ACCU-L® TECHNOLOGY

The Accu-L® SMD Inductor is based on thin-film multilayer technology. This technology provides a level of control on the electrical and physical characteristics of the component which gives consistent characteristics within a lot and lot-to-lot. The original design provides small size, excellent high-frequency performance and rugged construction for reliable automatic assembly.

The Accu-L® inductor is particularly suited for the telecommunications industry where there is a continuing trend towards miniaturization and increasing frequencies. The Accu-L® inductor meets both the performance and tolerance requirements of present cellular frequencies 450MHz and 900MHz and of future frequencies, such as 1700MHz, 1900MHz and 2400MHz.

FEATURES

- High Q
- RF Power Capability
- High SRF
- Low DC Resistance
- Ultra-Tight Tolerance on Inductance
- Standard 0603 and 0805 Chip Size
- Low Profile
- Rugged Construction
- Taped and Reeled

APPLICATIONS

- Mobile Communications
- Satellite TV Receivers
- GPS
- Vehicle Locations Systems
- Filters
- Matching Networks
Accu-L® 0603 and 0805
SMD High-Q RF Inductor

HOW TO ORDER

HOW TO ORDER

ELECTRICAL SPECIFICATIONS TABLE FOR ACCU-L® 0603

<table>
<thead>
<tr>
<th>Inductance (nH)</th>
<th>Available Inductance Tolerance</th>
<th>Q Typical</th>
<th>L (nH)</th>
<th>Q Typical</th>
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<th>L (nH)</th>
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<th>L (nH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.6±0.10</td>
<td>(0.6±0.084)</td>
<td>1.6±0.10</td>
<td>2.1±0.10</td>
<td>(0.83±0.04)</td>
<td>0.81±0.10</td>
<td>(0.032±0.004)</td>
<td>0.8±0.04</td>
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</tr>
<tr>
<td>0.8±0.10</td>
<td>(0.08±0.04)</td>
<td>0.8±0.10</td>
<td>1.5±0.10</td>
<td>(0.059±0.004)</td>
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<td>1.5±0.10</td>
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<tr>
<td>1.0±0.10</td>
<td>(0.10±0.04)</td>
<td>0.8±0.10</td>
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ELECTRICAL SPECIFICATIONS TABLE FOR ACCU-L® 0805

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<tr>
<th>Inductance (nH)</th>
<th>Available Inductance Tolerance</th>
<th>Q Typical</th>
<th>L (nH)</th>
<th>Q Typical</th>
<th>L (nH)</th>
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<th>L (nH)</th>
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<td>(0.059±0.004)</td>
<td>1.5±0.10</td>
</tr>
</tbody>
</table>

(1) | (2)  
---|---

L, Q, SRF measured on HP 4291A, Boonton 34A and Wiltron 360 Vector Analyzer, Rs measured on Keithley 580 micro-ohmmeter.
Accu-L® 0603 and 0805
SMD High-Q RF Inductor

**L0603**

**Typical Q vs. Frequency**

![Graph](image)

Measured on AGILENT 4291B/4287 using the 16196A test fixture

**Typical Inductance vs. Frequency**

![Graph](image)

Measured on AGILENT 4291B/4287 using the 16196A test fixture

**L0805**

**Typical Q vs. Frequency**

![Graph](image)

Measured on HP4291A and Boonton 34A Coaxial Line

**Typical Inductance vs. Frequency**

![Graph](image)

Measured on HP4291A and Wiltron 360 Vector Analyzer

**Maximum Temperature Rise**

at 25°C ambient temperature (on FR-4)

![Graph](image)

Temperature rise will typically be no higher than shown by the graph
Accu-L® 0603 and 0805
SMD High-Q RF Inductor

FINAL QUALITY INSPECTION
Finished parts are tested for electrical parameters and visual/mechanical characteristics.

ENVIRONMENTAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>TEST</th>
<th>CONDITIONS</th>
<th>REQUIREMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solderability</td>
<td>Components completely immersed in a solder bath at 235 ± 5°C for 2 secs.</td>
<td>Terminations to be well tinned. No visible damage.</td>
</tr>
<tr>
<td>Leach Resistance</td>
<td>Components completely immersed in a solder bath at 260 ±5°C for 60 secs.</td>
<td>Dissolution of termination faces ≤ 15% of area. Dissolution of termination edges ≤ 25% of length.</td>
</tr>
<tr>
<td>Storage</td>
<td>12 months minimum with components stored in “as received” packaging.</td>
<td>Good solderability</td>
</tr>
<tr>
<td>Shear</td>
<td>Components mounted to a substrate. A force of 5N applied normal to the line joining the terminations and in a line parallel to the substrate.</td>
<td>No visible damage</td>
</tr>
<tr>
<td>Rapid Change of Temperature</td>
<td>Components mounted to a substrate. 5 cycles -55°C to +125°C.</td>
<td>No visible damage</td>
</tr>
<tr>
<td>Bend Strength</td>
<td>Tested as shown in diagram 1mm deflection 45mm 45mm 45mm</td>
<td>No visible damage</td>
</tr>
<tr>
<td>Temperature Coefficient of Inductance (TCL)</td>
<td>Component placed in environmental chamber -55°C to +125°C.</td>
<td>$T_{CL} = \frac{L_2-L_1}{L_1(T_2-T_1)} \cdot 10^6$</td>
</tr>
</tbody>
</table>

Parts are 100% tested for inductance at 450MHz. Parts are 100% tested for $R_{DC}$. Each production lot is evaluated on a sample basis for:
- $Q$ at test frequency
- Static Humidity Resistance: 85°C, 85% RH, 160 hours
- Endurance: 125°C, $I_R$, 4 hours
HANDLING
SMD chips should be handled with care to avoid damage or contamination from perspiration and skin oils. The use of plastic tipped tweezers or vacuum pick-ups is strongly recommended for individual components. Bulk handling should ensure that abrasion and mechanical shock are minimized. For automatic equipment, taped and reeled product is the ideal medium for direct presentation to the placement machine.

CIRCUIT BOARD TYPE
All flexible types of circuit boards may be used (e.g. FR-4, G-10) and also alumina. For other circuit board materials, please consult factory.

COMPONENT PAD DESIGN
Component pads must be designed to achieve good joints and minimize component movement during soldering. Pad designs are given below for both wave and reflow soldering.

The basis of these designs is:

a. Pad width equal to component width. It is permissible to decrease this to as low as 85% of component width but it is not advisable to go below this.
b. Pad overlap about 0.3mm.
c. Pad extension about 0.3mm for reflow. Pad extension about 0.8mm for wave soldering.

WAVE SOLDERING
DIMENSIONS: millimeters (inches)

REFLOW SOLDERING
DIMENSIONS: millimeters (inches)

PREHEAT & SOLDERING
The rate of preheat in production should not exceed 4°C/second. It is recommended not to exceed 2°C/second.

Temperature differential from preheat to soldering should not exceed 150°C.

For further specific application or process advice, please consult AVX.

HAND SOLDERING & REWORK
Hand soldering is permissible. Preheat of the PCB to 100°C is required. The most preferable technique is to use hot air soldering tools. Where a soldering iron is used, a temperature controlled model not exceeding 30 watts should be used and set to not more than 260°C. Maximum allowed time at temperature is 1 minute. When hand soldering, the base side (white side) must be soldered to the board.

COOLING
After soldering, the assembly should preferably be allowed to cool naturally. In the event of assisted cooling, similar conditions to those recommended for preheating should be used.

CLEANING RECOMMENDATIONS
Care should be taken to ensure that the devices are thoroughly cleaned of flux residues, especially the space beneath the device. Such residues may otherwise become conductive and effectively offer a lossy bypass to the device. Various recommended cleaning conditions (which must be optimized for the flux system being used) are as follows:

Cleaning liquids . . . . . . i-propanol, ethanol, acetylacetone, water, and other standard PCB cleaning liquids.

Ultrasonic conditions . . power – 20w/liter max. frequency – 20kHz to 45kHz.

Temperature . . . . . . . . 80°C maximum (if not otherwise limited by chosen solvent system).

Time . . . . . . . . . . . . . . 5 minutes max.

STORAGE CONDITIONS
Recommended storage conditions for Accu-L® prior to use are as follows:

Temperature . . . . . . . . 15°C to 35°C
Humidity . . . . . . . . . . ≤65%
Air Pressure . . . . . . . . 860mbar to 1060mbar

RECOMMENDED SOLDERING PROFILE
For recommended soldering profile see page 23