

# DIGITRON SEMICONDUCTORS

2N3870-2N3873  
2N3896-2N3899  
2N6171-2N6174

SILICON CONTROLLED RECTIFIERS  
REVERSE BLOCKING TRIODE THYRISTOR  
35 AMPS RMS, 100-800 VOLTS

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 ( $T_C = 100^\circ\text{C}$ unless otherwise noted)

Rating	Symbol	Value	Unit
<b>Peak repetitive forward or reverse blocking voltage</b> <sup>(1)</sup> ( $T_J = -40$ to $100^\circ\text{C}$ , ½ sine wave, 50-400 Hz, gate open) 2N3870, 2N3896, 2N6171 2N3871, 2N3897, 2N6172 2N3872, 2N3898, 2N6173 2N3873, 2N3899, 2N6174	$V_{RRM}$ or $V_{DRM}$	100 200 400 600	Volts
<b>Peak non-repetitive forward or reverse blocking voltage</b> ( $t \leq 5\text{ms}$ ) 2N3870, 2N3896, 2N6171 2N3871, 2N3897, 2N6172 2N3872, 2N3898, 2N6173 2N3873, 2N3899, 2N6174	$V_{RSM}$ or $V_{DSM}$	150 330 660 700	Volts
<b>Average on-state current</b> <sup>(2)</sup> ( $T_C = -40$ to $65^\circ\text{C}$ ) ( $T_C = 85^\circ\text{C}$ )	$I_{T(AV)}$	22 11	Amps
<b>Peak non-repetitive surge current</b> (one cycle, 60Hz) ( $T_C = 65^\circ\text{C}$ )	$I_{TSM}$	350	Amps
<b>Circuit fusing</b> ( $T_C = -40$ to $100^\circ\text{C}$ ) ( $t = 1$ to $8.3\text{ms}$ )	$I^2t$	510	$\text{A}^2\text{s}$
<b>Peak gate power</b>	$P_{GM}$	20	Watts
<b>Average gate power</b>	$P_{G(AV)}$	0.5	Watt
<b>Peak forward gate current</b>	$I_{GM}$	2	Amps
<b>Peak gate voltage</b>	$V_{GM}$	10	Volts
<b>Operating junction temperature range</b>	$T_J$	-40 to 100	$^\circ\text{C}$
<b>Storage temperature range</b>	$T_{stg}$	-40 to 150	$^\circ\text{C}$
<b>Stud torque</b>	-	30	In. lb.
<b>Thermal resistance, junction to case</b> 2N3870 - 2N3873, 2N3896-2N3899 2N6171-2N6174	$R_{\theta JC}$	0.9 1	$^\circ\text{C}/\text{W}$

Note 1: Ratings apply for zero or negative gate voltage. Devices shall not have a positive bias applied to the gate concurrently with a negative potential on the anode. Devices should not be tested with a constant current source for forward or reverse blocking capability such that the voltage applied exceeds the rated blocking voltage.

Note 2: Isolated stud devices must be derated an additional 10 percent.

## ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
<b>Peak forward or reverse blocking current</b> (Rated $V_{DRM}$ or $V_{RRM}$ , gate open, $T_J = 100^\circ\text{C}$ ) 2N3870, 2N3896, 2N6171 2N3871, 2N3897, 2N6172 2N3872, 2N3898, 2N6173 2N3873, 2N3899, 2N6174	$I_{DRM}$ , $I_{RRM}$	-	1 1 1 1	2.0 2.5 3.0 4.0	mA
Rated $V_{DRM}$ or $V_{RRM}$ , gate open, $T_J = 25^\circ\text{C}$				10	$\mu\text{A}$
All devices		-	-	10	$\mu\text{A}$

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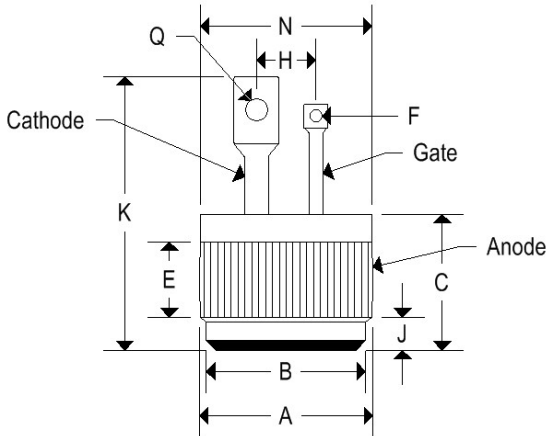
## ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Peak on-state voltage ( $I_{TM} = 69\text{A peak}$ )	$V_{TM}$	-	1.5	1.85	Volts
Gate trigger current (continuous dc) ( $V_D = 12\text{V}, R_L = 24\text{ohms}$ )	$I_{GT}$	- -	9 4	80 40	mA
Gate trigger voltage (continuous dc) ( $V_D = 12\text{V}, R_L = 24\text{ohms}$ )	$V_{GT}$	- -	0.9 0.69	3 1.6	Volts
Holding current (gate open) ( $V_D = 12\text{V}, I_{TM} = 200\text{mA}$ )	$I_H$	- -	14 5.2	90 50	mA
Gate controlled turn-on time ( $t_d+t_r$ ) ( $I_{TM} = 41\text{Adc}, V_D = \text{rated } V_{DRM}, I_{GT} = 40\text{mAdc}$ , Rise time $\leq 0.05\mu\text{s}$ , pulse width = $10\mu\text{s}$ )	$t_{gt}$	-	-	1.5	$\mu\text{s}$
Circuit commutated turn-off time ( $I_{TM} = 10\text{A}, I_R = 10\text{A}$ ) ( $I_{TM} = 10\text{A}, I_R = 10\text{A}, T_C = 100^\circ\text{C}$ )	$t_q$	- -	25 35	- -	$\mu\text{s}$
Forward voltage application rate ( $T_C = 100^\circ\text{C}, V_D = \text{rated } V_{DRM}$ )	$dv/dt$	-	50	-	$\text{V}/\mu\text{s}$

## MECHANICAL CHARACTERISTICS

2N3870-2N3873	
Case	DIGI PF2
Marking	Alpha-numeric
Pin out	See below

	DIGI PF2			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.501	0.505	12.730	12.830
B	0.465	0.475	11.810	12.060
C	0.330	0.380	8.390	9.650
E	0.100	-	2.540	-
F	0.035	0.085	0.890	2.160
H	0.148	0.174	3.750	4.410
J	0.080	0.097	2.040	2.460
K	-	0.800	-	20.320
N	-	0.510	-	12.950
Q	0.065	0.160	1.650	4.060

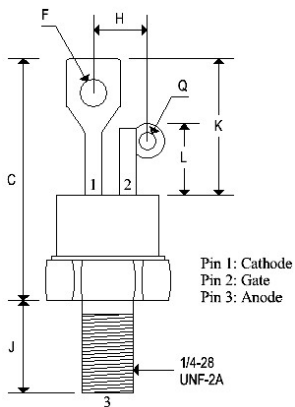
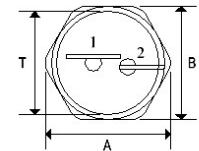


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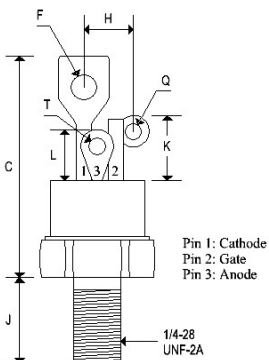
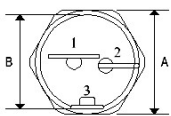
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<b>2N3896-2N3899</b>	
<b>Case</b>	TO-48
<b>Marking</b>	Alpha-numeric
<b>Pin out</b>	See below



	TO-48			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.604	0.614	15.340	15.600
B	0.551	0.559	14.000	14.200
C	1.050	1.190	2.670	30.230
F	0.135	0.160	3.430	4.060
H	-	0.265	-	6.730
J	0.420	0.455	10.670	11.560
K	0.620	0.670	15.750	17.020
L	0.300	0.350	7.620	8.890
Q	0.055	0.085	1.400	2.160
T	0.501	0.505	12.730	12.830

<b>2N6171-2N6174</b>	
<b>Case</b>	TO-48 ISO
<b>Marking</b>	Alpha-numeric
<b>Pin out</b>	See below

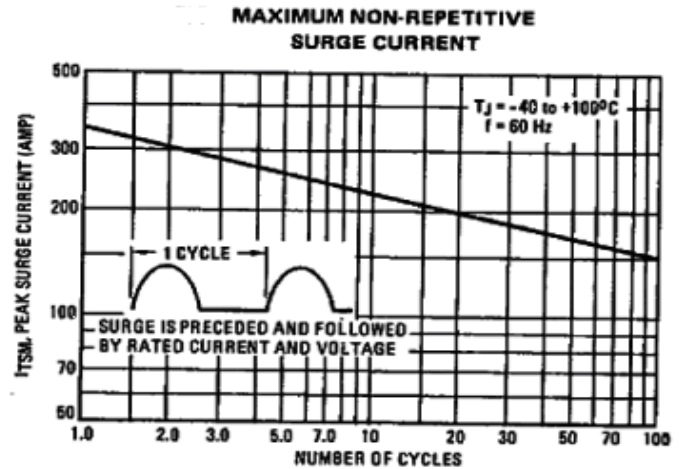
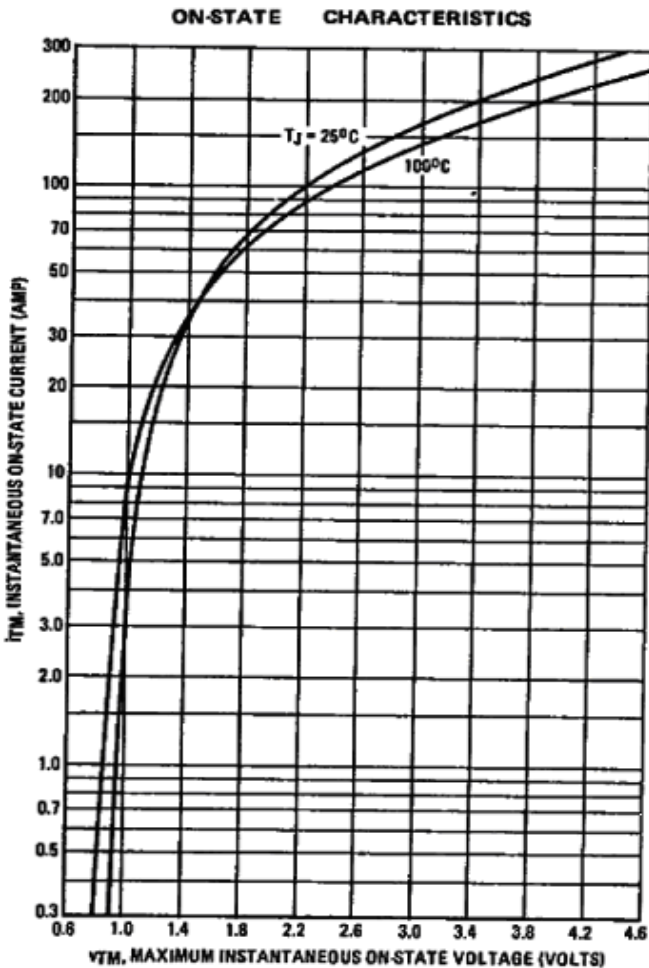
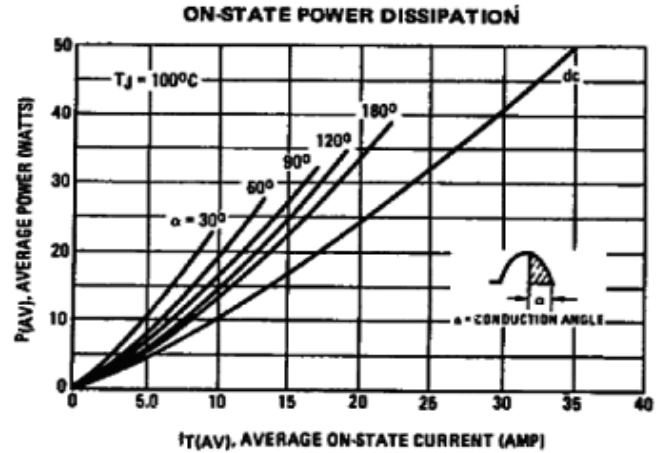
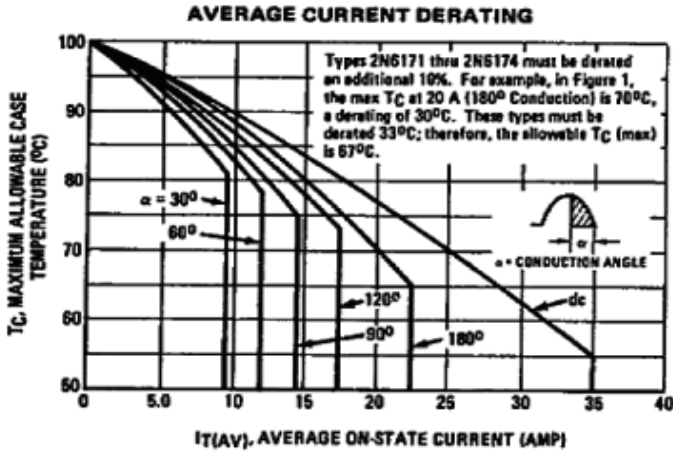


	TO-48 ISO			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.551	0.559	14.000	14.200
B	0.501	0.505	12.730	12.830
C	-	1.280	-	32.510
F	-	0.160	-	4.060
H	-	0.265	-	6.730
J	0.420	0.455	10.670	11.560
K	0.300	0.350	7.620	8.890
L	0.255	0.275	6.480	6.990
Q	0.055	0.085	1.400	2.160
T	0.135	0.150	3.430	3.810

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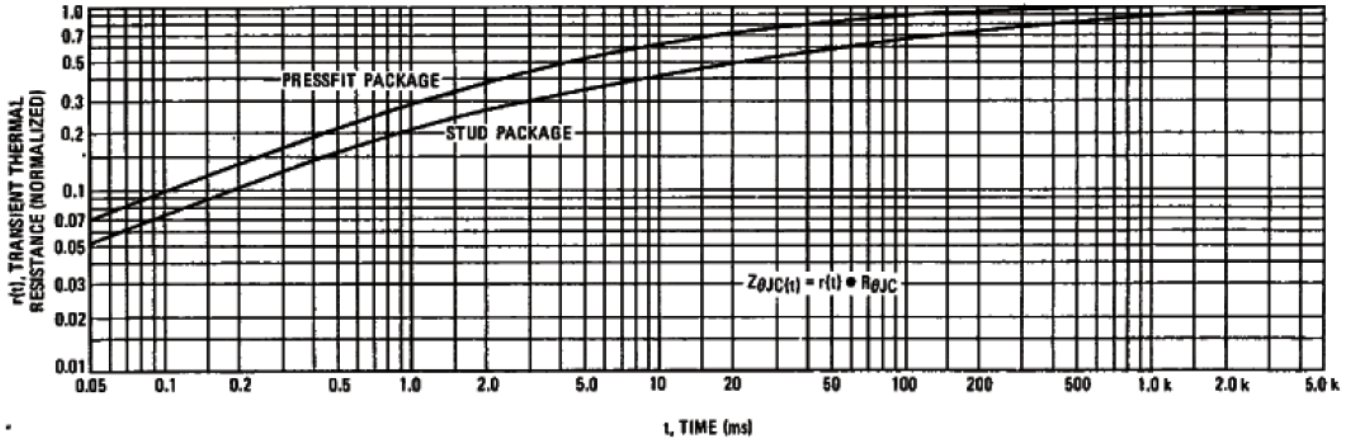
SILICON CONTROLLED RECTIFIERS

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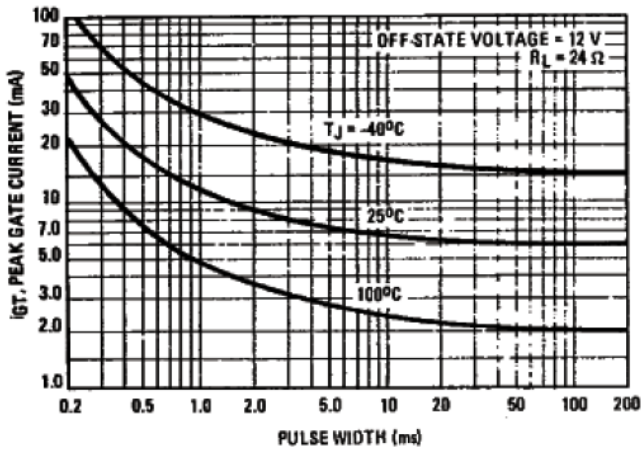
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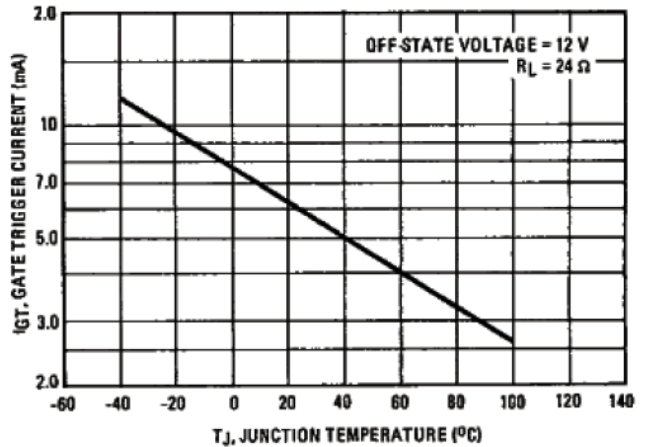
TYPICAL THERMAL RESPONSE



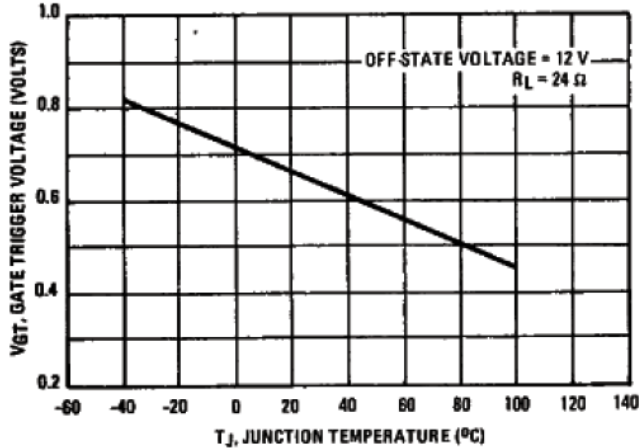
PULSE TRIGGER CURRENT



GATE TRIGGER CURRENT



GATE TRIGGER VOLTAGE



HOLDING CURRENT

