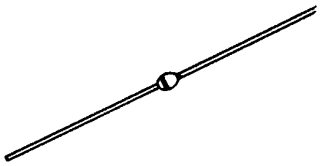
Passivated Rectifier

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.

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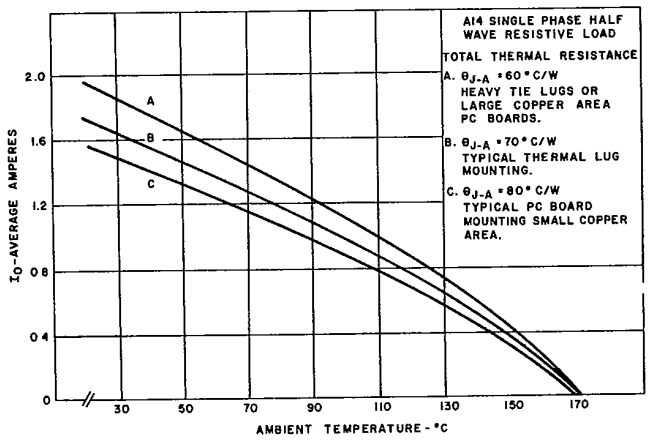
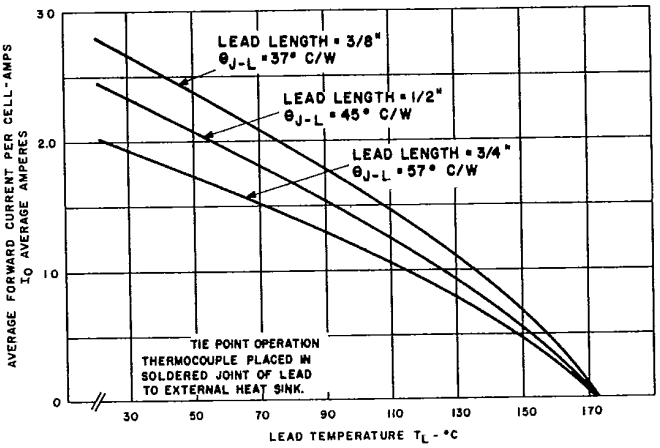
A14P

MAXIMUM ALLOWABLE DC OUTPUT CURRENT RATINGS

SINGLE PHASE
600 VOLTS & BELOW

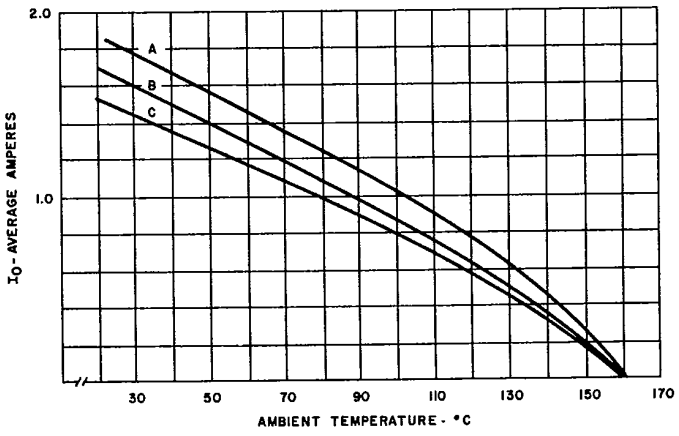


AMBIENT OPERATION

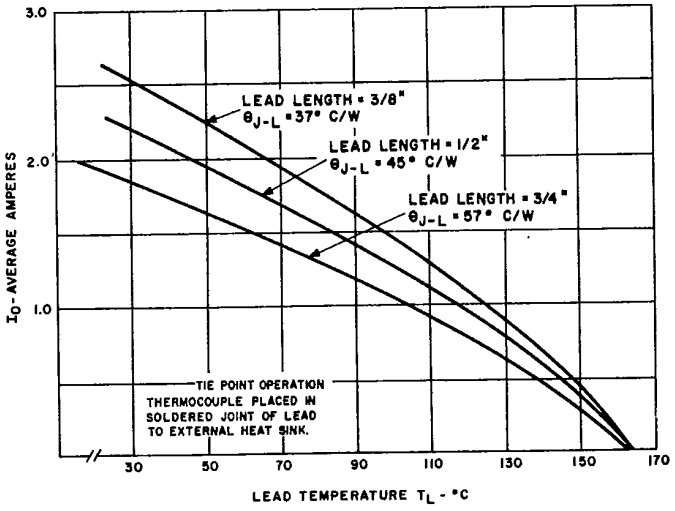


TIE POINT OPERATION

RESISTIVE OR INDUCTIVE LOAD
800 AND 1000 VOLTS

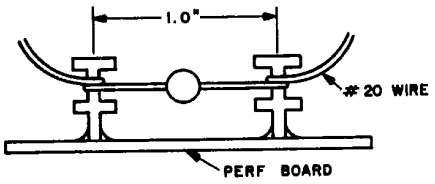


AMBIENT OPERATION

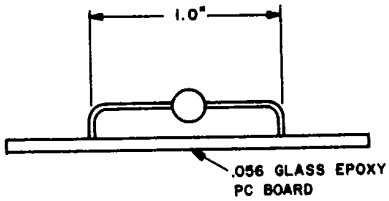


TIE POINT OPERATION

TYPICAL TIE LUG MOUNTS



TYPICAL PC BOARD MOUNTING



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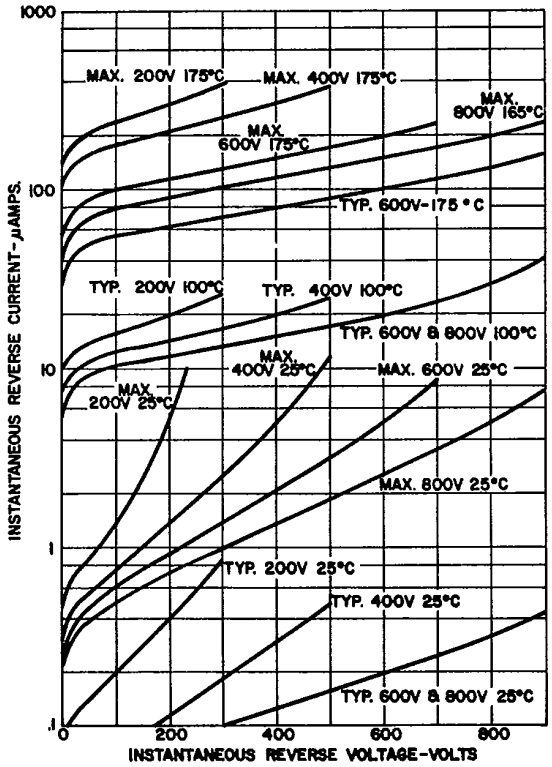
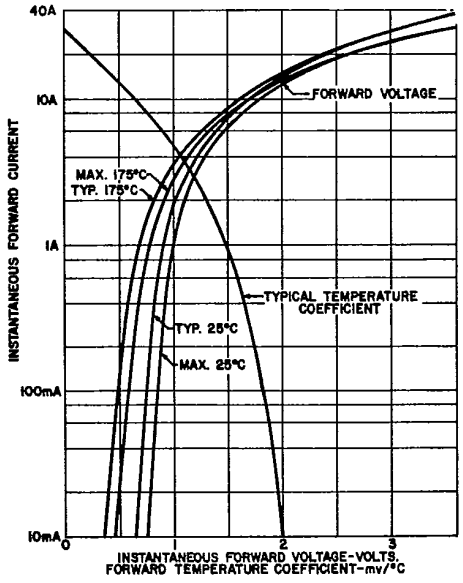
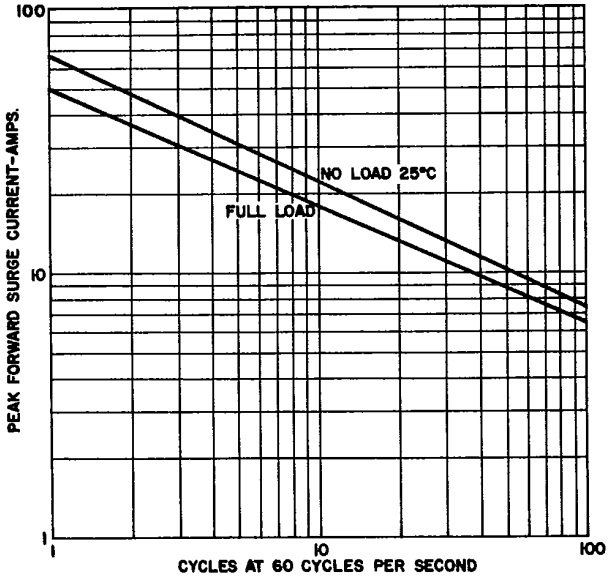
TYPICAL CHARACTERISTICS



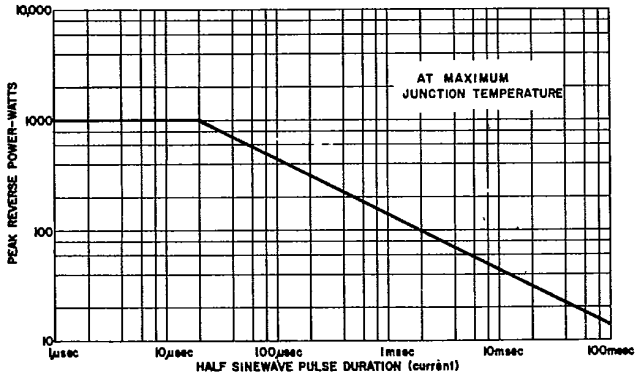
REVERSE CHARACTERISTICS AT SELECTED JUNCTION TEMPERATURES



FORWARD CHARACTERISTICS



MAXIMUM NON-REPETITIVE MULTICYCLE FORWARD SURGE CURRENT



MAXIMUM NON-REPETITIVE AVALANCHE SURGE POWER

1N5059-3

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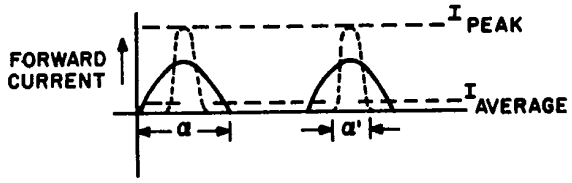
CAPACITIVE LOADS

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, α', 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 α' 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.

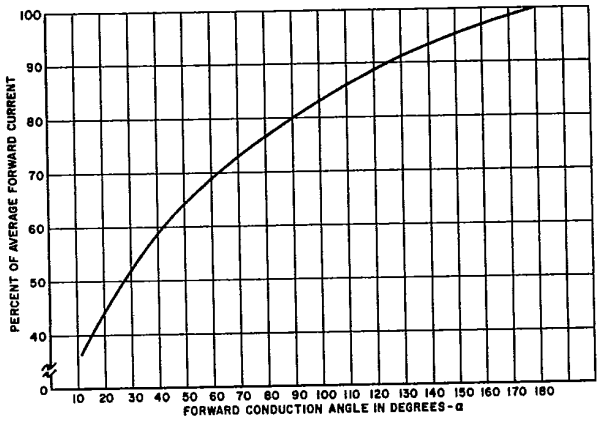
TYPICAL EXAMPLES (25°C Ambient Temperature)

	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

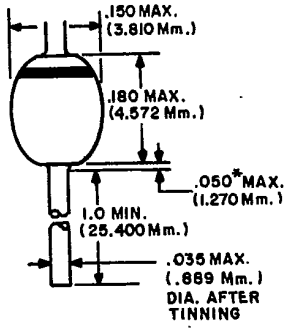


9. DERATING FOR SHORTENED CONDUCTION ANGLE

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