

Notice for TAIYO YUDEN products

Please read this notice before using the TAIYO YUDEN products.

REMINDERS

- Product information in this catalog is as of October 2013. All of the contents specified herein are subject to change without notice due to technical improvements, etc. Therefore, please check for the latest information carefully before practical application or usage of the Products.

Please note that TAIYO YUDEN CO., LTD. shall not be responsible for any defects in products or equipment incorporating such products, which are caused under the conditions other than those specified in this catalog or individual specification.

- Please contact TAIYO YUDEN CO., LTD. for further details of product specifications as the individual specification is available.

- Please conduct validation and verification of products in actual condition of mounting and operating environment before commercial shipment of the equipment.

- All electronic components or functional modules listed in this catalog are developed, designed and intended for use in general electronics equipment.(for AV, office automation, household, office supply, information service, telecommunications, (such as mobile phone or PC) etc.). Before incorporating the components or devices into any equipment in the field such as transportation,(automotive control, train control, ship control), transportation signal, disaster prevention, medical, public information network (telephone exchange, base station) etc. which may have direct influence to harm or injure a human body, please contact TAIYO YUDEN CO., LTD. for more detail in advance.

Do not incorporate the products into any equipment in fields such as aerospace, aviation, nuclear control, submarine system, military, etc. where higher safety and reliability are especially required.

In addition, even electronic components or functional modules that are used for the general electronic equipment, if the equipment or the electric circuit require high safety or reliability function or performances, a sufficient reliability evaluation check for safety shall be performed before commercial shipment and moreover, due consideration to install a protective circuit is strongly recommended at customer's design stage.

- The contents of this catalog are applicable to the products which are purchased from our sales offices or distributors (so called "TAIYO YUDEN' s official sales channel").

It is only applicable to the products purchased from any of TAIYO YUDEN' s official sales channel.

- Please note that TAIYO YUDEN CO., LTD. shall have no responsibility for any controversies or disputes that may occur in connection with a third party's intellectual property rights and other related rights arising from your usage of products in this catalog. TAIYO YUDEN CO., LTD. grants no license for such rights.

- Caution for export

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

LEADED COMMON MODE CHOKE COILS FOR DC AND SIGNAL LINES



WAVE

■ PARTS NUMBER

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

[TLF Type]

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T | L | F | △ | 9 | U | B | H | 3 | 0 | 2 | W | K | 1 |
| ① | ② | ③ | ④ | ⑤ | ⑥ | | | | | | | | |

△ = Blank space

① Series name

| Code | Series name |
|------|------------------------|
| TLF | Common mode choke coil |

② Dimensions of core

| Code | Dimensions of core [mm] |
|------|-------------------------|
| △9 | 9 |

③ Shape

| Code | Shape |
|------|----------------------------------|
| UB△ | U core, vertically split wound |
| UBH | U core, horizontally split wound |

④ Nominal Inductance

| Code (example) | Nominal Inductance [μH] |
|----------------|-------------------------|
| 302 | 3000 |
| 203 | 20000 |

⑤ Inductance tolerance

| Code | Inductance tolerance |
|------|----------------------|
| W | +100/-10% |

⑥ Internal code

| Code | Internal code |
|------|-------------------|
| K1 | Adhesive fixation |

[BU Type]

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| B | U | 0 | 8 | R | A | △ | 1 | 1 | △ |
| ① | ② | ③ | ④ | ⑤ | | | | | |

△ = Blank space

① Series name

| Code | Series name |
|------|------------------------|
| BU | Common mode choke coil |

② Dimensions of core

| Code | Dimensions of core [mm] |
|------|-------------------------|
| 08 | 8.0 |

③ Shape

| Code | Shape |
|------|------------------|
| RA | Double-wire lead |

④ Product classification code

| Code | Product classification code |
|---------|-----------------------------|
| △01~△20 | Product classification code |

⑤ Internal code

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

■ STANDARD EXTERNAL DIMENSIONS / MINIMUM QUANTITY

| TLF 9UB Type | TLF 9UBH Type | BU08RA Type |
|---|---|--|
| <p>11.0max (0.433max) 17.0max (0.669max) 16.0max (0.630max) φ0.6 (φ0.024) 4.5±1.0 8.0±0.5 (0.315±0.020) 1.0±0.5 (0.276±0.020)</p> <p>Minimum Quantity (pcs.) Box: 500</p> | <p>15.0max (0.591max) 17.0max (0.669max) 12.0max (0.472max) φ0.6 (φ0.024) 4.5±1.0 8.0±0.5 (0.315±0.020) 1.0±0.5 (0.276±0.020)</p> <p>Minimum Quantity (pcs.) Box: 500</p> | <p>11.0max (0.433max) 7.0max (0.276max)</p> <p>Minimum Quantity (pcs.) Bulk: 200</p> |

Unit: mm (inch)

■ PARTS NUMBER

| Parts number | EHS | Number of lines | Nominal inductance [mH] | Inductance tolerance | DC Resistance [Ω] (max.) | Rated current [A] (max.) | Rated voltage [V] (D.C.) | Insulation resistance [MΩ] (min.) |
|-----------------|------|-----------------|-------------------------|----------------------|--------------------------|--------------------------|--------------------------|-----------------------------------|
| TLF 9UBH302W K1 | RoHS | 2 | 3.0 | +100/-10% | 1.5 | 0.40 | 50 | 100 |
| TLF 9UB 302W K1 | RoHS | 2 | 3.0 | +100/-10% | 1.5 | 0.40 | 50 | 100 |
| TLF 9UBH802W K1 | RoHS | 2 | 8.0 | +100/-10% | 3.0 | 0.30 | 50 | 100 |
| TLF 9UB 802W K1 | RoHS | 2 | 8.0 | +100/-10% | 3.0 | 0.30 | 50 | 100 |
| TLF 9UBH203W K1 | RoHS | 2 | 20.0 | +100/-10% | 6.5 | 0.18 | 50 | 100 |
| TLF 9UB 203W K1 | RoHS | 2 | 20.0 | +100/-10% | 6.5 | 0.18 | 50 | 100 |

| Parts number | EHS | Number of lines | Nominal inductance [μH] | Inductance Measuring frequency [kHz] | Impedance [Ω] (typ.) | Impedance Measuring frequency [MHz] | DC Resistance [Ω] (max.) | Rated current [A] (max.) | Rated voltage [V] (D.C.) | Insulation resistance [MΩ] (min.) |
|--------------|------|-----------------|-------------------------|--------------------------------------|----------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|-----------------------------------|
| BU08RA 11 | RoHS | 2 | 0.7~1.3 | 1 | 1000 | 250 | 0.013 | 4.0 | 50 | 100 |
| BU08RA 16 | RoHS | 2 | 1.19~2.21 | 1 | 1200 | 200 | 0.011 | 3.0 | 50 | 100 |

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LEADED COMMON MODE CHOKE COILS FOR DC AND SIGNAL LINES

LEADED COMMON MODE CHOKE COILS FOR AC LINES

PACKAGING

① Minimum Quantity

● BU Type

| Type | Minimum Quantity [pcs] | |
|----------|------------------------|------|
| | Box | Bulk |
| BU08RA□□ | — | 200 |

● TLH/TLF Type

| Type | Minimum Quantity [pcs] | |
|----------|------------------------|--|
| | Box | |
| TLH10UA□ | 1000 | |
| TLH10UB | | |
| TLF10UAH | | |
| TLF9UA□ | 500 | |
| TLF9UB□ | | |
| TLF14CB□ | | |
| TLF24HB□ | | |

LEADED COMMON MODE CHOKE COILS FOR DC AND SIGNAL LINES, LEADED COMMON MODE CHOKE COILS FOR AC LINES

RELIABILITY DATA

| 1. Operating Temperature Range | | |
|------------------------------------|--|--------------------------------|
| Specified Value | BU—RA Type | -25 ~ + 105°C |
| | TLH, TLF Type | |
| Test Method and Remarks | Including temperature rise due to self-generated heat. | |
| 2. Storage temperature range | | |
| Specified Value | BU—RA Type | -40 ~ + 85°C |
| | TLH, TLF Type | |
| 3. Rated current | | |
| Specified Value | BU—RA Type | Within the specified range |
| | TLH, TLF Type | |
| Test Method and Remarks | TLH10U, TLF10UA : The maximum value of AC current within the temperature rise of 60°C TLF9UA, 14CB, 24HB : The maximum value of AC current within the temperature rise of 45°C TLF9UB : The maximum value of DC current within the temperature rise of 45°C | |
| 4. Inductance | | |
| Specified Value | BU—RA Type | Within the specified tolerance |
| | TLH, TLF Type | |
| Test Method and Remarks | BU—RA Measuring equipment : HP4262A TLF9U : Measuring equipment : LCR meter 4284A or its equivalent Measuring frequency : 1kHz Measuring voltage : 1Vrms TLH, TLF (except TLF9U) : Measuring equipment : LCR meter 4284A or its equivalent Measuring frequency : 1kHz Measuring voltage : 0.1Vrms | |
| 5. DC resistance | | |
| Specified Value | BU—RA Type | Within the specified tolerance |
| | TLH, TLF Type | |
| Test Method and Remarks | Measuring equipment : DC ohmmeter | |
| 6. Terminal strength tensile force | | |
| Specified Value | BU—RA Type | No abnormality |
| | TLH, TLF Type | |
| Test Method and Remarks | BU—RA: Apply the stated tensile force gradually in the direction to draw terminal 5N, 10±1sec. | |
| | TLH10UA, TLH10UB, TLF9U : Apply the stated tensile force gradually in the direction to draw terminal. | |
| | force [N] | duration [s] |
| | 5 | 30±5 |
| Test Method and Remarks | TLH10UAH, TLF (except TLF9U): Apply the stated tensile force gradually in the direction to draw terminal. | |
| | force [N] | duration [s] |
| | 10 | 30±5 |

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| 7. Insulation resistance between wires | | |
|--|---|---|
| Specified Value | BU—RA Type | 100M Ω min. |
| | TLH, TLF Type | |
| Test Method and Remarks | Applied voltage : 50VDC (BU—RA, : 500VDC (TLH, TLF (except TLF9UB)) : 250VDC (TLF9UB) Duration : 60sec. | |
| 8. Insulation resistance between wire and core | | |
| Specified Value | BU—RA Type | 100M Ω min.(except TLH, TLF10UAH Type) |
| | TLH, TLF Type | |
| Test Method and Remarks | TLF : Applied voltage : 500VDC (TLF (except TLF9UB)) : 250VDC (TLF9UB) Duration : 60 sec. | |
| 9. Withstanding : between wires | | |
| Specified Value | BU—RA Type | No abnormality |
| | TLH, TLF Type | |
| Test Method and Remarks | Applied voltage : 250VDC (BU—RA) : 2000VAC (TLH, TLF (except TLF9UB)) : 500VDC (TLF9UB) Duration : 60sec. | |
| 10. Withstanding : between wires and core | | |
| Specified Value | BU—RA Type | No abnormality(except TLH, TLF10UAH Type) |
| | TLH, TLF Type | |
| Test Method and Remarks | TLF : Applied voltage : 2000VAC (TLF (except TLF9UB)) : 500VDC (TLF9UB) Duration : 60sec. | |
| 11. Rated voltage | | |
| Specified Value | BU—RA Type | Within the specified range |
| | TLH, TLF Type | |
| Test Method and Remarks | TLH, TLF (except TLF9UB) : 250VAC BU—RA,TLF9UB : 50VDC | |
| 12. Resistance to vibration | | |
| Specified Value | BU—RA Type | TLF9U : Inductance change : Within $\pm 5\%$ TLH, TLF (except TLF9U) : Appearance is no abnormality and within the specified range |
| | TLH, TLF Type | |
| Test Method and Remarks | BU—RA,TLH, TLF : According to JIS C 0040 Direction : 2hrs each in X, Y and Z direction Total : 6hrs Frequency range : 10 to 55 to 10Hz (1 min.) Amplitude : 1.5mm (shall not exceed acceleration 196m/s ²) Mounting method : soldering onto PC board Recovery : At least 1hr of recovery under the standard condition after the removal from test chamber, followed by the measurement within 2hrs. (TLH, TLF) | |

| 13. Solderability | | |
|----------------------------------|--|--|
| Specified Value | BU—RA Type | At least 75% of terminal electrode is covered by new solder. |
| | TLH, TLF Type | At least 90% of terminal electrode is covered by new solder. |
| Test Method and Remarks | TLH, TLF : Solder temperature : 235±0.5°C Duration : 2±0.5sec. Immersion depth : Up to 1.5 to 2.0mm from PBC mounted level. | |
| | TLH, TLF : Solder temperature : 245±5°C Duration : 4±1sec. Immersion depth : Up to 1.0 to 1.5mm from PBC mounted level. | |
| 14. Resistance to soldering heat | | |
| Specified Value | BU—RA Type | Appearance : No abnormality Inductance change : Within ±15% |
| | TLH, TLF Type | TLF9UA : Inductance change : Within ±5% TLF14CB : Appearance is no abnormality and within the specified range |
| Test Method and Remarks | TLH, TLF : Solder temperature : 260±5°C Duration : 5±0.5sec. Immersion depth : Up to 1.5 to 2.0mm from PBC mounted level. Recovery : At least 1hr of recovery under the standard condition after the removal from test chamber, followed by the measurement within 2hrs. | |
| | TLH, TLF : Solder temperature : 260±5°C Duration : 10±1sec. Immersion depth : Up to 1.0 to 1.5mm from PBC mounted level. Recovery : At least 1hr of recovery under the standard condition after the removal from test chamber, followed by the measurement within 2hrs. | |
| 15. Thermal shock | | |
| Specified Value | BU—RA Type | Appearance : No abnormality Inductance change : Within ±15% |
| | TLH, TLF Type | TLF9UA : Inductance change : Within ±15% TLH, TLF (except TLF9UA) : Withstanding voltage : No abnormality Insulation resistance : No abnormality |
| Test Method and Remarks | BU—RA, TLH, TLF : According to JIS C 0025 Conditions for 1 cycle -25°C~+85°C, keep each 30min Number of cycles : 10 Recovery : At least 1hr of recovery under the standard condition after the removal from test chamber, followed by the measurement within 2 hrs. | |
| 16. Damp heat | | |
| Specified Value | BU—RA Type | |
| | TLH, TLF Type | TLF9UA : Inductance change : Within ±15% TLH, TLF (except TLF9UA) : Withstanding voltage : No abnormality Insulation resistance : No abnormality |
| Test Method and Remarks | TLH, TLF : Temperature : 60±2°C : 40±2°C (※except TLF9U) Humidity : 90~95%RH Duration : 500 hrs Recovery : At least 1hr of recovery under the standard removal from test chamber followed by the measurement within 2 hrs. | |

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| 17. Loading under damp heat | | | | | |
|-----------------------------|---|---|--------|--------|--------|
| Specified Value | BU—RA Type | Appearance : No abnormality Inductance change : Within $\pm 15\%$ | | | |
| | TLH, TLF Type | Withstanding voltage : No abnormality Insulation resistance : No abnormality | | | |
| Test Method and Remarks | BU—RA : Temperature : $40 \pm 2^\circ\text{C}$ Humidity : $90 \sim 95\% \text{RH}$ Applied current : 500 hrs Apply rated current across windings (※except TLF9U) Recovery : At least 1hr of recovery under the standard removal from test chamber followed by the measurement within 2 hrs. | | | | |
| | TLH, TLF : Temperature : $60 \pm 2^\circ\text{C}$: $40 \pm 2^\circ\text{C}$ (※except TLF9U) Humidity : $90 \sim 95\% \text{RH}$ Duration : 100 hrs : 500 hrs Apply rated current across windings (※except TLF9U) Applied voltage : Apply the following specified voltage between windings. <table border="1" style="margin-left: 40px; margin-top: 5px;"> <tr> <td>TLF9UA</td> <td>250VAC</td> </tr> <tr> <td>TLF9UB</td> <td>50VDC</td> </tr> </table> Recovery : At least 1hr of recovery under the standard removal from test chamber followed by the measurement within 2 hrs. | | TLF9UA | 250VAC | TLF9UB |
| TLF9UA | 250VAC | | | | |
| TLF9UB | 50VDC | | | | |

| 18. Low temperature life test | | |
|-------------------------------|---|--|
| Specified Value | BU—RA Type | Appearance : No abnormality Inductance change : Within $\pm 15\%$ |
| | TLH, TLF Type | TLF9U : Inductance change : Within $\pm 15\%$ TLH, TLF (except TLF9U) : Withstanding voltage : No abnormality Insulation resistance : No abnormality |
| Test Method and Remarks | BU—RA, TLH, TLF : Temperature : $-25 \pm 2^\circ\text{C}$: $-40 \pm 2^\circ\text{C}$ (※TLF•TLH) Duration : 500 hrs Recovery : At least 1hr of recovery under the standard removal from test chamber followed by the measurement within 2 hrs. | |

| 19. High Temperature life test | | |
|--------------------------------|--|--|
| Specified Value | BU—RA Type | Appearance : No abnormality Inductance change : Within $\pm 15\%$ |
| | TLH, TLF Type | TLF9U : Inductance change : Within $\pm 15\%$ TLH, TLF (except TLF9U) : Withstanding voltage : No abnormality Insulation resistance : No abnormality |
| Test Method and Remarks | BU—RA, TLH, TLF : Temperature : $85 \pm 2^\circ\text{C}$ (※ BU—RA) : $105 \pm 3^\circ\text{C}$ (※ TLF•TLH) Duration : 500 hrs Recovery : At least 1hr of recovery under the standard removal from test chamber followed by the measurement within 2 hrs. | |

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LEADED COMMON MODE CHOKE COILS FOR DC AND SIGNAL LINES, LEADED COMMON MODE CHOKE COILS FOR AC LINES

■ PRECAUTIONS

| 1. Circuit Design | |
|--------------------------|---|
| Precautions | <ul style="list-style-type: none"> ◆Operating environment <ol style="list-style-type: none"> 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. |
| 2. PCB Design | |
| Precautions | <ul style="list-style-type: none"> ◆Design <ol style="list-style-type: none"> 1. Please design insertion pitches as matching to that of leads of the component on PCBs. |
| Technical considerations | <ul style="list-style-type: none"> ◆Design <ol style="list-style-type: none"> 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. |
| 3. Soldering | |
| Precautions | <ul style="list-style-type: none"> ◆Wave soldering <ol style="list-style-type: none"> 1. Please refer to the specifications in the catalog for a wave soldering. 2. Do not immerse the entire inductor in the flux during the soldering operation. ◆Lead free soldering <ol style="list-style-type: none"> 1. When using products with lead free soldering, we request to use them after confirming of adhesion, temperature of resistance to soldering heat, etc. sufficiently. ◆Recommended conditions for using a soldering iron <ul style="list-style-type: none"> • Put the soldering iron on the land-pattern. • Soldering iron's temperature – Below 350°C • Duration – 3 seconds or less • The soldering iron should not directly touch the product. |
| Technical considerations | <ul style="list-style-type: none"> ◆Lead free soldering <ol style="list-style-type: none"> 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. ◆Recommended conditions for using a soldering iron <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> |
| 4. Cleaning | |
| Precautions | <ul style="list-style-type: none"> ◆Cleaning conditions <ol style="list-style-type: none"> 1. TLF type <p>Please contact any of our offices for about a cleaning.</p> |
| 5. Handling | |
| Precautions | <ul style="list-style-type: none"> ◆Handling <ol style="list-style-type: none"> 1. Keep the product away from all magnets and magnetic objects. ◆Mechanical considerations <ol style="list-style-type: none"> 1. Please do not give the product any excessive mechanical shocks. 2. TLF type <p>Please do not add any shock or power to a product in transportation.</p> ◆Packing <ol style="list-style-type: none"> 1. Please do not give the product any excessive mechanical shocks. <p>In loading, please pay attention to handling indication mentioned in a packing box (a loading direction / number of maximum loading / fragile item).</p> |
| Technical considerations | <ul style="list-style-type: none"> ◆Handling <ol style="list-style-type: none"> 1. There is a case that a characteristic varies with magnetic influence. ◆Mechanical considerations <ol style="list-style-type: none"> 1. There is a case to be damaged by a mechanical shock. 2. TLF type <p>There is a case to be broken by a fall.</p> ◆Packing <ol style="list-style-type: none"> 1. There is a case that a lead route turns at by a fall or an excessive shock. |

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6. Storage conditions

| | |
|--------------------------|--|
| Precautions | <p>◆Storage</p> <p>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.</p> <ul style="list-style-type: none">• Recommended conditions <p>Ambient temperature : 0~40°C Humidity : Below 70% RH</p> <p>The ambient temperature must be kept below 30°C. Even under ideal storage conditions, the solderability of electrodes decreases gradually, so the products should be mounted 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> |
| Technical considerations | <p>◆Storage</p> <p>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.</p> |

Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

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