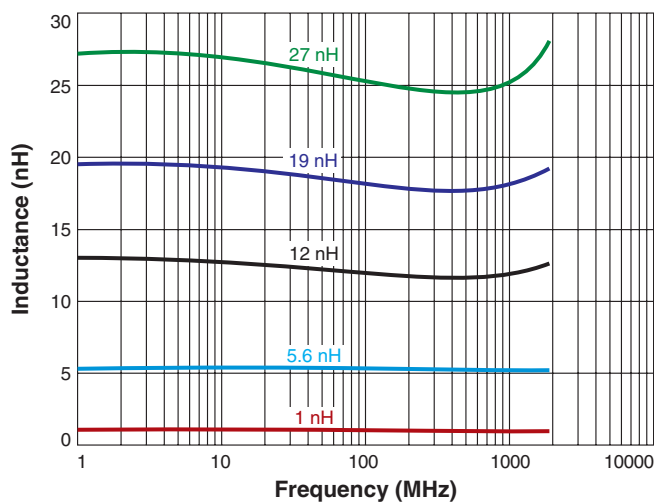


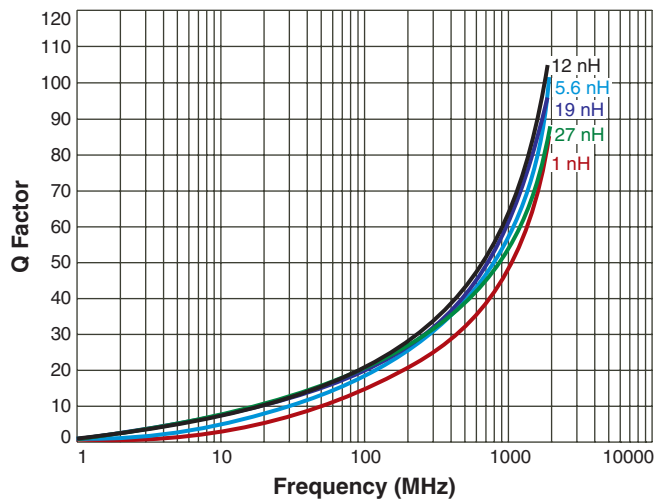
# Chip Inductors for Critical Applications<sup>ST235RAA</sup>

This 0402 size chip inductor series shares all of the characteristics of Coilcraft's other ceramic inductors: exceptionally high Q factors, especially at use frequencies; outstanding self-resonant frequency; tight inductance tolerance; and excellent batch-to-batch consistency.

## Typical L vs Frequency



## Typical Q vs Frequency



**Core material** Ceramic

**Ambient temperature**  $-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$  with  $I_{\text{max}}$  current

**Maximum part temperature**  $+140^{\circ}\text{C}$  (ambient + temp rise).

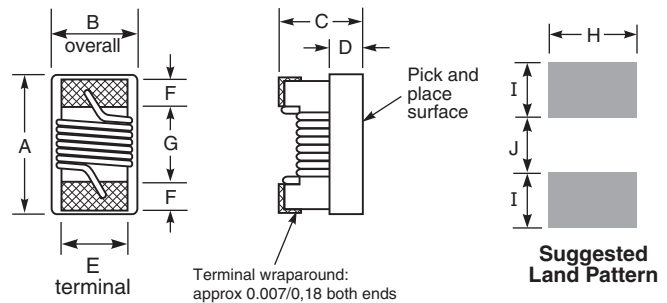
**Storage temperature** Component:  $-55^{\circ}\text{C}$  to  $+140^{\circ}\text{C}$ .  
Tape and reel packaging:  $-55^{\circ}\text{C}$  to  $+80^{\circ}\text{C}$

**Resistance to soldering heat** Max three 40 second reflows at  $+260^{\circ}\text{C}$ , parts cooled to room temperature between cycles

**Temperature Coefficient of Inductance (TCL)**  $+25$  to  $+155$  ppm/ $^{\circ}\text{C}$

**Moisture Sensitivity Level (MSL)** 1 (unlimited floor life at  $<30^{\circ}\text{C}$  / 85% relative humidity)

**Packaging** 2000 per 7" reel Paper tape: 8 mm wide, 0.68 mm thick, 2 mm pocket spacing



| A     | B     | C     | D     | E     | F     | G     | H     | I     | J     |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| max   | max   | max   | ref   |       |       |       |       |       |       |
| 0.047 | 0.025 | 0.026 | 0.010 | 0.020 | 0.009 | 0.022 | 0.026 | 0.014 | 0.018 |
| 1,19  | 0,64  | 0,66  | 0,25  | 0,51  | 0,23  | 0,56  | 0,66  | 0,36  | 0,46  |

Note: Dimensions are before optional solder application. For maximum overall dimensions including solder, add 0.0025 in / 0,064 mm to **B** and 0.006 in / 0,15 mm to **A** and **C**.

# ST235RAA Series (0402)

| Part number <sup>1</sup> | Inductance <sup>2</sup><br>(nH) | Percent<br>tolerance | Q min <sup>3</sup> | 900 MHz |                    | 1.7 GHz |                    | SRF min <sup>5</sup><br>(GHz) | DCR max <sup>6</sup><br>(Ohms) | I <sub>max</sub><br>(mA) |
|--------------------------|---------------------------------|----------------------|--------------------|---------|--------------------|---------|--------------------|-------------------------------|--------------------------------|--------------------------|
|                          |                                 |                      |                    | L typ   | Q typ <sup>4</sup> | L typ   | Q typ <sup>4</sup> |                               |                                |                          |
| ST235RAA1N0JLZ           | 1.0                             | 5                    | 20                 | 1.02    | 77                 | 1.02    | 69                 | >5.00                         | 0.045                          | 600                      |
| ST235RAA1N2JLZ           | 1.2                             | 5                    | 12                 | 1.17    | 28                 | 1.17    | 38                 | >5.00                         | 0.090                          | 360                      |
| ST235RAA1N8JLZ           | 1.8                             | 5                    | 20                 | 1.78    | 54                 | 1.78    | 75                 | >5.00                         | 0.070                          | 600                      |
| ST235RAA1N9JLZ           | 1.9                             | 5                    | 20                 | 1.72    | 68                 | 1.74    | 82                 | >5.00                         | 0.070                          | 600                      |
| ST235RAA2N0_LZ           | 2.0                             | 5,2                  | 20                 | 1.93    | 54                 | 1.93    | 75                 | >5.00                         | 0.070                          | 600                      |
| ST235RAA2N2_LZ           | 2.2                             | 5,2                  | 20                 | 2.19    | 59                 | 2.23    | 100                | >5.00                         | 0.070                          | 600                      |
| ST235RAA2N4_LZ           | 2.4                             | 5,2                  | 20                 | 2.24    | 51                 | 2.27    | 68                 | >5.00                         | 0.068                          | 600                      |
| ST235RAA2N7_LZ           | 2.7                             | 5,2                  | 16                 | 2.58    | 42                 | 2.60    | 61                 | >5.00                         | 0.120                          | 425                      |
| ST235RAA3N3_LZ           | 3.3                             | 5,2,1                | 20                 | 3.10    | 65                 | 3.12    | 87                 | >5.00                         | 0.066                          | 600                      |
| ST235RAA3N6_LZ           | 3.6                             | 5,2,1                | 20                 | 3.56    | 45                 | 3.62    | 71                 | >5.00                         | 0.066                          | 600                      |
| ST235RAA3N9_LZ           | 3.9                             | 5,2,1                | 20                 | 3.89    | 50                 | 4.00    | 75                 | >5.00                         | 0.066                          | 600                      |
| ST235RAA4N3_LZ           | 4.3                             | 5,2,1                | 20                 | 4.19    | 47                 | 4.30    | 71                 | >5.00                         | 0.091                          | 600                      |
| ST235RAA4N7_LZ           | 4.7                             | 5,2,1                | 20                 | 4.55    | 48                 | 4.68    | 68                 | 4.77                          | 0.130                          | 600                      |
| ST235RAA5N1_LZ           | 5.1                             | 5,2,1                | 20                 | 5.15    | 56                 | 5.25    | 82                 | 4.80                          | 0.083                          | 600                      |
| ST235RAA5N6_LZ           | 5.6                             | 5,2,1                | 20                 | 5.16    | 54                 | 5.28    | 81                 | 4.80                          | 0.083                          | 600                      |
| ST235RAA6N2_LZ           | 6.2                             | 5,2,1                | 20                 | 6.16    | 52                 | 6.37    | 76                 | 4.80                          | 0.083                          | 600                      |
| ST235RAA6N8_LZ           | 6.8                             | 5,2,1                | 20                 | 6.56    | 63                 | 6.93    | 78                 | 4.80                          | 0.083                          | 600                      |
| ST235RAA7N5_LZ           | 7.5                             | 5,2,1                | 22                 | 7.91    | 60                 | 8.22    | 88                 | 4.80                          | 0.104                          | 600                      |
| ST235RAA8N2_LZ           | 8.2                             | 5,2,1                | 22                 | 8.50    | 57                 | 8.85    | 84                 | 4.40                          | 0.104                          | 600                      |
| ST235RAA8N7_LZ           | 8.7                             | 5,2,1                | 20                 | 8.78    | 54                 | 9.21    | 73                 | 3.80                          | 0.195                          | 480                      |
| ST235RAA9N0_LZ           | 9.0                             | 5,2,1                | 22                 | 9.07    | 62                 | 9.53    | 78                 | 4.66                          | 0.100                          | 600                      |
| ST235RAA9N5_LZ           | 9.5                             | 5,2,1                | 20                 | 9.42    | 54                 | 9.98    | 69                 | 3.48                          | 0.195                          | 480                      |
| ST235RAA10N_LZ           | 10.0                            | 5,2,1                | 21                 | 9.8     | 50                 | 10.10   | 67                 | 3.68                          | 0.195                          | 480                      |
| ST235RAA11N_LZ           | 11.0                            | 5,2,1                | 24                 | 10.7    | 52                 | 11.20   | 78                 | 3.48                          | 0.120                          | 580                      |
| ST235RAA12N_LZ           | 12.0                            | 5,2,1                | 24                 | 11.9    | 53                 | 12.70   | 71                 | 3.60                          | 0.120                          | 580                      |
| ST235RAA13N_LZ           | 13.0                            | 5,2,1                | 20                 | 13.4    | 51                 | 14.63   | 57                 | 3.28                          | 0.210                          | 440                      |
| ST235RAA15N_LZ           | 15.0                            | 5,2,1                | 22                 | 14.6    | 55                 | 15.50   | 77                 | 3.10                          | 0.172                          | 500                      |
| ST235RAA16N_LZ           | 16.0                            | 5,2,1                | 23                 | 16.6    | 46                 | 18.86   | 47                 | 3.05                          | 0.220                          | 480                      |
| ST235RAA18N_LZ           | 18.0                            | 5,2,1                | 24                 | 18.3    | 57                 | 20.28   | 62                 | 2.68                          | 0.230                          | 420                      |
| ST235RAA19N_LZ           | 19.0                            | 5,2,1                | 24                 | 19.1    | 50                 | 21.10   | 67                 | 3.00                          | 0.202                          | 460                      |
| ST235RAA20N_LZ           | 20.0                            | 5,2,1                | 24                 | 20.7    | 52                 | 23.66   | 53                 | 2.90                          | 0.250                          | 400                      |
| ST235RAA22N_LZ           | 22.0                            | 5,2,1                | 24                 | 23.2    | 53                 | 26.75   | 53                 | 2.80                          | 0.300                          | 380                      |
| ST235RAA23N_LZ           | 23.0                            | 5,2,1                | 24                 | 23.8    | 49                 | 26.90   | 64                 | 2.72                          | 0.300                          | 400                      |
| ST235RAA24N_LZ           | 24.0                            | 5,2,1                | 24                 | 25.1    | 51                 | 29.50   | 50                 | 2.60                          | 0.300                          | 390                      |
| ST235RAA27N_LZ           | 27.0                            | 5,2,1                | 24                 | 28.7    | 49                 | 33.50   | 63                 | 2.48                          | 0.298                          | 380                      |
| ST235RAA30N_LZ           | 30.0                            | 5,2,1                | 24                 | 31.1    | 46                 | 38.50   | 39                 | 2.35                          | 0.300                          | 340                      |
| ST235RAA33N_LZ           | 33.0                            | 5,2,1                | 24                 | 34.9    | 31                 | 41.74   | 32                 | 2.30                          | 0.300                          | 340                      |
| ST235RAA36N_LZ           | 36.0                            | 5,2,1                | 24                 | 39.5    | 44                 | 48.40   | 53                 | 2.20                          | 0.440                          | 310                      |
| ST235RAA39N_LZ           | 39.0                            | 5,2                  | 24                 | 41.7    | 47                 | 50.23   | 45                 | 2.10                          | 0.550                          | 200                      |
| ST235RAA40N_LZ           | 40.0                            | 5,2,1                | 24                 | 39.0    | 44                 | 47.40   | 33                 | 2.24                          | 0.440                          | 290                      |
| ST235RAA43N_LZ           | 43.0                            | 5,2                  | 22                 | 45.8    | 46                 | 61.55   | 34                 | 2.03                          | 0.810                          | 100                      |
| ST235RAA47N_LZ           | 47.0                            | 5,2                  | 20                 | 50.0    | 38                 | —       | —                  | 2.10                          | 0.830                          | 150                      |
| ST235RAA51N_LZ           | 51.0                            | 5,2                  | 19                 | 56.6    | 40                 | —       | —                  | 1.75                          | 0.820                          | 100                      |
| ST235RAA56N_LZ           | 56.0                            | 5,2                  | 22                 | 62.8    | 42                 | —       | —                  | 1.76                          | 0.966                          | 100                      |
| ST235RAA68N_LZ           | 68.0                            | 5,2                  | 22                 | 78.2    | 36                 | —       | —                  | 1.62                          | 1.120                          | 100                      |
| ST235RAA82N_LZ           | 82.0                            | 5,2                  | 25                 | —       | —                  | —       | —                  | 1.26                          | 1.550                          | 50                       |
| ST235RAAR10_LZ           | 100.0                           | 5,2                  | 25                 | —       | —                  | —       | —                  | 1.16                          | 2.000                          | 50                       |
| ST235RAAR12_LZ           | 120.0                           | 5,2                  | 22                 | —       | —                  | —       | —                  | 1.20                          | 2.200                          | 50                       |

1. When ordering, specify **tolerance, termination** and **testing** codes:

ST235RAAR10GLZ

**Tolerance:** F = 1% G = 2% J = 5%

**Termination:** L = Silver-palladium-platinum-glass frit.

**Special order:**

T = Tin-silver-copper (95.5/4/0.5) over silver-palladium-platinum-glass frit

S = Tin-lead (63/37) over silver-palladium-platinum-glass frit.

R = Tin over nickel over silver-platinum-glass frit.

Q = Tin-silver-copper (95.5/4/0.5) over tin over nickel over silver-platinum-glass frit.

P = Tin-lead (63/37) over tin over nickel over silver-platinum-glass frit.

**Testing:** Z = Unscreened

H = Group A screening per Coilcraft CP-SA-10001

All screening performed to the document's latest revision  
Custom screening also available

2. Inductance measured at 250 MHz using a Coilcraft SMD-F test fixture and Coilcraft-provided correlation pieces with an Agilent/HP 4286A impedance analyzer or equivalent.

3. Q measured at 250 MHz using an Agilent/HP 4291A with an Agilent/HP 16197A test fixture or equivalents.

4. Q measured using an Agilent/HP 4291A with an Agilent/HP 16197A test fixture or equivalents.

5. SRF measured using an Agilent/HP 8753ES network analyzer and a Coilcraft CCF1232 test fixture.

6. DCR measured on a Keithley 580 micro-ohmmeter and a Coilcraft CCF1192 test fixture.

7. Electrical specifications at 25°C.

Refer to Doc 362 "Soldering Surface Mount Components" before soldering.



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This product may not be used in medical or high risk applications without prior Coilcraft approval. Specifications subject to change without notice. Please check our web site for latest information.