DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

2N1870A-2N1874A

SILICON CONTROLLED RECTFIERS

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

Ratings	Symbol	2N1870A	2N1871A	2N1872A	2N1873A	2N1874A	Unit
Repetitive peak off state voltage	V_{DRM}	30	60	100	150	200	V
Repetitive peak reverse voltage	V_{RRM}	30	60	100	150	200	V
DC on state current **100°C ambient** **100°C case**	I_T			250 1.25			 mA A
Repetitive peak on state current	I_{TRM}			Up to 30			A
Peak one cycle surge (non-repetitive) on state current	I_{TSM}			15			A
Peak gate current	I_{GM}			250			mA
Average gate current	$I_{G(AV)}$			25			mA
Reverse gate voltage	V_{GR}			5			V
Thermal resistance, junction to case	$R_{\Theta JC}$			20			°C/W
Operating and storage temperature range	T_J, T_{stg}			-65 to 150			°C

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

Test	Symbol	Min.	Typ.	Max.	Units	Test Conditions
25°C tests						
Off-state current	I_{DRM}	-	0.5	10	µA	R_{GK} = 1K, V_{DRM} = +rating
Reverse current	I_{RRM}	-	0.5	10	µA	R_{GK} = 1K, V_{RRM} = - rating
Gate trigger voltage	V_{GT}	0.4	0.55	0.8	V	R_{GS} = 100ohms, V_D = 5V
Gate trigger current	I_{GT}	-	30	200	µA	R_{GS} > 10K ohms, V_D = 5V
On-state voltage	V_{TM}	-	1.8	2.5	V	I_{TM} = 2A (pulse test)
Off-state voltage – critical rate of rise	dv_c/dt	100	-	-	V/µs	Specified test circuit
Reverse gate current	I_{GR}	-	0.5	10	µA	V_{GRM} = 5V, anode open
Holding current	I_H	0.3	-	5.0	mA	I_G = -150µA, V_D = 5V
125°C tests						
High temperature off state current	I_{DRM}	-	15	100	µA	R_{GK} = 1K, V_{DRM} = + rating
High temperature reverse current	I_{RRM}	-	15	100	µA	R_{GK} = 1K, V_{RRM} = - rating
High temperature gate non-trigger voltage	V_{GD}	0.2	-	-	V	R_{GS} = 100 ohms, V_D = 5V
High temperature holding current	I_H	0.2	-	-	mA	I_G = -150µA, V_D = 5V
-65 °C tests						
Low temperature gate trigger voltage	V_{GT}	-	-	1.0	V	R_{GK} = 100 ohms, V_D = 5V
Low temperature gate trigger current	I_{GT}	-	-	500	µA	R_{GK} > 10K ohms, V_D = 5V
Low temperature holding current	I_H	-	-	15	mA	I_G = -150µA, V_D = 5V

Voltage ratings apply over the full operating temperature range provided the gate is connected to the cathode through a resistor, 1K or smaller, or other adequate gate bias is used.

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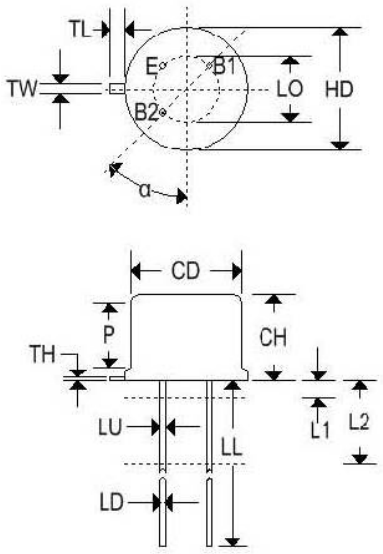
MECHANICAL CHARACTERISTICS

Case:	TO-5
Marking:	Alpha numberic
Pin out:	See below



Dim	TO-5			
	Inches		Millimeters	
	Min	Max	Min	Max
HD	0.335	0.370	8.510	9.400
CD	0.305	0.335	7.750	8.510
CH	0.240	0.260	6.100	6.600
LL	1.500	-	38.100	-
LD	0.016	0.021	0.410	0.530
LU	0.016	0.019	0.410	0.480
P	0.100	-	2.540	-
TL	0.029	0.045	0.740	1.140
TW	0.028	0.034	0.710	0.860
TH	0.009	0.125	0.230	3.180
LO	0.141 NOM		3.590 NOM	
α	45°TP		45°TP	

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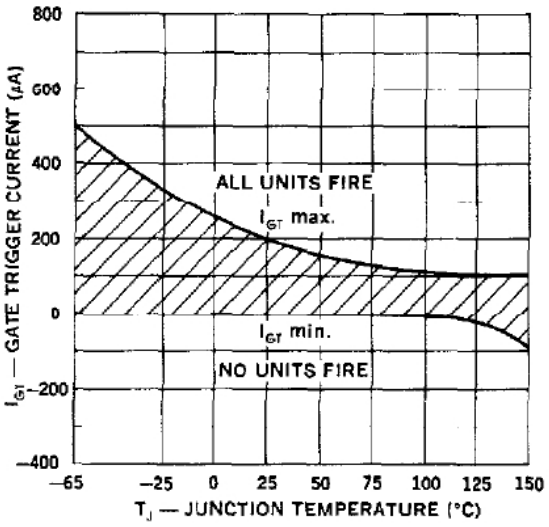
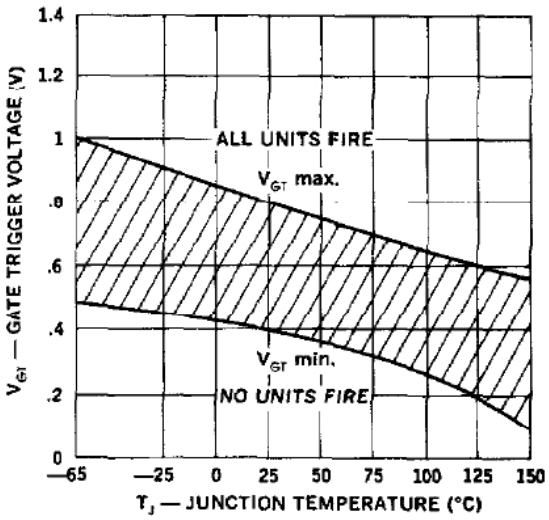
SILICON CONTROLLED RECTFIERS

TRIGGER AND BIAS STABILIZATION

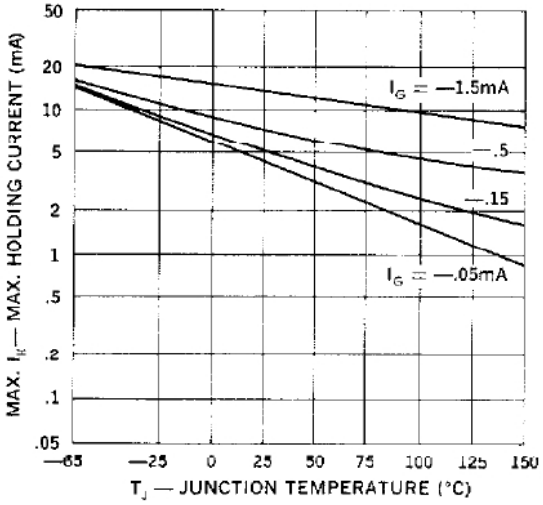


GATE TRIGGER CURRENT

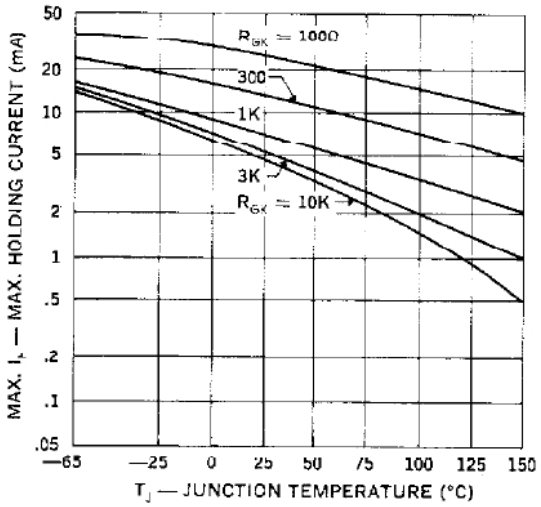


GATE TRIGGER VOLTAGE

HOLDING CURRENT



MAXIMUM HOLDING CURRENT
(CURRENT BIAS)



MAXIMUM HOLDING CURRENT
(RESISTOR BIAS)

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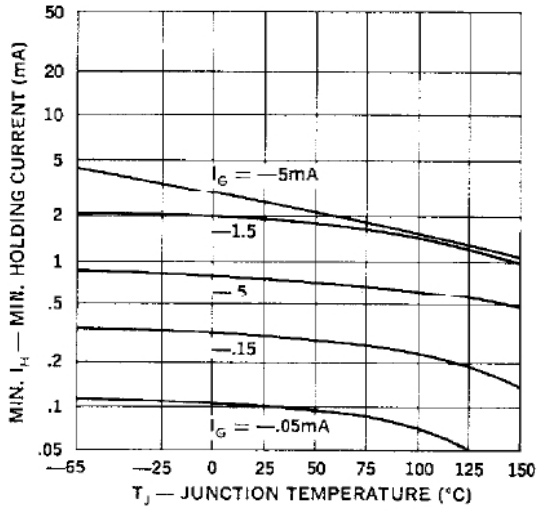
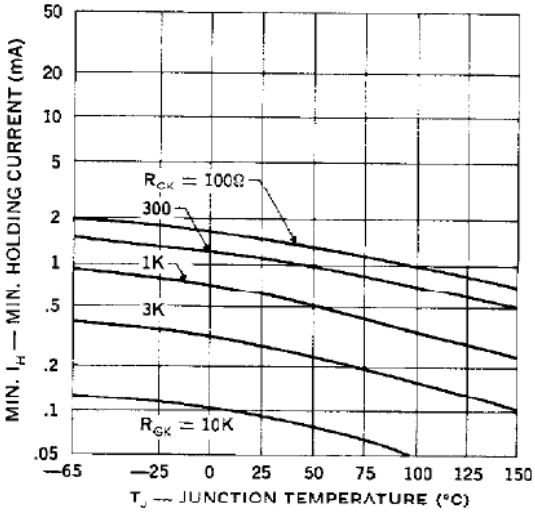
HOLDING CURRENT

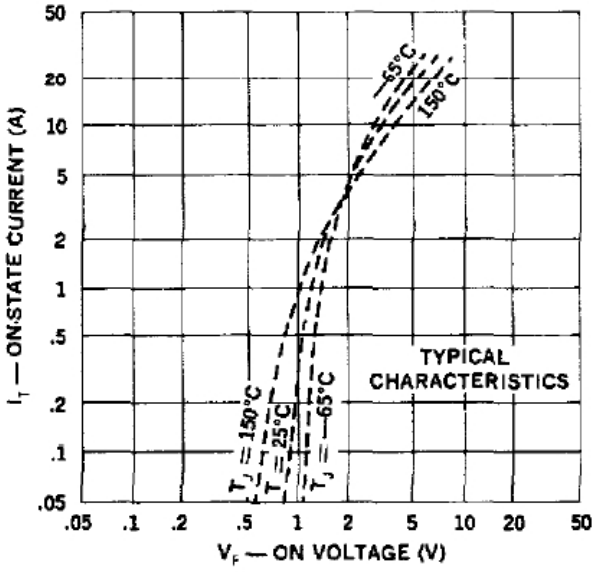


MINIMUM HOLDING CURRENT
(CURRENT BIAS)

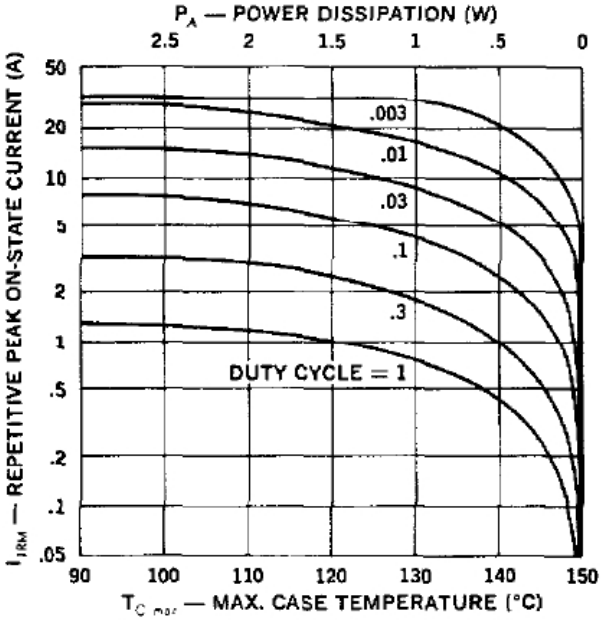


MINIMUM HOLDING CURRENT
(RESISTOR BIAS)

CURRENT RATINGS – THERMAL DESIGN



ON-STATE CURRENT VS VOLTAGE



PEAK CURRENT VS. CASE TEMPERATURE

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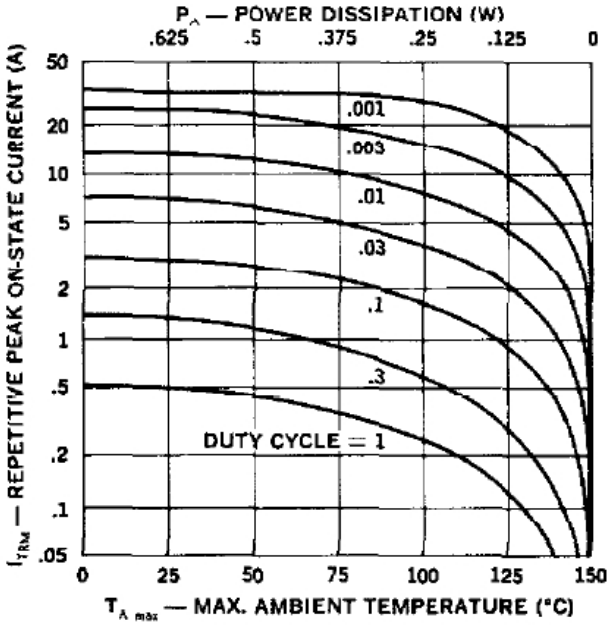
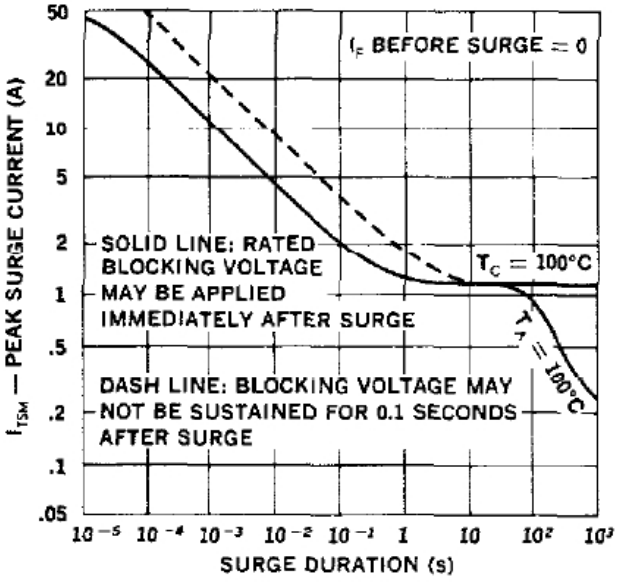
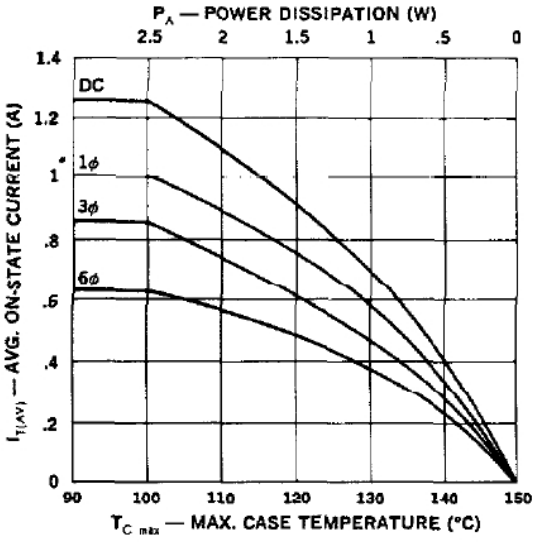
CURRENT RATINGS – THERMAL DESIGN



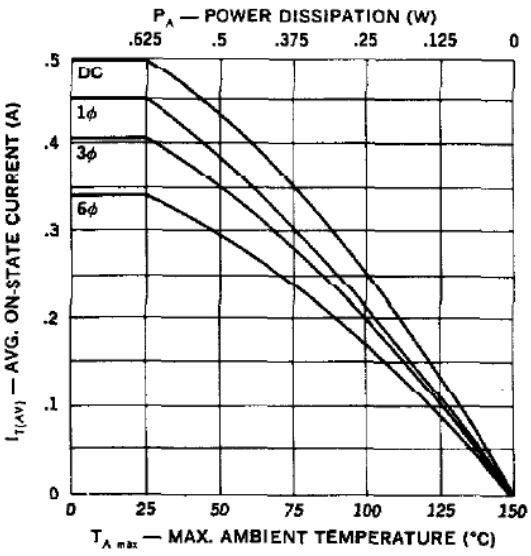
PEAK CURRENT VS. AMBIENT TEMPERATURE



SURGE CURRENT VS. TIME



AVERAGE CURRENT VS. CASE TEMPERATURE



AVERAGE CURRENT VS. AMBIENT TEMPERATURE