TS420-B/T

SENSITIVE SCR

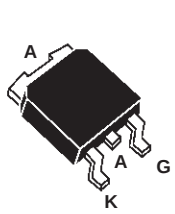
FEATURES

- $I_{T(RMS)} = 4A$
- $V_{DRM}/V_{RRM} = 400, 600V, 700V$
- $I_{GT} < 200\mu A$
- SMD PACKAGE

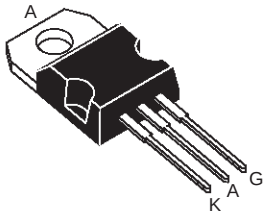
DESCRIPTION

The TS420-B/T series of SCR use a high performance TOPGLASS PNPN technology.

The parts are intended for general purpose applications using surface mount or through hole technology.



DPAK
(Plastic)
TS420-B



TO-220AB
(Plastic)
TS420-T

ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
$I_{T(RMS)}$	RMS on-state current (180° conduction angle)	Tc= 115°C	4	A
$I_{T(AV)}$	Average on-state current (180° conduction angle)	Tc= 115°C	2.5	A
I_{TSM}	Non repetitive surge peak on-state current	tp = 8.3ms	33	A
	(T_j initial = 25°C)	tp = 10ms	30	
I^2t	I^2t Value for fusing	tp = 10ms	4.5	A^2s
dI/dt	Critical rate of rise of on-state current I_G = 10 mA dI_G/dt = 0.1 A/µs.		100	A/µs
T_{stg} T_j	Storage junction temperature range Operating junction temperature range		- 40 to + 150 - 40 to + 125	°C
Tl	Maximum temperature for soldering during 10s		260	°C

Symbol	Parameter	TS420-			Unit
		400B/T	600B/T	700B/T	
V_{DRM} V_{RRM}	Repetitive peak off-state voltage T_j = 125°C R_{GK} = 220 Ω	400	600	700	V

THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
Rth(j-a)	Junction to ambient (S=0.5cm^2)	DPAK	70	°C/W
		TO-220AB	60	
Rth(j-c)	Junction to case for DC	DPAK / TO-220AB	3.0	°C/W

GATE CHARACTERISTICS (maximum values)

$P_{G(AV)}$= 0.2 W P_{GM} = 3 W (tp = 20 µs) I_{GM} = 1.2 A (tp = 20 µs)

ELECTRICAL CHARACTERISTICS

Symbol	Test Conditions		Type	Value	Unit
I_{GT}	V_D=12V (DC) R_L=33Ω	Tj= 25°C	MAX	200	µA
V_{GT}	V_D=12V (DC) R_L=33Ω	Tj= 25°C	MAX	0.8	V
V_{GD}	V_D=V_{DRM} R_L=3.3kΩ R_{GK} = 220 Ω	Tj= 125°C	MIN	0.1	V
V_{RG}	I_{RG} = 10µA	Tj= 25°C	MIN	8	V
I_H	I_T= 50mA R_{GK} = 1 KΩ	Tj= 25°C	MAX	5	mA
V_{TM}	I_{TM}= 8A tp= 380µs	Tj= 25°C	MAX	1.6	V
I_{DRM}	VD= V_{DRM} R_{GK} = 220 Ω	Tj= 25°C	MAX	5	mA
I_{RRM}	V_R= V_{RRM} R_{GK} = 220 Ω	Tj= 125°C	MAX	1	mA
dV/dt	V_D=67%V_{DRM} R_{GK} = 220 Ω	Tj= 125°C	MIN	5	V/µs

Fig. 1: Maximum average power dissipation versus average on-state current.

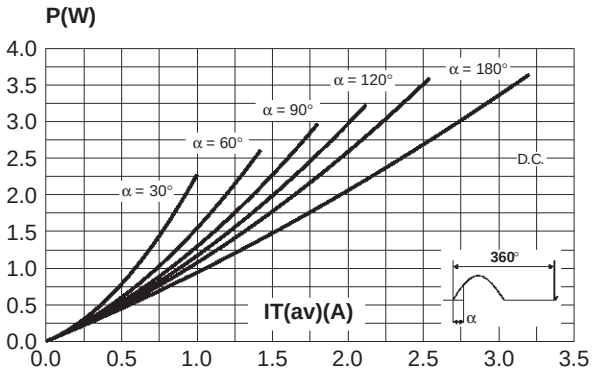


Fig. 2: Correlation between maximum average power dissipation and maximum allowable temperatures (Tamb and Tcase) for different thermal resistances heatsink + contact.

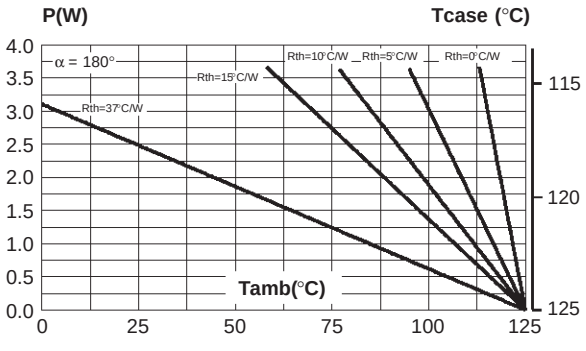


Fig. 3-1: Average and DC on-state current versus case temperature (TO-220AB).

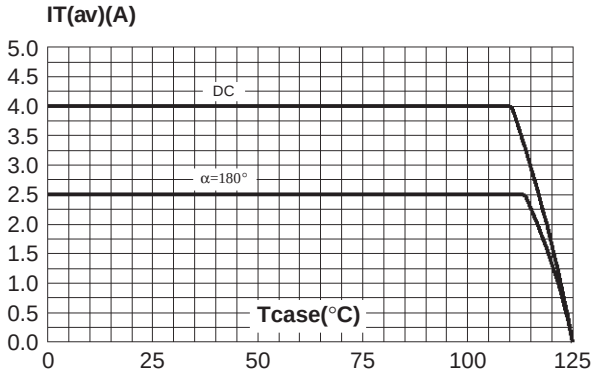


Fig. 3-2: Average and DC on-state current versus ambient temperature (device mounted on FR4 with recommended pad layout) (DPAK).

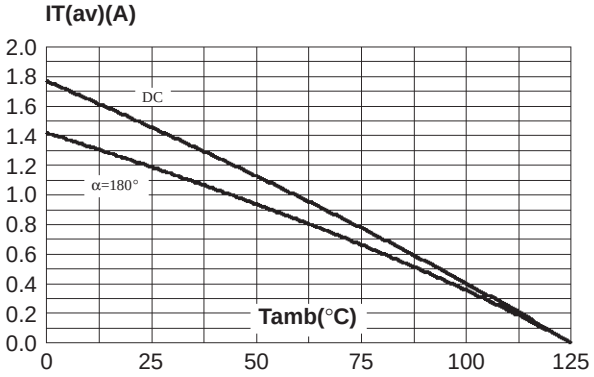


Fig. 4-1: Relative variation of thermal impedance junction to case versus pulse duration.

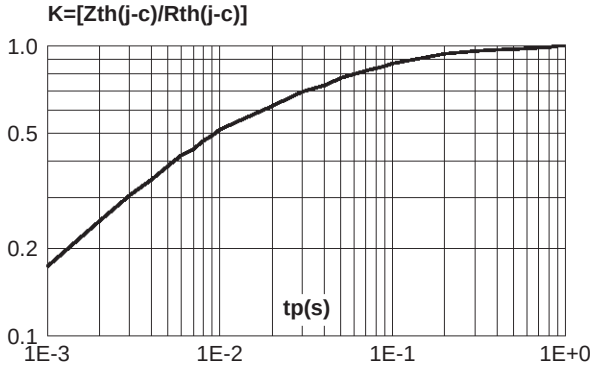


Fig. 4-2: Relative variation of thermal impedance junction to ambient versus pulse duration. (re-comended pad layout) (DPAK).

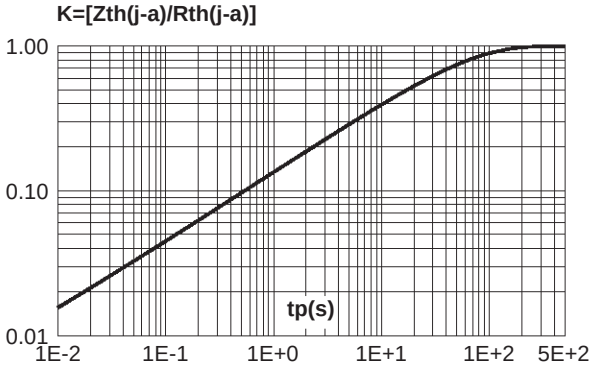


Fig. 5: Relative variation of gate trigger current and holding current versus junction temperature.

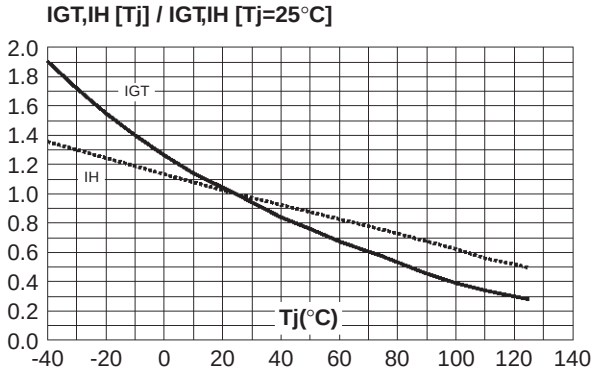


Fig. 6: Non repetitive surge peak on-state current versus number of cycles.

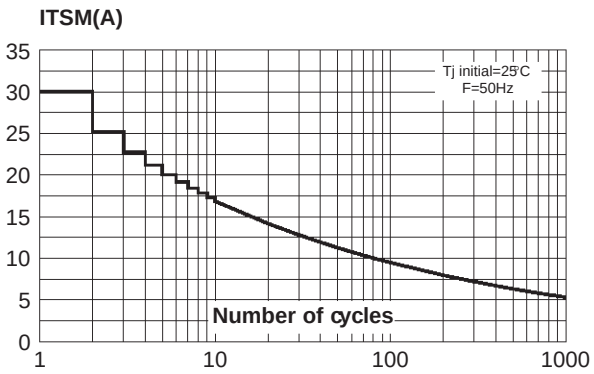


Fig. 7: Non repetitive surge peak on-state current for a sinusoidal pulse with width tp<10ms, and corresponding value of I^2t.

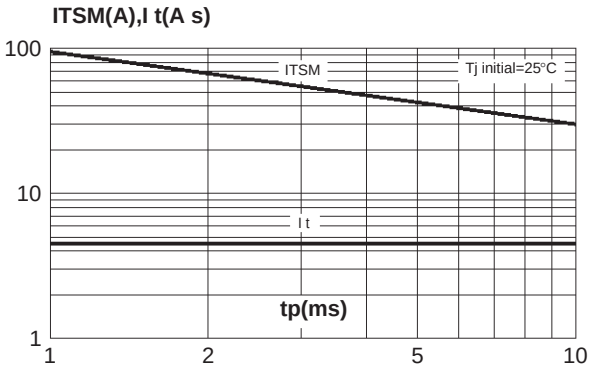


Fig. 8: On-state characteristics (maximum values).

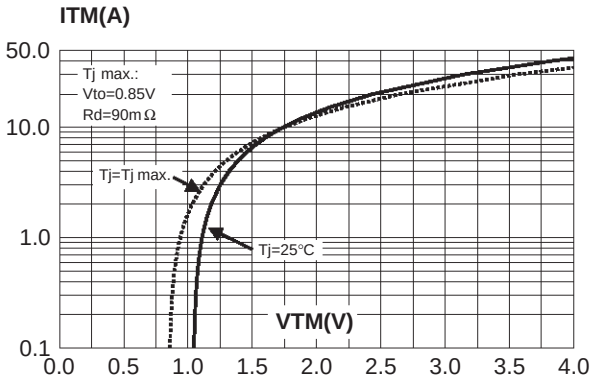


Fig. 9: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35µm) (DPAK).

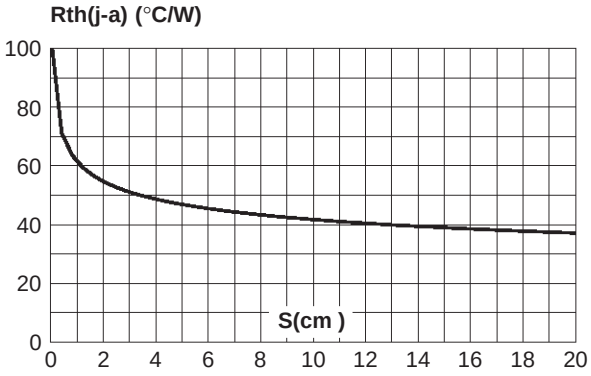
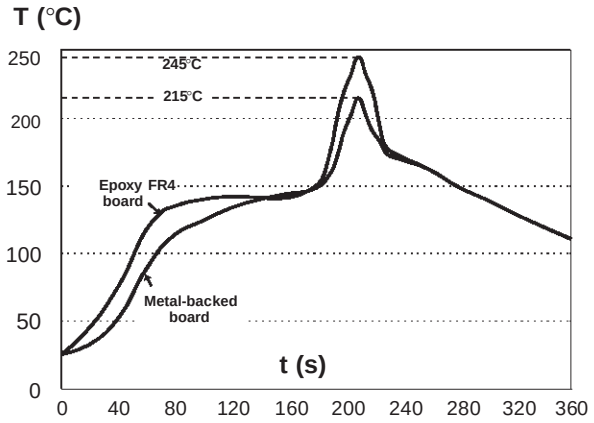
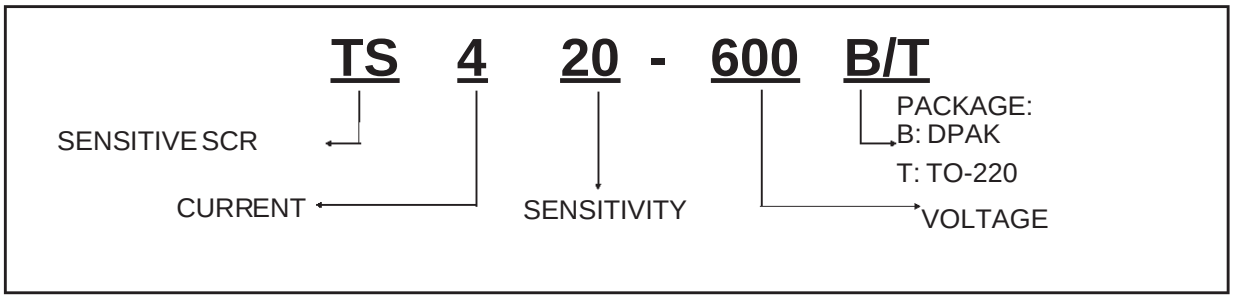


Fig. 10: Typical reflow soldering heat profile, either for mounting on FR4 or metal-backed boards.

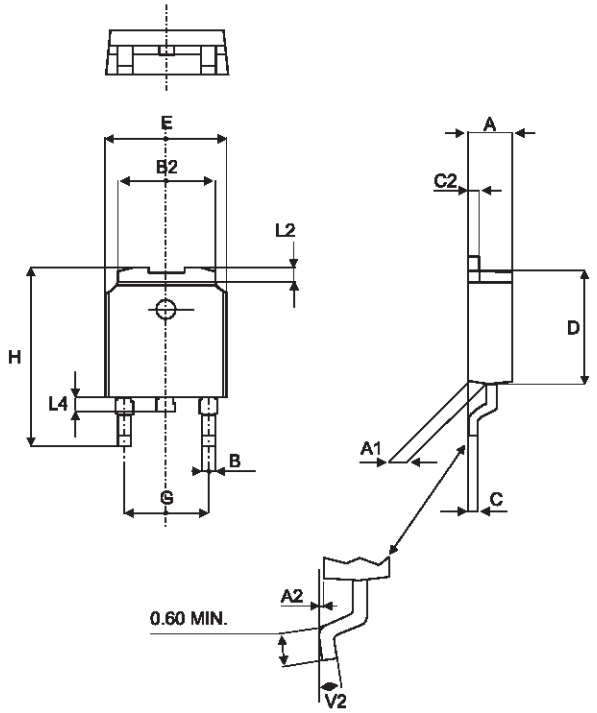


ORDERING INFORMATION Add "-TR" suffix for Tape & Reel shipment



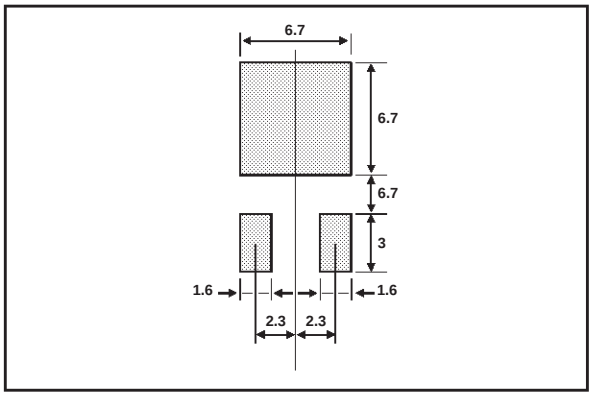
PACKAGE MECHANICAL DATA

DPAK (Plastic)



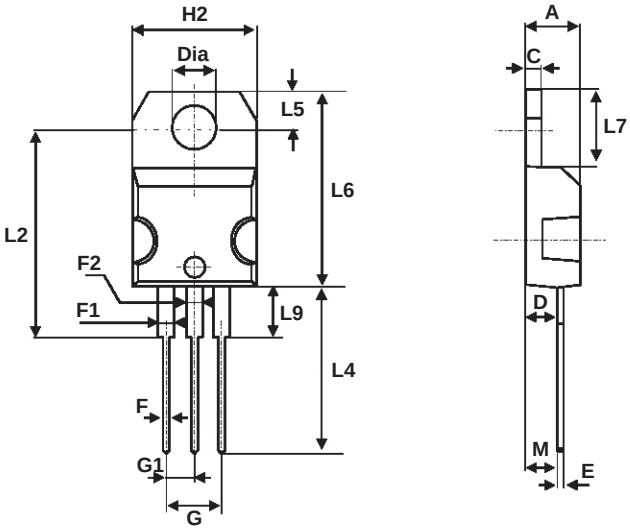
REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max	Min.	Typ.	Max.
A	2.20		2.40	0.086		0.094
A1	0.90		1.10	0.035		0.043
A2	0.03		0.23	0.001		0.009
B	0.64		0.90	0.025		0.035
B2	5.20		5.40	0.204		0.212
C	0.45		0.60	0.017		0.023
C2	0.48		0.60	0.018		0.023
D	6.00		6.20	0.236		0.244
E	6.40		6.60	0.251		0.259
G	4.40		4.60	0.173		0.181
H	9.35		10.10	0.368		0.397
L2		0.80			0.031	
L4	0.60		1.00	0.023		0.039
V2	0°		8°	0°		8°

FOOT PRINT DIMENSIONS (in millimeters)



PACKAGE MECHANICAL DATA

TO-220AB(Plastic)



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
C	1.23	1.32	0.048	0.051
D	2.40	2.72	0.094	0.107
E	0.49	0.70	0.019	0.027
F	0.61	0.88	0.024	0.034
F1	1.14	1.70	0.044	0.066
F2	1.14	1.70	0.044	0.066
G	4.95	5.15	0.194	0.202
G1	2.40	2.70	0.094	0.106
H2	10	10.40	0.393	0.409
L2	16.4 typ.		0.645 typ.	
L4	13	14	0.511	0.551
L5	2.65	2.95	0.104	0.116
L6	15.25	15.75	0.600	0.620
L7	6.20	6.60	0.244	0.259
L9	3.50	3.93	0.137	0.154
M	2.6 typ.		0.102 typ.	
Diam.	3.75	3.85	0.147	0.151

Type	Marking	Package	Weight	Base qty	Delivery mode
TS420-B	TS420x0	DPAK	0.3 g.	75	Tube
				2500	Tape and Reel
TS420-T	TS420x00T	TO-220AB	20 g.	50	Tube