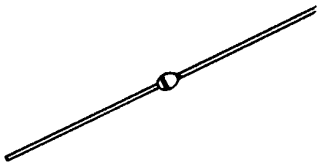
# Passivated Rectifier

## TRANSIENT VOLTAGE PROTECTED
2.5 Amps 200-1000 Volts

**A14 SERIES**
**1N5059**
**1N5060**
**1N5061**
**1N5062**
**A14P**

THE GENERAL ELECTRIC A14 IS A 2.5 AMPERE RATED, AXIAL-LEADED GENERAL PURPOSE RECTIFIER. DUAL HEATSINK CONSTRUCTION PROVIDES RIGID MECHANICAL SUPPORT FOR THE PELLET AND EXCELLENT THERMAL CHARACTERISTICS. PASSIVATION AND PROTECTION OF THE SILICON PELLETS PN JUNCTION ARE PROVIDED BY SOLID GLASS; NO ORGANIC MATERIALS ARE PRESENT WITHIN THE HERMETICALLY SEALED PACKAGE.

The A14 is "Transient-Voltage Protected." This device will dissipate up to 1000 watts in the reverse direction without damage. Voltage Transients generated by household or industrial power lines are dissipated.



## absolute maximum ratings: (25°C unless otherwise specified)

| | 1N5059 (A14B) | 1N5060 (A14D) | 1N5061 (A14M) | 1N5062 (A14N) | A14P | |
|---|---|---|---|---|---|---|
| *Reverse Voltage (−65°C to +175°C, $T_J$) (−65°C to +165°C for 1N5062 and A14P) | | | | | | |
| Working Peak, $V_{RWM}$ | 200 | 400 | 600 | 800 | 1000 | Volts |
| DC, $V_R$ | 200 | 400 | 600 | 800 | 1000 | Volts |
| *Average Forward Current, $I_O$ | | | | | | |
| *100°C Ambient (90°C for 1N5062 and A14P) | ← | | 1.0 | | → | Amp |
| 25°C Ambient (See Rating Curves) | ← | | 2.5 | | → | Amp |
| *Peak Surge Forward Current, $I_{FSM}$ Non-repetitive, .0083 sec., half sine wave, | | | | | | |
| Full Load JEDEC Method | ← | | 50 | | → | Amps |
| No Load (25°C Case) | ← | | 65 | | → | Amps |
| Peak Surge Forward Current, $I_{FSM}$ Non-repetitive, .001 sec., half sine wave, | | | | | | |
| Full Load | ← | | 90 | | → | Amps |
| No Load (25°C Case) | ← | | 100 | | → | Amps |
| *Junction Operating and Storage Temperature Range, $T_J$ & $T_{STG}$ | ← | −65 to +175 | → | ← | −65 to +165 | → °C |
| $I^2t$, RMS (for fusing), .001 to .01 sec. | ← | | 4.0 | | → | $Amps^2$ sec. |
| Maximum Avalanche Voltage | ← | | 1600 | | → | Volts |
| Peak Non-repetitive Reverse Power Rating, $P_{RM}$ 20 μsec., half sine wave, at Max. $T_J$ | ← | | 1000 | | → | Watts |
| *100 μsec., JEDEC | ← | | 450 | | → | Watts |

*Mounting: Any position. Lead Temperature 290°C maximum to ⅛ inch from body for 5 seconds maximum during mounting.

## electrical characteristics: (25°C unless otherwise specified)

| | | | | | | |
|---|---|---|---|---|---|---|
| *Maximum Forward Voltage Drop, $V_F$, 1A, $T_J$ = 75°C | ← | | 1.2 | | → | Volts |
| Maximum Reverse Current, $I_R$, at Rated $V_{RRM}$: | | | | | | |
| $T_J$ = 25°C | ← | | 5.0 | | → | μA |
| *$T_J$ = 165°C | — | — | — | 200 | 200 | μA |
| *$T_J$ = 175°C | 300 | 300 | 200 | — | — | μA |
| Typical Reverse Current, $I_R$, at Rated $V_{RRM}$ | ← | | 1.0 | | → | μA |
| Typical Reverse Current, $I_R$ | | | | | | |
| $T_J$ = 25°C | 0.2 | 0.2 | 0.3 | 0.5 | 0.5 | μA |
| $T_J$ = 100°C | 20 | 20 | 20 | 30 | 30 | μA |
| Typical Reverse Recovery Time, $T_{RR}$ | ← | | 3 | | → | μsec. |
| Maximum Reverse Recovery Time, $T_{RR}$ | ← | | 6 | | → | μsec. |

Recovery circuit per MIL-S-19500/286C.

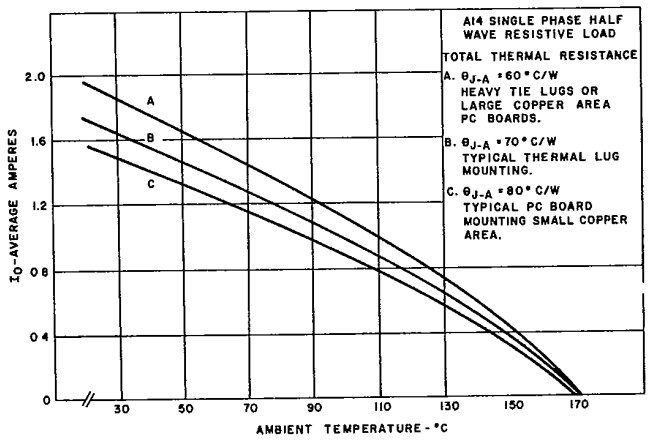
290 1N5059-1

*JEDEC Registered data.

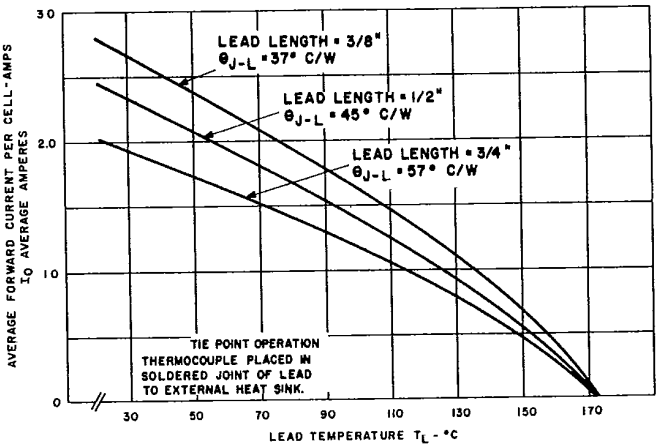
| 1N5059 |
|---|
| 1N5060 |
| 1N5061 |
| 1N5062 |
| A14P |

# MAXIMUM ALLOWABLE DC OUTPUT CURRENT RATINGS

## SINGLE PHASE
## 600 VOLTS & BELOW

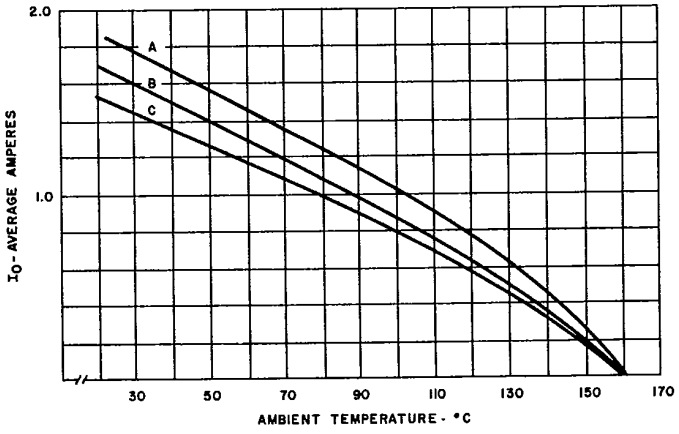



AMBIENT OPERATION

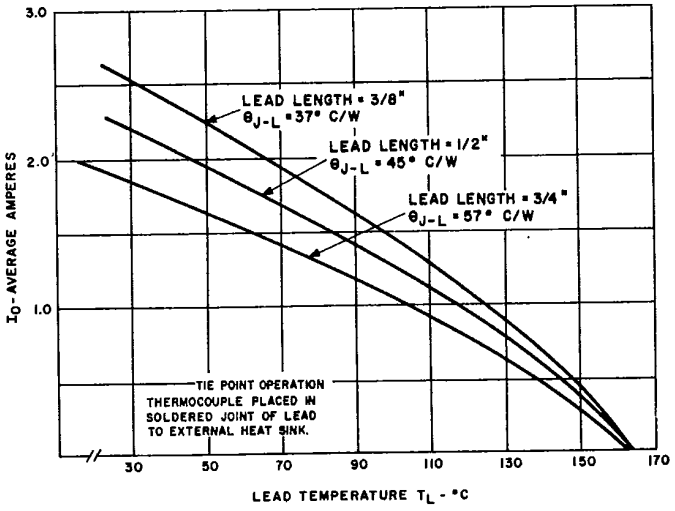



TIE POINT OPERATION

## RESISTIVE OR INDUCTIVE LOAD
## 800 AND 1000 VOLTS

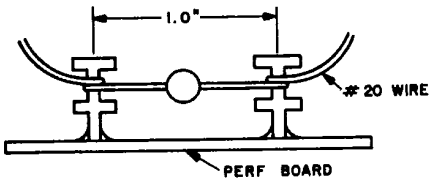



AMBIENT OPERATION

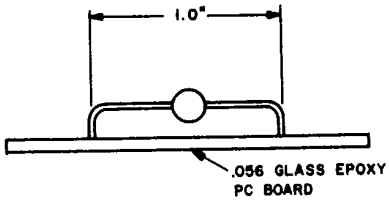



TIE POINT OPERATION

### TYPICAL TIE LUG MOUNTS

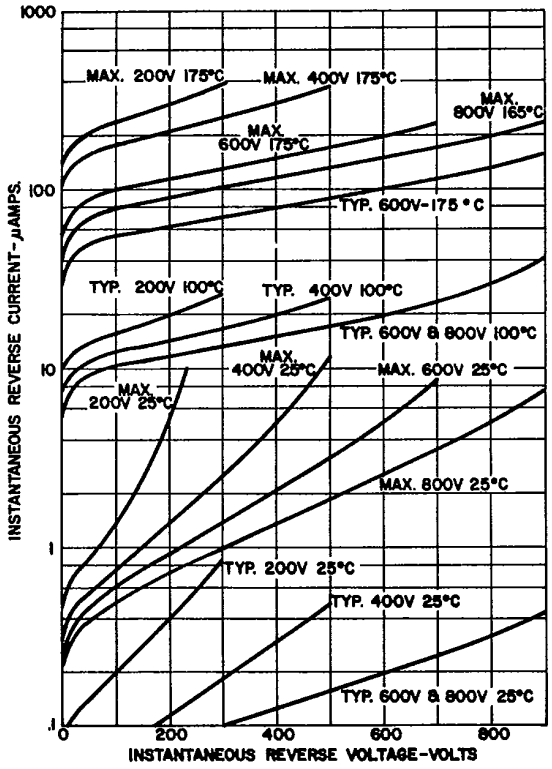



### TYPICAL PC BOARD MOUNTING

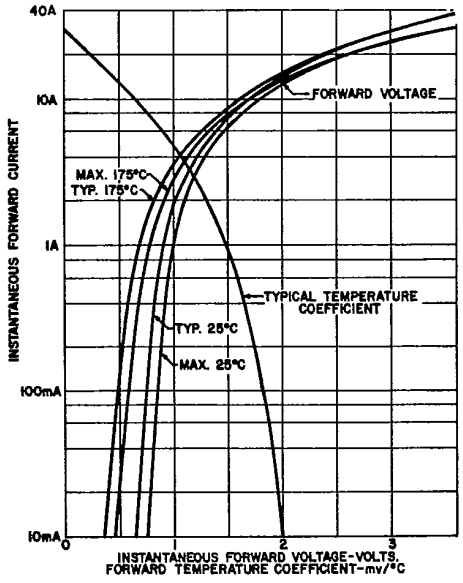


| 1N5059 |
|---|
| 1N5060 |
| 1N5061 |
| 1N5062 |
| A14P |

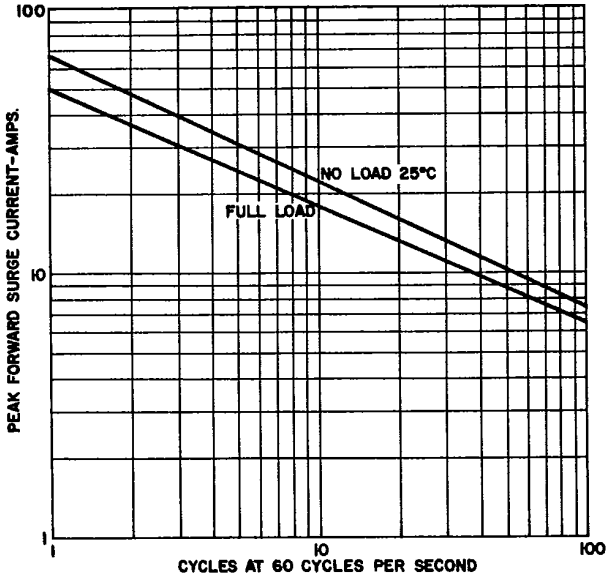
## TYPICAL CHARACTERISTICS



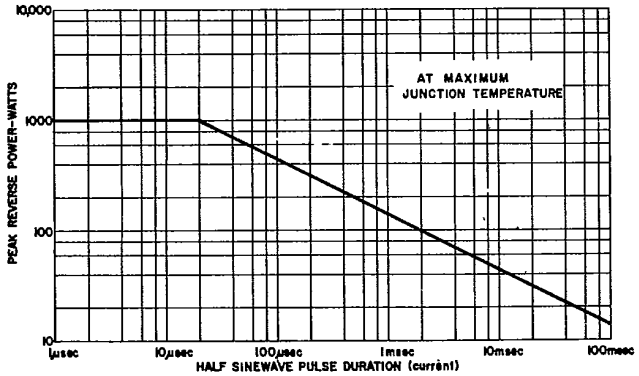

REVERSE CHARACTERISTICS AT SELECTED JUNCTION TEMPERATURES




FORWARD CHARACTERISTICS




MAXIMUM NON-REPETITIVE MULTICYCLE FORWARD SURGE CURRENT




MAXIMUM NON-REPETITIVE AVALANCHE SURGE POWER

1N5059-3

| 1N5059 |
|---|
| 1N5060 |
| 1N5061 |
| 1N5062 |
| A14P |

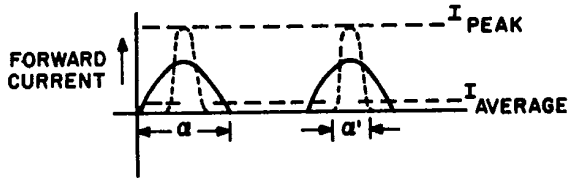
## CAPACITIVE LOADS

**Current Derating (capacitive load)**
Average forward current as specified under MAXIMUM RATINGS page 1 and derating curves for high temperature operation page 2, must be corrected for applications with capacitive loads. As the current conduction angle, $\alpha'$, is decreased, the peak current required to maintain the *same average current* increases, i.e., the peak-to-average current ratio increases from 3.14. Figure 9 gives the derating required based on this increase in peak to average current ratio for sine wave operation. For more complete information consult Application Note 200.30.

METHOD:
1. Determine conduction angle $\alpha'$ in degrees for *particular circuit as designed.*
2. Enter Figure 9 for the particular conduction angle and read corresponding percent of forward current per cell.
3. Multiply this value times average forward current for resistive load from figures on page 2 as given for the actual ambient or tiepoint temperature required.

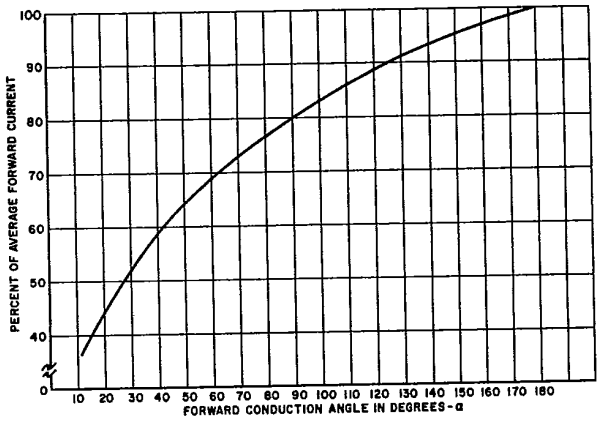
**TYPICAL EXAMPLES (25°C Ambient Temperature)**

| | Example No. 1 | Example No. 2 | Example No. 3 | Example No. 4 | Units |
|---|---|---|---|---|---|
| Input Voltage | 100 | 100 | 300 | 300 | Volts |
| D.C. (Average) Output Voltage | 34 | 75 | 180 | 270 | Volts |
| Surge Resistor | 1 | 1 | 3.5 | 3.5 | Ohms |
| Load Current | 0.5 | 0.5 | 0.5 | 0.5 | Amps. |
| Input Filter Capacitance | 30 | 100 | 30 | 100 | μF. |
| Conduction Angle | 170 | 70 | 90 | 50 | Degrees |
| Rated Average Current (Resistive Load) | 1 | 1 | 1 | 1 | Amp. |
| Rated Average Current (Capacitive Load) | 0.98 | 0.73 | 0.80 | 0.65 | Amp. |




α = CONDUCTION ANGLE (180°)
α' = SHORTENED CONDUCTION ANGLE

**OSCILLOSCOPE PRESENTATION**

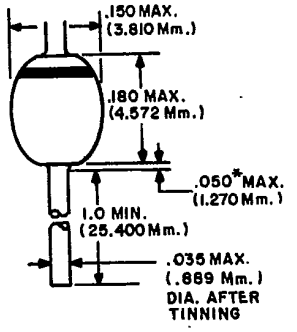



**9. DERATING FOR SHORTENED CONDUCTION ANGLE**

## INTERNAL CONSTRUCTION

1. Dual heatsink design for maximum heat dissipation under both surge and continuous duty. No fragile "whiskers" or S leads with their potential trouble spots.
2. Glass Package. No internal cavity to act as potential source of moisture or contamination on junction. Temperature coefficient of the glass is matched with the internal parts.
3. Diffused silicon junction passivated surface.

**Marking band to appear on cathode end.**




OUTLINE DRAWING

ALL DIMENTIONS ARE IN INCHES AND (METRIC)
*WELD AND SOLDER FLASH NOT CONTROLLED IN THIS AREA

## TYPICAL APPLICATIONS

- FREE-WHEELING RECTIFIERS
- TIME DELAY CIRCUITS
- POWER LOGIC CIRCUITS
- ARC SUPPRESSION
- BATTERY CHARGERS
- TV DAMPER DIODES
- TV AND RADIO POWER SUPPLIES
- COMMUNICATION EQUIPMENT
- S.C.R. TRIGGER CIRCUITS
- SMALL PORTABLE APPLIANCES
- GENERAL PURPOSE POWER SUPPLIES
- LOW LEVEL LIMITERS

littlediode
COMPONENTS FOR ALL

Littlediode supplies new, hard to find or obsolete electronic components and semiconductors all over the world.

With over two million different components listed you are sure to find the part you need.

Feel free to visit us today at our online store:

**LittleDiode.com**

Looking forward to providing you with the best possible service.