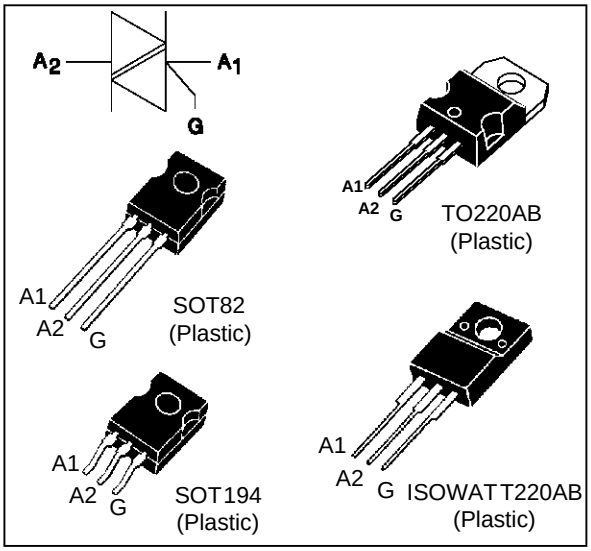
SGS-THOMSON MICROELECTRONICS

T410
T435

HIGH PERFORMANCE TRIACS

FEATURES

- I_{TRMS} = 4 A
- V_{DRM} = 400 V to 800 V
- SENSITIVE GATE : $I_{GT} \leq$ 10 mA
- HIGH COMMUTATION : (dI/dt)c > 3.5 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 intented 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	Tc = 110 °C	4	A
		ISOWATT220AB	Tc = 100 °C		
I_{TSM}	Non repetitive surge peak on-state current (Tj initial = 25°C)		tp = 8.3 ms	35	A
			tp = 10 ms	30	
I^2t	I^2t value		tp = 10 ms	4.5	A^2s
dI/dt	Critical rate of rise of on-state current Gate supply : I_G = 500mA di_G/dt = 1A/µs		Repetitive F = 50 Hz	10	A/µs
			Non Repetitive	50	
Tstg Tj	Storage and operating junction temperature range			- 40 to + 150 - 40 to + 125	°C °C
Tl	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 Tj = 125 °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	
		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 W P_{GM}= 10 W (tp = 20 µs) I_{GM} = 4 A (tp = 20 µs) V_{GM} = 16 V (tp = 20 µs).

ELECTRICAL CHARACTERISTICS

Symbol	Test Conditions		Quadrant		Suffix		Unit
					T410	T435	
I_{GT}	V_D=12V (DC) R_L=33Ω	Tj=25°C	I-II-III	MAX	10	35	mA
V_{GT}	V_D=12V (DC) R_L=33Ω	Tj=25°C	I-II-III	MAX	1.5		V
V_{GD}	V_D=V_{DRM} R_L=3.3kΩ	Tj=125°C	I-II-III	MIN	0.2		V
tgt	V_D=V_{DRM} I_G = 500mA dI_G/dt = 3A/µs I_{TM} = 5.5A	Tj=25°C	I-II-III	TYP	2		µs
I_L	I_G=1.2 I_{GT}	Tj=25°C	I-II-III	MAX	30	60	mA
I_H *	I_T= 100mA gate open	Tj=25°C		MAX	15	35	mA
V_{TM} *	I_{TM}= 5.5A tp= 380µs	Tj=25°C		MAX	1.75		V
I_{DRM} I_{RRM}	V_{DRM} Rated V_{RRM} Rated	Tj=25°C		MAX	0.01		mA
		Tj=125°C		MAX	2		
dV/dt *	Linear slope up to V_D=67%V_{DRM} gate open; V_{DRM} = 400V / 600V	Tj=125°C		MIN	50	250	V/µs
	Linear slope up to V_D=67%V_{DRM} gate open; V_{DRM} = 700V / 800V				30	250	
(dI/dt)c *	dV/dt = 0.1V/µs	Tj=125°C		MIN	2.7	4.4	A/ms
	dV/dt = 20V/µs			MIN	1.8	2.7	

* For either polarity of electrode A_2 voltage with reference to electrode A_1.

ORDERING INFORMATION

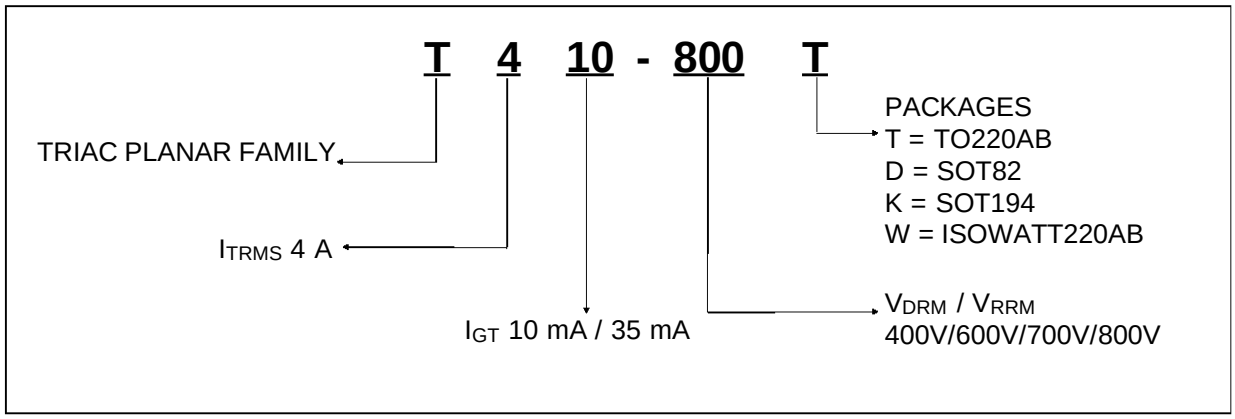


Fig.1 : Maximum RMS power dissipation versus RMS on-state current (F=50Hz).
(Curves are cut off by (dI/dt)c limitation)

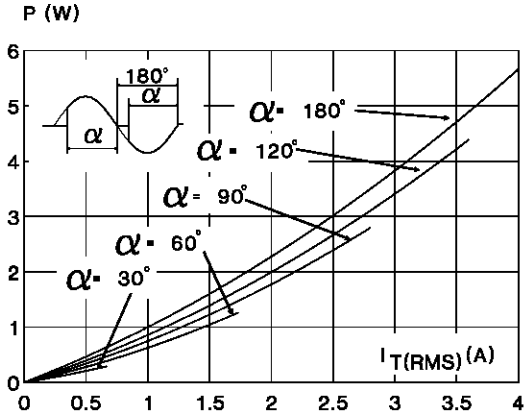


Fig.2 : Correlation between maximum RMS power dissipation and maximum allowable temperatures (T_{amb} and T_{case}) for different thermal resistances heatsink + contact (TO220AB / SOT82 / SOT 94).

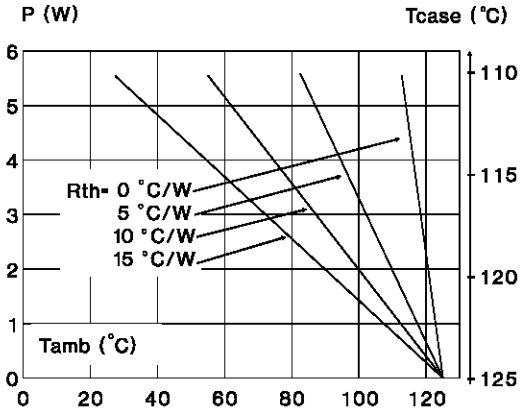


Fig.3 : Correlation between maximum RMS power dissipation and maximum allowable temperatures (T_{amb} and T_{case}) for different thermal resistances heatsink + contact (ISOWATT220AB).

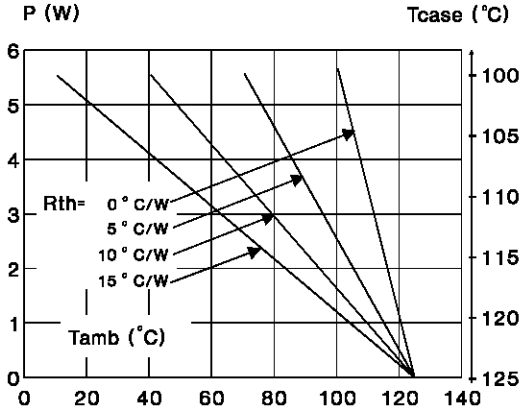


Fig.4 : RMS on-state current versus case temperature.

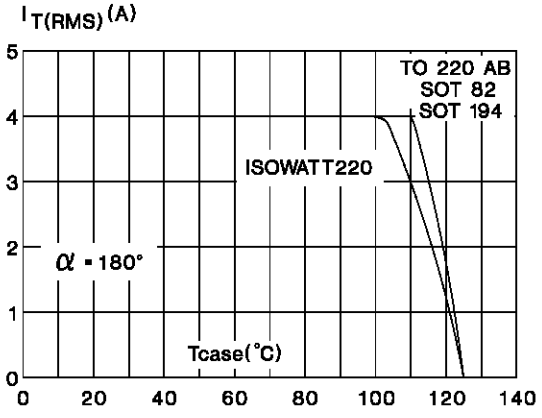


Fig.5 : Relative variation of thermal impedance versus pulse duration (SOT82 / SOT194 / TO220AB only).

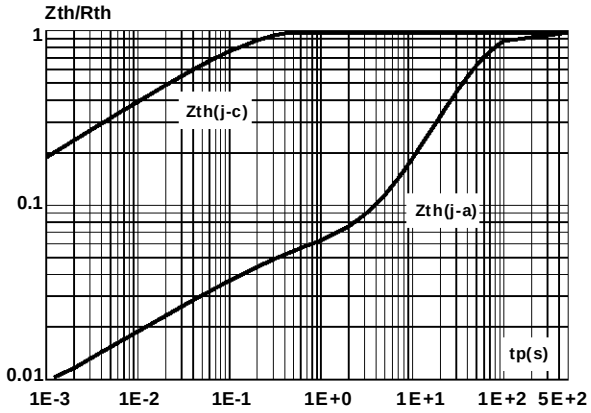


Fig.6 : Relative variation of thermal impedance versus pulse duration (ISOWATT220AB only).

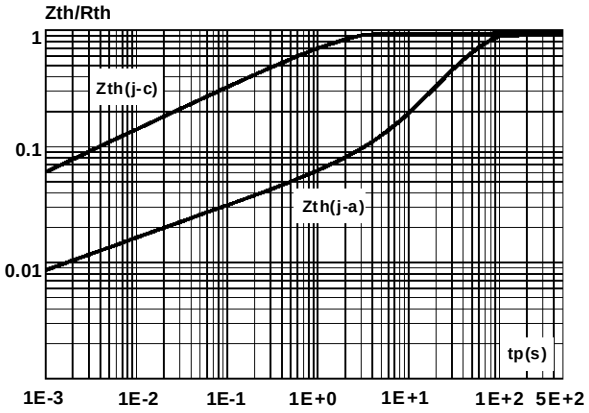


Fig.7 : Relative variation of gate trigger current and holding current versus junction temperature.

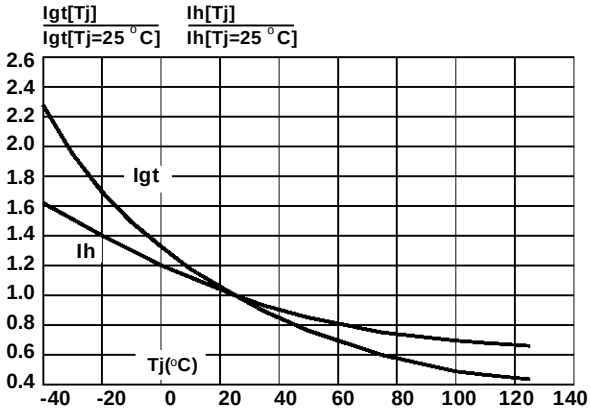


Fig.8 : Non Repetitive surge peak on-state current versus number of cycles.

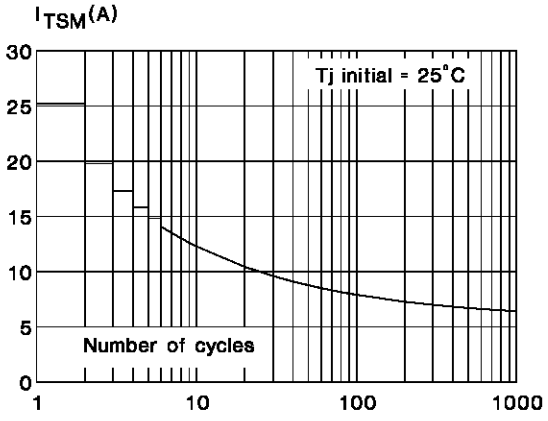


Fig.9 : Non repetitive surge peak on-state current for a sinusoidal pulse with width : t ≤ 10ms, and corresponding value of I^2t.

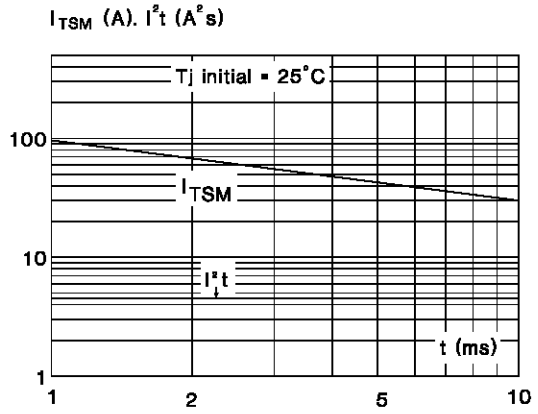
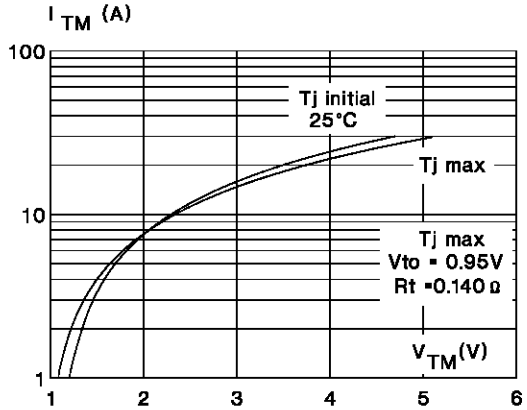
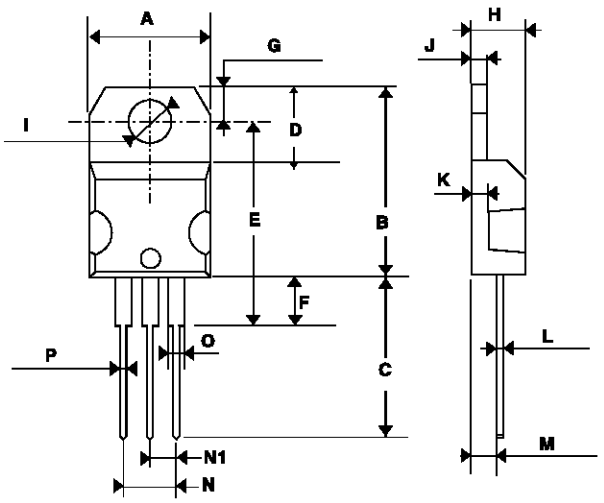


Fig.10 : On-state characteristics (maximum values).



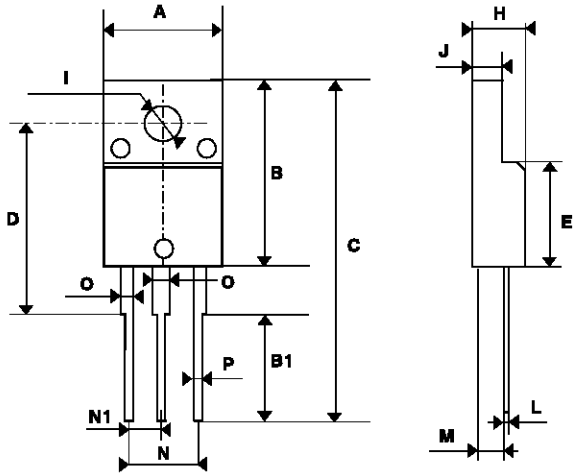
PACKAGE MECHANICAL DATA
TO220AB Plastic



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

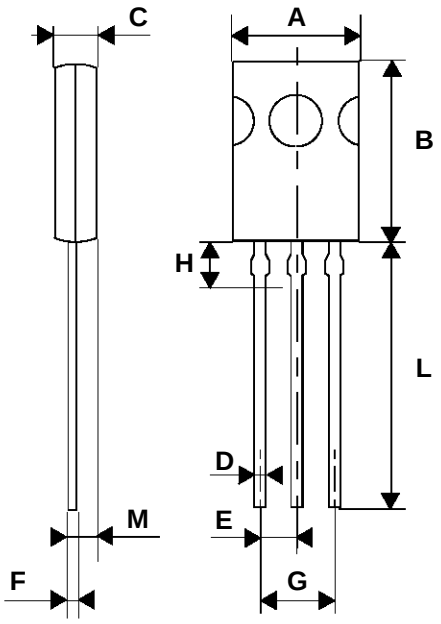


REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	10	10.4	0.393	0.409
B	15.9	16.4	0.626	0.645
B1	9.8	10.6	0.385	0.417
C	28.6	30.6	1.126	1.204
D	16 typ		0.630 typ	
E	9	9.3	0.354	0.366
H	4.4	4.6	0.173	0.181
I	3	3.2	0.118	0.126
J	2.5	2.7	0.098	0.106
L	0.4	0.7	0.015	0.027
M	2.5	2.75	0.098	0.108
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.

PACKAGE MECHANICAL DATA

SOT82 Plastic



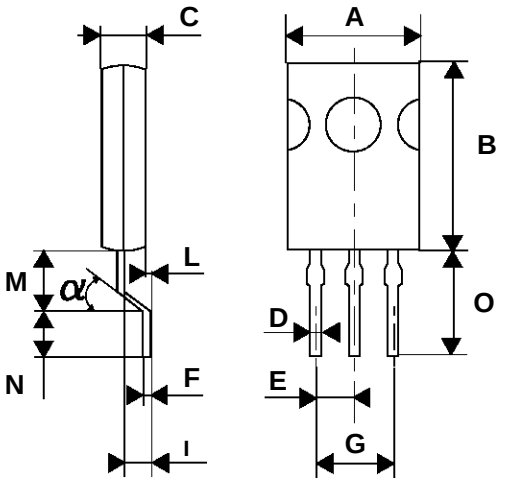
REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	7.4	7.8	0.291	0.307
B	10.5	10.8	0.413	0.425
C	2.4	2.7	0.094	0.106
D	0.7	0.9	0.027	0.035
E	2.2 typ.		0.087 typ.	
F	0.49	0.75	0.019	0.029
G	4.15	4.65	0.163	0.183
H (1)		2.54		0.100
L	15.7 typ.		0.618 typ.	
M	1.0	1.3	0.039	0.051

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

Marking : Type number
Weight : 0.72g

PACKAGE MECHANICAL DATA

SOT194 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	0.020
G	4.15	4.65	0.163	0.183
I	1.3 typ.		0.051 typ.	
L	0.1 typ.		0.004 typ.	
M	4 typ		0.158 typ	
N	2 typ.		0.078 typ.	
O	6 typ.		0.236 typ.	
α	45°		45°	

Marking : Type number
Weight : 0.68g

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