

DIGITRON SEMICONDUCTORS

2N4441-2N4444

SILICON CONTROLLED RECTIFIER

Available Non-RoHS (standard) or RoHS compliant (add PBF suffix).

Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak repetitive forward and reverse blocking voltage⁽¹⁾ 2N4441 2N4442 2N4443 2N4444	V_{RRM}, V_{DRM}	50 200 400 600	Volts
Non repetitive peak reverse blocking voltage (t = 5ms (max.) duration) 2N4441 2N4442 2N4443 2N4444	V_{RSM}	75 300 500 700	Volts
Forward current RMS (all conduction angles)	$I_{T(RMS)}$	8	Amps
Average on state current, $T_C = 73^\circ\text{C}$	$I_{T(AV)}$	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 $+100^\circ\text{C}$; t = 8.3ms	I^2t	25	A ² s
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	$^\circ\text{C}$
Storage temperature range	T_{stg}	-40 to +150	$^\circ\text{C}$
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	$^\circ\text{C}/\text{W}$
Thermal resistance, junction to ambient	$R_{\theta JA}$	40	-	$^\circ\text{C}/\text{W}$

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Peak forward blocking current (Rated V_{DRM} or V_{RRM} , gate open) $T_J = 25^\circ\text{C}$ $T_J = 100^\circ\text{C}$	I_{DRM} or I_{RRM}	- -	- -	10 2	μA mA
Gate trigger current (continuous dc) ($V_D = 7$ Vdc, $R_L = 100 \Omega$) $T_C = 25^\circ\text{C}$ $T_C = -40^\circ\text{C}$	I_{GT}	- -	7 -	30 60	mA

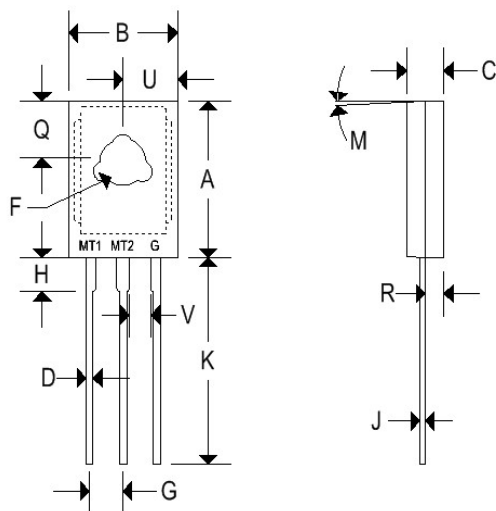
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Characteristic		Symbol	Min.	Typ.	Max.	Unit
Gate trigger voltage (continuous dc) (V _D = 7 Vdc, R _L = 100 Ω) (V _D = 7 Vdc, R _L = 100 Ω) (V _D = Rated V _{DRM} , R _L = 100 Ω)	T _C = 25°C	V _{GT}	-	0.75	1.5	Volts
	T _C = -40°C		-	-	2.5	
	T _C = 100°C		0.2	-	-	
Peak on state voltage (pulse width = 1 to 2ms, duty cycle ≤ 2%) (I _{TM} = 5A peak) (I _{TM} = 15.7A peak)		V _{TM}	- -	1 -	1.5 2	Volts
Holding current (V _D = 7Vdc, gate open) T _C = 25°C T _C = -40°C		I _H	- -	6 -	40 70	mA
Gate controlled turn-on time (I _{TM} = 5A, I _{GT} = 20mA, V _D = rated V _{DRM})		t _{gt}	-	1	-	μs
Circuit commutated turn-off time (I _{TM} = 5A, I _R = 5A) (I _{TM} = 5A, I _R = 5A, T _J = 100°C)		t _q	- -	15 20	- -	μs
Critical rate of rise of off-state voltage (V _D = rated V _{DRM} , exponential waveform, T _J = 100°C, gate open)		dv/dt	-	50	-	V/μs

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

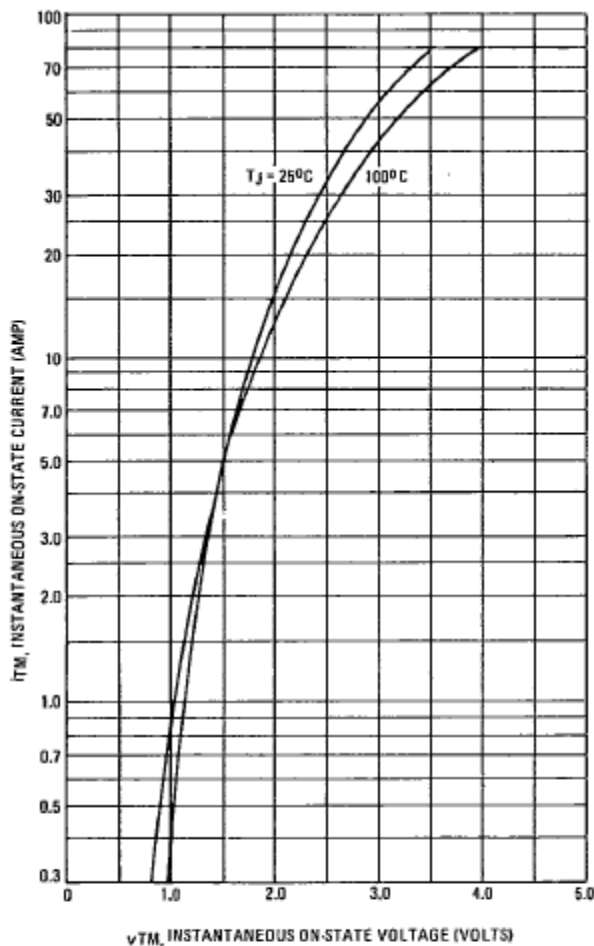


FIGURE 2 – MAXIMUM ON-STATE POWER DISSIPATION

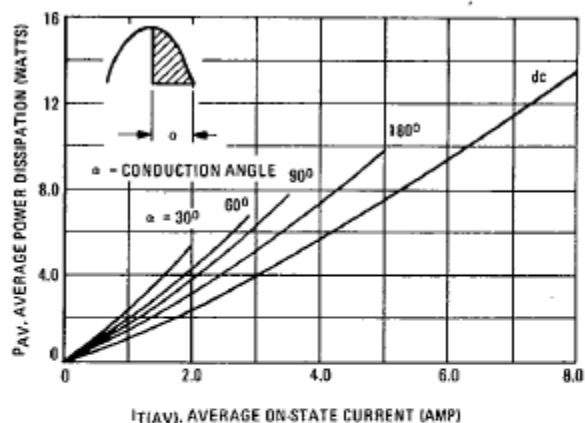


FIGURE 3 – AVERAGE CURRENT DERATING

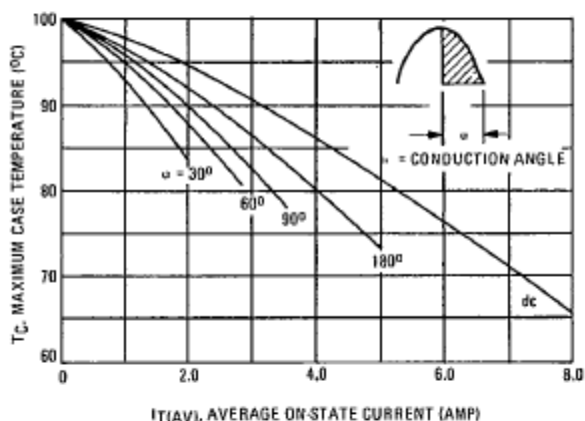
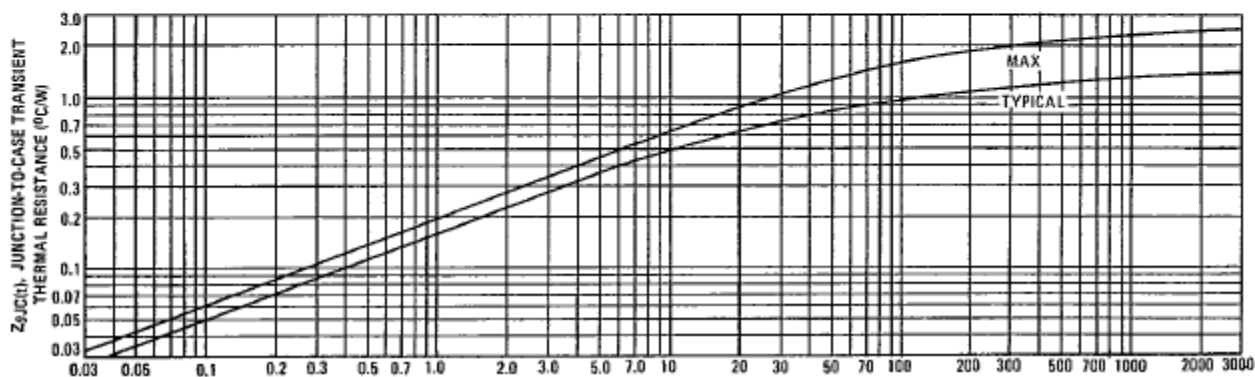


FIGURE 4 – THERMAL RESPONSE



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FIGURE 5 – MAXIMUM NON-REPETITIVE SURGE CURRENT

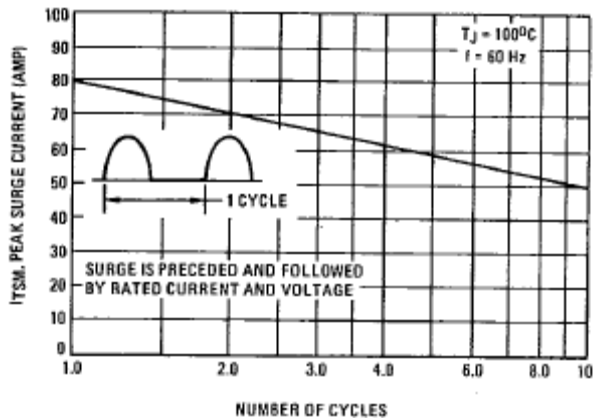


FIGURE 6 – TYPICAL HOLDING CURRENT

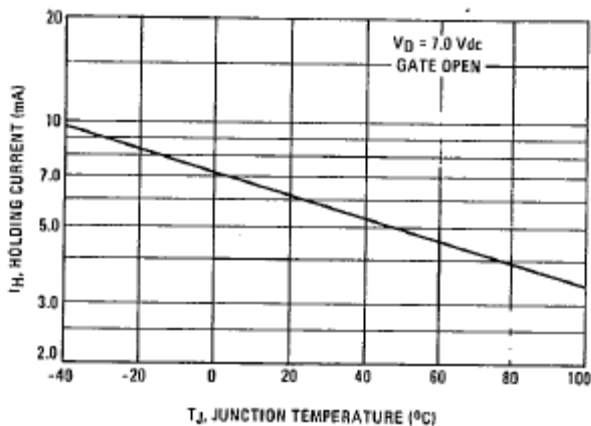


FIGURE 7 – TYPICAL GATE TRIGGER CURRENT

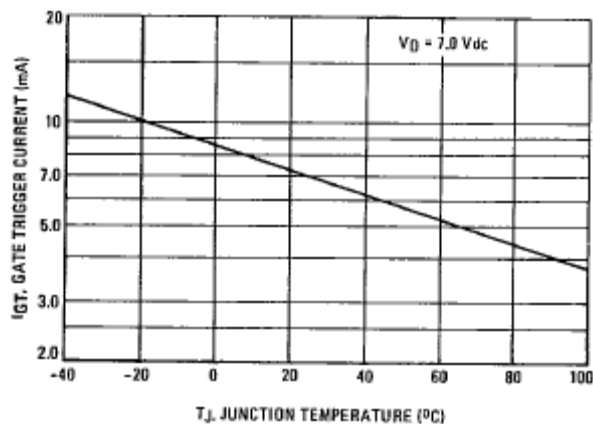


FIGURE 8 – TYPICAL GATE TRIGGER VOLTAGE

