DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

2N3668-2N3670, 2N4103

SILICON CONTROLLED RECTFIERS

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	2N3668	2N3669	2N3670	2N4103	Units
Non-repetitive peak reverse voltage	V_{RM}	150	330	660	700	V
Peak repetitive reverse voltage	V_{RRM}	100	200	400	600	V
Peak forward blocking voltage	V_{FBOM}	100	200	400	600	V
Forward current for case temperature T_C = +80°C @ average DC value at a conduction angle of 180° RMS value	 I_{FAV} I_{FRMS}	 8 12.5				A
Peak surge current for one cycle of applied voltage 60 Hz (sinusoidal), T_C = 80°C 50 Hz (sinusoidal), T_C = 80°C	I_{FM}	200 200 170				A
Fusing current (T_J = -40 to +100°C, t = 1 to 8.3ms)	I^2t	170				A^2s
Rate of change of forward current $V_{FB} = V_{BOO}$, I_{GT} = 200mA, 0.5ns rise time	di/dt	200				A/µs
Peak gate power for 10ns duration	P_{GM}	40				W
Average gate power	P_{GAV}	0.5				W
Storage temperature	T_{stg}	-40 to +125				°C
Operating case temperature	T_C	-40 to +100				°C

*Any values of peak gate current or peak gate voltage to give the maximum gate power is permissible.
* Temperature reference point is within 1/8" of the center of the underside of unit.

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

Characteristic	Symbol	2N3668			2N3669			2N3670			2N4103			Units
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
Peak repetitive blocking voltage @ T_C = 100°C	V_{DROM}	100	-	-	200	-	-	400	-	-	600	-	-	V
Forward peak blocking current @T_C = 100°C, $V_D = V_{DROM}$	I_{DOM}	-	0.2	2	-	0.25	2.5	-	0.3	3	-	0.35	4	mA
Reverse peak blocking current @ T_C = 100°C, $V_R = V_{RROM}$	I_{ROM}	-	0.05	1	-	0.1	1.25	-	0.2	1.5	-	0.3	3	mA
Forward voltage drop @ 25A T_C = 25°C	V_F	-	1.5	1.8	-	1.5	1.8	-	1.5	1.8	-	1.5	1.8	V
DC gate-trigger current @ T_C = 25°C	I_{GT}	1	20	40	1	20	40	1	20	40	1	20	40	mA
DC gate-trigger voltage @ T_C = 25°C	V_{GT}	-	1.5	2	-	1.5	2	-	1.5	2	-	1.5	2	V
Holding current @ T_C = 25°C	I_H	0.5	25	50	0.5	25	50	0.5	25	50	0.5	25	50	mA
Critical rate of forward voltage $V_F = V_{BOO}$, exponential rise T_C = 100°C	dv/dt	10	100	-	10	100	-	10	100	-	10	100	-	V/µs

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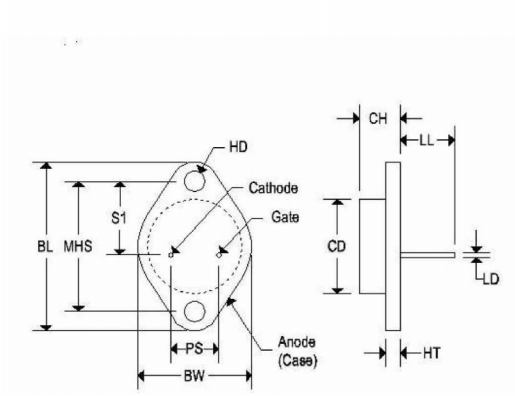
ELECTRICAL CHARACTERISTICS (@ maximum ratings and indicated case temperature (T_C)

Characteristic	Symbol	2N3668			2N3669			2N3670			2N4103			Units
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
Turn-on time **(delay time + rise time)** **$V_D = V_{DROM}$, I_T = 8A, I_G = 200mA, 0.1µs rise time, T_C = 25°C**	t_{on}	-	1.25	-	-	1.25	-	-	1.25	-	-	1.25	-	µs
Turn-off time **(reverse recovery time + gate recovery time)** **I_F = 8A, 50ns pulse width, dv_{FS}/dt = 20V/µs, di_r/dt = 30A/µs, I_{GT} = 200mA, T_C = 80°C**	t_{off}	-	20	50	-	20	50	-	20	50	-	20	50	µs
Thermal resistance **Junction to case**	$R_{\Theta JC}$	-	-	1.7	-	-	1.7	-	-	1.7	-	-	1.7	°C/W

MECHANICAL CHARACTERISTICS

Case:	TO-3
Marking:	Body painted, alpha-numeric
Pin out:	See below



	TO-3			
	Inches		Millimeters	
	Min	Max	Min	Max
CD	-	0.875	-	22.220
CH	0.250	0.380	6.860	9.650
HT	0.060	0.135	1.520	3.430
BW	-	1.050	-	26.670
HD	0.131	0.188	3.330	4.780
LD	0.038	0.043	0.970	1.090
LL	0.312	0.500	7.920	12.700
BL	1.550 REF		39.370 REF	
MHS	1.177	1.197	29.900	30.400
PS	0.420	0.440	10.670	11.180
S1	0.655	0.675	16.640	17.150

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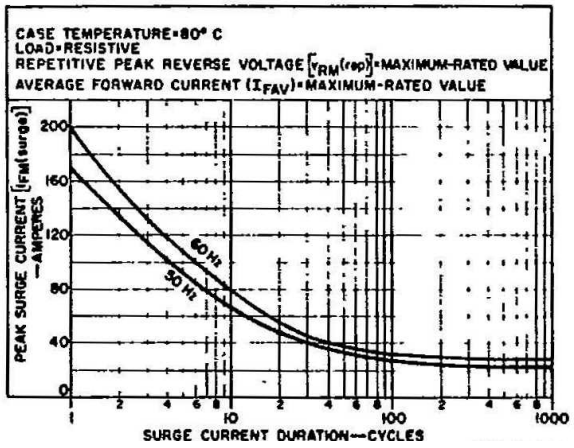

Fig. 1 – Peak surge current vs. surge current duration

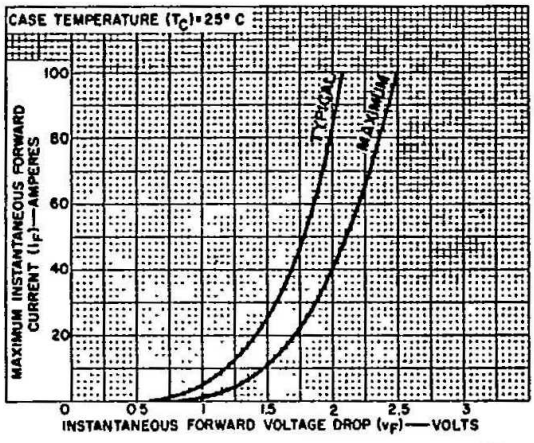

Fig. 2 - Instantaneous forward current vs. Instantaneous forward voltage drop

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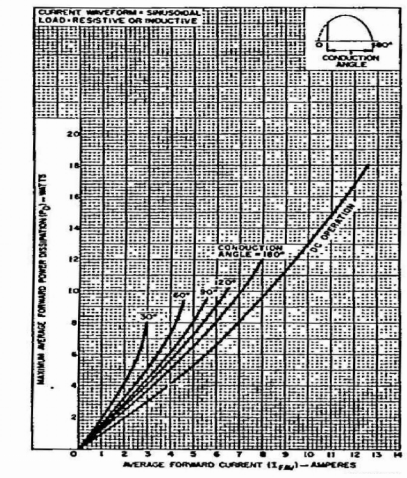

Fig. 3 — Power dissipation vs. forward current.

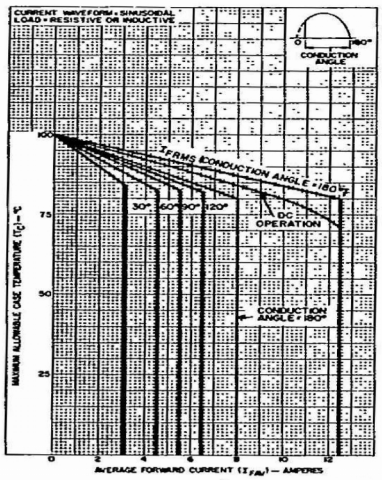

Fig. 4 — Maximum allowable case temperature vs. average forward current.

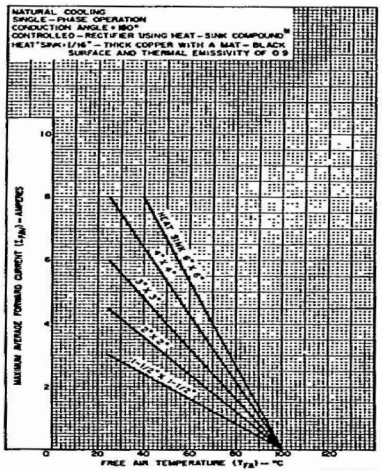

Fig. 5 — Natural-cooling operation guidance chart.

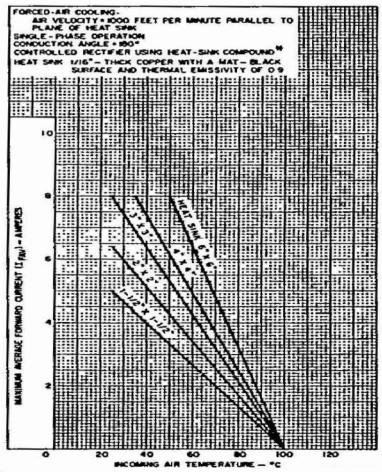

Fig. 6 — Forced-air cooling operation guidance chart.

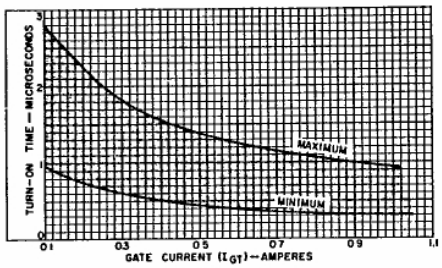

Fig. 7 — Turn-on time vs. gate current.