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## REMINDERS

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Please note that TAIYO YUDEN shall not be in any way responsible for any damages and defects in products or equipment incorporating our products, which are caused under the conditions other than those specified in this catalog or individual product specification sheets.

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- Please conduct validation and verification of our products in actual condition of mounting and operating environment before using our products.
- The products listed in this catalog are intended for use in general electronic equipment (e.g., AV equipment, OA equipment, home electric appliances, office equipment, information and communication equipment including, without limitation, mobile phone, and PC) and medical equipment classified as Class I or II by IMDRF. Please be sure to contact TAIYO YUDEN for further information before using the products for any equipment which may directly cause loss of human life or bodily injury (e.g., transportation equipment including, without limitation, automotive powertrain control system, train control system, and ship control system, traffic signal equipment, disaster prevention equipment, medical equipment classified as Class III by IMDRF, highly public information network equipment including, without limitation, telephone exchange, and base station).

Please do not incorporate our products into any equipment requiring high levels of safety and/or reliability (e.g., aerospace equipment, aviation equipment\*, medical equipment classified as Class IV by IMDRF, nuclear control equipment, undersea equipment, military equipment).

\*Note: There is a possibility that our products can be used only for aviation equipment that does not directly affect the safe operation of aircraft (e.g., in-flight entertainment, cabin light, electric seat, cooking equipment) if such use meets requirements specified separately by TAIYO YUDEN. Please be sure to contact TAIYO YUDEN for further information before using our products for such aviation equipment.

When our products are used even for high safety and/or reliability-required devices or circuits of general electronic equipment, it is strongly recommended to perform a thorough safety evaluation prior to use of our products and to install a protection circuit as necessary.

Please note that unless you obtain prior written consent of TAIYO YUDEN, TAIYO YUDEN shall not be in any way responsible for any damages incurred by you or third parties arising from use of the products listed in this catalog for any equipment requiring inquiry to TAIYO YUDEN or prohibited for use by TAIYO YUDEN as described above.

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Some of our products listed in this catalog may require specific procedures for export according to "U.S. Export Administration Regulations", "Foreign Exchange and Foreign Trade Control Law" of Japan, and other applicable regulations. Should you have any questions on this matter, please contact our sales staff.

# RADIAL LEADED INDUCTORS



WAVE

## ■ PARTS NUMBER

\*Operating Temp. : -25~+105°C (Including self-generated heat)

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L | H | △ | L | △ | 0 | 8 | T | B | 1 | 0 | 1 | K | △ | △ | △ |
| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |   |   |   |   |   |   |   |   |   |

△=Blank space

### ① Series name

| Code | Series name            |
|------|------------------------|
| LH△  | Radial leaded inductor |

### ② Characteristics

| Code | Characteristics                |
|------|--------------------------------|
| L△   | Standard type Taping available |
| LC   | High current type              |

### ③ Dimensions (D)

| Code | Dimensions (D) [mm max.] |
|------|--------------------------|
| 08   | 9.0                      |
| 10   | 11.0                     |

### ④ Packaging

| Code | Packaging            |
|------|----------------------|
| NB   | Bulk (LHL)           |
| TB   | Ammo packaging (LHL) |

### ⑤ Nominal inductance

| Code (example) | Nominal inductance [μH] |
|----------------|-------------------------|
| 1R0            | 1.0                     |
| 150            | 15                      |
| 102            | 1000                    |

※R=Decimal point

### ⑥ Inductance tolerance

| Code | Inductance tolerance |
|------|----------------------|
| J    | ±5%                  |
| K    | ±10%                 |
| M    | ±20%                 |
| N    | ±30%                 |

### ⑦ Internal code

| Code | Internal code |
|------|---------------|
| △△△  | Standard      |

## ■ STANDARD EXTERNAL DIMENSIONS / STANDARD QUANTITY

### LHL / LHLC



| Type    | D                       | H <sub>2</sub>          | l                        | F                        | φ d                       | Standard quantity [pcs] |      |        |
|---------|-------------------------|-------------------------|--------------------------|--------------------------|---------------------------|-------------------------|------|--------|
|         |                         |                         |                          |                          |                           | Box                     | Bulk | Taping |
| LH L 08 | 9.0 max<br>(0.354 max)  | 9.5 max<br>(0.374 max)  | 5.0±1.0<br>(0.197±0.039) | 5.0±1.0<br>(0.197±0.039) | 0.6±0.05<br>(0.024±0.002) | —                       | 100  | 1000   |
| LH L 10 | 11.0 max<br>(0.433 max) | 14.0 max<br>(0.551 max) | 5.0±1.0<br>(0.197±0.039) | 5.0±1.0<br>(0.197±0.039) | 0.6±0.05<br>(0.024±0.002) | —                       | 50   | 500    |

Unit: mm (inch)

● LHL08

| Parts number | EHS  | Nominal inductance<br>[ $\mu$ H] | Inductance<br>tolerance | Q<br>(min.) | Self-resonant<br>frequency<br>[MHz] (min.) | DC Resistance<br>[ $\Omega$ ] (max.) | Rated current<br>[A] (max.) | Measuring frequency<br>[MHz] |
|--------------|------|----------------------------------|-------------------------|-------------|--------------------------------------------|--------------------------------------|-----------------------------|------------------------------|
| LH L 08□1R0N | RoHS | 1.0                              | ±30%                    | 40          | 76                                         | 0.013                                | 4.7                         | 7.96                         |
| LH L 08□1R5M | RoHS | 1.5                              | ±20%                    | 40          | 65                                         | 0.014                                | 4.4                         | 7.96                         |
| LH L 08□2R2M | RoHS | 2.2                              | ±20%                    | 40          | 56                                         | 0.017                                | 4.1                         | 7.96                         |
| LH L 08□2R7M | RoHS | 2.7                              | ±20%                    | 40          | 48                                         | 0.019                                | 3.5                         | 7.96                         |
| LH L 08□3R3M | RoHS | 3.3                              | ±20%                    | 40          | 41                                         | 0.021                                | 3.2                         | 7.96                         |
| LH L 08□3R9M | RoHS | 3.9                              | ±20%                    | 40          | 33                                         | 0.024                                | 3.1                         | 7.96                         |
| LH L 08□4R7M | RoHS | 4.7                              | ±20%                    | 40          | 30                                         | 0.025                                | 3.0                         | 7.96                         |
| LH L 08□5R6M | RoHS | 5.6                              | ±20%                    | 40          | 23                                         | 0.028                                | 2.9                         | 7.96                         |
| LH L 08□6R8M | RoHS | 6.8                              | ±20%                    | 40          | 21                                         | 0.030                                | 2.8                         | 7.96                         |
| LH L 08□8R2M | RoHS | 8.2                              | ±20%                    | 40          | 19                                         | 0.034                                | 2.5                         | 7.96                         |
| LH L 08□100K | RoHS | 10                               | ±10%                    | 65          | 17                                         | 0.041                                | 2.4                         | 2.52                         |
| LH L 08□120K | RoHS | 12                               | ±10%                    | 65          | 16                                         | 0.044                                | 2.3                         | 2.52                         |
| LH L 08□150K | RoHS | 15                               | ±10%                    | 50          | 13                                         | 0.053                                | 2.0                         | 2.52                         |
| LH L 08□180K | RoHS | 18                               | ±10%                    | 50          | 12                                         | 0.060                                | 1.9                         | 2.52                         |
| LH L 08□220K | RoHS | 22                               | ±10%                    | 50          | 11                                         | 0.068                                | 1.8                         | 2.52                         |
| LH L 08□270K | RoHS | 27                               | ±10%                    | 50          | 10                                         | 0.091                                | 1.5                         | 2.52                         |
| LH L 08□330K | RoHS | 33                               | ±10%                    | 40          | 8.8                                        | 0.10                                 | 1.4                         | 2.52                         |
| LH L 08□390K | RoHS | 39                               | ±10%                    | 40          | 8.4                                        | 0.12                                 | 1.3                         | 2.52                         |
| LH L 08□470K | RoHS | 47                               | ±10%                    | 40          | 8.2                                        | 0.15                                 | 1.2                         | 2.52                         |
| LH L 08□560K | RoHS | 56                               | ±10%                    | 40          | 7.9                                        | 0.17                                 | 1.1                         | 2.52                         |
| LH L 08□680K | RoHS | 68                               | ±10%                    | 35          | 7.0                                        | 0.20                                 | 1.0                         | 2.52                         |
| LH L 08□820K | RoHS | 82                               | ±10%                    | 35          | 6.5                                        | 0.22                                 | 0.90                        | 2.52                         |
| LH L 08□101K | RoHS | 100                              | ±10%                    | 25          | 5.7                                        | 0.32                                 | 0.79                        | 0.796                        |
| LH L 08□121K | RoHS | 120                              | ±10%                    | 25          | 5.2                                        | 0.36                                 | 0.70                        | 0.796                        |
| LH L 08□151K | RoHS | 150                              | ±10%                    | 20          | 4.7                                        | 0.41                                 | 0.64                        | 0.796                        |
| LH L 08□181K | RoHS | 180                              | ±10%                    | 35          | 4.2                                        | 0.66                                 | 0.60                        | 0.796                        |
| LH L 08□221K | RoHS | 220                              | ±10%                    | 35          | 3.7                                        | 0.73                                 | 0.53                        | 0.796                        |
| LH L 08□271K | RoHS | 270                              | ±10%                    | 25          | 3.5                                        | 0.85                                 | 0.51                        | 0.796                        |
| LH L 08□331K | RoHS | 330                              | ±10%                    | 25          | 3.2                                        | 0.97                                 | 0.44                        | 0.796                        |
| LH L 08□391K | RoHS | 390                              | ±10%                    | 20          | 2.9                                        | 1.1                                  | 0.41                        | 0.796                        |
| LH L 08□471K | RoHS | 470                              | ±10%                    | 25          | 2.4                                        | 1.3                                  | 0.38                        | 0.796                        |
| LH L 08□561K | RoHS | 560                              | ±10%                    | 25          | 2.2                                        | 1.5                                  | 0.35                        | 0.796                        |
| LH L 08□681K | RoHS | 680                              | ±10%                    | 25          | 2.0                                        | 1.8                                  | 0.32                        | 0.796                        |
| LH L 08□821K | RoHS | 820                              | ±10%                    | 30          | 1.6                                        | 2.3                                  | 0.30                        | 0.796                        |
| LH L 08□102J | RoHS | 1000                             | ±5%                     | 55          | 1.5                                        | 2.7                                  | 0.25                        | 0.252                        |
| LH L 08□122J | RoHS | 1200                             | ±5%                     | 45          | 1.4                                        | 3.2                                  | 0.22                        | 0.252                        |
| LH L 08□152J | RoHS | 1500                             | ±5%                     | 55          | 1.3                                        | 4.1                                  | 0.20                        | 0.252                        |
| LH L 08□182J | RoHS | 1800                             | ±5%                     | 55          | 1.2                                        | 4.8                                  | 0.19                        | 0.252                        |
| LH L 08□222J | RoHS | 2200                             | ±5%                     | 55          | 1.1                                        | 5.6                                  | 0.16                        | 0.252                        |
| LH L 08□272J | RoHS | 2700                             | ±5%                     | 55          | 1.0                                        | 7.5                                  | 0.15                        | 0.252                        |
| LH L 08□332J | RoHS | 3300                             | ±5%                     | 55          | 0.85                                       | 8.5                                  | 0.14                        | 0.252                        |
| LH L 08□392J | RoHS | 3900                             | ±5%                     | 55          | 0.78                                       | 9.7                                  | 0.11                        | 0.252                        |
| LH L 08□472J | RoHS | 4700                             | ±5%                     | 65          | 0.68                                       | 14                                   | 0.10                        | 0.252                        |
| LH L 08□562J | RoHS | 5600                             | ±5%                     | 65          | 0.62                                       | 16                                   | 0.093                       | 0.252                        |
| LH L 08□682J | RoHS | 6800                             | ±5%                     | 65          | 0.61                                       | 18                                   | 0.092                       | 0.252                        |
| LH L 08□822J | RoHS | 8200                             | ±5%                     | 65          | 0.60                                       | 20                                   | 0.084                       | 0.252                        |
| LH L 08□103J | RoHS | 10000                            | ±5%                     | 60          | 0.48                                       | 32                                   | 0.070                       | L: 1kHz, Q: 0.0796MHz        |
| LH L 08□123J | RoHS | 12000                            | ±5%                     | 60          | 0.44                                       | 36                                   | 0.064                       | L: 1kHz, Q: 0.0796MHz        |
| LH L 08□153J | RoHS | 15000                            | ±5%                     | 60          | 0.35                                       | 62                                   | 0.051                       | L: 1kHz, Q: 0.0796MHz        |
| LH L 08□183J | RoHS | 18000                            | ±5%                     | 60          | 0.30                                       | 72                                   | 0.048                       | L: 1kHz, Q: 0.0796MHz        |
| LH L 08□223J | RoHS | 22000                            | ±5%                     | 60          | 0.28                                       | 82                                   | 0.044                       | L: 1kHz, Q: 0.0796MHz        |
| LH L 08□273J | RoHS | 27000                            | ±5%                     | 60          | 0.25                                       | 90                                   | 0.042                       | L: 1kHz, Q: 0.0796MHz        |
| LH L 08□333J | RoHS | 33000                            | ±5%                     | 60          | 0.23                                       | 100                                  | 0.040                       | L: 1kHz, Q: 0.0796MHz        |

□ Please specify the packaging code. (TB: Taping, NB: Bulk)

● LHL10

| Parts number | EHS  | Nominal inductance<br>[μH] | Inductance<br>tolerance | Q<br>(min.) | Self-resonant<br>frequency<br>[MHz] (min.) | DC Resistance<br>[Ω] (max.) | Rated current<br>[A] (max.) | Measuring frequency<br>[MHz] |
|--------------|------|----------------------------|-------------------------|-------------|--------------------------------------------|-----------------------------|-----------------------------|------------------------------|
| LH L 10□3R3M | RoHS | 3.3                        | ±20%                    | 50          | 46                                         | 0.019                       | 4.2                         | 7.96                         |
| LH L 10□3R9M | RoHS | 3.9                        | ±20%                    | 50          | 40                                         | 0.022                       | 4.1                         | 7.96                         |
| LH L 10□4R7M | RoHS | 4.7                        | ±20%                    | 50          | 38                                         | 0.024                       | 4.0                         | 7.96                         |
| LH L 10□5R6M | RoHS | 5.6                        | ±20%                    | 50          | 34                                         | 0.025                       | 3.8                         | 7.96                         |
| LH L 10□6R8M | RoHS | 6.8                        | ±20%                    | 50          | 30                                         | 0.028                       | 3.4                         | 7.96                         |
| LH L 10□8R2M | RoHS | 8.2                        | ±20%                    | 50          | 24                                         | 0.031                       | 3.3                         | 7.96                         |
| LH L 10□100K | RoHS | 10                         | ±10%                    | 90          | 19                                         | 0.034                       | 3.2                         | 2.52                         |
| LH L 10□120K | RoHS | 12                         | ±10%                    | 90          | 16                                         | 0.038                       | 2.8                         | 2.52                         |
| LH L 10□150K | RoHS | 15                         | ±10%                    | 90          | 12                                         | 0.042                       | 2.6                         | 2.52                         |
| LH L 10□180K | RoHS | 18                         | ±10%                    | 90          | 9.2                                        | 0.046                       | 2.4                         | 2.52                         |
| LH L 10□220K | RoHS | 22                         | ±10%                    | 60          | 8.6                                        | 0.061                       | 2.1                         | 2.52                         |
| LH L 10□270K | RoHS | 27                         | ±10%                    | 60          | 7.1                                        | 0.069                       | 2.0                         | 2.52                         |
| LH L 10□330K | RoHS | 33                         | ±10%                    | 60          | 6.8                                        | 0.078                       | 1.9                         | 2.52                         |
| LH L 10□390K | RoHS | 39                         | ±10%                    | 60          | 6.7                                        | 0.085                       | 1.8                         | 2.52                         |
| LH L 10□470K | RoHS | 47                         | ±10%                    | 50          | 6.2                                        | 0.093                       | 1.7                         | 2.52                         |
| LH L 10□560K | RoHS | 56                         | ±10%                    | 50          | 5.2                                        | 0.10                        | 1.6                         | 2.52                         |
| LH L 10□680K | RoHS | 68                         | ±10%                    | 40          | 4.9                                        | 0.12                        | 1.5                         | 2.52                         |
| LH L 10□820K | RoHS | 82                         | ±10%                    | 40          | 4.7                                        | 0.13                        | 1.4                         | 2.52                         |
| LH L 10□101K | RoHS | 100                        | ±10%                    | 40          | 3.8                                        | 0.18                        | 1.2                         | 0.796                        |
| LH L 10□121K | RoHS | 120                        | ±10%                    | 40          | 3.2                                        | 0.25                        | 1.0                         | 0.796                        |
| LH L 10□151K | RoHS | 150                        | ±10%                    | 40          | 2.9                                        | 0.29                        | 0.95                        | 0.796                        |
| LH L 10□181K | RoHS | 180                        | ±10%                    | 40          | 2.6                                        | 0.40                        | 0.80                        | 0.796                        |
| LH L 10□221K | RoHS | 220                        | ±10%                    | 40          | 2.3                                        | 0.44                        | 0.75                        | 0.796                        |
| LH L 10□271K | RoHS | 270                        | ±10%                    | 30          | 2.1                                        | 0.50                        | 0.70                        | 0.796                        |
| LH L 10□331K | RoHS | 330                        | ±10%                    | 30          | 2.0                                        | 0.56                        | 0.68                        | 0.796                        |
| LH L 10□391K | RoHS | 390                        | ±10%                    | 30          | 1.8                                        | 0.62                        | 0.63                        | 0.796                        |
| LH L 10□471K | RoHS | 470                        | ±10%                    | 30          | 1.7                                        | 0.84                        | 0.57                        | 0.796                        |
| LH L 10□561K | RoHS | 560                        | ±10%                    | 30          | 1.5                                        | 0.93                        | 0.52                        | 0.796                        |
| LH L 10□681K | RoHS | 680                        | ±10%                    | 30          | 1.4                                        | 1.0                         | 0.48                        | 0.796                        |
| LH L 10□821K | RoHS | 820                        | ±10%                    | 30          | 1.3                                        | 1.4                         | 0.42                        | 0.796                        |
| LH L 10□102J | RoHS | 1000                       | ±5%                     | 50          | 1.2                                        | 1.8                         | 0.41                        | 0.252                        |
| LH L 10□122J | RoHS | 1200                       | ±5%                     | 50          | 0.87                                       | 2.3                         | 0.33                        | 0.252                        |
| LH L 10□152J | RoHS | 1500                       | ±5%                     | 50          | 0.83                                       | 2.7                         | 0.30                        | 0.252                        |
| LH L 10□182J | RoHS | 1800                       | ±5%                     | 50          | 0.75                                       | 3.0                         | 0.29                        | 0.252                        |
| LH L 10□222J | RoHS | 2200                       | ±5%                     | 50          | 0.70                                       | 3.9                         | 0.25                        | 0.252                        |
| LH L 10□272J | RoHS | 2700                       | ±5%                     | 50          | 0.67                                       | 4.3                         | 0.24                        | 0.252                        |
| LH L 10□332J | RoHS | 3300                       | ±5%                     | 50          | 0.56                                       | 5.8                         | 0.21                        | 0.252                        |
| LH L 10□392J | RoHS | 3900                       | ±5%                     | 50          | 0.54                                       | 6.4                         | 0.20                        | 0.252                        |
| LH L 10□472J | RoHS | 4700                       | ±5%                     | 50          | 0.49                                       | 7.1                         | 0.19                        | 0.252                        |
| LH L 10□562J | RoHS | 5600                       | ±5%                     | 50          | 0.41                                       | 9.0                         | 0.17                        | 0.252                        |
| LH L 10□682J | RoHS | 6800                       | ±5%                     | 50          | 0.38                                       | 10                          | 0.16                        | 0.252                        |
| LH L 10□822J | RoHS | 8200                       | ±5%                     | 50          | 0.36                                       | 12                          | 0.15                        | 0.252                        |
| LH L 10□103J | RoHS | 10000                      | ±5%                     | 60          | 0.29                                       | 19                          | 0.12                        | L: 1kHz, Q: 0.0796MHz        |
| LH L 10□123J | RoHS | 12000                      | ±5%                     | 60          | 0.27                                       | 21                          | 0.11                        | L: 1kHz, Q: 0.0796MHz        |
| LH L 10□153J | RoHS | 15000                      | ±5%                     | 60          | 0.24                                       | 34                          | 0.090                       | L: 1kHz, Q: 0.0796MHz        |
| LH L 10□183J | RoHS | 18000                      | ±5%                     | 60          | 0.21                                       | 38                          | 0.081                       | L: 1kHz, Q: 0.0796MHz        |
| LH L 10□223J | RoHS | 22000                      | ±5%                     | 60          | 0.20                                       | 43                          | 0.075                       | L: 1kHz, Q: 0.0796MHz        |
| LH L 10□273J | RoHS | 27000                      | ±5%                     | 40          | 0.15                                       | 67                          | 0.060                       | L: 1kHz, Q: 0.0796MHz        |
| LH L 10□333J | RoHS | 33000                      | ±5%                     | 40          | 0.14                                       | 76                          | 0.056                       | L: 1kHz, Q: 0.0796MHz        |
| LH L 10□393J | RoHS | 39000                      | ±5%                     | 40          | 0.13                                       | 84                          | 0.053                       | L: 1kHz, Q: 0.0796MHz        |
| LH L 10□473J | RoHS | 47000                      | ±5%                     | 40          | 0.12                                       | 96                          | 0.050                       | L: 1kHz, Q: 0.0796MHz        |
| LH L 10□563J | RoHS | 56000                      | ±5%                     | 30          | 0.10                                       | 170                         | 0.036                       | L: 1kHz, Q: 0.0796MHz        |
| LH L 10□683J | RoHS | 68000                      | ±5%                     | 30          | 0.095                                      | 200                         | 0.035                       | L: 1kHz, Q: 0.0796MHz        |
| LH L 10□823J | RoHS | 82000                      | ±5%                     | 30          | 0.088                                      | 210                         | 0.033                       | L: 1kHz, Q: 0.0796MHz        |
| LH L 10□104J | RoHS | 100000                     | ±5%                     | 30          | 0.085                                      | 240                         | 0.031                       | L: 1kHz, Q: 0.0252MHz        |
| LH L 10□124J | RoHS | 120000                     | ±5%                     | 30          | 0.070                                      | 260                         | 0.030                       | L: 1kHz, Q: 0.0252MHz        |
| LH L 10□154J | RoHS | 150000                     | ±5%                     | 30          | 0.069                                      | 300                         | 0.028                       | L: 1kHz, Q: 0.0252MHz        |

□ Please specify the packaging code. (TB: Taping, NB: Bulk)

## LHLC08

| Parts number | EHS  | Nominal inductance<br>[ $\mu$ H] | Inductance<br>tolerance | Q<br>(min.) | Self-resonant<br>frequency<br>[MHz] (min.) | DC Resistance<br>[ $\Omega$ ] (max.) | Rated current<br>[A] (max.) | Measuring frequency<br>[MHz] |
|--------------|------|----------------------------------|-------------------------|-------------|--------------------------------------------|--------------------------------------|-----------------------------|------------------------------|
| LH LC08□1R0N | RoHS | 1.0                              | ±30%                    | 40          | 76                                         | 0.013                                | 5.4                         | 7.96                         |
| LH LC08□1R5M | RoHS | 1.5                              | ±20%                    | 40          | 65                                         | 0.014                                | 5.2                         | 7.96                         |
| LH LC08□2R2M | RoHS | 2.2                              | ±20%                    | 40          | 56                                         | 0.017                                | 4.8                         | 7.96                         |
| LH LC08□2R7M | RoHS | 2.7                              | ±20%                    | 40          | 48                                         | 0.019                                | 4.2                         | 7.96                         |
| LH LC08□3R3M | RoHS | 3.3                              | ±20%                    | 40          | 41                                         | 0.021                                | 3.8                         | 7.96                         |
| LH LC08□3R9M | RoHS | 3.9                              | ±20%                    | 40          | 33                                         | 0.024                                | 3.7                         | 7.96                         |
| LH LC08□4R7M | RoHS | 4.7                              | ±20%                    | 40          | 30                                         | 0.025                                | 3.6                         | 7.96                         |
| LH LC08□5R6M | RoHS | 5.6                              | ±20%                    | 40          | 23                                         | 0.028                                | 3.5                         | 7.96                         |
| LH LC08□6R8M | RoHS | 6.8                              | ±20%                    | 40          | 21                                         | 0.030                                | 3.4                         | 7.96                         |
| LH LC08□8R2M | RoHS | 8.2                              | ±20%                    | 40          | 19                                         | 0.034                                | 3.0                         | 7.96                         |
| LH LC08□100K | RoHS | 10                               | ±10%                    | 65          | 17                                         | 0.041                                | 2.9                         | 2.52                         |
| LH LC08□120K | RoHS | 12                               | ±10%                    | 65          | 16                                         | 0.044                                | 2.8                         | 2.52                         |
| LH LC08□150K | RoHS | 15                               | ±10%                    | 50          | 13                                         | 0.053                                | 2.6                         | 2.52                         |
| LH LC08□180K | RoHS | 18                               | ±10%                    | 50          | 12                                         | 0.060                                | 2.4                         | 2.52                         |
| LH LC08□220K | RoHS | 22                               | ±10%                    | 50          | 11                                         | 0.068                                | 2.3                         | 2.52                         |
| LH LC08□270K | RoHS | 27                               | ±10%                    | 50          | 10                                         | 0.091                                | 2.0                         | 2.52                         |
| LH LC08□330K | RoHS | 33                               | ±10%                    | 40          | 8.8                                        | 0.10                                 | 1.9                         | 2.52                         |
| LH LC08□390K | RoHS | 39                               | ±10%                    | 40          | 8.4                                        | 0.12                                 | 1.7                         | 2.52                         |
| LH LC08□470K | RoHS | 47                               | ±10%                    | 40          | 8.2                                        | 0.15                                 | 1.5                         | 2.52                         |
| LH LC08□560K | RoHS | 56                               | ±10%                    | 40          | 7.9                                        | 0.17                                 | 1.4                         | 2.52                         |
| LH LC08□680K | RoHS | 68                               | ±10%                    | 35          | 7.0                                        | 0.20                                 | 1.3                         | 2.52                         |
| LH LC08□820K | RoHS | 82                               | ±10%                    | 35          | 6.5                                        | 0.22                                 | 1.2                         | 2.52                         |
| LH LC08□101K | RoHS | 100                              | ±10%                    | 25          | 5.7                                        | 0.32                                 | 1.0                         | 0.796                        |
| LH LC08□121K | RoHS | 120                              | ±10%                    | 25          | 5.2                                        | 0.36                                 | 0.96                        | 0.796                        |
| LH LC08□151K | RoHS | 150                              | ±10%                    | 20          | 4.7                                        | 0.41                                 | 0.88                        | 0.796                        |
| LH LC08□181K | RoHS | 180                              | ±10%                    | 35          | 4.2                                        | 0.66                                 | 0.71                        | 0.796                        |
| LH LC08□221K | RoHS | 220                              | ±10%                    | 35          | 3.7                                        | 0.73                                 | 0.66                        | 0.796                        |
| LH LC08□271K | RoHS | 270                              | ±10%                    | 25          | 3.5                                        | 0.85                                 | 0.63                        | 0.796                        |
| LH LC08□331K | RoHS | 330                              | ±10%                    | 25          | 3.2                                        | 0.97                                 | 0.59                        | 0.796                        |
| LH LC08□391K | RoHS | 390                              | ±10%                    | 20          | 2.9                                        | 1.1                                  | 0.55                        | 0.796                        |
| LH LC08□471K | RoHS | 470                              | ±10%                    | 25          | 2.4                                        | 1.3                                  | 0.49                        | 0.796                        |
| LH LC08□561K | RoHS | 560                              | ±10%                    | 25          | 2.2                                        | 1.5                                  | 0.47                        | 0.796                        |
| LH LC08□681K | RoHS | 680                              | ±10%                    | 25          | 2.0                                        | 1.8                                  | 0.44                        | 0.796                        |
| LH LC08□821K | RoHS | 820                              | ±10%                    | 30          | 1.6                                        | 2.3                                  | 0.38                        | 0.796                        |
| LH LC08□102J | RoHS | 1000                             | ±5%                     | 55          | 1.5                                        | 2.7                                  | 0.35                        | 0.252                        |
| LH LC08□122J | RoHS | 1200                             | ±5%                     | 45          | 1.4                                        | 3.2                                  | 0.31                        | 0.252                        |
| LH LC08□152J | RoHS | 1500                             | ±5%                     | 55          | 1.3                                        | 4.1                                  | 0.29                        | 0.252                        |
| LH LC08□182J | RoHS | 1800                             | ±5%                     | 55          | 1.2                                        | 4.8                                  | 0.26                        | 0.252                        |
| LH LC08□222J | RoHS | 2200                             | ±5%                     | 55          | 1.1                                        | 5.6                                  | 0.23                        | 0.252                        |
| LH LC08□272J | RoHS | 2700                             | ±5%                     | 55          | 1.0                                        | 7.5                                  | 0.21                        | 0.252                        |
| LH LC08□332J | RoHS | 3300                             | ±5%                     | 55          | 0.85                                       | 8.5                                  | 0.19                        | 0.252                        |
| LH LC08□392J | RoHS | 3900                             | ±5%                     | 55          | 0.78                                       | 9.7                                  | 0.18                        | 0.252                        |
| LH LC08□472J | RoHS | 4700                             | ±5%                     | 65          | 0.68                                       | 14                                   | 0.16                        | 0.252                        |
| LH LC08□562J | RoHS | 5600                             | ±5%                     | 65          | 0.62                                       | 16                                   | 0.15                        | 0.252                        |
| LH LC08□682J | RoHS | 6800                             | ±5%                     | 65          | 0.61                                       | 18                                   | 0.14                        | 0.252                        |
| LH LC08□822J | RoHS | 8200                             | ±5%                     | 65          | 0.60                                       | 20                                   | 0.13                        | 0.252                        |
| LH LC08□103J | RoHS | 10000                            | ±5%                     | 60          | 0.48                                       | 32                                   | 0.11                        | L:1kHz, Q:0.0796MHz          |
| LH LC08□123J | RoHS | 12000                            | ±5%                     | 60          | 0.44                                       | 36                                   | 0.084                       | L:1kHz, Q:0.0796MHz          |
| LH LC08□153J | RoHS | 15000                            | ±5%                     | 60          | 0.35                                       | 62                                   | 0.068                       | L:1kHz, Q:0.0796MHz          |
| LH LC08□183J | RoHS | 18000                            | ±5%                     | 60          | 0.30                                       | 72                                   | 0.066                       | L:1kHz, Q:0.0796MHz          |
| LH LC08□223J | RoHS | 22000                            | ±5%                     | 60          | 0.28                                       | 82                                   | 0.057                       | L:1kHz, Q:0.0796MHz          |
| LH LC08□273J | RoHS | 27000                            | ±5%                     | 60          | 0.25                                       | 90                                   | 0.054                       | L:1kHz, Q:0.0796MHz          |
| LH LC08□333J | RoHS | 33000                            | ±5%                     | 60          | 0.23                                       | 100                                  | 0.053                       | L:1kHz, Q:0.0796MHz          |

□ Please specify the packaging code. (TB: Taping, NB: Bulk)

## LHLC10

| Parts number | EHS  | Nominal inductance<br>[ $\mu$ H] | Inductance<br>tolerance | Q<br>(min.) | Self-resonant<br>frequency<br>[MHz] (min.) | DC Resistance<br>[ $\Omega$ ] (max.) | Rated current<br>[A] (max.) | Measuring frequency<br>[MHz] |
|--------------|------|----------------------------------|-------------------------|-------------|--------------------------------------------|--------------------------------------|-----------------------------|------------------------------|
| LH LC10□3R3M | RoHS | 3.3                              | ±20%                    | 50          | 46                                         | 0.019                                | 5.0                         | 7.96                         |
| LH LC10□3R9M | RoHS | 3.9                              | ±20%                    | 50          | 40                                         | 0.022                                | 4.8                         | 7.96                         |
| LH LC10□4R7M | RoHS | 4.7                              | ±20%                    | 50          | 38                                         | 0.024                                | 4.7                         | 7.96                         |
| LH LC10□5R6M | RoHS | 5.6                              | ±20%                    | 50          | 34                                         | 0.025                                | 4.5                         | 7.96                         |
| LH LC10□6R8M | RoHS | 6.8                              | ±20%                    | 50          | 30                                         | 0.028                                | 4.1                         | 7.96                         |
| LH LC10□8R2M | RoHS | 8.2                              | ±20%                    | 50          | 24                                         | 0.031                                | 3.9                         | 7.96                         |
| LH LC10□100K | RoHS | 10                               | ±10%                    | 90          | 19                                         | 0.034                                | 3.6                         | 2.52                         |
| LH LC10□120K | RoHS | 12                               | ±10%                    | 90          | 16                                         | 0.038                                | 3.4                         | 2.52                         |
| LH LC10□150K | RoHS | 15                               | ±10%                    | 90          | 12                                         | 0.042                                | 3.2                         | 2.52                         |
| LH LC10□180K | RoHS | 18                               | ±10%                    | 90          | 9.2                                        | 0.046                                | 3.0                         | 2.52                         |
| LH LC10□220K | RoHS | 22                               | ±10%                    | 60          | 8.6                                        | 0.061                                | 2.8                         | 2.52                         |
| LH LC10□270K | RoHS | 27                               | ±10%                    | 60          | 7.1                                        | 0.069                                | 2.7                         | 2.52                         |
| LH LC10□330K | RoHS | 33                               | ±10%                    | 60          | 6.8                                        | 0.078                                | 2.6                         | 2.52                         |
| LH LC10□390K | RoHS | 39                               | ±10%                    | 60          | 6.7                                        | 0.085                                | 2.4                         | 2.52                         |
| LH LC10□470K | RoHS | 47                               | ±10%                    | 50          | 6.2                                        | 0.093                                | 2.3                         | 2.52                         |
| LH LC10□560K | RoHS | 56                               | ±10%                    | 50          | 5.2                                        | 0.10                                 | 2.1                         | 2.52                         |
| LH LC10□680K | RoHS | 68                               | ±10%                    | 40          | 4.6                                        | 0.12                                 | 2.0                         | 2.52                         |
| LH LC10□820K | RoHS | 82                               | ±10%                    | 40          | 4.7                                        | 0.13                                 | 1.8                         | 2.52                         |
| LH LC10□101K | RoHS | 100                              | ±10%                    | 40          | 3.8                                        | 0.18                                 | 1.5                         | 0.796                        |
| LH LC10□121K | RoHS | 120                              | ±10%                    | 40          | 3.2                                        | 0.25                                 | 1.3                         | 0.796                        |
| LH LC10□151K | RoHS | 150                              | ±10%                    | 40          | 2.9                                        | 0.29                                 | 1.2                         | 0.796                        |
| LH LC10□181K | RoHS | 180                              | ±10%                    | 40          | 2.6                                        | 0.40                                 | 1.0                         | 0.796                        |
| LH LC10□221K | RoHS | 220                              | ±10%                    | 40          | 2.3                                        | 0.44                                 | 0.97                        | 0.796                        |
| LH LC10□271K | RoHS | 270                              | ±10%                    | 30          | 2.1                                        | 0.50                                 | 0.90                        | 0.796                        |
| LH LC10□331K | RoHS | 330                              | ±10%                    | 30          | 2.0                                        | 0.56                                 | 0.86                        | 0.796                        |
| LH LC10□391K | RoHS | 390                              | ±10%                    | 30          | 1.8                                        | 0.62                                 | 0.75                        | 0.796                        |
| LH LC10□471K | RoHS | 470                              | ±10%                    | 30          | 1.7                                        | 0.84                                 | 0.65                        | 0.796                        |
| LH LC10□561K | RoHS | 560                              | ±10%                    | 30          | 1.5                                        | 0.93                                 | 0.61                        | 0.796                        |
| LH LC10□681K | RoHS | 680                              | ±10%                    | 30          | 1.4                                        | 1.0                                  | 0.57                        | 0.796                        |
| LH LC10□821K | RoHS | 820                              | ±10%                    | 30          | 1.3                                        | 1.4                                  | 0.50                        | 0.796                        |
| LH LC10□102J | RoHS | 1000                             | ±5%                     | 50          | 1.2                                        | 1.8                                  | 0.48                        | 0.252                        |
| LH LC10□122J | RoHS | 1200                             | ±5%                     | 50          | 0.87                                       | 2.3                                  | 0.40                        | 0.252                        |
| LH LC10□152J | RoHS | 1500                             | ±5%                     | 50          | 0.83                                       | 2.7                                  | 0.37                        | 0.252                        |
| LH LC10□182J | RoHS | 1800                             | ±5%                     | 50          | 0.75                                       | 3.0                                  | 0.36                        | 0.252                        |
| LH LC10□222J | RoHS | 2200                             | ±5%                     | 50          | 0.70                                       | 3.9                                  | 0.32                        | 0.252                        |
| LH LC10□272J | RoHS | 2700                             | ±5%                     | 50          | 0.67                                       | 4.3                                  | 0.30                        | 0.252                        |
| LH LC10□332J | RoHS | 3300                             | ±5%                     | 50          | 0.56                                       | 5.8                                  | 0.26                        | 0.252                        |
| LH LC10□392J | RoHS | 3900                             | ±5%                     | 50          | 0.54                                       | 6.4                                  | 0.25                        | 0.252                        |
| LH LC10□472J | RoHS | 4700                             | ±5%                     | 50          | 0.49                                       | 7.1                                  | 0.24                        | 0.252                        |
| LH LC10□562J | RoHS | 5600                             | ±5%                     | 50          | 0.41                                       | 9.0                                  | 0.21                        | 0.252                        |
| LH LC10□682J | RoHS | 6800                             | ±5%                     | 50          | 0.38                                       | 10                                   | 0.20                        | 0.252                        |
| LH LC10□822J | RoHS | 8200                             | ±5%                     | 50          | 0.36                                       | 12                                   | 0.18                        | 0.252                        |
| LH LC10□103J | RoHS | 10000                            | ±5%                     | 60          | 0.29                                       | 19                                   | 0.14                        | L: 1kHz, Q: 0.0796MHz        |
| LH LC10□123J | RoHS | 12000                            | ±5%                     | 60          | 0.27                                       | 21                                   | 0.13                        | L: 1kHz, Q: 0.0796MHz        |
| LH LC10□153J | RoHS | 15000                            | ±5%                     | 60          | 0.24                                       | 34                                   | 0.11                        | L: 1kHz, Q: 0.0796MHz        |
| LH LC10□183J | RoHS | 18000                            | ±5%                     | 60          | 0.21                                       | 38                                   | 0.10                        | L: 1kHz, Q: 0.0796MHz        |
| LH LC10□223J | RoHS | 22000                            | ±5%                     | 60          | 0.20                                       | 43                                   | 0.095                       | L: 1kHz, Q: 0.0796MHz        |
| LH LC10□273J | RoHS | 27000                            | ±5%                     | 40          | 0.15                                       | 67                                   | 0.076                       | L: 1kHz, Q: 0.0796MHz        |
| LH LC10□333J | RoHS | 33000                            | ±5%                     | 40          | 0.14                                       | 76                                   | 0.068                       | L: 1kHz, Q: 0.0796MHz        |
| LH LC10□393J | RoHS | 39000                            | ±5%                     | 40          | 0.13                                       | 84                                   | 0.065                       | L: 1kHz, Q: 0.0796MHz        |
| LH LC10□473J | RoHS | 47000                            | ±5%                     | 40          | 0.12                                       | 96                                   | 0.061                       | L: 1kHz, Q: 0.0796MHz        |
| LH LC10□563J | RoHS | 56000                            | ±5%                     | 30          | 0.10                                       | 170                                  | 0.045                       | L: 1kHz, Q: 0.0796MHz        |
| LH LC10□683J | RoHS | 68000                            | ±5%                     | 30          | 0.095                                      | 200                                  | 0.043                       | L: 1kHz, Q: 0.0796MHz        |
| LH LC10□823J | RoHS | 82000                            | ±5%                     | 30          | 0.088                                      | 210                                  | 0.041                       | L: 1kHz, Q: 0.0796MHz        |
| LH LC10□104J | RoHS | 100000                           | ±5%                     | 30          | 0.085                                      | 240                                  | 0.038                       | L: 1kHz, Q: 0.0252MHz        |
| LH LC10□124J | RoHS | 120000                           | ±5%                     | 30          | 0.070                                      | 260                                  | 0.037                       | L: 1kHz, Q: 0.0252MHz        |
| LH LC10□154J | RoHS | 150000                           | ±5%                     | 30          | 0.069                                      | 300                                  | 0.035                       | L: 1kHz, Q: 0.0252MHz        |

□ Please specify the packaging code. (TB: Taping, NB: Bulk)

# RADIAL LEADED INDUCTORS

## PACKAGING

### ① Minimum Quantity

| Type (EIA) | Standard quantity [pcs] |       |
|------------|-------------------------|-------|
|            | Bulk                    | Taped |
| LHL 08     | 100                     | 1000  |
| LHL 10     | 50                      | 500   |
| LHLC08     | 100                     | 1000  |
| LHLC10     | 50                      | 500   |

### ② Bulk dimensions

#### LHL08, LHL10



| Type  | Dimensions      |                 |                                        |                                        |                                         |
|-------|-----------------|-----------------|----------------------------------------|----------------------------------------|-----------------------------------------|
|       | $\phi D$ (max)  | $H_2$ (max)     | $F^*$                                  | $l$                                    | $\phi d$                                |
| LHL08 | 9.0<br>(0.354)  | 9.5<br>(0.374)  | $5.0 \pm 1.0$<br>( $0.197 \pm 0.039$ ) | $5.0 \pm 1.0$<br>( $0.197 \pm 0.039$ ) | $0.6 \pm 0.05$<br>( $0.024 \pm 0.002$ ) |
| LHL10 | 11.0<br>(0.433) | 14.0<br>(0.551) | $5.0 \pm 1.0$<br>( $0.197 \pm 0.039$ ) | $5.0 \pm 1.0$<br>( $0.197 \pm 0.039$ ) | $0.6 \pm 0.05$<br>( $0.024 \pm 0.002$ ) |

Unit: mm (inch)

\*Measured at the base of the leads.



|          | LHL08                                                 | LHL10                                                 |
|----------|-------------------------------------------------------|-------------------------------------------------------|
| D        | $\phi 9.0$ max<br>( $\phi 0.354$ max)                 | $\phi 11.0$ max<br>( $\phi 0.433$ max)                |
| $H_1$    | 30.5 max<br>(1.20 max)                                | 34.0 max<br>(1.34 max)                                |
| H        | $18.0 + 2.0 / - 0.0$<br>( $0.709 + 0.079 / - 0.000$ ) | $18.0 + 2.0 / - 0.0$<br>( $0.709 + 0.079 / - 0.000$ ) |
| $H_2$    | 9.5 max<br>(0.374 max)                                | 14.0 max<br>(0.551 max)                               |
| P        | $12.7 \pm 1.0$<br>( $0.500 \pm 0.039$ )               | $12.7 \pm 1.0$<br>( $0.500 \pm 0.039$ )               |
| $P_0$    | $12.7 \pm 0.3^{*1}$<br>( $0.500 \pm 0.012$ )          | $12.7 \pm 0.3^{*1}$<br>( $0.500 \pm 0.012$ )          |
| $P_1$    | $3.85 \pm 0.7$<br>( $0.152 \pm 0.028$ )               | $3.85 \pm 0.7$<br>( $0.152 \pm 0.028$ )               |
| $P_2$    | $6.35 \pm 1.3$<br>( $0.250 \pm 0.051$ )               | $6.35 \pm 1.3$<br>( $0.250 \pm 0.051$ )               |
| F        | $5.0 + 0.8 / - 0.2$<br>( $0.197 + 0.031 / 0.008$ )    | $5.0 + 0.8 / - 0.2$<br>( $0.197 + 0.031 / - 0.008$ )  |
| h        | $0.0 \pm 2.0$<br>( $0.0 \pm 0.079$ )                  | $0.0 \pm 2.0$<br>( $0.0 \pm 0.079$ )                  |
| W        | $18.0 + 1.0 / - 0.5$<br>( $0.709 + 0.039 / - 0.020$ ) | $18.0 + 1.0 / - 0.5$<br>( $0.709 + 0.039 / - 0.020$ ) |
| $W_0$    | 12.5 min<br>(0.492 min)                               | 12.5 min<br>(0.492 min)                               |
| $W_1$    | $9.0 \pm 0.5$<br>( $0.354 \pm 0.020$ )                | $9.0 \pm 0.5$<br>( $0.354 \pm 0.020$ )                |
| $W_2$    | 3.0 max <sup>*2</sup><br>(0.118 max)                  | 3.0 max <sup>*2</sup><br>(0.118 max)                  |
| $D_0$    | $\phi 4.0 \pm 0.2$<br>( $\phi 0.158 \pm 0.008$ )      | $\phi 4.0 \pm 0.2$<br>( $\phi 0.158 \pm 0.008$ )      |
| $\phi d$ | $\phi 0.6 \pm 0.05$<br>( $\phi 0.024 \pm 0.002$ )     | $\phi 0.6 \pm 0.05$<br>( $\phi 0.024 \pm 0.002$ )     |
| t        | $0.6 \pm 0.3$<br>( $0.024 \pm 0.012$ )                | $0.6 \pm 0.3$<br>( $0.024 \pm 0.012$ )                |

Unit: mm (inch)

※1 Accumulated error for 20 pitches is 1mm.

※2 Bonding tape must not protrude from the base tape.

▶ This catalog contains the typical specification only due to the limitation of space. When you consider the purchase of our products, please check our specification. For details of each product (characteristics graph, reliability information, precautions for use, and so on), see our Web site (<http://www.ty-top.com/>).

● LHLC08, LHLC10



| Type   | Dimensions      |                 |                                        |                                        |                                         |
|--------|-----------------|-----------------|----------------------------------------|----------------------------------------|-----------------------------------------|
|        | $\phi D$ (max)  | $H_2$ (max)     | $F^*$                                  | $l$                                    | $\phi d$                                |
| LHLC08 | 9.0<br>(0.354)  | 9.5<br>(0.374)  | $5.0 \pm 1.0$<br>( $0.197 \pm 0.039$ ) | $5.0 \pm 1.0$<br>( $0.197 \pm 0.039$ ) | $0.6 \pm 0.05$<br>( $0.024 \pm 0.002$ ) |
| LHLC10 | 11.0<br>(0.433) | 14.0<br>(0.551) | $5.0 \pm 1.0$<br>( $0.197 \pm 0.039$ ) | $5.0 \pm 1.0$<br>( $0.197 \pm 0.039$ ) | $0.6 \pm 0.05$<br>( $0.024 \pm 0.002$ ) |

Unit: mm (inch)

\*Measured at the base of the leads.



|          | LHLC08                                                | LHLC10                                                |
|----------|-------------------------------------------------------|-------------------------------------------------------|
| D        | $\phi 9.0 \text{max}$<br>( $\phi 0.354 \text{max}$ )  | $\phi 11.0 \text{max}$<br>( $\phi 0.433 \text{max}$ ) |
| $H_1$    | 30.5max<br>(1.20max)                                  | 34.0max<br>(1.34max)                                  |
| H        | $18.0 + 2.0 / - 0.0$<br>( $0.709 + 0.079 / - 0.000$ ) | $18.0 + 2.0 / - 0.0$<br>( $0.709 + 0.079 / - 0.000$ ) |
| $H_2$    | 9.5max<br>(0.374max)                                  | 14.0max<br>(0.551max)                                 |
| P        | $12.7 \pm 1.0$<br>( $0.500 \pm 0.039$ )               | $12.7 \pm 1.0$<br>( $0.500 \pm 0.039$ )               |
| $P_0$    | $12.7 \pm 0.3^{*1}$<br>( $0.500 \pm 0.012$ )          | $12.7 \pm 0.3^{*1}$<br>( $0.500 \pm 0.012$ )          |
| $P_1$    | $3.85 \pm 0.7$<br>( $0.152 \pm 0.028$ )               | $3.85 \pm 0.7$<br>( $0.152 \pm 0.028$ )               |
| $P_2$    | $6.35 \pm 1.3$<br>( $0.250 \pm 0.051$ )               | $6.35 \pm 1.3$<br>( $0.250 \pm 0.051$ )               |
| F        | $5.0 + 0.8 / - 0.2$<br>( $0.197 + 0.031 / - 0.008$ )  | $5.0 + 0.8 / - 0.2$<br>( $0.197 + 0.031 / - 0.008$ )  |
| H        | $0.0 \pm 2.0$<br>( $0.0 \pm 0.079$ )                  | $0.0 \pm 2.0$<br>( $0.0 \pm 0.079$ )                  |
| W        | $18.0 + 1.0 / - 0.5$<br>( $0.709 + 0.039 / - 0.020$ ) | $18.0 + 1.0 / - 0.5$<br>( $0.709 + 0.039 / - 0.020$ ) |
| $W_0$    | 12.5min<br>(0.492min)                                 | 12.5min<br>(0.492min)                                 |
| $W_1$    | $9.0 \pm 0.5$<br>( $0.354 \pm 0.020$ )                | $9.0 \pm 0.5$<br>( $0.354 \pm 0.020$ )                |
| $W_2$    | $3.0 \text{max}^{*2}$<br>(0.118max)                   | $3.0 \text{max}^{*2}$<br>(0.118max)                   |
| $D_0$    | $\phi 4.0 \pm 0.2$<br>( $\phi 0.158 \pm 0.008$ )      | $\phi 4.0 \pm 0.2$<br>( $\phi 0.158 \pm 0.008$ )      |
| $\phi d$ | $\phi 0.6 \pm 0.05$<br>( $\phi 0.024 \pm 0.002$ )     | $\phi 0.6 \pm 0.05$<br>( $\phi 0.024 \pm 0.002$ )     |
| t        | $0.6 \pm 0.3$<br>( $0.024 \pm 0.012$ )                | $0.6 \pm 0.3$<br>( $0.024 \pm 0.012$ )                |

Unit: mm (inch)

※1 Accumulated error for 20 pitches is 1mm.

※2 Bonding tape must not protrude from the base tape.



# AXIAL LEADED INDUCTORS (CAL Type)、 RADIAL LEADED INDUCTORS (LH Type)、 LEADED FERRITE BEAD INDUCTORS (FB Series A Type/R Type)

## ■ RELIABILITY DATA

### 1. Operating temperature Range

|                          |            |                               |
|--------------------------|------------|-------------------------------|
| Specified Value          | CAL45 Type | -25 ~ + 105°C                 |
|                          | LHL□□□     |                               |
|                          | FBA/FBR    |                               |
| Test Methods and Remarks | CAL45 Type | Including self-generated heat |
|                          | LHL□□□     |                               |
|                          | FBA/FBR    |                               |

### 2. Storage temperature Range

|                 |            |                                            |
|-----------------|------------|--------------------------------------------|
| Specified Value | CAL45 Type | -40 ~ + 85°C (Except for taping condition) |
|                 | LHL□□□     |                                            |
|                 | FBA/FBR    |                                            |

### 3. Rated current

|                          |              |                                                                                                                                                                                                                                                                      |
|--------------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Specified Value          | CAL45 Type   | Within the specified tolerance                                                                                                                                                                                                                                       |
|                          | LHL□□□       |                                                                                                                                                                                                                                                                      |
|                          | FBA/FBR      |                                                                                                                                                                                                                                                                      |
| Test Methods and Remarks | CAL45 Type : | The maximum DC value having inductance within 10% and temperature increase within 40°C by the application of DC bias.                                                                                                                                                |
|                          | LHL□□□ :     | The maximum DC value having inductance decrease within 10% (LHLC08, LHLC10: within 30%) and temperature increase within the following specified temperature by the application of DC bias.<br>Reference temperature : 25°C (LHL08, LHL10)<br>: 40°C (LHLC08, LHLC10) |
|                          | FBA/FBR :    | No disconnection or appearance abnormality by continuous current application for 30 min. Change after the application shall be within ±20% of the initial value.<br>This is not guaranteed for electrical characteristics during current application.                |

### 4. Impedance

|                          |                     |                                                  |
|--------------------------|---------------------|--------------------------------------------------|
| Specified Value          | CAL45 Type          | Within the specified tolerance                   |
|                          | LHL□□□              |                                                  |
|                          | FBA/FBR             |                                                  |
| Test Methods and Remarks | FBA/FBR :           |                                                  |
|                          | Measuring equipment | : Impedance analyzer (HP4191A) or its equivalent |
|                          | Measuring frequency | : Specified frequency                            |

### 5. Inductance

|                          |                     |                                                    |
|--------------------------|---------------------|----------------------------------------------------|
| Specified Value          | CAL45 Type          | Within the specified tolerance                     |
|                          | LHL□□□              |                                                    |
|                          | FBA/FBR             |                                                    |
| Test Methods and Remarks | CAL45 Type :        |                                                    |
|                          | Measuring equipment | : LCR meter (HP4285A + HP42851A or its equivalent) |
|                          | Measuring frequency | : Specified frequency                              |
| Test Methods and Remarks | LHL□□□ :            |                                                    |
|                          | Measuring equipment | : LCR meter (HP4285A + HP42851A or its equivalent) |
|                          | Measuring frequency | : LCR meter (HP4263A) or its equivalent (at 1kHz)  |
| Test Methods and Remarks | FBA/FBR :           |                                                    |
|                          | Measuring equipment | : LCR meter (HP4285A + HP42851A or its equivalent) |
|                          | Measuring frequency | : Specified frequency                              |

▶ This catalog contains the typical specification only due to the limitation of space. When you consider the purchase of our products, please check our specification. For details of each product (characteristics graph, reliability information, precautions for use, and so on), see our Web site (<http://www.ty-top.com/>).

| 6. Q                     |                                                                                                                                                                                    |                                |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| Specified Value          | CAL45 Type                                                                                                                                                                         |                                |
|                          | LHL□□□                                                                                                                                                                             | Within the specified tolerance |
|                          | FBA/FBR                                                                                                                                                                            |                                |
| Test Methods and Remarks | LHL□□□<br>Measuring equipment : LCR meter (HP4285A + HP42851A or its equivalent)<br>: LCR meter (HP4263A) or its equivalent (at 1kHz)<br>Measuring frequency : Specified frequency |                                |

| 7. DC Resistance         |                                   |                                |
|--------------------------|-----------------------------------|--------------------------------|
| Specified Value          | CAL45 Type                        |                                |
|                          | LHL□□□                            | Within the specified tolerance |
|                          | FBA/FBR                           |                                |
| Test Methods and Remarks | Measuring equipment : DC ohmmeter |                                |

| 8. Self resonance frequency |                                                                 |                                |
|-----------------------------|-----------------------------------------------------------------|--------------------------------|
| Specified Value             | CAL45 Type                                                      |                                |
|                             | LHL□□□                                                          | Within the specified tolerance |
|                             | FBA/FBR                                                         |                                |
| Test Methods and Remarks    | LHL□□□<br>Measuring equipment : (HP4191A, 4192A) its equivalent |                                |

| 9. Temperature characteristic |                                                                                                                                                                                                                                                                                                                                                                                                                |                                 |                  |        |   |    |   |                               |   |                           |   |                               |   |    |  |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|------------------|--------|---|----|---|-------------------------------|---|---------------------------|---|-------------------------------|---|----|--|
| Specified Value               | CAL45 Type                                                                                                                                                                                                                                                                                                                                                                                                     |                                 |                  |        |   |    |   |                               |   |                           |   |                               |   |    |  |
|                               | LHL□□□                                                                                                                                                                                                                                                                                                                                                                                                         | $\Delta L/L$ : Within $\pm 7\%$ |                  |        |   |    |   |                               |   |                           |   |                               |   |    |  |
|                               | FBA/FBR                                                                                                                                                                                                                                                                                                                                                                                                        |                                 |                  |        |   |    |   |                               |   |                           |   |                               |   |    |  |
| Test Methods and Remarks      | Change of maximum inductance deviation in step 1 to 5                                                                                                                                                                                                                                                                                                                                                          |                                 |                  |        |   |    |   |                               |   |                           |   |                               |   |    |  |
|                               | <table border="1"> <thead> <tr> <th rowspan="2">Step</th> <th>Temperature (°C)</th> </tr> <tr> <th>LHL□□□</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>20</td> </tr> <tr> <td>2</td> <td>Minimum operating temperature</td> </tr> <tr> <td>3</td> <td>20 (Standard temperature)</td> </tr> <tr> <td>4</td> <td>Maximum operating temperature</td> </tr> <tr> <td>5</td> <td>20</td> </tr> </tbody> </table> | Step                            | Temperature (°C) | LHL□□□ | 1 | 20 | 2 | Minimum operating temperature | 3 | 20 (Standard temperature) | 4 | Maximum operating temperature | 5 | 20 |  |
| Step                          | Temperature (°C)                                                                                                                                                                                                                                                                                                                                                                                               |                                 |                  |        |   |    |   |                               |   |                           |   |                               |   |    |  |
|                               | LHL□□□                                                                                                                                                                                                                                                                                                                                                                                                         |                                 |                  |        |   |    |   |                               |   |                           |   |                               |   |    |  |
| 1                             | 20                                                                                                                                                                                                                                                                                                                                                                                                             |                                 |                  |        |   |    |   |                               |   |                           |   |                               |   |    |  |
| 2                             | Minimum operating temperature                                                                                                                                                                                                                                                                                                                                                                                  |                                 |                  |        |   |    |   |                               |   |                           |   |                               |   |    |  |
| 3                             | 20 (Standard temperature)                                                                                                                                                                                                                                                                                                                                                                                      |                                 |                  |        |   |    |   |                               |   |                           |   |                               |   |    |  |
| 4                             | Maximum operating temperature                                                                                                                                                                                                                                                                                                                                                                                  |                                 |                  |        |   |    |   |                               |   |                           |   |                               |   |    |  |
| 5                             | 20                                                                                                                                                                                                                                                                                                                                                                                                             |                                 |                  |        |   |    |   |                               |   |                           |   |                               |   |    |  |

| 10. Tensile strength test                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                |              |    |    |                                             |           |              |                         |   |            |                         |    |                         |    |  |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------------|----|----|---------------------------------------------|-----------|--------------|-------------------------|---|------------|-------------------------|----|-------------------------|----|--|
| Specified Value                             | CAL45 Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                |              |    |    |                                             |           |              |                         |   |            |                         |    |                         |    |  |
|                                             | LHL□□□                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | No abnormality such as cut lead, or looseness. |              |    |    |                                             |           |              |                         |   |            |                         |    |                         |    |  |
|                                             | FBA/FBR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                |              |    |    |                                             |           |              |                         |   |            |                         |    |                         |    |  |
| Test Methods and Remarks                    | <p>CAL45 Type : Apply the stated tensile force progressively in the direction to draw terminal.</p> <table border="1"> <thead> <tr> <th>force (N)</th> <th>duration (s)</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>10</td> </tr> </tbody> </table> <p>LHL□□□ : Apply the stated tensile force progressively in the direction to draw terminal.</p> <table border="1"> <thead> <tr> <th>Nominal wire diameter tensile <math>\phi d</math> (mm)</th> <th>force (N)</th> <th>duration (s)</th> </tr> </thead> <tbody> <tr> <td><math>0.3 &lt; \phi d \leq 0.5</math></td> <td>5</td> <td rowspan="3">30 <math>\pm</math> 5</td> </tr> <tr> <td><math>0.5 &lt; \phi d \leq 0.8</math></td> <td>10</td> </tr> <tr> <td><math>0.8 &lt; \phi d \leq 1.2</math></td> <td>25</td> </tr> </tbody> </table> <p>FBA/FBR : The body of a component shall be fixed and a tensile force of 20 <math>\pm</math> 1N shall be applied to the lead wire in the axial direction of the component during 10 <math>\pm</math> 1 seconds.</p> | force (N)                                      | duration (s) | 10 | 10 | Nominal wire diameter tensile $\phi d$ (mm) | force (N) | duration (s) | $0.3 < \phi d \leq 0.5$ | 5 | 30 $\pm$ 5 | $0.5 < \phi d \leq 0.8$ | 10 | $0.8 < \phi d \leq 1.2$ | 25 |  |
| force (N)                                   | duration (s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                |              |    |    |                                             |           |              |                         |   |            |                         |    |                         |    |  |
| 10                                          | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                |              |    |    |                                             |           |              |                         |   |            |                         |    |                         |    |  |
| Nominal wire diameter tensile $\phi d$ (mm) | force (N)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | duration (s)                                   |              |    |    |                                             |           |              |                         |   |            |                         |    |                         |    |  |
| $0.3 < \phi d \leq 0.5$                     | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 30 $\pm$ 5                                     |              |    |    |                                             |           |              |                         |   |            |                         |    |                         |    |  |
| $0.5 < \phi d \leq 0.8$                     | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                |              |    |    |                                             |           |              |                         |   |            |                         |    |                         |    |  |
| $0.8 < \phi d \leq 1.2$                     | 25                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                |              |    |    |                                             |           |              |                         |   |            |                         |    |                         |    |  |

| 11. Over current         |                                                                                                                     |                                                                                          |
|--------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| Specified Value          | CAL45 Type                                                                                                          | No emission of smoke no firing.                                                          |
|                          | LHL□□□                                                                                                              | There shall be no scorch or short of wire.<br>LHLC08, LHLC10 : There shall be no firing. |
|                          | FBA/FBR                                                                                                             |                                                                                          |
| Test Methods and Remarks | LHL□□□・CAL45 Type :<br>Measuring current : Rated current × 2<br>Duration : 5 min.<br>Number of measuring : one time |                                                                                          |

| 12. Terminal strength : bending                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                               |                                                |                               |               |                       |                         |     |      |                         |   |      |                         |    |     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-------------------------------|---------------|-----------------------|-------------------------|-----|------|-------------------------|---|------|-------------------------|----|-----|
| Specified Value                                                                                                                                                                                                                                                                                                                                                                                                                 | CAL45 Type                                                                                                                                                                                                                                                                                                                                    | No abnormality such as cut lead, or looseness. |                               |               |                       |                         |     |      |                         |   |      |                         |    |     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | LHL□□□                                                                                                                                                                                                                                                                                                                                        |                                                |                               |               |                       |                         |     |      |                         |   |      |                         |    |     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | FBA/FBR                                                                                                                                                                                                                                                                                                                                       |                                                |                               |               |                       |                         |     |      |                         |   |      |                         |    |     |
| Test Methods and Remarks                                                                                                                                                                                                                                                                                                                                                                                                        | CAL45 Type :<br>Suspend a weight of specified mass at the end of the terminals and incline the body through the angle of 90 degrees and return it to the initial position. This operation is done over a period of 2-3 sec. Then second bend in the opposite direction shall be made.<br>Number of bends : Two times.                         |                                                |                               |               |                       |                         |     |      |                         |   |      |                         |    |     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | <table border="1"> <thead> <tr> <th>Nominal wire diameter tensile</th> <th>Bending force</th> <th>Mass reference weight</th> </tr> </thead> <tbody> <tr> <td><math>0.3 &lt; \phi d \leq 0.5</math></td> <td>2.5</td> <td>0.25</td> </tr> <tr> <td><math>0.5 &lt; \phi d \leq 0.8</math></td> <td>5</td> <td>0.50</td> </tr> </tbody> </table> |                                                | Nominal wire diameter tensile | Bending force | Mass reference weight | $0.3 < \phi d \leq 0.5$ | 2.5 | 0.25 | $0.5 < \phi d \leq 0.8$ | 5 | 0.50 |                         |    |     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                 | Nominal wire diameter tensile                                                                                                                                                                                                                                                                                                                 | Bending force                                  | Mass reference weight         |               |                       |                         |     |      |                         |   |      |                         |    |     |
| $0.3 < \phi d \leq 0.5$                                                                                                                                                                                                                                                                                                                                                                                                         | 2.5                                                                                                                                                                                                                                                                                                                                           | 0.25                                           |                               |               |                       |                         |     |      |                         |   |      |                         |    |     |
| $0.5 < \phi d \leq 0.8$                                                                                                                                                                                                                                                                                                                                                                                                         | 5                                                                                                                                                                                                                                                                                                                                             | 0.50                                           |                               |               |                       |                         |     |      |                         |   |      |                         |    |     |
| LHL□□□・FBA/FBR :<br>Suspend a weight of specified mass at the end of the terminals and incline the body through the angle of 90 degrees and return it to the initial position. This operation is done over a period of 2-3 sec. Then second bend in the opposite direction shall be made.<br>Number of bends : Two times.                                                                                                       |                                                                                                                                                                                                                                                                                                                                               |                                                |                               |               |                       |                         |     |      |                         |   |      |                         |    |     |
| <table border="1"> <thead> <tr> <th>Nominal wire diameter tensile</th> <th>Bending force</th> <th>Mass reference weight</th> </tr> </thead> <tbody> <tr> <td><math>0.3 &lt; \phi d \leq 0.5</math></td> <td>2.5</td> <td>0.25</td> </tr> <tr> <td><math>0.5 &lt; \phi d \leq 0.8</math></td> <td>5</td> <td>0.5</td> </tr> <tr> <td><math>0.8 &lt; \phi d \leq 1.2</math></td> <td>10</td> <td>1.0</td> </tr> </tbody> </table> |                                                                                                                                                                                                                                                                                                                                               |                                                | Nominal wire diameter tensile | Bending force | Mass reference weight | $0.3 < \phi d \leq 0.5$ | 2.5 | 0.25 | $0.5 < \phi d \leq 0.8$ | 5 | 0.5  | $0.8 < \phi d \leq 1.2$ | 10 | 1.0 |
| Nominal wire diameter tensile                                                                                                                                                                                                                                                                                                                                                                                                   | Bending force                                                                                                                                                                                                                                                                                                                                 | Mass reference weight                          |                               |               |                       |                         |     |      |                         |   |      |                         |    |     |
| $0.3 < \phi d \leq 0.5$                                                                                                                                                                                                                                                                                                                                                                                                         | 2.5                                                                                                                                                                                                                                                                                                                                           | 0.25                                           |                               |               |                       |                         |     |      |                         |   |      |                         |    |     |
| $0.5 < \phi d \leq 0.8$                                                                                                                                                                                                                                                                                                                                                                                                         | 5                                                                                                                                                                                                                                                                                                                                             | 0.5                                            |                               |               |                       |                         |     |      |                         |   |      |                         |    |     |
| $0.8 < \phi d \leq 1.2$                                                                                                                                                                                                                                                                                                                                                                                                         | 10                                                                                                                                                                                                                                                                                                                                            | 1.0                                            |                               |               |                       |                         |     |      |                         |   |      |                         |    |     |

| 13. Insulation resistance : between the terminals and body |                                                             |             |
|------------------------------------------------------------|-------------------------------------------------------------|-------------|
| Specified Value                                            | CAL45 Type                                                  | 100M Ω min. |
|                                                            | LHL□□□                                                      |             |
|                                                            | FBA/FBR                                                     |             |
| Test Methods and Remarks                                   | LHL□□□ :<br>Applied voltage : 500 VDC<br>Duration : 60 sec. |             |

| 14. Insulation resistance : between terminals and core |                                                                |           |
|--------------------------------------------------------|----------------------------------------------------------------|-----------|
| Specified Value                                        | CAL45 Type                                                     | 1M Ω min. |
|                                                        | LHL□□□                                                         |           |
|                                                        | FBA/FBR                                                        |           |
| Test Methods and Remarks                               | FBA/FBR :<br>Applied voltage : 100 VDC<br>Duration : 60±5 sec. |           |

| 15. Withstanding : between the terminals and body |                                                                                                                 |                                          |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|------------------------------------------|
| Specified Value                                   | CAL45 Type                                                                                                      | No abnormality such as insulation damage |
|                                                   | LHL□□□                                                                                                          |                                          |
|                                                   | FBA/FBR                                                                                                         |                                          |
| Test Methods and Remarks                          | LHL□□□ :<br>According to JIS C5101-1.<br>Metal global method<br>Applied voltage : 500 VDC<br>Duration : 60 sec. |                                          |

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| 16. DC bias characteristic |                                                                                                                         |                               |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| Specified Value            | CAL45 Type                                                                                                              | $\Delta L/L$ : Within $-10\%$ |
|                            | LHL□□□                                                                                                                  |                               |
|                            | FBA/FBR                                                                                                                 |                               |
| Test Methods and Remarks   | CAL45 Type : Measure inductance with application of rated current using LCR meter to compare it with the initial value. |                               |

| 17. Body strength        |                                                                                                                                                                                                                                                                                                                    |                                        |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| Specified Value          | CAL45 Type                                                                                                                                                                                                                                                                                                         | No abnormality as damage.              |
|                          | LHL□□□                                                                                                                                                                                                                                                                                                             |                                        |
|                          | FBA/FBR                                                                                                                                                                                                                                                                                                            | No abnormality such as cracks on body. |
| Test Methods and Remarks | <p>CAL45 Type :</p> <p>Applied force : 50N<br/>Duration : 10 sec.<br/>Speed : Shall attain to specified force in 2 sec.</p> <p>FBA :</p> <p>Applied force : <math>50 \pm 3</math>N<br/>Duration : <math>30 \pm 1</math> sec.</p>  |                                        |

| 18. Resistance to vibration |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| Specified Value             | CAL45 Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | $\Delta L/L$ : Within $\pm 5\%$                                                                |
|                             | LHL□□□                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Appearance : No abnormality<br>$\Delta L/L$ : Within $\pm 5\%$<br>Q change : Within $\pm 30\%$ |
|                             | FBA/FBR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Appearance : No abnormality<br>Impedance change : Within $\pm 20\%$                            |
| Test Methods and Remarks    | <p>CAL45 Type :</p> <p>Directions : 2 hrs each in X, Y and Z directions total : 6hrs.<br/>Frequency range : 10 to 55 to 10Hz (1min.)<br/>Amplitude : 1.5mm<br/>Mounting method : Soldering onto printed board.<br/>Recovery : At least 1hr of recovery under the standard condition after the test, followed by the measurement within 2hrs.</p> <p>LHL□□□ • FBA/FBR :</p> <p>Directions : 2 hrs each in X, Y and Z directions total : 6hrs.<br/>Frequency range : 10 to 55 to 10Hz (1min.)<br/>Amplitude : 1.5mm<br/>Mounting method : Soldering onto printed board.</p> |                                                                                                |

| 19. Resistance to shock  |                                                                                                                                           |                                          |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| Specified Value          | CAL45 Type                                                                                                                                | No significant abnormality in appearance |
|                          | LHL□□□                                                                                                                                    |                                          |
|                          | FBA/FBR                                                                                                                                   |                                          |
| Test Methods and Remarks | <p>CAL45 Type :</p> <p>Drop test</p> <p>Impact material : concrete or vinyl tile<br/>Height : 1m<br/>Total number of drops : 10 times</p> |                                          |

| 20. Solderability        |                                                                                                                                                                                                                                                                                                                           |                                                              |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| Specified Value          | CAL45 Type                                                                                                                                                                                                                                                                                                                | At least 75% of terminal electrode is covered by new solder. |
|                          | LHL□□□                                                                                                                                                                                                                                                                                                                    | At least 75% of terminal electrode is covered by new solder. |
|                          | FBA/FBR                                                                                                                                                                                                                                                                                                                   | At least 90% of terminal electrode is covered by new solder. |
| Test Methods and Remarks | CAL45 Type :<br>Solder temperature : 230±5°C<br>Duration : 2±0.5 sec.<br>LHL□□□ :<br>Solder temperature : 235±5°C<br>Duration : 2±0.5 sec.<br>Immersion depth : Up to 1.5mm from bottom of case.<br>FBA/FBR :<br>Solder temperature : 230±5°C<br>Duration : 3±1 sec.<br>Immersion depth : Up to 1.5mm from terminal root. |                                                              |

| 21. Resistance to soldering heat |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                      |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Specified Value                  | CAL45 Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ΔL/L : Within ±5%                                                                                    |
|                                  | LHL□□□                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | No significant abnormality in appearance<br>Inductance change : Within ±5%<br>Q change : Within ±30% |
|                                  | FBA/FBR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | No significant abnormality in appearance<br>Impedance change : Within ±20%                           |
| Test Methods and Remarks         | CAL45 Type :<br>Solder temperature : 270±5°C<br>Duration : 5±0.5 sec. One time<br>Immersed conditions : Inserted into substrate with t=1.6mm<br>Recovery : At least 1hr of recovery under the standard condition after the test, followed by the measurement within 2hrs.<br>LHL□□□ :<br>Solder bath method : Solder temperature : 260±5°C<br>Duration : 10±1 sec.<br>: Up to 1.5mm from the bottom of case.<br>Manual soldering : Solder temperature : 350±10°C (At the tip of soldering iron)<br>Duration : 5±1 sec.<br>: Up to 1.5mm from the bottom of case.<br>Caution : No excessive pressing shall be applied to terminals.<br>Recovery : 1 to 2hrs of recovery under the standard condition after the test.<br>FBA/FBR :<br>Solder bath method:<br>Condition 1 : Solder temperature : 260±5°C<br>Duration : 10±1 sec.<br>Immersion depth : Up to 1.5mm from the terminal root.<br>Condition 2 : Solder temperature : 350±5°C<br>Duration : 3±1 sec.<br>Immersion depth : Up to 1.5mm from the terminal root.<br>Recovery : 3hrs of recovery under the standard condition after the test. |                                                                                                      |

| 22. Resistance to solvent |                                                                                                                                                                          |                                                                            |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Specified Value           | CAL45 Type                                                                                                                                                               | Please avoid the ultrasonic cleaning of this product.                      |
|                           | LHL□□□                                                                                                                                                                   |                                                                            |
|                           | FBA/FBR                                                                                                                                                                  | No significant abnormality in appearance<br>Impedance change : Within ±20% |
| Test Methods and Remarks  | FBA/FBR :<br>Solvent temperature : 20~25°C<br>Duration : 30±5 sec.<br>Solvent type : Acetone<br>Recovery : 3hrs of recovery under the standard condition after the test. |                                                                            |

▶ This catalog contains the typical specification only due to the limitation of space. When you consider the purchase of our products, please check our specification. For details of each product (characteristics graph, reliability information, precautions for use, and so on), see our Web site (<http://www.ty-top.com/>).

| 23. Thermal shock                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                      |                  |                 |                               |            |           |                  |                  |          |                               |            |           |                  |                  |          |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|------------------|-----------------|-------------------------------|------------|-----------|------------------|------------------|----------|-------------------------------|------------|-----------|------------------|------------------|----------|--|
| Specified Value                                                                                                                                                                                                                                                                                                                                                                                                                                                     | CAL45 Type                                                                                                                                                                                                                                                                                                                                                                                                                                          | $\Delta L/L$ : Within $\pm 10\%$                                                                     |                  |                 |                               |            |           |                  |                  |          |                               |            |           |                  |                  |          |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | LHL□□□                                                                                                                                                                                                                                                                                                                                                                                                                                              | Appearance : No abnormality<br>Inductance change : Within $\pm 10\%$<br>Q change : Within $\pm 30\%$ |                  |                 |                               |            |           |                  |                  |          |                               |            |           |                  |                  |          |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | FBA/FBR                                                                                                                                                                                                                                                                                                                                                                                                                                             | Appearance : No abnormality<br>Impedance change : Within $\pm 20\%$                                  |                  |                 |                               |            |           |                  |                  |          |                               |            |           |                  |                  |          |  |
| Test Methods and Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                            | CAL45 Type: Conditions for 1 cycle                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                      |                  |                 |                               |            |           |                  |                  |          |                               |            |           |                  |                  |          |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> <th>Duration (min.)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td><math>-25+0/-3</math></td> <td><math>30\pm 3</math></td> </tr> <tr> <td>2</td> <td>Room temperature</td> <td>Within 3</td> </tr> <tr> <td>3</td> <td><math>+85+2/-0</math></td> <td><math>30\pm 3</math></td> </tr> <tr> <td>4</td> <td>Room temperature</td> <td>Within 3</td> </tr> </tbody> </table> | Step                                                                                                 | Temperature (°C) | Duration (min.) | 1                             | $-25+0/-3$ | $30\pm 3$ | 2                | Room temperature | Within 3 | 3                             | $+85+2/-0$ | $30\pm 3$ | 4                | Room temperature | Within 3 |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Step                                                                                                                                                                                                                                                                                                                                                                                                                                                | Temperature (°C)                                                                                     | Duration (min.)  |                 |                               |            |           |                  |                  |          |                               |            |           |                  |                  |          |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                   | $-25+0/-3$                                                                                           | $30\pm 3$        |                 |                               |            |           |                  |                  |          |                               |            |           |                  |                  |          |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Room temperature                                                                                     | Within 3         |                 |                               |            |           |                  |                  |          |                               |            |           |                  |                  |          |  |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | $+85+2/-0$                                                                                                                                                                                                                                                                                                                                                                                                                                          | $30\pm 3$                                                                                            |                  |                 |                               |            |           |                  |                  |          |                               |            |           |                  |                  |          |  |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Room temperature                                                                                                                                                                                                                                                                                                                                                                                                                                    | Within 3                                                                                             |                  |                 |                               |            |           |                  |                  |          |                               |            |           |                  |                  |          |  |
| Number of cycles : 5 cycles                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                      |                  |                 |                               |            |           |                  |                  |          |                               |            |           |                  |                  |          |  |
| Recovery : At least 1hr of recovery under the standard condition after the removal from test chamber, followed by the measurement within 2hrs.                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                      |                  |                 |                               |            |           |                  |                  |          |                               |            |           |                  |                  |          |  |
| LHL□□□•FBA/FBR: According to JIS C60068-2-14.<br>Conditions for 1 cycle                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                      |                  |                 |                               |            |           |                  |                  |          |                               |            |           |                  |                  |          |  |
| <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> <th>Duration (min.)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Minimum operating temperature</td> <td><math>30\pm 3</math></td> </tr> <tr> <td>2</td> <td>Room temperature</td> <td>Within 3</td> </tr> <tr> <td>3</td> <td>Maximum operating temperature</td> <td><math>30\pm 3</math></td> </tr> <tr> <td>4</td> <td>Room temperature</td> <td>Within 3</td> </tr> </tbody> </table> | Step                                                                                                                                                                                                                                                                                                                                                                                                                                                | Temperature (°C)                                                                                     | Duration (min.)  | 1               | Minimum operating temperature | $30\pm 3$  | 2         | Room temperature | Within 3         | 3        | Maximum operating temperature | $30\pm 3$  | 4         | Room temperature | Within 3         |          |  |
| Step                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Temperature (°C)                                                                                                                                                                                                                                                                                                                                                                                                                                    | Duration (min.)                                                                                      |                  |                 |                               |            |           |                  |                  |          |                               |            |           |                  |                  |          |  |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Minimum operating temperature                                                                                                                                                                                                                                                                                                                                                                                                                       | $30\pm 3$                                                                                            |                  |                 |                               |            |           |                  |                  |          |                               |            |           |                  |                  |          |  |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Room temperature                                                                                                                                                                                                                                                                                                                                                                                                                                    | Within 3                                                                                             |                  |                 |                               |            |           |                  |                  |          |                               |            |           |                  |                  |          |  |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Maximum operating temperature                                                                                                                                                                                                                                                                                                                                                                                                                       | $30\pm 3$                                                                                            |                  |                 |                               |            |           |                  |                  |          |                               |            |           |                  |                  |          |  |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Room temperature                                                                                                                                                                                                                                                                                                                                                                                                                                    | Within 3                                                                                             |                  |                 |                               |            |           |                  |                  |          |                               |            |           |                  |                  |          |  |
| Number of cycles : 10 cycles [LHL□□□]                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                      |                  |                 |                               |            |           |                  |                  |          |                               |            |           |                  |                  |          |  |
| Recovery : 5 cycles (FBA/ FBR)<br>: 1 to 2hrs of recovery under the standard condition after the removal from the test chamber. [LHL□□□]<br>: 3hrs of recovery under the standard condition after the removal from the test chamber. (FBA/ FBR)                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                      |                  |                 |                               |            |           |                  |                  |          |                               |            |           |                  |                  |          |  |

| 24. Damp heat            |                                                                                          |                                                                                                                   |
|--------------------------|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Specified Value          | CAL45 Type                                                                               | $\Delta L/L$ : Within $\pm 10\%$                                                                                  |
|                          | LHL□□□                                                                                   |                                                                                                                   |
|                          | FBA/FBR                                                                                  | Appearance : No abnormality<br>Impedance change : Within $\pm 20\%$                                               |
| Test Methods and Remarks | CAL45 Type :                                                                             |                                                                                                                   |
|                          | Temperature                                                                              | : $40\pm 2^{\circ}\text{C}$                                                                                       |
|                          | Humidity                                                                                 | : 90~95%RH                                                                                                        |
|                          | Duration                                                                                 | : 1000 hrs                                                                                                        |
|                          | Recovery                                                                                 | : At least 1hr of recovery under the standard removal from test chamber, followed by the measurement within 2hrs. |
| FBA/FBR :                |                                                                                          |                                                                                                                   |
| Temperature              | : $60\pm 2^{\circ}\text{C}$                                                              |                                                                                                                   |
| Humidity                 | : 90~95%RH                                                                               |                                                                                                                   |
| Duration                 | : 1000 hrs                                                                               |                                                                                                                   |
| Recovery                 | : 3hrs of recovery under the standard condition after the removal from the test chamber. |                                                                                                                   |

| 25. Loading under damp heat |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                      |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Specified Value             | CAL45 Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | $\Delta L/L$ : Within $\pm 10\%$                                                                     |
|                             | LHL□□□                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Appearance : No abnormality<br>Inductance change : Within $\pm 10\%$<br>Q change : Within $\pm 30\%$ |
|                             | FBA/FBR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                      |
| Test Methods and Remarks    | CAL45 Type :<br>Temperature : $40 \pm 2^\circ\text{C}$<br>Humidity : $90 \sim 95\%RH$<br>Duration : 1000 hrs<br>Applied current : Rated current<br>Recovery : At least 1hr of recovery under the standard removal from test chamber, followed by the measurement within 2hrs.<br>LHL□□□ :<br>Temperature : $40 \pm 2^\circ\text{C}$<br>Humidity : $90 \sim 95\%RH$<br>Duration : $1000 + 48 / -0$ hrs<br>Applied current : Rated current<br>Recovery : 1 to 2hrs of recovery under the standard condition after the removal from the test chamber. |                                                                                                      |

| 26. Loading at high temperature |                                                                                                                                                                                                                                                |                                  |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Specified Value                 | CAL45 Type                                                                                                                                                                                                                                     | $\Delta L/L$ : Within $\pm 10\%$ |
|                                 | LHL□□□                                                                                                                                                                                                                                         |                                  |
|                                 | FBA/FBR                                                                                                                                                                                                                                        |                                  |
| Test Methods and Remarks        | CAL45 Type :<br>Temperature : $85 \pm 2^\circ\text{C}$<br>Duration : 1000 hrs<br>Applied current : Rated current<br>Recovery : At least 1hr of recovery under the standard removal from test chamber, followed by the measurement within 2hrs. |                                  |

| 27. Low temperature life test |                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                      |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Specified Value               | CAL45 Type                                                                                                                                                                                                                                                                                                                                                                                                       | $\Delta L/L$ : Within $\pm 10\%$                                                                     |
|                               | LHL□□□                                                                                                                                                                                                                                                                                                                                                                                                           | Appearance : No abnormality<br>Inductance change : Within $\pm 10\%$<br>Q change : Within $\pm 30\%$ |
|                               | FBA/FBR                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                      |
| Test Methods and Remarks      | CAL45 Type :<br>Temperature : $-25 \pm 2^\circ\text{C}$<br>Duration : 1000 hrs<br>Recovery : At least 1hr of recovery under the standard removal from test chamber, followed by the measurement within 2hrs.<br>LHL□□□ :<br>Temperature : $-40 \pm 3^\circ\text{C}$<br>Duration : $1000 + 48 / -0$ hrs<br>Recovery : 1 to 2hrs of recovery under the standard condition after the removal from the test chamber. |                                                                                                      |

| 28. High temperature life test |                                                                                                                                                                                                  |                                                                                                      |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Specified Value                | CAL45 Type                                                                                                                                                                                       |                                                                                                      |
|                                | LHL□□□                                                                                                                                                                                           | Appearance : No abnormality<br>Inductance change : Within $\pm 10\%$<br>Q change : Within $\pm 30\%$ |
|                                | FBA/FBR                                                                                                                                                                                          |                                                                                                      |
| Test Methods and Remarks       | LHL□□□ :<br>Temperature : $105 \pm 2^\circ\text{C}$<br>Duration : $1000 + 48 / -0$ hrs<br>Recovery : 1 to 2hrs of recovery under the standard condition after the removal from the test chamber. |                                                                                                      |

# AXIAL LEADED INDUCTORS (CAL Type)、 RADIAL LEADED INDUCTORS (LH Type)、 LEADED FERRITE BEAD INDUCTORS (FB Series A Type/R Type)

## ■ PRECAUTIONS

| 1. Circuit Design                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Precautions                               | <p>◆Operating environment</p> <p>1. The products described in this specification are intended for use in general electronic equipment,(office supply equipment, telecommunications systems, measuring equipment, and household equipment). They are not intended for use in mission-critical equipment or systems requiring special quality and high reliability (traffic systems, safety equipment, aerospace systems, nuclear control systems and medical equipment including life-support systems,) where product failure might result in loss of life, injury or damage. For such uses, contact TAIYO YUDEN Sales Department in advance.</p>                                                                                                                                                                                     |
| 2. PCB Design                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Precautions                               | <p>◆Design</p> <p>1. Please design insertion pitches as matching to that of leads of the component on PCBs.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Technical considerations                  | <p>◆Design</p> <p>1. When Inductors are mounted onto a PC board, hole dimensions on the board should match the lead pitch of the component, if not, it will cause breakage of the terminals or cracking of terminal roots covered with resin as excess stress travels through the terminal legs.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 3. Considerations for automatic placement |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Precautions                               | <p>◆Adjustment of mounting machine</p> <p>1. Excessive impact load should not be imposed on the products when mounting onto the PC boards.<br/>2. Mounting and soldering conditions should be checked beforehand.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Technical considerations                  | <p>◆Adjustment of mounting machine</p> <p>1. When installing products, care should be taken not to apply distortion stress as it may deform the products.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 4. Soldering                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Precautions                               | <p>◆Wave soldering</p> <p>1. Please refer to the specifications in the catalog for a wave soldering.<br/>2. Do not immerse the entire inductor in the flux during the soldering operation.</p> <p>◆Lead free soldering</p> <p>1. When using products with lead free soldering, we request to use them after confirming adhesion, temperature of resistance to soldering heat, soldering etc sufficiently.</p> <p>◆Recommended conditions for using a soldering iron:</p> <ul style="list-style-type: none"> <li>•Put the soldering iron on the land-pattern.</li> <li>•Soldering iron's temperature – Below 350°C</li> <li>•Duration – 3 seconds or less</li> <li>•The soldering iron should not directly touch the inductor.</li> </ul> <p>◆Reflow soldering</p> <p>1. As for reflow soldering, please contact our sales staff.</p> |
| Technical considerations                  | <p>◆Lead free soldering</p> <p>1. If products are used beyond the range of the recommended conditions, heat stresses may deform the products, and consequently degrade the reliability of the products.</p> <p>◆Recommended conditions for using a soldering iron</p> <p>If products are used beyond the range of the recommended conditions, heat stresses may deform the products, and consequently degrade the reliability of the products.</p>                                                                                                                                                                                                                                                                                                                                                                                   |
| 5. Cleaning                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Precautions                               | <p>◆Cleaning conditions</p> <p>1. CAL type, LH type<br/>Please do not do cleaning by a supersonic wave.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Technical considerations                  | <p>◆Cleaning conditions</p> <p>1. CAL type, LH type,<br/>If washing by supersonic waves, supersonic waves may deform products.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

▶ This catalog contains the typical specification only due to the limitation of space. When you consider the purchase of our products, please check our specification. For details of each product (characteristics graph, reliability information, precautions for use, and so on), see our Web site (<http://www.ty-top.com/>).



| 6. Handling              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Precautions              | <ul style="list-style-type: none"> <li>◆ Handling               <ol style="list-style-type: none"> <li>1. Keep the inductors away from all magnets and magnetic objects.</li> </ol> </li> <li>◆ Mechanical considerations               <ol style="list-style-type: none"> <li>1. Please do not give the inductors any excessive mechanical shocks.</li> <li>2. LH type                   <ul style="list-style-type: none"> <li>If inductors are dropped onto the floor or a hard surface they should not be used.</li> </ul> </li> </ol> </li> <li>◆ Packing               <ol style="list-style-type: none"> <li>1. Please do not give the inductors any excessive mechanical shocks.                   <ul style="list-style-type: none"> <li>In loading, please pay attention to handling indication mentioned in a packing box (a loading direction / number of maximum loading / fragile item).</li> </ul> </li> </ol> </li> </ul> |
| Technical considerations | <ul style="list-style-type: none"> <li>◆ Handling               <ol style="list-style-type: none"> <li>1. There is a case that a characteristic varies with magnetic influence.</li> </ol> </li> <li>◆ Mechanical considerations               <ol style="list-style-type: none"> <li>1. There is a case to be damaged by a mechanical shock.</li> <li>2. LH type                   <ul style="list-style-type: none"> <li>There is a case to be broken by a fall.</li> </ul> </li> </ol> </li> <li>◆ Packing               <ol style="list-style-type: none"> <li>1. There is a case that a lead wire could be deformed by a fall or an excessive shock.</li> </ol> </li> </ul>                                                                                                                                                                                                                                                          |
| 7. Storage conditions    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Precautions              | <ul style="list-style-type: none"> <li>◆ Storage               <ol style="list-style-type: none"> <li>1. To maintain the solderability of terminal electrodes and to keep the packing material in good condition, temperature and humidity in the storage area should be controlled.                   <ul style="list-style-type: none"> <li>Recommended conditions</li> <li>• Ambient temperature 0~40°C</li> <li>• Humidity Below 70% RH</li> </ul> </li> </ol> <p>The ambient temperature must be kept below 30°C. Even under ideal storage conditions, solderability of products electrodes may decrease as time passes.</p> <p>For this reason, inductors should be used within one year from the time of delivery.</p> <p>In case of storage over 6 months, solderability shall be checked before actual usage.</p> </li></ul>                                                                                                     |
| Technical considerations | <ul style="list-style-type: none"> <li>◆ Storage               <ol style="list-style-type: none"> <li>1. Under a high temperature and humidity environment, problems such as reduced solderability caused by oxidation of terminal electrodes and deterioration of taping/packaging materials may take place.</li> </ol> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



## JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

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