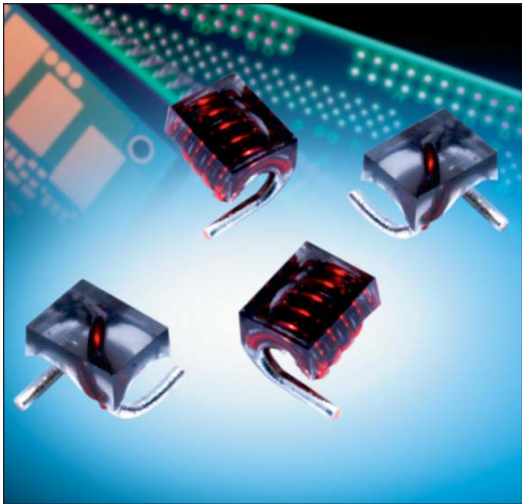


# Air Core RF Inductors



## AL Series



### GENERAL DESCRIPTION

AVX Air Core RF Inductors, part of the wound air core inductor family, are ideal for RF circuits, broadband I/O filtering, frequency selection, or impedance matching. The air core inductor provides better performance over solid core inductors with higher Q, and better current handling capabilities.

### FEATURES

- Air Core Construction
- High Q
- High Current
- Excellent SRF
- Many inductance values ranging from 1.65nH to 538nH

### APPLICATIONS

- RF Applications
- RF Circuits
- Broadband I/O Filtering
- Impedance Matching/Tuning
- Decoupling/Bypassing

### HOW TO ORDER

| AL                       | 05A         | 02N5              | G                | T                  | R                   |
|--------------------------|-------------|-------------------|------------------|--------------------|---------------------|
|                          |             |                   |                  |                    |                     |
| <b>Air Core Inductor</b> | <b>Size</b> | <b>Inductance</b> | <b>Tolerance</b> | <b>Termination</b> | <b>Packaging</b>    |
|                          | Size        | 02N5 = 2.5nH      | G = 2%           | T = Sn/Ag over Cu  | R = 7" reel         |
|                          | 05A = 0605  | 12N5 = 12.5nH     | J = 5%           | (96.5% Sn, 3% Ag,  | S = 13" reel*       |
|                          | 05B = 0605  | 130N = 130nH      | K = 10%          | 0.5% Cu)           |                     |
|                          | 12A = 1212  |                   |                  |                    | *AL016 & AL023 Only |
|                          | 12B = 1212  |                   |                  |                    |                     |
|                          | 016 = 1516  |                   |                  |                    |                     |
|                          | 023 = 2523  |                   |                  |                    |                     |

### ELECTRICAL SPECIFICATIONS

|                       |                                                               |
|-----------------------|---------------------------------------------------------------|
| Technical Data        | All technical data related to an ambient temperature of +25°C |
| Inductance Range      | 1.65nH to 538nH                                               |
| Inductance Tolerance  | 2%, 5%, 10%                                                   |
| Rated Current         | 1.5A to 4.0A                                                  |
| Operating Temperature | -40°C to +125°C                                               |
| Termination           | 96.5% Tin/3% Silver over 0.5% Copper                          |

# Air Core RF Inductors



## AL Series

### ELECTRICAL SPECIFICATIONS

| AVX P/N      | Turns | Inductance (nH) | Tolerance (%) | Q min. | Q typ. | Test Freq. (MHz) | DCR max (mΩ) | SRF GHz (min.) | Ir max Amps |
|--------------|-------|-----------------|---------------|--------|--------|------------------|--------------|----------------|-------------|
| AL05A1N65KTR | 2     | 1.65            | K             | 100    | -      | 800              | 4            | 10             | 1.60        |
| AL05A2N55*TR | 3     | 2.55            | J, K          | 100    | -      | 800              | 5            | 8.2            | 1.60        |
| AL05A3N85*TR | 4     | 3.85            | G, J, K       | 100    | -      | 800              | 6            | 7.5            | 1.60        |
| AL05A5N45*TR | 5     | 5.45            | G, J          | 100    | -      | 800              | 8            | 7              | 1.60        |
| AL05B05N6*TR | 6     | 5.6             | G, J          | 100    | -      | 800              | 9            | 6.5            | 1.60        |
| AL05B7N15*TR | 7     | 7.15            | G, J          | 100    | -      | 800              | 10           | 6              | 1.60        |
| AL05B08N8*TR | 8     | 8.8             | G, J          | 100    | -      | 800              | 12           | 6              | 1.60        |
| AL05B9N85*TR | 9     | 9.85            | G, J          | 100    | -      | 800              | 13           | 5.2            | 1.60        |
| AL05B12N5*TR | 10    | 12.55           | G, J          | 100    | -      | 800              | 14           | 4.6            | 1.60        |
| AL12A02N5KTR | 1     | 2.5             | K             | 145    | -      | 150              | 1.1          | 12.5           | 4.00        |
| AL12A05N0*TR | 2     | 5               | J, K          | 140    | -      | 150              | 1.8          | 6.5            | 4.00        |
| AL12A08N0*TR | 3     | 8               | G, J          | 140    | -      | 150              | 2.6          | 5              | 4.00        |
| AL12A12N5*TR | 4     | 12.5            | G, J          | 137    | -      | 150              | 3.4          | 3.3            | 4.00        |
| AL12A18N5*TR | 5     | 18.5            | G, J          | 132    | -      | 150              | 3.9          | 2.5            | 4.00        |
| AL12B17N5*TR | 6     | 17.5            | G, J          | 100    | -      | 150              | 4.5          | 2.2            | 4.00        |
| AL12B22N0*TR | 7     | 22              | G, J          | 102    | -      | 150              | 5.2          | 2.1            | 4.00        |
| AL12B28N0*TR | 8     | 28              | G, J          | 105    | -      | 150              | 6            | 1.8            | 4.00        |
| AL12B35N5*TR | 9     | 35.5            | G, J          | 112    | -      | 150              | 6.8          | 1.5            | 4.00        |
| AL12B43N0*TR | 10    | 43              | G, J          | 106    | -      | 150              | 7.9          | 1.2            | 4.00        |
| AL01622N0*TS | 4     | 22              | G, J          | 100    | 135    | 150              | 4.2          | 3.2            | 3.00        |
| AL01627N0*TS | 5     | 27              | G, J          | 100    | 135    | 150              | 4            | 2.7            | 3.50        |
| AL01633N0*TS | 5     | 33              | G, J          | 100    | 130    | 150              | 4.8          | 2.5            | 3.00        |
| AL01639N0*TS | 6     | 39              | G, J          | 100    | 135    | 150              | 4.4          | 2.1            | 3.00        |
| AL01647N0*TS | 6     | 47              | G, J          | 100    | 135    | 150              | 5.6          | 2.1            | 3.00        |
| AL01656N0*TS | 7     | 56              | G, J          | 100    | 125    | 150              | 6.2          | 1.5            | 3.00        |
| AL01668N0*TS | 7     | 68              | G, J          | 100    | 120    | 150              | 8.2          | 1.5            | 2.50        |
| AL01682N0*TS | 8     | 82              | G, J          | 100    | 120    | 150              | 9.4          | 1.3            | 2.50        |
| AL016100N*TS | 9     | 100             | G, J          | 100    | 115    | 150              | 12.3         | 1.2            | 1.70        |
| AL016120N*TS | 9     | 120             | G, J          | 100    | 125    | 150              | 17.3         | 1.1            | 1.50        |
| AL02390N0*TS | 9     | 90              | G, J          | 95     | 114    | 50               | 15           | 1.140          | 3.50        |
| AL023111N*TS | 10    | 111             | G, J          | 87     | 104    | 50               | 15           | 1.020          | 3.50        |
| AL023130N*TS | 11    | 130             | G, J          | 87     | 104    | 50               | 20           | 0.900          | 3.00        |
| AL023169N*TS | 12    | 169             | G, J          | 95     | 114    | 50               | 25           | 0.875          | 3.00        |
| AL023206N*TS | 13    | 206             | G, J          | 95     | 114    | 50               | 30           | 0.800          | 3.00        |
| AL023222N*TS | 14    | 222             | G, J          | 92     | 110    | 50               | 35           | 0.730          | 3.00        |
| AL023246N*TS | 15    | 246             | G, J          | 95     | 114    | 50               | 35           | 0.685          | 3.00        |
| AL023307N*TS | 16    | 307             | G, J          | 95     | 114    | 50               | 35           | 0.660          | 3.00        |
| AL023380N*TS | 17    | 380             | G, J          | 95     | 114    | 50               | 50           | 0.590          | 2.50        |
| AL023422N*TS | 18    | 422             | G, J          | 95     | 114    | 50               | 60           | 0.540          | 2.50        |
| AL023491N*TS | 19    | 491             | G, J          | 95     | 114    | 50               | 65           | 0.535          | 2.00        |
| AL023538N*TS | 20    | 538             | G, J          | 87     | 104    | 50               | 90           | 0.490          | 2.00        |

\*Tolerance: G= ± 2%, J: ± 5%, K: ± 10%

a. Test Equipment:

L/Q: HP-4291B With HP16193A test fixture or equivalent.

SRF: HP8753E /HP8720D or equivalent.

RDC: Chroma 16502 or equivalent.

b. Operating temperature range: -40°C to +125°C.

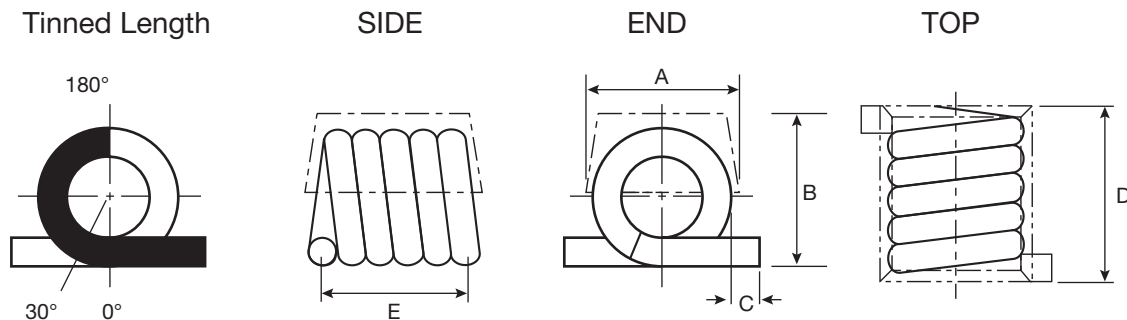
c. For Temperature Rise: 15°C

d. Storage Temp.: -40°C to +85°C.

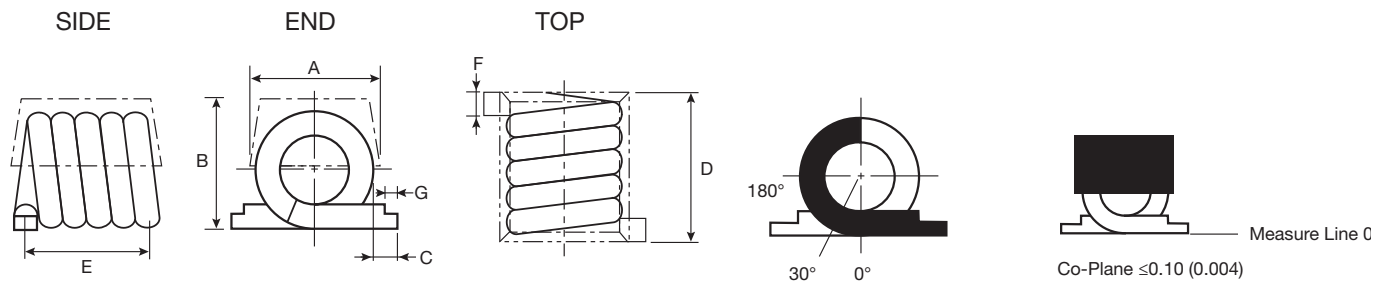
f. MSL: Level 1

### PHYSICAL DIMENSIONS

#### AL12A, AL12B, AL016, AL023



#### AL05A, AL05B



TINNED LENGTH BETWEEN 30° AND 180°

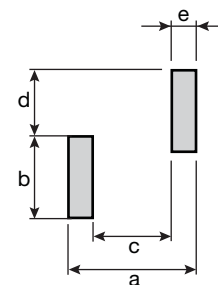
mm (inches)

| Part Number | A                              | B                              | C                              | D                              | E                              | F                         | G                         |
|-------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|---------------------------|---------------------------|
| AL05A       | 1.42 ± 0.13<br>(0.056 ± 0.005) | 1.37 ± 0.15<br>(0.056 ± 0.005) | 0.89 ± 0.25<br>(0.035 ± 0.010) | 2.21 ± 0.25<br>(0.087 ± 0.010) | 1.83 ± 0.25<br>(0.072 ± 0.010) | 0.51 max.<br>(0.200 max.) | 0.35 min.<br>(0.014 min.) |
| AL05B       | 1.42 ± 0.13<br>(0.056 ± 0.005) | 1.37 ± 0.15<br>(0.056 ± 0.005) | 0.89 ± 0.25<br>(0.035 ± 0.010) | 4.04 ± 0.30<br>(0.159 ± 0.012) | 3.66 ± 0.30<br>(0.144 ± 0.012) | 0.51 max.<br>0.200 max.   | 0.35 min.<br>0.014 min.   |
| AL12A       | 3.05 max.<br>(0.120 max.)      | 3.18 max.<br>(0.125 max.)      | 0.58 ± 0.38<br>(0.023 ± 0.015) | 3.68 max.<br>(0.145 max.)      | 2.92 ± 0.25<br>(0.115 ± 0.010) | —                         | —                         |
| AL12B       | 3.05 max.<br>(0.120 max.)      | 3.18 max.<br>(0.125 max.)      | 0.58 ± 0.38<br>(0.023 ± 0.015) | 6.86 max.<br>(0.270 max.)      | 5.84 ± 0.25<br>(0.230 ± 0.010) | —                         | —                         |
| AL016       | 3.81<br>(0.150)                | 4.20 max.<br>(0.165 max.)      | 1.53 ± 0.39<br>(0.060 ± 0.015) | 4.83 max.<br>(0.190 max.)      | 4.32 ± 0.39<br>(0.170 ± 0.015) | —                         | —                         |
| AL023       | 6.35 max.<br>(0.250 max.)      | 5.90 max.<br>(0.232 max.)      | 1.02 ± 0.39<br>(0.040 ± 0.015) | 10.55 max.<br>(0.415 max.)     | 7.98 ± 0.51<br>(0.314 ± 0.020) | —                         | —                         |

### RECOMMENDED LAND PATTERNS

mm (inches)

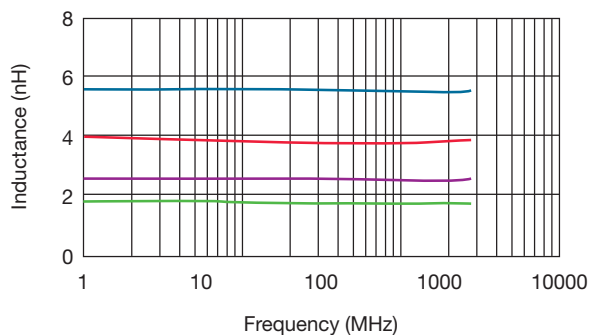
| Part Number | A               | B               | C               | D               | E               |
|-------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| AL05A       | 2.62<br>(0.103) | 2.46<br>(0.097) | 1.04<br>(0.041) | 1.02<br>(0.040) | 0.79<br>(0.031) |
| AL05B       | 4.45<br>(0.175) | 2.46<br>(0.097) | 2.87<br>(0.113) | 1.02<br>(0.040) | 0.79<br>(0.031) |
| AL12A       | 4.19<br>(0.165) | 3.30<br>(0.130) | 1.65<br>(0.065) | 2.79<br>(0.110) | 1.27<br>(0.050) |
| AL12B       | 7.24<br>(0.285) | 3.30<br>(0.130) | 4.70<br>(0.185) | 2.79<br>(0.110) | 1.27<br>(0.050) |
| AL016       | 5.80<br>(0.228) | 5.16<br>(0.203) | 2.85<br>(0.112) | 2.62<br>(0.103) | 1.48<br>(0.058) |
| AL023       | 10.0<br>(0.394) | 4.70<br>(0.185) | 5.95<br>(0.234) | 2.42<br>(0.095) | 2.04<br>(0.080) |



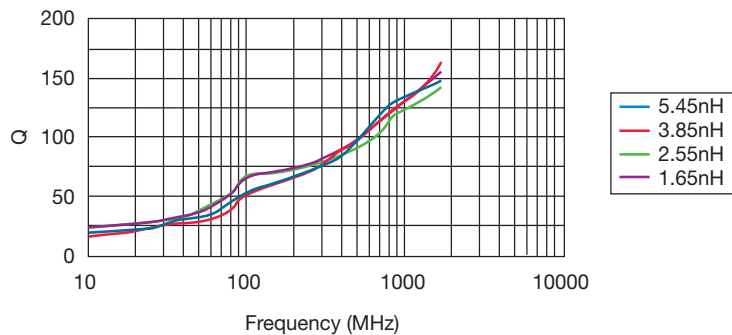
### PERFORMANCE SPECIFICATIONS

#### AL05A

Inductance vs. Frequency

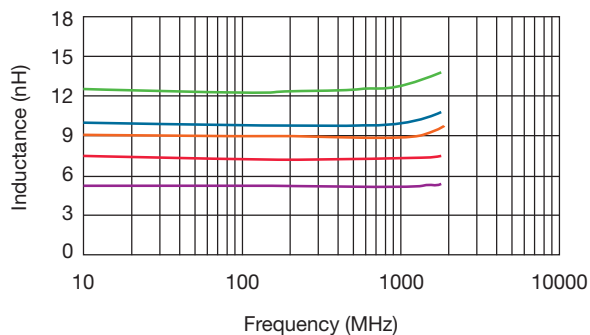


Typical Q vs. Frequency

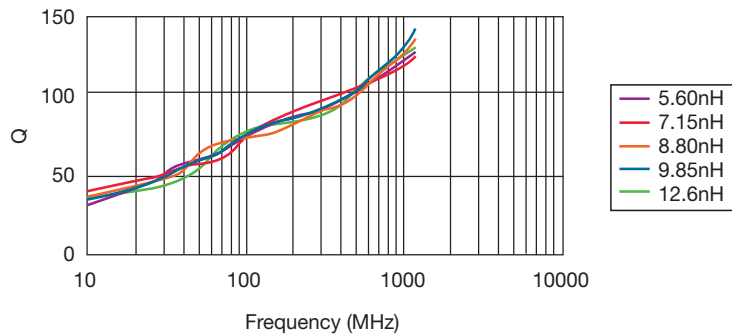


#### AL05B

Inductance vs. Frequency

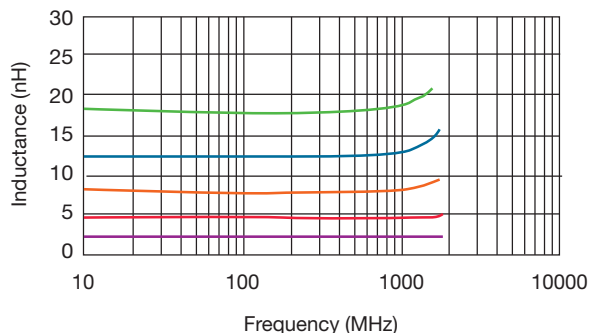


Typical Q vs. Frequency

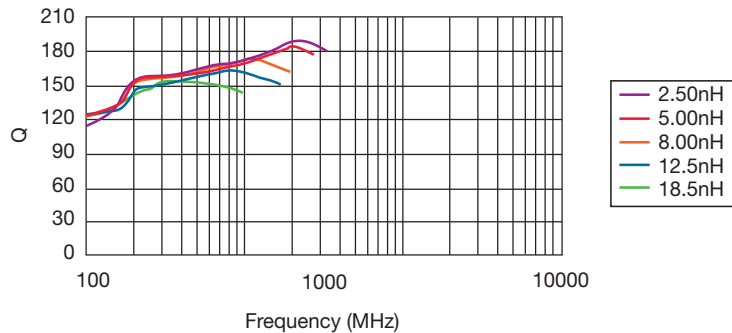


#### AL12A

Inductance vs. Frequency



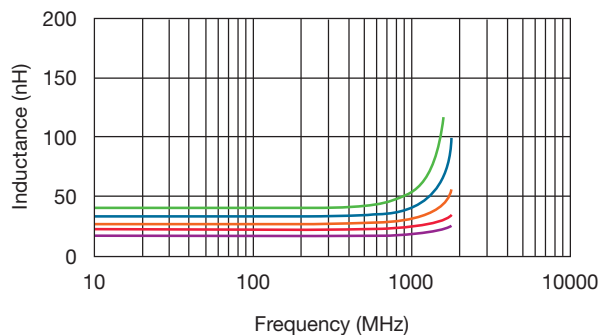
Typical Q vs. Frequency



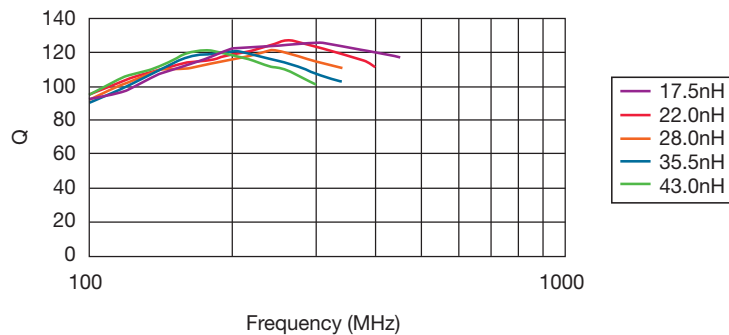
### PERFORMANCE SPECIFICATIONS

#### AL12B

Inductance vs. Frequency

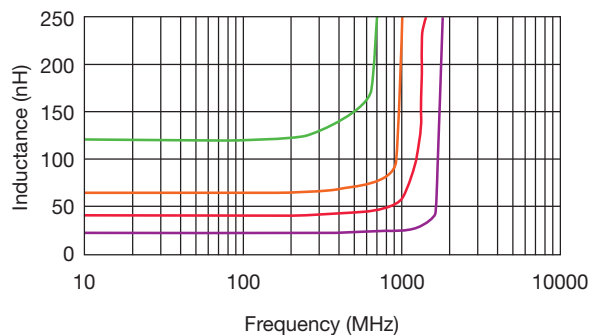


Typical Q vs. Frequency

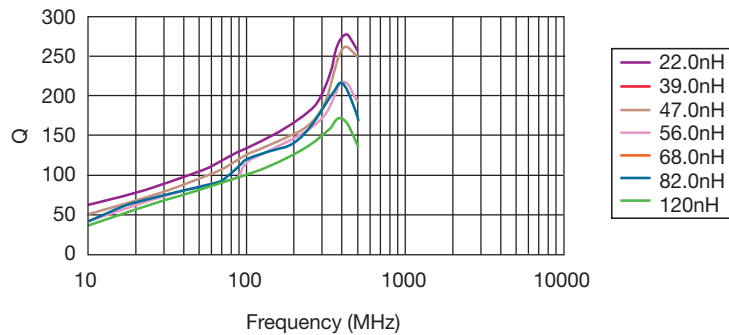


#### AL016

Inductance vs. Frequency

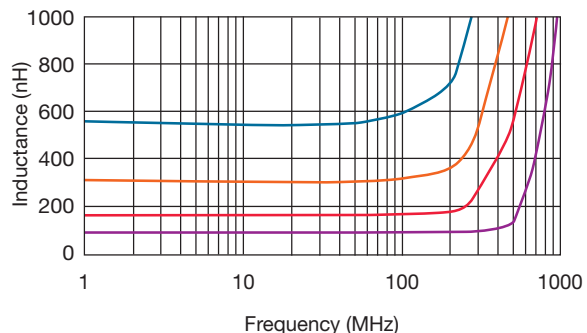


Typical Q vs. Frequency

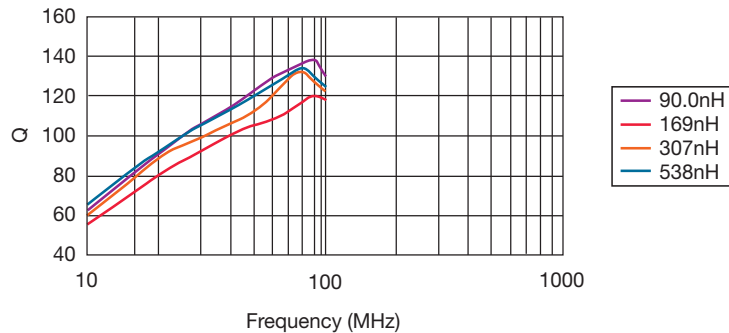


#### AL023

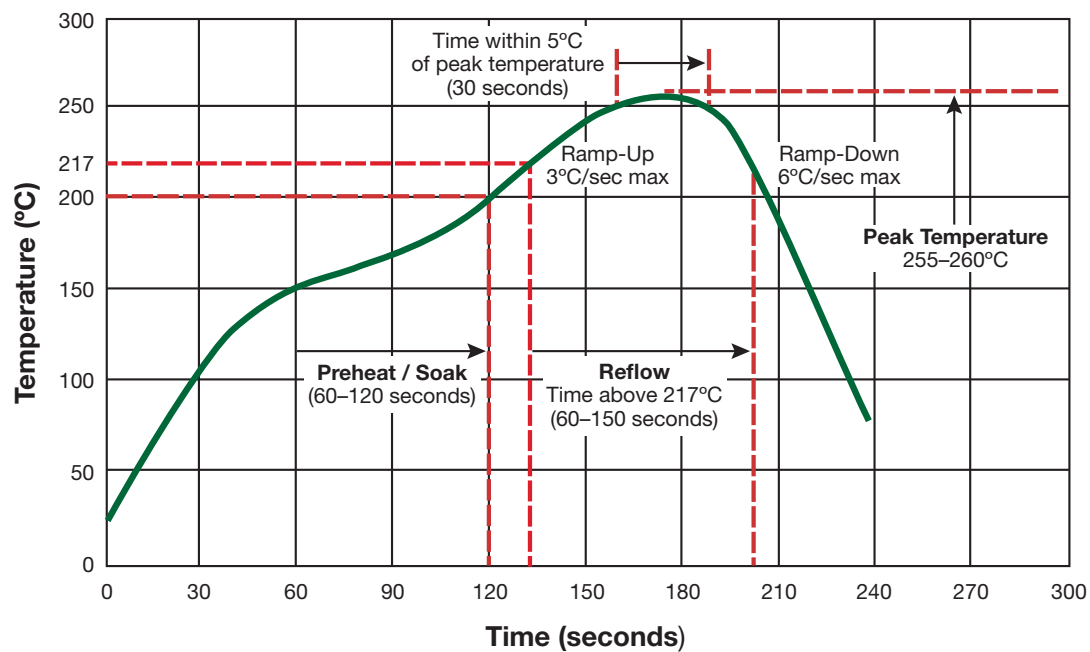
Inductance vs. Frequency



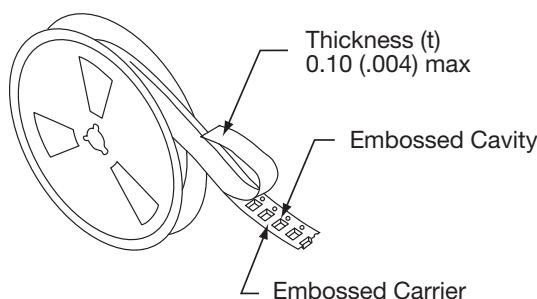
Typical Q vs. Frequency



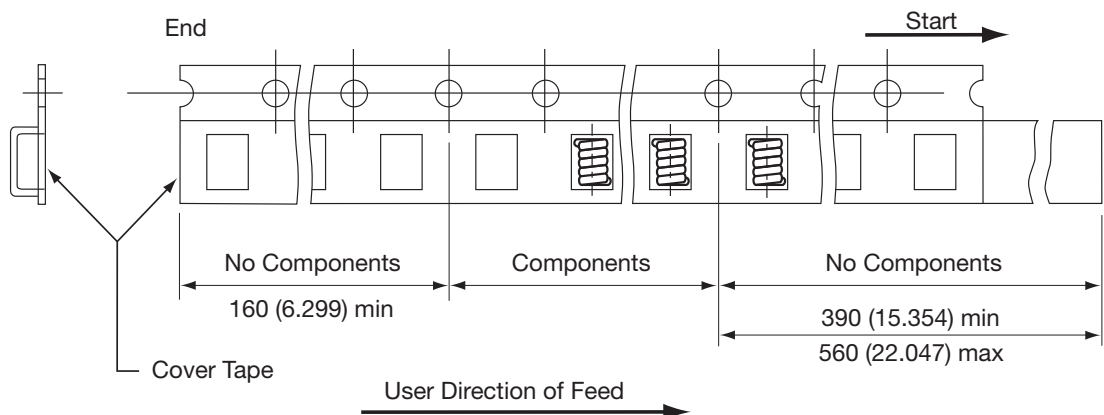
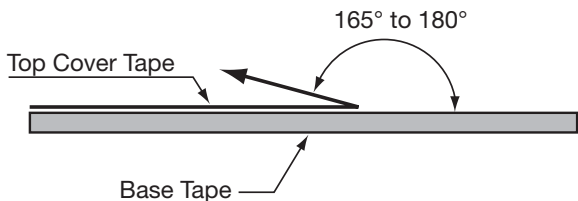
### TYPICAL RoHS REFLOW PROFILE



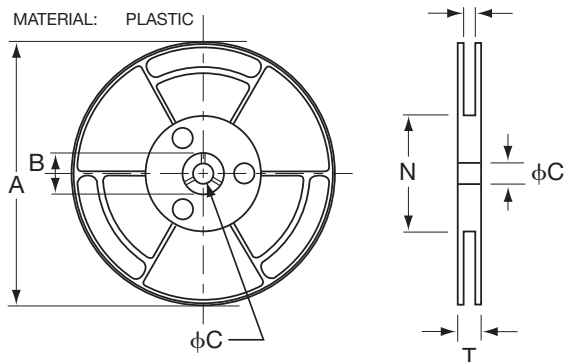
### PACKAGING SPECIFICATIONS



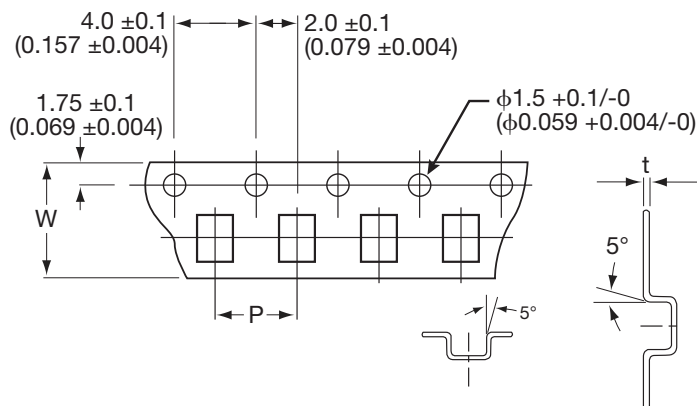
- The force for tearing off cover tape is 10 to 130 grams in the arrow direction



### CARRIER TAPE REELS



### DIMENSIONS OF CARRIER TAPE



mm (inches)

| Series | ITEM | A    | B    | C         | N    | G    | T    | W     | P     | t     |
|--------|------|------|------|-----------|------|------|------|-------|-------|-------|
| AL05A  | DIM. | 178  | 21   | 13        | 75   | 8.4  | 12.5 | 8     | 4     | 0.30  |
|        | TOL. | ±2.0 | ±0.8 | ±0.8      | ±2.0 | +1.5 | +1.5 | ±0.3  | ±0.1  | ±0.05 |
| AL05B  | DIM. | 180  | 21   | 13        | 50   | 12.4 | 18.4 | 12    | 4     | 0.35  |
|        | TOL. | MAX  | ±0.8 | +0.5/-0.2 | MIN  | +2.0 | MAX  | ±0.30 | ±0.10 | ±0.05 |
| AL12A  | DIM. | 178  | 25   | 15        | 75   | 12.5 | 16.4 | 12    | 8     | 0.25  |
|        | TOL. | ±2.0 | ±1.0 | ±0.5      | ±2.0 | +1.5 | +1.5 | ±0.2  | ±0.1  | ±0.05 |
| AL12B  | DIM. | 178  | 50   | 15        | 75   | 16.5 | 20.4 | 16    | 8     | 0.25  |
|        | TOL. | ±2.0 | ±1.0 | ±0.5      | ±2.0 | +1.5 | +1.5 | ±0.2  | ±0.1  | ±0.05 |
| AL016  | DIM. | 340  | 20.2 | 13        | 100  | 16.5 | 25.5 | 16    | 12    | 0.30  |
|        | TOL. | MAX  | MIN  | ±0.5      | REF  | ±0.5 | ±0.5 | ±0.30 | ±0.10 | ±0.05 |
| AL023  | DIM. | 340  | 20.2 | 13        | 100  | 24.5 | 30.4 | 24.0  | 12.0  | 0.35  |
|        | TOL. | MAX  | MIN  | ±0.5      | REF  | ±0.5 | ±0.5 | ±0.30 | ±0.10 | ±0.05 |