

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
Peak repetitive forward or reverse blocking voltage ⁽¹⁾ ($T_J = -40$ to 100°C , 1/2 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
Peak non-repetitive forward or reverse blocking voltage ($t \leq 5\text{ms}$) 2N3870, 2N3896, 2N6171 2N3871, 2N3897, 2N6172 2N3872, 2N3898, 2N6173 2N3873, 2N3899, 2N6174	V_{RSM} or V_{DSM}	150 330 660 700	Volts
Average on-state current ⁽²⁾ ($T_C = -40$ to 65°C) ($T_C = 85^\circ\text{C}$)	$I_{T(AV)}$	22 11	Amps
Peak non-repetitive surge current (one cycle, 60Hz) ($T_C = 65^\circ\text{C}$)	I_{TSM}	350	Amps
Circuit fusing ($T_C = -40$ to 100°C) ($t = 1$ to 8.3ms)	I^2t	510	A^2s
Peak gate power	P_{GM}	20	Watts
Average gate power	$P_{G(AV)}$	0.5	Watt
Peak forward gate current	I_{GM}	2	Amps
Peak gate voltage	V_{GM}	10	Volts
Operating junction temperature range	T_J	-40 to 100	$^\circ\text{C}$
Storage temperature range	T_{stg}	-40 to 150	$^\circ\text{C}$
Stud torque	-	30	In. lb.
Thermal resistance, junction to case 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
Peak forward or reverse blocking current (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, $T_J = 25^\circ\text{C}$ All devices		-	-	10	μA

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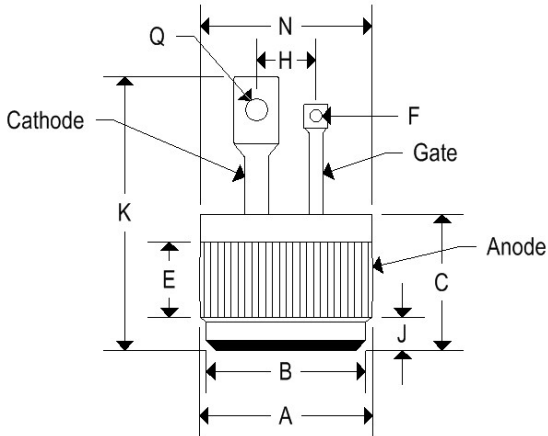
ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

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	μs
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	- -	μs
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

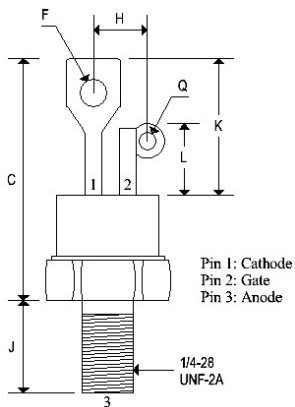
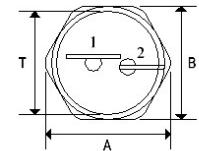


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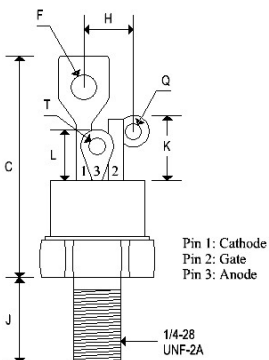
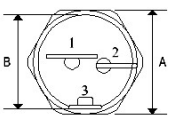
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2N3896-2N3899	
Case	TO-48
Marking	Alpha-numeric
Pin out	See below



	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

2N6171-2N6174	
Case	TO-48 ISO
Marking	Alpha-numeric
Pin out	See below

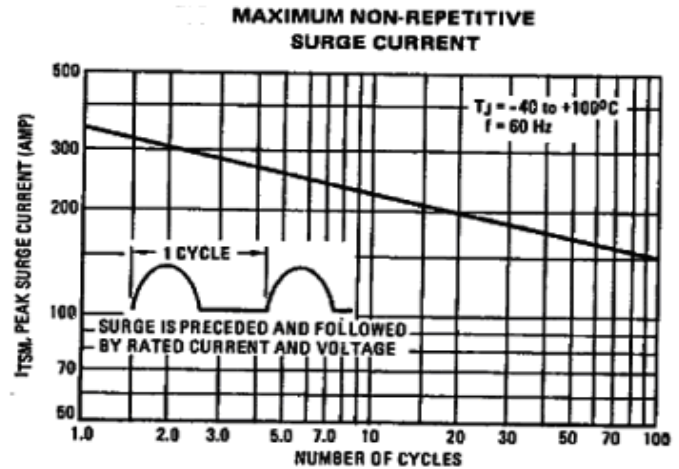
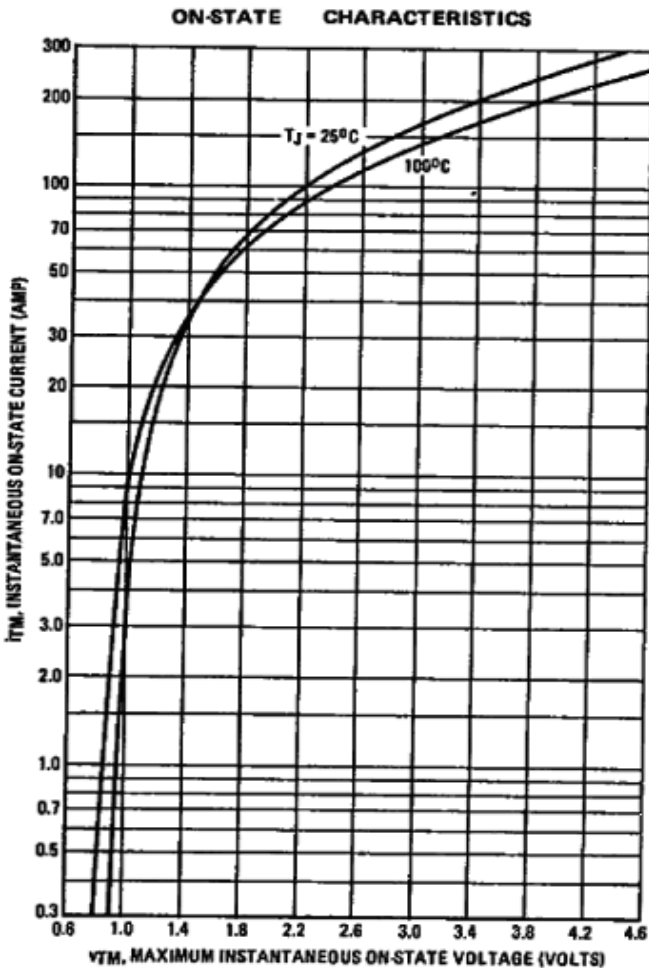
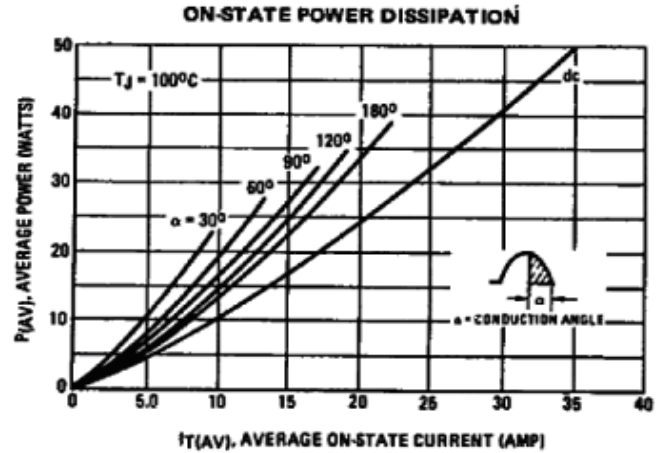
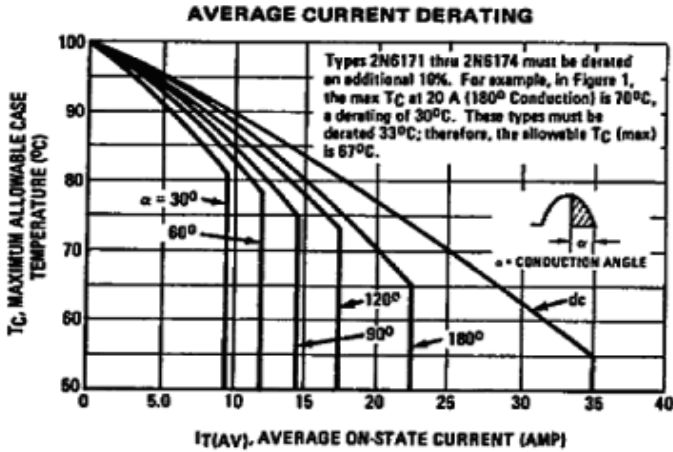


	TO-48 ISO			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.551	0.559	14.000	14.200
B	0.501	0.505	12.730	12.830
C	-	1.280	-	32.510
F	-	0.160	-	4.060
H	-	0.265	-	6.730
J	0.420	0.455	10.670	11.560
K	0.300	0.350	7.620	8.890
L	0.255	0.275	6.480	6.990
Q	0.055	0.085	1.400	2.160
T	0.135	0.150	3.430	3.810

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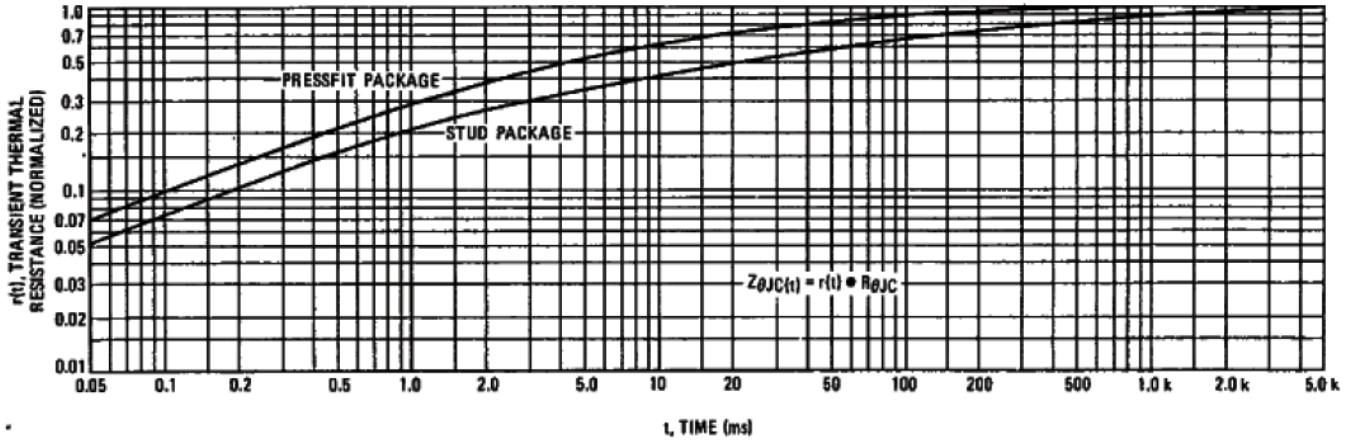
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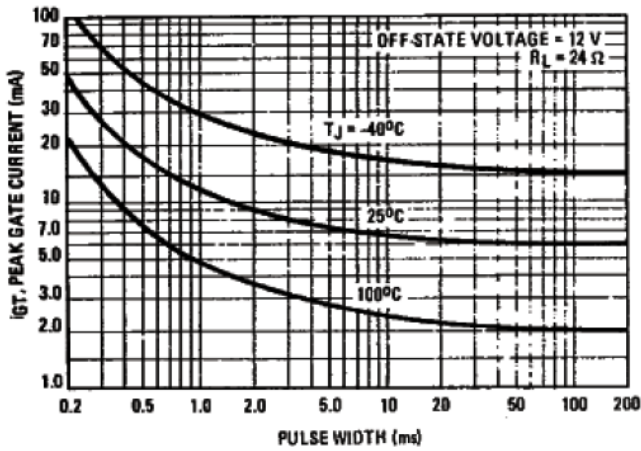
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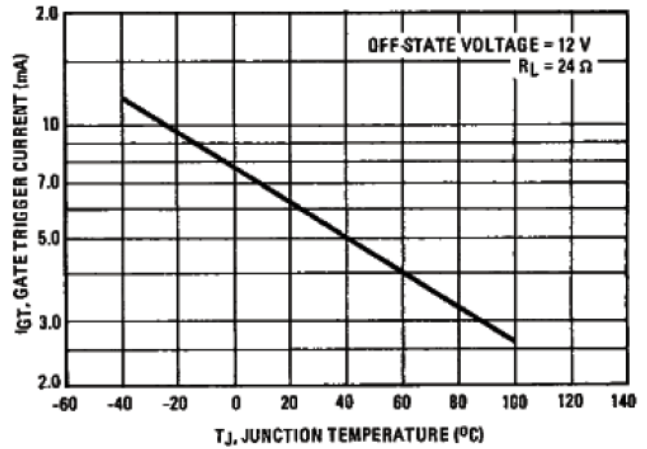
TYPICAL THERMAL RESPONSE



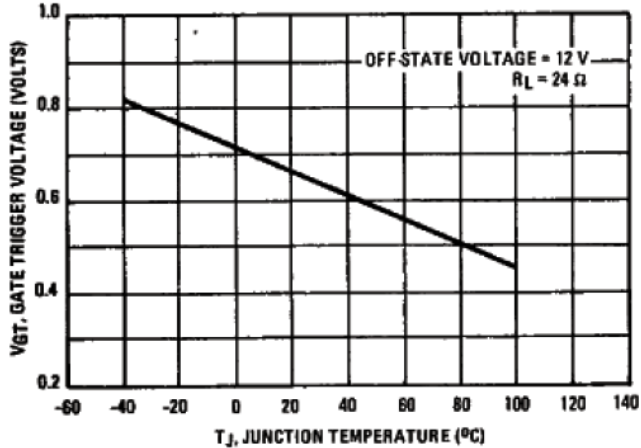
PULSE TRIGGER CURRENT



GATE TRIGGER CURRENT



GATE TRIGGER VOLTAGE



HOLDING CURRENT

