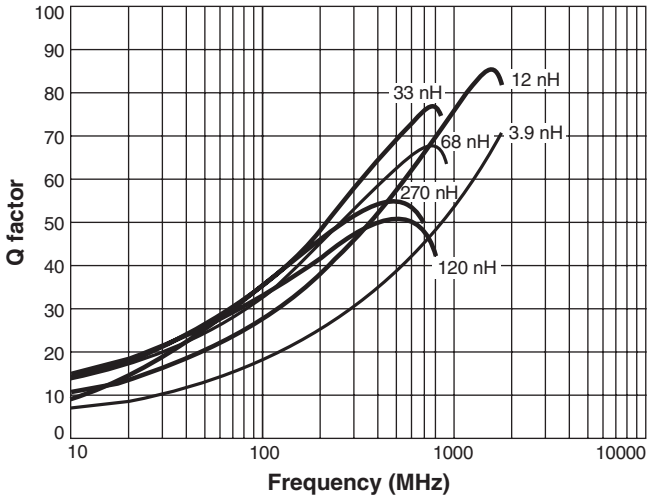
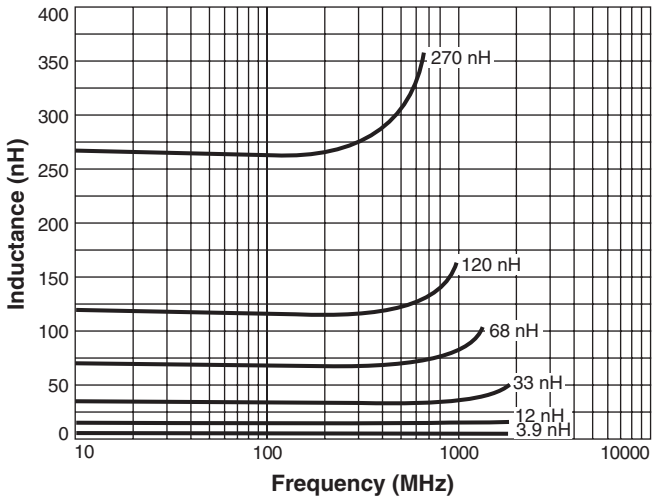
# Chip Inductors – 0603CS (1608)

Ultra-small size, exceptional Q and high SRFs make these inductors ideal for high frequency applications where size is at a premium. They also have excellent DCR and current carrying characteristics.

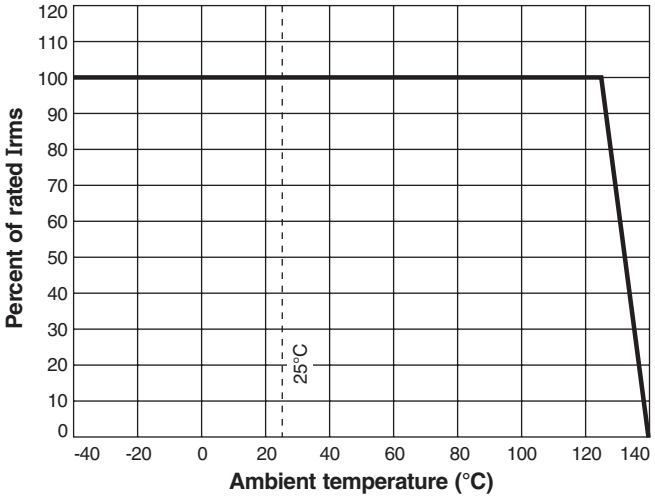
## Typical Q vs Frequency

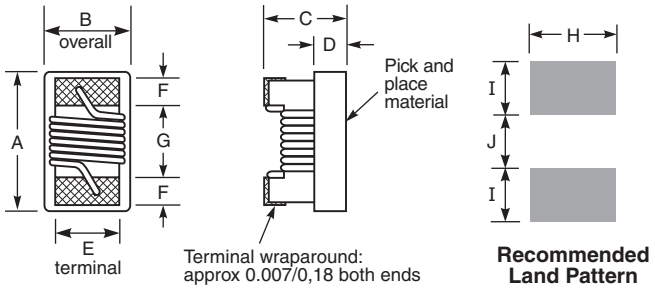



## Typical L vs Frequency




## Irms Derating




| A max | B max | C max | D ref | E | F | G | H | I | J | |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.071 | 0.044 | 0.040 | 0.015 | 0.030 | 0.013 | 0.034 | 0.040 | 0.025 | 0.025 | inches |
| 1,80 | 1,12 | 1,02 | 0,38 | 0,76 | 0,33 | 0,86 | 1,02 | 0,64 | 0,64 | mm |

**Note:** Height dimension (C) is before optional solder application. For maximum height dimension including solder, add 0.006 in / 0,152 mm.

**Core material** Ceramic

**Environmental** RoHS compliant, halogen free optional

**Terminations** RoHS compliant silver-palladium-platinum-glass frit. Other terminations available at additional cost.

**Weight** 3.2 – 3.7 mg

**Ambient temperature** –40°C to +125°C with Irms current, +125°C to +140°C with derated current

**Storage temperature** Component: –40°C to +140°C. Tape and reel packaging: –40°C to +80°C

**Resistance to soldering heat** Max three 40 second reflows at +260°C, parts cooled to room temperature between cycles

**Temperature Coefficient of Inductance (TCL)** +25 to +125 ppm/°C

**Moisture Sensitivity Level (MSL)** 1 (unlimited floor life at <30°C / 85% relative humidity)

**Failures in Time (FIT) / Mean Time Between Failures (MTBF)** One per billion hours / one billion hours, calculated per Telcordia SR-332

**Packaging** 2000 per 7″ reel Paper tape: 8 mm wide, 1.0 mm thick, 4 mm pocket spacing

**PCB washing** Tested with pure water or alcohol only. For other solvents, see Doc787_PCB_Washing.pdf

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# 0603CS Series (1608)

**Designer's Kits C324A** and **B** contain 10 each of all 5% values
**Designer's Kits C324A-2** and **B-2** contain 10 each of all 2% values

| Part number[1] | Inductance[2] (nH) | Percent tolerance[3] | Q min[4] | 900 MHz L typ | 900 MHz Q typ | 1.7 GHz L typ | 1.7 GHz Q typ | SRF min[5] (GHz) | DCR max[6] (Ohms) | Irms[7] (mA) | Color dot |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0603CS-1N6XJL_ | 1.6 @ 250 MHz | **5** | 24 | 1.67 | 49 | 1.65 | 63 | 12.5 | 0.030 | 700 | Red |
| 0603CS-1N8XJL_ | 1.8 @ 250 MHz | **5** | 16 | 1.83 | 35 | 1.86 | 50 | 12.5 | 0.045 | 700 | Black |
| 0603CS-2N2XJL_ | 2.2 @ 250 MHz | **5** | 13 | 2.22 | 31 | 2.24 | 44 | 12.5 | 0.250 | 100 | Yellow |
| 0603CS-3N3X_L_ | 3.3 @ 250 MHz | **5**,3,**2** | 35 | 3.31 | 75 | 3.38 | 88 | 5.90 | 0.045 | 700 | Blue |
| 0603CS-3N6X_L_ | 3.6 @ 250 MHz | **5**,3,**2** | 22 | 3.72 | 53 | 3.71 | 65 | 5.90 | 0.063 | 700 | Red |
| 0603CS-3N9X_L_ | 3.9 @ 250 MHz | **5**,3,**2** | 22 | 3.95 | 49 | 3.96 | 67 | 6.90 | 0.080 | 700 | Brown |
| 0603CS-4N3X_L_ | 4.3 @ 250 MHz | **5**,3,**2** | 22 | 4.32 | 50 | 4.33 | 70 | 5.90 | 0.063 | 700 | Orange |
| 0603CS-4N7X_L_ | 4.7 @ 250 MHz | **5**,3,**2** | 20 | 4.72 | 47 | 4.75 | 57 | 5.80 | 0.116 | 700 | Violet |
| 0603CS-5N1X_L_ | 5.1 @ 250 MHz | **5**,3,**2** | 20 | 4.93 | 47 | 4.95 | 56 | 5.70 | 0.140 | 700 | Green |
| 0603CS-5N6X_L_ | 5.6 @ 250 MHz | **5**,3,**2** | 26 | 5.77 | 63 | 6.05 | 80 | 4.76 | 0.075 | 700 | Black |
| 0603CS-6N8X_L_ | 6.8 @ 250 MHz | **5**,3,**2** | 27 | 6.75 | 60 | 7.10 | 81 | 5.80 | 0.110 | 700 | Red |
| 0603CS-7N5X_L_ | 7.5 @ 250 MHz | **5**,3,**2** | 28 | 7.70 | 60 | 7.82 | 65 | 4.80 | 0.106 | 700 | Brown |
| 0603CS-8N2X_L_ | 8.2 @ 250 MHz | **5**,3,**2** | 30 | 8.25 | 82 | 8.37 | 87 | 4.20 | 0.115 | 700 | Orange |
| 0603CS-8N7X_L_ | 8.7 @ 250 MHz | **5**,3,**2** | 28 | 8.86 | 62 | 9.32 | 58 | 4.60 | 0.109 | 700 | Yellow |
| 0603CS-9N5X_L_ | 9.5 @ 250 MHz | **5**,3,**2** | 28 | 9.7 | 59 | 9.92 | 61 | 5.40 | 0.135 | 700 | Blue |
| 0603CS-10NX_L_ | 10 @ 250 MHz | **5**,3,**2** | 31 | 10.0 | 66 | 10.6 | 83 | 4.80 | 0.130 | 700 | Orange |
| 0603CS-11NX_L_ | 11 @ 250 MHz | **5**,3,**2** | 30 | 11.0 | 53 | 11.5 | 56 | 4.00 | 0.130 | 700 | Gray |
| 0603CS-12NX_L_ | 12 @ 250 MHz | **5**,3,**2** | 35 | 12.3 | 72 | 13.5 | 83 | 4.00 | 0.130 | 700 | Yellow |
| 0603CS-15NX_L_ | 15 @ 250 MHz | **5**,3,**2** | 35 | 15.4 | 64 | 16.8 | 89 | 4.00 | 0.170 | 700 | Green |
| 0603CS-16NX_L_ | 16 @ 250 MHz | **5**,3,**2** | 34 | 16.2 | 55 | 17.3 | 52 | 3.30 | 0.170 | 700 | White |
| 0603CS-18NX_L_ | 18 @ 250 MHz | **5**,3,**2** | 35 | 18.7 | 70 | 21.4 | 69 | 3.10 | 0.170 | 700 | Blue |
| 0603CS-22NX_L_ | 22 @ 250 MHz | **5**,3,**2** | 38 | 22.8 | 73 | 26.1 | 71 | 3.00 | 0.190 | 700 | Violet |
| 0603CS-23NX_L_ | 23 @ 250 MHz | **5**,3,**2** | 38 | 24.1 | 71 | 28.0 | 67 | 2.85 | 0.190 | 700 | Orange |
| 0603CS-24NX_L_ | 24 @ 250 MHz | **5**,3,**2** | 36 | 24.5 | 45 | 28.7 | 39 | 2.65 | 0.190 | 700 | Black |
| 0603CS-27NX_L_ | 27 @ 250 MHz | **5**,3,**2** | 40 | 29.2 | 74 | 34.6 | 65 | 2.80 | 0.220 | 600 | Gray |
| 0603CS-30NX_L_ | 30 @ 250 MHz | **5**,3,**2** | 37 | 31.4 | 47 | 39.9 | 28 | 2.25 | 0.220 | 600 | Brown |
| 0603CS-33NX_L_ | 33 @ 250 MHz | **5**,3,**2** | 40 | 36.0 | 67 | 49.5 | 42 | 2.30 | 0.220 | 600 | White |
| 0603CS-36NX_L_ | 36 @ 250 MHz | **5**,3,**2** | 37 | 39.4 | 47 | 52.7 | 24 | 2.08 | 0.250 | 600 | Red |
| 0603CS-39NX_L_ | 39 @ 250 MHz | **5**,3,**2** | 40 | 42.7 | 60 | 60.2 | 40 | 2.20 | 0.250 | 600 | Black |
| 0603CS-43NX_L_ | 43 @ 250 MHz | **5**,3,**2** | 38 | 47.0 | 44 | 64.9 | 21 | 2.00 | 0.280 | 600 | Orange |
| 0603CS-47NX_L_ | 47 @ 200 MHz | **5**,3,**2** | 38 | 52.2 | 62 | 77.2 | 35 | 2.00 | 0.280 | 600 | Brown |
| 0603CS-51NX_L_ | 51 @ 200 MHz | **5**,3,**2** | 35 | 55.5 | 69 | 82.2 | 34 | 1.90 | 0.270 | 600 | Blue |
| 0603CS-56NX_L_ | 56 @ 200 MHz | **5**,3,**2** | 38 | 62.5 | 56 | 97.0 | 26 | 1.90 | 0.310 | 600 | Red |
| 0603CS-68NX_L_ | 68 @ 200 MHz | **5**,3,**2** | 37 | 80.5 | 54 | 168 | 21 | 1.70 | 0.340 | 600 | Orange |
| 0603CS-72NX_L_ | 72 @ 150 MHz | **5**,3,**2** | 34 | 82.0 | 53 | 135 | 20 | 1.70 | 0.490 | 400 | Yellow |
| 0603CS-82NX_L_ | 82 @ 150 MHz | **5**,3,**2** | 34 | 96.2 | 54 | 177 | 21 | 1.70 | 0.540 | 400 | Green |
| 0603CS-R10X_L_ | 100 @ 150 MHz | **5**,3,**2** | 34 | 124 | 49 | — | — | 1.40 | 0.580 | 400 | Blue |
| 0603CS-R11X_L_ | 110 @ 150 MHz | **5**,3,**2** | 32 | 138 | 43 | — | — | 1.35 | 0.610 | 300 | Violet |
| 0603CS-R12X_L_ | 120 @ 150 MHz | **5**,3,**2** | 32 | 166 | 39 | — | — | 1.30 | 0.650 | 300 | Gray |
| 0603CS-R15X_L_ | 150 @ 150 MHz | **5**,3,**2** | 28 | 250 | 25 | — | — | 0.990 | 0.920 | 280 | White |
| 0603CS-R18X_L_ | 180 @ 100 MHz | **5**,3,**2** | 25 | 305 | 22 | — | — | 0.990 | 1.25 | 240 | Black |
| 0603CS-R20X_L_ | 200 @ 100 MHz | **5**,3,**2** | 25 | — | — | — | — | 0.900 | 1.98 | 200 | Green |
| 0603CS-R21X_L_ | 210 @ 100 MHz | **5**,3,**2** | 27 | — | — | — | — | 0.895 | 2.06 | 200 | Gray |
| 0603CS-R22X_L_ | 220 @ 100 MHz | **5**,3,**2** | 25 | — | — | — | — | 0.900 | 2.10 | 200 | Brown |
| 0603CS-R25X_L_ | 250 @ 100 MHz | **5**,3,**2** | 25 | — | — | — | — | 0.822 | 3.55 | 120 | Violet |
| 0603CS-R27X_L_ | 270 @ 100 MHz | **5**,3,**2** | 26 | — | — | — | — | 0.830 | 2.16 | 170 | Red |
| 0603CS-R33X_L_ | 330 @ 100 MHz | **5**,3,**2** | 25 | — | — | — | — | 0.900 | 3.89 | 100 | Blue |
| 0603CS-R39X_L_ | 390 @ 100 MHz | **5**,3,**2** | 25 | — | — | — | — | 0.780 | 4.35 | 100 | Yellow |

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

**0603CS-R39XJLW**

**Tolerance:** **G** = 2% **H** = 3% **J** = 5%
(Table shows stock tolerances in bold.)

**Termination:** **L** = RoHS compliant silver-palladium-platinum-glass frit.
**E** = Halogen free component. RoHS compliant silver-palladium-platinum-glass frit terminations.
Special order: **T** = RoHS tin-silver-copper (95.5/4/0.5) or **S** = non-RoHS tin-lead (63/37).

**Packaging:** **W** = 7″ machine-ready reel. EIA-481 punched paper tape (2000 parts per full reel).
**U** = Less than full reel. In tape, but not machine ready. To have a leader and trailer added ($25 charge), use code letter W instead.

2. Inductance measured using a Coilcraft SMD-A fixture in an Agilent/HP 4286 impedance analyzer with Coilcraft-provided correlation pieces.
3. Tolerances in bold are stocked for immediate shipment.
4. Q measured at the same frequency as inductance using an Agilent/HP 4291A with an Agilent/HP 16193 test fixture.
5. SRF measured using an Agilent/HP 8720D network analyzer and a Coilcraft SMD-D test fixture.
6. DCR measured on a Cambridge Technology micro-ohmmeter and a Coilcraft CCF858 test fixture.
7. Current that causes a 15°C temperature rise from 25°C ambient.
8. Electrical specifications at 25°C.

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

**S-Parameter files**
ON OUR WEB SITE

**SPICE models**
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Document 195-2 Revised 05/02/12

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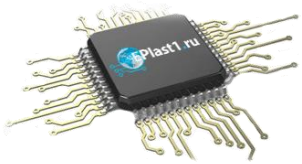
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.




**Как с нами связаться**

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