

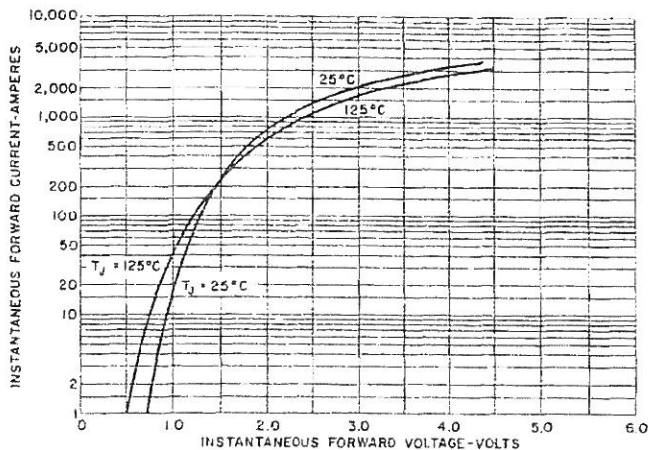
## A177

100A Avg.

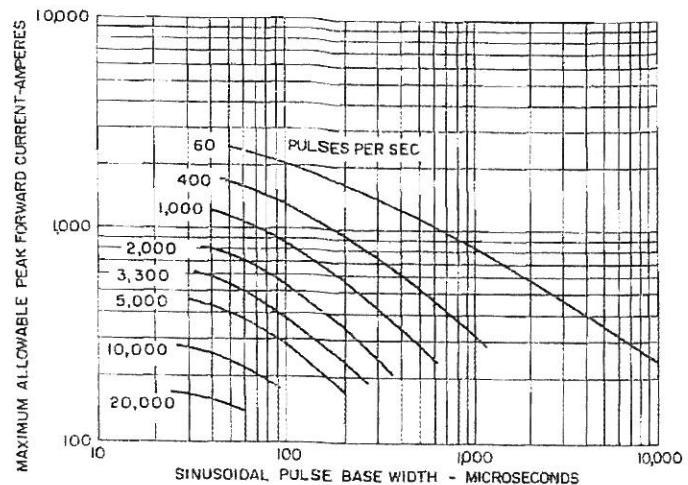
- 1 Assumes a heatsink thermal resistance of less than 2.0°C/watt.  
2 Non-repetitive voltage and current ratings, as contrasted to repetitive ratings, apply for occasional or unpredictable overloads. For example, the forward surge current ratings are non-repetitive ratings that are used in fault coordination work.  
3 Assumes a heatsink thermal resistance of less than 1.0°C/watt.  
4 "Pic-Pac" is an acronym for Pressure Internal Contact Package.

# DEVICE SPECIFICATIONS

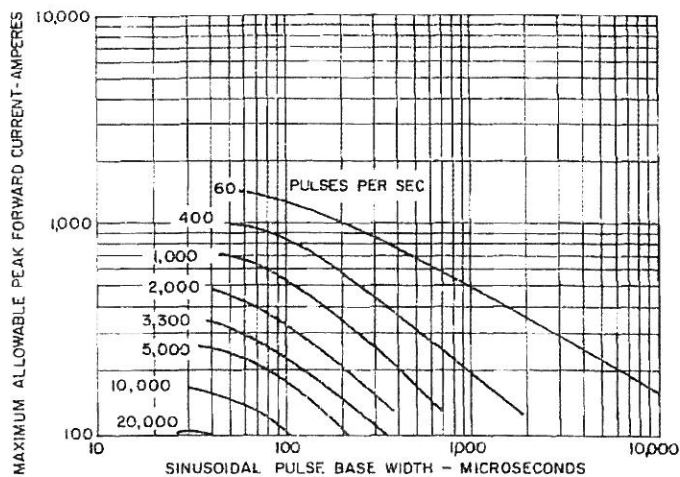
A177



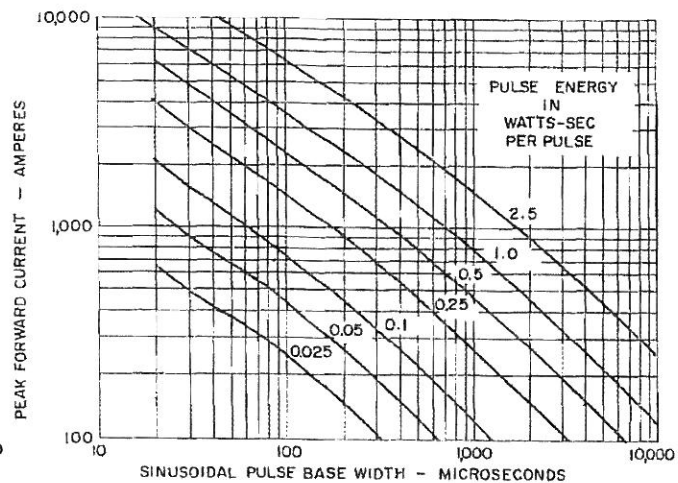
1. MAXIMUM FORWARD CHARACTERISTICS



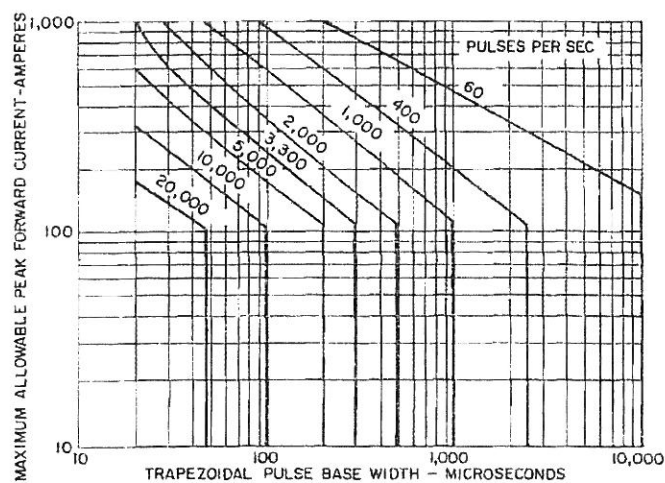
2. MAXIMUM ALLOWABLE PEAK FORWARD CURRENT  
SINUSOIDAL WAVEFORM ( $T_C = 65^\circ\text{C}$ )



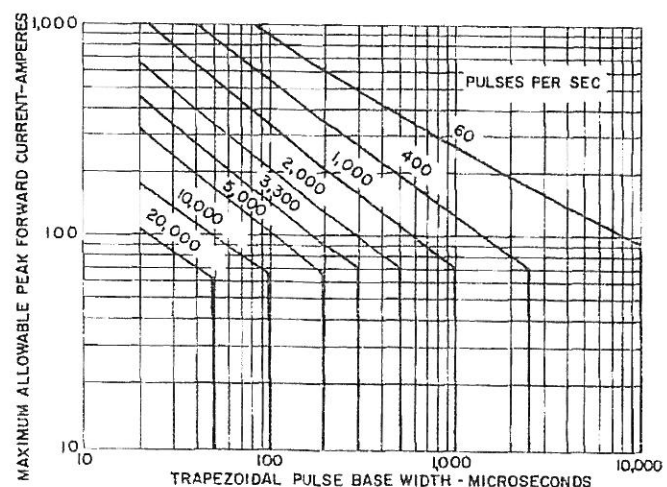
3. MAXIMUM ALLOWABLE PEAK FORWARD CURRENT  
SINUSOIDAL WAVEFORM ( $T_C = 90^\circ\text{C}$ )



4. SINUSOIDAL PULSE ENERGY ( $T_C = 125^\circ\text{C}$ )



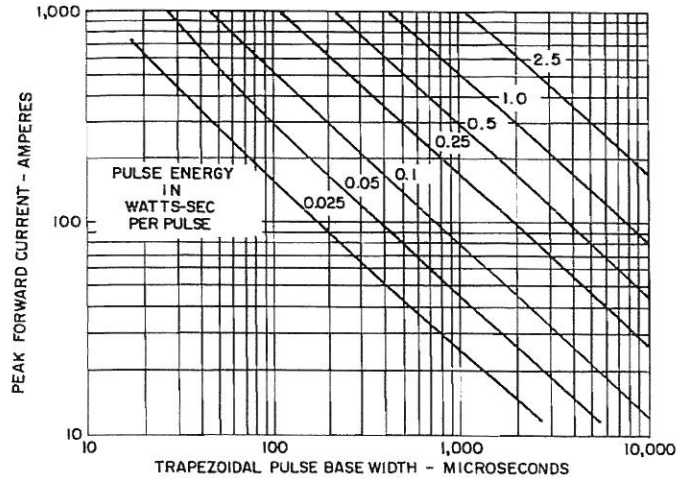
5. MAXIMUM ALLOWABLE PEAK FORWARD CURRENT, TRAPEZOIDAL WAVEFORM  
( $T_C = 65^\circ\text{C}$ ),  $DI/DT$   
(RISING & FALLING) = 100 A/ $\mu\text{S}$



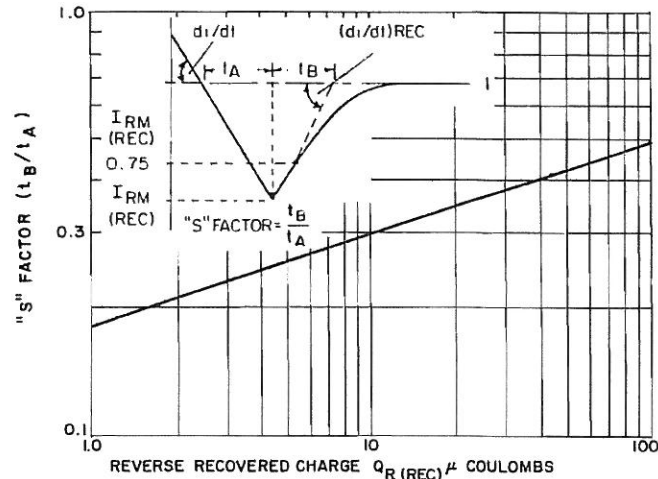
6. MAXIMUM ALLOWABLE PEAK FORWARD CURRENT, TRAPEZOIDAL WAVEFORM  
( $T_C = 90^\circ\text{C}$ ),  $DI/DT$   
(RISING & FALLING) = 100 A/ $\mu\text{S}$

# DEVICE SPECIFICATIONS

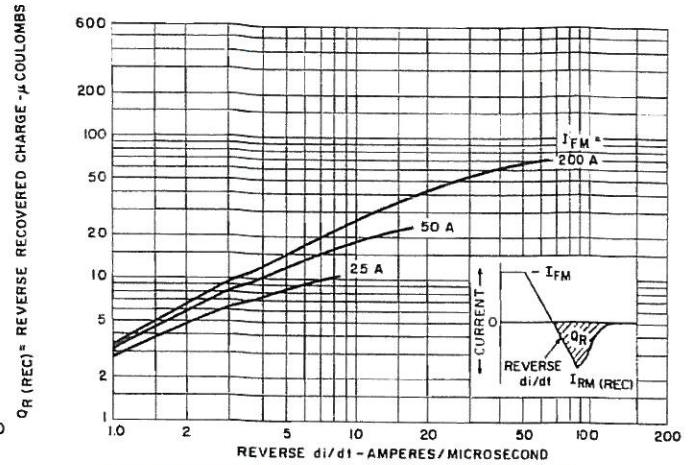
A177



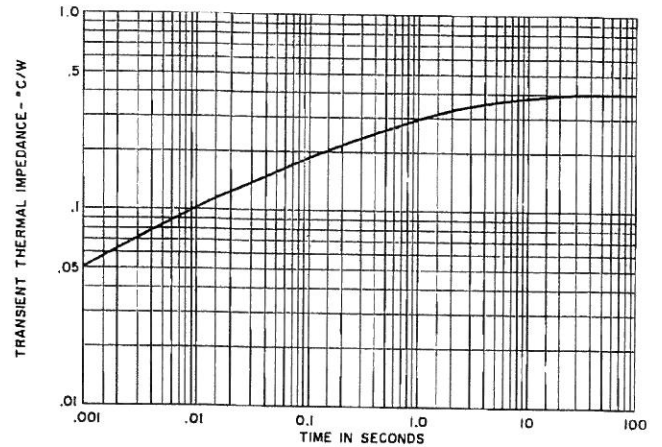
7. TRAPEZOIDAL PULSE ENERGY  
DI/DT (RISING & FALLING) = 100 A/ $\mu$ S



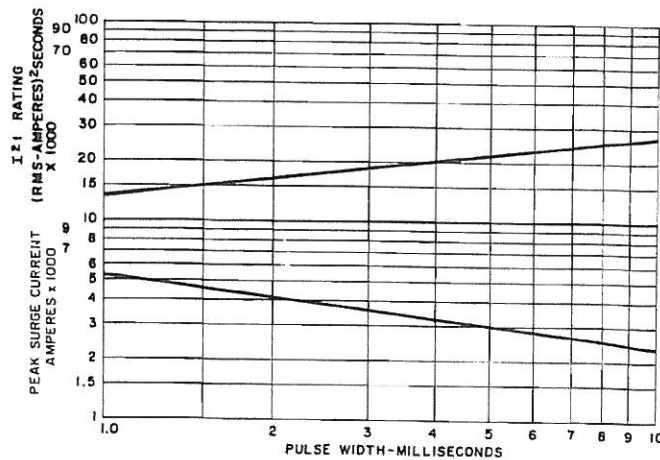
9. TYPICAL "S" FACTOR VERSUS REVERSE RECOVERED CHARGE ( $T_J = 125^\circ\text{C}$ )



8. RECOVERED CHARGE ( $T_J = 125^\circ\text{C}$ )  
(Maximum Recovered Charge Group 12)  
If maximum recovered charge group 12 is required, request A177 X9, e.g. A177BX9, A177RBX9, etc.

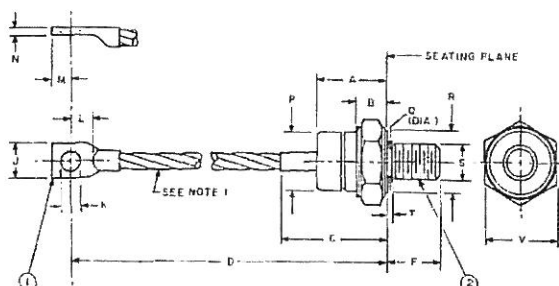


10. TRANSIENT THERMAL IMPEDANCE - JUNCTION-TO-CASE



11. SUB-CYCLE SURGE FORWARD CURRENT AND  $I^2t$  RATING VERSUS PULSE TIME FOLLOWING RATED LOAD CONDITIONS

## OUTLINE DRAWING



| MODEL                        | TERMINAL 1 | TERMINAL 2 | S<br>THREAD<br>SIZE | F<br>THREAD<br>LENGTH | Q<br>RELIEF<br>DIAMETER |
|------------------------------|------------|------------|---------------------|-----------------------|-------------------------|
| A177<br>FORWARD<br>POLARITY  | ANODE      | CATHODE    | 3/8 - 24            | .640<br>.610 IN.      | .373<br>.344 IN.        |
| A177R<br>REVERSE<br>POLARITY | CATHODE    | ANODE      | UNF - 2A            | 16.26<br>15.49 MM     | 9.47<br>8.74 MM         |

TABLE OF DIMENSIONS  
Conversion Table

| SYM. | DECIMAL INCHES |       | METRIC MM. |        | NOTES |
|------|----------------|-------|------------|--------|-------|
|      | MIN.           | MAX.  | MIN.       | MAX.   |       |
| A    | 1.020          | 1.140 | 25.90      | 28.96  |       |
| B    | .390           | .500  | 9.90       | 12.70  |       |
| C    | 1.570          | 1.750 | 39.87      | 44.45  |       |
| D    | 4.345          | 4.745 | 110.36     | 120.52 |       |
| J    | .500           | .625  | 12.70      | 15.20  |       |
| K    | .259           | .281  | 6.57       | 7.14   |       |
| L    | .320           | —     | 8.12       | —      |       |
| M    | .280           | .320  | 7.11       | 8.13   |       |
| N    | .060           | .090  | 1.52       | 2.29   |       |
| P    | .840           | .910  | 21.33      | 23.11  |       |
| R    | .920           | —     | 23.36      | —      | 3     |
| T    | —              | .060  | —          | 1.52   | 4     |
| V    | 1.052          | 1.063 | 26.72      | 27.00  |       |

### NOTES:

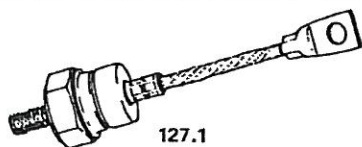
1. Flexible Copper Lead, 3/16 Inch Nominal Diameter.
2. One Nut and One Lockwasher Supplied With Each Unit. Material of Hardware is Steel Cad Plated.
3. "R" Dimension is Diameter of Effective Seating Area.
4. "T" Dimension is Area of Unthreaded Portion. Complete Threads are Within 2.5 Threads of Seating Plane.
5. Angular Orientation of Terminals is Undefined.
6. Approximate Weight: 105 Grams.

## MOUNTING INSTRUCTIONS

Following these installation instructions will result in a rectifier diode-to-heatsink contact thermal resistance of 0.10°C/watt or less.

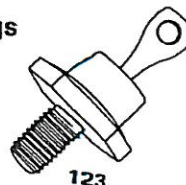
1. Be sure mounting surface is clean and flat within .001 inch/inch.
2. Mounting hole diameter should not exceed the outside diameter of the rectifier diode stud by more than 1/16 inch, and should be deburred.
3. Use Dow Corning's DC3, 4, 340 or 640 or GE G322L or equivalent, on mounting surfaces that 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 100 lb-in max.

## 5.2 Condensed Electrical and Thermal Characteristics and Ratings



127.1

### RECTIFIERS 20 TO 100 AMPERES



123



128

|            |     |      |           |             |      |
|------------|-----|------|-----------|-------------|------|
| JEDEC TYPE | —   | —    | 1N3289-96 | 1N3289A-96A | —    |
| GE TYPE    | A44 | A139 | —         | A170        | A177 |

#### SPECIFICATIONS

|                                                 |                                                                               |                      |                |            |            |            |            |
|-------------------------------------------------|-------------------------------------------------------------------------------|----------------------|----------------|------------|------------|------------|------------|
|                                                 | Max. average forward (1 phase operation)                                      |                      | 20             | 25         | 100        | 100        | 100        |
| I <sub>FM(AV)</sub>                             | T <sub>C</sub> = (°C)                                                         |                      | 110            | 75         | 130        | 130        | 65         |
| V <sub>RM</sub> (Rep)                           | Max. repetitive peak reverse voltage (V)                                      |                      | 50-600         | 50-1000    | 200-1200   | 100-1500   | 100-1500   |
| I <sub>FM</sub><br>(Surge)                      | Max. peak one cycle, non-recurrent surge current (1 phase operation) 50 Hz.   |                      | 270            | 360        | 1440       | 2250       | 2250       |
|                                                 | @ max. rated load conditions (A) 60 Hz.                                       |                      | 300            | 400        | 1600       | 2500       | 2500       |
| I <sup>2</sup> <sub>t</sub>                     | Max. non-repetitive for 1.5 msec (A <sup>2</sup> sec)                         |                      | 100            | 500        | 4000       | 5500       | 15000      |
| T <sub>J</sub>                                  | Operation junction temperature range (°C)                                     |                      | -65 to 175     | -40 to 125 | -40 to 200 | -40 to 200 | -40 to 125 |
| R <sub>θJC</sub>                                | Max. thermal resistance, junction-to-case (°C/W)                              |                      | 1.5<br>TYPICAL | 1.0        | .4         | .4         | .4         |
| V <sub>FM</sub>                                 | Max. peak forward voltage drop @ rated I <sub>F(AV)</sub> (1 phase operation) |                      | 1.0<br>TYPICAL | 1.0        | 1.4        | 1.3        | 1.3        |
|                                                 | @ T <sub>C</sub> = (°C)                                                       |                      | 25             | 75         | 25         | 130        | 25         |
| Q <sub>R(REC)</sub>                             | Reverse recovered charge @ rated T <sub>J</sub> (μc)                          |                      | —              | —          | —          | —          | 50         |
| t <sub>rr</sub>                                 | Reverse recovery time @ rated T <sub>J</sub> (μs)                             |                      | —              | 0.5        | —          | —          | 2.3        |
| V <sub>F</sub>                                  | Max. forward <sup>(1)</sup> voltage drop for the current range:               | I <sub>MIN</sub> (A) | .2             | .8         | 2          | 1          | 3          |
|                                                 |                                                                               | I <sub>MAX</sub> (A) | 200            | 800        | 2000       | 1000       | 3000       |
|                                                 |                                                                               | A                    | .38            | .6702      | .4283      | .4290      | .4405      |
|                                                 |                                                                               | B                    | .0352          | -.0094     | -.0099     | .1008      | .1163      |
|                                                 |                                                                               | C                    | .0082          | -.0008     | .0002      | .0011      | .0007      |
|                                                 |                                                                               | D                    | .0559          | .1434      | -.0553     | -.0008     | .0172      |
| R <sub>θJC</sub>                                | Transient thermal <sup>(2)</sup> resistance for time:                         | T <sub>MIN</sub> (S) | —              | —          | .001       | .001       | .001       |
|                                                 |                                                                               | T <sub>MAX</sub> (S) | —              | —          | .01        | .01        | .01        |
|                                                 |                                                                               | F                    | —              | —          | .4         | .4         | .4         |
|                                                 |                                                                               | G                    | —              | —          | .3         | .3         | .3         |
| Package Outline No.                             |                                                                               |                      | 126            | 123        | 127.1      | 127.1      | 127.1      |
| Maximum Stud Torque (In-Lbs/N-M)                |                                                                               |                      | —              | 30/3.39    | 100/11.3   | 100/11.3   | 100/11.3   |
| Expanded Electrical Characterization, see page: |                                                                               |                      | N.A.           | N.A.       | N.A.       | N.A.       | N.A.       |

<sup>(1)</sup>Voltage Drop Model:  $V_F = A + B \cdot L_N(I) + CI + D\sqrt{I}$

<sup>(2)</sup>Transient Thermal Resistance Model:  $R_{\theta JC} = F \cdot t^G$