

# DIGITRON SEMICONDUCTORS

## T6421 SERIES

## BIDIRECTIONAL TRIODE THYRISTORS

Available Non-RoHS (standard) or RoHS compliant (add PBF suffix).

Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
<b>Repetitive peak off-stage voltage, gate open</b> ( $T_J = -65$ to $+100^\circ\text{C}$ ) T6421B T6421D T6421M T6421N	$V_{\text{DRM}}$	200 400 600 800	Volts
<b>RMS on-state current</b> (conduction angle = $360^\circ$ , $T_C \leq 65^\circ\text{C}$ )	$I_{\text{T(RMS)}}$	30	Amps
<b>Peak non-repetitive surge current</b> (One Cycle, 60Hz)	$I_{\text{TSM}}$	300	Amps
<b>Circuit fusing considerations</b> ( $T_J = -65$ to $+100^\circ\text{C}$ , $t = 1.25$ to $10\text{ms}$ )	$I^2t$	450	$\text{A}^2\text{s}$
<b>Peak gate power</b> (pulse width = $1.0\mu\text{s}$ )	$P_{\text{GM}}$	40	Watts
<b>Average gate power</b>	$P_{\text{G(AV)}}$	0.75	Watts
<b>Peak gate current</b> (pulse width $\leq 1.0\mu\text{s}$ )	$I_{\text{GM}}$	2	Amps
<b>Operating junction temperature range</b>	$T_J$	-65 to +100	$^\circ\text{C}$
<b>Storage temperature range</b>	$T_{\text{stg}}$	-65 to +150	$^\circ\text{C}$
<b>Stud torque</b>		30	In. lb.

### THERMAL CHARACTERISTICS

Characteristics	Symbol	Max	Unit
<b>Thermal resistance, junction to case</b>	$R_{\theta\text{JC}}$	1.0	$^\circ\text{C/W}$

### ELECTRICAL CHARACTERISTICS

( $T_C = 25^\circ\text{C}$  unless otherwise noted, either polarity of MT2 to MT1, unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>Peak off state current</b> ( $V_D = V_{\text{DRM}}$ , gate open, $T_J = 100^\circ\text{C}$ )	$I_{\text{DRM}}$	-	-	4	mA
<b>Peak on-state voltage</b> (either direction) ( $I_{\text{TM}} = 100\text{A}$ peak)	$V_{\text{TM}}$	-	2.1	2.5	Volts
<b>DC gate trigger current</b> (continuous dc) ( $V_D = 12\text{V}$ , $R_L = 30\Omega$ ) MT2(+), G(+); MT2(-), G(-) MT2(+), G(-); MT2(-), G(+)	$I_{\text{GT}}$	-	20 35	50 80	mA
<b>DC gate trigger voltage</b> (continuous dc), all trigger modes ( $V_D = 12\text{V}$ , $R_L = 30\Omega$ ) ( $V_D = \text{Rated } V_{\text{DRM}}$ , $R_L = 125\Omega$ , $T_C = 100^\circ\text{C}$ )	$V_{\text{GT}}$	- 0.2	1.35 -	2.5 -	Volts
<b>Holding current</b> ( $V_D = 12\text{V}$ , gate open, $I_T = 150\text{mA}$ )	$I_{\text{H}}$	-	-	60	mA
<b>Gate controlled turn on time</b> ( $V_D = \text{Rated } V_{\text{DRM}}$ , $I_{\text{TM}} = 45\text{A}$ , $I_{\text{GT}} = 200\text{mA}$ , rise time = $0.1\mu\text{s}$ )	$t_{\text{gt}}$	-	1.7	3	$\mu\text{s}$
<b>Critical rate of rise of commutating voltage</b> (commutating $di/dt = 16\text{A/ms}$ , gate unenergized, $V_D = \text{Rated } V_{\text{DRM}}$ , $I_{\text{T(RMS)}} = 30\text{A}$ , $T_C = \text{rated value from figure 1}$ )	$dv/dt(c)$	3	20	-	$\text{V}/\mu\text{s}$
<b>Critical rate of rise of off-state voltage</b> ( $V_D = \text{Rated } V_{\text{DRM}}$ , gate open, exponential waveform, $T_C = 100^\circ\text{C}$ ) T6421B T6421D T6421M	$dv/dt$	40 25 20	-	-	$\text{V}/\mu\text{s}$

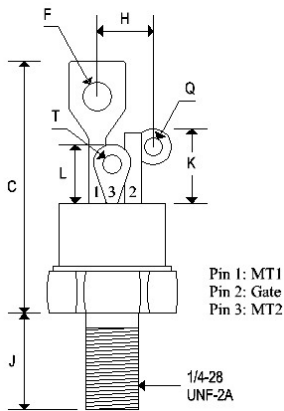
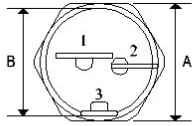
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## MECHANICAL CHARACTERISTICS

Case	TO-48 ISO
Marking	Alpha-numeric
Polarity	Cathode is stud



	TO-48 ISO			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.551	0.559	14.000	14.200
B	0.501	0.505	12.730	12.830
C	-	1.280	-	32.510
F	-	0.160	-	4.060
H	-	0.265	-	6.730
J	0.420	0.455	10.670	11.560
K	0.300	0.350	7.620	8.890
L	0.255	0.275	6.480	6.990
Q	0.055	0.085	1.400	2.160
T	0.135	0.150	3.430	3.810

FIGURE 1 – CURRENT DERATING

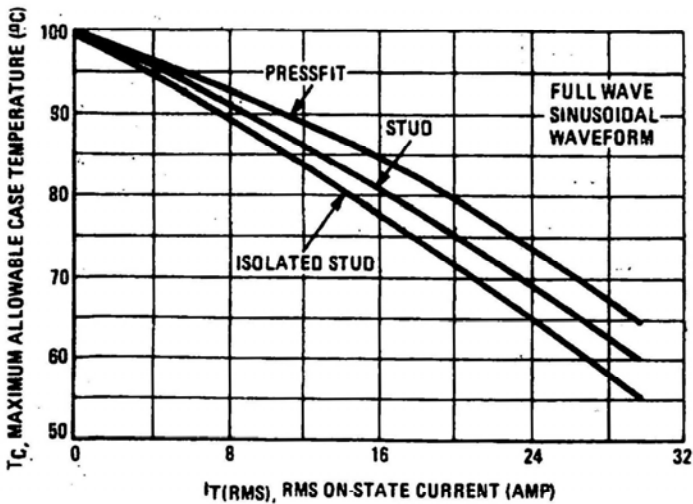


FIGURE 2 – POWER DISSIPATION

