

# LL1005-FHL Series

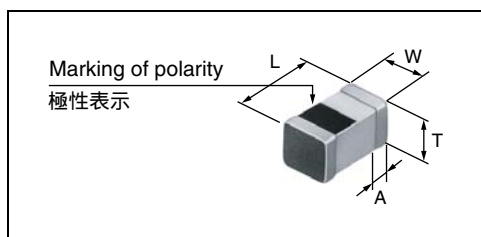
**Inductance Range:** 1.0~100nH (E-24 Series)、個別対応品order production available (1.1nH, 1.3nH, 1.6nH, 2.0nH, 2.4nH, 3.0nH, 3.6nH, 4.3nH, 5.1nH, 6.2nH, 7.5nH, 9.1nH)

**Temperature Coefficient of L:** + 250ppm/°C (for reference only)

## FEATURES / 特長

- Dual frequency standard for inductance value
- Tight tolerance physical dimensions ( $\pm 0.05\text{mm}$ )
- Supports high temperature reflow soldering (260°C, 3 times)
- Expanding operating temperature range ( $-55^{\circ}\text{C} \sim +125^{\circ}\text{C}$ )
- Extended applicable frequency range ( $\sim 10\text{GHz}$ )
- Surface mounting applicability (Supports reflow soldering)
- High reliability (ceramic integrated structure, and terminals plated)
- RoHS compliant
- インダクタンス値の2周波規格化
- 外形寸法の狭公差化 ( $\pm 0.05\text{mm}$ )
- 高温リフロー対応可 (260  $\times$  3回)
- 使用温度範囲の拡大化 ( $-55 \sim +125$ )
- 高周波適用性の拡大化 ( $\sim 10\text{GHz}$ )
- 面実装適用性 (リフロー対応)
- 高信頼性 (セラミッケー体構造、およびめっき端子電極)
- RoHS指令対応

## DIMENSIONS / 外形寸法図



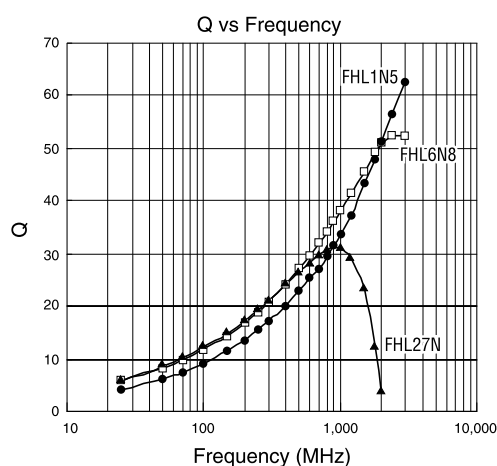
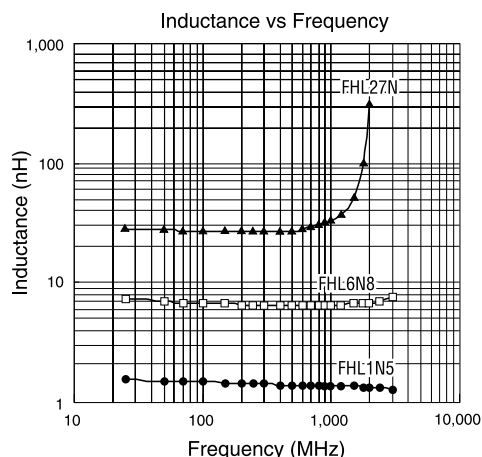
| Inductance | Length<br>L (mm) | Width<br>W (mm) | Thickness<br>T (mm) | Electrode width<br>A (mm) |
|------------|------------------|-----------------|---------------------|---------------------------|
| 1.0 ~ 68nH | $1.0 \pm 0.05$   | $0.5 \pm 0.05$  | $0.5 \pm 0.05$      | $0.25 \pm 0.1$            |
| 82 ~ 100nH | $1.0 \pm 0.05$   | $0.5 \pm 0.05$  | $0.5 \pm 0.1$       | $0.25 \pm 0.1$            |

- **Marking of polarity:** Marking is on the upper Surface of the unit.
- **極性表示:** 磁束方向を示します。この表示が、常に上を向くようにテーパーピングされています。

## ELECTRICAL CHARACTERISTICS / 電気的特性

- |                                                           |                                                                 |                    |                                                                     |
|-----------------------------------------------------------|-----------------------------------------------------------------|--------------------|---------------------------------------------------------------------|
| • Inductance Range                                        | 1.0~100nH (E-24 Series)                                         | • インダクタンス範囲        | 1.0 ~ 100nH (E-24 Series)                                           |
| • Inductance Tolerance                                    | S ; $\pm 0.3\text{nH}$ (1.0~6.2nH)<br>J ; $\pm 5\%$ (6.8~100nH) | • インダクタンス許容差       | S級; $\pm 0.3\text{nH}$ (1.0 ~ 6.2nH)<br>J級; $\pm 5\%$ (6.8 ~ 100nH) |
| • Q (Typical)                                             | 15~35 (at 800MHz)                                               | • Q (Typical)      | 15 ~ 35 (at 800MHz)                                                 |
| • Rated Current                                           | 200~500mA                                                       | • 許容電流値            | 200 ~ 500mA                                                         |
| • Inductance Temperature Coefficient (for reference only) | +250ppm/°C                                                      | • インダクタンス温度係数(参考値) | + 250ppm/°C                                                         |
| • Operating Temperature Range                             | $-55^{\circ}\text{C} \sim +125^{\circ}\text{C}$                 | • 使用温度範囲           | $-55 \sim +125$                                                     |
| • Storage Temperature Range                               | $-55^{\circ}\text{C} \sim +125^{\circ}\text{C}$                 | • 保存温度範囲           | $-55 \sim +125$                                                     |

## EXAMPLES OF CHARACTERISTICS / 代表特性例



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## TOKO STANDARD PART NUMBERS / 東光 標準品一覧

## LL1005-FHL Series (Quantity/reel; 10,000 PCS)

| TOKO<br>Part number | Inductance & Tolerance |                      | Q<br>Min.<br>100<br>MHz | Q Typical  |            |            |            |             |             |             | S.R.F.<br>(MHz)<br>Min. | R <sub>DC</sub><br>(Ω)<br>Max. | R <sub>DC</sub><br>(Ω)<br>Typ. | I <sub>DC</sub><br>(mA)<br>Max. |
|---------------------|------------------------|----------------------|-------------------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------------------|--------------------------------|--------------------------------|---------------------------------|
|                     | 100MHz                 | 800MHz<br>(**500MHz) |                         | 100<br>MHz | 300<br>MHz | 500<br>MHz | 800<br>MHz | 1000<br>MHz | 1800<br>MHz | 2400<br>MHz |                         |                                |                                |                                 |
| LL1005-FHL1N0S      | 1.0±0.3nH              | 0.93±0.5nH           | 8.0                     | 8.8        | 17.0       | 22.0       | 29.0       | 33.0        | 47.0        | 57.0        | 20000                   | 0.10                           | 0.07                           | 500                             |
| * LL1005-FHL1N1S    | 1.1±0.3nH              | 1.0±0.5nH            | 8.0                     | 9.0        | 16.0       | 21.0       | 27.0       | 30.0        | 43.0        | 53.0        | 16000                   | 0.10                           | 0.07                           | 500                             |
| LL1005-FHL1N2S      | 1.2±0.3nH              | 1.1±0.5nH            | 8.0                     | 9.0        | 17.0       | 22.0       | 28.0       | 32.0        | 46.0        | 55.0        | 16000                   | 0.10                           | 0.07                           | 500                             |
| * LL1005-FHL1N3S    | 1.3±0.3nH              | 1.2±0.5nH            | 8.0                     | 9.0        | 17.0       | 22.0       | 28.0       | 32.0        | 45.0        | 54.0        | 12000                   | 0.11                           | 0.07                           | 500                             |
| LL1005-FHL1N5S      | 1.5±0.3nH              | 1.4±0.5nH            | 8.0                     | 9.2        | 17.0       | 23.0       | 29.0       | 33.0        | 47.0        | 57.0        | 12000                   | 0.13                           | 0.08                           | 500                             |
| * LL1005-FHL1N6S    | 1.6±0.3nH              | 1.5±0.5nH            | 8.0                     | 10.0       | 17.0       | 23.0       | 29.0       | 33.0        | 46.0        | 55.0        | 12000                   | 0.13                           | 0.08                           | 500                             |
| LL1005-FHL1N8S      | 1.8±0.3nH              | 1.7±0.5nH            | 8.0                     | 9.1        | 16.0       | 22.0       | 28.0       | 32.0        | 44.0        | 53.0        | 12000                   | 0.14                           | 0.08                           | 500                             |
| * LL1005-FHL2N0S    | 2.0±0.3nH              | 1.9±0.5nH            | 8.0                     | 10.0       | 18.0       | 23.0       | 30.0       | 34.0        | 46.0        | 53.0        | 11000                   | 0.14                           | 0.08                           | 500                             |
| LL1005-FHL2N2S      | 2.2±0.3nH              | 2.0±0.5nH            | 8.0                     | 10.0       | 18.0       | 24.0       | 31.0       | 34.0        | 48.0        | 55.0        | 11000                   | 0.15                           | 0.09                           | 500                             |
| * LL1005-FHL2N4S    | 2.4±0.3nH              | 2.2±0.5nH            | 8.0                     | 11.0       | 18.0       | 24.0       | 31.0       | 35.0        | 49.0        | 54.0        | 8100                    | 0.15                           | 0.09                           | 500                             |
| LL1005-FHL2N7S      | 2.7±0.3nH              | 2.5±0.5nH            | 8.0                     | 10.0       | 18.0       | 24.0       | 31.0       | 35.0        | 50.0        | 58.0        | 8100                    | 0.15                           | 0.10                           | 500                             |
| * LL1005-FHL3N0S    | 3.0±0.3nH              | 2.9±0.5nH            | 8.0                     | 10.0       | 18.0       | 24.0       | 31.0       | 35.0        | 49.0        | 54.0        | 7700                    | 0.15                           | 0.10                           | 500                             |
| LL1005-FHL3N3S      | 3.3±0.3nH              | 3.1±0.5nH            | 8.0                     | 10.0       | 18.0       | 24.0       | 30.0       | 34.0        | 47.0        | 54.0        | 7700                    | 0.16                           | 0.10                           | 500                             |
| * LL1005-FHL3N6S    | 3.6±0.3nH              | 3.4±0.5nH            | 8.0                     | 10.0       | 18.0       | 24.0       | 30.0       | 34.0        | 46.0        | 52.0        | 6200                    | 0.16                           | 0.11                           | 500                             |
| LL1005-FHL3N9S      | 3.9±0.3nH              | 3.7±0.5nH            | 8.0                     | 10.0       | 18.0       | 24.0       | 31.0       | 36.0        | 48.0        | 55.0        | 6200                    | 0.18                           | 0.12                           | 500                             |
| * LL1005-FHL4N3S    | 4.3±0.3nH              | 4.1±0.5nH            | 8.0                     | 10.0       | 18.0       | 24.0       | 30.0       | 34.0        | 46.0        | 50.0        | 6000                    | 0.18                           | 0.12                           | 400                             |
| LL1005-FHL4N7S      | 4.7±0.3nH              | 4.4±0.5nH            | 9.0                     | 11.0       | 19.0       | 24.0       | 31.0       | 35.0        | 47.0        | 52.0        | 6000                    | 0.20                           | 0.13                           | 400                             |
| * LL1005-FHL5N1S    | 5.1±0.3nH              | 4.8±0.5nH            | 9.0                     | 11.0       | 19.0       | 25.0       | 31.0       | 35.0        | 45.0        | 49.0        | 5300                    | 0.20                           | 0.14                           | 400                             |
| LL1005-FHL5N6S      | 5.6±0.3nH              | 5.3±0.5nH            | 9.0                     | 12.0       | 21.0       | 27.0       | 35.0       | 39.0        | 50.0        | 53.0        | 5100                    | 0.22                           | 0.15                           | 400                             |
| * LL1005-FHL6N2S    | 6.2±0.3nH              | 6.0±0.5nH            | 9.0                     | 12.0       | 21.0       | 27.0       | 34.0       | 38.0        | 50.0        | 54.0        | 4700                    | 0.22                           | 0.15                           | 400                             |
| LL1005-FHL6N8J      | 6.8nH±5%               | 6.5nH±10%            | 9.0                     | 12.0       | 21.0       | 27.0       | 34.0       | 38.0        | 49.0        | 52.0        | 4700                    | 0.23                           | 0.16                           | 400                             |
| * LL1005-FHL7N5J    | 7.5nH±5%               | 7.3nH±10%            | 9.0                     | 12.0       | 21.0       | 27.0       | 34.0       | 38.0        | 46.0        | 46.0        | 4200                    | 0.23                           | 0.16                           | 400                             |
| LL1005-FHL8N2J      | 8.2nH±5%               | 7.9nH±10%            | 9.0                     | 12.0       | 21.0       | 27.0       | 33.0       | 37.0        | 46.0        | 46.0        | 4000                    | 0.25                           | 0.17                           | 400                             |
| * LL1005-FHL9N1J    | 9.1nH±5%               | 8.9nH±10%            | 9.0                     | 11.0       | 19.0       | 25.0       | 31.0       | 34.0        | 40.0        | 36.0        | 3600                    | 0.26                           | 0.18                           | 400                             |
| LL1005-FHL10NJ      | 10nH±5%                | 9.7nH±10%            | 9.0                     | 12.0       | 20.0       | 26.0       | 33.0       | 36.0        | 43.0        | 39.0        | 3600                    | 0.30                           | 0.19                           | 400                             |
| LL1005-FHL12NJ      | 12nH±5%                | 12nH±10%             | 9.0                     | 12.0       | 20.0       | 25.0       | 31.0       | 33.0        | 33.0        | 23.0        | 2800                    | 0.40                           | 0.21                           | 300                             |
| LL1005-FHL15NJ      | 15nH±5%                | 15nH±10%             | 9.0                     | 12.0       | 20.0       | 25.0       | 30.0       | 32.0        | 27.0        | -           | 2500                    | 0.50                           | 0.26                           | 300                             |
| LL1005-FHL18NJ      | 18nH±5%                | 18nH±10%             | 10.0                    | 12.0       | 21.0       | 26.0       | 31.0       | 33.0        | 27.0        | -           | 2300                    | 0.60                           | 0.44                           | 300                             |
| LL1005-FHL22NJ      | 22nH±5%                | 23nH±10%             | 10.0                    | 12.0       | 20.0       | 25.0       | 30.0       | 31.0        | 18.0        | -           | 2100                    | 0.70                           | 0.50                           | 300                             |
| LL1005-FHL27NJ      | 27nH±5%                | 30nH±10%             | 10.0                    | 12.0       | 21.0       | 26.0       | 31.0       | 31.0        | 12.0        | -           | 1700                    | 0.85                           | 0.52                           | 300                             |
| LL1005-FHL33NJ      | 33nH±5%                | 36nH±10%             | 10.0                    | 12.0       | 19.0       | 24.0       | 27.0       | 27.0        | -           | -           | 1700                    | 1.00                           | 0.70                           | 200                             |
| LL1005-FHL39NJ      | 39nH±5%                | 44nH±10%             | 10.0                    | 12.0       | 20.0       | 24.0       | 26.0       | 26.0        | -           | -           | 1600                    | 1.10                           | 0.80                           | 200                             |
| LL1005-FHL47NJ      | 47nH±5%                | **50nH±10%           | 10.0                    | 11.0       | 18.0       | 21.0       | 21.0       | 18.0        | -           | -           | 1200                    | 1.30                           | 0.93                           | 200                             |
| LL1005-FHL56NJ      | 56nH±5%                | **60nH±10%           | 10.0                    | 12.0       | 19.0       | 22.0       | 20.0       | 16.0        | -           | -           | 1100                    | 1.50                           | 1.20                           | 200                             |
| LL1005-FHL68NJ      | 68nH±5%                | **77nH±10%           | 10.0                    | 11.0       | 18.0       | 20.0       | 18.0       | 13.0        | -           | -           | 1100                    | 1.70                           | 1.25                           | 200                             |
| LL1005-FHL82NJ      | 82nH±5%                | **95nH±10%           | 10.0                    | 13.0       | 20.0       | 21.0       | 15.0       | -           | -           | -           | 970                     | 1.90                           | 1.26                           | 200                             |
| LL1005-FHLR10J      | 100nH±5%               | **122nH±10%          | 10.0                    | 13.0       | 19.0       | 19.0       | -          | -           | -           | -           | 870                     | 2.20                           | 1.45                           | 200                             |

注：(1)上表以外のインダクタンス値及び許容差(C級±0.2nH, T級±3%, B級±0.1nH, G級±2%)もご要望により用意いたします。

(2)\*印の品番は個別対応品です。サンプルキット等には入っておりませんので品番毎にご要求下さい。

Note：(1)Add tolerance to part number; B = ±0.1nH, C = ±0.2nH, G ±2%, T ±3%,

(2)\* Sign shows the order production product number. Please demand each product number because it is not a regular product number of the sample kit.

## ● Test Equipment &amp; note

(測定器 / 注意事項)

- L, Q : RF Impedance Analyzer 4291A/B (Agilent Technologies), Test Fixture 16192A (Agilent Technologies)
- Q at 2400MHz : RF Impedance Analyzer E4991A (Agilent Technologies), Test Fixture 16192A (Agilent Technologies)
- S.R.F. / 自己共振周波数 : Network Analyzer 8719D (Agilent Technologies), 8720D (Agilent Technologies)
- R<sub>DC</sub> / 直流抵抗 : Milliohmmeter 4338A/B (Agilent Technologies)
- Inductance tolerance / インダクタンス許容差 : S=±0.3nH, J=±5%
- Operating temperature range / 使用温度範囲 : -55°C ~ + 125°C
- Storage temperature range / 保存温度範囲 : -55°C ~ + 125°C