

## TRIACs, 40A Sunbberless

### FEATURES

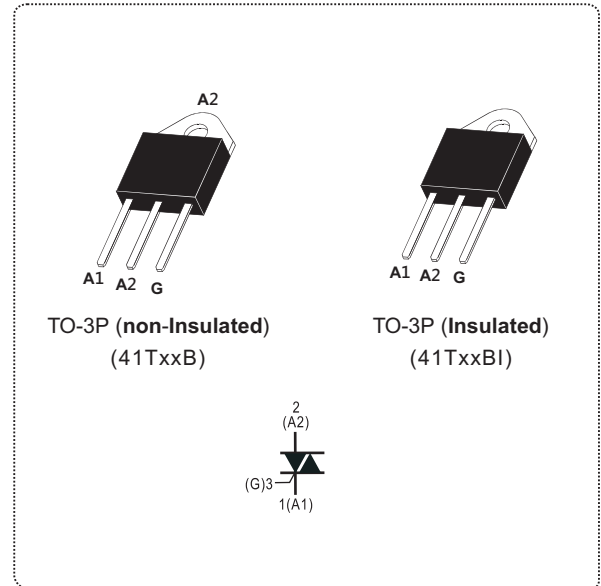
- High current triac
- Low thermal resistance with clip bonding
- Low thermal resistance insulation ceramic for insulated TO-3P package
- High commutation capability
- 41T series are **UL** certified (File ref: E320098)
- Packages are RoHS compliant

### APPLICATIONS

The snubberless concept offer suppression of RC network and it is suitable for applications such as on/off function in static relays, heating regulation, induction motor starting circuits, phase control operation in light dimmers, motor speed controllers, and silmilar.

Due to their clip assembly techniqe, they provide a superior performance in surge current handling capabilities.

By using an internal ceramic pad, the 41T series provides voltage insulated tab (rated at 2500VRMS) complying with UL standards.



### MAIN FEATURES

SYMBOL	VALUE	UNIT
$I_{T(RMS)}$	40	A
$V_{DRM}/V_{RRM}$	600 to 1600	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	$T_c = 95^\circ\text{C}$	40	A
		TO-3P insulated	$T_c = 80^\circ\text{C}$		
Non repetitive surge peak on-state current (full cycle, $T_j$ initial = $25^\circ\text{C}$ )	$I_{TSM}$	F = 50 Hz	t = 20 ms	400	A
		F = 60 Hz	t = 16.7 ms	420	
$I^2t$ Value for fusing	$I^2t$	$t_p = 10$ ms		800	$\text{A}^2\text{s}$
Critical rate of rise of on-state current $I_G = 2xI_{GT}$ , $t_r \leq 100\text{ns}$	dI/dt	F = 100 Hz	$T_j = 125^\circ\text{C}$	50	A/ $\mu\text{s}$
Peak gate current	$I_{GM}$	$T_p = 20 \mu\text{s}$	$T_j = 125^\circ\text{C}$	4	A
Peak gate power dissipation ( $t_p = 20\mu\text{s}$ )	$P_{GM}$	$T_j = 125^\circ\text{C}$		10	W
Average gate power dissipation	$P_{G(AV)}$	$T_j = 125^\circ\text{C}$		1	
Storage temperature range	$T_{stg}$			- 40 to + 150	$^\circ\text{C}$
Operating junction temperature range	$T_j$			- 40 to + 125	

© ELECTRICAL CHARACTERISTICS (T<sub>j</sub>= 25 °C unless otherwise specified)

SNUBBERLESS and Logic level (3 quadrants)					
SYMBOL	TEST CONDITIONS	QUADRANT		41Txxxx	Unit
				BW	
I <sub>GT</sub> <sup>(1)</sup>	V <sub>D</sub> = 12 V, R <sub>L</sub> = 30Ω	I - II - III	MAX.	50	mA
V <sub>GT</sub>		I - II - III		1.3	V
V <sub>GD</sub>	V <sub>D</sub> = V <sub>DRM</sub> , R <sub>L</sub> = 3.3KΩ T <sub>j</sub> = 125°C	I - II - III	MIN.	0.2	V
I <sub>H</sub> <sup>(2)</sup>	I <sub>T</sub> = 500 mA		MAX.	60	mA
I <sub>L</sub>	I <sub>G</sub> = 1.2 I <sub>GT</sub>	I - III	MAX.	80	mA
		II		100	
dV/dt <sup>(2)</sup>	V <sub>D</sub> = 67% V <sub>DRM</sub> , gate open, T <sub>j</sub> = 125°C		MIN.	1000	V/μs
(dI/dt) <sub>c</sub> <sup>(2)</sup>	Without snubber, T <sub>j</sub> = 125°C			20	A/ms

STATIC CHARACTERISTICS					
SYMBOL	TEST CONDITIONS			VALUE	UNIT
V <sub>TM</sub> <sup>(2)</sup>	I <sub>TM</sub> = 60 A, t <sub>p</sub> = 380 μs	T <sub>j</sub> = 25°C	MAX.	1.55	V
V <sub>t0</sub> <sup>(2)</sup>	Threshold voltage	T <sub>j</sub> = 125°C	MAX.	0.85	V
R <sub>d</sub> <sup>(2)</sup>	Dynamic resistance	T <sub>j</sub> = 125°C	MAX.	10	mΩ
I <sub>DRM</sub> I <sub>RRM</sub>	V <sub>D</sub> = V <sub>DRM</sub> V <sub>R</sub> = V <sub>RRM</sub>	T <sub>j</sub> = 25°C	MAX.	10	μA
		T <sub>j</sub> = 125°C		5	mA

Note 1: Minimum I<sub>GT</sub> is guaranteed at 5% of I<sub>GT</sub> max.

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

THERMAL RESISTANCE					
SYMBOL				VALUE	UNIT
R <sub>th(j-c)</sub>	Junction to case (AC)	TO-3P		0.6	°C/W
		TO-3P Insulated		0.9	
R <sub>th(j-a)</sub>	Junction to ambient	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	1600 V			
41TxxB-BW/41TxxBI-BW	V	V	V	V	V	50 mA	Snubberless	TO-3P

BI: Insulated TO-3P package

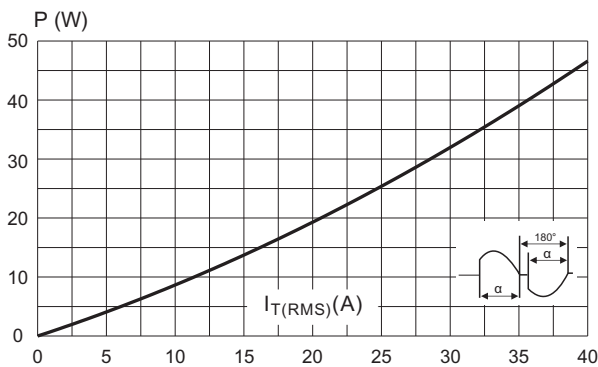
ORDERING INFORMATION					
ORDERING TYPE	MARKING	PACKAGE	WEIGHT	BASE Q'TY	DELIVERY MODE
41TxxB-yy	41TxxB-yy	TO-3P	4.3g	30	Tube
41TxxBI-yy	41TxxBI-yy	TO-3P insulated	4.8g	30	Tube

Note: xx = voltage, yy = sensitivity

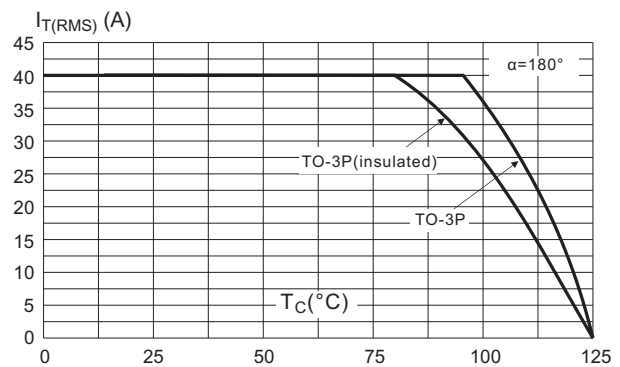
## ORDERING INFORMATION SCHEME

	<b>41</b>	<b>T</b>	<b>06</b>	<b>B</b>	<b>- BW</b>
<b>Current</b>	41 = 40A				
<b>Triac series</b>	T = 41T Series				
<b>Voltage</b>	06 = 600V 08 = 800V 10 = 1000V 12 = 1200V 16 = 1600V				
<b>Package type</b>	B = TO-3P (non-insulated) BI = TO-3P (insulated)				
<b>I<sub>GT</sub> Sensitivity</b>	BW = 50mA Snubberless				

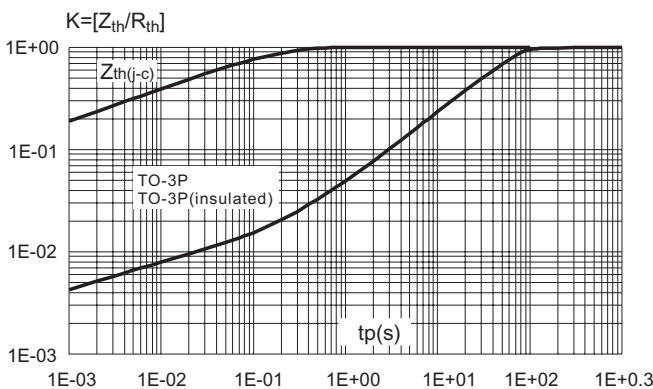
**Fig.1 Maximum power dissipation versus on-state rms current (full cycle)**



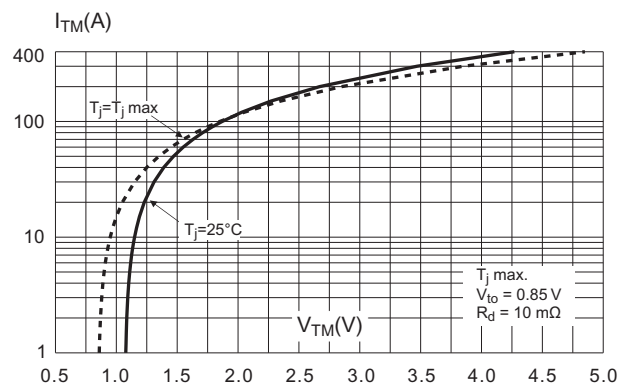
**Fig.2 On-state rms current versus case temperature (full cycle)**



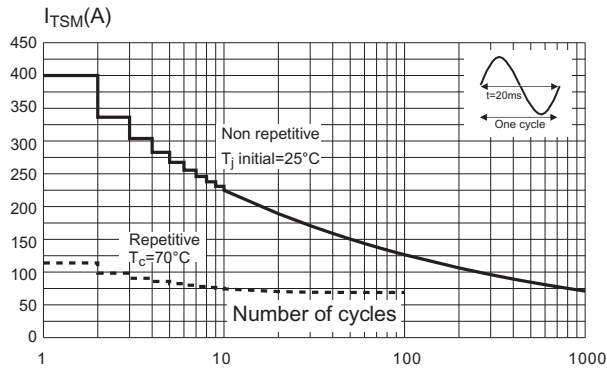
**Fig.3 Relative variation of thermal impedance versus pulse duration.**



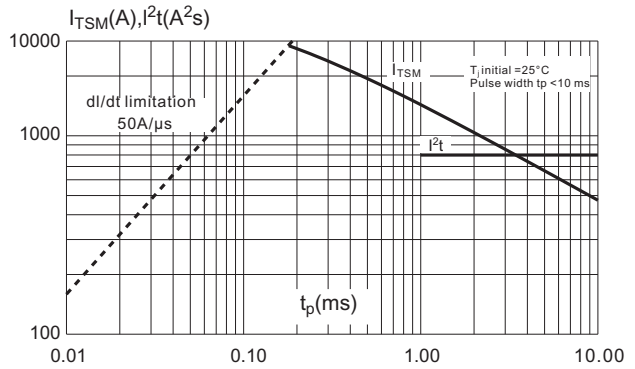
**Fig.4 On-state characteristics (maximum values).**



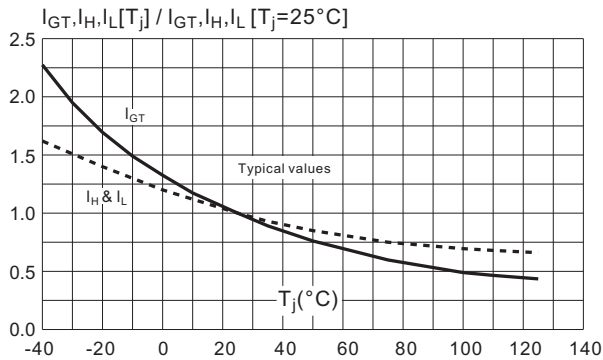
**Fig.5 Surge peak on-state current versus number of cycles.**



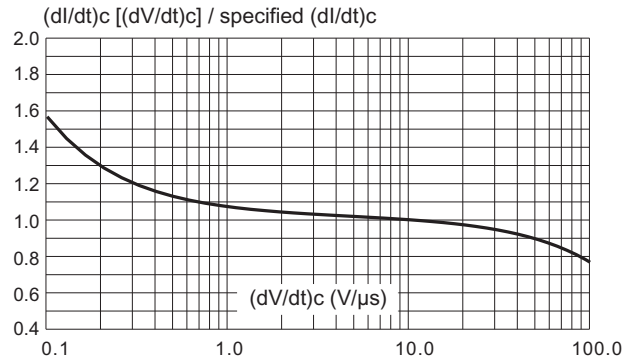
**Fig.6 Non-repetitive surge peak on-state current for a sinusoidal pulse and corresponding value of  $I^2t$ .**



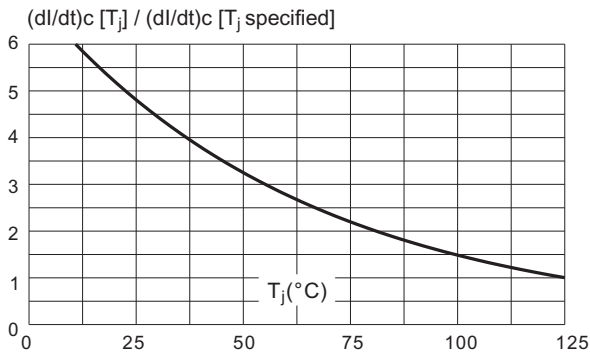
**Fig.7 Relative variation of gate trigger, holding and latching current versus junction temperature.**



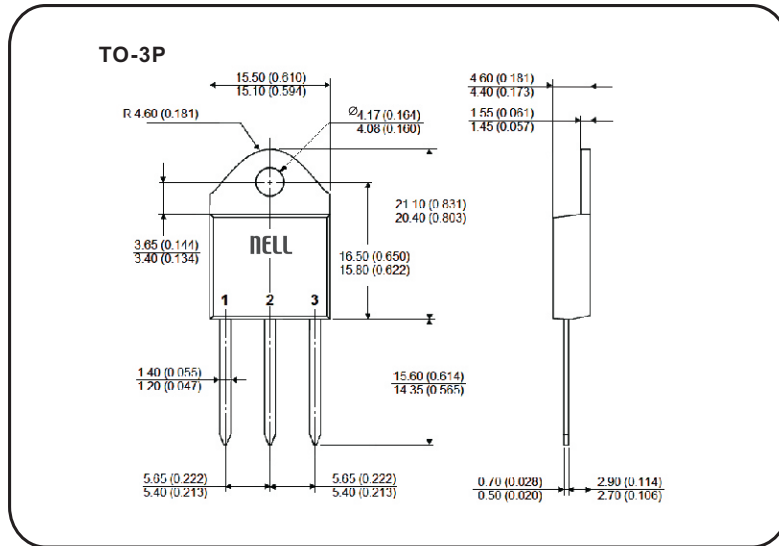
**Fig.8 Relative variation of critical rate of decrease of main current versus  $(dV/dt)_c$  (typical values).**



**Fig.9 Relative variation of critical rate of decrease of main current versus  $(dV/dt)_c$ .**



### Case Style



All dimensions in millimeters(inches)

