

2N1870A-2N1874A

SILICON CONTROLLED RECTIFIERS

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 ($T_A = 25^\circ\text{C}$ unless otherwise specified)

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

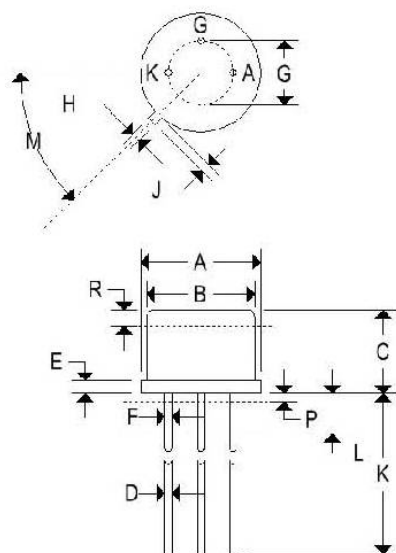
Voltage ratings apply over the full operating temperature range provided the gate is connected to the cathode through a resistor, 1K or smaller, or other adequate gate bias is used.

2N1870A-2N1874A

SILICON CONTROLLED RECTIFIERS

MECHANICAL CHARACTERISTICS

Case:	TO-9
Marking:	Body painted, alpha-numeric
Pin out:	See below

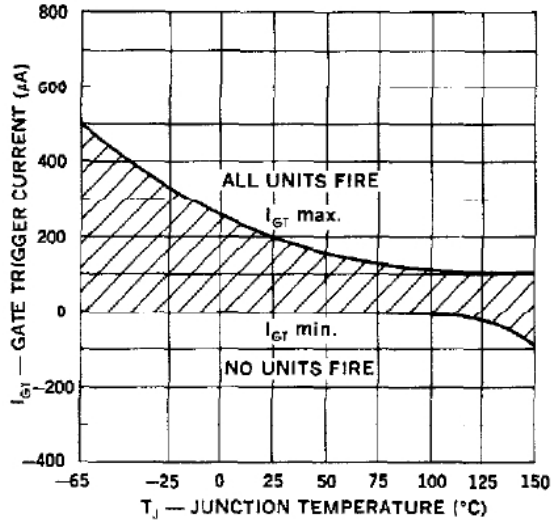


	TO-9			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.275	0.335	6.990	7.750
B	0.290	0.370	7.370	9.400
C	0.200	0.260	5.080	6.600
D	1.500	-	38.100	-
E	0.010	0.030	0.254	0.762
F	0.015	0.018	0.381	0.457
G	0.200 TYP		5.080 TYP	
H	0.100 TYP		2.540 TYP	
J	0.100 TYP		2.540 TYP	

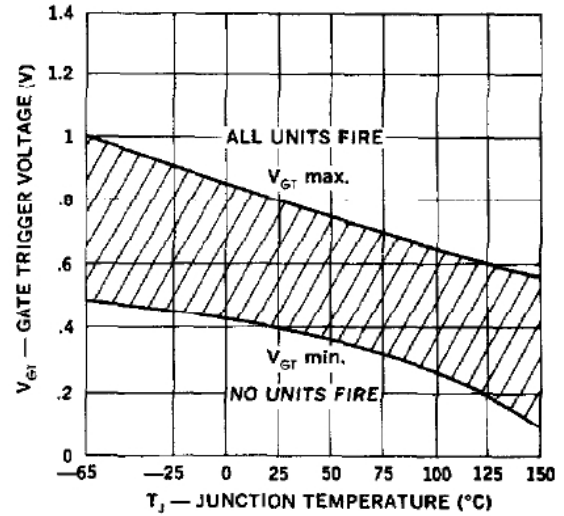
2N1870A-2N1874A

SILICON CONTROLLED RECTIFIERS

TRIGGER AND BIAS STABILIZATION

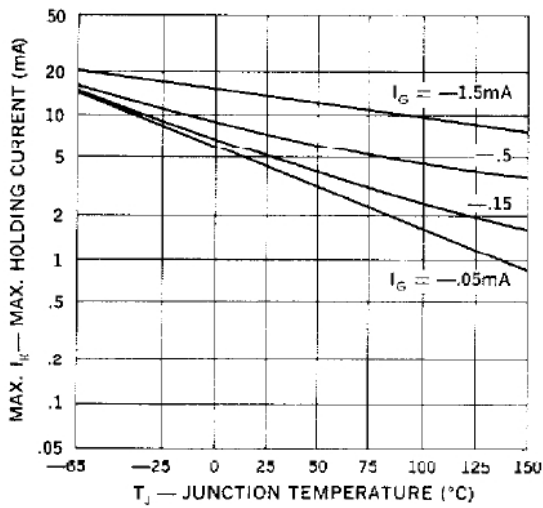


GATE TRIGGER CURRENT

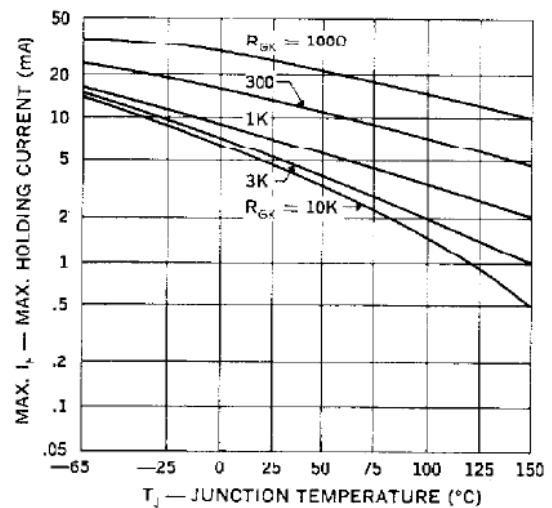


GATE TRIGGER VOLTAGE

HOLDING CURRENT



MAXIMUM HOLDING CURRENT
(CURRENT BIAS)

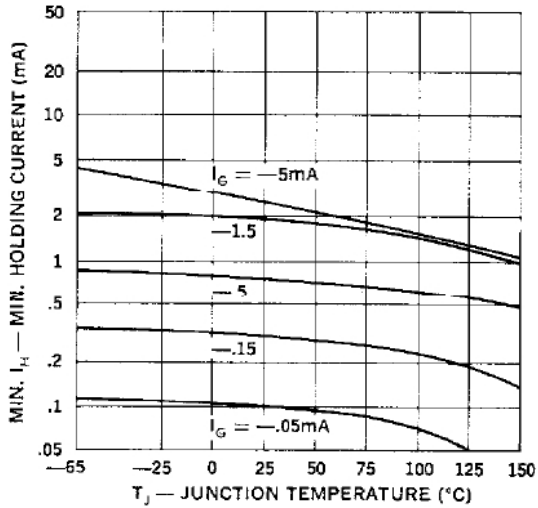


MAXIMUM HOLDING CURRENT
(RESISTOR BIAS)

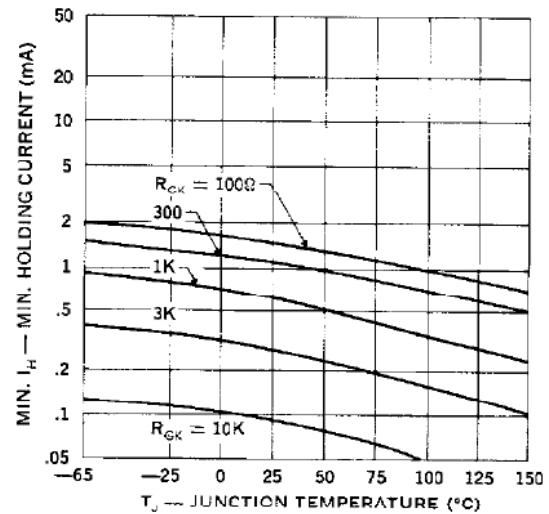
2N1870A-2N1874A

SILICON CONTROLLED RECTIFIERS

HOLDING CURRENT

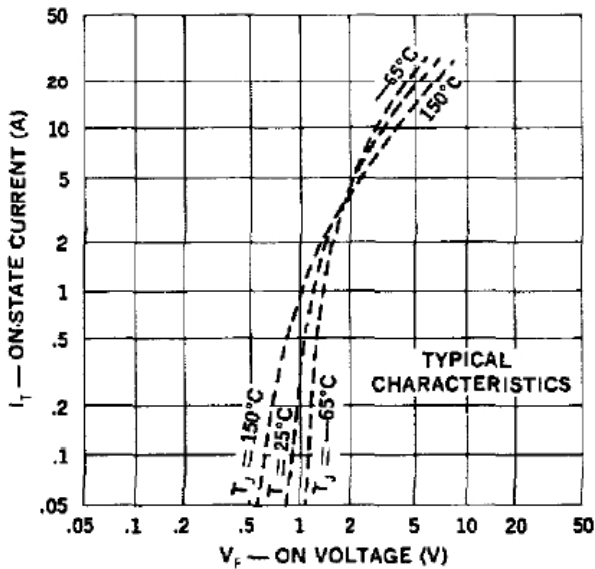


MINIMUM HOLDING CURRENT
(CURRENT BIAS)

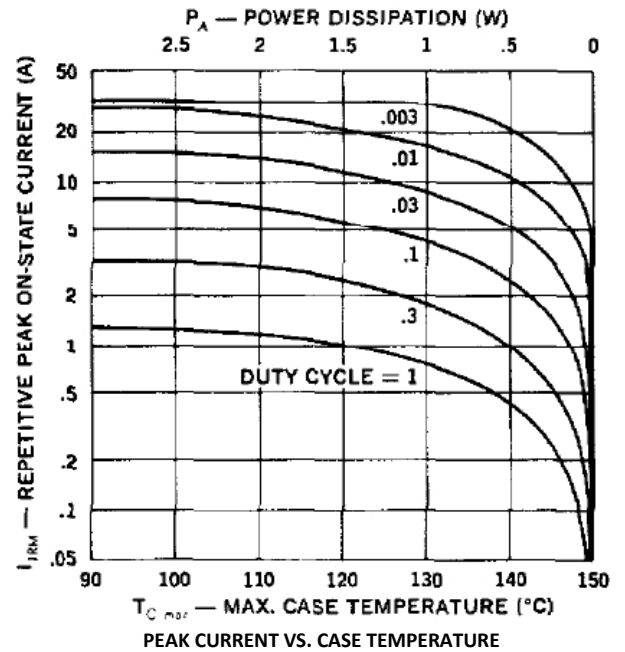


MINIMUM HOLDING CURRENT
(RESISTOR BIAS)

CURRENT RATINGS — THERMAL DESIGN



ON-STATE CURRENT VS VOLTAGE

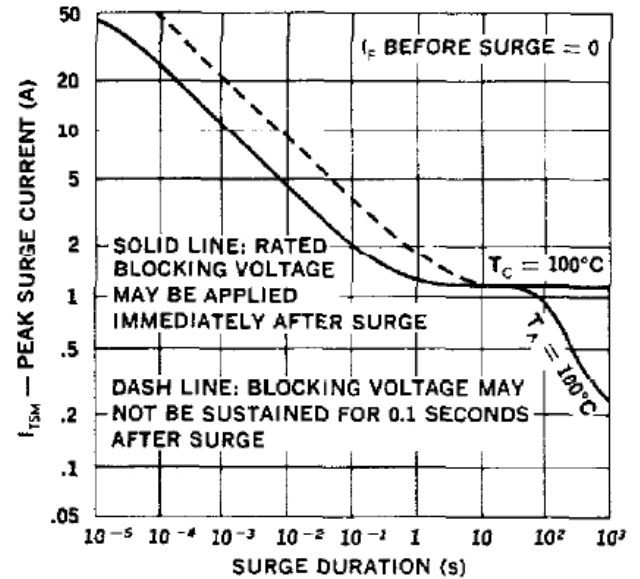
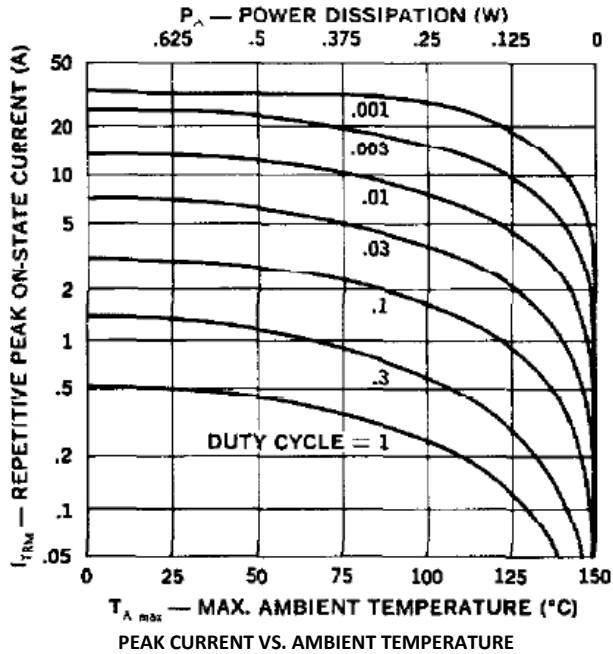


PEAK CURRENT VS. CASE TEMPERATURE

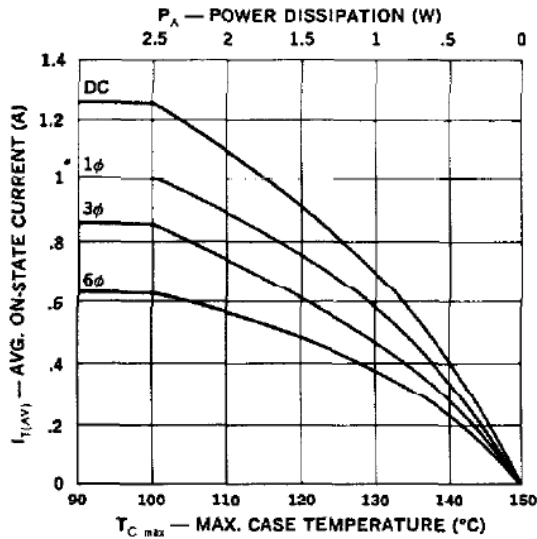
2N1870A-2N1874A

SILICON CONTROLLED RECTIFIERS

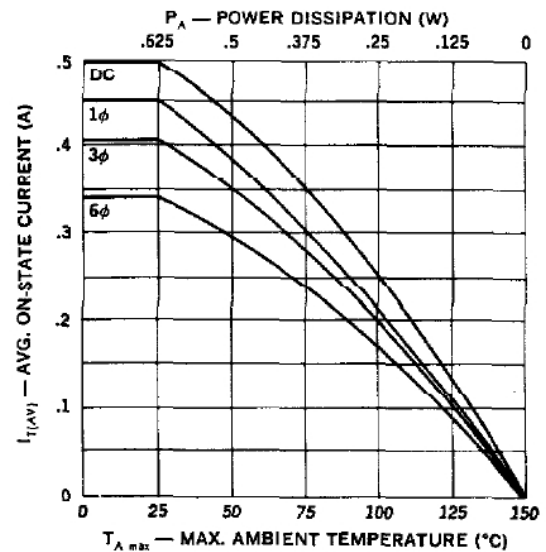
CURRENT RATINGS – THERMAL DESIGN



SURGE CURRENT VS. TIME



AVERAGE CURRENT VS. CASE TEMPERATURE



AVERAGE CURRENT VS. AMBIENT TEMPERATURE