



High-reliability discrete products
and engineering services since 1977

2N3870-2N1850,
2N3896-2N3899,
2N6171-2N6174

SILICON CONTROLLED RECTIFIER

FEATURES

- Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.
- Available as non-RoHS (Sn/Pb plating), standard, and as RoHS by adding "-PBF" suffix.

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak repetitive forward or reverse blocking voltage ⁽¹⁾ (T _J = -40 to 100°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
Peak non-repetitive forward or reverse blocking voltage (t ≤ 5ms) 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°C)	I _{T(AV)}	22 11	Amps
Peak non-repetitive surge current (one cycle, 60Hz) (T _C = 65°C)	I _{TSM}	350	Amps
Circuit fusing (T _C = -40 to 100°C) (t = 1 to 8.3 ms)	I ² t	510	A ² s
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	°C
Storage temperature range	T _{stg}	-40 to 150	°C
Stud torque	-	30	In. lb.
Thermal resistance, junction to case 2N3870 – 2N3873, 2N3896-2N3899 2N6171-2N6174	R _{θJC}	0.9 1	°C/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 ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Characteristic		Symbol	Min.	Typ.	Max.	Unit
Peak forward or reverse blocking current (Rated V_{DRM} or V_{RRM} , gate open, T_{J} = 100°C)		$I_{\text{DRM}}, I_{\text{RRM}}$				
2N3870, 2N3896, 2N6171			-	1	2.0	mA
2N3871, 2N3897, 2N6172			-	1	2.5	
2N3872, 2N3898, 2N6173			-	1	3.0	
2N3873, 2N3899, 2N6174			-	1	4.0	
Rated V_{DRM} Or V_{RRM} , gate open, T_{J} = 25°C)						
All devices		-	-	10	μA	
Peak on-state voltage (I_{TM} = 69A peak)		V_{TM}	-	1.5	1.85	Volts
Gate trigger current (continuous dc) V_{D} = 12V, R_{L} = 24ohms)	T_{C} = -40°C	I_{GT}	-	9	80	mA
	T_{C} = 25°C		-	4	40	
Gate trigger voltage (continuous dc) V_{D} = 12V, R_{L} = 24ohms)	T_{C} = -40°C	V_{GT}	-	0.9	3	Volts
	T_{C} = 25°C		-	0.69	1.6	
Holding current (gate open) V_{D} = 12V, I_{TM} = 200mA)	T_{C} = -40°C	I_{H}	-	14	90	mA
	T_{C} = 25°C		-	5.2	50	
Gate controlled turn-on time ($t_{\text{d}}+t_{\text{r}}$) (I_{TM} = 41Adc, V_{D} = rated V_{DRM} , I_{GT} = 40mAdc, Rise time ≤ 0.05μs, pulse width = 10μs)		t_{gt}	-	-	1.5	μs
Circuit commutated turn-off time (I_{TM} = 10A, I_{R} = 10A)		t_{q}	-	25	-	μs
(I_{TM} = 10A, I_{R} = 10A, T_{C} = 100°C)			-	35	-	
Forward voltage application rate (T_{C} = 100°C, V_{D} = rated V_{DRM})		dv/dt	-	50	-	V/μs



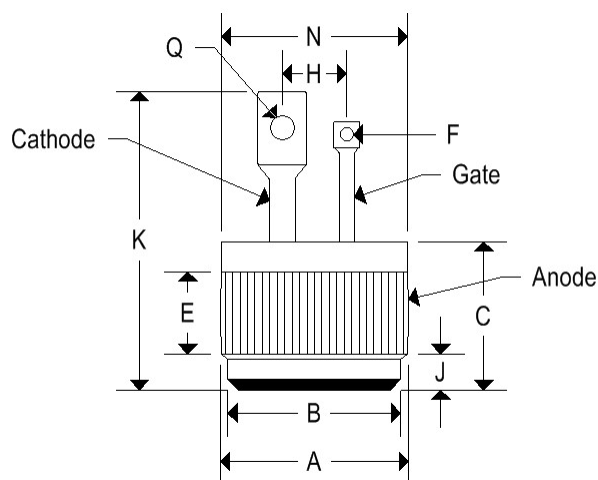
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MECHANICAL CHARACTERISTICS

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



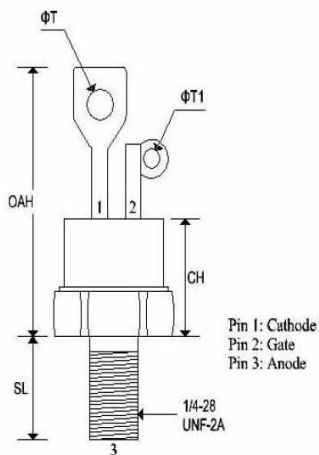
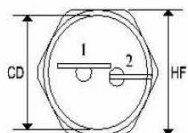
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MECHANICAL CHARACTERISTICS

2N3896-2N3899	
Case	TO-48
Marking	Alpha-numeric
Polarity	Cathode



	TO-48			
	Inches		Millimeters	
	Min	Max	Min	Max
CD	-	0.543	-	13.793
CH	-	0.550	-	13.970
HF	0.544	0.563	13.817	14.301
OA	-	1.193	-	30.303
SL	0.422	0.453	10.718	11.507
HT	0.125	0.165	3.175	4.191
HT1	0.060	0.075	1.524	1.905



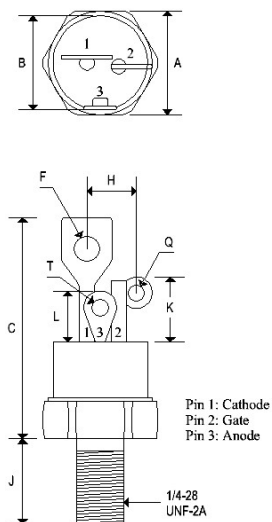
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MECHANICAL CHARACTERISTICS

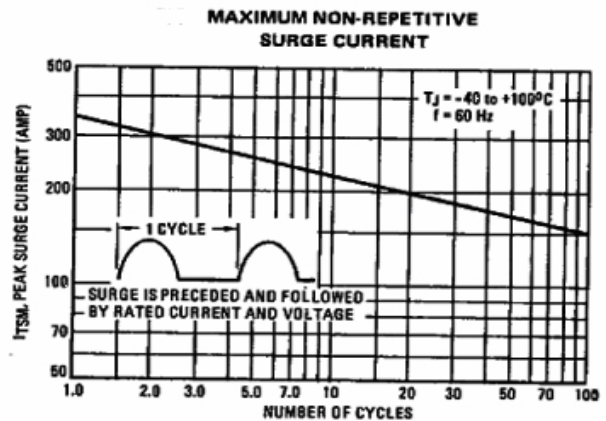
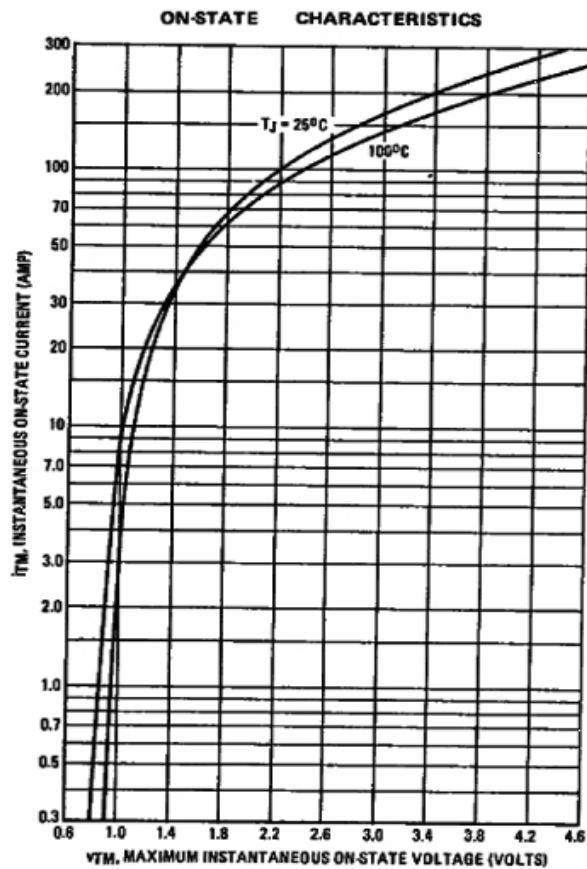
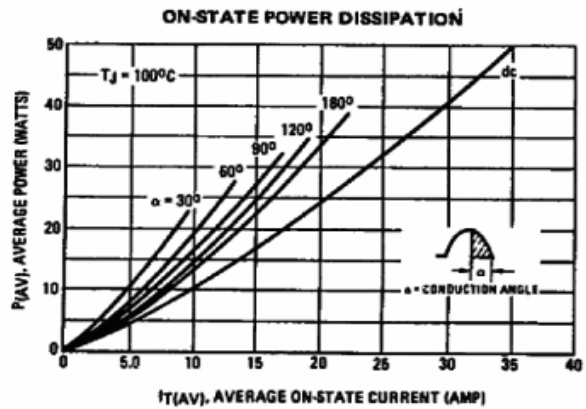
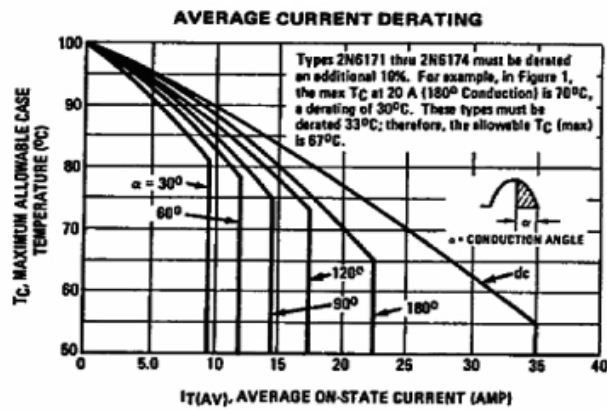
2N6171-2N6174	
Case	TO-48
Marking	Alpha-numeric
Polarity	Cathode



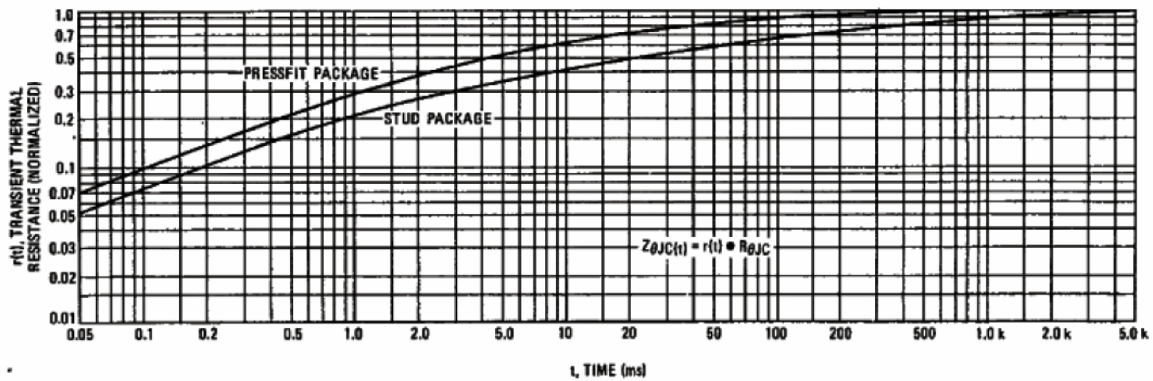
	TO-48 ISO			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.551	0.559	14.000	14.200
B	0.501	0.505	12.730	12.830
C	-	1.280	-	32.510
F	-	0.160	-	4.060
H	-	0.265	-	6.730
J	0.420	0.455	10.670	11.560
K	0.300	0.350	7.620	8.890
L	0.255	0.275	6.480	6.990
Q	0.055	0.085	1.400	2.160
T	0.135	0.150	3.430	3.810

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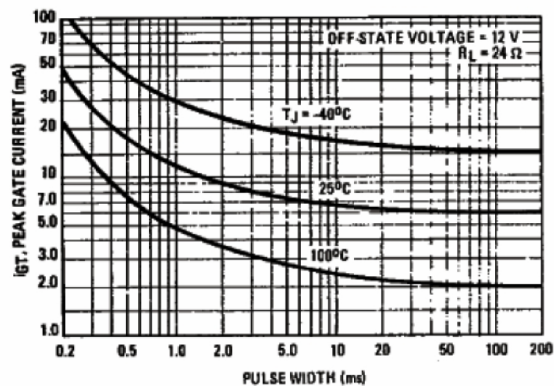
SILICON CONTROLLED RECTIFIER



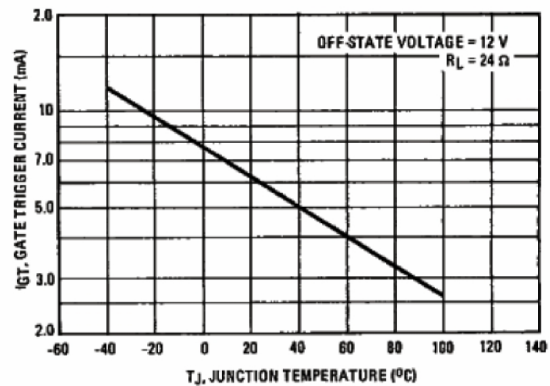
TYPICAL THERMAL RESPONSE



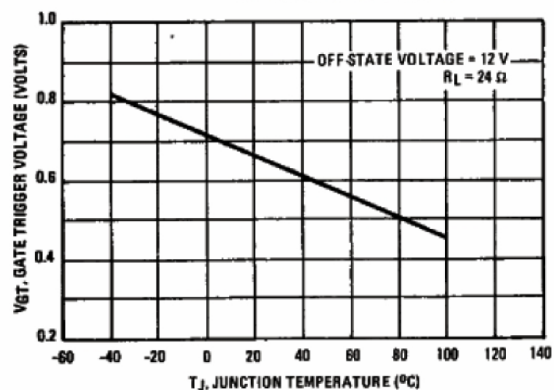
PULSE TRIGGER CURRENT



GATE TRIGGER CURRENT



GATE TRIGGER VOLTAGE



HOLDING CURRENT

