

Standard SCRs, 40A

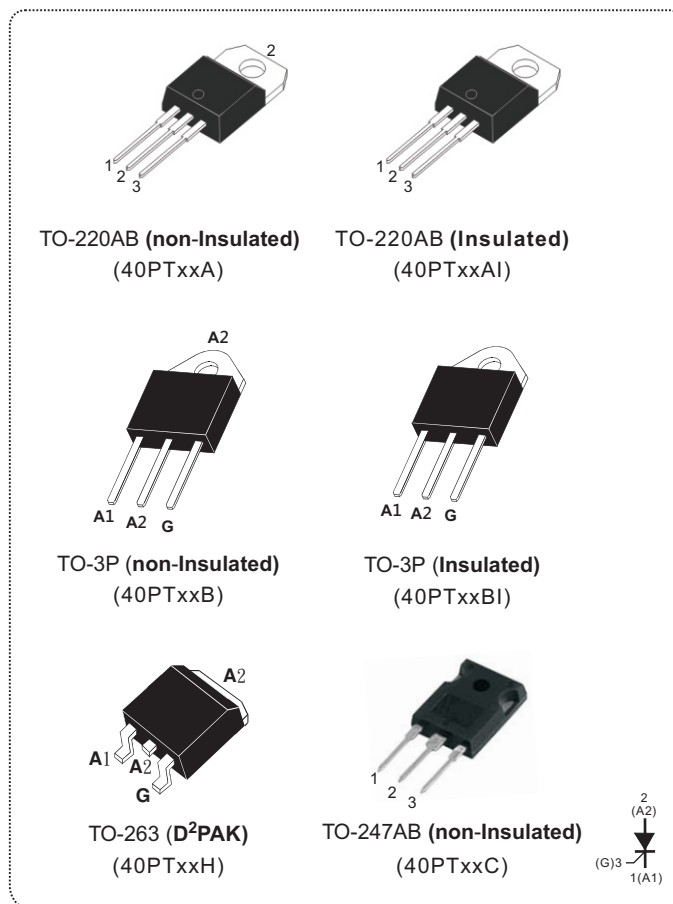
Main Features

Symbol	Value	Unit
$I_{T(RMS)}$	40	A
V_{DRM}/V_{RRM}	600 to 1600	V
I_{GT}	4 to 35	mA

DESCRIPTION

The 40PT series of silicon controlled rectifiers are high performance glass passivated technology, and are suitable for general purpose applications, where in-rush current conditions are critical such as overvoltage crowbar protection circuits in power supplies, in-rush current limiting circuits, solid state relay in back to back configuration, welding equipment and high power motor control.

Base on a clip assembly technology, they offer a superior performance in surge current capabilities.



ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUE	UNIT
RMS on-state current full sine wave (180° conduction angle)	$I_{T(RMS)}$	TO-3P/TO-247AB	$T_c=95^{\circ}\text{C}$	40	A
		TO-220AB/TO-263	$T_c=90^{\circ}\text{C}$		
		TO-220AB insulated/TO-3P insulated	$T_c=80^{\circ}\text{C}$		
Average on-state current (180° conduction angle)	$I_{T(AV)}$	TO-3P/TO-247AB	$T_c=95^{\circ}\text{C}$	25	A
		TO-220AB/TO-263	$T_c=90^{\circ}\text{C}$		
		TO-220AB insulated/TO-3P insulated	$T_c=80^{\circ}\text{C}$		
Non repetitive surge peak on-state current (full cycle, T_j initial = 25°C)	I_{TSM}	F = 50 Hz	t = 20 ms	460	A
		F = 60 Hz	t = 16.7 ms	480	
I^2t Value for fusing	I^2t	$t_p = 10 \text{ ms}$		1058	A^2s
Critical rate of rise of on-state current $I_G = 2 \times I_{GT}$, $t_r \leq 100\text{ns}$	di/dt	F = 60 Hz	$T_j = 125^{\circ}\text{C}$	50	$\text{A}/\mu\text{s}$
Peak gate current	I_{GM}	$T_p = 20 \mu\text{s}$	$T_j = 125^{\circ}\text{C}$	4	A
Maximum gate power	P_{GM}	$T_p = 20 \mu\text{s}$	$T_j = 125^{\circ}\text{C}$	10	W
Average gate power dissipation	$P_{G(AV)}$	$T_j = 125^{\circ}\text{C}$		1	W
Repetitive peak off-state voltage	V_{DRM}	$T_j = 125^{\circ}\text{C}$		600 to 1600	V
Repetitive peak reverse voltage	V_{RRM}				
Storage temperature range	T_{stg}			- 40 to + 150	$^{\circ}\text{C}$
Operating junction temperature range	T_j			- 40 to + 125	
Maximum peak reverse gate voltage	V_{RGM}			5	V

ELECTRICAL SPECIFICATIONS (T _J = 25 °C unless otherwise specified)					
SYMBOL	TEST CONDITIONS			40PTxxxx	Unit
I _{GT}	V _D = 12V, R _L = 33Ω		Min.	4	mA
			Max.	35	
V _{GT}			Max.	1.3	V
V _{GD}	V _D = V _{DRM} , R _L = 3.3KΩ, R _{GK} = 220Ω	T _J = 125 °C	Min.	0.2	V
I _H	I _T = 500mA, Gate open		Max.	75	mA
I _L	I _G = 1.2×I _{GT}		Max.	150	mA
dV/dt	V _D = 67% V _{DRM} , Gate open	T _J = 125 °C	Min.	1000	V/μs
V _{TM}	I _T = 80A, t _p = 380μs	T _J = 25 °C	Max.	1.6	V
I _{DRM} I _{RRM}	V _D =V _{DRM} , V _R =V _{RRM} R _{GK} = 220Ω	T _J = 25 °C	Max.	10	μA
		T _J = 125 °C	Max.	4	mA
V _{to}	Threshold Voltage	T _J = 125 °C	Max.	0.85	V
R _d	Dynamic Resistance	T _J = 125 °C	Max.	10	mΩ

THERMAL RESISTANCE					
SYMBOL	Parameter			VALUE	UNIT
R _{th(j-c)}	Junction to case (DC)	D ² PAK/TO-220AB/TO-3P/TO-247AB		0.8	°C/W
		TO-220AB insulated/TO-3P insulated		0.9	
R _{th(j-a)}	Junction to ambient	S = 1 cm ²	TO-263(D ² PAK)	45	°C/W
			TO-220AB/TO-220AB insulated	60	
			TO-3P/TO-247AB/TO-3P insulated	50	

S=Copper surface under tab

PRODUCT SELECTOR							
PART NUMBER	VOLTAGE (xx)					SENSITIVITY	PACKAGE
	600 V	800 V	1000 V	1200 V	1600 V		
40PTxxA/40PTxxAI	V	V	V	V	V	35 mA	TO-220AB
40PTxxH	V	V	V	V	V	35 mA	D ² PAK
40PTxxB/40PTxxBI	V	V	V	V	V	35 mA	TO-3P
40PTxxC	V	V	V	V	V	35 mA	TO-247AB

ORDERING INFORMATION					
ORDERING TYPE	MARKING	PACKAGE	WEIGHT	BASE Q'TY	DELIVERY MODE
40PTxxA	40PTxxA	TO-220AB	2.0g	50	Tube
40PTxxAI	40PTxxAI	TO-220AB (insulated)	2.3g	50	Tube
40PTxxH	40PTxxH	TO-263(D ² PAK)	2.0g	50	Tube
40PTxxB	40PTxxB	TO-3P	4.3g	30	Tube
40PTxxBI	40PTxxBI	TO-3P insulated	4.8g	30	Tube
40PTxxC	40PTxxC	TO-247AB	5g	30	Tube

Note: xx = voltage

ORDERING INFORMATION SCHEME

	40	PT	06	AI
Current				
40 = 40A, $I_{T(RMS)}$				
SCR series				
Voltage Code				
06 = 600V				
08 = 800V				
10 = 1000V				
12 = 1200V				
16 = 1600V				
Package type				
A = TO-220AB (non-insulated)				
AI = TO-220AB (insulated)				
B = TO-3P (non-insulated)				
BI = TO-3P (insulated)				
C = TO-247AB				
H = TO-263 (D ² PAK)				

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

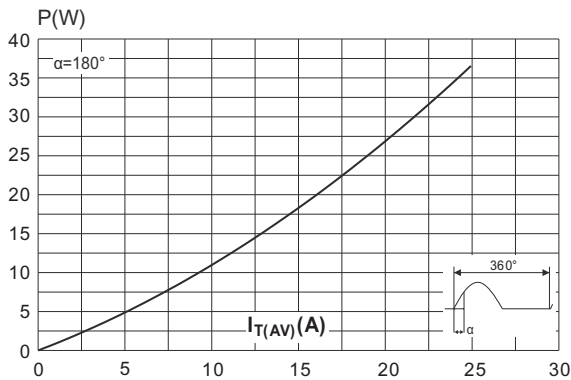


Fig.2 RMS on-state current versus case temperature.

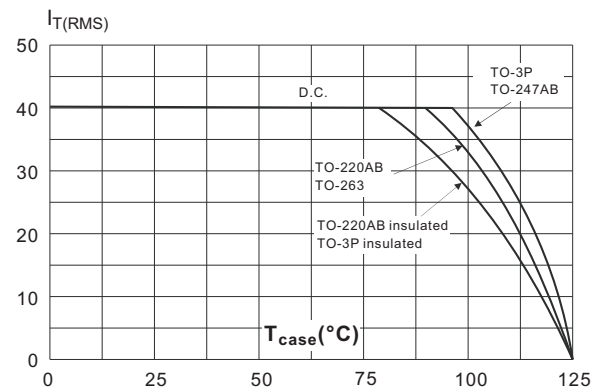


Fig.3 Relative variation of thermal impedance versus pulse duration.

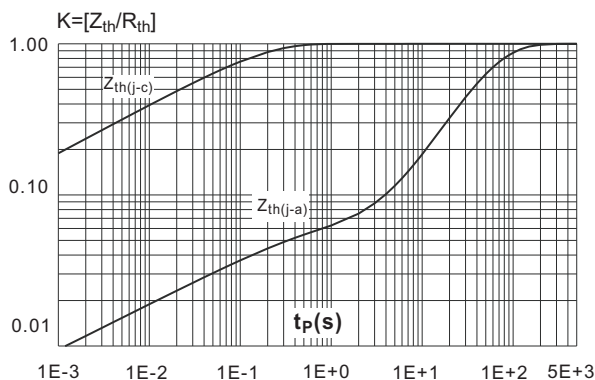


Fig.4 Relative variation of gate trigger current, holding current and latching current versus junction temperature.

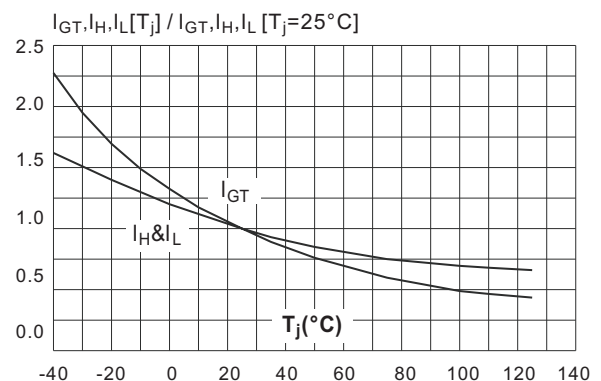


Fig.5 Surge peak on-state current versus number of cycles.

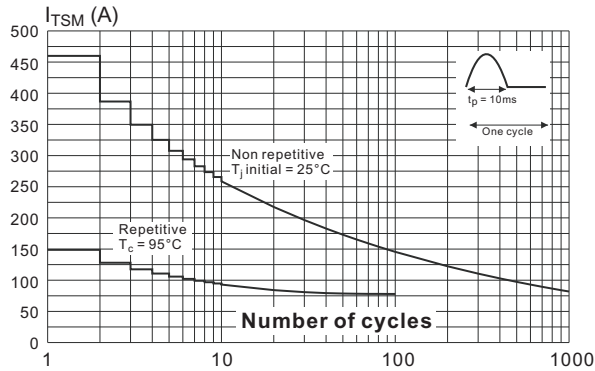


Fig.6 Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 10$ ms, and corresponding values of I^2t .

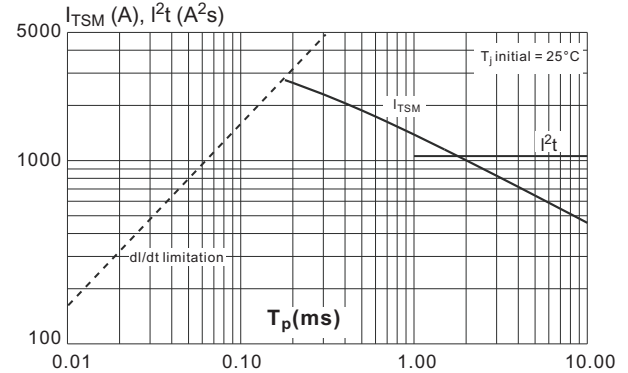
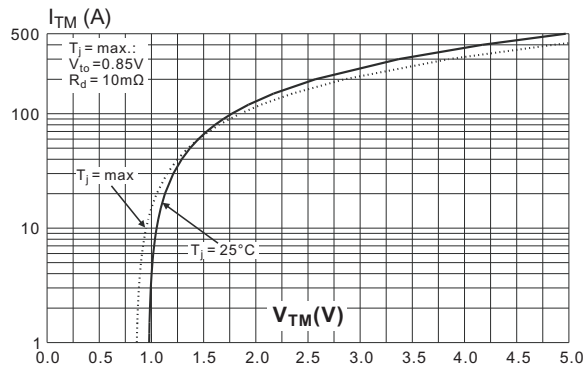
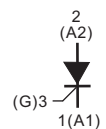
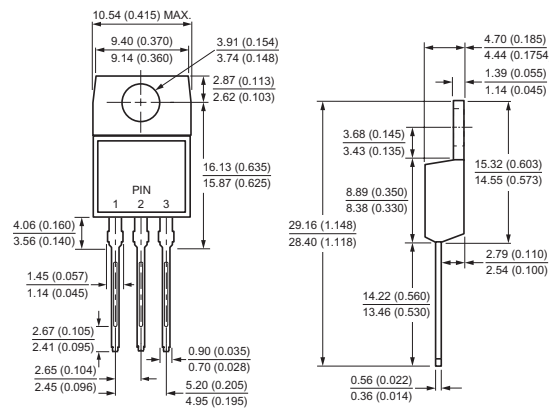


Fig.7 On-state characteristics (maximum values)



Case Style

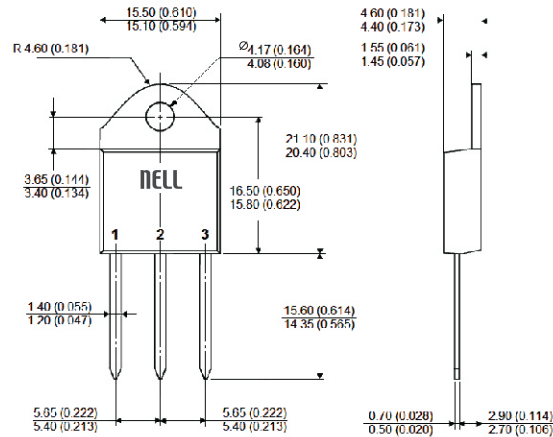
TO-220AB



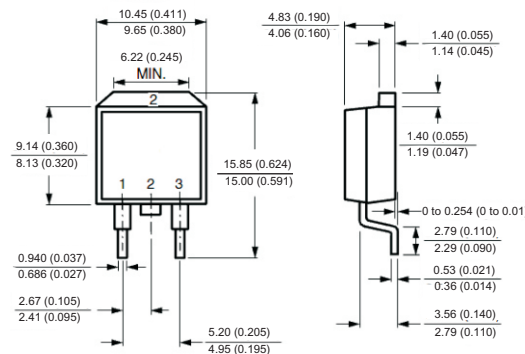
All dimensions in millimeters(inches)

Case Style

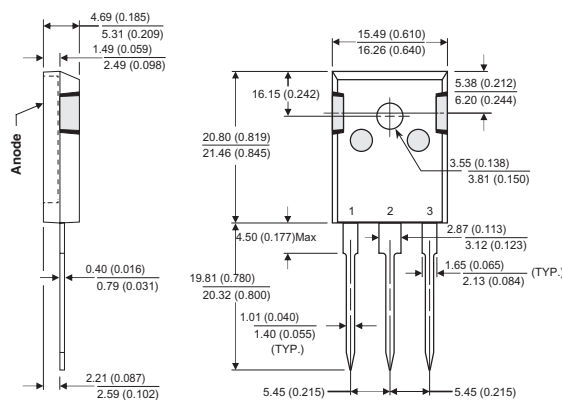
TO-3P



TO-263(D²PAK)



TO-247AB



All dimensions in millimeters(inches)

