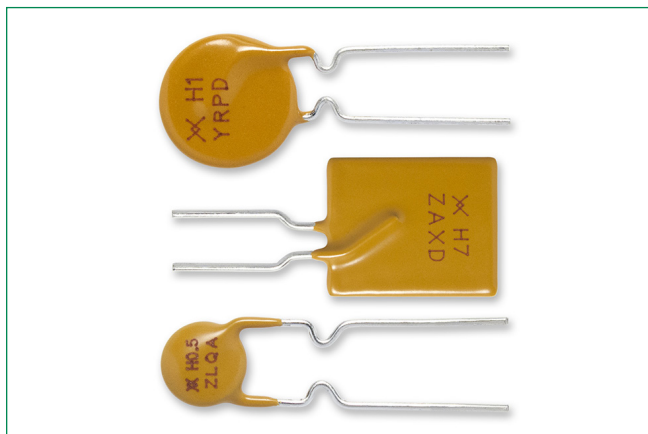


# RHEF Series

## Radial Leaded



### Description

Littelfuse PolySwitch radial-leaded devices represent the most comprehensive and complete set of PPTC products available in the industry today. RHEF series offers flatter thermal derating and operating temperatures up to 125°C.

### Features & Benefits

- Resettable and single-use overcurrent devices
- Wide range of form factor and termination methods
- Devices compatible with high-volume electronics assembly
- RoHS compliant, Lead-Free and Halogen-Free

### Additional Information



Resources



Accessories



Samples

### Agency Approvals

| Agency | Agency File Number |
|--------|--------------------|
|        | E74889             |
|        | 78165              |
|        | 72161789           |

### Applications

- Satellite video receivers
- Industrial controls
- Transformers
- Computer motherboards
- Modems
- USB hubs, ports and peripherals
- IEEE 1394 ports
- CD-ROMs
- Game machines
- Battery packs
- Phones
- Fax machines
- Analog and digital line cards
- Printers

### Electrical Characteristics

| Part Number                    | Ordering Part Number | I <sub>H</sub> | I <sub>T</sub> | V <sub>MAX</sub>   |                        | I <sub>MAX</sub>     |                       | P <sub>D</sub> Typ | Max Time-to-trip |     | R <sub>MIN</sub> | R <sub>MAX</sub> | R <sub>1MAX</sub> | Lead Size (mm <sup>2</sup> /AWG) |
|--------------------------------|----------------------|----------------|----------------|--------------------|------------------------|----------------------|-----------------------|--------------------|------------------|-----|------------------|------------------|-------------------|----------------------------------|
|                                |                      | (A)            | (A)            | (V <sub>DC</sub> ) | (V <sub>AC RMS</sub> ) | (DC <sub>ADC</sub> ) | (AC <sub>ARMS</sub> ) | (W)                | (A)              | (s) | (Ω)              | (Ω)              | (Ω)               |                                  |
| RHEF* – 30V - High Temperature |                      |                |                |                    |                        |                      |                       |                    |                  |     |                  |                  |                   |                                  |
| RHEF050                        | RF3295-000           | 0.5            | 0.9            | 30                 | —                      | 40                   | —                     | 0.9                | 2.5              | 2.5 | 0.480            | 0.780            | 1.10              | 0.205/24                         |
| RHEF070                        | RF3208-000           | 0.7            | 1.4            | 30                 | —                      | 40                   | —                     | 1.4                | 3.5              | 3.2 | 0.300            | 0.540            | 0.80              | 0.205/24                         |
| RHEF100                        | RF3300-000           | 1.0            | 1.8            | 30                 | —                      | 40                   | —                     | 1.4                | 5.0              | 5.2 | 0.180            | 0.300            | 0.43              | 0.205/24                         |

#### Notes:

$I_H$  : Hold current: maximum current device will pass without interruption in 20°C still air.  
 $I_T$  : Trip current: minimum current that will switch the device from low resistance to high resistance in 20°C still air.  
 $V_{MAX}$  : Maximum continuous voltage device can withstand without damage at rated current.  
 $I_{MAX}$  : Maximum fault current device can withstand without damage at rated voltage.  
 $P_D$  : Power dissipated from device when in the tripped state in 20°C still air.

$R_{MIN}$  : Minimum resistance of device as supplied at 20°C unless otherwise specified.  
 $R_{MAX}$  : Maximum resistance of device as supplied at 20°C unless otherwise specified.  
 $R_{1MAX}$  : Maximum resistance of device when measured one hour post reflow (surface-mount device) or one hour post trip (radial-leaded device) at 20°C unless otherwise specified.

\* Electrical characteristics determined at 25°C.

# RHEF Series

## Radial Leaded

### Electrical Characteristics (Cont'd)

| Part Number                    | Ordering Part Number | I <sub>H</sub> | I <sub>T</sub> | V <sub>MAX</sub>   |                        | I <sub>MAX</sub>     |                       | P <sub>D Typ</sub> | Max Time-to-trip |      | R <sub>MIN</sub> | R <sub>MAX</sub> | R <sub>1MAX</sub> | Lead Size<br>(mm <sup>2</sup> /<br>AWG) |
|--------------------------------|----------------------|----------------|----------------|--------------------|------------------------|----------------------|-----------------------|--------------------|------------------|------|------------------|------------------|-------------------|-----------------------------------------|
|                                |                      | (A)            | (A)            | (V <sub>DC</sub> ) | (V <sub>AC RMS</sub> ) | (DC <sub>ADC</sub> ) | (AC <sub>ARMS</sub> ) | (W)                | (A)              | (s)  | (Ω)              | (Ω)              | (Ω)               |                                         |
| RHEF* – 16V - High Temperature |                      |                |                |                    |                        |                      |                       |                    |                  |      |                  |                  |                   |                                         |
| RHEF200                        | RF3209-000           | 2.0            | 3.8            | 16                 | —                      | 100                  | —                     | 1.4                | 10.0             | 4.3  | 0.0450           | 0.07400          | 0.1100            | 0.205/24                                |
| RHEF300                        | RF3304-000           | 3.0            | 6.0            | 16                 | —                      | 100                  | —                     | 3.0                | 15.0             | 5.0  | 0.0330           | 0.05300          | 0.0790            | 0.520/20                                |
| RHEF400                        | RF3305-000           | 4.0            | 7.5            | 16                 | —                      | 100                  | —                     | 3.3                | 20.0             | 5.0  | 0.0240           | 0.04000          | 0.0600            | 0.520/20                                |
| RHEF450                        | RF3210-000           | 4.5            | 7.8            | 16                 | —                      | 100                  | —                     | 3.6                | 22.5             | 3.0  | 0.0220           | 0.03600          | 0.0540            | 0.520/20                                |
| RHEF550                        | RF3309-000           | 5.5            | 10.0           | 16                 | —                      | 100                  | —                     | 3.5                | 27.5             | 6.0  | 0.0150           | 0.02500          | 0.0370            | 0.520/20                                |
| RHEF600                        | RF3311-000           | 6.0            | 10.8           | 16                 | —                      | 100                  | —                     | 4.1                | 30.0             | 5.0  | 0.0130           | 0.02150          | 0.0320            | 0.520/20                                |
| RHEF650                        | RF3313-000           | 6.5            | 12.0           | 16                 | —                      | 100                  | —                     | 4.1                | 32.5             | 5.5  | 0.0110           | 0.01750          | 0.0260            | 0.520/20                                |
| RHEF700                        | RF3316-000           | 7.0            | 13.0           | 16                 | —                      | 100                  | —                     | 4.0                | 35.0             | 7.0  | 0.0100           | 0.01640          | 0.0250            | 0.520/20                                |
| RHEF750                        | RF3211-000           | 7.5            | 13.1           | 16                 | —                      | 100                  | —                     | 4.5                | 37.5             | 7.0  | 0.0094           | 0.01530          | 0.0220            | 0.520/20                                |
| RHEF800                        | RF3319-000           | 8.0            | 15.0           | 16                 | —                      | 100                  | —                     | 4.2                | 40.0             | 8.0  | 0.0080           | 0.01350          | 0.0200            | 0.520/20                                |
| RHEF900                        | RF3320-000           | 9.0            | 16.5           | 16                 | —                      | 100                  | —                     | 5.0                | 45.0             | 10.0 | 0.0074           | 0.01200          | 0.0170            | 0.520/20                                |
| RHEF1000                       | RF3321-000           | 10.0           | 18.5           | 16                 | —                      | 100                  | —                     | 5.3                | 50.0             | 9.0  | 0.0062           | 0.01050          | 0.0150            | 0.520/20                                |
| RHEF1100                       | RF3323-000           | 11.0           | 20.0           | 16                 | —                      | 100                  | —                     | 5.5                | 55.0             | 11.0 | 0.0055           | 0.00900          | 0.0130            | 0.520/20                                |
| RHEF1300                       | RF3324-000           | 13.0           | 24.0           | 16                 | —                      | 100                  | —                     | 6.9                | 65.0             | 13.0 | 0.0041           | 0.00690          | 0.0100            | 0.823/18                                |
| RHEF1400                       | RF3326-000           | 14.0           | 27.0           | 16                 | —                      | 100                  | —                     | 6.9                | 70.0             | 13.0 | 0.0030           | 0.00600          | 0.0090            | 0.823/18                                |
| RHEF1500                       | RF3060-000           | 15.0           | 28.0           | 16                 | —                      | 100                  | —                     | 7.0                | 75.0             | 20.0 | 0.0032           | 0.00613          | 0.0092            | 0.823/18                                |

#### Notes:

$I_H$  : Hold current: maximum current device will pass without interruption in 20°C still air.  
 $I_T$  : Trip current: minimum current that will switch the device from low resistance to high resistance in 20°C still air.  
 $V_{MAX}$  : Maximum continuous voltage device can withstand without damage at rated current.  
 $I_{MAX}$  : Maximum fault current device can withstand without damage at rated voltage.  
 $P_D$  : Power dissipated from device when in the tripped state in 20°C still air.

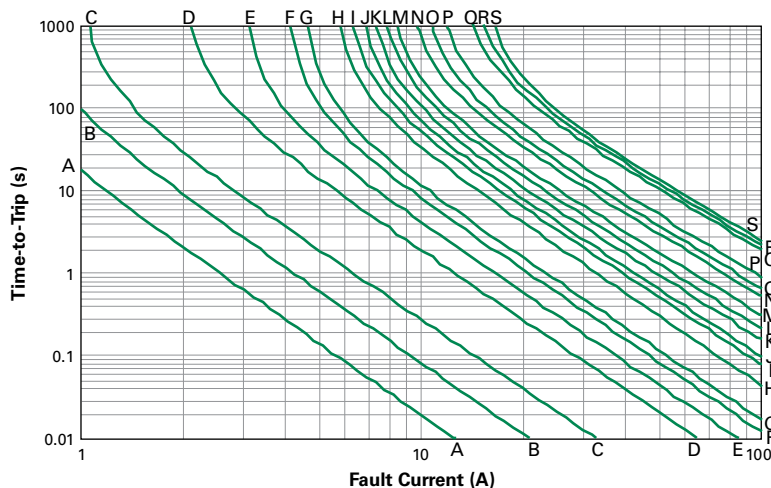
$R_{MIN}$  : Minimum resistance of device as supplied at 20°C unless otherwise specified.  
 $R_{MAX}$  : Maximum resistance of device as supplied at 20°C unless otherwise specified.  
 $R_{1MAX}$  : Maximum resistance of device when measured one hour post reflow (surface-mount device) or one hour post trip (radial-leaded device) at 20°C unless otherwise specified.

\* Electrical characteristics determined at 25°C.

### Typical Time-to-Trip Curves at 20°C

#### RHEF (data at 25°C)

|             |              |
|-------------|--------------|
| A = RHEF050 | K = RHEF700  |
| B = RHEF070 | L = RHEF750  |
| C = RHEF100 | M = RHEF800  |
| D = RHEF200 | N = RHEF900  |
| E = RHEF300 | O = RHEF1000 |
| F = RHEF400 | P = RHEF1100 |
| G = RHEF450 | Q = RHEF1300 |
| H = RHEF550 | R = RHEF1400 |
| I = RHEF600 | S = RHEF1500 |
| J = RHEF650 |              |



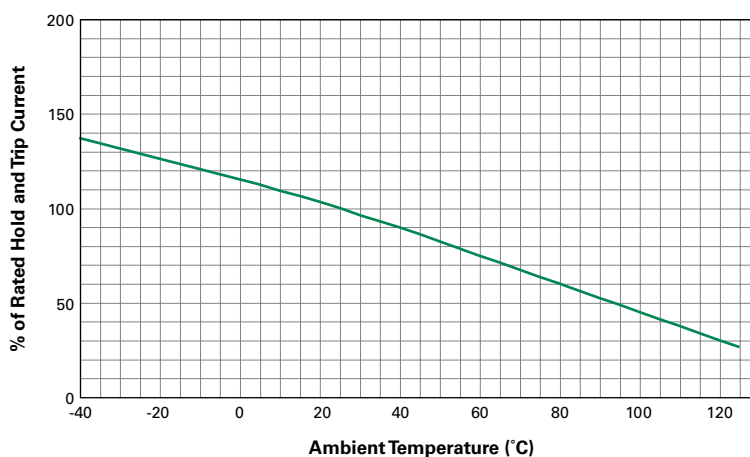
# RHEF Series

## Radial Leaded

### Temperature Derating

| Maximum Ambient Temperature   |       |       |       |       |       |       |       |       |      |      |       |
|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|
|                               | -40°C | -20°C | 0°C   | 20°C  | 25°C  | 40°C  | 50°C  | 60°C  | 70°C | 85°C | 125°C |
| Hold Current (A)              |       |       |       |       |       |       |       |       |      |      |       |
| RHEF – 30V - High Temperature |       |       |       |       |       |       |       |       |      |      |       |
| RHEF050                       | 0.68  | 0.62  | 0.56  | 0.51  | 0.50  | 0.44  | 0.40  | 0.36  | 0.34 | 0.28 | 0.12  |
| RHEF070                       | 0.95  | 0.87  | 0.79  | 0.72  | 0.70  | 0.62  | 0.56  | 0.51  | 0.47 | 0.39 | 0.17  |
| RHEF100                       | 1.36  | 1.24  | 1.13  | 1.03  | 1.00  | 0.89  | 0.80  | 0.73  | 0.67 | 0.56 | 0.24  |
| RHEF – 16V - High Temperature |       |       |       |       |       |       |       |       |      |      |       |
| RHEF200                       | 2.71  | 2.49  | 2.26  | 2.06  | 2.00  | 1.77  | 1.60  | 1.46  | 1.34 | 1.11 | 0.49  |
| RHEF300                       | 4.07  | 3.74  | 3.41  | 3.09  | 3.00  | 2.65  | 2.40  | 2.21  | 2.00 | 1.66 | 0.74  |
| RHEF400                       | 5.57  | 5.11  | 4.65  | 4.22  | 4.00  | 3.62  | 3.29  | 3.01  | 2.73 | 2.27 | 1.01  |
| RHEF450                       | 6.10  | 5.60  | 5.10  | 4.60  | 4.50  | 4.00  | 3.60  | 3.30  | 3.00 | 2.50 | 1.10  |
| RHEF550                       | 7.47  | 6.86  | 6.24  | 5.66  | 5.50  | 4.85  | 4.41  | 4.04  | 3.66 | 3.05 | 1.36  |
| RHEF600                       | 8.20  | 7.50  | 6.80  | 6.20  | 6.00  | 5.30  | 4.90  | 4.40  | 4.00 | 3.30 | 1.50  |
| RHEF650                       | 8.80  | 8.10  | 7.40  | 6.70  | 6.50  | 5.70  | 5.30  | 4.80  | 4.30 | 3.60 | 1.60  |
| RHEF700                       | 9.51  | 8.73  | 7.95  | 7.20  | 7.00  | 6.17  | 5.61  | 5.15  | 4.66 | 3.88 | 1.73  |
| RHEF750                       | 10.20 | 9.40  | 8.60  | 7.70  | 7.50  | 6.60  | 6.10  | 5.60  | 5.00 | 4.10 | 1.90  |
| RHEF800                       | 10.87 | 9.98  | 9.08  | 8.23  | 8.00  | 7.06  | 6.41  | 5.88  | 5.33 | 4.43 | 1.97  |
| RHEF900                       | 12.21 | 11.19 | 10.16 | 9.26  | 9.00  | 7.97  | 7.20  | 6.56  | 6.04 | 5.01 | 2.19  |
| RHEF1000                      | 13.60 | 12.50 | 11.40 | 10.30 | 10.00 | 8.80  | 8.10  | 7.40  | 6.60 | 5.50 | 2.50  |
| RHEF1100                      | 14.94 | 13.72 | 12.49 | 11.31 | 11.00 | 9.70  | 8.82  | 8.09  | 7.32 | 6.09 | 2.71  |
| RHEF1300                      | 17.70 | 16.30 | 14.80 | 13.40 | 13.00 | 11.40 | 10.50 | 9.60  | 8.60 | 7.20 | 3.30  |
| RHEF1400                      | 19.01 | 17.46 | 15.89 | 14.40 | 14.00 | 12.35 | 11.22 | 10.29 | 9.32 | 7.76 | 3.45  |
| RHEF1500                      | 20.40 | 18.80 | 17.10 | 15.50 | 15.00 | 13.20 | 12.10 | 11.10 | 9.90 | 8.30 | 3.80  |

### Temperature Derating Curve



# RHEF Series

## Radial Leaded

### Physical Specifications

|                                  |                                                                                                                                                                                                                                                                                   |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Lead Material</b>             | RHEF050 to RHEF200 : Tin-plated Copper-clad Steel, 0.205mm <sup>2</sup> (24AWG), ø0.51mm/0.020in<br>RHEF300 to RHEF1100 : Tin-plated Copper, 0.52mm <sup>2</sup> (20AWG), ø0.81mm/0.032in<br>RHEF1300 to RHEF1500 : Tin-plated Copper, 0.82mm <sup>2</sup> (18AWG), ø1.0mm/0.04in |
| <b>Soldering Characteristics</b> | Solderability per ANSI/J-STD-002 Category 3                                                                                                                                                                                                                                       |
| <b>Solder Heat Withstand</b>     | per IEC 60068-2-20, Test Tb, Method 1;<br>Can withstand 10s at 260°C ±5°C                                                                                                                                                                                                         |
| <b>Insulating Material</b>       | Cured, Flame-retardant Epoxy Polymer; Meets UL 94V-0                                                                                                                                                                                                                              |
| <b>Operation Temperature</b>     | -40°C~125°C                                                                                                                                                                                                                                                                       |

**Note:** Devices are not designed to be placed through a reflow process.

### Environmental Specifications

| Test                             | Conditions                                                                                                                                                           | Resistance Change |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| <b>Passive Aging</b>             | 70°C, 1000 hrs                                                                                                                                                       | ±5%               |
|                                  | 85°C, 1000 hrs                                                                                                                                                       | ±5%               |
| <b>Humidity Aging</b>            | 85°C, 85% R.H., 1000 hrs                                                                                                                                             | ±5%               |
| <b>Thermal Shock</b>             | 125°C, -40°C (10 Times)                                                                                                                                              | ±5%               |
| <b>Solvent Resistance</b>        | MIL-STD-202, Method 215F                                                                                                                                             | No change         |
| <b>Moisture Resistance Level</b> | Level 1, J-STD-020                                                                                                                                                   |                   |
| <b>Storage Conditions</b>        | 40°C max, 70% RH max; devices should remain in original sealed bags prior to use.<br>Devices may not meet specified values if these storage conditions are exceeded. |                   |

# RHEF Series

## Radial Leaded

### Dimension Figures

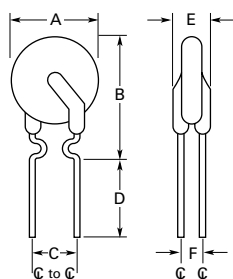


Figure 1

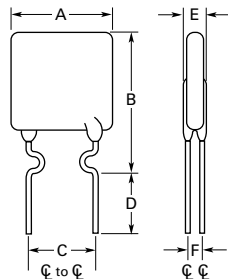


Figure 2

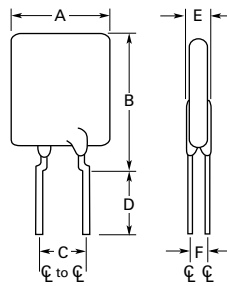


Figure 3

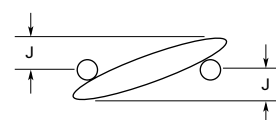


Figure 4

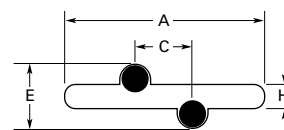


Figure 5

### Dimensions and Weights

| Part Number                   | Dimensions in Millimeters (Inches) |                |     |                |               |               |               |     |     |               |               |                 |                | Figure | Device Mass (g)<br>(Only for Reference) |
|-------------------------------|------------------------------------|----------------|-----|----------------|---------------|---------------|---------------|-----|-----|---------------|---------------|-----------------|----------------|--------|-----------------------------------------|
|                               | A                                  |                | B   |                | C             |               | D             |     | E   |               | F             | H               | J              |        |                                         |
|                               | Min                                | Max            | Min | Max            | Min           | Max           | Min           | Max | Min | Max           | Typ           | Typ             | Typ            |        |                                         |
| RHEF – 30V - High Temperature |                                    |                |     |                |               |               |               |     |     |               |               |                 |                |        |                                         |
| RHEF050                       | —                                  | 7.4<br>(0.29)  | —   | 12.7<br>(0.50) | 4.3<br>(0.17) | 5.8<br>(0.23) | 7.6<br>(0.30) | —   | —   | 3.0<br>(0.12) | 1.2<br>(0.05) | —               | —              | 1,4,5  | 0.177                                   |
| RHEF070                       | —                                  | 6.9<br>(0.27)  | —   | 10.8<br>(0.43) | 4.3<br>(0.17) | 5.8<br>(0.23) | 7.6<br>(0.30) | —   | —   | 3.0<br>(0.12) | 1.2<br>(0.05) | 1.24<br>(0.049) | 1.2<br>(0.05)  | 2,4,5  | 0.259                                   |
| RHEF100                       | —                                  | 9.7<br>(0.38)  | —   | 13.6<br>(0.54) | 4.3<br>(0.17) | 5.8<br>(0.23) | 7.6<br>(0.30) | —   | —   | 3.0<br>(0.12) | —             | —               | —              | 1,4,5  | 0.312                                   |
| RHEF – 16V - High Temperature |                                    |                |     |                |               |               |               |     |     |               |               |                 |                |        |                                         |
| RHEF200                       | —                                  | 9.4<br>(0.37)  | —   | 14.4<br>(0.57) | 4.3<br>(0.17) | 5.8<br>(0.23) | 7.6<br>(0.30) | —   | —   | 3.1<br>(0.12) | —             | —               | —              | 1,4,5  | 0.278                                   |
| RHEF300                       | —                                  | 8.8<br>(0.35)  | —   | 13.8<br>(0.55) | 4.3<br>(0.17) | 5.8<br>(0.23) | 7.6<br>(0.30) | —   | —   | 3.0<br>(0.12) | 1.2<br>(0.05) | —               | —              | 3,4,5  | 0.433                                   |
| RHEF400                       | —                                  | 10.0<br>(0.39) | —   | 15.0<br>(0.59) | 4.3<br>(0.17) | 5.8<br>(0.23) | 7.6<br>(0.30) | —   | —   | 3.0<br>(0.12) | 1.2<br>(0.05) | 1.24<br>(0.049) | 1.6<br>(0.06)  | 3,4,5  | 0.509                                   |
| RHEF450                       | —                                  | 10.4<br>(0.41) | —   | 15.6<br>(0.61) | 4.3<br>(0.17) | 5.8<br>(0.23) | 7.6<br>(0.30) | —   | —   | 3.0<br>(0.12) | 1.2<br>(0.05) | 1.24<br>(0.049) | 1.6<br>(0.06)  | 3,4,5  | 0.605                                   |
| RHEF550                       | —                                  | 11.2<br>(0.44) | —   | 18.9<br>(0.74) | 4.3<br>(0.17) | 5.8<br>(0.23) | 7.6<br>(0.30) | —   | —   | 3.0<br>(0.12) | 1.2<br>(0.05) | —               | —              | 3,4,5  | 0.704                                   |
| RHEF600                       | —                                  | 11.2<br>(0.44) | —   | 21.0<br>(0.83) | 4.3<br>(0.17) | 5.8<br>(0.23) | 7.6<br>(0.30) | —   | —   | 3.0<br>(0.12) | 1.2<br>(0.05) | 1.24<br>(0.049) | 1.7<br>(0.067) | 3,4,5  | 0.792                                   |
| RHEF650                       | —                                  | 12.7<br>(0.50) | —   | 22.2<br>(0.88) | 4.3<br>(0.17) | 5.8<br>(0.23) | 7.6<br>(0.30) | —   | —   | 3.0<br>(0.12) | 1.2<br>(0.05) | 1.24<br>(0.049) | 1.8<br>(0.07)  | 3,4,5  | 0.952                                   |
| RHEF700                       | —                                  | 14.0<br>(0.55) | —   | 21.9<br>(0.86) | 4.3<br>(0.17) | 5.8<br>(0.23) | 7.6<br>(0.30) | —   | —   | 3.0<br>(0.12) | 1.2<br>(0.05) | —               | —              | 3,4,5  | 0.850                                   |

# RHEF Series

## Radial Leaded

### Dimension Figures

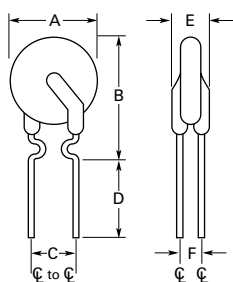


Figure 1

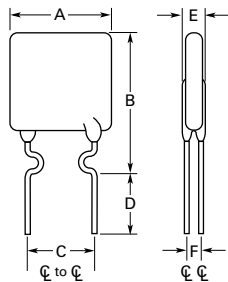


Figure 2

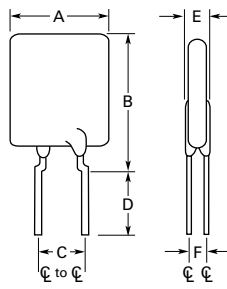


Figure 3

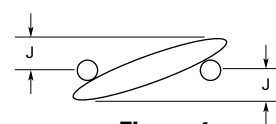


Figure 4

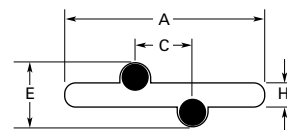


Figure 5

### Dimensions and Weights (Cont'd)

| Part Number                   | Dimensions in Millimeters (Inches) |                 |     |                |               |                |               |     |     |               |               |                 |                | Figure | Device Mass (g)<br>(Only for Reference) |
|-------------------------------|------------------------------------|-----------------|-----|----------------|---------------|----------------|---------------|-----|-----|---------------|---------------|-----------------|----------------|--------|-----------------------------------------|
|                               | A                                  |                 | B   |                | C             |                | D             |     | E   |               | F             | H               | J              |        |                                         |
|                               | Min                                | Max             | Min | Max            | Min           | Max            | Min           | Max | Min | Max           | Typ           | Typ             | Typ            |        |                                         |
| RHEF – 16V - High Temperature |                                    |                 |     |                |               |                |               |     |     |               |               |                 |                |        |                                         |
| RHEF750                       | —                                  | 14.0<br>(0.55)  | —   | 23.5<br>(0.93) | 4.3<br>(0.17) | 5.8<br>(0.23)  | 7.6<br>(0.30) | —   | —   | 3.0<br>(0.12) | 1.2<br>(0.05) | 1.24<br>(0.049) | 2.0<br>(0.08)  | 3,4,5  | 1.054                                   |
| RHEF800                       | —                                  | 16.5<br>(0.65)  | —   | 22.5<br>(0.88) | 4.3<br>(0.17) | 5.8<br>(0.23)  | 7.6<br>(0.30) | —   | —   | 3.0<br>(0.12) | 1.2<br>(0.05) | —               | —              | 3,4,5  | 1.073                                   |
| RHEF900                       | —                                  | 16.5<br>(0.65)  | —   | 25.7<br>(1.01) | 4.3<br>(0.17) | 5.8<br>(0.23)  | 7.6<br>(0.30) | —   | —   | 3.0<br>(0.12) | 1.2<br>(0.05) | —               | —              | 3,4,5  | 1.516                                   |
| RHEF1000                      | —                                  | 17.5<br>(0.69)  | —   | 26.5<br>(1.04) | 9.4<br>(0.37) | 10.9<br>(0.43) | 7.6<br>(0.30) | —   | —   | 3.0<br>(0.12) | 1.2<br>(0.05) | 1.24<br>(0.049) | 1.5<br>(0.06)  | 3,4,5  | 1.791                                   |
| RHEF1100                      | —                                  | 21.0<br>(0.83)  | —   | 26.1<br>(1.03) | 9.4<br>(0.37) | 10.9<br>(0.43) | 7.6<br>(0.30) | —   | —   | 3.0<br>(0.12) | 1.2<br>(0.05) | —               | —              | 3,4,5  | 1.570                                   |
| RHEF1300                      | —                                  | 23.5<br>(0.925) | —   | 28.7<br>(1.13) | 9.4<br>(0.37) | 10.9<br>(0.43) | 7.6<br>(0.30) | —   | —   | 3.6<br>(0.14) | 1.4<br>(0.06) | 1.45<br>(0.057) | 1.9<br>(0.084) | 3,4,5  | 2.257                                   |
| RHEF1400                      | —                                  | 23.5<br>(0.925) | —   | 28.6<br>(1.13) | 9.4<br>(0.37) | 10.9<br>(0.43) | 7.6<br>(0.30) | —   | —   | 3.6<br>(0.14) | 1.4<br>(0.06) | —               | —              | 3,4,5  | 2.051                                   |
| RHEF1500                      | —                                  | 23.5<br>(0.925) | —   | 28.7<br>(1.13) | 9.4<br>(0.37) | 10.9<br>(0.43) | 7.6<br>(0.30) | —   | —   | 3.6<br>(0.14) | 1.4<br>(0.06) | 1.45<br>(0.057) | 1.9<br>(0.084) | 3,4,5  | 2.257                                   |

# RHEF Series

## Radial Leaded

### Packaging and Marking Information

| Part Number                          | Bag Quantity | Tape and Reel Quantity | Ammo Pack Quantity | Standard Package Quantity | Part Marking | Agency Recognition |
|--------------------------------------|--------------|------------------------|--------------------|---------------------------|--------------|--------------------|
| <b>RHEF – 30V - High Temperature</b> |              |                        |                    |                           |              |                    |
| RHEF050                              | 500          | —                      | —                  | 10,000                    | H0.5         | UL, CSA, TÜV       |
| RHEF050-2                            | —            | 2,500                  | —                  | 12,500                    | H0.5         | UL, CSA, TÜV       |
| RHEF070                              | 500          | —                      | —                  | 10,000                    | H0.7         | UL, CSA, TÜV       |
| RHEF070-2                            | —            | 2,500                  | —                  | 12,500                    | H0.7         | UL, CSA, TÜV       |
| RHEF100                              | 500          | —                      | —                  | 10,000                    | H1           | UL, CSA, TÜV       |
| RHEF100-2                            | —            | 2,500                  | —                  | 12,500                    | H1           | UL, CSA, TÜV       |
| <b>RHEF – 16V - High Temperature</b> |              |                        |                    |                           |              |                    |
| RHEF200                              | 500          | —                      | —                  | 10,000                    | H2           | UL, CSA, TÜV       |
| RHEF200-2                            | —            | 2,500                  | —                  | 12,500                    | H2           | UL, CSA, TÜV       |
| RHEF200-AP                           | —            | —                      | 2,500              | 12,500                    | H2           | UL, CSA, TÜV       |
| RHEF300                              | 500          | —                      | —                  | 10,000                    | H3           | UL, CSA, TÜV       |
| RHEF300-2                            | —            | 2,000                  | —                  | 10,000                    | H3           | UL, CSA, TÜV       |
| RHEF300-AP                           | —            | —                      | 2,000              | 10,000                    | H3           | UL, CSA, TÜV       |
| RHEF400                              | 500          | —                      | —                  | 10,000                    | H4           | UL, CSA, TÜV       |
| RHEF400-2                            | —            | 1,500                  | —                  | 7,500                     | H4           | UL, CSA, TÜV       |
| RHEF400-AP                           | —            | —                      | 1,500              | 7,500                     | H4           | UL, CSA, TÜV       |
| RHEF450                              | 500          | —                      | —                  | 10,000                    | H4.5         | UL, CSA, TÜV       |
| RHEF450-2                            | —            | 1,500                  | —                  | 7,500                     | H4.5         | UL, CSA, TÜV       |
| RHEF450-AP                           | —            | —                      | 1,500              | 7,500                     | H4.5         | UL, CSA, TÜV       |
| RHEF550                              | 500          | —                      | —                  | 10,000                    | H5.5         | UL, CSA, TÜV       |
| RHEF550-2                            | —            | 2,000                  | —                  | 10,000                    | H5.5         | UL, CSA, TÜV       |
| RHEF550-AP                           | —            | —                      | 2,000              | 10,000                    | H5.5         | UL, CSA, TÜV       |
| RHEF600                              | 500          | —                      | —                  | 10,000                    | H6           | UL, CSA, TÜV       |
| RHEF600-2                            | —            | 2,000                  | —                  | 10,000                    | H6           | UL, CSA, TÜV       |
| RHEF600-AP                           | —            | —                      | 2,000              | 10,000                    | H6           | UL, CSA, TÜV       |
| RHEF650                              | 500          | —                      | —                  | 10,000                    | H6.5         | UL, CSA, TÜV       |
| RHEF650-2                            | —            | 1,500                  | —                  | 7,500                     | H6.5         | UL, CSA, TÜV       |
| RHEF650-AP                           | —            | —                      | 1,500              | 7,500                     | H6.5         | UL, CSA, TÜV       |
| RHEF700                              | 500          | —                      | —                  | 10,000                    | H7           | UL, CSA, TÜV       |
| RHEF700-2                            | —            | 1,500                  | —                  | 7,500                     | H7           | UL, CSA, TÜV       |
| RHEF700-AP                           | —            | —                      | 1,500              | 7,500                     | H7           | UL, CSA, TÜV       |
| RHEF750                              | 500          | —                      | —                  | 10,000                    | H7.5         | UL, CSA, TÜV       |
| RHEF750-2                            | —            | 1,000                  | —                  | 5,000                     | H7.5         | UL, CSA, TÜV       |
| RHEF750-AP                           | —            | —                      | 1,000              | 5,000                     | H7.5         | UL, CSA, TÜV       |
| RHEF800                              | 500          | —                      | —                  | 10,000                    | H8           | UL, CSA, TÜV       |
| RHEF800-2                            | —            | 1,000                  | —                  | 5,000                     | H8           | UL, CSA, TÜV       |
| RHEF800-AP                           | —            | —                      | 1,000              | 5,000                     | H8           | UL, CSA, TÜV       |

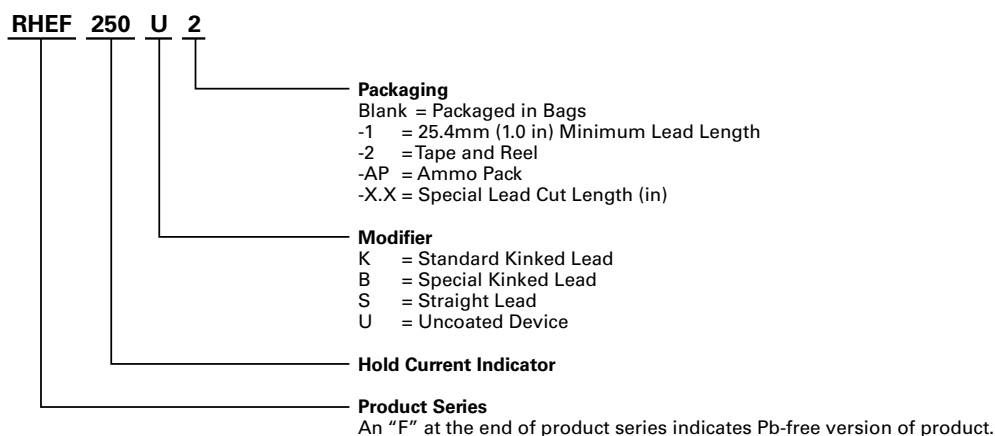
# RHEF Series

## Radial Leaded

### Packaging and Marking Information (Cont'd)

| Part Number                          | Bag Quantity | Tape and Reel Quantity | Ammo Pack Quantity | Standard Package Quantity | Part Marking | Agency Recognition |
|--------------------------------------|--------------|------------------------|--------------------|---------------------------|--------------|--------------------|
| <b>RHEF – 16V - High Temperature</b> |              |                        |                    |                           |              |                    |
| RHEF900                              | 250          | —                      | —                  | 5,000                     | H9           | UL, CSA, TÜV       |
| RHEF900-2                            | —            | 1,000                  | —                  | 5,000                     | H9           | UL, CSA, TÜV       |
| RHEF900-AP                           | —            | —                      | 1,000              | 5,000                     | H9           | UL, CSA, TÜV       |
| RHEF1000                             | 250          | —                      | —                  | 5,000                     | H10          | UL, CSA, TÜV       |
| RHEF1000-2                           | —            | 1,000                  | —                  | 5,000                     | H10          | UL, CSA, TÜV       |
| RHEF1000-AP                          | —            | —                      | 1,000              | 5,000                     | H10          | UL, CSA, TÜV       |
| RHEF1100                             | 250          | —                      | —                  | 5,000                     | H11          | UL, CSA, TÜV       |
| RHEF1100-2                           | —            | 1,000                  | —                  | 5,000                     | H11          | UL, CSA, TÜV       |
| RHEF1100-AP                          | —            | —                      | 1,000              | 5,000                     | H11          | UL, CSA, TÜV       |
| RHEF1300                             | 250          | —                      | —                  | 5,000                     | H13          | UL, CSA, TÜV       |
| RHEF1300-2                           | —            | 1,000                  | —                  | 5,000                     | H13          | UL, CSA, TÜV       |
| RHEF1300-AP                          | —            | —                      | 1,000              | 5,000                     | H13          | UL, CSA, TÜV       |
| RHEF1400                             | 250          | —                      | —                  | 5,000                     | H14          | UL, CSA, TÜV       |
| RHEF1400-2                           | —            | 1,000                  | —                  | 5,000                     | H14          | UL, CSA, TÜV       |
| RHEF1400-AP                          | —            | —                      | 1,000              | 5,000                     | H14          | UL, CSA, TÜV       |
| RHEF1500                             | 250          | —                      | —                  | 5,000                     | H15          | UL, CSA, TÜV       |
| RHEF1500-2                           | —            | 1,000                  | —                  | 5,000                     | H15          | UL, CSA, TÜV       |
| RHEF1500-AP                          | —            | —                      | 1,000              | 5,000                     | H15          | UL, CSA, TÜV       |

### Part Ordering Number System



**Note:** Kinked parts are recommended to control the height of the part on the PCB in non-auto PCB applications.

# RHEF Series

## Radial Leaded

### Tape and Reel Specifications

RHEF devices are available in tape and reel packaging per EIA468-B/IEC60286-2 standards. See Figures 1 and 2 for details.

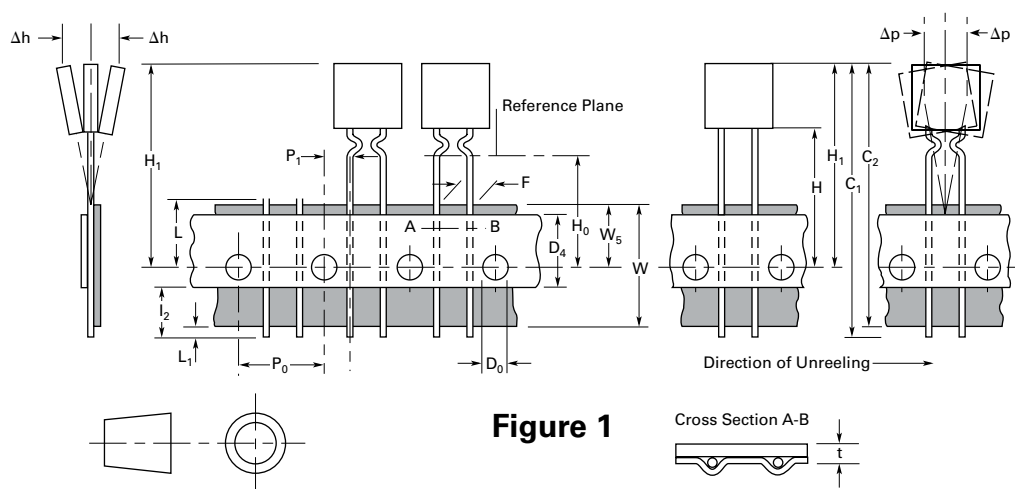
| Description                                                 | EIA Mark       | Dimension (mm) | Tolerance  |
|-------------------------------------------------------------|----------------|----------------|------------|
| Carrier Tape Width                                          | W              | 18             | -0.5/+1.0  |
| Hold-Down Tape Width                                        | W <sub>4</sub> | 11             | Minimum    |
| Top Distance between Tape Edges                             | W <sub>6</sub> | 3              | Maximum    |
| Sprocket Hole Position                                      | W <sub>5</sub> | 9              | -0.5/+0.75 |
| Sprocket Hole Diameter                                      | D <sub>0</sub> | 4              | ± 0.2      |
| Abscissa to Plane (Straight Lead)                           | H              | 18.5           | ± 2.5      |
| Abscissa to Plane (Kinked Lead) (RHEF050 to RHEF1500)       | H <sub>0</sub> | 16.0           | ± 0.5      |
| Abscissa to Top (RHEF050 to RHEF450)                        | H <sub>1</sub> | 32.2           | Maximum    |
| Abscissa to Top* (RHEF550 to RHEF1500)                      | H <sub>1</sub> | 45.0           | Maximum    |
| Overall Width with Lead Protrusion (RHEF050 to RHEF450)     | C <sub>1</sub> | 43.2           | Maximum    |
| Overall Width with Lead Protrusion (RHEF550 to RHEF1500)    | C <sub>1</sub> | 55             | Maximum    |
| Overall Width without Lead Protrusion (RHEF050 to RHEF450)  | C <sub>2</sub> | 42.5           | Maximum    |
| Overall Width without Lead Protrusion (RHEF550 to RHEF1500) | C <sub>2</sub> | 54             | Maximum    |
| Lead Protrusion                                             | L <sub>1</sub> | 1.0            | Maximum    |
| Protrusion of Cut-out                                       | L              | 11             | Maximum    |
| Protrusion beyond Hold-down Tape                            | I <sub>2</sub> | Not Specified  | —          |
| Sprocket Hole Pitch                                         | P <sub>0</sub> | 12.7           | ± 0.3      |
| Device Pitch (RHEF050 to RHEF600)                           | —              | 25.4           | ± 0.61     |
| Device Pitch (RHEF650 to RHEF1500)                          | —              | 25.4           | ± 0.6      |
| Pitch Tolerance                                             | —              | 20 Consecutive | ± 1        |
| Tape Thickness                                              | T              | 0.9            | Maximum    |
| Overall Tape and Lead Thickness* (RHEF050 to RHEF1100)      | T <sub>1</sub> | 2.0            | Maximum    |
| Overall Tape and Lead Thickness* (RHEF1300 to RHEF1500)     | T <sub>1</sub> | 2.3            | Maximum    |
| Splice Sprocket Hole Alignment                              | —              | 0              | ± 0.3      |
| Body Lateral Deviation                                      | h              | 0              | ± 1.0      |
| Body Tape Plane Deviation                                   | p              | 0              | ± 1.3      |
| Ordinate to Adjacent Component Lead (RHEF050 to RHEF900)    | P <sub>1</sub> | 3.81           | ± 0.7      |
| Ordinate to Adjacent Component Lead (RHEF1000 to RHEF1500)  | P <sub>1</sub> | 7.62           | ± 0.7      |
| Lead Spacing* (RHEF050 to RHEF900)                          | F              | 5.05           | ± 0.75     |
| Lead Spacing* (RHEF1000 to RHEF1500)                        | F              | 10.15          | ± 0.75     |
| Reel Width (RHEF050 to RHEF450)                             | W <sub>2</sub> | 56.0           | Maximum    |
| Reel Width* (RHEF550 to RHEF1500)                           | W <sub>2</sub> | 63.5           | Maximum    |
| Reel Diameter                                               | A              | 370.0          | Maximum    |
| Space between Flanges* (RHEF050 to RHEF450)                 | W <sub>1</sub> | 48.0           | Maximum    |
| Space between Flanges* (RHEF550 to RHEF1500)                | W <sub>1</sub> | 55.0           | Maximum    |
| Arbor Hold Diameter                                         | C              | 26.0           | ± 12.0     |
| Core Diameter*                                              | N              | 91.0           | Maximum    |
| Box                                                         | —              | 64/372/362     | Maximum    |
| Consecutive Missing Places                                  | —              | None           | —          |
| Empty Places per Reel                                       | —              | 0.1%           | Maximum    |

\*Differs from EIA specification.

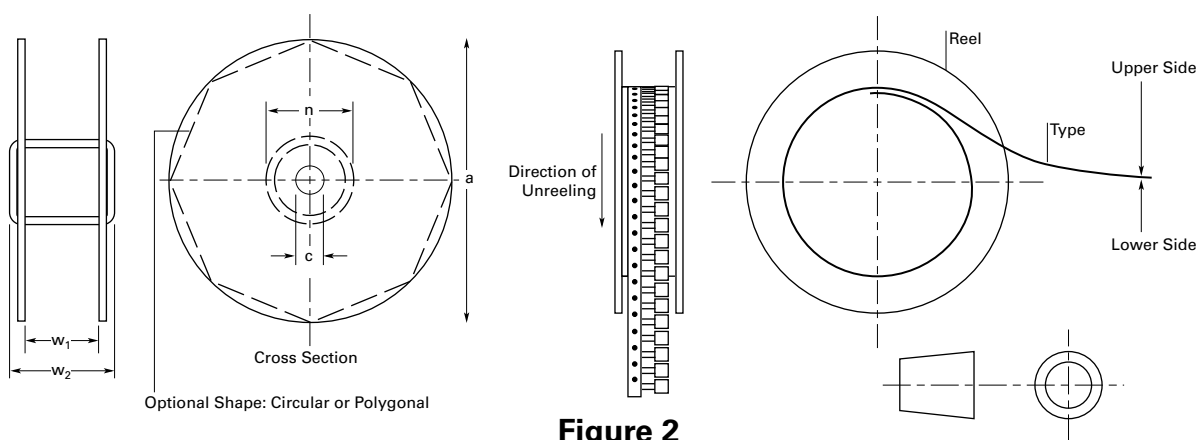
# RHEF Series

## Radial Leaded

### Tape and Reel Diagrams



**Figure 1**



**Figure 2**

#### Warning

- Users should independently evaluate the suitability of and test each product selected for their own application.
- Operation beyond the maximum ratings or improper use may result in device damage and possible electrical arcing and flame.
- These devices are intended for protection against damage caused by occasional overcurrent or overtemperature fault conditions and should not be used when repeated fault conditions or prolonged trip events are anticipated.
- Contamination of the PPTC material with certain silicone-based oils or some aggressive solvents can adversely impact the performance of the devices.
- Device performance can be impacted negatively if devices are handled in a manner inconsistent with recommended electronic, thermal, and mechanical procedures for electronic components.
- PPTC devices are not recommended for installation in applications where the device is constrained such that its PTC properties are inhibited, for example in rigid potting materials or in rigid housings, which lack adequate clearance to accommodate device expansion.
- Operation in circuits with a large inductance can generate a circuit voltage ( $L di/dt$ ) above the rated voltage of the device.

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