DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

2N4167-2N4174

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			
2N4167	V_{DRM}, V_{RRM}	25	V
2N4168		50	
2N4169		100	
2N4170		200	
2N4172		400	
2N4174		600	
Forward current RMS	$I_{T(RMS)}$	8	A
Peak forward surge current (one cycle, 60Hz, T_J = -40 to +100°C)	I_{TSM}	100	A
Circuit fusing (t = 8.3ms)	I^2t	40	A^2s
Peak gate power	P_{GM}	5	W
Average gate power	$P_{G(AV)}$	0.5	W
Peak gate current	I_{GM}	2	A
Peak gate voltage	V_{GM}	10	V
Operating temperature range	T_J	-40 to +100	°C
Storage temperature range	T_{stg}	-40 to +150	°C
Stud torque		15	In. lb.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Typ.	Max	Unit
Thermal resistance, junction to case	$R_{\Theta JC}$	1.5	2.5	°C/W

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

Characteristic	Symbol	Min	Typ	Max	Unit
Peak forward or reverse blocking current (Rated V_{DRM} or V_{RRM}, gate open)	I_{DRM}, I_{RRM}				
T_C = 25°C		-	-	10	µA
T_C = 100°C		-	-	2	mA
Gate trigger current (continuous dc)	I_{GT}				mA
(V_D = 7V, R_L = 100Ω)		-	10	30	
(V_D = 7V, R_L = 100Ω, T_C = -40°C)		-	-	60	
Gate trigger voltage (continuous dc)	V_{GT}				V
(V_D = 7V, R_L = 100Ω)		-	0.75	1.5	
(V_D = 7V, R_L = 100Ω, T_C = -40°C)		-	-	2.5	
(V_D = 7V, R_L = 100Ω, T_C = 100°C)		0.2	-	-	
Forward "on" voltage (pulsed, 1ms max., duty cycle ≤ 1%) (I_{TM} = 15.7A)	V_{TM}	-	1.4	2	V

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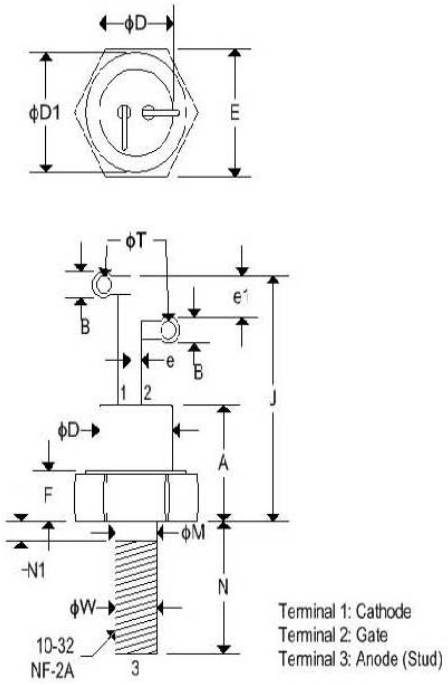
ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

Characteristic	Symbol	Min	Typ	Max	Unit
Holding current	I_H				mA
(V_D = 7V, gate open)		-	10	30	
(V_D = 7V, gate open, T_C = -40°C)		-	-	60	
Turn-on time (t_d+t_r)	t_{on}				µs
(I_G = 20mA, IF = 5A, V_D = rated V_{DRM})		-	1	-	
Turn-off time	t_{off}				µs
(I_F = 5A, I_R = 5A)		-	15	-	
(I_F = 5A, I_R = 5A, T_C = 100°C, V_D = rated V_{DRM})		-	25	-	
(dv/dt = 30V/µs)					
Forward voltage application rate (exponential)	dv/dt				V/µs
(Gate open, T_C = 100°C, V_D = rated V_{DRM})		-	50	-	

MECHANICAL CHARACTERISTICS

Case:	TO-64
Marking:	Body painted, alpha-numeric
Pin out:	See below



	TO-64			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.300	0.400	7.620	10.160
B	0.080	0.136	2.030	3.450
ΦD	-	0.424	-	10.770
$ΦD_1$	0.400	-	10.160	-
E	0.424	0.437	10.770	11.100
e	0.013	-	0.330	-
e_1	0.060	-	1.520	-
F	0.060	0.175	1.520	4.450
J	0.700	0.855	17.780	21.720
ΦM	0.163	0.189	4.140	4.800
N	0.400	0.453	10.160	11.510
N_1	-	0.078	-	1.980
ΦT	0.040	0.075	1.020	1.910
ΦW	0.1658	0.1697	4.212	4.310

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FIGURE 1 – PULSE CURRENT TRIGGERING

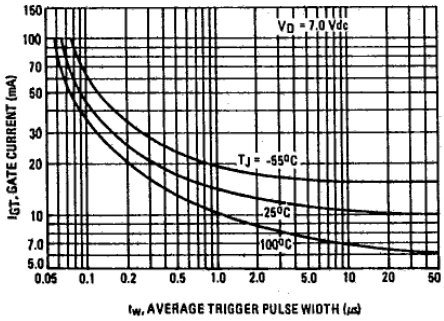

FIGURE 2 – CAPACITIVE DISCHARGE TRIGGERING

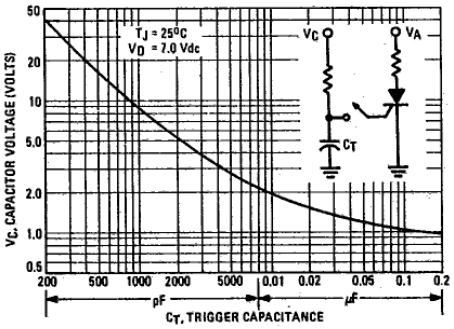

FIGURE 3 – MAXIMUM CASE TEMPERATURE

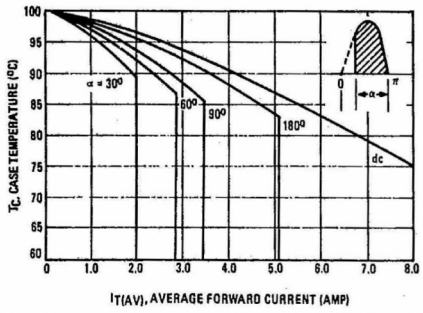

FIGURE 4 – MAXIMUM AMBIENT TEMPERATURE

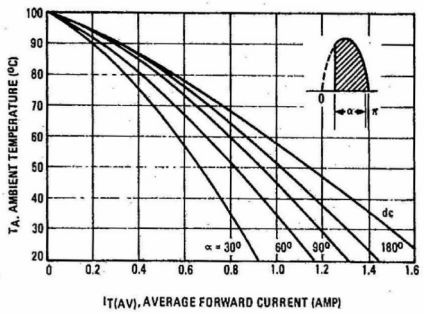

FIGURE 5 – POWER DISSIPATION

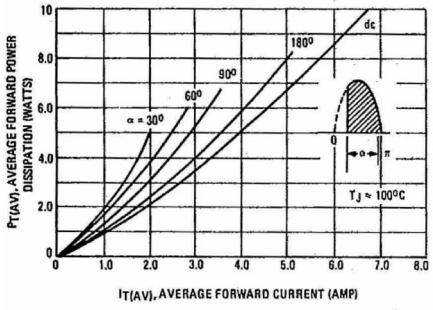

FIGURE 6 – MAXIMUM SURGE CAPABILITY

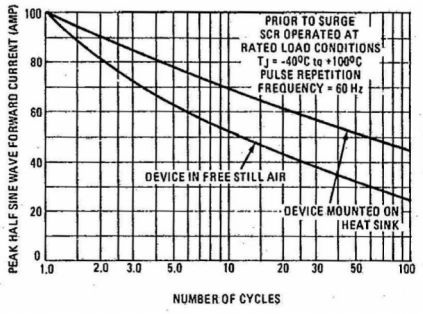

FIGURE 7 – THERMAL RESPONSE

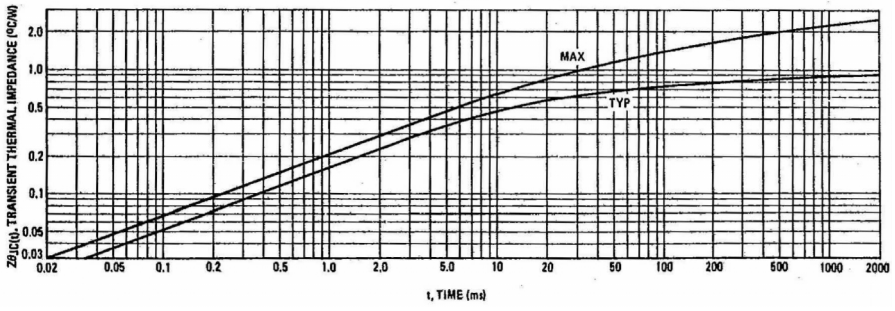

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FIGURE 8 – FORWARD VOLTAGE

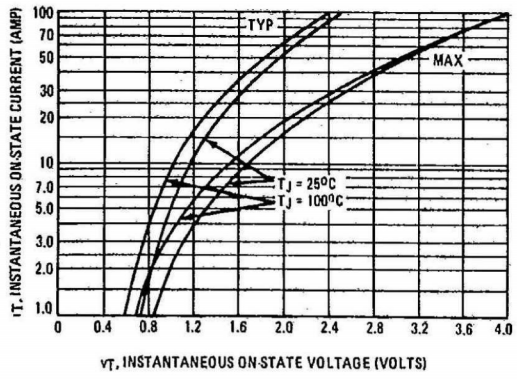

FIGURE 9 – HOLDING CURRENT

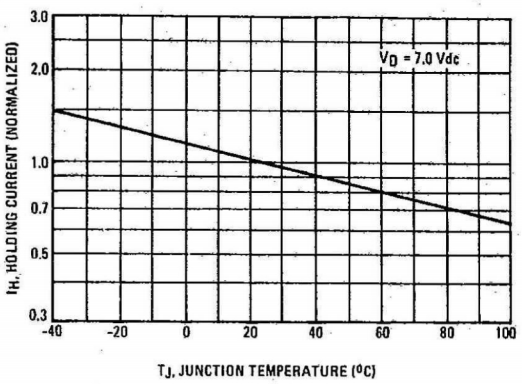

FIGURE 10 – TYPICAL THERMAL RESISTANCE OF PLATES

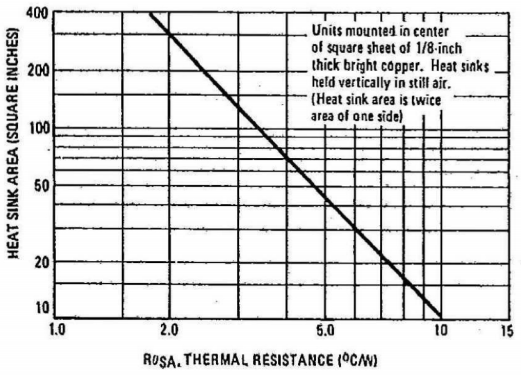

FIGURE 11 – CASE-TO-AMBIENT THERMAL RESISTANCE