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- Crosswords
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**REFERENCES**

- Electrical General Mathematics
- © 1996-2003
- U.S. Defense

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**- Inductance -**

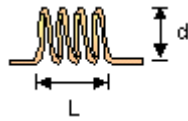
**Vendor Application Notes**

- [CoilCraft](#)

- [Inductance Conversion page](#)
- [Inductor Vendors page](#)

<p><b>Parallel Inductors</b></p> $\frac{1}{L_p} = \frac{1}{L_1} + \frac{1}{L_2} + \dots + \frac{1}{L_n}$	<p><b>Series Inductors</b></p> $L_s = L_1 + L_2 + \dots + L_n$
<p><b>Straight Wire</b></p> <p> <math>L</math> (low freq) = 0.002x [ln(2x/r) - 0.75] <math>\mu</math>H  <math>L</math> (high freq) = 0.002x [ln(2x/r) - 1.00] <math>\mu</math>H                  x = length, r = radius (use same units for both)             </p> <p>Look up wire diameter <a href="#">here</a>.</p>	$W = 1/2 Li^2$ $v(t) = L \frac{di(t)}{dt}$ $i(t) = \frac{1}{L} \int v(t) dt$ $X_L = 2 \pi f L$
<p><b>Coaxial Cable</b></p> $L = \frac{\mu_r \epsilon_r x}{8\pi} \ln\left(\frac{b}{a}\right)$	<p> <math>L</math> = inductance (H)  <math>N</math> = number of turns  <math>a</math> = inner radius  <math>b</math> = outer radius  <math>x</math> = length  <math>v</math> = voltage (V)  <math>W</math> = energy (J)             </p>
<p><b>Closely Wound Toroid</b></p> $L = \frac{\mu_r \epsilon_r N^2 h}{2\pi} \ln\left(\frac{b}{a}\right)$	<p><b>"Q" Factor</b></p> <ul style="list-style-type: none"> <li>● <math>Q = F_0/F_{3db}</math></li> <li>● <math>Q = E_{stored} / E_{loss\_per\_cycle}</math></li> <li>● <math>Q = R/(2*\pi*F_0*L)</math> for parallel tank</li> <li>● <math>Q = (2*\pi*F_0*L)/R</math> for series tank</li> <li>● <math>1/Q_{load} = 1/Q_{ext} + 1/Q_{tank}</math></li> </ul>
<p><b>Single-Layer Air-Core</b></p> $d^2 * n^2$	<p> <math>L</math> = inductance                  Where: <math>E</math> = energy                  ext = external             </p>

$$\text{Inductance } (\mu\text{H}) = \sqrt{18d + 40L}$$



$$n = \frac{(18d + 40L) * \text{sqrt}(2 * \text{Inductance } [\mu\text{H}])}{2d * \text{sqrt}(9d + 20L)}$$

Where: d and L are in inches  
n = number of turns

Note: If lead lengths are significant, use the straight wire calculation to add that inductance.