

### 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
RMS on-state current @ $T_C = 80^\circ\text{C}$	$I_{T(RMS)}$	16	A
Mean on-state current @ $T_C = 80^\circ\text{C}$	$I_{T(AV)}$	10	A
Non-repetitive surge peak on-state current @ $T_J \leq 125^\circ\text{C}$ $t = 8.3\text{ms}$ $t = 10\text{ms}$	$I_{TSM}$	157 150	A
$I^2t$ for fusing @ $T_J \leq 125^\circ\text{C}$ , $t = 10\text{ms}$	$I^2t$	112.5	$\text{A}^2\text{s}$
Critical rate of rise of on-state current	$di/dt$	100	$\text{A}/\mu\text{s}$
Operating junction temperature range	$T_J$	-40 to +150	$^\circ\text{C}$
Storage temperature range	$T_{stg}$	-40 to +125	$^\circ\text{C}$

### VOLTAGE RATINGS

$T_J = 125^\circ\text{C}$	2N 1842(A)	2N 1843(A)	2N 1844(A)	2N 1846(A)	2N 1848(A)	2N 1849(A)	2N 1850(A)	TR 6010	TR 7010	TR 8010	TR 9010	TR 1010	TR 1110	TR 1210
	VOLTS													
$V_{DRM} = V_{RRM}$	25	50	100	200	300	400	500	600	700	800	900	1000	1100	1200

### THERMAL RESISTANCE

Thermal resistance	Symbol	Value	Unit
Junction to case for DC	$R_{th(j-c)}$	2	$^\circ\text{C}/\text{W}$
Case to heatsink	$R_{th(c-h)}$	0.4	$^\circ\text{C}/\text{W}$

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

Characteristic	Symbol	Value			Unit	Test conditions			
		Min	Typ	Max					
Gate trigger current	$I_{GT}$	-	-	80	mA	$T_J = 25^\circ\text{C}$	$V_D = 12\text{V}$	$R_L = 33\Omega$	$t_p \geq 20\mu\text{s}$
Gate trigger voltage	$V_{GT}$	-	-	3	V	$T_J = 25^\circ\text{C}$	$V_D = 12\text{V}$	$R_L = 33\Omega$	$t_p \geq 20\mu\text{s}$
Peak gate voltage	$V_{GD}$	0.25	-	-		$T_J = 125^\circ\text{C}$	$V_D = V_{DRM}$	$R_L = 3.3\Omega$	
Holding current	$I_H$	-	20	-	mA	$T_J = 25^\circ\text{C}$	$I_T = 0.5\text{A}$	Gate open	
Peak on-state voltage	$V_{TM}$	-	-	2.2	V	$T_J = 25^\circ\text{C}$	$I_{TM} = 30\text{A}$	$t_p = 10\text{ms}$	
Maximum off-state current	$I_{DRM}$	-	-	5	mA	$T_J = 125^\circ\text{C}$	$V_{DRM}$ specified		
Maximum off-state current	$I_{RRM}$	-	-	5	mA	$T_J = 125^\circ\text{C}$	$V_{RRM}$ specified		
Turn on time	$t_{gt}$	-	2	-	$\mu\text{s}$	$T_J = 25^\circ\text{C}$ $I_G = 200\text{mA}$	$I_T = 30\text{A}$ $di_G/dt = 2\text{A}/\mu\text{s}$	$V_D = V_{DRM}$	
Turn off time	$t_q$	-	100	-	$\mu\text{s}$	$T_J = 125^\circ\text{C}$ $di_R/dt = 30\text{A}/\mu\text{s}$	$I_T = 10\text{A}$ $dv/dt = 20\text{V}/\mu\text{s}$	$V_R = 30\text{V}$	$V_D = 0.67 V_{DRM}$ Gate open
Critical rise of off-state voltage	$dv/dt$	100	-	-	$\text{V}/\mu\text{s}$	$T_J = 125^\circ\text{C}$	Linear slope up to $0.67 V_{DRM}$ specified		

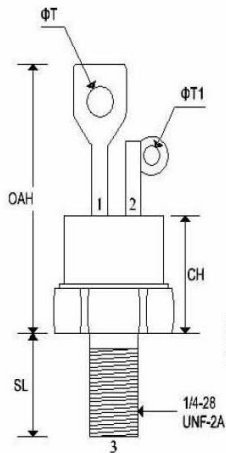
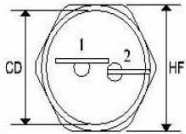
# 2N1842-2N1850A

## TR1010-TR9010

SILICON CONTROLLED RECTIFIER

### MECHANICAL CHARACTERISTICS

<b>Case</b>	TO-48
<b>Marking</b>	Alpha-numeric
<b>Polarity</b>	Cathode



Pin 1: Cathode  
Pin 2: Gate  
Pin 3: Anode

	TO-48			
	Inches		Millimeters	
	Min	Max	Min	Max
<b>CD</b>	-	0.543	-	13.793
<b>CH</b>	-	0.550	-	13.970
<b>HF</b>	0.544	0.563	13.817	14.301
<b>OAH</b>	-	1.193	-	30.303
<b>SL</b>	0.422	0.453	10.718	11.507
<b>ΦT</b>	0.125	0.165	3.175	4.191
<b>ΦT<sub>1</sub></b>	0.060	0.075	1.524	1.905

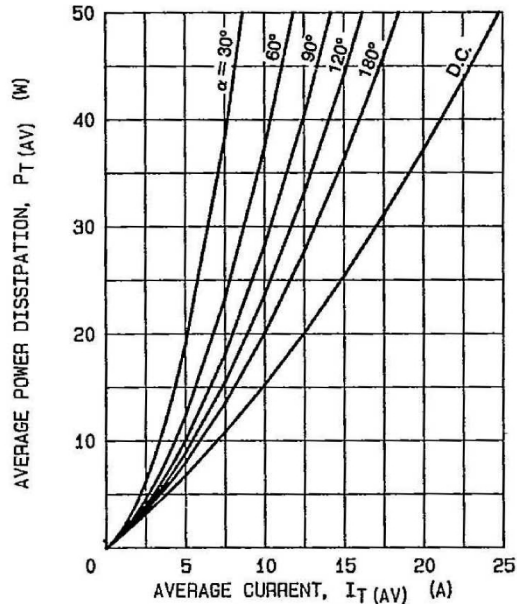


FIG.1 - MAXIMUM ON-STATE POWER DISSIPATION FOR SINUSOIDAL CURRENT WAVEFORM

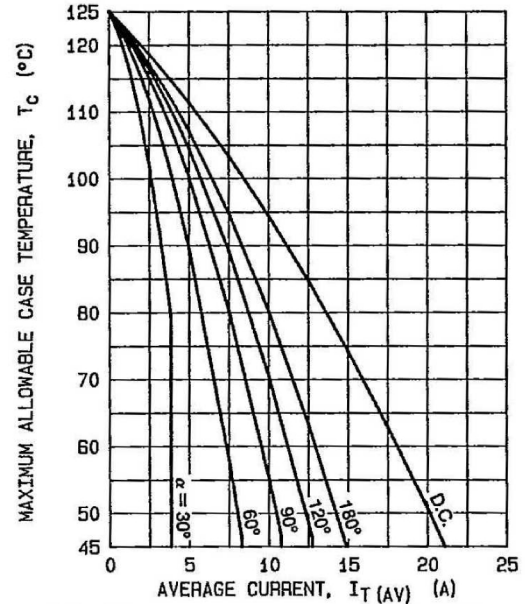


FIG.2 - MAXIMUM ALLOWABLE CASE TEMPERATURE FOR SINUSOIDAL CURRENT WAVEFORM

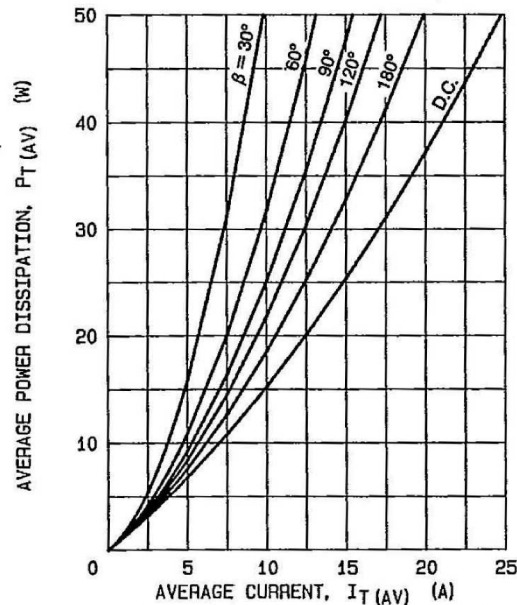
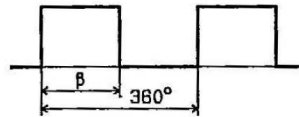


FIG.3 - MAXIMUM ON-STATE POWER DISSIPATION FOR RECTANGULAR CURRENT WAVEFORM

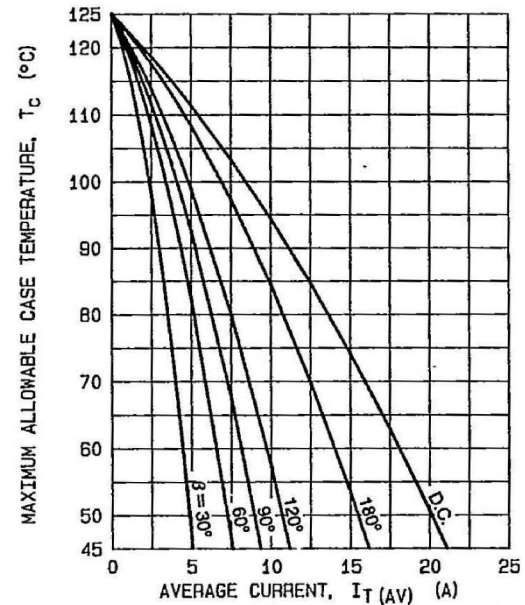


FIG.4 - MAXIMUM ALLOWABLE CASE TEMPERATURE FOR RECTANGULAR CURRENT WAVEFORM

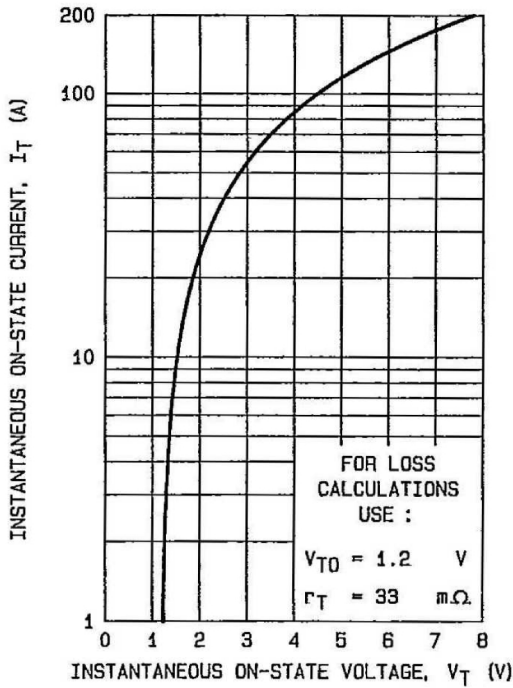


FIG.5 - MAXIMUM ON-STATE CONDUCTION CHARACTERISTIC ( $T_J = 125^\circ\text{C}$ ).

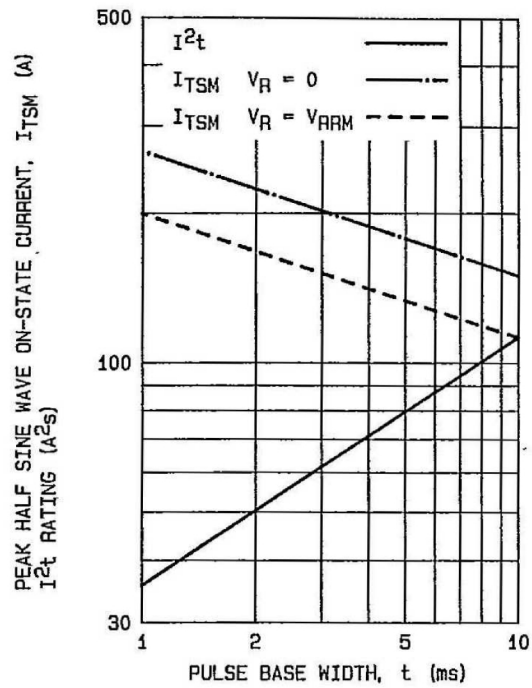


FIG.6 - NON REPETITIVE SUB-CYCLE SURGE ON-STATE CURRENT AND  $I^2t$  RATING (INITIAL  $T_J = 125^\circ\text{C}$ ).

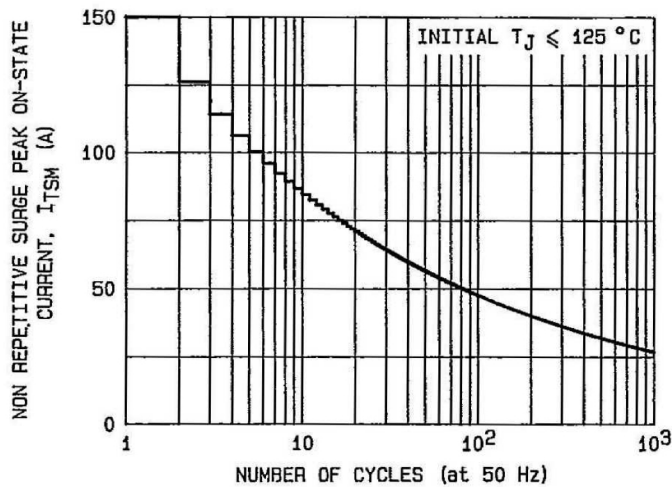
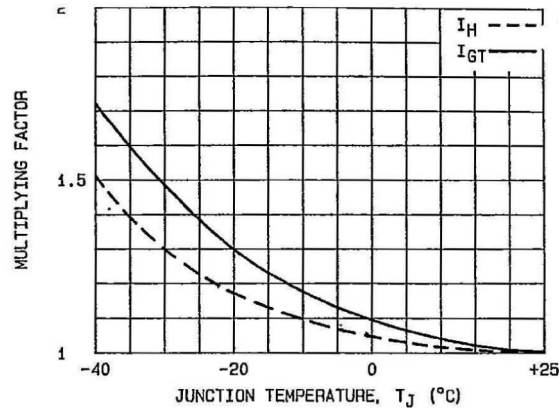


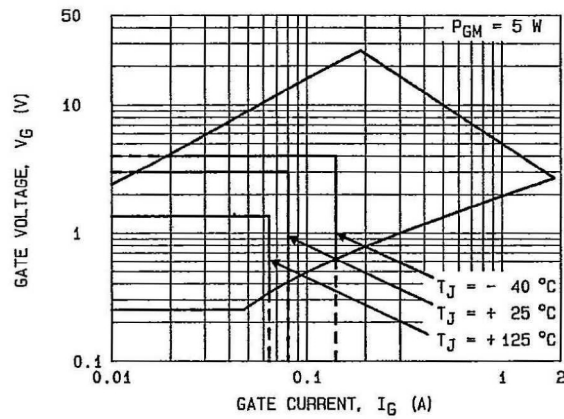
FIG.7 - NON REPETITIVE SURGE PEAK ON-STATE CURRENT VERSUS NUMBER OF CYCLES.

# 2N1842-2N1850A TR1010-TR9010

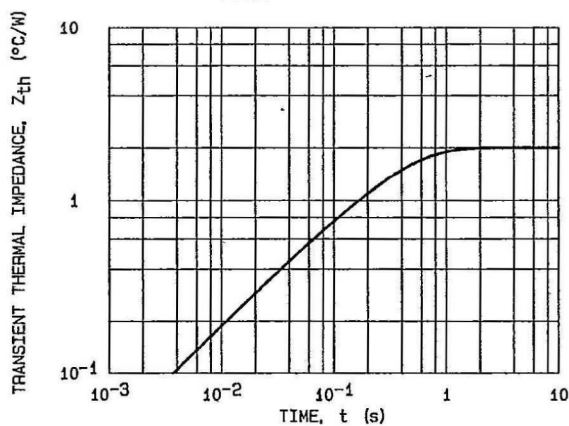
SILICON CONTROLLED RECTIFIER



**FIG.8 - RELATIVE VARIATION OF GATE TRIGGER CURRENT AND HOLDING CURRENT VERSUS JUNCTION TEMPERATURE.**



**FIG.9 - GATE TRIGGER CHARACTERISTICS.**



**FIG.10 - TRANSIENT THERMAL IMPEDANCE JUNCTION TO CASE.**

Conduction angle ( $\alpha, \beta$ )	Effective thermal resistance ( $^{\circ}\text{C}/\text{W}$ ) junction to case	
	Sinusoidal	Rectangular
180°	2.23	2.18
120°	2.31	3.09
90°	2.47	3.50
60°	2.88	3.91
30°	3.71	4.94