

### 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
<b>Peak repetitive forward and reverse blocking voltage<sup>(1)</sup></b> 2N4441 2N4442 2N4443 2N4444	$V_{RRM}, V_{DRM}$	50 200 400 600	Volts
<b>Non repetitive peak reverse blocking voltage</b> (t = 5ms (max.) duration) 2N4441 2N4442 2N4443 2N4444	$V_{RSM}$	75 300 500 700	Volts
<b>Forward current RMS</b> (all conduction angles)	$I_{T(RMS)}$	8	Amps
<b>Average on state current, <math>T_c = 73^\circ\text{C}</math></b>	$I_{T(AV)}$	5.1	Amps
<b>Peak non-repetitive surge current</b> (1/2 cycle, 60Hz preceded and followed by rated current and voltage)	$I_{TSM}$	80	Amps
<b>Circuit fusing considerations, <math>T_j = -40</math> to <math>+100^\circ\text{C}</math>; t = 8.3ms</b>	$I^2t$	25	$\text{A}^2\text{s}$
<b>Forward peak gate power</b>	$P_{GM}$	5	Watts
<b>Average gate power</b>	$P_{G(AV)}$	0.5	Watts
<b>Forward peak gate current</b>	$I_{GM}$	2	Amps
<b>Peak reverse gate voltage</b>	$V_{RGM}$	10	Volts
<b>Operating junction temperature range</b>	$T_j$	-40 to +100	$^\circ\text{C}$
<b>Storage temperature range</b>	$T_{stg}$	-40 to +150	$^\circ\text{C}$
<b>Mounting torque (6-32 screw)<sup>(2)</sup></b>	-	8	In. lb.

Note 1: Ratings apply for zero or negative gate voltage; however, positive gate voltage shall not be applied concurrent with negative potential on the anode. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.

Note 2: Torque rating applies with use of torque washer. Mounting torque in excess of 8 in. lbs. does not appreciably lower case-to-sink thermal resistance. Anode lead and heatsink contact pad are common. Soldering temperatures shall not exceed  $225^\circ\text{C}$ .

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Typical	Maximum	Unit
<b>Thermal resistance, junction to case</b>	$R_{\theta JC}$	-	2.5	$^\circ\text{C}/\text{W}$
<b>Thermal resistance, junction to ambient</b>	$R_{\theta JA}$	40	-	$^\circ\text{C}/\text{W}$

# 2N4441-2N4444

## SILICON CONTROLLED RECTIFIERS

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

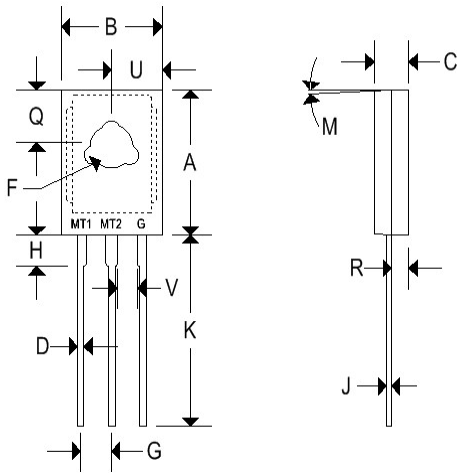
Characteristic	Symbol	Min.	Typ.	Max.	Unit
<b>Gate trigger voltage (continuous dc)</b> ( $V_D = 7 \text{ Vdc}$ , $R_L = 100 \Omega$ ) ( $V_D = 7 \text{ Vdc}$ , $R_L = 100 \Omega$ ) ( $V_D = \text{Rated } V_{\text{DRM}}$ , $R_L = 100 \Omega$ )	$V_{\text{GT}}$ $T_C = 25^\circ\text{C}$ $T_C = -40^\circ\text{C}$ $T_C = 100^\circ\text{C}$	- - 0.2	0.75 - -	1.5 2.5 -	Volts
<b>Peak on state voltage</b> (pulse width = 1 to 2ms, duty cycle $\leq 2\%$ ) ( $I_{\text{TM}} = 5 \text{ A peak}$ ) ( $I_{\text{TM}} = 15.7 \text{ A peak}$ )	$V_{\text{TM}}$	- -	1 -	1.5 2	Volts
<b>Holding current</b> ( $V_D = 7 \text{ Vdc}$ , gate open) $T_C = 25^\circ\text{C}$ $T_C = -40^\circ\text{C}$	$I_{\text{H}}$	- -	6 -	40 70	mA
<b>Gate controlled turn-on time</b> ( $I_{\text{TM}} = 5 \text{ A}$ , $I_{\text{GT}} = 20 \text{ mA}$ , $V_D = \text{rated } V_{\text{DRM}}$ )	$t_{\text{gt}}$	-	1	-	$\mu\text{s}$
<b>Circuit commutated turn-off time</b> ( $I_{\text{TM}} = 5 \text{ A}$ , $I_{\text{R}} = 5 \text{ A}$ ) ( $I_{\text{TM}} = 5 \text{ A}$ , $I_{\text{R}} = 5 \text{ A}$ , $T_J = 100^\circ\text{C}$ )	$t_{\text{q}}$	- -	15 20	- -	$\mu\text{s}$
<b>Critical rate of rise of off-state voltage</b> ( $V_D = \text{rated } V_{\text{DRM}}$ , exponential waveform, $T_J = 100^\circ\text{C}$ , gate open)	$dv/dt$	-	50	-	$\text{V}/\mu\text{s}$

# 2N4441-2N4444

## SILICON CONTROLLED RECTIFIERS

### MECHANICAL CHARACTERISTICS

Case:	TO-127
Marking:	Body painted, alpha-numeric
Pin out:	See below



	TO-127			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.635	0.645	16.130	16.380
B	0.495	0.505	12.570	12.830
C	0.125	0.135	3.180	3.430
D	0.043	0.049	1.090	1.240
F	0.138	0.148	3.510	3.760
G	0.166 BSC		4.220 BSC	
H	0.105	0.115	2.670	2.920
J	0.032	0.034	0.813	0.864
K	0.595	0.645	15.110	16.380
M	9° TYP		9° TYP	
Q	0.185	0.195	4.700	4.950
R	0.075	0.085	1.910	2.160
U	0.245	0.255	6.220	6.480
V	0.080	-	2.030	-

# 2N4441-2N4444

## SILICON CONTROLLED RECTIFIERS

FIGURE 1 – ON-STATE CHARACTERISTICS

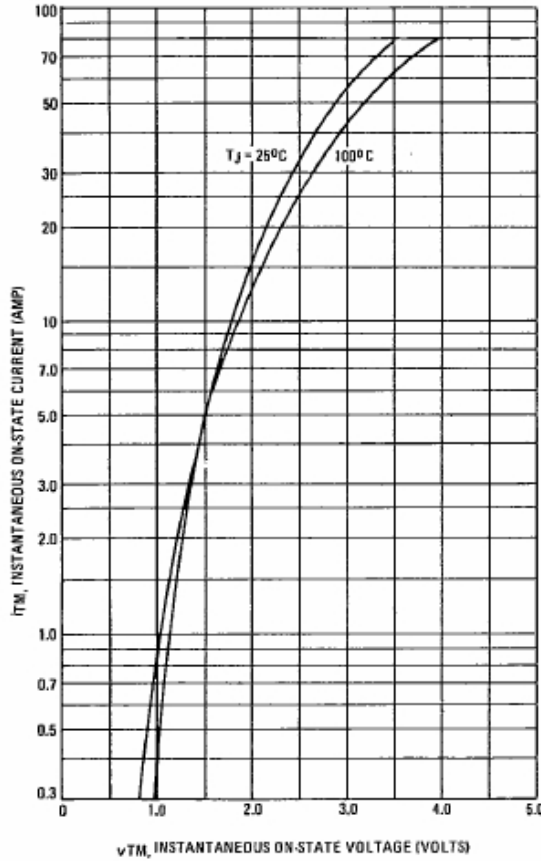


FIGURE 2 – MAXIMUM ON-STATE POWER DISSIPATION

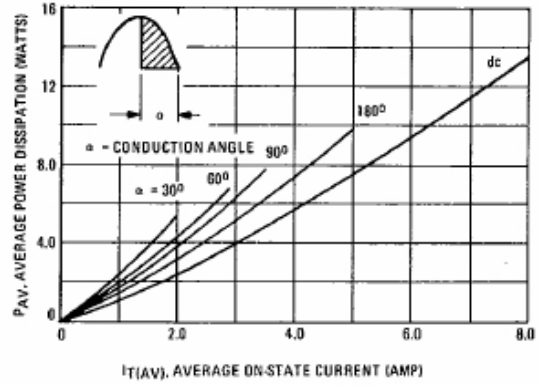


FIGURE 3 – AVERAGE CURRENT DERATING

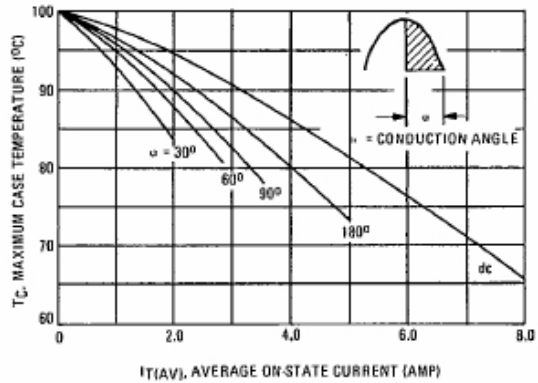
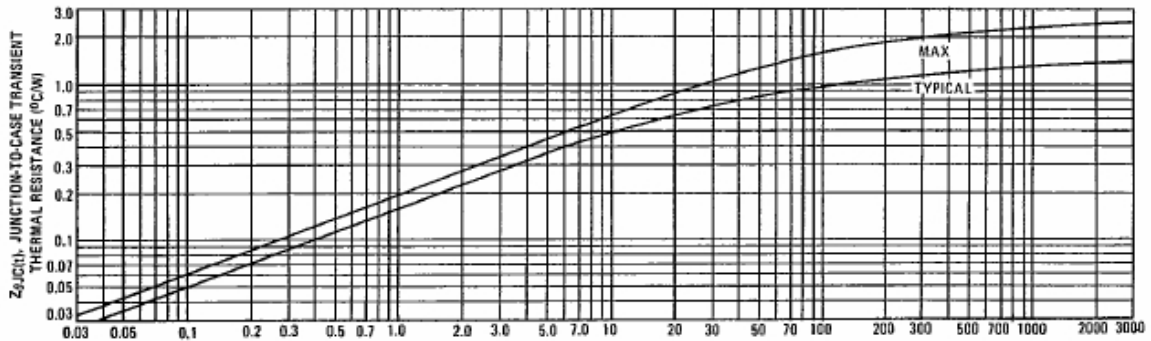


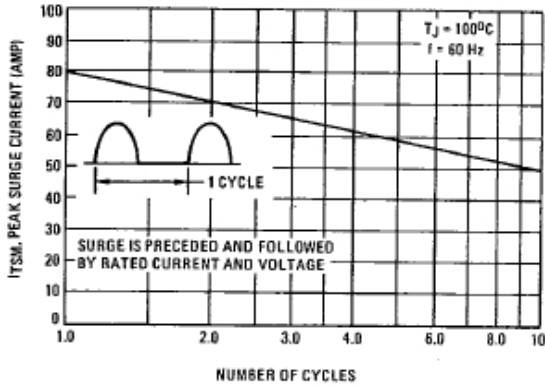
FIGURE 4 – THERMAL RESPONSE



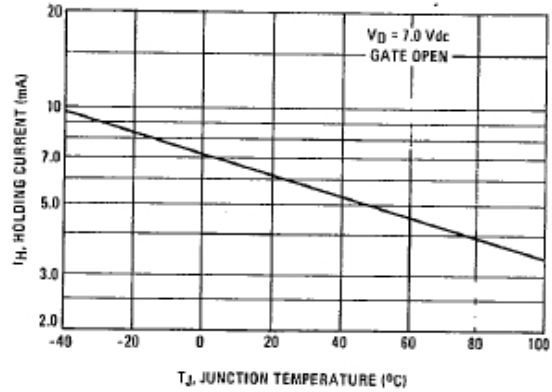
# 2N4441-2N4444

## SILICON CONTROLLED RECTIFIERS

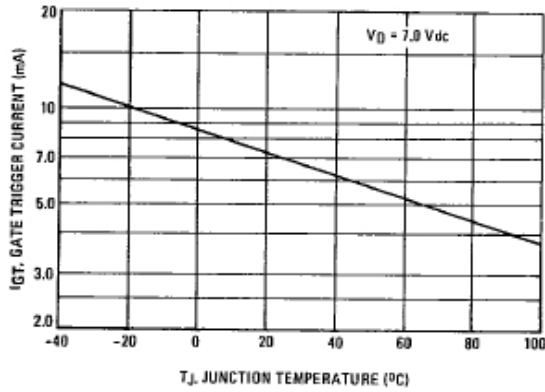
**FIGURE 5 – MAXIMUM NON-REPETITIVE SURGE CURRENT**



**FIGURE 6 – TYPICAL HOLDING CURRENT**



**FIGURE 7 – TYPICAL GATE TRIGGER CURRENT**



**FIGURE 8 – TYPICAL GATE TRIGGER VOLTAGE**

