AMP-TRAP®–Form 101

# A13X

## SEMICONDUCTOR PROTECTION FUSES


A13X Amp-trap® Form 101 Semiconductor Protection fuses were designed for the specific protection of diodes and other semiconductor devices rated 130VAC or less. A13X fuses are very small for their ampere ratings, especially the hockey-puck type in the higher ampere ratings.

### Features/Benefits

- **Low $I^2t$** minimizes damage to protected components on short circuit
- **Controlled arc voltage** reduces stress to circuit components during fuse clearing
- **Choice of mounting types** helps in equipment design

### Ratings

- **AC:** 1-6000A 130VAC, 8kA I.R.
- **DC:** 70-2000A 100VDC,10kA I.R. 2500-3000A 100VDC, 20kA I.R. L/R=10ms

### Approvals

- UL Recognized Component
- AC: Guide No. JFHR2 (1-25A, 70-2000A)
- DC Tested to UL Standard198L parameters (70-3000A)

### HIGHLIGHTS:

- Fast Acting
- Current Limiting
- Low $I^2t$
- Indicator Options Available

### APPLICATIONS:

- Protection of heavy duty devices such as electrochemical rectifiers

### Catalog Numbering System

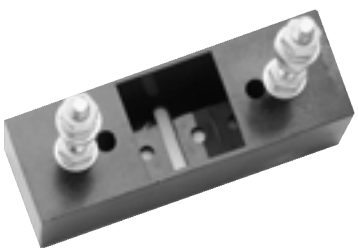
A 13 X 400 - 4 TI

| | |
|---|---|
| **Amp-trap® Fuse** | **A** |
| **Rated Volts - 130** | **13** |
| **Style** | **X** |
| **Amperes*** | **400** |
| **Mounting Types*** | |
| Ferrule | **1** |
| Ferrule, midget dims. (1-1/2" x 13/32") | **2** |
| Blades, bolt-in | **4** |
| Hockey puck, bolt-in | **128** |
| **Integral Blown-Fuse Indicator** | |
| Trigger Indicator | **TI** |
| Trigger Actuator | **TA** |

* For ampere ratings and types not listed, consult the factory.

### Single Pole Fuse Blocks for A13X Fuses

| FUSE AMPERE RATING | FUSE BLOCK CATALOG NUMBER |
|---|---|
| 1-30 | 30311 |
| 31-60 | 60306J |
| 61-100 | P243D |
| 101-200 | P243D |
| 201-450 | P243D |
| 500-600 | P243G |



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## Standard Fuse Ampere Ratings, Catalog Numbers

| AMPERE RATING | CATALOG NUMBER | OUTLINE FIG. | AMPERE RATING | CATALOG NUMBER | OUTLINE FIG. | AMPERE RATING | CATALOG NUMBER | OUTLINE FIG. | AMPERE RATING | CATALOG NUMBER | OUTLINE FIG. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | A13X1-2 | 1 | 60 | A13X60-1 | 1 | 350 | A13X350-4TI | 2 | 2000 | A13X2000-128TA | 5 |
| 2 | A13X2-2 | 1 | 70 | A13X70-4 | 2 | 400 | A13X400-4 | 2 | 2500 | A13X2500-128 | 4 |
| 3 | A13X3-2 | 1 | 70 | A13X70-4TI | 2 | 400 | A13X400-4TA | 3 | 2500 | A13X2500-128TA | 5 |
| 4 | A13X4-2 | 1 | 80 | 4A13X80-4 | 2 | 400 | A13X400-4TI | 2 | 3000 | A13X3000-128 | 4 |
| 5 | A13X5-2 | 1 | 80 | 4A13X80-4TI | 2 | 450 | A13X450-4 | 2 | 3000 | A13X3000-128TA | 5 |
| 6 | A13X6-2 | 1 | 90 | A13X90-4 | 2 | 450 | A13X450-4TA | 3 | 3500 | A13X3500-128 | 6 |
| 7 | A13X7-2 | 1 | 100 | A13X100-4 | 2 | 500 | A13X500-4 | 2 | 4000 | A13X4000-128 | 6 |
| 8 | A13X8-2 | 1 | 100 | A13X100-4TI | 2 | 500 | A13X500-4TA | 3 | 4000 | A13X4000-128TA | 7 |
| 10 | A13X10-2 | 1 | 130 | A13X130-4 | 2 | 600 | A13X600-4 | 2 | 5000 | A13X5000-128 | 8 |
| 12 | A13X12-2 | 1 | 130 | A13X130-4TI | 2 | 800 | A13X600-4TA | 3 | 6000 | A13X6000-128 | 8 |
| 15 | A13X15-2 | 1 | 150 | A13X150-4 | 2 | 800 | A13X800-4 | 2 | | | |
| 20 | A13X20-2 | 1 | 150 | A13X150-4TA | 3 | 1000 | A13X1000-4 | 2 | | | |
| 25 | A13X25-2 | 1 | 150 | A13X150-4TI | 2 | 1000 | A13X1000-4TA | 3 | | | |
| 30 | A13X30-2 | 1 | 200 | A13X200-4 | 2 | 1000 | A13X1000-4TI | 2 | | | |
| 35 | A13X35-1 | 1 | 200 | A13X200-4TA | 3 | 1000 | A13X1000-128 | 4 | | | |
| 40 | A13X40-1 | 1 | 250 | A13X250-4 | 2 | 1000 | A13X1000-128TA | 5 | | | |
| 40 | A13X40-4TI | 2 | 250 | A13X250-4TI | 2 | 1200 | A13X1200-128 | 4 | | | |
| 45 | A13X45-1 | 1 | 300 | A13X300-4 | 2 | 1200 | A13X1200-128TA | 5 | | | |
| 50 | A13X50-1 | 1 | 300 | A13X300-4TA | 3 | 1200 | A13X1500-128 | 4 | | | |
| 50 | A13X50-4 | 2 | 300 | A13X300-4TI | 2 | 1500 | A13X1500-128TA | 5 | | | |
| 55 | A13X55-1 | 1 | 350 | A13X350-4 | 2 | 2000 | A13X2000-128 | 4 | | | |

For ampere ratings and styles not listed, call Technical Services.

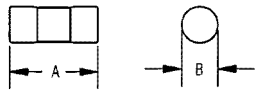


Figure 1

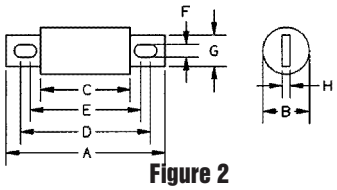


Figure 2

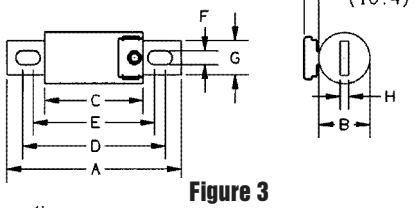


Figure 3

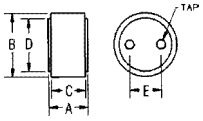


Figure 4

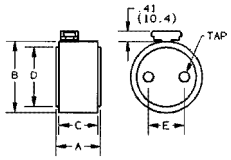


Figure 5

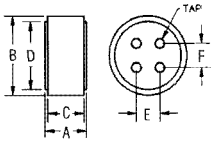


Figure 6

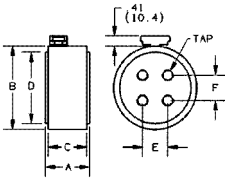


Figure 7

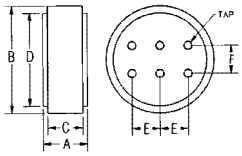


Figure 8

## Dimensions

| OUTLINE REF. | MOUNTING TYPE | FIG. | DIMENSIONS - INCHES (mm) | | | | | | | | TAP |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | A | B | C | D | E | F | G | H | |
| A13X1 to 30 | 2 | 1 | 1.50 | .41 | - | - | - | - | - | - | - |
| | | | (38.1) | (10.4) | - | - | - | - | - | - | - |
| A13X35 to 60 | 1 | 1 | 2.00 | .81 | - | - | - | - | - | - | - |
| | | | (50.8) | (20.6) | - | - | - | - | - | - | - |
| A13X70 to 450 | 4, 4TA* | 2, 3* | 2.66 | 1.13 | 1.16 | 2.19 | 1.91 | .31 | .88 | .19 | - |
| | | | (67.6) | (28.7) | (29.5) | (55.6) | (48.5) | (7.9) | (22.4) | (4.8) | - |
| A13X500 to 1000 | 4, 4TA* | 2, 3* | 3.50 | 1.50 | 1.25 | 2.56 | 1.94 | .41 | 1.00 | .25 | - |
| | | | (88.9) | (38.1) | (31.8) | (65.0) | (49.3) | (10.4) | (25.4) | (6.4) | - |
| A13X1000 to 2000 | 128 | 4 | 1.88 | 2.00 | 1.63 | 1.75 | 1.00 | - | - | - | 3/8-24-1/2 Deep |
| | | | (47.8) | (50.8) | (41.4) | (44.5) | (25.4) | - | - | - | - |
| A13X2500 to 3000 | 128, 128TA* | 4, 5* | 1.88 | 3.00 | 1.63 | 2.50 | 1.50 | - | - | - | 1/2-20-1/2 Deep |
| | | | (47.88) | (76.2) | (41.4) | (63.5) | (38.1) | - | - | - | - |
| A13X3500 to 4000 | 128, 128TA* | 6, 7* | 1.88 | 3.50 | 1.63 | 3.00 | 1.06 | 1.06 | - | - | 1/2-20-1/2 Deep |
| | | | (47.88) | (88.9) | (41.4) | (76.2) | (27.0) | (27.0) | - | - | - |
| A13X5000 to 6000 | 128 | 8 | 2.38 | 5.75 | 1.88 | 5.00 | 1.50 | 1.50 | - | - | 1/2-20-1/2 Deep |
| | | | (60.5) | (146) | (47.7) | (127) | (38.1) | (38.1) | - | - | - |

* Optional Trigger Actuator (TA)

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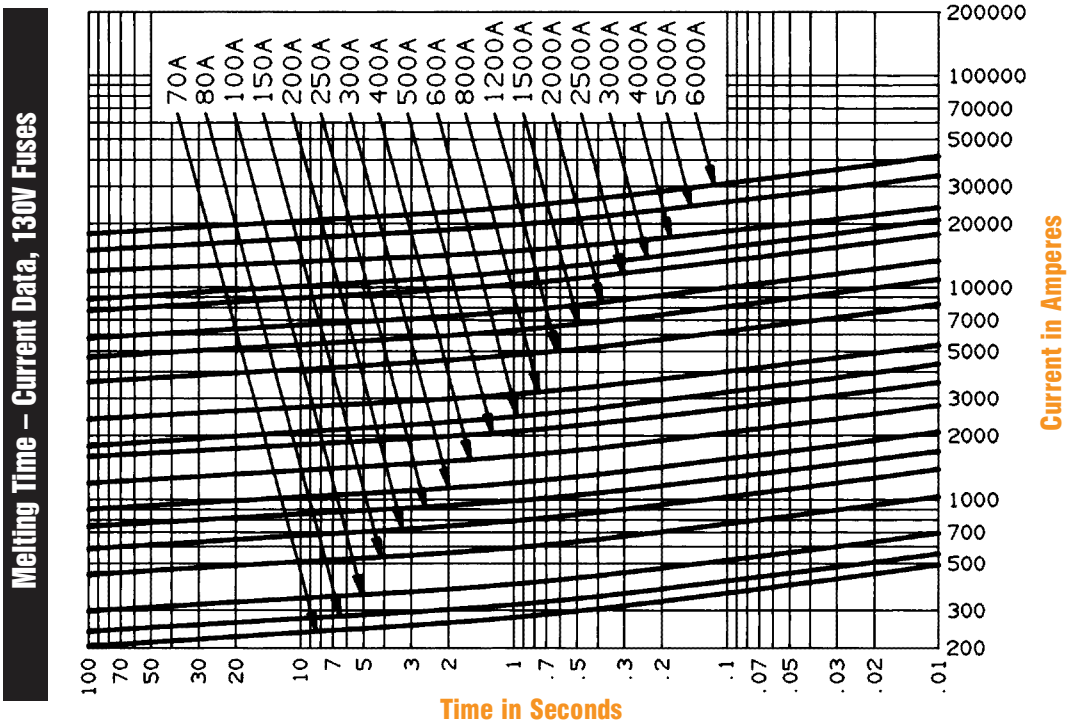
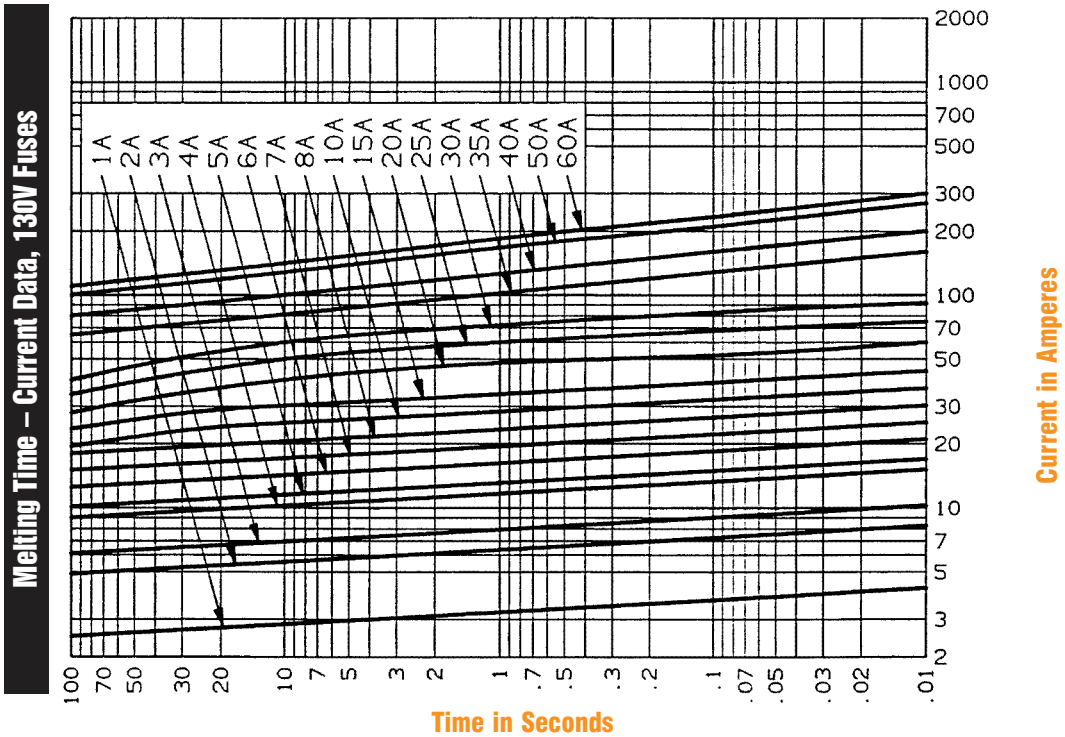
### A13X70 to 6000




### A13X1 TO 60



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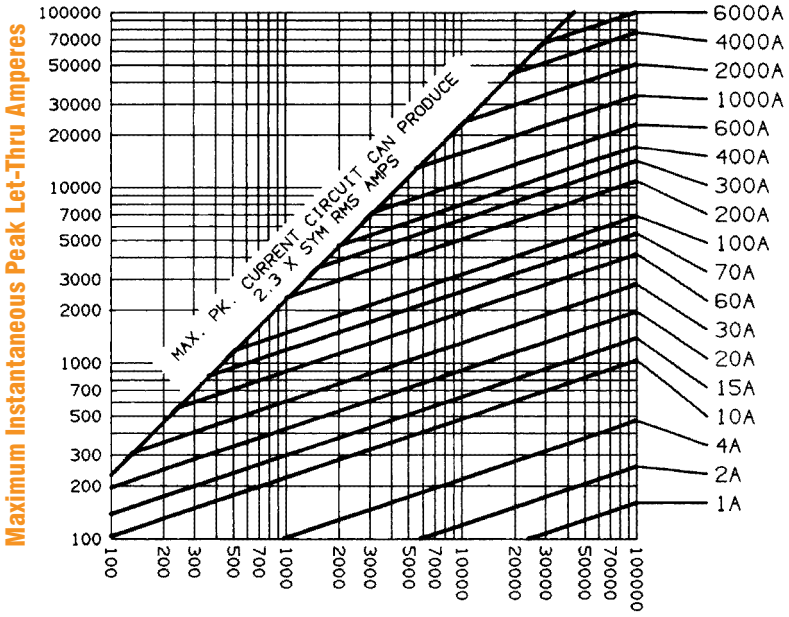
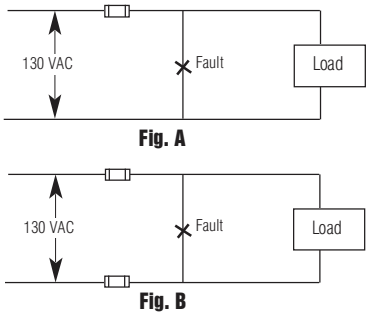
## Peak Let-Thru Current Data – A13X1 to 6000, 130 Volts AC

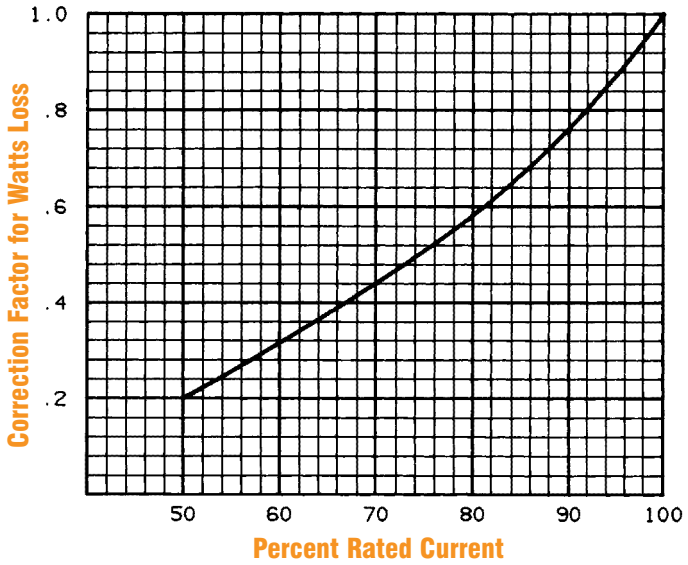



## Watts Loss at Rated Current

| AMPERE RATING | WATTS LOSS (W) | AMPERE RATING | WATTS LOSS (W) | AMPERE RATING | WATTS LOSS (W) |
|---|---|---|---|---|---|
| 70 | 2.7 | 350 | 18 | 2000 | 92 |
| 80 | 3.2 | 400 | 20 | 2500 | 116 |
| 90 | 3.9 | 450 | 23 | 3000 | 149 |
| 100 | 4.1 | 500 | 20 | 3500 | 178 |
| 130 | 5.8 | 600 | 26 | 4000 | 190 |
| 150 | 6.6 | 800 | 37 | 4500 | 240 |
| 200 | 9.1 | 1000 | 44 | 5000 | 280 |
| 250 | 12 | 1200 | 52 | 6000 | 356 |
| 300 | 15 | 1500 | 65 | | |

## Watts Loss Correction vs. Percent Rated Current




## $I^2t$ Data – 130 Volts AC

| FUSE AMPERE RATING | $I^2t$ DATA | | |
|---|---|---|---|
| | MELTING | CLEARING AT 130V | |
| | | 1 FUSE (FIG. A) | 2 FUSES IN SERIES (FIG. B) |
| | ($A^2s$) | ($A^2s$) | ($A^2s$) |
| 1 | .02 | .1 | .05 |
| 2 | .10 | .35 | .25 |
| 3 | .18 | .7 | .5 |
| 4 | .50 | 2 | 1.5 |
| 5 | .75 | 3 | 2 |
| 6 | 1.1 | 4 | 3 |
| 7 | 1.6 | 6 | 4 |
| 8 | 2.9 | 10 | 7 |
| 10 | 5.0 | 18 | 12 |
| 12 | 6.3 | 22 | 15 |
| 15 | 10 | 35 | 25 |
| 20 | 34 | 120 | 80 |
| 25 | 65 | 230 | 150 |
| 30 | 100 | 350 | 230 |
| 35 | 85 | 450 | 300 |
| 40 | 120 | 640 | 420 |
| 45 | 150 | 800 | 520 |
| 50 | 240 | 1,300 | 840 |
| 55 | 280 | 1,500 | 1,000 |
| 60 | 340 | 1,800 | 1,200 |
| 70 | 840 | 4,200 | 2,100 |
| 80 | 1,000 | 5,000 | 2,500 |
| 90 | 1,300 | 6,500 | 3,300 |
| 100 | 1,600 | 8,000 | 4,000 |
| 130 | 2,500 | 12,000 | 6,300 |
| 150 | 3,600 | 18,000 | 9,000 |
| 200 | 6,400 | 32,000 | 16,000 |
| 250 | 10,000 | 50,000 | 25,000 |
| 300 | 14,000 | 70,000 | 35,000 |
| 350 | 20,000 | 100,000 | 50,000 |
| 400 | 26,000 | 130,000 | 65,000 |
| 450 | 32,000 | 160,000 | 80,000 |
| 500 | 40,000 | 200,000 | 100,000 |
| 600 | 58,000 | 290,000 | 140,000 |
| 800 | 100,000 | 500,000 | 250,000 |
| 1,000 | 160,000 | 800,000 | 400,000 |
| 1,200 | 240,000 | 1,200,000 | 600,000 |
| 1,500 | 360,000 | 1,800,000 | 900,000 |
| 2,000 | 640,000 | 3,200,000 | 1,600,000 |
| 2,500 | 1,000,000 | 5,000,000 | 2,500,000 |
| 3,000 | 1,400,000 | 7,000,000 | 3,500,000 |
| 3,500 | 1,800,000 | 9,000,000 | 4,500,000 |
| 4,000 | 2,400,000 | 12,000,000 | 6,000,000 |
| 5,000 | 3,700,000 | 18,000,000 | 9,000,000 |
| 6,000 | 5,400,000 | 27,000,000 | 14,000,000 |

D