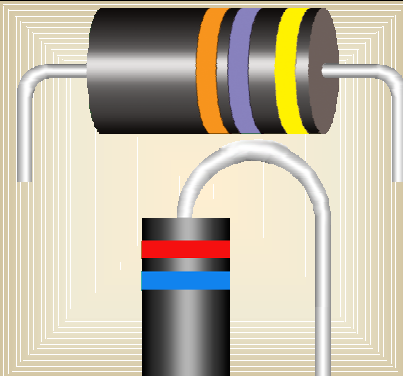
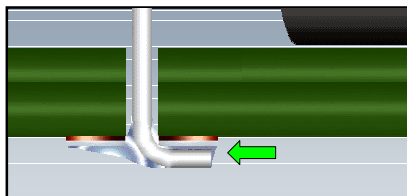


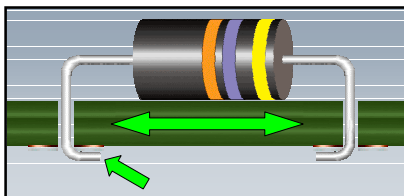
THROUGH-HOLE SOLDERING AXIAL COMPONENTS	
	<p>AXIAL COMPONENTS</p> <p>Axial-leaded components are often considered the most common type of discrete component used in through-hole printed wiring assembly.</p> <p>See Section 6.01 "Through-Hole Soldering, General Requirements", for common accept / reject criteria.</p>



PREFERRED HORIZONTAL MOUNTING IN NPTH COMPLETED ASSEMBLY

The component terminations are completely wetted. The solder fillets are smooth, nonporous, undisturbed, exhibit a concave profile, and extend to the edge of the termination pad.

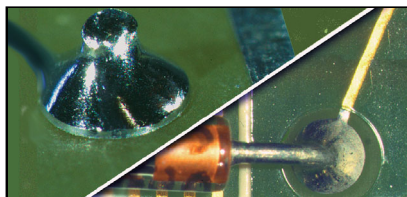
[NASA-STD-8739.3 \[13.6.1 \]](#)



PREFERRED HORIZONTAL MOUNTING IN NPTH INTERIM ASSEMBLY

Parts shall be parallel to, and in full contact with, the mounting surface, and centered between the termination holes. Leads shall be terminated with an off-the-pad-lap solder joint.

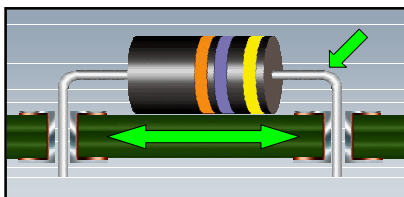
[NASA-STD-8739.3 \[8.4.2.a \]](#)



PREFERRED HORIZONTAL MOUNTING IN PTH COMPLETED ASSEMBLY

The component terminations on both sides of the board are completely wetted. The solder fillets are smooth, nonporous, undisturbed, exhibit a concave profile, and extend to the edge of the termination pad.


[NASA-STD-8739.3 \[13.6.1.f \]](#)

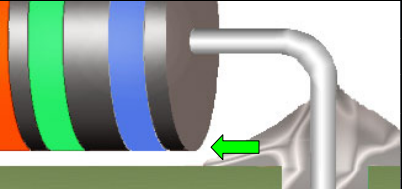
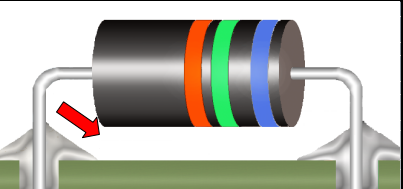


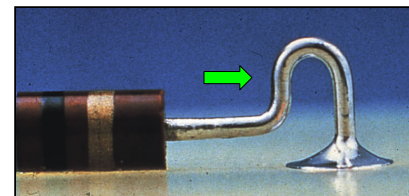
PREFERRED HORIZONTAL MOUNTING IN PTH INTERIM ASSEMBLY

Parts shall be parallel to, and in full contact with, the mounting surface, and approximately centered between the termination holes. Leads exhibit proper stress relief bends and spacing.

[NASA-STD-8739.3 \[8.4.2.a \]](#)

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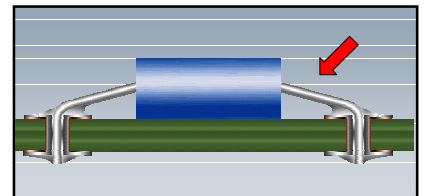
THROUGH-HOLE SOLDERING AXIAL COMPONENTS (cont.)	
	<p>ACCEPTABLE HORIZONTAL MOUNTING GAP</p> <p>When parts will be bonded, slight spacing [≤ 0.68 mm (0.025 in.)] will be acceptable. The part shall be mounted approximately parallel to the mounting surface.</p> <p>NASA-STD-8739.3 [8.4.2.a]</p>
	<p>UNACCEPTABLE IMPROPER HORIZONTAL SPACING</p> <p>Parts intended for horizontal mounting shall be parallel to, and in contact with, the mounting surface. Part spacing above the mounting surface should not exceed 0.68 mm (0.025 in.), unless the part will be bonded.</p> <p>NASA-STD-8739.3 [8.4.2.a]</p>



ACCEPTABLE STRESS RELIEF

Stress relief shall be incorporated, wherever possible, into all leads and conductors in solder connections to provide freedom of movement of part leads or conductors between points of constraint. Camel-hump bend pictured.

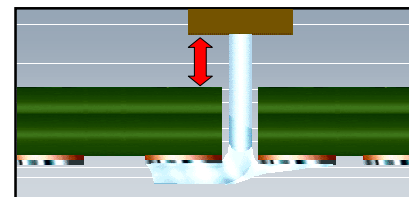
[NASA-STD-8739.3 \[8.1.1 \]](#)



UNACCEPTABLE INSUFFICIENT STRESS RELIEF

Stress relief shall be incorporated, wherever possible, into all leads and conductors in solder connections to provide freedom of movement of part leads or conductors between points of constraint.

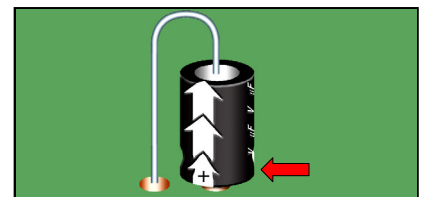
[NASA-STD-8739.3 \[8.1.1 \]](#), [13.6.2.a.10]



UNACCEPTABLE IMPROPER VERTICAL MOUNTING NON-PLATED-THROUGH HOLE (NPTH)

The component has been mounted with a space between the component end and the board surface, eliminating any mechanical support to the part or solder joint.


[NASA-STD-8739.3 \[13.6.2.a.6 \]](#)



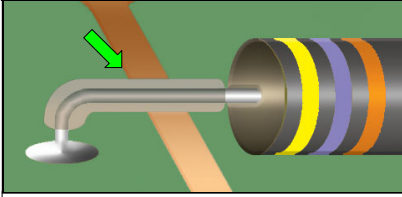
UNACCEPTABLE IMPROPER VERTICAL MOUNTING PLATED THROUGH HOLE (PTH)

The component has been mounted with the end of the component in contact with the plated-through-hole (PTH). This will result in solder contact with the part body meniscus.

[NASA-STD-8739.3 \[8.4.2.b.1 \]](#), [13.6.2.a.6]

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**THROUGH-HOLE SOLDERING
AXIAL COMPONENTS (cont.)**

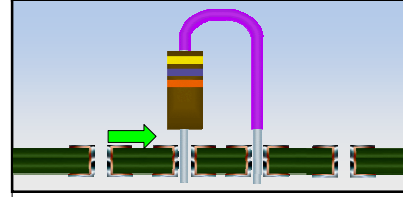


**ACCEPTABLE
LEADS CROSSING EXPOSED CONDUCTORS**

Leads crossing exposed conductors shall be sleeved with non-conductive sleeving or shrink tubing. Tubing shall be trimmed to meet insulation spacing requirements. Transparent / translucent material is recommended.

[Best Workmanship Practice](#)

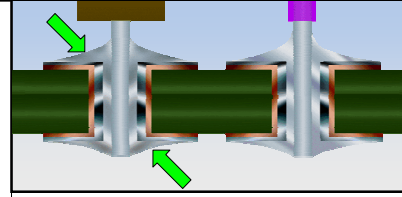
**THROUGH-HOLE SOLDERING
AXIAL COMPONENTS (cont.)**



**PREFERRED
VERTICAL MOUNTING IN PTH
INTERIM ASSEMBLY**

The component shall be mounted with a minimum of 0.5 mm (0.020 in) to a maximum of 1.27 mm (0.050 in.) clearance between the end of the component and the board surface.

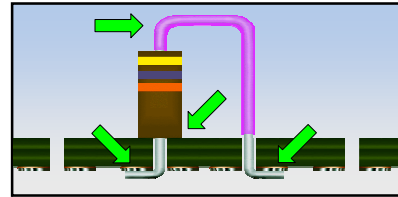
[NASA-STD-8739.3 \[8.4.2.b.1 \]](#)



**PREFERRED
VERTICAL MOUNTING IN PTH
COMPLETED ASSEMBLY**

The component terminations on both sides of the board are completely wetted. The solder fillets are smooth, nonporous, undisturbed, exhibit a concave profile, and extend to the edge of the termination pad.

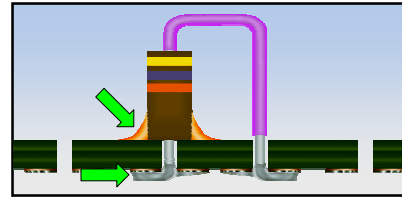
[NASA-STD-8739.3 \[13.6.1 \]](#)



**PREFERRED
VERTICAL MOUNTING IN NPTH
INTERIM ASSEMBLY**

The component shall be mounted with the end in contact with the board surface, and shall be terminated with an off-the-pad-lap solder joint. The opposite lead shall have 2 right angle bends.

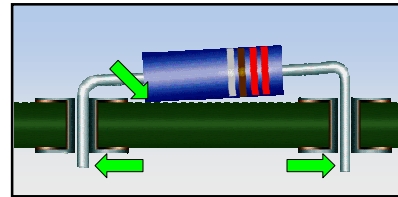
[NASA-STD-8739.3 \[8.4.2.b.2 \]](#)



**PREFERRED
VERTICAL MOUNTING IN NPTH
COMPLETED ASSEMBLY**

The component terminations are completely wetted. The solder fillets are smooth, nonporous, undisturbed, exhibit a concave profile, and extend to the edge of the termination pad. The component is staked.

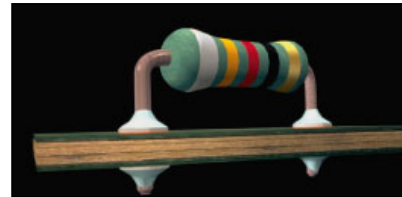
[NASA-STD-8739.3 \[13.6.1 \]](#)



**ACCEPTABLE
ANGULARITY**

Angularity shall not exceed 0.68 mm (0.025 in.), provided part of the component is in contact with the board, and the angularity does not violate minimum electrical spacing or lead protrusion requirements.


[Best Workmanship Practice](#)




**ACCEPTABLE
HEAT PRODUCING PARTS**

Parts which dissipate heat in quantities of 1 Watt or greater, or in quantities sufficient to damage the laminate shall be mounted with sufficient standoff [$\geq 1.5\text{mm}$ (0.060 in.)] and shall be mechanically restrained.

[Best Workmanship Practice](#)

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