



# Chip Inductors - 0402HP Series (1005)

- Higher Q and lower DCR than other 0402 inductors
- Very high SRF values – as high as 16 GHz
- Excellent current handling capability – up to 2300 mA
- 52 inductance values from 1.0 to 220 nH



|         | A max | B (min – max) | C max |        |       |       |        |
|---------|-------|---------------|-------|--------|-------|-------|--------|
| 0402HP  | 0.043 | 0.020 – 0.028 | 0.024 | inches |       |       |        |
|         | 1,09  | 0,51 – 0,71   | 0,61  | mm     |       |       |        |
|         | A max | B             | C max |        |       |       |        |
| 0402HPH | 0.044 | 0.026 ±0.002  | 0.026 | inches |       |       |        |
|         | 1,12  | 0,66 ±0,051   | 0,66  | mm     |       |       |        |
| D       | E     | F             | G     | H      | I     | J     |        |
| 0.010   | 0.020 | 0.008         | 0.024 | 0.026  | 0.014 | 0.020 | inches |
| 0,25    | 0,51  | 0,20          | 0,61  | 0,66   | 0,36  | 0,51  | 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** 0.7 – 1.0 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 or 5000 per 7" reel. Paper tape: 8 mm wide, 0.66 mm thick, 2 mm pocket spacing  
**PCB washing** Tested with pure water or alcohol only. For other solvents, see Doc787\_PCB\_Washing.pdf

## Current Derating



## Typical Q vs Frequency



## Typical L vs Frequency



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# 0402HP Series (1005)

Designer's Kits C403A and B contain 20 each of 5% values  
Designer's Kits C403A-2 and B-2 contain 20 each of 2% values

| Part number <sup>1</sup> | Inductance <sup>2</sup><br>(nH) | Percent<br>tolerance <sup>3</sup> | Test freq<br>(MHz) | 900 MHz |                    | 1.7 GHz |                    | SRF typ <sup>5</sup><br>(GHz) | DCR max <sup>6</sup><br>(Ohms) | Irms <sup>7</sup><br>(mA) |
|--------------------------|---------------------------------|-----------------------------------|--------------------|---------|--------------------|---------|--------------------|-------------------------------|--------------------------------|---------------------------|
|                          |                                 |                                   |                    | L typ   | Q typ <sup>4</sup> | L typ   | Q typ <sup>4</sup> |                               |                                |                           |
| 0402HP-1N0XJL_           | 1.0                             | <b>5</b>                          | 250                | 0.97    | 46                 | 0.99    | 72                 | 16.0                          | 0.030                          | 2300                      |
| 0402HP-2N0XJL_           | 2.0                             | <b>5</b>                          | 250                | 1.96    | 58                 | 1.98    | 85                 | 15.2                          | 0.038                          | 2100                      |
| 0402HP-2N2XJL_           | 2.2                             | <b>5</b>                          | 250                | 2.17    | 60                 | 2.17    | 86                 | 15.1                          | 0.038                          | 2100                      |
| 0402HP-2N4X_L_           | 2.4                             | <b>5,3,2</b>                      | 250                | 2.37    | 60                 | 2.38    | 83                 | 14.0                          | 0.042                          | 2000                      |
| 0402HP-2N7X_L_           | 2.7                             | <b>5,3,2</b>                      | 250                | 2.66    | 62                 | 2.68    | 85                 | 13.0                          | 0.085                          | 1500                      |
| 0402HP-3N3X_L_           | 3.3                             | <b>5,3,2</b>                      | 250                | 3.26    | 66                 | 3.28    | 95                 | 12.8                          | 0.045                          | 1700                      |
| 0402HP-3N6X_L_           | 3.6                             | <b>5,3,2</b>                      | 250                | 3.56    | 65                 | 3.58    | 94                 | 11.7                          | 0.045                          | 1700                      |
| 0402HP-3N9X_L_           | 3.9                             | <b>5,3,2</b>                      | 250                | 3.87    | 64                 | 3.91    | 98                 | 9.50                          | 0.045                          | 1700                      |
| 0402HP-4N3X_L_           | 4.3                             | <b>5,3,2</b>                      | 250                | 4.26    | 63                 | 4.33    | 90                 | 7.15                          | 0.050                          | 1600                      |
| 0402HP-4N7X_L_           | 4.7                             | <b>5,3,2</b>                      | 250                | 4.67    | 58                 | 4.74    | 83                 | 6.85                          | 0.075                          | 1500                      |
| 0402HP-5N1X_L_           | 5.1                             | <b>5,3,2</b>                      | 250                | 5.07    | 54                 | 5.16    | 76                 | 6.80                          | 0.125                          | 1200                      |
| 0402HP-5N6X_L_           | 5.6                             | <b>5,3,2</b>                      | 250                | 5.56    | 73                 | 5.66    | 105                | 6.50                          | 0.055                          | 1600                      |
| 0402HP-6N2X_L_           | 6.2                             | <b>5,3,2</b>                      | 250                | 6.18    | 73                 | 6.25    | 100                | 5.80                          | 0.055                          | 1600                      |
| 0402HP-6N8X_L_           | 6.8                             | <b>5,3,2</b>                      | 250                | 6.78    | 68                 | 6.97    | 94                 | 5.80                          | 0.070                          | 1500                      |
| 0402HP-7N5X_L_           | 7.5                             | <b>5,3,2</b>                      | 250                | 7.49    | 60                 | 7.77    | 82                 | 5.40                          | 0.100                          | 1400                      |
| 0402HP-8N2X_L_           | 8.2                             | <b>5,3,2</b>                      | 250                | 8.10    | 68                 | 8.40    | 95                 | 5.40                          | 0.065                          | 1500                      |
| 0402HP-8N7X_L_           | 8.7                             | <b>5,3,2</b>                      | 250                | 8.73    | 66                 | 9.04    | 95                 | 5.00                          | 0.070                          | 1500                      |
| 0402HP-9N0X_L_           | 9.0                             | <b>5,3,2</b>                      | 250                | 8.99    | 67                 | 9.21    | 92                 | 5.00                          | 0.080                          | 1400                      |
| 0402HP-9N5X_L_           | 9.5                             | <b>5,3,2</b>                      | 250                | 9.52    | 64                 | 9.97    | 90                 | 4.70                          | 0.090                          | 1400                      |
| 0402HP-10NX_L_           | 10                              | <b>5,3,2</b>                      | 250                | 9.98    | 62                 | 10.4    | 90                 | 4.70                          | 0.110                          | 1300                      |
| 0402HP-11NX_L_           | 11                              | <b>5,3,2</b>                      | 250                | 11.0    | 68                 | 11.6    | 98                 | 4.70                          | 0.065                          | 1400                      |
| 0402HP-12NX_L_           | 12                              | <b>5,3,2</b>                      | 250                | 12.0    | 66                 | 12.6    | 100                | 4.40                          | 0.100                          | 1200                      |
| 0402HP-13NX_L_           | 13                              | <b>5,3,2</b>                      | 250                | 13.1    | 62                 | 13.9    | 82                 | 4.20                          | 0.155                          | 870                       |
| 0402HP-15NX_L_           | 15                              | <b>5,3,2</b>                      | 250                | 15.1    | 62                 | 16.0    | 85                 | 3.90                          | 0.115                          | 1100                      |
| 0402HP-16NX_L_           | 16                              | <b>5,3,2</b>                      | 250                | 16.2    | 57                 | 17.3    | 77                 | 3.70                          | 0.150                          | 850                       |
| 0402HP-18NX_L_           | 18                              | <b>5,3,2</b>                      | 250                | 18.2    | 58                 | 19.5    | 74                 | 3.55                          | 0.120                          | 900                       |
| 0402HP-19NX_L_           | 19                              | <b>5,3,2</b>                      | 250                | 19.2    | 61                 | 20.7    | 88                 | 3.50                          | 0.145                          | 850                       |
| 0402HP-20NX_L_           | 20                              | <b>5,3,2</b>                      | 250                | 20.3    | 58                 | 22.0    | 76                 | 3.50                          | 0.185                          | 780                       |
| 0402HP-21NX_L_           | 21                              | <b>5,3,2</b>                      | 250                | 21.3    | 48                 | 23.2    | 62                 | 1.70                          | 0.460                          | 450                       |
| 0402HP-22NX_L_           | 22                              | <b>5,3,2</b>                      | 250                | 22.3    | 60                 | 24.4    | 74                 | 3.30                          | 0.160                          | 800                       |
| 0402HP-23NX_L_           | 23                              | <b>5,3,2</b>                      | 250                | 23.3    | 60                 | 25.5    | 77                 | 3.30                          | 0.160                          | 800                       |
| 0402HP-24NX_L_           | 24                              | <b>5,3,2</b>                      | 250                | 24.5    | 55                 | 27.1    | 71                 | 3.15                          | 0.210                          | 700                       |
| 0402HP-25NX_L_           | 25                              | <b>5,3,2</b>                      | 250                | 25.5    | 57                 | 28.3    | 73                 | 3.15                          | 0.260                          | 700                       |
| 0402HP-26NX_L_           | 26                              | <b>5,3,2</b>                      | 250                | 26.6    | 56                 | 29.3    | 74                 | 3.15                          | 0.290                          | 700                       |
| 0402HP-27NX_L_           | 27                              | <b>5,3,2</b>                      | 250                | 27.3    | 62                 | 29.5    | 86                 | 3.20                          | 0.350                          | 450                       |
| 0402HP-30NX_L_           | 30                              | <b>5,3,2</b>                      | 250                | 30.8    | 61                 | 35.0    | 87                 | 2.90                          | 0.350                          | 450                       |
| 0402HP-33NX_L_           | 33                              | <b>5,3,2</b>                      | 250                | 34.0    | 61                 | 38.3    | 80                 | 2.80                          | 0.330                          | 490                       |
| 0402HP-36NX_L_           | 36                              | <b>5,3,2</b>                      | 250                | 37.1    | 59                 | 42.2    | 76                 | 2.80                          | 0.390                          | 480                       |
| 0402HP-37NX_L_           | 37                              | <b>5,3,2</b>                      | 250                | 38.2    | 57                 | 44.0    | 72                 | 2.70                          | 0.480                          | 470                       |
| 0402HP-39NX_L_           | 39                              | <b>5,3,2</b>                      | 250                | 40.5    | 56                 | 47.0    | 84                 | 2.60                          | 0.430                          | 450                       |
| 0402HP-40NX_L_           | 40                              | <b>5,3,2</b>                      | 250                | 41.3    | 56                 | 47.4    | 75                 | 2.60                          | 0.430                          | 450                       |
| 0402HP-43NX_L_           | 43                              | <b>5,3,2</b>                      | 250                | 45.0    | 52                 | 54.1    | 68                 | 2.50                          | 0.520                          | 450                       |
| 0402HP-47NX_L_           | 47                              | <b>5,3,2</b>                      | 250                | 49.0    | 48                 | 58.9    | 62                 | 2.40                          | 0.580                          | 420                       |
| 0402HP-51NX_L_           | 51                              | <b>5,3,2</b>                      | 250                | 49.1    | 52                 | 58.8    | 59                 | 2.30                          | 0.700                          | 360                       |
| 0402HPH-56NX_L_          | 56                              | <b>5,3,2</b>                      | 250                | 58.8    | 56                 | 72.2    | 64                 | 2.07                          | 0.900                          | 330                       |
| 0402HPH-68NX_L_          | 68                              | <b>5,3,2</b>                      | 250                | 72.2    | 56                 | 91.4    | 64                 | 1.84                          | 1.00                           | 320                       |
| 0402HPH-82NX_L_          | 82                              | <b>5,3,2</b>                      | 250                | 89.7    | 52                 | —       | —                  | 1.75                          | 1.10                           | 315                       |
| 0402HPH-R10X_L_          | 100                             | <b>5,3,2</b>                      | 250                | —       | —                  | —       | —                  | 1.58                          | 1.20                           | 310                       |
| 0402HPH-R12X_L_          | 120                             | <b>5,3,2</b>                      | 250                | —       | —                  | —       | —                  | 1.25                          | 1.20                           | 310                       |
| 0402HPH-R15X_L_          | 150                             | <b>5,3,2</b>                      | 100                | —       | —                  | —       | —                  | 1.14                          | 2.0                            | 240                       |
| 0402HPH-R18X_L_          | 180                             | <b>5,3,2</b>                      | 100                | —       | —                  | —       | —                  | 1.08                          | 2.1                            | 240                       |
| 0402HPH-R22X_L_          | 220                             | <b>5,3,2</b>                      | 100                | —       | —                  | —       | —                  | 0.96                          | 3.1                            | 160                       |

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

0402HP-82NXJLW

**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).  
Q = 7" machine-ready reel. EIA-481 punched paper tape (5000 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 at test frequency using a Coilcraft SMD-F 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 using an Agilent/HP 4287A with an Agilent/HP 16197 test fixture.

5. SRF measured using an Agilent/HP 8722ES network analyzer and a Coilcraft SMD-D test fixture.

6. DCR measured on a 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.



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