



Background

Undoubtedly, a crack appearing on an inductor's surface may automatically trigger a quality concern. However, cracks can represent mere surface imperfection that have no effect on the performance of the inductor. The purpose of this Visual Inspection Guide is to provide a better understanding of the surface appearance regarding cracks for the Bourns® Models SRP1038A, SRP1238A, SRP1245A, SRP1265A and SRP7028A Inductor Series.

The Bourns® Model SRP-A Series Shielded Power Inductors are constructed with an iron powder core mixed with a bonding agent that is processed in a high pressure molding and oven baked environment. It is natural that cracks may develop on the core surface of the finished product. Cracks may have been caused by friction from the press mold wall when the inductor was released from the molding cavity or thermal expansion of copper wire coil during the bonding agent oven curing process. Not only can surface cracks develop during the inductor manufacturing process - they may also arise through the inductor's soldering assembly process and during the course of its application, as well.

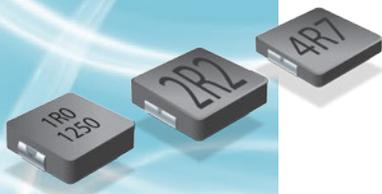
As a result, Bourns has established a set of guidelines to help identify the severity of cracks and to determine whether the inductor with surface cracks is in an acceptable condition or if it should be rejected.

Inductor samples containing minor crack lines deemed to be acceptable have been subjected to the tests listed below:

- Salt Spray
- Resistance to Soldering Heat
- Humidity
- Inductance
- DC Resistance

The test reports are available upon request. After these tests, samples with minor cracks were thoroughly examined, both electrically and visually. Corrosion was not observed at, and or near the cracked area. The severity of the crack line was not found to worsen. A mechanical cross-sectional analysis at the cracked area was conducted after the salt spray test and corrosion was not observed below the cracked surface. Inductance and DC Resistance were found well within specifications, before and after the environmental testing.

Various tests have been conducted on inductor samples containing minor crack lines. The test results indicated that the electrical characteristics and mechanical integrity of these inductors had not been degraded.



ACCEPTANCE VS. REJECTION CRITERIA OF A SURFACE CRACK

Top Surface

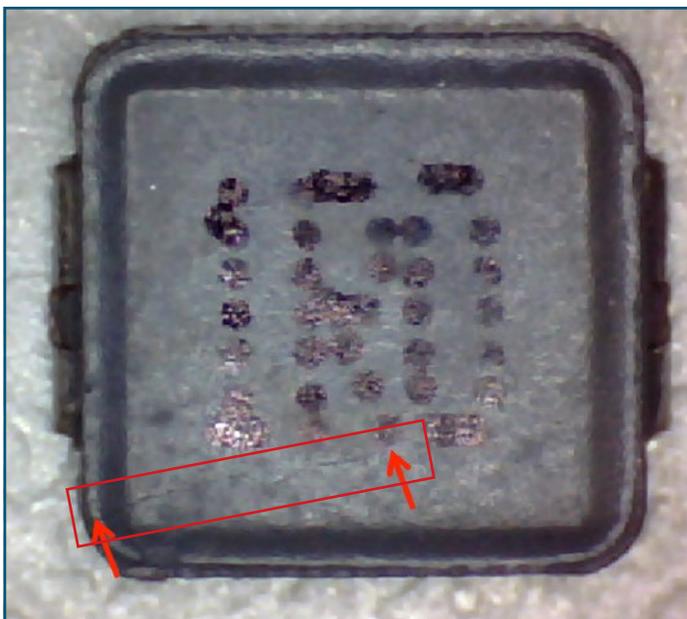


Figure 1 | *Acceptable Crack*

Crack starts from one edge of the top surface but is not extended to the opposite edge.

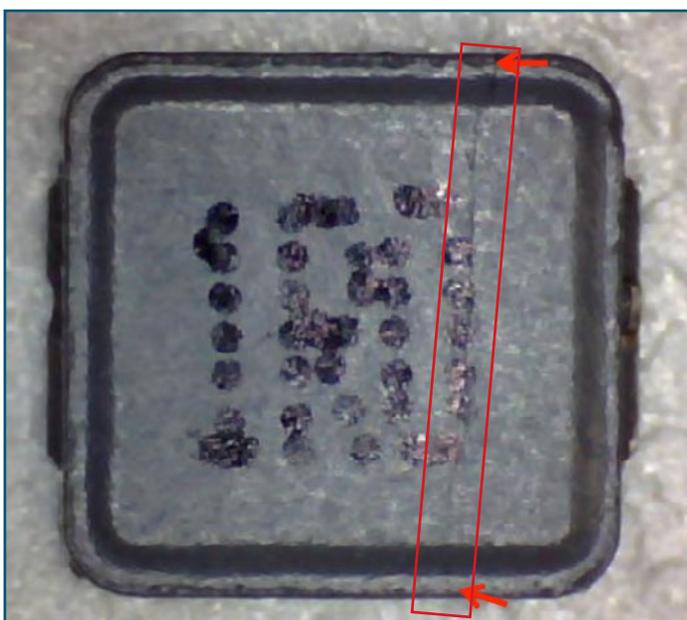
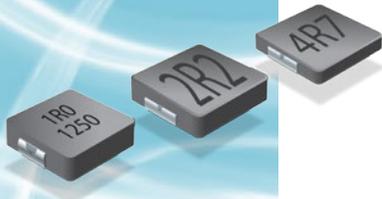


Figure 2 | *Rejected Crack*

Crack starts from one edge of the top surface and extends to the opposite edge.



ACCEPTANCE VS. REJECTION CRITERIA OF A SURFACE CRACK

Bottom Surface



Figure 3 | *Acceptable Crack*

Crack is located only at the groove of the body and does not extend beyond convexity.

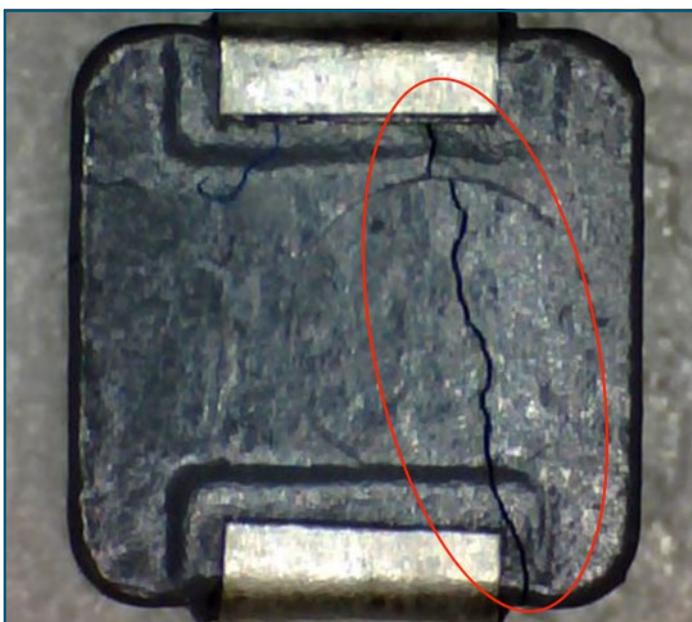


Figure 4 | *Rejected Crack*

Crack is located at the groove of the body and extends beyond convexity.



ACCEPTANCE VS. REJECTION CRITERIA OF A SURFACE CRACK

Side without Pad

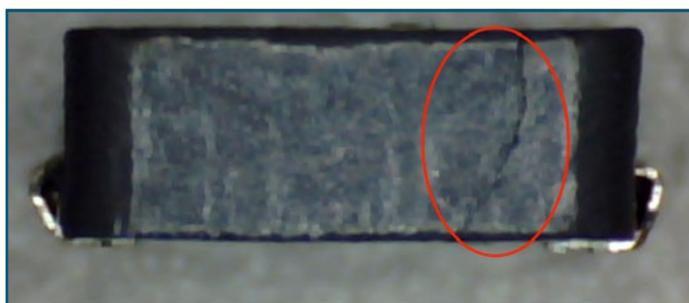


Vertical crack: Crack does not extend from one side to another.

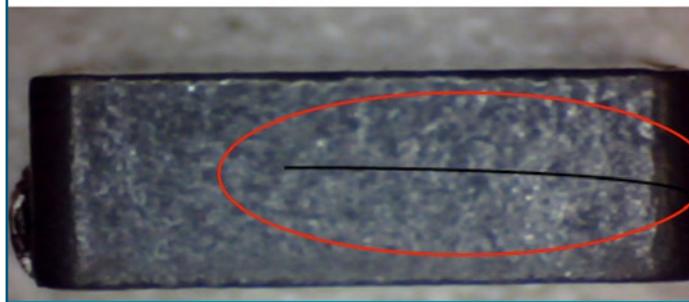


Lateral crack: Crack covers less than 50 % of the length of the side.

Figure 5 | *Acceptable Crack*



Vertical crack: Crack extends from one side to another.



Lateral crack: Crack covers more than 50 % of the length of the side.

Figure 6 | *Rejected Crack*



ACCEPTANCE VS. REJECTION CRITERIA OF A SURFACE CRACK

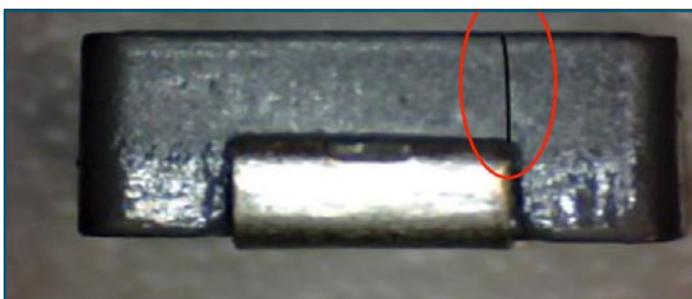
Side with Pad



Crack around soldering pad that does not extend to the top or side edge.



Figure 7 | Acceptable Crack



Crack around soldering pad that extends to the top or side edge.

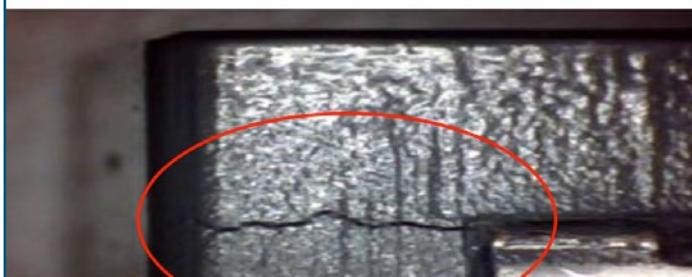


Figure 8 | Rejected Crack

Bourns® Model SRP-A Series VISUAL INSPECTION GUIDE



ACCEPTANCE VS. REJECTION CRITERIA OF A SURFACE CRACK

Crack Width on any Surface



Figure 9 | *Acceptable Crack*

Crack width is less than or equal to 0.2 mm.

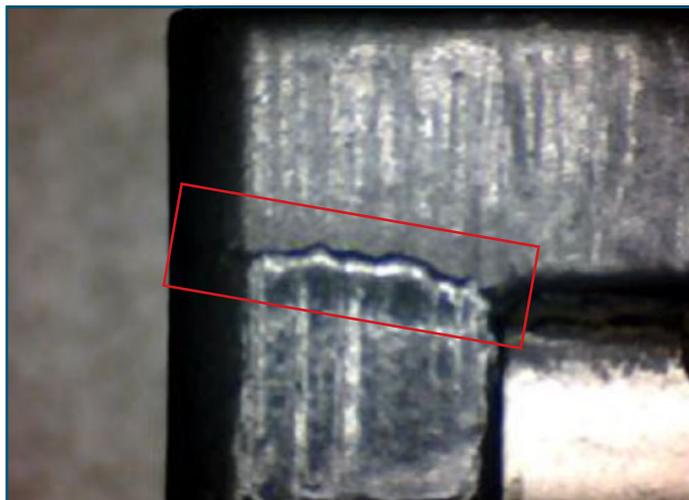


Figure 10 | *Rejected Crack*

Crack width is wider than 0.2 mm.

For more information about Bourns® Shielded Power Inductors, please visit

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