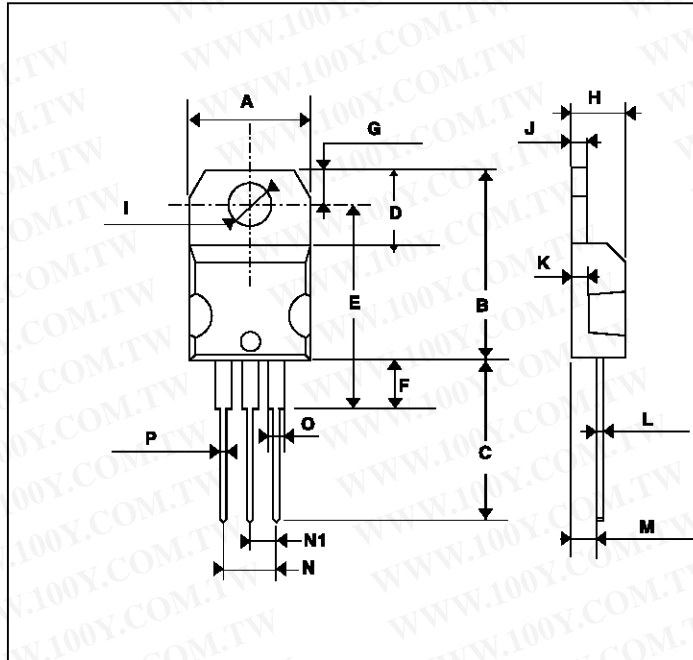
**Fig.9** : Non repetitive surge peak on-state current for a sinusoidal pulse with width :  $t \leq 10\text{ms}$ , and corresponding value of  $I^2t$ .



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



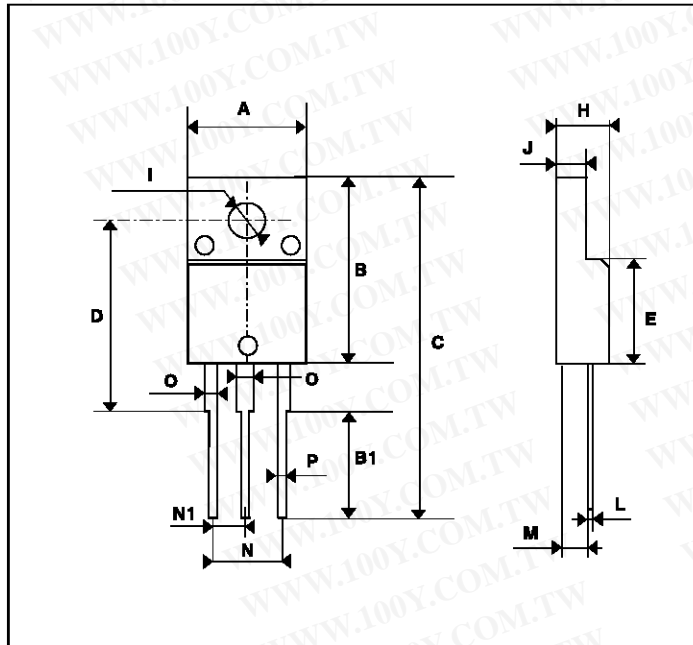
**PACKAGE MECHANICAL DATA**  
TO220AB Plastic



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	10.0	10.4	0.393	0.409
B	15.2	15.9	0.598	0.626
C	13	14	0.511	0.551
D	6.2	6.6	0.244	0.260
E	16.4 typ.		0.645 typ.	
F	3.5	4.2	0.137	0.165
G	2.65	2.95	0.104	0.116
H	4.4	4.6	0.173	0.181
I	3.75	3.85	0.147	0.151
J	1.23	1.32	0.048	0.051
K	1.27 typ.		0.050 typ.	
L	0.49	0.70	0.019	0.027
M	2.4	2.72	0.094	0.107
N	4.95	5.15	0.194	0.203
N1	2.40	2.70	0.094	0.106
O	1.14	1.70	0.044	0.067
P	0.61	0.88	0.024	0.034

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



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	10	10.4	0.393	0.409
B	15.9	16.4	0.626	0.645
B1	9.8	10.6	0.385	0.417
C	28.6	30.6	1.126	1.204
D	16 typ		0.630 typ	
E	9	9.3	0.354	0.366
H	4.4	4.6	0.173	0.181
I	3	3.2	0.118	0.126
J	2.5	2.7	0.098	0.106
L	0.4	0.7	0.015	0.027
M	2.5	2.75	0.098	0.108
N	4.95	5.2	0.195	0.204
N1	2.4	2.7	0.094	0.106
O	1.15	1.7	0.045	0.067
P	0.75	1	0.030	0.039

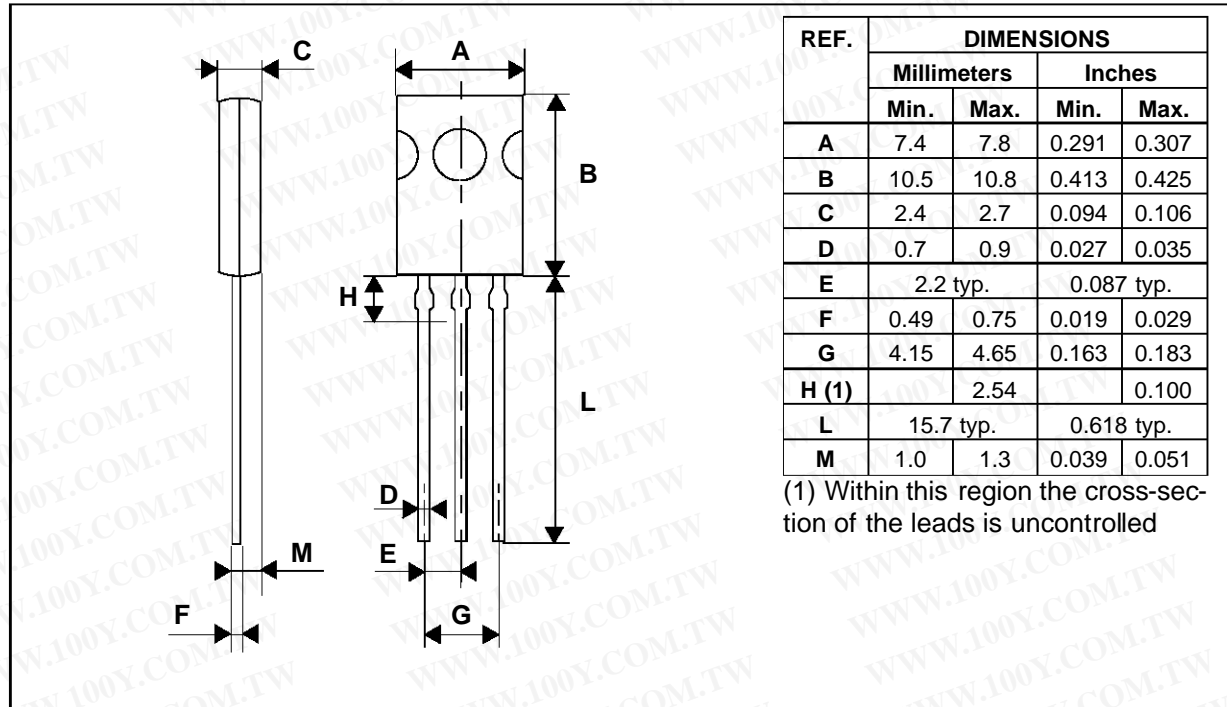
Cooling Method : C  
 Marking : Type number  
 Weight : 2.1g  
 Recommended torque value : 0.55 m.N.  
 Maximum torque value : 0.70 m.N.

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**T410 / T435**

**PACKAGE MECHANICAL DATA**

SOT82 Plastic

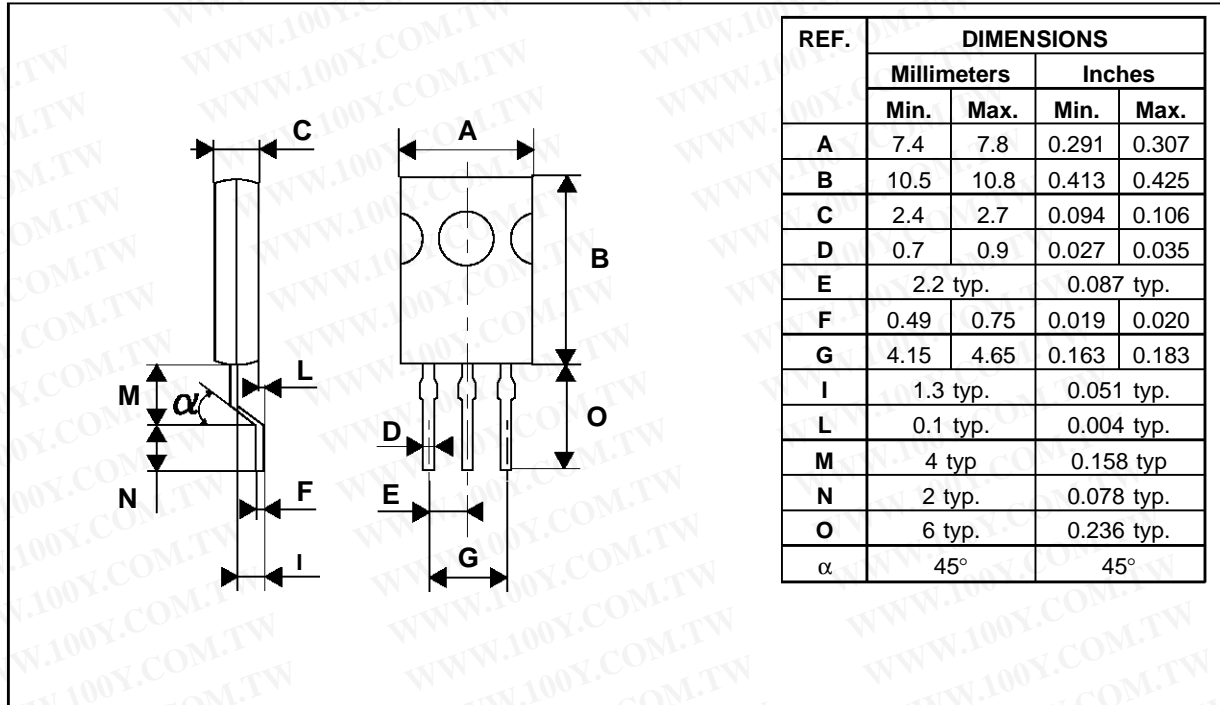


Marking : Type number  
Weight : 0.72g

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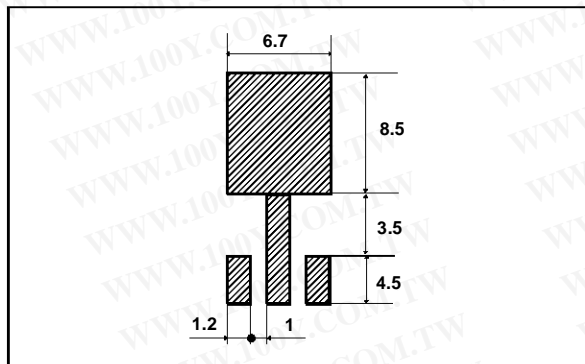
**PACKAGE MECHANICAL DATA**

SOT194 Plastic



Marking : Type number

Weight : 0.68g

**FOOT PRINT**

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