



RXE Selection Guide and Product Data

This section has two parts:

- A Selection Guide that walks you through the process of selecting the correct RXE device for a circuit.
- Product Data that outlines electrical characteristics, physical characteristics, agency recognitions, environmental specifications, component layouts, tape and reel specifications, and ordering information for RXE devices.

RXE Selection Guide

Follow these seven steps to select a PolySwitch RXE device for a circuit:

1. Define the operating parameters for the circuit.

These include:

- Maximum ambient operating temperature
- Normal operating current
- Maximum operating voltage (RXE is 60 V maximum)
- Maximum interrupt current

2. Select the RXE device that accommodates the circuit's maximum ambient operating temperature and normal operating current.
3. Compare the RXE device's maximum operating voltage and maximum interrupt current with the circuit's to be sure the circuit does not exceed the device ratings.
4. Check the RXE device's time-to-trip to be sure it will protect the circuit.
5. Verify that the circuit's ambient operating temperatures are within the RXE device's operating temperature range.
6. Verify that the RXE device's dimensions fit the application's space considerations.
7. Independently evaluate and test the suitability and performance of the RXE device in the application.



1. Define the circuit's operating parameters.

Fill in the following information about the circuit:

Maximum ambient operating temperature _____

Normal operating current _____

Maximum operating voltage (RXE is 60 V max.) _____

Maximum interrupt current _____

2. Select the PolySwitch RXE device that will accommodate the circuit's maximum ambient operating temperature and normal operating current.

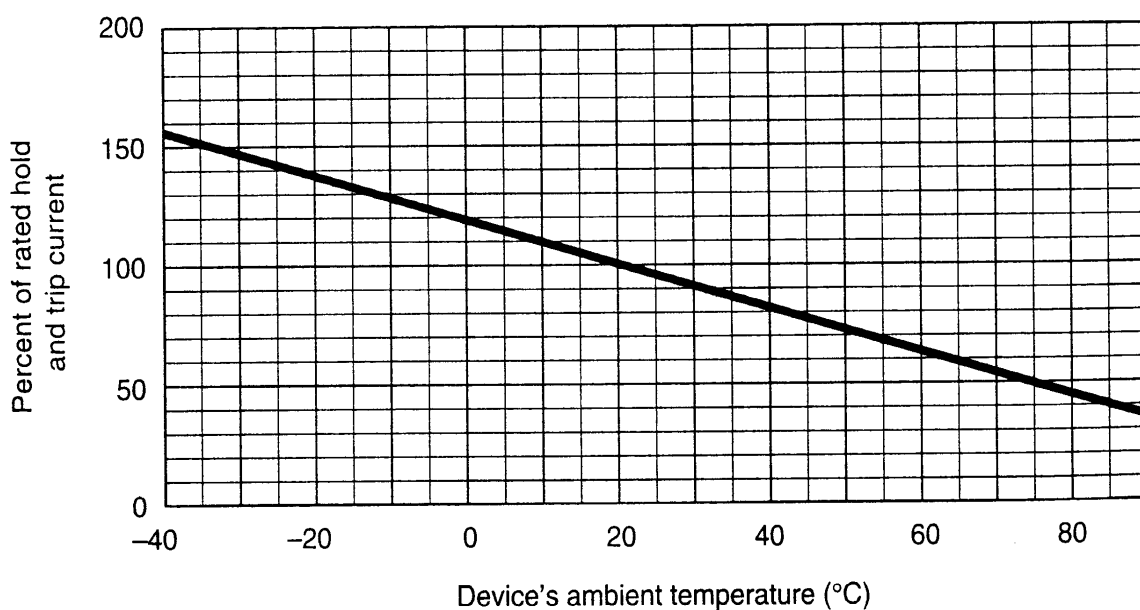
Look across the top of the table on the next page to find the temperature that most closely matches the circuit's maximum ambient operating temperature. Look down that column to find the value equal to or greater than the circuit's normal operating current. Now look to the far left of that row to find the part number for the RXE device that will best accommodate the circuit.

The thermal derating curve located on the next page is a normalized representation of the data in the table located on the same page.

I_{Hold} vs. temperature

| Part number | Maximum ambient operating temperatures (°C) | | | | | | | | |
|-------------|---|------|------|------|------|------|------|------|------|
| | -40° | -20° | 0° | 20° | 40° | 50° | 60° | 70° | 85° |
| RXE010 | 0.16 | 0.14 | 0.12 | 0.10 | 0.08 | 0.07 | 0.06 | 0.05 | 0.04 |
| RXE017 | 0.26 | 0.23 | 0.20 | 0.17 | 0.14 | 0.12 | 0.11 | 0.09 | 0.07 |
| RXE020 | 0.31 | 0.27 | 0.24 | 0.20 | 0.16 | 0.14 | 0.13 | 0.11 | 0.08 |
| RXE025 | 0.39 | 0.34 | 0.30 | 0.25 | 0.20 | 0.18 | 0.16 | 0.14 | 0.10 |
| RXE030 | 0.47 | 0.41 | 0.36 | 0.30 | 0.24 | 0.22 | 0.19 | 0.16 | 0.12 |
| RXE040 | 0.62 | 0.54 | 0.48 | 0.40 | 0.32 | 0.29 | 0.25 | 0.22 | 0.16 |
| RXE050 | 0.78 | 0.68 | 0.60 | 0.50 | 0.41 | 0.36 | 0.32 | 0.27 | 0.20 |
| RXE065 | 1.01 | 0.88 | 0.77 | 0.65 | 0.53 | 0.47 | 0.41 | 0.35 | 0.26 |
| RXE075 | 1.16 | 1.02 | 0.89 | 0.75 | 0.61 | 0.54 | 0.47 | 0.41 | 0.30 |
| RXE090 | 1.40 | 1.22 | 1.07 | 0.90 | 0.73 | 0.65 | 0.57 | 0.49 | 0.36 |
| RXE110 | 1.71 | 1.50 | 1.31 | 1.10 | 0.89 | 0.79 | 0.69 | 0.59 | 0.44 |
| RXE135 | 2.09 | 1.84 | 1.61 | 1.35 | 1.09 | 0.97 | 0.85 | 0.73 | 0.54 |
| RXE160 | 2.48 | 2.18 | 1.90 | 1.60 | 1.30 | 1.15 | 1.01 | 0.86 | 0.64 |
| RXE185 | 2.87 | 2.52 | 2.20 | 1.85 | 1.50 | 1.33 | 1.17 | 1.00 | 0.74 |
| RXE250 | 3.88 | 3.40 | 2.98 | 2.50 | 2.03 | 1.80 | 1.58 | 1.35 | 1.00 |
| RXE300 | 4.65 | 4.08 | 3.57 | 3.00 | 2.43 | 2.16 | 1.89 | 1.62 | 1.20 |
| RXE375 | 5.81 | 5.10 | 4.46 | 3.75 | 3.04 | 2.70 | 2.36 | 2.03 | 1.50 |

Thermal derating curve





3. Compare maximum operating voltages and maximum interrupt currents.

Look down the first column of the table below to find the part number you selected in Step 1. Look to the right in that row to find the device's maximum operating voltage (V max.) and maximum interrupt current (I max.).

Compare both ratings with the circuit's to be sure the circuit's ratings do not exceed those of the RXE device.

Maximum device voltages and currents

| Part number | V max. (volts) | I max.* (amps) |
|-------------|----------------|----------------|
| RXE010 | 60 | 40 |
| RXE017 | 60 | 40 |
| RXE020 | 60 | 40 |
| RXE025 | 60 | 40 |
| RXE030 | 60 | 40 |
| RXE040 | 60 | 40 |
| RXE050 | 60 | 40 |
| RXE065 | 60 | 40 |
| RXE075 | 60 | 40 |
| RXE090 | 60 | 40 |
| RXE110 | 60 | 40 |
| RXE135 | 60 | 40 |
| RXE160 | 60 | 40 |
| RXE185 | 60 | 40 |
| RXE250 | 60 | 40 |
| RXE300 | 60 | 40 |
| RXE375 | 60 | 40 |

* Devices may withstand higher interrupt current at lower voltages. Each application will need to be individually qualified.

4. Determine time-to-trip.

Time-to-trip is the amount of time it takes for a device to switch to a high-resistance state once a fault current has been applied across the device.

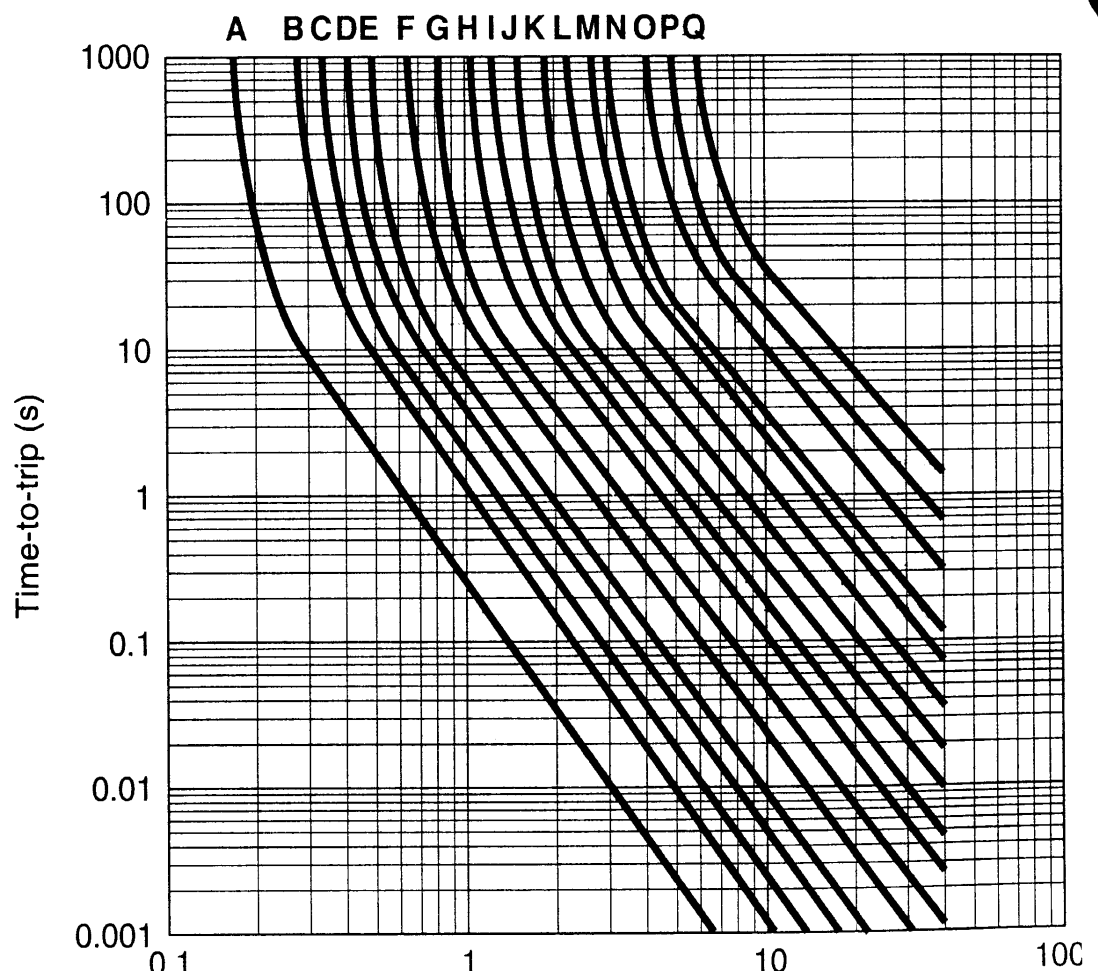
Identifying the RXE device's time-to-trip is important in order to provide the desired protection capabilities. If the device you choose trips too fast, undesired or nuisance tripping will occur. If the device trips too slowly, the components being protected may be damaged before the device switches to a high-resistance state.

The chart below shows the typical time-to-trip at 20°C for each PolySwitch RXE device. For example, the chart indicates that the typical time-to-trip for RXE050 at 5 A is 0.3 second.

On the chart below, find the typical time-to-trip for the RXE device you selected. If the RXE device's time-to-trip is too fast or too slow for the circuit, go back to Step 2 and choose an alternate device.

Typical time-to-trip at 20°C

- A = RXE010
- B = RXE017
- C = RXE020
- D = RXE025
- E = RXE030
- F = RXE040
- G = RXE050
- H = RXE065
- I = RXE075
- J = RXE090
- K = RXE110
- L = RXE135
- M = RXE160
- N = RXE185
- O = RXE250
- P = RXE300
- Q = RXE375



5. Verify ambient operating conditions.

Ensure that your application's minimum and maximum ambient temperatures are within the operating temperature range of -40°C and 85°C .

Maximum device surface temperature in the tripped state is 125°C .

6. Verify the RXE device's dimensions.

Using dimensions from the table below, compare the dimensions of the RXE device you selected with the application's space considerations.

Product dimensions (millimeters/inches)

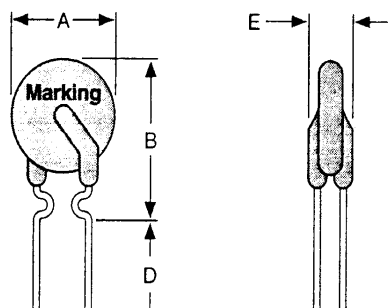
| Part number | A max. | | B max. | | C typ. | | D min. | | E max. | | F typ. | |
|-------------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|
| RXE010 | 7.4 | (0.29) | 12.7 | (0.50) | 5.1 | (0.20) | 7.6 | (0.30) | 3.1 | (0.12) | 1.1 | (0.04) |
| RXE017 | 7.4 | (0.29) | 12.7 | (0.50) | 5.1 | (0.20) | 7.6 | (0.30) | 3.1 | (0.12) | 1.6 | (0.06) |
| RXE020 | 7.4 | (0.29) | 12.2 | (0.48) | 5.1 | (0.20) | 7.6 | (0.30) | 3.1 | (0.12) | 1.1 | (0.04) |
| RXE025 | 7.4 | (0.29) | 12.7 | (0.50) | 5.1 | (0.20) | 7.6 | (0.30) | 3.1 | (0.12) | 1.1 | (0.04) |
| RXE030 | 7.4 | (0.29) | 13.0 | (0.51) | 5.1 | (0.20) | 7.6 | (0.30) | 3.1 | (0.12) | 1.1 | (0.04) |
| RXE040 | 7.6 | (0.30) | 13.5 | (0.53) | 5.1 | (0.20) | 7.6 | (0.30) | 3.1 | (0.12) | 1.1 | (0.04) |
| RXE050 | 7.9 | (0.31) | 13.7 | (0.54) | 5.1 | (0.20) | 7.6 | (0.30) | 3.1 | (0.12) | 1.1 | (0.04) |
| RXE065 | 9.7 | (0.38) | 14.5 | (0.57) | 5.1 | (0.20) | 7.6 | (0.30) | 3.1 | (0.12) | 1.1 | (0.04) |
| RXE075 | 10.4 | (0.41) | 15.2 | (0.60) | 5.1 | (0.20) | 7.6 | (0.30) | 3.1 | (0.12) | 1.1 | (0.04) |
| RXE090 | 11.7 | (0.46) | 15.8 | (0.62) | 5.1 | (0.20) | 7.6 | (0.30) | 3.1 | (0.12) | 1.1 | (0.04) |
| RXE110 | 13.0 | (0.51) | 18.0 | (0.71) | 5.1 | (0.20) | 7.6 | (0.30) | 3.1 | (0.12) | 1.4 | (0.06) |
| RXE135 | 14.5 | (0.57) | 19.6 | (0.77) | 5.1 | (0.20) | 7.6 | (0.30) | 3.1 | (0.12) | 1.4 | (0.06) |
| RXE160 | 16.3 | (0.64) | 21.3 | (0.84) | 5.1 | (0.20) | 7.6 | (0.30) | 3.1 | (0.12) | 1.4 | (0.06) |
| RXE185 | 17.8 | (0.70) | 22.9 | (0.90) | 5.1 | (0.20) | 7.6 | (0.30) | 3.1 | (0.12) | 1.4 | (0.06) |
| RXE250 | 21.3 | (0.84) | 26.4 | (1.04) | 10.2 | (0.40) | 7.6 | (0.30) | 3.1 | (0.12) | 1.4 | (0.06) |
| RXE300 | 24.9 | (0.98) | 30.0 | (1.18) | 10.2 | (0.40) | 7.6 | (0.30) | 3.1 | (0.12) | 1.4 | (0.06) |
| RXE375 | 28.5 | (1.12) | 33.5 | (1.32) | 10.2 | (0.40) | 7.6 | (0.30) | 3.1 | (0.12) | 1.4 | (0.06) |

Lead size

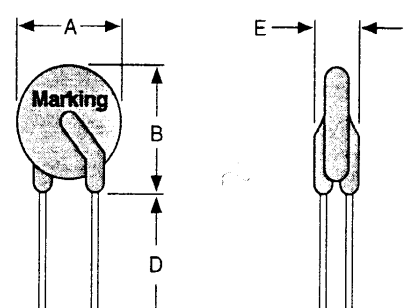
RXE010–RXE090 $\varnothing 0.51$
 (0.020)
 24 AWG

RXE110–RXE375 $\varnothing 0.81$
 (0.032)
 20 AWG

RXE010–RXE090*



RXE110–RXE375**



RXE Product Data

Now that you have selected your RXE device, please review the device's characteristics in this section to verify that the device will perform as required.

Electrical characteristics (20°C)

| Part Number | I _H (A) | I _T (A) | Max. time to trip (s) at 5xI _H | P _d (W) | Initial resistance | | Post-trip resistance |
|-------------|--------------------|--------------------|---|--------------------|--------------------|------------|-------------------------|
| | | | | | R min. (Ω) | R max. (Ω) | R ₁ max. (Ω) |
| RXE010 | 0.10 | 0.20 | 4.0 | 0.38 | 2.50 | 4.50 | 7.50 |
| RXE017 | 0.17 | 0.34 | 3.0 | 0.48 | 3.30 | 5.21 | 8.00 |
| RXE020 | 0.20 | 0.40 | 2.2 | 0.41 | 1.83 | 2.75 | 4.40 |
| RXE025 | 0.25 | 0.50 | 2.5 | 0.45 | 1.25 | 1.95 | 3.00 |
| RXE030 | 0.30 | 0.60 | 3.0 | 0.49 | 0.88 | 1.33 | 2.10 |
| RXE040 | 0.40 | 0.80 | 3.8 | 0.56 | 0.55 | 0.86 | 1.29 |
| RXE050 | 0.50 | 1.00 | 4.0 | 0.77 | 0.50 | 0.77 | 1.17 |
| RXE065 | 0.65 | 1.30 | 5.3 | 0.88 | 0.31 | 0.48 | 0.72 |
| RXE075 | 0.75 | 1.50 | 6.3 | 0.92 | 0.25 | 0.40 | 0.60 |
| RXE090 | 0.90 | 1.80 | 7.2 | 0.99 | 0.20 | 0.31 | 0.47 |
| RXE110 | 1.10 | 2.20 | 8.2 | 1.50 | 0.15 | 0.25 | 0.38 |
| RXE135 | 1.35 | 2.70 | 9.6 | 1.70 | 0.12 | 0.19 | 0.30 |
| RXE160 | 1.60 | 3.20 | 11.4 | 1.90 | 0.09 | 0.14 | 0.22 |
| RXE185 | 1.85 | 3.70 | 12.6 | 2.10 | 0.08 | 0.12 | 0.19 |
| RXE250 | 2.50 | 5.00 | 15.6 | 2.50 | 0.05 | 0.08 | 0.13 |
| RXE300 | 3.00 | 6.00 | 19.8 | 2.80 | 0.04 | 0.06 | 0.10 |
| RXE375 | 3.75 | 7.50 | 24.0 | 3.20 | 0.03 | 0.05 | 0.08 |

I_H = Hold current—maximum current at which the device will not trip at 20°C.

I_T = Trip current—minimum current at which the device will always trip at 20°C.

P_d = Typical power dissipation—typical amount of power dissipated by the device when in tripped state in 20°C still air.

R min. = Minimum device resistance at 20°C prior to tripping.

R max. = Maximum device resistance at 20°C prior to tripping.

R₁ max. = Maximum device resistance at 20°C measured 1 hour post trip.

Physical characteristics

| | |
|---------------------------|--|
| Lead material | RXE010: Tin coated nickel-copper alloy, 24 AWG, Ø 0.51 mm/0.020 in RXE017–040: Tin/lead-plated copper-clad steel, 24 AWG, Ø 0.51 mm/0.020 in RXE050–090: Tin/lead-plated copper, 24 AWG, Ø 0.51 mm/0.020 in RXE110–375: Tin-plated copper, 20 AWG, Ø 0.81 mm/0.032 in |
| Soldering characteristics | Solderability per MIL-STD-202, Method 208E Solder heat withstand per MIL-STD-202, Method 210, Condition B |
| Insulating material | Cured, flame-retardant epoxy polymer; meets UL 94V-O |



Agency recognitions

| | |
|-----|------------------------|
| UL | File # E74889 |
| CSA | File # CA78165C |
| TÜV | Certificate # R9477354 |

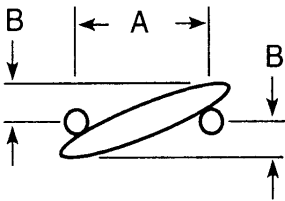
Environmental specifications

| Test | Test method | Conditions | Resistance change |
|--------------------|---------------------------|----------------------------|-------------------|
| Passive aging | Raychem PS300 | 70°C, 1000 hours | ±5% |
| | | 85°C, 1000 hours | ±5% |
| Humidity aging | Raychem PS300 | 85°C, 85% R.H., 1000 hours | ±5% |
| Thermal shock | Raychem PS300 | 125°C, -55°C (10 times) | ±5% |
| Solvent resistance | Raychem PS300, Method 215 | MIL-STD-202, Method 215F | No change |

Component layouts

The dimensions in the table below provide the component layout for each RXE device.

Component layout dimensions (millimeters/inches)



| Device | A nom. | B max. |
|--------|-------------|------------|
| RXE010 | 5.1 (0.20) | 1.0 (0.04) |
| RXE017 | 5.1 (0.20) | 1.7 (0.07) |
| RXE020 | 5.1 (0.20) | 1.0 (0.04) |
| RXE025 | 5.1 (0.20) | 1.0 (0.04) |
| RXE030 | 5.1 (0.20) | 1.0 (0.04) |
| RXE040 | 5.1 (0.20) | 1.2 (0.05) |
| RXE050 | 5.1 (0.20) | 1.2 (0.05) |
| RXE065 | 5.1 (0.20) | 1.5 (0.06) |
| RXE075 | 5.1 (0.20) | 1.5 (0.06) |
| RXE090 | 5.1 (0.20) | 1.5 (0.06) |
| RXE110 | 5.1 (0.20) | 1.2 (0.05) |
| RXE135 | 5.1 (0.20) | 1.2 (0.05) |
| RXE160 | 5.1 (0.20) | 1.5 (0.06) |
| RXE185 | 5.1 (0.20) | 1.5 (0.06) |
| RXE250 | 10.2 (0.40) | 1.7 (0.07) |

Tape and reel specifications (dimensions in millimeters)

Product availability: RXE010–RXE185

Devices taped using EIA468–B/IEC286-2 standards. See table below and Figures 1 and 2 for details.

| Dimension description | EIA mark | IEC mark | Dimensions | |
|---|----------------------|----------------------|---------------|-------------|
| | | | Dim. (mm) | Tol. (mm) |
| Carrier tape width | <i>W</i> | <i>W</i> | 18 | –0.5/+1.0 |
| Hold down tape width | <i>W₄</i> | <i>W₀</i> | 11 | min. |
| Top distance between tape edges | <i>W₆</i> | <i>W₂</i> | 3 | max. |
| Sprocket hole position | <i>W₅</i> | <i>W₁</i> | 9 | –0.5/+0.75 |
| Sprocket hole diameter* | <i>D₀</i> | <i>D₀</i> | 4 | –0.32/+0.2 |
| Abscissa to plane (straight lead) | <i>H</i> | <i>H</i> | 18.5 | ± 3.0 |
| Abscissa to plane (kinked lead) | <i>H₀</i> | <i>H₀</i> | 16 | ± 0.5 |
| Abscissa to top: RXE010-RXE090 | <i>H₁</i> | <i>H₁</i> | 32.2 | max. |
| Abscissa to top: RXE110-RXE185* | <i>H₁</i> | <i>H₁</i> | 37.6 | max. |
| Overall width w/lead protrusion: RXE10-RXE90 | <i>C₁</i> | | 43.2 | max. |
| Overall width w/o lead protrusion: RXE135-RXE185* | <i>C₂</i> | | 46.6 | max. |
| Lead protrusion | <i>L₁</i> | <i>l₁</i> | 1.0 | max. |
| Protrusion of cutout | <i>L</i> | <i>L</i> | 11 | max. |
| Protrusion beyond hold-down tape | <i>l₂</i> | <i>l₂</i> | Not specified | |
| Sprocket hole pitch: RXE010-RXE090 | <i>P₀</i> | <i>P₀</i> | 12.7 | ±0.3 |
| Sprocket hole pitch* | <i>P₀</i> | <i>P₀</i> | 25.5 | ±0.5 |
| Pitch tolerance | | | 20 consec. | ±1 |
| Device pitch: RXE010-RXE090 | | | 12.7 | |
| Device pitch: RXE110-RXE185 | | | 25.4 | |
| Tape thickness | <i>t</i> | <i>t</i> | 0.9 | max. |
| Tape thickness with splice | <i>t₁</i> | | 2.0 | max. |
| Splice sprocket hole alignment | | | 0 | ±0.3 |
| Body lateral deviation | Δh | Δh | 0 | ±1.0 |
| Body tape plane deviation | Δp | Δp | 0 | ±1.3 |
| Ordinate to adjacent component lead* | <i>P₁</i> | <i>P₁</i> | 3.81 | ±1.0 |
| Lead spacing* | <i>F</i> | <i>F</i> | 5.08 | ±0.8 |
| Reel width: RXE090-RXE135* | <i>w₂</i> | <i>w</i> | 56 | max. |
| Reel width: RXE160-RXE185* | <i>w₂</i> | <i>w</i> | 63.5 | max. |
| Reel diameter | <i>a</i> | <i>d</i> | 370 | max. |
| Space between flanges less device* | <i>w₁</i> | | 4.75 | –3.25/+9.25 |
| Arbor hole diameter | <i>c</i> | <i>f</i> | 26 | ±12.0 |
| Core diameter* | <i>n</i> | <i>h</i> | 91 | max. |
| Box | | | 56/372/372 | max. |
| Consecutive missing places | | | None | |
| Empty places per reel | | | 0.1% max. | |

* Differs from EIA specification.

Figure 1: EIA Referenced Taped Component Dimensions

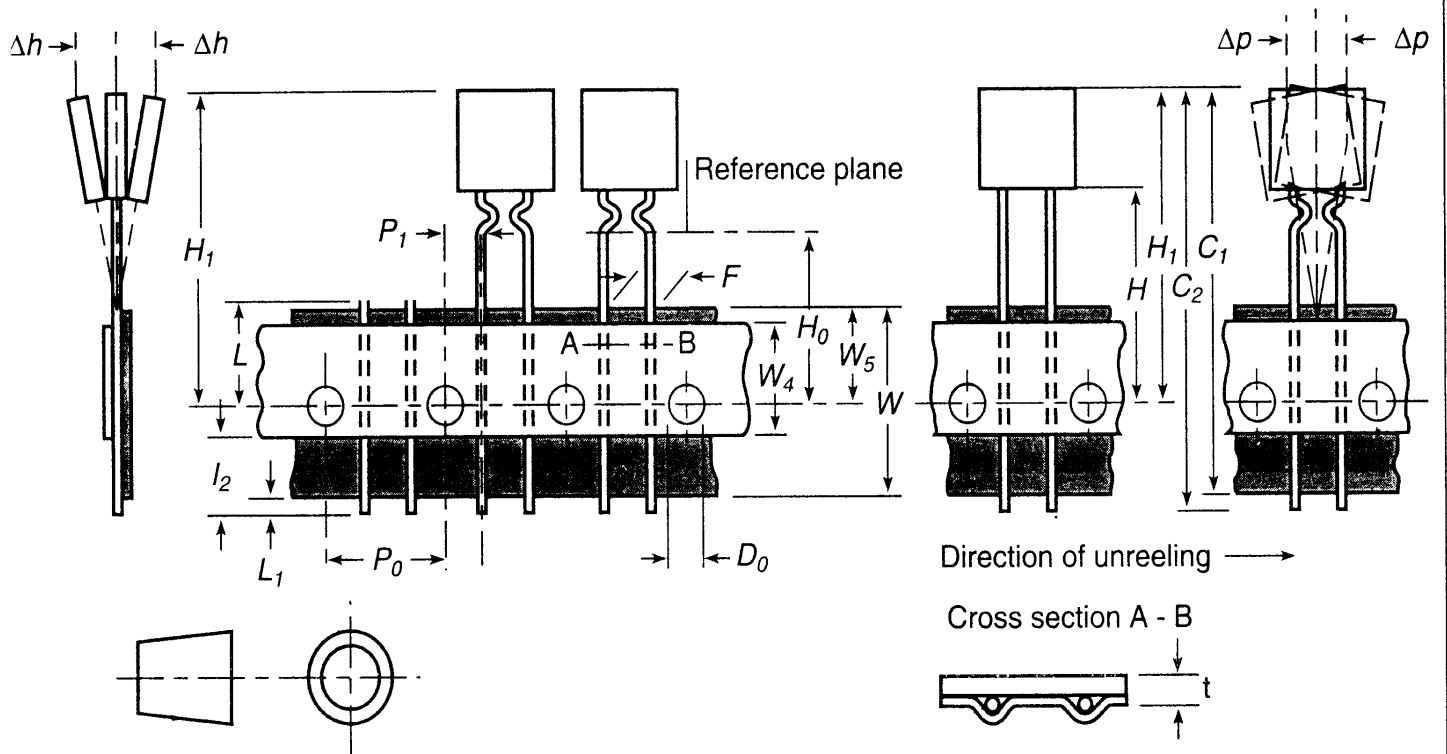
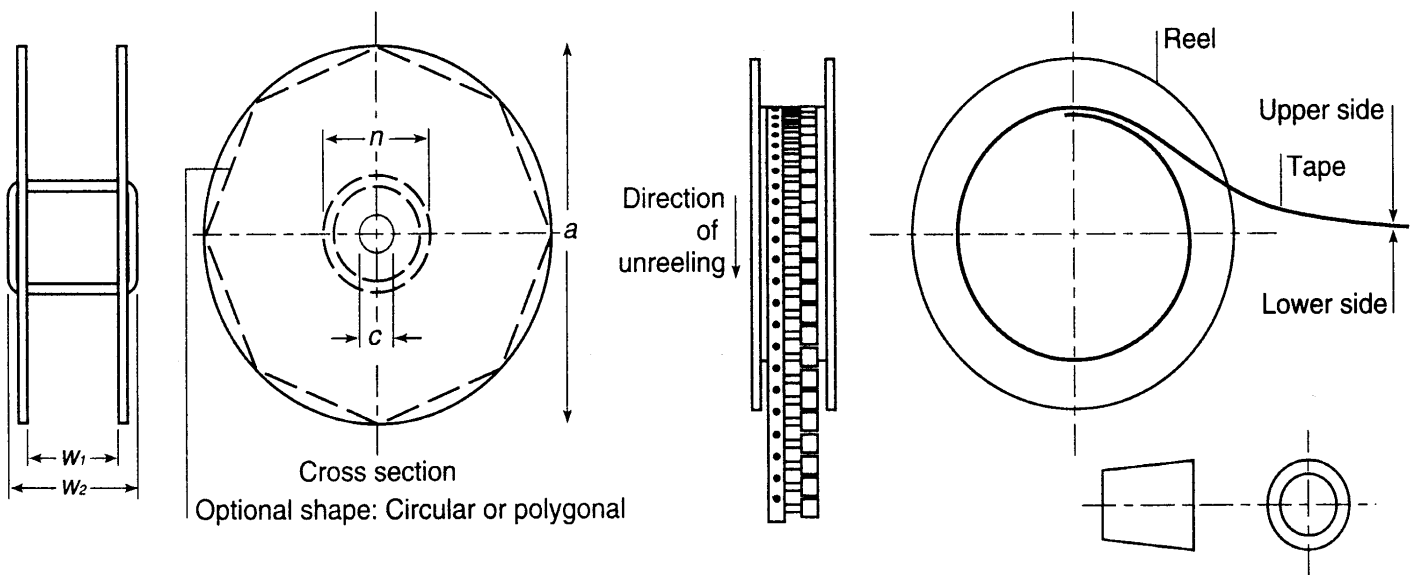


Figure 2: Reel Dimensions

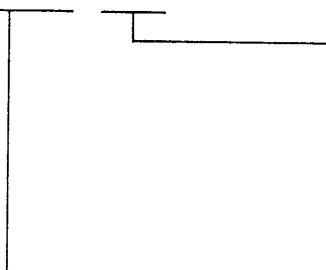


Ordering information

| Product description | Bag quantity | Tape and reel quantity | AMMO pack | Standard package |
|---------------------|--------------|------------------------|-----------|------------------|
| RXE010 | 500 | | | 10000 |
| RXE010-2 | | 3000 | | 15000 |
| RXE010-AP | | | 2000 | 10000 |
| RXE017 | 500 | | | 10000 |
| RXE017-2 | | 2500 | | 12500 |
| RXE017-AP | | | 1500 | 7500 |
| RXE020 | 500 | | | 10000 |
| RXE020-2 | | 3000 | | 15000 |
| RXE020-AP | | | 2000 | 10000 |
| RXE025 | 500 | | | 10000 |
| RXE025-2 | | 3000 | | 15000 |
| RXE025-AP | | | 2000 | 10000 |
| RXE030 | 500 | | | 10000 |
| RXE030-2 | | 3000 | | 15000 |
| RXE030-AP | | | 2000 | 10000 |
| RXE040 | 500 | | | 10000 |
| RXE040-2 | | 3000 | | 15000 |
| RXE040-AP | | | 2000 | 10000 |
| RXE050 | 500 | | | 10000 |
| RXE050-2 | | 3000 | | 15000 |
| RXE050-AP | | | 2000 | 10000 |
| RXE065 | 500 | | | 10000 |
| RXE065-2 | | 3000 | | 15000 |
| RXE065-AP | | | 2000 | 10000 |
| RXE075 | 500 | | | 10000 |
| RXE075-2 | | 3000 | | 15000 |
| RXE075-AP | | | 2000 | 10000 |
| RXE090 | 500 | | | 10000 |
| RXE090-2 | | 3000 | | 15000 |
| RXE090-AP | | | 2000 | 10000 |
| RXE0110 | 500 | | | 10000 |
| RXE110-2 | | 1500 | | 7500 |
| RXE110-AP | | | 1000 | 5000 |
| RXE135 | 500 | | | 10000 |
| RXE135-2 | | 1500 | | 7500 |
| RXE135-AP | | | 1000 | 5000 |
| RXE160 | 500 | | | 10000 |
| RXE160-2 | | 1500 | | 7500 |
| RXE160-AP | | | 1000 | 5000 |
| RXE185 | 500 | | | 10000 |
| RXE185-2 | | 1500 | | 7500 |
| RXE185-AP | | | 1000 | 5000 |
| RXE250 | 500 | * | * | 10000 |



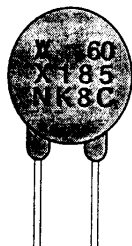
Part numbering system

 RXE suffix


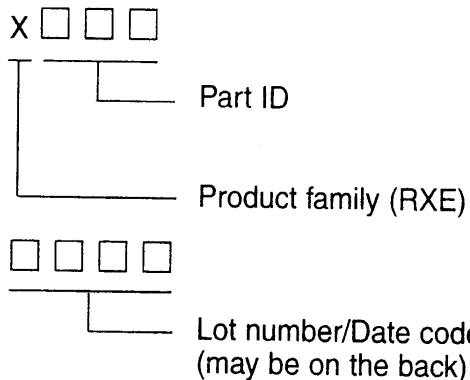
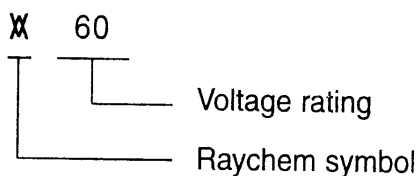
- Blank = Bulk packaged
- 2 = Tape and reel
- AP = AMMO pack
- 1 = 25.4-mm (1.0 inch) minimum lead length
- K = Kinked leads
- S = Straight leads

Current rating

Part marking system



Example



| Part description | Part ID |
|------------------|---------|
| RXE010 | 010 |
| RXE017 | 017 |
| RXE020 | 020 |
| RXE025 | 025 |
| RXE030 | 030 |
| RXE040 | 040 |
| RXE050 | 050 |
| RXE065 | 065 |
| RXE075 | 075 |
| RXE090 | 090 |
| RXE110 | 110 |
| RXE135 | 135 |
| RXE160 | 160 |
| RXE185 | 185 |
| RXE250 | 250 |
| RXE300 | 300 |
| RXE375 | 375 |

WARNING:

- Operation beyond maximum ratings or improper use may result in device damage and possible electrical arcing and flame.
- These devices are intended for protection against occasional over-current or overtemperature fault conditions, and should not be used when repeated fault conditions are anticipated.