

# Axial Lead Inductors(Coils) For Signal Line

Conformity to RoHS Directive

## SP Series SP0305

### FEATURES

- The SP series inductors are available in ranging from 0203 to 0406 types.
- These are coaxial horizontal types, highly miniaturized and light-weight.
- Epoxy resin construction assures high reliability.
- Available in ammo-pack style tape packaging to support automated mounting machines.
- Terminal platings and internal connecting solder use lead-free materials.
- It is a product conforming to RoHS directive.

### APPLICATIONS

Televisions, VCRs, personal computers, and other electronic equipment.

### SPECIFICATIONS

|                             |                                                   |
|-----------------------------|---------------------------------------------------|
| Operating temperature range | -20 to +80°C<br>[Including self-temperature rise] |
| Storage temperature range   | -40 to +80°C [Unit of products]                   |
| Terminal tensile strength   | 9.8N min.                                         |

### PRODUCT IDENTIFICATION

|     |      |     |     |     |      |
|-----|------|-----|-----|-----|------|
| SP  |      |     |     |     |      |
| PL  |      |     |     |     |      |
| SPT | 0305 | SA- | 1R0 | K   | - PF |
| (1) | (2)  | (3) | (4) | (5) | (6)  |

#### (1)Series name

|     |                      |
|-----|----------------------|
| SP  | Bulk                 |
| PL  | Formed lead products |
| SPT | Taping (ammo-pack)   |

#### (2)Dimensions

|      |            |
|------|------------|
| 0305 | ø3.0×6.5mm |
|------|------------|

#### (3)Packaging style

|      |            |
|------|------------|
| None | Bulk       |
| S    | Formed     |
| SA   | 26mmTaping |
| A    | 52mmTaping |

#### (4)Inductance value

|     |       |
|-----|-------|
| 1R0 | 1μH   |
| 100 | 10μH  |
| 101 | 100μH |

#### (5)Inductance tolerance

|   |      |
|---|------|
| K | ±10% |
| J | ±5%  |

#### (6)Lead-free compatible product

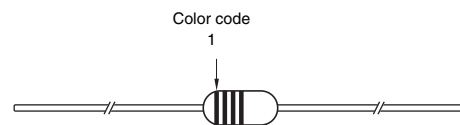
|    |                              |
|----|------------------------------|
| PF | Lead-free compatible product |
|----|------------------------------|

### PACKAGING STYLE AND QUANTITIES

| Packaging style   | Quantity        |
|-------------------|-----------------|
| Taping(Ammo-pack) | 2000 pieces/box |
| Bulk              | 200 pieces/pack |

### COLOR CODE MARKINGS (from left)

- 1: The first effective number
- 2: The second effective number
- 3: Multiplier
- 4: Inductance tolerance



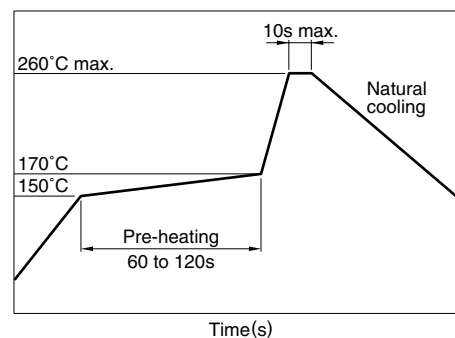
### Color code table

| Color  | Effective number | Multiplier | Inductance tolerance |
|--------|------------------|------------|----------------------|
| Black  | 0                | 1          | —                    |
| Brown  | 1                | 10         | —                    |
| Red    | 2                | 100        | —                    |
| Orange | 3                | 1000       | —                    |
| Yellow | 4                | —          | —                    |
| Green  | 5                | —          | —                    |
| Blue   | 5                | —          | —                    |
| Purple | 7                | —          | —                    |
| Gray   | 8                | —          | —                    |
| White  | 9                | —          | —                    |
| Silver | —                | 0.01       | ±10%                 |
| Gold   | —                | 0.1        | ±5%                  |

- According to JIS-C-0801

### RECOMMENDED SOLDERING CONDITIONS

#### FLOW SOLDERING



#### IRON SOLDERING

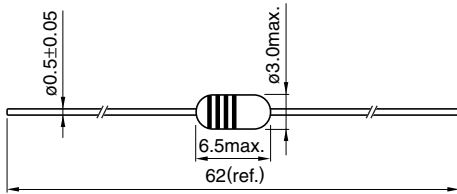
|                 |                     |
|-----------------|---------------------|
| Tip temperature | 350°C max.          |
| Heating time    | 5 seconds/soldering |

- The use of reflow soldering is not guaranteed.

• Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

• All specifications are subject to change without notice.

## SHAPES AND DIMENSIONS



Dimensions in mm

## CHARACTERISTICS

|                             |                                                              |
|-----------------------------|--------------------------------------------------------------|
| Operating temperature range | -20 to +80°C<br>[Including self-temperature rise, 20°C max.] |
| Rated current               | Based on temperature rise                                    |
| Terminal tensile strength   | 9.8N min.                                                    |
| Terminal bending strength   | 2.94N min.                                                   |

## ELECTRICAL CHARACTERISTICS

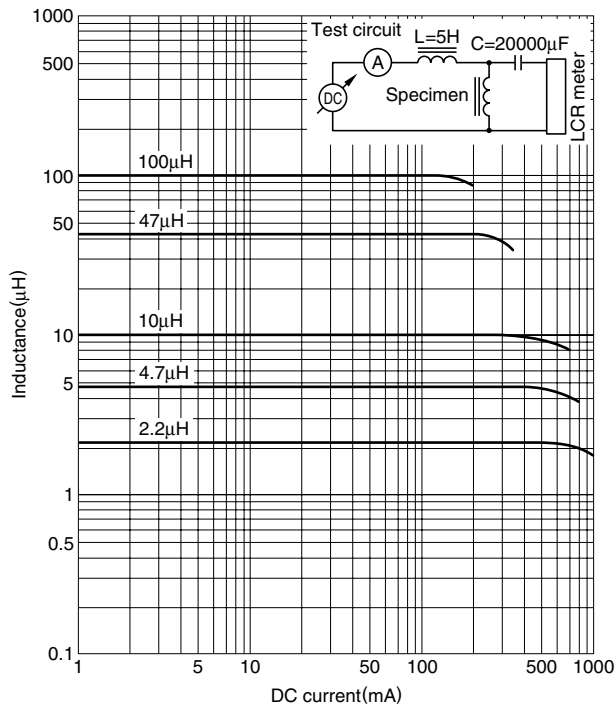
| Inductance (μH) | Inductance tolerance | Q min. | Test frequency L, Q (MHz) | Self-resonant frequency (MHz)min. | DC resistance (Ω)max. | Rated current (mA)max. | Part No.       |
|-----------------|----------------------|--------|---------------------------|-----------------------------------|-----------------------|------------------------|----------------|
| 0.22            | ±10%                 | 40     | 25.2                      | 380                               | 0.075                 | 1150                   | SP0305-R22K-PF |
| 0.27            | ±10%                 | 40     | 25.2                      | 360                               | 0.085                 | 1110                   | SP0305-R27K-PF |
| 0.33            | ±10%                 | 40     | 25.2                      | 335                               | 0.095                 | 1110                   | SP0305-R33K-PF |
| 0.39            | ±10%                 | 40     | 25.2                      | 310                               | 0.10                  | 1000                   | SP0305-R39K-PF |
| 0.47            | ±10%                 | 40     | 25.2                      | 270                               | 0.11                  | 1000                   | SP0305-R47K-PF |
| 0.56            | ±10%                 | 40     | 25.2                      | 245                               | 0.12                  | 950                    | SP0305-R56K-PF |
| 0.68            | ±10%                 | 40     | 25.2                      | 230                               | 0.13                  | 900                    | SP0305-R68K-PF |
| 0.82            | ±10%                 | 40     | 25.2                      | 200                               | 0.14                  | 875                    | SP0305-R82K-PF |
| 1.00            | ±5%                  | 40     | 25.2                      | 180                               | 0.15                  | 815                    | SP0305-1R0J-PF |
| 1.20            | ±5%                  | 40     | 7.96                      | 165                               | 0.18                  | 740                    | SP0305-1R2J-PF |
| 1.50            | ±5%                  | 45     | 7.96                      | 150                               | 0.20                  | 700                    | SP0305-1R5J-PF |
| 1.80            | ±5%                  | 50     | 7.96                      | 125                               | 0.23                  | 655                    | SP0305-1R8J-PF |
| 2.20            | ±5%                  | 50     | 7.96                      | 110                               | 0.25                  | 630                    | SP0305-2R2J-PF |
| 2.70            | ±5%                  | 50     | 7.96                      | 95                                | 0.28                  | 595                    | SP0305-2R7J-PF |
| 3.30            | ±5%                  | 50     | 7.96                      | 68                                | 0.30                  | 575                    | SP0305-3R3J-PF |
| 3.90            | ±5%                  | 45     | 7.96                      | 50                                | 0.32                  | 555                    | SP0305-3R9J-PF |
| 4.70            | ±5%                  | 45     | 7.96                      | 38                                | 0.35                  | 530                    | SP0305-4R7J-PF |
| 5.60            | ±5%                  | 45     | 7.96                      | 32                                | 0.40                  | 500                    | SP0305-5R6J-PF |
| 6.80            | ±5%                  | 40     | 7.96                      | 28                                | 0.45                  | 470                    | SP0305-6R8J-PF |
| 8.20            | ±5%                  | 40     | 7.96                      | 20                                | 0.55                  | 425                    | SP0305-8R2J-PF |
| 10.0            | ±5%                  | 40     | 7.96                      | 18                                | 0.75                  | 370                    | SP0305-100J-PF |
| 12.0            | ±5%                  | 45     | 2.52                      | 16                                | 0.80                  | 350                    | SP0305-120J-PF |
| 15.0            | ±5%                  | 50     | 2.52                      | 16                                | 0.93                  | 335                    | SP0305-150J-PF |
| 18.0            | ±5%                  | 50     | 2.52                      | 15                                | 1.00                  | 315                    | SP0305-180J-PF |
| 22.0            | ±5%                  | 50     | 2.52                      | 13                                | 1.20                  | 285                    | SP0305-220J-PF |
| 27.0            | ±5%                  | 50     | 2.52                      | 11                                | 1.35                  | 270                    | SP0305-270J-PF |
| 33.0            | ±5%                  | 50     | 2.52                      | 10                                | 1.50                  | 255                    | SP0305-330J-PF |
| 39.0            | ±5%                  | 50     | 2.52                      | 9.5                               | 1.70                  | 240                    | SP0305-390J-PF |
| 47.0            | ±5%                  | 60     | 2.52                      | 8.5                               | 2.70                  | 205                    | SP0305-470J-PF |
| 56.0            | ±5%                  | 60     | 2.52                      | 7.5                               | 2.95                  | 195                    | SP0305-560J-PF |
| 68.0            | ±5%                  | 60     | 2.52                      | 6.5                               | 3.30                  | 185                    | SP0305-680J-PF |
| 82.0            | ±5%                  | 60     | 2.52                      | 6.0                               | 3.60                  | 175                    | SP0305-820J-PF |
| 100             | ±5%                  | 60     | 2.52                      | 5.5                               | 4.10                  | 165                    | SP0305-101J-PF |
| 120             | ±5%                  | 60     | 0.796                     | 5.4                               | 4.70                  | 160                    | SP0305-121J-PF |
| 150             | ±5%                  | 60     | 0.796                     | 4.75                              | 5.40                  | 150                    | SP0305-151J-PF |
| 180             | ±5%                  | 60     | 0.796                     | 4.35                              | 6.00                  | 140                    | SP0305-181J-PF |
| 220             | ±5%                  | 60     | 0.796                     | 4.0                               | 6.80                  | 130                    | SP0305-221J-PF |
| 270             | ±5%                  | 60     | 0.796                     | 3.7                               | 7.70                  | 120                    | SP0305-271J-PF |
| 330             | ±5%                  | 60     | 0.796                     | 3.4                               | 11.1                  | 100                    | SP0305-331J-PF |
| 390             | ±5%                  | 60     | 0.796                     | 2.8                               | 12.6                  | 95                     | SP0305-391J-PF |
| 470             | ±5%                  | 60     | 0.796                     | 2.55                              | 14.0                  | 90                     | SP0305-471J-PF |
| 560             | ±5%                  | 60     | 0.796                     | 2.35                              | 15.5                  | 85                     | SP0305-561J-PF |

• Different product names are used depending on the type of packaging used at the time of delivery. Please see "PRODUCT IDENTIFICATION" for details.

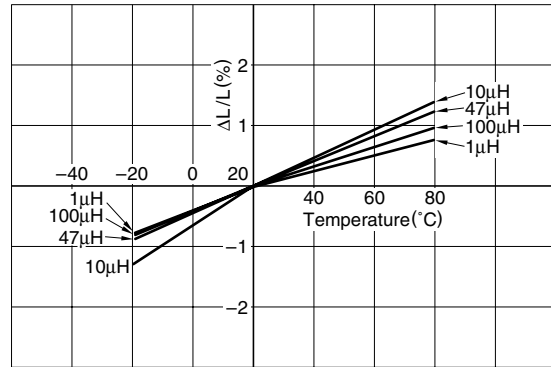
- Test equipment L, Q: HP4194A IMPEDANCE ANALYZER, or equivalent  
SRF: HP8753C NETWORK ANALYZER, or equivalent  
Rdc: NATIONAL VP-2941A MILLIOHM METER, or equivalent

## TYPICAL ELECTRICAL CHARACTERISTICS

### INDUCTANCE CHANGE vs. DC SUPERPOSITION CHARACTERISTICS



### INDUCTANCE CHANGE vs. TEMPERATURE CHARACTERISTICS



### Q vs. FREQUENCY CHARACTERISTICS

