DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

2N4441-2N4444

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

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

THERMAL CHARACTERISTICS

Characteristic	Symbol	Typical	Maximum	Unit
Thermal resistance, junction to case	$R_{\Theta JC}$	-	2.5	°C/W
Thermal resistance, junction to ambient	$R_{\Theta JA}$	40	-	°C/W

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

Characteristic		Symbol	Min.	Typ.	Max.	Unit
Gate trigger voltage (continuous dc)		V_{GT}				Volts
(V_D = 7 Vdc, R_L = 100 Ω)	T_C = 25°C		-	0.75	1.5	
(V_D = 7 Vdc, R_L = 100 Ω)	T_C = -40°C		-	-	2.5	
(V_D = Rated V_{DRM}, R_L = 100 Ω)	T_C = 100°C		0.2	-	-	
Peak on state voltage		V_{TM}				Volts
(pulse width = 1 to 2ms, duty cycle ≤ 2%)						
(I_{TM} = 5A peak)			-	1	1.5	
(I_{TM} = 15.7A peak)			-	-	2	
Holding current		I_H				mA
(V_D = 7Vdc, gate open)						
T_C = 25°C			-	6	40	
T_C = -40°C			-	-	70	
Gate controlled turn-on time		t_{gt}				µs
(I_{TM} = 5A, I_{GT} = 20mA, V_D = rated V_{DRM})			-	1	-	
Circuit commutated turn-off time		t_q				µs
(I_{TM} = 5A, I_R = 5A)			-	15	-	
(I_{TM} = 5A, I_R = 5A, T_J = 100°C)			-	20	-	
Critical rate of rise of off-state voltage		dv/dt				V/µs
(V_D = rated V_{DRM}, exponential waveform, T_J = 100°C, gate open)			-	50	-	

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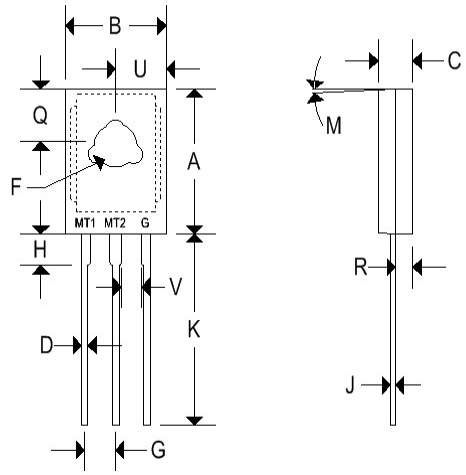
MECHANICAL CHARACTERISTICS

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	-

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FIGURE 1 – ON-STATE CHARACTERISTICS

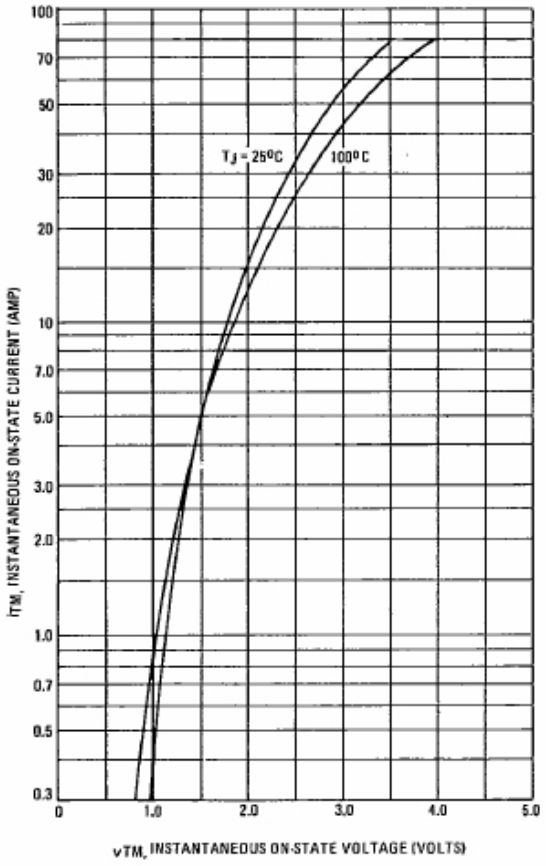

FIGURE 2 – MAXIMUM ON-STATE POWER DISSIPATION

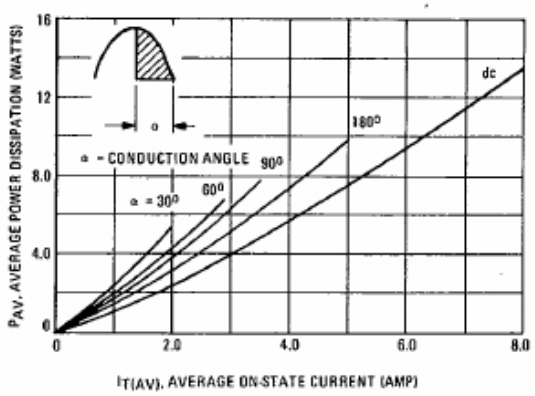

FIGURE 3 – AVERAGE CURRENT DERATING

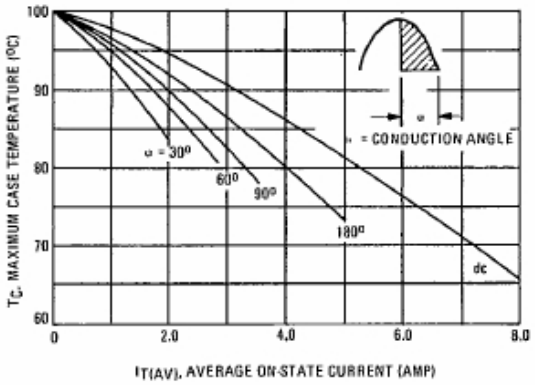

FIGURE 4 – THERMAL RESPONSE

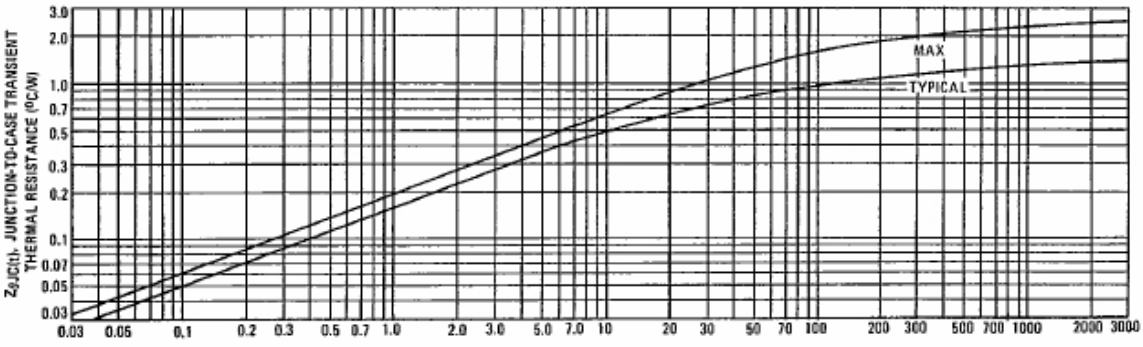

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FIGURE 5 – MAXIMUM NON-REPETITIVE SURGE CURRENT

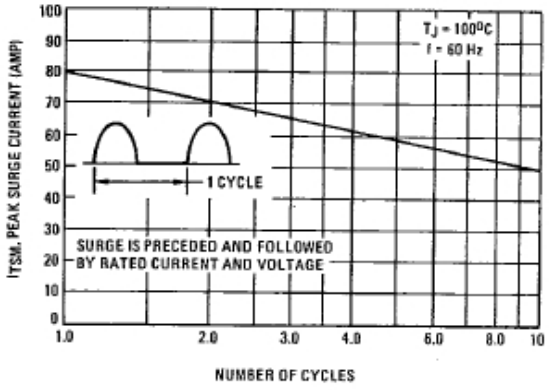

FIGURE 6 – TYPICAL HOLDING CURRENT

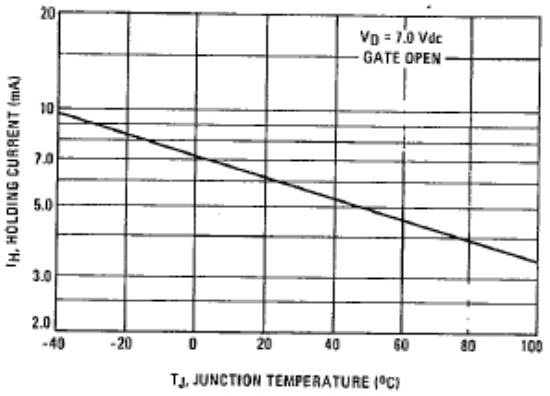

FIGURE 7 – TYPICAL GATE TRIGGER CURRENT

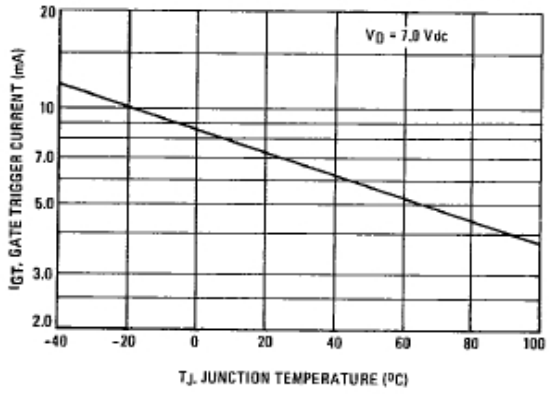

FIGURE 8 – TYPICAL GATE TRIGGER VOLTAGE