TRIACs, 25A
Snubberless and Standard

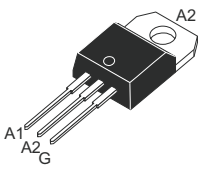
FEATURES

- High current triac
- Low thermal resistance with clip bonding
- Low thermal resistance insulation ceramic for insulated TO-220AB & TO-3P package
- High commutation (4 quadrant) or very High commutation (3 quadrant) capability
- 25T series are **UL** certified (File ref: E320098)
- Packages are RoHS compliant

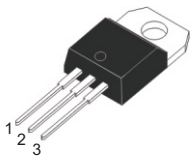
APPLICATIONS

Applications include the ON/OFF function in applications such as static relays, heating regulation, induction motor starting circuits, etc., or for phase control operation in light dimmers, motor speed controllers, and silmilar.

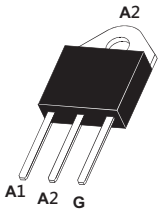
The snubberless versions are especially recommended for use on inductive loads, due to their high commutation performances. The 25T series provides an insulated tab (rated at 2500V_{RMS}).



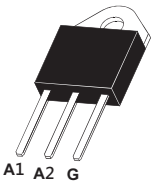
TO-220AB (**non-Insulated**)
(25TxxA)



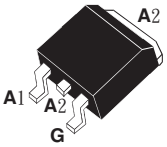
TO-220AB **(Insulated)**
(25TxxAI)



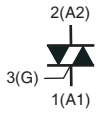
TO-3P (**non-Insulated**)
(25TxxB)



TO-3P (**Insulated**)
(25TxxBI)



TO-263 (**D^2PAK**)
(25TxxH)



MAIN FEATURES

SYMBOL	VALUE	UNIT
$I_{T(RMS)}$	25	A
V_{DRM}/V_{RRM}	600 to 1200	V
$I_{GT(Q1)}$	35 to 50	mA

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUE	UNIT
RMS on-state current (full sine wave)	$I_{T(RMS)}$	TO-3P	T_c = 105ºC	25	A
		TO-263/TO-220AB/TO-3P insulated	T_c = 100ºC		
		TO-220AB insulated	T_c = 75ºC		
Non repetitive surge peak on-state current (full cycle, T_j initial = 25°C)	I_{TSM}	F =50 Hz	t = 20 ms	250	A
		F =60 Hz	t = 16.7 ms	260	
I^2t Value for fusing	I^2t	t_p = 10 ms		340	A^2s
Critical rate of rise of on-state current $I_G = 2xI_{GT}$, $t_r \leq 100ns$	dI/dt	F =100 Hz	T_j =125ºC	50	A/µs
Peak gate current	I_{GM}	T_p =20 µs	T_j =125ºC	4	A
Average gate power dissipation	$P_{G(AV)}$	T_j =125ºC		1	W
Storage temperature range	T_{stg}			- 40 to + 150	ºC
Operating junction temperature range	T_j			- 40 to + 125	

◎ ELECTRICAL CHARACTERISTICS (T_J= 25 ºC unless otherwise specified)

SNUBBERLESS and Logic level (3 quadrants)						
SYMBOL	TEST CONDITIONS	QUADRANT		25Txxxx		Unit
				CW	BW	
I_{GT}(1)	V_D = 12 V, R_L = 30Ω	I - II - III	MAX.	35	50	mA
V_{GT}		I - II - III		1.3		V
V_{GD}	V_D = V_{DRM}, R_L = 3.3KΩ T_j = 125°C	I - II - III	MIN.	0.2		V
I_H(2)	I_T = 500 mA		MAX.	50	75	mA
I_L	I_G = 1.2 I_{GT}	I - III	MAX.	70	80	mA
		II		80	100	
dV/dt(2)	V_D = 67% V_{DRM}, gate open ,T_j = 125°C		MIN.	500	1000	V/µs
(dI/dt)c(2)	Without snubber, T_j = 125°C			13	22	A/ms

◎ ELECTRICAL CHARACTERISTICS (T_J= 25 ºC unless otherwise specified)

Standard (4 quadrants)					
SYMBOL	TEST CONDITIONS	QUADRANT		25Txxxx	UNIT
				B	
I_{GT}(1)	V_D = 12 V, R_L = 30Ω	I - II - III	MAX.	50	mA
		IV		100	
V_{GT}		ALL		1.3	V
V_{GD}	V_D = V_{DRM}, R_L = 3.3KΩ, T_j = 125°C	ALL		0.2	V
I_H(2)	I_T = 500 mA		MAX.	80	mA
I_L	I_G = 1.2 I_{GT}	I - III - IV	MAX.	70	mA
		II		160	
dV/d_t(2)	V_D = 67% V_{DRM}, gate open, T_j = 125°C		MIN.	500	V/µs
(dV/dt)c(2)	(dI/dt)c =13.3 A/ms, T_j = 125°C		MIN.	10	V/µs

STATIC CHARACTERISTICS					
SYMBOL	TEST CONDITIONS			VALUE	UNIT
V_{TM}(2)	I_{TM} = 35 A, t_P = 380 µs	T_j = 25°C	MAX.	1.55	V
V_{t0}(2)	Threshold voltage	T_j = 125°C	MAX.	0.85	V
R_d(2)	Dynamic resistance	T_j = 125°C	MAX.	16	mΩ
I_{DRM} I_{RRM}	V_D = V_{DRM} V_R = V_{RRM}	T_j = 25°C	MAX.	5	µA
		T_j = 125°C		3	mA

Note 1: Minimum I_{GT} is guaranted at 5% of I_{GT} max.

Note 2: For both polarities of A2 referenced to A1.

THERMAL RESISTANCE				
SYMBOL			VALUE	UNIT
$R_{th(j-c)}$	Junction to case (AC)	TO-3P	0.6	°C/W
		TO-263/TO-220AB	0.8	
		TO-3P Insulated	0.9	
		TO-220AB Insulated	1.7	
$R_{th(j-a)}$	Junction to ambient S = 1 cm^2	TO-263	45	
		TO-220AB Insulated, TO-220AB	60	
		TO-3P, TO-3P Insulated	50	

S = Copper surface under tab.

PRODUCT SELECTOR

PART NUMBER	VOLTAGE (xx)				SENSITIVITY	TYPE	PACKAGE
	600 V	800 V	1000 V	1200 V			
25TxxA-B/25TxxAI-B	V	V	V	V	50 mA	Standard	TO-220AB
25TxxA-CW/25TxxAI-CW	V	V	V	V	35 mA	Snubberless	TO-220AB
25TxxA-BW/25TxxAI-BW	V	V	V	V	50 mA	Snubberless	TO-220AB
25TxxB-B/25TxxBI-B	V	V	V	V	50 mA	Standard	TO-3P
25TxxB-CW/25TxxBI-CW	V	V	V	V	35 mA	Snubberless	TO-3P
25TxxB-BW/25TxxBI-BW	V	V	V	V	50 mA	Snubberless	TO-3P
25TxxH-B	V	V	V	V	50 mA	Standard	D^2PAK
25TxxH-CW	V	V	V	V	35 mA	Snubberless	D^2PAK
25TxxH-BW	V	V	V	V	50 mA	Snubberless	D^2PAK

AI: Insulated TO-220AB package
BI: Insulated TO-3P package

ORDERING INFORMATION

ORDERING TYPE	MARKING	PACKAGE	WEIGHT	BASE Q'TY	DELIVERY MODE
25TxxA-yy	25TxxA-yy	TO-220AB	2.0g	50	Tube
25TxxAI-yy	25TxxAI-yy	TO-220AB (insulated)	2.3g	50	Tube
25TxxB-yy	25TxxB-yy	TO-3P	4.3g	30	Tube
25TxxBI-yy	25TxxBI-yy	TO-3P (insulated)	4.8g	30	Tube
25TxxH-yy	25TxxH-yy	D^2PAK	2.0g	50	Tube

Note: xx = voltage, yy = sensitivity

ORDERING INFORMATION SCHEME

25 T 06 A - BW

Current
25 = 25A
Triac series
Voltage
06 = 600V
08 = 800V
10 = 1000V
12 = 1200V
Package type
A = TO-220AB (non-insulated)
AI = TO-220AB (insulated)
B = TO-3P (non-insulated)
BI = TO-3P (insulated)
H = TO-263 (D^2PAK)
I_{GT} Sensitivity
BW = 50mA Snubberless
CW = 35mA Snubberless
B = 50mA Standard

Fig.1 Maximum power dissipation versus RMS on-state current (full cycle)

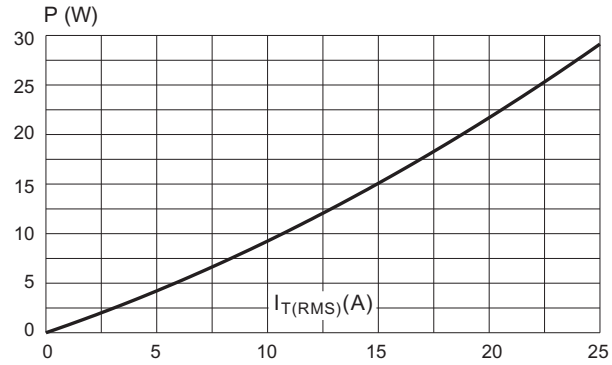


Fig.2 RMS on-state current versus case temperature (full cycle)

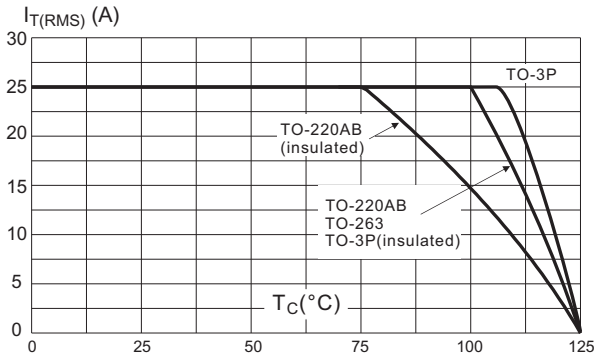


Fig.3 D^2PAK RMS on-state current versus ambient temperature (printed circuit board FR4, copper thickness: 35µm)(full cycle)

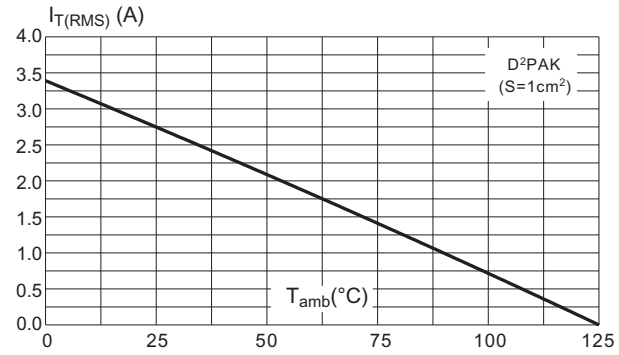


Fig.4 Relative variation of thermal impedance versus pulse duration.

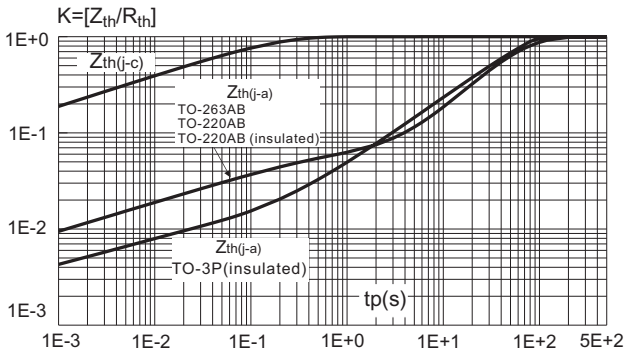


Fig.5 On-state characteristics (maximum values).

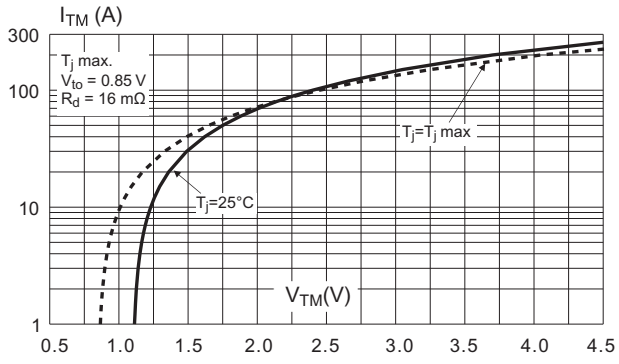


Fig.6 Surge peak on-state current versus number of cycles.

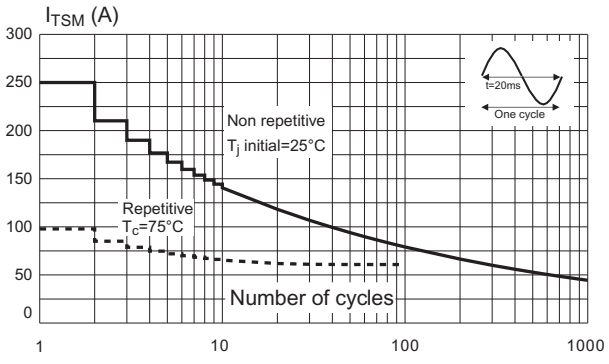


Fig.7 Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp < 10ms. and corresponding value of I^2t.

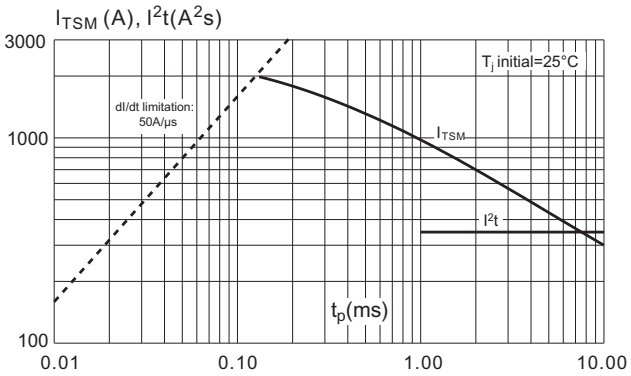


Fig.8 Relative variation of gate trigger current,holding current and latching current versus junction temperature (typical values).

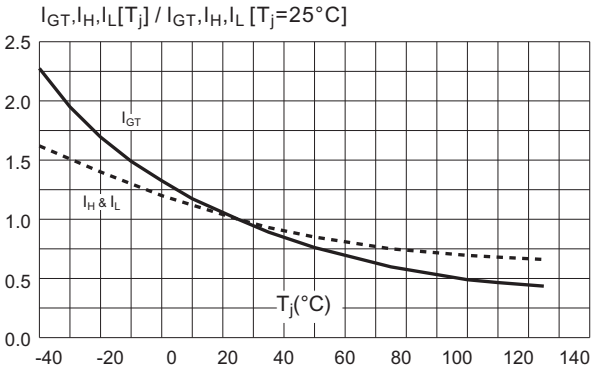


Fig.9 Relative variation of critical rate of decrease of main current versus (dV/dt)c (typical values).

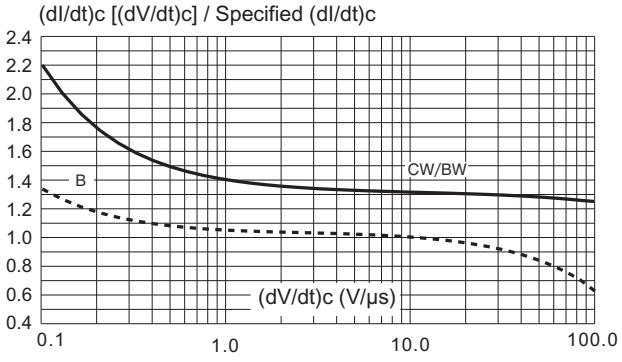


Fig.10 Relative variation of critical rate of decrease of main current versus T_j

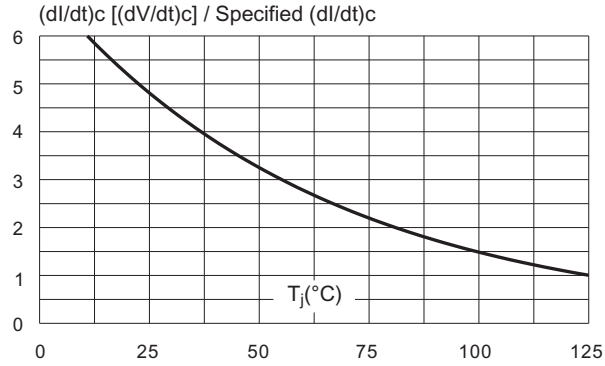
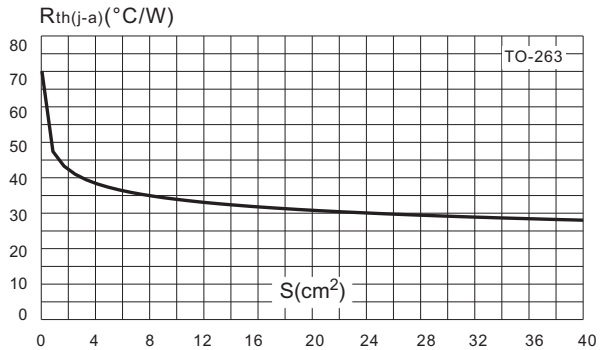
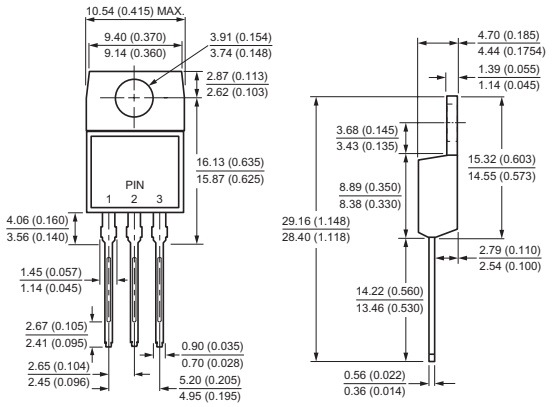


Fig.11 D^2PAK thermal resistance junction to ambient versus copper surface under tab (printed circuit board FR4, copper thickness: 35µm)

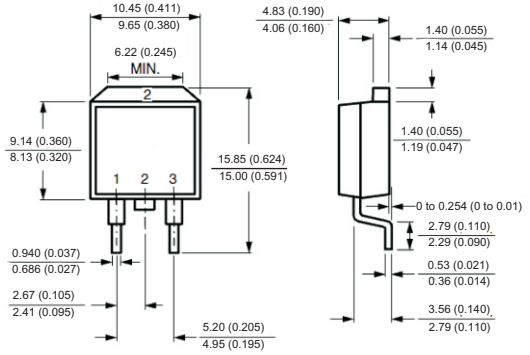


Case Style

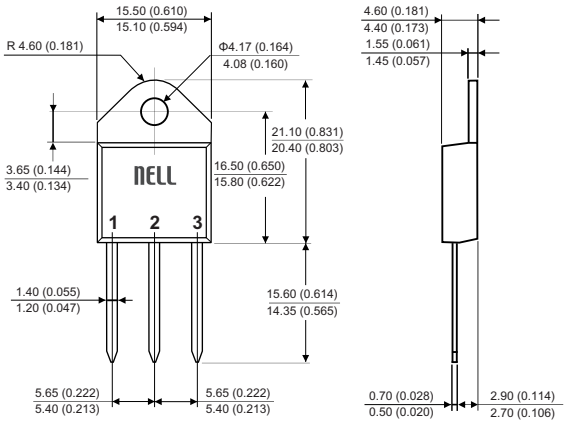
TO-220AB

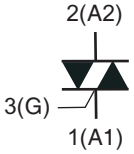


TO-263(D^2PAK)



TO-3P





All dimensions in millimeters(inches)