Notice for TAIYO YUDEN products

Please read this notice before using the TAIYO YUDEN products.

/!\ REMINDERS

Product Information in this Catalog

Product information in this catalog is as of January 2021. All of the contents specified herein and production status of the products listed in this catalog are subject to change without notice due to technical improvement of our products, etc. Therefore, please check for the latest information carefully before practical application or use of our products.

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.

Approval of Product Specifications

Please contact TAIYO YUDEN for further details of product specifications as the individual product specification sheets are available. When using our products, please be sure to approve our product specifications or make a written agreement on the product specification with TAIYO YUDEN in advance.

Pre-Evaluation in the Actual Equipment and Conditions

Please conduct validation and verification of our products in actual conditions of mounting and operating environment before using our products.

Limited Application

1. Equipment Intended for Use

The products listed in this catalog are intended for general-purpose and standard 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 other equipment specified in this catalog or the individual product specification sheets.

TAIYO YUDEN has the line-up of the products intended for use in automotive electronic equipment, telecommunications infrastructure and industrial equipment, or medical devices classified as GHTF Classes A to C (Japan Classes I to III). Therefore, when using our products for these equipment, please check available applications specified in this catalog or the individual product specification sheets and use the corresponding products.

2. Equipment Requiring Inquiry

Please be sure to contact TAIYO YUDEN for further information before using the products listed in this catalog for the following equipment (excluding intended equipment as specified in this catalog or the individual product specification sheets) which may cause loss of human life, bodily injury, serious property damage and/or serious public impact due to a failure or defect of the products and/or malfunction attributed thereto.

- (1) Transportation equipment (automotive powertrain control system, train control system, and ship control system, etc.)
- (2) Traffic signal equipment
- (3) Disaster prevention equipment, crime prevention equipment
- (4) Medical devices classified as GHTF Class C (Japan Class III)
- (5) Highly public information network equipment, dataprocessing equipment (telephone exchange, and base station, etc.)
- (6) Any other equipment requiring high levels of quality and/or reliability equal to the equipment listed above

3. Equipment Prohibited for Use

Please do not incorporate our products into the following equipment requiring extremely high levels of safety and/or reliability.

- (1) Aerospace equipment (artificial satellite, rocket, etc.)
- (2) Aviation equipment *1
- (3) Medical devices classified as GHTF Class D (Japan Class IV), implantable medical devices *2

- (4) Power generation control equipment (nuclear power, hydroelectric power, thermal power plant control system, etc.)
- (5) Undersea equipment (submarine repeating equipment, underwater work equipment, etc.)
- (6) Military equipment
- (7) Any other equipment requiring extremely high levels of safety and/or reliability equal to the equipment listed above

*Notes

- 1. 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.
- Implantable medical devices contain not only internal unit which is implanted in a body, but also external unit which is connected to the internal unit.

4. Limitation of Liability

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 that is not intended for use by TAIYO YUDEN, or any equipment requiring inquiry to TAIYO YUDEN or prohibited for use by TAIYO YUDEN as described above.

Safety Design

When using our products for high safety and/or reliability-required equipment or circuits, please fully perform safety and/or reliability evaluation. In addition, please install (i) systems equipped with a protection circuit and a protection device and/or (ii) systems equipped with a redundant circuit or other system to prevent an unsafe status in the event of a single fault for a failsafe design to ensure safety.

Intellectual Property Rights

Information contained in this catalog is intended to convey examples of typical performances and/or applications of our products and is not intended to make any warranty with respect to the intellectual property rights or any other related rights of TAIYO YUDEN or any third parties nor grant any license under such rights.

Limited Warranty

Please note that the scope of warranty for our products is limited to the delivered our products themselves and TAIYO YUDEN shall not be in any way responsible for any damages resulting from a failure or defect in our products. Notwithstanding the foregoing, if there is a written agreement (e.g., supply and purchase agreement, quality assurance agreement) signed by TAIYO YUDEN and your company, TAIYO YUDEN will warrant our products in accordance with such agreement.

■ TAIYO YUDEN's Official Sales Channel

The contents of this catalog are applicable to our products which are purchased from our sales offices or authorized distributors (hereinafter "TAIYO YUDEN's official sales channel"). Please note that the contents of this catalog are not applicable to our products purchased from any seller other than TAIYO YUDEN's official sales channel.

Caution for Export

2021

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.

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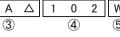
EADED COMMON MODE CHOKE COILS FOR AC LINES

PARTS NUMBER

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

△=Blank space







①Series name

Code	Series name
TLF	Common mode choke
TLH	Hybrid choke

E/Dimensions of core						
Code	Dimensions of core[mm]					
Δ9	9					
10	10					

<u> 3</u> S	hap	е
	C	_

Code	Shape
UA△	U core, vertical type
UAH	U core, horizontal type
UB△	U core, vertically split wound
	•

4 Nominal Inductance

Code (example)	Nominal Inductance[μ H]
102	1000
103	10000

Office tolerance						
	Code	Inductance tolerance				
	Δ	Nominal Values or higher				
	W	+100/-10%				

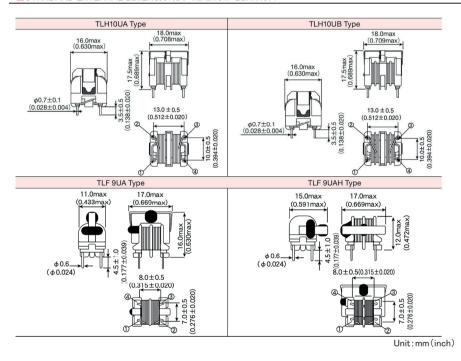
6 Rated current

Code	Rated current[A]		
R54	0.54		
0R8	0.8		

7Internal code

Code	Internal code
K1	Adhesive fixation

■ STANDARD EXTERNAL DIMENSIONS / MINIMUM QUANTITY



Туре	Minimum quantity(pcs.) Box		
TLH type	500		
TLF type	500		

2021

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TLH10UA type(Hybrid choke)

TENTOOA type (nyorid choke)							
Parts number	EHS	Common mode inductance [mH]	Inductance tolerance	Normal mode inductance [mH] (typ.)	DC Resistance $[\Omega]$ (max.)	Rated current [A] (max.)	Rated voltage AC [V] (max.)
TLH10UA 901 2R0	RoHS	0.9	min.	0.067	0.089	2.0	250
TLH10UA 112 1R8	RoHS	1.1	min.	0.087	0.126	1.8	250
TLH10UA 152 1R6	RoHS	1.5	min.	0.126	0.171	1.6	250
TLH10UA 212 1R4	RoHS	2.1	min.	0.160	0.222	1.4	250
TLH10UA 282 1R2	RoHS	2.8	min.	0.215	0.272	1.2	250
TLH10UA 432 1R0	RoHS	4.3	min.	0.330	0.398	1.0	250
TLH10UA 622 0R8	RoHS	6.2	min.	0.430	0.578	0.8	250
TLH10UA 872 0R7	RoHS	8.7	min.	0.644	0.878	0.7	250
TLH10UA 992 0R6	RoHS	9.9	min.	0.836	1.138	0.6	250
TLH10UA 143 0R5	RoHS	14	min.	1.256	1.567	0.5	250

TLH10UB type(Hybrid choke)

Parts number	EHS	Common mode inductance [mH]	Inductance tolerance	Normal mode inductance [mH] (typ.)	DC Resistance [Ω](max.)	Rated current [A] (max.)	Rated voltage AC [V] (max.)
TLH10UB 701 2R0	RoHS	0.7	min.	0.056	0.097	2.0	250
TLH10UB 112 1R7	RoHS	1.1	min.	0.068	0.133	1.7	250
TLH10UB 142 1R4	RoHS	1.4	min.	0.113	0.214	1.4	250
TLH10UB 232 1R2	RoHS	2.3	min.	0.150	0.274	1.2	250
TLH10UB 352 1R0	RoHS	3.5	min.	0.232	0.422	1.0	250
TLH10UB 442 0R8	RoHS	4.4	min.	0.328	0.624	0.8	250
TLH10UB 872 0R7	RoHS	8.7	min.	0.580	0.982	0.7	250
TLH10UB 972 0R6	RoHS	9.7	min.	0.735	1.314	0.6	250
TLH10UB 113 0R5	RoHS	11	min.	0.877	1.577	0.5	250

TLF 9UA type

▼1El Cont type							
	Parts number	EHS	Common mode inductance [mH]	Inductance tolerance	DC Resistance $[\Omega]$ (max.)	Rated current [A] (max.)	Rated voltage AC [V] (max.)
	TLF 9UA 102W0R8K1	RoHS	1.0	+100/-10%	0.5	0.80	250
	TLF 9UA 202WR54K1	RoHS	2.0	+100/-10%	1.0	0.54	250
	TLF 9UA 302WR42K1	RoHS	3.0	+100/-10%	1.5	0.42	250
	TLF 9UA 502WR32K1	RoHS	5.0	+100/-10%	2.5	0.32	250
	TLF 9UA 802WR25K1	RoHS	8.0	+100/-10%	4.0	0.25	250
	TLF 9UA 103WR23K1	RoHS	10	+100/-10%	4.5	0.23	250

TLF 9UAH type

Parts number	EHS	Common mode inductance [mH]	Inductance tolerance	DC Resistance [Ω](max.)	Rated current [A] (max.)	Rated voltage AC [V] (max.)
TLF 9UAH102W0R8K1	RoHS	1.0	+100/-10%	0.5	0.80	250
TLF 9UAH202WR54K1	RoHS	2.0	+100/-10%	1.0	0.54	250
TLF 9UAH302WR42K1	RoHS	3.0	+100/-10%	1.5	0.42	250
TLF 9UAH502WR32K1	RoHS	5.0	+100/-10%	2.5	0.32	250
TLF 9UAH802WR25K1	RoHS	8.0	+100/-10%	4.0	0.25	250
TLF 9UAH103WR23K1	RoHS	10	+100/-10%	4.5	0.23	250

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

■PACKAGING

1Minimum Quantity

TLH/TLF Type

Time	Minimum Quantity[pcs]	
Туре	Вох	
TLH10UA	1000	
TLH10UB		
TLF9UA□	E00	
TLF9UB□	300	
TLF9UB□	500	

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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 TLH, TLF Type -25~+ 105°C Test Method and Including temperature rise due to self-generated heat. Remarks 2. Storage temperature range -40~+ 85°C TLH, TLF Type Specified Value 3. Rated current Specified Value TLH, TLF Type Within the specified range TLH10U : The maximum value of AC current within the temperature rise of 60°C Test Method and TLF9UA : The maximum value of AC current within the temperature rise of 45°C Remarks TLF9UB : The maximum value of DC current within the temperature rise of 45°C 4. Inductance Specified Value TLH, TLF Type Within the specified tolerance TI F9U: : LCR meter 4284A or its equivalent Measuring equipment : 1kHz Measuring frequency Test Method and Measuring voltage : 1Vrms Remarks TLH, TLF(except TLF9U): Measuring equipment : LCR meter 4284A or its equivalent : 1kHz Measuring frequency Measuring voltage : 0.1Vrms 5. DC resistance Specified Value TLH, TLF Type Within the specified tolerance Test Method and : DC ohmmeter Measuring equipment Remarks 6. Terminal strength tensile force Specified Value TLH, TLF Type No abnormality TLH10UA, TLH10UB, TLF9U: Apply the stated tensile force gradually in the direction to draw terminal. force [N] duration [s] 30±5 Test Method and Remarks TLF (except TLF9U): Apply the stated tensile force gradually in the direction to draw terminal. force [N] duration [s] 10 30 ± 5 7. Insulation resistance between wires TLH, TLF Type 100M Ω min. Specified Value : 500VDC (TLH, TLF (except TLF9UB)) Applied voltage Test Method and : 250VDC (TLF9UB) Remarks Duration : 60sec.

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8. Insulation resista	nce between wire and core			
Specified Value	TLH, TLF Type	100MΩ min.(except TLH)		
Test Method and Remarks	TLF: Applied voltage : 500VDC (TLF (excep : 250VDC (TLF9UB) Duration : 60 sec.	t TLF9UB))		
9. Withstanding : be	tween wires			
Specified Value	TLH, TLF Type	No abnormality		
Test Method and Remarks	Applied voltage : 2000VAC (TLH, TLF : 500VDC (TLF9UB) Duration : 60sec	L except TLF9UB))		
10 Withstanding : h	etween wires and core			
Specified Value	TLH, TLF Type	No abnormality(except TLH)		
Test Method and Remarks	TLF: Applied voltage : 2000VAC (TLF (exce : 500VDC (TLF9UB) Duration : 60sec.	t TLF9UB))		
11. Rated voltage				
Specified Value	TLH, TLF Type	Within the specified range		
Test Method and Remarks	TLH, TLF (except TLF9UB) : 250VAC TLF9UB : 50VDC			
12. Resistance to v	ibration			
Specified Value	TLH, TLF Type	TLF9U: Inductance change: Within ±5% TLH, TLF (except TLF9U): Appearance is no abnormality and within the specified range		
Test Method and Remarks	Frequency range : 10 to 55 to 10Hz Amplitude : 1.5mm (shall not Mounting method : soldering onto P0	exceed acceleration 196m/s^2) C board ecovery under the standard condition after the removal from test chamber, followed by the		
13. Solderability				
Specified Value	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 2.0m	nm from PBC mounted level.		
	TLH, TLF: Solder temperature : 245±5°C Duration : 4±1sec. Immersion depth : Up to 1.0 to 1.5m	ım from PBC mounted level.		

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14. Resistance to s	soldering heat			
Specified Value	TLH, TLF Type	TLF9UA : Inductance change : Within ±5%		
Test Method and Remarks	Recovery : At least 1hr of re measurement with TLH, TLF: Solder temperature : $260\pm5^{\circ}$ C Duration : 10 ± 1 sec. Immersion depth : Up to 1.0 to 1.5mr	n from PBC mounted level. covery under the standard condition after the removal from test chamber, followed by the		
15. Thermal shock				
Specified Value	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: According to JIS C60068-2-14. 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	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.			
17. Loading under o	damp heat			
Specified Value	TLH, TLF Type	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 : 100 hrs : 500 hrs Apply rated current across windings (※except TLF9U) Applied voltage : Apply the following specified voltage between windings. TLF9UA 250VAC TLF9UB 50VDC Recovery : At least 1hr of recovery under the standard removal from test chamber followed by the measurement within 2 hrs			

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18. Low temperature life test				
Specified Value	TLH, TLF Type	TLF9U : Inductance change : Within ±15% TLH, TLF (except TLF9U) : Withstanding voltage : No abnormality Insulation resistance : No abnormality		
Test Method and Remarks	TLH, TLF :	LH) ry under the standard removal from test chamber followed by the measurement within 2 hrs.		

19. High Temperatu	re life test	
Specified Value	TLH, TLF Type	TLF9U: Inductance change: Within ±15% TLH, TLF (except TLF9U): Withstanding voltage: No abnormality Insulation resistance: No abnormality
Test Method and Remarks	TLH, TL F: Temperature : 105±3°C (※ TLF・ Duration : 500 hrs Recovery : At least 1hr of recov	TLH) ery under the standard removal from test chamber followed by the measurement within 2 hrs.

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

PRECAUTIONS

1. Circuit Design Operating environment 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 Precautions 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 **♦**Design Precautions 1. Please design insertion pitches as matching to that of leads of the component on PCBs. Technical 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 considerations cause breakage of the terminals or cracking of terminal roots covered with resin as excess stress travels through the terminal legs. 3. Soldering ◆Wave soldering 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 1. When using products with lead free soldering, we request to use them after confirming of adhesion, temperature of resistance to Precautions soldering heat, etc. sufficiently. ◆Recommended conditions for using a soldering iron · 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. ◆Lead free soldering 1. If products are used beyond the range of the recommended conditions, heat stresses may deform the products, and consequently Technical degrade the reliability of the products. considerations ◆Recommended conditions for using a soldering iron 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. 4. Cleaning Cleaning conditions Precautions 1. Please contact any of our offices for about a cleaning. 5. Handling ◆Handling 1. Keep the product away from all magnets and magnetic objects. ◆Mechanical considerations 1. Please do not give the product any excessive mechanical shocks. Precautions 2. Please do not add any shock or power to a product in transportation. Packing 1. Please do not give the product any excessive mechanical shocks. In loading, please pay attention to handling indication mentioned in a packing box (a loading direction / number of maximum loading / ◆Handling 1. There is a case that a characteristic varies with magnetic influence. Mechanical considerations Technical 1. There is a case to be damaged by a mechanical shock. considerations 2. There is a case to be broken by a fall. ◆Packing

1. There is a case that a lead route turns at by a fall or an excessive shock.

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6. Storage condit	tions
Precautions	 ♦ Storage 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. • Recommended conditions Ambient temperature : 0~40°C Humidity : Below 70% RH The ambient temperature must be kept below 30°C. Even under ideal storage conditions, the solderbility of electrodes decreases gradually, so the products should be mounted within one year from the time of delivery. In case of storage over 6 months, solderability shall be checked before actual usage.
Technical considerations	◆Storage 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.

X-ON Electronics

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UAL21V07012500 UAL21VR0802000 UAL24VR06500CH UALSC023000000 UALSC1020JH000 UALSC1520JH000
UALSU10VR20010 UALSU16VD30030 UALSU16VD40010 UALSU9H0305000 UALSU9HF060300 UALSU9VD070100 36-00037
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PLT10HH501100PNB PLT10HH401100PNB PLT10HH1026R0PNB PE-67531 EXC-X4CH120X TLH10UB 113 0R5 2752041447
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