



**ELECTRONIC
INNOVATIONS**
IN ACTION
SEMICONDUCTORS

HIGH POWER Silicon Rectifier

145.30 9/68
Supersedes 145.30 7/62

1200 Volts

250 A AVG.

A90

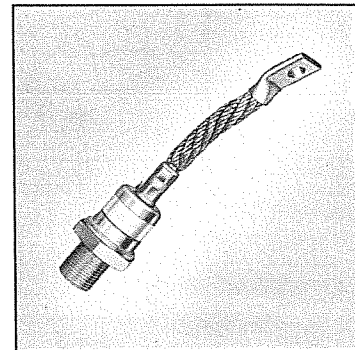
1N3735—1N3742

The A90 (1N3735) Series is General Electric's highly reliable, double-diffused, all hard soldered 250 ampere silicon rectifier diode.

This series of rectifier diodes is particularly suited to a wide range of industrial applications, especially those requiring high performance rectifiers.

Typical applications are:

- Transportation Equipment
- DC Motor Control
- DC Power Supplies
- Battery Vehicles



Maximum Allowable Ratings

TYPES*	REPETITIVE PEAK REVERSE VOLTAGE (PRV) ⁽¹⁾	TRANSIENT PEAK REVERSE VOLTAGE (non-recurrent 5 msec max) ⁽²⁾	D.C. BLOCKING VOLTAGE ⁽³⁾	FULL LOAD REVERSE CURRENT (full-cycle average, 130°C case temperature, single phase)
A90A, 1N3735	100 Volts	200 Volts	100 Volts	16.0 mA
A90B, 1N3736	200	300	200	16.0
A90C, 1N3737	300	400	300	16.0
A90D, 1N3738	400	525	400	16.0
A90E, 1N3739	500	650	500	13.0
A90M, 1N3740	600	800	600	12.0
A90S	700	925	700	11.0
A90N, 1N3741	800	1050	800	9.0
A90T	900	1175	900	8.0
A90P, 1N3742	1000	1300	1000	7.0
A90PA	1100	1400	1100	7.0
A90PB	1200	1500	1200	7.0

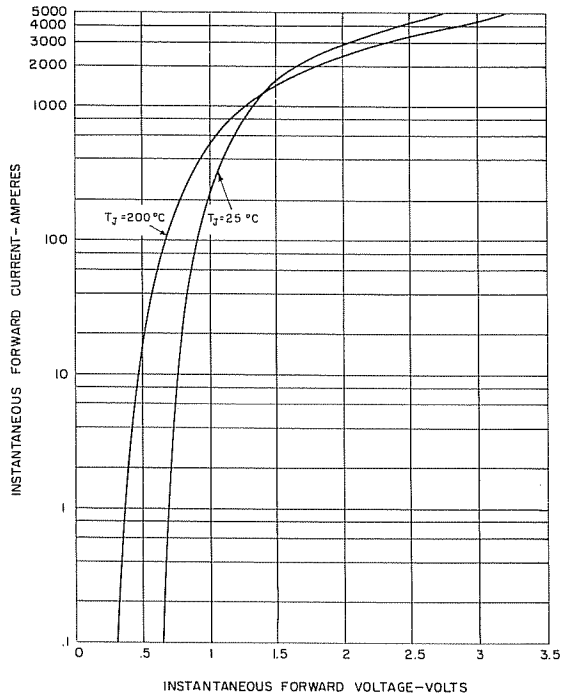
*Models listed are stud cathode (forward polarity) types. Specify A91__ or 1N37__R for stud anode (reverse polarity) types. Ratings and specifications are for frequencies from 50 to 400 Hz., except where noted otherwise.

Average Forward Current, I_o ($T_c = +130^\circ\text{C}$, single-phase, half sine wave)	250 Amperes
Peak One-Cycle Surge Current (non-repetitive), I_{FM} (surge)	4500 Amperes
Minimum I^2t Rating (see Curve 5), $t \geq 1\text{msec}$. (non-repetitive)	31,360 Ampere ² seconds
Forward Peak Voltage Drop, V_{FM} ($T_c = +130^\circ\text{C}$, $I_o = 250$ amps avg.)	1.3 Volts
Thermal Resistance, θ_{J-C}	DC 0.18°C/Watt
	1 ϕ & 3 ϕ (50 to 400 Hz) 0.24°C/Watt
	6 ϕ (50 to 400 Hz) 0.30°C/Watt
Storage and Operating Junction Temperature, T_J	-40°C to +200°C
Stud Torque ⁽⁴⁾	275 Lb-in (Min), 325 Lb-in (Max) 320 Kg-cm (Min), 380 Kg-cm (Max)

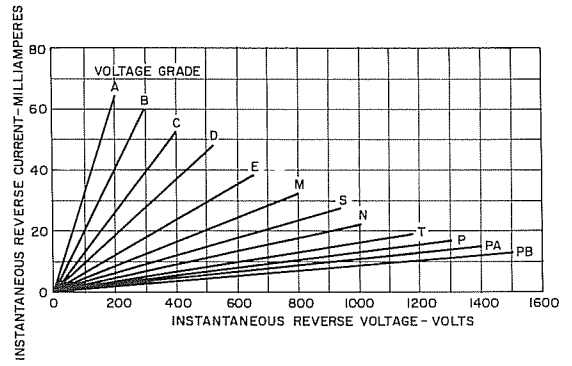
Notes:

- (1) Assumes a heatsink thermal resistance of less than 2.0°C/watt.
- (2) Non-recurrent voltage and current ratings, as contrasted to repetitive ratings, apply for occasional or unpredictable overloads. For example, the forward surge current ratings are non-recurrent ratings that are used in fault coordination work.
- (3) Assumes a heatsink thermal resistance of less than 1.0°C/watt.
- (4) Use of Burndy's Penetrox "A" between the rectifier diode base and the heatsink is recommended.

DEVICE SPECIFICATIONS

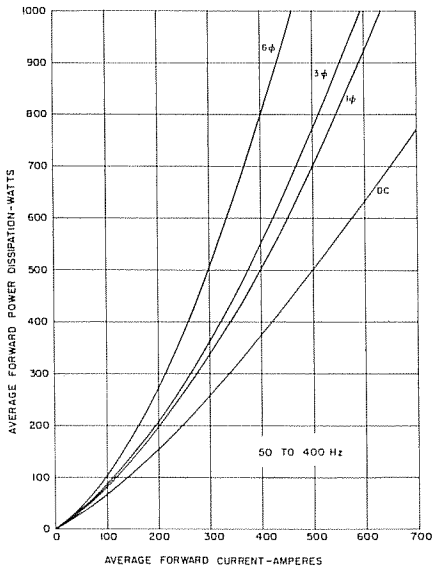
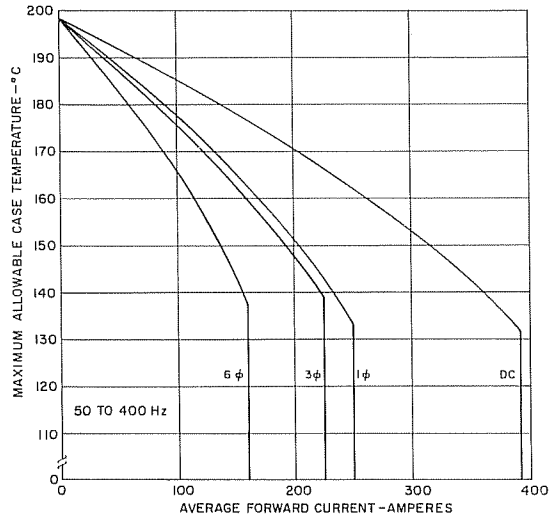


1. MAXIMUM FORWARD CHARACTERISTICS

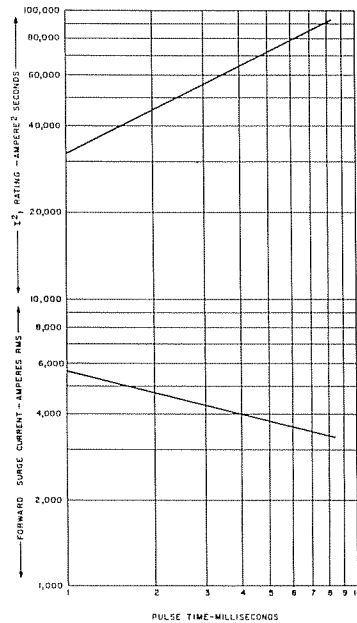


2. MAXIMUM REVERSE CHARACTERISTICS

3. MAXIMUM CASE TEMPERATURE VS. AVERAGE FORWARD CURRENT



4. AVERAGE FORWARD POWER DISSIPATION VS. AVERAGE FORWARD CURRENT

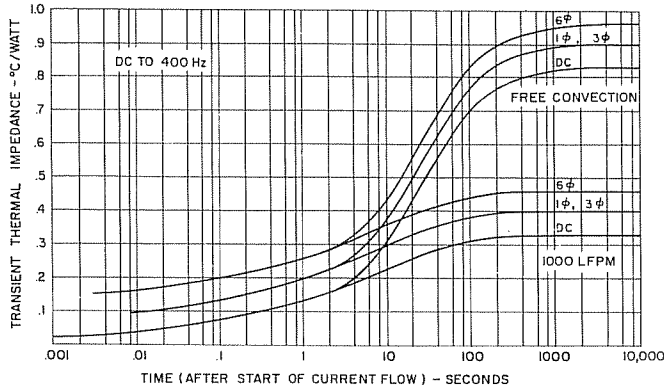


5. SUBCYCLE SURGE FORWARD CURRENT AND I^2t RATING VS. PULSE TIME FOLLOWING RATED LOAD CONDITIONS

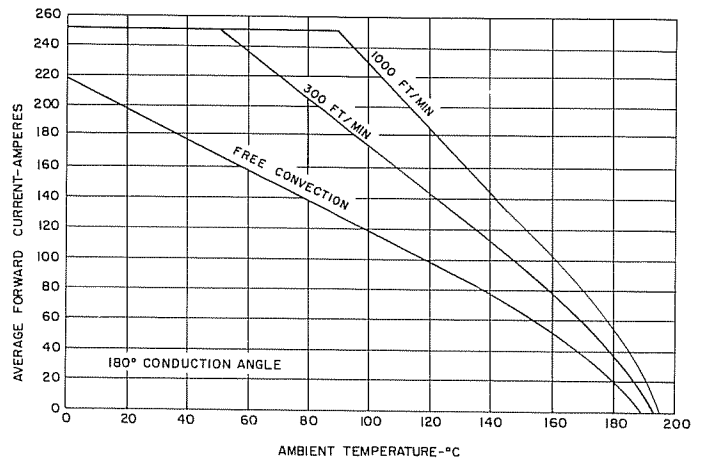
MAXIMUM CIRCUIT RATINGS

Device Mounted On A 5"x5"x6" Aluminum Extrusion (GE #15)

6. 1

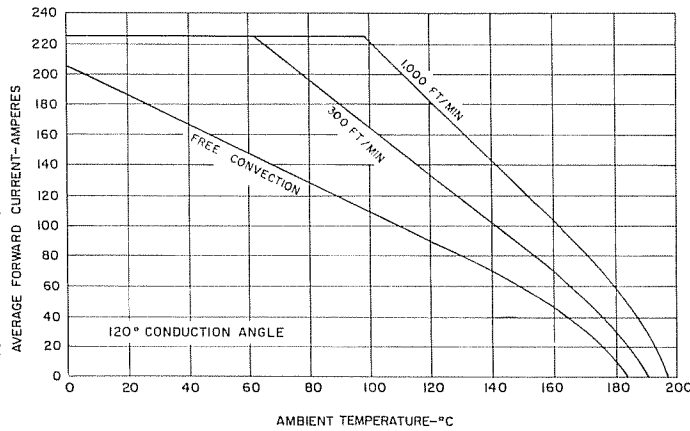


10. TRANSIENT THERMAL IMPEDANCE—JUNCTION-TO-AMBIENT

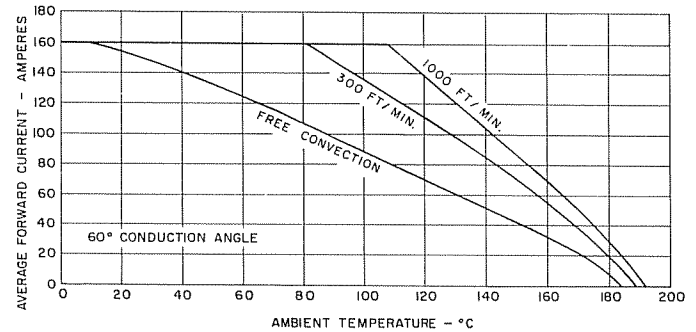


11. SINGLE-PHASE, HALF-WAVE FORWARD CURRENT VS. AMBIENT TEMPERATURE

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12. THREE-PHASE FORWARD CURRENT VS. AMBIENT TEMPERATURE



13. SIX-PHASE FORWARD CURRENT VS. AMBIENT TEMPERATURE

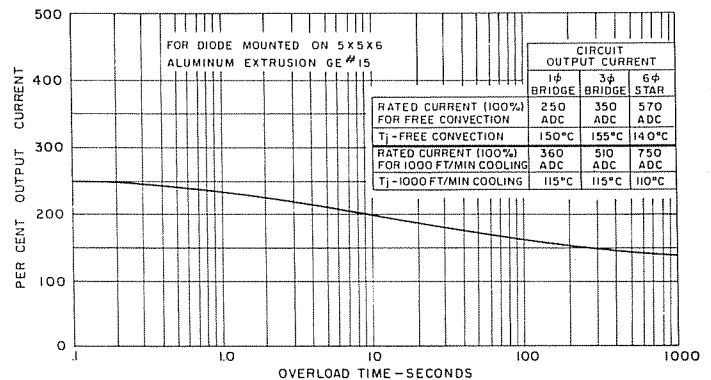
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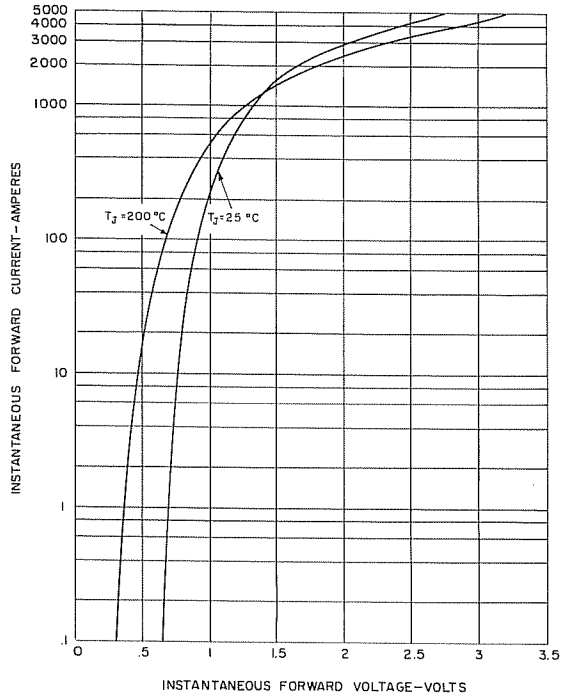
14. RECURRENT OVERLOAD CURVE MEETING NEMA STANDARDS FOR "GENERAL PURPOSE RECTIFIER EQUIPMENTS UNDER 100 KW", AT 40°C AMBIENT (FOR OVERLOAD CONDITIONS OTHER THAN AS SHOWN REFER TO APPLICATION NOTE 200.9)

Note:

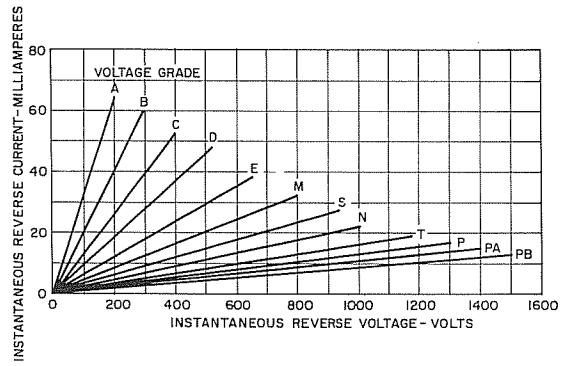
RECURRENT OVERLOAD RATINGS



DEVICE SPECIFICATIONS

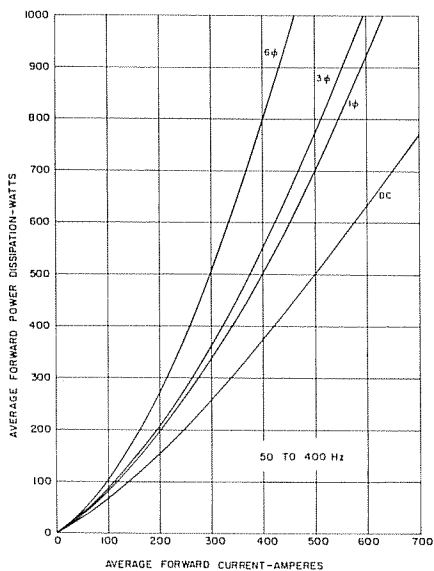
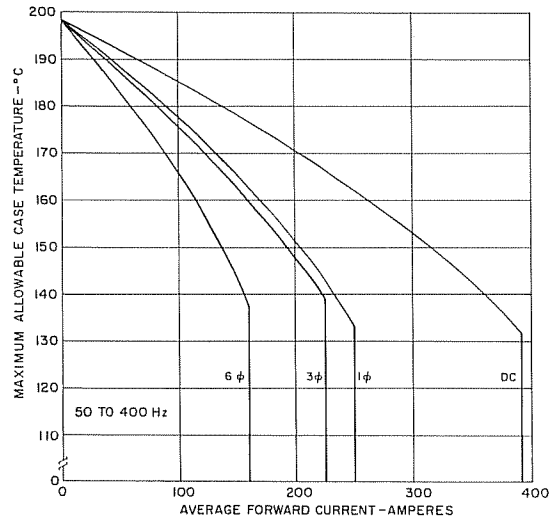


1. MAXIMUM FORWARD CHARACTERISTICS

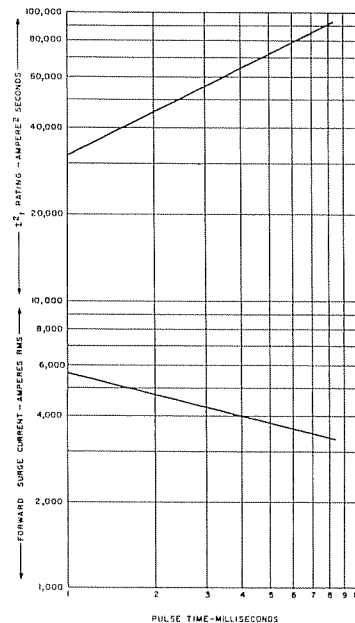


2. MAXIMUM REVERSE CHARACTERISTICS

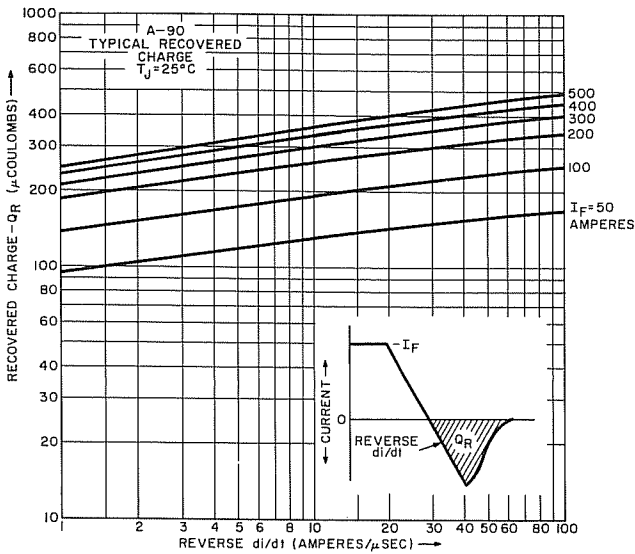
3. MAXIMUM CASE TEMPERATURE VS. AVERAGE FORWARD CURRENT



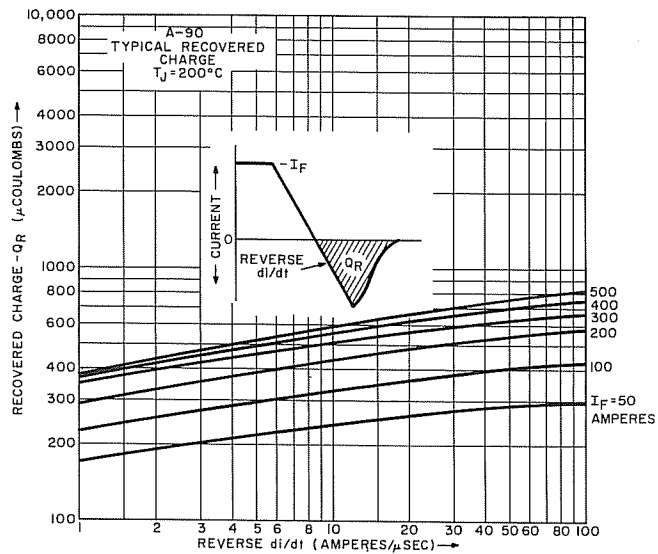
4. AVERAGE FORWARD POWER DISSIPATION VS. AVERAGE FORWARD CURRENT



5. SUBCYCLE SURGE FORWARD CURRENT AND I^2t RATING VS. PULSE TIME FOLLOWING RATED LOAD CONDITIONS

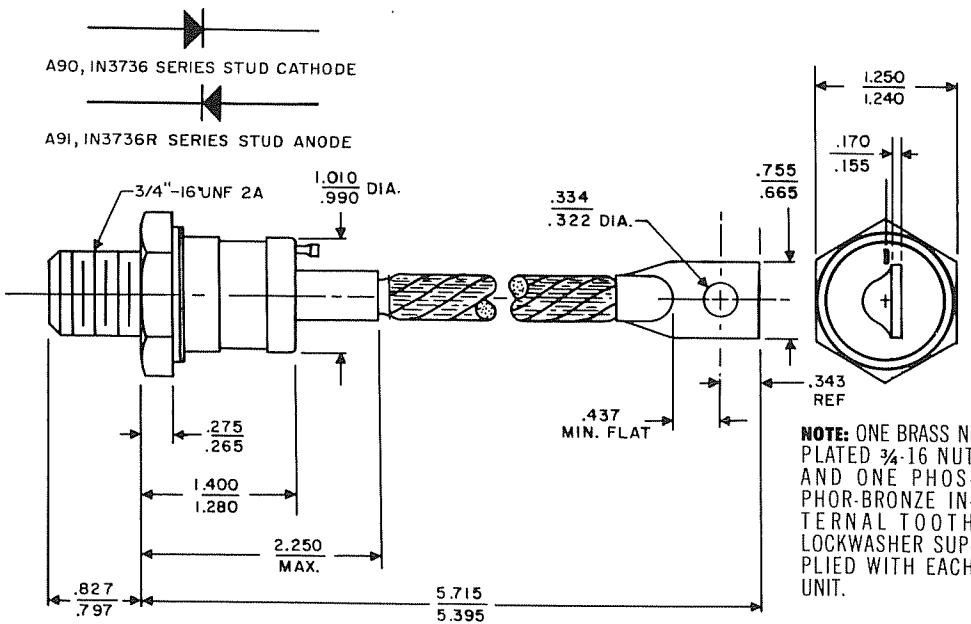


8. TYPICAL RECOVERED CHARGE ($T_J = 25^\circ\text{C}$)



9. TYPICAL RECOVERED CHARGE ($T_J = 200^\circ\text{C}$)

OUTLINE DRAWING



Device Configuration complies with EIA Registered Outline DO-9

CONVERSION TABLE	
Inches	Millimeters
.155	3.936
.170	4.318
.265	6.730
.275	6.985
.322	8.178
.334	8.483
.343	8.712
.437	11.099
.665	16.890
.755	19.177
.797	20.243
.827	21.006
.990	25.145
1.010	25.654
1.240	31.495
1.250	31.750
1.280	32.511
1.400	35.560
2.250	57.149
5.395	137.031
5.715	145.160

INSTALLATION INSTRUCTIONS

Following these installation instructions will result in a rectifier diode-to-heatsink contact thermal resistance of 0.08°C/watt.

- (1) Be sure mounting surface is clean, and flat within .001 inch/inch.
- (2) Mounting hole diameter should not exceed the outside diameter of the rectifier diode stud by more than 1/16 inch, and should be de-burred.
- (3) Use Burndy's Penetrox "A", or equivalent, on mounting surfaces that come in contact with the heatsink.
- (4) Use only hardware furnished with each rectifier diode.
- (5) Tighten with a torque wrench, from nut side, to 300 lb-in.

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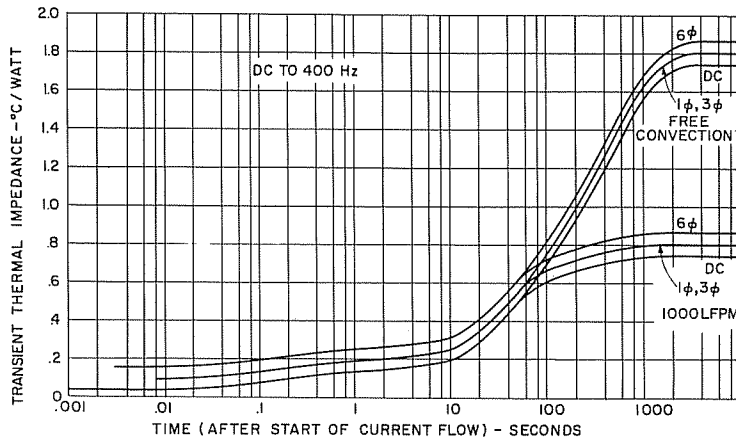
BIENT

CUT CURRENT	
3 φ RIDGE STAR	6 φ STAR
145	410
100	ADC
53°C	165°C
910	620
100	ADC
16°C	136°C

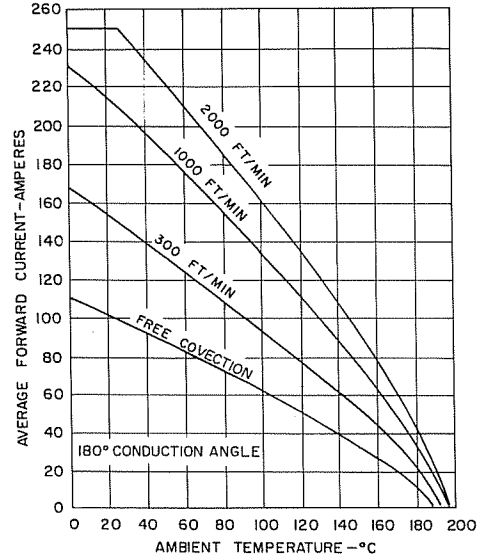
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MAXIMUM CIRCUIT RATINGS

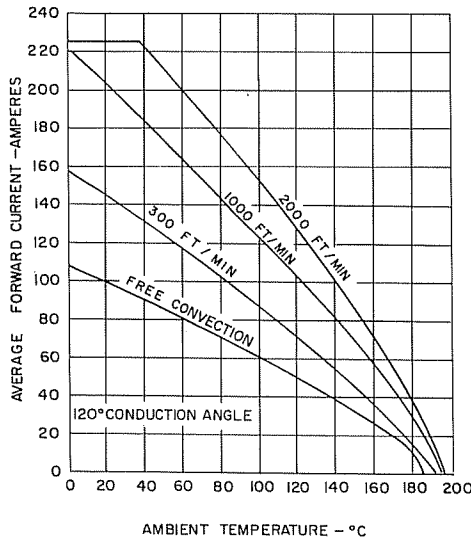
Device Mounted On A $7 \times 7 \times \frac{3}{8}$ " Aluminum Fin (GE #13) or A $7 \times 7 \times \frac{1}{4}$ " Copper Fin
Minimum Fin Spacing 1 Inch
Fins Mounted Vertically or Parallel to Forced Air Flow



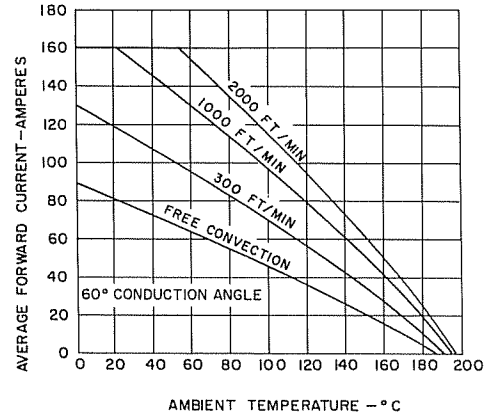
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