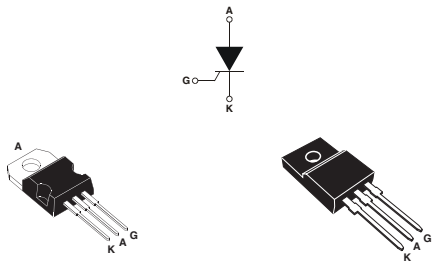
TYN612M

12 A SCR

Main features

Symbol	Value	Unit
$I_{T(RMS)}$	12	A
V_{DRM}/V_{RRM}	600	V
I_{GT} (min / max)	1.5 / 5	mA



TO-220AB
TYN612MRG

TO-220FPAB
TYN612MFP

Description

The TYN612M SCR is suitable to fit modes of control found in applications such as voltage regulation circuits for motorbikes, overvoltage crowbar protection, motor control circuits in power tools and kitchen aids, inrush current limiting circuits, capacitive discharge ignition.

The insulated fullpack package allows a back to back configuration.

Order codes

Part Numbers	Marking
TYN612MRG	TYN612M
TYN612MFP	TYN612MFP

Table 1. Absolute ratings (limiting values)

Symbol	Parameter			Value	Unit
$I_{T(RMS)}$	RMS on-state current (180° conduction angle)	TO-220AB	T_c = 105° C	12	A
		TO-220FPAB	T_c = 70° C	12	
$I_{T(AV)}$	Average on-state current (180° conduction angle)	TO-220AB	T_c = 105° C	8	A
		TO-220FPAB	T_c = 70° C	8	
I_{TSM}	Non repetitive surge peak on-state current	t_p = 8.3 ms	T_j = 25° C	125	A
		t_p = 10 ms		120	
I^2t	I^2t Value for fusing	t_p = 10 ms	T_j = 25° C	72	A^2s
dI/dt	Critical rate of rise of on-state current I_G = 2 x I_{GT} , $t_r \leq$ 100 ns	F = 60 Hz	T_j = 125° C	50	A/µs
I_{GM}	Peak gate current	t_p = 20 µs	T_j = 125° C	4	A
$P_{G(AV)}$	Average gate power dissipation		T_j = 125° C	1	W
T_{stg} T_j	Storage junction temperature range Operating junction temperature range			- 40 to + 150 - 40 to + 125	° C
V_{RGM}	Maximum peak reverse gate voltage			5	V

1 Characteristics

Table 2. Electrical characteristics (T_j = 25° C, unless otherwise specified)

Symbol	Test Conditions			Value	Unit
I_{GT}	V_D = 12 V R_L = 140 Ω		MIN.	1.5	mA
			MAX.	5	
V_{GT}	V_D = 12 V R_L = 140 Ω		MIN.	0.5	V
			TYP.	0.7	
			MAX.	1.3	
V_{GD}	$V_D = V_{DRM}$ R_L = 3.3 kΩ	T_j = 125° C	MIN.	0.2	V
I_H	I_T = 500 mA Gate open		MAX.	20	mA
I_L	I_G = 1.2 I_{GT}		MAX.	40	mA
dV/dt	V_D = 67 % V_{DRM} Gate open	T_j =125° C	MIN.	50	V/µs
V_{TM}	I_{TM} = 24 A t_p = 380 µs	T_j = 25° C	MAX.	1.6	V
V_{t0}	Threshold voltage	T_j = 125° C	MAX.	0.85	V
R_d	Dynamic resistance	T_j = 125° C	MAX.	30	mΩ
I_{DRM} I_{RRM}	$V_{DRM} = V_{RRM}$	T_j = 25° C	MAX.	5	µA
		T_j = 125° C		2	mA

Table 3. Thermal resistance

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case (DC)	TO-220AB	1.3	° C/W
		TO-220FPAB	4.5	
$R_{th(j-a)}$	Junction to ambient (DC)	TO-220AB	55	° C/W
		TO-220FPAB	55	

Figure 1. Maximum average power dissipation versus average on-state current

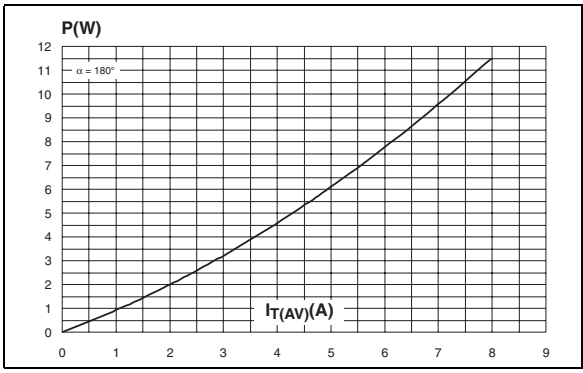


Figure 2. Average and D.C. on-state current versus case temperature (TO-220AB)

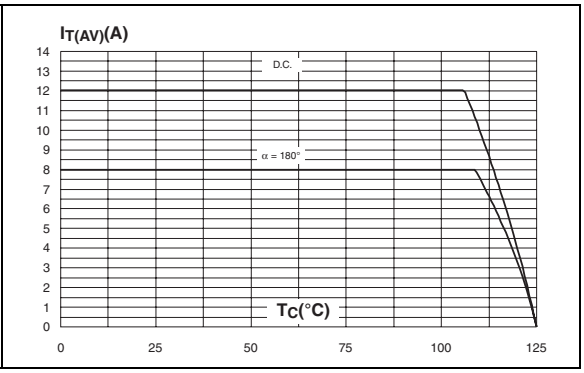


Figure 3. Average and D.C. on-state current versus case temperature (TO-220FPAB)

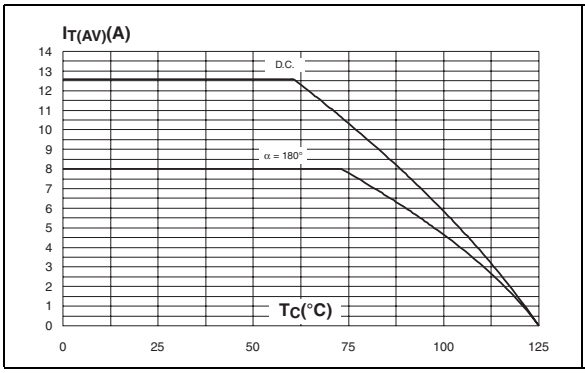


Figure 4. Relative variation of thermal impedance versus pulse duration (TO-220AB)

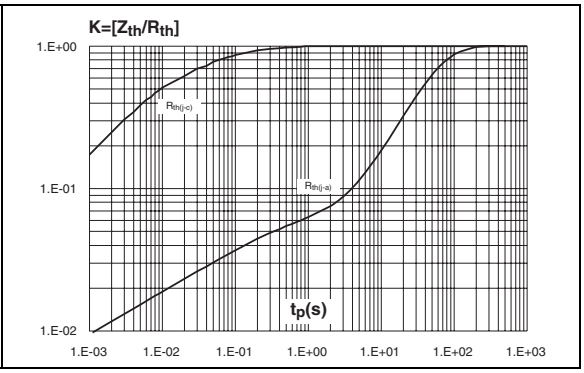


Figure 5. Relative variation of thermal impedance versus pulse duration (TO-220FPAB)

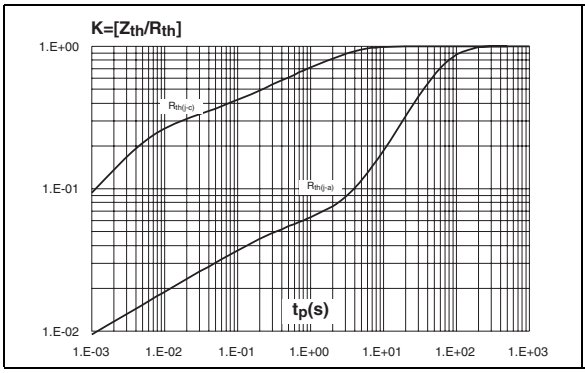


Figure 6. Relative variation of gate trigger current, holding current, latching current and gate trigger voltage versus junction temperature (typical values)

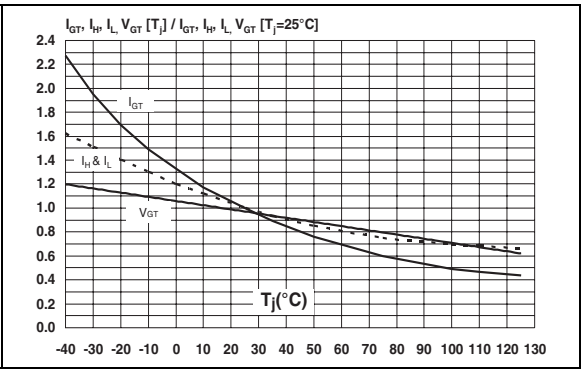


Figure 7. Surge peak on-state current versus number of cycles

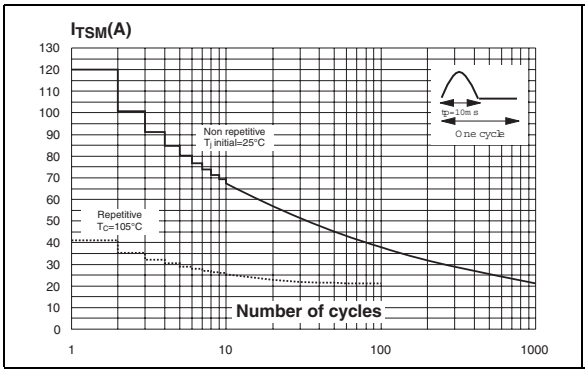


Figure 8. Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp < 10 ms, and corresponding values of I²t

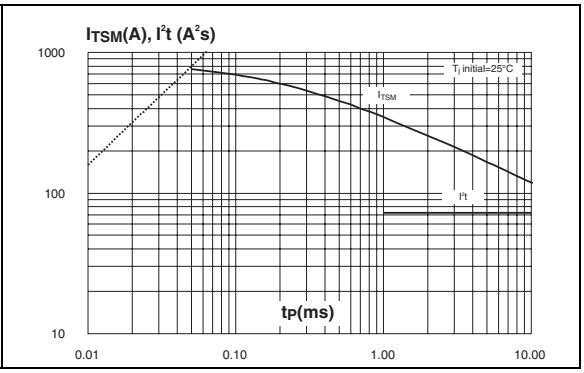
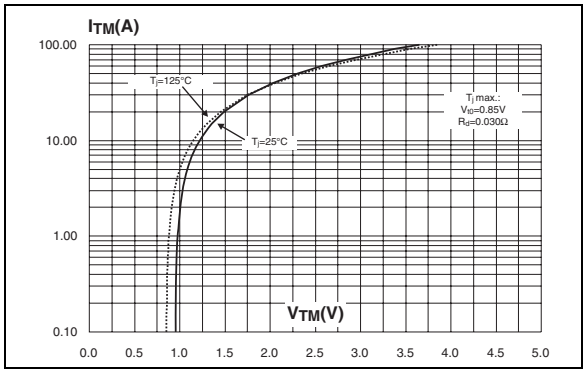


Figure 9. On-state characteristics (maximum values)



2 Ordering information scheme

TYN 6 12 M FP RG

Standard SCR

Voltage
6 = 600V

Current
12 = 12A

Sensitivity
M = 5mA

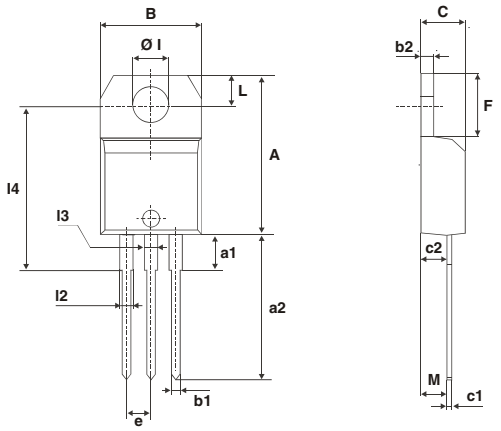
Package
FP = TO-220FPAB
Blank = TO-220AB

Packing mode
RG = Tube (TO-220AB)
Blank = Tube (TO-220FPAB)

3 Package information

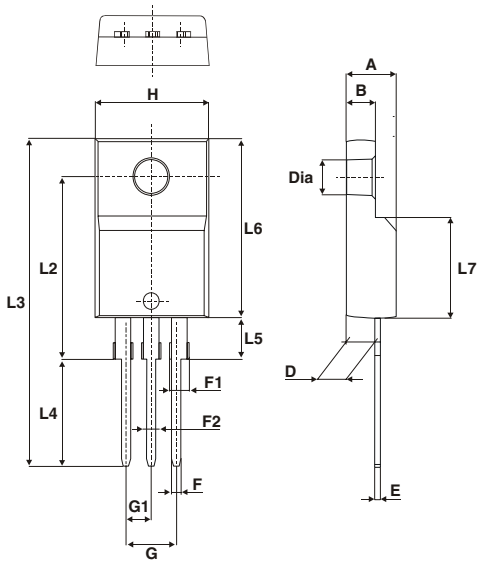
- Epoxy meets UL94, V0

Table 4. TO-220AB dimensions



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	15.20		15.90	0.598		0.625
a1		3.75			0.147	
a2	13.00		14.00	0.511		0.551
B	10.00		10.40	0.393		0.409
b1	0.61		0.88	0.024		0.034
b2	1.23		1.32	0.048		0.051
C	4.40		4.60	0.173		0.181
c1	0.49		0.70	0.019		0.027
c2	2.40		2.72	0.094		0.107
e	2.40		2.70	0.094		0.106
F	6.20		6.60	0.244		0.259
ØI	3.75		3.85	0.147		0.151
l4	15.80	16.40	16.80	0.622	0.646	0.661
L	2.65		2.95	0.104		0.116
l2	1.14		1.70	0.044		0.066
l3	1.14		1.70	0.044		0.066
M		2.60			0.102	

Table 5. TO-220FPAB Dimensions



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.4	4.6	0.173	0.181
B	2.5	2.7	0.098	0.106
D	2.5	2.75	0.098	0.108
E	0.45	0.70	0.018	0.027
F	0.75	1	0.030	0.039
F1	1.15	1.70	0.045	0.067
F2	1.15	1.70	0.045	0.067
G	4.95	5.20	0.195	0.205
G1	2.4	2.7	0.094	0.106
H	10	10.4	0.393	0.409
L2	16 Typ.		0.63 Typ.	
L3	28.6	30.6	1.126	1.205
L4	9.8	10.6	0.386	0.417
L5	2.9	3.6	0.114	0.142
L6	15.9	16.4	0.626	0.646
L7	9.00	9.30	0.354	0.366
Dia.	3.00	3.20	0.118	0.126

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a lead-free second level interconnect. The category of second level interconnect is marked on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com.

4 Ordering information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
TYN612MRG	TYN612M	TO-220AB	2.3 g	50	Tube
TYN612MFP	TYN612MFP	TO-220AB	2.0 g	50	Tube

5 Revision history

Date	Revision	Description of Changes
Sep-2002	1A	Last update.
10-Fev-2005	2	TO-220FPAB package added.
11-Apr-2007	3	Reformatted to current standards. Added typical and minimum values for V_{GT} in *Table 2*.
17-Apr-2007	4	Added V_{GT} curve in *Figure 6*.

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